



**WOOD BUFFALO  
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**Wood Buffalo Environmental Association**

**NOVEMBER 2024  
MONTHLY REPORT**

CONTINUOUS MONITORING

December 23, 2024

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association





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December 23, 2024

Director, Environmental Monitoring and Evaluation Branch  
Alberta Environment and Protected Areas  
11<sup>th</sup> Floor, Oxbridge Place  
9820 106 Street  
Edmonton, Alberta T5K 2J6

**RE: Monthly Ambient Air Quality Monitoring Report November 2024  
Wood Buffalo Environmental Association**

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Enclosed is the November 2024 Ambient Air Quality Monitoring Report for the continuous ambient air quality monitoring stations of the Wood Buffalo Environmental Association (WBEA) regional air quality monitoring network. The WBEA works closely with Alberta Environment and Protected Areas (AEPA) and funding for this work was provided by the Oil Sands Monitoring Program (OSM). It is independent of any position of the OSM Program.

The continuous ambient air quality monitoring network stations are:

AMS 01 – Bertha Ganter – Fort McKay	AMS 19 – Firebag
AMS 02 – Mildred Lake	AMS 20 – MacKay River
AMS 03 – Lower Camp (Meteorology)	AMS 21 – Conklin
AMS 04 – Buffalo Viewpoint	AMS 22 – Janvier
AMS 05 – Mannix	AMS 23 – Fort Hills
AMS 06 – Patricia McInnes	AMS 25 – Waskōw ohci Pimâtisiwin
AMS 07 – Athabasca Valley	AMS 26 – Christina Lake
AMS 08 – Fort Chipewyan	AMS 27 – Jackfish 2/3
AMS 09 – Barge Landing	AMS 29 – Surmont 2
AMS 11 – Lower Camp (Air Quality)	AMS 30 – Ells River
AMS 13 – Fort McKay South	AMS 33 – Monday Creek
AMS 14 – Anzac	AMS 506 – Jackfish 1
AMS 17 – Wapasu	AMS 508 – Kirby North
AMS 18 – Stony Mountain	AMS 512 – Hangingstone Expansion



The WBEA submits this report on behalf of its members and for some members to satisfy the requirements contained in their EPEA Approvals (as amended):

<b>Industry Operators</b>	<b>EPEA Approval No.</b>
Athabasca Oil Corporation	289664-01-00; 241311-01-00
Canadian Natural	153125-01-00; 20809-02-00; 149968-01-05; 224816-01-00; 237382-01-00; 308463-00-00
Cenovus Energy Inc.	48522-02-00; 206355-01-00
Chemtrade Logistics	404827-00-00
CNOOC International	137467-01-00; 236394-01-00
Connacher Oil and Gas Ltd.	240008-01-00
ConocoPhillips	48263-01-00
Greenfire Resources Operating Corporation	153105-01-00
Hammerstone Corporation	189942-01-00
Harvest Operations Corp.	246984-01-00
H.J. Baker Sulphur Canada ULC	426549-00-00
Imperial Oil Ltd.	46586-01-00
Inter Pipeline Ltd.	73203-02-00
IPC Canada Ltd.	301778-00-01
Keyera Energy Ltd.	187-03-03
MEG Energy Corp.	216466-01-00
Parsons Creek Aggregates	231302-00-00
PetroChina Canada Ltd.	254465-00-00
Suncor Energy Inc.	094-03-00; 80105-01-00; 151469-01-00; 48408-02-00
Sunshine Oilsands Ltd.	305529-00-00
Surmont Energy	318401-00-00
Syncrude Canada Ltd.	026-03-00
Titan Tire Reclamation Corporation	364232-00-00
<b>Government and Non-Government Organizations</b>	
Alberta Energy Regulator	Health Canada
Alberta Environment and Protected Areas	Keyano College
Alberta Health	Parks Canada
Alberta Health Services	Regional Municipality of Wood Buffalo
Environment and Climate Change Canada	
<b>Indigenous Communities</b>	
Athabasca Chipewyan First Nation	Fort McKay Métis Nation
Chard Métis Nation	Fort McMurray 468 First Nation
Chipewyan Prairie Dene First Nation	Lakeland Métis
Christina River Dene Nation Council	McMurray Métis
Conklin Resource Development Advisory Committee	Mikisew Cree First Nation
Fort McKay First Nation	

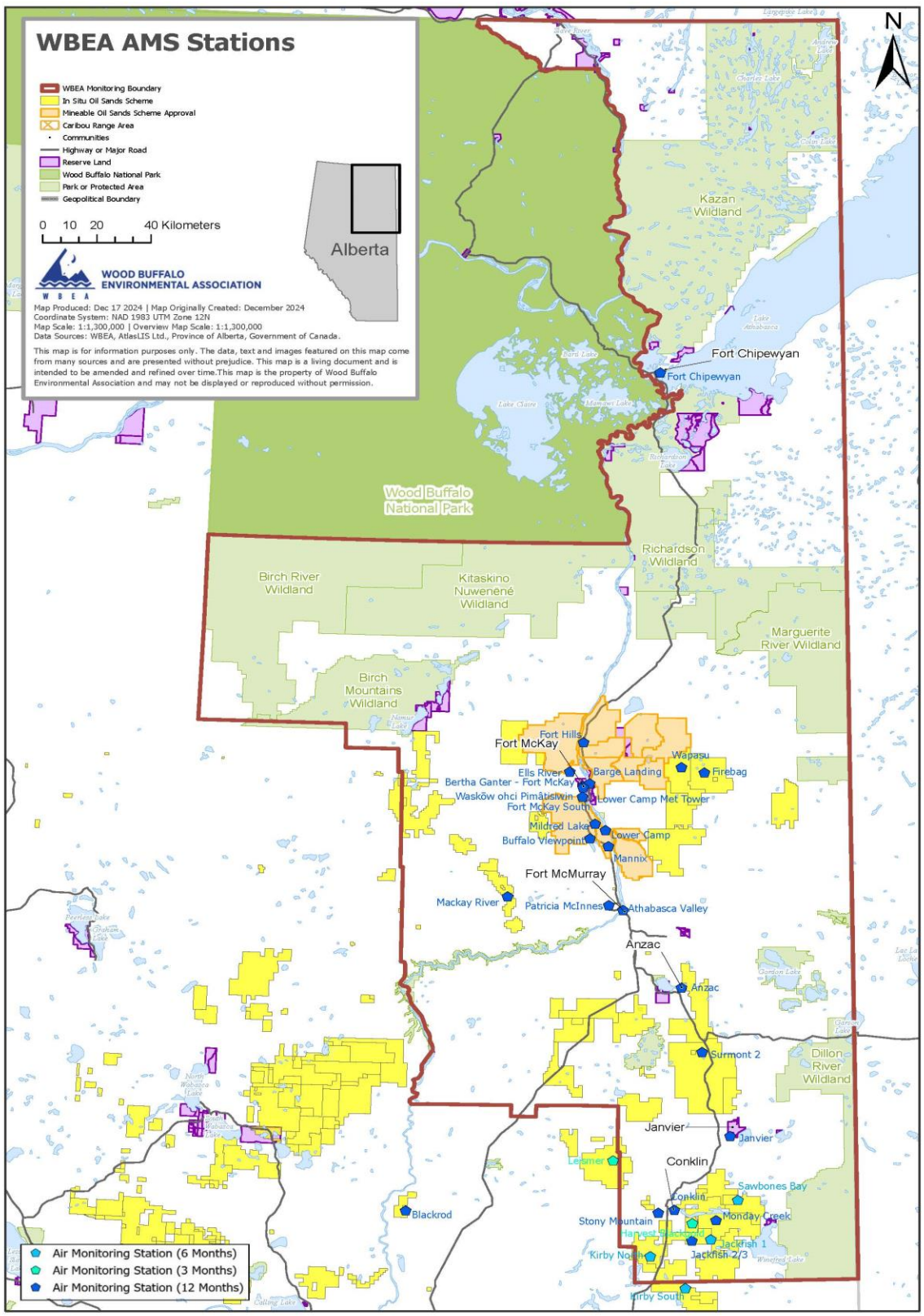


Figure 1. Map of WBEA Continuous Monitoring Network



The following operational notes are provided as per the Air Monitoring Directive requirements.

## 1.0 Concentrations in Excess of Alberta Ambient Air Quality Guidelines and Objectives

There were no ambient concentrations in excess of the Alberta Ambient Air Quality Objectives or Guidelines (AAAQO/AAAQG) as indicated in the Air Monitoring Directive Section RC 15-F for CO, NH<sub>3</sub>, NO<sub>2</sub>, O<sub>3</sub>, PM<sub>2.5</sub> and SO<sub>2</sub>.

There were six ground-level concentrations in excess of the 1-hour H<sub>2</sub>S/TRS objective reported to AEPA; following data validation and processing, the exceedances were confirmed.

There were two ground-level concentrations in excess of the 24-hour H<sub>2</sub>S/TRS objective reported to AEPA; following data validation and processing, the exceedances were confirmed.

Site	Parameter	Date /Time	Reference	Period	Reported	Final	Status*
Lower Camp	H2S	3Nov24, 10:00	434855	1-hr	10	10.7	exc
Lower Camp	H2S	3Nov24, 12:00	434855	1-hr	13	13.6	exc
Lower Camp	H2S	5Nov24, 24:00	434938	1-hr	12	12.2	exc
Lower Camp	H2S	8Nov24, 17:00	435046	1-hr	24	23.9	exc
Lower Camp	H2S	8Nov24, 18:00	435048	1-hr	22	22.1	exc
Lower Camp	H2S	8Nov24, 24:00	435052	24-hr	3	3.4	exc
Lower Camp	H2S	9Nov24, 17:00	435063	1-hr	21	20.8	exc
Lower Camp	H2S	3Nov24, 24:00	436297	24-hr	3	3	late

## 2.0 Data Processing and Validation

Concentrations reported in near real-time are raw values. The final values are determined after processing data for reporting. For all parameters, except PM<sub>2.5</sub>, the final 5-minute data values are determined by subtracting the daily zero responses, interpolated to the time of each raw 5-minute value, from the raw 5-minute data values. The PM<sub>2.5</sub> analyzers do not have the capability of performing zero's, therefore, the raw 5-minute values are validated through a comparison with associated parameters at the same, or a nearby, AMS. The final 5-minute data values are then rounded to one decimal place greater than the reporting precision indicated in the Air Monitoring Directive (AMD). The final 1-hour data values are calculated from final 5-minute data values and then rounded to reporting precision. The final 24-hour data values are calculated from the final 1-hour values.

After data processing and validation, NO<sub>2</sub> concentrations are re-calculated from baseline-corrected NO<sub>x</sub> and NO concentrations. Specifically, the NO concentration is subtracted from the NO<sub>x</sub> concentration to determine the NO<sub>2</sub> concentration.

## 2.1 Revisions to ETS Electronic Transfer System – Data and Monthly Reports

There were no revisions to historical data stored in the Electronic Transfer System with this monthly report.



### 3.0 Operational Status

#### 3.1 Continuous Monitoring

In November 2024, there were 7 instances that resulted in monitoring instruments operating less than 90% of the time.

Station	Parameter	Details
Stony Mountain	Wind Speed (WS) and Wind Direction (WD) at 10-meter elevation	<p>The wind speed and wind direction (WS/WD) sensor at the 10-meter elevation at Stony Mountain AMS operated less than 90% of December 2024, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter 6, Clause DQ 4-C. This incident was reported to Alberta Environment and Protected Areas (AB EPA) on December 17, 2024 (reference number 436182).</p> <p>On December 3, the WS/WD sensor was not reading properly so the tower was lowered for troubleshooting. The pulley mechanism was not operating normally, and in addition, the sensor was frozen to the tower crossarm due to weather conditions. On December 18, the pulley was repaired, and the sensor was properly deployed. Data from the event was invalidated for a total of 340 hours, resulting in a sensor operational time of 46% for December.</p>
		<p>The relative humidity (RH) sensor at the 75m elevation at the Mannix air monitoring station (AMS) operated less than 90% of November 2024, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter 6, Clause DQ 4-C. This incident was reported to Alberta Environment and Protected Areas (AB EPA) on December 6, 2024 (reference number 435901).</p> <p>During monthly data validation, it was identified that the RH sensor data at the 75m elevation was intermittently out of normal range. The WBEA relies on a third-party contractor for sensor replacement, which is subject to their availability. On November 9, sensor replacement was attempted but was unsuccessful due to instrument communication errors. The WBEA is currently working with the contractor to schedule their return at the earliest available opportunity. Data was invalidated during periods when RH measurements were inconsistent with comparable sensors in the WBEA ambient network, resulting in 86.67% operational time for November.</p>
Mannix	Relative Humidity (RH) at 75-meter elevation	
Fort McKay South	Total Hydrocarbon, Non-methane Hydrocarbon and Methane (THC/NMHC/CH <sub>4</sub> )	<p>The THC/NMHC/CH<sub>4</sub> analyzer at the Fort McKay South AMS operated for less than 90% of November 2024, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter 6, Clause DQ 4-C. This incident was reported to Alberta Environment and Protected Areas (AB EPA) on December 6, 2024 (reference number 435904).</p> <p>During the month of November, the THC/NMHC/CH<sub>4</sub> analyzer displayed periods of unstable baseline response and days when the daily QA span check failed to meet AMD criteria. WBEA performed maintenance throughout November to adjust the span response and the chromatogram window, and to replace the actuator in the analyzer. The problem persisted prompting analyzer replacement on November 25. Data from periods of maintenance and unstable operation were invalidated for a total of 98 hours, resulting in an analyzer operational time of 86.4% for November.</p>
		<p>The routine monthly calibration was not conducted on the PM<sub>2.5</sub> analyzer at Fort Chipewyan AMS for the month of November 2024, which is a contravention of Chapter 7, Clause Cal 2-G of the Air Monitoring Directive (AMD) (2016, as amended). This incident was reported to the Alberta Environment and Protected Areas (AB EPA) on December 12, 2024 (reference number 436050).</p> <p>The routine monthly calibration for PM<sub>2.5</sub> was attempted on November 29; however, it was not completed due to a malfunction of the instrument used for calibration of this analyzer. The WBEA worked with the local technicians to arrange for delivery of a replacement instrument and to reschedule the calibration. The calibration was completed on December 10, 2024.</p> <p>The data validation for November confirmed that the monthly calibrations performed prior to November, on October 22, and after, on December 10, both met the AMD calibration criteria, and daily quality checks during this period were also within AMD criteria; trending closely with the nearest station, Fort Hills, located 219 km south. In addition, there were no ground level concentration exceedances of the maximum 24-hour</p>
Fort Chipewyan	Particulate Matter (PM <sub>2.5</sub> )	



Alberta Ambient Air Quality Objective (29 µg/m³) and the 1-hour Alberta Ambient Air Quality Guideline (80 µg/m³) for the Fort Chipewyan or Fort Hills station, or any station across the network for the month of November. The highest maximum 24-hour and 1-hour concentration reported at Fort Chipewyan for November was 14.2 µg/m³ and 28.7 µg/m³, respectively. Graph 1, attached, compares the hourly PM2.5 concentrations at Fort Chipewyan (AMS 8) and Fort Hills (AMS 23) from October 22 to December 10, 2024. The graph shows that the readings followed a consistent trend most days, with no significant discrepancies or irregularities.

Based on this review, there is no evidence to suggest the data from this period is invalid. Therefore, the data will be reported following standard procedures.

Athabasca Valley	Barometric Pressure (BP)	<p>The barometric pressure (BP) sensor at Athabasca Valley AMS operated less than 90% of November 2024, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter 6, Clause DQ 4-C. This incident was reported to Alberta Environment and Protected Areas (AB EPA) on December 12, 2024 (reference number 436051).</p> <p>On November 23, a local power outage occurred, impacting the station and causing the BP sensor signal to flatline. The WBEA reset the sensor, verified its performance, and resolved the issue on November 27. Data from this incident was invalidated for a total of 92 hours, resulting in an operational time of 87%.</p>
Conklin	Total Hydrocarbon, Non-methane Hydrocarbon and Methane (THC/NMHC/CH <sub>4</sub> )	<p>The THC/NMHC/CH<sub>4</sub> analyzer at the Conklin AMS operated for less than 90% of November 2024, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter 6, Clause DQ 4-C. This incident was reported to Alberta Environment and Protected Areas (AB EPA) on December 13, 2024 (reference number 436107).</p> <p>During daily system checks on November 16 and 17, the THC/NMHC/CH<sub>4</sub> analyzer displayed unstable baseline readings and span response. The WBEA performed maintenance to adjust the span response and to replace the sample inlet filter. The problem persisted prompting analyzer replacement on November 18. Data from this incident were invalidated, resulting in an analyzer operational time of 89% for November.</p>
Fort McKay – Bertha Ganter	Wind Speed (WS) and Wind Direction (WD) at 10-meter elevation	<p>The wind speed and wind direction (WS/WD) sensor at Bertha Ganter – Fort McKay AMS operated less than 90% of November and December 2024, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter 6, Clause DQ 4-C. This incident was reported to Alberta Environment and Protected Areas (AB EPA) on December 19, 2024 (reference number 436271).</p> <p>Intermittently throughout November and December, the WS/WD sensor displayed odd signal outputs prompting an investigation. On December 4, the sensor was replaced, and normal operations resumed. Data from the event was invalidated for a total of 160 hours in November and 87 hours in December.</p>

### 3.2 Intermittent Monitoring

The results for time-integrated sampling of dustfall, precipitation, PAH, TSP, VOC, PM<sub>2.5</sub> ECOC, PM<sub>2.5</sub>, and PM<sub>10</sub> will be submitted in the 2024 Annual Report.

### 3.3 General Network Notes

The Ammonia (NH<sub>3</sub>) analyzer currently operates on a 0 to 2500 ppb operating range with a detection level of 5 ppb in the WBEA network. In data processing, values less than five ppb have been considered below detection levels and are reported as zero.

Total hydrocarbon (THC), non-methane hydrocarbon (NMHC), and methane (CH<sub>4</sub>) measurements are collected at some air monitoring stations in the WBEA network using the Thermo Environmental model 55i direct THC/CH<sub>4</sub>/NMHC analyzer. This analyzer uses a Gas Chromatography (GC) based system, which resets the baseline value at the start of every run. This may cause the ambient background to indicate a response below the expected 1.8 ppm background level. When all measurable criteria indicate valid data during the QAQC and validation process, the data is reported without any additional flags. However, a

response below the expected 1.8 ppm triggers an investigation of the analyzer to determine if there is an issue.

Monitoring notes, including changes to monitoring locations, methods, or equipment, and any reporting or monitoring irregularities, for the continuous monitoring stations, are provided on a station-by-station basis. Notes of each interrupted event are provided in chronological order, and meteorological parameters are mentioned last.

### ***Station 1, Bertha Ganter – Fort McKay***

The NH<sub>3</sub> analyzer required additional time to stabilize to levels below ambient concentrations following the automated daily spans and routine monthly multipoint calibrations. Additional time is required for stabilization after exposure to high concentrations of NH<sub>3</sub> gas, and this is an inherent behavior in the NH<sub>3</sub> analyzer operations due to the properties of the NH<sub>3</sub> gas. Data for 1 hour following the daily spans have been reported as invalid for a total of 30 hours this month.

Stabilization following a maintenance of the H<sub>2</sub>S analyzer on November 6 and 7 resulted in 21 hours of downtime.

Cleaning of the manifold on November 20 interrupted the normal operations of all gaseous analyzers, except the NH<sub>3</sub> analyzer, for 1 hour.

Sensor failure due to inconsistency response of the output signal of the wind sensor from November 3 through 30 resulted in 160 hours of invalid data. Subsequent maintenance to lower the tower and de-ice the wind sensor on November 19 resulted in additional 1 hour of downtime.

Failure to record data of precipitation collector sensor on November 29 and 30 resulted in 48 hours of invalid data.

The surface leaf wetness sensor periodically operated out of range on November 3, 12 and 17 resulting in 8 hours of invalid data.

The daily span check for the TRS analyzer was outside the 10% AMD criteria on November 7 and 8 due to settling of the calibration gas cylinder following its replacement on November 7.

### ***Station 2, Mildred Lake***

Unstable operation due to excessive baseline noise of the THC/NMHC/CH<sub>4</sub> analyzer on November 3 resulted in 1 hour of invalid data.

Maintenance to replace the station modem on November 5 interrupted the normal operations of all air quality analyzers for 1 hour.

Maintenance to replace the support gas cylinder for the THC/NMHC/CH<sub>4</sub> analyzer on November 8 resulted in 3 hours of downtime.

Cleaning of the manifold on November 21 interrupted the normal operations of the SO<sub>2</sub> and THC/NMHC/CH<sub>4</sub> analyzers for 1 hour.



### ***Station 3, Lower Camp – Meteorology***

Failure to record data of relative humidity and temperature sensor throughout the month resulted in 45 hours of invalid data.

Flatline in the output signal of the wind sensor at 20-meter elevation on November 5 resulted in 2 hours of invalid data.

Flatline in the output signal of the wind sensor at 45-meter elevation on November 5-6 and 17 resulted in 27 hours of invalid data.

Flatline in the output signal of the wind sensor at 100-meter elevation throughout the month resulted in 29 hours of invalid data.

Flatline in the output signal of the wind sensor at 163-meter elevation throughout the month resulted in 28 hours of invalid data.

### ***Station 4, Buffalo Viewpoint***

Maintenance to replace the support gas cylinder for the THC/NMHC/CH<sub>4</sub> analyzer on November 25 resulted in 2 hours of downtime.

Cleaning of the manifold on November 26 interrupted the normal operations of all gaseous analyzers for 1 hour.

### ***Station 5, Mannix***

Maintenance to reinitiate daily QA checks on November 24 for H<sub>2</sub>S analyzer resulted in 2 hours of downtime.

Maintenance due to station operator activities on November 8 interrupted the normal operations of all meteorological sensors resulted in 6 hours of downtime.

The relative humidity sensor at 20-meter elevation operated out of range throughout the month resulting in 59 hours of invalid data.

The relative humidity sensor at 75-meter elevation operated out of range throughout the month resulting in 90 hours of invalid data.

The relative humidity sensor at 90-meter elevation operated out of range throughout the month resulting in 26 hours of invalid data.

Flatlines in the output signal due to frozen wind sensor at 45-meter elevation throughout the month resulted in 26 hours of invalid data.

Flatlines in the output signal due to frozen wind sensor at 75-meter elevation throughout the month resulted in 35 hours of invalid data.

Flatlines in the output signal due to frozen wind sensor at 90-meter elevation throughout the month resulted in 37 hours of invalid data.

### ***Station 6, Patricia McInnes***

The NH<sub>3</sub> analyzer required additional time to stabilize to levels below ambient concentrations following the automated daily spans and routine monthly multipoint calibrations. NH<sub>3</sub> analyzers require additional time for stabilization after being exposed to high concentrations, this is due to the physical properties of the NH<sub>3</sub> gas. Data for 1 hour following each daily span has been reported as invalid for a total of 32 hours this month.

Unstable operation of the THC/NMHC/CH<sub>4</sub> analyzer due to excessive baseline noise on November 2 resulted in 7 hours of invalid data. Multiple subsequent maintenances to address the excessive baseline noise on throughout the month resulted in additional 13 hours of downtime.

Unstable operation due to flatline in the output signal of the THC/NMHC/CH<sub>4</sub> analyzer on November 29 to 30 resulted in 27 hours of invalid data. Subsequent maintenance to replace the analyzer on November 30 and stabilize overnight resulted in additional 16 hours of downtime.

### ***Station 7, Athabasca Valley***

Unstable operation of the THC/NMHC/CH<sub>4</sub> analyzer due to AMD non-compliance on November 13 to 15 resulted in 53 hours of invalid data. Subsequent maintenance to replace the support gas cylinder for the THC/NMHC/CH<sub>4</sub> analyzer on November 28 resulted in 2 hours of downtime.

Failure to record data of SO<sub>2</sub> analyzer on November 22 resulted in 1 hour of invalid data.

The station power failure on November 23 interrupted the normal operations of all air quality analyzers resulting in 3 hours of invalid data.

Maintenance to replace the calibration gas cylinder for the NO<sub>x</sub>/NO/NO<sub>2</sub> analyzer on November 27 resulted in 7 hours of downtime.

Maintenance to reboot the barometric sensor on November 27 resulted in 1 hour of invalid data.

Flatline in the output signal due to frozen wind sensor on November 4 and 5 resulted in 30 hours of invalid data. Subsequent maintenance to de-ice the wind sensor on November 5 resulted in additional 3 hours of downtime.

### ***Station 8, Fort Chipewyan***

Unstable operation due to flatline in the analyzer output signal of the SO<sub>2</sub> analyzer on November 4 to 5 resulted in 30 hours of invalid data. Subsequent maintenance to reboot the analyzer on November 5 resulted in additional 1 hour of downtime.

Flatline in the output signal of the wind sensor at 10-meter elevation on November 12 and 13 resulted in 2 hours of invalid data.



The surface leaf wetness sensor periodically operated out of range on November 3 resulting in 1 hour of invalid data.

### ***Station 9, Barge Landing***

Flatlines in the output signal of the wind sensor at 10-meter elevation throughout the month resulted in 9 hours of invalid data.

Flatlines in the output signal of the wind sensor at 20-meter elevation throughout the month resulted in 5 hours of invalid data.

### ***Station 11, Lower Camp***

Failure to record data of all gaseous analyzer on November 13 resulted in 1 hour of invalid data.

Unstable operation due to excessive baseline noise of the THC/NMHC/CH<sub>4</sub> analyzer on November 18 resulted in 7 hours of invalid data.

Flatlines in the output signal of the wind sensor throughout the month resulted in 7 hours of invalid data.

### ***Station 13, Fort McKay South***

Unstable operation due to excessive baseline noise of the THC/NMHC/CH<sub>4</sub> analyzer between November 17 and November 25 resulted in 90 hours of invalid data. Subsequent maintenance on November 18, 22, and 24 to perform additional calibrations, replace the actuator, and replace the analyzer resulted in 8 additional hours of downtime for the THC/NMHC/CH<sub>4</sub> analyzer.

Maintenance to address internal alarms on the NO<sub>x</sub>/NO/NO<sub>2</sub> analyzer on November 5 and 6 resulted in 20 hours of downtime.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 15 hours of invalid data.

The relative humidity sensor periodically operated out of range on November 7 and 17 resulting in 4 hours of invalid data.

### ***Station 14, Anzac***

Analyzer failure due to a deteriorating sample pump of the THC/NMHC/CH<sub>4</sub> analyzer on November 20 and 21 resulted in 35 hours of invalid data. Subsequent maintenance to replace the sample pump of the THC/NMHC/CH<sub>4</sub> analyzer on November 6 resulted in additional 6 hours of downtime.

Unstable operations due to excessive baseline drift of the O<sub>3</sub> analyzer on November 5 and 30 resulted in 5 hours of invalid data.



### ***Station 17, Wapasu***

The relative humidity sensor periodically operated out of range on November 7 and 12 resulting in 8 hours of invalid data.

Flatlines in the output signal due to frozen wind sensor on November 2, 29 and 30 resulted in 13 hours of invalid data.

### ***Station 18, Stony Mountain***

Cleaning of the manifold on November 7 interrupted the normal operations of CO<sub>2</sub>, NO<sub>x</sub>/NO/NO<sub>2</sub>, O<sub>3</sub>, THC/NMHC/CH<sub>4</sub>, TRS and SO<sub>2</sub> analyzers for 1 hour.

Unstable operations due to excessive baseline noise of the THC/NMHC/CH<sub>4</sub> analyzer on November 10 resulted in 8 hours of invalid data.

Cleaning of the manifold on November 28 interrupted the normal operations of CO<sub>2</sub>, O<sub>3</sub>, THC/NMHC/CH<sub>4</sub>, and SO<sub>2</sub> analyzers for 2 to 3 hours.

Sensor failure due to inconsistency response of the output signal of the wind sensor at the 20-meter elevation from November 1 through 13 resulted in 299 hours of invalid data. Subsequent maintenance to replace wind speed sensor on November 13 resulted in additional 2 hours of downtime.

Failure to record data of precipitation collector sensor on November 7, 8, and 13 resulted in 25 hours of invalid data.

The relative humidity sensor periodically operated out of range on November 11 and 12 resulted in 7 hours of invalid data.

A flatline in the output signal of the wind sensor at the 20-meter elevation on November 15 resulted in 8 hours of invalid data.

### ***Station 19, Firebag***

Maintenance to adjust the converter temperature of the H<sub>2</sub>S analyzer and left to stabilize overnight resulted in 20 hours of downtime.

The station power failure on November 27 interrupted the normal operations of all air quality analyzers resulting in 6-7 hours of invalid data.

Flatlines in the output signal due to frozen wind sensor on November 2 and 19 resulted in 20 hours of invalid data.

### ***Station 20, MacKay River***

Flatlines in the output signal of the wind sensor throughout the month resulted in 60 hours of invalid data.





### ***Station 21, Conklin***

Unstable operation due to flatline in output signal of the O<sub>3</sub> analyzer on November 5, 6 and 7 resulted in 37 hours of invalid data. Subsequent maintenance to reboot the O<sub>3</sub> analyzer on November 5 resulted in additional 1 hour of downtime.

Maintenance to replace the support gas cylinder for THC/NMHC/CH<sub>4</sub> analyzer on November 5 resulted in 2 hours of downtime.

Unstable operations due to excessive baseline noise of the THC/NMHC/CH<sub>4</sub> analyzer on November 15 and 16 resulted in 29 hours of invalid data. Subsequent maintenance to remotely troubleshoot the analyzer resulted in additional 3 hours of downtime.

Unstable operations due to excessive baseline drift of the THC/NMHC/CH<sub>4</sub> analyzer on November 16 through 18 resulted in 44 hours of invalid data. Subsequent maintenance to replace the THC/NMHC/CH<sub>4</sub> on November 18 resulted in additional 1 hour of downtime.

Cleaning of the manifold on November 28 interrupted the normal operations of NO<sub>x</sub>/NO/NO<sub>2</sub>, O<sub>3</sub>, THC/NMHC/CH<sub>4</sub> and TRS analyzers for 1 hour.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 8 hours of invalid data.

Note: Automated daily zero-response checks of the O<sub>3</sub> analyzer did not meet WBEA's QC acceptance criteria for November. Therefore, the calibrator zeros from the October, November and December multi-point calibrations were used to validate the analyzer baseline response.

### ***Station 22, Janvier***

Analyzer failure due to a deteriorating UV lamp of the O<sub>3</sub> analyzer on November 12 and 13 resulted in 31 hours of invalid data. Subsequent maintenance to replace the UV lamp of the O<sub>3</sub> analyzer on November 13 resulted in additional 4 hours of downtime.

Unstable operation due to flatline in output signal of the NO<sub>x</sub>/NO/NO<sub>2</sub> analyzer on November 13 and 13 resulted in 13 hours of invalid data. Subsequent maintenance to reboot the NO<sub>x</sub>/NO/NO<sub>2</sub> analyzer on November 13 resulted in additional 1 hour of downtime.

A flatline in the output signal of the wind sensor at the 10-meter elevation on November 1 and 3 resulted in 3 hours of invalid data.

Intermittent flatlines in the output signal of the wind sensor at the 20-meter elevation throughout the month resulted in 6 hours of invalid data.

Note: Automated daily zero-response checks of the O<sub>3</sub> analyzer did not meet WBEA's QC acceptance criteria for November. Therefore, the calibrator zeros from the October and November multi-point calibrations were used to validate the analyzer baseline response.



### ***Station 23, Fort Hills***

Failure to record data of all parameters on November 21 resulted in 1 hour of invalid data.

Cleaning of the manifold on November 21 interrupted the normal operations of all gaseous analyzers except for TRS analyzer for 1 hour.

### ***Station 25, Waskōw ohci Pimâtisiwin***

Cleaning of the manifold on November 28 interrupted the normal operations of all gaseous analyzers for 1 hour.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 57 hours of invalid data.

### ***Station 26, Christina Lake***

Note: Christina Lake AMS 26 has been decommissioned and relocated to a new site within the Christina Lake facility and is now referred to as Monday Creek AMS 33. Removal calibrations for Christina Lake AMS was completed on November 5, 2024, and installation calibrations for Monday Creek AMS were finalized on November 7, 2024. Calibration reports are included in the WBEA November 2024 Calibration Report for both stations.

A flatline in the output signal of the wind sensor on November 3 resulted in 1 hour of invalid data.

### ***Station 27, Jackfish 2/3***

Failure to record data of all parameters on November 14 and 15 resulted in 2 hours of invalid data.

Maintenance to reset logger/modem on November 16 interrupted the normal operations of all parameters for 1 hour.

Baseline stabilization of the H<sub>2</sub>S analyzer's following routine calibration on November 19 resulted in 3 hours of invalid data.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 7 hours of invalid data.

### ***Station 29, Surmont 2***

Cleaning of the manifold on November 5 interrupted the normal operations of NO<sub>x</sub>/NO/NO<sub>2</sub>, SO<sub>2</sub>, and THC analyzers for 1 hour.

Unstable operation due to flatline in output signal of the PM<sub>2.5</sub> analyzer on November 12 and 13 resulted in 22 hours of invalid data.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 5 hours of invalid data.



### ***Station 30, Ells River***

Cleaning of the manifold on November 12 interrupted the normal operations of all gaseous analyzers for 1 hour.

Maintenance to reset logger/modem on November 20 interrupted the normal operations of all parameters for 1 hour.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 20 hours of invalid data.

### ***Station 33, Monday Creek***

Note: Christina Lake AMS 26 has been decommissioned and relocated to a new site within the Christina Lake facility and is now referred to as Monday Creek AMS 33. Removal calibrations for Christina Lake AMS was completed on November 5, 2024, and installation calibrations for Monday Creek AMS were finalized on November 7, 2024. Calibration reports are included in the WBEA November 2024 Calibration Report for both stations.

A flatline in the output signal of the wind sensor on November 24 resulted in 1 hour of invalid data.

### ***Station 506, Jackfish 1***

Cleaning of the manifold on November 20 interrupted the normal operations of NO<sub>x</sub>/NO/NO<sub>2</sub> and SO<sub>2</sub> analyzers for 2 hours.

A flatline in the output signal of the wind sensor on November 1 and 2 resulted in 3 hours of invalid data.

### ***Station 508, Kirby North***

No operational issues to report.

### ***Station 512, Hangingstone Expansion***

Maintenance to reinitiate daily QA checks on November 8 for SO<sub>2</sub> analyzer resulted in 1 hour of downtime.

A flatline in the output signal of the wind sensor on November 1 and 2 resulted in 13 hours of invalid data.



If additional information is required, please contact the Wood Buffalo Environmental Association at (780) 799-4420.

Yours sincerely,

**Wood Buffalo Environmental Association**

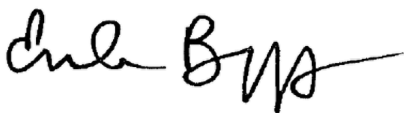
The representative of the Person Responsible for this monitoring program is Emilie Briggs, Operations Manager, WBEA.

Level one (L1) data review was completed by the Field Technicians responsible for each respective air monitoring station. Level two (L2) data validation, report preparation, and submission were completed by Asad Hidayat and Denny Estador of WBEA. The WBEA has retained the services of Air Resource Specialists (ARS) to conduct Level three (L3) review on its behalf. Contact information for WBEA staff is included below.

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I certify that I have reviewed and verified this report, and that the information is complete, accurate and representative of the monitoring results, reporting timeframe, and the specified analysis, summarization, and reporting requirements.



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MONTHLY AIR MONITORING SUMMARY

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APPROVAL NUMBERS	REPORT DATE						
	MONTH	YEAR					
289664-00-00	11	2024					
241311-00-00	CONTINUOUS AMBIENT MONITORING						
20809-02-00			ONE-HOUR AVERAGE		24-HOUR AVERAGE		
149968-01-00	PARAMETER	STN. NO.	% TIME OPERATIONAL	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
237382-00-00	SO2(ppb)	1	100	15	0	1.4	0
48522-01-00	SO2(ppb)	2	100	35.7	0	5.9	0
240008-00-00	SO2(ppb)	4	100	10.9	0	1.9	0
48263-01-00	SO2(ppb)	5	100	40.4	0	7.7	0
224816-00-00	SO2(ppb)	6	100	15.3	0	3.4	0
151469-01-00	SO2(ppb)	7	99	10.6	0	2.2	0
189942-00-00	SO2(ppb)	8	96	9.2	0	1.8	0
206355-00-00	SO2(ppb)	9	100	10.8	0	2.2	0
46586-00-00	SO2(ppb)	11	100	168.8	0	21.7	0
73203-02-00	SO2(ppb)	13	100	11.6	0	2.1	0
216466-01-00	SO2(ppb)	14	100	8.0	0	2.2	0
137467-01-00	SO2(ppb)	17	100	20.4	0	5.7	0
236394-00-00	SO2(ppb)	18	100	7.0	0	1.4	0
254465-00-00	SO2(ppb)	19	99	15.5	0	4.9	0
094-03-00	SO2(ppb)	20	100	59.5	0	13.3	0
80105-01-00	SO2(ppb)	21	100	3.4	0	1.2	0
305529-00-00	SO2(ppb)	22	100	7.5	0	1.7	0
318401-00-00	SO2(ppb)	23	100	11.7	0	2.2	0
026-03-00	SO2(ppb)	25	100	11.4	0	1.1	0
364232-00-00	SO2(ppb)	26	100	3.5	0	0.9	0
228044-00-00	SO2(ppb)	27	100	13.3	0	5.1	0
247548-00-00	SO2(ppb)	29	100	6.7	0	2.1	0
231302-00-00	SO2(ppb)	30	100	11.3	0	2.8	0
246984-01-00	SO2(ppb)	33	100	6.7	0	1.9	0
153125-01-00	SO2(ppb)	506	99	15.1	0	4.9	0
	SO2(ppb)	508	100	5.7	0	2.2	0
	SO2(ppb)	512	100	168.5	0	28.6	0
	H2S(ppb)	1	97	2.3	0	0.5	0
	H2S(ppb)	2	100	4.5	0	0.9	0
	H2S(ppb)	4	100	2.2	0	0.6	0
	H2S(ppb)	5	100	5.7	0	1.6	0
	H2S(ppb)	11	100	23.9	6	3.4	2
	H2S(ppb)	17	100	0.9	0	0.4	0
	H2S(ppb)	19	96	2.8	0	0.4	0
	H2S(ppb)	20	100	0.7	0	0.4	0
	H2S(ppb)	25	100	2.2	0	0.5	0
	H2S(ppb)	26	100	1.1	0	0.2	0
	H2S(ppb)	27	99	1.9	0	0.4	0
	H2S(ppb)	29	100	0.3	0	0.1	0
	H2S(ppb)	33	100	0.5	0	0.2	0
	H2S(ppb)	506	100	1.1	0	0.3	0
	H2S(ppb)	508	100	1.8	0	0.3	0
	H2S(ppb)	512	100	1.6	0	0.4	0
	TRS(ppb)	1	100	3.0	0	0.9	0
	TRS(ppb)	6	100	0.9	0	0.4	0
	TRS(ppb)	7	100	1.8	0	0.7	0
	TRS(ppb)	8	100	0.4	0	0.2	0
	TRS(ppb)	9	100	3.4	0	1.1	0
	TRS(ppb)	13	100	3.2	0	0.9	0
	TRS(ppb)	14	100	0.7	0	0.3	0
	TRS(ppb)	18	100	0.6	0	0.4	0
	TRS(ppb)	21	100	0.5	0	0.3	0
	TRS(ppb)	22	100	0.5	0	0.2	0
	TRS(ppb)	23	100	3.9	0	0.8	0
	TRS(ppb)	30	100	3.0	0	0.7	0
	THC(ppm)	1	100	3.8	-	2.6	-
	THC(ppm)	2	99	3.7	-	2.4	-
	THC(ppm)	4	100	3.7	-	2.3	-
	THC(ppm)	5	100	4.5	-	2.7	-
	THC(ppm)	6	91	3.4	-	2.3	-
	THC(ppm)	7	92	3.5	-	2.4	-
	THC(ppm)	9	100	3.1	-	2.3	-

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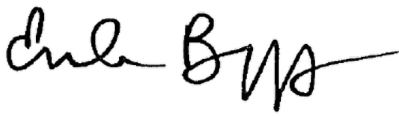
APPROVAL NUMBERS	REPORT DATE						
	MONTH	YEAR					
	11	2024					
289664-00-00	CONTINUOUS AMBIENT MONITORING						
241311-00-00				ONE-HOUR AVERAGE		24-HOUR AVERAGE	
20809-02-00	PARAMETER	STN. NO.	% TIME OPERATIONAL	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
149968-01-00	THC(ppm)	11	99	4.4	-	2.5	-
237382-00-00	THC(ppm)	13	86	3.6	-	2.6	-
48522-01-00	THC(ppm)	14	94	2.8	-	2.2	-
151469-01-00	THC(ppm)	17	100	3.1	-	2.5	-
189942-00-00	THC(ppm)	18	98	2.2	-	2.2	-
206355-00-00	THC(ppm)	19	99	2.7	-	2.4	-
46586-00-00	THC(ppm)	20	100	3.2	-	2.8	-
73203-02-00	THC(ppm)	21	89	2.2	-	2.1	-
216466-01-00	THC(ppm)	22	100	2.3	-	2.1	-
137467-01-00	THC(ppm)	23	100	4.7	-	2.7	-
236394-00-00	THC(ppm)	29	100	2.6	-	2.4	-
254465-00-00	THC(ppm)	30	100	4.1	-	2.7	-
094-03-00	THC(ppm)	508	100	2.6	-	2.4	-
80105-01-00	O3(ppb)	1	100	33.2	0	30.3	-
305529-00-00	O3(ppb)	4	100	38.2	0	30.7	-
318401-00-00	O3(ppb)	6	100	39.3	0	32.9	-
026-03-00	O3(ppb)	7	100	37.4	0	31.9	-
364232-00-00	O3(ppb)	8	100	34.8	0	32.7	-
228044-00-00	O3(ppb)	13	100	33.9	0	30.7	-
247548-00-00	O3(ppb)	14	99	37.6	0	32.4	-
231302-00-00	O3(ppb)	17	100	38.9	0	35.8	-
246984-01-00	O3(ppb)	18	100	40.3	0	33.9	-
153125-01-00	O3(ppb)	21	95	39.3	0	31.7	-
	O3(ppb)	22	95	42.0	0	36.1	-
	NO2(ppb)	1	100	37.4	0	25.7	-
	NO2(ppb)	4	100	30.3	0	23.6	-
	NO2(ppb)	6	100	30.8	0	21.1	-
	NO2(ppb)	7	99	31.9	0	24.2	-
	NO2(ppb)	8	100	13.1	0	5.3	-
	NO2(ppb)	9	100	34.4	0	26.7	-
	NO2(ppb)	13	97	39.3	0	27.2	-
	NO2(ppb)	14	100	28.3	0	7.6	-
	NO2(ppb)	17	100	27.6	0	8.7	-
	NO2(ppb)	18	100	8.6	0	3.3	-
	NO2(ppb)	19	99	20.5	0	8.3	-
	NO2(ppb)	20	100	29.7	0	25.2	-
	NO2(ppb)	21	100	11.5	0	4.0	-
	NO2(ppb)	22	96	12.7	0	4.2	-
	NO2(ppb)	23	100	42.9	0	25.1	-
	NO2(ppb)	26	100	16.8	0	4.7	-
	NO2(ppb)	27	100	14.9	0	3.6	-
	NO2(ppb)	29	100	12.3	0	6.0	-
	NO2(ppb)	30	100	31.7	0	20.8	-
	NO2(ppb)	33	100	13.2	0	4.7	-
	NO2(ppb)	506	99	23.8	0	8.2	-
	NO2(ppb)	508	100	9.3	0	3.3	-
	NO2(ppb)	512	100	18.7	0	10.1	-
	CO(ppm)	1	100	0.4	0	0.3	-
	CO(ppm)	7	100	0.5	0	0.2	-
	CO(ppm)	8	100	0.4	0	0.2	-
	CO(ppm)	18	100	0.4	0	0.2	-
	CO2(ppm)	1	100	478.6	-	463.3	-
	CO2(ppm)	8	100	451.1	-	441.2	-
	CO2(ppm)	18	99	460.5	-	443.3	-
	NH3(ppb)	1	96	0.0	0	0.0	-
	NH3(ppb)	6	95	0.0	0	0.0	-
	PM2.5(ug/m3)	1	100	60.6	0	14.6	0
	PM2.5(ug/m3)	4	100	12.0	0	7.3	0
	PM2.5(ug/m3)	6	100	44.4	0	7.9	0
	PM2.5(ug/m3)	7	100	35.3	0	12.6	0
	PM2.5(ug/m3)	8	100	28.7	0	14.2	0
	PM2.5(ug/m3)	9	100	41.3	0	9.6	0
	PM2.5(ug/m3)	18	100	9.0	0	4.6	0
	PM2.5(ug/m3)	21	100	41.4	0	7.6	0

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APPROVAL NUMBERS	REPORT DATE						
	MONTH	YEAR					
289664-00-00	11	2024					
241311-00-00	CONTINUOUS AMBIENT MONITORING						
20809-02-00				ONE-HOUR AVERAGE		24-HOUR AVERAGE	
149968-01-00	PARAMETER	STN. NO.	% TIME OPERATIONAL	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
237382-00-00	PM2.5(ug/m3)	13	100	11.7	0	6.8	0
48522-01-00	PM2.5(ug/m3)	14	100	21.1	0	6.1	0
240008-00-00	PM2.5(ug/m3)	17	100	11.3	0	6	0
48263-01-00	PM2.5(ug/m3)	18	100	11.8	0	5.6	0
224816-00-00	PM2.5(ug/m3)	21	100	62.1	0	6.9	0
151469-01-00	PM2.5(ug/m3)	22	100	64.4	0	9.1	0
189942-00-00	PM2.5(ug/m3)	23	100	68.7	0	16	0
206355-00-00	PM2.5(ug/m3)	29	97	12.4	0	6.6	0
46586-00-00	PM2.5(ug/m3)	30	100	12.9	0	6.7	0
73203-02-00	WS(km/h)	1	78	-	-	-	-
216466-01-00	WS(km/h)	2	100	-	-	-	-
137467-01-00	WS(km/h)	4	100	-	-	-	-
236394-00-00	WS(km/h)	5	99	-	-	-	-
254465-00-00	WS(km/h)	6	100	-	-	-	-
094-03-00	WS(km/h)	7	95	-	-	-	-
80105-01-00	WS(km/h)	8	100	-	-	-	-
305529-00-00	WS(km/h)	9	99	-	-	-	-
318401-00-00	WS(km/h)	11	99	-	-	-	-
026-03-00	WS(km/h)	13	98	-	-	-	-
364232-00-00	WS(km/h)	14	100	-	-	-	-
228044-00-00	WS(km/h)	17	98	-	-	-	-
247548-00-00	WS(km/h)	18	57	-	-	-	-
231302-00-00	WS(km/h)	19	97	-	-	-	-
246984-01-00	WS(km/h)	20	92	-	-	-	-
153125-01-00	WS(km/h)	21	99	-	-	-	-
	WS(km/h)	22	99	-	-	-	-
	WS(km/h)	23	100	-	-	-	-
	WS(km/h)	25	92	-	-	-	-
	WS(km/h)	26	99	-	-	-	-
	WS(km/h)	27	99	-	-	-	-
	WS(km/h)	29	99	-	-	-	-
	WS(km/h)	30	97	-	-	-	-
	WS(km/h)	33	100	-	-	-	-
	WS(km/h)	506	100	-	-	-	-
	WS(km/h)	508	100	-	-	-	-
	WS(km/h)	512	98	-	-	-	-
							
SIGNATURE OF ASSOCIATION REPRESENTATIVE					FOR ALBERTA ENVIRONMENT USE ONLY		



## **WOOD BUFFALO ENVIRONMENTAL ASSOCIATION**

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS01 BERTHA GANTER - FORT MCKAY NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY - BERTHA GANTER (AMS01)  
NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	684	35	36	99.86	15	0	1.4	0
H2S(ppb) Average	661	37	59	96.94	2.3	0	0.5	0
TRS(ppb) Average	683	36	37	99.86	3	0	0.9	0
THC(ppm) Average	684	35	36	99.86	3.8	-	2.6	-
NMHC(ppm) Average	684	35	36	99.86	0.823	-	0.137	-
CH4(ppm) Average	684	35	36	99.86	3.1	-	2.4	-
O3 (ppb) Average	685	34	35	99.86	33.2	0	30.3	-
NO2 (ppb) Average	683	36	37	99.86	37.4	0	25.7	-
NO (ppb) Average	683	36	37	99.86	121.2	-	28.7	-
NOX (ppb) Average	683	36	37	99.86	158.6	-	54.4	-
NH3 (ppb) Average	648	42	72	95.83	0	0	0	-
PM2.5 (ug/m3) Average	718	2	2	100	60.6	0	14.6	0
CO(ppm) Average	685	34	35	99.86	0.4	0	0.3	0
CO2(ppm) Average	685	34	35	99.86	478.6	0	463.3	0
Temperature 2 m (C) Average	720	0	0	100	13	-	6.2	-
Temperature 10 m (C) Average	720	0	0	100	12.8	-	6.6	-
Relative Humidity (%) Average	720	0	0	100	97.5	-	93.7	-
Wind Speed 10 m (km/h) Average	559	0	161	77.64	19	-	13	-
Wind Direction 10 m (deg) Average	559	0	161	77.64	-	-	-	-
Precipitation (mm) Total	672	0	48	93.33	1.7	-	11.5	-
Leaf Wetness (% of range) Average	712	0	8	98.89	76.9	-	17.9	-
Global Solar Radiation (W/m2) Average	720	0	0	100	322.9	-	68.4	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER FORT MCKAY (AMS01)  
 NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	684	0.33	1	-	0	0	0	0	0.2	0.8	15
H2S (ppb) Average	661	0.25	0.3	-	0	0.1	0.1	0.1	0.3	0.6	2.3
TRS (ppb) Average	683	0.54	0.3	-	0.3	0.3	0.4	0.4	0.6	0.9	3
THC (ppm) Average	684	2.15	0.2	-	1.9	2	2	2.1	2.2	2.4	3.8
NMHC(ppm) Average	684	0.037	0.086	-	0	0	0	0	0	0.1	0.823
CH4(ppm) Average	684	2.11	0.2	-	1.9	2	2	2.1	2.2	2.3	
O3 (ppb) Average	685	13.28	9.1	-	0	1.1	5.3	12.9	20.4	26.1	33.2
NO2 (ppb) Average	683	8.71	7.2	-	0	0.5	3	7.7	12.5	19.4	37.4
NO (ppb) Average	683	4.83	11.8	-	0	0	0	1.1	3.2	13.1	121.2
NOX (ppb) Average	683	13.54	16.7	-	0	1.4	3.4	8.8	17	31	158.6
NH3 (ppb) Average	648	0	0	-	0	0	0	0	0	0	0
PM2.5 (ug/m3) Average	718	5.84	4.5	-	1	2.1	3	4.8	7.4	10.1	60.6
CO(ppm) Average	685	0.19	0.1	-	0	0.1	0.1	0.2	0.2	0.3	0.4
CO2(ppm) Average	685	447.25	8.6	-	430.8	436.2	441.5	446.9	452.7	457.9	478.6
Temperature 2 m (C) Average	720	-7.93	8.5	-	-31.9	-18.4	-14.3	-6.3	-1.6	1.6	13
Temperature 10 m (C) Average	720	-7.94	8.5	-	-31.4	-18.3	-14.5	-6.5	-1.5	2.1	12.8
Relative Humidity (%) Average	720	82.02	8.8	-	41.2	71.5	77.3	82.2	88	93.7	97.5
Wind Speed 10 m (km/h) Average	559	7	4	-	0	2	4	6	10	13	19
Wind Direction 10 m (deg) Average	559	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	672	-	-	25.78	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	712	7.42	6.4	-	1.7	2.6	3	6.4	9	15.2	76.9
Global Solar Radiation (W/m2) Average	720	20.89	48.2	-	0	0	0	0	19.1	63.3	322.9

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER FORT MCKAY (AMS01)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
All Gaseous Analyzers (except NH3)	20 Nov 2024 14:00	20 Nov 2024 14:00	1	Maintenance - sample manifold cleaned
H2S	06 Nov 2024 17:00	07 Nov 2024 13:00	21	Stabilization after maintenance
NH3	01 Nov 2024 05:00	30 Nov 2024 04:00	30	Stabilization after daily QA check
Wind Speed, Wind Direction	03 Nov 2024 04:00	01 Dec 2024 00:00	160	Sensor Failure - inconsistent response
Wind Speed, Wind Direction	19 Nov 2024 14:00	19 Nov 2024 14:00	1	Maintenace - tower lowered to de-ice sensor
Precipitation Collector	29 Nov 2024 01:00	01 Dec 2024 00:00	48	DAS Failure - data not recorded
Surface Leaf Wetness	03 Nov 2024 13:00	03 Nov 2024 14:00	2	Sensor operated out of range
Surface Leaf Wetness	12 Nov 2024 10:00	12 Nov 2024 10:00	1	Sensor operated out of range
Surface Leaf Wetness	17 Nov 2024 14:00	17 Nov 2024 15:00	2	Sensor operated out of range
Surface Leaf Wetness	17 Nov 2024 17:00	17 Nov 2024 19:00	3	Sensor operated out of range



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**

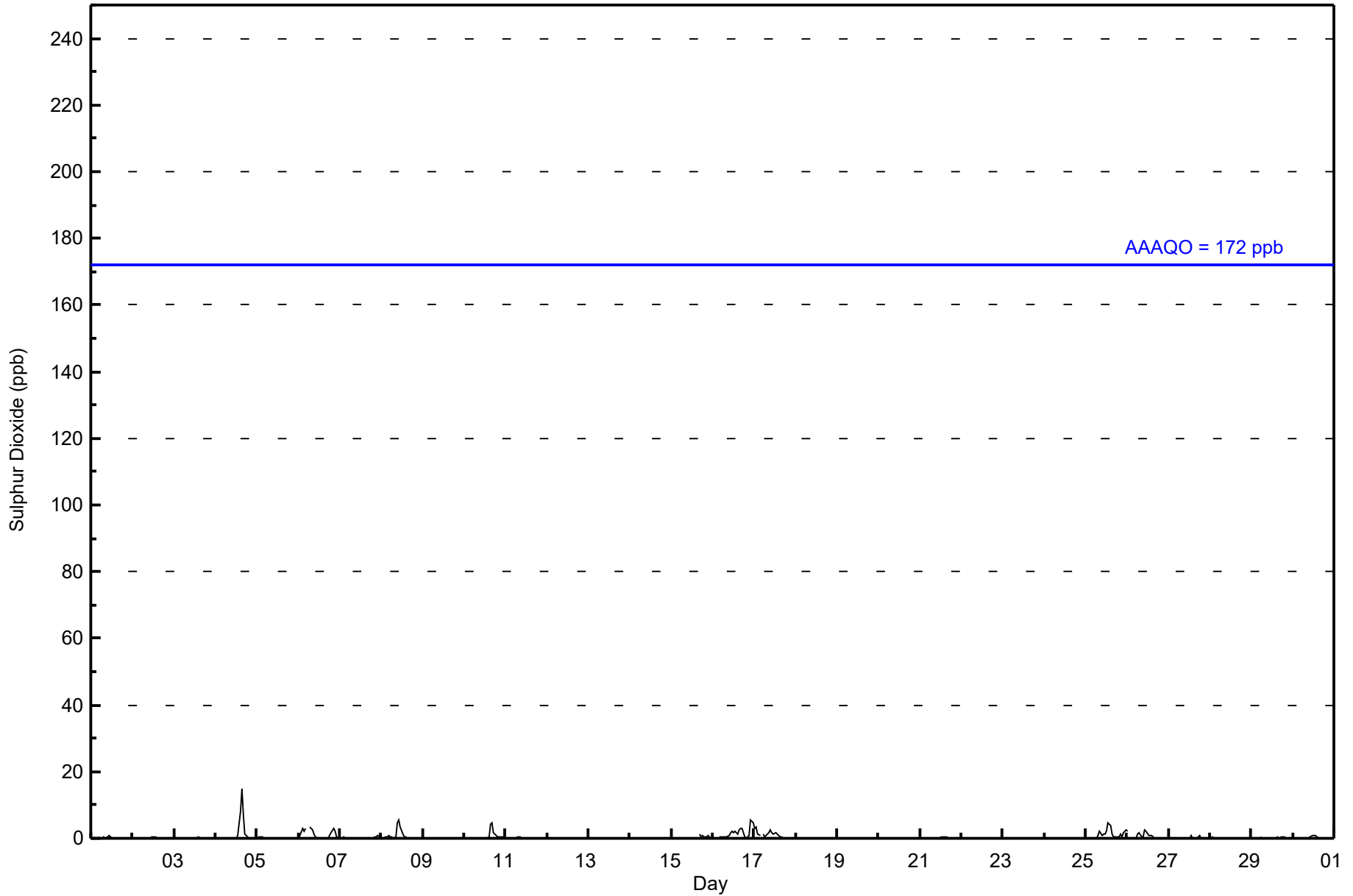
**Fort McKay - Bertha Ganter - November 2024**

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																		
Maximum Value: 15.0 ppb on Nov 4 16:00		Maximum Daily Average: 1.4 ppb on Nov 4				Hours of Data:		684																		
Minimum Value: 0.0 ppb on Nov 1 21:00		Minimum Daily Average: 0.0 ppb on Nov 24				Hours of Missing Data:		36																		
Maximum Diurnal Average: 0.9 ppb at hour 16		Minimum Diurnal Average: 0.1 ppb at hour 6				Hours of Calibration:		35																		
Monthly Average: 0.33 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 0.8 P <sub>99</sub> = 4.6				Percent Operational Time:		99.9																		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	Z	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.3	0.9	0.4	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.9
2-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
3-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
4-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	8.0	15.0	7.3	1.4	0.2	0.0	0.0	0.0	0.0	0.1	15.0	
5-Nov	0.0	0.3	0.4	0.2	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	
6-Nov	0.0	1.0	2.8	1.9	2.8	Z	3.4	2.9	2.7	1.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	1.0	1.7	2.8	2.0	0.5	0.2	3.4	
7-Nov	Z	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.6	0.9	0.5	0.1	0.9	
8-Nov	0.7	Z	0.6	0.3	0.8	0.6	0.2	0.1	0.5	4.5	5.4	3.2	1.2	0.4	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.0	5.4	
9-Nov	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
10-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.3	4.2	4.7	1.9	0.7	0.4	0.3	0.2	0.2	0.2	4.7	
11-Nov	0.2	0.2	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
12-Nov	0.0	0.1	0.0	0.0	0.0	Z	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	
13-Nov	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	
14-Nov	0.1	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
15-Nov	0.0	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	C	C	C	C	C	1.4	0.4	0.6	0.5	0.3	0.7	0.6	0.1	1.4	
16-Nov	0.0	0.1	0.1	Z	0.3	0.4	0.6	0.4	0.4	1.0	1.9	2.3	1.5	2.0	1.1	2.4	3.1	2.9	0.3	0.2	0.2	1.0	5.4	4.7	5.4	
17-Nov	2.9	3.4	1.1	0.7	Z	1.2	0.5	0.8	1.6	2.7	1.7	1.4	1.6	1.5	0.9	0.4	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	3.4	
18-Nov	0.0	0.0	0.1	0.0	0.1	Z	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.2	
19-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	M	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	
21-Nov	0.1	0.1	Z	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.4	0.5	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	
22-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2	
23-Nov	0.1	0.0	0.1	0.1	Z	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
24-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
25-Nov	Z	0.1	0.1	0.0	0.1	0.0	0.1	0.9	2.3	0.9	1.1	1.3	2.2	4.6	3.8	1.1	0.5	0.5	0.3	0.6	1.1	0.4	1.6	2.6	4.6	
26-Nov	2.2	Z	0.0	0.0	0.1	0.0	1.3	1.8	0.6	0.6	2.7	2.0	0.8	0.8	0.8	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	
27-Nov	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.1	0.6	0.8	0.1	0.1	0.0	0.0	0.0	0.8	
28-Nov	0.0	0.2	0.1	Z	0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.2	
29-Nov	0.1	0.1	0.1	0.2	Z	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.6	0.3	0.2	0.1	0.1	0.6	
30-Nov	0.0	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.6	0.8	0.7	0.7	0.3	0.1	0.0	0.1	0.2	0.0	0.1	0.1	0.0	0.0	0.8	
																								Diurnal Average		
																								Diurnal Maximum		
																								0.3 0.3 0.3 0.2 0.2 0.1 0.2 0.3 0.3 0.4 0.5 0.4 0.3 0.5 0.6 0.9 0.6 0.3 0.2 0.2 0.2 0.2 0.3 0.3		
																								2.9 3.4 2.8 1.9 2.8 1.2 3.4 2.9 2.7 4.5 5.4 3.2 2.2 4.6 8.0 15.0 7.3 2.9 1.0 1.7 2.8 2.0 5.4 4.7		
Z - zerspan C - Calibration M - Maintenance																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																										



Wood Buffalo Environmental Association  
Hourly Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Fort McKay - Bertha Ganter - November 2024





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	683	99.85	99.85
11 - 20	1	0.15	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Fort McKay - Bertha Ganter - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	90	57	14	4	3	2	5	24	121	47	32	22	27	33	21	26	528
11 - 20	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	90	57	14	4	3	2	5	24	122	47	32	22	27	33	21	26	529

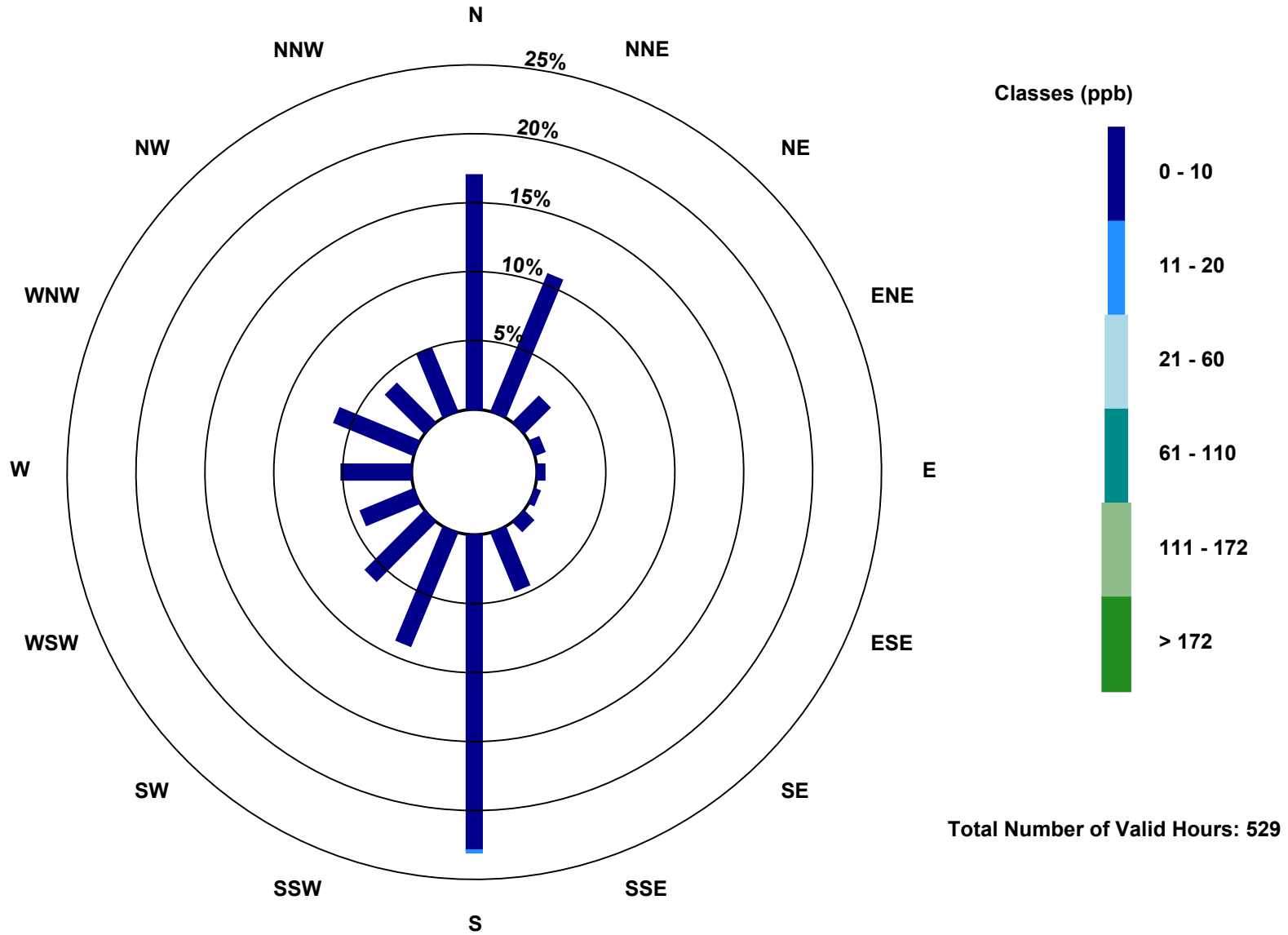
Total Number of Valid Hours: 529

Total Number of Hours: 720

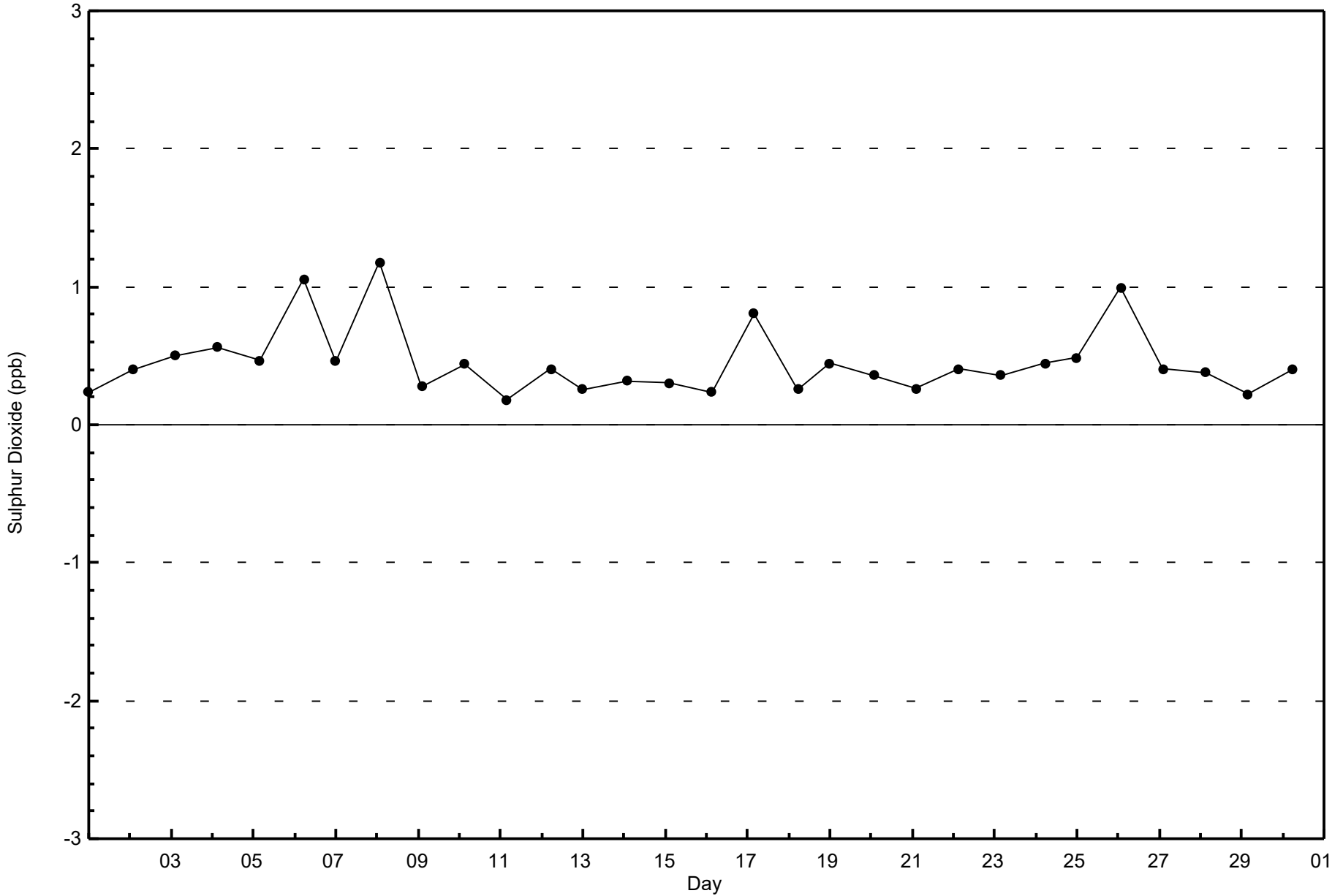


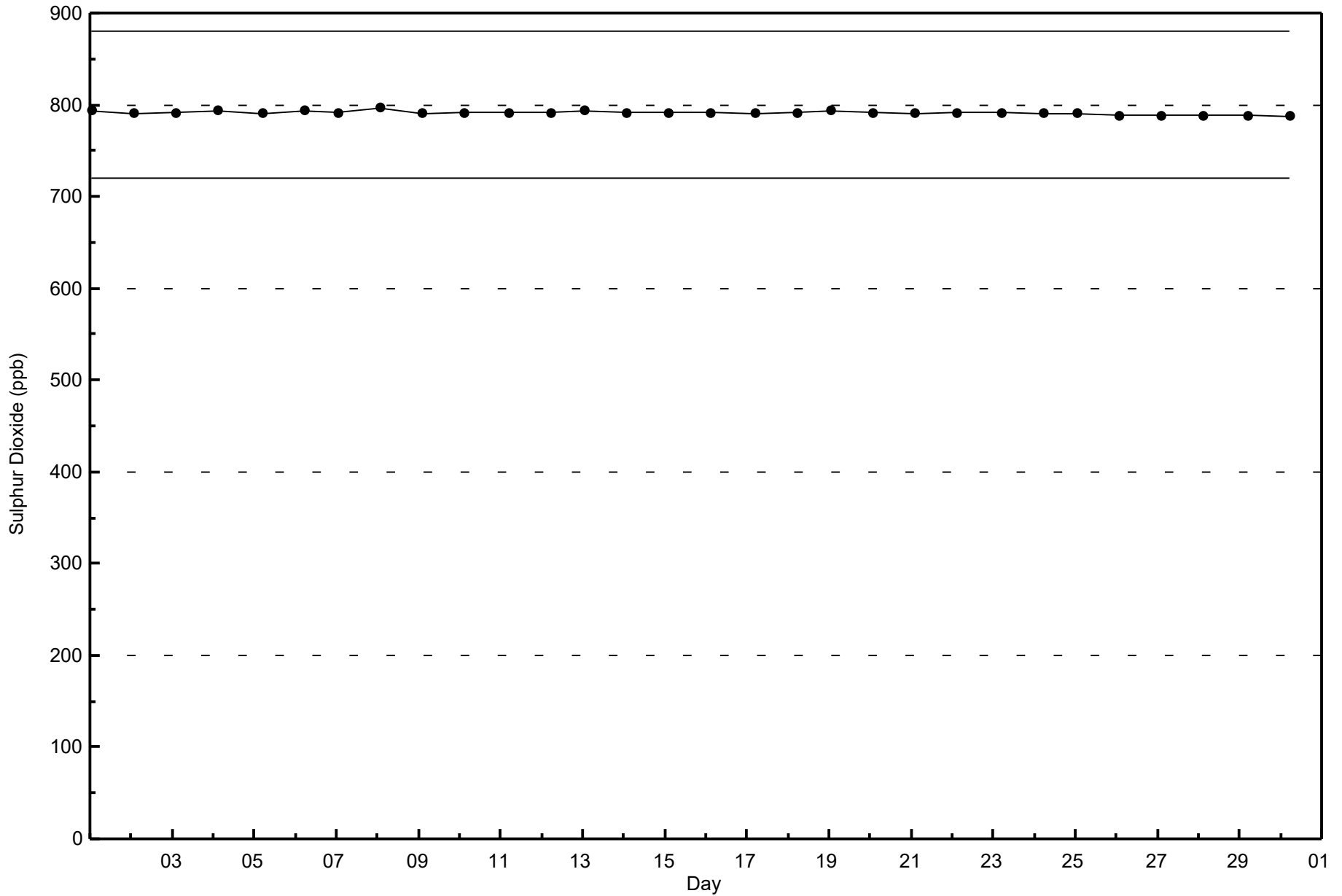
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Fort McKay - Bertha Ganter











Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 2.3 ppb on Nov 8 10:00	Maximum Daily Average: 0.5 ppb on Nov 8		Hours of Data:	661
Minimum Value: 0.0 ppb on Nov 9 03:00	Minimum Daily Average: 0.1 ppb on Nov 27		Hours of Missing Data:	59
Maximum Diurnal Average: 0.3 ppb at hour 17	Minimum Diurnal Average: 0.2 ppb at hour 8		Hours of Calibration:	37
Monthly Average: 0.25 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.1 Median = 0.1 Q <sub>3</sub> = 0.3 P <sub>90</sub> = 0.6 P <sub>99</sub> = 1.4		Percent Operational Time:	96.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.2	0.3	0.2	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.3	0.3	0.2	0.4
2-Nov	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.5	0.5	0.7	0.4	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.3	0.7
3-Nov	0.3	0.3	0.3	Z	0.4	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.2	0.4
4-Nov	0.0	0.1	0.3	0.3	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.9	1.5	1.6	1.5	1.1	0.9	0.8	0.6	0.5	0.4	0.5	1.6
5-Nov	0.4	1.0	0.9	0.7	0.6	Z	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.3	1.0
6-Nov	Z	0.2	0.4	0.2	0.2	0.1	0.3	0.3	0.3	0.2	0.2	0.2	C	C	C	C	M	M	M	M	M	M	M	M	M	0.4
7-Nov	M	M	M	M	M	M	M	M	M	M	M	M	M	C	C	C	C	M	M	M	M	M	M	M	M	0.7
8-Nov	0.5	0.7	Z	0.2	0.4	1.7	1.4	0.2	0.5	2.3	2.3	1.0	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.5	2.3
9-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.1	0.3
10-Nov	0.3	0.2	0.2	0.1	Z	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	1.0	1.3	1.2	1.1	0.9	0.8	0.7	0.6	0.6	0.4	1.3
11-Nov	0.4	0.3	0.2	0.2	0.1	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4
12-Nov	Z	0.2	0.3	0.3	0.2	0.5	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5
13-Nov	0.1	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
14-Nov	0.1	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
15-Nov	0.1	0.1	0.1	Z	0.1	0.2	0.2	0.2	0.2	0.3	0.5	0.6	0.4	0.3	0.3	0.5	0.8	0.5	0.4	0.3	0.2	0.2	0.2	0.1	0.3	0.8
16-Nov	0.1	0.1	0.1	0.2	Z	0.4	0.8	0.6	0.2	0.5	0.7	0.7	0.3	0.5	0.3	0.4	0.5	0.5	0.1	0.1	0.1	0.3	1.0	0.9	0.4	1.0
17-Nov	0.5	0.6	0.3	0.3	0.3	Z	0.3	0.3	0.9	1.2	0.8	0.8	0.9	0.9	0.7	0.4	0.7	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.5	1.2
18-Nov	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.5	0.5	0.7	0.6	0.4	0.4	0.4	0.2	0.7
19-Nov	0.3	Z	0.4	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4
20-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	M	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
21-Nov	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2
22-Nov	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.7	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.2	0.7
23-Nov	0.1	0.1	0.1	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2
24-Nov	Z	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.4	0.3	0.5	0.5	0.5	0.6	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.6
25-Nov	0.4	Z	0.6	0.6	0.4	0.4	0.4	0.4	0.8	0.5	0.3	0.2	0.4	0.9	0.7	0.3	0.3	0.3	0.4	0.4	0.6	0.5	0.6	0.5	0.5	0.9
26-Nov	0.5	0.1	Z	0.1	0.1	0.1	0.2	0.3	0.3	0.1	0.2	0.1	0.2	0.2	0.2	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.5
27-Nov	0.1	0.1	0.0	Z	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1
28-Nov	0.0	0.0	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.3
29-Nov	0.2	0.2	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.3	0.6	0.5	0.6	1.0	0.7	0.4	0.4	0.4	0.4	0.3	1.0
30-Nov	Z	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	1.2	1.5	1.4	1.4	0.7	0.3	0.2	0.3	0.5	0.3	0.2	0.2	0.2	0.2	0.5	1.5

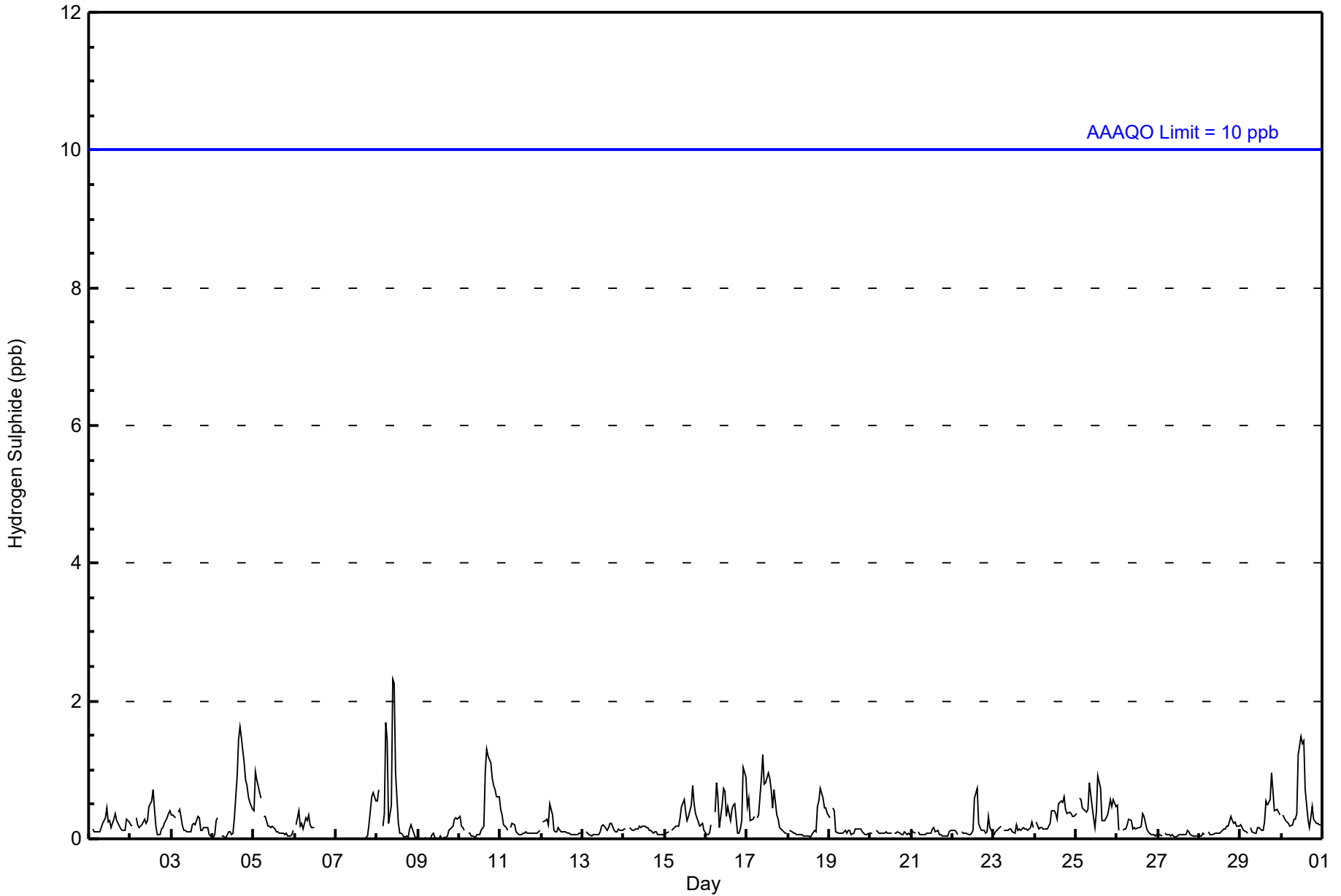
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.2	Diurnal Average	
0.5	1.0	0.9	0.7	0.6	1.7	1.4	0.6	0.9	2.3	2.3	1.5	1.4	1.4	0.9	1.5	1.6	1.5	1.1	0.9	0.8	0.7	1.0	0.9	Diurnal Maximum		

Z - zerospan      C - Calibration      M - Maintenance  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb    24-hr 3 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Fort McKay - Bertha Ganter - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	661	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 661

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Fort McKay - Bertha Ganter - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	87	59	14	4	3	2	4	26	116	45	29	20	26	27	22	22	506
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	87	59	14	4	3	2	4	26	116	45	29	20	26	27	22	22	506

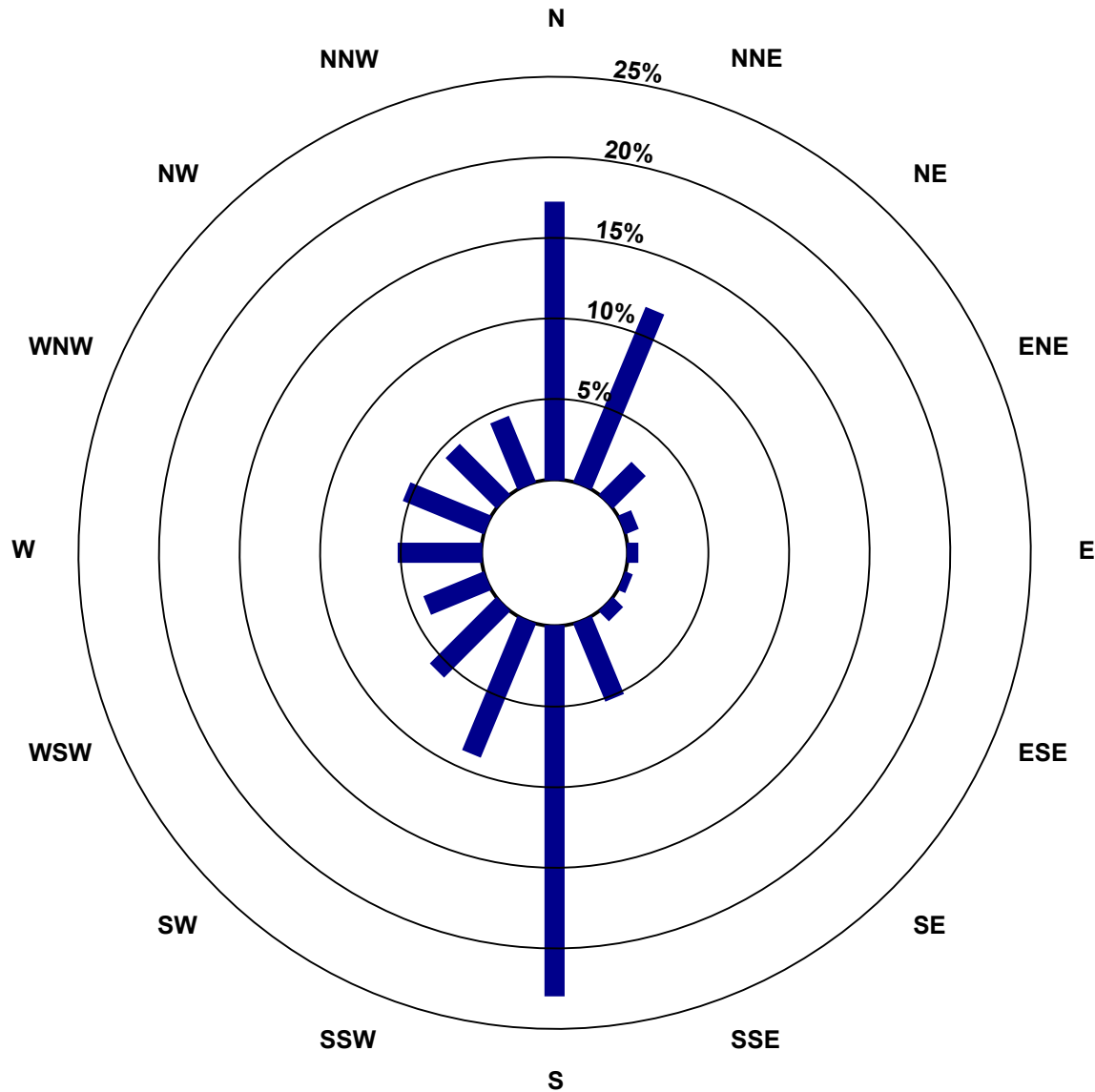
Total Number of Valid Hours: 506

Total Number of Hours: 720

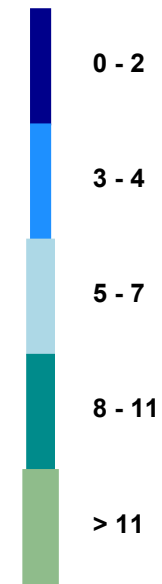


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

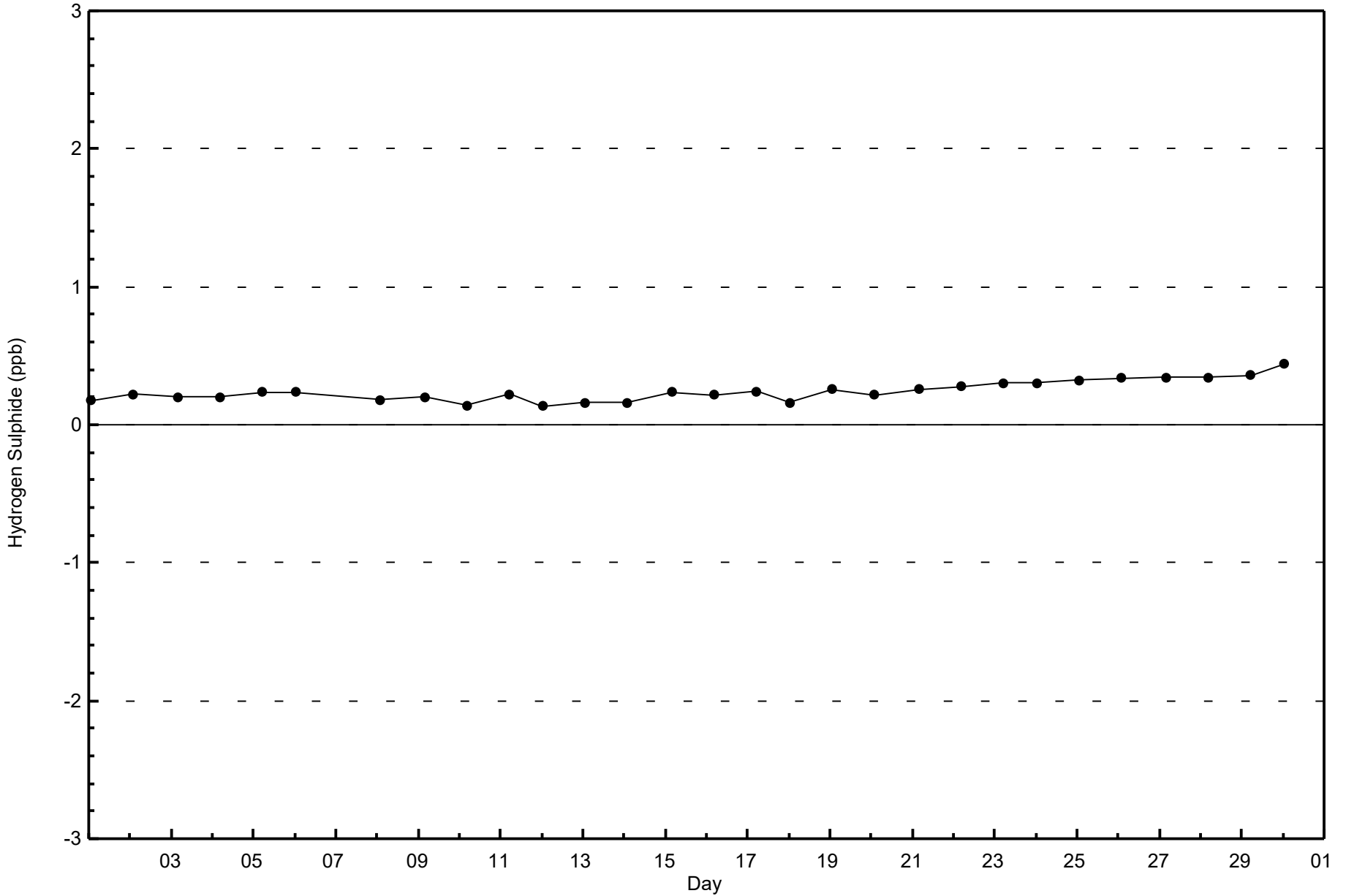
Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Fort McKay - Bertha Ganter



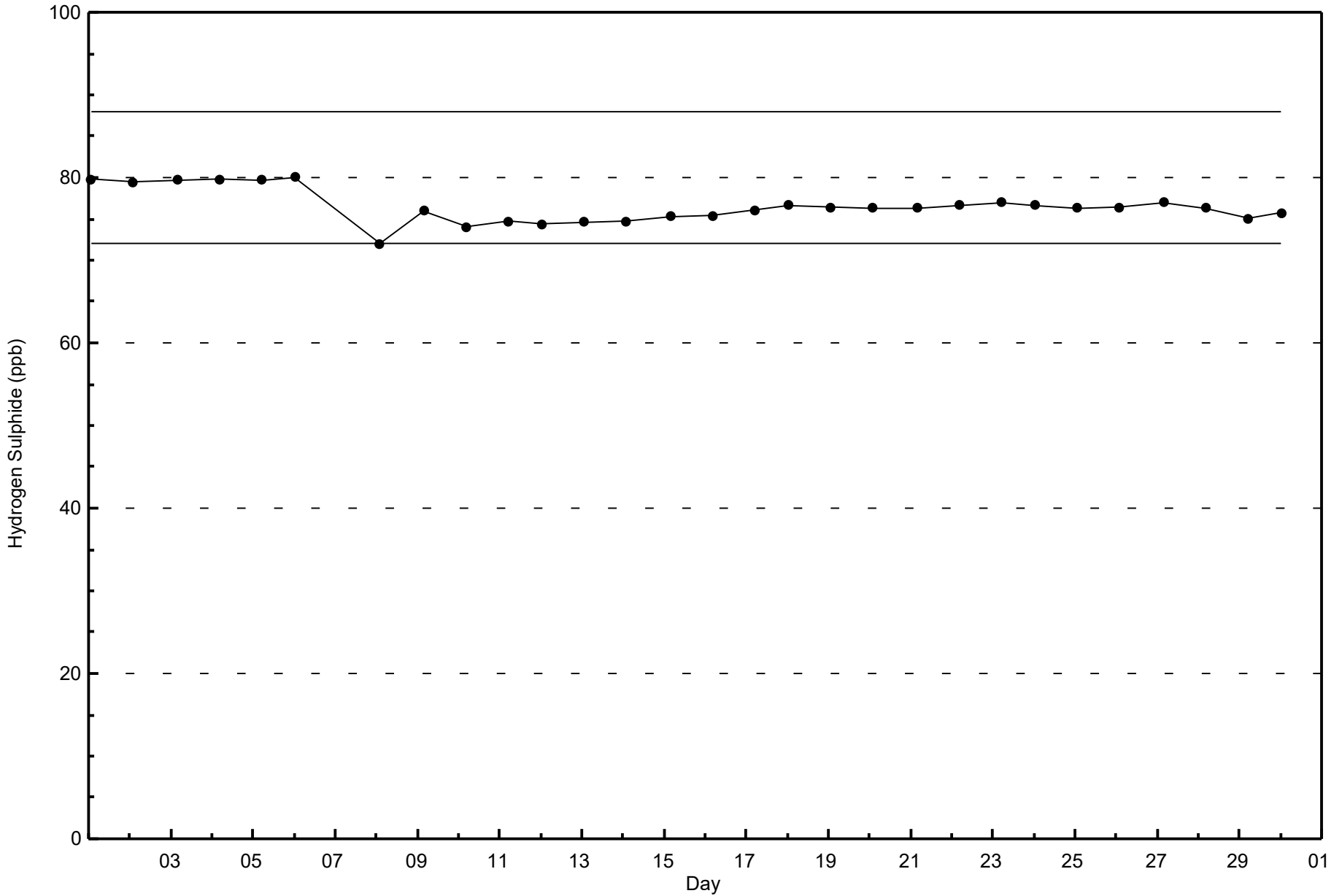
Classes (ppb)



Total Number of Valid Hours: 506





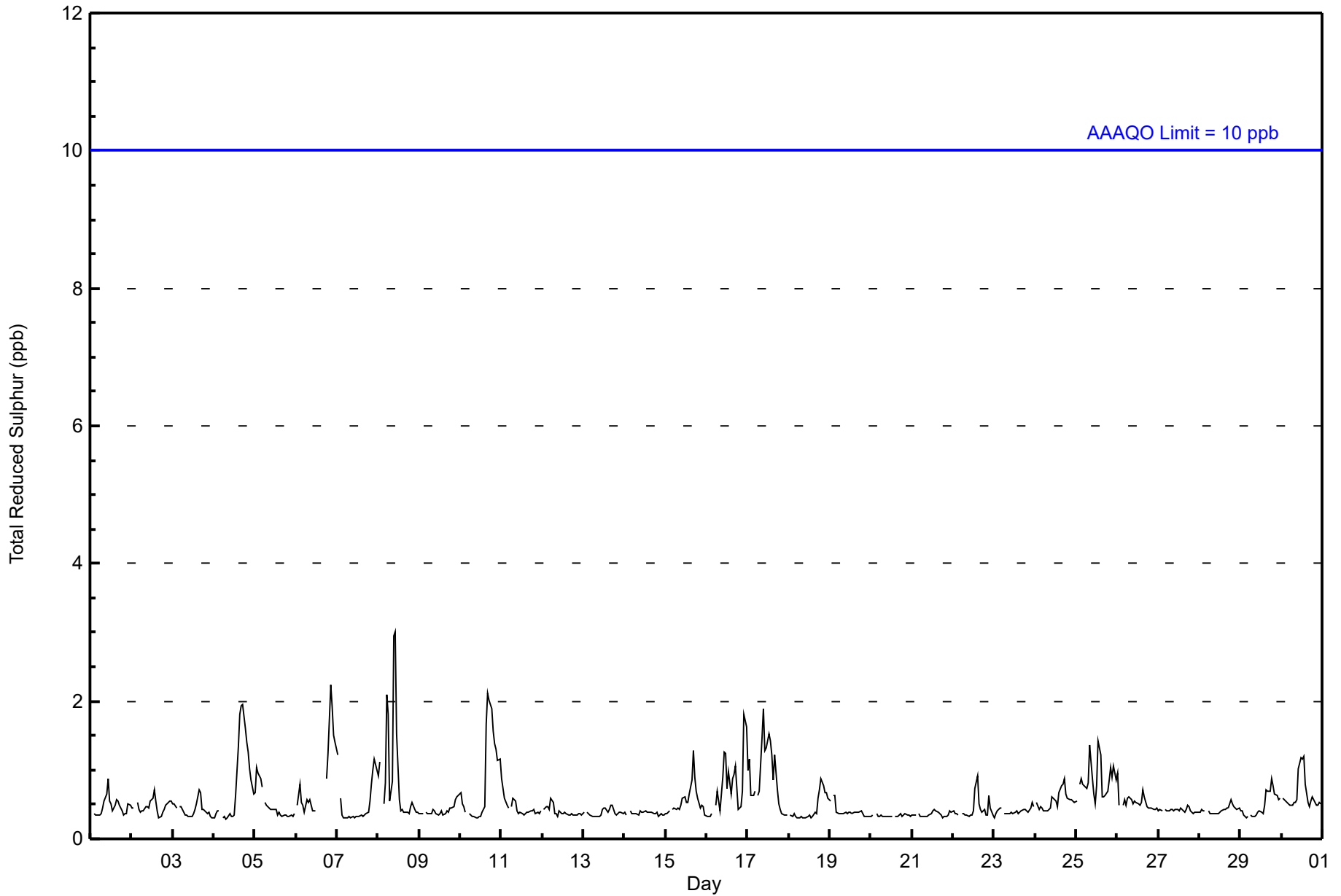






Wood Buffalo Environmental Association  
Hourly Averages

Total Reduced Sulphur (TRS) - ppb  
Fort McKay - Bertha Ganter - November 2024





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	681	99.71	99.71
3 - 4	2	0.29	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 2	87	59	14	4	3	2	5	27	118	45	31	21	29	33	23	25	526
3 - 4	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	87	59	14	4	3	2	5	27	120	45	31	21	29	33	23	25	528

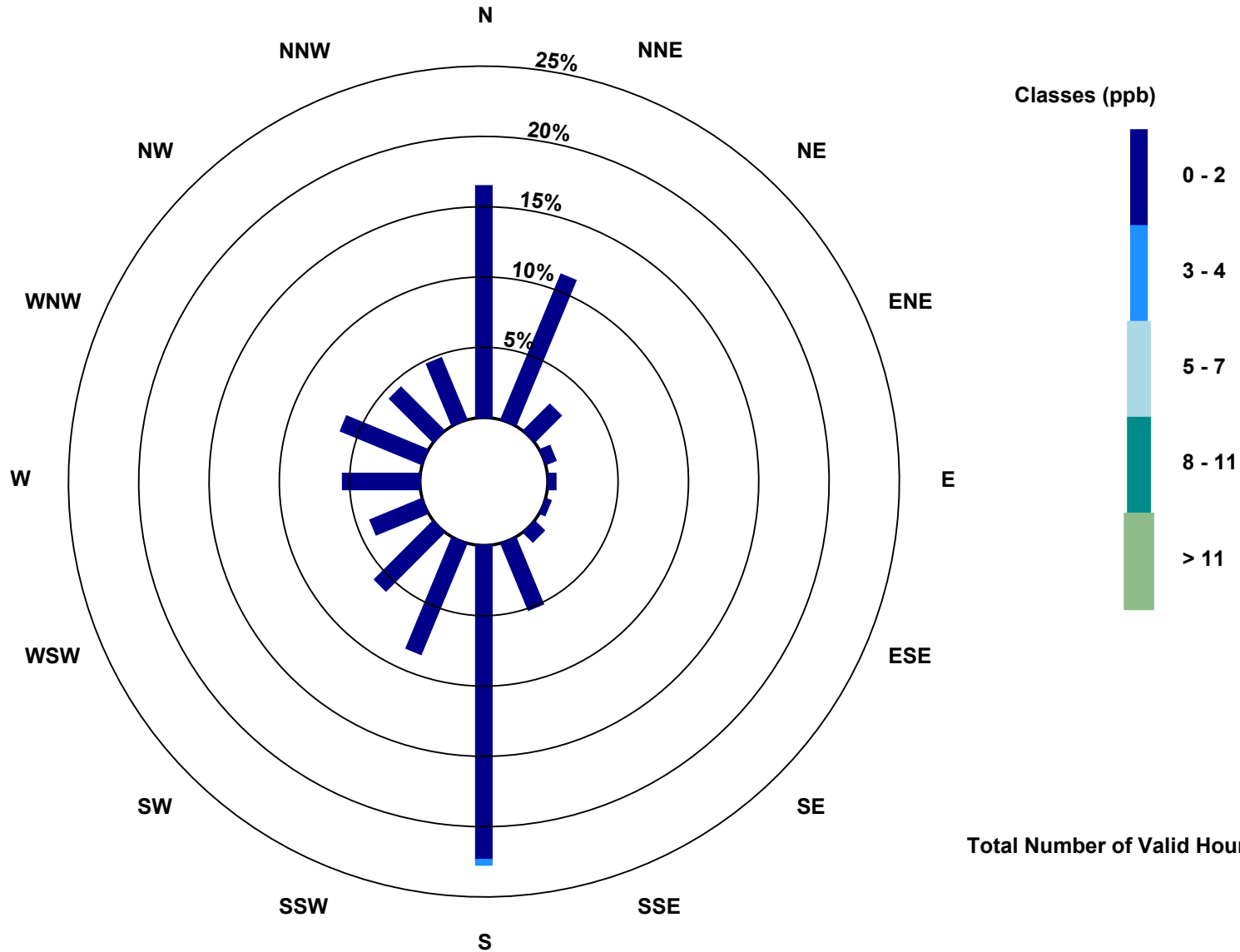
Total Number of Valid Hours: 528

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Reduced Sulphur (TRS) - ppb  
Fort McKay - Bertha Ganter

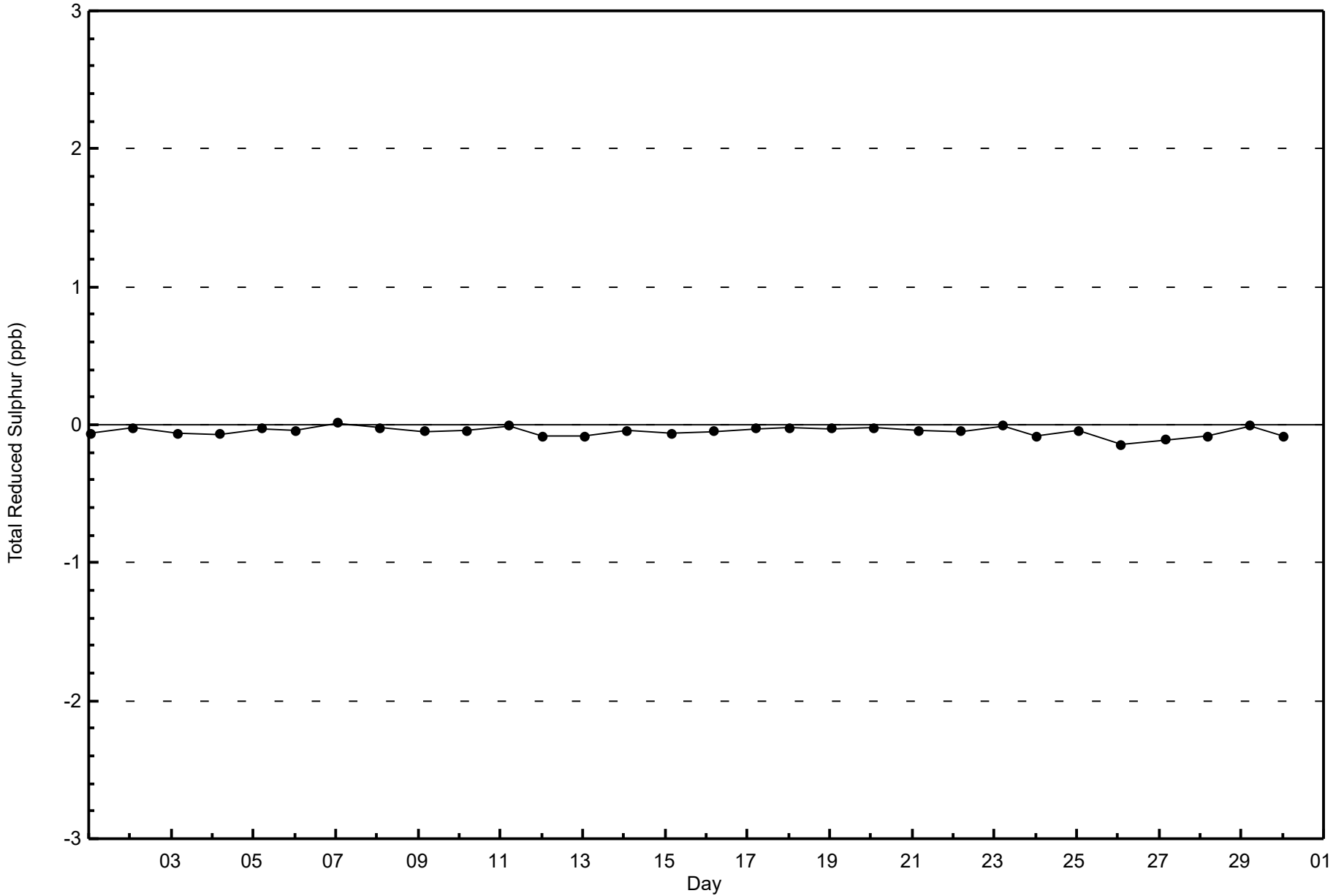


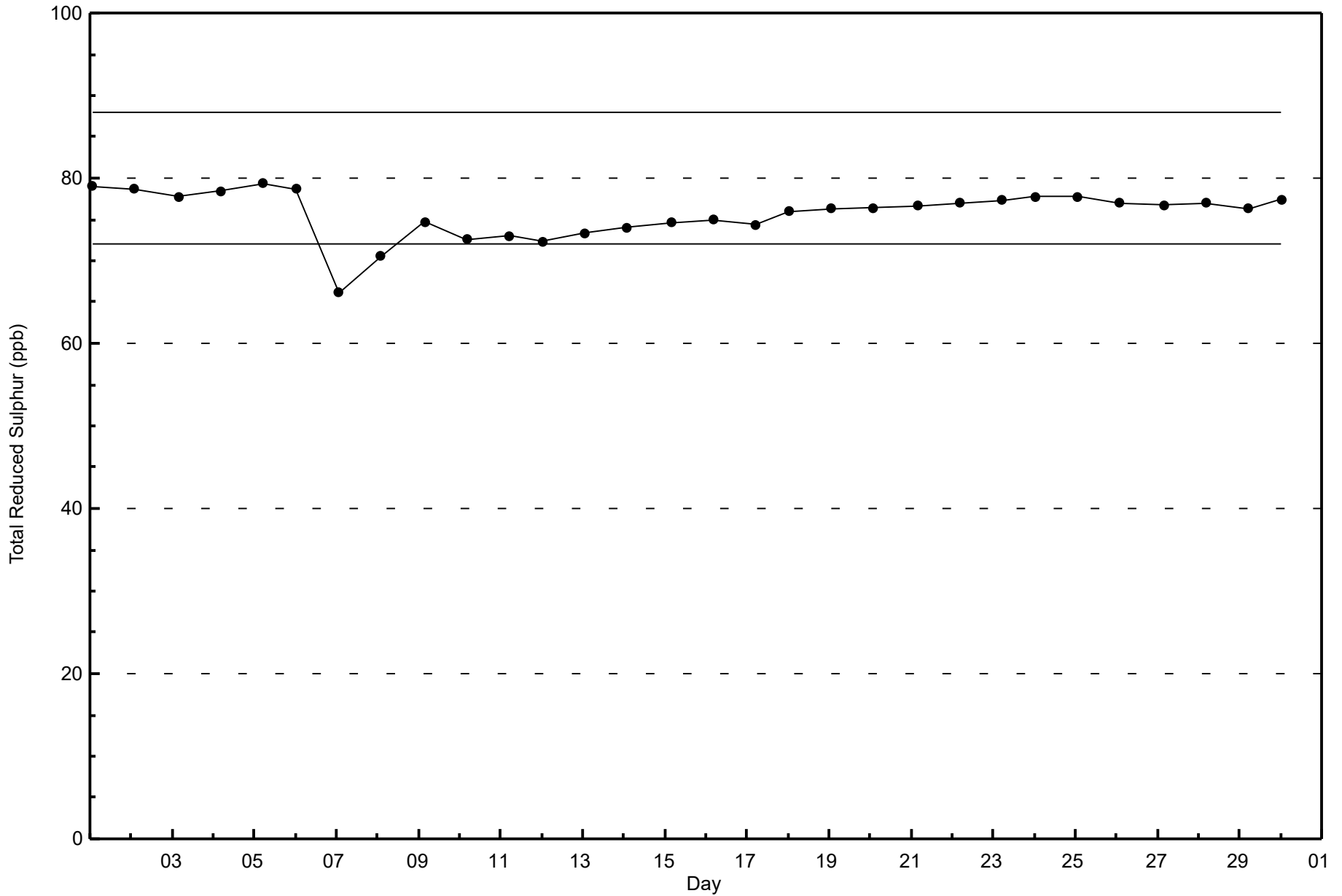
Total Number of Valid Hours: 528



**Wood Buffalo Environmental Association**  
**Zero Responses**

**Total Reduced Sulphur (TRS) - ppb**  
**Fort McKay - Bertha Ganter - November 2024**









Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Fort McKay - Bertha Ganter - November 2024

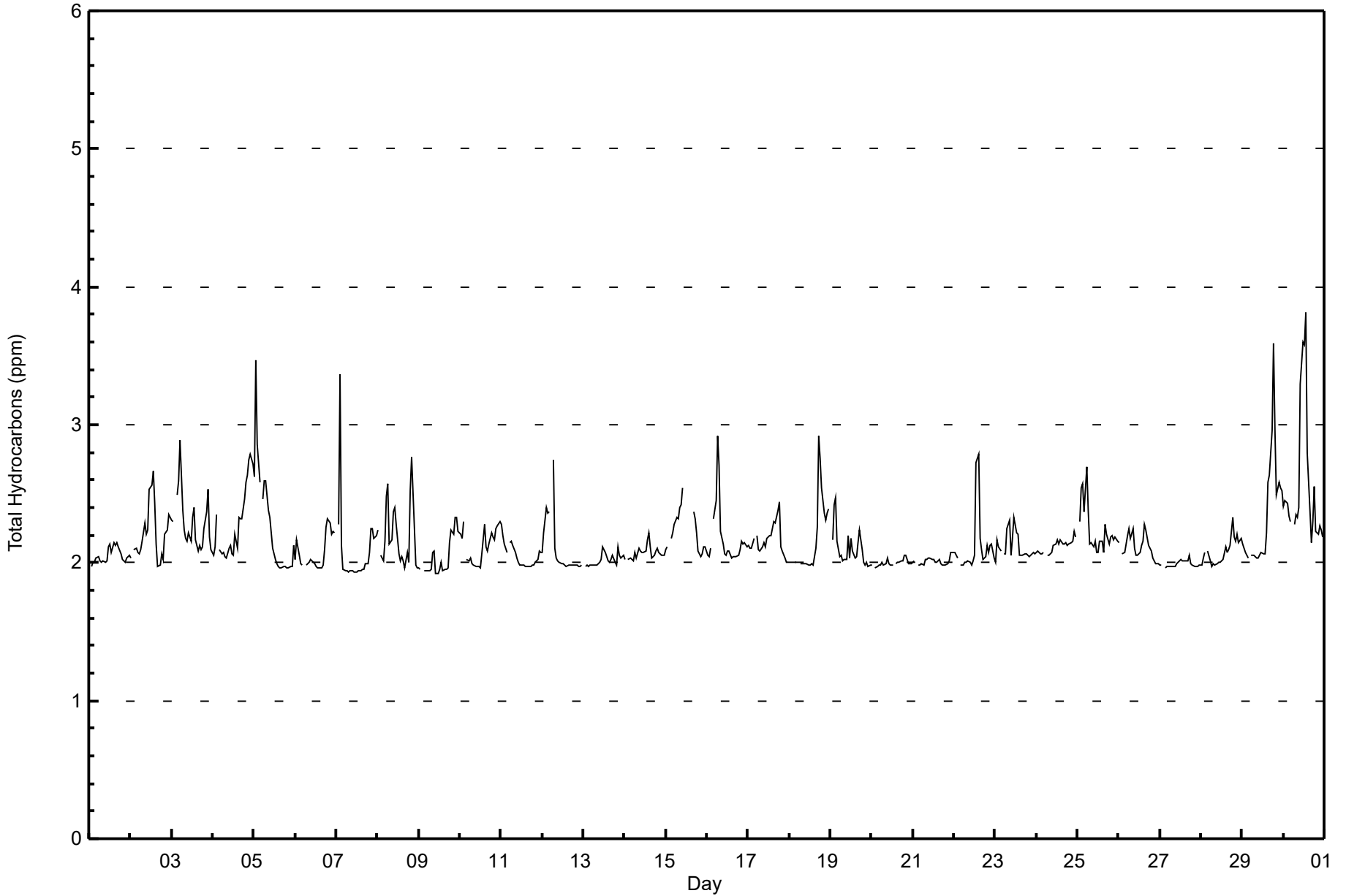
Maximum Value: 3.8 ppm on Nov 30 14:00		Maximum Daily Average: 2.6 ppm on Nov 30		Hours in Service:	720																							
Minimum Value: 1.9 ppm on Nov 9 12:00		Minimum Daily Average: 2.0 ppm on Nov 27		Hours of Data:	684																							
Maximum Diurnal Average: 2.2 ppm at hour 3		Minimum Diurnal Average: 2.1 ppm at hour 10		Hours of Missing Data:	36																							
Monthly Average: 2.15 ppm		Percentiles: P <sub>1</sub> = 1.9 P <sub>10</sub> = 2.0 Q <sub>1</sub> = 2.0 Median = 2.1 Q <sub>3</sub> = 2.2 P <sub>90</sub> = 2.4 P <sub>99</sub> = 3.0		Hours of Calibration:	35																							
				Percent Operational Time:	99.9																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Nov	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1
2-Nov	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.5	2.6	2.7	2.4	2.1	2.0	2.0	2.1	2.0	2.2	2.2	2.4	2.3	2.2	2.2	2.7	2.7
3-Nov	2.3	2.3	Z	2.5	2.6	2.9	2.4	2.2	2.2	2.2	2.2	2.3	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.5	2.2	2.1	2.3	2.3	2.9	2.9
4-Nov	2.1	2.1	2.3	Z	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.3	2.3	2.3	2.5	2.6	2.6	2.7	2.8	2.7	2.3	2.3	2.3	2.8	2.8
5-Nov	2.6	3.5	2.9	2.6	Z	2.5	2.6	2.6	2.4	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.3	3.5	3.5
6-Nov	2.0	2.2	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.3	2.3	2.3
7-Nov	Z	2.3	3.4	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.1	2.1	3.4	3.4
8-Nov	2.2	Z	2.1	2.0	2.2	2.5	2.6	2.1	2.2	2.4	2.4	2.3	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.5	2.8	2.2	2.0	2.0	2.2	2.2	2.8	2.8
9-Nov	2.0	2.0	Z	1.9	1.9	1.9	1.9	2.0	2.1	2.1	1.9	1.9	2.0	2.0	1.9	1.9	2.0	2.0	2.1	2.2	2.2	2.3	2.3	2.2	2.0	2.0	2.3	2.3
10-Nov	2.2	2.2	2.3	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.1	2.1	2.3	2.3
11-Nov	2.3	2.2	2.1	2.1	Z	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.3	2.3
12-Nov	2.1	2.2	2.4	2.4	2.4	Z	2.7	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.7	2.7
13-Nov	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.0	2.1	2.0	2.1	2.1	2.1
14-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
15-Nov	2.1	2.1	Z	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.5	C	C	C	C	C	2.4	2.3	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.5
16-Nov	2.1	2.0	2.1	Z	2.3	2.4	2.9	2.7	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.9	2.9
17-Nov	2.1	2.1	2.1	2.2	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.1	2.1	2.0	2.0	2.0	2.2	2.2	2.4	2.4
18-Nov	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.9	2.8	2.5	2.4	2.3	2.4	2.4	2.2	2.2	2.2	2.9	2.9
19-Nov	Z	2.2	2.4	2.5	2.2	2.0	2.1	2.0	2.0	2.0	2.2	2.0	2.2	2.1	2.0	2.0	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.5	2.5
20-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	M	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1
21-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.1
22-Nov	2.1	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.7	2.8	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.8	2.8
23-Nov	2.0	2.2	2.1	2.1	Z	2.1	2.1	2.2	2.3	2.1	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.3	2.3
24-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.2
25-Nov	Z	2.3	2.5	2.6	2.4	2.7	2.4	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.1	2.3	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.7	2.7
26-Nov	2.1	Z	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.3
27-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1
28-Nov	2.0	2.0	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.3	2.3
29-Nov	2.1	2.1	2.1	2.0	Z	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.6	2.6	3.0	3.6	3.0	2.5	2.6	2.5	2.5	2.3	2.3	3.6	3.6
30-Nov	2.4	2.5	2.4	2.3	2.3	Z	2.3	2.4	2.3	2.4	3.3	3.6	3.6	3.8	2.8	2.4	2.1	2.3	2.6	2.2	2.2	2.3	2.2	2.6	2.6	3.8	3.8	3.8
																								Diurnal Average				
																								Diurnal Maximum				
																								2.1				
																								2.6				

Z - zerospan C - Calibration M - Maintenance



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Fort McKay - Bertha Ganter - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	278	40.64	40.64
2.1 - 3.0	399	58.33	98.98
3.1 - 10.0	7	1.02	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Concentration</b> <b>Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	33	22	8	2	2	2	3	13	32	14	13	12	22	25	11	11	225
2.1 - 3.0	57	35	6	2	1	0	2	11	90	33	19	10	5	7	9	15	302
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	90	57	14	4	3	2	5	24	122	47	32	22	27	33	21	26	529

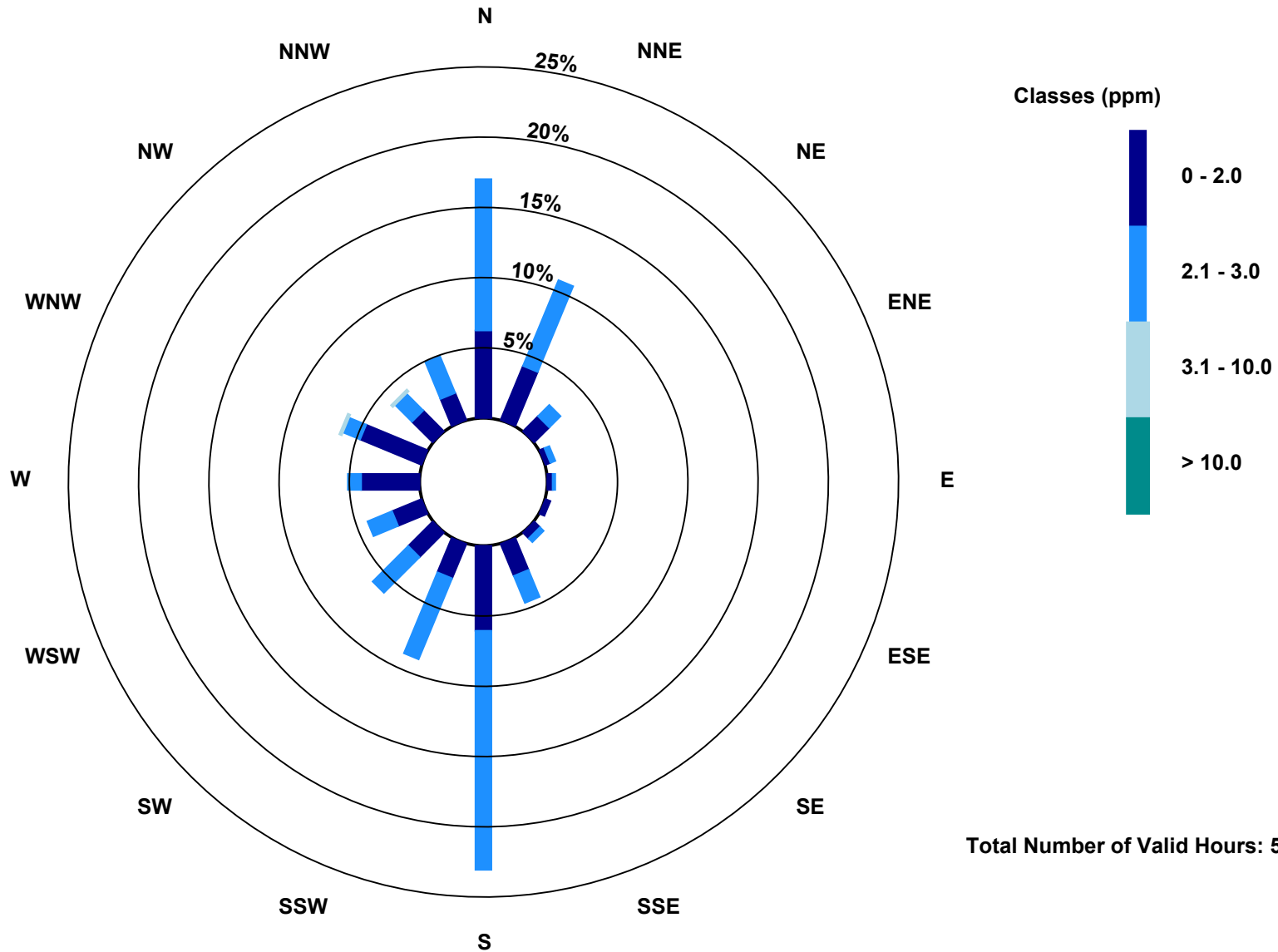
Total Number of Valid Hours: 529

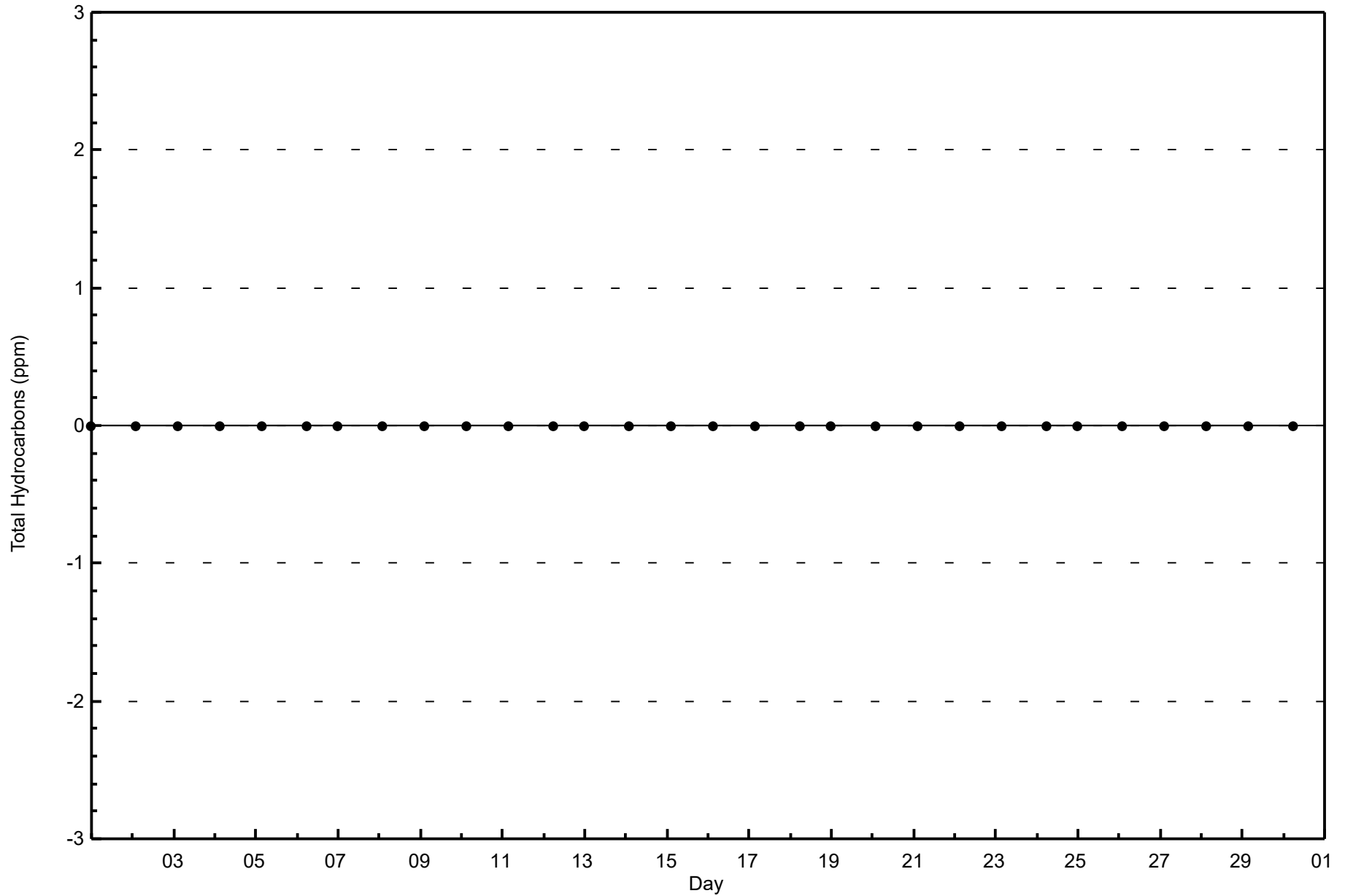
Total Number of Hours: 720

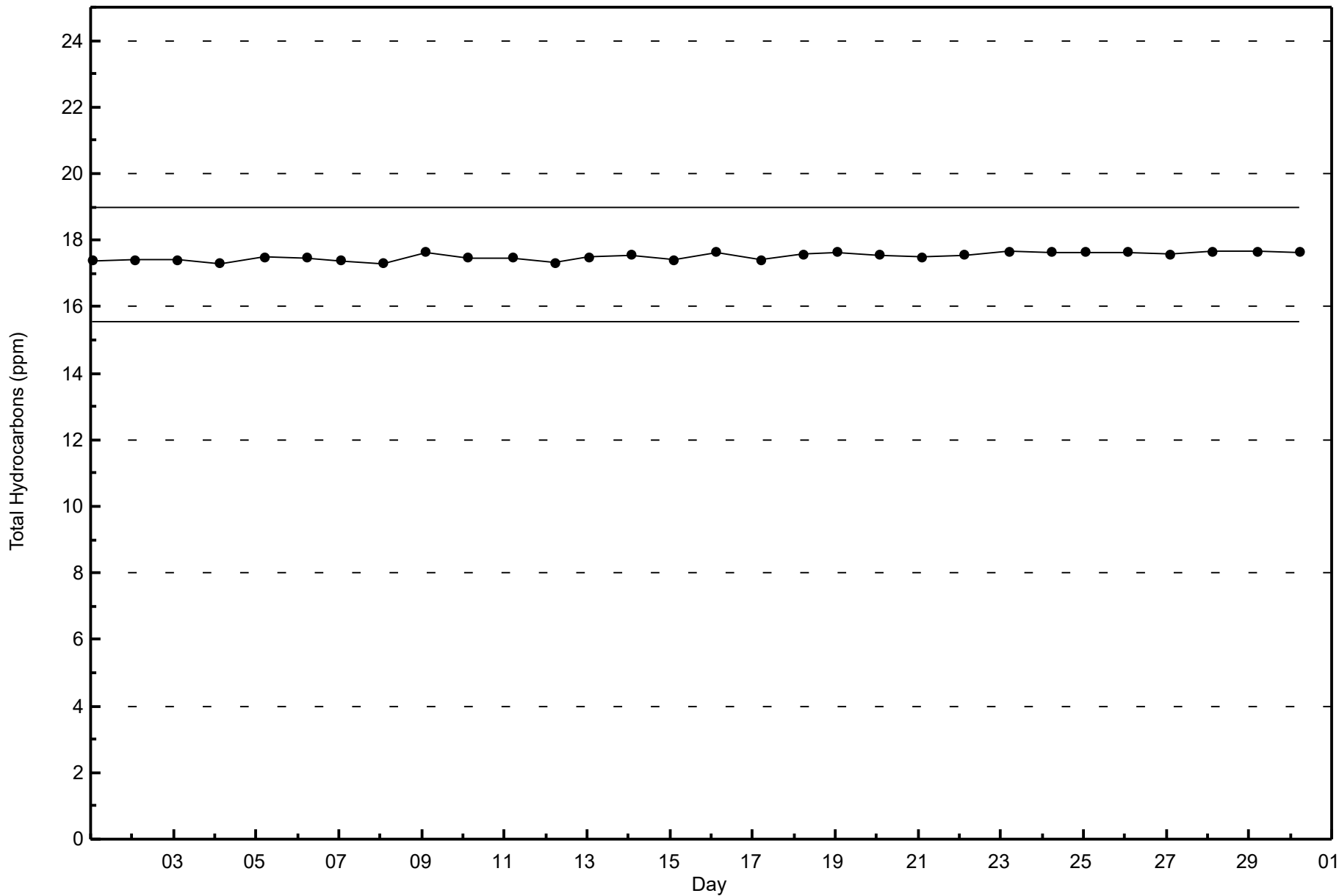


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Hydrocarbons (THC) - ppm  
Fort McKay - Bertha Garter







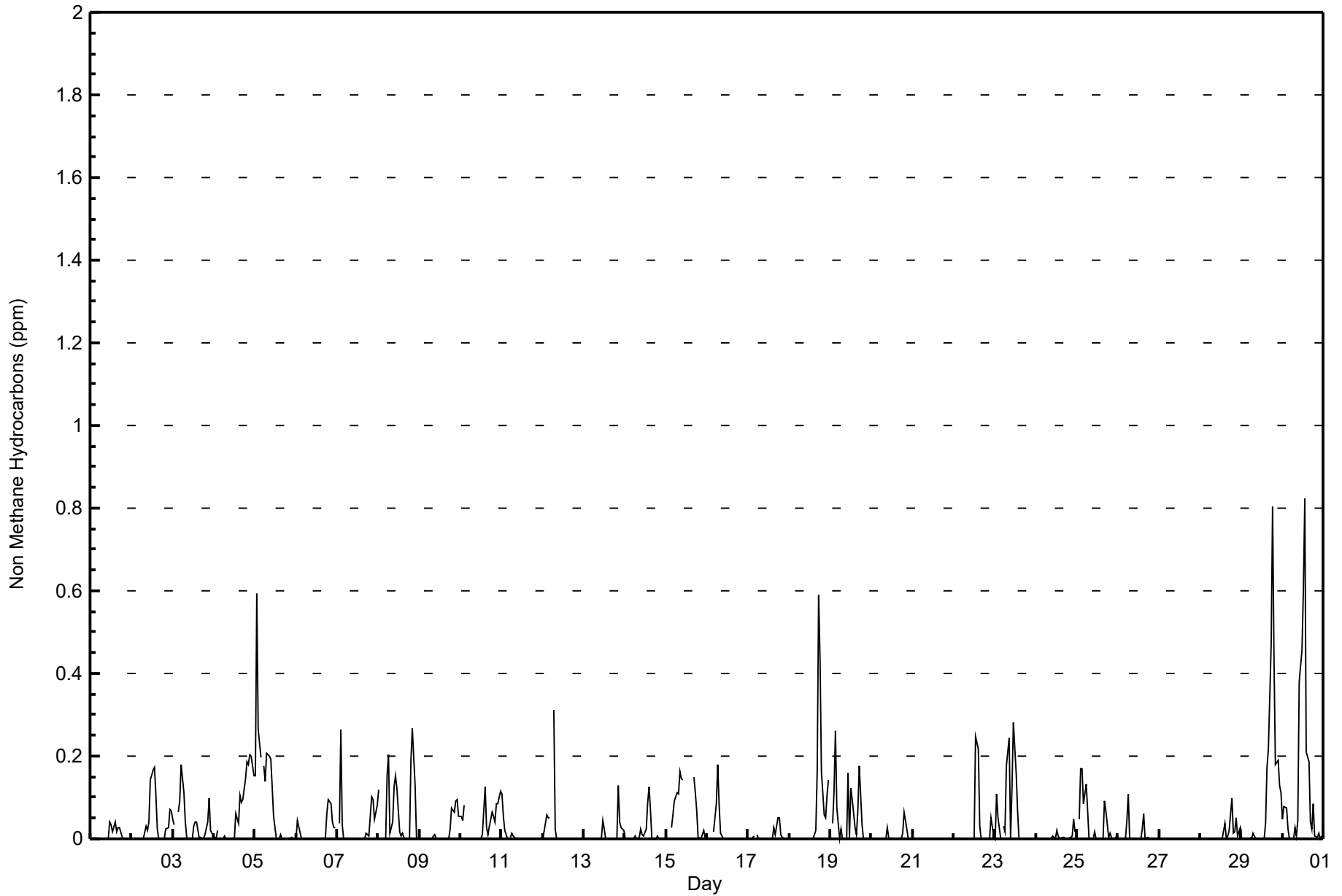


**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Fort McKay - Bertha Ganter - November 2024**

Maximum Value: 0.823 ppm on Nov 30 14:00		Maximum Daily Average: 0.137 ppm on Nov 30		Hours in Service: 720																						
Minimum Value: 0.000 ppm on Nov 1 02:00		Minimum Daily Average: 0.000 ppm on Nov 21		Hours of Data: 684																						
Maximum Diurnal Average: 0.063 ppm at hour 19		Minimum Diurnal Average: 0.015 ppm at hour 5		Hours of Missing Data: 36																						
Monthly Average: 0.037 ppm		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.1 P <sub>99</sub> = 0.4		Hours of Calibration: 35																						
				Percent Operational Time: 99.9																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	Z	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.040	0.036	0.016	0.041	0.018	0.026	0.028	0.002	0.000	0.000	0.000	0.000	0.000	0.009	0.041
2-Nov	0.000	Z	0.001	0.000	0.000	0.001	0.000	0.000	0.030	0.021	0.040	0.142	0.167	0.174	0.106	0.023	0.000	0.000	0.000	0.000	0.025	0.027	0.070	0.067	0.039	0.174
3-Nov	0.048	0.032	Z	0.064	0.091	0.179	0.111	0.041	0.004	0.000	0.000	0.000	0.031	0.040	0.039	0.000	0.002	0.000	0.000	0.011	0.041	0.097	0.019	0.012	0.037	0.179
4-Nov	0.002	0.000	0.021	Z	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.062	0.037	0.104	0.087	0.096	0.144	0.188	0.179	0.203	0.201	0.154	0.065	0.203	
5-Nov	0.151	0.592	0.265	0.198	Z	0.178	0.140	0.207	0.202	0.195	0.125	0.055	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.101	0.592	
6-Nov	0.000	0.046	0.013	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.060	0.094	0.086	0.040	0.026	0.027	0.017	0.094	
7-Nov	Z	0.036	0.263	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.006	0.053	0.102	0.096	0.046	0.032	0.263	
8-Nov	0.119	Z	0.000	0.000	0.000	0.154	0.204	0.014	0.041	0.126	0.151	0.121	0.016	0.007	0.013	0.004	0.000	0.000	0.000	0.186	0.267	0.129	0.004	0.068	0.267	
9-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.006	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.076	0.063	0.093	0.095	0.018	0.095	
10-Nov	0.053	0.043	0.083	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.126	0.027	0.009	0.032	0.064	0.053	0.041	0.083	0.086	0.036	0.126	
11-Nov	0.109	0.054	0.020	0.000	Z	0.005	0.015	0.007	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.109	
12-Nov	0.000	0.018	0.058	0.050	0.052	Z	0.312	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.312	
13-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.045	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.128	0.042	0.026	0.013	0.128	
14-Nov	0.001	Z	0.000	0.000	0.000	0.000	0.008	0.001	0.003	0.022	0.010	0.007	0.025	0.087	0.124	0.066	0.001	0.000	0.006	0.000	0.000	0.000	0.000	0.016	0.124	
15-Nov	0.000	0.000	Z	0.028	0.058	0.090	0.112	0.107	0.163	0.146	0.143	C	C	C	C	C	0.150	0.112	0.067	0.005	0.000	0.009	0.022	0.067	0.163	
16-Nov	0.000	0.000	0.000	Z	0.017	0.084	0.179	0.083	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.179	
17-Nov	0.000	0.000	0.001	0.007	Z	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.010	0.050	0.051	0.010	0.004	0.000	0.000	0.007	0.051	
18-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.166	0.590	0.437	0.164	0.058	0.050	0.106	0.075	0.590	
19-Nov	Z	0.037	0.115	0.260	0.074	0.001	0.024	0.000	0.000	0.000	0.160	0.005	0.123	0.095	0.029	0.009	0.066	0.177	0.032	0.000	0.000	0.000	0.000	0.052	0.260	
20-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.004	0.000	0.000	M	0.000	0.000	0.000	0.000	0.013	0.063	0.043	0.000	0.000	0.007	0.063	
21-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.248	0.216	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.051	0.024	0.248	
23-Nov	0.000	0.109	0.050	0.000	Z	0.029	0.018	0.175	0.243	0.000	0.121	0.283	0.158	0.066	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.054	0.283	
24-Nov	0.000	0.001	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.006	0.000	0.019	0.007	0.001	0.003	0.003	0.001	0.000	0.000	0.003	0.005	0.048	0.018	0.005	0.048	
25-Nov	Z	0.048	0.170	0.169	0.083	0.131	0.069	0.000	0.000	0.000	0.016	0.000	0.000	0.000	0.000	0.000	0.092	0.068	0.004	0.014	0.003	0.000	0.007	0.038	0.170	
26-Nov	0.005	Z	0.000	0.000	0.000	0.045	0.109	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.060	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.011	0.109		
27-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
28-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.000	0.008	0.022	0.099	0.014	0.016	0.052	0.006	0.012	0.099	
29-Nov	0.000	0.000	0.000	0.000	Z	0.002	0.000	0.013	0.000	0.001	0.000	0.000	0.000	0.000	0.036	0.171	0.218	0.472	0.803	0.441	0.179	0.190	0.127	0.120	0.803	
30-Nov	0.047	0.077	0.076	0.023	0.001	Z	0.001	0.026	0.008	0.044	0.379	0.457	0.607	0.823	0.211	0.187	0.040	0.023	0.086	0.008	0.002	0.012	0.001	0.137	0.823	
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan      C - Calibration      M - Maintenance																										







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	421	61.55	61.55
0.006 - 0.05	133	19.44	80.99
0.06 - 0.1	77	11.26	92.25
> 0.1	53	7.75	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	60	23	14	3	2	2	4	16	72	27	17	14	24	28	15	17	338
0.006 - 0.05	22	20	0	1	1	0	1	5	26	10	7	4	0	0	0	5	102
0.06 - 0.1	6	8	0	0	0	0	0	2	21	6	8	0	2	2	1	2	58
> 0.1	2	6	0	0	0	0	0	1	3	4	0	4	1	3	5	2	31
<b>Totals</b>	90	57	14	4	3	2	5	24	122	47	32	22	27	33	21	26	529

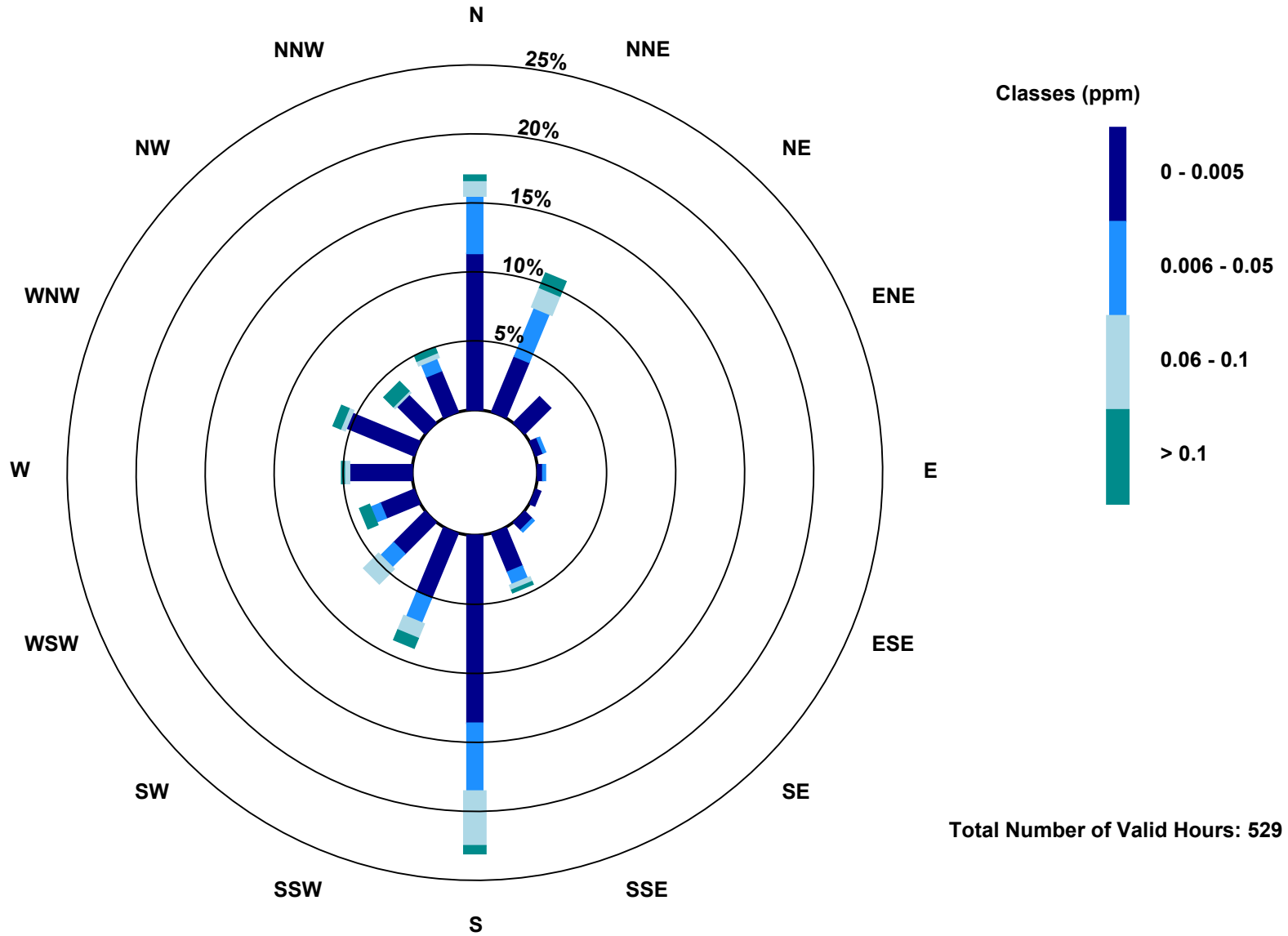
Total Number of Valid Hours: 529

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

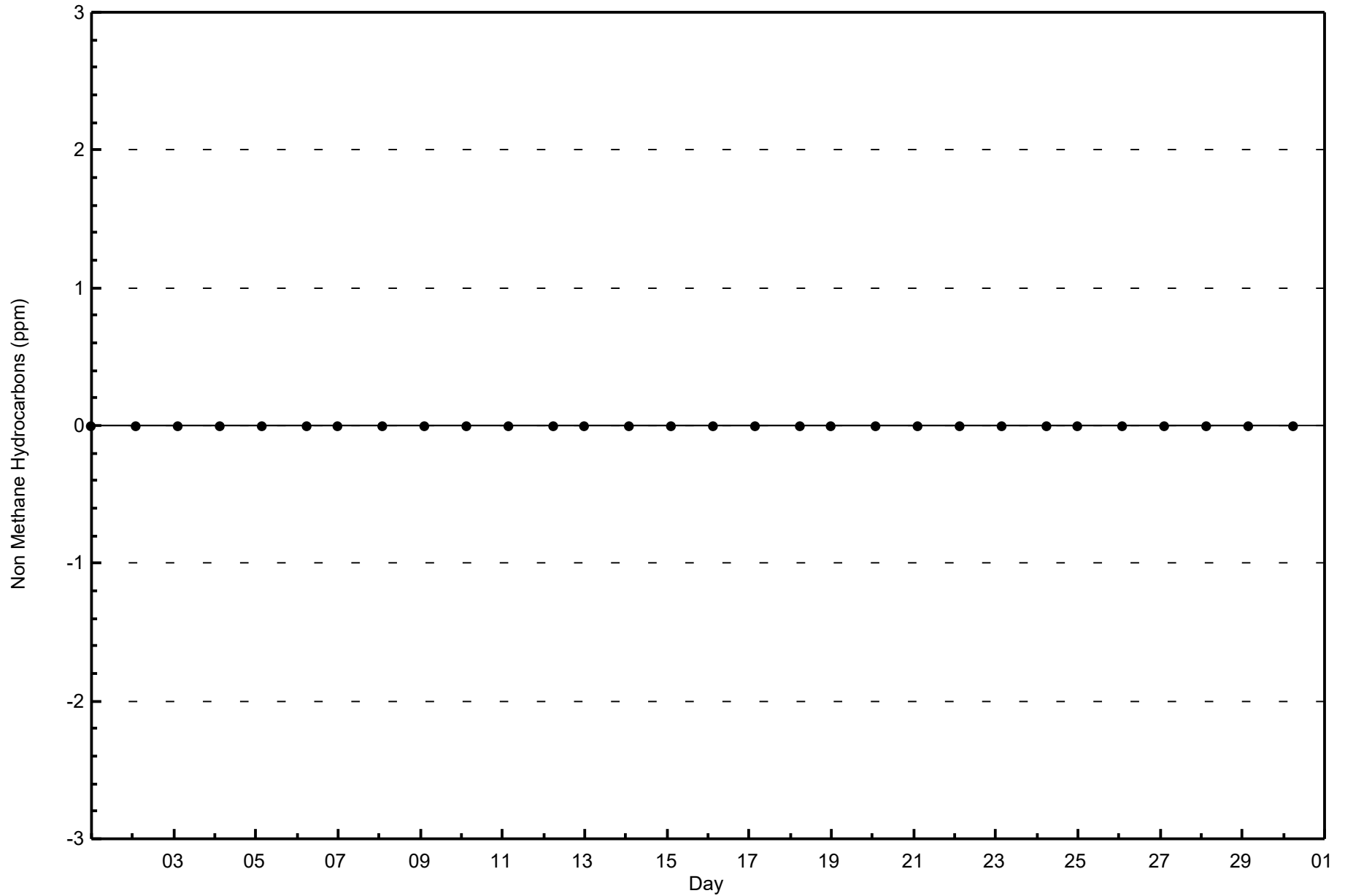
Non Methane Hydrocarbons (NMHC) - ppm  
Fort McKay - Bertha Ganter

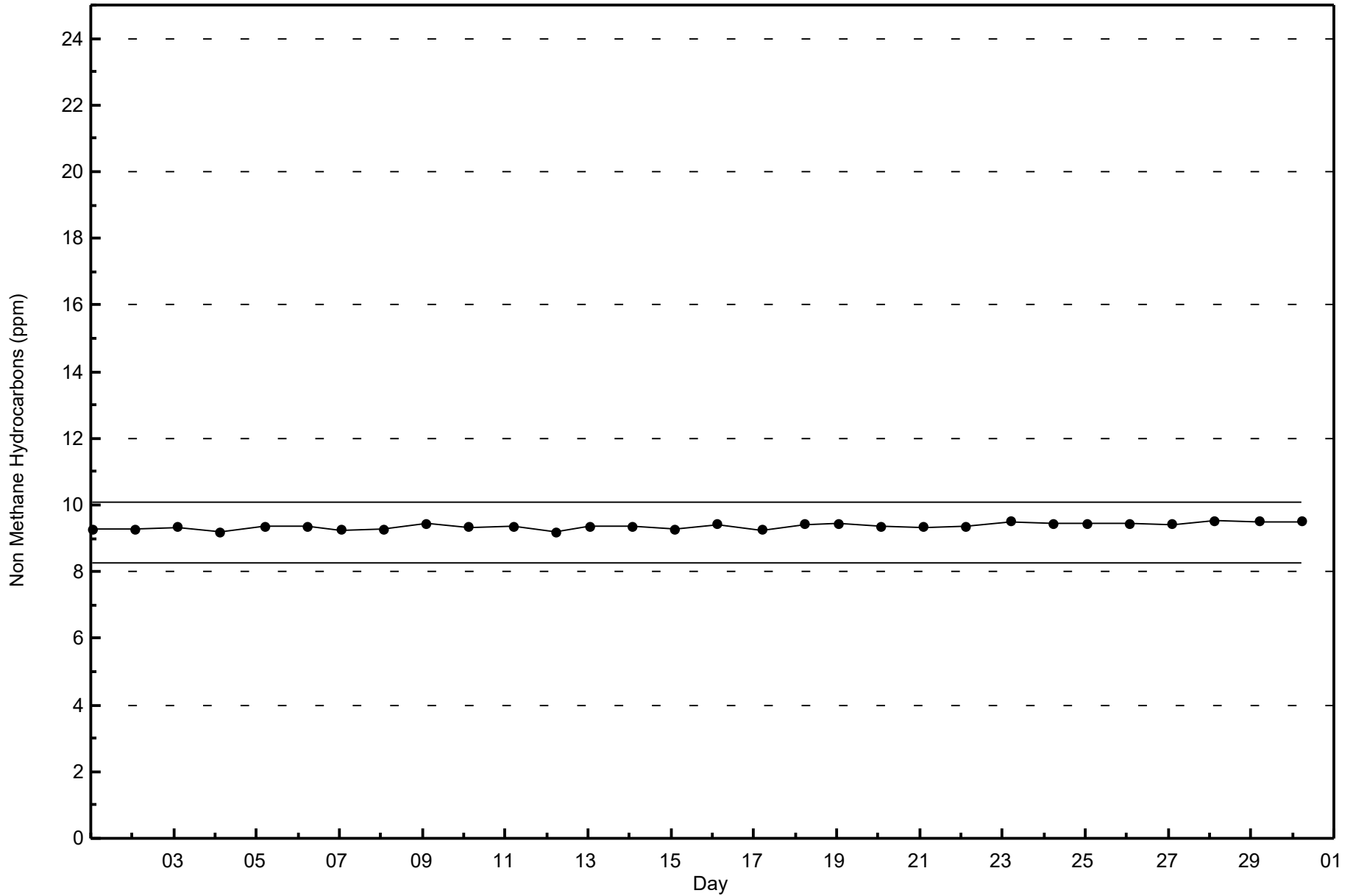




Wood Buffalo Environmental Association  
Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm  
Fort McKay - Bertha Ganter - November 2024





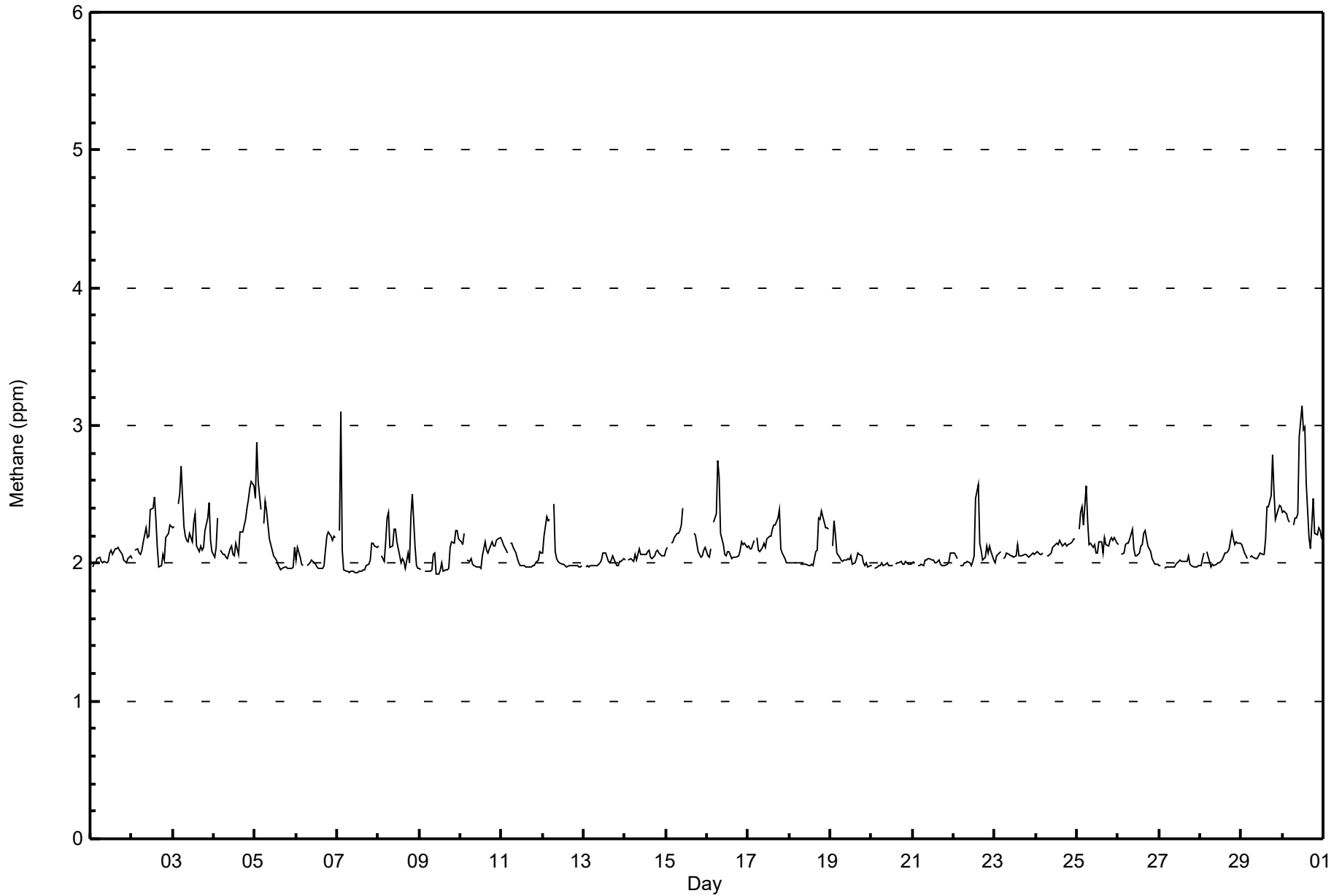


**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Methane (CH<sub>4</sub>) - ppm**

**Fort McKay - Bertha Ganter - November 2024**

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service: 720							
Maximum Value: 3.1 ppm on Nov 30 12:00		Maximum Daily Average: 2.4 ppm on Nov 30																			Hours of Data: 684							
Minimum Value: 1.9 ppm on Nov 9 12:00		Minimum Daily Average: 2.0 ppm on Nov 27																			Hours of Missing Data: 36							
Maximum Diurnal Average: 2.2 ppm at hour 3		Minimum Diurnal Average: 2.1 ppm at hour 10																			Hours of Calibration: 35							
Monthly Average: 2.11 ppm		Percentiles: P <sub>1</sub> = 1.9 P <sub>10</sub> = 2.0 Q <sub>1</sub> = 2.0 Median = 2.1 Q <sub>3</sub> = 2.2 P <sub>90</sub> = 2.3 P <sub>99</sub> = 2.8																			Percent Operational Time: 99.9							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Nov	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1
2-Nov	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.4	2.4	2.5	2.3	2.1	2.0	2.0	2.1	2.0	2.2	2.2	2.3	2.3	2.2	2.2	2.5	2.5
3-Nov	2.3	2.3	Z	2.4	2.5	2.7	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.4	2.2	2.1	2.3	2.7	2.7	
4-Nov	2.0	2.1	2.3	Z	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.4	2.5	2.5	2.6	2.6	2.2	2.6	2.6	
5-Nov	2.5	2.9	2.6	2.4	Z	2.3	2.5	2.4	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.9	2.9	
6-Nov	2.0	2.1	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	
7-Nov	Z	2.2	3.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	3.1	3.1	
8-Nov	2.1	Z	2.1	2.0	2.2	2.3	2.4	2.1	2.1	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.3	2.5	2.1	2.0	2.0	2.1	2.5	2.5	
9-Nov	2.0	2.0	Z	1.9	1.9	1.9	1.9	2.0	2.1	2.1	1.9	1.9	2.0	2.0	1.9	1.9	2.0	2.0	2.1	2.2	2.1	2.2	2.2	2.2	2.0	2.2	2.2	
10-Nov	2.2	2.1	2.2	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.2	2.2	
11-Nov	2.2	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.2	2.2	
12-Nov	2.1	2.2	2.3	2.3	2.3	Z	2.4	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	2.4	
13-Nov	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	
14-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
15-Nov	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	C	C	C	C	C	2.2	2.2	2.2	2.1	2.0	2.1	2.1	2.1	2.4	2.4	
16-Nov	2.1	2.0	2.1	Z	2.3	2.4	2.7	2.6	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.7	2.7	
17-Nov	2.1	2.1	2.1	2.2	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.1	2.1	2.0	2.0	2.0	2.2	2.4	2.4	
18-Nov	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.2	2.1	2.4	2.4	
19-Nov	Z	2.1	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.3	
20-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
21-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	
22-Nov	2.1	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5	2.6	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.6	2.6	
23-Nov	2.0	2.1	2.1	2.1	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	
24-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2	2.2	
25-Nov	Z	2.2	2.4	2.4	2.3	2.6	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.2	2.6	2.6	
26-Nov	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.2	
27-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	
28-Nov	2.0	2.0	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2.2	
29-Nov	2.1	2.1	2.1	2.0	Z	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.4	2.4	2.5	2.8	2.5	2.3	2.4	2.4	2.4	2.2	2.8	2.8	
30-Nov	2.4	2.4	2.4	2.3	2.3	Z	2.3	2.3	2.3	2.4	2.9	3.1	3.0	3.0	2.6	2.2	2.1	2.3	2.5	2.2	2.2	2.3	2.2	2.2	2.4	3.1	3.1	
																								Diurnal Average				
																								Diurnal Maximum				
Z - zerospan C - Calibration M - Maintenance																												







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	294	42.98	42.98
2.1 - 3.0	388	56.73	99.71
3.1 - 10.0	2	0.29	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Fort McKay - Bertha Ganter - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	35	29	8	2	2	2	3	13	34	14	13	13	22	25	11	11	237
2.1 - 3.0	55	28	6	2	1	0	2	11	88	33	19	9	5	7	10	15	291
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	90	57	14	4	3	2	5	24	122	47	32	22	27	33	21	26	529

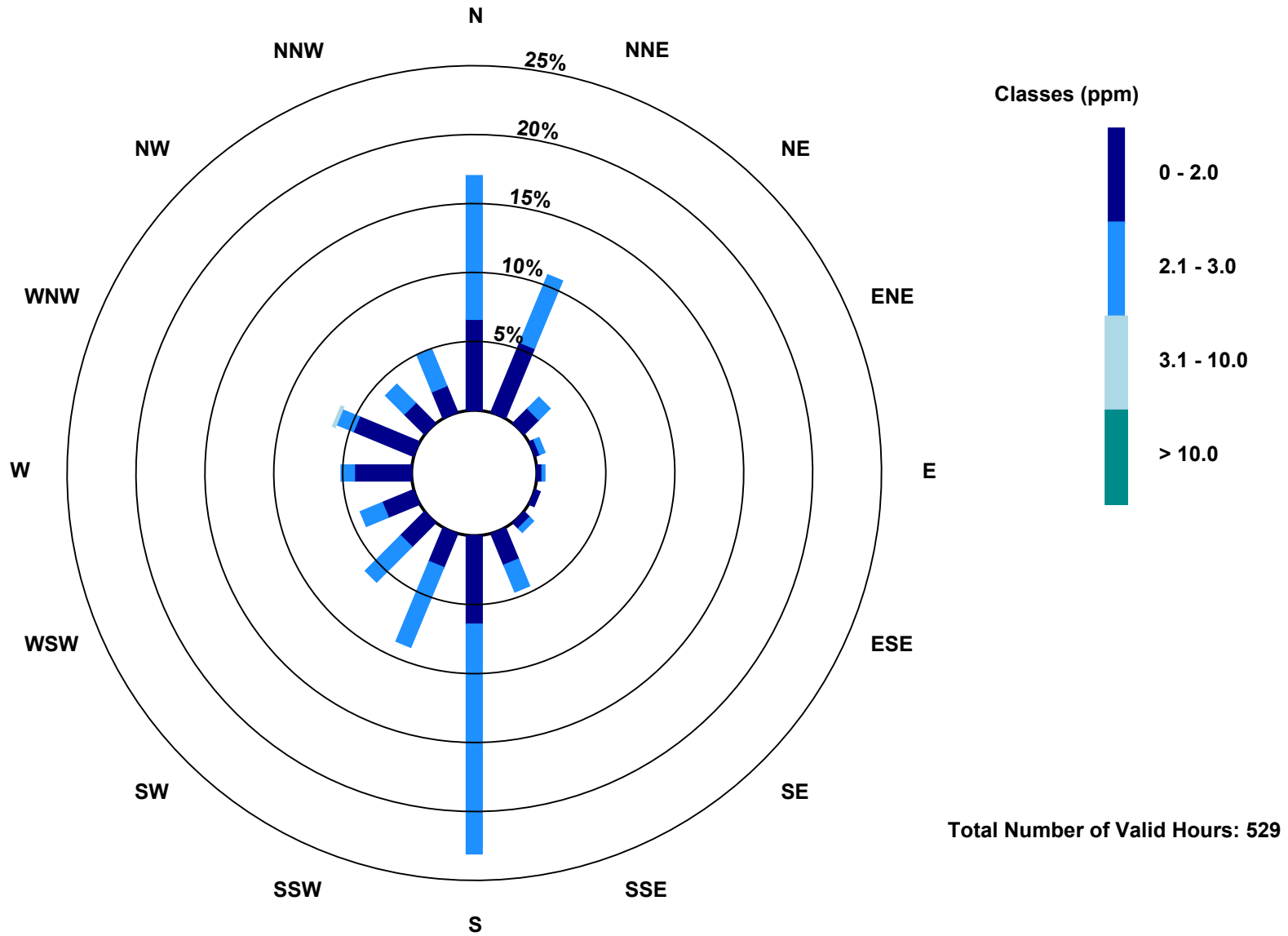
Total Number of Valid Hours: 529

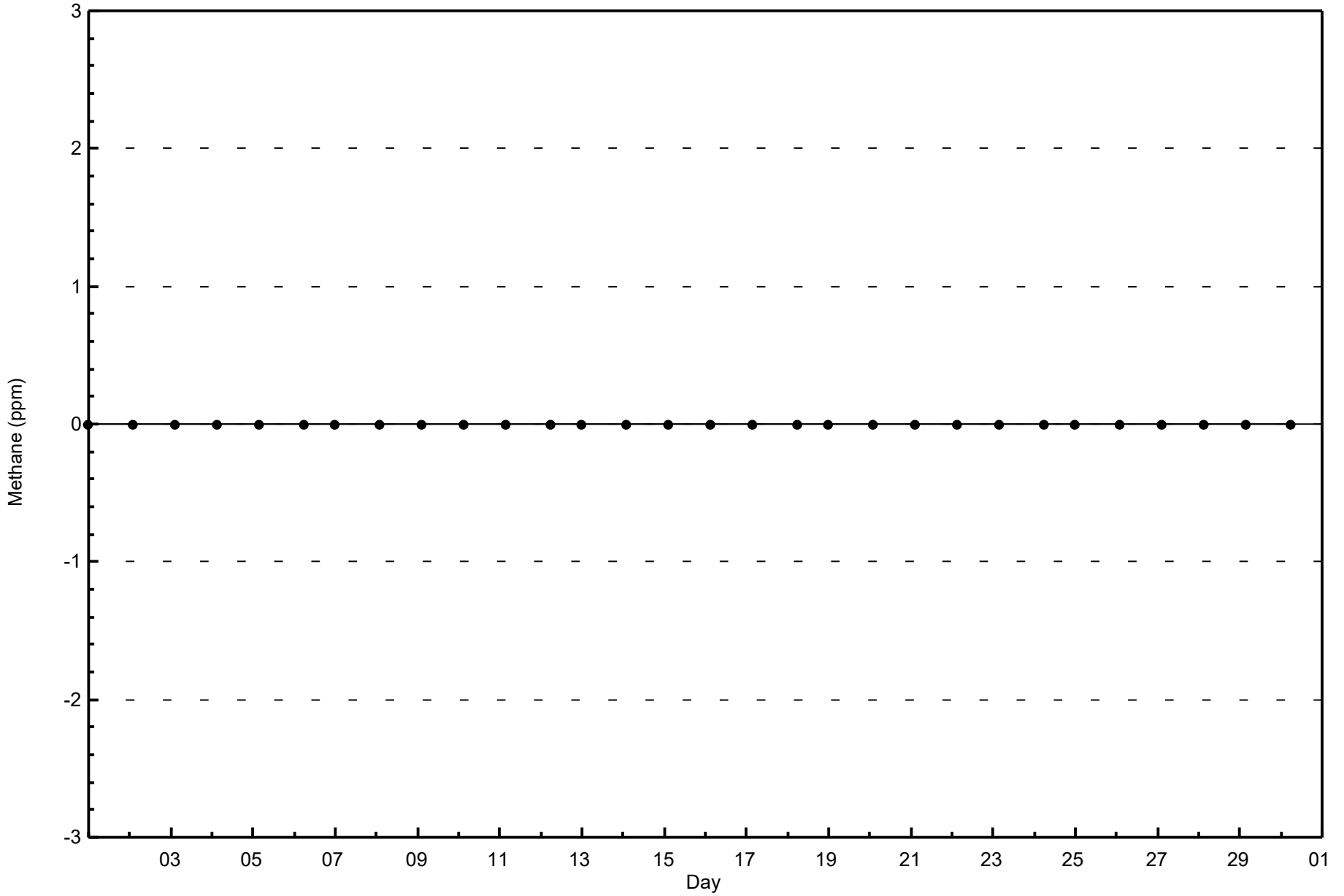
Total Number of Hours: 720

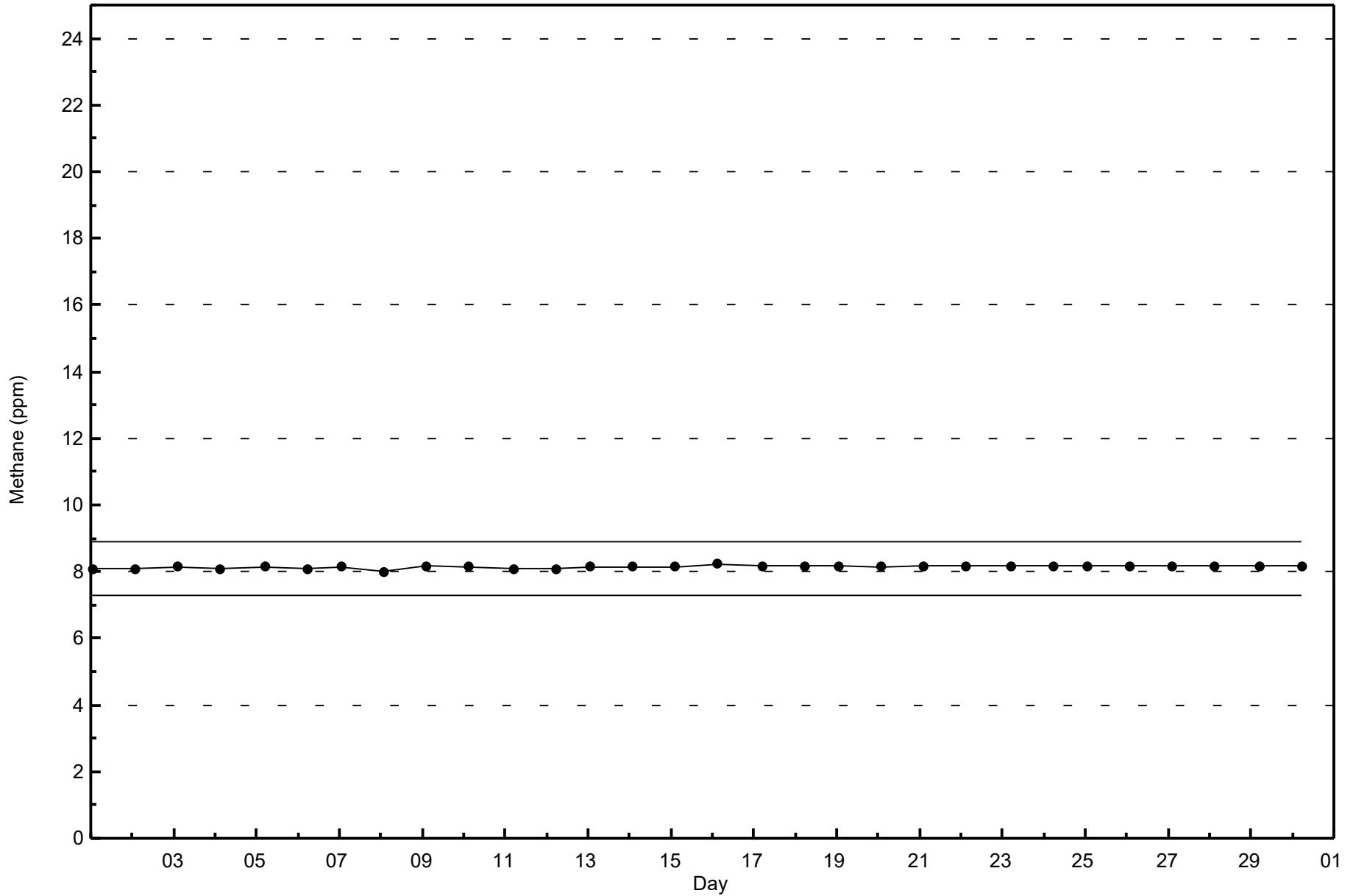


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Methane (CH<sub>4</sub>) - ppm  
Fort McKay - Bertha Ganter

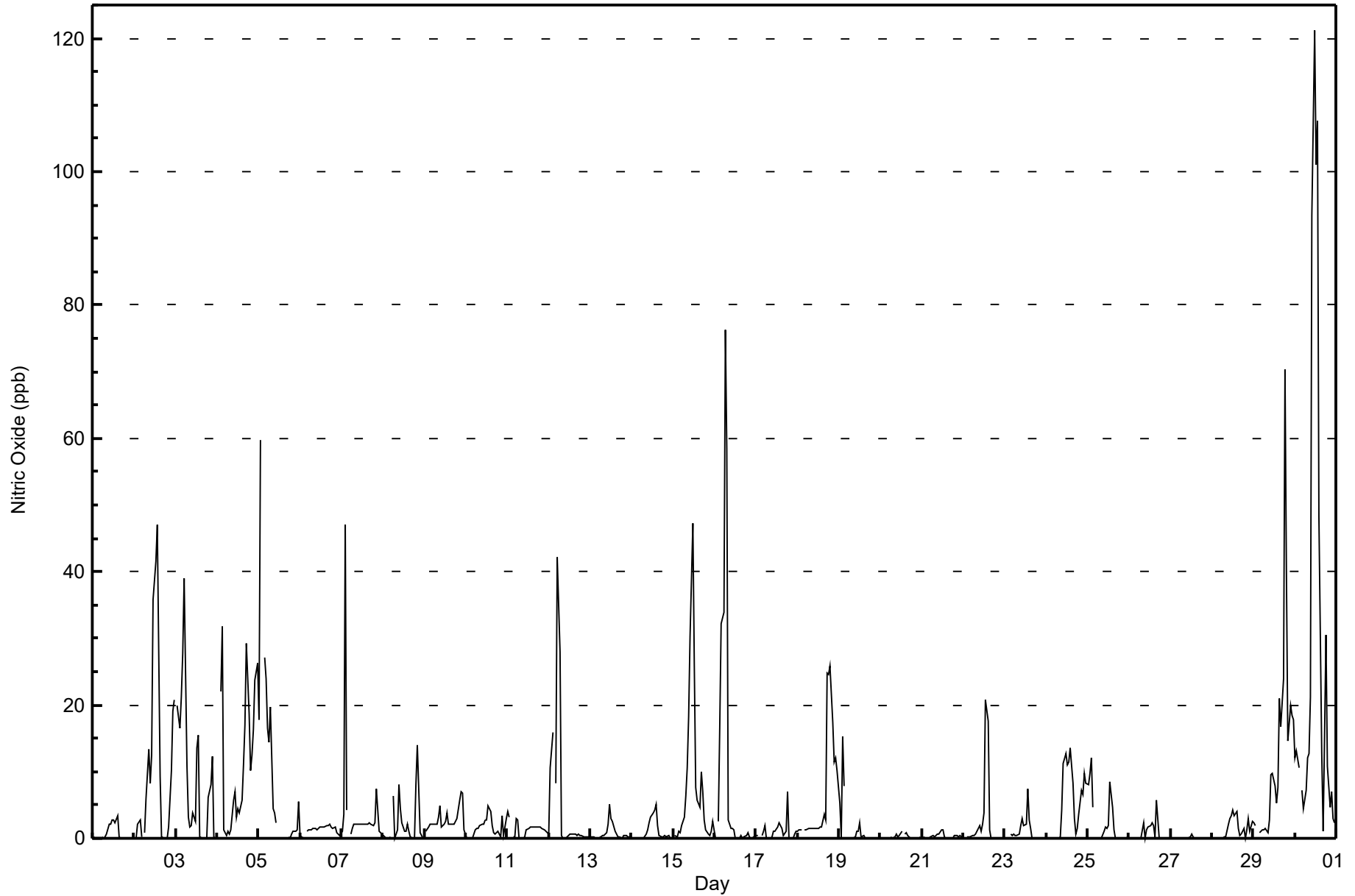








Maximum Value: 121.2 ppb on Nov 30 12:00																						Hours in Service:		720																							
Maximum Daily Average: 28.7 ppb on Nov 30																						Hours of Data:		683																							
Minimum Value: 0.0 ppb on Nov 1 03:00																						Hours of Missing Data:		37																							
Minimum Daily Average: 0.1 ppb on Nov 27																						Hours of Calibration:		36																							
Maximum Diurnal Average: 9.6 ppb at hour 14																						Percent Operational Time:		99.9																							
Minimum Diurnal Average: 2.2 ppb at hour 1																																															
Monthly Average: 4.83 ppb																						Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 1.1 Q <sub>3</sub> = 3.2 P <sub>90</sub> = 13.1 P <sub>99</sub> = 58.7																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Nov	0.1	0.0	0.0	0.0	Z	0.1	0.0	0.2	0.7	2.0	2.1	2.7	2.7	2.3	3.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	3.4																					
2-Nov	0.0	0.0	2.1	2.7	0.2	Z	0.8	5.9	13.4	8.3	12.6	35.9	41.5	47.1	28.2	9.3	0.2	0.0	0.0	0.0	1.7	10.2	19.1	20.8	11.3	47.1																					
3-Nov	Z	19.9	16.5	21.2	27.8	38.9	10.8	3.2	1.7	2.0	3.8	2.6	13.6	15.5	0.3	0.0	0.0	0.0	0.0	6.0	8.0	12.3	0.1	0.0	8.9	38.9																					
4-Nov	0.0	Z	22.1	31.7	1.3	0.3	1.0	0.7	1.2	5.7	7.0	3.3	4.5	3.8	5.7	11.0	17.0	29.3	18.7	10.2	12.5	16.2	23.7	26.2	11.0	31.7																					
5-Nov	17.7	59.8	Z	27.2	23.8	16.4	14.3	19.7	4.5	3.7	2.4	C	C	C	C	C	C	0.1	0.1	0.7	1.1	1.0	1.2	5.5	--	59.8																					
6-Nov	0.4	0.3	0.0	Z	1.0	1.3	1.3	1.4	1.4	1.5	1.2	1.8	1.6	1.8	1.8	1.9	1.9	2.1	1.7	1.5	1.7	0.8	0.7	0.5	1.3	2.1																					
7-Nov	1.0	3.6	47.1	4.2	Z	0.6	1.5	2.0	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.0	2.2	2.1	2.0	2.2	7.4	4.3	1.0	0.6	4.3	47.1																					
8-Nov	0.4	0.2	0.0	0.0	0.1	Z	6.4	0.0	1.3	8.1	4.5	2.2	1.2	1.1	2.1	1.1	0.2	0.0	0.0	8.0	14.0	0.9	0.4	0.0	2.3	14.0																					
9-Nov	Z	1.0	1.7	2.0	2.1	2.1	2.1	3.2	4.9	1.6	2.1	2.5	3.7	2.0	2.2	2.1	2.1	2.4	2.9	5.7	7.0	6.8	1.3	2.9	7.0																						
10-Nov	0.0	Z	0.0	0.0	0.0	1.2	1.4	1.6	1.9	2.1	2.1	2.8	2.8	4.8	4.0	1.9	0.8	0.7	1.0	0.7	0.2	3.5	0.5	2.9	1.6	4.8																					
11-Nov	4.0	3.1	Z	0.2	0.1	3.0	2.8	0.0	0.0	0.0	0.2	1.2	1.6	1.6	1.7	1.6	1.7	1.6	1.6	1.6	1.4	1.3	1.1	0.8	1.4	4.0																					
12-Nov	0.6	10.5	15.9	Z	8.3	42.1	28.0	0.5	0.0	0.0	0.0	0.4	0.6	0.7	0.6	0.6	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.2	4.9	42.1																					
13-Nov	0.2	0.2	0.1	0.0	Z	0.2	0.2	0.3	0.3	0.8	2.1	5.0	3.0	2.5	1.2	0.6	0.3	0.1	0.0	0.3	0.4	0.4	0.2	0.2	0.8	5.0																					
14-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.7	1.3	2.3	3.1	3.7	4.2	5.2	2.0	0.4	0.2	0.3	0.4	0.2	0.4	0.0	0.0	1.1	5.2																					
15-Nov	Z	0.5	0.3	1.1	0.7	2.0	3.2	6.4	10.7	18.2	30.3	47.2	26.2	7.6	5.8	4.6	10.0	6.9	2.7	1.2	0.5	0.4	1.1	2.6	8.3	47.2																					
16-Nov	0.0	Z	2.5	16.5	32.2	33.9	76.2	58.5	2.8	1.4	1.4	1.3	0.0	0.0	0.4	0.0	0.1	0.4	0.8	0.1	0.0	0.0	0.5	10.0	76.2																						
17-Nov	0.5	0.5	Z	0.5	1.0	1.9	0.0	0.0	0.0	0.2	1.1	1.0	1.7	2.3	1.9	1.4	0.5	1.1	7.0	0.0	0.0	0.0	0.6	1.0	1.1	7.0																					
18-Nov	1.1	1.2	1.2	Z	1.4	1.4	1.4	1.5	1.5	1.5	1.4	1.5	1.5	1.6	1.7	3.7	2.9	24.9	24.6	25.8	17.5	11.4	12.1	10.1	6.6	25.8																					
19-Nov	5.4	0.2	15.3	7.8	Z	0.0	0.0	0.0	0.0	0.2	1.0	1.0	2.3	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	15.3																					
20-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.3	0.5	0.3	0.5	1.1	M	0.5	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.1	1.1																					
21-Nov	Z	0.3	0.0	0.0	0.1	0.1	0.4	0.3	0.5	0.7	0.7	1.4	1.2	0.2	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.3	0.3	0.3	0.3	1.4																					
22-Nov	0.0	Z	0.2	0.1	0.2	0.5	0.5	0.6	1.1	2.0	1.0	2.2	3.8	20.7	17.6	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	20.7																					
23-Nov	0.0	0.0	Z	0.7	0.5	0.6	0.4	0.4	0.6	1.9	3.0	1.9	2.2	7.3	2.8	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	7.3																						
24-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	4.2	11.3	12.6	11.0	11.4	13.5	8.2	3.1	0.6	1.5	3.6	7.1	6.5	9.8	8.2	4.9	13.5																					
25-Nov	8.1	9.8	12.1	4.6	Z	0.1	0.0	0.0	0.0	1.1	1.7	1.6	1.9	8.5	4.6	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.4	12.1																						
26-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	2.3	0.0	1.4	1.7	1.9	2.3	1.9	0.1	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.8	5.7																						
27-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6																						
28-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.3	2.1	2.9	3.5	4.3	3.4	4.0	1.4	0.5	0.6	1.5	0.1	1.3	2.9	1.1	2.6	1.4	4.3																					
29-Nov	2.3	2.0	Z	0.8	1.1	1.3	1.2	1.4	0.9	2.8	9.5	9.8	7.9	5.3	7.7	20.9	16.7	24.0	70.3	40.4	14.5	20.0	18.4	17.8	12.9	70.3																					
30-Nov	12.1	13.2	10.7	Z	7.3	4.3	7.1	12.1	12.8	21.3	93.5	121.2	101.1	107.6	48.3	13.0	1.1	15.2	30.5	10.8	4.8	6.9	2.9	2.4	28.7	121.2																					
																						2.2	5.1	5.9	4.9	4.4	6.1	5.4	4.0	2.2	3.4	6.8	9.4	8.6	9.6	5.8	3.2	2.3	3.7	5.6	3.9	3.4	3.6	3.4	3.5	Diurnal Average	
																						17.7	59.8	47.1	31.7	32.2	42.1	76.2	58.5	13.4	21.3	93.5	121.2	101.1	107.6	48.3	20.9	17.0	29.3	70.3	40.4	17.5	20.0	23.7	26.2	Diurnal Maximum	
Z - zerospan																						C - Calibration			M - Maintenance																						





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	642	94.00	94.00
21 - 40	27	3.95	97.95
41 - 80	10	1.46	99.41
81 - 159	4	0.59	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Fort McKay - Bertha Ganter - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	81	58	15	4	3	2	5	25	123	38	32	17	26	32	19	24	504
21 - 40	4	0	0	0	0	0	0	1	1	6	0	0	2	0	1	1	16
41 - 80	1	1	0	0	0	0	0	0	0	0	2	1	1	1	1	0	8
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	86	59	15	4	3	2	5	26	124	44	34	18	29	33	21	25	528

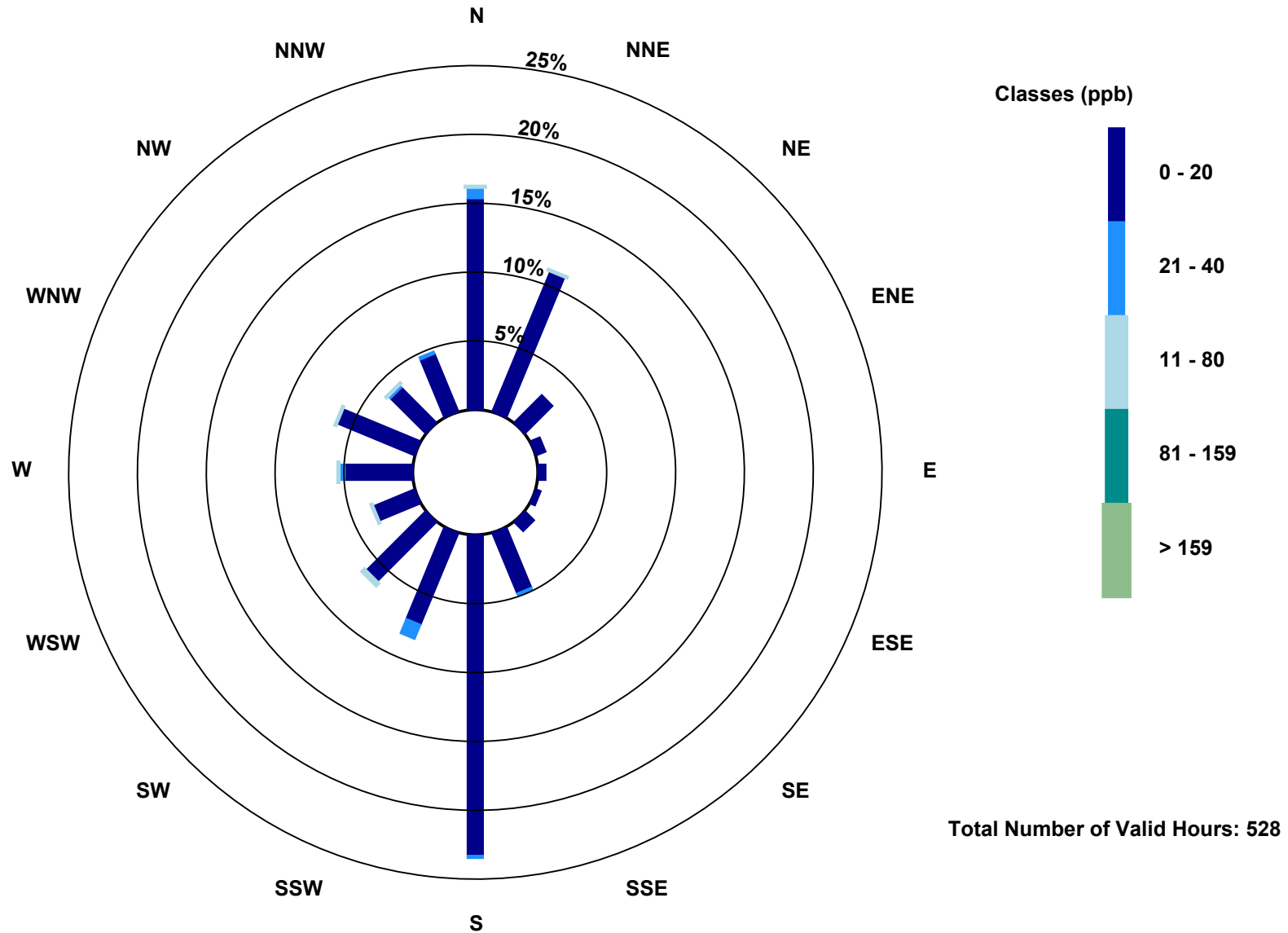
Total Number of Valid Hours: 528

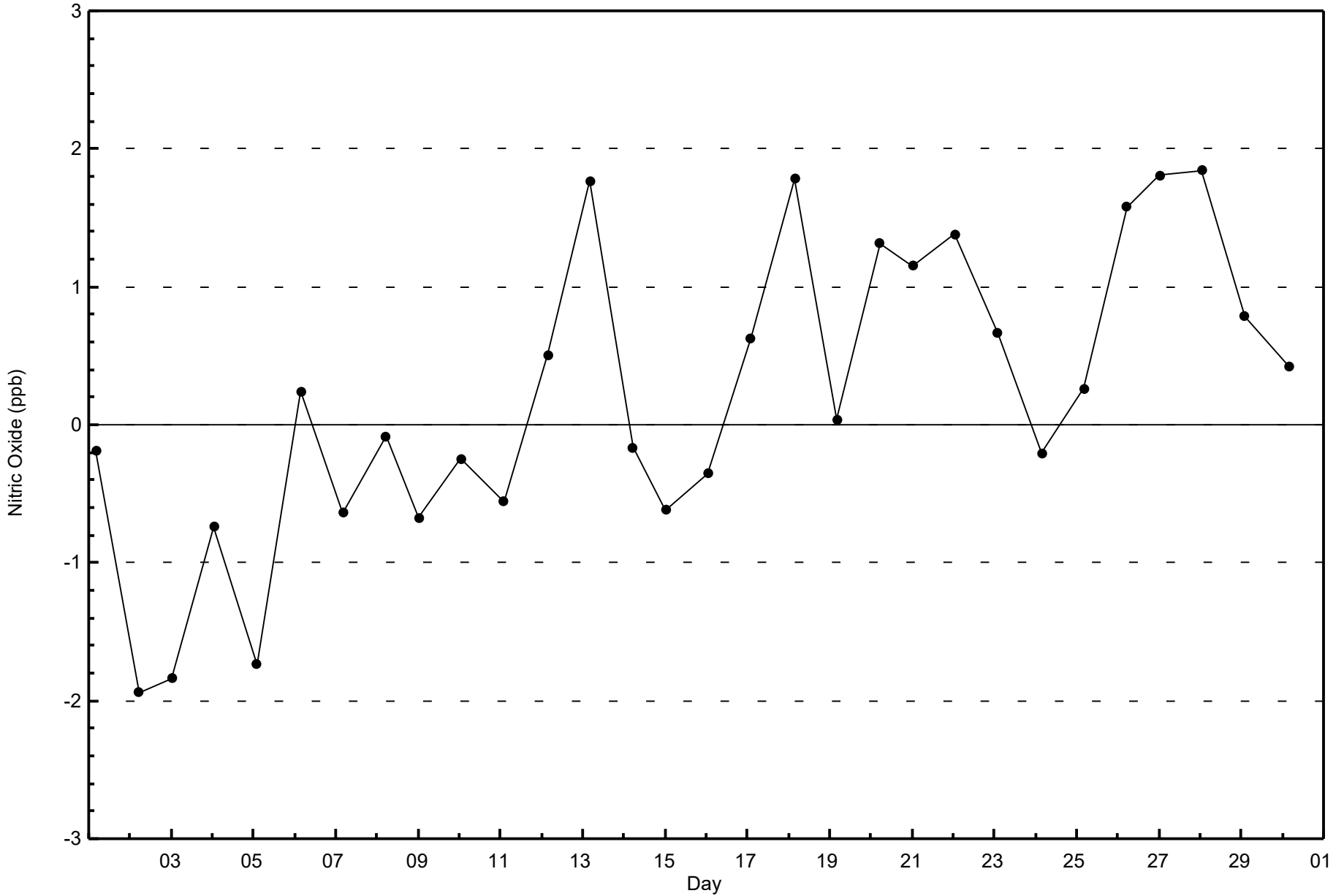
Total Number of Hours: 720

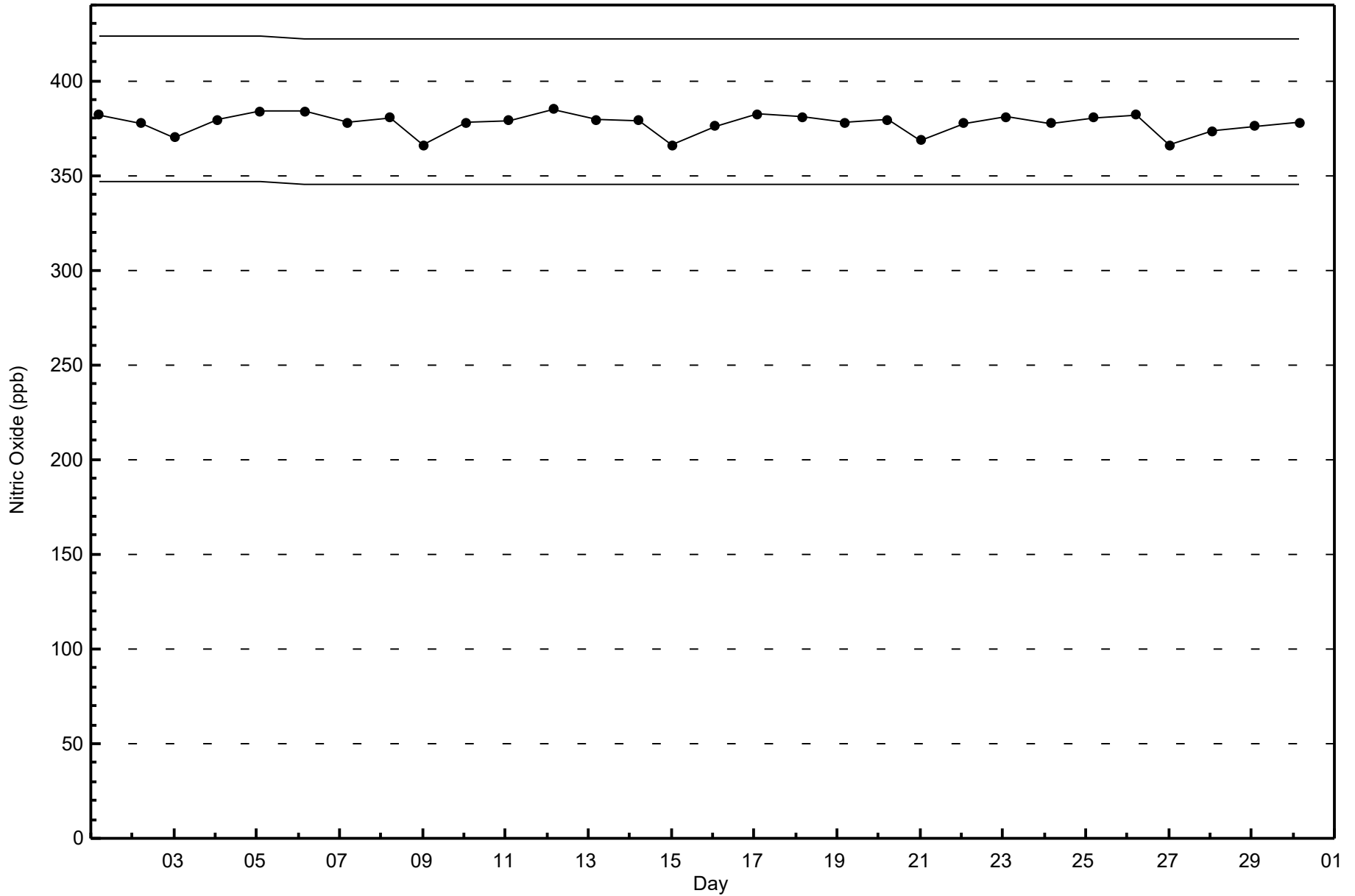


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitric Oxide (NO) - ppb  
Fort McKay - Bertha Ganter









**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**

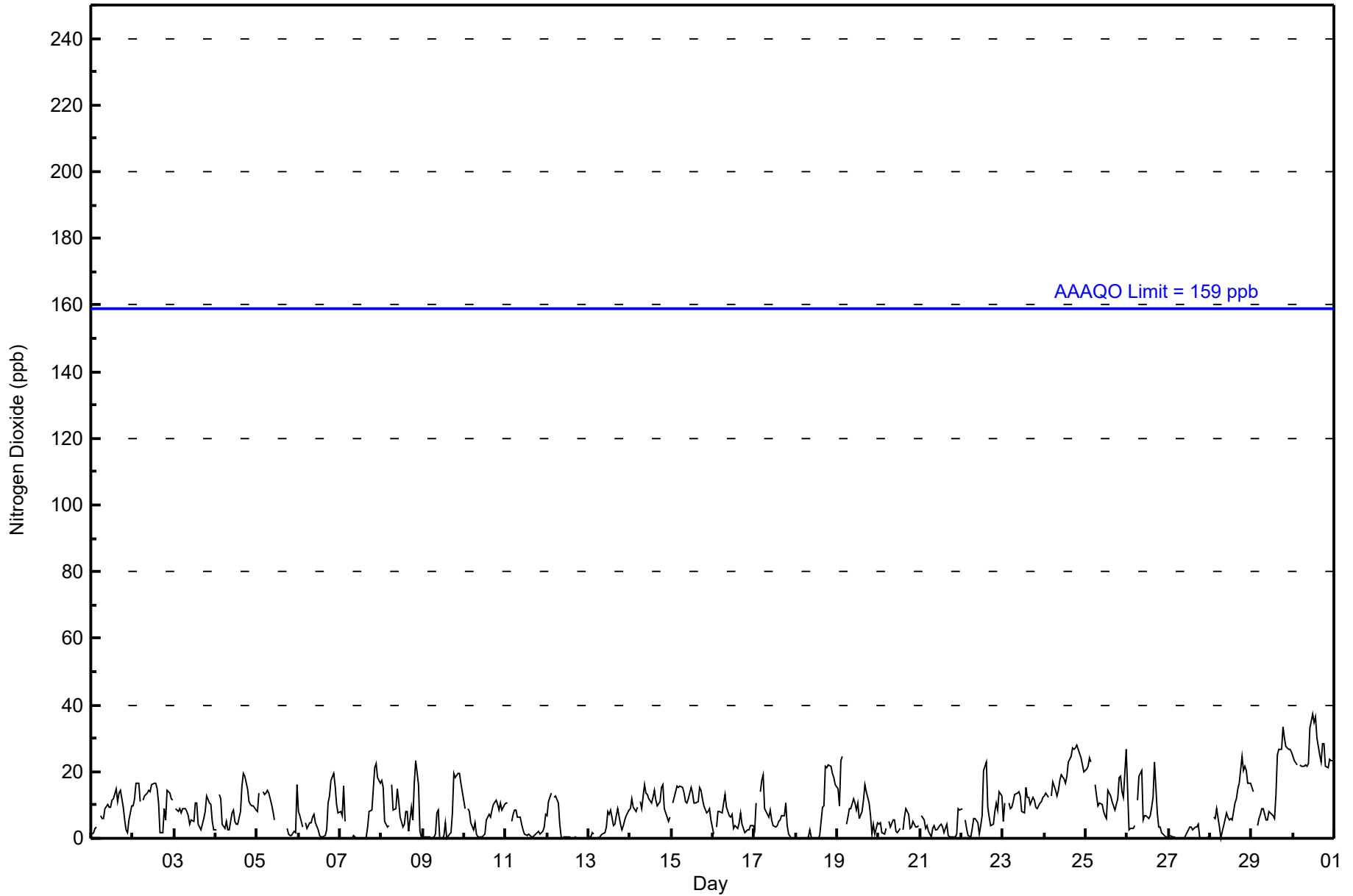
**Fort McKay - Bertha Ganter - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 37.4 ppb on Nov 30 12:00      Maximum Daily Average: 25.7 ppb on Nov 30		Hours in Service: 720 Hours of Data: 683 Hours of Missing Data: 37 Hours of Calibration: 36 Percent Operational Time: 99.9																									
Minimum Value: 0.0 ppb on Nov 7 08:00      Minimum Daily Average: 1.2 ppb on Nov 27 Maximum Diurnal Average: 10.8 ppb at hour 19      Minimum Diurnal Average: 6.9 ppb at hour 13 Monthly Average: 8.71 ppb      Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 3.0 Median = 7.7 Q <sub>3</sub> = 12.5 P <sub>90</sub> = 19.4 P <sub>99</sub> = 28.8																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
1-Nov	1.3	1.7	2.9	3.2	Z	6.6	5.9	6.1	8.8	10.2	9.4	9.3	11.4	11.9	15.0	11.0	13.7	14.4	9.5	5.3	2.7	1.8	5.7	9.8	7.7	15.0	
2-Nov	9.9	11.9	16.7	16.5	11.2	Z	11.4	12.5	13.7	14.2	13.8	16.0	16.4	16.4	15.0	10.5	1.7	1.8	8.9	5.4	14.2	13.6	11.8	11.5	12.0	16.7	
3-Nov	Z	9.1	8.2	8.7	7.5	8.8	9.0	8.0	6.6	4.3	5.4	5.1	10.5	10.7	4.2	2.5	4.4	6.0	8.0	12.9	10.4	10.1	5.1	2.4	7.3	12.9	
4-Nov	2.4	Z	13.3	11.8	4.4	3.1	5.0	2.7	2.5	7.7	8.5	5.2	4.2	4.2	8.0	15.6	19.3	18.5	15.0	11.0	10.2	9.6	9.7	8.4	8.7	19.3	
5-Nov	8.0	13.6	Z	13.9	13.1	13.7	14.3	13.4	10.0	8.1	5.4	C	C	C	C	C	C	2.8	1.3	1.0	0.9	2.3	1.5	16.3	--	16.3	
6-Nov	8.0	6.8	3.2	Z	4.5	2.9	4.7	4.8	6.5	7.0	4.6	2.6	0.9	0.3	0.4	0.7	2.4	10.8	12.8	17.2	19.7	15.5	10.1	7.7	6.7	19.7	
7-Nov	8.0	6.7	15.8	4.9	Z	0.2	0.1	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.6	3.6	8.0	8.5	14.7	21.0	22.6	18.1	16.6	6.5	22.6	
8-Nov	17.5	15.3	5.0	3.3	3.9	Z	16.2	8.4	8.7	15.0	10.9	6.4	3.4	4.2	7.9	8.2	2.0	9.4	5.5	16.6	23.4	16.3	2.2	0.5	9.1	23.4	
9-Nov	Z	0.5	0.4	0.6	0.3	0.2	0.4	1.2	7.8	8.5	0.0	0.0	1.0	4.8	0.1	1.2	1.8	7.6	19.4	18.4	19.6	19.5	16.4	13.8	6.2	19.6	
10-Nov	8.9	Z	9.0	8.0	4.6	2.6	4.5	1.3	0.6	0.3	0.3	0.9	1.1	5.6	7.2	6.5	8.4	10.3	11.3	10.2	8.4	10.6	8.4	10.0	6.0	11.3	
11-Nov	10.7	10.4	Z	5.1	7.3	8.3	8.6	6.4	6.2	4.4	2.6	1.1	0.9	1.1	0.7	0.5	0.6	1.3	1.5	2.0	1.3	2.2	3.4	7.2	4.1	10.7	
12-Nov	6.9	11.2	13.4	Z	12.1	12.6	10.7	4.3	0.4	0.0	0.4	0.5	0.4	0.3	0.2	0.1	0.3	0.2	0.2	0.2	0.0	0.1	0.2	3.2	13.4		
13-Nov	0.4	0.3	1.6	1.2	Z	0.3	0.2	0.7	1.1	1.5	3.3	7.9	7.2	8.3	4.0	4.1	6.7	8.9	4.2	2.7	3.8	5.5	6.8	8.3	3.9	8.9	
14-Nov	8.7	11.7	9.3	7.9	9.3	Z	11.2	8.7	16.2	13.5	13.2	11.9	10.7	12.3	14.3	11.4	9.6	11.0	15.3	15.9	8.7	6.3	5.1	6.3	10.8	16.2	
15-Nov	Z	10.5	14.1	15.8	15.2	15.7	15.4	13.6	10.9	10.6	11.7	15.3	13.7	10.4	10.8	11.2	15.4	14.5	11.8	9.6	7.6	8.1	8.7	5.6	12.0	15.8	
16-Nov	1.3	Z	3.4	7.9	8.2	7.6	10.4	13.0	9.4	6.8	6.5	7.0	3.1	3.8	3.1	4.8	7.5	4.3	1.8	2.1	2.6	2.7	3.7	3.8	5.4	13.0	
17-Nov	2.7	10.7	Z	13.9	17.2	19.2	9.0	8.0	6.3	8.4	5.7	3.8	3.6	3.7	5.0	5.7	6.9	6.6	10.8	3.9	1.4	0.0	0.0	0.1	6.6	19.2	
18-Nov	0.2	0.2	0.0	Z	0.0	0.0	0.0	0.5	2.7	0.4	0.0	0.0	0.0	0.1	0.8	9.3	9.8	21.7	21.3	22.0	21.6	19.6	18.2	15.9	7.1	22.0	
19-Nov	14.8	9.6	23.2	24.7	Z	4.1	6.3	8.8	9.0	12.0	10.4	8.5	10.7	5.8	8.0	11.6	16.0	13.9	10.6	6.6	1.4	4.1	1.2	4.5	9.8	24.7	
20-Nov	4.2	4.7	1.9	1.4	3.1	Z	5.0	3.5	5.7	5.3	2.0	1.8	3.0	M	2.5	6.2	9.1	7.3	3.1	3.4	4.9	3.5	3.6	4.0	4.1	9.1	
21-Nov	Z	6.6	5.4	3.0	4.0	2.1	0.6	3.1	3.9	2.5	2.4	3.8	4.2	3.2	1.7	4.1	0.8	0.5	0.5	0.3	0.5	1.3	8.8	8.3	3.1	8.8	
22-Nov	9.0	Z	5.4	2.8	0.8	0.6	3.1	5.8	6.1	4.6	1.3	3.7	6.7	20.5	22.9	9.4	6.2	4.0	4.4	7.9	10.5	8.4	14.0	12.5	7.4	22.9	
23-Nov	5.2	10.7	Z	10.5	9.0	9.4	11.2	13.1	13.5	14.0	12.5	7.9	7.5	15.2	12.4	12.1	10.3	12.1	11.4	9.4	8.8	10.7	11.2	12.3	10.9	15.2	
24-Nov	12.8	13.4	12.2	Z	12.6	16.9	14.6	12.8	14.5	17.2	19.0	17.8	16.6	18.5	22.7	24.6	27.1	26.6	27.0	27.9	25.6	24.3	22.0	20.1	19.4	27.9	
25-Nov	20.7	21.6	24.3	22.8	Z	15.9	12.5	9.8	10.4	10.1	8.0	6.6	6.0	14.3	12.5	11.1	9.9	8.4	11.7	18.4	18.8	13.9	12.1	26.7	14.2	26.7	
26-Nov	14.4	2.6	2.8	3.1	3.7	Z	11.5	18.7	20.3	5.4	6.6	6.6	6.0	6.7	9.3	12.2	22.8	7.7	3.3	3.2	1.9	0.8	0.6	0.6	7.4	22.8	
27-Nov	Z	0.8	0.4	0.3	0.2	0.2	0.1	0.1	0.2	0.9	2.4	3.6	3.4	2.6	3.2	3.5	4.2	0.3	0.0	0.0	0.0	0.0	0.0	0.6	1.2	4.2	
28-Nov	0.7	Z	6.2	6.0	8.9	3.4	0.1	2.3	3.7	7.5	6.2	5.6	6.1	5.6	10.7	11.9	14.8	16.7	24.5	20.4	21.5	20.3	16.6	16.6	10.3	24.5	
29-Nov	15.2	14.1	Z	3.9	5.9	7.4	8.7	9.1	5.7	5.5	7.9	7.7	6.7	5.8	13.3	25.2	26.5	26.6	33.3	30.2	27.4	26.6	26.8	26.0	15.9	33.3	
30-Nov	24.6	23.2	22.0	Z	22.1	21.7	21.5	21.9	21.6	22.3	32.9	37.4	34.8	36.3	30.1	25.0	23.0	28.5	28.2	21.6	21.1	23.7	23.4	23.3	25.7	37.4	
Diurnal Average      8.7   9.1   8.8   8.0   7.6   7.3   7.7   7.4   7.8   7.6   7.1   7.0   6.9   8.3   8.5   9.0   9.8   10.5   10.8   10.7   10.7   10.1   9.2   10.0																								Diurnal Average			
Diurnal Maximum      24.6   23.2   24.3   24.7   22.1   21.7   21.5   21.9   21.6   22.3   32.9   37.4   34.8   36.3   30.1   25.2   27.1   28.5   33.3   30.2   27.4   26.6   26.8   26.7																								Diurnal Maximum			
Z - zerospan      C - Calibration      M - Maintenance Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																											



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Fort McKay - Bertha Ganter - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	623	91.22	91.22
21 - 40	60	8.78	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Fort McKay - Bertha Ganter - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	84	59	15	4	3	2	5	26	118	44	34	18	29	33	20	22	516
21 - 40	2	0	0	0	0	0	0	0	6	0	0	0	0	0	1	3	12
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	86	59	15	4	3	2	5	26	124	44	34	18	29	33	21	25	528

Total Number of Valid Hours: 528

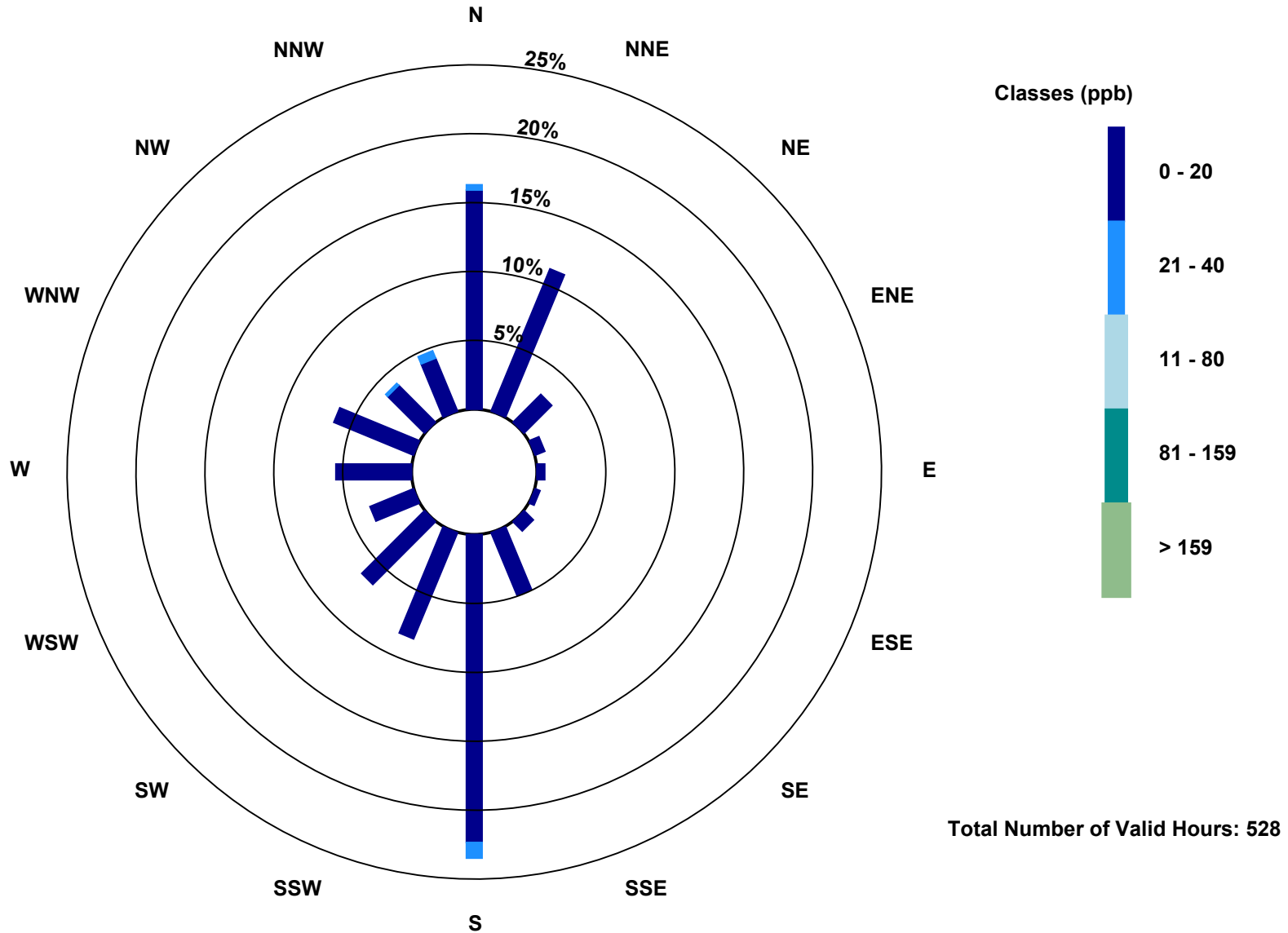
Total Number of Hours: 720

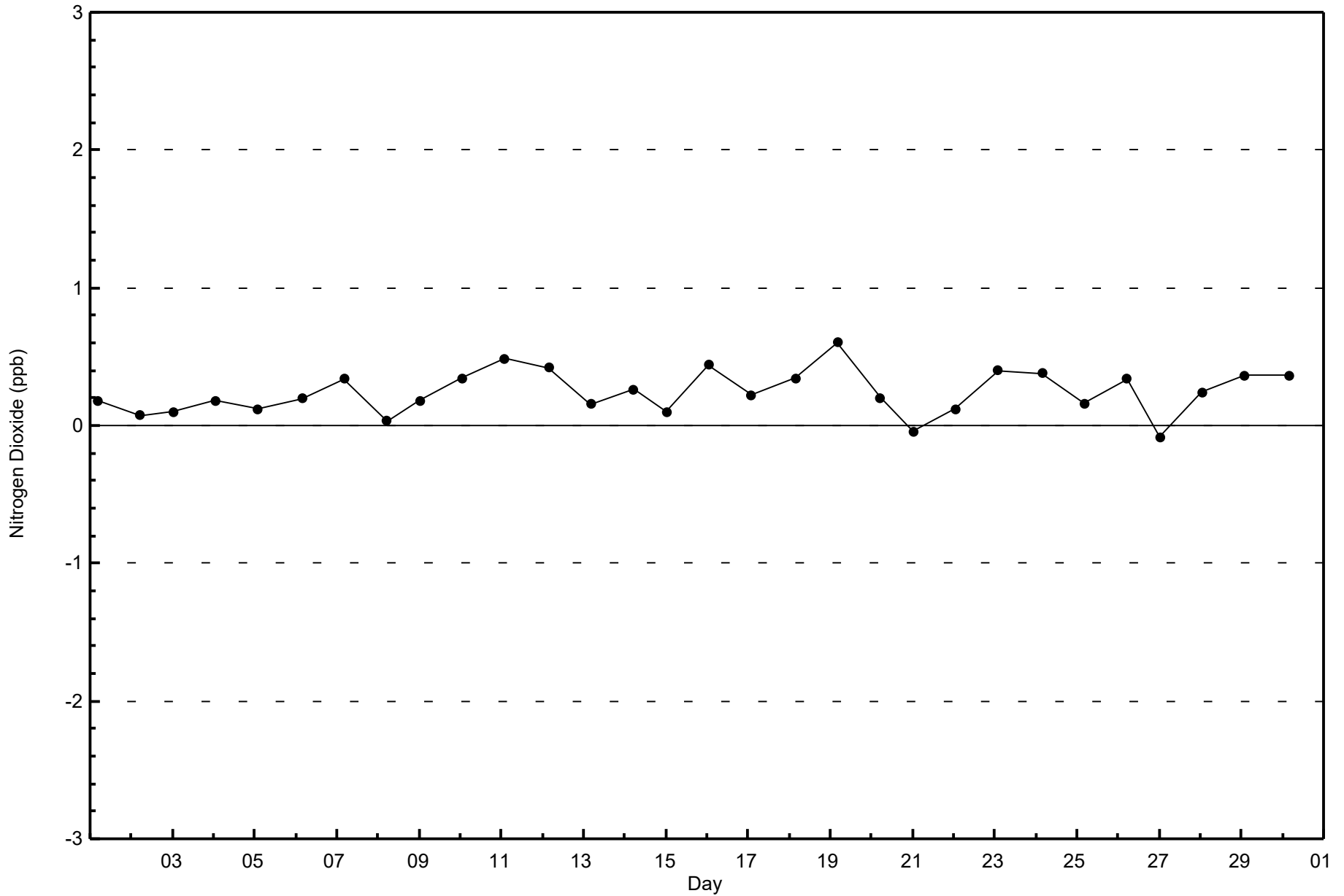


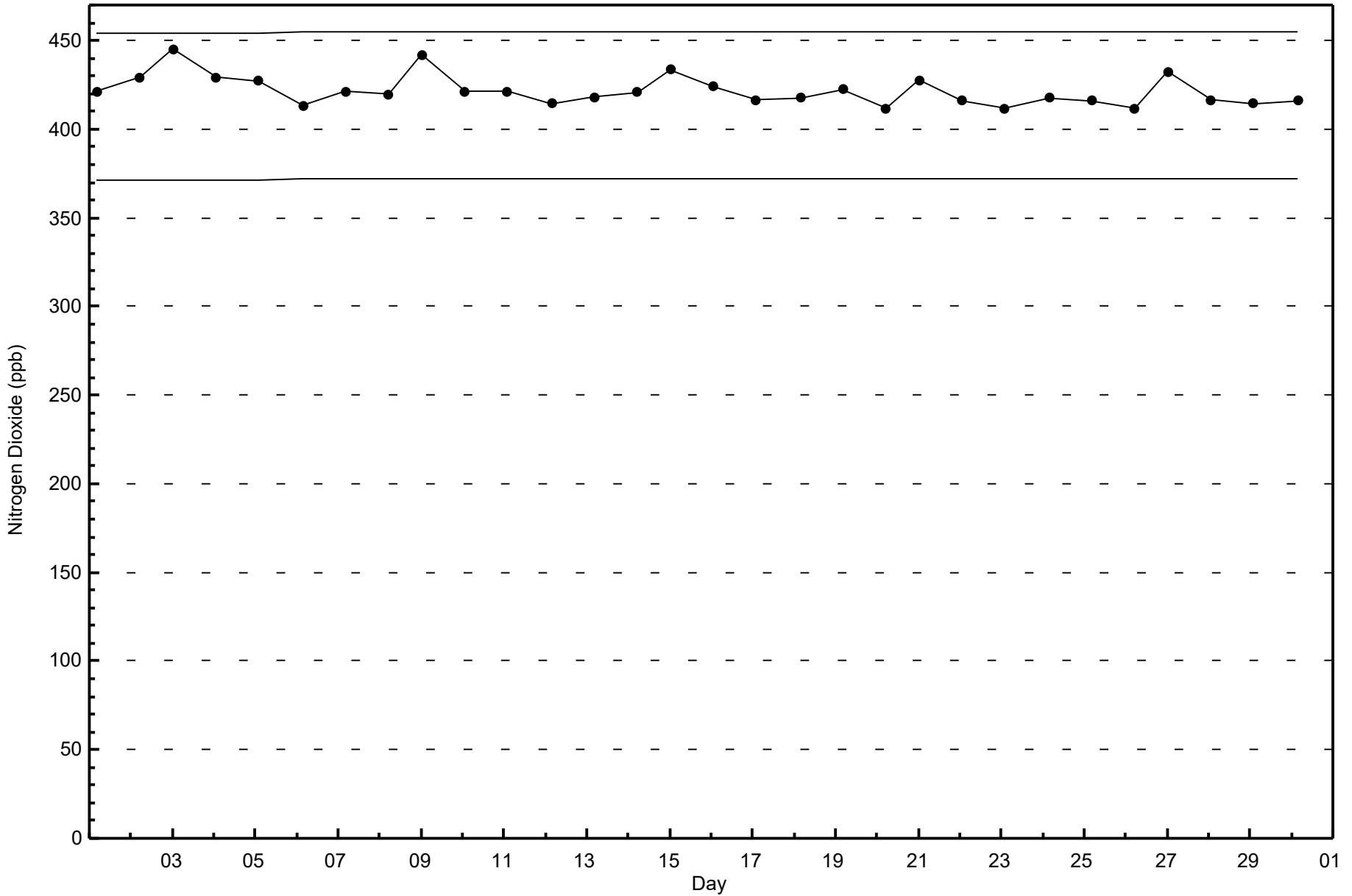


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort McKay - Bertha Ganter









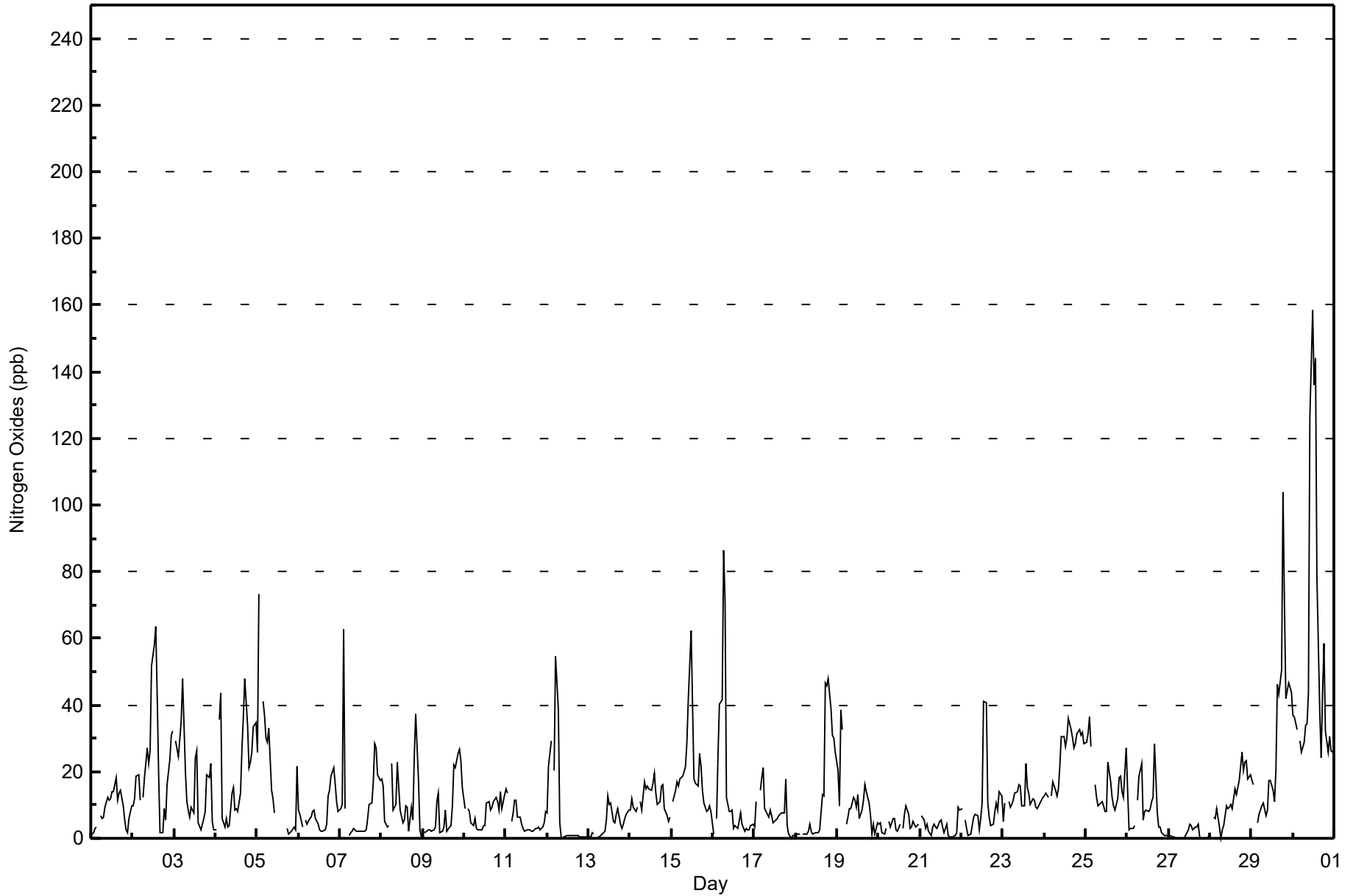
Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO<sub>x</sub>) - ppb

Fort McKay - Bertha Ganter - November 2024

Maximum Value: 158.6 ppb on Nov 30 12:00																						Maximum Daily Average: 54.4 ppb on Nov 30				Hours in Service: 720	
Minimum Value: 0.0 ppb on Nov 12 10:00																						Minimum Daily Average: 1.2 ppb on Nov 27				Hours of Data: 683	
Maximum Diurnal Average: 18.0 ppb at hour 14																						Minimum Diurnal Average: 10.0 ppb at hour 9				Hours of Missing Data: 37	
Monthly Average: 13.54 ppb																						Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 1.4 Q <sub>1</sub> = 3.4 Median = 8.8 Q <sub>3</sub> = 17.0 P <sub>90</sub> = 31.0 P <sub>99</sub> = 74.3				Hours of Calibration: 36	
																										Percent Operational Time: 99.9	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	1.4	1.7	2.9	3.2	Z	6.7	5.9	6.3	9.5	12.2	11.5	12.0	14.1	14.2	18.4	11.3	13.7	14.4	9.5	5.3	2.7	1.8	5.7	9.8	8.4	18.4	
2-Nov	9.9	11.9	18.8	19.2	11.4	Z	12.2	18.4	27.1	22.5	26.4	51.9	57.9	63.5	43.2	19.8	1.9	1.8	8.9	5.4	15.9	23.8	30.9	32.3	23.3	63.5	
3-Nov	Z	29.0	24.7	29.9	35.3	47.7	19.8	11.2	8.3	6.3	9.2	7.7	24.1	26.2	4.5	2.5	4.4	6.0	8.0	18.9	18.4	22.4	5.2	2.4	16.2	47.7	
4-Nov	2.4	Z	35.4	43.5	5.7	3.4	6.0	3.4	3.7	13.4	15.5	8.5	8.7	8.0	13.7	26.6	36.3	47.8	33.7	21.2	22.7	25.8	33.4	34.6	19.7	47.8	
5-Nov	25.7	73.4	Z	41.1	36.9	30.1	28.6	33.1	14.5	11.8	7.8	C	C	C	C	C	C	2.9	1.4	1.7	2.0	3.3	2.7	21.8	--	73.4	
6-Nov	8.4	7.1	3.2	Z	5.5	4.2	6.0	6.2	7.9	8.5	5.8	4.4	2.5	2.1	2.2	2.6	4.3	12.9	14.5	18.7	21.4	16.3	10.8	8.2	8.0	21.4	
7-Nov	9.0	10.3	62.9	9.1	Z	0.8	1.6	2.0	2.9	2.2	2.2	2.1	2.1	2.1	2.2	2.6	5.8	10.1	10.5	16.9	28.4	26.9	19.1	17.2	10.8	62.9	
8-Nov	17.9	15.5	5.0	3.3	4.0	Z	22.6	8.4	10.0	23.1	15.4	8.6	4.6	5.3	10.0	9.3	2.2	9.4	5.5	24.6	37.4	17.2	2.6	0.5	11.4	37.4	
9-Nov	Z	1.5	2.1	2.6	2.4	2.3	2.5	3.3	11.0	13.4	1.6	2.1	3.5	8.5	2.1	3.4	3.9	9.7	21.8	21.3	25.3	26.5	23.2	15.1	9.1	26.5	
10-Nov	8.9	Z	9.0	8.0	4.6	3.8	5.9	2.9	2.5	2.4	2.4	3.7	3.9	10.4	11.2	8.4	9.2	11.0	12.3	10.9	8.6	14.1	8.9	12.9	7.6	14.1	
11-Nov	14.7	13.5	Z	5.3	7.4	11.3	11.4	6.4	6.2	4.4	2.8	2.3	2.5	2.7	2.4	2.1	2.3	2.9	3.1	3.6	2.7	3.5	4.5	8.0	5.5	14.7	
12-Nov	7.5	21.7	29.3	Z	20.4	54.7	38.7	4.8	0.4	0.0	0.4	0.9	1.0	1.0	0.8	0.7	0.7	0.7	0.6	0.5	0.3	0.3	0.4	0.4	8.1	54.7	
13-Nov	0.6	0.5	1.7	1.2	Z	0.5	0.4	1.0	1.4	2.3	5.4	12.9	10.2	10.8	5.2	4.7	7.0	9.0	4.2	3.0	4.2	5.9	7.0	8.5	4.7	12.9	
14-Nov	8.7	11.7	9.3	7.9	9.3	Z	11.2	8.7	16.9	14.8	15.5	15.0	14.4	16.5	19.5	13.4	10.0	11.2	15.6	16.3	8.9	6.7	5.1	6.3	11.9	19.5	
15-Nov	Z	11.0	14.4	16.9	15.9	17.7	18.6	20.0	21.6	28.8	42.0	62.5	39.9	18.0	16.6	15.8	25.4	21.4	14.5	10.8	8.1	8.5	9.8	8.2	20.3	62.5	
16-Nov	1.3	Z	5.9	24.4	40.4	41.5	86.6	71.5	12.2	8.2	7.9	8.3	3.1	3.8	3.1	5.2	7.5	4.4	2.2	2.9	2.7	2.7	3.7	4.3	15.4	86.6	
17-Nov	3.2	11.2	Z	14.4	18.2	21.1	9.0	8.0	6.3	8.6	6.8	4.8	5.3	6.0	6.9	7.1	7.4	7.7	17.8	3.9	1.4	0.0	0.6	1.1	7.7	21.1	
18-Nov	1.3	1.4	1.2	Z	1.4	1.4	1.4	2.0	4.2	1.9	1.4	1.5	1.5	1.7	2.5	13.0	12.7	46.6	45.9	47.8	39.1	31.0	30.3	26.0	13.8	47.8	
19-Nov	20.2	9.8	38.5	32.5	Z	4.1	6.3	8.8	9.0	12.2	11.4	9.5	13.0	6.1	8.4	11.6	16.0	13.9	10.6	6.6	1.4	4.1	1.2	4.5	11.3	38.5	
20-Nov	4.2	4.7	1.9	1.4	3.1	Z	5.1	3.5	6.0	5.8	2.3	2.3	4.1	M	3.0	7.0	9.5	7.3	3.1	3.4	4.9	3.5	3.6	4.1	4.3	9.5	
21-Nov	Z	6.9	5.4	3.0	4.1	2.2	1.0	3.4	4.4	3.2	3.1	5.2	5.4	3.4	1.7	4.1	0.8	0.5	0.6	0.6	0.9	1.6	9.1	8.6	3.5	9.1	
22-Nov	9.0	Z	5.6	2.9	1.0	1.1	3.6	6.4	7.2	6.6	2.3	5.9	10.5	41.2	40.5	10.7	6.2	4.0	4.4	7.9	10.5	8.4	14.0	12.5	9.7	41.2	
23-Nov	5.2	10.7	Z	11.2	9.5	10.0	11.6	13.5	14.1	15.9	15.5	9.8	9.7	22.5	15.2	13.6	10.3	12.1	11.4	9.4	8.8	10.7	11.2	12.3	11.9	22.5	
24-Nov	12.8	13.4	12.2	Z	12.6	16.9	14.6	12.8	14.7	21.4	30.3	30.4	27.6	29.9	36.2	32.8	30.2	27.2	28.5	31.5	32.7	30.8	31.8	28.3	24.3	36.2	
25-Nov	28.8	31.4	36.4	27.4	Z	16.0	12.5	9.8	10.4	11.2	9.7	8.2	7.9	22.8	17.1	12.4	9.9	8.4	11.7	18.4	18.8	13.9	12.1	27.0	16.6	36.4	
26-Nov	14.4	2.6	2.8	3.1	3.7	Z	11.5	18.7	22.6	5.4	8.0	8.3	7.9	9.0	11.2	12.3	28.5	7.7	3.3	3.2	1.9	0.8	0.6	0.6	8.2	28.5	
27-Nov	Z	0.8	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.2	1.0	2.7	4.2	3.7	2.6	3.2	3.5	4.2	0.3	0.0	0.0	0.0	0.0	0.6	1.2	4.2	
28-Nov	0.7	Z	6.2	6.0	8.9	3.4	0.1	2.4	4.0	9.6	9.1	9.1	10.4	9.0	14.7	13.3	15.3	17.3	26.0	20.5	22.8	23.2	17.7	19.2	11.7	26.0	
29-Nov	17.5	16.1	Z	4.7	7.0	8.7	9.9	10.5	6.6	8.3	17.4	17.5	14.6	11.1	21.0	46.1	43.2	50.6	103.6	70.6	41.9	46.6	45.2	43.8	28.8	103.6	
30-Nov	36.7	36.4	32.7	Z	29.4	26.0	28.6	34.0	34.4	43.6	126.4	158.6	135.9	143.9	78.4	38.0	24.1	43.7	58.7	32.4	25.9	30.6	26.3	25.7	54.4	158.6	
																						Diurnal Average					
																						Diurnal Maximum					
10.8 14.2 14.7 12.9 11.9 13.4 13.1 11.4 10.0 10.9 13.9 16.4 15.5 18.0 14.3 12.2 12.2 14.2 16.4 14.6 14.0 13.7 12.6 13.5																											
36.7 73.4 62.9 43.5 40.4 54.7 86.6 71.5 34.4 43.6 126.4 158.6 135.9 143.9 78.4 46.1 43.2 50.6 103.6 70.6 41.9 46.6 45.2 43.8																											
Z - zerospan		C - Calibration				M - Maintenance																					





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	544	79.65	79.65
21 - 40	101	14.79	94.44
41 - 80	32	4.69	99.12
81 - 159	6	0.88	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Fort McKay - Bertha Ganter - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	71	53	15	4	3	2	5	23	105	33	28	16	26	31	15	18	448
21 - 40	12	5	0	0	0	0	0	3	19	7	4	1	1	1	5	6	64
11 - 80	3	1	0	0	0	0	0	0	0	4	2	0	2	1	1	1	15
81 - 159	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	86	59	15	4	3	2	5	26	124	44	34	18	29	33	21	25	528

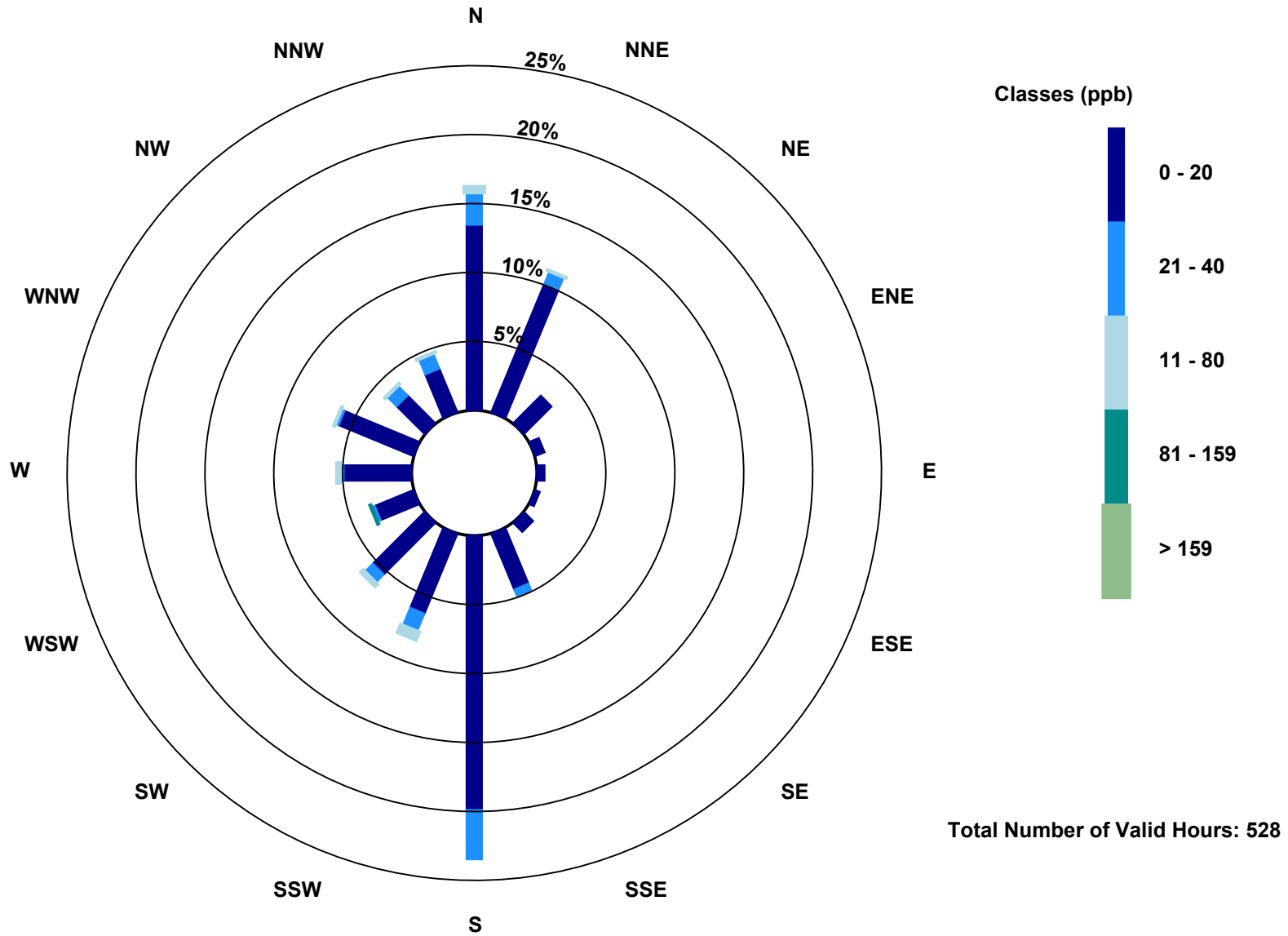
Total Number of Valid Hours: 528

Total Number of Hours: 720

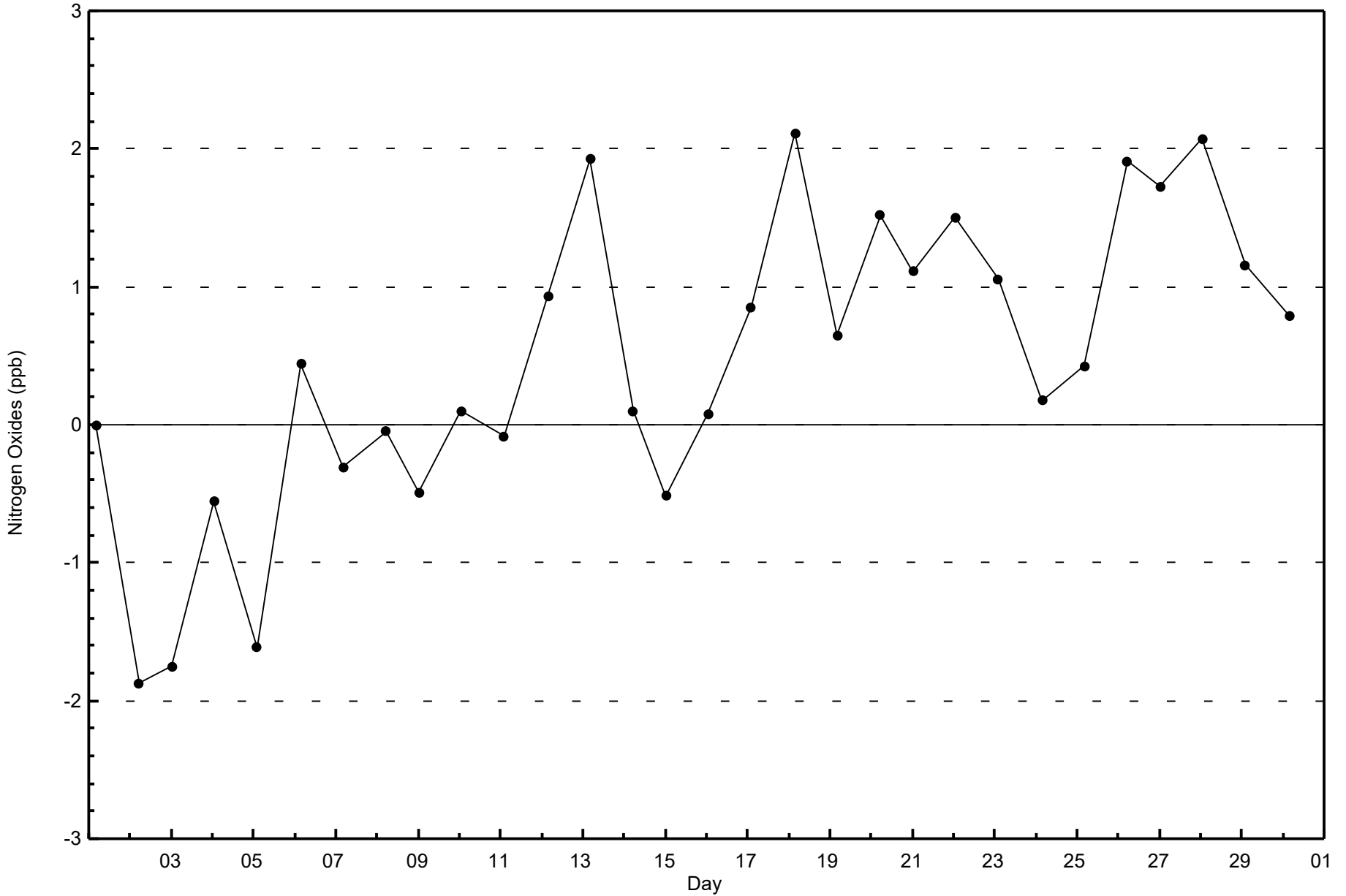


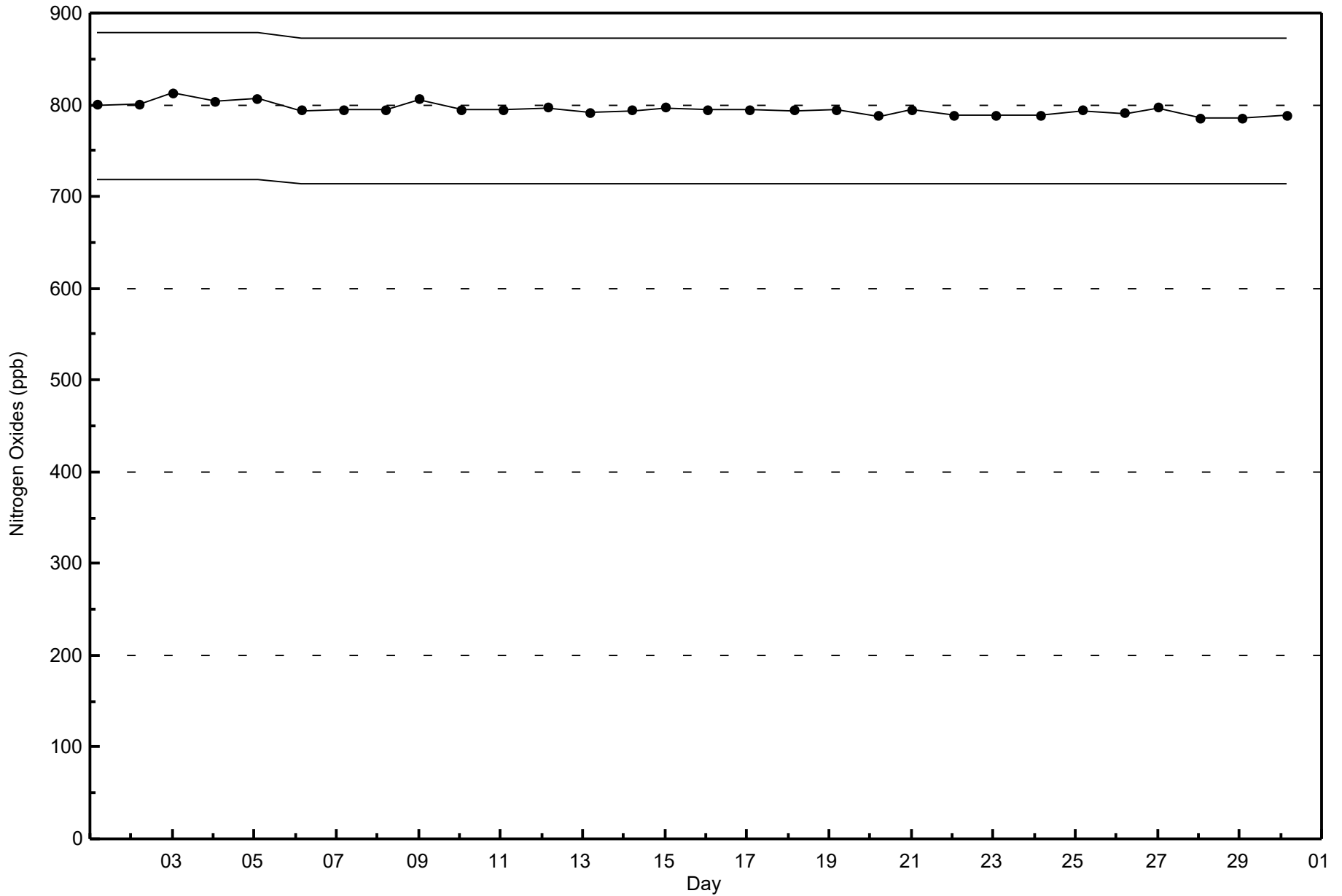
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Fort McKay - Bertha Ganter



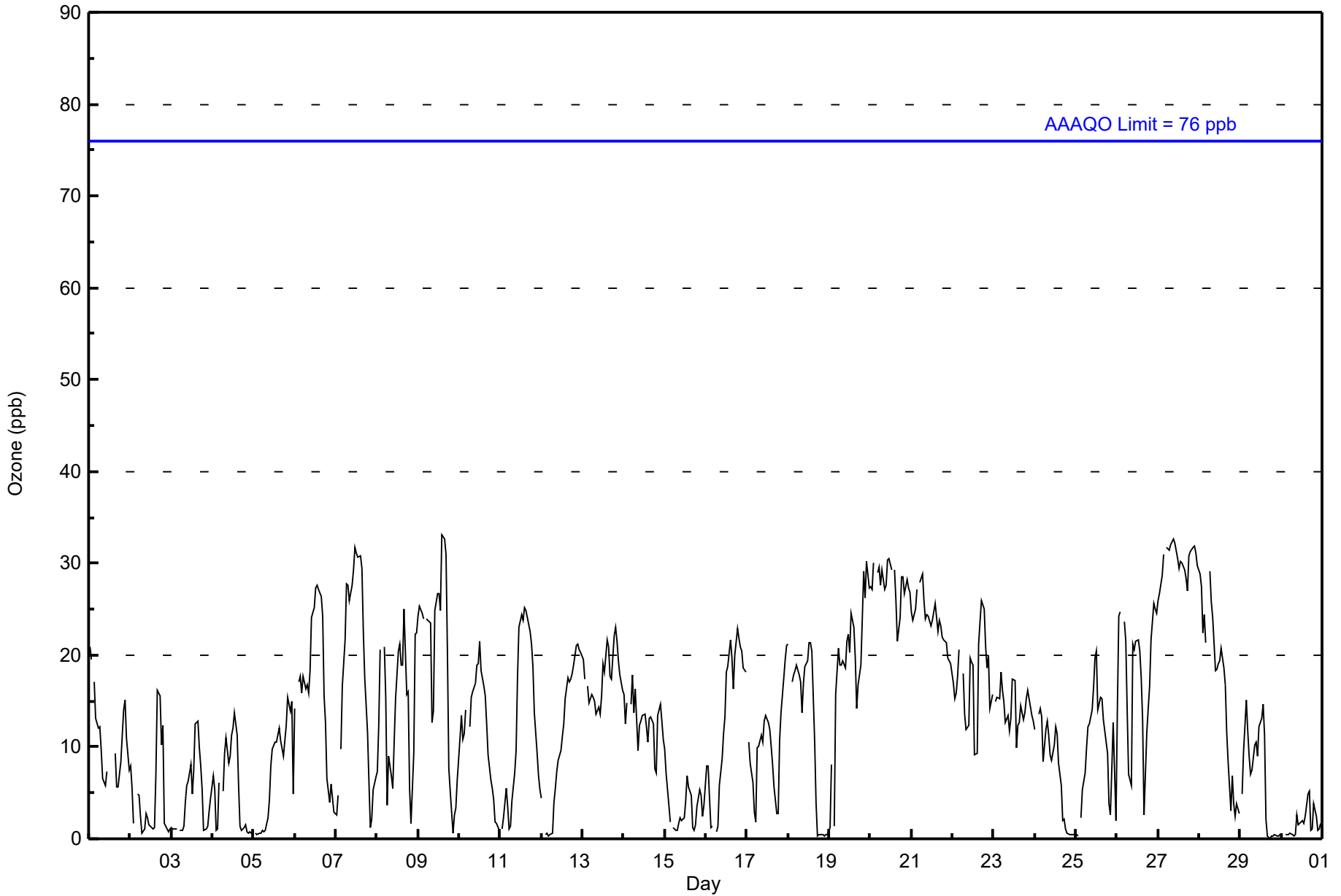








Number of Exceedences (AAAQO):      1-hr: 0    24-hr: 0 Maximum Value: 33.2 ppb on Nov 9 15:00      Maximum Daily Average: 30.3 ppb on Nov 27		Hours in Service:                          720 Hours of Data:                                685																								
Minimum Value: 0.0 ppb on Nov 29 18:00      Minimum Daily Average: 1.6 ppb on Nov 30 Maximum Diurnal Average: 17.5 ppb at hour 13      Minimum Diurnal Average: 10.6 ppb at hour 24		Hours of Missing Data:                    35 Hours of Calibration:                      34																								
Monthly Average: 13.28 ppb		Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 1.1 Q <sub>1</sub> = 5.3 Median = 12.9 Q <sub>3</sub> = 20.4 P <sub>90</sub> = 26.1 P <sub>99</sub> = 31.8																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	20.9	19.5	Z	17.2	13.1	12.1	12.3	9.7	6.5	5.8	7.4	C	C	C	C	9.2	5.6	5.6	8.3	11.3	14.0	15.1	11.0	7.4	11.2	20.9
2-Nov	7.9	5.5	1.6	Z	4.8	4.8	2.4	0.5	1.0	2.7	2.3	1.6	1.2	1.1	1.1	6.9	16.2	15.5	10.2	12.3	1.6	1.0	0.8	1.1	4.5	16.2
3-Nov	1.2	1.1	1.1	1.1	Z	0.9	1.0	1.4	3.9	5.8	6.2	8.0	4.9	7.5	12.5	12.9	9.9	7.9	5.3	1.0	1.1	1.3	3.1	4.5	4.5	12.9
4-Nov	6.8	5.4	0.9	1.0	6.1	Z	5.2	9.3	11.0	8.2	9.0	11.2	12.0	13.7	11.3	5.7	1.4	0.9	1.2	1.5	0.8	0.6	0.8	0.4	5.4	13.7
5-Nov	Z	0.6	0.5	0.6	0.6	1.0	0.8	0.9	2.3	4.3	7.9	9.7	10.5	10.6	11.3	12.0	10.7	9.0	10.6	12.3	15.5	13.8	15.0	4.9	7.2	15.5
6-Nov	14.2	Z	17.2	17.6	15.8	17.7	16.3	16.8	15.9	18.3	24.1	25.2	27.3	27.6	27.1	26.4	24.2	15.5	12.7	6.5	4.0	5.9	4.4	2.9	16.7	27.6
7-Nov	2.6	4.7	Z	9.7	16.6	21.7	27.7	27.6	25.9	27.7	29.3	31.7	31.1	30.7	30.9	29.5	22.6	17.5	11.6	6.3	1.2	2.1	5.4	6.8	18.3	31.7
8-Nov	7.3	12.4	20.6	Z	21.0	15.4	3.6	9.0	6.8	5.5	10.5	15.2	20.4	21.2	18.9	18.9	25.0	15.8	16.0	5.5	1.8	9.3	22.3	22.4	14.1	25.0
9-Nov	24.3	25.4	24.5	23.9	Z	24.0	23.7	23.5	12.6	13.9	24.9	26.7	26.7	24.8	33.2	32.6	30.9	20.3	7.6	5.2	0.6	2.6	3.4	6.4	19.2	33.2
10-Nov	10.9	13.4	10.8	11.4	14.0	Z	12.2	15.3	16.0	16.9	18.9	19.1	21.6	18.3	16.7	15.5	12.5	9.1	6.4	5.5	4.2	1.8	1.7	0.9	11.9	21.6
11-Nov	Z	1.0	2.3	5.4	3.5	1.0	1.4	4.1	7.2	9.6	17.5	23.0	24.5	23.8	25.1	24.9	24.0	22.6	21.3	18.7	13.7	9.3	6.8	5.4	12.9	25.1
12-Nov	4.5	Z	0.4	0.6	0.3	0.5	0.6	4.0	5.5	7.4	8.6	9.6	11.1	12.5	15.3	17.6	17.1	17.4	18.1	18.9	21.1	21.2	20.5	20.3	11.0	21.2
13-Nov	19.5	17.4	Z	16.6	14.7	15.6	15.3	14.9	13.5	14.3	13.6	15.5	19.1	18.1	21.6	20.9	17.7	17.3	22.1	23.0	21.5	19.4	17.8	16.1	17.6	23.0
14-Nov	15.8	12.6	14.8	Z	14.7	17.9	13.7	16.3	9.6	12.3	12.9	13.4	13.7	12.2	10.5	13.1	13.3	12.6	7.7	7.1	13.4	14.7	12.9	10.8	12.9	17.9
15-Nov	9.8	7.2	3.7	1.8	Z	1.3	0.9	1.0	1.6	2.2	1.9	2.3	4.2	6.8	5.6	4.7	1.1	0.9	1.5	3.4	5.3	4.7	2.4	3.6	3.4	9.8
16-Nov	8.0	8.0	4.5	1.2	1.3	Z	0.8	1.4	5.9	8.6	11.5	13.2	18.2	18.8	21.6	19.7	16.4	20.0	23.0	21.8	21.0	20.5	18.5	18.1	13.1	23.0
17-Nov	Z	10.6	8.2	6.1	2.9	1.8	9.9	10.1	11.4	10.6	12.8	13.3	12.7	11.9	10.1	8.1	5.6	2.8	2.7	10.7	13.7	17.5	19.6	21.1	10.2	21.1
18-Nov	21.3	Z	17.2	17.8	18.3	19.0	17.9	17.0	13.7	16.9	18.7	19.4	21.3	21.4	20.4	10.7	4.0	0.2	0.4	0.4	0.4	0.3	0.4	0.4	12.1	21.4
19-Nov	1.2	8.0	Z	1.4	15.8	20.8	18.8	18.9	19.3	18.6	21.5	22.3	20.3	24.5	23.0	19.7	14.1	16.7	18.9	24.0	29.1	26.3	30.2	27.3	19.2	30.2
20-Nov	27.4	27.2	30.1	Z	29.0	29.6	27.6	29.3	27.1	27.7	30.4	30.5	29.3	M	29.3	25.9	21.6	24.1	28.5	28.5	26.7	28.2	27.3	26.9	27.8	30.5
21-Nov	24.7	23.8	25.0	27.1	Z	27.9	28.9	25.9	24.0	24.5	24.3	23.3	23.7	24.7	25.6	22.6	23.7	23.1	22.0	21.6	21.3	19.7	19.3	19.0	23.7	28.9
22-Nov	16.9	15.3	15.8	17.7	20.7	Z	18.1	13.6	11.9	12.3	19.7	19.2	18.9	9.1	9.3	21.1	23.6	26.0	25.0	20.9	18.6	20.0	14.1	15.6	17.5	26.0
23-Nov	Z	14.9	15.5	15.3	18.1	16.2	14.9	12.6	13.4	11.7	13.1	17.4	17.2	9.9	12.3	12.7	14.4	12.9	13.8	15.3	16.2	14.4	13.4	12.8	14.3	18.1
24-Nov	11.9	Z	13.6	14.2	13.3	8.5	11.9	12.8	11.3	9.1	8.6	10.3	12.3	11.5	8.2	5.7	2.0	2.2	1.0	0.7	0.4	0.4	0.5	0.4	7.4	14.2
25-Nov	0.5	0.3	Z	2.3	5.3	7.1	9.8	12.2	12.4	14.0	16.4	19.6	20.4	14.0	15.4	15.2	13.0	11.7	9.4	3.9	2.7	7.5	12.7	2.0	9.9	20.4
26-Nov	14.1	24.2	24.8	Z	23.6	21.5	13.9	7.1	5.8	21.2	20.6	21.5	21.7	20.5	17.5	12.9	2.6	11.6	14.3	16.7	21.7	25.6	25.0	24.5	18.0	25.6
27-Nov	25.9	26.8	28.7	31.0	Z	31.8	31.5	32.0	32.4	32.7	32.2	30.5	29.5	30.2	30.0	29.2	28.3	27.0	30.9	31.2	31.8	31.9	31.1	29.7	30.3	32.7
28-Nov	28.8	27.5	22.5	24.4	21.3	Z	29.1	25.8	24.2	18.3	18.4	19.1	19.3	20.8	18.6	16.7	11.5	8.4	3.1	6.8	3.8	2.4	3.9	2.7	16.4	29.1
29-Nov	Z	4.8	9.5	15.1	11.7	9.1	7.0	7.5	10.3	10.5	9.0	12.2	13.1	14.7	11.3	2.1	0.3	0.0	0.3	0.3	0.5	0.3	0.3	0.5	6.5	15.1
30-Nov	0.5	Z	0.5	0.5	0.4	0.5	0.4	0.3	0.5	2.6	1.6	1.9	2.0	1.7	2.4	4.8	5.2	0.9	1.0	3.9	2.4	1.0	1.1	1.7	1.6	5.2
13.1 12.7 12.6 11.2 12.3 13.1 12.6 12.7 12.1 13.1 15.1 16.8 17.5 16.5 17.1 15.9 14.0 12.5 11.8 11.5 11.0 11.3 11.5 10.6																								Diurnal Average		
28.8 27.5 30.1 31.0 29.0 31.8 31.5 32.0 32.4 32.7 32.2 31.7 31.1 30.7 33.2 32.6 30.9 27.0 30.9 31.2 31.8 31.9 31.1 29.7																								Diurnal Maximum		
Z - zerospan      C - Calibration      M - Maintenance																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb																										





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	518	75.62	75.62
21 - 50	167	24.38	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Concentration</b> <b>Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	65	34	14	3	3	2	4	17	105	39	29	16	20	11	12	14	388
21 - 50	22	20	1	1	0	0	1	10	15	7	7	6	9	21	11	11	142
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	87	54	15	4	3	2	5	27	120	46	36	22	29	32	23	25	530

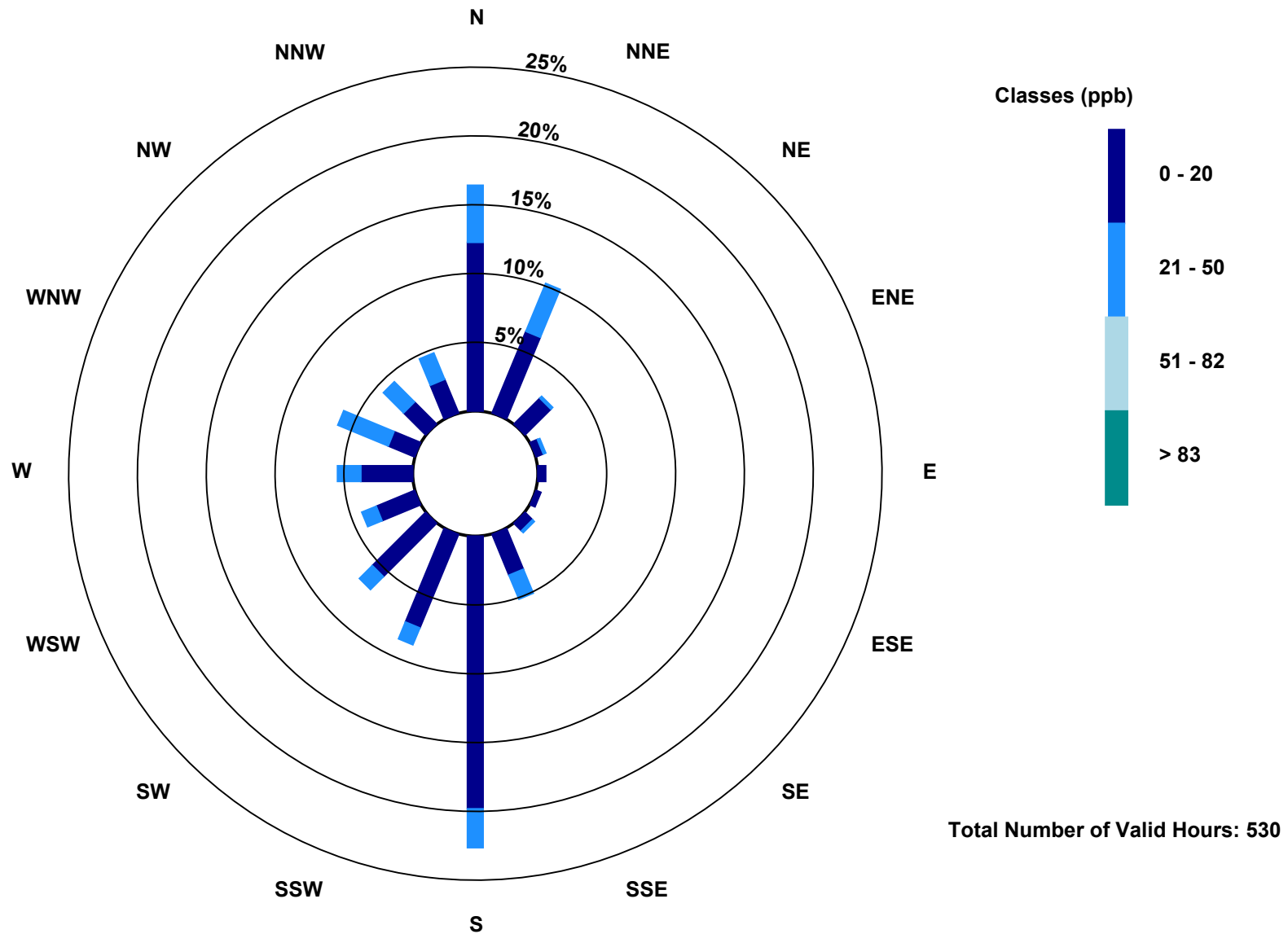
Total Number of Valid Hours: 530

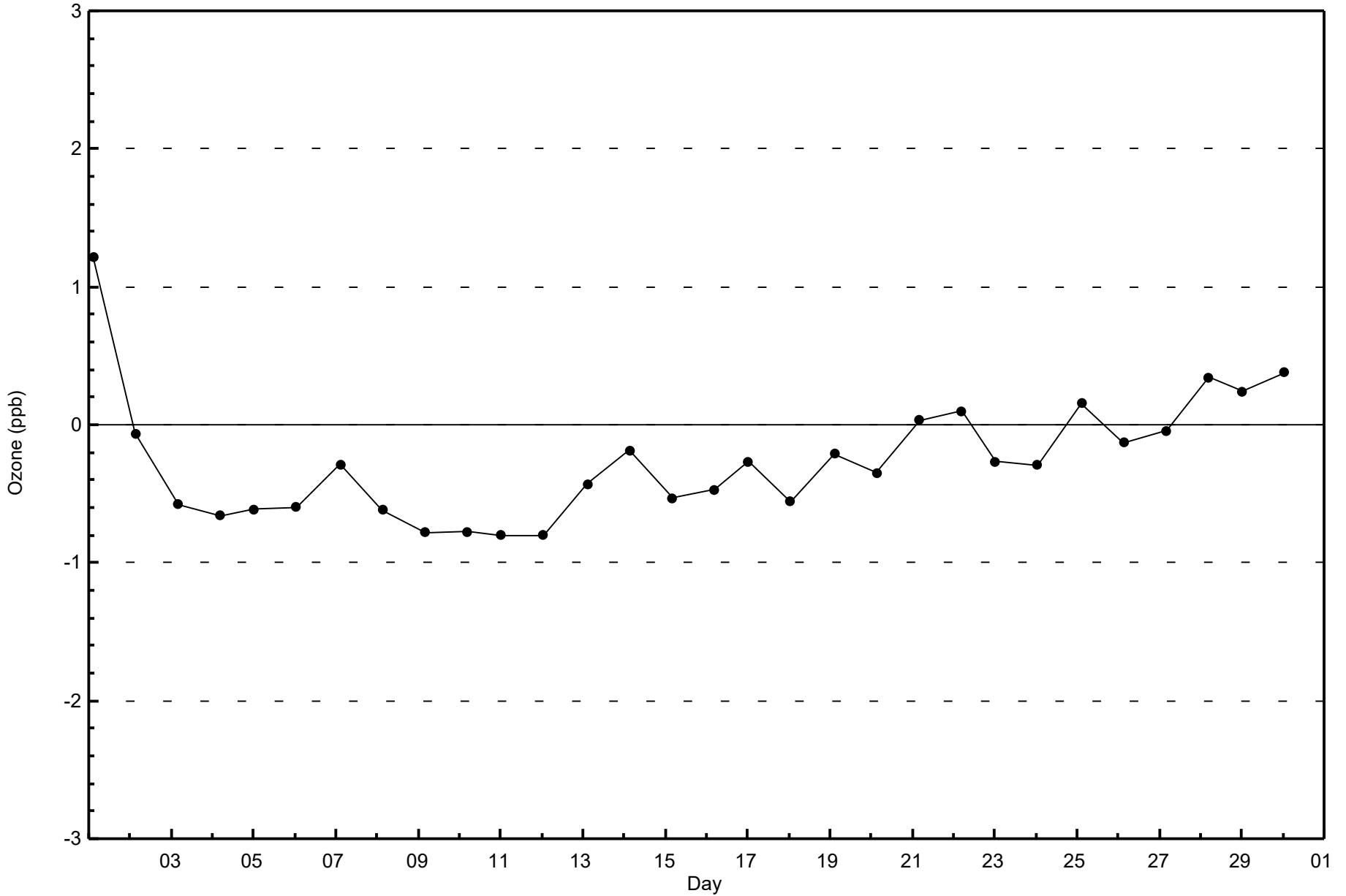
Total Number of Hours: 720



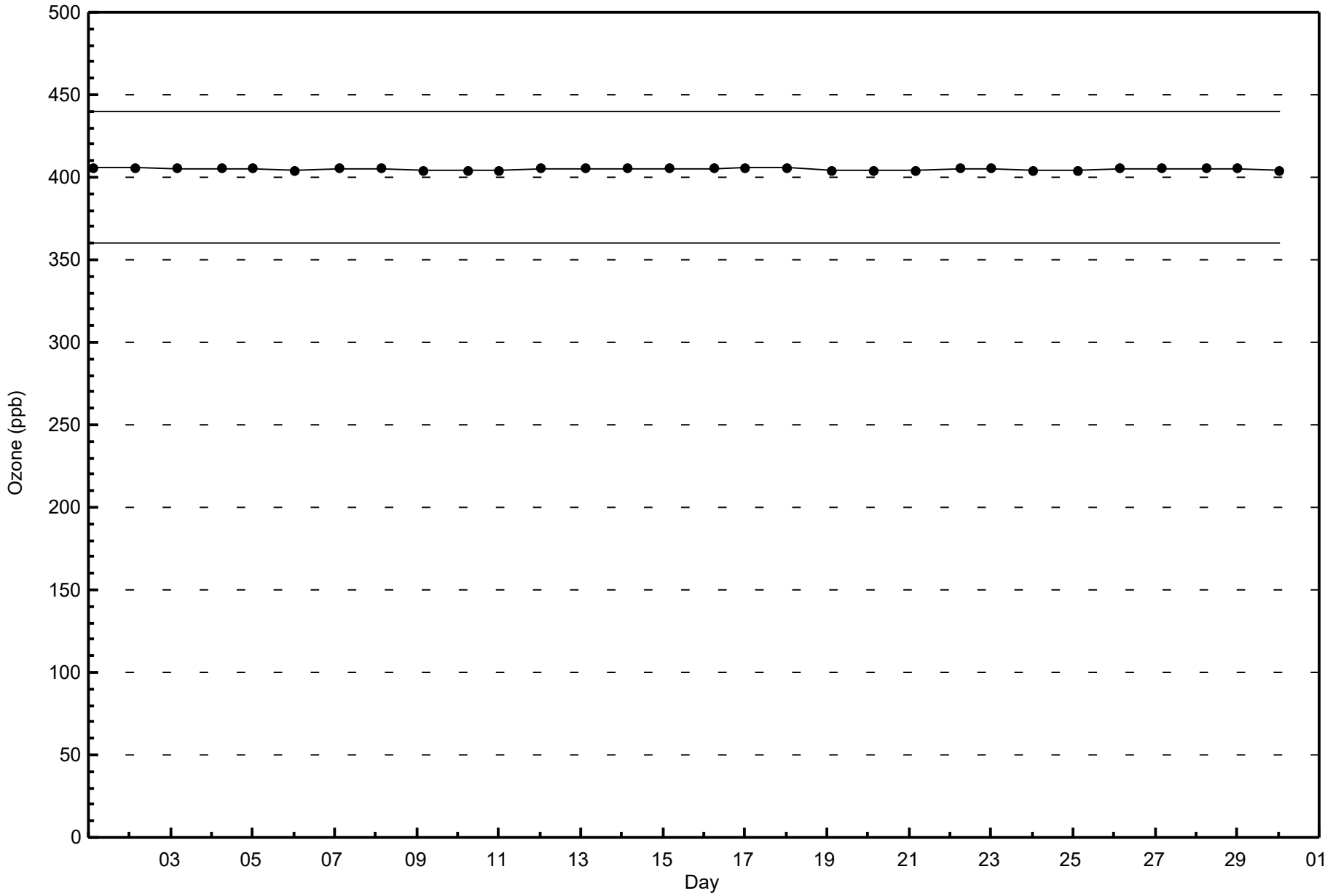
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Ozone (O<sub>3</sub>) - ppb  
Fort McKay - Bertha Ganter











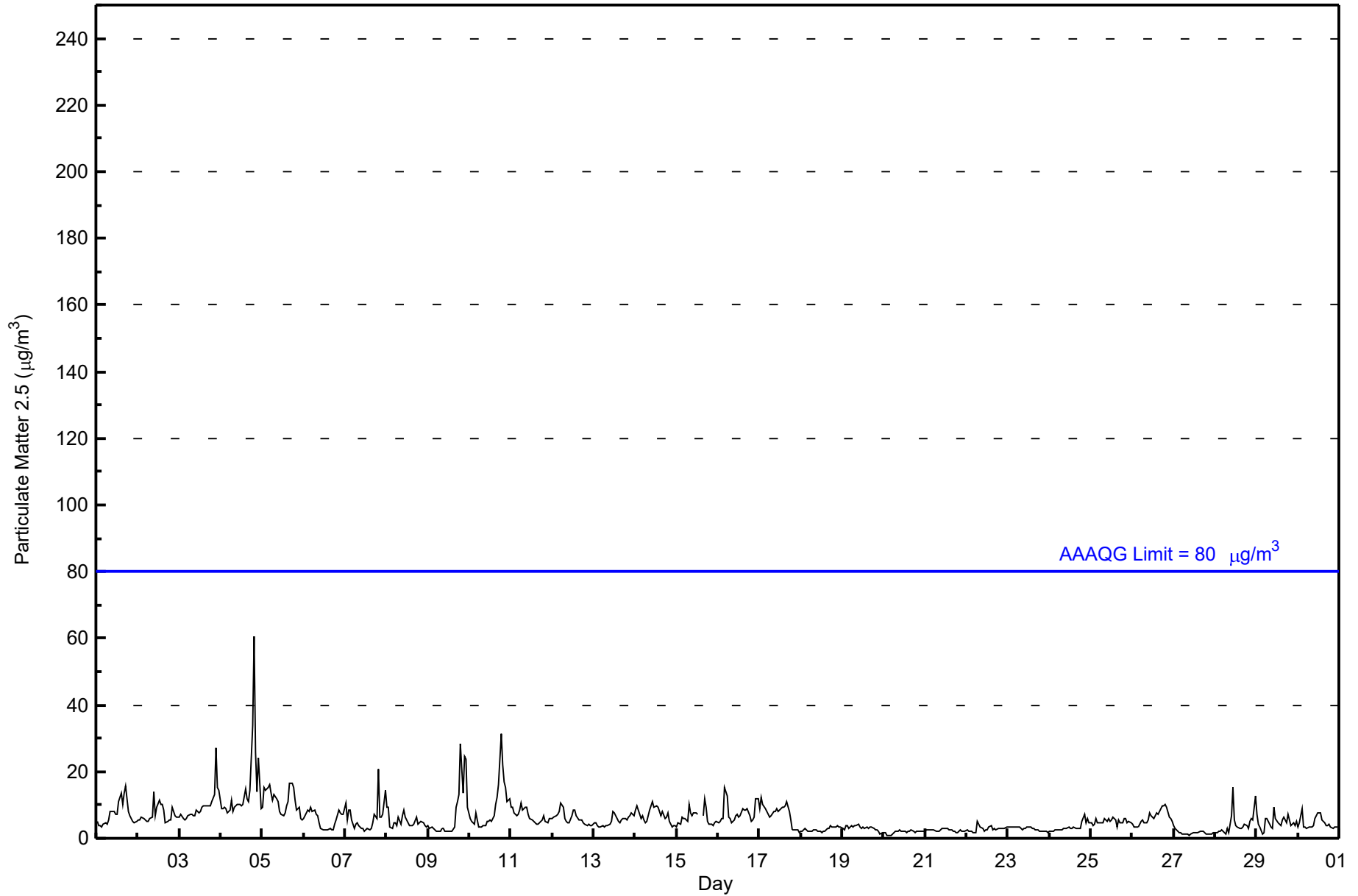
# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

## Fort McKay - Bertha Ganter - November 2024

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720																										
Maximum Value: 60.6 µg/m <sup>3</sup> on Nov 4 20:00		Maximum Daily Average: 14.6 µg/m <sup>3</sup> on Nov 4																	Hours of Data:	718																												
Minimum Value: 1.0 µg/m <sup>3</sup> on Nov 20 04:00		Minimum Daily Average: 1.8 µg/m <sup>3</sup> on Nov 27																	Hours of Missing Data:	2																												
Maximum Diurnal Average: 8.7 µg/m <sup>3</sup> at hour 20		Minimum Diurnal Average: 4.9 µg/m <sup>3</sup> at hour 4																	Hours of Calibration:	2																												
Monthly Average: 5.84 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 1.2 P <sub>10</sub> = 2.1 Q <sub>1</sub> = 3.0 Median = 4.8 Q <sub>3</sub> = 7.4 P <sub>90</sub> = 10.1 P <sub>99</sub> = 24.1																	Percent Operational Time:	100.0																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	4.9	4.0	3.7	3.2	4.1	4.5	4.2	5.6	8.2	8.3	7.9	7.1	7.4	11.1	13.7	10.3	13.7	15.8	8.0	6.9	5.9	5.1	4.8	5.2	7.2	15.8																						
2-Nov	5.4	5.7	6.2	5.9	5.4	5.3	5.1	5.8	6.5	14.0	6.6	9.5	11.3	10.2	10.1	8.4	4.8	5.0	5.6	5.5	9.2	6.6	6.5	6.4	7.1	14.0																						
3-Nov	6.5	7.3	5.9	5.7	5.9	6.9	7.1	7.2	7.0	6.9	8.5	7.8	8.1	9.2	9.6	9.8	9.9	9.7	9.7	11.1	13.0	27.0	15.0	14.5	9.6	27.0																						
4-Nov	8.7	9.1	9.1	9.0	7.6	8.7	11.3	8.0	9.4	10.2	10.3	10.1	9.7	10.0	14.9	11.8	11.2	14.4	33.7	60.6	26.0	14.2	24.2	9.1	14.6	60.6																						
5-Nov	9.3	15.0	14.4	15.2	16.2	13.4	11.6	13.1	11.8	11.1	8.1	7.1	6.9	7.8	9.7	10.9	16.3	16.6	15.2	11.3	8.3	9.4	6.1	5.5	11.3	16.6																						
6-Nov	5.8	6.7	8.4	8.2	9.2	7.9	8.6	7.3	6.8	4.7	2.8	2.5	2.7	2.7	2.5	2.9	2.7	2.7	4.4	5.7	8.4	7.7	7.3	7.2	5.6	9.2																						
7-Nov	10.4	5.4	8.5	8.5	5.3	3.0	4.4	4.6	3.9	2.8	2.8	2.2	2.6	2.8	2.7	2.8	4.5	7.3	5.8	21.0	6.3	6.3	7.4	14.6	6.1	21.0																						
8-Nov	9.1	9.1	3.3	2.8	4.6	4.7	3.9	6.3	4.1	6.9	8.6	6.3	4.7	3.6	4.0	3.9	4.2	6.2	4.1	4.7	5.0	4.6	3.7	3.5	5.1	9.1																						
9-Nov	3.7	2.9	3.4	3.0	2.7	2.2	2.2	2.1	3.1	3.0	2.0	2.2	2.3	2.3	2.0	3.3	9.5	11.0	13.3	28.3	13.8	24.7	23.8	9.3	7.3	28.3																						
10-Nov	6.1	5.1	4.9	4.3	7.8	3.4	3.5	3.5	3.6	3.9	5.1	4.9	5.4	5.2	6.6	10.3	12.5	16.1	31.4	21.9	17.1	15.2	11.0	11.7	9.2	31.4																						
11-Nov	9.2	9.3	7.7	6.9	7.4	8.4	10.7	8.3	9.2	9.1	7.0	5.8	5.3	5.2	4.6	4.4	4.2	5.2	5.4	6.7	5.1	4.8	5.9	6.1	6.8	10.7																						
12-Nov	5.9	6.2	6.9	7.3	8.1	10.4	9.3	6.0	5.1	4.5	4.7	6.6	8.3	8.4	6.7	5.6	5.5	5.3	4.7	4.3	3.9	4.0	3.9	3.8	6.1	10.4																						
13-Nov	4.5	4.5	3.8	3.6	3.4	3.9	3.6	4.0	4.0	4.2	5.2	7.9	7.5	6.6	5.2	4.9	5.4	6.1	5.8	5.5	6.4	6.9	7.6	6.7	5.3	7.9																						
14-Nov	8.6	9.7	8.6	6.1	6.8	5.5	4.6	5.1	8.3	9.6	11.1	9.4	9.8	9.5	8.1	6.7	8.0	5.7	6.3	7.6	5.1	3.5	3.6	4.0	7.1	11.1																						
15-Nov	3.5	4.6	4.4	6.3	6.0	5.9	5.3	10.3	7.7	6.6	7.4	7.8	7.2	C	C	6.9	11.9	9.2	5.3	4.3	4.3	3.8	4.7	4.9	6.3	11.9																						
16-Nov	4.8	5.0	5.8	6.0	15.3	12.6	6.5	5.9	4.7	5.4	7.0	7.4	6.2	6.6	8.9	8.7	8.6	8.8	6.6	5.2	5.6	6.3	11.7	12.0	7.6	15.3																						
17-Nov	8.8	12.5	10.1	8.8	8.2	7.3	6.5	6.7	8.1	8.2	8.9	7.9	9.0	9.2	9.3	9.6	11.0	8.2	5.4	2.5	2.5	2.5	2.4	1.9	7.3	12.5																						
18-Nov	2.0	2.2	2.8	2.5	2.0	2.0	2.2	2.3	2.7	2.4	1.9	1.9	1.8	2.3	2.2	3.0	2.9	4.0	3.5	3.6	3.5	4.0	3.5	3.2	2.7	4.0																						
19-Nov	2.9	2.5	3.8	4.0	3.1	3.6	3.4	4.0	4.0	4.3	3.4	3.1	3.3	3.2	3.3	3.1	3.3	3.3	2.9	2.5	2.4	2.3	1.2	1.7	3.1	4.3																						
20-Nov	1.8	1.6	1.0	1.0	1.0	1.2	1.6	2.1	2.1	2.4	2.1	2.0	2.0	1.8	2.2	2.3	2.5	2.2	1.8	2.1	2.1	2.2	2.1	2.0	1.9	2.5																						
21-Nov	2.3	2.6	2.6	2.5	2.5	2.4	2.2	2.2	2.3	2.5	2.8	3.0	2.9	2.8	2.6	2.6	2.0	2.0	1.6	1.5	2.4	1.9	1.9	1.9	2.3	3.0																						
22-Nov	2.7	2.1	2.0	2.0	1.6	1.8	5.2	4.0	3.6	2.9	2.1	2.7	2.4	3.2	3.7	2.7	3.1	2.7	2.9	2.8	2.9	3.0	3.1	3.2	2.9	5.2																						
23-Nov	3.3	3.4	3.5	3.5	3.4	3.5	3.4	3.3	2.7	2.9	3.2	3.2	3.3	3.3	3.1	2.8	2.6	2.4	2.2	2.1	2.0	2.0	1.9	1.8	2.9	3.5																						
24-Nov	2.1	2.1	2.2	2.5	2.5	2.6	2.6	2.6	2.9	3.1	3.1	3.2	3.1	3.2	3.2	3.1	3.1	3.0	3.0	4.9	7.2	4.5	5.9	4.5	3.3	7.2																						
25-Nov	4.7	3.8	4.2	6.1	4.7	4.7	4.7	4.6	5.8	5.2	5.9	5.2	5.4	6.5	5.3	3.3	5.3	4.6	4.8	6.0	5.9	4.5	5.1	4.8	5.0	6.5																						
26-Nov	4.4	3.2	3.2	3.3	4.1	4.9	5.5	4.8	4.8	5.5	7.8	6.9	6.1	6.6	7.5	7.1	7.9	9.8	9.9	10.1	9.2	6.4	5.8	5.1	6.2	10.1																						
27-Nov	3.9	3.1	2.3	1.8	1.8	1.5	1.3	1.2	1.1	1.0	1.3	1.5	1.9	1.8	1.8	2.1	2.1	2.3	1.6	1.5	1.5	1.5	1.4	1.5	1.8	3.9																						
28-Nov	1.5	1.8	2.2	1.9	2.4	1.7	1.3	2.9	1.8	6.8	15.2	5.7	3.9	3.2	3.0	3.0	3.6	4.3	3.6	3.1	5.0	5.9	5.7	12.9	4.3	15.2																						
29-Nov	7.3	4.4	3.2	1.4	1.6	5.9	5.7	5.3	3.3	2.8	9.1	5.9	4.5	4.2	4.0	5.5	6.5	4.8	7.3	5.4	3.9	4.8	3.8	5.0	4.8	9.1																						
30-Nov	3.4	4.5	9.1	3.5	3.3	3.1	3.4	3.2	3.4	3.8	6.1	7.5	7.6	7.7	5.6	4.7	3.7	3.9	4.2	3.4	3.0	3.3	3.2	3.4	4.5	9.1																						
																								5.3	5.3	5.2	4.9	5.3	5.1	5.0	5.1	5.1	5.5	5.9	5.5	5.4	5.5	5.7	5.5	6.4	6.8	7.3	8.7	6.6	6.6	6.5	5.9	Diurnal Average
																								10.4	15.0	14.4	15.2	16.2	13.4	11.6	13.1	11.8	14.0	15.2	10.1	11.3	11.1	14.9	11.8	16.3	16.6	33.7	60.6	26.0	27.0	24.2	14.6	Diurnal Maximum
C - Calibration																																																
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m <sup>3</sup> 24-hr 29 µg/m <sup>3</sup>																																																





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	420	58.50	58.50
6 - 15	281	39.14	97.63
16 - 25	11	1.53	99.16
26 - 80	6	0.84	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>**  
**Fort McKay - Bertha Ganter - November 2024**

Concentration Ranges (μg/m <sup>3</sup> )	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	55	41	8	2	1	0	2	13	48	18	12	14	16	25	16	19	290
6 - 15	37	19	7	2	2	2	3	14	73	25	20	9	14	9	7	7	250
16 - 25	1	0	0	0	0	0	0	0	5	3	1	0	0	0	1	0	11
26 - 80	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	6
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	93	60	15	4	3	2	5	27	126	49	36	23	30	34	24	26	557

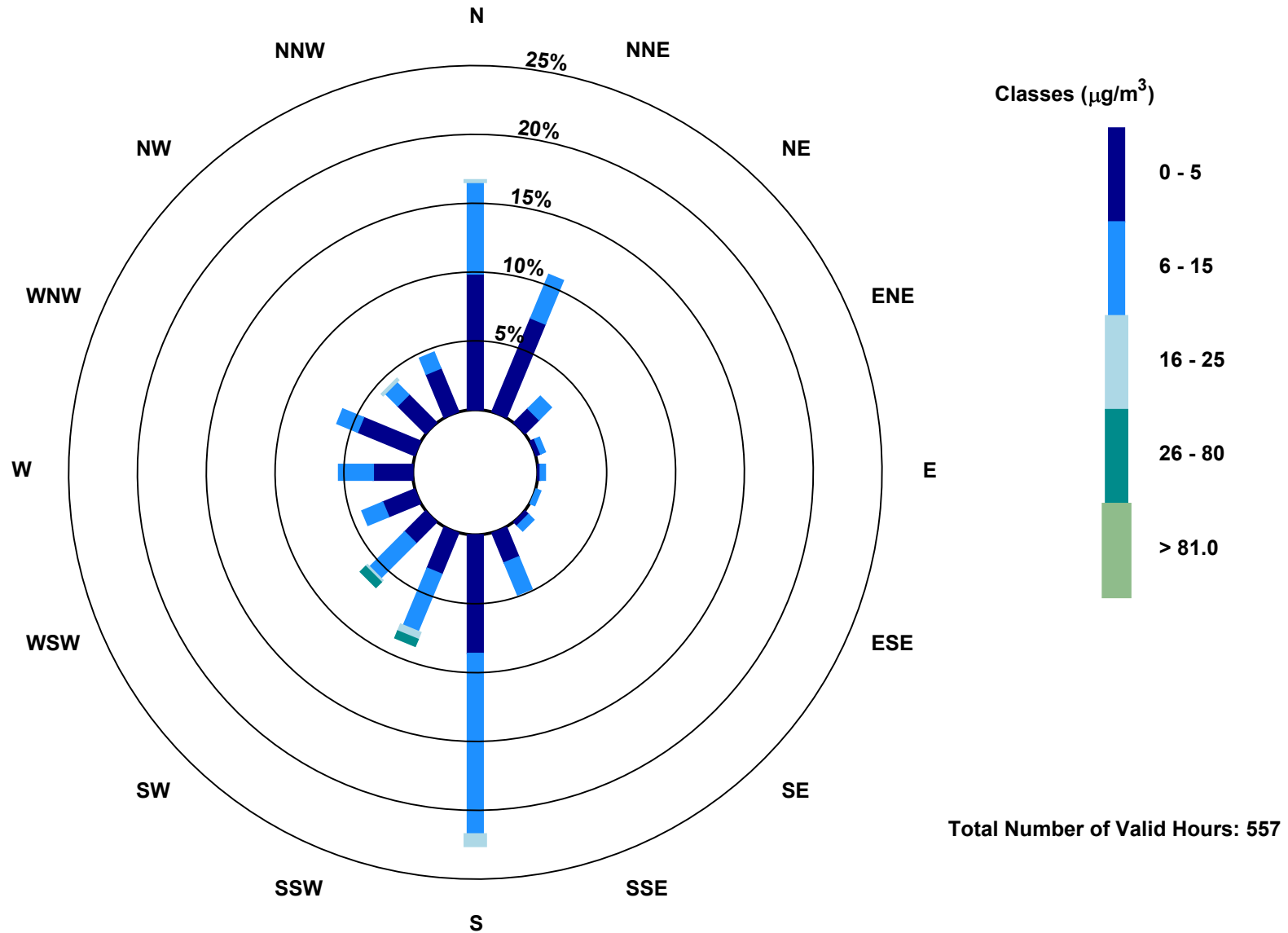
Total Number of Valid Hours: 557

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Fort McKay - Bertha Ganter





# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Carbon Monoxide (CO) - ppm

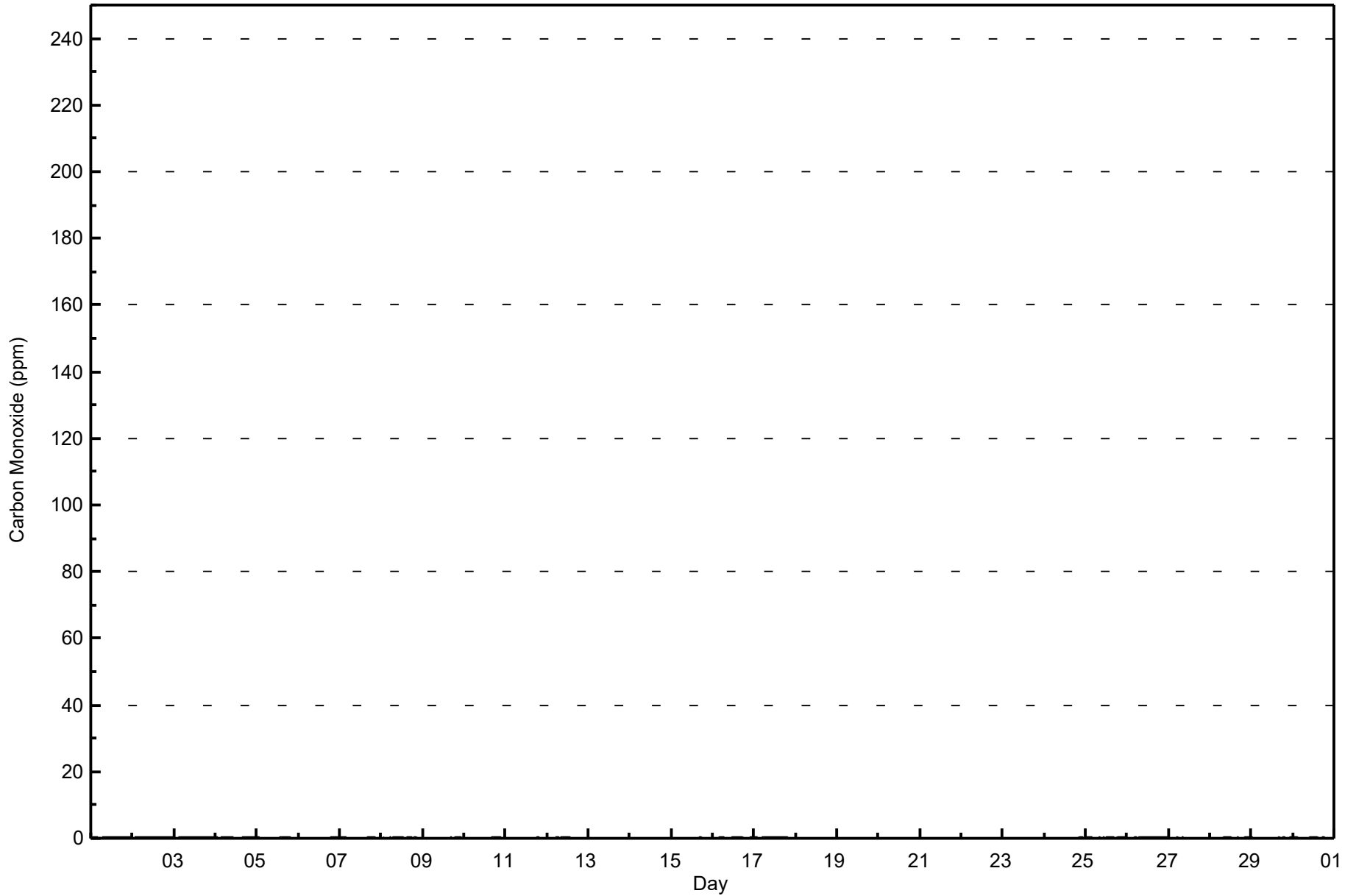
## Fort McKay - Bertha Ganter - November 2024

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0										Hours in Service: 720																			
Maximum Value: 0.4 ppm on Nov 4 20:00										Maximum Daily Average: 0.3 ppm on Nov 4										Hours of Data: 685									
Minimum Value: 0.0 ppm on Nov 29 05:00										Minimum Daily Average: 0.1 ppm on Nov 21										Hours of Missing Data: 35									
Maximum Diurnal Average: 0.2 ppm at hour 17										Minimum Diurnal Average: 0.2 ppm at hour 5										Hours of Calibration: 34									
Monthly Average: 0.19 ppm										Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.1 Median = 0.2 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 0.3 P <sub>99</sub> = 0.4										Percent Operational Time: 99.9									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Nov	0.2	0.2	0.2	0.3	0.2	Z	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3			
2-Nov	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2		
3-Nov	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3		
4-Nov	0.3	0.3	Z	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	C	C	C	C	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.2		
5-Nov	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
6-Nov	0.2	0.2	0.2	0.2	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
7-Nov	0.3	0.2	0.3	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
8-Nov	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
9-Nov	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3		
10-Nov	0.2	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3		
11-Nov	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
12-Nov	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2		
13-Nov	0.2	0.2	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2		
14-Nov	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
15-Nov	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
16-Nov	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3		
17-Nov	0.2	0.3	0.3	Z	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3		
18-Nov	0.2	0.2	0.2	0.2	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2		
19-Nov	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
20-Nov	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	M	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
21-Nov	0.0	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
22-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2		
23-Nov	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2		
24-Nov	0.2	0.2	0.2	0.2	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.3		
25-Nov	0.2	0.2	0.2	0.2	0.2	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
26-Nov	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3		
27-Nov	0.2	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
28-Nov	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3		
29-Nov	0.2	0.2	0.2	Z	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
30-Nov	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3		
																								Diurnal Average					
																								Diurnal Maximum					
Z - zerospan C - Calibration M - Maintenance																													
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 13 ppm																													



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Carbon Monoxide (CO) - ppm**  
**Fort McKay - Bertha Ganter - November 2024**







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Carbon Monoxide (CO) - ppm**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	677	98.83	98.83
0.4 - 0.5	8	1.17	100.00
0.6 - 0.7	0	0.00	100.00
0.8 - 1.4	0	0.00	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Carbon Monoxide (CO) - ppm**  
**Fort McKay - Bertha Ganter - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.3	90	56	14	4	3	2	4	25	120	44	31	23	27	32	22	25	522
0.4 - 0.5	0	0	0	0	0	0	0	0	0	3	3	0	1	0	0	0	7
0.6 - 0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.8 - 1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	90	56	14	4	3	2	4	25	120	47	34	23	28	32	22	25	529

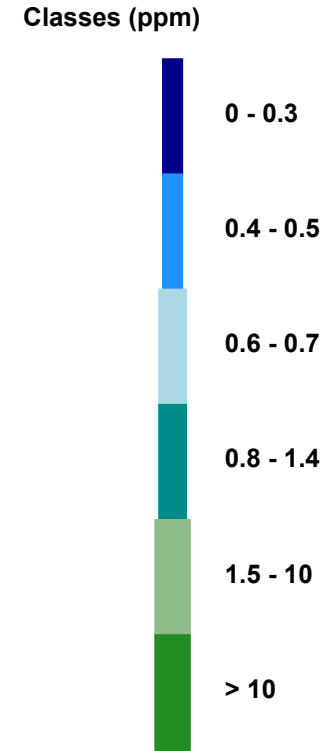
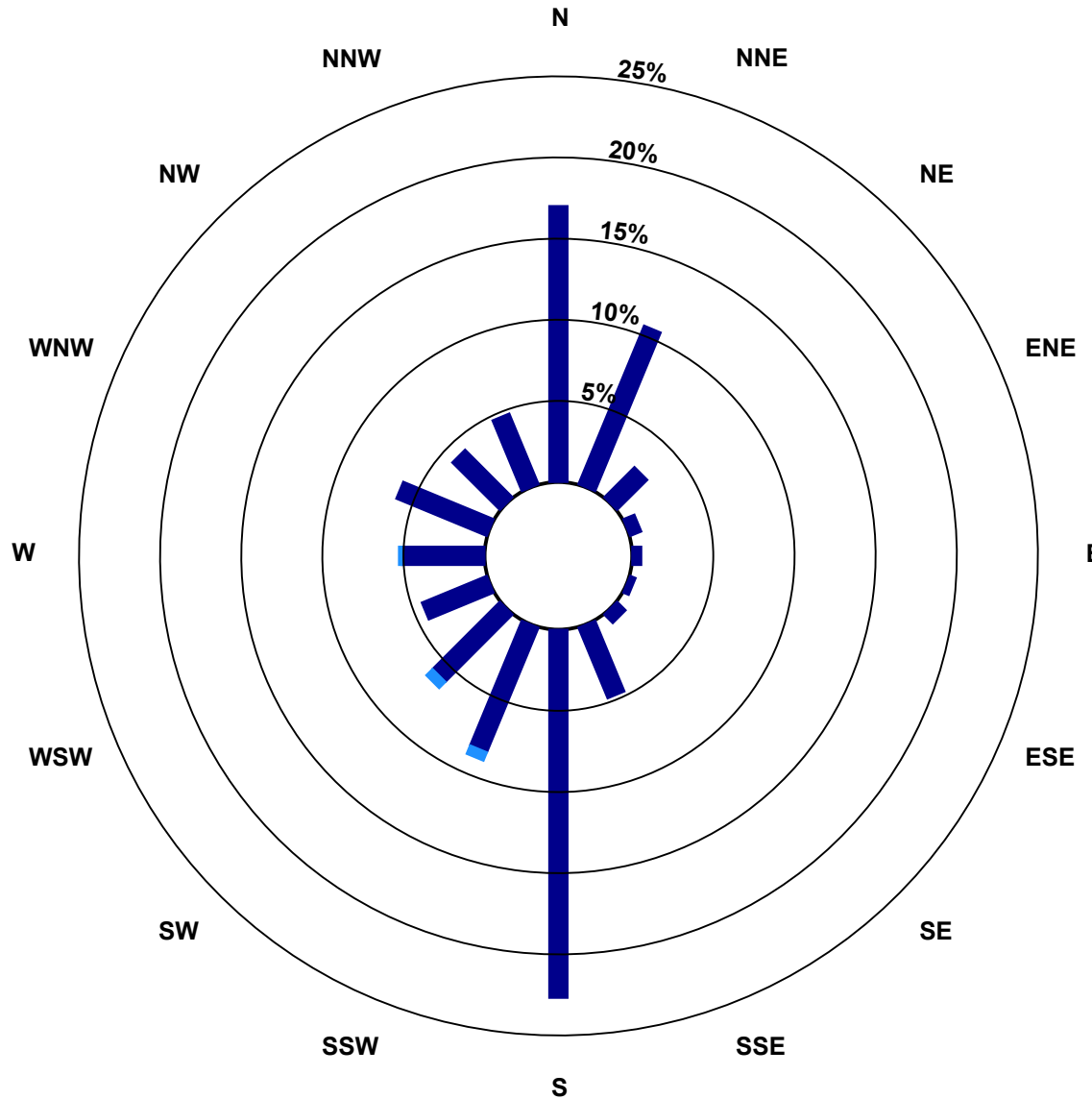
Total Number of Valid Hours: 529

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Carbon Monoxide (CO) - ppm  
Fort McKay - Bertha Ganter



Total Number of Valid Hours: 529



Wood Buffalo Environmental Association

Summary of Hour Averages

Carbon Dioxide (CO<sub>2</sub>) - ppm

Fort McKay - Bertha Ganter - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 478.6 ppm on Nov 4 23:00	Maximum Daily Average: 463.3 ppm on Nov 4		Hours of Data:	685
Minimum Value: 430.8 ppm on Nov 20 08:00	Minimum Daily Average: 432.1 ppm on Nov 20		Hours of Missing Data:	35
Maximum Diurnal Average: 449.3 ppm at hour 1	Minimum Diurnal Average: 444.4 ppm at hour 16		Hours of Calibration:	34
Monthly Average: 447.25 ppm	Percentiles: P <sub>1</sub> = 431.4 P <sub>10</sub> = 436.2 Q <sub>1</sub> = 441.5 Median = 446.9 Q <sub>3</sub> = 452.7 P <sub>90</sub> = 457.9 P <sub>99</sub> = 471.9		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	441.8	442.8	443.3	443.4	444.5	Z	445.6	446.7	448.0	448.1	447.1	448.2	448.9	447.9	448.0	445.5	447.8	447.4	445.8	444.6	443.0	442.7	443.4	445.9	445.7	448.9
2-Nov	Z	444.8	445.9	446.5	446.9	447.9	449.0	451.4	452.0	449.5	449.1	452.4	453.8	455.3	453.8	448.9	444.2	444.5	446.4	446.7	450.4	452.8	456.2	456.7	449.8	456.7
3-Nov	458.8	Z	459.1	459.7	463.8	465.3	460.2	459.1	455.1	454.5	454.0	453.1	454.7	452.7	450.4	450.0	451.2	454.5	455.0	457.8	464.7	464.2	462.3	462.3	457.5	465.3
4-Nov	461.2	457.8	Z	464.5	461.1	461.3	464.2	460.7	456.7	455.4	453.2	453.3	452.7	454.5	462.3	462.0	464.3	468.6	469.3	472.0	473.9	475.9	478.6	471.6	463.3	478.6
5-Nov	472.0	477.0	469.8	Z	465.5	462.0	460.0	462.9	459.9	459.1	457.0	455.6	454.5	452.6	453.1	453.7	451.6	452.3	451.2	448.9	446.7	448.9	446.1	446.1	456.8	477.0
6-Nov	444.2	446.1	447.6	447.6	Z	449.0	452.6	452.3	453.5	447.1	442.9	443.3	442.7	442.0	441.7	442.0	443.8	446.7	448.8	453.2	457.0	458.7	462.8	464.4	449.1	464.4
7-Nov	467.8	460.4	461.6	454.0	445.3	Z	439.3	438.7	439.8	437.7	436.9	436.2	437.2	436.9	436.9	437.5	440.9	444.3	448.8	456.1	454.8	454.3	454.4	454.6	446.7	467.8
8-Nov	Z	452.4	453.2	448.4	448.1	454.2	458.8	457.8	462.6	460.7	455.6	450.8	445.0	443.3	443.2	442.9	441.7	446.5	447.6	449.2	449.8	447.0	446.1	446.2	450.0	462.6
9-Nov	444.8	Z	444.1	444.2	444.0	442.6	443.2	443.3	449.7	448.1	441.6	440.6	440.2	440.6	437.8	437.9	440.1	443.5	445.8	452.5	459.4	455.6	457.4	454.0	445.7	459.4
10-Nov	451.8	448.7	Z	449.4	449.7	449.2	450.7	449.6	448.8	447.3	445.6	444.7	443.4	443.9	445.2	447.8	450.3	454.0	456.4	457.6	458.7	464.0	461.0	465.0	451.4	465.0
11-Nov	463.4	465.0	466.7	Z	464.3	471.9	472.5	466.8	460.3	457.4	449.2	444.1	443.0	443.2	442.8	442.6	443.3	444.6	446.1	448.3	452.4	456.2	457.0	455.1	454.6	472.5
12-Nov	456.1	457.2	457.7	457.7	Z	463.8	460.4	453.2	452.6	448.6	449.5	C	C	C	C	444.6	445.1	445.0	444.2	444.0	442.7	442.4	442.6	442.5	450.0	463.8
13-Nov	443.8	445.0	446.1	446.2	447.4	Z	446.3	446.2	448.5	445.4	446.2	446.3	445.9	443.3	443.4	441.8	443.2	441.6	439.5	440.8	440.7	440.9	441.7	440.8	444.0	448.5
14-Nov	Z	441.4	441.3	440.7	440.5	440.1	440.2	442.0	442.7	444.8	444.1	441.6	441.1	441.4	442.1	440.9	442.5	440.9	442.8	443.2	441.3	441.4	443.1	444.1	441.9	444.8
15-Nov	444.5	Z	447.0	448.0	447.8	450.1	451.8	456.4	463.3	458.9	457.9	453.2	450.5	448.9	451.4	450.8	453.6	454.0	455.1	455.2	455.5	457.8	456.3	454.2	453.1	463.3
16-Nov	451.2	451.4	Z	457.9	461.9	465.8	469.8	462.0	453.1	454.4	454.0	452.2	448.1	448.6	447.1	447.9	449.6	448.3	445.8	447.0	447.9	448.1	449.1	449.9	452.7	469.8
17-Nov	449.4	453.8	454.9	Z	454.8	456.5	455.0	455.1	453.4	453.6	453.8	452.4	452.1	452.4	453.0	454.2	456.3	456.9	456.5	451.5	450.5	449.1	447.8	446.9	453.0	456.9
18-Nov	446.7	447.7	447.6	447.2	Z	446.6	447.7	447.8	453.7	447.0	445.0	444.3	443.1	443.4	444.2	446.3	448.6	451.5	451.3	451.5	450.6	451.4	452.5	454.3	448.3	454.3
19-Nov	451.9	448.9	446.2	443.5	439.5	Z	438.1	438.2	438.5	436.9	434.6	434.8	435.4	435.1	436.7	435.7	434.7	433.2	432.6	432.9	432.6	432.3	431.6	431.9	437.2	451.9
20-Nov	Z	431.3	431.5	431.4	432.6	431.4	431.4	430.8	431.2	431.2	431.0	431.2	433.0	M	432.5	434.0	434.2	432.3	431.5	431.6	431.8	432.1	433.3	434.8	432.1	434.8
21-Nov	434.6	Z	435.4	434.7	434.2	433.1	433.1	433.7	434.2	434.4	434.9	435.6	436.1	436.7	436.1	437.4	436.3	436.9	437.2	437.0	438.0	437.5	435.8	436.8	435.6	438.0
22-Nov	439.2	439.1	Z	439.4	439.2	438.2	443.3	449.3	448.3	448.5	440.7	439.3	438.7	441.6	441.4	437.1	435.9	435.6	435.9	435.7	437.0	437.5	436.8	436.3	439.7	449.3
23-Nov	437.8	437.3	439.2	Z	437.6	439.3	438.0	438.2	438.8	439.2	440.8	441.7	442.1	440.9	440.2	440.1	441.5	441.8	441.8	440.8	441.5	442.2	442.9	441.6	440.2	442.9
24-Nov	442.8	442.8	441.9	442.6	Z	440.1	440.6	440.9	441.3	443.9	443.8	443.3	442.3	442.2	442.0	442.9	443.2	442.9	442.7	443.6	451.0	450.0	455.4	453.9	444.2	455.4
25-Nov	452.1	451.2	451.8	451.3	448.7	Z	448.5	447.6	446.7	447.5	448.0	446.4	444.2	447.7	448.0	447.8	455.4	453.8	451.8	453.6	455.0	455.6	451.3	453.0	450.3	455.6
26-Nov	Z	444.0	443.7	444.0	445.0	447.7	451.0	450.9	452.2	447.4	450.9	449.1	450.1	449.9	454.0	453.3	451.6	451.6	451.3	449.2	445.8	442.7	442.4	442.4	448.3	454.0
27-Nov	441.5	Z	439.4	437.8	437.3	437.0	437.0	436.7	436.3	436.0	436.0	436.6	437.1	435.7	435.7	436.1	438.0	436.0	435.3	435.1	435.0	435.1	435.4	436.6	441.5	441.5
28-Nov	435.6	435.9	Z	435.6	437.7	437.0	435.6	438.6	439.9	444.3	443.5	444.0	443.5	440.3	438.5	437.3	440.9	441.0	439.8	440.1	445.1	449.6	448.6	452.7	441.1	452.7
29-Nov	454.0	454.1	449.2	Z	447.7	452.2	455.1	454.8	448.8	452.9	459.5	451.5	448.9	446.0	443.4	447.4	446.5	448.2	451.4	447.3	442.9	447.4	446.2	447.8	449.7	459.5
30-Nov	446.6	449.6	451.5	448.7	Z	445.8	447.3	447.7	448.2	447.4	453.9	455.9	454.7	455.1	448.7	445.9	447.7	451.1	450.0	445.3	443.7	445.1	444.5	445.6	448.7	455.9

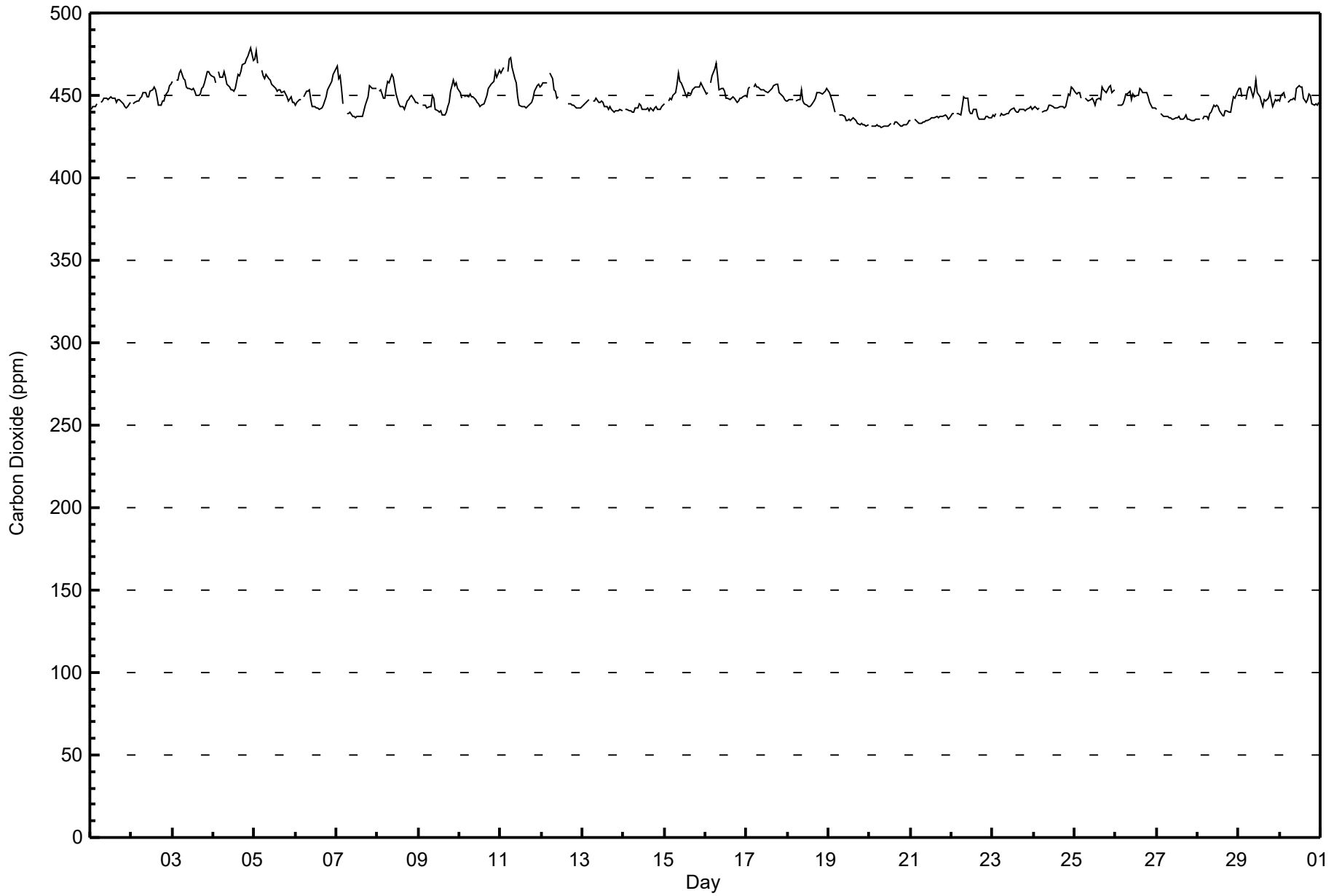
449.3	449.0	448.6	446.6	447.4	449.1	448.9	448.6	448.6	447.6	446.7	445.6	444.9	445.1	444.6	444.4	445.4	446.4	446.6	447.1	448.0	448.6	448.7	448.9	Diurnal Average	
472.0	477.0	469.8	464.5	465.5	471.9	472.5	466.8	463.3	460.7	459.5	455.9	454.7	455.3	462.3	462.0	464.3	468.6	469.3	472.0	473.9	475.9	478.6	471.6	Diurnal Maximum	

Z - zerospan                    C - Calibration                    M - Maintenance



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Carbon Dioxide (CO<sub>2</sub>) - ppm**  
**Fort McKay - Bertha Ganter - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Carbon Dioxide (CO<sub>2</sub>) - ppm**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
400 - 420	0	0.00	0.00
420 - 440	145	21.17	21.17
440 - 460	490	71.53	92.70
460 - 480	50	7.30	100.00
480 - 500	0	0.00	100.00
> 500	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Carbon Dioxide (CO<sub>2</sub>) - ppm**  
**Fort McKay - Bertha Ganter - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
400 - 420	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420 - 440	29	31	1	1	0	0	1	1	0	1	3	0	4	15	8	12	107
440 - 460	57	25	13	3	3	2	3	24	117	39	21	19	15	15	8	10	374
460 - 480	4	0	0	0	0	0	0	1	4	9	10	4	5	2	6	3	48
480 - 500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	90	56	14	4	3	2	4	26	121	49	34	23	24	32	22	25	529

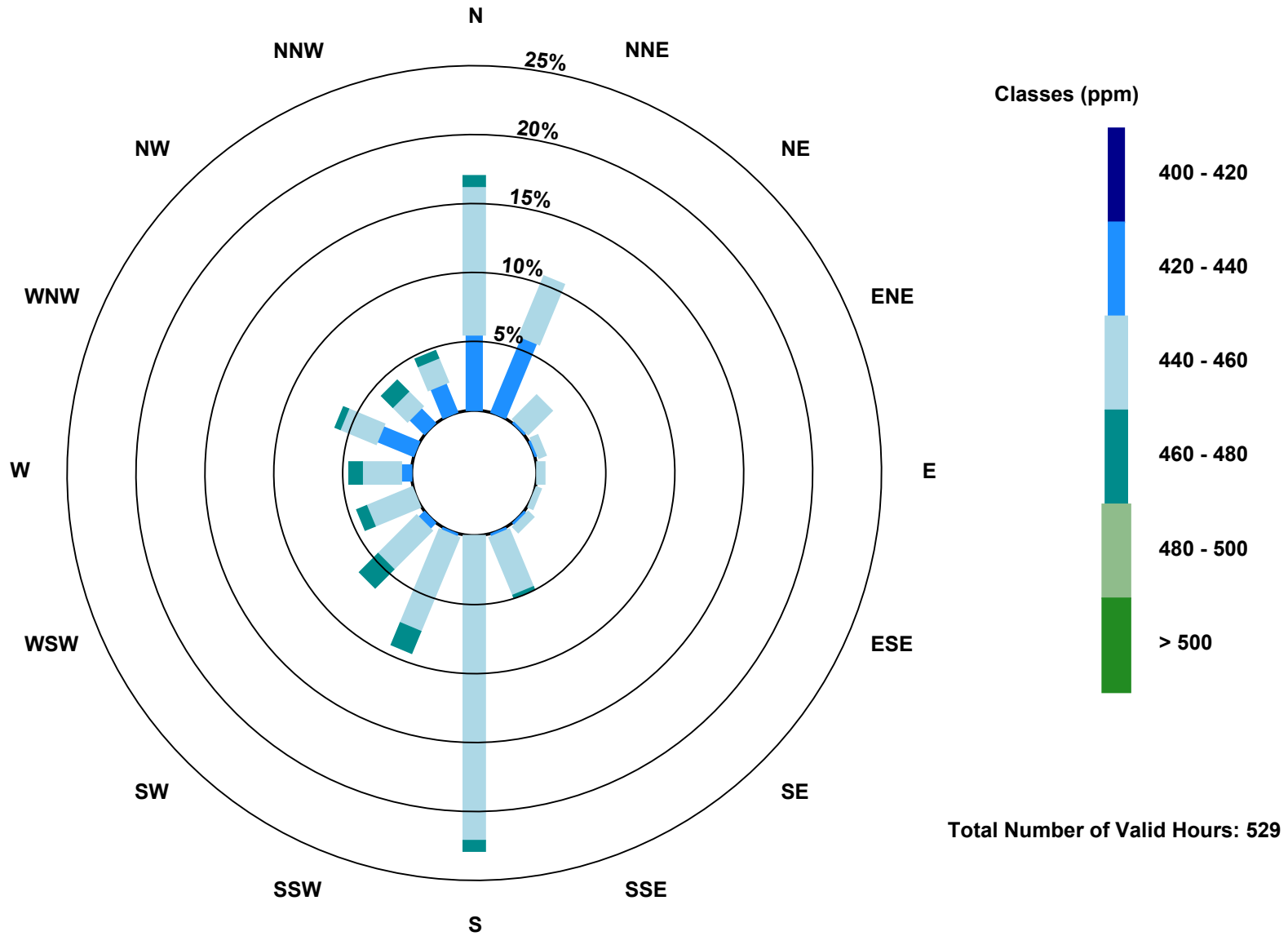
Total Number of Valid Hours: 529

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Carbon Dioxide (CO<sub>2</sub>) - ppm  
Fort McKay - Bertha Ganter







Number of Exceedences (AAAQO): 1-hr: 0		Hours in Service: 720	
Maximum Value: 0.0 ppb on Nov 1 01:00		Maximum Daily Average: 0.0 ppb on Nov 1	
Minimum Value: 0.0 ppb on Nov 1 01:00		Hours of Data: 648	
Maximum Diurnal Average: 0.0 ppb at hour 1		Hours of Missing Data: 72	
Monthly Average: 0.00 ppb		Hours of Calibration: 42	
Minimum Daily Average: 0.0 ppb on Nov 1		Percent Operational Time: 95.8	
Minimum Diurnal Average: 0.0 ppb at hour 1		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.0 P <sub>99</sub> = 0.0	

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2-Nov	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-Nov	0.0	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4-Nov	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-Nov	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6-Nov	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7-Nov	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8-Nov	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9-Nov	0.0	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-Nov	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-Nov	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12-Nov	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-Nov	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14-Nov	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15-Nov	0.0	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16-Nov	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17-Nov	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18-Nov	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19-Nov	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0
20-Nov	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0
21-Nov	0.0	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22-Nov	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23-Nov	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24-Nov	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25-Nov	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26-Nov	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27-Nov	0.0	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28-Nov	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29-Nov	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30-Nov	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
																								Diurnal Average			
																								Diurnal Maximum			

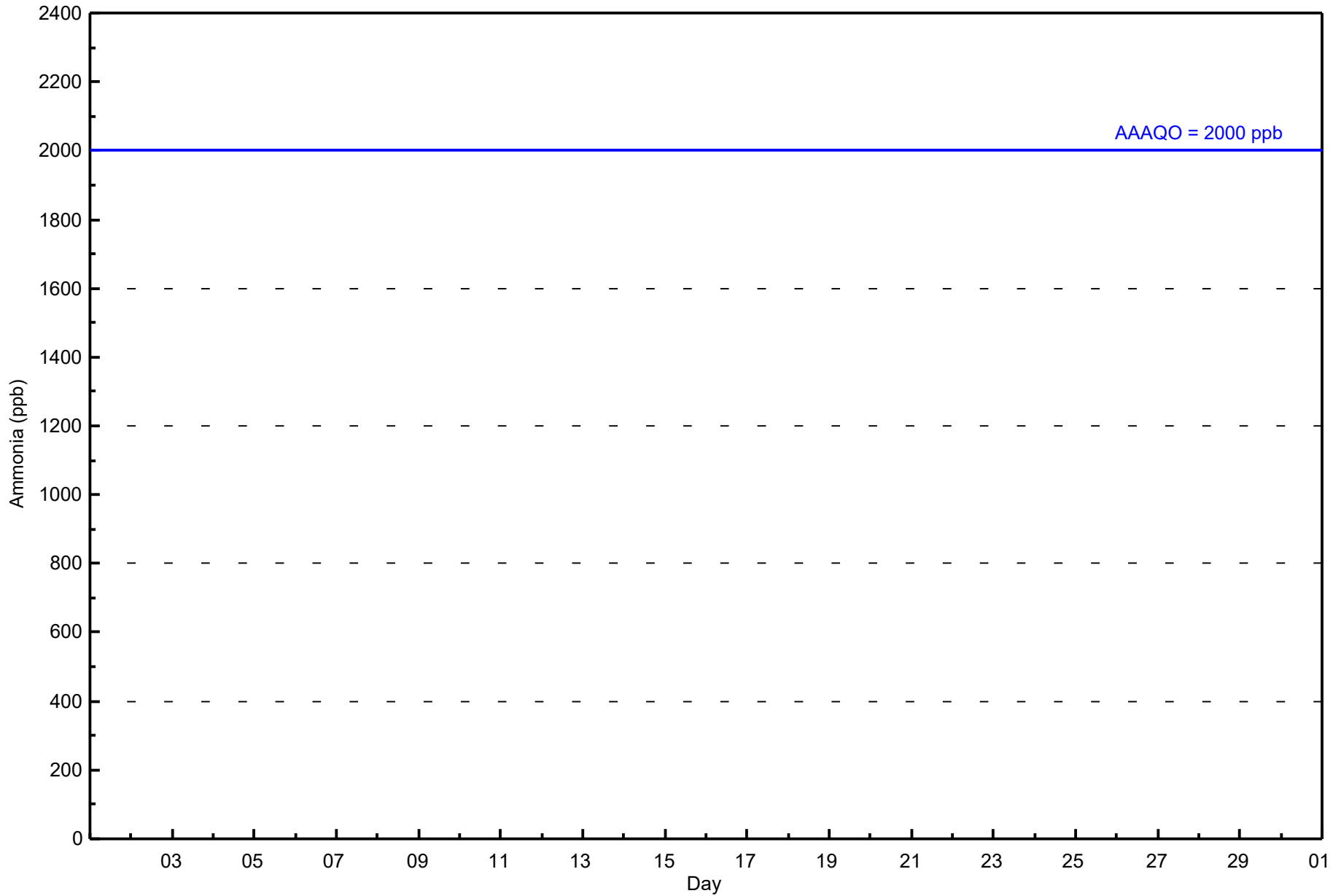
  

Z - zerospan      C - Calibration      RE - Recovery  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 2000 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ammonia (NH<sub>3</sub>) - ppb**  
**Fort McKay - Bertha Ganter - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ammonia (NH<sub>3</sub>) - ppb**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	648	100.00	100.00
6 - 10	0	0.00	100.00
11 - 15	0	0.00	100.00
16 - 20	0	0.00	100.00
21 - 25	0	0.00	100.00
> 26	0	0.00	100.00

Total Number of Valid Hours: 648

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Ammonia (NH<sub>3</sub>) - ppb**  
**Fort McKay - Bertha Ganter - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	79	52	15	4	3	2	5	26	118	41	34	17	30	32	20	22	500
6 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	79	52	15	4	3	2	5	26	118	41	34	17	30	32	20	22	500

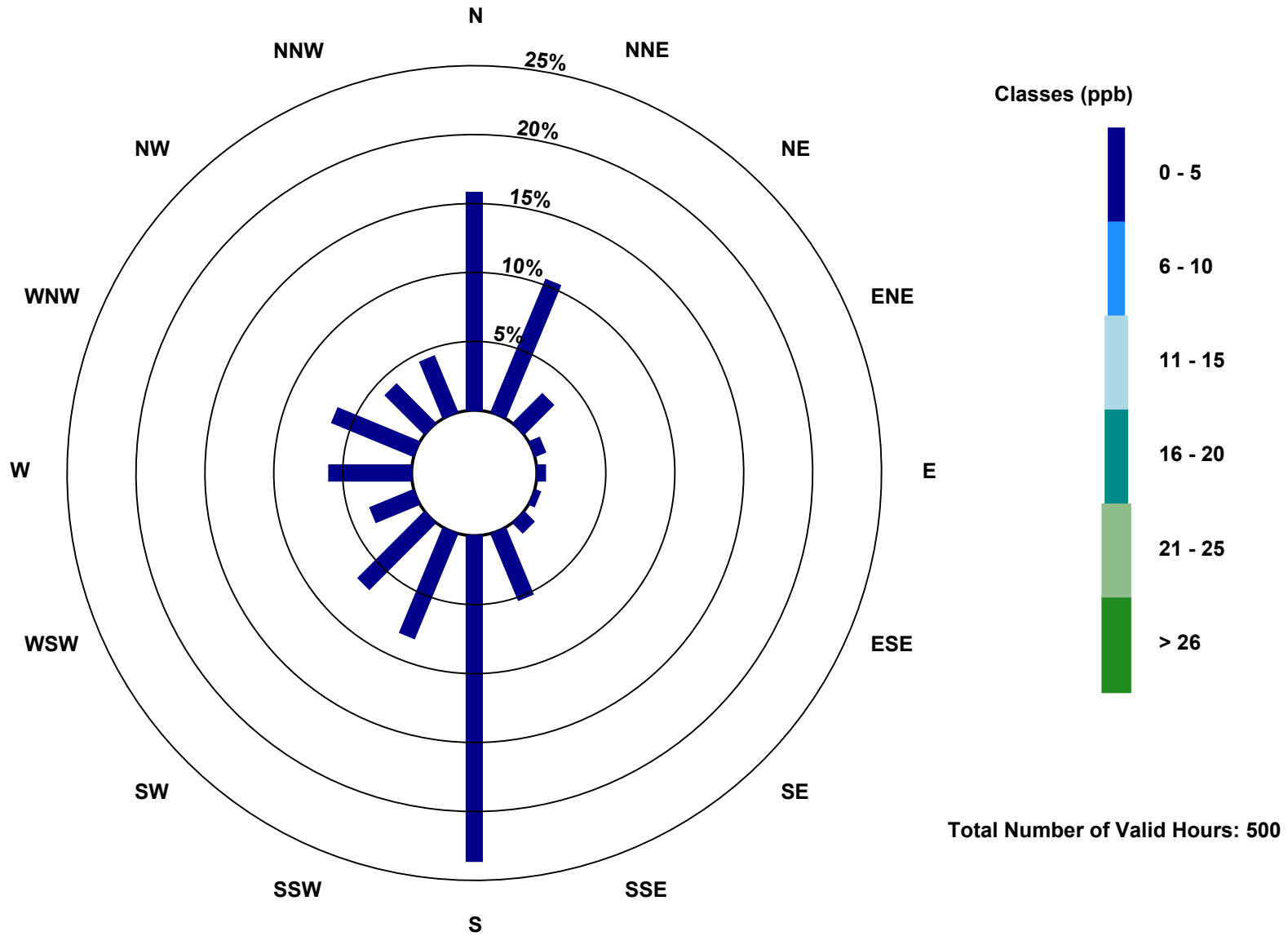
Total Number of Valid Hours: 500

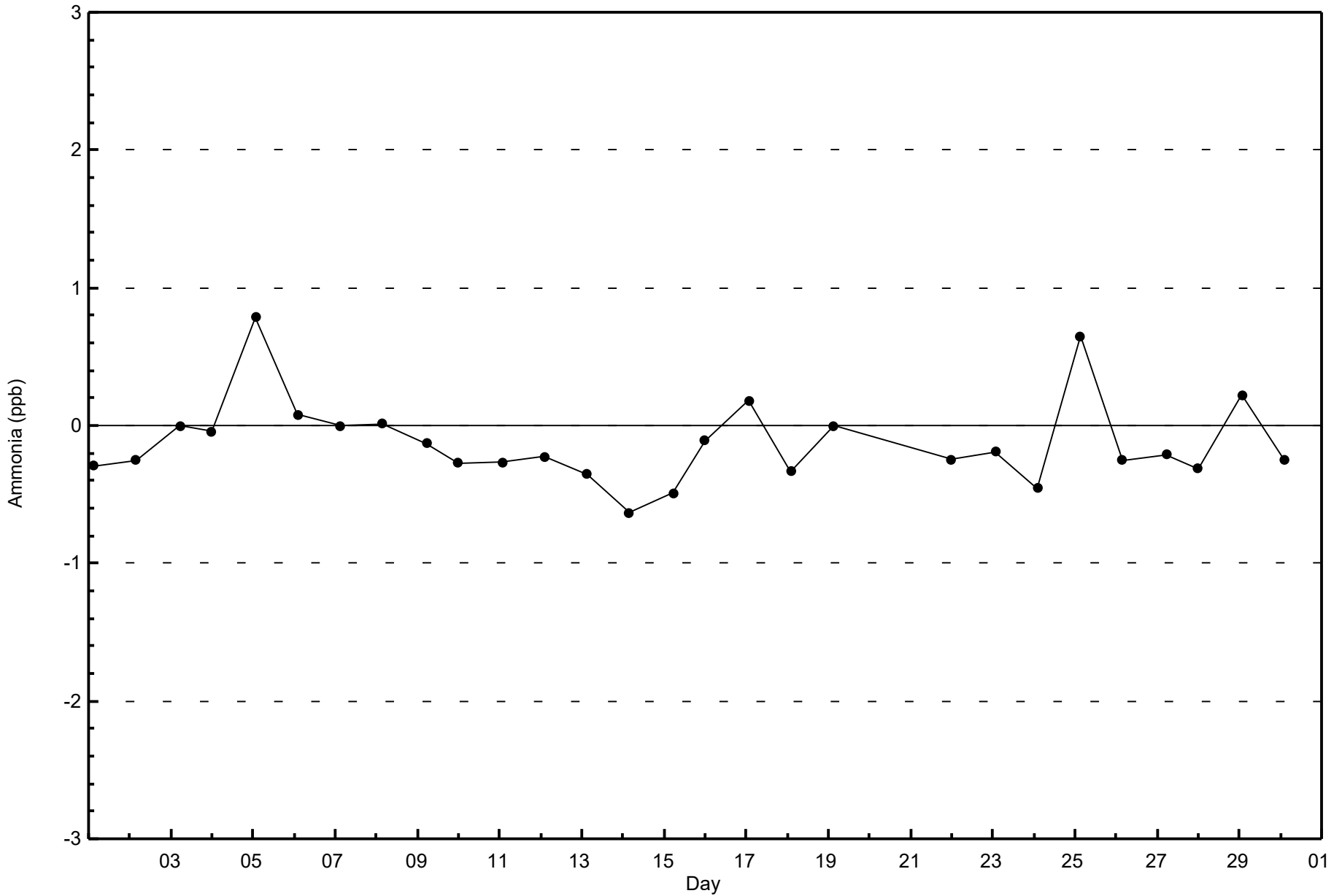
Total Number of Hours: 720

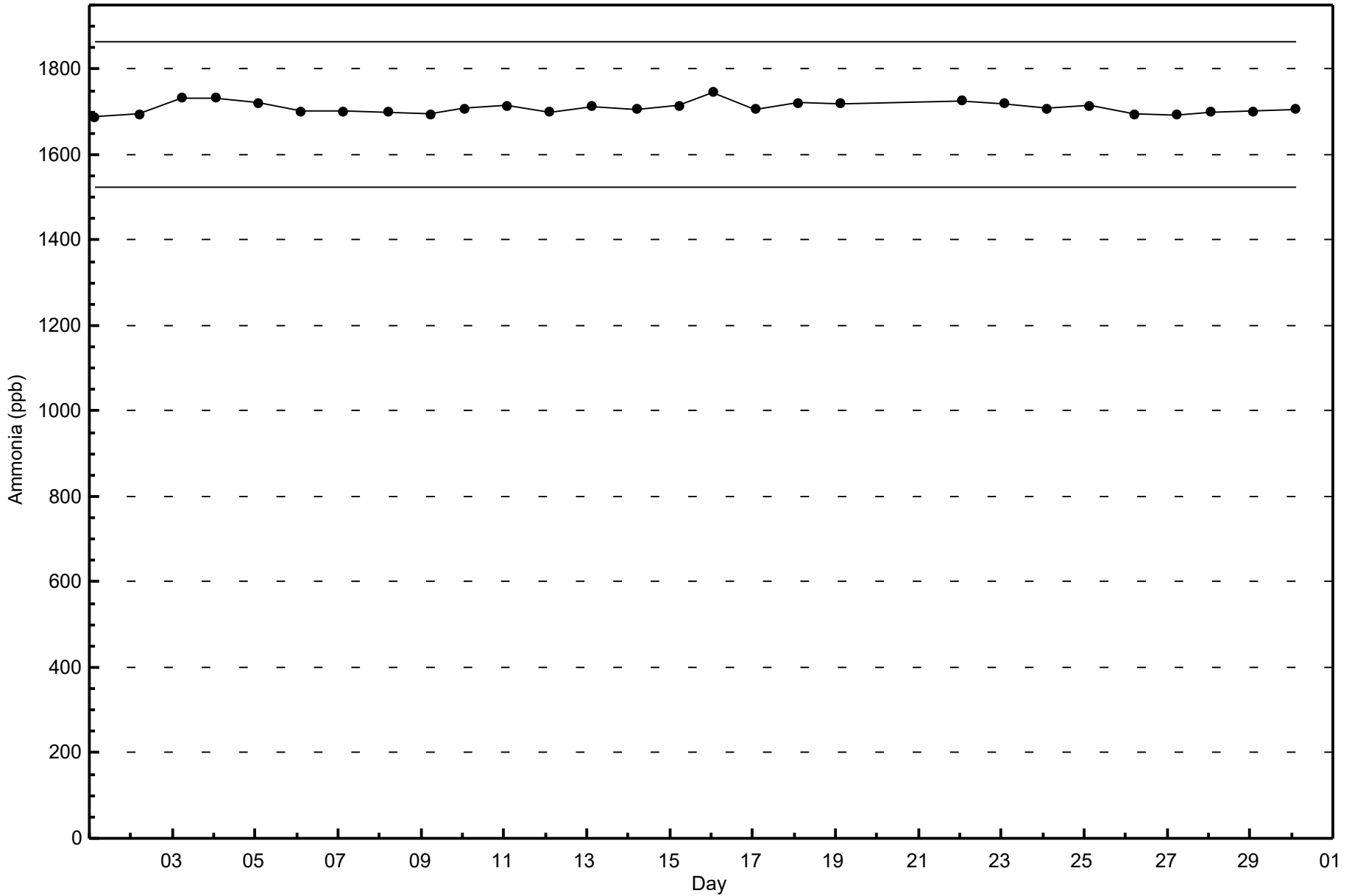


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Ammonia (NH<sub>3</sub>) - ppb  
Fort McKay - Bertha Ganter









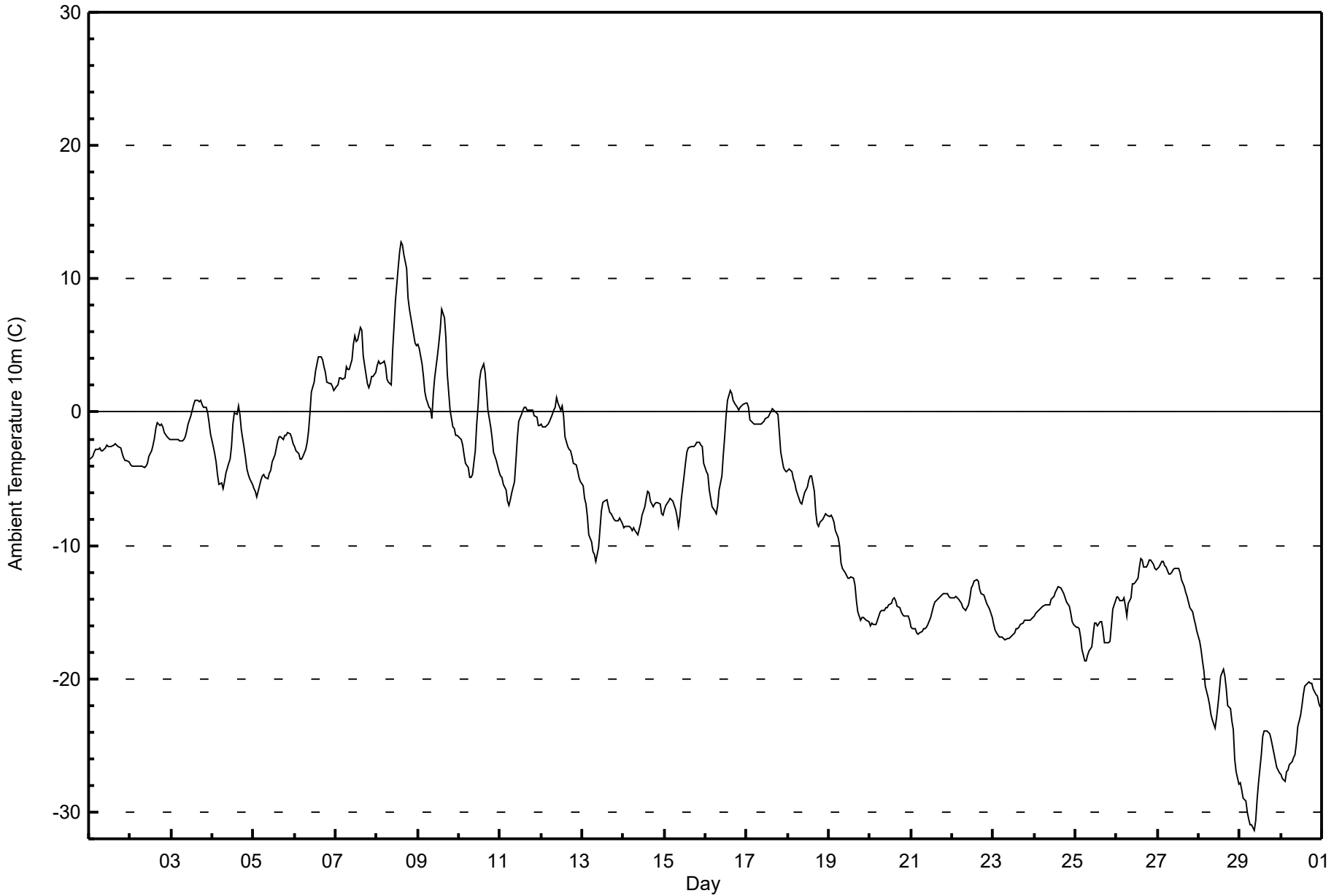
Maximum Value: 12.8 C on Nov 8 15:00																				Maximum Daily Average: 6.6 C on Nov 8					Hours in Service:	720
Minimum Value: -31.4 C on Nov 29 09:00																				Minimum Daily Average: -27.4 C on Nov 29					Hours of Data:	720
Maximum Diurnal Average: -5.9 C at hour 15																				Minimum Diurnal Average: -9.4 C at hour 8					Hours of Missing Data:	0
Monthly Average: -7.94 C																				Percentiles: P <sub>1</sub> = -29.0 P <sub>10</sub> = -18.3 Q <sub>1</sub> = -14.5 Median = -6.5 Q <sub>3</sub> = -1.5 P <sub>90</sub> = 2.1 P <sub>99</sub> = 8.2					Hours of Calibration:	0
																									Percent Operational Time:	100.0
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	-3.5	-3.5	-3.3	-2.9	-2.8	-2.8	-2.7	-2.9	-2.9	-2.7	-2.5	-2.6	-2.6	-2.5	-2.5	-2.4	-2.5	-2.5	-2.7	-3.1	-3.5	-3.6	-3.6	-3.8	-2.9	-2.4
2-Nov	-3.9	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0	-4.1	-4.2	-4.1	-3.8	-3.3	-2.9	-2.4	-1.9	-1.2	-0.8	-1.0	-0.9	-1.1	-1.5	-1.9	-1.9	-2.1	-2.8	-0.8
3-Nov	-2.0	-2.1	-2.1	-2.1	-2.1	-2.2	-2.2	-2.1	-1.8	-1.4	-0.9	-0.2	0.1	0.6	0.9	0.9	0.8	0.8	0.5	0.4	0.4	0.0	-0.8	-1.7	-0.8	0.9
4-Nov	-2.6	-3.1	-3.8	-4.7	-5.5	-5.3	-5.7	-5.2	-4.5	-3.9	-3.5	-2.5	-0.9	-0.1	-0.2	0.5	-0.1	-1.3	-2.7	-3.4	-4.3	-4.7	-5.0	-5.5	-3.3	0.5
5-Nov	-5.8	-6.0	-6.3	-5.5	-5.1	-4.8	-4.7	-4.9	-5.0	-4.6	-4.3	-3.8	-3.2	-2.6	-2.2	-1.8	-1.8	-2.0	-1.7	-1.7	-1.5	-1.7	-1.9	-2.4	-3.6	-1.5
6-Nov	-2.6	-2.8	-3.1	-3.5	-3.5	-3.3	-2.8	-2.3	-1.4	-0.1	1.6	2.2	3.1	3.6	4.2	4.2	3.9	3.4	3.0	2.2	2.2	2.1	1.9	1.7	0.6	4.2
7-Nov	1.9	2.1	2.5	2.5	2.5	2.6	3.4	3.2	3.2	3.9	5.1	5.8	5.4	5.4	6.3	6.2	4.3	3.5	2.1	1.8	2.1	2.6	2.7	3.0	3.5	6.3
8-Nov	3.5	3.8	3.7	3.7	3.8	3.4	2.5	2.3	2.1	4.5	6.5	8.3	10.9	12.0	12.8	12.5	11.8	10.8	8.6	7.7	7.1	5.9	5.2	5.0	6.6	12.8
9-Nov	5.1	4.7	3.6	2.7	1.6	1.0	0.4	0.3	-0.5	1.3	2.6	4.3	5.2	6.2	7.7	7.1	5.6	2.9	1.6	0.2	-1.1	-1.2	-1.7	-1.7	2.4	7.7
10-Nov	-1.9	-2.0	-2.5	-3.2	-3.8	-4.2	-4.8	-4.9	-4.7	-2.9	-0.9	0.5	2.4	3.1	3.6	3.0	1.6	0.1	-1.1	-2.0	-3.0	-3.4	-3.6	-4.5	-1.6	3.6
11-Nov	-4.7	-4.9	-5.4	-5.9	-6.7	-7.0	-6.6	-6.0	-5.2	-3.7	-2.0	-0.7	-0.1	0.1	0.4	0.4	0.2	0.2	0.2	0.2	-0.2	-0.4	-1.0	-1.1	-2.5	0.4
12-Nov	-0.9	-1.1	-1.1	-1.0	-0.8	-0.6	-0.2	0.1	0.4	1.1	0.6	0.2	0.5	-0.3	-1.8	-2.6	-2.8	-2.9	-3.3	-3.8	-4.0	-4.3	-4.9	-5.2	-1.6	1.1
13-Nov	-5.5	-6.5	-6.9	-7.8	-9.2	-9.7	-10.4	-10.7	-11.2	-10.2	-8.7	-7.4	-6.7	-6.7	-6.5	-7.1	-7.5	-7.6	-8.1	-8.1	-8.2	-8.1	-8.0	-8.3	-8.1	-5.5
14-Nov	-8.6	-8.6	-8.6	-8.6	-8.7	-8.9	-8.6	-8.9	-9.2	-8.8	-8.4	-7.7	-7.1	-6.5	-5.9	-6.0	-6.6	-7.1	-6.9	-6.8	-6.8	-6.9	-7.6	-7.7	-7.7	-5.9
15-Nov	-7.4	-7.0	-6.7	-6.5	-6.6	-6.6	-7.3	-7.9	-8.6	-7.8	-6.6	-4.8	-3.8	-3.0	-2.7	-2.6	-2.6	-2.6	-2.5	-2.3	-2.3	-2.4	-2.6	-3.8	-4.9	-2.3
16-Nov	-4.4	-4.7	-5.8	-6.4	-7.1	-7.4	-7.6	-7.0	-5.9	-4.8	-3.2	-1.8	-0.2	0.9	1.6	1.4	0.9	0.7	0.4	0.2	0.4	0.5	0.5	0.7	-2.4	1.6
17-Nov	0.7	0.4	-0.5	-0.8	-0.9	-0.9	-0.9	-0.9	-0.9	-0.8	-0.6	-0.5	-0.3	-0.2	0.0	0.2	0.2	-0.1	-0.2	-1.5	-3.0	-4.1	-4.4	-4.5	-1.0	0.7
18-Nov	-4.4	-4.3	-4.4	-5.0	-5.3	-5.9	-6.4	-6.8	-6.9	-6.5	-6.0	-5.6	-5.1	-4.7	-4.8	-5.9	-7.5	-8.3	-8.5	-8.2	-8.0	-7.8	-7.6	-7.7	-6.3	-4.3
19-Nov	-7.8	-7.7	-7.9	-8.3	-8.8	-9.4	-10.0	-11.3	-11.7	-12.0	-12.3	-12.4	-12.5	-12.3	-12.5	-13.0	-14.1	-14.9	-15.6	-15.4	-15.4	-15.5	-15.6	-15.8	-12.2	-7.7
20-Nov	-16.0	-15.8	-15.9	-15.9	-15.6	-15.3	-15.0	-14.9	-14.8	-14.7	-14.7	-14.4	-14.3	-14.1	-13.9	-14.1	-14.6	-14.7	-15.0	-15.2	-15.3	-15.3	-15.3	-15.6	-15.0	-13.9
21-Nov	-16.1	-16.3	-16.3	-16.6	-16.7	-16.6	-16.4	-16.2	-16.3	-16.1	-16.0	-15.4	-14.9	-14.5	-14.2	-14.1	-13.9	-13.8	-13.7	-13.6	-13.6	-13.6	-13.8	-13.9	-15.1	-13.6
22-Nov	-13.9	-13.9	-13.8	-13.9	-14.1	-14.3	-14.6	-14.8	-14.8	-14.5	-13.9	-13.2	-13.0	-12.7	-12.6	-12.7	-13.3	-13.6	-13.7	-14.1	-14.3	-14.6	-14.8	-15.3	-13.9	-12.6
23-Nov	-15.9	-16.3	-16.6	-16.9	-16.9	-16.9	-17.0	-17.1	-17.0	-17.0	-16.8	-16.7	-16.5	-16.2	-16.2	-16.1	-16.0	-15.8	-15.6	-15.6	-15.6	-15.6	-15.5	-15.4	-16.3	-15.4
24-Nov	-15.3	-15.1	-14.8	-14.8	-14.7	-14.5	-14.5	-14.5	-14.4	-14.1	-13.8	-13.5	-13.3	-13.1	-13.2	-13.4	-13.6	-13.9	-14.3	-14.5	-15.1	-15.7	-16.0	-16.0	-14.4	-13.1
25-Nov	-16.1	-16.2	-16.3	-16.9	-17.8	-18.6	-18.2	-17.9	-17.6	-16.7	-15.8	-15.9	-16.0	-15.7	-15.7	-16.4	-17.3	-17.2	-17.3	-17.2	-17.2	-16.0	-14.7	-14.2	-16.7	-14.2
26-Nov	-13.8	-13.9	-14.1	-14.1	-13.9	-14.6	-15.3	-14.3	-14.0	-12.8	-12.8	-12.7	-12.4	-11.6	-11.0	-11.0	-11.6	-11.6	-11.4	-11.1	-11.1	-11.4	-11.7	-11.8	-12.7	-11.0
27-Nov	-11.8	-11.6	-11.2	-11.2	-11.5	-11.6	-12.2	-12.1	-12.0	-11.8	-11.7	-11.7	-11.8	-12.0	-12.6	-13.1	-13.5	-13.8	-14.2	-14.6	-15.0	-15.5	-15.9	-16.5	-12.9	-11.2
28-Nov	-17.2	-17.9	-18.7	-19.4	-20.6	-21.4	-21.9	-22.7	-23.1	-23.7	-22.9	-22.0	-20.9	-19.8	-19.3	-19.8	-20.8	-22.0	-22.3	-23.1	-23.8	-26.1	-26.9	-27.9	-21.8	-17.2
29-Nov	-27.8	-28.3	-28.9	-29.2	-30.0	-30.5	-31.0	-30.9	-31.4	-30.7	-29.1	-27.7	-25.7	-24.3	-24.0	-23.9	-23.9	-24.1	-24.5	-25.1	-25.6	-26.7	-26.9	-27.0	-27.4	-23.9
30-Nov	-27.2	-27.4	-27.6	-27.0	-26.9	-26.4	-26.2	-25.9	-25.6	-24.8	-23.6	-22.8	-22.0	-21.2	-20.6	-20.3	-20.3	-20.3	-20.3	-20.7	-21.2	-21.3	-21.8	-22.1	-23.5	-20.3
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 10m (AT10) - C**  
**Fort McKay - Bertha Ganter - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ambient Temperature 10m (AT10) - C**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	65	9.03	9.03
-20 - 0	528	73.33	82.36
0 - 10	121	16.81	99.17
10 - 20	6	0.83	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

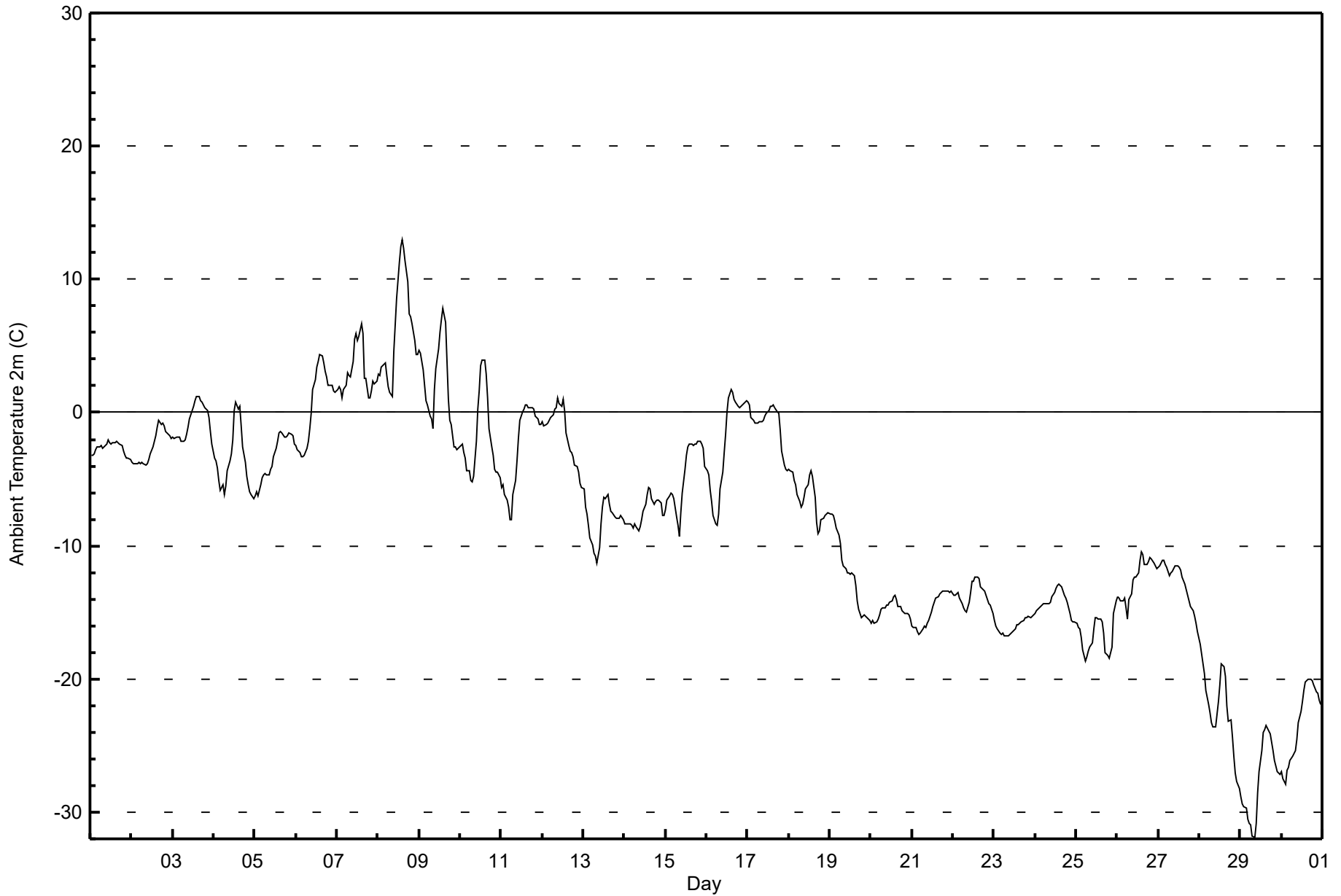
Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Ambient Temperature 2m (AT2) - C**  
**Fort McKay - Bertha Ganter - November 2024**

Maximum Value: 13.0 C on Nov 8 15:00      Maximum Daily Average: 6.2 C on Nov 8																				Hours in Service: 720 Hours of Data: 720						
Minimum Value: -31.9 C on Nov 29 09:00      Minimum Daily Average: -27.6 C on Nov 29 Maximum Diurnal Average: -5.6 C at hour 15      Minimum Diurnal Average: -9.5 C at hour 7 Monthly Average: -7.93 C      Percentiles: P <sub>1</sub> = -29.6 P <sub>10</sub> = -18.4 Q <sub>1</sub> = -14.3 Median = -6.3 Q <sub>3</sub> = -1.6 P <sub>90</sub> = 1.6 P <sub>99</sub> = 7.7																				Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	-3.2	-3.2	-3.1	-2.8	-2.6	-2.5	-2.5	-2.7	-2.6	-2.3	-2.1	-2.3	-2.3	-2.3	-2.2	-2.2	-2.3	-2.4	-2.5	-2.9	-3.2	-3.4	-3.4	-3.5	-2.7	-2.1
2-Nov	-3.7	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8	-4.0	-3.8	-3.6	-3.1	-2.6	-2.2	-1.7	-1.1	-0.6	-0.9	-0.8	-1.0	-1.4	-1.7	-1.7	-1.9	-2.6	-0.6
3-Nov	-1.9	-1.9	-1.9	-1.9	-1.8	-2.1	-2.1	-2.0	-1.7	-1.1	-0.4	0.2	0.5	0.9	1.2	1.2	0.9	0.8	0.6	0.4	0.2	-0.4	-1.4	-2.4	-0.7	1.2
4-Nov	-3.4	-3.6	-4.2	-5.1	-5.8	-5.4	-6.2	-5.5	-4.4	-3.6	-3.1	-2.1	0.2	0.8	0.3	0.5	-1.0	-2.6	-3.7	-4.7	-5.4	-5.9	-6.2	-6.5	-3.6	0.8
5-Nov	-6.2	-5.9	-6.2	-5.4	-4.9	-4.7	-4.5	-4.6	-4.7	-4.2	-4.0	-3.3	-2.7	-2.2	-1.6	-1.4	-1.6	-1.8	-1.8	-1.7	-1.5	-1.6	-1.8	-2.3	-3.4	-1.4
6-Nov	-2.5	-2.8	-3.0	-3.3	-3.4	-3.2	-2.7	-2.1	-1.3	0.0	1.7	2.5	3.4	3.8	4.4	4.2	3.7	3.1	2.7	2.1	2.1	2.0	1.6	1.5	0.6	4.4
7-Nov	1.7	2.0	1.7	1.1	1.7	2.0	3.0	2.7	2.7	3.8	5.5	6.0	5.4	5.7	6.6	5.9	2.6	2.6	1.1	1.1	1.6	2.3	2.2	2.3	3.1	6.6
8-Nov	2.8	2.8	3.4	3.6	3.7	2.8	2.0	1.6	1.3	4.6	6.6	8.5	11.3	12.5	13.0	12.4	11.4	9.8	7.4	7.2	6.7	5.4	4.3	4.4	6.2	13.0
9-Nov	4.7	4.5	3.2	2.1	0.9	0.5	-0.2	-0.4	-1.2	1.7	3.3	4.8	6.1	7.0	7.8	6.8	3.8	1.0	-0.6	-0.9	-2.5	-2.5	-2.8	-2.7	1.8	7.8
10-Nov	-2.5	-2.4	-3.0	-3.4	-4.3	-4.4	-5.1	-5.2	-4.7	-2.1	0.3	1.6	3.5	4.0	4.0	2.8	1.1	-1.2	-2.5	-3.2	-4.2	-4.5	-4.5	-4.9	-1.9	4.0
11-Nov	-5.6	-5.4	-6.2	-6.6	-7.0	-8.0	-8.0	-6.1	-5.1	-3.7	-1.9	-0.5	0.1	0.3	0.5	0.5	0.3	0.3	0.3	0.3	-0.2	-0.4	-0.9	-0.9	-2.7	0.5
12-Nov	-0.7	-0.9	-0.9	-0.8	-0.5	-0.4	-0.1	0.2	0.3	1.1	0.7	0.4	1.0	0.1	-1.5	-2.5	-2.9	-3.0	-3.4	-4.0	-4.0	-4.4	-5.3	-5.6	-1.5	1.1
13-Nov	-5.8	-7.1	-7.6	-8.4	-9.4	-9.9	-10.5	-10.8	-11.3	-10.1	-8.3	-7.1	-6.4	-6.4	-6.1	-6.9	-7.4	-7.5	-7.9	-7.9	-8.0	-7.9	-7.7	-8.1	-8.1	-5.8
14-Nov	-8.4	-8.3	-8.4	-8.4	-8.5	-8.6	-8.4	-8.6	-8.9	-8.5	-8.1	-7.4	-6.8	-6.2	-5.6	-5.7	-6.5	-6.9	-6.7	-6.6	-6.6	-6.8	-7.8	-7.7	-7.5	-5.6
15-Nov	-7.3	-6.6	-6.3	-6.0	-6.2	-6.5	-7.9	-8.5	-9.3	-7.5	-6.1	-4.3	-3.3	-2.6	-2.4	-2.4	-2.4	-2.4	-2.2	-2.2	-2.2	-2.3	-2.7	-4.0	-4.7	-2.2
16-Nov	-4.4	-4.6	-5.8	-6.7	-7.7	-8.3	-8.5	-7.6	-5.7	-4.5	-3.0	-1.6	0.0	1.1	1.8	1.5	1.0	0.8	0.5	0.3	0.5	0.6	0.6	0.8	-2.4	1.8
17-Nov	0.8	0.5	-0.4	-0.6	-0.8	-0.8	-0.7	-0.7	-0.7	-0.6	-0.2	-0.1	0.1	0.5	0.5	0.5	0.3	0.1	0.0	-1.3	-2.9	-3.9	-4.3	-4.4	-0.8	0.8
18-Nov	-4.3	-4.3	-4.5	-5.1	-5.5	-6.2	-6.6	-7.1	-6.9	-6.4	-5.8	-5.4	-4.7	-4.3	-4.8	-6.3	-8.2	-9.1	-8.8	-8.0	-7.9	-7.7	-7.6	-7.6	-6.4	-4.3
19-Nov	-7.6	-7.6	-7.8	-8.1	-8.6	-9.2	-9.8	-11.1	-11.5	-11.8	-12.0	-12.1	-12.1	-12.1	-12.2	-13.0	-14.1	-14.8	-15.4	-15.3	-15.2	-15.3	-15.4	-15.6	-12.0	-7.6
20-Nov	-15.8	-15.6	-15.8	-15.7	-15.5	-15.1	-14.8	-14.7	-14.7	-14.5	-14.5	-14.2	-14.1	-13.9	-13.8	-14.0	-14.6	-14.6	-14.9	-15.0	-15.1	-15.1	-15.2	-15.5	-14.9	-13.8
21-Nov	-16.0	-16.1	-16.1	-16.4	-16.6	-16.5	-16.3	-16.0	-16.1	-15.8	-15.6	-15.0	-14.6	-14.2	-13.9	-13.8	-13.6	-13.5	-13.4	-13.4	-13.4	-13.4	-13.5	-13.4	-14.9	-13.4
22-Nov	-13.7	-13.7	-13.6	-13.5	-13.9	-14.4	-14.6	-14.9	-15.0	-14.3	-13.5	-12.6	-12.6	-12.4	-12.3	-12.4	-13.1	-13.2	-13.4	-13.7	-14.0	-14.3	-14.5	-15.1	-13.7	-12.3
23-Nov	-15.6	-16.1	-16.3	-16.6	-16.6	-16.6	-16.7	-16.8	-16.7	-16.6	-16.6	-16.5	-16.2	-16.0	-15.9	-15.9	-15.7	-15.6	-15.4	-15.3	-15.3	-15.4	-15.3	-15.2	-16.0	-15.2
24-Nov	-15.1	-14.9	-14.6	-14.6	-14.5	-14.3	-14.3	-14.3	-14.2	-13.8	-13.5	-13.2	-13.0	-12.9	-13.1	-13.4	-13.7	-14.0	-14.2	-15.1	-15.6	-15.7	-15.7	-14.3	-12.9	
25-Nov	-15.9	-16.1	-16.3	-16.9	-17.8	-18.6	-18.4	-17.9	-17.6	-17.3	-16.3	-15.4	-15.4	-15.5	-15.5	-15.7	-16.6	-18.0	-18.3	-18.4	-18.0	-17.6	-15.1	-14.1	-16.8	-14.1
26-Nov	-13.9	-14.0	-14.1	-14.1	-14.0	-14.7	-15.5	-14.1	-13.6	-12.6	-12.4	-12.4	-12.0	-11.1	-10.5	-10.6	-11.4	-11.4	-11.1	-10.9	-11.0	-11.2	-11.5	-11.7	-12.5	-10.5
27-Nov	-11.6	-11.5	-11.0	-11.1	-11.4	-11.6	-12.2	-12.1	-11.9	-11.7	-11.6	-11.5	-11.6	-11.8	-12.4	-12.9	-13.3	-13.7	-14.1	-14.5	-14.9	-15.3	-15.8	-16.5	-12.8	-11.0
28-Nov	-17.4	-18.1	-18.8	-19.6	-20.9	-21.9	-22.6	-23.2	-23.6	-23.6	-22.6	-21.7	-20.5	-18.8	-19.1	-19.8	-22.0	-23.2	-23.1	-24.3	-25.8	-27.1	-27.7	-28.2	-22.2	-17.4
29-Nov	-28.8	-29.4	-29.6	-29.7	-30.6	-30.8	-31.0	-31.8	-31.9	-30.9	-28.6	-26.9	-25.4	-24.1	-23.8	-23.5	-23.8	-24.1	-24.7	-25.4	-26.1	-26.9	-27.1	-27.1	-27.6	-23.5
30-Nov	-27.0	-27.5	-27.9	-26.9	-26.6	-26.1	-25.8	-25.6	-25.4	-24.5	-23.3	-22.4	-21.7	-20.9	-20.3	-20.0	-20.0	-20.0	-20.1	-20.5	-20.9	-21.1	-21.6	-21.9	-23.2	-20.0
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	64	8.89	8.89
-20 - 0	523	72.64	81.53
0 - 10	128	17.78	99.31
10 - 20	5	0.69	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Relative Humidity 2m (RH2) - %**

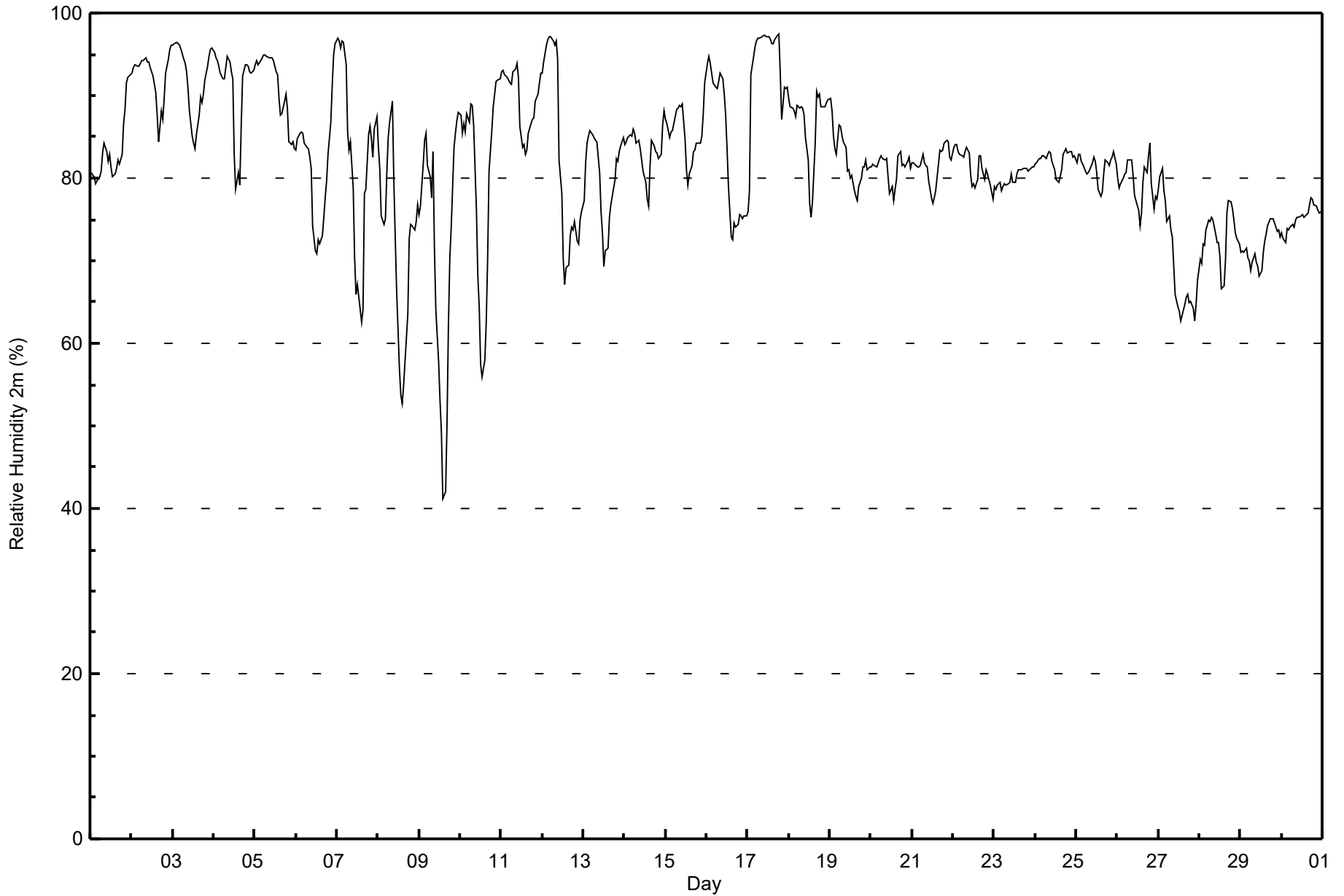
**Fort McKay - Bertha Ganter - November 2024**

Maximum Value: 97.5 % on Nov 17 19:00																						Maximum Daily Average: 93.7 % on Nov 17																						Hours in Service: 720					
Minimum Value: 41.2 % on Nov 9 15:00																						Minimum Daily Average: 69.5 % on Nov 27																						Hours of Data: 720					
Maximum Diurnal Average: 85.5 % at hour 9																						Minimum Diurnal Average: 74.9 % at hour 15																						Hours of Missing Data: 0					
Monthly Average: 82.02 %																						Percentiles: P <sub>1</sub> = 55.1 P <sub>10</sub> = 71.5 Q <sub>1</sub> = 77.3 Median = 82.2 Q <sub>3</sub> = 88.0 P <sub>90</sub> = 93.7 P <sub>99</sub> = 97.1																						Hours of Calibration: 0					
																																												Percent Operational Time: 100.0					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	80.6	80.3	80.2	79.4	79.6	80.2	80.8	83.1	84.2	83.2	82.0	82.9	81.3	80.2	80.5	81.1	82.1	81.6	82.9	86.5	88.3	91.6	92.3	92.6	83.2	92.6																							
2-Nov	92.7	93.4	93.7	93.6	93.6	93.8	94.2	94.2	94.5	94.0	94.0	93.4	92.3	91.4	90.4	87.7	84.4	88.1	87.2	89.7	92.7	94.4	95.6	96.0	92.3	96.0																							
3-Nov	96.2	96.3	96.4	96.2	96.1	95.6	94.5	93.9	92.8	90.9	88.1	85.2	84.2	83.5	85.2	87.7	89.9	89.1	90.2	91.8	93.6	94.7	95.7	95.7	91.8	96.4																							
4-Nov	95.3	94.7	94.2	93.6	92.7	92.1	92.0	93.4	94.8	94.1	92.8	92.1	82.9	78.6	80.7	79.2	86.2	92.4	93.8	93.7	93.6	93.0	92.7	93.0	90.9	95.3																							
5-Nov	93.7	94.2	93.7	94.2	94.7	94.9	94.9	94.7	94.5	94.6	94.5	94.2	93.0	92.6	89.6	87.7	87.8	89.3	90.2	88.5	84.4	84.0	84.3	83.6	91.2	94.9																							
6-Nov	83.4	84.7	85.4	85.5	85.5	84.2	83.7	83.5	82.5	81.3	74.2	71.2	70.8	72.6	72.0	73.0	75.2	77.6	79.6	82.8	86.8	91.2	94.9	96.3	81.6	96.3																							
7-Nov	96.9	96.6	95.7	96.6	96.4	93.7	85.5	83.4	84.3	78.8	70.4	65.9	67.0	65.6	62.6	64.1	78.1	78.6	85.3	86.3	84.7	82.5	85.9	87.4	82.2	96.9																							
8-Nov	83.7	80.9	75.5	74.4	75.2	80.6	84.9	86.8	89.3	79.6	72.9	66.4	57.0	53.7	52.6	54.9	57.9	63.6	72.7	74.4	74.3	73.7	74.8	76.7	72.3	89.3																							
9-Nov	75.6	76.6	81.8	84.5	85.4	81.5	80.2	77.6	83.2	71.5	64.0	57.8	53.0	49.1	41.2	42.0	50.4	62.2	70.3	74.1	83.8	85.4	86.9	87.9	71.1	87.9																							
10-Nov	87.7	85.4	86.6	85.7	87.8	86.9	89.1	88.8	86.5	76.1	68.1	64.3	57.4	56.0	57.9	62.6	70.2	80.8	85.8	88.6	90.3	91.6	91.8	92.1	79.9	92.1																							
11-Nov	93.0	93.0	92.5	92.3	91.9	91.5	91.3	92.8	93.3	93.9	92.2	86.3	83.7	84.0	82.9	83.3	85.4	86.6	87.1	87.2	89.3	90.2	91.5	92.8	89.5	93.9																							
12-Nov	92.7	94.1	96.0	96.8	97.1	97.0	96.7	96.1	96.5	94.5	82.2	78.1	70.2	67.1	69.2	69.5	73.1	74.1	73.7	74.8	72.3	72.0	74.9	76.0	82.7	97.1																							
13-Nov	77.3	81.9	84.3	85.1	85.8	85.3	84.9	84.5	84.5	80.6	75.9	73.4	69.3	71.2	71.6	75.2	76.8	77.8	79.9	82.4	82.0	83.2	84.0	85.0	80.1	85.8																							
14-Nov	84.1	84.4	84.9	85.2	85.1	86.0	85.4	84.3	84.6	83.6	82.2	80.9	79.5	77.5	76.7	81.4	84.5	83.9	83.3	83.0	82.4	82.9	86.5	88.1	83.3	88.1																							
15-Nov	87.2	86.7	84.9	85.6	85.7	86.6	88.3	88.5	88.8	88.6	89.0	84.7	81.1	79.1	80.5	81.6	83.1	83.4	84.2	84.2	85.1	87.9	91.5	85.4	91.5	85.4																							
16-Nov	94.0	94.7	93.8	92.7	91.6	91.0	90.9	91.7	92.7	92.0	90.2	87.7	83.5	79.0	73.0	72.5	74.6	74.1	74.3	75.6	75.4	75.1	75.4	75.4	83.8	94.7																							
17-Nov	76.0	78.5	92.5	94.8	96.0	96.6	96.9	97.0	97.2	97.3	97.3	97.1	97.1	96.8	96.2	96.3	96.8	97.3	97.5	92.7	87.2	91.1	90.9	91.1	93.7	97.5																							
18-Nov	89.6	88.7	88.4	88.1	87.4	88.8	88.5	88.7	88.4	87.6	84.9	82.2	77.0	75.3	77.1	84.4	90.6	89.9	90.1	88.7	88.7	88.7	89.1	89.4	86.7	90.6																							
19-Nov	89.6	88.1	85.2	83.6	82.9	86.4	86.3	85.3	84.5	83.8	80.9	81.1	80.0	80.4	78.4	77.7	77.3	78.9	80.1	81.3	81.3	82.2	81.0	81.4	82.4	89.6																							
20-Nov	81.3	81.6	81.6	81.3	81.9	82.4	82.7	82.4	82.2	82.3	80.1	78.2	79.0	77.3	78.6	79.8	82.8	83.3	81.5	81.8	81.3	82.1	82.5	81.2	81.2	83.3																							
21-Nov	81.9	81.9	81.5	81.3	81.3	81.5	82.8	81.8	81.6	81.3	79.7	77.6	76.9	77.6	78.5	81.7	83.4	83.3	83.5	84.2	84.6	84.5	82.5	82.2	81.5	84.6																							
22-Nov	83.8	84.1	84.1	83.2	82.9	82.7	82.6	83.2	83.8	83.1	80.4	79.0	79.3	78.8	79.8	82.6	82.7	81.2	79.9	81.0	80.5	79.8	79.2	77.5	81.5	84.1																							
23-Nov	79.1	78.7	79.1	79.4	78.6	79.1	79.3	79.2	79.3	79.4	80.6	79.4	79.5	80.6	80.9	81.0	81.0	81.2	81.2	81.2	80.9	81.2	81.4	81.3	80.1	81.4																							
24-Nov	81.6	81.9	82.4	82.3	82.7	82.7	82.4	82.9	83.3	83.1	82.0	80.9	79.9	79.7	79.5	81.0	82.8	83.3	83.6	83.1	83.3	83.2	82.6	82.7	82.2	83.6																							
25-Nov	81.8	82.9	83.0	82.0	81.7	80.9	80.6	80.7	81.1	81.8	82.6	82.1	80.7	78.6	77.8	78.4	80.5	82.1	81.8	81.5	82.2	82.6	83.3	81.8	81.4	83.3																							
26-Nov	80.0	78.8	79.4	80.1	80.6	80.6	82.2	82.3	82.3	80.3	77.9	77.2	76.1	74.3	75.8	79.5	81.4	80.7	82.8	84.3	79.3	76.2	77.8	77.5	79.5	84.3																							
27-Nov	78.7	80.1	81.2	78.4	77.4	74.7	75.5	73.6	72.8	69.4	65.9	64.5	63.9	62.8	63.4	64.8	65.6	66.0	65.0	65.1	64.2	62.8	64.7	67.7	69.5	81.2																							
28-Nov	70.1	69.7	72.0	71.9	73.7	74.9	74.7	75.2	74.9	73.3	72.2	72.2	70.5	66.6	67.0	70.1	75.7	77.3	77.0	76.3	74.9	73.4	72.6	72.1	72.9	77.3																							
29-Nov	71.0	71.1	71.0	71.5	70.4	70.0	68.9	69.7	70.8	69.9	69.3	68.1	68.9	70.9	72.4	73.2	74.2	75.1	75.1	75.0	74.5	73.5	73.7	72.9	71.7	75.1																							
30-Nov	73.3	72.8	72.2	73.9	73.8	74.1	74.4	74.1	74.9	75.3	75.2	75.4	75.7	75.3	75.4	75.8	76.7	77.7	77.5	76.8	76.6	76.1	75.7	75.9	75.2	77.7																							
																								84.4	84.6	85.1	85.1	85.2	85.2	85.2	85.1	85.5	83.5	80.7	78.6	76.4	75.2	74.9	76.3	79.0	80.7	81.9	82.6	82.6	82.9	83.7	84.2	Diurnal Average	
																								96.9	96.6	96.4	96.8	97.1	97.0	96.9	97.0	97.2	97.3	97.3	97.1	97.1	96.8	96.2	96.3	96.8	97.3	97.5	93.7	93.6	94.7	95.7	96.3	Diurnal Maximum	



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 2m (RH2) - %**  
**Fort McKay - Bertha Ganter - November 2024**





Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

Fort McKay - Bertha Ganter - November 2024

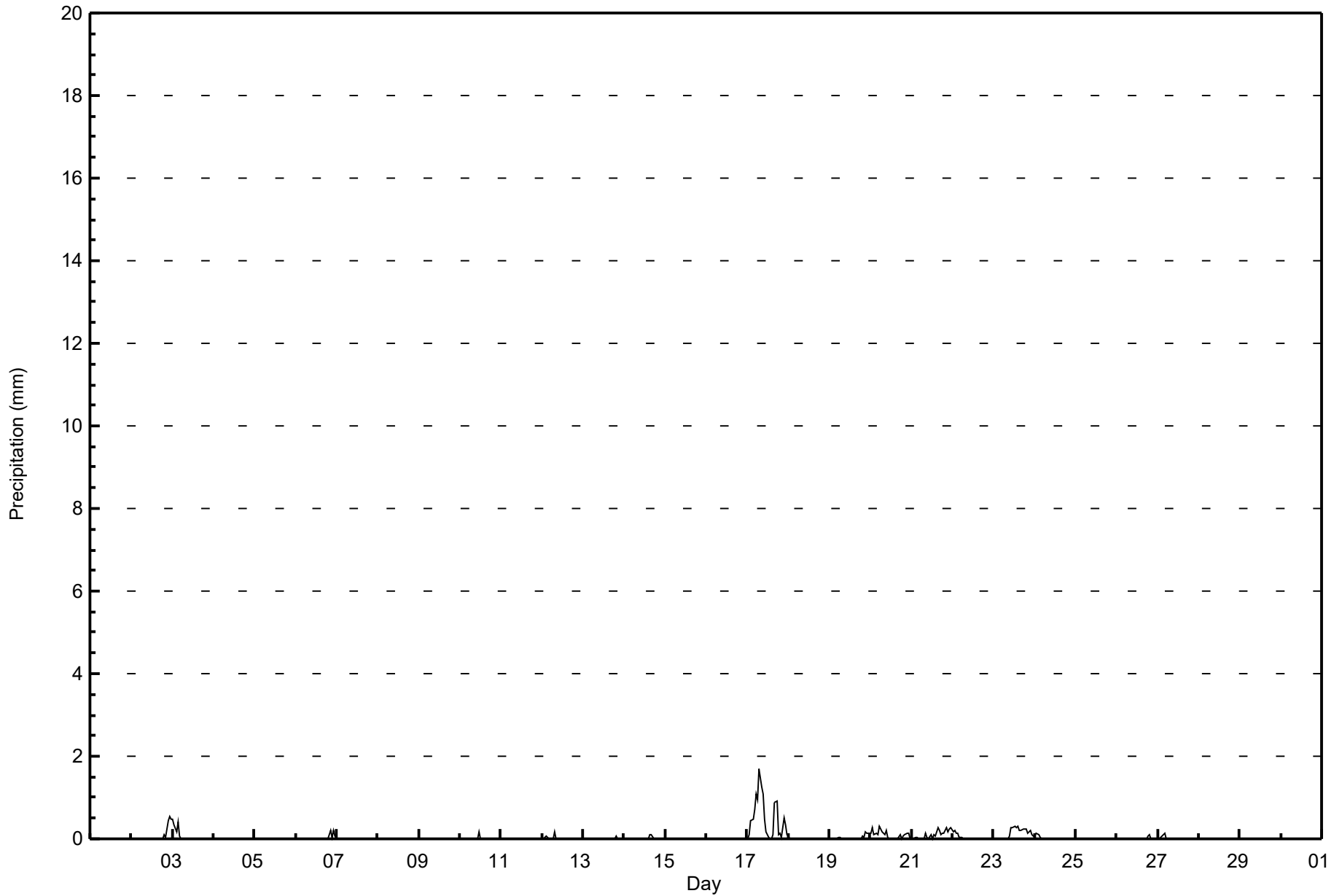
Maximum Value: 1.7 mm on Nov 17 08:00		Maximum Daily Total: 11.5 mm on Nov 17		Hours in Service: 720																									
Minimum Value: 0.0 mm on Nov 1 01:00		Minimum Daily Total: 0.0 mm on Nov 1		Hours of Data: 672																									
Maximum Diurnal Total: 2.0 mm at hour 8		Minimum Diurnal Total: 0.4 mm at hour 13		Hours of Missing Data: 48																									
Monthly Total: 25.78 mm		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.1 P <sub>99</sub> = 0.8		Hours of Calibration: 0																									
				Percent Operational Time: 93.3																									
Day	Hourly Period Ending At (MST)																								Daily Total	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.5	0.5	1.6	0.5	0.0	0.0	
3-Nov	0.5	0.3	0.2	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.5	0.0	0.0	
4-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.5	0.2	0.0	0.0	
7-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	
11-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12-Nov	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.0	
13-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	
14-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	
15-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
16-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17-Nov	0.0	0.1	0.4	0.5	0.7	1.1	1.0	1.7	1.2	1.1	0.5	0.2	0.1	0.0	0.0	0.1	0.9	0.9	0.1	0.1	0.0	0.5	0.4	0.1	11.5	1.7	0.0	0.0	
18-Nov	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	
19-Nov	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.6	0.2	0.0	0.0		
20-Nov	0.1	0.3	0.1	0.2	0.1	0.3	0.2	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	2.3	0.3	0.0	0.0		
21-Nov	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.3	0.2	0.1	0.1	0.1	0.3	0.2	0.3	2.3	0.3	0.0	0.0		
22-Nov	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.2	0.0	0.0		
23-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	3.2	0.3	0.0	0.0		
24-Nov	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0		
25-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
26-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0		
27-Nov	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0		
28-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
29-Nov	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	--	0.0	0.0		
30-Nov	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	--	0.0	0.0	0.0	0.0
																								Diurnal Average					
																								Diurnal Maximum					
																								DF - DAS Failure					





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Precipitation (PC) - mm**  
**Fort McKay - Bertha Ganter - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Precipitation (PC) - mm**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (mm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	655	97.47	97.47
0.4 - 0.5	9	1.34	98.81
0.6 - 0.7	1	0.15	98.96
0.8 - 1.4	6	0.89	99.85
1.5 - 10	1	0.15	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 672

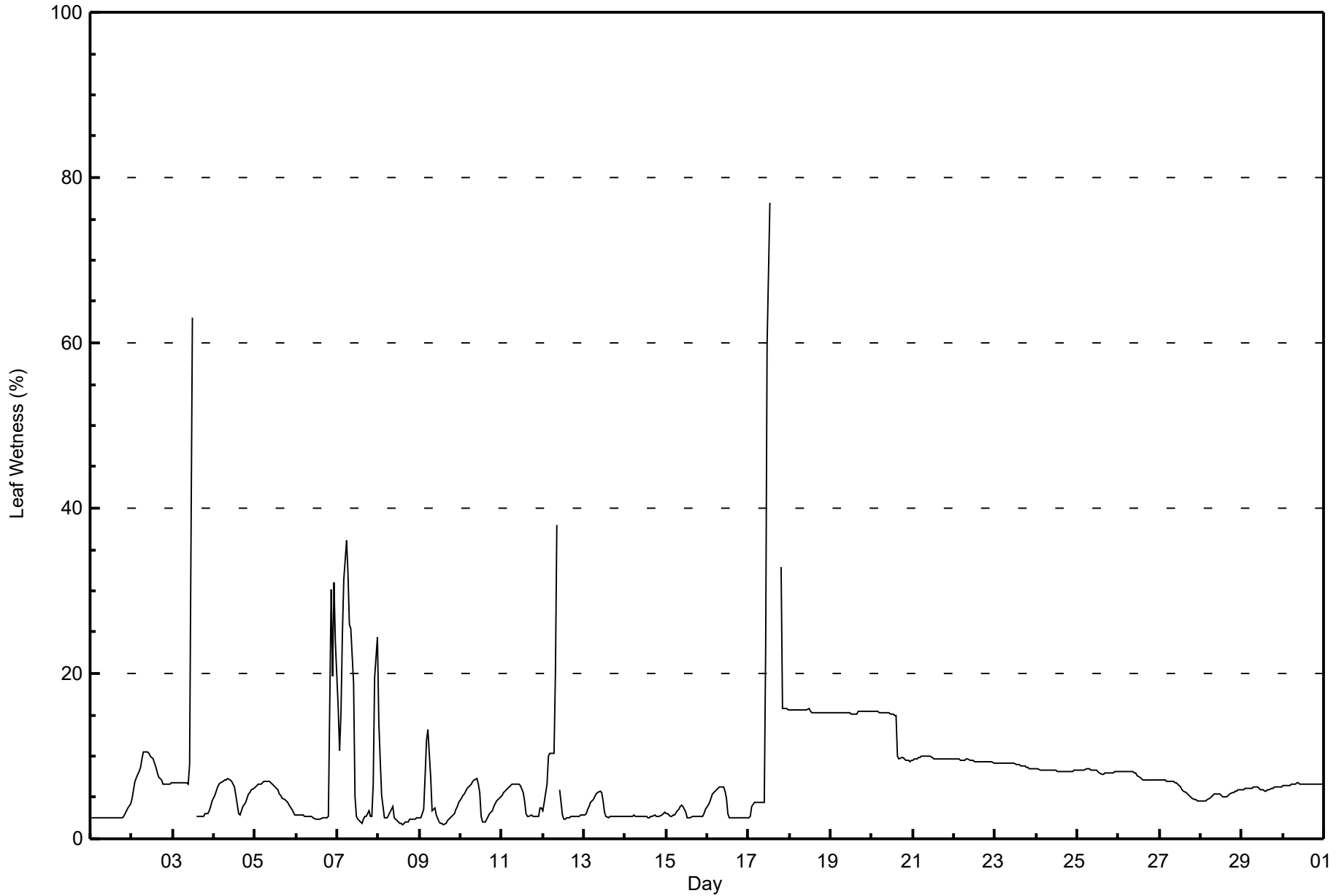
Total Number of Hours: 720



Summary of Hour Averages

Fort McKay - Bertha Ganter - November 2024

Maximum Value: 76.9 % on Nov 17 13:00		Maximum Daily Average: 17.9 % on Nov 17		Hours in Service: 720																																												
Minimum Value: 1.7 % on Nov 9 15:00		Minimum Daily Average: 2.8 % on Nov 1		Hours of Data: 712																																												
Maximum Diurnal Average: 10.4 % at hour 12		Minimum Diurnal Average: 5.6 % at hour 17		Hours of Missing Data: 8																																												
Monthly Average: 7.42 %		Percentiles: P <sub>1</sub> = 1.9 P <sub>10</sub> = 2.6 Q <sub>1</sub> = 3.0 Median = 6.4 Q <sub>3</sub> = 9.0 P <sub>90</sub> = 15.2 P <sub>99</sub> = 32.0		Hours of Calibration: 0																																												
				Percent Operational Time: 98.9																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	2.6	2.6	2.6	2.5	2.5	2.5	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.7	3.1	3.5	3.7	4.2	2.8	4.2																						
2-Nov	4.9	6.0	7.0	7.8	8.2	8.6	9.7	10.5	10.5	10.4	10.3	10.0	9.6	9.1	8.6	8.0	7.4	7.1	6.7	6.6	6.6	6.7	6.7	6.7	8.1	10.5																						
3-Nov	6.7	6.7	6.7	6.7	6.8	6.8	6.7	6.7	6.7	6.5	9.0	63.1	OR	OR	2.8	2.7	2.7	2.7	2.8	3.0	3.1	3.4	4.0	4.7	7.8	63.1																						
4-Nov	5.2	5.7	6.2	6.5	6.8	7.0	7.1	7.2	7.3	7.2	7.0	6.6	6.2	5.2	3.0	2.8	3.4	3.9	4.5	4.9	5.3	5.6	5.9	6.1	5.7	7.3																						
5-Nov	6.3	6.5	6.6	6.6	6.8	6.9	7.0	7.0	7.0	6.8	6.7	6.5	6.2	5.9	5.5	5.2	4.9	4.7	4.6	4.4	4.0	3.6	3.1	3.0	5.6	7.0																						
6-Nov	2.8	2.9	2.8	2.8	2.8	2.8	2.8	2.8	2.7	2.7	2.5	2.4	2.4	2.4	2.4	2.5	2.5	2.6	2.6	2.6	30.2	19.6	31.0	23.8	6.6	31.0																						
7-Nov	15.9	10.7	15.2	24.8	31.3	36.1	32.0	25.9	25.5	18.9	5.1	2.8	2.3	2.2	1.9	2.3	2.8	2.7	3.4	2.7	2.7	6.6	19.5	24.4	13.2	36.1																						
8-Nov	14.0	9.5	5.3	2.6	2.5	2.6	2.8	3.2	3.9	2.6	2.4	2.2	1.9	1.8	1.7	1.9	2.0	2.1	2.3	2.3	2.3	2.4	2.5	2.5	3.3	14.0																						
9-Nov	2.5	2.5	3.5	7.4	11.8	13.3	7.4	3.4	3.6	3.7	2.9	2.0	1.9	1.8	1.7	1.9	2.2	2.4	2.5	2.7	3.1	3.5	3.9	4.4	4.0	13.3																						
10-Nov	4.9	5.3	5.5	5.7	6.1	6.4	6.7	7.0	7.2	7.2	6.7	5.5	2.8	2.0	2.0	2.3	2.6	3.0	3.4	3.8	4.3	4.6	4.8	5.0	4.8	7.2																						
11-Nov	5.3	5.6	5.8	6.0	6.3	6.5	6.7	6.7	6.6	6.6	6.6	6.4	5.5	4.5	3.1	2.7	2.8	2.8	2.8	2.8	2.8	2.8	3.8	3.8	4.8	6.7																						
12-Nov	3.5	4.4	6.6	10.1	10.4	10.4	10.3	20.2	37.9	OR	5.9	2.9	2.4	2.4	2.5	2.5	2.6	2.7	2.7	2.7	2.7	2.7	2.8	2.9	6.7	37.9																						
13-Nov	2.8	3.1	3.6	4.0	4.4	4.8	5.1	5.4	5.6	5.8	5.6	4.6	3.3	2.6	2.5	2.7	2.8	2.7	2.7	2.8	2.8	2.7	2.8	2.8	3.7	5.8																						
14-Nov	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.7	2.7	2.7	2.6	2.6	2.7	2.8	2.8	2.8	2.7	2.7	2.8	3.0	3.2	2.8	3.2																						
15-Nov	3.1	3.0	2.8	2.8	2.9	2.9	3.3	3.6	3.9	4.1	3.9	3.2	2.6	2.6	2.6	2.7	2.7	2.7	2.7	2.7	2.8	2.8	3.0	3.5	3.0	4.1																						
16-Nov	4.0	4.4	4.9	5.4	5.7	5.9	6.1	6.3	6.3	6.2	5.8	4.9	3.1	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	4.0	6.3																						
17-Nov	2.5	2.7	3.9	4.3	4.4	4.4	4.4	4.4	4.4	4.4	23.4	59.8	76.9	OR	OR	45.5	OR	OR	OR	32.9	15.7	15.7	15.7	15.7	17.9	76.9																						
18-Nov	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.5	15.8	15.4	15.3	15.2	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.5	15.8																						
19-Nov	15.3	15.3	15.3	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.1	15.1	15.1	15.1	15.4	15.5	15.5	15.4	15.4	15.4	15.4	15.4	15.3	15.5																						
20-Nov	15.4	15.3	15.4	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.2	15.1	15.0	14.9	14.8	10.1	9.6	9.8	9.8	9.6	9.5	9.4	9.4	9.4	13.1	15.4																						
21-Nov	9.5	9.7	9.7	9.8	9.9	10.0	10.0	10.0	10.0	10.0	10.0	9.8	9.7	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.7	10.0																						
22-Nov	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.5	9.4	9.4	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.4	9.6																						
23-Nov	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.1	9.1	9.0	9.0	8.9	8.8	8.8	8.8	8.7	8.6	8.6	8.5	8.5	8.5	9.0	9.2																						
24-Nov	8.4	8.4	8.4	8.4	8.3	8.3	8.3	8.4	8.4	8.4	8.3	8.3	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.2	8.2	8.2	8.2	8.2	8.4	8.4																					
25-Nov	8.2	8.3	8.3	8.3	8.3	8.4	8.4	8.4	8.4	8.4	8.3	8.2	8.1	8.0	7.9	7.9	7.9	8.0	8.0	8.0	8.0	8.0	8.1	8.1	8.2	8.4	8.4																					
26-Nov	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.0	7.9	7.7	7.5	7.3	7.1	7.1	7.2	7.2	7.2	7.2	7.2	7.1	7.1	7.1	7.6	8.1																						
27-Nov	7.1	7.1	7.1	7.0	7.0	7.0	7.0	7.0	6.9	6.8	6.7	6.5	6.2	6.0	5.7	5.5	5.4	5.2	5.1	5.0	4.8	4.7	4.6	4.5	6.1	7.1																						
28-Nov	4.6	4.6	4.6	4.6	4.8	5.0	5.1	5.2	5.4	5.5	5.4	5.4	5.3	5.1	5.0	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	5.9	5.2	5.9																						
29-Nov	6.0	6.0	6.1	6.1	6.1	6.1	6.2	6.2	6.2	6.2	6.1	5.9	5.9	5.8	5.8	5.9	6.0	6.1	6.2	6.2	6.3	6.3	6.3	6.4	6.1	6.4																						
30-Nov	6.4	6.4	6.4	6.4	6.5	6.5	6.6	6.7	6.7	6.7	6.7	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.5	6.6	6.7																						
																								7.1	6.9	7.2	7.8	8.2	8.5	8.3	8.4	9.0	7.7	7.8	10.4	8.7	6.1	5.8	6.9	5.6	5.7	5.7	6.7	7.0	6.9	7.8	7.8	Diurnal Average
																								15.9	15.6	15.6	24.8	31.3	36.1	32.0	25.9	37.9	18.9	23.4	63.1	76.9	15.3	15.2	45.5	15.4	15.5	15.5	32.9	30.2	19.6	31.0	24.4	Diurnal Maximum
OR - Out of Range																																																





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Leaf Wetness (LW) - %**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	0	0.00	0.00
0.4 - 0.5	0	0.00	0.00
0.6 - 0.7	0	0.00	0.00
0.8 - 1.4	0	0.00	0.00
1.5 - 10	608	85.39	85.39
> 10	104	14.61	100.00

Total Number of Valid Hours: 712

Total Number of Hours: 720

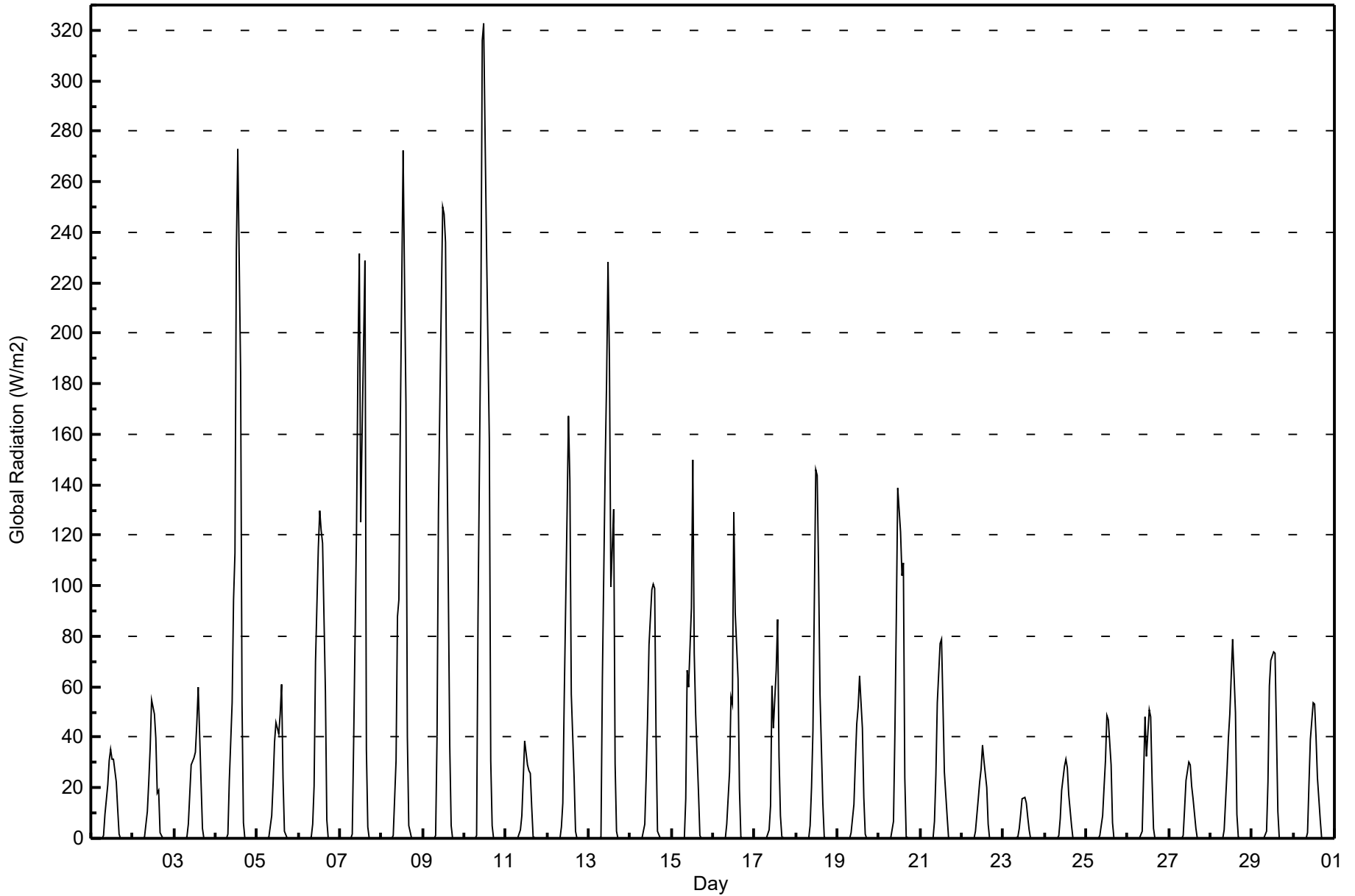


Maximum Value: 322.9 W/m2 on Nov 10 12:00																						Hours in Service: 720				
Maximum Daily Average: 68.4 W/m2 on Nov 10																						Hours of Data: 720				
Minimum Value: 0.0 W/m2 on Nov 1 01:00																						Hours of Missing Data: 0				
Maximum Diurnal Average: 102.4 W/m2 at hour 13																						Hours of Calibration: 0				
Monthly Average: 20.89 W/m2																						Percent Operational Time: 100.0				
Minimum Daily Average: 2.9 W/m2 on Nov 23																										
Minimum Diurnal Average: 0.0 W/m2 at hour 1																										
Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 19.1 P <sub>90</sub> = 63.3 P <sub>99</sub> = 235.6																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	9.3	21.0	31.0	35.0	31.5	31.4	22.1	11.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	35.0
2-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	10.4	22.3	36.0	54.6	49.3	39.5	18.0	18.9	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.5	54.6
3-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	5.6	17.4	29.0	32.0	34.2	45.1	59.8	22.2	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.4	59.8
4-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	22.7	53.8	94.4	113.0	233.2	273.1	184.5	53.1	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.2	273.1
5-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	8.9	21.7	38.3	45.8	41.5	49.1	61.0	23.8	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.2	61.0
6-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	5.5	20.5	69.7	115.3	129.8	121.7	116.9	58.2	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.9	129.8
7-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	38.4	121.6	187.5	231.8	125.0	161.4	228.6	35.0	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.3	231.8
8-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	30.6	87.8	94.3	163.4	272.4	220.2	172.4	40.2	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.3	272.4
9-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	40.5	129.5	172.7	250.3	247.4	235.8	160.0	36.4	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.3	250.3
10-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	88.0	206.6	316.0	322.9	277.8	234.8	157.5	30.9	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.4	322.9
11-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	8.8	23.2	38.4	29.2	26.9	25.7	12.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	38.4
12-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	4.3	13.8	55.3	128.2	167.3	141.5	57.3	23.9	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.8	167.3
13-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	62.9	148.3	182.0	228.1	189.1	99.4	130.5	29.6	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.7	228.1
14-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7	24.7	47.4	76.5	98.2	100.4	99.0	39.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.6	100.4
15-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	15.4	66.4	59.8	91.3	149.7	73.4	49.0	18.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.9	149.7
16-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7	26.1	56.0	53.1	129.0	89.5	63.2	19.6	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.5	129.0
17-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	13.0	60.7	43.4	66.5	86.9	32.6	8.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.2	86.9
18-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	19.9	42.7	146.1	144.0	105.9	57.2	13.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.3	146.1
19-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	13.3	30.4	45.5	52.0	64.4	43.6	16.4	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.2	64.4
20-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9	41.7	87.1	138.5	121.4	104.0	109.1	23.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.4	138.5
21-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	25.0	53.7	77.1	78.9	53.2	26.5	8.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.7	78.9
22-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	15.5	22.6	27.4	37.1	30.6	20.0	5.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	37.1
23-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.7	9.3	15.5	16.0	13.7	8.2	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	16.0
24-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	8.1	18.8	28.4	31.5	28.0	17.4	4.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	31.5
25-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	8.9	20.3	30.7	48.7	47.1	29.1	6.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	48.7
26-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	25.3	48.0	32.3	51.1	48.0	22.7	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.8	51.1
27-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	11.8	23.1	30.0	28.8	20.7	15.5	4.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	30.0
28-Nov	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	3.6	26.3	39.8	49.1	64.3	78.9	49.8	9.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.4	78.9
29-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	22.5	60.2	70.7	73.9	73.1	42.4	10.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.8	73.9
30-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	21.4	38.9	53.5	52.9	40.3	24.3	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	53.5
																								Diurnal Average		
																								Diurnal Maximum		



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Global Radiation (GR) - W/m<sup>2</sup>**  
**Fort McKay - Bertha Ganter - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Global Radiation (GR) - W/m2**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Concentration Ranges (W/m2)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	544	75.56	75.56
21 - 100	129	17.92	93.47
101 - 300	45	6.25	99.72
301 - 600	2	0.28	100.00
601 - 900	0	0.00	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720





Maximum Speed: 19 km/h on Nov 16 16:00	Maximum Daily Speed Average: 12.8 km/h on Nov 20	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 15 01:00	Minimum Daily Speed Average: 1.2 km/h on Nov 1	Hours of Data: 559
Maximum Diurnal Speed Average: 2.4 km/h at hour 21	Minimum Diurnal Speed Average: 0.2 km/h at hour 17	Hours of Missing Data: 161
Monthly Average Velocity: 0.8 km/h 302.3 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 2 Q <sub>1</sub> = 4 Median = 6 Q <sub>3</sub> = 10 P <sub>90</sub> = 13 P <sub>99</sub> = 18	Percent Operational Time: 77.6

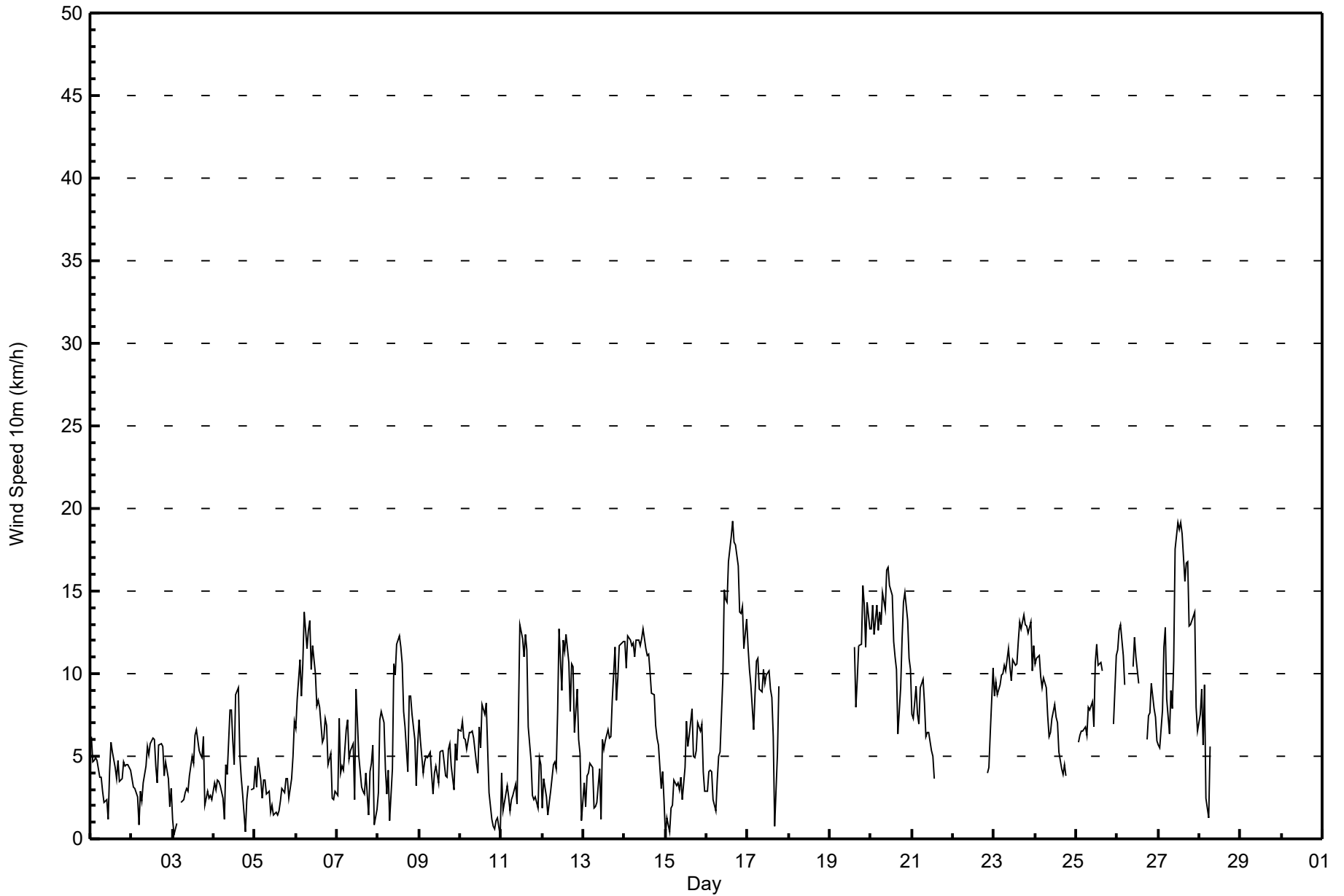
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	SW6	SW5	S5	S5	S5	S4	SSE4	SE3	E2	ESE2	ESE1	NNE4	N6	NNE5	NNE4	N4	N5	N3	NE4	NNE5	ENE4	NE4	NNE5	NE4	ENE1.2	SW6	
2-Nov	NE4	NE3	NE3	NNE3	N1	NW3	NNW2	N3	N4	N6	NNE5	N6	N6	NNE6	N4	E3	E6	NE6	NE6	NE4	N5	N4	NNE2	N3	NNE3.5	N6	
3-Nov	N1	NNE0	NW1	UO	UO	SSW2	SSW2	SW3	WSW3	SSW3	SW4	SSW5	S5	SSE6	SSE7	S5	S5	S5	S6	SSW2	SSW3	SW2	WSW3	WSW2	SSW2.9	SSE7	
4-Nov	WSW3	SSW3	S4	SSW4	SW3	SSW2	SW1	SW5	SW4	S8	SSW8	SSW6	SSW4	SSE9	S9	S5	SW4	W3	SW0	SSW2	SSW3	UO	SSW3	N3	SSW3.6	S9	
5-Nov	NW4	NW3	NW5	NNW4	NW2	NW4	NNW4	WNW3	WNW3	WSW2	WNW2	SSW1	SW2	WSW1	SW2	WSW2	S3	SSW3	W4	W4	WSW2	SW4	SSW5	SSW7	W2.0	SSW7	
6-Nov	S7	S8	S11	S9	S11	S14	S11	S13	S13	S10	SSW12	S10	SW8	WSW8	WSW8	SW6	S6	S7	S7	S4	S5	S2	NNW2	NNW3	S7.2	S14	
7-Nov	W3	NNW7	WNW4	SW4	WSW4	WNW7	WNW7	NW5	W5	WNW6	NNW2	WNW9	WNW7	W5	SW3	SE3	SSE3	S4	SSE1	S4	S5	S6	SE1	S2	W2.6	WNW9	
8-Nov	SW3	SSW7	S8	S7	S4	WSW3	WSW4	SW1	S4	S11	S10	S12	S12	S12	S11	SSW8	SSW7	SSW4	NW9	NNW9	NW8	WNW6	W3	W6	SSW4.6	S12	
9-Nov	W7	W6	WSW4	SW5	WSW5	WSW5	WSW5	SW4	SSW3	WSW4	W4	WSW3	SSE5	S5	SW5	SW4	SSW4	S5	S6	SSW4	S3	SSW6	S5	S7	SW4.0	W7	
10-Nov	SSW6	SSW7	S6	S6	SSW5	S6	S6	S7	S6	SSW5	SSW4	S7	SSW6	SSE8	S8	S8	S5	S3	SW1	S1	SW1	W1	NW1	SW0	S4.5	S8	
11-Nov	N4	N2	NNW2	NW3	W3	SW2	SW2	N3	NNE3	NE2	SE7	SSE13	SSE12	SSE11	SSE12	SSE11	SSE7	SSE5	SSE3	SSE2	NNE3	N2	NNE5	N4	SE2.4	SSE13	
12-Nov	N2	NNE4	NNW3	N1	SW2	W3	W4	SSW5	SW4	W8	WNW13	W9	W12	W11	W12	W11	WSW8	W11	W10	W6	NW9	NW6	WNW5	S1	W5.9	WNW13	
13-Nov	SW3	SSW2	S4	SSW4	WSW5	W4	NW2	W2	WNW2	WNW4	W1	NNE6	ENE5	NE6	ENE7	NE6	NE6	NE8	NNE12	NNE8	NNE10	NNE12	NNE12	N12	NNE3.6	N12	
14-Nov	N12	N10	N12	N12	N12	N12	N11	N12	N12	N12	N12	N13	N12	NNE11	N11	N10	N9	N9	N7	NNW6	NNW6	NNE3	NW4	WNW2	N9.4	N13	
15-Nov	SSW0	SE1	SW0	S2	SSW2	S4	S3	S3	SSE3	SW4	SSW2	SW4	SSE7	S6	S6	SSE8	S5	S5	S5	S7	S6	S7	SSW6	WSW3	S3.9	SSE8	
16-Nov	SW3	SSW4	S4	S4	SSW2	SSW2	WSW4	SW5	S5	SSE10	S15	S14	S14	S17	S18	S19	S18	S18	S17	S14	S14	S14	S12	S13	S10.5	S19	
17-Nov	S12	S10	SSE9	SSE7	SSE9	S11	SSE11	S9	S9	S10	S9	S10	S10	S9	S9	S6	SSW1	N5	N9	UO	UO	UO	UO	UO	S7.2	S12	
18-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
19-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	NNE12	NNE8	NNE10	NNE12	NNE12	N15	N14	N12	NNE14	N13	---	N15	
20-Nov	NNE13	NNE14	N12	N14	NNE13	N14	NNE13	NNE15	NNE14	NNE16	NNE16	NNE15	N15	N12	N11	N10	N6	NNE9	NNE12	NNE14	NNE15	N13	N11	N10	NNE12.8	NNE16	
21-Nov	N8	NNE7	NNE9	N8	NNW7	NNW9	N10	N8	NW6	NW6	WNW6	WNW5	NW5	WNW4	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	N10	
22-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	NNE10	
23-Nov	NNE9	NNE10	NNE9	NNE9	NNE10	N10	NNE11	NNE10	NNE11	NNE10	NNE10	NNE11	NNE10	NNE11	N12	N13	N13	N14	N13	NNE13	N12	N13	N10	N12	NNE10.9	N14	
24-Nov	N11	N11	N11	N10	N9	N10	N9	N7	N6	N6	N7	N8	N7	N7	N5	N4	NNW4	NNW4	NNW4	UO	UO	UO	UO	UO	N7.4	N11	
25-Nov	UO	S6	S6	S7	S7	S7	S6	S8	S8	S8	S7	SSE11	S12	S11	S11	S10	UO	UO	UO	UO	UO	UO	SSW7	S11	---	S12	
26-Nov	S11	S13	S13	S11	SSW9	UO	UO	UO	UO	SSW10	S12	S11	S9	UO	UO	UO	UO	UO	W6	WNW7	WNW8	WNW9	WNW8	WNW7	WNW6	---	S13
27-Nov	WNW6	W5	WNW8	WNW12	WNW13	WNW9	WNW6	WNW9	WNW8	NW11	NW18	NNW19	NNW19	NNW19	NNW18	NNW16	NNW17	NNW17	NNW13	N13	N14	N14	N8	N7	NW11.4	NNW19	
28-Nov	NNW8	NW9	NW6	NW9	W2	W1	WNW6	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	NW9	
29-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
30-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
NW1.4NW0.8WSW0.5 W0.9 W1.2WNW1.2WNW1.3WNW0.9WNW0.7WSW1.2WSW1.3 SW0.9SSW1.1SSW0.9SSW1.0 S1.0 W0.2NNW1.0NNW2.1 N2.0 N2.4NNW2.3NNW2.0NNW1.8																								Diurnal Average			
NNE13 NNE14 S13 N14WNW13 S14 NNE13 NNE15 NNE14 NNE16 NW18NNW19NNW19NNW19NNW18 S19 S18 S18 S17 N15 NNE15 S14 NNE14 S13																								Diurnal Maximum			

M - Maintenance UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 10m (WS10) - km/h**  
**Fort McKay - Bertha Ganter - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	243	43.47	43.47
6 - 11	220	39.36	82.83
12 - 19	96	17.17	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 559

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Fort McKay - Bertha Ganter - November 2024**

<b>Wind Speed</b> <b>Ranges (km/h)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 5	22	14	9	3	2	2	4	8	39	34	34	20	17	11	13	11	243
6 - 11	38	26	6	1	1	0	1	16	64	14	2	3	11	20	10	7	220
12 - 19	33	20	0	0	0	0	0	3	25	1	0	0	2	3	1	8	96
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	93	60	15	4	3	2	5	27	128	49	36	23	30	34	24	26	559

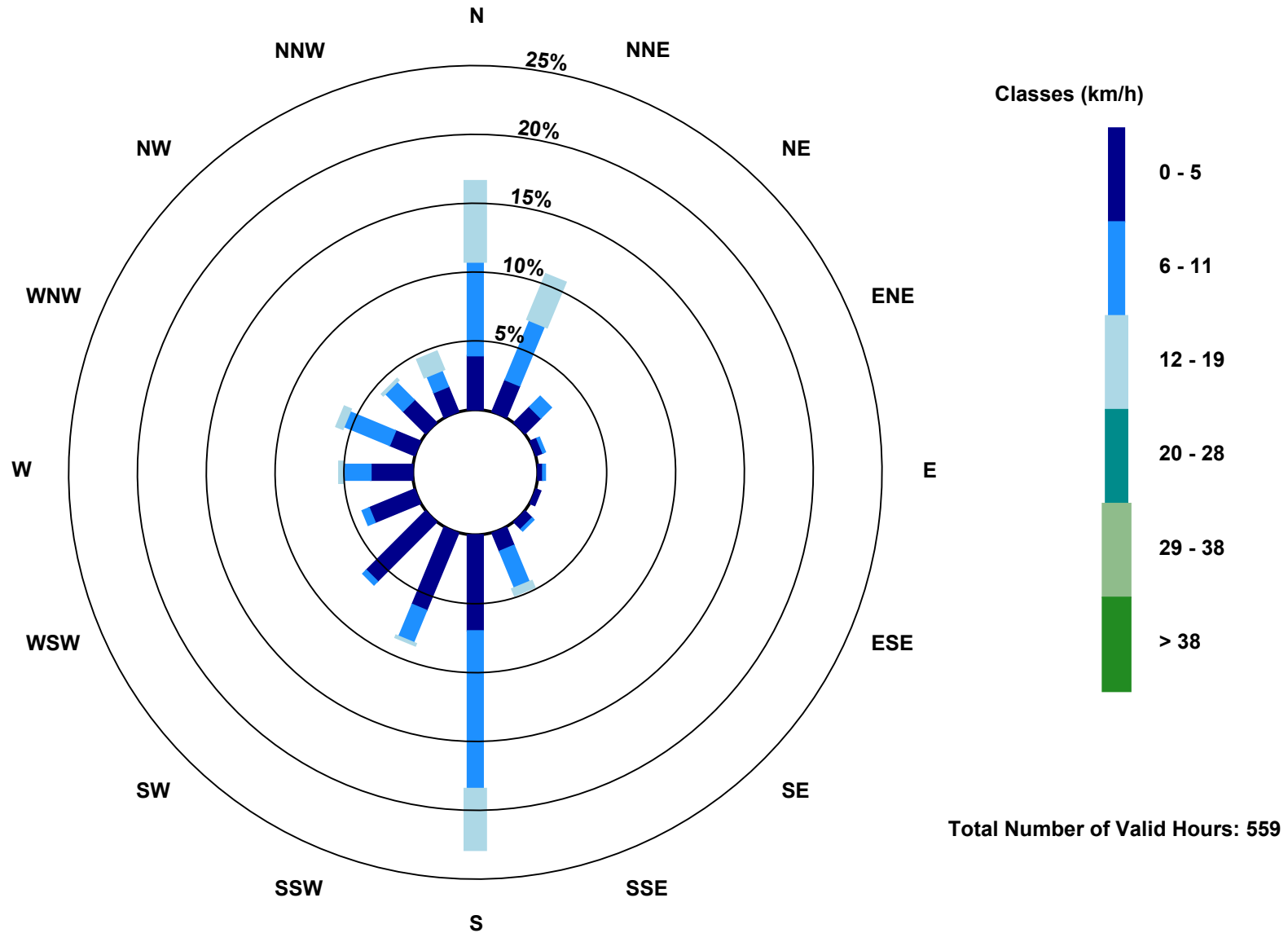
Total Number of Valid Hours: 559

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Fort McKay - Bertha Ganter





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Fort McKay - Bertha Ganter - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 5 km/h on Nov 12 15:00	Hours of Data: 559
Minimum Value: 1 km/h on Nov 24 18:00	Hours of Missing Data: 161
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 3 P <sub>99</sub> = 5	Hours of Calibration: 0
	Percent Operational Time: 77.6

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	3	2	1	1	1	2	1	2	1	1	1	2	1	1	1	1	1	2	2	1	2	1	2	1	3
2-Nov	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	3	2	2	2	1	1	1	1	1	3
3-Nov	1	1	1	UO	UO	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	1	2	
4-Nov	1	1	1	1	1	1	1	1	1	2	3	2	2	1	2	2	1	1	1	2	1	UO	2	2	3
5-Nov	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	2
6-Nov	2	2	2	2	3	3	3	2	3	4	3	3	3	4	3	2	2	1	2	2	1	2	1	1	4
7-Nov	1	4	3	1	1	3	3	2	2	2	2	4	4	2	2	1	2	1	1	1	1	2	1	1	4
8-Nov	2	2	1	2	1	1	1	2	3	3	2	3	4	3	3	2	2	1	3	3	2	3	1	2	4
9-Nov	3	2	1	1	2	2	2	2	1	1	2	2	2	1	2	1	1	1	1	2	2	1	2	1	3
10-Nov	2	2	3	2	1	2	1	1	1	1	1	2	2	1	1	1	2	1	1	1	1	1	2	1	3
11-Nov	1	2	2	1	2	2	1	1	1	1	4	4	3	3	3	3	1	2	1	1	1	1	1	1	4
12-Nov	1	2	1	1	1	2	2	1	2	3	5	4	5	5	5	5	3	5	4	3	2	2	2	1	5
13-Nov	1	1	1	1	2	2	2	2	2	1	2	2	2	2	2	2	2	3	3	2	2	3	2	2	3
14-Nov	3	2	2	3	2	2	2	2	2	2	2	3	3	2	2	2	1	1	1	1	1	1	2	2	3
15-Nov	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	2
16-Nov	1	1	1	1	1	1	1	1	1	4	3	3	3	3	4	4	3	4	4	3	3	3	2	3	4
17-Nov	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	5	UO	UO	UO	UO	UO	5
18-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
19-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	5
20-Nov	4	3	3	3	3	3	3	4	3	4	4	4	3	2	2	2	1	3	3	3	4	3	2	3	4
21-Nov	2	2	3	2	1	2	2	2	1	2	2	2	1	1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	3
22-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2
23-Nov	3	3	2	3	3	2	2	2	2	2	2	3	3	3	2	2	3	3	2	3	3	2	2	3	2
24-Nov	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	UO	UO	UO	UO	UO	3
25-Nov	UO	1	1	1	1	1	3	2	2	2	1	2	2	2	3	2	UO	UO	UO	UO	UO	UO	UO	UO	3
26-Nov	2	2	3	3	2	UO	UO	UO	UO	3	3	2	2	UO	UO	UO	UO	UO	2	3	3	4	3	2	4
27-Nov	2	2	3	4	4	2	2	3	3	4	4	4	5	4	5	4	4	4	3	3	5	5	2	1	5
28-Nov	2	2	3	2	1	1	2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	3
29-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
30-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
	4	4	3	4	4	3	3	4	3	4	5	4	5	5	5	5	4	5	5	5	5	5	3	3	

Diurnal Maximum

M - Maintenance UO - Unstable Operation



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 10m (WD10) - deg

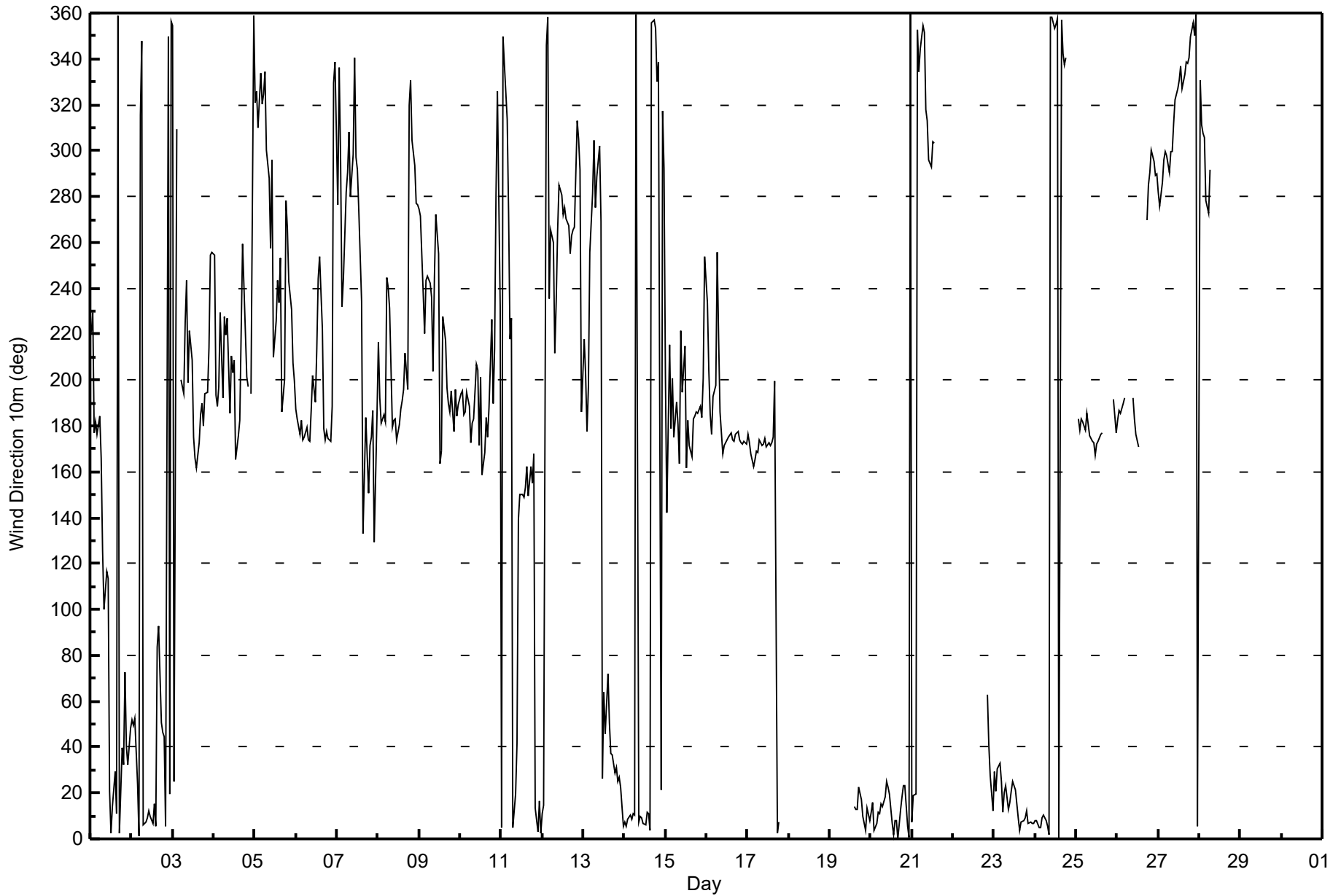
Fort McKay - Bertha Ganter - November 2024

Direction of Maximum Speed: 174 deg on Nov 16 16:00		Hours in Service:	720
Direction of Maximum Daily Speed Average: 12.7 deg on Nov 20		Hours of Data:	559
Direction of Minimum Speed: 202 deg on Nov 15 01:00		Hours of Missing Data:	161
Direction of Minimum Daily Speed Average: 1.2 deg on Nov 1		Percent Operational Time:	77.6
Monthly Average Direction: 302.3 deg			

Day	Hourly Period Ending At (MST)																								Daily Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	221	230	177	182	176	184	166	126	100	117	114	21	3	14	29	11	359	2	40	32	72	40	32	48	58.3	
2-Nov	52	49	52	24	1	315	348	6	7	9	12	10	7	15	6	83	93	51	46	44	6	349	19	357	23.3	
3-Nov	354	25	309	UO	UO	200	194	225	243	199	221	209	175	166	162	173	185	190	180	194	195	214	254	255	195.1	
4-Nov	254	193	188	197	229	192	227	219	227	186	210	203	209	165	176	182	221	259	221	201	197	UO	194	359	200.9	
5-Nov	321	326	310	334	320	325	334	300	288	258	296	210	226	244	233	254	186	200	279	266	243	230	207	200	268.4	
6-Nov	187	183	177	182	174	175	180	174	173	187	202	191	214	244	254	222	179	174	178	175	173	189	329	339	189.0	
7-Nov	277	336	296	232	244	282	290	308	280	299	340	297	292	274	235	133	159	183	150	171	175	187	129	185	266.4	
8-Nov	217	192	181	185	182	245	240	231	179	182	183	174	181	187	191	196	212	196	320	331	305	294	277	277	207.5	
9-Nov	275	271	238	220	243	246	242	236	204	244	272	255	164	169	227	217	197	190	186	195	178	196	184	189	218.3	
10-Nov	194	195	185	186	195	188	173	181	183	207	204	171	201	159	169	184	175	188	226	190	214	280	326	232	185.6	
11-Nov	5	350	337	314	273	218	227	5	20	41	139	150	150	149	153	162	150	162	155	168	13	3	16	2	142.6	
12-Nov	11	15	346	358	236	265	260	212	234	265	285	281	272	275	270	267	255	263	266	267	313	305	292	186	274.9	
13-Nov	218	203	177	197	256	281	305	275	289	302	269	26	64	46	72	50	37	37	29	31	25	27	22	6	22.7	
14-Nov	8	6	9	10	8	11	10	360	7	10	9	7	6	12	11	4	356	357	353	330	339	22	318	292	3.8	
15-Nov	202	142	216	179	201	175	190	181	164	222	194	215	162	183	172	167	183	184	186	185	189	184	201	254	184.9	
16-Nov	234	204	185	176	193	198	256	219	186	168	171	173	174	175	177	174	173	177	178	174	173	172	173	172	177.2	
17-Nov	176	172	168	162	165	169	168	174	171	172	174	171	172	172	172	175	200	3	7	UO	UO	UO	UO	UO	169.8	
18-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
19-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	14	13	13	23	17	10	7	4	13	8	--
20-Nov	12	16	4	7	12	11	15	14	18	25	22	20	7	2	8	8	0	13	18	23	23	6	1	360	12.7	
21-Nov	7	19	19	353	334	344	354	351	318	313	296	293	304	303	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
22-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	63	41	27	12	--
23-Nov	29	21	30	33	25	11	20	23	13	16	21	25	21	15	9	4	7	8	9	12	7	7	7	7	14.9	
24-Nov	8	8	5	5	9	10	8	5	2	358	358	354	355	357	1	357	342	338	341	UO	UO	UO	UO	UO	UO	1.4
25-Nov	UO	183	178	183	182	178	186	180	176	173	172	167	172	173	177	177	UO	UO	UO	UO	UO	UO	UO	192	177	--
26-Nov	183	187	186	190	192	UO	UO	UO	UO	192	183	176	171	UO	UO	UO	UO	270	285	290	300	296	289	290	--	
27-Nov	282	276	286	296	299	298	291	300	299	312	322	327	331	337	327	333	339	338	340	349	356	350	359	5	326.1	
28-Nov	331	311	308	306	278	273	292	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
29-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
30-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--

314.6	300.5	257.7	272.5	262.2	288.1	293.8	295.6	283.6	240.2	244.4	221.1	212.2	202.7	204.0	190.8	270.1	332.0	347.6	350.8	355.1	346.8	347.5	345.3
Diurnal Average																							

M - Maintenance      UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods







**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Fort McKay - Bertha Ganter - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 96 deg on Nov 15 03:00	Hours of Data: 559
Minimum Value: 7 deg on Nov 24 19:00	Hours of Missing Data: 161
Percentiles: P <sub>1</sub> = 9 P <sub>10</sub> = 12 Q <sub>1</sub> = 14 Median = 19 Q <sub>3</sub> = 32 P <sub>90</sub> = 47 P <sub>99</sub> = 89	Hours of Calibration: 0
	Percent Operational Time: 77.6

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	36	42	20	20	14	24	28	38	31	32	64	19	16	16	24	23	14	16	46	27	28	27	27	33	64	
2-Nov	26	32	37	26	38	20	37	17	15	13	15	12	14	14	33	49	24	25	29	31	20	32	18	26	49	
3-Nov	32	28	30	UO	UO	29	36	46	49	37	39	27	29	14	12	18	13	16	12	45	57	28	34	29	57	
4-Nov	37	38	24	26	39	25	46	26	45	17	28	30	42	13	14	15	17	31	94	69	20	UO	38	45	94	
5-Nov	23	41	14	14	16	16	12	25	32	56	35	38	40	50	58	51	22	32	26	31	59	28	24	20	59	
6-Nov	15	14	14	15	13	13	14	13	12	18	22	22	34	49	45	45	30	12	20	22	12	74	50	45	74	
7-Nov	48	38	40	18	29	29	25	36	26	28	76	33	45	54	67	51	39	21	19	21	17	22	79	66	79	
8-Nov	36	13	13	14	19	31	28	94	42	15	13	13	20	16	18	19	22	29	25	20	15	25	23	25	94	
9-Nov	32	38	42	32	37	40	36	40	47	41	47	77	29	46	46	35	19	10	9	14	60	13	14	11	77	
10-Nov	18	17	22	14	18	20	11	21	15	35	49	27	40	11	12	12	16	37	68	86	95	53	60	82	95	
11-Nov	13	38	45	45	57	59	38	41	21	28	19	14	14	13	15	16	16	21	23	39	37	41	15	17	59	
12-Nov	26	21	36	75	51	43	52	27	35	41	32	37	38	38	39	41	43	35	35	47	19	20	37	83	83	
13-Nov	29	72	25	14	44	47	89	89	61	34	75	31	29	34	31	29	19	19	18	16	15	15	15	15	89	
14-Nov	13	13	13	14	13	15	14	15	13	13	14	15	15	15	15	15	13	14	14	12	20	18	30	54	54	
15-Nov	91	65	96	31	31	18	15	11	21	22	54	47	19	21	19	12	20	14	13	13	14	12	24	64	96	
16-Nov	60	42	25	15	27	71	20	23	18	16	13	13	13	13	13	13	13	13	13	12	12	12	13	11	71	
17-Nov	13	12	12	13	13	12	13	13	12	12	13	12	12	12	12	17	88	13	15	UO	UO	UO	UO	UO	88	
18-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
19-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	16	14	13	14	15	16	15	14	15	16	16	
20-Nov	15	15	16	14	15	14	14	14	15	15	15	17	15	17	17	13	14	14	14	16	16	15	14	13	17	
21-Nov	15	15	15	19	12	12	13	15	11	14	22	24	22	24	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	24	
22-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	25	21	20	14	25
23-Nov	19	14	17	19	16	16	16	16	16	15	16	14	14	15	13	13	13	14	13	15	14	13	14	14	19	
24-Nov	14	13	15	13	11	13	13	15	14	13	14	14	13	13	16	11	9	9	7	UO	UO	UO	UO	UO	16	
25-Nov	UO	9	9	10	9	9	12	13	13	11	14	10	12	12	12	11	UO	UO	UO	UO	UO	UO	UO	14	14	
26-Nov	12	12	12	13	13	UO	UO	UO	UO	14	14	14	13	UO	UO	UO	UO	38	30	26	22	24	24	28	38	
27-Nov	33	35	27	22	20	18	23	19	21	18	13	12	12	13	12	14	13	13	14	15	17	17	17	13	35	
28-Nov	18	13	25	12	52	88	28	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	88	
29-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
30-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
	91	72	96	75	57	88	89	94	61	56	76	77	45	54	67	51	88	38	94	86	95	74	79	83		

Diurnal Maximum

M - Maintenance UO - Unstable Operation



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS02 MILDRED LAKE NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS02)  
NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	684	34	36	99.72	35.7	0	5.9	0
H2S (ppb) Average	684	35	36	99.86	4.5	0	0.9	0
THC (ppm) Average	680	34	40	99.17	3.7	-	2.4	-
NMHC(ppm) Average	680	34	40	99.17	0.268	-	0.037	-
CH4(ppm) Average	680	34	40	99.17	3.7	-	2.4	-
Temperature (C) Average	720	0	0	100	13.4	-	7.5	-
Relative Humidity (%) Average	720	0	0	100	99.4	-	94.6	-
Wind Speed 10 m (km/h) Average	720	0	0	100	22	-	15	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS02)  
NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	684	0.97	3.1	-	0	0	0	0.2	0.4	1.4	35.7
H2S (ppb) Average	684	0.31	0.5	-	0	0.1	0.1	0.2	0.3	0.6	4.5
THC (ppm) Average	680	2.19	0.2	-	2	2	2.1	2.1	2.3	2.4	3.7
NMHC(ppm) Average	680	0.001	0.016	-	0	0	0	0	0	0	0.268
CH4(ppm) Average	680	2.19	0.2	-	2	2	2.1	2.1	2.3	2.4	3.7
Temperature 2 m (C) Average	720	-7.72	8.7	-	-30	-18.4	-14.6	-5.7	-1	2.5	13.4
Relative Humidity (%) Average	720	83.86	8.6	-	38	74.2	78.9	84.4	88.8	95.4	99.4
Wind Speed 10 m (km/h) Average	720	8.1	4	-	0	3	5	8	11	14	22
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS02)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC/NMHC/CH4	03 Nov 2024 06:00	03 Nov 2024 06:00	1	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	08 Nov 2024 11:00	08 Nov 2024 13:00	3	Maintenance - calibration gas cylinder replaced
SO2/TRS/THC/NMHC/CH4	05 Nov 2024 13:00	05 Nov 2024 13:00	1	Maintenance - station operator activities
SO2/THC/NMHC/CH4	21 Nov 2024 15:00	21 Nov 2024 15:00	1	Maintenance - sample manifold cleaned



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb

Mildred Lake - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 35.7 ppb on Nov 11 10:00	Maximum Daily Average: 5.9 ppb on Nov 11		Hours of Data:	684
Minimum Value: 0.0 ppb on Nov 1 05:00	Minimum Daily Average: 0.0 ppb on Nov 23		Hours of Missing Data:	36
Maximum Diurnal Average: 2.4 ppb at hour 14	Minimum Diurnal Average: 0.2 ppb at hour 21		Hours of Calibration:	34
Monthly Average: 0.97 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.2 Q <sub>3</sub> = 0.4 P <sub>90</sub> = 1.4 P <sub>99</sub> = 17.3		Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.6	0.1	Z	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.1	1.3	2.6	1.0	0.5	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.4	2.6	
2-Nov	0.1	0.1	0.1	Z	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.0	0.1	0.7	0.6	0.6	0.2	0.1	0.1	0.2	0.2	2.4	0.7	0.6	0.4	2.4	
3-Nov	0.2	0.0	0.2	0.0	Z	0.5	0.4	0.1	0.1	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.2	1.3	1.0	0.2	0.2	0.3	0.9	0.3	0.3	1.3	
4-Nov	0.2	0.1	0.1	0.1	0.4	Z	1.0	0.1	0.0	0.0	0.0	C	C	C	9.6	1.6	0.4	0.5	0.3	0.2	0.6	0.5	0.5	0.9	9.6		
5-Nov	Z	0.6	0.7	0.9	0.8	0.7	0.5	0.5	0.6	0.6	1.0	0.5	M	0.3	0.2	0.2	0.3	0.6	0.3	0.3	0.3	0.1	0.1	0.1	0.5	1.0	
6-Nov	0.2	Z	0.0	0.1	0.1	0.1	0.2	0.3	0.2	0.1	0.3	0.2	0.4	0.7	0.3	0.3	0.2	0.2	2.0	1.1	0.4	0.3	0.2	0.5	0.4	2.0	
7-Nov	0.9	0.5	Z	0.1	9.7	2.4	0.3	0.2	0.2	0.1	0.1	0.1	0.3	0.1	4.6	4.4	1.8	7.4	1.6	0.4	0.3	0.9	12.7	10.9	2.6	12.7	
8-Nov	4.8	0.6	0.4	Z	0.4	22.5	23.8	1.5	9.9	6.2	1.3	0.6	0.2	0.2	0.4	0.1	0.2	0.2	0.1	0.2	0.0	0.1	0.1	0.1	3.2	23.8	
9-Nov	2.3	0.6	18.7	17.2	Z	0.4	0.3	0.2	0.2	1.2	5.4	4.1	9.1	15.9	3.7	4.6	1.0	0.5	0.4	0.2	0.1	0.2	0.2	0.2	3.8	18.7	
10-Nov	0.3	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.1	0.2	3.2	1.1	1.4	2.7	6.6	0.6	0.2	0.4	0.3	1.2	0.8	6.2	9.0	3.4	1.7	9.0	
11-Nov	Z	0.9	1.3	1.8	0.4	0.2	1.9	7.7	6.5	35.7	13.0	6.3	17.8	23.2	9.8	2.6	0.8	0.9	1.2	1.0	0.9	0.7	1.0	1.0	5.9	35.7	
12-Nov	0.4	Z	0.2	0.3	0.1	0.1	0.4	0.1	0.4	5.6	10.2	2.3	9.7	17.4	6.4	3.5	9.2	11.0	13.7	0.9	0.4	0.3	0.2	1.7	4.1	17.4	
13-Nov	0.8	0.6	Z	0.8	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.8	
14-Nov	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15-Nov	0.1	0.1	0.1	0.2	Z	0.3	0.6	0.7	1.2	5.5	10.8	0.7	0.6	4.4	5.6	0.6	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.1	1.5	10.8	
16-Nov	0.1	0.1	0.2	0.1	1.0	Z	0.3	0.5	0.4	0.1	0.4	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	1.0	
17-Nov	Z	0.1	5.1	2.1	0.3	0.0	1.4	1.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	5.1	
18-Nov	1.2	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.4	0.1	0.0	0.0	0.1	0.1	0.0	0.1	1.2	
19-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	
20-Nov	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
21-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	M	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	
22-Nov	0.0	0.0	0.1	0.2	0.1	Z	0.4	0.5	0.3	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.5	
23-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	
24-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.4	0.3	0.2	0.1	0.4	
25-Nov	0.2	0.9	Z	1.0	1.8	0.4	0.3	0.5	0.4	0.5	0.6	0.6	0.5	0.4	0.4	0.4	0.3	0.6	0.8	0.5	0.4	1.1	6.7	5.3	1.1	6.7	
26-Nov	0.6	0.3	0.2	Z	1.0	0.5	0.4	0.3	0.4	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.2	1.6	0.9	0.1	0.0	0.1	0.0	0.0	0.3	1.6	
27-Nov	0.0	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.0	0.0	0.1	0.0	0.2	
28-Nov	0.0	0.0	0.4	0.2	0.1	Z	0.0	0.0	0.4	0.3	0.1	0.2	0.0	0.1	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.4	
29-Nov	Z	0.0	0.2	0.1	0.1	0.4	0.5	0.6	1.1	1.3	1.0	0.9	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.2	0.3	0.4	1.3	
30-Nov	0.3	Z	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.6	0.7	0.4	0.0	0.1	0.2	0.0	0.0	0.0	0.2	0.7	

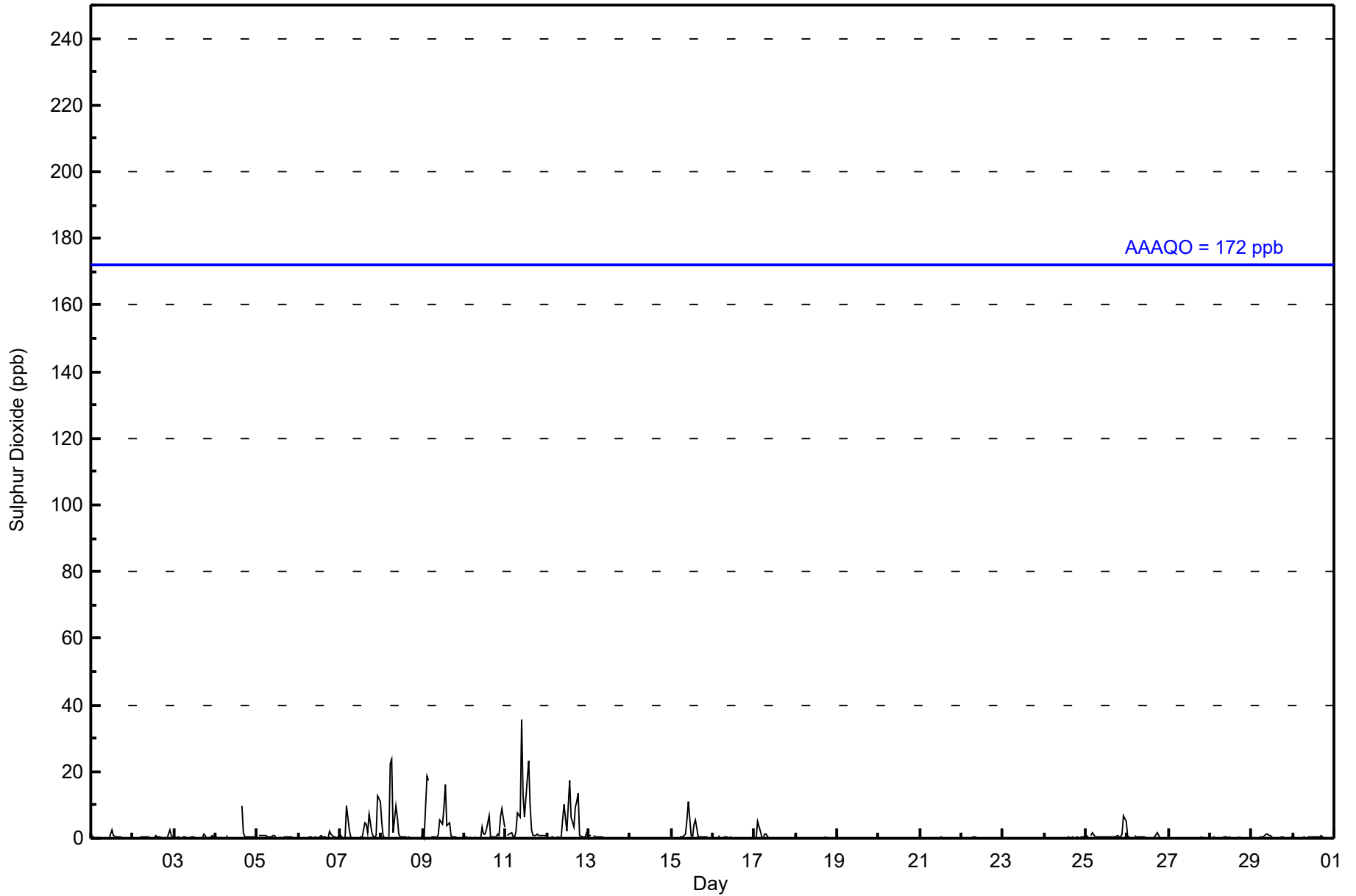
0.5	0.2	1.1	1.0	0.7	1.2	1.1	0.5	0.8	2.0	1.6	0.7	1.6	2.4	1.4	1.0	0.6	0.9	0.8	0.3	0.2	0.5	1.1	0.9	Diurnal Average	
4.8	0.9	18.7	17.2	9.7	22.5	23.8	7.7	9.9	35.7	13.0	6.3	17.8	23.2	9.8	9.6	9.2	11.0	13.7	1.2	0.9	6.2	12.7	10.9	Diurnal Maximum	

Z - zerospan      C - Calibration      M - Maintenance  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb    24-hr 48 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Mildred Lake - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Mildred Lake - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	669	97.81	97.81
11 - 20	11	1.61	99.42
21 - 60	4	0.58	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Mildred Lake - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	139	60	18	5	4	21	49	95	36	35	30	18	26	56	30	47	669
11 - 20	0	0	0	0	0	0	4	0	1	0	0	1	5	0	0	0	11
21 - 60	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	139	60	18	5	4	21	57	95	37	35	30	19	31	56	30	47	684

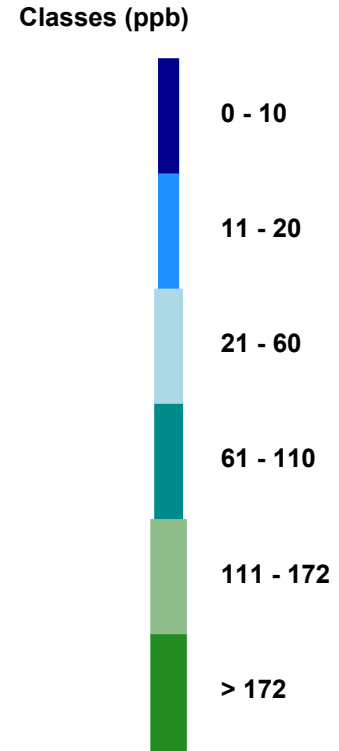
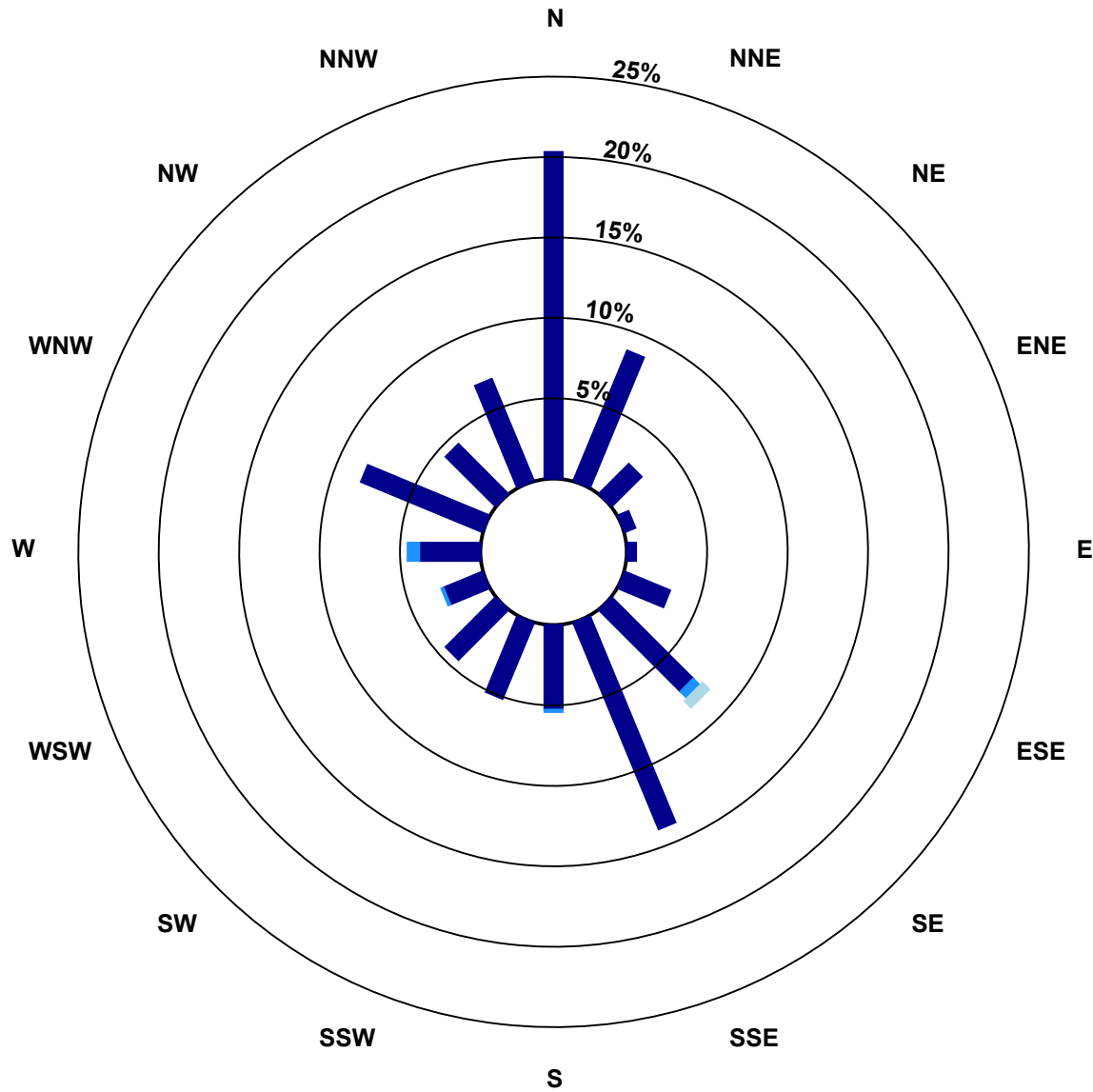
Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Mildred Lake

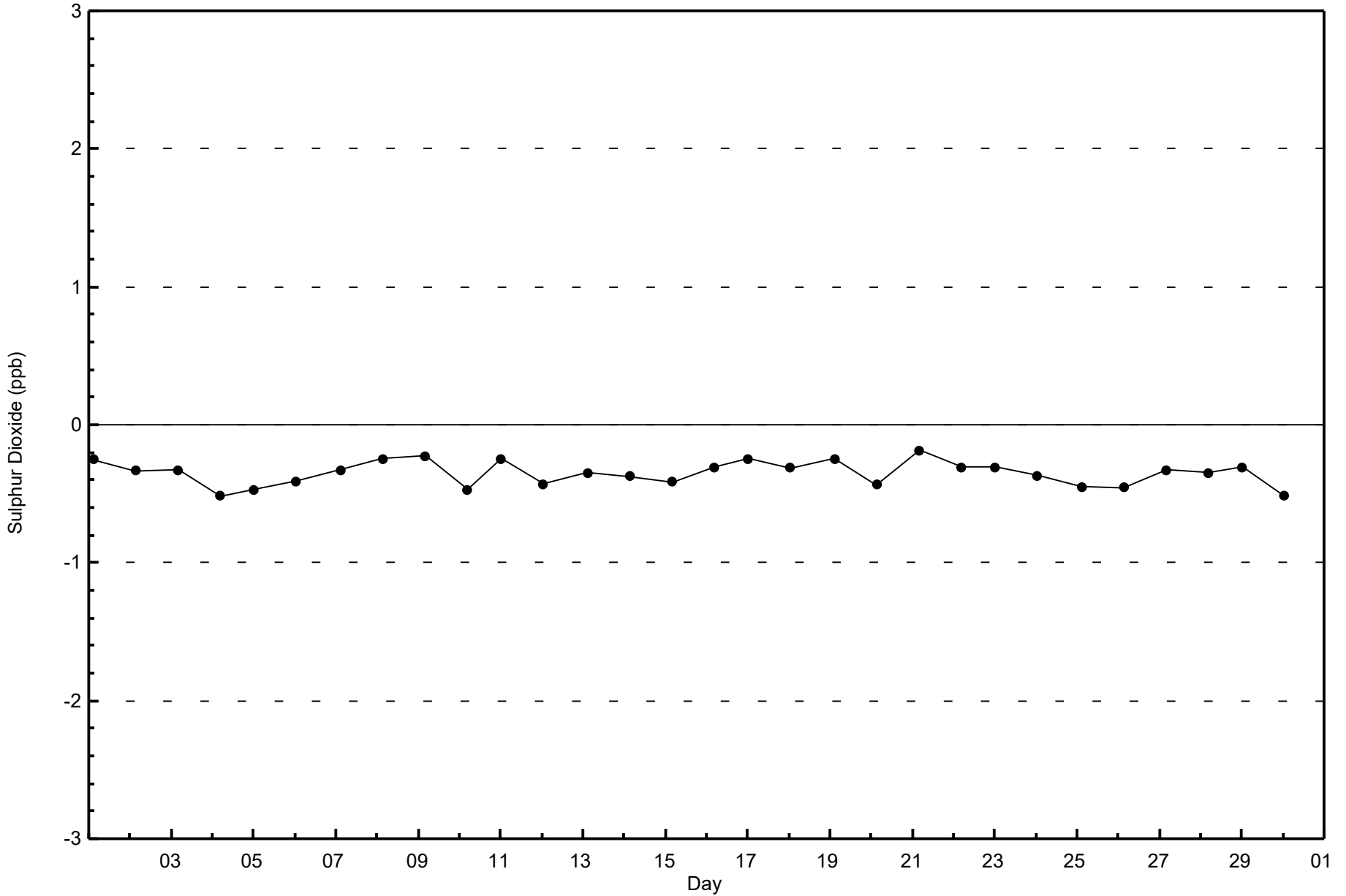


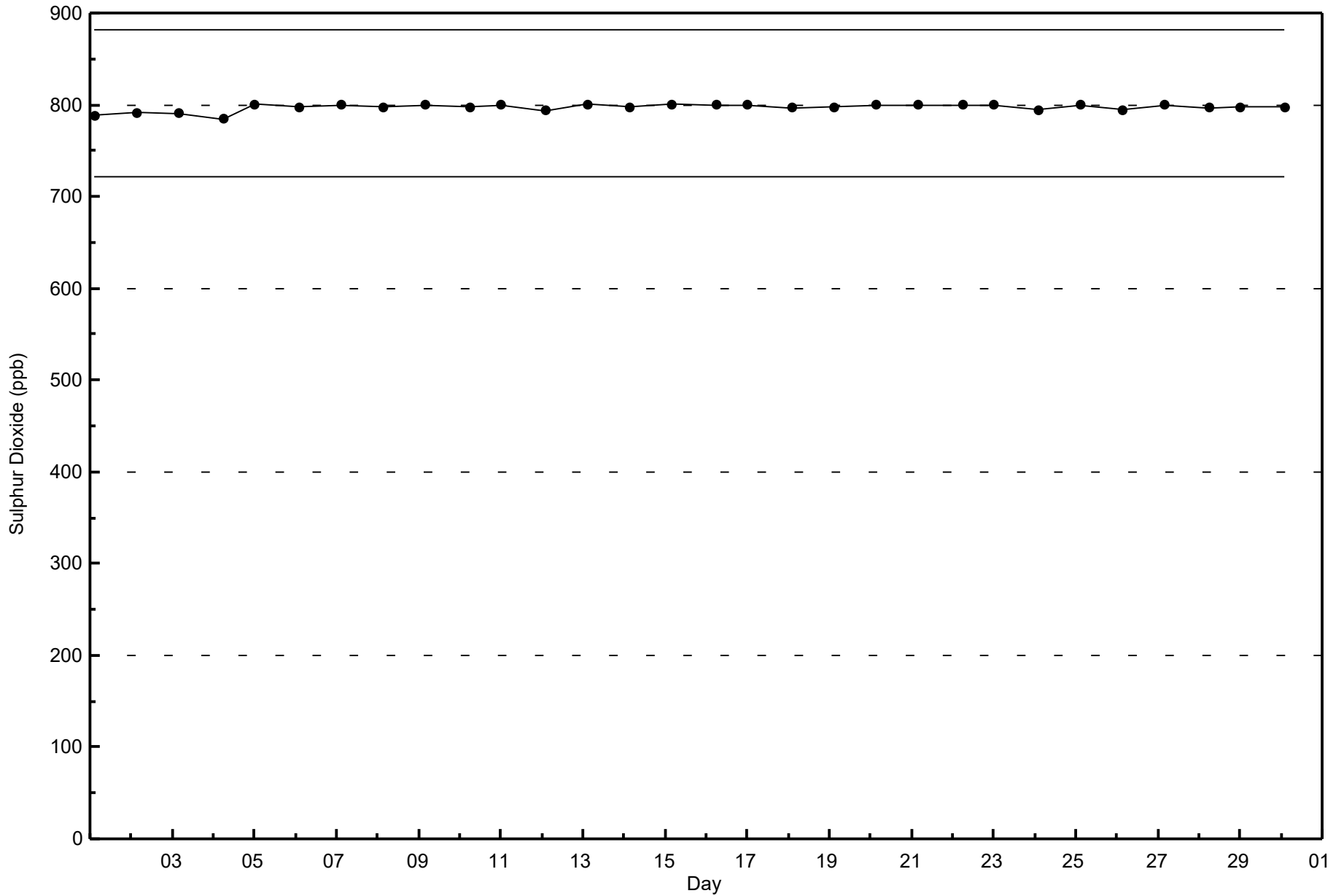
Total Number of Valid Hours: 684



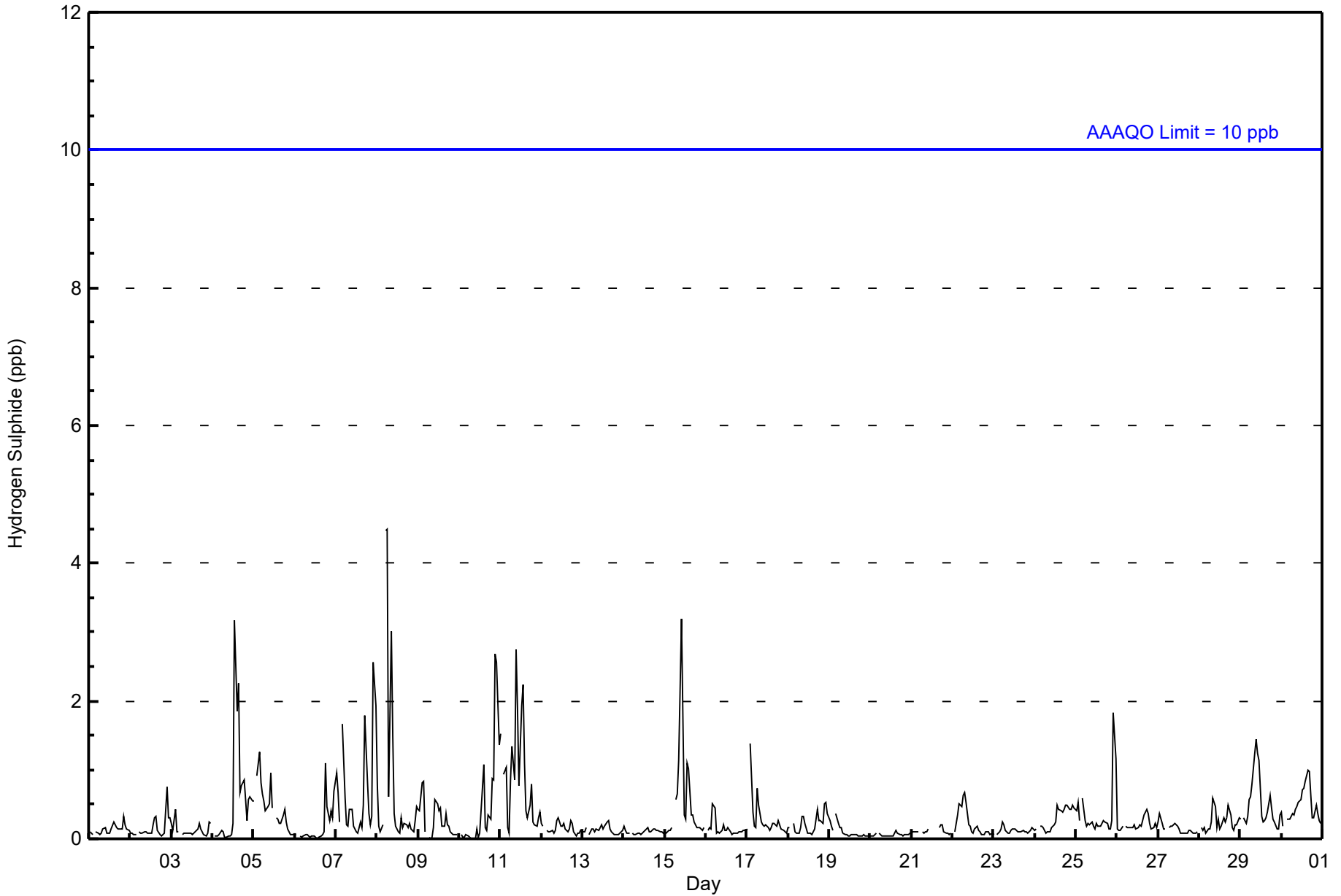
Wood Buffalo Environmental Association  
Zero Responses

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Mildred Lake - November 2024











**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Mildred Lake - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	675	98.68	98.68
3 - 4	9	1.32	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Mildred Lake - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	139	59	19	5	4	19	54	96	33	36	29	19	35	54	28	46	675
3 - 4	0	0	0	0	0	2	6	0	1	0	0	0	0	0	0	0	9
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	139	59	19	5	4	21	60	96	34	36	29	19	35	54	28	46	684

Total Number of Valid Hours: 684

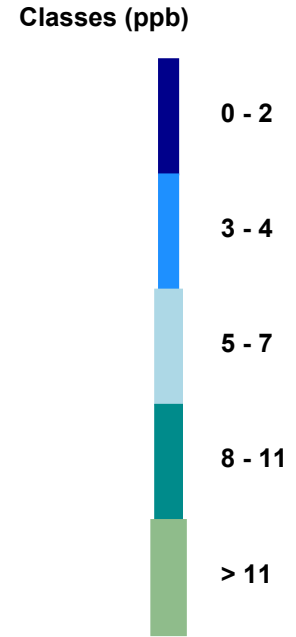
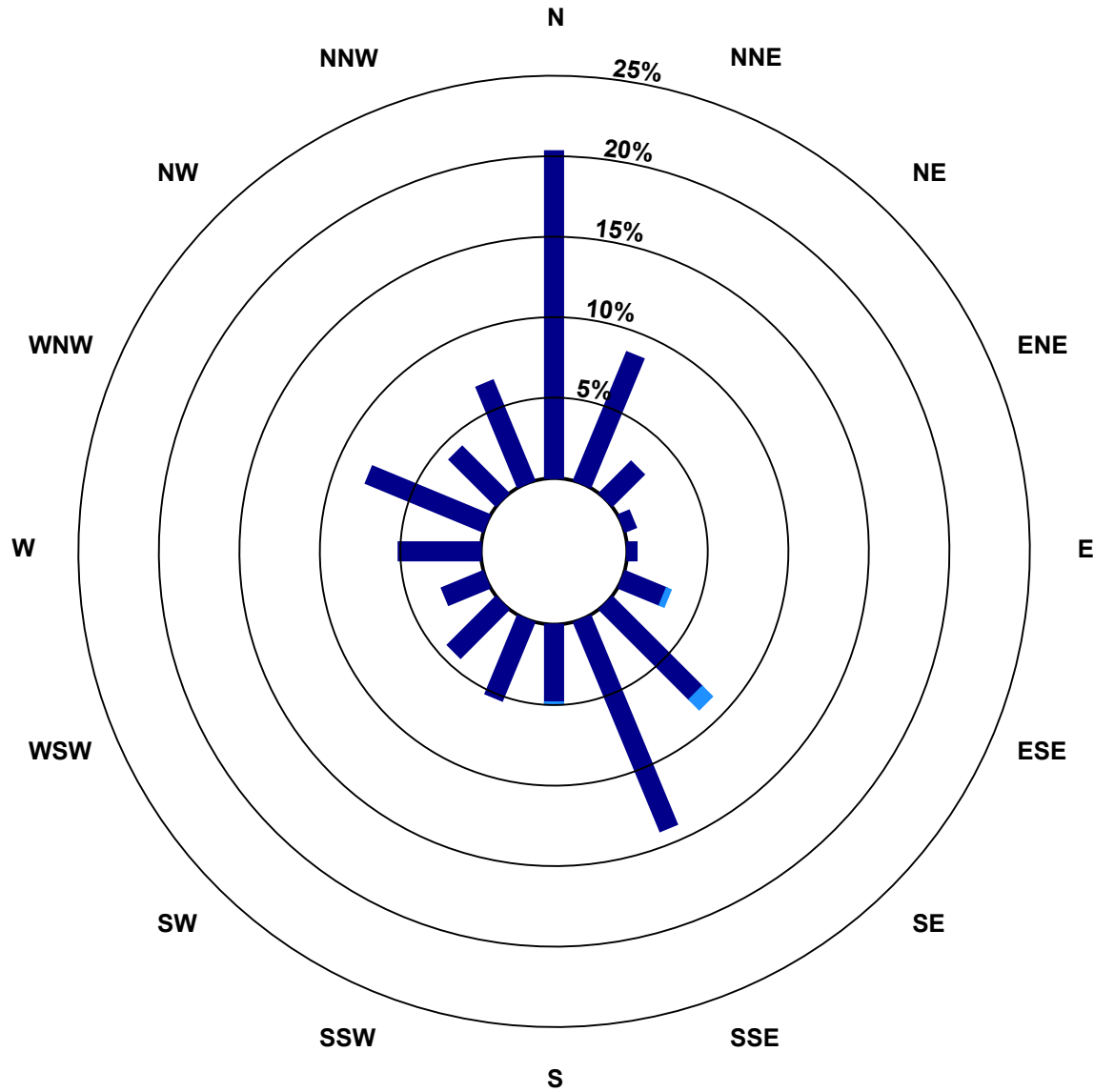
Total Number of Hours: 720



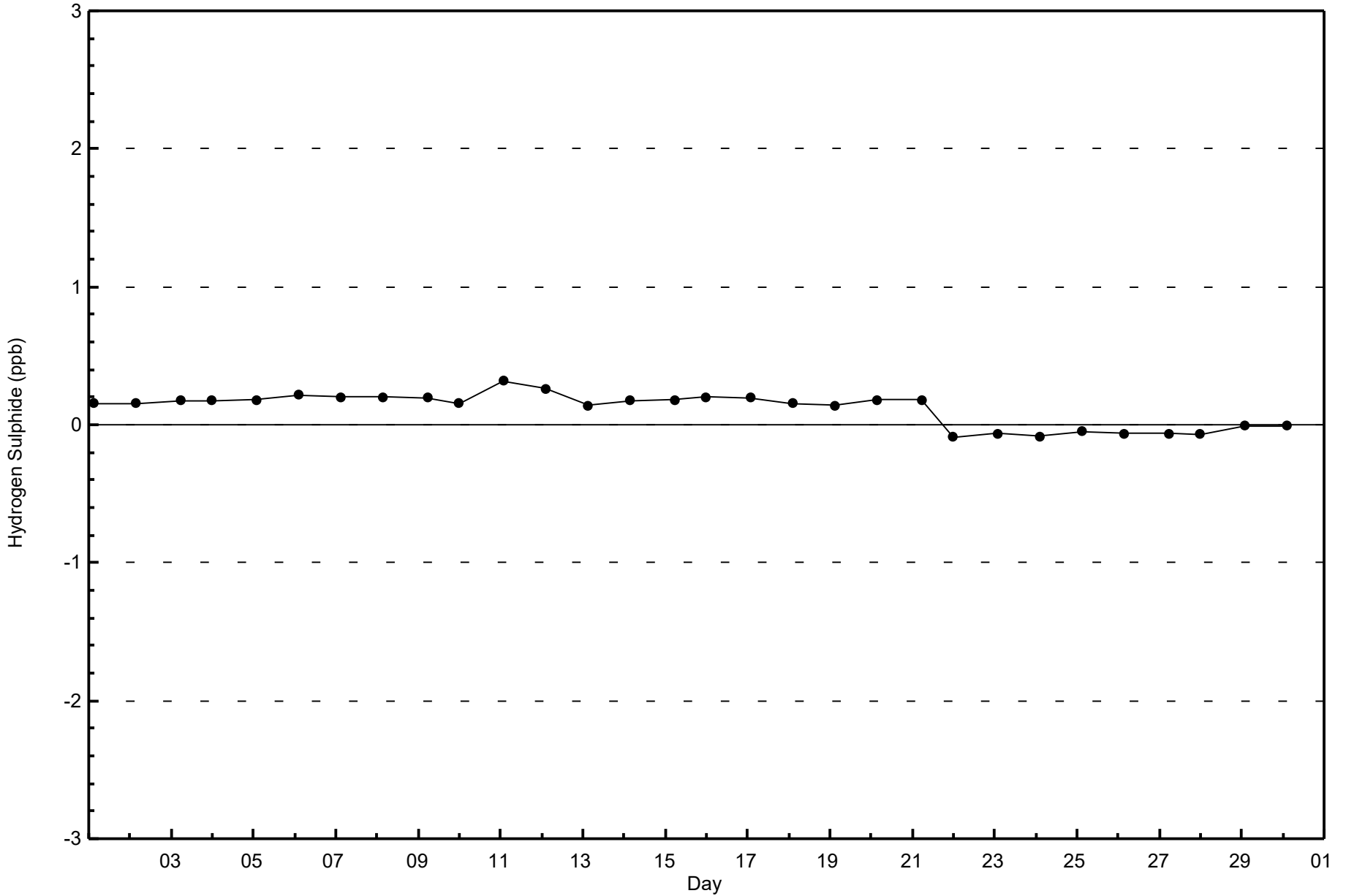


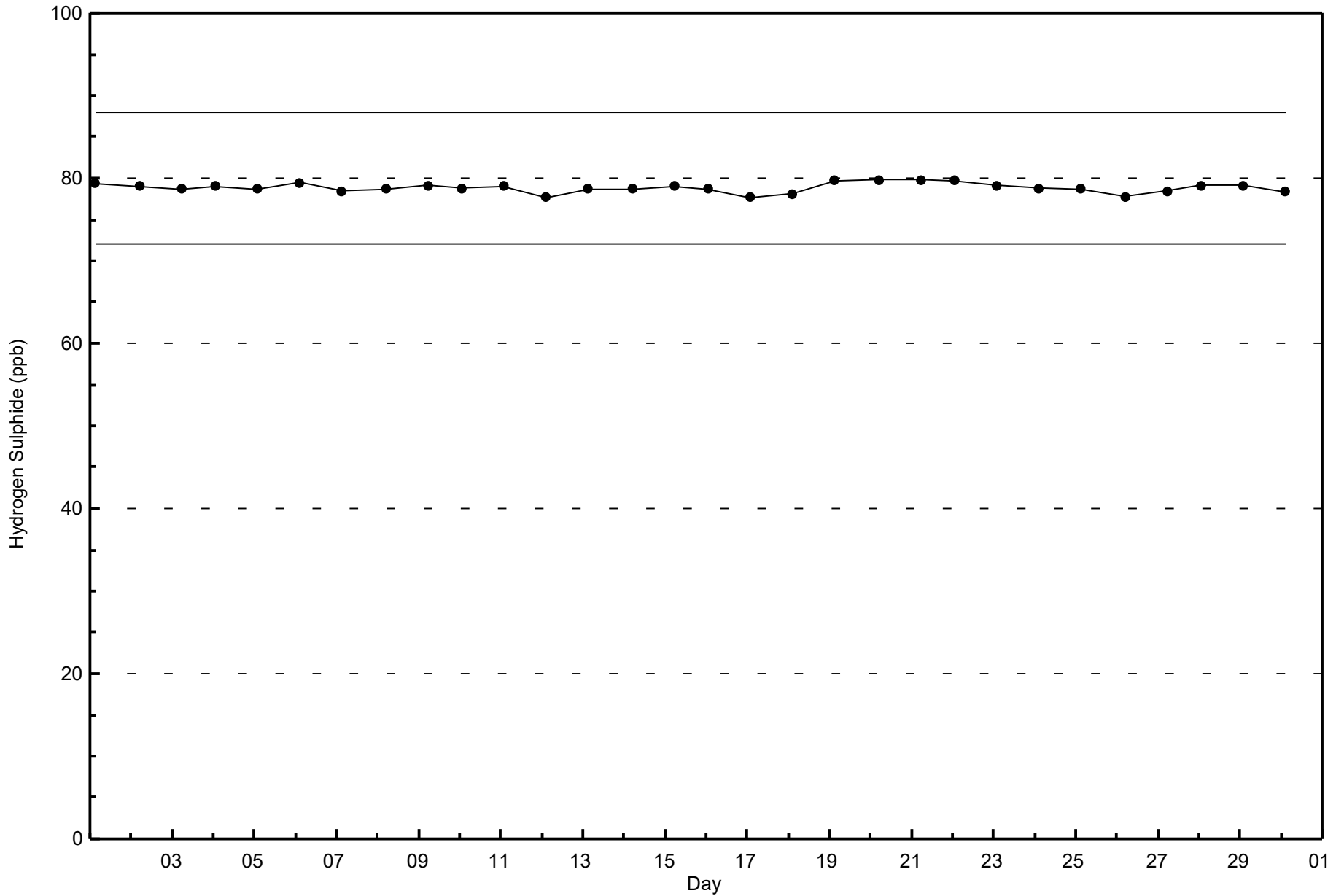
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Mildred Lake



Total Number of Valid Hours: 684







**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

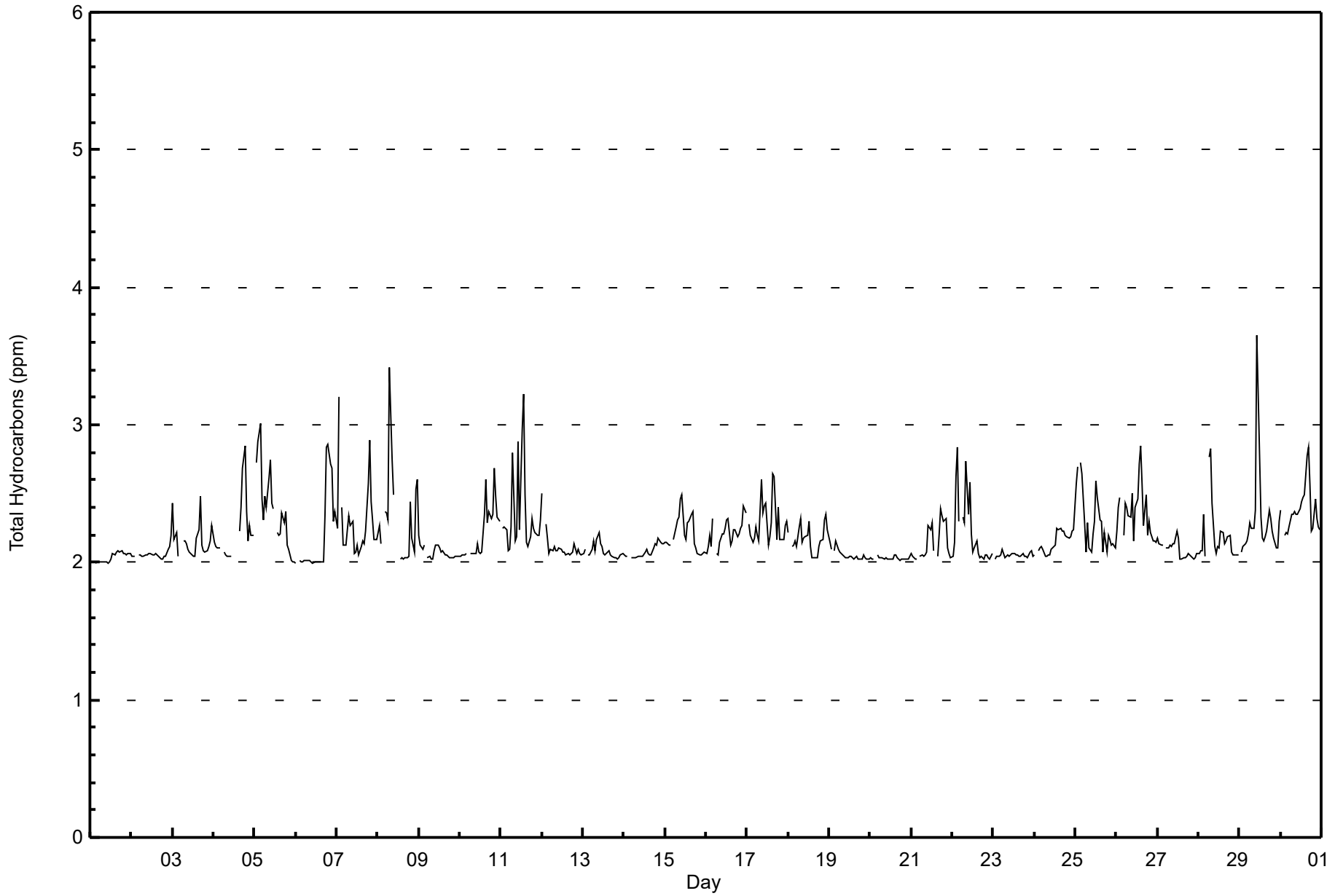
**Total Hydrocarbons (THC) - ppm**  
**Mildred Lake - November 2024**

Maximum Value: 3.7 ppm on Nov 29 11:00		Maximum Daily Average: 2.4 ppm on Nov 30		Hours in Service: 720																																																					
Minimum Value: 2.0 ppm on Nov 6 01:00		Minimum Daily Average: 2.0 ppm on Nov 20		Hours of Data: 680																																																					
Maximum Diurnal Average: 2.2 ppm at hour 11		Minimum Diurnal Average: 2.1 ppm at hour 6		Hours of Missing Data: 40																																																					
Monthly Average: 2.19 ppm		Percentiles: P <sub>1</sub> = 2.0 P <sub>10</sub> = 2.0 Q <sub>1</sub> = 2.1 Median = 2.1 Q <sub>3</sub> = 2.3 P <sub>90</sub> = 2.4 P <sub>99</sub> = 2.9		Hours of Calibration: 34																																																					
				Percent Operational Time: 99.2																																																					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																																	
1-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.2																									
2-Nov	2.0	2.0	2.0	Z	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.1	2.2																									
3-Nov	2.4	2.2	2.2	2.0	Z	UO	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.2	2.2	2.5	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.3	2.2	2.5	2.2																									
4-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	C	C	C	C	2.2	2.4	2.7	2.9	2.4	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.9																									
5-Nov	Z	2.7	2.9	3.0	2.5	2.3	2.5	2.4	2.6	2.7	2.4	2.4	M	2.2	2.2	2.2	2.4	2.3	2.4	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	3.0																										
6-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.8	2.9	2.7	2.7	2.3	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.9																										
7-Nov	2.2	3.2	Z	2.4	2.1	2.1	2.2	2.3	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.6	2.9	2.4	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3	3.2																										
8-Nov	2.2	2.3	2.1	Z	2.4	2.4	2.3	3.4	2.7	2.5	M	M	M	2.0	2.0	2.0	2.0	2.0	2.0	2.4	2.2	2.1	2.5	2.6	2.2	2.2	2.2	2.2	2.2	2.3	3.4																										
9-Nov	2.2	2.1	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2																										
10-Nov	2.0	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.6	2.3	2.4	2.3	2.3	2.7	2.5	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.7																										
11-Nov	Z	2.3	2.3	2.2	2.1	2.1	2.3	2.8	2.2	2.2	2.9	2.2	3.0	3.2	2.5	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.4																										
12-Nov	2.5	Z	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.5																									
13-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																									
14-Nov	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																									
15-Nov	2.1	2.1	2.1	2.1	Z	2.2	2.3	2.3	2.3	2.3	2.5	2.5	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																									
16-Nov	2.1	2.1	2.2	2.1	2.3	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.4																									
17-Nov	Z	2.3	2.2	2.1	2.2	2.3	2.2	2.2	2.6	2.4	2.4	2.4	2.1	2.2	2.3	2.6	2.6	2.2	2.4	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.6																									
18-Nov	2.2	Z	2.1	2.1	2.2	2.1	2.3	2.3	2.1	2.2	2.2	2.2	2.3	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3																									
19-Nov	2.1	2.1	Z	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																									
20-Nov	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																									
21-Nov	2.1	2.0	2.0	2.0	Z	2.0	2.1	2.0	2.1	2.1	2.3	2.2	2.3	2.1	M	2.0	2.2	2.4	2.3	2.3	2.3	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4																									
22-Nov	2.0	2.2	2.6	2.8	2.3	Z	2.3	2.3	2.7	2.4	2.6	2.2	2.1	2.1	2.2	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.2																									
23-Nov	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1																									
24-Nov	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2																									
25-Nov	2.6	2.7	Z	2.7	2.6	2.3	2.1	2.3	2.1	2.1	2.2	2.3	2.6	2.5	2.3	2.3	2.1	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																									
26-Nov	2.2	2.4	2.5	Z	2.2	2.4	2.4	2.3	2.3	2.5	2.2	2.4	2.5	2.7	2.8	2.6	2.3	2.5	2.2	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4																									
27-Nov	2.2	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.2																									
28-Nov	2.1	2.1	2.1	2.4	2.0	Z	2.8	2.8	2.4	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																									
29-Nov	Z	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.3	2.4	3.7	3.2	2.3	2.2	2.2	2.2	2.2	2.2	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	3.7																									
30-Nov	2.4	Z	2.2	2.2	2.2	2.3	2.4	2.3	2.4	2.4	2.3	2.4	2.4	2.5	2.5	2.8	2.8	2.6	2.2	2.2	2.5	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.8																									
																											Diurnal Average	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
																											Diurnal Maximum	2.6	3.2	2.9	3.0	2.6	2.4	2.8	3.4	2.7	2.7	3.7	3.2	3.0	3.2	2.8	2.8	2.8	2.7	2.9	2.9	2.7	2.7	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6
																											Z - zerspan	C - Calibration			M - Maintenance				UO - Unstable Operation																						



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Mildred Lake - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Mildred Lake - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	160	23.53	23.53
2.1 - 3.0	515	75.74	99.26
3.1 - 10.0	5	0.74	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Mildred Lake - November 2024**

<b>Concentration</b> <b>Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	56	25	5	0	2	0	5	10	16	10	13	3	0	1	5	9	160
2.1 - 3.0	83	35	13	5	2	21	51	83	19	25	17	15	31	54	23	38	515
3.1 - 10.0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	2	0	5
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	139	60	18	5	4	21	57	94	35	35	30	18	31	56	30	47	680

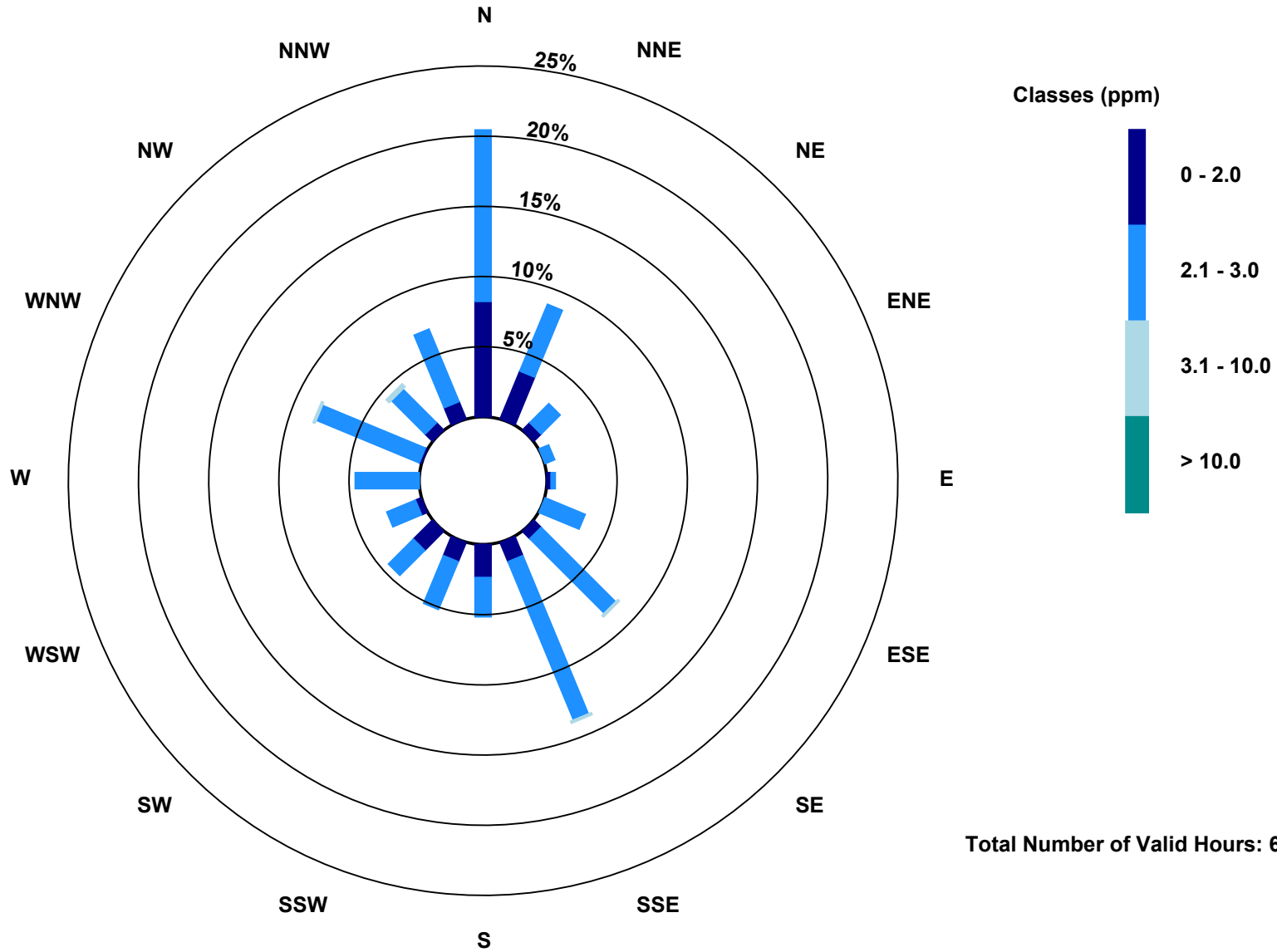
Total Number of Valid Hours: 680

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Hydrocarbons (THC) - ppm  
Mildred Lake

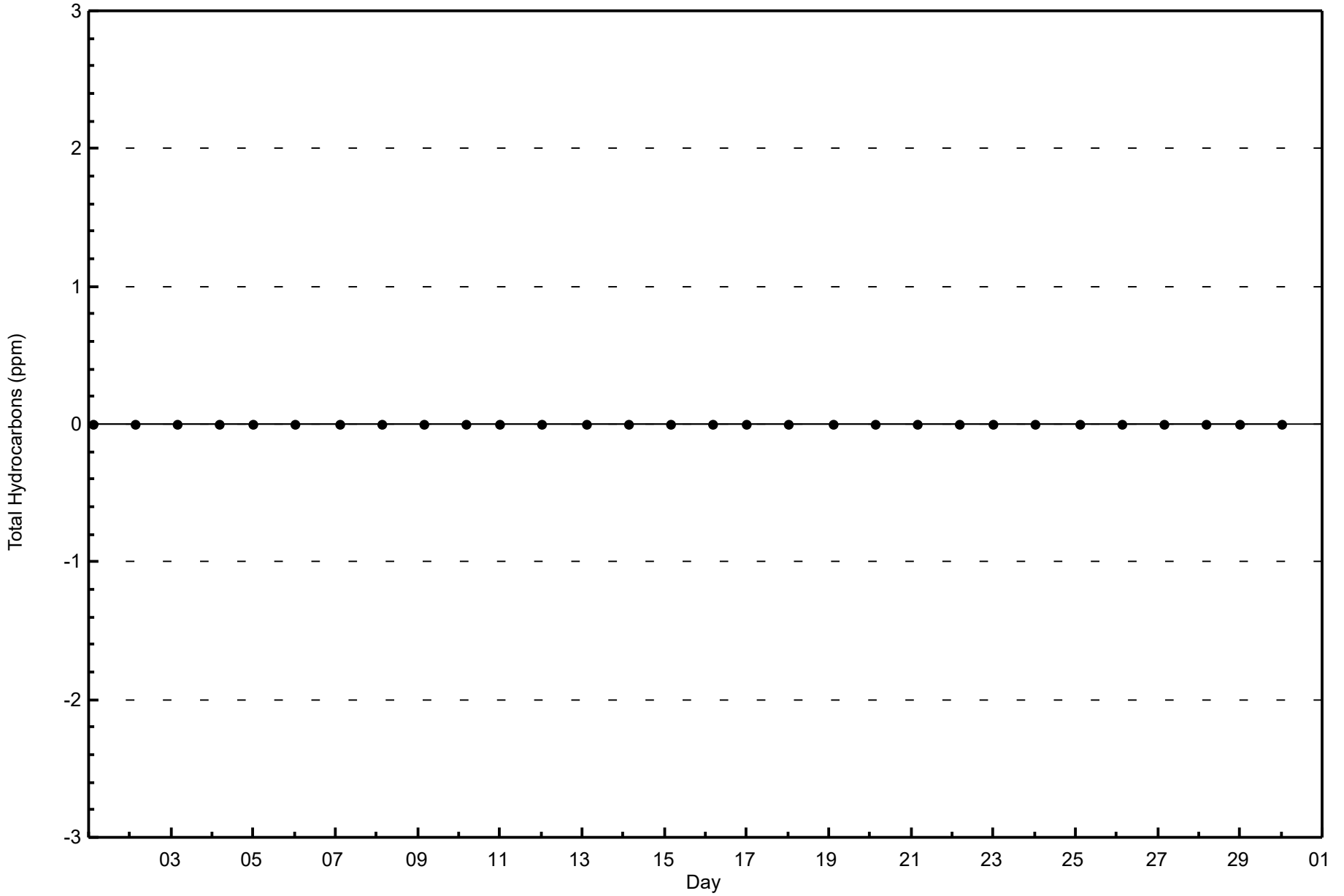


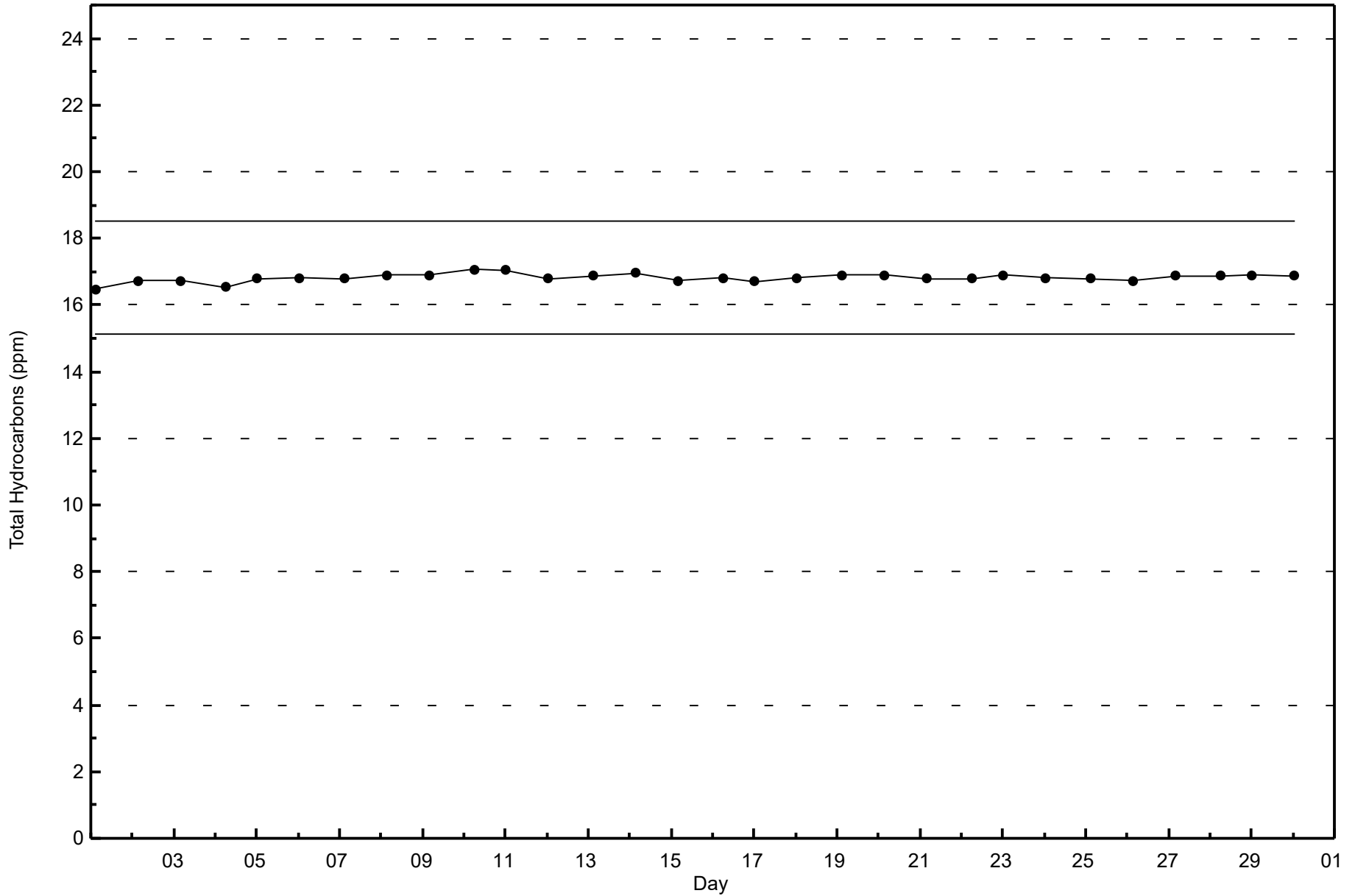




Wood Buffalo Environmental Association  
Zero Responses

Total Hydrocarbons (THC) - ppm  
Mildred Lake - November 2024



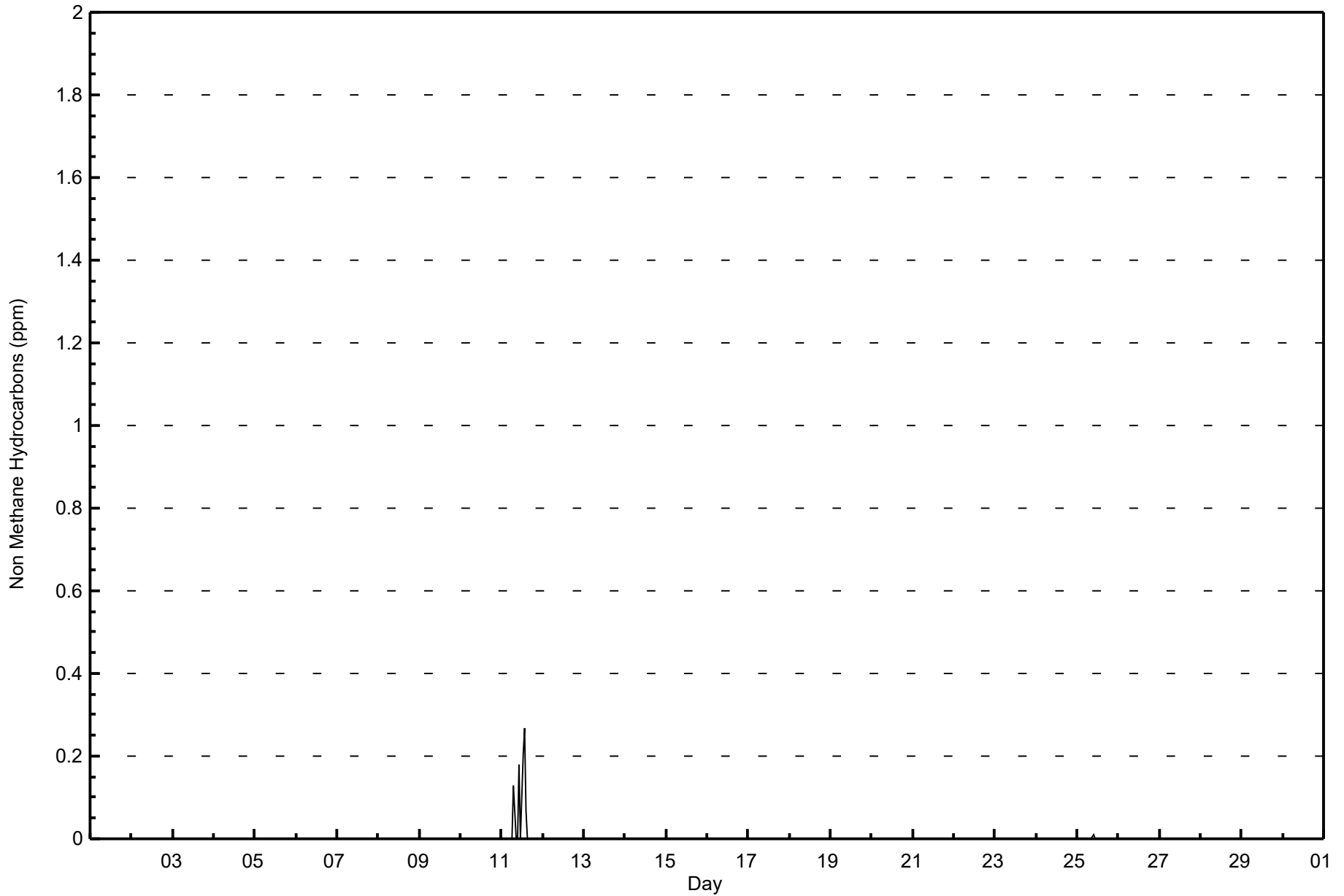






Wood Buffalo Environmental Association  
Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm  
Mildred Lake - November 2024





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Mildred Lake - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	674	99.12	99.12
0.006 - 0.05	1	0.15	99.26
0.06 - 0.1	2	0.29	99.56
> 0.1	3	0.44	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Mildred Lake - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	139	60	18	5	4	19	54	94	34	35	30	18	31	56	30	47	674
0.006 - 0.05	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
0.06 - 0.1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
> 0.1	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
<b>Totals</b>	139	60	18	5	4	21	57	94	35	35	30	18	31	56	30	47	680

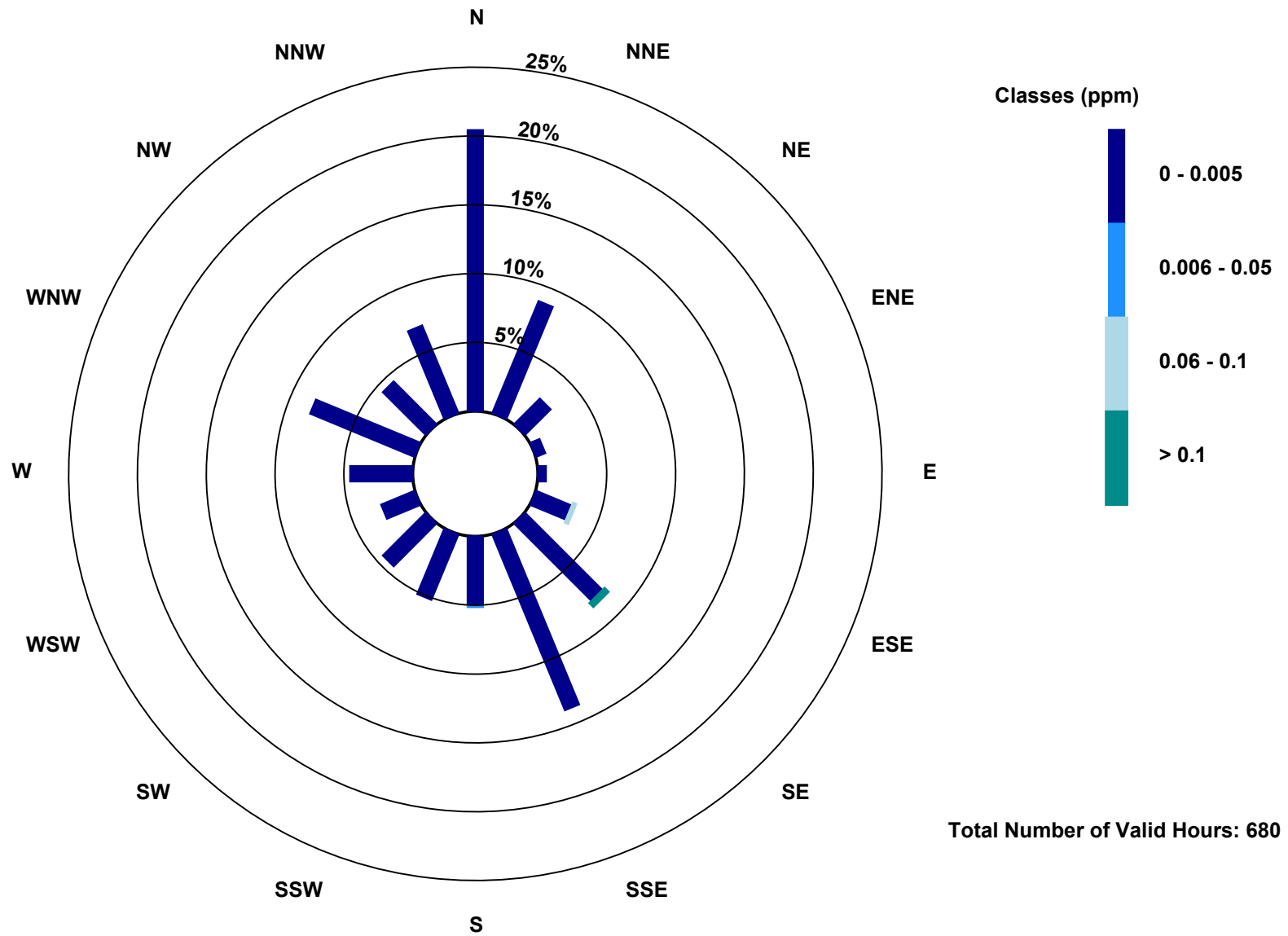
Total Number of Valid Hours: 680

Total Number of Hours: 720

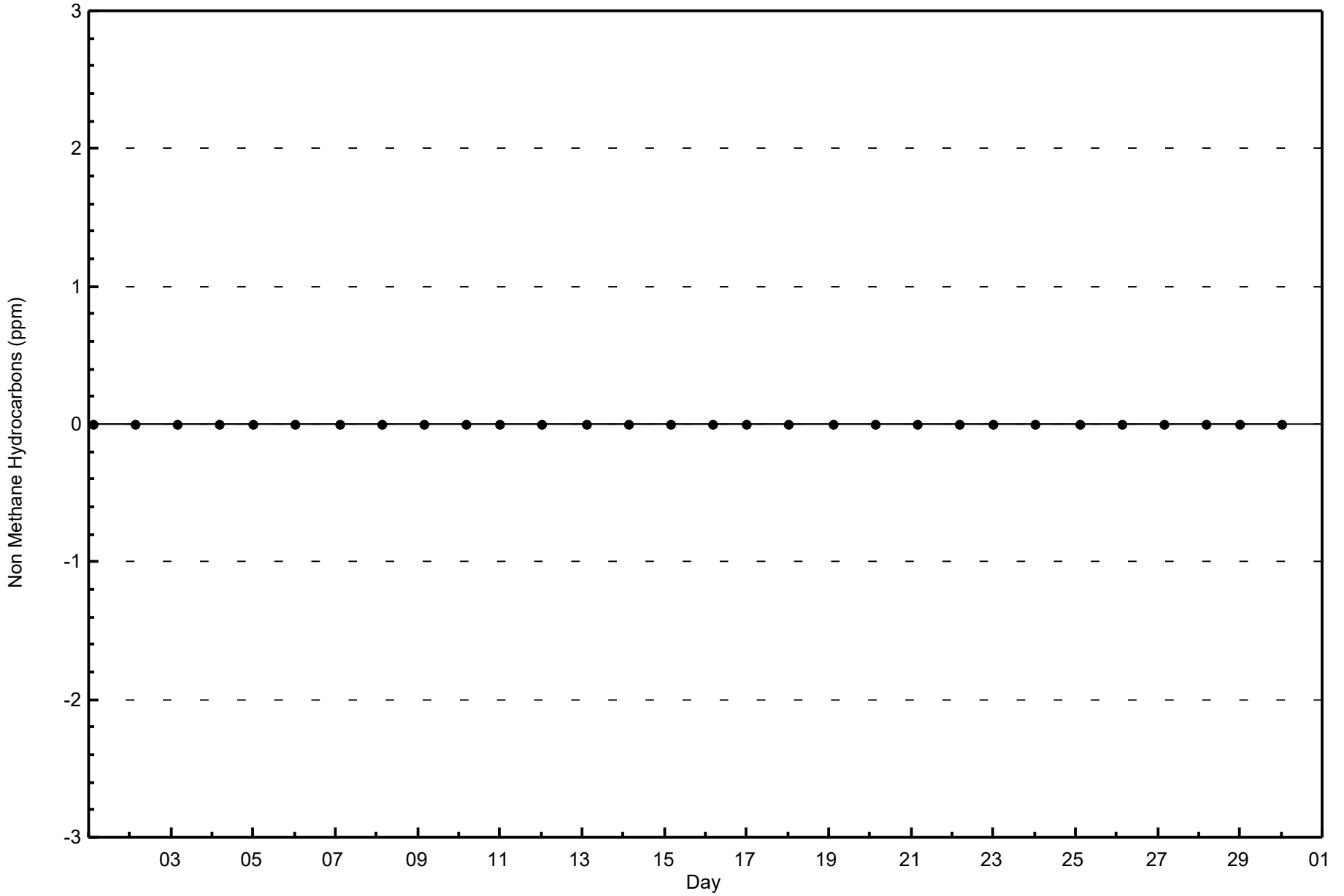


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

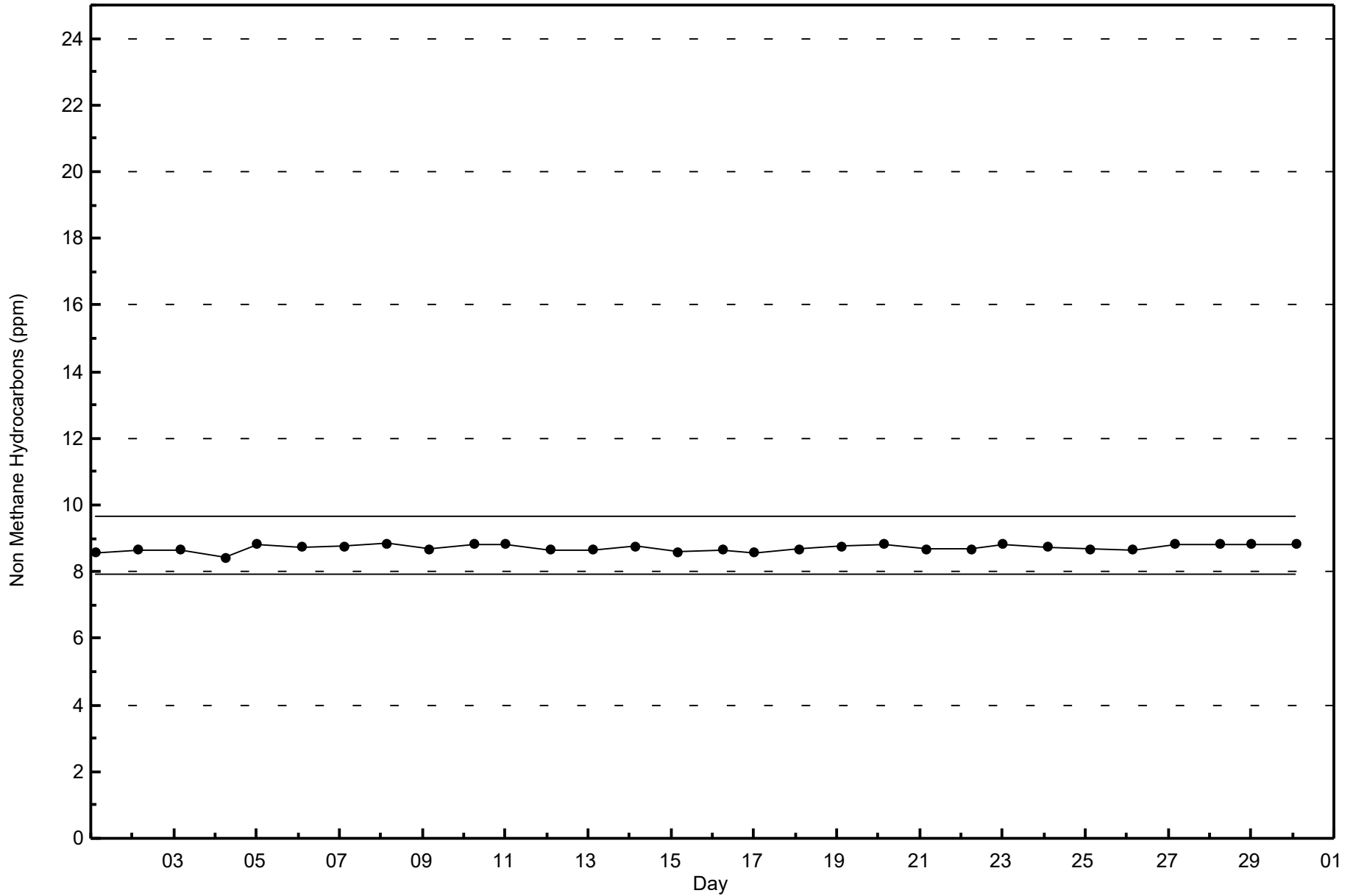
Non Methane Hydrocarbons (NMHC) - ppm  
Mildred Lake



Total Number of Valid Hours: 680









**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

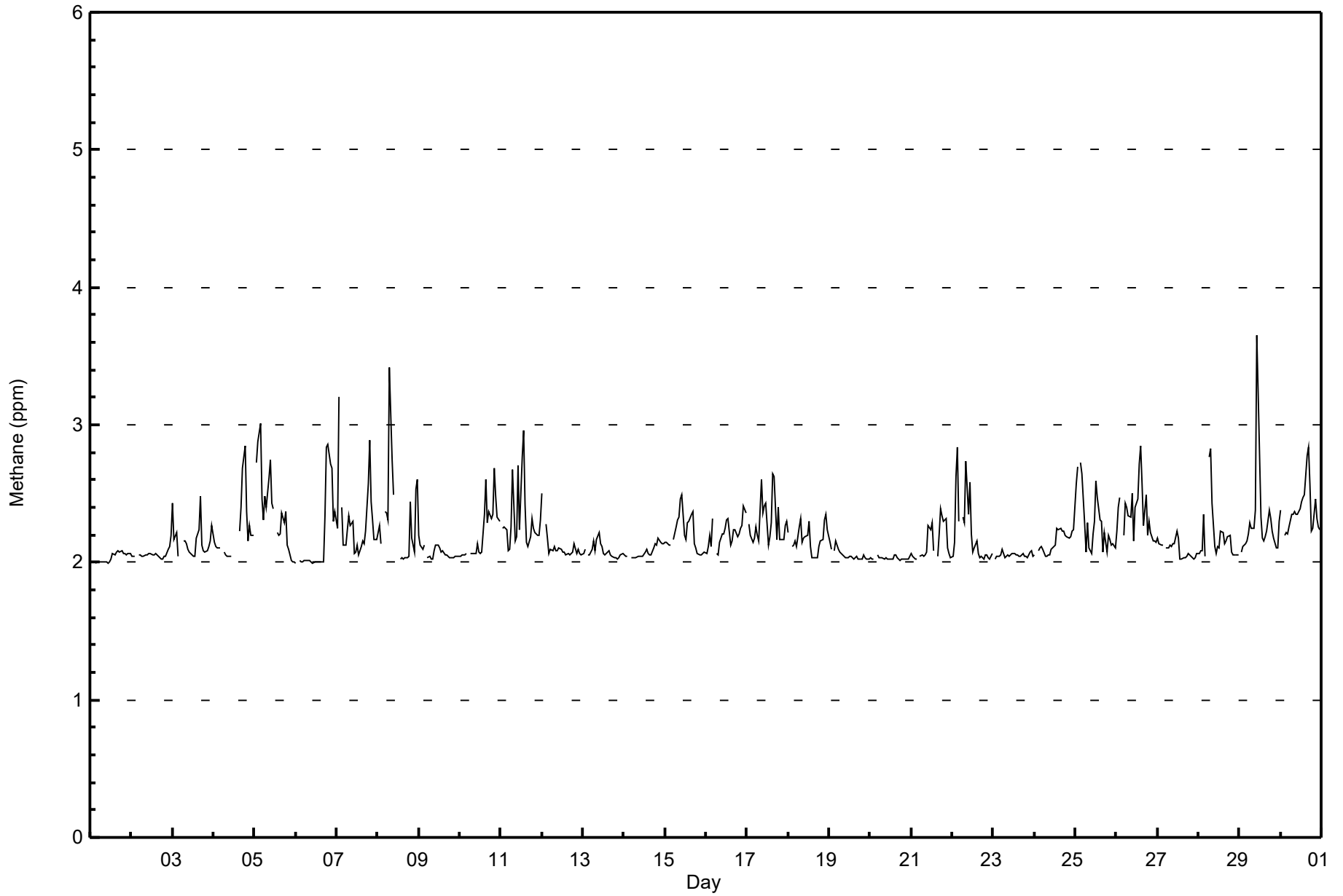
**Methane (CH<sub>4</sub>) - ppm**  
**Mildred Lake - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0		Hours in Service: 720																			Daily Average		Daily Maximum															
Maximum Value: 3.7 ppm on Nov 29 11:00		Maximum Daily Average: 2.4 ppm on Nov 30																			Hours of Data: 680		Daily Maximum															
Minimum Value: 2.0 ppm on Nov 6 01:00		Minimum Daily Average: 2.0 ppm on Nov 20																			Hours of Missing Data: 40		Daily Maximum															
Maximum Diurnal Average: 2.2 ppm at hour 11		Minimum Diurnal Average: 2.1 ppm at hour 6																			Hours of Calibration: 34		Daily Maximum															
Monthly Average: 2.19 ppm		Percentiles: P <sub>1</sub> = 2.0 P <sub>10</sub> = 2.0 Q <sub>1</sub> = 2.1 Median = 2.1 Q <sub>3</sub> = 2.3 P <sub>90</sub> = 2.4 P <sub>99</sub> = 2.9																			Percent Operational Time: 99.2		Daily Maximum															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24														
1-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.2	2.2					
2-Nov	2.0	2.0	2.0	Z	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2				
3-Nov	2.4	2.2	2.2	2.0	Z	UO	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.2	2.2	2.5	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	2.2			
4-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	C	C	C	C	2.2	2.4	2.7	2.9	2.4	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.9	2.2			
5-Nov	Z	2.7	2.9	3.0	2.5	2.3	2.5	2.4	2.6	2.7	2.4	2.4	M	2.2	2.2	2.2	2.4	2.3	2.4	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	3.0				
6-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.8	2.9	2.7	2.7	2.3	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.9	2.2			
7-Nov	2.2	3.2	Z	2.4	2.1	2.1	2.2	2.3	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.6	2.9	2.4	2.3	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	3.2				
8-Nov	2.2	2.3	2.1	Z	2.4	2.4	2.3	3.4	2.7	2.5	M	M	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	2.2	2.1	2.5	2.6	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	3.4			
9-Nov	2.2	2.1	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2				
10-Nov	2.0	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.6	2.3	2.4	2.3	2.3	2.7	2.5	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.7	2.7			
11-Nov	Z	2.3	2.3	2.2	2.1	2.1	2.3	2.7	2.2	2.2	2.7	2.2	2.8	3.0	2.4	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	3.0			
12-Nov	2.5	Z	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.5			
13-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2			
14-Nov	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2		
15-Nov	2.1	2.1	2.1	2.1	Z	2.2	2.3	2.3	2.3	2.5	2.5	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.5	
16-Nov	2.1	2.1	2.2	2.1	2.3	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.4	
17-Nov	Z	2.3	2.2	2.1	2.2	2.3	2.2	2.2	2.6	2.4	2.4	2.4	2.1	2.2	2.3	2.6	2.6	2.2	2.4	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.6		
18-Nov	2.2	Z	2.1	2.1	2.2	2.1	2.3	2.3	2.1	2.2	2.2	2.2	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3		
19-Nov	2.1	2.1	Z	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	
20-Nov	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
21-Nov	2.1	2.0	2.0	2.0	Z	2.0	2.1	2.0	2.1	2.1	2.3	2.2	2.3	2.1	M	2.0	2.2	2.4	2.3	2.3	2.3	2.3	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.1	
22-Nov	2.0	2.2	2.6	2.8	2.3	Z	2.3	2.3	2.7	2.4	2.6	2.2	2.1	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	
23-Nov	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	
24-Nov	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	
25-Nov	2.6	2.7	Z	2.7	2.6	2.3	2.1	2.3	2.1	2.1	2.2	2.3	2.6	2.5	2.3	2.3	2.1	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.7	
26-Nov	2.2	2.4	2.5	Z	2.2	2.4	2.4	2.3	2.3	2.5	2.2	2.4	2.5	2.7	2.8	2.6	2.3	2.5	2.2	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.8
27-Nov	2.2	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	
28-Nov	2.1	2.1	2.1	2.4	2.0	Z	2.8	2.8	2.4	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.8
29-Nov	Z	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.3	2.4	3.7	3.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	3.7	
30-Nov	2.4	Z	2.2	2.2	2.2	2.3	2.4	2.3	2.4	2.4	2.3	2.4	2.4	2.5	2.5	2.8	2.8	2.6	2.2	2.2	2.5	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.8	
2.2																												Diurnal Average										
2.6																												Diurnal Maximum										
Z - zerospan	C - Calibration					M - Maintenance					UO - Unstable Operation																											



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Methane (CH<sub>4</sub>) - ppm**  
**Mildred Lake - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Mildred Lake - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	160	23.53	23.53
2.1 - 3.0	516	75.88	99.41
3.1 - 10.0	4	0.59	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Mildred Lake - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	56	25	5	0	2	0	5	10	16	10	13	3	0	1	5	9	160
2.1 - 3.0	83	35	13	5	2	21	52	83	19	25	17	15	31	54	23	38	516
3.1 - 10.0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	2	0	4
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	139	60	18	5	4	21	57	94	35	35	30	18	31	56	30	47	680

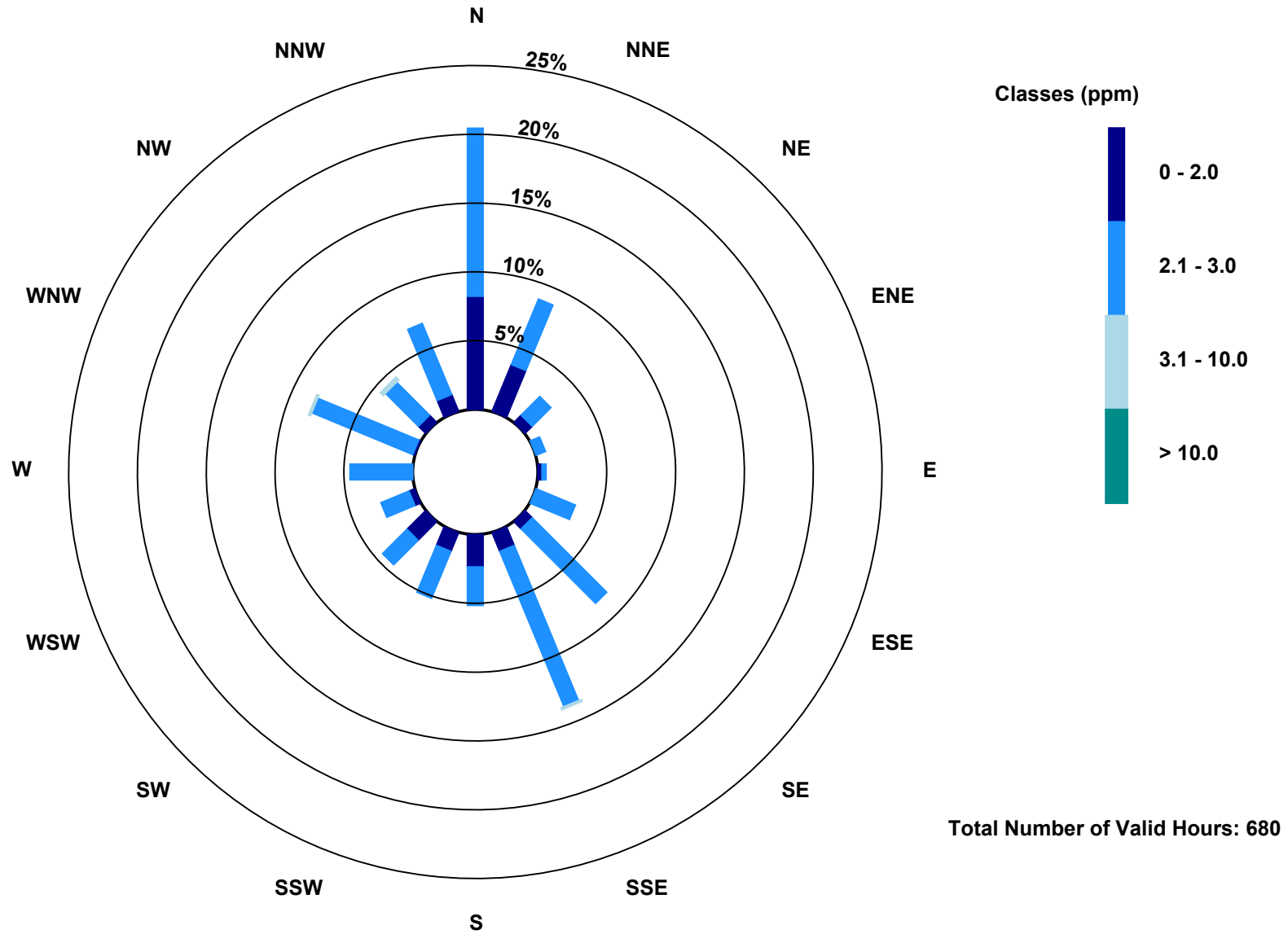
Total Number of Valid Hours: 680

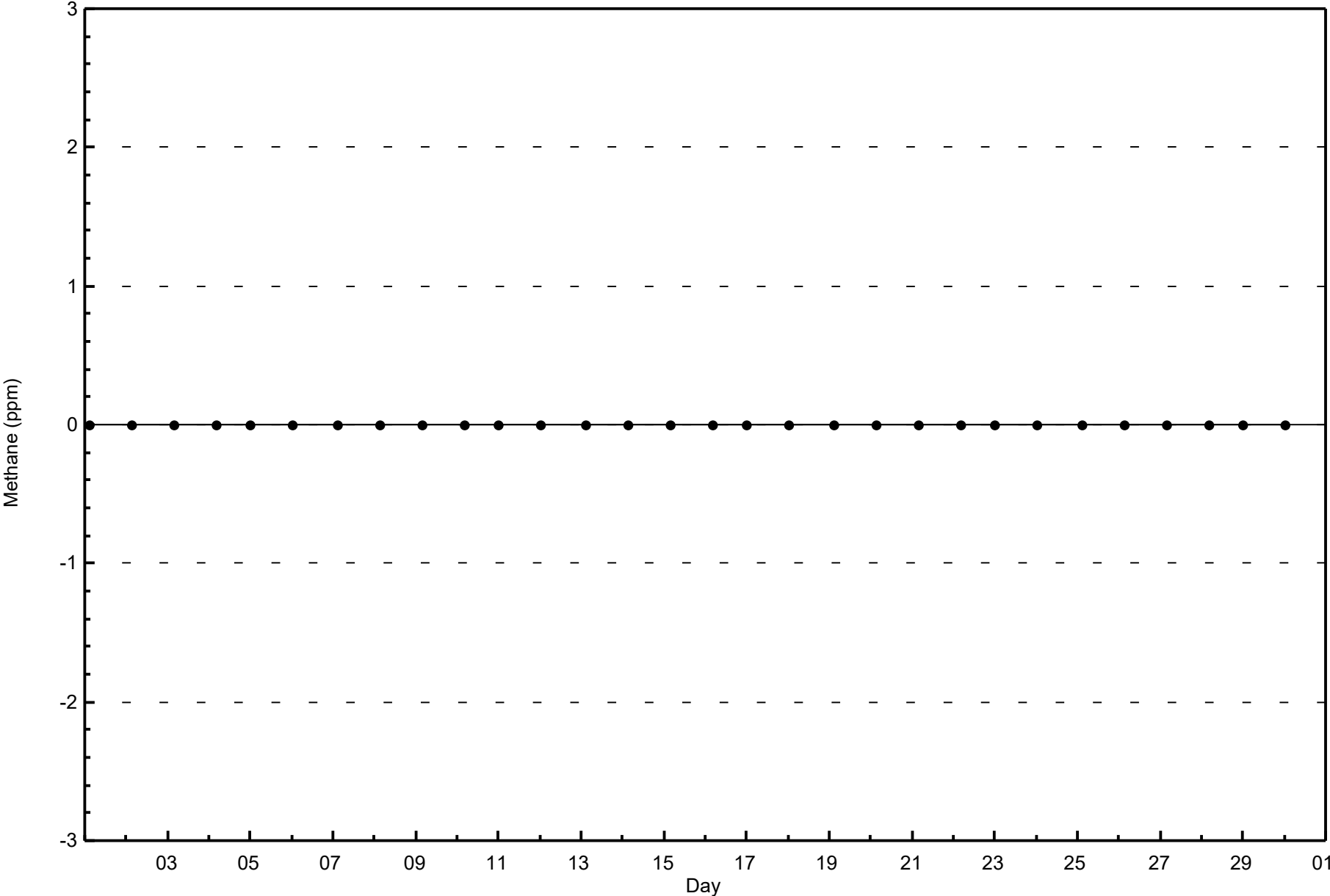
Total Number of Hours: 720

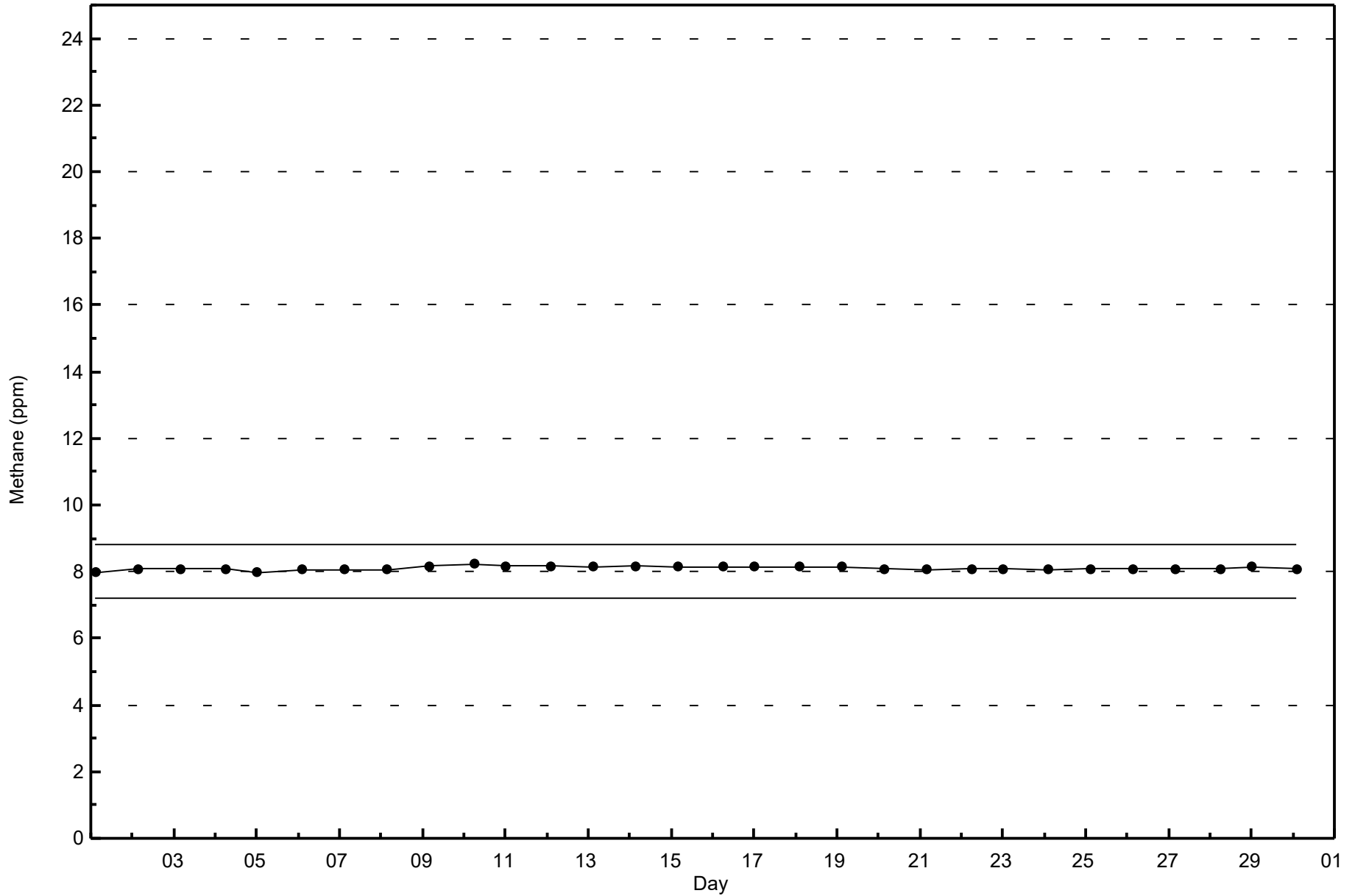


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Methane (CH<sub>4</sub>) - ppm  
Mildred Lake









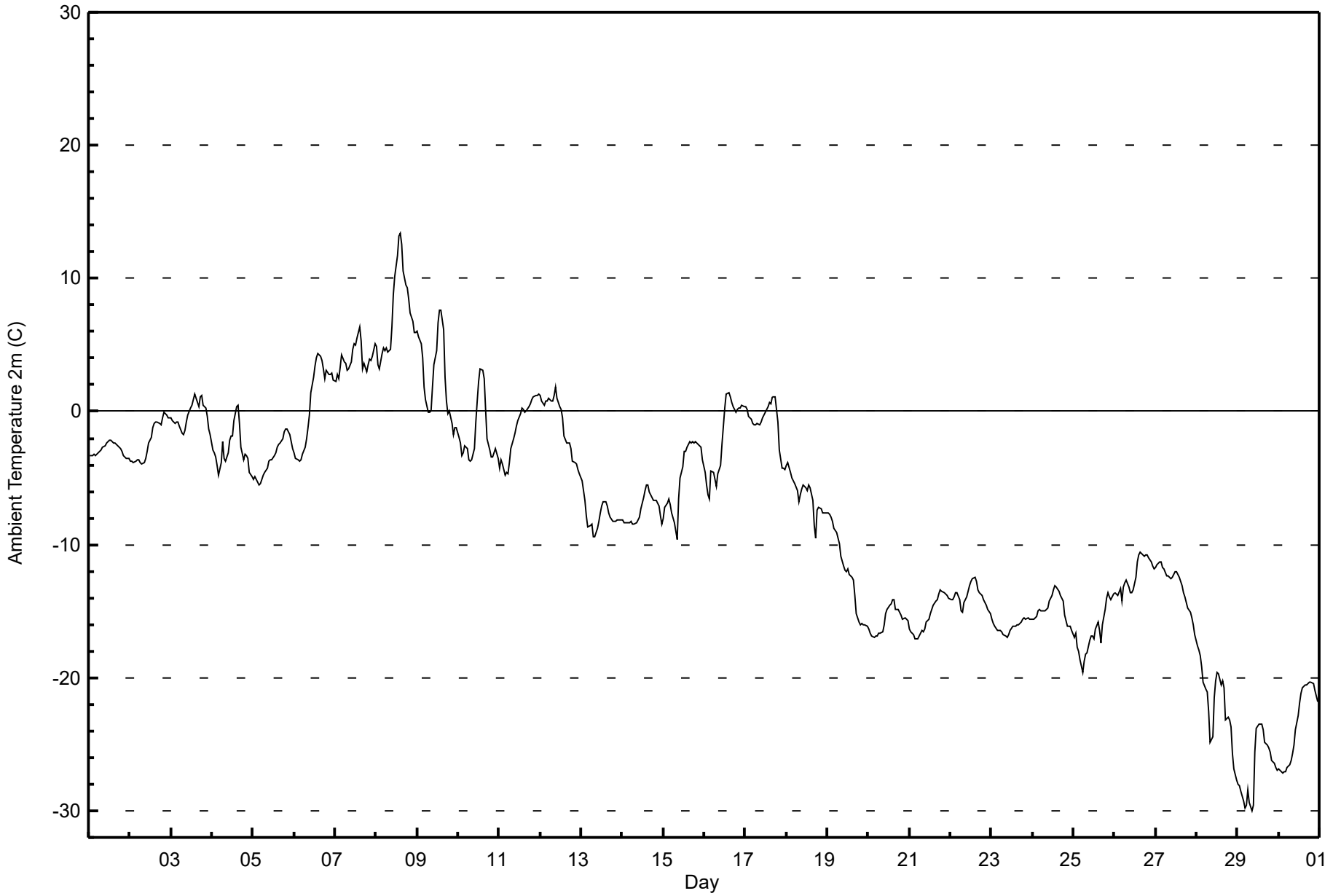


Maximum Value: 13.4 C on Nov 8 15:00      Maximum Daily Average: 7.5 C on Nov 8																						Hours in Service: 720 Hours of Data: 720																										
Minimum Value: -30.0 C on Nov 29 09:00      Minimum Daily Average: -26.7 C on Nov 29 Maximum Diurnal Average: -5.9 C at hour 15      Minimum Diurnal Average: -8.9 C at hour 8 Monthly Average: -7.72 C      Percentiles: P <sub>1</sub> = -28.3 P <sub>10</sub> = -18.4 Q <sub>1</sub> = -14.6 Median = -5.7 Q <sub>3</sub> = -1.0 P <sub>90</sub> = 2.5 P <sub>99</sub> = 9.2																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-3.3	-3.3	-3.3	-3.2	-3.3	-3.1	-3.0	-2.9	-2.7	-2.6	-2.4	-2.2	-2.1	-2.2	-2.4	-2.4	-2.5	-2.6	-2.8	-3.0	-3.3	-3.5	-3.5	-3.6	-2.9	-2.1																						
2-Nov	-3.7	-3.8	-3.8	-3.8	-3.7	-3.6	-3.8	-3.9	-3.8	-3.5	-3.0	-2.3	-2.0	-1.2	-0.9	-0.7	-0.8	-0.9	-1.0	-0.4	0.0	-0.3	-0.5	-0.4	-2.2	0.0																						
3-Nov	-0.5	-0.7	-0.9	-0.7	-0.8	-1.1	-1.7	-1.7	-1.5	-0.8	-0.3	0.2	0.5	0.9	1.3	0.7	0.4	1.1	1.2	0.4	0.2	-0.4	-1.4	-1.8	-0.3	1.3																						
4-Nov	-2.9	-3.1	-3.4	-4.0	-4.8	-3.9	-2.3	-3.5	-3.7	-3.1	-2.2	-1.8	-1.9	-0.7	0.4	0.5	-0.9	-2.7	-3.6	-3.2	-3.3	-3.5	-4.6	-4.9	-2.8	0.5																						
5-Nov	-5.1	-4.9	-5.1	-5.5	-5.4	-5.1	-4.7	-4.5	-4.3	-3.8	-3.6	-3.7	-3.3	-3.1	2.7	-2.5	-2.4	-2.0	-1.5	-1.3	-1.3	-1.8	-2.2	-2.8	-3.4	-1.3																						
6-Nov	-3.1	-3.5	-3.6	-3.8	-3.7	-3.2	-2.7	-2.0	-1.2	-0.2	1.4	2.6	3.4	4.1	4.4	4.2	3.9	3.2	2.5	3.1	2.8	2.8	2.8	2.4	0.7	4.4																						
7-Nov	2.2	2.8	2.5	3.3	4.2	3.8	3.6	3.1	3.2	3.7	4.7	5.1	5.0	5.5	6.3	5.3	3.2	3.6	2.9	3.5	3.9	3.8	4.1	5.1	3.9	6.3																						
8-Nov	4.9	3.5	3.2	4.3	4.8	4.6	4.8	4.5	4.7	6.4	8.7	10.1	11.7	13.2	13.4	12.6	10.6	9.5	9.3	8.4	7.4	6.8	5.9	5.9	7.5	13.4																						
9-Nov	6.0	5.7	5.1	4.1	1.8	0.9	-0.1	0.0	0.1	1.8	3.6	4.6	6.7	7.6	7.6	6.2	2.5	0.8	-0.2	0.1	-0.9	-1.7	-1.2	-1.3	2.5	7.6																						
10-Nov	-1.9	-2.4	-3.3	-3.1	-2.6	-2.8	-3.6	-3.8	-3.7	-2.8	-0.8	0.8	2.2	3.2	3.1	2.5	0.1	-2.1	-2.9	-3.5	-3.5	-3.1	-2.8	-3.6	-1.7	3.2																						
11-Nov	-4.3	-3.6	-4.0	-4.8	-4.6	-4.7	-3.8	-2.8	-2.0	-1.6	-1.1	-0.6	-0.1	0.3	0.1	0.0	0.1	0.3	0.5	0.9	1.1	1.2	1.2	1.3	-1.3	1.3																						
12-Nov	1.2	0.8	0.5	0.8	0.7	1.0	0.8	0.8	1.2	1.9	1.0	0.3	0.2	-0.5	-1.8	-2.4	-2.4	-2.3	-2.8	-3.7	-3.9	-3.9	-4.3	-4.7	-0.9	1.9																						
13-Nov	-5.2	-6.0	-6.6	-7.8	-8.6	-8.6	-8.4	-9.4	-9.4	-8.8	-8.3	-7.6	-7.1	-6.7	-6.8	-7.1	-7.6	-8.0	-8.2	-8.3	-8.2	-8.2	-8.2	-8.1	-7.8	-5.2																						
14-Nov	-8.1	-8.3	-8.4	-8.3	-8.3	-8.3	-8.5	-8.5	-8.3	-8.1	-7.9	-7.3	-6.4	-5.9	-5.6	-5.5	-6.1	-6.4	-6.7	-6.7	-6.7	-7.1	-7.8	-8.4	-7.4	-5.5																						
15-Nov	-8.0	-7.2	-6.9	-6.6	-7.0	-7.6	-8.4	-9.0	-9.6	-6.6	-4.9	-4.2	-3.0	-3.0	-2.6	-2.3	-2.3	-2.3	-2.2	-2.5	-2.5	-2.7	-3.6	-4.9	-2.2	-2.2																						
16-Nov	-4.6	-5.5	-6.2	-6.5	-4.4	-4.5	-5.1	-5.6	-4.7	-4.0	-2.4	-1.1	0.2	1.3	1.4	1.1	0.7	0.3	0.0	0.2	0.3	0.3	0.5	0.4	-2.0	1.4																						
17-Nov	0.4	0.2	-0.4	-0.6	-0.9	-1.0	-1.0	-0.9	-1.0	-0.8	-0.5	-0.3	0.1	0.4	0.6	0.6	1.1	1.1	0.1	-0.8	-2.9	-4.2	-4.3	-4.4	-0.8	1.1																						
18-Nov	-4.1	-3.9	-4.6	-5.0	-5.2	-5.4	-5.9	-6.8	-6.3	-5.9	-5.5	-5.7	-6.0	-5.5	-5.7	-6.6	-8.6	-9.6	-7.4	-7.2	-7.3	-7.6	-7.6	-7.6	-6.3	-3.9																						
19-Nov	-7.6	-7.7	-8.0	-8.3	-8.7	-9.1	-9.5	-9.9	-10.9	-11.6	-11.9	-12.1	-11.8	-12.3	-12.4	-12.6	-13.9	-15.1	-15.9	-16.1	-15.9	-16.0	-16.0	-16.2	-12.1	-7.6																						
20-Nov	-16.3	-16.6	-16.9	-16.9	-16.9	-16.8	-16.7	-16.6	-16.6	-16.0	-15.2	-14.9	-14.6	-14.4	-14.1	-14.2	-14.9	-14.9	-15.1	-15.3	-15.6	-15.5	-15.6	-15.8	-15.7	-14.1																						
21-Nov	-16.3	-16.6	-16.8	-17.0	-17.1	-17.0	-16.7	-16.5	-16.6	-16.3	-15.9	-15.6	-15.2	-14.9	-14.5	-14.3	-14.1	-13.7	-13.5	-13.5	-13.6	-13.7	-13.8	-14.1	-15.3	-13.5																						
22-Nov	-14.2	-14.2	-13.9	-13.6	-13.6	-14.1	-15.0	-15.1	-14.4	-14.0	-13.5	-13.0	-12.7	-12.6	-12.4	-12.7	-13.4	-13.6	-13.8	-14.1	-14.3	-14.5	-14.8	-15.2	-13.9	-12.4																						
23-Nov	-15.6	-15.9	-16.1	-16.5	-16.4	-16.5	-16.6	-16.7	-16.8	-17.0	-16.7	-16.4	-16.2	-16.1	-16.1	-16.0	-16.0	-15.8	-15.6	-15.5	-15.6	-15.5	-15.6	-15.6	-16.1	-15.5																						
24-Nov	-15.6	-15.6	-15.4	-15.0	-14.9	-15.0	-15.0	-14.9	-14.7	-14.3	-13.8	-13.4	-13.1	-13.2	-13.5	-13.8	-14.0	-14.3	-15.3	-16.1	-16.1	-16.1	-16.1	-16.4	-14.8	-13.1																						
25-Nov	-17.0	-16.6	-17.7	-18.0	-18.6	-19.6	-18.8	-18.2	-17.2	-16.9	-16.9	-17.1	-16.4	-15.8	-16.4	-17.4	-16.0	-14.8	-14.0	-13.6	-13.9	-14.2	-13.7	-13.7	-16.5	-13.6																						
26-Nov	-13.6	-13.7	-13.8	-13.3	-14.2	-13.2	-12.8	-12.7	-13.2	-13.6	-13.6	-13.4	-12.5	-11.3	-10.8	-10.6	-10.7	-10.9	-10.8	-10.8	-11.0	-11.3	-11.6	-11.8	-12.3	-10.6																						
27-Nov	-11.7	-11.5	-11.3	-11.3	-11.7	-11.8	-12.4	-12.4	-12.5	-12.6	-12.4	-12.1	-12.1	-12.2	-12.5	-13.1	-13.6	-13.9	-14.3	-14.8	-15.1	-15.5	-16.1	-16.7	-13.1	-11.3																						
28-Nov	-17.6	-17.9	-18.3	-19.2	-20.3	-20.8	-21.1	-22.6	-24.9	-24.4	-21.5	-20.2	-19.6	-19.7	-20.5	-20.2	-20.7	-23.1	-22.9	-23.2	-23.7	-25.7	-26.8	-27.7	-21.8	-17.6																						
29-Nov	-28.0	-28.1	-28.6	-29.3	-29.8	-29.6	-28.4	-29.4	-30.0	-29.6	-25.6	-23.8	-23.5	-23.5	-23.5	-24.0	-24.9	-25.0	-25.3	-25.6	-26.2	-26.4	-26.7	-27.0	-26.7	-23.5																						
30-Nov	-26.9	-27.0	-27.2	-27.1	-27.0	-26.7	-26.5	-26.2	-25.7	-25.1	-23.9	-22.9	-22.0	-21.2	-20.8	-20.5	-20.5	-20.4	-20.3	-20.3	-20.4	-21.0	-21.4	-21.9	-23.5	-20.3																						
																								-8.0	-8.1	-8.4	-8.6	-8.7	-8.8	-8.8	-8.9	-8.9	-8.4	-7.5	-6.9	-6.4	-6.0	-5.9	-6.1	-6.8	-7.2	-7.3	-7.4	-7.6	-7.9	-8.2	-8.4	Diurnal Average
																								6.0	5.7	5.1	4.3	4.8	4.6	4.8	4.5	4.7	6.4	8.7	10.1	11.7	13.2	13.4	12.6	10.6	9.5	9.3	8.4	7.4	6.8	5.9	5.9	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 2m (AT2) - C**  
**Mildred Lake - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Mildred Lake - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	66	9.17	9.17
-20 - 0	514	71.39	80.56
0 - 10	134	18.61	99.17
10 - 20	6	0.83	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

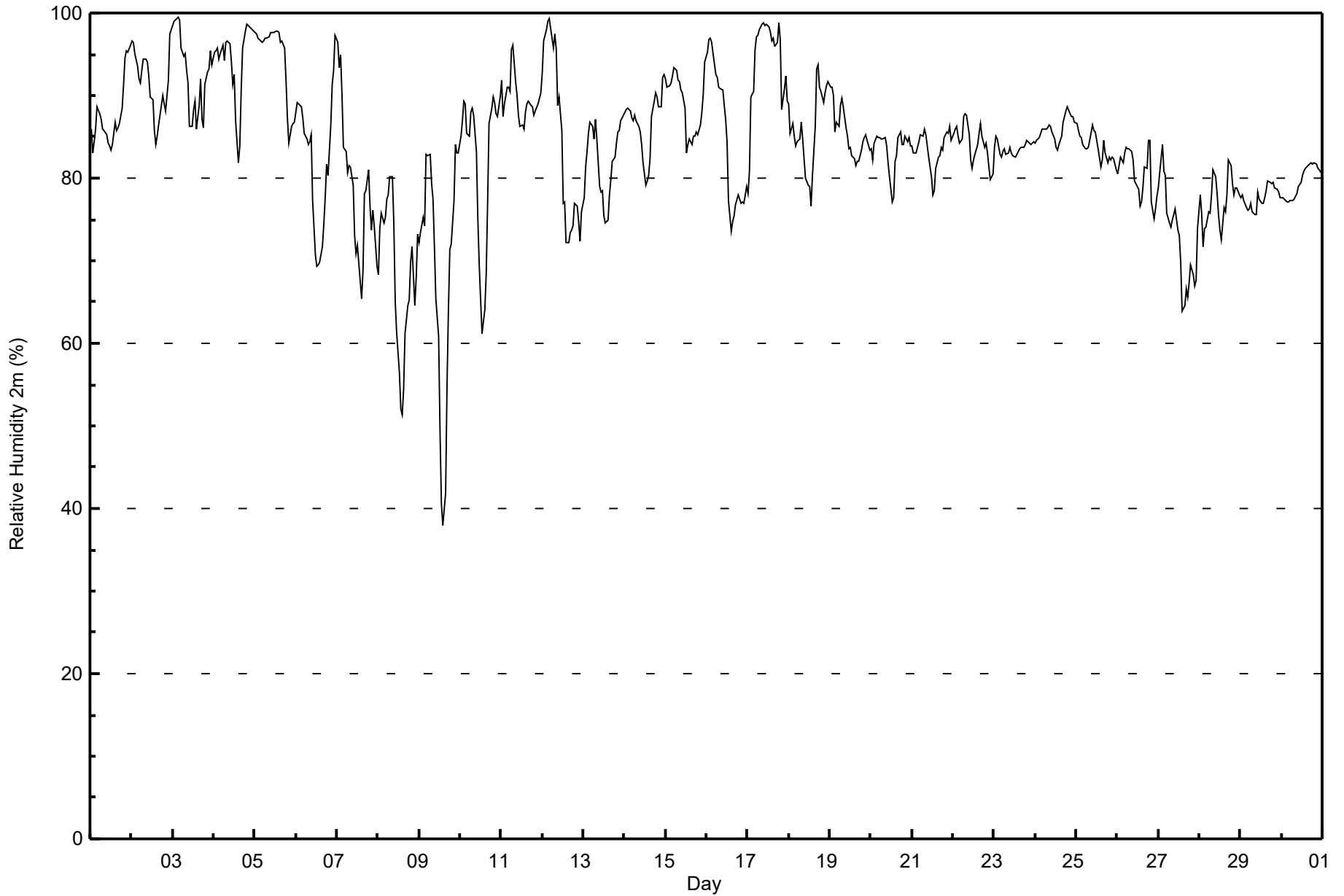
Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Relative Humidity 2m (RH2) - %**  
**Mildred Lake - November 2024**

Maximum Value: 99.4 % on Nov 3 04:00      Maximum Daily Average: 94.6 % on Nov 5																						Hours in Service: 720 Hours of Data: 720																											
Minimum Value: 38.0 % on Nov 9 15:00      Minimum Daily Average: 68.2 % on Nov 8 Maximum Diurnal Average: 87.0 % at hour 3      Minimum Diurnal Average: 77.7 % at hour 15 Monthly Average: 83.86 %      Percentiles: P <sub>1</sub> = 55.2 P <sub>10</sub> = 74.2 Q <sub>1</sub> = 78.9 Median = 84.4 Q <sub>3</sub> = 88.8 P <sub>90</sub> = 95.4 P <sub>99</sub> = 98.8																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	85.9	83.1	84.3	86.0	88.7	87.8	87.2	86.0	85.8	85.3	84.2	84.0	83.4	84.1	86.8	85.8	86.0	86.6	88.5	91.4	94.6	95.4	95.3	96.2	87.6	96.2																							
2-Nov	96.6	96.4	95.2	93.6	92.1	91.5	93.1	94.5	94.4	94.1	92.3	89.9	89.4	85.7	84.1	85.0	86.4	88.9	90.0	88.9	88.2	91.9	97.4	98.0	91.6	98.0																							
3-Nov	98.6	99.1	99.3	99.4	99.2	95.8	94.7	95.1	93.1	91.4	86.3	86.3	88.4	89.3	85.9	88.8	92.0	87.1	86.1	91.4	92.9	93.3	95.4	93.7	92.6	99.4																							
4-Nov	95.2	95.4	95.8	94.5	95.0	96.0	94.3	96.5	96.7	96.2	94.2	91.4	92.6	86.9	81.9	83.9	90.6	95.8	97.9	98.6	98.5	98.3	98.1	97.7	94.3	98.6																							
5-Nov	97.6	97.5	97.0	96.5	96.5	96.6	96.9	97.0	97.2	97.6	97.7	97.6	97.7	97.7	97.6	96.5	96.7	95.8	91.9	87.4	84.3	86.3	86.6	86.8	94.6	97.7																							
6-Nov	87.9	89.1	88.8	88.6	87.3	85.5	84.7	84.1	84.5	85.3	77.2	70.8	69.3	69.4	69.8	71.7	74.4	77.6	81.7	80.3	86.5	91.4	93.1	97.3	82.3	97.3																							
7-Nov	96.5	93.4	94.9	90.0	83.7	83.2	80.6	81.5	81.3	79.2	73.0	70.9	71.8	69.7	65.5	68.8	78.1	78.4	81.1	76.7	73.7	76.1	74.2	69.4	78.8	96.5																							
8-Nov	68.4	73.9	75.8	74.6	75.3	77.5	78.0	80.2	80.1	74.5	65.1	61.3	56.4	52.1	51.4	54.4	61.2	64.6	65.3	69.8	71.8	64.6	67.9	73.2	68.2	80.2																							
9-Nov	72.2	73.4	75.3	74.2	82.9	82.7	82.8	79.3	77.5	71.7	65.4	60.8	49.4	40.5	38.0	41.8	54.9	64.1	71.4	72.0	77.2	84.0	83.1	83.1	69.1	84.0																							
10-Nov	85.0	87.0	89.4	89.0	85.5	85.0	87.9	88.5	87.6	83.2	75.0	69.5	65.3	61.1	64.0	68.6	77.2	86.6	88.4	89.8	89.2	87.8	87.4	89.9	82.0	89.9																							
11-Nov	91.9	87.5	89.0	91.1	91.0	90.5	95.5	96.0	91.6	90.1	87.7	86.2	86.4	86.0	88.0	88.9	89.4	88.8	88.7	87.7	88.1	88.9	89.7	90.4	89.5	96.0																							
12-Nov	92.6	96.6	98.0	99.0	99.3	98.1	95.8	97.4	95.6	88.8	89.9	85.8	76.9	77.2	72.3	72.3	73.5	73.7	74.2	77.0	76.7	74.7	72.3	75.9	84.7	99.3																							
13-Nov	77.7	81.4	83.3	85.5	86.7	86.3	84.8	87.1	84.8	79.0	78.4	78.5	75.4	74.5	74.9	77.9	79.9	82.0	82.5	84.2	85.6	85.8	86.9	87.6	82.1	87.6																							
14-Nov	87.9	88.3	88.4	88.1	87.3	86.9	87.7	86.9	86.2	85.6	84.0	81.9	79.1	79.7	80.4	82.3	87.4	89.4	89.9	88.6	88.7	92.1	92.5	86.7	92.5	86.7																							
15-Nov	92.1	90.9	91.2	91.6	92.4	93.4	93.1	91.9	91.7	90.6	90.3	88.5	83.0	84.2	84.8	84.1	85.0	85.1	85.7	85.2	86.5	88.0	90.2	94.1	88.9	94.1																							
16-Nov	95.3	96.8	96.9	96.4	95.2	92.5	92.3	91.1	90.9	90.7	88.8	87.1	84.3	77.3	73.5	74.8	75.3	76.7	77.9	77.5	76.9	77.0	76.9	79.0	85.1	96.9																							
17-Nov	78.1	80.9	89.8	90.5	95.6	97.1	97.3	97.9	98.7	98.9	98.5	98.6	98.3	97.6	96.6	97.0	96.0	96.4	98.8	96.7	88.3	90.9	92.3	89.3	94.2	98.9																							
18-Nov	89.0	85.4	86.6	85.0	83.9	84.5	84.7	86.8	84.7	82.4	80.0	79.1	79.0	76.6	80.4	86.3	93.2	93.7	91.0	90.5	89.1	90.3	91.2	91.7	86.0	93.7																							
19-Nov	91.1	91.1	90.0	85.6	86.8	86.3	88.7	89.6	88.6	86.2	85.1	83.5	83.8	82.8	82.5	81.5	82.0	82.0	83.4	84.4	84.9	85.2	84.5	83.3	85.5	91.1																							
20-Nov	83.5	82.2	84.2	85.1	84.8	84.9	84.7	84.8	84.9	83.9	81.8	80.1	77.1	77.6	82.0	82.7	84.9	85.5	84.1	84.1	85.1	84.4	85.0	83.9	83.4	85.5																							
21-Nov	83.9	83.1	83.0	83.7	84.4	85.2	85.1	86.0	85.2	83.8	82.5	80.2	78.0	78.5	81.2	82.5	82.8	83.8	83.4	84.9	85.5	85.4	86.2	84.6	83.5	86.2																							
22-Nov	85.5	85.9	86.3	85.0	84.3	84.8	87.5	87.9	87.6	85.3	82.1	81.2	82.2	82.9	84.1	85.5	86.6	85.1	83.8	84.3	83.0	81.4	79.8	80.5	84.3	87.9																							
23-Nov	83.7	85.1	84.8	82.9	82.5	83.2	83.5	82.9	83.1	83.7	83.1	82.7	82.5	82.9	83.2	83.6	83.7	83.8	84.2	84.5	84.3	84.2	84.2	84.4	83.6	85.1																							
24-Nov	84.2	84.6	85.0	85.4	85.9	86.0	85.9	86.2	86.4	86.3	85.7	84.8	83.7	83.3	84.1	85.0	86.8	87.5	88.2	88.6	87.8	87.5	87.4	86.8	86.0	88.6																							
25-Nov	86.5	85.7	85.2	84.9	84.1	83.6	83.5	83.8	84.7	86.4	85.8	85.7	84.5	83.6	81.3	82.2	84.7	83.0	81.8	82.5	82.2	82.5	82.4	80.9	83.8	86.5																							
26-Nov	80.6	81.5	82.5	81.9	83.1	83.8	83.5	83.5	83.2	82.2	79.7	79.2	78.6	76.6	77.2	78.8	81.4	81.1	84.5	84.6	77.2	75.1	76.2	77.9	80.6	84.6																							
27-Nov	78.8	80.8	84.0	80.8	80.3	75.8	74.5	74.1	74.9	75.6	76.3	73.7	73.0	69.8	64.0	64.6	66.7	65.6	67.2	69.5	68.3	66.9	67.6	73.8	72.8	84.0																							
28-Nov	77.9	75.5	71.8	73.9	74.0	76.0	75.8	78.0	81.0	80.1	78.2	75.7	73.7	72.6	76.4	75.9	77.9	82.2	81.5	79.3	78.0	78.8	78.7	78.0	77.1	82.2																							
29-Nov	77.7	77.9	77.4	76.5	76.1	76.2	76.9	76.0	75.6	75.6	78.3	77.4	77.0	77.0	77.6	78.5	79.6	79.5	79.4	79.6	78.8	78.6	78.3	77.7	77.6	79.6																							
30-Nov	77.6	77.7	77.3	77.1	77.1	77.2	77.3	77.4	77.8	78.2	78.9	79.5	80.3	80.9	81.2	81.5	81.7	81.8	81.8	81.8	81.8	81.2	81.0	80.7	79.5	81.8																							
																								86.0	86.2	87.0	86.6	86.7	86.5	86.6	86.9	86.5	85.1	82.9	81.1	79.3	77.9	77.7	79.0	81.9	83.1	83.8	84.1	83.8	84.2	84.7	85.3	Diurnal Average	
																								98.6	99.1	99.3	99.4	99.3	98.1	97.3	97.9	98.7	98.9	98.5	98.6	98.3	97.7	97.6	97.0	96.7	96.4	98.8	98.6	98.5	98.3	98.1	98.0	Diurnal Maximum	





Maximum Speed: 22 km/h on Nov 27 15:00	Maximum Daily Speed Average: 13.5 km/h on Nov 27	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 3 03:00	Minimum Daily Speed Average: 0.8 km/h on Nov 1	Hours of Data: 720
Maximum Diurnal Speed Average: 2.2 km/h at hour 19	Minimum Diurnal Speed Average: 0.5 km/h at hour 9	Hours of Missing Data: 0
Monthly Average Velocity: 0.7 km/h 322.4 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 3 Q <sub>1</sub> = 5 Median = 8 Q <sub>3</sub> = 11 P <sub>90</sub> = 14 P <sub>99</sub> = 19	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	WSW8	SW5	SSW8	S6	S7	SSW2	SE2	SE4	SE4	SSE5	S6	SW4	WSW5	NW4	NNE4	NE4	ENE4	NNE4	ENE5	NE6	NE6	NE5	NE4	NNE3	SE0.8	SSW8
2-Nov	NNE4	NNE6	NE5	NE4	E3	NE2	N3	N4	N5	N5	NNE5	NNE5	N6	ESE6	E6	ESE7	E8	NE7	NE4	SE9	SE8	SE6	SE7	SE7	ENE3.4	SE9
3-Nov	SSE5	SE3	E0	S5	W4	WSW5	SW4	SW4	WSW3	SW2	W4	SSW4	SSE4	SSE8	SSE10	SSE8	SSW4	WSW6	SW4	S8	SSW8	WSW7	W5	W6	SSW3.6	SSE10
4-Nov	SW6	SW6	WSW5	SW7	SSW2	SW4	WSW9	SW11	SSW8	S7	S9	SSE9	SE8	SE9	SE9	SE8	SE5	ESE2	SSE2	S4	SE5	S4	ESE3	ESE4	S4.7	SW11
5-Nov	NNW3	NNW7	NNW6	N6	N5	NW6	NW5	NW5	NW5	NNW5	NNW4	NW5	W4	WNW4	W5	NW5	N2	WSW2	WNNW7	WNNW7	W6	SW10	SSW8	SW9	WNNW3.9	SW10
6-Nov	S7	SSE11	SSE14	SSE11	SSE13	SSE16	S16	SSE16	SSE14	S14	SSW13	SW12	SW13	SW15	SW12	SSW9	S8	SE8	SE7	SE8	SE9	SSE8	ENE1	NNE4	S9.1	S16
7-Nov	NNW5	NW9	NW8	WNW9	W15	WNW15	WNW12	WNW10	WNW11	NW8	WNW9	NNW10	W8	WNW9	NW6	ENE4	ESE6	SSE4	SE5	SE8	SE11	SE9	SE9	SE12	W3.5	W15
8-Nov	SSE11	SSE7	SSE9	SE14	SSE11	SE9	SE11	SSE11	ESE8	SSE10	SSE10	S10	S11	SSW9	SSW8	S6	SW4	SW3	WSW4	NNW8	NNW11	NW9	WNNW7	WNNW8	S4.6	SE14
9-Nov	W10	W13	W12	W8	SW6	SW6	SSW5	SW6	SW4	SW7	W1	W2	W6	W9	WNNW7	WSW3	S2	S5	S3	SSE5	SSW5	SSW6	S8	S7	WSW4.7	W13
10-Nov	S6	SSE8	S7	SSW7	SSW9	SSW7	SSW7	SSW7	SW8	SW9	SW6	SSW6	SSW4	S6	SE7	SE8	SSE3	SSE4	SE3	SSE4	SE5	ESE4	SE4	ESE5	S4.8	SSW9
11-Nov	E5	ESE5	ESE5	SSE3	SW5	SSE7	SE12	ESE11	ESE12	SE11	SE16	ESE12	SE13	SE14	ESE15	ESE11	ESE10	ESE8	SE6	SSE10	SE10	SSE9	SE7	SE7	SE8.8	SE16
12-Nov	SSE6	ESE3	NNW2	NNE2	SSW7	SW10	WSW8	SSW8	WSW8	WSW14	W17	W17	W18	W18	W21	W22	WSW17	WSW14	W14	W11	W13	WNNW11	WNNW14	WNNW12	W10.5	W22
13-Nov	W10	WNNW10	WSW5	SW6	SSW7	WSW5	WSW5	SSW5	W5	NNW6	N10	NNE7	NE7	NE8	NE8	NE6	NNE6	NNE9	NNE10	NNE7	NNE10	NNE10	N9	N10	N4.1	W10
14-Nov	N11	N11	N13	N12	N11	NNE10	N11	N12	N10	N10	N10	N10	N10	N10	N10	N9	N8	N10	N7	N6	NNW7	NNE5	NNE4	NNW4	N9.1	N13
15-Nov	NNE3	NE3	NE3	NE1	W2	SSE2	SSW2	SSW1	ESE3	S3	S6	SSW6	SSE5	SE6	ESE6	SE7	SSE8	SSE8	S8	SSE9	SSE8	SSE9	SSE8	SSE6	SSE4.1	SSE9
16-Nov	S5	S5	SSW5	SSE6	SE11	SSE13	SSE8	S9	SSE15	SSE17	SE14	SSE16	SSE18	SSE17	SSE18	SE18	SSE19	SSE19	SSE15	SSE15	SSE15	SSE12	SE13	SSE13	SSE13.0	SSE19
17-Nov	SSE13	SE14	SE11	SE12	SE12	SE15	SE14	SSE12	SSE10	SSE12	SSE11	SSE10	SSE9	SSE9	SSE9	SE6	SSE7	WSW2	NNW12	NNW18	NW19	WNNW14	WNNW11	WNNW10	SSE4.5	WNNW19
18-Nov	WNNW9	W13	WNNW12	WNNW9	WNNW8	WNNW10	WNNW9	WNNW7	WNNW9	WNNW8	WNNW9	NW10	NW6	NW6	NNW3	WNNW3	NNW3	NE5	NNE3	N3	N5	NNW6	N4	NNE4	NW5.9	W13
19-Nov	NNE4	NNE5	NNE6	NNE9	N9	NNE9	NNE11	N11	N12	N10	N10	N12	N11	NNE14	NNE12	N11	N10	N12	N12	N12	N8	N7	N10	N12	N9.7	NNE14
20-Nov	N11	N11	N7	NNW7	N7	N7	N7	N7	NNE8	NNE12	NNE14	NNE13	N14	N10	N8	N8	N7	NNE8	NNE14	N13	N16	N12	N10	N9	N9.9	N16
21-Nov	N9	N10	N11	N7	NNW5	NNW7	NNW8	NNW8	NNW8	NW10	WNNW10	NW9	NW10	NW9	NW8	NW7	NW7	WNNW6	NW7	NNW6	NNW3	N5	NNE4	NNE3	NNW6.7	N11
22-Nov	NNW4	W2	WNNW3	WNNW3	W5	W2	SSW1	ESE1	NNW2	NNW2	NW5	N6	N7	N6	NNE5	NNE7	NNE7	NNE5	NNE5	NE6	N6	N6	N8	N10	N3.8	N10
23-Nov	N9	NNE9	NNE8	NNE10	NNE9	N9	N11	NNE11	N10	N10	NNE9	NNE9	N12	N11	N12	N11	N12	N13	N11	N11	N12	N13	N11	N11	N10.6	N13
24-Nov	N11	N11	N11	N11	N10	N9	N9	N9	N8	N8	N9	N9	N8	N7	NNW7	NNW5	NNW5	N5	N4	NNE3	S1	SSW3	S3	SSE3	N6.2	N11
25-Nov	SSE4	SSE6	SSE5	SSE7	SSE7	S8	SSE8	SE9	S7	S8	SSE9	SSE12	SSE10	SSE10	SSE11	S6	S6	SE14	SE16	SSE16	SSE15	SE14	SE16	SSE9.8	SSE16	
26-Nov	SSE13	SSE13	SSE12	SSE13	SSE11	SSE10	SSE12	SSE15	SSE15	SSE12	SSE12	SSE13	SSE9	SSE9	SSE9	SSE7	SW3	WNNW8	W14	WNNW14	WNNW13	WNNW13	WNNW12	WNNW11	S5.9	SSE15
27-Nov	WNNW12	W11	W13	WNNW15	WNNW17	WNNW16	WNNW15	WNNW14	WNNW14	WNNW14	WNNW14	WNNW14	NW20	NW22	NNW20	NW17	WNNW19	NW16	NNW10	NNW13	NNW14	N11	N7	NW13.5	NW22	
28-Nov	N7	NNW9	NW8	NW11	NW10	NW9	NW7	N3	NNE2	N5	NW1	SSW2	NNW2	NNW4	N4	NNE5	NNE4	N5	NNE5	NNE6	NNE5	NNE4	N3	N4	NNW4.6	NW11
29-Nov	NNE3	SSW3	S4	SSW2	SE1	SSW2	SW1	SSW1	ENE1	NNE2	NW1	WNNW1	NNE5	NNW7	NNW7	NNW6	N5	N7	N8	N8	N7	N6	N5	N6	N2.9	N8
30-Nov	N7	N5	NNE5	N5	N5	N6	N7	N6	N6	N6	N5	N6	N7	NNW8	NNW8	N7	N7	N5	NNW7	NNW8	N7	NNW7	NNW7	NNW7	N6.3	NNW8

NNW1.0	NW1.1	NW1.0	WNNW0.7	WSW1.3	WSW1.4	WSW0.9	SW0.8	W0.5	WSW0.7	W1.0	W0.9	WNNW1.0	NNW1.0	N1.0	NNE1.0	NE0.9	NNE1.4	N2.2	NNE1.6	N1.4	NNW1.2	N1.3	NNW1.3	Diurnal Average
SSE13	SE14	SSE14	WNNW15	WNNW17	WNNW16	S16	SSE16	SSE15	SSE17	W17	W17	W18	NW20	NW22	W22	SSE19	NNW19	SE16	NNW18	WNNW19	SSE15	SE14	SE16	Diurnal Maximum

All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

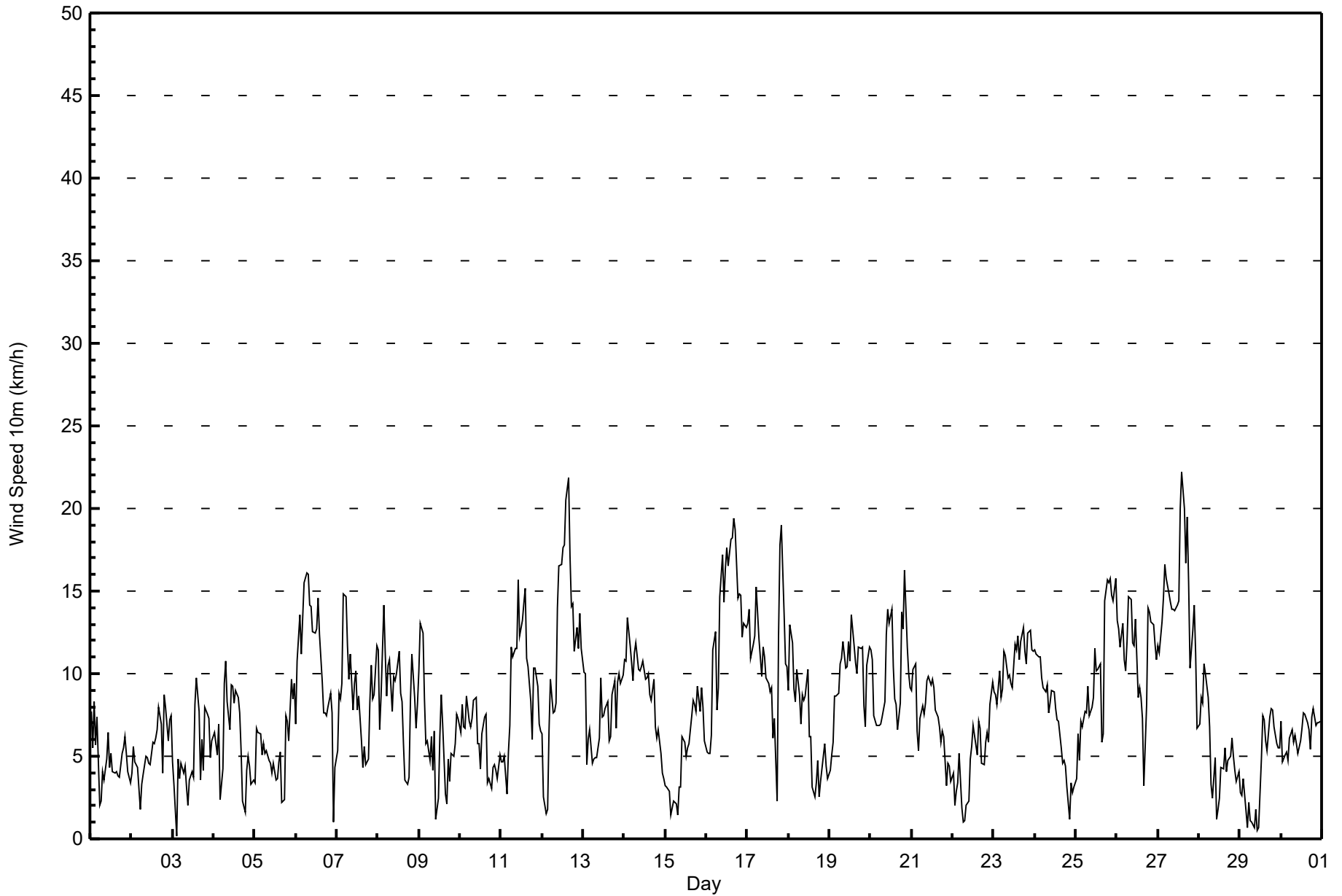
**Wind Speed 10m (WS10) - km/h**  
**Mildred Lake - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 6 km/h on Nov 12 15:00 Minimum Value: 0 km/h on Nov 22 09:00 Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 5																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	3	2	2	1	2	2	1	1	1	1	1	2	2	1	1	1	1	1	1	2	2	1	1	1	3	
2-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	2	2	2	2	5	3	2	3	2	5
3-Nov	1	1	1	1	2	2	1	2	1	1	1	2	2	2	2	2	2	2	3	2	2	2	2	2	3	
4-Nov	2	2	2	2	2	3	3	3	3	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	3	
5-Nov	2	2	1	2	2	1	1	1	1	1	1	1	1	2	1	1	1	2	2	2	3	3	2	3	3	
6-Nov	1	2	2	3	3	4	3	3	3	3	3	4	4	4	4	3	2	2	2	2	2	1	2	1	4	
7-Nov	2	4	2	3	4	4	3	3	3	2	3	3	3	2	3	2	1	1	1	2	2	2	2	3	4	
8-Nov	3	2	3	3	3	2	2	2	1	2	2	3	3	3	2	2	2	2	2	2	2	3	2	2	3	
9-Nov	4	5	4	4	2	2	2	2	2	2	2	1	2	3	2	2	2	1	1	2	2	2	1	1	5	
10-Nov	3	2	2	2	2	4	3	2	2	3	3	2	1	1	2	2	1	1	1	1	1	1	1	2	4	
11-Nov	1	2	2	1	2	2	3	3	3	4	4	4	4	5	4	4	2	2	2	2	2	2	2	2	5	
12-Nov	1	1	1	2	3	4	3	2	3	4	6	5	6	6	6	6	6	5	5	4	3	3	4	4	6	
13-Nov	4	3	2	2	1	3	2	1	2	2	2	3	2	2	2	2	2	2	2	2	3	3	2	2	4	
14-Nov	2	2	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	3	
15-Nov	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	2	2	2	2	2	2	1	2	
16-Nov	1	1	1	2	2	4	4	4	3	3	3	3	3	3	3	3	4	4	3	3	3	2	3	2	4	
17-Nov	3	3	3	3	2	3	3	3	2	2	2	2	2	2	3	1	2	3	3	5	5	4	3	4	5	
18-Nov	3	4	4	4	3	3	2	2	2	2	3	3	2	1	2	1	1	1	2	1	2	1	1	1	4	
19-Nov	1	1	1	3	2	2	3	3	3	2	2	3	3	4	4	3	3	3	3	3	2	2	4	3	4	
20-Nov	4	3	2	2	2	2	2	2	2	4	4	4	4	3	2	2	2	3	4	4	5	3	3	3	5	
21-Nov	2	3	3	2	1	1	2	2	2	2	2	2	2	2	1	1	1	2	1	1	1	1	1	2	3	
22-Nov	1	1	1	1	2	1	1	1	0	1	2	1	1	2	2	3	2	1	1	1	2	2	2	2	3	
23-Nov	3	2	2	3	2	2	3	3	3	3	2	2	3	3	3	3	3	3	3	3	3	3	2	3	3	
24-Nov	3	3	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	3	
25-Nov	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	3	3	4	3	2	3	3	4	
26-Nov	2	3	3	3	2	2	2	2	2	3	2	2	2	2	2	2	2	4	4	4	4	4	3	3	4	
27-Nov	3	3	4	4	5	4	4	4	4	4	4	4	4	4	5	5	4	4	4	2	3	3	3	2	5	
28-Nov	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
29-Nov	1	1	1	1	1	1	1	1	1	0	1	1	2	2	1	1	1	1	1	1	2	1	1	1	2	
30-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
																	Diurnal Maximum									



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 10m (WS10) - km/h**  
**Mildred Lake - November 2024**







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Mildred Lake - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	208	28.89	28.89
6 - 11	374	51.94	80.83
12 - 19	133	18.47	99.31
20 - 28	5	0.69	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Mildred Lake - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	24	31	11	5	3	10	11	15	12	18	13	11	12	7	8	17	208
6 - 11	100	25	8	0	2	9	32	50	23	18	15	6	10	28	21	27	374
12 - 19	19	6	0	0	0	3	18	36	2	1	4	3	12	22	2	5	133
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	5
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	143	62	19	5	5	22	61	101	37	37	32	20	36	57	33	50	720

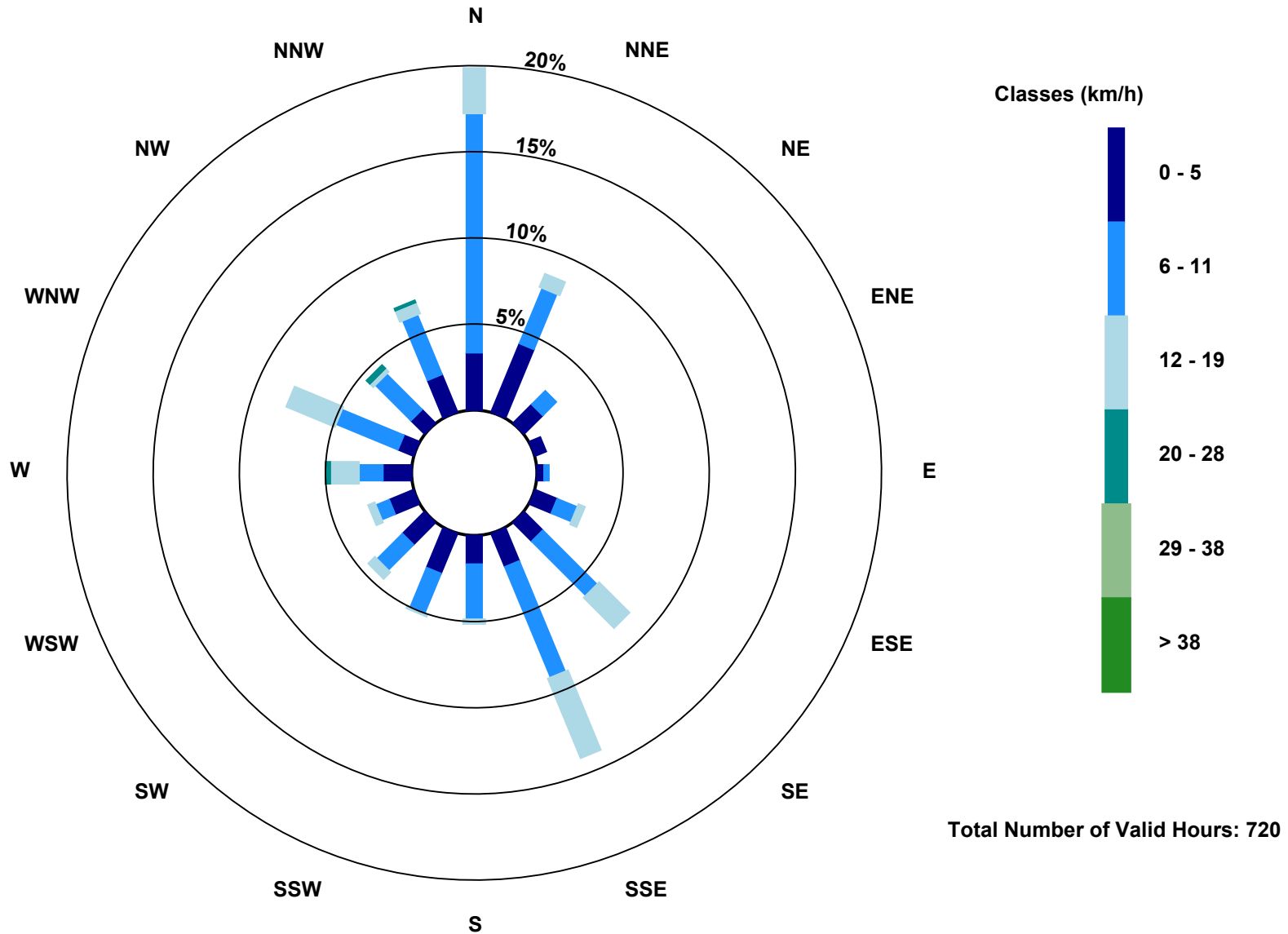
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Mildred Lake





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Mildred Lake - November 2024**

Direction of Maximum Speed: 324 deg on Nov 27 15:00		Hours in Service: 720
Direction of Maximum Daily Speed Average: 309.4 deg on Nov 27		Hours of Data: 720
Direction of Minimum Speed: 101 deg on Nov 3 03:00	Direction of Minimum Daily Speed Average: 0.8 deg on Nov 1	Hours of Missing Data: 0
Monthly Average Direction: 322.4 deg		Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	245	224	192	179	179	209	139	145	136	165	173	216	254	326	17	39	60	31	60	41	35	35	41	16	142.1
2-Nov	25	28	41	42	79	38	9	357	359	10	22	17	2	104	99	114	85	49	46	140	146	124	135	140	72.6
3-Nov	147	136	101	187	261	256	219	231	248	225	266	206	164	165	151	155	194	255	215	175	204	245	266	276	205.3
4-Nov	226	218	240	230	212	223	238	229	210	175	186	164	140	146	138	136	145	119	153	170	140	179	108	102	181.2
5-Nov	341	346	341	350	7	326	324	319	311	294	284	310	281	298	280	309	352	256	290	288	261	225	210	219	295.1
6-Nov	169	152	149	159	160	166	173	167	167	173	198	217	225	224	221	204	179	142	132	142	139	147	67	12	174.6
7-Nov	348	308	315	283	276	282	295	293	292	308	298	282	280	295	306	62	107	154	135	141	144	142	130	143	278.4
8-Nov	149	168	148	144	149	136	144	148	123	150	161	185	188	212	201	190	216	229	258	335	339	315	294	287	174.0
9-Nov	278	281	277	262	220	224	200	229	233	226	260	264	260	277	286	242	172	179	186	156	193	192	184	181	237.2
10-Nov	174	164	171	201	209	211	197	210	220	227	232	205	193	169	135	142	160	154	136	147	127	113	131	102	179.0
11-Nov	92	113	123	164	214	156	132	109	117	129	134	120	131	135	115	117	104	116	127	149	143	152	135	141	129.1
12-Nov	161	113	332	16	192	228	251	212	246	252	269	277	273	266	275	275	241	255	276	277	272	283	283	282	263.2
13-Nov	277	289	256	228	206	251	254	196	279	338	359	22	47	39	35	36	19	33	23	13	19	19	8	1	355.4
14-Nov	2	1	358	7	10	13	4	0	3	5	6	4	11	11	1	6	3	3	360	354	342	21	20	333	3.8
15-Nov	13	36	50	39	279	165	194	193	109	171	183	193	161	124	123	143	153	167	170	164	163	168	166	163	157.1
16-Nov	174	183	194	165	146	148	160	172	147	148	146	150	149	149	149	146	148	151	156	151	150	148	146	149	151.5
17-Nov	148	146	141	142	145	145	142	147	149	149	150	147	157	149	158	133	158	255	338	341	304	297	302	303	157.1
18-Nov	288	281	282	289	299	291	301	293	296	288	298	313	312	321	339	301	348	52	27	356	354	344	2	16	307.6
19-Nov	19	24	15	14	8	16	24	10	1	1	10	5	10	28	19	3	360	2	2	1	357	359	357	359	7.9
20-Nov	2	358	353	346	352	2	5	8	14	22	14	15	5	359	1	3	0	15	12	10	7	354	353	357	4.7
21-Nov	8	8	11	360	329	342	334	327	327	316	298	304	317	324	324	322	312	301	308	339	334	349	20	28	333.0
22-Nov	345	276	303	284	261	277	197	105	348	342	315	355	3	7	15	29	31	17	22	38	8	7	356	354	357.5
23-Nov	6	13	19	26	12	3	8	12	8	6	18	18	0	2	4	4	360	3	8	4	359	2	8	358	7.0
24-Nov	3	1	2	2	0	4	10	359	2	357	356	355	354	352	341	336	337	359	3	24	186	201	177	163	358.1
25-Nov	158	150	157	154	157	170	152	145	171	173	152	150	156	150	154	172	175	145	146	151	151	147	142	145	152.7
26-Nov	152	157	156	149	150	155	151	148	148	153	150	149	148	150	149	158	234	282	281	286	286	287	282	290	178.4
27-Nov	286	281	281	292	290	288	285	291	287	287	292	297	303	324	324	327	326	329	324	333	338	339	349	8	309.4
28-Nov	1	333	322	324	324	317	307	349	31	3	305	203	330	333	349	24	25	10	19	26	21	27	2	356	347.2
29-Nov	16	192	187	194	142	194	218	195	66	21	324	294	19	347	337	341	352	358	360	1	359	9	6	6	355.7
30-Nov	2	11	13	0	1	356	358	358	2	355	354	358	349	341	348	351	356	357	346	347	352	330	333	341	352.3

333.4 315.0 312.9 284.0 240.1 247.4 248.1 215.2 262.8 249.1 265.9 276.0 301.4 326.3 1.2 27.2 41.1 12.1 352.5 12.3 349.9 328.9 350.9 348.5

Diurnal Average

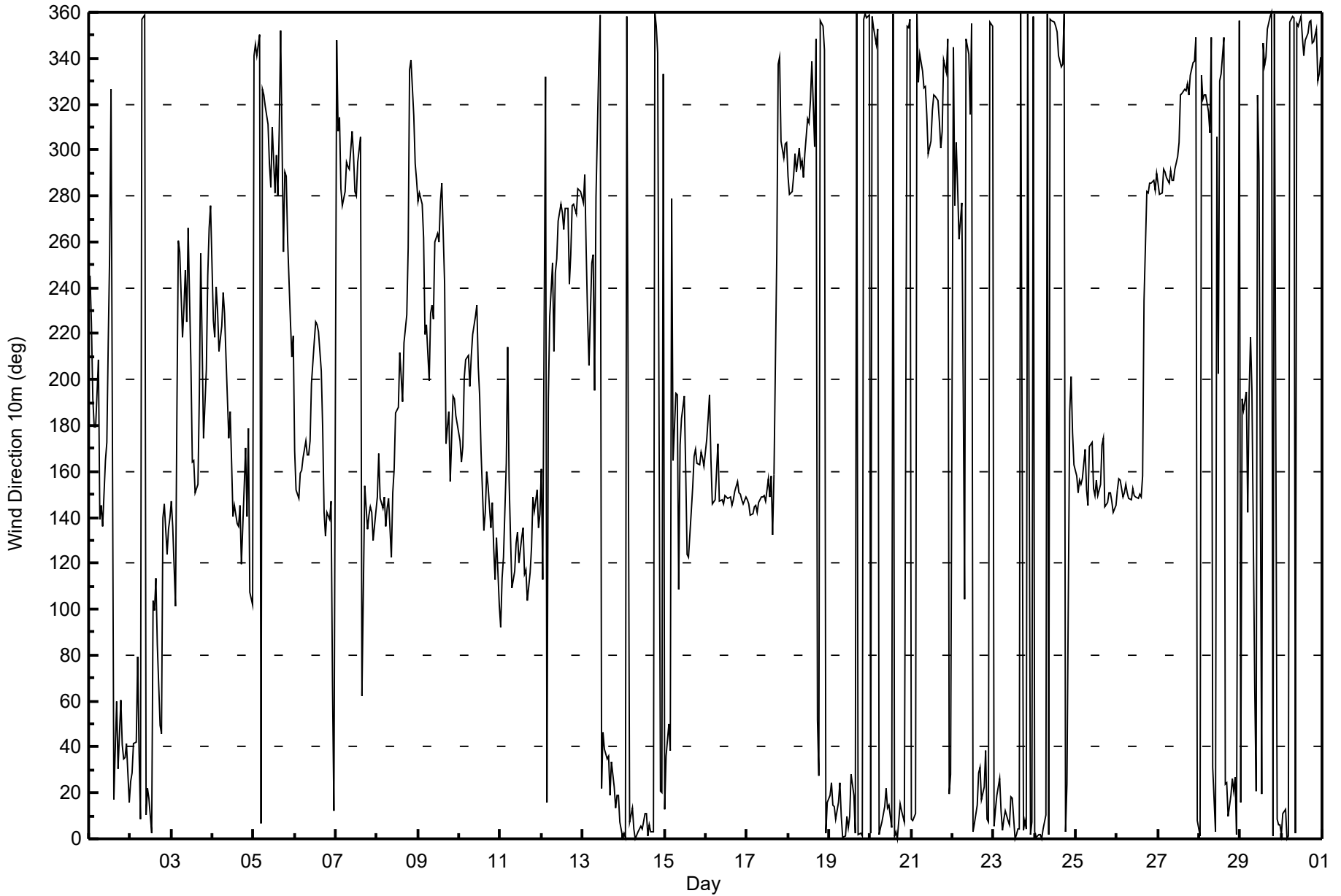
All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Mildred Lake - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 103 deg on Nov 9 11:00 Minimum Value: 9 deg on Nov 21 09:00 Percentiles: P <sub>1</sub> = 10 P <sub>10</sub> = 12 Q <sub>1</sub> = 14 Median = 18 Q <sub>3</sub> = 23 P <sub>90</sub> = 37 P <sub>99</sub> = 77																			Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																								
Day	Hourly Period Ending At (MST)																								Daily Maximum																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																			
1-Nov	26	37	15	18	19	69	61	26	29	24	15	38	25	41	21	20	19	21	14	19	18	22	21	22	69																		
2-Nov	19	18	20	20	27	66	38	21	15	15	18	16	17	30	21	24	14	21	26	28	22	21	18	16	66																		
3-Nov	11	16	93	27	46	29	23	27	38	58	35	49	59	15	14	15	73	30	53	14	33	21	21	30	93																		
4-Nov	15	23	41	21	64	37	23	22	35	34	17	14	21	15	18	16	14	15	64	14	16	20	31	35	64																		
5-Nov	68	12	13	16	20	13	11	14	14	20	28	17	34	29	24	16	33	65	18	22	37	24	21	24	68																		
6-Nov	24	13	12	16	15	15	14	14	16	13	21	25	24	22	23	26	25	13	14	15	12	15	75	38	75																		
7-Nov	20	19	26	17	19	19	17	15	17	23	25	21	27	26	34	29	20	25	12	13	14	19	17	19	34																		
8-Nov	20	15	12	12	12	14	9	10	18	15	16	18	16	23	19	30	46	53	43	19	15	23	18	18	53																		
9-Nov	22	21	21	37	31	29	43	24	39	35	103	57	31	22	24	45	63	18	36	30	31	21	11	12	103																		
10-Nov	27	17	15	23	23	53	27	21	25	27	47	28	45	20	17	17	39	35	38	18	18	17	24	18	53																		
11-Nov	19	21	36	59	37	27	19	17	19	20	20	20	19	19	20	19	14	19	19	13	16	12	23	18	59																		
12-Nov	18	57	77	87	36	27	23	27	28	20	23	20	20	21	21	19	24	23	23	20	17	21	18	23	87																		
13-Nov	22	19	36	19	16	50	44	27	42	19	18	26	24	30	20	19	19	17	19	20	18	19	16	15	50																		
14-Nov	14	14	14	17	17	17	16	15	14	15	16	18	20	20	18	18	15	16	15	15	12	27	42	31	42																		
15-Nov	32	32	35	56	52	34	45	56	36	28	16	23	32	20	28	13	17	16	15	16	17	15	15	12	56																		
16-Nov	21	14	9	14	10	13	23	29	12	11	15	12	11	14	14	12	12	13	14	12	12	13	13	11	29																		
17-Nov	11	12	14	14	12	11	14	13	11	14	13	12	15	17	17	19	17	71	13	20	16	16	17	17	71																		
18-Nov	20	18	19	24	20	17	16	15	15	18	20	15	20	10	37	30	17	22	68	34	16	14	17	19	68																		
19-Nov	22	17	17	16	17	18	18	19	15	17	18	16	20	19	21	19	19	17	17	18	17	16	16	16	22																		
20-Nov	18	18	20	16	15	17	19	18	19	21	20	20	19	18	16	17	15	19	19	21	21	17	15	17	21																		
21-Nov	18	17	18	17	14	12	15	11	9	13	16	18	15	14	13	11	12	18	18	12	22	21	20	27	27																		
22-Nov	14	49	33	47	23	69	63	34	25	18	16	21	19	20	24	26	22	25	24	21	20	24	18	15	69																		
23-Nov	20	19	20	18	20	15	18	18	21	20	17	19	17	16	17	16	16	16	17	16	14	15	16	15	21																		
24-Nov	16	15	14	14	14	13	15	13	14	12	13	15	14	16	13	11	11	14	13	10	93	12	20	18	93																		
25-Nov	28	13	18	17	11	12	19	12	18	18	15	12	14	13	14	18	12	11	11	10	10	10	12	11	28																		
26-Nov	12	15	14	13	14	13	11	11	10	12	13	10	14	13	14	14	57	32	19	19	18	19	18	18	57																		
27-Nov	17	19	18	18	18	17	17	17	17	17	16	17	17	12	10	11	12	11	10	12	14	14	13	15	19																		
28-Nov	14	9	15	10	11	13	15	40	27	13	76	83	57	19	26	11	17	12	21	14	16	14	17	16	83																		
29-Nov	18	73	11	64	80	44	72	61	57	35	62	85	32	16	13	11	13	11	12	11	11	13	14	13	85																		
30-Nov	13	16	14	11	15	14	13	16	13	14	13	12	11	11	14	13	13	14	11	12	16	12	11	17	17																		
																			68	73	93	87	80	69	72	61	57	58	103	85	59	41	37	45	73	71	68	34	93	27	75	38	
Diurnal Maximum																																											





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS03 LOWER CAMP METEOROLOGY NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)  
NOVEMBER 2024

MONTHLY SUMMARY for  
AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
Temperature 20 m (C) Average	675	0	45	93.75	13.6	-	7.7	-
Temperature 45 m (C) Average	720	0	0	100	13.9	-	8.4	-
Temperature 100 m (C) Average	720	0	0	100	13.8	-	8.9	-
Temperature 163 m (C) Average	720	0	0	100	13.4	-	9.0	-
Relative Humidity 20 m (%) Average	675	0	45	93.75	98.6	-	91.0	-
Relative Humidity 45 m (%) Average	720	0	0	100	97.4	-	89.3	-
Relative Humidity 100 m (%) Average	720	0	0	100	98.5	-	90.4	-
Relative Humidity 163 m (%) Average	720	0	0	100	97.6	-	89.6	-
Wind Speed 20 m (km/h) Average	718	0	2	99.72	28	-	17.0	-
Wind Speed 45 m (km/h) Average	693	0	27	96.25	36	-	21.0	-
Wind Speed 100 m (km/h) Average	691	0	29	95.97	42	-	27.0	-
Wind Speed 163 m (km/h) Average	692	0	28	96.11	47	-	31.0	-
Wind Direction 20 m (deg) Average	718	0	2	99.72	-	-	-	-
Wind Direction 45 m (deg) Average	693	0	27	96.25	-	-	-	-
Wind Direction 100 m (deg) Average	691	0	29	95.97	-	-	-	-
Wind Direction 163 m (deg) Average	692	0	28	96.11	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	718	0	2	99.72	0.8	-	0.1	-
Vertical Wind Speed 45 m (km/h) Average	693	0	27	96.25	1.1	-	0.6	-
Vertical Wind Speed 100 m (km/h) Average	691	0	29	95.97	2.4	-	1.0	-
Vertical Wind Speed 163 m (km/h) Average	692	0	28	96.11	5.1	-	2.0	-

Note : Operational time includes periods of data collection and instrument calibration



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)  
NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
Temperature 20 m (C) Average	675	0	45	-	13.6	0	7.7	0	7.8	12.4	20.2
Temperature 45 m (C) Average	720	0	0	-	13.9	0	8.4	0	8	12.4	20.5
Temperature 100 m (C) Average	720	0	0	-	13.8	0	8.9	0	8.1	12.5	20.6
Temperature 163 m (C) Average	720	0	0	-	13.4	0	9	0	8	12.3	20.1
Relative Humidity 20 m (%) Average	675	0	45	-	98.6	0	91	27	79	88.9	98.2
Relative Humidity 45 m (%) Average	720	0	0	-	97.4	0	89.3	30	77.5	87.7	98
Relative Humidity 100 m (%) Average	720	0	0	-	98.5	0	90.4	30	76.3	87.1	99.3
Relative Humidity 163 m (%) Average	720	0	0	-	97.6	0	89.6	29	73	87.4	98.4
Wind Speed 20 m (km/h) Average	718	0	2	-	28	0	17	0	14	18	26
Wind Speed 45 m (km/h) Average	693	0	27	-	36	0	21	0	20	24	35
Wind Speed 100 m (km/h) Average	691	0	29	-	42	0	27	0	25	31	47
Wind Speed 163 m (km/h) Average	692	0	28	-	47	0	31	0	29	35	56
Wind Direction 20 m (deg) Average	718	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	693	-	-	-	-	-	-	-	-	-	-
Wind Direction 100 m (deg) Average	691	-	-	-	-	-	-	-	-	-	-
Wind Direction 163 m (deg) Average	692	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	718	0	2	-	0.8	0	0.1	0	0	0.1	0.3
Vertical Wind Speed 45 m (km/h) Average	693	0	27	-	1.1	0	0.6	0	0.4	0.6	1.2
Vertical Wind Speed 100 m (km/h) Average	691	0	29	-	2.4	0	1	0	0.3	0.8	2.6
Vertical Wind Speed 163 m (km/h) Average	692	0	28	-	5.1	0	2	0	1.3	2.1	5.3

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)  
NOVEMBER 2024

OPERATIONAL NOTES

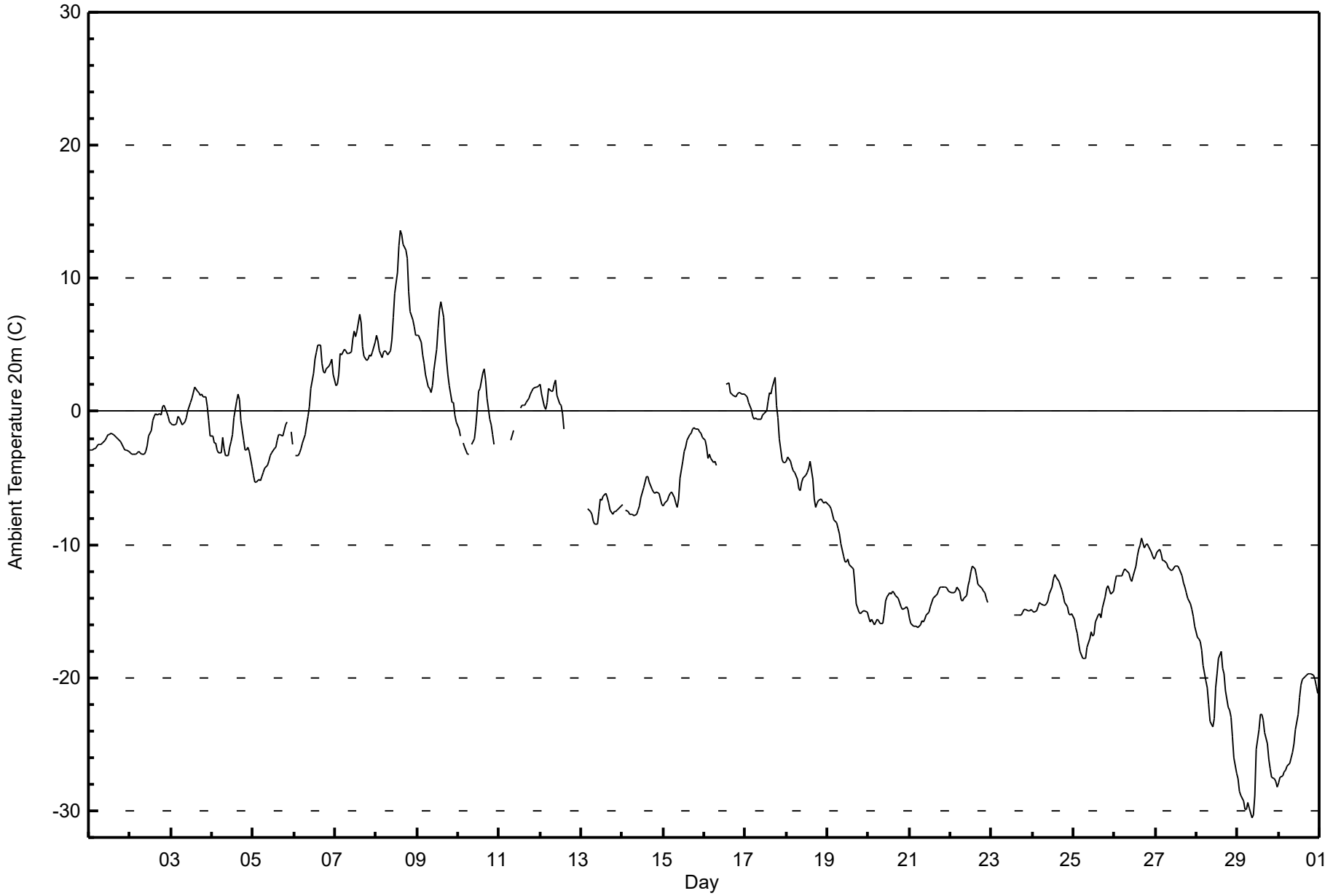
Parameter	Period Start	Period End	Duration (Hours)	Notes
Relative Humidity, Temperature 20m	05 Nov 2024 22:00	05 Nov 2024 22:00	1	DAS Failure - data not recorded
Relative Humidity, Temperature 20m	06 Nov 2024 01:00	06 Nov 2024 01:00	1	DAS Failure - data not recorded
Relative Humidity, Temperature 20m	10 Nov 2024 03:00	10 Nov 2024 03:00	1	DAS Failure - data not recorded
Relative Humidity, Temperature 20m	10 Nov 2024 08:00	10 Nov 2024 08:00	1	DAS Failure - data not recorded
Relative Humidity, Temperature 20m	10 Nov 2024 23:00	11 Nov 2024 03:00	5	DAS Failure - data not recorded
Relative Humidity, Temperature 20m	11 Nov 2024 05:00	11 Nov 2024 07:00	3	DAS Failure - data not recorded
Relative Humidity, Temperature 20m	11 Nov 2024 10:00	11 Nov 2024 12:00	3	DAS Failure - data not recorded
Relative Humidity, Temperature 20m	12 Nov 2024 16:00	12 Nov 2024 20:00	5	DAS Failure - data not recorded
Relative Humidity, Temperature 20m	12 Nov 2024 22:00	13 Nov 2024 02:00	5	DAS Failure - data not recorded
Relative Humidity, Temperature 20m	13 Nov 2024 04:00	13 Nov 2024 04:00	1	DAS Failure - data not recorded
Relative Humidity, Temperature 20m	14 Nov 2024 02:00	14 Nov 2024 02:00	1	DAS Failure - data not recorded
Relative Humidity, Temperature 20m	16 Nov 2024 09:00	16 Nov 2024 09:00	1	DAS Failure - data not recorded
Relative Humidity, Temperature 20m	16 Nov 2024 11:00	16 Nov 2024 13:00	3	DAS Failure - data not recorded
Relative Humidity, Temperature 20m	23 Nov 2024 00:00	23 Nov 2024 13:00	14	DAS Failure - data not recorded
Wind Speed, Wind Direction, Vertical Wind Speed, 20m	05 Nov 2024 11:00	05 Nov 2024 12:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed, 45m	05 Nov 2024 04:00	06 Nov 2024 03:00	24	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed, 45m	17 Nov 2024 20:00	17 Nov 2024 22:00	3	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed, 100m	05 Nov 2024 03:00	06 Nov 2024 01:00	23	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed, 100m	06 Nov 2024 07:00	06 Nov 2024 07:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed, 100m	12 Nov 2024 07:00	12 Nov 2024 07:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed, 100m	17 Nov 2024 20:00	17 Nov 2024 21:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed, 100m	25 Nov 2024 10:00	25 Nov 2024 10:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed, 100m	25 Nov 2024 13:00	25 Nov 2024 13:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed, 163m	05 Nov 2024 03:00	05 Nov 2024 23:00	21	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed, 163m	17 Nov 2024 19:00	17 Nov 2024 23:00	5	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed, 163m	25 Nov 2024 09:00	25 Nov 2024 10:00	2	Flat line in sensor output signal



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Ambient Temperature 20m (AT20) - C**  
**Lower Camp Met Tower - November 2024**

Maximum Value: 13.6 C on Nov 8 15:00																				Maximum Daily Average: 7.7 C on Nov 8					Hours in Service: 720				
Minimum Value: -30.5 C on Nov 29 09:00																				Minimum Daily Average: -27.3 C on Nov 29					Hours of Data: 675				
Maximum Diurnal Average: -5.2 C at hour 15																				Minimum Diurnal Average: -8.1 C at hour 8					Hours of Missing Data: 45				
Monthly Average: -7.12 C																				Percentiles: P <sub>1</sub> = -29.0 P <sub>10</sub> = -18.6 Q <sub>1</sub> = -13.8 Median = -5.3 Q <sub>3</sub> = -0.4 P <sub>90</sub> = 3.0 P <sub>99</sub> = 9.4					Hours of Calibration: 0				
																				Percent Operational Time: 93.8									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Nov	-2.8	-2.9	-2.8	-2.8	-2.8	-2.5	-2.5	-2.4	-2.3	-2.1	-1.9	-1.8	-1.7	-1.6	-1.8	-1.8	-1.9	-2.1	-2.2	-2.5	-2.7	-2.9	-2.9	-3.0	-2.4	-1.6			
2-Nov	-3.1	-3.2	-3.2	-3.2	-3.1	-3.0	-3.1	-3.2	-3.2	-3.0	-2.5	-1.8	-1.4	-0.6	-0.3	-0.2	-0.2	-0.2	-0.2	0.3	0.5	-0.1	-0.4	-0.8	-1.6	0.5			
3-Nov	-0.9	-1.0	-1.0	-0.8	-0.4	-0.5	-1.0	-0.9	-0.8	-0.5	0.0	0.7	1.0	1.4	1.8	1.5	1.4	1.2	1.4	1.1	1.1	0.4	-0.7	-1.8	0.1	1.8			
4-Nov	-1.8	-2.4	-2.4	-2.9	-3.1	-3.1	-2.0	-2.8	-3.3	-3.3	-2.7	-2.3	-1.7	-0.5	0.8	1.3	0.9	-0.7	-2.2	-2.9	-2.9	-2.7	-3.0	-4.1	-2.1	1.3			
5-Nov	-4.8	-5.4	-5.3	-5.1	-5.2	-4.9	-4.5	-4.3	-4.1	-3.7	-3.3	-3.1	-2.8	-2.6	-2.1	-1.8	-1.8	-1.9	-1.4	-1.0	-0.8	DF	-1.6	-2.5	-3.2	-0.8			
6-Nov	DF	-3.3	-3.3	-3.1	-2.8	-2.3	-1.7	-1.0	-0.4	0.4	1.7	2.9	3.9	4.5	4.9	5.0	3.7	3.0	2.9	3.3	3.4	3.6	3.9	2.8	1.4	5.0			
7-Nov	2.0	2.0	2.8	4.3	4.3	4.6	4.6	4.3	4.4	4.5	5.4	6.0	5.6	6.0	7.3	6.7	4.9	4.1	3.8	3.9	4.3	4.1	4.4	5.2	4.6	7.3			
8-Nov	5.7	5.4	4.6	4.1	4.4	4.6	4.5	4.3	4.6	5.4	7.1	8.9	10.4	12.5	13.6	13.3	12.5	12.1	11.5	9.0	7.5	6.8	6.3	5.8	7.7	13.6			
9-Nov	5.8	5.8	5.2	4.3	3.6	2.8	1.9	1.8	1.4	1.9	3.1	4.7	6.3	7.6	8.3	7.1	5.3	3.9	2.7	2.0	0.7	0.7	-0.3	-0.8	3.6	8.3			
10-Nov	-1.4	-1.8	DF	-2.4	-2.7	-3.2	-3.2	DF	-2.5	-2.0	-1.2	0.2	1.6	1.7	2.8	3.2	2.4	1.0	-0.6	-1.0	-1.7	-2.5	DF	DF	-0.7	3.2			
11-Nov	DF	DF	DF	-3.8	DF	DF	DF	-2.2	-1.4	DF	DF	DF	0.3	0.5	0.4	0.5	0.6	1.0	1.3	1.5	1.7	1.9	1.9	2.0	--	2.0			
12-Nov	2.0	1.4	0.4	0.2	0.6	1.8	1.6	1.5	2.0	2.4	1.3	0.6	0.5	-0.2	-1.4	DF	DF	DF	DF	DF	-3.5	DF	DF	DF	--	2.4			
13-Nov	DF	DF	-5.8	DF	-7.3	-7.5	-7.7	-8.3	-8.5	-8.5	-7.5	-6.6	-6.7	-6.3	-6.2	-6.5	-6.9	-7.4	-7.7	-7.6	-7.5	-7.5	-7.4	-7.1	-7.3	-5.8			
14-Nov	-7.0	DF	-7.5	-7.6	-7.7	-7.7	-7.7	-7.8	-7.7	-7.4	-7.1	-6.4	-5.8	-5.3	-4.8	-4.9	-5.3	-5.8	-6.0	-6.1	-6.0	-6.1	-6.6	-7.0	-6.6	-4.8			
15-Nov	-7.1	-6.8	-6.7	-6.4	-6.2	-6.1	-6.5	-6.9	-7.2	-6.5	-5.0	-3.7	-2.9	-2.7	-2.2	-1.7	-1.6	-1.3	-1.2	-1.3	-1.3	-1.6	-1.7	-1.9	-4.0	-1.2			
16-Nov	-2.2	-2.7	-3.5	-3.2	-3.6	-3.8	-3.8	-4.1	DF	-3.5	DF	DF	DF	2.0	2.2	1.5	1.3	1.3	1.1	1.3	1.4	1.4	1.3	1.3	-0.7	2.2			
17-Nov	1.2	1.1	0.7	0.2	-0.4	-0.6	-0.5	-0.6	-0.6	-0.5	-0.3	-0.2	0.1	0.8	1.4	1.3	1.9	2.6	0.4	-0.4	-2.1	-3.6	-3.8	-3.8	-0.2	2.6			
18-Nov	-3.7	-3.4	-3.7	-4.1	-4.4	-4.6	-5.1	-5.8	-5.9	-5.3	-5.0	-4.8	-4.6	-4.3	-3.7	-5.1	-6.5	-7.2	-6.9	-6.6	-6.5	-6.8	-6.8	-6.8	-5.3	-3.4			
19-Nov	-7.0	-7.1	-7.3	-7.7	-8.1	-8.3	-8.7	-9.2	-10.0	-10.9	-11.3	-11.3	-11.0	-11.6	-11.7	-11.8	-13.0	-14.4	-15.1	-15.2	-15.1	-14.9	-15.0	-15.1	-11.3	-7.0			
20-Nov	-15.4	-15.8	-15.6	-16.0	-15.8	-15.6	-15.7	-16.0	-16.0	-15.2	-14.3	-13.9	-13.6	-13.7	-13.5	-13.6	-13.8	-14.1	-14.4	-14.7	-14.8	-14.8	-14.7	-14.9	-14.8	-13.5			
21-Nov	-15.5	-15.9	-16.1	-16.1	-16.1	-16.2	-16.0	-15.7	-15.8	-15.6	-15.3	-15.1	-14.7	-14.3	-14.0	-13.8	-13.7	-13.4	-13.2	-13.2	-13.2	-13.2	-13.3	-13.5	-14.7	-13.2			
22-Nov	-13.6	-13.6	-13.6	-13.5	-13.2	-13.5	-14.1	-14.2	-14.1	-13.8	-13.1	-12.6	-12.0	-11.6	-11.8	-12.3	-13.0	-13.1	-13.3	-13.5	-13.7	-14.0	-14.3	DF	-13.3	-11.6			
23-Nov	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	-15.3	-15.3	-15.3	-15.3	-15.3	-15.1	-14.8	-14.9	-15.0	-15.0	-14.9	--	-14.8			
24-Nov	-15.0	-15.1	-15.0	-14.7	-14.4	-14.5	-14.6	-14.5	-14.4	-14.2	-13.7	-13.1	-12.5	-12.2	-12.5	-12.7	-13.1	-13.4	-13.8	-14.3	-14.6	-15.2	-15.3	-15.1	-14.1	-12.2			
25-Nov	-15.6	-16.3	-16.6	-17.4	-18.0	-18.6	-18.6	-17.7	-17.0	-16.5	-16.8	-16.8	-15.9	-15.3	-15.2	-15.5	-14.7	-13.9	-13.3	-13.0	-13.4	-13.7	-13.5	-13.5	-15.9	-13.0			
26-Nov	-12.8	-12.4	-12.3	-12.3	-12.4	-12.0	-11.8	-11.9	-12.2	-12.6	-12.7	-12.4	-11.6	-10.9	-10.3	-10.0	-9.5	-10.2	-10.1	-9.9	-10.2	-10.6	-10.9	-11.1	-11.4	-9.5			
27-Nov	-10.9	-10.6	-10.4	-10.7	-11.1	-11.1	-11.4	-11.7	-11.8	-11.9	-12.0	-11.7	-11.6	-11.6	-11.8	-12.4	-12.9	-13.2	-13.6	-14.0	-14.4	-14.8	-15.4	-16.1	-12.4	-10.4			
28-Nov	-16.9	-17.0	-17.3	-17.9	-19.1	-20.2	-20.8	-22.0	-23.3	-23.7	-23.1	-20.7	-19.7	-18.5	-18.1	-19.3	-19.7	-21.0	-22.2	-22.5	-23.0	-24.4	-26.0	-27.1	-21.0	-16.9			
29-Nov	-27.6	-28.5	-28.8	-29.3	-29.9	-29.8	-29.4	-29.8	-30.5	-30.3	-28.9	-25.4	-23.9	-22.7	-22.8	-23.2	-24.1	-24.9	-26.1	-26.8	-27.5	-27.6	-27.8	-28.2	-27.3	-22.7			
30-Nov	-27.9	-27.5	-27.4	-27.1	-27.0	-26.6	-26.4	-26.0	-25.5	-24.9	-23.9	-22.7	-21.5	-20.6	-20.1	-19.9	-19.8	-19.7	-19.7	-19.7	-19.8	-20.1	-20.6	-21.1	-23.1	-19.7			
																								Diurnal Average					
																								Diurnal Maximum					
-7.6 -7.6 -7.9 -7.7 -7.9 -7.9 -8.0 -8.1 -8.1 -7.9 -7.5 -6.8 -6.0 -5.5 -5.2 -5.5 -6.0 -6.3 -6.7 -6.9 -7.0 -7.6 -7.8 -7.9																													
5.8 5.8 5.2 4.3 4.4 4.6 4.6 4.3 4.6 5.4 7.1 8.9 10.4 12.5 13.6 13.3 12.5 12.1 11.5 9.0 7.5 6.8 6.3 5.8																													
DF - DAS Failure																													





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 20m (AT20) - C  
Lower Camp Met Tower - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	56	8.30	8.30
-20 - 0	463	68.59	76.89
0 - 10	149	22.07	98.96
10 - 20	7	1.04	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 675

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

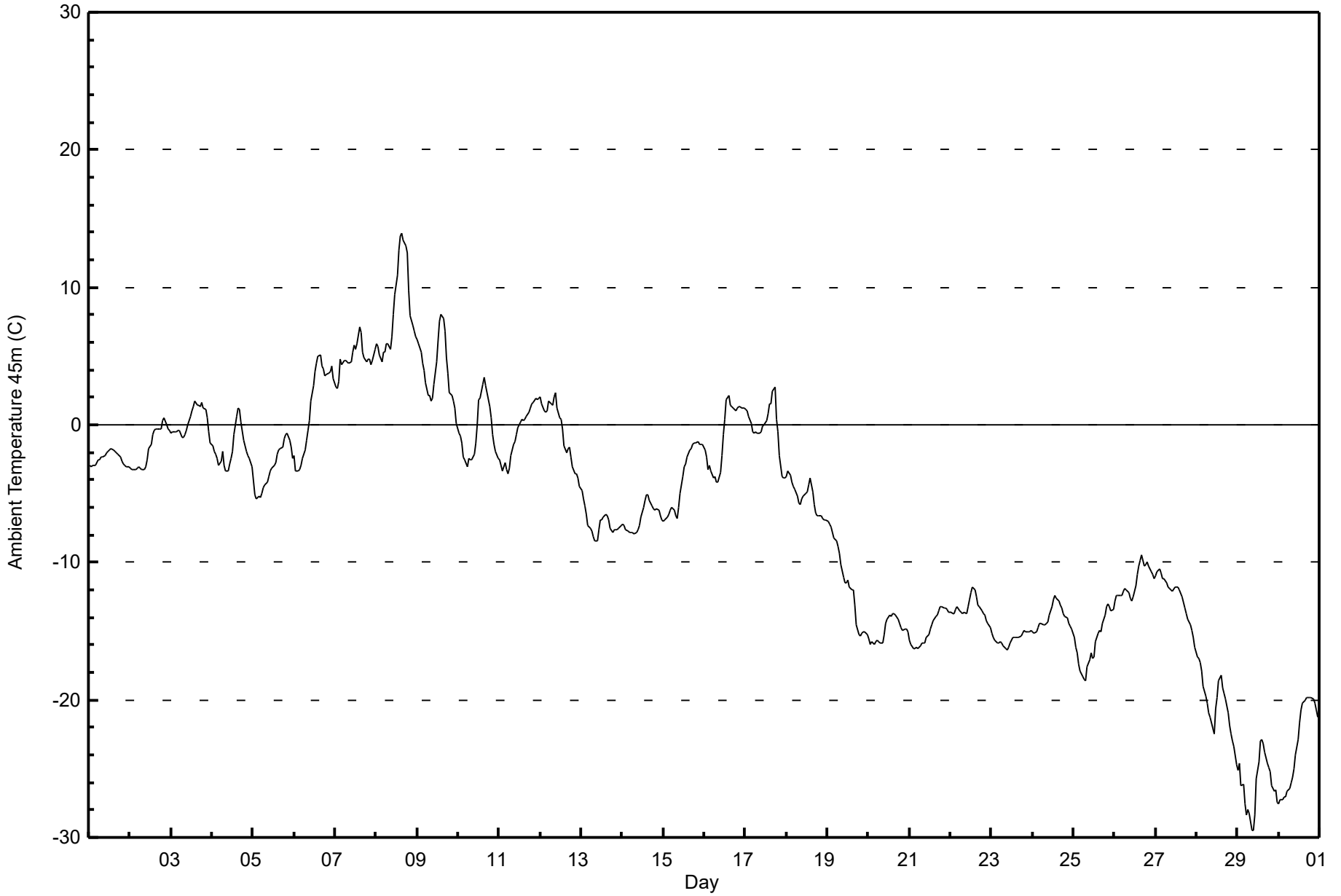
**Ambient Temperature 45m (AT45) - C**  
**Lower Camp Met Tower - November 2024**

Maximum Value: 13.9 C on Nov 8 16:00		Maximum Daily Average: 8.4 C on Nov 8		Hours in Service: 720																																												
Minimum Value: -29.5 C on Nov 29 09:00		Minimum Daily Average: -26.1 C on Nov 29		Hours of Data: 720																																												
Maximum Diurnal Average: -5.3 C at hour 15		Minimum Diurnal Average: -8.1 C at hour 9		Hours of Missing Data: 0																																												
Monthly Average: -6.97 C		Percentiles: P <sub>1</sub> = -27.5 P <sub>10</sub> = -17.9 Q <sub>1</sub> = -13.9 Median = -5.1 Q <sub>3</sub> = -0.5 P <sub>90</sub> = 3.1 P <sub>99</sub> = 9.7		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-3.0	-3.0	-3.0	-3.0	-2.9	-2.6	-2.5	-2.4	-2.4	-2.2	-2.0	-1.9	-1.9	-1.8	-1.9	-1.9	-2.0	-2.2	-2.4	-2.6	-2.9	-3.0	-3.1	-3.1	-2.5	-1.8																						
2-Nov	-3.2	-3.3	-3.3	-3.3	-3.2	-3.1	-3.1	-3.2	-3.2	-3.0	-2.6	-1.7	-1.4	-0.7	-0.4	-0.3	-0.3	-0.3	-0.3	0.3	0.5	0.0	-0.3	-0.4	-1.7	0.5																						
3-Nov	-0.6	-0.5	-0.5	-0.5	-0.4	-0.5	-1.0	-1.0	-0.7	-0.5	0.0	0.6	1.0	1.3	1.7	1.5	1.4	1.3	1.7	1.2	1.1	0.6	-0.5	-1.3	0.2	1.7																						
4-Nov	-1.5	-1.9	-2.2	-2.4	-2.9	-2.6	-1.9	-2.9	-3.4	-3.4	-2.8	-2.5	-2.0	-0.7	0.6	1.3	1.1	0.2	-1.1	-1.5	-2.0	-2.2	-2.4	-3.0	-1.8	1.3																						
5-Nov	-4.1	-5.1	-5.4	-5.2	-5.3	-5.0	-4.6	-4.3	-4.2	-3.7	-3.4	-3.2	-2.9	-2.8	-2.2	-1.8	-1.8	-1.6	-1.1	-0.7	-0.6	-1.1	-1.6	-2.4	-3.1	-0.6																						
6-Nov	-2.2	-3.3	-3.4	-3.2	-3.0	-2.4	-1.8	-1.1	-0.4	0.3	1.7	2.9	3.9	4.5	5.0	5.0	4.2	4.1	3.5	3.7	3.8	3.8	4.3	3.4	1.4	5.0																						
7-Nov	2.8	2.7	3.1	4.8	4.4	4.7	4.7	4.6	4.5	4.5	5.3	5.8	5.5	5.8	7.1	6.8	5.3	4.8	4.5	4.8	4.8	4.4	4.7	5.5	4.8	7.1																						
8-Nov	5.9	5.7	5.1	4.6	5.3	5.3	5.9	5.9	5.5	6.4	8.0	9.5	10.9	12.7	13.7	13.9	13.5	13.0	12.6	9.8	7.9	7.2	6.8	6.4	8.4	13.9																						
9-Nov	6.3	5.9	5.3	4.5	4.0	3.1	2.1	2.1	1.8	1.9	3.0	4.5	6.1	7.5	8.0	7.7	6.8	4.8	3.7	2.4	2.1	1.8	1.2	0.1	4.0	8.0																						
10-Nov	-0.6	-0.8	-1.3	-2.3	-2.6	-3.0	-2.5	-2.5	-2.6	-2.2	-1.3	0.0	1.8	1.9	2.9	3.4	2.9	2.4	1.3	0.5	-0.7	-1.5	-1.9	-2.5	-0.5	3.4																						
11-Nov	-2.5	-2.9	-3.3	-2.8	-3.2	-3.6	-3.1	-2.3	-1.4	-1.2	-0.7	-0.2	0.2	0.4	0.3	0.4	0.6	1.0	1.2	1.5	1.7	1.9	1.9	1.9	-0.6	1.9																						
12-Nov	2.1	1.6	1.1	0.9	1.0	1.7	1.5	1.4	2.0	2.4	1.2	0.5	0.4	-0.3	-1.5	-2.1	-1.8	-1.6	-2.3	-3.0	-3.6	-3.6	-3.9	-4.4	-0.4	2.4																						
13-Nov	-4.8	-5.4	-5.9	-6.5	-7.3	-7.5	-7.7	-8.2	-8.4	-8.4	-7.6	-7.0	-6.9	-6.7	-6.5	-6.6	-6.9	-7.5	-7.8	-7.7	-7.6	-7.6	-7.5	-7.3	-7.1	-4.8																						
14-Nov	-7.2	-7.3	-7.6	-7.7	-7.8	-7.8	-7.8	-7.9	-7.9	-7.6	-7.3	-6.7	-6.0	-5.5	-5.1	-5.1	-5.4	-5.9	-6.1	-6.2	-6.2	-6.3	-6.6	-6.9	-6.8	-5.1																						
15-Nov	-7.0	-6.9	-6.7	-6.5	-6.2	-6.0	-6.2	-6.6	-6.8	-6.0	-5.0	-3.8	-3.1	-2.8	-2.3	-1.9	-1.7	-1.4	-1.3	-1.3	-1.3	-1.5	-1.4	-1.4	-4.0	-1.3																						
16-Nov	-1.8	-2.3	-3.2	-2.9	-3.4	-3.8	-3.7	-4.1	-4.2	-3.4	-2.2	-0.7	0.4	1.9	2.1	1.4	1.3	1.2	1.1	1.3	1.3	1.3	1.2	1.3	-0.8	2.1																						
17-Nov	1.2	1.0	0.7	0.1	-0.5	-0.6	-0.5	-0.6	-0.6	-0.5	-0.1	0.0	0.3	0.9	1.5	1.6	2.4	2.7	0.4	-0.5	-2.2	-3.8	-3.9	-3.9	-0.2	2.7																						
18-Nov	-3.7	-3.4	-3.7	-4.1	-4.5	-4.7	-5.2	-5.7	-5.8	-5.4	-5.2	-5.0	-4.9	-4.3	-3.9	-4.9	-5.8	-6.4	-6.7	-6.6	-6.6	-6.8	-6.9	-6.9	-5.3	-3.4																						
19-Nov	-7.1	-7.2	-7.4	-7.8	-8.3	-8.5	-8.9	-9.4	-10.1	-11.1	-11.5	-11.5	-11.3	-11.8	-12.0	-12.0	-13.1	-14.5	-15.2	-15.4	-15.2	-15.0	-15.1	-15.2	-11.4	-7.1																						
20-Nov	-15.6	-15.9	-15.7	-16.0	-15.8	-15.6	-15.7	-15.9	-15.9	-15.2	-14.5	-14.1	-13.9	-13.9	-13.8	-13.7	-13.9	-14.2	-14.5	-14.8	-14.9	-14.9	-14.8	-15.0	-14.9	-13.7																						
21-Nov	-15.6	-16.0	-16.3	-16.3	-16.2	-16.3	-16.1	-15.9	-15.9	-15.8	-15.5	-15.3	-14.9	-14.5	-14.2	-13.9	-13.8	-13.5	-13.2	-13.3	-13.3	-13.3	-13.4	-13.6	-14.8	-13.2																						
22-Nov	-13.6	-13.7	-13.7	-13.4	-13.2	-13.5	-13.6	-13.7	-13.7	-13.8	-13.2	-12.7	-12.2	-11.8	-12.0	-12.5	-13.1	-13.2	-13.5	-13.7	-13.8	-14.2	-14.5	-14.7	-13.4	-11.8																						
23-Nov	-15.2	-15.4	-15.7	-15.9	-15.8	-15.8	-15.8	-16.1	-16.2	-16.3	-16.1	-15.8	-15.5	-15.4	-15.4	-15.4	-15.4	-15.4	-15.2	-14.9	-15.0	-15.1	-15.1	-15.0	-15.6	-14.9																						
24-Nov	-15.1	-15.2	-15.1	-14.7	-14.5	-14.5	-14.6	-14.6	-14.5	-14.3	-13.8	-13.3	-12.7	-12.4	-12.6	-12.8	-13.1	-13.3	-13.7	-13.9	-14.0	-14.4	-14.6	-14.8	-14.0	-12.4																						
25-Nov	-15.5	-16.1	-16.6	-17.4	-17.9	-18.3	-18.5	-18.6	-17.6	-17.0	-16.6	-16.9	-16.9	-16.7	-15.2	-14.9	-15.1	-14.4	-13.8	-13.2	-13.0	-13.2	-13.5	-13.5	-15.8	-13.0																						
26-Nov	-12.8	-12.4	-12.4	-12.4	-12.4	-12.1	-11.9	-12.0	-12.2	-12.6	-12.8	-12.6	-11.7	-10.9	-10.2	-9.8	-9.5	-10.3	-10.2	-10.0	-10.2	-10.7	-10.9	-11.2	-11.4	-9.5																						
27-Nov	-11.0	-10.6	-10.5	-10.8	-11.2	-11.2	-11.5	-11.8	-11.9	-12.0	-12.1	-11.8	-11.8	-11.8	-12.0	-12.5	-13.0	-13.3	-13.7	-14.1	-14.5	-14.9	-15.4	-16.2	-12.5	-10.5																						
28-Nov	-16.9	-17.0	-17.3	-17.9	-19.0	-19.8	-20.2	-21.0	-21.2	-22.1	-22.5	-20.6	-19.8	-18.7	-18.2	-19.1	-19.5	-19.9	-20.9	-21.9	-22.5	-23.0	-23.4	-24.7	-20.3	-16.9																						
29-Nov	-25.1	-24.7	-26.3	-26.1	-27.5	-28.4	-27.9	-28.3	-29.5	-29.5	-28.4	-25.8	-24.5	-23.0	-22.9	-23.2	-23.8	-24.6	-24.9	-25.2	-26.3	-26.7	-26.6	-27.4	-26.1	-22.9																						
30-Nov	-27.6	-27.3	-27.2	-27.0	-27.0	-26.7	-26.5	-26.0	-25.6	-25.0	-24.0	-22.9	-21.7	-20.7	-20.2	-20.0	-19.8	-19.8	-19.8	-19.8	-19.9	-20.3	-20.7	-21.2	-23.2	-19.8																						
																								-7.2	-7.4	-7.6	-7.7	-7.9	-8.0	-8.0	-8.1	-8.1	-7.9	-7.4	-6.7	-6.2	-5.6	-5.3	-5.4	-5.6	-5.9	-6.3	-6.5	-6.8	-7.1	-7.3	-7.6	Diurnal Average
																								6.3	5.9	5.3	4.8	5.3	5.3	5.9	5.9	5.5	6.4	8.0	9.5	10.9	12.7	13.7	13.9	13.5	13.0	12.6	9.8	7.9	7.2	6.8	6.4	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 45m (AT45) - C**  
**Lower Camp Met Tower - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 45m (AT45) - C  
Lower Camp Met Tower - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	55	7.64	7.64
-20 - 0	503	69.86	77.50
0 - 10	155	21.53	99.03
10 - 20	7	0.97	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

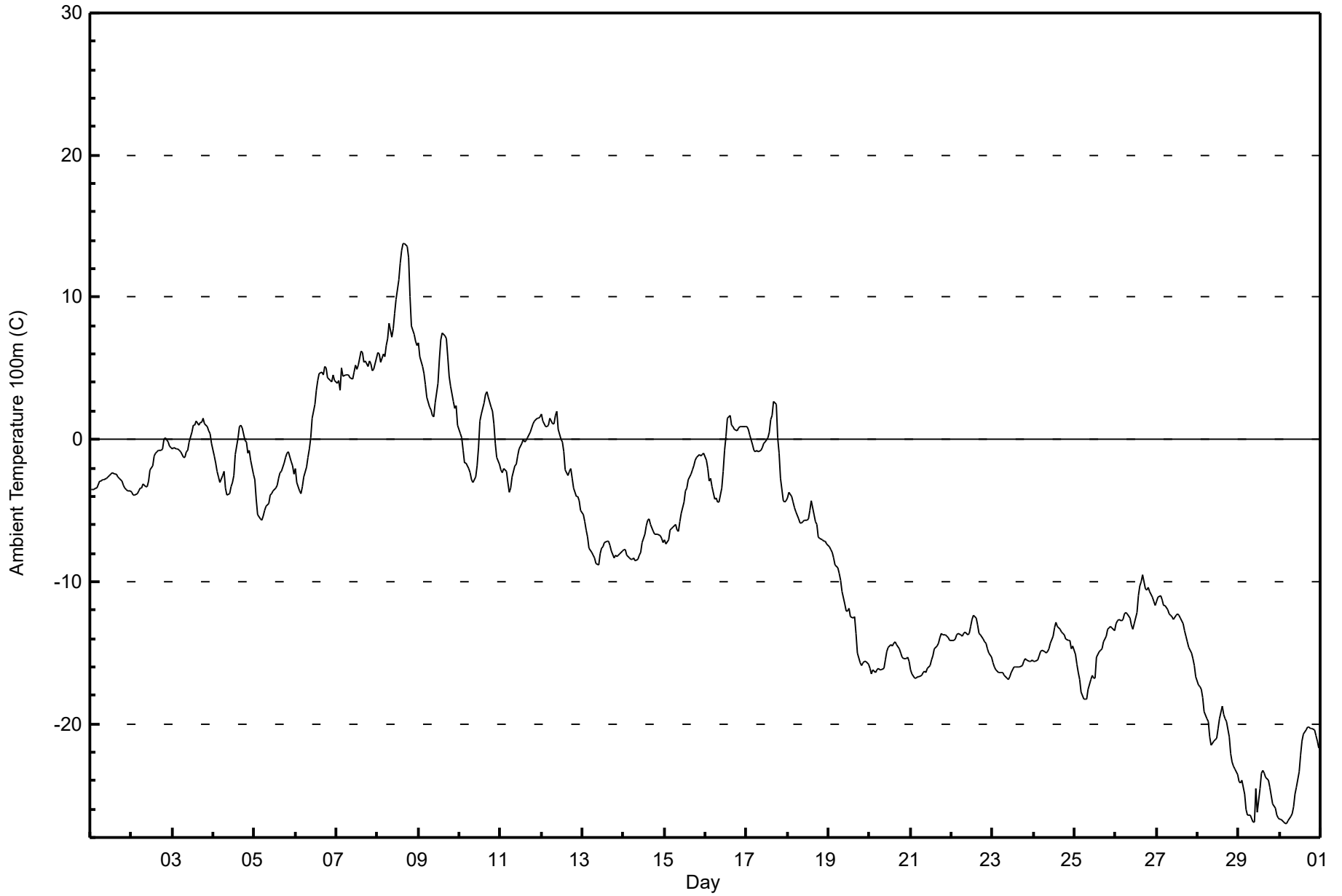




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Ambient Temperature 100m (AT100) - C**  
**Lower Camp Met Tower - November 2024**

Maximum Value: 13.8 C on Nov 8 17:00		Maximum Daily Average: 8.9 C on Nov 8		Hours in Service: 720																																												
Minimum Value: -27.0 C on Nov 30 04:00		Minimum Daily Average: -25.2 C on Nov 29		Hours of Data: 720																																												
Maximum Diurnal Average: -5.8 C at hour 15		Minimum Diurnal Average: -8.2 C at hour 9		Hours of Missing Data: 0																																												
Monthly Average: -7.15 C		Percentiles: P <sub>1</sub> = -26.7 P <sub>10</sub> = -17.8 Q <sub>1</sub> = -14.4 Median = -5.6 Q <sub>3</sub> = -0.7 P <sub>90</sub> = 3.5 P <sub>99</sub> = 10.0		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-3.6	-3.5	-3.5	-3.5	-3.4	-2.9	-2.9	-2.8	-2.8	-2.7	-2.6	-2.5	-2.4	-2.3	-2.4	-2.5	-2.6	-2.8	-2.9	-3.2	-3.4	-3.6	-3.6	-3.6	-3.0	-2.3																						
2-Nov	-3.7	-3.9	-3.9	-3.8	-3.6	-3.4	-3.4	-3.2	-3.3	-3.3	-2.9	-2.2	-1.8	-1.2	-1.0	-0.8	-0.8	-0.8	-0.7	0.0	0.1	-0.2	-0.4	-0.6	-2.0	0.1																						
3-Nov	-0.6	-0.6	-0.7	-0.7	-0.8	-0.9	-1.3	-1.3	-0.8	-0.8	-0.2	0.5	1.0	1.0	1.3	1.0	1.2	1.2	1.5	1.1	0.9	0.6	0.4	-0.3	0.1	1.5																						
4-Nov	-1.2	-1.7	-2.2	-2.6	-3.1	-2.5	-2.2	-3.4	-3.9	-3.8	-3.3	-3.0	-2.5	-1.1	0.1	0.9	1.0	0.8	-0.1	-0.2	-0.9	-0.8	-1.5	-2.4	-1.7	1.0																						
5-Nov	-2.8	-4.2	-5.3	-5.6	-5.7	-5.4	-5.0	-4.7	-4.5	-3.9	-3.8	-3.7	-3.5	-3.3	-2.8	-2.3	-2.2	-1.6	-1.2	-1.0	-0.9	-1.5	-1.8	-2.5	-3.3	-0.9																						
6-Nov	-2.0	-3.0	-3.6	-3.8	-3.3	-2.7	-1.9	-1.3	-0.6	0.1	1.4	2.5	3.5	4.1	4.7	4.8	4.5	5.1	5.1	4.3	4.2	4.0	4.5	4.2	1.4	5.1																						
7-Nov	4.0	4.2	3.4	5.0	4.4	4.5	4.5	4.5	4.3	4.2	4.7	5.2	4.9	5.2	6.2	6.1	5.5	5.5	5.1	5.5	5.3	4.9	5.0	5.7	4.9	6.2																						
8-Nov	6.1	6.0	5.4	6.0	5.8	6.6	7.1	8.1	7.2	7.7	8.9	9.8	11.2	12.4	13.3	13.8	13.8	13.5	12.8	10.0	8.0	7.4	6.9	6.6	8.9	13.8																						
9-Nov	6.8	5.8	5.2	4.6	3.9	3.0	2.3	2.1	1.7	1.6	2.6	3.9	5.6	7.0	7.5	7.3	7.1	5.8	4.5	3.7	2.7	2.2	2.3	1.0	4.2	7.5																						
10-Nov	0.4	0.2	-0.8	-1.6	-1.7	-2.0	-2.4	-2.9	-3.0	-2.7	-1.8	-0.5	1.3	1.8	2.6	3.1	3.4	2.9	2.3	1.9	1.1	-0.3	-1.3	-1.8	-0.1	3.4																						
11-Nov	-2.1	-2.3	-2.0	-2.2	-3.0	-3.8	-3.4	-2.7	-1.9	-1.7	-1.2	-0.7	-0.3	0.0	-0.1	-0.1	0.1	0.5	0.8	1.1	1.3	1.5	1.5	1.6	-0.8	1.6																						
12-Nov	1.8	1.3	0.9	0.9	1.0	1.5	1.1	1.1	1.7	2.0	0.8	0.1	-0.2	-0.9	-2.1	-2.6	-2.3	-2.0	-2.8	-3.5	-4.0	-4.0	-4.3	-5.0	-0.8	2.0																						
13-Nov	-5.3	-5.7	-6.3	-6.9	-7.7	-7.9	-8.1	-8.3	-8.8	-8.8	-8.1	-7.7	-7.5	-7.3	-7.1	-7.2	-7.4	-7.8	-8.3	-8.2	-8.2	-8.2	-8.1	-7.9	-7.6	-5.3																						
14-Nov	-7.8	-7.8	-8.1	-8.3	-8.4	-8.4	-8.4	-8.5	-8.5	-8.2	-7.9	-7.3	-6.6	-6.1	-5.6	-5.6	-6.0	-6.4	-6.7	-6.7	-6.7	-6.8	-7.0	-7.2	-7.3	-5.6																						
15-Nov	-7.1	-7.3	-7.1	-6.3	-6.2	-6.1	-5.9	-6.3	-6.5	-5.8	-5.2	-4.4	-3.6	-3.4	-2.8	-2.4	-2.1	-1.9	-1.4	-1.3	-1.0	-1.1	-1.0	-1.0	-4.1	-1.0																						
16-Nov	-1.5	-2.0	-2.9	-2.7	-3.3	-4.2	-4.1	-4.5	-4.4	-3.5	-2.3	-0.8	0.3	1.5	1.7	1.0	0.9	0.7	0.6	0.8	0.9	0.9	0.9	0.9	-1.0	1.7																						
17-Nov	0.9	0.7	0.3	-0.3	-0.8	-0.9	-0.8	-0.9	-0.8	-0.6	-0.3	-0.2	0.1	0.6	1.4	1.7	2.6	2.4	0.1	-1.0	-2.8	-4.3	-4.4	-4.3	-0.5	2.6																						
18-Nov	-4.1	-3.7	-4.0	-4.5	-4.8	-5.1	-5.6	-5.9	-5.9	-5.8	-5.7	-5.7	-5.6	-5.0	-4.4	-5.3	-5.8	-6.0	-6.8	-7.0	-7.1	-7.2	-7.2	-7.3	-5.6	-3.7																						
19-Nov	-7.6	-7.7	-7.9	-8.3	-8.8	-9.0	-9.4	-10.0	-10.7	-11.6	-12.0	-12.1	-11.9	-12.4	-12.5	-12.5	-13.6	-15.0	-15.7	-15.9	-15.7	-15.6	-15.6	-15.8	-12.0	-7.6																						
20-Nov	-16.1	-16.5	-16.2	-16.4	-16.2	-16.1	-16.2	-16.2	-16.1	-15.6	-15.0	-14.6	-14.4	-14.5	-14.3	-14.2	-14.4	-14.7	-15.0	-15.4	-15.5	-15.4	-15.4	-15.6	-15.4	-14.2																						
21-Nov	-16.2	-16.5	-16.8	-16.8	-16.7	-16.7	-16.6	-16.4	-16.3	-16.4	-16.1	-15.9	-15.5	-15.2	-14.8	-14.5	-14.3	-13.9	-13.7	-13.7	-13.7	-13.8	-13.9	-14.1	-15.4	-13.7																						
22-Nov	-14.1	-14.2	-14.0	-13.7	-13.7	-13.8	-13.8	-13.6	-13.6	-13.8	-13.7	-13.2	-12.6	-12.3	-12.5	-13.1	-13.6	-13.8	-14.0	-14.2	-14.4	-14.7	-15.0	-15.3	-13.8	-12.3																						
23-Nov	-15.7	-16.0	-16.3	-16.4	-16.4	-16.4	-16.4	-16.6	-16.8	-16.9	-16.7	-16.4	-16.0	-16.0	-16.0	-16.0	-16.0	-15.9	-15.6	-15.5	-15.5	-15.6	-15.6	-15.5	-16.1	-15.5																						
24-Nov	-15.6	-15.7	-15.6	-15.2	-14.9	-14.8	-15.0	-15.0	-14.9	-14.8	-14.4	-13.8	-13.2	-12.9	-13.1	-13.3	-13.5	-13.6	-13.8	-14.0	-14.2	-14.1	-14.7	-14.6	-14.4	-12.9																						
25-Nov	-15.1	-15.8	-16.4	-16.9	-17.8	-18.3	-18.2	-18.2	-17.5	-16.9	-16.6	-16.7	-16.8	-15.3	-14.9	-14.8	-14.7	-14.2	-13.9	-13.4	-13.2	-13.1	-13.3	-13.4	-15.7	-13.1																						
26-Nov	-13.0	-12.7	-12.7	-12.7	-12.7	-12.3	-12.2	-12.3	-12.6	-13.0	-13.3	-13.0	-12.1	-11.0	-10.3	-10.0	-9.5	-10.5	-10.6	-10.4	-10.7	-11.1	-11.4	-11.6	-11.7	-9.5																						
27-Nov	-11.4	-11.1	-11.0	-11.3	-11.7	-11.7	-12.0	-12.3	-12.4	-12.5	-12.6	-12.4	-12.3	-12.4	-12.5	-13.0	-13.5	-13.8	-14.2	-14.6	-15.0	-15.4	-15.9	-16.7	-13.0	-11.0																						
28-Nov	-17.3	-17.4	-17.6	-18.1	-19.2	-19.6	-19.9	-20.9	-21.5	-21.2	-21.1	-21.0	-20.4	-19.6	-18.8	-19.4	-19.6	-19.9	-20.9	-22.1	-22.7	-23.0	-23.2	-23.6	-20.3	-17.3																						
29-Nov	-24.1	-24.2	-24.0	-24.9	-26.0	-26.4	-26.4	-26.4	-26.9	-27.0	-24.6	-26.2	-24.5	-23.5	-23.3	-23.5	-23.8	-24.0	-24.5	-25.1	-25.6	-26.0	-26.4	-26.7	-25.2	-23.3																						
30-Nov	-26.7	-26.7	-26.9	-27.0	-27.0	-26.8	-26.5	-26.3	-25.8	-25.0	-24.4	-23.4	-22.2	-21.2	-20.7	-20.4	-20.3	-20.3	-20.3	-20.3	-20.3	-20.4	-20.8	-21.2	-23.4	-20.3																						
																								-7.2	-7.4	-7.7	-7.8	-8.1	-8.1	-8.1	-8.2	-8.2	-8.0	-7.6	-7.2	-6.6	-6.1	-5.8	-5.8	-5.9	-6.0	-6.3	-6.6	-6.9	-7.2	-7.4	-7.6	Diurnal Average
																								6.8	6.0	5.4	6.0	5.8	6.6	7.1	8.1	7.2	7.7	8.9	9.8	11.2	12.4	13.3	13.8	13.8	13.5	12.8	10.0	8.0	7.4	6.9	6.6	Diurnal Maximum





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 100m (AT100) - C  
Lower Camp Met Tower - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	60	8.33	8.33
-20 - 0	502	69.72	78.06
0 - 10	150	20.83	98.89
10 - 20	8	1.11	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

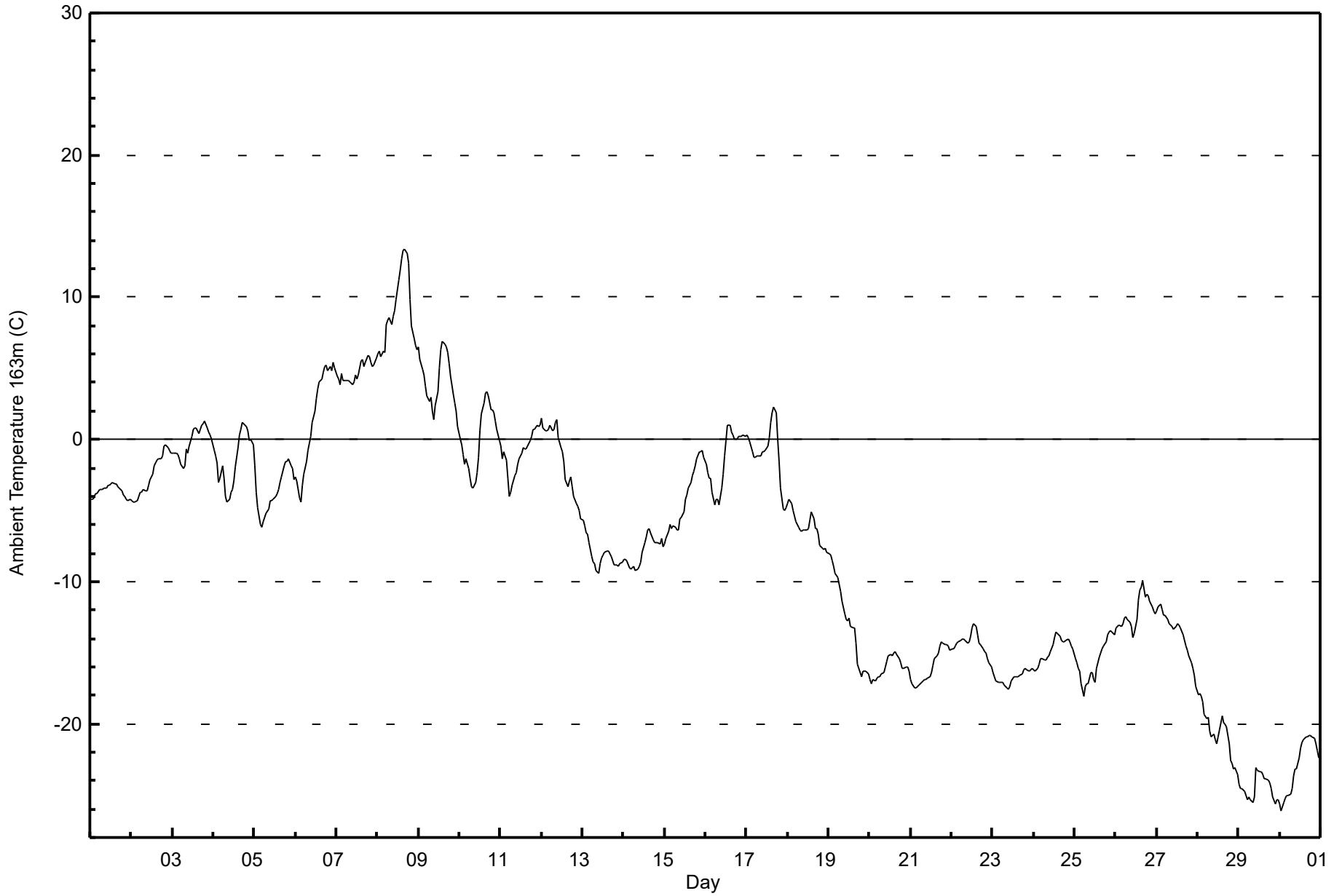
Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Ambient Temperature 163m (AT163) - C**  
**Lower Camp Met Tower - November 2024**

Maximum Value: 13.4 C on Nov 8 17:00      Maximum Daily Average: 9.0 C on Nov 8																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: -26.2 C on Nov 30 02:00      Minimum Daily Average: -24.5 C on Nov 29 Maximum Diurnal Average: -6.3 C at hour 16      Minimum Diurnal Average: -8.3 C at hour 9 Monthly Average: -7.44 C      Percentiles: P <sub>1</sub> = -25.3 P <sub>10</sub> = -17.9 Q <sub>1</sub> = -14.9 Median = -6.0 Q <sub>3</sub> = -0.8 P <sub>90</sub> = 3.4 P <sub>99</sub> = 9.8																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	-4.2	-4.2	-4.1	-3.8	-3.8	-3.5	-3.6	-3.5	-3.4	-3.4	-3.3	-3.2	-3.1	-3.0	-3.1	-3.2	-3.3	-3.4	-3.6	-3.9	-4.0	-4.2	-4.3	-4.2	-3.6	-3.0
2-Nov	-4.3	-4.4	-4.4	-4.3	-4.0	-3.7	-3.7	-3.5	-3.6	-3.6	-3.2	-2.8	-2.4	-1.9	-1.6	-1.5	-1.4	-1.4	-1.2	-0.5	-0.4	-0.6	-0.7	-0.9	-2.5	-0.4
3-Nov	-0.9	-1.0	-1.0	-1.1	-1.3	-1.8	-2.1	-1.8	-0.7	-0.9	-0.5	0.2	0.7	0.8	0.8	0.4	0.7	1.0	1.1	1.3	0.8	0.5	0.3	0.0	-0.2	1.3
4-Nov	-0.7	-1.1	-1.7	-3.0	-2.8	-1.9	-2.7	-4.0	-4.4	-4.2	-3.7	-3.5	-2.9	-1.9	-0.5	0.3	0.7	1.2	1.0	0.9	0.6	-0.1	0.0	-0.4	-1.5	1.2
5-Nov	-1.8	-3.7	-4.8	-6.0	-6.2	-5.8	-5.5	-5.2	-4.9	-4.3	-4.3	-4.2	-4.0	-3.9	-3.5	-3.0	-2.6	-1.9	-1.5	-1.5	-1.4	-1.9	-2.1	-2.9	-3.6	-1.4
6-Nov	-2.7	-2.9	-4.1	-4.4	-3.3	-2.4	-1.5	-0.8	-0.3	0.2	1.2	2.0	2.9	3.6	4.1	4.3	4.7	5.1	5.2	4.9	5.2	4.8	5.4	5.1	1.5	5.4
7-Nov	4.4	4.2	3.8	4.7	4.1	4.1	4.1	4.1	4.0	3.8	4.1	4.5	4.3	4.5	5.5	5.6	5.1	5.4	5.9	5.8	5.4	5.1	5.3	5.7	4.7	5.9
8-Nov	6.0	6.2	5.8	6.2	6.1	8.0	8.4	8.6	8.1	8.7	9.1	9.8	11.2	11.9	12.7	13.2	13.4	13.1	12.4	9.8	8.0	7.1	6.6	6.3	9.0	13.4
9-Nov	6.5	5.6	5.0	4.5	3.7	3.0	2.6	3.0	2.0	1.4	2.4	3.4	5.0	6.3	6.9	6.7	6.5	6.1	5.3	4.5	3.2	2.6	1.9	0.9	4.1	6.9
10-Nov	0.0	-0.4	-1.0	-1.8	-1.4	-2.0	-2.7	-3.3	-3.4	-3.0	-2.4	-1.2	0.6	1.8	2.5	3.2	3.4	3.1	2.1	2.1	1.9	1.3	0.7	-0.1	0.0	3.4
11-Nov	-0.5	-1.3	-0.9	-1.4	-2.8	-4.0	-3.8	-3.3	-2.5	-2.3	-1.8	-1.4	-0.9	-0.6	-0.7	-0.7	-0.4	-0.1	0.2	0.7	0.7	1.0	0.9	1.0	-1.0	1.0
12-Nov	1.4	0.8	0.6	0.6	0.7	1.0	0.6	0.7	1.2	1.4	0.1	-0.5	-0.9	-1.6	-2.8	-3.3	-2.9	-2.6	-3.4	-4.1	-4.5	-4.7	-5.0	-5.6	-1.4	1.4
13-Nov	-5.7	-6.1	-6.6	-6.6	-7.2	-8.2	-8.6	-8.8	-9.3	-9.4	-8.8	-8.4	-8.2	-7.9	-7.8	-7.9	-8.0	-8.3	-8.9	-8.8	-8.9	-8.9	-8.8	-8.6	-8.1	-5.7
14-Nov	-8.5	-8.4	-8.6	-9.0	-9.1	-9.0	-8.9	-9.2	-9.2	-8.9	-8.6	-8.0	-7.3	-6.8	-6.3	-6.3	-6.6	-7.1	-7.3	-7.3	-7.3	-7.4	-7.0	-7.6	-7.9	-6.3
15-Nov	-7.4	-7.0	-6.5	-6.0	-6.3	-6.0	-6.2	-6.3	-6.4	-5.6	-5.5	-5.1	-4.2	-4.0	-3.4	-3.0	-2.6	-2.2	-1.8	-1.4	-0.8	-0.9	-0.8	-1.3	-4.2	-0.8
16-Nov	-1.8	-2.3	-2.7	-2.8	-3.7	-4.6	-4.2	-4.2	-4.6	-3.4	-2.5	-1.2	0.0	1.0	1.0	0.5	0.3	0.0	0.0	0.2	0.2	0.2	0.3	0.3	-1.4	1.0
17-Nov	0.3	0.1	-0.2	-0.9	-1.2	-1.3	-1.2	-1.2	-1.1	-0.9	-0.9	-0.8	-0.4	0.1	1.2	1.9	2.3	1.9	0.0	-1.6	-3.5	-4.9	-5.0	-4.8	-0.9	2.3
18-Nov	-4.5	-4.2	-4.5	-5.0	-5.4	-5.8	-6.2	-6.4	-6.5	-6.3	-6.4	-6.4	-6.3	-5.7	-5.1	-5.6	-6.3	-6.3	-6.7	-7.5	-7.7	-7.8	-7.6	-7.9	-6.2	-4.2
19-Nov	-8.1	-8.2	-8.6	-9.0	-9.5	-9.7	-10.2	-10.7	-11.4	-12.3	-12.7	-12.8	-12.6	-13.2	-13.3	-13.2	-14.3	-15.8	-16.4	-16.7	-16.3	-16.3	-16.3	-16.5	-12.7	-8.1
20-Nov	-16.9	-17.1	-16.9	-17.0	-16.8	-16.7	-16.7	-16.5	-16.4	-16.0	-15.6	-15.3	-15.1	-15.2	-15.0	-15.0	-15.1	-15.4	-15.8	-16.1	-16.1	-16.0	-16.0	-16.3	-16.0	-15.0
21-Nov	-16.9	-17.2	-17.5	-17.5	-17.4	-17.2	-17.1	-17.0	-16.8	-16.9	-16.8	-16.7	-16.4	-15.9	-15.4	-15.2	-15.0	-14.5	-14.2	-14.3	-14.4	-14.5	-14.6	-14.8	-16.0	-14.2
22-Nov	-14.7	-14.7	-14.5	-14.3	-14.3	-14.2	-14.1	-14.1	-14.1	-14.4	-14.2	-13.8	-13.3	-13.0	-13.2	-13.8	-14.3	-14.5	-14.8	-14.9	-15.1	-15.4	-15.7	-16.0	-14.4	-13.0
23-Nov	-16.4	-16.7	-16.9	-17.1	-17.1	-17.1	-17.1	-17.3	-17.5	-17.6	-17.4	-17.0	-16.7	-16.7	-16.7	-16.7	-16.6	-16.5	-16.2	-16.1	-16.2	-16.3	-16.2	-16.1	-16.8	-16.1
24-Nov	-16.2	-16.3	-16.1	-15.8	-15.4	-15.4	-15.5	-15.5	-15.3	-15.2	-15.0	-14.4	-13.9	-13.5	-13.6	-13.9	-14.1	-14.2	-14.2	-14.1	-14.1	-14.3	-14.5	-14.7	-14.8	-13.5
25-Nov	-15.4	-15.7	-16.1	-16.3	-17.2	-18.1	-17.4	-17.2	-17.2	-16.4	-16.4	-16.9	-17.1	-16.1	-15.3	-15.0	-14.8	-14.5	-14.2	-13.8	-13.5	-13.5	-13.6	-13.7	-15.6	-13.5
26-Nov	-13.2	-13.1	-13.0	-13.1	-12.9	-12.5	-12.5	-12.7	-12.8	-13.2	-13.9	-13.6	-12.7	-11.3	-10.6	-10.4	-9.9	-11.0	-10.9	-11.0	-11.4	-11.8	-12.1	-12.3	-12.2	-9.9
27-Nov	-12.1	-11.7	-11.6	-12.0	-12.4	-12.4	-12.7	-12.9	-13.1	-13.2	-13.3	-13.1	-13.0	-13.1	-13.3	-13.7	-14.2	-14.5	-14.9	-15.3	-15.7	-16.1	-16.6	-17.4	-13.7	-11.6
28-Nov	-18.0	-17.9	-18.1	-18.5	-19.4	-19.6	-19.6	-20.6	-20.9	-20.7	-21.1	-21.4	-20.9	-20.4	-19.5	-20.0	-20.0	-20.3	-21.4	-22.6	-22.8	-23.1	-23.0	-23.6	-20.6	-17.9
29-Nov	-24.3	-24.6	-24.5	-24.8	-25.1	-25.3	-25.1	-25.4	-25.5	-25.2	-23.1	-23.3	-23.4	-23.4	-23.6	-23.9	-23.9	-23.9	-24.2	-24.5	-25.2	-25.7	-25.3	-25.3	-24.5	-23.1
30-Nov	-25.6	-26.2	-25.5	-25.3	-25.0	-25.0	-24.9	-24.5	-23.7	-23.2	-23.2	-22.4	-21.7	-21.3	-21.1	-20.9	-20.9	-20.9	-20.8	-20.9	-21.0	-21.4	-21.9	-22.4	-22.9	-20.8
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 163m (AT163) - C  
Lower Camp Met Tower - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	63	8.75	8.75
-20 - 0	505	70.14	78.89
0 - 10	145	20.14	99.03
10 - 20	7	0.97	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

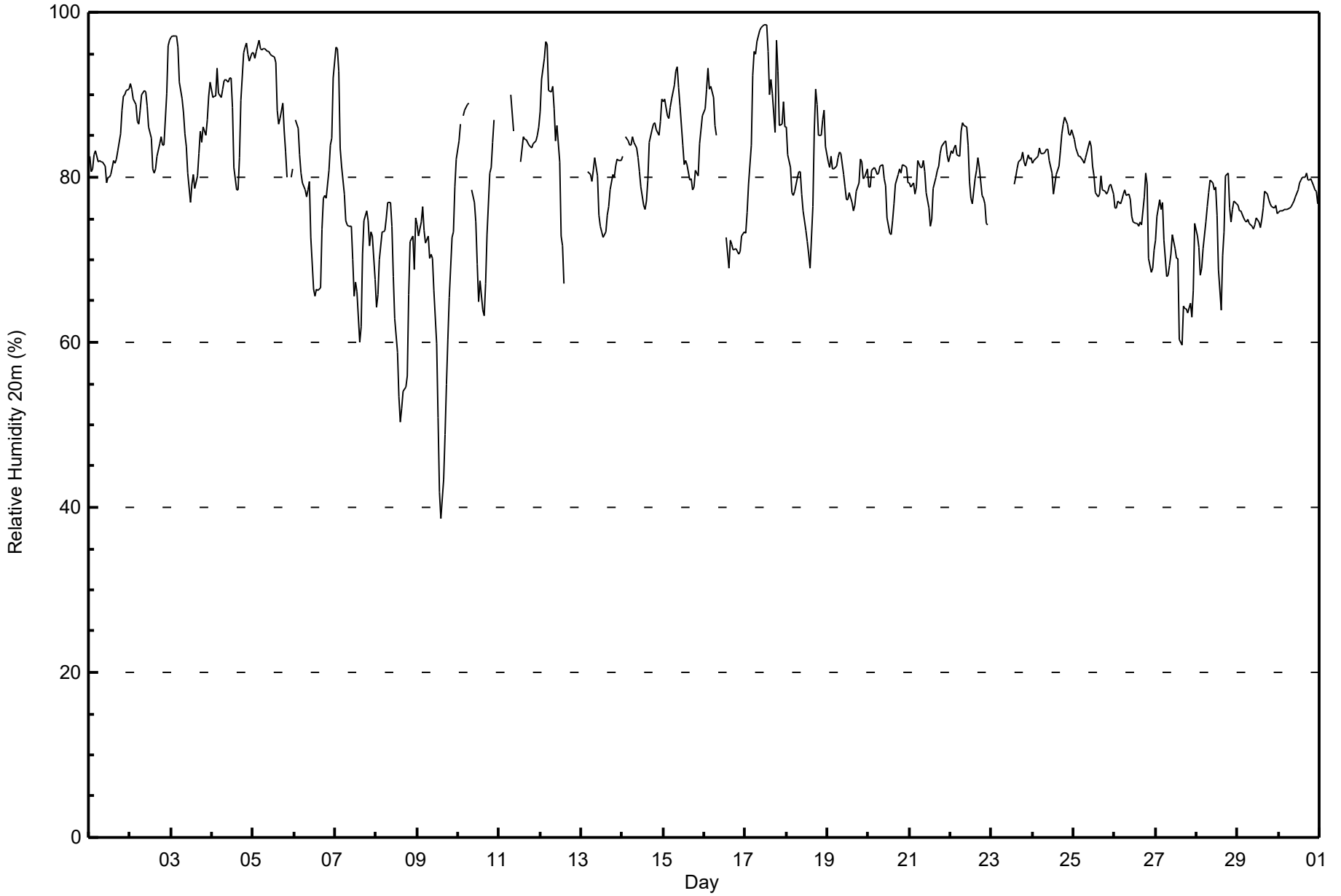
**Relative Humidity 20m (RH20) - %**  
**Lower Camp Met Tower - November 2024**

Maximum Value: 98.6 % on Nov 17 13:00		Maximum Daily Average: 91.0 % on Nov 5		Hours in Service: 720																							
Minimum Value: 38.7 % on Nov 9 15:00		Minimum Daily Average: 65.2 % on Nov 9		Hours of Data: 675																							
Maximum Diurnal Average: 83.4 % at hour 4		Minimum Diurnal Average: 73.3 % at hour 15		Hours of Missing Data: 45																							
Monthly Average: 80.10 %		Percentiles: P <sub>1</sub> = 53.0 P <sub>10</sub> = 70.4 Q <sub>1</sub> = 75.9 Median = 80.4 Q <sub>3</sub> = 85.0 P <sub>90</sub> = 90.6 P <sub>99</sub> = 97.1		Hours of Calibration: 0																							
				Percent Operational Time: 93.8																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	82.5	80.6	81.1	82.8	83.3	81.9	82.0	81.8	81.9	81.4	79.2	80.1	80.0	80.4	82.0	81.6	82.2	83.3	85.2	88.2	89.9	90.0	90.5	90.7	83.4	90.7	
2-Nov	91.4	90.6	89.4	88.8	86.8	86.5	88.1	90.1	90.5	90.3	88.6	86.1	84.8	81.1	80.6	81.0	82.5	84.1	85.0	83.9	83.9	90.3	95.9	96.7	87.4	96.7	
3-Nov	97.0	97.1	97.1	97.1	95.8	91.6	89.5	87.8	85.3	83.8	80.6	77.0	79.2	80.3	78.6	80.2	82.9	85.6	84.2	86.2	85.1	87.0	89.8	91.6	87.1	97.1	
4-Nov	89.7	89.9	89.8	93.3	90.1	89.6	90.6	91.7	91.9	91.6	92.0	92.0	88.4	81.2	78.4	78.4	82.4	89.3	95.1	95.7	96.3	94.9	94.2	95.1	90.1	96.3	
5-Nov	95.1	94.5	95.2	96.5	95.5	95.3	95.6	95.5	95.3	95.2	94.9	94.8	94.7	93.8	88.1	86.5	87.1	89.0	85.7	83.0	80.0	DF	80.0	81.1	91.0	96.5	
6-Nov	DF	86.9	86.0	82.7	80.6	79.3	78.5	77.6	78.5	79.5	72.6	66.5	65.5	66.4	66.2	66.7	73.7	77.4	77.8	77.4	80.9	83.9	84.8	92.0	77.5	92.0	
7-Nov	95.8	95.6	92.9	83.6	81.4	78.0	74.7	74.2	74.0	74.1	70.0	65.6	67.2	66.1	60.0	61.9	70.7	74.7	75.9	74.7	71.7	73.3	72.8	67.7	74.9	95.8	
8-Nov	64.3	65.7	70.1	73.4	73.4	73.6	75.1	76.9	76.9	74.0	68.0	62.8	58.7	53.3	50.4	52.0	54.1	54.6	55.9	65.8	72.1	72.8	68.8	75.1	66.2	76.9	
9-Nov	74.2	72.9	74.6	76.5	73.5	72.0	72.8	70.1	70.6	70.2	66.2	59.8	50.8	41.9	38.7	43.3	48.8	55.0	60.4	65.5	72.7	73.4	78.8	82.3	65.2	82.3	
10-Nov	84.4	86.5	DF	87.5	88.2	88.8	89.0	DF	78.4	76.9	74.5	69.5	64.9	67.5	63.8	63.2	67.1	73.0	80.6	81.1	84.3	86.9	DF	DF	77.8	89.0	
11-Nov	DF	DF	DF	88.8	DF	DF	DF	90.0	85.6	DF	DF	DF	81.8	83.3	84.9	84.6	84.6	83.8	83.7	83.5	84.1	84.5	85.0	86.1	--	90.0	
12-Nov	87.9	91.9	94.4	96.4	96.1	90.5	90.4	91.0	88.3	84.4	86.3	81.9	72.9	71.8	67.1	DF	DF	DF	DF	DF	74.1	DF	DF	DF	--	96.4	
13-Nov	DF	DF	77.5	DF	80.6	80.3	79.6	80.8	82.4	80.3	75.5	74.0	73.4	72.7	73.3	75.5	76.5	78.5	80.3	80.1	81.3	82.2	82.0	82.1	78.5	82.4	
14-Nov	82.6	DF	84.9	84.5	83.9	84.0	84.9	84.2	83.5	82.3	80.6	78.8	76.6	76.0	77.2	79.7	84.2	85.8	86.4	86.6	85.7	85.0	86.8	89.4	83.2	89.4	
15-Nov	89.2	89.5	87.4	87.1	88.4	89.5	91.2	92.8	93.5	90.8	88.7	84.0	81.5	82.0	81.6	79.7	79.8	78.4	78.9	80.8	80.1	84.0	85.8	87.5	85.5	93.5	
16-Nov	88.3	90.6	93.2	90.8	91.0	89.6	86.3	85.1	DF	86.0	DF	DF	DF	72.6	69.0	72.4	71.9	71.2	71.3	71.0	70.6	70.9	73.0	73.4	79.4	93.2	
17-Nov	73.2	75.7	79.1	84.0	92.4	95.3	95.0	96.4	97.9	98.2	98.4	98.5	98.6	95.2	90.0	91.8	90.2	85.5	96.5	92.9	86.2	86.5	89.2	86.2	90.5	98.6	
18-Nov	86.1	82.6	81.1	78.2	77.9	78.4	80.0	80.6	80.7	77.9	75.9	73.6	72.1	70.7	69.0	76.5	85.6	90.6	88.8	85.0	85.1	87.0	88.1	83.7	80.6	90.6	
19-Nov	81.8	81.3	82.5	81.0	81.0	81.3	82.4	83.0	82.8	80.3	78.8	77.3	77.2	78.1	76.9	75.9	76.6	78.2	79.3	82.1	81.9	79.8	80.1	81.0	80.0	83.0	
20-Nov	78.7	78.8	80.8	81.2	80.9	80.3	80.5	81.4	81.5	79.9	79.0	75.1	73.2	73.1	74.7	76.9	79.2	80.4	81.0	80.5	81.6	81.3	81.2	79.3	79.2	81.6	
21-Nov	79.4	78.7	79.3	78.0	78.8	82.0	81.3	81.1	82.1	80.7	78.2	76.3	74.0	75.0	78.7	80.0	80.9	81.3	82.9	83.8	84.2	84.5	82.7	81.9	80.2	84.5	
22-Nov	83.2	82.9	83.5	84.0	82.6	82.5	85.5	86.6	86.3	86.2	83.9	79.6	77.5	76.8	79.8	80.9	82.3	81.2	77.8	77.4	76.7	74.4	74.3	DF	81.1	86.6	
23-Nov	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	79.1	80.0	81.0	81.9	82.2	83.0	81.8	81.3	82.7	82.2	82.3	--	83.0	
24-Nov	81.7	82.1	82.3	82.6	83.5	82.9	82.8	83.1	83.5	83.5	82.0	80.4	77.9	79.1	80.3	81.3	83.2	85.3	86.5	87.2	86.4	85.3	85.1	85.7	83.1	87.2	
25-Nov	84.6	83.6	83.1	82.6	82.5	82.0	81.7	82.3	83.0	84.3	83.7	81.3	80.1	78.1	77.7	78.0	80.1	78.5	78.4	78.0	78.3	78.9	79.1	77.9	80.7	84.6	
26-Nov	76.3	76.2	77.1	76.8	77.2	78.0	78.5	77.8	78.0	77.3	75.2	74.6	74.5	74.0	74.6	74.3	77.6	80.5	79.2	70.2	68.5	69.0	71.2	75.5	80.5		
27-Nov	72.5	75.2	77.3	76.0	77.0	72.4	68.0	68.1	69.4	70.6	73.0	71.4	70.1	70.2	60.3	59.6	64.3	64.1	64.0	63.6	64.7	63.1	66.3	74.4	69.0	77.3	
28-Nov	72.9	71.5	68.1	69.0	71.3	74.5	76.5	78.1	79.7	79.3	78.5	78.8	75.4	68.8	63.9	70.6	73.4	80.1	80.6	76.3	74.5	76.1	77.2	76.8	74.7	80.6	
29-Nov	76.5	76.0	75.9	75.1	74.8	74.6	75.0	74.5	74.1	73.7	74.3	75.1	74.6	73.9	75.0	76.3	78.2	78.0	77.4	76.8	76.4	76.2	76.6	75.6	75.6	78.2	
30-Nov	75.7	75.9	75.9	76.0	76.0	76.1	76.3	76.4	76.7	77.1	77.6	78.4	79.3	79.7	79.9	79.9	80.4	79.6	79.6	79.8	79.0	78.5	78.4	76.7	77.9	80.4	
		82.5	82.8	83.0	83.4	83.0	82.5	82.6	82.8	82.6	81.8	79.9	77.5	75.9	74.8	73.3	74.8	77.2	78.8	80.1	80.3	80.0	80.8	81.3	82.3	Diurnal Average	
		97.0	97.1	97.1	97.1	96.1	95.3	95.6	96.4	97.9	98.2	98.4	98.5	98.6	95.2	90.0	91.8	90.2	90.6	96.5	95.7	96.3	94.9	95.9	96.7	Diurnal Maximum	
DF - DAS Failure																											



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 20m (RH20) - %**  
**Lower Camp Met Tower - November 2024**







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 20m (RH20) - %**  
**Lower Camp Met Tower - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	1	0.15	0.15
40 - 60	15	2.22	2.37
60 - 80	301	44.59	46.96
80 - 100	358	53.04	100.00

Total Number of Valid Hours: 675  
Total Number of Hours: 720

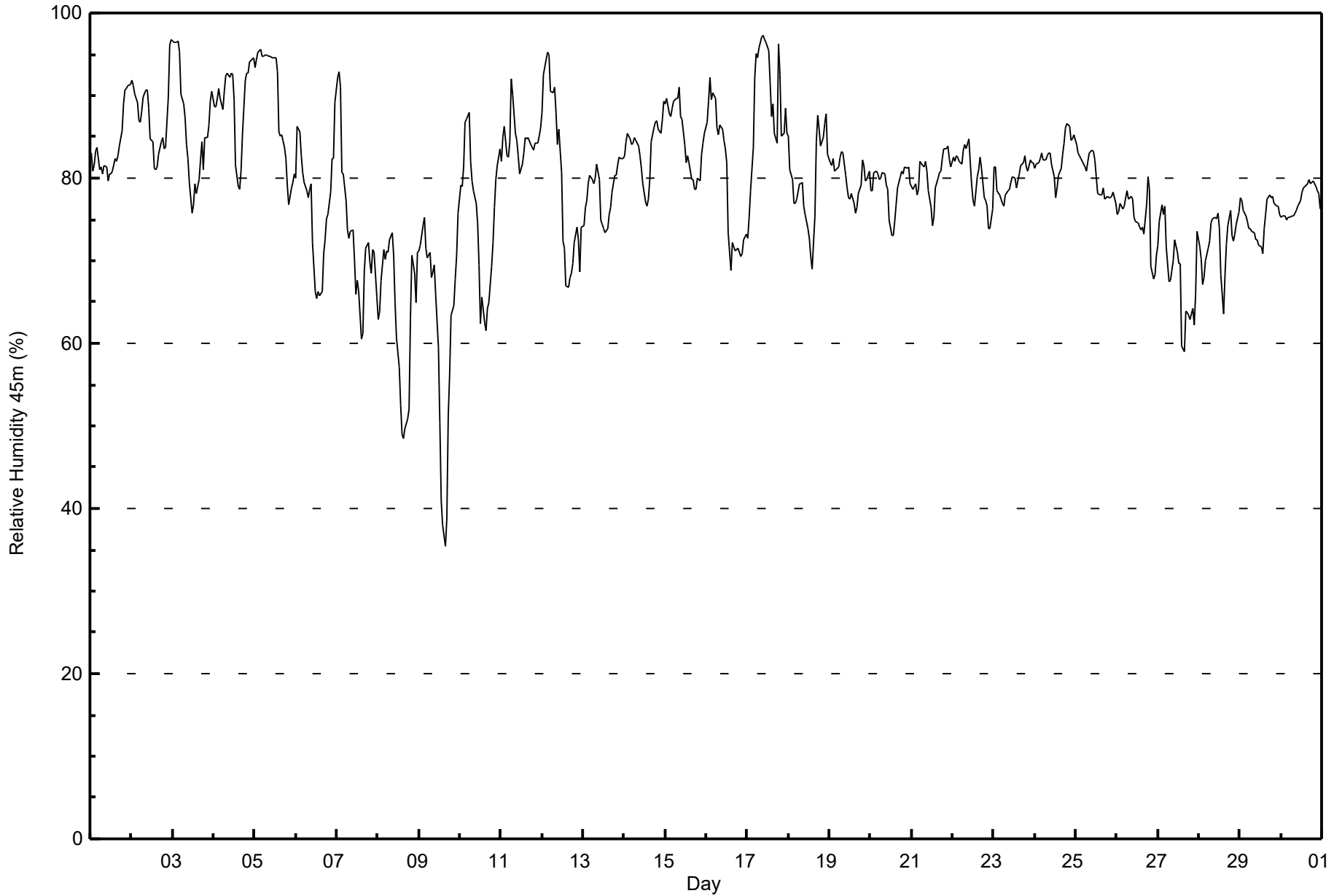


Maximum Value: 97.4 % on Nov 17 10:00																						Maximum Daily Average: 89.3 % on Nov 4				Hours in Service: 720																					
Minimum Value: 35.5 % on Nov 9 16:00																						Minimum Daily Average: 62.1 % on Nov 9				Hours of Data: 720																					
Maximum Diurnal Average: 82.5 % at hour 3																						Minimum Diurnal Average: 73.0 % at hour 15				Hours of Missing Data: 0																					
Monthly Average: 79.22 %																						Percentiles: P <sub>1</sub> = 50.4 P <sub>10</sub> = 68.9 Q <sub>1</sub> = 74.8 Median = 79.9 Q <sub>3</sub> = 84.2 P <sub>90</sub> = 89.9 P <sub>99</sub> = 96.4				Hours of Calibration: 0																					
																										Percent Operational Time: 100.0																					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Nov	83.1	80.9	81.5	83.2	83.7	81.0	81.4	80.5	81.6	81.3	79.7	80.6	80.6	80.9	82.3	82.1	82.8	83.9	85.8	89.0	90.7	90.8	91.2	91.3	83.7	91.3																					
2-Nov	91.9	91.2	90.1	89.2	87.0	86.7	88.1	89.9	90.7	90.7	88.5	84.8	84.5	81.2	81.0	81.3	82.8	84.3	85.0	83.6	83.8	89.8	96.1	96.8	87.5	96.8																					
3-Nov	96.6	96.4	96.5	96.6	95.2	90.1	89.0	87.3	84.0	82.5	79.4	75.7	76.8	79.3	78.2	79.8	82.2	84.4	81.0	85.0	85.0	86.5	89.2	90.5	86.1	96.6																					
4-Nov	88.7	88.6	89.6	90.9	89.6	88.3	90.5	92.3	92.6	92.3	92.7	92.6	89.5	81.6	78.9	78.6	81.0	85.4	91.9	92.7	92.6	94.0	94.2	94.5	89.3	94.5																					
5-Nov	93.3	94.5	95.2	95.7	94.8	94.8	94.9	94.9	94.8	94.8	94.6	94.6	94.5	93.0	85.6	85.1	85.2	83.8	82.4	79.2	76.7	78.8	79.5	80.6	89.2	95.7																					
6-Nov	80.0	86.3	85.5	82.8	80.7	79.5	78.5	77.6	78.6	79.4	72.2	66.3	65.4	66.3	65.7	66.3	70.8	72.6	75.2	75.6	78.3	82.3	82.3	89.1	76.5	89.1																					
7-Nov	92.2	92.9	91.1	80.6	80.5	77.3	73.7	72.8	73.6	73.7	70.1	66.0	67.6	66.3	60.5	61.1	68.6	71.6	72.3	69.8	68.5	71.4	71.1	65.7	73.3	92.9																					
8-Nov	62.9	63.9	67.7	71.3	70.2	71.2	71.1	72.5	73.4	70.6	64.9	60.8	57.1	52.5	49.0	48.4	49.6	50.8	52.1	63.0	70.7	68.5	64.9	71.0	63.3	73.4																					
9-Nov	71.2	71.9	74.2	75.2	71.6	70.3	71.0	68.0	68.6	69.5	65.9	59.6	50.4	40.9	37.9	35.5	38.8	51.1	56.2	63.5	64.6	67.7	70.7	75.8	62.1	75.8																					
10-Nov	79.1	79.0	81.4	86.7	87.1	88.0	82.0	79.7	78.5	77.0	74.6	69.5	62.3	65.6	62.6	61.5	64.2	65.0	69.2	72.2	76.5	79.8	81.6	83.5	75.3	88.0																					
11-Nov	82.1	84.8	86.2	82.8	82.6	84.3	92.0	90.2	85.4	84.6	82.8	80.6	81.8	83.0	84.9	84.8	84.9	84.0	83.7	83.5	84.2	84.3	85.1	86.2	84.5	92.0																					
12-Nov	88.0	92.5	94.3	95.3	95.0	90.4	90.3	91.0	88.0	84.0	86.0	80.7	72.4	71.4	67.0	66.8	67.9	68.5	69.7	72.3	74.1	72.5	68.6	74.0	80.0	95.3																					
13-Nov	74.3	76.5	77.3	79.3	80.3	79.9	79.4	79.9	81.8	79.9	74.9	74.4	73.9	73.4	74.0	75.6	76.4	78.4	80.3	80.3	81.5	82.5	82.4	82.4	78.3	82.5																					
14-Nov	82.8	84.4	85.4	84.8	84.1	84.2	85.0	84.6	83.9	82.7	81.1	79.3	77.1	76.6	77.5	79.8	84.3	86.0	86.7	87.0	86.0	85.4	87.1	89.3	83.5	89.3																					
15-Nov	89.0	89.7	87.7	87.4	88.5	89.3	89.7	89.7	91.0	87.5	87.1	84.0	81.9	82.6	81.9	79.8	79.8	78.6	78.7	80.0	79.6	82.9	84.2	85.4	84.8	91.0																					
16-Nov	86.8	89.2	92.2	89.5	90.4	89.7	86.1	85.3	86.5	85.9	84.5	83.6	81.9	73.5	68.9	72.2	71.7	71.2	71.4	71.1	70.4	70.8	72.6	73.3	79.9	92.2																					
17-Nov	72.7	75.3	78.4	83.7	92.2	95.1	94.6	95.8	97.1	97.4	96.8	96.5	95.5	91.6	87.4	89.0	85.4	84.2	96.4	92.5	85.1	85.4	88.5	85.4	89.2	97.4																					
18-Nov	85.1	81.1	79.9	77.0	76.9	77.4	79.3	79.4	79.5	76.5	75.5	73.8	72.6	70.5	69.1	75.4	84.4	87.7	85.9	83.9	84.8	86.7	87.9	82.9	79.7	87.9																					
19-Nov	81.8	81.5	82.4	80.8	81.0	81.4	82.6	83.3	83.0	80.4	78.7	77.6	77.5	78.2	76.9	75.8	76.4	78.1	79.2	82.3	81.6	79.6	79.9	80.9	80.0	83.3																					
20-Nov	78.5	78.5	80.6	80.9	80.5	79.8	79.9	80.7	80.6	79.2	78.6	74.9	73.0	73.1	74.8	76.8	78.8	80.2	80.8	80.5	81.4	81.2	81.3	79.3	78.9	81.4																					
21-Nov	79.1	78.7	79.4	78.0	78.7	82.0	81.5	81.3	82.0	80.9	78.4	76.5	74.3	75.3	78.9	80.0	80.7	80.8	82.3	83.5	83.6	83.9	82.4	81.4	80.1	83.9																					
22-Nov	82.6	82.1	82.8	82.5	82.0	81.7	83.4	84.2	83.6	84.8	81.8	79.2	77.3	76.6	80.2	81.1	82.5	81.2	77.7	77.2	76.6	74.0	73.9	76.3	80.2	84.8																					
23-Nov	81.3	81.4	78.4	77.9	77.4	76.9	76.6	77.9	78.4	78.7	79.6	80.2	80.0	78.9	79.7	80.5	81.5	81.8	82.6	81.4	80.9	82.2	81.9	81.8	79.9	82.6																					
24-Nov	81.2	81.6	81.9	82.4	83.1	82.3	82.2	82.6	83.1	83.0	81.7	80.1	77.6	78.9	80.3	81.1	82.8	84.3	86.0	86.6	86.3	84.5	84.7	85.2	82.7	86.6																					
25-Nov	84.0	83.0	82.8	82.3	82.1	81.3	80.8	82.1	83.1	83.4	83.2	82.3	80.1	78.1	78.0	78.0	78.8	77.5	77.8	77.5	77.6	77.8	78.3	76.9	80.3	84.0																					
26-Nov	75.6	76.0	77.0	76.3	76.7	77.7	78.4	77.4	77.7	77.4	75.3	74.7	74.6	74.1	73.7	74.0	73.2	76.7	80.2	78.6	69.4	67.8	68.3	70.7	75.1	80.2																					
27-Nov	71.9	74.7	76.8	75.6	76.5	71.8	67.5	67.6	68.8	70.1	72.6	71.1	69.6	69.6	59.7	59.0	63.9	63.7	63.4	62.9	64.2	62.2	65.9	73.6	68.4	76.8																					
28-Nov	71.7	70.1	67.1	67.9	70.0	71.5	72.3	74.7	75.1	75.3	75.1	75.8	73.9	68.3	63.6	68.3	72.0	74.2	76.1	73.0	72.4	73.3	74.3	75.9	72.2	76.1																					
29-Nov	77.6	77.2	76.1	75.4	74.7	73.9	73.8	73.6	73.3	72.5	72.5	71.9	71.7	70.9	73.9	75.6	77.4	78.0	77.7	77.7	77.0	76.6	76.7	75.5	75.0	78.0																					
30-Nov	75.2	75.4	75.4	74.9	75.3	75.3	75.4	75.4	75.8	76.2	76.5	77.3	78.2	78.8	79.1	79.3	79.8	79.3	79.5	79.7	78.9	78.4	78.1	76.3	77.2	79.8																					
																						81.3	82.0	82.5	82.2	82.3	81.8	81.7	81.7	81.8	81.1	79.5	77.5	75.8	74.4	73.0	73.8	75.6	76.9	78.2	78.8	78.8	79.4	80.1	81.0	Diurnal Average	
																						96.6	96.4	96.5	96.6	95.2	95.1	94.9	95.8	97.1	97.4	96.8	96.5	95.5	93.0	87.4	89.0	85.4	87.7	96.4	92.7	92.6	94.0	96.1	96.8	Diurnal Maximum	



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 45m (RH45) - %**  
**Lower Camp Met Tower - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 45m (RH45) - %**  
**Lower Camp Met Tower - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	3	0.42	0.42
40 - 60	14	1.94	2.36
60 - 80	350	48.61	50.97
80 - 100	353	49.03	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

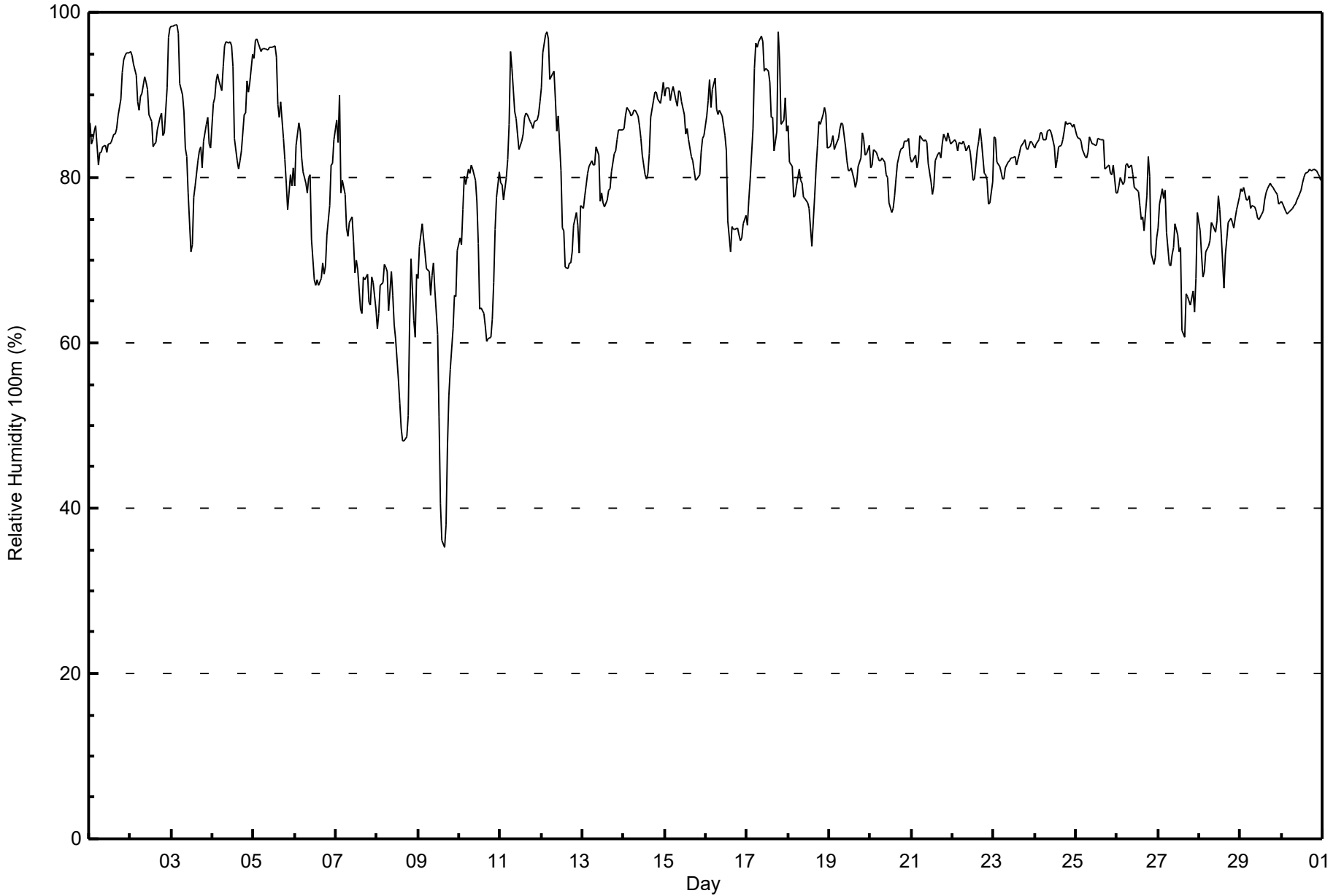
**Relative Humidity 100m (RH100) - %**  
**Lower Camp Met Tower - November 2024**

Maximum Value: 98.5 % on Nov 3 04:00      Maximum Daily Average: 90.4 % on Nov 4																						Hours in Service: 720 Hours of Data: 720																										
Minimum Value: 35.2 % on Nov 9 16:00      Minimum Daily Average: 60.4 % on Nov 9 Maximum Diurnal Average: 83.8 % at hour 3      Minimum Diurnal Average: 75.4 % at hour 15 Monthly Average: 80.53 %      Percentiles: P <sub>1</sub> = 48.9 P <sub>10</sub> = 68.6 Q <sub>1</sub> = 76.3 Median = 81.9 Q <sub>3</sub> = 85.8 P <sub>90</sub> = 90.9 P <sub>99</sub> = 97.4																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	86.7	84.0	84.5	85.6	86.3	81.6	83.0	83.0	83.8	84.0	83.1	84.0	84.0	84.2	85.3	85.2	86.0	87.4	89.4	92.8	94.3	94.7	95.1	95.1	86.8	95.1																						
2-Nov	95.3	94.8	93.8	92.4	89.2	88.1	89.9	90.1	92.2	91.5	90.7	87.6	86.8	83.7	84.1	84.3	85.8	87.3	87.7	85.1	85.5	90.8	97.0	98.2	89.7	98.2																						
3-Nov	98.3	98.3	98.5	98.5	97.4	91.3	90.0	88.0	83.6	82.6	78.2	71.1	71.9	77.7	79.0	82.0	83.3	83.7	81.2	84.5	86.5	87.2	84.1	83.5	85.8	98.5																						
4-Nov	89.0	89.7	91.8	92.6	91.7	90.4	93.3	95.9	96.4	96.2	96.4	96.0	93.4	84.8	82.0	81.0	82.0	83.2	87.6	87.8	91.7	90.3	91.5	94.8	90.4	96.4																						
5-Nov	94.3	96.7	96.8	95.8	95.3	95.6	95.6	95.5	95.4	95.8	95.8	95.8	95.9	94.6	88.9	87.3	89.1	84.7	82.2	79.4	76.1	80.4	79.0	81.3	90.3	96.8																						
6-Nov	78.9	83.9	86.5	85.6	82.4	80.6	79.3	78.1	80.0	80.4	72.5	67.7	67.0	67.6	66.9	67.7	69.7	68.2	69.3	73.0	76.6	81.5	81.8	84.5	76.2	86.5																						
7-Nov	86.9	84.3	90.1	78.2	79.7	77.9	73.9	72.8	74.6	75.2	72.2	68.5	70.0	68.8	64.1	63.6	68.0	67.7	68.2	64.9	64.6	68.0	67.3	64.1	72.2	90.1																						
8-Nov	61.7	63.5	67.0	67.2	69.5	69.1	68.6	63.9	68.7	65.8	62.3	60.5	55.6	52.8	49.7	48.2	48.1	48.7	51.1	62.3	70.1	62.7	60.7	68.3	61.1	70.1																						
9-Nov	67.7	71.7	74.4	72.5	70.9	69.1	68.6	65.8	68.1	69.7	66.5	61.1	51.0	40.5	36.0	35.2	38.0	47.4	53.5	56.7	61.7	65.8	65.7	71.1	60.4	74.4																						
10-Nov	72.7	71.8	76.2	80.2	79.1	81.0	80.6	81.6	81.1	79.7	77.2	72.0	64.1	64.3	63.6	62.1	60.2	60.4	60.6	62.8	67.2	73.8	77.6	80.8	72.1	81.6																						
11-Nov	79.4	79.1	77.2	79.9	82.2	86.5	95.3	93.3	88.0	87.2	85.2	83.4	84.3	85.3	87.2	87.7	87.6	86.9	86.4	85.9	86.8	87.0	87.7	89.1	85.8	95.3																						
12-Nov	90.8	95.1	97.3	97.7	96.8	91.9	92.5	93.0	89.5	85.7	87.4	80.9	73.9	73.6	69.1	69.0	69.7	69.6	71.1	74.3	75.7	74.2	70.8	76.6	81.9	97.7																						
13-Nov	76.3	77.8	79.1	80.5	81.4	82.0	81.6	81.5	83.8	82.7	77.2	78.2	77.0	76.5	77.4	78.4	78.6	80.6	82.9	83.3	84.6	85.8	85.8	85.7	80.8	85.8																						
14-Nov	85.9	87.5	88.5	88.1	87.5	87.6	88.1	88.1	87.5	86.2	84.7	82.7	80.3	79.8	80.6	82.9	87.3	89.3	90.3	90.4	89.5	89.0	90.2	91.6	86.8	91.6																						
15-Nov	89.8	90.9	90.9	89.3	90.3	91.0	89.2	88.6	90.5	90.3	89.2	87.6	85.3	86.0	84.6	82.6	82.0	80.8	79.6	79.9	80.3	83.0	84.7	85.2	86.3	91.0																						
16-Nov	87.5	89.3	91.8	88.5	90.7	92.0	88.3	87.6	88.1	87.5	86.4	85.1	83.2	74.7	71.0	74.1	73.8	73.8	73.9	73.1	72.3	72.8	74.3	75.4	81.5	92.0																						
17-Nov	74.3	77.2	79.9	86.0	93.2	96.2	95.7	96.5	97.2	96.4	92.9	93.2	92.9	91.5	87.3	87.2	83.2	85.5	97.6	94.1	86.5	86.9	89.7	85.7	89.4	97.6																						
18-Nov	86.3	81.9	81.3	77.6	77.8	78.9	81.0	79.7	79.4	77.6	77.5	76.9	76.2	73.8	71.7	77.7	81.1	83.8	86.7	86.4	87.6	88.5	87.7	83.6	80.9	88.5																						
19-Nov	83.8	84.2	85.0	83.4	84.0	84.7	85.9	86.7	86.5	83.8	82.0	80.9	80.8	81.1	79.8	78.8	79.4	81.3	82.4	85.5	84.6	82.7	83.0	84.0	83.1	86.7																						
20-Nov	81.2	81.5	83.5	83.1	82.6	82.1	82.0	82.3	81.8	80.4	80.0	76.9	75.8	76.2	77.8	79.8	81.7	83.2	83.6	83.6	84.3	84.3	84.7	82.5	81.5	84.7																						
21-Nov	81.9	82.0	82.8	81.2	82.0	85.0	84.6	84.4	84.6	84.3	81.7	79.5	78.0	79.0	82.1	82.9	83.0	82.4	84.1	85.3	84.4	85.5	84.8	84.1	82.9	85.5																						
22-Nov	84.4	84.6	84.2	83.3	84.3	84.1	84.5	83.8	83.3	83.8	83.1	81.3	79.6	79.8	83.4	84.4	86.0	84.5	80.6	80.3	79.7	76.8	76.9	79.6	82.3	86.0																						
23-Nov	84.9	84.8	81.9	81.3	80.6	79.9	79.8	81.2	81.8	82.1	82.4	82.4	82.5	81.6	82.2	83.0	83.7	84.3	84.6	83.6	83.5	84.5	84.3	83.9	82.7	84.9																						
24-Nov	83.6	84.1	84.6	85.4	85.4	84.6	84.6	85.6	85.8	85.8	85.2	83.8	81.1	82.3	83.8	83.9	84.6	85.6	86.8	86.4	86.7	86.4	86.1	86.4	84.9	86.8																						
25-Nov	85.1	84.7	84.8	84.4	83.4	82.6	82.4	83.1	84.9	84.0	84.1	83.9	83.9	84.7	84.6	84.7	84.6	81.1	81.4	81.6	80.4	80.4	81.5	78.1	83.1	85.1																						
26-Nov	78.1	78.9	80.0	79.1	79.5	81.6	81.7	81.1	81.5	80.3	78.8	78.7	78.3	76.6	74.9	75.2	73.5	77.8	82.5	80.2	70.9	69.5	70.3	72.7	77.6	82.5																						
27-Nov	73.8	76.8	78.7	77.4	78.4	73.4	69.5	69.4	70.6	71.5	74.5	73.0	71.1	71.6	61.5	60.7	66.0	65.6	65.1	64.5	66.2	63.6	67.8	75.8	70.3	78.7																						
28-Nov	73.6	70.7	68.0	68.7	71.1	71.7	72.4	74.5	74.3	73.5	74.8	77.9	76.1	73.2	66.7	70.7	72.6	74.6	75.1	74.6	74.0	75.1	76.0	77.6	73.2	77.9																						
29-Nov	78.6	78.4	78.8	77.3	77.3	77.7	76.2	76.6	76.4	76.0	75.2	74.9	75.7	75.9	77.2	78.1	78.6	79.4	79.0	78.8	78.5	77.9	76.9	76.9	77.3	79.4																						
30-Nov	77.1	76.7	75.9	75.5	75.8	76.0	76.3	76.5	76.8	77.2	77.7	78.5	79.4	80.0	80.5	80.7	81.0	80.8	80.9	81.1	80.9	80.6	80.3	79.7	78.6	81.1																						
																								82.3	82.8	83.8	83.2	83.5	83.1	83.1	82.9	83.2	82.6	81.2	79.5	77.8	76.7	75.4	76.0	76.9	77.7	78.8	79.4	79.7	80.3	80.8	81.9	Diurnal Average
																								98.3	98.3	98.5	98.5	97.4	96.2	95.7	96.5	97.2	96.4	96.4	96.0	95.9	94.6	88.9	87.7	89.1	89.3	97.6	94.1	94.3	94.7	97.0	98.2	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 100m (RH100) - %**  
**Lower Camp Met Tower - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Relative Humidity 100m (RH100) - %  
Lower Camp Met Tower - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	3	0.42	0.42
40 - 60	12	1.67	2.08
60 - 80	272	37.78	39.86
80 - 100	433	60.14	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Relative Humidity 163m (RH163) - %**  
**Lower Camp Met Tower - November 2024**

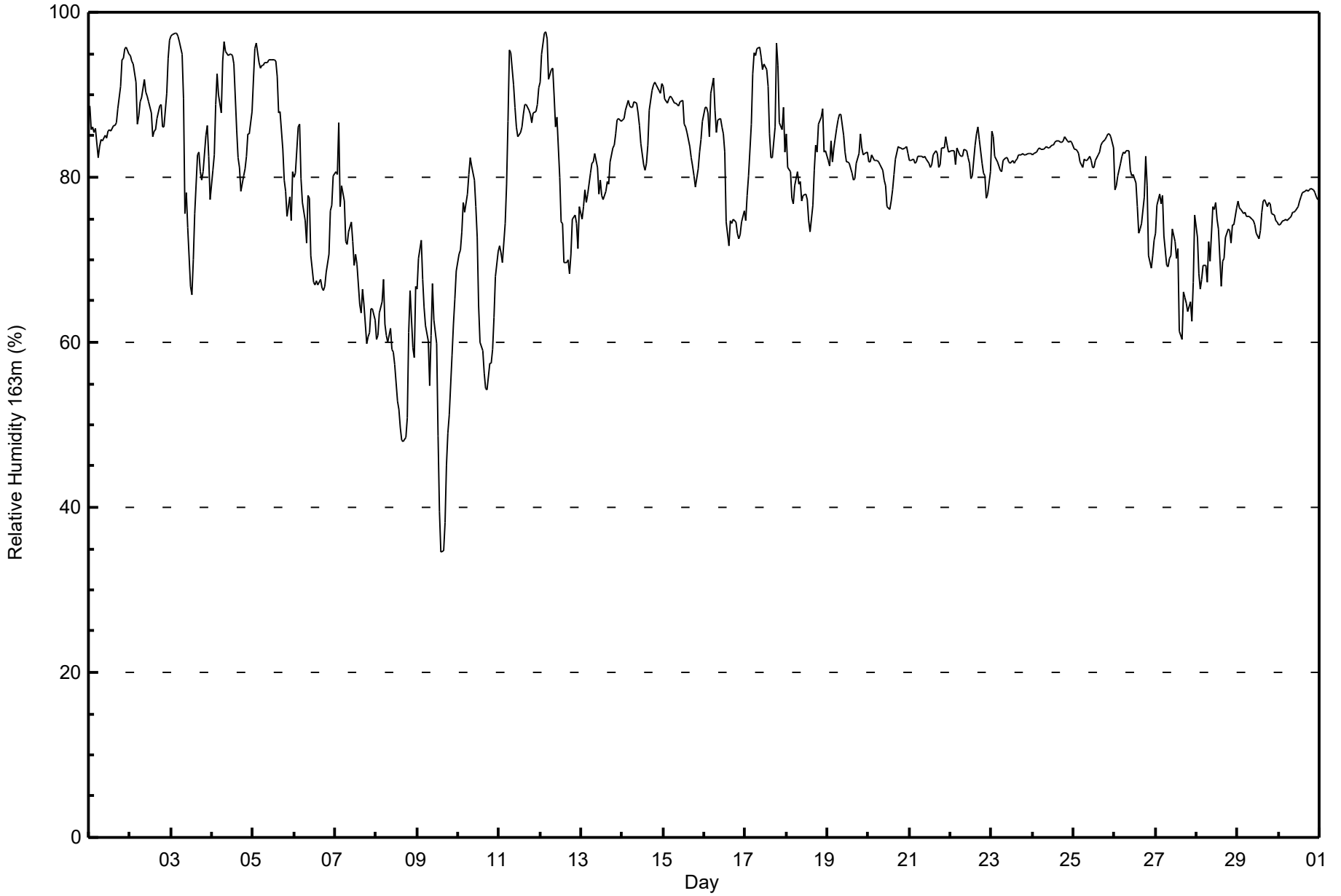
Maximum Value: 97.6 % on Nov 12 04:00		Maximum Daily Average: 89.6 % on Nov 2		Hours in Service: 720																																												
Minimum Value: 34.6 % on Nov 9 15:00		Minimum Daily Average: 56.8 % on Nov 9		Hours of Data: 720																																												
Maximum Diurnal Average: 82.4 % at hour 3		Minimum Diurnal Average: 75.4 % at hour 15		Hours of Missing Data: 0																																												
Monthly Average: 79.61 %		Percentiles: P <sub>1</sub> = 48.6 P <sub>10</sub> = 66.6 Q <sub>1</sub> = 74.8 Median = 81.8 Q <sub>3</sub> = 85.6 P <sub>90</sub> = 91.0 P <sub>99</sub> = 96.7		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	88.6	85.8	86.1	85.4	86.0	82.4	83.8	84.5	84.5	85.1	84.7	85.6	85.7	86.3	86.3	86.7	88.2	91.1	94.2	94.3	95.5	95.7	95.0	87.8	95.7																							
2-Nov	94.7	94.1	93.7	91.5	86.5	87.4	89.2	89.7	91.8	90.4	89.8	89.2	87.9	85.0	85.6	85.7	87.1	88.7	88.8	86.1	86.1	90.2	94.4	96.6	89.6	96.6																						
3-Nov	97.1	97.3	97.4	97.4	97.1	96.4	94.9	89.5	75.7	78.1	73.9	66.8	65.7	70.0	75.6	82.8	83.1	80.7	79.7	80.6	85.0	86.3	82.6	77.3	83.8	97.4																						
4-Nov	80.9	82.7	88.7	92.5	89.9	87.8	94.1	96.5	95.2	94.7	95.0	94.8	93.7	85.7	82.4	81.2	78.3	80.2	80.9	82.6	85.2	85.3	88.0	88.0	96.5																							
5-Nov	91.9	95.5	96.2	93.8	93.3	93.6	93.6	93.8	93.9	94.3	94.2	94.2	94.2	92.2	87.9	87.9	83.3	79.2	78.3	75.3	77.6	74.8	80.7	88.9	96.2																							
6-Nov	80.0	80.5	86.1	86.4	79.8	77.0	74.7	72.0	77.7	77.5	70.5	67.3	67.0	67.4	66.9	67.6	66.6	66.3	66.8	68.5	70.8	76.0	76.7	80.2	73.8	86.4																						
7-Nov	80.7	80.3	86.6	76.5	78.9	77.1	72.2	71.9	73.4	74.6	72.2	69.3	70.7	69.5	64.6	63.5	66.5	64.6	59.9	60.6	61.2	64.1	64.0	62.7	70.2	86.6																						
8-Nov	60.4	60.8	63.6	64.8	67.6	62.2	60.8	60.0	61.7	59.2	58.7	57.3	52.9	51.8	49.6	48.2	47.9	48.6	50.9	61.2	66.3	59.4	58.2	66.9	58.3	67.6																						
9-Nov	66.4	70.2	72.4	67.6	64.3	62.0	60.1	54.7	60.9	67.1	62.7	59.8	48.6	39.5	34.6	34.7	38.2	45.1	49.0	51.2	58.5	62.1	65.2	68.6	56.8	72.4																						
10-Nov	70.7	71.1	73.5	77.0	75.7	78.0	80.3	82.3	81.4	79.6	76.4	72.7	64.5	60.0	58.9	56.3	54.5	54.3	57.4	57.4	59.1	63.0	67.9	71.0	68.5	82.3																						
11-Nov	71.7	70.8	69.6	74.4	79.2	86.7	95.4	95.1	91.1	88.4	86.2	84.9	85.4	86.1	87.7	88.9	88.8	88.2	87.7	86.6	87.8	88.0	88.8	90.8	85.3	95.4																						
12-Nov	91.5	94.9	97.4	97.6	96.7	91.9	93.1	93.1	89.8	86.0	87.4	80.1	74.5	74.5	69.7	69.7	70.0	68.3	70.8	74.9	75.5	74.5	71.3	76.4	82.1	97.6																						
13-Nov	75.0	76.4	78.4	76.9	78.0	80.5	81.6	81.8	82.9	81.2	78.0	79.6	77.8	77.3	78.4	79.5	79.2	81.9	83.5	84.0	85.2	86.9	87.1	86.9	80.7	87.1																						
14-Nov	86.9	87.1	88.2	89.3	88.7	88.6	88.5	89.2	88.9	87.9	86.4	84.1	81.5	80.9	81.7	83.9	88.2	90.5	91.3	91.5	91.3	90.5	90.1	91.4	87.8	91.5																						
15-Nov	91.0	89.5	88.9	89.5	89.8	89.7	89.0	89.0	88.8	88.7	89.1	89.2	86.5	86.2	85.5	83.7	82.4	81.3	80.1	78.9	80.9	83.0	84.5	86.7	86.3	91.0																						
16-Nov	88.5	88.6	87.9	84.9	90.1	92.1	88.1	85.4	87.0	87.2	86.2	85.3	83.0	74.5	71.6	74.7	74.4	74.9	74.5	73.2	72.6	73.1	74.6	76.0	81.2	92.1																						
17-Nov	74.8	77.8	80.1	86.4	92.6	95.2	94.8	95.6	95.8	94.6	93.1	93.8	93.0	91.0	85.3	82.4	82.3	86.2	96.3	93.6	86.7	85.8	88.5	83.1	88.7	96.3																						
18-Nov	85.2	81.2	80.7	77.5	76.8	79.0	80.7	79.2	79.4	77.1	77.7	78.0	77.2	74.8	73.5	76.6	80.9	83.8	83.1	86.4	87.2	88.2	83.0	83.2	80.4	88.2																						
19-Nov	82.0	81.4	84.5	81.8	83.6	85.9	87.0	87.7	87.6	85.2	83.1	81.9	81.8	81.6	80.5	79.6	79.8	81.7	82.9	85.2	83.5	82.8	82.9	83.1	83.2	87.7																						
20-Nov	81.8	81.9	82.7	82.0	82.0	82.0	81.8	81.5	80.9	79.6	79.0	76.5	76.0	77.1	78.5	80.3	82.2	83.7	83.5	83.6	83.4	83.6	83.7	82.8	81.3	83.7																						
21-Nov	82.0	82.0	82.2	81.8	81.9	82.6	82.5	82.6	82.4	82.5	82.2	81.7	81.2	81.6	82.8	83.2	82.9	81.2	81.5	83.5	83.6	84.9	83.9	83.1	82.5	84.9																						
22-Nov	83.2	83.3	83.2	81.5	83.6	82.8	82.6	82.6	83.3	83.2	82.5	81.7	79.7	80.2	83.9	85.3	86.1	84.5	81.6	80.5	80.2	77.4	77.9	80.7	82.1	86.1																						
23-Nov	85.6	85.0	82.6	81.9	81.4	80.8	80.7	82.0	82.4	82.4	81.9	81.8	82.1	81.7	82.0	82.2	82.7	82.8	82.9	82.8	82.7	82.9	82.9	82.8	82.4	85.6																						
24-Nov	82.7	82.9	83.0	83.4	83.5	83.5	83.5	83.7	83.6	83.6	83.8	83.9	84.2	84.4	84.3	84.3	84.3	84.2	84.4	84.9	84.4	84.2	84.5	84.2	83.9	84.9																						
25-Nov	83.5	83.4	83.3	82.9	81.8	81.1	82.3	82.1	82.1	82.6	82.0	81.3	81.2	82.0	82.7	83.1	83.9	84.2	84.6	84.9	85.2	85.2	85.0	83.6	83.1	85.2																						
26-Nov	78.5	79.0	80.2	81.6	82.5	83.1	82.9	83.3	83.2	80.8	80.2	80.3	79.3	76.4	73.2	73.8	74.5	77.7	82.5	79.0	70.5	69.0	70.6	72.3	78.1	83.3																						
27-Nov	73.2	76.6	77.9	76.8	77.7	72.9	69.2	69.1	70.2	70.6	73.7	72.2	70.1	71.3	61.3	60.4	66.1	65.3	64.8	63.7	65.0	62.6	67.3	75.4	69.7	77.9																						
28-Nov	72.8	68.3	66.4	67.6	69.3	69.4	67.3	72.1	69.8	76.5	76.1	77.0	74.8	73.8	66.7	69.8	70.1	72.7	73.7	73.6	72.1	74.2	74.3	76.3	71.9	77.0																						
29-Nov	77.1	76.3	76.1	75.7	75.7	75.2	75.3	75.3	74.9	74.7	74.3	73.2	72.5	73.6	75.7	77.1	77.3	76.4	76.9	76.7	75.5	75.4	74.8	74.6	75.4	77.3																						
30-Nov	74.3	74.2	74.7	74.8	74.9	74.8	75.0	75.3	75.7	75.8	75.9	76.5	77.2	77.6	78.2	78.3	78.4	78.3	78.4	78.6	78.5	78.1	77.7	77.3	76.6	78.6																						
																								81.1	81.3	82.4	82.0	82.3	82.0	82.2	82.0	81.9	81.6	80.6	79.3	77.7	76.8	75.4	75.7	76.5	76.9	77.6	78.2	78.4	79.0	79.3	80.6	Diurnal Average
																								97.1	97.3	97.4	97.6	97.1	96.4	95.4	96.5	95.8	94.7	95.0	95.0	94.8	94.2	92.2	88.9	88.8	90.5	96.3	94.2	94.3	95.5	95.7	96.6	Diurnal Maximum





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 163m (RH163) - %**  
**Lower Camp Met Tower - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Relative Humidity 163m (RH163) - %  
Lower Camp Met Tower - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	4	0.56	0.56
40 - 60	27	3.75	4.31
60 - 80	268	37.22	41.53
80 - 100	421	58.47	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Speed: 28 km/h on Nov 12 17:00	Maximum Daily Speed Average: 16.7 km/h on Nov 16	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 15 11:00	Minimum Daily Speed Average: 1.1 km/h on Nov 1	Hours of Data: 718
Maximum Diurnal Speed Average: 2.0 km/h at hour 11	Minimum Diurnal Speed Average: 0.2 km/h at hour 21	Hours of Missing Data: 2
Monthly Average Velocity: 0.5 km/h 231.7 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 2 Q <sub>1</sub> = 4 Median = 8 Q <sub>3</sub> = 12 P <sub>90</sub> = 16 P <sub>99</sub> = 24	Percent Operational Time: 99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	W8	W6	SSW7	SSW4	S4	SSW7	S1	ENE3	E3	SE3	S7	SSW8	SW8	WNW3	NNW5	N5	NNE3	NNE2	NNE3	NNE3	NNE4	N4	NNE2	NNW2	WSW1.1	W8
2-Nov	N4	N4	N2	NW1	E1	NW1	NNW2	NW4	NNW4	NNW4	NW3	N4	NNW4	E6	E7	E7	E7	NE4	NE2	ESE9	SE5	E1	NE1	NNW3	NE2.0	ESE9
3-Nov	NNW3	NW3	NW2	NNW1	SW4	WSW6	SSW4	SW8	SW11	SW7	SW8	SSW10	SSE8	SSE12	SSE15	SSE15	SSE13	SSE1	SE2	SE7	S5WSW13	WSW11	SW6	SSW5.2	SSE15	
4-Nov	SSW5	SSW4	S3	SE4	SW5	SSE2	SW12	SW11	S6	SE6	SE11	SE9	SE10	SE12	SE9	SE8	SE4	N2	NW2	NNW1	SE2	SE2	E2	N1	SSE3.9	SW12
5-Nov	NNW4	NNW2	NNW5	NNW6	N4	NW5	NW5	WNW4	WNW3	WNW1	UO	UO	N2	NW2	W3	NW1	E2	ESE4	SE5	SE2	WSW6	SW16	SSW10	SSW11	W2.1	SW16
6-Nov	SSE11	SE15	SE10	SE11	SSE20	SSE24	SSE23	SSE23	SSE26	SSE18	S16	SSW15	SW14	WSW12	SW12	S6	SE12	SE16	ESE12	ESE8	ESE10	SE10	ESE3	NNW4	SSE11.3	SSE26
7-Nov	NW2	NNW5	NW7	WNW11	W12	WNW15	WNW17	WNW16	NW14	W5	WSW7	WNW12	WNW8	W7	WSW3	E1	SE5	ESE3	ESE2	SE10	SE16	SE11	SE7	SE8	W3.3	WNW17
8-Nov	SE10	SSE9	SE10	SE13	SE13	SE18	SE17	SE17	SE13	SE16	SE17	SE14	SE13	S10	S9	S9	S10	S9	WSW4	NW5	NNW4	NNW2	W4	WSW5	SSE8.2	SE18
9-Nov	WSW7	W7	WSW6	WSW7	SW15	SW14	WSW9	WSW16	SW4	SW8	SW11	SSW4	SW9	SW10	WSW6	SW4	S2	SSE3	ESE1	SSE4	SE5	SE8	SE11	SE8	SW5.5	WSW16
10-Nov	SE8	SE9	SE12	SE8	SE9	SE7	SE9	S7	S8	S7	SW10	SW7	SSE6	SE12	SE9	SE8	ESE6	SE4	SSE2	ESE3	ESE3	ESE1	SE3	ESE4	SE5.8	SE12
11-Nov	E2	SSW1	ENE1	WNW2	SW6	SE6	SE11	ESE8	ESE11	SE17	SE17	ESE16	SE18	SE19	ESE15	SE12	ESE8	ESE9	SE9	SE12	SE12	SE11	SE8	SE8	SE9.3	SE19
12-Nov	SSE12	SSE1	N5	NNW5	SSW5	SW12	WSW13	SW8	SW12	WSW17	WSW22	W20	WSW21	WSW24	W24	W24	WSW28	WSW24	W16	W11	WSW12	W11	W13	WNW7	WSW13.0	WSW28
13-Nov	W9	W9	WSW9	WSW13	WSW10	W6	SW5	SW8	WSW2	W3	NNW7	NNE8	NE6	NE7	NE7	NE5	N6	NNE8	N8	N6	N8	N8	N8	N10	NW3.8	WSW13
14-Nov	N10	N10	N13	N12	N10	N9	N11	N10	NNW7	NNW5	NNW10	N9	N9	N9	NNW9	NNW10	NNW6	NNW5	NW4	NW4	NW5	NNW5	NNE2	NW3	N7.6	N13
15-Nov	NNW3	N1	NE1	ESE0	NW3	NE1	NW1	NNE1	NNE1	WSW1	SE0	SSE2	SE4	ESE5	SE5	SE7	SSE11	SSE11	SSE12	SE12	SE18	SE16	SE15	SE13	SE5.0	SSE18
16-Nov	SE10	SE10	ESE4	SE11	SE9	SE6	SE11	SSE16	SE14	SE15	SE17	SE20	SE13	SSE26	SSE23	SE20	SE24	SSE26	SSE24	SSE24	SSE25	SSE24	SE20	SE15	SE16.7	SSE26
17-Nov	SE18	SE19	SE16	SE17	SE15	SE15	SE17	SE17	SE14	SE15	SE17	SE17	SE17	SE13	SE13	ESE6	SE9	S7	NW10	NNW16	NW16	WNW16	NW10	NW12	SE7.7	SE19
18-Nov	WNW5	W10	W12	WNW13	NW8	WNW12	WNW8	WNW4	NW4	W6	WNW8	NW8	WNW6	WNW2	WNW3	WNW2	NNW1	E1	NNW1	NNW2	N3	NW3	NNW3	NE3	WNW4.9	WNW13
19-Nov	NE2	NNE4	N6	N8	N6	N7	N11	N8	NNW10	N12	N12	NNW12	N12	NNE15	N12	N12	NNW11	NNW9	NNW11	N16	NNW9	NNW11	N13	N11	N9.9	N16
20-Nov	N13	NNW15	NNW12	NNW8	NNW9	N9	NNW8	NNW9	N9	N9	N14	N14	N12	NNW12	N11	N11	N10	N15	N12	N17	NNW10	NNW10	NNW13	NNW13	N11.3	N17
21-Nov	N11	NNW11	NNW12	NNW14	NNW7	NW6	NW8	NW7	NW8	NW8	WNW9	WNW9	NW7	NW7	NW6	NW6	NW5	NNW4	N5	NNW4	NNW4	NNW3	NNE4	NNW2	NNW6.6	NNW14
22-Nov	WNW4	W3	W2	W2	W4	W2	NNW0	N1	NNW2	NW2	NNW4	N6	N5	NNW6	N7	NNE8	N7	N4	NNE6	NNE7	N7	N8	N8	NNW8	N3.9	N8
23-Nov	N9	N10	N10	N9	N8	N10	N11	N10	N8	N9	N9	N7	NNW9	NNW12	NNW12	NNW10	NNW7	NNW8	NNW8	NNW9	NNW11	NNW10	NNW8	NNW8	N9.2	NNW12
24-Nov	NNW7	NNW7	NNW6	NNW5	NNW5	NNW5	NNW4	NNW4	NNW3	NNW3	NNW4	NNW5	NNW6	NNW4	NW5	NW5	NW4	NNW3	NW1	WSW1	WSW2	SSW1	SW2	SE4	NNW3.5	NNW7
25-Nov	SE6	ESE5	SE6	SE8	SE6	SE9	SE10	SE10	SSE11	SE12	SE11	SE13	SE12	SE11	SE11	SSE7	ESE3	SE9	SE14	SE17	SE15	SE13	SE12	SE12	SE10.0	SE17
26-Nov	SE14	SE19	SE17	SE18	SE14	SE15	SE16	SE20	SE15	SE16	SSE14	SE13	SE10	SE10	SE10	SE7	S7	W6	W14	WNW17	WNW20	WNW16	WNW16	WNW15	SSE6.4	SE20
27-Nov	WNW16	WNW13	WNW19	WNW15	WNW15	WNW17	WNW20	WNW17	WNW18	WNW19	WNW16	WNW17	NW17	NW14	NW15	NW17	NW9	NW10	NW10	NNW10	NNW9	NNW10	NNW10	N8	WNW13.4	WNW20
28-Nov	NNW7	NW7	NW9	NW7	NW7	NNW2	NW3	WSW2	NW2	NW3	W2	N1	NW2	N3	NNW4	NW2	WSW0	NNW4	NNW5	N5	NW4	NW3	NNW4	NNW3	NW3.7	NW9
29-Nov	NNW3	NNW3	NW4	NNW5	NW4	NW3	NW4	NNW3	NNW3	NW3	WNW2	NNW2	NNW3	NNW4	NW6	NNW5	NNW3	NW3	NNW4	N3	NW2	NW1	NW3	NW2	NNW3.2	NW6
30-Nov	NNW3	NNW3	NNW4	NNW4	NNW4	NNW4	NW4	NNW5	NW4	NW3	NNW4	NNW4	NNW3	NNW5	NW5	NW6	NNW4	NW5	NW5	NNW5	NNW5	NW6	NW7	NNW7	NNW4.5	NNW7

NNW0.5	NW0.6	NW1.3	NW0.9	SW1.2	SW1.4	SW1.4	SSW1.8	SSW1.3	SSW1.8	SSW2.0	SW1.1	SSW0.9	S1.1	SSE0.5	ENE0.5	SSE1.3	SE0.4	NNW0.7	NNE1.4	NW0.2	NNW0.8	NNW1.0	NNW1.2	Diurnal Average
SE18	SE19	WNW19	SE18	SSE20	SSE24	SSE23	SSE23	SSE26	WNW19	WSW22	W20	WSW21	SSE26	W24	W24	WSW28	SSE26	SSE24	SSE24	SSE25	SSE24	SE20	WNW15	Diurnal Maximum

UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

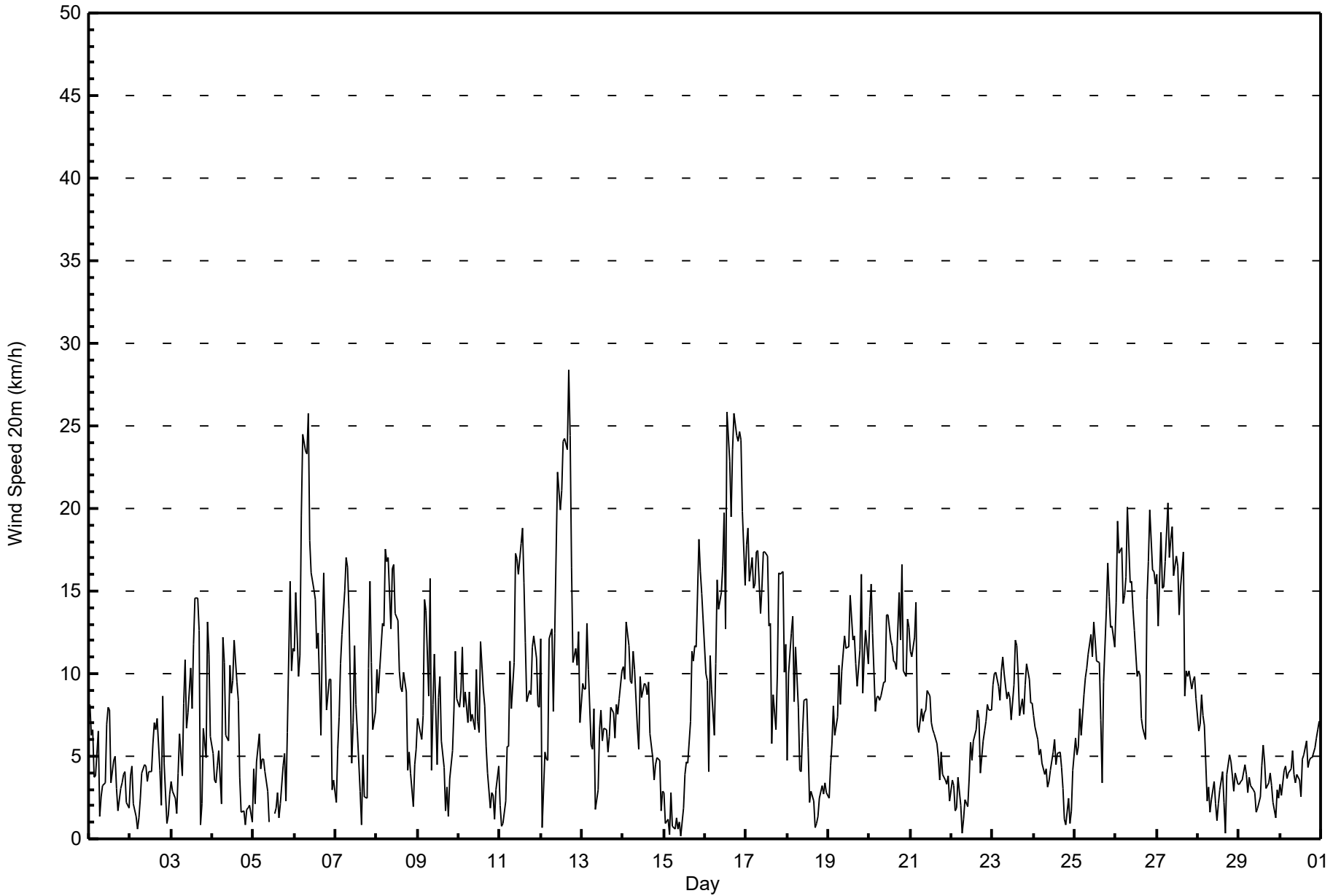
**Wind Speed 20m (WS20) - km/h**  
**Lower Camp Met Tower - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Nov 12 16:00	Hours in Service: 720 Hours of Data: 718 Hours of Missing Data: 2 Hours of Calibration: 0 Percent Operational Time: 99.7
Minimum Value: 0 km/h on Nov 28 17:00	
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 2 Median = 3 Q <sub>3</sub> = 4 P <sub>90</sub> = 5 P <sub>99</sub> = 7	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	3	2	1	1	2	1	2	1	1	1	1	1	2	2	2	2	1	1	1	2	2	2	1	1	3
2-Nov	2	2	2	1	1	1	1	1	2	1	1	1	1	4	3	3	3	2	2	4	3	2	1	1	4
3-Nov	1	1	1	1	3	2	2	4	2	2	2	3	3	4	2	2	3	3	2	3	3	2	2	3	4
4-Nov	4	3	3	1	3	2	8	5	3	3	2	3	2	2	2	3	1	1	1	2	1	2	1	1	8
5-Nov	3	2	2	3	2	2	4	3	1	1	UO	UO	1	1	2	1	1	1	1	1	4	2	2	2	4
6-Nov	2	3	5	4	5	5	4	4	4	4	3	4	4	4	5	3	3	3	4	2	3	3	3	3	5
7-Nov	1	4	3	5	4	5	5	5	4	4	4	4	5	4	3	2	1	1	2	1	4	2	3	2	5
8-Nov	4	3	2	2	4	4	4	3	3	3	3	5	5	3	2	2	2	2	5	2	2	2	1	2	5
9-Nov	3	2	2	3	2	3	5	3	4	4	2	2	2	3	2	2	1	1	2	2	3	2	3	3	5
10-Nov	2	2	3	2	2	2	2	2	3	3	3	2	3	2	2	2	1	2	1	1	1	1	1	2	3
11-Nov	2	1	1	2	5	4	4	4	6	5	5	5	6	6	5	4	3	3	2	2	2	3	3	3	6
12-Nov	4	4	4	2	6	2	3	3	3	5	7	6	6	7	8	8	7	6	6	4	4	4	5	3	8
13-Nov	4	3	3	3	4	3	2	2	2	1	3	3	2	3	3	3	2	3	3	2	3	3	3	4	4
14-Nov	3	3	4	4	4	3	4	4	4	2	3	3	3	3	3	3	2	2	2	2	2	2	2	1	4
15-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	4	2	5	4	3	2	2	2	5
16-Nov	2	3	2	5	4	3	5	4	8	6	5	5	5	7	6	5	6	5	5	4	5	6	5	4	8
17-Nov	5	5	4	4	4	3	4	4	3	4	3	4	3	3	3	3	4	3	5	7	6	6	4	4	7
18-Nov	2	5	4	5	3	4	4	2	2	3	3	3	3	2	1	1	1	1	1	1	1	1	1	1	5
19-Nov	2	2	2	3	4	3	4	3	4	5	4	3	4	5	4	5	4	3	5	6	4	4	5	4	6
20-Nov	5	5	4	3	3	4	3	3	3	3	5	4	5	4	4	4	4	5	4	7	4	5	5	4	7
21-Nov	4	4	4	5	3	2	2	2	2	2	3	3	3	2	2	2	2	1	1	2	1	1	2	1	5
22-Nov	1	1	1	1	2	2	1	1	1	1	2	2	2	2	3	3	4	2	2	3	3	4	3	4	4
23-Nov	3	3	3	4	3	3	4	3	3	3	3	2	3	3	4	3	3	3	3	3	4	3	3	3	4
24-Nov	3	3	2	2	2	2	2	2	2	1	2	2	2	2	2	2	1	1	1	1	1	1	1	2	3
25-Nov	2	2	3	2	3	2	3	2	3	2	3	3	3	2	2	5	3	4	5	5	5	4	4	4	5
26-Nov	4	4	4	5	4	4	4	5	4	3	3	3	2	3	2	3	4	4	5	6	6	6	5	5	6
27-Nov	5	5	6	5	6	7	7	6	6	6	6	5	5	5	6	6	3	3	4	4	4	4	4	3	7
28-Nov	2	3	2	2	2	2	1	1	1	1	1	1	1	1	2	1	0	1	2	2	1	1	2	2	3
29-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	2	2	1	1	1	1	2
30-Nov	1	1	2	2	2	2	1	2	1	1	1	2	1	2	2	2	2	1	2	2	2	2	2	3	3
	5	5	6	5	6	7	8	6	8	6	7	6	6	7	8	8	7	6	6	7	6	6	5	5	

Diurnal Maximum

UO - Unstable Operation





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 20m (WS20) - km/h  
Lower Camp Met Tower - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	264	36.77	36.77
6 - 11	268	37.33	74.09
12 - 19	159	22.14	96.24
20 - 28	27	3.76	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

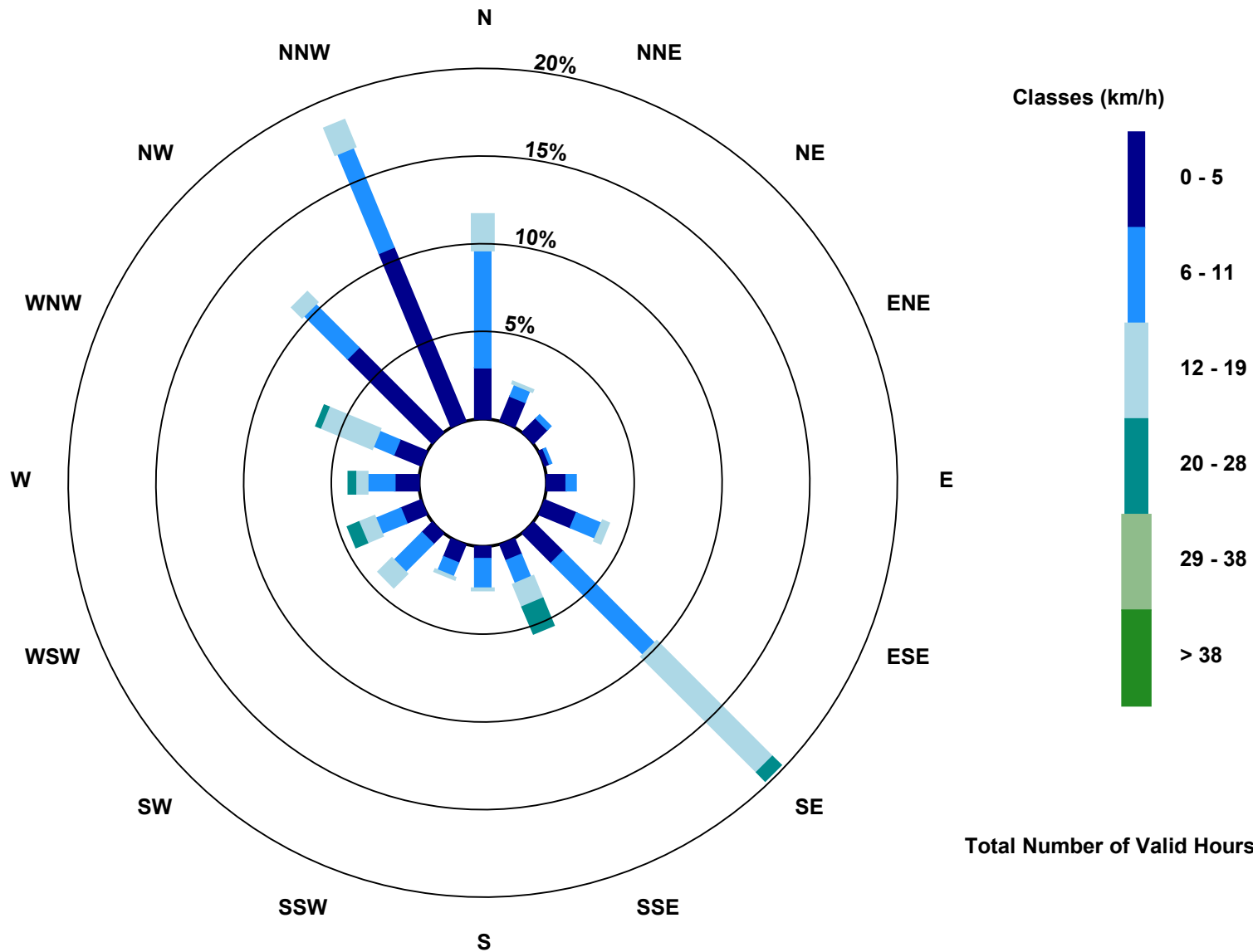
Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 20m (WS20) - km/h  
Lower Camp Met Tower



Total Number of Valid Hours: 718



Maximum Speed: 36 km/h on Nov 12 17:00	Maximum Daily Speed Average: 21.1 km/h on Nov 16	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 15 08:00	Minimum Daily Speed Average: 1.3 km/h on Nov 1	Hours of Data: 693
Maximum Diurnal Speed Average: 2.4 km/h at hour 3	Minimum Diurnal Speed Average: 0.1 km/h at hour 18	Hours of Missing Data: 27
Monthly Average Velocity: 0.5 km/h 284.0 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 4 Q <sub>1</sub> = 7 Median = 11 Q <sub>3</sub> = 16 P <sub>90</sub> = 22 P <sub>99</sub> = 30	Percent Operational Time: 96.3

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Nov	W11	W9	SW7	SW4	SSW5	SSW8	SSW4	E3	ESE4	SE4	S7	SSW9	SW8	WNW5	NNW7	N7	NNE5	NNE3	NNE5	NNE5	NNE6	N5	NNE3	N3	W1.3	W11		
2-Nov	N5	N6	NNE3	N3	E2	NNW1	N3	NNW5	NNW7	NNW6	NNW4	NNW3	NNW5	E9	E11	E11	E12	NE7	ENE4	ESE14	ESE9	ESE4	E4	E1	ENE3.4	ESE14		
3-Nov	NNW3	NW1	S2	S2	SW7	WSW10	SW6	SW11	SW15	SW10	SW11	SSW14	S10	SSE14	SSE16	SSE17	SSE15	SSW3	S3	SSE9	SSW8	WSW18	WSW16	SW12	SSW7.8	WSW18		
4-Nov	SW9	SSW7	S5	SSE6	SW8	SW6	SW17	SW14	SSW7	SE7	SSW11	SE10	SE11	SE14	SE12	SE11	SE7	SE1	NW3	NNW2	ESE5	SE6	ESE5	ESE2	SSE5.4	SW17		
5-Nov	N4	NNW5	NNW7	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	NNW7		
6-Nov	UO	UO	UO	SE16	SSE24	SSE29	SSE27	SSE27	SSE29	SSE21	S19	SSW18	SW18	WSW16	SW17	SSW8	SE14	SE19	SE15	ESE11	SE15	SE13	SE5	NNW5	SSE13.9	SSE29		
7-Nov	NW7	NNW9	NW14	WNW19	WSW19	WNW22	WNW26	WNW26	WNW20	WNW8	WSW9	WNW16	WNW12	W8	W4	E2	ESE8	SE7	SE7	SE15	SE19	SE15	ESE11	ESE15	W4.8	WNW26		
8-Nov	SE15	SE12	SE13	SE17	SE20	SE24	SE23	SE22	SE18	SE20	SE19	SE15	SSE15	S13	S11	S13	SSW15	SSW13	SW8	NW11	NW9	NNW6	W8	WSW9	SSE9.9	SE24		
9-Nov	WSW13	W11	WSW9	WSW12	SW19	SW19	WSW15	WSW22	WSW9	WSW11	SW13	SW6	SW10	WSW12	WSW9	WSW6	SSW5	S6	SE4	SE7	SE9	SSE9	SSE13	SE12	SW8.4	WSW22		
10-Nov	SE11	SE12	SE14	SE12	SE12	SE10	S9	SSW8	S8	SSW8	SW11	SW7	S5	SE11	SE11	SE11	SE9	SE8	SE7	SE8	SE8	ESE7	ESE7	ESE8	SE8.1	SE14		
11-Nov	ESE6	SE3	ESE4	S1	SW8	SE8	ESE18	ESE13	ESE16	SE25	SE26	ESE23	SE28	SE30	ESE24	ESE18	ESE12	ESE13	SE12	SE15	SE15	SE15	SE11	SE13	SE14.3	SE30		
12-Nov	SSE16	SE4	N2	NNW3	SSW8	SW16	SW16	SW10	SW17	WSW25	WSW31	W28	WSW29	WSW33	W34	W34	WSW36	WSW33	W23	W16	WSW16	W14	W18	W10	WSW17.9	WSW36		
13-Nov	W13	WSW13	WSW13	WSW17	WSW15	WSW10	WSW8	WSW12	W4	NNW4	NNW9	NNE11	NE9	NE9	ENE9	NNE8	N9	NNE11	N11	N9	N12	N11	N12	N14	NW5.3	WSW17		
14-Nov	N15	N14	N19	N18	N14	N13	N17	N15	N11	NNW9	N13	N13	N14	N13	N12	NNW13	NNW10	NNW8	NNW6	NW6	NNW7	NNW7	NNE3	NNW3	N11.2	N19		
15-Nov	NNW4	NNE2	N2	E1	NW4	N0	S1	W0	ESE1	SSE2	S2	SSE2	SE4	ESE6	SE6	SE9	SE14	SSE13	SSE15	SE15	SSE22	SSE19	SSE16	SSE16	SE6.3	SSE22		
16-Nov	SSE15	SSE14	SE9	SSE16	SE13	SE10	SE14	SSE19	SE19	SE19	SE23	SE25	SE17	SSE30	SSE27	SE27	SE29	SSE29	SSE27	SSE27	SSE29	SE28	SE24	SE19	SE21.1	SSE30		
17-Nov	SE22	SE24	SE20	SE22	SE21	SE20	SE23	SE23	SE18	SE22	SE21	SSE20	SE19	SE17	SSE16	SE10	SSE14	SSW9	NNW17	UO	UO	UO	NW14	NW16	SE13.7	SE24		
18-Nov	WNW8	W15	W18	WNW20	NW13	WNW18	WNW12	W9	WNW7	W10	WNW12	NW12	WNW7	NW3	WNW4	NW5	N3	NNE1	NE2	N3	N4	NNW4	NNW6	NE5	WNW7.2	WNW20		
19-Nov	NE4	NNE5	N8	N12	N9	N10	N16	N12	N15	N17	N16	N16	N18	NNE21	N18	N18	N15	N13	NNW17	N23	N14	N17	N18	N16	N14.3	N23		
20-Nov	N20	NNW22	N19	NNW12	NNW13	N15	N14	N14	N16	N15	N20	N20	N17	N17	N16	N16	N16	N23	N18	N25	N16	NNW14	N19	N18	N17.2	N25		
21-Nov	N17	NNW16	NNW18	NNW20	NNW11	NNW10	NW11	NW10	NW11	NW10	NNW11	NW10	NNW12	NNW11	NW9	NW8	NW8	NW8	NW7	NW5	NNW7	NNW6	NNW5	NNW6	NNE6	N3	NNW9.2	NNW20
22-Nov	NW5	WNW5	WNW2	W4	W6	W3	WSW1	WNW2	NW2	NW3	NNW5	N7	NNW6	NNW9	NNE10	NNE12	N10	N6	NNE8	NNE10	N10	N12	N12	NNW11	N5.6	N12		
23-Nov	N14	N15	N14	N13	N12	N15	N17	N15	N12	N13	N12	N11	NNW14	N18	N17	N15	NNW12	NNW13	NNW12	N15	N16	NNW15	NNW13	NNW13	N13.8	N18		
24-Nov	NNW12	NNW12	NNW10	NNW9	NNW9	NNW9	NNW8	NNW8	NNW6	NNW6	NNW7	NNW8	NNW6	NW8	NW8	NW8	NNW7	NNW4	NW2	WSW3	SW2	SSE2	SE6	SE6	NNW6.2	NNW12		
25-Nov	SE8	SE10	SE8	SE11	SE9	SE12	SE15	SE14	SSE13	SSE13	SE13	SE16	SE14	SE14	SE13	SE11	SE9	SE19	SE24	SE27	SE24	SE23	SE23	SE19	SE15.0	SE27		
26-Nov	SE21	SE24	SE22	SE25	SE22	SE21	SE21	SE28	SE23	SE19	SE17	SE16	SE13	SE13	SE12	SE8	S10	W9	W21	WNW25	WNW28	WNW23	WNW24	WNW22	SSE8.1	SE28		
27-Nov	WNW23	WNW19	WNW27	WNW22	WNW21	WNW25	WNW29	WNW25	WNW27	WNW28	WNW23	WNW23	NW22	NW19	NW22	NW25	NW13	NW14	NW15	NNW16	NNW14	NNW15	NNW15	N14	WNW19.3	WNW29		
28-Nov	NNW11	NNW12	NW14	NW12	NW12	NNW5	NNW7	WNW2	WNW3	NNW5	WNW4	WSW2	WNW3	NNW4	NNW6	NNW5	N3	N7	N9	N8	NNW6	NNW4	NNW5	NW5	NNW6.0	NW14		
29-Nov	NW4	WSW6	WNW3	WNW4	NW5	WNW2	NNW3	NW3	NNW4	NNW5	NW4	NW2	NW3	NW7	NW8	NNW8	NNW6	NNW8	NNW8	NNW9	NNW8	N6	N7	NNW6	NNW5.0	NNW9		
30-Nov	N6	NNW5	NNW7	NNW6	NNW6	NNW6	NNW6	NNW8	NNW6	NW5	NNW5	NNW5	NNW4	NNW7	NNW8	NW9	NNW8	NNW8	NNW8	NNW8	NNW9	NNW9	NNW9	NNW10	NNW11	NNW7.0	NNW11	

NNW1.4	NW1.7	NW2.4	NNW1.1	WSW1.8	SW1.9	SW1.8	SW2.3	SSW1.5	SSW1.8	SW2.2	SW1.3	WSW1.0	S0.7	ENE0.2	NE1.2	SE1.3	NE0.1	N1.7	NNE2.3	ENE1.2	NNE1.2	N2.0	N2.1	Diurnal Average	
WNW2.3	SE2.4	WNW2.7	SE2.5	SSE2.4	SSE2.9	WNW2.9	SE2.8	SSE2.9	WNW2.8	WSW3.1	W2.8	WSW2.9	WSW3.3	W3.4	W3.4	WSW3.6	WSW3.3	SSE2.7	SSE2.7	SSE2.9	SE2.8	SE2.4	WNW2.2	Diurnal Maximum	

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

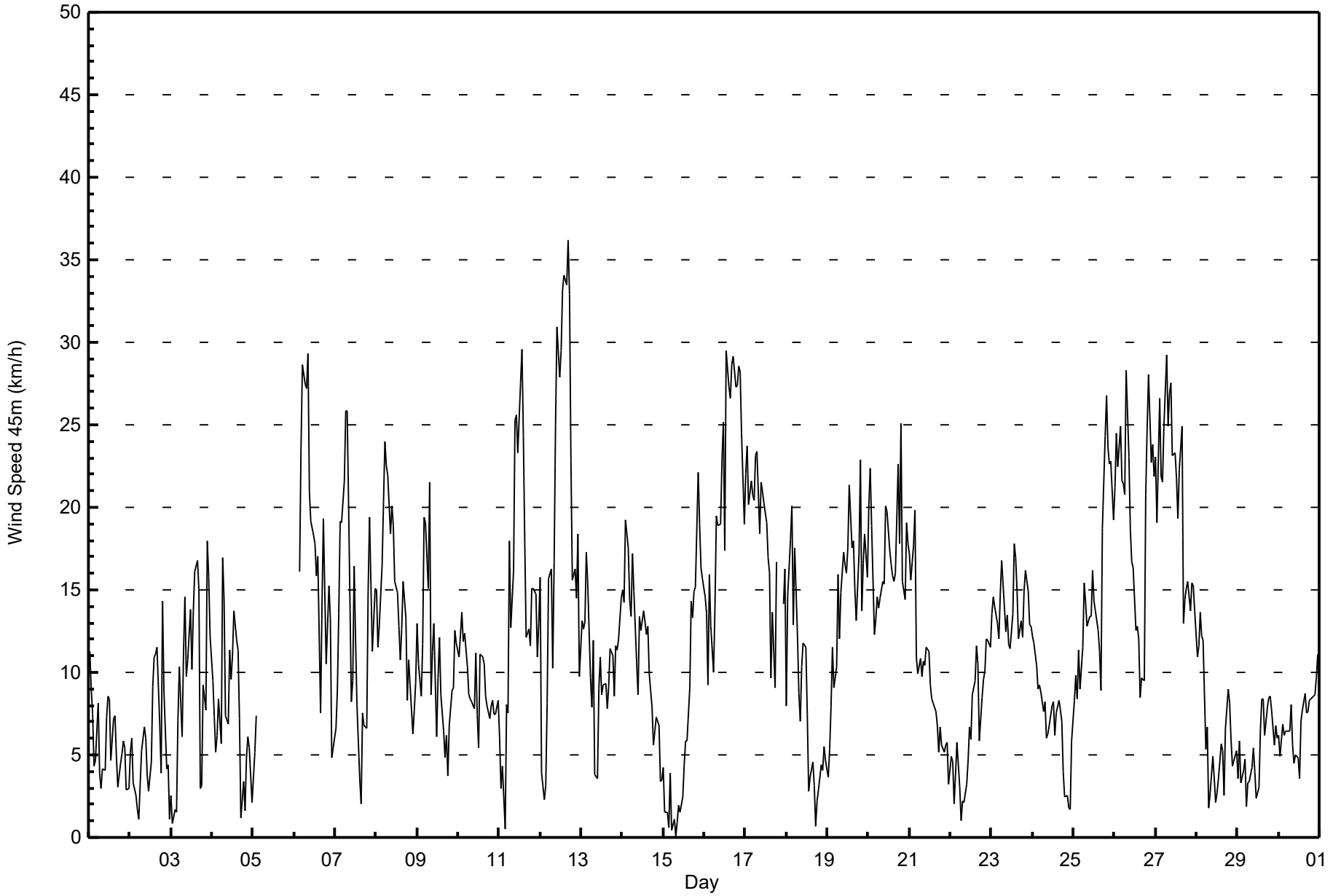
**Wind Speed 45m (WS45) - km/h**  
**Lower Camp Met Tower - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Nov 16 09:00	Hours in Service: 720 Hours of Data: 693 Hours of Missing Data: 27 Hours of Calibration: 0 Percent Operational Time: 96.3
Minimum Value: 0 km/h on Nov 22 08:00	
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 2 Median = 3 Q <sub>3</sub> = 4 P <sub>90</sub> = 5 P <sub>99</sub> = 7	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	3	2	1	1	2	2	2	1	1	1	1	2	2	1	1	2	1	2	1	2	2	2	1	1	3
2-Nov	2	2	2	2	2	2	1	1	1	2	1	1	1	4	3	3	3	2	2	5	5	4	3	1	5
3-Nov	1	1	1	2	3	2	4	5	2	2	2	3	4	4	2	2	3	4	3	3	3	2	2	5	
4-Nov	5	4	4	2	4	2	7	4	3	2	2	3	2	2	2	2	4	1	1	1	3	2	1	7	
5-Nov	4	2	3	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	4	
6-Nov	UO	UO	UO	4	5	5	4	5	5	5	4	5	4	4	5	4	3	2	3	2	2	3	5	5	
7-Nov	2	5	4	6	3	6	5	4	4	6	4	5	6	2	2	1	2	2	3	3	2	2	3	6	
8-Nov	4	4	2	2	2	2	2	2	3	3	3	3	3	3	2	2	2	4	2	4	2	3	2	4	
9-Nov	3	3	3	3	2	2	5	2	6	4	2	3	2	2	2	2	2	3	3	3	2	2	2	6	
10-Nov	2	1	2	2	1	2	2	3	3	3	4	2	2	1	2	2	2	3	2	1	1	1	2	4	
11-Nov	3	2	2	2	7	5	4	5	7	4	4	5	5	5	6	4	3	3	3	2	2	2	3	7	
12-Nov	4	5	2	2	7	3	3	3	3	4	6	6	5	6	7	7	5	5	6	4	4	4	5	7	
13-Nov	4	3	3	2	4	3	3	2	2	2	3	4	3	3	3	3	2	3	3	2	2	3	3	4	
14-Nov	3	3	3	3	4	3	3	3	4	2	3	3	3	2	3	2	2	2	2	2	2	2	2	4	
15-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	3	3	5	3	4	2	2	5	
16-Nov	2	2	3	6	4	4	5	4	8	7	4	5	5	8	6	5	5	6	5	5	5	5	4	8	
17-Nov	5	5	3	4	3	3	3	4	3	3	3	3	3	3	3	3	4	3	6	UO	UO	UO	3	6	
18-Nov	3	5	4	4	3	4	4	2	2	4	3	3	3	2	1	1	1	1	2	2	2	1	2	5	
19-Nov	2	2	2	2	4	3	4	3	4	4	3	3	4	5	5	5	4	3	4	6	4	5	5	6	
20-Nov	4	4	5	3	3	4	3	3	3	4	4	4	5	4	4	4	5	5	5	7	5	5	5	7	
21-Nov	3	4	3	4	3	2	2	2	2	3	3	3	2	2	2	2	2	2	1	2	1	2	2	4	
22-Nov	1	1	1	3	2	2	1	0	1	1	2	2	2	2	2	3	4	2	2	2	4	4	3	4	
23-Nov	3	3	3	4	3	3	3	3	3	3	2	2	3	3	3	4	3	3	2	3	3	3	2	4	
24-Nov	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	3	
25-Nov	2	2	3	1	3	2	2	2	3	2	3	2	2	2	3	6	5	6	4	4	4	3	3	6	
26-Nov	3	4	4	4	3	3	3	4	3	3	3	3	2	3	2	3	3	4	5	6	5	7	5	7	
27-Nov	5	5	5	6	6	7	6	5	5	5	5	5	5	7	7	4	3	4	4	6	5	4	3	7	
28-Nov	2	4	2	2	2	2	1	1	1	1	1	2	1	2	2	1	1	2	3	2	1	1	2	4	
29-Nov	3	2	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	2	2	2	1	2	1	3	
30-Nov	1	1	1	1	1	1	1	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	
	5	5	5	6	7	7	7	5	8	7	6	6	6	8	7	7	5	6	6	7	6	7	5	5	

Diurnal Maximum

UO - Unstable Operation





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 45m (WS45) - km/h**  
**Lower Camp Met Tower - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	133	19.19	19.19
6 - 11	227	32.76	51.95
12 - 19	233	33.62	85.57
20 - 28	85	12.27	97.84
29 - 38	15	2.16	100.00
> 38	0	0.00	100.00

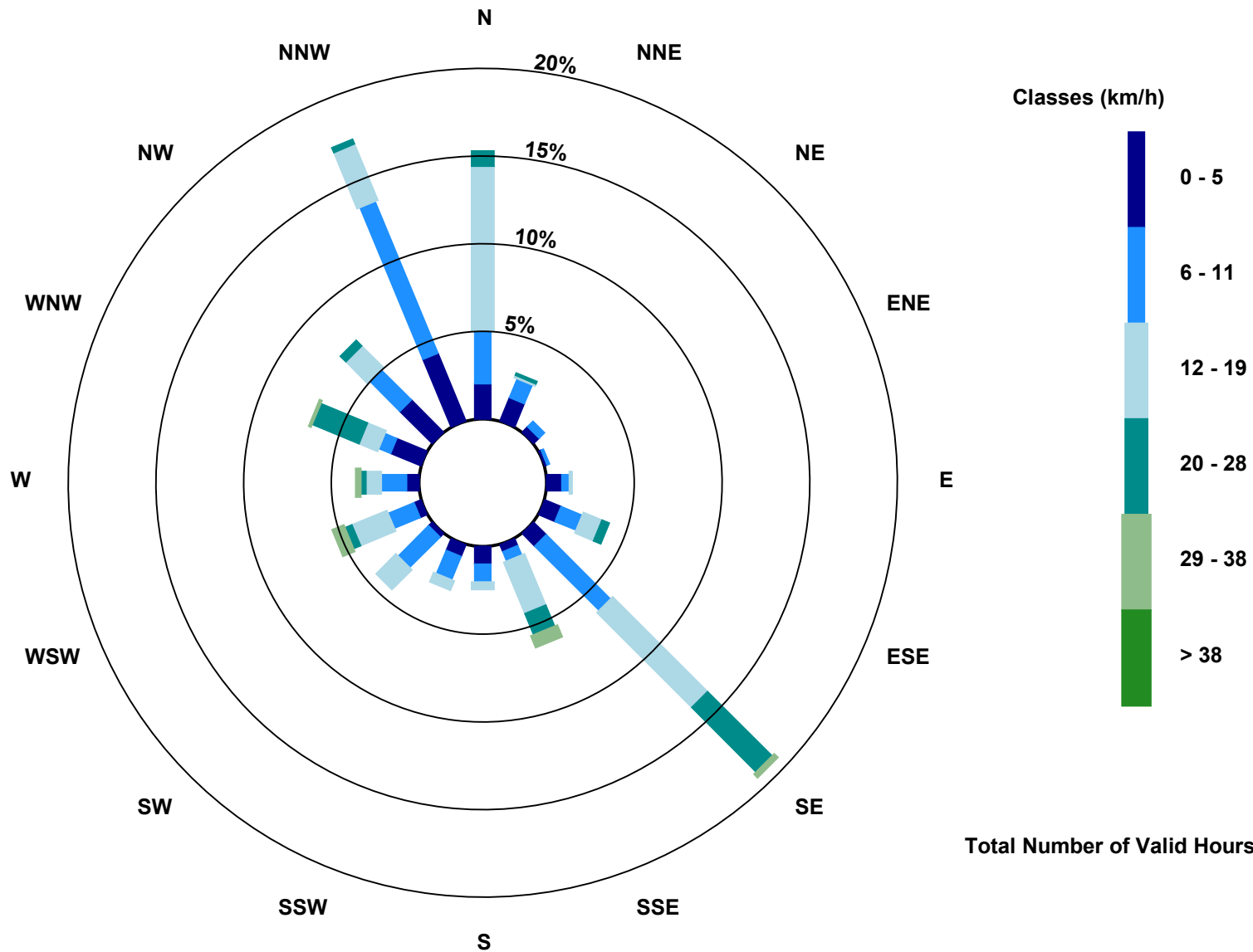
Total Number of Valid Hours: 693

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 45m (WS45) - km/h  
Lower Camp Met Tower



Total Number of Valid Hours: 693



Maximum Speed: 42 km/h on Nov 12 17:00	Maximum Daily Speed Average: 26.6 km/h on Nov 16	Hours in Service: 720
Minimum Speed Value: 1 km/h on Nov 2 07:00	Minimum Daily Speed Average: 1.9 km/h on Nov 1	Hours of Data: 691
Maximum Diurnal Speed Average: 4.5 km/h at hour 8	Minimum Diurnal Speed Average: 0.5 km/h at hour 15	Hours of Missing Data: 29
Monthly Average Velocity: 1.5 km/h 251.2 deg	Percentiles: P <sub>1</sub> = 2 P <sub>10</sub> = 5 Q <sub>1</sub> = 9 Median = 14 Q <sub>3</sub> = 20 P <sub>90</sub> = 27 P <sub>99</sub> = 37	Percent Operational Time: 96.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	W13	W10	SW8	WSW6	SW6	SW10	SW7	SSE3	SSE6	SSE4	SSW8	SSW9	SW9	WNW6	NNW8	N8	NNE6	NE5	NNE5	NNE7	NNE8	NNE7	NNE4	N4	W1.9	W13	
2-Nov	N6	N7	NNE5	NNE5	E4	ESE1	NE1	NE2	NNE4	NNE4	NNE3	E1	NNW3	ESE13	ESE15	ESE15	E16	ENE9	ESE7	SE23	SE16	ESE12	ESE13	SE8	E6.2	SE23	
3-Nov	SE4	SE5	SSE6	S9	SW13	WSW15	SW10	SW16	WSW19	SW14	SW16	SSW13	S19	SSE19	SSE19	S16	SW11	SW9	S13	SW14	WSW24	W20	W14	SW11.7	WSW24		
4-Nov	WSW16	SW13	SW12	SSW9	WSW14	SW12	WSW21	SW18	SSW10	SSE6	SSE11	SSE9	SE10	SE12	SE12	SE14	SE11	SSE8	SSE2	SSE3	SE10	SSE10	SSE9	SE10	S7.9	WSW21	
5-Nov	S1	NNW8	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	NNW8	
6-Nov	UO	SSE25	SE26	SSE19	SSE31	SSE33	UO	SSE36	S39	S30	SSW29	SW25	SW24	WSW23	WSW23	SW12	S11	S18	SSE19	SSE19	SSE21	SSE19	SSE8	ENE2	S19.2	S39	
7-Nov	NNW7	NW15	NW21	WNW29	W27	WNW31	WNW35	WNW35	WNW29	WNW15	W11	WNW21	WNW16	W10	W4	E3	ESE14	SE14	SSE12	SSE21	SSE27	SE21	SE20	SE26	W7.4	WNW35	
8-Nov	SE22	SE17	SSE16	SE26	SE24	SE23	SSE21	SSE22	SE18	SSE23	SSE20	SSE17	S23	SSW17	SSW14	SSW15	SSW20	SW19	WSW13	NW15	NNW16	NW13	WNW10	W13	S11.6	SE26	
9-Nov	W21	W19	WSW15	WSW20	WSW24	WSW24	WSW23	WSW27	WSW16	WSW19	WSW16	WSW9	WSW11	WSW15	WSW13	WSW7	SSW10	SSW19	S8	SSE10	SSW12	SSW13	S15	S13	SW14.0	WSW27	
10-Nov	S10	S14	S13	SSE9	S8	S6	SW13	SW14	SW14	SW14	SW12	SW8	SSW7	SE9	SE12	SSE12	SSE10	S9	SSE6	SSE12	SE13	SE14	SE14	SE13	S9.4	SE14	
11-Nov	ESE13	ESE12	ESE16	SE8	SSW10	SE12	SE25	ESE17	SE22	SE29	SE32	SE28	SE34	SE34	ESE30	ESE22	ESE18	ESE18	SE16	SE20	SE19	SE17	SE15	SE17	SE19.8	SE34	
12-Nov	SSE20	SE8	SSE7	SSE5	SSW16	SW22	UO	SW17	WSW23	WSW33	WSW38	W34	WSW35	WSW38	W41	W41	WSW42	WSW40	W28	W20	W21	W18	W23	W14	WSW22.7	WSW42	
13-Nov	W17	W17	WSW17	WSW20	WSW18	WSW14	WSW12	WSW11	W8	NW5	N10	NNE12	NE10	NE10	NE10	NE11	NNE12	NNE17	NNE15	NNE11	N14	N14	N13	N16	NNW6.4	WSW20	
14-Nov	N17	N16	N20	N20	N17	N15	N20	N18	N14	N11	N14	N14	N14	N13	N13	NNW13	NNW11	N8	NNW8	NNW9	N9	NNE6	NNW5	N13.2	N20		
15-Nov	NNW4	NNE3	NNW2	ESE3	WSW4	SW4	SSW4	SW4	ESE3	ESE7	S6	S3	SSE5	ESE7	SE7	SE10	SSE17	SSE19	SSE21	SSE23	SSE29	SSE26	S22	SSE22	SSE9.1	SSE29	
16-Nov	S21	S18	SSE16	SSE24	SSE20	SE15	SSE20	SSE28	SSE27	SSE26	SE29	SSE30	SSE24	SSE36	SSE32	SE33	SE32	SSE32	SSE32	SSE32	SSE32	SSE33	SSE33	SSE29	SSE24	SSE26.6	SSE36
17-Nov	SE25	SE27	SE24	SE26	SE25	SSE23	SE26	SE27	SE21	SE24	SSE24	SSE24	SSE21	SSE19	S21	SSE16	S18	SW15	NNW24	UO	UO	WNW30	NW19	WNW22	SSE14.1	WNW30	
18-Nov	WNW13	W20	W24	WNW27	WNW20	WNW23	WNW17	WNW15	W13	WNW15	WNW15	NW13	WNW8	NW3	NW4	NW4	N6	NE6	ENE5	NE1	N5	N3	N5	ENE5	WNW9.4	WNW27	
19-Nov	NE4	NNE6	N8	N12	N11	N11	N18	N15	N16	N18	N17	N17	N19	NNE24	N20	N21	N18	N16	N21	N27	N17	N21	N23	N19	N16.4	N27	
20-Nov	N24	N27	N24	N18	N18	N20	N20	N22	N23	N21	N23	N23	N20	N19	N18	N18	N20	N26	N22	N29	N18	NNW18	N22	N21	N21.3	N29	
21-Nov	N21	N18	N21	N23	NNW14	NNW13	NNW13	NNW12	NNW13	NW14	NW14	NW13	NW10	NW10	NW10	NW10	NW9	WNW9	NW8	NNW7	NW6	NNW7	NNE7	N4	NNW11.3	N23	
22-Nov	NNW6	NW5	WNW4	W6	W8	WNW5	W2	W5	WNW6	NW5	WNW6	NNW6	NNW6	N10	N10	NNE13	N12	N7	NNE10	NNE10	N11	N14	N13	NNW14	NNW6.6	N14	
23-Nov	N15	N16	N15	NNE14	N14	N16	N19	N17	N14	N15	N12	N13	N15	N19	N20	N18	NNW17	N17	N16	N17	N19	N18	N17	N17	N16.1	N20	
24-Nov	N17	N17	N15	N13	N13	N13	N12	N12	N10	NNW9	NNW8	NNW9	NNW9	NNW7	NNW9	NNW11	NNW10	NNW11	N10	NNE6	NE1	SE3	S2	SSE6	N8.6	N17	
25-Nov	SSE11	SSE13	SSE13	SSE13	SE11	SSE14	SSE18	SSE17	S16	UO	SSE12	SE14	UO	SE13	SE15	SSE16	SE19	SE29	SE31	SE32	SE32	SE31	SE29	SE26	SE19.0	SE32	
26-Nov	SE25	SE27	SE25	SE30	SE27	SE24	SE24	SE30	SE26	SE23	SE19	SE19	SE14	SSE15	SSE16	SSE12	S15	W14	W27	WNW32	WNW34	WNW30	WNW29	WNW28	S10.2	WNW34	
27-Nov	WNW29	WNW24	WNW33	WNW28	WNW29	WNW32	WNW32	WNW36	WNW32	WNW34	WNW36	WNW29	WNW27	NW27	NW24	NW30	NW32	NW18	NW20	NNW21	NNW22	NNW19	NNW22	N20	N17	NW24.8	WNW36
28-Nov	N15	NNW16	NW20	NW19	NW19	NW12	NW12	NNW4	NNW7	NNW10	NW6	W5	NW3	NW4	NNW7	N8	N7	N11	NNE13	NNE13	NNE11	NNE8	NNE8	N9	NNW9.2	NW20	
29-Nov	N7	NW4	W3	W7	NW5	W5	W8	W5	W4	WNW3	NNW2	WNW4	NW7	NNW10	NNW10	NNW11	NNW11	NNW14	N13	N12	N11	N9	N7	N9	NNW6.3	NNW14	
30-Nov	N11	N8	NNE5	NNW3	NNW5	NNW7	NNW6	NNW8	N8	N6	NW6	NNW6	NNW5	NNW9	NNW9	NNW11	N11	N11	NNW12	NNW13	NNW11	NNW11	NNW13	NNW14	NNW8.5	NNW14	

WNW1.5	W1.4	W1.6	WSW2.2	WSW3.9	WSW4.1	W3.8	SW4.5	SW3.5	SW3.3	SW3.8	WSW2.9	WSW2.6	SSW1.1	WSW0.5	NE1.0	SSE1.3	WSW1.0	NNW1.6	ENE1.9	E1.2	NW1.1	N1.5	N1.4	Diurnal Average
WNW29	SE27	WNW33	SE30	SSE31	SSE33	WNW36	SSE36	S39	WNW36	WSW38	W34	WSW35	WSW38	W41	W41	WSW42	WSW40	SSE32	SSE32	WNW34	SSE33	SE29	WNW28	Diurnal Maximum

UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

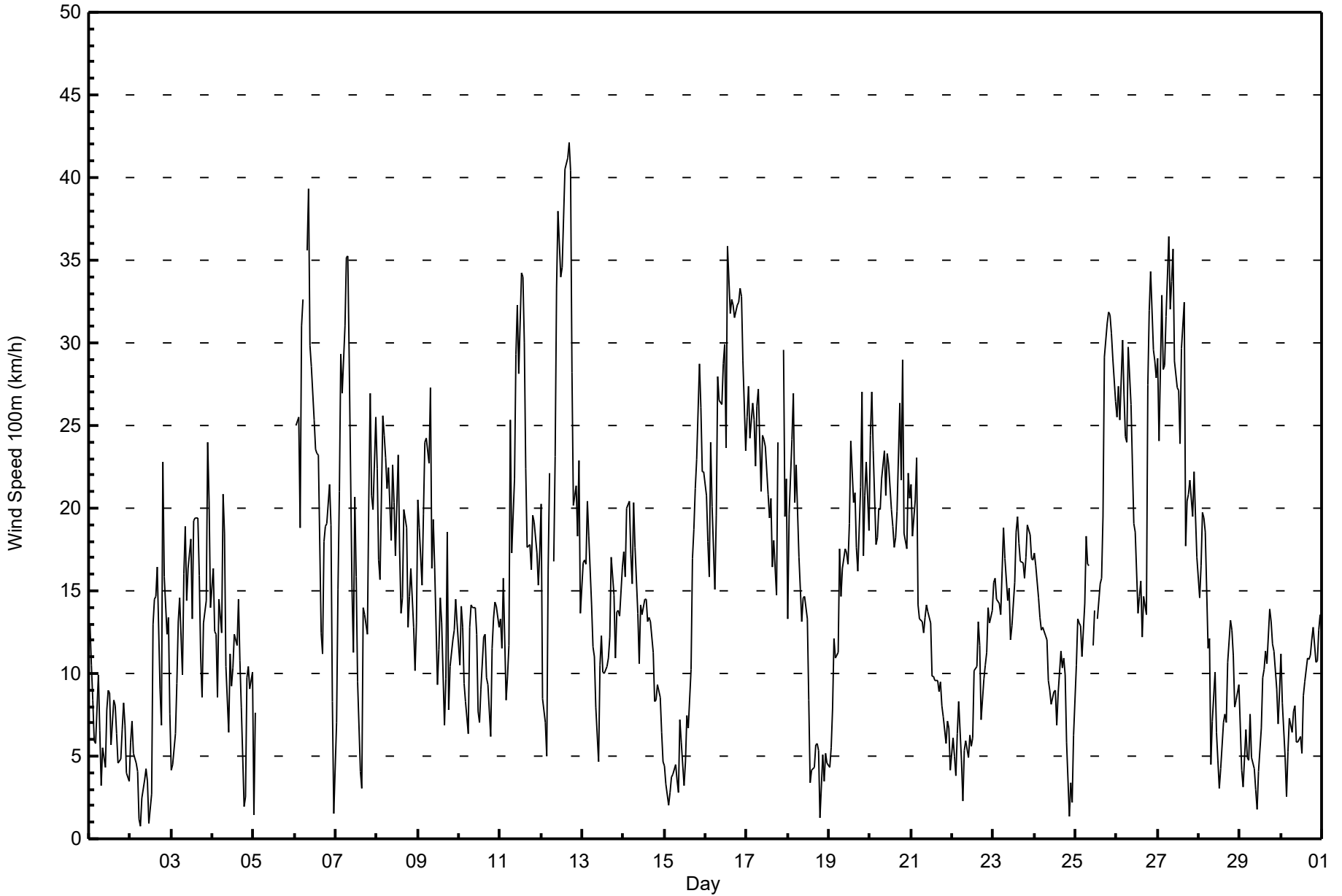
**Wind Speed 100m (WS100) - km/h**  
**Lower Camp Met Tower - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Nov 12 05:00	Hours in Service: 720 Hours of Data: 691 Hours of Missing Data: 29 Hours of Calibration: 0 Percent Operational Time: 96.0
Minimum Value: 1 km/h on Nov 24 19:00	
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 2 Median = 2 Q <sub>3</sub> = 4 P <sub>90</sub> = 5 P <sub>99</sub> = 7	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	2	2	1	2	2	2	1	2	2	1	2	2	2	1	1	1	1	2	1	2	3	2	2	1	3
2-Nov	1	2	2	2	3	2	1	1	2	1	1	1	1	4	3	3	2	3	2	4	7	5	3	2	7
3-Nov	2	2	2	3	3	2	5	6	2	2	2	3	3	2	2	3	3	5	2	4	2	2	2	6	
4-Nov	2	4	4	2	3	2	3	4	4	3	2	2	1	2	2	1	3	3	1	1	5	2	1	1	5
5-Nov	2	2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2
6-Nov	UO	4	5	4	6	3	UO	5	4	5	4	4	4	5	4	2	2	2	2	3	3	5	1	6	
7-Nov	2	5	5	4	3	6	4	3	4	8	4	5	6	3	2	2	2	2	4	4	4	3	4	3	8
8-Nov	3	4	3	3	3	2	2	2	3	5	4	3	5	3	2	2	2	3	2	4	3	4	3	6	6
9-Nov	3	5	5	2	2	2	3	2	7	4	2	3	2	2	1	2	5	2	5	2	3	2	2	2	7
10-Nov	2	2	2	1	2	2	4	3	4	3	4	2	2	2	1	2	2	3	2	2	2	1	2	3	4
11-Nov	2	2	4	3	6	6	4	5	7	3	4	4	4	4	6	4	4	3	3	2	2	2	4	2	7
12-Nov	3	6	4	3	8	2	UO	3	3	3	5	4	4	5	5	6	4	4	6	3	3	4	4	5	8
13-Nov	4	3	2	2	2	2	3	2	3	1	3	3	2	2	2	4	2	3	4	2	2	2	2	2	4
14-Nov	2	2	2	3	4	3	3	2	3	2	2	2	2	2	2	1	2	2	2	2	1	2	3	1	4
15-Nov	2	2	1	2	2	1	1	2	2	1	3	2	1	1	1	2	5	3	5	4	2	2	2	2	5
16-Nov	1	2	2	2	4	3	6	5	7	6	4	6	7	8	7	4	5	5	5	5	5	6	6	5	8
17-Nov	5	5	3	4	3	3	3	3	3	3	3	3	3	3	3	3	2	3	5	UO	UO	4	4	4	5
18-Nov	4	6	4	5	3	4	3	4	2	4	3	2	4	2	1	1	1	2	3	2	1	1	2	1	6
19-Nov	2	2	2	2	4	3	4	3	3	3	2	2	3	4	4	5	4	3	4	5	4	4	5	3	5
20-Nov	4	4	4	3	4	3	3	3	3	4	4	4	4	3	3	4	5	4	5	6	5	5	4	3	6
21-Nov	3	3	3	3	3	2	1	2	3	2	2	3	2	2	2	2	1	2	1	2	1	1	1	2	3
22-Nov	1	1	1	2	2	3	1	1	1	1	1	1	1	1	2	3	4	2	2	2	4	3	2	4	4
23-Nov	2	3	3	3	2	3	3	3	3	3	2	2	2	2	2	3	2	2	2	3	2	2	2	2	3
24-Nov	2	2	1	2	1	2	2	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	2
25-Nov	3	3	3	1	2	5	2	2	3	UO	2	2	UO	2	3	3	3	5	3	3	4	2	3	4	5
26-Nov	3	4	4	3	2	2	3	5	3	3	3	3	2	3	2	2	2	4	5	5	4	6	4	4	6
27-Nov	4	5	4	5	6	7	5	4	4	3	4	4	4	5	7	6	4	3	3	4	7	5	4	3	7
28-Nov	2	5	4	2	2	3	2	2	1	1	2	2	1	3	2	1	1	1	2	4	4	2	2	1	5
29-Nov	1	1	1	2	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	2
30-Nov	1	1	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2

5	6	5	5	8	7	6	6	7	8	5	6	7	8	7	6	5	5	6	6	7	6	6	6	6	
Diurnal Maximum																									

UO - Unstable Operation





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 100m (WS100) - km/h  
Lower Camp Met Tower - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	76	11.00	11.00
6 - 11	171	24.75	35.75
12 - 19	246	35.60	71.35
20 - 28	135	19.54	90.88
29 - 38	58	8.39	99.28
> 38	5	0.72	100.00

Total Number of Valid Hours: 691

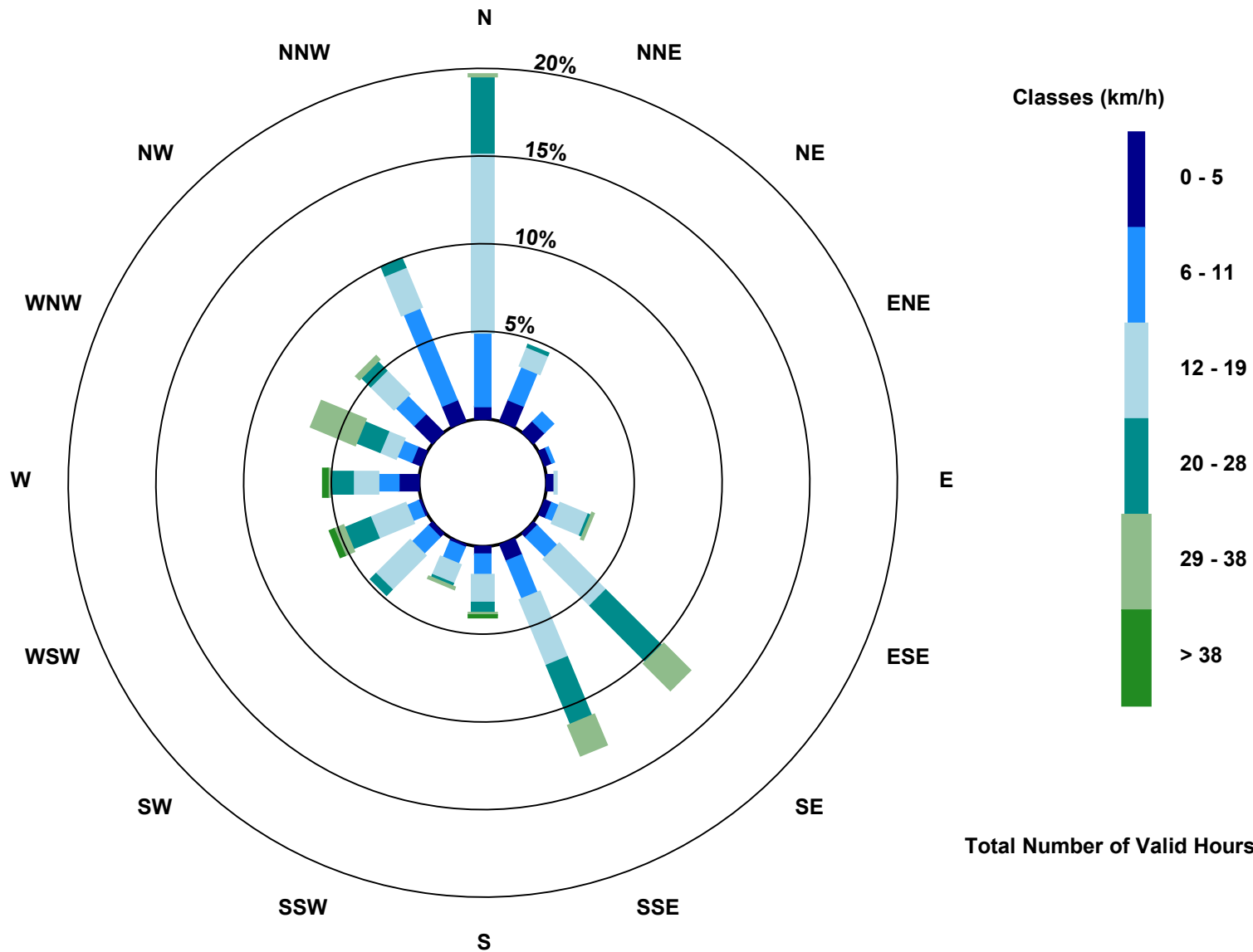
Total Number of Hours: 720





Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 100m (WS100) - km/h  
Lower Camp Met Tower





Maximum Speed: 47 km/h on Nov 6 07:00	Maximum Daily Speed Average: 30.8 km/h on Nov 16	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 15 02:00	Minimum Daily Speed Average: 2.2 km/h on Nov 1	Hours of Data: 692
Maximum Diurnal Speed Average: 6.1 km/h at hour 6	Minimum Diurnal Speed Average: 0.4 km/h at hour 21	Hours of Missing Data: 28
Monthly Average Velocity: 2.1 km/h 249.7 deg	Percentiles: P <sub>1</sub> = 2 P <sub>10</sub> = 6 Q <sub>1</sub> = 11 Median = 17 Q <sub>3</sub> = 24 P <sub>90</sub> = 30 P <sub>99</sub> = 42	Percent Operational Time: 96.1

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	W14	W11	WSW9	W8	WSW7	SW11	SW7	S5	S7	S5	SSW8	SW9	SW9	WNW6	N9	N8	NNE8	NE6	NE6	NE8	NE11	NE9	NE6	NE4	W2.2	W14
2-Nov	NNE6	NE8	ENE8	NE8	ENE6	SSE3	SE2	ESE4	E3	E6	E5	ESE3	ENE3	ESE16	ESE17	ESE17	ESE20	E10	ESE11	SE27	SE22	SE19	SE21	SE15	ESE9.6	SE27
3-Nov	SE11	SSE9	SSE11	S15	WSW16	WSW16	WSW13	WSW18	WSW21	WSW19	WSW20	WSW19	SW13	SSW20	S22	S21	SSW15	WSW16	SW13	SW16	WSW20	W22	WNW16	WNW16	SW13.3	S22
4-Nov	W13	WSW14	WSW19	SW16	W19	WSW18	WSW21	WSW18	SW12	S8	S12	S9	SSE9	SE12	SE12	SE16	SSE15	SSE17	S14	S14	S13	S19	SSW15	SW5	SSW10.5	WSW21
5-Nov	WSW5	NNW6	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	WSW24
6-Nov	S18	S34	SSE31	SSE25	S42	S47	S47	S42	S46	SSW39	SSW35	SW30	WSW29	WSW28	WSW28	SW18	SW16	SSW20	SSW23	S27	S27	S26	SW13	WNW4	SSW26.4	S47
7-Nov	N11	NW23	NW28	WNW31	W30	WNW38	WNW42	WNW41	WNW38	WNW23	W14	WNW22	WNW18	W11	W6	E3	ESE15	SSE17	S20	SSE27	SSE34	SSE28	SE27	SE30	W10.3	WNW42
8-Nov	SE26	SSE24	SSE25	SSE34	S31	S27	S20	SSW20	S21	SSW23	SSW25	SSW25	SSW28	SSW21	SW15	SSW15	SW20	WSW21	WSW16	NW16	NNW23	NW18	WNW14	WNW17	SSW14.6	SSE34
9-Nov	W24	W26	W22	W22	W26	W26	W21	W26	W23	WSW26	WSW17	WSW12	WSW14	WSW16	W14	WSW8	SW11	SW24	SSW16	S19	SW19	SW17	SSW15	SSW15	WSW17.2	W26
10-Nov	SW12	SSW13	SSW13	SW11	SW14	WSW13	WSW17	WSW18	WSW19	WSW19	WSW13	SW9	SSW8	S8	S12	S13	SSW10	SW11	SSW8	S13	SSE17	SSE16	SSE17	SSE19	SSW11.4	WSW19
11-Nov	SE19	SE18	SE24	SE19	S14	SSE16	SE30	SE21	SE28	SE33	SE38	SE32	SE38	SE38	SE34	SE27	ESE23	SE23	SE21	SE22	SE23	SSE19	SE17	SE18	SE24.6	SE38
12-Nov	SSE22	SSE12	SSE15	S13	SSW22	WSW27	WSW26	WSW22	WSW28	WSW37	W42	W38	W36	WSW38	W42	W44	WSW44	WSW45	W32	W22	W23	WNW21	WNW25	W18	WSW25.3	WSW45
13-Nov	W20	W19	W16	W18	W16	W15	W12	WNW8	N10	NW6	N11	NNE12	NE10	NE10	ENE11	NE12	NE16	NE17	NE20	NNE14	NNE16	NNE16	NNE15	NNE18	NNW7.9	W20
14-Nov	NNE19	NNE20	NNE23	NNE23	NNE21	NNE19	NNE24	NNE20	NNE16	N11	NNE13	NNE14	NNE14	NNE14	N12	N13	N14	N14	N11	N9	N9	N10	ENE7	NNE5	NNE14.5	NNE24
15-Nov	WNW3	NW0	N2	ESE5	SW3	SW7	SSW5	SSW2	ESE4	SE10	S11	SSW6	S6	SE9	SSE7	SSE11	S18	SSE24	SSE25	SSE28	S28	S26	SSW20	S21	S10.5	SSE28
16-Nov	SSW19	S14	SSE19	SSE19	SSE26	SSE21	SSE30	S39	SSE35	SSE35	SSE36	SSE36	SSE30	SSE41	SSE35	SSE35	SSE35	SSE33	SSE35	SSE37	SSE37	SSE36	SSE33	SSE28	SSE30.8	SSE41
17-Nov	SSE28	SSE29	SSE27	SE30	SSE28	SSE26	SSE28	SSE28	SSE24	SSE27	SSE26	SSE26	S25	S24	SSW22	S20	SSW21	SW19	UO	UO	UO	UO	UO	NW27	SSE21.6	SE30
18-Nov	WNW19	W24	W29	WNW29	WNW27	WNW25	NW21	WNW17	WNW15	WNW17	WNW16	NW13	NW8	NW4	NW4	NNW4	N6	NE6	ENE9	E2	NNE5	NNE3	NE3	E3	WNW10.6	WNW29
19-Nov	ENE4	ENE5	NNE7	N12	NNE13	NNE12	NNE18	NNE17	NNE18	N17	N16	N16	NNE19	NNE26	NNE22	N23	N20	N19	N24	N30	N19	N23	N25	N20	N17.5	N30
20-Nov	N27	N30	N28	N24	N23	N25	N25	N28	NNE31	NNE26	N26	N24	N22	N20	N19	N20	N22	N28	N25	N33	N21	N19	N24	N21	N24.4	N33
21-Nov	N25	N21	N22	N25	N16	N15	N14	NNW13	NNW14	NNW15	NW14	NW14	NW11	NNW11	NNW11	NW11	NW11	NW13	NW12	NNW9	NW7	NNW7	NNE8	NNE7	NNW12.6	N25
22-Nov	N8	NNW6	WNW6	WNW7	W10	WNW9	W5	WNW5	WNW7	NW7	WNW7	NNW5	N7	N11	NNE11	NNE14	NNE12	NNE8	NNE11	NNE11	NNE13	N14	N12	N14	NNW7.5	N14
23-Nov	N16	NNE16	NNE14	NNE16	NNE15	NNE18	NNE21	NNE17	N15	N16	NNE13	NNE14	N16	N18	N20	N19	N19	N19	NNE18	NNE19	N21	N20	N19	N20	N17.3	N21
24-Nov	N19	N19	N19	N17	NNE17	NNE18	NNE16	NNE15	NNE12	NNE11	N9	N9	N9	N7	N8	N10	N10	N11	N10	NE8	E4	SSE4	SSW6	S9	N9.7	N19
25-Nov	SSE15	SSE17	SSE19	SSE15	SSE14	SSE22	S20	S18	UO	UO	S16	S10	SSE9	SSE8	SSE11	SSE11	SSE13	SE12	SE10	SE10	SE17	SSE21	SSE27	SE27	SSE15.1	SE27
26-Nov	SSE30	SSE29	SSE29	SSE30	SSE28	SSE26	SSE27	SSE28	SSE27	SSE26	SSE20	SSE18	SSE13	SSE18	SSE21	SSE17	SSW14	W17	W30	WNW36	WNW38	WNW34	WNW30	WNW32	S12.0	WNW38
27-Nov	WNW33	WNW28	WNW37	WNW34	WNW35	WNW36	WNW40	WNW36	WNW37	WNW38	WNW32	NW31	NW30	NNW27	NNW33	NNW37	NNW21	NNW24	NNW24	NNW26	NNW23	NNW27	N22	N20	NW28.2	WNW40
28-Nov	N19	NNW21	NNW26	NNW25	NNW24	NW20	NW20	NW11	NNW12	N12	NNE10	WNW3	NW5	NW6	NNW9	N9	NNE11	N13	NNE17	NE20	NE22	NE18	NE18	NNE15	N13.4	NNW26
29-Nov	NNE10	NNE6	N3	NNE4	NNE5	N3	NW2	NNW3	NW2	NW3	NNE2	NNE5	NNE10	N12	N10	N12	NNE14	NNE17	NNE18	NE15	NE14	NE12	ENE5	ENE2	NNE7.4	NNE18
30-Nov	NNE5	NE5	ENE5	E5	E4	E2	ENE3	NE7	ENE7	ENE9	NE7	NNE8	NNE9	N10	N11	N11	N13	N13	N13	N14	N11	NNW10	N14	NNW14	NNE7.5	NNW14

W1.3	W1.6	WSW1.9	W2.2	WSW4.9	WSW6.1	WSW5.5	WSW5.1	WSW4.6	SW4.4	SW4.3	WSW3.4	WSW2.8	SW1.6	WSW1.0	NE0.5	S0.8	W1.7	NNW1.2	ENE1.3	SE0.4	WNW0.6	N0.6	NW1.5	Diurnal Average
WNW33	S34	WNW37	SSE34	S42	S47	S47	S42	S46	SSW39	W42	W38	SE38	SSE41	W42	W44	WSW44	WSW45	SSE35	SSE37	WNW38	SSE36	SSE33	WNW32	Diurnal Maximum

UO - Unstable Operation  
All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

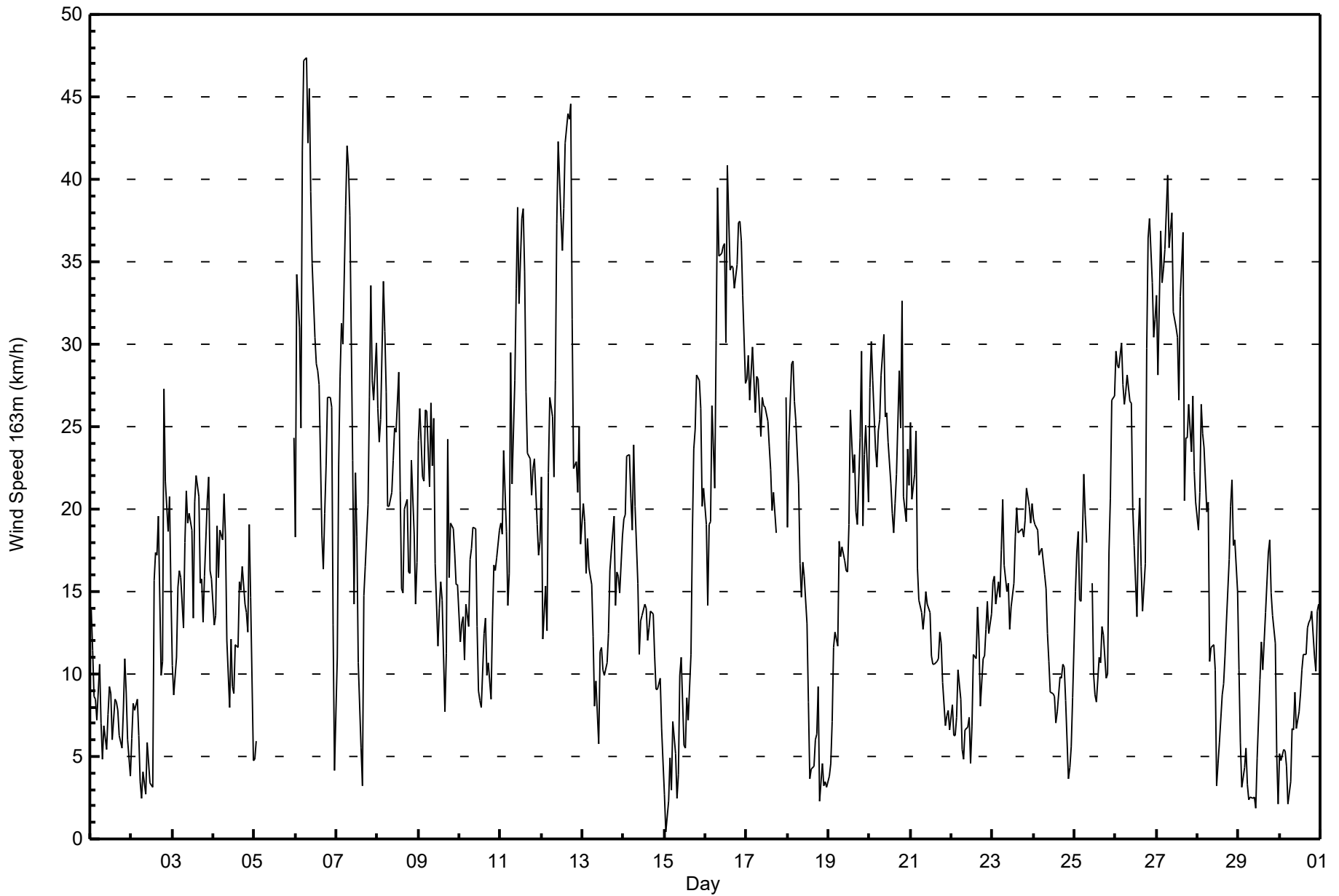
**Wind Speed 163m (WS163) - km/h**  
**Lower Camp Met Tower - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 9 km/h on Nov 7 10:00	Hours of Data: 692
Minimum Value: 0 km/h on Nov 24 17:00	Hours of Missing Data: 28
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 2 Median = 3 Q <sub>3</sub> = 4 P <sub>90</sub> = 5 P <sub>99</sub> = 7	Hours of Calibration: 0
	Percent Operational Time: 96.1

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	2	2	2	2	3	2	2	2	2	1	1	2	2	1	1	1	1	3	2	2	3	2	3	1	3	
2-Nov	1	2	3	3	2	2	2	1	1	2	2	2	2	4	3	2	2	5	5	4	6	5	2	4	6	
3-Nov	3	2	2	2	2	1	4	4	2	2	2	1	4	1	2	1	2	2	4	2	3	3	1	1	4	
4-Nov	1	4	1	2	4	1	2	3	3	2	2	2	1	2	1	2	3	2	2	2	3	2	4	1	4	
5-Nov	1	3	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2	3
6-Nov	3	4	4	5	7	6	5	2	3	5	3	4	4	3	4	3	3	2	3	2	2	2	7	3	7	
7-Nov	4	4	3	4	3	5	3	3	3	9	5	5	6	2	3	2	3	3	2	3	1	6	3	3	9	
8-Nov	3	5	3	3	3	2	3	2	3	2	4	5	2	3	2	2	3	3	3	3	4	5	3	5	5	
9-Nov	4	5	4	3	2	2	2	2	6	3	3	2	2	2	1	2	4	2	5	2	1	2	2	2	6	
10-Nov	2	2	2	1	2	3	3	2	2	3	3	2	2	2	1	1	3	3	1	3	2	3	2	4	4	
11-Nov	2	3	3	4	5	6	3	5	6	4	3	4	3	3	6	4	3	3	3	2	2	3	3	2	6	
12-Nov	2	6	5	3	6	2	2	3	3	2	4	3	4	4	4	5	3	3	6	3	3	3	3	5	6	
13-Nov	3	2	2	3	3	4	3	1	2	2	3	3	2	2	2	4	1	3	4	2	3	3	2	4	4	
14-Nov	2	3	2	2	4	3	2	3	3	2	2	3	2	2	2	1	2	2	2	1	1	1	2	2	4	
15-Nov	1	1	1	2	1	1	1	1	3	2	3	3	1	1	1	2	4	1	3	2	2	2	4	3	4	
16-Nov	3	1	3	3	4	4	8	3	5	6	4	6	7	7	8	4	5	5	5	4	4	4	7	6	8	
17-Nov	6	4	4	3	4	4	4	4	3	4	3	3	3	2	4	2	2	3	UO	UO	UO	UO	UO	4	6	
18-Nov	5	7	4	4	2	3	3	4	2	3	3	2	4	2	1	1	1	1	3	2	1	1	2	1	7	
19-Nov	2	2	2	4	5	3	4	4	4	4	2	2	3	4	5	5	4	4	4	5	4	4	5	4	5	
20-Nov	5	4	4	3	4	3	2	2	3	5	5	4	4	3	3	4	5	3	5	6	6	5	3	3	6	
21-Nov	3	3	3	3	3	2	2	1	2	1	3	2	2	2	2	2	1	1	2	3	1	1	1	2	3	
22-Nov	2	1	1	1	2	2	1	1	1	1	2	1	2	2	2	3	4	2	1	3	4	4	2	3	4	
23-Nov	2	3	3	4	3	4	3	3	4	3	3	2	3	2	3	3	2	2	2	3	2	2	2	3	4	
24-Nov	3	2	2	2	2	2	2	1	1	1	1	1	2	1	1	1	0	1	1	2	1	1	2	1	3	
25-Nov	2	2	2	2	1	3	4	2	UO	UO	2	2	2	2	2	2	3	4	3	4	6	5	4	3	6	
26-Nov	5	5	4	3	3	3	4	3	3	3	3	2	3	2	2	3	2	6	4	4	3	5	3	3	6	
27-Nov	3	5	3	4	5	6	4	3	3	2	3	5	4	5	6	5	4	3	3	4	7	5	4	3	7	
28-Nov	3	7	3	2	2	2	3	2	2	2	5	1	1	4	1	1	1	1	2	5	4	3	2	2	7	
29-Nov	2	2	0	1	1	1	1	1	1	1	1	2	1	2	1	1	2	1	1	1	1	2	1	1	2	
30-Nov	2	1	1	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	

6	7	5	5	7	6	8	5	6	9	5	6	7	7	8	5	5	6	6	6	7	6	7	6	
Diurnal Maximum																								

UO - Unstable Operation





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 163m (WS163) - km/h**  
**Lower Camp Met Tower - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	59	8.53	8.53
6 - 11	139	20.09	28.61
12 - 19	228	32.95	61.56
20 - 28	179	25.87	87.43
29 - 38	71	10.26	97.69
> 38	16	2.31	100.00

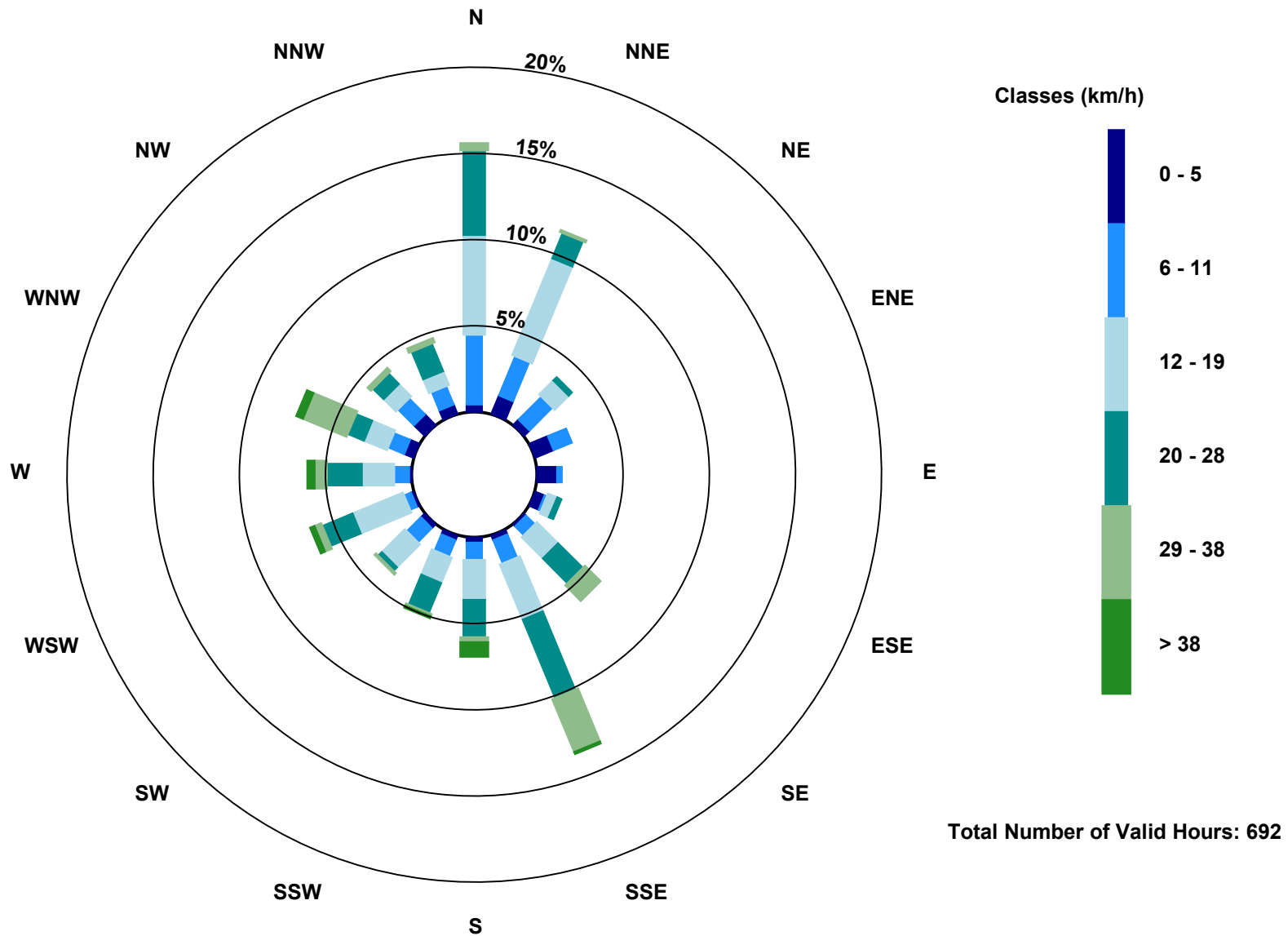
Total Number of Valid Hours: 692

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 163m (WS163) - km/h  
Lower Camp Met Tower





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 20m (WD20) - deg**  
**Lower Camp Met Tower - November 2024**

Direction of Maximum Speed: 243 deg on Nov 12 17:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 145.6 deg on Nov 16	Hours of Data: 718
Direction of Minimum Speed: 137 deg on Nov 15 11:00	Hours of Missing Data: 2
Direction of Minimum Daily Speed Average: 1.1 deg on Nov 1	Percent Operational Time: 99.7
Monthly Average Direction: 231.7 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	269	271	213	209	188	209	169	77	97	127	188	201	226	294	332	356	18	25	29	18	12	2	13	346	250.9
2-Nov	349	351	9	320	95	311	344	324	331	337	326	349	342	95	96	97	82	38	55	121	127	92	34	347	39.6
3-Nov	330	320	318	334	220	248	207	214	223	219	221	199	166	163	155	150	155	147	131	135	184	241	243	229	196.9
4-Nov	211	198	184	137	229	161	235	230	184	125	146	140	137	139	137	144	138	351	322	333	137	128	81	353	164.4
5-Nov	343	340	336	328	355	306	306	294	298	299	UO	UO	4	314	270	308	97	117	135	144	242	229	212	212	262.0
6-Nov	158	134	125	139	150	151	150	154	155	162	185	209	229	240	235	173	135	127	123	119	122	124	113	343	156.7
7-Nov	325	343	325	286	260	282	293	292	305	281	252	285	288	260	256	97	138	114	119	131	134	128	133	131	270.2
8-Nov	139	163	146	126	135	132	134	132	134	131	129	125	143	172	179	170	187	187	248	320	331	329	270	251	147.1
9-Nov	255	264	256	249	232	234	240	238	220	229	229	212	226	233	250	230	186	155	103	150	141	132	131	130	219.3
10-Nov	129	131	128	132	127	124	143	169	171	180	222	222	151	137	130	135	121	130	162	121	123	112	125	102	144.0
11-Nov	87	197	64	296	229	134	126	111	122	133	124	122	124	130	122	125	117	120	130	133	141	134	130	125	128.0
12-Nov	159	158	352	339	203	226	237	223	236	250	254	261	256	254	264	264	243	248	259	271	256	279	280	286	253.5
13-Nov	268	260	257	250	249	263	235	236	253	280	342	12	49	35	56	35	5	13	352	360	352	356	352	356	322.3
14-Nov	3	355	352	1	2	2	1	351	343	337	346	358	1	349	347	344	331	328	326	315	323	338	24	323	349.9
15-Nov	345	9	38	103	326	52	308	19	14	243	137	147	134	120	128	141	150	148	153	145	151	142	137	139	141.5
16-Nov	144	142	121	142	134	133	144	155	139	143	137	142	141	152	150	137	143	151	156	153	148	147	144	146	145.6
17-Nov	142	141	140	139	136	139	138	138	138	138	144	146	145	137	146	110	144	189	326	341	307	289	311	309	144.3
18-Nov	292	265	272	288	322	294	292	295	320	278	294	312	294	282	292	302	329	89	328	336	357	318	333	40	297.4
19-Nov	40	20	354	0	356	1	353	359	344	349	353	347	358	12	4	350	347	348	344	352	348	347	349	356	354.2
20-Nov	359	343	348	338	339	351	346	343	349	351	355	359	359	345	5	359	359	2	1	358	346	338	345	347	351.9
21-Nov	359	344	342	342	335	319	317	317	312	306	302	300	322	318	313	316	312	341	350	334	339	330	15	338	328.1
22-Nov	300	277	265	264	273	265	344	355	331	315	348	354	350	338	10	28	9	358	19	14	0	354	5	342	350.3
23-Nov	351	5	9	10	349	350	2	358	349	353	352	353	341	347	348	347	334	337	343	344	345	339	338	339	349.8
24-Nov	338	334	337	337	338	338	335	334	336	327	330	330	339	328	322	323	320	334	312	247	241	212	225	133	329.3
25-Nov	129	120	128	130	130	137	131	130	149	146	137	138	142	142	143	157	121	131	130	129	128	126	125	128	134.2
26-Nov	129	143	141	134	131	132	140	135	132	144	149	143	144	142	137	138	171	281	269	291	292	295	293	292	159.4
27-Nov	291	282	283	291	296	288	285	287	284	283	286	299	304	322	320	322	320	314	323	327	330	332	345	354	302.1
28-Nov	343	325	317	319	317	337	320	254	326	314	281	2	310	349	335	325	245	336	341	352	320	320	329	327	325.9
29-Nov	331	334	320	335	322	326	324	337	328	326	301	341	337	329	319	334	336	324	343	349	320	308	309	323	328.3
30-Nov	337	330	339	345	338	331	323	333	318	313	339	334	333	328	324	322	327	321	324	333	338	323	326	338	329.7

333.8 305.9 321.8 314.5 235.8 222.2 218.3 202.8 196.3 193.1 210.6 215.3 207.3 177.6 167.8 67.1 146.6 131.9 340.9 25.6 310.6 282.1 330.5 339.1

Diurnal Average

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods

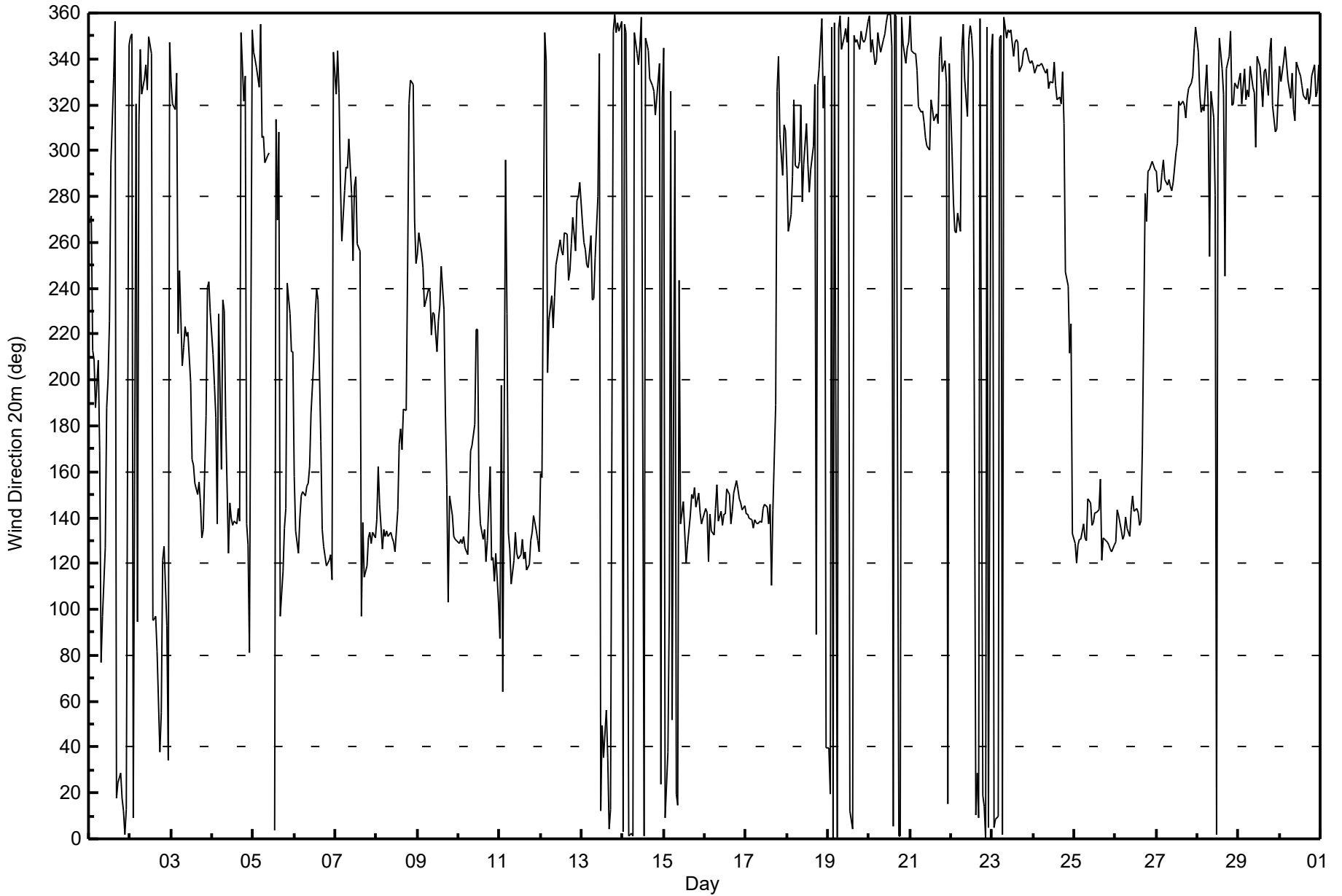


**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 20m (WD20) - deg**  
**Lower Camp Met Tower - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 105 deg on Nov 15 11:00		Hours in Service: 720 Hours of Data: 718 Hours of Missing Data: 2 Hours of Calibration: 0 Percent Operational Time: 99.7																							
Minimum Value: 6 deg on Nov 15 23:00																									
Percentiles: P <sub>1</sub> = 7 P <sub>10</sub> = 11 Q <sub>1</sub> = 15 Median = 19 Q <sub>3</sub> = 27 P <sub>90</sub> = 52 P <sub>99</sub> = 87																									
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	22	18	18	17	33	12	89	30	18	28	19	14	13	34	18	21	28	55	32	32	40	23	42	27	89
2-Nov	22	29	66	67	92	64	43	26	21	23	30	18	30	41	26	22	18	30	64	31	55	89	72	59	92
3-Nov	26	15	28	68	54	22	61	21	8	16	13	13	29	14	9	8	14	78	71	25	41	9	10	23	78
4-Nov	56	48	60	21	42	55	32	23	29	38	13	16	14	9	12	10	52	49	43	62	67	43	65	68	68
5-Nov	43	78	18	26	40	30	31	42	58	64	UO	UO	73	42	36	67	27	15	19	52	47	7	10	13	78
6-Nov	20	11	35	25	9	8	9	8	9	9	15	13	17	17	14	40	9	7	9	13	16	18	75	23	75
7-Nov	38	32	18	20	15	21	15	15	16	59	29	21	32	28	68	74	15	51	51	11	8	14	15	25	74
8-Nov	29	28	18	10	13	9	9	7	12	7	9	16	17	24	11	9	8	21	36	22	30	61	29	24	61
9-Nov	19	23	16	24	8	10	62	10	58	21	11	47	14	16	23	9	61	41	87	36	21	15	10	14	87
10-Nov	14	12	11	12	12	18	18	26	27	28	17	18	31	7	11	11	14	39	38	21	26	62	26	19	62
11-Nov	69	90	79	65	79	37	19	31	23	14	16	15	16	14	18	17	20	16	16	11	11	12	13	18	90
12-Nov	16	86	39	18	83	13	12	11	15	14	15	16	15	14	17	17	13	12	18	21	19	25	22	34	86
13-Nov	21	17	15	12	26	33	29	15	74	39	23	29	26	32	26	24	19	17	21	21	17	22	18	16	74
14-Nov	16	16	13	17	18	15	15	19	24	23	16	21	20	18	17	14	17	21	24	17	17	26	81	26	81
15-Nov	37	78	52	93	19	77	85	46	87	47	105	66	30	23	25	19	20	12	19	14	9	8	6	7	105
16-Nov	8	11	34	20	25	29	24	15	29	19	14	13	17	11	14	13	11	10	9	9	10	10	11	14	34
17-Nov	11	12	12	11	12	12	12	12	12	14	10	10	7	15	13	21	16	57	16	16	20	18	16	16	57
18-Nov	32	17	18	23	18	18	20	31	26	26	23	20	31	64	42	29	86	53	67	41	26	26	18	40	86
19-Nov	51	27	16	18	26	22	17	22	20	16	18	14	21	19	20	19	17	18	18	18	22	18	22	19	51
20-Nov	18	15	18	19	19	22	20	18	18	19	17	18	22	18	18	19	19	17	19	17	21	20	15	15	22
21-Nov	18	15	15	14	19	16	16	16	11	17	18	23	22	19	19	17	16	21	11	49	17	18	27	37	49
22-Nov	14	21	27	52	22	66	79	33	12	38	23	12	21	22	22	22	23	27	20	20	18	23	18	20	79
23-Nov	18	19	18	19	18	15	17	21	25	21	17	20	16	14	16	17	17	16	17	17	17	15	16	16	25
24-Nov	18	20	17	20	19	18	18	20	20	19	21	18	18	19	18	15	12	13	52	62	24	83	31	22	83
25-Nov	14	27	24	11	15	19	16	13	11	13	12	10	10	9	9	67	57	22	16	16	15	16	16	17	67
26-Nov	14	11	12	13	13	12	12	12	14	10	13	12	12	9	7	12	49	28	20	19	17	18	17	16	49
27-Nov	17	19	16	18	17	19	16	17	17	17	17	16	17	18	17	15	15	16	16	17	22	17	19	17	22
28-Nov	13	14	14	14	15	47	28	52	32	19	45	82	38	24	21	29	68	23	19	24	32	36	26	47	82
29-Nov	21	17	16	14	26	16	18	21	17	22	44	35	33	25	15	14	27	18	24	21	30	54	21	27	54
30-Nov	18	26	17	16	21	20	17	17	19	21	20	23	31	19	18	16	21	15	18	23	21	17	17	17	31
Diurnal Maximum																								68	
UO - Unstable Operation																									







**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 45m (WD45) - deg**  
**Lower Camp Met Tower - November 2024**

Direction of Maximum Speed: 243 deg on Nov 12 17:00		Hours in Service: 720
Direction of Maximum Daily Speed Average: 144.7 deg on Nov 16		Hours of Data: 693
Direction of Minimum Speed: 272 deg on Nov 15 08:00		Hours of Missing Data: 27
Direction of Minimum Daily Speed Average: 1.3 deg on Nov 1		Percent Operational Time: 96.3
Monthly Average Direction: 284.0 deg		

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	268	268	217	217	195	213	200	99	116	134	190	202	227	294	336	360	25	31	28	24	20	6	15	350	264.6
2-Nov	353	357	16	352	80	340	358	340	340	348	337	347	337	97	97	101	88	49	72	120	120	106	96	95	62.7
3-Nov	331	308	183	182	224	244	221	218	225	216	220	202	173	168	157	150	160	213	189	152	199	241	246	233	202.4
4-Nov	216	204	189	162	234	216	235	231	193	126	150	141	131	132	132	137	128	131	325	336	121	132	116	110	167.5
5-Nov	349	335	338	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
6-Nov	UO	UO	UO	139	151	152	152	156	158	167	190	212	229	239	234	195	135	132	125	120	124	125	126	346	161.8
7-Nov	322	332	325	286	258	282	291	290	300	291	254	286	290	262	271	100	117	131	126	129	137	124	115	116	275.3
8-Nov	125	146	142	124	128	127	130	131	124	131	132	129	161	182	189	180	192	198	236	320	326	332	269	255	148.8
9-Nov	249	265	257	243	232	234	237	238	238	239	233	227	232	237	250	245	205	189	124	136	144	147	147	138	222.8
10-Nov	135	145	134	132	130	128	170	192	186	197	224	222	172	129	127	134	127	141	130	130	126	120	123	113	145.0
11-Nov	112	145	123	170	220	131	122	114	122	130	124	121	124	128	120	120	114	119	126	130	136	133	124	124	125.8
12-Nov	159	140	6	337	202	226	236	222	235	248	253	260	255	254	264	264	243	246	259	271	255	277	280	278	251.5
13-Nov	266	258	254	247	245	254	239	239	269	302	346	15	49	36	57	32	5	15	357	0	357	357	355	358	323.3
14-Nov	4	357	354	2	2	3	1	355	350	344	350	2	3	353	351	347	338	335	338	326	331	342	23	342	353.4
15-Nov	342	19	7	80	321	357	175	272	105	150	191	156	135	117	131	134	148	150	152	146	152	147	149	147	145.0
16-Nov	152	151	137	148	137	127	145	157	139	143	134	140	142	151	147	134	141	148	154	151	147	146	141	144	144.7
17-Nov	140	140	137	135	134	136	136	134	136	135	144	147	146	139	151	124	153	204	328	UO	UO	UO	306	306	141.8
18-Nov	289	263	273	285	314	291	292	281	297	278	292	311	298	309	302	315	357	33	40	355	6	336	343	51	297.3
19-Nov	44	20	356	2	355	1	355	1	349	351	356	351	0	12	4	354	350	353	348	355	354	352	351	359	356.7
20-Nov	0	346	352	345	346	355	352	349	355	356	358	0	0	349	6	1	2	3	2	0	350	343	349	350	355.0
21-Nov	0	348	346	346	339	330	323	320	317	309	301	301	321	318	313	316	309	322	344	337	333	333	18	350	330.9
22-Nov	309	289	286	263	269	277	252	289	320	315	331	351	348	343	13	26	9	2	20	15	1	355	4	346	349.4
23-Nov	356	6	8	10	353	353	2	0	353	354	355	358	346	350	351	352	339	341	348	350	349	344	343	346	353.0
24-Nov	340	339	341	343	342	344	342	340	342	333	334	333	342	330	323	326	325	337	334	322	248	234	157	126	336.1
25-Nov	126	126	131	128	127	141	135	132	155	148	135	135	137	142	141	146	135	126	126	126	125	125	124	125	131.9
26-Nov	128	138	137	132	128	130	136	132	130	141	142	137	136	134	137	144	174	279	268	289	291	293	289	290	157.4
27-Nov	289	283	283	291	294	287	285	287	285	284	287	299	304	322	321	324	322	316	324	330	334	335	346	357	303.1
28-Nov	346	327	318	320	318	327	333	299	295	333	290	248	300	339	336	344	351	349	357	360	347	339	331	324	331.1
29-Nov	308	247	301	284	324	286	339	313	331	331	320	316	310	323	322	334	333	336	331	340	345	354	351	343	326.9
30-Nov	349	336	345	344	341	336	332	335	329	326	332	332	329	331	328	325	336	331	330	336	344	328	330	339	334.4

337.0	306.3	321.2	300.8	238.2	231.2	230.0	215.2	210.8	208.0	224.1	236.0	236.7	174.4	58.4	38.4	132.4	44.6	352.9	33.1	61.2	21.8	354.6	1.7
Diurnal Average																							

UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

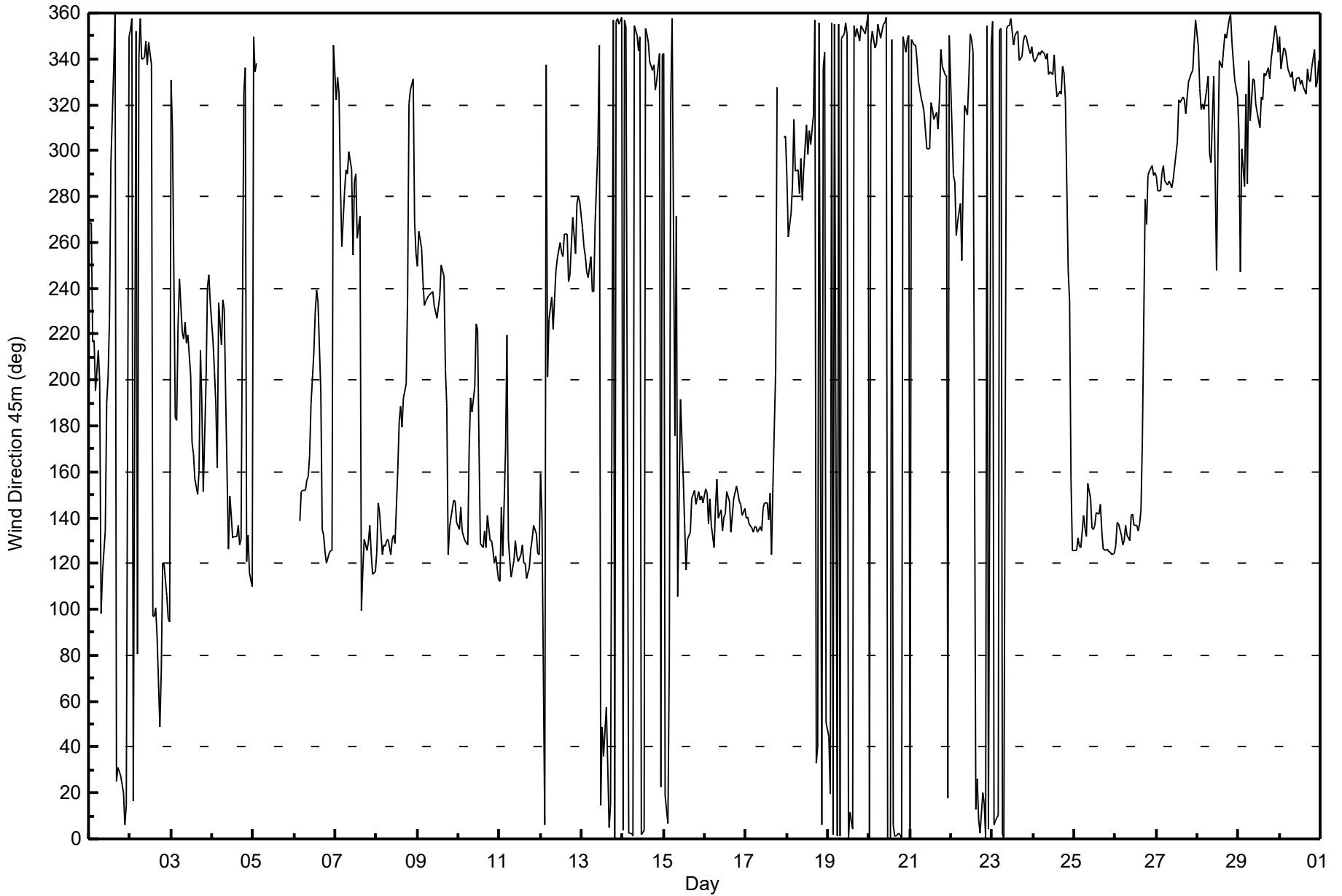
**Wind Direction 45m (WD45) - deg**  
**Lower Camp Met Tower - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 94 deg on Nov 15 08:00	Hours of Data: 693
Minimum Value: 3 deg on Nov 8 06:00	Hours of Missing Data: 27
	Hours of Calibration: 0
	Percent Operational Time: 96.3
Percentiles: P <sub>1</sub> = 5 P <sub>10</sub> = 8 Q <sub>1</sub> = 10 Median = 12 Q <sub>3</sub> = 18 P <sub>90</sub> = 33 P <sub>99</sub> = 87	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	18	11	16	14	24	10	31	34	24	28	15	12	11	31	11	13	15	44	25	24	24	19	32	19	44
2-Nov	17	18	38	39	85	78	29	20	14	14	32	49	24	32	15	12	9	24	56	16	34	65	40	87	87
3-Nov	33	90	43	63	39	11	64	17	6	12	9	10	24	10	9	6	15	82	80	22	30	6	5	11	90
4-Nov	18	27	43	16	29	29	15	13	28	32	13	14	10	5	8	6	21	86	16	44	24	13	8	35	86
5-Nov	73	11	12	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	73
6-Nov	UO	UO	UO	15	9	7	8	8	9	9	15	12	14	12	10	33	15	6	7	10	10	14	69	18	69
7-Nov	10	19	10	12	10	16	9	7	12	48	21	15	23	21	70	44	11	13	16	7	10	9	10	12	70
8-Nov	18	21	18	7	5	3	4	3	5	6	8	15	15	17	10	9	6	8	19	18	14	33	18	23	33
9-Nov	10	19	12	18	6	5	15	5	48	14	9	36	8	12	13	7	20	25	49	13	16	13	12	7	49
10-Nov	10	9	10	5	5	9	24	21	28	27	15	15	32	5	8	6	7	36	10	7	6	9	11	13	36
11-Nov	27	42	25	87	71	24	11	18	16	7	8	9	7	6	11	9	14	11	13	7	8	8	10	10	87
12-Nov	11	78	87	50	64	11	8	9	12	8	10	9	9	8	10	11	10	8	16	18	14	21	17	29	87
13-Nov	16	12	9	6	12	17	18	7	48	30	15	23	16	26	17	17	12	13	15	13	12	14	13	10	48
14-Nov	10	9	7	9	11	8	8	11	15	14	9	15	12	11	10	7	11	14	15	11	11	22	49	30	49
15-Nov	32	47	64	92	14	87	59	94	90	28	72	47	25	17	21	17	20	11	14	11	8	7	8	7	94
16-Nov	6	10	12	16	19	16	15	14	16	14	10	10	14	9	13	10	10	9	8	8	9	9	11	12	19
17-Nov	10	10	10	8	7	8	8	6	8	8	8	8	7	11	11	15	13	51	9	UO	UO	UO	10	10	51
18-Nov	24	12	14	17	14	10	12	17	19	14	18	14	23	52	34	16	17	75	60	51	23	15	11	23	75
19-Nov	39	19	12	10	18	16	10	15	16	11	11	9	14	11	12	13	13	13	11	12	13	11	15	13	39
20-Nov	12	8	11	13	13	14	12	10	10	11	11	11	16	14	11	12	12	9	11	11	14	13	10	10	16
21-Nov	10	10	8	8	12	12	11	10	9	13	12	15	15	14	13	12	11	22	8	35	11	11	22	30	35
22-Nov	14	19	21	27	15	42	37	18	17	21	19	9	12	12	15	15	15	19	13	13	13	16	10	15	42
23-Nov	10	12	11	14	12	9	9	14	18	14	11	11	10	8	9	11	11	9	10	9	10	9	9	10	18
24-Nov	10	10	9	11	10	10	11	10	10	9	12	10	10	13	11	9	6	5	10	13	31	33	45	9	45
25-Nov	7	11	15	7	10	14	9	8	13	11	8	5	8	6	8	21	24	10	7	7	8	7	8	9	24
26-Nov	8	9	8	7	6	6	9	6	8	9	11	7	8	5	7	16	39	19	14	12	10	13	10	10	39
27-Nov	11	13	10	12	13	13	9	10	10	9	10	10	14	13	13	11	11	11	11	12	17	12	14	9	17
28-Nov	9	10	10	10	8	12	9	51	27	12	44	74	28	23	15	11	15	11	13	18	27	18	18	23	74
29-Nov	45	14	21	16	23	37	35	24	14	8	18	24	26	19	11	7	11	8	6	11	7	11	6	17	45
30-Nov	8	16	7	6	9	10	10	10	14	17	16	13	20	11	12	10	11	11	10	12	12	15	12	12	20

73	90	87	92	85	87	64	94	90	48	72	74	32	52	70	44	39	86	80	51	34	65	69	87	
Diurnal Maximum																								

UO - Unstable Operation





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 100m (WD100) - deg**  
**Lower Camp Met Tower - November 2024**

Direction of Maximum Speed: 246 deg on Nov 12 17:00		Hours in Service: 720
Direction of Maximum Daily Speed Average: 151.4 deg on Nov 16		Hours of Data: 691
Direction of Minimum Speed: 40 deg on Nov 2 07:00	Direction of Minimum Daily Speed Average: 1.9 deg on Nov 1	Hours of Missing Data: 29
Monthly Average Direction: 251.2 deg		Percent Operational Time: 96.0

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	266	264	232	238	221	227	214	156	159	163	198	207	229	291	343	3	28	40	33	27	26	18	29	2	267.1
2-Nov	3	11	33	33	83	103	40	37	13	31	19	96	341	107	104	109	98	74	102	129	127	122	119	134	97.2
3-Nov	141	146	149	182	228	249	235	230	238	224	230	222	198	180	167	154	181	227	218	186	217	248	262	261	214.1
4-Nov	237	231	227	210	243	231	240	235	206	162	167	160	138	127	130	134	142	150	154	153	134	166	156	133	186.1
5-Nov	189	327	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
6-Nov	UO	149	142	152	162	157	UO	168	171	180	199	217	233	241	237	222	175	179	162	148	147	149	168	74	176.8
7-Nov	336	318	322	288	264	282	290	288	292	294	263	286	290	269	269	97	110	144	157	152	152	145	124	125	265.1
8-Nov	131	145	149	146	144	143	147	161	144	158	166	166	187	197	201	197	208	221	243	323	333	319	287	276	174.5
9-Nov	265	268	258	252	244	246	245	247	248	246	239	238	240	245	254	248	208	206	182	158	196	196	182	184	235.3
10-Nov	191	176	169	164	191	189	224	217	219	222	226	218	205	139	143	151	168	183	166	150	143	132	128	139	176.2
11-Nov	123	118	120	133	204	144	128	123	125	130	126	124	127	127	120	120	114	121	127	132	135	140	126	133	127.7
12-Nov	160	144	161	160	203	236	UO	231	242	249	256	262	256	254	266	266	246	249	262	271	259	281	281	267	251.2
13-Nov	263	261	256	248	249	253	249	256	270	320	351	19	43	37	55	37	17	33	14	12	5	2	1	2	328.3
14-Nov	8	9	4	8	6	10	5	359	1	355	357	9	9	1	356	353	348	348	352	343	341	353	30	348	0.9
15-Nov	336	14	343	119	255	221	207	229	110	118	180	177	154	120	143	142	160	158	152	152	158	168	176	166	160.0
16-Nov	174	169	156	160	149	136	158	165	149	147	146	149	151	153	150	139	145	150	153	152	150	150	147	150	151.4
17-Nov	146	144	143	139	141	147	144	141	146	145	150	152	156	152	170	152	180	221	335	UO	UO	293	304	302	157.4
18-Nov	284	263	275	285	302	292	296	284	279	283	293	311	303	318	312	318	1	46	71	34	10	355	9	66	296.8
19-Nov	50	27	2	3	1	9	1	7	359	355	359	357	5	15	8	357	357	1	356	358	358	355	355	359	1.4
20-Nov	0	352	357	353	354	1	358	358	6	6	3	2	360	351	5	4	5	4	3	3	356	348	351	354	359.2
21-Nov	2	354	351	351	348	342	334	330	329	318	305	307	319	320	317	316	308	302	318	331	316	337	16	3	333.8
22-Nov	333	315	287	276	265	292	267	264	302	321	301	332	343	350	11	26	10	10	22	18	8	358	3	347	345.5
23-Nov	359	9	11	19	2	0	7	4	358	357	3	7	354	355	356	356	347	350	359	360	356	352	352	355	359.1
24-Nov	351	349	350	351	357	2	359	352	357	348	343	341	345	338	332	332	337	344	349	16	54	134	183	159	349.7
25-Nov	151	147	149	147	142	162	157	152	177	UO	151	141	UO	144	144	147	140	133	136	137	135	135	136	132	142.7
26-Nov	140	142	144	138	136	141	144	138	138	143	142	140	141	147	155	160	182	267	270	288	289	292	289	290	172.2
27-Nov	287	283	284	291	295	288	285	289	287	286	290	300	307	324	322	325	324	322	328	334	336	339	349	360	305.5
28-Nov	355	331	326	322	324	319	311	340	341	332	325	261	308	321	342	4	9	2	13	19	24	25	27	4	343.6
29-Nov	360	325	270	260	312	275	259	271	270	282	338	284	317	331	330	343	342	347	351	350	351	359	2	349	330.1
30-Nov	349	349	12	338	334	334	346	334	355	358	318	331	332	336	339	340	355	349	344	344	348	333	338	341	342.6

302.5 279.3 274.1 251.8 241.0 247.5 262.1 231.9 231.7 232.5 229.3 240.0 253.4 210.9 243.7 45.8 153.1 236.8 346.6 56.9 100.4 308.3 352.9 1.0

Diurnal Average

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods



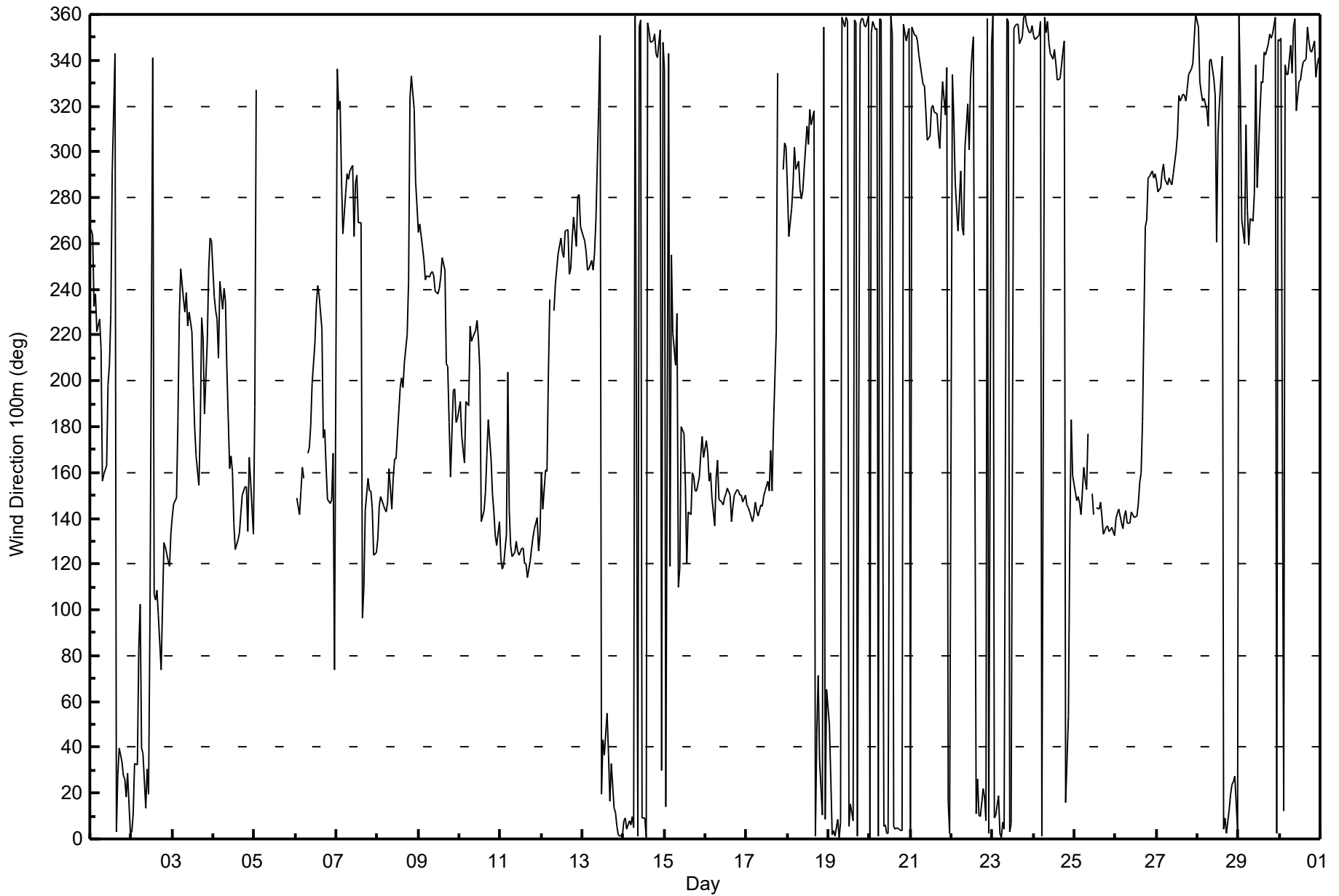
**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 100m (WD100) - deg**  
**Lower Camp Met Tower - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 95 deg on Nov 2 12:00	Hours of Data: 691
Minimum Value: 2 deg on Nov 24 18:00	Hours of Missing Data: 29
Percentiles: P <sub>1</sub> = 4 P <sub>10</sub> = 6 Q <sub>1</sub> = 7 Median = 9 Q <sub>3</sub> = 13 P <sub>90</sub> = 23 P <sub>99</sub> = 60	Hours of Calibration: 0
	Percent Operational Time: 96.0

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	15	9	12	14	16	10	12	40	24	27	12	11	9	29	7	10	13	28	21	18	17	19	26	19	40
2-Nov	10	16	23	24	48	79	85	37	29	20	56	95	60	18	10	10	6	14	43	7	15	18	7	17	95
3-Nov	27	28	16	9	20	5	44	13	4	7	7	7	17	6	9	5	18	12	59	15	18	3	3	11	59
4-Nov	5	15	14	18	7	9	7	7	24	32	14	15	11	7	6	5	8	13	30	35	19	8	14	7	35
5-Nov	73	5	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	73
6-Nov	UO	13	10	12	7	5	UO	7	7	6	12	9	11	8	7	16	20	8	11	8	9	13	16	61	61
7-Nov	10	10	14	7	6	11	6	4	7	25	19	11	13	16	60	21	7	9	12	6	7	12	6	4	60
8-Nov	9	9	8	7	7	9	9	5	9	8	8	16	7	9	7	7	6	10	17	20	13	20	13	14	20
9-Nov	8	12	11	8	6	4	5	3	13	7	8	14	8	9	5	11	11	4	33	12	14	12	11	11	33
10-Nov	12	6	10	9	14	24	11	9	15	13	13	12	14	13	9	10	10	33	28	8	10	8	5	10	33
11-Nov	9	8	6	32	57	19	7	13	11	5	5	6	4	5	10	7	8	7	8	5	6	11	9	7	57
12-Nov	6	31	31	40	16	8	UO	5	8	4	6	6	6	5	7	7	8	5	13	15	9	18	16	22	40
13-Nov	11	8	6	4	6	9	12	8	21	24	14	18	13	23	15	11	9	8	13	10	9	10	9	7	24
14-Nov	7	7	6	7	9	7	6	7	9	12	9	11	11	8	7	6	6	8	10	9	7	18	30	17	30
15-Nov	20	23	36	45	32	32	22	12	51	12	30	59	25	12	20	13	15	7	8	6	4	4	5	6	59
16-Nov	5	7	7	5	12	12	13	9	9	9	7	9	10	8	11	9	9	8	7	7	7	7	9	9	13
17-Nov	8	8	8	8	8	8	8	7	8	7	6	6	7	11	12	9	13	40	5	UO	UO	6	9	9	40
18-Nov	18	7	11	12	8	6	7	12	8	9	13	9	16	41	27	15	12	19	19	94	20	12	15	21	94
19-Nov	30	23	11	7	15	13	7	12	14	8	8	8	12	8	10	11	12	9	9	8	9	8	11	10	30
20-Nov	8	6	8	8	8	9	8	7	6	9	8	9	12	10	7	10	8	7	9	7	10	8	7	6	12
21-Nov	6	7	7	5	9	8	9	7	6	9	8	11	12	11	10	8	9	9	12	17	7	12	14	18	18
22-Nov	11	19	22	13	9	39	54	7	10	9	15	11	8	8	12	10	13	15	9	9	12	12	6	9	54
23-Nov	7	10	9	13	11	8	8	10	15	11	11	9	9	5	6	7	7	5	7	7	8	5	6	8	15
24-Nov	6	6	5	6	6	7	8	5	5	6	9	8	8	10	7	4	3	2	5	18	66	10	41	17	66
25-Nov	11	8	8	6	9	10	7	8	13	UO	11	8	UO	7	8	7	7	5	4	5	5	4	5	5	13
26-Nov	8	7	7	5	4	6	8	7	6	7	9	6	7	10	8	11	28	12	9	7	6	8	6	7	28
27-Nov	7	10	7	8	9	10	6	6	5	4	7	7	12	12	8	8	8	8	9	8	11	9	10	7	12
28-Nov	7	9	6	5	4	7	7	26	6	7	47	15	26	30	13	10	5	6	10	15	14	17	14	10	47
29-Nov	11	27	15	7	19	25	5	10	8	32	32	14	11	12	8	4	6	3	5	5	4	8	8	5	32
30-Nov	4	8	14	27	7	10	9	14	10	22	11	14	12	9	7	7	6	6	4	5	7	10	8	7	27
	73	31	36	45	57	79	85	40	51	32	56	95	60	41	60	21	28	40	59	94	66	20	41	61	
	Diurnal Maximum																								

UO - Unstable Operation





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 163m (WD163) - deg**  
**Lower Camp Met Tower - November 2024**

Direction of Maximum Speed: 184 deg on Nov 6 07:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 158.5 deg on Nov 16	Hours of Data: 692
Direction of Minimum Speed: 325 deg on Nov 15 02:00	Direction of Minimum Daily Speed Average: 2.2 deg on Nov 1
Direction of Minimum Daily Speed Average: 2.2 deg on Nov 1	Hours of Missing Data: 28
Monthly Average Direction: 249.7 deg	Percent Operational Time: 96.1

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	265	263	250	268	249	235	227	190	187	191	206	214	234	290	350	5	28	42	45	39	37	36	46	34	278.5
2-Nov	29	39	57	56	74	147	131	110	92	99	100	111	69	118	116	120	110	88	119	137	133	129	127	132	112.7
3-Nov	139	147	160	187	242	257	249	246	250	239	247	242	223	198	181	169	204	246	236	217	237	265	283	297	228.3
4-Nov	271	245	244	236	262	257	248	241	216	190	186	184	153	137	135	139	157	166	169	183	176	188	197	216	204.5
5-Nov	242	337	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	240	--
6-Nov	191	171	156	167	182	182	184	191	191	196	210	224	239	246	243	236	217	208	193	180	184	183	217	287	196.6
7-Nov	349	318	323	299	277	287	295	293	293	295	274	288	291	278	264	86	123	162	186	166	166	158	138	137	266.3
8-Nov	144	156	159	164	169	185	191	196	185	193	194	194	205	208	214	211	225	240	258	317	338	325	295	286	201.3
9-Nov	278	276	269	272	263	267	271	272	263	254	257	246	255	255	259	249	216	219	202	188	228	231	204	213	250.1
10-Nov	221	200	209	217	236	240	238	237	239	243	237	227	211	181	174	175	206	218	211	169	160	159	162	150	205.1
11-Nov	135	129	133	137	180	155	136	131	130	132	132	129	132	131	126	125	122	128	133	139	140	149	135	145	134.1
12-Nov	162	153	168	175	213	247	251	243	251	254	262	268	260	258	269	270	252	256	269	278	271	288	285	270	255.2
13-Nov	274	279	274	274	278	270	264	283	279	315	1	31	39	37	57	45	34	48	34	31	22	16	13	12	346.3
14-Nov	20	26	22	19	16	23	21	12	15	10	13	21	20	12	10	5	358	1	5	4	357	7	57	20	15.2
15-Nov	293	325	360	106	217	232	199	204	119	143	178	192	178	134	160	157	171	166	159	165	180	191	201	181	174.3
16-Nov	192	183	168	167	158	153	166	169	158	158	154	155	158	157	155	147	151	155	155	156	156	158	155	155	158.5
17-Nov	152	151	151	144	150	154	153	152	154	155	158	161	169	172	193	181	200	231	UO	UO	UO	UO	UO	304	164.8
18-Nov	284	271	281	289	299	296	306	294	284	290	299	314	312	325	325	327	354	36	72	88	26	16	49	79	300.4
19-Nov	65	59	21	11	15	20	12	18	15	3	7	9	15	20	14	3	5	11	6	5	5	2	2	4	10.2
20-Nov	6	1	5	2	3	8	8	10	16	18	10	10	5	356	8	10	11	10	9	11	5	356	357	1	6.8
21-Nov	8	3	359	357	356	355	349	343	345	334	316	318	323	330	331	325	316	308	306	328	320	347	23	19	342.6
22-Nov	356	330	295	299	271	298	276	298	295	314	303	327	350	3	12	27	17	17	24	22	17	5	2	351	348.1
23-Nov	6	16	17	29	14	12	15	14	9	5	17	18	8	7	5	5	0	5	15	14	8	4	7	9	10.4
24-Nov	4	5	9	9	16	19	17	14	24	19	4	358	356	354	351	350	351	354	360	43	83	162	197	174	9.8
25-Nov	164	156	166	158	159	166	184	177	UO	UO	178	169	161	159	147	157	150	134	136	143	145	147	149	145	157.3
26-Nov	152	152	152	150	149	155	154	150	151	148	147	151	157	161	164	168	200	263	281	291	292	295	291	294	186.5
27-Nov	290	286	289	297	299	292	290	294	294	293	300	306	315	329	327	331	331	330	335	339	342	345	355	7	311.6
28-Nov	4	339	335	335	338	326	322	320	335	3	18	300	326	324	346	8	12	6	24	34	39	40	35	28	357.5
29-Nov	32	13	353	14	14	351	326	335	321	316	29	25	13	6	0	7	21	24	24	36	40	47	66	65	20.6
30-Nov	26	48	72	94	100	80	78	54	57	73	51	33	23	2	1	359	8	9	4	355	357	345	350	345	17.2

280.9 265.3 256.4 260.0 248.8 252.3 251.3 245.6 245.0 234.1 228.3 240.1 250.3 220.1 240.9 45.2 182.6 266.2 337.7 72.7 130.9 288.0 9.6 310.2

Diurnal Average

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

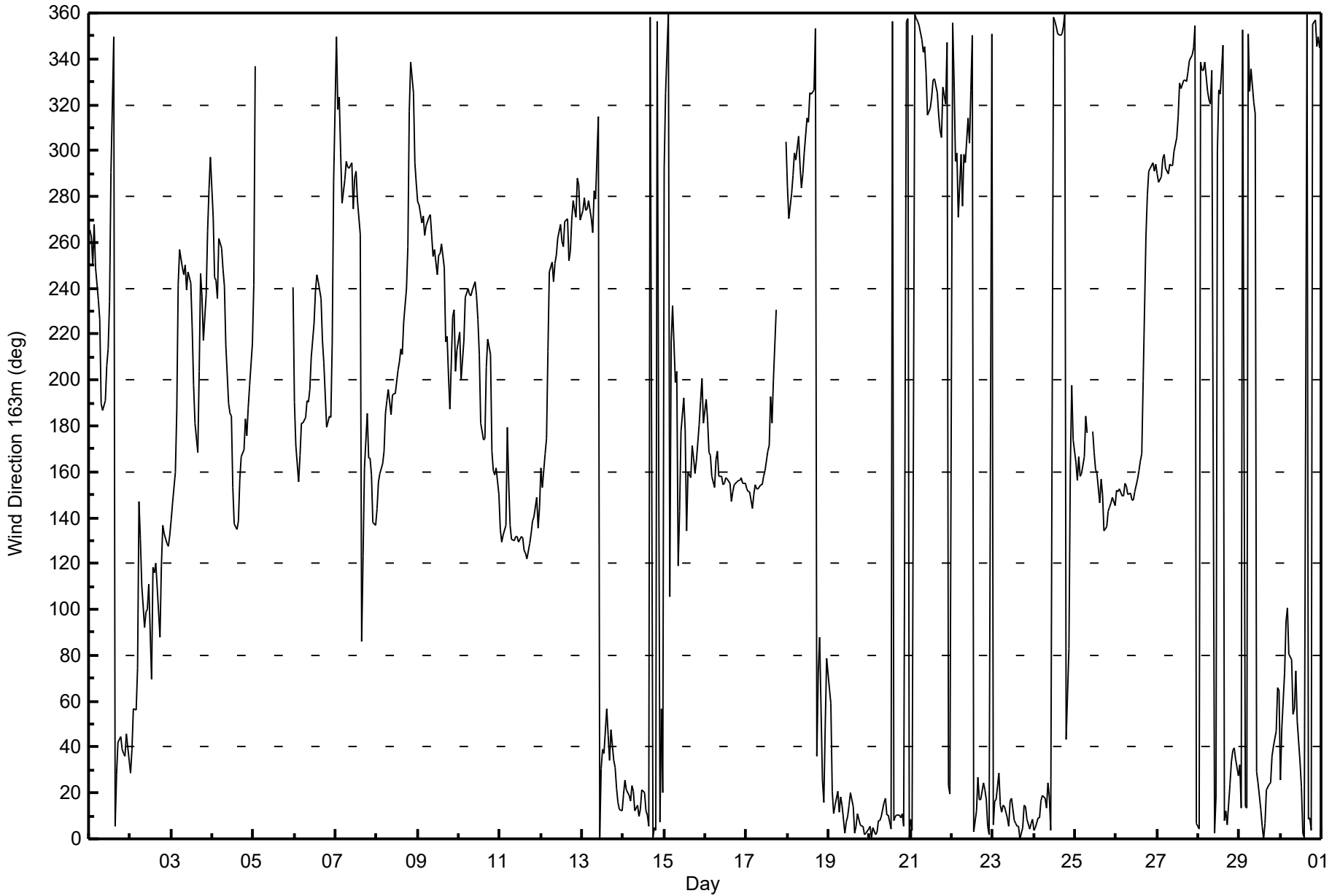
**Wind Direction 163m (WD163) - deg**  
**Lower Camp Met Tower - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 78 deg on Nov 15 02:00	Hours of Data: 692
Minimum Value: 2 deg on Nov 24 18:00	Hours of Missing Data: 28
	Hours of Calibration: 0
	Percent Operational Time: 96.1
Percentiles: P <sub>1</sub> = 3 P <sub>10</sub> = 5 Q <sub>1</sub> = 6 Median = 8 Q <sub>3</sub> = 11 P <sub>90</sub> = 18 P <sub>99</sub> = 42	

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	11	8	8	8	13	10	12	25	16	18	12	11	8	26	10	7	9	23	18	14	12	12	16	23	26	
2-Nov	10	13	13	12	15	57	29	16	24	12	34	48	60	12	9	9	7	10	28	6	7	9	3	10	60	
3-Nov	13	11	18	9	14	6	14	8	3	4	9	7	15	5	9	4	20	8	21	10	11	6	7	4	21	
4-Nov	9	12	3	7	10	8	7	6	22	23	11	13	13	11	8	6	9	4	5	8	13	4	6	23	23	
5-Nov	30	23	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	8	30
6-Nov	17	6	8	10	8	4	5	5	5	4	8	7	9	5	6	10	8	6	9	7	7	14	14	43	43	
7-Nov	14	7	12	6	6	8	4	3	4	13	15	10	9	14	32	26	6	16	14	4	6	8	5	4	32	
8-Nov	8	8	4	5	5	7	7	6	8	9	9	8	4	7	8	8	7	11	18	15	10	14	9	8	18	
9-Nov	8	7	8	9	6	8	10	4	7	4	8	10	8	7	5	7	11	5	13	11	10	9	11	10	13	
10-Nov	9	8	8	15	6	9	7	7	7	5	11	11	12	13	9	7	11	21	25	11	5	6	6	11	25	
11-Nov	7	4	5	12	27	18	4	9	7	5	4	5	3	4	8	6	5	6	6	5	6	9	10	8	27	
12-Nov	5	18	11	10	15	4	5	4	5	3	5	6	5	5	5	5	7	5	12	11	8	14	14	14	18	
13-Nov	8	6	10	8	9	10	10	14	10	19	18	15	14	21	14	8	6	7	9	8	7	10	8	7	21	
14-Nov	6	7	5	5	8	5	4	6	9	12	9	9	8	8	10	7	6	7	8	9	9	12	21	31	31	
15-Nov	25	78	38	15	52	21	17	24	42	21	13	25	19	15	16	11	8	4	5	7	7	6	6	4	78	
16-Nov	5	11	4	6	8	12	7	3	7	8	6	7	6	7	9	8	8	7	7	6	6	5	8	7	12	
17-Nov	7	6	7	7	8	7	7	8	6	6	5	6	5	8	12	6	12	33	UO	UO	UO	UO	UO	9	33	
18-Nov	13	6	9	9	4	4	4	10	5	8	9	8	14	37	23	16	8	18	14	58	25	17	36	29	58	
19-Nov	26	33	16	10	14	14	8	11	13	8	8	9	11	7	9	10	11	9	9	7	8	7	9	9	33	
20-Nov	7	6	7	6	7	7	5	4	3	8	7	7	10	8	7	8	6	5	7	6	10	7	6	6	10	
21-Nov	4	7	6	5	7	6	7	6	5	9	7	9	10	10	10	8	7	6	6	12	13	14	10	13	14	
22-Nov	9	17	12	16	7	9	12	7	10	11	13	13	8	8	10	9	14	11	6	11	11	11	8	8	17	
23-Nov	7	9	11	11	11	8	7	9	14	11	10	8	9	6	6	7	6	6	7	7	8	5	6	7	14	
24-Nov	6	6	5	5	5	5	6	5	5	8	9	7	7	7	4	3	3	2	8	9	19	22	19	7	22	
25-Nov	9	4	7	4	4	5	9	9	UO	UO	5	7	12	15	17	8	12	14	15	15	11	8	6	7	17	
26-Nov	8	7	7	7	7	6	6	7	6	5	6	8	9	8	5	5	20	14	5	4	4	6	5	5	20	
27-Nov	5	9	5	6	7	7	4	5	4	3	6	6	10	11	6	6	6	6	6	6	7	7	9	6	11	
28-Nov	6	10	4	5	4	8	4	14	7	7	39	30	21	30	13	9	7	4	8	9	5	6	6	6	39	
29-Nov	9	18	25	9	10	19	28	28	25	32	21	9	7	7	6	4	5	3	2	6	4	7	5	14	32	
30-Nov	10	10	11	10	8	36	10	15	6	6	16	7	4	7	8	5	5	6	5	3	7	5	5	6	36	

30	78	38	16	52	57	29	28	42	32	39	48	60	37	32	26	20	33	28	58	25	22	36	43	
Diurnal Maximum																								

UO - Unstable Operation





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Vertical Wind Speed 20m (VW20) - km/h**  
**Lower Camp Met Tower - November 2024**

Maximum Value: 0.8 km/h on Nov 5 08:00		Maximum Daily Average: 0.1 km/h on Nov 5		Hours in Service: 720																						
Minimum Value: -1.1 km/h on Nov 12 14:00		Minimum Daily Average: -0.5 km/h on Nov 12		Hours of Data: 718																						
Maximum Diurnal Average: -0.1 km/h at hour 18		Minimum Diurnal Average: -0.3 km/h at hour 12		Hours of Missing Data: 2																						
Monthly Average: -0.17 km/h		Percentiles: P <sub>1</sub> = -0.9 P <sub>10</sub> = -0.5 Q <sub>1</sub> = -0.3 Median = -0.1 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.1 P <sub>99</sub> = 0.4		Hours of Calibration: 0																						
				Percent Operational Time: 99.7																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	-0.4	-0.2	-0.2	0.0	-0.1	0.0	0.3	-0.2	-0.4	0.0	-0.2	-0.2	-0.3	0.0	0.1	-0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.1	0.0	-0.1	0.3
2-Nov	-0.1	-0.1	0.0	-0.1	-0.1	0.0	-0.1	-0.2	-0.1	-0.2	0.0	-0.1	-0.2	-0.1	-0.2	-0.2	0.0	0.0	0.0	-0.2	0.1	0.1	0.0	0.0	-0.1	0.1
3-Nov	-0.1	-0.1	0.0	0.1	0.2	0.0	0.7	0.5	0.5	0.1	0.2	0.1	0.0	-0.3	-0.4	-0.3	-0.2	0.0	0.2	0.1	0.0	-0.5	-0.3	-0.2	0.0	0.7
4-Nov	0.0	0.0	-0.1	0.2	-0.3	0.0	-0.3	-0.3	-0.3	-0.2	-0.4	-0.4	-0.5	-0.4	-0.2	-0.1	0.1	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	-0.2	0.2
5-Nov	0.0	0.0	0.0	0.1	0.3	0.0	0.6	0.8	0.7	0.2	UO	UO	0.4	0.0	-0.1	-0.1	-0.1	0.1	0.0	0.1	-0.1	-0.3	-0.3	-0.3	0.1	0.8
6-Nov	-0.3	-0.4	-0.2	-0.4	-0.5	-0.4	-0.6	-0.5	-0.6	-0.5	-0.6	-0.4	-0.3	-0.5	-0.2	0.0	-0.1	0.0	-0.3	-0.3	-0.4	-0.5	0.0	0.0	-0.3	0.0
7-Nov	0.0	0.0	-0.2	-0.2	-0.5	-0.6	-0.6	-0.6	-0.5	-0.1	-0.1	-0.2	-0.2	-0.2	-0.1	0.1	0.1	0.0	0.0	0.1	-0.3	-0.3	-0.1	-0.3	-0.2	0.1
8-Nov	-0.3	-0.3	-0.3	-0.5	-0.3	-0.4	-0.4	-0.2	-0.5	-0.4	-0.3	-0.2	-0.2	-0.3	-0.4	-0.2	-0.2	0.0	-0.1	-0.1	0.0	0.0	-0.2	-0.1	-0.2	0.0
9-Nov	-0.2	-0.2	-0.3	-0.3	-0.2	-0.1	0.1	-0.2	-0.1	-0.2	-0.5	-0.2	-0.4	-0.3	0.0	-0.1	0.0	-0.1	0.1	0.0	0.1	0.2	-0.1	0.1	-0.1	0.2
10-Nov	0.1	0.1	-0.1	0.1	0.1	0.1	0.3	-0.1	-0.6	-0.5	-0.4	-0.2	-0.2	-0.3	-0.2	-0.2	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.0	-0.1	0.3
11-Nov	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.3	-0.1	-0.3	-0.5	-0.6	-0.5	-0.7	-0.6	-0.4	-0.4	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.3	0.0
12-Nov	-0.2	0.1	0.1	0.0	0.0	-0.2	-0.3	-0.1	-0.4	-0.8	-1.0	-1.0	-0.9	-1.1	-1.1	-1.1	-0.9	-0.9	-0.7	-0.4	-0.5	-0.4	-0.3	-0.2	-0.5	0.1
13-Nov	-0.4	-0.5	-0.4	-0.6	-0.3	-0.3	-0.2	-0.1	0.0	-0.2	0.0	-0.2	0.0	0.0	-0.2	0.0	0.1	0.0	-0.1	0.0	0.0	-0.2	0.0	-0.1	-0.2	0.1
14-Nov	0.1	0.0	-0.3	0.2	0.1	0.1	0.1	-0.3	-0.1	0.2	-0.2	0.0	-0.1	-0.3	-0.4	-0.4	-0.1	-0.1	0.0	0.0	0.2	0.0	-0.2	-0.1	-0.1	0.2
15-Nov	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.2	-0.2	-0.5	-0.2	-0.2	-0.1	-0.2	-0.3	-0.1	0.1	-0.1	0.1
16-Nov	0.4	0.3	0.0	-0.1	-0.1	-0.2	-0.1	-0.4	0.0	-0.1	-0.4	-0.7	-0.2	-0.7	-0.8	-0.4	-0.7	-0.7	-0.9	-0.7	-0.7	-0.9	-0.7	-0.3	-0.4	0.4
17-Nov	-0.6	-0.5	-0.4	-0.6	-0.5	-0.5	-0.6	-0.8	-0.5	-0.6	-0.6	-0.7	-0.6	-0.5	-0.3	-0.2	0.2	-0.1	-0.1	-0.4	-0.4	-0.4	-0.3	-0.6	-0.4	0.2
18-Nov	-0.1	-0.4	-0.6	-0.6	-0.1	-0.4	-0.2	-0.1	-0.1	-0.1	-0.3	-0.3	-0.2	0.2	0.0	0.0	0.0	0.0	0.2	-0.2	0.0	0.0	-0.1	-0.1	-0.1	0.2
19-Nov	-0.1	-0.2	-0.2	0.0	0.1	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.3	0.0	0.1	-0.1	-0.1	-0.3	-0.1	-0.1	-0.5	-0.1	-0.2	-0.3	-0.2	-0.1	0.1
20-Nov	-0.2	-0.5	-0.1	0.0	-0.2	0.1	-0.1	-0.1	-0.2	0.0	-0.2	-0.2	0.0	-0.2	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.3	-0.5	-0.2	0.1
21-Nov	-0.1	-0.3	-0.3	-0.5	0.1	-0.1	-0.3	-0.1	-0.3	-0.4	-0.4	-0.3	-0.2	-0.2	-0.4	-0.2	-0.1	0.1	0.0	-0.2	0.0	0.1	0.0	0.0	-0.2	0.1
22-Nov	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	0.0	0.0	-0.1	-0.1	0.0	-0.3	-0.2	-0.1	0.0	0.0	-0.2	0.0	0.0	0.0	-0.1	-0.2	0.0	-0.1	-0.1	0.0
23-Nov	-0.1	-0.1	-0.2	-0.1	-0.2	-0.4	0.0	-0.1	-0.2	0.0	-0.4	-0.1	-0.3	-0.4	-0.4	-0.2	-0.1	-0.2	-0.1	-0.3	-0.4	-0.1	-0.1	-0.1	-0.2	0.0
24-Nov	0.0	0.1	0.0	0.0	-0.1	0.0	-0.1	-0.1	0.0	0.1	0.1	0.1	-0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3
25-Nov	0.0	-0.3	-0.2	-0.1	-0.1	-0.1	-0.3	-0.4	-0.1	-0.3	-0.5	-0.5	-0.6	-0.4	-0.3	0.0	0.1	-0.1	-0.3	-0.6	-0.5	-0.5	-0.5	-0.5	-0.3	0.1
26-Nov	-0.5	-0.5	-0.4	-0.5	-0.5	-0.5	-0.6	-0.6	-0.3	-0.4	-0.4	-0.4	-0.4	-0.4	-0.2	0.0	-0.1	-0.2	-0.6	-0.4	-0.8	-0.6	-0.5	-0.7	-0.4	0.0
27-Nov	-0.7	-0.3	-0.6	-0.4	-0.8	-0.3	-0.6	-0.4	-0.4	-0.3	-0.3	-0.9	-0.7	-0.5	-0.3	-0.5	-0.2	-0.2	-0.2	-0.1	-0.1	0.1	-0.2	0.0	-0.4	0.1
28-Nov	0.0	-0.1	-0.2	-0.2	-0.2	0.0	-0.1	0.0	0.0	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1
29-Nov	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.2	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.2
30-Nov	0.0	-0.1	-0.1	-0.1	0.0	0.0	-0.1	-0.2	-0.1	-0.1	0.0	0.0	0.3	0.0	0.0	-0.1	0.0	-0.1	0.0	0.1	-0.1	0.0	-0.1	-0.1	0.0	0.3
																								Diurnal Average		
																								Diurnal Maximum		
UO - Unstable Operation																										



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Vertical Wind Speed 20m (VW20) - km/h**  
**Lower Camp Met Tower - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																				Hours in Service: 720					
Maximum Value: 4.4 km/h on Nov 12 15:00																				Hours of Data: 718					
Minimum Value: 0.1 km/h on Nov 22 07:00																				Hours of Missing Data: 2					
Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 0.8 Median = 1.2 Q <sub>3</sub> = 1.9 P <sub>90</sub> = 2.5 P <sub>99</sub> = 3.5																				Hours of Calibration: 0					
																				Percent Operational Time: 99.7					
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	1.6	1.2	0.8	0.5	0.6	0.7	0.7	0.6	0.7	0.7	0.9	1.0	0.8	0.8	1.0	0.9	0.7	0.7	0.7	0.9	1.0	0.9	0.7	0.6	1.6
2-Nov	0.7	0.9	0.7	0.6	0.5	0.5	0.4	0.6	0.7	0.7	0.8	0.6	0.6	1.5	1.6	1.5	1.4	1.1	0.7	2.0	1.3	0.9	0.9	0.6	2.0
3-Nov	0.5	0.3	0.3	0.5	1.0	1.1	1.2	1.2	1.1	1.0	1.2	1.2	1.0	1.2	1.4	1.2	1.1	0.6	0.9	1.0	1.2	1.2	1.2	0.9	1.4
4-Nov	0.7	0.6	0.6	0.6	0.7	0.7	1.6	1.6	1.3	0.9	1.1	1.5	1.6	1.5	1.4	1.0	0.6	0.3	0.2	0.2	0.2	0.3	0.2	0.2	1.6
5-Nov	0.5	0.4	0.9	1.5	1.6	1.5	1.9	1.8	1.3	0.6	UO	UO	1.1	0.5	0.6	0.5	0.2	0.3	0.6	0.5	1.1	1.3	1.0	1.1	1.9
6-Nov	0.8	2.0	2.4	2.5	2.2	2.5	2.4	2.3	2.4	1.8	2.0	2.2	2.1	2.1	1.7	0.9	1.0	1.3	1.0	0.8	1.4	1.3	1.0	0.5	2.5
7-Nov	0.3	0.8	1.3	2.0	2.2	2.9	2.9	2.7	2.5	1.4	1.4	2.4	1.7	1.4	1.1	0.4	0.4	0.4	0.4	0.9	1.3	1.2	0.9	1.7	2.9
8-Nov	1.5	0.8	0.9	1.3	1.9	2.0	1.6	1.4	1.4	1.3	1.5	1.2	1.3	1.1	0.7	0.5	0.7	0.7	0.5	0.7	0.7	0.4	0.7	0.7	2.0
9-Nov	0.9	1.1	0.8	1.2	1.0	1.3	1.4	1.5	1.1	1.3	1.1	1.1	1.0	1.2	1.3	0.3	0.3	0.6	0.7	0.5	0.7	0.8	1.1	1.0	1.5
10-Nov	0.8	1.0	1.3	0.9	0.8	0.9	1.0	1.2	1.4	1.4	1.3	1.1	1.0	1.0	1.1	0.9	0.4	0.7	0.2	0.1	0.2	0.2	0.5	0.8	1.4
11-Nov	0.6	0.4	0.4	0.5	1.0	0.7	2.2	1.8	2.3	3.0	3.1	2.9	3.3	3.4	3.0	2.3	1.7	1.6	1.3	1.4	1.4	1.4	1.0	1.5	3.4
12-Nov	1.2	0.9	1.0	0.7	1.1	1.4	1.4	0.9	1.5	2.8	3.7	3.4	3.5	3.9	4.4	4.4	3.5	3.4	2.7	2.0	2.1	2.0	2.4	1.8	4.4
13-Nov	1.9	1.6	1.5	1.8	1.9	1.4	1.1	1.0	0.7	0.6	1.4	1.9	1.5	1.7	1.6	1.1	1.2	1.3	1.4	1.2	1.5	1.5	1.6	1.9	1.9
14-Nov	1.9	1.8	2.0	2.3	1.9	1.7	2.1	1.9	1.6	1.3	1.7	1.9	1.8	1.7	1.6	1.6	1.2	1.2	0.8	0.8	1.1	1.0	0.7	0.3	2.3
15-Nov	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.2	0.1	0.4	0.6	0.9	1.0	1.0	0.9	1.2	1.5	1.3	1.3	1.4	1.6	1.4	1.1	1.0	1.6
16-Nov	0.9	0.9	0.9	1.5	1.4	1.6	2.0	2.2	2.6	2.1	2.5	2.6	2.1	2.8	3.1	3.2	3.1	2.9	2.5	2.5	2.6	2.9	2.6	2.1	3.2
17-Nov	2.1	2.6	2.1	2.2	2.3	2.2	2.4	2.5	1.9	2.2	2.1	1.9	1.7	1.9	1.4	1.0	0.8	1.2	2.0	2.9	3.1	3.0	1.8	1.9	3.1
18-Nov	1.1	1.8	2.2	2.6	1.7	2.1	1.6	1.0	0.7	1.4	1.7	1.8	1.4	1.1	0.8	0.3	0.2	0.2	0.6	0.5	0.6	0.5	0.7	0.8	2.6
19-Nov	0.7	0.8	1.0	1.5	1.3	1.5	2.0	1.9	1.9	2.1	2.1	1.9	2.4	2.8	2.4	2.4	1.9	1.7	2.4	2.9	1.7	2.1	2.5	2.1	2.9
20-Nov	2.5	2.6	2.4	1.6	1.6	1.8	1.6	1.7	1.6	1.8	2.6	2.6	2.4	2.1	2.1	2.1	2.0	2.7	2.3	3.2	2.1	2.0	2.3	2.1	3.2
21-Nov	2.1	1.9	2.2	2.3	1.5	1.1	1.4	1.3	1.0	1.3	1.6	1.8	1.5	1.4	1.2	1.2	0.8	0.7	0.8	0.8	0.6	0.8	0.9	0.6	2.3
22-Nov	0.4	0.4	0.2	0.3	0.7	0.4	0.1	0.1	0.2	0.4	0.8	1.0	1.0	1.2	1.4	1.6	1.5	0.9	1.3	1.3	1.4	1.7	1.5	1.5	1.7
23-Nov	1.7	1.9	1.8	1.8	1.6	1.7	2.1	2.0	1.8	1.8	1.5	1.5	1.7	2.0	2.1	1.9	1.6	1.6	1.4	1.7	2.0	1.8	1.6	1.7	2.1
24-Nov	1.6	1.5	1.3	1.2	1.1	1.0	0.8	0.9	0.7	0.8	1.1	1.2	1.2	1.0	1.1	1.0	0.6	0.4	0.2	0.2	0.1	0.1	0.2	0.2	1.6
25-Nov	0.8	1.1	0.9	0.9	0.8	1.3	1.8	1.5	1.1	1.2	1.4	1.6	1.4	1.3	1.2	1.0	1.0	2.0	2.9	3.1	2.9	2.4	2.5	2.1	3.1
26-Nov	2.3	2.3	2.2	2.6	2.3	2.3	2.0	2.8	2.6	1.9	1.8	1.8	1.3	1.1	0.9	0.8	0.9	1.4	2.8	3.3	3.6	2.9	3.0	2.7	3.6
27-Nov	2.8	2.4	3.3	2.9	2.9	3.3	3.6	3.1	3.5	3.4	2.8	2.9	2.7	2.5	3.0	3.3	1.7	1.9	2.0	2.0	2.1	2.1	1.9	1.6	3.6
28-Nov	1.1	1.3	1.4	1.2	1.1	0.3	0.2	0.2	0.1	0.2	0.5	0.5	0.8	0.8	0.9	0.4	0.1	0.3	0.7	1.0	0.8	0.5	0.6	0.5	1.4
29-Nov	0.4	0.3	0.2	0.4	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.8	0.9	1.0	1.0	0.7	0.4	0.4	0.5	0.3	0.3	0.1	0.2	0.3	1.0
30-Nov	0.6	0.3	0.7	0.7	0.8	0.8	0.8	0.9	0.8	0.8	0.9	1.1	0.9	1.2	1.1	1.2	0.9	0.8	1.1	1.2	1.0	1.2	1.2	1.2	1.2
2.8 2.6 3.3 2.9 2.9 3.3 3.6 3.1 3.5 3.4 3.7 3.4 3.5 3.9 4.4 4.4 3.5 3.4 2.9 3.3 3.6 3.0 3.0 2.7																									
Diurnal Maximum																									
UO - Unstable Operation																									



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Vertical Wind Speed 45m (VW45) - km/h**  
**Lower Camp Met Tower - November 2024**

Maximum Value: 1.1 km/h on Nov 16 10:00		Maximum Daily Average: 0.6 km/h on Nov 16		Hours in Service: 720																						
Minimum Value: -1.0 km/h on Nov 26 21:00		Minimum Daily Average: -0.2 km/h on Nov 27		Hours of Data: 693																						
Maximum Diurnal Average: 0.3 km/h at hour 7		Minimum Diurnal Average: 0.1 km/h at hour 9		Hours of Missing Data: 27																						
Monthly Average: 0.22 km/h		Percentiles: P <sub>1</sub> = -0.6 P <sub>10</sub> = -0.1 Q <sub>1</sub> = 0.1 Median = 0.2 Q <sub>3</sub> = 0.4 P <sub>90</sub> = 0.6 P <sub>99</sub> = 0.9		Hours of Calibration: 0																						
				Percent Operational Time: 96.3																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	-0.1	0.0	0.2	0.3	0.3	0.4	0.9	0.0	-0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.3	0.4	0.1	0.3	0.2	0.2	0.9
2-Nov	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	-0.1	0.2	0.0	0.0	0.3	0.4	0.4	0.2	0.2	0.2	0.7	0.9	0.6	0.5	0.2	0.2	0.9
3-Nov	0.1	0.2	0.2	0.1	0.5	0.6	0.8	0.9	0.9	0.4	0.4	0.7	0.5	0.2	0.0	0.2	0.0	0.4	0.6	0.5	0.3	0.3	0.2	0.2	0.4	0.9
4-Nov	0.5	0.4	0.2	0.3	0.0	0.2	0.3	0.5	0.0	0.1	0.1	0.0	0.1	0.4	0.4	0.5	0.2	0.3	0.2	0.2	0.3	0.1	0.3	0.2	0.2	0.5
5-Nov	0.1	0.1	0.2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.2
6-Nov	UO	UO	UO	0.8	0.4	0.3	0.3	0.1	-0.1	-0.1	0.0	0.2	0.3	0.3	0.5	0.2	0.3	0.6	-0.1	-0.1	-0.1	-0.2	0.2	0.2	0.2	0.8
7-Nov	0.0	0.1	-0.1	-0.1	-0.1	-0.3	-0.7	-0.6	-0.6	0.2	0.6	0.3	-0.1	0.1	0.2	0.4	0.4	0.5	0.4	0.5	0.3	0.1	0.2	0.7	0.1	0.7
8-Nov	0.2	0.3	0.3	0.0	0.4	0.1	0.2	0.5	-0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.3	0.6	0.8	0.2	0.0	0.1	0.1	0.1	0.2	0.2	0.8
9-Nov	0.5	0.0	0.0	-0.1	0.5	0.8	1.0	0.7	0.6	0.4	0.1	0.3	0.1	0.3	0.5	0.2	0.2	0.0	0.2	0.2	0.5	0.4	0.2	0.8	0.3	1.0
10-Nov	0.7	0.8	0.4	0.6	0.7	0.6	0.6	0.1	-0.6	-0.4	0.2	0.6	0.0	0.0	0.1	0.4	0.6	0.5	0.4	0.4	0.4	0.5	0.4	0.3	0.3	0.8
11-Nov	0.2	0.3	0.3	0.2	0.7	0.0	0.7	0.3	0.2	0.6	0.4	0.2	0.3	0.6	0.4	0.3	0.2	0.1	0.2	0.1	0.0	0.2	0.2	0.4	0.3	0.7
12-Nov	0.5	0.2	0.2	0.2	0.4	0.3	0.3	0.3	0.3	0.0	-0.3	-0.5	-0.3	-0.3	-0.8	-0.4	0.4	0.3	-0.2	0.0	0.1	0.0	-0.3	0.1	0.0	0.5
13-Nov	-0.1	0.0	0.0	-0.1	0.7	0.3	0.2	0.4	0.5	0.0	0.2	0.1	0.3	0.1	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.5	0.3	0.4	0.2	0.7
14-Nov	0.6	0.7	0.4	0.4	0.5	0.2	0.5	0.6	0.4	0.4	0.2	0.5	0.5	0.2	0.2	0.0	0.2	0.2	0.3	0.1	0.3	0.3	0.1	0.1	0.3	0.7
15-Nov	0.2	0.2	0.1	0.1	-0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.0	0.0	0.2	0.1	0.4	0.1	0.2	0.6	0.9	0.6	0.6	0.3	0.7	0.3	0.9
16-Nov	1.0	0.8	0.4	0.4	0.4	0.4	0.6	0.3	1.0	1.1	0.7	0.7	0.4	0.7	0.4	0.8	0.6	1.0	0.0	0.2	0.3	0.2	0.8	0.4	0.6	1.1
17-Nov	0.8	0.7	0.7	0.4	0.3	0.6	0.5	0.2	0.4	0.4	0.3	0.1	0.2	0.6	0.3	0.5	0.6	0.3	-0.3	UO	UO	UO	-0.2	-0.3	0.3	0.8
18-Nov	-0.1	-0.1	0.0	-0.2	-0.3	-0.4	-0.1	0.1	0.1	0.3	0.0	-0.1	0.1	0.8	0.3	0.1	0.2	0.2	0.1	0.0	0.4	0.1	0.1	0.2	0.1	0.8
19-Nov	0.1	-0.1	0.3	0.3	0.4	0.2	0.4	0.4	0.2	0.0	0.3	0.1	0.5	0.2	0.3	0.3	0.0	0.4	0.2	0.4	0.3	0.6	0.4	0.4	0.3	0.6
20-Nov	0.5	-0.1	0.4	0.4	0.1	0.3	0.2	0.2	0.2	0.4	0.5	0.4	0.5	0.3	0.2	0.4	0.4	0.3	0.4	0.3	0.4	0.2	0.2	0.2	0.3	0.5
21-Nov	0.4	0.3	-0.1	0.0	0.2	0.0	-0.1	-0.1	-0.2	-0.1	-0.2	0.0	0.0	0.0	-0.2	-0.1	-0.1	0.2	0.1	-0.1	0.1	0.2	0.2	0.2	0.0	0.4
22-Nov	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	-0.1	0.1	0.0	0.3	0.4	0.3	0.2	0.2	0.2	0.3	0.1	0.4	0.1	0.1	0.4
23-Nov	0.4	0.1	0.1	0.2	0.1	0.1	0.4	0.4	-0.1	0.3	0.1	0.5	0.1	0.0	0.1	0.2	0.2	0.0	0.2	0.3	0.1	0.1	0.3	0.2	0.2	0.5
24-Nov	0.2	0.2	0.2	0.3	0.1	0.3	0.3	0.2	0.2	0.2	0.0	0.1	-0.2	0.4	0.1	0.1	0.0	0.2	0.1	0.1	0.2	0.2	0.2	0.6	0.2	0.6
25-Nov	0.4	0.2	-0.1	0.2	0.3	0.5	0.5	0.4	0.2	0.5	0.3	0.4	0.3	0.2	0.2	0.7	0.4	0.9	0.7	0.5	0.4	0.5	0.4	0.4	0.4	0.9
26-Nov	0.4	1.0	1.0	0.7	0.5	0.6	0.7	0.6	0.7	0.9	0.7	0.5	0.3	0.2	0.4	0.4	0.7	0.2	-0.1	-0.5	-1.0	-0.7	-0.6	-0.6	0.3	1.0
27-Nov	-0.4	0.3	-0.6	-0.4	-0.4	-0.6	-0.4	-0.3	-0.3	-0.3	-0.2	-0.8	-0.5	-0.4	-0.1	-0.4	-0.2	-0.1	-0.2	-0.2	0.0	0.5	0.3	0.5	-0.2	0.5
28-Nov	0.2	0.0	-0.1	0.0	-0.1	0.1	0.1	0.2	0.1	0.2	-0.1	0.0	-0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2
29-Nov	0.1	0.3	0.1	0.2	0.1	0.2	0.3	0.2	0.2	0.1	-0.1	0.1	0.4	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.4
30-Nov	0.2	0.1	0.1	0.0	0.2	0.1	0.0	-0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.3
																								Diurnal Average		
																								Diurnal Maximum		
UO - Unstable Operation																										



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Vertical Wind Speed 45m (VW45) - km/h**  
**Lower Camp Met Tower - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 4.2 km/h on Nov 12 16:00	Hours of Data: 693
Minimum Value: 0.1 km/h on Nov 15 09:00	Hours of Missing Data: 27
Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 0.8 Median = 1.2 Q <sub>3</sub> = 1.7 P <sub>90</sub> = 2.3 P <sub>99</sub> = 3.2	Hours of Calibration: 0
	Percent Operational Time: 96.3

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	1.5	1.1	0.9	0.6	0.7	0.8	1.0	0.8	0.9	0.8	0.9	1.2	1.0	0.8	0.9	0.7	0.8	0.8	0.8	1.0	1.2	1.1	0.8	0.6	1.5
2-Nov	0.7	1.0	0.9	0.7	0.6	0.5	0.4	0.4	0.6	0.6	0.8	0.6	0.5	1.5	1.4	1.3	1.4	1.2	0.8	1.9	1.5	1.5	1.1	0.8	1.9
3-Nov	0.6	0.4	0.5	0.5	1.3	1.1	1.1	1.3	1.0	1.1	1.2	1.4	1.2	1.4	1.5	1.2	1.1	0.9	1.1	1.1	1.5	0.9	0.9	0.6	1.5
4-Nov	0.9	0.9	1.0	0.9	0.8	0.9	1.3	1.7	1.6	0.9	1.2	1.4	1.1	0.7	1.0	0.8	0.6	0.5	0.2	0.3	0.3	0.6	0.3	0.3	1.7
5-Nov	0.3	0.4	0.8	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.8
6-Nov	UO	UO	UO	2.5	2.5	2.7	2.4	2.6	2.7	2.1	2.4	2.7	2.4	2.1	1.6	1.1	1.0	1.0	0.9	1.0	1.4	1.4	1.0	0.3	2.7
7-Nov	0.4	0.6	1.3	1.7	1.9	3.0	2.5	2.1	2.5	1.8	1.7	2.5	2.0	1.4	1.3	0.4	0.5	0.7	0.6	1.0	1.4	1.0	1.0	1.9	3.0
8-Nov	1.4	1.0	0.7	1.3	1.3	0.9	0.7	0.7	0.8	0.8	1.1	1.2	1.5	1.4	1.0	0.6	1.0	1.1	0.8	0.9	0.8	0.5	0.8	0.7	1.5
9-Nov	0.9	1.5	1.2	1.5	0.8	1.0	1.2	0.9	1.0	1.6	1.1	1.3	1.1	1.0	1.2	0.2	0.6	0.9	0.8	0.7	1.2	1.2	0.7	0.9	1.6
10-Nov	0.9	0.7	0.9	0.7	0.7	0.9	1.4	1.7	1.7	1.7	1.7	1.3	1.0	0.5	0.7	0.8	0.5	1.0	0.4	0.3	0.4	0.4	0.6	1.0	1.7
11-Nov	0.7	0.5	0.6	0.7	1.2	1.0	2.0	1.7	2.1	2.0	2.3	2.5	2.5	2.2	2.2	2.0	1.8	1.7	1.4	1.3	1.3	1.2	1.0	1.4	2.5
12-Nov	1.3	1.0	1.1	0.8	1.4	1.4	1.3	1.2	1.4	2.4	3.2	3.2	2.9	3.0	4.1	4.2	3.0	3.0	2.3	2.0	2.2	2.1	2.4	2.2	4.2
13-Nov	2.0	1.7	1.4	1.3	1.6	1.5	1.2	0.8	0.9	0.8	1.4	1.7	1.5	1.6	1.5	1.3	1.1	1.2	1.5	1.2	1.2	1.6	1.4	1.7	2.0
14-Nov	1.7	1.4	1.4	1.9	1.7	1.4	1.7	1.6	1.6	1.3	1.4	1.8	1.7	1.5	1.4	1.1	1.2	1.2	0.9	0.8	1.0	1.1	0.9	0.3	1.9
15-Nov	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.1	0.3	0.8	1.0	0.9	0.9	0.8	1.2	1.5	1.5	1.4	1.6	1.7	1.3	1.0	0.8	1.7
16-Nov	0.9	0.9	1.1	1.8	1.8	1.8	2.1	2.5	2.7	2.3	2.4	2.5	2.3	3.5	3.3	2.8	3.3	3.1	2.9	3.0	2.9	3.1	2.7	2.5	3.5
17-Nov	2.1	2.7	1.9	2.0	1.8	1.9	1.8	1.8	1.6	1.7	2.0	2.0	1.7	1.7	1.4	1.1	1.0	1.5	1.8	UO	UO	UO	1.8	2.0	2.7
18-Nov	1.3	1.9	2.4	2.5	1.9	2.1	1.6	1.0	1.0	1.3	1.8	1.8	1.7	1.1	1.0	0.3	0.2	0.3	0.9	0.6	0.6	0.5	0.6	0.8	2.5
19-Nov	0.7	1.0	1.0	1.2	1.3	1.5	1.7	1.9	1.9	1.5	1.6	1.6	2.2	2.6	2.2	2.2	1.8	1.7	2.1	2.7	1.8	2.0	2.2	2.0	2.7
20-Nov	2.2	2.1	2.1	1.6	1.5	1.7	1.5	1.5	1.4	1.7	2.2	2.3	2.1	1.9	1.9	1.9	1.8	2.3	2.1	2.9	1.8	1.8	1.9	1.8	2.9
21-Nov	1.9	1.6	1.8	1.8	1.4	1.2	1.3	1.3	0.9	1.5	1.8	1.8	1.7	1.7	1.3	1.2	0.8	0.9	0.7	0.6	0.5	0.8	0.8	0.6	1.9
22-Nov	0.4	0.4	0.2	0.4	0.7	0.5	0.2	0.2	0.2	0.3	0.5	0.8	1.0	1.0	1.2	1.7	1.3	0.9	1.2	1.1	1.4	1.5	1.2	1.3	1.7
23-Nov	1.5	1.7	1.5	1.7	1.4	1.4	1.7	1.8	1.5	1.6	1.2	1.3	1.5	1.3	1.7	1.6	1.6	1.4	1.3	1.3	1.7	1.5	1.5	1.5	1.8
24-Nov	1.5	1.5	1.2	1.1	1.0	1.0	0.9	1.0	0.7	0.7	1.0	1.1	0.9	1.1	1.2	1.0	0.6	0.3	0.3	0.2	0.2	0.2	0.3	0.4	1.5
25-Nov	0.7	0.9	0.9	0.8	0.8	1.3	1.2	0.9	1.2	1.2	1.1	1.0	1.1	1.0	1.2	1.2	1.4	2.1	2.2	2.4	2.3	2.0	2.2	1.7	2.4
26-Nov	1.9	2.2	1.9	1.8	1.6	1.5	1.6	1.8	1.8	1.9	1.7	1.4	1.0	0.8	0.8	0.8	1.1	1.5	2.7	3.0	3.2	3.0	2.6	2.6	3.2
27-Nov	2.8	2.6	3.0	2.8	3.2	3.0	3.2	2.8	2.9	3.1	2.6	2.6	3.0	2.5	3.5	3.4	1.8	2.2	2.1	2.1	2.1	2.2	1.9	1.4	3.5
28-Nov	1.0	1.2	1.4	1.3	1.0	0.5	0.4	0.4	0.2	0.2	0.5	0.6	0.8	0.9	1.0	0.4	0.2	0.3	0.9	1.5	1.2	0.7	1.0	0.8	1.5
29-Nov	0.7	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.8	0.8	1.0	0.9	0.6	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	1.0
30-Nov	0.3	0.3	0.3	0.4	0.6	0.7	0.7	0.6	0.7	0.7	0.9	1.0	0.9	1.0	1.0	1.0	0.9	0.9	1.0	1.2	1.0	1.2	1.2	1.2	1.2
	2.8	2.7	3.0	2.8	3.2	3.0	3.2	2.8	2.9	3.1	3.2	3.2	3.0	3.5	4.1	4.2	3.3	3.1	2.9	3.0	3.2	3.1	2.7	2.6	
	Diurnal Maximum																								

UO - Unstable Operation



Maximum Value: 2.4 km/h on Nov 16 18:00																				Maximum Daily Average: 1.0 km/h on Nov 16					Hours in Service: 720		
Minimum Value: -1.6 km/h on Nov 10 09:00																				Minimum Daily Average: -0.7 km/h on Nov 27					Hours of Data: 691		
Maximum Diurnal Average: 0.3 km/h at hour 18																				Minimum Diurnal Average: 0.0 km/h at hour 4					Hours of Missing Data: 29		
Monthly Average: 0.14 km/h																				Percentiles: P <sub>1</sub> = -1.3 P <sub>10</sub> = -0.4 Q <sub>1</sub> = -0.1 Median = 0.0 Q <sub>3</sub> = 0.3 P <sub>90</sub> = 0.9 P <sub>99</sub> = 2.1					Hours of Calibration: 0		
																									Percent Operational Time: 96.0		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	-0.2	-0.2	0.0	0.1	0.3	0.2	1.3	-0.1	0.2	0.2	0.3	0.0	0.0	-0.1	-0.2	0.0	0.2	0.5	-0.2	0.3	0.8	0.0	0.1	0.2	0.2	1.3	
2-Nov	0.1	0.1	0.1	0.0	0.0	-0.1	-0.1	0.0	-0.2	-0.3	-0.1	-0.3	-0.1	0.5	0.6	0.7	0.2	0.0	0.4	1.3	1.4	1.6	2.1	0.2	0.3	2.1	
3-Nov	0.0	0.1	-0.1	0.0	0.9	0.6	0.7	0.8	0.5	0.4	0.4	1.0	0.7	0.4	-0.2	0.2	-0.2	0.8	0.6	1.0	0.7	0.0	0.1	0.1	0.4	1.0	
4-Nov	1.0	0.5	0.0	0.1	0.1	0.1	0.3	1.0	-0.1	-0.1	0.1	0.1	0.2	0.2	0.1	0.6	0.1	0.4	0.0	0.3	-0.3	0.0	0.3	0.2	1.0	1.0	
5-Nov	0.0	-0.2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.0	0.0
6-Nov	UO	1.0	2.1	2.2	1.2	2.3	UO	0.4	-0.1	0.1	0.4	0.5	0.3	0.4	0.4	0.3	0.0	-0.7	-0.9	-0.6	-0.3	-0.9	0.0	0.0	0.4	2.3	
7-Nov	-0.1	-0.4	-0.5	-0.5	-0.2	-1.0	-1.3	-1.2	-1.2	0.0	0.5	0.4	-0.6	-0.4	0.2	0.3	0.5	0.9	0.2	0.5	0.7	0.4	0.2	1.6	0.0	1.6	
8-Nov	0.5	0.8	0.5	-0.1	0.6	0.1	0.3	-0.4	0.1	-0.4	-0.4	0.0	0.4	0.4	0.1	0.3	0.5	0.6	-0.1	-0.2	-0.2	-0.2	-0.3	-0.2	0.1	0.8	
9-Nov	0.4	-0.4	-0.1	-0.3	0.0	0.3	1.3	0.2	0.8	0.6	0.2	0.6	-0.1	0.3	0.4	0.0	0.1	0.5	0.0	-0.2	-0.2	-0.6	-0.3	-0.1	0.1	1.3	
10-Nov	-0.1	-0.1	-0.3	-0.1	-0.2	0.1	0.7	-0.2	-1.6	-1.1	0.1	0.6	-0.4	-0.3	0.3	0.2	-0.1	-0.2	0.0	0.2	0.4	0.5	0.2	0.5	0.0	0.7	
11-Nov	0.5	0.6	0.4	0.4	0.9	-0.2	1.5	0.2	0.2	0.5	0.1	0.3	-0.2	0.5	0.3	0.3	0.1	-0.1	-0.1	-0.3	-0.5	0.3	0.0	0.7	0.3	1.5	
12-Nov	1.6	0.1	0.0	-0.1	0.4	0.1	UO	0.1	0.0	-0.1	-0.4	-0.9	-0.2	-0.4	-1.1	-0.4	0.3	0.3	-0.3	0.3	0.4	-0.1	-0.4	0.0	0.0	1.6	
13-Nov	-0.2	-0.3	-0.1	-0.4	0.9	0.6	0.1	0.0	0.9	-0.2	0.0	0.0	0.1	0.0	0.5	0.0	0.2	-0.2	0.0	0.2	-0.1	0.3	0.2	0.0	0.1	0.9	
14-Nov	0.2	0.8	0.2	-0.2	0.2	0.0	0.1	0.6	0.7	0.2	0.2	0.8	0.4	0.3	0.1	-0.2	0.1	0.1	0.2	0.0	-0.1	0.0	-0.1	-0.1	0.2	0.8	
15-Nov	0.0	-0.1	-0.1	0.1	-0.1	-0.1	-0.1	0.1	0.1	0.1	0.0	0.0	-0.2	0.3	0.1	0.8	0.0	0.4	1.9	2.4	1.3	0.7	0.0	0.1	0.3	2.4	
16-Nov	0.6	0.6	0.4	0.0	0.4	0.7	1.1	0.9	2.3	2.0	1.0	1.4	0.9	1.6	1.3	1.9	1.7	2.4	0.6	0.4	0.4	0.4	1.6	0.6	1.0	2.4	
17-Nov	1.5	1.3	1.2	0.8	0.9	1.5	0.7	0.9	1.4	1.4	0.3	0.2	0.2	0.6	0.1	1.2	0.4	0.4	-0.5	UO	UO	-1.0	-0.7	-0.6	0.6	1.5	
18-Nov	-0.5	-0.2	-0.1	-0.7	-1.3	-1.0	-0.3	0.3	0.2	0.3	-0.1	-0.4	-0.1	1.4	-0.1	0.0	0.1	0.1	0.1	0.1	0.5	0.0	-0.1	0.2	-0.1	1.4	
19-Nov	0.2	-0.3	0.2	0.2	0.0	-0.2	0.2	0.5	0.1	-0.4	-0.3	-0.3	0.4	-0.2	0.0	0.2	-0.3	0.6	0.1	0.4	0.3	0.8	0.1	0.3	0.1	0.8	
20-Nov	0.2	-0.6	0.1	0.3	0.2	0.0	-0.1	0.0	0.0	0.1	0.3	0.0	0.6	0.5	-0.2	0.1	0.2	-0.3	0.0	0.2	0.1	-0.1	0.2	0.2	0.1	0.6	
21-Nov	0.2	-0.1	-0.5	-0.4	0.1	-0.2	-0.4	-0.2	-0.4	-0.5	-0.5	-0.3	0.1	-0.4	-0.7	-0.4	-0.5	0.1	-0.3	-0.3	-0.3	0.0	0.2	0.0	-0.2	0.2	
22-Nov	-0.1	-0.2	-0.1	-0.2	0.0	-0.2	-0.1	0.0	-0.3	-0.2	-0.3	-0.2	-0.3	-0.5	0.3	-0.1	-0.1	0.1	0.2	-0.1	0.0	-0.2	0.0	-0.1	-0.1	0.3	
23-Nov	0.2	-0.4	-0.2	0.0	0.0	-0.1	0.0	0.3	0.1	0.3	0.0	0.3	0.1	-0.1	0.0	0.0	0.1	0.0	0.2	0.3	0.0	0.0	0.0	0.1	0.0	0.3	
24-Nov	0.0	0.0	0.0	0.2	0.1	0.4	0.2	0.0	0.0	0.0	0.0	-0.2	-0.4	0.3	-0.1	-0.2	0.0	-0.1	0.0	0.0	0.0	0.1	0.0	-0.2	0.0	0.4	
25-Nov	0.4	0.6	-0.7	0.1	0.0	0.0	0.1	0.0	-0.1	UO	0.1	0.4	UO	0.3	0.8	1.5	1.0	1.8	1.6	1.4	1.6	1.7	1.3	1.0	0.7	1.8	
26-Nov	0.9	2.1	2.2	1.1	1.0	1.1	1.7	1.2	1.5	2.1	1.9	0.8	0.7	0.2	0.3	0.4	1.4	0.2	0.2	-1.0	-1.5	-1.3	-1.2	-1.1	0.6	2.2	
27-Nov	-1.0	-0.1	-1.3	-0.9	-0.6	-1.0	-1.2	-0.9	-0.8	-1.4	-0.9	-0.8	-1.1	-0.4	-0.9	-0.9	-0.2	-0.4	-0.3	-0.6	-0.5	0.0	0.2	0.1	-0.7	0.2	
28-Nov	0.0	-0.4	-0.5	-0.3	-0.3	-0.3	-0.5	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	0.0	0.1	0.0	-0.2	0.0	-0.1	0.0	0.0	0.1	-0.1	0.1	
29-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.1	-0.2	-0.2	-0.2	-0.2	-0.1	0.0	-0.1	0.0	-0.1	0.1	0.0	0.0	0.0	0.0	0.1	
30-Nov	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.3	0.0	0.2	-0.2	-0.3	0.0	-0.3	-0.1	0.0	0.2	-0.1	0.0	-0.1	0.0	-0.1	0.1	0.0	-0.1	0.2	
																								Diurnal Average			
																								Diurnal Maximum			
UO - Unstable Operation																											



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Vertical Wind Speed 100m (VW100) - km/h**  
**Lower Camp Met Tower - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.2 km/h on Nov 16 14:00 Minimum Value: 0.1 km/h on Nov 29 10:00 Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 0.8 Median = 1.3 Q <sub>3</sub> = 1.8 P <sub>90</sub> = 2.3 P <sub>99</sub> = 3.5																				Hours in Service: 720 Hours of Data: 691 Hours of Missing Data: 29 Hours of Calibration: 0 Percent Operational Time: 96.0					
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	1.4	1.3	0.7	0.5	0.7	0.9	0.9	0.8	1.0	1.0	0.9	1.4	1.1	0.9	0.6	0.7	0.9	0.8	1.0	1.3	1.4	1.2	1.0	0.8	1.4
2-Nov	0.9	1.1	1.1	1.0	0.9	0.6	0.4	0.5	0.5	0.6	1.1	0.9	0.8	1.9	1.5	1.4	1.2	1.2	1.3	2.0	1.2	1.6	1.2	1.5	2.0
3-Nov	1.0	0.7	0.9	0.9	1.3	0.9	1.1	1.1	0.4	0.9	0.9	0.9	1.3	1.2	1.4	1.1	1.2	1.2	1.3	1.3	1.6	0.5	0.6	0.6	1.6
4-Nov	0.6	1.0	1.5	1.2	1.0	1.0	1.0	1.3	1.7	1.1	1.2	1.3	0.9	0.8	1.0	0.8	1.2	1.0	0.3	0.6	0.4	0.8	0.8	0.5	1.7
5-Nov	0.4	0.4	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.4
6-Nov	UO	2.0	2.8	2.7	2.7	2.7	UO	2.2	2.1	2.0	2.3	2.4	2.3	2.0	1.7	1.4	1.5	1.2	1.0	1.5	1.8	1.8	1.2	0.4	2.8
7-Nov	0.6	0.8	1.0	1.3	1.6	3.1	2.2	1.7	2.5	2.5	2.0	2.4	1.8	1.1	1.4	0.5	0.6	1.2	1.0	1.5	1.6	1.5	0.8	1.5	3.1
8-Nov	1.8	1.5	1.3	2.1	2.0	1.4	1.2	1.0	1.0	1.3	1.6	1.6	1.6	1.5	1.3	0.9	1.2	1.2	1.3	1.0	0.9	0.8	0.9	1.1	2.1
9-Nov	1.0	1.9	1.3	1.4	0.7	1.0	1.0	0.8	1.1	1.4	1.0	1.2	1.0	1.0	0.8	0.2	0.4	1.0	1.3	1.0	1.3	1.4	1.0	0.9	1.9
10-Nov	0.7	0.6	1.0	0.6	0.8	1.2	1.2	1.8	1.7	1.8	1.6	1.5	1.2	0.6	0.9	1.0	0.8	1.3	0.6	0.6	0.6	0.5	0.5	1.0	1.8
11-Nov	0.7	0.9	0.9	1.1	1.5	1.4	1.8	1.8	2.3	2.1	2.1	2.5	2.1	2.2	1.9	2.0	1.7	1.7	1.5	1.4	1.6	1.6	1.1	1.7	2.5
12-Nov	1.7	1.5	1.8	1.1	1.6	1.1	UO	0.8	1.0	1.7	2.4	2.7	2.3	2.2	3.2	3.5	2.2	2.3	1.8	2.2	2.2	2.0	2.3	2.5	3.5
13-Nov	2.0	1.5	1.2	0.8	1.2	1.4	1.2	0.7	1.0	0.8	1.3	1.9	2.0	1.9	1.9	1.0	1.1	0.9	1.7	1.3	1.5	2.0	1.7	1.8	2.0
14-Nov	1.9	1.4	1.4	1.9	2.1	1.4	1.7	1.6	1.6	1.4	1.5	1.9	1.9	1.7	1.3	0.9	1.0	1.0	1.1	0.7	0.7	0.8	1.1	0.4	2.1
15-Nov	0.4	0.4	0.4	0.3	0.3	0.4	0.5	0.4	0.2	0.4	1.1	1.2	0.9	0.8	0.7	1.3	1.5	1.4	1.4	1.7	1.1	1.1	0.9	0.6	1.7
16-Nov	0.7	0.8	1.4	2.0	2.7	2.4	2.6	2.7	2.8	3.0	2.8	3.5	2.5	4.2	4.0	3.2	4.0	3.7	3.6	3.6	3.3	3.5	3.5	2.8	4.2
17-Nov	2.7	2.8	2.3	2.2	2.2	2.3	2.2	2.1	2.0	2.0	2.2	2.0	1.8	1.8	1.2	1.4	1.4	1.6	1.2	UO	UO	2.3	2.0	2.0	2.8
18-Nov	1.4	1.9	2.3	2.0	1.9	1.6	1.4	0.9	0.9	1.2	1.6	1.4	1.5	1.3	0.8	0.3	0.2	0.5	1.2	0.9	1.0	0.6	0.7	0.6	2.3
19-Nov	0.8	1.1	1.1	1.3	1.5	1.8	1.7	2.2	2.3	1.6	1.8	1.8	2.6	2.9	2.6	2.8	2.1	2.1	2.4	3.0	2.0	2.3	2.1	2.5	3.0
20-Nov	2.5	2.2	2.2	1.7	1.7	1.5	1.5	1.4	1.5	2.1	2.6	2.4	2.6	2.1	2.1	2.2	1.8	2.0	2.1	2.9	1.8	1.8	2.1	2.0	2.9
21-Nov	1.8	2.0	1.9	1.7	1.6	1.2	1.0	1.0	0.7	1.2	1.5	1.9	2.0	1.6	1.2	1.0	0.9	1.1	0.8	0.7	0.4	0.6	1.0	0.9	2.0
22-Nov	0.6	0.5	0.3	0.5	0.8	0.7	0.2	0.3	0.3	0.2	0.4	0.4	0.7	0.9	1.5	1.8	1.5	1.2	1.3	1.3	1.5	1.7	1.1	1.1	1.8
23-Nov	1.6	1.7	1.8	2.2	1.6	1.5	2.0	1.8	1.7	1.6	1.3	1.3	1.3	1.1	1.5	1.6	1.4	1.1	1.3	1.3	1.5	1.1	1.1	1.4	2.2
24-Nov	1.2	1.1	0.8	0.9	0.8	1.0	1.0	0.7	0.5	0.5	0.9	0.8	0.8	1.1	0.9	0.5	0.2	0.1	0.1	0.2	0.2	0.3	0.2	0.5	1.2
25-Nov	1.1	0.9	1.2	0.7	0.8	1.6	1.1	1.2	1.2	UO	1.2	1.3	UO	1.4	1.6	1.4	1.8	1.8	1.9	2.3	2.1	1.6	1.9	1.6	2.3
26-Nov	2.3	2.8	2.4	2.0	1.5	1.8	2.0	2.3	2.0	1.9	1.9	1.8	1.3	1.3	1.2	1.0	1.2	1.8	2.3	2.5	2.5	2.8	2.1	2.2	2.8
27-Nov	2.3	2.9	2.6	2.9	3.3	2.7	2.9	2.4	2.3	2.0	2.2	2.7	2.7	2.6	3.1	3.0	1.8	1.9	2.0	2.2	2.1	2.2	1.8	1.6	3.3
28-Nov	1.1	1.2	1.2	0.9	0.7	0.7	0.5	0.4	0.3	0.3	0.7	0.5	0.8	0.9	1.0	0.3	0.3	0.3	1.2	2.1	1.7	1.4	1.2	0.9	2.1
29-Nov	0.7	0.4	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.4	0.6	0.8	0.5	0.3	0.3	0.3	0.5	0.5	0.3	0.4	0.3	0.2	0.8
30-Nov	0.2	0.3	0.3	0.3	0.3	0.2	0.4	0.3	0.4	0.4	0.6	0.6	0.7	0.7	0.8	0.6	0.7	0.7	0.5	0.8	0.8	1.0	1.1	0.9	1.1
Diurnal Maximum																									
UO - Unstable Operation																									





Maximum Value: 5.1 km/h on Nov 25 21:00																				Maximum Daily Average: 2.0 km/h on Nov 25					Hours in Service: 720				
Minimum Value: -1.3 km/h on Nov 10 09:00																				Minimum Daily Average: 0.0 km/h on Nov 20					Hours of Data: 692				
Maximum Diurnal Average: 0.9 km/h at hour 7																				Minimum Diurnal Average: 0.5 km/h at hour 15					Hours of Missing Data: 28				
Monthly Average: 0.65 km/h																				Percentiles: P <sub>1</sub> = -0.6 P <sub>10</sub> = -0.1 Q <sub>1</sub> = 0.1 Median = 0.4 Q <sub>3</sub> = 1.0 P <sub>90</sub> = 1.9 P <sub>99</sub> = 3.4					Hours of Calibration: 0				
																				Percent Operational Time: 96.1									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Nov	0.6	0.4	0.5	0.7	1.0	0.7	1.5	0.6	1.1	0.5	1.0	0.4	0.5	0.3	-0.1	0.1	1.1	0.9	-0.2	0.4	1.2	0.2	0.2	0.3	0.6	1.5			
2-Nov	0.2	0.0	0.1	-0.1	-0.1	0.3	0.1	0.3	0.1	0.0	0.1	-0.6	0.1	0.6	0.6	0.8	-0.1	0.0	0.8	1.4	2.0	2.5	2.8	0.7	0.5	2.8			
3-Nov	0.4	0.6	0.3	0.7	2.0	1.8	1.8	1.8	1.6	1.6	1.4	1.6	1.8	1.7	0.5	0.5	0.5	1.7	1.3	2.7	2.4	1.3	0.8	0.7	1.3	2.7			
4-Nov	1.4	1.4	0.8	1.3	1.2	1.3	1.4	2.4	0.5	0.1	0.4	0.3	0.5	0.7	0.3	0.8	0.0	0.7	0.5	0.0	0.4	0.3	0.4	0.3	0.7	2.4			
5-Nov	0.4	0.1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	1.2	--	1.2			
6-Nov	0.7	1.4	3.7	4.3	3.2	2.8	2.5	1.9	1.2	1.9	2.0	2.0	1.7	2.1	1.8	1.5	1.4	0.3	-0.5	-0.8	-0.4	-1.0	0.5	0.3	1.4	4.3			
7-Nov	0.1	0.0	0.4	0.4	1.2	0.5	0.2	0.1	0.0	1.0	1.5	2.0	0.4	0.1	0.6	0.2	0.3	1.0	0.9	0.9	1.5	1.2	0.8	2.0	0.7	2.0			
8-Nov	1.1	1.0	1.2	-0.3	0.5	-0.2	0.2	0.1	0.1	-0.2	0.6	1.5	2.0	1.2	0.7	0.8	1.3	1.4	0.7	0.3	0.1	0.2	0.3	0.7	0.6	2.0			
9-Nov	1.4	0.8	1.2	0.8	1.3	1.7	2.4	1.7	2.6	3.0	1.3	1.6	0.5	1.2	1.5	0.4	0.7	2.0	0.5	0.1	0.9	0.4	0.6	0.8	1.2	3.0			
10-Nov	0.8	0.7	0.4	0.6	0.7	0.9	1.7	0.7	-1.3	-0.6	0.7	0.9	-0.1	0.1	0.5	0.3	0.4	0.3	0.5	0.4	0.7	0.7	0.6	1.2	0.5	1.7			
11-Nov	1.0	0.9	0.5	1.0	1.6	0.4	2.2	0.4	-0.1	0.1	-0.1	-0.1	-0.8	0.2	0.0	0.3	0.0	-0.3	0.0	-0.2	-0.3	1.0	0.0	1.5	0.4	2.2			
12-Nov	2.6	0.3	1.1	-0.1	1.4	1.2	1.3	1.0	1.3	2.0	1.5	0.6	1.4	1.5	0.7	2.0	2.3	2.5	1.2	1.9	1.5	0.8	0.9	1.0	1.3	2.6			
13-Nov	1.1	0.6	0.9	0.6	1.7	1.7	0.9	0.1	1.3	0.2	0.1	-0.1	0.2	0.4	0.5	-0.2	0.1	-0.5	0.0	0.2	0.2	0.1	0.3	0.0	0.4	1.7			
14-Nov	0.2	0.8	0.6	0.0	0.1	0.3	0.3	0.9	1.1	0.4	0.4	1.2	0.6	0.2	0.2	-0.1	0.2	0.1	0.1	0.0	0.0	-0.2	0.1	0.3	0.3	1.2			
15-Nov	0.2	0.2	0.2	0.1	0.3	0.5	0.3	0.1	0.2	0.3	0.4	0.0	0.1	0.3	0.6	1.3	0.5	1.9	2.9	2.9	2.0	1.6	1.4	0.7	0.8	2.9			
16-Nov	1.5	1.0	0.7	0.5	0.3	1.3	3.4	3.4	3.3	2.5	1.5	1.4	1.8	2.2	2.2	3.2	2.2	3.0	1.3	0.8	0.8	0.8	1.7	1.0	1.7	3.4			
17-Nov	1.8	2.2	1.9	1.8	2.5	1.9	1.9	2.1	2.1	2.4	0.7	0.8	0.9	1.3	1.2	1.4	1.3	1.4	UO	UO	UO	UO	UO	0.3	1.6	2.5			
18-Nov	0.4	1.0	1.5	0.8	-0.4	-0.1	0.5	1.3	1.2	1.4	0.8	0.2	0.4	1.6	0.1	0.3	0.2	0.2	0.4	0.4	0.3	0.2	0.0	0.3	0.5	1.6			
19-Nov	0.3	0.1	0.3	0.2	0.0	-0.1	0.2	0.4	0.5	-0.4	-0.2	-0.2	0.5	-0.6	0.0	0.1	-0.2	0.8	0.0	0.0	0.5	0.6	-0.2	0.2	0.1	0.8			
20-Nov	0.0	-0.7	-0.1	0.1	0.1	0.1	-0.2	-0.1	0.1	0.2	-0.2	-0.3	0.7	0.3	-0.2	0.0	0.3	-0.6	-0.4	-0.3	-0.1	0.1	0.2	0.2	0.0	0.7			
21-Nov	0.2	-0.2	-0.5	-0.5	0.3	0.3	0.0	0.3	0.2	0.1	1.0	0.2	0.2	0.0	-0.1	-0.2	-0.2	0.7	0.2	0.2	-0.1	0.3	0.3	0.0	0.1	1.0			
22-Nov	0.1	0.1	0.2	0.1	0.9	0.2	0.3	0.1	0.1	0.0	0.0	0.0	-0.1	-0.2	0.5	-0.2	-0.3	0.1	0.5	0.0	0.1	-0.1	0.0	0.1	0.1	0.9			
23-Nov	-0.1	-0.3	0.1	0.0	0.1	0.0	0.0	0.4	0.3	0.3	0.2	0.4	0.4	-0.2	-0.2	-0.1	0.1	-0.1	0.4	0.6	0.1	0.0	0.0	-0.2	0.1	0.6			
24-Nov	0.0	-0.1	-0.1	0.5	0.3	0.8	0.5	0.2	0.1	0.2	0.1	0.1	0.0	0.4	0.1	0.3	0.3	0.2	0.2	-0.1	0.0	0.2	0.4	-0.2	0.2	0.8			
25-Nov	0.6	0.9	-1.1	0.3	0.5	0.8	0.5	0.3	UO	UO	-0.2	1.1	2.5	1.8	2.2	3.0	3.2	4.4	4.3	3.4	5.1	4.0	3.2	2.2	2.0	5.1			
26-Nov	1.7	2.0	2.3	1.6	1.5	1.8	2.2	1.6	1.9	2.8	2.6	1.3	1.0	1.0	0.9	1.4	1.9	1.4	1.8	0.4	0.0	-0.1	-0.1	0.2	1.4	2.8			
27-Nov	0.2	1.1	0.1	0.4	0.9	0.6	0.2	0.4	0.5	0.2	0.1	0.1	0.0	0.3	-0.1	0.0	0.4	0.2	0.1	0.0	0.0	0.7	0.3	0.1	0.3	1.1			
28-Nov	-0.2	-0.1	0.1	0.4	0.2	0.1	-0.1	0.2	0.2	0.0	0.4	0.2	-0.1	0.0	-0.1	0.0	0.1	-0.1	-0.1	-0.1	0.1	0.1	0.2	0.6	0.1	0.6			
29-Nov	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1	-0.1	-0.2	0.4	0.2	0.4	-0.1	-0.1	-0.3	0.0	0.0	0.1	0.4			
30-Nov	0.1	-0.1	0.0	0.2	0.1	0.1	0.3	-0.1	-0.3	0.0	-0.1	0.0	0.4	-0.1	0.0	0.2	0.2	0.0	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0.4			
																								Diurnal Average					
																								Diurnal Maximum					
UO - Unstable Operation																													



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Vertical Wind Speed 163m (VW163) - km/h**  
**Lower Camp Met Tower - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 4.3 km/h on Nov 16 15:00	Hours of Data: 692
Minimum Value: 0.1 km/h on Nov 29 11:00	Hours of Missing Data: 28
Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.8 Median = 1.2 Q <sub>3</sub> = 1.8 P <sub>90</sub> = 2.4 P <sub>99</sub> = 3.6	Hours of Calibration: 0
	Percent Operational Time: 96.1

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	1.3	1.2	0.9	0.6	0.7	1.2	1.0	1.0	0.9	1.1	0.8	1.1	1.0	0.9	0.5	0.7	0.8	0.8	0.8	1.0	1.2	1.2	1.1	0.9	1.3
2-Nov	0.8	1.1	1.0	1.1	1.2	0.7	0.5	0.6	0.6	0.7	1.4	1.2	1.2	2.1	1.5	1.4	0.9	1.0	2.0	2.7	1.8	1.6	1.2	2.2	2.7
3-Nov	1.4	1.1	1.3	0.9	1.2	0.7	1.3	1.3	0.6	0.6	0.9	0.9	1.4	0.7	0.9	0.8	1.4	1.0	1.4	1.0	1.1	0.8	0.7	0.5	1.4
4-Nov	0.6	0.7	1.4	1.1	1.2	0.9	0.9	1.3	1.6	1.1	1.1	1.2	1.0	0.8	1.0	0.9	1.2	1.1	0.7	1.0	0.4	1.0	1.0	0.5	1.6
5-Nov	0.6	0.4	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.9	0.9
6-Nov	0.7	1.3	2.6	2.6	1.8	1.7	1.4	1.6	1.3	1.6	1.9	2.3	2.6	1.9	1.8	1.4	1.5	1.5	1.0	1.2	1.1	1.5	1.2	0.6	2.6
7-Nov	0.7	0.9	0.9	1.2	1.7	2.9	1.8	1.2	2.0	2.3	2.2	2.5	1.9	1.3	1.4	0.7	0.6	1.5	0.8	1.0	0.9	1.3	1.4	1.9	2.9
8-Nov	2.6	2.4	1.5	1.8	1.8	1.1	1.2	1.1	0.9	1.1	1.5	1.4	1.2	1.5	1.4	1.0	1.3	1.4	1.6	1.4	1.1	1.0	1.0	1.5	2.6
9-Nov	1.4	1.6	1.5	1.6	1.1	1.2	1.4	0.7	1.3	1.0	0.9	1.1	0.9	1.2	0.9	0.4	0.4	0.8	1.5	0.8	1.0	0.8	1.2	1.3	1.6
10-Nov	0.9	0.9	1.0	0.8	0.9	1.2	1.2	1.8	1.6	1.5	1.2	1.5	1.1	0.6	0.8	0.6	0.7	0.7	0.5	0.7	0.5	0.6	0.7	1.0	1.8
11-Nov	0.9	0.7	0.9	1.2	1.4	1.5	1.9	2.1	2.4	2.4	1.9	2.2	1.5	2.3	1.8	1.9	1.6	1.6	1.4	1.5	1.8	2.0	1.2	1.9	2.4
12-Nov	1.5	2.1	2.4	1.2	1.5	1.0	0.9	0.6	1.1	1.4	1.9	2.3	2.4	2.2	2.8	3.0	2.1	2.0	1.8	2.1	2.2	2.2	2.5	2.7	3.0
13-Nov	1.9	1.2	1.0	0.7	1.3	1.4	1.2	0.9	1.0	0.7	1.4	2.3	1.8	2.1	2.2	0.6	0.6	0.6	1.5	1.0	1.2	2.1	1.9	1.6	2.3
14-Nov	1.5	1.5	1.1	1.5	1.8	1.2	1.0	1.3	1.6	1.5	1.6	1.9	1.7	1.5	1.4	1.0	1.0	1.1	1.1	0.8	0.6	0.7	0.8	0.5	1.9
15-Nov	0.4	0.3	0.3	0.4	0.4	0.4	0.5	0.3	0.3	0.5	1.2	1.3	0.8	0.6	0.8	1.4	1.5	1.0	1.2	1.1	0.9	1.0	0.9	0.5	1.5
16-Nov	0.8	0.9	1.2	1.4	2.7	3.2	2.4	1.4	2.4	3.2	2.8	3.6	2.8	4.1	4.3	3.6	4.2	3.7	3.7	3.2	3.1	2.6	3.8	2.9	4.3
17-Nov	2.8	2.9	2.5	2.4	2.8	2.7	2.6	2.7	2.4	2.6	1.9	1.5	1.4	1.3	0.9	0.8	1.5	1.7	UO	UO	UO	UO	UO	1.9	2.9
18-Nov	1.3	1.6	1.8	1.7	1.3	1.3	1.2	1.0	1.2	1.3	1.5	1.4	1.3	1.5	0.9	0.4	0.2	0.5	1.3	1.1	1.0	0.7	0.5	0.6	1.8
19-Nov	0.7	1.1	1.3	1.2	1.6	1.9	1.8	2.3	2.7	1.8	1.9	2.0	2.8	2.5	2.8	3.1	2.3	2.3	2.8	3.2	2.0	2.3	2.0	2.6	3.2
20-Nov	2.4	2.3	2.0	1.5	1.7	1.3	1.1	0.8	1.0	2.2	2.7	2.5	2.6	2.3	2.1	2.0	1.8	1.7	2.0	2.8	1.8	1.8	2.0	2.1	2.8
21-Nov	1.4	1.9	1.9	1.6	1.6	1.2	1.0	0.8	0.6	0.8	2.0	1.9	1.8	1.3	1.0	0.8	1.0	1.1	0.7	0.6	0.6	0.5	0.9	1.0	2.0
22-Nov	0.7	0.5	0.4	0.6	0.7	0.5	0.3	0.3	0.4	0.2	0.5	0.4	0.6	0.8	1.7	1.5	1.5	1.0	0.9	1.1	1.5	1.6	1.0	0.9	1.7
23-Nov	1.6	1.7	1.9	2.1	1.7	1.5	1.9	1.8	1.5	1.5	1.3	1.4	1.3	1.1	1.6	1.6	1.3	1.1	1.6	1.4	1.4	1.1	1.3	1.5	2.1
24-Nov	1.3	1.1	1.0	0.8	1.0	1.2	1.2	0.8	0.6	0.5	0.7	0.7	0.6	0.9	0.5	0.3	0.2	0.1	0.2	0.3	0.3	0.3	0.4	0.5	1.3
25-Nov	1.1	1.0	1.4	0.8	0.6	1.4	0.8	0.8	UO	UO	1.1	1.7	1.3	1.3	1.2	1.3	1.8	2.4	2.7	3.1	2.6	2.3	2.3	2.5	3.1
26-Nov	3.3	3.3	2.9	2.6	2.4	2.4	2.5	2.7	2.1	1.9	2.0	1.5	1.5	1.1	0.8	1.3	1.8	1.8	1.8	1.8	1.9	2.3	2.0	1.7	3.3
27-Nov	2.0	2.9	2.2	2.4	2.7	2.6	2.4	1.8	1.6	1.3	1.8	2.6	2.8	2.5	2.8	2.7	1.8	1.8	1.7	2.1	1.9	1.9	1.6	1.6	2.9
28-Nov	1.3	1.0	1.0	0.8	0.5	0.7	0.5	0.5	0.5	0.5	0.7	0.7	0.8	0.8	1.0	0.4	0.4	0.6	1.2	2.2	1.3	1.4	1.3	1.5	2.2
29-Nov	1.2	0.6	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.4	0.4	0.7	0.4	0.4	0.3	0.5	0.5	0.6	0.3	0.4	0.3	0.2	1.2
30-Nov	0.2	0.3	0.4	0.4	0.3	0.3	0.4	0.5	0.4	0.4	0.7	0.4	0.4	0.6	0.6	0.4	0.8	0.8	0.5	0.3	0.7	0.8	0.8	0.8	0.8
	3.3	3.3	2.9	2.6	2.8	3.2	2.6	2.7	2.7	3.2	2.8	3.6	2.8	4.1	4.3	3.6	4.2	3.7	3.7	3.2	3.1	2.6	3.8	2.9	
	Diurnal Maximum																								

UO - Unstable Operation



## **WOOD BUFFALO ENVIRONMENTAL ASSOCIATION**

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS04 BUFFALO VIEWPOINT NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS04)

NOVEMBER 2024

## MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	686	33	34	99.86	10.9	0	1.9	0
H2S (ppb) Average	685	34	35	99.86	2.2	0	0.6	0
THC (ppm) Average	684	33	36	99.58	3.7	-	2.3	-
NMHC(ppm) Average	684	33	36	99.58	0.001	-	0	-
CH4(ppm) Average	684	33	36	99.58	3.7	-	2.3	-
O3(ppb) Average	685	34	35	99.86	38.2	0	30.7	-
NO2(ppb) Average	684	35	36	99.86	30.3	0	23.6	-
NO(ppb) Average	684	35	36	99.86	92.8	-	15.8	-
NOX(ppb) Average	684	35	36	99.86	111.8	-	36.6	-
PM2.5(ug/m3) Average	719	1	1	100	12	0	7.3	0
Temperature (C) Average	720	0	0	100	14	-	7.6	-
Relative Humidity (%) Average	720	0	0	100	97.9	-	93.7	-
Wind Speed 10 m (km/h) Average	720	0	0	100	23	-	16	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS04)  
NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	686	0.25	0.9	-	0	0	0	0.1	0.2	0.3	10.9
H2S (ppb) Average	685	0.16	0.2	-	0	0	0.1	0.1	0.2	0.3	2.2
THC (ppm) Average	684	2.13	0.1	-	2	2.1	2.1	2.1	2.1	2.3	3.7
NMHC(ppm) Average	684	0	0	-	0	0	0	0	0	0	0.001
CH4(ppm) Average	684	2.13	0.1	-	2	2.1	2.1	2.1	2.1	2.3	3.7
O3(ppb) Average	685	18.34	8.4	-	1.4	5.4	12.7	19.2	24.7	29.3	38.2
NO2(ppb) Average	684	5.95	6.8	-	0.2	0.7	1.4	3.1	7.3	16.7	30.3
NO(ppb) Average	684	2.24	7.3	-	0	0	0	0.2	0.7	6.2	92.8
NOX(ppb) Average	684	8.19	12.6	-	0.2	0.9	1.5	3.4	8.2	23.2	111.8
PM2.5(ug/m3) Average	719	3.26	1.8	-	0.3	1.3	2	3	4.1	5.2	12
Temperature 2 m (C) Average	720	-7.71	8.6	-	-28.6	-19.1	-14.5	-5.9	-1.1	2.5	14
Relative Humidity (%) Average	720	82.83	9.1	-	35.2	73.6	77.7	83.5	88.6	94.3	97.9
Wind Speed 10 m (km/h) Average	720	8.1	4	-	0	4	5	7	11	14	23
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS04)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL GASEOUS ANALYZERS	26 Nov 2024 08:00	26 Nov 2024 08:00	1	Maintenance - sample manifold cleaned
THC/NMHC/CH4	25 Nov 2024 08:00	25 Nov 2024 09:00	2	Maintenance - replaced support gas cylinder



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 10.9 ppb on Nov 21 14:00	Maximum Daily Average: 1.9 ppb on Nov 21		Hours of Data:	686
Minimum Value: 0.0 ppb on Nov 1 08:00	Minimum Daily Average: 0.0 ppb on Nov 6		Hours of Missing Data:	34
Maximum Diurnal Average: 0.5 ppb at hour 14	Minimum Diurnal Average: 0.1 ppb at hour 24		Hours of Calibration:	33
Monthly Average: 0.25 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.1 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 0.3 P <sub>99</sub> = 5.2		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.9	0.7	0.5	0.6	0.4	0.3	0.0	0.1	0.1	0.1	0.2	0.9
2-Nov	Z	0.1	0.1	0.4	7.7	4.9	2.2	1.9	2.2	0.9	5.3	2.6	0.5	0.3	0.3	0.2	0.2	0.4	0.4	0.3	0.2	0.2	0.2	0.1	1.4	7.7
3-Nov	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3
4-Nov	0.2	0.2	Z	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.2
5-Nov	0.0	0.1	0.3	Z	0.5	1.4	5.6	3.0	1.9	1.0	0.7	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	5.6
6-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7-Nov	0.1	0.3	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
8-Nov	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.3	0.2	0.0	0.1	0.1	0.3
9-Nov	0.1	Z	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.3
10-Nov	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.2	0.0	0.0	0.0	0.1	0.2	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3
11-Nov	0.1	0.1	0.2	Z	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.2
12-Nov	0.1	0.0	0.0	0.1	Z	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
13-Nov	0.0	0.0	0.0	0.0	0.1	Z	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.3	0.4	0.1	0.3	0.2	0.3	0.1	0.1	0.1	0.2	0.1	0.4
14-Nov	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.2
15-Nov	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.3
16-Nov	0.0	0.1	Z	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.3
17-Nov	0.0	0.1	0.1	Z	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.1	0.0	0.1	0.2
18-Nov	0.0	0.0	0.1	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.8	0.2	0.1	0.0	0.0	0.0	1.2	0.2	0.1	0.0	0.1	0.1	1.2
19-Nov	0.2	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
20-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2
21-Nov	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	1.8	0.9	3.1	10.6	10.9	1.3	5.1	7.2	1.3	0.2	0.2	0.1	0.1	0.1	0.0	1.9	10.9
22-Nov	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
23-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24-Nov	0.2	0.1	0.0	0.0	Z	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2
25-Nov	0.2	0.1	0.1	0.1	0.1	Z	0.2	0.3	0.3	0.3	0.3	0.6	0.6	0.5	0.4	0.5	0.3	0.2	0.2	0.4	0.4	0.4	0.5	0.5	0.3	0.6
26-Nov	Z	0.5	0.4	0.3	0.2	0.3	0.3	M	0.2	0.1	0.3	0.3	0.2	0.3	0.2	0.3	0.1	0.2	0.1	0.3	0.0	0.1	0.2	0.2	0.2	0.5
27-Nov	0.1	Z	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.1	1.0	1.5	2.6	5.9	3.7	4.4	1.6	0.4	0.2	0.1	1.0	5.9
28-Nov	0.2	0.2	Z	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	1.1	0.6	0.2	0.2	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.2	1.1
29-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.1	0.0	0.1	0.1	0.2	0.0	0.0	0.2	0.1	0.1	0.6
30-Nov	0.1	0.3	0.2	0.1	Z	0.5	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.2	0.0	0.4	0.6	0.1	0.0	0.0	0.1	0.6

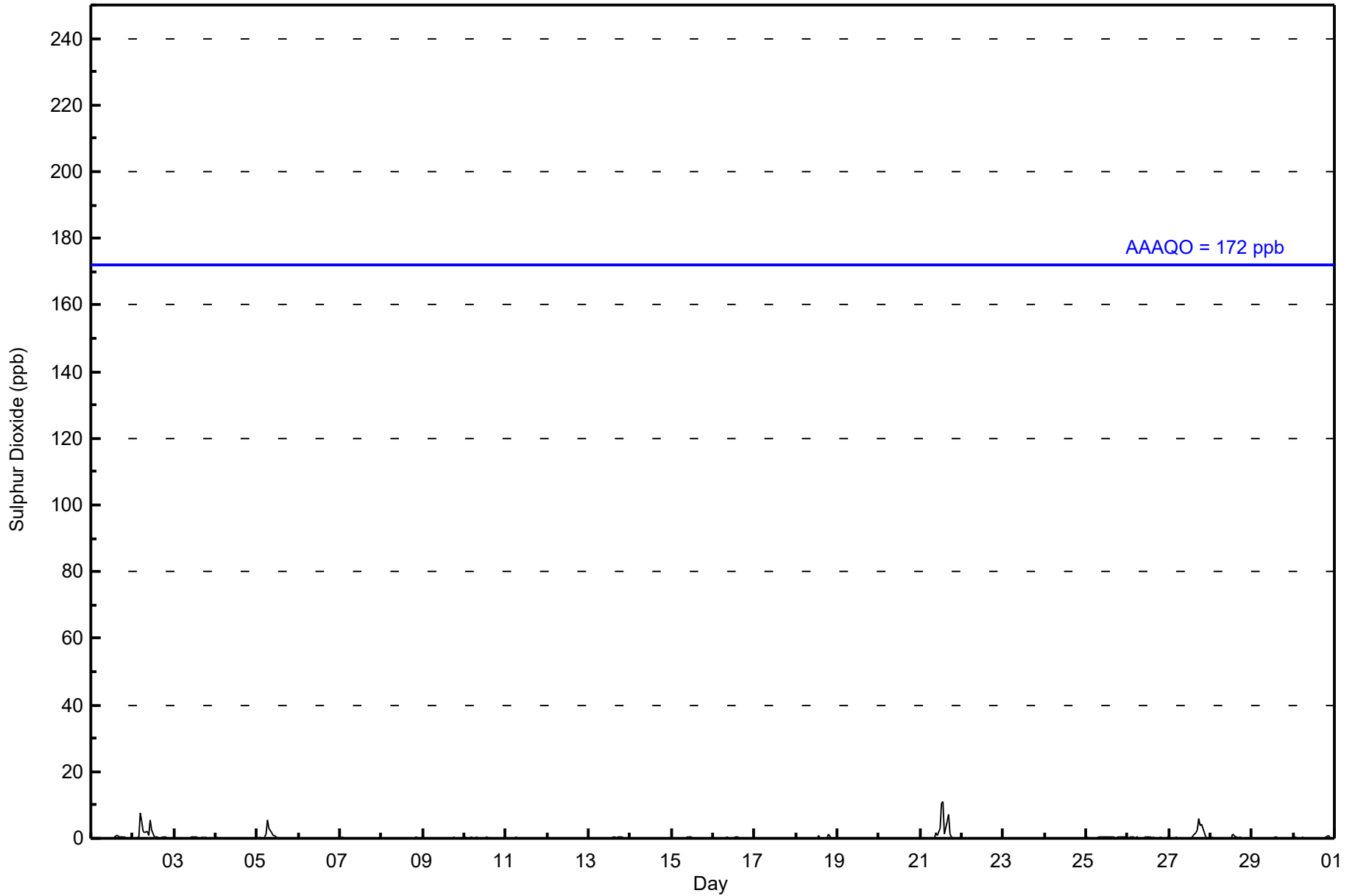
0.1	0.1	0.1	0.1	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.5	0.5	0.3	0.3	0.4	0.3	0.2	0.3	0.2	0.1	0.1	0.1	Diurnal Average	
0.2	0.5	0.4	0.4	7.7	4.9	5.6	3.0	2.2	1.8	5.3	3.1	10.6	10.9	1.3	5.1	7.2	5.9	3.7	4.4	1.6	0.4	0.5	0.5	Diurnal Maximum		

Z - zerospan      C - Calibration      M - Maintenance  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb    24-hr 48 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Buffalo Viewpoint - November 2024**







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Buffalo Viewpoint - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	684	99.71	99.71
11 - 20	2	0.29	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Buffalo Viewpoint - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	112	70	22	5	3	13	56	127	33	24	20	40	45	47	29	38	684
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	112	70	22	5	3	13	56	127	33	24	20	40	45	47	29	40	686

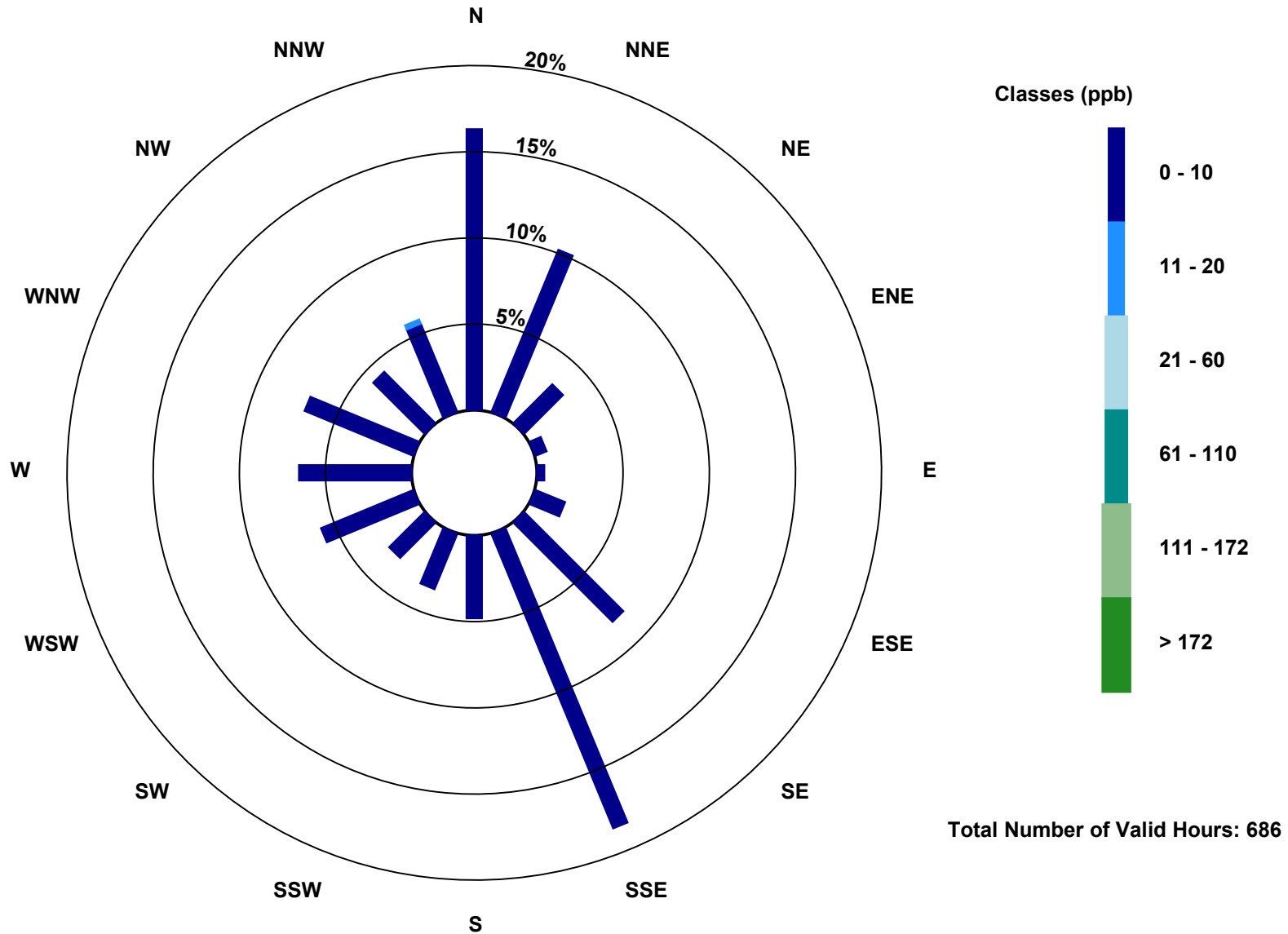
Total Number of Valid Hours: 686

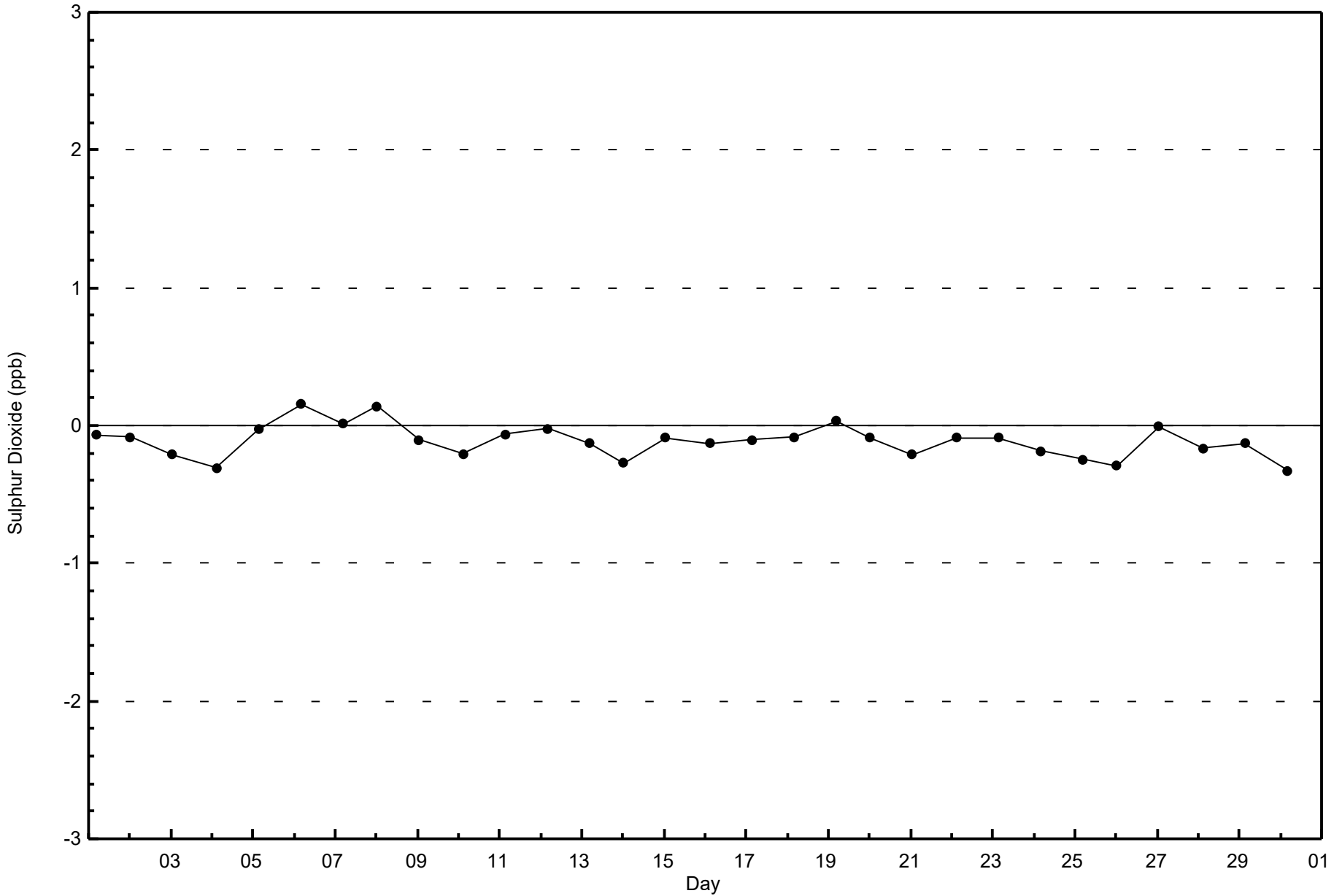
Total Number of Hours: 720

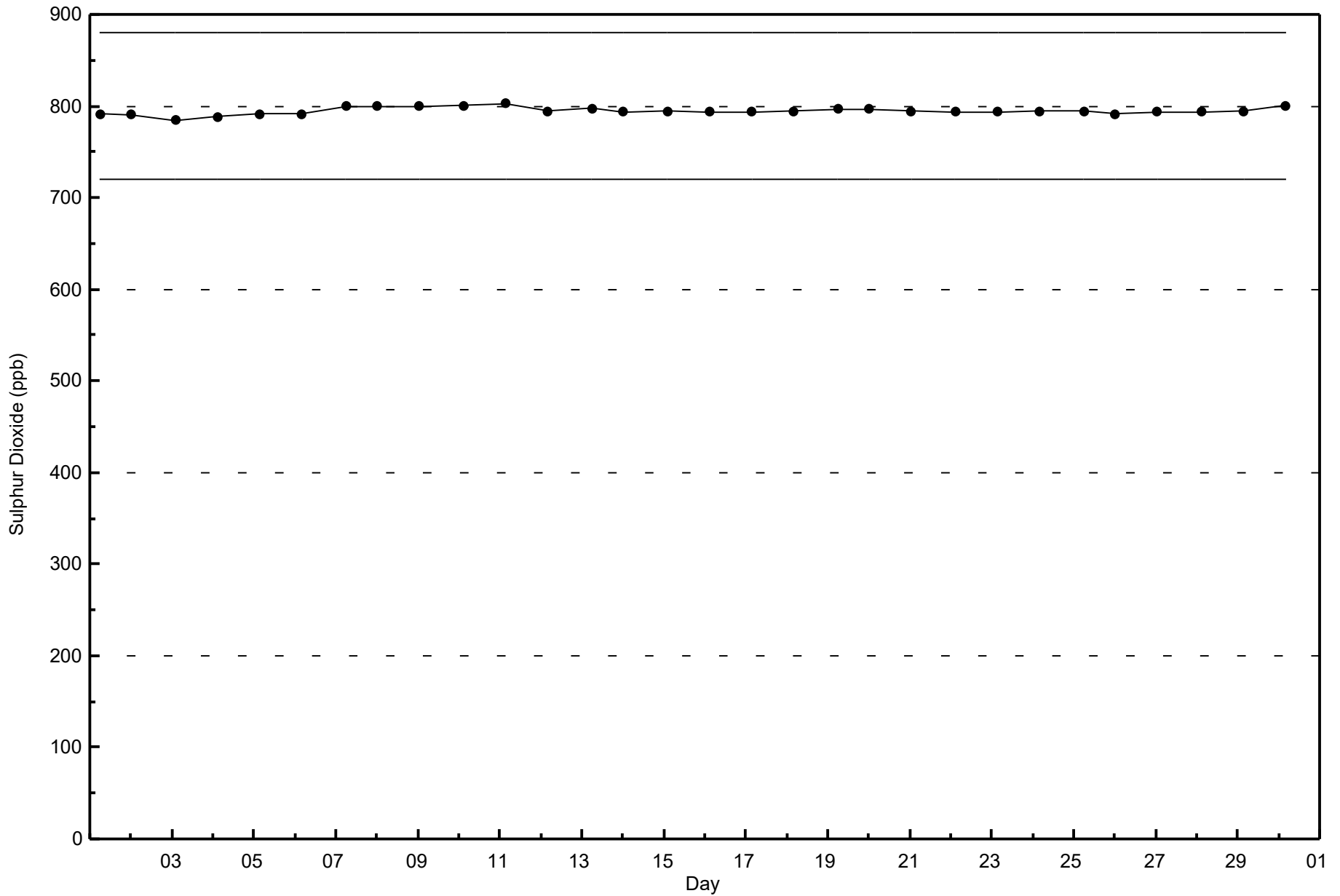


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Buffalo Viewpoint









Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H<sub>2</sub>S) - ppb

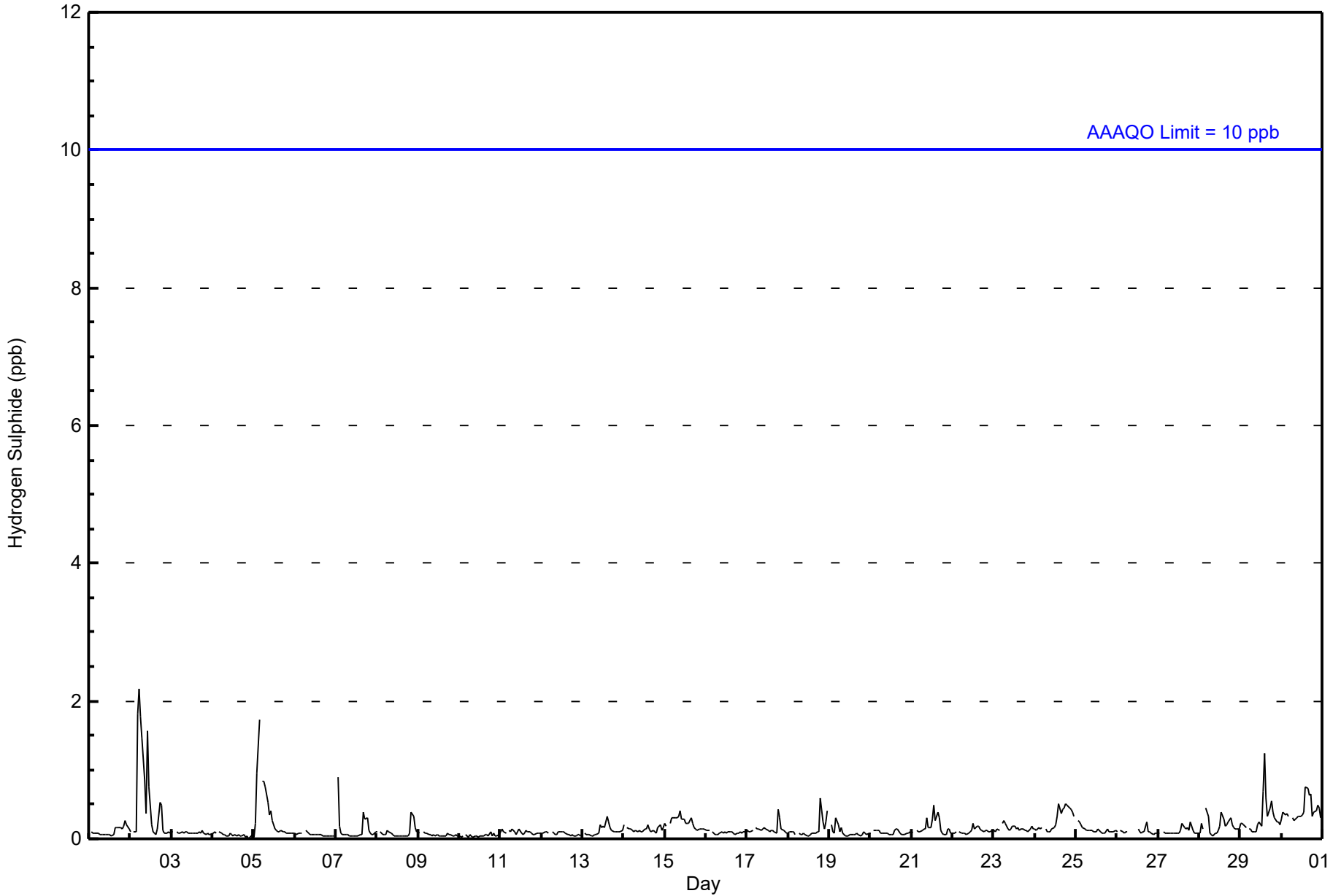
Buffalo Viewpoint - November 2024

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720																											
Maximum Value: 2.2 ppb on Nov 2 06:00		Maximum Daily Average: 0.6 ppb on Nov 2																	Hours of Data:	685																													
Minimum Value: 0.0 ppb on Nov 4 22:00		Minimum Daily Average: 0.0 ppb on Nov 10																	Hours of Missing Data:	35																													
Maximum Diurnal Average: 0.2 ppb at hour 6		Minimum Diurnal Average: 0.1 ppb at hour 1																	Hours of Calibration:	34																													
Monthly Average: 0.16 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.1 Median = 0.1 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 0.3 P <sub>99</sub> = 1.0																	Percent Operational Time:	99.9																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.2	0.1	0.1	0.3																							
2-Nov	0.1	Z	0.1	0.1	1.8	2.2	1.8	1.5	0.8	0.4	1.6	0.7	0.2	0.1	0.1	0.1	0.1	0.5	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.6	2.2																						
3-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
4-Nov	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1																						
5-Nov	0.0	0.2	1.0	1.7	Z	0.8	0.8	0.8	0.8	0.5	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	1.7																						
6-Nov	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1																						
7-Nov	Z	0.9	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9																						
8-Nov	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.3	0.2	0.1	0.1	0.1	0.4																						
9-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1																						
10-Nov	0.0	0.0	0.0	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1																						
11-Nov	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
12-Nov	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1																						
13-Nov	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3																						
14-Nov	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.2																						
15-Nov	0.2	0.2	Z	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4																						
16-Nov	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
17-Nov	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.4																						
18-Nov	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.3	0.1	0.3	0.4	0.1	0.6																						
19-Nov	Z	0.2	0.1	0.1	0.3	0.2	0.1	0.2	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3																						
20-Nov	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
21-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.3	0.5	0.3	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5																						
22-Nov	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
23-Nov	0.1	0.1	0.1	0.1	Z	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3																						
24-Nov	0.1	0.1	0.2	0.1	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.5																						
25-Nov	Z	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3																						
26-Nov	0.1	Z	0.1	0.1	0.1	0.1	0.1	M	C	C	C	C	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3																						
27-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2																						
28-Nov	0.1	0.2	0.1	Z	0.4	0.3	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.4																						
29-Nov	0.2	0.2	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.7	1.2	0.6	0.3	0.4	0.5	0.4	0.3	0.3	0.2	0.2	0.1	1.2																						
30-Nov	0.3	0.4	0.3	0.4	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.8	0.7	0.6	0.6	0.3	0.4	0.4	0.5	0.4	0.3	0.1	0.8																						
																								0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	Diurnal Average	
																								0.3	0.9	1.0	1.7	1.8	2.2	1.8	1.5	0.8	0.4	1.6	0.7	0.3	0.7	1.2	0.7	0.6	0.6	0.5	0.6	0.5	0.5	0.4	0.4	Diurnal Maximum	
Z - zerospan      C - Calibration      M - Maintenance																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb      24-hr 3 ppb																																																	



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Buffalo Viewpoint - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Buffalo Viewpoint - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	685	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Buffalo Viewpoint - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	111	69	23	5	3	14	56	127	34	25	19	38	49	44	29	39	685
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	111	69	23	5	3	14	56	127	34	25	19	38	49	44	29	39	685

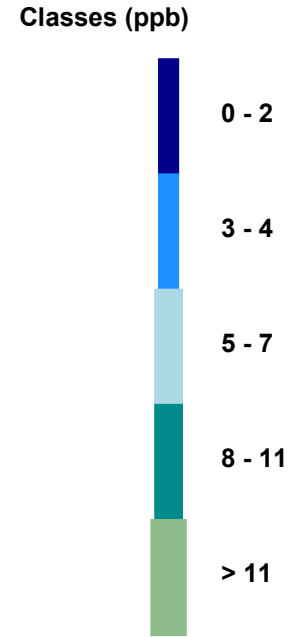
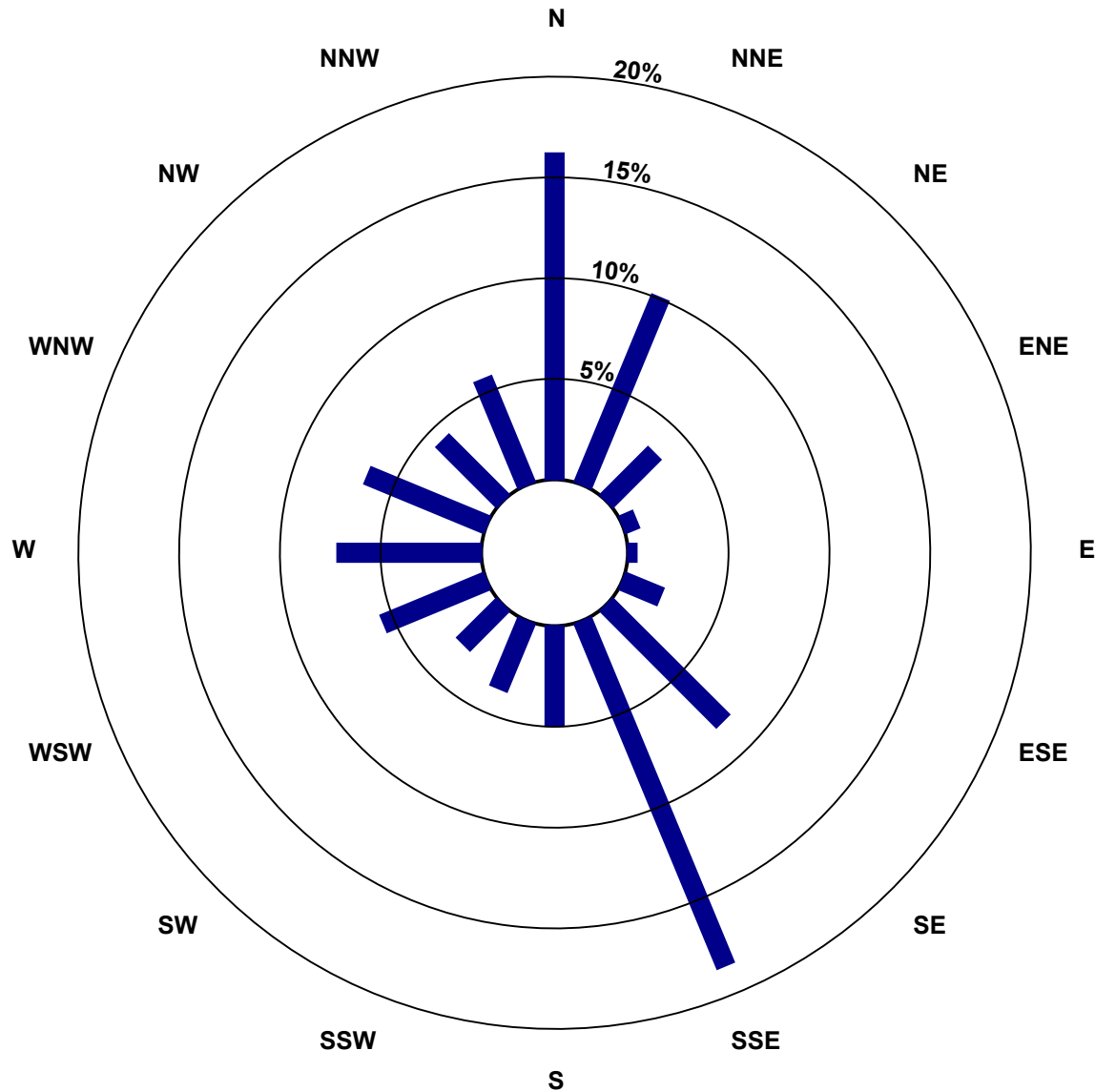
Total Number of Valid Hours: 685

Total Number of Hours: 720

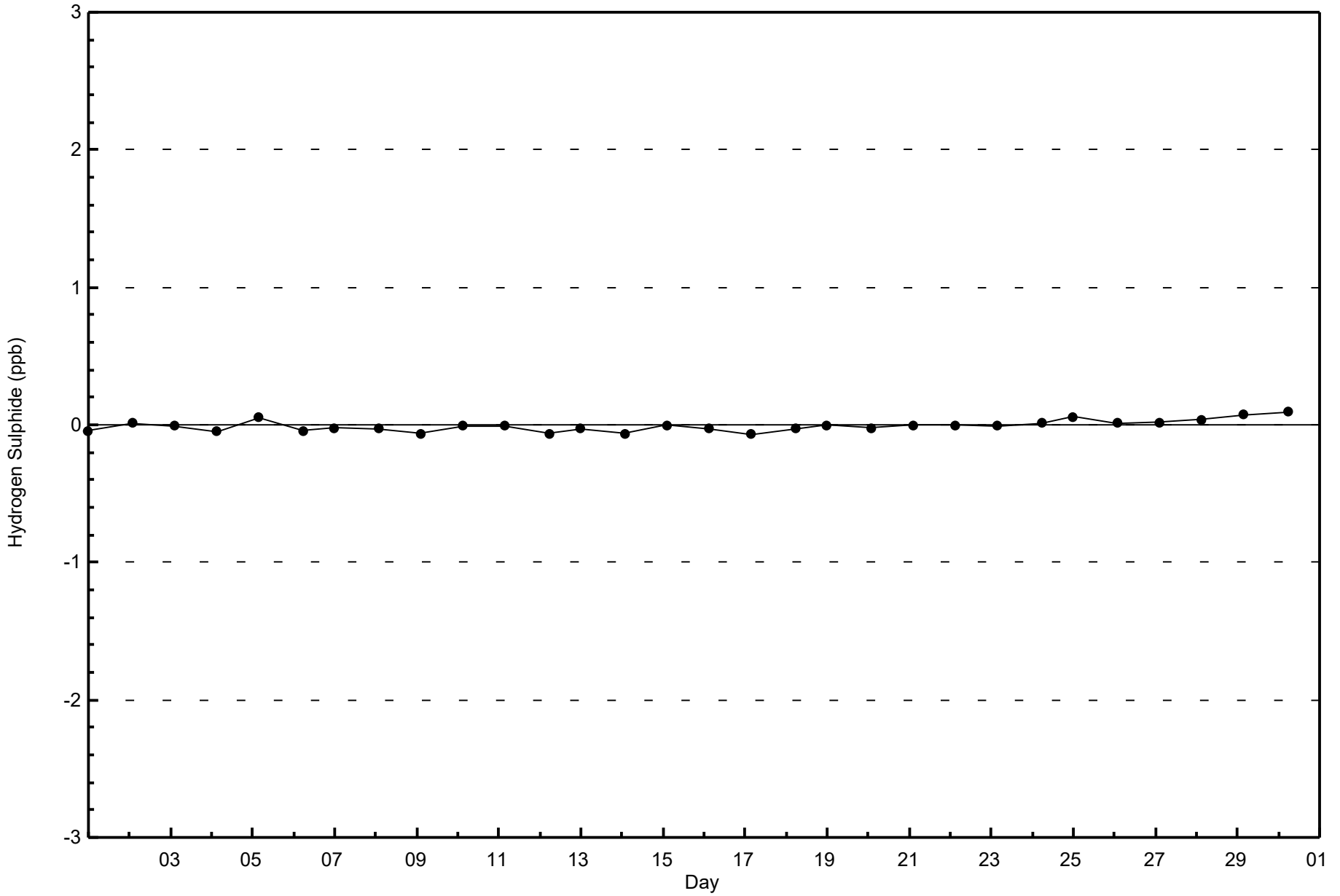


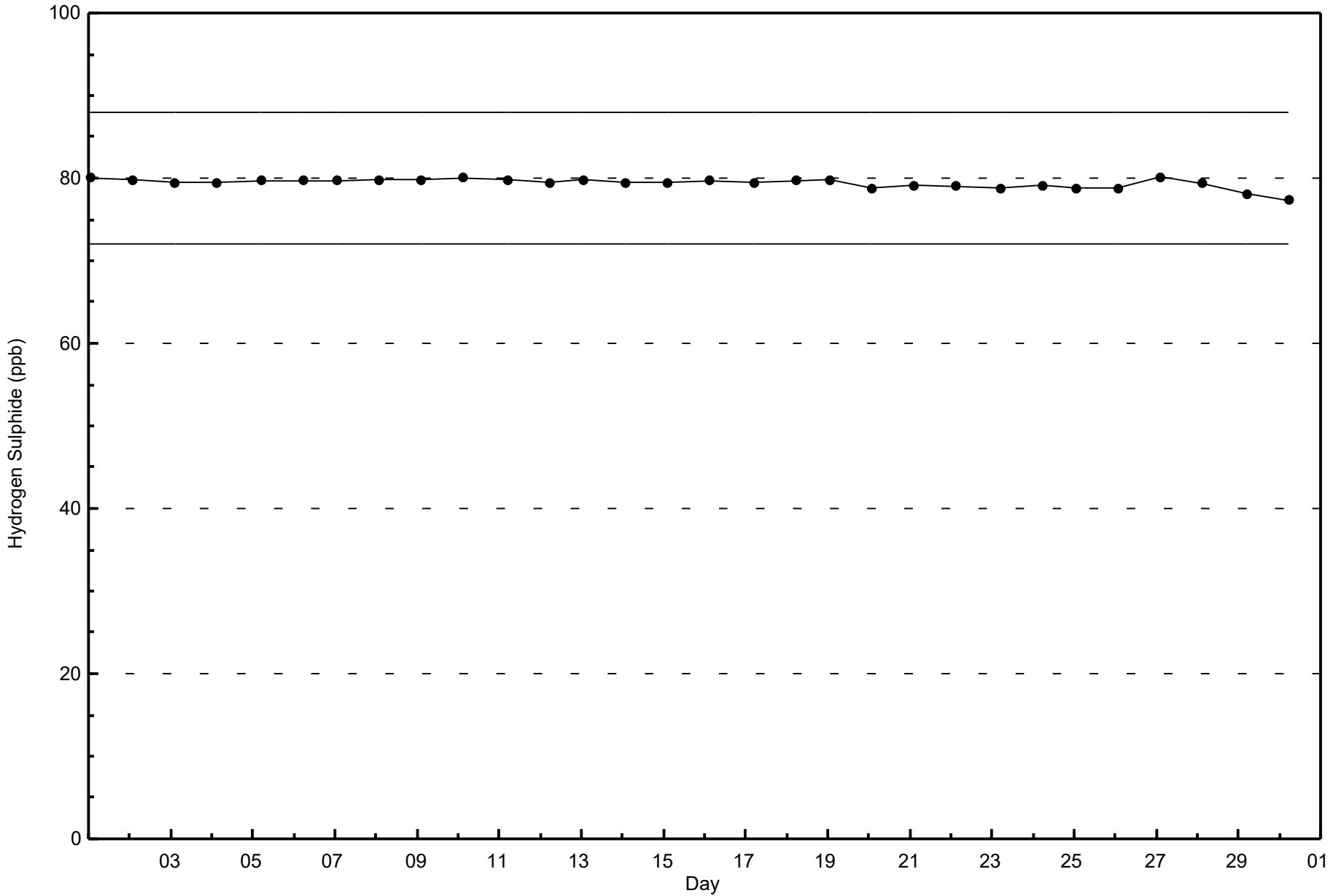
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Buffalo Viewpoint



Total Number of Valid Hours: 685



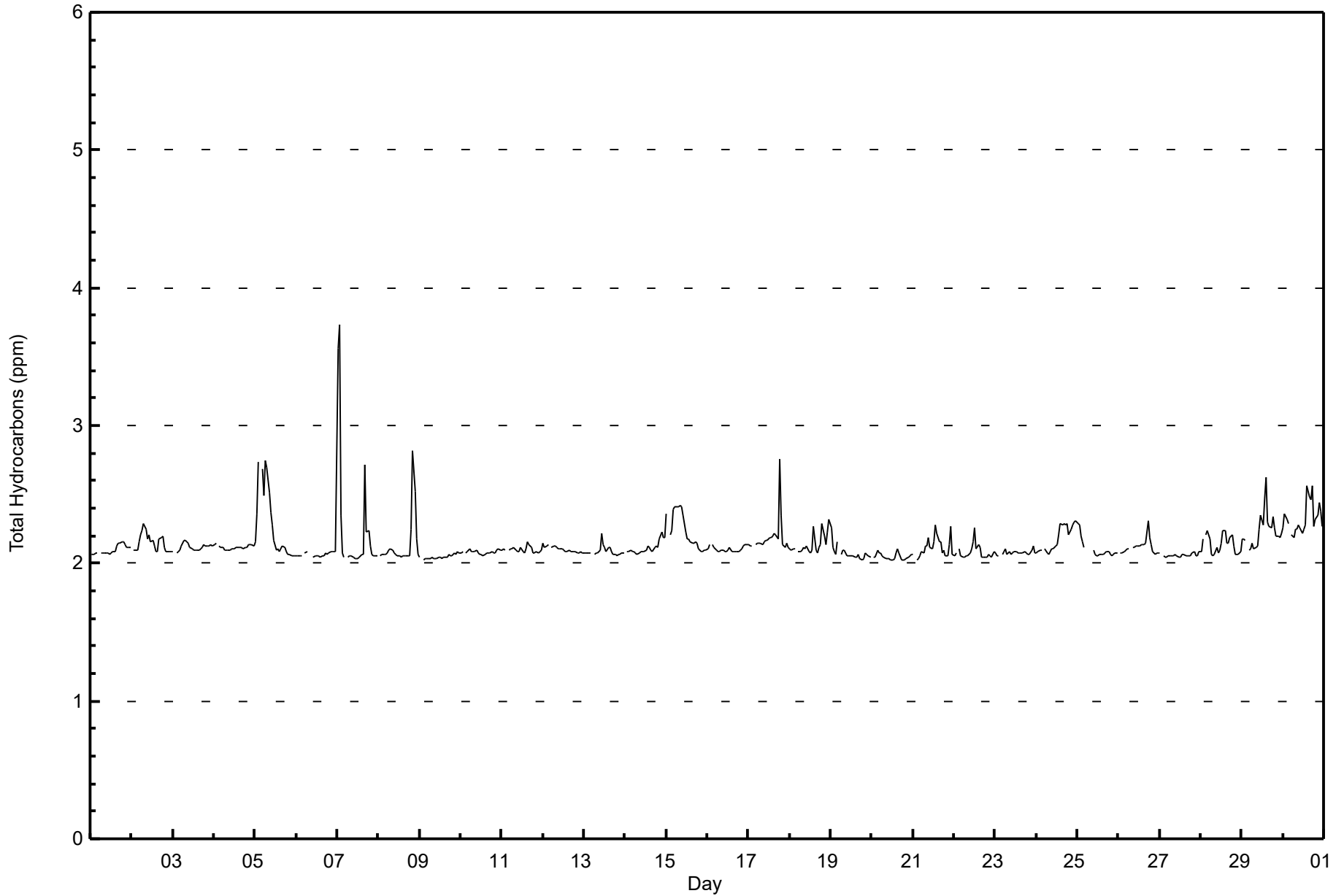






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Buffalo Viewpoint - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Buffalo Viewpoint - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	66	9.65	9.65
2.1 - 3.0	616	90.06	99.71
3.1 - 10.0	2	0.29	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Buffalo Viewpoint - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	23	4	2	0	0	0	0	1	1	2	3	9	12	5	3	1	66
2.1 - 3.0	89	66	20	5	3	13	56	124	32	22	17	31	33	42	25	38	616
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	112	70	22	5	3	13	56	125	33	24	20	40	45	47	29	40	684

Total Number of Valid Hours: 684

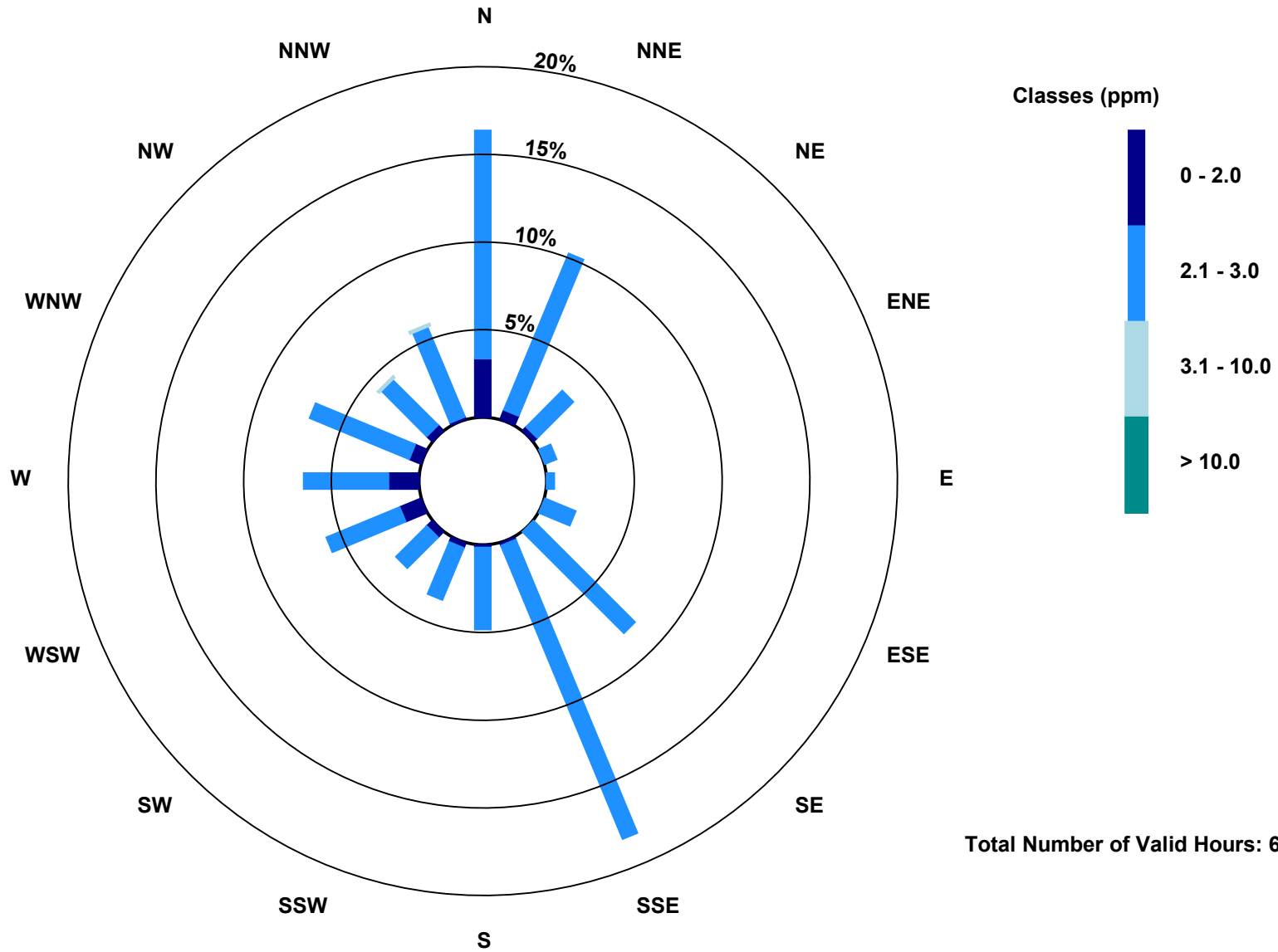
Total Number of Hours: 720



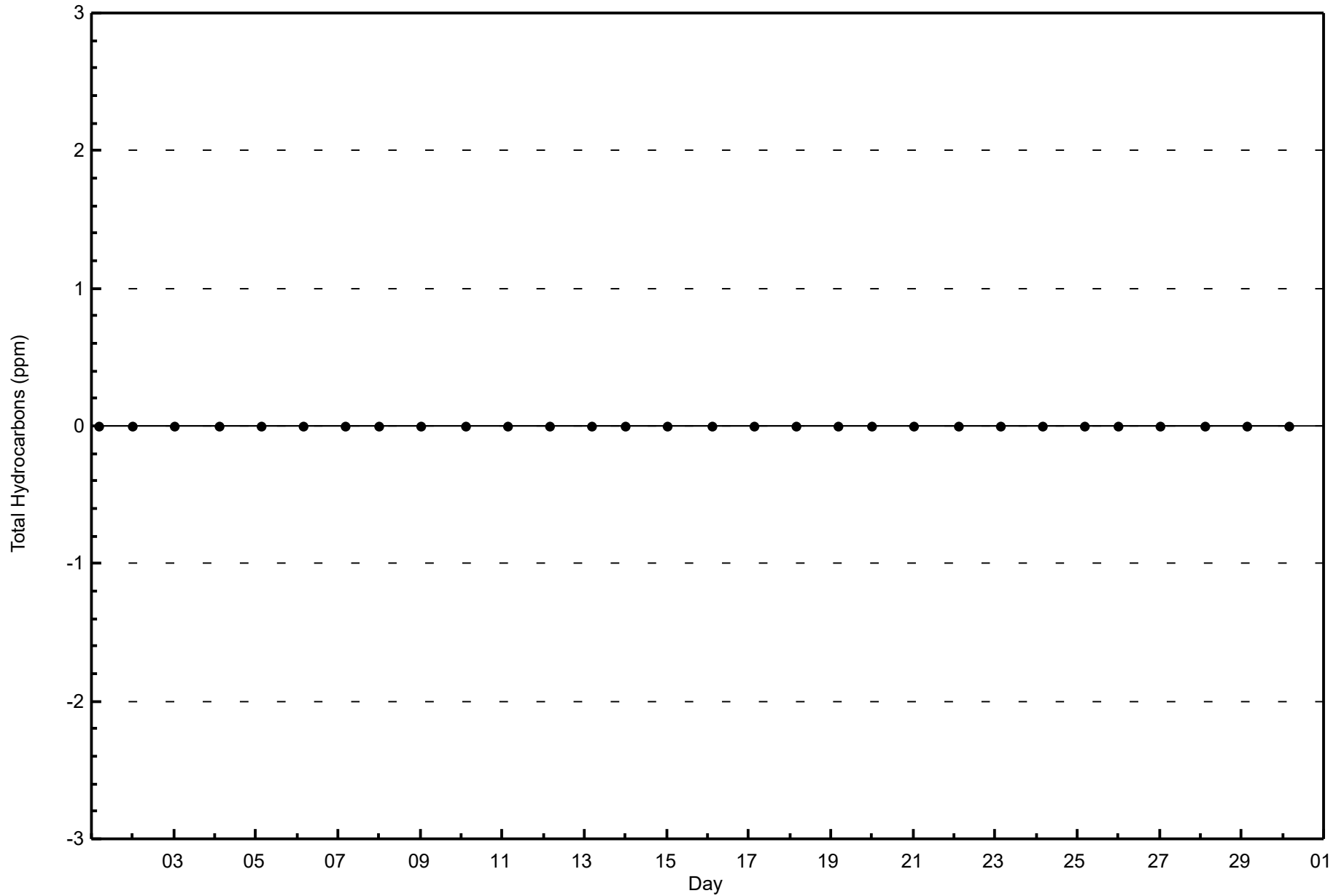


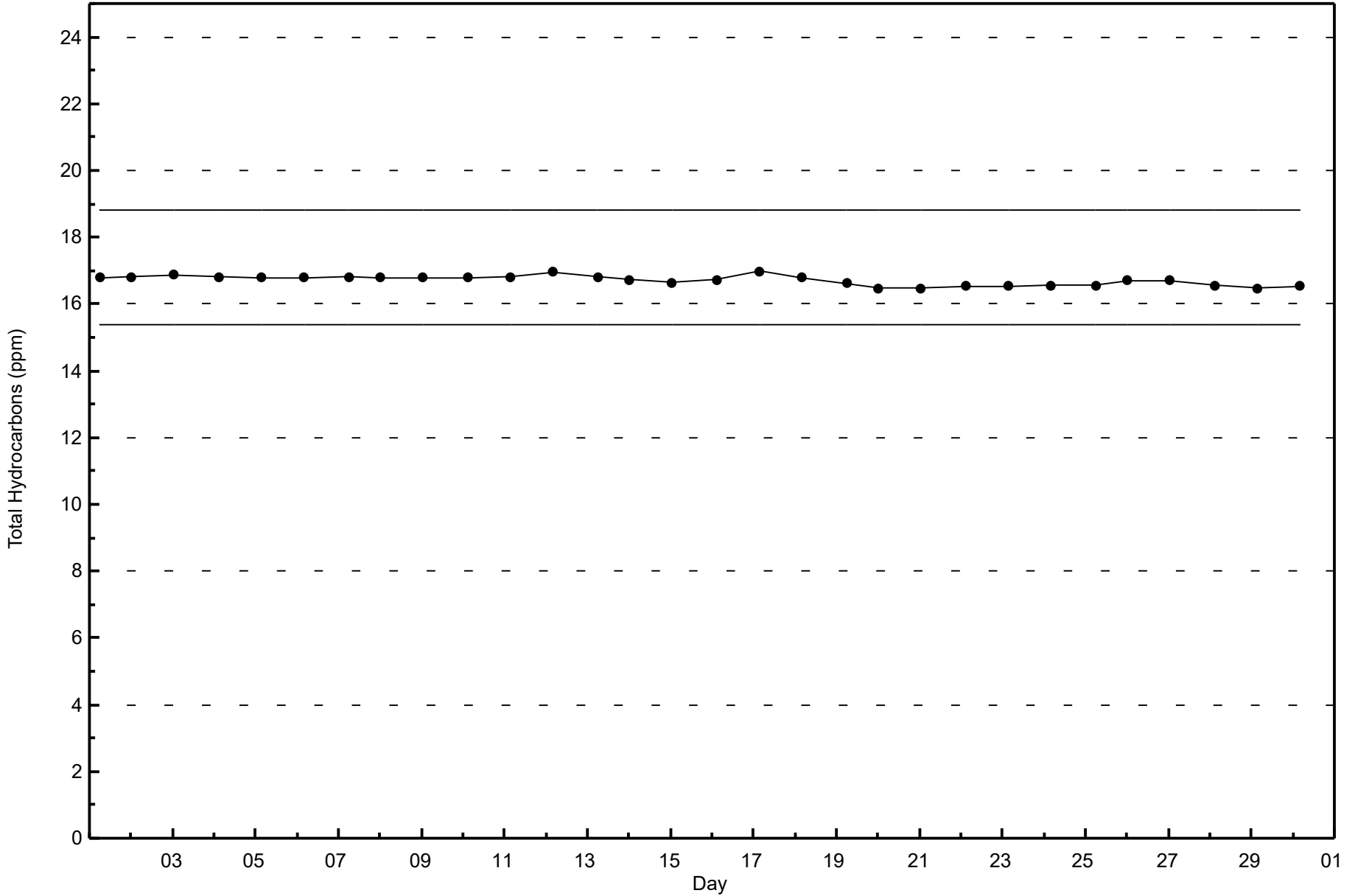
**Wood Buffalo Environmental Association**  
**Wind Rose Nov 2024**

**Total Hydrocarbons (THC) - ppm**  
**Buffalo Viewpoint**



**Total Number of Valid Hours: 684**



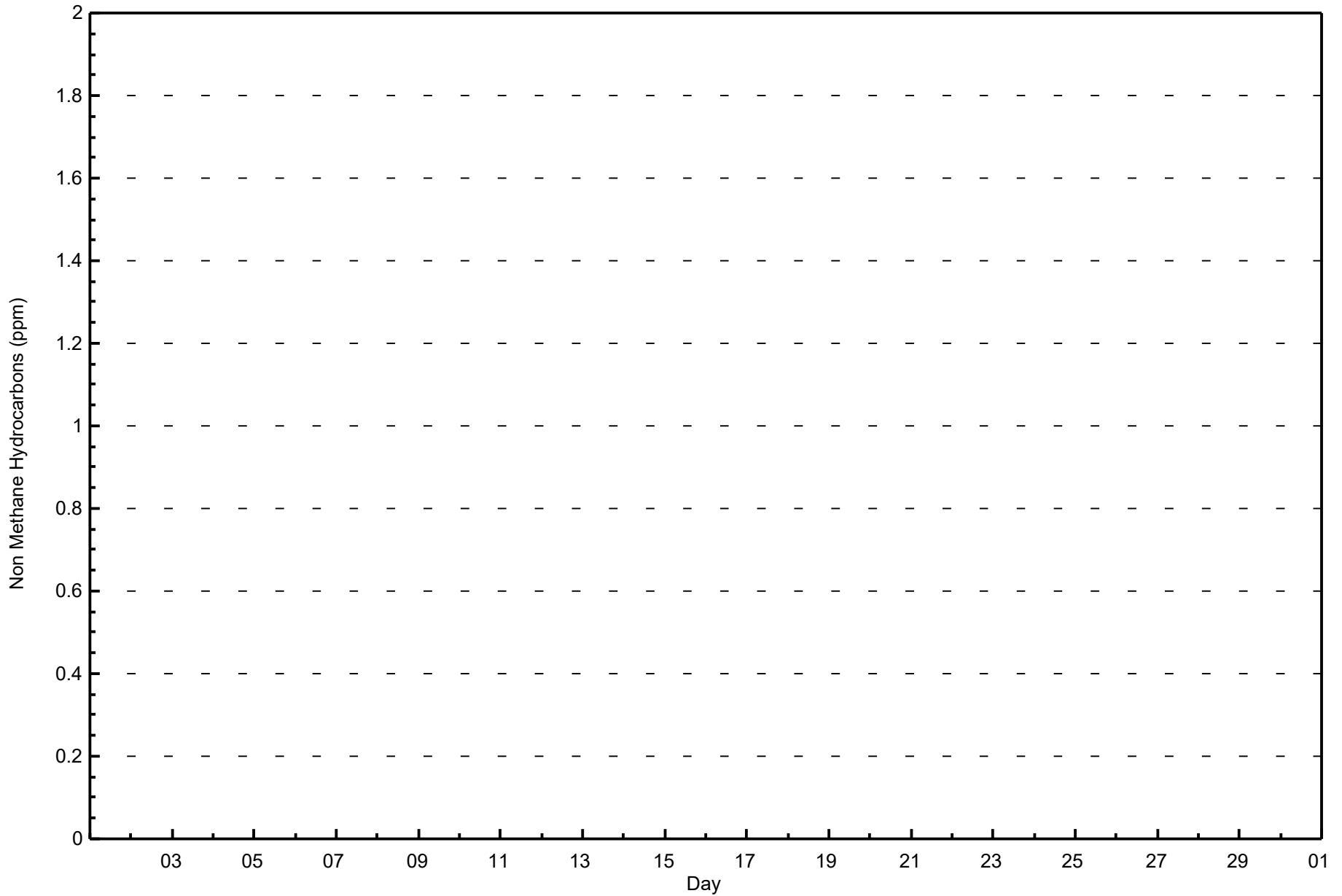






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Buffalo Viewpoint - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Buffalo Viewpoint - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	684	100.00	100.00
0.006 - 0.05	0	0.00	100.00
0.06 - 0.1	0	0.00	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Buffalo Viewpoint - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	112	70	22	5	3	13	56	125	33	24	20	40	45	47	29	40	684
0.006 - 0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.06 - 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	112	70	22	5	3	13	56	125	33	24	20	40	45	47	29	40	684

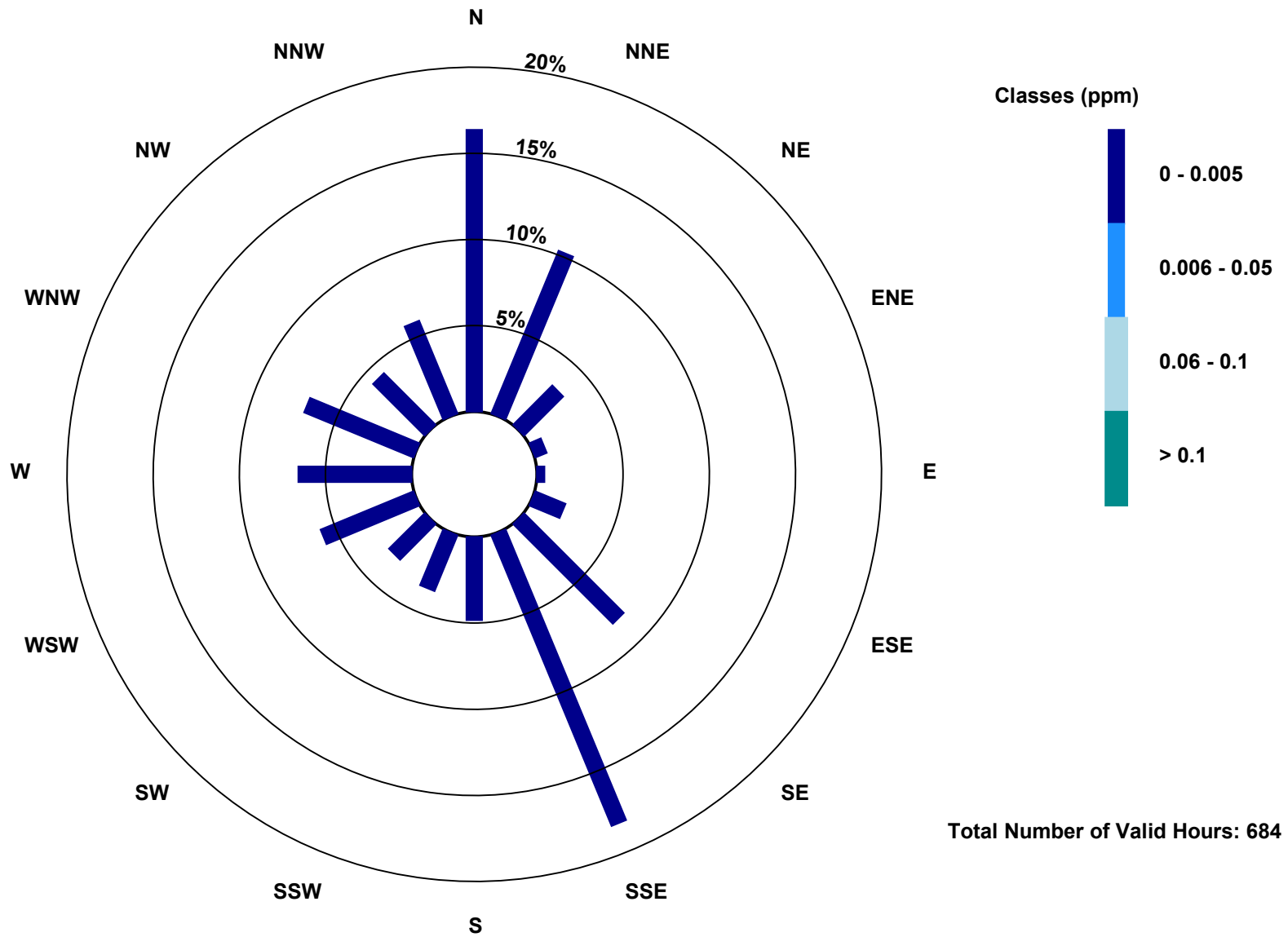
Total Number of Valid Hours: 684

Total Number of Hours: 720

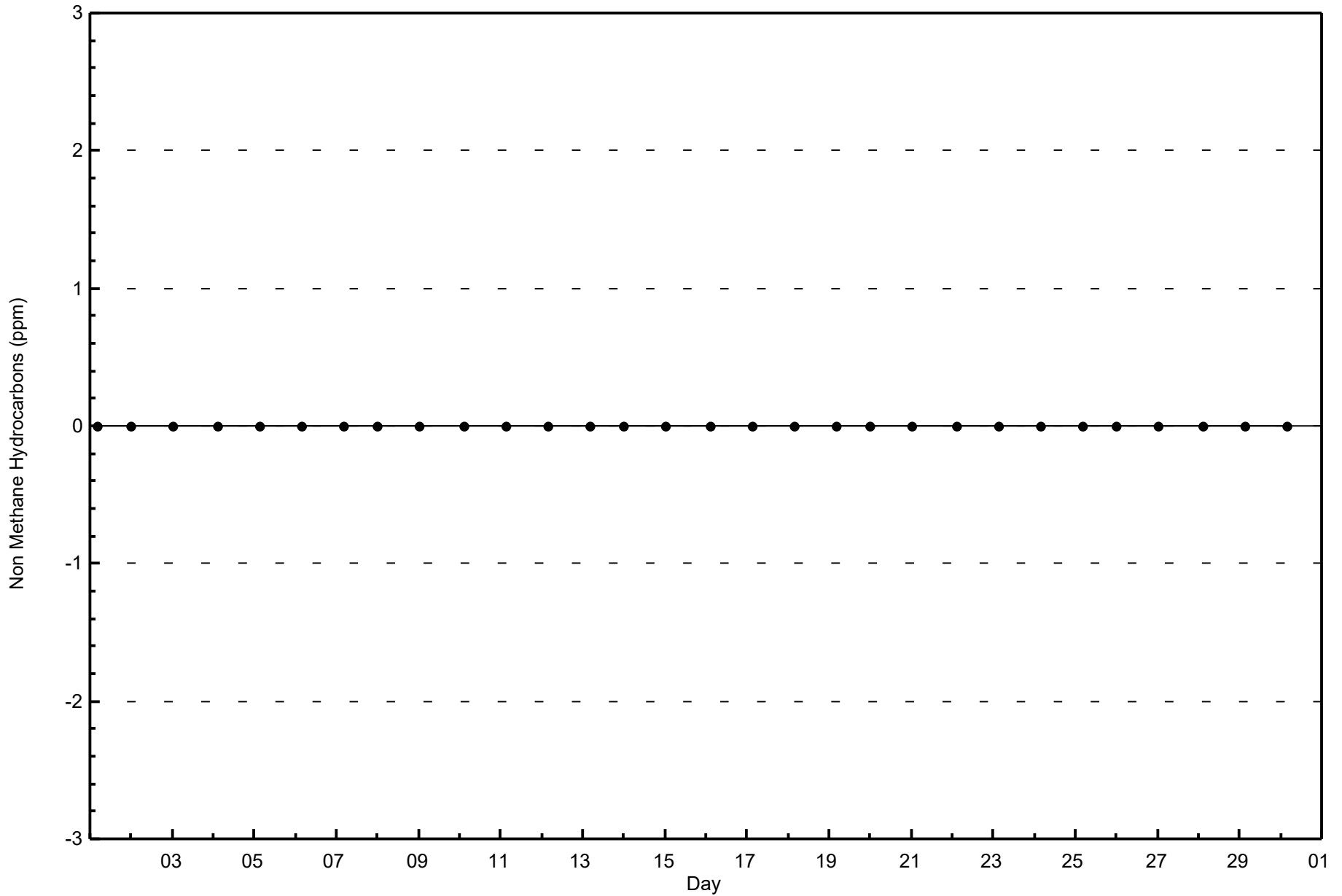


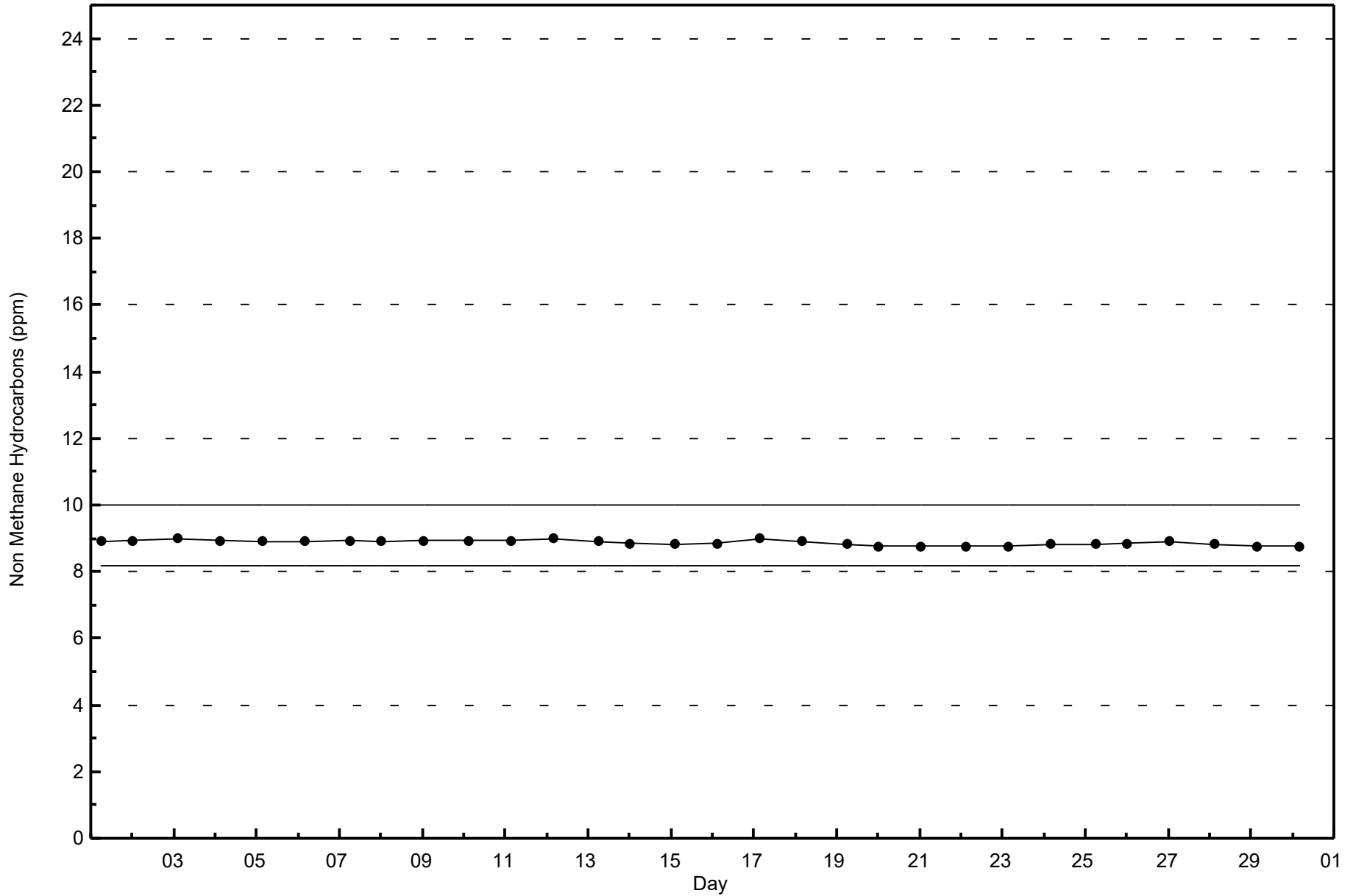
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Non Methane Hydrocarbons (NMHC) - ppm  
Buffalo Viewpoint







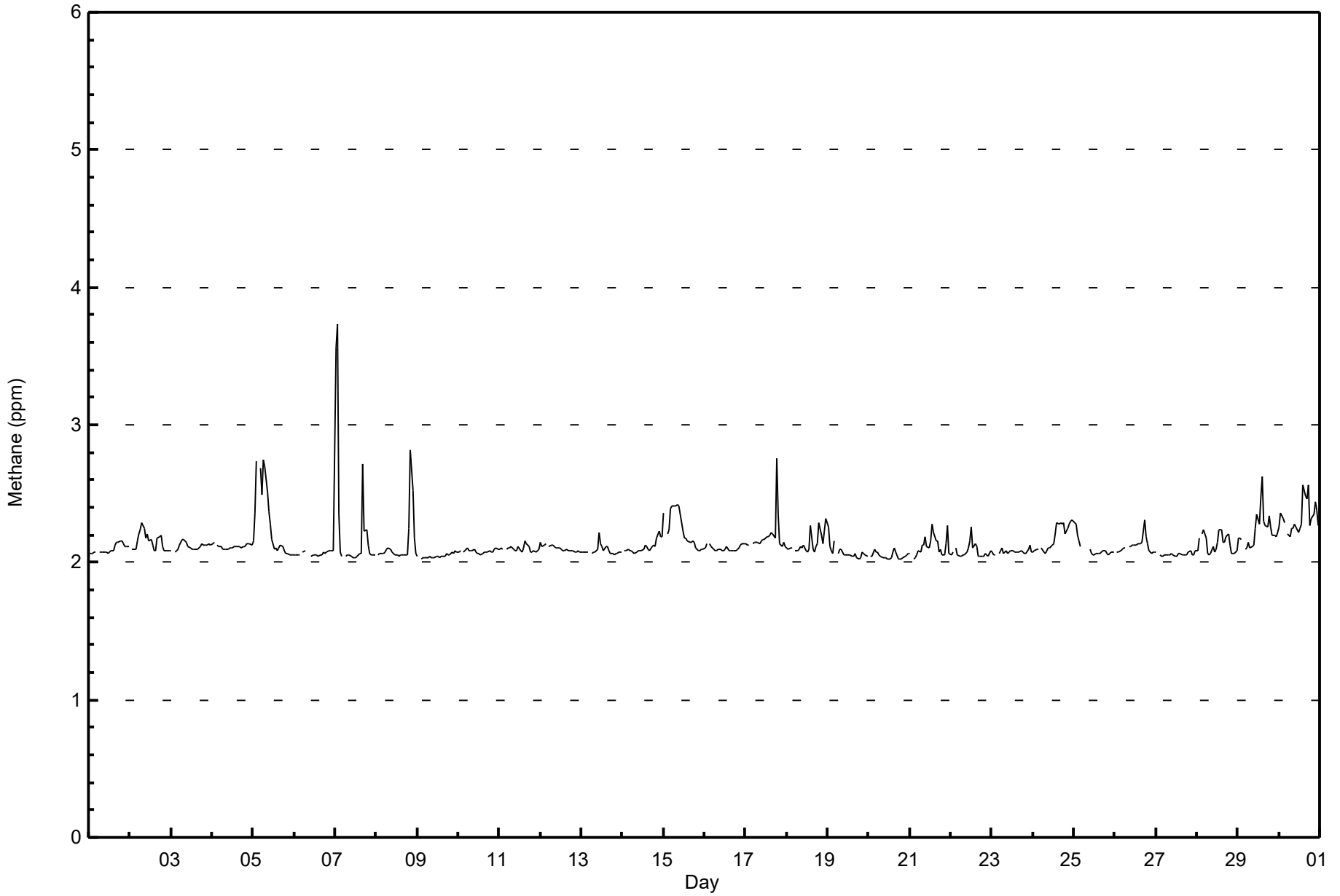




Summary of Hour Averages

Buffalo Viewpoint - November 2024

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 3.7 ppm on Nov 7 02:00 Maximum Daily Average: 2.3 ppm on Nov 30																	Hours in Service: 720 Hours of Data: 684 Hours of Missing Data: 36 Hours of Calibration: 33 Percent Operational Time: 99.6									
Minimum Value: 2.0 ppm on Nov 9 03:00 Minimum Daily Average: 2.0 ppm on Nov 9 Maximum Diurnal Average: 2.2 ppm at hour 2 Minimum Diurnal Average: 2.1 ppm at hour 4 Monthly Average: 2.13 ppm Percentiles: P <sub>1</sub> = 2.0 P <sub>10</sub> = 2.1 Q <sub>1</sub> = 2.1 Median = 2.1 Q <sub>3</sub> = 2.1 P <sub>90</sub> = 2.3 P <sub>99</sub> = 2.7																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2
2-Nov	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.3
3-Nov	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
4-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
5-Nov	2.2	2.4	2.7	Z	2.7	2.5	2.7	2.7	2.5	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.3	2.7
6-Nov	2.1	2.1	2.1	2.1	Z	2.1	2.1	C	C	C	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
7-Nov	3.6	3.7	2.3	2.1	2.0	Z	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.7	2.2	2.2	2.1	2.1	2.0	2.1	2.2	3.7	
8-Nov	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.8	2.5	2.2	2.1	2.1	2.8
9-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1
10-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
11-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
12-Nov	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
13-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
14-Nov	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.2
15-Nov	2.4	Z	2.2	2.2	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.4
16-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
17-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.8	2.4	2.1	2.1	2.1	2.1	2.2	2.8
18-Nov	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.1	2.1	2.1	2.3	2.2	2.1	2.2	2.3	2.1	2.3
19-Nov	2.3	2.1	2.1	2.1	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.3
20-Nov	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1
21-Nov	2.1	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.1	2.1	2.0	2.1	2.1	2.3	2.1	2.1	2.3
22-Nov	2.0	2.1	Z	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.3	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.3
23-Nov	2.1	2.0	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
24-Nov	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.2	2.3
25-Nov	2.3	2.3	2.2	2.2	2.1	Z	2.1	M	M	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
26-Nov	Z	2.1	2.1	2.1	2.1	2.1	2.1	M	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.3
27-Nov	2.1	Z	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
28-Nov	2.1	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2
29-Nov	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.3	2.5	2.6	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.6
30-Nov	2.3	2.4	2.3	2.3	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.3	2.6	2.5	2.5	2.6	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.6
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerspan C - Calibration M - Maintenance																										





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Buffalo Viewpoint - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	66	9.65	9.65
2.1 - 3.0	616	90.06	99.71
3.1 - 10.0	2	0.29	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Buffalo Viewpoint - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	23	4	2	0	0	0	0	1	1	2	3	9	12	5	3	1	66
2.1 - 3.0	89	66	20	5	3	13	56	124	32	22	17	31	33	42	25	38	616
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	112	70	22	5	3	13	56	125	33	24	20	40	45	47	29	40	684

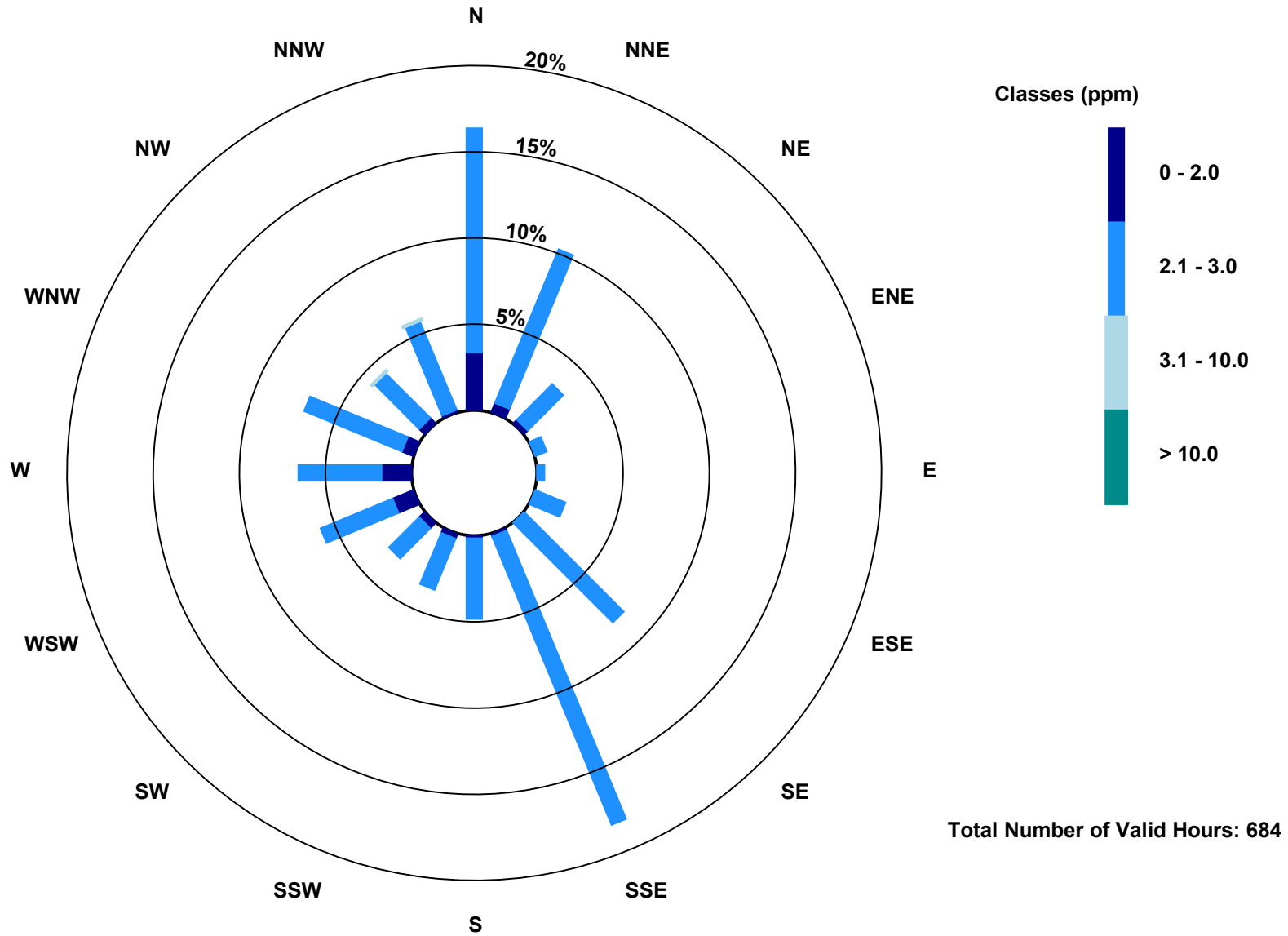
Total Number of Valid Hours: 684

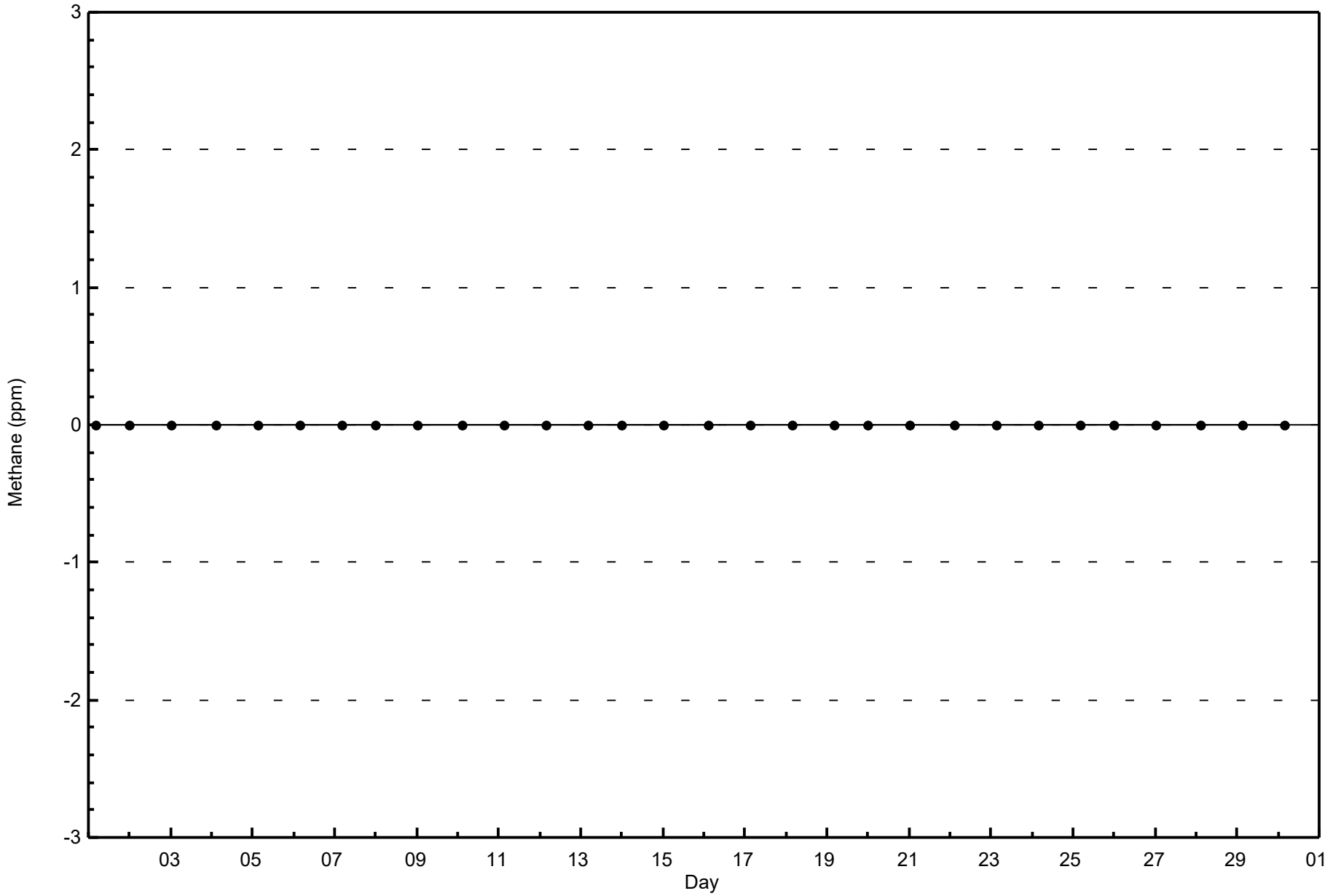
Total Number of Hours: 720



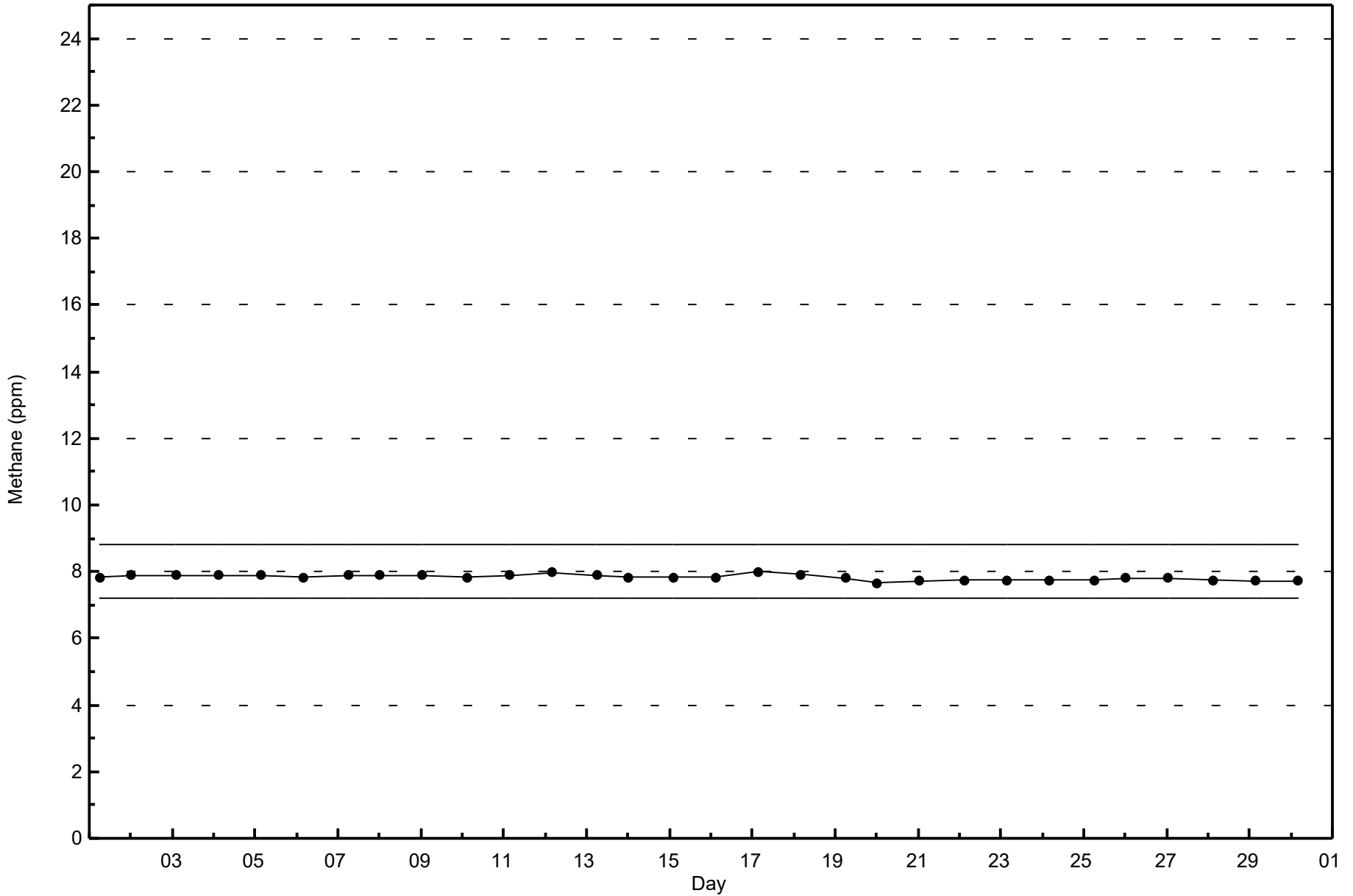
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Methane (CH<sub>4</sub>) - ppm  
Buffalo Viewpoint









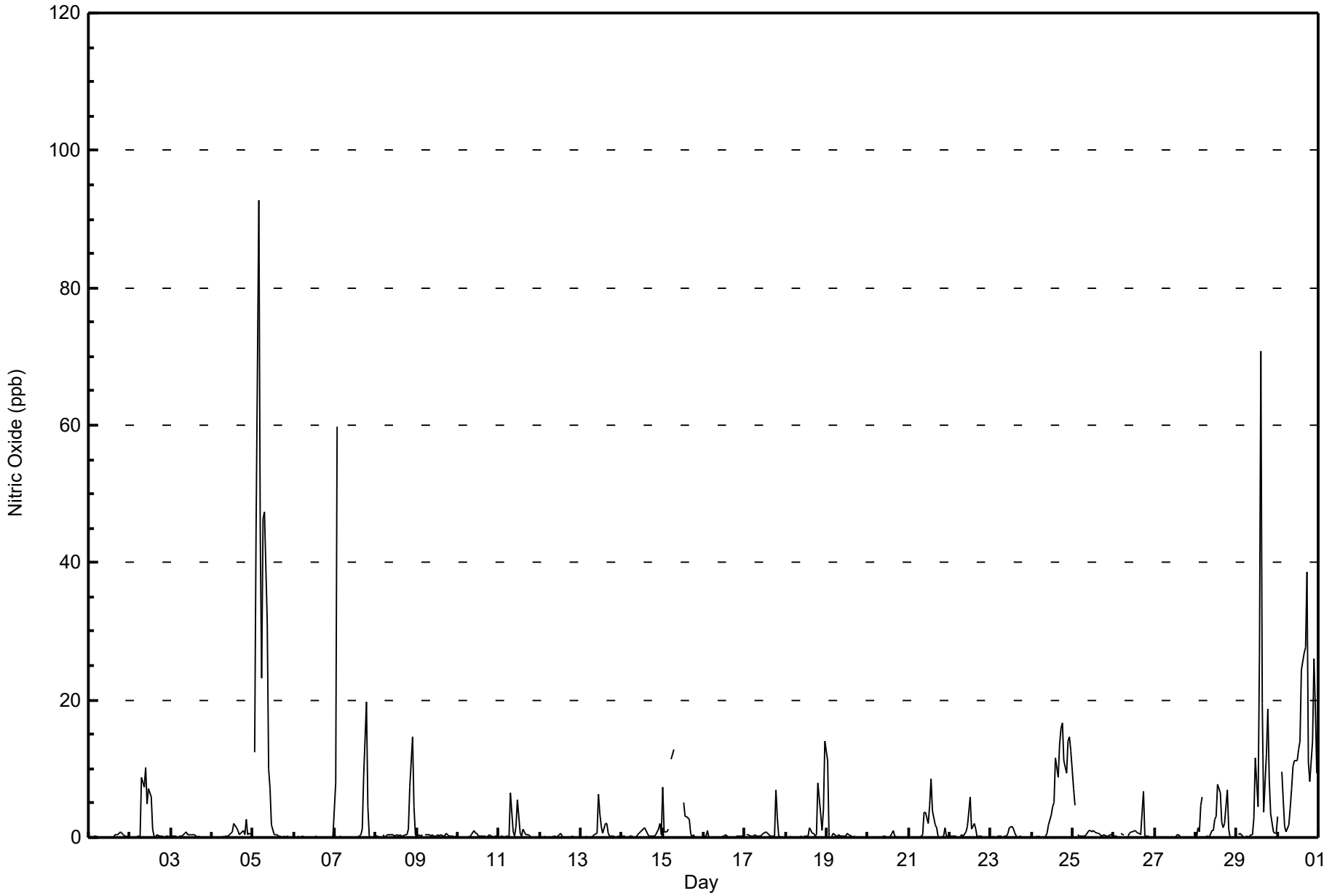


Maximum Value: 92.8 ppb on Nov 5 04:00																				Maximum Daily Average: 15.8 ppb on Nov 5					Hours in Service: 720	
Minimum Value: 0.0 ppb on Nov 1 08:00																				Minimum Daily Average: 0.0 ppb on Nov 6					Hours of Data: 684	
Maximum Diurnal Average: 4.5 ppb at hour 15																				Minimum Diurnal Average: 1.3 ppb at hour 24					Hours of Missing Data: 36	
Monthly Average: 2.24 ppb																				Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.2 Q <sub>3</sub> = 0.7 P <sub>90</sub> = 6.2 P <sub>99</sub> = 39.7					Hours of Calibration: 35	
																									Percent Operational Time: 99.9	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.0	0.1	Z	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.5	0.5	0.3	0.9	0.7	0.4	0.1	0.2	0.0	0.2	0.9	
2-Nov	0.1	0.0	0.0	Z	0.3	0.1	0.1	8.8	7.4	10.2	5.0	7.1	6.0	1.3	0.3	0.1	0.5	0.2	0.2	0.2	0.1	0.2	0.2	0.1	2.1	10.2
3-Nov	0.1	0.2	0.1	0.2	Z	0.2	0.2	0.3	0.6	0.9	0.3	0.3	0.4	0.5	0.4	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9
4-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.2	0.0	0.1	0.2	0.4	0.6	0.8	2.0	1.5	1.1	0.5	0.5	0.9	0.5	2.6	0.4	0.7	0.4	0.6	2.6
5-Nov	Z	12.5	44.6	92.8	44.3	23.2	46.5	47.5	31.2	10.0	7.0	1.9	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.0	15.8	92.8
6-Nov	0.0	Z	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3
7-Nov	7.8	59.7	Z	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	1.3	9.0	19.7	4.5	0.1	0.0	0.1	0.1	4.5	59.7
8-Nov	0.1	0.1	0.0	Z	0.4	0.1	0.2	0.4	0.5	0.3	0.4	0.2	0.4	0.3	0.4	0.2	0.2	0.3	0.3	1.1	7.2	14.7	4.4	0.5	1.4	14.7
9-Nov	0.2	0.4	0.2	0.3	Z	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.4	0.2	0.1	0.7	0.4	0.2	0.2	0.2	0.0	0.2	0.3	0.7
10-Nov	0.1	0.0	0.0	0.0	0.0	Z	0.3	0.1	0.4	1.1	0.5	0.6	0.2	0.3	0.3	0.2	0.2	0.1	0.4	0.1	0.1	0.0	0.2	0.2	0.2	1.1
11-Nov	Z	0.2	0.2	0.1	0.1	0.1	0.0	6.5	0.8	0.1	1.6	5.6	0.5	0.2	1.2	0.9	0.5	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.8	6.5
12-Nov	0.0	Z	0.2	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.5	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.5
13-Nov	0.0	0.0	Z	0.3	0.1	0.1	0.1	0.2	0.5	0.6	6.2	3.5	1.7	0.6	2.0	2.0	0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.8	6.2
14-Nov	0.2	0.1	0.3	Z	0.2	0.2	0.1	0.0	0.1	0.3	0.6	0.7	1.2	1.4	1.1	0.6	0.2	0.1	0.3	0.1	0.3	1.1	2.0	0.3	0.5	2.0
15-Nov	7.4	0.7	0.9	1.2	Z	11.5	12.9	C	C	C	C	C	5.0	3.1	3.0	2.6	0.7	0.0	0.3	0.0	0.0	0.0	0.0	0.0	2.7	12.9
16-Nov	0.3	0.2	1.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.3	0.3	0.3	0.2	1.0
17-Nov	Z	0.4	0.4	0.3	0.3	0.3	0.4	0.2	0.2	0.3	0.4	0.5	0.9	0.6	0.4	0.3	0.2	0.2	6.9	2.8	0.1	0.0	0.1	0.0	0.7	6.9
18-Nov	0.0	Z	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.3	0.2	0.3	1.4	0.6	0.5	0.3	0.4	8.0	3.5	1.1	4.2	14.1	1.5	14.1
19-Nov	11.2	0.3	Z	0.2	0.6	0.2	0.1	0.4	0.2	0.1	0.1	0.2	0.5	0.4	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	11.2
20-Nov	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.3	0.6	1.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0
21-Nov	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.4	3.7	3.6	2.0	4.7	8.5	3.9	1.9	1.4	0.3	0.1	0.0	0.2	1.5	0.2	0.2	1.4	8.5
22-Nov	0.2	0.2	0.1	0.2	0.2	Z	0.3	0.3	0.3	0.7	1.5	3.6	5.9	1.3	2.1	1.3	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.8	5.9
23-Nov	Z	0.2	0.0	0.0	0.2	0.2	0.2	0.1	0.2	0.3	0.6	1.4	1.6	1.2	0.6	0.2	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.6
24-Nov	0.0	Z	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.6	1.9	3.2	4.5	5.1	11.6	8.7	13.5	15.9	16.6	11.2	9.3	14.0	14.7	12.6	6.3	16.6
25-Nov	7.1	4.6	Z	0.5	0.1	0.2	0.1	0.2	0.4	1.0	0.9	0.8	0.9	0.9	0.7	0.6	0.3	0.2	0.4	0.3	0.3	0.2	0.3	0.4	0.9	7.1
26-Nov	0.3	0.3	0.3	Z	0.6	0.4	0.4	M	0.3	0.6	0.8	0.9	1.1	0.9	0.6	0.5	0.4	6.7	0.2	0.1	0.1	0.1	0.0	0.1	0.7	6.7
27-Nov	0.0	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.4
28-Nov	0.0	1.5	0.9	4.6	6.0	Z	0.2	0.1	0.0	1.0	1.1	2.7	3.0	7.8	6.4	2.2	1.4	2.1	6.8	1.1	0.0	0.0	0.0	0.0	2.1	7.8
29-Nov	Z	0.3	0.6	0.3	0.1	0.0	0.2	0.0	0.4	0.4	2.8	11.5	4.5	26.7	70.8	19.6	3.7	12.2	18.7	8.2	3.5	0.8	0.7	0.6	8.1	70.8
30-Nov	3.1	Z	9.6	5.5	1.6	0.9	1.7	4.3	7.1	10.4	11.3	11.2	12.9	14.0	24.3	26.8	27.7	38.7	11.1	8.2	14.1	26.0	18.7	9.4	13.0	38.7
																								Diurnal Average		
																								Diurnal Maximum		
1.5 3.3 2.4 4.3 2.2 1.5 2.2 2.5 1.8 1.5 1.7 2.1 2.0 2.6 4.5 2.4 1.8 3.0 2.8 1.6 1.4 2.0 1.6 1.3																										
11.2 59.7 44.6 92.8 44.3 23.2 46.5 47.5 31.2 10.4 11.3 11.5 12.9 26.7 70.8 26.8 27.7 38.7 19.7 11.2 14.1 26.0 18.7 14.1																										
Z - zerospan			C - Calibration			M - Maintenance																				



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Buffalo Viewpoint - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Buffalo Viewpoint - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	669	97.81	97.81
21 - 40	8	1.17	98.98
41 - 80	6	0.88	99.85
81 - 159	1	0.15	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Buffalo Viewpoint - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	105	71	23	5	3	14	55	127	33	24	17	38	49	46	23	36	669
21 - 40	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	8
41 - 80	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	6
81 - 159	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	111	71	23	5	3	14	55	127	33	24	17	38	49	46	28	40	684

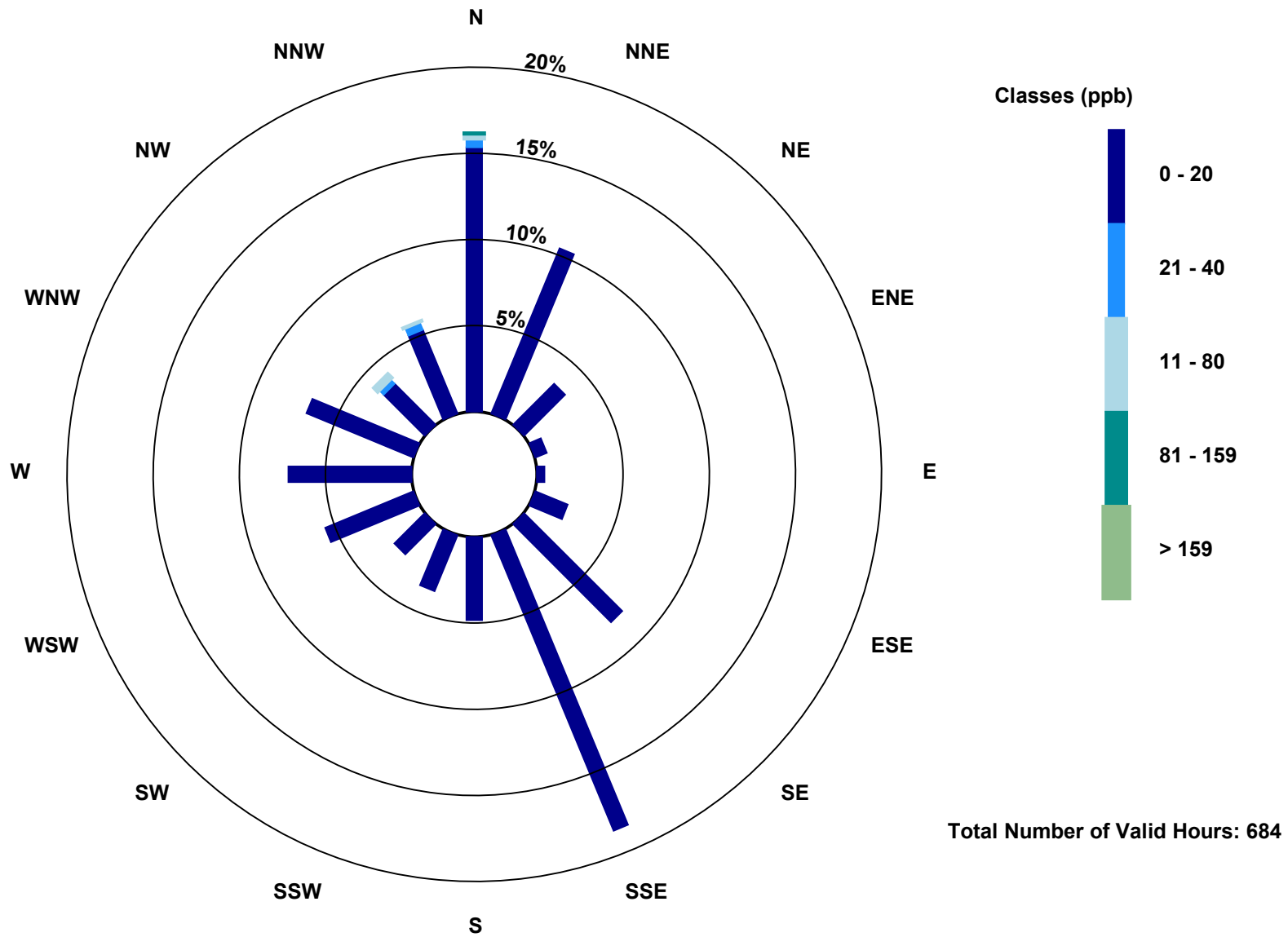
Total Number of Valid Hours: 684

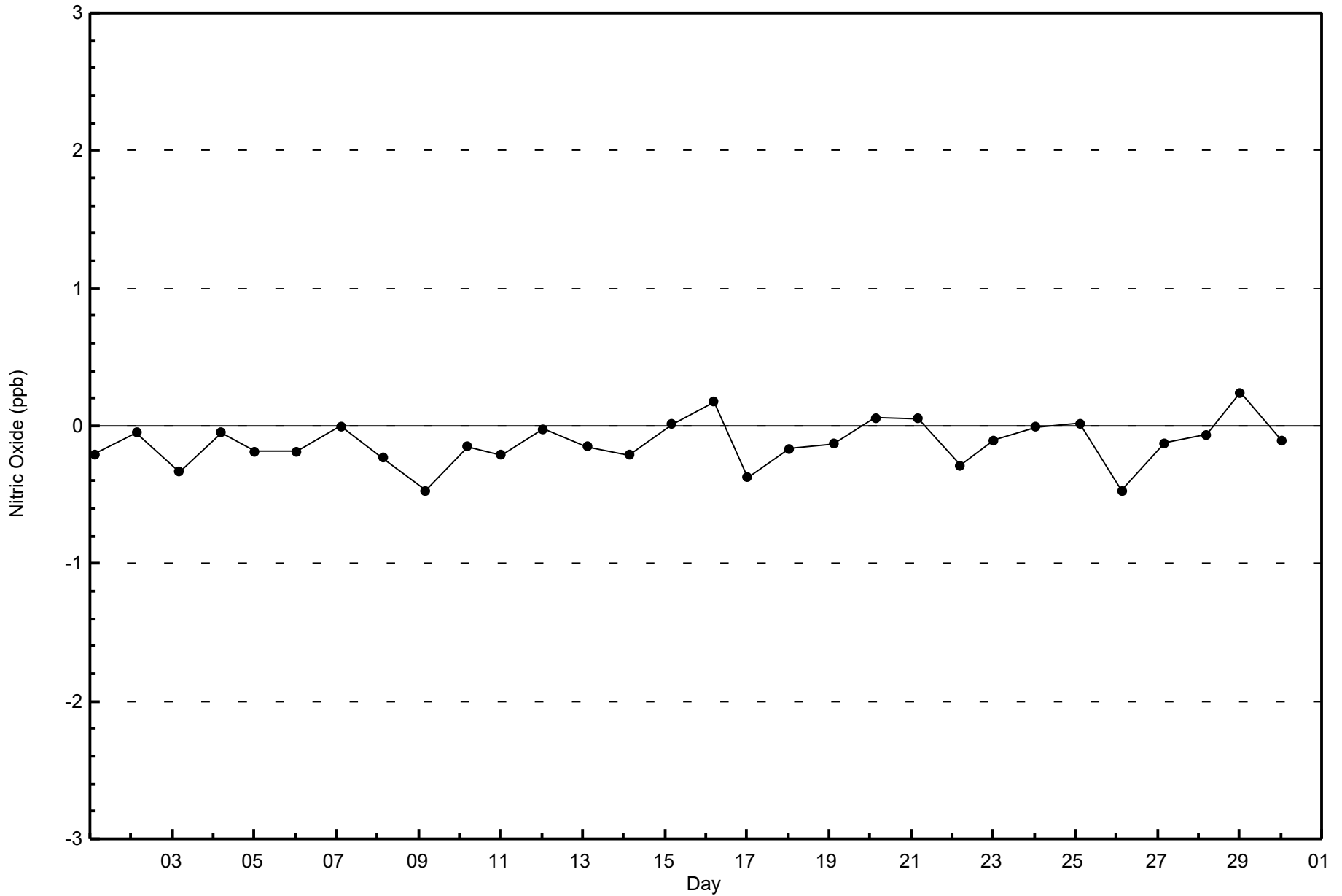
Total Number of Hours: 720

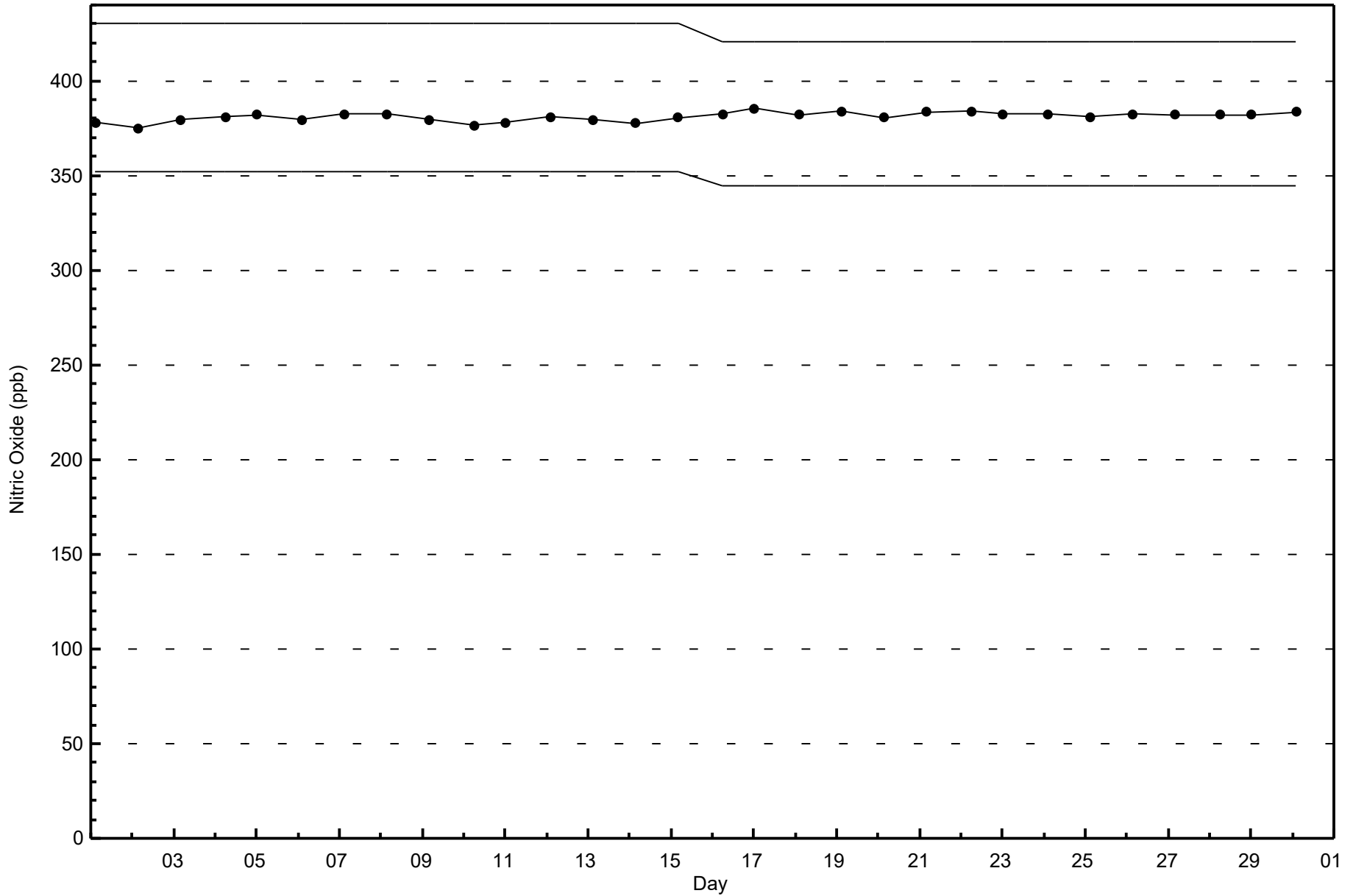


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitric Oxide (NO) - ppb  
Buffalo Viewpoint











Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb

Buffalo Viewpoint - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 30.3 ppb on Nov 29 15:00	Maximum Daily Average: 23.6 ppb on Nov 30		Hours of Data:	684
Minimum Value: 0.2 ppb on Nov 5 23:00	Minimum Daily Average: 1.0 ppb on Nov 12		Hours of Missing Data:	36
Maximum Diurnal Average: 9.4 ppb at hour 18	Minimum Diurnal Average: 4.4 ppb at hour 13		Hours of Calibration:	35
Monthly Average: 5.95 ppb	Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.7 Q <sub>1</sub> = 1.4 Median = 3.1 Q <sub>3</sub> = 7.3 P <sub>90</sub> = 16.7 P <sub>99</sub> = 28.7		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.9	1.5	Z	1.0	1.1	2.4	2.0	1.7	1.5	1.2	0.7	0.6	0.8	0.9	1.2	6.2	7.8	9.1	9.7	10.4	7.9	5.2	5.1	5.6	3.7	10.4	
2-Nov	4.6	2.4	2.5	Z	6.0	4.7	4.4	10.4	10.2	10.1	6.9	9.7	12.0	6.8	1.1	1.2	6.9	3.6	5.8	5.6	1.1	0.9	0.8	0.7	5.1	12.0	
3-Nov	0.7	0.6	1.2	0.9	Z	3.2	4.4	4.1	3.2	1.9	0.9	1.2	1.2	0.9	1.0	1.1	2.5	1.9	3.5	1.9	1.5	1.9	2.0	1.7	1.9	4.4	
4-Nov	1.5	1.9	1.2	1.1	1.8	Z	1.2	1.5	1.1	1.1	1.7	1.7	1.8	3.0	2.6	4.4	5.1	8.2	9.4	7.6	9.3	5.4	7.4	8.0	3.8	9.4	
5-Nov	Z	10.0	14.6	19.0	16.8	Z	15.3	15.8	16.2	16.0	13.7	11.5	5.8	2.1	1.5	2.3	1.5	2.3	2.0	2.4	1.2	1.2	1.3	0.2	0.4	7.5	19.0
6-Nov	0.6	Z	1.0	0.6	0.6	1.5	1.8	2.8	1.8	1.1	0.6	0.7	0.9	0.8	1.1	0.8	0.6	1.7	1.4	1.0	1.0	1.0	0.9	4.9	1.3	4.9	
7-Nov	10.5	22.2	Z	1.1	0.8	0.6	0.9	0.9	1.0	1.1	0.7	0.5	0.5	0.5	1.7	4.7	12.8	28.3	28.2	16.9	4.8	2.3	1.5	1.8	6.3	28.3	
8-Nov	2.1	1.9	1.5	Z	1.6	2.2	6.8	6.9	3.7	2.0	1.4	0.9	0.8	0.6	0.5	0.6	0.7	2.6	2.2	5.7	20.9	22.4	15.6	2.7	4.6	22.4	
9-Nov	1.2	0.4	0.4	0.7	Z	0.9	0.9	0.8	1.0	0.4	0.3	0.6	0.5	0.4	0.4	0.8	2.3	12.2	7.3	4.0	4.3	1.8	1.3	1.7	1.9	12.2	
10-Nov	1.7	2.3	1.4	1.2	1.2	Z	4.3	3.5	3.5	3.1	1.8	1.6	0.9	0.9	1.5	1.7	3.2	4.5	7.4	3.8	7.0	3.8	3.8	3.7	2.9	7.4	
11-Nov	Z	3.9	1.9	2.1	2.8	2.3	2.9	15.8	10.3	4.0	11.3	18.0	5.4	2.0	10.8	13.6	15.8	15.2	11.2	7.5	3.0	1.0	2.2	4.7	7.3	18.0	
12-Nov	2.7	Z	1.4	1.4	0.9	1.0	1.5	0.7	1.6	1.0	1.3	1.8	1.4	0.8	0.6	0.6	0.5	0.6	0.7	0.3	0.3	0.6	0.4	0.5	1.0	2.7	
13-Nov	0.7	0.7	Z	1.7	0.6	0.3	0.4	1.6	1.8	1.8	9.7	6.2	4.8	2.6	6.6	9.9	6.3	3.6	1.7	1.6	1.6	1.1	1.6	2.9	3.0	9.9	
14-Nov	5.2	4.2	3.2	Z	3.0	4.6	3.2	2.5	3.4	4.0	4.4	4.2	5.2	6.6	5.8	4.9	5.1	5.9	8.2	7.0	10.2	16.7	15.3	9.4	6.2	16.7	
15-Nov	16.2	13.1	13.5	14.9	Z	14.9	14.4	C	C	C	C	C	6.4	7.6	9.2	10.3	8.4	7.3	9.0	6.2	4.4	3.7	2.9	2.0	9.1	16.2	
16-Nov	4.7	4.3	5.7	3.8	1.8	Z	1.1	0.9	1.4	1.7	1.6	1.4	1.4	2.4	1.7	1.6	1.5	1.4	1.5	1.6	1.8	1.8	1.6	1.4	2.1	5.7	
17-Nov	Z	1.4	1.2	1.5	1.8	1.6	1.7	2.2	1.8	1.6	1.8	2.1	2.0	1.8	2.8	3.1	3.0	1.9	11.5	7.2	0.7	0.4	0.5	0.8	2.4	11.5	
18-Nov	0.4	Z	0.7	0.5	0.4	0.5	0.3	0.6	1.2	1.3	0.8	0.7	0.7	1.1	4.1	4.5	9.2	7.9	7.2	17.5	16.8	12.7	17.4	20.5	5.5	20.5	
19-Nov	19.2	6.6	Z	2.2	15.6	10.8	4.0	8.1	4.6	2.0	2.0	2.1	2.6	2.4	1.6	2.8	6.3	1.8	1.2	1.2	4.8	4.4	1.7	1.7	4.8	19.2	
20-Nov	3.6	2.2	1.5	Z	6.0	4.5	3.7	3.4	3.3	3.1	2.1	1.0	0.9	1.8	5.3	10.6	9.8	4.6	1.3	0.8	0.4	0.6	2.3	3.7	3.3	10.6	
21-Nov	4.7	4.5	0.9	0.6	Z	6.5	6.1	9.6	10.0	16.5	11.3	6.8	11.7	17.4	14.5	14.4	19.5	7.9	1.1	1.0	1.9	11.7	5.5	3.1	8.1	19.5	
22-Nov	1.7	2.5	3.3	2.2	1.7	Z	0.8	1.6	3.1	4.1	5.9	7.6	11.7	5.9	10.4	10.5	4.1	4.8	4.3	2.8	5.3	4.0	2.9	6.1	4.7	11.7	
23-Nov	Z	2.2	3.2	3.0	6.4	10.1	10.1	4.5	6.5	3.7	4.5	5.5	5.6	5.1	4.4	3.9	4.6	5.6	3.8	2.7	2.5	4.0	6.0	3.1	4.8	10.1	
24-Nov	2.2	Z	4.2	3.8	5.9	6.6	5.4	4.5	5.7	6.5	8.2	9.3	10.9	13.5	21.2	23.3	28.4	28.8	28.4	29.3	27.0	25.3	21.8	19.7	14.8	29.3	
25-Nov	16.6	17.5	Z	10.3	7.2	6.9	8.0	6.4	6.7	6.4	4.2	2.4	2.1	2.2	2.2	4.3	3.5	6.0	7.4	3.1	2.6	2.7	3.5	3.9	5.9	17.5	
26-Nov	2.9	2.4	2.1	Z	2.3	2.3	2.5	M	3.1	2.7	2.4	2.3	2.6	2.4	3.0	4.4	6.0	16.9	4.4	3.6	1.9	1.0	1.0	1.1	3.3	16.9	
27-Nov	1.6	0.7	0.8	0.3	Z	0.7	1.2	0.6	1.3	1.4	0.8	0.4	0.4	2.7	3.3	1.9	2.0	3.6	3.6	4.1	4.2	2.4	1.3	5.5	1.9	5.5	
28-Nov	5.1	16.3	12.2	20.5	28.5	Z	1.1	0.6	1.1	7.6	5.4	8.5	9.6	16.4	16.8	16.2	20.7	25.7	29.3	16.1	5.8	4.8	4.3	4.4	12.0	29.3	
29-Nov	Z	14.0	13.6	11.5	7.7	5.5	10.8	6.3	7.2	3.5	5.7	11.6	7.2	20.1	30.3	23.8	25.8	28.7	29.5	27.3	24.8	17.9	16.9	17.7	16.0	30.3	
30-Nov	22.9	Z	26.0	26.1	22.2	19.4	22.1	24.6	23.1	20.1	17.8	16.8	17.6	19.0	25.5	28.0	29.4	30.2	23.4	26.0	27.8	25.6	24.6	24.2	23.6	30.2	

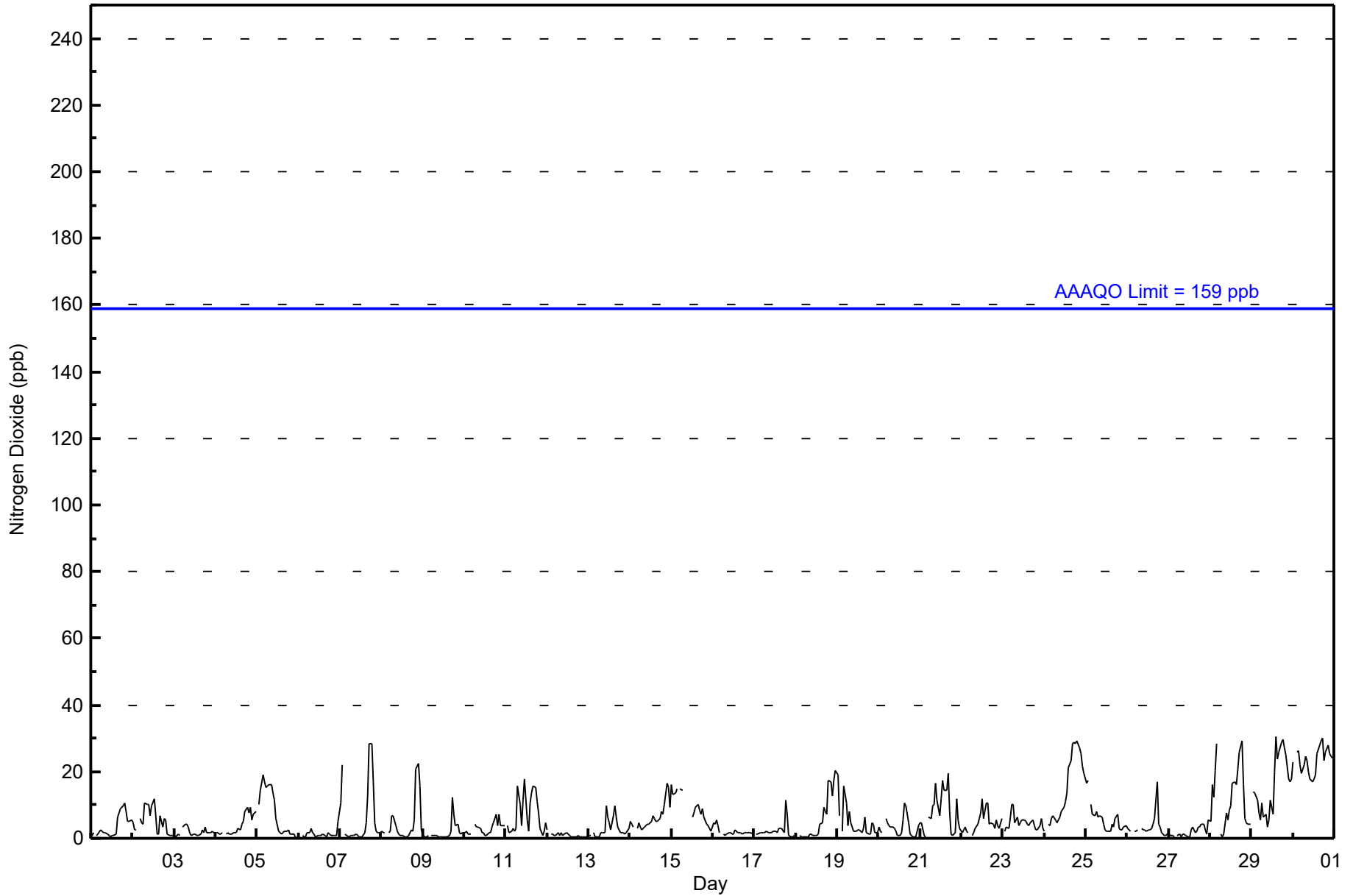
5.4	5.6	4.8	5.3	5.8	5.2	4.8	5.1	4.8	4.4	4.4	4.6	4.4	5.0	6.4	7.2	8.5	9.4	8.9	7.5	6.9	6.3	5.7	5.6	Diurnal Average	
22.9	22.2	26.0	26.1	28.5	19.4	22.1	24.6	23.1	20.1	17.8	18.0	17.6	20.1	30.3	28.0	29.4	30.2	29.5	29.3	27.8	25.6	24.6	24.2	Diurnal Maximum	

Z - zerospan      C - Calibration      M - Maintenance  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Buffalo Viewpoint - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Buffalo Viewpoint - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	640	93.57	93.57
21 - 40	44	6.43	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Buffalo Viewpoint - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	95	64	22	4	3	14	54	126	31	24	17	37	49	45	23	32	640
21 - 40	16	7	1	1	0	0	1	1	2	0	0	1	0	1	5	8	44
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	111	71	23	5	3	14	55	127	33	24	17	38	49	46	28	40	684

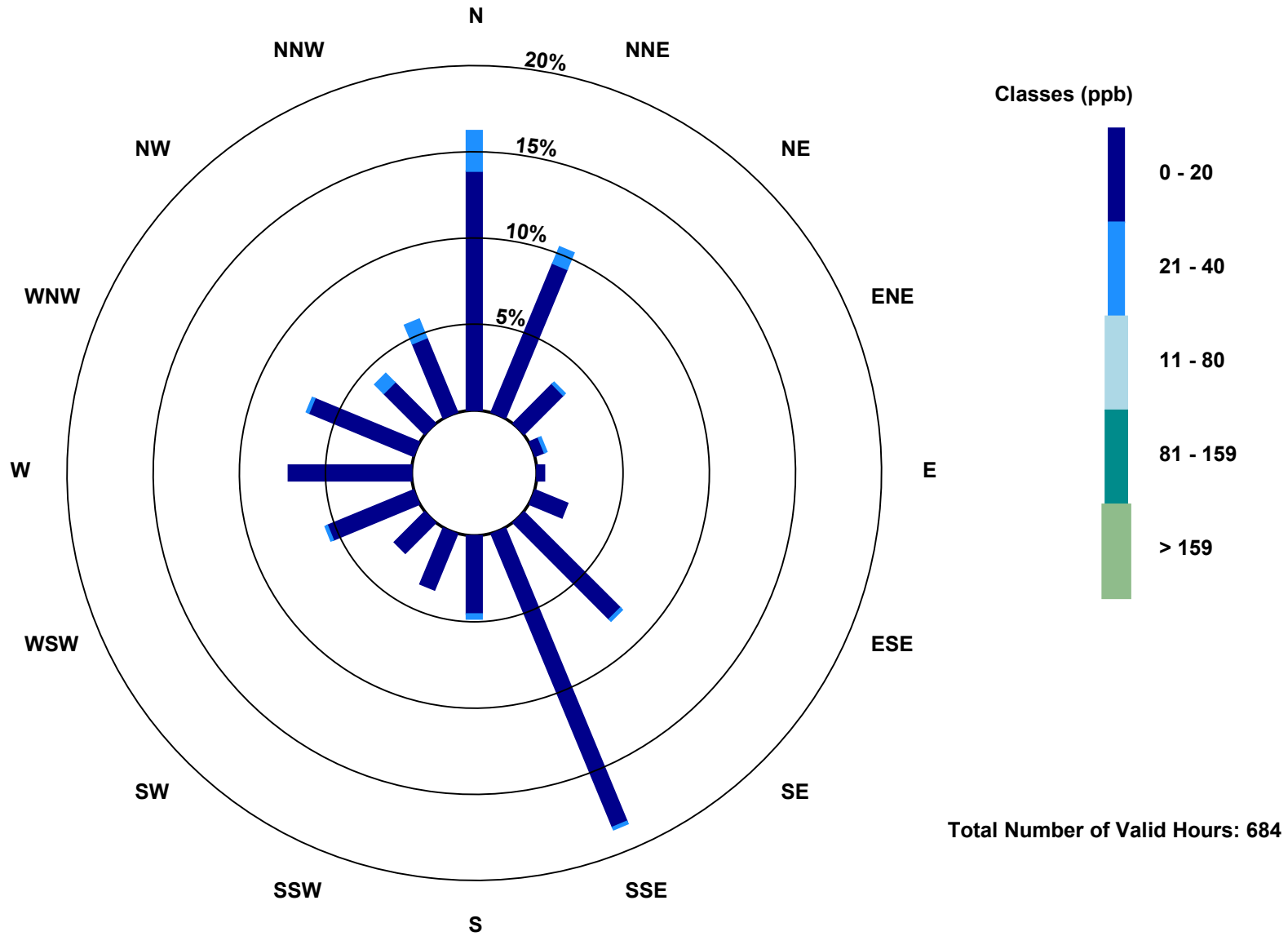
Total Number of Valid Hours: 684

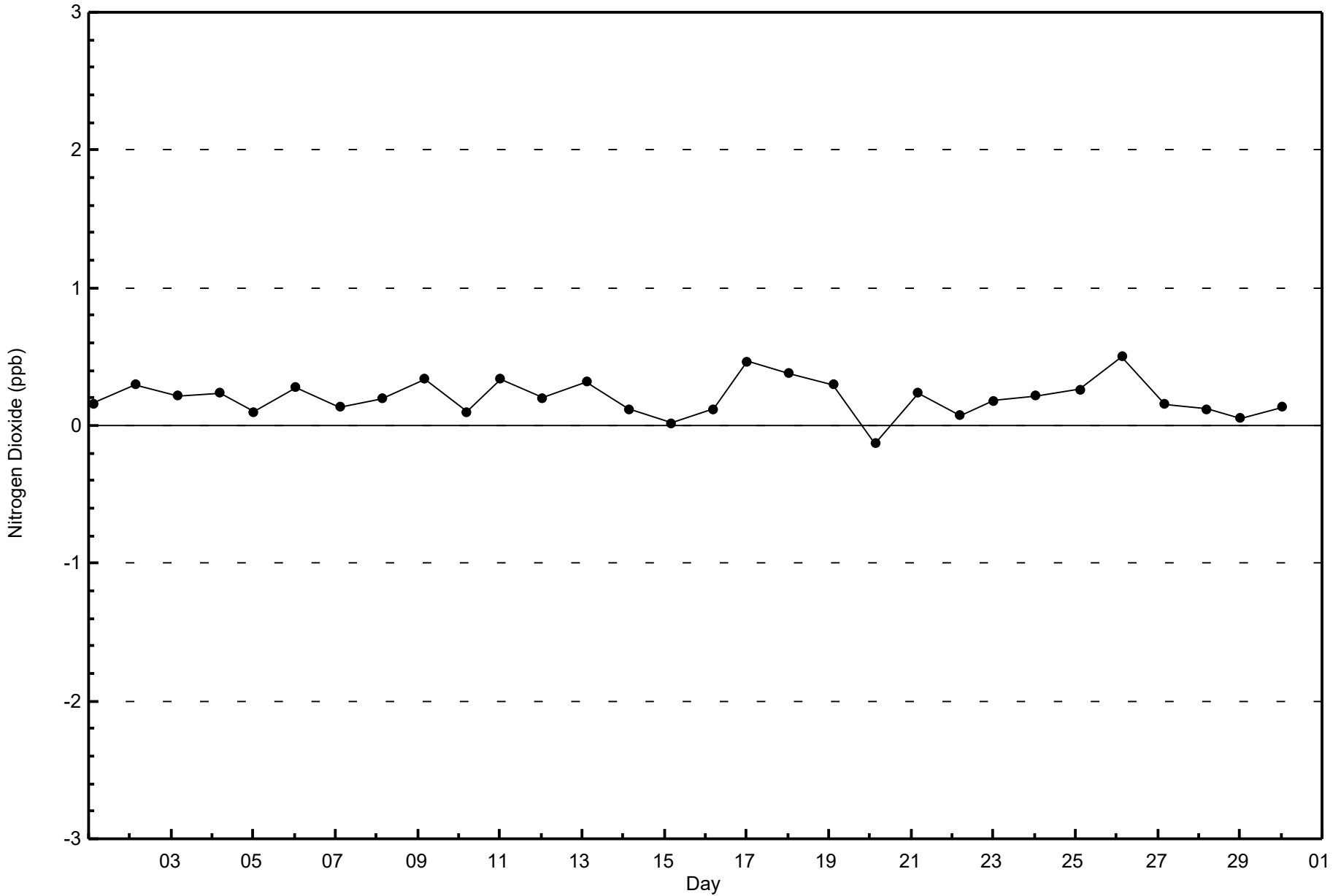
Total Number of Hours: 720

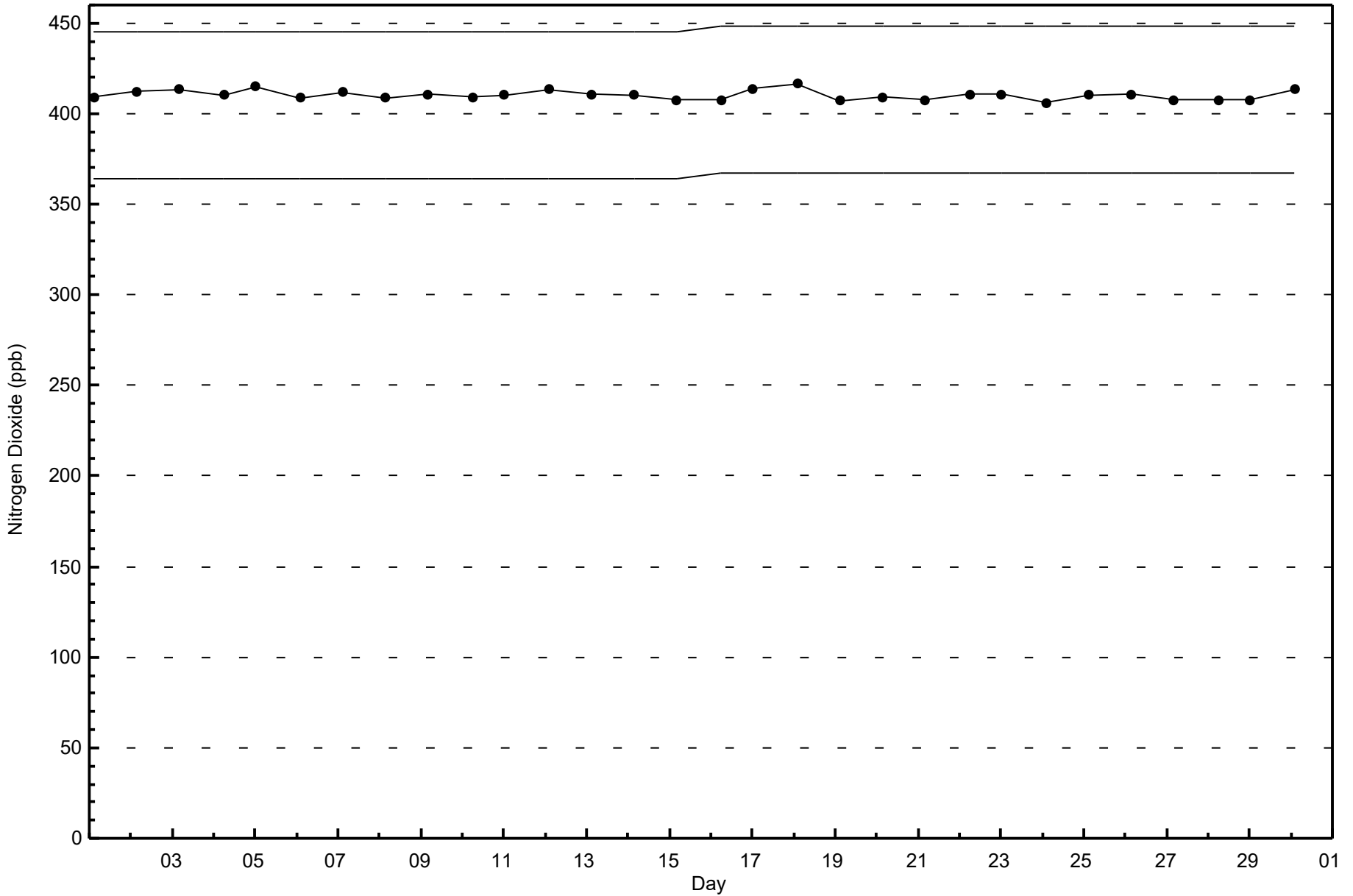


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Buffalo Viewpoint









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO<sub>x</sub>) - ppb

Buffalo Viewpoint - November 2024

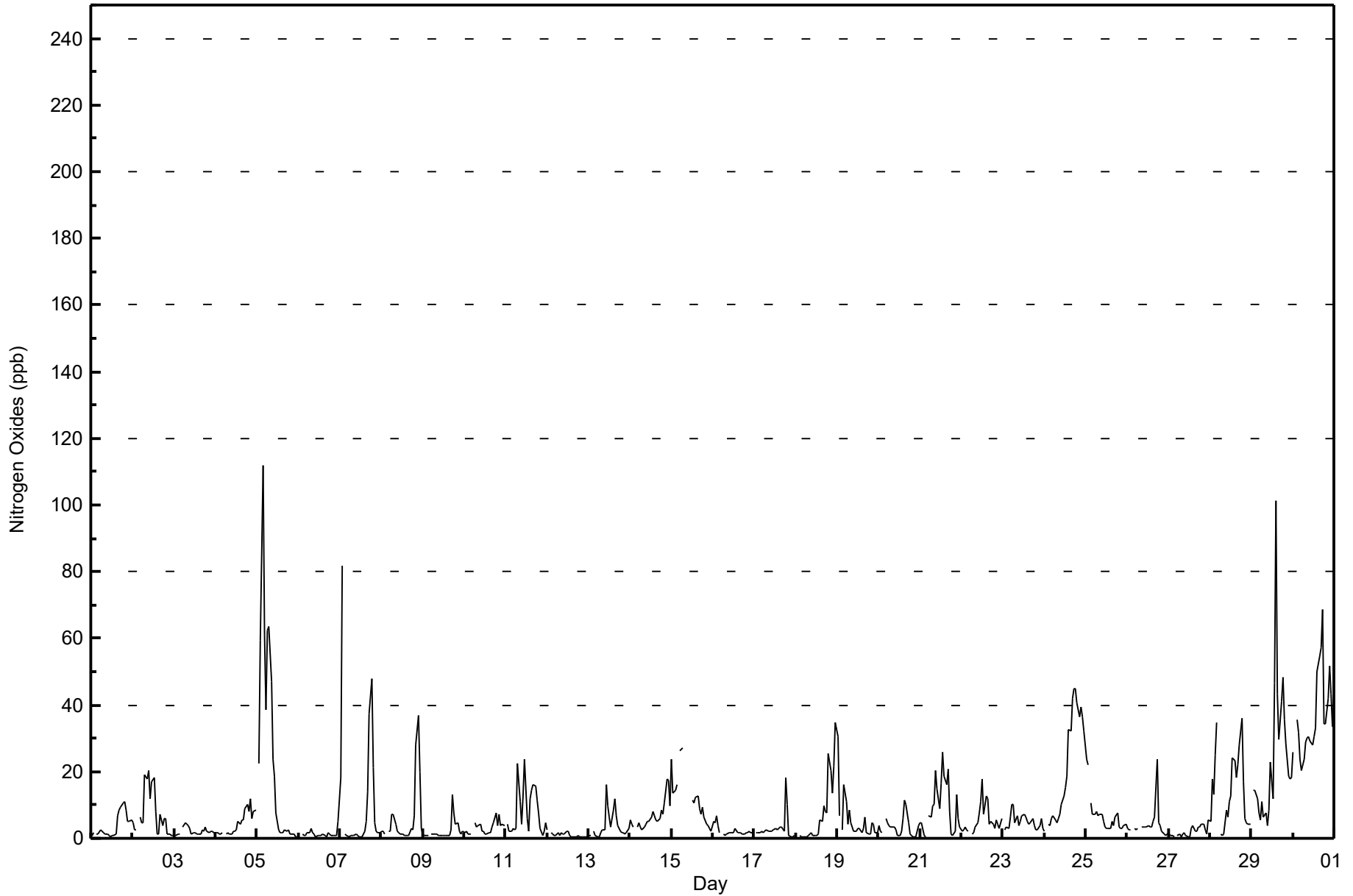
Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	720						
Maximum Value: 111.8 ppb on Nov 5 04:00		Maximum Daily Average: 36.6 ppb on Nov 30																	Hours of Data: 684								
Minimum Value: 0.2 ppb on Nov 5 23:00		Minimum Daily Average: 1.1 ppb on Nov 12																	Hours of Missing Data: 36								
Maximum Diurnal Average: 12.4 ppb at hour 18		Minimum Diurnal Average: 5.9 ppb at hour 10																	Hours of Calibration: 35								
Monthly Average: 8.19 ppb		Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.9 Q <sub>1</sub> = 1.5 Median = 3.4 Q <sub>3</sub> = 8.2 P <sub>90</sub> = 23.2 P <sub>99</sub> = 59.5																	Percent Operational Time: 99.9								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.9	1.6	Z	1.3	1.2	2.5	2.0	1.7	1.5	1.2	0.8	0.6	0.9	0.9	1.2	6.7	8.3	9.4	10.6	11.1	8.3	5.3	5.3	5.6	3.9	11.1	
2-Nov	4.7	2.4	Z	2.5	Z	6.3	4.8	4.5	19.2	17.6	20.3	11.9	16.8	18.0	8.1	1.4	1.3	7.4	3.8	6.0	5.8	1.2	1.1	1.0	0.8	7.3	20.3
3-Nov	0.8	0.8	1.3	1.1	Z	3.4	4.6	4.4	3.8	2.8	1.2	1.5	1.6	1.4	1.4	1.1	2.7	1.9	3.5	1.9	1.5	1.9	2.0	1.7	2.1	4.6	
4-Nov	1.5	1.9	1.2	1.1	1.8	Z	1.4	1.5	1.2	1.3	2.1	2.3	2.6	5.0	4.1	5.5	5.6	8.7	10.3	8.1	11.9	5.8	8.1	8.4	4.4	11.9	
5-Nov	Z	22.5	59.2	111.8	61.1	38.5	62.3	63.7	47.2	23.7	18.5	7.7	2.5	1.9	1.6	1.7	2.4	2.1	2.5	1.3	1.4	1.3	0.2	0.4	23.3	111.8	
6-Nov	0.6	Z	1.3	0.7	0.7	1.6	1.8	2.8	1.8	1.1	0.6	0.7	0.9	0.9	1.1	0.8	0.6	1.7	1.4	1.0	1.0	1.0	0.9	5.1	1.3	5.1	
7-Nov	18.3	81.9	Z	1.3	0.9	0.6	0.9	0.9	1.0	1.1	0.7	0.5	0.5	0.5	2.0	5.2	14.1	37.3	47.9	21.4	4.9	2.3	1.6	1.9	10.8	81.9	
8-Nov	2.2	2.0	1.5	Z	2.0	2.3	7.0	7.3	4.2	2.3	1.8	1.1	1.2	0.9	0.9	0.8	0.9	2.9	2.5	6.8	28.1	37.1	20.0	3.2	6.0	37.1	
9-Nov	1.4	0.8	0.6	1.0	Z	1.3	1.2	1.1	1.2	0.7	0.6	0.8	0.8	0.7	0.8	1.0	2.4	12.9	7.7	4.2	4.5	2.0	1.3	1.9	2.2	12.9	
10-Nov	1.8	2.3	1.4	1.2	1.2	Z	4.6	3.6	3.9	4.2	2.3	2.2	1.1	1.2	1.8	1.9	3.4	4.6	7.8	3.9	7.1	3.8	4.0	3.9	3.2	7.8	
11-Nov	Z	4.1	2.1	2.2	2.9	2.4	2.9	22.3	11.1	4.1	12.9	23.6	5.9	2.2	12.0	14.5	16.3	15.5	11.4	7.5	3.0	1.0	2.2	4.7	8.1	23.6	
12-Nov	2.7	Z	1.6	1.4	1.0	1.0	1.5	0.7	1.7	1.1	1.3	2.3	1.9	0.9	0.6	0.6	0.5	0.6	0.7	0.4	0.3	0.6	0.4	0.6	1.1	2.7	
13-Nov	0.7	0.7	Z	2.0	0.7	0.4	0.5	1.8	2.3	2.4	15.9	9.7	6.5	3.2	8.6	11.9	6.8	3.8	1.9	1.8	1.7	1.2	1.7	3.0	3.9	15.9	
14-Nov	5.4	4.3	3.5	Z	3.2	4.8	3.3	2.5	3.5	4.3	5.0	4.9	6.4	8.0	6.9	5.5	5.3	6.0	8.5	7.1	10.5	17.8	17.3	9.7	6.7	17.8	
15-Nov	23.6	13.8	14.4	16.1	Z	26.4	27.3	C	C	C	C	C	11.4	10.7	12.2	12.9	9.1	7.3	9.3	6.2	4.4	3.7	2.9	2.0	11.9	27.3	
16-Nov	5.0	4.5	6.7	3.8	1.8	Z	1.1	0.9	1.4	1.7	1.7	1.6	1.7	2.8	1.7	1.7	1.5	1.5	1.5	1.7	1.9	2.1	1.9	1.7	2.3	6.7	
17-Nov	Z	1.8	1.6	1.8	2.1	1.9	2.1	2.4	2.0	1.9	2.2	2.6	2.9	2.4	3.2	3.4	3.2	2.1	18.4	10.0	0.8	0.4	0.6	0.8	3.1	18.4	
18-Nov	0.4	Z	0.9	0.5	0.4	0.5	0.3	0.7	1.2	1.5	0.8	1.0	0.9	1.4	5.5	5.1	9.7	8.2	7.6	25.5	20.3	13.8	21.6	34.6	7.1	34.6	
19-Nov	30.4	6.9	Z	2.4	16.2	11.0	4.1	8.5	4.8	2.1	2.1	2.3	3.1	2.8	1.8	2.8	6.4	1.8	1.2	1.2	4.8	4.4	1.7	1.7	5.4	30.4	
20-Nov	3.6	2.2	1.5	Z	6.0	4.6	3.7	3.4	3.3	3.2	2.3	1.0	0.9	2.1	5.9	11.6	10.0	4.6	1.3	0.8	0.4	0.6	2.3	3.7	3.4	11.6	
21-Nov	4.7	4.5	0.9	0.6	Z	6.6	6.2	9.7	10.4	20.2	14.9	8.8	16.4	25.9	18.4	16.3	20.9	8.2	1.2	1.0	2.1	13.2	5.7	3.3	9.6	25.9	
22-Nov	1.9	2.7	3.4	2.4	1.9	Z	1.1	1.9	3.4	4.8	7.4	11.2	17.6	7.2	12.5	11.8	4.2	4.9	4.4	2.8	5.4	4.1	3.0	6.1	5.5	17.6	
23-Nov	Z	2.4	3.2	3.0	6.6	10.3	10.3	4.6	6.7	4.0	5.1	6.9	7.2	6.3	5.0	4.1	4.6	5.9	3.8	2.7	2.5	4.0	6.0	3.1	5.2	10.3	
24-Nov	2.2	Z	4.4	3.9	6.0	6.7	5.4	4.5	5.8	7.1	10.1	12.5	15.4	18.6	32.8	32.0	41.9	44.7	45.0	40.5	36.3	39.3	36.5	32.3	21.0	45.0	
25-Nov	23.7	22.1	Z	10.8	7.3	7.1	8.1	6.6	7.1	7.4	5.1	3.2	3.0	3.1	2.9	4.9	3.8	6.2	7.8	3.4	2.9	2.9	3.8	4.3	6.8	23.7	
26-Nov	3.2	2.7	2.4	Z	2.9	2.7	2.9	M	3.4	3.3	3.2	3.2	3.7	3.3	3.6	4.9	6.4	23.6	4.6	3.7	2.0	1.1	1.0	1.2	4.1	23.6	
27-Nov	1.6	0.7	0.8	0.4	Z	0.7	1.2	0.6	1.3	1.5	0.9	0.4	0.4	3.1	3.6	2.0	2.0	3.6	3.6	4.1	4.3	2.4	1.3	5.5	2.0	5.5	
28-Nov	5.1	17.8	13.1	25.1	34.5	Z	1.3	0.7	1.1	8.6	6.5	11.2	12.6	24.2	23.2	18.4	22.1	27.8	36.1	17.2	5.8	4.8	4.3	4.4	14.2	36.1	
29-Nov	Z	14.3	14.2	11.8	7.8	5.5	11.0	6.3	7.6	3.9	8.5	23.1	11.7	46.8	101.1	43.4	29.5	40.9	48.2	35.5	28.3	18.7	17.6	18.3	24.1	101.1	
30-Nov	26.0	Z	35.6	31.6	23.8	20.3	23.8	28.9	30.2	30.5	29.1	28.0	30.5	33.0	49.8	54.8	57.1	68.9	34.5	34.2	41.9	51.6	43.3	33.6	36.6	68.9	
		6.9	8.9	7.2	9.6	8.0	6.7	6.9	7.6	6.6	5.9	6.1	6.6	6.3	7.7	10.9	9.6	10.3	12.4	11.7	9.1	8.3	8.3	7.3	6.9	Diurnal Average	
		30.4	81.9	59.2	111.8	61.1	38.5	62.3	63.7	47.2	30.5	29.1	28.0	30.5	46.8	101.1	54.8	57.1	68.9	48.2	40.5	41.9	51.6	43.3	34.6	Diurnal Maximum	
Z - zerspan		C - Calibration				M - Maintenance																					





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Buffalo Viewpoint - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Buffalo Viewpoint - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	607	88.74	88.74
21 - 40	53	7.75	96.49
41 - 80	21	3.07	99.56
81 - 159	3	0.44	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Buffalo Viewpoint - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	88	61	22	4	3	12	52	124	29	24	17	37	48	44	19	23	607
21 - 40	10	9	1	1	0	2	2	3	4	0	0	1	1	2	4	13	53
11 - 80	12	1	0	0	0	0	1	0	0	0	0	0	0	0	3	4	21
81 - 159	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	3
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	111	71	23	5	3	14	55	127	33	24	17	38	49	46	28	40	684

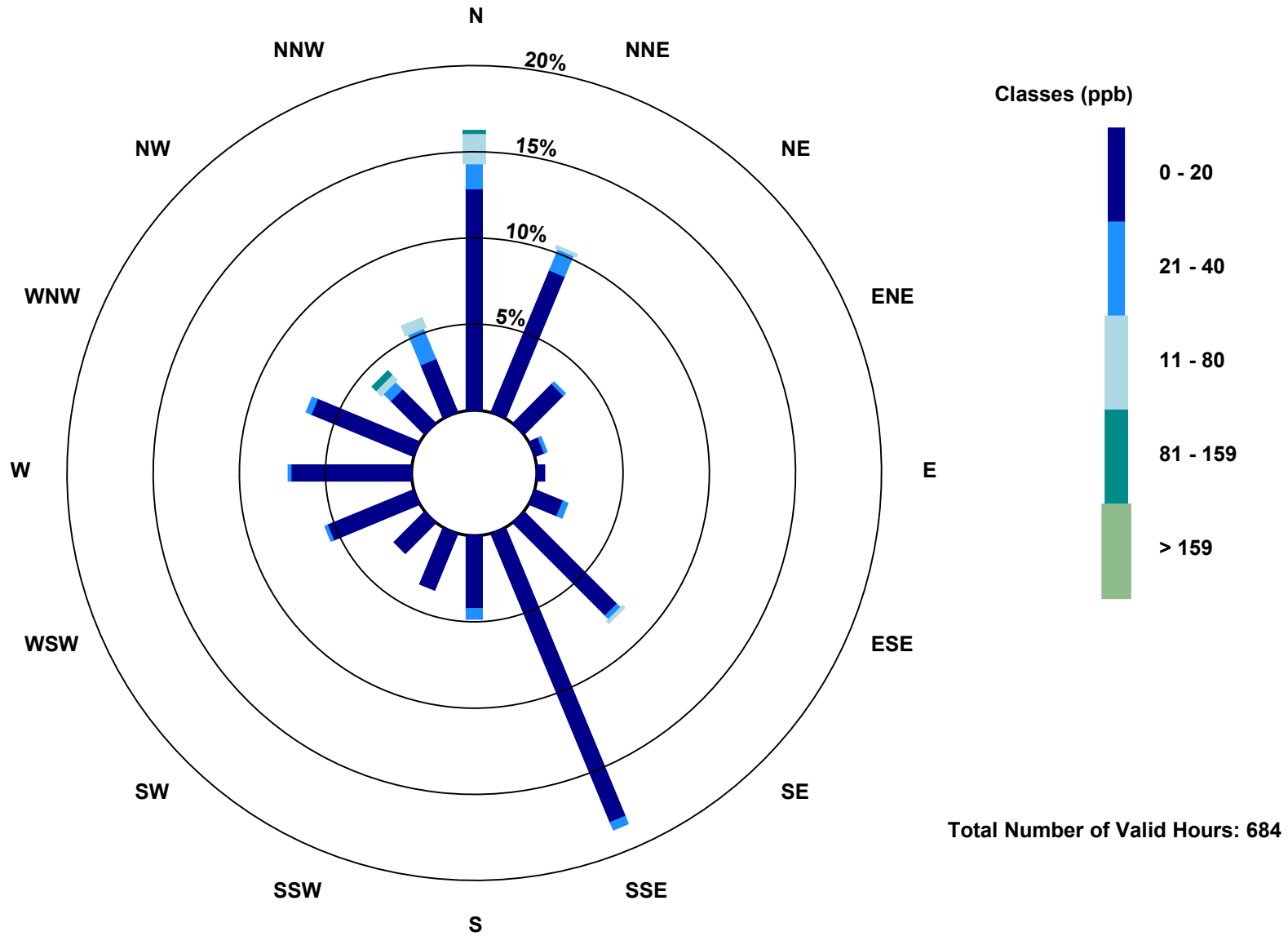
Total Number of Valid Hours: 684

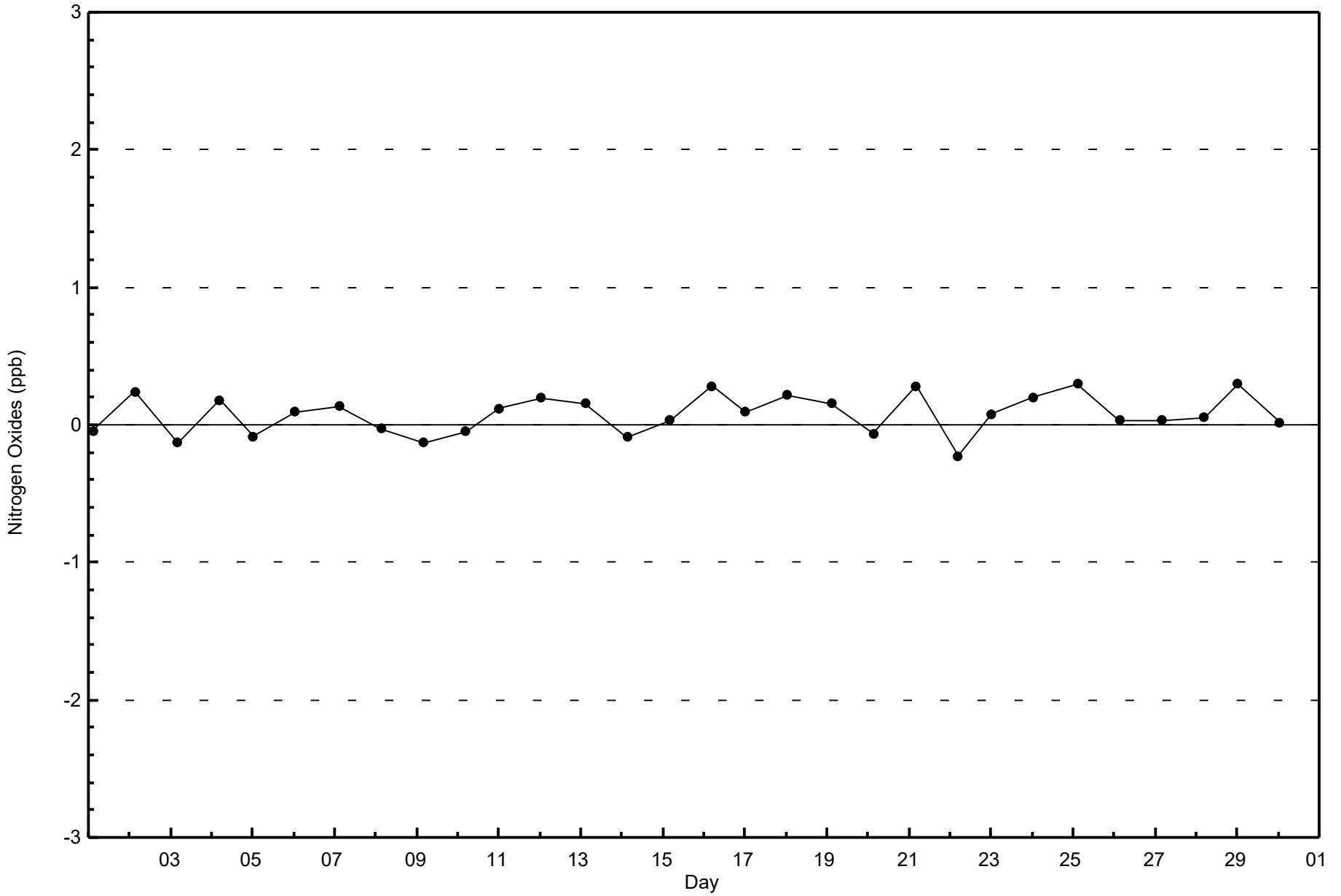
Total Number of Hours: 720

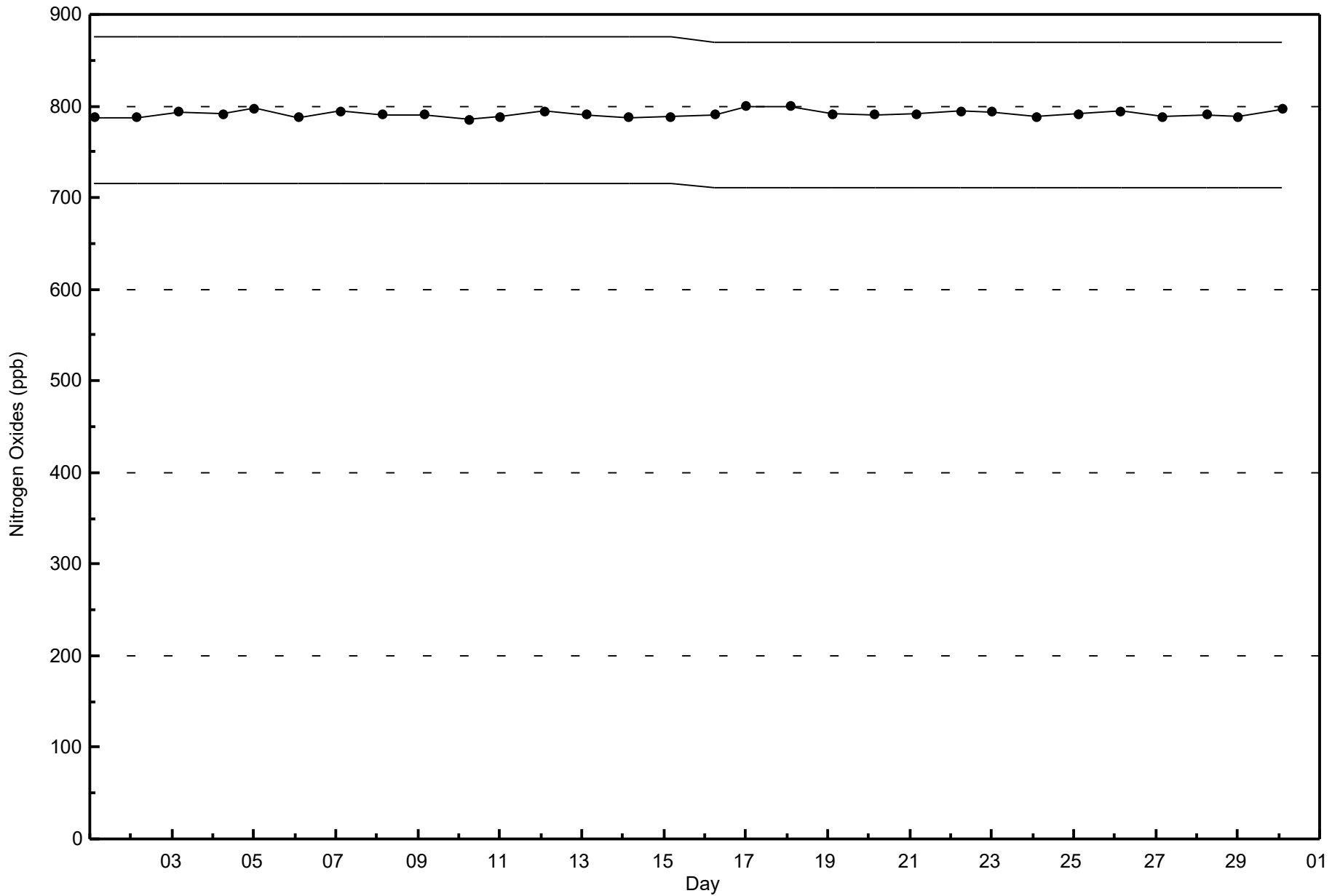


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Buffalo Viewpoint









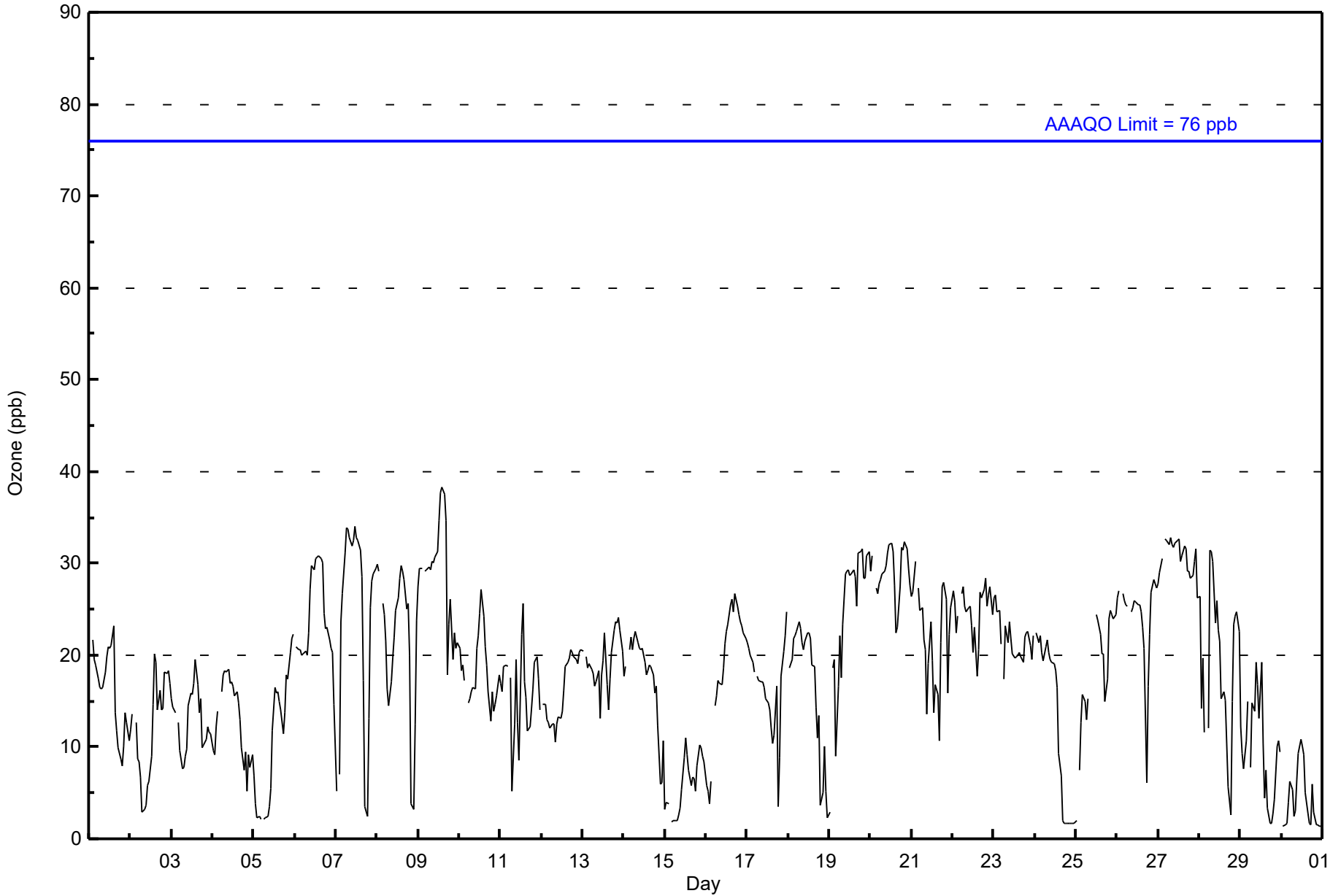
Summary of Hour Averages

Buffalo Viewpoint - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 38.2 ppb on Nov 9 15:00	Maximum Daily Average: 30.7 ppb on Nov 27		Hours of Data:	685
Minimum Value: 1.4 ppb on Dec 1 00:00	Minimum Daily Average: 4.2 ppb on Nov 30		Hours of Missing Data:	35
Maximum Diurnal Average: 21.5 ppb at hour 13	Minimum Diurnal Average: 15.6 ppb at hour 18		Hours of Calibration:	34
Monthly Average: 18.34 ppb	Percentiles: P <sub>1</sub> = 1.6 P <sub>10</sub> = 5.4 Q <sub>1</sub> = 12.7 Median = 19.2 Q <sub>3</sub> = 24.7 P <sub>90</sub> = 29.3 P <sub>99</sub> = 33.8		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	22.4	Z	21.6	19.5	18.9	17.3	16.5	16.4	16.4	18.2	19.9	20.9	20.7	21.0	23.2	13.8	11.8	9.8	8.6	7.9	10.1	13.7	12.7	10.7	16.2	23.2																							
2-Nov	11.8	13.6	Z	12.6	8.7	8.3	6.7	3.0	3.2	3.6	5.9	6.2	9.0	14.6	20.2	19.2	14.1	16.2	14.1	14.2	18.1	18.0	18.4	17.0	12.0	20.2																							
3-Nov	15.3	14.4	13.7	Z	12.6	9.6	7.6	7.8	9.0	9.8	14.5	15.9	15.8	16.9	19.6	16.7	13.7	15.3	9.9	10.3	10.8	12.2	11.6	11.4	12.8	19.6																							
4-Nov	9.7	9.2	12.2	13.9	Z	16.0	17.8	18.2	18.2	18.5	16.9	17.0	16.6	15.6	16.0	14.7	13.0	9.8	7.4	9.5	5.2	9.1	7.8	9.2	13.1	18.5																							
5-Nov	6.8	3.8	2.3	2.5	2.2	Z	2.1	2.2	2.5	3.6	5.6	11.7	16.5	15.8	16.0	14.9	14.1	11.5	13.7	17.8	17.4	20.3	21.9	22.3	10.8	22.3																							
6-Nov	Z	20.9	20.7	20.5	20.0	20.1	20.4	19.9	22.4	27.2	29.7	29.3	30.5	30.7	30.9	30.4	30.1	24.5	22.8	23.0	21.7	20.8	20.2	14.6	24.0	30.9																							
7-Nov	5.2	Z	7.0	23.7	26.7	31.1	33.9	33.7	32.8	31.9	32.5	34.0	32.8	32.4	31.4	28.5	17.2	3.5	2.4	13.1	25.2	28.1	28.8	29.5	24.6	34.0																							
8-Nov	29.9	29.1	Z	25.7	24.4	21.5	16.4	14.5	17.1	19.7	22.0	24.9	26.2	28.3	29.7	29.1	28.3	25.0	25.7	19.9	3.8	3.1	12.6	23.8	21.8	29.9																							
9-Nov	27.4	29.4	29.4	Z	29.2	29.3	29.6	29.3	30.1	30.0	30.7	31.3	34.6	37.7	38.2	37.5	34.6	17.9	23.4	26.1	19.6	22.4	20.7	21.3	28.7	38.2																							
10-Nov	20.8	18.2	18.9	17.2	Z	14.8	15.2	16.0	16.4	16.3	20.8	22.1	24.5	27.1	24.2	20.9	18.9	16.0	12.8	16.1	14.0	14.7	15.5	17.8	18.2	27.1																							
11-Nov	16.9	16.0	18.8	19.0	18.8	Z	17.6	5.1	12.5	19.6	12.7	8.5	22.3	25.6	17.1	15.3	11.7	12.3	14.2	16.4	19.2	19.9	17.5	14.0	16.1	25.6																							
12-Nov	Z	14.6	14.6	12.9	12.7	12.1	12.6	12.5	10.6	12.4	13.2	13.2	13.9	16.2	18.7	19.3	19.7	20.6	20.3	19.9	19.5	19.1	20.3	20.7	16.1	20.7																							
13-Nov	20.5	Z	19.9	18.6	19.1	18.5	18.0	16.6	17.1	18.3	13.1	17.9	19.4	22.4	16.8	14.0	17.4	20.3	22.7	23.6	23.4	24.0	22.7	20.5	19.3	24.0																							
14-Nov	17.8	18.8	Z	20.6	21.9	20.6	21.8	22.6	21.4	20.8	20.6	20.7	19.2	17.8	18.3	18.9	18.8	17.8	15.9	16.6	12.3	6.0	6.1	10.6	17.7	22.6																							
15-Nov	3.1	3.9	3.8	Z	1.9	2.0	2.0	2.0	2.6	3.3	5.3	8.9	11.1	9.2	7.5	5.8	6.7	6.6	5.3	8.0	10.2	10.0	9.1	8.5	5.9	11.1																							
16-Nov	5.9	5.1	3.9	6.3	Z	14.5	15.6	17.2	16.9	16.7	18.6	21.2	22.6	23.4	25.4	26.0	24.7	26.7	25.3	24.4	23.7	23.1	22.4	21.7	18.7	26.7																							
17-Nov	21.4	20.8	19.9	19.2	18.2	Z	17.8	17.2	17.0	17.1	16.4	15.3	14.9	14.0	12.1	10.4	11.2	16.7	3.5	8.8	17.6	20.5	22.1	24.7	16.4	24.7																							
18-Nov	Z	18.6	19.5	21.8	22.1	22.6	23.6	22.9	21.3	20.7	21.4	22.4	22.4	21.8	18.8	18.7	14.3	10.9	13.4	3.6	5.1	10.0	5.2	2.3	16.7	23.6																							
19-Nov	2.9	Z	18.6	19.5	8.9	16.6	22.2	17.5	23.3	28.8	29.1	29.3	28.7	28.9	29.3	28.5	25.4	31.1	31.3	31.6	28.3	28.4	30.8	31.2	24.8	31.6																							
20-Nov	29.2	30.8	Z	27.3	26.7	27.8	28.3	28.8	29.1	29.8	31.1	32.0	32.2	31.3	27.7	22.4	23.0	27.4	31.7	31.4	32.4	31.5	29.4	27.6	29.1	32.4																							
21-Nov	26.5	26.8	30.2	Z	27.3	24.9	25.2	21.7	20.6	13.6	19.0	23.6	19.4	13.8	16.8	15.6	10.7	21.3	27.4	27.9	26.1	15.9	22.2	25.2	21.8	30.2																							
22-Nov	27.0	25.7	22.4	24.3	Z	26.7	27.4	25.3	24.8	25.2	25.3	23.1	20.3	23.0	17.7	20.7	26.8	26.2	27.1	28.4	25.4	26.6	27.5	24.4	24.8	28.4																							
23-Nov	26.3	26.5	24.7	24.9	21.2	Z	17.4	23.2	21.4	23.7	21.8	20.1	19.6	19.8	19.9	20.3	19.8	19.2	22.0	22.4	22.6	21.1	19.6	22.1	21.7	26.5																							
24-Nov	Z	22.4	21.3	22.1	20.4	19.3	20.9	21.7	20.3	19.6	19.2	19.1	18.3	16.4	9.3	6.9	2.0	1.7	1.7	1.7	1.7	1.7	1.7	1.7	12.7	22.4																							
25-Nov	1.9	Z	7.5	12.6	15.8	15.0	13.0	15.3	C	C	C	C	24.4	23.8	22.3	20.2	20.1	15.0	17.4	24.0	24.8	24.5	23.9	24.3	18.2	24.8																							
26-Nov	26.2	26.9	Z	26.6	25.9	25.5	25.3	M	24.7	25.2	26.0	25.8	25.4	25.5	24.7	23.0	20.7	6.1	16.6	22.2	26.8	28.2	27.8	27.3	24.2	28.2																							
27-Nov	27.7	28.9	30.5	Z	32.7	32.4	32.0	32.8	32.0	31.7	32.2	32.4	32.6	30.2	30.8	31.9	31.5	29.2	29.2	28.3	28.7	30.2	31.6	26.2	30.7	32.8																							
28-Nov	26.3	14.2	19.6	11.6	Z	12.1	31.5	31.3	30.2	23.4	25.9	22.7	21.5	15.2	16.0	15.1	10.3	5.6	2.6	14.9	23.4	24.3	24.7	22.6	19.4	31.5																							
29-Nov	12.2	9.4	7.6	10.8	14.9	Z	7.8	14.8	13.8	19.2	16.8	13.1	19.3	10.3	4.4	7.5	3.3	1.6	1.7	2.8	4.2	10.0	10.7	9.5	9.8	19.3																							
30-Nov	Z	1.4	1.5	1.7	4.0	6.3	5.4	2.4	3.1	6.4	9.4	10.9	10.0	9.1	5.0	2.7	1.6	1.6	5.9	3.0	1.5	1.5	1.4	1.4	4.2	10.9																							
																								17.6	18.0	16.4	17.4	18.2	18.6	18.4	17.7	18.3	19.1	19.8	20.5	21.5	21.3	20.3	19.0	17.2	15.6	15.9	17.3	17.4	18.0	18.2	18.1	Diurnal Average	
																								29.9	30.8	30.5	27.3	32.7	32.4	33.9	33.7	32.8	31.9	32.5	34.0	34.6	37.7	38.2	37.5	34.6	31.1	31.7	31.6	32.4	31.5	31.6	31.2	Diurnal Maximum	

Z - zerospan      C - Calibration      M - Maintenance  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Buffalo Viewpoint - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	394	57.52	57.52
21 - 50	291	42.48	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Buffalo Viewpoint - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	48	34	21	4	3	14	43	74	25	17	10	19	27	12	14	29	394
21 - 50	64	36	2	1	0	0	12	52	9	8	8	18	23	34	14	10	291
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	112	70	23	5	3	14	55	126	34	25	18	37	50	46	28	39	685

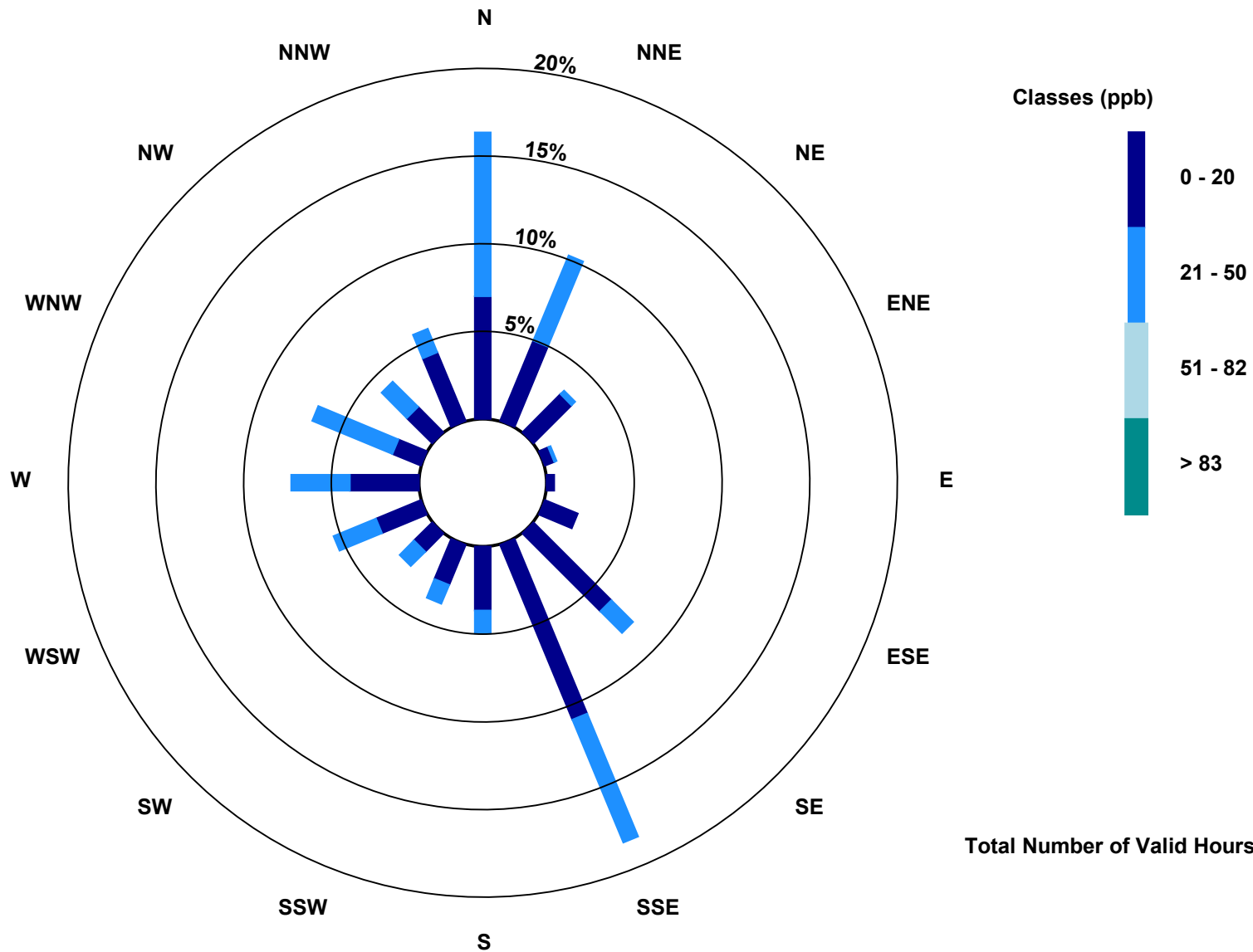
Total Number of Valid Hours: 685

Total Number of Hours: 720

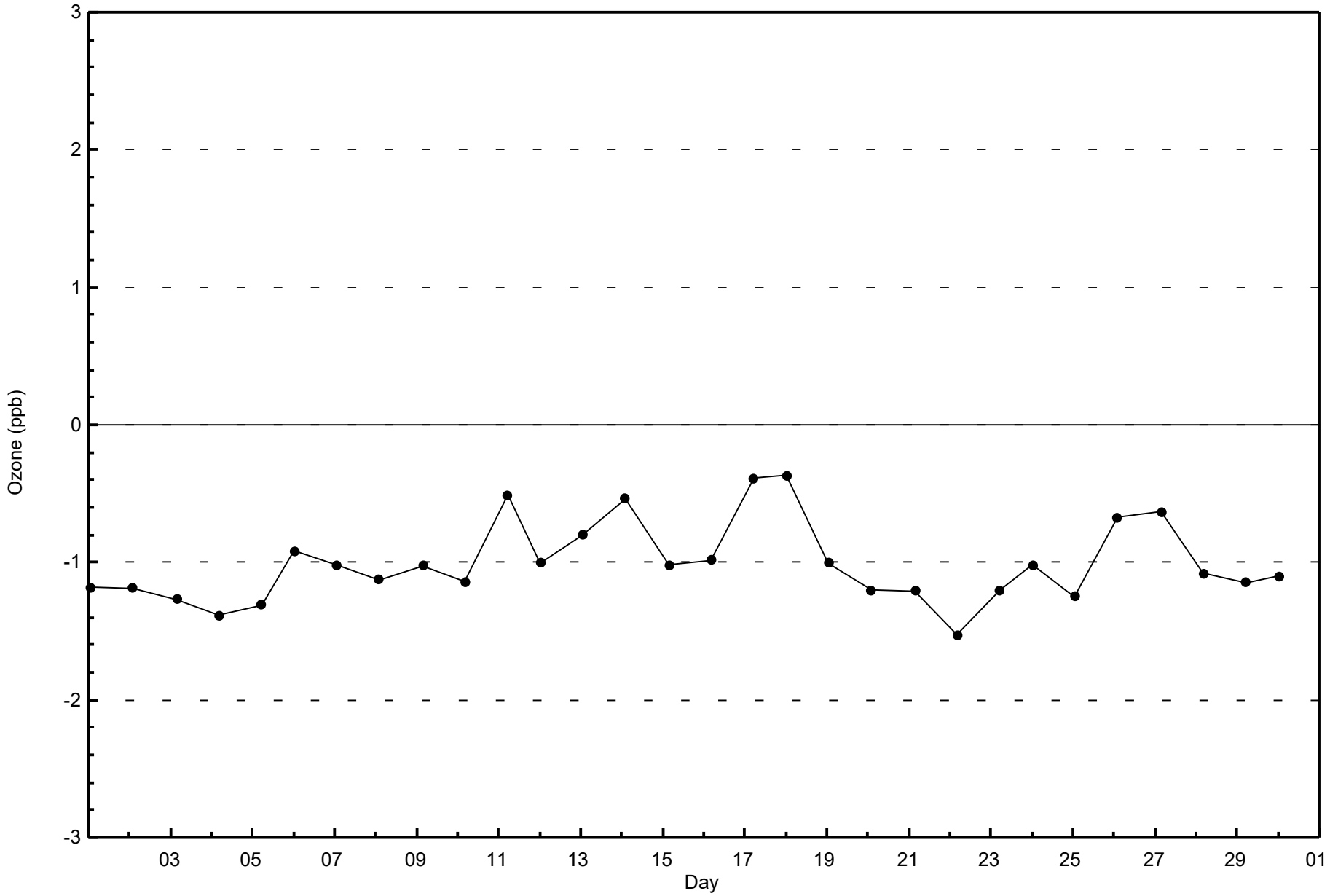


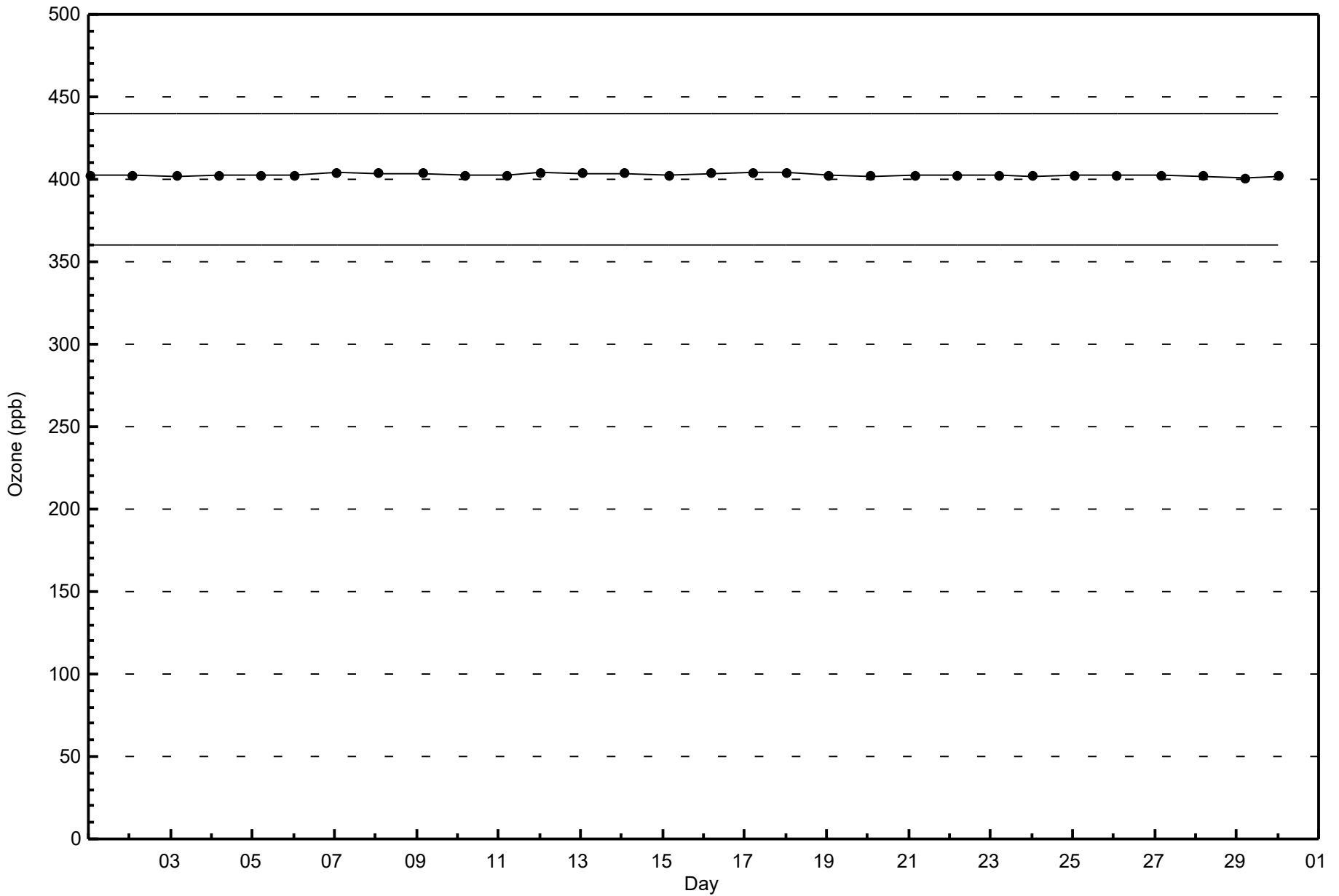
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Ozone (O<sub>3</sub>) - ppb  
Buffalo Viewpoint



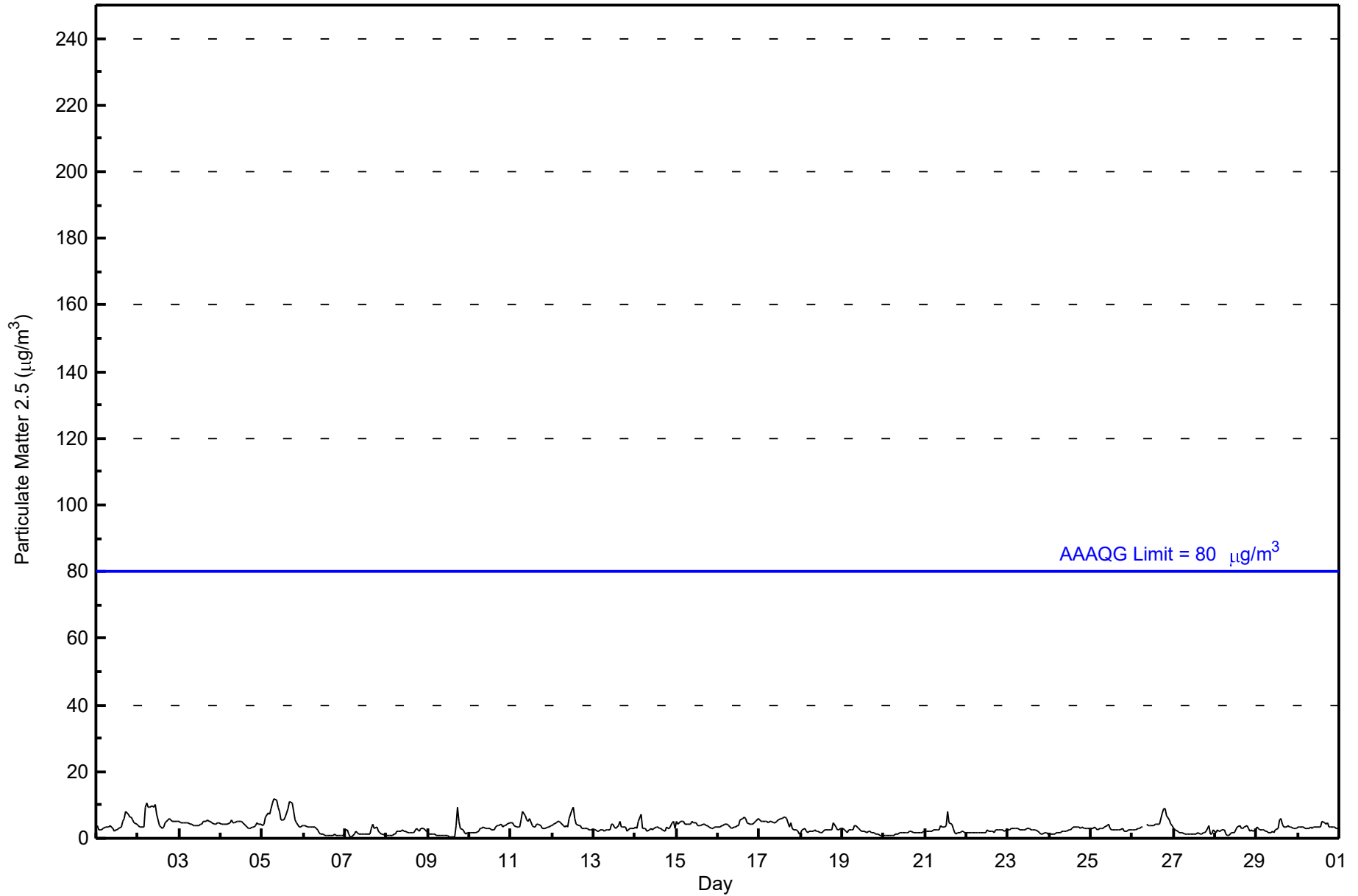
Total Number of Valid Hours: 685







Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720				
Maximum Value: 12.0 µg/m <sup>3</sup> on Nov 5 08:00		Maximum Daily Average: 7.3 µg/m <sup>3</sup> on Nov 5																	Hours of Data:	719						
Minimum Value: 0.3 µg/m <sup>3</sup> on Nov 9 15:00		Minimum Daily Average: 1.4 µg/m <sup>3</sup> on Nov 20																	Hours of Missing Data:	1						
Maximum Diurnal Average: 3.8 µg/m <sup>3</sup> at hour 18		Minimum Diurnal Average: 2.9 µg/m <sup>3</sup> at hour 24																	Hours of Calibration:	1						
Monthly Average: 3.26 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 0.7 P <sub>10</sub> = 1.3 Q <sub>1</sub> = 2.0 Median = 3.0 Q <sub>3</sub> = 4.1 P <sub>90</sub> = 5.2 P <sub>99</sub> = 9.8																	Percent Operational Time:	100.0						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	3.9	2.7	2.4	2.7	3.1	3.4	3.5	3.4	3.9	2.8	2.2	2.4	2.6	2.9	3.2	5.2	5.9	8.1	7.3	6.4	6.3	5.4	4.6	4.3	4.1	8.1
2-Nov	3.7	3.4	3.3	3.4	9.1	10.5	9.2	9.3	9.9	9.2	10.0	7.4	3.8	3.4	3.1	3.6	4.7	5.5	6.0	5.4	5.0	5.0	5.1	4.9	6.0	10.5
3-Nov	4.9	4.8	4.9	4.8	4.6	4.6	4.4	4.1	3.7	3.6	3.9	4.0	4.2	4.4	5.0	5.3	5.4	5.2	5.0	4.6	4.4	4.3	4.7	4.7	4.6	5.4
4-Nov	4.3	4.2	4.3	4.2	4.4	4.6	5.5	4.6	4.7	5.1	5.2	5.0	5.1	4.5	3.7	3.3	3.1	3.0	3.3	3.6	3.8	4.6	4.4	4.2	4.3	5.5
5-Nov	3.9	4.3	6.2	7.8	7.3	8.8	10.8	12.0	11.4	9.2	7.9	5.6	5.6	6.2	7.4	8.8	10.9	10.6	8.2	5.6	4.8	3.6	3.3	3.6	7.3	12.0
6-Nov	3.8	3.7	3.5	3.5	3.4	3.3	3.2	3.0	2.5	1.5	1.1	1.1	1.1	1.0	1.0	0.8	0.8	0.9	1.1	0.9	0.9	0.9	0.7	1.0	1.9	3.8
7-Nov	2.7	2.7	1.2	0.4	0.4	1.2	2.1	1.6	1.4	1.2	1.2	1.1	1.2	1.1	1.3	2.8	4.1	3.2	3.3	2.2	1.5	1.4	1.1	1.0	1.7	4.1
8-Nov	0.8	0.7	0.8	1.0	1.2	1.5	2.0	2.0	2.2	2.3	2.1	1.9	1.8	1.7	1.6	1.6	1.8	2.8	2.5	2.0	2.8	2.8	2.5	2.2	1.9	2.8
9-Nov	1.6	1.3	1.4	1.2	1.1	1.0	0.9	0.9	1.0	1.0	0.8	0.7	0.6	0.4	0.3	0.3	4.0	9.2	5.2	2.9	2.7	1.8	1.4	1.5	1.8	9.2
10-Nov	1.6	1.6	1.5	1.5	1.6	1.9	2.8	2.9	3.2	3.0	3.0	2.9	2.8	2.5	2.6	3.2	4.0	3.8	4.2	3.5	3.9	3.8	4.4	4.7	3.0	4.7
11-Nov	4.5	4.7	3.9	3.6	3.3	3.5	5.7	8.2	6.7	5.6	5.1	5.8	4.0	3.6	3.6	4.2	4.1	3.7	3.0	3.0	3.1	3.3	3.5	3.8	4.3	8.2
12-Nov	4.0	4.2	4.5	5.1	5.1	4.5	3.6	3.3	3.9	3.6	5.8	8.7	9.1	5.9	4.1	3.8	3.7	3.1	3.0	2.8	2.8	2.7	2.6	2.6	4.3	9.1
13-Nov	2.7	2.5	2.3	2.2	2.3	2.4	2.3	2.5	2.5	2.5	4.4	4.2	3.4	2.8	3.9	4.9	3.5	3.3	3.2	2.3	2.7	2.9	2.9	2.9	3.0	4.9
14-Nov	3.6	3.0	5.3	7.3	3.0	3.1	2.8	2.1	2.6	2.9	2.7	2.9	3.5	3.2	3.1	2.8	2.5	2.3	3.4	3.2	3.0	4.8	5.0	3.2	3.4	7.3
15-Nov	5.1	4.3	4.9	5.1	5.0	4.3	4.2	4.2	4.3	5.2	4.8	4.5	4.0	3.8	4.0	4.1	4.0	4.0	3.8	3.2	2.8	3.1	3.2	3.2	4.1	5.2
16-Nov	3.4	3.6	3.8	4.0	4.3	4.1	3.7	3.3	3.1	3.3	3.4	3.7	4.0	5.3	6.1	6.2	5.8	4.5	4.3	4.0	4.3	4.6	5.1	5.9	4.3	6.2
17-Nov	5.5	5.0	5.1	5.2	4.9	4.8	4.9	5.0	4.6	4.8	5.1	5.3	5.8	5.9	6.4	6.2	6.0	3.5	4.5	3.1	2.5	2.6	2.3	1.4	4.6	6.4
18-Nov	1.7	2.6	2.8	2.0	1.6	2.0	2.0	2.2	2.5	2.3	2.0	1.8	1.7	2.0	2.5	2.4	2.4	2.5	2.6	4.5	3.4	2.7	2.7	3.2	2.4	4.5
19-Nov	3.0	2.8	2.2	1.8	2.4	2.3	2.6	3.7	3.6	2.8	2.5	2.1	1.9	2.0	1.7	2.0	2.3	1.5	1.5	1.2	1.4	1.2	0.8	0.7	2.1	3.7
20-Nov	1.0	0.7	0.6	0.8	0.8	0.9	0.9	1.1	1.5	1.6	1.6	1.6	1.5	1.5	1.6	2.0	2.0	1.6	1.5	1.5	1.6	1.6	1.8	2.0	1.4	2.0
21-Nov	1.9	2.0	2.0	2.1	2.3	2.5	2.6	2.6	2.7	3.8	3.2	3.2	4.0	8.1	4.6	4.4	3.1	1.8	1.4	1.6	1.8	2.1	2.3	1.7	2.8	8.1
22-Nov	1.5	1.6	1.7	1.8	1.8	1.7	1.7	1.7	1.8	1.6	1.6	1.7	2.5	2.0	2.2	2.3	1.8	2.6	2.6	2.5	2.6	2.5	2.3	2.5	2.0	2.6
23-Nov	2.4	2.6	2.8	2.8	2.9	3.0	3.0	2.8	2.7	2.5	2.7	2.8	2.8	2.7	2.5	2.4	2.0	1.5	1.4	1.4	1.5	1.5	1.3	2.4	3.0	
24-Nov	1.2	1.2	1.4	1.4	1.6	1.7	1.8	1.9	2.0	2.1	2.3	2.5	2.6	2.8	3.4	3.3	3.3	3.3	3.2	3.2	3.0	3.0	2.9	3.0	2.4	3.4
25-Nov	2.9	3.0	3.2	3.0	2.7	2.9	3.0	3.0	3.3	3.9	4.2	3.1	2.7	2.5	2.5	2.4	2.4	2.6	3.0	2.2	2.0	2.3	2.5	2.7	2.8	4.2
26-Nov	2.7	2.4	2.6	3.0	3.0	3.3	3.5	C	4.1	3.9	3.6	3.6	3.8	4.2	4.3	4.3	4.2	7.5	9.1	9.0	6.7	5.5	4.4	3.9	4.5	9.1
27-Nov	3.1	2.7	2.0	1.6	1.7	1.5	1.5	1.3	1.2	1.2	1.2	1.1	1.2	1.3	1.9	1.2	1.3	1.5	1.5	2.0	3.7	1.4	1.2	2.3	1.7	3.7
28-Nov	1.8	2.5	2.0	2.1	2.8	2.7	1.2	1.0	1.0	1.6	1.6	1.9	2.4	3.2	3.7	3.0	2.8	3.2	3.9	2.8	2.2	2.4	2.2	2.4	2.4	3.9
29-Nov	3.3	3.0	2.6	2.5	2.5	2.2	2.2	1.9	1.9	2.0	1.8	2.7	2.9	5.5	5.7	4.1	3.5	3.6	3.9	3.6	3.4	3.1	3.0	2.9	3.1	5.7
30-Nov	3.2	3.6	3.4	3.3	3.1	3.0	3.1	3.2	3.1	3.2	3.2	3.2	3.2	3.4	5.0	4.6	4.4	4.8	3.4	3.6	3.5	3.3	3.0	3.0	3.5	5.0
																								Diurnal Average		
																								Diurnal Maximum		
C - Calibration																										
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m <sup>3</sup> 24-hr 29 µg/m <sup>3</sup>																										





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Buffalo Viewpoint - November 2024**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	660	91.79	91.79
6 - 15	59	8.21	100.00
16 - 25	0	0.00	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>**  
**Buffalo Viewpoint - November 2024**

Concentration Ranges (μg/m <sup>3</sup> )	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	112	73	17	3	2	10	51	127	36	26	19	38	40	42	27	37	660
6 - 15	3	1	7	2	1	4	6	9	0	0	1	2	11	6	3	3	59
16 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	115	74	24	5	3	14	57	136	36	26	20	40	51	48	30	40	719

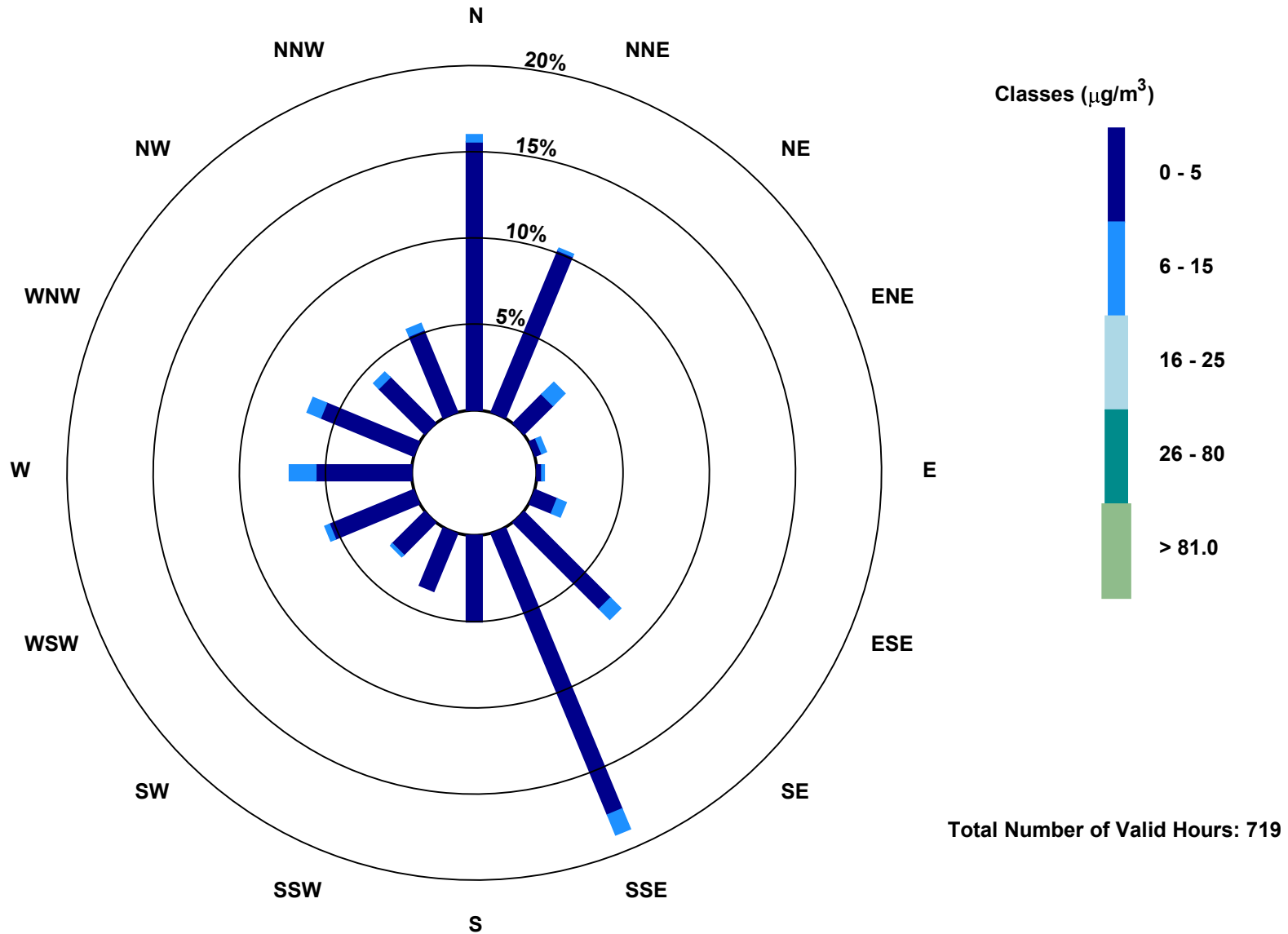
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Buffalo Viewpoint



Total Number of Valid Hours: 719



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

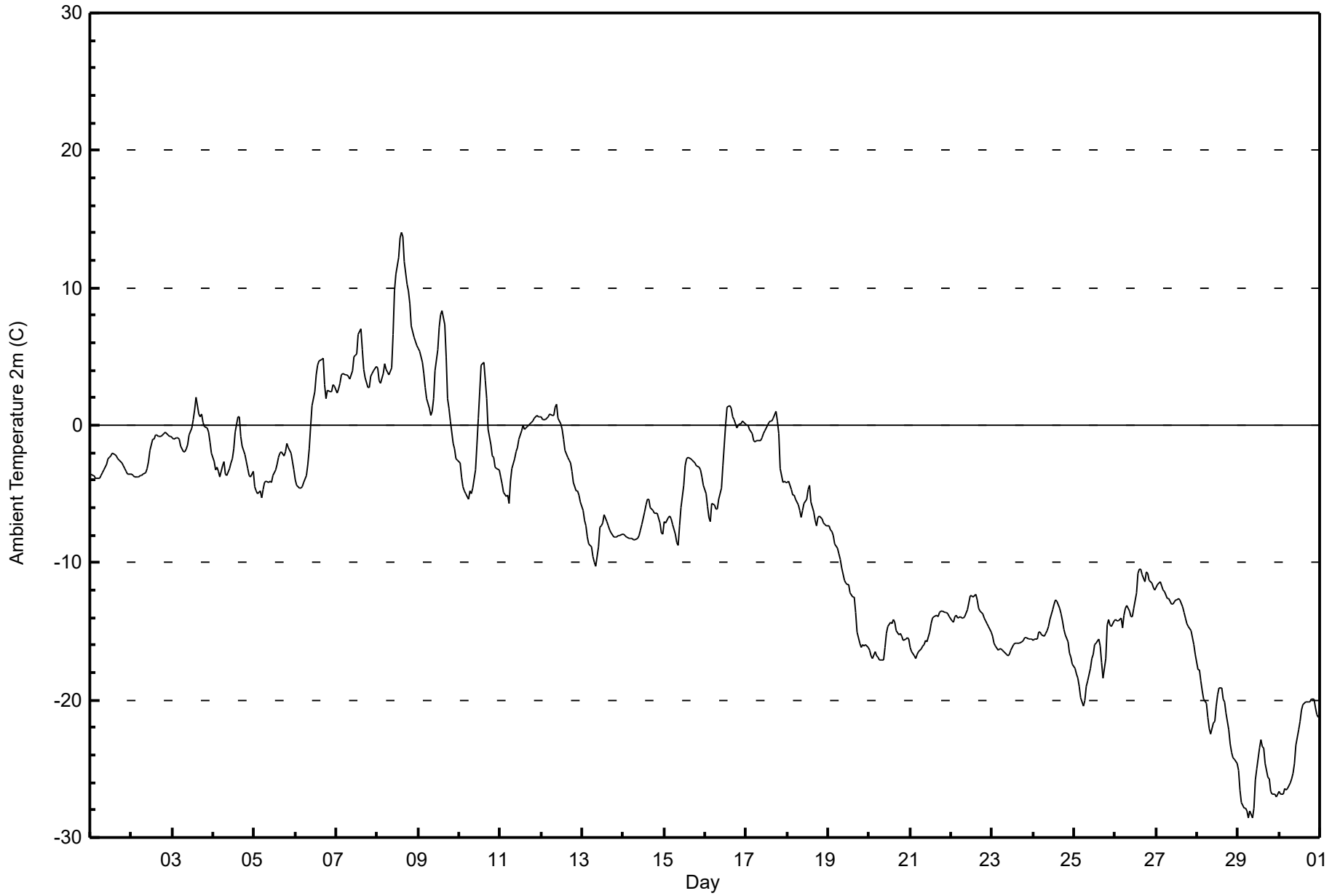
**Ambient Temperature 2m (AT2) - C**  
**Buffalo Viewpoint - November 2024**

Maximum Value: 14.0 C on Nov 8 15:00      Maximum Daily Average: 7.6 C on Nov 8																				Hours in Service: 720 Hours of Data: 720																												
Minimum Value: -28.6 C on Nov 29 07:00      Minimum Daily Average: -26.3 C on Nov 29 Maximum Diurnal Average: -5.6 C at hour 15      Minimum Diurnal Average: -9.0 C at hour 8 Monthly Average: -7.71 C      Percentiles: P <sub>1</sub> = -27.4 P <sub>10</sub> = -19.1 Q <sub>1</sub> = -14.5 Median = -5.9 Q <sub>3</sub> = -1.1 P <sub>90</sub> = 2.5 P <sub>99</sub> = 9.8																				Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-3.6	-3.7	-3.7	-3.8	-3.9	-3.9	-3.6	-3.5	-3.3	-2.8	-2.5	-2.3	-2.2	-2.1	-2.1	-2.2	-2.4	-2.6	-2.7	-2.9	-3.1	-3.4	-3.5	-3.6	-3.1	-2.1																						
2-Nov	-3.6	-3.6	-3.8	-3.8	-3.7	-3.7	-3.7	-3.6	-3.4	-3.1	-2.7	-1.9	-1.1	-1.0	-0.7	-0.7	-0.8	-0.8	-0.7	-0.6	-0.5	-0.7	-0.8	-0.8	-2.1	-0.5																						
3-Nov	-0.9	-1.0	-0.9	-0.9	-1.1	-1.5	-1.9	-2.0	-1.8	-1.4	-0.8	-0.2	0.4	1.2	2.0	0.8	0.6	0.8	0.2	-0.1	-0.2	-0.5	-1.2	-2.1	-0.5	2.0																						
4-Nov	-2.7	-3.3	-3.1	-3.4	-3.8	-2.9	-2.7	-3.6	-3.6	-3.1	-2.8	-2.4	-1.7	-0.5	0.6	0.6	-0.8	-1.5	-2.1	-2.6	-3.2	-3.7	-3.7	-3.4	-2.5	0.6																						
5-Nov	-4.4	-4.7	-5.0	-4.8	-5.3	-4.7	-4.2	-4.1	-4.2	-4.1	-4.1	-3.7	-3.3	-2.8	-2.3	-2.0	-1.9	-2.2	-1.9	-1.3	-1.6	-2.0	-2.6	-3.3	-3.4	-1.3																						
6-Nov	-4.0	-4.4	-4.5	-4.5	-4.5	-4.2	-3.6	-2.9	-1.7	-0.1	1.4	2.4	3.6	4.3	4.7	4.8	4.9	2.9	2.0	2.5	2.4	2.4	3.0	2.9	0.4	4.9																						
7-Nov	2.4	2.6	3.0	3.6	3.8	3.7	3.7	3.5	3.4	4.0	5.0	5.1	5.2	6.6	7.0	5.5	4.1	3.4	2.7	2.8	3.6	3.8	3.9	4.3	4.0	7.0																						
8-Nov	4.2	3.2	3.1	3.8	4.5	4.1	3.9	3.6	4.2	6.6	9.8	11.0	12.2	13.6	14.0	13.7	11.9	10.3	9.7	8.8	7.2	6.4	6.1	5.8	7.6	14.0																						
9-Nov	5.6	5.4	4.5	3.8	2.8	1.9	1.2	0.7	1.0	2.0	3.9	5.5	7.2	8.0	8.3	7.4	5.0	1.9	1.2	0.3	-1.4	-1.7	-2.4	-2.6	2.9	8.3																						
10-Nov	-2.8	-3.8	-4.5	-4.7	-4.9	-5.4	-4.8	-5.0	-4.6	-3.2	-1.4	0.5	2.5	4.3	4.6	3.3	2.0	-0.3	-1.4	-2.2	-2.4	-3.1	-3.1	-3.3	-1.8	4.6																						
11-Nov	-3.8	-4.2	-4.9	-5.1	-5.1	-5.7	-4.1	-3.1	-2.5	-2.0	-1.7	-1.0	-0.4	0.0	-0.3	-0.2	-0.1	0.1	0.2	0.3	0.5	0.7	0.7	0.6	-1.7	0.7																						
12-Nov	0.6	0.4	0.4	0.5	0.6	0.9	0.7	0.7	1.3	1.5	0.5	0.1	-0.3	-1.0	-1.9	-2.4	-2.5	-2.8	-3.4	-4.2	-4.8	-4.8	-5.0	-5.6	-1.3	1.5																						
13-Nov	-6.2	-6.9	-7.3	-8.1	-8.6	-8.9	-9.6	-10.0	-10.3	-8.8	-7.4	-7.3	-7.1	-6.5	-7.0	-7.4	-7.6	-7.8	-8.1	-8.2	-8.1	-8.1	-8.0	-8.0	-8.0	-8.0	-6.2																					
14-Nov	-7.9	-8.0	-8.1	-8.2	-8.2	-8.2	-8.3	-8.3	-8.2	-8.0	-7.7	-7.2	-6.3	-5.8	-5.3	-5.4	-6.0	-6.2	-6.4	-6.5	-6.4	-7.1	-7.9	-8.0	-7.2	-5.3																						
15-Nov	-7.1	-7.2	-6.7	-6.6	-6.8	-7.2	-8.0	-8.6	-8.7	-7.3	-6.0	-4.4	-2.9	-2.5	-2.4	-2.4	-2.5	-2.7	-2.8	-2.9	-3.1	-3.3	-3.7	-4.3	-5.0	-2.4																						
16-Nov	-5.0	-5.9	-6.7	-7.0	-5.7	-5.8	-6.1	-6.1	-5.4	-4.6	-3.0	-1.4	0.1	1.4	1.4	1.2	0.6	0.4	-0.2	0.0	0.1	0.1	0.3	0.1	-2.4	1.4																						
17-Nov	0.0	0.0	-0.3	-0.6	-1.1	-1.2	-1.1	-1.1	-1.1	-0.9	-0.6	-0.4	0.0	0.2	0.3	0.4	0.5	1.0	0.3	-0.6	-3.1	-4.2	-4.1	-4.2	-0.9	1.0																						
18-Nov	-4.2	-4.1	-4.7	-5.1	-5.1	-5.4	-5.8	-6.3	-6.7	-6.2	-5.7	-5.4	-4.7	-4.3	-5.6	-6.3	-6.9	-7.3	-6.7	-6.6	-6.8	-7.2	-7.2	-7.3	-5.9	-4.1																						
19-Nov	-7.3	-7.6	-7.7	-8.1	-8.6	-8.9	-9.3	-9.8	-10.4	-11.3	-11.5	-11.6	-11.6	-12.2	-12.5	-12.6	-13.6	-15.0	-15.8	-16.2	-16.0	-16.0	-16.0	-16.2	-11.9	-7.3																						
20-Nov	-16.4	-16.7	-17.0	-16.5	-16.8	-16.9	-17.1	-17.0	-17.0	-16.2	-15.1	-14.6	-14.3	-14.4	-14.2	-14.4	-14.9	-15.3	-15.2	-15.4	-15.6	-15.5	-15.5	-15.6	-15.7	-14.2																						
21-Nov	-16.2	-16.5	-16.8	-17.0	-16.7	-16.4	-16.3	-16.0	-16.0	-15.7	-15.7	-15.1	-14.4	-14.0	-13.9	-13.9	-13.9	-13.7	-13.5	-13.5	-13.6	-13.6	-13.7	-14.0	-15.0	-13.5																						
22-Nov	-14.2	-14.3	-13.9	-13.9	-14.0	-13.9	-14.0	-14.0	-14.0	-13.4	-12.9	-12.4	-12.4	-12.5	-12.3	-12.7	-13.3	-13.6	-13.7	-14.1	-14.3	-14.5	-14.7	-15.0	-13.7	-12.3																						
23-Nov	-15.3	-15.8	-16.0	-16.3	-16.3	-16.3	-16.4	-16.5	-16.6	-16.8	-16.7	-16.3	-15.9	-15.9	-15.9	-15.9	-15.9	-15.8	-15.6	-15.4	-15.5	-15.5	-15.5	-15.5	-16.0	-15.3																						
24-Nov	-15.6	-15.6	-15.5	-15.1	-15.0	-15.3	-15.3	-15.2	-15.0	-14.6	-14.1	-13.5	-13.0	-12.7	-12.8	-13.3	-13.8	-14.2	-14.8	-15.3	-15.7	-16.5	-16.9	-17.4	-14.8	-12.7																						
25-Nov	-17.7	-18.1	-18.4	-19.1	-19.8	-20.4	-20.0	-19.0	-18.6	-17.7	-17.0	-16.7	-15.9	-15.9	-15.5	-16.1	-17.3	-18.4	-17.0	-14.6	-14.2	-14.5	-14.6	-14.3	-17.1	-14.2																						
26-Nov	-14.1	-14.2	-14.3	-14.0	-14.7	-13.9	-13.4	-13.1	-13.6	-13.9	-13.9	-13.3	-12.2	-10.8	-10.5	-10.5	-10.9	-11.4	-10.6	-10.7	-11.3	-11.5	-11.8	-12.0	-12.5	-10.5																						
27-Nov	-11.8	-11.6	-11.4	-11.6	-12.0	-12.1	-12.6	-12.6	-12.8	-13.0	-13.0	-12.8	-12.7	-12.6	-12.7	-13.3	-13.7	-14.0	-14.4	-14.6	-15.0	-15.5	-16.0	-16.7	-13.3	-11.4																						
28-Nov	-17.8	-17.8	-18.6	-19.3	-19.9	-20.3	-21.3	-22.1	-22.5	-21.6	-21.6	-20.5	-19.6	-19.1	-19.1	-19.9	-20.1	-21.0	-22.2	-23.2	-23.8	-24.2	-24.3	-24.7	-21.0	-17.8																						
29-Nov	-25.1	-26.6	-27.4	-27.8	-27.9	-28.1	-28.6	-28.1	-28.6	-27.9	-25.8	-25.0	-23.5	-22.9	-23.3	-23.5	-24.6	-25.6	-25.8	-26.6	-26.9	-26.8	-27.1	-26.9	-26.3	-22.9																						
30-Nov	-26.7	-26.9	-26.9	-26.4	-26.5	-26.4	-26.1	-25.7	-25.3	-24.6	-23.3	-22.2	-21.5	-20.8	-20.3	-20.2	-20.2	-20.2	-20.1	-19.9	-19.9	-20.5	-21.0	-21.3	-23.0	-19.9																						
																								-8.1	-8.4	-8.6	-8.7	-8.8	-8.9	-8.9	-9.0	-8.9	-8.3	-7.5	-6.9	-6.2	-5.7	-5.6	-5.9	-6.5	-7.0	-7.3	-7.4	-7.8	-8.0	-8.2	-8.4	Diurnal Average
																								5.6	5.4	4.5	3.8	4.5	4.1	3.9	3.6	4.2	6.6	9.8	11.0	12.2	13.6	14.0	13.7	11.9	10.3	9.7	8.8	7.2	6.4	6.1	5.8	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 2m (AT2) - C**  
**Buffalo Viewpoint - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Buffalo Viewpoint - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	63	8.75	8.75
-20 - 0	524	72.78	81.53
0 - 10	126	17.50	99.03
10 - 20	7	0.97	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

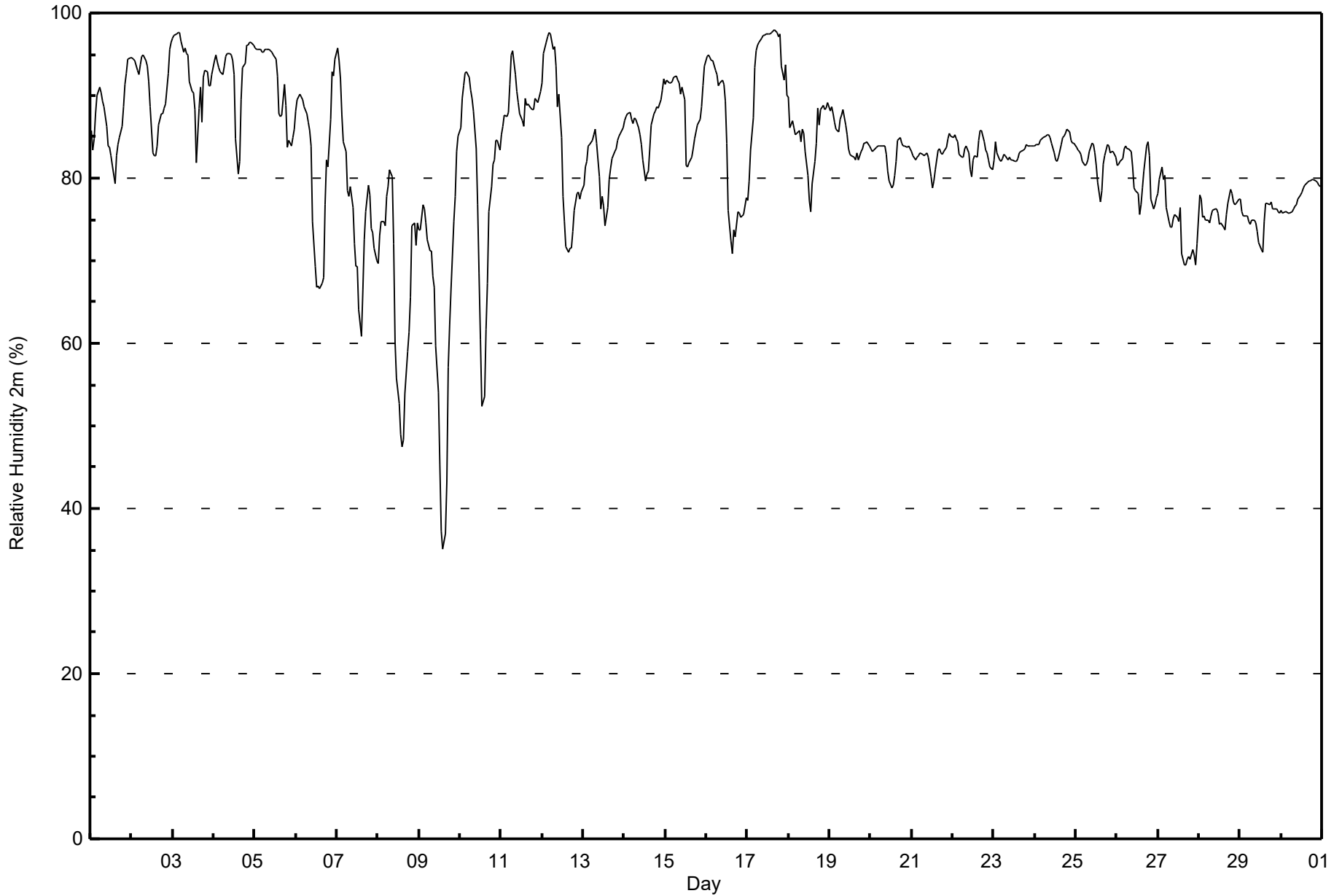
Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Relative Humidity 2m (RH2) - %**  
**Buffalo Viewpoint - November 2024**

Maximum Value: 97.9 % on Nov 17 17:00																						Maximum Daily Average: 93.7 % on Nov 17																						Hours in Service: 720				
Minimum Value: 35.2 % on Nov 9 15:00																						Minimum Daily Average: 64.3 % on Nov 9																						Hours of Data: 720				
Maximum Diurnal Average: 86.0 % at hour 4																						Minimum Diurnal Average: 75.7 % at hour 15																						Hours of Missing Data: 0				
Monthly Average: 82.83 %																						Percentiles: P <sub>1</sub> = 49.6 P <sub>10</sub> = 73.6 Q <sub>1</sub> = 77.7 Median = 83.5 Q <sub>3</sub> = 88.6 P <sub>90</sub> = 94.3 P <sub>99</sub> = 97.5																						Hours of Calibration: 0				
																																												Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	85.8	83.5	84.8	87.9	90.1	91.0	90.4	89.4	88.7	86.2	83.9	83.7	82.7	81.6	79.4	82.7	84.1	84.9	86.3	88.6	91.3	92.7	94.5	94.6	87.0	94.6																						
2-Nov	94.6	94.4	94.2	93.1	92.5	93.7	94.7	94.9	94.3	93.6	91.7	88.6	83.0	82.7	82.8	84.0	86.4	87.8	87.7	88.5	89.0	92.6	95.7	96.5	90.7	96.5																						
3-Nov	97.0	97.2	97.4	97.6	97.6	96.6	95.2	95.8	95.1	95.0	91.6	90.5	90.4	88.2	81.8	88.4	91.1	86.8	92.2	93.1	92.9	91.1	91.2	92.6	92.8	97.6																						
4-Nov	94.2	95.0	94.1	93.4	92.9	92.5	93.5	94.7	95.0	95.0	94.9	94.2	92.5	84.8	80.5	82.1	89.4	93.4	94.0	96.1	96.1	96.4	96.5	96.1	92.8	96.5																						
5-Nov	95.7	95.7	95.6	95.6	95.2	95.3	95.6	95.6	95.6	95.4	95.2	94.9	94.5	92.4	87.9	87.4	87.6	91.3	88.9	83.7	84.6	83.8	85.0	85.9	91.6	95.7																						
6-Nov	88.2	89.4	90.2	89.9	89.5	88.6	87.7	86.8	85.8	83.9	74.7	69.3	66.8	66.9	66.6	67.3	68.0	76.8	82.3	81.4	87.2	92.9	92.4	94.4	82.0	94.4																						
7-Nov	95.8	94.3	92.0	87.7	84.3	83.3	78.4	77.7	79.1	76.5	72.1	69.3	69.3	64.1	60.9	66.5	72.5	75.9	79.1	78.0	73.9	73.4	71.5	70.1	76.9	95.8																						
8-Nov	69.6	73.1	74.7	74.8	74.3	77.7	79.0	81.1	80.2	72.1	60.1	55.8	52.8	49.0	47.4	48.3	53.9	59.1	61.4	65.6	74.3	74.6	71.9	74.5	66.9	81.1																						
9-Nov	73.7	73.7	76.7	76.2	74.5	72.6	71.1	71.2	68.2	66.9	59.6	54.1	45.3	37.3	35.2	36.9	43.3	57.1	62.2	66.7	74.8	77.8	83.2	85.1	64.3	85.1																						
10-Nov	86.1	89.7	91.2	92.7	92.8	92.2	90.7	89.7	88.2	83.5	76.7	68.5	60.5	52.3	53.6	61.7	67.2	76.0	79.0	81.7	82.2	84.6	84.6	83.3	79.5	92.8																						
11-Nov	85.3	86.2	87.6	87.4	88.0	91.4	95.0	95.5	92.5	90.5	89.2	87.8	87.0	86.3	89.6	88.8	89.0	88.6	88.3	88.4	89.7	89.2	89.8	90.5	89.2	95.5																						
12-Nov	91.5	95.0	96.5	97.2	97.6	97.4	95.6	95.9	93.6	88.6	90.1	84.8	77.8	74.7	71.8	71.0	71.5	71.5	73.5	76.2	78.2	78.3	77.4	78.4	84.3	97.6																						
13-Nov	79.1	81.3	82.1	83.9	84.0	84.5	85.3	85.9	84.3	80.2	76.3	77.7	76.6	74.3	76.4	79.9	81.1	82.3	83.2	83.5	84.5	85.0	85.4	86.2	81.8	86.2																						
14-Nov	86.9	87.4	87.9	88.0	87.2	86.6	87.3	87.1	86.1	85.3	84.1	82.2	79.7	80.4	80.9	83.6	86.4	87.8	88.2	88.6	88.5	89.4	90.7	92.1	86.4	92.1																						
15-Nov	91.4	91.9	91.6	91.5	91.7	92.2	92.4	91.8	91.6	90.2	91.0	89.5	81.5	81.3	81.8	82.6	83.5	84.7	85.6	86.5	87.2	88.6	91.1	93.5	88.5	93.5																						
16-Nov	94.7	95.0	94.6	94.2	94.3	93.0	92.5	91.3	91.5	91.8	91.4	89.3	84.2	76.1	72.3	70.9	73.7	72.9	76.0	75.8	75.2	75.4	75.6	77.6	84.1	95.0																						
17-Nov	77.4	79.7	83.4	87.3	93.4	95.4	96.1	96.5	96.9	97.2	97.3	97.4	97.5	97.5	97.6	97.8	97.9	97.6	97.2	97.2	97.5	93.5	91.8	93.7	90.0	93.7																						
18-Nov	89.9	86.0	86.9	86.2	85.2	85.4	85.8	84.4	85.9	85.4	83.2	80.4	77.2	76.0	79.3	82.1	84.3	88.5	86.4	88.3	88.7	88.3	88.5	89.2	85.1	89.9																						
19-Nov	88.1	88.6	87.9	86.9	86.0	85.5	87.1	87.6	88.3	86.5	85.3	83.6	82.8	82.6	82.6	82.2	83.0	82.1	83.2	83.6	84.3	84.3	84.4	83.9	85.0	88.6																						
20-Nov	83.6	83.2	83.4	83.7	83.8	83.9	84.0	83.9	83.8	82.8	80.9	79.6	78.8	79.1	80.4	82.0	84.6	84.9	84.2	83.9	83.9	83.8	83.9	83.5	82.9	84.9																						
21-Nov	83.3	82.8	82.3	82.5	82.7	83.1	82.8	82.8	82.8	83.0	82.5	80.2	78.8	79.6	81.0	83.4	83.5	83.1	82.9	83.3	83.8	84.7	85.4	85.1	82.7	85.4																						
22-Nov	84.9	85.3	84.8	84.4	82.8	82.6	82.6	83.5	84.0	83.0	81.0	80.2	82.2	82.7	82.6	84.6	85.7	85.7	84.4	83.4	83.1	82.2	81.3	81.0	83.3	85.7																						
23-Nov	82.2	84.4	83.1	82.2	82.0	82.4	82.9	82.7	82.3	82.5	82.3	82.2	82.0	82.0	82.4	83.0	83.3	83.4	83.6	84.0	83.9	84.0	83.9	83.9	82.9	84.4																						
24-Nov	83.9	84.0	84.1	84.6	84.8	84.9	85.0	85.2	85.2	84.9	84.3	83.0	82.2	82.1	82.6	84.0	84.9	85.0	85.4	85.9	85.5	84.5	84.3	84.2	84.4	85.9																						
25-Nov	83.7	83.3	83.3	82.8	82.1	81.6	81.7	82.2	83.2	84.2	84.0	83.1	81.5	79.4	77.0	78.4	81.7	82.7	84.1	83.9	83.0	83.3	83.2	82.5	82.3	84.2																						
26-Nov	81.6	81.8	82.1	82.4	83.5	83.8	83.6	83.5	83.3	81.3	78.8	78.5	78.1	75.7	76.7	78.8	80.9	83.9	84.3	82.7	77.5	76.2	76.7	77.7	80.6	84.3																						
27-Nov	78.1	79.9	81.4	79.9	80.3	76.4	74.7	74.1	74.0	75.0	75.7	75.3	74.7	76.5	70.9	69.6	69.5	70.1	70.5	70.2	71.4	70.6	69.5	72.0	74.2	81.4																						
28-Nov	77.9	77.5	75.3	75.4	74.9	74.9	74.6	75.4	76.1	76.2	76.3	75.7	74.3	74.6	74.1	73.7	75.6	76.9	78.6	78.2	77.1	76.8	77.0	77.4	76.0	78.6																						
29-Nov	77.5	75.9	75.5	75.3	75.4	74.8	74.4	74.9	74.9	74.5	73.6	72.2	71.3	71.0	74.8	76.9	76.9	76.8	77.2	76.2	76.2	76.2	75.9	75.8	75.2	77.5																						
30-Nov	76.1	75.8	75.9	75.9	75.7	75.8	76.0	76.3	76.5	76.8	77.5	78.0	78.4	78.7	79.1	79.4	79.6	79.6	79.7	79.9	79.7	79.5	79.2	79.0	77.8	79.9																						
																								85.3	85.7	86.0	86.0	86.0	86.0	85.9	85.9	85.6	84.3	82.2	80.3	78.1	76.3	75.7	77.3	79.3	81.2	82.3	82.8	83.4	83.7	84.1	84.6	Diurnal Average
																								97.0	97.2	97.4	97.6	97.6	97.4	96.1	96.5	96.9	97.2	97.3	97.4	97.5	97.5	97.6	97.8	97.9	97.6	97.2	97.5	96.1	96.4	96.5	96.5	Diurnal Maximum





Maximum Speed: 23 km/h on Nov 12 13:00	Maximum Daily Speed Average: 15.1 km/h on Nov 27	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 2 06:00	Minimum Daily Speed Average: 1.0 km/h on Nov 1	Hours of Data: 720
Maximum Diurnal Speed Average: 2.7 km/h at hour 11	Minimum Diurnal Speed Average: 0.9 km/h at hour 18	Hours of Missing Data: 0
Monthly Average Velocity: 1.4 km/h 316.2 deg	Percentiles: P <sub>1</sub> = 2 P <sub>10</sub> = 4 Q <sub>1</sub> = 5 Median = 7 Q <sub>3</sub> = 11 P <sub>90</sub> = 14 P <sub>99</sub> = 19	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	W8	SW6	S4	SSE4	S4	S4	SE4	SE3	SSE4	SSW4	SSW5	SSW6	WSW6	W5	W7	NNE3	ENE3	NE3	NE5	ENE4	NE5	NE5	NE4	NE3	S1.0	W8	
2-Nov	NE5	NE6	NE6	NE5	SE2	W0	SE1	NE3	NE5	NE5	NE4	E4	E6	ESE8	SE7	ESE7	E8	ENE9	ESE5	ESE6	SE6	SE6	SE7	SE5	E4.0	ENE9	
3-Nov	SSE4	SSE4	S4	SSW4	WSW5	WSW5	SSW3	SSW4	SSW4	S5	SSW6	S5	SSE5	SSE6	S8	SSE6	S4	SW6	SSE6	S7	SSW7	WSW11	W11	SW4	SSW4.6	W11	
4-Nov	S6	S6	SSW6	SSW8	SW5	SW7	W11	WSW7	SSW5	SSW2	SSE5	S5	SE7	ESE8	ESE8	SE7	SSE5	SE6	SSE6	SSE5	SE7	SSE7	SE8	SE6	S4.7	W11	
5-Nov	SSW3	NNE4	N5	N6	N8	NNW5	NNW4	NW5	NW5	W4	WSW6	W5	W6	W7	W7	WNV6	WNV5	SSE4	SW5	WSW6	WSW8	SW8	SW8	SW7	W3.7	SW8	
6-Nov	SSE6	SSE10	SSE11	SSE10	SSE11	SSE11	SSE12	SSE10	SSE10	S10	SSW13	SW15	SW13	WSW7	WSW12	WSW12	SSW7	SE10	SE10	SSE8	SE7	SE8	SSE4	NE2	S7.4	SW15	
7-Nov	NNW5	NW11	NW14	WNW13	W15	W18	WNW17	WNW14	WNW12	W13	W13	W10	WNW9	NW7	NNW4	ENE6	SE5	S4	SE5	SE6	SSE8	SSE7	SE6	SSE6	W5.4	W18	
8-Nov	SSE7	S6	SSE8	SE12	SSE9	SE8	SE9	SSE7	SE8	SSE8	S9	S8	S9	SSW7	SSW8	SSW6	S5	SSE7	SW2	WNW7	NW7	WNW7	W6	WSW6	S4.9	SE12	
9-Nov	WSW11	W14	W12	WSW11	SW9	WSW10	WSW7	SW8	WSW7	W13	W11	W8	W8	W11	W7	WSW3	S5	SSE7	SE6	SSE7	SSE8	SSE7	SSE5	SE6	WSW6.0	W14	
10-Nov	SSE6	SSE5	SSE5	SE7	SE7	SSE5	SSE4	S4	S7	SSW5	WSW10	WSW8	WSW6	SSW5	SSE4	SE5	SE7	SSE7	SE8	SSE7	SE7	SSE6	SSE5	SE6	SSE4.8	WSW10	
11-Nov	SSE5	SSE5	S5	SSE5	SW4	SE6	SE8	ESE10	ESE9	SE10	ESE10	ESE9	SE9	SE11	ESE12	SE10	ESE8	SE7	SE5	SE4	SE6	SSE3	ESE3	SE4	SE6.7	ESE12	
12-Nov	S4	SSE4	S4	S4	SSW6	WSW8	WSW8	SW7	WSW12	WSW17	W22	W19	W23	W23	W22	WNW18	WSW19	WSW17	W15	W11	W12	W13	W15	W17	WSW12.2	W23	
13-Nov	WSW7	WSW7	WSW8	WSW6	W8	W10	WSW5	SW4	WSW7	WNW7	NNW7	NNE10	NE8	NNE8	NE7	NE8	NNE9	NNE10	NNE11	NNE9	NNE12	NNE12	NNE12	NNE11	N4.3	NNE12	
14-Nov	NNE11	NNE11	NNE14	NNE14	NNE13	NNE13	NNE12	NNE11	NNE11	NNE12	NNE12	NNE12	N10	NNE10	N10	N10	N9	N10	N9	N8	NNW6	NNE5	NNE5	NNW4	NNE10.1	NNE14	
15-Nov	NNW1	ESE2	NNE1	S2	SW4	S4	S3	S3	SE5	SSE2	S4	SSW5	S3	SE5	SE5	SE6	SSE7	SSE7	SSE6	SSE6	S5	SSE4	S6	SSE3.9	SSE7		
16-Nov	SSE5	SSE4	S4	SSE6	SSE8	SSE8	SSE10	SSE10	SSE10	SSE11	SSE12	SSE14	SSE13	SSE15	SSE14	SSE13	SSE13	SSE15	SSE11	SSE11	SSE12	SSE11	SSE11	SSE8	SSE10.2	SSE15	
17-Nov	SSE9	SSE9	SE9	SE9	SSE9	SSE10	SSE8	SSE7	SSE8	SSE8	SSE8	SSE8	SSE8	SSE8	SSE6	SE5	SE6	SSW4	NNW12	NNW17	NW20	NW17	NW13	NW14	S2.4	NW20	
18-Nov	W10	W16	W14	WNW13	WNW11	WNW13	WNW11	W10	W9	WNW9	WNW11	NW10	WNW6	NW3	NNE4	NNE5	NNE4	S2	SW3	NNW5	NNE5	NNE6	NNW5	NNW4	WNW6.3	W16	
19-Nov	NNE3	NNE5	NNE3	NNE8	NNE10	NE11	NNE11	NNE10	N9	N12	N10	N11	N12	NNE17	NNE14	N14	N13	N14	N15	N15	N12	N9	N11	N15	N10.8	NNE17	
20-Nov	N14	N14	N11	N15	N11	N11	N9	N9	N10	N13	N15	N15	N15	N13	N12	N11	N9	N9	N16	N16	N17	N13	N12	N12	N12.4	N17	
21-Nov	N13	N13	N13	NNE11	N10	N13	N14	N10	N10	NNW9	NW10	NW9	NNW8	NNW7	N8	NNW6	NW6	NW7	WNW8	WNW6	NW7	NW5	NNE4	NNE5	NNW8.1	N14	
22-Nov	N1	SW4	W6	WNW6	WSW7	W8	WSW3	WSW2	WSW3	NW5	WNW6	NW7	NNE6	NNE5	N4	NNE8	NE8	NNE5	NNE5	NE6	NNE7	NNE7	N8	N10	NNW3.5	N10	
23-Nov	N10	N11	NNE12	NNE12	N11	N10	N12	N12	N12	N12	NNE13	NNE13	N13	N13	N13	N11	N15	N14	N12	N11	N13	N13	N12	N12	N11.9	N15	
24-Nov	N13	N13	N12	NNE11	NNE10	NNE10	NNE10	NNE8	N6	NNW6	N7	N6	N6	N5	NNW4	NNW4	N4	N4	N4	N2	WSW1	S4	SSE4	SE5	N5.4	N13	
25-Nov	SSE5	SSE5	SSE6	SE6	SSE6	SSE6	SSE5	SSE5	SSE4	SSE6	SSE6	SSE7	SSE7	SSE8	S7	S7	SE3	SE4	SSE6	SSE6	SSE10	SSE10	SSE10	SSE10	SSE6.6	SSE10	
26-Nov	SSE10	SSE9	SSE9	SSE8	SSE6	SSE6	SSE6	SSE8	SSE9	SSE9	SSE9	SSE8	SSE7	SSE7	SSE6	SSE4	SSW3	WNW7	W15	WNW15	WNW15	WNW15	WNW13	WNW14	SSW4.1	WNW15	
27-Nov	WNW14	W13	WNW16	WNW17	WNW19	WNW17	WNW17	WNW17	WNW18	WNW17	WNW16	WNW17	NW18	NW19	NW16	NNW18	NNW19	NNW20	NNW19	NNW16	NNW16	N14	N16	N13	N9	NW15.1	NNW20
28-Nov	N6	NNW8	NW11	NW12	NW12	NW10	WNW9	WNW8	NNW6	WNW3	SW4	W4	WNW4	NNW4	NNE4	NE4	ENE5	NE4	NNE7	NE6	NNE3	NNW2	NNW4	NW4	NNW4.6	NW12	
29-Nov	WNW4	WSW3	W3	W3	WNW4	WNW3	W2	WNW4	WNW4	NNW3	NW2	N3	NNW3	NW5	NW5	NNW6	N5	N7	NNE8	N6	N5	N6	N5	N5	NNW3.4	NNE8	
30-Nov	NNE6	NNE5	NNE5	NNE2	NNE3	NNE5	N5	N5	NNE6	N4	NNW4	N4	N4	NNW4	N5	NNW5	N6	NNW5	NNW6	NNW6	N6	N7	N7	N8	N4.9	N8	

NW1.0WNW1.3 NW1.7 NW1.2WNW1.8WNW1.9WNW1.5WNW1.1 W1.3 W2.0 W2.7WNW2.3WNW2.0 NW1.2NNW1.4 N1.6NNE1.3NNE0.9 N1.9NNW2.0NNW1.8NNW1.7NNW1.6NNW1.7 N14 W16WNW16WNW17WNW19 W18WNW17WNW18WNW17WSW17 W22 W19 W23 W23 W22NNW19NNW20NNW19 N16NNW17 NW20WNW17 W15 W17	Diurnal Average	Diurnal Maximum
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All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

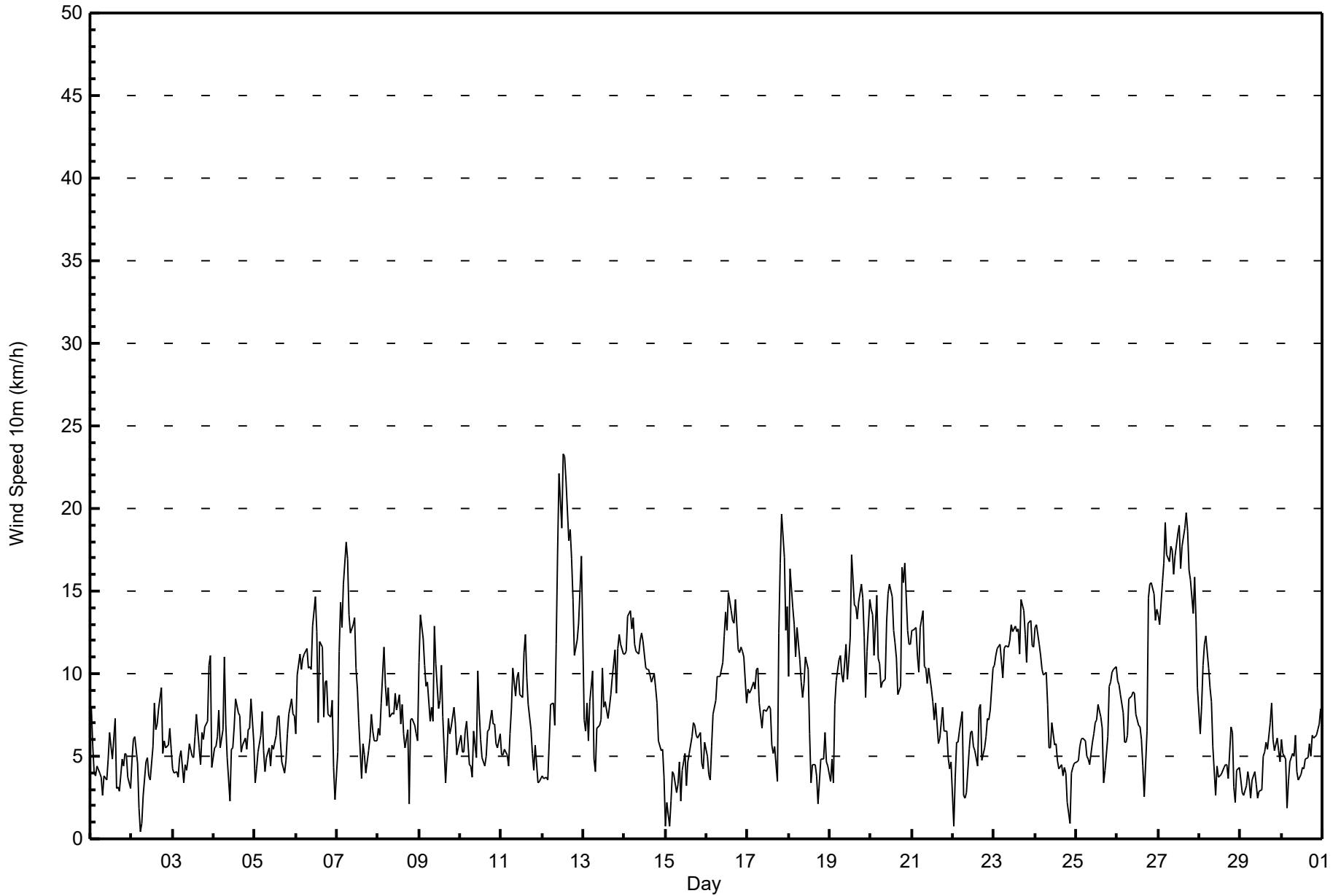
**Wind Speed 10m (WS10) - km/h**  
**Buffalo Viewpoint - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Nov 12 15:00 Minimum Value: 0 km/h on Nov 24 19:00 Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 5																		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	2	1	1	1	1	1	1	2	2	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	2
2-Nov	2	2	2	2	1	1	1	1	1	1	1	1	3	3	2	2	2	2	2	2	1	2	2	2	3
3-Nov	1	1	1	1	2	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	3	3	2	3
4-Nov	1	1	1	2	2	2	4	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	4
5-Nov	2	1	2	2	2	2	1	1	1	1	1	2	2	2	2	2	1	1	3	2	2	2	2	2	3
6-Nov	2	3	3	3	3	3	3	3	4	3	3	4	6	4	4	3	2	2	2	2	2	2	3	1	6
7-Nov	1	5	4	3	3	5	5	4	3	4	4	3	3	2	2	1	1	1	1	2	2	2	2	2	5
8-Nov	2	2	2	3	3	2	2	2	2	2	3	2	3	2	2	2	1	1	2	2	2	1	1	1	3
9-Nov	5	4	3	3	3	2	2	2	2	5	3	3	3	3	3	1	1	1	1	1	1	1	2	2	5
10-Nov	1	1	1	1	2	2	2	2	1	3	3	3	2	1	2	1	1	1	1	1	1	1	2	2	3
11-Nov	1	1	2	2	2	2	3	3	3	3	3	2	3	4	4	3	2	2	2	1	2	1	1	1	4
12-Nov	1	1	1	1	1	2	2	1	4	4	5	5	5	5	7	5	5	4	3	3	2	2	3	4	7
13-Nov	3	3	3	2	3	2	2	2	2	3	3	2	2	2	2	2	2	4	3	3	3	3	3	3	4
14-Nov	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	1	2	1	4
15-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	2
16-Nov	1	1	1	1	2	2	3	3	3	3	4	4	4	5	5	5	5	5	4	3	4	3	3	3	5
17-Nov	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	3	3	6	6	5	4	4	6
18-Nov	3	3	3	3	3	3	3	2	2	2	3	3	3	1	1	1	1	1	1	2	1	2	1	2	3
19-Nov	1	1	1	2	3	3	3	3	3	3	3	3	4	4	4	4	3	4	4	4	3	2	4	3	4
20-Nov	4	3	3	4	3	3	3	3	2	3	4	4	4	3	3	3	2	2	4	4	5	3	3	3	5
21-Nov	3	3	3	3	2	3	3	2	3	2	3	3	2	2	2	2	2	2	2	2	2	2	1	2	3
22-Nov	1	1	1	2	2	1	2	1	1	1	2	2	2	1	2	3	2	1	1	2	2	2	2	3	3
23-Nov	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	3	3	4
24-Nov	3	3	3	3	2	2	2	2	1	1	2	1	1	1	1	1	1	1	0	1	1	1	1	1	3
25-Nov	1	1	1	1	1	1	1	1	2	2	2	2	2	3	2	2	1	1	2	3	3	3	3	3	3
26-Nov	3	3	3	2	2	2	2	3	3	3	3	2	2	2	2	1	2	2	4	4	4	4	3	4	4
27-Nov	4	3	4	5	5	5	4	5	5	4	4	5	5	4	5	5	5	5	4	5	4	4	4	3	5
28-Nov	2	2	3	3	3	3	2	2	3	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	3
29-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	1	1	1	1	1	2
30-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	2	2	2
Diurnal Maximum																									



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 10m (WS10) - km/h**  
**Buffalo Viewpoint - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Buffalo Viewpoint - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	220	30.56	30.56
6 - 11	352	48.89	79.44
12 - 19	142	19.72	99.17
20 - 28	6	0.83	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Buffalo Viewpoint - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	19	24	15	3	1	3	16	36	24	15	10	9	8	8	9	20	220
6 - 11	49	31	9	2	2	10	40	91	12	10	9	24	22	17	12	12	352
12 - 19	47	19	0	0	0	1	1	10	0	1	1	7	17	23	8	7	142
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	1	6
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	115	74	24	5	3	14	57	137	36	26	20	40	51	48	30	40	720

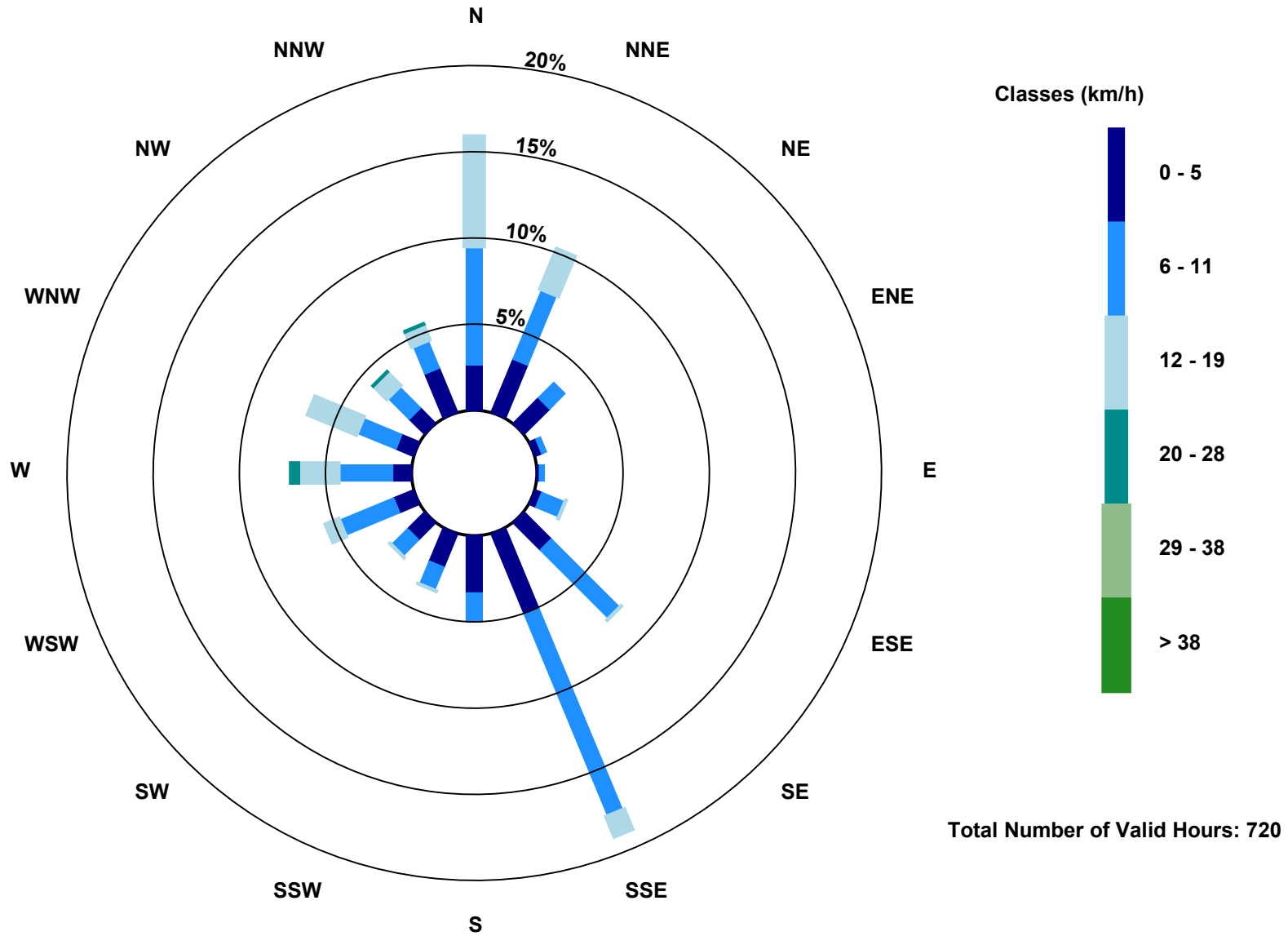
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Buffalo Viewpoint





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Buffalo Viewpoint - November 2024**

Direction of Maximum Speed: 262 deg on Nov 12 13:00		Hours in Service: 720
Direction of Maximum Daily Speed Average: 312.8 deg on Nov 27		Hours of Data: 720
Direction of Minimum Speed: 266 deg on Nov 2 06:00	Direction of Minimum Daily Speed Average: 1.0 deg on Nov 1	Hours of Missing Data: 0
Monthly Average Direction: 316.2 deg		Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	271	235	191	147	170	170	143	146	164	192	195	212	239	263	273	28	61	55	56	65	49	56	55	42	179.0
2-Nov	38	38	36	50	135	266	134	48	37	40	36	83	101	116	129	117	89	76	103	118	130	137	144	145	92.5
3-Nov	153	156	176	192	238	249	199	211	192	191	207	190	167	154	171	150	179	221	160	174	194	254	262	216	197.8
4-Nov	183	175	209	208	226	228	266	243	209	195	165	173	136	123	119	131	157	145	151	165	148	154	126	134	170.9
5-Nov	193	12	10	355	2	340	327	317	305	266	251	280	272	278	275	289	282	168	229	255	242	235	218	216	276.2
6-Nov	155	154	150	151	150	155	159	158	164	186	206	218	236	244	247	249	194	130	140	156	145	144	164	38	176.6
7-Nov	334	308	311	283	265	277	296	301	287	273	263	281	283	305	338	77	125	177	131	144	149	149	136	155	277.8
8-Nov	166	181	148	146	151	138	132	151	143	165	175	184	186	206	209	199	185	164	221	303	315	291	272	258	180.1
9-Nov	256	266	263	253	236	240	246	229	248	259	262	278	279	259	267	249	180	154	144	166	162	147	159	138	236.5
10-Nov	156	163	163	138	139	154	168	172	189	204	255	251	250	203	166	142	128	159	145	148	144	155	154	140	168.3
11-Nov	153	158	170	159	214	142	129	107	122	124	120	115	125	129	123	127	120	128	135	130	128	148	103	139	130.4
12-Nov	172	153	169	182	197	239	237	215	243	251	267	270	262	259	278	284	254	249	269	269	263	264	261	263	257.1
13-Nov	243	248	258	237	260	275	248	225	247	288	342	30	34	24	48	49	24	31	22	28	18	24	19	19	355.2
14-Nov	19	20	13	17	18	19	16	13	20	16	12	16	11	12	6	5	5	360	6	2	347	23	29	337	12.3
15-Nov	346	103	25	179	214	182	169	172	128	162	176	204	178	132	143	138	156	164	164	168	161	170	166	169	163.0
16-Nov	167	167	185	160	147	149	150	157	149	151	151	155	152	158	160	155	154	157	162	158	160	158	154	151	155.8
17-Nov	152	147	146	145	148	147	144	153	155	153	155	154	157	151	148	139	144	206	329	327	307	304	312	308	178.2
18-Nov	274	265	274	292	286	303	301	273	278	286	293	304	302	319	28	22	33	172	230	339	13	15	348	347	298.5
19-Nov	23	25	13	18	31	44	14	21	353	8	0	1	11	22	15	7	359	6	7	4	354	352	358	356	9.0
20-Nov	358	354	358	353	352	360	357	1	3	8	8	5	2	7	2	355	2	6	6	7	2	353	357	359	0.8
21-Nov	8	6	9	17	6	0	356	358	353	332	318	317	327	345	358	331	324	311	302	301	305	320	18	29	346.3
22-Nov	2	220	275	286	251	267	256	241	253	308	303	318	15	13	357	26	36	30	28	36	21	14	8	0	343.3
23-Nov	359	9	15	20	8	1	5	11	8	6	16	16	4	2	359	356	358	358	4	3	1	3	0	357	4.9
24-Nov	2	0	8	12	17	18	22	13	358	344	357	356	1	350	345	342	350	353	352	6	240	190	156	144	5.3
25-Nov	164	165	156	142	150	155	154	151	152	154	156	155	156	154	172	179	145	146	161	161	161	155	152	155	156.7
26-Nov	159	161	163	158	160	161	161	160	161	164	164	163	155	163	160	168	196	298	279	290	291	295	284	291	210.5
27-Nov	290	275	289	295	299	291	293	297	291	290	297	304	307	317	329	331	330	328	329	334	353	354	354	358	312.8
28-Nov	357	329	310	320	321	310	287	292	328	300	231	276	303	346	33	37	57	34	25	37	19	329	342	314	329.9
29-Nov	292	258	265	273	283	284	263	285	289	341	322	355	327	314	312	345	351	8	23	10	9	10	6	10	335.0
30-Nov	14	21	20	15	29	24	7	6	18	10	341	4	3	342	353	348	350	346	338	330	351	353	350	354	358.9

314.5 299.8 306.1 316.5 285.7 291.1 299.9 290.1 280.2 279.6 274.5 291.1 297.5 317.4 328.2 7.4 25.1 29.1 0.8 347.7 341.6 330.4 339.9 337.7

Diurnal Average

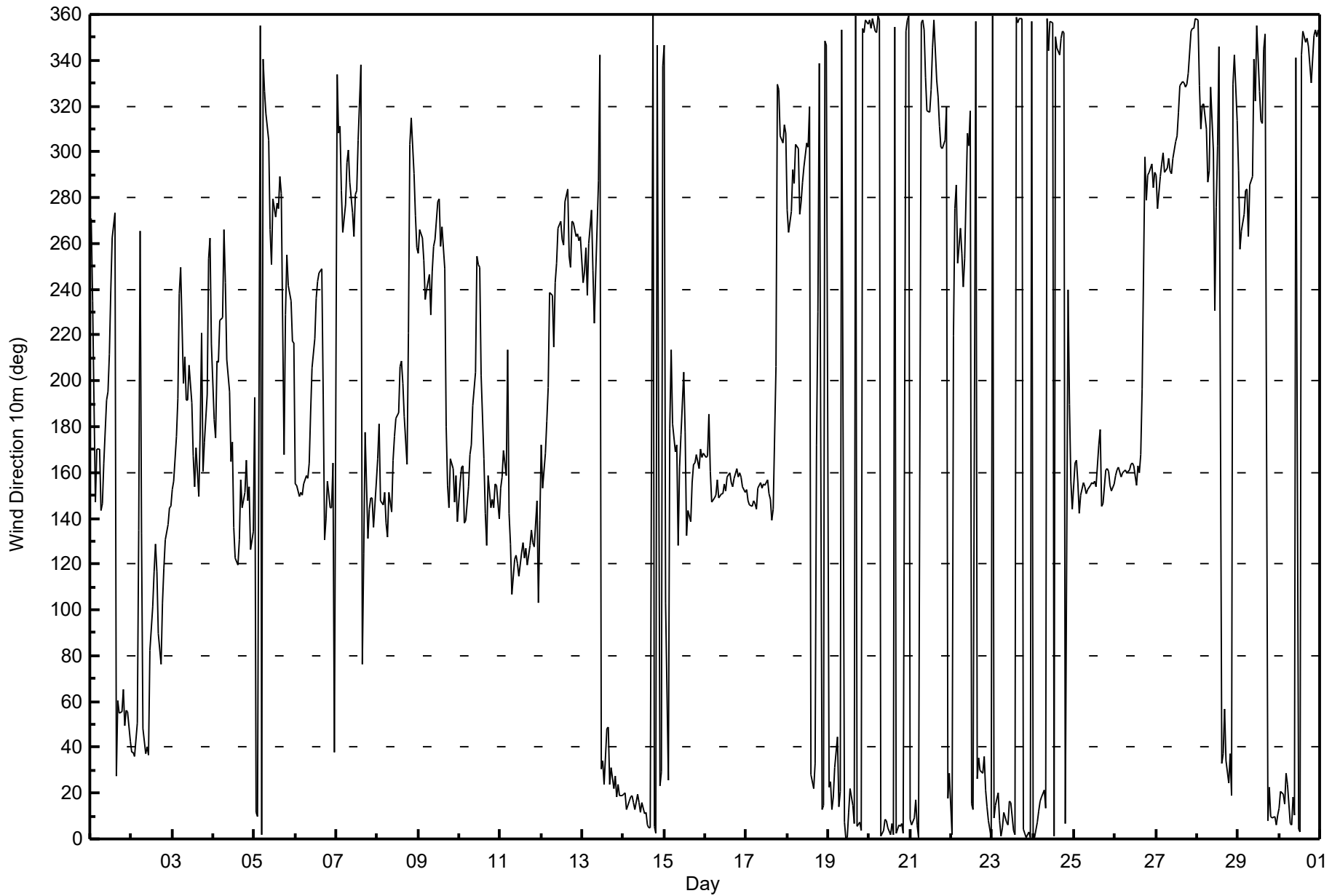
All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Buffalo Viewpoint - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 92 deg on Nov 2 07:00 Minimum Value: 3 deg on Nov 24 20:00 Percentiles: P <sub>1</sub> = 11 P <sub>10</sub> = 15 Q <sub>1</sub> = 18 Median = 21 Q <sub>3</sub> = 27 P <sub>90</sub> = 31 P <sub>99</sub> = 66																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0										
Day	Hourly Period Ending At (MST)																								Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	19	21	27	20	18	27	26	72	41	32	26	22	25	25	19	61	44	27	18	20	20	19	24	23	72		
2-Nov	21	21	19	29	59	67	92	22	12	17	20	35	42	24	29	25	21	14	38	24	25	28	29	27	92		
3-Nov	23	24	26	16	25	17	30	18	26	22	15	17	29	27	29	28	30	26	20	21	15	16	13	34	34		
4-Nov	16	25	18	16	29	30	22	20	34	64	28	28	22	19	19	16	11	13	14	11	15	7	7	21	64		
5-Nov	33	18	19	22	19	20	19	16	21	19	27	15	16	17	16	20	14	35	47	15	18	18	14	21	47		
6-Nov	25	26	26	24	27	29	27	28	29	26	19	18	34	63	20	18	30	15	16	19	24	19	82	50	82		
7-Nov	24	17	19	20	14	18	22	21	20	18	20	21	20	27	54	25	25	24	24	26	27	28	28	45	54		
8-Nov	44	26	24	24	26	23	18	21	22	27	23	25	24	27	18	21	15	20	72	22	18	17	20	17	72		
9-Nov	13	12	13	22	18	18	21	21	23	19	21	25	24	18	20	33	18	9	7	14	7	16	23	19	33		
10-Nov	21	21	18	14	17	45	31	54	17	48	16	22	39	26	42	26	16	12	14	12	16	14	23	27	54		
11-Nov	25	22	34	31	36	25	29	22	28	27	24	22	27	27	24	28	25	28	32	31	28	29	31	28	36		
12-Nov	29	29	31	25	21	21	17	14	18	15	15	18	12	13	21	22	19	16	18	20	13	11	11	13	31		
13-Nov	33	31	25	23	20	17	38	45	21	21	37	22	21	24	20	21	20	20	21	20	20	19	19	19	45		
14-Nov	20	18	19	20	19	19	19	19	17	16	18	19	21	21	21	21	21	20	21	18	20	26	33	25	33		
15-Nov	77	33	74	44	24	23	39	13	11	49	28	23	48	36	27	29	26	24	26	27	31	31	28	20	77		
16-Nov	21	16	18	17	25	29	27	27	28	27	27	28	29	30	31	31	29	29	27	27	29	27	28	28	31		
17-Nov	31	27	29	29	28	28	28	32	28	31	28	27	29	25	24	26	22	54	18	25	22	22	19	21	54		
18-Nov	19	11	16	19	19	21	21	19	17	20	22	21	23	34	19	10	12	58	28	29	19	19	27	28	58		
19-Nov	37	27	32	16	21	18	21	21	22	23	23	20	21	20	19	21	21	20	20	19	19	18	18	19	37		
20-Nov	20	19	18	19	18	17	19	18	16	19	20	22	21	18	21	19	18	18	19	19	21	19	19	19	22		
21-Nov	17	18	19	18	17	19	19	19	19	19	20	23	20	26	19	21	19	21	20	21	19	30	22	25	30		
22-Nov	45	11	17	20	17	11	56	34	32	20	27	23	24	22	21	24	20	26	20	20	24	21	21	22	56		
23-Nov	21	19	20	20	19	22	21	20	23	19	17	17	18	18	19	19	17	18	21	19	19	20	20	18	23		
24-Nov	19	19	18	17	16	16	15	20	20	21	19	17	18	25	20	19	12	12	10	3	77	28	20	15	77		
25-Nov	17	17	15	12	13	19	20	28	30	29	28	29	30	30	32	28	25	30	32	27	28	28	31	30	32		
26-Nov	29	31	27	32	28	28	28	26	27	27	29	32	32	33	31	25	61	21	18	19	20	21	19	20	61		
27-Nov	20	16	20	20	21	21	19	21	20	20	20	21	20	19	19	19	17	19	18	20	21	21	19	19	21		
28-Nov	21	22	19	17	17	18	17	16	32	31	20	28	24	36	19	16	21	25	21	14	38	30	13	22	38		
29-Nov	22	17	31	16	14	19	40	20	11	36	36	24	28	21	24	23	11	13	15	13	15	11	12	13	40		
30-Nov	12	11	12	14	19	13	17	19	12	18	20	20	18	25	23	18	18	18	17	18	19	18	17	20	25		
																	77 33 74 44 59 67 92 72 41 64 37 35 48 63 54 61 61 58 72 31 77 31 82 50										
Diurnal Maximum																											







## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

**AMS05  
MANNIX  
NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)  
NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	687	33	33	100	40.4	0	7.7	0
H2S (ppb) Average	683	35	37	99.72	6	0	1.6	0
THC (ppm) Average	687	33	33	100	4.5	-	2.7	-
NMHC(ppm) Average	687	33	33	100	0.169	-	0.026	-
CH4(ppm) Average	687	33	33	100	4.5	-	2.6	-
Temperature 2 m (C) Average	714	0	6	99.17	11.9	-	6.1	-
Temperature 20 m (C) Average	714	0	6	99.17	13.4	-	7.3	-
Temperature 45 m (C) Average	714	0	6	99.17	13.2	-	7.6	-
Temperature 75 m (C) Average	714	0	6	99.17	13.1	-	8.1	-
Temperature 90 m (C) Average	714	0	6	99.17	13.2	-	8.3	-
Relative Humidity 2 m (%) Average	714	0	6	99.17	97	-	95	-
Relative Humidity 20 m (%) Average	655	0	65	90.97	100	-	90	-
Relative Humidity 45 m (%) Average	714	0	6	99.17	99	-	92	-
Relative Humidity 75 m (%) Average	624	0	96	86.67	100	-	95	-
Relative Humidity 90 m (%) Average	688	0	32	95.56	100	-	94	-
Wind Speed 20 m (km/h) Average	714	0	6	99.17	29	-	20	-
Wind Speed 45 m (km/h) Average	688	0	32	95.56	33	-	25	-
Wind Speed 75 m (km/h) Average	679	0	41	94.31	36	-	29	-
Wind Speed 90 m (km/h) Average	677	0	43	94.03	38	-	30	-
Wind Direction 20 m (deg) Average	714	0	6	99.17	-	-	-	-
Wind Direction 45 m (deg) Average	688	0	32	95.56	-	-	-	-
Wind Direction 75 m (deg) Average	679	0	41	94.31	-	-	-	-
Wind Direction 90 m (deg) Average	677	0	43	94.03	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	714	0	6	99.17	1.2	-	0.6	-
Vertical Wind Speed 45 m (km/h) Average	688	0	32	95.56	1.8	-	0.5	-
Vertical Wind Speed 75 m (km/h) Average	679	0	41	94.31	1.5	-	0.5	-
Vertical Wind Speed 90 m (km/h) Average	677	0	43	94.03	2	-	1.3	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)

NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	687	1.16	3.6	-	0	0	0.1	0.1	0.5	2.8	40.4
H2S (ppb) Average	683	0.34	0.5	-	0	0.1	0.1	0.2	0.3	0.8	5.7
THC (ppm) Average	687	2.21	0.2	-	2.1	2.1	2.1	2.1	2.2	2.4	4.5
NMHC(ppm) Average	687	0.007	0.017	-	0	0	0	0	0	0	0.169
CH4(ppm) Average	687	2.2	0.2	-	2.1	2.1	2.1	2.1	2.2	2.4	4.5
Temperature 2 m (C) Average	714	-7.82	8.2	-	-27.3	-18.8	-14.5	-5.8	-1.4	1.4	11.9
Temperature 20 m (C) Average	714	-7.6	8.4	-	-26.6	-18.8	-14.6	-5.7	-1.1	2.3	13.4
Temperature 45 m (C) Average	714	-7.68	8.5	-	-26.5	-18.8	-14.8	-5.9	-1.1	2.6	13.2
Temperature 75 m (C) Average	714	-7.75	8.5	-	-26	-18.5	-15.1	-6.2	-1.1	2.7	13.1
Temperature 90 m (C) Average	714	-7.66	8.5	-	-25.6	-18.1	-15	-6.1	-1	2.7	13.2
Relative Humidity 2 m (%) Average	714	83.2	8	-	39	75	78	83	89	94	97
Relative Humidity 20 m (%) Average	655	81.1	9	-	36	71	76	82	86	91	100
Relative Humidity 45 m (%) Average	714	82.2	9	-	35	71	77	84	88	93	99
Relative Humidity 75 m (%) Average	624	82.7	10	-	36	68	77	85	89	95	100
Relative Humidity 90 m (%) Average	688	82.3	10	-	36	69	78	84	88	94	100
Wind Speed 20 m (km/h) Average	714	10.6	5	-	1	4	7	10	14	18	29
Wind Speed 45 m (km/h) Average	688	14.3	7	-	0	6	9	14	19	24	33
Wind Speed 75 m (km/h) Average	679	16.7	8	-	1	6	11	16	23	28	36
Wind Speed 90 m (km/h) Average	677	17.5	8	-	1	6	11	17	24	30	38
Wind Direction 20 m (deg) Average	714	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	688	-	-	-	-	-	-	-	-	-	-
Wind Direction 75 m (deg) Average	679	-	-	-	-	-	-	-	-	-	-
Wind Direction 90 m (deg) Average	677	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	714	0.06	0.3	-	-1.6	-0.3	-0.2	0	0.3	0.6	1.2
Vertical Wind Speed 45 m (km/h) Average	688	-0.03	0.4	-	-2.3	-0.6	-0.3	0	0.2	0.5	1.8
Vertical Wind Speed 75 m (km/h) Average	679	0.16	0.3	-	-0.9	-0.2	0	0.1	0.3	0.6	1.5
Vertical Wind Speed 90 m (km/h) Average	677	0.06	0.5	-	-1.2	-0.5	-0.3	0	0.4	0.8	2

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S	24 Nov 2024 11:00	24 Nov 2024 12:00	2	Maintenance - verify daily QA response
ALL METEOROLOGICAL SENSORS	08 Nov 2024 10:00	08 Nov 2024 15:00	6	Maintenance - station operator activities
Relative Humidity, 20m	01 Nov 2024 22:00	02 Nov 2024 01:00	4	Sensor operated out of range
Relative Humidity, 20m	02 Nov 2024 06:00	02 Nov 2024 07:00	2	Sensor operated out of range
Relative Humidity, 20m	02 Nov 2024 23:00	03 Nov 2024 10:00	12	Sensor operated out of range
Relative Humidity, 20m	04 Nov 2024 08:00	04 Nov 2024 13:00	6	Sensor operated out of range
Relative Humidity, 20m	04 Nov 2024 22:00	05 Nov 2024 04:00	7	Sensor operated out of range
Relative Humidity, 20m	05 Nov 2024 07:00	05 Nov 2024 14:00	8	Sensor operated out of range
Relative Humidity, 20m	11 Nov 2024 07:00	11 Nov 2024 08:00	2	Sensor operated out of range
Relative Humidity, 20m	12 Nov 2024 02:00	12 Nov 2024 06:00	5	Sensor operated out of range
Relative Humidity, 20m	17 Nov 2024 06:00	17 Nov 2024 16:00	11	Sensor operated out of range
Relative Humidity, 20m	17 Nov 2024 19:00	17 Nov 2024 20:00	2	Sensor operated out of range
Relative Humidity, 75m	01 Nov 2024 02:00	01 Nov 2024 02:00	1	Sensor operated out of range
Relative Humidity, 75m	01 Nov 2024 19:00	02 Nov 2024 03:00	9	Sensor operated out of range
Relative Humidity, 75m	02 Nov 2024 06:00	02 Nov 2024 07:00	2	Sensor operated out of range
Relative Humidity, 75m	02 Nov 2024 22:00	03 Nov 2024 07:00	10	Sensor operated out of range
Relative Humidity, 75m	03 Nov 2024 23:00	03 Nov 2024 23:00	1	Sensor operated out of range
Relative Humidity, 75m	04 Nov 2024 03:00	04 Nov 2024 14:00	12	Sensor operated out of range
Relative Humidity, 75m	05 Nov 2024 01:00	05 Nov 2024 18:00	18	Sensor operated out of range
Relative Humidity, 75m	11 Nov 2024 06:00	11 Nov 2024 09:00	4	Sensor operated out of range
Relative Humidity, 75m	12 Nov 2024 00:00	12 Nov 2024 09:00	10	Sensor operated out of range
Relative Humidity, 75m	12 Nov 2024 11:00	12 Nov 2024 11:00	1	Sensor operated out of range
Relative Humidity, 75m	14 Nov 2024 23:00	15 Nov 2024 01:00	3	Sensor operated out of range
Relative Humidity, 75m	16 Nov 2024 02:00	16 Nov 2024 05:00	4	Sensor operated out of range
Relative Humidity, 75m	17 Nov 2024 04:00	17 Nov 2024 15:00	12	Sensor operated out of range
Relative Humidity, 75m	17 Nov 2024 19:00	17 Nov 2024 20:00	2	Sensor operated out of range
Relative Humidity, 75m	17 Nov 2024 23:00	17 Nov 2024 23:00	1	Sensor operated out of range
Relative Humidity, 90m	02 Nov 2024 23:00	03 Nov 2024 06:00	8	Sensor operated out of range
Relative Humidity, 90m	05 Nov 2024 03:00	05 Nov 2024 03:00	1	Sensor operated out of range
Relative Humidity, 90m	12 Nov 2024 02:00	12 Nov 2024 07:00	6	Sensor operated out of range
Relative Humidity, 90m	17 Nov 2024 06:00	17 Nov 2024 14:00	9	Sensor operated out of range
Relative Humidity, 90m	17 Nov 2024 19:00	17 Nov 2024 20:00	2	Sensor operated out of range

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction, Vertical Wind Speed, 45m	05 Nov 2024 05:00	06 Nov 2024 01:00	21	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed, 45m	17 Nov 2024 20:00	17 Nov 2024 21:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed, 45m	18 Nov 2024 02:00	18 Nov 2024 02:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed, 45m	25 Nov 2024 15:00	25 Nov 2024 16:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed, 75m	01 Nov 2024 22:00	02 Nov 2024 11:00	14	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed, 75m	05 Nov 2024 04:00	05 Nov 2024 21:00	18	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed, 75m	25 Nov 2024 11:00	25 Nov 2024 13:00	3	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed, 90m	01 Nov 2024 23:00	02 Nov 2024 12:00	14	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed, 90m	05 Nov 2024 04:00	05 Nov 2024 05:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed, 90m	05 Nov 2024 07:00	05 Nov 2024 23:00	17	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed, 90m	25 Nov 2024 09:00	25 Nov 2024 09:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed, 90m	25 Nov 2024 12:00	25 Nov 2024 14:00	3	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb

Mannix - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 40.4 ppb on Nov 24 02:00	Maximum Daily Average: 7.7 ppb on Nov 23		Hours of Data:	687
Minimum Value: 0.0 ppb on Nov 4 15:00	Minimum Daily Average: 0.0 ppb on Nov 12		Hours of Missing Data:	33
Maximum Diurnal Average: 2.2 ppb at hour 2	Minimum Diurnal Average: 0.4 ppb at hour 8		Hours of Calibration:	33
Monthly Average: 1.16 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.1 Median = 0.1 Q <sub>3</sub> = 0.5 P <sub>90</sub> = 2.8 P <sub>99</sub> = 19.2		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.1	Z	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.3	3.5	1.2	0.6	0.5	0.3	0.2	0.1	0.1	0.1	0.3	3.5	
2-Nov	0.1	0.2	Z	0.5	0.4	0.5	0.4	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.2	0.5	
3-Nov	0.1	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	
4-Nov	0.0	0.1	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
5-Nov	0.0	0.0	0.6	0.6	5.8	Z	0.6	0.3	0.4	0.7	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	5.8	
6-Nov	Z	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	
7-Nov	0.6	Z	0.6	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.6	
8-Nov	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.1	0.1	0.1	0.3	
9-Nov	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.2	
10-Nov	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	
11-Nov	0.1	0.2	0.2	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	
12-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.5	2.8	0.2	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.2	2.8	
14-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.4	0.1	0.3	0.1	0.2	4.8	11.9	2.9	2.6	10.4	4.0	1.7	0.5	1.7	11.9	
15-Nov	0.9	0.4	0.9	Z	0.4	0.3	0.4	0.3	0.4	0.6	0.2	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.3	0.9	
16-Nov	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	
17-Nov	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.5	0.0	0.0	0.0	0.3	0.2	0.5	
18-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.6	4.0	1.4	1.4	3.2	2.3	1.1	1.7	1.0	0.9	0.9	0.6	0.9	4.0	
19-Nov	1.3	Z	0.9	0.5	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	1.6	1.5	0.6	2.5	1.9	1.1	0.5	0.5	6.8	0.9	6.8	
20-Nov	6.3	3.3	Z	2.5	3.8	2.4	0.8	1.8	0.7	0.4	0.4	0.3	0.4	2.2	1.6	1.1	0.8	0.3	0.5	1.7	3.9	5.3	4.3	2.8	2.1	6.3	
21-Nov	0.7	0.8	0.5	Z	7.7	8.1	1.9	0.8	0.4	0.3	C	C	C	0.6	0.3	0.1	0.1	1.0	0.7	0.1	0.0	0.1	0.2	0.0	1.2	8.1	
22-Nov	1.1	1.2	0.2	0.1	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.6	9.1	4.9	1.5	0.2	0.1	0.2	0.1	0.1	2.9	7.6	6.7	1.6	9.1
23-Nov	6.4	0.5	0.2	0.1	1.9	Z	0.4	0.2	0.8	6.5	0.4	0.2	0.9	7.2	8.1	7.6	11.7	27.2	7.6	2.5	9.7	33.4	24.2	18.6	7.7	33.4	
24-Nov	30.6	40.4	14.8	15.1	11.9	3.9	2.3	1.2	Z	0.5	10.2	6.7	1.4	5.2	0.7	0.4	0.5	1.4	7.0	8.6	3.7	1.0	0.7	0.7	7.3	40.4	
25-Nov	0.5	Z	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.5	
26-Nov	0.3	0.2	Z	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.4	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.4
27-Nov	0.1	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.3	0.1	0.1	0.1	0.1	0.3	0.4	0.2	0.4	3.8	1.7	0.4	3.8	
28-Nov	0.7	4.0	1.0	0.4	Z	0.3	0.3	0.2	0.2	1.3	1.0	0.2	2.6	0.6	0.6	2.2	3.1	3.1	1.1	0.2	0.2	0.1	0.1	0.1	1.0	4.0	
29-Nov	2.4	1.5	0.3	0.3	0.2	Z	0.2	0.3	0.3	1.2	2.5	0.6	3.9	2.1	0.6	0.2	0.9	1.2	0.2	0.5	0.2	2.4	2.8	6.8	1.4	6.8	
30-Nov	6.1	Z	23.0	22.6	2.7	3.9	3.6	4.0	9.9	3.6	3.6	2.9	3.1	2.2	0.8	0.7	5.5	12.8	5.4	2.4	10.3	3.2	0.9	0.7	5.8	23.0	

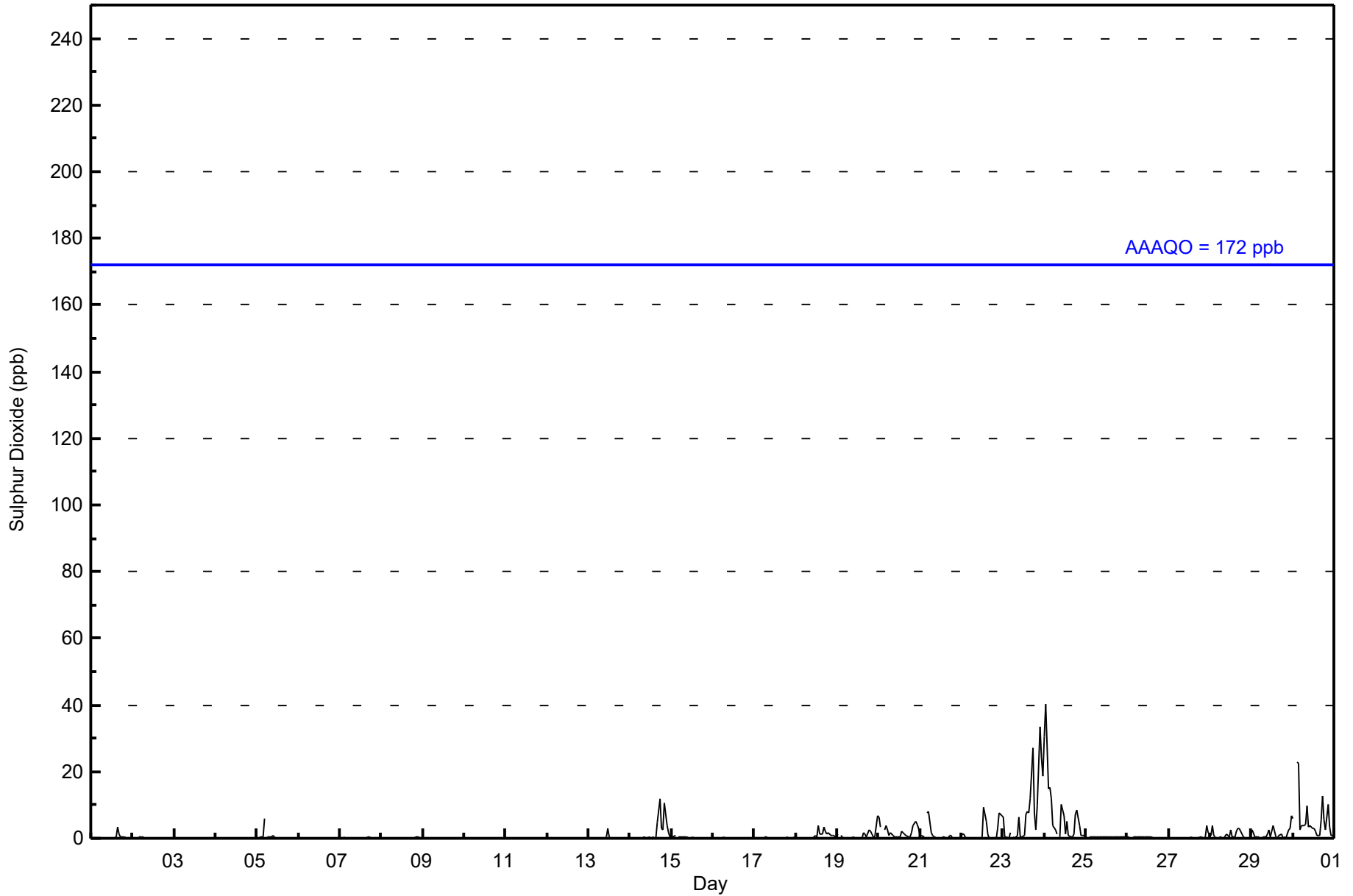
2.2	2.2	1.8	1.8	1.5	0.8	0.4	0.4	0.5	0.6	0.7	0.6	0.6	1.2	0.7	0.7	1.2	2.2	1.0	0.8	1.4	1.8	1.6	1.6	Diurnal Average	
30.6	40.4	23.0	22.6	11.9	8.1	3.6	4.0	9.9	6.5	10.2	6.7	3.9	9.1	8.1	7.6	11.7	27.2	7.6	8.6	10.4	33.4	24.2	18.6	Diurnal Maximum	

Z - zerospan      C - Calibration  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb    24-hr 48 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Mannix - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Mannix - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	673	97.96	97.96
11 - 20	7	1.02	98.98
21 - 60	7	1.02	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Mannix - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	66	74	7	4	4	7	75	119	23	33	26	35	65	40	51	38	667
11 - 20	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	7
21 - 60	6	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	7
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	77	74	7	4	4	7	75	119	23	33	26	35	65	41	51	40	681

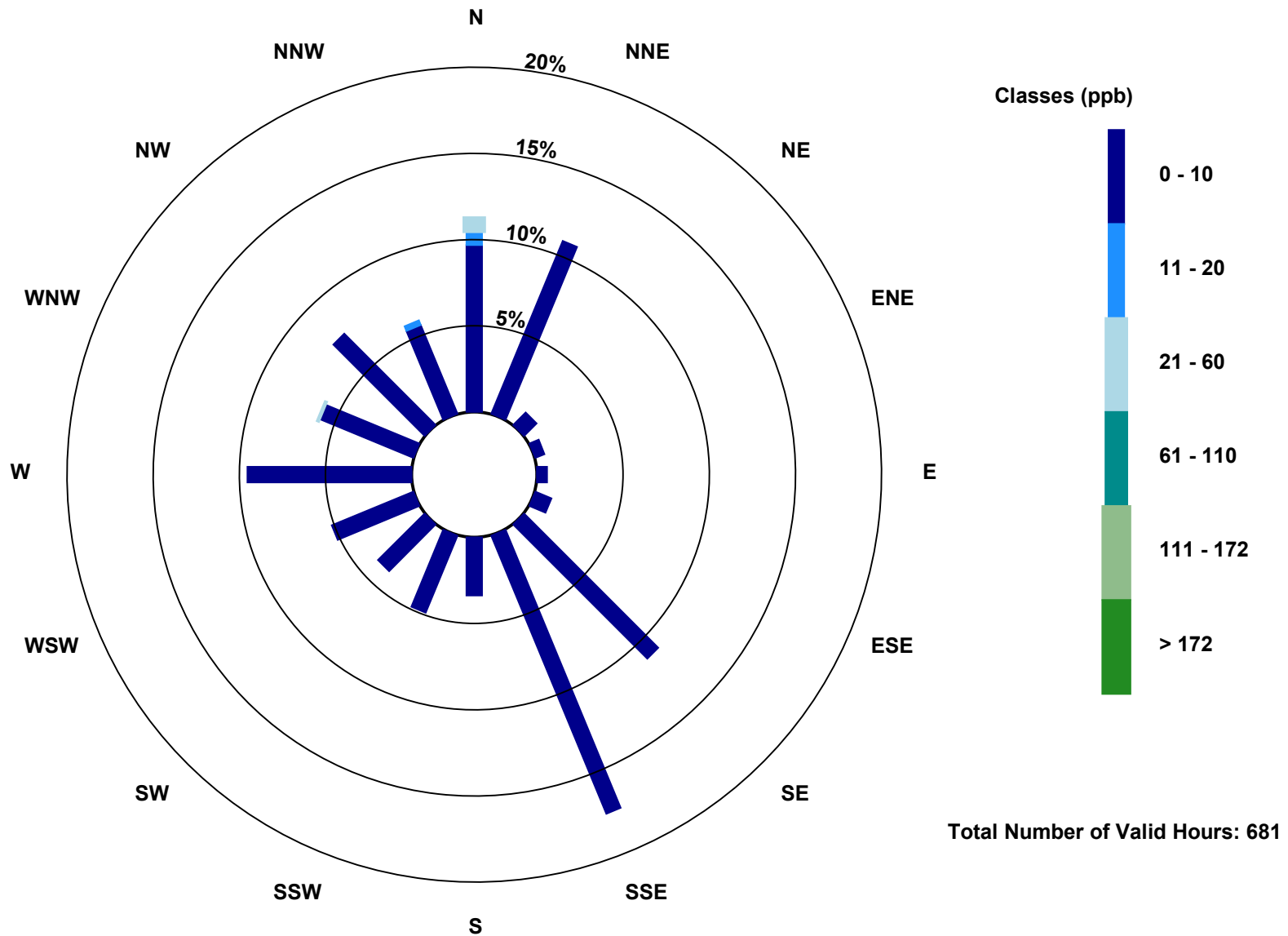
Total Number of Valid Hours: 681

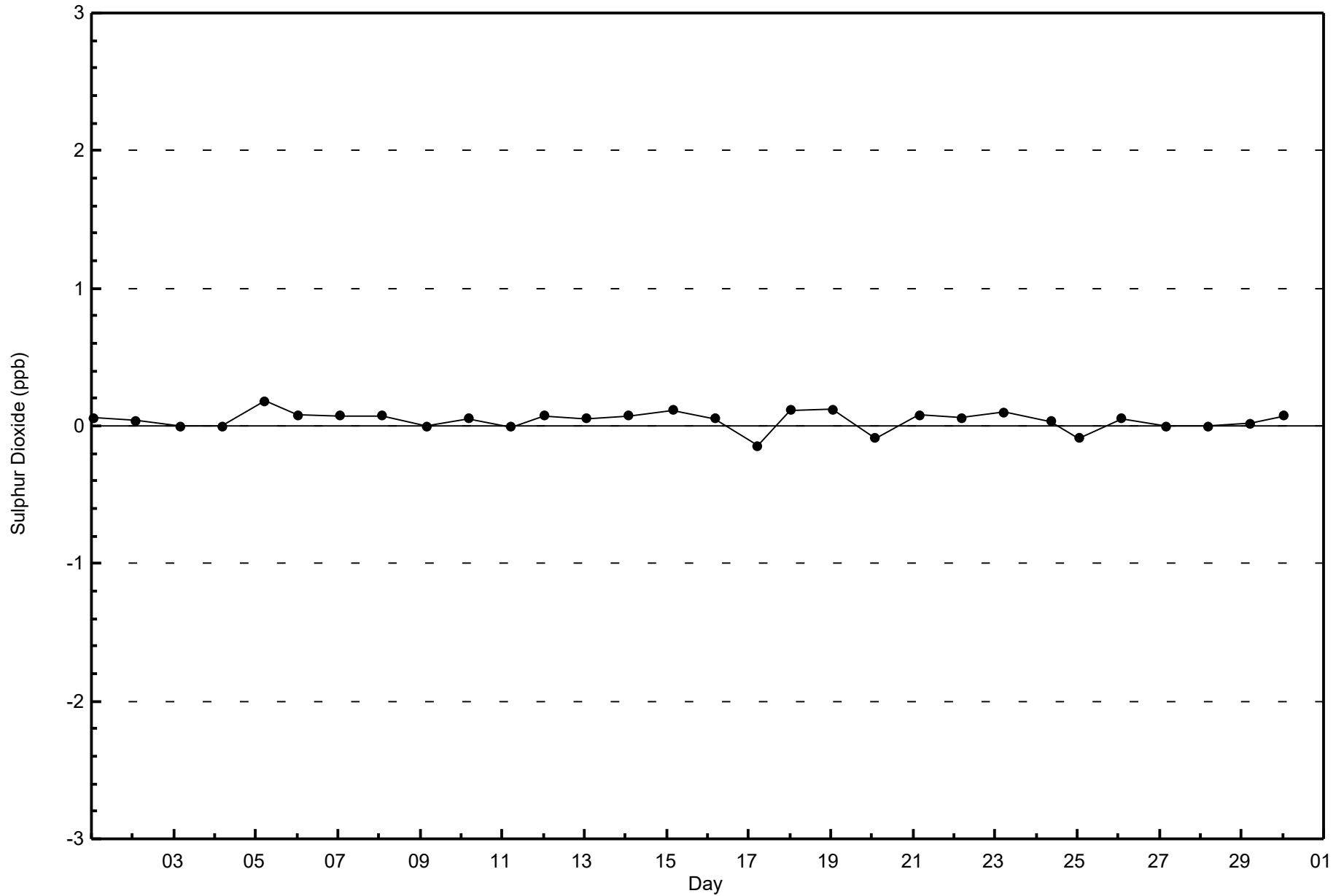
Total Number of Hours: 720

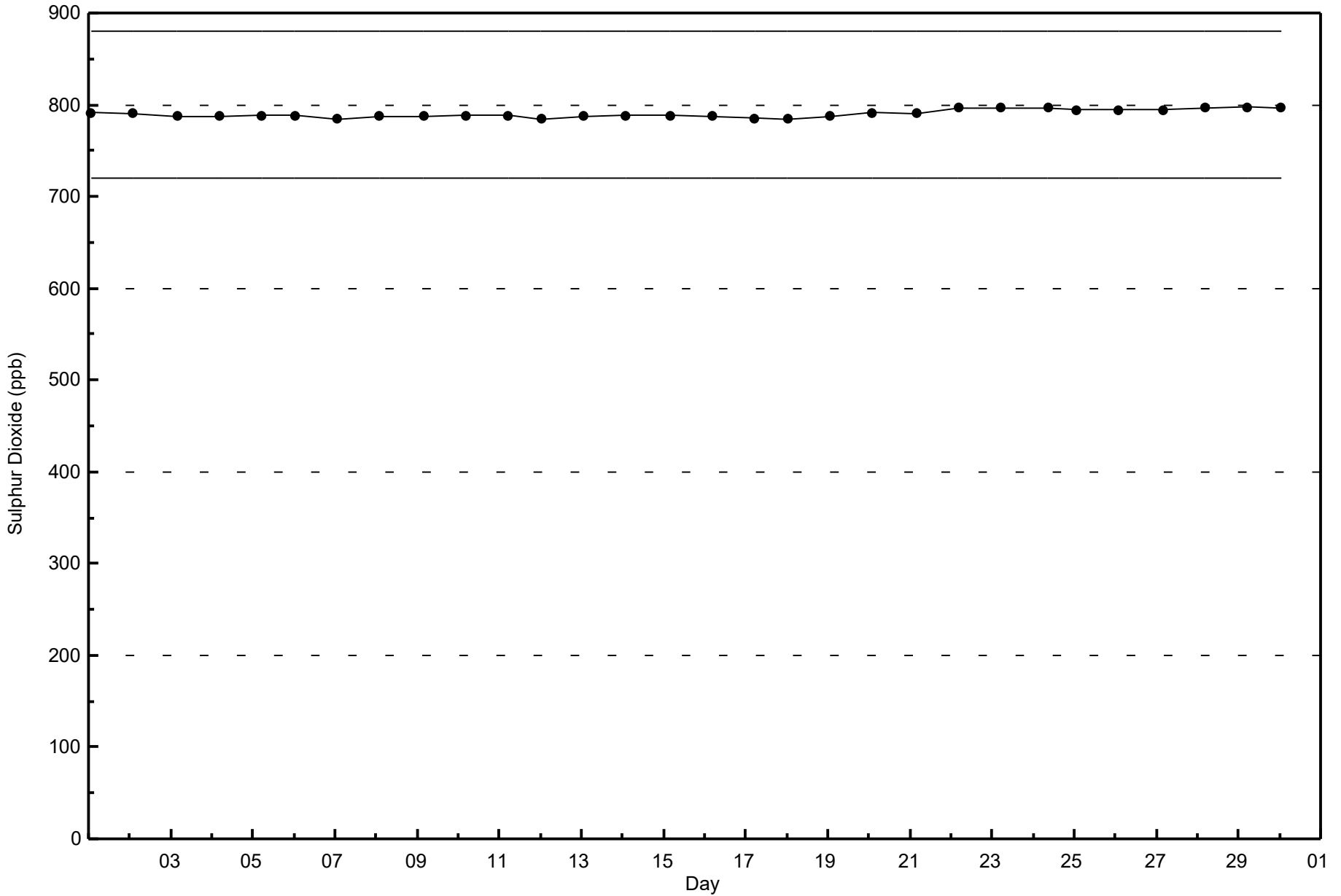


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Mannix









Wood Buffalo Environmental Association

Summary of Hour Averages

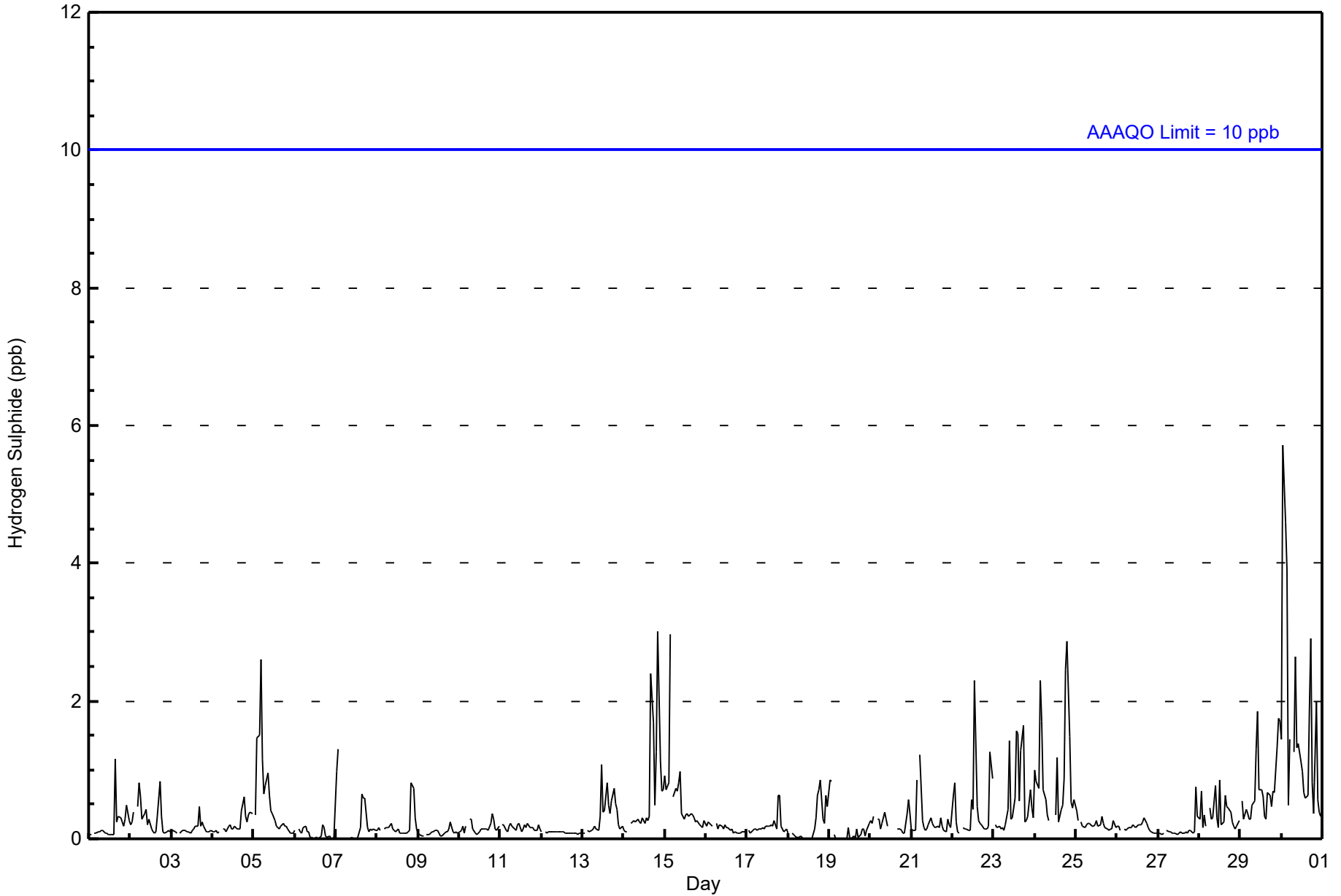
Hydrogen Sulphide (H<sub>2</sub>S) - ppb

Mannix - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 5.7 ppb on Nov 30 02:00	Maximum Daily Average: 1.6 ppb on Nov 30		Hours of Data:	683
Minimum Value: 0.0 ppb on Nov 6 23:00	Minimum Daily Average: 0.1 ppb on Nov 6		Hours of Missing Data:	37
Maximum Diurnal Average: 0.6 ppb at hour 4	Minimum Diurnal Average: 0.2 ppb at hour 7		Hours of Calibration:	35
Monthly Average: 0.34 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.1 Median = 0.2 Q <sub>3</sub> = 0.3 P <sub>90</sub> = 0.8 P <sub>99</sub> = 2.7		Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2	0.2	0.3	0.3	0.3	0.2	0.3	0.5	0.3	0.2	1.2																							
2-Nov	0.2	0.3	0.4	Z	0.5	0.8	0.6	0.3	0.4	0.4	0.2	0.3	0.1	0.1	0.1	0.1	0.3	0.8	0.3	0.1	0.1	0.1	0.1	0.1	0.3	0.8																						
3-Nov	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.5																						
4-Nov	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.4	0.6	0.3	0.2	0.4	0.4	0.4	0.6																						
5-Nov	Z	0.3	1.5	1.5	2.6	1.2	0.7	0.8	1.0	0.6	0.4	0.4	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	2.6																						
6-Nov	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2																						
7-Nov	1.0	1.3	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.6	0.6	0.2	0.1	0.1	0.1	0.1	0.1	0.1	1.3																						
8-Nov	0.1	0.2	0.1	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8	0.7	0.3	0.1	0.1	0.8																						
9-Nov	0.1	0.1	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2																						
10-Nov	0.1	0.1	0.2	0.1	0.2	Z	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.1	0.1	0.2	0.1	0.4																						
11-Nov	Z	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.2																						
12-Nov	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
13-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.3	1.1	0.4	0.4	0.8	0.5	0.4	0.5	0.7	0.5	0.4	0.2	0.1	0.2	0.3	1.1																						
14-Nov	0.1	0.1	0.1	Z	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.3	0.3	0.3	2.4	1.7	0.5	1.3	3.0	1.1	0.7	0.7	0.6	3.0																						
15-Nov	0.9	0.7	0.8	3.0	Z	0.6	0.7	0.7	0.8	1.0	0.4	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.3	0.6	3.0																						
16-Nov	0.2	0.3	0.2	0.2	0.2	Z	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3																						
17-Nov	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.6	0.6	0.2	0.1	0.1	0.1	0.2	0.6																						
18-Nov	0.1	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.6	0.7	0.8	0.3	0.2	0.6	0.5	0.2	0.8																							
19-Nov	0.9	0.8	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.9																						
20-Nov	0.3	0.2	0.3	Z	0.3	0.3	0.1	0.2	0.4	0.3	0.2	C	C	C	C	C	0.1	0.1	0.1	0.1	0.1	0.4	0.6	0.4	0.2	0.6																						
21-Nov	0.1	0.1	0.1	0.9	Z	1.2	0.3	0.2	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.3	0.2	0.2	0.3	1.2																						
22-Nov	0.6	0.8	0.2	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.6	0.4	2.3	0.5	0.3	0.2	0.2	0.2	0.1	0.2	0.2	1.3	0.9	0.4	2.3																						
23-Nov	Z	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.4	1.4	0.3	0.3	0.6	1.6	1.5	0.6	1.3	1.6	0.3	0.3	0.3	0.7	0.4	0.3	0.6	1.6																						
24-Nov	1.0	0.8	0.7	2.3	1.7	0.7	0.6	0.3	0.3	Z	M	M	0.3	1.2	0.2	0.4	0.5	0.9	2.5	2.9	1.5	0.5	0.4	0.6	1.0	2.9																						
25-Nov	0.4	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.4																						
26-Nov	0.2	0.2	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3																						
27-Nov	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8	0.3	0.1	0.8																						
28-Nov	0.3	0.7	0.2	0.3	0.2	Z	0.5	0.3	0.3	0.8	0.3	0.2	0.8	0.2	0.2	0.6	0.5	0.4	0.4	0.2	0.2	0.1	0.2	0.3	0.4	0.8																						
29-Nov	Z	0.6	0.3	0.4	0.4	0.3	0.3	0.5	0.5	1.3	1.9	0.7	0.7	0.6	0.3	0.3	0.7	0.6	0.5	0.7	0.7	1.3	1.8	1.7	0.7	1.9																						
30-Nov	1.4	5.7	4.6	3.9	0.5	1.5	Z	1.3	2.7	1.3	1.4	1.1	1.0	0.7	0.6	0.6	1.9	2.9	0.8	0.4	2.0	0.6	0.4	0.3	1.6	5.7																						
																								0.3	0.5	0.4	0.6	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.4	0.5	0.4	0.4	0.4	0.3	0.3	0.3	Dial Average
																								1.4	5.7	4.6	3.9	2.6	1.5	0.7	1.3	2.7	1.4	1.9	1.1	1.0	2.3	1.5	1.2	2.4	2.9	2.5	2.9	3.0	1.3	1.8	1.7	Dial Maximum

Z - zerospan      C - Calibration      M - Maintenance  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb    24-hr 3 ppb





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Mannix - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	674	98.68	98.68
3 - 4	7	1.02	99.71
5 - 7	2	0.29	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Mannix - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	72	75	6	4	4	7	73	121	23	32	27	33	67	40	52	32	668
3 - 4	2	0	0	0	1	0	0	0	0	0	0	0	0	1	0	3	7
5 - 7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	75	75	6	4	5	7	73	121	23	32	27	33	67	41	53	35	677

Total Number of Valid Hours: 677

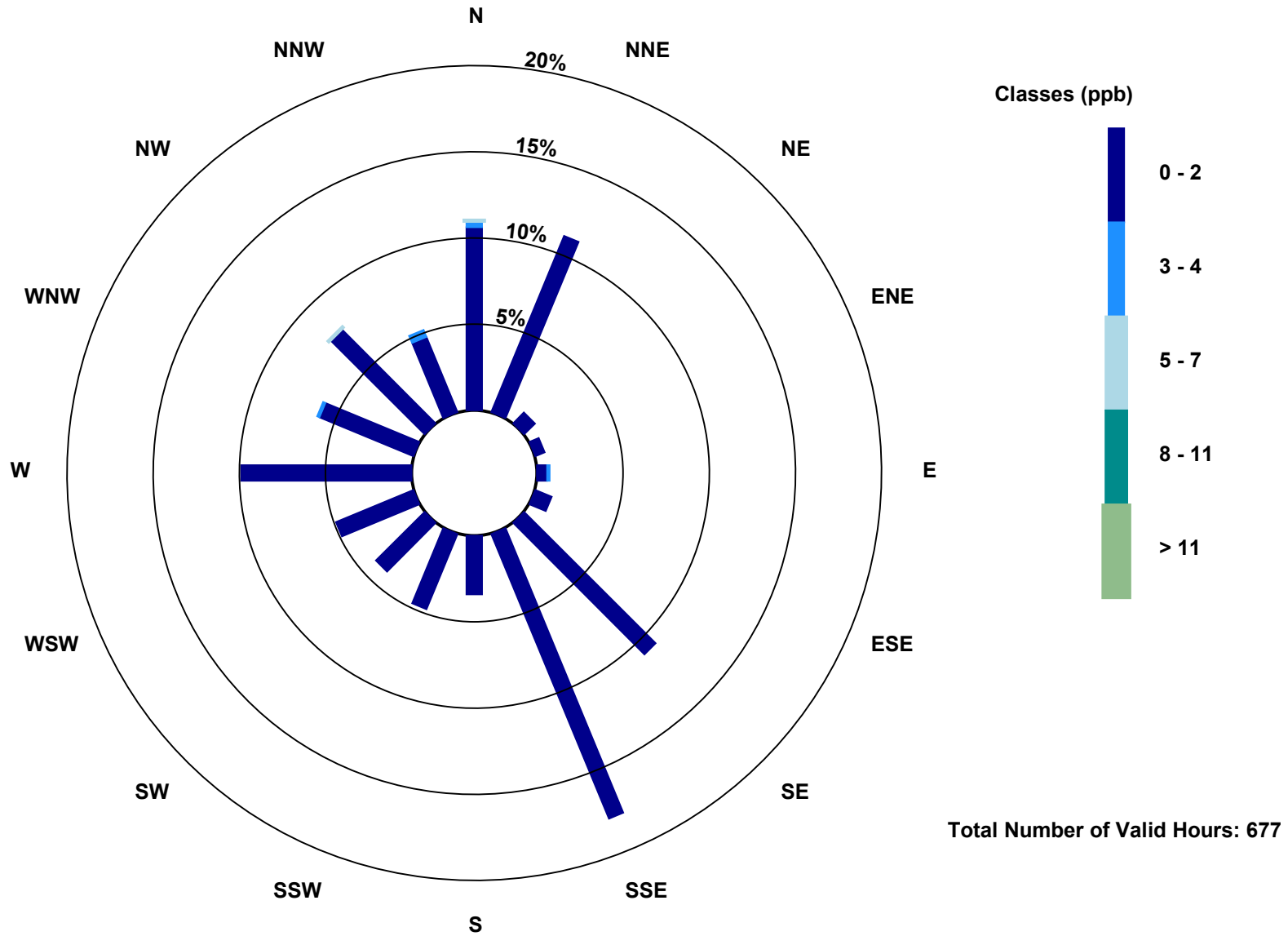
Total Number of Hours: 720

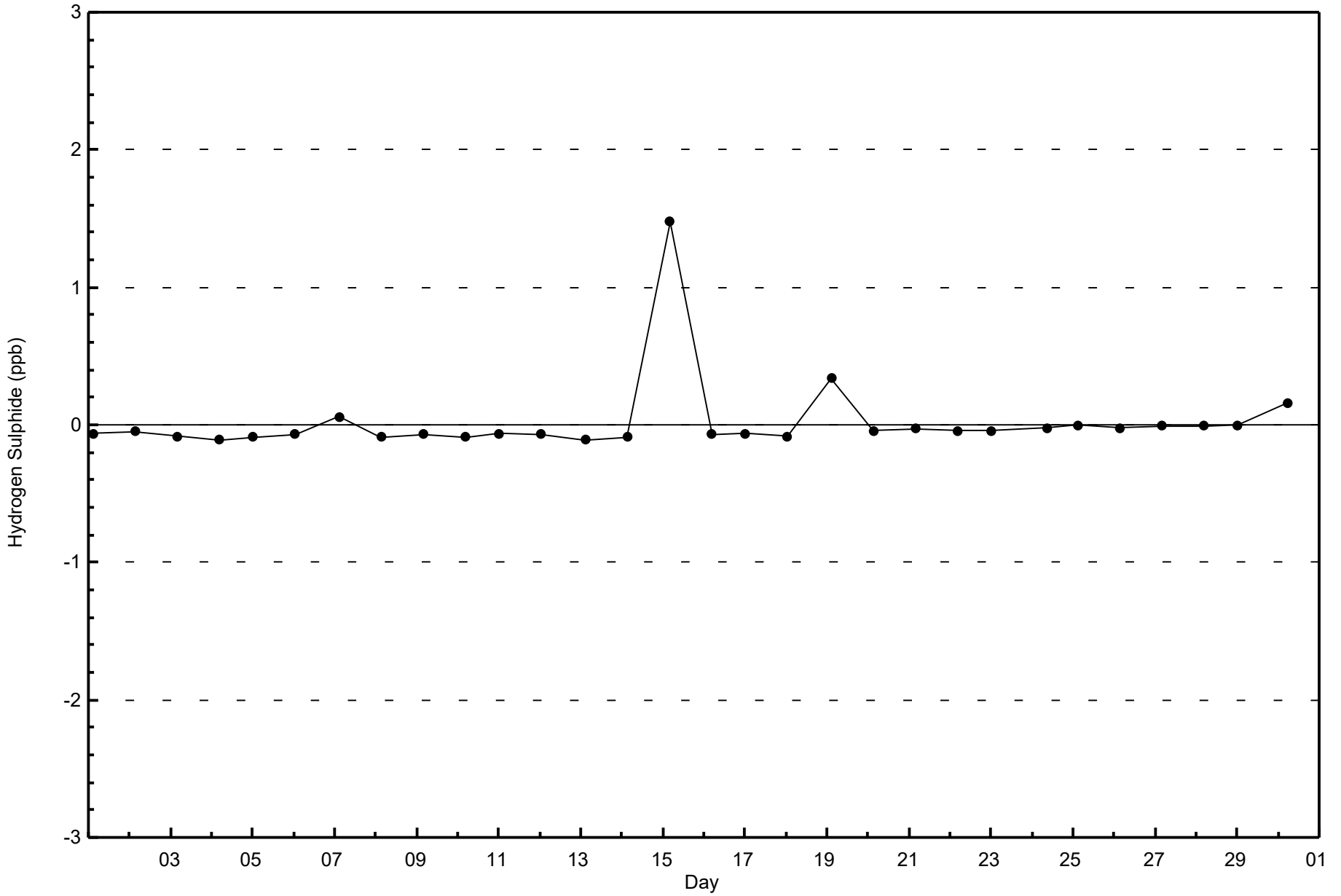


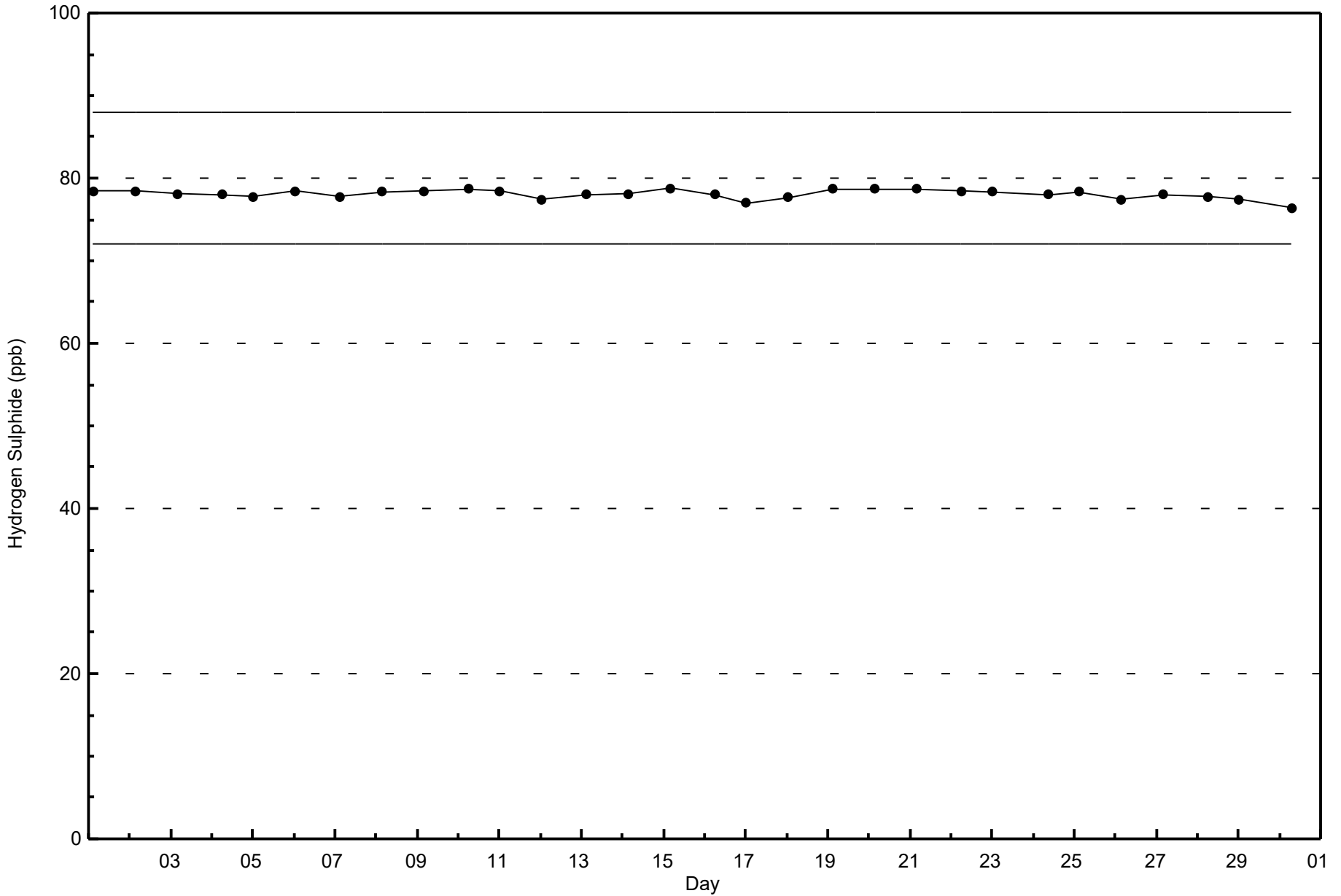


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Mannix





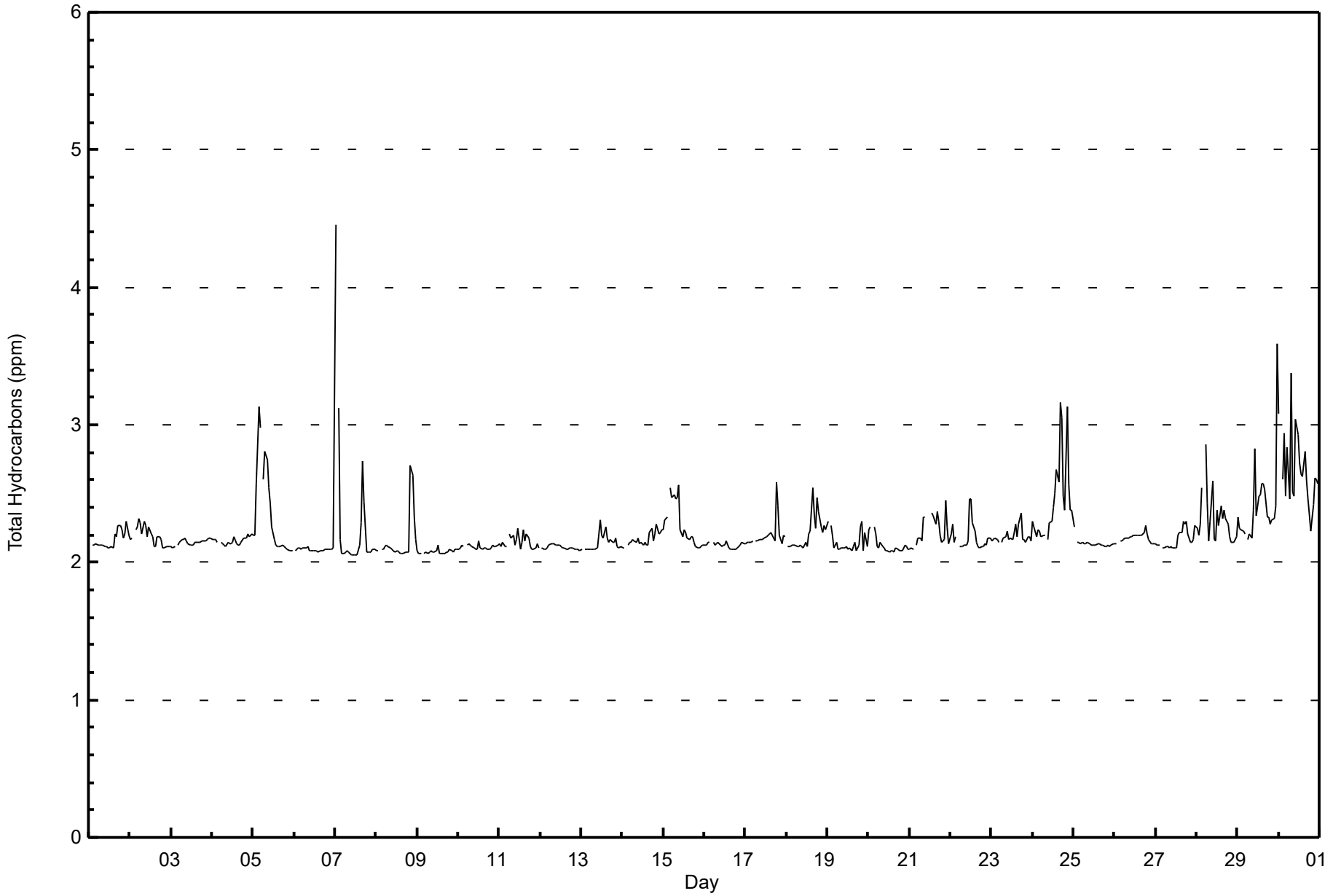




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Total Hydrocarbons (THC) - ppm**  
**Mannix - November 2024**

Maximum Value: 4.5 ppm on Nov 7 01:00		Maximum Daily Average: 2.7 ppm on Nov 30		Hours in Service: 720																																																		
Minimum Value: 2.1 ppm on Nov 7 13:00		Minimum Daily Average: 2.1 ppm on Nov 9		Hours of Data: 687																																																		
Maximum Diurnal Average: 2.3 ppm at hour 1		Minimum Diurnal Average: 2.2 ppm at hour 2		Hours of Missing Data: 33																																																		
Monthly Average: 2.21 ppm		Percentiles: P <sub>1</sub> = 2.1 P <sub>10</sub> = 2.1 Q <sub>1</sub> = 2.1 Median = 2.1 Q <sub>3</sub> = 2.2 P <sub>90</sub> = 2.4 P <sub>99</sub> = 3.1		Hours of Calibration: 33																																																		
				Percent Operational Time: 100.0																																																		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																														
1-Nov	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.2	2.3																						
2-Nov	2.2	2.2	Z	2.2	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.3	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3																							
3-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2																								
4-Nov	2.2	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2																								
5-Nov	2.2	2.2	2.6	3.1	3.0	Z	2.6	2.8	2.7	2.5	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	3.1																								
6-Nov	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																								
7-Nov	4.5	Z	3.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.7	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	4.5																								
8-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.7	2.6	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.7																								
9-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																								
10-Nov	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																								
11-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.1	2.2	2.3	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																								
12-Nov	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																								
13-Nov	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.3	2.2	2.1	2.2	2.1	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.3																								
14-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3																								
15-Nov	2.2	2.3	2.3	Z	2.5	2.5	2.5	2.5	2.5	2.6	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.6																								
16-Nov	2.1	2.1	2.1	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2																								
17-Nov	2.1	2.1	2.1	2.1	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.4	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.6																								
18-Nov	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.5	2.4	2.2	2.5	2.4	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.5																								
19-Nov	2.3	Z	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.3																								
20-Nov	2.2	2.3	Z	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																								
21-Nov	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.3	2.3	C	C	C	2.4	2.3	2.3	2.4	2.3	2.2	2.1	2.2	2.4	2.3	2.1	2.2	2.4	2.3	2.1	2.2	2.4																								
22-Nov	2.2	2.3	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.5	2.5	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.5																								
23-Nov	2.2	2.2	2.2	2.2	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.4	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4																								
24-Nov	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.3	2.3	2.4	2.5	2.7	2.6	3.2	3.1	2.5	2.4	3.1	2.6	2.4	2.4	2.4	2.4	2.4	2.4	2.4	3.2																								
25-Nov	2.3	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																								
26-Nov	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																								
27-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3																								
28-Nov	2.3	2.2	2.3	2.5	Z	2.9	2.4	2.2	2.3	2.6	2.2	2.2	2.4	2.3	2.4	2.3	2.4	2.3	2.4	2.3	2.3	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.9																								
29-Nov	2.3	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.4	2.8	2.3	2.5	2.5	2.6	2.6	2.5	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	3.6	2.4	3.6	3.6																								
30-Nov	3.1	Z	2.6	2.9	2.5	2.8	2.5	3.4	2.5	2.5	3.0	2.9	2.7	2.6	2.6	2.8	2.6	2.5	2.3	2.2	2.4	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	3.4																								
																								2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	Diumal Average	
																								4.5	2.3	3.1	3.1	3.0	2.9	2.6	3.4	2.7	2.6	3.0	2.9	2.7	2.6	2.7	2.8	3.2	3.1	2.6	2.4	3.1	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	3.6	Diumal Maximum
Z - zerospan																								C - Calibration																														





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Mannix - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	0	0.00	0.00
2.1 - 3.0	678	98.69	98.69
3.1 - 10.0	9	1.31	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Mannix - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	76	74	7	4	4	7	75	119	23	33	26	35	64	40	48	37	672
3.1 - 10.0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	3	3	9
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	77	74	7	4	4	7	75	119	23	33	26	35	65	41	51	40	681

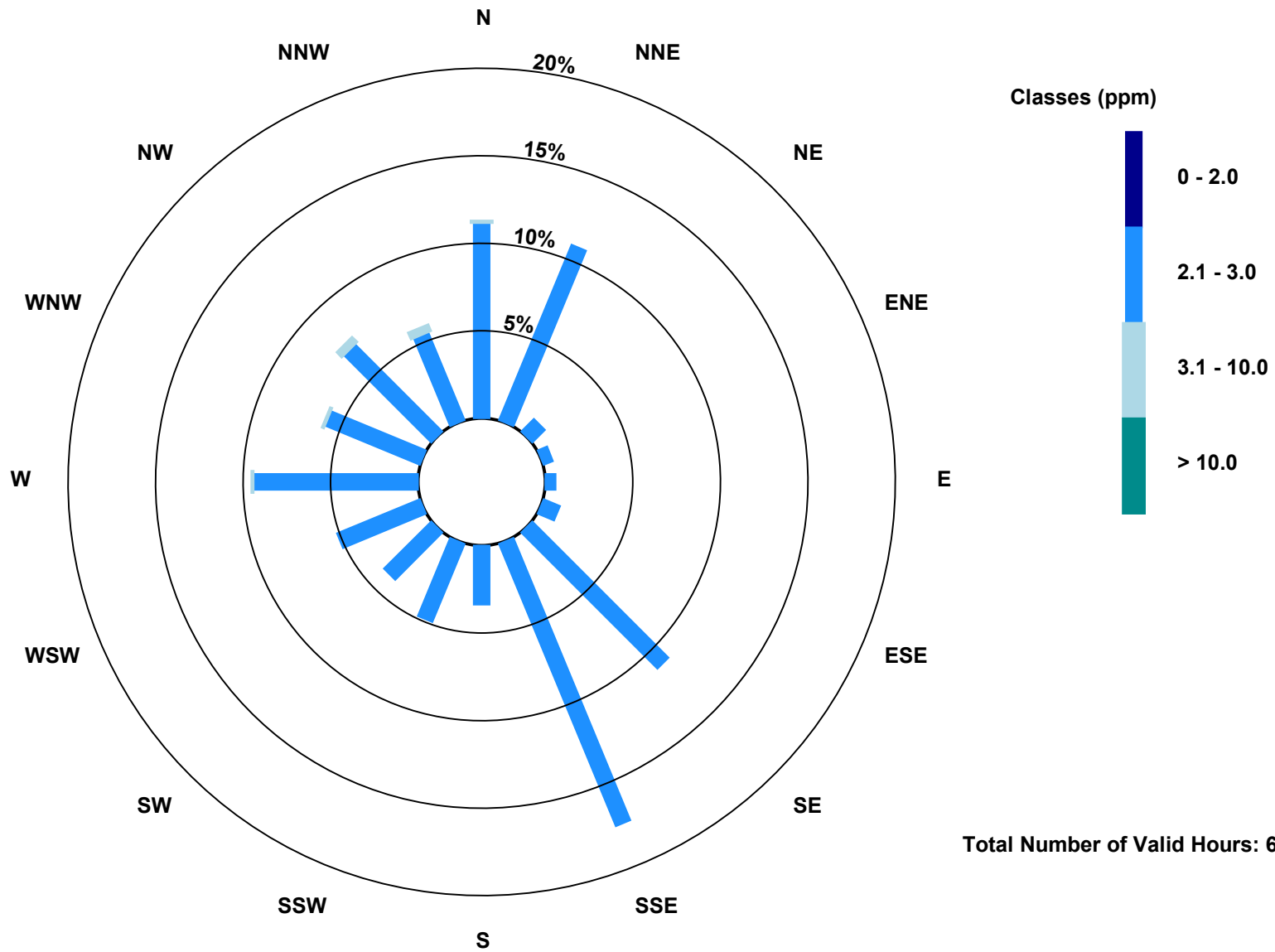
Total Number of Valid Hours: 681

Total Number of Hours: 720

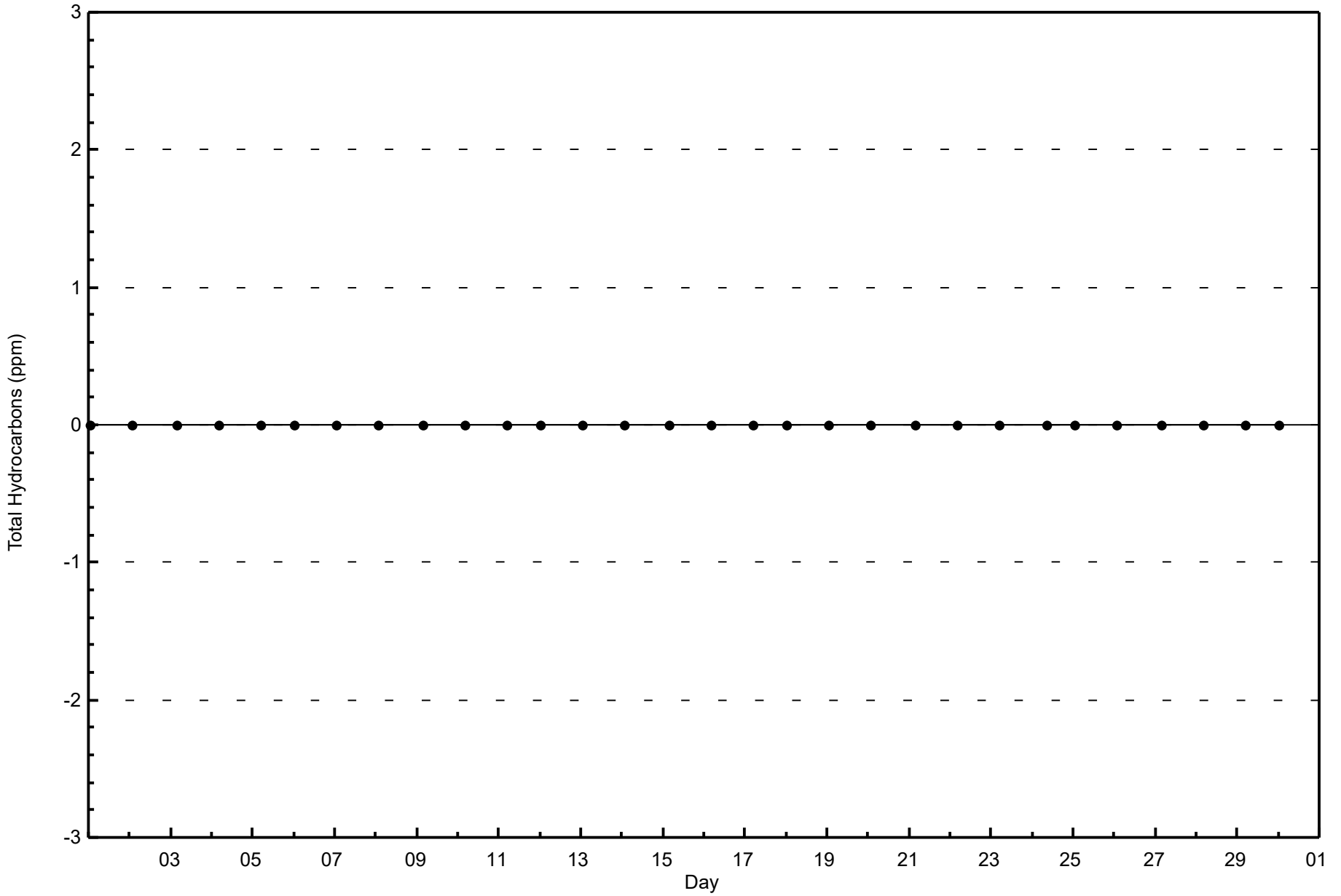


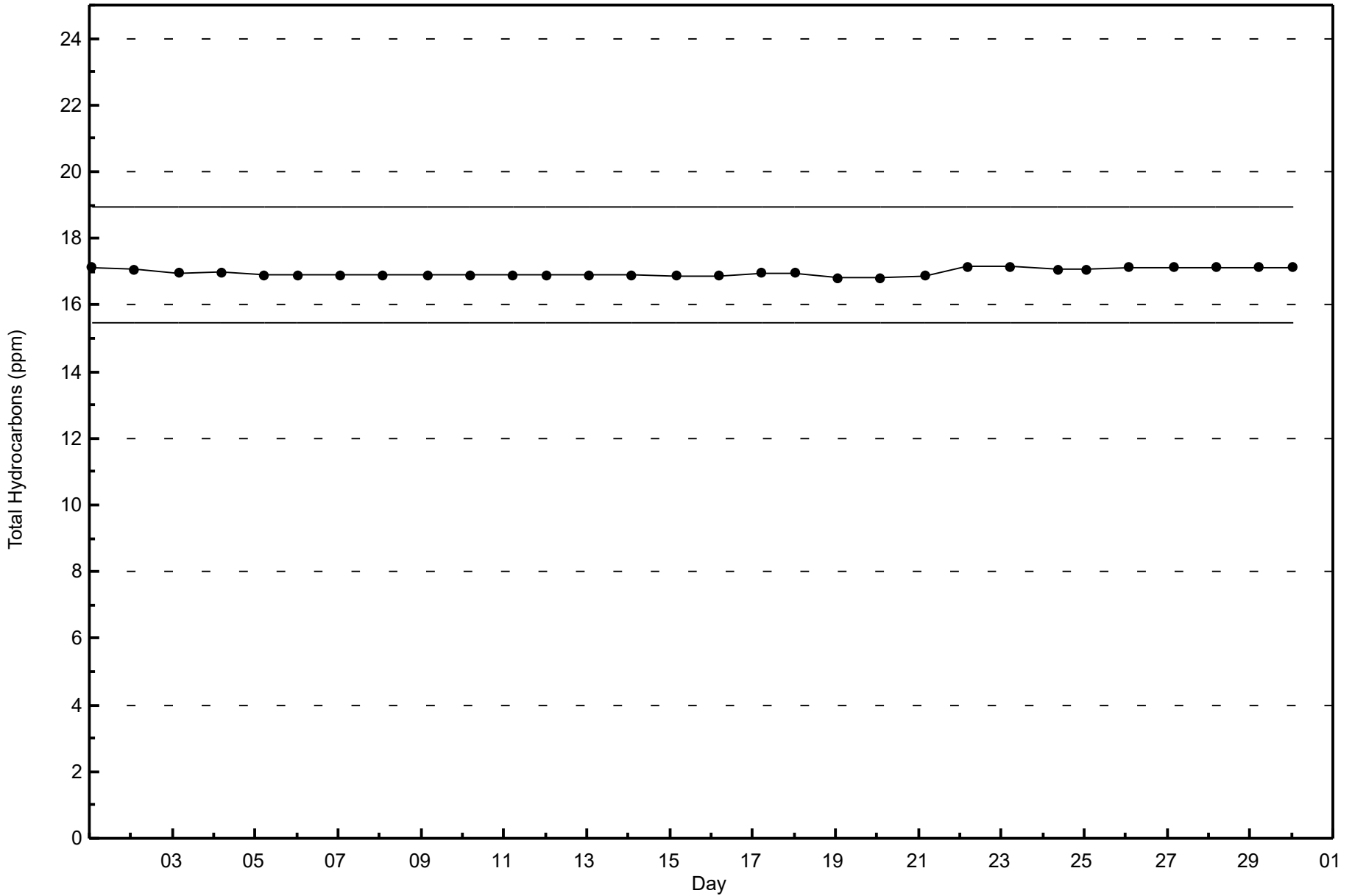
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Hydrocarbons (THC) - ppm  
Mannix







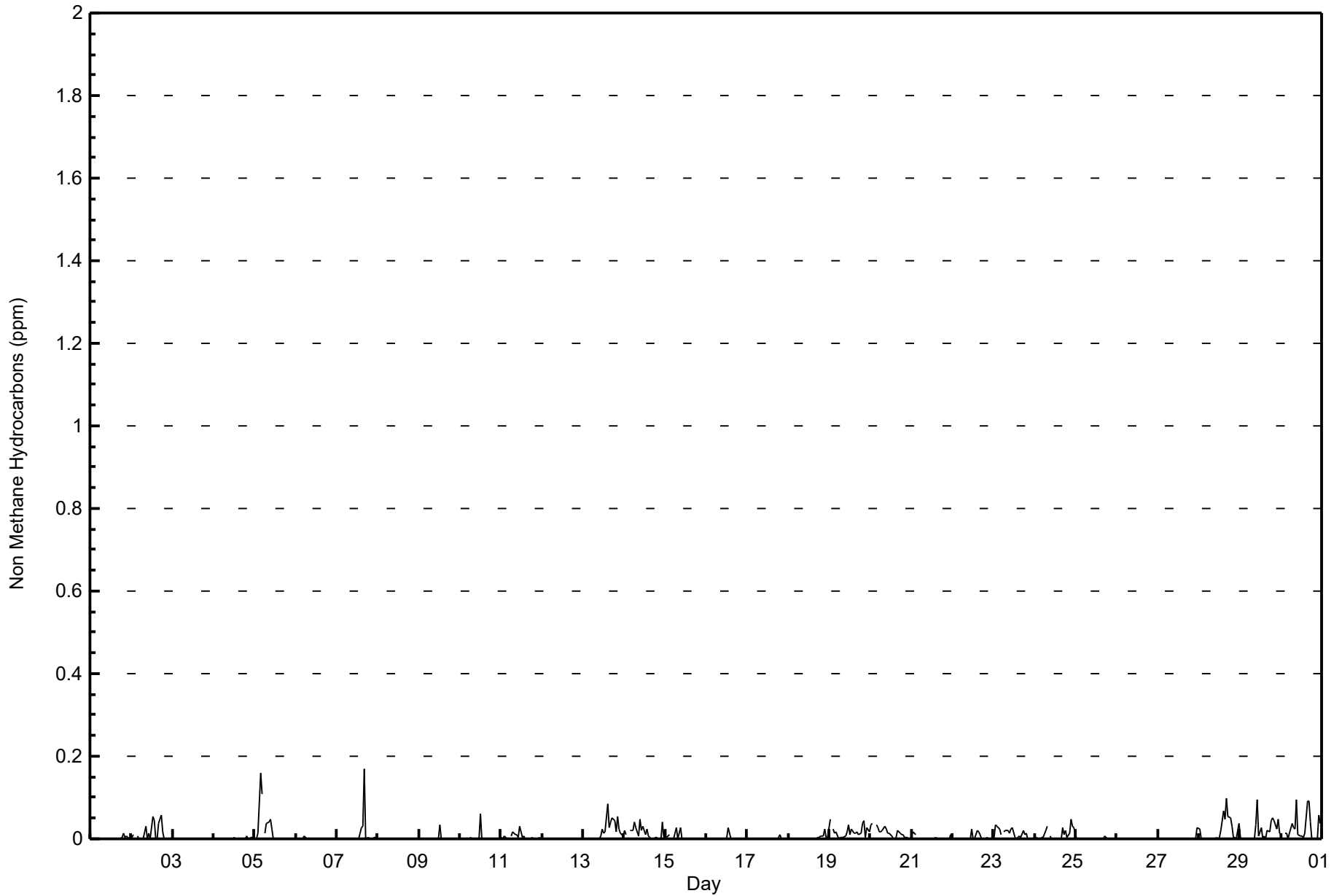




Summary of Hour Averages

Mannix - November 2024

Maximum Value: 0.169 ppm on Nov 7 17:00		Maximum Daily Average: 0.026 ppm on Nov 30		Hours in Service: 720																						
Minimum Value: 0.000 ppm on Nov 1 01:00		Minimum Daily Average: 0.000 ppm on Nov 26		Hours of Data: 687																						
Maximum Diurnal Average: 0.018 ppm at hour 17		Minimum Diurnal Average: 0.002 ppm at hour 6		Hours of Missing Data: 33																						
Monthly Average: 0.007 ppm		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.0 P <sub>99</sub> = 0.1		Hours of Calibration: 33																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.013	0.002	0.006	0.003	0.000	0.001	0.013
2-Nov	0.005	0.009	Z	0.008	0.000	0.000	0.000	0.000	0.030	0.000	0.013	0.002	0.056	0.043	0.000	0.000	0.037	0.057	0.017	0.000	0.000	0.000	0.000	0.000	0.012	0.057
3-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001
4-Nov	0.000	0.001	0.001	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.003	0.003	0.001	0.006
5-Nov	0.000	0.000	0.012	0.161	0.109	Z	0.012	0.037	0.040	0.047	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.161
6-Nov	Z	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.005
7-Nov	0.001	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.030	0.169	0.000	0.003	0.000	0.000	0.000	0.002	0.005	0.010	0.169
8-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
9-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.035
10-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.059	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.003	0.059
11-Nov	0.004	0.000	0.006	0.000	0.000	Z	0.006	0.019	0.011	0.009	0.004	0.030	0.003	0.006	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.000	0.002	0.000	0.004	0.030
12-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.024	0.014	0.017	0.084	0.027	0.042	0.052	0.043	0.016	0.053	0.022	0.015	0.008	0.018	0.084
14-Nov	0.022	0.012	Z	0.019	0.020	0.020	0.041	0.028	0.006	0.047	0.021	0.031	0.011	0.024	0.007	0.002	0.000	0.000	0.004	0.004	0.000	0.000	0.041	0.004	0.016	0.047
15-Nov	0.000	0.003	0.009	Z	0.000	0.000	0.000	0.028	0.000	0.014	0.026	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.028
16-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.005	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.027
17-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.011	0.002	0.000	0.000	0.000	0.001	0.111
18-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.004	0.005	0.006	0.023	0.002	0.003	0.002	0.023
19-Nov	0.049	Z	0.023	0.013	0.017	0.002	0.002	0.003	0.004	0.005	0.016	0.033	0.011	0.025	0.015	0.013	0.018	0.012	0.012	0.036	0.044	0.003	0.026	0.017	0.017	0.049
20-Nov	0.035	0.038	Z	0.034	0.028	0.016	0.017	0.021	0.032	0.025	0.015	0.012	0.008	0.001	0.001	0.002	0.020	0.014	0.011	0.010	0.005	0.004	0.000	0.000	0.015	0.038
21-Nov	0.006	0.016	0.010	Z	0.000	0.000	0.000	0.000	0.000	0.001	C	C	C	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.011	0.002	0.016	0.161
22-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.000	0.000	0.022	0.016	0.011	0.001	0.001	0.000	0.005	0.001	0.000	0.000	0.004	0.023
23-Nov	0.004	0.032	0.032	0.022	0.012	Z	0.018	0.022	0.020	0.013	0.022	0.027	0.003	0.001	0.003	0.007	0.005	0.020	0.012	0.015	0.000	0.000	0.000	0.000	0.013	0.032
24-Nov	0.004	0.003	0.001	0.000	0.004	0.005	0.021	0.029	Z	0.005	0.000	0.000	0.000	0.000	0.000	0.028	0.009	0.022	0.002	0.014	0.046	0.031	0.027	0.011	0.046	0.046
25-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
26-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
27-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.029	0.001	0.029
28-Nov	0.025	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.002	0.019	0.069	0.048	0.099	0.054	0.051	0.031	0.003	0.002	0.001	0.037	0.019	0.099
29-Nov	0.004	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.033	0.096	0.006	0.026	0.000	0.006	0.000	0.020	0.017	0.043	0.051	0.044	0.022	0.048	0.019	0.096
30-Nov	0.011	Z	0.015	0.012	0.001	0.015	0.037	0.028	0.025	0.096	0.009	0.006	0.008	0.002	0.013	0.090	0.092	0.042	0.001	0.000	0.000	0.000	0.058	0.037	0.026	0.096
																								Diurnal Average		
																								Diurnal Maximum		
																								0.006 0.005 0.004 0.011 0.008 0.002 0.006 0.006 0.006 0.010 0.008 0.007 0.008 0.006 0.008 0.008 0.018 0.010 0.008 0.007 0.006 0.004 0.008 0.007 0.006 0.007		
																								0.049 0.038 0.032 0.161 0.109 0.020 0.041 0.037 0.040 0.096 0.096 0.033 0.059 0.043 0.084 0.090 0.169 0.057 0.051 0.051 0.053 0.046 0.058 0.037		
Z - zerspan C - Calibration																										





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Mannix - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	516	75.11	75.11
0.006 - 0.05	157	22.85	97.96
0.06 - 0.1	12	1.75	99.71
> 0.1	2	0.29	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Mannix - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	36	14	1	2	1	6	63	116	22	30	25	34	63	35	36	26	510
0.006 - 0.05	39	60	5	2	2	0	11	3	0	3	1	1	2	6	13	9	157
0.06 - 0.1	2	0	1	0	1	1	0	0	1	0	0	0	0	0	2	4	12
> 0.1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	2
<b>Totals</b>	<b>77</b>	<b>74</b>	<b>7</b>	<b>4</b>	<b>4</b>	<b>7</b>	<b>75</b>	<b>119</b>	<b>23</b>	<b>33</b>	<b>26</b>	<b>35</b>	<b>65</b>	<b>41</b>	<b>51</b>	<b>40</b>	<b>681</b>

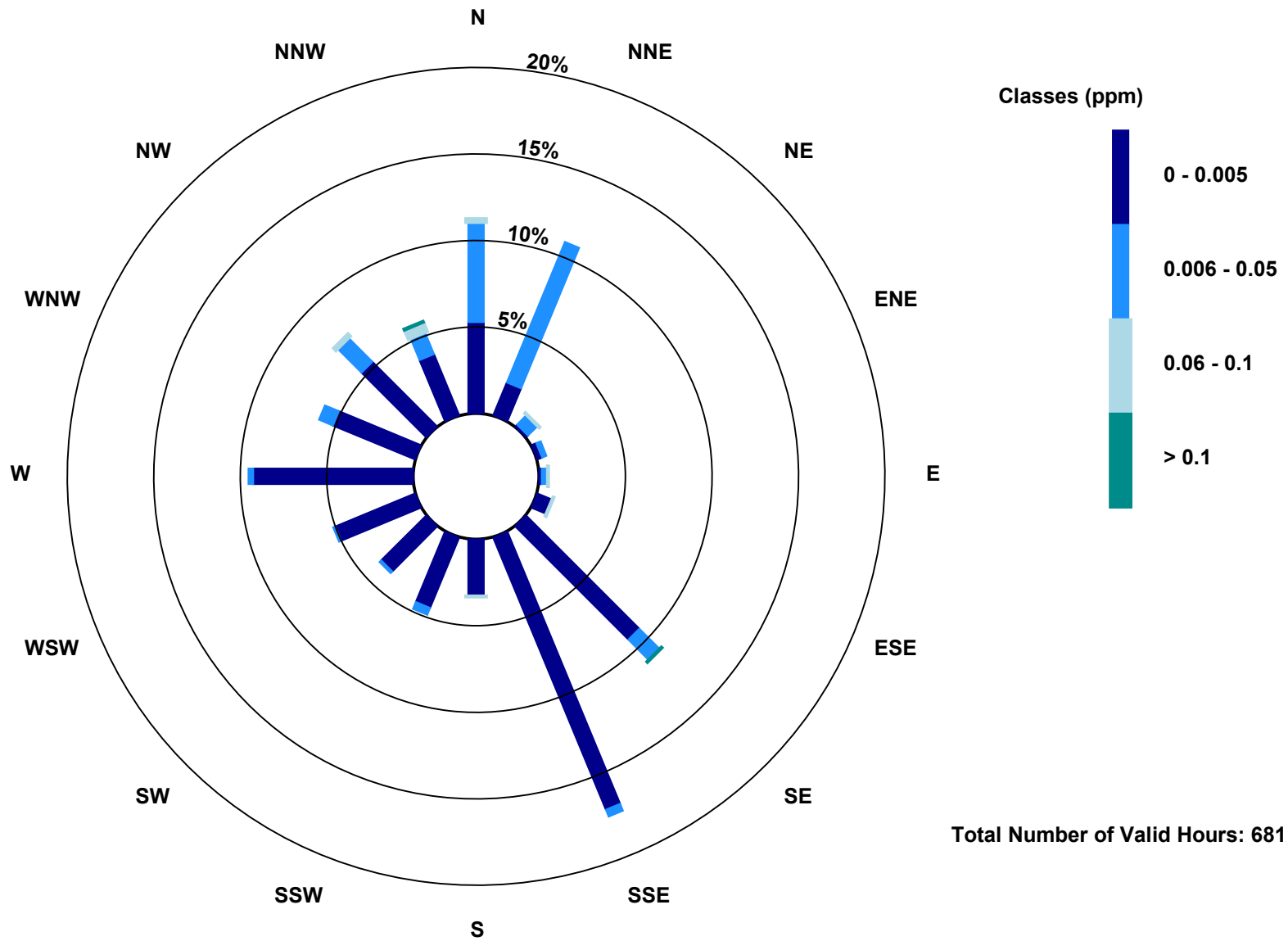
Total Number of Valid Hours: 681

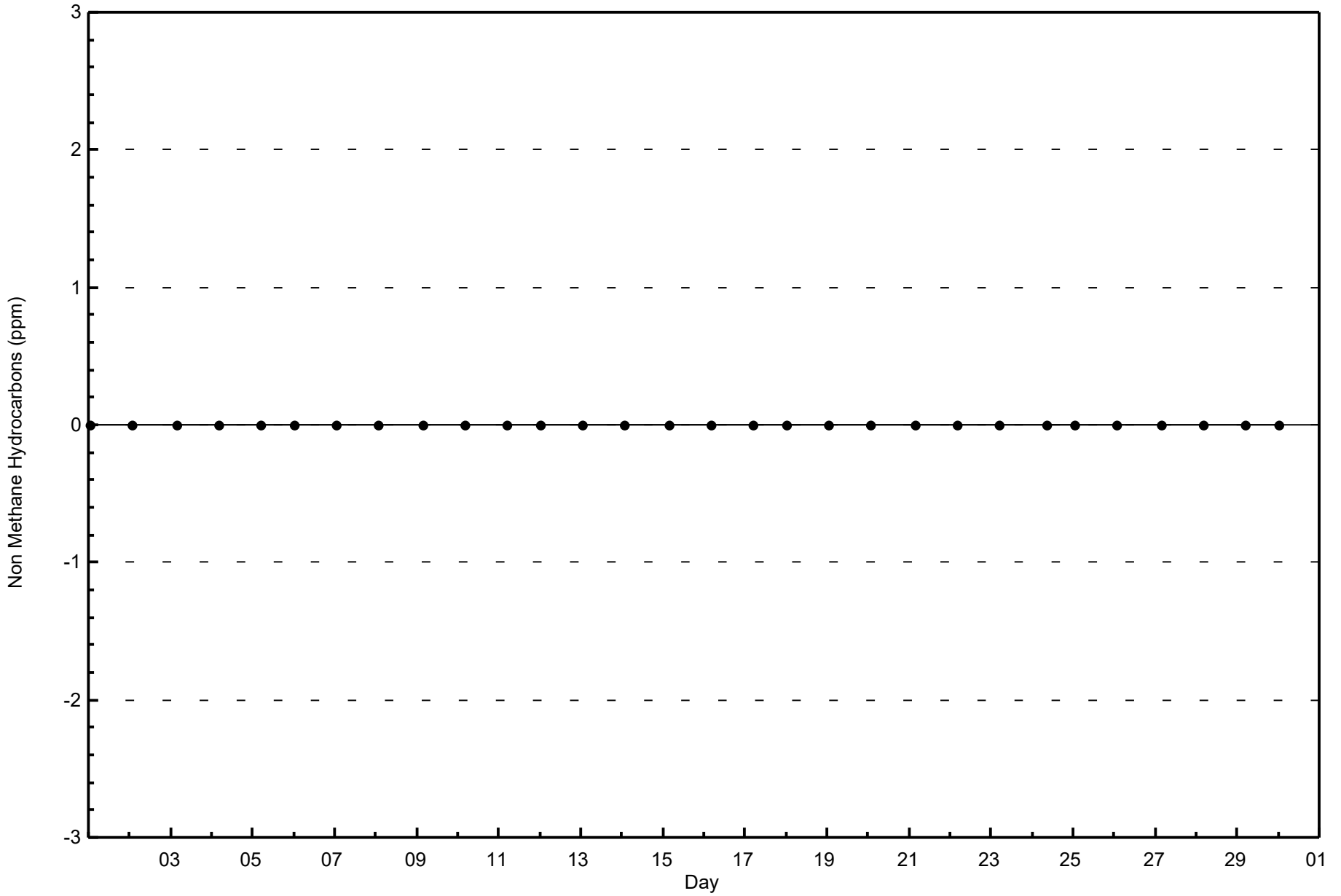
Total Number of Hours: 720



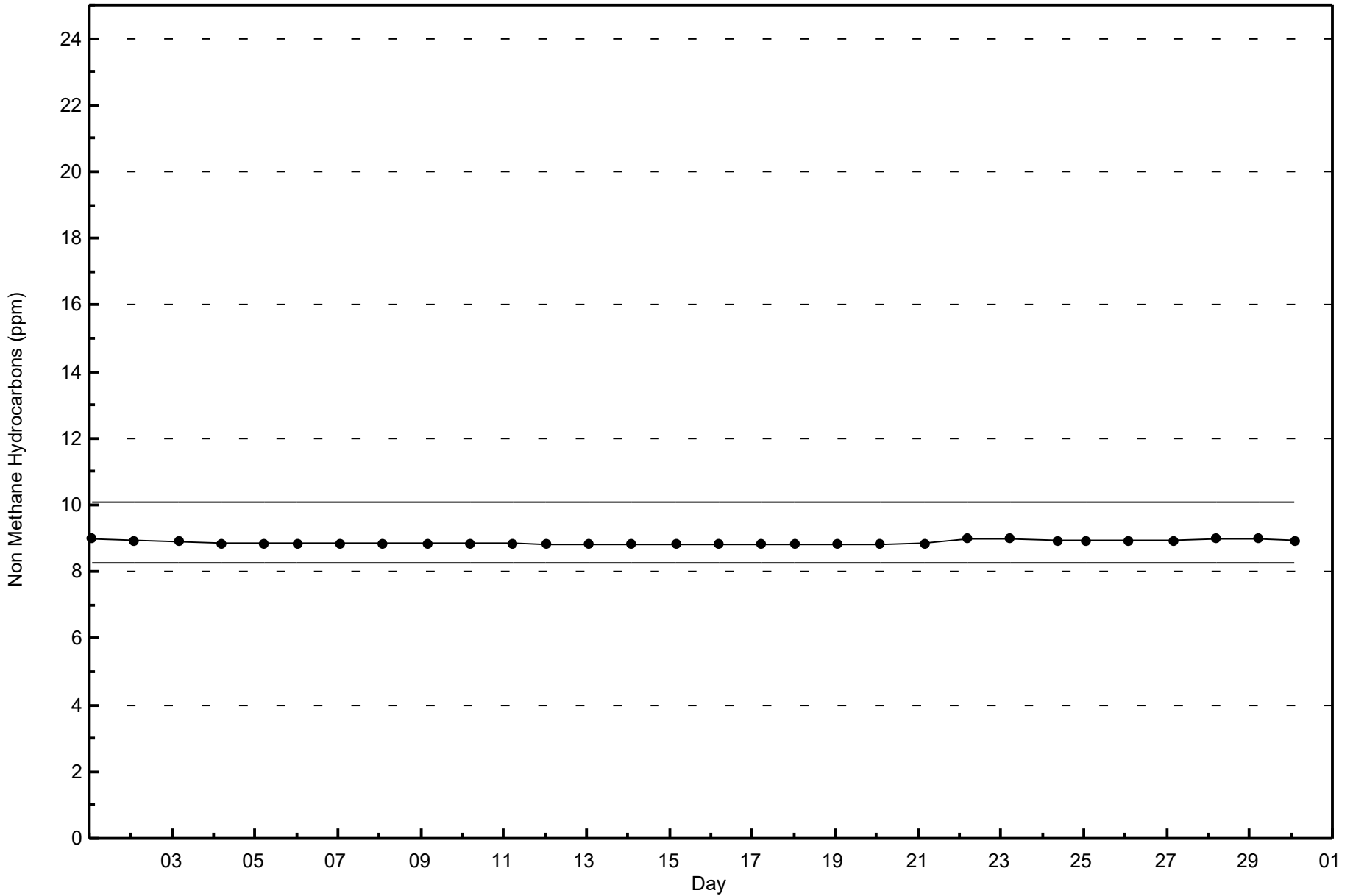
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Non Methane Hydrocarbons (NMHC) - ppm  
Mannix











Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH<sub>4</sub>) - ppm

Mannix - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 4.5 ppm on Nov 7 01:00	Maximum Daily Average: 2.6 ppm on Nov 30		Hours of Data:	687
Minimum Value: 2.1 ppm on Nov 7 13:00	Minimum Daily Average: 2.1 ppm on Nov 9		Hours of Missing Data:	33
Maximum Diurnal Average: 2.3 ppm at hour 1	Minimum Diurnal Average: 2.2 ppm at hour 2		Hours of Calibration:	33
Monthly Average: 2.20 ppm	Percentiles: P <sub>1</sub> = 2.1 P <sub>10</sub> = 2.1 Q <sub>1</sub> = 2.1 Median = 2.1 Q <sub>3</sub> = 2.2 P <sub>90</sub> = 2.4 P <sub>99</sub> = 3.0		Percent Operational Time:	100.0

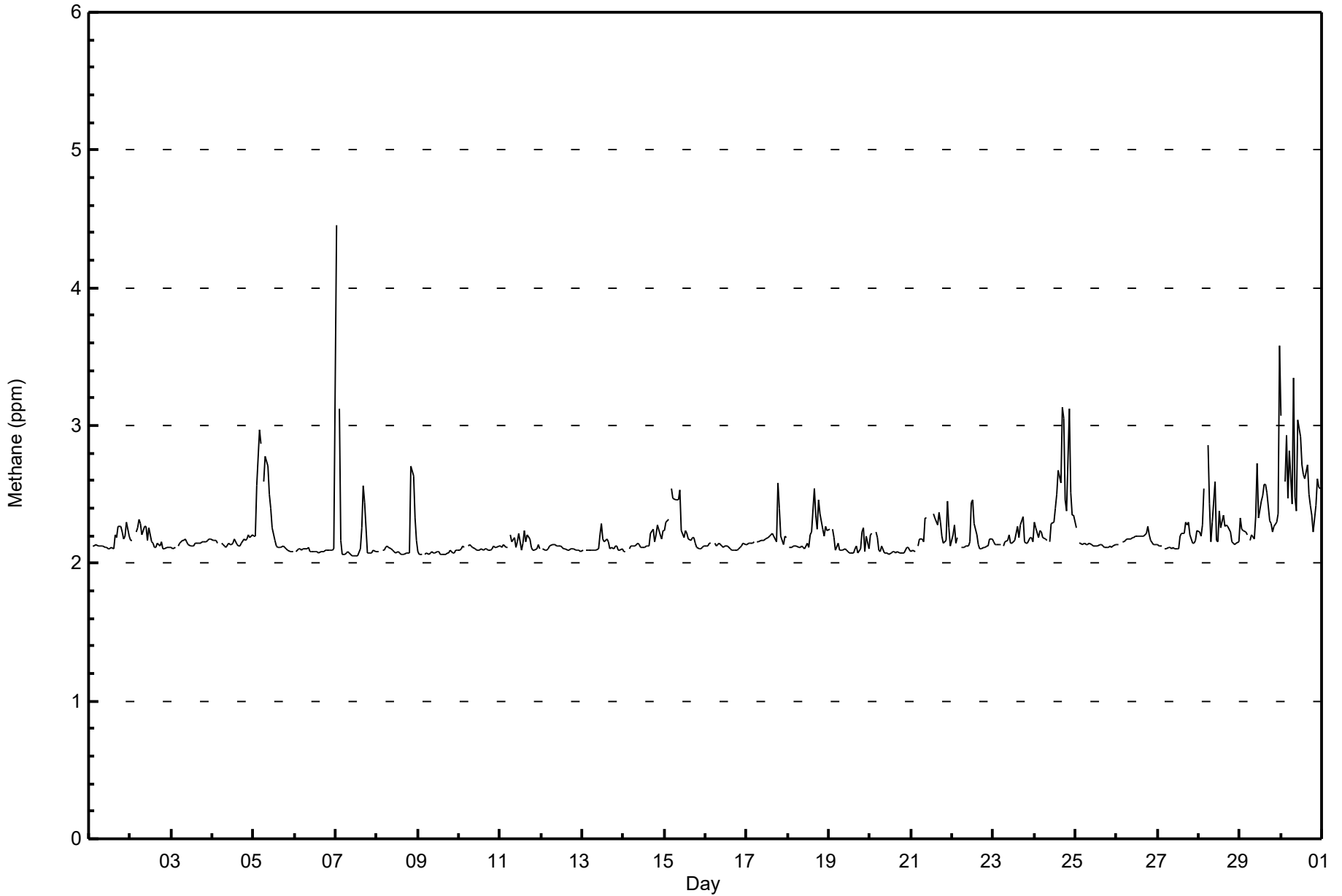
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																													
1-Nov	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3																									
2-Nov	2.2	2.2	Z	2.2	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3																							
3-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2																								
4-Nov	2.2	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2																								
5-Nov	2.2	2.2	2.6	3.0	2.9	Z	2.6	2.8	2.7	2.5	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	3.0																							
6-Nov	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																							
7-Nov	4.5	Z	3.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.6	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	4.5																							
8-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.7	2.6	2.3	2.2	2.2	2.2	2.2	2.2	2.7	2.7																							
9-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																							
10-Nov	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																							
11-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																							
12-Nov	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																							
13-Nov	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																							
14-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3																							
15-Nov	2.2	2.3	2.3	Z	2.5	2.5	2.5	2.5	2.5	2.5	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.5																						
16-Nov	2.1	2.1	2.1	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2																							
17-Nov	2.1	2.1	2.1	2.1	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.4	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.6																							
18-Nov	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.5	2.4	2.2	2.5	2.4	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.5																							
19-Nov	2.3	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.3																							
20-Nov	2.2	2.2	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																							
21-Nov	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.3	2.3	C	C	C	2.4	2.3	2.3	2.4	2.3	2.2	2.1	2.2	2.4	2.3	2.1	2.2	2.2	2.2	2.2	2.4	2.4																							
22-Nov	2.2	2.3	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.5	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.5																							
23-Nov	2.2	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.3	2.2	2.3	2.3	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3																							
24-Nov	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.3	2.4	2.5	2.7	2.6	3.1	3.0	2.5	2.4	3.1	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	3.1																							
25-Nov	2.3	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																							
26-Nov	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																							
27-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3																							
28-Nov	2.2	2.2	2.3	2.5	Z	2.9	2.4	2.2	2.3	2.6	2.2	2.2	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.9																							
29-Nov	2.3	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.3	2.7	2.3	2.5	2.5	2.6	2.6	2.5	2.3	2.3	2.2	2.3	2.3	2.4	3.6	3.6	3.6	3.6	3.6	3.6	3.6																							
30-Nov	3.1	Z	2.6	2.9	2.5	2.8	2.4	3.3	2.5	2.4	3.0	2.9	2.7	2.6	2.6	2.7	2.5	2.4	2.3	2.2	2.4	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.3																							
																								2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	Diurnal Average
																								4.5	2.3	3.1	3.0	2.9	2.9	2.6	3.3	2.7	2.6	3.0	2.9	2.7	2.6	2.7	3.1	3.0	2.6	2.4	3.1	2.6	2.5	3.6	3.6	3.6	3.6	3.6	3.6	3.6	Diurnal Maximum

Z - zerospan C - Calibration



Wood Buffalo Environmental Association  
Hourly Averages

Methane (CH<sub>4</sub>) - ppm  
Mannix - November 2024





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Mannix - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	0	0.00	0.00
2.1 - 3.0	680	98.98	98.98
3.1 - 10.0	7	1.02	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Mannix - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	76	74	7	4	4	7	75	119	23	33	26	35	64	40	48	39	674
3.1 - 10.0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	3	1	7
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	77	74	7	4	4	7	75	119	23	33	26	35	65	41	51	40	681

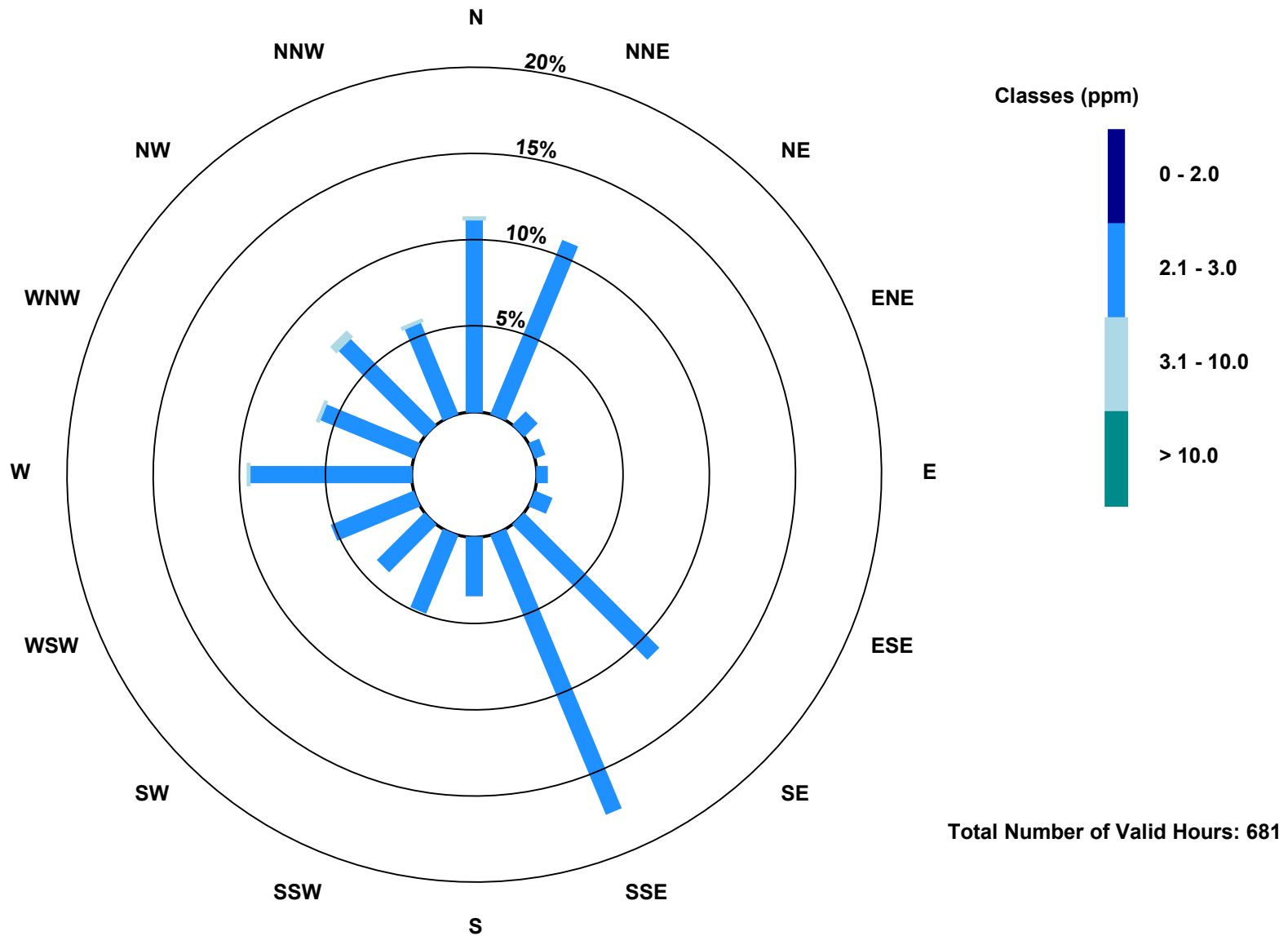
Total Number of Valid Hours: 681

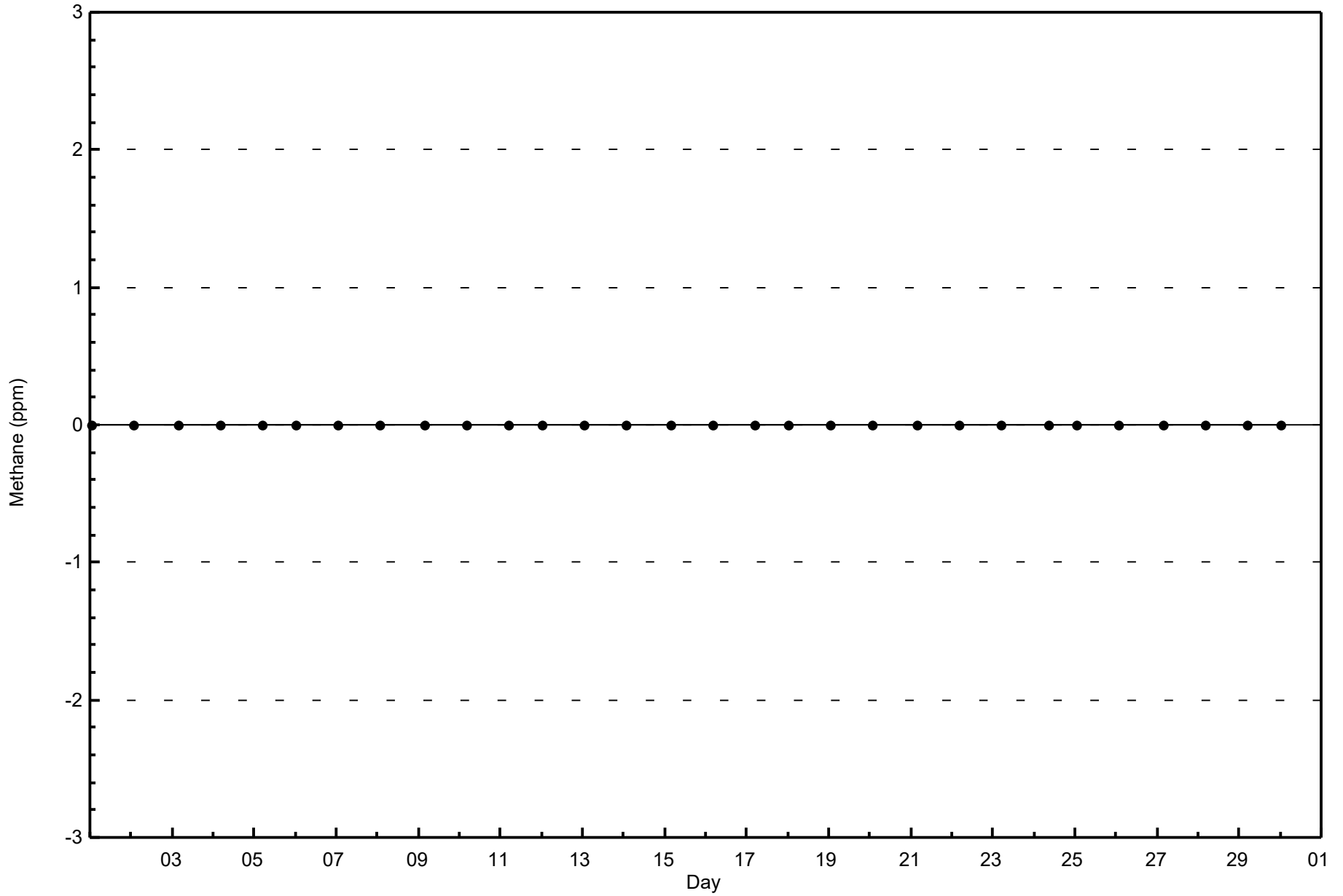
Total Number of Hours: 720

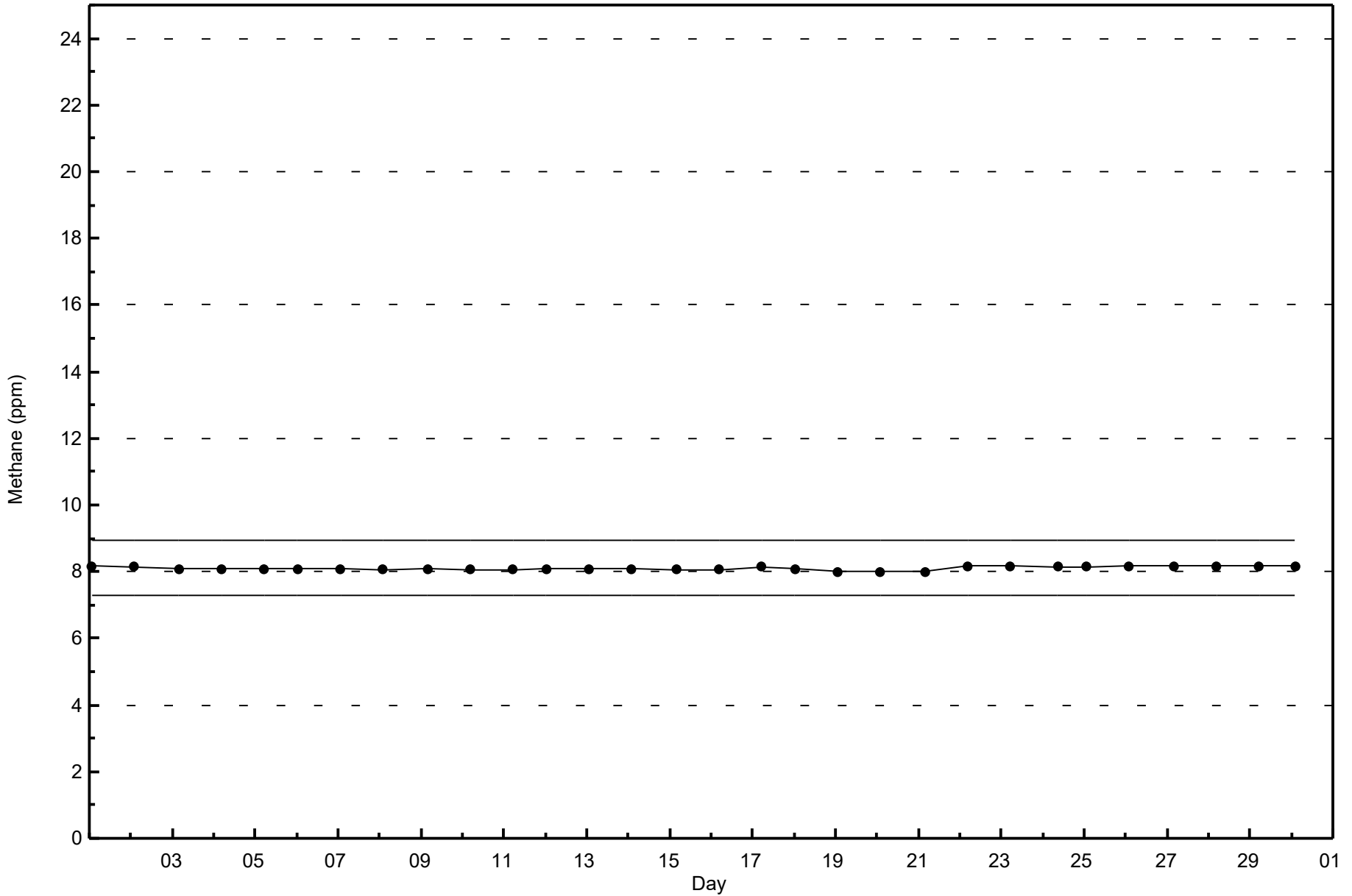


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Methane (CH<sub>4</sub>) - ppm  
Mannix



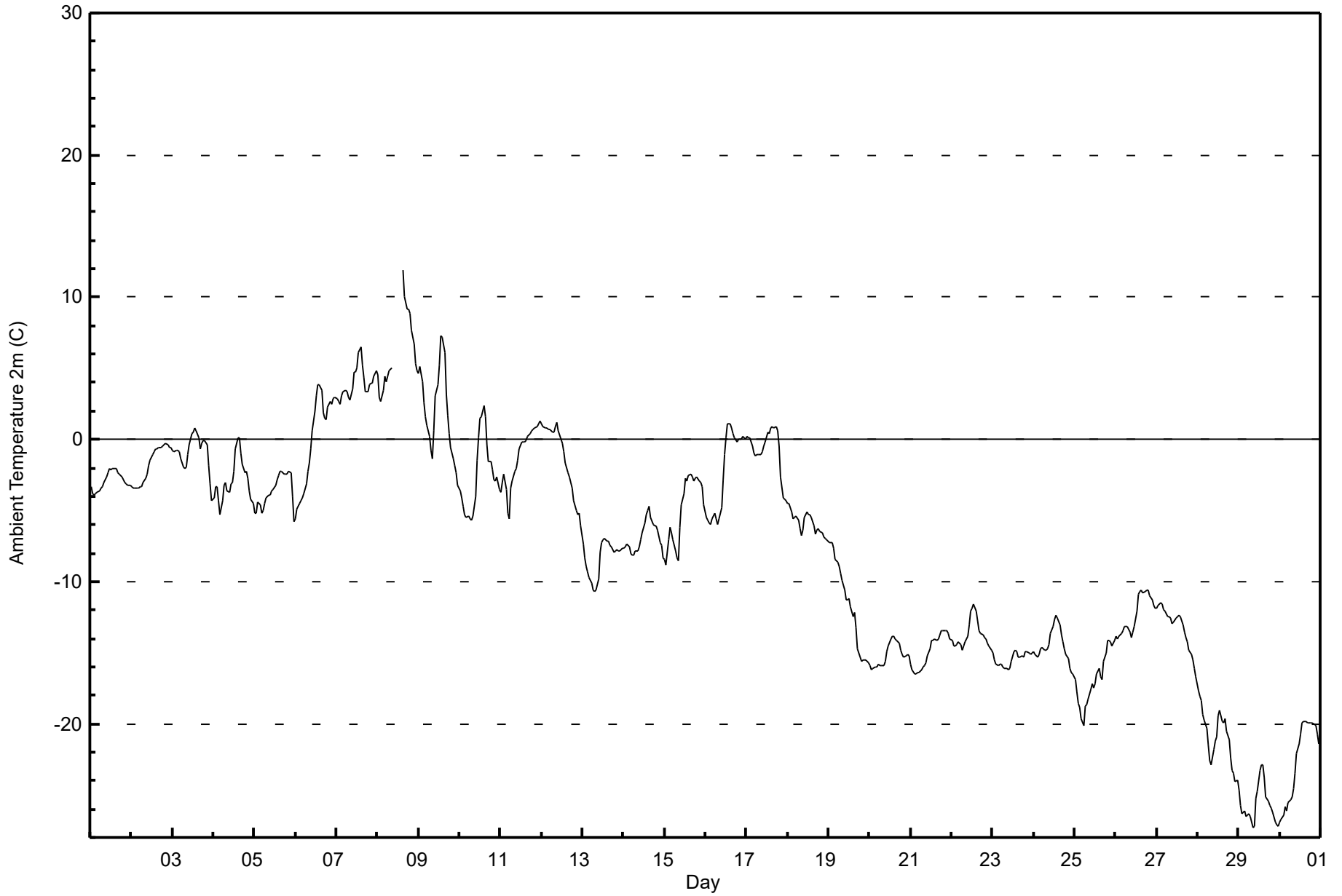








Maximum Value: 11.9 C on Nov 8 16:00		Maximum Daily Average: 6.1 C on Nov 8		Hours in Service: 720																							
Minimum Value: -27.3 C on Nov 29 09:00		Minimum Daily Average: -25.6 C on Nov 29		Hours of Data: 714																							
Maximum Diurnal Average: -6.1 C at hour 16		Minimum Diurnal Average: -8.8 C at hour 8		Hours of Missing Data: 6																							
Monthly Average: -7.82 C		Percentiles: P <sub>1</sub> = -26.5 P <sub>10</sub> = -18.8 Q <sub>1</sub> = -14.5 Median = -5.8 Q <sub>3</sub> = -1.4 P <sub>90</sub> = 1.4 P <sub>99</sub> = 7.1		Hours of Calibration: 0																							
				Percent Operational Time: 99.2																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	-3.4	-3.8	-3.9	-3.8	-3.7	-3.6	-3.4	-3.3	-3.1	-2.7	-2.3	-2.1	-2.1	-2.0	-2.1	-2.3	-2.5	-2.6	-2.9	-3.0	-3.1	-3.2	-3.2	-2.9	-2.0		
2-Nov	-3.3	-3.5	-3.4	-3.4	-3.4	-3.4	-3.3	-3.0	-2.7	-2.4	-1.9	-1.4	-1.1	-0.9	-0.7	-0.6	-0.6	-0.5	-0.4	-0.4	-0.3	-0.4	-0.6	-0.6	-1.8	-0.3	
3-Nov	-0.8	-0.8	-0.8	-0.8	-0.9	-1.3	-2.0	-2.1	-1.9	-1.1	-0.4	0.4	0.5	0.8	0.6	0.2	-0.7	-0.3	-0.1	-0.1	-0.4	-1.9	-3.1	-4.3	-0.9	0.8	
4-Nov	-4.1	-3.3	-3.4	-4.3	-5.3	-4.3	-3.2	-3.1	-3.6	-3.7	-3.1	-3.0	-2.2	-0.7	0.1	0.1	-1.0	-1.8	-2.3	-2.2	-2.8	-3.6	-4.3	-4.5	-2.9	0.1	
5-Nov	-5.2	-5.2	-4.4	-4.6	-5.2	-5.0	-4.5	-4.1	-3.9	-3.9	-3.7	-3.6	-3.3	-2.9	-2.5	-2.3	-2.2	-2.4	-2.4	-2.2	-2.3	-4.0	-5.7	-3.7	-2.2		
6-Nov	-5.6	-4.9	-4.5	-4.3	-4.1	-3.8	-3.1	-2.2	-1.6	-0.6	0.6	2.0	3.0	3.8	3.9	3.4	1.9	1.5	1.4	2.3	2.6	2.5	2.9	3.0	0.0	3.9	
7-Nov	2.8	2.7	2.5	3.1	3.4	3.4	3.4	3.0	2.8	3.6	4.7	4.8	5.0	6.1	6.5	5.3	4.3	3.4	3.4	3.8	4.0	3.9	4.4	4.8	4.0	6.5	
8-Nov	4.6	2.9	2.6	3.5	4.4	4.1	4.4	4.9	5.1	M	M	M	M	M	M	11.9	10.0	9.1	9.2	8.9	7.7	6.7	5.3	4.8	6.1	11.9	
9-Nov	4.6	5.1	4.1	2.6	1.6	1.0	0.3	-0.8	-1.3	0.6	3.1	3.8	5.3	7.3	7.1	6.1	3.1	1.7	0.4	-0.6	-1.3	-1.8	-2.4	-3.2	1.9	7.3	
10-Nov	-3.7	-4.2	-4.7	-5.2	-5.5	-5.4	-5.6	-5.7	-5.4	-4.0	-1.4	0.1	1.5	1.6	2.4	1.6	-0.4	-1.5	-1.6	-2.2	-2.9	-2.9	-2.6	-3.5	-2.6	2.4	
11-Nov	-3.7	-3.0	-2.5	-3.5	-5.2	-5.6	-3.4	-2.9	-2.3	-2.0	-1.4	-0.7	-0.1	-0.1	-0.2	-0.1	0.2	0.4	0.6	0.7	0.8	0.9	1.1	1.3	-1.3	1.3	
12-Nov	1.1	0.9	0.8	0.8	0.7	0.7	0.5	0.5	0.9	1.2	0.6	0.0	-0.3	-0.8	-1.7	-2.3	-2.6	-3.1	-3.4	-4.3	-5.0	-5.2	-5.2	-6.1	-1.3	1.2	
13-Nov	-7.3	-8.3	-8.9	-9.3	-9.7	-10.1	-10.6	-10.7	-10.6	-9.8	-7.9	-7.3	-7.1	-7.0	-7.2	-7.1	-7.5	-7.6	-7.9	-7.9	-7.8	-7.9	-7.8	-7.7	-8.4	-7.0	
14-Nov	-7.6	-7.5	-7.3	-7.6	-8.0	-8.1	-8.1	-7.8	-7.8	-7.6	-7.1	-6.5	-5.8	-5.3	-5.0	-4.7	-5.5	-6.0	-6.1	-6.1	-6.4	-7.2	-7.5	-8.3	-6.9	-4.7	
15-Nov	-8.5	-8.8	-7.0	-6.2	-6.6	-7.0	-7.9	-8.3	-8.5	-6.2	-4.6	-3.9	-2.8	-2.9	-2.6	-2.4	-2.6	-2.9	-2.7	-2.6	-3.0	-3.0	-3.4	-4.6	-5.0	-2.4	
16-Nov	-5.4	-5.7	-5.9	-6.0	-5.6	-5.2	-5.6	-6.0	-5.6	-4.8	-2.9	-1.1	0.1	1.1	1.1	0.8	0.4	0.1	-0.2	0.0	0.1	0.1	0.2	0.0	-2.3	1.1	
17-Nov	0.2	0.2	0.1	-0.5	-1.0	-1.1	-1.1	-1.1	-1.0	-0.8	-0.4	-0.2	0.5	0.5	0.8	0.9	0.8	0.9	0.6	-0.5	-2.6	-4.1	-4.2	-4.3	-0.7	0.9	
18-Nov	-4.5	-4.5	-5.0	-5.6	-5.5	-5.4	-5.7	-6.3	-6.8	-6.3	-5.5	-5.1	-5.3	-5.3	-5.4	-6.0	-6.7	-6.4	-6.2	-6.5	-6.6	-6.9	-7.0	-7.1	-5.9	-4.5	
19-Nov	-7.2	-7.2	-7.2	-7.6	-8.4	-8.7	-8.9	-9.5	-9.9	-10.6	-11.3	-11.3	-11.2	-11.8	-12.4	-12.2	-13.2	-14.8	-15.3	-15.6	-15.5	-15.5	-15.5	-15.7	-11.5	-7.2	
20-Nov	-15.9	-16.2	-16.1	-16.0	-16.0	-15.8	-15.9	-15.9	-15.9	-15.6	-14.9	-14.5	-14.0	-13.8	-13.8	-14.0	-14.2	-14.4	-14.8	-15.1	-15.3	-15.2	-15.1	-15.3	-15.2	-13.8	
21-Nov	-15.8	-16.2	-16.5	-16.5	-16.4	-16.4	-16.2	-16.0	-16.0	-15.7	-15.3	-14.7	-14.2	-14.1	-14.0	-14.1	-14.1	-13.7	-13.4	-13.4	-13.5	-13.5	-13.6	-14.0	-14.9	-13.4	
22-Nov	-14.1	-14.5	-14.6	-14.4	-14.2	-14.4	-14.8	-14.5	-14.2	-13.9	-13.1	-12.1	-11.8	-11.6	-12.0	-12.7	-13.4	-13.6	-13.8	-14.0	-14.0	-14.3	-14.5	-14.8	-13.7	-11.6	
23-Nov	-15.0	-15.5	-15.8	-16.0	-15.8	-15.8	-16.0	-16.1	-16.1	-16.2	-16.1	-15.6	-14.9	-14.8	-15.0	-15.3	-15.3	-15.2	-15.3	-14.9	-14.9	-15.1	-15.1	-15.0	-15.4	-14.8	
24-Nov	-14.9	-15.1	-15.3	-15.1	-14.7	-14.7	-14.8	-14.9	-14.8	-14.4	-13.6	-13.1	-12.7	-12.4	-12.6	-13.1	-13.8	-14.2	-14.7	-15.2	-15.4	-16.1	-16.4	-16.5	-14.5	-12.4	
25-Nov	-16.9	-17.8	-18.5	-18.8	-19.6	-20.2	-18.7	-18.7	-18.3	-17.6	-17.2	-17.1	-17.2	-16.5	-16.1	-16.7	-16.9	-15.6	-15.0	-14.1	-14.1	-14.2	-14.5	-14.1	-16.9	-14.1	
26-Nov	-13.8	-14.0	-13.8	-13.6	-13.5	-13.2	-13.2	-13.2	-13.5	-13.9	-13.5	-13.1	-12.1	-10.9	-10.7	-10.6	-10.8	-10.7	-10.6	-10.6	-11.0	-11.3	-11.7	-11.9	-12.3	-10.6	
27-Nov	-11.8	-11.7	-11.5	-11.6	-12.0	-12.0	-12.5	-12.5	-12.6	-12.9	-12.9	-12.6	-12.4	-12.3	-12.4	-13.0	-13.5	-13.9	-14.3	-14.8	-15.1	-15.5	-16.1	-16.6	-13.2	-11.5	
28-Nov	-17.7	-18.1	-18.3	-19.4	-19.8	-20.3	-21.5	-22.6	-22.8	-21.8	-21.2	-20.9	-19.5	-19.1	-19.8	-20.0	-19.7	-20.5	-21.1	-22.4	-23.3	-23.5	-24.1	-24.0	-20.9	-17.7	
29-Nov	-24.6	-25.7	-26.3	-26.1	-26.5	-26.4	-26.4	-26.5	-27.3	-27.2	-25.3	-24.7	-23.2	-22.9	-22.9	-23.8	-25.1	-25.5	-25.7	-25.9	-26.3	-26.9	-27.1	-27.2	-25.6	-22.9	
30-Nov	-26.9	-26.7	-26.5	-25.9	-26.2	-25.6	-25.4	-25.1	-24.5	-23.5	-22.1	-21.4	-20.7	-20.0	-19.9	-19.8	-20.0	-19.9	-19.9	-19.9	-20.0	-20.1	-20.7	-21.4	-22.6	-19.8	
		-8.2	-8.3	-8.4	-8.5	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8	-7.9	-7.4	-6.8	-6.4	-6.4	-6.1	-6.7	-7.0	-7.1	-7.3	-7.6	-7.9	-8.2	-8.5	Diurnal Average	
		4.6	5.1	4.1	3.5	4.4	4.1	4.4	4.9	5.1	3.6	4.7	4.8	5.3	7.3	7.1	11.9	10.0	9.1	9.2	8.9	7.7	6.7	5.3	4.8	Diurnal Maximum	
M - Maintenance																											





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C**  
**Mannix - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	55	7.70	7.70
-20 - 0	534	74.79	82.49
0 - 10	123	17.23	99.72
10 - 20	2	0.28	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 714

Total Number of Hours: 720

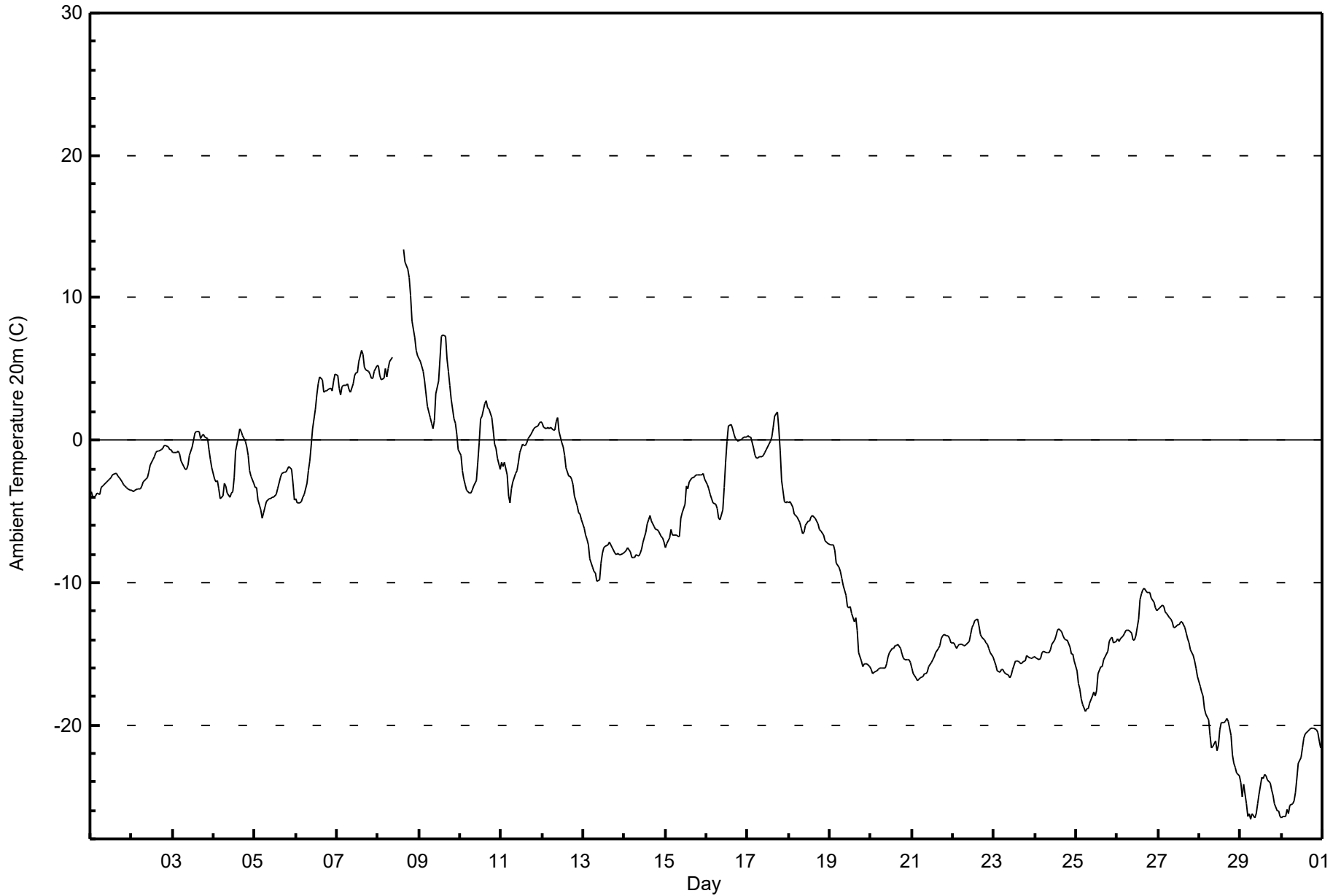


Maximum Value: 13.4 C on Nov 8 16:00		Maximum Daily Average: 7.3 C on Nov 8		Hours in Service: 720																																												
Minimum Value: -26.6 C on Nov 29 07:00		Minimum Daily Average: -25.1 C on Nov 29		Hours of Data: 714																																												
Maximum Diurnal Average: -6.0 C at hour 16		Minimum Diurnal Average: -8.8 C at hour 10		Hours of Missing Data: 6																																												
Monthly Average: -7.60 C		Percentiles: P <sub>1</sub> = -26.3 P <sub>10</sub> = -18.8 Q <sub>1</sub> = -14.6 Median = -5.7 Q <sub>3</sub> = -1.1 P <sub>90</sub> = 2.3 P <sub>99</sub> = 7.3		Hours of Calibration: 0																																												
				Percent Operational Time: 99.2																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-3.6	-4.0	-4.1	-3.9	-3.7	-3.8	-3.3	-3.3	-3.1	-3.0	-2.8	-2.8	-2.7	-2.4	-2.3	-2.4	-2.6	-2.6	-2.9	-3.1	-3.2	-3.4	-3.4	-3.5	-3.2	-2.3																						
2-Nov	-3.5	-3.6	-3.5	-3.4	-3.4	-3.5	-3.2	-3.0	-2.8	-2.6	-2.2	-1.8	-1.4	-1.2	-0.9	-0.8	-0.8	-0.7	-0.5	-0.4	-0.3	-0.5	-0.7	-0.7	-1.9	-0.3																						
3-Nov	-0.8	-0.9	-0.9	-0.8	-1.0	-1.4	-1.9	-2.0	-2.1	-1.7	-1.1	-0.4	0.0	0.5	0.6	0.6	0.1	0.3	0.4	0.2	0.1	-0.7	-1.4	-2.0	-0.7	0.6																						
4-Nov	-2.7	-2.9	-2.9	-3.4	-4.1	-3.9	-3.0	-3.2	-3.8	-4.1	-3.7	-3.6	-2.7	-0.8	0.2	0.8	0.6	0.3	-0.1	-0.5	-1.1	-2.2	-2.5	-3.0	-2.2	0.8																						
5-Nov	-3.4	-3.3	-4.3	-4.9	-5.5	-5.1	-4.7	-4.3	-4.1	-4.1	-4.1	-4.0	-3.8	-3.4	-3.0	-2.7	-2.3	-2.2	-2.3	-2.1	-1.9	-2.1	-3.0	-4.2	-3.5	-1.9																						
6-Nov	-4.1	-4.4	-4.4	-4.3	-4.0	-3.8	-3.0	-2.1	-1.5	-0.3	0.8	2.1	3.2	4.0	4.4	4.2	3.4	3.4	3.5	3.6	3.6	3.4	4.2	4.6	0.7	4.6																						
7-Nov	4.5	3.7	3.1	3.8	3.8	3.8	3.9	3.6	3.4	3.9	4.5	4.8	4.8	5.6	6.3	6.0	5.1	4.9	4.8	4.6	4.3	4.4	4.9	5.2	4.5	6.3																						
8-Nov	5.2	4.6	4.2	4.3	5.0	4.4	5.0	5.5	5.9	M	M	M	M	M	M	13.4	12.5	12.1	11.4	10.1	8.4	7.2	6.3	5.9	7.3	13.4																						
9-Nov	5.7	5.6	4.9	4.1	3.2	2.3	1.6	1.2	0.8	1.4	3.2	4.1	5.8	7.3	7.4	7.3	5.8	4.8	3.9	2.8	1.4	1.2	0.4	-0.6	3.6	7.4																						
10-Nov	-1.0	-2.2	-2.7	-3.1	-3.6	-3.7	-3.7	-3.5	-3.3	-2.8	-1.5	-0.2	1.5	1.7	2.6	2.7	2.3	2.2	1.6	0.7	-0.3	-0.5	-1.2	-2.1	-0.8	2.7																						
11-Nov	-1.6	-1.9	-1.5	-2.5	-3.9	-4.4	-3.4	-2.9	-2.4	-2.2	-1.5	-0.8	-0.3	-0.4	-0.3	-0.1	0.2	0.4	0.6	0.8	0.9	1.0	1.2	1.3	-1.0	1.3																						
12-Nov	1.2	0.9	0.8	0.9	0.8	0.9	0.7	0.7	1.3	1.6	0.6	-0.2	-0.5	-1.1	-2.0	-2.6	-2.6	-2.7	-3.1	-3.9	-4.6	-5.1	-5.1	-5.6	-1.2	1.6																						
13-Nov	-6.2	-6.7	-6.9	-7.4	-8.3	-8.9	-9.2	-9.3	-9.9	-9.8	-8.6	-7.9	-7.5	-7.5	-7.4	-7.2	-7.3	-7.6	-8.0	-8.0	-8.0	-8.1	-8.0	-7.9	-8.0	-6.2																						
14-Nov	-7.8	-7.7	-7.5	-7.8	-8.2	-8.3	-8.2	-8.0	-8.1	-7.9	-7.6	-7.1	-6.5	-5.9	-5.6	-5.2	-5.7	-6.1	-6.3	-6.3	-6.4	-6.7	-6.9	-7.1	-7.0	-5.2																						
15-Nov	-7.6	-7.3	-6.9	-6.2	-6.7	-6.6	-6.6	-6.8	-6.7	-5.5	-5.1	-4.5	-3.2	-3.4	-2.9	-2.7	-2.6	-2.5	-2.4	-2.4	-2.5	-2.4	-2.3	-2.7	-4.5	-2.3																						
16-Nov	-3.1	-3.5	-3.8	-4.1	-4.4	-4.5	-4.8	-5.5	-5.6	-4.9	-3.3	-1.5	-0.1	1.0	1.1	0.8	0.4	0.1	-0.1	0.0	0.1	0.1	0.2	0.2	-1.9	1.1																						
17-Nov	0.3	0.2	0.2	-0.6	-1.1	-1.3	-1.2	-1.2	-1.2	-1.1	-0.9	-0.6	-0.3	-0.1	0.2	0.9	1.7	2.0	0.8	-0.8	-2.9	-4.3	-4.4	-4.3	-0.8	2.0																						
18-Nov	-4.4	-4.3	-4.7	-5.2	-5.3	-5.3	-5.7	-6.1	-6.5	-6.5	-6.0	-5.7	-5.7	-5.4	-5.3	-5.5	-5.7	-5.8	-6.3	-6.4	-6.6	-7.1	-7.1	-7.2	-5.8	-4.3																						
19-Nov	-7.4	-7.3	-7.3	-7.8	-8.7	-8.9	-9.2	-9.7	-10.2	-10.9	-11.7	-11.8	-11.7	-12.2	-12.8	-12.5	-13.3	-14.9	-15.6	-15.9	-15.7	-15.7	-15.7	-15.9	-11.8	-7.3																						
20-Nov	-16.2	-16.4	-16.3	-16.2	-16.1	-16.1	-16.0	-16.0	-16.0	-15.7	-15.2	-15.0	-14.6	-14.6	-14.5	-14.4	-14.4	-14.6	-15.0	-15.3	-15.4	-15.4	-15.4	-15.6	-15.4	-14.4																						
21-Nov	-16.0	-16.4	-16.7	-16.9	-16.8	-16.7	-16.6	-16.4	-16.4	-16.3	-15.9	-15.7	-15.4	-15.2	-14.9	-14.7	-14.4	-14.0	-13.7	-13.7	-13.7	-13.8	-13.9	-14.2	-15.3	-13.7																						
22-Nov	-14.2	-14.4	-14.6	-14.5	-14.3	-14.4	-14.4	-14.4	-14.3	-14.2	-13.7	-13.1	-13.0	-12.6	-12.6	-13.0	-13.7	-13.9	-14.0	-14.3	-14.3	-14.6	-14.9	-15.2	-14.0	-12.6																						
23-Nov	-15.5	-15.8	-16.2	-16.3	-16.1	-16.1	-16.3	-16.4	-16.5	-16.7	-16.5	-16.1	-15.5	-15.6	-15.5	-15.6	-15.7	-15.5	-15.5	-15.2	-15.2	-15.3	-15.3	-15.2	-15.8	-15.2																						
24-Nov	-15.2	-15.4	-15.4	-15.3	-14.9	-14.8	-14.9	-15.0	-14.9	-14.7	-14.3	-14.1	-13.8	-13.3	-13.3	-13.4	-13.8	-14.0	-14.0	-14.0	-14.5	-15.0	-15.0	-15.5	-14.5	-13.3																						
25-Nov	-16.2	-17.1	-17.5	-18.1	-18.5	-19.1	-18.8	-18.9	-18.5	-17.9	-17.7	-18.0	-17.6	-16.4	-15.9	-15.9	-15.5	-15.2	-14.8	-14.2	-13.9	-13.8	-14.2	-14.2	-16.6	-13.8																						
26-Nov	-13.9	-14.2	-13.9	-13.7	-13.6	-13.4	-13.3	-13.4	-13.6	-14.1	-14.0	-13.7	-12.6	-11.2	-10.8	-10.5	-10.4	-10.7	-10.7	-10.7	-11.1	-11.4	-11.8	-11.9	-12.4	-10.4																						
27-Nov	-11.9	-11.8	-11.6	-11.7	-12.1	-12.1	-12.5	-12.5	-12.7	-13.1	-13.2	-13.0	-12.9	-12.8	-12.7	-13.2	-13.6	-13.9	-14.3	-14.7	-15.1	-15.5	-16.0	-16.6	-13.3	-11.6																						
28-Nov	-17.3	-17.6	-17.9	-18.9	-19.3	-19.7	-20.8	-21.6	-21.5	-21.1	-21.8	-21.5	-20.3	-19.8	-19.8	-19.8	-19.6	-19.7	-20.7	-22.1	-22.7	-23.0	-23.4	-23.5	-20.6	-17.3																						
29-Nov	-24.1	-25.0	-24.2	-25.6	-26.4	-26.3	-26.6	-26.2	-26.5	-26.2	-25.5	-24.9	-23.7	-23.7	-23.5	-23.6	-23.9	-24.0	-24.5	-24.9	-25.5	-26.0	-26.1	-26.4	-25.1	-23.5																						
30-Nov	-26.5	-26.5	-26.4	-25.9	-26.2	-25.7	-25.5	-25.4	-24.8	-23.7	-22.7	-22.3	-21.7	-21.0	-20.7	-20.4	-20.4	-20.2	-20.3	-20.2	-20.4	-20.5	-21.1	-21.6	-22.9	-20.2																						
																								-7.6	-7.9	-8.0	-8.2	-8.4	-8.5	-8.5	-8.5	-8.5	-8.8	-8.3	-7.9	-7.3	-6.9	-6.7	-6.0	-6.2	-6.3	-6.6	-6.9	-7.2	-7.5	-7.7	-8.0	Diurnal Average
																								5.7	5.6	4.9	4.3	5.0	4.4	5.0	5.5	5.9	3.9	4.5	4.8	5.8	7.3	7.4	13.4	12.5	12.1	11.4	10.1	8.4	7.2	6.3	5.9	Diurnal Maximum
M - Maintenance																																																



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 20m (AT20) - C**  
**Mannix - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 20m (AT20) - C  
Mannix - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	61	8.54	8.54
-20 - 0	517	72.41	80.95
0 - 10	131	18.35	99.30
10 - 20	5	0.70	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 714

Total Number of Hours: 720

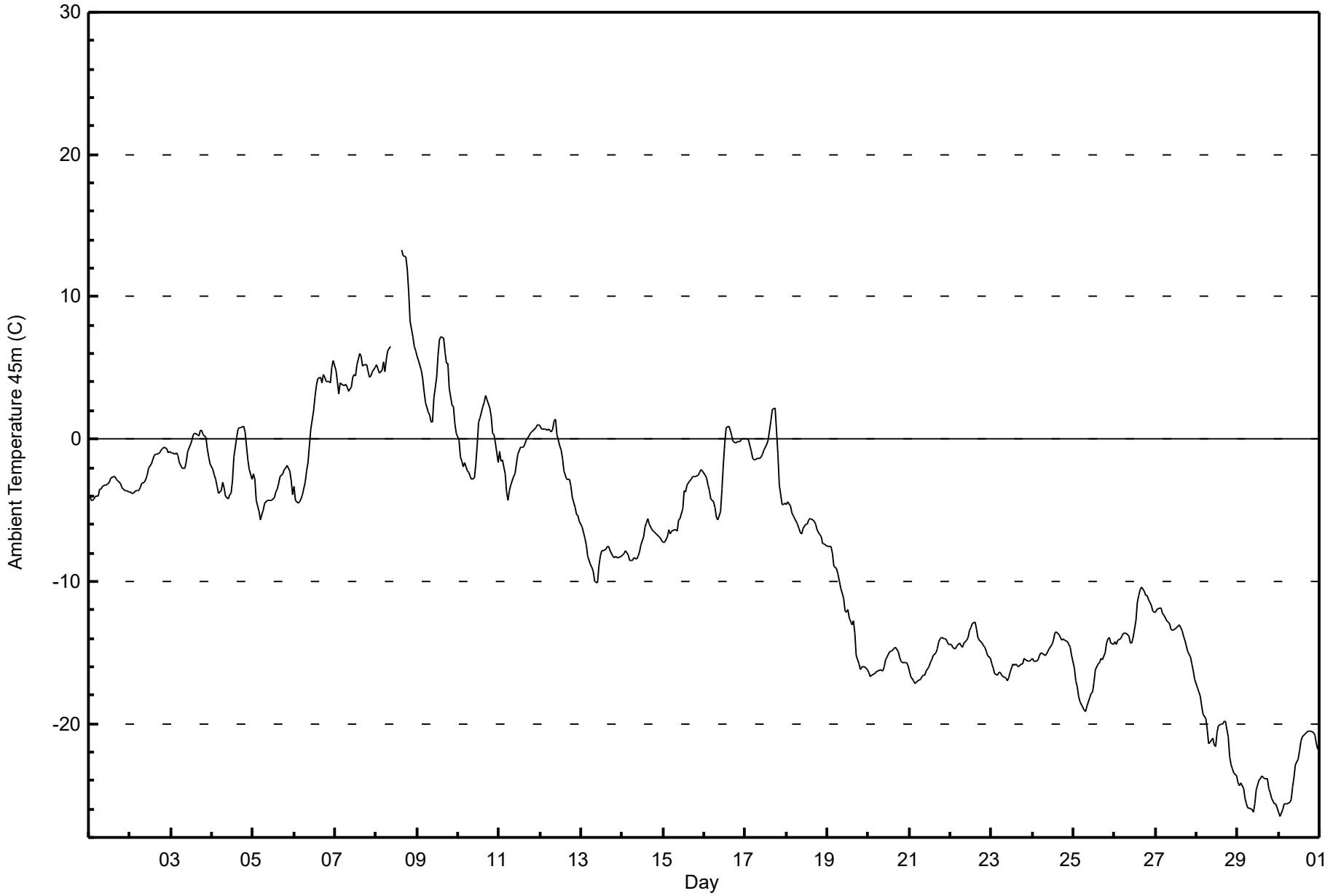


Maximum Value: 13.2 C on Nov 8 16:00		Maximum Daily Average: 7.6 C on Nov 8		Hours in Service: 720																							
Minimum Value: -26.5 C on Nov 30 02:00		Minimum Daily Average: -24.9 C on Nov 29		Hours of Data: 714																							
Maximum Diurnal Average: -6.2 C at hour 16		Minimum Diurnal Average: -8.9 C at hour 10		Hours of Missing Data: 6																							
Monthly Average: -7.68 C		Percentiles: P <sub>1</sub> = -25.9 P <sub>10</sub> = -18.8 Q <sub>1</sub> = -14.8 Median = -5.9 Q <sub>3</sub> = -1.1 P <sub>90</sub> = 2.6 P <sub>99</sub> = 7.2		Hours of Calibration: 0																							
				Percent Operational Time: 99.2																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	-3.9	-4.3	-4.4	-4.2	-4.0	-4.1	-3.5	-3.5	-3.3	-3.3	-3.2	-3.1	-3.0	-2.8	-2.6	-2.7	-2.8	-2.9	-3.1	-3.4	-3.5	-3.6	-3.7	-3.7	-3.4	-2.6	
2-Nov	-3.8	-3.9	-3.8	-3.6	-3.6	-3.7	-3.4	-3.2	-3.0	-2.9	-2.5	-2.1	-1.7	-1.5	-1.2	-1.1	-1.1	-1.0	-0.8	-0.7	-0.6	-0.7	-1.0	-0.9	-2.1	-0.6	
3-Nov	-1.0	-1.0	-1.0	-1.0	-1.2	-1.7	-2.0	-2.0	-2.0	-1.6	-0.9	-0.4	-0.1	0.3	0.4	0.3	0.2	0.6	0.6	0.3	0.1	-0.6	-1.3	-1.8	-0.7	0.6	
4-Nov	-2.1	-2.5	-2.8	-3.3	-3.8	-3.6	-3.0	-3.5	-4.0	-4.2	-4.0	-3.8	-2.9	-1.2	0.1	0.7	0.8	0.8	0.9	0.5	-0.5	-1.4	-2.2	-2.9	-2.0	0.9	
5-Nov	-2.5	-2.9	-4.3	-5.1	-5.7	-5.3	-5.0	-4.5	-4.3	-4.3	-4.3	-4.3	-4.1	-3.7	-3.5	-3.1	-2.7	-2.4	-2.1	-2.1	-1.9	-2.3	-2.9	-3.9	-3.6	-1.9	
6-Nov	-3.3	-4.3	-4.6	-4.5	-4.2	-3.9	-3.1	-2.2	-1.6	-0.5	0.7	1.9	3.0	3.8	4.3	4.4	4.0	4.5	4.4	4.1	4.0	3.9	5.0	5.5	0.9	5.5	
7-Nov	4.9	4.0	3.2	4.0	3.8	3.7	3.9	3.7	3.4	3.6	4.3	4.6	4.5	5.2	6.0	5.8	5.1	5.2	5.3	4.7	4.4	4.4	4.7	5.1	4.5	6.0	
8-Nov	5.2	4.9	4.6	4.9	5.4	4.7	5.6	6.2	6.5	M	M	M	M	M	M	13.2	12.9	12.8	11.9	10.4	8.3	7.2	6.5	6.2	7.6	13.2	
9-Nov	5.8	5.5	4.9	4.2	3.4	2.6	1.9	1.7	1.2	1.2	2.8	4.4	5.9	7.0	7.2	7.1	6.1	5.3	5.3	3.6	2.4	2.2	1.1	0.5	3.9	7.2	
10-Nov	-0.1	-1.3	-1.5	-2.0	-1.6	-2.2	-2.4	-2.6	-2.9	-2.7	-1.8	-0.4	1.2	1.5	2.3	2.6	3.0	2.8	2.1	1.6	0.4	0.3	-0.3	-1.6	-0.2	3.0	
11-Nov	-0.9	-1.5	-1.4	-2.5	-3.7	-4.3	-3.6	-3.2	-2.6	-2.5	-1.8	-1.1	-0.6	-0.6	-0.6	-0.4	-0.1	0.2	0.4	0.5	0.6	0.8	1.0	1.0	-1.1	1.0	
12-Nov	0.9	0.7	0.7	0.7	0.6	0.7	0.6	0.7	1.2	1.4	0.4	-0.5	-0.8	-1.4	-2.3	-2.8	-2.8	-2.9	-3.3	-4.1	-4.8	-5.3	-5.4	-5.8	-1.4	1.4	
13-Nov	-6.2	-6.6	-6.9	-7.4	-8.2	-8.8	-9.0	-9.3	-10.0	-10.1	-9.0	-8.2	-7.9	-7.8	-7.7	-7.5	-7.6	-7.9	-8.3	-8.3	-8.3	-8.4	-8.3	-8.2	-8.2	-6.2	
14-Nov	-8.1	-8.0	-7.8	-8.1	-8.5	-8.6	-8.5	-8.3	-8.4	-8.2	-7.9	-7.5	-6.9	-6.2	-5.9	-5.6	-6.0	-6.3	-6.5	-6.6	-6.6	-6.9	-7.0	-7.1	-7.3	-5.6	
15-Nov	-7.3	-7.3	-6.9	-6.4	-6.7	-6.4	-6.4	-6.4	-6.5	-5.7	-5.5	-4.9	-3.6	-3.7	-3.2	-3.0	-2.8	-2.6	-2.6	-2.6	-2.5	-2.3	-2.1	-2.3	-4.6	-2.1	
16-Nov	-2.5	-2.8	-3.2	-3.7	-4.2	-4.4	-4.8	-5.5	-5.7	-5.1	-3.5	-1.8	-0.3	0.8	0.9	0.6	0.2	-0.1	-0.3	-0.2	-0.2	-0.1	0.0	0.0	-1.9	0.9	
17-Nov	0.0	0.0	-0.1	-0.8	-1.3	-1.5	-1.5	-1.4	-1.4	-1.3	-1.0	-0.8	-0.4	-0.1	0.6	1.3	2.1	2.2	0.6	-1.1	-3.2	-4.6	-4.6	-4.5	-0.9	2.2	
18-Nov	-4.6	-4.4	-4.7	-5.2	-5.4	-5.6	-6.0	-6.3	-6.6	-6.6	-6.3	-6.0	-6.0	-5.7	-5.6	-5.7	-5.7	-6.0	-6.4	-6.6	-6.9	-7.3	-7.4	-7.5	-6.0	-4.4	
19-Nov	-7.6	-7.6	-7.6	-8.0	-9.0	-9.2	-9.5	-10.0	-10.5	-11.2	-12.0	-12.1	-12.0	-12.6	-13.1	-12.8	-13.6	-15.2	-15.8	-16.2	-16.0	-16.0	-16.0	-16.2	-12.1	-7.6	
20-Nov	-16.4	-16.7	-16.6	-16.5	-16.4	-16.3	-16.3	-16.3	-16.3	-16.0	-15.5	-15.3	-15.0	-14.9	-14.8	-14.7	-14.7	-14.9	-15.3	-15.6	-15.7	-15.7	-15.7	-15.9	-15.7	-14.7	
21-Nov	-16.3	-16.7	-17.0	-17.2	-17.1	-17.0	-16.8	-16.7	-16.6	-16.6	-16.3	-16.0	-15.8	-15.6	-15.2	-15.0	-14.7	-14.3	-14.0	-14.0	-14.0	-14.0	-14.2	-14.5	-15.6	-14.0	
22-Nov	-14.4	-14.6	-14.7	-14.7	-14.5	-14.4	-14.5	-14.6	-14.4	-14.2	-13.9	-13.4	-13.3	-13.0	-12.9	-13.4	-14.0	-14.1	-14.3	-14.6	-14.6	-14.9	-15.2	-15.4	-14.3	-12.9	
23-Nov	-15.8	-16.1	-16.5	-16.6	-16.4	-16.4	-16.6	-16.7	-16.8	-17.0	-16.8	-16.4	-15.8	-15.9	-15.8	-16.0	-15.8	-15.8	-15.4	-15.5	-15.6	-15.6	-15.5	-15.4	-16.1	-15.4	
24-Nov	-15.5	-15.6	-15.6	-15.5	-15.2	-15.0	-15.2	-15.2	-15.1	-15.0	-14.7	-14.4	-14.1	-13.7	-13.6	-13.7	-13.9	-14.1	-14.1	-14.1	-14.3	-14.5	-14.6	-15.2	-14.7	-13.6	
25-Nov	-16.1	-17.0	-17.4	-18.1	-18.5	-18.8	-19.0	-19.1	-18.7	-18.1	-17.8	-17.8	-17.1	-16.2	-15.8	-15.7	-15.4	-15.5	-15.0	-14.4	-14.0	-14.0	-14.3	-14.4	-16.6	-14.0	
26-Nov	-14.2	-14.4	-14.2	-14.0	-13.9	-13.7	-13.6	-13.6	-13.9	-14.3	-14.3	-13.9	-12.8	-11.5	-11.0	-10.6	-10.4	-10.7	-11.0	-11.0	-11.3	-11.6	-12.0	-12.2	-12.7	-10.4	
27-Nov	-12.1	-12.0	-11.9	-11.9	-12.3	-12.4	-12.7	-12.8	-13.0	-13.4	-13.5	-13.3	-13.3	-13.1	-13.0	-13.4	-13.8	-14.2	-14.5	-15.0	-15.3	-15.8	-16.3	-16.9	-13.6	-11.9	
28-Nov	-17.5	-17.8	-18.1	-18.8	-19.4	-19.6	-20.4	-21.4	-21.3	-21.0	-21.5	-21.6	-20.7	-20.1	-20.1	-20.0	-19.8	-19.8	-20.9	-22.3	-22.8	-23.1	-23.5	-23.7	-20.6	-17.5	
29-Nov	-24.1	-24.3	-24.2	-24.6	-25.2	-25.7	-25.9	-25.9	-26.0	-26.2	-25.6	-24.7	-23.9	-23.9	-23.7	-23.8	-23.8	-23.9	-24.5	-24.8	-25.3	-25.6	-25.6	-26.0	-24.9	-23.7	
30-Nov	-26.2	-26.5	-26.0	-25.6	-25.7	-25.6	-25.6	-25.4	-24.5	-23.8	-22.9	-22.5	-21.9	-21.3	-20.9	-20.7	-20.6	-20.5	-20.5	-20.5	-20.6	-20.8	-21.4	-21.8	-23.0	-20.5	
		-7.5	-7.8	-8.0	-8.2	-8.4	-8.5	-8.6	-8.6	-8.6	-8.9	-8.6	-8.1	-7.6	-7.2	-6.9	-6.2	-6.3	-6.4	-6.6	-6.9	-7.3	-7.5	-7.7	-8.0	Diurnal Average	
		5.8	5.5	4.9	4.9	5.4	4.7	5.6	6.2	6.5	3.6	4.3	4.6	5.9	7.0	7.2	13.2	12.9	12.8	11.9	10.4	8.3	7.2	6.5	6.2	Diurnal Maximum	
M - Maintenance																											



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 45m (AT45) - C**  
**Mannix - November 2024**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 45m (AT45) - C  
Mannix - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	64	8.96	8.96
-20 - 0	517	72.41	81.37
0 - 10	128	17.93	99.30
10 - 20	5	0.70	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 714

Total Number of Hours: 720

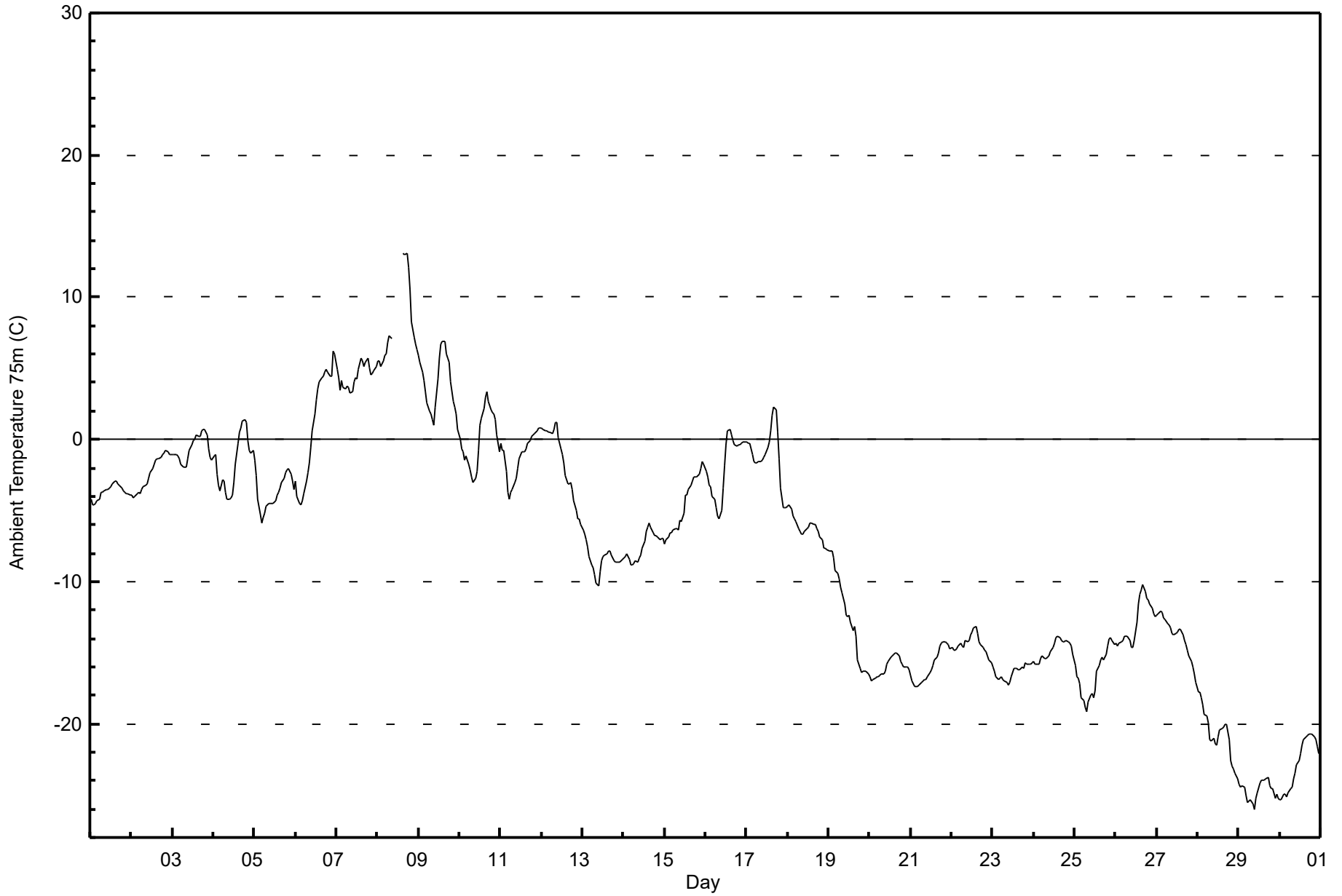


Maximum Value: 13.1 C on Nov 8 16:00		Maximum Daily Average: 8.1 C on Nov 8		Hours in Service: 720																							
Minimum Value: -26.0 C on Nov 29 10:00		Minimum Daily Average: -24.7 C on Nov 29		Hours of Data: 714																							
Maximum Diurnal Average: -6.4 C at hour 16		Minimum Diurnal Average: -9.1 C at hour 10		Hours of Missing Data: 6																							
Monthly Average: -7.75 C		Percentiles: P <sub>1</sub> = -25.3 P <sub>10</sub> = -18.5 Q <sub>1</sub> = -15.1 Median = -6.2 Q <sub>3</sub> = -1.1 P <sub>90</sub> = 2.7 P <sub>99</sub> = 7.2		Hours of Calibration: 0																							
				Percent Operational Time: 99.2																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	-4.2	-4.6	-4.6	-4.5	-4.3	-4.2	-3.8	-3.7	-3.6	-3.6	-3.5	-3.4	-3.3	-3.1	-2.9	-3.0	-3.1	-3.2	-3.4	-3.7	-3.8	-3.8	-3.8	-3.9	-3.7	-2.9	
2-Nov	-3.9	-4.1	-4.0	-3.8	-3.8	-3.8	-3.6	-3.3	-3.2	-3.1	-2.7	-2.3	-2.0	-1.7	-1.5	-1.3	-1.3	-1.3	-1.0	-0.9	-0.8	-0.9	-1.1	-1.0	-2.4	-0.8	
3-Nov	-1.1	-1.0	-1.1	-1.1	-1.4	-1.8	-2.0	-2.0	-1.9	-1.4	-0.8	-0.4	-0.1	0.0	0.3	0.3	0.2	0.6	0.7	0.7	0.3	-0.6	-1.2	-1.5	-0.7	0.7	
4-Nov	-1.2	-1.1	-2.4	-3.3	-3.6	-2.9	-2.9	-3.7	-4.2	-4.2	-4.1	-3.9	-3.1	-1.7	-0.3	0.5	0.8	1.3	1.4	1.2	-0.1	-0.8	-1.0	-0.8	-1.7	1.4	
5-Nov	-1.5	-2.5	-4.2	-5.3	-5.9	-5.5	-5.1	-4.7	-4.5	-4.5	-4.5	-4.3	-4.0	-3.7	-3.4	-3.0	-2.7	-2.3	-2.1	-2.0	-2.5	-2.9	-3.6	-3.7	-1.5		
6-Nov	-2.9	-4.0	-4.5	-4.6	-4.3	-3.8	-2.9	-2.3	-1.7	-0.6	0.6	1.8	2.8	3.6	4.1	4.3	4.5	4.8	4.9	4.7	4.5	4.4	6.2	6.0	1.1	6.2	
7-Nov	5.0	4.3	3.4	4.1	3.7	3.6	3.8	3.6	3.3	3.4	4.0	4.3	4.2	4.9	5.7	5.6	5.1	5.4	5.7	5.0	4.6	4.6	4.8	5.1	4.5	5.7	
8-Nov	5.5	5.5	5.2	5.5	5.9	6.0	6.8	7.3	7.1	M	M	M	M	M	M	13.1	13.0	13.1	12.1	10.5	8.3	7.2	6.7	6.3	8.1	13.1	
9-Nov	5.9	5.4	4.8	4.2	3.4	2.6	2.0	1.8	1.4	1.0	2.3	4.3	5.7	6.7	6.9	6.9	6.0	5.7	5.4	4.1	2.7	2.2	1.8	0.7	3.9	6.9	
10-Nov	0.0	-0.6	-0.8	-1.5	-1.2	-1.7	-2.1	-2.6	-3.0	-2.8	-2.2	-0.7	1.0	1.5	2.2	3.0	3.3	2.7	2.0	1.9	1.8	1.4	0.3	-0.8	0.0	3.3	
11-Nov	-0.3	-0.8	-0.8	-2.3	-3.7	-4.2	-3.7	-3.5	-3.0	-2.7	-2.0	-1.4	-0.8	-0.9	-0.8	-0.7	-0.3	-0.1	0.2	0.3	0.4	0.6	0.8	0.8	-1.2	0.8	
12-Nov	0.8	0.7	0.6	0.6	0.5	0.5	0.4	0.7	1.2	1.2	0.1	-0.7	-1.0	-1.7	-2.6	-3.1	-3.1	-3.1	-3.5	-4.3	-5.0	-5.5	-5.6	-6.0	-1.6	1.2	
13-Nov	-6.4	-6.6	-7.0	-7.5	-8.2	-8.8	-9.1	-9.5	-10.1	-10.3	-9.3	-8.6	-8.2	-8.0	-7.8	-7.9	-8.2	-8.6	-8.6	-8.6	-8.6	-8.7	-8.6	-8.5	-8.4	-6.4	
14-Nov	-8.3	-8.3	-8.0	-8.4	-8.8	-8.8	-8.8	-8.5	-8.7	-8.4	-8.2	-7.7	-7.1	-6.5	-6.2	-5.9	-6.2	-6.6	-6.8	-6.8	-6.8	-7.1	-7.0	-6.9	-7.5	-5.9	
15-Nov	-7.3	-7.0	-6.8	-6.5	-6.6	-6.4	-6.3	-6.3	-6.4	-5.7	-5.8	-5.2	-3.9	-3.9	-3.5	-3.2	-2.9	-2.7	-2.6	-2.7	-2.4	-2.0	-1.6	-1.8	-4.6	-1.6	
16-Nov	-2.2	-2.7	-3.2	-3.3	-4.0	-4.2	-4.8	-5.4	-5.6	-5.0	-3.4	-1.8	-0.4	0.6	0.7	0.3	0.0	-0.4	-0.5	-0.4	-0.4	-0.3	-0.2	-0.2	-1.9	0.7	
17-Nov	-0.2	-0.2	-0.3	-1.1	-1.5	-1.7	-1.7	-1.6	-1.6	-1.5	-1.2	-1.0	-0.6	-0.2	0.6	1.7	2.2	2.1	0.5	-1.3	-3.5	-4.8	-4.8	-4.8	-1.1	2.2	
18-Nov	-4.7	-4.6	-4.9	-5.4	-5.6	-5.8	-6.2	-6.4	-6.7	-6.7	-6.5	-6.3	-6.2	-5.9	-5.9	-5.9	-6.0	-6.2	-6.5	-6.8	-7.1	-7.6	-7.7	-7.8	-6.2	-4.6	
19-Nov	-7.8	-7.8	-7.9	-8.3	-9.2	-9.4	-9.8	-10.4	-10.8	-11.5	-12.4	-12.5	-12.3	-12.9	-13.4	-13.1	-13.9	-15.5	-16.1	-16.4	-16.3	-16.3	-16.3	-16.5	-12.4	-7.8	
20-Nov	-16.7	-17.0	-16.9	-16.8	-16.7	-16.6	-16.6	-16.5	-16.5	-16.3	-15.9	-15.6	-15.3	-15.3	-15.1	-15.0	-15.0	-15.2	-15.6	-15.8	-16.0	-16.0	-16.0	-16.2	-16.0	-15.0	
21-Nov	-16.6	-17.0	-17.3	-17.4	-17.4	-17.2	-17.1	-17.0	-16.9	-16.9	-16.6	-16.4	-16.2	-15.9	-15.5	-15.3	-15.0	-14.5	-14.3	-14.2	-14.2	-14.3	-14.5	-14.7	-15.9	-14.2	
22-Nov	-14.7	-14.9	-14.8	-14.7	-14.6	-14.3	-14.5	-14.6	-14.2	-14.2	-14.1	-13.7	-13.5	-13.2	-13.2	-13.7	-14.3	-14.4	-14.7	-14.9	-14.9	-15.2	-15.5	-15.7	-14.4	-13.2	
23-Nov	-16.1	-16.3	-16.7	-16.9	-16.8	-16.7	-16.9	-17.0	-17.1	-17.3	-17.1	-16.7	-16.1	-16.1	-16.1	-16.2	-16.2	-16.0	-16.1	-15.8	-15.8	-15.8	-15.8	-15.7	-16.4	-15.7	
24-Nov	-15.6	-15.8	-15.9	-15.8	-15.4	-15.2	-15.4	-15.4	-15.3	-15.2	-14.9	-14.6	-14.4	-13.9	-13.9	-14.0	-14.1	-14.2	-14.2	-14.2	-14.3	-14.4	-14.6	-15.1	-14.8	-13.9	
25-Nov	-15.9	-16.7	-16.8	-17.1	-18.2	-18.4	-18.9	-19.2	-18.5	-18.0	-17.9	-18.2	-17.7	-16.3	-15.9	-15.5	-15.3	-15.6	-15.1	-14.5	-14.0	-13.9	-14.2	-14.5	-16.5	-13.9	
26-Nov	-14.3	-14.5	-14.3	-14.2	-14.1	-13.9	-13.8	-13.9	-14.2	-14.7	-14.6	-14.2	-12.9	-11.6	-10.9	-10.6	-10.2	-10.7	-11.2	-11.2	-11.6	-11.9	-12.3	-12.5	-12.8	-10.2	
27-Nov	-12.4	-12.3	-12.1	-12.2	-12.6	-12.6	-13.0	-13.0	-13.3	-13.7	-13.7	-13.6	-13.6	-13.4	-13.3	-13.7	-14.1	-14.4	-14.8	-15.2	-15.6	-16.1	-16.5	-17.1	-13.8	-12.1	
28-Nov	-17.7	-17.8	-18.2	-18.7	-19.4	-19.4	-19.9	-21.2	-21.2	-21.0	-21.4	-21.6	-21.0	-20.4	-20.4	-20.2	-20.0	-20.0	-21.1	-22.5	-23.0	-23.2	-23.5	-23.8	-20.7	-17.7	
29-Nov	-24.3	-24.4	-24.3	-24.5	-25.1	-25.6	-25.5	-25.4	-25.6	-26.0	-25.3	-24.8	-24.1	-24.0	-24.0	-24.0	-23.9	-23.8	-24.4	-24.6	-24.5	-25.2	-24.9	-25.2	-24.7	-23.8	
30-Nov	-25.4	-25.3	-24.9	-25.0	-25.1	-24.8	-24.5	-24.5	-23.8	-23.5	-22.9	-22.6	-22.1	-21.5	-21.2	-21.0	-20.9	-20.7	-20.7	-20.7	-20.9	-21.1	-21.6	-22.1	-22.8	-20.7	
		-7.5	-7.7	-8.0	-8.2	-8.5	-8.5	-8.5	-8.6	-8.6	-9.1	-8.8	-8.3	-7.8	-7.4	-7.2	-6.4	-6.4	-6.5	-6.7	-7.0	-7.3	-7.6	-7.7	-7.9	Diurnal Average	
		5.9	5.5	5.2	5.5	5.9	6.0	6.8	7.3	7.1	3.4	4.0	4.3	5.7	6.7	6.9	13.1	13.0	13.1	12.1	10.5	8.3	7.2	6.7	6.3	Diurnal Maximum	
M - Maintenance																											



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 75m (AT75) - C**  
**Mannix - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 75m (AT75) - C  
Mannix - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	65	9.10	9.10
-20 - 0	519	72.69	81.79
0 - 10	125	17.51	99.30
10 - 20	5	0.70	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 714

Total Number of Hours: 720

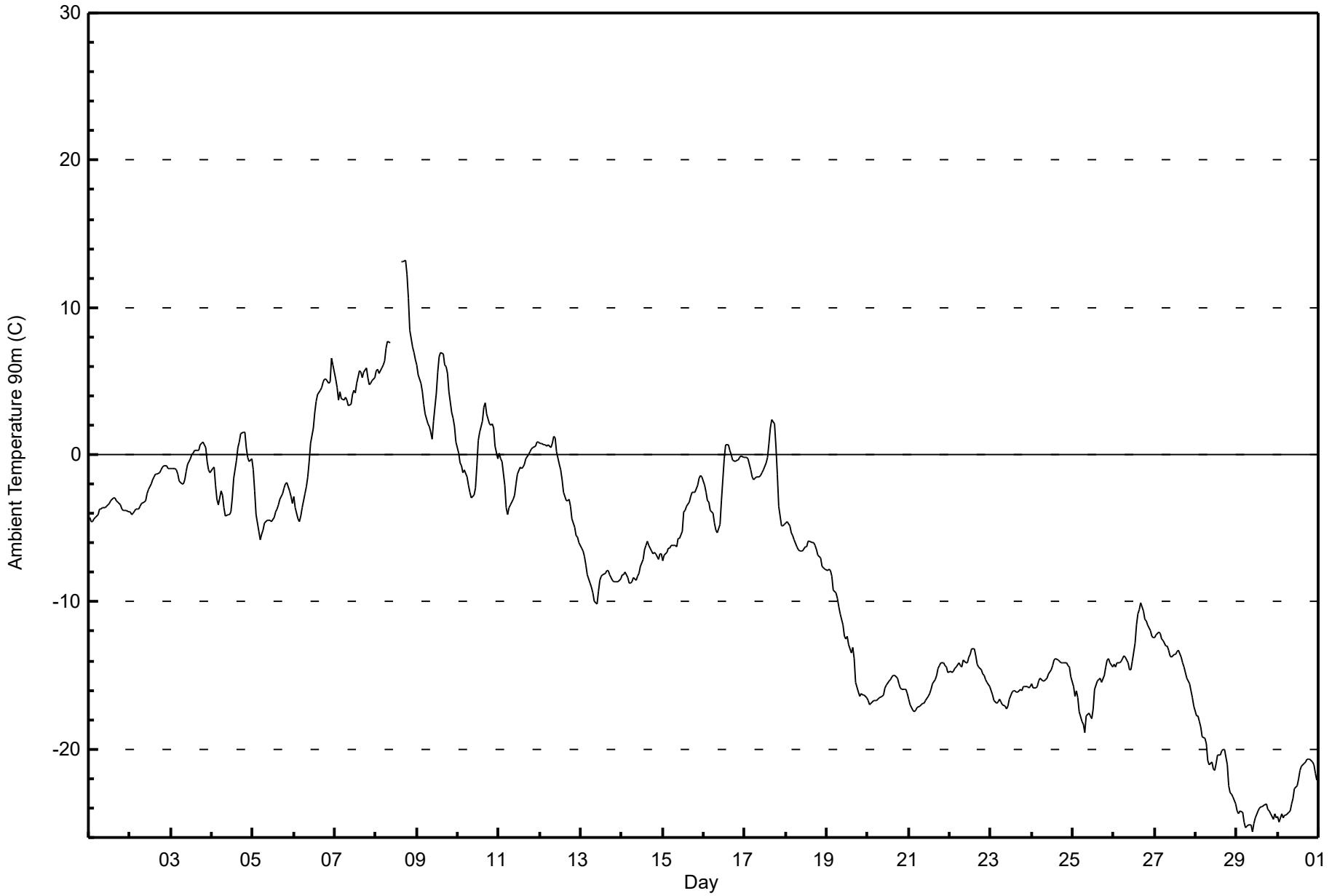


Maximum Value: 13.2 C on Nov 8 18:00		Maximum Daily Average: 8.3 C on Nov 8		Hours in Service: 720																							
Minimum Value: -25.6 C on Nov 29 10:00		Minimum Daily Average: -24.5 C on Nov 29		Hours of Data: 714																							
Maximum Diurnal Average: -6.3 C at hour 16		Minimum Diurnal Average: -9.0 C at hour 10		Hours of Missing Data: 6																							
Monthly Average: -7.66 C		Percentiles: P <sub>1</sub> = -24.9 P <sub>10</sub> = -18.1 Q <sub>1</sub> = -15.0 Median = -6.1 Q <sub>3</sub> = -1.0 P <sub>90</sub> = 2.7 P <sub>99</sub> = 7.6		Hours of Calibration: 0																							
				Percent Operational Time: 99.2																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	-4.2	-4.6	-4.6	-4.4	-4.3	-4.1	-3.7	-3.7	-3.6	-3.6	-3.5	-3.4	-3.3	-3.1	-2.9	-3.0	-3.1	-3.2	-3.4	-3.6	-3.7	-3.8	-3.8	-3.9	-3.7	-2.9	
2-Nov	-3.9	-4.0	-4.0	-3.7	-3.7	-3.7	-3.5	-3.3	-3.2	-3.1	-2.7	-2.3	-2.0	-1.7	-1.5	-1.3	-1.3	-1.3	-1.0	-0.9	-0.7	-0.8	-1.0	-0.9	-2.3	-0.7	
3-Nov	-1.0	-0.9	-1.0	-1.1	-1.3	-1.8	-2.0	-2.0	-1.7	-1.1	-0.6	-0.3	0.0	0.1	0.3	0.3	0.3	0.7	0.8	0.9	0.5	-0.5	-1.0	-1.2	-0.6	0.9	
4-Nov	-1.0	-0.8	-2.0	-3.0	-3.4	-2.4	-2.8	-3.6	-4.2	-4.1	-4.1	-3.9	-3.0	-1.6	-0.3	0.5	0.9	1.5	1.5	1.5	0.5	-0.2	-0.4	-0.3	-1.4	1.5	
5-Nov	-1.1	-2.4	-4.0	-5.2	-5.8	-5.4	-5.1	-4.7	-4.4	-4.5	-4.5	-4.2	-3.9	-3.7	-3.4	-3.0	-2.6	-2.2	-2.0	-1.9	-2.4	-2.8	-3.3	-3.6	-1.1		
6-Nov	-2.8	-3.6	-4.4	-4.5	-4.1	-3.6	-2.7	-2.2	-1.6	-0.5	0.7	1.8	2.9	3.6	4.1	4.4	4.6	4.9	5.1	5.1	4.9	4.9	6.6	6.1	1.2	6.6	
7-Nov	5.1	4.6	3.7	4.3	3.8	3.7	3.9	3.7	3.3	3.4	4.1	4.3	4.2	4.9	5.7	5.6	5.2	5.6	5.9	5.2	4.8	4.8	5.0	5.3	4.6	5.9	
8-Nov	5.7	5.8	5.5	5.9	6.1	6.4	7.3	7.7	7.6	M	M	M	M	M	M	13.1	13.1	13.2	12.3	10.6	8.5	7.3	6.9	6.4	8.3	13.2	
9-Nov	6.1	5.5	4.8	4.3	3.5	2.7	2.1	1.9	1.5	1.1	2.3	4.2	5.6	6.7	6.9	6.9	6.1	5.9	5.5	4.2	2.9	2.5	1.9	0.8	4.0	6.9	
10-Nov	0.1	-0.5	-0.7	-1.2	-1.0	-1.6	-2.0	-2.5	-3.0	-2.7	-2.2	-0.7	0.9	1.5	2.3	3.3	3.5	2.8	2.1	2.0	2.1	1.9	0.6	-0.3	0.2	3.5	
11-Nov	0.1	-0.3	-0.5	-2.1	-3.6	-4.1	-3.6	-3.4	-3.0	-2.7	-2.0	-1.3	-0.8	-0.9	-0.8	-0.7	-0.3	0.0	0.2	0.4	0.5	0.6	0.9	0.8	-1.1	0.9	
12-Nov	0.8	0.7	0.7	0.7	0.6	0.6	0.5	0.8	1.2	1.2	0.2	-0.7	-1.0	-1.7	-2.6	-3.1	-3.1	-3.0	-3.5	-4.3	-5.0	-5.5	-5.6	-6.0	-1.5	1.2	
13-Nov	-6.3	-6.6	-6.9	-7.5	-8.2	-8.7	-9.0	-9.4	-10.0	-10.2	-9.3	-8.6	-8.2	-8.1	-7.9	-7.9	-8.2	-8.6	-8.6	-8.6	-8.6	-8.7	-8.6	-8.4	-8.4	-6.3	
14-Nov	-8.2	-8.2	-7.9	-8.4	-8.8	-8.8	-8.6	-8.3	-8.5	-8.2	-8.1	-7.6	-7.1	-6.5	-6.2	-5.9	-6.1	-6.5	-6.7	-6.7	-6.7	-7.1	-6.7	-6.7	-7.4	-5.9	
15-Nov	-7.2	-6.8	-6.6	-6.3	-6.4	-6.2	-6.1	-6.2	-6.3	-5.7	-5.7	-5.2	-3.9	-3.8	-3.5	-3.2	-2.8	-2.5	-2.5	-2.5	-2.1	-1.6	-1.4	-1.5	-4.4	-1.4	
16-Nov	-2.0	-2.6	-3.1	-3.3	-3.8	-4.0	-4.6	-5.1	-5.3	-4.7	-3.2	-1.7	-0.2	0.7	0.7	0.3	0.0	-0.4	-0.5	-0.3	-0.3	-0.2	-0.1	-0.1	-1.8	0.7	
17-Nov	-0.2	-0.2	-0.3	-1.1	-1.5	-1.7	-1.6	-1.6	-1.5	-1.4	-1.2	-1.0	-0.6	-0.2	0.7	1.9	2.3	2.1	0.6	-1.3	-3.5	-4.8	-4.8	-4.7	-1.1	2.3	
18-Nov	-4.7	-4.5	-4.9	-5.3	-5.5	-5.8	-6.2	-6.4	-6.6	-6.6	-6.5	-6.3	-6.2	-5.9	-5.9	-5.9	-6.0	-6.2	-6.4	-6.8	-7.1	-7.6	-7.7	-7.8	-6.2	-4.5	
19-Nov	-7.8	-7.8	-7.9	-8.3	-9.2	-9.4	-9.8	-10.4	-10.8	-11.5	-12.4	-12.5	-12.4	-12.9	-13.4	-13.1	-13.9	-15.5	-16.1	-16.4	-16.3	-16.3	-16.3	-16.5	-12.4	-7.8	
20-Nov	-16.7	-17.0	-16.8	-16.7	-16.7	-16.7	-16.6	-16.5	-16.5	-16.3	-15.9	-15.6	-15.4	-15.3	-15.1	-15.0	-15.0	-15.2	-15.6	-15.8	-16.0	-16.0	-16.0	-16.2	-16.0	-15.0	
21-Nov	-16.6	-17.0	-17.4	-17.4	-17.4	-17.2	-17.1	-16.9	-16.9	-16.8	-16.7	-16.4	-16.2	-16.0	-15.5	-15.3	-15.0	-14.5	-14.3	-14.1	-14.2	-14.3	-14.5	-14.8	-15.9	-14.1	
22-Nov	-14.7	-14.8	-14.7	-14.5	-14.4	-14.2	-14.4	-14.4	-14.0	-14.1	-14.1	-13.7	-13.5	-13.2	-13.2	-13.7	-14.2	-14.4	-14.7	-14.9	-14.9	-15.2	-15.5	-15.7	-14.4	-13.2	
23-Nov	-16.0	-16.3	-16.7	-16.9	-16.7	-16.6	-16.8	-17.0	-17.1	-17.2	-17.0	-16.6	-16.1	-16.1	-16.1	-16.1	-16.0	-16.0	-15.7	-15.7	-15.8	-15.8	-15.7	-15.7	-16.3	-15.7	
24-Nov	-15.6	-15.8	-15.8	-15.7	-15.4	-15.2	-15.3	-15.3	-15.2	-14.9	-14.6	-14.3	-13.9	-13.8	-14.0	-14.1	-14.1	-14.1	-14.1	-14.2	-14.3	-14.4	-14.4	-15.0	-14.8	-13.8	
25-Nov	-15.8	-16.5	-16.1	-16.5	-17.5	-18.1	-18.3	-18.9	-17.8	-17.6	-17.7	-17.9	-17.3	-16.0	-15.4	-15.3	-15.2	-15.4	-15.0	-14.4	-14.0	-13.9	-14.2	-14.4	-16.2	-13.9	
26-Nov	-14.2	-14.4	-14.2	-14.2	-14.1	-13.8	-13.7	-13.8	-14.2	-14.6	-14.6	-14.1	-12.8	-11.5	-10.8	-10.5	-10.1	-10.6	-11.2	-11.2	-11.5	-11.9	-12.3	-12.5	-12.8	-10.1	
27-Nov	-12.4	-12.2	-12.1	-12.2	-12.5	-12.6	-13.0	-13.0	-13.3	-13.7	-13.7	-13.6	-13.6	-13.4	-13.3	-13.7	-14.1	-14.5	-14.8	-15.2	-15.6	-16.1	-16.5	-17.1	-13.8	-12.1	
28-Nov	-17.7	-17.7	-18.1	-18.5	-19.2	-19.3	-19.6	-20.8	-21.1	-20.9	-21.3	-21.5	-21.0	-20.4	-20.4	-20.2	-20.0	-20.0	-20.0	-21.1	-22.5	-23.0	-23.1	-23.7	-20.6	-17.7	
29-Nov	-24.2	-24.4	-24.2	-24.3	-24.9	-25.3	-25.2	-25.2	-25.2	-25.6	-25.1	-24.7	-24.2	-24.0	-23.9	-24.0	-23.8	-23.7	-24.1	-24.2	-24.4	-24.8	-24.4	-24.7	-24.5	-23.7	
30-Nov	-24.6	-24.9	-24.4	-24.7	-24.5	-24.3	-24.2	-23.7	-23.3	-22.7	-22.5	-22.0	-21.5	-21.1	-20.9	-20.9	-20.7	-20.7	-20.7	-20.7	-20.8	-21.1	-21.6	-22.1	-22.6	-20.7	
		-7.4	-7.6	-7.8	-8.1	-8.3	-8.4	-8.4	-8.5	-8.5	-9.0	-8.7	-8.3	-7.8	-7.4	-7.1	-6.3	-6.3	-6.4	-6.6	-6.9	-7.2	-7.5	-7.6	-7.8	Diurnal Average	
		6.1	5.8	5.5	5.9	6.1	6.4	7.3	7.7	7.6	3.4	4.1	4.3	5.6	6.7	6.9	13.1	13.1	13.2	12.3	10.6	8.5	7.3	6.9	6.4	Diurnal Maximum	
M - Maintenance																											



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 90m (AT90) - C**  
**Mannix - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ambient Temperature 90m (AT90) - C**  
**Mannix - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	65	9.10	9.10
-20 - 0	516	72.27	81.37
0 - 10	128	17.93	99.30
10 - 20	5	0.70	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 714

Total Number of Hours: 720



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Mannix - November 2024

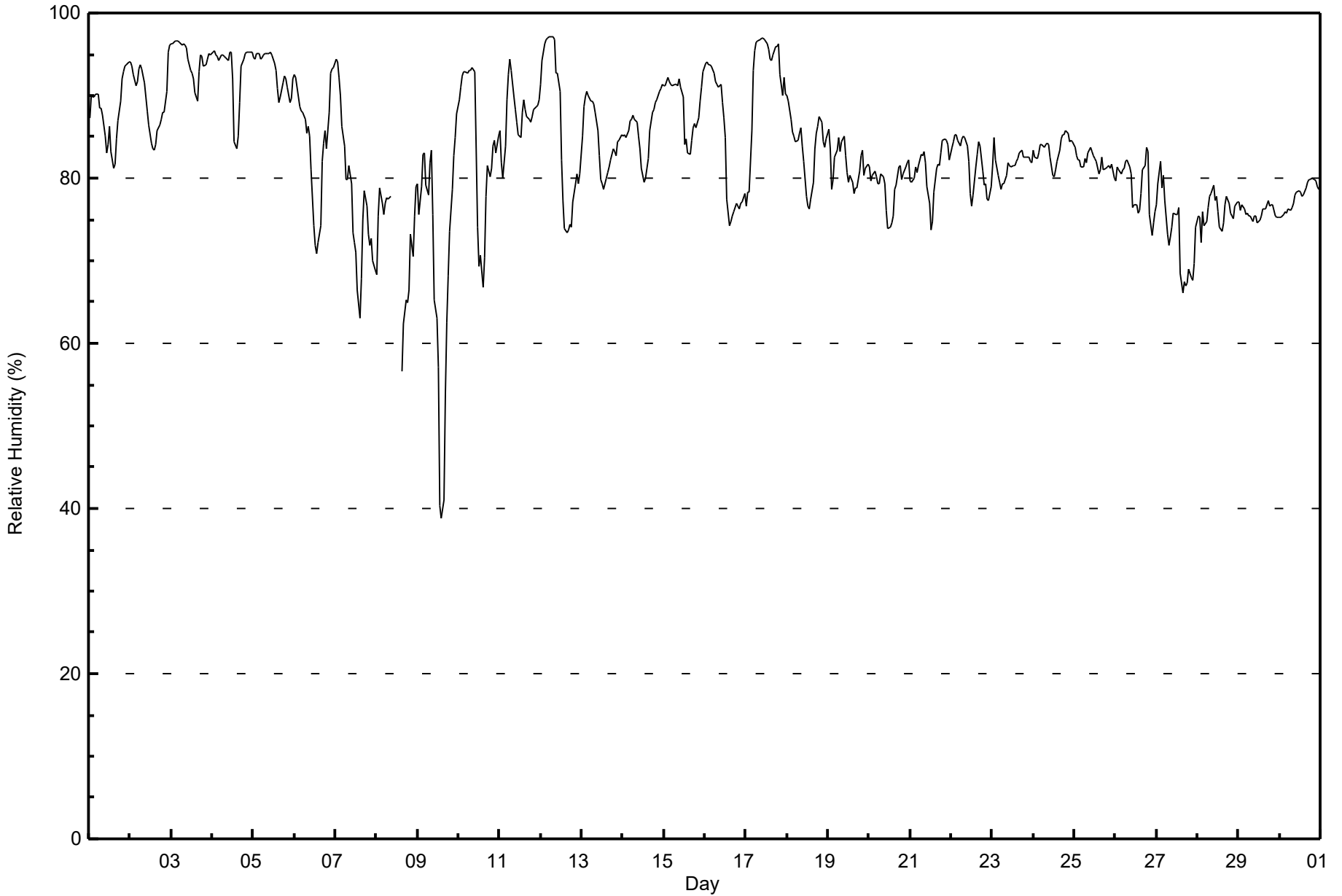
Maximum Value: 97 % on Nov 12 07:00																		Maximum Daily Average: 94.6 % on Nov 3						Hours in Service: 720			
Minimum Value: 39 % on Nov 9 15:00																		Minimum Daily Average: 70.7 % on Nov 9						Hours of Data: 714			
Maximum Diurnal Average: 86.0 % at hour 5																		Minimum Diurnal Average: 77.8 % at hour 15						Hours of Missing Data: 6			
Monthly Average: 83.2 %																		Percentiles: P <sub>1</sub> = 63 P <sub>10</sub> = 75 Q <sub>1</sub> = 78 Median = 83 Q <sub>3</sub> = 89 P <sub>90</sub> = 94 P <sub>99</sub> = 97						Hours of Calibration: 0			
																		Percent Operational Time: 99.2									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	87	90	90	90	90	90	89	88	88	85	83	84	86	83	81	82	85	87	89	92	93	94	94	94	88.1	94	
2-Nov	94	94	93	91	92	93	94	93	92	90	88	86	84	84	83	84	86	86	87	88	88	91	95	96	89.6	96	
3-Nov	96	96	97	97	97	96	96	96	96	96	94	93	93	92	90	89	93	95	95	93	94	94	95	95	94.6	97	
4-Nov	95	95	95	95	94	95	95	95	95	94	95	95	92	84	84	85	89	94	94	95	95	95	95	95	93.2	95	
5-Nov	95	94	95	95	94	95	95	95	95	95	95	95	94	93	91	89	90	91	92	92	91	89	90	92	93.0	95	
6-Nov	93	92	90	89	88	88	87	85	86	85	81	74	72	71	72	74	82	84	86	84	88	93	93	93	84.6	93	
7-Nov	94	94	92	90	86	84	80	80	82	79	73	72	71	66	63	68	75	78	77	73	72	73	70	69	77.6	94	
8-Nov	68	75	79	77	76	77	78	78	78	M	M	M	M	M	M	57	62	65	65	66	73	71	75	79	72.1	79	
9-Nov	79	76	79	83	83	79	78	82	83	76	65	63	57	40	39	41	54	63	68	74	79	83	85	88	70.7	88	
10-Nov	90	91	92	93	93	93	93	93	93	93	84	74	69	71	67	70	78	82	80	81	84	85	83	85	84.0	93	
11-Nov	86	82	80	84	89	92	94	93	90	88	87	85	85	88	90	88	87	87	87	87	88	89	89	90	87.7	94	
12-Nov	91	94	96	97	97	97	97	97	97	93	93	91	82	77	74	73	74	74	74	77	79	81	79	80	86.1	97	
13-Nov	85	89	90	90	90	89	89	89	88	86	83	80	79	79	80	81	81	82	84	83	83	84	85	85	84.8	90	
14-Nov	85	85	85	86	87	87	88	87	87	85	84	81	80	80	81	82	86	88	88	89	90	90	91	91	86.0	91	
15-Nov	91	91	92	92	91	91	91	91	91	92	91	90	84	85	83	83	85	86	87	86	87	89	91	93	88.9	93	
16-Nov	94	94	94	94	94	93	92	91	91	91	89	87	85	78	74	75	75	76	77	77	76	77	77	78	84.5	94	
17-Nov	77	78	78	86	93	95	96	97	97	97	97	96	96	94	94	95	96	96	96	96	93	90	92	90	92.3	97	
18-Nov	90	89	87	86	85	84	85	85	86	84	82	78	77	76	77	80	84	85	86	88	87	84	84	85	83.9	90	
19-Nov	86	83	79	80	83	83	85	83	84	85	83	81	79	80	80	78	79	79	81	83	83	80	81	82	81.7	86	
20-Nov	81	80	80	81	80	79	79	80	80	79	76	74	74	75	76	79	79	81	82	80	80	81	82	82	79.2	82	
21-Nov	80	80	80	81	81	81	83	83	83	82	79	77	74	75	78	81	82	81	83	85	85	85	84	82	81.0	85	
22-Nov	84	84	85	85	85	84	85	85	85	84	82	78	77	78	81	83	84	84	81	79	79	77	77	79	81.9	85	
23-Nov	82	85	82	80	79	79	79	80	82	81	81	81	81	82	82	83	83	83	83	82	83	83	82	82	81.6	85	
24-Nov	83	83	82	83	84	84	84	84	84	84	83	80	80	81	82	83	85	85	85	86	86	84	85	84	83.5	86	
25-Nov	84	83	82	82	81	81	82	82	83	84	83	83	82	82	81	81	83	81	81	81	82	81	82	80	82.0	84	
26-Nov	80	81	81	81	81	81	82	82	81	80	76	77	77	76	76	78	81	82	84	83	76	73	75	76	79.1	84	
27-Nov	77	79	82	79	80	77	73	72	73	74	76	76	76	77	69	66	67	67	67	69	68	68	70	74	73.1	82	
28-Nov	75	75	72	76	74	75	76	78	78	79	77	78	76	74	74	75	77	78	77	76	75	75	77	77	76.0	79	
29-Nov	77	76	77	76	76	76	75	75	75	75	75	75	75	75	76	76	76	77	77	77	77	75	75	75	75.9	77	
30-Nov	75	75	76	76	76	76	76	77	77	78	78	79	78	78	78	79	79	80	80	80	80	80	79	79	77.8	80	
																		85.1 85.5 85.4 85.8 86.0 85.9 85.9 85.9 86.0 85.4 83.3 81.5 79.9 78.4 77.8 77.9 80.5 82.0 82.4 82.7 83.1 83.1 83.7 84.4						Diurnal Average			
																		96 96 97 97 97 97 97 97 97 97 97 97 96 96 94 94 95 96 96 96 95 95 95 96						Diurnal Maximum			
M - Maintenance																											





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity (RH) - %**  
**Mannix - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity (RH) - %**  
**Mannix - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	1	0.14	0.14
40 - 60	5	0.70	0.84
60 - 80	235	32.91	33.75
80 - 100	473	66.25	100.00

Total Number of Valid Hours: 714

Total Number of Hours: 720



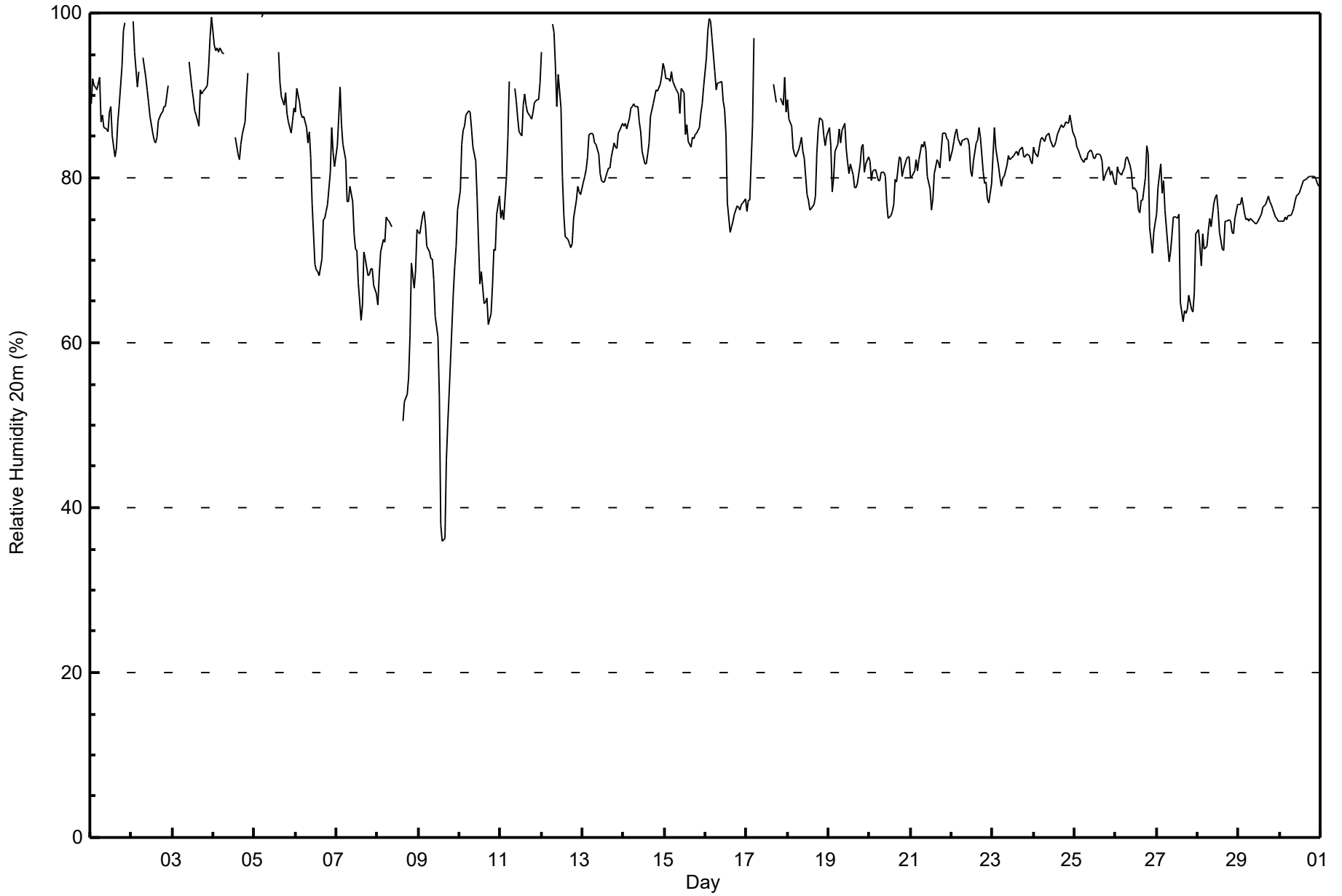
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 20m (RH20) - %

Mannix - November 2024

Maximum Value: 100 % on Nov 5 06:00																			Maximum Daily Average: 89.6 % on Nov 2																			Hours in Service: 720	
Minimum Value: 36 % on Nov 9 15:00																			Minimum Daily Average: 62.6 % on Nov 9																			Hours of Data: 655	
Maximum Diurnal Average: 84.7 % at hour 5																			Minimum Diurnal Average: 76.6 % at hour 16																			Hours of Missing Data: 65	
Monthly Average: 81.1 %																			Percentiles: P <sub>1</sub> = 53 P <sub>10</sub> = 71 Q <sub>1</sub> = 76 Median = 82 Q <sub>3</sub> = 86 P <sub>90</sub> = 91 P <sub>99</sub> = 99																			Hours of Calibration: 0	
																																						Percent Operational Time: 91.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24															
1-Nov	89	92	91	91	91	92	87	88	86	86	86	88	89	85	83	84	87	89	94	98	99	OR	OR	OR	89.1	99													
2-Nov	OR	99	95	91	93	OR	OR	95	92	91	89	88	85	85	84	85	87	88	88	89	89	91	OR	OR	89.6	99													
3-Nov	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	94	91	90	88	88	86	91	90	90	91	91	94	97	99	--	99													
4-Nov	96	96	96	95	96	95	95	OR	OR	OR	OR	OR	OR	OR	83	82	84	85	87	90	93	OR	OR	OR	--	96													
5-Nov	OR	OR	OR	OR	100	100	OR	OR	OR	OR	OR	OR	OR	OR	95	91	90	89	90	88	87	85	87	88	--	100													
6-Nov	88	91	89	88	87	87	86	84	86	82	77	69	69	68	70	75	75	76	77	81	86	83	81	80.2	91														
7-Nov	84	87	91	87	84	82	77	77	79	77	73	71	71	67	63	65	71	70	68	68	69	69	67	66	74.3	91													
8-Nov	65	68	71	73	72	75	75	75	74	M	M	M	M	M	M	50	53	54	56	61	70	67	69	74	66.7	75													
9-Nov	73	73	75	76	74	72	71	70	70	68	63	61	53	38	36	36	46	50	54	58	66	69	72	76	62.6	76													
10-Nov	79	84	86	86	88	88	88	86	84	82	78	72	67	69	65	65	65	62	63	67	71	71	76	78	75.8	88													
11-Nov	75	76	75	80	85	92	OR	OR	91	89	87	86	85	89	90	89	88	87	87	88	89	90	90	91	86.3	92													
12-Nov	95	OR	OR	OR	OR	OR	99	98	94	89	93	88	80	76	73	73	72	72	72	75	77	79	78	78	82.1	99													
13-Nov	79	80	81	83	85	85	85	84	84	83	81	80	80	81	81	81	83	84	84	84	85	86	87	82.7	87														
14-Nov	86	87	86	87	88	89	89	89	89	87	86	83	82	82	83	84	87	89	90	91	91	91	92	94	87.5	94													
15-Nov	93	92	92	92	93	92	91	90	90	88	91	90	85	86	84	84	85	85	85	85	86	88	89	91	88.7	93													
16-Nov	95	98	99	99	97	93	91	91	92	92	89	88	85	77	73	74	75	76	77	76	76	77	77	77	85.2	99													
17-Nov	76	77	77	86	97	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	91	89	OR	OR	90	89	92	88	--	97													
18-Nov	89	87	86	84	83	83	83	84	85	83	82	78	77	76	76	77	78	83	86	87	87	85	84	85	82.9	89													
19-Nov	86	84	78	80	83	84	86	84	86	87	84	82	81	82	80	79	79	79	82	84	84	81	82	82	82.4	87													
20-Nov	82	80	81	81	80	80	80	81	81	80	77	75	75	76	77	80	80	83	82	80	81	82	83	83	79.9	83													
21-Nov	80	80	81	82	81	82	84	84	84	83	80	79	76	77	80	82	82	81	83	85	85	85	85	82	81.9	85													
22-Nov	83	84	85	86	85	84	85	85	85	85	84	81	80	82	84	84	86	85	81	79	80	77	77	79	82.8	86													
23-Nov	83	86	84	81	80	79	80	80	82	83	82	82	83	83	83	83	83	84	82	82	83	83	82	82	82.3	86													
24-Nov	84	83	83	84	85	85	84	85	85	85	84	84	84	85	86	86	86	86	87	87	88	87	86	86	85.1	88													
25-Nov	85	84	83	83	82	82	82	82	83	83	83	82	82	83	83	83	82	80	81	81	81	80	81	79	82.1	85													
26-Nov	79	81	81	80	81	81	82	83	82	81	79	79	78	76	76	77	77	80	84	83	74	71	73	75	78.9	84													
27-Nov	76	79	82	78	80	76	72	70	71	73	75	75	75	76	65	63	64	64	64	66	64	64	66	73	71.2	82													
28-Nov	74	72	69	73	71	72	74	75	74	77	78	78	76	73	71	71	75	75	75	75	73	73	75	77	74.0	78													
29-Nov	77	77	78	76	75	75	75	75	75	75	74	75	75	76	76	77	77	78	77	77	76	75	75	75	75.8	78													
30-Nov	75	75	75	75	75	75	75	76	76	77	78	78	79	79	80	80	80	80	80	80	80	80	79	79	77.8	80													
																			82.4 83.4 83.4 83.6 84.7 83.9 83.0 82.8 83.0 82.6 81.8 80.1 78.6 77.7 77.4 76.6 78.6 79.0 79.5 80.4 81.4 80.5 80.8 81.7																			Diurnal Average	
																			96 99 99 99 100 100 99 98 94 92 94 91 90 89 95 91 91 90 94 98 99 94 97 99																			Diurnal Maximum	
M - Maintenance																			OR - Out of Range																				





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 20m (RH20) - %**  
**Mannix - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	3	0.46	0.46
40 - 60	9	1.37	1.83
60 - 80	241	36.79	38.63
80 - 100	401	61.22	99.85

Total Number of Valid Hours: 655

Total Number of Hours: 720

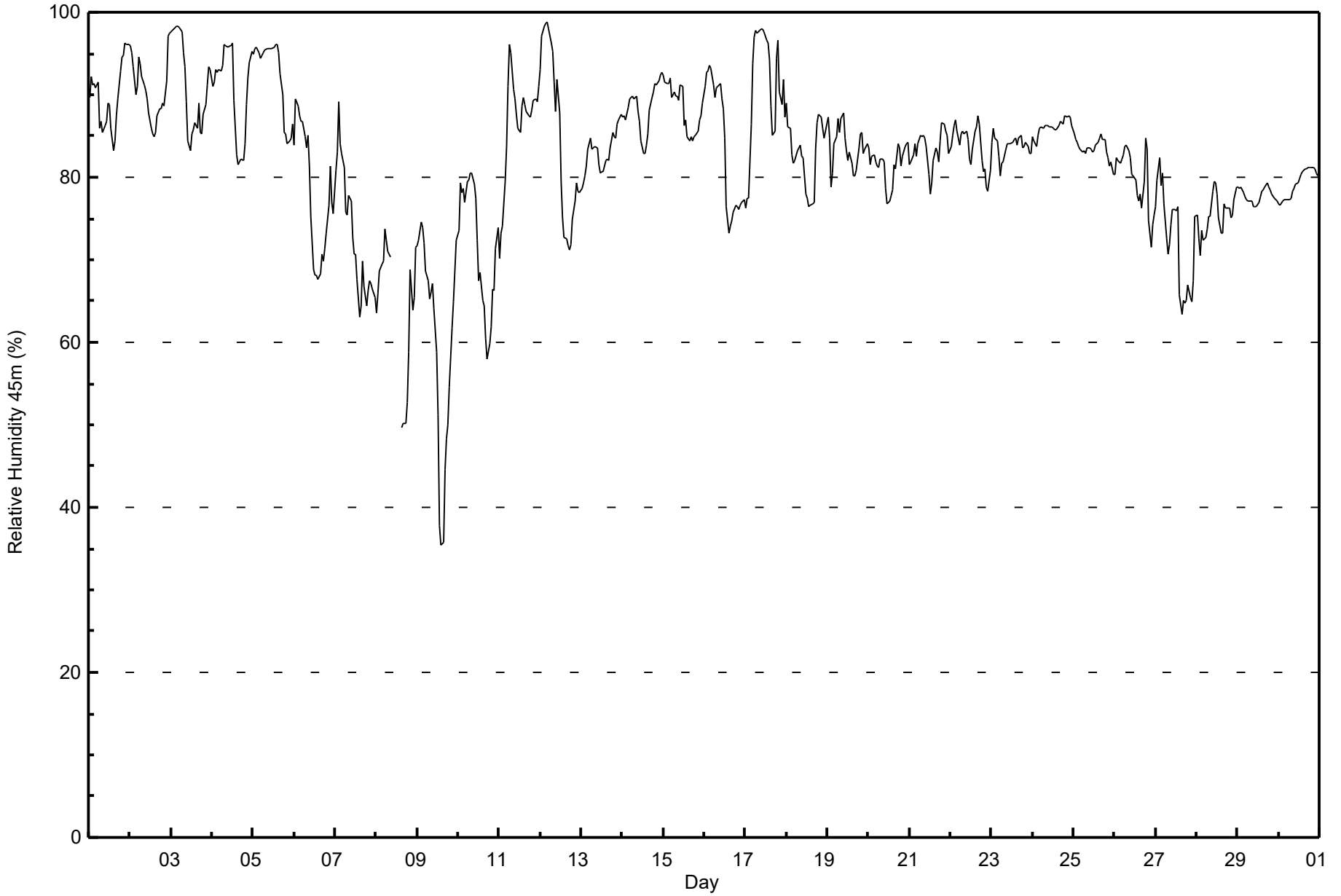


Maximum Value: 99 % on Nov 12 05:00      Maximum Daily Average: 92.5 % on Nov 5																		Hours in Service: 720 Hours of Data: 714 Hours of Missing Data: 6 Hours of Calibration: 0 Percent Operational Time: 99.2								
Minimum Value: 35 % on Nov 9 15:00      Minimum Daily Average: 60.3 % on Nov 9 Maximum Diurnal Average: 85.2 % at hour 6      Minimum Diurnal Average: 77.6 % at hour 16 Monthly Average: 82.2 %      Percentiles: P <sub>1</sub> = 50 P <sub>10</sub> = 71 Q <sub>1</sub> = 77 Median = 84 Q <sub>3</sub> = 88 P <sub>90</sub> = 93 P <sub>99</sub> = 98																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	90	92	91	91	91	92	86	87	85	86	87	89	89	86	83	84	87	90	93	95	95	96	96	96	89.9	96
2-Nov	96	95	93	90	91	94	94	92	91	91	89	88	86	85	85	85	88	88	88	89	89	92	97	98	90.6	98
3-Nov	98	98	98	98	98	98	98	95	93	89	84	83	85	86	87	86	89	85	85	88	89	91	93	93	91.2	98
4-Nov	91	92	93	93	93	93	93	96	96	96	96	96	96	89	83	82	82	82	82	84	89	92	94	95	90.7	96
5-Nov	95	96	96	95	94	95	95	95	96	96	96	96	96	96	96	95	93	90	85	85	84	84	85	86	92.5	96
6-Nov	84	90	89	87	87	87	85	83	85	81	75	69	68	68	68	68	71	70	71	73	77	81	77	76	77.9	90
7-Nov	81	83	89	84	83	81	76	75	78	77	73	71	71	68	63	64	70	67	64	66	67	67	66	65	72.9	89
8-Nov	64	66	69	70	70	74	72	71	70	M	M	M	M	M	M	50	50	50	53	59	69	64	65	71	64.2	74
9-Nov	72	72	75	74	72	69	68	65	66	67	64	59	51	38	35	36	45	48	50	55	62	65	69	72	60.3	75
10-Nov	73	79	78	79	77	79	80	81	80	79	77	72	67	68	65	64	60	58	60	62	66	66	71	74	71.6	81
11-Nov	70	73	74	80	84	91	96	95	91	90	88	86	85	89	90	89	88	88	87	88	89	89	89	91	86.6	96
12-Nov	93	97	98	99	99	98	96	95	92	88	92	88	79	75	73	73	72	71	72	75	77	79	78	78	84.9	99
13-Nov	79	79	80	81	83	85	83	84	84	84	81	81	81	81	82	82	84	85	85	85	86	87	88	88	83.0	88
14-Nov	87	88	87	88	90	90	90	90	90	88	87	84	83	83	84	85	88	90	90	91	91	92	92	93	88.3	93
15-Nov	92	91	91	91	92	90	90	90	90	89	91	91	86	87	85	84	85	84	85	85	86	87	87	89	88.4	92
16-Nov	91	93	93	94	93	91	90	91	91	91	89	88	85	76	73	74	75	76	77	76	76	77	77	77	83.9	94
17-Nov	76	77	77	86	94	97	98	98	98	98	98	98	97	96	94	89	85	86	94	97	90	89	92	87	91.3	98
18-Nov	89	86	86	83	82	82	83	84	84	83	82	78	77	76	77	77	77	84	87	88	87	86	85	86	82.8	89
19-Nov	87	85	79	81	84	85	87	85	87	88	85	83	82	83	82	80	80	81	84	85	85	83	83	84	83.7	88
20-Nov	84	81	83	83	82	81	81	82	82	82	79	77	77	78	78	82	81	84	84	81	83	84	84	84	81.5	84
21-Nov	82	82	83	84	83	84	85	85	85	85	84	80	78	79	82	83	83	82	84	87	87	86	85	83	83.3	87
22-Nov	84	85	86	87	86	84	85	86	85	86	85	82	82	83	86	86	87	87	82	81	81	79	78	81	83.9	87
23-Nov	84	86	85	84	83	80	82	82	83	84	84	84	84	85	85	84	85	85	84	84	84	84	83	83	83.7	86
24-Nov	85	84	84	85	86	86	86	86	86	86	86	86	86	86	86	86	87	87	86	88	87	87	87	86	86.1	88
25-Nov	85	85	84	84	83	83	83	83	84	84	83	83	83	83	84	85	85	85	85	83	82	81	82	80	83.5	85
26-Nov	80	82	82	82	82	83	84	84	83	82	80	80	80	78	77	78	76	79	85	83	75	72	74	75	79.9	85
27-Nov	76	80	82	79	80	77	73	71	72	74	76	76	76	76	66	63	65	65	65	67	65	65	67	75	72.2	82
28-Nov	75	73	71	74	72	73	74	75	75	78	79	79	78	75	73	73	77	76	76	76	75	75	77	79	75.4	79
29-Nov	79	79	79	78	78	77	77	77	77	76	76	76	77	78	78	79	79	79	79	78	78	77	77	77	77.8	79
30-Nov	77	77	77	77	77	77	77	78	78	79	79	79	80	80	81	81	81	81	81	81	81	81	81	80	79.3	81
83.3   84.2   84.4   84.7   84.9   85.2   84.9   84.7   84.6   84.7   83.7   82.2   80.9   79.7   78.6   77.6   78.4   78.7   79.5   80.5   81.0   81.3   82.0   82.8																								Diurnal Average		
98   98   98   99   99   98   98   98   98   98   98   98   97   96   96   95   93   90   94   97   95   96   97   98																								Diurnal Maximum		
M - Maintenance																										



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 45m (RH45) - %**  
**Mannix - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 45m (RH45) - %**  
**Mannix - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	3	0.42	0.42
40 - 60	13	1.82	2.24
60 - 80	220	30.81	33.05
80 - 100	478	66.95	100.00

Total Number of Valid Hours: 714

Total Number of Hours: 720





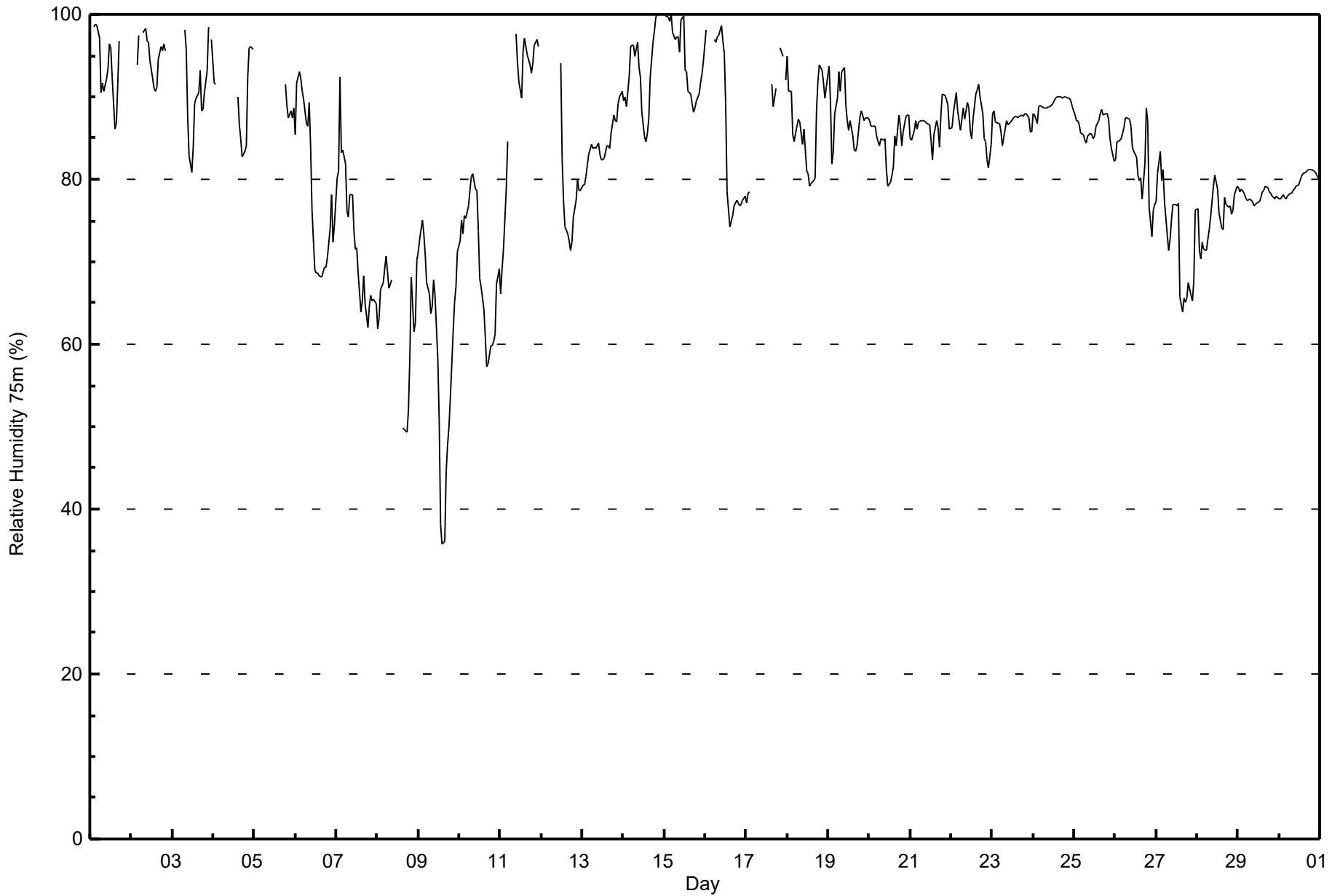
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity 75m (RH75) - %

Mannix - November 2024

Maximum Value: 100 % on Nov 14 21:00																			Maximum Daily Average: 94.5 % on Nov 15																			Hours in Service: 720	
Minimum Value: 36 % on Nov 9 15:00																			Minimum Daily Average: 59.9 % on Nov 9																			Hours of Data: 624	
Maximum Diurnal Average: 86.4 % at hour 10																			Minimum Diurnal Average: 79.4 % at hour 16																			Hours of Missing Data: 96	
Monthly Average: 82.7 %																			Percentiles: P <sub>1</sub> = 50 P <sub>10</sub> = 68 Q <sub>1</sub> = 77 Median = 85 Q <sub>3</sub> = 89 P <sub>90</sub> = 95 P <sub>99</sub> = 100																			Hours of Calibration: 0	
																																						Percent Operational Time: 86.7	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24															
1-Nov	98	OR	98	99	99	97	90	92	91	92	93	97	96	92	86	87	91	97	OR	OR	OR	OR	OR	OR	--	99													
2-Nov	OR	OR	OR	94	97	OR	OR	98	98	97	97	94	92	91	91	91	95	96	96	96	96	OR	OR	OR	--	98													
3-Nov	OR	OR	OR	OR	OR	OR	OR	98	96	88	83	81	84	89	90	90	93	88	88	90	93	98	OR	97	--	98													
4-Nov	92	92	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	90	87	85	83	83	84	92	96	96	96	--	96													
5-Nov	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	91	89	87	88	88	89	--	91													
6-Nov	85	92	93	92	91	90	87	86	89	84	76	69	69	69	68	68	69	69	69	71	74	78	72	74	78.6	93													
7-Nov	80	81	92	83	84	82	76	75	78	78	74	72	72	69	64	65	68	65	62	65	66	65	65	65	72.7	92													
8-Nov	62	63	67	67	69	71	69	67	68	M	M	M	M	M	M	50	50	49	52	58	68	62	63	70	62.5	71													
9-Nov	71	73	75	73	71	67	66	64	65	68	66	58	51	38	36	36	45	48	50	54	62	65	67	71	59.9	75													
10-Nov	73	75	73	76	75	77	79	80	81	79	79	74	68	67	64	61	57	58	60	60	60	61	67	69	69.7	81													
11-Nov	66	69	72	79	85	OR	OR	OR	OR	98	94	92	90	95	97	96	95	94	93	94	96	97	96	OR	89.3	98													
12-Nov	OR	OR	OR	OR	OR	OR	OR	OR	OR	95	OR	94	82	77	74	73	72	71	72	75	77	80	79	79	--	95													
13-Nov	79	79	80	82	83	84	84	84	84	84	83	82	82	83	84	84	84	86	88	87	87	89	90	91	84.3	91													
14-Nov	89	90	89	93	96	96	96	95	97	94	92	88	85	85	86	88	92	97	98	100	100	100	OR	OR	92.9	100													
15-Nov	OR	100	100	99	100	98	97	97	97	95	99	100	93	93	91	90	89	88	89	90	90	92	93	94	94.5	100													
16-Nov	98	OR	OR	OR	OR	97	97	97	97	99	97	95	89	78	74	75	76	77	77	77	77	77	78	78	85.5	99													
17-Nov	77	78	78	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	92	89	91	OR	OR	96	95	OR	92	--	96													
18-Nov	95	91	91	85	85	86	87	87	86	84	86	81	81	79	80	80	80	88	92	94	93	92	90	91	86.8	95													
19-Nov	94	89	82	83	88	90	93	91	93	94	89	87	86	87	85	84	83	84	87	88	88	87	87	87	87.8	94													
20-Nov	87	86	86	86	85	85	84	85	85	85	81	79	80	81	82	85	84	88	86	84	86	88	88	88	84.7	88													
21-Nov	85	85	86	87	86	87	87	87	87	87	87	87	85	82	85	87	86	84	88	90	90	90	89	86	86.6	90													
22-Nov	86	88	89	90	88	86	87	89	87	89	89	86	85	87	90	91	91	90	88	85	85	82	81	84	87.3	91													
23-Nov	88	88	87	87	87	86	84	85	87	87	87	87	88	88	88	87	88	88	88	88	88	87	86	86	87.0	88													
24-Nov	88	88	87	89	89	89	89	89	89	89	89	89	89	90	90	90	90	90	90	90	90	90	89	89	89.1	90													
25-Nov	88	87	87	87	86	85	85	84	85	86	85	85	85	85	87	87	88	88	88	88	88	87	85	84	82	86.1	88												
26-Nov	82	85	85	85	86	86	87	87	87	86	84	83	83	80	80	80	78	82	89	87	77	73	76	77	82.7	89													
27-Nov	77	81	83	80	81	77	73	71	73	75	77	77	77	77	66	64	66	65	66	67	66	65	68	76	72.8	83													
28-Nov	76	71	70	72	72	71	73	74	75	79	80	80	79	76	74	74	78	77	77	77	76	76	78	79	75.6	80													
29-Nov	79	78	79	78	78	77	78	78	77	77	77	77	77	78	78	79	79	79	79	78	78	78	78	78	78.0	79													
30-Nov	78	78	78	78	78	78	78	78	79	79	79	79	80	80	81	81	81	81	81	81	81	81	80	80	79.5	81													
																			82.9 82.8 83.6 84.4 84.8 84.4 83.7 84.8 85.2 86.4 84.9 83.6 81.8 80.7 80.0 79.4 80.1 80.7 81.0 81.7 83.0 82.8 81.1 82.6																			Diurnal Average	
																			98 100 100 99 100 98 97 98 98 99 99 100 96 95 97 96 95 97 98 100 100 100 100 96 97																			Diurnal Maximum	
M - Maintenance			OR - Out of Range																																				





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 75m (RH75) - %**  
**Mannix - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	3	0.48	0.48
40 - 60	15	2.40	2.88
60 - 80	200	32.05	34.94
80 - 100	403	64.58	99.52

Total Number of Valid Hours: 624

Total Number of Hours: 720

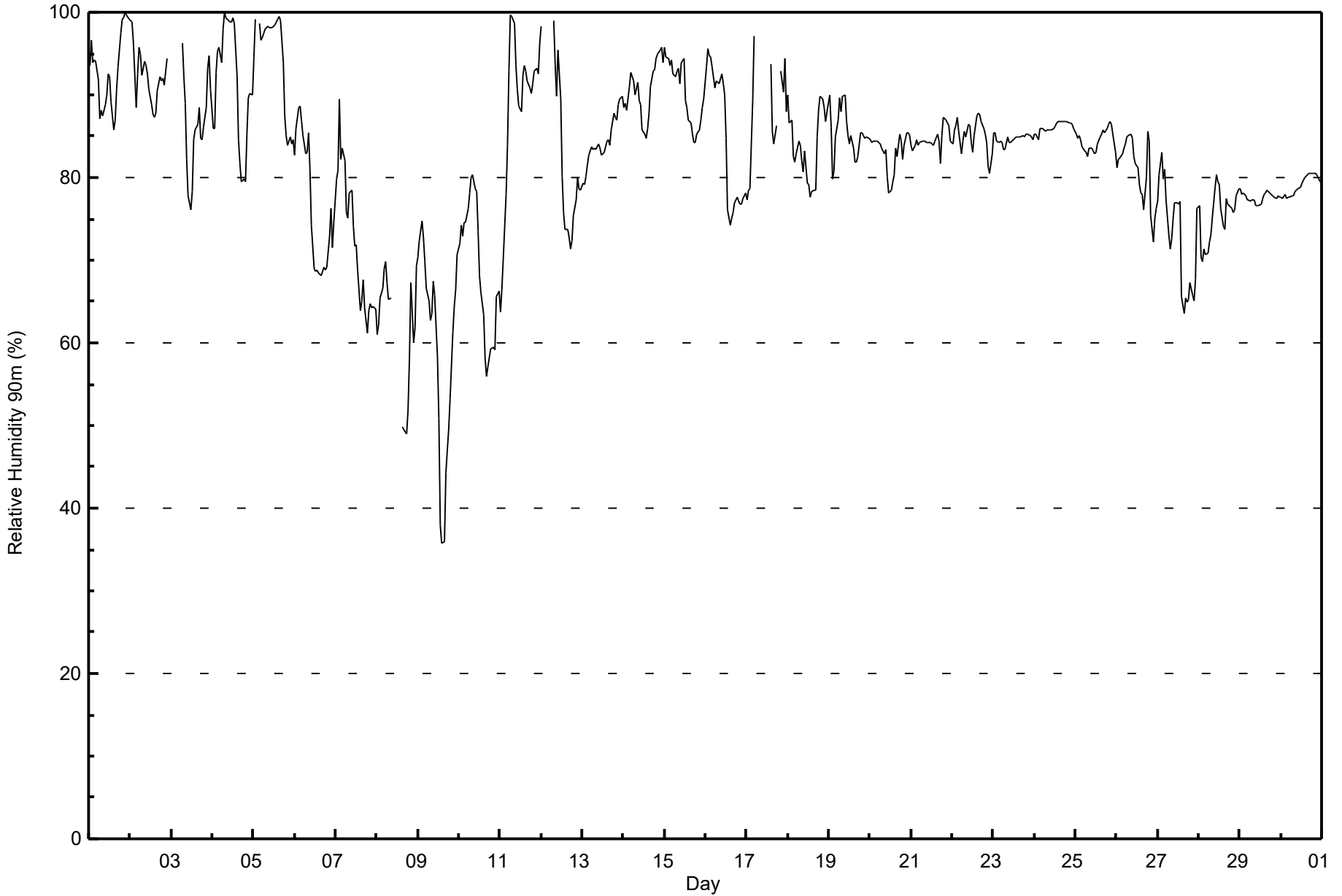


Maximum Value: 100 % on Nov 4 08:00		Maximum Daily Average: 94.4 % on Nov 5		Hours in Service: 720																																														
Minimum Value: 36 % on Nov 9 15:00		Minimum Daily Average: 59.5 % on Nov 9		Hours of Data: 688																																														
Maximum Diurnal Average: 85.0 % at hour 10		Minimum Diurnal Average: 78.5 % at hour 16		Hours of Missing Data: 32																																														
Monthly Average: 82.3 %		Percentiles: P <sub>1</sub> = 50 P <sub>10</sub> = 69 Q <sub>1</sub> = 78 Median = 84 Q <sub>3</sub> = 88 P <sub>90</sub> = 94 P <sub>99</sub> = 99		Hours of Calibration: 0																																														
				Percent Operational Time: 95.6																																														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Nov	94	97	94	94	94	92	87	88	87	89	90	93	92	89	86	87	91	93	97	99	99	100	100	99	93.0	100																								
2-Nov	99	99	96	89	93	96	95	92	94	94	92	91	89	88	87	88	91	92	92	92	91	94	OR	OR	92.4	99																								
3-Nov	OR	OR	OR	OR	OR	OR	96	92	89	82	78	76	78	85	86	86	88	85	85	86	88	93	95	91	86.6	96																								
4-Nov	86	86	93	95	96	94	98	100	99	99	99	99	99	99	92	85	82	80	80	80	85	90	90	90	91.4	100																								
5-Nov	95	99	OR	99	97	97	97	98	98	98	98	98	98	99	99	99	99	94	87	85	84	85	84	84	94.4	99																								
6-Nov	83	86	88	89	87	85	83	83	85	81	74	69	69	69	68	68	69	69	69	69	73	76	72	75	76.6	89																								
7-Nov	80	81	90	82	84	82	76	75	78	79	74	72	72	69	64	65	68	64	61	64	65	64	64	64	72.3	90																								
8-Nov	61	62	65	67	69	70	67	65	65	M	M	M	M	M	M	50	49	49	52	58	67	60	62	69	61.6	70																								
9-Nov	70	72	75	73	70	67	65	63	64	67	66	58	51	38	36	36	44	47	50	53	61	64	66	71	59.5	75																								
10-Nov	72	74	73	75	75	76	78	80	80	79	78	74	68	66	63	58	56	57	59	59	59	59	66	66	68.8	80																								
11-Nov	64	67	70	78	84	93	100	99	99	94	91	89	88	92	94	93	92	91	90	91	93	93	93	96	88.8	100																								
12-Nov	98	OR	OR	OR	OR	OR	OR	99	94	90	95	89	80	76	74	74	73	71	72	76	77	80	79	79	82.0	99																								
13-Nov	79	79	80	81	83	84	83	84	83	84	84	83	83	83	84	85	84	86	88	87	87	89	90	90	84.3	90																								
14-Nov	88	89	88	91	93	92	92	90	92	89	86	85	85	86	88	91	93	93	94	95	95	96	94	94	90.6	96																								
15-Nov	96	95	94	94	94	93	92	93	93	91	94	94	89	88	87	87	85	84	84	85	86	87	89	89	90.2	96																								
16-Nov	93	96	95	95	93	91	92	92	91	93	91	90	85	76	74	75	76	77	78	77	77	77	78	78	84.9	96																								
17-Nov	77	78	79	89	97	OR	OR	OR	OR	OR	OR	OR	OR	OR	94	86	84	86	OR	OR	93	90	94	88	--	97																								
18-Nov	90	87	87	82	82	83	84	84	82	81	83	79	79	78	78	78	78	85	88	90	90	88	87	88	83.8	90																								
19-Nov	90	86	80	81	85	87	90	88	90	90	87	85	84	85	83	82	82	83	85	86	85	85	85	85	85.3	90																								
20-Nov	85	84	84	84	84	84	84	84	83	83	80	78	79	79	80	84	83	85	84	82	84	85	85	85	83.1	85																								
21-Nov	84	83	84	85	84	84	84	84	84	84	84	84	84	84	84	85	84	82	85	87	87	87	86	84	84.6	87																								
22-Nov	84	86	86	87	86	83	84	86	85	86	86	84	83	85	88	88	88	87	86	85	84	81	81	83	85.1	88																								
23-Nov	85	85	84	84	84	84	83	83	85	84	84	84	85	85	85	85	85	85	85	85	85	85	85	85	84.7	85																								
24-Nov	85	85	85	86	86	86	86	86	86	86	86	86	86	87	87	87	87	87	87	87	87	87	86	86	86.1	87																								
25-Nov	85	85	85	85	84	83	83	83	83	84	83	83	83	83	84	85	85	86	86	86	87	87	85	83	84.5	87																								
26-Nov	81	82	82	83	84	84	85	85	85	85	82	82	81	79	78	78	76	80	86	84	75	72	75	76	80.9	86																								
27-Nov	77	80	83	80	81	77	73	71	73	75	77	77	77	77	66	64	65	65	65	67	66	65	68	76	72.7	83																								
28-Nov	77	70	70	71	71	71	72	73	75	79	80	80	79	76	74	74	78	77	76	76	76	76	78	79	75.3	80																								
29-Nov	79	78	78	78	77	77	77	77	77	77	77	77	77	77	78	78	78	78	78	78	78	77	78	78	77.6	79																								
30-Nov	78	77	78	77	78	78	78	78	78	78	79	79	79	80	80	80	80	81	81	81	80	80	80	80	79.0	81																								
																								83.3	83.2	83.2	84.0	84.7	84.2	84.5	84.6	84.8	85.0	84.4	82.8	81.5	80.6	80.0	78.5	79.0	79.2	79.6	80.4	81.5	81.8	81.9	82.4	Diurnal Average		
																								99	99	96	99	97	97	100	100	99	99	99	99	99	99	99	99	99	99	94	97	99	99	100	100	99	Diurnal Maximum	
M - Maintenance																								OR - Out of Range																										



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 90m (RH90) - %**  
**Mannix - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 90m (RH90) - %**  
**Mannix - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	3	0.44	0.44
40 - 60	19	2.76	3.20
60 - 80	214	31.10	34.30
80 - 100	451	65.55	99.85

Total Number of Valid Hours: 688

Total Number of Hours: 720



Maximum Speed: 29 km/h on Nov 12 15:00	Maximum Daily Speed Average: 18.3 km/h on Nov 27	Hours in Service: 720
Minimum Speed Value: 1 km/h on Nov 29 11:00	Minimum Daily Speed Average: 1.9 km/h on Nov 1	Hours of Data: 714
Maximum Diurnal Speed Average: 2.7 km/h at hour 5	Minimum Diurnal Speed Average: 0.1 km/h at hour 16	Hours of Missing Data: 6
Monthly Average Velocity: 1.0 km/h 255.6 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 4 Q <sub>1</sub> = 7 Median = 10 Q <sub>3</sub> = 14 P <sub>90</sub> = 18 P <sub>99</sub> = 24	Percent Operational Time: 99.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	W8	W6	WSW5	S2	SSW4	WSW5	SW3	S4	SSW5	SSW5	SSW5	SSW6	WSW6	W6	W7	NW4	NNE6	NNE3	NNE4	NNE6	NNE5	NNE6	N4	N3	W1.9	W8
2-Nov	NNE5	NNE6	NNE6	NNE5	SW3	WSW2	SSE4	ESE4	ENE1	E3	SE7	SE6	ESE8	SE11	SE15	SE12	E13	E12	SE8	SE11	SSE9	SE11	SE10	SSE8	ESE5.6	SE15
3-Nov	S5	SSE6	SSE6	SSW6	SW8	WSW8	SW8	SW10	SW7	SSW8	SW9	SSW7	S7	S10	SSE10	SSE11	SSE8	SSW6	S7	S10	SSW7	SW8	WSW8	SW9	SSW6.9	SSE11
4-Nov	SW11	SW9	SW6	SSW6	SW6	SSW5	WSW4	WSW9	SW8	SSE6	SSE9	SE7	SE7	SE9	SE8	SE10	SSE8	SSE7	S7	SSW6	SSE11	SSE6	SE4	SE4	S5.7	SW11
5-Nov	SSW5	WNW4	N5	NNW7	NNW7	NNW6	NW5	NW4	NNW6	W5	WSW4	W6	W7	W7	W8	W6	W3	S4	S6	SW4	WSW8	SW10	SSW9	SSW10	W4.2	WSW10
6-Nov	SSE10	SSE14	SSE20	SSE16	SSE18	SSE21	SSE17	SSE16	SSE15	S13	SSW13	SW20	SW18	SW12	SW11	S7	SSE10	SSE11	SSE12	SSE12	SSE13	SSE12	SSE12	SE5	S12.4	SSE21
7-Nov	NNW4	WNW12	NW15	WNW17	W18	W22	WNW23	W21	W11	WSW5	W18	W19	W11	WNW10	WNW5	E6	SE5	SSE9	SSE11	SE11	SSE13	SSE11	SE15	SE17	WSW6.0	WNW23
8-Nov	SE14	SSE11	SSE13	SSE12	SSE19	SE12	SE12	SSE14	SSE13	M	M	M	M	M	M	SSW9	S9	SSW10	WSW7	W10	NW12	WNW11	W10	W11	S6.6	SSE19
9-Nov	W11	W17	W13	W12	W13	W14	WSW11	WSW12	SW6	SSE5	SE3	ESE4	SE1	W11	W11	WSW4	SSW8	SSW9	S10	SSE10	S11	S10	SSE12	SSE13	SW6.7	W17
10-Nov	SSE11	SSE12	SSE10	SSE9	SSE11	SSE10	SSE7	S8	SSW7	SSW8	SSW4	SW5	S3	SE8	SSE11	SSE10	SSE8	SSW9	SSE7	SSE9	SE9	SSE10	SSE10	SE10	SSE8.1	SSE12
11-Nov	SE11	SE11	SE14	SSE11	SSW7	SSE11	SE15	SE18	SE17	SE19	ESE16	SE13	SE17	SE17	ESE14	SE15	ESE13	SE15	SE14	SE13	SE15	SE12	SE9	SE10	SE13.2	SE19
12-Nov	SE7	SE7	SSE8	S7	SSW10	SW11	SW10	SSW7	WSW14	WSW21	W24	W23	W24	WSW24	W29	W26	WSW26	WSW23	W17	W14	W14	WSW12	WSW16	W12	WSW14.2	W29
13-Nov	WSW9	SW8	WSW6	WSW7	WSW7	SSW5	SSW6	SW6	WSW9	WSW7	NW7	N7	NNE9	NE9	NE9	NNE10	NNE9	NNE12	NE10	NE9	NNE11	NNE11	NNE10	N12	N3.2	N12
14-Nov	NNE15	NNE13	NNE17	NNE17	NNE16	NNE16	NNE15	NNE13	N12	NNE12	NNE11	NNE12	N12	NNE10	NNE11	N9	NNW8	N10	N10	N6	NNW5	N6	NNE7	NNW4	N11.0	NNE17
15-Nov	WNW5	ENE1	NW2	E1	WSW6	WSW4	WSW4	ENE1	SSE4	S6	SSW6	SSE4	SE7	SSE8	SSE9	SSE9	SSE7	SSE9	SSE11	SSE12	SSE13	SSE11	SSE8	SE8	S5.1	SSE13
16-Nov	SSE9	SSE12	SSE13	SSE13	SSE14	SSE18	SSE15	S17	SSE18	SE15	SSE14	SSE16	SSE17	SSE23	SSE22	SSE21	SSE20	SSE19	SSE19	SSE18	SSE19	SSE19	SSE18	SSE13	SSE16.6	SSE23
17-Nov	SE14	SE14	SE14	SE16	SE13	SE14	SE15	SE16	SE12	SE14	SSE15	SSE16	SSE15	SSE14	SSE12	SSE11	SSE10	SSW10	NW11	NNW18	WNW22	WNW23	WNW18	WNW19	S6.4	WNW23
18-Nov	W10	W13	W18	WNW16	W10	WNW15	WNW13	W11	W9	W10	W10	WNW11	WNW7	WNW4	NW5	NW4	NNW5	NE3	SW1	ENE1	ESE6	NE7	NNE6	N5	WNW6.4	W18
19-Nov	NNE4	NNE6	NE6	NNE7	NNE10	NNE7	N8	NNE13	NNE11	N13	NNE15	NNE17	NNE16	NNE17	NNE18	N16	N14	NNE18	N17	N17	N16	N12	N13	N17	NNE12.6	NNE18
20-Nov	N17	N16	N16	NNW14	N14	NNE16	NNE17	N14	NNE19	NNE17	NNE20	NNE18	NNE14	NNW12	N14	N11	NNE14	NNE14	NNE20	NNE23	NNE21	N11	NNW11	NNW13	N15.4	NNE23
21-Nov	N16	N16	N14	N11	NNW10	NNW9	NNW6	NNW7	NW9	NW11	NW15	NW13	NW12	NW10	NW8	NW9	NW9	WNW11	WNW9	W8	WNW6	NW5	N6	NNE8	NNW8.7	N16
22-Nov	WNW4	WSW4	W3	W3	WSW9	W8	WNW2	SW3	WSW5	W5	WNW6	NW8	NNW6	NNW6	N9	NNE11	NNE9	NNE7	NNE9	N10	N8	N8	N10	NNW9	NNW4.5	NNE11
23-Nov	N9	NNE11	NNE14	NNE13	N13	NNE15	NNE17	NNE15	N12	N10	NNE11	NNE9	N10	N11	N11	N12	NNW11	N15	NNE16	N15	N13	N15	N18	N17	N12.9	N18
24-Nov	N12	N13	N13	N12	N11	N12	NNE12	N11	NNE10	N7	NNW4	NW6	NW7	NW6	NW6	NW5	NNW5	NNW5	N4	W3	SW7	SSW5	SSE8	SSW5	NNW5.7	N13
25-Nov	SSE8	SSE8	SSE10	SSE10	SSE9	SSE12	SSE13	SSE12	SSE12	SSE12	SSE10	SSE10	SSE11	SSE9	SSE11	SSE10	SE11	SE17	SE18	SE19	SE18	SE16	SE17	SE19	SSE12.5	SE19
26-Nov	SE17	SSE14	SSE15	SE16	SE15	SE16	SE13	SE15	SE14	SE12	SE11	SSE10	SSE8	SSE8	SSE9	S6	S7	WSW7	W17	W21	W22	WNW19	W19	W20	S6.5	W22
27-Nov	W18	W19	W22	W23	WNW23	W24	W23	WNW22	W24	W24	W23	WNW22	WNW22	NW21	NW22	NW22	NW19	NW18	NW17	NW13	NNW15	NNW16	NNW13	N13	WNW18.3	W24
28-Nov	N9	NNW12	NW14	NW14	NW14	NW12	WNW10	WNW5	NW6	NNW6	W5	W4	NW6	NW7	NW7	N4	N4	N6	NNE9	NNE12	NNE10	NNE9	N7	N8	NNW7.2	NW14
29-Nov	NNW5	W7	WNW5	WNW7	WNW5	W4	W5	WNW3	NW2	NNE1	NNW1	WNW4	NNW5	NW7	NW7	NW7	NNW7	N10	N9	N10	N8	N5	N4	WNW4	NW4.5	N10
30-Nov	N4	NW3	N4	WNW3	WNW4	NW2	NNW3	NW4	N4	N3	WNW3	NW5	NW5	NW7	NW7	NW7	NNW6	NNW5	NW7	NNW7	NNW7	NW8	NNW8	NW8	NNW4.9	NW8

W0.6	WSW1.3	W0.8	W1.0	WSW2.7	WSW2.3	WSW1.6	SW2.0	SW1.6	SW1.6	WSW2.1	W2.3	W1.6	W1.3	WNW1.1	N0.1	ESE0.4	ESE0.3	N0.6	N1.0	WNW0.8	W0.9	W0.5	NW0.8	Diurnal Average
W18	W19	W22	W23	WNW23	W24	W23	WNW22	W24	W24	W24	W23	W24	WSW24	W29	W26	WSW26	WSW23	NNE20	NNE23	WNW22	WNW23	W19	W20	Diurnal Maximum

M - Maintenance  
 All monthly, daily, and diurnal averages have been calculated using vector methods



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 7 km/h on Nov 16 14:00	Hours of Data: 714
Minimum Value: 1 km/h on Nov 30 02:00	Hours of Missing Data: 6
	Hours of Calibration: 0
	Percent Operational Time: 99.2
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 2 Median = 2 Q <sub>3</sub> = 4 P <sub>90</sub> = 5 P <sub>99</sub> = 6	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	2	1	1	1	1	1	1	1	2	1	2	2	2	2	2	2	1	1	1	2	2	1	1	1	2
2-Nov	1	2	2	2	1	1	2	2	1	2	3	3	3	3	4	3	3	3	3	3	2	3	3	2	4
3-Nov	1	1	2	2	2	1	1	2	1	2	2	2	2	3	3	2	2	1	2	3	2	1	1	2	3
4-Nov	1	1	1	1	1	1	2	3	3	3	3	2	2	3	2	3	2	1	1	2	2	2	2	2	3
5-Nov	2	1	1	2	3	2	3	2	2	3	2	2	2	2	2	3	1	1	1	1	2	2	2	2	3
6-Nov	2	3	4	3	4	4	4	4	4	4	4	6	4	4	4	3	1	2	2	2	2	2	2	4	6
7-Nov	2	4	4	3	3	5	5	4	3	4	4	5	3	3	2	2	2	2	2	2	2	2	4	4	5
8-Nov	3	2	3	3	3	3	3	3	3	M	M	M	M	M	M	3	2	3	2	2	3	2	2	2	3
9-Nov	3	3	2	2	2	2	3	2	3	2	1	1	3	3	3	1	1	1	2	2	2	2	2	1	3
10-Nov	2	2	1	1	1	2	2	1	3	2	2	2	2	2	2	2	2	3	2	2	2	1	2	2	3
11-Nov	3	2	4	3	4	2	4	5	5	5	5	5	6	6	5	5	4	4	4	4	4	3	3	3	6
12-Nov	2	2	2	2	3	3	2	2	4	5	6	5	6	6	6	5	6	4	4	3	2	3	3	3	6
13-Nov	2	2	2	2	1	2	2	3	1	2	2	2	3	2	3	3	2	3	3	2	3	2	2	3	3
14-Nov	3	3	3	4	4	3	3	3	4	3	3	3	3	3	2	2	3	3	2	2	1	1	1	2	4
15-Nov	3	1	1	1	2	2	2	2	2	2	3	2	2	3	2	2	2	2	3	2	2	2	2	1	3
16-Nov	2	2	2	2	3	4	3	4	4	4	4	4	4	7	5	5	5	5	4	4	4	4	4	3	7
17-Nov	4	4	4	4	4	4	4	4	3	4	3	3	3	3	3	2	1	2	4	6	6	6	5	6	6
18-Nov	3	4	3	3	3	4	4	2	2	2	2	3	3	1	1	1	1	1	1	2	2	2	2	1	4
19-Nov	2	1	3	3	3	3	3	4	4	3	4	5	4	5	6	5	4	5	5	6	6	3	5	6	6
20-Nov	5	5	5	4	5	6	5	6	5	5	6	5	4	4	4	3	4	6	5	5	6	4	3	4	6
21-Nov	5	5	4	4	4	3	3	2	3	4	3	3	3	3	2	2	3	2	2	2	2	2	2	2	5
22-Nov	1	1	1	1	2	2	1	1	2	1	2	2	2	2	3	4	4	3	2	2	3	3	3	3	4
23-Nov	3	3	3	4	3	4	4	4	4	3	3	3	2	3	3	3	3	4	4	4	3	4	5	4	5
24-Nov	3	4	4	3	3	3	3	3	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	1	4
25-Nov	2	2	2	2	2	3	3	3	3	3	2	2	3	2	2	2	2	5	4	4	4	4	4	4	5
26-Nov	4	3	3	4	4	4	3	4	4	3	3	2	2	2	2	2	2	3	4	4	4	4	5	3	5
27-Nov	3	3	4	5	5	5	4	5	5	4	5	5	6	5	6	6	5	5	5	4	4	5	4	4	6
28-Nov	3	3	4	3	3	3	2	4	2	2	2	2	2	3	2	1	1	2	4	2	2	2	2	2	4
29-Nov	2	1	2	2	1	2	2	1	1	1	1	1	2	2	2	2	1	2	2	2	2	2	2	1	2
30-Nov	1	1	1	1	2	1	1	1	1	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2

5	5	5	5	5	6	5	6	5	5	5	6	6	6	7	6	6	6	6	5	6	6	6	5	6	
Diurnal Maximum																									

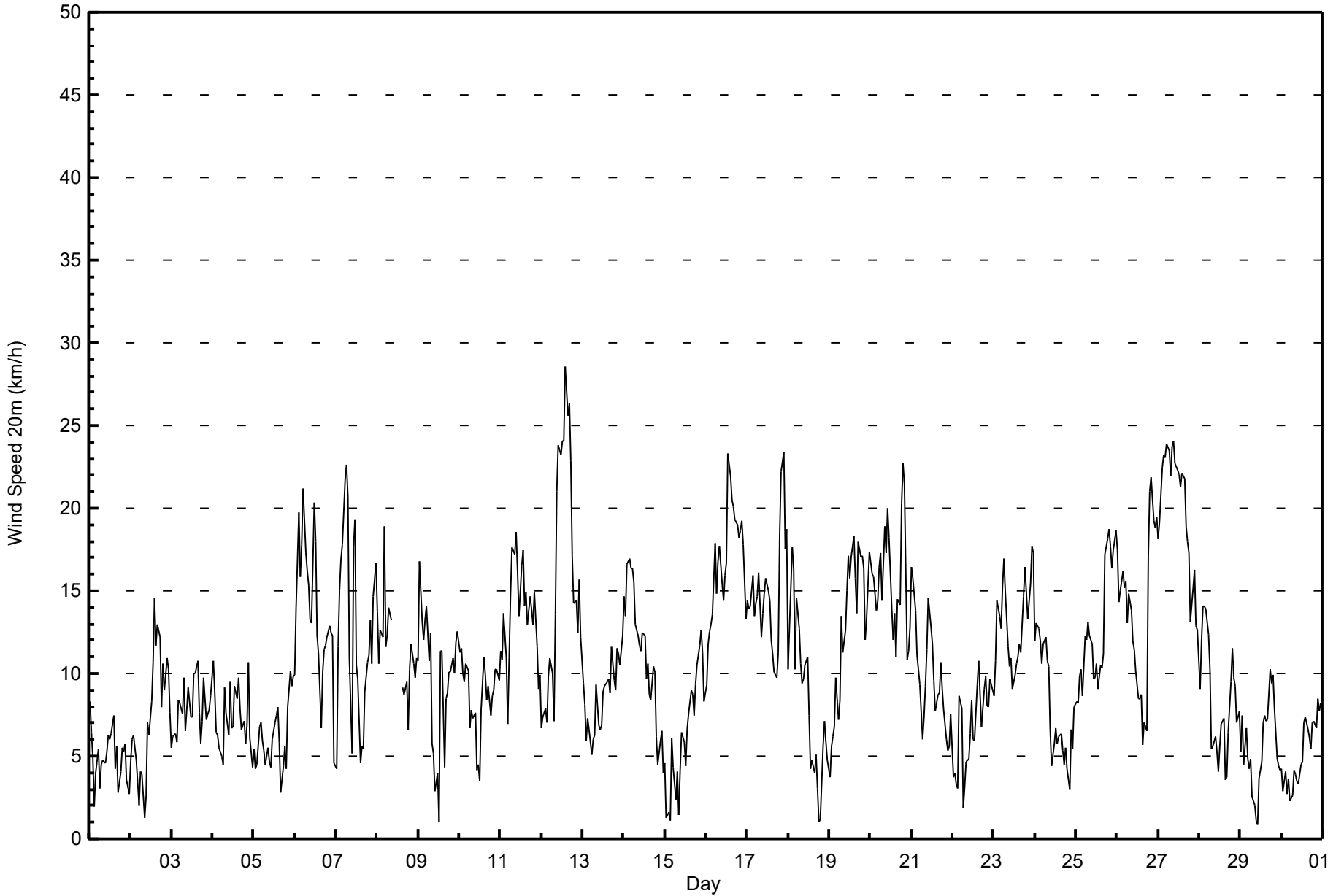
M - Maintenance





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 20m (WS20) - km/h**  
**Mannix - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 20m (WS20) - km/h**  
**Mannix - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	121	16.95	16.95
6 - 11	322	45.10	62.04
12 - 19	229	32.07	94.12
20 - 28	41	5.74	99.86
29 - 38	1	0.14	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 714

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Wind Speed 20m (WS20) - km/h**  
**Mannix - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	13	7	1	4	2	2	5	4	5	10	6	11	10	15	14	12	121
6 - 11	32	33	6	0	1	2	25	65	16	23	19	17	26	11	27	19	322
12 - 19	34	35	0	0	2	3	47	51	2	1	2	4	18	8	12	10	229
20 - 28	0	4	0	0	0	0	0	6	0	0	1	4	15	8	3	0	41
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	79	79	7	4	5	7	77	126	23	34	28	36	70	42	56	41	714

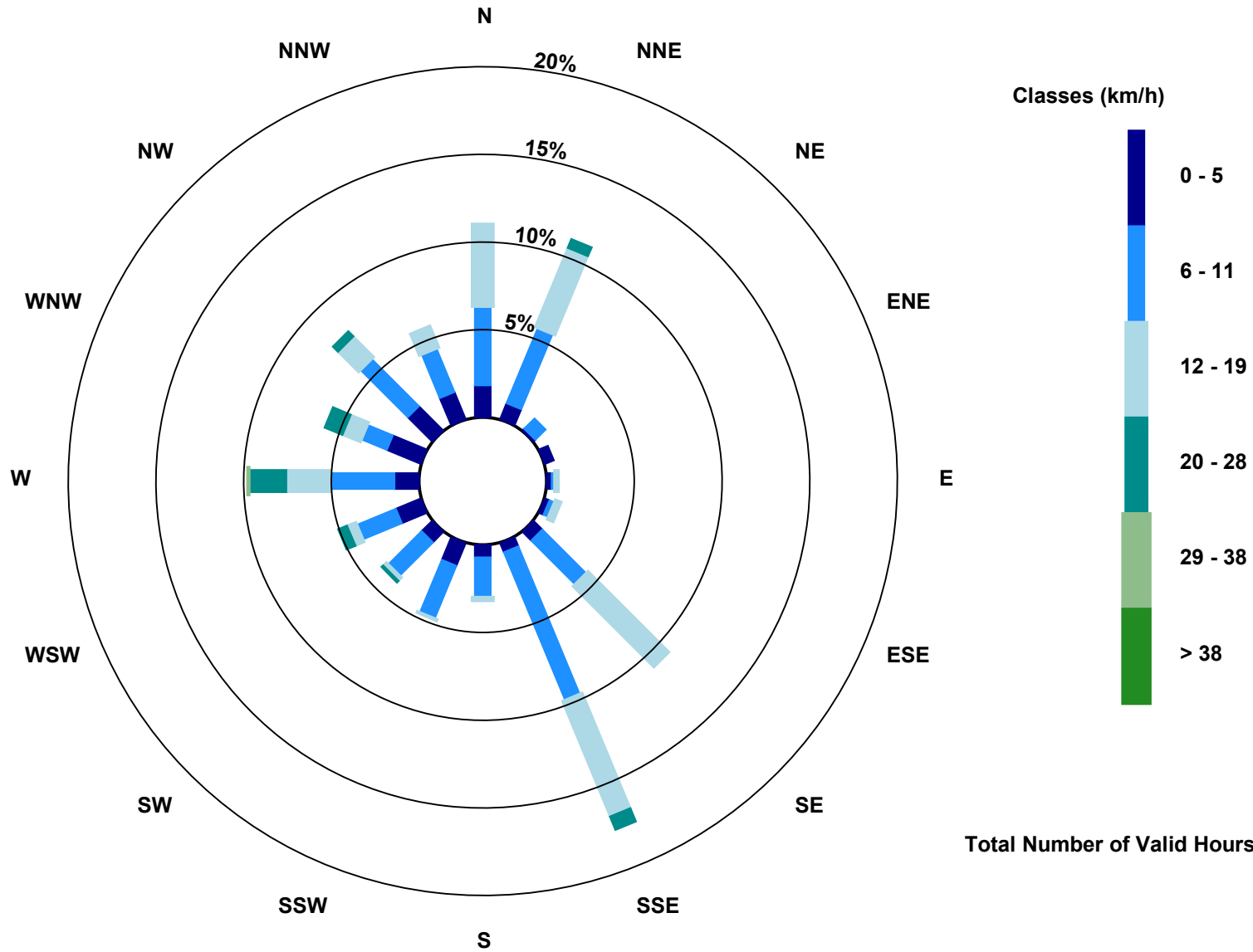
Total Number of Valid Hours: 714

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 20m (WS20) - km/h  
Mannix





Maximum Speed: 33 km/h on Nov 12 15:00	Maximum Daily Speed Average: 23.2 km/h on Nov 16	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 24 21:00	Minimum Daily Speed Average: 2.4 km/h on Nov 1	Hours of Data: 688
Maximum Diurnal Speed Average: 3.7 km/h at hour 5	Minimum Diurnal Speed Average: 0.3 km/h at hour 18	Hours of Missing Data: 32
Monthly Average Velocity: 1.1 km/h 242.7 deg	Percentiles: P <sub>1</sub> = 2 P <sub>10</sub> = 6 Q <sub>1</sub> = 9 Median = 14 Q <sub>3</sub> = 19 P <sub>90</sub> = 24 P <sub>99</sub> = 30	Percent Operational Time: 95.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	W9	W7	WSW6	SSW2	SSW5	SW7	WSW4	S5	SSW6	SSW6	SSW7	SSW8	SW7	WSW7	W9	NW5	NNE6	NNE3	NNE5	NNE7	NNE6	NNE6	NNE4	N3	W2.4	W9	
2-Nov	N6	NNE7	NNE7	NE6	SSW3	SW2	SSE5	ESE5	E2	E4	SE9	ESE8	E10	SE13	SE18	SE15	E15	E14	ESE10	SE14	SE12	SE15	SE15	SE11	ESE7.6	SE18	
3-Nov	SSE9	SSE10	SSE10	S10	SW12	WSW11	SW11	SW14	SW11	SSW13	SW14	SSW13	S12	SSE14	SSE13	SSE15	S12	SW10	S12	S16	SSW14	SW11	WSW10	SW12	SSW10.5	S16	
4-Nov	SW17	SW15	SW11	SW11	WSW9	SW8	WSW8	WSW12	SW11	SSE7	SSE11	SE7	SE8	SE11	SE10	SE13	SE13	SE11	SSE13	S11	SSE11	SSE15	SSE12	SE9	S8.2	SW17	
5-Nov	S9	WSW3	N6	NNW10	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	NNW10	
6-Nov	UO	SSE21	SSE27	SSE22	SSE24	SSE28	SSE25	SSE23	SSE22	S22	S21	SW28	SW24	SW17	SW15	SSW10	SSE15	S16	SSE19	SSE20	SSE21	SSE21	S19	SSE6	S18.4	SSE28	
7-Nov	NNW9	NNW19	NW23	WNW25	W23	W28	WNW31	W28	W16	WSW8	W21	W24	W14	W11	W6	E6	ESE8	SSE14	SSE18	SE18	SSE20	SE16	SE21	SE23	WSW7.9	WNW31	
8-Nov	SE20	SE17	SSE18	SSE21	SSE27	SE20	SE20	SSE22	SSE22	M	M	M	M	M	M	M	SSW15	SSW17	SSW18	WSW13	WNW15	NW18	WNW16	WNW14	W17	S10.3	SSE27
9-Nov	W16	W21	W18	W17	W18	W20	W18	WSW18	WSW11	S5	SSE3	ESE3	SW2	W13	W13	WSW6	SSW13	SSW16	S17	S17	SSW18	S14	SSE18	S17	SW10.6	W21	
10-Nov	S14	SSE18	S14	S12	SSW12	S11	S7	SSW9	SW13	SW12	SSW6	SW5	S4	SSE9	SSE13	SSE13	SSE12	SW14	SSE10	SSE15	SSE16	SSE18	SSE16	SE15	S10.9	SSE18	
11-Nov	SE16	SE16	SE20	SE16	SSW12	SSE16	SE17	SE20	SE21	SE23	ESE18	ESE15	SE20	SE19	ESE15	SE17	ESE14	SE17	SE17	SE17	SE19	SE15	SE12	SE13	SE16.6	SE23	
12-Nov	SE9	SE11	SSE12	S12	SSW16	SW16	WSW15	SW13	WSW19	WSW28	W29	W27	W28	WSW29	W33	W29	WSW32	WSW30	W21	W18	W19	WSW16	WSW20	W15	WSW18.1	W33	
13-Nov	WSW11	WSW10	W9	WSW10	WSW11	WSW6	SW7	WSW9	WSW12	WSW8	NW8	NNE8	NNE10	NNE11	NE11	NNE12	NNE11	NNE15	NNE13	NE11	NNE15	NNE14	NNE13	NNE16	N4.9	NNE16	
14-Nov	NNE18	NNE17	NNE21	NNE22	NNE21	NNE21	NNE20	NNE17	N16	NNE14	NNE14	NNE15	NNE15	NNE11	NNE12	N11	N12	N14	N13	N8	NNW6	N8	NE9	N5	NNE13.9	NNE22	
15-Nov	NW7	NE2	NNE2	ENE2	WSW6	WSW7	SSW2	SW3	E3	SE6	S10	SSW8	SSE5	SE8	SSE9	SSE11	SSE13	SSE12	SSE14	SSE15	SSE18	SSE19	SSE18	SE15	SSE7.3	SSE19	
16-Nov	SSE16	SSE19	SSE20	SSE22	SSE22	SSE26	SSE23	S26	SSE25	SE22	SE20	SSE21	SSE23	SSE30	SSE29	SSE26	SE27	SSE25	SSE25	SSE24	SSE25	SSE26	SSE24	SE18	SSE23.2	SSE30	
17-Nov	SE19	SE19	SE18	SE20	SE19	SE19	SE20	SE21	SE16	SE18	SSE19	SSE20	SSE19	SSE19	SSE17	SSE17	S16	SSW16	NW15	UO	UO	WNW30	WNW24	WNW26	SSE11.1	WNW30	
18-Nov	WNW15	UO	W23	WNW22	W14	WNW19	WNW17	W14	W13	W14	W13	WNW14	WNW10	WNW5	NW6	NW6	NNW7	NE4	SE1	E1	ESE7	NE8	NNE7	NNE6	WNW8.1	W23	
19-Nov	NNE4	NE6	NE7	NNE8	NNE12	NNE9	N11	NNE17	NNE14	N16	NNE19	NNE22	NNE20	NNE21	NNE24	N21	N18	NNE23	N22	N23	N22	N16	N18	N23	NNE16.0	NNE24	
20-Nov	N22	N21	N21	NNW19	N19	N21	NNE23	N19	NNE26	NNE23	NNE26	NNE23	NNE18	N16	N18	N14	NNE19	NNE19	NNE27	NNE30	NNE28	N15	NNW16	NNW17	N20.4	NNE30	
21-Nov	N22	N21	N18	N14	NNW15	NNW13	NNW8	NNW10	NW13	NW15	NW18	NW16	NW14	NW12	NW9	NW11	NW12	WNW14	WNW11	WNW9	WNW7	NW7	N8	NNE9	NNW11.3	N22	
22-Nov	NW5	W5	W6	W6	WSW12	W12	WNW5	WSW5	W9	WNW8	WNW9	NW10	NNW7	NNW7	N11	NNE14	NNE11	NNE8	NNE10	N12	N11	N10	N12	NNW12	NNW6.4	NNE14	
23-Nov	N11	NNE14	NNE18	NNE17	N16	NNE20	NNE22	NNE19	N14	N13	NNE13	NNE12	N12	N14	N15	N16	N15	N20	NNE22	N20	N18	N22	N24	N24	N16.9	N24	
24-Nov	N17	N18	N18	N17	N14	N16	NNE16	N14	NNE13	N9	NNW6	NW7	NW8	NW7	NW7	NW8	NNW7	N8	NNE5	W0	SSW6	SSW7	SSE12	N7.8	N18		
25-Nov	SE12	SSE13	SSE16	SSE16	SSE16	SSE21	SSE17	SSE17	SSE15	SSE13	SSE11	SE11	SE12	SSE10	UO	UO	SE17	SE24	SE26	SE26	SE25	SE23	SE24	SE25	SSE17.6	SE26	
26-Nov	SE24	SE19	SE20	SE21	SE19	SE20	SE17	SE20	SE18	SE15	SE13	SE12	SSE11	SSE11	SSE11	SSE9	S13	WSW10	W20	W25	W26	WNW24	W22	W24	S8.4	W26	
27-Nov	W21	W22	W26	W28	WNW30	W29	W28	WNW28	WNW29	W29	W28	W28	WNW28	WNW29	NW27	NW29	NW29	NW25	NW24	NW24	NNW18	NNW20	NNW22	NNW18	N17	WNW23.1	WNW30
28-Nov	N13	NNW18	NW20	NW21	NW20	NW19	WNW17	WNW10	NW9	N9	WNW6	WNW5	NW7	NW9	NNW9	N5	NNE5	N9	NNE14	NNE15	NNE13	NNE13	NNE10	N11	NNW10.4	NW21	
29-Nov	N7	WNW7	NW5	NW4	N3	NNW3	WNW8	NW4	NW4	NE2	NW2	NNW4	N6	NW7	NW9	NW9	NNW9	N16	N15	N16	NNE13	NNE9	NNE4	NNW2	NNW6.2	N16	
30-Nov	N6	NNW4	NNE5	N2	N2	NNW3	N4	NNW5	N8	NNE5	NNW3	NW5	NW5	NW8	NNW9	NW8	NNW8	NNW8	NNW9	NNW9	NNW9	NNW11	NNW10	NNW11	NNW6.4	NNW11	

NNW0.7	SSW0.8	WSW1.0	WSW2.0	WSW3.7	WSW3.3	WSW2.5	SW2.8	SW2.5	SSW1.9	WSW2.6	W2.5	W1.7	WSW1.4	NW1.4	NNE0.5	SE1.0	S0.3	NNE0.8	E0.9	E0.9	WNW0.3	E0.3	N0.9	Diurnal Average
SE24	W22	SSE27	W28	WNW30	W29	WNW31	W28	W29	W28	W29	SW28	WNW29	SSE30	W33	W29	WSW32	WSW30	NNE27	NNE30	NNE28	WNW30	SE24	WNW26	Diurnal Maximum

M - Maintenance UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 45m (WS45) - km/h**  
**Mannix - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 7 km/h on Nov 19 21:00	Hours of Data: 688
Minimum Value: 1 km/h on Nov 3 01:00	Hours of Missing Data: 32
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 2 Median = 3 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 6	Hours of Calibration: 0
	Percent Operational Time: 95.6

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	2	1	1	1	1	1	3	1	2	1	1	1	2	1	1	2	1	1	1	2	2	1	1	1	3
2-Nov	1	1	2	2	2	1	3	3	2	2	3	3	3	3	4	4	3	3	3	3	3	3	3	2	4
3-Nov	1	1	1	2	2	1	2	1	1	2	2	2	2	2	2	2	1	1	3	1	2	1	1	2	3
4-Nov	1	2	1	1	2	2	2	3	3	3	2	2	2	3	3	3	1	1	2	1	1	1	2	2	3
5-Nov	2	1	2	2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2
6-Nov	UO	3	3	3	3	3	4	3	4	4	3	5	4	4	4	3	1	2	2	1	1	2	4	4	5
7-Nov	3	6	4	3	3	4	5	3	3	4	3	4	3	3	2	2	3	2	2	2	2	2	3	4	6
8-Nov	3	2	3	3	3	2	3	3	2	M	M	M	M	M	M	3	2	3	2	3	3	2	2	2	3
9-Nov	3	3	2	2	2	2	4	2	6	2	2	1	4	3	3	2	2	2	2	1	1	2	2	2	6
10-Nov	3	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	3	3	3	1	1	1	2	3	3
11-Nov	4	4	4	4	5	2	4	5	6	5	5	5	5	6	4	5	4	5	4	3	4	3	3	3	6
12-Nov	2	2	2	2	2	2	2	2	4	5	5	5	6	6	6	4	5	4	3	3	2	2	3	5	6
13-Nov	2	2	2	2	2	2	2	4	1	2	2	2	3	2	3	2	2	3	3	2	3	3	2	3	4
14-Nov	2	3	3	3	4	3	3	2	3	3	2	2	2	2	2	2	3	2	2	2	1	1	2	1	4
15-Nov	3	1	1	1	3	3	2	1	3	3	3	2	2	3	2	2	2	2	3	2	2	2	2	1	3
16-Nov	1	1	1	2	3	3	3	3	4	4	4	3	4	7	5	5	5	5	4	4	4	4	4	4	7
17-Nov	3	4	3	4	3	3	4	4	3	3	3	3	2	2	2	2	1	2	3	UO	UO	4	5	6	6
18-Nov	3	UO	3	3	3	4	4	3	2	2	3	3	1	1	1	1	1	1	2	3	2	2	1	4	4
19-Nov	2	2	3	3	3	2	3	4	4	2	3	4	4	5	6	6	4	5	5	6	7	3	5	7	7
20-Nov	6	5	5	4	5	6	6	7	6	5	5	6	4	4	4	3	4	7	4	5	6	5	4	4	7
21-Nov	5	5	4	3	3	3	3	2	3	3	2	2	3	2	2	2	3	1	2	1	2	1	2	2	5
22-Nov	2	1	1	2	2	3	2	1	2	2	1	2	1	2	3	4	5	3	2	2	3	3	4	4	5
23-Nov	3	3	2	4	3	3	3	3	4	3	3	2	2	3	3	3	3	4	5	3	3	5	5	4	5
24-Nov	3	4	4	3	3	2	2	3	3	2	1	2	1	1	1	1	1	2	1	1	1	1	1	2	4
25-Nov	2	2	3	2	2	4	4	3	2	3	2	2	2	2	UO	UO	3	5	4	4	3	3	4	4	5
26-Nov	4	3	3	4	4	4	3	3	4	3	3	2	2	2	2	2	2	3	4	3	4	4	3	3	4
27-Nov	3	3	5	4	4	4	4	4	4	3	4	4	5	5	6	6	4	5	4	4	4	4	4	4	6
28-Nov	3	3	4	3	3	3	1	6	2	2	3	2	2	4	2	2	1	3	4	2	2	2	2	2	6
29-Nov	3	1	1	2	1	1	2	1	2	1	1	1	3	1	2	1	2	2	1	1	1	1	2	1	3
30-Nov	1	1	1	1	1	1	1	2	2	3	1	1	1	2	2	1	1	1	2	2	1	2	2	2	3

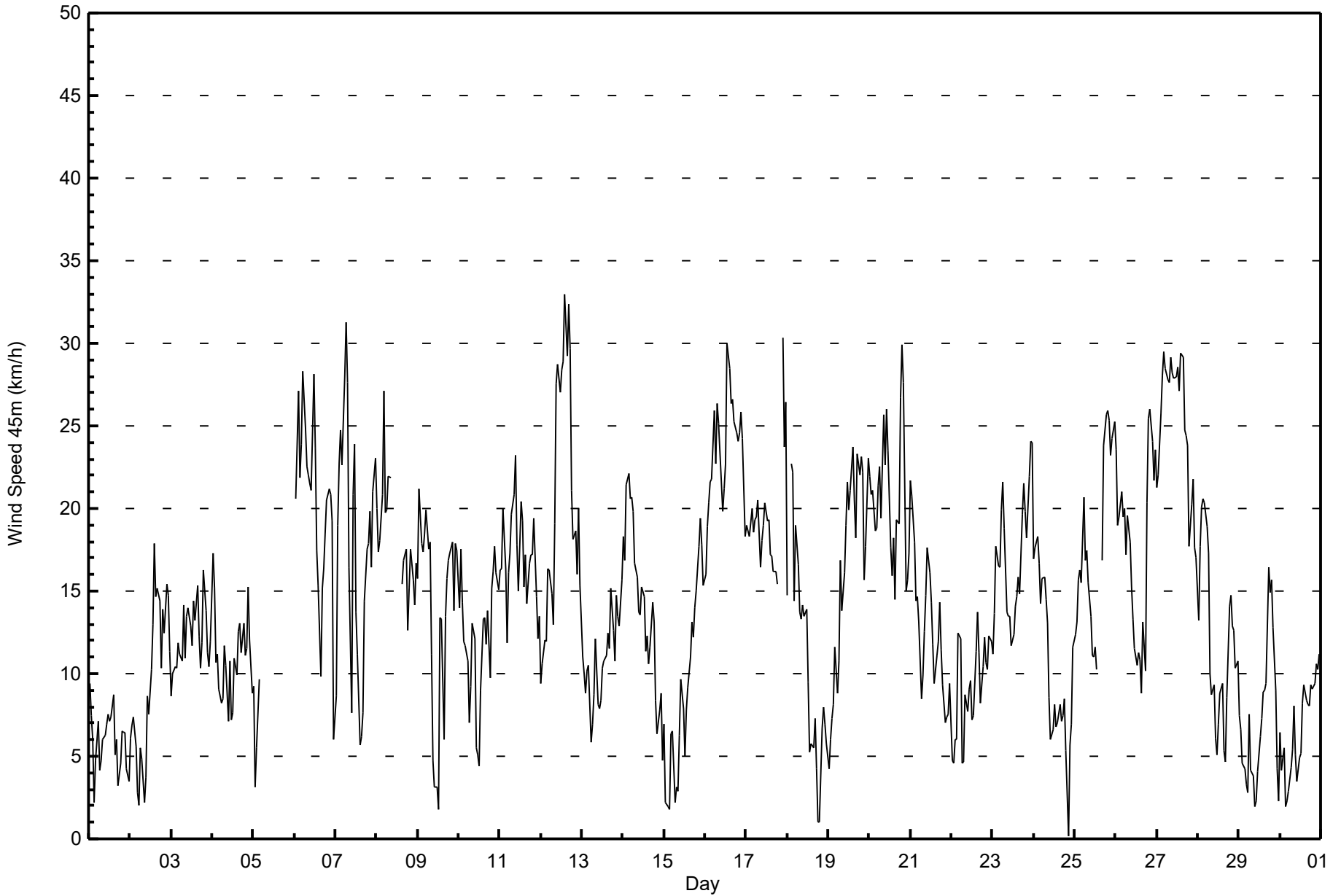
Diurnal Maximum

M - Maintenance UO - Unstable Operation



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 45m (WS45) - km/h**  
**Mannix - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 45m (WS45) - km/h**  
**Mannix - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	66	9.59	9.59
6 - 11	192	27.91	37.50
12 - 19	270	39.24	76.74
20 - 28	144	20.93	97.67
29 - 38	16	2.33	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 688

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Wind Speed 45m (WS45) - km/h**  
**Mannix - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	7	10	3	1	4	2	1	3	3	4	4	3	2	3	9	7	66
6 - 11	20	21	6	1	2	4	13	17	6	10	11	19	8	11	23	20	192
12 - 19	39	36	0	0	2	4	45	46	16	13	13	8	19	10	10	9	270
20 - 28	16	20	0	0	0	0	25	36	3	0	2	2	23	7	8	2	144
29 - 38	0	1	0	0	0	0	0	1	0	0	0	3	5	4	2	0	16
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	82	88	9	2	8	10	84	103	28	27	30	35	57	35	52	38	688

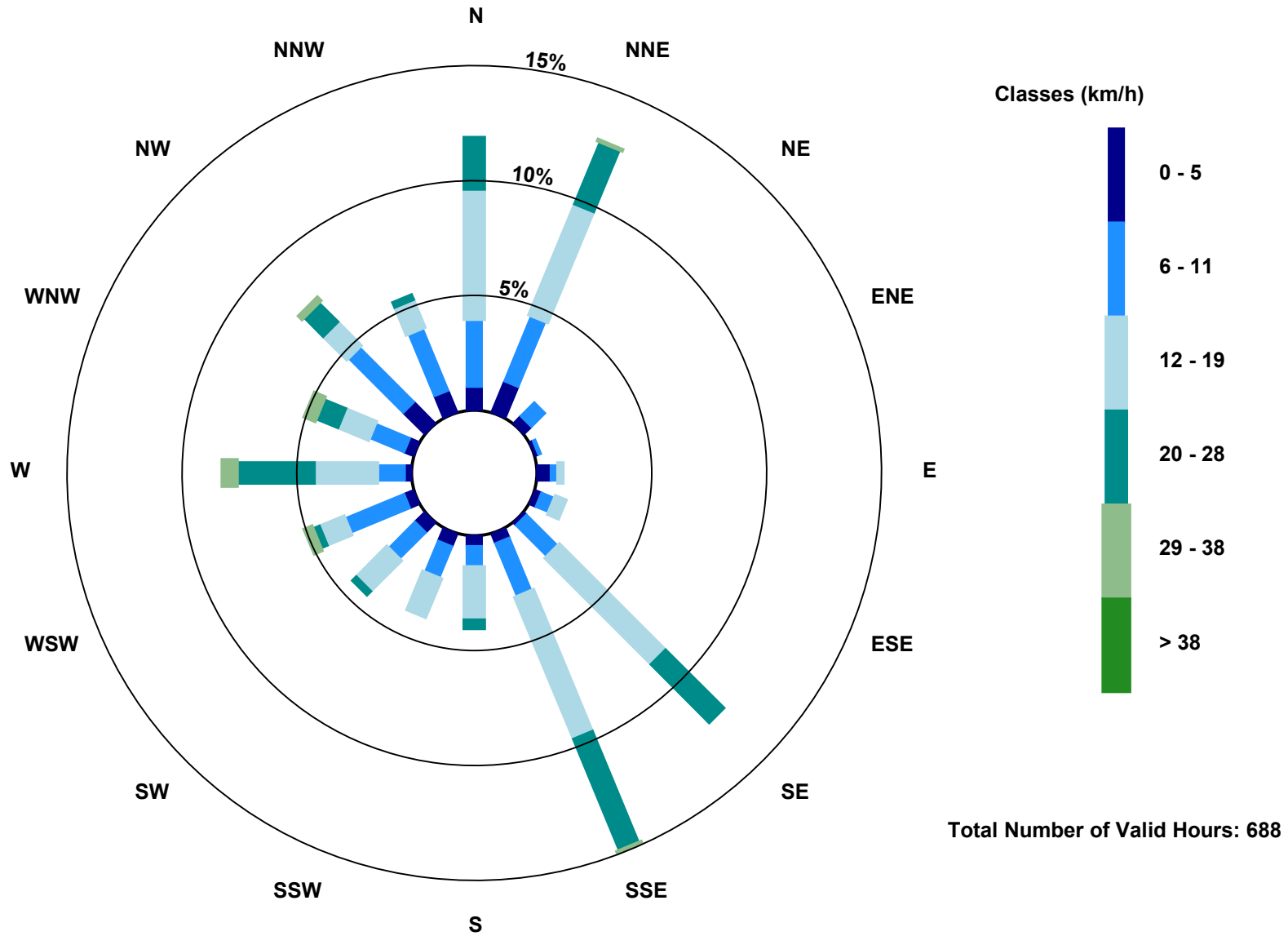
Total Number of Valid Hours: 688

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 45m (WS45) - km/h  
Mannix





Maximum Speed: 36 km/h on Nov 16 14:00	Maximum Daily Speed Average: 28.4 km/h on Nov 16	Hours in Service: 720
Minimum Speed Value: 1 km/h on Nov 18 20:00	Minimum Daily Speed Average: 3.5 km/h on Nov 1	Hours of Data: 679
Maximum Diurnal Speed Average: 4.6 km/h at hour 5	Minimum Diurnal Speed Average: 0.2 km/h at hour 21	Hours of Missing Data: 41
Monthly Average Velocity: 1.6 km/h 242.7 deg	Percentiles: P <sub>1</sub> = 2 P <sub>10</sub> = 6 Q <sub>1</sub> = 11 Median = 16 Q <sub>3</sub> = 23 P <sub>90</sub> = 28 P <sub>99</sub> = 33	Percent Operational Time: 94.3

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	W10	W8	WSW7	SW3	SW5	WSW9	WSW5	S4	SSW6	SSW7	SSW7	SSW8	SW8	WSW8	W9	NW5	NNE6	NNE3	NNE4	NNE7	NNE7	UO	UO	UO	WSW3.5	W10
2-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	ESE6	ESE9	SE13	SE17	SE14	E14	E15	SE12	SE17	SE16	SE19	SE18	SE15	---	SE19
3-Nov	SSE12	SSE13	SSE14	S14	SW14	WSW13	WSW13	SW17	SW16	SW18	SW18	SSW17	S15	S17	SSE16	SSE19	S15	SW13	SSW12	SSW19	SW17	WSW15	WSW15	WSW14	SSW13.0	SSE19
4-Nov	WSW18	SW18	SW15	SW15	WSW14	WSW14	W13	WSW13	SW12	S7	SSE11	SSE6	SE6	SE10	SE9	SE11	SSE15	SSE14	SSE13	SSE13	S18	S18	S9	SSW9.2	S18	
5-Nov	SSW7	WNW3	NNW6	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	SW22	
6-Nov	S18	SSE29	SSE33	SSE26	SSE28	SSE33	SSE30	SSE27	S28	S28	SSW26	SW33	SW27	SW21	SW18	SSW12	S16	S18	S21	S26	S28	S28	SSW19	S22.2	SSE33	
7-Nov	NNW12	NW25	NW28	WNW30	W26	W32	WNW36	W32	W21	WSW10	W22	W25	W15	W12	W6	E6	ESE7	SSE17	SSE22	SSE24	SSE26	SSE23	SE24	SE27	WSW9.4	WNW36
8-Nov	SE26	SE24	SSE23	SSE30	S32	SSE23	S19	S24	S25	M	M	M	M	M	M	SSW19	SSW20	SW20	WSW16	WNW18	NNW22	NW19	WNW18	W21	SSW12.3	S32
9-Nov	W21	W25	W22	W21	W23	W25	W22	W22	WSW16	SW5	SSW3	SSE2	WSW4	W14	W14	WSW7	SSW16	SW20	SSW19	S19	SSW18	SSW14	S18	SSW16	WSW13.5	W25
10-Nov	SSW11	S15	SSW14	SW14	SW15	SW11	SW6	SW11	SW14	SW15	SW7	SW5	SSW5	SSE9	SSE15	S15	S8	SW14	S9	SSE17	SSE20	SSE18	SSE19	SE21	S10.9	SE21
11-Nov	SE15	SE17	SE16	SE17	S15	SSE20	SE15	SE14	SE17	SE19	SE13	SE12	SE19	SE14	ESE12	SE12	ESE11	SE12	SE14	SE17	SE20	SE15	SE11	SE16	SE14.8	SE20
12-Nov	SSE12	SSE14	SSE16	S16	SSW21	SW21	WSW19	SW17	WSW24	WSW32	W32	W29	W30	WSW32	W34	W31	WSW35	WSW35	W24	W21	W22	W19	W23	W19	WSW20.8	WSW35
13-Nov	W13	W13	W12	WSW12	W14	W10	WSW9	WSW10	W15	W10	NW8	NNE9	NNE11	NE11	NE12	NE14	NNE14	NE18	NE16	NE12	NNE18	NNE15	NNE14	NNE17	N6.0	NNE18
14-Nov	NNE20	NNE19	NNE24	NNE24	NNE23	NNE23	NNE23	NNE19	NNE18	NNE14	NNE14	NNE16	NNE15	NNE12	NNE13	N11	N13	N16	NNE14	N9	N7	N8	NE8	NNE5	NNE15.1	NNE24
15-Nov	NW7	N3	N2	ENE2	WSW4	SW6	S4	S5	SE3	SE8	S12	SSW9	S5	SSE8	SSE10	SSE13	SSE18	SSE17	SSE19	SSE20	SSE24	SSE25	S21	SSE22	SSE9.6	SSE25
16-Nov	S21	S22	S24	S26	SSE29	SSE33	S29	S33	SSE32	SSE28	SSE26	SSE26	SSE28	SSE36	SSE33	SSE30	SSE31	SSE29	SSE29	SSE28	SSE29	SSE31	SSE29	SSE23	SSE28.4	SSE36
17-Nov	SE22	SSE22	SSE21	SE23	SSE23	SSE24	SE24	SE24	SSE20	SSE23	SSE23	SSE24	S22	SSE23	S20	S21	S20	SSW20	NW18	NNW32	WNW32	WNW32	WNW27	WNW29	S10.6	WNW32
18-Nov	W18	W19	W25	WNW26	WNW17	WNW21	WNW18	W16	W17	WNW18	WNW15	WNW10	WNW5	NW6	NNW7	NNW8	NE5	E3	ESE1	ESE5	NE8	NE7	NNE6	WNW9.7	WNW26	
19-Nov	NNE4	NE7	ENE8	NNE8	NE13	NE9	NNE12	NNE19	NNE15	NNE17	NNE21	NNE24	NNE22	NNE24	NNE27	NNE23	N20	NNE26	NNE25	N26	N25	NNE17	N20	N25	NNE17.7	NNE27
20-Nov	N25	N24	N25	N22	N22	NNE24	NNE26	NNE24	NNE31	NNE27	NNE29	NNE26	NNE20	N18	N20	NNE16	NNE22	NNE22	NNE30	NNE33	NNE31	N17	N18	N20	N23.4	NNE33
21-Nov	N24	NNE24	NNE21	N16	NNW18	N16	NNW10	NNW11	NNW14	NW16	NW18	NW17	NW15	NW12	NW9	NW12	NW13	NW15	WNW12	WNW9	NW7	NW8	NNE8	NNE11	NNW12.6	N24
22-Nov	NW5	WNW5	WNW9	WNW10	W16	WNW15	WNW9	W9	WNW12	WNW9	WNW10	NW9	NNW7	N8	NNE12	NNE15	NNE12	NNE9	NNE11	NNE13	NNE12	N11	N14	N13	NNW7.7	W16
23-Nov	N12	NNE15	NNE19	NNE18	NNE18	NNE20	NNE23	NNE20	NNE15	N15	NNE15	NNE13	N13	N16	N17	N18	N17	N22	NNE24	NNE23	N21	N25	N26	N26	NNE18.7	N26
24-Nov	N20	N20	NNE22	N20	N16	NNE18	NNE18	NNE17	NNE14	NNE10	N7	NNW6	NNW8	NW7	NW7	NW9	NNW8	N9	N8	NNE7	ESE2	S7	S8	SSE13	N8.7	NNE22
25-Nov	SSE17	SSE18	SSE22	SSE22	SSE23	SSE28	SSE23	SSE22	S17	SSE14	UO	UO	UO	SSE13	SE19	SE21	SE22	SE29	SE33	SE32	SE32	SE29	SE31	SE31	SSE23.3	SE33
26-Nov	SE29	SE24	SE24	SE24	SE23	SE23	SE22	SE23	SE20	SE17	SSE14	SE13	SSE14	SSE14	SSE13	S17	WSW14	W23	WNW28	WNW28	WNW27	W23	WNW26	S10.3	SE29	
27-Nov	WNW24	W24	W28	WNW30	WNW33	WNW31	W30	WNW30	WNW32	WNW30	WNW30	WNW31	WNW31	NW29	NNW33	NNW33	NW28	NNW29	NNW28	NNW28	NNW24	NNW25	NNW21	N20	NW25.5	NNW33
28-Nov	N16	NNW22	NNW24	NNW25	NNW26	NNW24	NW21	WNW15	NNW11	N11	N6	NW5	NW7	NW10	NNW11	N6	NNE5	NNE10	NNE17	NNE17	NNE16	NNE17	NNE16	NNE14	NNW13.1	NNW26
29-Nov	NNE9	NW5	NNW4	NNE3	NNE3	N2	NNW3	NW3	NNW3	N3	NNW4	N5	N7	N7	NW9	NNW9	N11	NNE20	NNE18	NNE15	NE11	NE7	NE4	NNE2	N6.3	NNE20
30-Nov	NNE3	NNE5	ENE6	E4	ENE2	NE4	NE7	NNE8	NE9	ENE8	NNE3	N4	N5	NNW8	NNW10	NNW9	NNW9	N10	NNW10	NNW11	NNW10	NNW11	NNW11	NNW13	N6.4	NNW13

WSW0.9 SW1.5 SW1.7 SW2.9	WSW4.8 WSW3.4 SW3.7 SW3.6 SW2.5	WSW3.4 W2.8 W2.2	WSW1.5 NW0.8 ESE0.4 S1.1	WSW0.7 NNE0.9 NE1.0 SSE0.2	SW1.5 SSW1.0	NNW0.6	Diurnal Average	
SE29 SSE29 SSE33	WNW30 WNW33 SSE33	WNW36 S33 SSE32	WSW32 W32 SW33	WNW31 SSE36	W34 NNW33	WSW35 WSW35 SE33	NNE33 WNW32 WNW32 SE31 SE31	Diurnal Maximum

M - Maintenance UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 75m (WS75) - km/h**  
**Mannix - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Nov 20 08:00	Hours in Service: 720 Hours of Data: 679 Hours of Missing Data: 41 Hours of Calibration: 0 Percent Operational Time: 94.3
Minimum Value: 0 km/h on Nov 24 22:00	
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 2 Median = 2 Q <sub>3</sub> = 4 P <sub>90</sub> = 5 P <sub>99</sub> = 7	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	2	1	1	1	1	2	3	1	2	1	1	1	2	1	1	2	1	1	1	2	2	UO	UO	UO	3
2-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	3	3	4	6	5	4	4	4	3	3	3	3	2	6
3-Nov	1	1	1	2	2	1	2	1	1	2	2	1	2	2	2	2	2	1	3	2	2	2	2	2	3
4-Nov	1	2	2	2	3	2	2	2	2	3	2	2	2	4	3	3	2	2	1	2	1	1	2	2	4
5-Nov	1	1	2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2	3	2	3
6-Nov	3	3	3	3	3	3	4	3	4	4	4	4	4	4	4	3	2	2	2	3	1	2	5	2	5
7-Nov	4	6	4	4	3	4	4	3	4	5	3	4	3	3	3	2	3	2	2	1	2	2	4	5	6
8-Nov	2	2	3	3	4	1	2	2	2	M	M	M	M	M	M	2	2	4	3	4	3	2	2	2	4
9-Nov	3	3	2	2	2	2	4	3	7	2	2	1	4	3	3	2	3	2	1	1	1	2	2	3	7
10-Nov	2	2	1	1	1	3	2	3	2	2	3	2	2	2	2	1	2	3	2	3	2	2	2	4	4
11-Nov	6	7	6	7	4	2	6	6	7	8	5	5	7	6	4	5	4	5	5	5	5	4	4	3	8
12-Nov	2	1	2	2	2	2	2	2	4	4	4	5	6	6	6	4	5	4	3	3	3	2	3	6	6
13-Nov	2	2	1	3	2	3	2	4	1	2	2	2	2	3	2	2	3	3	3	3	3	3	2	3	4
14-Nov	2	2	2	2	4	2	2	2	3	2	2	2	2	2	1	2	3	2	2	2	1	1	2	1	4
15-Nov	2	1	1	2	3	2	3	1	1	4	3	3	2	3	2	2	2	2	3	2	2	2	2	1	4
16-Nov	1	1	1	1	3	2	2	2	4	3	4	3	4	6	5	5	5	5	4	4	3	3	4	4	6
17-Nov	4	4	3	3	3	3	4	4	3	3	3	3	2	2	2	2	2	3	6	5	4	4	5	6	6
18-Nov	3	4	2	3	3	4	3	3	2	3	2	2	3	1	1	1	1	1	2	2	2	2	1	1	4
19-Nov	1	2	3	3	3	3	3	3	3	2	3	3	4	5	5	6	5	4	5	6	7	3	5	6	7
20-Nov	6	5	6	4	6	7	7	8	5	5	4	5	4	4	4	3	5	7	3	4	6	6	4	4	8
21-Nov	5	5	4	3	4	3	3	2	3	3	2	2	2	2	2	2	2	1	2	2	1	1	1	2	5
22-Nov	1	2	1	2	1	2	2	1	1	3	2	2	2	2	3	4	5	3	2	2	3	3	4	4	5
23-Nov	3	3	2	4	2	2	2	2	4	2	3	2	2	2	2	2	3	3	4	3	3	5	5	3	5
24-Nov	4	3	4	2	2	2	2	2	3	2	1	1	1	1	1	1	1	1	1	1	2	0	1	3	4
25-Nov	1	2	2	2	2	3	4	3	3	4	UO	UO	UO	3	2	2	2	4	3	3	2	2	3	3	4
26-Nov	3	3	3	5	4	4	3	3	3	3	3	3	2	2	2	2	2	3	3	4	3	4	3	3	5
27-Nov	3	3	4	4	4	4	4	4	4	3	4	4	4	6	5	6	4	4	4	4	4	4	4	4	6
28-Nov	3	3	4	3	2	3	1	6	1	2	4	1	2	4	2	2	1	3	5	2	3	2	3	3	6
29-Nov	2	1	1	1	1	1	1	1	1	1	1	2	3	2	2	1	3	2	1	2	1	1	2	1	3
30-Nov	1	2	1	2	2	2	1	2	1	2	1	1	1	2	2	1	1	1	1	1	1	2	2	2	2

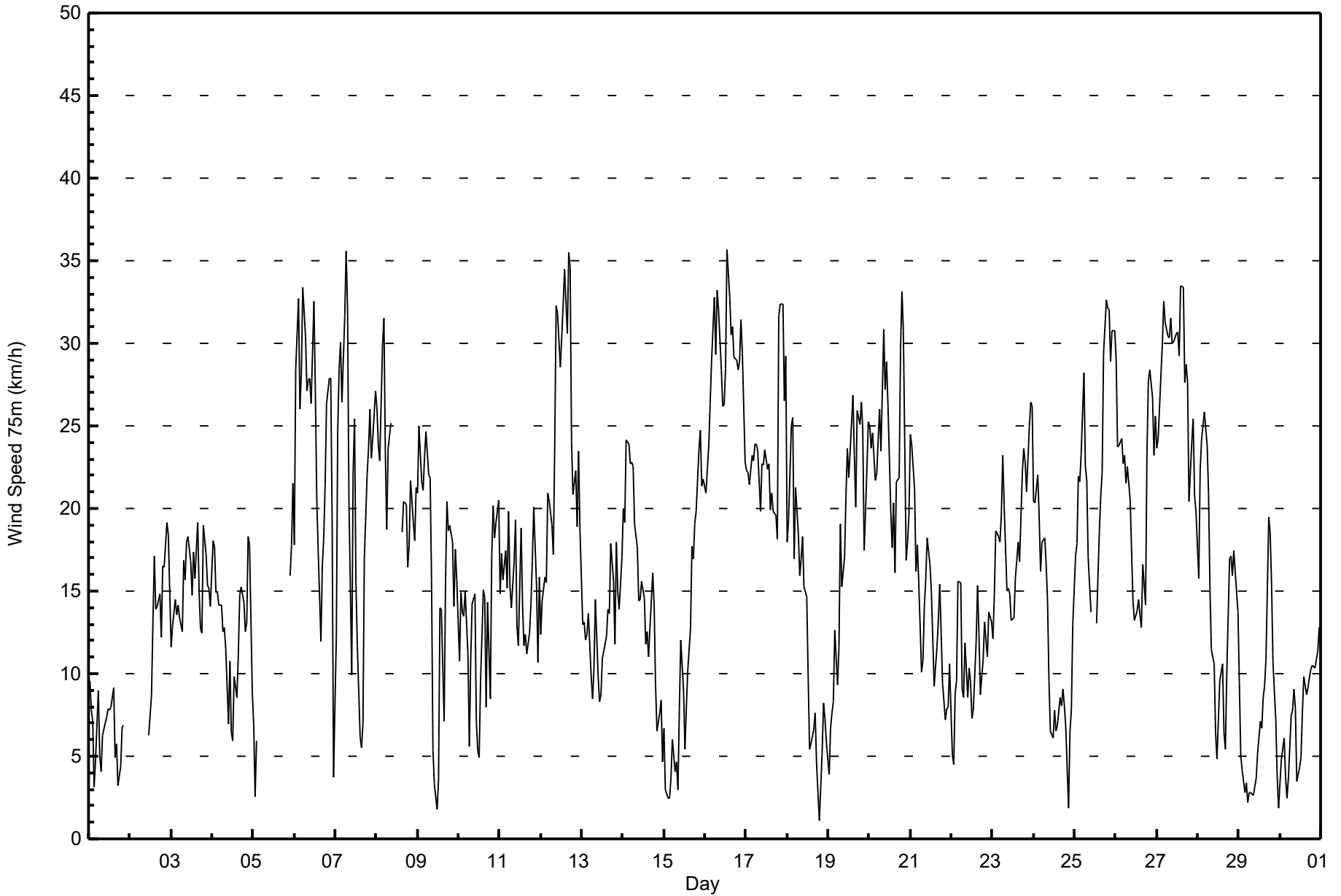
Diurnal Maximum

M - Maintenance UO - Unstable Operation



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 75m (WS75) - km/h**  
**Mannix - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 75m (WS75) - km/h**  
**Mannix - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	56	8.25	8.25
6 - 11	135	19.88	28.13
12 - 19	241	35.49	63.62
20 - 28	182	26.80	90.43
29 - 38	65	9.57	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 679

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Wind Speed 75m (WS75) - km/h**  
**Mannix - November 2024**

<b>Wind Speed</b> <b>Ranges (km/h)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	7	11	3	2	2	3	1	1	4	2	5	3	0	3	5	4	56
6 - 11	16	16	9	4	1	4	6	5	6	7	6	7	7	7	12	22	135
12 - 19	18	46	5	0	2	2	29	32	18	13	19	15	16	12	10	4	241
20 - 28	22	31	0	0	0	0	19	37	17	4	6	1	22	8	4	11	182
29 - 38	0	5	0	0	0	0	8	17	3	0	1	4	8	14	1	4	65
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	63	109	17	6	5	9	63	92	48	26	37	30	53	44	32	45	679

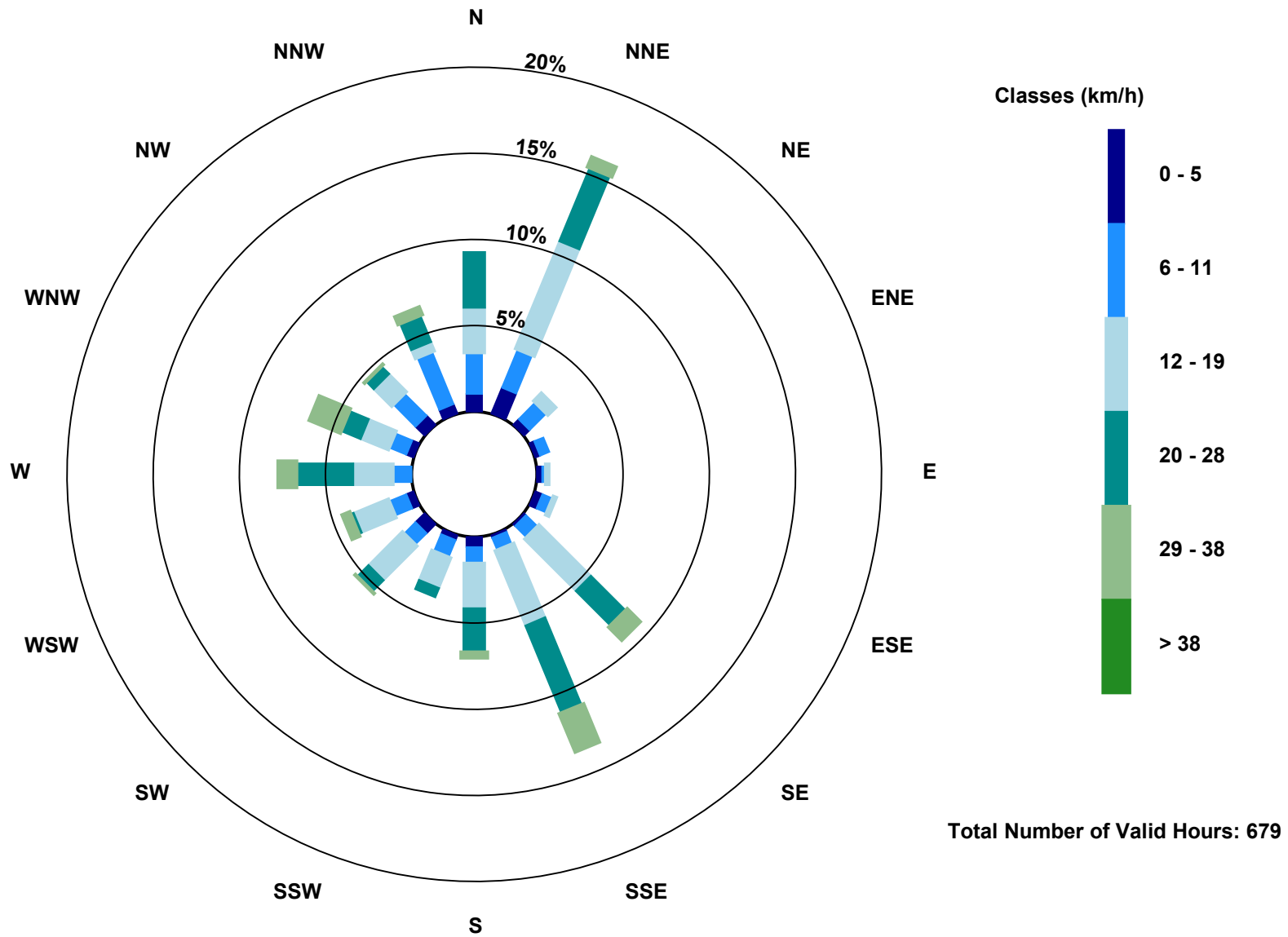
Total Number of Valid Hours: 679

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 75m (WS75) - km/h  
Mannix







Maximum Speed: 38 km/h on Nov 7 07:00	Maximum Daily Speed Average: 29.5 km/h on Nov 16	Hours in Service: 720
Minimum Speed Value: 1 km/h on Nov 30 00:00	Minimum Daily Speed Average: 3.4 km/h on Nov 1	Hours of Data: 677
Maximum Diurnal Speed Average: 4.3 km/h at hour 6	Minimum Diurnal Speed Average: 0.3 km/h at hour 18	Hours of Missing Data: 43
Monthly Average Velocity: 1.0 km/h 267.5 deg	Percentiles: P <sub>1</sub> = 2 P <sub>10</sub> = 6 Q <sub>1</sub> = 11 Median = 17 Q <sub>3</sub> = 24 P <sub>90</sub> = 30 P <sub>99</sub> = 35	Percent Operational Time: 94.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	W10	W8	WSW8	WSW4	SW5WSW10	W6	SSW4	SSW6	SSW7	SSW7	SSW8	SW8	WSW8	W9	NW5	NNE6	NNE3	NNE4	NNE7	NNE7	NE6	UO	UO	W3.4	WSW10		
2-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	ESE12	SE14	SE18	SE15	E17	E16	ESE13	SE18	SE17	SE21	SE20	SE16	---	SE21		
3-Nov	SSE12	SSE14	SSE16	S14	SW15WSW14	WSW13	SW18	SW18	SW20	SW20	SW18	SSW15	S18	SSE16	SSE20	S15WSW14	SW13	SSW18	SW18WSW18	W18WSW15	SSW13.5	SW20					
4-Nov	WSW16WSW16	WSW17WSW17	WSW17WSW17	W14WSW13	SW11	S7	S10	SSE6	SE6	SE10	SE9	SE11	SSE15	SSE16	SSE14	S13	SSE13	S18	S16	SSW5	SSW9.0	S18					
5-Nov	SW5	WNW4	NNW6	UO	UO	NNW11	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	SW24		
6-Nov	S18	SSE31	SSE34	SSE27	SSE29	SSE34	SSE32	S29	S30	S30	SSW28	SW34	SW28	SW22	SW18	SW13	SSW16	SSW19	S22	S28	S29	S30	SSW19	W5	S23.1	SSE34	
7-Nov	NNW14	NW27	NW31	NNW32	W28	W34	NNW38	NNW34	W23	W11	W23	W26	W16	W12	W7	E5	ESE9	S17	S22	SSE24	SSE28	SSE25	SE26	SE29	WSW10.1	NNW38	
8-Nov	SE26	SE25	SSE25	SSE32	S31	S23	S18	S22	S23	M	M	M	M	M	M	M	WSW19	SW20	WSW20	NNW18	NW19	N24	NNW21	NW20	NW23	SSW8.8	SSE32
9-Nov	WNW23	WNW26	WNW23	WNW23	WNW25	WNW26	WNW24	WNW24	WNW17	W7	W4	WSW1	W5	WNW14	WNW14	W7	WSW16	WSW22	SW19	SW18	WSW18	WSW14	SSW16	SW15	W14.5	WNW26	
10-Nov	SW10	SW13	WSW13	WSW15	W17	W12	W6	W12	W15	W16	W8	W5	SW5	SSW9	SSW15	SSW13	SW7	WSW14	SW8	SSW16	SSW18	S17	S20	S24	SW10.5	S24	
11-Nov	SSE21	SSE19	SSE19	SSE19	SSW16	S21	SSE19	SSE19	SSE22	SSE24	SSE18	SSE15	SSE22	SSE19	SE17	SSE17	SE16	SSE16	SSE17	SSE19	SSE22	SSE17	SSE12	S17	SSE18.0	SSE24	
12-Nov	S13	S15	S17	SSW16	SW22	W22	W21	W19	W26	W33	WNW33	WNW29	WNW30	WNW33	WNW34	WNW31	WNW36	W36	WNW25	WNW22	WNW24	WNW20	WNW24	WNW20	W21.5	WNW36	
13-Nov	WNW14	WNW14	WNW13	WNW13	WNW15	WNW12	WNW10	WNW10	WNW15	NW11	NNW9	NE9	ENE11	ENE11	ENE12	ENE14	ENE14	ENE18	ENE16	ENE12	ENE19	ENE16	NE14	NE17	NNE6.7	ENE19	
14-Nov	NE20	NE20	NE25	NE24	NE23	NE23	NE23	NE19	NE18	NE14	NE15	NE15	NE14	NE12	NE12	NE11	NNE13	NNE17	NE15	NE9	NNE6	NNE8	ENE7	NE4	NE15.0	NE25	
15-Nov	NNW7	NNE2	NNE2	ESE2	WSW3	WSW6	SSW5	SSW6	SSE5	S9	SSW13	SW9	SSW5	S8	SSW11	S13	S19	SSW18	S21	S22	SSW26	SSW25	SSW20	SSW22	SSW10.3	SSW26	
16-Nov	SSW21	SSW21	SSW23	SSW26	SSW30	SSW34	SSW31	SSW35	S34	S31	S28	S29	S31	S37	S34	S32	S32	S30	S30	S30	S30	S33	S31	S24	S29.5	S37	
17-Nov	S23	S24	S22	S24	S24	S26	S25	S25	S21	S24	S23	SSW24	SSW23	SSW23	SSW20	SSW20	SW20	WSW20	NNW20	N34	NW34	NW34	NNW28	NNW31	SSW10.9	NW34	
18-Nov	NW19	WNW21	NW26	NW27	NW18	NW22	NW19	NW17	NW19	NW20	NW16	NW15	NW10	NNW6	N6	N7	N8	ENE4	ESE3	SE1	SE7	E8	ENE7	NE6	NW10.4	NW27	
19-Nov	NE4	E6	E7	ENE8	ENE12	ENE9	NE12	ENE19	NE16	NE17	NE21	NE24	NE22	NE24	NE28	NE24	NNE21	NE27	NE26	NNE28	NNE26	NE18	NNE21	NNE26	NE18.0	NNE28	
20-Nov	NNE26	NNE25	NNE26	NNE23	NNE23	NE25	NE27	NE25	NE32	NE29	NE30	NE27	NE20	NNE19	NNE21	NE17	NE22	NE22	NE30	NE34	NE32	NNE18	NNE19	NNE21	NE24.3	NE34	
21-Nov	NE25	NE25	NE22	NNE17	N20	NNE17	N11	N12	N15	N17	NNW19	NNW17	N16	N13	N10	NNW12	NNW14	NNW16	NNW13	NNW10	NNW8	N8	NE8	NE11	N13.5	NE25	
22-Nov	N5	NW5	NW10	NW11	WNW16	NW17	NW10	NW10	NW12	NNW9	NW11	NNW10	N7	NNE8	NE12	NE16	NE13	NE9	NE11	NE13	NE13	NNE11	NNE15	NNE14	N8.7	NW17	
23-Nov	NNE12	NE15	NE19	NE19	NE18	NE19	NE23	NE20	NE15	NE16	NE15	NE14	NE14	NNE17	NNE18	NNE19	NNE18	NNE23	NE24	NE24	NE22	NNE26	NE27	NE27	NE19.1	NE27	
24-Nov	NNE22	NNE21	NE23	NE21	NNE17	NE19	NE20	NE17	NE15	NE10	NNE7	N6	N8	N7	NNW7	NNW9	N9	NNE9	NNE8	ENE7	SE2	SSW6	SSW8	S13	NNE9.3	NE23	
25-Nov	S18	S19	SSW19	S17	S21	SSW27	SSW23	SSW22	UO	SSW13	S10	UO	UO	UO	SSE19	SSE22	SSE22	SSE31	S34	S33	S32	S29	S31	S32	S23.3	S34	
26-Nov	S30	S25	S25	S26	SSE24	S25	S23	SSE24	S21	S18	S15	S14	S15	S16	S15	SSW14	SW17	WNW15	WNW24	NW29	NW29	NW28	NW24	NW26	SSW10.7	S30	
27-Nov	NW25	NW25	NW29	NW31	NW34	NW32	NW31	NW32	NW33	NW31	NW31	NW32	NW32	NNW31	N36	N36	N29	N31	N30	N22	N26	N27	N22	NNE21	NNW27.2	N36	
28-Nov	NNE17	N25	N27	N28	N28	N25	NNW22	NNW18	N13	NNE11	NNE7	N5	NNW8	N10	N12	NNE7	NE6	NE11	NE18	NE18	NE18	ENE20	NE19	NE16	NNE14.6	N28	
29-Nov	NE10	N5	NNE4	NE3	NE4	NE4	NNE3	NNE2	NNE2	NNE3	NNE4	NE6	NE8	NNE7	N8	N9	NE12	NE19	NE19	ENE14	ENE10	ENE6	E3	E1	NE6.6	NE19	
30-Nov	NE3	ENE5	E6	ESE4	SE5	E5	E7	ENE7	ENE8	E8	E3	NE5	NNE5	N8	N10	N9	NNE10	NNE10	N11	NNE11	NNE11	N11	N12	N14	NNE6.2	N14	

W0.4	SW1.0	WSW1.3	WSW2.4	W4.2	W4.3	W3.3	WSW3.5	WSW2.9	WSW2.2	W2.6	NNW2.3	NNW1.6	NNW1.0	NNE0.8	ENE0.8	SE0.4	NNW0.3	ENE1.8	ENE2.1	E1.1	E0.4	ENE0.5	N0.8	Diurnal Average
S30	SSE31	SSE34	WNW32	NW34	SSE34	WNW38	SSW35	S34	W33	WNW33	SW34	NW32	S37	N36	N36	WNW36	W36	S34	NE34	NW34	NW34	S31	S32	Diurnal Maximum

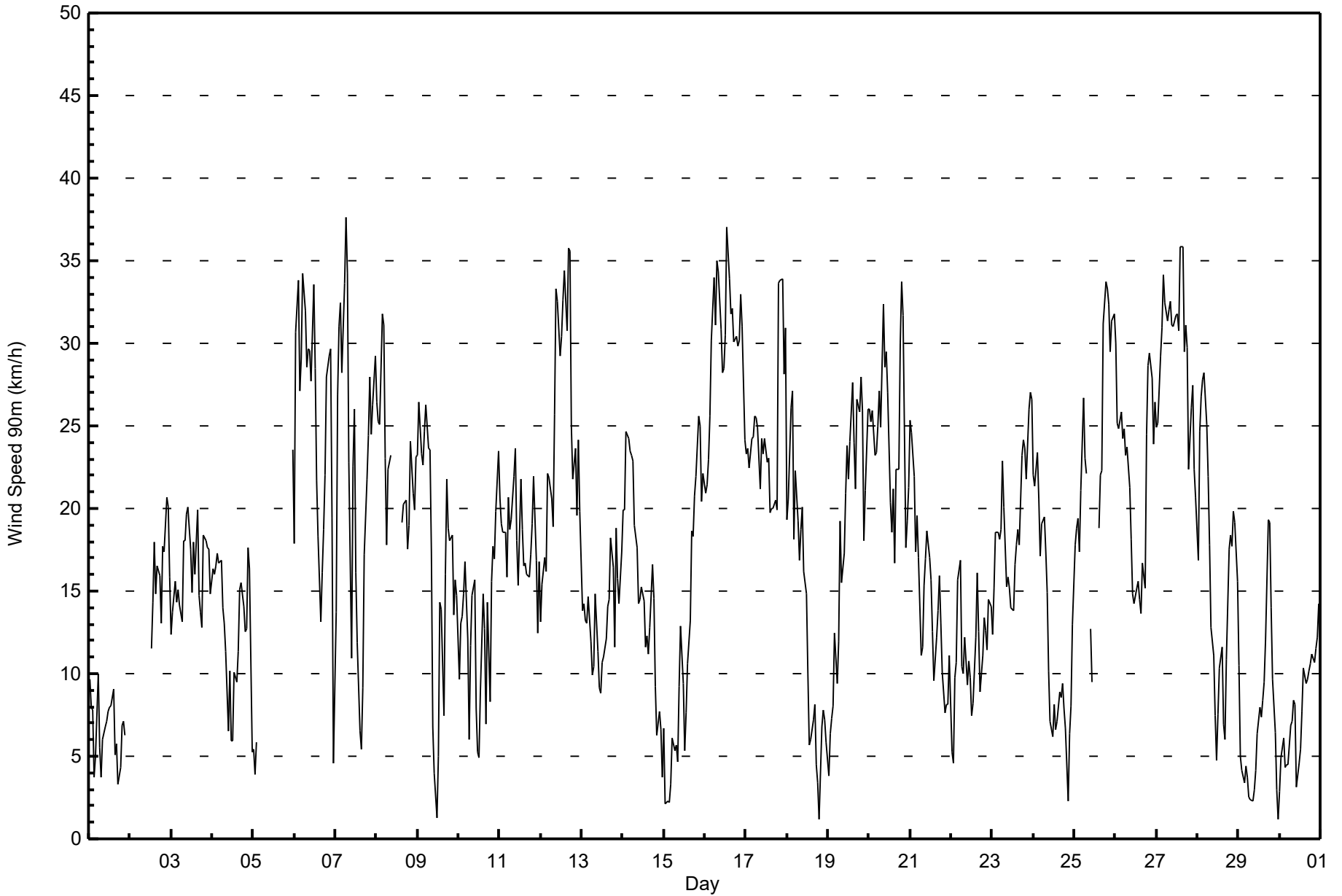
M - Maintenance UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 90m (WS90) - km/h**  
**Mannix - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Nov 20 08:00 Minimum Value: 0 km/h on Nov 24 22:00 Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 2 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 7																	Hours in Service: 720 Hours of Data: 677 Hours of Missing Data: 43 Hours of Calibration: 0 Percent Operational Time: 94.0								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	2	1	1	1	1	2	3	1	2	1	1	1	2	1	1	2	1	1	2	2	2	1	UO	UO	3
2-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	3	3	4	4	4	4	3	2	2	3	2	2	4
3-Nov	0	1	1	2	2	1	2	2	1	2	2	1	2	2	2	1	2	1	2	2	2	2	1	1	2
4-Nov	1	2	2	2	3	2	3	2	2	3	3	2	2	4	2	2	2	2	1	2	1	2	2	2	4
5-Nov	1	1	2	UO	UO	2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2
6-Nov	3	3	3	3	3	3	4	3	4	4	3	4	4	4	4	4	2	2	2	3	1	2	5	3	5
7-Nov	4	7	4	4	3	4	4	3	4	5	3	4	4	3	3	2	2	2	1	1	2	2	3	4	7
8-Nov	2	1	3	2	3	1	2	2	2	M	M	M	M	M	M	2	2	4	4	4	3	2	2	3	4
9-Nov	3	3	2	2	2	2	4	3	7	3	2	1	5	3	3	2	4	2	1	1	1	2	2	2	7
10-Nov	2	2	1	2	1	3	2	3	2	2	4	2	2	2	2	1	2	3	2	3	2	2	2	4	4
11-Nov	5	5	5	7	4	2	4	4	5	5	5	4	5	5	4	4	4	4	4	4	4	4	3	2	7
12-Nov	1	2	2	2	3	2	2	2	4	4	4	5	6	6	6	4	4	4	3	3	3	2	3	6	6
13-Nov	2	2	1	3	2	3	2	3	2	3	2	2	3	3	2	2	3	3	3	3	4	3	2	3	4
14-Nov	1	2	2	2	4	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	1	1	3	1	4
15-Nov	2	1	1	1	3	1	2	1	1	4	3	3	2	2	3	2	1	2	3	2	2	2	2	2	4
16-Nov	1	1	1	1	3	2	2	2	3	3	3	3	3	5	4	5	5	5	4	3	3	3	3	3	5
17-Nov	3	4	3	3	3	2	3	3	2	3	3	3	2	2	2	2	2	4	5	5	5	4	5	5	5
18-Nov	3	4	3	3	3	4	3	3	2	3	2	2	3	1	1	1	1	1	2	2	2	2	1	1	4
19-Nov	1	2	3	3	3	3	3	3	3	2	2	3	3	5	5	6	5	4	6	6	7	4	6	6	7
20-Nov	6	5	6	5	6	7	7	8	5	6	4	5	4	4	4	3	5	7	3	3	6	5	4	4	8
21-Nov	5	4	4	4	4	3	4	2	3	3	2	2	2	3	2	2	2	1	2	2	1	1	1	2	5
22-Nov	2	2	2	2	2	2	1	1	1	2	2	2	2	2	3	5	5	3	2	2	3	3	4	3	5
23-Nov	3	3	2	3	2	2	2	2	4	2	3	2	2	2	2	2	3	3	4	3	3	5	4	3	5
24-Nov	4	3	3	2	2	2	2	2	3	2	1	1	1	1	1	1	1	1	1	1	2	0	1	2	4
25-Nov	1	2	2	1	1	3	4	2	UO	2	2	UO	UO	UO	2	2	2	4	3	2	2	3	2	4	4
26-Nov	2	2	3	3	3	3	3	2	3	3	3	2	2	2	1	2	1	4	3	4	3	4	3	3	4
27-Nov	3	3	5	3	4	4	4	4	4	3	4	4	4	6	5	6	4	4	4	4	4	4	4	4	6
28-Nov	4	3	5	2	2	2	1	5	2	2	4	1	2	5	2	2	1	3	5	2	3	2	2	3	5
29-Nov	2	1	1	1	1	1	1	1	1	1	1	2	3	2	2	1	3	2	1	2	1	1	1	1	3
30-Nov	1	2	1	2	2	2	1	2	1	2	1	1	1	2	1	1	1	1	1	1	1	2	2	2	2
																	Diurnal Maximum								
M - Maintenance																	UO - Unstable Operation								





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 90m (WS90) - km/h**  
**Mannix - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	52	7.68	7.68
6 - 11	131	19.35	27.03
12 - 19	229	33.83	60.86
20 - 28	182	26.88	87.74
29 - 38	83	12.26	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 677

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Wind Speed 90m (WS90) - km/h**  
**Mannix - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	3	11	7	2	5	3	3	1	0	4	3	3	4	1	2	0	52
6 - 11	18	19	15	11	6	1	5	1	5	9	5	5	10	2	7	12	131
12 - 19	9	18	39	12	2	2	8	23	24	19	13	19	10	13	10	8	229
20 - 28	11	18	34	1	0	0	5	15	31	17	8	3	7	17	11	4	182
29 - 38	6	0	6	0	0	0	1	7	27	4	1	0	3	10	16	2	83
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	47	66	101	26	13	6	22	47	87	53	30	30	34	43	46	26	677

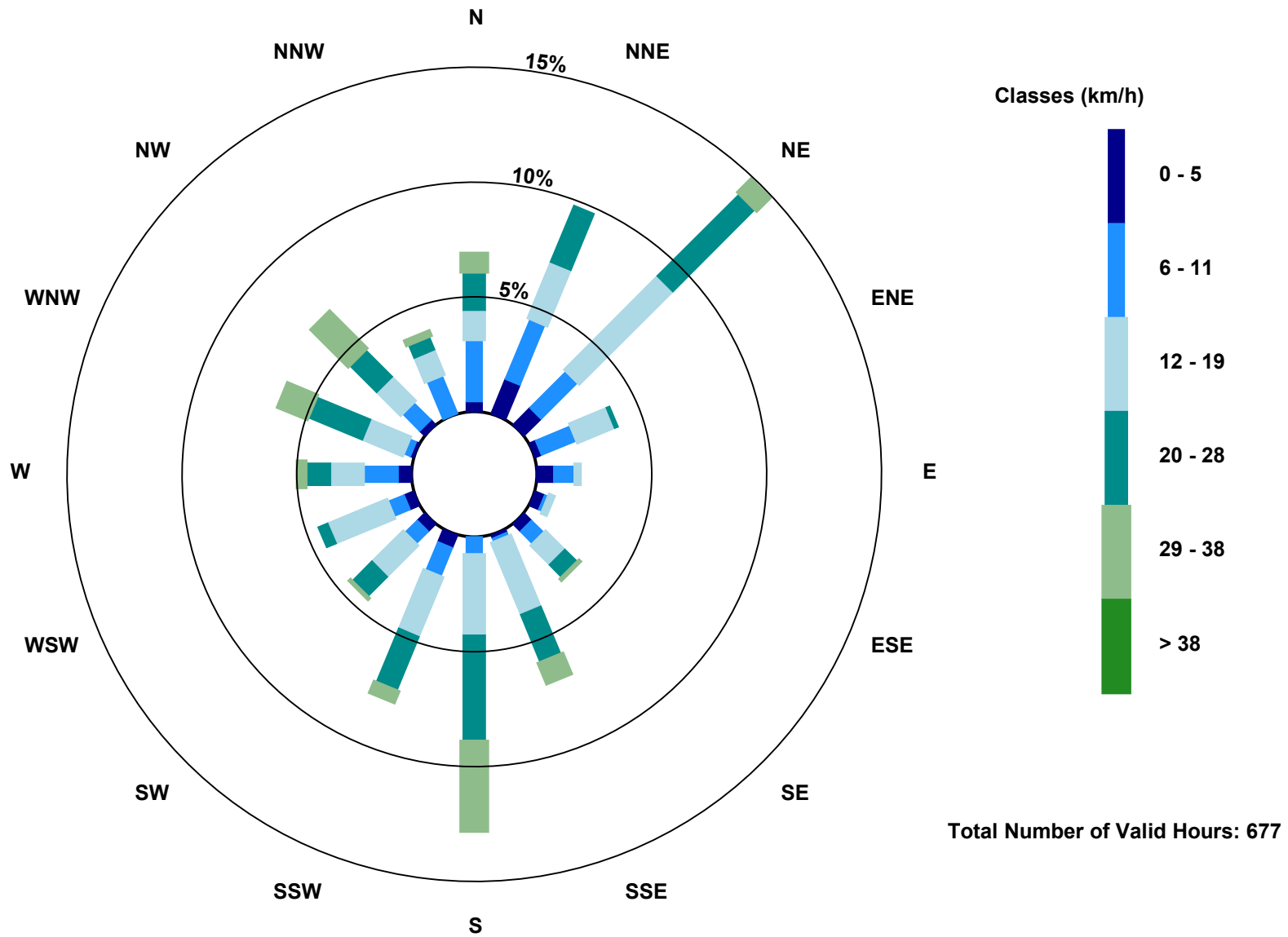
Total Number of Valid Hours: 677

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 90m (WS90) - km/h  
Mannix





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 20m (WD20) - deg**  
**Mannix - November 2024**

Direction of Maximum Speed: 269 deg on Nov 12 15:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 298.1 deg on Nov 27	Hours of Data: 714
Direction of Minimum Speed: 334 deg on Nov 29 11:00	Hours of Missing Data: 6
Direction of Minimum Daily Speed Average: 1.9 deg on Nov 1	Percent Operational Time: 99.2
Monthly Average Direction: 255.6 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	274	270	239	187	209	238	216	171	200	200	200	210	238	259	265	323	13	32	19	17	18	24	10	357	264.4
2-Nov	13	25	28	28	223	253	167	121	75	101	146	124	107	131	137	137	90	84	126	140	150	139	141	149	120.9
3-Nov	173	164	167	198	226	238	227	221	233	211	219	199	175	170	155	157	167	199	177	177	195	221	237	224	196.7
4-Nov	229	228	224	209	214	193	246	257	218	155	158	146	136	135	137	135	147	150	177	196	159	165	152	141	177.3
5-Nov	192	286	9	343	339	328	319	307	289	263	249	267	259	260	268	275	279	184	187	215	246	236	212	213	261.0
6-Nov	162	157	162	163	163	163	162	165	168	185	192	219	233	232	231	184	161	159	154	160	161	160	168	143	175.4
7-Nov	328	298	309	285	268	279	289	280	278	239	276	276	278	286	284	90	127	160	159	146	152	151	136	135	258.0
8-Nov	140	155	162	154	164	143	145	155	159	M	M	M	M	M	M	203	191	200	240	280	317	294	279	271	185.0
9-Nov	273	270	272	265	262	259	257	247	228	157	137	107	126	273	264	242	197	207	180	166	181	174	162	164	228.3
10-Nov	162	160	162	162	167	159	155	178	210	204	209	217	172	145	155	159	157	208	158	157	146	151	159	144	165.4
11-Nov	140	145	135	153	210	154	133	129	128	131	118	126	130	127	118	128	115	132	132	133	136	136	127	138	132.7
12-Nov	143	144	163	182	200	226	234	210	240	247	260	268	261	253	269	272	254	246	267	267	262	254	255	262	250.5
13-Nov	242	234	241	245	247	193	197	226	242	246	305	9	28	35	47	32	22	27	35	34	26	19	14	11	356.5
14-Nov	15	14	14	13	13	13	15	12	9	18	13	17	11	21	17	5	346	358	8	355	340	351	32	328	10.5
15-Nov	292	70	321	100	250	239	206	241	70	151	184	199	153	139	164	151	157	167	158	161	160	164	163	158	169.3
16-Nov	166	159	159	162	155	160	166	175	151	145	147	151	154	153	152	148	147	150	151	152	153	157	149	147	153.9
17-Nov	138	141	143	140	143	146	138	136	145	144	151	159	165	161	161	156	164	195	306	338	290	288	300	296	169.5
18-Nov	275	263	271	283	279	289	290	267	279	279	280	292	287	293	324	320	343	37	221	70	109	56	25	8	290.0
19-Nov	20	33	50	18	29	20	8	28	17	9	25	27	25	18	21	9	5	16	10	350	354	8	355	6	14.0
20-Nov	2	349	3	347	2	12	14	10	19	22	18	18	12	347	353	6	14	15	17	15	13	358	347	348	7.4
21-Nov	6	10	8	352	343	346	334	334	320	310	304	307	320	317	311	311	308	298	288	275	289	316	5	17	328.3
22-Nov	299	243	266	270	250	265	282	216	258	272	283	316	335	330	10	21	22	24	15	10	5	359	351	347	334.2
23-Nov	354	14	16	21	10	15	21	17	8	3	15	14	1	356	359	4	348	1	12	9	360	1	3	3	7.3
24-Nov	354	360	4	358	358	11	18	11	12	6	339	316	316	315	306	306	313	336	344	5	262	225	198	153	348.5
25-Nov	148	150	157	147	148	162	160	157	162	159	158	152	151	161	157	157	142	137	143	145	144	140	140	140	149.4
26-Nov	143	149	147	139	137	139	140	135	139	143	142	152	154	153	152	169	173	252	269	279	278	284	273	280	181.8
27-Nov	277	271	274	281	286	278	276	283	281	278	281	287	294	310	325	324	316	322	323	326	332	335	338	357	298.1
28-Nov	356	332	320	314	315	315	290	291	316	346	277	268	307	314	325	352	8	9	15	13	14	15	6	7	334.4
29-Nov	338	273	296	284	287	280	272	283	310	29	334	294	344	314	308	309	332	2	3	3	10	4	352	293	324.5
30-Nov	357	322	1	295	284	314	331	316	358	3	295	309	307	316	324	318	334	340	325	331	336	326	334	323	326.6

261.5 253.8 263.5 261.1 247.9 244.2 242.6 216.5 227.5 217.2 246.1 262.9 271.8 259.3 285.3 355.2 102.2 107.9 10.7 358.3 302.0 268.0 270.3 317.4

Diurnal Average

M - Maintenance

All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 20m (WD20) - deg**  
**Mannix - November 2024**

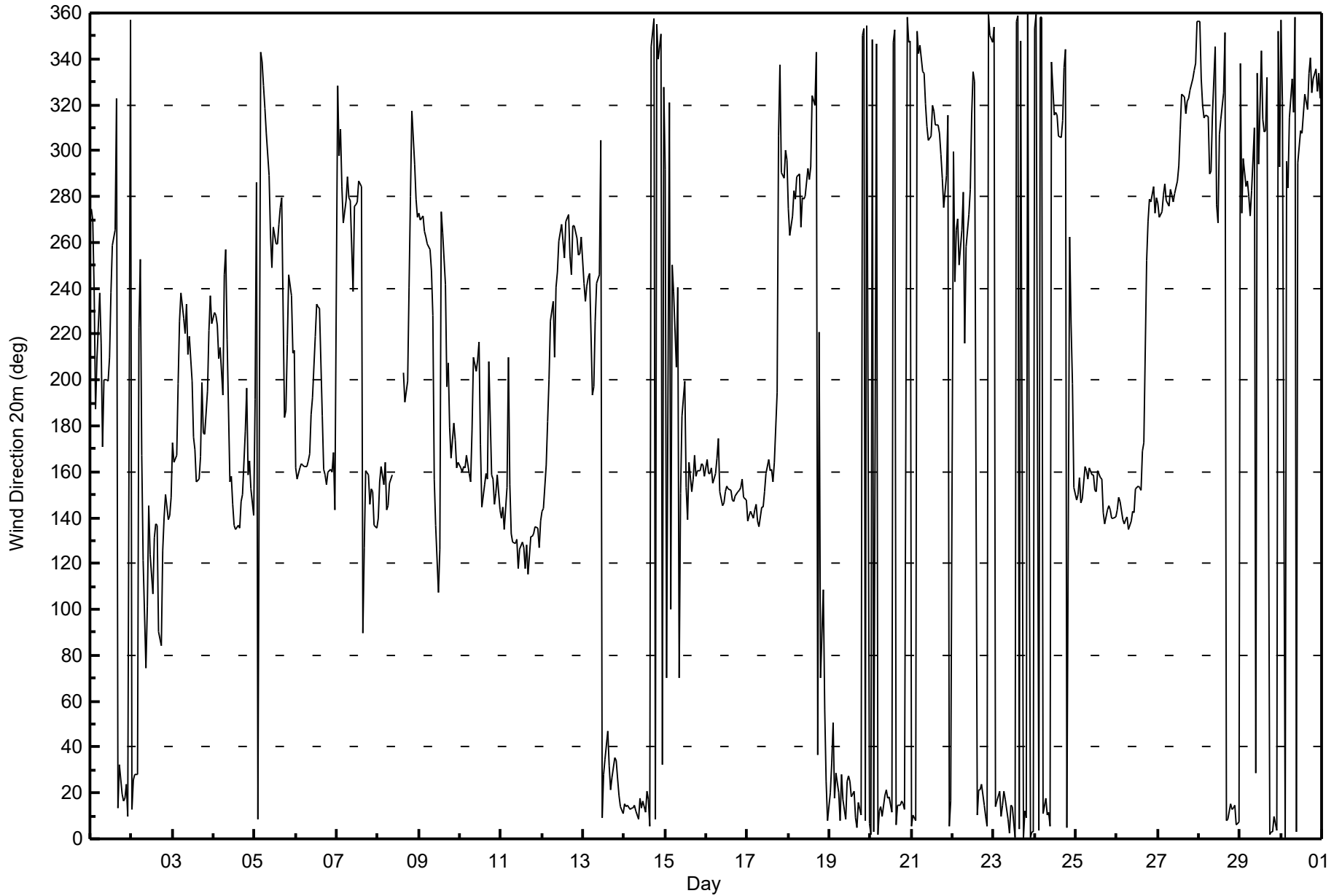
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 88 deg on Nov 15 04:00	Hours of Data: 714
Minimum Value: 4 deg on Nov 10 00:00	Hours of Missing Data: 6
Percentiles: P <sub>1</sub> = 6 P <sub>10</sub> = 8 Q <sub>1</sub> = 9 Median = 12 Q <sub>3</sub> = 16 P <sub>90</sub> = 26 P <sub>99</sub> = 63	Hours of Calibration: 0
	Percent Operational Time: 99.2

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	14	17	13	34	15	12	36	13	15	16	22	19	21	15	13	39	12	29	17	17	17	17	22	27	39
2-Nov	26	14	19	20	24	60	58	31	75	50	18	22	17	18	10	11	14	13	35	11	12	10	10	14	75
3-Nov	8	8	12	16	16	8	13	9	11	12	11	16	16	15	11	8	9	14	9	13	14	15	6	6	16
4-Nov	5	10	17	11	20	12	33	17	24	22	11	13	13	11	10	8	9	8	14	12	18	5	18	17	33
5-Nov	23	35	24	18	18	22	20	22	23	42	36	21	13	12	9	14	20	22	15	34	12	9	9	10	42
6-Nov	14	8	8	8	7	8	8	13	15	14	17	12	12	16	14	35	7	9	5	8	6	8	7	68	68
7-Nov	30	14	14	9	8	10	10	8	14	45	12	9	14	16	59	20	12	16	11	9	8	12	8	9	59
8-Nov	9	12	8	9	7	9	8	8	7	M	M	M	M	M	M	16	15	16	45	10	17	17	9	7	45
9-Nov	9	10	10	10	8	6	8	9	54	17	30	15	74	12	9	18	9	7	15	8	8	11	6	4	74
10-Nov	7	6	5	8	8	9	16	20	14	14	30	23	47	14	11	8	11	14	16	6	7	5	15	14	47
11-Nov	12	10	10	16	36	14	9	8	9	10	14	13	9	10	14	11	13	9	8	9	9	8	12	10	36
12-Nov	14	11	14	15	18	14	13	12	13	10	13	10	9	12	11	10	13	10	11	12	8	9	10	15	18
13-Nov	12	14	20	11	13	26	15	25	9	16	43	27	18	17	16	12	13	11	15	14	12	10	9	43	43
14-Nov	8	9	9	9	9	8	8	10	12	10	12	10	11	14	9	14	12	13	10	16	12	17	13	43	43
15-Nov	22	56	62	88	9	41	61	15	75	35	19	21	31	20	11	12	14	10	11	9	8	7	8	9	88
16-Nov	11	7	6	6	8	7	9	11	10	11	10	9	9	10	10	10	10	10	9	9	8	9	9	10	11
17-Nov	9	9	9	9	10	10	10	9	10	10	9	9	8	8	8	7	8	17	38	17	13	11	12	11	38
18-Nov	14	10	7	8	10	11	9	11	7	12	15	12	14	32	16	13	10	46	75	84	22	23	15	26	84
19-Nov	35	15	27	23	13	21	20	14	16	12	12	11	14	12	13	17	19	13	14	18	15	12	15	14	35
20-Nov	15	15	18	15	16	15	12	15	12	13	14	14	14	16	16	14	13	14	11	10	12	22	18	14	22
21-Nov	15	12	13	14	15	16	23	18	15	15	10	11	12	15	15	11	13	10	13	9	14	19	18	16	23
22-Nov	25	10	13	28	10	29	49	20	19	14	17	15	18	20	18	15	16	21	12	11	15	17	15	14	49
23-Nov	15	13	9	12	12	12	10	11	17	18	13	12	16	13	13	13	15	12	11	12	12	12	11	18	18
24-Nov	13	13	12	12	11	9	11	11	9	13	18	15	12	13	11	9	10	17	8	7	33	9	23	7	33
25-Nov	9	8	11	8	9	10	10	9	9	9	9	9	9	12	8	8	9	9	9	9	9	8	8	9	12
26-Nov	9	10	10	10	9	9	9	9	9	9	10	10	10	10	9	26	10	45	7	9	9	10	8	8	45
27-Nov	8	7	8	8	9	9	8	10	9	7	9	10	10	11	12	12	11	12	12	13	13	12	11	14	14
28-Nov	15	13	16	11	10	13	11	58	18	17	52	23	22	24	17	27	21	16	19	8	10	9	13	13	58
29-Nov	26	10	15	9	11	16	19	31	33	54	63	31	33	13	12	12	13	8	8	10	8	14	36	21	63
30-Nov	21	21	20	44	33	37	25	38	21	30	33	22	14	14	14	12	15	15	12	12	14	13	14	16	44

35	56	62	88	36	60	61	58	75	54	63	31	74	32	59	39	21	46	75	84	33	23	36	68	
Diurnal Maximum																								

M - Maintenance







**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 45m (WD45) - deg**  
**Mannix - November 2024**

Direction of Maximum Speed: 267 deg on Nov 12 15:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 154.5 deg on Nov 16	Hours of Data: 688
Direction of Minimum Speed: 268 deg on Nov 24 21:00	Hours of Missing Data: 32
Direction of Minimum Daily Speed Average: 2.4 deg on Nov 1	Percent Operational Time: 95.6
Monthly Average Direction: 242.7 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	269	266	238	199	213	234	238	172	201	195	194	207	235	254	261	315	12	22	18	18	19	25	12	353	258.8
2-Nov	7	26	28	35	210	223	155	122	86	95	135	117	99	126	130	129	86	80	119	134	140	133	135	140	115.5
3-Nov	160	158	163	189	225	241	233	223	229	211	217	197	174	168	154	153	169	216	191	180	197	231	250	233	197.6
4-Nov	230	225	225	220	241	230	252	251	214	157	157	141	130	129	130	129	143	143	160	175	160	166	159	145	179.4
5-Nov	169	255	356	336	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
6-Nov	UO	150	155	160	159	158	159	163	167	181	189	215	229	230	230	194	167	171	161	162	165	163	172	164	174.9
7-Nov	330	302	305	282	265	273	285	277	273	244	270	272	273	281	278	82	118	158	159	143	149	144	130	130	252.6
8-Nov	133	145	155	152	159	146	146	156	160	M	M	M	M	M	M	206	193	207	242	283	321	301	283	272	182.9
9-Nov	270	269	269	264	260	260	259	253	242	177	159	114	219	271	264	241	203	213	191	173	192	188	161	172	230.3
10-Nov	171	164	179	186	202	189	178	213	221	219	208	217	180	152	156	163	165	217	165	161	150	151	148	143	174.9
11-Nov	130	135	131	144	195	149	128	125	126	128	118	122	129	124	115	125	114	127	129	131	134	134	125	137	130.2
12-Nov	145	144	160	178	197	227	238	219	242	248	259	267	259	252	267	272	254	247	265	268	262	256	257	262	248.1
13-Nov	252	254	260	253	257	238	230	243	249	255	307	12	28	33	43	31	25	28	32	37	26	22	15	12	349.1
14-Nov	15	16	14	13	13	13	14	12	11	20	12	18	13	22	18	5	349	360	8	359	342	349	37	353	11.3
15-Nov	305	42	15	73	250	254	196	225	95	142	180	198	163	142	163	153	157	165	159	159	160	162	161	156	165.4
16-Nov	168	167	165	163	157	158	168	172	151	145	145	151	153	153	152	147	146	148	150	151	153	156	149	146	154.5
17-Nov	138	141	143	139	143	146	140	136	145	144	152	159	165	161	162	157	174	203	307	UO	UO	299	301	297	163.5
18-Nov	282	UO	270	284	280	289	291	272	277	280	280	292	287	294	326	326	346	45	131	89	107	54	31	15	293.0
19-Nov	15	42	56	21	28	27	9	28	18	9	22	25	24	19	21	9	4	15	9	350	355	8	355	6	13.6
20-Nov	1	350	1	348	2	11	13	10	17	20	16	18	13	349	353	8	15	15	15	14	12	359	348	345	6.8
21-Nov	5	11	9	352	340	344	337	335	322	314	304	306	318	318	314	311	306	300	291	283	295	316	6	18	329.7
22-Nov	311	262	277	274	256	272	283	249	276	287	284	315	332	339	8	20	22	21	17	11	10	360	352	347	331.2
23-Nov	355	15	17	22	10	13	20	18	8	4	14	18	1	358	0	5	352	1	12	9	2	2	3	4	7.8
24-Nov	358	1	6	1	360	10	15	10	13	6	342	321	321	317	309	305	320	343	352	17	268	203	199	153	354.3
25-Nov	146	148	156	150	151	164	162	157	162	156	153	145	143	153	UO	UO	138	136	141	143	142	138	139	139	147.1
26-Nov	142	145	145	137	136	137	139	134	138	142	141	145	152	154	148	163	177	247	270	278	278	284	273	280	177.2
27-Nov	277	271	274	280	286	279	277	283	280	278	281	287	292	310	325	323	317	321	323	328	331	334	339	357	299.4
28-Nov	355	336	321	319	319	319	298	293	323	354	302	282	307	318	328	356	12	10	14	14	17	22	18	11	337.8
29-Nov	357	292	316	312	352	329	295	318	321	48	318	334	353	325	312	315	346	8	7	7	15	12	25	329	345.8
30-Nov	358	336	23	10	357	331	349	341	9	32	331	323	321	317	328	320	338	347	329	333	339	326	335	326	338.2

304.4 210.5 240.7 247.1 238.8 239.1 246.8 220.2 225.0 212.9 243.2 262.5 268.9 256.1 313.0 21.2 137.9 185.1 19.8 82.0 100.0 285.4 91.9 359.9

Diurnal Average

M - Maintenance

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction 45m (WD45) - deg

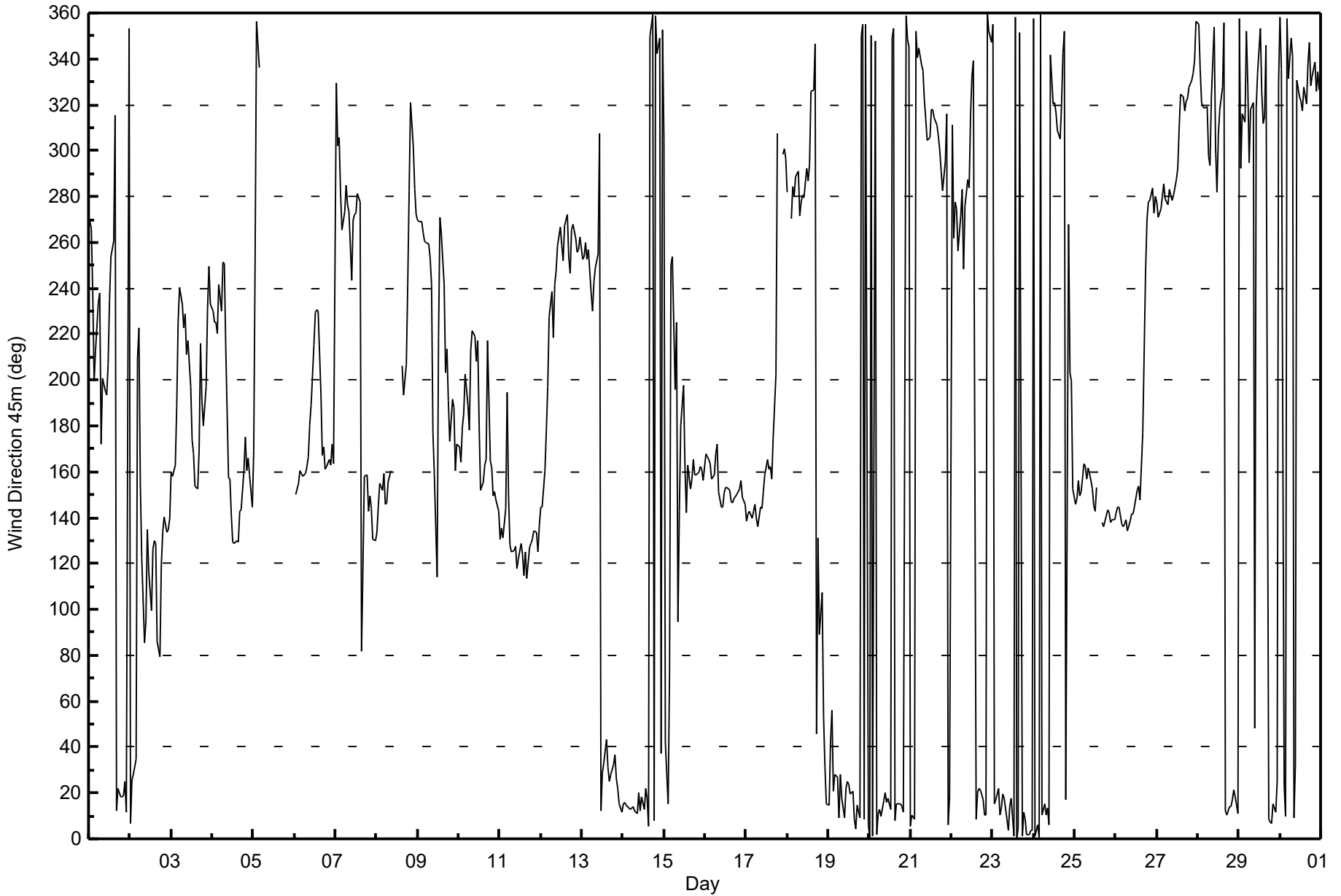
Mannix - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 94 deg on Nov 18 20:00			Hours of Data:	688
Minimum Value: 3 deg on Nov 29 18:00			Hours of Missing Data:	32
			Hours of Calibration:	0
			Percent Operational Time:	95.6
Percentiles: P <sub>1</sub> = 4 P <sub>10</sub> = 6 Q <sub>1</sub> = 7 Median = 9 Q <sub>3</sub> = 13 P <sub>90</sub> = 22 P <sub>99</sub> = 68				

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	12	13	9	32	13	9	39	16	15	9	15	16	17	12	10	36	10	21	14	13	11	12	17	15	39
2-Nov	22	10	11	20	50	58	47	27	68	43	16	21	14	16	9	9	13	10	31	8	9	8	7	10	68
3-Nov	5	5	8	10	16	5	8	5	8	6	6	11	11	11	8	5	11	9	6	8	10	14	4	4	16
4-Nov	3	5	11	9	10	12	13	14	21	20	11	12	12	10	9	6	7	3	12	7	11	5	6	8	21
5-Nov	8	55	18	9	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	55
6-Nov	UO	4	5	5	5	6	6	10	12	8	12	9	10	11	11	31	8	9	8	5	4	5	4	53	53
7-Nov	17	15	12	7	6	8	6	5	10	35	9	7	10	14	57	21	11	22	12	7	5	9	5	6	57
8-Nov	6	7	4	5	4	5	4	7	4	M	M	M	M	M	M	11	10	15	38	10	14	13	6	5	38
9-Nov	7	8	8	9	6	4	5	6	43	32	38	19	70	10	7	14	6	4	17	7	7	15	6	4	70
10-Nov	6	8	8	13	7	9	24	14	7	8	23	19	41	14	10	8	16	10	23	5	6	5	16	12	41
11-Nov	10	8	6	12	27	12	8	8	8	7	11	11	7	8	12	10	10	8	6	6	7	7	11	7	27
12-Nov	13	8	10	9	15	11	9	6	10	8	10	8	7	9	9	8	11	7	10	9	6	7	7	12	15
13-Nov	9	10	10	7	7	20	16	16	6	14	40	23	14	13	12	9	9	8	10	13	9	8	8	6	40
14-Nov	5	6	5	5	6	5	5	7	8	6	9	6	7	9	6	10	8	8	6	11	10	18	8	44	44
15-Nov	24	26	38	79	12	39	70	24	74	25	12	14	31	18	9	10	11	7	8	6	6	3	6	4	79
16-Nov	6	4	4	4	5	5	6	6	7	8	8	7	7	8	8	8	8	8	8	7	6	7	7	8	8
17-Nov	6	8	8	7	7	7	8	7	8	7	7	7	6	6	5	5	7	12	39	UO	UO	4	9	7	39
18-Nov	10	UO	6	6	6	8	6	10	4	9	13	8	10	28	14	11	9	36	85	94	21	19	11	23	94
19-Nov	36	16	23	16	10	18	15	10	13	8	8	8	10	9	9	14	17	9	11	13	11	9	13	11	36
20-Nov	12	13	16	11	13	12	10	12	8	10	10	10	10	14	14	11	9	9	7	6	8	19	15	11	19
21-Nov	12	9	10	12	11	11	18	15	10	12	7	8	10	11	12	8	9	5	10	6	12	16	15	12	18
22-Nov	24	11	10	13	6	9	21	15	12	7	12	13	14	15	13	11	11	18	9	8	13	15	14	10	24
23-Nov	12	9	7	9	9	8	6	8	14	15	8	9	13	8	8	11	8	7	9	8	8	8	8	7	15
24-Nov	9	9	8	8	7	6	8	8	8	10	11	13	10	9	9	5	8	12	6	12	87	16	11	6	87
25-Nov	8	7	7	6	5	7	6	7	7	8	12	7	7	11	UO	UO	5	7	6	6	6	5	6	6	12
26-Nov	6	7	8	7	7	7	7	7	7	7	7	9	11	8	10	20	4	41	6	7	9	8	6	6	41
27-Nov	7	5	7	7	7	7	7	7	7	6	7	7	7	11	9	9	8	9	8	10	10	9	9	10	11
28-Nov	12	10	13	8	8	8	6	27	20	13	48	21	19	23	12	25	14	10	12	6	8	7	11	10	48
29-Nov	13	17	23	27	17	31	19	27	31	20	35	33	27	17	10	9	13	3	3	6	4	10	29	34	35
30-Nov	11	22	10	40	36	24	20	31	24	15	36	16	12	10	10	9	12	10	10	10	9	9	10	11	40

36	55	38	79	50	58	70	31	74	43	48	33	70	28	57	36	17	41	85	94	87	19	29	53	
Diurnal Maximum																								

M - Maintenance      UO - Unstable Operation





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 75m (WD75) - deg**  
**Mannix - November 2024**

Direction of Maximum Speed: 157 deg on Nov 16 14:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 159.2 deg on Nov 16	Hours of Data: 679
Direction of Minimum Speed: 106 deg on Nov 18 20:00	Hours of Missing Data: 41
Direction of Minimum Daily Speed Average: 3.5 deg on Nov 1	Percent Operational Time: 94.3
Monthly Average Direction: 242.7 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	270	268	248	227	224	239	257	187	206	198	197	210	235	256	263	315	15	22	26	28	27	UO	UO	UO	251.1
2-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	108	102	132	132	131	91	83	124	137	140	137	135	140	--
3-Nov	155	158	164	185	231	247	241	231	232	219	225	206	186	174	163	157	182	235	213	199	215	244	256	250	207.1
4-Nov	244	236	235	236	254	253	261	249	215	171	166	148	134	133	132	133	150	157	163	164	163	171	173	174	192.8
5-Nov	197	284	348	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	238	224	228	--
6-Nov	181	160	160	166	165	164	165	168	172	183	195	217	231	233	233	213	191	190	179	177	178	177	202	236	184.1
7-Nov	334	309	309	286	268	275	288	281	276	255	271	275	274	281	275	84	119	168	168	151	153	147	135	135	253.9
8-Nov	138	144	154	158	169	166	169	175	174	M	M	M	M	M	M	210	201	221	255	289	329	310	292	278	193.9
9-Nov	272	272	270	268	262	262	262	259	249	224	209	158	237	271	264	245	210	219	197	187	213	205	176	192	240.5
10-Nov	192	178	205	218	230	228	224	234	234	232	223	227	195	167	161	174	189	225	181	168	161	161	148	145	190.3
11-Nov	134	135	132	140	184	148	133	127	130	132	124	126	135	127	117	127	120	128	133	136	138	139	133	141	134.8
12-Nov	152	149	162	179	200	232	243	229	246	250	261	269	261	254	269	274	256	250	269	272	266	262	262	266	249.7
13-Nov	263	267	267	258	261	264	257	255	260	272	314	18	32	37	47	36	32	36	37	45	31	30	22	18	349.4
14-Nov	23	24	21	19	17	19	20	19	18	29	17	24	19	26	24	10	359	7	13	7	353	354	47	14	17.9
15-Nov	307	356	359	71	243	233	182	185	128	142	177	197	176	149	165	160	161	165	160	160	163	168	173	164	167.7
16-Nov	177	175	172	171	164	165	172	171	156	149	148	154	157	157	155	151	151	152	155	156	156	160	154	151	159.2
17-Nov	144	147	147	144	147	150	146	143	148	148	157	162	169	166	170	169	189	212	314	342	297	293	302	300	176.6
18-Nov	280	268	274	289	286	293	296	279	281	285	283	296	290	299	326	327	348	51	87	106	115	56	41	26	293.7
19-Nov	15	56	67	31	34	40	15	32	22	14	24	28	27	24	23	13	8	18	13	356	360	12	358	9	17.9
20-Nov	4	355	6	355	6	14	16	13	19	22	20	21	16	354	358	13	20	19	18	17	15	3	352	349	10.7
21-Nov	9	14	15	356	343	349	343	340	329	322	309	310	322	324	323	318	312	308	298	297	308	323	12	23	336.6
22-Nov	323	287	283	285	268	282	284	274	291	299	292	318	334	354	12	24	26	24	23	16	17	6	357	352	333.2
23-Nov	2	20	22	27	16	18	23	21	14	9	18	25	7	5	5	8	360	6	16	14	8	7	9	9	12.8
24-Nov	6	6	12	7	6	15	19	16	20	12	354	336	334	326	317	310	332	351	0	30	104	178	174	160	5.3
25-Nov	153	152	163	158	158	166	166	160	175	160	UO	UO	UO	148	144	141	141	141	144	145	145	142	144	142	150.7
26-Nov	145	146	146	141	141	141	145	140	143	145	147	145	153	149	161	187	253	272	282	282	287	276	284	178.0	
27-Nov	282	274	279	284	290	282	280	287	284	283	285	292	296	315	329	328	323	327	328	333	336	338	345	1	304.6
28-Nov	359	344	329	330	329	328	312	300	329	3	350	315	312	326	335	360	14	13	18	21	26	30	29	20	347.5
29-Nov	12	316	344	13	22	2	327	324	341	349	337	7	10	353	324	329	5	23	22	27	37	37	40	33	8.0
30-Nov	19	24	66	82	78	39	41	28	38	58	27	352	353	330	337	329	348	359	341	343	347	330	340	335	0.2

237.0 223.6 235.9 233.0 238.8 240.3 256.3 235.2 234.8 227.5 258.6 271.7 271.8 248.8 308.2 115.8 171.3 241.8 15.1 52.0 151.7 217.6 210.1 283.4

Diurnal Average

M - Maintenance

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

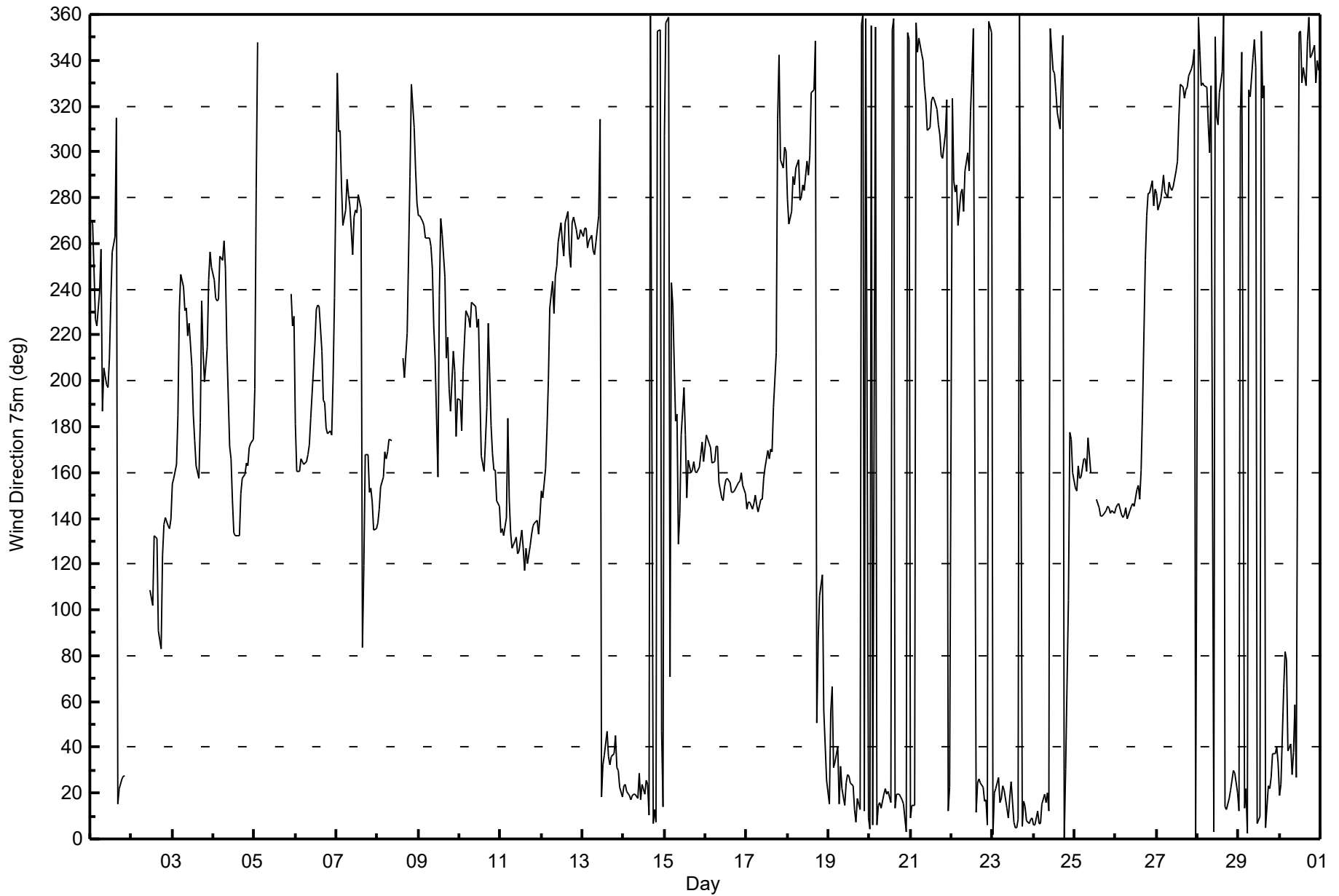
**Wind Direction 75m (WD75) - deg**  
**Mannix - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 81 deg on Nov 18 20:00	Hours of Data: 679
Minimum Value: 2 deg on Nov 29 18:00	Hours of Missing Data: 41
Percentiles: P <sub>1</sub> = 3 P <sub>10</sub> = 4 Q <sub>1</sub> = 6 Median = 8 Q <sub>3</sub> = 12 P <sub>90</sub> = 20 P <sub>99</sub> = 53	Hours of Calibration: 0
	Percent Operational Time: 94.3

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	11	11	8	24	13	12	39	25	18	8	12	13	17	11	10	36	12	21	11	9	10	UO	UO	UO	39
2-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	20	14	14	9	9	13	8	28	6	6	6	4	7	28
3-Nov	4	3	7	9	15	5	6	4	6	5	4	11	9	8	6	3	16	8	9	6	9	11	3	4	16
4-Nov	4	5	6	9	4	9	9	12	20	24	10	15	17	11	11	7	10	2	5	7	3	3	3	8	24
5-Nov	9	55	11	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	5	5	6	55
6-Nov	15	5	4	5	4	5	6	8	9	6	11	8	9	10	10	23	8	8	10	4	4	4	7	52	52
7-Nov	17	14	12	7	6	8	6	5	8	26	9	6	10	13	56	25	15	28	12	6	3	7	4	5	56
8-Nov	3	4	3	4	4	3	4	6	3	M	M	M	M	M	M	9	7	12	31	17	13	10	6	4	31
9-Nov	6	7	7	8	5	4	4	5	20	32	37	59	59	10	7	12	5	4	11	13	3	15	9	8	59
10-Nov	12	10	8	12	5	9	20	10	7	6	19	25	34	12	8	8	14	10	24	6	5	6	8	8	34
11-Nov	9	9	8	10	23	9	10	11	11	10	12	12	9	12	14	12	13	12	9	7	6	6	10	6	23
12-Nov	10	6	6	8	15	11	8	4	7	6	10	8	7	7	9	8	10	7	10	8	5	5	6	11	15
13-Nov	8	8	7	5	5	8	13	12	5	14	36	18	11	11	9	7	7	6	8	13	6	7	7	5	36
14-Nov	5	4	3	4	5	4	4	5	8	6	9	6	6	7	5	8	6	5	5	8	14	19	13	38	38
15-Nov	19	22	23	58	49	33	38	27	17	18	9	11	25	13	8	7	7	4	5	5	3	4	5	4	58
16-Nov	5	3	3	3	4	4	4	4	6	5	6	5	5	6	7	7	6	6	6	6	5	6	5	6	7
17-Nov	5	6	6	5	5	5	6	6	6	5	6	6	5	5	5	6	8	9	40	11	7	6	8	6	40
18-Nov	10	6	5	6	5	6	5	10	4	7	13	6	9	27	16	9	10	31	53	81	21	18	11	25	81
19-Nov	38	12	17	16	10	19	14	8	11	7	6	6	9	7	8	13	14	8	10	12	10	8	11	11	38
20-Nov	11	10	15	10	12	11	8	9	5	8	9	8	8	13	12	11	7	8	5	4	6	17	14	8	17
21-Nov	11	8	8	12	9	10	14	15	9	11	7	7	8	11	12	9	8	5	7	5	9	14	15	9	15
22-Nov	20	16	10	8	4	8	5	6	6	6	10	14	15	14	9	10	10	16	8	8	12	14	12	9	20
23-Nov	11	9	6	7	8	9	5	5	13	14	8	7	12	6	6	7	7	5	6	7	7	6	6	5	14
24-Nov	8	7	6	6	6	5	6	6	8	10	9	16	9	8	11	6	7	10	6	14	56	12	5	5	56
25-Nov	6	5	4	3	2	3	4	5	10	11	UO	UO	UO	8	4	4	2	3	4	4	2	3	3	3	11
26-Nov	4	4	5	5	5	5	6	4	5	5	6	8	7	8	8	12	11	30	5	7	8	7	6	6	30
27-Nov	7	6	6	6	6	7	6	7	6	6	6	7	6	11	8	7	7	7	6	9	8	8	7	9	11
28-Nov	9	8	9	5	5	7	6	9	20	10	36	20	17	22	11	24	12	9	10	5	8	5	7	9	36
29-Nov	11	27	24	23	8	30	35	20	15	20	21	30	23	20	14	10	7	2	2	9	7	6	10	39	39
30-Nov	15	16	14	12	22	32	6	11	12	11	35	15	13	12	10	9	12	7	8	8	8	8	8	9	35

38	55	24	58	49	33	39	27	20	32	37	59	59	27	56	36	16	31	53	81	56	19	15	52	
Diurnal Maximum																								

M - Maintenance      UO - Unstable Operation





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 90m (WD90) - deg**  
**Mannix - November 2024**

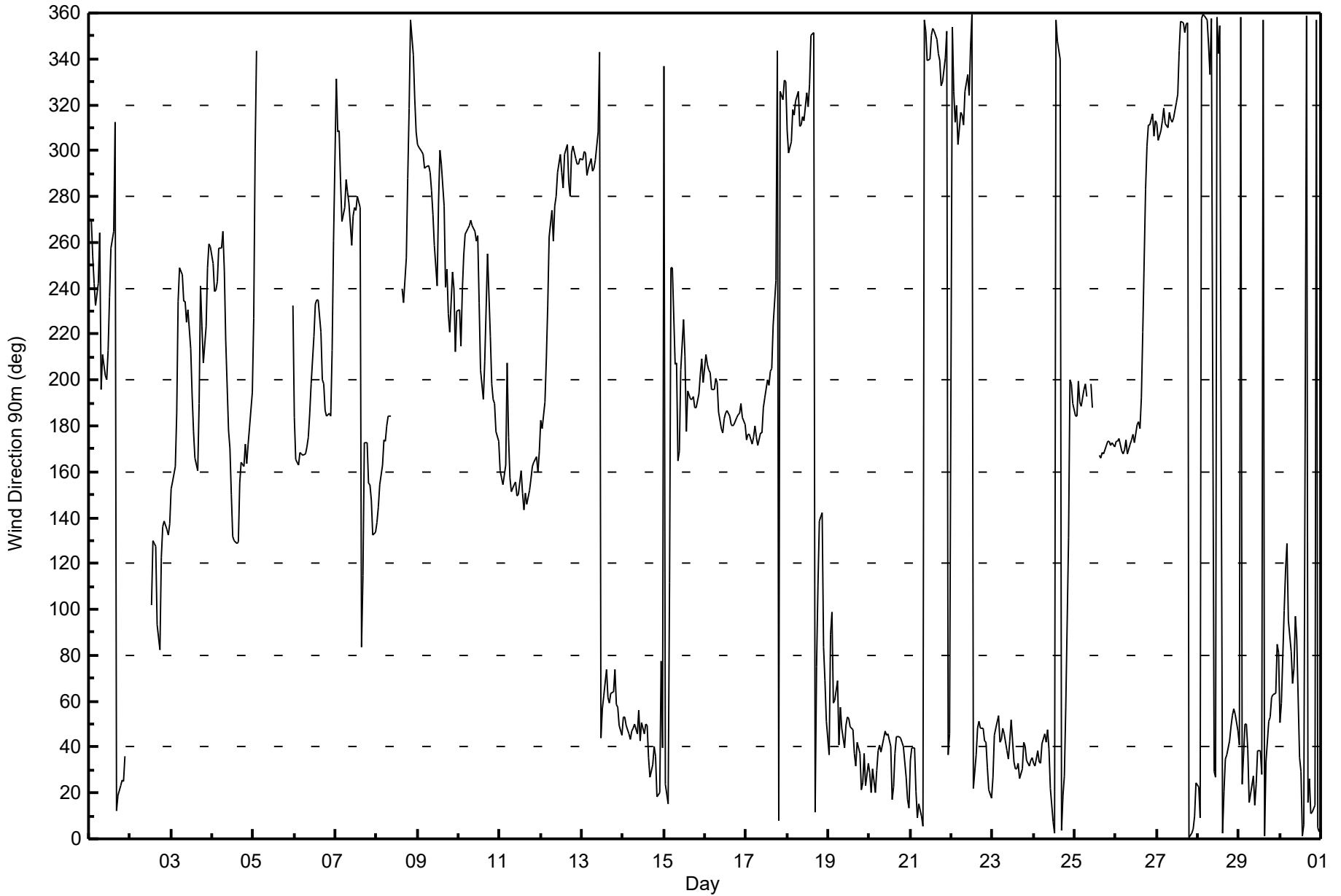
Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 89 deg on Nov 18 20:00			Hours of Data:	677
Minimum Value: 2 deg on Nov 29 18:00			Hours of Missing Data:	43
			Hours of Calibration:	0
			Percent Operational Time:	94.0
Percentiles: P <sub>1</sub> = 3 P <sub>10</sub> = 4 Q <sub>1</sub> = 5 Median = 7 Q <sub>3</sub> = 11 P <sub>90</sub> = 18 P <sub>99</sub> = 49				

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	10	11	6	16	13	11	38	26	17	8	11	12	16	10	10	33	11	17	10	8	9	10	UO	UO	38
2-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	13	15	8	9	11	9	26	5	5	5	3	6	26
3-Nov	4	3	7	10	15	5	4	3	5	5	3	10	10	7	6	4	18	7	9	6	9	8	3	5	18
4-Nov	5	6	4	7	4	7	8	11	19	27	12	17	19	9	10	6	10	3	2	4	5	4	6	16	27
5-Nov	19	39	9	UO	UO	16	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	6	39
6-Nov	15	4	4	5	4	5	5	8	9	6	10	8	8	9	9	19	8	7	9	4	4	5	7	37	37
7-Nov	16	12	11	6	6	7	5	4	7	21	9	6	10	12	52	27	11	29	11	7	3	6	4	5	52
8-Nov	3	3	3	4	5	4	5	8	5	M	M	M	M	M	M	8	6	11	29	18	11	8	7	4	29
9-Nov	5	7	6	7	5	4	4	5	10	28	32	84	49	9	8	12	4	6	9	16	4	14	10	9	84
10-Nov	12	11	8	12	4	11	15	10	7	5	17	30	32	13	7	9	13	9	23	6	6	5	5	7	32
11-Nov	6	6	5	9	21	9	9	8	8	8	8	9	8	8	10	9	10	9	8	6	5	6	10	5	21
12-Nov	10	5	5	8	13	11	8	4	7	6	9	8	7	8	9	7	10	7	9	7	5	5	6	10	13
13-Nov	8	7	5	5	5	6	11	9	4	12	31	18	11	12	10	7	6	6	7	14	6	7	8	6	31
14-Nov	5	4	4	4	5	4	4	6	9	5	9	7	6	7	6	8	6	5	5	8	14	18	23	35	35
15-Nov	17	50	50	60	41	32	23	18	16	17	9	10	23	14	8	6	6	4	5	4	3	5	6	4	60
16-Nov	5	4	4	3	3	3	4	3	6	5	5	4	4	6	7	6	6	6	6	5	5	5	5	6	7
17-Nov	5	6	6	5	4	4	6	6	5	5	6	6	5	5	6	7	7	9	39	9	7	6	7	6	39
18-Nov	9	6	5	5	5	6	5	10	3	6	12	6	9	24	15	8	9	33	27	89	18	18	12	27	89
19-Nov	35	14	18	19	11	19	13	8	11	6	6	6	8	7	7	13	14	7	10	11	9	8	11	10	35
20-Nov	10	10	14	9	12	11	8	9	5	7	8	8	8	12	11	11	7	7	5	4	6	15	13	7	15
21-Nov	11	8	7	11	8	9	11	13	7	9	6	6	7	9	11	7	7	4	7	6	7	11	17	9	17
22-Nov	19	17	9	8	2	8	4	5	5	5	10	14	14	13	9	9	10	16	8	8	12	14	11	8	19
23-Nov	11	9	6	7	8	9	4	5	13	13	8	11	6	4	6	6	4	6	6	7	5	6	5	13	13
24-Nov	7	7	5	6	5	5	5	6	8	11	8	13	8	8	9	6	8	9	6	15	47	13	4	4	47
25-Nov	4	4	3	4	2	4	4	4	UO	11	14	UO	UO	UO	4	3	3	5	4	4	2	3	3	3	14
26-Nov	4	4	5	5	4	5	6	5	5	5	6	7	6	7	6	11	13	28	5	6	7	7	6	6	28
27-Nov	6	6	6	5	6	6	6	6	6	5	6	6	6	10	6	6	6	6	5	7	6	6	6	8	10
28-Nov	8	7	6	4	4	6	5	7	18	10	27	16	14	18	9	24	10	9	10	6	7	5	5	9	27
29-Nov	10	28	16	16	9	15	20	21	24	25	16	23	21	18	15	9	7	2	2	8	5	7	18	83	83
30-Nov	28	18	14	10	13	25	9	8	11	15	40	18	10	10	8	7	11	6	8	7	8	6	6	8	40

35	50	50	60	41	32	38	26	24	28	40	84	49	24	52	33	18	33	39	89	47	18	23	83	
Diurnal Maximum																								

M - Maintenance      UO - Unstable Operation







Maximum Value: 1.2 km/h on Nov 11 17:00		Maximum Daily Average: 0.6 km/h on Nov 11		Hours in Service:	720																														
Minimum Value: -1.6 km/h on Nov 17 21:00		Minimum Daily Average: -0.4 km/h on Nov 27		Hours of Data:	714																														
Maximum Diurnal Average: 0.1 km/h at hour 13		Minimum Diurnal Average: 0.0 km/h at hour 20		Hours of Missing Data:	6																														
Monthly Average: 0.06 km/h		Percentiles: P <sub>1</sub> = -0.6 P <sub>10</sub> = -0.3 Q <sub>1</sub> = -0.2 Median = 0.0 Q <sub>3</sub> = 0.3 P <sub>90</sub> = 0.6 P <sub>99</sub> = 0.9		Hours of Calibration:	0																														
				Percent Operational Time:	99.2																														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Nov	0.1	0.1	0.0	0.1	0.0	-0.1	0.0	0.1	0.0	0.0	0.2	-0.1	0.1	0.1	0.1	0.0	-0.2	0.2	0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2				
2-Nov	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	0.2	0.4	0.2	0.1	0.4	0.6	0.7	0.5	0.6	0.7	0.6	0.4	0.5	0.5	0.4	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.7					
3-Nov	0.1	0.2	0.1	0.0	-0.2	-0.3	-0.2	-0.2	-0.1	-0.1	-0.1	0.1	0.2	0.4	0.5	0.6	0.4	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6				
4-Nov	0.0	-0.1	0.0	-0.1	0.0	-0.1	0.0	0.0	0.1	0.2	0.5	0.3	0.5	0.7	0.5	0.4	0.5	0.3	0.1	0.0	0.3	0.6	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.7				
5-Nov	0.1	0.0	-0.1	-0.1	-0.3	0.0	0.1	0.2	0.3	0.3	0.1	0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3				
6-Nov	0.4	0.9	1.1	0.8	0.9	1.1	1.0	0.7	0.7	0.0	0.1	-0.1	-0.2	0.1	0.0	0.2	0.5	0.5	0.7	0.7	0.7	0.9	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.1			
7-Nov	-0.1	-0.3	-0.5	-0.3	-0.1	-0.3	-0.6	-0.3	-0.1	0.0	-0.2	-0.2	-0.1	-0.2	-0.1	0.4	0.3	0.4	0.5	0.6	0.7	0.5	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9		
8-Nov	0.7	0.4	0.7	0.7	0.9	0.7	0.7	0.8	0.8	M	M	M	M	M	M	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.9			
9-Nov	-0.2	-0.2	-0.1	-0.2	-0.2	-0.4	-0.3	-0.4	-0.1	0.2	0.4	0.4	0.4	0.0	-0.2	-0.1	-0.2	-0.3	0.0	0.3	-0.1	0.1	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5			
10-Nov	0.3	0.5	0.2	0.2	0.1	0.1	0.1	-0.1	-0.1	-0.2	-0.1	-0.3	0.3	0.4	0.3	0.3	0.3	-0.2	0.2	0.3	0.4	0.5	0.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5			
11-Nov	0.7	0.4	0.7	0.3	-0.1	0.3	0.4	0.4	0.5	0.7	0.9	1.1	0.3	0.7	1.0	0.6	1.2	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1.2		
12-Nov	0.3	0.3	0.3	0.0	-0.1	-0.3	-0.3	-0.2	-0.5	-0.6	-0.8	-0.5	-0.5	-0.6	-0.6	-0.5	-0.7	-0.8	-0.3	-0.2	-0.3	-0.4	-0.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	0.3		
13-Nov	-0.3	-0.3	-0.2	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.1	-0.1	0.1	0.3	0.2	0.3	0.1	0.1	0.2	0.3	0.1	0.2	0.1	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3		
14-Nov	-0.2	-0.1	-0.2	-0.3	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	0.0	-0.1	-0.3	0.2	-0.1	-0.2	-0.1	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2		
15-Nov	-0.1	0.0	0.0	0.2	-0.2	-0.2	-0.1	-0.2	0.1	0.3	0.1	0.1	0.7	0.5	0.2	0.4	0.3	0.1	0.3	0.3	0.3	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.7		
16-Nov	0.2	0.4	0.5	0.5	0.6	0.6	0.4	0.0	0.6	0.6	0.6	0.6	0.6	0.5	0.7	0.8	0.6	0.7	0.5	0.6	0.5	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8		
17-Nov	0.5	0.5	0.4	0.6	0.6	0.5	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.3	-0.2	-0.4	-1.6	-1.6	-1.1	-0.6	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	0.6		
18-Nov	-0.2	-0.2	-0.3	-0.4	-0.1	-0.3	-0.3	-0.3	-0.2	-0.2	-0.1	-0.2	-0.1	0.0	0.0	0.0	-0.1	0.1	0.0	0.1	0.5	0.2	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.5		
19-Nov	0.0	0.1	0.2	0.0	0.2	0.1	-0.1	-0.1	0.0	-0.2	0.3	0.1	0.2	-0.1	0.0	-0.1	0.0	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.3		
20-Nov	-0.2	-0.3	-0.3	0.0	-0.1	-0.3	-0.1	-0.2	-0.2	-0.1	-0.3	0.0	-0.1	-0.1	-0.1	0.0	-0.2	0.2	-0.2	-0.4	-0.5	0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.2		
21-Nov	-0.2	-0.1	-0.2	-0.3	0.0	0.0	0.1	-0.1	0.1	-0.1	-0.4	-0.2	-0.2	-0.1	0.0	-0.3	0.0	-0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1		
22-Nov	0.0	0.0	0.0	0.0	-0.3	-0.1	0.0	-0.1	-0.1	0.0	0.0	-0.1	0.0	0.1	-0.1	0.3	0.2	0.0	-0.1	-0.2	0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	0.3		
23-Nov	-0.1	-0.1	-0.2	0.2	-0.1	-0.1	0.0	-0.1	-0.2	-0.2	0.0	0.2	-0.2	-0.1	-0.2	-0.1	-0.2	-0.5	-0.2	-0.2	-0.2	-0.2	-0.4	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	0.2		
24-Nov	-0.2	-0.2	-0.2	-0.3	-0.3	-0.1	0.0	-0.2	-0.1	-0.1	0.1	0.1	0.1	0.1	-0.1	0.0	0.0	-0.1	-0.2	0.0	-0.1	-0.3	-0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
25-Nov	0.3	0.2	0.2	0.4	0.3	0.3	0.5	0.4	0.3	0.3	0.2	0.3	0.3	0.1	0.2	0.2	0.3	0.6	0.7	0.7	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7		
26-Nov	0.8	0.6	0.5	0.6	0.5	0.6	0.6	0.5	0.8	0.8	0.6	0.4	0.3	0.5	0.2	0.1	0.2	0.0	-0.3	-0.4	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	0.8		
27-Nov	-0.2	-0.2	-0.4	-0.4	-0.3	-0.4	-0.4	-0.3	-0.4	-0.4	-0.2	-0.4	-0.2	-0.6	-0.6	-0.7	-0.4	-0.4	-0.4	-0.5	-0.3	-0.4	-0.3	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	
28-Nov	0.1	-0.3	-0.4	-0.4	-0.3	-0.4	-0.2	-0.1	-0.2	-0.1	-0.1	-0.1	0.2	-0.1	0.0	0.0	0.0	-0.1	0.0	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.2		
29-Nov	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.1	-0.1	0.0	0.2	0.1	0.0	0.1	-0.2	-0.1	-0.1	-0.2	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.2	
30-Nov	-0.1	0.0	-0.1	-0.1	-0.2	0.1	-0.1	-0.1	0.0	0.0	0.2	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.2	
		0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Dial Average	
		0.8	0.9	1.1	0.8	0.9	1.1	1.0	0.8	0.8	0.8	0.9	1.1	0.7	0.7	1.0	0.8	1.2	0.7	0.7	0.7	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	Dial Maximum
M - Maintenance																																			



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 2.9 km/h on Nov 17 20:00 Minimum Value: 0.1 km/h on Nov 29 03:00 Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.7 Median = 1.1 Q <sub>3</sub> = 1.7 P <sub>90</sub> = 2.1 P <sub>99</sub> = 2.7																					Hours in Service: 720 Hours of Data: 714 Hours of Missing Data: 6 Hours of Calibration: 0 Percent Operational Time: 99.2				
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	0.8	0.7	0.6	0.4	0.5	0.6	0.7	0.5	0.7	0.7	1.0	0.9	0.9	0.8	0.8	0.7	0.6	0.5	0.6	0.7	0.7	0.8	0.5	0.4	1.0
2-Nov	0.6	0.7	0.8	0.6	0.4	0.4	0.4	0.7	0.7	0.8	1.1	1.1	1.4	1.5	1.8	1.6	1.6	1.6	1.2	1.4	1.2	1.4	1.4	0.9	1.8
3-Nov	0.5	0.5	0.7	0.9	1.0	0.8	0.6	0.8	0.6	1.0	1.0	1.2	1.0	1.3	1.0	1.1	0.6	0.7	0.7	1.1	1.0	0.5	0.3	0.3	1.3
4-Nov	0.4	0.6	0.5	0.6	0.3	0.5	0.8	1.0	1.1	0.8	1.0	1.0	1.1	1.1	1.1	1.1	0.7	0.3	0.4	0.4	0.5	0.5	0.5	0.5	1.1
5-Nov	0.4	0.3	0.6	1.2	1.3	1.1	1.0	1.0	0.9	1.0	0.8	0.8	0.9	0.9	0.7	0.7	0.4	0.5	0.6	0.6	0.8	1.1	1.0	1.0	1.3
6-Nov	0.5	1.4	1.9	1.5	1.5	1.9	1.6	1.7	1.7	2.0	1.9	2.4	2.1	1.9	1.4	0.9	0.7	0.7	0.7	0.9	1.0	1.0	0.9	0.5	2.4
7-Nov	0.5	1.3	1.7	1.6	1.3	2.2	2.5	1.7	1.4	1.0	1.6	1.6	1.4	1.3	1.1	0.7	0.9	0.7	0.8	1.0	1.2	1.1	1.7	2.0	2.5
8-Nov	1.6	0.9	0.8	1.0	1.3	1.4	1.2	1.2	1.0	M	M	M	M	M	M	1.2	0.9	1.1	0.8	0.6	1.4	1.0	0.4	0.5	1.6
9-Nov	0.6	1.4	1.2	0.8	0.8	0.9	1.0	0.7	0.4	0.5	0.8	0.8	1.1	1.2	0.9	0.4	0.5	0.6	0.6	0.6	1.0	0.6	0.6	0.5	1.4
10-Nov	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.6	0.8	0.9	1.0	1.0	1.1	1.0	1.0	0.7	0.5	0.6	0.3	0.3	0.6	0.5	0.7	0.9	1.1
11-Nov	1.2	1.1	1.7	1.4	0.8	1.0	1.7	2.1	2.2	2.4	2.0	2.0	1.9	2.1	1.9	1.9	1.9	1.8	1.6	1.5	1.6	1.3	1.1	1.2	2.4
12-Nov	0.6	0.8	0.8	0.9	1.5	1.2	1.1	1.0	1.7	2.6	2.6	2.0	2.3	2.8	2.6	2.1	2.6	2.6	1.6	1.2	1.4	1.4	1.8	1.5	2.8
13-Nov	0.7	0.5	0.4	0.5	0.6	0.5	0.5	0.5	0.7	0.9	1.3	1.4	1.4	1.5	1.5	1.4	1.1	1.5	1.5	1.2	1.6	1.3	1.2	1.4	1.6
14-Nov	1.5	1.5	1.9	2.0	1.8	1.7	1.7	1.6	1.6	1.4	1.4	1.6	1.5	1.5	1.2	1.1	1.1	1.4	1.1	0.9	0.5	0.5	0.6	0.4	2.0
15-Nov	0.3	0.2	0.2	0.5	0.5	0.5	0.4	0.3	0.4	0.8	1.2	1.2	1.2	1.0	1.0	1.0	1.1	0.8	1.0	1.0	1.0	1.0	0.8	0.5	1.2
16-Nov	0.5	0.6	0.7	0.9	1.3	1.6	1.5	2.0	1.9	1.9	1.7	1.7	1.8	2.6	2.4	2.4	2.4	2.3	2.0	2.1	2.0	1.9	2.0	1.8	2.6
17-Nov	1.7	1.8	1.8	1.9	1.8	1.8	1.8	1.9	1.5	1.8	1.6	1.6	1.5	1.4	1.2	1.0	0.8	1.1	1.7	2.9	2.8	2.5	2.0	2.2	2.9
18-Nov	1.1	1.2	1.3	1.5	0.9	1.6	1.4	0.8	0.6	1.0	1.2	1.4	1.0	0.7	0.7	0.5	0.3	0.5	0.4	0.5	1.0	0.9	0.7	0.6	1.6
19-Nov	0.6	0.8	1.0	0.9	1.2	1.0	1.2	1.8	1.6	1.6	1.9	2.2	2.2	2.2	2.5	2.5	2.1	2.6	2.5	2.9	2.6	1.7	2.2	2.5	2.9
20-Nov	2.5	2.3	2.4	2.1	2.3	2.4	2.3	2.2	2.6	2.5	2.7	2.5	2.1	1.9	2.2	1.7	2.0	2.2	2.5	2.7	2.7	1.8	2.0	2.0	2.7
21-Nov	2.3	2.1	2.0	1.7	1.7	1.7	1.2	1.3	1.4	1.5	1.4	1.5	1.6	1.4	1.2	1.1	1.2	1.1	0.9	0.7	0.6	0.7	0.9	1.1	2.3
22-Nov	0.5	0.3	0.4	0.5	1.0	0.6	0.6	0.5	0.5	0.5	0.8	1.0	0.9	1.0	1.2	1.7	1.4	1.1	1.2	1.2	1.3	1.2	1.4	1.3	1.7
23-Nov	1.3	1.5	1.7	1.8	1.7	1.8	2.0	1.8	1.4	1.4	1.4	1.3	1.3	1.5	1.7	1.7	1.6	1.9	2.0	2.0	1.9	2.2	2.3	2.2	2.3
24-Nov	1.7	1.8	1.8	1.8	1.4	1.4	1.3	1.3	1.2	0.9	0.8	0.8	0.9	0.8	0.7	0.6	0.5	0.5	0.2	0.2	0.2	0.2	0.3	0.6	1.8
25-Nov	0.8	0.8	0.8	1.0	1.0	1.0	1.2	1.3	1.1	1.1	0.9	1.0	1.2	1.0	1.0	0.9	1.2	2.2	2.3	2.2	2.0	2.0	1.9	2.1	2.3
26-Nov	2.1	1.5	1.6	2.0	1.8	1.8	1.7	1.7	1.7	1.5	1.3	1.1	0.9	1.1	0.8	0.7	0.7	1.0	1.3	1.8	1.9	2.1	1.5	1.8	2.1
27-Nov	1.5	1.3	1.7	2.1	2.4	2.1	1.8	2.4	2.4	2.1	2.3	2.4	2.4	2.3	2.8	2.8	2.2	2.4	2.3	1.9	2.1	2.2	1.8	1.8	2.8
28-Nov	1.3	1.6	1.8	1.3	1.7	1.4	0.9	0.6	0.5	0.6	0.9	0.6	0.9	1.0	1.1	0.6	0.5	0.6	1.5	1.2	1.0	0.8	0.8	0.9	1.8
29-Nov	0.7	0.2	0.1	0.4	0.4	0.4	0.7	0.3	0.3	0.2	0.4	0.6	1.1	0.8	0.8	0.6	0.5	1.0	0.9	1.0	0.7	0.4	0.3	0.2	1.1
30-Nov	0.2	0.2	0.3	0.2	0.3	0.3	0.5	0.6	0.6	0.5	0.6	0.7	0.7	0.8	1.0	0.8	0.8	0.8	0.8	0.9	0.9	1.0	1.1	1.1	1.1
2.5 2.3 2.4 2.1 2.4 2.4 2.5 2.4 2.6 2.6 2.7 2.5 2.4 2.8 2.8 2.8 2.6 2.6 2.5 2.9 2.8 2.5 2.3 2.5																								Diurnal Maximum	
M - Maintenance																									



Maximum Value: 1.8 km/h on Nov 11 17:00		Maximum Daily Average: 0.5 km/h on Nov 11		Hours in Service: 720																						
Minimum Value: -2.3 km/h on Nov 17 22:00		Minimum Daily Average: -0.7 km/h on Nov 12		Hours of Data: 688																						
Maximum Diurnal Average: 0.1 km/h at hour 13		Minimum Diurnal Average: -0.1 km/h at hour 8		Hours of Missing Data: 32																						
Monthly Average: -0.03 km/h		Percentiles: P <sub>1</sub> = -1.0 P <sub>10</sub> = -0.6 Q <sub>1</sub> = -0.3 Median = 0.0 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 0.5 P <sub>99</sub> = 0.9		Hours of Calibration: 0																						
				Percent Operational Time: 95.6																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	-0.1	-0.1	-0.3	-0.1	-0.2	-0.3	-0.1	-0.1	-0.2	-0.2	0.0	-0.3	-0.1	-0.1	-0.3	-0.1	-0.3	0.2	0.2	-0.1	0.0	-0.1	0.1	-0.1	-0.1	0.2
2-Nov	-0.1	0.0	0.1	0.1	-0.1	-0.1	0.0	0.3	0.3	0.1	0.3	0.9	1.0	0.3	0.4	0.8	0.8	0.5	0.5	0.2	0.2	0.3	0.2	0.1	0.3	1.0
3-Nov	0.0	0.1	0.0	-0.1	-0.3	-0.5	-0.4	-0.5	-0.4	-0.5	-0.5	-0.3	0.1	0.2	0.3	0.6	0.1	-0.3	-0.2	0.0	-0.4	-0.4	-0.4	-0.5	-0.2	0.6
4-Nov	-0.6	-0.7	-0.4	-0.5	-0.4	-0.5	-0.4	-0.4	-0.1	0.0	0.4	0.1	0.4	0.4	0.3	0.2	0.4	0.2	0.1	0.0	0.3	0.3	0.2	0.2	0.0	0.4
5-Nov	0.1	-0.1	-0.2	-0.2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.1
6-Nov	UO	0.9	1.2	0.6	0.6	0.8	0.6	0.5	0.4	-0.1	-0.2	-0.8	-0.7	-0.3	-0.5	-0.1	0.3	0.2	0.5	0.6	0.4	0.8	-0.1	-0.1	0.2	1.2
7-Nov	-0.3	-0.7	-0.8	-0.8	-0.5	-0.6	-1.0	-0.7	-0.4	-0.3	-0.6	-0.5	-0.4	-0.2	-0.2	0.5	0.6	0.3	0.4	0.5	0.6	0.5	0.8	0.8	-0.1	0.8
8-Nov	0.7	0.4	0.5	0.6	0.9	0.8	0.8	0.8	0.7	M	M	M	M	M	M	-0.7	-0.6	-0.8	-0.6	-0.5	-0.5	-0.4	-0.5	-0.5	0.1	0.9
9-Nov	-0.6	-0.7	-0.5	-0.6	-0.7	-0.8	-0.7	-0.8	-0.5	-0.1	0.2	0.2	0.5	-0.3	-0.5	-0.2	-0.6	-0.8	-0.4	-0.1	-0.6	-0.4	0.2	-0.1	-0.4	0.5
10-Nov	-0.2	0.1	-0.3	-0.4	-0.6	-0.4	-0.2	-0.6	-0.5	-0.7	-0.1	-0.6	0.2	0.1	0.0	0.0	0.0	-0.6	-0.1	0.0	0.4	0.4	0.2	0.4	-0.1	0.4
11-Nov	0.7	0.4	1.0	0.4	-0.4	0.2	0.0	0.0	0.2	0.2	0.7	1.4	0.1	0.8	1.3	0.4	1.8	0.4	0.3	0.3	0.2	0.1	0.7	0.3	0.5	1.8
12-Nov	0.1	0.1	0.1	-0.1	-0.6	-0.9	-0.8	-0.6	-0.9	-1.2	-1.3	-0.9	-0.9	-1.0	-1.0	-0.9	-1.2	-1.4	-0.9	-0.5	-0.7	-0.7	-0.8	-0.6	-0.7	0.1
13-Nov	-0.5	-0.7	-0.6	-0.3	-0.3	-0.4	-0.4	-0.6	-0.7	-0.5	0.1	0.1	0.7	0.6	0.5	0.2	0.3	0.4	0.4	0.2	0.6	0.4	0.0	0.0	0.0	0.7
14-Nov	0.1	0.2	0.1	0.0	0.2	0.2	0.2	0.1	0.3	0.0	0.0	0.1	0.0	0.5	-0.2	-0.1	-0.1	-0.2	0.0	0.0	-0.2	-0.2	0.1	0.0	0.0	0.5
15-Nov	-0.2	0.0	0.0	0.2	-0.3	-0.2	-0.1	-0.2	0.1	0.2	-0.1	-0.1	0.7	0.4	0.0	0.2	0.2	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.1	0.7
16-Nov	-0.1	-0.1	0.1	0.2	0.5	0.4	0.2	-0.2	0.6	0.5	0.3	0.4	0.3	0.6	0.8	0.6	0.6	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.4	0.8
17-Nov	0.4	0.5	0.5	0.3	0.5	0.4	0.6	0.4	0.4	0.3	0.2	0.4	0.2	0.2	0.2	0.2	-0.2	-0.7	-0.5	UO	UO	-2.3	-1.0	-0.8	0.0	0.6
18-Nov	0.0	UO	-0.8	-0.7	-0.4	-0.6	-0.5	-0.5	-0.4	-0.6	-0.4	-0.5	-0.3	-0.1	-0.2	-0.2	-0.1	0.2	-0.1	0.0	1.0	0.2	0.1	0.1	-0.2	1.0
19-Nov	0.2	0.3	0.4	0.1	0.2	0.2	0.1	0.4	0.2	0.1	0.6	0.4	0.5	0.5	0.4	0.5	0.1	0.3	0.5	0.4	0.2	0.0	0.3	0.2	0.3	0.6
20-Nov	0.3	0.2	0.5	0.3	0.4	0.2	0.3	0.4	0.1	0.4	0.0	0.2	0.5	0.2	0.2	0.2	0.4	0.7	0.2	0.0	-0.1	0.4	0.1	0.0	0.2	0.7
21-Nov	0.1	0.6	0.4	-0.2	-0.2	0.1	0.1	-0.4	0.0	-0.2	-0.6	-0.3	-0.1	-0.2	0.0	-0.4	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	0.2	-0.1	0.6
22-Nov	-0.2	-0.2	-0.3	-0.3	-0.7	-0.4	-0.4	-0.4	-0.5	-0.2	-0.1	-0.2	-0.2	0.0	0.0	0.7	0.5	0.2	0.0	-0.4	0.1	-0.1	0.0	-0.3	-0.1	0.7
23-Nov	0.1	0.0	0.0	0.5	0.0	0.1	0.1	0.2	0.2	-0.2	0.2	0.5	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	-0.1	0.0	-0.1	-0.3	0.0	0.5
24-Nov	0.0	-0.1	0.2	-0.2	-0.2	0.1	0.3	0.1	0.1	0.0	0.1	0.1	0.0	0.0	-0.2	-0.2	-0.2	-0.1	-0.1	0.0	0.0	-0.2	-0.3	0.3	0.0	0.3
25-Nov	0.3	0.1	0.3	0.3	0.2	0.2	0.3	0.1	0.0	0.1	-0.8	0.1	0.3	0.4	UO	UO	-0.2	0.2	0.8	0.7	0.5	0.4	0.5	0.4	0.2	0.8
26-Nov	0.6	0.4	0.3	0.5	0.5	0.4	0.4	0.3	0.5	0.7	0.5	0.1	0.0	0.1	0.0	0.0	-0.1	-0.4	-0.7	-0.6	-0.7	-0.5	-0.5	-0.9	0.0	0.7
27-Nov	-0.4	-0.5	-0.7	-0.8	-0.9	-0.7	-0.7	-0.8	-0.8	-0.9	-0.7	-0.9	-0.5	-0.5	-0.7	-0.6	-0.4	-0.4	-0.5	-0.4	-0.3	-0.6	-0.5	0.3	-0.6	0.3
28-Nov	0.4	-0.5	-0.5	-0.7	-0.6	-0.7	-0.8	-0.5	-0.6	-0.1	0.0	-0.4	0.2	-0.3	-0.2	0.0	-0.1	-0.1	0.2	-0.4	-0.3	-0.2	-0.2	0.1	-0.3	0.4
29-Nov	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.4	-0.2	-0.1	0.1	-0.2	-0.2	0.3	-0.2	-0.1	-0.3	-0.2	-0.1	-0.1	0.0	0.1	-0.1	0.0	-0.1	-0.1	0.3
30-Nov	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	0.1	0.1	0.4	-0.1	-0.1	-0.1	-0.2	-0.2	-0.1	0.0	-0.4	-0.4	-0.3	-0.2	-0.2	-0.1	-0.1	0.4
																								Diurnal Average		
																								Diurnal Maximum		
0.0 0.0 0.0 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 0.0 0.1 0.1 0.0 0.1 0.1 -0.1 0.0 0.0 0.0 -0.1 0.0 0.0																										
0.7 0.9 1.2 0.6 0.9 0.8 0.8 0.8 0.7 0.7 0.7 0.7 1.4 1.0 0.8 1.3 0.8 1.8 0.7 0.8 0.7 1.0 0.8 0.8 0.8																										
M - Maintenance UO - Unstable Operation																										



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 3.2 km/h on Nov 27 15:00 Minimum Value: 0.1 km/h on Nov 24 22:00 Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 0.7 Median = 1.2 Q <sub>3</sub> = 1.7 P <sub>90</sub> = 2.3 P <sub>99</sub> = 2.9																					Hours in Service: 720 Hours of Data: 688 Hours of Missing Data: 32 Hours of Calibration: 0 Percent Operational Time: 95.6				
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	1.0	0.8	0.6	0.5	0.3	0.4	0.7	0.5	0.8	0.7	1.0	1.0	1.3	1.0	0.9	0.8	0.7	0.7	0.9	0.9	0.9	0.9	0.6	0.3	1.3
2-Nov	0.6	0.7	0.9	0.8	0.4	0.6	0.4	0.9	0.8	1.0	1.4	1.4	1.6	1.8	2.1	1.9	1.7	1.8	1.4	1.6	1.5	1.6	1.6	1.0	2.1
3-Nov	0.2	0.2	0.5	0.8	0.9	0.7	0.4	0.5	0.4	0.7	0.9	0.8	0.8	1.2	0.9	1.0	0.5	0.7	0.4	0.7	0.7	0.5	0.3	0.2	1.2
4-Nov	0.2	0.4	0.4	0.5	0.3	0.6	0.9	1.0	1.2	0.8	1.1	1.2	1.4	1.3	1.3	1.0	0.5	0.3	0.2	0.3	0.3	0.4	0.4	0.6	1.4
5-Nov	0.2	0.3	0.6	1.0	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	1.0
6-Nov	UO	1.6	1.8	1.6	1.5	2.0	1.5	1.6	1.8	1.9	1.8	2.5	2.2	2.2	1.7	1.1	0.8	0.9	0.7	0.7	0.9	0.9	0.7	0.5	2.5
7-Nov	0.8	1.2	1.6	1.3	1.5	2.3	2.5	1.6	1.5	1.3	1.8	1.6	1.4	1.5	1.3	0.9	1.0	0.7	0.5	0.9	1.2	1.1	1.6	1.9	2.5
8-Nov	1.6	0.9	0.6	1.2	1.0	1.1	0.9	0.9	0.7	M	M	M	M	M	M	1.0	0.6	0.9	0.9	0.7	1.5	1.0	0.5	0.6	1.6
9-Nov	0.8	1.5	1.3	1.0	0.9	0.9	0.7	0.6	0.5	0.6	0.9	0.8	1.2	1.5	1.0	0.5	0.3	0.5	0.4	0.3	0.4	0.6	0.8	0.5	1.5
10-Nov	0.6	0.5	0.3	0.5	0.5	0.5	0.5	0.8	0.5	0.7	1.3	1.2	1.2	1.0	1.0	0.6	0.4	0.4	0.4	0.4	0.5	0.3	0.5	0.9	1.3
11-Nov	1.2	1.3	1.6	1.7	0.8	1.2	2.0	2.4	2.6	2.6	2.5	2.8	2.2	2.6	2.6	2.5	2.5	2.3	1.7	1.4	1.7	1.3	1.5	1.4	2.8
12-Nov	0.8	0.7	0.8	0.7	1.2	1.0	1.2	0.8	1.8	2.9	2.7	2.4	2.5	3.2	2.7	2.3	2.8	2.5	1.8	1.4	1.4	1.3	1.7	1.7	3.2
13-Nov	0.9	0.7	0.6	0.5	0.5	0.5	0.5	0.6	0.7	0.9	1.6	1.7	1.7	1.9	1.7	1.5	1.4	1.6	1.7	1.4	1.9	1.6	1.3	1.3	1.9
14-Nov	1.3	1.3	1.5	1.6	1.7	1.5	1.5	1.4	1.4	1.4	1.3	1.4	1.3	1.6	1.2	1.2	0.9	1.2	1.0	0.7	0.5	0.4	0.6	0.4	1.7
15-Nov	0.2	0.2	0.2	0.5	0.3	0.4	0.2	0.2	0.5	0.8	1.1	1.2	1.4	1.1	0.9	1.1	1.0	0.6	0.9	1.0	0.9	0.8	0.7	0.5	1.4
16-Nov	0.4	0.5	0.5	0.7	1.4	1.5	1.4	1.4	2.0	2.1	1.8	1.7	2.0	2.9	2.7	2.9	2.8	2.6	2.5	2.3	2.1	2.1	2.1	1.9	2.9
17-Nov	1.8	2.0	2.0	2.1	2.0	2.1	2.1	1.9	1.7	2.1	1.7	1.7	1.4	1.2	0.9	0.8	0.7	1.1	1.8	UO	UO	2.5	1.6	2.0	2.5
18-Nov	1.1	UO	1.6	1.5	0.8	1.5	1.2	0.7	0.5	0.8	1.2	1.4	0.9	0.7	0.8	0.5	0.2	0.5	0.5	0.7	1.1	1.2	0.9	0.8	1.6
19-Nov	0.7	1.1	1.2	0.9	1.2	1.1	1.4	1.9	1.8	1.5	1.8	2.1	2.3	2.5	2.7	2.9	2.4	2.6	2.9	3.1	2.8	1.8	2.5	2.7	3.1
20-Nov	2.7	2.8	2.7	2.4	2.7	2.6	2.6	2.3	2.5	2.8	2.8	2.4	2.2	2.2	2.4	1.9	2.1	2.3	2.3	2.4	2.7	2.0	2.3	2.3	2.8
21-Nov	2.3	2.3	2.2	2.1	2.1	1.9	1.6	1.5	1.6	1.6	1.4	1.6	2.0	1.6	1.3	1.1	1.2	0.9	0.8	0.5	0.6	0.6	0.7	1.1	2.3
22-Nov	0.5	0.3	0.3	0.7	0.8	0.5	0.8	0.4	0.5	0.2	0.7	1.3	1.1	1.1	1.2	1.9	1.4	1.3	1.5	1.3	1.4	1.4	1.5	1.5	1.9
23-Nov	1.3	1.6	1.6	2.0	1.6	1.3	1.8	1.7	1.4	1.4	1.5	1.5	1.3	1.3	1.6	1.4	1.6	1.6	1.8	1.9	1.8	1.9	1.9	1.7	2.0
24-Nov	1.8	1.8	1.7	1.6	1.2	1.1	1.2	1.2	1.1	0.8	0.9	0.9	0.9	0.9	0.7	0.6	0.5	0.5	0.3	0.3	0.2	0.1	0.2	0.5	1.8
25-Nov	0.8	0.8	0.7	0.9	1.0	0.8	1.1	1.4	0.9	2.0	1.3	1.0	1.2	0.9	UO	UO	1.2	2.1	2.6	2.3	2.1	1.9	2.0	2.1	2.6
26-Nov	2.3	1.7	1.7	2.3	2.0	1.9	2.0	1.8	1.9	1.8	1.6	1.4	1.0	1.1	0.9	0.8	0.4	0.9	1.5	2.0	2.0	2.2	1.6	1.7	2.3
27-Nov	1.7	1.5	2.0	2.1	2.7	2.3	2.0	2.4	2.4	2.1	2.3	2.5	2.5	2.7	3.2	3.2	2.5	2.9	2.5	2.2	2.6	2.5	2.0	2.0	3.2
28-Nov	1.6	1.8	2.1	1.3	1.8	1.3	0.7	0.8	0.6	0.6	0.9	0.5	1.1	1.3	1.2	0.8	0.6	0.9	1.5	1.2	1.4	1.1	1.2	1.0	2.1
29-Nov	0.8	0.3	0.2	0.2	0.2	0.2	0.5	0.3	0.3	0.2	0.4	0.8	1.4	0.7	0.9	0.7	0.5	0.5	0.5	0.6	0.4	0.4	0.3	0.2	1.4
30-Nov	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7	0.7	0.8	1.1	1.0	0.8	0.8	0.9	1.0	0.9	1.3	1.1	1.2	1.3
2.7 2.8 2.7 2.4 2.7 2.6 2.6 2.4 2.6 2.9 2.8 2.8 2.5 3.2 3.2 3.2 2.8 2.9 2.9 3.1 2.8 2.5 2.5 2.7																									
Diurnal Maximum																									
M - Maintenance UO - Unstable Operation																									



Maximum Value: 1.5 km/h on Nov 25 10:00		Maximum Daily Average: 0.5 km/h on Nov 16		Hours in Service: 720																						
Minimum Value: -0.9 km/h on Nov 17 20:00		Minimum Daily Average: -0.1 km/h on Nov 28		Hours of Data: 679																						
Maximum Diurnal Average: 0.3 km/h at hour 13		Minimum Diurnal Average: 0.1 km/h at hour 18		Hours of Missing Data: 41																						
Monthly Average: 0.16 km/h		Percentiles: P <sub>1</sub> = -0.6 P <sub>10</sub> = -0.2 Q <sub>1</sub> = 0.0 Median = 0.1 Q <sub>3</sub> = 0.3 P <sub>90</sub> = 0.6 P <sub>99</sub> = 1.0		Hours of Calibration: 0																						
				Percent Operational Time: 94.3																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.4	0.2	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.1	0.0	0.2	0.3	0.1	0.1	-0.1	0.4	0.4	0.1	0.2	UO	UO	UO	0.1	0.4
2-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	1.2	1.0	-0.1	-0.3	0.4	0.4	0.2	0.2	-0.1	-0.2	-0.4	-0.4	-0.2	--	1.2
3-Nov	0.2	0.2	0.2	0.2	0.0	0.0	-0.1	-0.2	-0.2	-0.2	-0.3	-0.1	0.2	0.3	0.4	0.7	0.2	0.0	-0.1	-0.1	-0.3	0.0	0.0	-0.1	0.0	0.7
4-Nov	-0.1	-0.3	-0.2	-0.3	0.0	-0.2	0.0	0.0	0.2	0.0	0.5	0.0	0.3	0.0	0.0	-0.2	0.3	0.5	0.4	0.4	0.5	0.4	0.3	0.3	0.1	0.5
5-Nov	0.1	0.2	0.1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.2
6-Nov	0.1	1.0	1.3	0.7	0.7	0.9	0.8	0.7	0.5	0.0	-0.1	-0.4	-0.1	0.4	-0.2	0.1	0.2	0.0	0.4	0.6	0.4	0.8	-0.1	0.2	0.4	1.3
7-Nov	0.1	0.2	0.1	0.1	0.2	0.5	0.3	0.3	0.4	0.3	-0.1	0.4	0.3	0.5	0.0	0.4	0.8	0.0	0.5	0.4	0.6	0.2	-0.1	-0.1	0.3	0.8
8-Nov	-0.1	0.1	0.6	0.8	0.8	0.7	0.5	0.6	0.6	M	M	M	M	M	M	-0.1	0.0	-0.1	0.1	0.2	-0.1	0.2	0.3	0.2	0.3	0.8
9-Nov	0.1	0.2	0.3	0.2	-0.1	-0.1	0.1	0.1	0.2	0.1	0.4	0.2	0.9	0.3	0.1	0.3	-0.1	-0.2	0.1	0.3	-0.2	0.0	0.5	0.2	0.2	0.9
10-Nov	0.1	0.3	0.0	0.0	0.0	0.0	0.2	0.0	0.1	-0.2	0.2	-0.3	0.5	0.3	0.3	0.2	0.0	0.1	0.4	0.7	0.5	0.1	0.2	0.2	0.7	
11-Nov	0.1	-0.2	0.2	0.2	0.2	0.1	-0.3	-0.5	-0.3	-0.7	0.2	1.1	-0.6	0.2	0.7	-0.1	1.4	-0.1	-0.5	-0.5	-0.5	-0.4	0.4	0.0	0.0	1.4
12-Nov	0.1	0.1	0.6	0.4	0.1	-0.1	0.0	0.1	0.0	0.1	0.0	0.3	0.3	0.4	0.4	0.3	-0.2	-0.2	0.1	0.3	0.2	0.0	0.0	0.2	0.1	0.6
13-Nov	0.0	-0.2	-0.2	0.2	0.2	0.1	0.2	0.0	0.0	0.0	0.4	0.2	0.6	0.4	0.2	0.1	0.1	0.2	0.1	0.2	0.3	0.1	0.0	0.0	0.1	0.6
14-Nov	-0.2	0.1	-0.1	-0.1	0.0	0.1	0.0	0.1	0.2	0.0	0.1	-0.1	0.0	0.4	-0.2	0.1	0.0	-0.2	0.1	0.1	0.0	0.2	0.2	0.2	0.0	0.4
15-Nov	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.8	0.3	0.4	0.5	0.5	0.4	0.5	0.6	0.7	0.5	0.5	0.3	0.8
16-Nov	0.5	0.5	0.7	0.8	1.0	1.0	0.8	0.6	0.6	0.1	0.0	0.3	0.6	0.6	0.7	0.2	0.2	0.3	0.5	0.7	0.7	0.7	0.5	0.4	0.5	1.0
17-Nov	0.0	0.2	0.2	-0.3	0.0	0.1	0.0	-0.2	0.1	0.0	0.4	0.7	0.6	0.6	0.5	0.5	0.2	-0.1	-0.1	-0.9	0.6	0.0	0.2	0.3	0.1	0.7
18-Nov	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.2	0.1	0.0	0.3	0.1	0.3	0.2	0.1	-0.1	0.1	0.3	0.2	0.3	1.2	0.0	0.0	0.2	0.2	1.2
19-Nov	0.3	0.6	0.4	0.1	0.1	0.3	0.1	0.1	0.0	-0.1	0.0	-0.1	0.0	0.2	0.0	1.0	0.4	-0.1	0.5	0.5	0.4	-0.1	0.6	0.6	0.2	1.0
20-Nov	0.7	0.8	0.8	0.8	0.8	0.5	0.3	0.6	-0.2	-0.1	-0.5	-0.3	0.5	0.5	0.5	0.5	0.5	0.6	-0.4	-0.3	-0.3	0.6	0.4	0.2	0.3	0.8
21-Nov	0.4	0.6	0.4	0.1	0.2	0.3	0.3	0.0	0.2	0.3	-0.1	0.2	0.1	0.0	0.4	0.1	0.6	0.3	0.4	0.5	0.2	0.2	0.2	0.2	0.3	0.6
22-Nov	0.0	0.1	0.1	0.3	-0.1	0.1	0.0	-0.1	-0.1	0.3	0.3	0.1	-0.1	0.5	0.0	0.7	0.6	0.1	-0.3	-0.6	0.3	-0.1	0.0	-0.2	0.1	0.7
23-Nov	0.2	-0.1	-0.1	0.2	0.0	-0.4	-0.3	-0.1	0.3	0.0	0.0	0.3	0.1	0.0	-0.1	0.1	0.1	0.0	-0.1	0.0	-0.2	0.0	-0.4	-0.4	0.0	0.3
24-Nov	0.2	-0.1	0.4	-0.2	-0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.3	0.1	0.2	0.5	0.1	0.5
25-Nov	0.4	0.3	0.5	0.6	0.6	0.7	0.5	0.3	1.1	1.5	UO	UO	UO	0.6	-0.3	-0.6	-0.6	-0.3	-0.3	-0.2	-0.3	-0.3	-0.4	-0.4	0.2	1.5
26-Nov	-0.1	0.0	-0.1	-0.1	-0.2	-0.1	0.1	-0.4	0.0	0.3	0.2	0.0	0.1	0.2	0.0	0.3	0.3	0.2	0.1	0.4	0.4	0.4	0.4	0.3	0.1	0.4
27-Nov	0.7	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.5	0.0	-0.5	-0.2	0.2	-0.2	-0.1	-0.1	-0.3	-0.4	-0.3	0.4	0.1	0.7
28-Nov	0.8	-0.1	-0.2	-0.5	-0.5	-0.3	0.0	0.0	-0.4	0.0	0.3	0.0	0.5	0.3	-0.1	0.2	0.0	0.0	0.3	-0.7	-0.6	-0.5	-0.5	0.1	-0.1	0.8
29-Nov	-0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.0	-0.1	0.1	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.3
30-Nov	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.3	0.8	0.0	0.2	0.3	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.1	0.0	0.1	0.1	0.1	0.8
																								Diurnal Average		
																								Diurnal Maximum		
0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.1 0.2 0.1 0.2 0.2 0.3 0.3 0.1 0.2 0.2 0.1 0.1 0.1 0.2 0.1 0.1 0.1																										
0.8 1.0 1.3 0.8 1.0 1.0 0.8 0.7 1.1 1.5 0.8 1.2 1.0 0.6 0.7 1.0 1.4 0.6 0.5 0.7 1.2 0.8 0.6 0.6																										
M - Maintenance UO - Unstable Operation																										



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 3.4 km/h on Nov 11 15:00			Hours of Data:	679
Minimum Value: 0.1 km/h on Nov 3 02:00			Hours of Missing Data:	41
			Hours of Calibration:	0
Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 0.7 Median = 1.1 Q <sub>3</sub> = 1.6 P <sub>90</sub> = 2.3 P <sub>99</sub> = 3.0			Percent Operational Time:	94.3

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	1.0	0.9	0.5	0.5	0.3	0.5	0.8	0.6	1.1	0.7	1.1	1.1	1.3	1.0	0.9	0.9	0.8	0.7	0.9	1.1	1.0	UO	UO	UO	1.3	
2-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	1.8	2.3	2.2	2.1	2.4	2.3	1.9	1.6	1.4	1.2	1.3	1.2	0.7	2.4	
3-Nov	0.2	0.1	0.5	0.9	0.9	0.7	0.4	0.4	0.4	0.5	0.7	0.5	0.6	0.9	0.8	0.8	0.4	0.9	0.4	0.4	0.6	0.5	0.4	0.3	0.9	
4-Nov	0.2	0.3	0.5	0.4	0.4	0.9	0.9	1.0	1.1	0.8	1.0	1.2	1.3	1.5	1.4	1.0	0.4	0.2	0.2	0.3	0.2	0.3	0.4	0.4	1.5	
5-Nov	0.3	0.4	0.5	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.8	0.4	0.5	0.8
6-Nov	0.4	1.2	1.4	1.6	1.4	1.8	1.4	1.5	1.8	1.9	1.7	2.2	2.4	2.4	2.0	1.4	1.0	1.2	0.8	0.7	0.7	0.8	0.7	0.6	2.4	
7-Nov	0.8	1.1	1.4	1.1	1.7	2.4	2.4	1.5	1.6	1.7	2.0	1.7	1.5	1.7	1.2	1.0	1.5	0.6	0.4	0.6	1.0	0.9	1.3	1.7	2.4	
8-Nov	1.1	0.7	0.7	1.1	1.0	0.6	0.5	0.7	0.5	M	M	M	M	M	M	0.9	0.6	1.0	1.0	0.8	1.2	1.0	0.5	0.6	1.2	
9-Nov	0.8	1.6	1.4	1.1	0.9	1.0	0.7	0.8	0.4	0.8	0.9	0.9	1.5	1.7	1.0	0.6	0.2	0.4	0.4	0.4	0.3	0.7	1.1	0.8	1.7	
10-Nov	0.8	0.6	0.5	0.5	0.6	0.6	0.7	1.0	0.5	0.6	1.2	1.1	1.3	0.8	0.8	0.4	0.3	0.5	0.5	0.3	0.3	0.3	0.4	0.7	1.3	
11-Nov	1.4	1.3	1.5	1.6	1.0	1.0	1.9	2.6	2.7	2.4	2.9	3.2	2.1	2.9	3.4	2.8	3.2	2.6	1.7	1.5	1.7	1.3	1.8	1.1	3.4	
12-Nov	0.5	0.3	0.8	0.6	1.0	0.9	1.0	0.8	1.8	2.5	2.5	2.3	2.5	3.0	2.9	2.5	2.5	2.3	1.8	1.5	1.2	1.0	1.4	1.5	3.0	
13-Nov	1.0	0.7	0.5	0.5	0.5	0.6	0.7	0.5	0.4	0.9	1.6	1.9	2.0	2.1	1.6	1.3	1.2	1.2	1.4	1.5	1.6	1.5	1.2	1.1	2.1	
14-Nov	0.9	1.0	0.9	1.1	1.4	1.1	1.0	0.9	1.1	1.1	1.1	1.2	1.3	1.3	1.1	1.1	0.9	0.9	0.7	0.5	0.4	0.5	0.5	0.4	1.4	
15-Nov	0.3	0.3	0.3	0.4	0.2	0.3	0.2	0.2	0.7	1.0	1.0	1.1	1.3	1.0	0.8	0.9	0.6	0.4	0.7	0.9	0.7	0.7	0.6	0.5	1.3	
16-Nov	0.5	0.5	0.5	0.6	1.2	1.2	1.2	1.1	1.6	1.7	1.4	1.4	1.7	2.7	2.7	2.5	2.6	2.4	2.2	2.0	1.8	1.7	1.8	1.7	2.7	
17-Nov	1.4	1.9	1.7	1.8	1.6	1.6	1.8	1.8	1.5	1.7	1.6	1.5	1.3	1.0	0.7	0.7	0.9	1.2	1.7	2.7	2.6	2.4	1.9	1.9	2.7	
18-Nov	1.1	1.5	1.5	1.5	0.9	1.5	1.2	0.7	0.5	0.7	1.1	1.2	1.0	0.9	0.7	0.5	0.3	0.6	0.7	0.7	1.4	1.1	0.9	0.8	1.5	
19-Nov	0.7	1.4	1.3	1.0	1.0	1.3	1.4	1.7	1.8	1.4	1.5	2.0	1.9	2.3	2.5	2.9	2.5	2.5	3.1	3.1	2.7	1.9	2.6	2.7	3.1	
20-Nov	2.9	3.0	2.6	2.7	2.7	2.6	2.4	2.3	1.9	2.7	2.7	2.1	2.0	2.2	2.4	2.0	2.0	1.8	1.7	1.9	2.6	2.1	2.2	2.2	3.0	
21-Nov	1.9	1.8	1.9	2.2	2.1	2.2	1.7	1.7	1.6	1.6	1.4	1.7	1.9	1.7	1.3	1.2	1.1	0.9	0.8	0.7	0.7	0.5	0.6	1.1	2.2	
22-Nov	0.6	0.4	0.2	0.7	0.5	0.6	0.5	0.3	0.4	0.3	0.8	1.4	1.2	1.3	1.2	2.0	1.4	1.4	1.4	1.3	1.6	1.4	1.4	1.5	2.0	
23-Nov	1.4	1.6	1.4	1.8	1.5	1.0	1.4	1.3	1.3	1.2	1.3	1.4	1.2	1.2	1.1	1.2	1.6	1.4	1.5	1.6	1.7	1.8	1.6	1.4	1.8	
24-Nov	1.8	1.6	1.4	1.4	1.2	1.0	1.1	1.0	0.9	0.8	0.7	0.8	0.9	0.8	0.7	0.5	0.5	0.4	0.2	0.3	0.4	0.2	0.2	0.3	1.8	
25-Nov	0.4	0.4	0.5	0.4	0.5	0.4	1.0	0.9	1.3	1.4	UO	UO	UO	0.9	0.8	0.9	0.8	1.7	1.7	1.5	1.0	1.1	1.1	1.5	1.7	
26-Nov	1.6	1.3	1.4	2.0	1.7	1.7	1.7	1.5	1.5	1.4	1.3	1.3	0.7	0.8	0.7	0.5	0.4	1.0	1.6	2.2	2.2	2.3	1.7	1.8	2.3	
27-Nov	2.0	1.6	2.0	2.2	2.5	2.4	2.3	2.6	2.5	2.1	2.4	2.5	2.6	2.8	2.7	3.0	2.4	2.5	2.2	2.2	2.3	2.2	1.8	1.8	3.0	
28-Nov	1.7	1.5	2.0	1.0	1.2	0.7	0.4	0.8	0.5	0.6	1.0	0.5	1.0	1.4	1.3	0.8	0.6	1.1	1.3	1.2	1.5	1.1	1.3	1.1	2.0	
29-Nov	0.9	0.4	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.2	0.3	0.9	1.5	0.9	0.8	0.7	0.5	0.3	0.3	0.4	0.3	0.4	0.3	0.3	1.5	
30-Nov	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.7	0.9	0.6	0.6	0.8	0.9	0.9	0.7	0.6	0.7	0.9	0.7	1.1	1.2	1.2	1.2	

2.9	3.0	2.6	2.7	2.7	2.6	2.4	2.6	2.7	2.7	2.9	3.2	2.6	3.0	3.4	3.0	3.2	2.6	3.1	3.1	2.7	2.4	2.6	2.7	
Diurnal Maximum																								

M - Maintenance      UO - Unstable Operation



Maximum Value: 2.0 km/h on Nov 19 16:00																				Maximum Daily Average: 1.3 km/h on Nov 20					Hours in Service:	720
Minimum Value: -1.2 km/h on Nov 12 18:00																				Minimum Daily Average: -0.6 km/h on Nov 12					Hours of Data:	677
Maximum Diurnal Average: 0.2 km/h at hour 17																				Minimum Diurnal Average: -0.1 km/h at hour 8					Hours of Missing Data:	43
Monthly Average: 0.06 km/h																				Percentiles: P <sub>1</sub> = -1.0 P <sub>10</sub> = -0.5 Q <sub>1</sub> = -0.3 Median = 0.0 Q <sub>3</sub> = 0.4 P <sub>90</sub> = 0.8 P <sub>99</sub> = 1.8					Hours of Calibration:	0
																									Percent Operational Time:	94.0
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.1	-0.2	-0.3	-0.2	-0.2	-0.4	0.1	-0.3	-0.4	-0.3	-0.2	-0.4	-0.2	-0.1	-0.2	-0.1	-0.1	0.3	0.4	0.1	0.3	0.0	UO	UO	-0.1	0.4
2-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	1.3	0.1	-0.2	0.5	0.8	0.5	0.3	0.2	0.1	0.1	0.0	0.0	--	1.3
3-Nov	-0.1	-0.1	-0.2	-0.2	-0.6	-0.4	-0.5	-0.7	-0.8	-0.7	-0.9	-0.6	-0.4	-0.3	-0.1	0.3	-0.3	-0.4	-0.5	-0.6	-0.7	-0.4	-0.4	-0.4	-0.4	0.3
4-Nov	-0.5	-0.7	-0.8	-0.7	-0.3	-0.6	-0.3	-0.4	-0.3	-0.3	0.1	-0.2	0.1	0.0	-0.1	-0.2	0.2	0.0	0.0	-0.1	0.1	-0.1	-0.1	-0.1	-0.2	0.2
5-Nov	-0.1	0.0	0.0	UO	UO	0.4	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.4
6-Nov	-0.4	0.4	0.6	0.1	0.0	0.1	0.0	0.0	-0.2	-0.7	-0.8	-1.2	-0.8	-0.3	-0.7	-0.3	-0.4	-0.6	-0.3	-0.2	-0.4	0.0	-0.6	-0.1	-0.3	0.6
7-Nov	0.1	0.1	0.0	-0.3	-0.5	-0.2	-0.2	-0.1	-0.1	-0.1	-0.6	-0.1	-0.2	0.1	-0.2	0.4	0.8	-0.1	-0.2	0.2	0.3	0.4	0.4	0.7	0.0	0.8
8-Nov	0.9	0.6	0.3	0.1	-0.2	-0.1	-0.1	-0.1	-0.1	M	M	M	M	M	M	-0.7	-0.7	-0.7	-0.5	-0.2	0.3	0.0	-0.3	-0.4	-0.1	0.9
9-Nov	-0.5	-0.5	-0.3	-0.3	-0.8	-0.9	-0.6	-0.7	-0.3	-0.2	0.2	0.0	0.7	-0.2	-0.4	0.0	-0.6	-0.9	-0.5	-0.5	-0.7	-0.5	-0.4	-0.5	-0.4	0.7
10-Nov	-0.4	-0.4	-0.4	-0.5	-0.5	-0.4	0.0	-0.4	-0.3	-0.6	-0.1	-0.5	0.3	-0.3	-0.2	-0.4	-0.2	-0.4	-0.3	-0.3	-0.1	-0.2	0.0	0.3	-0.3	0.3
11-Nov	0.0	-0.7	-0.4	-0.1	-0.5	-0.1	-0.6	-0.9	-0.7	-1.1	-0.1	0.8	-0.9	-0.3	0.8	-0.4	1.4	-0.4	-0.8	-0.5	-0.6	-0.4	0.1	0.0	-0.3	1.4
12-Nov	-0.2	-0.2	-0.1	-0.4	-0.7	-0.8	-0.6	-0.4	-0.7	-0.9	-1.1	-0.7	-0.7	-0.7	-0.6	-0.6	-1.2	-1.2	-0.6	-0.3	-0.4	-0.6	-0.6	-0.4	-0.6	-0.1
13-Nov	-0.4	-0.7	-0.6	-0.3	-0.3	-0.2	-0.1	-0.4	-0.5	-0.4	0.4	0.3	1.0	0.9	0.6	0.6	0.6	0.8	0.8	0.7	1.0	0.6	0.5	0.4	0.2	1.0
14-Nov	0.4	0.7	0.6	0.5	0.6	0.8	0.7	0.9	0.8	0.5	0.7	0.3	0.4	0.6	0.1	0.4	0.4	0.4	0.5	0.3	0.1	0.1	0.3	0.2	0.5	0.9
15-Nov	-0.1	0.1	0.0	0.2	-0.1	-0.2	-0.1	-0.2	-0.1	0.0	-0.3	-0.1	0.5	0.0	-0.2	-0.2	0.4	-0.1	-0.3	-0.3	-0.4	-0.5	-0.5	-0.5	-0.2	0.5
16-Nov	-0.6	-0.6	-0.5	-0.5	-0.2	-0.3	-0.5	-0.8	-0.2	0.0	0.0	-0.3	-0.3	-0.4	-0.1	-0.3	-0.3	-0.2	-0.2	-0.1	-0.2	-0.3	-0.3	0.0	-0.3	0.0
17-Nov	0.0	-0.2	0.1	-0.2	-0.2	-0.3	-0.3	-0.1	-0.2	-0.3	-0.3	-0.2	-0.5	-0.4	-0.5	-0.5	-0.6	-0.7	-0.1	0.0	-0.4	-1.0	-0.5	-0.5	-0.3	0.1
18-Nov	-0.3	-0.5	-0.5	-0.5	-0.2	-0.4	-0.4	-0.3	-0.3	-0.5	-0.2	-0.5	0.0	0.0	0.0	-0.1	0.2	0.5	0.3	0.1	1.2	0.2	0.2	0.2	-0.1	1.2
19-Nov	0.3	0.8	0.6	0.4	0.5	0.5	0.4	1.0	0.5	0.4	0.5	0.6	0.7	0.9	1.0	2.0	1.3	0.9	1.7	1.9	1.6	0.6	1.5	1.9	0.9	2.0
20-Nov	1.9	1.9	1.9	1.8	2.0	1.7	1.4	1.8	1.1	0.9	0.5	0.5	1.3	1.2	1.4	1.4	1.4	1.4	0.5	0.7	0.8	1.3	1.1	1.0	1.3	2.0
21-Nov	1.5	1.6	1.3	0.7	0.7	0.9	0.5	0.1	0.4	0.3	-0.4	-0.1	0.0	0.1	0.4	0.1	0.5	0.1	-0.1	0.1	-0.1	0.2	0.4	0.5	0.4	1.6
22-Nov	-0.1	-0.1	-0.2	-0.1	-0.5	-0.3	-0.3	-0.4	-0.5	0.0	0.1	-0.1	-0.1	0.8	0.4	1.1	0.9	0.3	-0.1	-0.2	0.8	0.3	0.4	0.2	0.1	1.1
23-Nov	0.7	0.4	0.3	0.7	0.5	0.1	0.3	0.4	0.7	0.5	0.4	0.8	0.5	0.5	0.6	0.8	0.9	1.0	0.7	0.9	0.6	1.1	0.6	0.5	0.6	1.1
24-Nov	1.0	0.7	1.3	0.6	0.5	0.7	0.7	0.7	0.6	0.4	0.4	0.3	0.1	0.2	-0.1	-0.2	0.1	0.2	0.2	0.3	0.2	-0.2	-0.1	-0.1	0.4	1.3
25-Nov	0.0	-0.1	-0.4	0.0	0.1	0.1	-0.1	-0.2	UO	0.3	0.7	UO	UO	UO	1.0	0.5	0.3	0.0	0.5	0.1	-0.1	0.1	0.0	0.0	0.1	1.0
26-Nov	0.1	0.0	-0.1	0.1	-0.1	0.0	-0.1	-0.2	0.0	0.2	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.5	-0.3	-0.5	-0.3	-0.3	-0.3	-0.1	-0.3	-0.2	0.2
27-Nov	0.1	-0.4	-0.5	-0.4	-0.5	-0.5	-0.3	-0.5	-0.4	-0.4	-0.3	-0.5	-0.5	-0.1	0.2	0.3	0.4	0.3	0.2	0.2	0.2	0.1	0.3	1.3	-0.1	1.3
28-Nov	1.6	0.7	0.1	-0.1	0.0	0.0	0.0	-0.4	-0.3	0.3	0.4	0.0	0.3	0.4	0.0	0.3	0.1	0.3	0.9	-0.4	-0.2	0.1	0.1	0.6	0.2	1.6
29-Nov	0.2	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.7	0.3	0.2	0.2	0.4	0.5	0.7	0.7	0.5	0.3	0.1	0.1	0.2	0.7
30-Nov	0.1	0.2	0.3	0.1	0.2	0.1	0.4	0.4	0.6	0.5	1.0	0.1	0.4	0.4	0.3	0.2	0.3	0.4	0.2	0.1	0.2	0.0	0.3	0.4	0.3	1.0
																								Diurnal Average		
																								Diurnal Maximum		
0.2 0.1 0.1 0.0 0.0 0.0 0.0 0.0 -0.1 -0.1 -0.1 0.0 -0.1 0.1 0.1 0.1 0.2 0.2 0.1 0.1 0.1 0.1 0.0 0.1 0.1																										
1.9 1.9 1.9 1.8 2.0 1.7 1.4 1.8 1.1 0.9 1.0 0.8 1.3 1.2 1.4 2.0 1.4 1.4 1.7 1.9 1.6 1.3 1.5 1.9																										
M - Maintenance UO - Unstable Operation																										





Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 3.3 km/h on Nov 19 19:00 Minimum Value: 0.1 km/h on Nov 4 19:00 Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 0.7 Median = 1.1 Q <sub>3</sub> = 1.6 P <sub>90</sub> = 2.3 P <sub>99</sub> = 2.9																				Hours in Service: 720 Hours of Data: 677 Hours of Missing Data: 43 Hours of Calibration: 0 Percent Operational Time: 94.0					
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	1.0	0.8	0.5	0.5	0.4	0.6	1.0	0.8	1.2	0.7	1.2	1.1	1.4	1.0	0.9	1.0	0.9	0.8	1.0	1.1	1.0	0.8	UO	UO	1.4
2-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2.0	2.2	2.2	2.7	2.0	1.8	1.6	1.4	1.1	1.1	0.8	0.4	2.7
3-Nov	0.1	0.1	0.5	0.9	1.0	0.7	0.4	0.4	0.3	0.5	0.6	0.3	0.6	0.9	0.7	0.8	0.4	0.9	0.5	0.4	0.6	0.5	0.5	0.4	1.0
4-Nov	0.2	0.3	0.5	0.3	0.4	0.9	1.0	1.0	1.1	0.8	1.0	1.3	1.3	1.5	1.3	0.9	0.3	0.2	0.1	0.2	0.2	0.2	0.4	0.4	1.5
5-Nov	0.2	0.5	0.4	UO	UO	1.2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.5	1.2
6-Nov	0.4	1.0	1.4	1.5	1.5	1.8	1.4	1.5	1.8	1.9	1.7	2.2	2.5	2.4	2.3	1.6	1.1	1.2	0.8	0.8	0.7	0.9	0.7	0.7	2.5
7-Nov	0.8	0.9	1.3	1.1	1.6	2.4	2.4	1.5	1.6	1.8	2.1	1.7	1.6	1.7	1.4	1.0	1.5	0.7	0.3	0.4	0.8	0.9	1.1	1.6	2.4
8-Nov	1.1	0.9	0.7	1.0	0.9	0.5	0.5	0.8	0.5	M	M	M	M	M	M	1.0	0.7	1.2	1.0	0.9	1.2	0.9	0.4	0.6	1.2
9-Nov	0.8	1.7	1.4	1.2	0.9	1.1	0.7	0.9	0.5	0.9	0.9	1.0	1.6	1.8	1.1	0.6	0.3	0.3	0.3	0.3	0.4	0.7	1.2	0.7	1.8
10-Nov	0.8	0.6	0.5	0.5	0.7	0.7	0.7	1.1	0.5	0.6	1.1	1.3	1.4	0.7	0.8	0.3	0.3	0.6	0.6	0.3	0.3	0.2	0.3	0.5	1.4
11-Nov	1.0	1.1	1.2	1.3	1.0	1.0	1.8	2.5	2.7	2.4	2.9	3.2	2.0	2.9	3.1	2.8	2.9	2.6	1.7	1.3	1.3	1.2	1.7	1.0	3.2
12-Nov	0.5	0.3	0.9	0.5	0.9	0.8	0.9	0.7	1.7	2.4	2.5	2.5	2.6	2.9	3.1	2.7	2.5	2.1	1.9	1.6	1.2	0.9	1.4	1.5	3.1
13-Nov	1.1	0.8	0.6	0.5	0.6	0.7	0.7	0.4	0.4	0.9	1.8	2.1	2.1	2.2	1.7	1.3	1.0	1.2	1.3	1.6	1.5	1.5	1.2	1.1	2.2
14-Nov	0.8	0.9	0.8	1.0	1.3	0.9	0.8	0.9	1.0	1.1	1.0	1.2	1.3	1.2	1.0	1.1	0.8	0.9	0.7	0.5	0.4	0.6	0.5	0.5	1.3
15-Nov	0.3	0.6	0.3	0.5	0.3	0.3	0.2	0.2	0.5	0.9	0.9	1.1	1.5	0.9	0.8	0.8	0.6	0.3	0.6	0.9	0.7	0.7	0.6	0.5	1.5
16-Nov	0.4	0.6	0.5	0.7	1.1	1.0	1.0	0.9	1.5	1.6	1.3	1.3	1.6	2.9	2.7	2.6	2.6	2.5	2.4	2.1	1.9	1.6	1.8	1.7	2.9
17-Nov	1.4	1.8	1.7	1.7	1.5	1.5	1.7	1.7	1.5	1.6	1.6	1.5	1.2	0.8	0.7	0.8	0.9	1.3	1.6	2.5	2.6	2.5	1.9	1.7	2.6
18-Nov	1.1	1.6	1.6	1.4	1.0	1.4	1.1	0.7	0.4	0.6	1.2	1.1	1.1	0.9	0.7	0.5	0.4	0.6	0.7	0.8	1.3	1.1	0.9	0.8	1.6
19-Nov	0.7	1.5	1.4	1.0	1.0	1.3	1.4	1.8	1.8	1.4	1.5	2.1	2.0	2.2	2.5	2.9	2.6	2.5	3.3	3.2	2.7	2.0	2.7	2.8	3.3
20-Nov	2.8	3.0	2.7	2.8	2.8	2.6	2.2	2.2	1.8	2.5	2.6	2.1	2.0	2.3	2.4	2.1	2.0	1.7	1.7	2.0	2.6	2.3	2.2	2.2	3.0
21-Nov	1.9	1.7	1.8	2.2	2.1	2.1	1.8	1.8	1.5	1.5	1.3	1.6	1.8	1.7	1.4	1.2	1.1	0.8	0.8	0.7	0.6	0.5	0.7	1.0	2.2
22-Nov	0.7	0.4	0.2	0.6	0.4	0.6	0.5	0.3	0.3	0.2	0.8	1.4	1.3	1.2	1.3	2.0	1.4	1.4	1.4	1.3	1.7	1.5	1.4	1.5	2.0
23-Nov	1.3	1.5	1.4	1.8	1.4	1.0	1.3	1.2	1.3	1.1	1.2	1.3	1.1	1.0	1.0	1.2	1.5	1.3	1.4	1.4	1.7	1.8	1.6	1.4	1.8
24-Nov	1.8	1.6	1.4	1.3	1.1	1.0	1.0	0.9	1.0	0.7	0.7	0.7	0.8	0.7	0.7	0.4	0.5	0.5	0.2	0.3	0.4	0.1	0.1	0.3	1.8
25-Nov	0.4	0.4	0.4	0.3	0.3	0.4	0.8	0.8	UO	0.9	0.9	UO	UO	UO	1.3	1.0	0.8	1.2	1.5	1.4	1.1	1.0	1.2	1.2	1.5
26-Nov	1.4	1.4	1.5	1.7	1.4	1.5	1.6	1.3	1.4	1.2	1.2	1.2	0.6	0.8	0.7	0.4	0.4	1.1	1.8	2.4	2.3	2.3	1.9	1.9	2.4
27-Nov	2.2	1.8	2.1	2.3	2.6	2.5	2.5	2.6	2.6	2.2	2.4	2.5	2.6	2.6	2.8	2.9	2.3	2.5	2.1	2.2	2.3	2.1	1.7	1.9	2.9
28-Nov	1.7	1.4	2.0	1.0	1.0	0.6	0.4	0.7	0.5	0.6	1.0	0.5	1.0	1.5	1.4	0.9	0.7	1.1	1.4	1.1	1.5	1.1	1.2	1.1	2.0
29-Nov	0.9	0.6	0.3	0.2	0.2	0.2	0.3	0.4	0.3	0.2	0.3	0.9	1.4	1.1	0.8	0.7	0.6	0.3	0.3	0.4	0.4	0.4	0.3	0.2	1.4
30-Nov	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.7	1.0	0.7	0.7	0.7	0.9	0.9	0.7	0.6	0.7	0.8	0.7	1.1	1.2	1.3	1.3
Diurnal Maximum																									
M - Maintenance      UO - Unstable Operation																									



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS06 PATRICIA MCINNES NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS06)

NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	684	34	36	99.72	15.3	0	3.4	0
TRS (ppb) Average	683	35	37	99.72	0.9	0	0.4	0
THC (ppm) Average	623	32	97	90.97	3.4	-	2.3	-
NMHC(ppm) Average	623	32	97	90.97	0.38	-	0.094	-
CH4(ppm) Average	623	32	97	90.97	3	-	2.2	-
O3 (ppb) Average	685	35	35	100	39.3	0	32.9	-
NO2 (ppb) Average	682	36	38	99.72	30.8	0	21.1	-
NO (ppb) Average	682	36	38	99.72	75.5	-	16.2	-
NOX (ppb) Average	682	36	38	99.72	94.3	-	29.8	-
NH3 (ppb) Average	647	39	73	95.28	0	0	0	-
PM2.5 (ug/m3) Average	719	1	1	100	44.4	0	7.9	0
Temperature 2 m (C) Average	720	0	0	100	14.1	-	8	-
Relative Humidity (%) Average	720	0	0	100	98.2	-	92.6	-
Wind Speed 10 m (km/h) Average	720	0	0	100	27	-	20	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS06)  
 NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	684	0.79	1.9	-	0	0	0	0.1	0.5	2	15.3
TRS (ppb) Average	683	0.21	0.1	-	0	0.1	0.1	0.2	0.2	0.4	0.9
THC (ppm) Average	623	2.07	0.1	-	1.9	2	2	2	2.1	2.2	3.4
NMHC(ppm) Average	623	0.037	0.033	-	0	0	0	0	0.1	0.1	0.38
CH4(ppm) Average	623	2.03	0.1	-	1.9	1.9	2	2	2.1	2.1	3
O3 (ppb) Average	685	18.93	8.7	-	1.5	5.7	12.7	19.4	25.3	30.4	39.3
NO2 (ppb) Average	682	6.67	6.2	-	0	0.4	1.9	4.9	9.8	15.2	30.8
NO (ppb) Average	682	2.55	5.8	-	0	0.1	0.3	0.8	2.5	5.7	75.5
NOX (ppb) Average	682	9.22	10.5	-	0	0.5	2.4	6.1	12.1	21.8	94.3
NH3 (ppb) Average	647	0	0	-	0	0	0	0	0	0	0
PM2.5 (ug/m3) Average	719	4.35	3	-	0.4	1.4	2.7	3.8	5.4	7.3	44.4
Temperature 2 m (C) Average	720	-7.51	8.5	-	-29.6	-19.2	-14.6	-5.9	-1.1	2.9	14.1
Relative Humidity (%) Average	720	81.7	8.9	-	47.1	70.8	76.3	82.1	88	94	98.2
Wind Speed 10 m (km/h) Average	720	9.1	5	-	1	4	6	9	11	14	27
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA MCINNES (AMS06)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL GASEOUS ANALYZERS	05 Nov 2024 14:00	05 Nov 2024 15:00	2	Maintenance - sample manifold cleaned
THC/NMHC/CH4	02 Nov 2024 04:00	02 Nov 2024 10:00	7	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	15 Nov 2024 11:00	15 Nov 2024 15:00	5	Maintenance - replaced actuator and adjust span
THC/NMHC/CH4	22 Nov 2024 11:00	22 Nov 2024 15:00	5	Maintenance - adjust span window
THC/NMHC/CH4	26 Nov 2024 13:00	26 Nov 2024 15:00	3	Maintenance - replaced support gas cylinder
THC/NMHC/CH4	29 Nov 2024 06:00	30 Nov 2024 08:00	27	Unstable Operation - flatline in analyzer output signal
THC/NMHC/CH4	30 Nov 2024 09:00	01 Dec 2024 00:00	16	Maintenance - analyzer replaced
NH3	01 Nov 2024 05:00	30 Nov 2024 04:00	32	Stabilization after daily QA check



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb

Patricia McInnes - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 15.3 ppb on Nov 23 01:00	Maximum Daily Average: 3.4 ppb on Nov 21		Hours of Data:	684
Minimum Value: 0.0 ppb on Nov 2 23:00	Minimum Daily Average: 0.0 ppb on Nov 4		Hours of Missing Data:	36
Maximum Diurnal Average: 1.4 ppb at hour 15	Minimum Diurnal Average: 0.4 ppb at hour 6		Hours of Calibration:	34
Monthly Average: 0.79 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.1 Q <sub>3</sub> = 0.5 P <sub>90</sub> = 2.0 P <sub>99</sub> = 9.8		Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	Z	0.5	0.3	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.1	0.5
2-Nov	0.4	Z	0.7	0.4	0.3	0.2	0.1	0.1	0.1	0.0	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.7
3-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2
4-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
5-Nov	0.0	0.0	0.0	0.2	Z	5.5	4.3	8.8	9.4	9.8	7.1	2.7	0.8	M	M	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.0	2.4	9.8
6-Nov	0.1	0.1	0.3	0.5	0.4	Z	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5
7-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.2	0.1	0.2	0.2	0.4	0.1	0.4
8-Nov	0.3	Z	0.4	0.4	0.4	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.0	0.1	0.2	0.4
9-Nov	0.0	0.0	Z	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.2
10-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.0	0.1	0.2	0.2	0.2	0.1	0.2
11-Nov	0.1	0.1	0.2	0.2	Z	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2
12-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.2	0.0	0.2
13-Nov	Z	0.1	0.1	0.0	0.1	0.0	0.1	0.2	0.1	0.1	2.0	6.4	14.3	14.8	9.8	0.6	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	2.2	14.8
14-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	1.1	1.0	2.2	2.8	2.2	1.1	1.0	0.5	2.8
15-Nov	2.3	1.6	Z	1.3	0.9	0.9	0.8	0.8	0.7	0.6	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.6	2.3
16-Nov	0.1	0.0	0.0	Z	0.0	0.2	0.4	0.3	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.1	0.1	0.5
17-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
18-Nov	0.0	0.0	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.3	1.0	2.9	1.2	0.4	4.0	7.6	2.2	1.6	1.3	1.0	7.6
19-Nov	Z	1.7	0.8	1.0	0.5	0.2	0.3	0.2	0.2	0.3	0.2	0.1	0.1	0.0	1.0	0.3	2.3	4.1	1.4	2.0	2.0	1.4	0.5	0.4	0.9	4.1
20-Nov	3.1	Z	0.7	0.8	0.4	0.4	0.8	0.7	1.2	0.7	0.3	0.2	0.4	1.4	1.4	2.0	1.4	0.6	0.6	0.3	0.4	0.8	0.2	0.2	0.8	3.1
21-Nov	0.4	0.8	Z	0.9	1.0	0.3	0.2	0.2	0.3	1.3	2.0	5.2	8.1	8.9	12.0	11.3	7.2	10.1	3.2	1.5	1.3	0.5	0.3	0.2	3.4	12.0
22-Nov	0.2	0.2	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.2	1.0	2.3	2.4	0.8	0.3	0.1	0.0	0.1	2.0	10.0	0.9	10.0
23-Nov	15.3	6.1	0.8	0.1	Z	0.2	0.4	0.1	0.0	0.0	0.9	0.4	0.0	0.7	2.7	4.8	4.8	4.9	7.5	3.8	3.0	4.3	7.6	4.4	3.2	15.3
24-Nov	4.4	7.4	7.0	5.0	3.4	Z	1.8	2.1	2.3	2.6	2.1	1.8	1.4	1.7	1.6	2.8	2.1	0.9	0.5	0.3	0.4	0.4	0.4	0.4	2.3	7.4
25-Nov	Z	0.4	0.4	0.4	0.4	0.3	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.5	0.4	0.3	0.3	0.4	0.3	0.4	0.5
26-Nov	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.1	0.3	0.4
27-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.9	0.7	1.1	0.5	0.1	1.1
28-Nov	2.0	1.3	0.0	Z	0.2	0.0	0.0	0.0	0.0	0.1	0.1	3.0	3.8	3.2	4.4	4.1	3.1	2.4	2.0	1.0	0.2	0.1	0.2	0.7	1.4	4.4
29-Nov	1.5	2.0	0.9	0.4	Z	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.3	0.7	2.5	6.2	2.2	0.6	0.5	0.9	1.2	0.9	1.0	2.5	1.2	6.2
30-Nov	2.4	1.3	1.4	1.3	1.2	Z	1.3	1.3	0.6	0.6	0.7	0.5	0.4	0.4	0.4	0.4	0.6	1.4	0.9	0.8	0.4	0.7	0.3	0.4	0.9	2.4

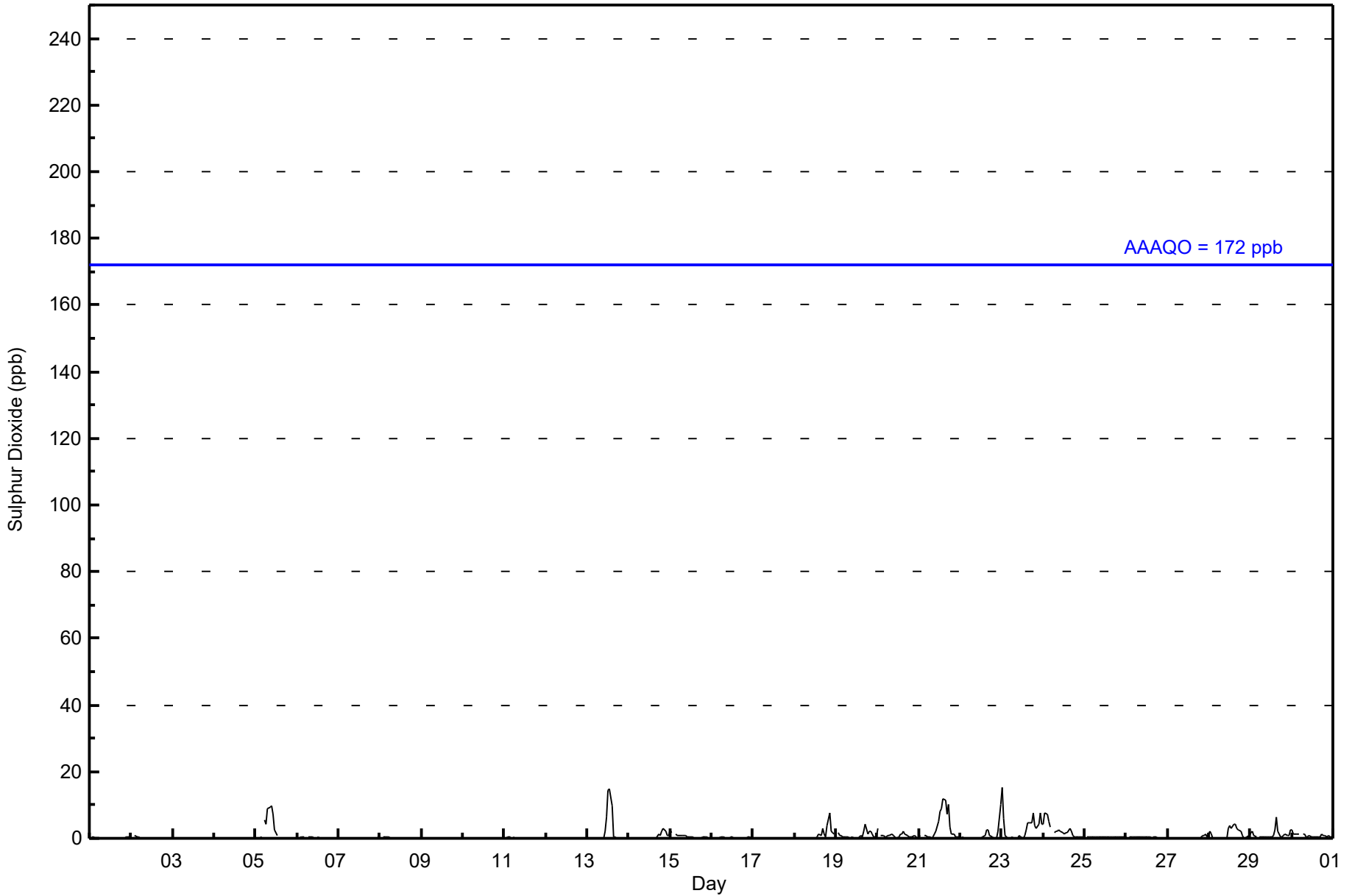
1.3	1.0	0.6	0.6	0.4	0.4	0.4	0.6	0.6	0.6	0.6	0.6	0.8	1.1	1.2	1.4	1.3	1.0	1.0	0.7	0.6	0.7	0.6	0.6	0.8	Diurnal Average	
15.3	7.4	7.0	5.0	3.4	5.5	4.3	8.8	9.4	9.8	9.8	7.1	6.4	14.3	14.8	12.0	11.3	7.2	10.1	7.5	4.0	7.6	4.3	7.6	10.0	Diurnal Maximum	

Z - zerospan      C - Calibration      M - Maintenance  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb    24-hr 48 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Patricia McInnes - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Patricia McInnes - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	679	99.27	99.27
11 - 20	5	0.73	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Patricia McInnes - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 10	84	55	16	6	7	25	77	47	32	39	37	48	39	54	35	78	679
11 - 20	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	<b>85</b>	<b>57</b>	<b>16</b>	<b>6</b>	<b>7</b>	<b>25</b>	<b>77</b>	<b>47</b>	<b>32</b>	<b>39</b>	<b>37</b>	<b>48</b>	<b>39</b>	<b>54</b>	<b>35</b>	<b>80</b>	<b>684</b>

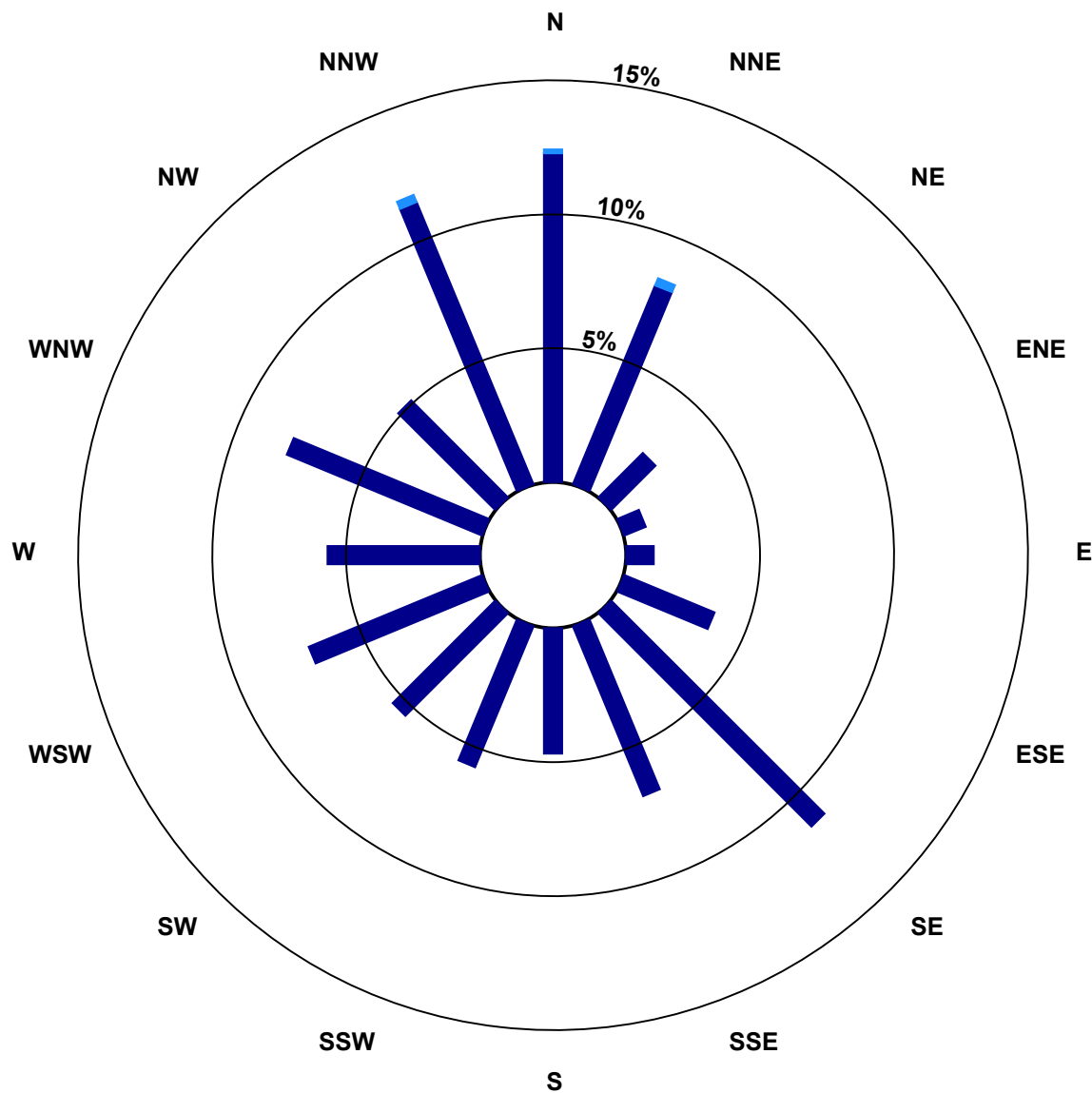
Total Number of Valid Hours: 684

Total Number of Hours: 720

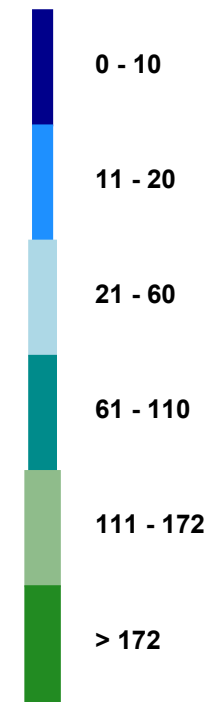


# Wood Buffalo Environmental Association Wind Rose Nov 2024

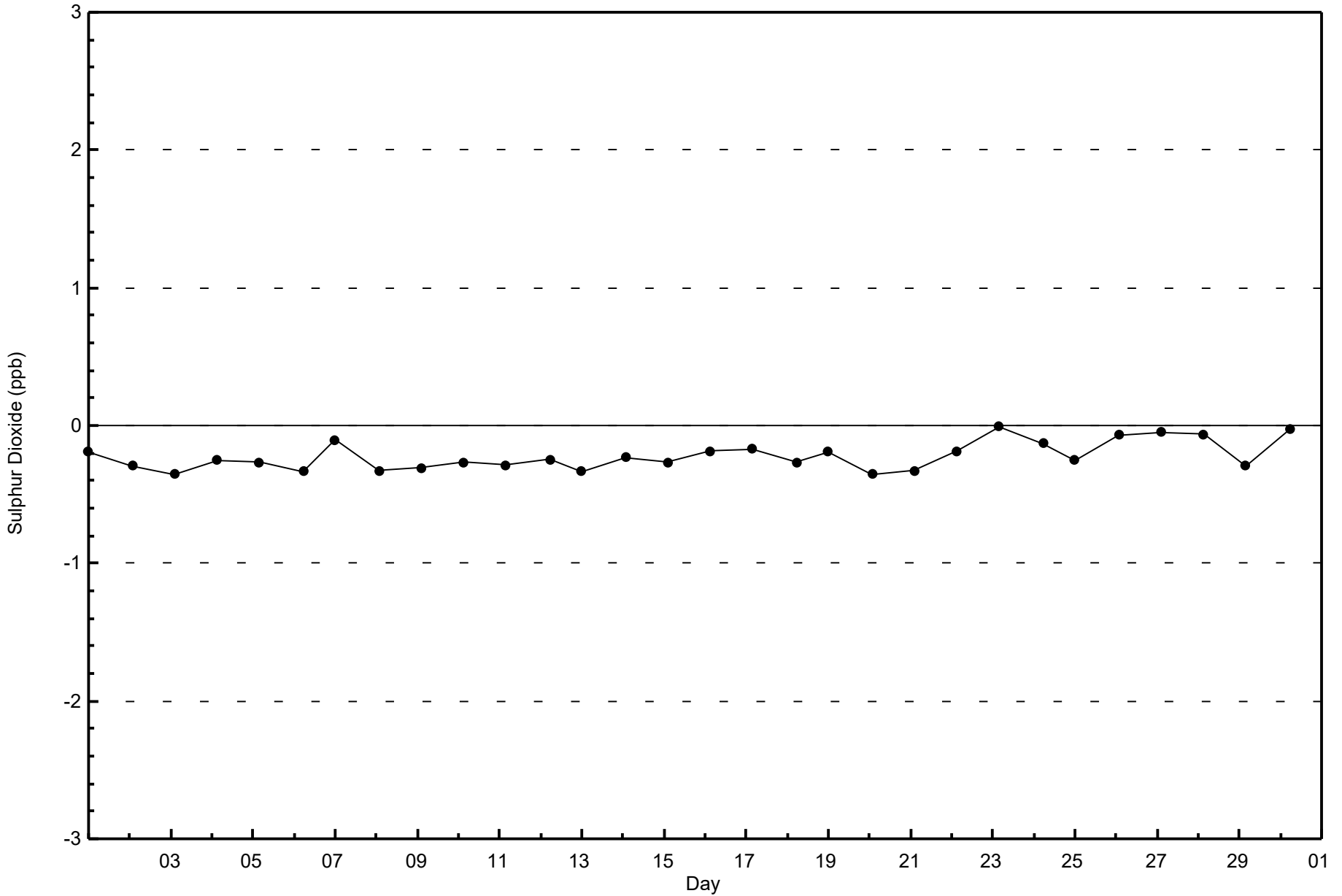
# Sulphur Dioxide (SO<sub>2</sub>) - ppb Patricia McInnes

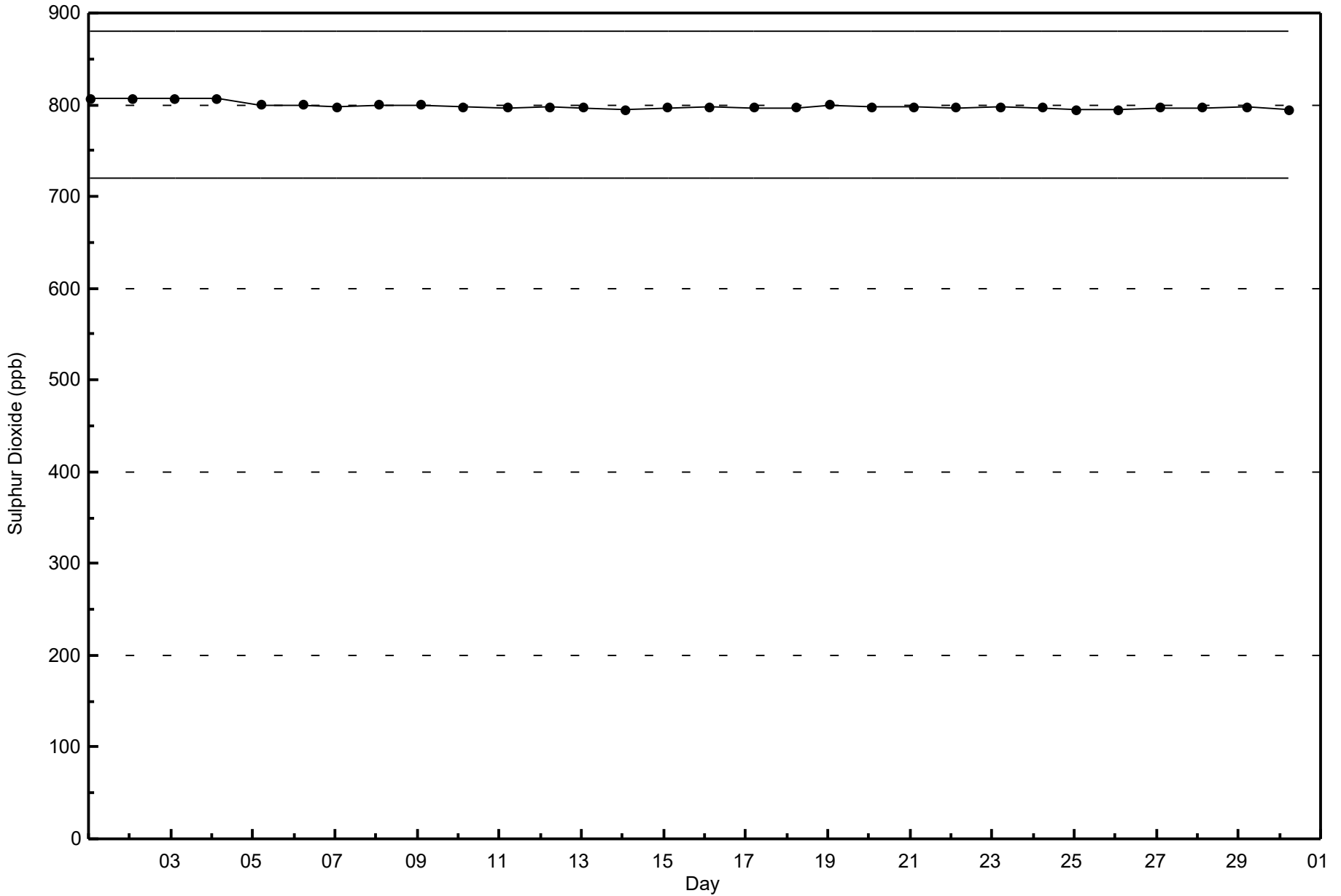


Classes (ppb)



Total Number of Valid Hours: 684



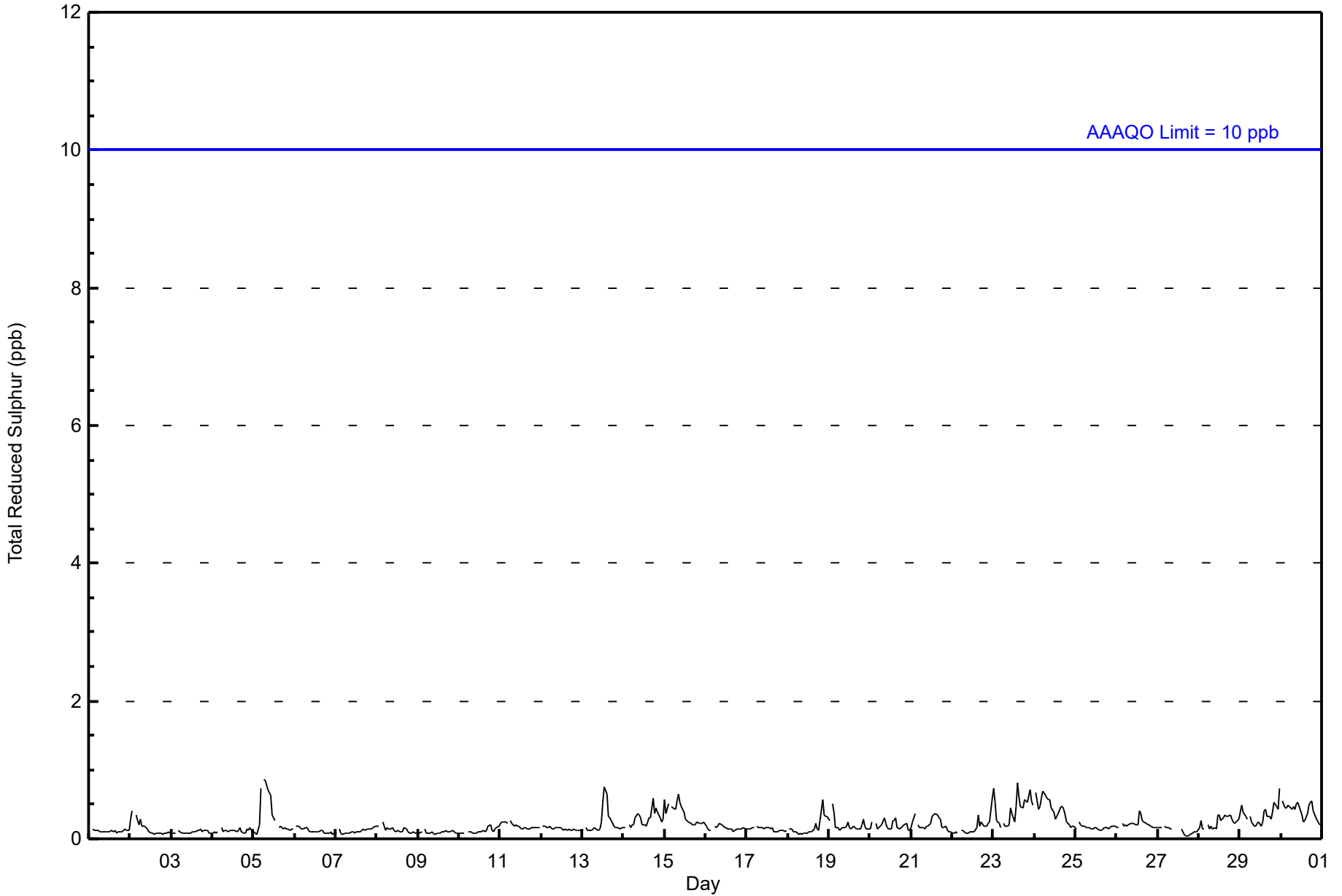






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Reduced Sulphur (TRS) - ppb**  
**Patricia McInnes - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb**  
**Patricia McInnes - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	683	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Patricia McInnes - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	84	57	17	6	7	30	79	46	30	39	38	50	36	52	34	78	683
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	84	57	17	6	7	30	79	46	30	39	38	50	36	52	34	78	683

Total Number of Valid Hours: 683

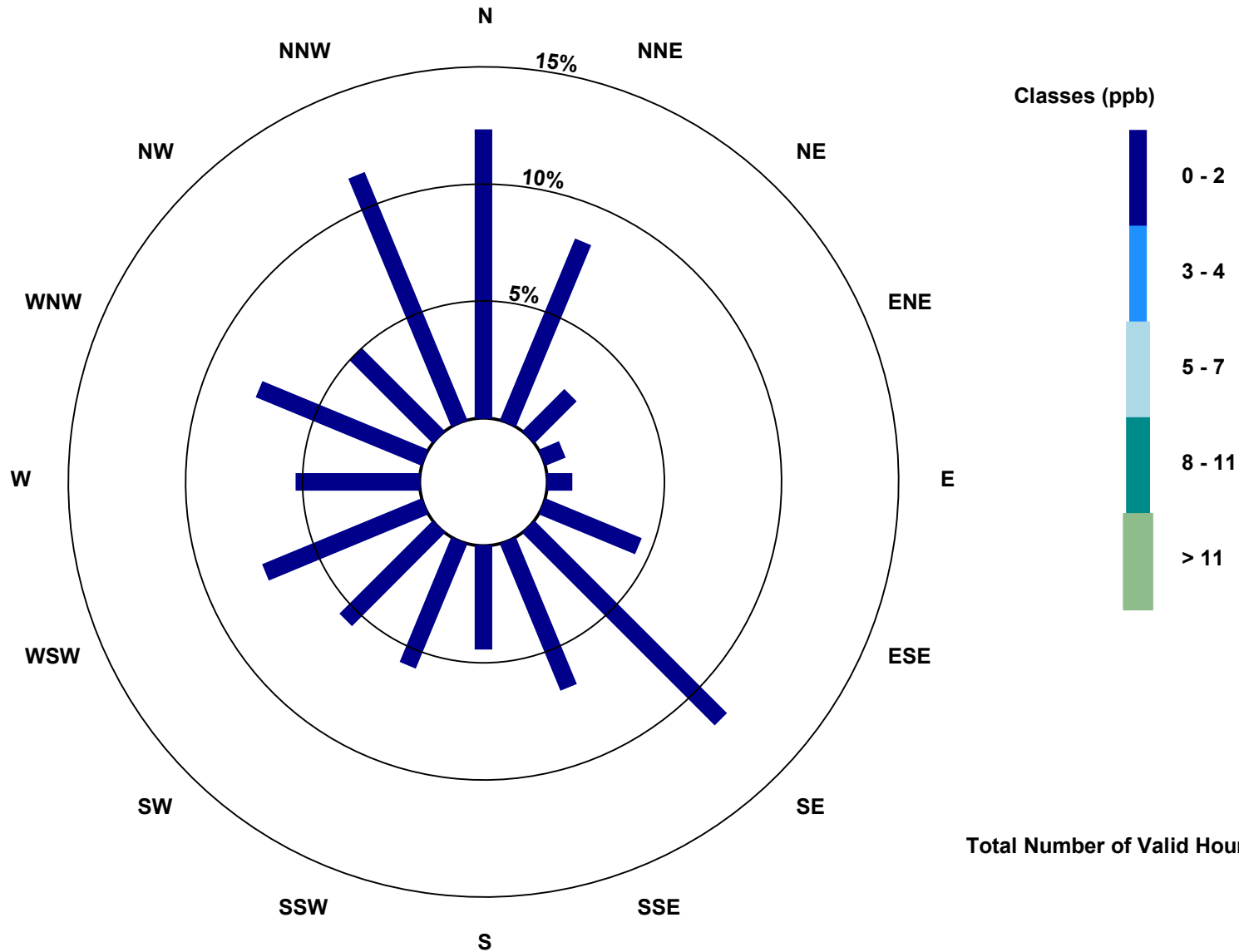
Total Number of Hours: 720



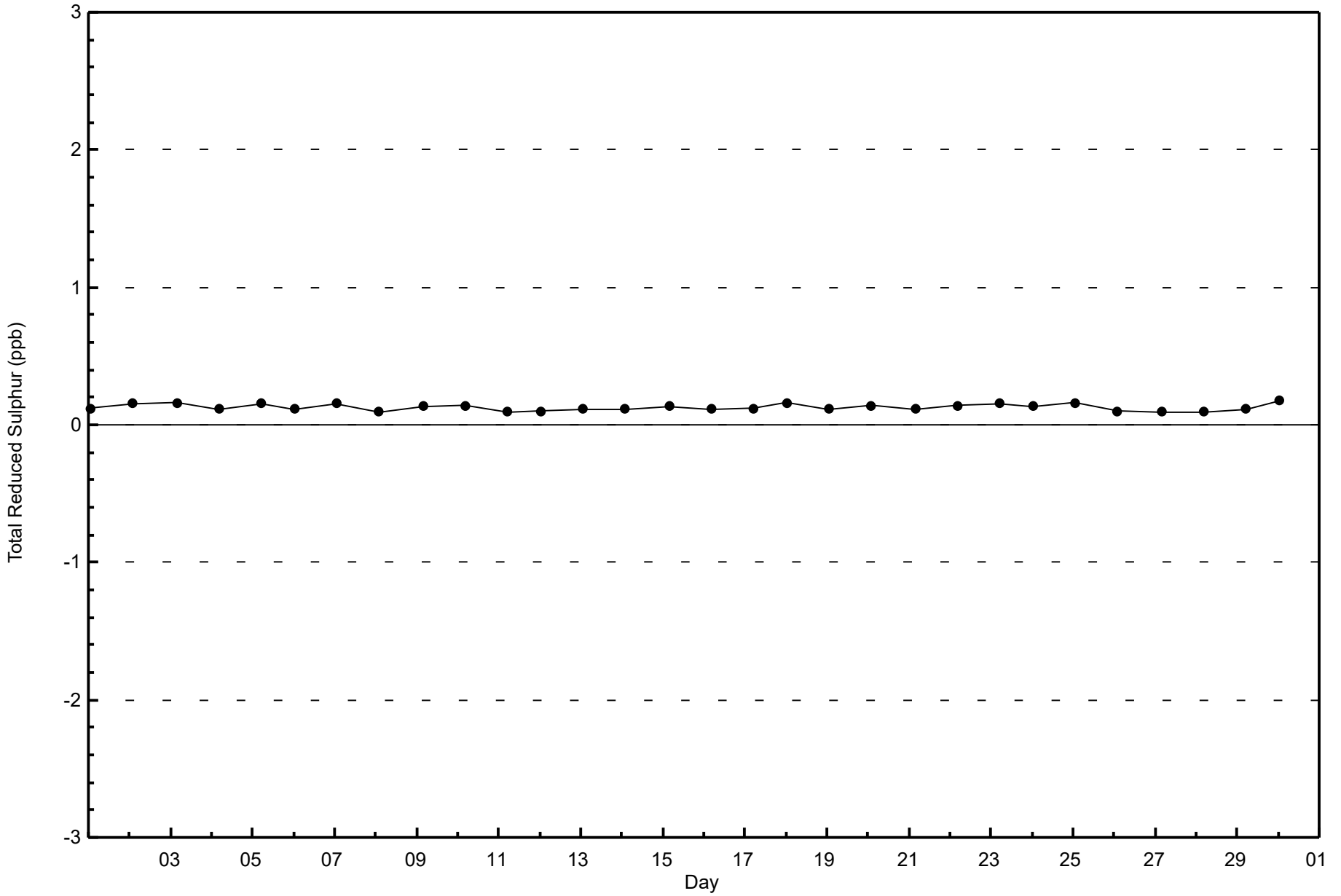


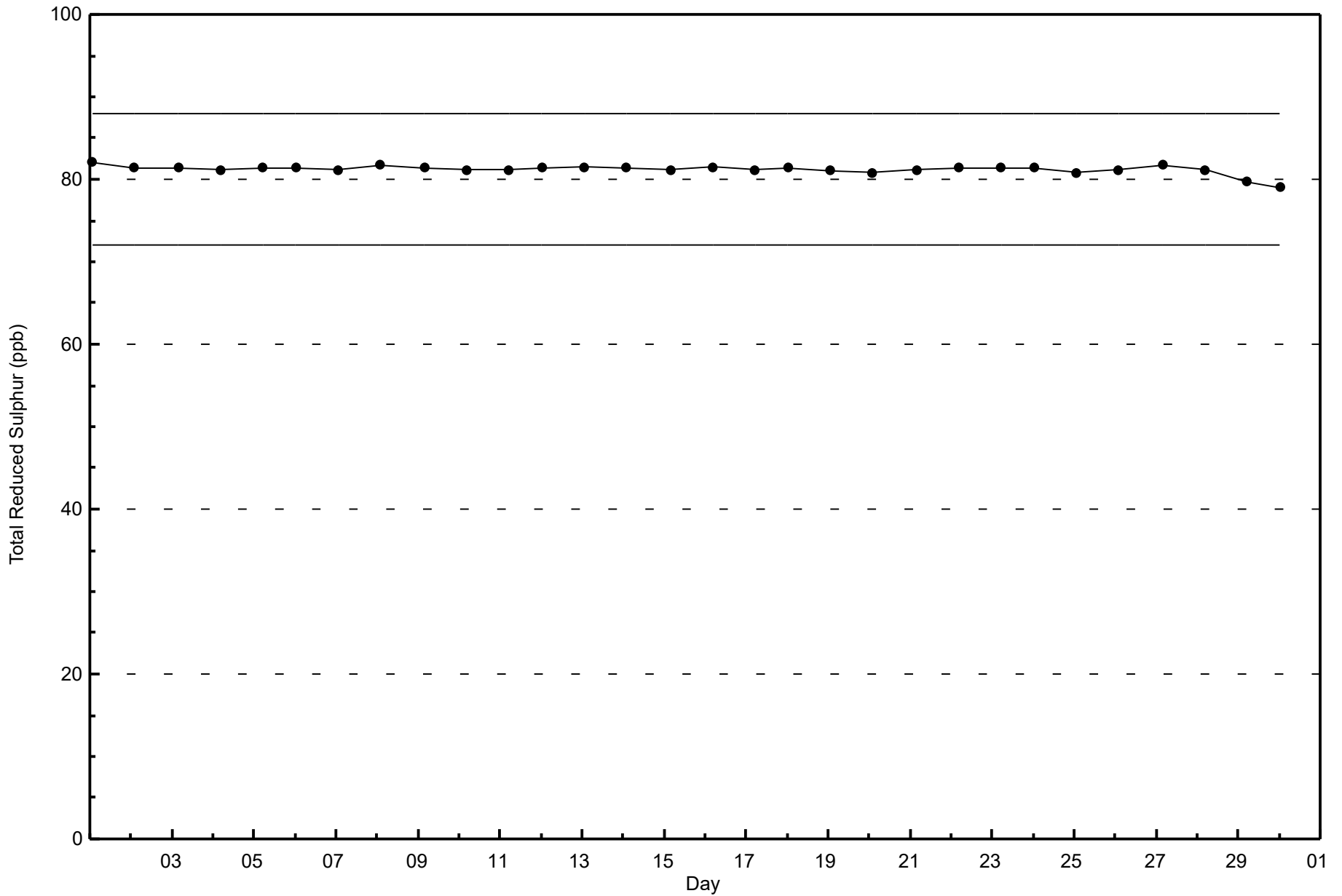
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Reduced Sulphur (TRS) - ppb  
Patricia McInnes



Total Number of Valid Hours: 683



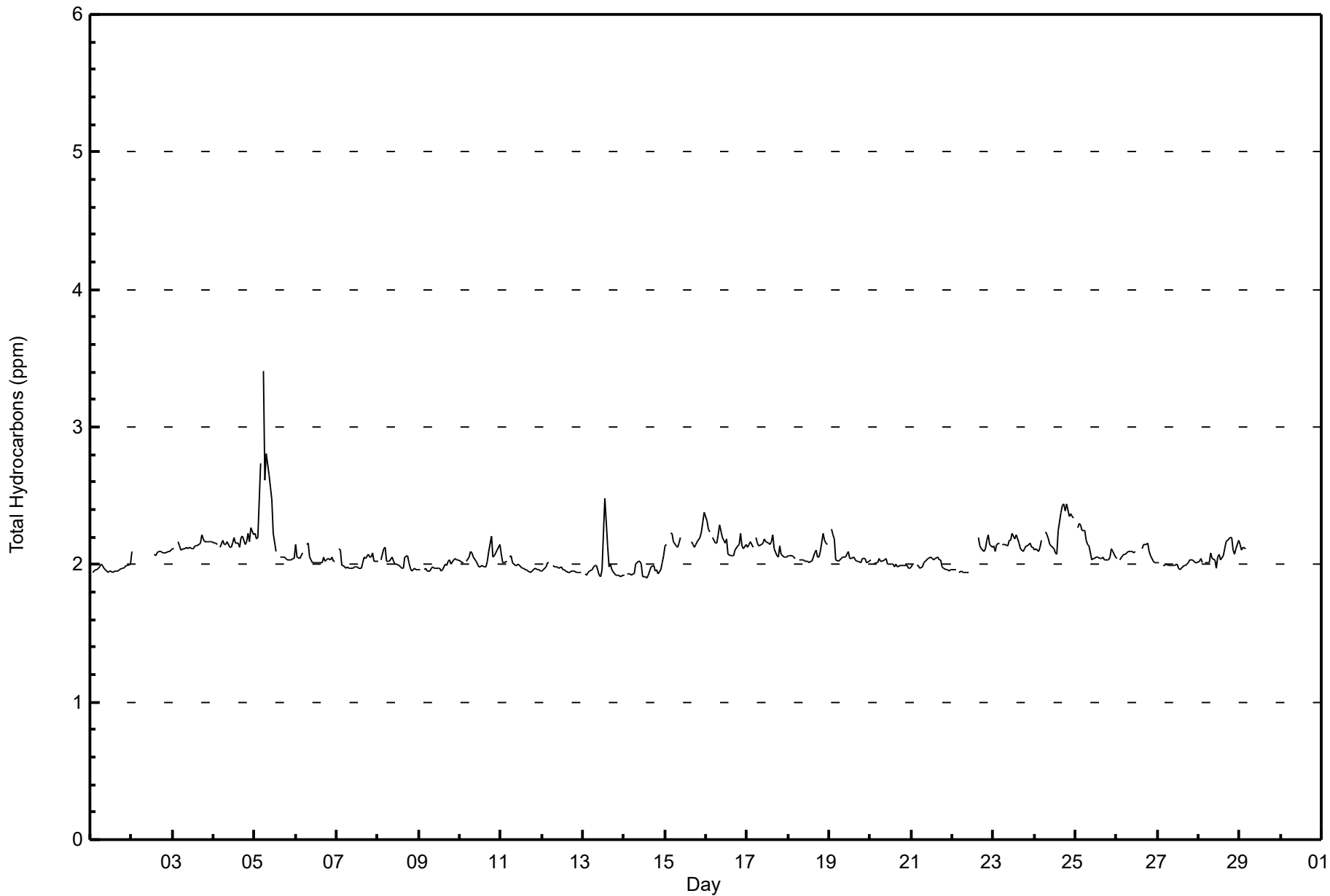






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Patricia McInnes - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Patricia McInnes - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	323	51.85	51.85
2.1 - 3.0	299	47.99	99.84
3.1 - 10.0	1	0.16	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 623

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Patricia McInnes - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	31	24	11	2	1	9	27	3	4	25	24	29	28	43	21	41	323
2.1 - 3.0	36	26	5	2	4	14	47	43	25	14	12	19	9	7	11	25	299
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	67	50	16	4	5	23	74	46	29	39	36	48	37	50	32	67	623

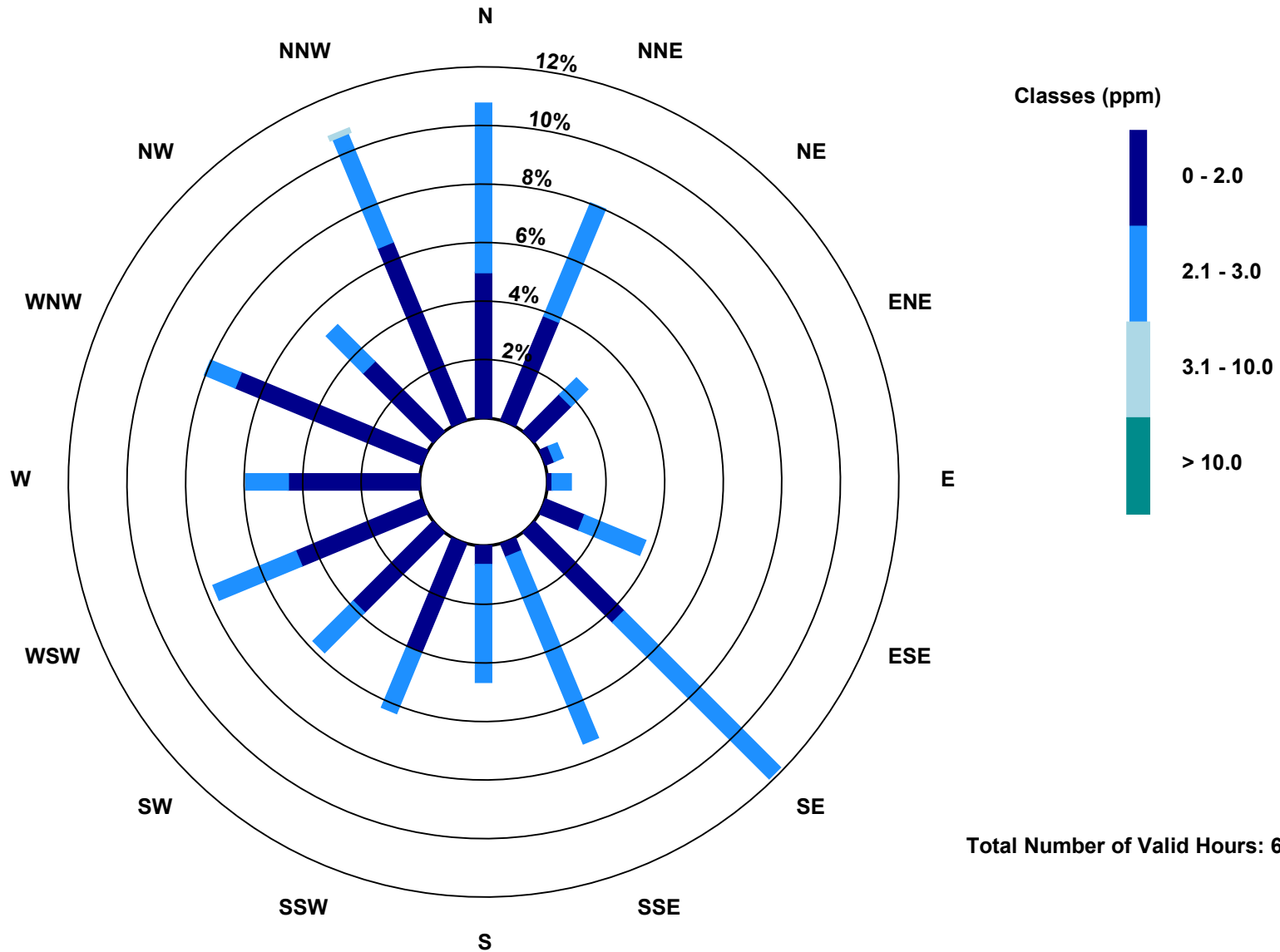
Total Number of Valid Hours: 623

Total Number of Hours: 720

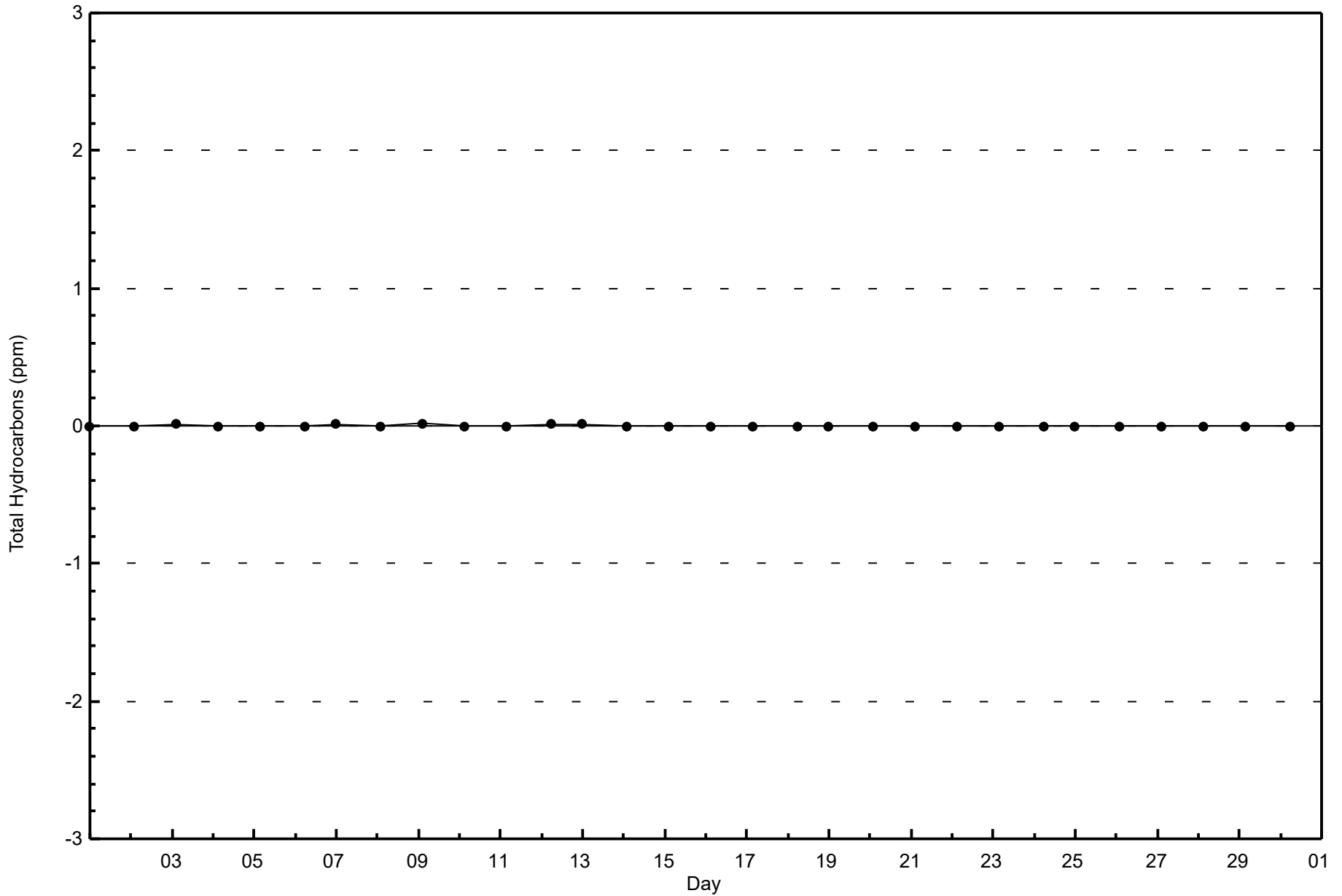


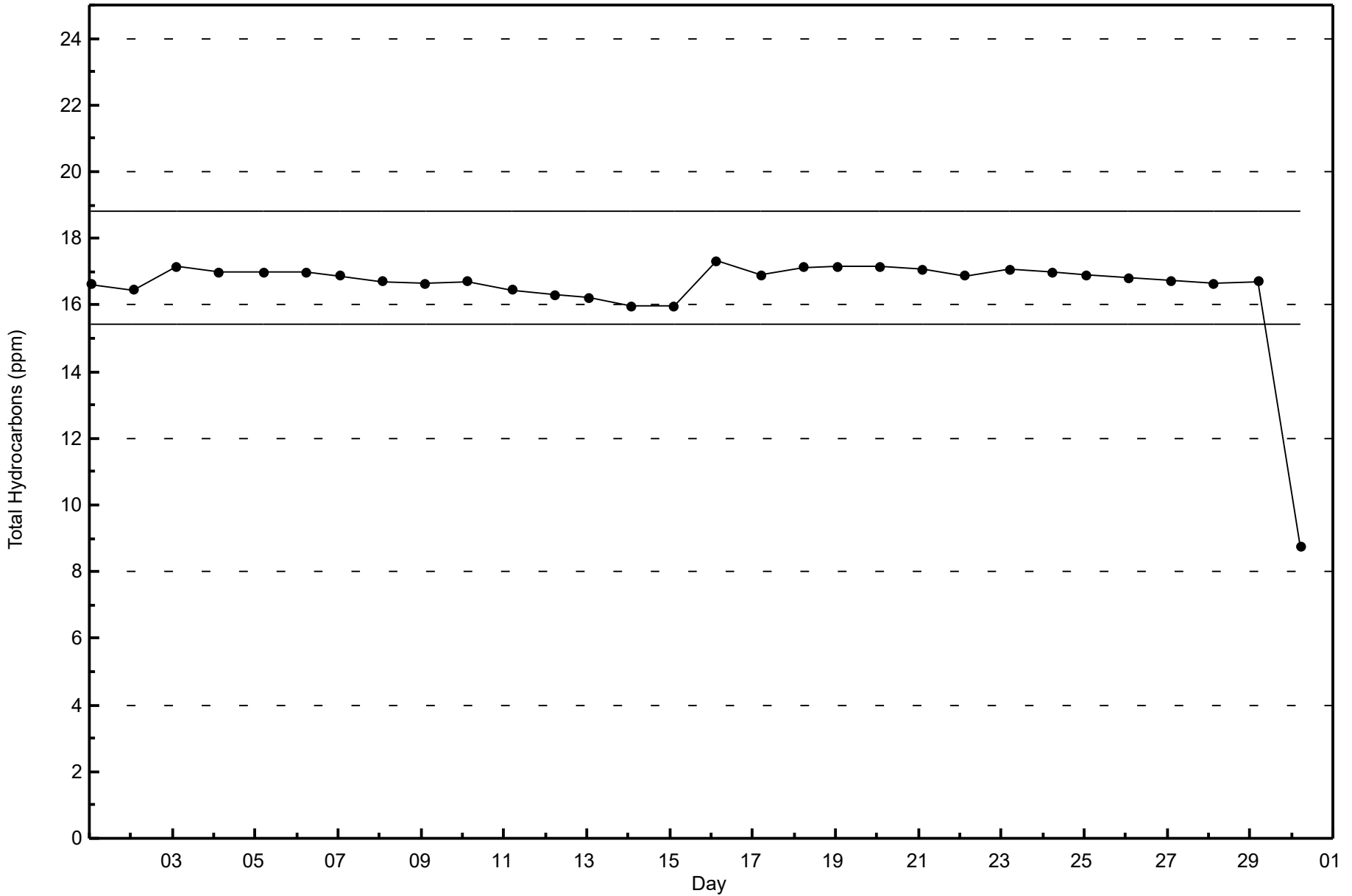
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Hydrocarbons (THC) - ppm  
Patricia McInnes







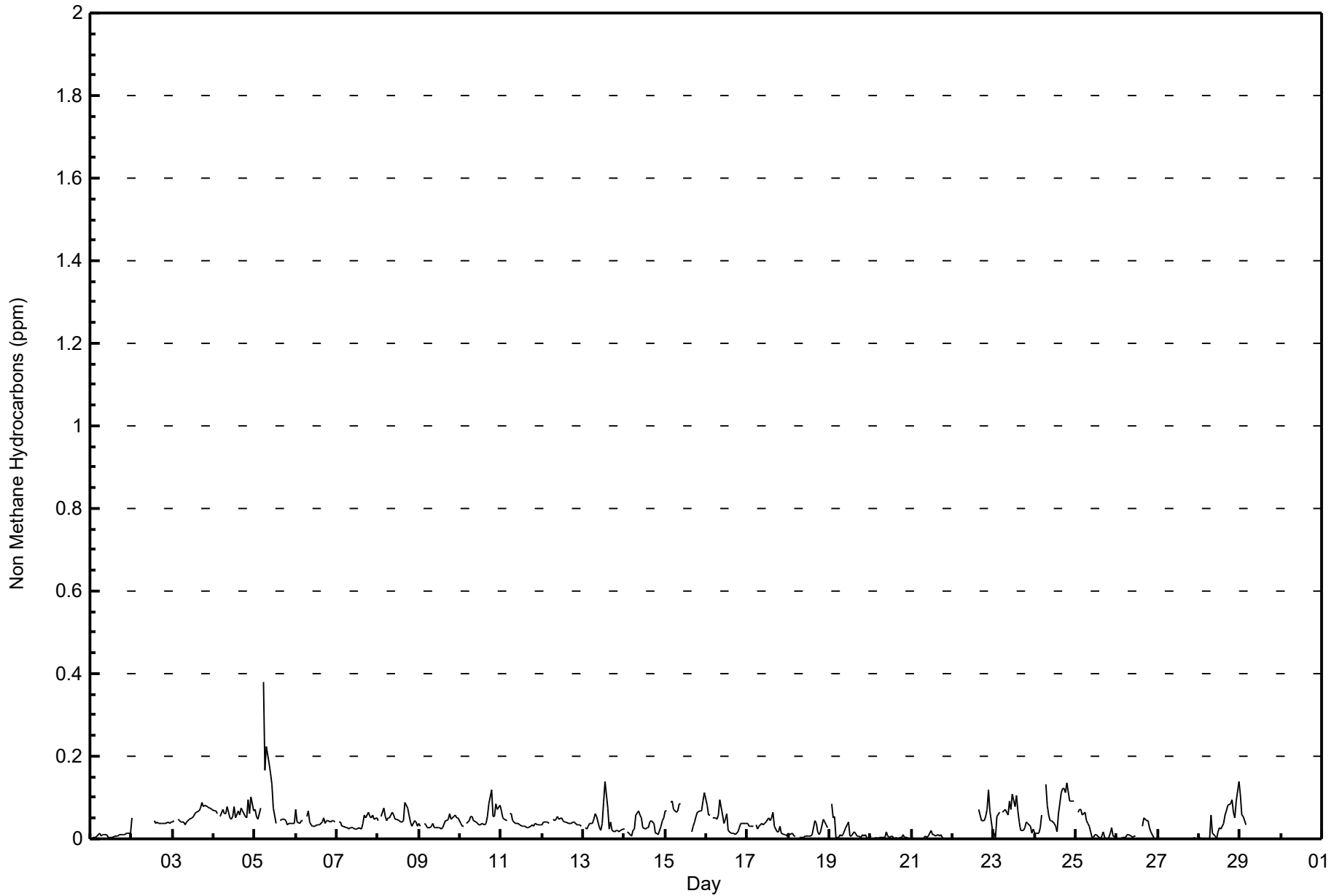




Summary of Hour Averages

Patricia McInnes - November 2024

Maximum Value: 0.380 ppm on Nov 5 06:00		Maximum Daily Average: 0.094 ppm on Nov 5		Hours in Service: 720																							
Minimum Value: 0.000 ppm on Nov 27 04:00		Minimum Daily Average: 0.000 ppm on Nov 27		Hours of Data: 623																							
Maximum Diurnal Average: 0.046 ppm at hour 6		Minimum Diurnal Average: 0.029 ppm at hour 5		Hours of Missing Data: 97																							
Monthly Average: 0.037 ppm		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.1 P <sub>90</sub> = 0.1 P <sub>99</sub> = 0.1		Hours of Calibration: 32																							
				Percent Operational Time: 91.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	Z	0.003	0.003	0.004	0.006	0.013	0.008	0.012	0.010	0.011	0.003	0.002	0.004	0.003	0.008	0.007	0.007	0.010	0.010	0.011	0.012	0.015	0.013	0.015	0.008	0.015	
2-Nov	0.050	Z	0.064	UO	UO	UO	UO	UO	UO	UO	C	C	C	0.044	0.036	0.039	0.039	0.036	0.036	0.036	0.039	0.041	0.038	0.040	--	0.064	
3-Nov	0.042	0.044	Z	0.047	0.043	0.041	0.040	0.035	0.039	0.046	0.048	0.050	0.056	0.062	0.065	0.069	0.076	0.087	0.077	0.080	0.078	0.075	0.073	0.071	0.058	0.087	
4-Nov	0.067	0.068	0.061	Z	0.054	0.071	0.060	0.061	0.080	0.051	0.049	0.056	0.079	0.051	0.069	0.059	0.076	0.067	0.054	0.052	0.096	0.061	0.102	0.069	0.066	0.102	
5-Nov	0.071	0.055	0.048	0.073	Z	0.380	0.167	0.224	0.184	0.160	0.134	0.074	0.036	M	M	0.046	0.046	0.046	0.044	0.034	0.038	0.037	0.037	0.036	0.094	0.380	
6-Nov	0.072	0.041	0.038	0.045	0.043	Z	0.056	0.067	0.041	0.035	0.031	0.031	0.034	0.033	0.034	0.040	0.051	0.038	0.043	0.043	0.041	0.044	0.045	0.039	0.043	0.072	
7-Nov	Z	0.041	0.040	0.029	0.030	0.027	0.028	0.024	0.027	0.028	0.025	0.024	0.024	0.028	0.024	0.037	0.056	0.051	0.066	0.055	0.051	0.058	0.049	0.049	0.038	0.066	
8-Nov	0.046	Z	0.054	0.076	0.056	0.045	0.052	0.051	0.063	0.056	0.047	0.046	0.043	0.041	0.042	0.044	0.088	0.073	0.058	0.041	0.030	0.043	0.040	0.032	0.051	0.088	
9-Nov	0.036	0.031	Z	0.037	0.035	0.029	0.026	0.032	0.038	0.029	0.027	0.026	0.028	0.025	0.026	0.046	0.042	0.046	0.062	0.048	0.055	0.057	0.052	0.050	0.038	0.062	
10-Nov	0.037	0.032	0.030	Z	0.038	0.045	0.055	0.055	0.043	0.039	0.036	0.035	0.033	0.037	0.035	0.037	0.053	0.083	0.120	0.055	0.053	0.086	0.072	0.083	0.052	0.120	
11-Nov	0.068	0.052	0.046	0.043	Z	0.061	0.061	0.046	0.036	0.038	0.037	0.035	0.031	0.032	0.031	0.028	0.028	0.031	0.032	0.032	0.037	0.033	0.034	0.034	0.039	0.068	
12-Nov	0.035	0.041	0.042	0.041	0.039	Z	0.047	0.043	0.047	0.054	0.048	0.051	0.043	0.041	0.042	0.038	0.037	0.037	0.039	0.041	0.034	0.032	0.032	0.031	0.041	0.054	
13-Nov	Z	0.027	0.024	0.032	0.036	0.038	0.047	0.061	0.054	0.026	0.021	0.038	0.088	0.140	0.076	0.025	0.039	0.021	0.017	0.019	0.019	0.018	0.019	0.023	0.039	0.140	
14-Nov	0.025	Z	0.018	0.011	0.006	0.019	0.024	0.056	0.067	0.058	0.049	0.026	0.025	0.026	0.028	0.041	0.045	0.039	0.014	0.013	0.011	0.031	0.045	0.052	0.032	0.067	
15-Nov	0.067	0.068	Z	0.089	0.090	0.070	0.066	0.069	0.083	0.086	M	M	M	M	M	0.016	0.032	0.041	0.054	0.066	0.067	0.069	0.092	0.112	0.069	0.112	
16-Nov	0.080	0.059	0.058	Z	0.052	0.051	0.046	0.058	0.095	0.058	0.039	0.046	0.061	0.020	0.014	0.012	0.012	0.018	0.018	0.026	0.037	0.039	0.036	0.037	0.042	0.095	
17-Nov	0.037	0.031	0.030	0.031	Z	0.033	0.024	0.030	0.038	0.036	0.036	0.041	0.050	0.043	0.052	0.066	0.031	0.018	0.015	0.031	0.014	0.011	0.009	0.008	0.031	0.066	
18-Nov	0.012	0.009	0.015	0.007	0.006	Z	0.005	0.004	0.003	0.003	0.005	0.005	0.006	0.006	0.009	0.044	0.037	0.015	0.011	0.017	0.047	0.041	0.034	0.027	0.016	0.047	
19-Nov	Z	0.084	0.050	0.053	0.004	0.004	0.009	0.006	0.009	0.026	0.033	0.042	0.006	0.005	0.015	0.014	0.005	0.005	0.003	0.011	0.008	0.011	0.002	0.001	0.018	0.084	
20-Nov	0.005	Z	0.001	0.002	0.001	0.005	0.002	0.004	0.005	0.016	0.006	0.002	0.006	0.002	0.001	0.003	0.001	0.003	0.004	0.010	0.003	0.002	0.000	0.001	0.004	0.016	
21-Nov	0.001	0.002	Z	0.001	0.001	0.001	0.001	0.004	0.008	0.005	0.005	0.021	0.010	0.009	0.008	0.009	0.008	0.011	0.003	0.001	0.000	0.001	0.000	0.001	0.005	0.021	
22-Nov	0.000	0.001	0.001	Z	0.001	0.000	0.001	0.001	0.000	0.000	M	M	M	M	M	0.073	0.059	0.044	0.044	0.056	0.071	0.118	0.068	0.017	0.031	0.118	
23-Nov	0.012	0.004	0.056	0.066	Z	0.064	0.067	0.070	0.059	0.093	0.071	0.108	0.079	0.104	0.067	0.040	0.022	0.022	0.027	0.041	0.036	0.031	0.013	0.023	0.051	0.108	
24-Nov	0.013	0.015	0.013	0.026	0.057	Z	0.133	0.082	0.059	0.045	0.043	0.037	0.032	0.017	0.061	0.114	0.123	0.123	0.111	0.137	0.090	0.090	0.093	0.091	0.070	0.137	
25-Nov	Z	0.065	0.071	0.072	0.059	0.065	0.043	0.036	0.032	0.005	0.004	0.011	0.010	0.006	0.001	0.006	0.017	0.002	0.001	0.002	0.013	0.026	0.007	0.004	0.024	0.072	
26-Nov	0.003	Z	0.001	0.003	0.004	0.004	0.009	0.010	0.006	0.005	0.008	0.007	M	M	M	0.031	0.051	0.043	0.045	0.027	0.016	0.003	0.000	0.001	0.014	0.051	
27-Nov	0.001	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.003	0.001	0.000	0.000	0.003	
28-Nov	0.004	0.001	0.000	Z	0.000	0.000	0.001	0.058	0.014	0.006	0.001	0.018	0.027	0.024	0.037	0.058	0.067	0.080	0.084	0.096	0.066	0.051	0.093	0.137	0.040	0.137	
29-Nov	0.104	0.056	0.053	0.033	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.104	
30-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--	
		0.037	0.035	0.034	0.036	0.029	0.046	0.040	0.044	0.042	0.037	0.032	0.033	0.034	0.033	0.032	0.037	0.041	0.039	0.039	0.039	0.038	0.040	0.039	0.039	Diurnal Average	
		0.104	0.084	0.071	0.089	0.090	0.380	0.167	0.224	0.184	0.160	0.134	0.108	0.088	0.140	0.076	0.114	0.123	0.123	0.120	0.137	0.096	0.118	0.102	0.137	Diurnal Maximum	
Z - zerspan		C - Calibration				M - Maintenance				UO - Unstable Operation																	





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Patricia McInnes - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	111	17.82	17.82
0.006 - 0.05	369	59.23	77.05
0.06 - 0.1	138	22.15	99.20
> 0.1	5	0.80	100.00

Total Number of Valid Hours: 623

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Patricia McInnes - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	16	3	0	1	1	1	12	0	0	0	1	3	7	25	16	25	111
0.006 - 0.05	36	26	16	3	2	15	52	26	13	27	30	35	28	21	11	28	369
0.06 - 0.1	15	21	0	0	2	7	10	20	16	12	5	10	2	2	4	12	138
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	5
<b>Totals</b>	67	50	16	4	5	23	74	46	29	39	36	48	37	50	32	67	623

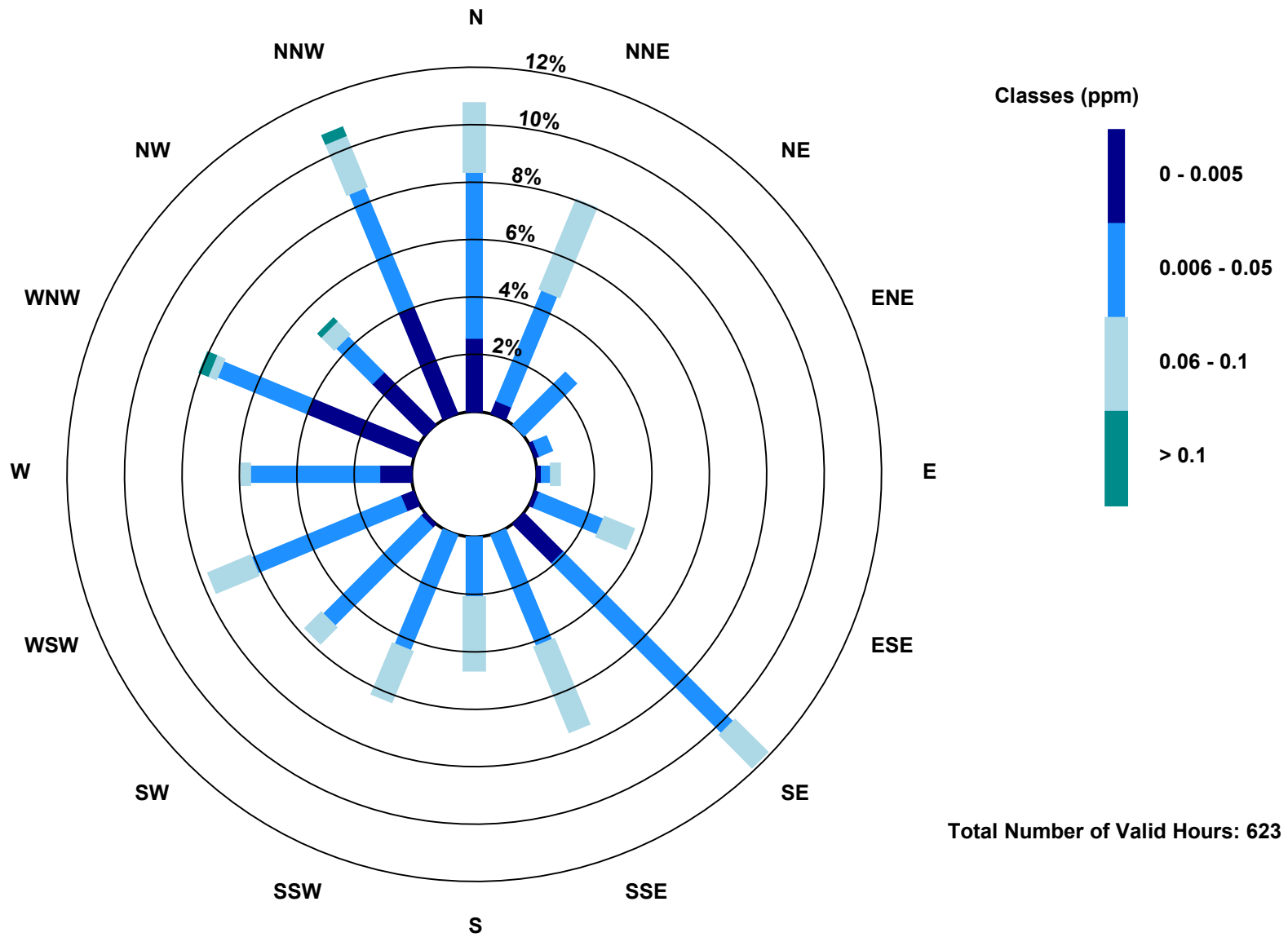
Total Number of Valid Hours: 623

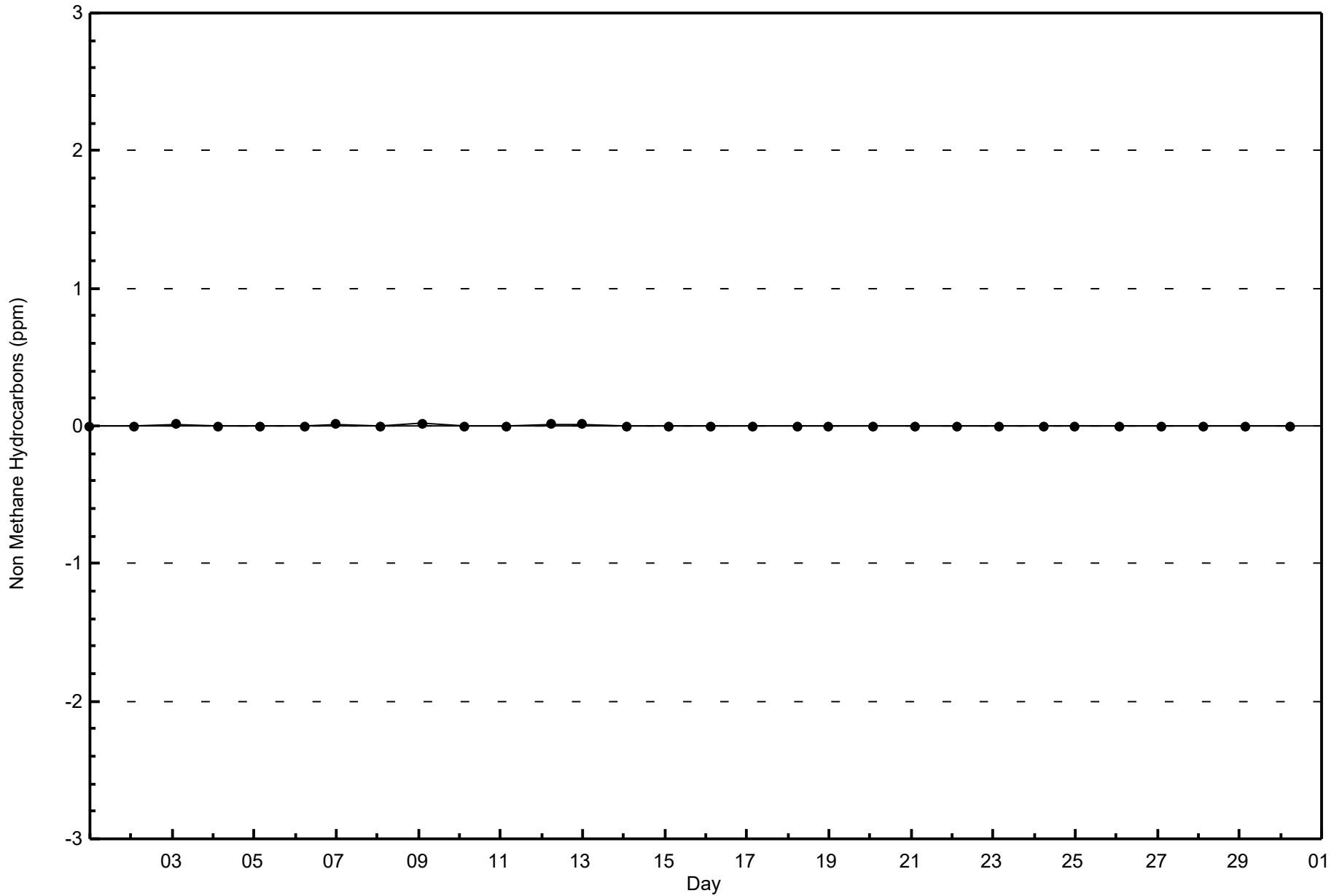
Total Number of Hours: 720



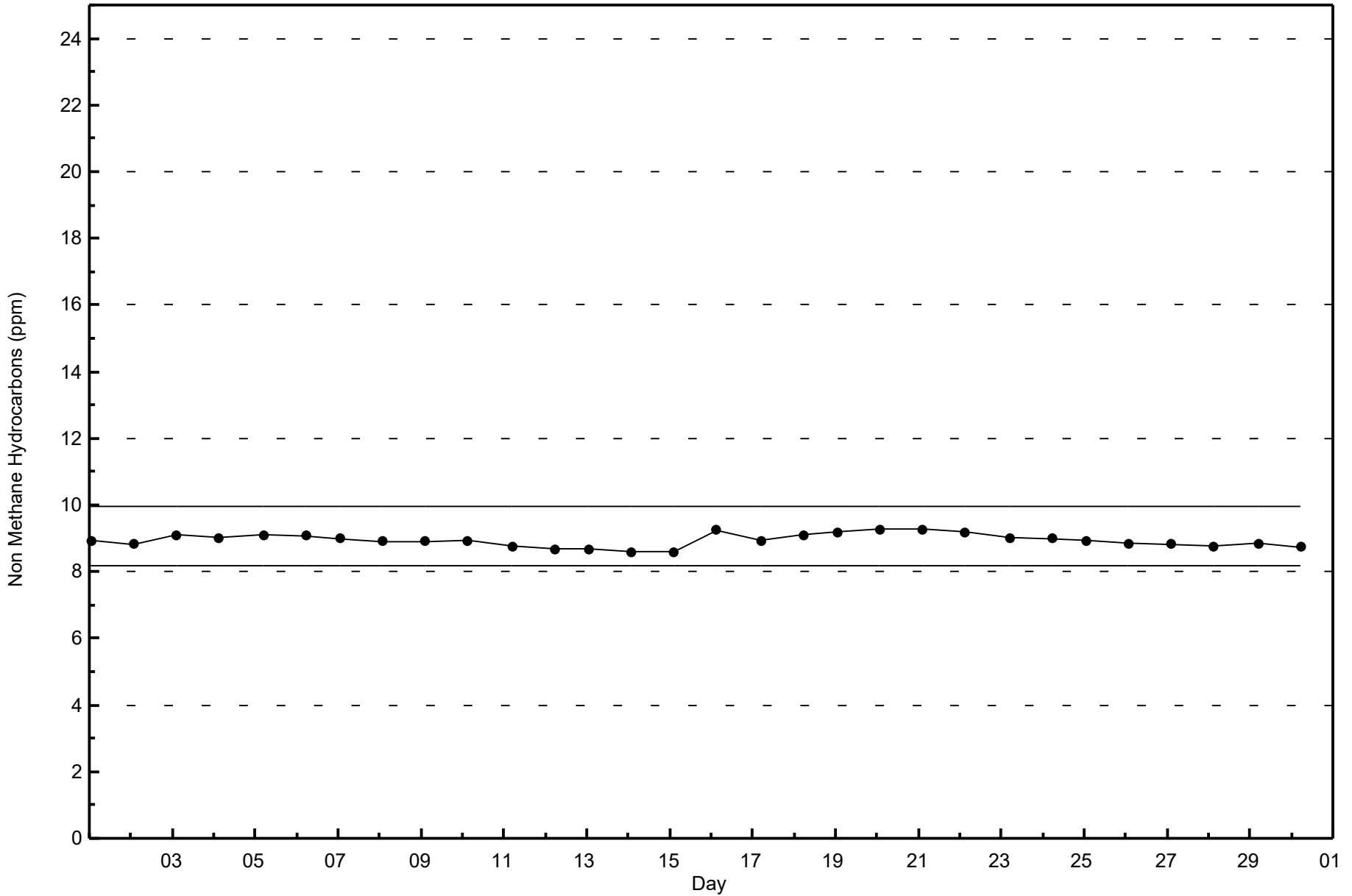
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Non Methane Hydrocarbons (NMHC) - ppm  
Patricia McInnes











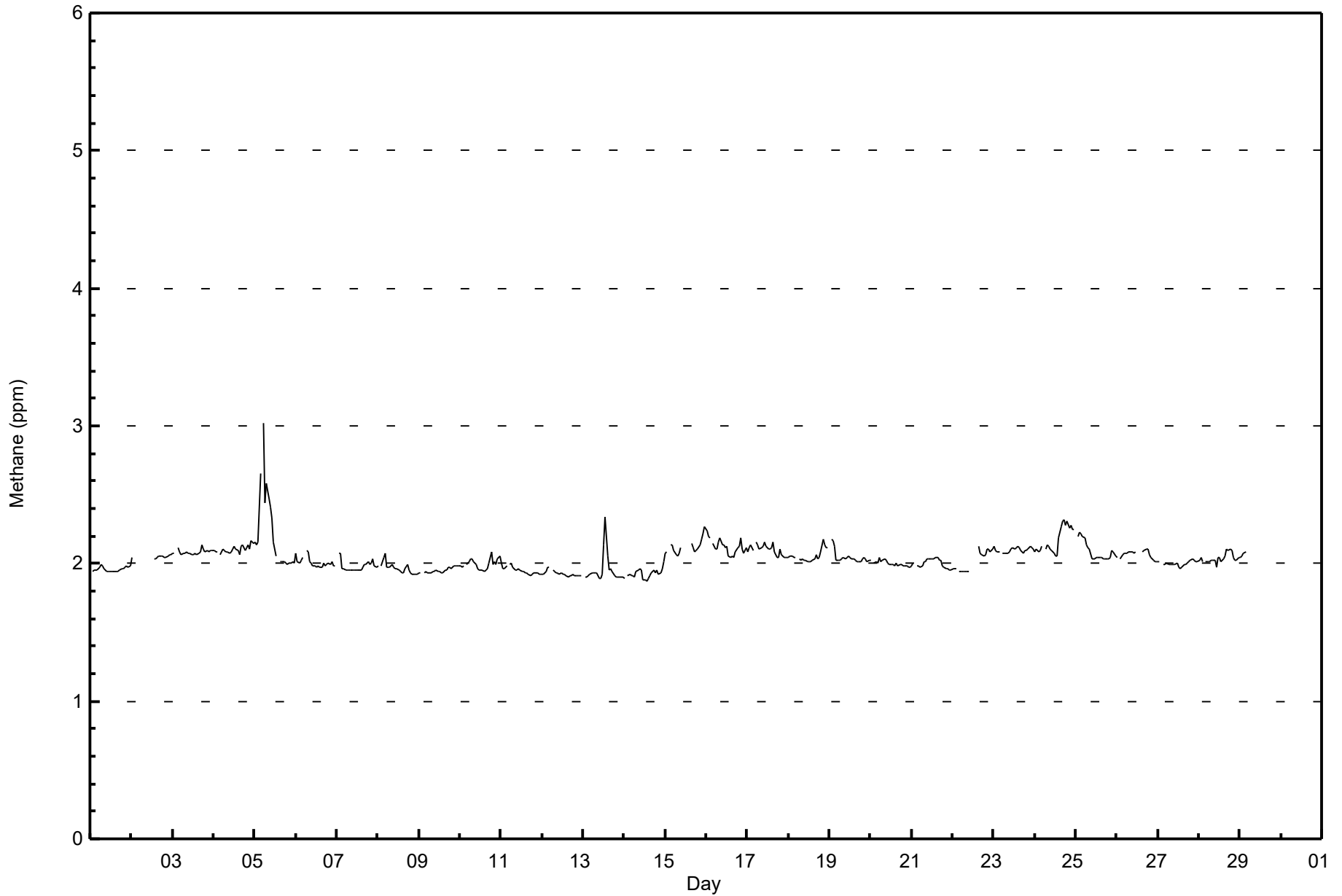
# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Methane (CH<sub>4</sub>) - ppm

Patricia McInnes - November 2024

Number of Exceedences (AAAQO): 1-hr: 0    24-hr: 0 Maximum Value: 3.0 ppm on Nov 5 06:00    Maximum Daily Average: 2.2 ppm on Nov 5																	Hours in Service: 720 Hours of Data: 623 Hours of Missing Data: 97 Hours of Calibration: 32 Percent Operational Time: 91.0										
Minimum Value: 1.9 ppm on Nov 14 14:00    Minimum Daily Average: 1.9 ppm on Nov 12 Maximum Diurnal Average: 2.1 ppm at hour 6    Minimum Diurnal Average: 2.0 ppm at hour 15 Monthly Average: 2.03 ppm    Percentiles: P <sub>1</sub> = 1.9 P <sub>10</sub> = 1.9 Q <sub>1</sub> = 2.0 Median = 2.0 Q <sub>3</sub> = 2.1 P <sub>90</sub> = 2.1 P <sub>99</sub> = 2.3																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	Z	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
2-Nov	2.0	Z	2.1	UO	UO	UO	UO	UO	UO	UO	C	C	C	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	--	2.1	
3-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
4-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2
5-Nov	2.2	2.1	2.2	2.7	Z	3.0	2.4	2.6	2.5	2.4	2.3	2.2	2.1	M	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	3.0	3.0
6-Nov	2.1	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1
7-Nov	Z	2.1	2.1	2.0	2.0	1.9	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
8-Nov	2.0	Z	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.1	
9-Nov	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
10-Nov	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.1	
11-Nov	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	
12-Nov	1.9	1.9	1.9	2.0	2.0	Z	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	
13-Nov	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.3	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.3	
14-Nov	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0	1.9	2.0	1.9	2.0	2.0	1.9	2.0	
15-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	M	M	M	M	M	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.1	2.3	
16-Nov	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	
17-Nov	2.1	2.1	2.1	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.2	
18-Nov	2.0	2.1	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.2	
19-Nov	Z	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	
20-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
21-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
22-Nov	2.0	2.0	2.0	Z	1.9	1.9	1.9	1.9	1.9	1.9	M	M	M	M	M	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
23-Nov	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
24-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	
25-Nov	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	
26-Nov	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	M	M	M	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	
27-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
28-Nov	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	
29-Nov	2.0	2.0	2.1	2.1	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2.1	
30-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	
																								Diurnal Average			
																								Diurnal Maximum			
																								2.0			
																								2.2			
Z - zerospan                  C - Calibration                  M - Maintenance                  UO - Unstable Operation																											





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Patricia McInnes - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	392	62.92	62.92
2.1 - 3.0	231	37.08	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 623

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Patricia McInnes - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	36	28	12	2	1	13	37	13	12	30	27	32	31	46	25	47	392
2.1 - 3.0	31	22	4	2	4	10	37	33	17	9	9	16	6	4	7	20	231
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	67	50	16	4	5	23	74	46	29	39	36	48	37	50	32	67	623

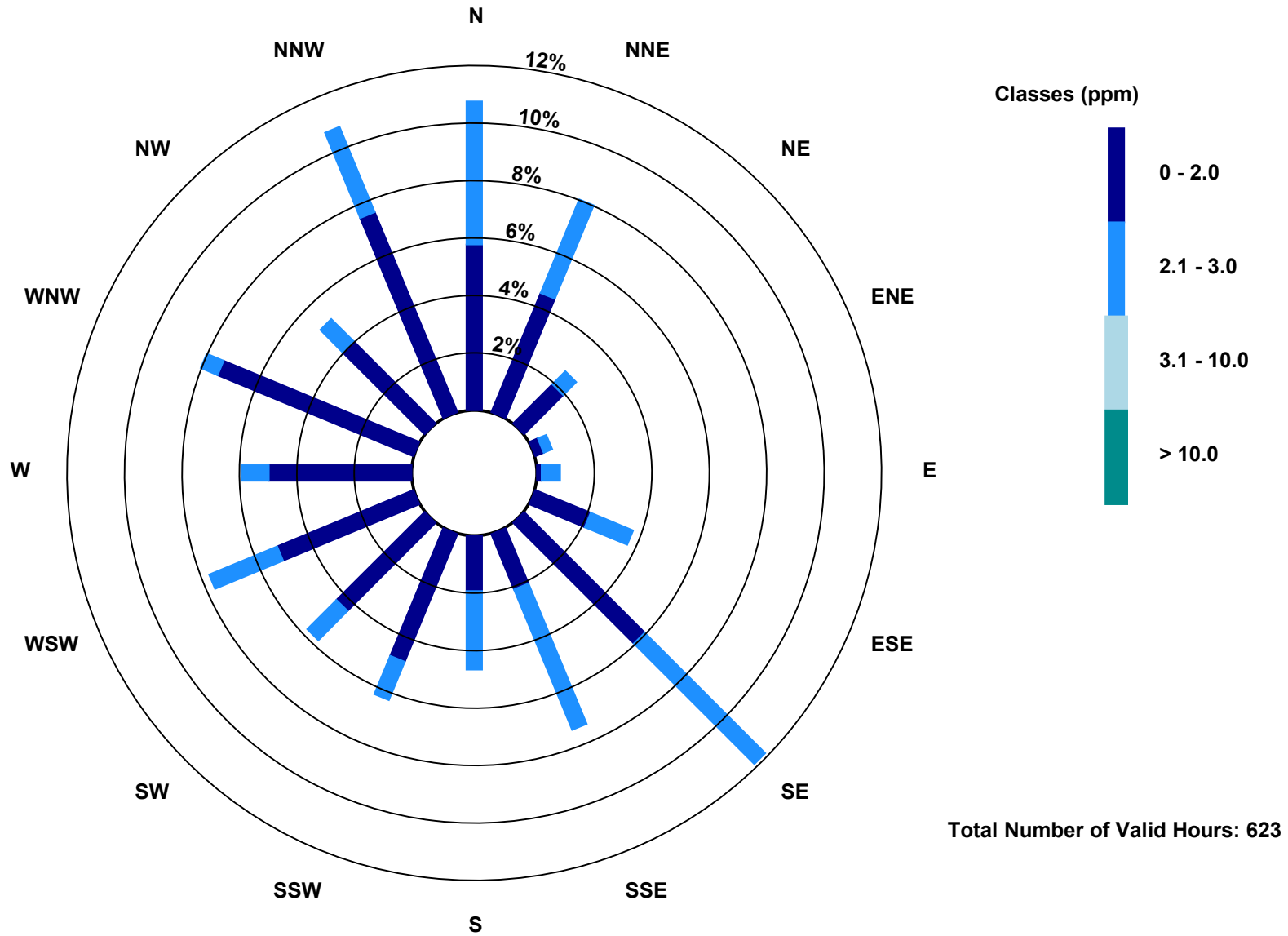
Total Number of Valid Hours: 623

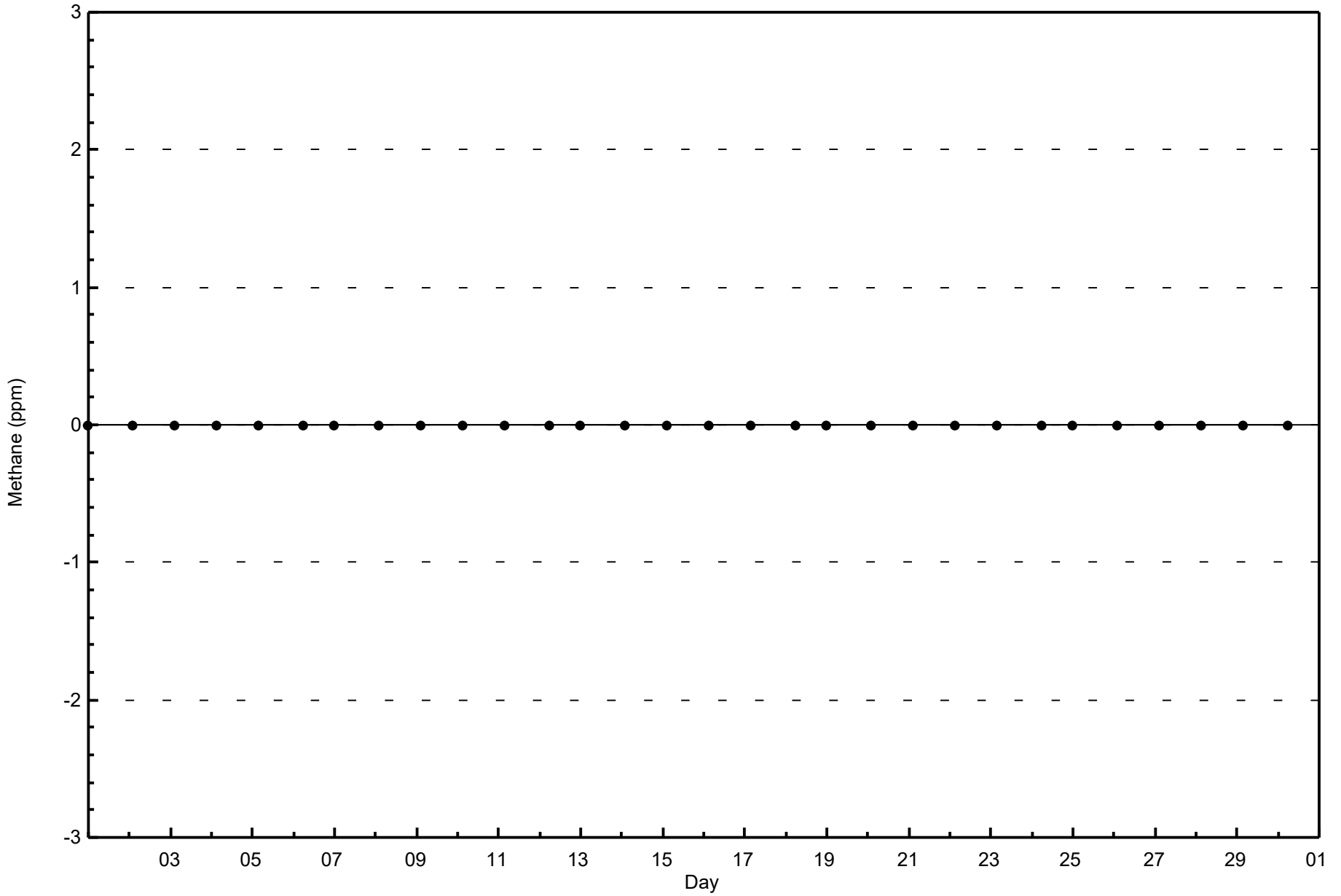
Total Number of Hours: 720

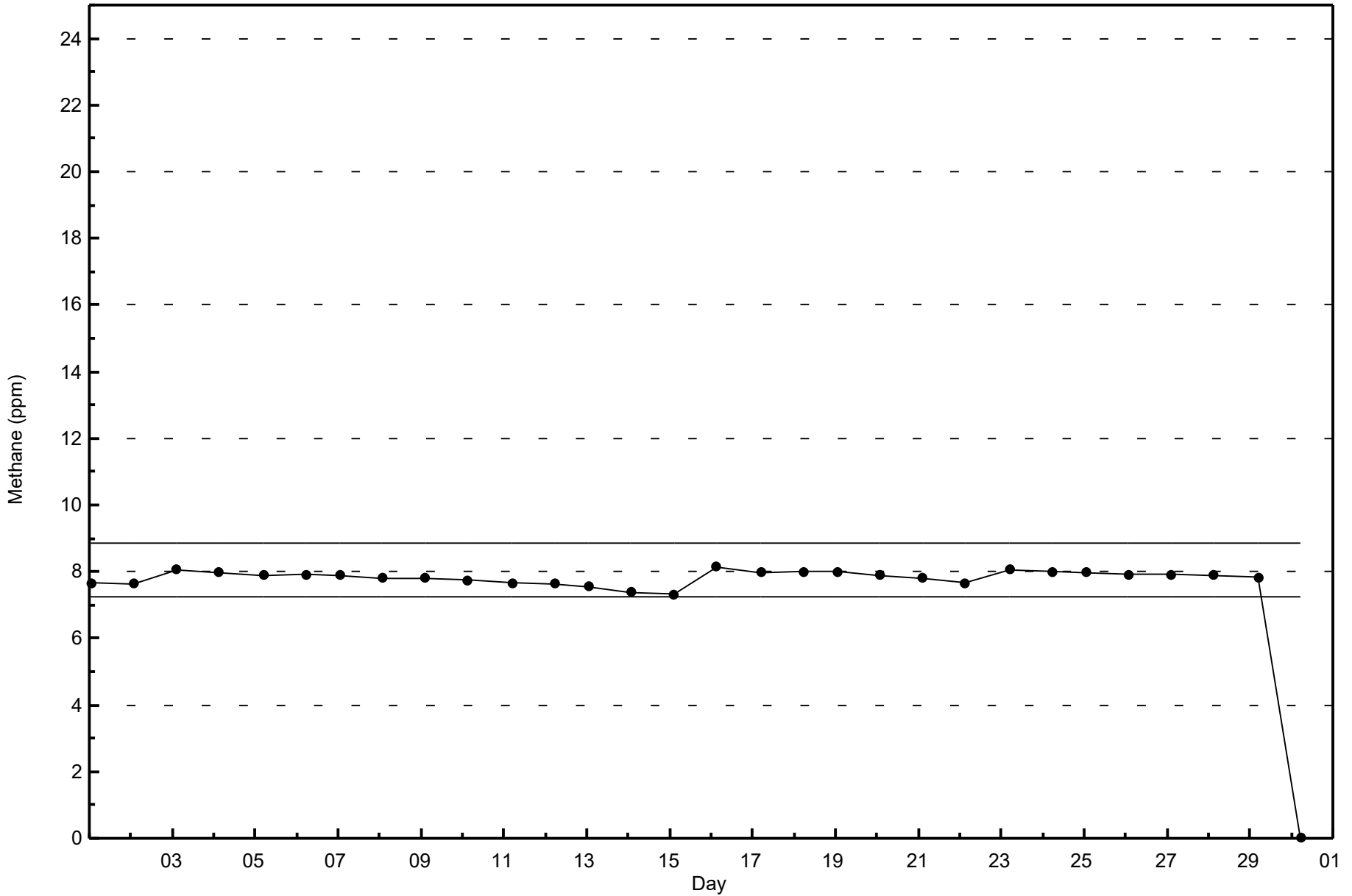


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Methane (CH<sub>4</sub>) - ppm  
Patricia McInnes











Summary of Hour Averages

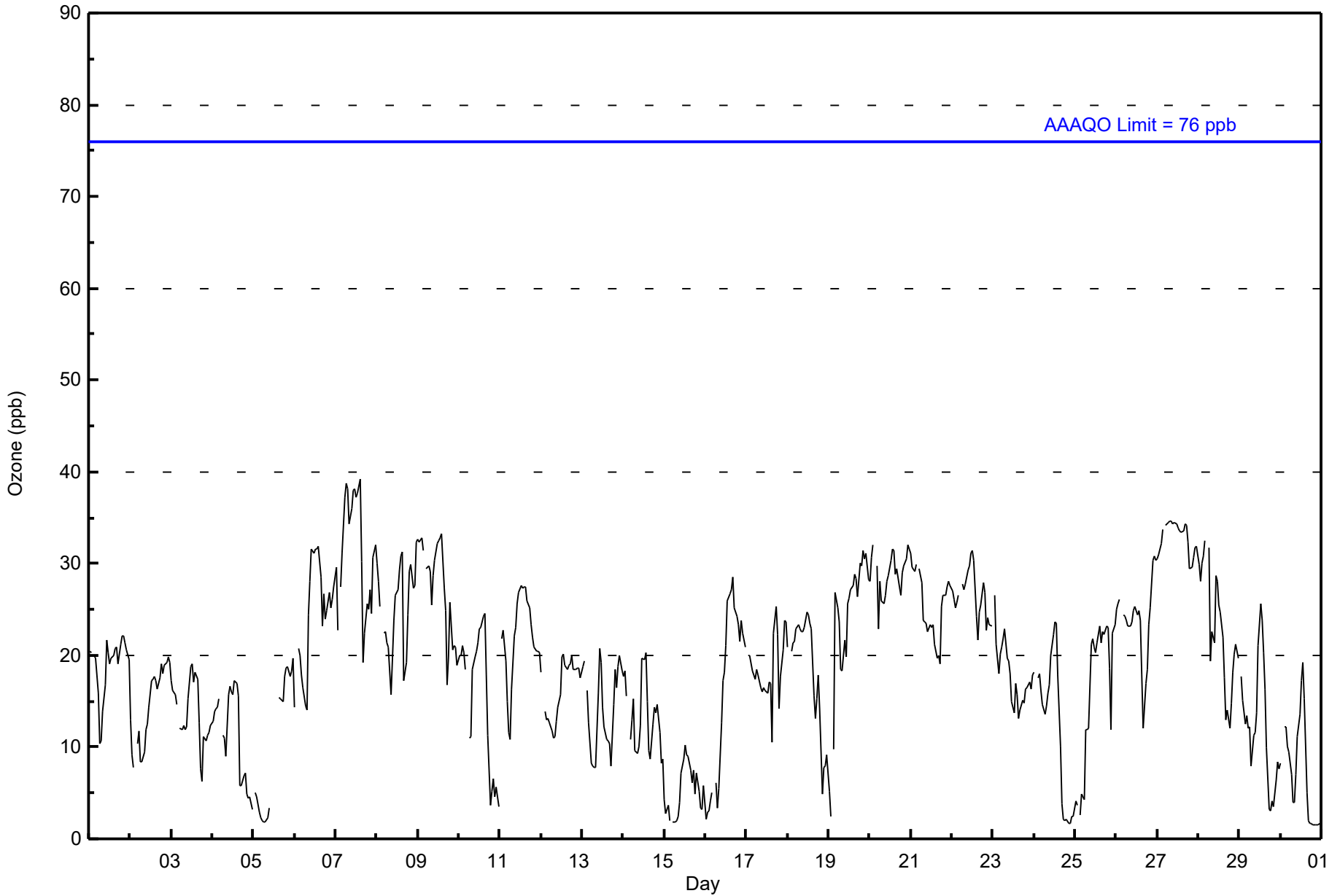
Patricia McInnes - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 39.3 ppb on Nov 7 15:00	Maximum Daily Average: 32.9 ppb on Nov 27		Hours of Data:	685
Minimum Value: 1.5 ppb on Nov 30 23:00	Minimum Daily Average: 5.2 ppb on Nov 15		Hours of Missing Data:	35
Maximum Diurnal Average: 23.5 ppb at hour 14	Minimum Diurnal Average: 16.1 ppb at hour 8		Hours of Calibration:	35
Monthly Average: 18.93 ppb	Percentiles: P <sub>1</sub> = 1.7 P <sub>10</sub> = 5.7 Q <sub>1</sub> = 12.7 Median = 19.4 Q <sub>3</sub> = 25.3 P <sub>90</sub> = 30.4 P <sub>99</sub> = 37.2		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	20.4	20.3	Z	20.0	19.7	15.9	10.4	10.6	13.8	16.8	21.7	20.2	19.1	19.8	20.1	20.7	20.9	19.1	21.2	22.1	22.1	21.3	20.6	19.5	19.0	22.1
2-Nov	12.9	9.1	7.8	Z	10.3	11.7	8.4	8.4	9.5	12.0	12.4	14.3	17.2	17.4	17.6	17.2	16.4	17.6	19.1	18.1	18.9	19.2	19.8	19.2	14.5	19.8
3-Nov	17.3	16.1	15.8	14.6	Z	12.1	12.0	12.3	11.8	12.2	15.3	18.8	19.1	17.1	18.1	17.4	12.7	7.6	6.3	11.1	10.7	11.3	11.6	12.3	13.6	19.1
4-Nov	12.8	13.9	14.2	14.3	15.3	Z	11.2	10.9	9.0	15.7	16.6	16.0	15.7	17.2	16.9	15.6	5.8	5.8	6.8	7.2	4.9	4.4	4.6	3.3	11.2	17.2
5-Nov	Z	5.0	4.6	2.9	2.3	2.0	1.8	1.8	2.2	3.3	C	C	C	C	C	15.5	15.3	15.0	17.7	18.6	18.8	17.6	18.3	19.6	10.1	19.6
6-Nov	14.3	Z	20.8	20.0	17.9	16.5	14.5	14.1	24.4	28.1	31.6	31.2	31.6	31.6	31.9	28.6	23.2	26.7	23.9	24.8	26.9	25.2	26.0	27.4	24.4	31.9
7-Nov	29.7	22.7	Z	27.5	31.0	37.2	38.7	38.1	34.4	36.0	38.0	38.1	37.2	37.7	39.3	30.2	19.2	22.4	25.6	25.1	27.2	24.6	30.6	32.0	31.4	39.3
8-Nov	30.0	28.1	25.3	Z	22.4	22.6	21.3	20.9	15.7	19.7	23.8	26.6	27.1	29.3	30.8	31.2	17.2	19.2	24.3	29.1	30.0	27.3	27.7	32.4	25.3	32.4
9-Nov	32.6	32.4	32.8	31.4	Z	29.5	29.7	29.1	25.5	28.7	30.3	32.2	32.5	32.8	33.2	27.4	24.9	16.8	19.8	25.8	20.5	21.0	20.9	19.0	27.3	33.2
10-Nov	20.0	19.9	21.0	20.3	18.5	Z	11.0	11.2	18.5	19.9	20.5	21.3	22.9	23.0	24.2	24.5	17.8	11.3	3.7	5.2	6.6	4.5	5.7	3.5	15.4	24.5
11-Nov	Z	21.8	22.7	19.4	14.9	11.6	10.8	16.3	22.2	23.0	25.7	26.8	27.6	27.2	27.4	27.4	25.9	25.1	23.4	22.0	20.9	20.4	20.5	20.3	21.9	27.6
12-Nov	18.1	Z	13.9	12.9	13.1	12.7	11.8	11.0	11.2	12.9	14.3	15.8	19.9	20.1	18.9	18.5	18.9	19.1	19.9	18.4	18.4	18.7	18.7	17.5	16.3	20.1
13-Nov	18.7	19.4	Z	16.2	12.7	8.2	8.0	7.8	7.7	15.9	20.7	19.2	14.4	12.2	10.9	10.7	10.4	7.9	14.7	18.4	16.5	18.8	19.9	18.4	14.2	20.7
14-Nov	17.6	18.3	15.6	Z	10.8	13.0	15.3	9.6	9.2	10.1	12.4	19.7	19.5	20.3	15.0	9.6	8.7	12.5	14.3	13.7	14.7	11.6	8.2	8.7	13.4	20.3
15-Nov	4.3	2.7	3.6	2.0	Z	1.8	1.9	2.0	2.5	4.0	7.2	8.8	10.2	9.2	9.0	7.4	6.1	7.4	4.9	7.2	5.2	3.4	3.2	5.9	5.2	10.2
16-Nov	2.1	2.9	3.0	4.2	5.0	Z	6.2	3.4	5.5	12.6	17.2	18.2	21.0	25.9	26.8	27.1	28.5	25.1	24.2	23.3	21.6	23.7	22.5	20.9	16.1	28.5
17-Nov	Z	20.0	19.9	18.3	17.9	17.3	18.5	17.8	16.5	16.1	16.4	16.2	15.8	17.1	17.0	10.5	22.5	25.4	22.3	14.2	17.7	20.6	23.9	23.7	18.5	25.4
18-Nov	20.9	Z	20.5	21.4	21.6	22.9	23.4	22.9	22.6	22.6	23.1	24.8	24.3	23.5	22.8	15.6	13.2	15.2	17.9	14.1	4.9	7.7	7.9	9.2	18.4	24.8
19-Nov	5.2	2.4	Z	9.7	26.9	25.1	23.7	18.5	18.3	21.7	19.9	25.7	26.2	27.2	27.6	28.8	28.4	26.3	30.1	29.7	31.5	30.5	31.1	28.2	23.6	31.5
20-Nov	28.0	30.6	32.1	Z	29.8	22.9	28.1	25.9	25.6	26.5	28.1	28.6	30.3	31.6	31.5	28.8	29.4	27.5	26.6	29.0	29.8	30.5	32.0	31.6	28.9	32.1
21-Nov	31.2	29.6	29.1	29.9	Z	29.4	27.9	23.8	23.7	23.5	22.6	23.3	23.0	23.3	21.2	19.6	20.1	19.1	25.3	26.5	26.5	27.4	28.0	27.6	25.3	31.2
22-Nov	27.0	26.1	25.2	25.8	26.6	Z	27.8	27.1	27.7	29.3	29.7	31.2	31.5	30.4	24.3	21.7	24.6	25.5	27.9	26.8	22.7	24.0	23.3	23.1	26.5	31.5
23-Nov	Z	26.5	21.3	18.0	20.2	20.9	21.7	22.8	19.6	19.4	18.0	14.9	13.7	16.9	15.7	13.2	14.0	15.1	14.8	16.4	16.5	17.0	16.3	17.9	17.9	26.5
24-Nov	18.2	Z	17.5	18.0	16.1	14.7	13.5	14.5	15.9	16.8	20.0	22.3	23.7	23.4	17.8	10.1	3.8	2.2	2.0	2.1	1.7	1.7	2.5	2.4	12.2	23.7
25-Nov	4.1	3.6	Z	2.6	4.9	4.3	11.8	11.9	12.0	21.2	21.8	21.0	20.2	21.3	23.2	21.3	22.6	22.3	23.2	23.1	18.7	11.9	22.4	23.3	16.2	23.3
26-Nov	25.0	25.6	26.1	Z	24.3	24.2	23.7	23.2	23.2	23.7	24.9	25.3	24.5	24.9	23.8	17.8	12.0	16.9	18.5	23.3	25.2	30.4	30.9	30.4	23.8	30.9
27-Nov	30.5	30.9	32.2	33.7	Z	34.2	34.4	34.6	34.7	34.4	34.4	34.3	33.9	33.6	33.4	33.6	34.3	34.2	32.4	29.4	29.6	30.7	31.8	31.9	32.9	34.7
28-Nov	29.9	28.0	30.0	30.8	32.4	Z	31.7	19.3	22.5	21.4	28.7	28.0	25.5	24.7	21.9	17.5	13.0	14.1	12.1	14.7	18.1	20.1	21.2	19.7	22.9	32.4
29-Nov	Z	17.7	15.1	12.5	13.4	12.0	12.2	7.9	11.3	11.7	13.7	21.0	25.6	23.9	20.3	16.4	9.9	3.2	3.1	4.1	3.5	6.3	8.3	7.6	12.2	25.6
30-Nov	8.2	Z	12.2	12.2	10.1	9.5	7.1	3.9	4.0	7.1	11.2	13.5	17.2	19.3	15.3	5.0	2.0	1.7	1.6	1.6	1.5	1.6	1.5	1.7	7.3	19.3

19.2	18.9	19.3	17.5	17.5	17.3	17.3	16.1	16.7	18.9	21.4	22.7	23.1	23.5	22.6	19.6	17.4	16.9	17.6	18.2	17.7	17.8	18.7	18.6	Diurnal Average	
32.6	32.4	32.8	33.7	32.4	37.2	38.7	38.1	34.7	36.0	38.0	38.1	37.2	37.7	39.3	33.6	34.3	34.2	32.4	29.7	31.5	30.7	32.0	32.4	Diurnal Maximum	

Z - zerospan      C - Calibration  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Patricia McInnes - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	384	56.06	56.06
21 - 50	301	43.94	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb  
Patricia McInnes - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	52	37	16	5	5	23	38	32	24	20	22	34	15	10	12	39	384
21 - 50	32	21	1	1	1	6	41	17	5	17	15	18	19	46	20	41	301
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	84	58	17	6	6	29	79	49	29	37	37	52	34	56	32	80	685

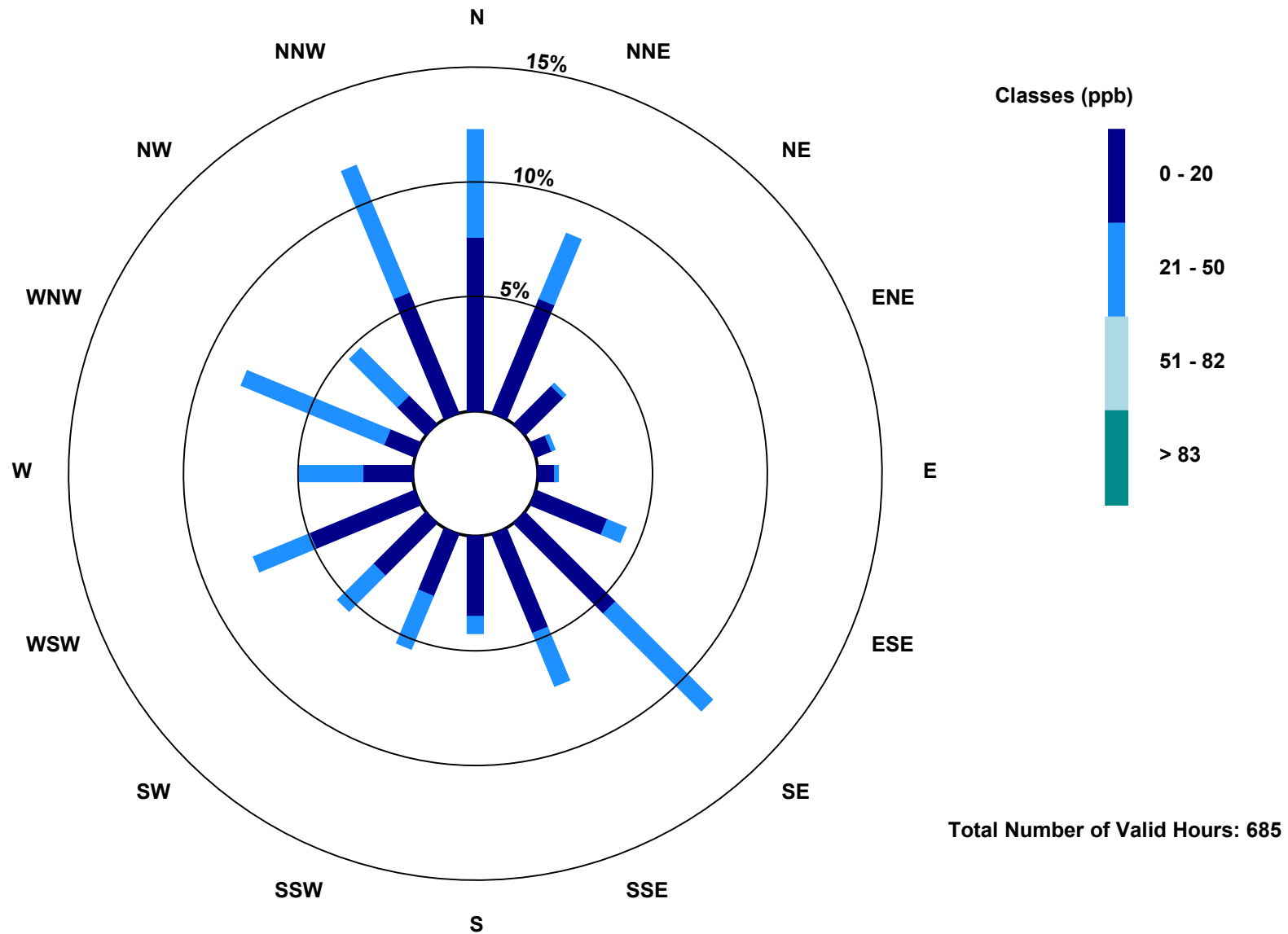
Total Number of Valid Hours: 685

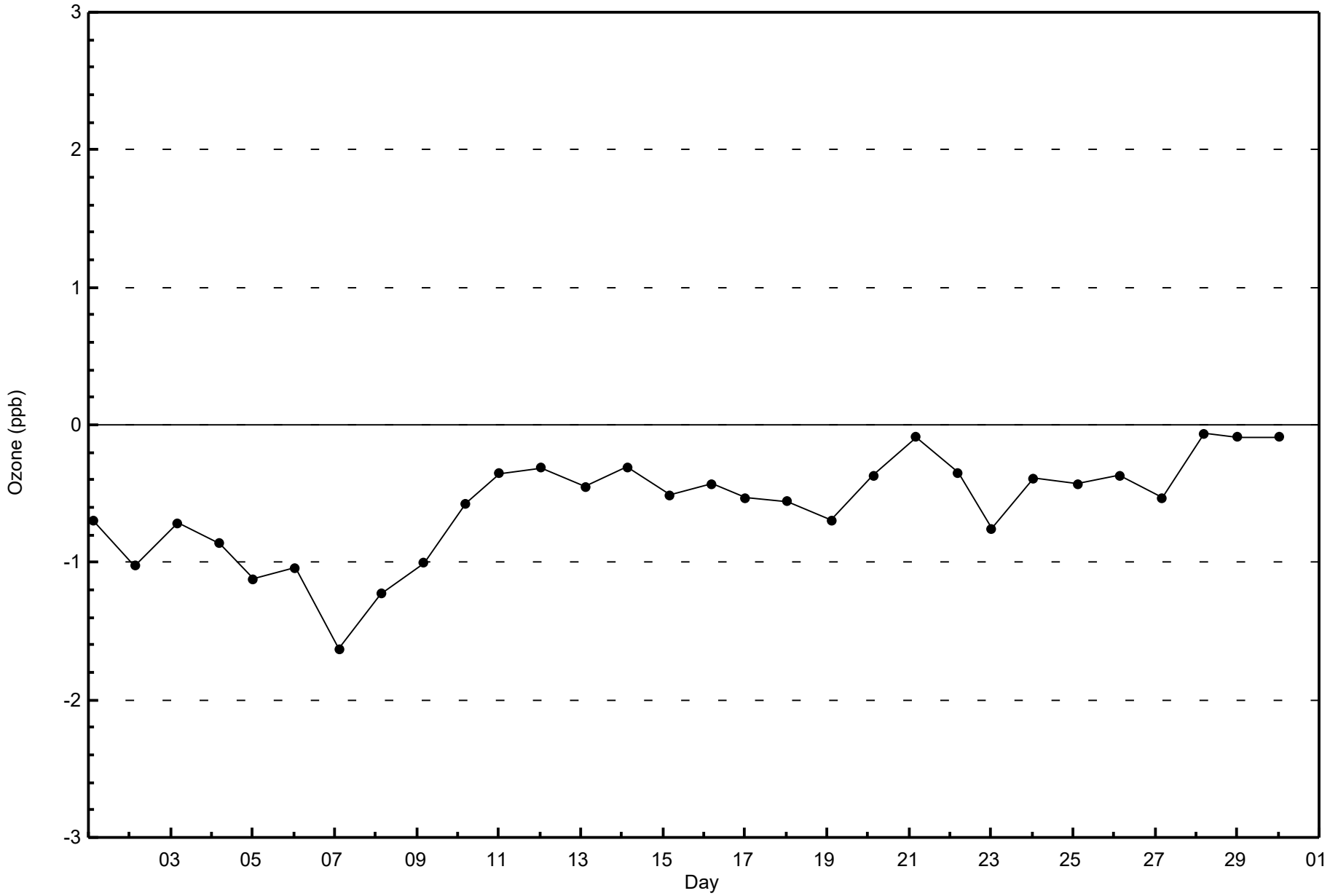
Total Number of Hours: 720

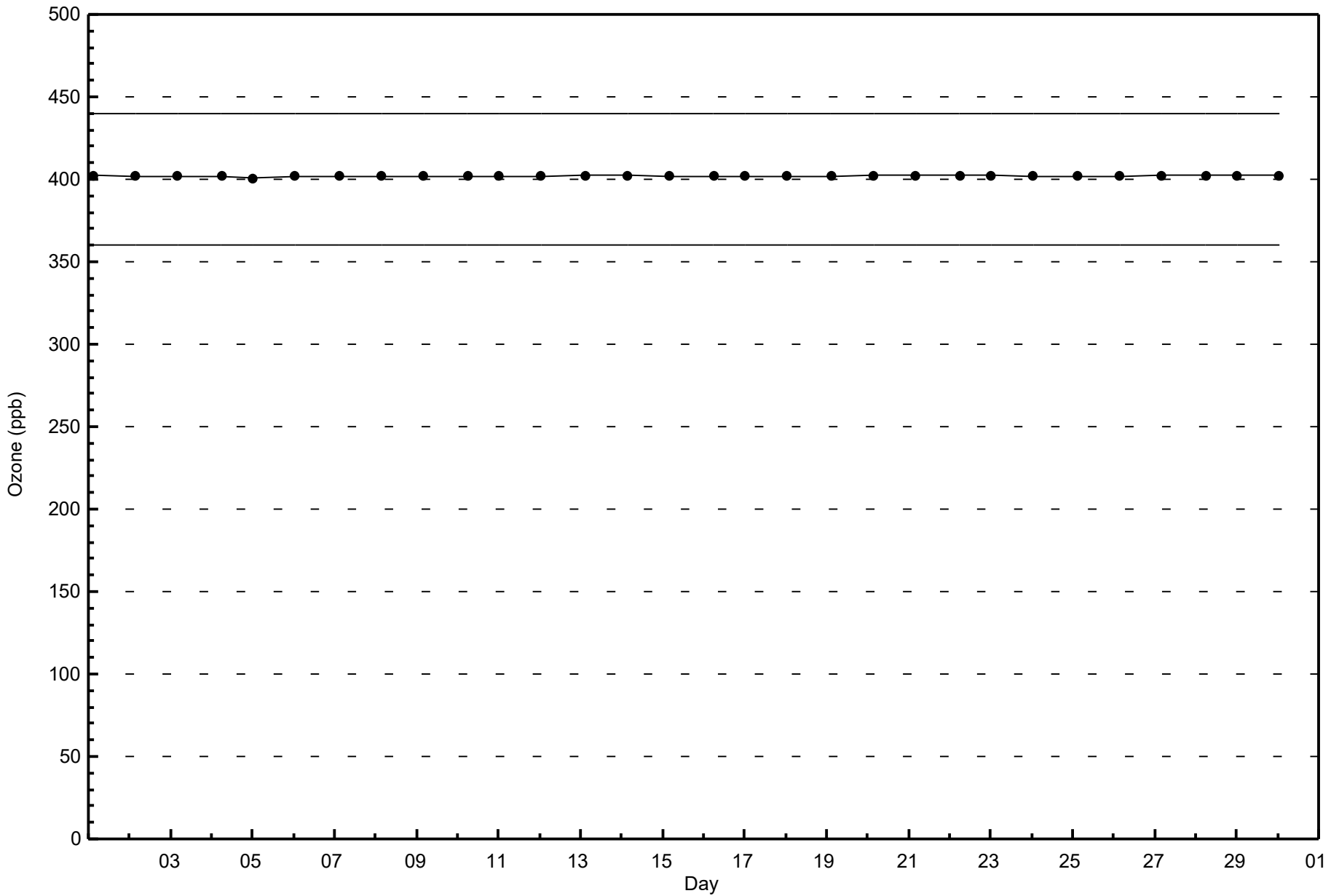


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Ozone (O<sub>3</sub>) - ppb  
Patricia McInnes









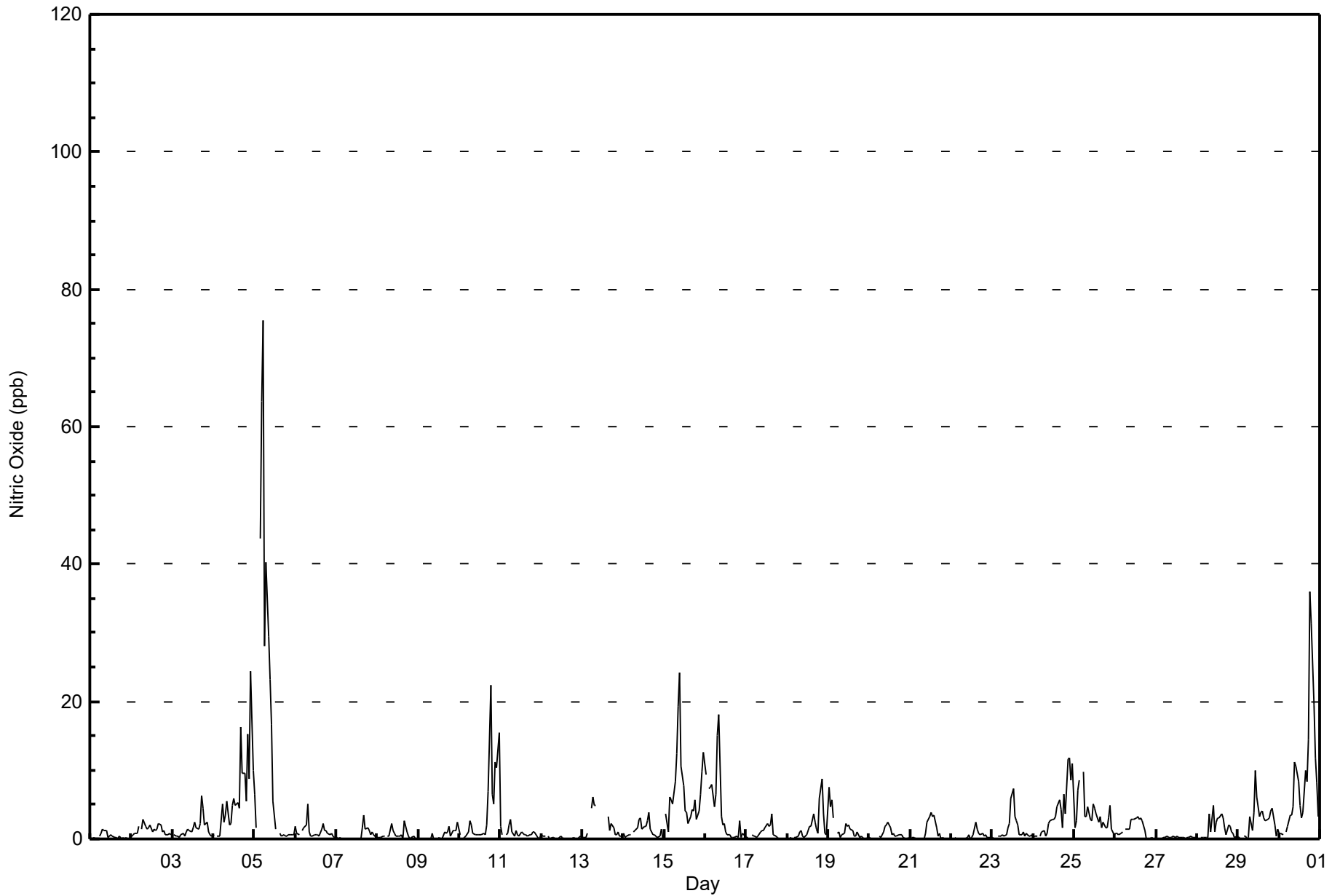
Maximum Value: 75.5 ppb on Nov 5 06:00																				Maximum Daily Average: 16.2 ppb on Nov 5					Hours in Service: 720		
Minimum Value: 0.0 ppb on Nov 7 06:00																				Minimum Daily Average: 0.2 ppb on Nov 12					Hours of Data: 682		
Maximum Diurnal Average: 4.6 ppb at hour 6																				Minimum Diurnal Average: 0.8 ppb at hour 2					Hours of Missing Data: 38		
Monthly Average: 2.55 ppb																				Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.3 Median = 0.8 Q <sub>3</sub> = 2.5 P <sub>90</sub> = 5.7 P <sub>99</sub> = 28.3					Hours of Calibration: 36		
																									Percent Operational Time: 99.7		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.1	0.1	0.1	0.0	Z	0.3	0.8	1.4	1.3	1.1	0.1	0.4	0.7	0.3	0.2	0.2	0.0	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.4	1.4	
2-Nov	0.4	0.5	0.7	0.8	1.8	Z	1.4	2.8	1.8	1.4	1.6	2.0	1.0	1.5	1.3	1.4	2.2	2.1	1.0	1.3	0.7	0.7	0.8	0.7	1.3	2.8	
3-Nov	Z	0.5	0.4	0.4	0.2	0.6	0.7	0.4	1.0	1.5	1.3	1.0	1.6	2.5	1.6	1.5	2.2	6.4	4.4	2.0	2.4	1.0	0.7	0.3	1.5	6.4	
4-Nov	0.6	Z	0.4	0.5	0.5	5.2	2.4	3.4	5.6	2.0	2.2	4.9	6.0	4.8	5.3	4.5	16.4	9.6	9.6	5.5	15.3	8.7	24.4	10.0	6.4	24.4	
5-Nov	6.4	1.7	Z	43.8	63.7	75.5	28.0	40.4	29.4	23.2	16.7	5.5	1.5	M	M	0.8	0.3	0.6	0.3	0.4	0.5	0.7	0.7	0.6	16.2	75.5	
6-Nov	1.8	0.8	0.7	Z	1.2	1.7	2.1	5.2	1.0	0.5	0.4	0.6	0.6	0.6	0.3	1.4	2.2	1.3	1.2	0.8	0.6	0.7	0.4	0.3	1.1	5.2	
7-Nov	0.1	0.0	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	1.6	3.4	1.5	1.6	1.2	0.6	1.0	0.6	0.2	0.5	3.4	
8-Nov	0.1	0.2	0.2	0.5	0.3	Z	0.4	0.5	2.2	1.1	0.8	0.3	0.4	0.4	0.6	0.1	2.6	1.1	0.4	0.0	0.2	0.3	0.0	0.0	0.5	2.6	
9-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.1	0.0	0.0	0.1	0.0	0.0	1.0	0.8	1.0	1.9	0.4	1.3	1.3	1.1	2.3	0.5	2.3	
10-Nov	0.5	Z	0.0	0.1	0.4	1.0	2.7	2.0	0.9	0.5	0.6	0.7	0.7	0.5	0.8	0.7	2.0	7.0	22.3	6.4	5.0	11.3	10.4	15.4	4.0	22.3	
11-Nov	1.8	0.6	Z	0.6	0.7	2.0	2.9	0.9	0.5	1.2	0.6	0.4	0.9	0.8	0.5	0.6	0.4	0.6	0.7	1.1	1.0	0.4	0.1	0.3	0.8	2.9	
12-Nov	0.7	0.4	0.4	Z	0.4	0.0	0.2	0.2	0.0	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.4	0.2	0.7	
13-Nov	0.2	0.2	0.2	0.9	Z	4.4	6.1	4.9	4.9	C	C	C	C	C	C	3.3	1.1	2.2	1.7	0.7	0.7	1.1	0.5	0.5	--	6.1	
14-Nov	0.9	0.2	0.4	0.6	0.7	Z	1.0	1.2	1.6	2.9	3.1	1.4	1.7	1.8	2.7	3.9	1.4	0.7	0.6	0.4	0.3	0.3	1.4	0.1	1.3	3.9	
15-Nov	Z	3.7	1.1	6.1	5.6	5.0	8.4	12.4	19.3	24.1	10.6	7.7	4.0	3.8	2.3	3.3	4.3	4.0	5.8	2.9	4.0	6.5	9.9	12.7	7.3	24.1	
16-Nov	9.4	Z	7.3	7.4	7.9	4.7	6.5	15.0	18.2	3.3	2.0	2.3	0.9	0.6	0.6	0.2	0.2	0.2	0.4	0.3	2.7	0.2	0.9	0.4	4.0	18.2	
17-Nov	0.2	0.3	Z	0.6	0.4	0.4	0.2	0.5	1.1	1.2	1.1	1.6	2.3	1.9	2.1	3.8	0.6	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.8	3.8	
18-Nov	0.0	0.1	0.3	Z	0.2	0.1	0.5	1.0	1.1	0.4	0.2	0.6	1.2	1.7	1.8	3.7	2.4	1.4	0.8	5.9	8.7	3.7	0.9	0.7	1.6	8.7	
19-Nov	7.5	4.7	5.7	3.1	Z	0.8	1.0	0.2	0.6	0.7	2.2	1.9	2.0	1.3	1.1	0.5	0.4	1.0	0.3	0.3	0.2	0.1	0.1	0.3	1.6	7.5	
20-Nov	0.1	0.0	0.0	0.0	0.1	Z	0.4	0.2	1.1	1.8	2.0	2.4	1.6	0.6	0.8	0.4	0.4	0.7	0.7	0.6	0.2	0.0	0.0	0.1	0.6	2.4	
21-Nov	Z	0.3	0.2	0.0	0.1	0.0	0.0	0.0	0.1	0.8	2.5	3.3	3.8	3.3	3.4	1.6	0.4	0.8	0.1	0.1	0.1	0.0	0.0	0.0	0.9	3.8	
22-Nov	0.0	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.5	0.0	0.3	0.6	2.5	1.4	0.9	0.6	0.7	0.5	0.6	0.2	0.2	0.1	0.4	2.5	
23-Nov	0.1	0.1	Z	0.4	0.4	0.4	0.7	0.5	0.7	1.6	2.3	6.0	7.4	3.2	2.6	2.0	0.7	0.7	1.0	0.4	0.8	0.5	0.5	0.5	1.4	7.4	
24-Nov	0.3	0.5	0.3	Z	0.4	1.0	1.2	0.3	0.7	2.2	2.6	2.8	2.9	3.2	4.7	5.7	4.2	1.7	6.5	3.6	11.7	11.7	8.6	11.0	3.8	11.7	
25-Nov	1.6	2.6	7.1	8.6	Z	9.8	3.2	3.2	4.8	2.8	2.5	5.1	4.4	3.7	2.3	3.3	1.7	2.4	1.7	1.7	3.0	4.9	1.4	0.7	3.6	9.8	
26-Nov	0.7	0.7	0.7	0.7	1.1	Z	1.4	1.5	1.5	2.9	2.8	2.8	3.1	3.2	2.8	3.1	2.7	1.3	0.0	0.1	0.0	0.1	0.0	0.0	1.4	3.2	
27-Nov	Z	0.1	0.1	0.0	0.2	0.2	0.4	0.2	0.2	0.2	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.1	0.3	0.2	0.3	0.2	0.3	0.2	0.4	0.4
28-Nov	0.1	Z	0.2	0.2	0.2	0.1	0.2	3.7	0.9	5.0	1.0	2.3	3.0	3.0	3.7	3.0	1.6	0.6	2.0	1.9	1.1	0.8	0.2	0.3	1.5	5.0	
29-Nov	0.1	0.1	Z	0.4	0.4	0.1	0.2	3.3	1.3	3.8	9.9	6.1	3.2	3.8	4.1	3.1	2.6	2.9	3.1	4.0	4.5	1.9	0.4	1.4	2.6	9.9	
30-Nov	0.8	0.9	0.7	Z	1.0	1.9	3.5	3.6	4.6	11.2	10.6	8.3	4.9	3.1	3.8	9.9	8.2	14.5	36.1	31.3	19.4	11.9	8.2	3.2	8.8	36.1	
																								Diurnal Average			
																								Diurnal Maximum			
1.4 0.8 1.1 3.0 3.5 4.6 2.6 3.6 3.6 3.4 2.8 2.5 2.1 1.8 1.9 2.2 2.2 2.3 3.5 2.5 2.9 2.3 2.4 2.1 9.4 4.7 7.3 43.8 63.7 75.5 28.0 40.4 29.4 24.1 16.7 8.3 7.4 4.8 5.3 9.9 16.4 14.5 36.1 31.3 19.4 11.9 24.4 15.4																											
Z - zerospan      C - Calibration      M - Maintenance																											





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Patricia McInnes - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Patricia McInnes - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	670	98.24	98.24
21 - 40	9	1.32	99.56
41 - 80	3	0.44	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Patricia McInnes - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	82	55	16	6	5	29	77	47	31	37	36	50	38	54	32	75	670
21 - 40	0	0	0	0	0	1	1	1	0	0	0	0	0	2	1	3	9
11 - 80	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	84	55	16	6	5	30	78	48	31	37	36	50	38	56	33	79	682

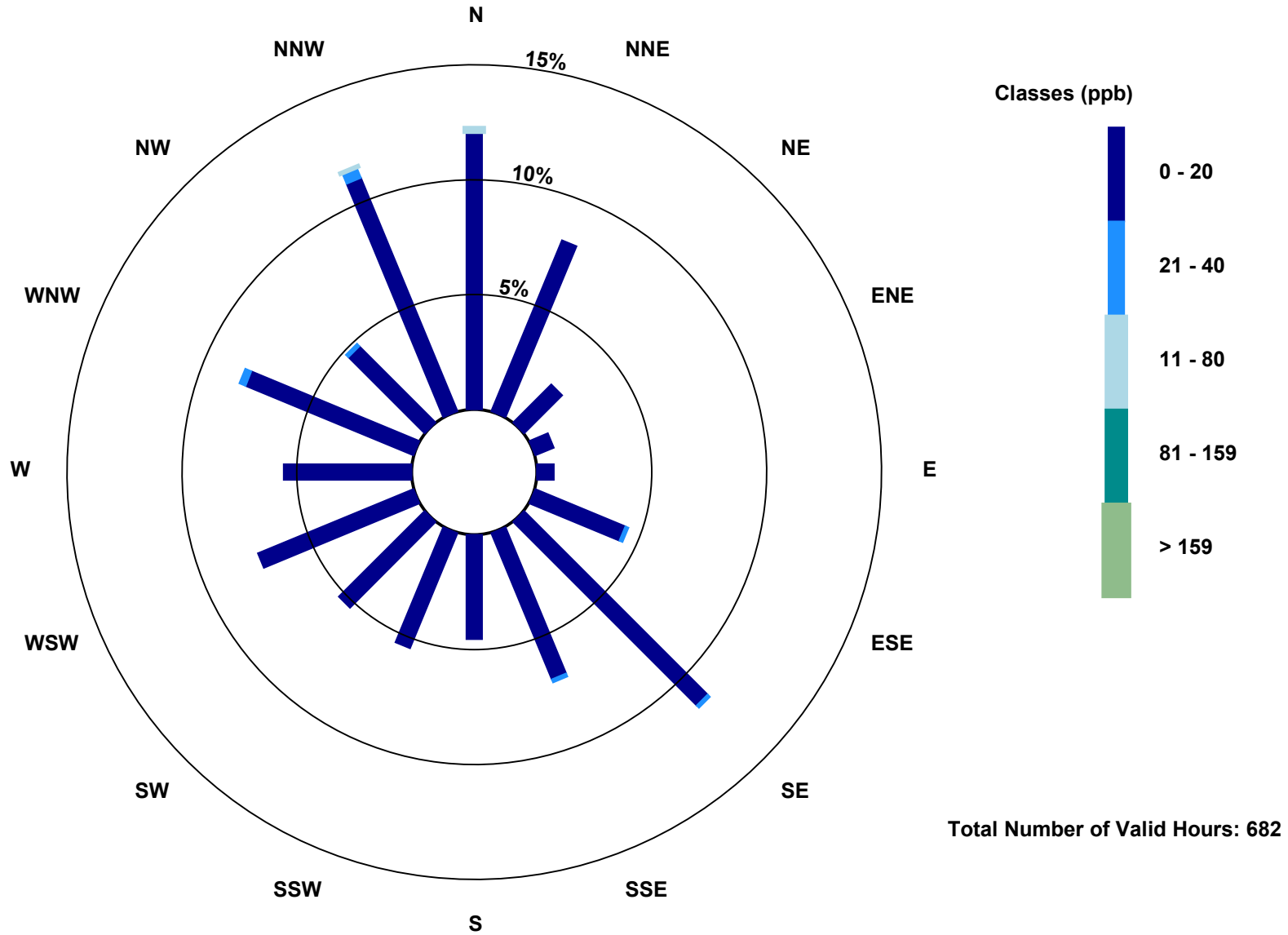
Total Number of Valid Hours: 682

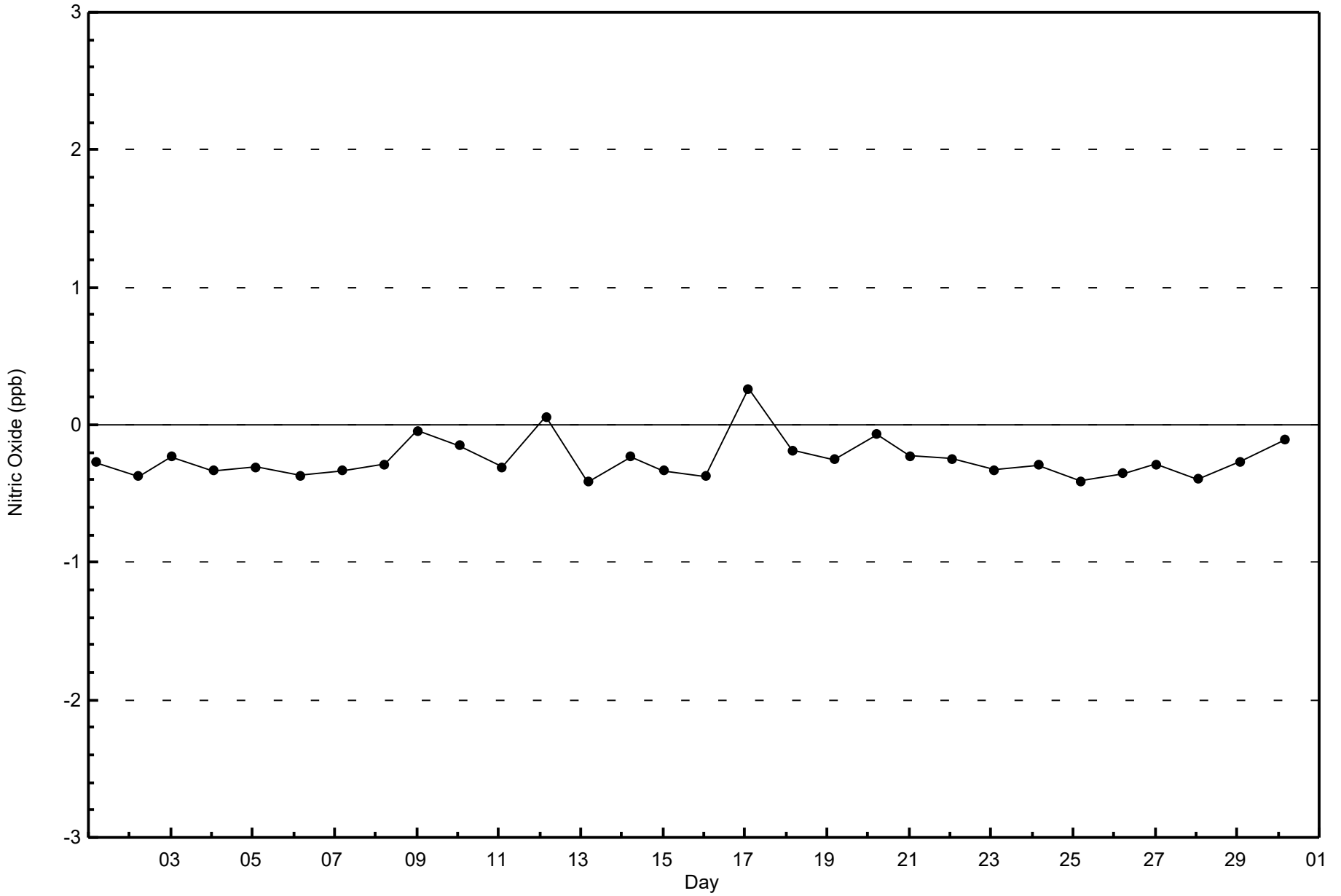
Total Number of Hours: 720

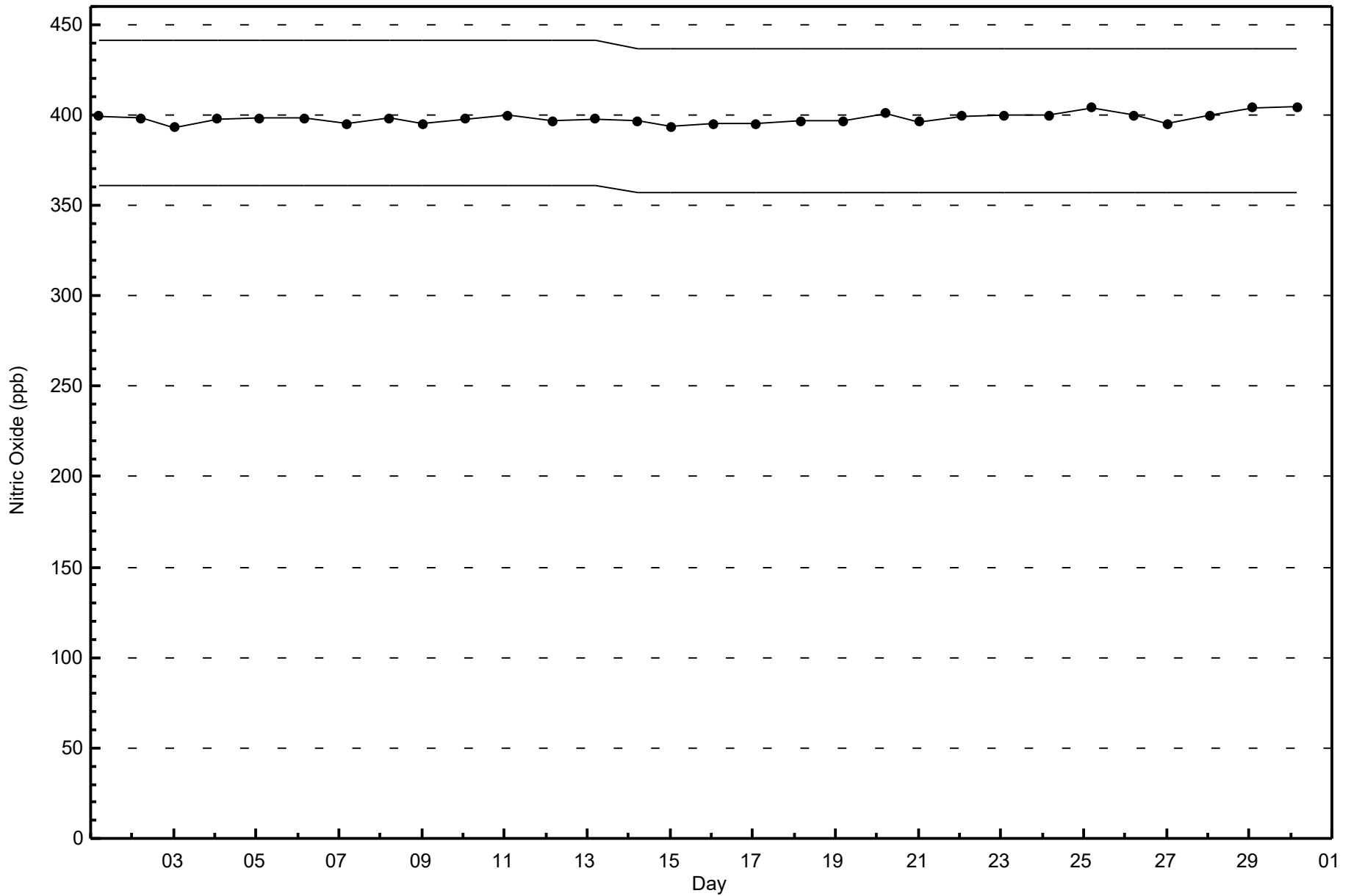


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitric Oxide (NO) - ppb  
Patricia McInnes









# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Nitrogen Dioxide (NO<sub>2</sub>) - ppb

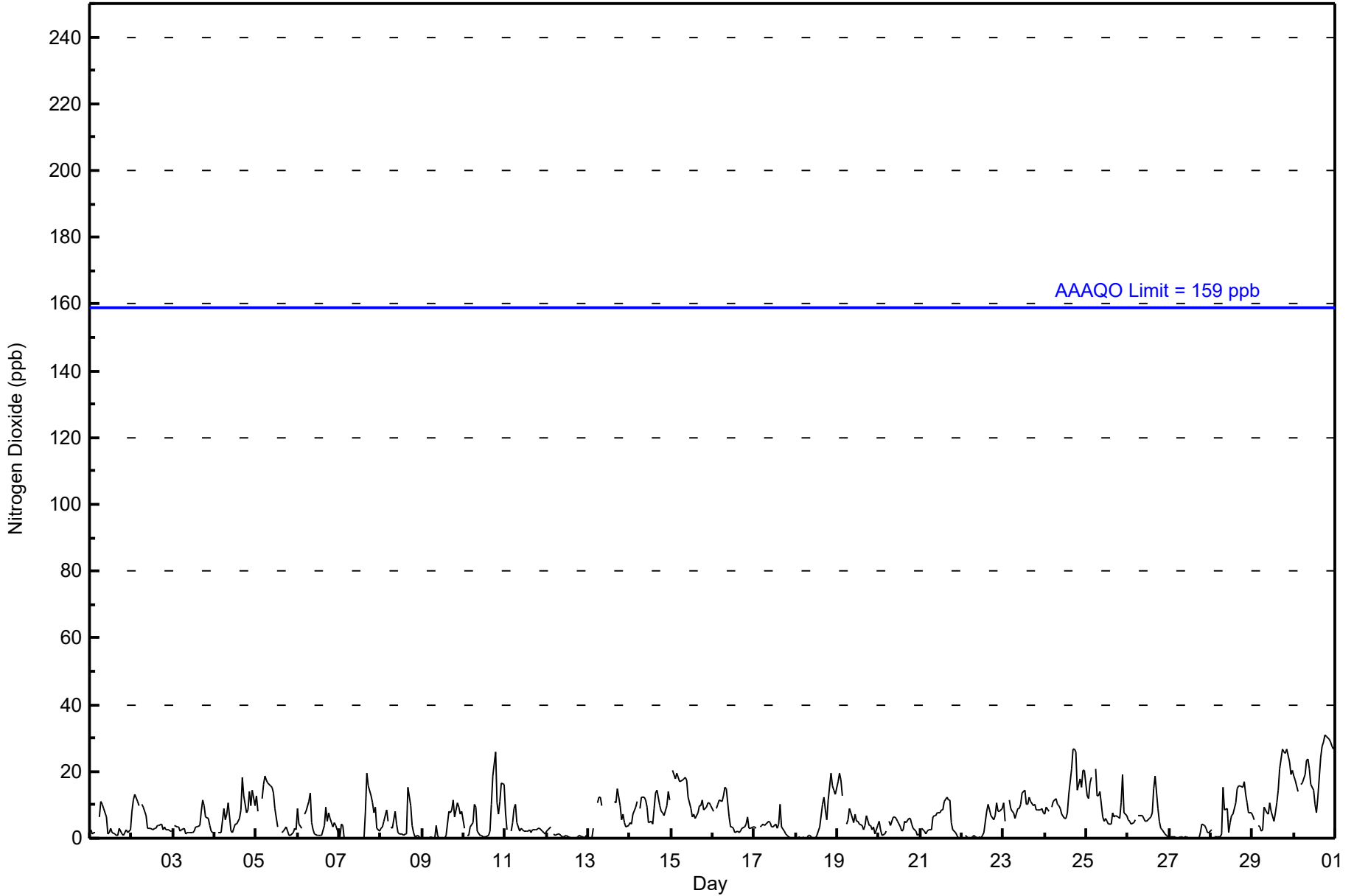
## Patricia McInnes - November 2024

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Daily Average		Daily Maximum																									
Maximum Value: 30.8 ppb on Nov 30 19:00		Maximum Daily Average: 21.1 ppb on Nov 30		Hours of Data: 682																	Hours of Missing Data: 38		Hours of Calibration: 36		Percent Operational Time: 99.7																							
Minimum Value: 0.0 ppb on Nov 7 07:00		Minimum Daily Average: 0.9 ppb on Nov 27		Hours of Missing Data: 38																	Hours of Calibration: 36		Percent Operational Time: 99.7																									
Maximum Diurnal Average: 10.2 ppb at hour 17		Minimum Diurnal Average: 3.7 ppb at hour 14		Hours of Calibration: 36																	Hours of Calibration: 36		Percent Operational Time: 99.7																									
Monthly Average: 6.67 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 1.9 Median = 4.9 Q <sub>3</sub> = 9.8 P <sub>90</sub> = 15.2 P <sub>99</sub> = 27.0		Hours of Calibration: 36																	Hours of Calibration: 36		Percent Operational Time: 99.7																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	2.5	1.3	1.6	1.5	Z	6.2	11.0	10.2	8.7	6.3	1.2	1.9	3.0	1.8	1.1	0.8	0.8	3.1	1.2	1.0	1.5	2.5	1.8	2.5	3.2	11.0																						
2-Nov	8.1	11.6	13.1	11.0	9.6	Z	10.1	9.3	6.9	3.0	2.8	3.0	2.5	3.1	3.1	3.9	4.0	4.1	2.7	3.2	2.6	2.5	2.3	2.1	5.4	13.1																						
3-Nov	Z	3.8	3.5	3.3	2.3	2.6	2.8	1.3	1.5	1.7	1.6	1.8	2.2	3.5	3.6	3.8	8.0	11.6	9.7	6.3	6.0	3.9	2.1	1.8	3.9	11.6																						
4-Nov	1.8	Z	1.8	1.6	1.7	9.1	5.6	7.3	10.4	2.1	1.8	3.0	4.1	4.1	6.1	8.4	18.1	12.6	7.8	8.6	14.0	9.6	14.3	9.9	7.1	18.1																						
5-Nov	12.6	8.0	Z	11.9	16.0	18.8	17.3	16.7	15.8	15.2	13.6	9.0	3.4	M	M	1.7	2.1	3.5	2.3	1.0	1.0	1.8	2.8	2.7	8.4	18.8																						
6-Nov	9.1	4.2	3.0	Z	7.0	8.1	11.2	13.4	4.5	2.7	1.4	1.0	0.7	1.0	0.9	3.8	9.2	5.0	7.7	6.0	3.4	4.5	3.7	2.4	5.0	13.4																						
7-Nov	0.6	4.4	4.0	0.2	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	19.7	15.7	12.5	10.8	7.7	9.5	3.0	2.1	4.3	19.7																						
8-Nov	3.0	3.3	5.1	8.5	5.0	Z	3.2	3.1	8.2	4.2	1.8	1.2	1.1	0.9	1.2	1.3	15.2	9.8	3.8	1.5	0.5	0.9	0.5	0.2	3.6	15.2																						
9-Nov	Z	0.1	0.1	0.0	0.0	0.3	0.0	0.2	3.7	0.7	0.0	0.0	0.2	0.1	0.7	8.0	7.8	8.6	11.3	6.4	10.6	9.5	7.4	7.9	3.6	11.3																						
10-Nov	2.8	Z	0.8	0.9	3.3	4.5	10.1	9.4	2.2	1.0	0.7	0.6	0.6	0.6	1.0	2.0	10.0	18.8	25.8	10.7	7.3	11.1	16.7	16.2	6.8	25.8																						
11-Nov	7.7	2.5	Z	2.3	4.5	8.9	10.1	4.7	2.1	2.9	2.5	2.3	2.1	2.2	2.4	1.9	2.4	2.4	2.6	3.0	2.9	2.0	1.5	1.4	3.4	10.1																						
12-Nov	2.1	2.7	3.2	Z	1.3	0.9	1.3	1.2	0.9	0.6	0.6	1.0	0.6	0.5	0.2	0.0	0.0	0.1	0.6	0.9	0.4	0.3	0.2	0.9	0.9	3.2																						
13-Nov	0.1	0.2	0.2	2.9	Z	10.4	12.1	9.8	C	C	C	C	C	C	C	11.0	10.7	15.0	9.6	5.5	7.0	4.8	3.3	3.9	--	15.0																						
14-Nov	4.5	4.3	7.2	9.5	11.0	Z	8.7	12.4	12.4	11.6	9.5	4.7	5.2	4.2	8.7	13.5	14.2	9.8	8.2	7.8	6.8	9.6	13.8	11.6	9.1	14.2																						
15-Nov	Z	20.2	17.6	19.6	18.2	16.9	17.2	18.0	18.4	17.5	12.2	8.9	6.5	7.2	6.0	7.6	9.8	9.6	11.3	8.6	9.4	10.8	10.7	9.9	12.7	20.2																						
16-Nov	8.1	Z	8.8	10.1	11.3	11.1	12.7	15.1	14.7	6.2	3.4	3.5	3.1	1.9	2.1	1.7	2.1	3.1	3.6	4.3	6.3	2.9	2.8	3.3	6.2	15.1																						
17-Nov	3.5	3.1	Z	3.4	3.7	4.3	3.8	4.1	4.9	4.7	3.6	3.6	4.3	3.0	4.1	10.2	3.4	2.1	1.1	1.0	0.4	0.1	0.2	0.1	3.2	10.2																						
18-Nov	0.1	0.2	0.4	Z	0.4	0.2	0.0	1.0	0.9	0.3	0.0	0.0	1.0	2.1	3.2	10.2	12.2	8.3	5.3	11.3	19.3	15.7	14.4	13.0	5.2	19.3																						
19-Nov	16.9	19.6	17.5	12.7	Z	4.4	5.4	8.8	7.6	4.7	7.1	5.1	5.1	4.1	4.0	2.6	3.7	6.6	3.7	3.7	2.7	3.3	1.4	3.7	6.7	19.6																						
20-Nov	4.9	2.4	1.0	1.3	2.2	Z	4.9	3.9	6.2	6.4	5.8	5.2	3.6	2.0	2.5	5.1	4.5	6.1	6.1	4.2	2.9	2.1	0.8	1.4	3.7	6.4																						
21-Nov	Z	2.8	2.2	1.3	2.2	2.5	2.7	6.2	6.9	6.6	7.5	7.6	8.6	8.6	10.9	12.3	11.4	11.6	4.8	2.7	1.7	0.7	0.1	0.0	5.3	12.3																						
22-Nov	0.1	Z	0.7	0.3	0.1	0.0	0.3	0.7	0.5	0.1	0.6	0.1	0.7	1.7	8.0	10.0	8.3	6.8	5.6	6.7	10.6	8.1	8.2	9.0	3.8	10.6																						
23-Nov	10.7	4.9	Z	11.6	9.0	8.2	7.5	6.0	9.0	9.0	10.0	13.6	14.6	10.3	10.2	12.4	10.9	9.7	10.2	8.3	8.6	8.4	9.1	7.6	9.6	14.6																						
24-Nov	7.2	9.2	8.2	Z	9.5	11.1	11.9	10.1	9.6	9.1	7.0	5.9	6.1	7.6	13.2	20.8	26.9	26.6	25.7	14.3	17.8	15.2	20.2	20.2	13.6	26.9																						
25-Nov	12.7	11.8	16.6	18.1	Z	20.9	12.9	12.7	14.0	6.5	5.2	6.0	5.0	4.4	4.3	7.6	6.4	6.9	6.2	5.9	10.8	19.1	7.7	6.6	9.9	20.9																						
26-Nov	5.4	4.9	4.3	4.6	5.6	Z	6.6	6.8	6.6	6.1	4.9	4.9	6.1	6.4	7.8	14.7	18.7	8.8	4.9	3.1	2.5	1.4	0.7	0.5	5.9	18.7																						
27-Nov	Z	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.1	0.3	0.3	0.2	0.1	0.1	0.2	0.2	0.2	0.1	1.5	4.1	3.8	2.9	1.9	1.6	0.9	4.1																						
28-Nov	2.5	Z	0.4	0.5	0.5	0.3	1.1	15.1	8.6	8.7	1.9	4.5	6.6	7.3	10.6	15.0	15.6	15.7	15.4	16.9	13.0	10.6	7.6	7.8	8.1	16.9																						
29-Nov	6.7	5.5	Z	3.9	3.5	2.1	2.7	9.5	7.5	7.1	10.8	8.2	5.2	7.6	10.6	14.5	20.7	26.8	26.0	25.4	26.8	22.9	19.2	20.4	12.8	26.8																						
30-Nov	18.5	17.4	14.0	Z	16.2	16.5	19.2	23.2	23.6	20.9	16.3	14.2	10.1	7.8	12.1	24.1	27.6	29.0	30.8	30.4	29.6	28.9	27.6	26.6	21.1	30.8																						
																								6.1	6.0	5.4	5.7	5.8	6.7	7.1	8.1	7.5	5.7	4.6	4.2	3.9	3.7	5.0	7.9	10.2	9.9	8.9	7.5	7.9	7.5	6.9	6.6	Diurnal Average
																								18.5	20.2	17.6	19.6	18.2	20.9	19.2	23.2	23.6	20.9	16.3	14.2	14.6	10.3	13.2	24.1	27.6	29.0	30.8	30.4	29.6	28.9	27.6	26.6	Diurnal Maximum
Z - zerospan      C - Calibration      M - Maintenance																																																
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Patricia McInnes - November 2024**







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Patricia McInnes - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	658	96.48	96.48
21 - 40	24	3.52	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Patricia McInnes - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	77	54	16	6	5	30	77	47	31	37	36	50	38	56	31	67	658
21 - 40	7	1	0	0	0	0	1	1	0	0	0	0	0	0	2	12	24
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	84	55	16	6	5	30	78	48	31	37	36	50	38	56	33	79	682

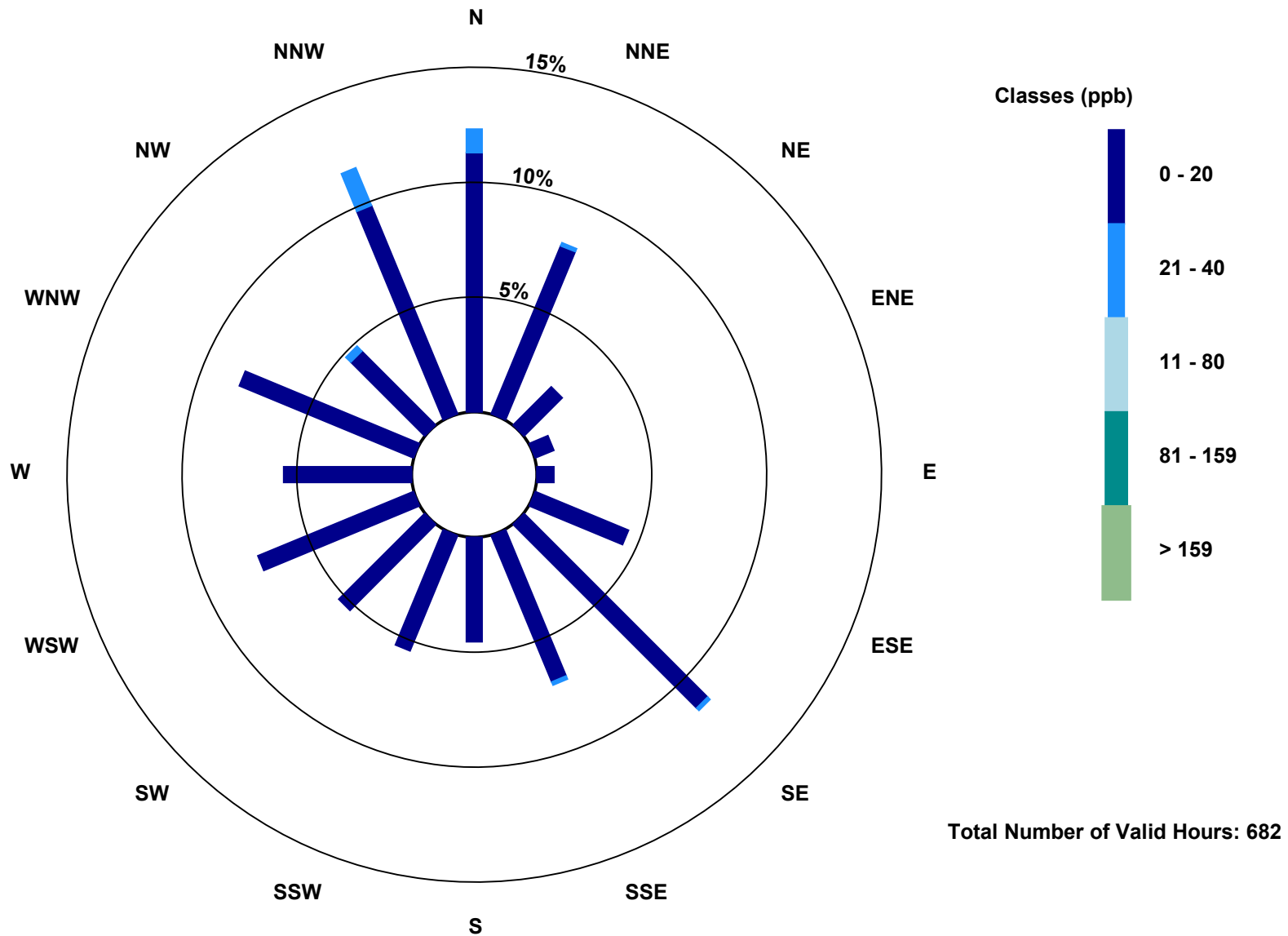
Total Number of Valid Hours: 682

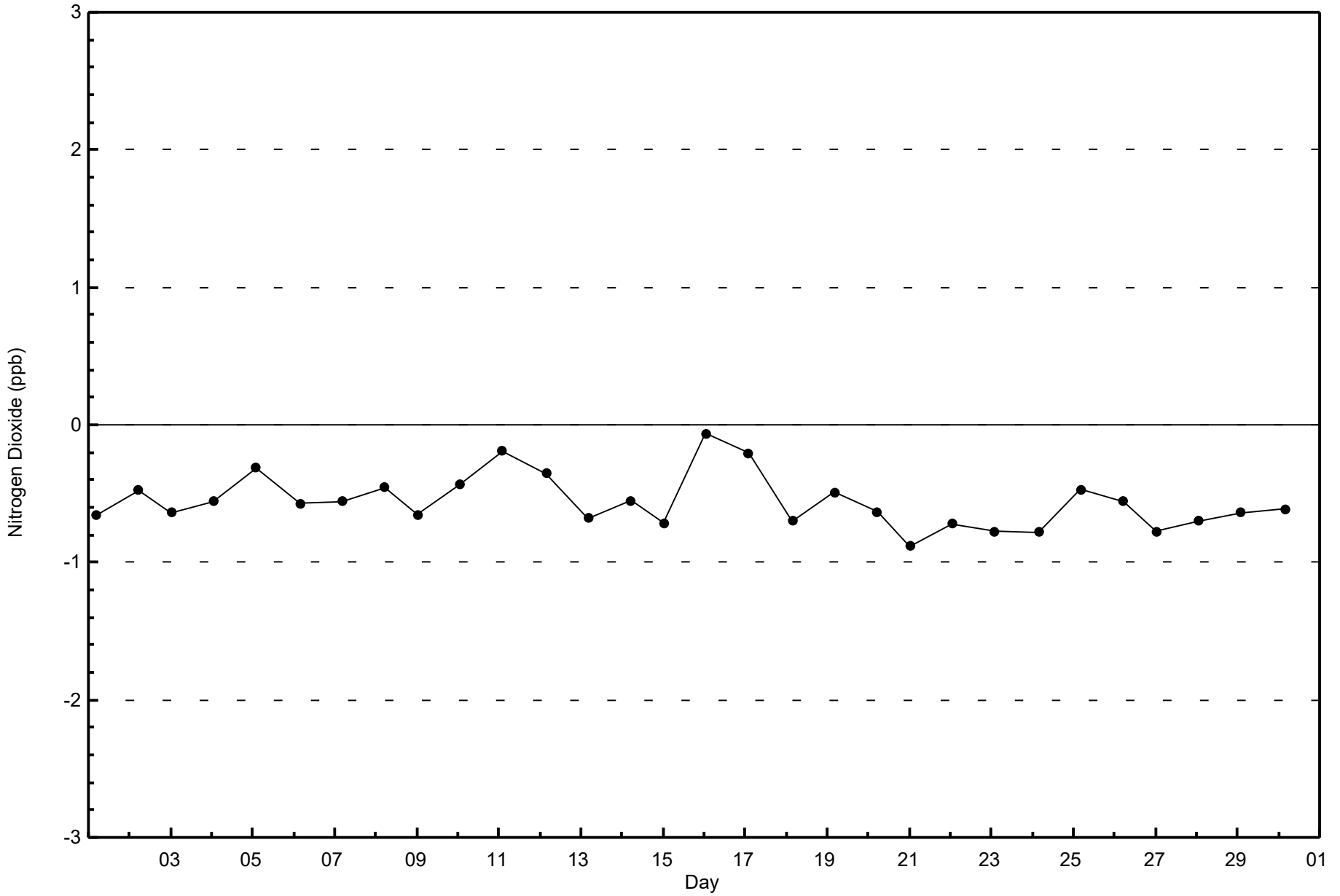
Total Number of Hours: 720

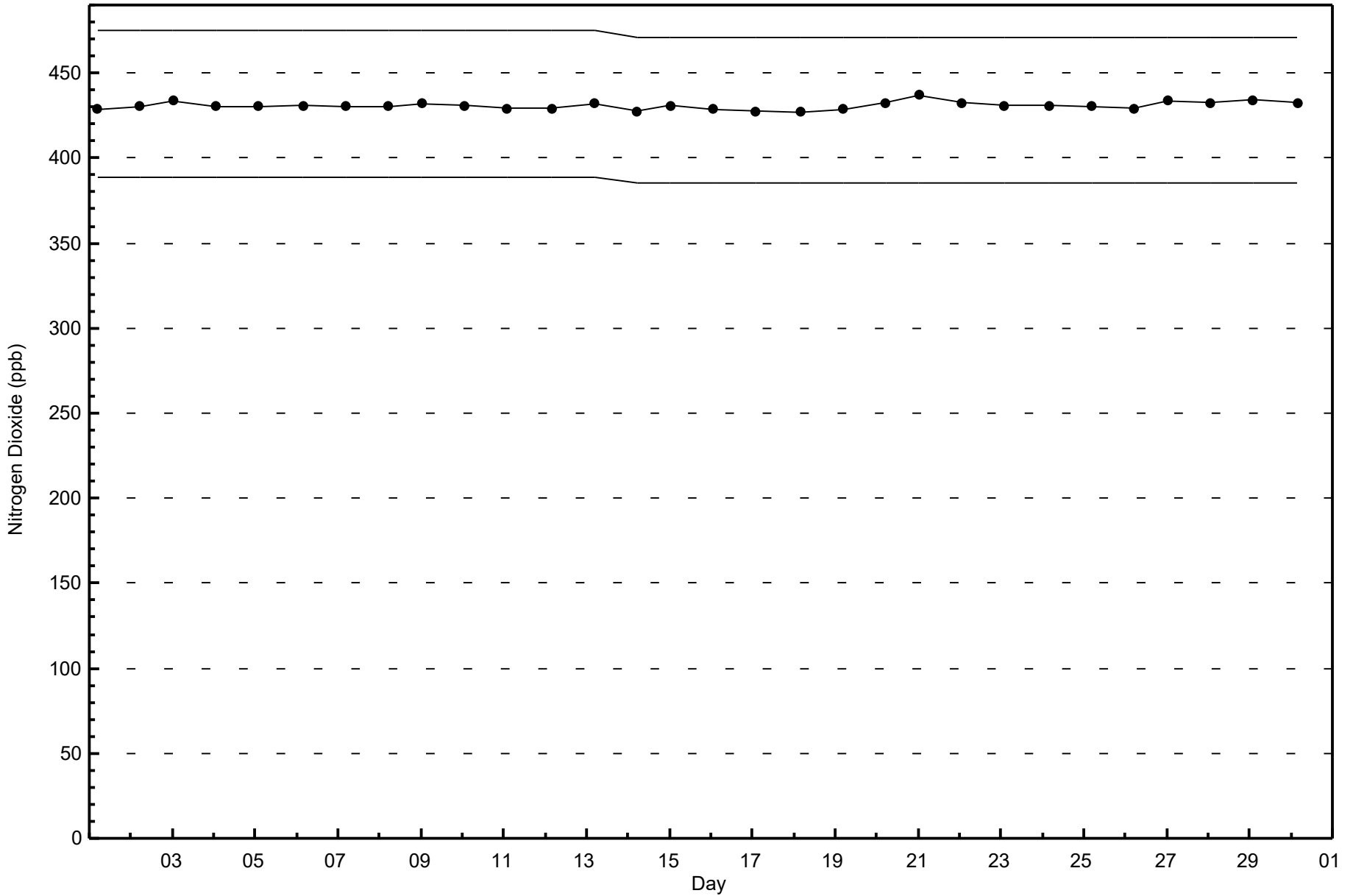


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Patricia McInnes









**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

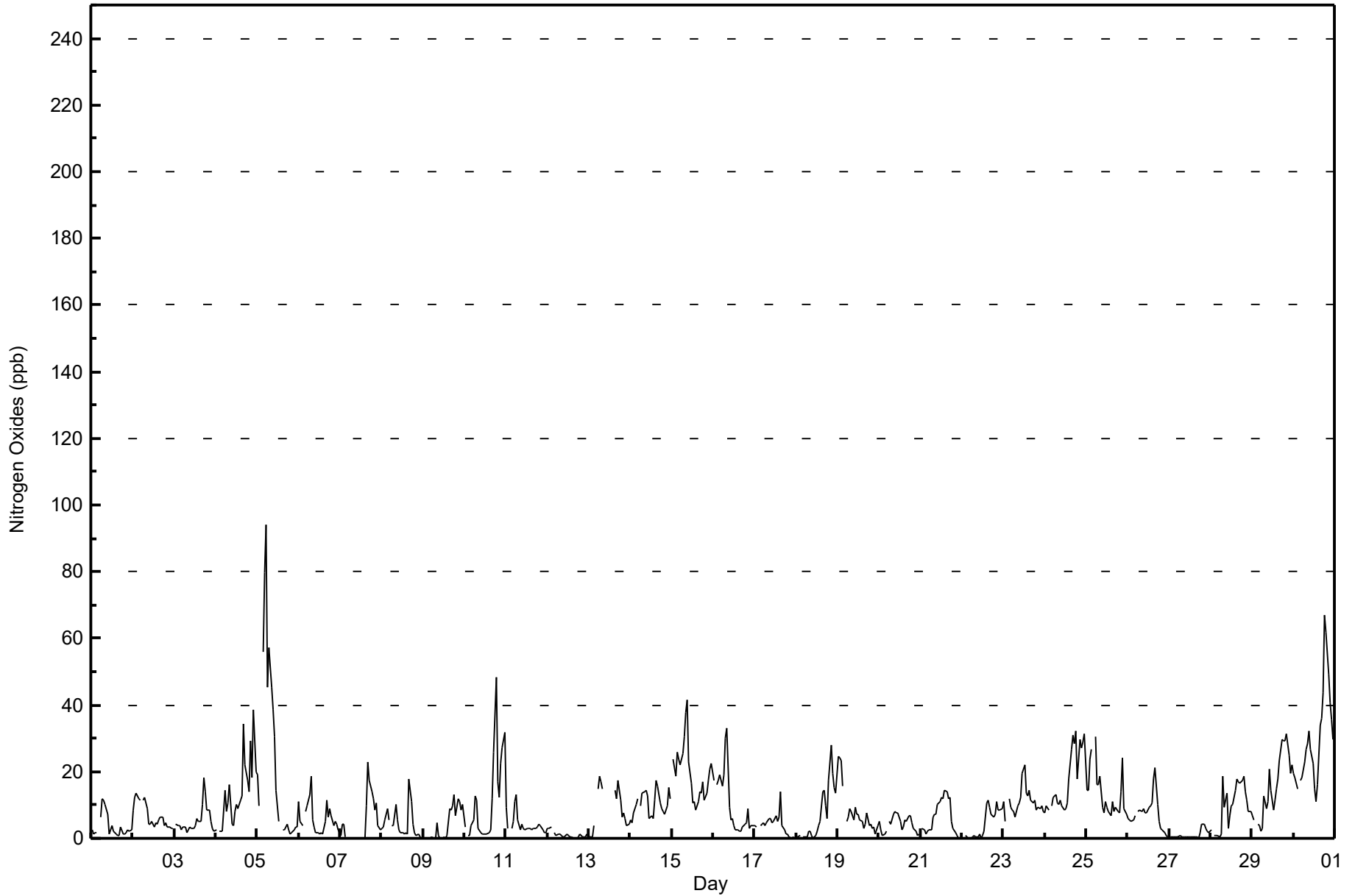
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Patricia McInnes - November 2024**

Maximum Value: 94.3 ppb on Nov 5 06:00		Maximum Daily Average: 29.8 ppb on Nov 30		Hours in Service: 720																							
Minimum Value: 0.0 ppb on Nov 7 07:00		Minimum Daily Average: 1.0 ppb on Nov 12		Hours of Data: 682																							
Maximum Diurnal Average: 12.5 ppb at hour 19		Minimum Diurnal Average: 5.5 ppb at hour 14		Hours of Missing Data: 38																							
Monthly Average: 9.22 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 2.4 Median = 6.1 Q <sub>3</sub> = 12.1 P <sub>90</sub> = 21.8 P <sub>99</sub> = 48.3		Hours of Calibration: 36																							
				Percent Operational Time: 99.7																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	2.6	1.4	1.7	1.5	Z	6.5	11.8	11.6	10.0	7.4	1.3	2.3	3.7	2.1	1.3	1.0	0.8	3.4	1.3	1.1	1.6	2.7	1.9	2.6	3.6	11.8	
2-Nov	8.5	12.1	13.8	11.8	11.4	Z	11.5	12.1	8.7	4.4	4.4	5.0	3.5	4.6	4.4	5.3	6.2	6.2	3.7	4.5	3.3	3.2	3.1	2.8	6.7	13.8	
3-Nov	Z	4.3	3.9	3.7	2.5	3.2	3.5	1.7	2.5	3.2	2.9	2.8	3.8	6.0	5.2	5.3	10.2	18.0	14.1	8.3	8.4	4.9	2.8	2.1	5.4	18.0	
4-Nov	2.4	Z	2.2	2.1	2.2	14.3	8.0	10.7	16.0	4.1	4.0	7.9	10.1	8.9	11.4	12.9	34.5	22.2	17.4	14.1	29.3	18.3	38.7	19.9	13.5	38.7	
5-Nov	19.0	9.7	Z	55.7	79.7	94.3	45.3	57.1	45.2	38.4	30.3	14.5	4.9	M	M	2.5	2.4	4.1	2.6	1.4	1.5	2.5	3.5	3.3	24.7	94.3	
6-Nov	10.9	5.0	3.7	Z	8.2	9.8	13.3	18.6	5.5	3.2	1.8	1.6	1.3	1.6	1.2	5.2	11.4	6.3	8.9	6.8	4.0	5.2	4.1	2.7	6.1	18.6	
7-Nov	0.7	4.4	4.1	0.2	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	9.8	23.1	17.2	14.1	12.0	8.3	10.5	3.6	2.3	4.8	23.1	
8-Nov	3.1	3.5	5.3	9.0	5.3	Z	3.6	3.6	10.4	5.3	2.6	1.5	1.5	1.3	1.8	1.4	17.8	10.9	4.2	1.5	0.7	1.2	0.5	0.2	4.2	17.8	
9-Nov	Z	0.1	0.1	0.0	0.0	0.3	0.0	0.2	4.5	0.8	0.0	0.0	0.3	0.1	0.7	9.0	8.6	9.6	13.2	6.8	11.9	10.8	8.5	10.2	4.2	13.2	
10-Nov	3.3	Z	0.8	1.0	3.7	5.5	12.8	11.4	3.1	1.5	1.3	1.3	1.3	1.1	1.8	2.7	12.0	25.8	48.1	17.1	12.3	22.4	27.1	31.6	10.8	48.1	
11-Nov	9.5	3.1	Z	2.9	5.2	10.9	13.0	5.6	2.6	4.1	3.1	2.7	3.0	3.0	2.9	2.5	2.8	3.0	3.3	4.1	3.9	2.4	1.6	1.7	4.2	13.0	
12-Nov	2.8	3.1	3.6	Z	1.7	0.9	1.5	1.4	0.9	0.6	0.6	1.4	0.7	0.5	0.2	0.0	0.0	0.1	0.6	1.1	0.4	0.3	0.3	1.3	1.0	3.6	
13-Nov	0.3	0.4	0.4	3.8	Z	14.8	18.5	17.0	14.7	C	C	C	C	C	C	14.3	11.8	17.2	11.3	6.2	7.7	5.9	3.8	4.4	--	18.5	
14-Nov	5.4	4.5	7.6	10.1	11.7	Z	9.7	13.6	14.0	14.5	12.6	6.1	6.9	6.0	11.4	17.4	15.6	10.5	8.8	8.2	7.1	9.9	15.2	11.7	10.4	17.4	
15-Nov	Z	23.9	18.7	25.7	23.8	21.9	25.6	30.4	37.7	41.6	22.8	16.6	10.5	11.0	8.3	10.9	14.1	13.6	17.1	11.5	13.4	17.3	20.6	22.6	20.0	41.6	
16-Nov	17.5	Z	16.1	17.5	19.2	15.8	19.2	30.1	32.9	9.5	5.4	5.8	4.0	2.5	2.7	1.9	2.3	3.3	4.0	4.6	9.0	3.1	3.7	3.7	10.2	32.9	
17-Nov	3.7	3.4	Z	4.0	4.1	4.7	4.0	4.6	6.0	5.9	4.7	5.2	6.6	4.9	6.2	14.0	4.0	2.6	1.3	1.1	0.5	0.1	0.2	0.1	4.0	14.0	
18-Nov	0.1	0.3	0.7	Z	0.6	0.3	0.5	2.0	2.0	0.7	0.2	0.6	2.2	3.8	5.0	13.9	14.6	9.7	6.1	17.2	28.0	19.4	15.3	13.7	6.8	28.0	
19-Nov	24.4	24.3	23.2	15.8	Z	5.2	6.4	9.0	8.2	5.4	9.3	7.0	7.1	5.4	5.1	3.1	4.1	7.6	4.0	4.0	2.9	3.4	1.5	4.0	8.3	24.4	
20-Nov	5.0	2.4	1.0	1.3	2.3	Z	5.3	4.1	7.3	8.2	7.8	7.6	5.2	2.6	3.3	5.5	4.9	6.8	6.8	4.8	3.1	2.1	0.8	1.5	4.3	8.2	
21-Nov	Z	3.1	2.4	1.3	2.3	2.5	2.7	6.2	7.0	7.4	10.0	10.9	12.4	11.9	14.3	13.9	11.8	12.4	4.9	2.8	1.8	0.7	0.1	0.0	6.2	14.3	
22-Nov	0.1	Z	0.8	0.4	0.2	0.1	0.3	0.8	0.6	0.2	1.1	0.1	1.0	2.3	10.5	11.4	9.2	7.4	6.3	7.2	11.2	8.3	8.4	9.1	4.2	11.4	
23-Nov	10.8	5.0	Z	12.0	9.4	8.6	8.2	6.5	9.7	10.6	12.3	19.6	22.0	13.5	12.8	14.4	11.6	10.4	11.2	8.7	9.4	8.9	9.6	8.1	11.0	22.0	
24-Nov	7.5	9.7	8.5	Z	9.9	12.1	13.1	10.4	10.3	11.3	9.6	8.7	9.0	10.8	17.9	26.5	31.1	28.3	32.2	17.9	29.5	26.9	28.8	31.2	17.4	32.2	
25-Nov	14.3	14.4	23.7	26.7	Z	30.7	16.1	15.9	18.8	9.3	7.7	11.1	9.4	8.1	6.6	10.9	8.1	9.3	7.9	7.6	13.8	24.0	9.1	7.3	13.5	30.7	
26-Nov	6.1	5.6	5.0	5.3	6.7	Z	8.0	8.3	8.1	9.0	7.7	7.7	9.2	9.6	10.6	17.8	21.4	10.1	4.9	3.2	2.5	1.5	0.7	0.5	7.4	21.4	
27-Nov	Z	0.5	0.4	0.3	0.4	0.4	0.7	0.5	0.3	0.5	0.6	0.5	0.5	0.3	0.4	0.4	0.4	0.2	1.8	4.3	4.1	3.1	2.2	1.8	1.1	4.3	
28-Nov	2.6	Z	0.6	0.7	0.7	0.4	1.3	18.8	9.5	13.7	2.9	6.8	9.6	10.3	14.3	18.0	17.2	16.3	17.4	18.8	14.1	11.4	7.8	8.1	9.6	18.8	
29-Nov	6.8	5.6	Z	4.3	3.9	2.2	2.9	12.8	8.8	10.9	20.7	14.3	8.4	11.4	14.7	17.6	23.3	29.7	29.1	29.4	31.3	24.8	19.6	21.8	15.4	31.3	
30-Nov	19.3	18.3	14.7	Z	17.2	18.4	22.7	26.8	28.2	32.1	26.9	22.5	15.0	10.9	15.9	34.0	35.8	43.5	66.9	61.7	49.0	40.8	35.8	29.8	29.8	66.9	
		7.5	6.7	6.5	8.7	9.3	11.4	9.7	11.7	11.1	9.1	7.4	6.6	6.0	5.5	6.8	10.1	12.4	12.2	12.5	9.9	10.8	9.9	9.3	8.7	Diurnal Average	
		24.4	24.3	23.7	55.7	79.7	94.3	45.3	57.1	45.2	41.6	30.3	22.5	22.0	13.5	17.9	34.0	35.8	43.5	66.9	61.7	49.0	40.8	38.7	31.6	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance																					



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Patricia McInnes - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Patricia McInnes - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	610	89.44	89.44
21 - 40	59	8.65	98.09
41 - 80	12	1.76	99.85
81 - 159	1	0.15	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Patricia McInnes - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	71	48	16	5	3	28	74	40	24	36	34	48	36	53	30	64	610
21 - 40	10	7	0	1	2	1	3	8	7	1	2	2	2	2	2	9	59
11 - 80	3	0	0	0	0	1	1	0	0	0	0	0	0	1	1	5	12
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	84	55	16	6	5	30	78	48	31	37	36	50	38	56	33	79	682

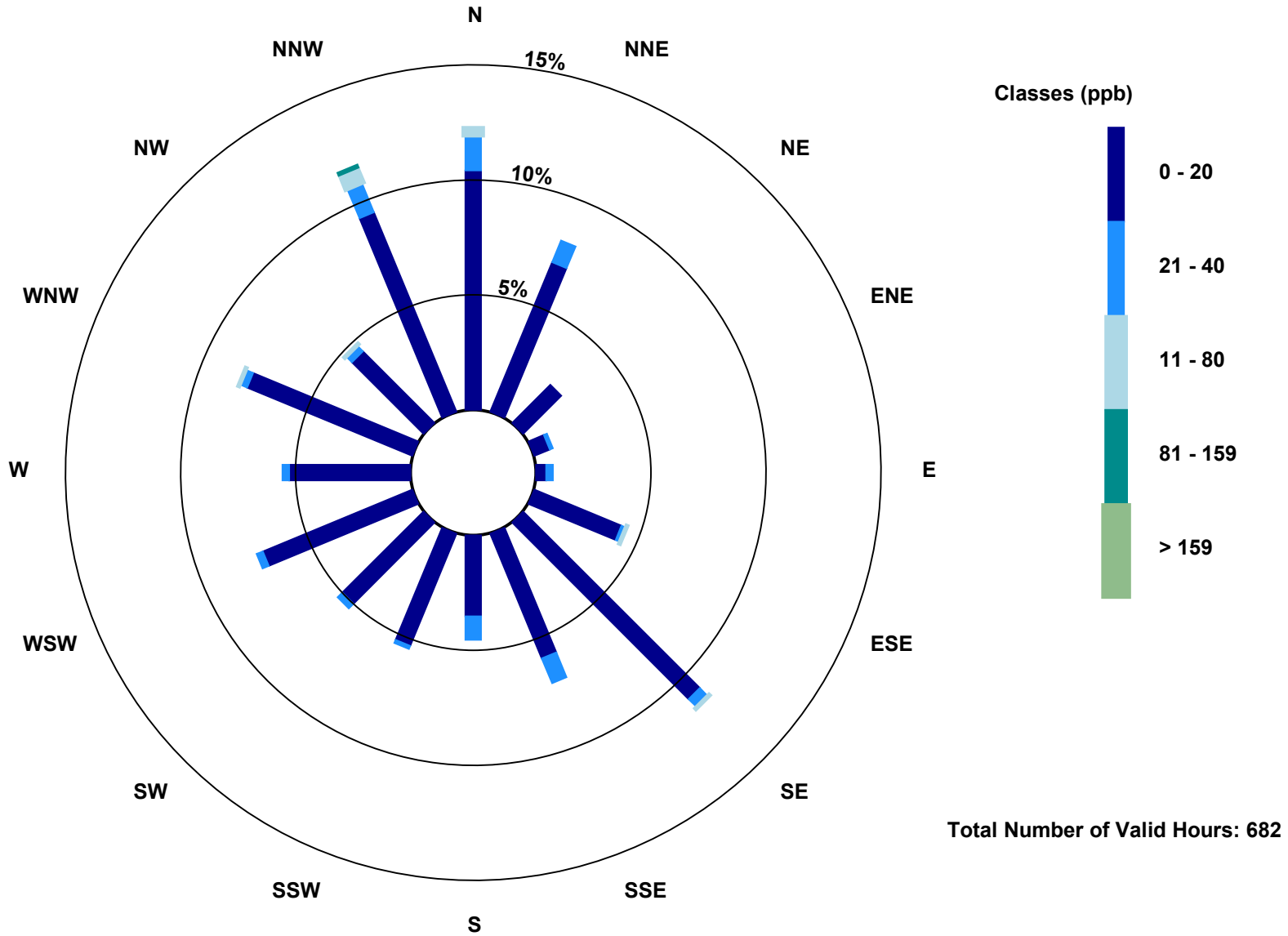
Total Number of Valid Hours: 682

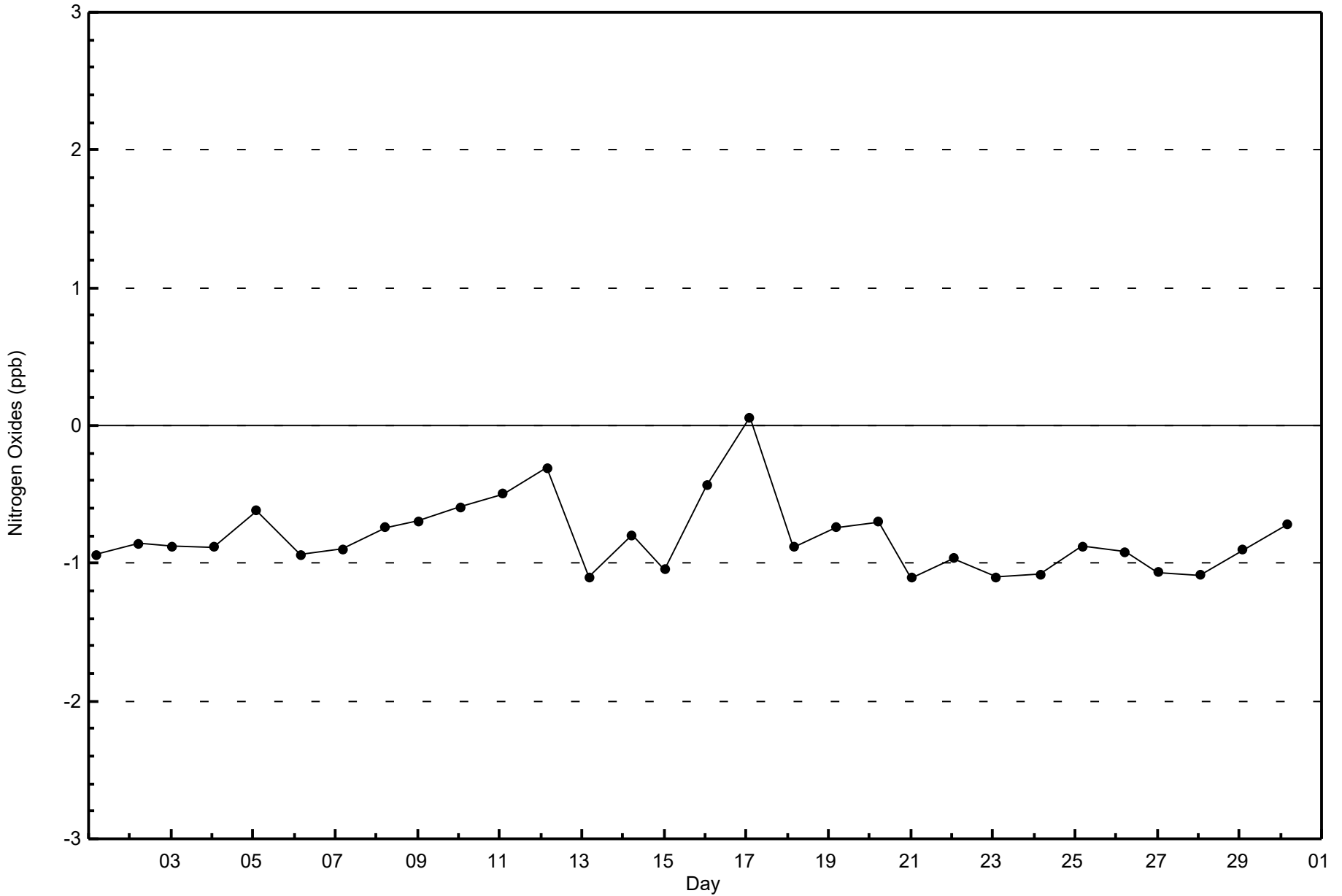
Total Number of Hours: 720

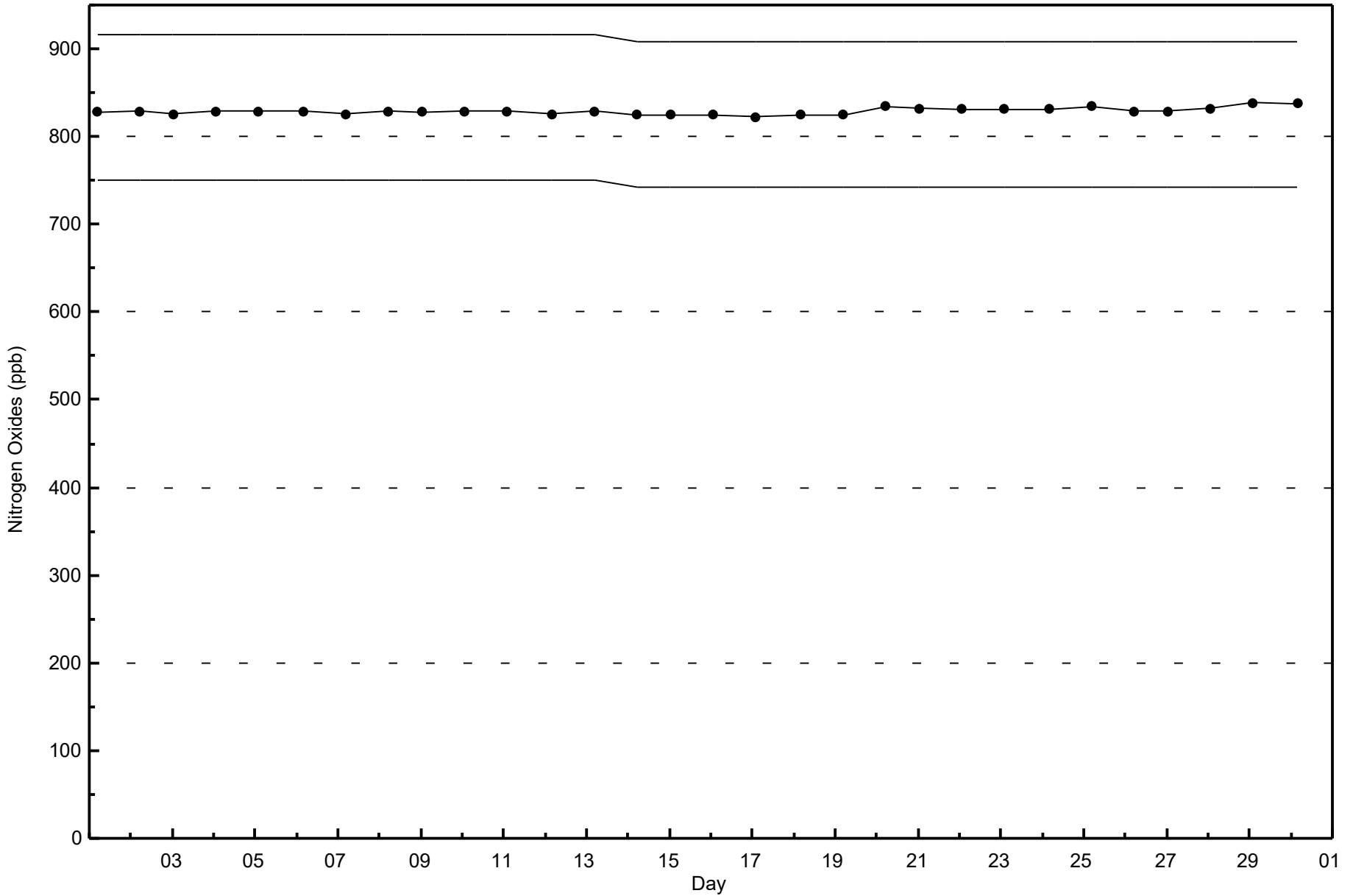


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Patricia McInnes







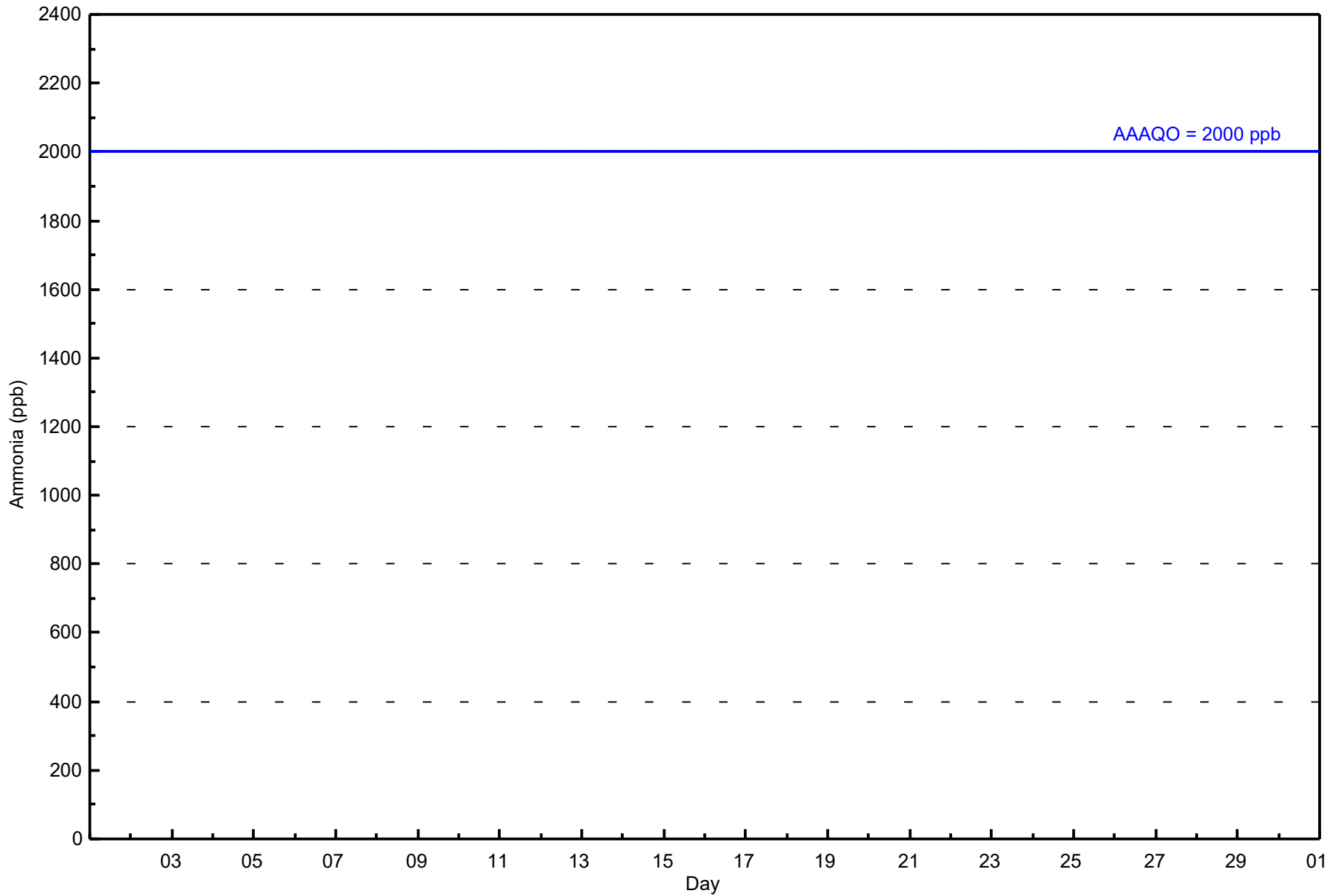


Number of Exceedences (AAQO): 1-hr: 0		Hours in Service: 720																									
Maximum Value: 0.0 ppb on Nov 1 01:00		Maximum Daily Average: 0.0 ppb on Nov 1																									
Minimum Value: 0.0 ppb on Nov 1 01:00		Hours of Data: 647																									
Maximum Diurnal Average: 0.0 ppb at hour 1		Hours of Missing Data: 73																									
Monthly Average: 0.00 ppb		Hours of Calibration: 39																									
Minimum Daily Average: 0.0 ppb on Nov 1		Percent Operational Time: 95.3																									
Minimum Diurnal Average: 0.0 ppb at hour 1		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.0 P <sub>99</sub> = 0.0																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2-Nov	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-Nov	0.0	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4-Nov	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-Nov	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	M	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6-Nov	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7-Nov	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8-Nov	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9-Nov	0.0	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-Nov	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-Nov	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12-Nov	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-Nov	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14-Nov	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15-Nov	0.0	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16-Nov	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17-Nov	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18-Nov	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19-Nov	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	C	C	C	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-Nov	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-Nov	0.0	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22-Nov	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23-Nov	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24-Nov	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25-Nov	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26-Nov	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27-Nov	0.0	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28-Nov	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29-Nov	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30-Nov	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan      C - Calibration      M - Maintenance      RE - Recovery																											
Alberta Ambient Air Quality Objectives (AAQO): 1-hr 2000 ppb																											



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ammonia (NH<sub>3</sub>) - ppb**  
**Patricia McInnes - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ammonia (NH<sub>3</sub>) - ppb**  
**Patricia McInnes - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	647	100.00	100.00
6 - 10	0	0.00	100.00
11 - 15	0	0.00	100.00
16 - 20	0	0.00	100.00
21 - 25	0	0.00	100.00
> 26	0	0.00	100.00

Total Number of Valid Hours: 647

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Ammonia (NH<sub>3</sub>) - ppb**  
**Patricia McInnes - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	80	51	15	5	5	29	74	46	30	33	34	45	37	54	33	76	647
6 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	80	51	15	5	5	29	74	46	30	33	34	45	37	54	33	76	647

Total Number of Valid Hours: 647

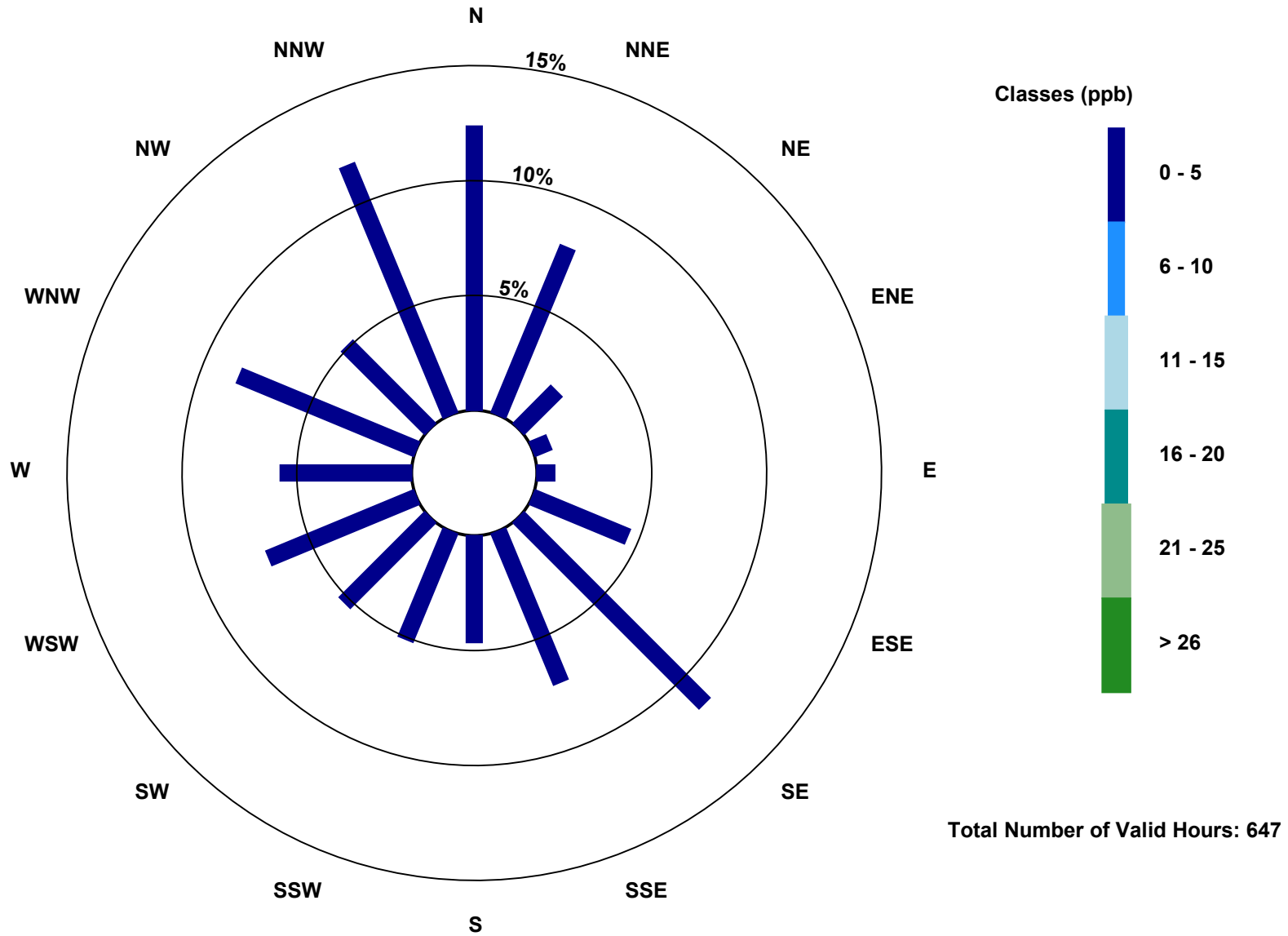
Total Number of Hours: 720

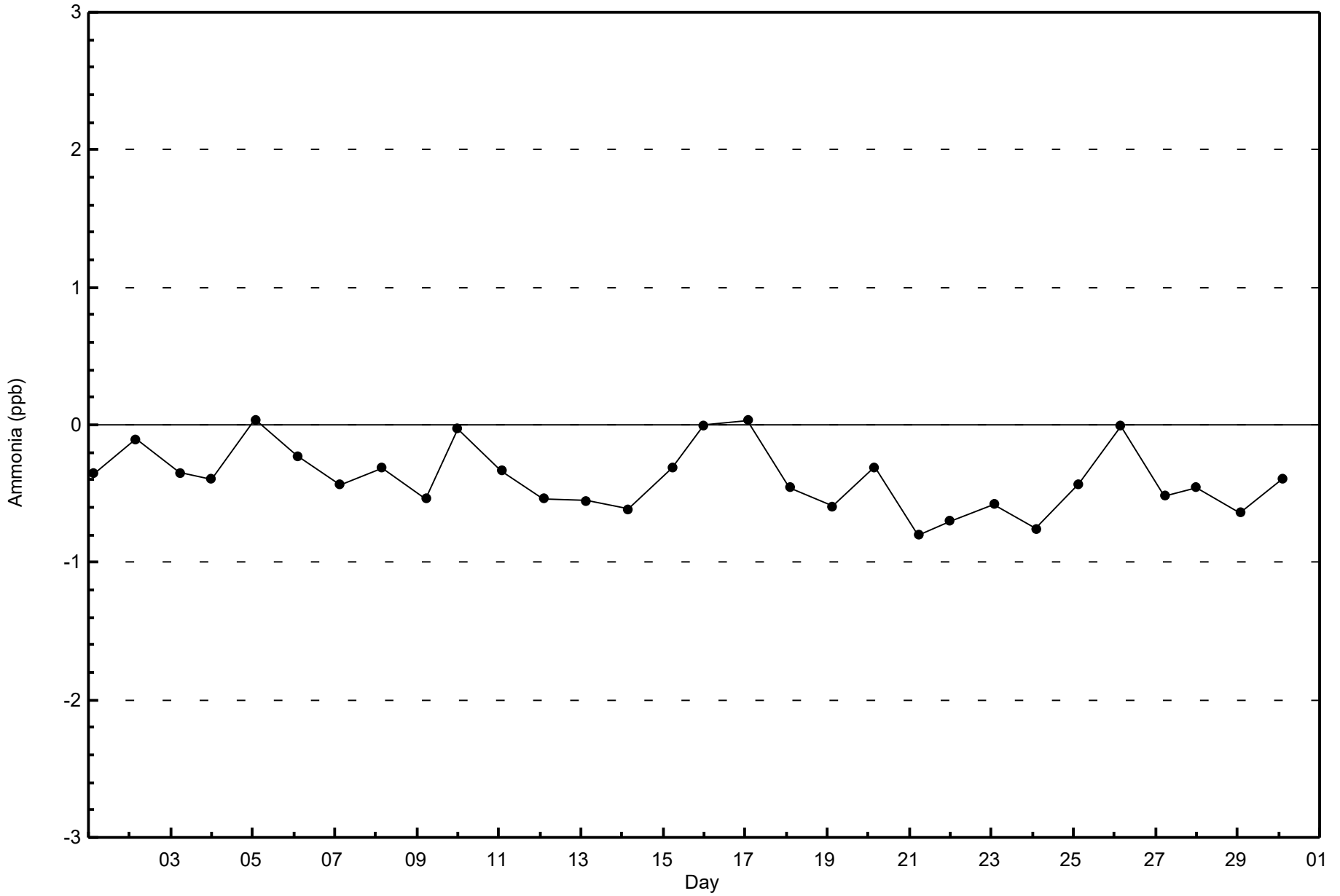


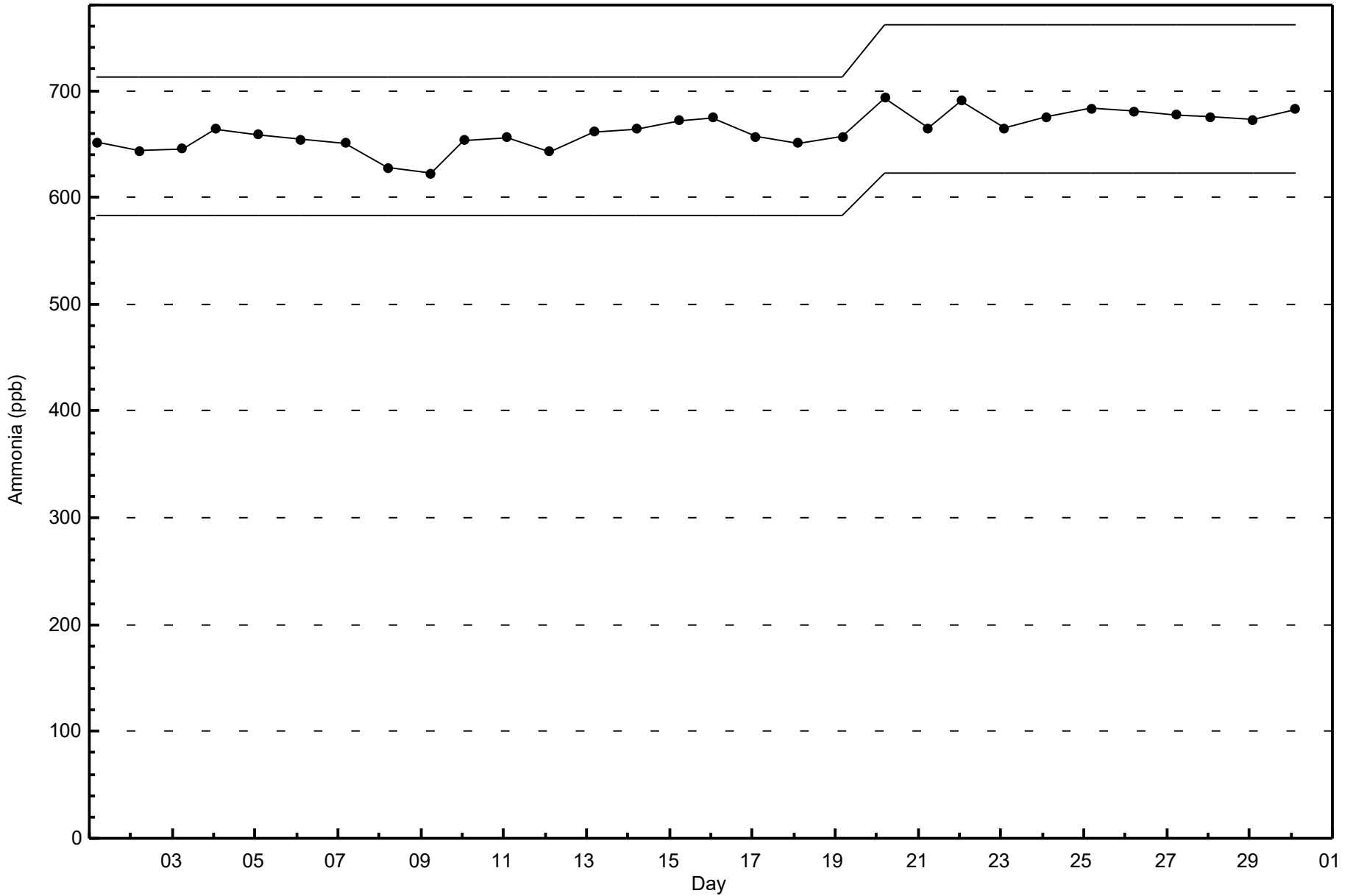


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Ammonia (NH<sub>3</sub>) - ppb  
Patricia McInnes









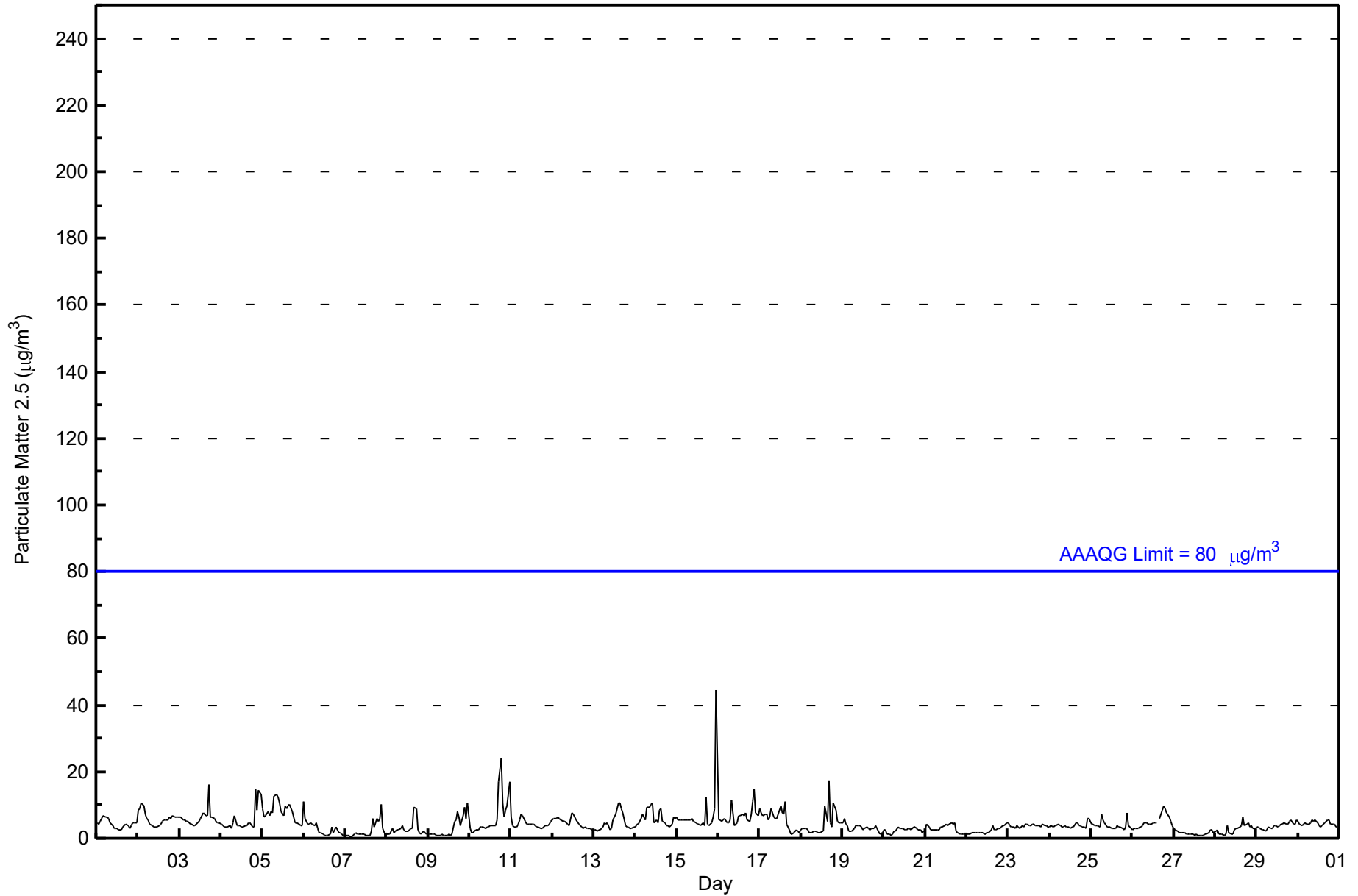
# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

## Patricia McInnes - November 2024

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720															720																											
Maximum Value: 44.4 µg/m <sup>3</sup> on Nov 16 00:00				Maximum Daily Average: 7.9 µg/m <sup>3</sup> on Nov 5		Hours of Data: 719															719																											
Minimum Value: 0.4 µg/m <sup>3</sup> on Nov 7 04:00				Minimum Daily Average: 1.6 µg/m <sup>3</sup> on Nov 27		Hours of Missing Data: 1															1																											
Maximum Diurnal Average: 5.9 µg/m <sup>3</sup> at hour 24				Minimum Diurnal Average: 3.7 µg/m <sup>3</sup> at hour 6		Hours of Calibration: 1															1																											
Monthly Average: 4.35 µg/m <sup>3</sup>				Percentiles: P <sub>1</sub> = 0.8 P <sub>10</sub> = 1.4 Q <sub>1</sub> = 2.7 Median = 3.8 Q <sub>3</sub> = 5.4 P <sub>90</sub> = 7.3 P <sub>99</sub> = 14.6		Percent Operational Time: 100.0															100.0																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	4.6	4.3	5.0	5.8	6.7	6.2	6.4	6.1	4.8	3.8	3.0	2.9	2.9	2.5	2.7	3.3	3.8	4.4	3.9	3.1	3.7	4.7	4.5	4.7	4.3	6.7																						
2-Nov	8.7	8.9	10.5	9.6	7.4	5.8	5.3	4.3	4.0	3.4	3.4	3.5	3.6	4.2	5.2	5.6	5.5	5.5	6.3	6.1	6.9	6.5	6.3	6.2	5.9	10.5																						
3-Nov	6.2	6.2	5.6	5.5	5.2	4.9	4.3	4.1	4.0	4.0	4.4	5.1	5.7	6.8	7.7	6.6	6.7	15.9	6.4	6.4	5.8	5.2	4.7	4.6	5.9	15.9																						
4-Nov	4.3	4.0	3.5	3.4	3.3	4.0	3.2	4.8	6.6	3.7	3.8	3.8	3.6	3.4	3.7	3.8	4.5	4.7	3.6	3.5	14.6	8.5	14.4	13.1	5.4	14.6																						
5-Nov	8.8	6.3	6.8	8.0	6.9	8.0	7.7	12.6	13.2	12.2	10.8	8.1	7.0	9.6	9.0	9.8	10.1	8.1	6.3	4.8	4.8	4.3	3.9	3.6	7.9	13.2																						
6-Nov	11.0	5.9	4.4	4.3	4.8	4.1	4.0	4.6	2.8	1.6	1.5	1.2	1.0	1.0	0.9	1.5	3.3	1.6	2.5	3.2	1.5	1.7	1.1	0.8	2.9	11.0																						
7-Nov	0.7	0.9	0.9	0.4	0.4	1.1	1.5	1.3	1.3	1.2	1.1	1.1	1.0	0.8	0.7	2.3	5.9	3.5	5.8	5.0	6.0	10.4	2.8	0.9	2.4	10.4																						
8-Nov	1.4	1.3	1.4	2.8	1.7	2.1	2.4	2.5	2.9	3.9	2.6	2.3	2.3	2.6	3.0	3.2	9.4	9.1	2.4	1.6	1.4	2.1	1.9	1.4	2.8	9.4																						
9-Nov	1.2	1.3	1.3	1.2	1.1	1.0	0.9	0.9	1.1	1.0	0.9	0.8	1.1	0.9	1.2	5.0	5.5	8.0	6.5	4.0	6.6	9.5	6.0	10.6	3.2	10.6																						
10-Nov	2.9	1.8	1.9	2.3	2.6	2.7	3.3	3.5	3.2	3.1	3.3	3.3	3.7	3.9	4.0	3.7	5.5	16.9	24.0	10.6	6.2	8.4	9.8	16.9	6.1	24.0																						
11-Nov	6.4	4.0	3.3	3.5	4.4	5.4	7.1	7.0	5.2	4.3	4.1	4.0	4.0	4.1	3.8	3.3	3.6	3.0	3.2	3.4	3.7	3.9	4.1	4.9	4.3	7.1																						
12-Nov	5.4	5.9	6.1	6.4	6.1	5.4	5.0	4.9	4.8	4.4	3.8	7.7	7.1	6.2	5.3	4.4	3.8	3.5	3.2	3.2	3.1	2.9	2.8	2.7	4.8	7.7																						
13-Nov	2.6	2.4	2.3	2.4	2.7	3.5	4.5	4.2	4.5	2.7	2.8	5.4	6.1	7.3	10.7	10.6	9.0	7.4	3.8	3.4	3.4	3.2	3.0	3.4	4.6	10.7																						
14-Nov	3.5	4.2	4.4	5.8	7.1	6.4	5.4	9.1	9.4	10.2	10.6	4.7	5.6	4.8	8.6	8.9	5.1	4.8	3.8	3.7	3.2	4.4	6.3	6.1	6.1	10.6																						
15-Nov	6.2	5.3	5.6	5.7	5.6	5.6	5.4	5.6	5.7	6.0	5.2	4.6	4.0	4.4	4.0	4.5	3.8	12.1	4.0	3.8	4.9	6.2	9.0	44.4	7.1	44.4																						
16-Nov	5.6	5.4	5.1	5.5	5.9	4.8	4.5	5.6	11.2	4.0	4.3	4.8	6.6	6.9	7.3	6.7	7.5	5.4	5.2	7.2	11.2	14.8	7.8	7.0	6.7	14.8																						
17-Nov	9.0	7.4	6.7	7.3	7.2	5.7	6.2	8.8	6.3	5.9	5.9	7.3	9.6	7.5	7.1	11.2	4.1	2.4	1.2	1.4	1.8	2.6	2.1	1.9	5.7	11.2																						
18-Nov	2.4	2.8	2.9	3.0	2.6	1.6	1.6	2.0	2.1	2.2	1.9	1.7	2.0	2.2	9.5	5.1	17.2	4.8	3.5	10.6	8.4	5.1	4.6	4.7	4.4	17.2																						
19-Nov	4.7	6.1	4.4	3.9	2.1	2.2	2.5	3.0	3.7	3.9	3.7	3.5	2.6	3.1	3.3	3.0	2.7	3.0	2.9	3.8	2.8	2.2	1.1	1.5	3.2	6.1																						
20-Nov	2.5	2.5	1.4	1.1	0.8	1.2	1.9	2.1	3.5	2.9	2.9	2.9	2.7	2.5	2.9	2.8	2.6	3.2	3.5	2.9	2.6	2.6	1.8	2.2	2.4	3.5																						
21-Nov	2.3	4.2	3.6	2.4	2.6	2.4	2.5	2.7	2.7	3.2	3.5	4.0	4.2	3.9	4.3	4.8	4.4	4.6	2.3	1.5	1.3	1.2	1.2	1.3	3.0	4.8																						
22-Nov	1.3	1.3	1.3	1.5	1.8	1.7	1.7	1.7	1.7	1.5	1.4	1.4	1.7	1.9	2.7	3.7	2.7	2.7	2.9	3.1	3.3	3.7	3.8	4.6	2.3	4.6																						
23-Nov	4.7	4.0	3.5	3.3	3.1	4.0	3.3	3.1	3.8	3.4	4.3	4.1	3.7	3.7	4.3	4.1	4.0	3.6	4.0	3.6	4.1	3.8	3.7	3.3	3.8	4.7																						
24-Nov	3.3	3.9	3.6	3.9	3.6	4.1	3.7	3.3	3.4	3.6	3.3	3.4	3.1	3.3	3.5	4.7	4.6	3.8	3.8	3.4	3.3	3.0	5.8	5.8	3.8	5.8																						
25-Nov	4.0	4.3	3.9	3.9	3.7	3.4	7.3	5.5	4.7	3.4	3.5	3.2	3.1	2.9	3.1	3.9	3.5	3.5	2.9	2.6	3.5	7.5	4.0	3.1	3.9	7.5																						
26-Nov	2.7	2.8	2.9	3.2	3.3	3.5	3.9	4.6	4.5	4.2	4.3	4.4	4.6	4.8	4.8	C	6.1	8.6	9.8	8.8	7.6	6.2	5.0	3.8	5.0	9.8																						
27-Nov	3.2	2.7	2.1	1.6	1.5	1.5	1.5	1.3	1.2	1.3	1.2	1.2	1.1	1.1	1.0	1.0	0.9	0.9	1.1	1.5	1.8	2.4	2.7	1.7	1.6	3.2																						
28-Nov	1.9	2.7	1.5	1.2	1.1	1.0	1.1	4.0	1.7	1.4	1.1	2.6	3.0	2.9	3.4	3.7	6.4	3.8	4.1	4.5	3.5	3.9	3.0	3.1	2.8	6.4																						
29-Nov	3.3	3.4	3.0	2.6	2.4	2.1	2.3	3.2	2.8	2.9	3.9	3.7	3.3	3.7	4.1	4.2	4.6	4.4	4.2	5.2	5.6	4.4	4.2	5.6	3.7	5.6																						
30-Nov	5.1	4.1	3.8	4.1	4.6	4.3	4.3	4.6	5.4	5.1	5.4	4.7	3.9	3.4	3.7	4.7	5.1	5.3	5.4	4.4	4.1	4.0	3.6	3.4	4.5	5.4																						
																								4.3	4.0	3.8	3.8	3.7	3.7	3.8	4.4	4.4	3.8	3.7	3.7	3.8	3.9	4.5	4.8	5.4	5.6	4.7	4.3	4.7	5.0	4.5	5.9	Dial Average
																								11.0	8.9	10.5	9.6	7.4	8.0	7.7	12.6	13.2	12.2	10.8	8.1	9.6	9.6	10.7	11.2	17.2	16.9	24.0	10.6	14.6	14.8	14.4	44.4	Dial Maximum
C - Calibration																																																
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m <sup>3</sup> 24-hr 29 µg/m <sup>3</sup>																																																





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Patricia McInnes - November 2024**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	552	76.77	76.77
6 - 15	161	22.39	99.17
16 - 25	5	0.70	99.86
26 - 80	1	0.14	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>  
Patricia McInnes - November 2024**

Concentration Ranges (μg/m <sup>3</sup> )	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	73	46	11	5	2	20	59	18	19	28	32	45	33	52	33	76	552
6 - 15	14	14	6	1	5	9	22	30	12	11	6	7	7	8	3	6	161
16 - 25	1	0	0	0	0	1	1	0	1	0	0	0	0	0	0	1	5
26 - 80	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	88	60	17	6	7	30	82	49	32	39	38	52	40	60	36	83	719

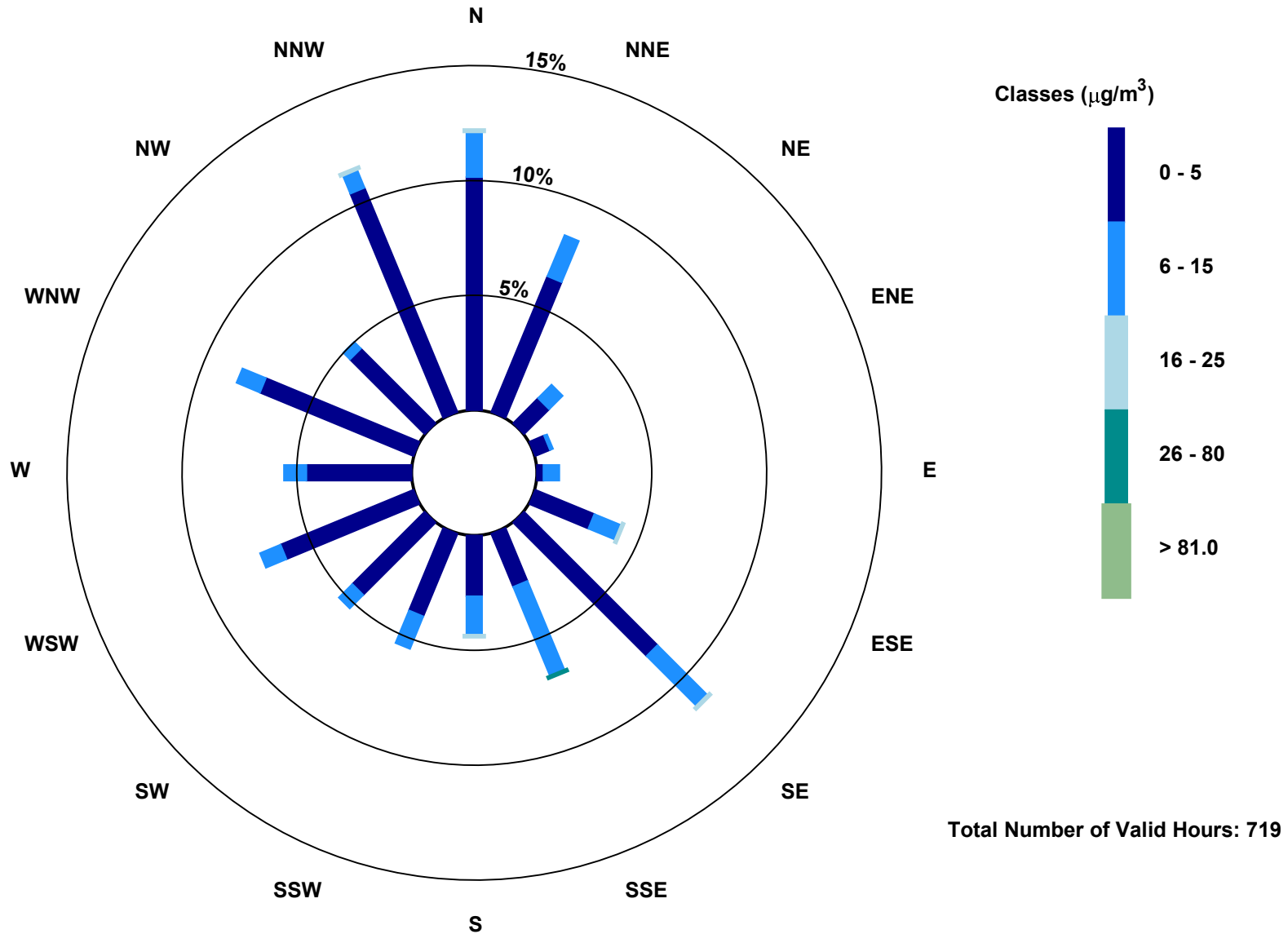
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Patricia McInnes







**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

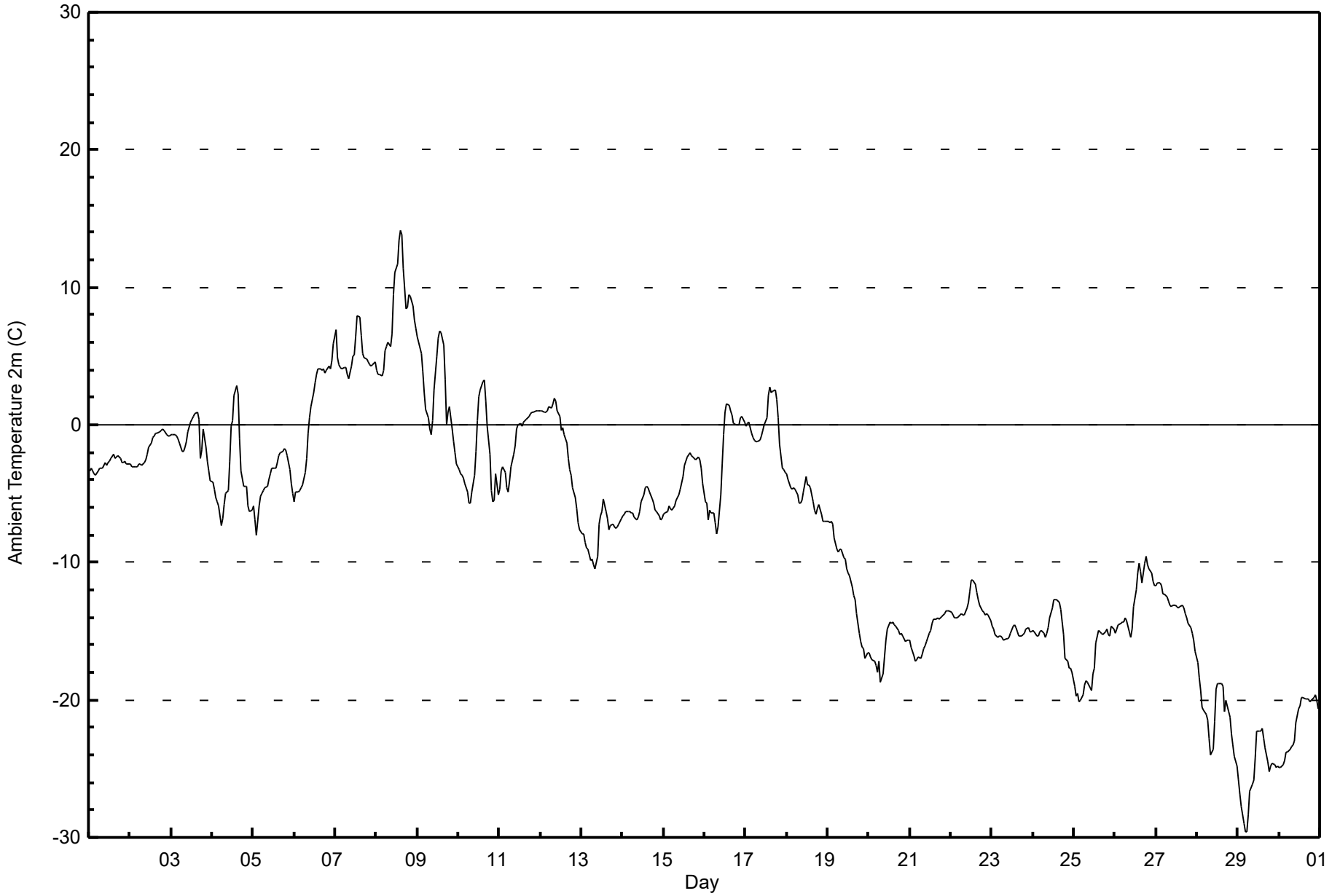
**Ambient Temperature 2m (AT2) - C**  
**Patricia McInnes - November 2024**

Maximum Value: 14.1 C on Nov 8 15:00		Maximum Daily Average: 8.0 C on Nov 8		Hours in Service: 720																																												
Minimum Value: -29.6 C on Nov 29 05:00		Minimum Daily Average: -25.4 C on Nov 29		Hours of Data: 720																																												
Maximum Diurnal Average: -5.3 C at hour 15		Minimum Diurnal Average: -8.8 C at hour 6		Hours of Missing Data: 0																																												
Monthly Average: -7.51 C		Percentiles: P <sub>1</sub> = -26.1 P <sub>10</sub> = -19.2 Q <sub>1</sub> = -14.6 Median = -5.9 Q <sub>3</sub> = -1.1 P <sub>90</sub> = 2.9 P <sub>99</sub> = 9.4		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-3.4	-3.2	-3.4	-3.6	-3.7	-3.3	-3.1	-3.2	-3.1	-2.7	-2.9	-2.8	-2.6	-2.4	-2.1	-2.5	-2.4	-2.3	-2.5	-2.7	-2.7	-2.7	-2.9	-2.8	-2.9	-2.1																						
2-Nov	-2.9	-3.0	-3.0	-3.0	-3.0	-2.9	-2.9	-2.9	-2.8	-2.5	-2.2	-1.7	-1.3	-0.9	-0.9	-0.7	-0.6	-0.5	-0.4	-0.3	-0.4	-0.7	-0.8	-0.8	-1.7	-0.3																						
3-Nov	-0.7	-0.7	-0.7	-0.8	-1.0	-1.3	-1.9	-1.9	-1.7	-1.2	-0.5	0.2	0.4	0.6	0.9	1.0	0.4	-2.5	-1.8	-0.3	-1.6	-2.7	-3.4	-4.0	-1.1	1.0																						
4-Nov	-4.2	-4.7	-5.3	-5.6	-5.9	-7.3	-6.9	-5.8	-5.0	-4.8	-2.6	-0.1	0.3	2.1	2.8	2.2	-1.0	-3.4	-4.4	-4.5	-4.4	-5.9	-6.3	-6.2	-3.6	2.8																						
5-Nov	-5.9	-6.9	-8.1	-5.9	-5.1	-5.0	-4.8	-4.6	-4.5	-4.0	-3.6	-3.2	-3.2	-3.2	-2.7	-2.2	-2.0	-1.9	-1.8	-1.8	-2.2	-3.2	-4.3	-5.0	-4.0	-1.8																						
6-Nov	-5.6	-4.9	-4.8	-4.8	-4.6	-4.3	-3.4	-2.5	-0.6	0.5	1.3	2.3	3.1	3.6	4.0	4.1	3.9	4.0	3.8	4.0	4.3	4.1	4.6	5.9	0.8	5.9																						
7-Nov	6.9	4.9	4.4	4.2	4.1	4.1	4.2	3.7	3.4	4.2	5.0	5.0	6.4	7.9	7.9	6.5	5.2	4.9	4.8	4.5	4.3	4.2	4.4	4.6	5.0	7.9																						
8-Nov	4.0	3.7	3.6	3.6	4.0	5.3	5.7	6.0	5.7	6.6	9.5	11.1	11.7	13.4	14.1	13.8	11.4	8.5	8.6	9.4	9.4	8.7	7.6	7.0	8.0	14.1																						
9-Nov	6.4	6.0	5.2	3.9	2.3	1.1	0.5	-0.3	-0.8	0.3	2.5	5.0	6.3	6.8	6.7	5.8	3.2	0.0	1.0	1.3	-0.3	-1.3	-2.1	-2.8	2.4	6.8																						
10-Nov	-3.3	-3.5	-3.6	-3.9	-4.3	-4.9	-5.7	-5.7	-4.8	-3.7	-1.9	0.3	2.1	2.5	3.2	3.3	1.7	-0.1	-2.2	-4.8	-5.6	-5.5	-3.6	-5.1	-2.5	3.3																						
11-Nov	-4.6	-3.3	-3.1	-3.5	-4.6	-4.9	-4.1	-3.1	-2.1	-1.5	-0.3	0.0	0.1	-0.1	0.2	0.4	0.5	0.6	0.8	0.9	1.0	1.0	1.0	1.0	-1.2	1.0																						
12-Nov	1.0	1.0	0.9	0.9	1.0	1.3	1.3	1.5	1.9	1.8	1.0	0.6	-0.4	-0.3	-0.7	-1.3	-2.4	-3.3	-3.7	-4.6	-5.3	-6.1	-7.1	-7.6	-1.2	1.9																						
13-Nov	-7.9	-8.0	-8.5	-9.0	-9.1	-9.9	-9.8	-10.2	-10.4	-9.6	-7.2	-6.6	-6.3	-5.4	-6.3	-6.8	-7.7	-7.3	-7.2	-7.5	-7.6	-7.4	-7.2	-6.9	-7.9	-5.4																						
14-Nov	-6.6	-6.5	-6.3	-6.3	-6.3	-6.4	-6.4	-6.8	-6.9	-6.7	-6.3	-5.6	-5.0	-4.6	-4.5	-4.6	-4.9	-5.4	-5.7	-6.2	-6.3	-6.7	-6.9	-6.9	-6.0	-4.5																						
15-Nov	-6.5	-6.4	-6.3	-5.9	-6.1	-6.3	-5.9	-5.5	-5.3	-5.1	-4.6	-3.8	-3.0	-2.6	-2.4	-2.0	-2.3	-2.3	-2.4	-2.6	-2.4	-2.5	-3.1	-4.3	-4.1	-2.0																						
16-Nov	-5.6	-5.7	-6.9	-6.2	-6.5	-6.4	-7.1	-7.9	-7.4	-5.0	-2.9	-0.7	0.9	1.6	1.5	1.0	0.7	0.1	0.0	0.0	0.5	0.6	0.2	-2.6	1.6																							
17-Nov	-0.1	0.1	0.2	-0.6	-0.9	-1.1	-1.2	-1.2	-1.1	-0.8	-0.5	0.0	0.6	2.1	2.7	2.4	2.5	2.6	1.8	0.5	-1.4	-3.1	-3.3	-3.5	-0.1	2.7																						
18-Nov	-3.6	-3.9	-4.6	-4.6	-4.6	-4.6	-5.1	-5.6	-5.7	-5.5	-4.9	-3.7	-4.4	-4.4	-4.5	-5.6	-6.2	-6.5	-6.1	-5.8	-6.5	-7.0	-7.0	-7.0	-5.3	-3.6																						
19-Nov	-7.0	-7.1	-7.0	-7.2	-8.2	-9.1	-9.2	-9.0	-9.0	-9.6	-9.8	-10.5	-10.8	-11.0	-11.8	-12.4	-12.7	-13.7	-15.1	-15.8	-16.1	-16.3	-17.0	-16.5	-11.3	-7.0																						
20-Nov	-16.5	-16.8	-17.1	-17.1	-17.5	-18.0	-17.2	-18.7	-18.1	-16.9	-15.7	-14.8	-14.3	-14.4	-14.3	-14.5	-14.6	-14.9	-15.2	-15.2	-15.4	-15.7	-15.7	-15.7	-16.0	-14.3																						
21-Nov	-15.7	-16.2	-16.8	-17.2	-17.1	-16.9	-17.0	-16.7	-16.3	-16.1	-15.7	-15.2	-14.9	-14.4	-14.2	-14.1	-14.1	-14.1	-14.1	-13.9	-13.7	-13.5	-13.5	-13.6	-15.2	-13.5																						
22-Nov	-13.6	-13.8	-14.1	-14.1	-14.1	-13.8	-13.7	-13.9	-13.8	-13.3	-12.9	-12.1	-11.3	-11.3	-11.6	-12.2	-12.7	-13.1	-13.5	-13.6	-13.8	-13.7	-13.8	-14.3	-13.3	-11.3																						
23-Nov	-14.6	-14.9	-15.3	-15.5	-15.3	-15.3	-15.5	-15.6	-15.6	-15.4	-15.2	-14.6	-14.5	-14.7	-15.0	-15.3	-15.4	-15.3	-15.1	-14.8	-14.7	-15.0	-15.0	-15.1	-14.5	-14.5																						
24-Nov	-14.9	-15.0	-15.4	-15.3	-15.0	-14.9	-15.1	-15.5	-15.2	-14.7	-14.1	-13.3	-12.8	-12.7	-12.7	-12.9	-13.4	-14.3	-15.3	-17.0	-17.2	-17.7	-17.7	-18.0	-15.0	-12.7																						
25-Nov	-19.0	-19.7	-19.5	-20.1	-20.0	-19.6	-18.9	-18.6	-18.7	-19.2	-19.3	-18.1	-17.6	-15.9	-14.9	-15.1	-15.3	-15.0	-14.9	-15.2	-15.4	-14.6	-14.9	-14.9	-17.3	-14.6																						
26-Nov	-15.1	-14.9	-14.6	-14.4	-14.3	-14.3	-14.0	-14.2	-15.1	-15.4	-14.9	-13.2	-12.0	-10.8	-10.1	-10.6	-11.5	-10.1	-9.5	-10.1	-10.5	-10.7	-11.4	-11.7	-12.6	-9.5																						
27-Nov	-11.7	-11.5	-11.4	-11.7	-12.3	-12.3	-12.5	-12.8	-13.2	-13.2	-13.2	-13.1	-13.2	-13.3	-13.2	-13.1	-13.4	-13.7	-14.1	-14.4	-14.7	-15.1	-15.7	-16.4	-13.3	-11.4																						
28-Nov	-17.3	-18.4	-19.4	-20.6	-20.7	-21.1	-21.5	-22.8	-24.0	-23.6	-21.6	-19.2	-18.8	-18.8	-18.8	-19.0	-20.8	-20.0	-20.9	-21.2	-22.5	-23.3	-24.1	-24.8	-21.0	-17.3																						
29-Nov	-25.8	-26.8	-27.8	-29.0	-29.6	-29.5	-28.4	-26.7	-26.2	-25.9	-24.2	-22.3	-22.2	-22.3	-22.1	-22.7	-23.5	-24.5	-25.2	-24.9	-24.6	-24.8	-24.9	-24.8	-25.4	-22.1																						
30-Nov	-25.0	-24.9	-24.7	-24.4	-23.8	-23.8	-23.6	-23.4	-23.3	-23.0	-21.7	-20.6	-20.4	-19.8	-19.8	-19.9	-20.0	-19.9	-20.1	-20.0	-19.8	-19.6	-20.0	-20.7	-21.8	-19.6																						
																								-8.0	-8.2	-8.4	-8.6	-8.7	-8.8	-8.8	-8.8	-8.6	-8.2	-7.3	-6.4	-5.9	-5.4	-5.3	-5.6	-6.2	-6.8	-7.0	-7.2	-7.5	-7.9	-8.1	-8.3	Diurnal Average
																								6.9	6.0	5.2	4.2	4.1	5.3	5.7	6.0	5.7	6.6	9.5	11.1	11.7	13.4	14.1	13.8	11.4	8.5	8.6	9.4	9.4	8.7	7.6	7.0	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 2m (AT2) - C**  
**Patricia McInnes - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Patricia McInnes - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	58	8.06	8.06
-20 - 0	521	72.36	80.42
0 - 10	135	18.75	99.17
10 - 20	6	0.83	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

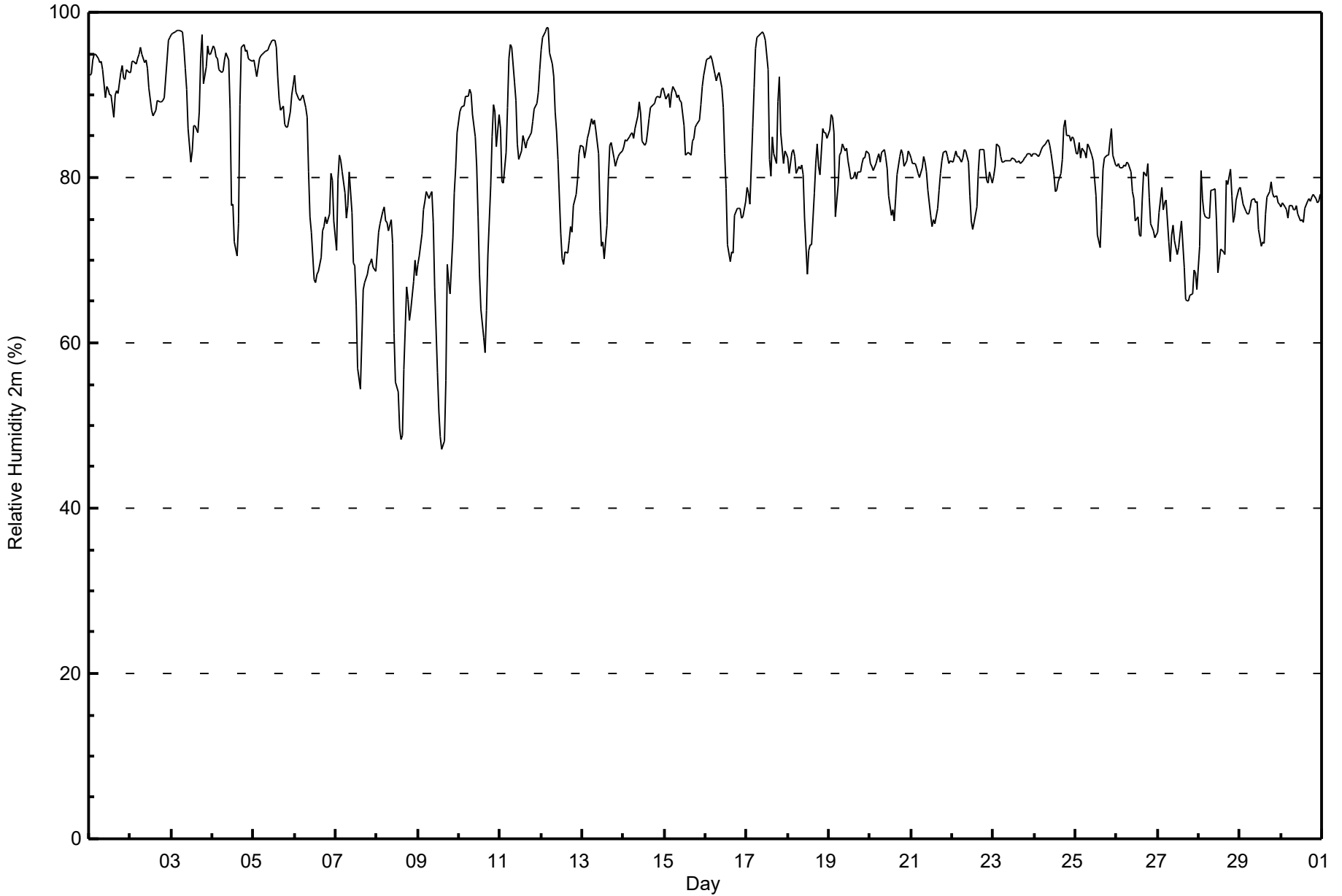
**Relative Humidity 2m (RH2) - %**  
**Patricia McInnes - November 2024**

Maximum Value: 98.2 % on Nov 12 05:00		Maximum Daily Average: 92.6 % on Nov 3		Hours in Service: 720																																												
Minimum Value: 47.1 % on Nov 9 15:00		Minimum Daily Average: 65.8 % on Nov 8		Hours of Data: 720																																												
Maximum Diurnal Average: 85.6 % at hour 8		Minimum Diurnal Average: 74.3 % at hour 15		Hours of Missing Data: 0																																												
Monthly Average: 81.70 %		Percentiles: P <sub>1</sub> = 54.1 P <sub>10</sub> = 70.8 Q <sub>1</sub> = 76.3 Median = 82.1 Q <sub>3</sub> = 88.0 P <sub>90</sub> = 94.0 P <sub>99</sub> = 97.6		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	92.3	92.6	94.3	94.9	94.9	94.3	93.9	94.0	93.0	89.7	91.0	90.6	89.9	90.0	87.3	90.0	90.6	90.2	92.7	93.5	92.0	91.8	93.1	92.8	92.1	94.9																						
2-Nov	92.7	94.0	94.0	93.8	94.4	94.9	95.7	94.9	93.9	94.3	93.2	90.8	88.2	87.5	87.8	88.1	89.2	89.2	89.1	89.4	89.6	94.3	96.6	96.9	92.2	96.9																						
3-Nov	97.3	97.5	97.6	97.8	97.8	97.9	97.6	95.8	93.2	90.6	86.0	81.9	83.2	86.3	86.3	85.4	88.1	94.4	97.2	91.4	93.4	95.9	95.0	95.0	92.6	97.9																						
4-Nov	96.0	95.6	94.6	94.5	93.0	92.7	92.9	94.3	95.1	94.3	88.3	76.6	76.8	72.2	70.5	74.5	88.7	95.8	96.2	95.2	95.5	94.4	94.2	94.0	89.8	96.2																						
5-Nov	94.3	93.2	92.2	94.4	94.8	95.0	95.1	95.3	95.5	95.9	96.3	96.6	96.6	95.8	92.3	89.6	88.1	88.7	86.5	86.1	86.1	88.0	90.0	91.2	92.4	96.6																						
6-Nov	92.4	90.3	89.4	89.3	89.6	90.0	88.5	87.2	80.7	75.3	73.4	67.6	67.3	68.3	68.6	70.3	73.6	74.1	75.3	74.3	75.5	80.6	79.7	74.8	79.0	92.4																						
7-Nov	71.1	79.9	82.7	82.0	80.7	78.2	75.1	76.7	80.7	75.8	69.7	69.3	64.5	57.0	54.4	60.4	66.4	67.4	68.3	69.3	69.7	70.1	69.2	68.6	71.1	82.7																						
8-Nov	71.1	73.3	74.4	76.0	76.5	74.8	74.5	73.6	74.8	72.0	61.2	55.3	54.1	49.6	48.3	48.8	56.7	66.9	65.3	62.6	64.0	67.4	70.0	68.1	65.8	76.5																						
9-Nov	69.4	70.4	73.2	76.2	77.1	78.3	77.5	78.0	78.4	74.6	66.7	56.5	51.7	48.7	47.1	48.2	55.3	69.4	67.5	65.9	72.8	78.1	81.1	85.4	68.7	85.4																						
10-Nov	88.0	88.5	88.6	88.7	89.8	89.8	90.7	90.3	87.6	85.0	81.3	75.2	68.2	64.1	60.6	58.7	64.0	70.7	79.1	84.9	88.9	88.0	83.7	87.7	80.9	90.7																						
11-Nov	86.0	79.4	79.3	83.1	88.4	94.3	96.2	95.8	91.5	89.4	84.1	82.3	83.2	85.1	84.4	83.6	84.4	85.1	85.5	86.8	88.3	88.9	90.3	93.0	87.0	96.2																						
12-Nov	95.4	97.0	97.7	98.1	98.2	95.1	93.7	92.1	87.9	85.7	82.2	73.3	70.1	69.6	71.0	70.8	72.4	74.1	73.4	76.6	77.9	79.8	82.8	83.9	83.3	98.2																						
13-Nov	83.7	82.3	83.4	84.8	85.4	87.1	86.5	86.9	85.7	82.9	76.0	71.6	72.3	70.2	74.3	80.2	83.9	84.2	82.3	81.3	82.1	82.5	82.8	83.2	81.5	87.1																						
14-Nov	83.8	84.6	84.4	84.9	85.3	85.5	84.7	86.0	87.5	89.2	87.8	84.4	83.9	84.3	85.6	87.1	88.5	88.7	89.0	89.7	89.8	89.7	90.7	90.9	86.9	90.9																						
15-Nov	90.1	89.4	90.1	88.6	90.2	91.0	90.4	89.6	90.0	89.2	89.1	86.3	82.8	82.8	83.1	82.8	84.5	84.7	86.1	86.4	87.0	88.8	91.0	92.4	87.8	92.4																						
16-Nov	94.2	94.4	94.4	94.8	94.2	92.6	91.8	92.4	92.8	90.8	88.5	82.9	78.7	71.9	69.8	71.0	70.8	75.5	76.3	76.3	76.3	75.0	75.2	77.1	83.2	94.8																						
17-Nov	78.7	78.1	76.7	86.1	90.8	95.7	96.9	97.2	97.4	97.6	97.4	96.6	93.1	82.3	80.2	84.9	82.8	81.7	89.2	92.3	85.5	81.7	83.2	82.8	87.9	97.6																						
18-Nov	82.3	80.6	83.1	83.3	82.6	80.6	81.3	81.1	81.5	80.3	75.2	68.3	71.1	71.9	71.8	78.2	81.7	84.2	81.4	80.3	85.9	85.4	85.4	84.8	80.1	85.9																						
19-Nov	85.8	87.7	87.4	85.5	75.2	79.2	82.7	83.1	84.1	83.3	83.5	82.1	81.0	79.9	80.0	80.6	79.8	80.7	80.7	81.7	82.3	82.4	83.2	82.8	82.3	87.7																						
20-Nov	81.6	81.4	80.9	81.7	82.4	82.9	81.9	83.0	83.3	82.4	81.0	77.7	75.4	76.1	74.7	77.5	80.4	82.6	83.4	82.9	81.4	82.0	83.2	83.0	80.9	83.4																						
21-Nov	82.3	81.7	81.7	81.1	80.5	80.1	81.2	82.6	81.8	80.7	78.5	75.4	74.0	74.8	74.3	76.3	78.4	80.4	82.1	83.1	83.2	82.6	81.7	82.1	80.0	83.2																						
22-Nov	81.8	82.5	83.2	82.5	82.6	81.8	82.4	83.4	83.2	81.9	77.7	74.7	73.7	74.5	76.5	80.7	83.3	83.4	83.4	81.4	79.7	79.3	80.6	79.4	80.6	83.4																						
23-Nov	80.1	81.4	84.1	83.7	82.5	81.9	81.8	82.0	82.1	82.0	82.4	82.1	81.8	81.9	82.1	81.7	82.1	82.4	82.5	82.9	82.9	82.5	82.8	82.8	82.2	84.1																						
24-Nov	82.8	83.0	82.6	82.9	83.3	83.8	84.0	84.5	84.5	83.9	83.0	80.3	78.3	78.4	79.4	80.5	82.2	86.0	87.0	85.1	85.1	84.3	84.9	84.8	83.1	87.0																						
25-Nov	82.9	83.0	84.3	82.4	83.6	83.1	82.4	84.1	83.7	82.7	82.0	79.9	77.8	73.1	71.5	76.1	80.9	82.3	82.7	82.7	84.5	86.0	82.7	81.6	81.5	86.0																						
26-Nov	81.4	81.6	81.2	81.2	81.5	81.4	81.8	81.8	80.7	78.3	77.4	74.7	75.3	73.0	72.9	77.3	80.7	80.2	81.7	77.6	74.5	73.5	72.8	73.0	78.1	81.8																						
27-Nov	73.4	75.8	78.7	76.1	77.0	77.3	72.1	69.9	73.0	74.3	72.5	70.7	71.5	73.3	74.8	69.2	65.3	65.1	65.0	65.8	66.0	68.8	68.5	66.4	71.3	78.7																						
28-Nov	71.7	80.8	77.5	75.8	75.3	75.0	75.1	78.5	78.4	78.6	74.7	68.4	70.1	71.4	71.0	70.7	79.7	79.1	81.0	77.9	74.6	75.5	77.3	78.6	75.7	81.0																						
29-Nov	78.8	77.8	76.8	76.0	75.6	75.7	76.2	77.3	77.5	76.9	77.1	73.8	71.7	72.2	72.1	75.5	77.6	78.4	79.5	78.1	77.7	77.8	77.0	76.7	76.4	79.5																						
30-Nov	76.5	77.0	76.5	76.1	75.1	76.6	76.6	76.2	76.0	76.7	75.6	74.7	75.0	74.7	76.3	77.1	77.5	77.1	77.6	77.9	77.5	76.9	77.1	77.9	76.5	77.9																						
																								83.9	84.5	84.8	85.2	85.3	85.5	85.4	85.6	85.2	83.8	81.1	77.4	76.1	74.7	74.3	75.9	78.6	80.8	81.6	81.3	81.7	82.4	82.8	83.1	Diurnal Average
																								97.3	97.5	97.7	98.1	98.2	97.9	97.6	97.2	97.4	97.6	97.4	96.6	96.6	95.8	92.3	90.0	90.6	95.8	97.2	95.2	95.5	95.9	96.6	96.9	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 2m (RH2) - %**  
**Patricia McInnes - November 2024**





Maximum Speed: 27 km/h on Nov 12 13:00	Maximum Daily Speed Average: 18.8 km/h on Nov 27	Hours in Service: 720
Minimum Speed Value: 1 km/h on Nov 4 20:00	Minimum Daily Speed Average: 2.3 km/h on Nov 15	Hours of Data: 720
Maximum Diurnal Speed Average: 2.9 km/h at hour 12	Minimum Diurnal Speed Average: 1.5 km/h at hour 9	Hours of Missing Data: 0
Monthly Average Velocity: 2.0 km/h 310.7 deg	Percentiles: $P_1 = 1$ $P_{10} = 4$ $Q_1 = 6$ Median = 9 $Q_3 = 11$ $P_{90} = 14$ $P_{99} = 24$	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	ESE1	NNW5	N6	N6	N6	N4	NNE2	NE3	ENE4	NNE1	W2	WSW5	SW5	WSW3	NW5	WNW7	NW3	NNW3	NNW5	NNW7	NNW3	NNE4	WNW2	NNW2	NNW2.6	WNW7	
2-Nov	NE5	NE5	NNE4	E3	ESE4	E4	ENE5	ENE5	E6	ESE10	ESE9	ESE10	ESE10	ESE11	ESE11	ESE10	E12	E11	SE10	SE9	SE9	ESE9	ESE11	SE8	ESE7.2	E12	
3-Nov	SE4	SE5	SSE5	S3	SW4	WSW4	SW5	WSW7	SW7	SW6	SE6	SSW6	S7	SSE6	S7	S7	S5	NNW3	WSW2	SSW7	SW7	WSW8	WSW11	WSW10	SSW4.9	WSW11	
4-Nov	WSW11	WSW10	WSW10	WSW9	WSW9	SSW6	SSW7	S4	SSE5	S8	ESE2	ESE5	ESE7	ESE7	ESE6	SE6	SE3	WSW1	WSW3	SSE1	SSE5	SW3	SSE3	SSE1	SSW3.3	WSW11	
5-Nov	NNW2	WSW2	NNW2	N6	N10	NNW8	NNW6	NW3	WNW3	WNW2	WNW3	NW4	W6	WNW8	WNW5	W3	WSW3	WSW3	WSW6	WSW9	WSW9	SW8	SW7	SW7	W3.9	N10	
6-Nov	SSE7	S8	SSE9	SSE8	SE8	SE8	SSE7	SSE7	S10	SSW10	SSW12	SW17	SW20	WSW21	WSW17	SSW7	SSE7	SSW9	S8	S9	SSW10	S10	SSW7	WSW9	SSW8.6	WSW21	
7-Nov	W10	NNW14	NW19	NNW14	W15	WNW19	WNW20	WNW15	W11	W13	W19	NNW14	WNW8	W8	WNW10	SW1	S4	S7	SSE6	SSE6	SSE6	SE6	SE11	SE14	W6.7	WNW20	
8-Nov	SE10	SE10	SSE9	SSE8	SSW8	SW11	SW11	SW8	SSW5	SSW3	SW6	SW11	SW11	SSW10	SW9	SW7	SSW4	SW4	WSW8	WSW9	NNW11	NW11	WNW9	NNW12	SW5.9	WNW12	
9-Nov	W11	W15	WNW15	W12	W11	WSW12	WSW12	WSW11	SW7	WSW13	WSW14	W14	WSW11	WSW12	WSW9	SW5	WSW6	SSW5	SSW7	SSW8	SSW6	SSW7	SSW7	SSW6	WSW8.7	W15	
10-Nov	SSW9	SW9	WSW13	WSW13	WSW8	SSW7	S6	S7	SSW12	SW11	SW10	SW11	SSW11	SSW13	SSW12	SSW8	SW6	S6	SE3	SSW4	SSE2	SSE3	S4	ESE5	SSW7.2	SSW13	
11-Nov	SE6	SE11	SE14	SE15	SE8	SE6	ESE9	ESE11	SE16	SE14	SE14	SE15	SE15	ESE13	ESE13	ESE13	ESE12	SE12	SE11	ESE10	SE11	SE10	ESE11	SE10	SE11.7	SE16	
12-Nov	SE7	ESE6	SE4	SSW5	SW10	WSW11	WSW9	WSW10	WSW15	W20	W24	W25	W27	W23	WNW21	WNW19	NW17	WNW12	W9	W7	W8	W10	W9	WSW13	W11.2	W27	
13-Nov	WSW11	W10	W6	SSW5	SSW5	S5	SSW2	SW2	SW4	NNW6	N8	NNE8	NNE8	NNE10	N11	N9	NNE12	NE11	NNE12	NE13	NE11	NE10	NE9	N3.8	NE13		
14-Nov	NE9	NNE11	NNE14	NNE13	NE11	NE11	NE10	N9	N10	NNE9	NNE10	NNE11	NNE10	NNE9	NNE10	N10	N9	N10	N9	NNW7	NNW8	NNW7	NNE5	NW6	NNE9.0	NNE14	
15-Nov	NNW6	NNE7	NNW6	N3	W3	WSW4	SSW3	E1	E1	ESE4	S6	SW5	S4	SE7	S6	SE5	SE6	SSE5	SE6	SE7	SSE6	SE4	SSE4	SSE5	SSE2.3	SSE7	
16-Nov	S6	S7	S7	SSE8	SSE8	S8	SSW6	SSE6	SE7	SE7	SE9	SSE8	SSE14	SSE18	SSE19	SSE18	SSE17	SSE14	SSE12	SSE10	SSE10	SSE12	SSE11	SE10	SSE10.2	SSE19	
17-Nov	SE8	SE10	SE9	SE8	SE8	SSE9	SE10	SE10	SE8	SE9	SSE9	SSE8	S7	S8	S7	ESE3	SW9	SW12	WSW16	NW22	NW22	NW21	WNW17	WNW17	SSW3.6	NW22	
18-Nov	W12	W14	W13	W9	WNW8	NNW13	NW13	NNW12	WNW9	WNW6	NW10	NNW9	NNE7	NNE6	N7	N5	N6	N2	NNW5	NE5	ENE7	NE7	NE5	NE3	NW5.6	W14	
19-Nov	NNE5	NNE7	N3	ENE8	E12	ENE8	NE6	NNE6	N11	NNE14	NNE13	N16	NNE16	NNE16	NNE18	N14	NNE16	N13	N15	N14	N12	NNW8	NNW10	NNW10	NNE10.4	NNE18	
20-Nov	N12	NNW12	NNW12	NNW10	NNW9	NNW8	N10	NW7	N8	NNE12	NNE13	NNE13	N13	NNW14	N16	N13	N11	N8	N9	N16	NNW11	NNW12	NNW12	N14	N11.0	N16	
21-Nov	N12	N11	NNW9	NNW12	NNW10	NNW9	NNW8	NW8	NNW10	NW11	NW12	NNW12	NNW12	NNW11	NNW10	NNW10	NNW10	NW9	WNW6	WNW5	WNW5	WNW6	NW6	NW6	NNW8.8	NNW12	
22-Nov	NNW7	NW6	WNW6	WNW7	W5	W8	W5	W5	WSW7	W7	W9	NW9	N8	N9	N11	NNE11	NNE10	NNE9	NNE11	N11	NNE11	N10	N9	N11	NNW6.2	NNE11	
23-Nov	N13	N14	NNE16	NNE14	N12	N13	NNE14	NNE13	N11	NNE11	N10	NNE10	NNE11	NNE12	N11	N13	N14	N13	N12	NNW13	N12	N14	N15	N14	N12.6	NNE16	
24-Nov	N14	N13	N13	N13	N12	N10	N8	NNW8	NNW10	NNW9	NNW9	NNW9	NNW8	N8	NNW8	NNW6	NNW4	NNW3	NW3	W3	SW2	S3	S3	NW6.9	N14		
25-Nov	SSE2	S2	S4	SSE4	SSE5	SSE4	SSE7	SSE4	SE7	SE8	SE7	SE7	SE7	SE8	SE8	ESE9	SE8	SE14	SE14	SE14	SE12	SE8	SE5	SE10	SE14	SE7.5	SE14
26-Nov	SE13	SE13	SE13	SE12	SE11	SE12	SE12	SE13	SE14	SE11	SE11	SE10	SE8	SE8	SE6	SSE3	SW4	WSW9	W14	WNW17	WNW18	WNW16	WNW18	WNW18	SSE3.6	WNW18	
27-Nov	WNW18	WNW19	WNW19	WNW21	WNW20	WNW22	WNW25	WNW24	WNW23	WNW23	WNW24	WNW26	WNW24	NW23	NW21	NW18	NNW21	NW16	NNW17	NNW14	NNW13	NNW13	NNW14	NNW13	NW18.8	WNW26	
28-Nov	NNW9	NW7	NNW11	NW10	NW10	NW8	WNW7	SW3	W3	WSW3	W5	NNW7	NNW6	NNE6	NNE6	NNE4	N2	NNW4	NNW5	NNE12	N9	N7	NNW8	NW5	NNW5.5	NNE12	
29-Nov	NW6	WNW7	NW4	WSW4	SW2	WNW2	WNW2	WNW2	WNW2	W1	N2	N4	N10	N10	N9	N7	N8	NNW6	NW4	N6	N7	N6	NNW5	NNE6	NNW4.4	N10	
30-Nov	N7	NNE7	NNE7	NNE5	NNE5	NNE5	NNE6	N6	N7	NNE6	NNW5	N4	N6	NNW7	NNW9	NNW9	NNW9	N8	NNW9	NNW9	NNW8	NNW6	NNW7	NW6	N6.4	NNW9	

NNW2.0	NW2.3	NW2.6	NW1.9	NNW1.9	NNW2.3	NNW2.0	W1.8	W1.5	W1.7	NNW2.7	NNW2.9	NW2.2	NW1.8	NNW2.5	NNW2.3	N2.0	NNW1.5	NW1.7	NNW2.7	NW2.6	NW2.7	NW2.0	NW2.1	Diurnal Average		
WNW18	WNW19	WNW19	WNW21	WNW20	WNW22	WNW25	WNW24	WNW23	WNW23	WNW24	WNW26	WNW24	NW23	NW21	NW18	NNW21	NW16	NNW17	NNW14	NNW13	NNW13	NNW14	NNW13	NNW14	NNW13	Diurnal Maximum

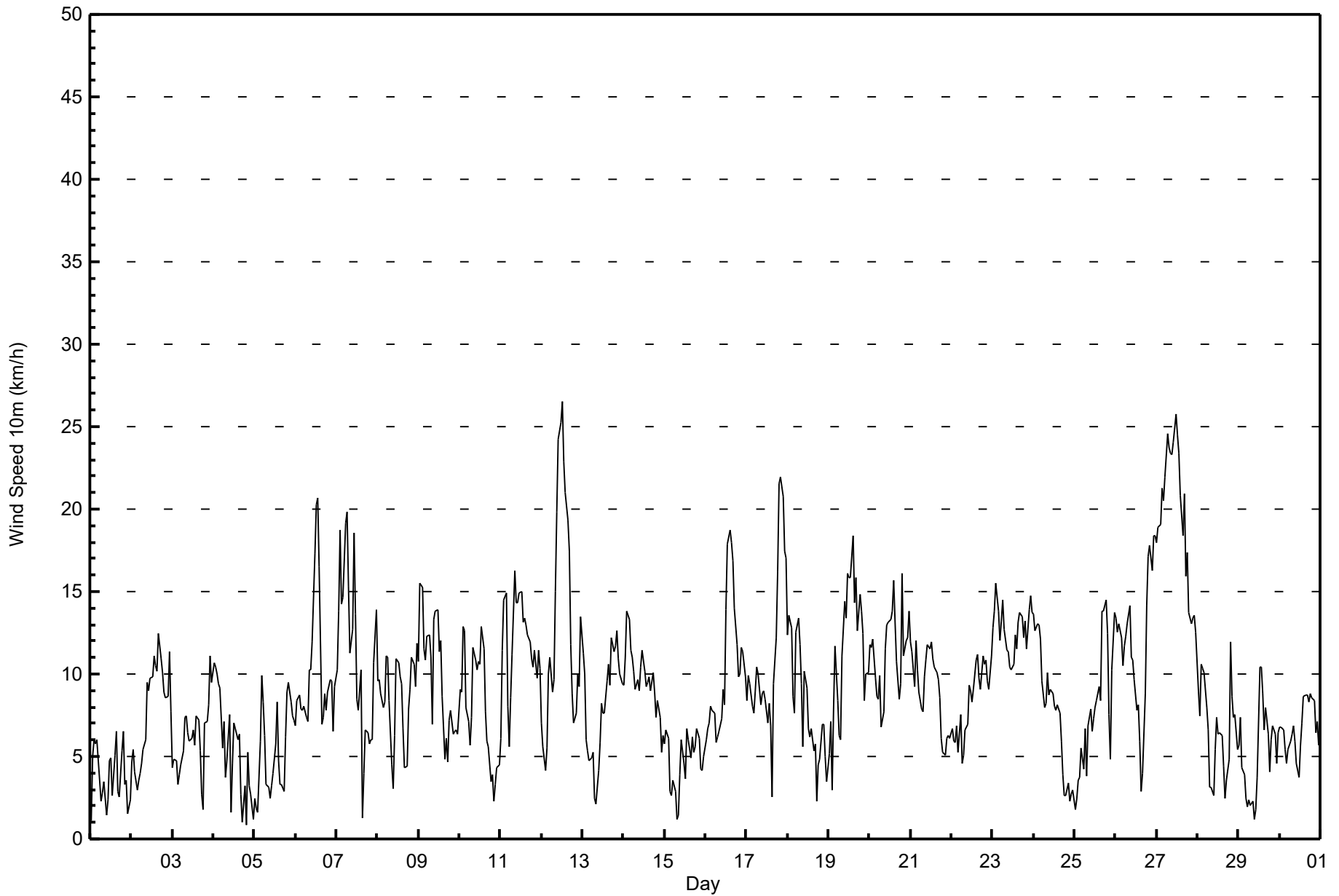
All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Patricia McInnes - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Nov 13 01:00																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Minimum Value: 0 km/h on Nov 24 21:00																									
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 2 P <sub>90</sub> = 3 P <sub>99</sub> = 5																									
Day	Hourly Period Ending At (MST)																							Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		24
1-Nov	1	1	1	1	1	1	1	1	1	1	1	2	1	1	3	1	1	1	1	1	1	1	1	1	3
2-Nov	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	2	3	3	3	3	2	2	3
3-Nov	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	1	2	1	1	1	1	1	2	1	2
4-Nov	1	1	2	2	2	2	1	2	2	2	1	2	1	1	1	1	1	1	1	2	1	1	1	1	2
5-Nov	2	2	1	2	2	2	1	1	1	1	1	1	1	2	1	1	1	1	3	1	1	1	1	1	3
6-Nov	1	2	2	1	1	1	1	2	2	2	3	4	4	4	5	3	1	2	1	1	2	1	2	3	5
7-Nov	2	3	4	3	3	4	4	3	2	3	4	5	3	4	3	2	1	1	1	1	1	2	2	3	5
8-Nov	2	2	1	1	2	2	2	3	2	2	3	3	4	3	2	3	1	1	2	1	2	2	3	2	4
9-Nov	2	3	3	2	1	1	2	2	2	2	3	3	2	2	2	1	1	1	1	1	1	1	1	1	3
10-Nov	1	2	2	2	1	2	1	3	2	3	2	3	2	3	3	1	1	1	1	1	1	1	2	1	3
11-Nov	1	3	4	4	3	3	3	4	4	3	3	3	4	3	3	3	3	3	2	2	2	2	3	2	4
12-Nov	2	1	1	2	2	2	1	2	3	5	5	6	6	6	5	4	4	2	2	1	2	1	1	4	6
13-Nov	7	2	2	1	1	2	2	2	1	2	4	1	2	3	2	2	2	3	3	2	2	2	2	2	7
14-Nov	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2	1	1	1	1	2	1	2
15-Nov	1	1	1	1	2	2	1	1	2	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	2
16-Nov	1	1	1	1	1	1	1	1	1	2	2	2	4	4	4	4	5	3	2	2	2	2	2	2	5
17-Nov	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	5	5	5	4	5	5
18-Nov	2	2	3	2	2	3	3	2	2	1	2	2	1	1	2	1	1	1	1	2	2	1	1	1	3
19-Nov	1	2	1	3	3	2	1	1	4	3	3	3	3	3	4	4	5	3	3	3	3	2	1	2	5
20-Nov	3	2	2	2	2	2	2	1	3	2	3	3	3	3	3	4	2	2	2	4	3	2	2	3	4
21-Nov	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	2
22-Nov	1	1	1	1	1	1	1	1	1	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2
23-Nov	3	3	3	3	3	2	3	2	2	2	2	2	2	2	2	2	3	2	2	2	2	3	3	3	3
24-Nov	3	2	3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	3
25-Nov	1	1	1	1	1	1	2	1	2	2	1	1	2	2	2	2	3	3	3	3	2	2	2	3	3
26-Nov	3	3	3	3	2	3	3	3	3	2	2	2	2	2	1	1	1	3	2	3	4	3	4	4	4
27-Nov	3	3	4	4	4	5	5	5	4	5	5	5	4	4	5	4	4	3	4	3	2	3	2	3	5
28-Nov	1	1	2	1	1	2	1	2	1	2	1	2	2	2	1	1	1	1	2	2	2	1	1	1	2
29-Nov	1	1	1	1	1	1	1	1	1	1	1	3	2	2	2	1	2	2	1	1	1	2	1	2	3
30-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2
																	Diurnal Maximum								







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Patricia McInnes - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	156	21.67	21.67
6 - 11	384	53.33	75.00
12 - 19	155	21.53	96.53
20 - 28	25	3.47	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Patricia McInnes - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	9	10	6	3	4	7	8	17	11	11	13	13	10	11	8	15	156
6 - 11	50	31	10	3	1	19	52	25	21	24	22	26	16	17	17	50	384
12 - 19	29	19	1	0	2	4	22	8	0	4	2	11	10	20	6	17	155
20 - 28	0	0	0	0	0	0	0	0	0	0	1	2	4	12	5	1	25
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	88	60	17	6	7	30	82	50	32	39	38	52	40	60	36	83	720

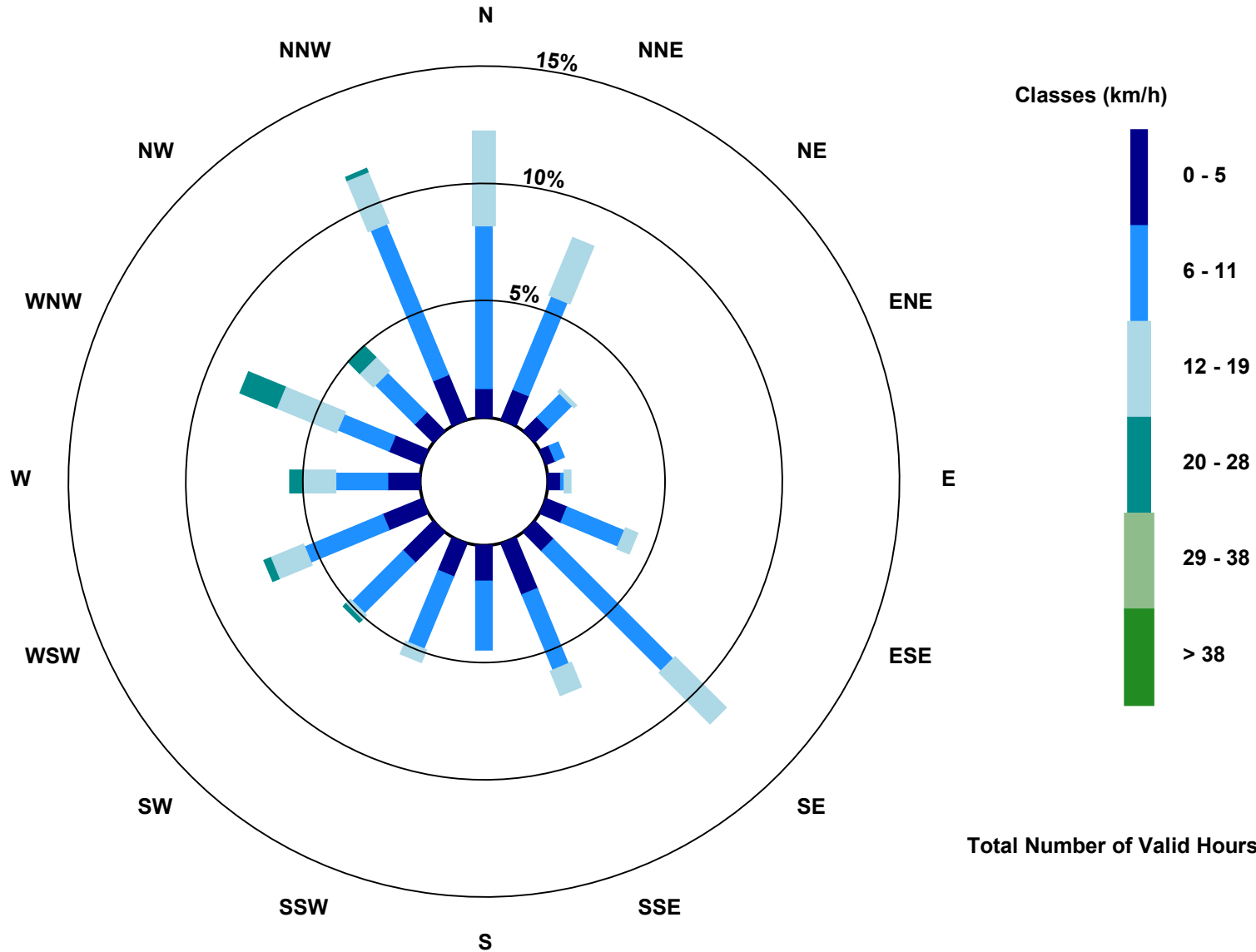
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Patricia McInnes





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Patricia McInnes - November 2024**

Direction of Maximum Speed: 279 deg on Nov 12 13:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 306.6 deg on Nov 27	Hours of Data: 720
Direction of Minimum Speed: 164 deg on Nov 4 20:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 2.3 deg on Nov 15	Percent Operational Time: 100.0
Monthly Average Direction: 310.7 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	122	341	7	6	10	11	25	35	72	26	276	247	230	244	319	303	316	337	338	340	343	13	299	339	339.1
2-Nov	35	36	33	101	117	92	58	70	101	117	112	110	116	112	117	110	87	93	135	128	125	109	122	133	105.8
3-Nov	141	138	155	190	233	237	235	240	228	232	230	210	191	155	176	190	190	348	258	213	215	238	241	246	213.1
4-Nov	243	245	239	243	246	195	198	189	161	182	112	109	112	111	109	127	128	247	257	164	158	221	167	157	193.6
5-Nov	332	239	330	351	353	344	335	316	289	302	296	305	280	285	286	268	253	241	254	246	241	233	229	227	280.8
6-Nov	168	174	163	155	146	141	149	159	183	198	212	227	236	241	242	204	167	210	190	183	201	188	209	238	200.2
7-Nov	275	332	311	299	281	285	291	282	263	280	276	284	292	275	291	231	179	180	162	156	150	127	133	132	275.4
8-Nov	134	145	155	159	197	216	220	215	200	211	223	225	228	211	216	221	199	230	241	252	294	320	291	296	223.5
9-Nov	281	277	285	280	264	258	253	252	227	237	245	260	240	245	237	217	240	202	198	208	205	192	194	194	245.8
10-Nov	193	221	243	245	238	202	172	187	212	221	229	215	205	198	195	210	215	189	141	209	153	159	179	121	207.9
11-Nov	126	127	126	130	139	125	119	114	124	128	130	131	126	115	108	118	118	124	126	122	126	129	120	134	124.2
12-Nov	138	123	133	198	224	248	243	246	253	259	276	278	279	277	296	302	304	301	278	271	272	264	264	249	269.9
13-Nov	254	270	268	203	195	193	181	192	218	236	348	354	20	26	14	360	351	22	39	33	37	40	41	43	8.6
14-Nov	44	31	30	32	36	36	37	11	5	14	19	32	33	30	18	8	8	350	352	342	339	345	13	324	16.8
15-Nov	339	24	340	6	275	248	213	81	87	115	169	221	184	161	184	136	135	150	131	141	151	145	147	164	152.8
16-Nov	176	175	174	164	162	171	194	168	134	144	143	166	161	162	167	162	167	149	149	149	154	167	157	140	160.1
17-Nov	128	143	141	128	139	151	141	131	144	143	153	160	170	186	179	118	214	220	240	311	307	306	301	298	207.7
18-Nov	275	272	279	280	298	300	321	301	291	293	311	327	12	28	0	11	8	351	345	38	68	48	51	43	321.0
19-Nov	15	25	355	62	81	65	47	14	5	17	27	9	14	12	13	8	12	1	358	351	349	342	337	338	11.9
20-Nov	355	348	344	343	330	338	351	321	354	16	28	24	360	344	353	349	5	7	358	9	344	341	339	352	354.3
21-Nov	350	357	343	342	341	345	333	317	329	318	320	331	343	339	336	331	331	314	302	296	296	303	314	323	330.7
22-Nov	332	311	302	297	277	261	264	260	258	266	277	320	349	353	359	14	16	18	19	10	15	352	3	357	337.6
23-Nov	4	7	16	15	11	4	13	14	9	16	11	24	13	12	357	354	354	358	359	348	356	355	357	4	5.1
24-Nov	352	0	354	356	353	359	351	344	346	344	344	344	348	2	351	346	339	331	336	317	221	184	169		347.9
25-Nov	159	179	178	152	158	161	166	147	128	137	131	130	128	133	122	131	126	124	128	129	135	139	139	137	135.6
26-Nov	134	129	133	133	130	131	130	131	129	126	131	136	139	133	130	160	217	243	271	293	294	295	293	291	166.7
27-Nov	291	294	294	292	294	288	291	295	295	296	297	301	301	304	308	319	327	325	330	332	338	346	345	336	306.6
28-Nov	334	315	302	306	309	311	283	220	280	248	274	345	343	12	18	13	0	336	346	14	359	353	343	326	330.4
29-Nov	316	291	304	254	231	287	285	296	297	268	358	354	359	3	353	349	0	344	315	355	360	354	334	15	338.8
30-Nov	355	13	27	18	21	19	13	356	357	14	348	355	11	346	347	342	342	352	338	336	340	335	327	326	352.9

315.9 321.3 313.4 309.9 292.4 285.3 285.9 279.5 269.7 266.9 285.7 298.7 306.3 309.9 328.9 346.9 353.5 341.9 318.3 331.9 325.0 322.7 314.2 310.9

Diurnal Average

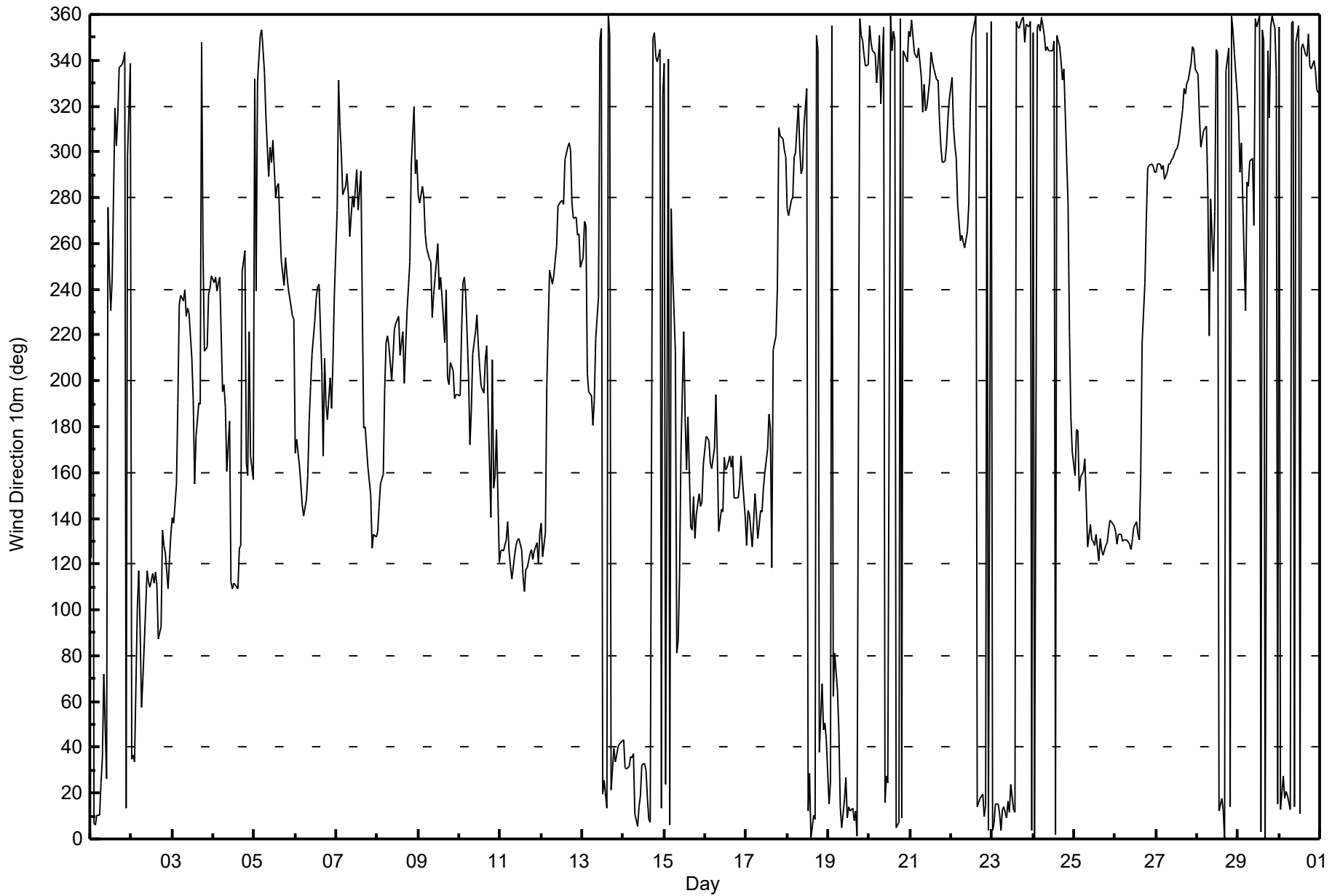
All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Patricia McInnes - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 95 deg on Nov 7 16:00 Minimum Value: 4 deg on Nov 22 08:00 Percentiles: P <sub>1</sub> = 7 P <sub>10</sub> = 10 Q <sub>1</sub> = 12 Median = 14 Q <sub>3</sub> = 17 P <sub>90</sub> = 28 P <sub>99</sub> = 75																		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	61	13	19	22	13	26	74	50	20	65	40	26	19	44	64	10	26	29	14	13	25	29	37	54	74
2-Nov	15	14	16	40	19	17	20	16	22	12	13	14	14	14	15	13	16	19	17	15	15	12	14	40	
3-Nov	14	13	18	17	14	9	10	11	10	10	11	19	15	17	17	12	26	29	63	13	15	8	8	6	63
4-Nov	7	9	8	9	12	29	14	71	26	16	67	24	15	13	14	10	26	75	9	71	15	28	35	77	77
5-Nov	57	54	19	16	13	14	15	15	15	20	15	15	15	12	14	11	14	37	29	10	11	11	9	11	57
6-Nov	13	11	13	12	10	11	14	20	18	15	13	13	12	12	12	33	16	17	15	12	13	9	17	11	33
7-Nov	29	12	13	11	12	13	10	11	13	12	13	19	23	42	20	95	19	13	10	16	15	19	12	13	95
8-Nov	11	13	12	8	17	13	12	27	56	80	34	13	13	18	19	23	21	24	10	12	25	9	14	9	80
9-Nov	12	12	10	9	7	7	8	8	21	11	11	12	14	17	12	11	9	14	11	10	13	10	19	15	21
10-Nov	14	17	11	7	12	20	25	22	12	13	13	13	15	13	13	22	12	26	35	14	41	29	23	14	41
11-Nov	18	13	13	16	26	25	16	15	13	14	14	15	15	13	15	14	12	12	12	11	12	14	14	13	26
12-Nov	17	15	27	22	19	11	12	11	11	11	12	13	14	14	14	10	9	11	17	10	11	10	8	6	27
13-Nov	45	15	28	13	17	13	17	43	72	28	65	18	23	28	19	15	14	12	14	13	11	12	12	12	72
14-Nov	12	10	10	11	11	11	12	15	13	10	10	11	12	12	11	12	12	13	13	9	7	17	20	18	20
15-Nov	27	21	20	29	77	25	23	76	84	28	17	20	29	21	16	23	14	13	14	13	11	12	16	14	84
16-Nov	7	9	7	9	7	14	10	18	11	16	15	14	13	14	13	13	13	12	12	13	12	13	15	14	18
17-Nov	14	13	14	13	15	11	12	13	13	13	12	12	15	13	18	50	12	13	14	16	11	10	12	12	50
18-Nov	12	11	10	16	12	12	12	11	10	17	16	18	16	17	22	14	11	51	17	32	20	14	21	44	51
19-Nov	28	17	59	24	13	31	21	19	16	11	15	14	12	12	13	15	14	15	16	16	13	14	8	13	59
20-Nov	15	14	13	12	17	18	20	21	26	12	15	15	19	13	16	14	15	12	13	15	14	12	13	14	26
21-Nov	14	15	15	11	10	13	11	12	10	12	12	14	14	12	13	11	10	11	10	11	11	9	10	9	15
22-Nov	9	11	8	8	16	7	9	4	7	11	13	18	17	15	15	12	13	15	11	14	13	16	18	15	18
23-Nov	16	13	11	12	12	14	13	13	19	12	13	10	12	13	13	13	14	14	13	11	14	14	14	13	19
24-Nov	13	15	14	14	13	14	13	9	9	10	10	10	13	17	15	8	7	14	15	13	18	37	28	16	37
25-Nov	22	29	18	12	11	15	13	31	16	13	16	14	14	16	13	13	12	11	11	12	16	22	12	13	31
26-Nov	13	12	12	13	14	14	13	13	12	12	13	15	16	14	14	45	19	13	14	10	11	11	12	11	45
27-Nov	11	11	10	10	9	11	10	10	10	10	10	10	9	9	10	11	10	10	11	10	10	14	12	9	14
28-Nov	7	12	8	7	9	12	21	53	50	68	24	19	17	16	12	13	25	37	28	12	14	13	9	17	68
29-Nov	25	5	26	15	28	34	23	48	45	64	78	56	16	15	18	13	14	15	26	13	14	16	17	17	78
30-Nov	13	15	11	15	22	17	21	16	17	13	23	28	18	13	13	13	10	12	9	9	10	11	9	17	28
																		Diurnal Maximum							
																		61 54 59 40 77 34 74 76 84 80 78 56 29 44 64 95 26 75 63 71 41 37 37 77							





## **WOOD BUFFALO ENVIRONMENTAL ASSOCIATION**

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS07 ATHABASCA VALLEY NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS07)  
NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	682	34	38	99.44	10.6	0	2.2	0
TRS (ppb) Average	681	36	39	99.58	1.8	0	0.7	0
THC (ppm) Average	631	31	89	91.94	3.5	-	2.4	-
NMHC (ppm) Average	631	31	89	91.94	1.472	-	0.074	-
CH4(ppm) Average	631	31	89	91.94	2.8	-	2.4	-
O3 (ppb) Average	683	34	37	99.58	37.4	0	31.9	-
NO2 (ppb) Average	674	36	46	98.61	31.9	0	24.2	-
NO (ppb) Average	674	36	46	98.61	55.3	-	14.7	-
NOX (ppb) Average	674	36	46	98.61	79.4	-	38.9	-
PM2.5 (ug/m3) Average	715	2	5	99.58	35.3	0	12.6	0
CO(ppm) Average	683	34	37	99.58	0.5	0	0.2	-
Temperature 2 m (C) Average	720	0	0	100	12.1	-	6.5	-
Relative Humidity (%) Average	720	0	0	100	98.1	-	90.9	-
Barometric Pressure (inHg) Average	628	0	92	87.22	29.7	-	29.6	-
Wind Speed 10 m (km/h) Average	687	0	33	95.42	29	-	20	-
Wind Direction 10 m (deg) Average	687	0	33	95.42	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS07)  
 NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	682	0.48	1.2	-	0	0	0.1	0.1	0.3	0.9	10.6
TRS (ppb) Average	681	0.25	0.2	-	0.1	0.1	0.1	0.2	0.3	0.5	1.8
THC (ppm) Average	631	2.14	0.1	-	2	2	2.1	2.1	2.2	2.3	3.5
NMHC (ppm) Average	631	0.008	0.066	-	0	0	0	0	0	0	1.472
CH4(ppm) Average	631	2.13	0.1	-	2	2	2.1	2.1	2.2	2.3	2.8
O3 (ppb) Average	683	17.24	8.5	-	1.8	5.3	10.7	17.4	23.4	29.1	37.4
NO2 (ppb) Average	674	8.64	6.6	-	0.7	1.8	3.8	7	11.2	19.1	31.9
NO (ppb) Average	674	4.14	6.7	-	0	0	0.4	1.6	4.7	11.6	55.3
NOX (ppb) Average	674	12.78	12.2	-	0.7	2.1	4.4	8.8	15.9	29.7	79.4
PM2.5 (ug/m3) Average	715	5.83	4	-	1	2.6	3.3	4.9	6.9	9.8	35.3
CO(ppm) Average	683	0.15	0	-	0.1	0.1	0.1	0.1	0.2	0.2	0.5
Temperature 2 m (C) Average	720	-6.76	8.3	-	-27.7	-18.8	-13.6	-4.9	-0.3	2.8	12.1
Relative Humidity (%) Average	720	78.22	8.8	-	48	68	72.8	77.3	83.7	91.4	98.1
Barometric Pressure (inHg) Average	628	29.03	0.4	-	28.2	28.6	28.8	29	29.4	29.6	29.7
Wind Speed 10 m (km/h) Average	687	8.7	5	-	0	3	5	8	11	15	29
Wind Direction 10 m (deg) Average	687	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS07)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	23 Nov 2024 19:00	23 Nov 2024 21:00	3	Station power failure
SO2	22 Nov 2024 12:00	22 Nov 2024 12:00	1	DAS Failure - data not recorded
THC/NMHC/CH4	13 Nov 2024 07:00	15 Nov 2024 11:00	53	Unstable Operations - AMD noncompliance
THC/NMHC/CH4	28 Nov 2024 11:00	28 Nov 2024 12:00	2	Maintenance - replaced support gas cylinder
NO2	27 Nov 2024 10:00	27 Nov 2024 16:00	7	Maintenance - calibration gas cylinder replaced
Barometric Pressure	27 Nov 2024 14:00	27 Nov 2024 14:00	1	Maintenance - sensor rebooted
Wind Speed, Wind Direction	04 Nov 2024 01:00	04 Nov 2024 11:00	11	Flat line in sensor output signal
Wind Speed, Wind Direction	04 Nov 2024 18:00	05 Nov 2024 12:00	19	Flat line in sensor output signal
Wind Speed, Wind Direction	05 Nov 2024 13:00	05 Nov 2024 15:00	3	Maintenance -de-ice wind sensor



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 10.6 ppb on Nov 18 20:00	Maximum Daily Average: 2.2 ppb on Nov 18		Hours of Data:	682
Minimum Value: 0.0 ppb on Nov 3 23:00	Minimum Daily Average: 0.0 ppb on Nov 11		Hours of Missing Data:	38
Maximum Diurnal Average: 0.8 ppb at hour 15	Minimum Diurnal Average: 0.2 ppb at hour 2		Hours of Calibration:	34
Monthly Average: 0.48 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.1 Median = 0.1 Q <sub>3</sub> = 0.3 P <sub>90</sub> = 0.9 P <sub>99</sub> = 7.0		Percent Operational Time:	99.4

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.1	0.1	0.2	0.1	0.0	Z	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.2	0.3	0.4	0.1	0.4
2-Nov	Z	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.2
3-Nov	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2
4-Nov	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
5-Nov	0.0	0.1	0.0	Z	1.5	9.5	5.8	4.5	5.0	5.1	5.1	7.2	3.3	0.5	0.3	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	2.1	9.5
6-Nov	0.1	0.1	0.2	0.3	Z	0.2	0.2	0.3	0.3	0.4	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.5
7-Nov	0.1	0.1	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2
8-Nov	Z	0.2	0.3	0.3	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.2	0.5
9-Nov	0.1	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1
10-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1
11-Nov	0.0	0.0	0.0	Z	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
12-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1
13-Nov	0.0	0.1	0.1	0.0	0.0	Z	0.0	0.1	0.1	0.1	0.1	2.0	8.9	6.9	3.9	0.6	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	1.1	8.9
14-Nov	Z	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.9	0.7	1.4	1.7	0.8	0.6	0.3	1.7
15-Nov	1.1	Z	1.0	1.6	1.3	1.1	0.9	0.7	0.6	0.4	C	C	C	C	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	1.6
16-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
17-Nov	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.2
18-Nov	0.0	0.1	0.2	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	3.1	4.7	7.6	7.4	7.3	10.6	6.0	1.2	0.7	0.5	2.2	10.6
19-Nov	0.7	0.7	0.5	0.5	0.3	Z	0.2	0.2	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.7
20-Nov	Z	0.1	0.4	0.4	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.7	1.5	1.6	0.1	0.1	0.0	0.0	0.0	0.1	0.5	0.1	0.3	1.6
21-Nov	0.2	Z	0.1	0.2	0.6	0.6	0.2	0.3	0.1	0.7	0.7	2.8	5.4	6.5	6.3	5.7	4.1	5.3	5.3	1.2	1.1	0.8	0.3	0.2	2.1	6.5
22-Nov	0.2	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	DF	0.1	0.1	1.6	1.4	0.5	0.1	0.1	0.1	0.1	0.1	0.4	5.2	0.5	5.2
23-Nov	1.4	0.2	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.4	0.6	3.9	3.8	PF	PF	PF	0.1	0.1	0.1	0.6	3.9
24-Nov	0.0	0.0	0.1	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.5	1.2	1.4	1.2	1.0	1.4	1.0	0.5	0.3	0.3	0.2	0.1	0.2	0.4	1.4
25-Nov	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.3
26-Nov	Z	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.4
27-Nov	0.1	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.8	3.4	5.3	0.7	0.5	0.7	0.5	5.3
28-Nov	0.3	0.7	Z	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.1	1.4	1.9	0.9	0.7	0.8	0.7	0.3	0.2	0.1	0.1	0.5	1.9
29-Nov	0.1	0.5	0.4	Z	0.7	0.6	0.8	0.8	0.6	0.5	0.5	0.4	0.3	0.3	0.5	0.3	1.0	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.5	1.0
30-Nov	0.2	0.3	0.8	0.8	Z	1.4	3.0	1.9	1.5	1.2	1.2	0.9	0.6	0.7	0.9	0.6	0.8	1.1	1.0	0.9	0.7	0.7	0.7	0.4	1.0	3.0

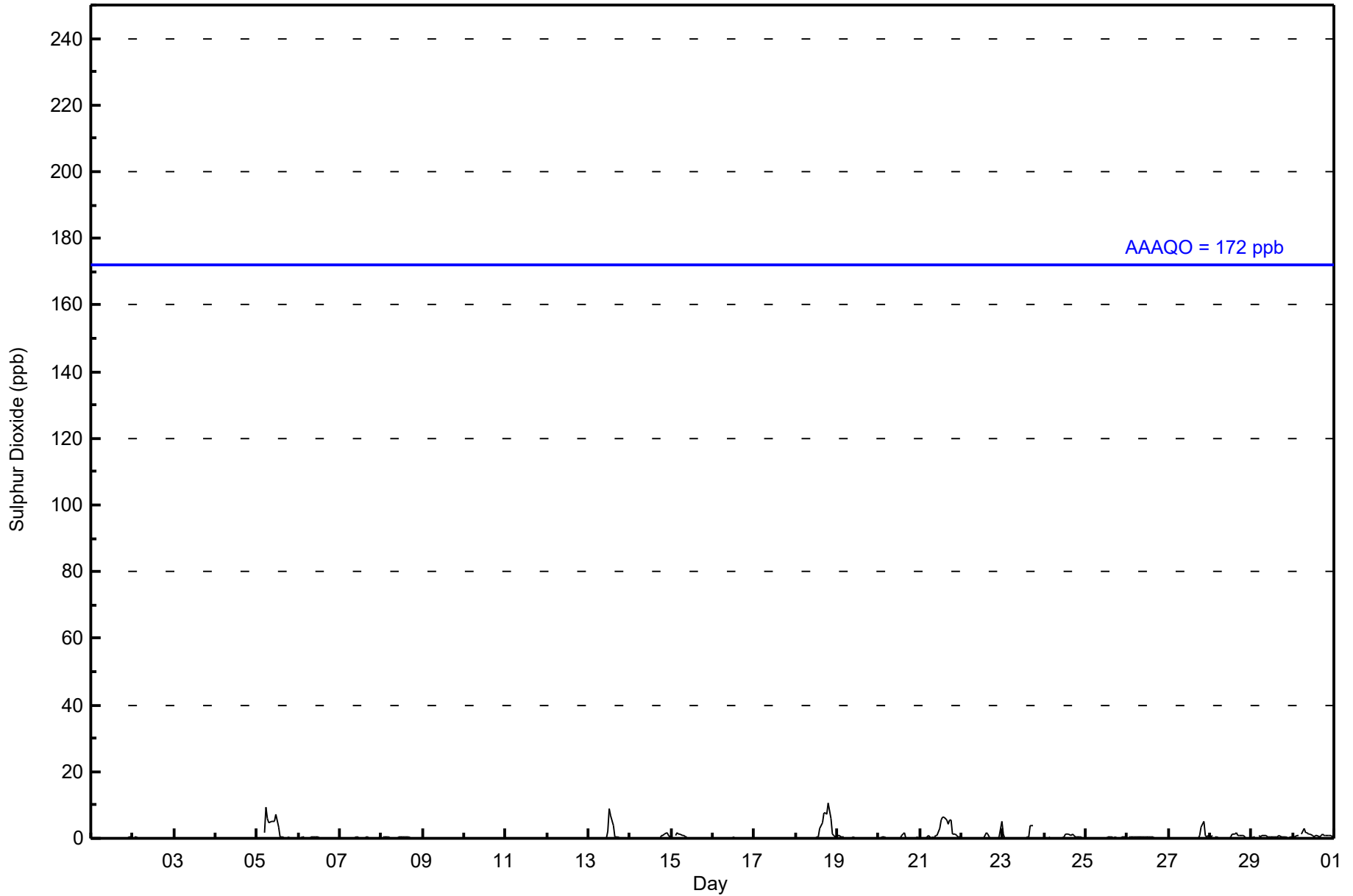
0.2	0.2	0.2	0.2	0.3	0.6	0.4	0.3	0.3	0.4	0.4	0.6	0.8	0.7	0.8	0.7	0.8	0.7	0.7	0.7	0.6	0.3	0.2	0.3	Diurnal Average	
1.4	0.7	1.0	1.6	1.5	9.5	5.8	4.5	5.0	5.1	5.1	7.2	8.9	6.9	6.3	5.7	7.6	7.4	7.3	10.6	6.0	1.7	0.8	5.2	Diurnal Maximum	

Z - zerospan      C - Calibration      DF - DAS Failure      PF - Power Failure  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb      24-hr 48 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Athabasca Valley - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Athabasca Valley - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	681	99.85	99.85
11 - 20	1	0.15	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Athabasca Valley - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	24	23	20	12	9	119	63	23	24	23	45	18	39	32	84	92	650
11 - 20	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	24	24	20	12	9	119	63	23	24	23	45	18	39	32	84	92	651

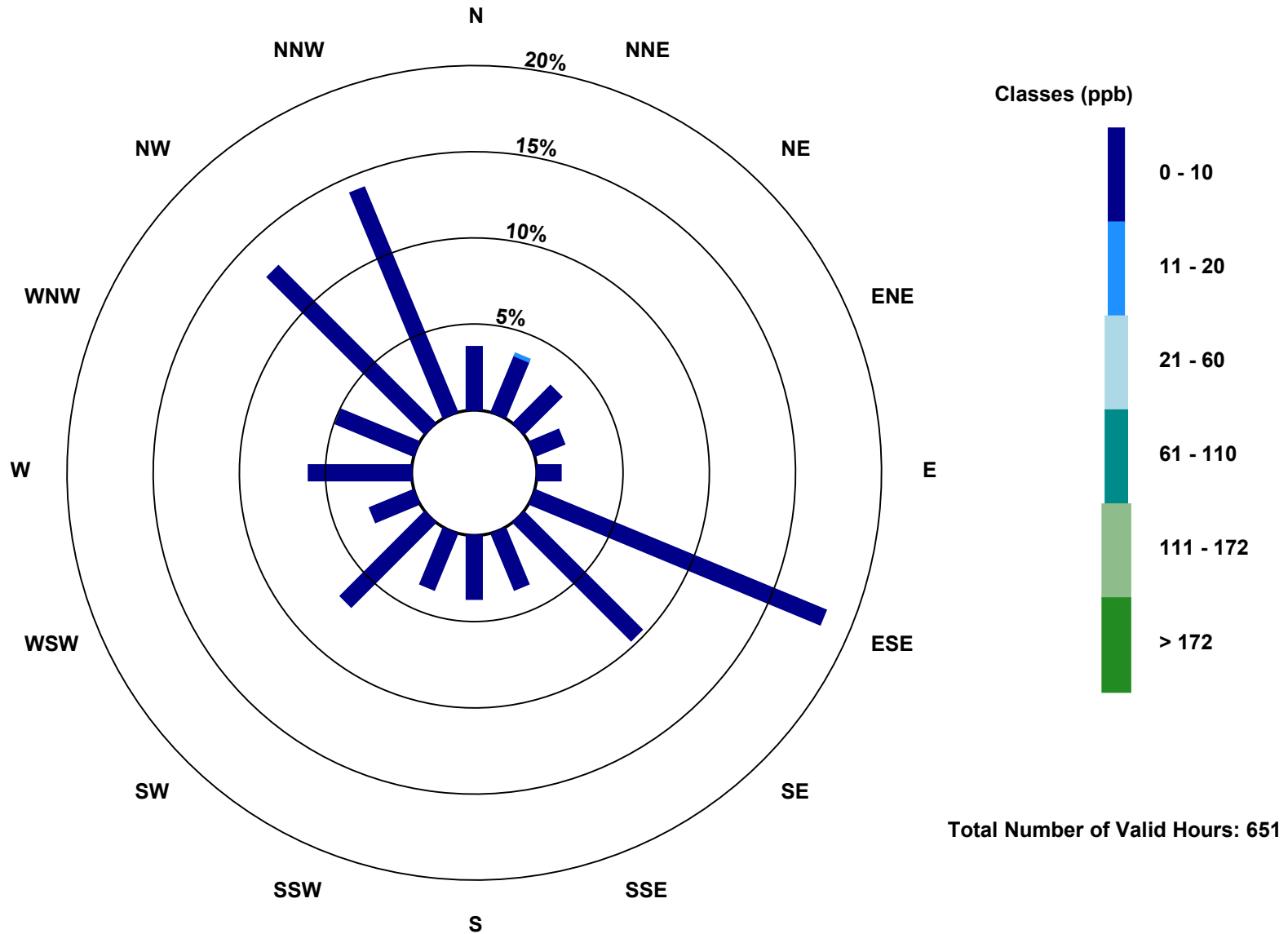
Total Number of Valid Hours: 651

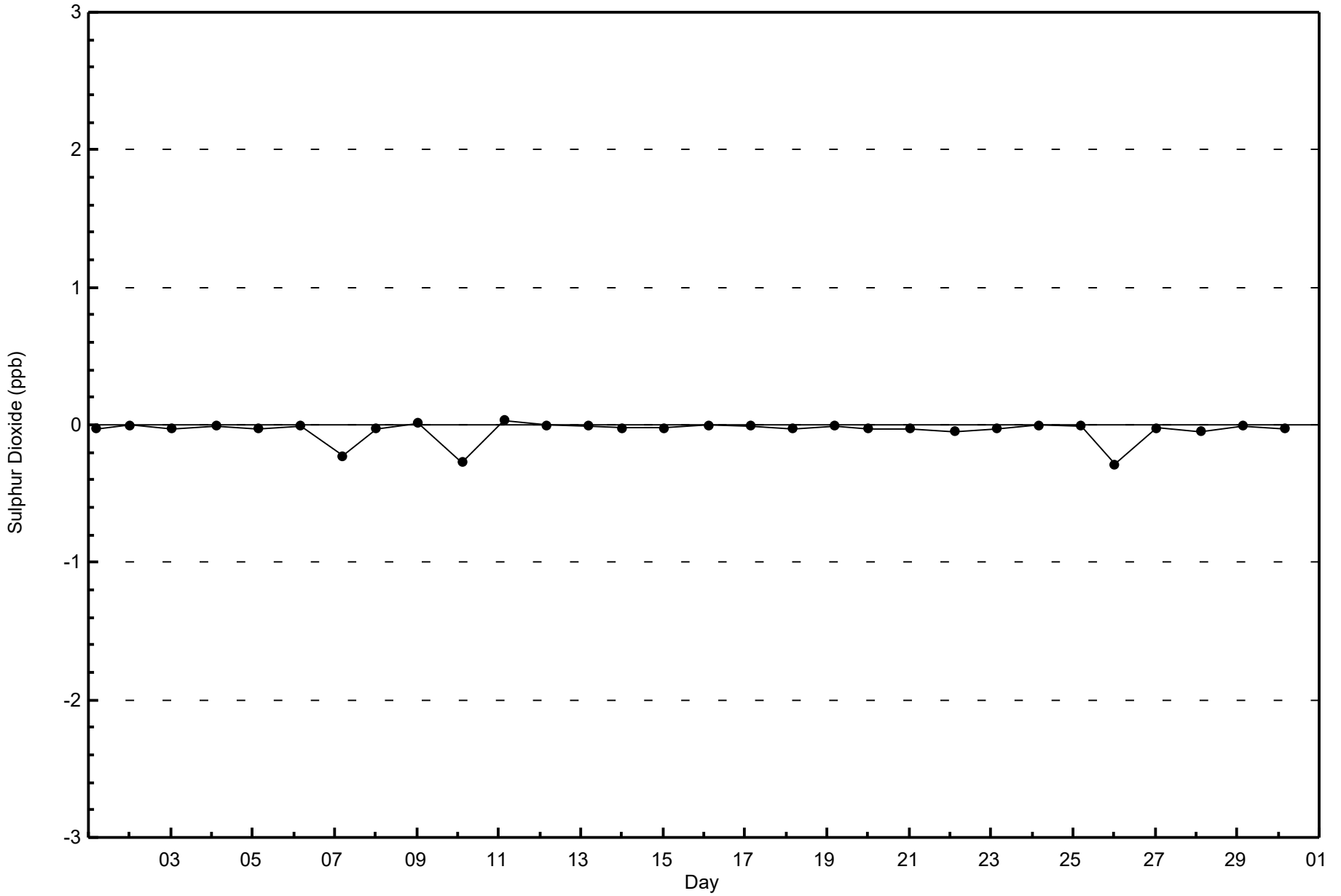
Total Number of Hours: 720



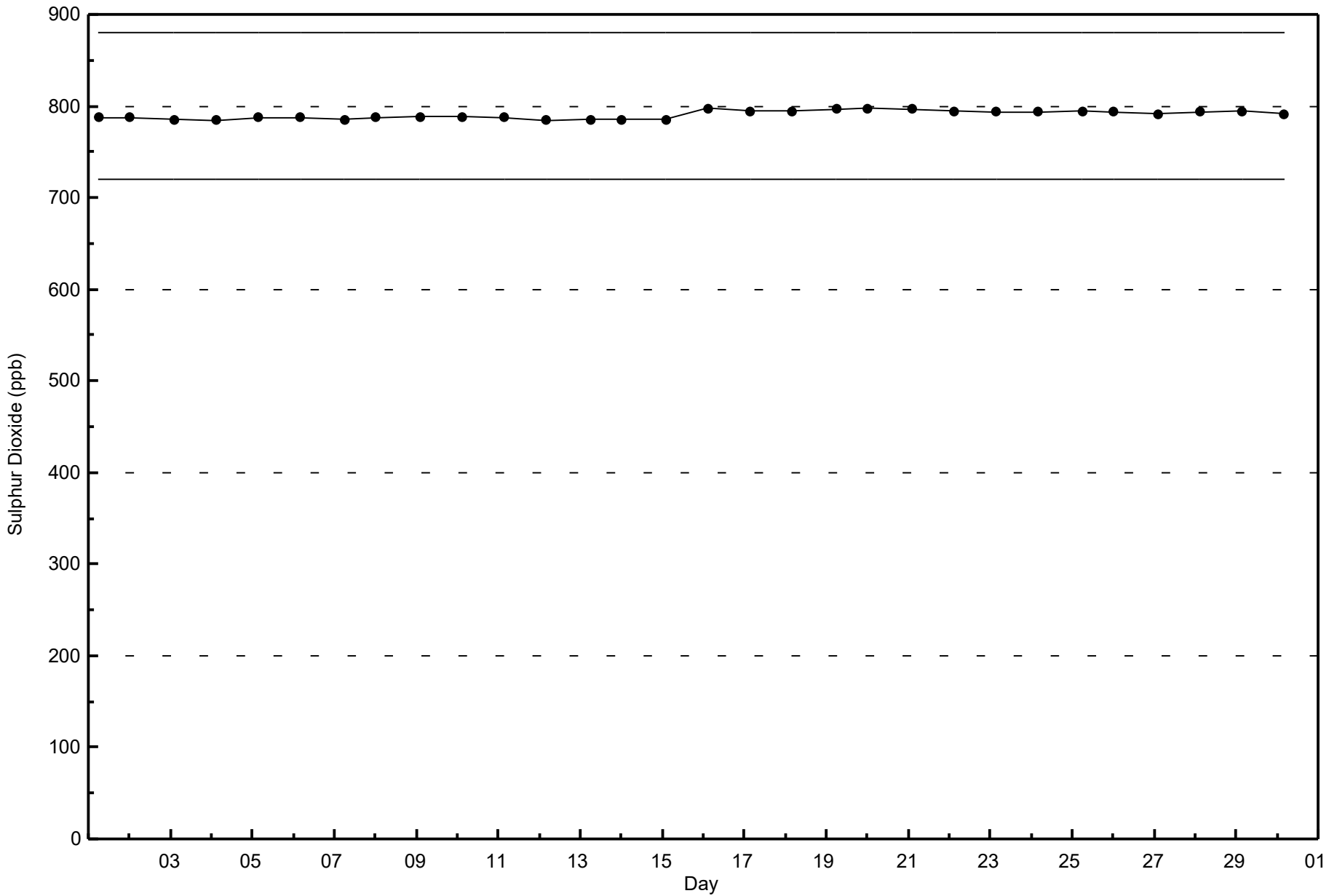
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Athabasca Valley











**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

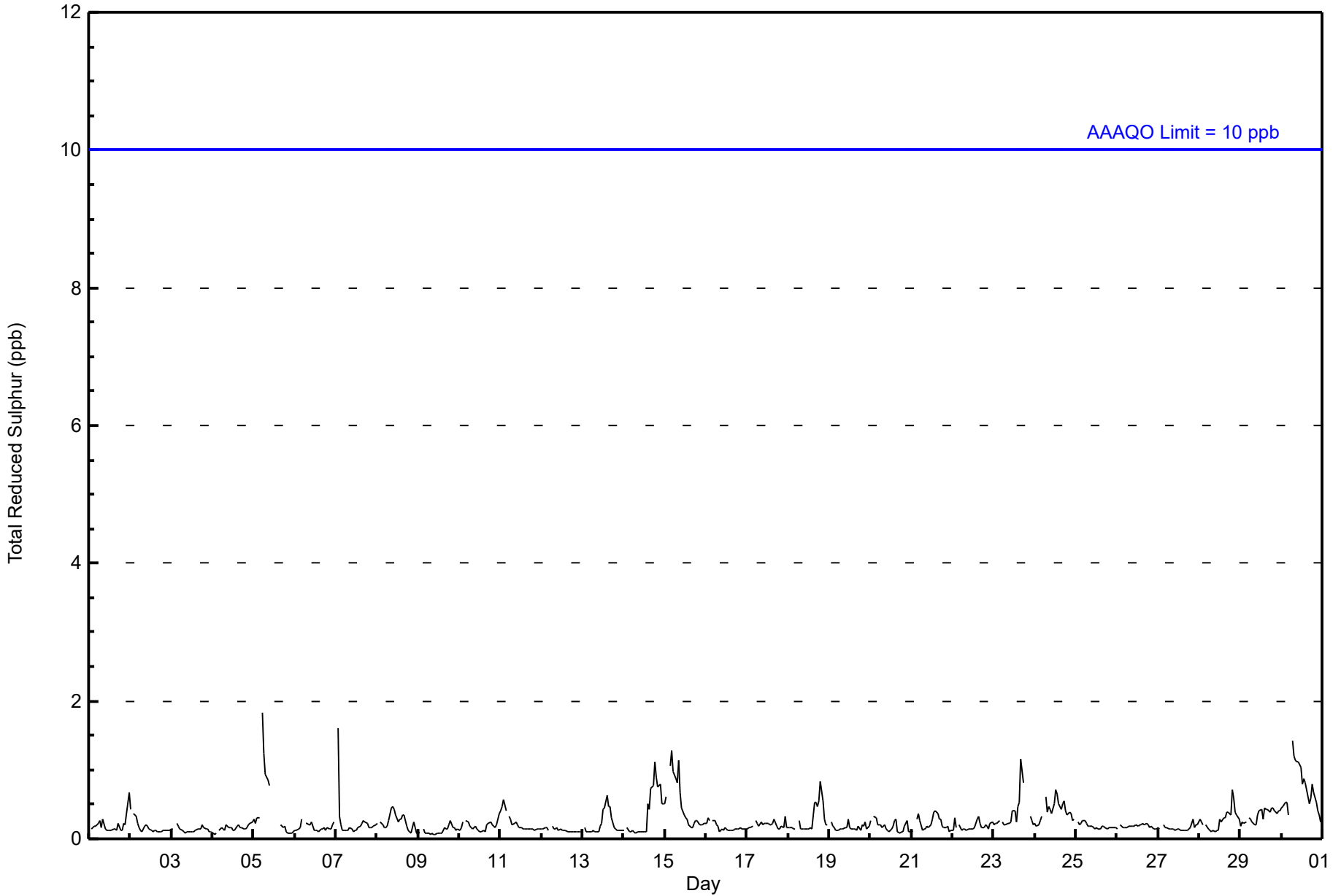
**Total Reduced Sulphur (TRS) - ppb**  
**Athabasca Valley - November 2024**

Number of Exceedences (AAAQO):		1-hr: 0    24-hr: 0		Hours in Service:		720																				
Maximum Value: 1.8 ppb on Nov 5 06:00		Maximum Daily Average: 0.7 ppb on Nov 30		Hours of Data:		681																				
Minimum Value: 0.1 ppb on Nov 4 02:00		Minimum Daily Average: 0.1 ppb on Nov 9		Hours of Missing Data:		39																				
Maximum Diurnal Average: 0.3 ppb at hour 7		Minimum Diurnal Average: 0.2 ppb at hour 23		Hours of Calibration:		36																				
Monthly Average: 0.25 ppb		Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.1 Median = 0.2 Q <sub>3</sub> = 0.3 P <sub>90</sub> = 0.5 P <sub>99</sub> = 1.1		Percent Operational Time:		99.6																				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.4	0.7	0.2	0.7
2-Nov	0.4	Z	0.4	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4
3-Nov	0.2	0.1	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2
4-Nov	0.1	0.1	0.1	Z	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.3
5-Nov	0.3	0.2	0.3	0.3	Z	1.8	1.2	0.9	0.8	0.8	C	C	C	C	C	C	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	--	1.8
6-Nov	0.1	0.1	0.1	0.2	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.3
7-Nov	Z	1.6	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.6
8-Nov	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.4	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.5
9-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.3
10-Nov	0.1	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.2	0.4
11-Nov	0.4	0.5	0.6	0.4	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6
12-Nov	0.1	0.1	0.2	0.2	0.1	Z	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
13-Nov	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.6	0.5	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.6
14-Nov	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.4	0.7	0.8	1.1	0.9	0.8	0.8	0.5	0.5	0.4	1.1
15-Nov	0.5	0.6	Z	1.1	1.3	1.0	0.9	0.8	1.1	0.7	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.5	1.3
16-Nov	0.2	0.3	0.3	Z	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.3
17-Nov	0.2	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.3
18-Nov	0.2	0.2	0.2	0.1	0.1	Z	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.5	0.5	0.5	0.5	0.8	0.6	0.3	0.2	0.2	0.3	0.8
19-Nov	Z	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.3	0.1	0.2	0.2	0.3
20-Nov	0.3	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.2	0.3
21-Nov	0.1	0.1	Z	0.3	0.4	0.3	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.4
22-Nov	0.1	0.3	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3
23-Nov	0.2	0.2	0.2	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.2	0.5	0.5	1.2	0.8	PF	PF	PF	0.3	0.3	0.2	0.4	1.2
24-Nov	0.2	0.2	0.2	0.3	0.3	Z	0.6	0.4	0.5	0.4	0.4	0.5	0.7	0.6	0.5	0.4	0.5	0.6	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.7
25-Nov	Z	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3
26-Nov	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2
27-Nov	0.2	0.1	Z	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3
28-Nov	0.3	0.2	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.3	0.4	0.4	0.3	0.7	0.6	0.4	0.4	0.3	0.3	0.7
29-Nov	0.2	0.2	0.2	0.2	Z	0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5
30-Nov	0.4	0.5	0.5	0.5	0.3	Z	1.4	1.2	1.1	1.1	1.1	1.0	0.8	0.9	0.8	0.6	0.5	0.6	0.8	0.7	0.5	0.4	0.3	0.2	0.7	1.4
																								Diurnal Average		
																								Diurnal Maximum		
																								0.2 0.3 0.2 0.3 0.2 0.3 0.3 0.2 0.3 0.2 0.2 0.2 0.2 0.2 0.3 0.3 0.3 0.3 0.3 0.3 0.2 0.2 0.2 0.2 0.2 0.2 0.7 1.4		
																								0.5 1.6 0.6 1.1 1.3 1.8 1.4 1.2 1.1 1.1 1.1 1.0 0.8 0.9 0.8 0.6 1.2 0.8 1.1 0.9 0.8 0.8 0.5 0.7		
Z - zerospan      C - Calibration      PF - Power Failure																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb    24-hr 3 ppb																										



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Reduced Sulphur (TRS) - ppb**  
**Athabasca Valley - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Athabasca Valley - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	681	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Athabasca Valley - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	23	23	21	12	12	116	66	24	24	25	42	21	39	33	80	94	655
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	23	23	21	12	12	116	66	24	24	25	42	21	39	33	80	94	655

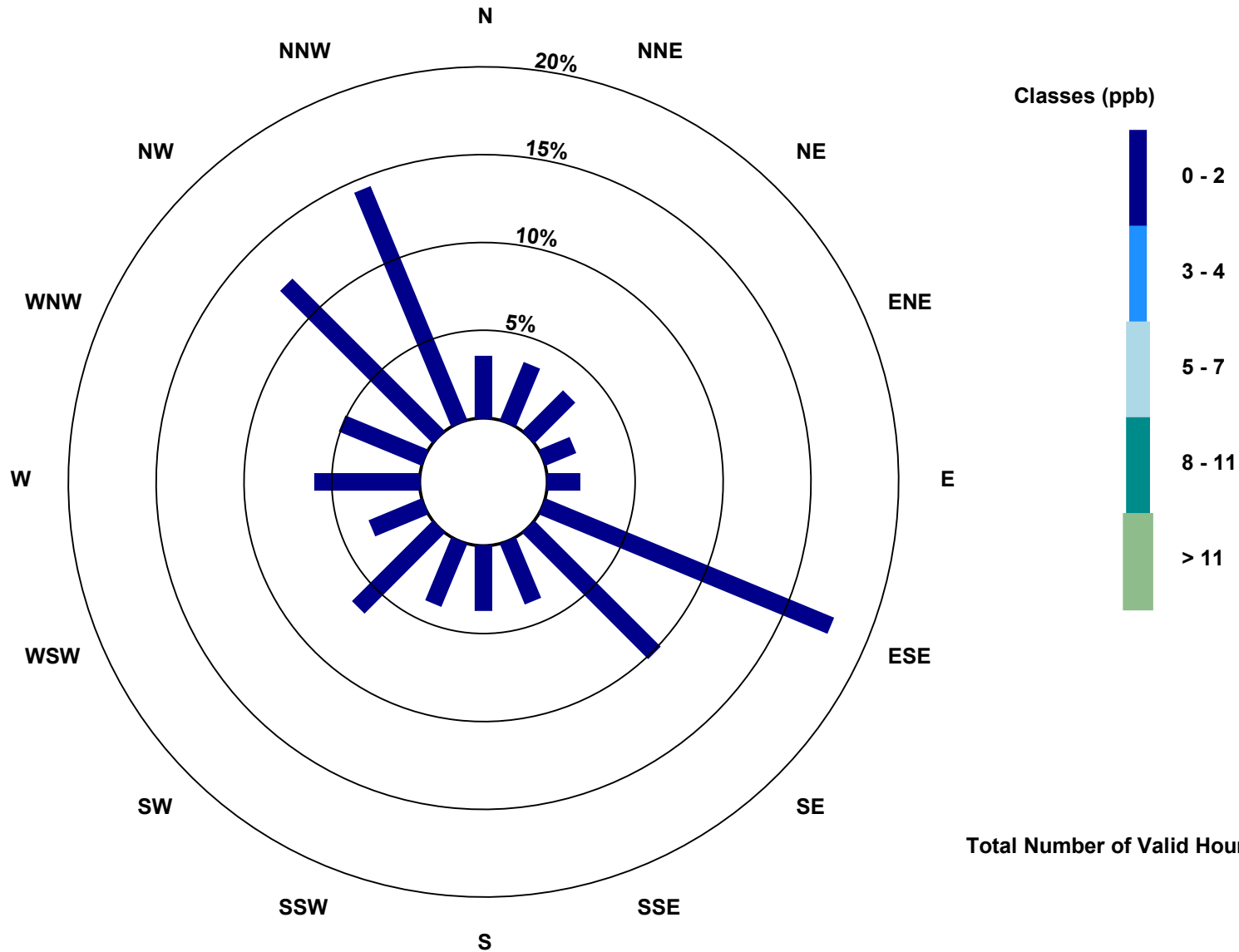
Total Number of Valid Hours: 655

Total Number of Hours: 720

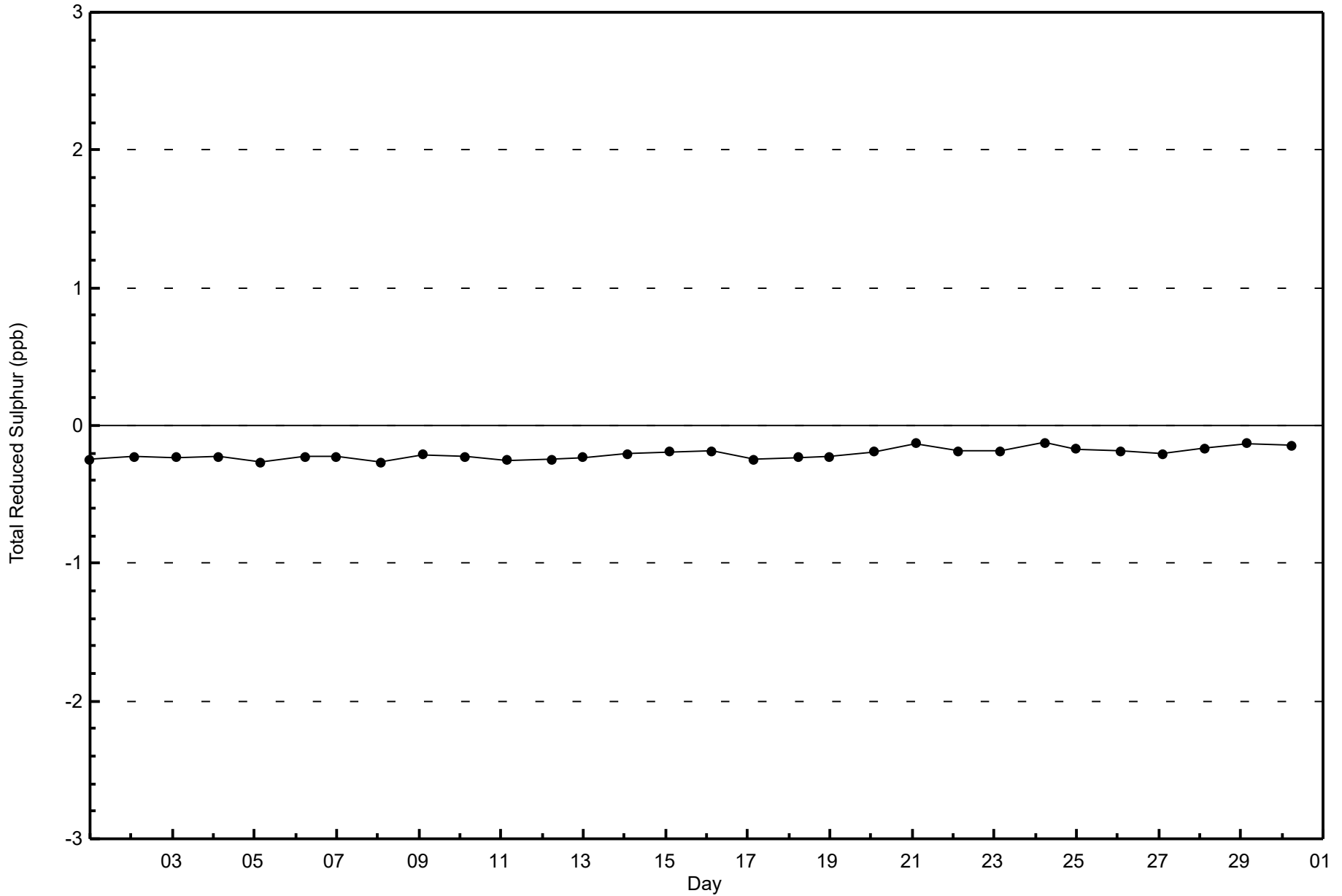


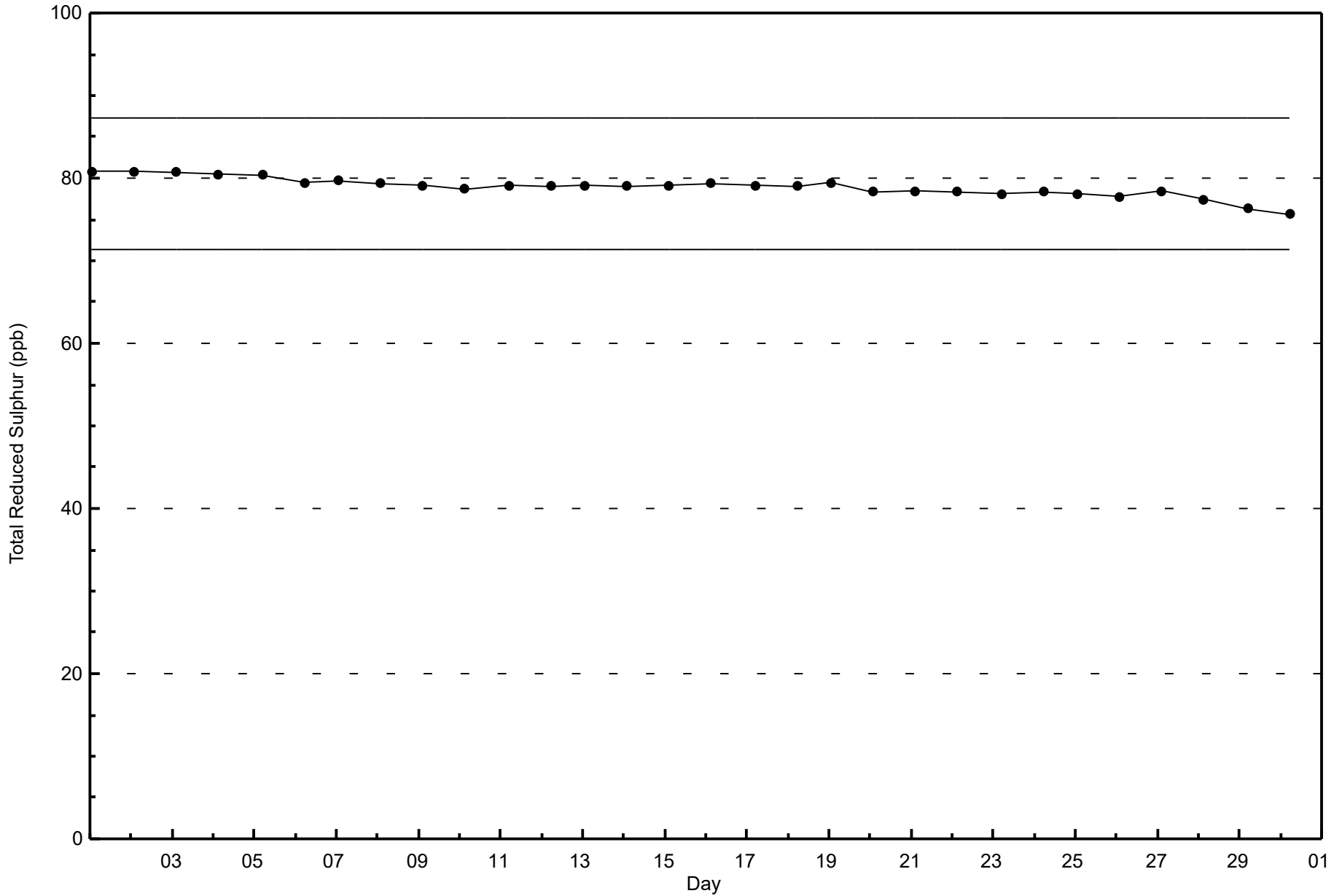
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Reduced Sulphur (TRS) - ppb  
Athabasca Valley



Total Number of Valid Hours: 655





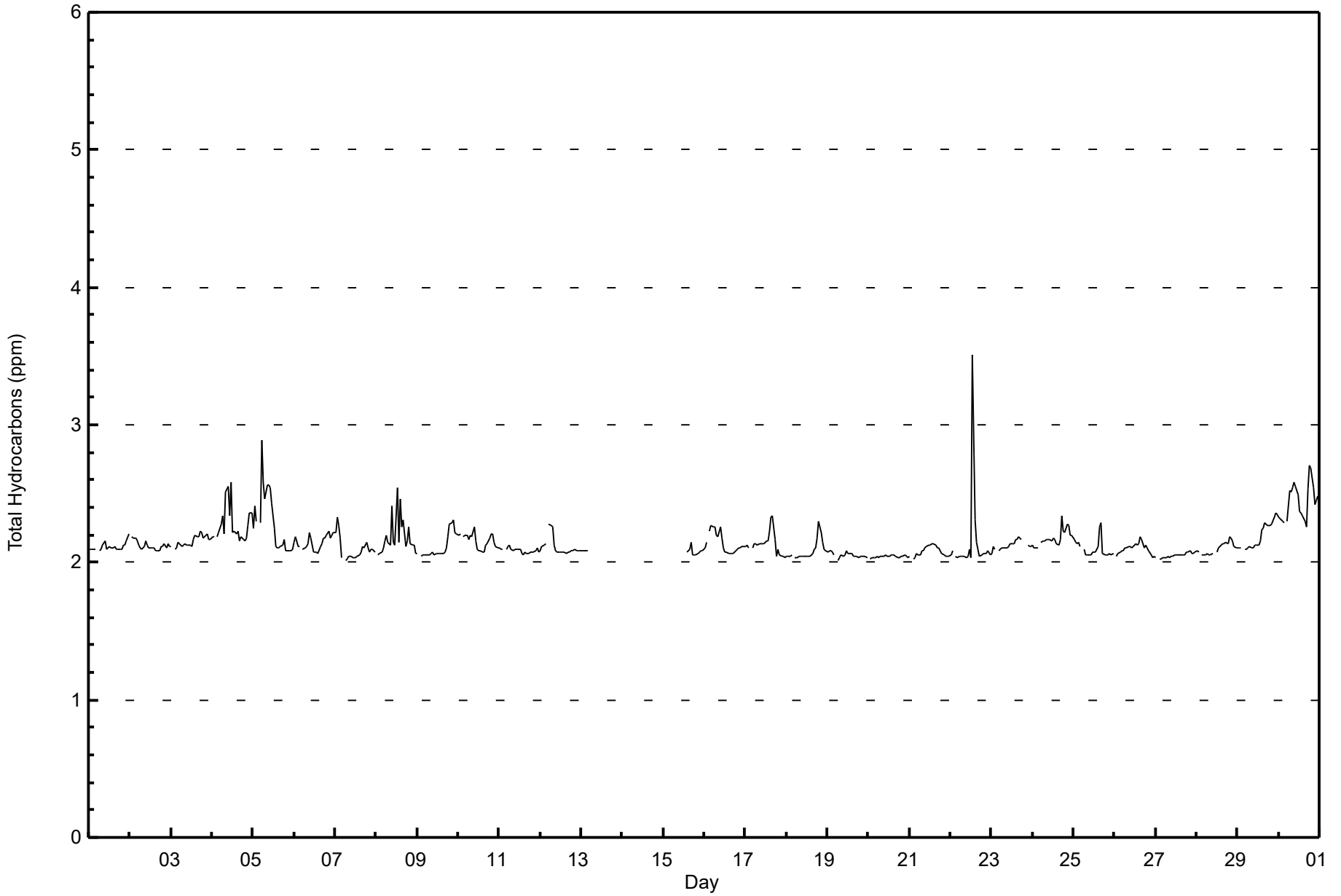




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Total Hydrocarbons (THC) - ppm**  
**Athabasca Valley - November 2024**

Maximum Value: 3.5 ppm on Nov 22 14:00		Maximum Daily Average: 2.4 ppm on Nov 30		Hours in Service: 720																							
Minimum Value: 2.0 ppm on Nov 19 07:00		Minimum Daily Average: 2.0 ppm on Nov 20		Hours of Data: 631																							
Maximum Diurnal Average: 2.2 ppm at hour 10		Minimum Diurnal Average: 2.1 ppm at hour 5		Hours of Missing Data: 89																							
Monthly Average: 2.14 ppm		Percentiles: P <sub>1</sub> = 2.0 P <sub>10</sub> = 2.0 Q <sub>1</sub> = 2.1 Median = 2.1 Q <sub>3</sub> = 2.2 P <sub>90</sub> = 2.3 P <sub>99</sub> = 2.6		Hours of Calibration: 31																							
				Percent Operational Time: 91.9																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	
2-Nov	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
3-Nov	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
4-Nov	2.2	2.2	Z	2.2	2.2	2.3	2.3	2.3	2.2	2.5	2.6	2.3	2.6	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.3	2.6
5-Nov	2.3	2.4	2.3	Z	2.3	2.3	2.9	2.6	2.5	2.6	2.6	2.5	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.3	2.9
6-Nov	2.1	2.2	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2
7-Nov	2.2	2.3	2.3	2.2	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
8-Nov	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.4	2.1	2.1	2.5	2.1	2.5	2.3	2.3	2.1	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.2	2.5
9-Nov	2.1	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.3	2.2	2.2	2.1	2.3	
10-Nov	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.3	
11-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
12-Nov	2.1	2.1	2.1	2.1	Z	2.3	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
13-Nov	2.1	2.1	2.1	2.1	2.1	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2.1
14-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
15-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	--
16-Nov	2.1	2.1	Z	2.2	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
17-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.2	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.3
18-Nov	2.0	2.0	2.0	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.3
19-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
20-Nov	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
21-Nov	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1
22-Nov	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	3.5	2.3	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	3.5
23-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	PF	PF	PF	2.1	2.1	2.1	2.1	2.2
24-Nov	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.3	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.3
25-Nov	2.2	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
26-Nov	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.2
27-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
28-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	M	M	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.2
29-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4
30-Nov	2.3	2.3	2.3	2.3	Z	2.3	2.5	2.5	2.5	2.6	2.6	2.5	2.4	2.4	2.3	2.3	2.3	2.5	2.7	2.7	2.5	2.4	2.4	2.5	2.4	2.4	2.7
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan      C - Calibration      M - Maintenance      UO - Unstable Operation      PF - Power Failure																											





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Athabasca Valley - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	90	14.26	14.26
2.1 - 3.0	540	85.58	99.84
3.1 - 10.0	1	0.16	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 631

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Athabasca Valley - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	5	4	2	0	0	1	0	0	1	1	7	5	18	10	26	10	90
2.1 - 3.0	14	13	9	12	9	117	63	23	21	20	38	13	21	21	44	71	509
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	19	17	11	12	9	118	63	23	22	21	45	18	39	31	70	82	600

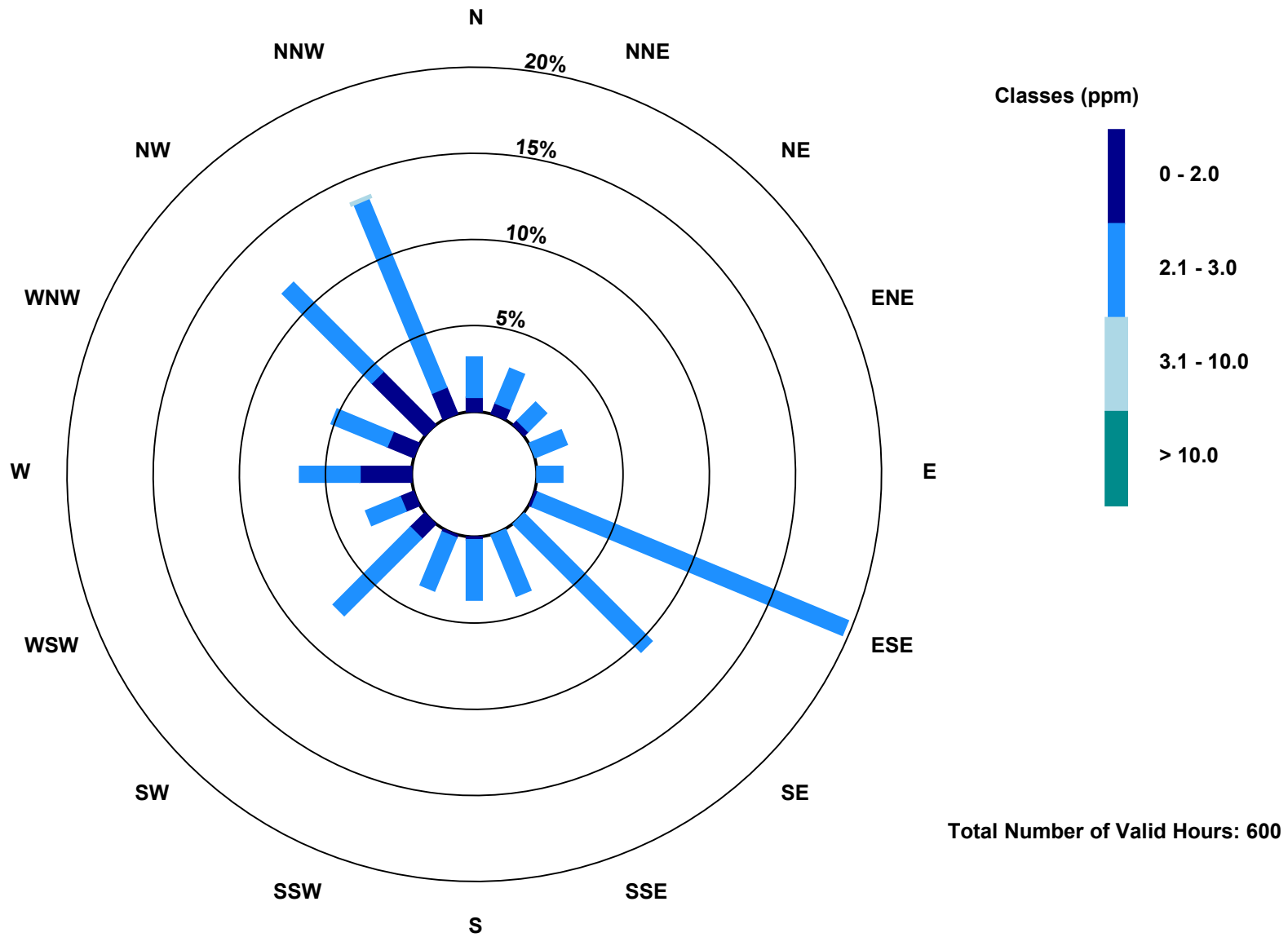
Total Number of Valid Hours: 600

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

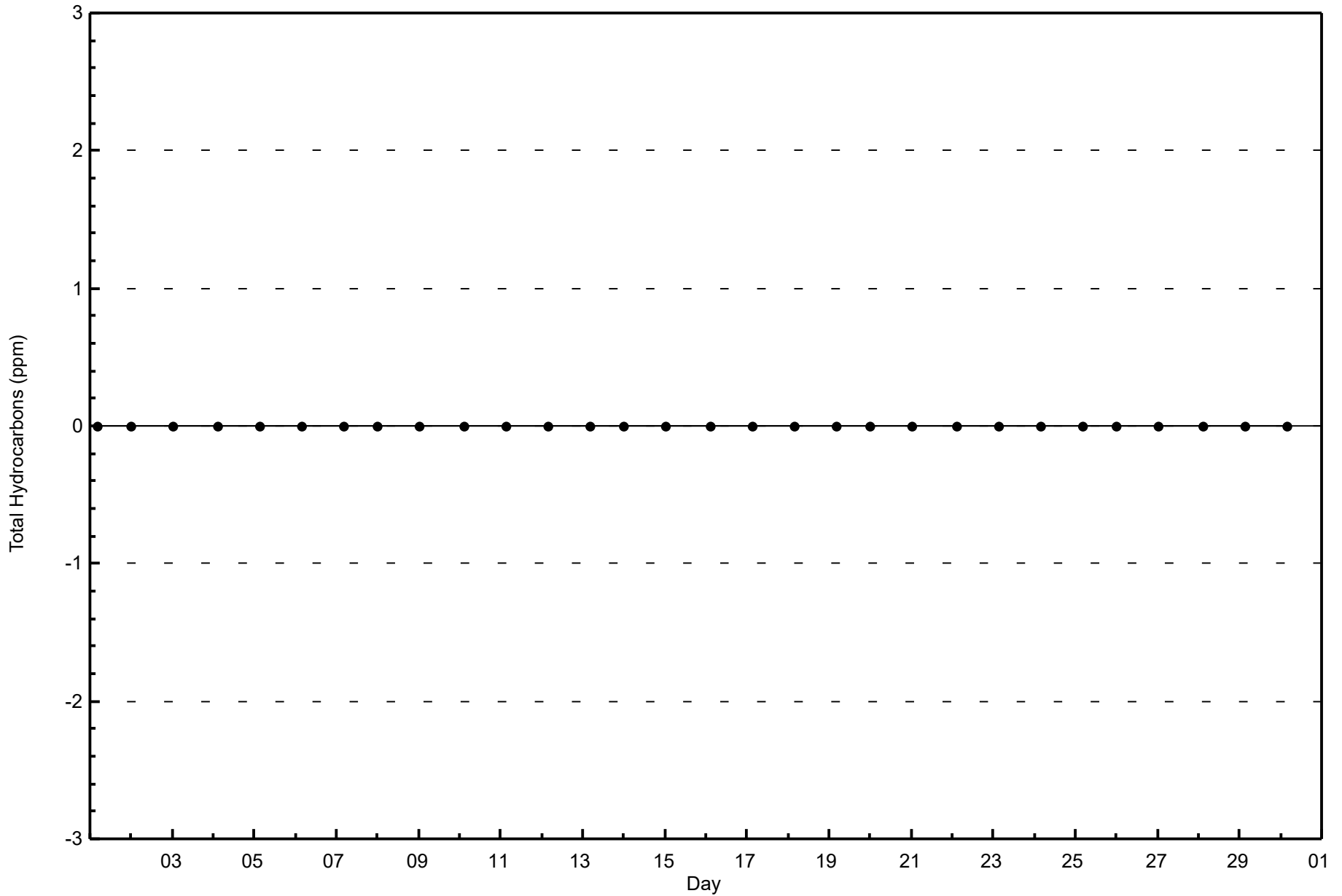
Total Hydrocarbons (THC) - ppm  
Athabasca Valley

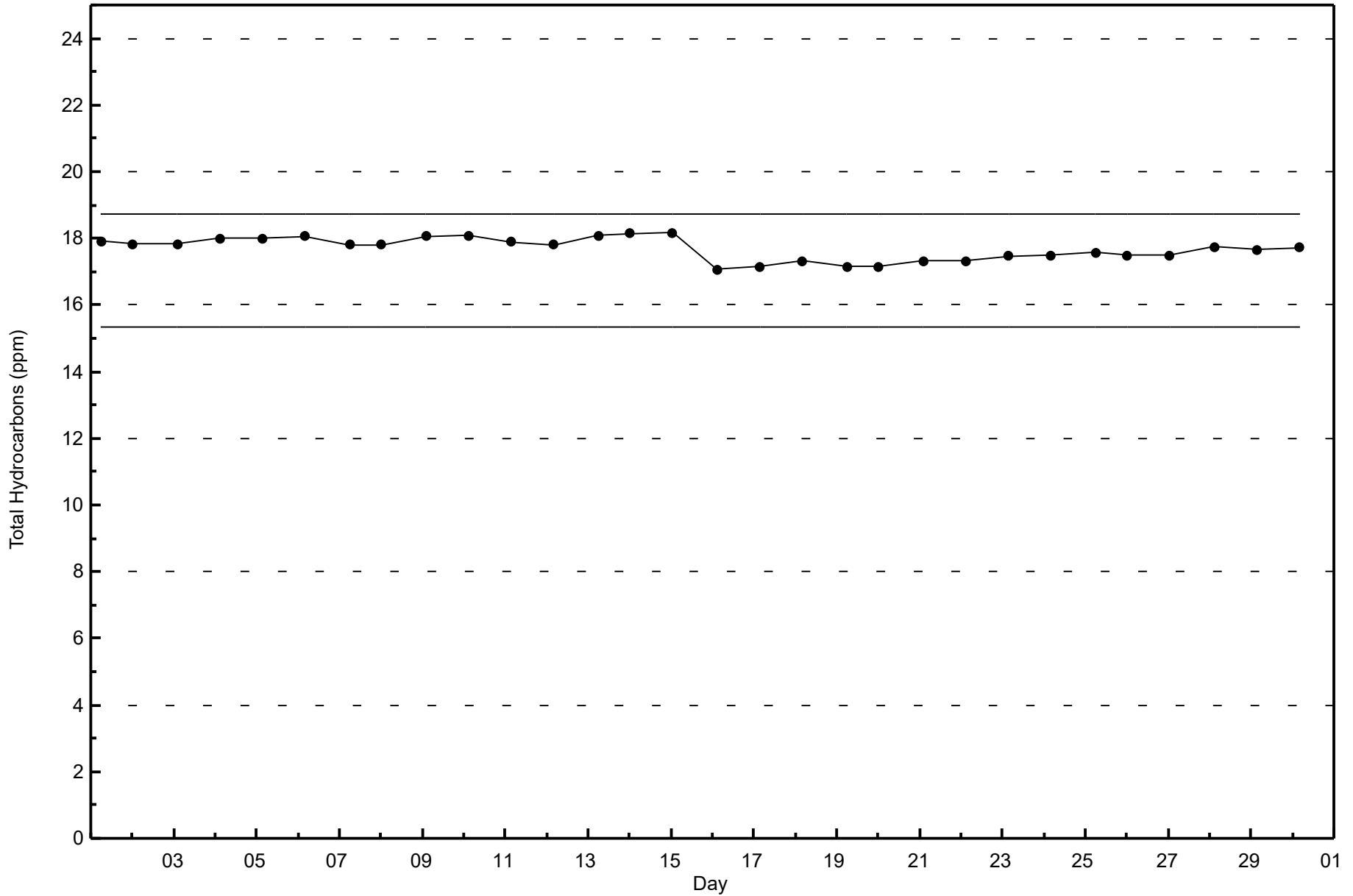




Wood Buffalo Environmental Association  
Zero Responses

Total Hydrocarbons (THC) - ppm  
Athabasca Valley - November 2024

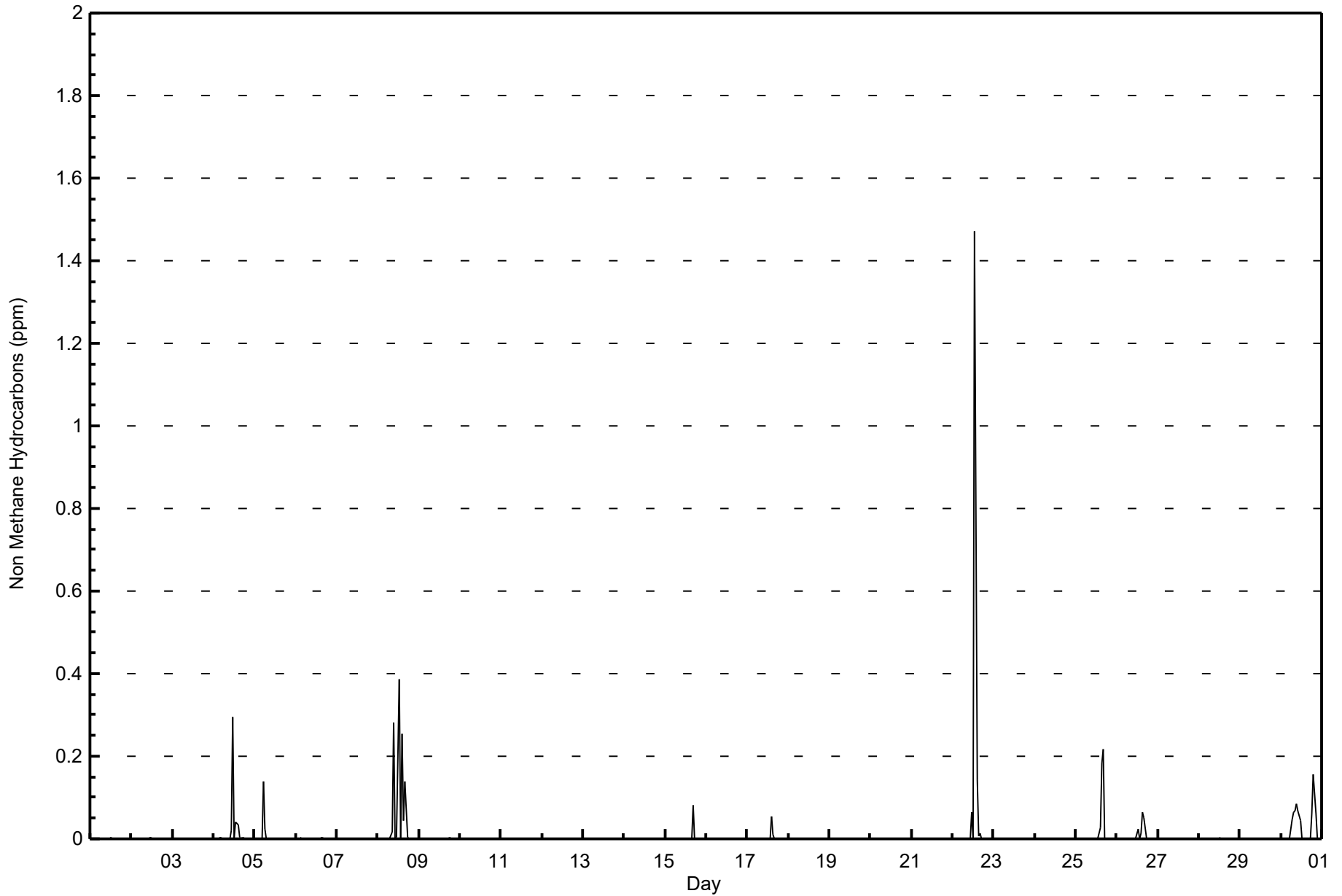






Maximum Value: 1.472 ppm on Nov 22 14:00		Maximum Daily Average: 0.074 ppm on Nov 22		Hours in Service:	720																													
Minimum Value: 0.000 ppm on Nov 1 01:00		Minimum Daily Average: 0.000 ppm on Nov 3		Hours of Data:	631																													
Maximum Diurnal Average: 0.056 ppm at hour 14		Minimum Diurnal Average: 0.000 ppm at hour 1		Hours of Missing Data:	89																													
Monthly Average: 0.008 ppm		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.0 P <sub>99</sub> = 0.2		Hours of Calibration:	31																													
				Percent Operational Time:	91.9																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24										
1-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.004		
2-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.004	
3-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4-Nov	0.000	0.000	Z	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.020	0.295	0.000	0.041	0.033	0.002	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.295		
5-Nov	0.000	0.000	0.000	Z	0.000	0.139	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.139			
6-Nov	0.000	0.000	0.000	0.004	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.004		
7-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
8-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.282	0.000	0.003	0.386	0.000	0.255	0.045	0.139	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.049	0.386			
9-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002		
10-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
11-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
12-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
13-Nov	0.000	0.000	0.000	0.000	0.000	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.000
14-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.000
15-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	0.000	0.000	0.083	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	
16-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
17-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.053	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.053	0.053		
18-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
19-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
20-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
21-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
22-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.065	0.000	1.472	0.142	0.006	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.074	1.472	1.472		
23-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
24-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
25-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.182	0.218	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.218	0.218			
26-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.000	0.012	0.063	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.063	0.063	0.063			
27-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
28-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	M	M	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002	
29-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
30-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.049	0.066	0.069	0.083	0.067	0.044	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.029	0.155	0.155	0.155			
		0.000	0.000	0.000	0.000	0.006	0.003	0.002	0.003	0.014	0.003	0.016	0.015	0.056	0.019	0.011	0.018	0.000	0.002	0.006	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Diurnal Average	
		0.000	0.000	0.000	0.004	0.003	0.139	0.049	0.066	0.069	0.282	0.067	0.295	0.386	1.472	0.255	0.182	0.218	0.004	0.061	0.155	0.063	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Diurnal Maximum
Z - zerspan		C - Calibration					M - Maintenance					UO - Unstable Operation					PF - Power Failure																	







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Athabasca Valley - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	595	94.29	94.29
0.006 - 0.05	16	2.54	96.83
0.06 - 0.1	12	1.90	98.73
> 0.1	8	1.27	100.00

Total Number of Valid Hours: 631

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Athabasca Valley - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	19	17	11	11	6	110	59	23	20	21	44	18	39	30	66	73	567
0.006 - 0.05	0	0	0	0	2	3	3	0	1	0	1	0	0	0	1	3	14
0.06 - 0.1	0	0	0	0	1	1	0	0	1	0	0	0	0	1	2	5	11
> 0.1	0	0	0	1	0	4	1	0	0	0	0	0	0	0	1	1	8
<b>Totals</b>	19	17	11	12	9	118	63	23	22	21	45	18	39	31	70	82	600

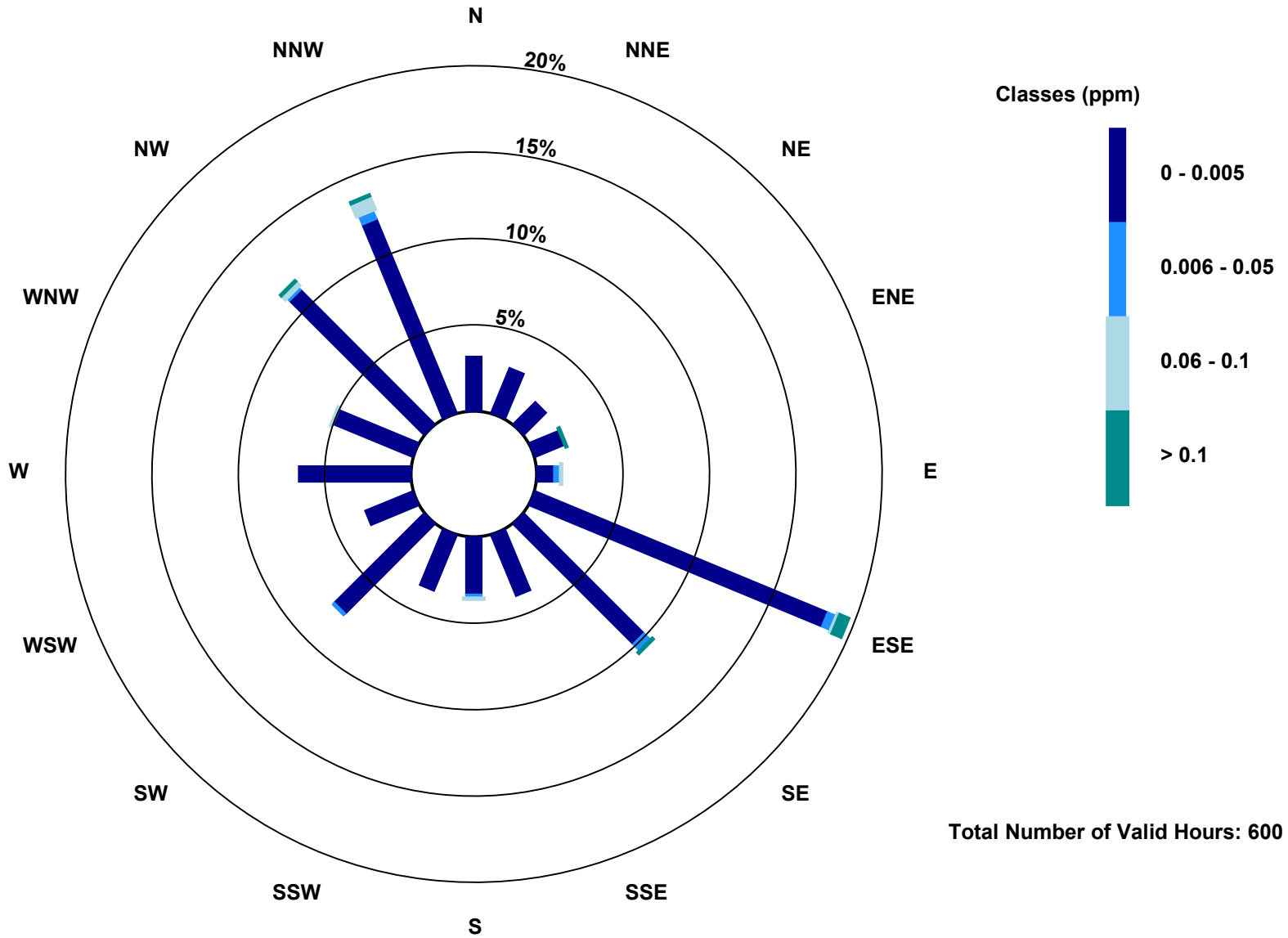
Total Number of Valid Hours: 600

Total Number of Hours: 720

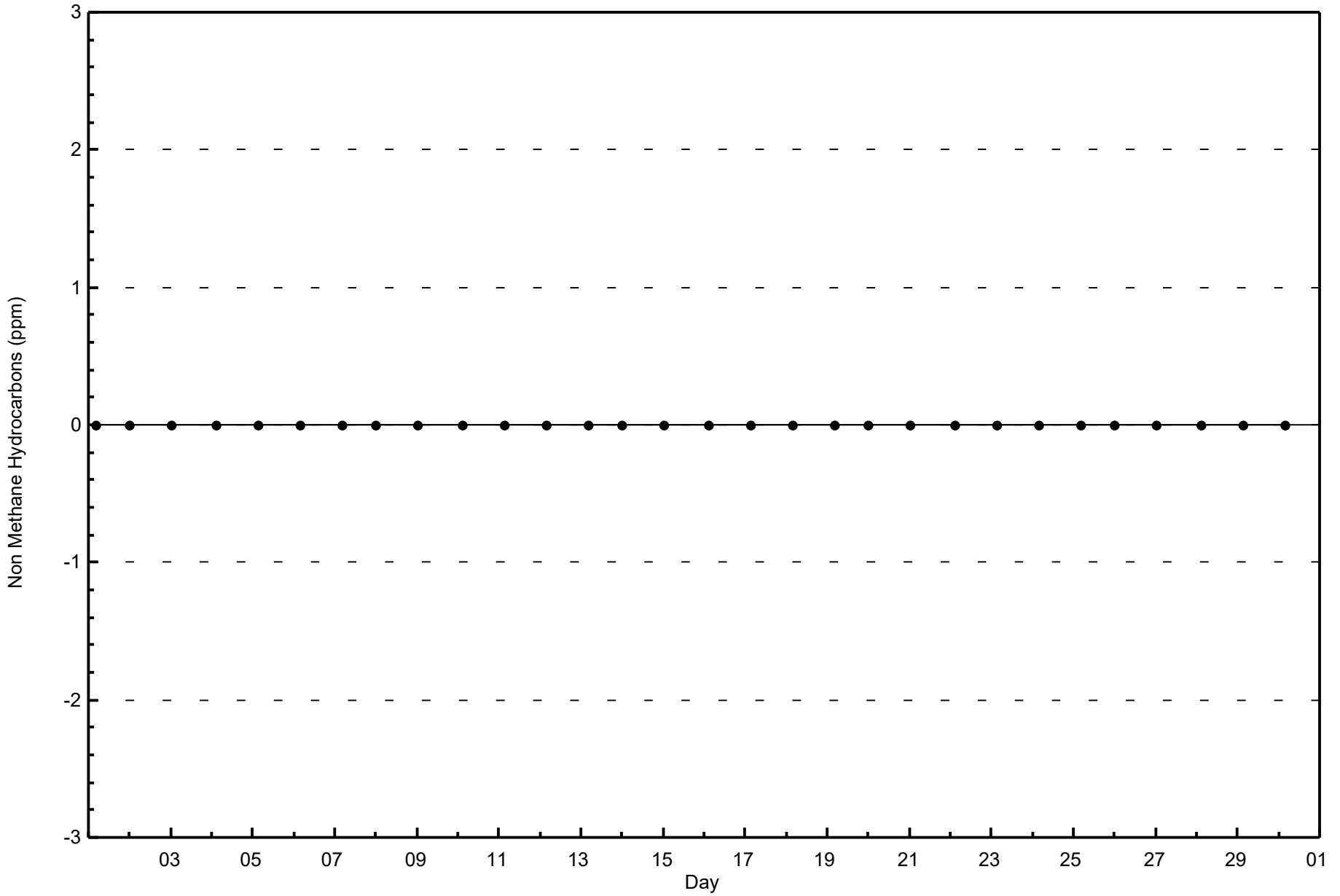


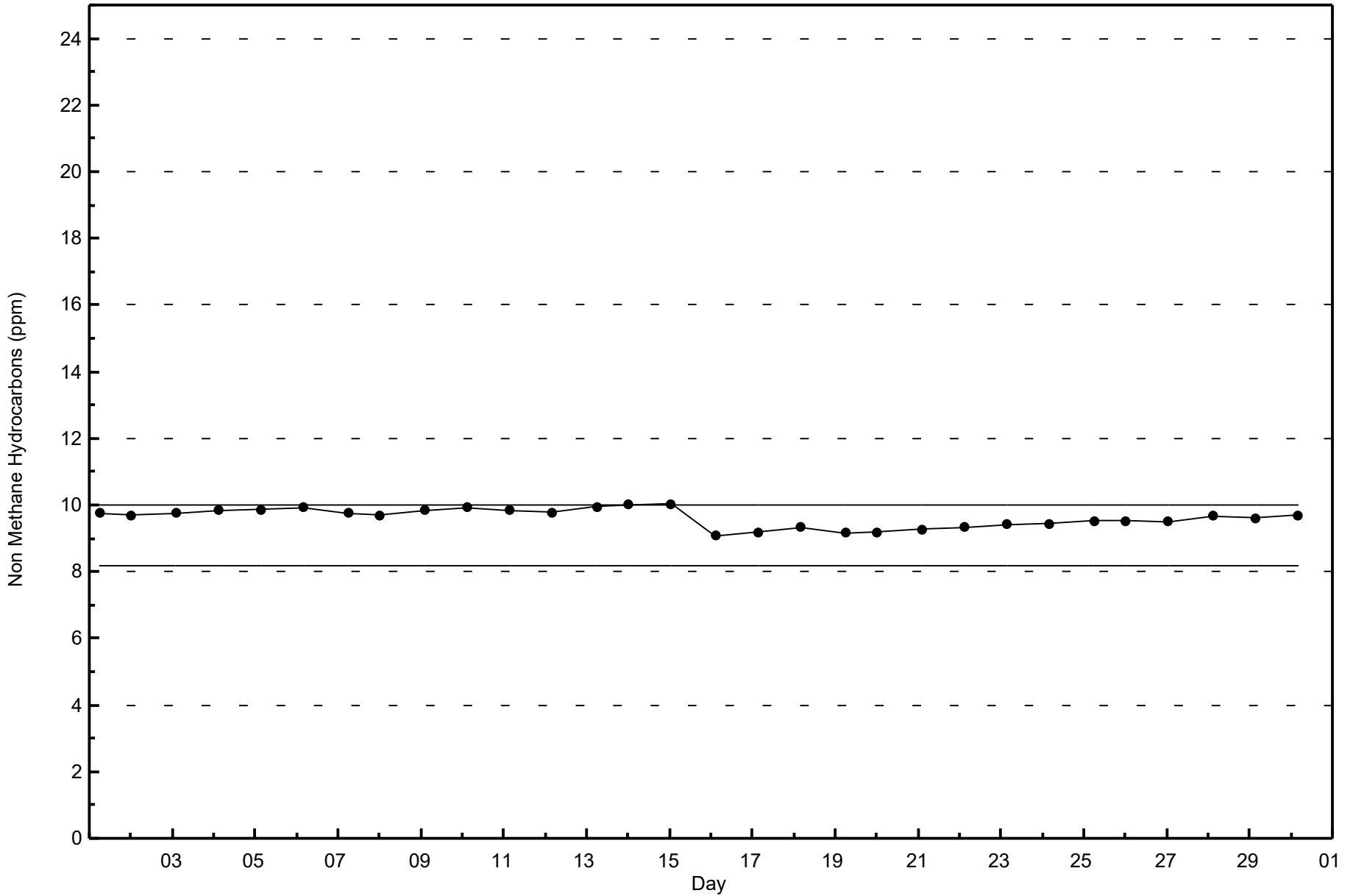
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Non Methane Hydrocarbons (NMHC) - ppm  
Athabasca Valley



Total Number of Valid Hours: 600



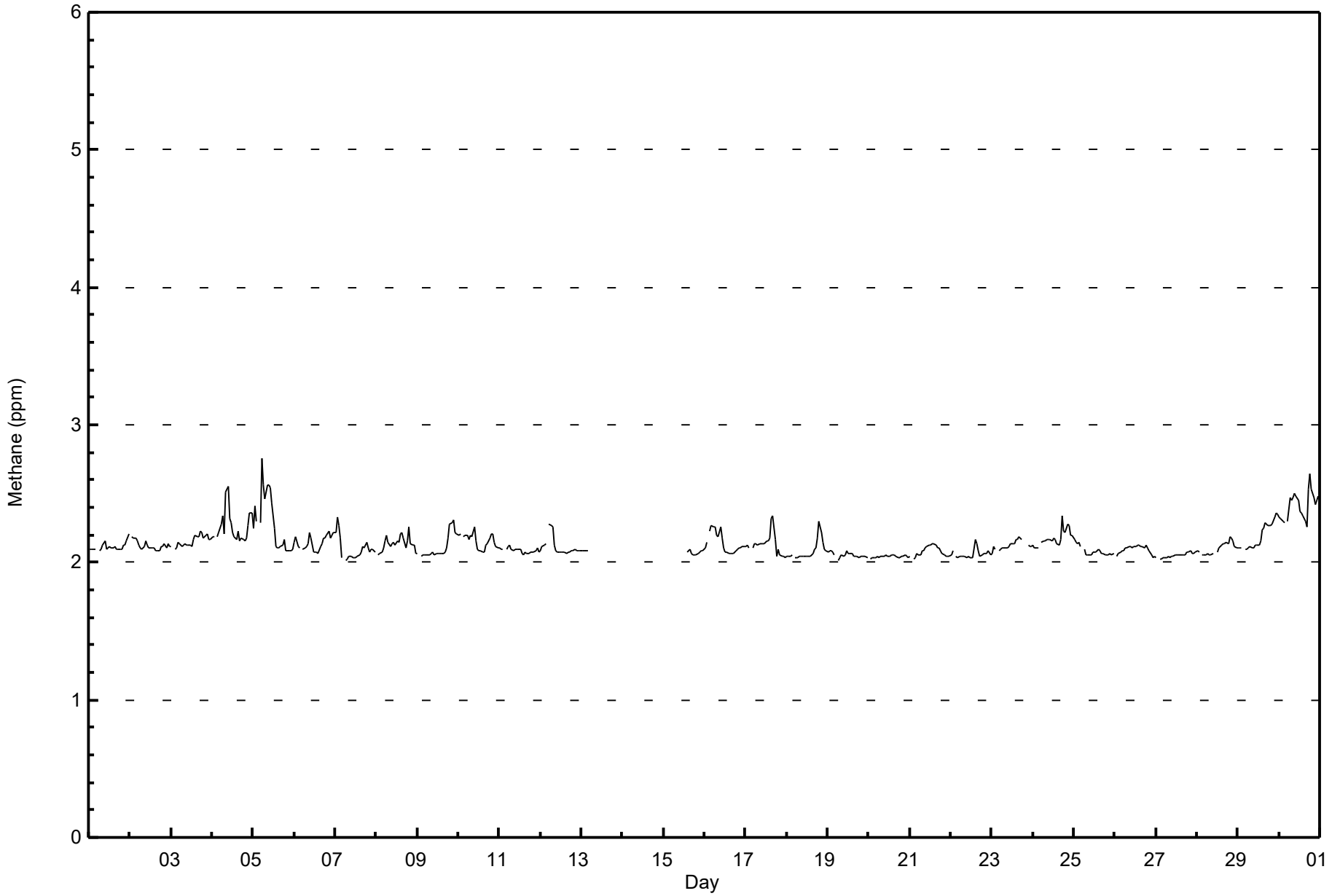




Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 2.8 ppm on Nov 5 06:00	Maximum Daily Average: 2.4 ppm on Nov 30		Hours of Data:	631
Minimum Value: 2.0 ppm on Nov 19 07:00	Minimum Daily Average: 2.0 ppm on Nov 20		Hours of Missing Data:	89
Maximum Diurnal Average: 2.2 ppm at hour 10	Minimum Diurnal Average: 2.1 ppm at hour 5		Hours of Calibration:	31
Monthly Average: 2.13 ppm	Percentiles: P <sub>1</sub> = 2.0 P <sub>10</sub> = 2.0 Q <sub>1</sub> = 2.1 Median = 2.1 Q <sub>3</sub> = 2.2 P <sub>90</sub> = 2.3 P <sub>99</sub> = 2.5		Percent Operational Time:	91.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2																								
2-Nov	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																							
3-Nov	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2																							
4-Nov	2.2	2.2	Z	2.2	2.2	2.3	2.3	2.3	2.2	2.5	2.6	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.3	2.6																							
5-Nov	2.3	2.4	2.3	Z	2.3	2.8	2.6	2.5	2.6	2.6	2.5	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.8																							
6-Nov	2.1	2.2	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2																							
7-Nov	2.2	2.3	2.3	2.2	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																							
8-Nov	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.1	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.3																							
9-Nov	2.1	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.3	2.2	2.2	2.1	2.3																								
10-Nov	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.3																								
11-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																							
12-Nov	2.1	2.1	2.1	2.1	Z	2.3	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																							
13-Nov	2.1	2.1	2.1	2.1	2.1	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2.1																							
14-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--																							
15-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	--																							
16-Nov	2.1	2.1	Z	2.2	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																							
17-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.2	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.3																							
18-Nov	2.0	2.0	2.0	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.3																							
19-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																							
20-Nov	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																							
21-Nov	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1																							
22-Nov	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																							
23-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	PF	PF	PF	2.1	2.1	2.1	2.2																							
24-Nov	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.3																							
25-Nov	2.2	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																							
26-Nov	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1																							
27-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																							
28-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	M	M	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.2																							
29-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.2	2.4																							
30-Nov	2.3	2.3	2.3	2.3	Z	2.3	2.5	2.4	2.5	2.5	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.5	2.6	2.5	2.5	2.4	2.4	2.5	2.4	2.4	2.6																							
																								2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	Diumal Average	
																								2.3	2.4	2.3	2.3	2.3	2.8	2.6	2.5	2.6	2.6	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.5	2.6	2.5	2.5	2.4	2.4	2.5	2.4	2.5	Diumal Maximum

Z - zerospan	C - Calibration	M - Maintenance	UO - Unstable Operation	PF - Power Failure
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**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Athabasca Valley - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	92	14.58	14.58
2.1 - 3.0	539	85.42	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 631

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Athabasca Valley - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	5	4	2	0	0	1	0	0	1	1	7	5	18	11	26	11	92
2.1 - 3.0	14	13	9	12	9	117	63	23	21	20	38	13	21	20	44	71	508
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	19	17	11	12	9	118	63	23	22	21	45	18	39	31	70	82	600

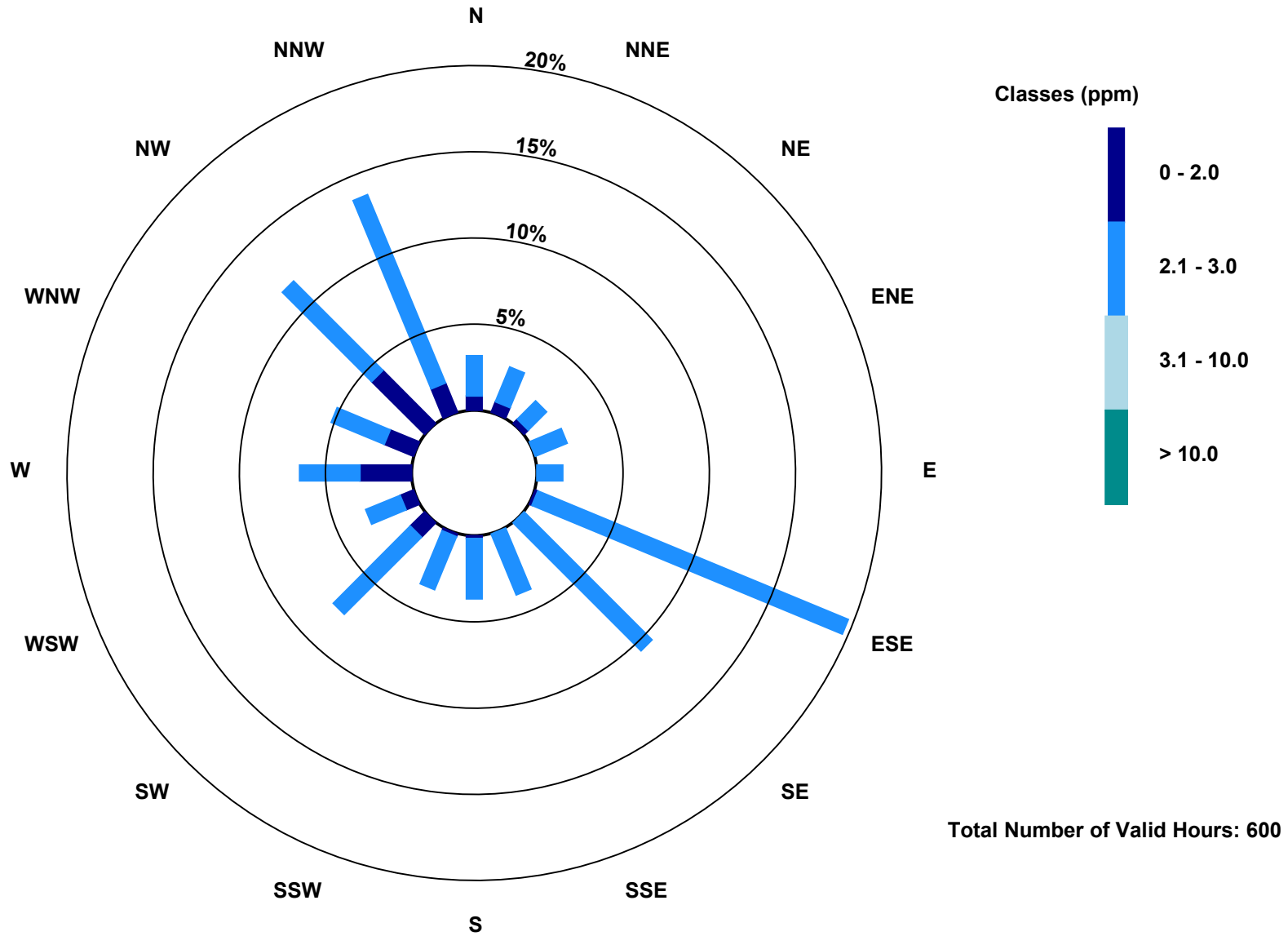
Total Number of Valid Hours: 600

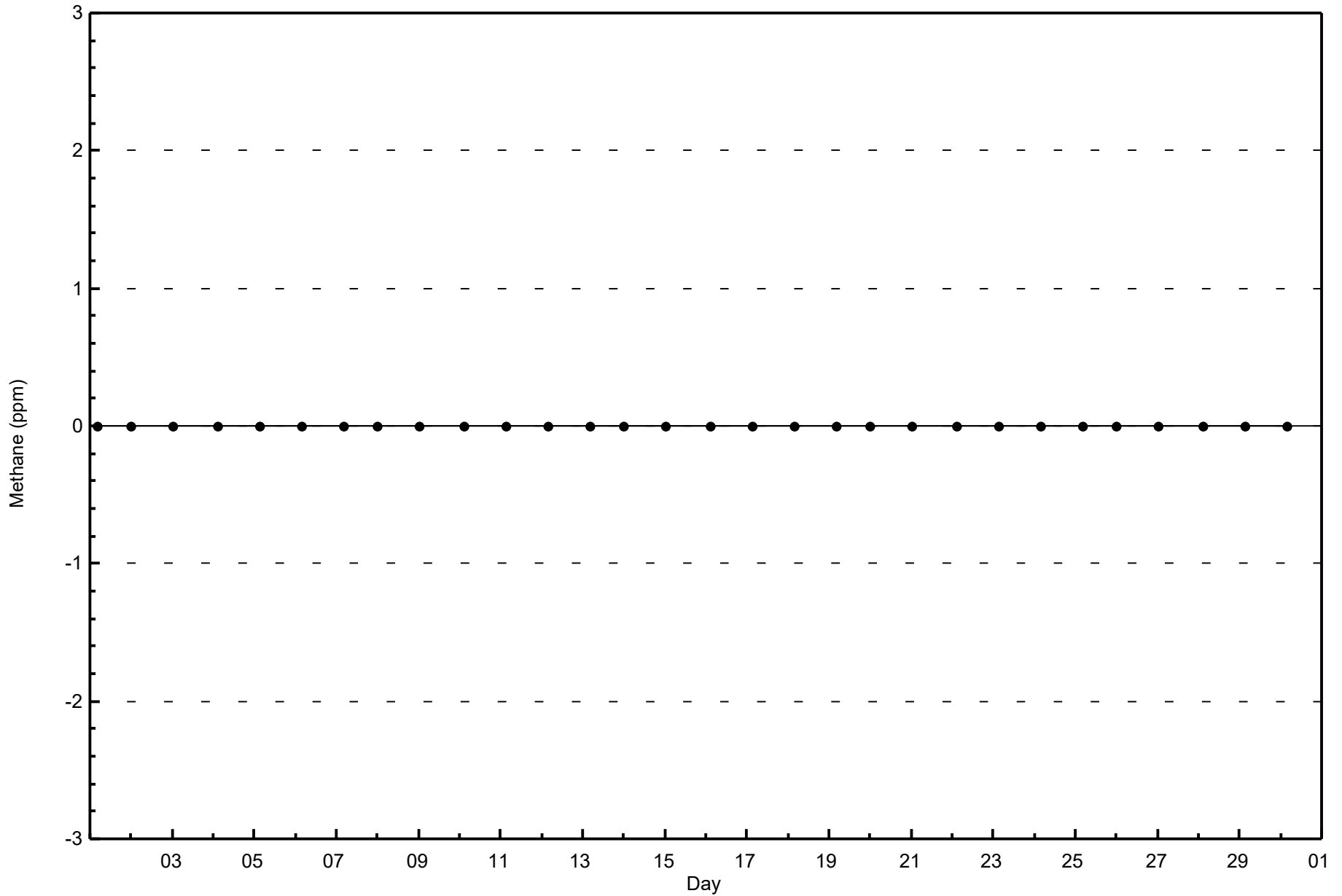
Total Number of Hours: 720

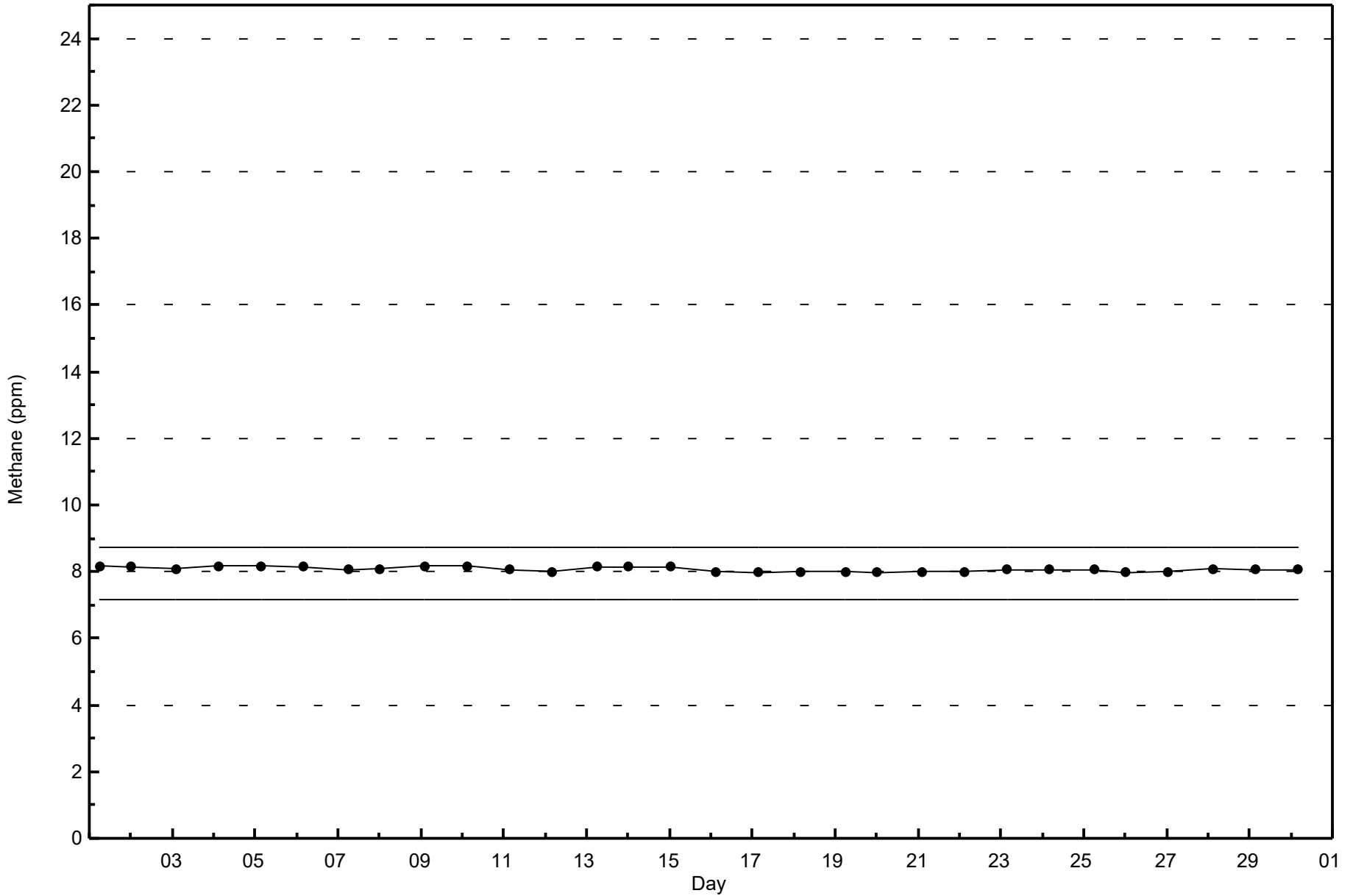


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Methane (CH<sub>4</sub>) - ppm  
Athabasca Valley







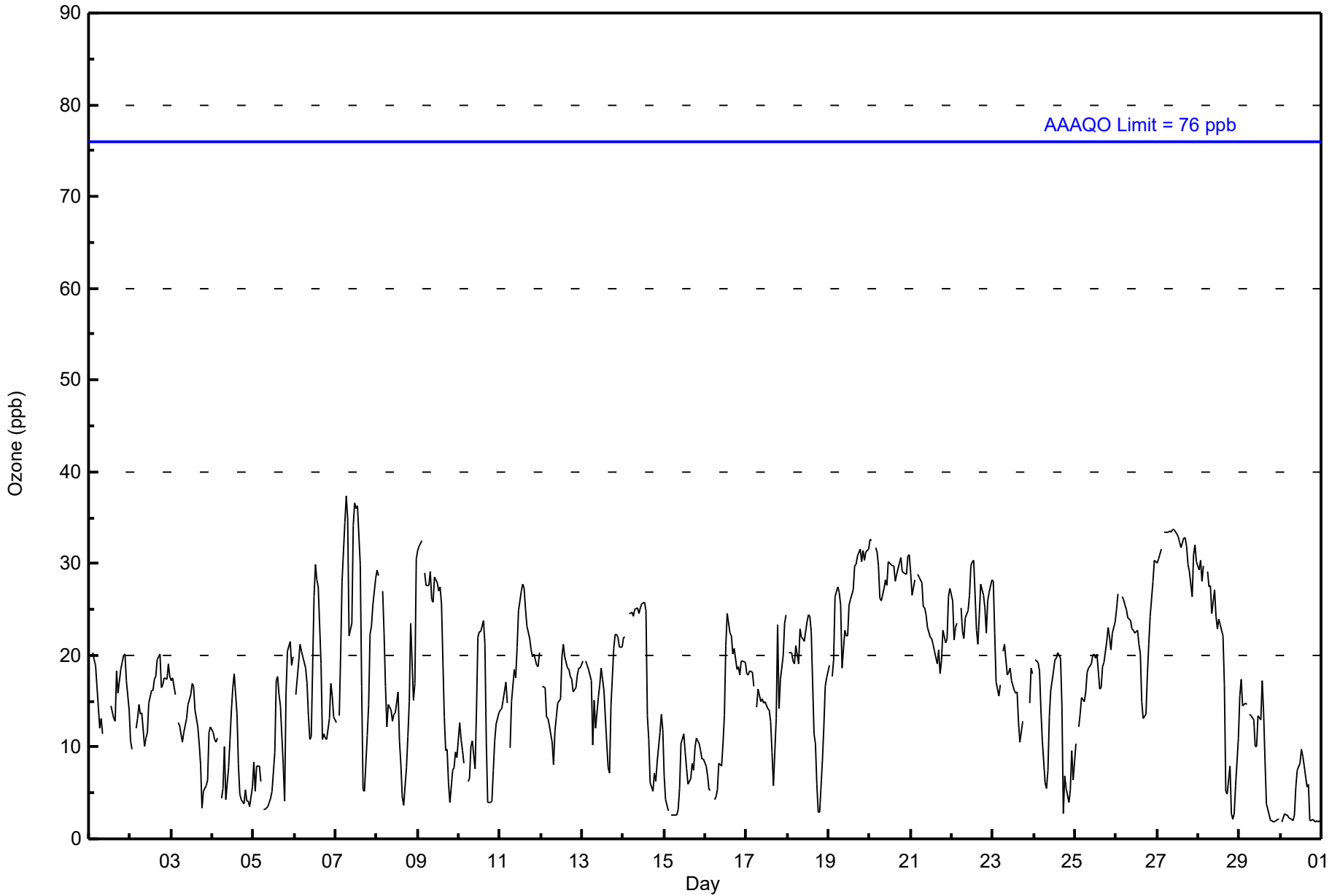


Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 37.4 ppb on Nov 7 07:00	Maximum Daily Average: 31.9 ppb on Nov 27		Hours of Data:	683
Minimum Value: 1.8 ppb on Nov 30 23:00	Minimum Daily Average: 4.0 ppb on Nov 30		Hours of Missing Data:	37
Maximum Diurnal Average: 21.2 ppb at hour 13	Minimum Diurnal Average: 13.3 ppb at hour 18		Hours of Calibration:	34
Monthly Average: 17.24 ppb	Percentiles: P <sub>1</sub> = 1.9 P <sub>10</sub> = 5.3 Q <sub>1</sub> = 10.7 Median = 17.4 Q <sub>3</sub> = 23.4 P <sub>90</sub> = 29.1 P <sub>99</sub> = 33.8		Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	21.8	Z	20.2	19.5	18.9	14.3	12.1	13.1	11.4	C	C	C	C	14.4	13.1	12.8	18.4	15.9	18.4	19.2	19.9	20.2	17.2	14.0	16.6	21.8
2-Nov	10.7	9.8	Z	12.1	13.1	14.7	13.5	13.8	10.1	11.0	11.7	14.8	16.2	16.2	17.3	17.8	19.5	20.2	16.5	16.8	17.6	17.4	19.1	17.7	15.1	20.2
3-Nov	17.2	17.5	15.7	Z	12.7	12.3	10.5	11.6	12.3	13.1	14.7	15.7	16.9	16.7	14.1	12.1	10.4	8.1	3.4	5.1	5.8	6.4	11.6	12.2	12.0	17.5
4-Nov	11.6	10.8	10.6	10.9	Z	4.4	5.5	10.0	4.2	7.8	10.9	14.0	16.5	18.1	13.6	8.1	4.9	4.3	3.8	5.4	4.1	4.1	3.6	5.6	8.4	18.1
5-Nov	8.4	5.2	7.9	7.9	6.2	Z	3.2	3.1	3.6	4.0	4.4	5.1	9.4	17.2	17.7	15.7	14.4	8.1	4.2	15.8	20.5	21.5	18.9	19.9	10.5	21.5
6-Nov	Z	15.7	19.2	21.3	20.4	19.8	18.6	17.0	13.4	10.8	11.2	26.4	29.9	28.2	27.4	19.1	10.8	11.5	11.0	10.8	13.1	16.9	15.5	13.3	17.4	29.9
7-Nov	12.6	Z	13.4	20.2	28.0	34.4	37.4	35.0	22.0	23.5	34.2	36.6	36.1	36.3	29.9	16.6	5.3	5.1	11.3	14.7	22.3	23.2	25.5	28.4	24.0	37.4
8-Nov	29.3	28.6	Z	27.0	22.4	16.6	12.2	14.7	14.1	12.8	13.6	13.8	16.0	10.6	8.0	4.5	3.7	7.7	11.2	15.0	23.4	15.0	16.9	30.5	16.0	30.5
9-Nov	31.4	31.8	32.5	Z	28.9	27.6	27.6	29.1	26.0	25.7	28.6	27.9	27.0	27.5	25.6	13.3	9.6	9.8	6.2	4.0	7.5	7.8	9.5	8.9	20.6	32.5
10-Nov	12.6	10.8	9.6	8.2	Z	6.3	6.6	10.0	10.7	7.6	14.1	22.0	22.6	22.5	23.8	21.2	10.5	3.9	3.9	4.1	7.4	10.7	12.5	13.8	12.0	23.8
11-Nov	14.0	14.2	15.2	17.0	14.9	Z	9.9	14.9	18.5	17.5	20.9	24.8	27.0	27.8	27.3	25.0	23.2	21.7	20.6	19.8	20.2	18.9	18.7	20.3	19.7	27.8
12-Nov	Z	16.7	16.4	13.3	13.1	12.3	10.5	8.1	11.7	13.2	14.7	15.2	19.8	21.2	19.9	18.6	18.5	17.6	17.4	15.9	16.5	17.8	18.6	18.6	15.9	21.2
13-Nov	19.4	Z	19.4	19.0	18.5	17.2	10.2	15.1	12.1	15.5	16.8	18.6	17.3	16.2	10.4	7.8	7.1	14.5	20.8	22.3	22.3	22.0	20.9	20.9	16.7	22.3
14-Nov	22.0	21.9	Z	24.5	24.5	24.7	24.2	25.0	25.2	24.6	25.2	25.6	25.8	24.8	13.4	10.9	6.1	5.1	7.2	6.3	8.3	11.6	13.6	11.9	17.9	25.8
15-Nov	6.9	4.2	3.1	Z	2.6	2.6	2.6	2.6	3.2	5.5	10.4	11.4	9.5	7.6	6.0	6.6	8.2	7.5	9.9	10.9	10.4	9.6	8.8	8.7	6.9	11.4
16-Nov	7.9	6.9	5.4	5.4	Z	4.3	4.6	5.3	8.2	8.0	10.4	13.4	21.1	24.6	22.4	22.2	20.1	20.8	18.5	18.7	17.9	19.4	19.4	19.3	14.1	24.6
17-Nov	18.1	17.8	18.3	18.1	16.7	Z	14.3	16.3	15.0	15.2	14.9	14.9	14.2	14.1	12.8	9.4	5.8	13.1	23.4	14.2	17.4	19.9	23.4	24.5	16.2	24.5
18-Nov	Z	20.3	20.3	19.4	19.0	21.0	19.1	22.8	22.0	21.9	21.5	23.7	24.4	24.2	22.6	11.5	10.3	5.9	2.8	2.8	8.5	12.3	16.6	17.5	17.0	24.4
19-Nov	18.9	Z	17.7	19.5	26.4	27.4	26.9	25.4	18.6	22.7	22.2	22.2	25.4	26.0	27.1	29.8	29.9	30.9	31.5	30.3	31.4	30.3	31.2	31.6	26.2	31.6
20-Nov	32.6	32.5	Z	31.8	31.2	29.8	26.2	25.9	27.2	28.2	27.6	30.2	29.9	29.8	28.1	28.8	30.0	30.7	29.1	29.0	28.8	30.9	31.0		29.5	32.6
21-Nov	29.0	26.6	28.3	Z	28.8	28.6	27.9	25.4	25.2	24.3	23.0	22.0	21.8	21.2	20.5	19.1	20.6	18.1	19.4	22.7	21.3	21.9	26.4	27.4	23.9	29.0
22-Nov	25.9	21.7	23.1	23.5	Z	25.1	22.6	21.8	24.1	24.9	26.6	29.7	30.2	30.4	22.7	21.2	24.4	27.8	26.5	25.2	22.5	26.0	26.8	28.2	25.3	30.4
23-Nov	28.1	22.5	17.1	15.6	16.7	Z	20.5	21.2	17.8	18.2	18.6	17.2	16.1	15.8	16.0	12.6	10.5	12.8	PF	PF	PF	14.8	18.6	17.9	17.4	28.1
24-Nov	Z	19.5	19.3	18.4	14.0	10.7	6.1	5.6	7.5	13.2	16.1	18.3	19.5	19.6	20.3	19.7	14.4	2.8	6.8	5.6	3.9	5.3	9.6	6.4	12.3	20.3
25-Nov	10.3	Z	12.2	13.6	15.3	15.0	16.0	18.2	18.7	19.1	20.0	20.1	19.7	20.1	16.3	16.5	18.8	19.2	21.5	23.0	21.9	20.6	22.4	23.7	18.4	23.7
26-Nov	25.0	26.7	Z	26.3	26.1	25.4	25.0	24.0	23.8	22.9	22.7	22.5	22.7	21.2	20.2	15.0	13.1	13.5	17.9	21.3	24.2	28.1	30.4	30.1	23.0	30.4
27-Nov	30.1	30.5	31.5	Z	33.4	33.4	33.4	33.6	33.4	33.7	33.7	33.3	32.9	32.3	31.8	32.8	32.8	31.9	29.9	29.1	26.5	31.0	32.0	30.3	31.9	33.7
28-Nov	29.3	30.4	28.1	29.8	Z	29.1	27.5	27.6	24.5	27.2	24.3	22.9	23.9	23.3	22.2	16.8	5.2	4.9	8.0	2.7	2.1	2.7	5.8	11.1	18.7	30.4
29-Nov	15.5	17.5	14.5	14.8	14.7	Z	13.5	13.4	13.0	10.0	10.1	13.4	13.0	17.3	13.8	8.6	3.8	2.5	2.1	1.9	1.9	1.9	2.2	2.2	9.6	17.5
30-Nov	Z	1.9	2.7	2.6	2.6	2.3	2.1	2.1	2.6	5.6	7.4	8.2	9.8	9.0	7.9	5.6	5.9	2.0	2.0	2.1	1.9	1.9	1.8	1.9	4.0	9.8

19.5	18.5	16.9	17.6	18.8	18.4	16.3	17.1	16.0	16.8	18.3	20.1	21.2	21.1	19.1	16.0	13.8	13.3	14.0	14.3	15.5	16.3	17.6	18.3	Diurnal Average	
32.6	32.5	32.5	31.8	33.4	34.4	37.4	35.0	33.4	33.7	34.2	36.6	36.1	36.3	31.8	32.8	32.8	31.9	31.5	30.3	31.4	31.0	32.0	31.6	Diurnal Maximum	

Z - zerospan      C - Calibration      PF - Power Failure  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Athabasca Valley - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	441	64.57	64.57
21 - 50	242	35.43	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Athabasca Valley - November 2024**

<b>Concentration</b> <b>Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	11	11	9	11	10	87	57	20	13	15	28	13	12	12	32	69	410
21 - 50	12	12	12	0	1	29	11	2	9	10	16	6	25	21	51	25	242
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	23	23	21	11	11	116	68	22	22	25	44	19	37	33	83	94	652

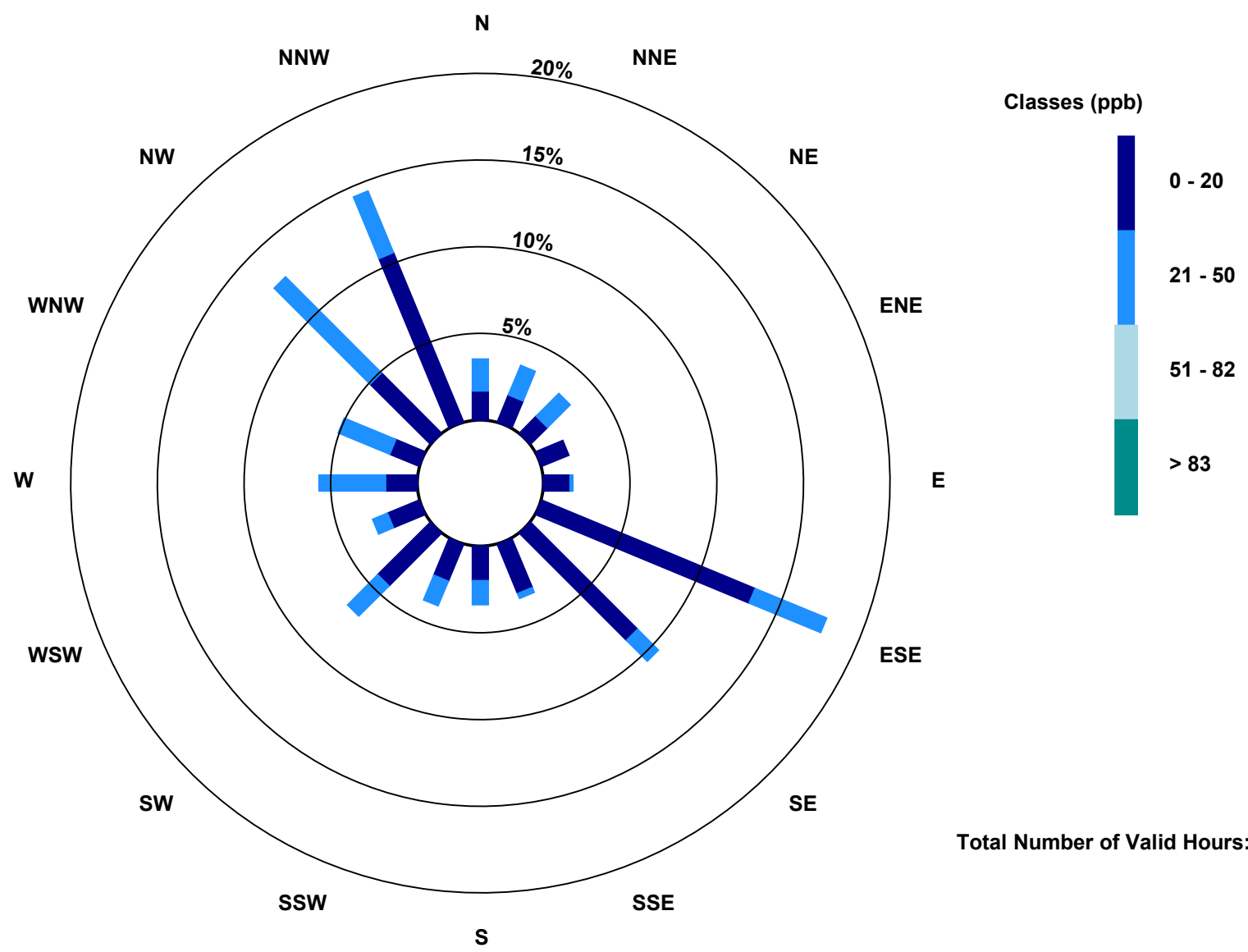
Total Number of Valid Hours: 652

Total Number of Hours: 720

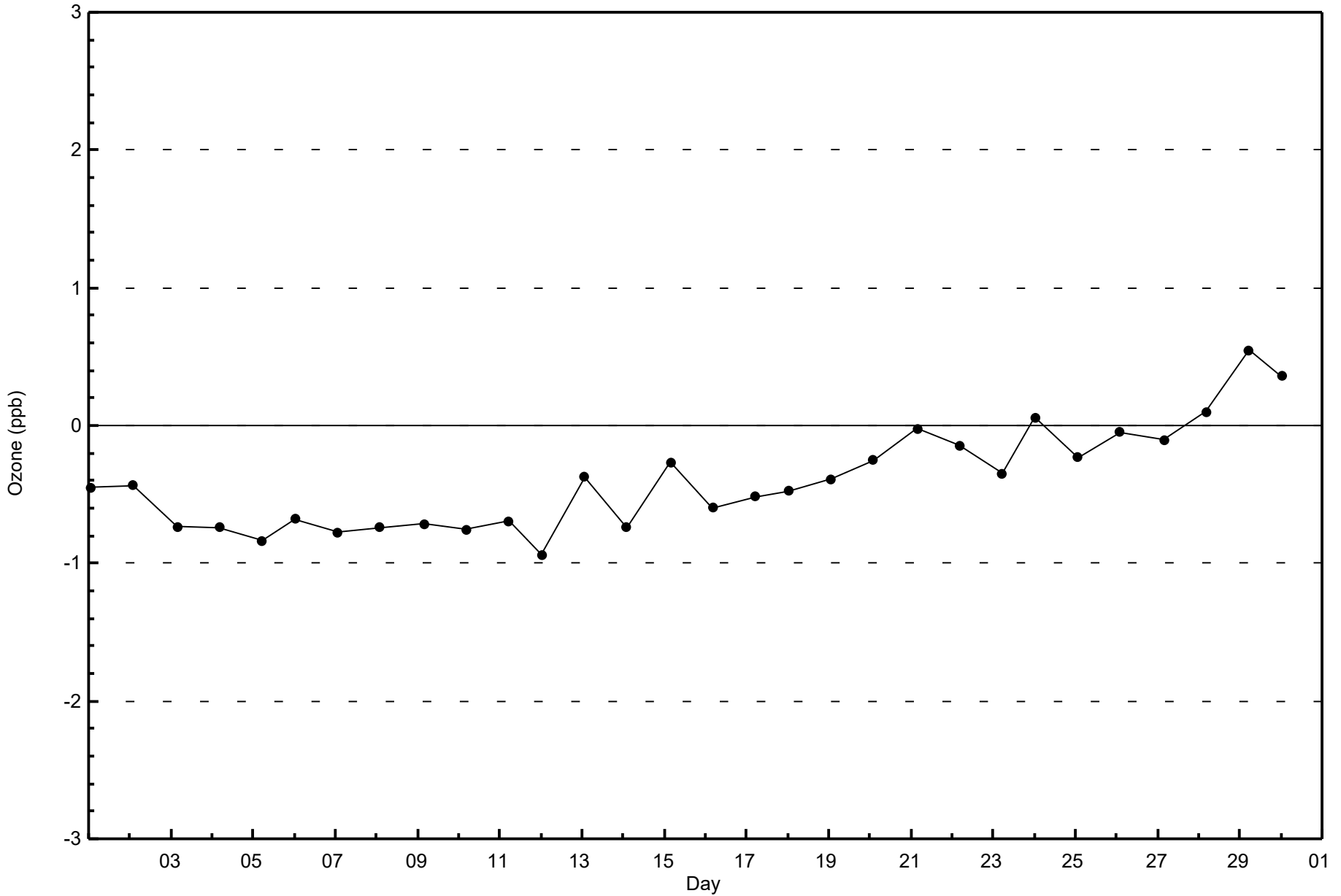


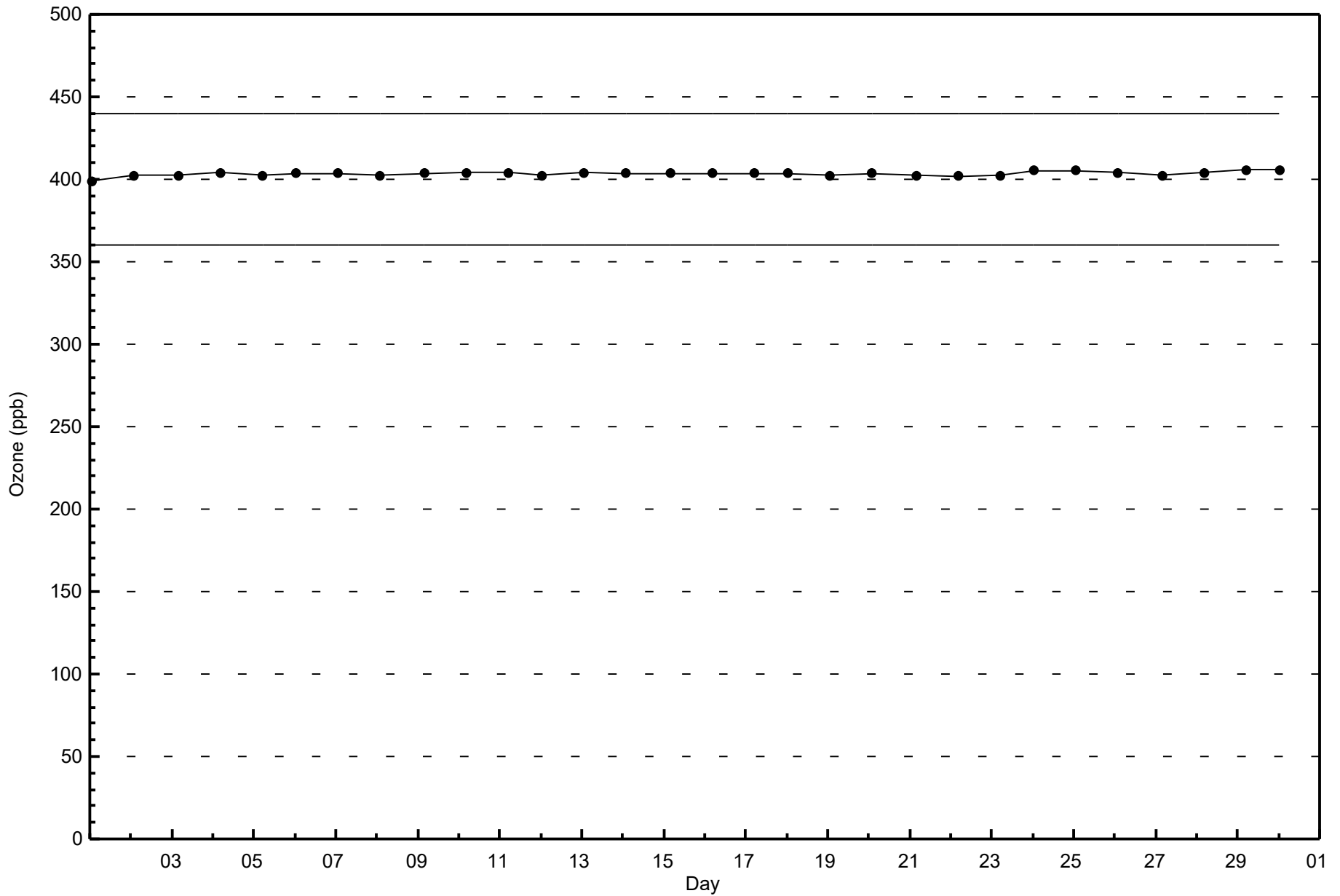
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Ozone (O<sub>3</sub>) - ppb  
Athabasca Valley



Total Number of Valid Hours: 652





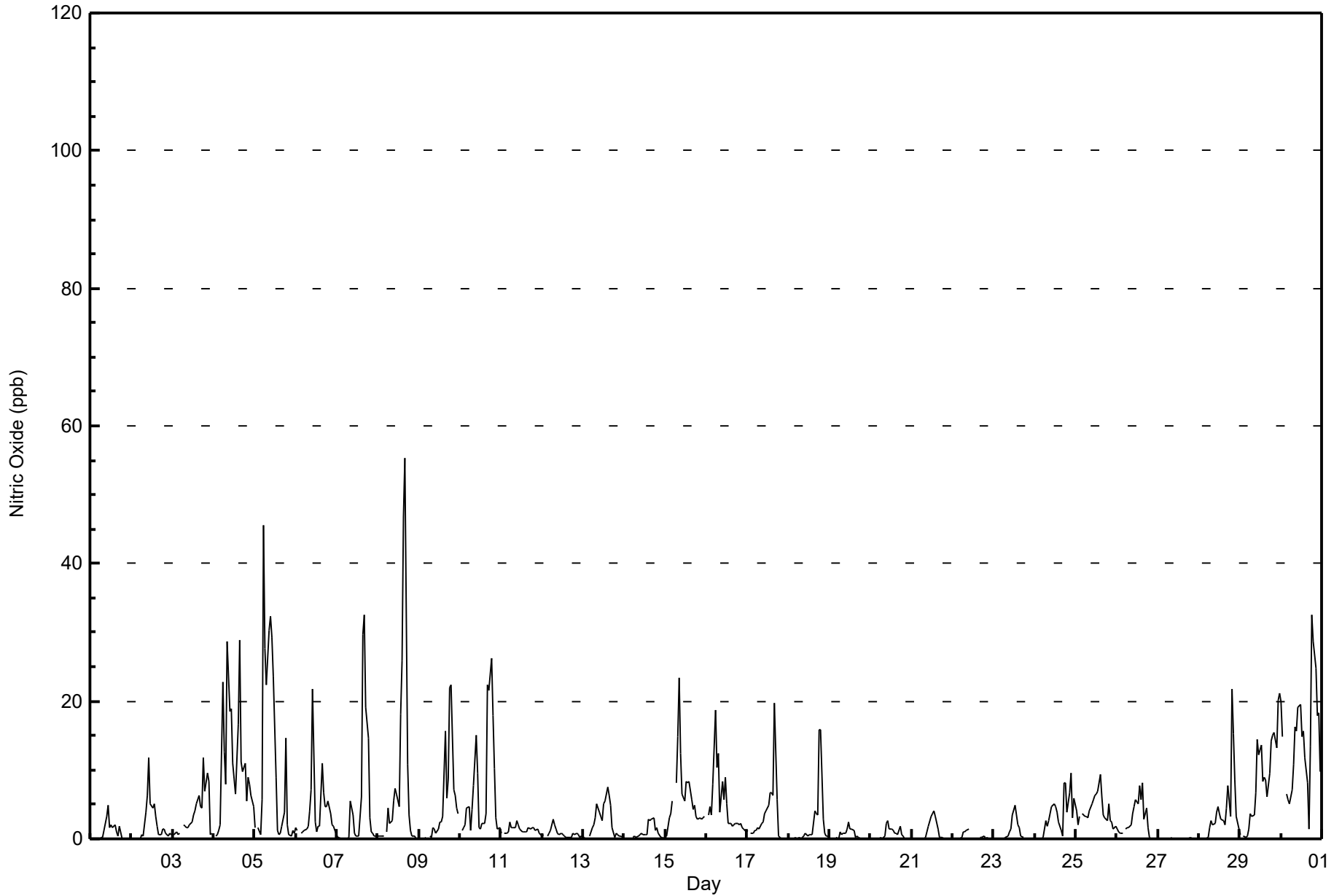


Maximum Value: 55.3 ppb on Nov 8 17:00																				Maximum Daily Average: 14.7 ppb on Nov 30					Hours in Service: 720				
Minimum Value: 0.0 ppb on Nov 1 01:00																				Minimum Daily Average: 0.5 ppb on Nov 19					Hours of Data: 674				
Maximum Diurnal Average: 7.6 ppb at hour 16																				Minimum Diurnal Average: 0.8 ppb at hour 3					Hours of Missing Data: 46				
Monthly Average: 4.14 ppb																				Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.4 Median = 1.6 Q <sub>3</sub> = 4.7 P <sub>90</sub> = 11.6 P <sub>99</sub> = 29.8					Hours of Calibration: 36				
																									Percent Operational Time: 98.6				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Nov	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.3	1.2	3.2	4.8	1.7	2.1	1.7	2.0	1.0	0.4	1.8	0.0	0.0	0.0	0.1	0.0	0.0	0.9	4.8			
2-Nov	0.0	0.0	0.0	0.1	Z	0.0	0.6	0.3	3.9	6.3	11.9	5.2	4.4	5.1	3.3	1.8	0.6	0.6	1.5	1.4	0.8	0.3	0.8	0.6	2.1	11.9			
3-Nov	0.6	0.7	0.9	0.7	0.8	Z	2.1	1.7	1.7	1.5	2.0	2.5	3.5	4.1	5.0	6.4	4.6	4.5	11.8	7.0	9.6	8.4	0.7	0.7	3.5	11.8			
4-Nov	Z	0.4	0.6	1.2	2.0	22.9	12.5	12.5	28.7	18.4	19.0	11.0	8.7	6.5	16.8	28.8	11.3	9.8	11.0	5.5	9.0	8.0	6.2	4.6	10.9	28.8			
5-Nov	1.7	Z	1.5	0.6	5.7	45.7	27.6	22.3	30.2	32.3	29.2	23.6	8.9	1.3	0.6	0.8	1.9	3.9	14.6	2.1	0.7	0.4	1.3	0.7	11.2	45.7			
6-Nov	1.6	1.3	Z	0.8	1.0	1.3	1.4	1.8	4.0	7.1	21.7	2.4	1.1	1.9	1.7	10.9	6.7	4.7	4.6	5.5	3.6	2.0	1.8	1.3	3.9	21.7			
7-Nov	0.1	0.1	0.0	Z	0.1	0.1	0.0	0.2	5.5	3.5	0.8	0.4	0.5	0.4	6.2	29.6	32.5	19.2	14.7	3.1	1.0	0.9	0.5	0.5	5.2	32.5			
8-Nov	0.4	0.4	0.4	0.3	Z	1.0	4.5	2.2	2.6	5.4	7.3	6.5	4.6	18.1	25.9	46.8	55.3	10.7	3.4	1.3	0.3	0.3	0.1	0.0	8.6	55.3			
9-Nov	0.0	0.0	0.0	0.0	0.2	Z	0.5	0.2	1.6	1.5	0.8	1.5	2.5	2.4	3.2	15.6	5.9	8.7	21.9	22.3	7.1	6.3	4.4	3.7	4.8	22.3			
10-Nov	Z	1.1	1.7	2.1	4.6	4.6	1.2	4.3	7.8	15.1	9.6	1.6	1.4	2.2	2.3	3.7	22.3	21.5	26.2	17.8	10.3	3.0	1.5	1.5	7.3	26.2			
11-Nov	0.8	Z	0.8	0.8	1.1	2.5	1.6	1.6	1.6	2.7	2.1	1.5	1.1	1.1	1.1	1.1	1.6	1.4	1.6	1.6	1.2	1.5	0.9	0.6	1.4	2.7			
12-Nov	0.4	0.6	Z	0.4	0.8	1.3	2.8	1.9	1.4	0.9	0.6	0.7	0.6	0.4	0.3	0.2	0.1	0.2	0.8	0.7	0.7	0.5	0.3	0.4	0.7	2.8			
13-Nov	0.1	0.1	0.1	Z	0.5	1.7	2.0	3.2	5.1	3.9	3.4	2.6	5.1	5.5	7.5	6.2	5.0	1.7	0.2	0.8	0.6	0.4	0.3	0.3	2.4	7.5			
14-Nov	0.0	0.1	0.0	0.0	Z	0.2	0.5	0.2	0.4	0.7	0.8	0.6	0.5	0.5	2.9	2.5	2.9	3.1	1.2	1.6	0.7	0.2	0.3	0.1	0.9	3.1			
15-Nov	0.5	0.4	3.0	3.6	5.4	Z	8.2	14.8	23.4	12.4	6.5	5.6	8.2	8.1	8.3	5.7	4.3	4.9	3.3	2.8	3.0	2.9	3.0	3.3	6.2	23.4			
16-Nov	Z	3.4	4.7	3.6	7.8	18.6	10.4	12.5	3.8	8.3	5.7	9.0	5.0	2.3	2.2	1.9	2.0	2.2	2.2	2.1	2.2	1.6	1.4	1.0	4.9	18.6			
17-Nov	1.3	Z	0.7	0.8	1.3	1.3	1.6	1.4	2.2	2.5	3.7	4.1	4.9	6.7	6.6	6.2	19.8	5.6	0.5	0.2	0.0	0.0	0.0	0.0	3.1	19.8			
18-Nov	0.0	0.1	Z	0.0	0.1	0.0	0.2	0.0	0.1	0.4	0.9	0.4	0.6	0.6	0.5	4.1	3.6	3.5	15.8	15.8	2.9	0.8	0.3	0.3	2.2	15.8			
19-Nov	0.0	0.0	0.1	Z	0.2	0.0	1.0	0.7	0.8	0.9	1.3	2.4	1.4	1.3	1.1	0.2	0.4	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.5	2.4			
20-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.4	2.2	2.6	1.4	1.5	1.1	0.9	0.9	0.6	1.8	0.7	0.4	0.0	0.0	0.0	0.0	0.6	2.6			
21-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.2	1.0	1.9	3.3	3.6	4.0	3.3	1.5	0.2	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.9	4.0			
22-Nov	Z	0.0	0.0	0.0	0.0	0.3	1.1	1.1	1.1	1.5	C	C	C	C	C	C	0.1	0.2	0.4	0.0	0.2	0.0	0.0	0.0	--	1.5			
23-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.0	1.4	3.5	4.9	3.5	2.0	1.7	0.5	0.2	PF	PF	PF	0.1	0.0	0.0	1.0	4.9			
24-Nov	0.0	0.0	Z	0.0	0.0	0.2	2.6	1.9	2.7	3.6	4.6	5.1	4.6	3.9	2.4	1.2	0.4	8.0	8.1	3.8	6.8	9.6	3.1	5.8	3.4	9.6			
25-Nov	4.0	2.1	3.3	Z	3.7	3.2	3.2	3.1	4.0	5.2	5.6	6.3	6.6	7.0	9.3	6.1	3.4	3.1	2.6	5.1	2.7	2.4	1.4	1.8	4.1	9.3			
26-Nov	1.5	1.0	0.8	0.9	Z	1.5	1.6	1.6	2.1	3.6	4.7	5.7	5.0	7.8	5.7	8.1	2.9	4.4	1.6	0.2	0.1	0.0	0.0	0.0	2.6	8.1			
27-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	M	M	M	M	M	M	M	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	--	0.1			
28-Nov	Z	0.0	0.0	0.0	0.0	0.2	1.6	2.6	2.1	2.3	3.9	4.7	3.6	2.9	2.6	2.1	4.4	7.7	3.2	21.8	15.3	8.5	3.2	1.4	4.1	21.8			
29-Nov	0.6	Z	0.4	0.2	0.4	1.4	3.6	3.3	3.4	6.7	14.4	12.2	13.7	8.4	9.0	8.5	6.2	9.6	14.3	15.0	15.4	13.2	20.2	21.2	8.8	21.2			
30-Nov	19.9	14.9	Z	6.6	5.8	5.0	7.2	10.9	16.3	15.6	19.1	19.6	14.8	15.6	11.8	8.2	1.4	13.5	32.5	28.6	24.9	17.8	18.2	9.8	14.7	32.5			
																								Diurnal Average					
																								Diurnal Maximum					
Z - zerspan C - Calibration M - Maintenance PF - Power Failure																													



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Athabasca Valley - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Athabasca Valley - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	647	95.99	95.99
21 - 40	24	3.56	99.55
41 - 80	3	0.45	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 674

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Athabasca Valley - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	22	25	20	11	12	116	63	17	22	24	42	19	34	30	79	89	625
21 - 40	1	0	0	1	0	1	2	6	1	0	0	0	0	0	3	1	16
41 - 80	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	23	25	20	12	12	117	66	23	24	24	42	19	34	30	82	90	643

Total Number of Valid Hours: 643

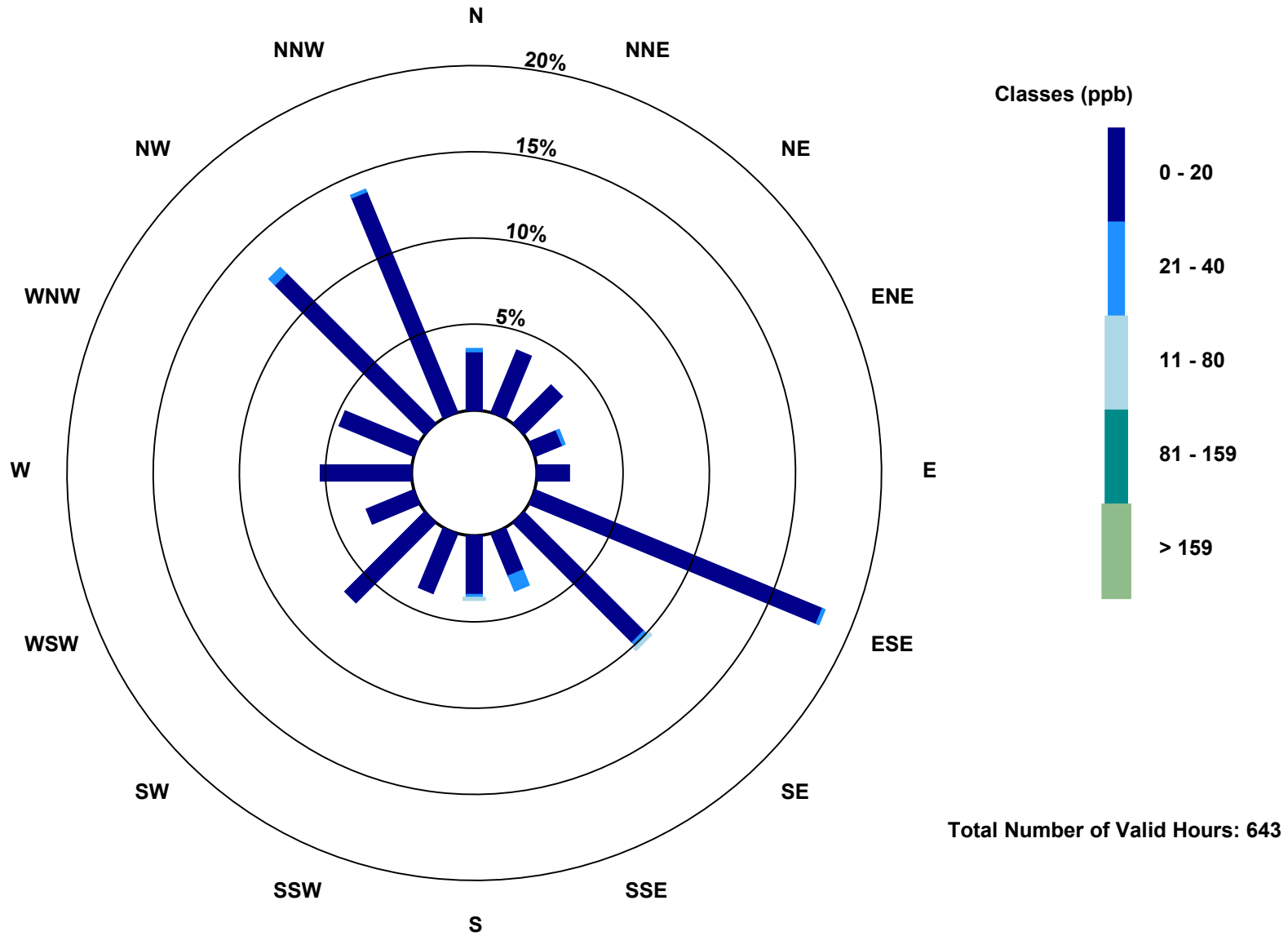
Total Number of Hours: 720

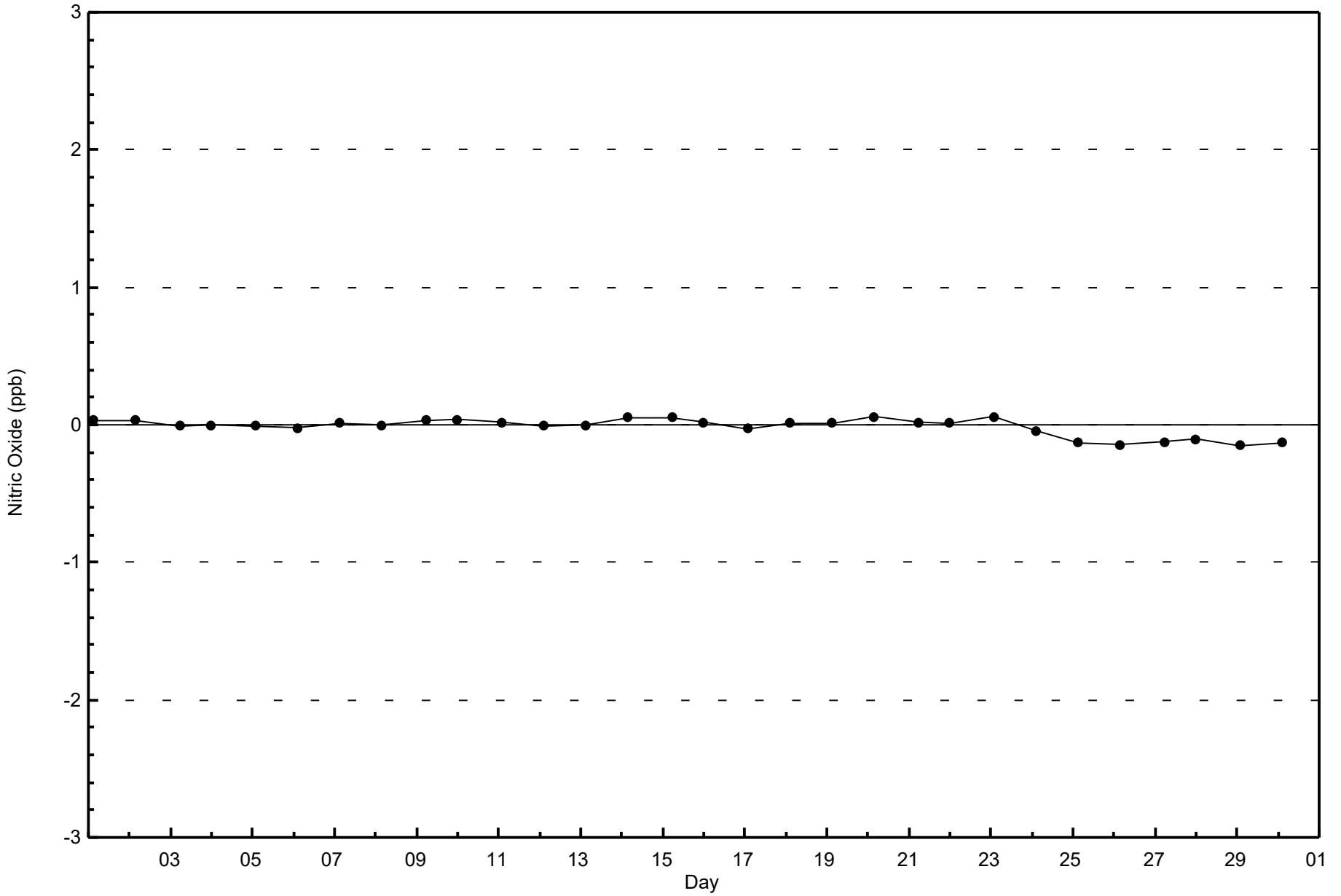


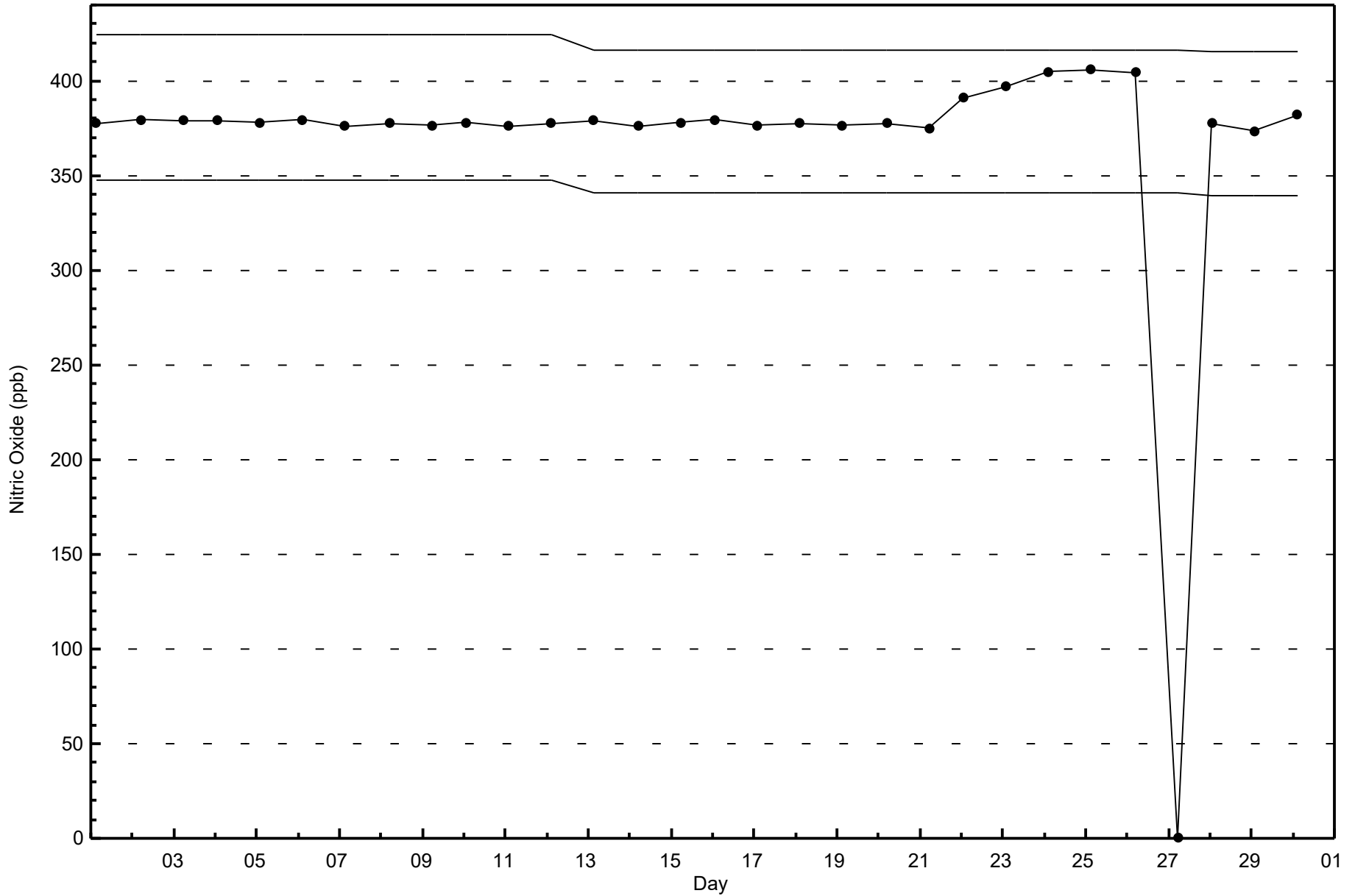


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitric Oxide (NO) - ppb  
Athabasca Valley









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb

Athabasca Valley - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 31.9 ppb on Nov 7 17:00	Maximum Daily Average: 24.2 ppb on Nov 30		Hours of Data:	674
Minimum Value: 0.7 ppb on Nov 14 04:00	Minimum Daily Average: 2.7 ppb on Nov 12		Hours of Missing Data:	46
Maximum Diurnal Average: 13.8 ppb at hour 17	Minimum Diurnal Average: 5.4 ppb at hour 3		Hours of Calibration:	36
Monthly Average: 8.64 ppb	Percentiles: P <sub>1</sub> = 0.8 P <sub>10</sub> = 1.8 Q <sub>1</sub> = 3.8 Median = 7.0 Q <sub>3</sub> = 11.2 P <sub>90</sub> = 19.1 P <sub>99</sub> = 28.8		Percent Operational Time:	98.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	1.2	1.0	1.0	Z	2.5	6.7	8.7	6.8	9.3	11.9	11.4	7.8	6.8	7.2	8.9	8.4	2.2	5.1	1.9	1.3	3.2	3.0	4.9	6.8	5.6	11.9
2-Nov	8.1	8.8	7.9	5.8	Z	2.8	2.0	1.5	5.9	6.9	7.1	5.1	5.6	5.5	5.5	3.7	1.1	1.2	6.2	5.7	5.3	4.7	4.0	4.9	5.0	8.8
3-Nov	5.0	4.4	5.6	5.1	6.5	Z	4.6	3.3	2.0	1.6	2.1	3.1	4.6	6.3	9.8	12.1	12.5	13.4	15.1	11.2	10.5	9.5	2.4	1.8	6.6	15.1
4-Nov	Z	2.6	2.2	1.7	3.2	10.8	9.5	7.2	14.3	9.5	9.4	7.0	6.1	6.5	12.6	20.2	19.0	16.3	15.2	9.1	10.6	10.0	9.3	9.3	9.6	20.2
5-Nov	4.4	Z	5.9	5.0	7.0	15.2	17.3	16.8	16.5	16.3	16.0	15.3	10.7	4.7	3.1	4.1	5.2	10.4	16.7	4.8	1.4	1.2	4.3	3.7	9.0	17.3
6-Nov	10.9	8.9	Z	4.1	5.1	5.3	6.1	8.1	12.3	16.7	20.8	4.9	2.4	4.6	5.2	14.0	23.1	20.5	19.3	18.8	14.8	7.4	8.2	8.4	10.9	23.1
7-Nov	5.1	7.9	9.0	Z	1.5	1.7	1.5	3.3	12.3	10.5	3.1	1.8	1.6	1.7	8.1	26.5	31.9	28.2	24.6	15.8	8.0	7.1	5.0	4.2	9.6	31.9
8-Nov	3.4	3.4	3.5	3.9	Z	6.5	10.6	8.4	8.9	9.7	8.5	9.0	9.4	14.1	20.2	24.5	24.1	13.2	9.4	4.9	2.8	10.1	6.3	1.4	9.4	24.5
9-Nov	1.6	1.1	0.8	1.2	1.4	Z	3.1	2.2	5.2	4.5	1.9	3.0	3.8	3.8	7.4	21.0	19.2	12.9	18.5	21.4	18.0	18.3	15.6	13.4	8.7	21.4
10-Nov	Z	8.9	8.7	9.1	10.3	10.7	7.8	8.1	9.6	11.7	7.7	2.3	1.9	3.0	4.4	7.8	18.8	22.1	22.1	19.2	15.2	10.0	6.3	5.4	10.0	22.1
11-Nov	4.2	Z	3.6	3.4	5.2	8.2	9.5	6.3	5.8	7.0	6.8	5.7	4.4	3.6	4.2	5.8	7.2	7.5	7.5	7.0	5.3	5.7	5.6	3.3	5.8	9.5
12-Nov	3.2	4.8	Z	4.0	2.5	2.5	4.3	5.9	2.3	1.8	1.6	2.1	1.5	1.4	1.5	1.7	2.1	3.4	3.9	4.1	3.1	2.1	1.8	1.2	2.7	5.9
13-Nov	0.8	1.4	1.2	Z	1.6	2.8	7.3	4.4	6.2	4.3	5.1	4.8	7.9	9.2	14.5	15.5	16.2	9.1	3.2	2.1	1.9	2.2	2.8	2.7	5.5	16.2
14-Nov	2.0	2.0	1.1	0.7	Z	1.0	1.3	0.8	0.8	1.1	1.0	0.8	0.8	1.4	11.0	13.3	18.3	19.4	15.9	16.7	14.1	11.2	8.7	9.5	6.6	19.4
15-Nov	14.5	17.6	18.8	18.9	18.6	Z	17.6	17.7	17.3	12.2	9.5	8.0	10.3	11.6	12.4	11.1	9.3	11.0	8.7	7.5	5.5	5.5	5.8	5.4	11.9	18.9
16-Nov	Z	5.6	5.6	6.2	5.7	7.0	6.8	7.5	3.9	5.1	4.6	8.0	6.8	5.0	6.4	6.2	8.6	8.2	9.9	9.4	10.1	7.5	6.4	5.8	6.8	10.1
17-Nov	6.6	Z	5.3	5.3	6.1	7.2	8.5	6.4	7.9	7.3	7.3	7.0	7.5	7.7	8.3	11.3	18.1	12.6	2.1	2.5	1.8	1.2	1.2	1.2	6.5	18.1
18-Nov	1.4	1.3	Z	2.2	2.8	2.2	4.0	2.5	2.6	2.6	2.2	1.1	1.2	1.1	2.3	13.0	13.9	17.7	21.5	22.4	15.5	10.8	6.8	5.4	6.8	22.4
19-Nov	3.9	3.7	3.7	Z	1.9	1.3	1.4	2.1	7.5	3.7	4.9	8.0	5.6	5.8	5.1	2.2	2.5	4.0	3.1	4.1	3.4	4.3	2.8	2.2	3.8	8.0
20-Nov	1.8	1.6	2.3	2.4	Z	4.0	8.0	7.9	6.2	5.5	6.5	4.1	4.2	4.4	4.4	6.0	5.0	4.1	3.2	4.3	4.2	4.4	2.2	1.9	4.3	8.0
21-Nov	3.4	5.5	3.6	2.3	2.9	Z	4.3	6.4	6.7	7.4	7.5	9.2	9.7	10.8	12.0	13.3	11.5	13.5	11.9	7.8	8.3	7.1	2.8	1.4	7.4	13.5
22-Nov	Z	7.5	4.4	3.2	2.8	3.4	6.2	7.5	5.4	4.3	C	C	C	C	C	C	8.1	5.2	5.8	7.5	11.2	7.3	6.0	4.7	--	11.2
23-Nov	4.1	Z	12.6	13.5	12.6	9.2	8.2	7.6	11.0	10.7	9.6	11.0	12.3	11.9	11.1	13.7	15.3	12.3	PF	PF	PF	10.9	6.9	7.6	10.6	15.3
24-Nov	8.8	6.2	Z	7.2	11.7	15.3	21.1	21.7	19.6	13.3	10.7	9.4	9.2	9.8	9.7	10.2	15.6	28.8	20.2	19.6	20.9	22.2	16.9	19.2	15.1	28.8
25-Nov	14.7	10.7	11.5	Z	9.1	8.2	8.8	8.4	8.6	8.0	8.2	7.1	7.2	8.8	14.4	14.6	12.2	12.0	9.8	13.2	9.1	10.5	7.7	7.9	10.0	14.7
26-Nov	6.9	5.7	5.4	5.2	Z	6.1	6.5	7.3	7.8	8.9	9.0	9.5	9.4	11.4	14.6	20.2	18.0	16.0	8.9	5.2	3.8	3.0	1.8	1.2	8.3	20.2
27-Nov	1.1	1.0	1.0	0.8	1.0	Z	1.7	1.8	1.9	M	M	M	M	M	M	M	2.0	3.0	4.7	5.4	7.5	3.0	2.2	3.4	--	7.5
28-Nov	Z	3.4	4.0	2.0	3.1	4.2	5.6	4.1	7.1	3.8	6.3	8.7	8.3	8.1	9.4	14.5	24.9	24.7	19.8	28.0	29.0	25.5	21.0	14.5	12.2	29.0
29-Nov	9.6	Z	6.9	6.6	6.3	6.5	7.3	7.4	7.7	9.6	11.7	10.4	12.0	12.6	17.1	22.8	26.6	26.6	26.0	25.2	24.2	22.6	23.6	23.6	15.3	26.6
30-Nov	23.8	23.7	Z	21.7	21.3	22.3	24.9	25.6	25.7	22.0	20.3	19.6	17.2	18.1	19.9	22.9	22.3	28.6	30.8	30.5	30.2	29.4	28.9	27.8	24.2	30.8

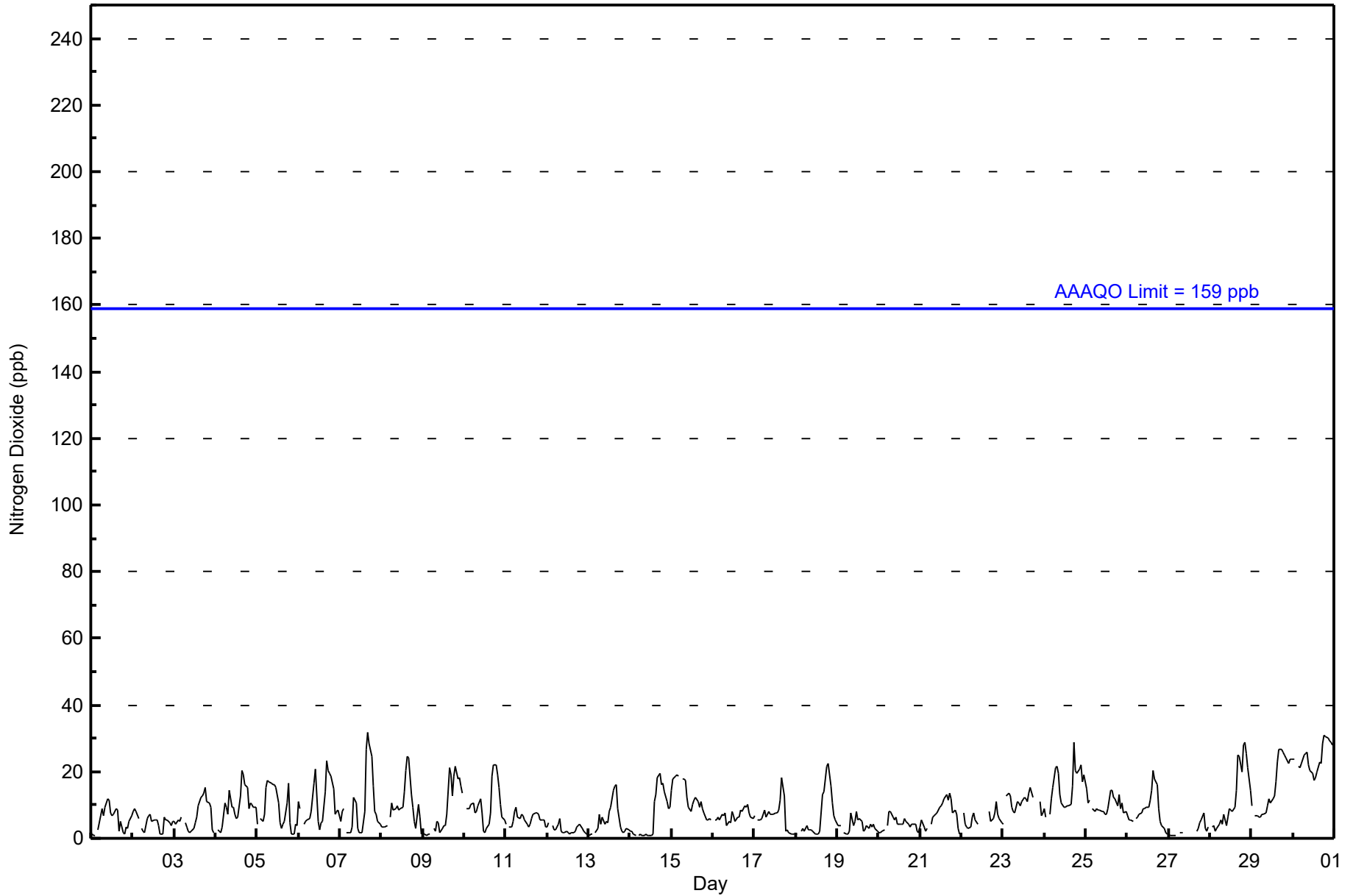
6.0	5.9	5.4	5.7	6.1	6.8	7.8	7.5	8.6	8.2	7.9	6.9	6.7	7.1	9.4	12.9	13.8	13.7	12.6	11.5	10.3	9.3	7.6	7.0	Diurnal Average	
23.8	23.7	18.8	21.7	21.3	22.3	24.9	25.6	25.7	22.0	20.8	19.6	17.2	18.1	20.2	26.5	31.9	28.8	30.8	30.5	30.2	29.4	28.9	27.8	Diurnal Maximum	

Z - zerospan      C - Calibration      M - Maintenance      PF - Power Failure  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Athabasca Valley - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Athabasca Valley - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	621	92.14	92.14
21 - 40	53	7.86	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 674

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Athabasca Valley - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	20	23	17	10	11	113	63	18	21	24	41	17	32	27	77	76	590
21 - 40	3	2	3	2	1	4	3	5	3	0	1	2	2	3	5	14	53
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	23	25	20	12	12	117	66	23	24	24	42	19	34	30	82	90	643

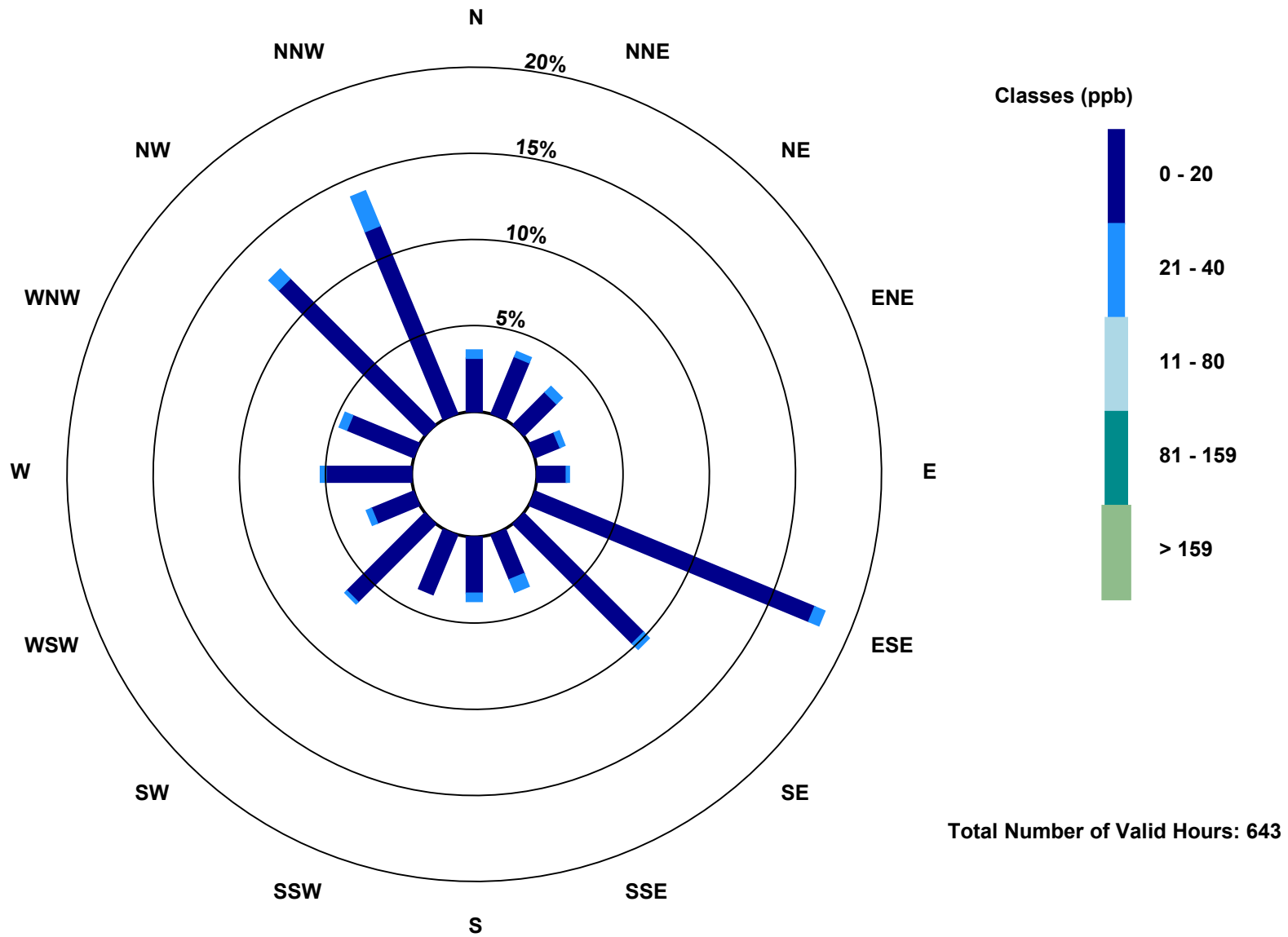
Total Number of Valid Hours: 643

Total Number of Hours: 720

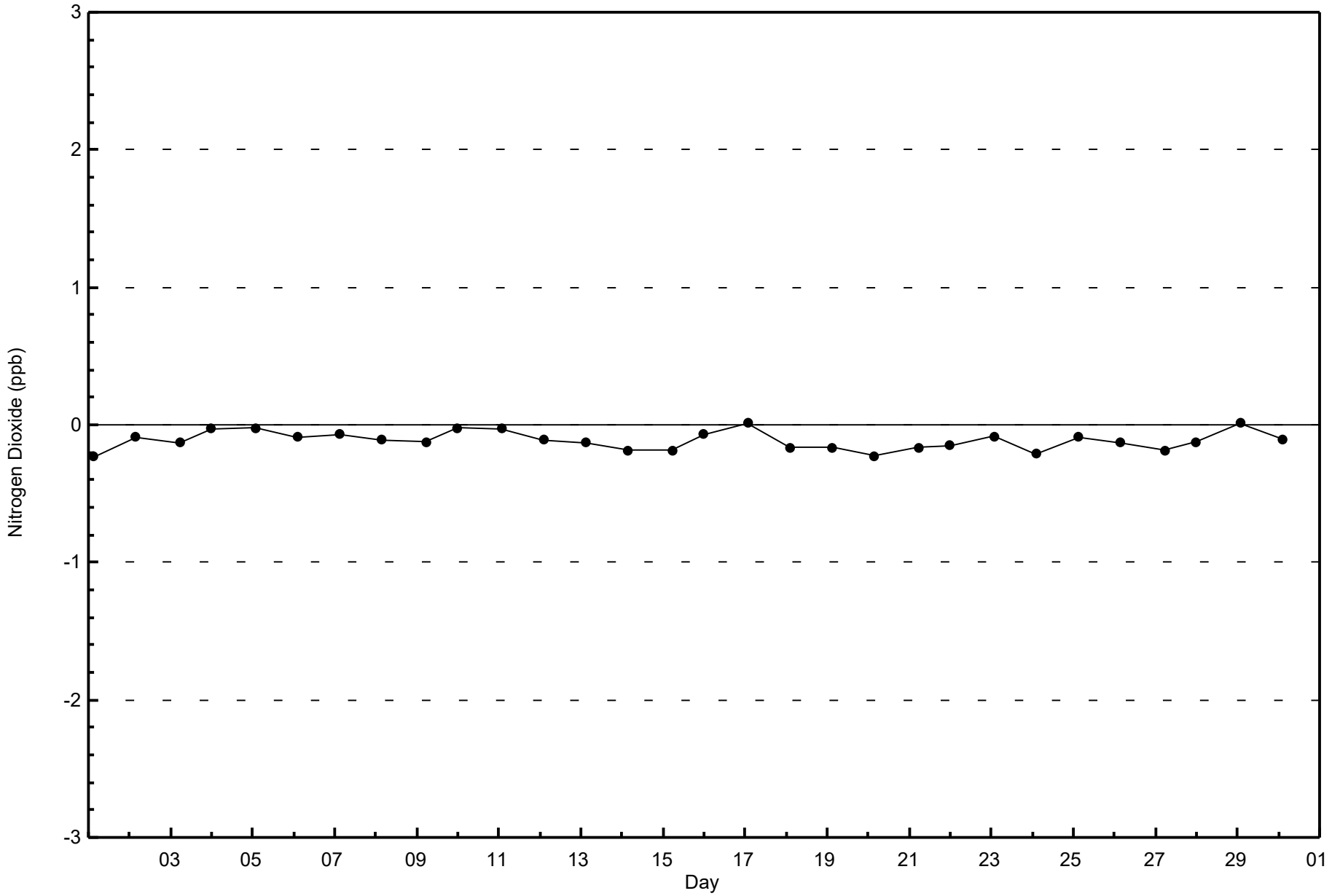


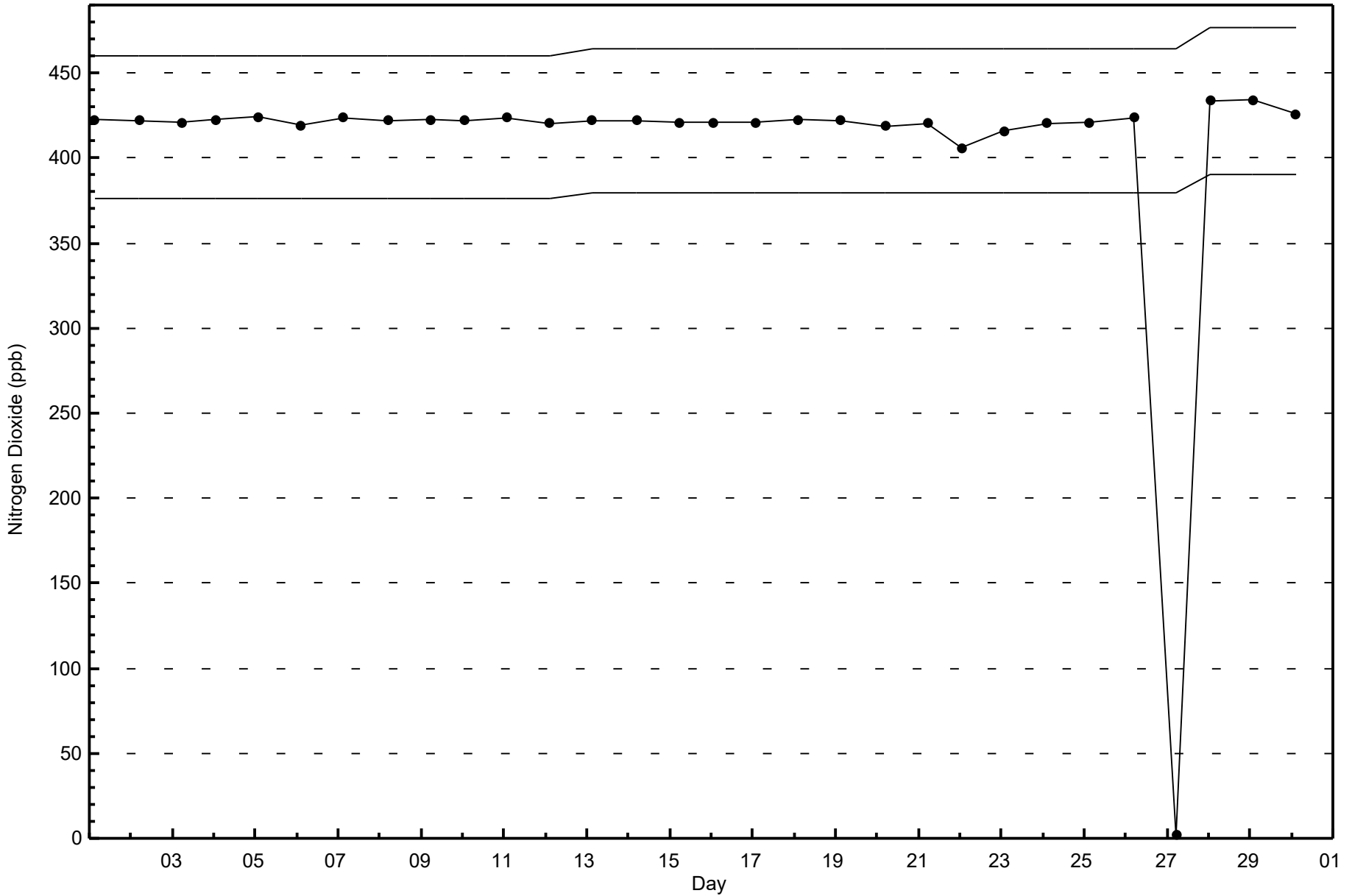
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Athabasca Valley











**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

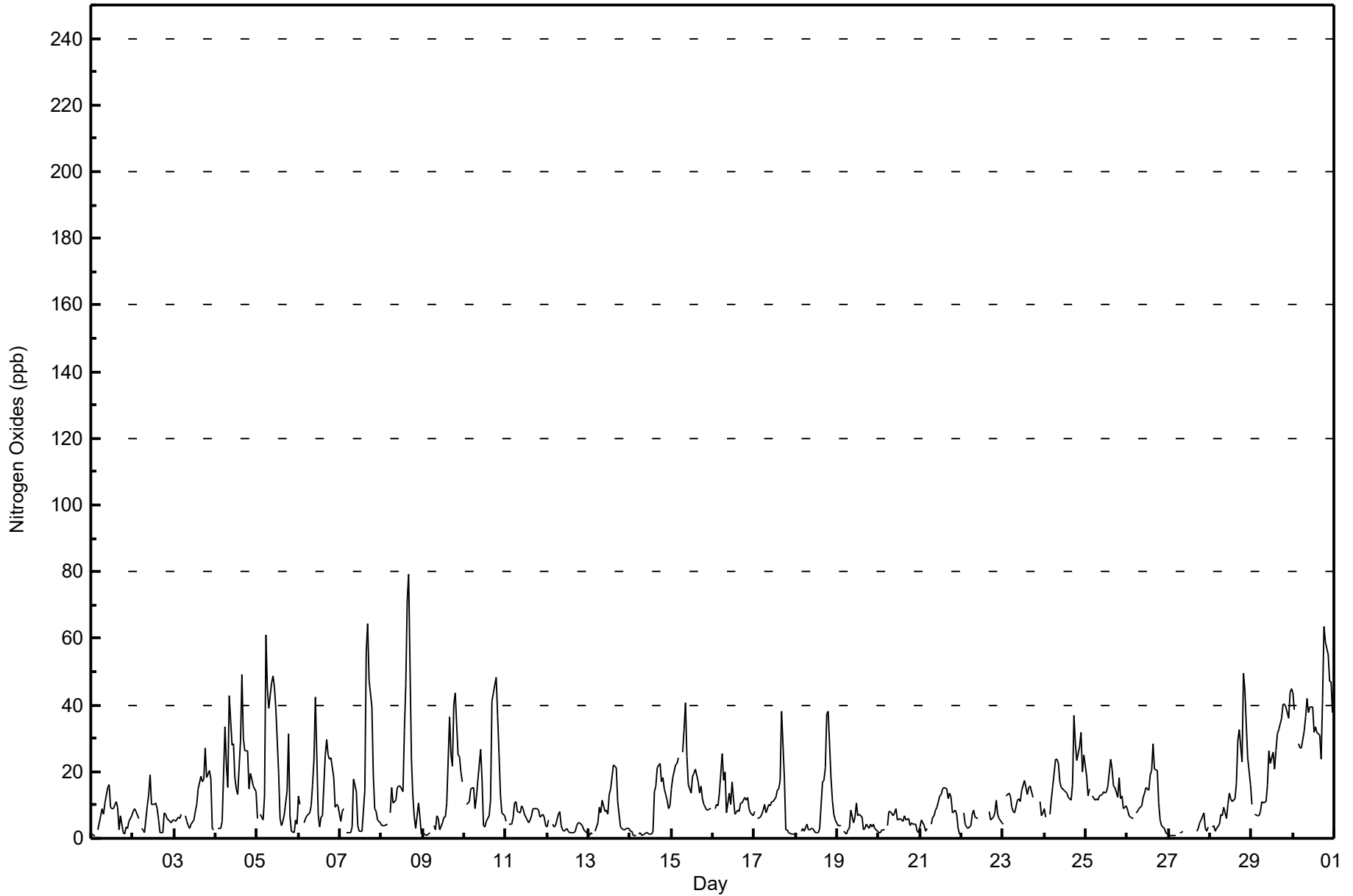
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Athabasca Valley - November 2024**

Maximum Value: 79.4 ppb on Nov 8 17:00		Maximum Daily Average: 38.9 ppb on Nov 30		Hours in Service: 720																																													
Minimum Value: 0.7 ppb on Nov 14 04:00		Minimum Daily Average: 3.5 ppb on Nov 12		Hours of Data: 674																																													
Maximum Diurnal Average: 20.5 ppb at hour 17		Minimum Diurnal Average: 6.2 ppb at hour 3		Hours of Missing Data: 46																																													
Monthly Average: 12.78 ppb		Percentiles: P <sub>1</sub> = 1.0 P <sub>10</sub> = 2.1 Q <sub>1</sub> = 4.4 Median = 8.8 Q <sub>3</sub> = 15.9 P <sub>90</sub> = 29.7 P <sub>99</sub> = 55.4		Hours of Calibration: 36																																													
				Percent Operational Time: 98.6																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	1.2	1.0	1.0	Z	2.5	6.8	8.8	7.1	10.5	15.1	16.2	9.5	8.9	8.9	10.9	9.4	2.6	6.9	1.9	1.3	3.2	3.1	4.9	6.8	6.5	16.2																							
2-Nov	8.1	8.8	7.9	5.9	Z	2.8	2.6	1.8	9.8	13.2	19.0	10.3	10.0	10.6	8.8	5.5	1.7	1.8	7.7	7.1	6.1	5.0	4.8	5.5	7.2	19.0																							
3-Nov	5.6	5.1	6.5	5.8	7.3	Z	6.7	5.0	3.7	3.1	4.1	5.6	8.1	10.4	14.8	18.5	17.1	17.9	26.9	18.2	20.1	17.9	3.1	2.5	10.2	26.9																							
4-Nov	Z	3.0	2.8	2.9	5.2	33.7	22.0	15.2	43.0	27.9	28.4	18.0	14.8	13.0	29.4	49.0	30.3	26.1	26.2	14.6	19.6	18.0	15.5	13.9	20.5	49.0																							
5-Nov	6.1	Z	7.4	5.6	12.7	60.9	44.9	39.1	46.7	48.6	45.2	38.9	19.6	6.0	3.7	4.9	7.1	14.3	31.3	6.9	2.1	1.6	5.6	4.4	20.2	60.9																							
6-Nov	12.5	10.2	Z	4.9	6.1	6.6	7.5	9.9	16.3	23.8	42.5	7.3	3.5	6.5	6.9	24.9	29.8	25.2	23.9	24.3	18.4	9.4	10.0	9.7	14.8	42.5																							
7-Nov	5.2	8.0	9.0	Z	1.6	1.8	1.5	3.5	17.8	14.0	3.9	2.2	2.1	2.1	14.3	56.1	64.4	47.4	39.3	18.9	9.0	8.0	5.5	4.7	14.8	64.4																							
8-Nov	3.8	3.8	3.9	4.2	Z	7.5	15.1	10.6	11.5	15.1	15.8	15.5	14.0	32.2	46.1	71.3	79.4	23.9	12.8	6.2	3.1	10.4	6.4	1.4	18.0	79.4																							
9-Nov	1.6	1.1	0.8	1.2	1.6	Z	3.6	2.4	6.8	6.0	2.7	4.5	6.3	6.2	10.6	36.6	25.1	21.6	40.4	43.7	25.1	24.6	20.0	17.1	13.4	43.7																							
10-Nov	Z	10.0	10.4	11.2	14.9	15.3	9.0	12.4	17.4	26.8	17.3	3.9	3.3	5.2	6.7	11.5	41.1	43.6	48.3	37.0	25.5	13.0	7.8	6.9	17.3	48.3																							
11-Nov	5.0	Z	4.4	4.2	6.3	10.7	11.1	7.9	7.4	9.7	8.9	7.2	5.5	4.7	5.3	6.9	8.8	8.9	9.1	8.6	6.5	7.2	6.5	3.9	7.2	11.1																							
12-Nov	3.6	5.4	Z	4.4	3.3	3.8	7.1	7.8	3.7	2.7	2.2	2.8	2.1	1.8	1.8	1.9	2.2	3.6	4.7	4.8	3.8	2.6	2.1	1.6	3.5	7.8																							
13-Nov	0.9	1.5	1.3	Z	2.1	4.5	9.3	7.6	11.3	8.2	8.5	7.4	13.0	14.7	22.0	21.7	21.2	10.8	3.4	2.9	2.5	2.6	3.1	3.0	8.0	22.0																							
14-Nov	2.0	2.1	1.1	0.7	Z	1.2	1.8	1.0	1.2	1.8	1.8	1.4	1.3	1.9	13.9	15.8	21.2	22.5	17.1	18.3	14.8	11.4	9.0	9.6	7.5	22.5																							
15-Nov	15.0	18.0	21.8	22.5	24.0	Z	25.8	32.5	40.7	24.6	16.0	13.6	18.5	19.7	20.7	16.8	13.6	15.9	12.0	10.3	8.5	8.4	8.8	8.7	18.1	40.7																							
16-Nov	Z	9.0	10.3	9.8	13.5	25.6	17.2	20.0	7.7	13.4	10.3	17.0	11.8	7.3	8.6	8.1	10.6	10.4	12.1	11.5	12.3	9.1	7.8	6.8	11.7	25.6																							
17-Nov	7.9	Z	6.0	6.1	7.4	8.5	10.1	7.8	10.1	9.8	11.0	11.1	12.4	14.4	14.9	17.5	37.9	18.2	2.6	2.7	1.8	1.2	1.2	1.2	9.6	37.9																							
18-Nov	1.4	1.4	Z	2.2	2.9	2.2	4.2	2.5	2.7	3.0	3.1	1.5	1.8	1.7	2.8	17.1	17.5	21.2	37.3	38.2	18.4	11.6	7.1	5.7	9.0	38.2																							
19-Nov	3.9	3.7	3.8	Z	2.1	1.3	2.4	2.8	8.3	4.6	6.2	10.4	7.0	7.1	6.2	2.4	2.9	4.2	3.1	4.2	3.4	4.3	2.8	2.2	4.3	10.4																							
20-Nov	1.8	1.6	2.3	2.4	Z	4.0	8.1	8.0	6.6	7.7	9.1	5.5	5.7	5.5	5.3	6.9	5.6	5.9	3.9	4.7	4.2	4.4	2.2	1.9	4.9	9.1																							
21-Nov	3.4	5.5	3.6	2.3	2.9	Z	4.4	6.5	6.9	8.4	9.4	12.5	13.3	14.8	15.3	14.8	11.7	13.6	12.1	7.8	8.4	7.1	2.8	1.4	8.2	15.3																							
22-Nov	Z	7.5	4.4	3.2	2.8	3.7	7.3	8.6	6.5	5.8	C	C	C	C	C	C	8.2	5.4	6.2	7.5	11.4	7.3	6.0	4.7	--	11.4																							
23-Nov	4.1	Z	12.6	13.5	12.6	9.2	8.2	7.7	11.4	11.7	11.0	14.5	17.2	15.4	13.1	15.4	15.8	12.5	PF	PF	PF	11.0	6.9	7.6	11.6	17.2																							
24-Nov	8.8	6.2	Z	7.2	11.7	15.5	23.7	23.6	22.3	16.9	15.3	14.5	13.8	13.7	12.1	11.4	16.0	36.8	28.3	23.4	27.7	31.8	20.0	25.0	18.5	36.8																							
25-Nov	18.7	12.8	14.8	Z	12.8	11.4	12.0	11.5	12.6	13.2	13.8	13.4	13.8	15.8	23.7	20.7	15.6	15.1	12.4	18.3	11.8	12.9	9.1	9.7	14.2	23.7																							
26-Nov	8.4	6.7	6.2	6.1	Z	7.6	8.1	8.9	9.9	12.5	13.7	15.2	14.4	19.2	20.3	28.3	20.9	20.4	10.5	5.4	3.9	3.0	1.8	1.2	11.0	28.3																							
27-Nov	1.1	1.0	1.0	0.8	1.0	Z	1.8	1.9	2.0	M	M	M	M	M	M	M	2.1	3.1	4.8	5.5	7.5	3.0	2.2	3.4	--	7.5																							
28-Nov	Z	3.4	4.0	2.0	3.1	4.4	7.2	6.7	9.2	6.1	10.2	13.4	11.9	11.0	12.0	16.6	29.3	32.4	23.0	49.8	44.3	34.0	24.2	15.9	16.3	49.8																							
29-Nov	10.2	Z	7.3	6.8	6.7	7.9	10.9	10.7	11.1	16.3	26.1	22.6	25.7	21.0	26.1	31.3	32.8	36.2	40.3	40.2	39.6	35.8	43.8	44.8	24.1	44.8																							
30-Nov	43.7	38.6	Z	28.3	27.1	27.3	32.1	36.5	42.0	37.6	39.4	39.2	32.0	33.7	31.7	31.1	23.7	42.1	63.3	59.1	55.1	47.2	47.1	37.6	38.9	63.3																							
																								7.4	7.0	6.2	6.6	7.8	11.4	11.2	10.9	13.9	14.1	14.7	12.1	11.1	11.6	14.6	20.4	20.5	18.9	19.5	17.3	14.4	12.2	9.9	9.0	Diurnal Average	
																								43.7	38.6	21.8	28.3	27.1	60.9	44.9	39.1	46.7	48.6	45.2	39.2	32.0	33.7	46.1	71.3	79.4	47.4	63.3	59.1	55.1	47.2	47.1	44.8	Diurnal Maximum	
Z - zerspan		C - Calibration			M - Maintenance			PF - Power Failure																																									



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Athabasca Valley - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Athabasca Valley - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	551	81.75	81.75
21 - 40	92	13.65	95.40
41 - 80	31	4.60	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 674

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Athabasca Valley - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	19	22	16	9	10	104	53	16	18	23	40	15	29	27	67	66	534
21 - 40	2	3	4	1	2	12	9	2	4	1	2	4	5	1	11	21	84
11 - 80	2	0	0	2	0	1	4	5	2	0	0	0	0	2	4	3	25
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	23	25	20	12	12	117	66	23	24	24	42	19	34	30	82	90	643

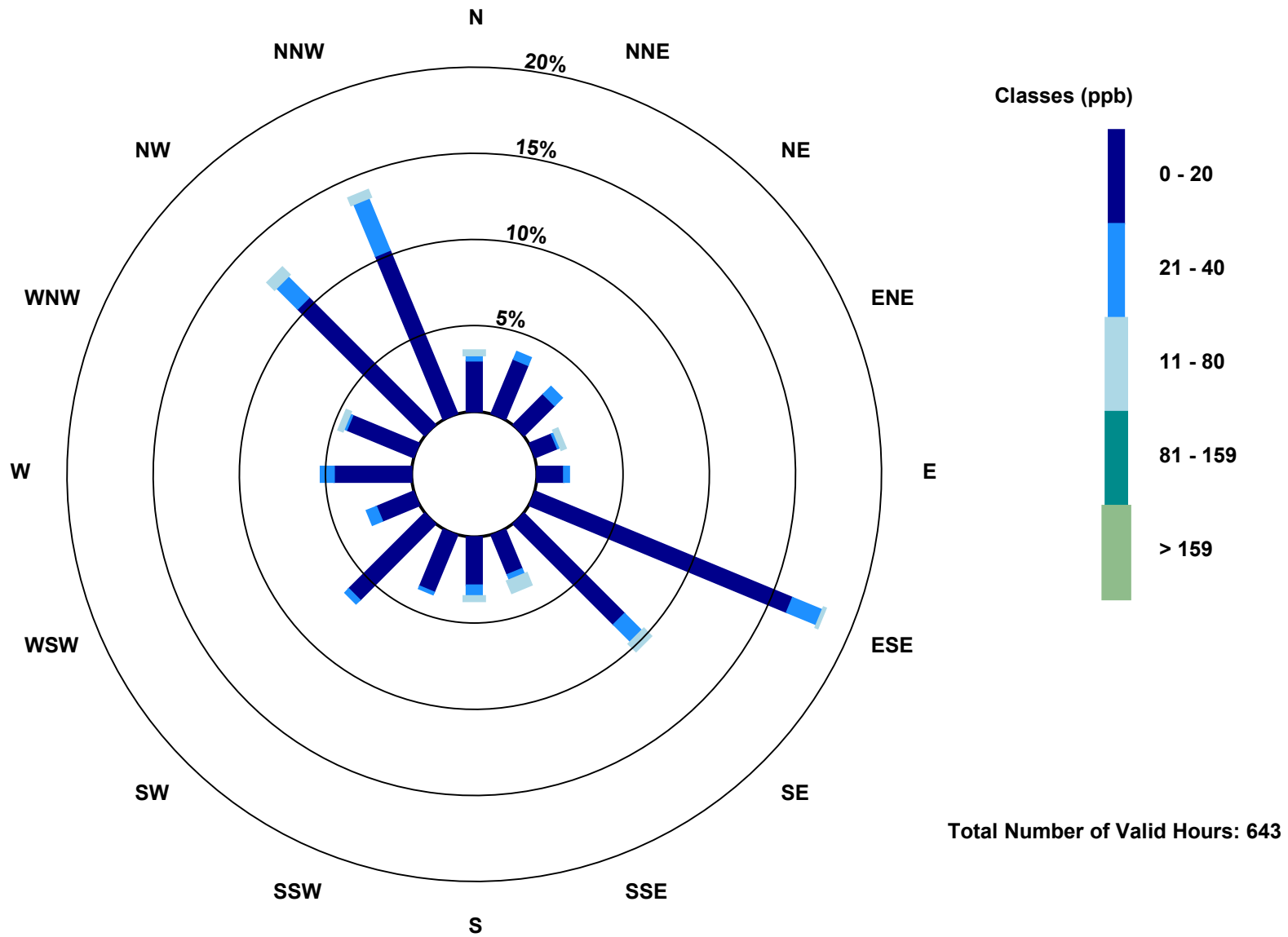
Total Number of Valid Hours: 643

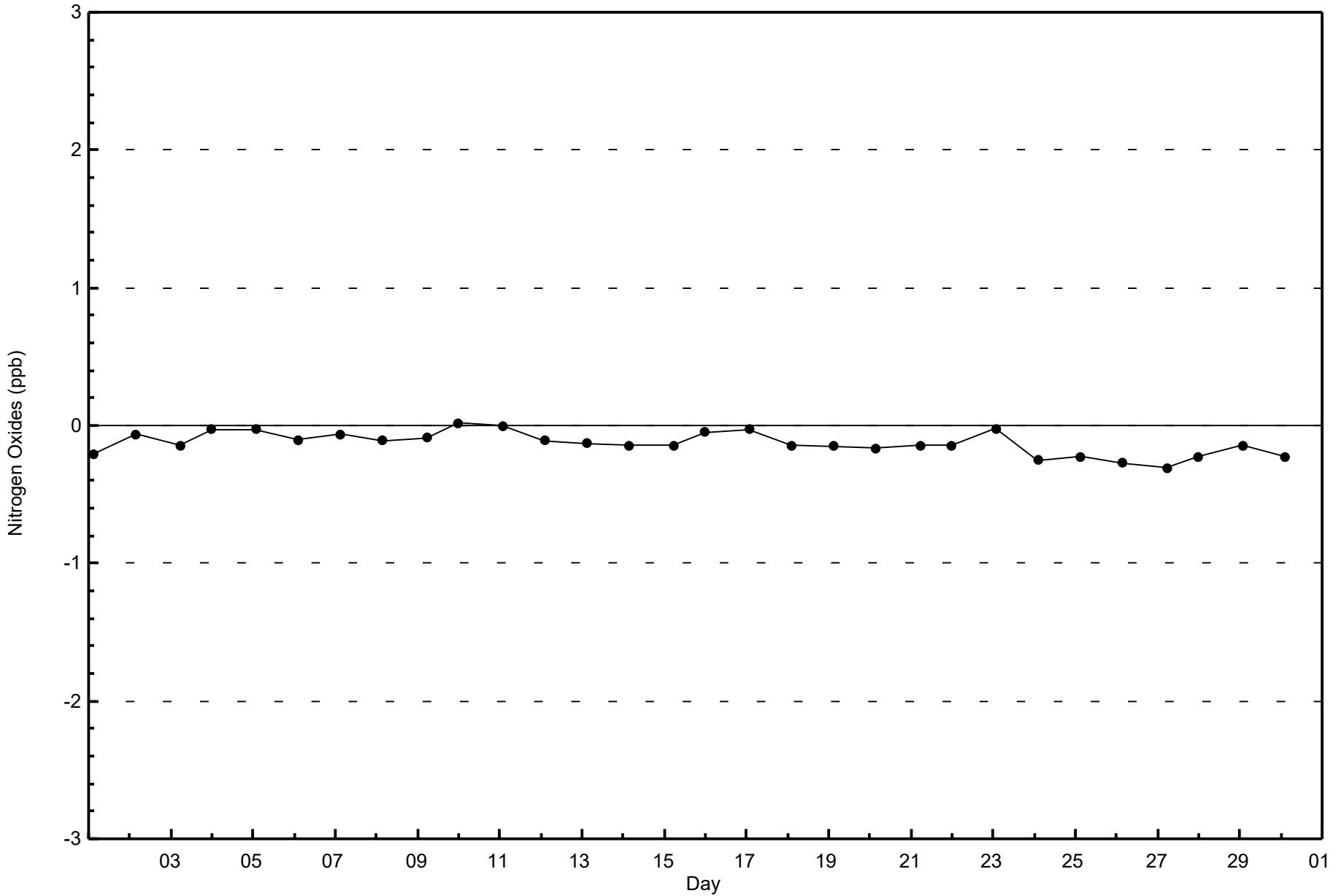
Total Number of Hours: 720



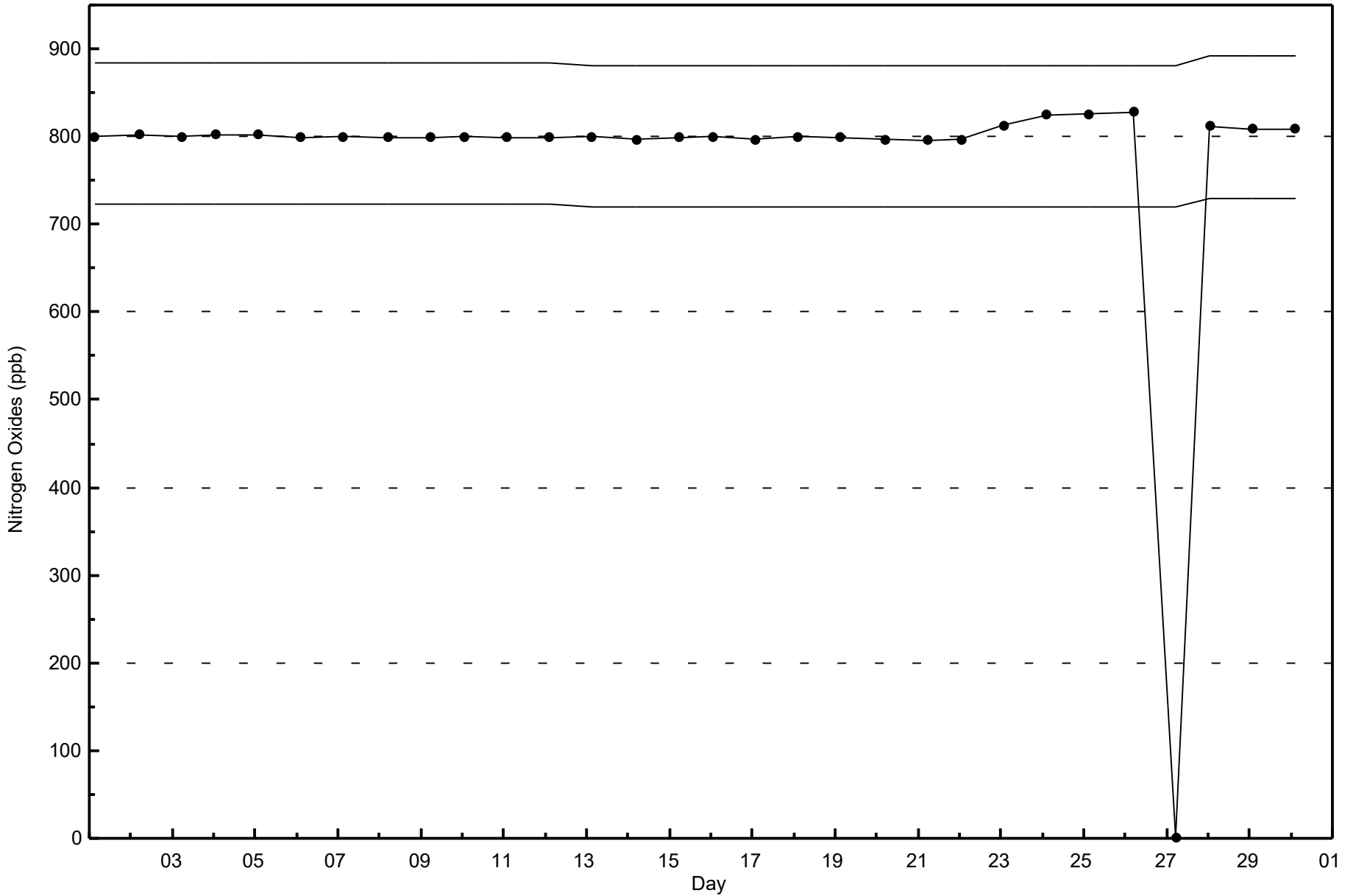
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Athabasca Valley











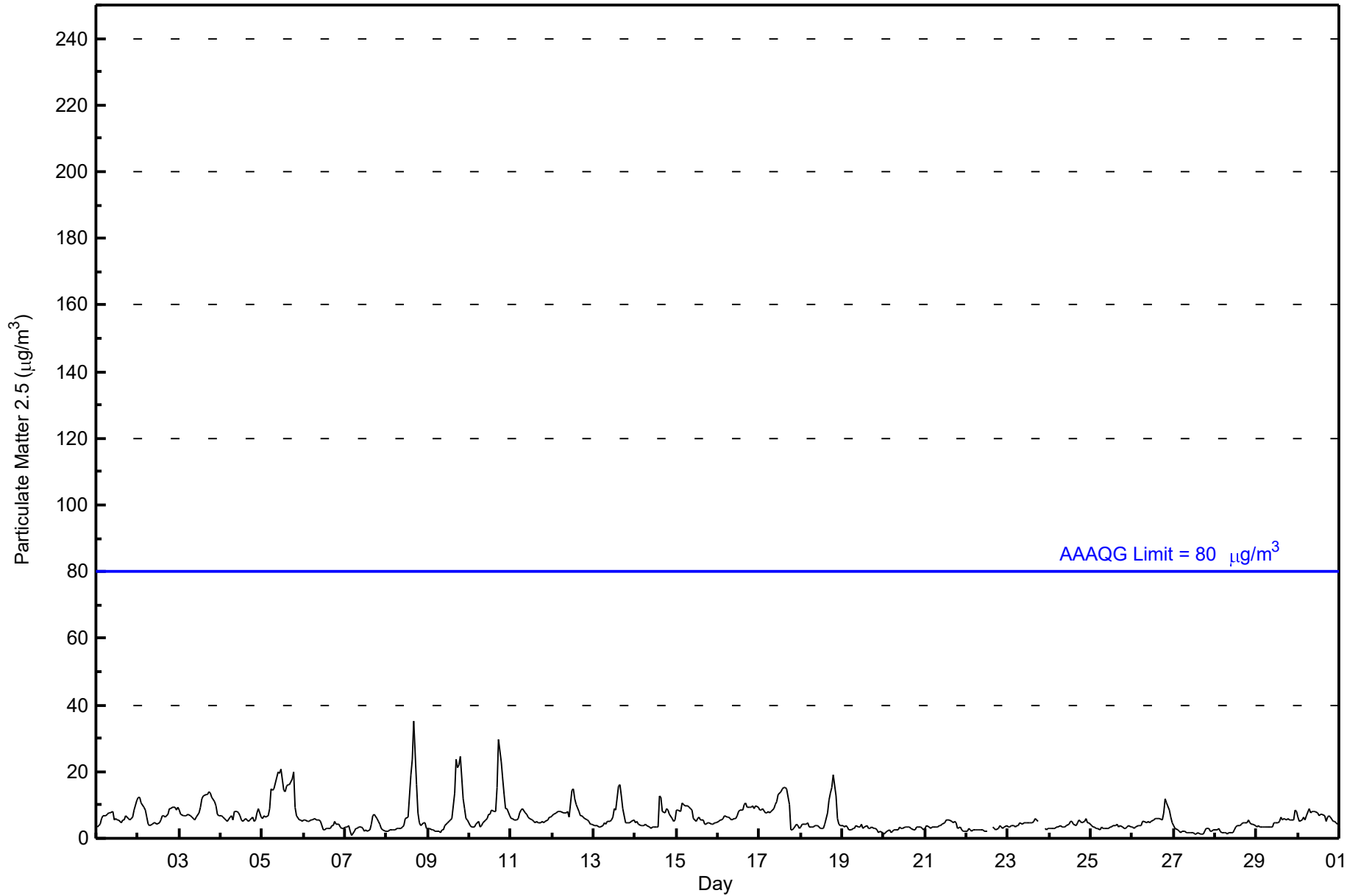
# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

## Athabasca Valley - November 2024

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Daily Average		Daily Maximum																									
Maximum Value: 35.3 µg/m <sup>3</sup> on Nov 8 17:00		Maximum Daily Average: 12.6 µg/m <sup>3</sup> on Nov 5																	Hours of Data: 715		Hours of Missing Data: 5																											
Minimum Value: 1.0 µg/m <sup>3</sup> on Nov 7 05:00		Minimum Daily Average: 2.0 µg/m <sup>3</sup> on Nov 27																	Hours of Calibration: 2		Percent Operational Time: 99.6																											
Maximum Diurnal Average: 8.5 µg/m <sup>3</sup> at hour 17		Minimum Diurnal Average: 4.6 µg/m <sup>3</sup> at hour 4																																														
Monthly Average: 5.83 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 1.5 P <sub>10</sub> = 2.6 Q <sub>1</sub> = 3.3 Median = 4.9 Q <sub>3</sub> = 6.9 P <sub>90</sub> = 9.8 P <sub>99</sub> = 21.3																																														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	3.4	3.7	4.2	5.8	6.8	6.9	7.2	7.6	7.6	7.9	5.3	6.0	5.7	5.5	4.7	5.3	5.4	6.9	5.9	5.3	5.9	6.5	8.3	11.5	6.2	11.5																						
2-Nov	12.2	12.5	10.7	9.4	8.7	6.3	4.1	3.8	4.2	4.5	4.6	4.1	4.5	5.7	6.7	6.7	6.2	7.0	8.8	9.1	9.3	9.4	8.6	9.3	7.4	12.5																						
3-Nov	8.4	7.2	6.9	6.6	6.7	7.1	6.9	6.3	5.8	5.7	6.5	7.5	9.1	11.7	12.9	13.0	13.2	13.8	13.3	12.2	11.0	9.6	7.1	6.7	9.0	13.8																						
4-Nov	6.7	6.5	6.0	5.4	5.2	6.6	6.8	5.4	8.0	8.1	7.8	6.9	5.4	5.2	5.9	5.4	5.2	5.4	6.3	5.0	5.6	7.7	8.9	6.2	6.3	8.9																						
5-Nov	5.9	6.7	6.2	6.8	8.9	14.6	14.2	15.0	18.1	19.8	19.3	20.7	14.3	13.8	15.8	16.0	16.3	17.9	20.1	9.5	6.7	5.7	5.5	5.2	12.6	20.7																						
6-Nov	5.7	5.3	5.1	4.9	5.4	5.6	6.0	5.7	5.4	5.3	5.2	2.7	2.5	2.8	3.0	3.0	3.9	3.8	5.2	4.3	4.3	3.3	3.1	3.1	4.4	6.0																						
7-Nov	3.2	3.5	3.7	2.1	1.0	2.2	2.9	2.8	3.3	3.6	2.8	2.2	2.5	2.3	2.5	4.2	6.9	7.3	6.1	5.0	4.3	3.0	2.5	2.2	3.4	7.3																						
8-Nov	2.1	2.1	2.4	2.4	2.5	2.7	3.0	3.0	3.1	3.5	4.0	6.0	6.5	12.6	19.0	23.9	35.3	16.0	7.5	4.9	3.9	4.6	4.8	3.1	7.5	35.3																						
9-Nov	3.0	2.8	2.6	2.6	2.3	2.1	2.0	1.9	2.5	2.7	3.7	4.6	5.0	5.7	5.9	13.5	23.9	21.4	22.2	24.8	11.8	9.0	5.7	5.4	7.8	24.8																						
10-Nov	3.8	3.4	3.2	3.5	4.3	5.1	3.2	4.0	4.7	5.6	6.1	7.0	7.4	8.3	8.1	8.3	15.4	29.5	22.9	17.8	13.1	8.8	8.9	6.7	8.7	29.5																						
11-Nov	5.9	6.0	5.7	5.5	6.1	7.8	8.5	9.0	7.8	7.1	6.5	5.8	5.4	5.1	4.8	4.9	4.7	4.7	5.1	4.8	5.0	5.4	6.2	6.3	6.0	9.0																						
12-Nov	6.6	7.2	7.5	8.1	8.3	8.0	7.7	7.8	7.8	8.1	6.4	14.3	14.9	12.0	10.0	7.9	7.0	6.7	6.5	6.1	5.7	4.9	4.4	4.1	7.8	14.9																						
13-Nov	3.9	3.7	3.7	3.5	3.5	3.8	4.8	4.1	5.0	5.1	5.4	6.3	8.8	8.6	15.8	16.3	12.8	8.8	4.8	4.6	4.6	4.8	5.2	5.3	6.4	16.3																						
14-Nov	4.8	4.9	4.3	3.8	3.9	4.0	4.1	3.7	3.6	3.2	3.3	3.6	3.2	3.3	12.6	12.4	8.1	7.5	9.0	8.3	7.1	5.9	5.3	5.5	5.6	12.6																						
15-Nov	8.3	8.7	8.2	10.4	10.0	9.8	9.7	9.5	8.9	8.5	6.0	5.0	6.0	6.3	5.4	5.7	4.2	4.4	4.7	4.7	4.4	4.3	4.7	4.7	6.8	10.4																						
16-Nov	5.2	5.4	5.6	5.9	6.6	6.2	6.2	6.0	5.6	6.0	6.0	6.7	7.9	8.7	8.5	10.0	10.4	9.3	9.2	9.5	9.6	9.0	9.7	9.1	7.6	10.4																						
17-Nov	8.5	8.7	9.1	7.7	7.7	8.0	7.6	8.3	9.0	10.0	11.0	13.0	13.8	15.0	15.2	15.4	15.0	10.0	2.7	2.7	3.2	4.1	3.6	3.1	8.8	15.4																						
18-Nov	3.4	4.2	4.3	4.4	4.5	3.4	3.4	3.3	3.7	3.8	3.6	3.0	2.9	3.0	4.4	7.7	11.3	13.5	15.4	19.0	12.7	5.8	4.2	3.9	6.2	19.0																						
19-Nov	3.6	3.6	3.6	3.4	2.7	2.7	3.0	3.1	3.9	3.6	3.2	4.3	2.9	3.5	3.8	2.8	3.0	3.2	3.1	3.1	2.5	1.8	2.0	1.8	3.1	4.3																						
20-Nov	1.4	1.9	2.1	2.4	1.7	2.2	2.5	2.7	2.7	3.2	2.8	3.1	3.4	3.5	3.2	3.6	3.2	2.7	2.8	3.2	3.3	3.3	2.8	2.6	2.8	3.6																						
21-Nov	3.0	3.6	3.2	3.0	3.3	3.5	3.3	3.6	3.6	3.9	4.3	4.8	5.6	5.5	5.4	5.1	4.5	5.2	4.7	2.8	3.2	2.7	2.0	1.9	3.8	5.6																						
22-Nov	2.0	2.9	2.7	2.1	2.4	2.5	2.6	2.6	2.5	2.5	2.2	2.1	1.9	C	C	3.4	3.0	2.7	3.1	3.6	3.2	3.0	3.5	3.8	2.7	3.8																						
23-Nov	3.2	3.2	3.9	4.0	3.6	3.7	3.8	4.6	4.3	4.9	4.5	4.7	4.7	4.5	4.5	5.0	5.9	5.2	PF	PF	PF	3.0	2.7	2.8	4.1	5.9																						
24-Nov	2.8	2.8	2.8	3.0	3.2	3.3	3.7	3.5	3.5	3.4	3.8	4.3	5.0	5.0	4.4	4.0	4.6	5.7	5.0	4.7	5.0	5.9	4.7	4.9	4.1	5.9																						
25-Nov	3.9	3.4	3.4	2.9	2.8	2.8	3.4	2.8	3.0	2.9	3.0	3.2	3.4	3.6	3.9	4.0	3.3	3.7	3.4	3.2	2.9	3.2	3.7	3.5	3.3	4.0																						
26-Nov	3.4	3.0	3.4	3.7	3.8	4.0	4.9	5.3	4.9	4.9	4.7	4.9	5.6	5.8	5.9	6.1	6.0	5.4	7.8	11.9	10.8	8.5	6.4	4.8	5.7	11.9																						
27-Nov	3.9	3.1	2.7	2.0	1.9	1.9	2.0	1.7	1.6	1.7	1.7	1.5	1.5	1.5	1.5	1.3	1.2	1.4	1.9	3.1	3.1	2.2	2.0	2.4	2.0	3.9																						
28-Nov	2.5	2.5	3.0	1.9	1.9	1.7	1.7	1.5	1.8	1.5	1.9	2.4	3.5	3.7	4.0	4.1	4.8	4.9	4.8	5.4	4.7	4.2	4.0	3.7	3.2	5.4																						
29-Nov	3.6	3.6	3.4	3.4	3.4	3.3	3.2	3.4	3.4	3.3	4.5	4.5	4.8	5.0	6.4	5.5	5.8	5.6	5.8	5.6	5.4	5.4	8.3	7.9	4.8	8.3																						
30-Nov	6.4	5.1	5.4	6.4	5.5	6.6	8.9	7.8	8.0	8.1	8.2	7.8	6.9	7.4	7.3	6.7	5.0	6.2	6.8	6.2	5.2	5.0	4.8	4.4	6.5	8.9																						
																								4.7	4.7	4.6	4.6	4.6	5.0	5.0	5.0	5.2	5.4	5.3	5.8	5.8	6.4	7.3	7.7	8.5	8.2	7.8	7.3	6.1	5.3	5.1	4.9	Diurnal Average
																								12.2	12.5	10.7	10.4	10.0	14.6	14.2	15.0	18.1	19.8	19.3	20.7	14.9	15.0	19.0	23.9	35.3	29.5	22.9	24.8	13.1	9.6	9.7	11.5	Diurnal Maximum
C - Calibration PF - Power Failure																																																
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m <sup>3</sup> 24-hr 29 µg/m <sup>3</sup>																																																





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Athabasca Valley - November 2024**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	432	60.42	60.42
6 - 15	260	36.36	96.78
16 - 25	21	2.94	99.72
26 - 80	2	0.28	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 715

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>**  
**Athabasca Valley - November 2024**

Concentration Ranges (μg/m <sup>3</sup> )	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	16	18	15	5	3	68	35	8	11	13	27	18	31	28	67	64	427
6 - 15	8	6	7	6	9	50	31	14	11	11	18	3	10	6	16	31	237
16 - 25	0	1	0	2	0	3	4	2	0	1	0	0	0	0	3	0	16
26 - 80	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	24	25	22	13	12	121	70	24	24	25	45	21	41	34	86	95	682

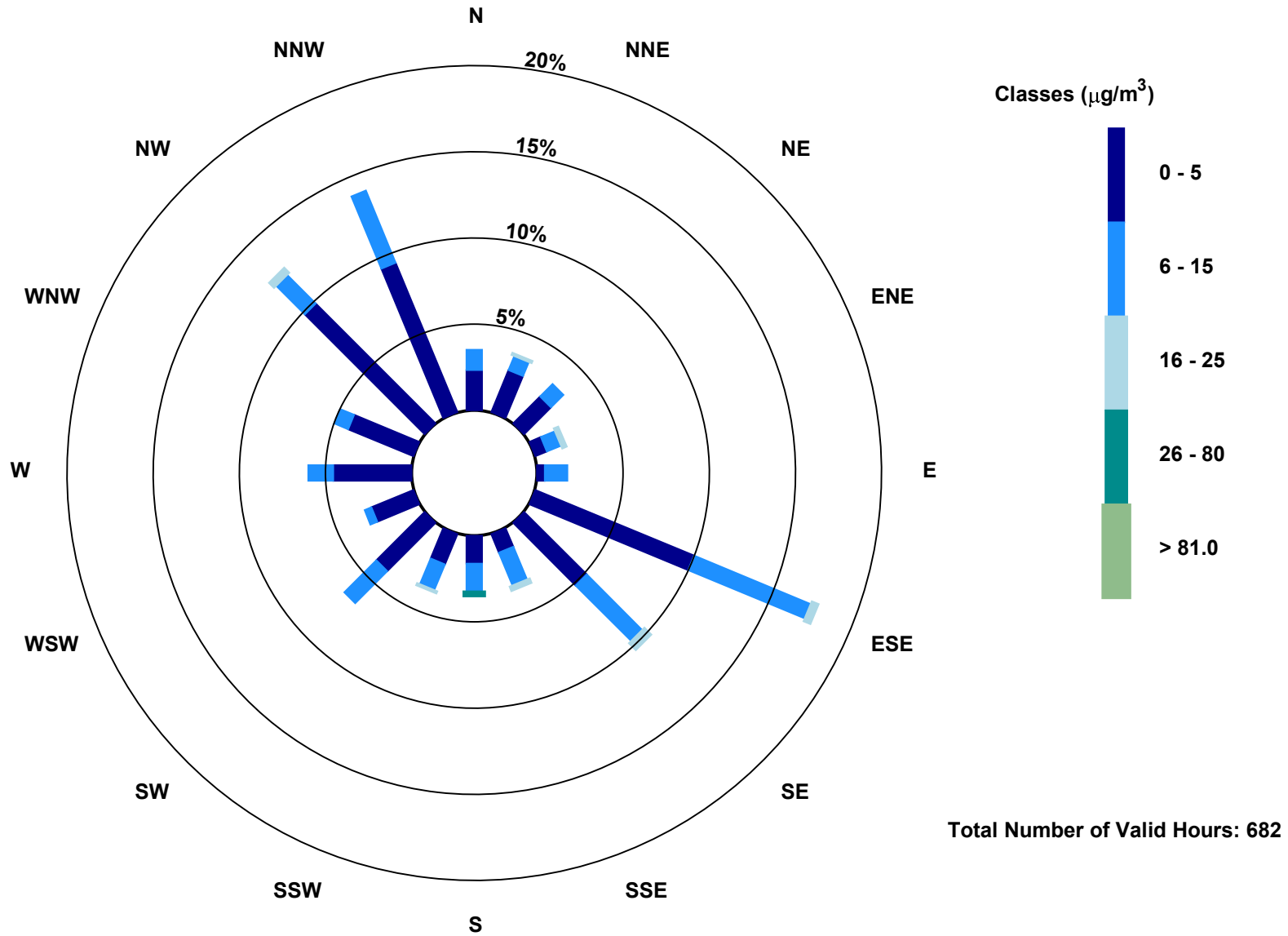
Total Number of Valid Hours: 682

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Athabasca Valley

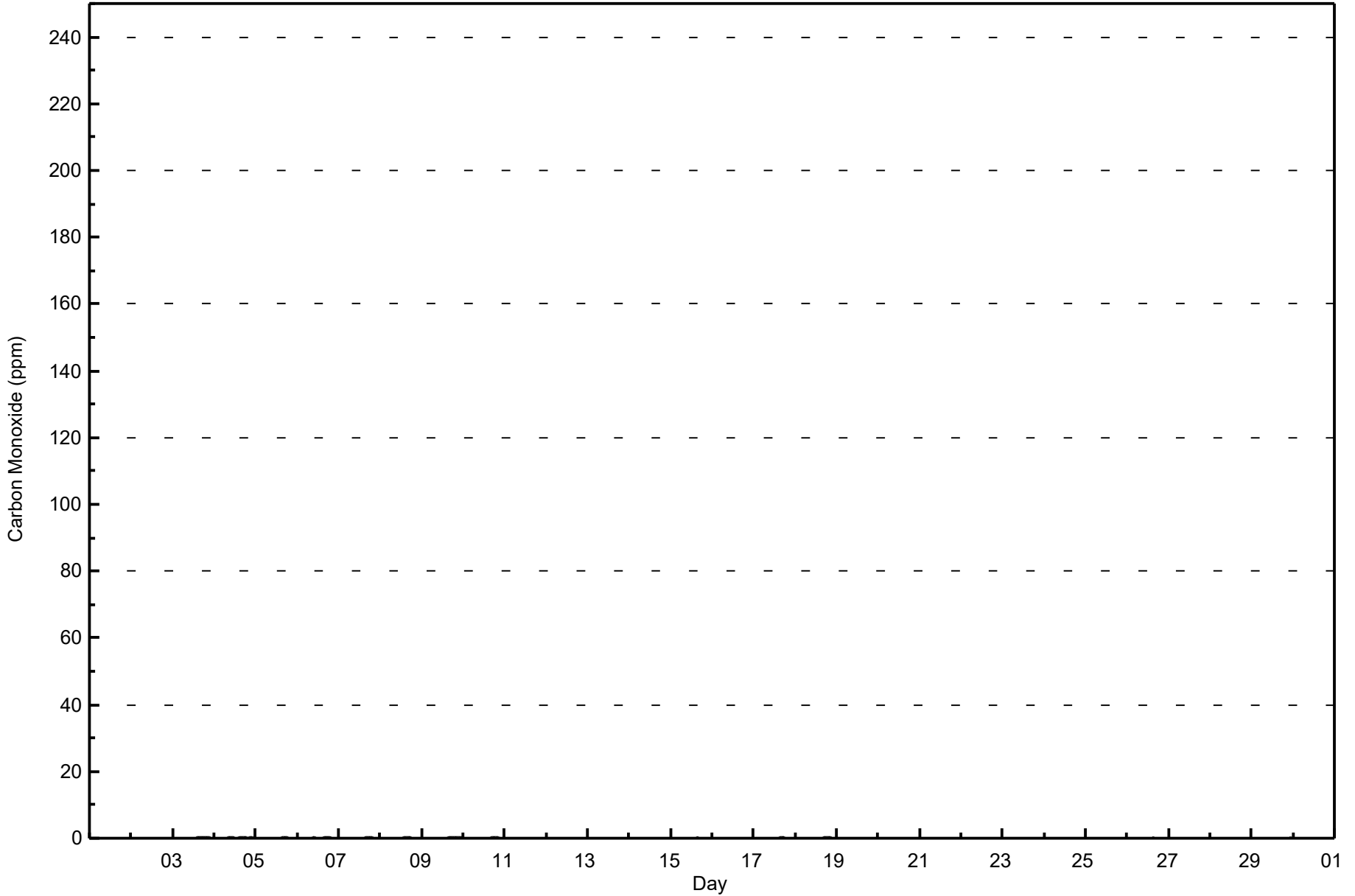






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Carbon Monoxide (CO) - ppm**  
**Athabasca Valley - November 2024**







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Carbon Monoxide (CO) - ppm**  
**Athabasca Valley - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	673	98.54	98.54
0.4 - 0.5	10	1.46	100.00
0.6 - 0.7	0	0.00	100.00
0.8 - 1.4	0	0.00	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Carbon Monoxide (CO) - ppm  
Athabasca Valley - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.3	24	24	20	13	12	116	61	19	22	24	44	18	36	33	82	94	642
0.4 - 0.5	0	0	0	0	0	1	4	3	2	0	0	0	0	0	0	0	10
0.6 - 0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.8 - 1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	24	24	20	13	12	117	65	22	24	24	44	18	36	33	82	94	652

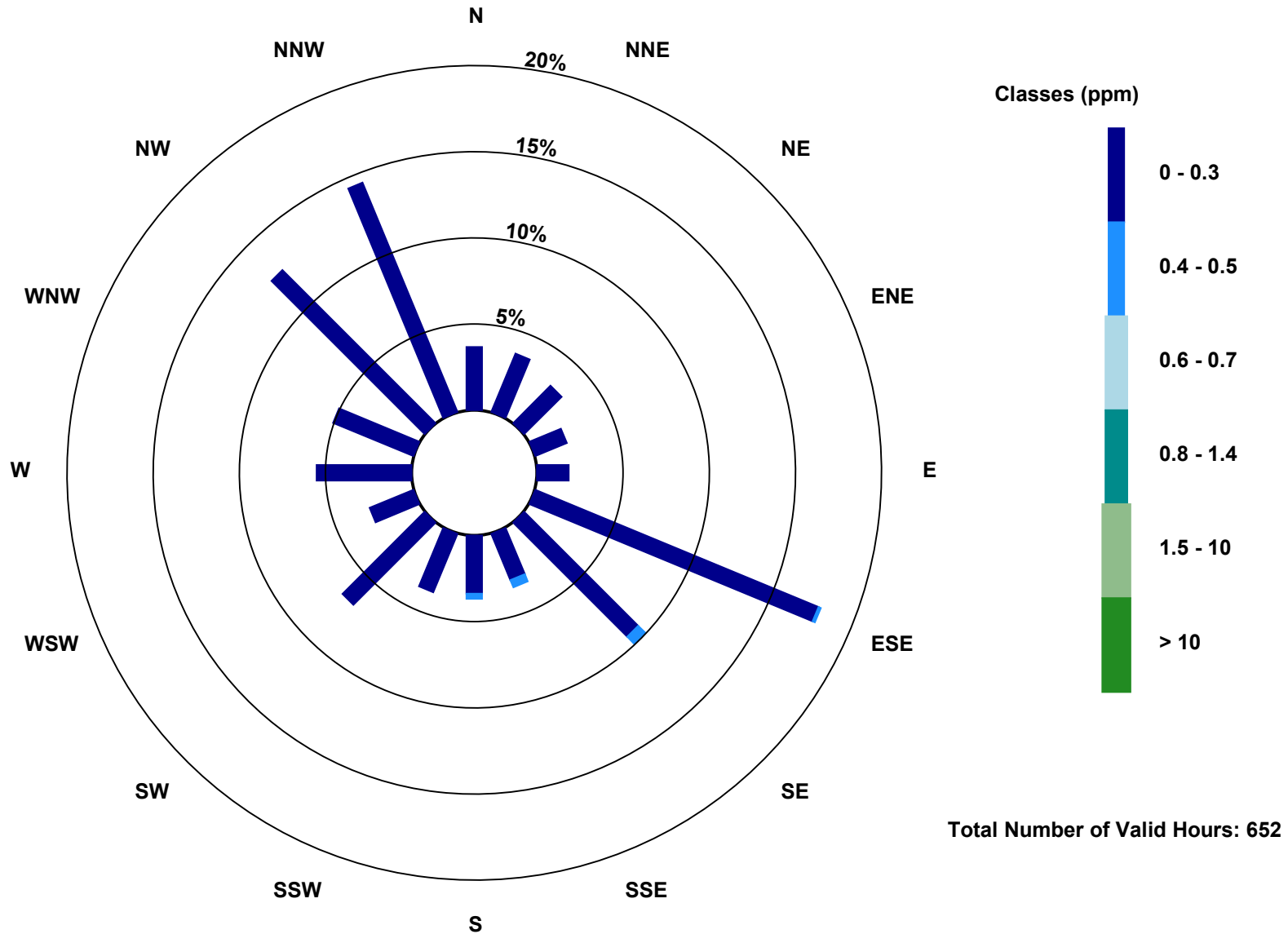
Total Number of Valid Hours: 652

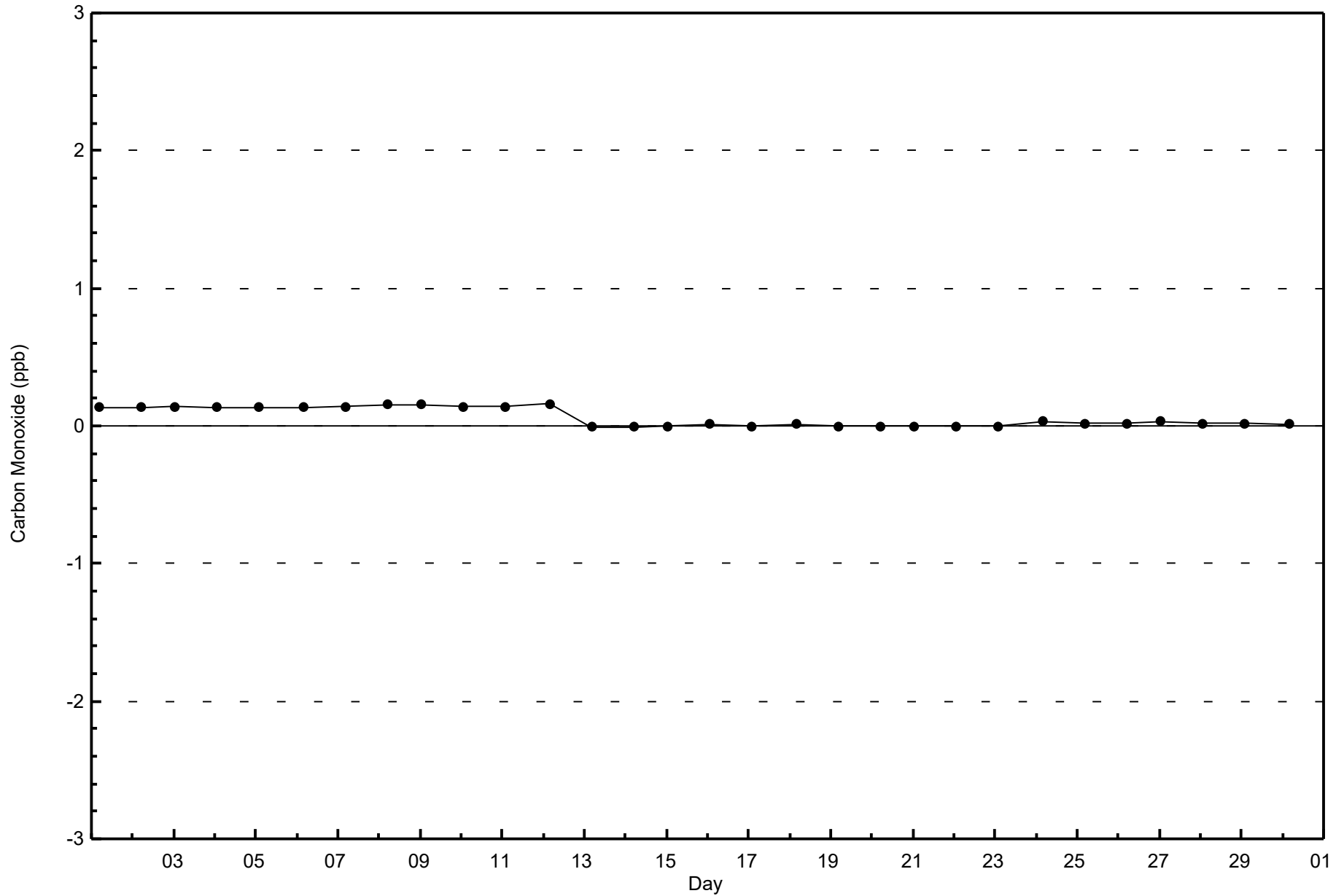
Total Number of Hours: 720

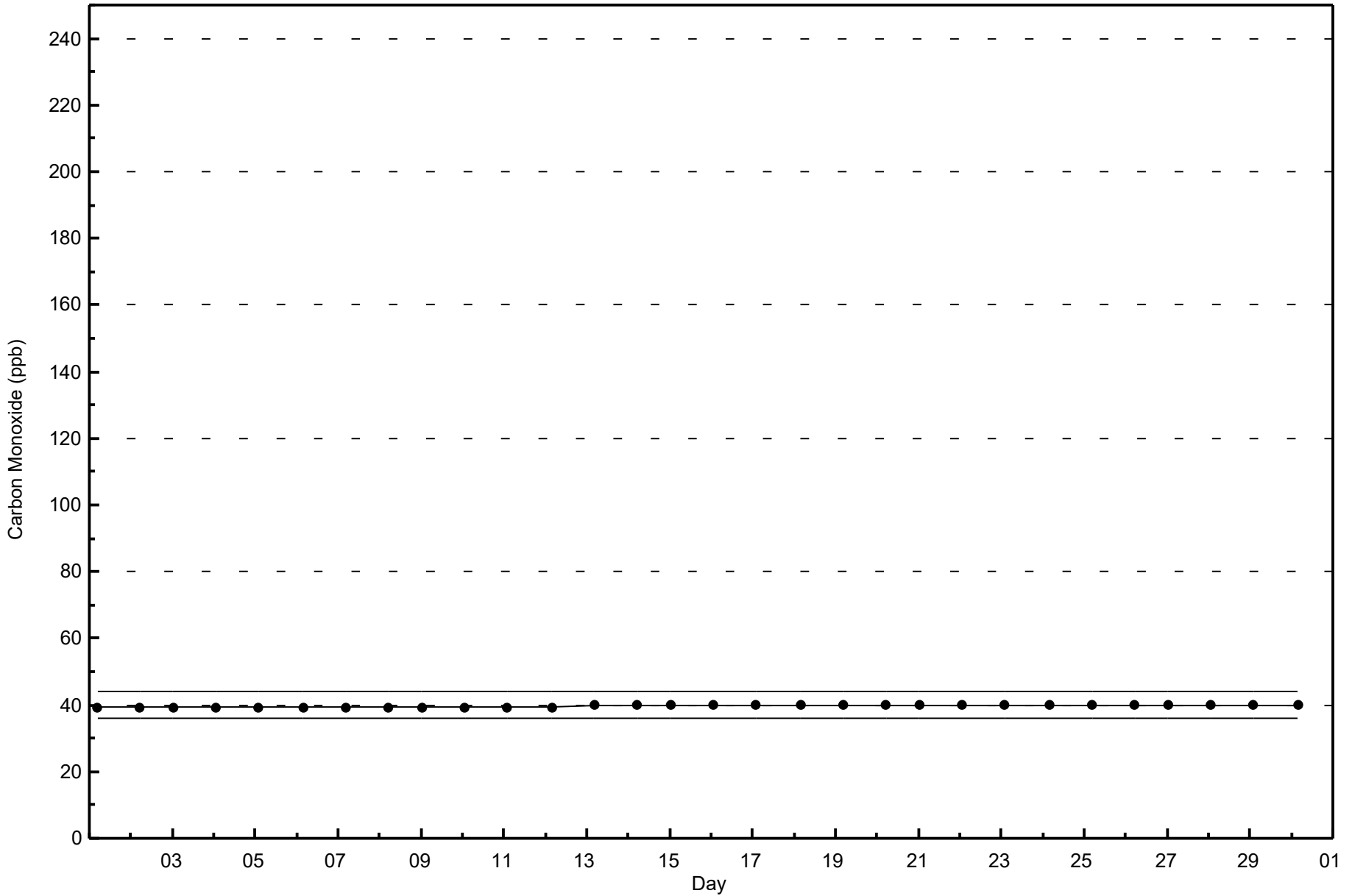


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Carbon Monoxide (CO) - ppm  
Athabasca Valley









**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

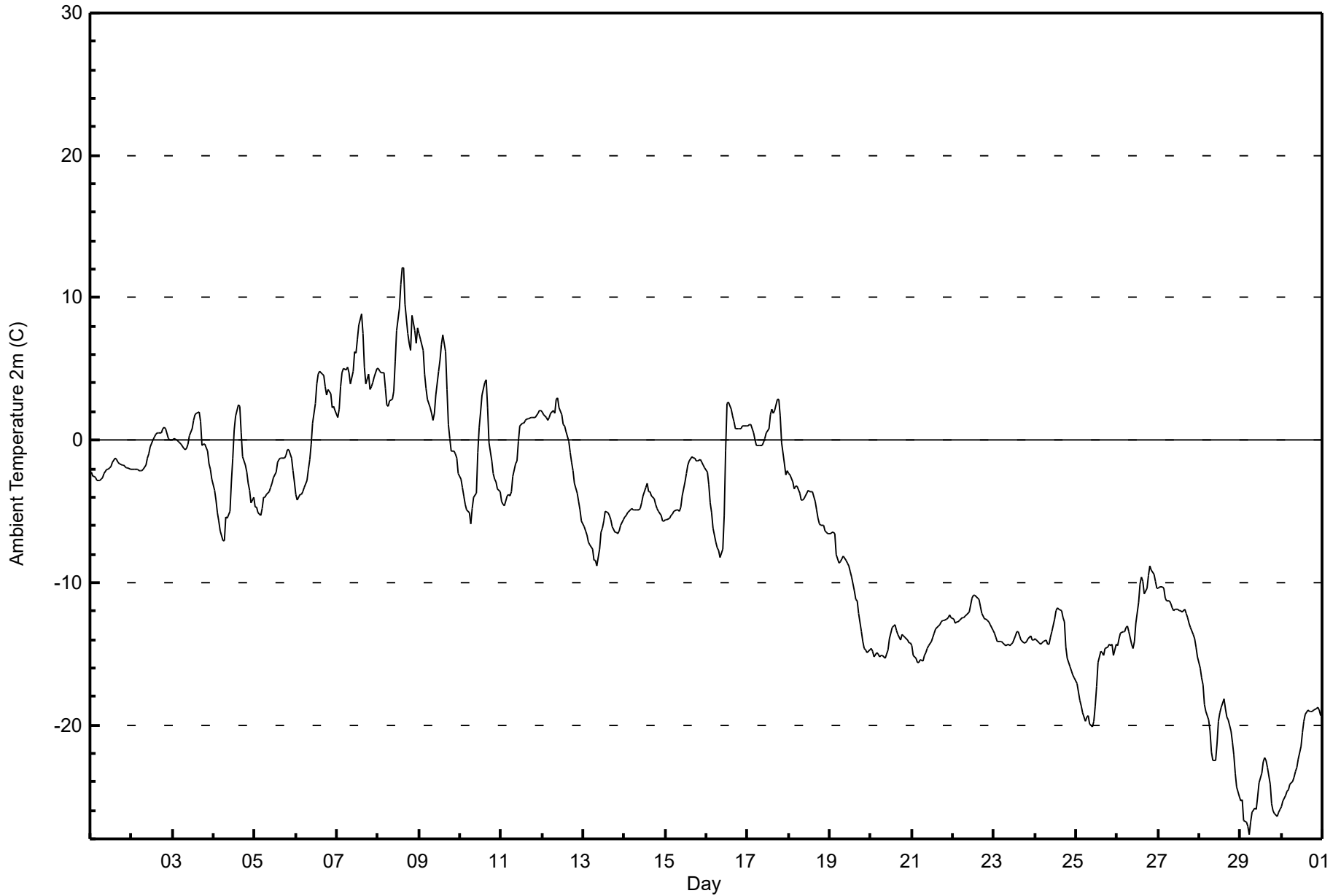
**Ambient Temperature 2m (AT2) - C**  
**Athabasca Valley - November 2024**

Maximum Value: 12.1 C on Nov 8 16:00		Maximum Daily Average: 6.5 C on Nov 8		Hours in Service: 720																																												
Minimum Value: -27.7 C on Nov 29 06:00		Minimum Daily Average: -25.3 C on Nov 29		Hours of Data: 720																																												
Maximum Diurnal Average: -4.6 C at hour 15		Minimum Diurnal Average: -8.1 C at hour 7		Hours of Missing Data: 0																																												
Monthly Average: -6.76 C		Percentiles: P <sub>1</sub> = -26.2 P <sub>10</sub> = -18.8 Q <sub>1</sub> = -13.6 Median = -4.9 Q <sub>3</sub> = -0.3 P <sub>90</sub> = 2.8 P <sub>99</sub> = 8.0		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-2.3	-2.5	-2.5	-2.6	-2.8	-2.8	-2.7	-2.6	-2.3	-2.0	-2.0	-2.0	-1.8	-1.5	-1.3	-1.4	-1.6	-1.7	-1.7	-1.7	-1.9	-2.0	-2.0	-2.0	-2.1	-1.3																						
2-Nov	-2.0	-2.1	-2.1	-2.1	-2.1	-2.1	-2.2	-2.0	-1.8	-1.3	-0.9	-0.5	0.0	0.2	0.4	0.5	0.5	0.5	0.8	0.9	0.8	0.1	0.0	0.0	-0.7	0.9																						
3-Nov	0.1	0.1	0.0	-0.1	-0.2	-0.3	-0.6	-0.7	-0.6	-0.2	0.3	0.8	1.4	1.8	1.9	2.0	1.3	-0.3	-0.3	-0.3	-0.8	-1.6	-2.1	-2.7	-0.1	2.0																						
4-Nov	-3.5	-4.2	-5.1	-5.7	-6.3	-7.0	-7.0	-5.4	-5.5	-5.0	-2.9	-1.2	0.8	1.7	2.5	2.4	0.5	-1.2	-1.8	-2.3	-3.1	-3.5	-4.4	-4.0	-3.0	2.5																						
5-Nov	-4.7	-4.7	-5.1	-5.3	-4.8	-4.0	-4.0	-3.8	-3.7	-3.3	-3.0	-2.6	-2.2	-1.6	-1.4	-1.2	-1.3	-1.3	-1.1	-0.7	-0.7	-1.2	-2.1	-3.0	-2.8	-0.7																						
6-Nov	-3.8	-4.2	-3.8	-3.8	-3.7	-3.3	-2.8	-2.1	-1.3	-0.3	1.2	2.6	3.9	4.6	4.9	4.6	4.6	3.8	3.2	3.5	3.3	2.2	2.4	2.1	0.7	4.9																						
7-Nov	1.6	2.2	3.7	4.7	5.1	5.0	5.2	4.7	3.9	4.9	6.2	6.1	7.1	8.1	8.9	7.5	5.1	3.9	4.6	3.6	3.8	4.0	4.4	5.0	5.0	8.9																						
8-Nov	5.0	4.8	4.7	4.7	3.6	2.5	2.4	2.8	2.9	3.5	5.5	7.6	9.3	10.9	12.1	12.1	9.5	7.5	6.8	6.3	8.7	7.7	6.8	7.9	6.5	12.1																						
9-Nov	7.5	7.1	6.3	4.6	3.7	2.9	2.2	1.9	1.4	1.9	3.1	4.8	5.6	6.7	7.3	6.3	3.5	1.1	0.2	-0.7	-0.8	-1.0	-1.3	-2.3	3.0	7.5																						
10-Nov	-2.7	-3.4	-3.9	-4.5	-4.9	-5.1	-5.8	-4.8	-4.0	-3.7	-0.9	0.9	2.0	3.2	4.1	4.2	2.3	-0.1	-1.4	-2.3	-2.7	-2.9	-3.4	-3.6	-1.8	4.2																						
11-Nov	-4.3	-4.5	-4.6	-3.9	-3.8	-3.9	-3.6	-2.6	-1.6	-1.5	-0.1	1.0	1.2	1.2	1.4	1.5	1.5	1.6	1.6	1.6	1.6	1.9	2.1	2.0	-0.6	2.1																						
12-Nov	2.0	1.8	1.6	1.4	1.6	1.9	2.1	1.9	2.8	3.0	2.2	1.8	1.1	1.0	0.7	-0.1	-0.8	-1.5	-2.1	-3.0	-3.8	-4.3	-4.9	-5.7	0.0	3.0																						
13-Nov	-6.1	-6.4	-6.7	-7.1	-7.4	-7.6	-8.4	-8.4	-8.8	-7.6	-6.5	-6.2	-5.7	-5.0	-5.1	-5.3	-5.6	-6.1	-6.4	-6.5	-6.6	-6.4	-6.0	-5.6	-6.6	-5.0																						
14-Nov	-5.4	-5.3	-5.1	-4.9	-4.8	-4.9	-4.9	-4.9	-4.9	-4.8	-4.4	-3.9	-3.4	-3.0	-3.6	-3.6	-3.9	-4.1	-4.5	-4.8	-5.0	-5.3	-5.7	-5.7	-4.6	-3.0																						
15-Nov	-5.6	-5.6	-5.4	-5.2	-5.1	-5.0	-4.9	-4.9	-5.0	-4.7	-3.9	-2.9	-2.4	-1.8	-1.4	-1.2	-1.3	-1.3	-1.5	-1.5	-1.4	-1.6	-1.7	-2.0	-3.2	-1.2																						
16-Nov	-2.3	-3.1	-4.4	-5.1	-6.2	-7.1	-7.5	-7.8	-8.3	-7.7	-5.3	-0.8	2.6	2.6	2.2	1.7	1.3	0.8	0.8	0.8	0.8	1.0	1.0	1.0	-2.0	2.6																						
17-Nov	1.0	1.1	1.1	0.5	0.0	-0.4	-0.4	-0.4	-0.4	-0.2	0.1	0.5	0.8	1.8	2.2	1.9	2.1	2.9	2.8	1.6	-0.2	-1.6	-2.4	-2.2	0.5	2.9																						
18-Nov	-2.4	-2.4	-2.9	-3.5	-3.3	-3.3	-3.7	-4.2	-4.2	-4.1	-3.9	-3.6	-3.6	-3.6	-3.7	-4.3	-4.9	-5.4	-5.9	-5.9	-6.0	-6.4	-6.4	-6.6	-4.3	-2.4																						
19-Nov	-6.5	-6.5	-6.4	-6.6	-8.0	-8.6	-8.6	-8.4	-8.1	-8.4	-8.7	-8.8	-9.2	-9.6	-10.6	-11.2	-11.3	-12.2	-13.4	-14.2	-14.6	-14.7	-14.9	-14.7	-10.2	-6.4																						
20-Nov	-14.6	-14.8	-15.2	-14.9	-15.0	-15.2	-15.1	-15.1	-15.3	-15.1	-14.7	-14.0	-13.2	-13.0	-13.0	-13.3	-13.6	-14.0	-13.7	-13.8	-13.8	-14.0	-14.2	-14.3	-14.3	-13.0																						
21-Nov	-14.5	-15.1	-15.3	-15.6	-15.6	-15.5	-15.5	-15.1	-14.9	-14.6	-14.4	-14.1	-13.9	-13.6	-13.2	-13.0	-12.9	-12.8	-12.7	-12.7	-12.6	-12.5	-12.3	-12.5	-13.9	-12.3																						
22-Nov	-12.6	-12.9	-12.8	-12.7	-12.7	-12.5	-12.5	-12.4	-12.3	-12.1	-11.6	-11.1	-10.9	-10.9	-11.1	-11.2	-11.6	-12.2	-12.5	-12.6	-12.6	-12.8	-13.0	-13.4	-12.2	-10.9																						
23-Nov	-13.6	-13.9	-14.1	-14.1	-14.1	-14.2	-14.3	-14.4	-14.3	-14.4	-14.4	-14.2	-13.7	-13.5	-13.4	-13.7	-14.0	-14.2	-14.3	-14.1	-13.9	-13.8	-14.0	-14.0	-14.0	-13.4																						
24-Nov	-13.9	-14.0	-14.2	-14.3	-14.2	-14.1	-14.0	-14.3	-14.3	-13.9	-13.4	-12.6	-12.0	-11.8	-11.8	-12.0	-12.5	-12.8	-14.5	-15.3	-15.9	-16.2	-16.5	-16.7	-14.0	-11.8																						
25-Nov	-17.0	-17.7	-18.3	-18.6	-19.2	-19.8	-19.4	-19.4	-20.0	-20.1	-19.7	-18.7	-17.3	-15.6	-14.9	-15.0	-15.1	-14.7	-14.5	-14.4	-14.4	-14.3	-15.2	-14.3	-17.0	-14.3																						
26-Nov	-14.4	-13.9	-13.5	-13.4	-13.4	-13.2	-13.1	-13.5	-14.3	-14.6	-14.1	-12.9	-11.4	-10.1	-9.6	-9.9	-10.8	-10.4	-9.5	-8.8	-9.1	-9.4	-9.9	-10.4	-11.8	-8.8																						
27-Nov	-10.4	-10.3	-10.3	-10.4	-11.1	-11.2	-11.3	-11.4	-11.8	-11.9	-11.9	-11.9	-12.0	-12.0	-12.1	-11.9	-12.2	-12.5	-12.8	-13.2	-13.6	-14.0	-14.5	-15.2	-12.1	-10.3																						
28-Nov	-16.0	-16.7	-17.2	-18.6	-19.1	-19.6	-20.5	-22.0	-22.5	-22.5	-21.4	-19.7	-19.2	-18.7	-18.2	-18.9	-19.5	-19.6	-20.5	-21.3	-22.1	-23.4	-24.3	-25.1	-20.3	-16.0																						
29-Nov	-25.3	-25.3	-26.7	-26.8	-27.2	-27.7	-26.8	-26.2	-25.9	-25.9	-25.1	-24.1	-23.4	-22.6	-22.3	-22.5	-23.0	-24.2	-25.5	-26.0	-26.2	-26.4	-26.1	-26.0	-25.3	-22.3																						
30-Nov	-25.7	-25.3	-24.9	-24.7	-24.5	-24.2	-24.0	-23.7	-23.3	-23.0	-22.4	-21.5	-20.5	-19.8	-19.3	-19.0	-19.0	-19.1	-19.0	-19.0	-18.8	-18.8	-18.9	-19.4	-21.6	-18.8																						
																								-7.1	-7.3	-7.4	-7.6	-7.9	-8.0	-8.1	-8.0	-7.9	-7.7	-6.9	-6.0	-5.3	-4.8	-4.6	-4.8	-5.4	-6.0	-6.3	-6.6	-6.7	-7.0	-7.3	-7.4	Diurnal Average
																								7.5	7.1	6.3	4.7	5.1	5.0	5.2	4.7	3.9	4.9	6.2	7.6	9.3	10.9	12.1	12.1	9.5	7.5	6.8	6.3	8.7	7.7	6.8	7.9	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 2m (AT2) - C**  
**Athabasca Valley - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Athabasca Valley - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	49	6.81	6.81
-20 - 0	505	70.14	76.94
0 - 10	163	22.64	99.58
10 - 20	3	0.42	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

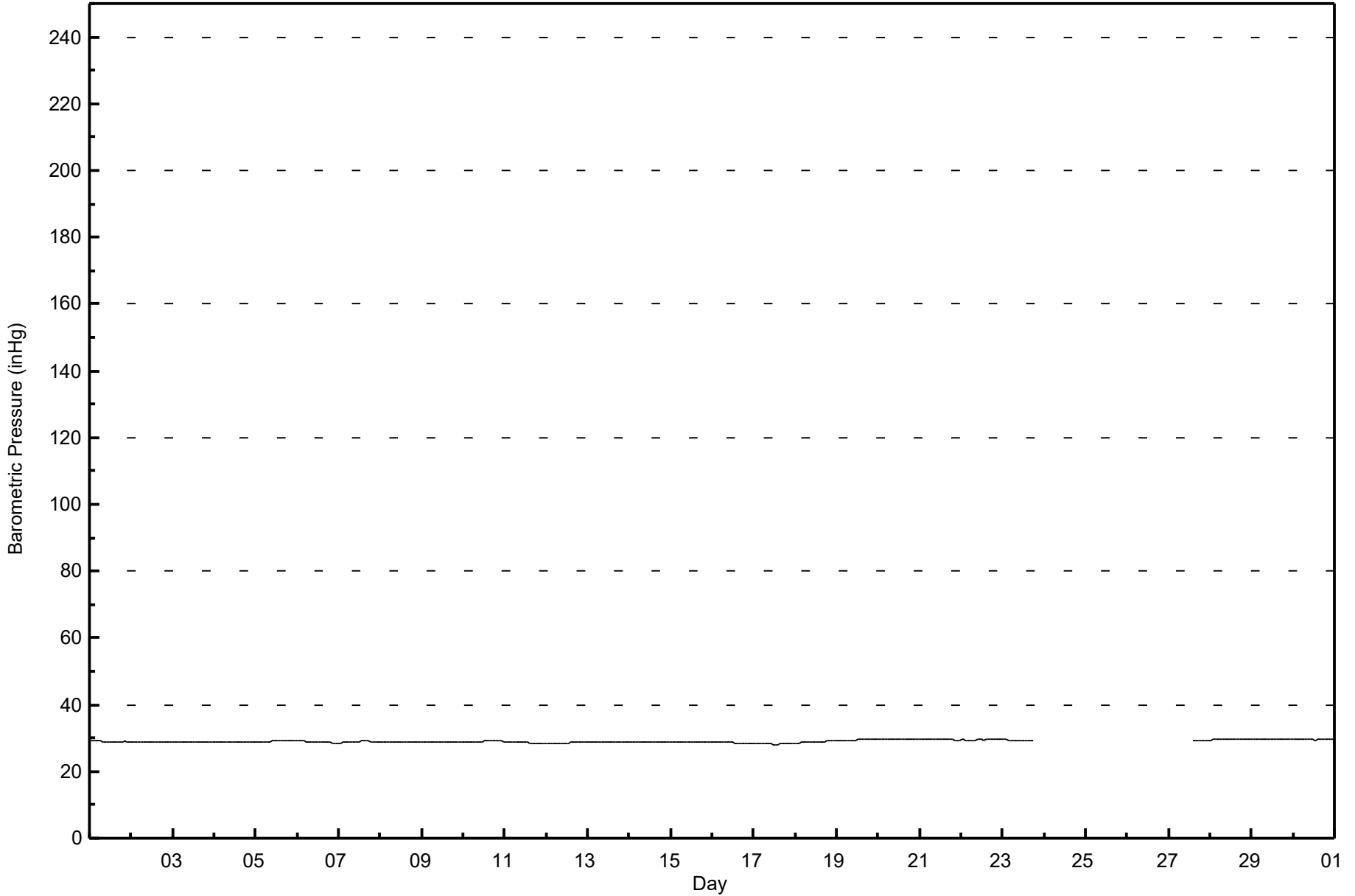
**Barometric Pressure (BP) - inHg**  
**Athabasca Valley - November 2024**

Maximum Value: 29.7 inHg on Nov 20 08:00		Maximum Daily Average: 29.6 inHg on Nov 20		Hours in Service: 720																																															
Minimum Value: 28.2 inHg on Nov 17 14:00		Minimum Daily Average: 28.2 inHg on Nov 17		Hours of Data: 628																																															
Maximum Diurnal Average: 29.0 inHg at hour 18		Minimum Diurnal Average: 29.0 inHg at hour 1		Hours of Missing Data: 92																																															
Monthly Average: 29.03 inHg		Percentiles: P <sub>1</sub> = 28.2 P <sub>10</sub> = 28.6 Q <sub>1</sub> = 28.8 Median = 29.0 Q <sub>3</sub> = 29.4 P <sub>90</sub> = 29.6 P <sub>99</sub> = 29.7		Hours of Calibration: 0																																															
				Percent Operational Time: 87.2																																															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																											
1-Nov	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1																							
2-Nov	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	29.0																						
3-Nov	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8																						
4-Nov	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8																						
5-Nov	28.8	28.8	28.8	28.8	28.9	28.9	28.9	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.2																							
6-Nov	29.2	29.1	29.1	29.1	29.0	29.0	29.0	28.9	28.9	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.5	28.5	28.5	28.5	28.5	28.5	28.8	29.2																							
7-Nov	28.5	28.6	28.7	28.7	28.8	28.8	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	29.0																							
8-Nov	28.9	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.7	28.9																							
9-Nov	28.8	28.8	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	29.0																							
10-Nov	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0																							
11-Nov	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.4	28.4	28.4	28.4	28.4	28.4	28.7	29.0																							
12-Nov	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.5	28.5	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.6	28.8																							
13-Nov	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9																							
14-Nov	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0																							
15-Nov	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0																							
16-Nov	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.4	28.4	28.4	28.4	28.3	28.6	28.9	28.9																							
17-Nov	28.3	28.3	28.3	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.3	28.3	28.4	28.4	28.5	28.2	28.5	28.5																								
18-Nov	28.5	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.2	28.9	29.2	29.2																								
19-Nov	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.4	29.6	29.6																								
20-Nov	29.6	29.6	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.6	29.6	29.6	29.6	29.7	29.7	29.7	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.7																							
21-Nov	29.6	29.6	29.6	29.6	29.6	29.6	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.4	29.5	29.6	29.6																								
22-Nov	29.5	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5																							
23-Nov	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.3	UO	UO	UO	UO	UO	UO	29.4	29.5																								
24-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--																								
25-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--																								
26-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--																								
27-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	29.4	29.4																								
28-Nov	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6																							
29-Nov	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.5	29.5	29.5	29.5	29.5	29.6	29.6	29.6																							
30-Nov	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.6																							
																								29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	
																								29.6	29.6	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.6	29.6	29.6	29.6	29.7	29.7	29.7	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6
M - Maintenance																								UO - Unstable Operation																											



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Barometric Pressure (BP) - inHg**  
**Athabasca Valley - November 2024**





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

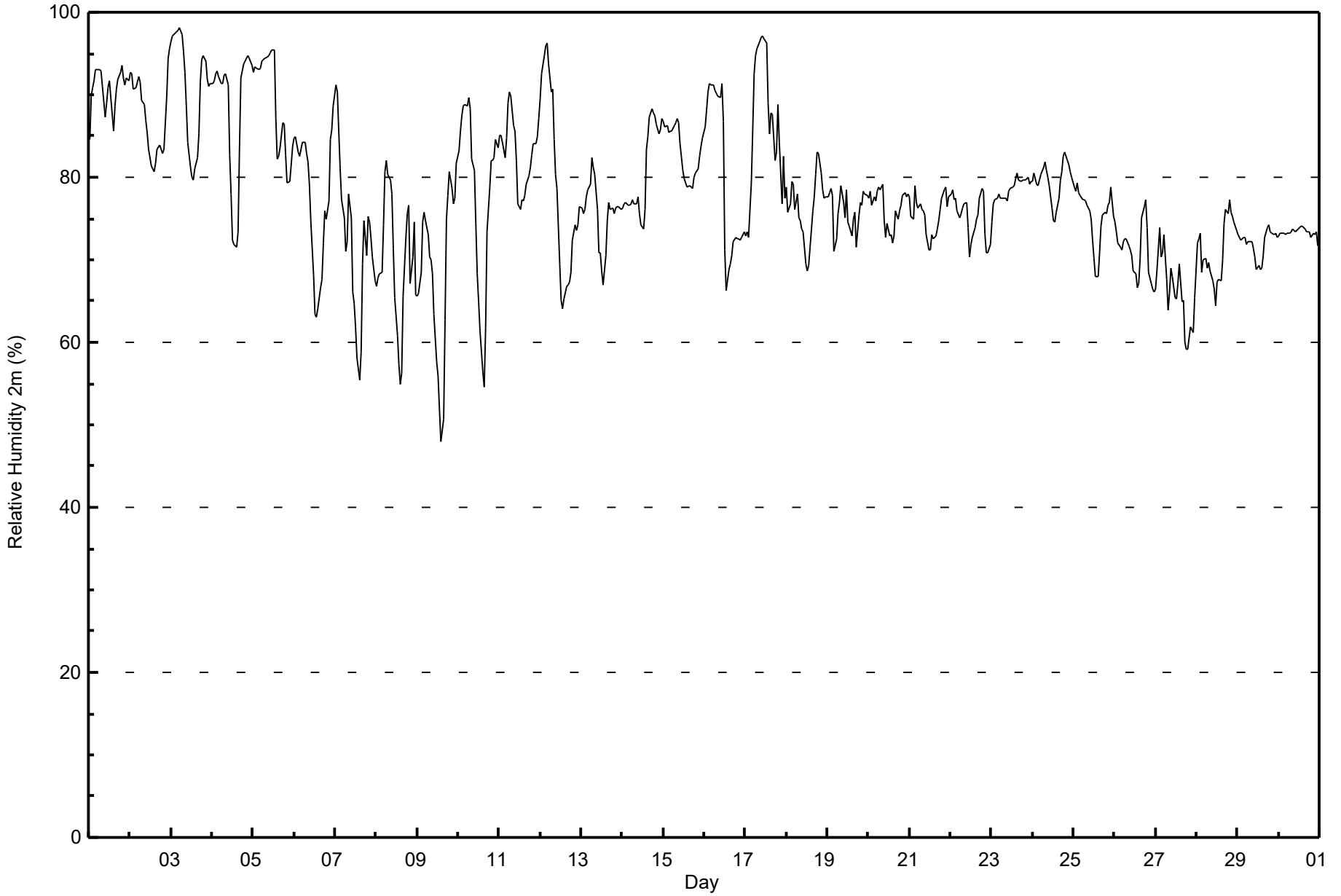
**Relative Humidity 2m (RH2) - %**  
**Athabasca Valley - November 2024**

Maximum Value: 98.1 % on Nov 3 06:00      Maximum Daily Average: 90.9 % on Nov 3																						Hours in Service: 720 Hours of Data: 720																										
Minimum Value: 48.0 % on Nov 9 15:00      Minimum Daily Average: 66.0 % on Nov 27 Maximum Diurnal Average: 81.8 % at hour 7      Minimum Diurnal Average: 71.4 % at hour 15 Monthly Average: 78.22 %      Percentiles: P <sub>1</sub> = 56.3 P <sub>10</sub> = 68.0 Q <sub>1</sub> = 72.8 Median = 77.3 Q <sub>3</sub> = 83.7 P <sub>90</sub> = 91.4 P <sub>99</sub> = 97.0																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	84.7	89.8	90.9	91.8	93.0	93.1	93.0	92.9	91.0	87.2	89.0	90.9	91.7	89.7	85.6	88.7	90.6	91.8	92.7	93.6	92.1	91.2	92.0	91.7	90.8	93.6																						
2-Nov	92.7	92.5	90.8	90.8	91.6	92.2	91.5	89.3	88.8	87.0	85.4	83.4	81.4	81.0	80.6	81.7	83.4	83.9	83.4	82.9	83.3	89.8	94.4	95.6	87.4	95.6																						
3-Nov	96.4	97.0	97.5	97.7	97.9	98.1	97.4	95.2	92.7	88.6	84.2	81.2	79.9	79.7	81.0	82.4	85.2	91.5	94.3	94.7	94.0	91.9	91.0	91.3	90.9	98.1																						
4-Nov	91.4	91.6	92.5	92.8	92.2	91.4	91.3	92.4	92.6	91.2	82.7	78.0	72.3	71.9	71.5	73.5	83.4	92.1	93.8	94.1	94.5	94.7	94.4	93.6	87.9	94.7																						
5-Nov	92.7	93.5	93.3	93.1	93.3	94.0	94.2	94.3	94.5	94.8	95.1	95.5	95.5	87.1	82.1	82.6	83.6	86.7	86.5	82.8	79.3	79.5	81.5	83.7	89.1	95.5																						
6-Nov	84.8	84.9	83.0	82.5	83.4	84.3	84.3	82.8	81.9	79.2	74.7	68.2	63.4	63.0	64.0	66.5	67.7	72.0	75.9	75.0	77.1	84.6	85.8	88.7	77.4	88.7																						
7-Nov	91.2	90.4	85.6	81.1	77.3	75.0	71.1	72.2	78.0	75.1	66.1	64.8	61.8	58.2	55.4	58.8	69.5	74.7	70.4	75.2	74.5	72.7	70.3	67.4	72.4	91.2																						
8-Nov	66.8	67.8	68.3	68.6	74.2	80.6	82.1	80.3	79.7	78.0	71.3	65.4	60.9	57.3	55.0	56.3	65.5	72.7	75.6	76.6	67.1	70.3	74.6	65.8	70.0	82.1																						
9-Nov	65.6	66.0	68.5	74.5	75.7	74.8	73.1	70.4	69.9	68.3	63.3	57.6	55.9	51.9	48.0	50.7	62.7	74.8	77.9	80.7	78.6	76.8	77.4	81.7	68.5	81.7																						
10-Nov	83.2	85.5	87.5	88.7	88.8	88.7	89.6	88.3	82.2	80.8	74.3	68.3	64.9	61.3	56.4	54.5	61.7	73.5	78.9	82.0	82.0	82.4	84.7	83.6	78.0	89.6																						
11-Nov	85.1	85.2	84.3	82.3	84.8	89.1	90.4	89.8	86.3	85.7	82.1	76.7	76.1	77.3	77.1	77.9	79.1	80.2	81.2	82.7	84.1	84.2	84.9	87.1	83.1	90.4																						
12-Nov	89.4	92.5	94.7	95.9	96.2	93.8	90.4	90.7	84.6	80.3	78.6	69.4	65.1	64.1	65.2	66.8	66.9	67.3	68.6	72.4	74.2	73.5	74.2	76.4	78.8	96.2																						
13-Nov	76.3	75.7	76.1	77.6	78.4	79.1	82.4	81.2	80.4	76.2	70.9	70.9	68.7	66.9	70.5	74.8	76.9	76.0	76.3	75.7	76.3	76.5	76.4	76.1	75.7	82.4																						
14-Nov	76.3	76.7	77.0	76.6	76.6	76.7	77.3	76.8	76.8	77.7	75.7	74.2	73.7	76.1	83.3	84.9	87.2	88.3	87.8	87.5	86.4	85.3	85.8	87.1	80.5	88.3																						
15-Nov	86.7	86.2	86.3	85.4	85.5	85.6	86.2	86.7	87.1	86.7	84.1	80.9	79.9	79.3	78.8	79.0	78.9	78.7	79.9	80.6	81.0	82.5	83.7	84.8	83.1	87.1																						
16-Nov	86.1	88.1	90.4	91.3	91.2	91.2	90.5	90.2	89.8	89.7	91.4	86.7	71.2	66.2	68.8	69.4	70.5	72.2	72.6	72.5	72.5	72.4	72.7	73.4	80.5	91.4																						
17-Nov	73.0	73.3	72.7	79.3	85.8	92.5	94.8	95.6	96.4	97.0	97.2	96.8	96.2	89.0	85.3	87.8	87.7	82.0	83.1	88.8	84.3	76.8	82.5	77.4	86.5	97.2																						
18-Nov	78.9	75.7	76.9	79.5	79.2	76.2	78.0	75.1	74.7	73.8	73.4	69.5	68.6	69.3	71.5	75.9	77.7	80.4	83.0	82.9	80.4	78.5	77.5	77.6	76.4	83.0																						
19-Nov	77.6	78.2	78.6	77.8	71.1	72.6	75.7	76.9	79.0	76.9	75.0	78.5	74.6	74.1	72.9	74.8	75.8	71.5	75.5	77.0	76.6	78.3	78.0	77.8	76.0	79.0																						
20-Nov	77.4	78.4	76.6	77.7	77.1	78.3	78.9	78.4	79.1	74.7	72.7	74.5	72.9	73.1	72.1	72.8	76.0	74.9	75.9	76.5	77.7	78.2	77.6	77.9	76.2	79.1																						
21-Nov	77.7	75.2	75.0	79.0	77.0	76.2	76.8	76.1	75.9	75.4	73.1	71.1	71.3	73.1	72.6	72.9	73.7	74.8	76.0	77.5	78.5	78.8	76.5	77.6	75.5	79.0																						
22-Nov	78.0	78.6	77.4	77.4	76.0	75.1	75.6	76.2	76.8	76.9	74.0	70.4	71.9	72.8	73.9	74.9	75.4	77.5	78.6	78.3	73.2	70.8	70.8	71.9	75.1	78.6																						
23-Nov	74.6	76.8	77.2	77.5	78.0	77.4	77.5	77.4	77.0	78.4	78.7	78.8	79.0	79.9	80.5	79.6	79.4	79.7	79.7	79.7	80.0	79.2	79.5	79.5	78.5	80.5																						
24-Nov	79.5	80.5	79.2	78.9	79.7	80.4	81.3	81.8	80.9	79.9	78.9	76.3	74.8	74.5	75.8	77.4	79.7	80.6	82.6	83.1	82.0	81.6	80.7	80.0	79.6	83.1																						
25-Nov	78.8	78.2	79.3	78.2	77.9	77.3	77.4	77.2	76.5	75.9	75.0	72.4	70.2	68.0	68.0	70.9	74.0	75.4	82.7	75.6	76.5	76.9	78.7	75.3	75.4	79.3																						
26-Nov	74.6	73.3	72.1	71.6	71.2	72.2	72.6	72.5	71.8	71.2	70.5	68.6	68.2	66.6	67.1	70.2	75.1	76.5	77.3	73.8	68.5	67.1	66.5	66.2	71.1	77.3																						
27-Nov	66.4	68.6	73.9	70.4	70.9	73.0	67.7	63.9	65.9	68.9	67.9	65.5	65.2	67.2	69.5	65.0	65.0	60.0	59.1	59.1	61.9	61.5	61.2	65.5	66.0	73.9																						
28-Nov	72.1	72.5	73.1	68.5	69.9	70.2	69.0	69.6	68.7	67.5	66.4	64.5	67.3	67.6	67.5	70.0	74.4	76.1	75.7	77.3	75.7	75.3	74.5	73.5	71.1	77.3																						
29-Nov	73.1	72.7	72.3	72.8	72.7	71.8	72.3	72.2	72.1	71.3	70.4	68.8	69.3	68.8	68.9	70.4	72.7	73.9	74.2	73.5	73.2	73.1	73.2	72.8	71.9	74.2																						
30-Nov	72.9	73.2	73.2	73.2	73.1	73.3	73.2	73.4	73.6	73.5	73.4	73.7	73.9	74.0	74.0	73.8	73.4	73.5	73.5	72.7	73.1	73.0	73.3	71.7	73.3	74.0																						
																								80.1	80.6	80.8	81.1	81.3	81.8	81.8	81.3	80.8	79.5	77.2	74.7	72.9	71.6	71.4	72.9	75.8	77.8	78.8	79.5	78.6	78.6	79.1	79.1	Diurnal Average
																								96.4	97.0	97.5	97.7	97.9	98.1	97.4	95.6	96.4	97.0	97.2	96.8	96.2	89.7	85.6	88.7	90.6	92.1	94.3	94.7	94.5	94.7	94.4	95.6	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 2m (RH2) - %**  
**Athabasca Valley - November 2024**





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Speed 10m (WS10) - km/h**  
**Athabasca Valley - November 2024**

Maximum Speed: 29 km/h on Nov 12 12:00	Maximum Daily Speed Average: 18.8 km/h on Nov 27	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 1 14:00	Minimum Daily Speed Average: 2.1 km/h on Nov 29	Hours of Data: 687
Maximum Diurnal Speed Average: 2.8 km/h at hour 15	Minimum Diurnal Speed Average: 0.5 km/h at hour 4	Hours of Missing Data: 33
Monthly Average Velocity: 1.3 km/h 300.4 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 3 Q <sub>1</sub> = 5 Median = 8 Q <sub>3</sub> = 11 P <sub>90</sub> = 15 P <sub>99</sub> = 25	Percent Operational Time: 95.4

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	N3	NNE4	NNE4	NNW8	NNW9	NNW6	NNW5	NNW4	NE3	E3	S4	W2	ENE3	SE0	NE2	NNW3	N5	NNE4	NNW4	NNW5	NNW5	N3	NW1	N2	N2.8	NNW9	
2-Nov	NNW3	NNE3	NE2	NNE1	NE3	NNE3	NNE4	NNE4	ESE3	ESE9	ESE7	ESE9	ESE6	ESE9	ESE8	E8	ENE12	E7	SE8	SE8	ESE6	ESE4	SE8	SSE4	E4.6	ENE12	
3-Nov	SSE4	SE6	SE4	SSE4	SSE2	SW2	SW2	SW4	SW6	SW7	SW6	SW5	S4	ESE5	SE6	SE6	SE7	E2	W1	SSW2	SSE4	SSE5	S6	SSW8	S3.3	SSW8	
4-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	ENE4	ESE4	E5	S5	SSE5	NW2	UO	UO	UO	UO	UO	---	SSE5	
5-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	NW3	ENE3	ESE2	ESE3	SW8	SW15	SW14	S6	SE5	---	SW15
6-Nov	ESE6	SE7	SE9	SE12	SE13	ESE13	ESE13	ESE14	ESE12	ESE9	SSE5	SW11	SW13	S5	SSW6	ESE5	ESE10	ESE10	ESE8	ESE9	ESE11	ESE14	ESE9	ESE6	SE8.3	ESE14	
7-Nov	NNW3	NNW10	NW9	W10	WSW15	W20	W23	WSW12	SSW3	S2	SW7	W10	W6	NE4	NE2	SSE4	SSE2	SE1	ESE5	ESE3	ESE5	ESE7	ESE8	ESE12	WSW3.1	W23	
8-Nov	SE17	ESE17	SE14	SE11	SSE7	SSE5	SSE4	SE6	ESE8	ESE6	ESE7	ESE10	ESE9	SE8	ESE5	SE3	S2	SSW3	WSW2	WSW5	WSW12	NNW7	W5	WNNW12	SE4.6	SE17	
9-Nov	WSW10	WSW15	W6	WSW5	SW10	SW4	SW5	SW10	SW9	S6	S9	S7	SSW10	SSW12	SSW8	S4	ENE1	SE2	SSE4	SE3	SE2	SE6	ESE8	SE6	SSW5.1	WSW15	
10-Nov	SE9	SE5	SE4	SE5	ESE5	ESE6	ENE5	S6	SSE5	ESE5	SSE4	S9	S10	SSW11	SSW9	S6	SE3	S1	SSE2	SE3	SE5	ESE5	ESE5	ESE10	SSE4.7	SSW11	
11-Nov	ESE7	ESE8	ESE9	ESE11	SE9	SSE5	E4	ESE10	ESE11	SE11	ESE11	ESE10	ESE13	E11	ESE10	ESE10	ESE11	ESE10	ESE9	ESE9	ESE10	ESE9	ESE10	ESE12	ESE9.4	ESE13	
12-Nov	ESE6	ESE6	ESE6	SE4	SSW6	SW7	SSW4	SSE1	SW13	WSW17	W23	W29	W26	W29	NNW23	NNW22	NNW22	NNW15	WSW11	SW9	SW9	SW12	SW13	SW12	WSW10.5	W29	
13-Nov	SW9	SW7	S5	SSW6	SSW8	SSW9	ESE4	SSW9	S4	SSW4	NNW4	NNW8	NNW7	NW8	NW11	NW12	NNW9	N9	NNW7	N8	N8	N7	NNE6	NE6	NW2.7	NW12	
14-Nov	NE10	NE9	NNE9	NNE10	NE9	NE10	NE8	NE9	NNE8	NNE7	NE8	NE9	NNE6	NW12	NW12	NW10	NW11	NW9	NW10	NNW10	NNW5	NNW5	NW7	N7.1	NW12		
15-Nov	NNW8	NNW7	NW6	NW5	NNW3	WNNW1	NE3	NNW4	N4	NNW3	SE6	E1	ENE5	E4	SE4	ESE5	ESE7	SE7	ESE8	ESE10	ESE11	ESE10	ESE8	SE9	E2.5	ESE11	
16-Nov	SE7	SE6	SSE6	SE5	S4	S3	S3	SSW4	SSW6	SSW4	SW2	SSE7	SSE14	SE15	SE12	SE14	ESE11	SE12	SE11	SE11	SE11	SE12	SE12	ESE8	SE7.5	SE15	
17-Nov	ESE8	ESE9	ESE9	ESE9	ESE8	SE8	ESE8	ESE9	SE7	ESE9	ESE9	ESE10	SE10	SE10	SE9	ESE8	SE5	SSE5	SW15	W22	WNNW25	WNNW23	NW11	WNNW18	SSE2.7	WNNW25	
18-Nov	W10	WSW16	WSW14	SW4	WSW7	WNNW10	NW13	WNNW11	W13	WNNW7	NW7	NW10	NNW7	N7	NW8	NNW4	N5	NNE3	NNE3	NNE3	NE4	N5	N5	NNE5	WNNW5.4	WSW16	
19-Nov	NE5	ENE6	ENE3	ENE7	ESE5	NE4	N4	NNE4	NE5	NNE10	N9	NNW14	NNW12	NNW12	N15	NNW17	N13	NNW18	NNW20	NW18	NW15	NW14	WNNW12	NW14	NNW8.8	NNW20	
20-Nov	NW21	NW17	NW15	NW16	NW13	NW14	NW12	WNNW12	NW9	NNE9	NNE9	NNW12	NW15	NW15	NW17	NNW13	NNW9	NNE9	N13	N14	NW15	NW15	WNNW14	NW14	NW12.5	NW21	
21-Nov	NW8	NNE9	NNW8	NW11	NW13	NW13	NW12	WNNW12	WNNW14	WNNW14	WNNW14	WNNW13	NW13	NW11	NW10	NW10	NW11	WNNW10	WNNW10	NW8	NW4	WNNW5	NW10	NW9	NW10.1	WNNW14	
22-Nov	NW9	NW7	NW6	NW6	W6	SW7	SW5	SW6	SW7	SW8	WSW8	WNNW9	NNW8	NNW9	NNW10	NNW9	NW9	NNW9	NNW7	NNW10	NNW9	NW11	NW13	NW13	NW6.3	NW13	
23-Nov	NNW12	NNW13	NNW11	NNW10	NW12	NNW13	NNW13	NNW11	NNW10	NNW10	NW11	NNW10	NNW10	NNW12	NNW13	NNW12	NNW13	NNW13	NNW13	NNW13	NNW14	NNW12	NW16	NNW17	NNW14	NNW12.2	NNW17
24-Nov	NW15	NNW12	NNW14	NW15	NNW13	NNW10	NNW10	NNW6	NNW7	NNW7	NNW8	NNW8	NNW8	NNW7	NNW6	NNW4	NW3	S1	WSW1	SSE3	ESE6	ESE7	ESE6	ESE6	NNW5.9	NW15	
25-Nov	ESE8	ESE6	ESE7	SE8	SE10	SE12	ESE10	ESE11	SE13	SE10	SE9	SE10	SE8	SE7	SE11	ESE11	ESE12	ESE13	SE13	ESE12	ESE8	ESE8	ESE8	ESE16	ESE10.1	ESE16	
26-Nov	SE16	ESE20	ESE23	ESE22	ESE20	ESE16	ESE20	ESE16	ESE14	ESE12	SE13	SE12	ESE9	ESE8	E5	E2	SW2	SSW3	SW10	W20	W19	W14	WNNW19	W18	SE6.0	ESE23	
27-Nov	W20	W16	W15	W18	W16	W16	W24	W22	W21	W27	W27	W25	W25	W25	WNNW22	WNNW21	NW19	NW21	NW20	NW19	NW14	NW16	NW14	NW10	WNNW18.8	W27	
28-Nov	NW9	WNNW9	W9	NW10	WNNW8	W8	SW9	SSW12	SSW7	SSW10	S3	WNNW2	N6	NW7	NNW5	NW4	W2	WSW4	WSW4	NNW5	NW4	NNW2	WSW4	SW5	W4.1	SSW12	
29-Nov	SW7	SW6	WSW4	WSW3	SW3	WSW4	SW7	SSW6	SW5	W2	W2	W3	NW4	NW9	NNW7	NNW5	N4	NNW1	SW3	W3	NNW2	NE2	ENE4	ENE5	W2.1	NW9	
30-Nov	N2	N4	N4	NE2	E3	NE3	NNW5	NNW6	NNW6	NNW6	NNW6	NNW5	NNW7	NNW7	NNW7	NNW9	NNW10	NNW8	NW8	NW8	NW6	WNNW5	WNNW7	WNNW8	NNW5.4	NNW10	

NW0.9	NNW0.8	N0.7	NNW0.5	WSW1.1	W1.8	WNNW1.5	WSW1.5	SW1.6	SSW1.1	WSW1.5	W2.2	WNNW1.5	NW1.9	NW2.8	NNW2.4	N2.6	NNW2.1	WNNW1.5	NW2.7	WNNW2.4	NW2.1	NW1.4	WNNW1.3	Diurnal Average
NW21	ESE20	ESE23	ESE22	ESE20	W20	W24	W22	W21	W27	W27	W29	W26	W29	WNNW23	WNNW22	WNNW22	NW21	NW20	W22	WNNW25	WNNW23	WNNW19	WNNW18	Diurnal Maximum

M - Maintenance      UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Athabasca Valley - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Nov 12 13:00	Hours in Service: 720 Hours of Data: 687 Hours of Missing Data: 33 Hours of Calibration: 0 Percent Operational Time: 95.4
Minimum Value: 1 km/h on Nov 24 19:00	
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 5	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	1	1	1	3	2	2	1	2	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	3
2-Nov	2	1	1	1	1	1	1	1	2	2	2	3	2	2	2	3	2	2	2	2	2	2	2	1	3
3-Nov	1	1	1	1	2	1	1	2	2	2	1	2	1	2	2	2	2	1	2	1	2	1	2	2	2
4-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	1	1	1	UO	UO	UO	UO	UO	UO	UO	1
5-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	2	1	1	2	3	3	3	2	2	3
6-Nov	2	2	2	3	2	2	2	3	2	2	2	4	3	2	2	2	2	3	3	2	3	2	2	2	4
7-Nov	1	4	3	5	2	5	4	5	2	2	4	3	3	2	2	1	1	1	2	2	2	2	2	3	5
8-Nov	2	3	3	3	3	2	2	2	3	3	2	2	2	2	1	2	1	2	1	2	2	2	2	2	3
9-Nov	1	4	6	3	2	2	2	5	4	3	3	2	2	2	2	1	1	1	1	1	2	3	1	2	6
10-Nov	2	2	2	2	1	2	2	3	3	2	2	2	2	2	3	2	1	1	1	1	2	2	2	2	3
11-Nov	2	2	3	3	3	1	2	2	2	2	3	3	3	3	3	2	3	2	2	2	2	2	2	2	3
12-Nov	4	2	1	1	1	2	1	2	4	5	6	6	7	6	5	4	3	3	2	1	1	2	2	3	7
13-Nov	3	2	1	2	2	3	2	3	3	2	2	2	2	2	2	2	2	3	2	2	2	1	2	2	3
14-Nov	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	2	1	2	2	2	2	2	2
15-Nov	2	2	2	2	1	1	1	1	1	1	2	1	1	2	1	2	2	2	2	2	3	3	2	2	3
16-Nov	3	2	1	1	1	2	1	2	2	2	1	3	6	4	3	3	3	3	2	2	3	3	3	2	6
17-Nov	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	1	1	5	6	5	5	5	4	6	
18-Nov	3	3	3	2	1	2	3	3	2	2	2	3	2	2	1	2	1	1	1	1	2	1	1	1	3
19-Nov	1	1	1	2	2	2	2	1	2	2	2	4	4	3	4	5	4	5	5	4	4	2	2	3	5
20-Nov	4	4	3	3	3	3	3	3	2	3	3	3	3	3	2	4	3	2	4	4	3	3	2	2	4
21-Nov	3	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	1	1	2	1	3
22-Nov	2	1	1	1	2	2	1	1	1	2	1	2	2	2	2	2	2	2	3	2	3	2	3	3	3
23-Nov	3	3	3	3	2	3	3	3	3	2	3	3	2	3	2	2	3	3	2	2	3	3	3	3	3
24-Nov	3	3	3	2	2	2	2	1	1	2	2	2	1	1	2	1	1	1	1	1	1	2	2	2	3
25-Nov	2	2	2	2	2	2	3	2	3	2	2	2	3	2	1	2	2	3	3	3	3	3	4	4	4
26-Nov	3	4	4	4	4	4	5	4	4	3	4	2	3	2	2	1	1	1	3	3	4	3	4	3	5
27-Nov	3	4	3	4	4	5	4	4	5	4	5	5	4	4	4	4	4	4	4	4	2	3	2	2	5
28-Nov	2	2	2	2	3	2	2	3	3	3	4	1	2	1	1	2	1	1	2	1	1	1	1	1	4
29-Nov	2	2	2	2	2	1	2	1	1	1	1	1	1	2	1	1	1	1	2	1	1	1	1	1	2
30-Nov	1	1	1	1	1	1	2	1	2	2	1	1	1	1	2	2	2	2	1	1	1	1	1	2	2
	4	4	6	5	4	5	5	5	5	5	6	6	7	6	5	5	4	5	5	6	5	5	5	4	

Diurnal Maximum

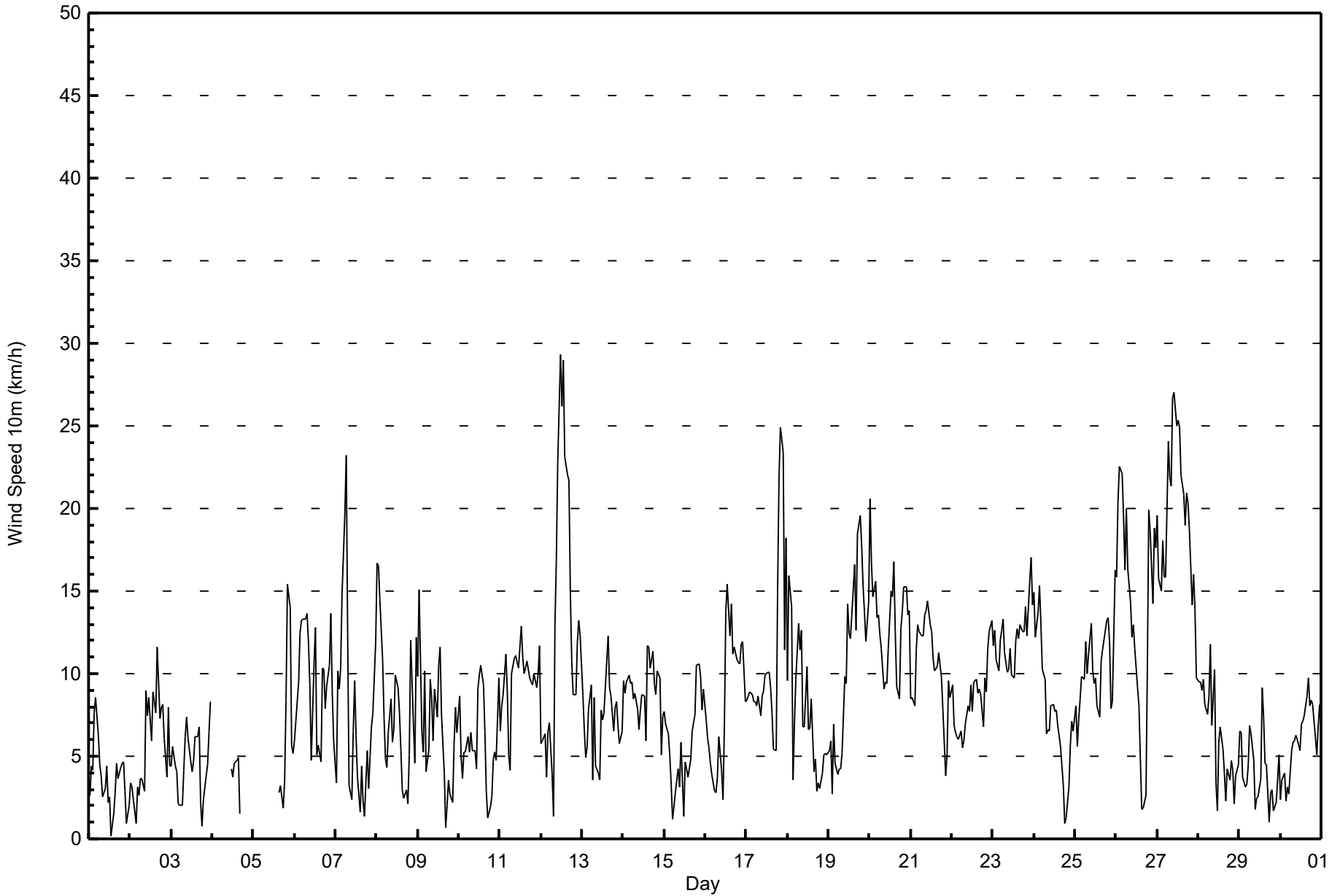
M - Maintenance

UO - Unstable Operation



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 10m (WS10) - km/h**  
**Athabasca Valley - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Athabasca Valley - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	205	29.84	29.84
6 - 11	313	45.56	75.40
12 - 19	136	19.80	95.20
20 - 28	31	4.51	99.71
29 - 38	2	0.29	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Athabasca Valley - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	13	13	13	10	9	18	18	20	15	8	14	10	8	4	10	22	205
6 - 11	7	12	9	2	3	81	36	3	9	15	23	4	7	11	39	52	313
12 - 19	4	0	0	1	0	17	16	1	0	2	8	7	9	12	34	25	136
20 - 28	0	0	0	0	0	5	0	0	0	0	0	0	15	7	3	1	31
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	24	25	22	13	12	121	70	24	24	25	45	21	41	34	86	100	687

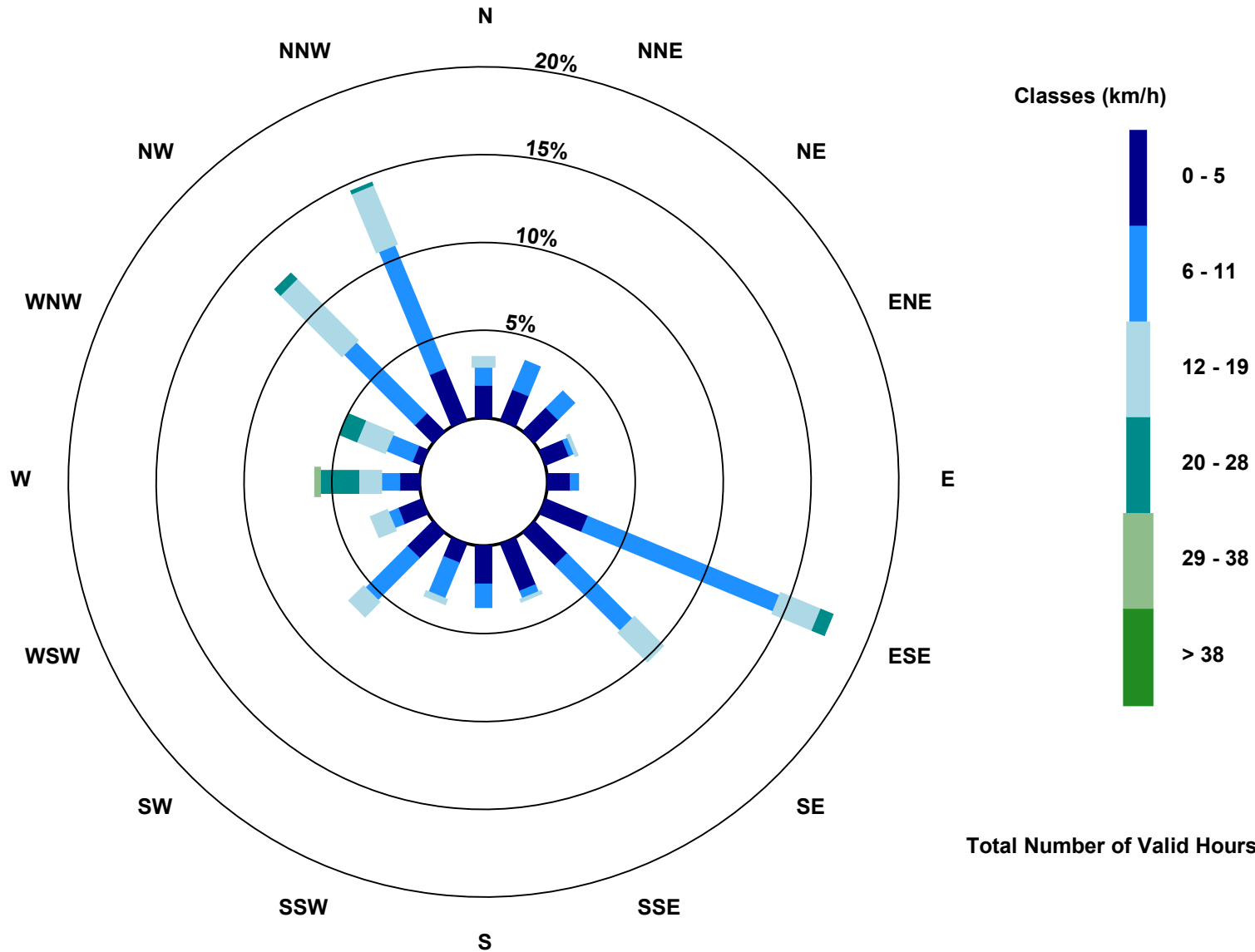
Total Number of Valid Hours: 687

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Athabasca Valley





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Athabasca Valley - November 2024**

Direction of Maximum Speed: 265 deg on Nov 12 12:00																				Hours in Service: 720						
Direction of Maximum Daily Speed Average: 283.9 deg on Nov 27																				Hours of Data: 687						
Direction of Minimum Speed: 142 deg on Nov 1 14:00										Direction of Minimum Daily Speed Average: 2.1 deg on Nov 29										Hours of Missing Data: 33						
Monthly Average Direction: 300.4 deg																				Percent Operational Time: 95.4						
Day	Hourly Period Ending At (MST)																								Daily Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	9	27	18	337	336	334	331	342	55	92	187	275	70	142	49	331	349	14	338	342	329	355	310	359	351.0	
2-Nov	342	12	40	16	50	14	13	20	105	121	117	113	112	115	109	98	77	79	136	128	122	111	124	147	100.7	
3-Nov	149	138	136	148	152	222	231	234	225	232	230	220	176	116	133	136	124	83	268	203	162	165	171	211	175.2	
4-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	75	118	96	175	154	322	UO	UO	UO	UO	UO	UO	--
5-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	313	68	112	115	219	227	225	180	133	--	
6-Nov	123	130	130	131	126	118	118	117	115	114	152	216	222	183	197	123	118	121	120	119	121	123	116	118	131.4	
7-Nov	339	327	321	270	253	261	267	251	206	170	236	275	265	41	50	148	149	133	119	119	115	109	118	123	251.2	
8-Nov	124	123	124	130	150	153	147	125	120	111	107	121	114	130	121	139	171	200	238	237	243	332	273	282	139.1	
9-Nov	252	247	262	238	216	215	227	236	219	177	183	176	198	207	203	182	73	132	157	138	137	124	123	127	202.8	
10-Nov	130	135	129	128	122	118	61	172	165	118	155	183	189	204	202	176	132	178	150	124	124	122	111	118	149.2	
11-Nov	116	113	117	118	133	163	95	117	121	124	122	119	111	99	103	109	114	114	114	109	109	118	109	108	114.9	
12-Nov	121	116	119	133	198	218	207	147	231	240	260	265	272	270	286	296	298	296	249	235	228	225	232	221	256.7	
13-Nov	217	222	183	195	206	192	113	205	183	210	342	335	330	313	315	320	332	1	333	358	2	357	16	35	308.3	
14-Nov	48	34	16	22	40	36	45	52	28	30	39	44	52	28	319	323	324	324	323	324	322	327	343	317	4.7	
15-Nov	327	334	310	326	306	303	40	344	349	342	134	83	62	100	133	120	121	125	119	115	123	119	117	125	95.5	
16-Nov	132	133	149	144	170	188	185	201	212	209	218	152	148	135	126	127	121	129	125	125	130	126	124	114	137.9	
17-Nov	121	121	114	120	119	126	120	113	125	114	120	122	124	125	126	111	125	150	223	280	288	284	310	285	158.8	
18-Nov	262	253	255	233	255	288	307	287	267	288	310	324	346	352	325	329	358	24	12	24	51	8	359	13	302.3	
19-Nov	56	73	78	71	108	41	0	27	34	20	11	331	348	348	349	338	352	331	333	322	326	313	301	316	345.0	
20-Nov	320	316	310	313	318	311	324	301	309	15	16	348	321	313	312	333	345	15	353	352	320	314	302	312	324.8	
21-Nov	324	13	343	305	313	310	304	295	299	296	286	299	315	308	312	311	306	291	292	313	308	297	306	313	307.2	
22-Nov	316	309	309	307	280	231	216	220	217	214	240	291	348	330	327	347	325	345	346	329	340	326	326	323	309.6	
23-Nov	333	331	343	337	322	337	331	334	329	335	325	331	331	333	331	337	329	329	331	328	328	326	328	329	330.8	
24-Nov	326	331	328	325	327	327	327	328	333	329	335	334	333	334	333	337	328	309	186	254	161	116	110	117	332.7	
25-Nov	122	113	116	124	128	125	127	121	116	126	131	131	131	130	142	131	114	113	121	127	121	118	110	121	123.4	
26-Nov	126	110	107	109	110	116	112	111	115	122	127	125	120	120	99	85	220	202	230	268	272	279	282	268	132.4	
27-Nov	267	270	271	273	275	272	268	273	272	267	271	273	275	280	285	297	306	304	306	309	312	312	312	321	283.9	
28-Nov	313	300	281	313	284	267	215	204	199	205	191	283	350	322	333	304	279	237	246	333	304	330	248	225	271.8	
29-Nov	222	228	241	244	222	252	215	209	218	273	281	279	325	325	329	329	354	331	232	277	332	48	58	61	271.9	
30-Nov	11	360	350	48	99	37	340	345	345	347	343	347	338	336	336	328	328	331	323	309	311	297	301	303	333.0	
317.4	337.4	353.3	344.0	241.4	263.6	285.3	236.5	218.9	206.5	246.6	280.9	297.8	307.9	312.0	332.9	352.6	347.7	303.6	306.0	294.0	305.5	311.5	300.4			
Diurnal Average																										
M - Maintenance                      UO - Unstable Operation																										
All monthly, daily, and diurnal averages have been calculated using vector methods																										



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

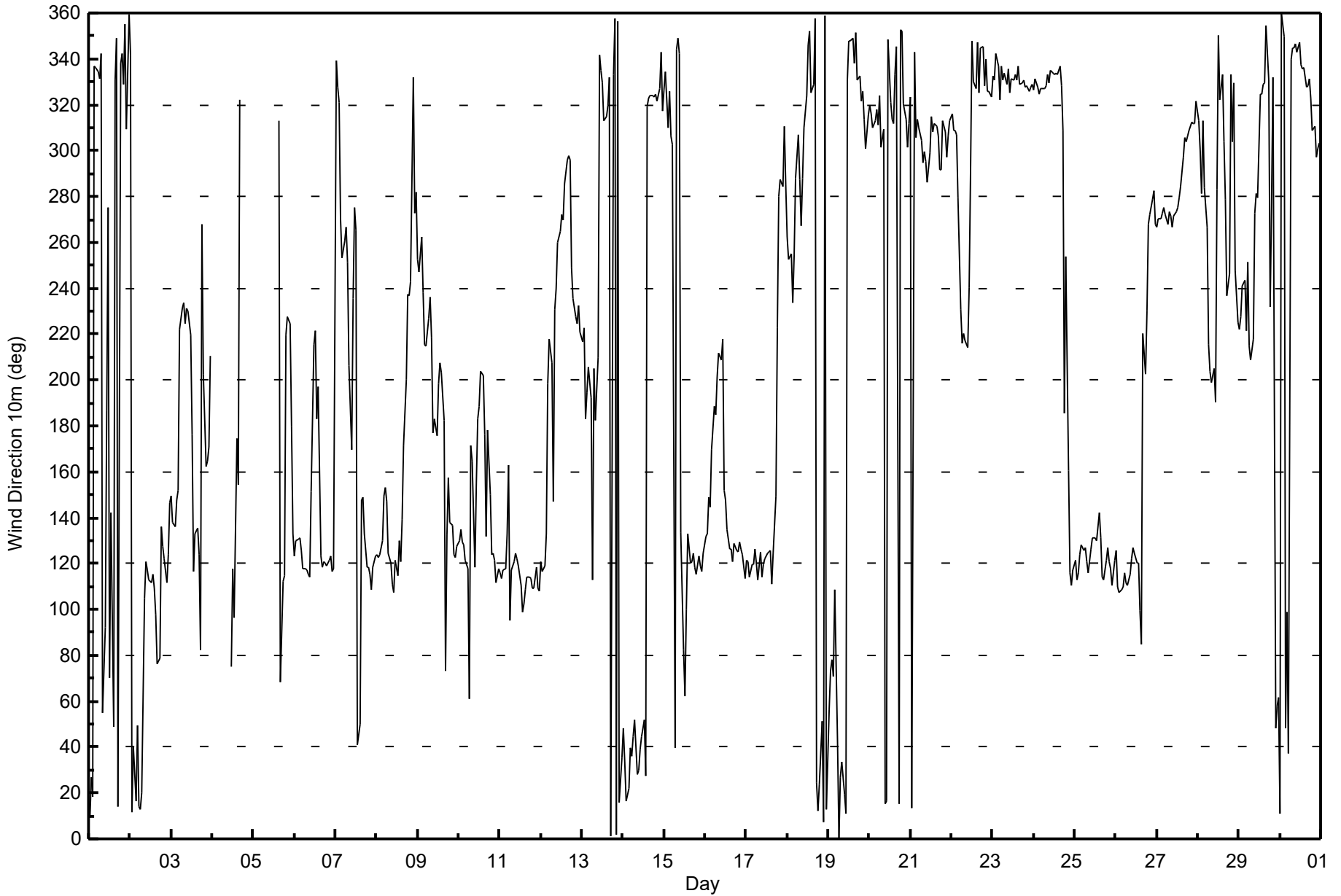
**Wind Direction 10m (WD10) - deg**  
**Athabasca Valley - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 93 deg on Nov 15 06:00	Hours of Data: 687
Minimum Value: 8 deg on Nov 24 04:00	Hours of Missing Data: 33
	Hours of Calibration: 0
	Percent Operational Time: 95.4
Percentiles: P <sub>1</sub> = 9 P <sub>10</sub> = 11 Q <sub>1</sub> = 13 Median = 18 Q <sub>3</sub> = 27 P <sub>90</sub> = 50 P <sub>99</sub> = 77	

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	32	18	20	22	13	22	25	37	45	35	27	33	50	91	65	44	30	25	18	22	18	34	69	51	91	
2-Nov	27	24	48	86	20	31	20	16	56	16	19	21	28	23	21	22	12	21	25	20	25	55	20	27	86	
3-Nov	21	17	16	15	47	41	64	20	14	10	11	22	37	22	22	16	18	58	89	57	60	18	25	18	89	
4-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	56
5-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	62	18	62	36	38	10	12	28	23	62	
6-Nov	22	14	14	13	12	12	12	12	12	13	38	16	16	57	36	44	11	13	21	13	10	10	18	26	57	
7-Nov	56	29	28	28	12	11	10	22	76	74	42	16	38	47	76	25	63	89	38	55	40	25	19	14	89	
8-Nov	10	10	13	16	39	48	52	38	27	41	38	17	15	14	19	49	58	59	75	23	15	21	34	15	75	
9-Nov	16	12	75	50	16	72	44	39	26	50	31	31	13	10	13	12	66	62	24	46	74	54	11	20	75	
10-Nov	14	42	55	25	18	21	31	51	43	32	54	14	12	13	16	21	48	61	64	51	28	30	45	16	64	
11-Nov	33	21	24	20	27	40	41	15	15	15	17	18	15	17	20	15	15	14	13	13	13	15	13	12	41	
12-Nov	65	18	22	43	19	16	50	57	11	14	15	13	16	11	15	9	8	15	27	15	9	9	10	13	65	
13-Nov	20	21	30	20	15	15	59	33	64	45	53	22	27	22	11	11	22	21	30	18	14	18	23	23	64	
14-Nov	13	20	15	14	16	19	16	12	18	20	21	17	16	29	8	8	9	9	11	11	10	14	34	17	34	
15-Nov	17	21	32	18	34	93	22	25	24	46	40	82	13	30	28	22	20	19	20	15	18	15	18	17	93	
16-Nov	23	26	30	26	29	60	49	55	11	41	74	26	19	18	14	14	15	15	14	14	13	14	14	16	74	
17-Nov	14	16	16	16	16	18	14	15	19	12	13	14	12	13	12	27	28	29	13	28	10	12	17	11	29	
18-Nov	15	12	11	72	19	13	13	15	9	21	27	11	23	20	10	33	17	19	20	23	58	24	18	17	72	
19-Nov	24	11	37	22	53	66	63	23	25	23	18	19	19	19	19	18	20	19	16	18	19	15	11	14	66	
20-Nov	9	14	14	13	23	18	23	20	24	23	26	21	17	12	10	25	26	15	20	21	12	14	13	10	26	
21-Nov	34	18	35	12	12	15	10	11	11	13	13	18	13	12	13	14	12	16	17	13	24	13	10	9	35	
22-Nov	12	14	12	12	21	20	21	11	10	11	23	24	18	14	11	20	19	23	31	15	19	16	13	11	31	
23-Nov	16	15	18	18	10	15	14	16	16	16	12	13	14	14	12	15	12	13	13	10	13	10	11	12	18	
24-Nov	10	14	12	8	10	12	13	12	14	20	15	15	15	14	15	14	17	20	71	63	61	22	18	16	71	
25-Nov	14	37	19	14	13	15	13	14	14	11	14	23	17	28	14	11	11	12	15	15	17	29	36	14	37	
26-Nov	14	13	11	12	12	16	14	17	20	19	16	13	17	17	30	49	57	47	21	11	12	13	15	11	57	
27-Nov	10	13	13	14	13	17	11	13	12	10	12	12	10	11	13	10	10	9	11	9	8	10	9	16	17	
28-Nov	11	10	21	14	18	24	17	11	21	19	75	62	26	14	19	20	37	19	33	27	13	39	17	20	75	
29-Nov	16	22	22	56	44	23	12	11	12	54	36	40	32	11	15	16	17	82	66	26	46	52	16	18	82	
30-Nov	39	26	27	54	33	40	27	20	23	19	17	19	15	15	15	14	12	14	13	9	14	12	9	24	54	

65	42	75	86	53	93	64	57	76	74	75	82	50	91	76	62	66	89	89	63	74	55	69	51	
Diurnal Maximum																								

M - Maintenance      UO - Unstable Operation





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS08 FORT CHIPEWYAN NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)  
NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	657	32	63	95.69	9.2	0	1.8	0
TRS (ppb) Average	686	34	34	100	0.4	0	0.2	0
O3(ppb) Average	687	33	33	100	34.8	0	32.7	-
NO2(ppb) Average	685	35	35	100	13.1	0	5.3	-
NO(ppb) Average	685	35	35	100	7	-	0.9	-
NOX(ppb) Average	685	35	35	100	16.5	-	6.2	-
PM2.5(ug/m3) Average	720	0	0	100	28.7	0	14.2	0
CO(ppm) Average	687	33	33	100	0.4	0	0.2	-
CO2(ppm) Average	686	34	34	100	451.1	-	441.2	-
Temperature 2 m (C) Average	720	0	0	100	4.8	-	2.5	-
Relative Humidity (%) Average	720	0	0	100	98.5	-	95.2	-
Wind Speed 10 m (km/h) Average	718	0	2	99.72	40	-	25	-
Wind Direction 10 m (deg) Average	718	0	2	99.72	-	-	-	-
PC(mm) Total	720	0	0	100	1.5	-	5.7	-
Leaf Wetness (% of range) Average	719	0	1	99.86	97.2	-	22.7	-
Global Solar Radiation (W/m2) Average	720	0	0	100	298.5	-	61.5	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)  
NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	657	0.23	0.8	-	0	0	0	0	0	0.5	9.2
TRS (ppb) Average	686	0.13	0	-	0.1	0.1	0.1	0.1	0.1	0.2	0.4
O3(ppb) Average	687	23.08	6.4	-	0.1	15.5	19.4	23	28.4	30.6	34.8
NO2(ppb) Average	685	0.97	1.7	-	0	0	0.2	0.4	0.8	2.4	13.1
NO(ppb) Average	685	0.21	0.5	-	0	0	0	0.1	0.2	0.4	7
NOX(ppb) Average	685	1.17	2.1	-	0	0.1	0.3	0.5	1	2.6	16.5
PM2.5(ug/m3) Average	720	3.6	3.3	-	0.4	1.3	1.9	2.8	3.9	6.1	28.7
CO(ppm) Average	687	0.05	0.1	-	0	0	0	0	0.1	0.1	0.4
CO2(ppm) Average	686	431.91	5.8	-	421.3	424.8	427.4	431.5	436	440.2	451.1
Temperature 2 m (C) Average	720	-10.22	8.6	-	-29.9	-23.5	-16.5	-8.3	-2.9	-1	4.8
Relative Humidity (%) Average	720	85.2	6.7	-	65.7	75.7	80.3	84.7	90.1	94.8	98.5
Wind Speed 10 m (km/h) Average	718	12.5	7	-	1	5	8	11	16	21	40
Wind Direction 10 m (deg) Average	718	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	720	-	-	27.76	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	719	7.85	8.7	-	1.4	2.1	6.6	6.8	8.1	12	97.2
Global Solar Radiation (W/m2) Average	720	24.76	52.8	-	0	0	0	0	20.9	91.5	298.5



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	04 Nov 2024 04:00	05 Nov 2024 09:00	30	Unstable Operation - flatline in analyzer output signal
SO2	05 Nov 2024 10:00	05 Nov 2024 10:00	1	Maintenance - analyzer rebooted
Wind Speed, Wind Direction	12 Nov 2024 08:00	12 Nov 2024 08:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	13 Nov 2024 23:00	13 Nov 2024 23:00	1	Flat line in sensor output signal
Surface Leaf Wetness	03 Nov 2024 14:00	03 Nov 2024 14:00	1	Sensor operated out of range



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb

Fort Chipewyan - November 2024

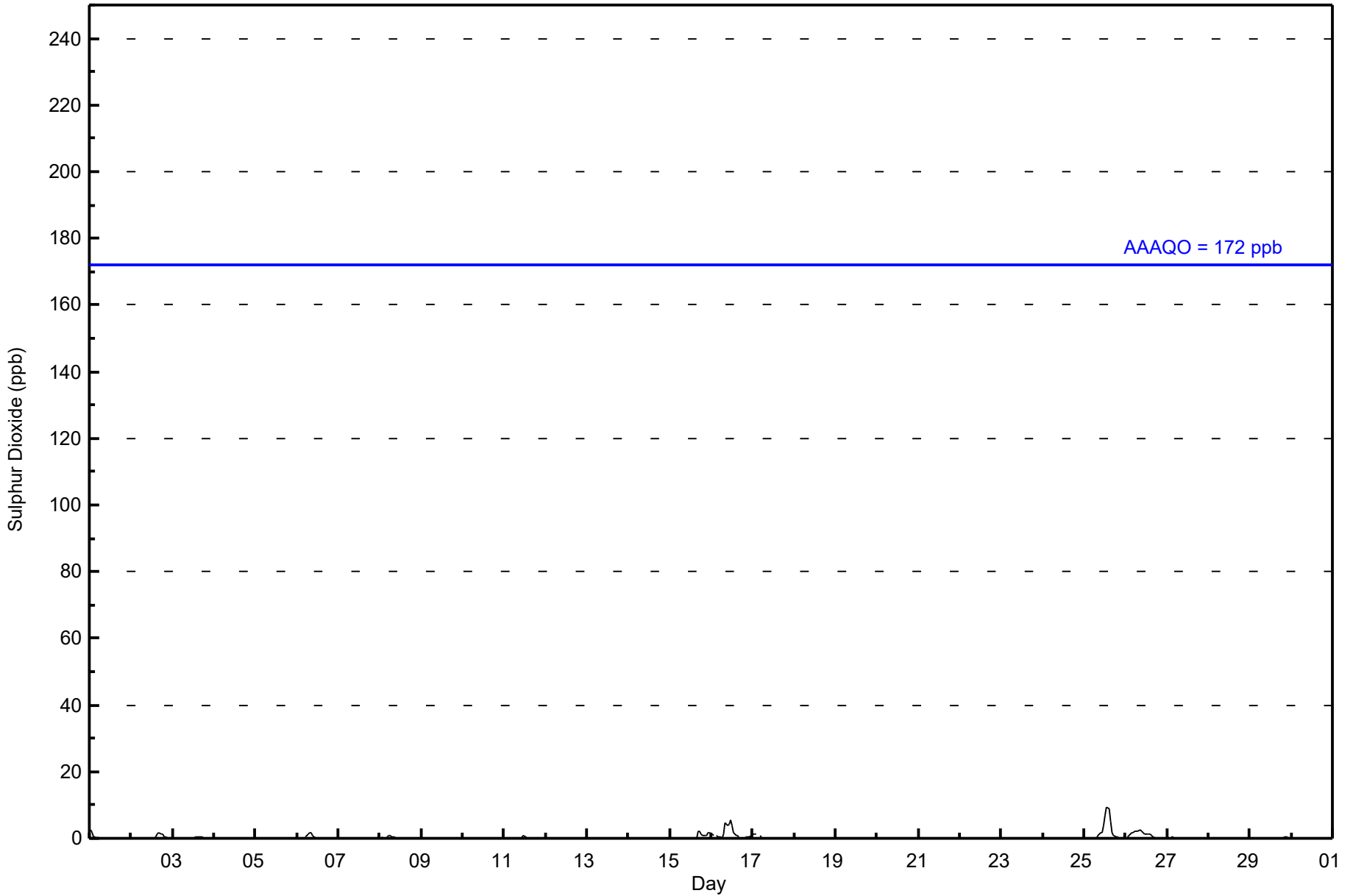
Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 9.2 ppb on Nov 25 14:00	Maximum Daily Average: 1.8 ppb on Nov 25		Hours of Data:	657
Minimum Value: 0.0 ppb on Nov 1 17:00	Minimum Daily Average: 0.0 ppb on Nov 12		Hours of Missing Data:	63
Maximum Diurnal Average: 0.5 ppb at hour 14	Minimum Diurnal Average: 0.1 ppb at hour 21		Hours of Calibration:	32
Monthly Average: 0.23 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.5 P <sub>99</sub> = 4.0		Percent Operational Time:	95.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	2.5	1.8	0.6	0.3	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.5
2-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	1.4	1.9	1.4	1.1	0.5	0.3	0.2	0.1	0.0	0.3	1.9
3-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3
4-Nov	0.0	0.0	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.0
5-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0
6-Nov	0.0	0.0	0.0	0.0	Z	0.5	1.2	1.7	1.6	1.0	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.7
7-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2
8-Nov	Z	0.3	0.1	0.1	0.5	0.8	0.8	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
9-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8
12-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	0.0	0.1	2.0	2.1	1.2	1.0	0.8	0.9	1.9	1.9	0.6	2.1
16-Nov	1.4	0.8	Z	0.8	0.6	0.4	0.2	1.2	4.7	3.7	4.1	5.7	4.0	1.7	0.9	0.8	0.2	0.1	0.1	0.2	0.3	0.4	0.6	0.8	1.5	5.7
17-Nov	1.3	1.4	1.2	Z	0.7	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.4
18-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
22-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
23-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.2	0.7	1.6	1.6	3.7	6.8	9.2	8.7	5.0	1.5	0.7	0.4	0.4	0.2	0.1	0.2	0.3	1.8	9.2
26-Nov	Z	0.6	1.0	1.7	1.9	2.1	2.0	2.2	2.6	2.0	1.6	1.3	1.1	1.3	1.3	0.8	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	1.1	2.6
27-Nov	0.1	Z	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
28-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.1	0.0	0.0	0.4
30-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1

0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.3	0.3	0.4	0.4	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Diurnal Average
2.5	1.8	1.2	1.7	1.9	2.1	2.0	2.2	4.7	3.7	4.1	5.7	6.8	9.2	8.7	5.0	2.0	2.1	1.2	1.0	0.8	0.9	1.9	1.9	0.0	0.0	Diurnal Maximum

Z - zerospan                      C - Calibration                      M - Maintenance                      UO - Unstable Operation

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb    24-hr 48 ppb





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Fort Chipewyan - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	657	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 657

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Fort Chipewyan - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	6	6	5	50	88	28	21	44	19	21	12	28	107	79	109	32	655
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	6	6	5	50	88	28	21	44	19	21	12	28	107	79	109	32	655

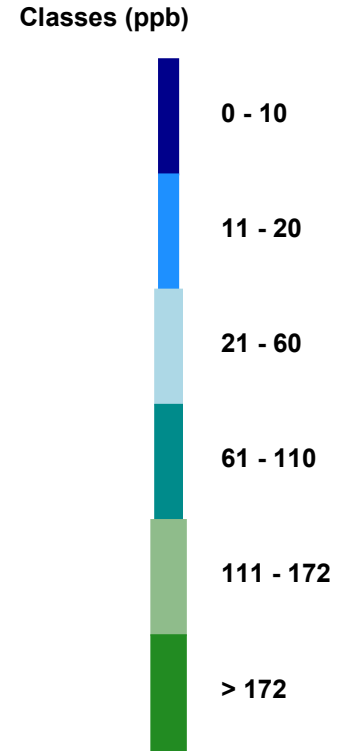
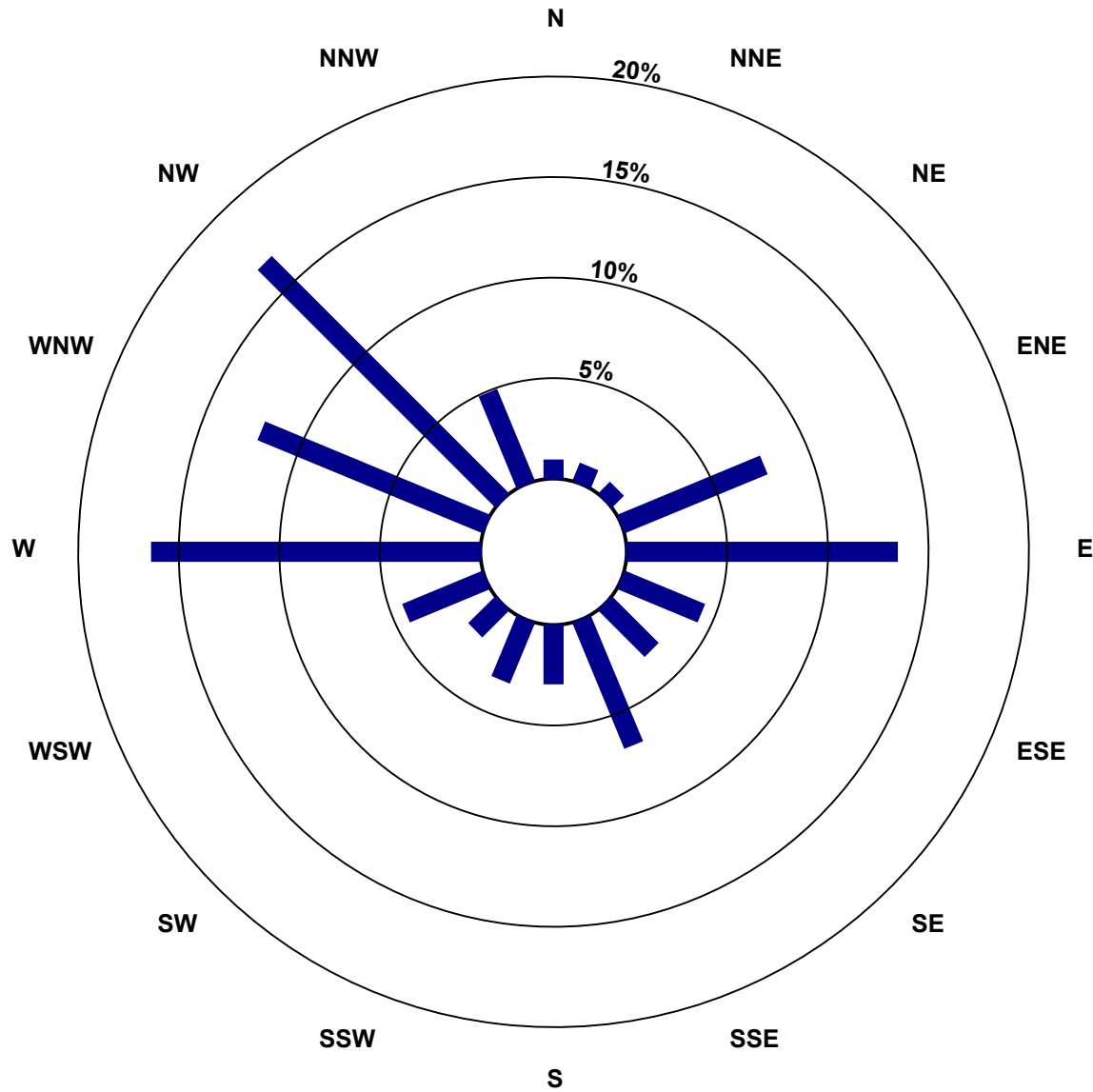
Total Number of Valid Hours: 655

Total Number of Hours: 720

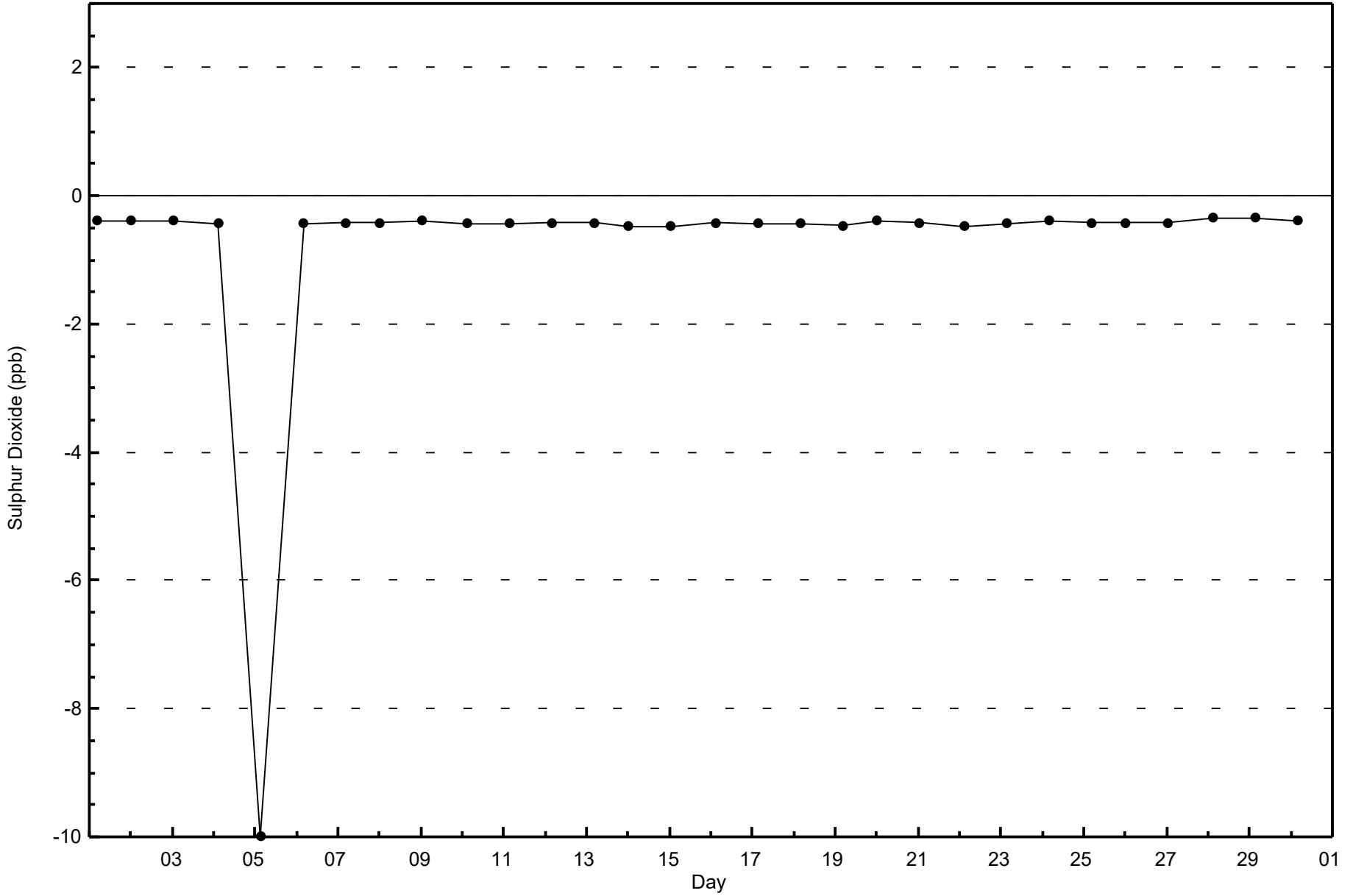


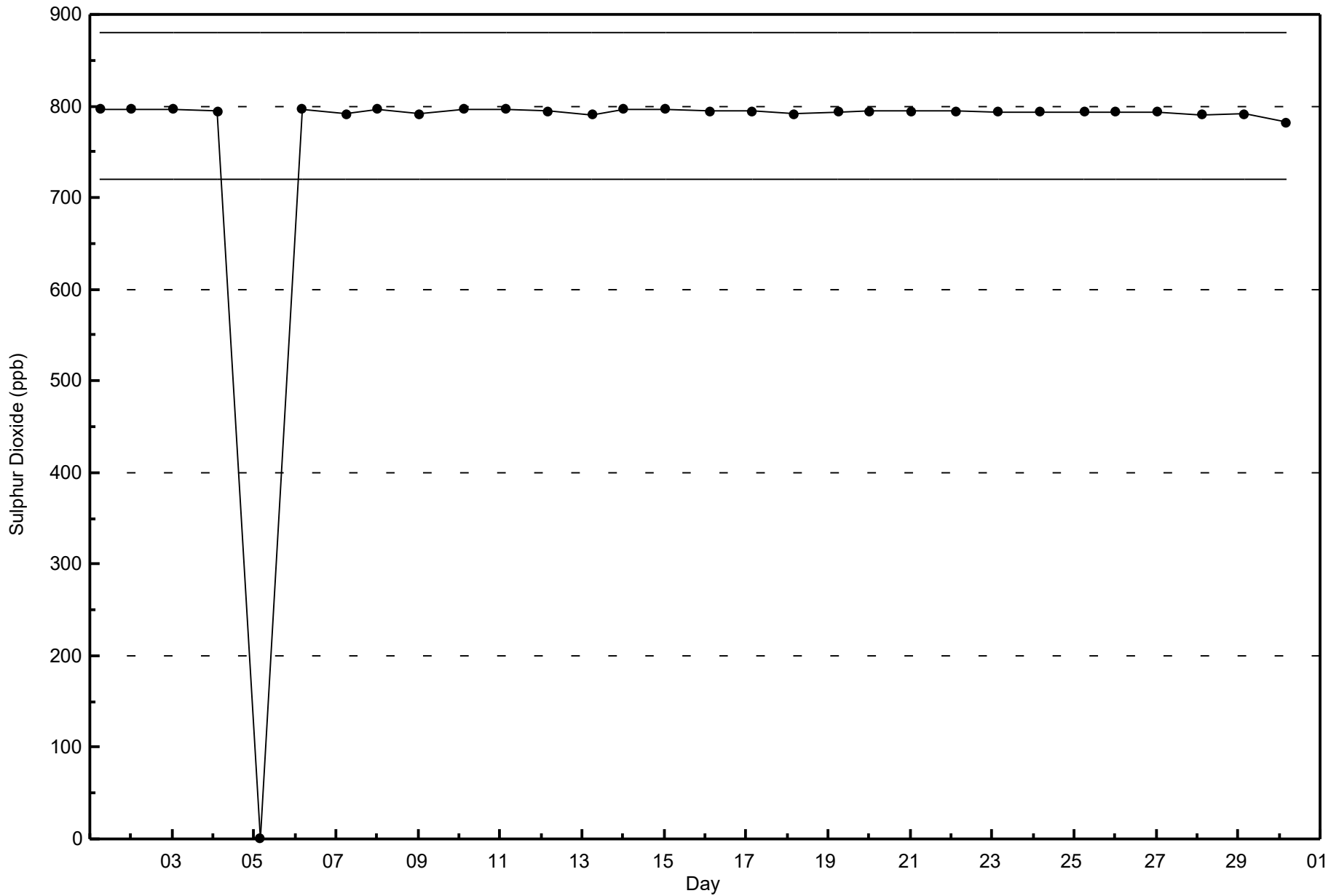
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Fort Chipewyan



Total Number of Valid Hours: 655





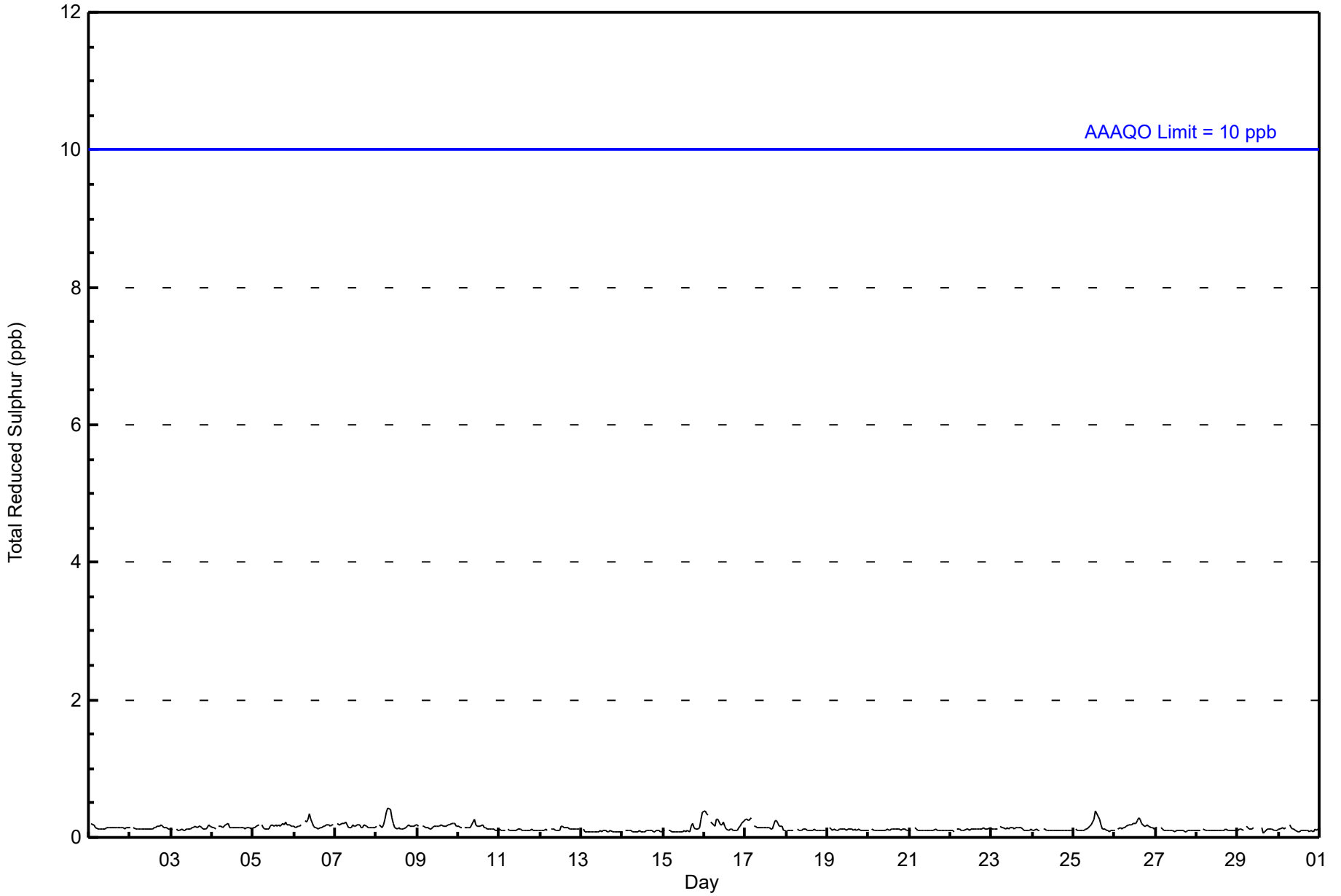






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Reduced Sulphur (TRS) - ppb**  
**Fort Chipewyan - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb**  
**Fort Chipewyan - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	686	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb**  
**Fort Chipewyan - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	5	7	10	52	94	27	23	46	20	20	15	32	117	78	106	32	684
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	5	7	10	52	94	27	23	46	20	20	15	32	117	78	106	32	684

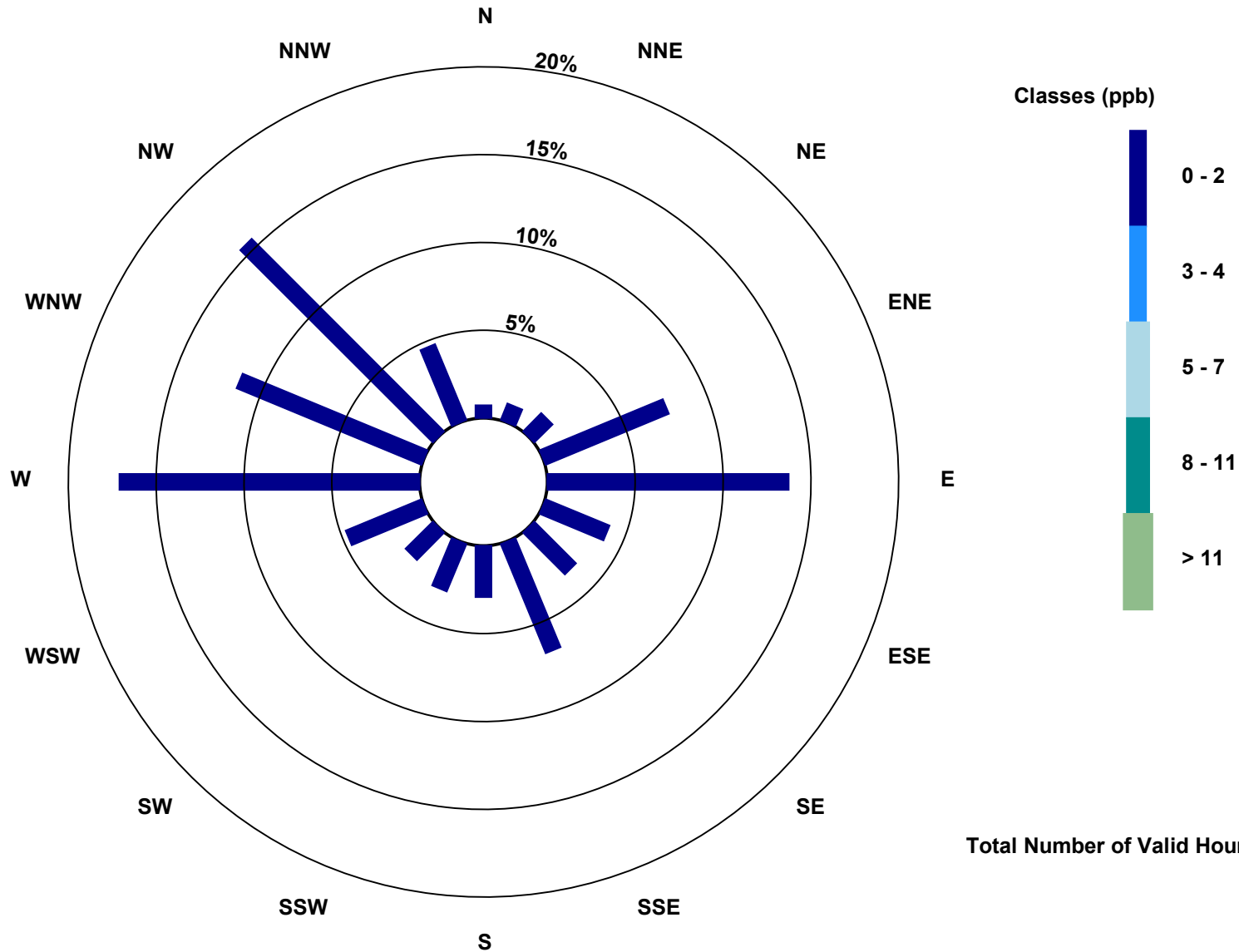
Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Reduced Sulphur (TRS) - ppb  
Fort Chipewyan

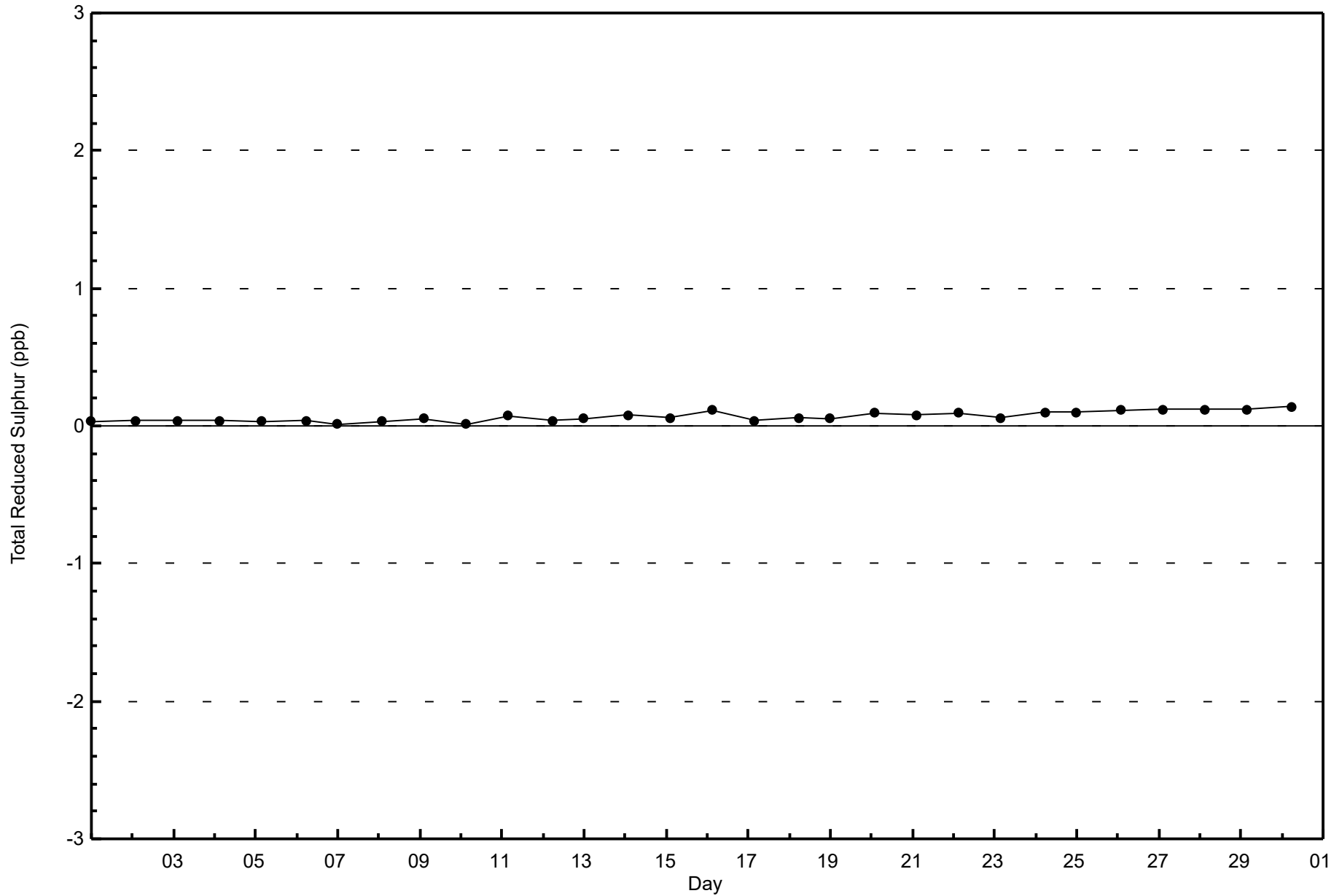


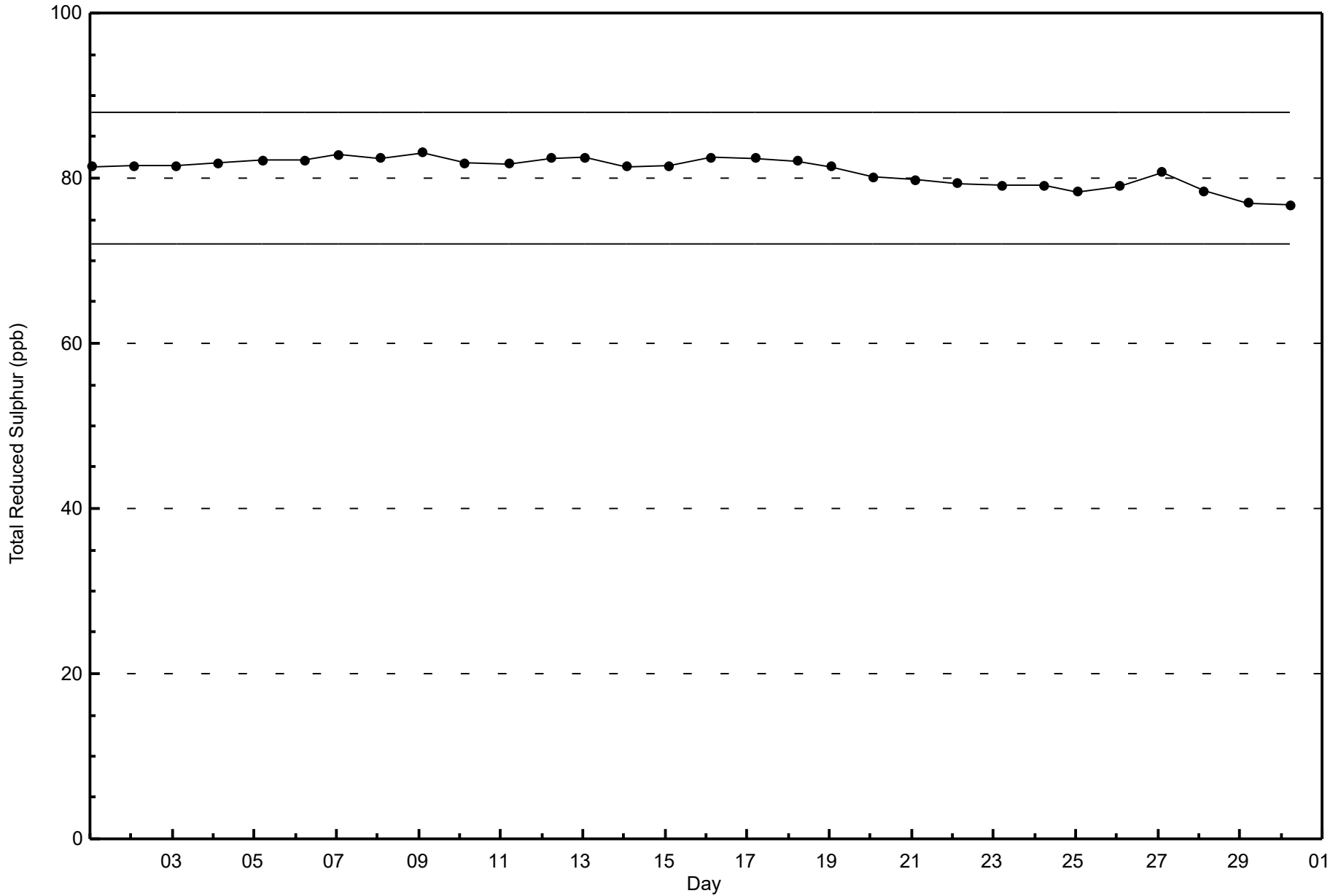
Total Number of Valid Hours: 684



**Wood Buffalo Environmental Association**  
**Zero Responses**

**Total Reduced Sulphur (TRS) - ppb**  
**Fort Chipewyan - November 2024**







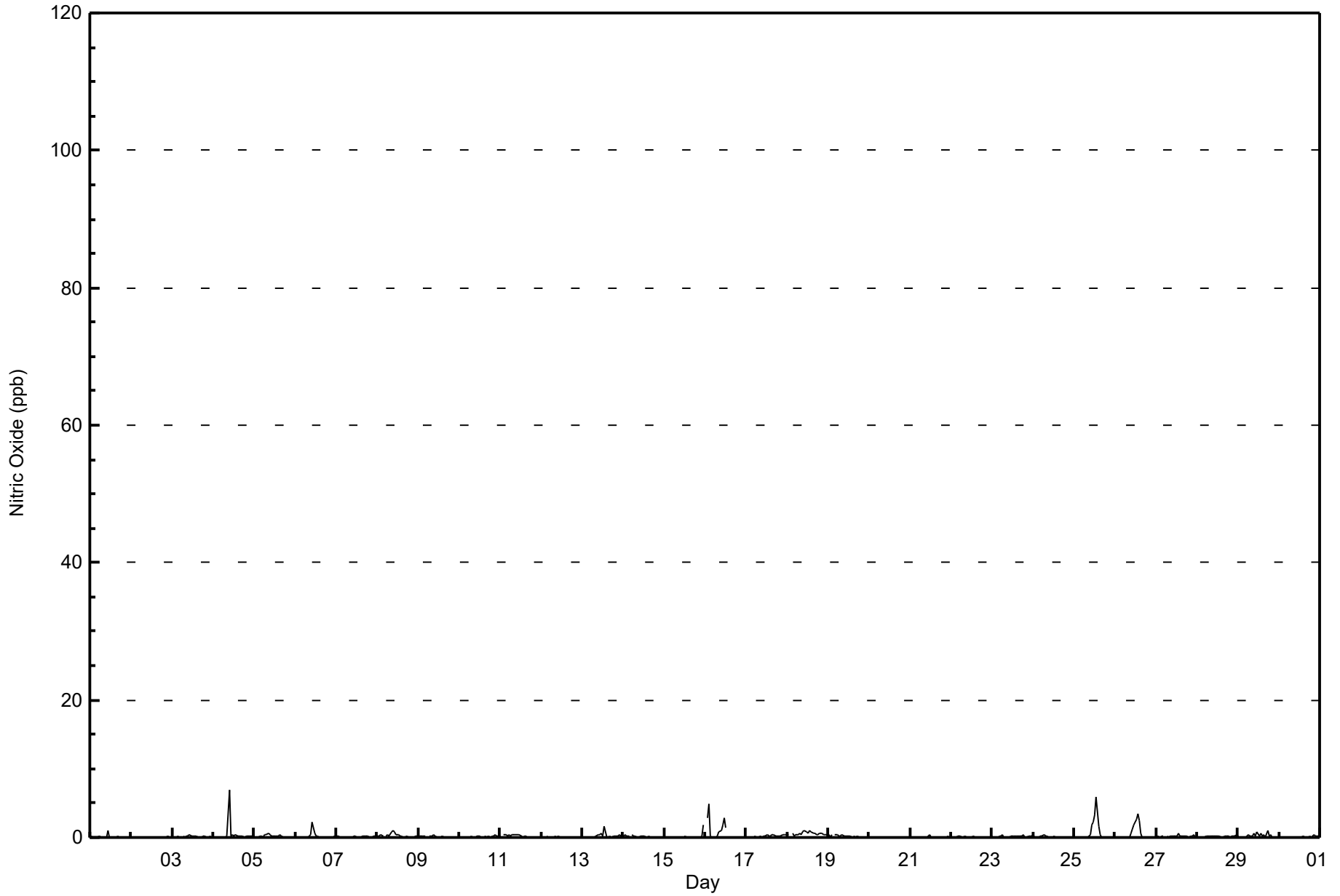
Maximum Value: 7.0 ppb on Nov 4 10:00																				Maximum Daily Average: 0.9 ppb on Nov 16					Hours in Service: 720				
Minimum Value: 0.0 ppb on Nov 1 02:00																				Minimum Daily Average: 0.0 ppb on Nov 20					Hours of Data: 685				
Maximum Diurnal Average: 0.5 ppb at hour 14																				Minimum Diurnal Average: 0.1 ppb at hour 5					Hours of Missing Data: 35				
Monthly Average: 0.21 ppb																				Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.1 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 0.4 P <sub>99</sub> = 2.7					Hours of Calibration: 35				
																				Percent Operational Time: 100.0									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Nov	0.2	0.0	0.0	Z	0.0	0.1	0.0	0.1	0.0	0.1	1.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0			
2-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.2			
3-Nov	0.0	0.1	0.1	0.1	0.0	Z	0.2	0.0	0.1	0.3	0.3	0.2	0.1	0.3	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.3			
4-Nov	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.2	7.0	0.1	0.5	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.3	0.2	0.2	0.1	0.2	0.1	0.2			
5-Nov	0.3	Z	0.0	0.1	0.3	0.1	0.4	0.4	0.6	0.4	0.3	0.2	0.2	0.2	0.2	0.4	0.2	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0				
6-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.3	2.3	0.7	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.3			
7-Nov	0.1	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.2	0.2	0.2	0.3	0.1	0.1	0.1	0.2	0.2	0.1	0.3			
8-Nov	0.2	0.3	0.3	0.3	Z	0.2	0.4	0.2	0.9	1.1	0.9	0.3	0.4	0.2	0.2	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.2	0.2	0.3	1.1			
9-Nov	0.2	0.3	0.3	0.3	0.2	Z	0.2	0.2	0.2	0.4	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4			
10-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.0	0.2	0.2	0.4	0.2	0.2	0.1	0.4			
11-Nov	0.1	Z	0.4	0.3	0.1	0.4	0.2	0.4	0.3	0.3	0.4	0.3	0.2	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.4			
12-Nov	0.0	0.0	Z	0.2	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3			
13-Nov	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.4	0.3	0.6	0.2	1.6	0.1	0.1	0.1	0.0	0.2	0.2	0.3	0.3	0.4	0.1	0.2	1.6			
14-Nov	0.2	0.3	0.2	0.3	Z	0.4	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.4			
15-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.9	1.9				
16-Nov	Z	2.8	4.9	0.2	0.0	0.0	0.0	0.1	0.8	1.1	1.9	2.9	1.4	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.9	4.9			
17-Nov	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.2	0.2	0.4	0.1	0.2	0.5	0.4	0.2	0.3	0.2	0.3	0.4	0.3	0.5	0.2	0.5			
18-Nov	0.4	0.4	Z	0.6	0.3	0.4	0.4	0.6	0.5	0.9	1.0	0.9	0.5	1.1	0.8	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	1.1			
19-Nov	0.4	0.1	0.5	Z	0.4	0.4	0.3	0.2	0.4	0.2	0.1	0.2	0.2	0.2	0.0	0.2	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.5			
20-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
21-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.4			
22-Nov	Z	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.3			
23-Nov	0.1	Z	0.0	0.1	0.1	0.2	0.3	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.3	0.0	0.1	0.2	0.2	0.2	0.1	0.3			
24-Nov	0.3	0.1	Z	0.1	0.1	0.1	0.3	0.2	0.1	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3			
25-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.5	1.9	2.3	3.2	5.9	1.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	5.9			
26-Nov	0.0	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.5	1.2	1.8	2.7	3.5	2.3	0.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.6	3.5			
27-Nov	0.2	0.1	0.1	0.2	0.1	Z	0.3	0.0	0.2	0.2	0.2	0.3	0.2	0.5	0.2	0.1	0.2	0.1	0.2	0.0	0.1	0.1	0.3	0.1	0.2	0.5			
28-Nov	Z	0.1	0.1	0.0	0.1	0.2	0.1	0.3	0.1	0.2	0.3	0.1	0.3	0.2	0.0	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.3			
29-Nov	0.0	Z	0.0	0.1	0.0	0.3	0.3	0.2	0.1	0.5	0.2	0.9	0.3	0.5	0.3	0.3	0.0	1.0	0.2	0.5	0.0	0.0	0.0	0.0	0.3	1.0			
30-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.2	0.1	0.3	0.1	0.1	0.2	0.1	0.3			
																								Diurnal Average					
																								Diurnal Maximum					
0.1 0.2 0.3 0.1 0.1 0.1 0.1 0.1 0.2 0.5 0.5 0.4 0.4 0.5 0.2 0.2 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.2 0.4																													
0.4 2.8 4.9 0.6 0.4 0.4 0.4 0.6 0.9 7.0 2.3 2.9 3.2 5.9 2.3 0.6 0.6 1.0 0.5 0.5 0.5 0.5 0.5 0.5 1.9																													
Z - zerospan C - Calibration																													





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Fort Chipewyan - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Fort Chipewyan - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	685	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Fort Chipewyan - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	6	7	10	55	90	28	22	41	19	22	14	33	116	78	109	33	683
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	6	7	10	55	90	28	22	41	19	22	14	33	116	78	109	33	683

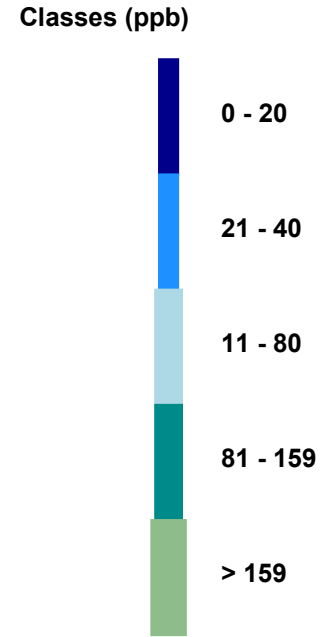
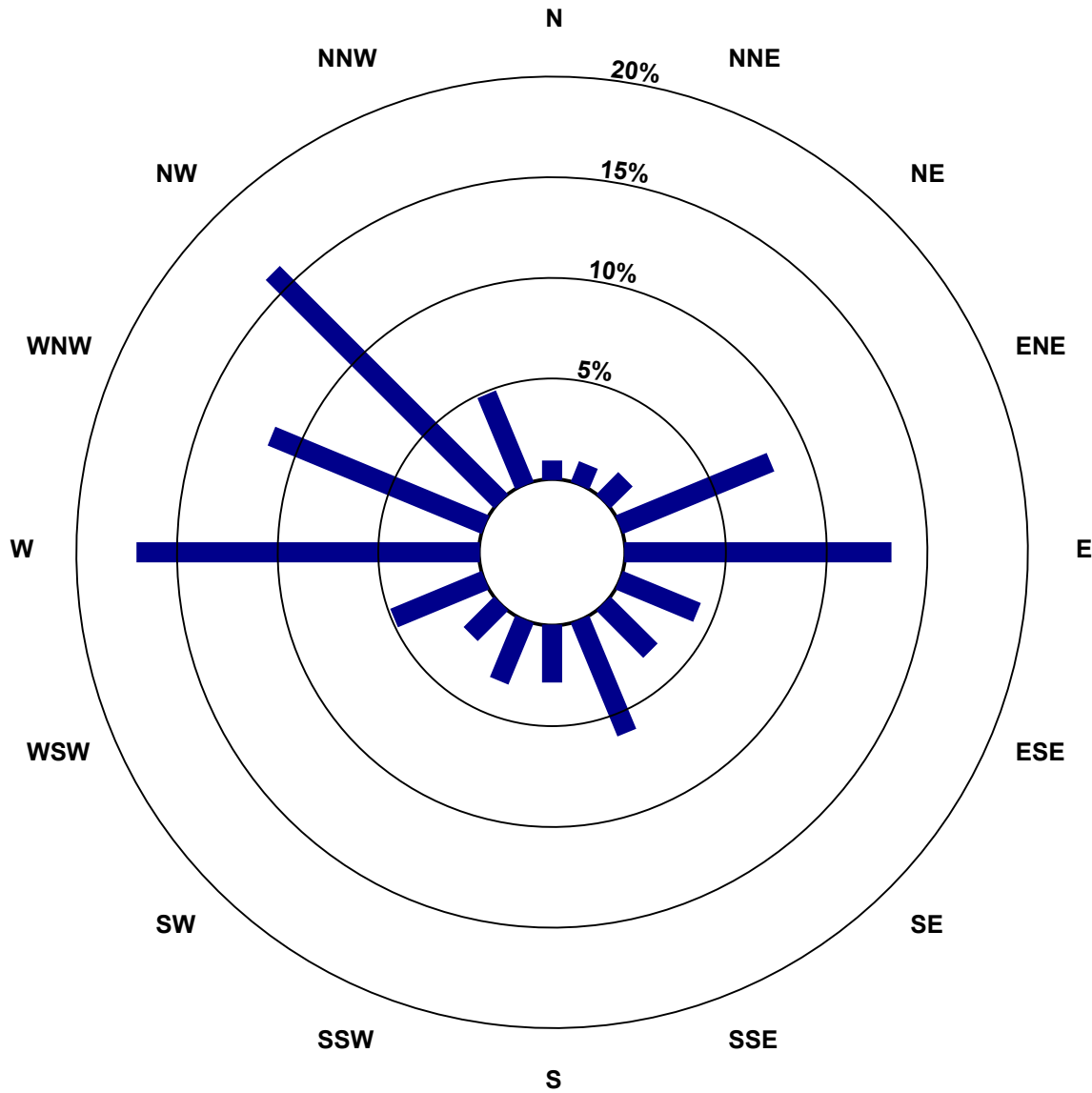
Total Number of Valid Hours: 683

Total Number of Hours: 720

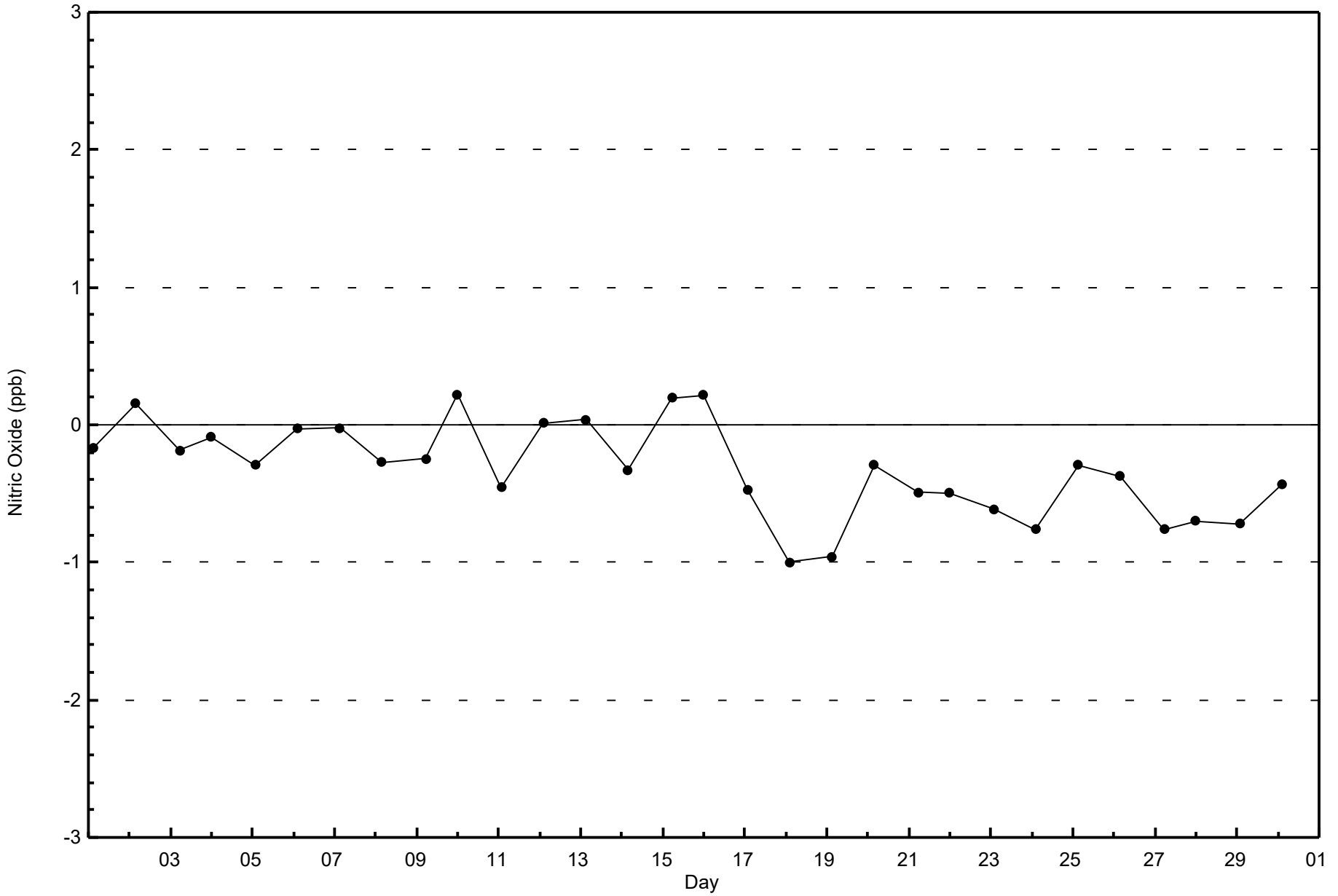


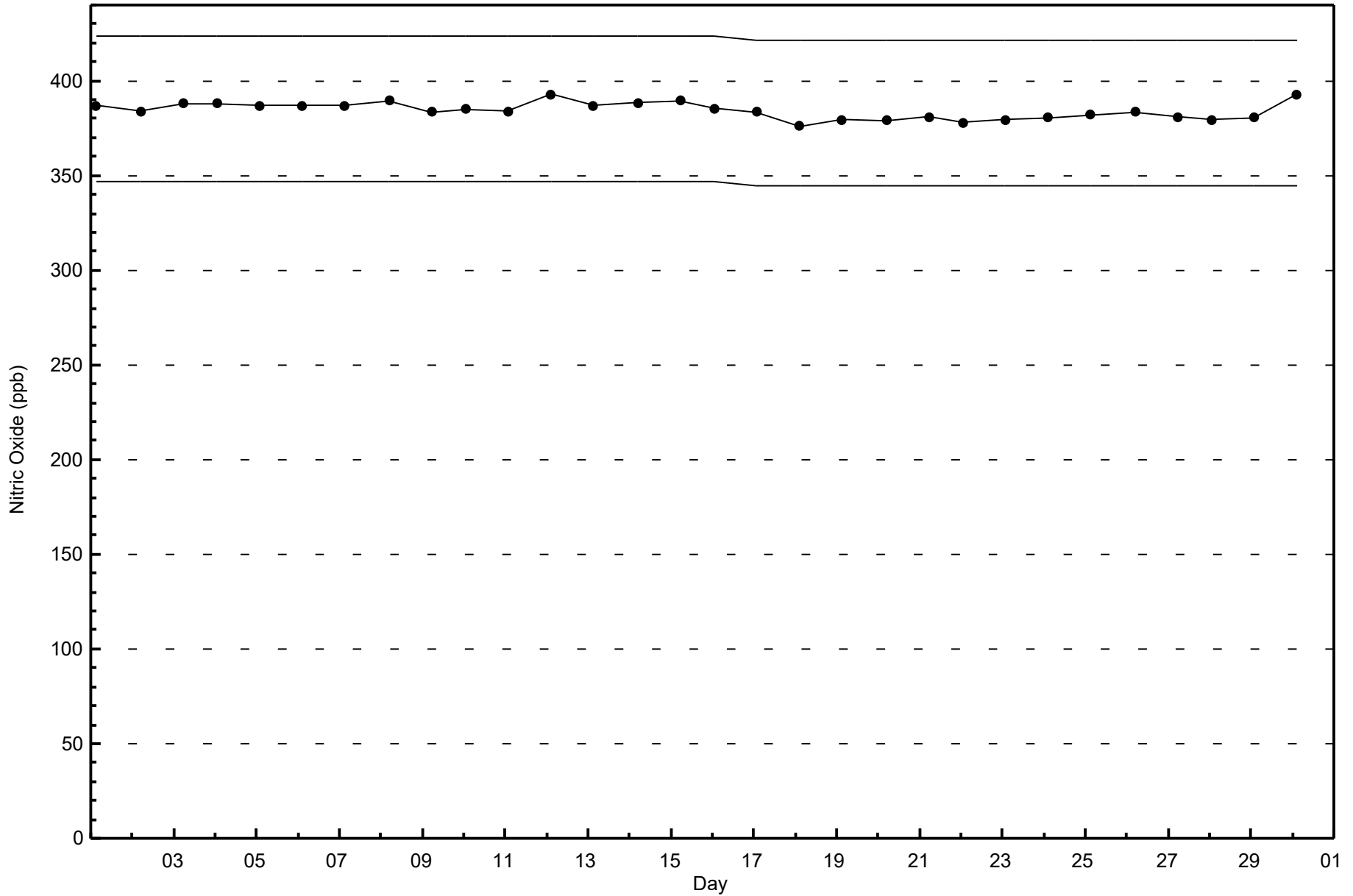
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitric Oxide (NO) - ppb  
Fort Chipewyan



Total Number of Valid Hours: 683







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb

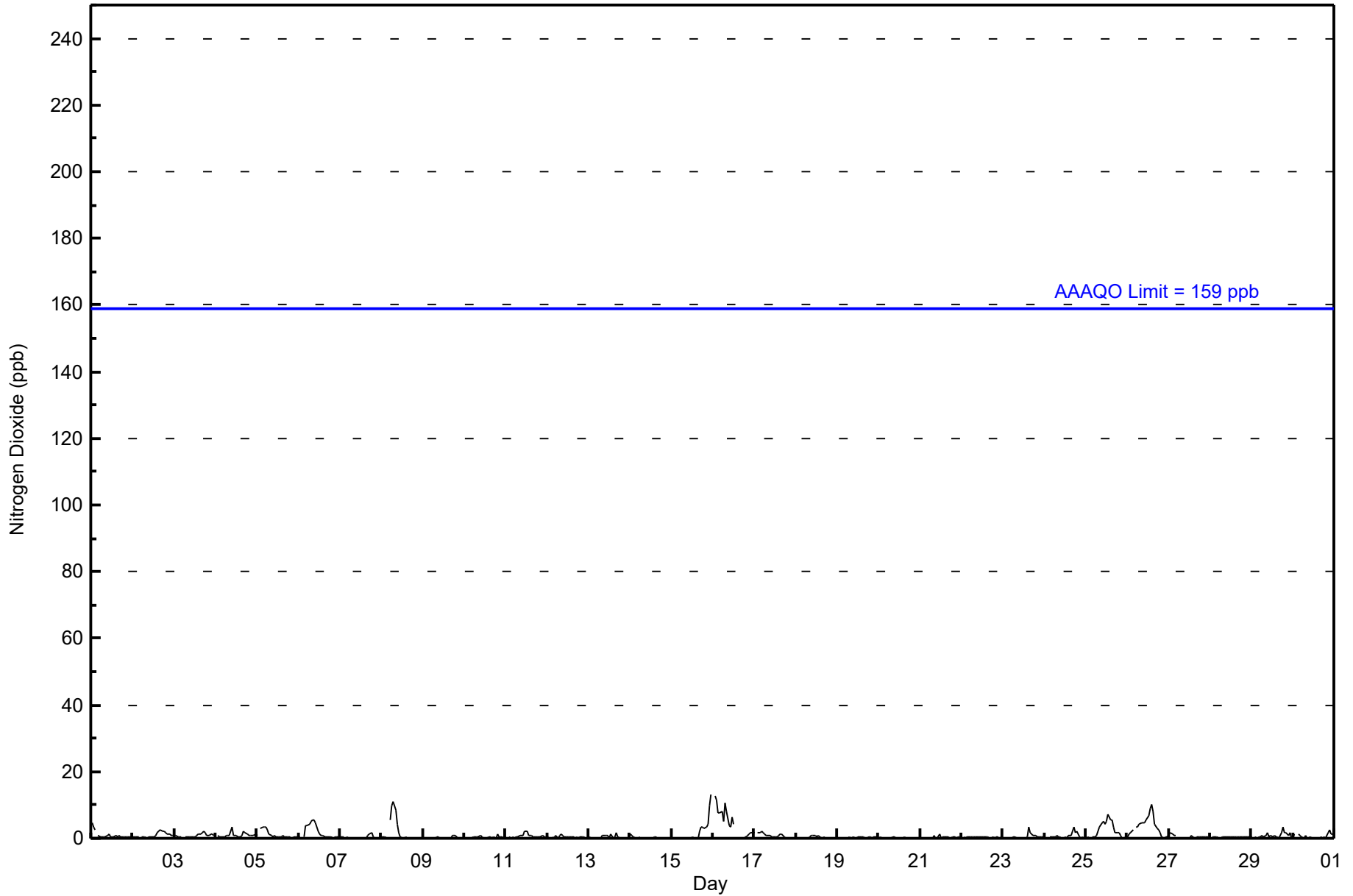
Fort Chipewyan - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 13.1 ppb on Nov 16 00:00	Maximum Daily Average: 5.3 ppb on Nov 16		Hours of Data:	685
Minimum Value: 0.0 ppb on Nov 7 10:00	Minimum Daily Average: 0.2 ppb on Nov 20		Hours of Missing Data:	35
Maximum Diurnal Average: 1.4 ppb at hour 8	Minimum Diurnal Average: 0.6 ppb at hour 8		Hours of Calibration:	35
Monthly Average: 0.97 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.2 Median = 0.4 Q <sub>3</sub> = 0.8 P <sub>90</sub> = 2.4 P <sub>99</sub> = 9.8		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	4.5	3.3	2.5	Z	1.0	0.4	0.5	0.3	0.3	0.7	1.4	0.6	0.4	0.5	0.7	0.5	0.8	0.6	0.4	0.3	0.3	0.3	0.5	0.5	0.9	4.5	
2-Nov	0.4	0.3	0.4	0.3	Z	0.3	0.3	0.3	0.1	0.3	0.3	0.4	0.4	0.9	1.5	2.0	2.4	2.3	2.3	1.6	1.3	1.1	0.9	0.9	0.9	2.4	
3-Nov	0.7	0.7	0.5	0.5	0.5	Z	0.4	0.3	0.4	0.4	0.4	0.5	0.5	0.7	1.1	1.3	1.8	2.3	1.5	1.0	1.0	1.2	1.2	0.7	0.9	2.3	
4-Nov	Z	0.7	0.6	0.6	0.4	0.6	0.7	0.8	0.8	0.8	3.6	0.7	0.9	0.7	0.6	0.6	0.7	2.2	1.5	1.2	0.9	0.9	0.8	0.9	1.2	1.0	3.6
5-Nov	1.0	Z	3.0	3.4	3.2	3.5	2.7	1.4	0.7	0.5	0.7	0.6	0.6	0.6	0.3	0.8	0.6	0.3	0.3	0.3	0.2	0.5	0.4	0.4	1.1	3.5	
6-Nov	0.4	0.3	Z	0.6	3.7	3.7	4.2	5.1	5.4	5.5	4.5	2.0	1.1	0.8	0.7	0.6	0.4	0.4	0.3	0.5	0.2	0.4	0.6	0.6	1.8	5.5	
7-Nov	0.6	0.6	0.3	Z	0.4	0.2	0.2	0.2	0.2	0.0	0.2	0.1	0.1	0.0	0.0	0.2	0.8	1.2	1.7	0.4	0.0	0.0	0.0	0.0	0.3	1.7	
8-Nov	0.5	0.4	0.3	0.2	Z	5.3	9.9	10.9	8.4	4.1	1.7	0.3	0.0	0.2	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	10.9	
9-Nov	0.0	0.0	0.0	0.0	0.1	Z	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.9	0.8	1.0	0.1	0.1	0.0	0.0	0.2	1.0	
10-Nov	Z	0.1	0.0	0.0	0.1	0.4	0.5	0.6	0.5	0.7	0.3	0.2	0.2	0.2	0.3	0.4	0.2	0.3	0.1	1.1	0.6	0.4	0.6	0.2	0.3	1.1	
11-Nov	0.3	Z	0.3	0.2	0.4	0.2	0.5	0.6	0.9	0.9	0.7	2.3	2.0	0.9	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.7	0.5	0.4	0.7	2.3	
12-Nov	0.3	0.3	Z	0.5	0.2	0.7	0.2	0.8	1.1	0.7	0.4	0.4	0.5	0.5	0.4	0.3	0.2	0.3	0.2	0.3	0.4	0.4	0.2	0.2	0.4	1.1	
13-Nov	0.3	0.0	0.1	Z	0.1	0.1	0.2	0.1	0.9	1.0	0.7	0.7	0.2	1.2	0.1	0.3	1.8	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.4	1.8	
14-Nov	1.2	0.7	0.4	0.1	Z	0.4	0.0	0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.3	0.5	0.2	0.2	0.1	0.2	0.0	0.1	0.1	0.1	0.2	1.2	
15-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	2.0	3.5	3.3	3.1	3.4	4.1	9.8	13.1	1.9	13.1	
16-Nov	Z	12.6	11.6	7.8	7.7	7.9	5.2	10.5	8.2	3.7	3.5	6.2	4.2	C	C	C	C	C	0.6	0.6	1.0	1.3	1.5	1.7	5.3	12.6	
17-Nov	1.8	Z	1.9	1.8	2.1	1.9	1.4	0.9	0.9	0.7	0.5	0.4	0.4	0.4	0.7	1.3	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.8	2.1	
18-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.6	1.0	0.8	0.9	0.3	0.8	0.5	0.2	0.5	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.3	1.0	
19-Nov	0.0	0.0	0.0	Z	0.0	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.4	
20-Nov	0.2	0.3	0.0	0.1	Z	0.1	0.2	0.1	0.3	0.6	0.2	0.2	0.1	0.1	0.0	0.5	0.2	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.2	0.6	
21-Nov	0.0	0.0	0.0	0.1	0.0	Z	0.1	0.1	0.7	0.2	0.2	1.2	0.1	0.3	0.3	0.3	0.4	0.1	0.2	0.4	0.3	0.2	0.4	0.3	0.3	1.2	
22-Nov	Z	0.5	0.2	0.4	0.4	0.4	0.4	0.3	0.6	0.4	0.5	0.6	0.5	0.5	0.4	0.3	0.2	0.2	0.4	0.2	0.3	0.5	0.2	0.4	0.4	0.6	
23-Nov	0.2	Z	0.2	0.2	0.1	0.1	0.4	0.3	0.2	0.1	0.1	0.2	0.2	0.2	0.3	3.2	1.5	0.8	0.8	0.7	0.5	0.5	0.6	0.6	0.5	3.2	
24-Nov	0.4	0.2	Z	0.3	0.3	0.4	0.5	0.7	0.6	0.4	0.2	0.2	0.3	0.2	0.7	1.0	2.3	3.4	1.5	2.2	0.3	0.0	0.6	0.2	0.7	3.4	
25-Nov	0.1	0.4	0.0	Z	0.3	0.3	1.0	2.3	3.4	4.6	4.9	4.3	5.0	7.4	5.5	5.6	3.5	1.6	1.7	1.7	0.9	0.1	0.0	0.5	2.4	7.4	
26-Nov	0.4	1.2	1.7	2.7	Z	3.2	3.5	4.4	4.6	4.8	4.8	5.7	6.8	8.8	10.3	8.2	4.4	2.9	2.7	1.9	0.3	0.2	0.6	0.5	3.7	10.3	
27-Nov	0.9	1.8	1.4	1.0	0.9	Z	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.7	0.4	0.2	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.5	1.8	
28-Nov	Z	0.4	0.5	0.4	0.4	0.2	0.2	0.3	0.4	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.5	0.3	0.6	0.5	0.6	0.4	0.6	
29-Nov	0.6	Z	0.4	0.2	0.3	0.5	0.7	0.6	0.7	1.9	0.6	1.0	0.3	0.7	0.4	0.4	0.2	1.8	3.4	1.6	1.5	1.0	1.9	0.0	0.9	3.4	
30-Nov	0.0	1.4	Z	1.2	0.8	0.5	0.2	0.7	0.0	0.0	0.3	0.0	0.0	0.1	0.0	0.2	0.3	0.1	0.6	0.2	1.6	2.4	1.3	1.1	0.6	2.4	

0.6	1.0	1.1	0.9	0.9	1.3	1.2	1.4	1.4	1.3	1.0	1.0	0.9	1.0	0.9	1.0	1.0	0.9	0.9	0.7	0.6	0.6	0.8	0.8	Diurnal Average	
4.5	12.6	11.6	7.8	7.7	7.9	9.9	10.9	8.4	5.5	4.9	6.2	6.8	8.8	10.3	8.2	4.4	3.5	3.4	3.1	3.4	4.1	9.8	13.1	Diurnal Maximum	

Z - zerospan C - Calibration  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort Chipewyan - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	685	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort Chipewyan - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	6	7	10	55	90	28	22	41	19	22	14	33	116	78	109	33	683
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	6	7	10	55	90	28	22	41	19	22	14	33	116	78	109	33	683

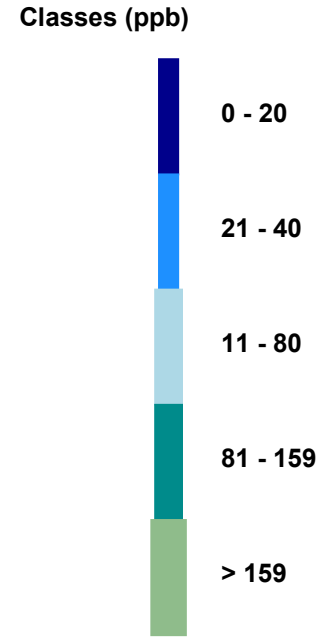
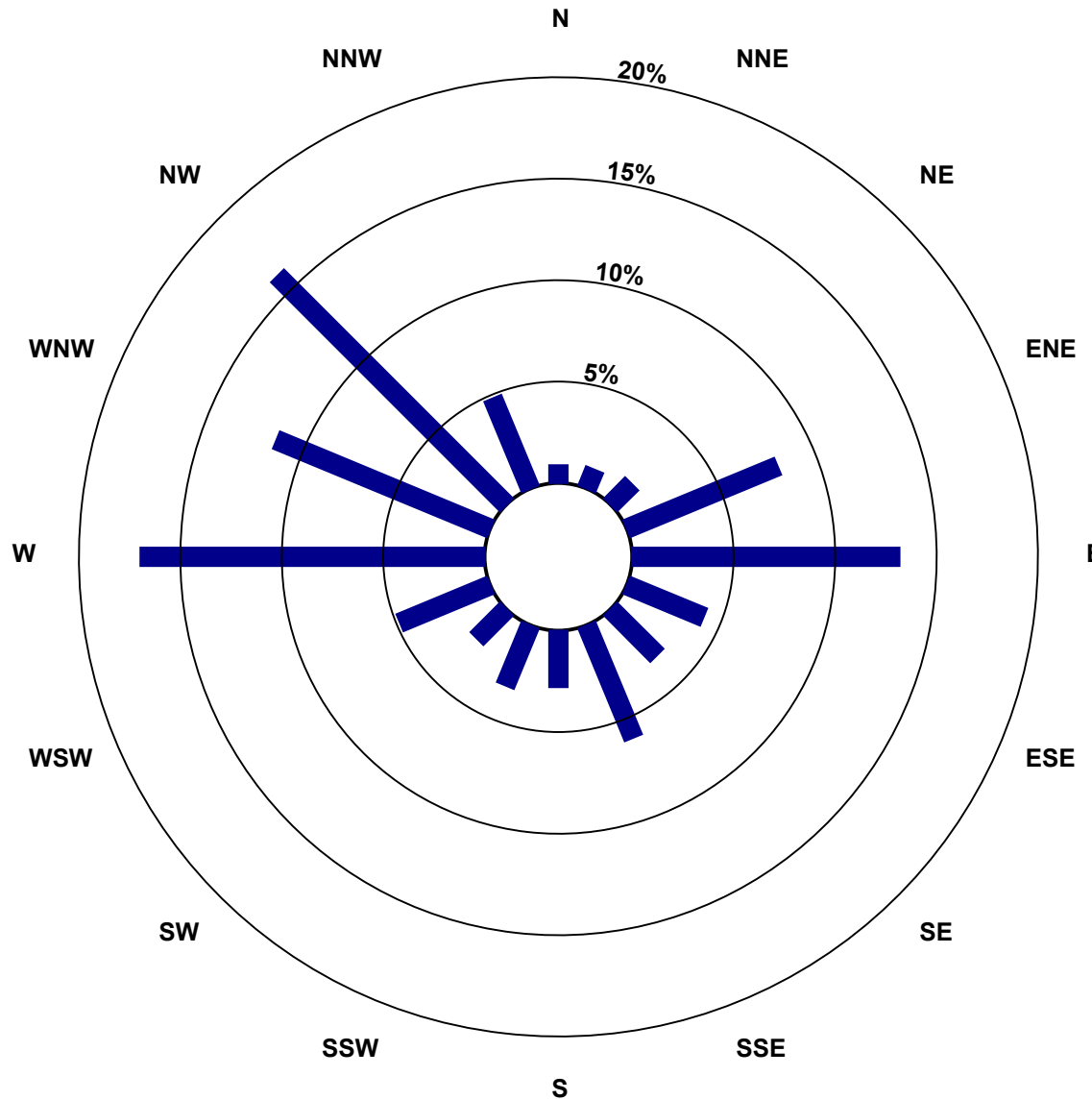
Total Number of Valid Hours: 683

Total Number of Hours: 720

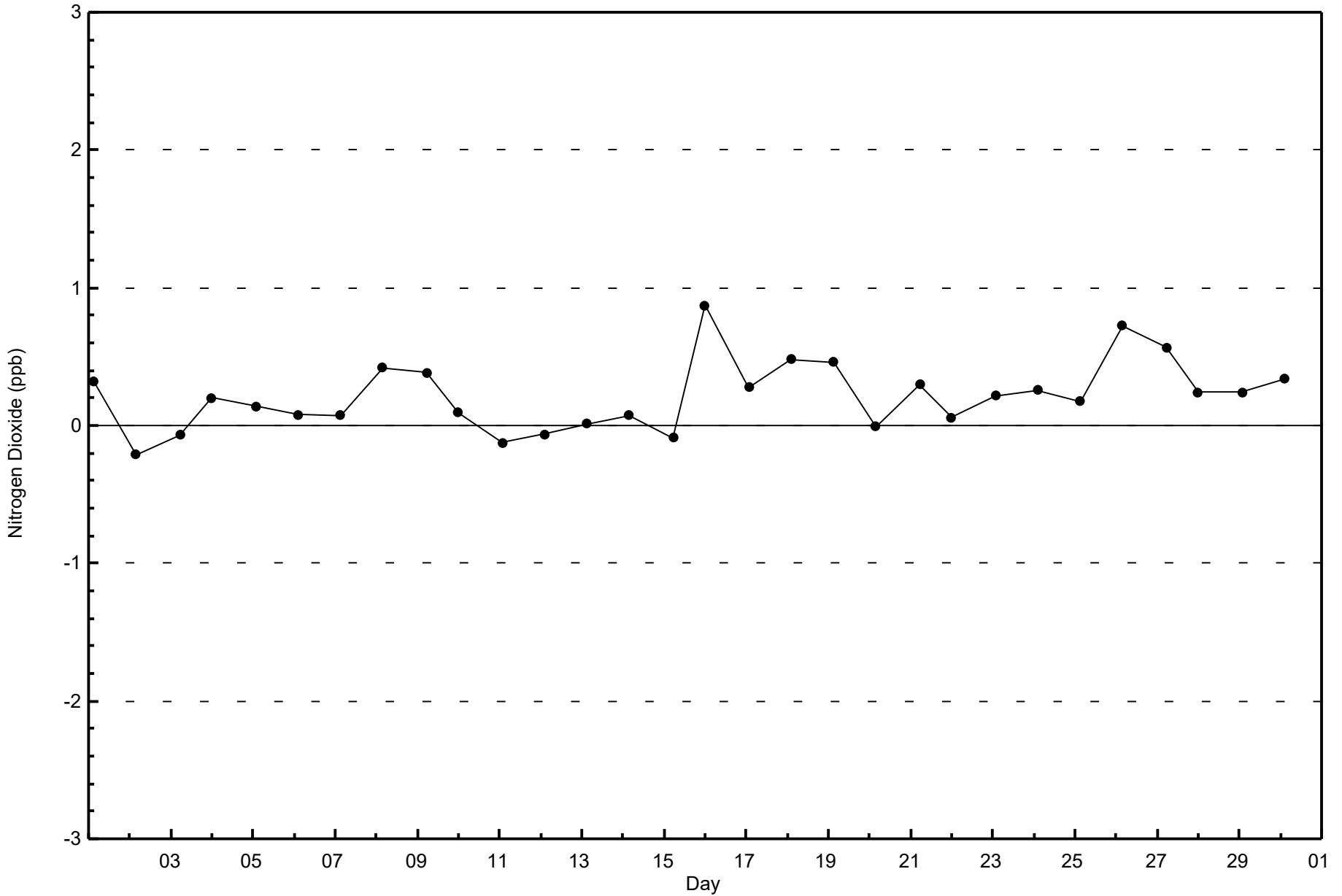


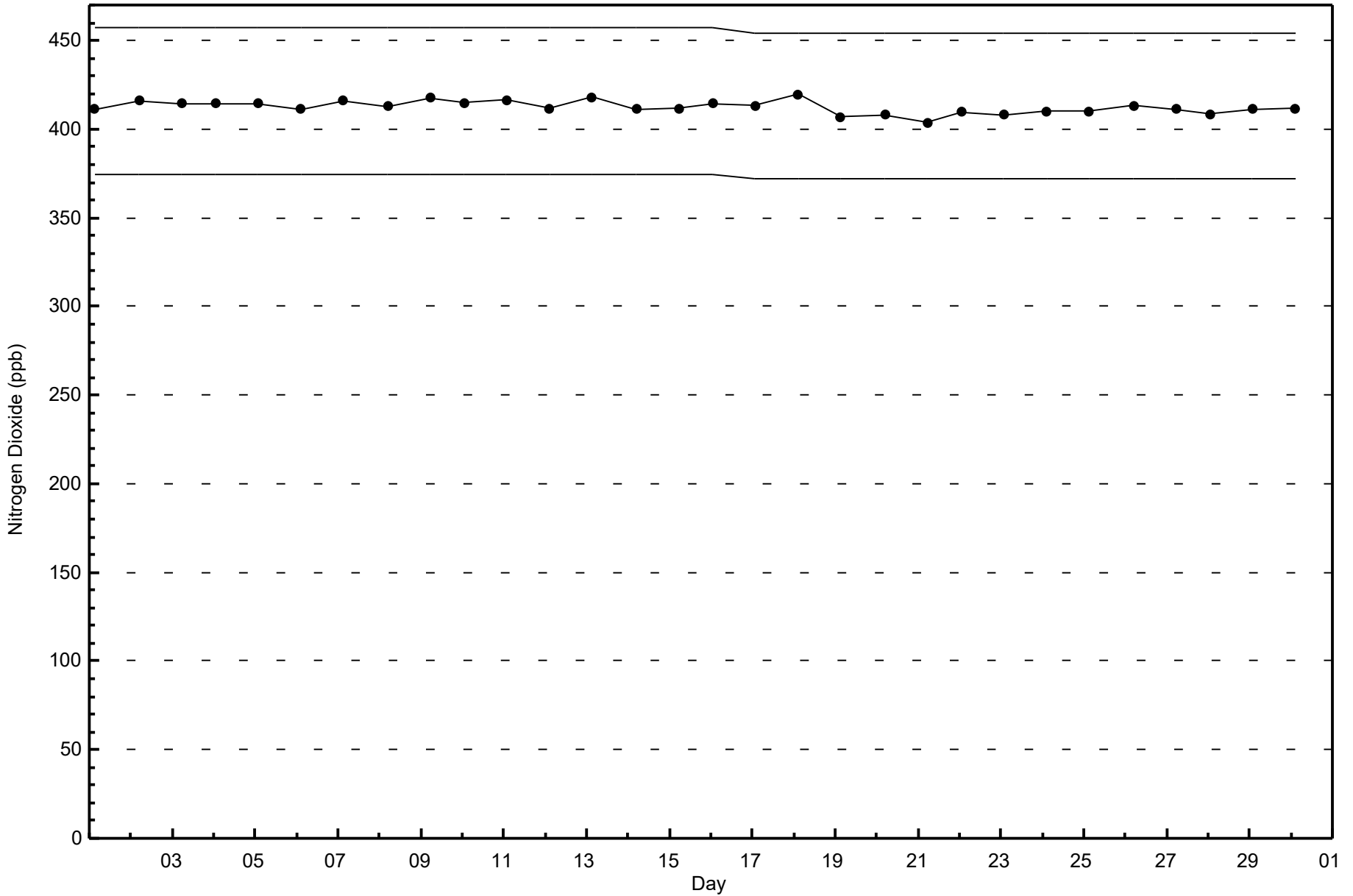
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort Chipewyan



Total Number of Valid Hours: 683







**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

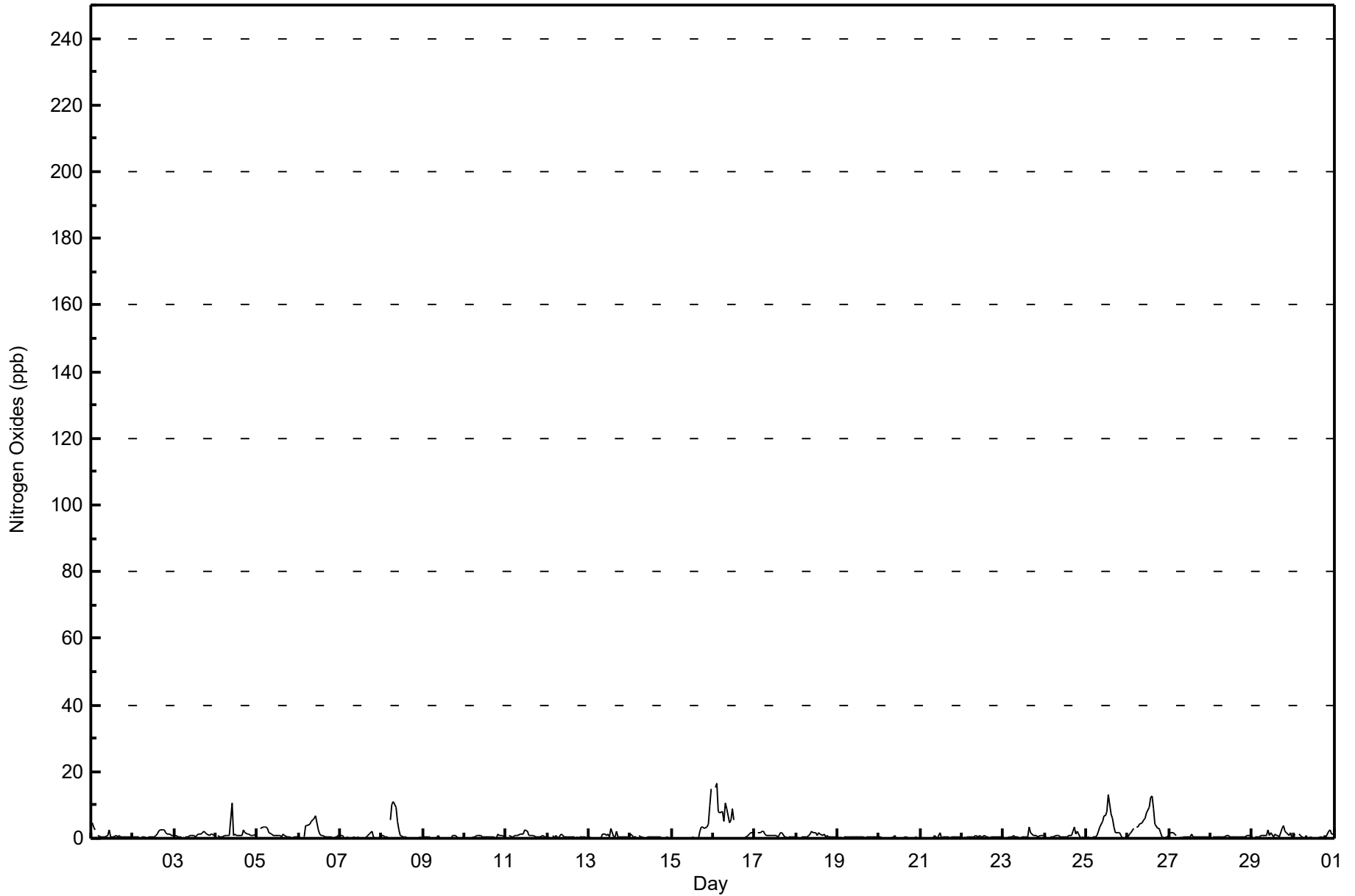
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Fort Chipewyan - November 2024**

Maximum Value: 16.5 ppb on Nov 16 03:00		Maximum Daily Average: 6.2 ppb on Nov 16		Hours in Service: 720																							
Minimum Value: 0.0 ppb on Nov 8 21:00		Minimum Daily Average: 0.2 ppb on Nov 20		Hours of Data: 685																							
Maximum Diurnal Average: 1.8 ppb at hour 10		Minimum Diurnal Average: 0.6 ppb at hour 21		Hours of Missing Data: 35																							
Monthly Average: 1.17 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.3 Median = 0.5 Q <sub>3</sub> = 1.0 P <sub>90</sub> = 2.6 P <sub>99</sub> = 10.7		Hours of Calibration: 35																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	4.7	3.3	2.5	Z	1.0	0.5	0.5	0.4	0.3	0.8	2.4	0.6	0.4	0.5	0.7	0.5	0.9	0.6	0.4	0.3	0.3	0.3	0.5	0.5	1.0	4.7	
2-Nov	0.4	0.3	0.4	0.3	Z	0.3	0.3	0.3	0.1	0.3	0.3	0.4	0.4	0.9	1.5	2.1	2.4	2.4	2.3	1.6	1.3	1.3	1.0	0.9	0.9	2.4	
3-Nov	0.7	0.8	0.6	0.6	0.5	Z	0.6	0.3	0.5	0.7	0.7	0.7	0.6	1.0	1.3	1.4	1.8	2.3	1.6	1.1	1.1	1.2	1.3	0.7	1.0	2.3	
4-Nov	Z	0.8	0.6	0.6	0.4	0.7	0.7	0.9	1.0	10.6	0.8	1.4	0.9	0.8	0.9	2.4	1.7	1.3	1.2	1.1	1.0	1.0	1.4	1.4	1.4	10.6	
5-Nov	1.3	Z	3.0	3.5	3.5	3.6	3.1	1.8	1.3	0.9	1.0	0.8	0.8	0.8	0.5	1.2	0.8	0.3	0.4	0.3	0.2	0.5	0.5	0.4	1.3	3.6	
6-Nov	0.4	0.3	Z	0.6	3.7	3.7	4.2	5.1	5.6	5.8	6.8	2.7	1.3	0.9	0.7	0.6	0.5	0.5	0.3	0.5	0.2	0.4	0.6	0.8	2.0	6.8	
7-Nov	0.7	0.7	0.3	Z	0.4	0.2	0.2	0.2	0.3	0.1	0.4	0.2	0.1	0.1	0.0	0.4	1.0	1.4	2.0	0.5	0.1	0.1	0.2	0.2	0.4	2.0	
8-Nov	0.7	0.7	0.6	0.5	Z	5.5	10.3	11.1	9.3	5.2	2.6	0.6	0.4	0.4	0.5	0.0	0.1	0.2	0.1	0.1	0.0	0.0	0.2	0.2	2.1	11.1	
9-Nov	0.2	0.3	0.3	0.3	0.3	Z	0.2	0.2	0.5	0.7	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.9	0.8	1.0	0.1	0.1	0.0	0.0	0.3	1.0	
10-Nov	Z	0.1	0.0	0.0	0.1	0.4	0.5	0.7	0.6	0.7	0.5	0.4	0.4	0.3	0.4	0.6	0.3	0.5	0.1	1.3	0.8	0.8	0.8	0.4	0.5	1.3	
11-Nov	0.4	Z	0.7	0.5	0.5	0.6	0.7	1.0	1.2	1.2	1.1	2.6	2.2	0.9	0.8	0.8	0.7	0.6	0.5	0.5	0.5	0.7	0.5	0.4	0.9	2.6	
12-Nov	0.3	0.3	Z	0.7	0.2	0.7	0.2	0.8	1.4	0.7	0.5	0.4	0.5	0.5	0.4	0.3	0.2	0.3	0.2	0.3	0.5	0.4	0.2	0.2	0.4	1.4	
13-Nov	0.4	0.0	0.1	Z	0.1	0.1	0.2	0.1	1.1	1.4	1.0	1.3	0.4	2.8	0.2	0.4	1.9	0.3	0.4	0.3	0.5	0.4	0.5	0.2	0.6	2.8	
14-Nov	1.4	1.0	0.6	0.4	Z	0.8	0.2	0.2	0.2	0.1	0.3	0.3	0.4	0.3	0.3	0.6	0.2	0.2	0.1	0.2	0.0	0.2	0.1	0.1	0.4	1.4	
15-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	2.0	3.5	3.3	3.1	3.4	4.1	9.9	15.0	1.9	15.0	
16-Nov	Z	15.4	16.5	8.0	7.7	7.9	5.2	10.6	9.0	4.8	5.4	9.1	5.6	C	C	C	C	C	0.6	0.6	1.0	1.3	1.5	1.7	6.2	16.5	
17-Nov	1.8	Z	1.9	1.8	2.1	2.0	1.4	0.9	1.0	0.7	0.7	0.6	0.8	0.5	0.9	1.8	1.7	0.5	0.3	0.2	0.3	0.4	0.3	0.6	1.0	2.1	
18-Nov	0.4	0.4	Z	0.6	0.3	0.4	0.5	0.7	1.1	1.9	1.8	1.8	0.8	1.9	1.3	0.7	1.1	0.6	0.6	0.5	0.5	0.6	0.6	0.5	0.8	1.9	
19-Nov	0.4	0.1	0.5	Z	0.4	0.6	0.5	0.5	0.6	0.5	0.3	0.4	0.5	0.5	0.4	0.5	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.6	
20-Nov	0.2	0.3	0.0	0.1	Z	0.1	0.2	0.1	0.3	0.6	0.2	0.2	0.1	0.1	0.0	0.5	0.2	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.2	0.6	
21-Nov	0.0	0.0	0.0	0.1	0.0	Z	0.1	0.1	0.7	0.2	0.2	1.6	0.1	0.3	0.3	0.3	0.5	0.1	0.2	0.4	0.3	0.2	0.5	0.3	0.3	1.6	
22-Nov	Z	0.5	0.2	0.5	0.5	0.5	0.4	0.3	0.7	0.5	0.6	0.6	0.5	0.8	0.4	0.3	0.2	0.2	0.4	0.2	0.3	0.6	0.3	0.4	0.4	0.8	
23-Nov	0.3	Z	0.2	0.3	0.2	0.3	0.7	0.3	0.2	0.1	0.2	0.4	0.3	0.4	0.4	3.4	1.6	1.0	1.1	0.7	0.6	0.7	0.7	0.8	0.7	3.4	
24-Nov	0.7	0.3	Z	0.4	0.4	0.5	0.8	0.9	0.7	0.4	0.3	0.2	0.5	0.2	0.7	1.0	2.3	3.4	1.5	2.2	0.3	0.0	0.6	0.2	0.8	3.4	
25-Nov	0.1	0.4	0.0	Z	0.3	0.3	1.0	2.3	3.4	5.1	6.8	6.6	8.2	13.3	7.2	6.0	3.5	1.6	1.7	1.7	0.9	0.1	0.0	0.5	3.1	13.3	
26-Nov	0.4	1.2	1.7	2.8	Z	3.2	3.5	4.4	4.6	5.3	6.0	7.5	9.5	12.3	12.6	8.8	4.4	2.9	2.8	1.9	0.3	0.2	0.6	0.5	4.2	12.6	
27-Nov	1.1	1.9	1.5	1.2	1.0	Z	0.4	0.2	0.3	0.4	0.4	0.4	0.3	1.2	0.6	0.3	0.5	0.5	0.6	0.4	0.5	0.4	0.6	0.5	0.7	1.9	
28-Nov	Z	0.5	0.6	0.4	0.5	0.4	0.3	0.6	0.5	0.7	0.7	0.5	0.6	0.6	0.4	0.5	0.6	0.4	0.5	0.6	0.5	0.8	0.7	0.9	0.6	0.9	
29-Nov	0.6	Z	0.4	0.3	0.3	0.8	1.0	0.8	0.8	2.4	0.8	1.9	0.6	1.2	0.7	0.7	0.2	2.8	3.6	2.1	1.5	1.0	1.9	0.0	1.2	3.6	
30-Nov	0.0	1.4	Z	1.2	0.8	0.5	0.2	0.7	0.1	0.0	0.3	0.0	0.0	0.2	0.1	0.3	0.3	0.1	0.8	0.3	1.9	2.5	1.4	1.3	0.6	2.5	
		0.7	1.2	1.3	1.0	1.0	1.4	1.3	1.6	1.6	1.8	1.4	1.5	1.3	1.5	1.2	1.2	1.1	1.0	1.0	0.8	0.6	0.7	0.9	1.0	Diurnal Average	
		4.7	15.4	16.5	8.0	7.7	7.9	10.3	11.1	9.3	10.6	6.8	9.1	9.5	13.3	12.6	8.8	4.4	3.5	3.6	3.1	3.4	4.1	9.9	15.0	Diurnal Maximum	
Z - zerspan		C - Calibration																									



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Fort Chipewyan - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Fort Chipewyan - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	685	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Fort Chipewyan - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	6	7	10	55	90	28	22	41	19	22	14	33	116	78	109	33	683
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	6	7	10	55	90	28	22	41	19	22	14	33	116	78	109	33	683

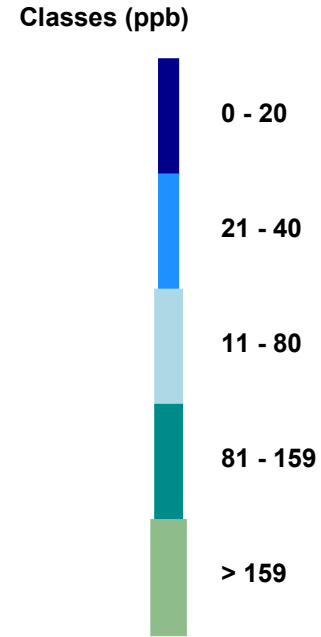
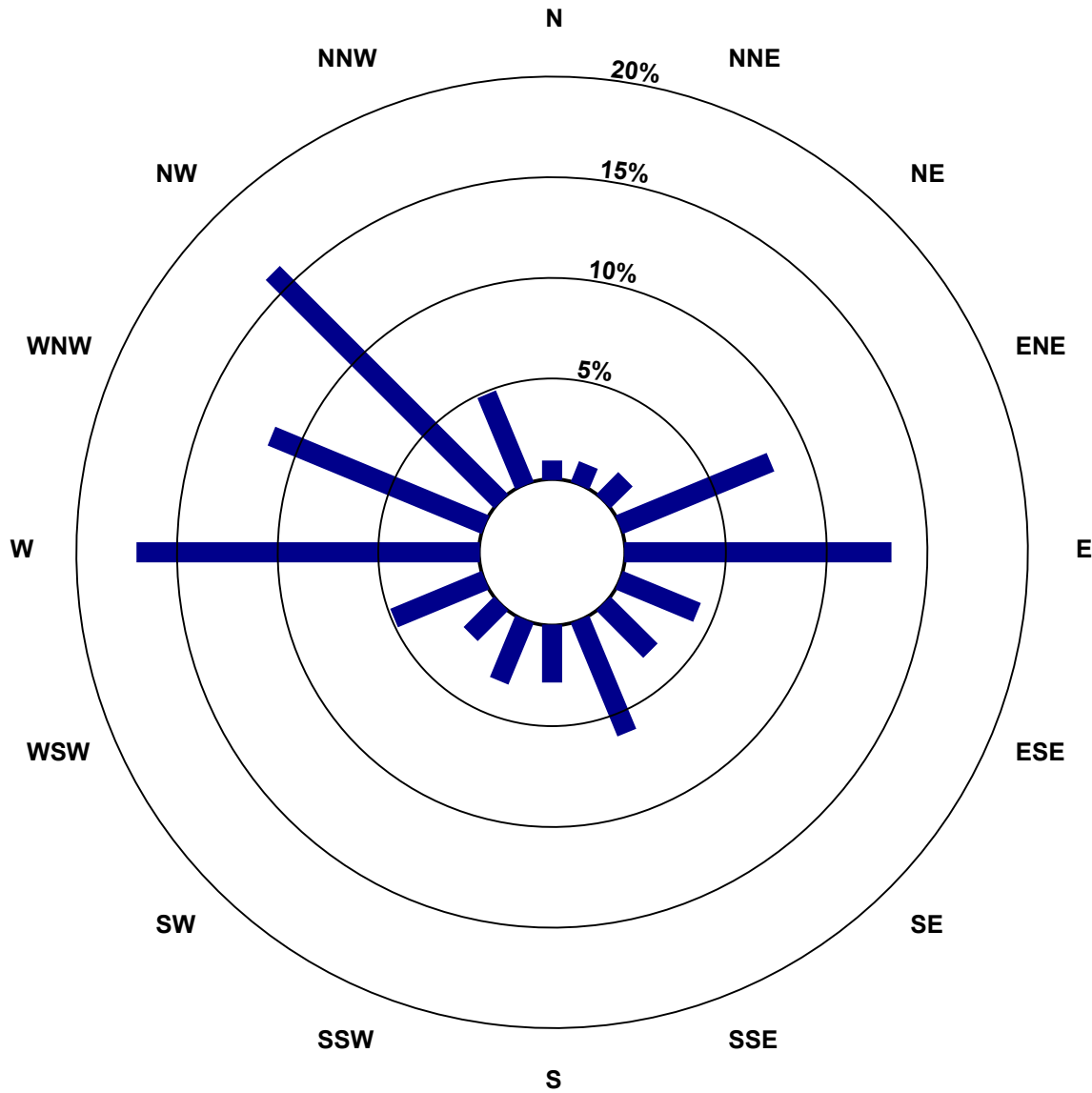
Total Number of Valid Hours: 683

Total Number of Hours: 720

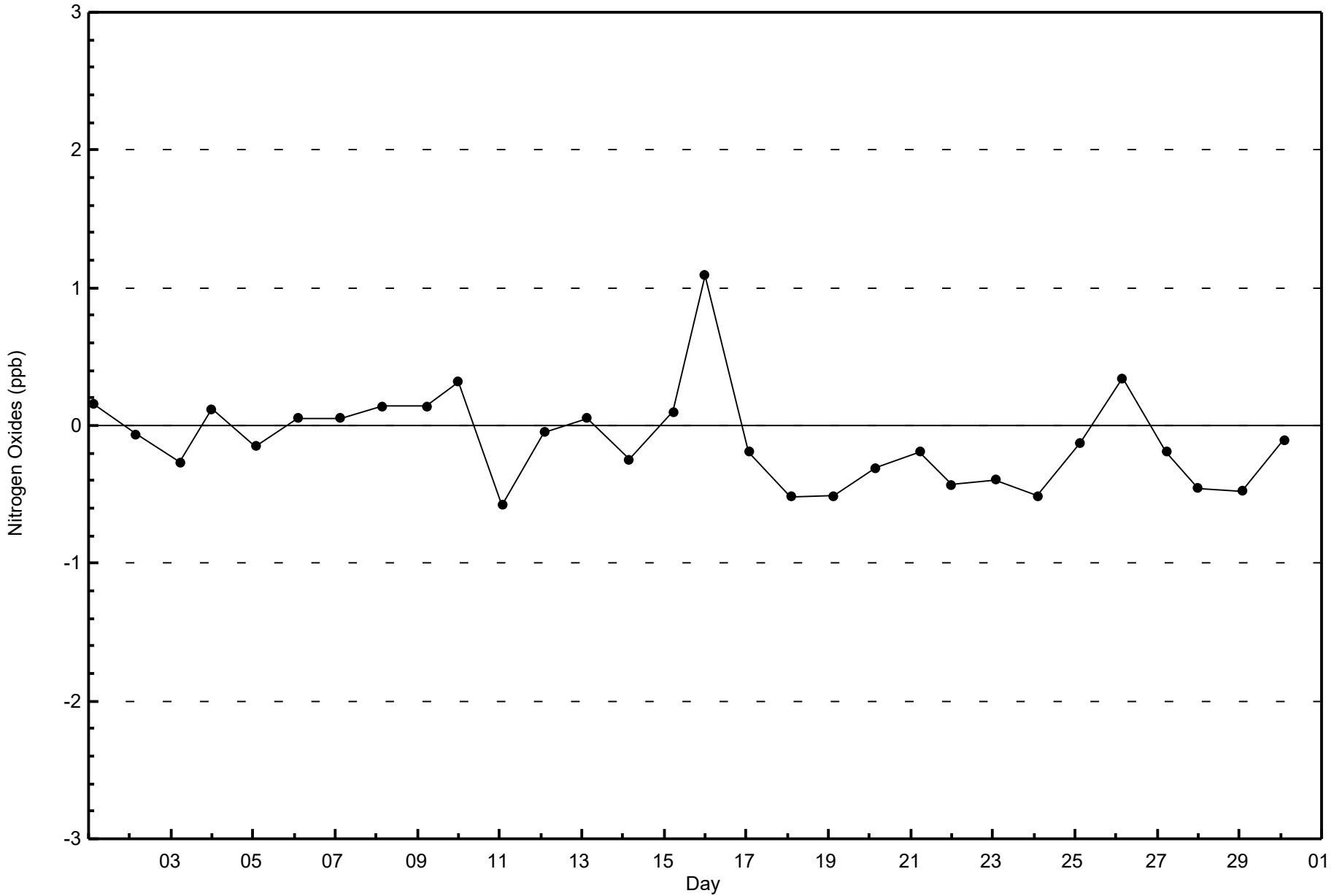


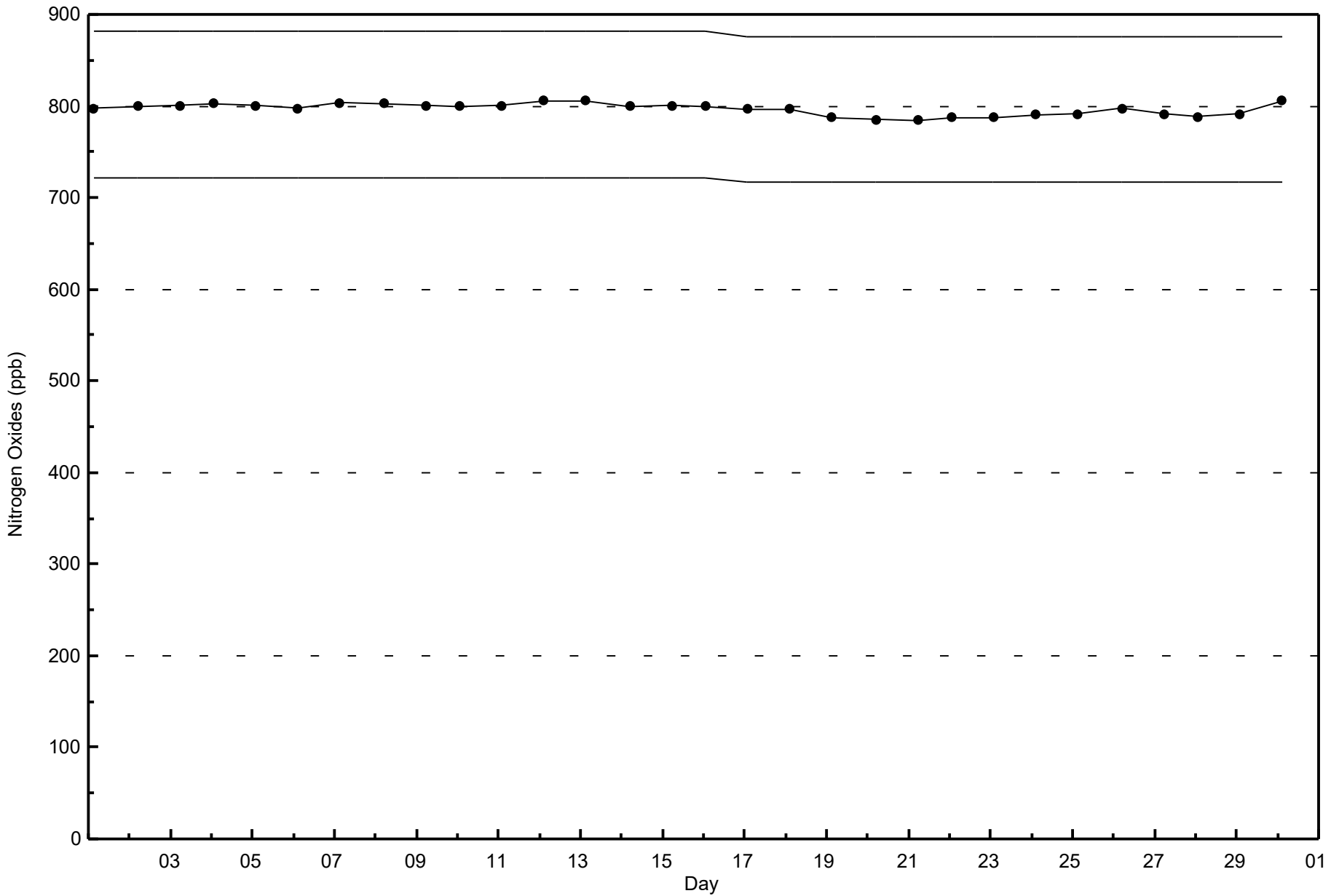
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Fort Chipewyan



Total Number of Valid Hours: 683







Wood Buffalo Environmental Association

Summary of Hour Averages

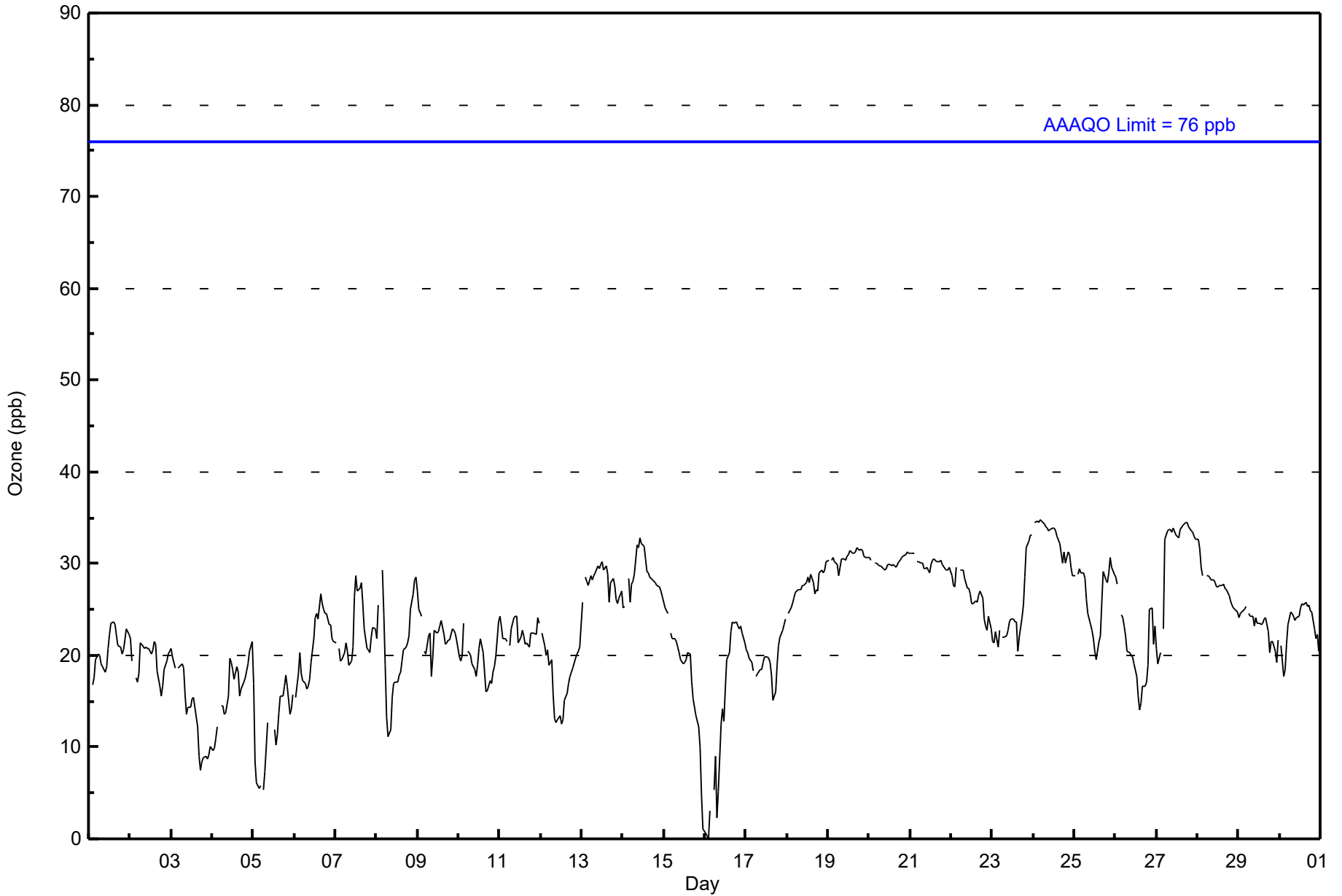
Ozone (O<sub>3</sub>) - ppb

Fort Chipewyan - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 34.8 ppb on Nov 24 05:00	Maximum Daily Average: 32.7 ppb on Nov 24		Hours of Data:	687
Minimum Value: 0.1 ppb on Nov 16 03:00	Minimum Daily Average: 12.0 ppb on Nov 5		Hours of Missing Data:	33
Maximum Diurnal Average: 23.7 ppb at hour 21	Minimum Diurnal Average: 21.7 ppb at hour 3		Hours of Calibration:	33
Monthly Average: 23.08 ppb	Percentiles: P <sub>1</sub> = 5.2 P <sub>10</sub> = 15.5 Q <sub>1</sub> = 19.4 Median = 23.0 Q <sub>3</sub> = 28.4 P <sub>90</sub> = 30.6 P <sub>99</sub> = 34.3		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	16.7	Z	16.8	17.6	19.6	20.2	19.9	19.1	18.7	18.1	18.7	20.7	22.3	23.5	23.6	23.3	22.1	21.1	20.9	20.2	20.6	21.7	22.8	22.2	20.5	23.6																						
2-Nov	21.8	19.4	Z	17.5	17.1	18.1	21.4	21.2	20.8	20.9	20.8	20.7	20.1	20.5	21.5	21.2	18.3	16.7	15.5	16.6	18.4	19.4	20.1	20.5	19.5	21.8																						
3-Nov	20.7	19.9	18.7	Z	18.7	18.8	19.0	18.6	15.7	13.6	14.3	14.3	15.3	15.4	14.4	12.3	8.9	7.5	8.3	8.8	9.0	8.6	9.1	10.0	13.9	20.7																						
4-Nov	9.6	9.9	11.0	12.2	Z	14.5	14.5	13.6	13.7	15.6	19.7	19.2	18.4	17.4	18.8	18.2	15.6	16.3	17.1	17.5	18.3	19.1	20.5	21.5	16.2	21.5																						
5-Nov	17.0	8.3	6.1	5.4	5.7	Z	5.3	7.4	12.7	C	C	C	11.8	10.3	11.4	13.8	15.5	15.6	16.6	17.8	16.6	13.7	14.3	15.7	12.0	17.8																						
6-Nov	Z	15.4	18.0	20.3	18.0	17.2	17.0	16.3	16.7	17.3	19.2	21.9	24.0	24.6	24.0	26.8	25.6	25.0	24.6	24.6	23.4	23.3	21.9	21.4	21.1	26.8																						
7-Nov	21.3	Z	20.8	19.4	19.6	20.4	21.3	20.4	18.9	19.4	20.9	26.5	28.7	27.0	27.2	27.9	25.6	22.9	20.7	20.6	20.3	21.9	23.0	22.9	22.5	28.7																						
8-Nov	21.8	25.4	Z	29.3	24.6	18.8	13.2	11.2	12.0	15.4	16.9	17.0	17.1	17.9	18.1	19.4	20.7	20.9	21.3	22.2	25.0	26.8	28.2	28.5	20.5	29.3																						
9-Nov	27.0	25.1	24.2	Z	20.5	20.1	22.1	22.4	17.7	19.8	22.8	22.4	22.5	23.2	23.7	22.2	21.3	21.3	21.6	21.6	22.9	22.8	22.5	21.7	22.2	27.0																						
10-Nov	19.9	19.3	19.9	23.4	Z	20.4	20.3	20.0	19.1	18.5	17.7	18.9	20.8	21.9	20.3	18.1	16.0	16.1	17.3	17.0	18.2	18.8	19.8	23.6	19.4	23.6																						
11-Nov	24.2	23.2	21.8	21.8	21.5	Z	21.1	22.8	24.1	24.2	24.2	21.4	22.0	22.7	22.1	21.2	21.3	20.9	22.5	22.4	22.4	22.3	24.1	23.5	22.5	24.2																						
12-Nov	Z	22.5	21.1	20.1	20.5	18.9	19.5	15.7	13.1	12.7	12.9	13.4	12.5	12.9	15.2	15.9	16.9	17.7	18.1	18.6	19.6	20.1	20.5	20.9	17.4	22.5																						
13-Nov	25.7	Z	28.5	28.0	27.6	28.6	28.3	28.7	29.0	29.8	29.4	29.9	30.2	29.3	29.7	28.8	25.8	27.9	28.3	27.6	26.1	25.7	26.3	27.0	28.1	30.2																						
14-Nov	25.2	25.3	Z	28.4	25.8	27.7	28.1	28.8	32.0	31.7	32.8	32.3	31.8	30.5	29.2	29.0	28.6	28.2	28.1	27.9	27.6	27.5	27.1	26.5	28.7	32.8																						
15-Nov	25.8	25.1	24.6	Z	22.5	21.8	21.9	21.5	20.9	20.3	19.5	19.0	19.2	19.5	20.3	20.1	17.1	15.2	14.3	13.4	12.2	9.9	4.7	1.1	17.8	25.8																						
16-Nov	0.6	0.4	0.1	3.1	Z	5.4	9.0	2.2	5.2	12.5	14.3	12.8	16.3	19.5	20.3	22.5	23.7	23.4	23.7	23.2	22.9	23.2	22.4	21.4	14.3	23.7																						
17-Nov	20.6	20.3	19.6	19.3	18.3	Z	17.7	18.1	18.5	18.5	19.3	19.8	19.8	19.7	19.3	17.8	15.1	15.9	18.8	21.1	22.0	22.8	23.4	23.9	19.6	23.9																						
18-Nov	Z	24.5	25.1	25.6	26.2	26.8	27.2	27.2	27.1	27.7	27.6	27.9	28.5	28.0	28.9	27.9	26.7	27.1	27.0	29.0	29.3	29.0	29.3	30.1	27.6	30.1																						
19-Nov	30.3	Z	30.3	30.6	30.1	29.9	28.7	29.6	30.5	30.6	30.4	30.8	30.9	31.4	31.2	31.1	31.3	31.7	31.4	31.6	31.4	30.9	30.6	30.7	30.7	31.7																						
20-Nov	30.6	30.4	Z	30.1	30.0	29.9	29.8	29.8	29.5	29.3	29.5	29.9	29.9	29.7	29.9	29.7	29.6	30.2	30.3	30.6	30.9	31.0	31.3	31.1	30.1	31.3																						
21-Nov	31.1	31.1	31.1	Z	30.1	30.2	30.0	30.0	29.5	29.5	29.5	29.0	30.0	30.3	30.4	30.3	30.2	30.2	30.3	29.9	29.4	29.2	29.2	29.5	30.0	31.1																						
22-Nov	28.7	27.6	27.5	29.7	Z	29.3	29.3	29.3	28.4	27.4	27.3	26.6	25.7	25.6	26.0	25.9	26.6	27.0	26.2	23.9	23.2	22.7	24.3	22.9	26.6	29.7																						
23-Nov	21.5	21.3	22.5	20.9	22.7	Z	21.9	22.0	22.1	22.7	23.6	24.0	24.0	23.7	23.6	20.5	21.9	24.1	25.5	28.6	31.7	32.5	33.1	33.1	24.7	33.1																						
24-Nov	Z	34.4	34.6	34.5	34.8	34.6	34.3	34.0	33.8	33.6	33.7	33.9	33.5	32.9	32.2	31.1	30.0	31.3	30.1	31.2	31.0	31.2	31.0	29.6	28.7	32.7	34.8																					
25-Nov	28.6	Z	28.9	29.5	29.0	28.9	28.4	26.2	24.5	23.3	22.7	21.7	20.9	19.6	21.5	22.2	25.8	29.1	28.3	28.0	29.0	30.6	29.5	28.9	26.3	30.6																						
26-Nov	28.6	27.8	Z	24.4	24.1	23.2	22.1	20.4	20.3	20.0	19.9	19.1	17.6	15.6	14.0	14.8	16.6	16.7	17.1	18.9	25.1	25.1	21.2	23.1	20.7	28.6																						
27-Nov	20.7	19.0	20.3	Z	23.0	32.6	33.6	33.7	33.7	33.5	33.8	33.2	33.0	32.8	33.7	34.1	34.3	34.5	34.5	34.0	33.6	33.4	32.9	32.6	31.3	34.5																						
28-Nov	32.6	31.6	29.6	28.7	Z	28.6	28.6	28.6	28.2	28.2	27.9	27.4	27.5	27.6	27.6	27.7	27.4	27.1	26.5	26.0	25.5	25.1	25.0	24.6	27.7	32.6																						
29-Nov	24.1	24.6	24.7	25.1	25.3	Z	24.6	24.3	24.2	23.1	24.1	23.5	23.6	23.3	23.5	23.9	24.2	22.6	20.3	21.5	21.5	20.4	19.2	21.7	23.2	25.3																						
30-Nov	Z	21.1	17.8	18.4	21.3	23.4	24.7	24.5	24.2	23.8	24.1	24.2	25.2	25.6	25.5	25.8	25.4	25.4	24.9	24.7	22.9	21.8	22.2	20.4	23.4	25.8																						
																								23.0	22.1	21.7	22.5	23.1	23.5	22.8	22.3	22.2	22.8	23.4	23.5	23.4	23.4	23.6	23.5	23.0	22.9	23.0	23.3	23.7	23.7	23.6	23.7	Diurnal Average
																								32.6	34.4	34.6	34.5	34.8	34.6	34.3	34.0	33.8	33.6	33.8	33.9	33.9	33.5	33.7	34.1	34.3	34.5	34.5	34.0	33.6	33.4	33.1	33.1	Diurnal Maximum

Z - zerospan      C - Calibration  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Fort Chipewyan - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	227	33.04	33.04
21 - 50	460	66.96	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Fort Chipewyan - November 2024**

<b>Concentration</b> <b>Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	2	1	8	6	26	15	10	20	15	15	12	18	56	12	7	3	226
21 - 50	4	5	2	48	67	13	12	26	5	6	2	13	59	67	101	29	459
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	6	6	10	54	93	28	22	46	20	21	14	31	115	79	108	32	685

Total Number of Valid Hours: 685

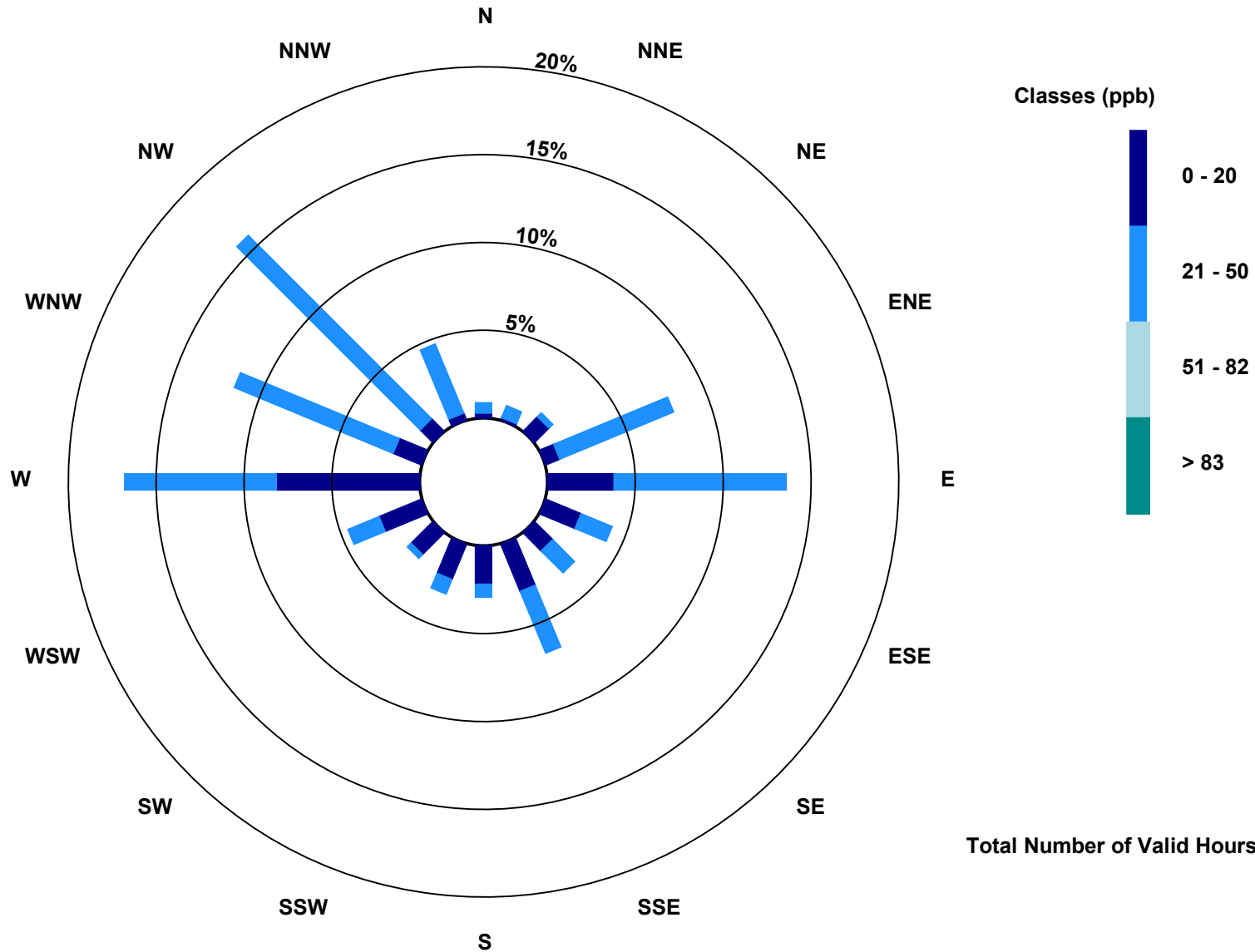
Total Number of Hours: 720

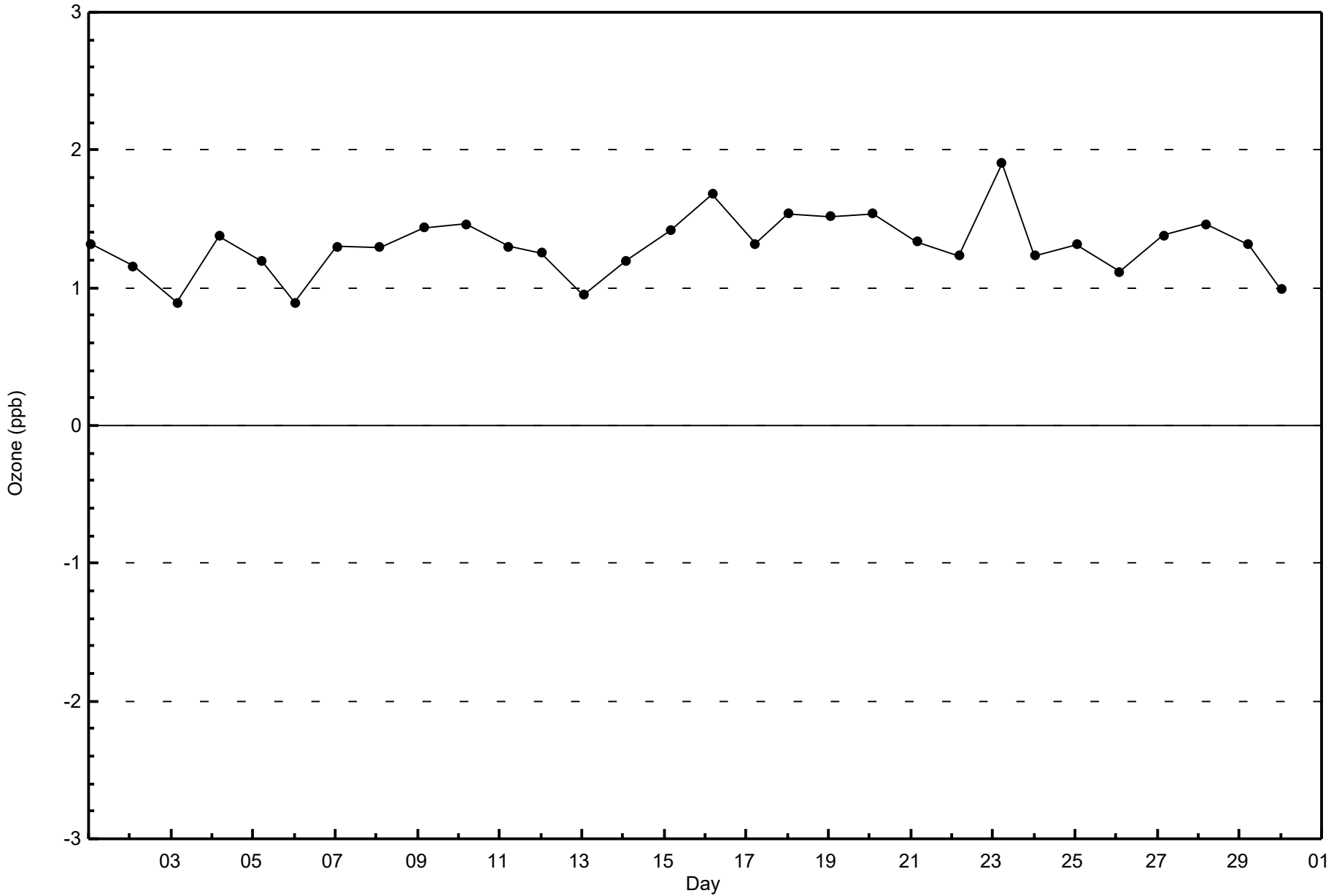


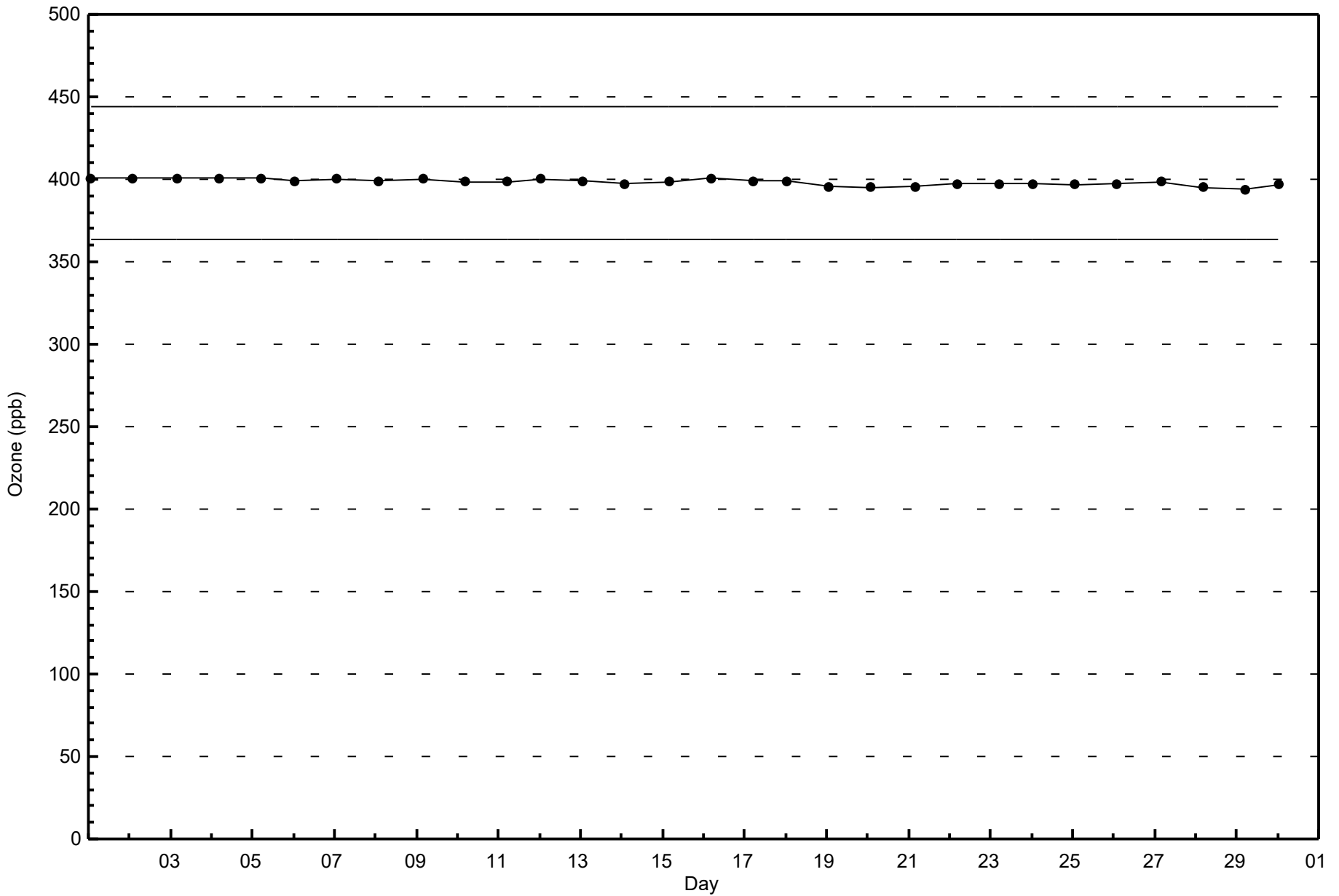


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Ozone (O<sub>3</sub>) - ppb  
Fort Chipewyan









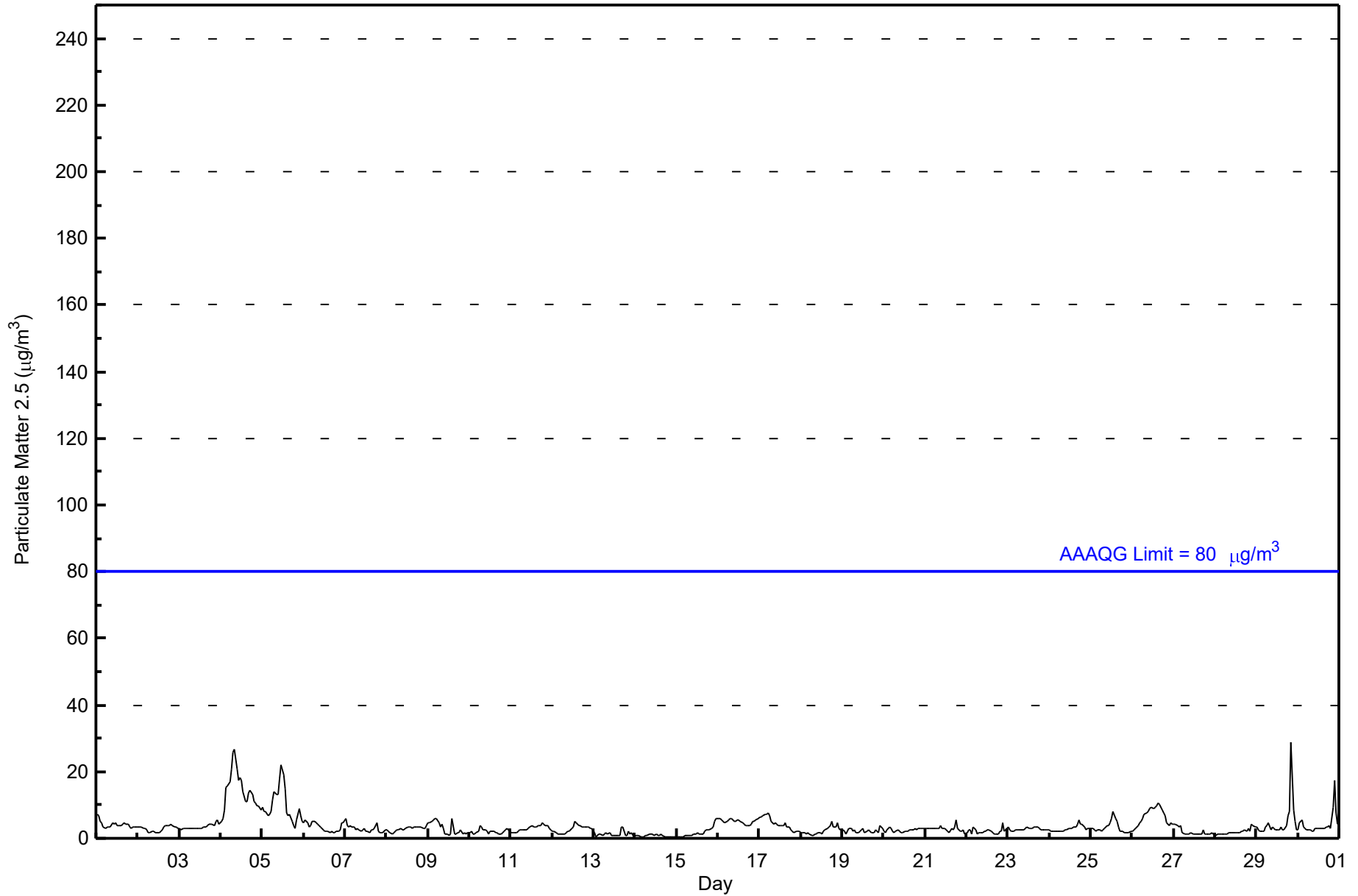
Wood Buffalo Environmental Association

Summary of Hour Averages

Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

Fort Chipewyan - November 2024

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720														720																												
Maximum Value: 28.7 µg/m <sup>3</sup> on Nov 29 21:00		Maximum Daily Average: 14.2 µg/m <sup>3</sup> on Nov 4		Hours of Data: 720														0																														
Minimum Value: 0.4 µg/m <sup>3</sup> on Nov 14 19:00		Minimum Daily Average: 0.8 µg/m <sup>3</sup> on Nov 14		Hours of Missing Data: 0														0																														
Maximum Diurnal Average: 4.1 µg/m <sup>3</sup> at hour 21		Minimum Diurnal Average: 3.2 µg/m <sup>3</sup> at hour 24		Hours of Calibration: 0														100.0																														
Monthly Average: 3.60 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 0.5 P <sub>10</sub> = 1.3 Q <sub>1</sub> = 1.9 Median = 2.8 Q <sub>3</sub> = 3.9 P <sub>90</sub> = 6.1 P <sub>99</sub> = 18.0		Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	7.3	7.0	5.3	4.7	3.5	3.2	3.3	3.4	3.6	4.7	4.3	4.7	3.9	3.9	3.9	4.2	4.7	4.2	4.2	3.3	2.9	3.5	3.5	3.5	4.2	7.3																						
2-Nov	3.3	3.6	3.3	2.9	2.8	2.6	1.7	1.7	2.0	2.0	1.9	1.8	1.8	2.2	2.6	3.3	3.6	3.6	4.0	4.2	3.7	3.6	3.2	2.9	2.8	4.2																						
3-Nov	2.8	2.7	2.9	2.8	2.9	3.0	3.0	3.0	3.0	3.1	2.9	3.0	2.9	3.2	3.4	3.6	3.7	4.1	4.2	4.2	3.8	4.9	5.7	4.2	3.5	5.7																						
4-Nov	5.0	6.1	8.5	15.1	15.5	17.1	20.9	25.7	26.7	20.8	17.2	18.0	17.4	13.9	10.9	11.1	13.7	14.6	13.2	10.9	10.6	9.6	9.6	8.6	14.2	26.7																						
5-Nov	9.1	8.2	8.1	6.9	7.4	8.0	11.6	13.9	13.1	13.2	17.7	22.0	19.0	14.7	7.8	6.6	7.4	4.9	3.8	2.8	5.7	8.8	6.7	5.1	9.7	22.0																						
6-Nov	4.8	5.5	4.5	3.4	3.7	5.1	4.9	4.7	4.4	3.9	3.3	2.5	2.2	2.2	2.0	1.7	2.3	1.8	1.9	2.1	2.1	2.7	4.7	4.6	3.4	5.5																						
7-Nov	5.7	3.7	3.4	3.7	3.5	3.2	2.8	3.1	2.6	2.3	2.7	2.9	1.9	2.0	1.9	2.6	2.7	3.1	4.7	1.9	1.7	1.8	1.8	2.4	2.8	5.7																						
8-Nov	2.6	2.0	1.5	1.4	1.6	2.2	2.6	2.7	2.8	2.6	2.5	3.1	3.4	3.4	3.5	3.2	3.4	3.4	3.4	3.5	3.2	3.0	2.9	3.6	2.8	3.6																						
9-Nov	4.6	4.6	4.9	5.4	5.9	6.1	4.6	3.2	4.1	3.0	1.2	1.1	1.0	1.3	6.0	1.4	1.3	1.7	1.6	2.5	1.5	1.7	1.2	1.6	3.0	6.1																						
10-Nov	1.9	2.0	1.4	1.4	1.7	2.2	3.9	3.4	2.6	2.5	2.0	1.5	2.0	2.3	2.0	1.9	1.6	1.3	1.5	1.6	2.2	2.5	3.1	2.1	2.1	3.9																						
11-Nov	1.9	1.8	1.8	1.7	1.9	2.5	2.7	2.7	2.7	2.7	2.8	3.5	3.8	3.4	3.3	3.6	3.9	3.9	4.7	4.4	3.7	3.7	2.8	2.5	3.0	4.7																						
12-Nov	2.3	2.0	1.6	1.4	1.5	1.3	1.3	1.4	1.8	2.0	2.2	2.8	3.5	5.0	4.8	4.0	3.7	3.4	3.2	3.4	3.5	3.3	3.1	2.9	2.7	5.0																						
13-Nov	1.7	0.6	0.7	1.3	1.4	0.9	1.3	1.8	1.4	1.6	0.9	0.9	0.8	0.8	0.7	0.7	3.2	3.5	0.7	0.9	2.1	1.3	1.7	0.6	1.3	3.5																						
14-Nov	0.7	0.7	0.7	0.5	0.5	0.6	0.7	0.9	1.1	1.2	1.2	1.0	1.1	0.8	0.9	1.4	1.1	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.8	1.4																						
15-Nov	0.4	0.4	0.4	0.5	0.6	0.7	0.7	0.9	1.0	1.0	1.1	1.4	1.6	1.4	1.4	1.3	2.1	2.5	2.5	2.5	2.8	3.3	5.3	5.7	1.7	5.7																						
16-Nov	6.1	6.1	5.7	4.9	4.5	5.1	5.7	6.1	5.8	5.2	5.0	5.5	5.3	5.0	4.5	4.2	3.7	3.8	3.9	4.2	5.0	5.2	5.4	5.9	5.1	6.1																						
17-Nov	6.4	6.4	6.7	7.2	7.3	7.5	6.9	5.1	4.4	4.8	4.4	3.8	3.7	3.7	3.9	4.6	3.3	3.5	2.7	2.1	1.9	2.1	2.2	2.3	4.5	7.5																						
18-Nov	1.8	1.6	1.6	1.4	1.6	1.3	1.0	1.0	1.3	1.5	1.5	1.8	1.4	2.2	2.6	3.0	3.2	3.7	5.0	3.3	3.4	4.6	3.0	2.6	2.3	5.0																						
19-Nov	2.4	2.2	1.4	2.0	2.9	3.1	2.2	2.8	1.9	1.9	2.2	2.7	2.8	1.8	2.1	2.5	2.1	1.8	1.6	2.7	2.1	1.8	3.8	2.8	2.3	3.8																						
20-Nov	2.3	1.9	2.4	3.6	3.0	2.3	1.8	2.0	2.8	2.2	1.9	1.9	2.1	2.1	2.3	2.5	2.6	2.6	2.8	2.7	2.8	3.0	3.1	3.1	2.5	3.6																						
21-Nov	3.0	2.9	3.0	2.9	2.9	3.0	3.0	2.9	3.1	3.6	3.2	3.1	2.5	2.2	1.5	2.8	2.4	3.4	5.5	3.2	2.0	2.0	2.4	1.2	2.8	5.5																						
22-Nov	1.8	2.4	2.5	1.4	3.2	2.7	1.1	1.7	1.6	1.8	2.2	2.3	2.5	2.4	2.3	1.8	1.3	1.4	1.1	2.1	2.3	4.5	2.0	3.2	2.1	4.5																						
23-Nov	3.4	2.4	1.9	2.1	2.6	2.5	2.4	2.7	2.6	2.7	3.0	3.3	2.9	2.8	2.9	3.3	3.3	3.3	2.9	2.4	2.6	2.4	2.6	2.6	2.7	3.4																						
24-Nov	2.4	2.3	2.3	2.1	2.3	2.1	2.2	2.3	2.3	2.6	2.7	2.9	3.1	3.1	3.3	3.6	4.2	5.5	4.3	4.3	3.6	2.7	3.0	2.9	3.0	5.5																						
25-Nov	2.9	2.8	2.6	2.1	2.4	2.3	2.3	2.7	3.1	3.6	3.9	4.6	6.1	8.0	5.8	5.0	3.4	2.3	2.1	1.8	1.6	1.6	1.8	2.0	3.2	8.0																						
26-Nov	2.3	2.5	3.1	4.0	4.6	5.1	6.1	7.3	7.5	8.0	8.9	9.2	9.1	9.3	9.7	10.4	10.2	8.7	7.8	6.9	4.7	4.0	4.7	4.0	6.6	10.4																						
27-Nov	4.1	4.3	3.8	3.6	3.8	1.9	1.4	1.1	1.2	1.4	1.8	1.4	1.3	1.4	1.4	1.4	1.3	2.5	1.4	1.2	1.2	1.4	1.6	1.3	2.0	4.3																						
28-Nov	1.1	1.1	1.3	1.4	1.4	1.4	1.3	1.3	1.8	1.5	1.5	1.5	1.6	1.6	1.6	1.9	2.1	2.6	2.3	2.8	2.1	4.2	3.7	3.4	1.9	4.2																						
29-Nov	3.4	2.5	2.3	2.2	2.2	3.2	4.0	4.5	2.6	3.3	2.8	2.8	2.5	2.6	3.4	2.6	2.3	3.6	6.7	8.0	28.7	8.3	4.9	2.5	4.7	28.7																						
30-Nov	2.6	4.6	5.6	3.2	2.9	2.5	2.4	2.7	2.3	2.3	2.8	2.8	2.8	3.0	2.9	3.1	3.2	3.3	3.8	3.0	9.5	17.3	7.8	4.4	4.2	17.3																						
																								3.3	3.2	3.2	3.2	3.4	3.5	3.7	4.0	3.9	3.8	3.7	4.0	3.9	3.7	3.5	3.4	3.6	3.6	3.6	3.3	4.1	4.0	3.6	3.2	Diurnal Average
																								9.1	8.2	8.5	15.1	15.5	17.1	20.9	25.7	26.7	20.8	17.7	22.0	19.0	14.7	10.9	11.1	13.7	14.6	13.2	10.9	28.7	17.3	9.6	8.6	Diurnal Maximum
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m <sup>3</sup> 24-hr 29 µg/m <sup>3</sup>																																																





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Fort Chipewyan - November 2024**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	627	87.08	87.08
6 - 15	79	10.97	98.06
16 - 25	11	1.53	99.58
26 - 80	3	0.42	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>**  
**Fort Chipewyan - November 2024**

Concentration Ranges (μg/m <sup>3</sup> )	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	6	7	5	52	95	27	17	33	13	17	11	26	97	75	111	33	625
6 - 15	0	0	5	4	2	2	6	13	7	5	2	3	21	6	3	0	79
16 - 25	0	0	0	0	0	0	0	2	1	0	1	3	3	1	0	0	11
26 - 80	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	3
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	6	7	10	56	97	29	23	48	21	22	15	33	121	83	114	33	718

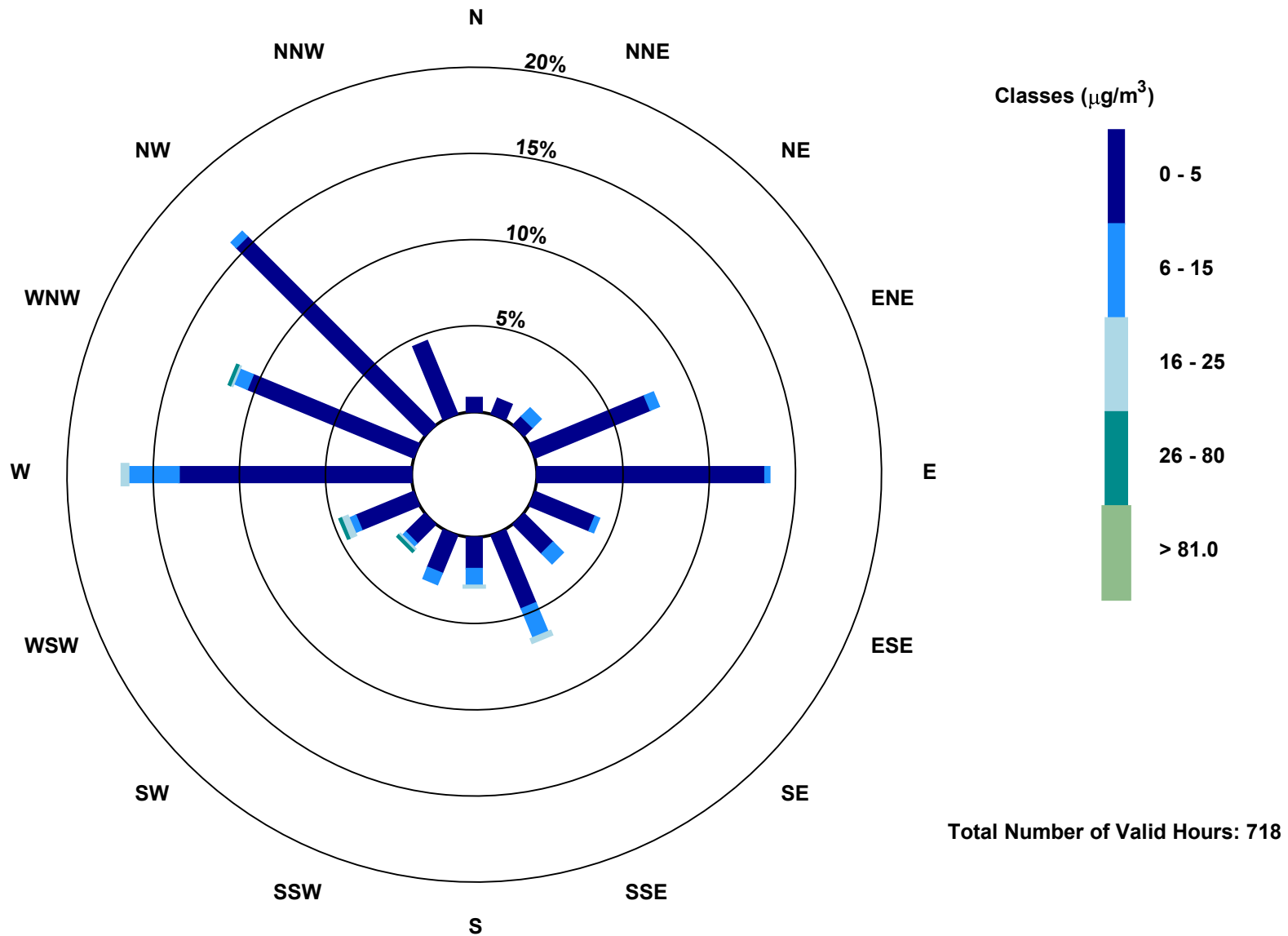
Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Fort Chipewyan







Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 0.4 ppm on Nov 29 18:00	Maximum Daily Average: 0.2 ppm on Nov 29		Hours of Data:	687
Minimum Value: 0.0 ppm on Nov 1 21:00	Minimum Daily Average: 0.0 ppm on Nov 8		Hours of Missing Data:	33
Maximum Diurnal Average: 0.1 ppm at hour 18	Minimum Diurnal Average: 0.0 ppm at hour 1		Hours of Calibration:	33
Monthly Average: 0.05 ppm	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.1 P <sub>90</sub> = 0.1 P <sub>99</sub> = 0.2		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
5-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
6-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
11-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
14-Nov	0.0	0.0	0.1	0.1	0.1	Z	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15-Nov	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
16-Nov	0.0	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
17-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
19-Nov	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
20-Nov	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
21-Nov	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
22-Nov	0.1	Z	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
23-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
24-Nov	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25-Nov	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
26-Nov	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
27-Nov	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
28-Nov	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
29-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4
30-Nov	0.1	0.1	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2

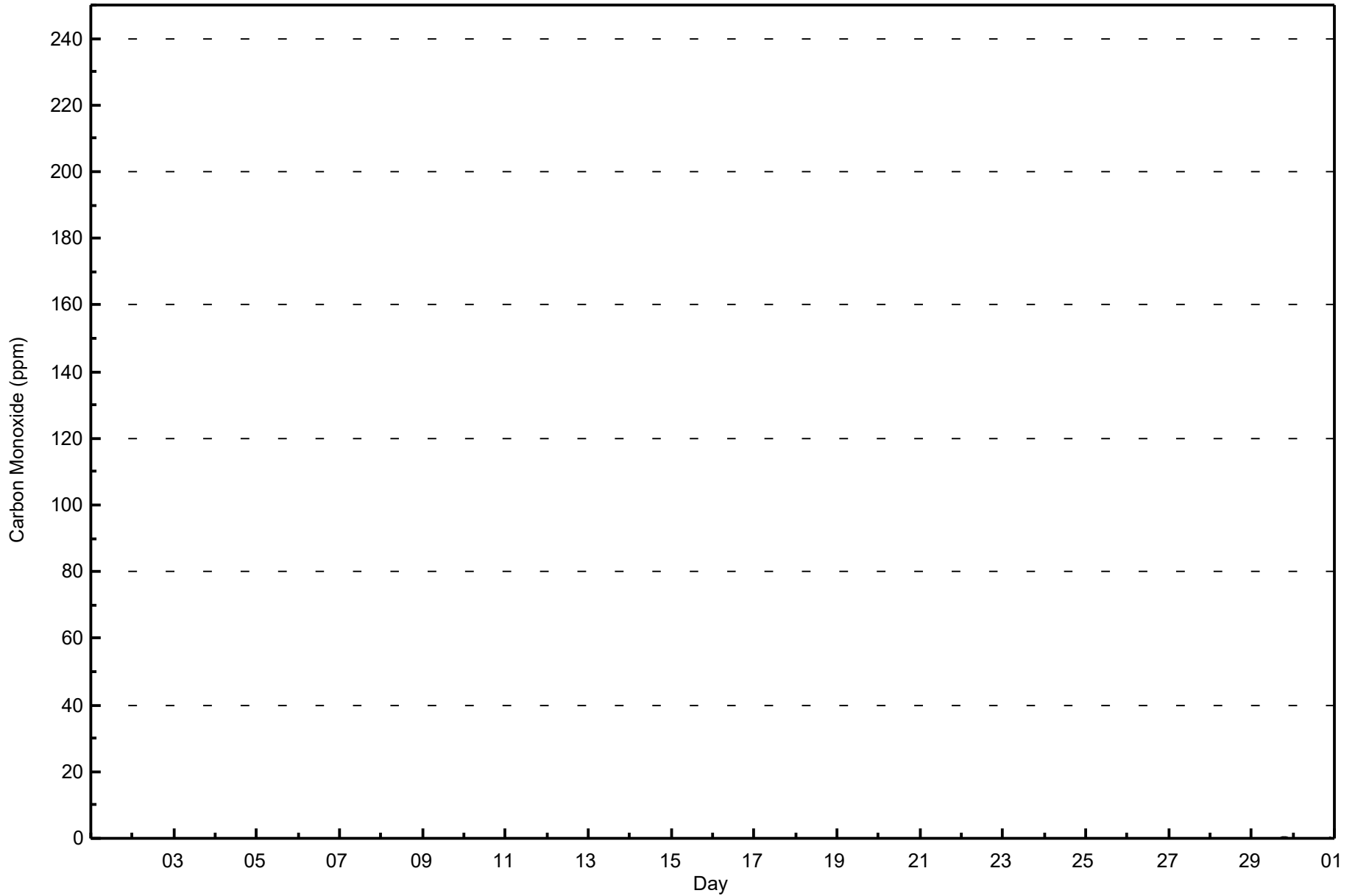
0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	Diurnal Average	
0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.4	0.4	0.3	0.3	0.2	0.2	0.2	Diurnal Maximum		

Z - zerospan      C - Calibration  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 13 ppm



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Carbon Monoxide (CO) - ppm**  
**Fort Chipewyan - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Carbon Monoxide (CO) - ppm**  
**Fort Chipewyan - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	685	99.71	99.71
0.4 - 0.5	2	0.29	100.00
0.6 - 0.7	0	0.00	100.00
0.8 - 1.4	0	0.00	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Carbon Monoxide (CO) - ppm  
Fort Chipewyan - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.3	6	7	10	54	92	29	22	44	18	21	15	32	111	80	110	32	683
0.4 - 0.5	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
0.6 - 0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.8 - 1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	6	7	10	54	92	29	22	44	18	22	15	32	111	81	110	32	685

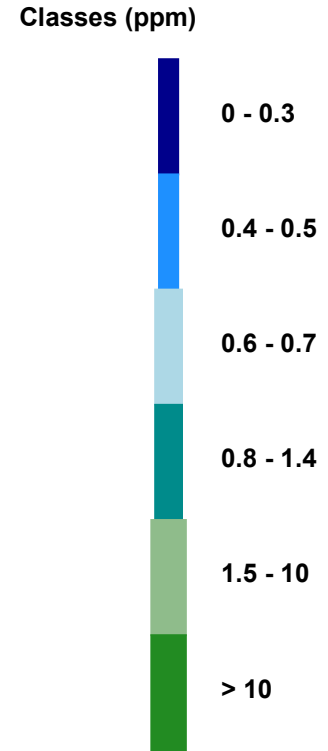
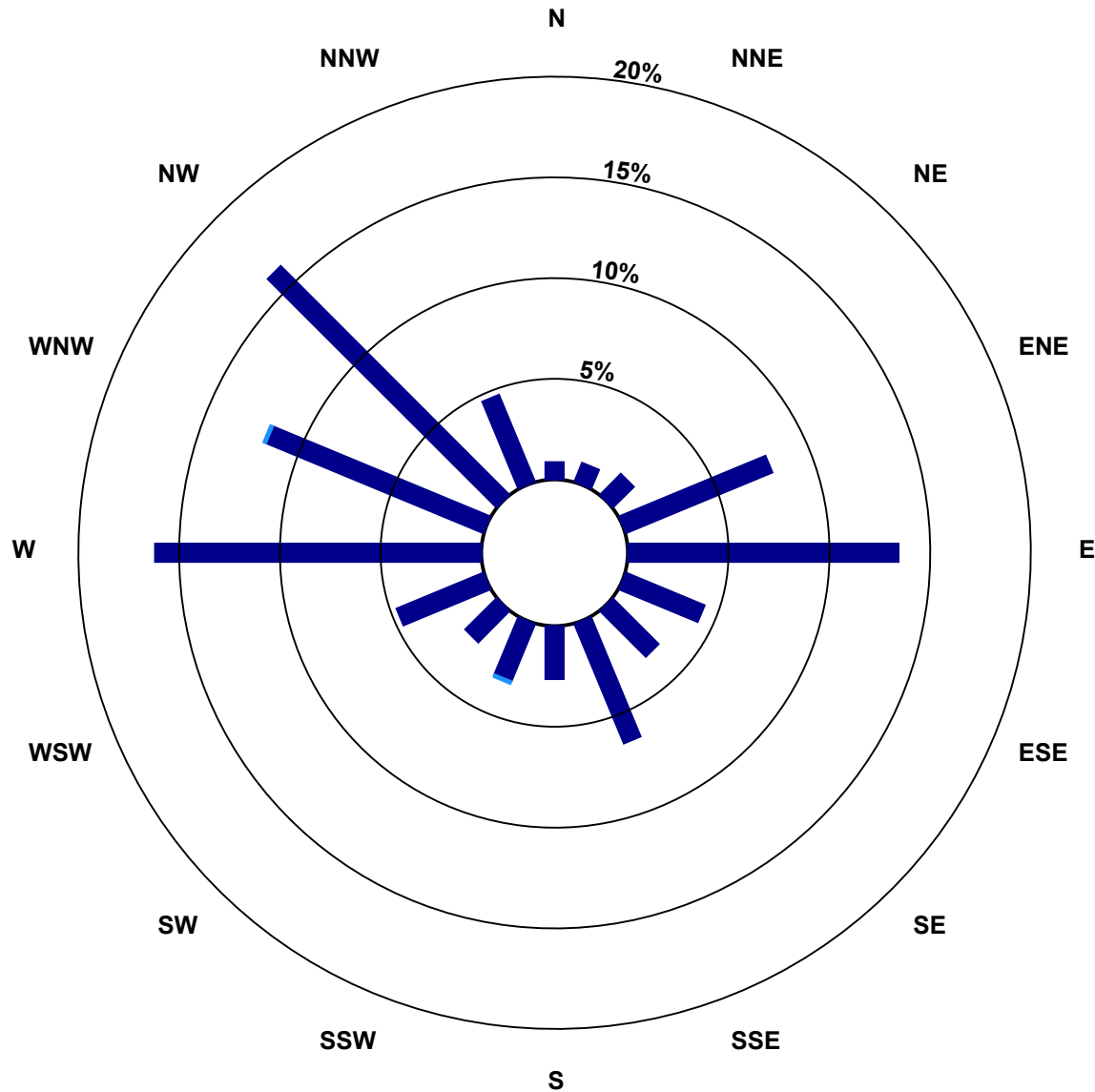
Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Carbon Monoxide (CO) - ppm  
Fort Chipewyan



Total Number of Valid Hours: 685



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

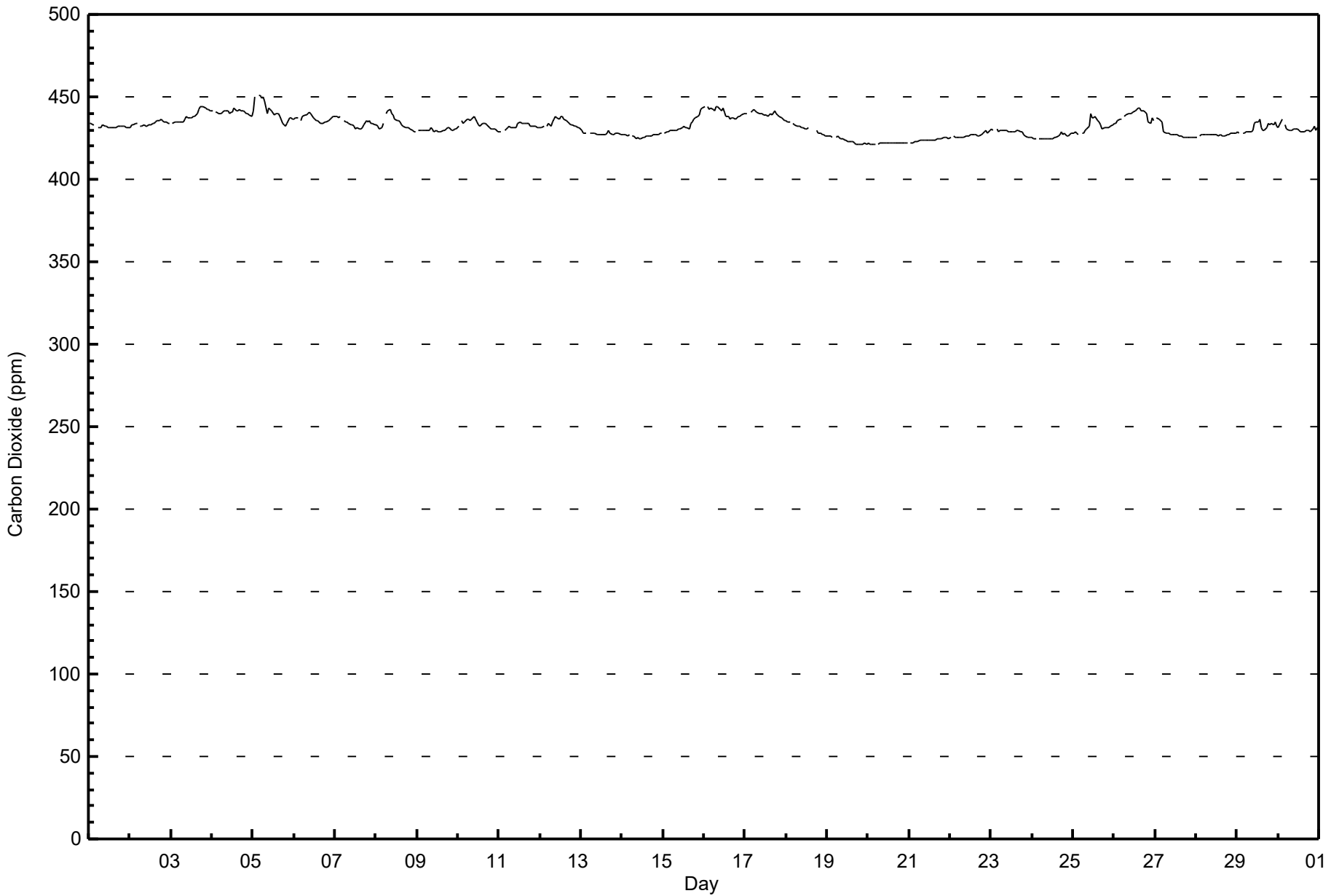
**Carbon Dioxide (CO<sub>2</sub>) - ppm**  
**Fort Chipewyan - November 2024**

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	720						
Maximum Value: 451.1 ppm on Nov 5 04:00		Maximum Daily Average: 441.2 ppm on Nov 5																	Hours of Data:		686						
Minimum Value: 421.3 ppm on Nov 19 20:00		Minimum Daily Average: 421.7 ppm on Nov 20																	Hours of Missing Data:		34						
Maximum Diurnal Average: 432.6 ppm at hour 5		Minimum Diurnal Average: 431.3 ppm at hour 21																	Hours of Calibration:		34						
Monthly Average: 431.91 ppm		Percentiles: P <sub>1</sub> = 421.5 P <sub>10</sub> = 424.8 Q <sub>1</sub> = 427.4 Median = 431.5 Q <sub>3</sub> = 436.0 P <sub>90</sub> = 440.2 P <sub>99</sub> = 444.2																	Percent Operational Time:		100.0						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	434.1	434.0	433.1	432.7	Z	431.1	431.5	431.6	432.8	432.6	431.8	431.5	431.6	431.5	431.6	431.6	431.7	432.0	432.0	432.4	432.3	431.8	431.3	431.4	432.1	432.1	434.1
2-Nov	431.7	432.8	433.3	433.6	434.2	Z	432.5	432.6	432.8	432.5	432.5	432.8	433.2	433.7	434.0	434.5	435.6	435.6	436.3	435.9	435.0	434.4	434.0	433.9	433.8	433.8	436.3
3-Nov	Z	434.3	434.8	434.8	434.9	434.8	434.7	434.9	436.5	438.1	437.6	437.6	437.3	437.9	438.3	439.6	442.0	444.1	444.2	443.8	443.1	442.4	442.0	441.6	438.7	444.2	444.2
4-Nov	441.7	Z	440.5	440.3	440.1	440.2	440.6	441.5	441.8	441.6	439.7	440.5	440.3	443.0	441.4	441.3	442.4	441.9	441.2	440.8	440.1	439.7	438.8	438.2	440.8	443.0	443.0
5-Nov	441.4	449.8	Z	451.1	451.0	449.5	450.0	447.5	440.2	443.0	442.5	441.8	439.2	439.6	439.8	439.4	438.2	434.2	432.8	431.8	433.8	437.0	437.0	436.2	441.2	451.1	451.1
6-Nov	436.1	437.7	437.0	Z	435.9	437.8	438.6	439.3	440.1	440.5	439.5	437.7	436.3	435.9	435.7	433.5	434.0	434.3	434.5	434.6	435.5	436.3	437.5	438.0	436.8	440.5	440.5
7-Nov	437.9	438.4	437.7	437.9	Z	435.6	434.6	434.7	434.0	432.8	433.1	432.0	430.8	431.2	430.9	430.7	431.4	433.1	435.5	435.0	436.0	434.0	433.8	433.2	434.1	438.4	438.4
8-Nov	433.1	431.9	430.8	431.5	434.1	Z	439.6	441.5	442.0	440.2	439.0	436.5	435.8	435.8	435.1	433.2	432.0	431.6	431.4	431.2	430.2	429.6	429.1	428.9	434.1	442.0	442.0
9-Nov	Z	429.3	429.4	429.6	430.1	430.0	429.5	429.5	431.3	430.5	429.2	429.3	429.2	429.0	429.1	429.3	429.9	430.8	430.9	431.1	429.8	430.1	430.2	430.5	429.9	431.3	431.3
10-Nov	432.0	Z	435.9	433.8	434.8	436.3	436.6	435.9	436.5	437.7	436.8	434.5	432.8	432.0	433.6	434.0	434.3	432.9	431.5	430.8	430.5	430.2	430.2	429.1	433.6	437.7	437.7
11-Nov	428.5	429.0	Z	430.0	430.5	431.7	432.0	431.5	431.0	431.2	431.4	434.3	435.0	433.6	434.0	434.3	433.7	433.7	432.6	432.1	431.9	432.2	431.5	431.6	432.1	435.0	435.0
12-Nov	431.5	431.6	432.2	Z	432.4	433.6	432.5	434.9	436.6	438.2	437.4	436.3	438.1	438.3	436.4	435.6	434.6	433.9	433.4	433.0	432.5	432.0	431.5	431.3	434.3	438.3	438.3
13-Nov	429.4	428.0	428.0	428.1	Z	428.0	428.1	427.9	427.8	427.4	427.5	427.4	427.3	427.3	427.2	427.8	429.3	428.0	427.4	427.5	428.2	427.9	427.6	427.2	427.8	429.4	429.4
14-Nov	427.4	427.4	427.3	426.4	426.9	Z	426.4	426.1	424.8	425.0	424.8	424.9	425.1	425.6	426.1	426.4	426.6	426.9	427.1	427.1	427.1	427.5	427.7	427.9	426.4	427.9	427.9
15-Nov	Z	428.3	428.4	428.8	429.5	Z	429.7	429.6	429.8	430.0	430.8	431.6	432.0	431.4	431.4	430.9	433.8	434.9	436.0	437.2	437.8	439.3	442.0	443.5	432.9	443.5	443.5
16-Nov	444.0	Z	444.0	442.6	443.6	442.3	441.1	443.9	444.1	442.0	441.4	442.9	440.8	438.4	437.8	436.4	436.9	437.1	436.2	436.9	437.9	438.4	438.9	439.6	440.3	444.1	444.1
17-Nov	439.9	440.0	Z	440.6	441.7	442.7	441.8	440.9	440.2	440.0	439.5	439.0	438.7	438.5	438.9	439.6	439.4	441.2	439.7	438.7	438.1	437.3	436.5	435.8	439.5	442.7	442.7
18-Nov	435.3	435.0	434.5	Z	433.5	432.8	432.6	432.4	432.0	431.5	431.1	430.9	430.4	431.4	C	C	C	C	430.0	428.3	427.6	427.4	426.8	426.3	431.0	435.3	435.3
19-Nov	426.1	426.1	425.9	425.5	Z	425.7	426.0	425.6	424.8	424.2	424.1	423.8	423.3	423.0	422.8	422.5	422.0	421.5	421.4	421.3	421.5	421.5	421.7	421.6	423.6	426.1	426.1
20-Nov	421.7	421.6	421.4	421.6	421.5	Z	421.4	421.6	421.8	421.9	421.8	421.9	422.0	422.2	421.9	421.9	421.8	421.7	421.7	421.7	421.7	421.7	421.8	422.0	421.7	422.2	422.2
21-Nov	Z	422.3	422.3	422.5	423.0	423.1	423.5	423.6	423.9	423.8	424.0	424.1	424.0	423.9	423.9	424.0	424.3	424.3	424.5	424.8	425.1	425.3	425.2	425.0	423.9	425.3	425.3
22-Nov	425.3	Z	426.2	425.2	425.2	425.2	425.1	425.1	425.4	426.3	426.2	426.6	427.1	427.2	426.9	427.0	426.6	426.4	426.9	428.3	428.8	429.5	428.0	429.3	426.7	429.5	429.5
23-Nov	430.4	430.0	Z	430.7	429.0	429.3	429.8	429.8	429.7	429.3	428.6	428.4	428.5	428.7	429.0	429.4	429.5	429.1	428.7	427.5	426.1	425.8	425.7	425.6	428.6	430.7	430.7
24-Nov	425.2	424.7	424.4	Z	424.3	424.4	424.7	424.9	424.8	424.8	424.6	424.6	424.9	425.1	425.5	426.2	426.8	428.5	426.9	428.0	426.3	426.0	427.3	427.8	425.7	428.5	428.5
25-Nov	427.9	428.5	427.8	427.5	Z	428.3	428.2	429.2	430.5	431.8	439.9	437.1	436.9	438.3	435.4	434.7	432.7	430.9	431.2	431.5	431.4	431.2	432.2	433.3	432.0	439.9	439.9
26-Nov	433.8	434.2	435.2	436.3	436.5	Z	437.9	439.1	439.8	440.0	440.2	440.7	441.5	442.7	443.2	442.9	441.7	441.7	440.9	439.4	434.4	434.2	437.4	435.7	438.7	443.2	443.2
27-Nov	Z	437.2	436.4	435.7	434.4	429.0	428.1	427.8	427.7	427.5	427.0	427.1	427.0	426.9	426.3	425.9	425.8	425.5	425.3	425.5	425.5	425.5	425.7	425.7	428.2	437.2	437.2
28-Nov	425.7	Z	426.6	426.8	426.8	426.8	426.7	426.8	426.8	426.8	426.8	426.8	426.8	426.7	426.7	426.6	426.6	426.6	426.9	427.3	427.6	427.8	427.8	428.1	426.9	428.1	428.1
29-Nov	428.6	428.2	Z	428.0	428.1	428.7	428.8	429.2	429.1	429.6	434.3	435.1	434.7	436.3	431.6	429.9	429.8	431.1	433.5	432.8	433.9	433.4	434.4	432.1	431.4	436.3	436.3
30-Nov	431.7	432.8	436.8	Z	432.7	430.7	429.5	429.9	429.8	430.2	430.2	430.2	429.3	429.2	429.2	429.2	429.3	429.3	429.5	429.0	430.2	431.8	429.8	431.2	430.5	436.8	436.8
432.0 431.7 431.6 432.1 432.6 432.3 432.1 432.3 432.3 432.4 432.4 432.3 432.0 432.1 431.9 431.7 431.8 431.8 431.7 431.5 431.3 431.4 431.4 431.4																								Diurnal Average			
444.0 449.8 444.0 451.1 451.0 449.5 450.0 447.5 444.1 443.0 442.5 442.9 441.5 443.0 443.2 442.9 442.4 444.1 444.2 443.8 443.1 442.4 442.0 443.5																								Diurnal Maximum			
Z - zerspan		C - Calibration																									



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Carbon Dioxide (CO<sub>2</sub>) - ppm**  
**Fort Chipewyan - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Carbon Dioxide (CO<sub>2</sub>) - ppm**  
**Fort Chipewyan - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
400 - 420	0	0.00	0.00
420 - 440	625	91.11	91.11
440 - 460	61	8.89	100.00
460 - 480	0	0.00	100.00
480 - 500	0	0.00	100.00
> 500	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Carbon Dioxide (CO<sub>2</sub>) - ppm  
Fort Chipewyan - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
400 - 420	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420 - 440	6	7	7	52	92	26	13	35	17	16	10	27	98	77	109	31	623
440 - 460	0	0	3	2	0	3	9	9	1	6	5	5	14	3	0	1	61
460 - 480	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480 - 500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	6	7	10	54	92	29	22	44	18	22	15	32	112	80	109	32	684

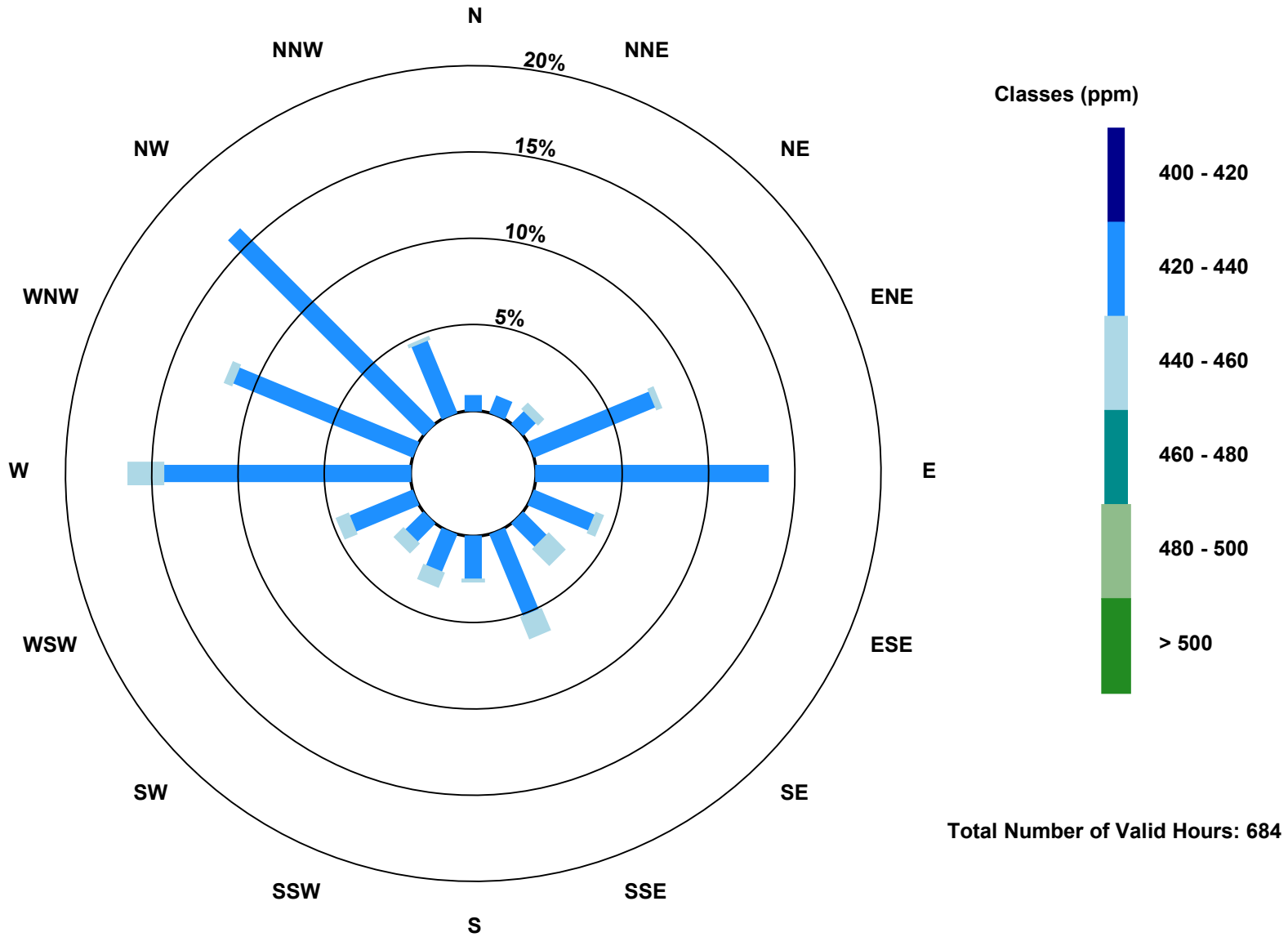
Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Wind Rose Nov 2024**

**Carbon Dioxide (CO<sub>2</sub>) - ppm**  
**Fort Chipewyan**





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

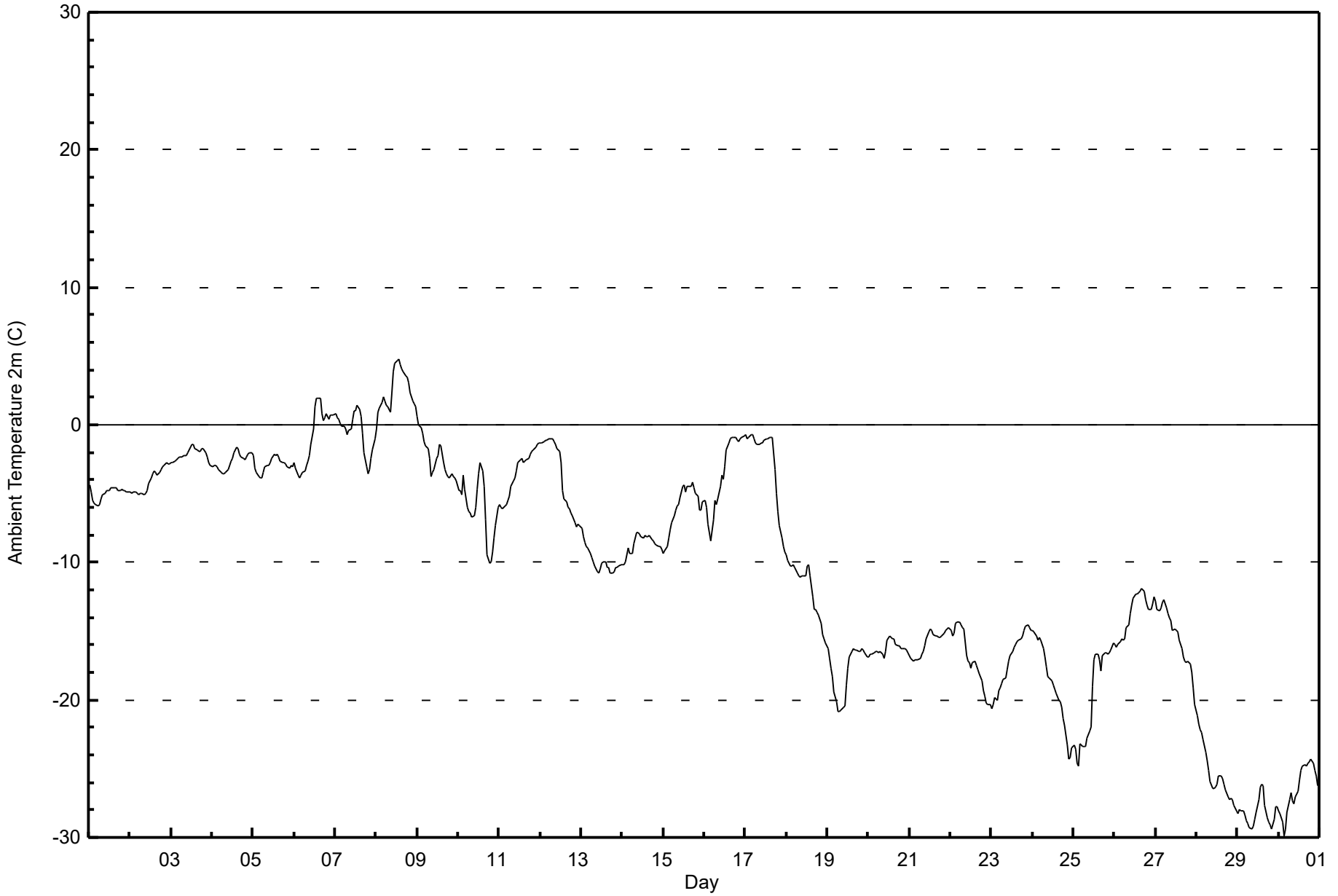
**Ambient Temperature 2m (AT2) - C**  
**Fort Chipewyan - November 2024**

Maximum Value: 4.8 C on Nov 8 14:00		Maximum Daily Average: 2.5 C on Nov 8		Hours in Service: 720																						
Minimum Value: -29.9 C on Nov 30 04:00		Minimum Daily Average: -28.2 C on Nov 29		Hours of Data: 720																						
Maximum Diurnal Average: -9.1 C at hour 14		Minimum Diurnal Average: -10.7 C at hour 24		Hours of Missing Data: 0																						
Monthly Average: -10.22 C		Percentiles: P <sub>1</sub> = -29.0 P <sub>10</sub> = -23.5 Q <sub>1</sub> = -16.5 Median = -8.3 Q <sub>3</sub> = -2.9 P <sub>90</sub> = -1.0 P <sub>99</sub> = 3.6		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	-4.4	-4.9	-5.5	-5.7	-5.8	-5.9	-5.8	-5.4	-5.1	-4.9	-4.8	-4.8	-4.6	-4.6	-4.5	-4.6	-4.8	-4.8	-4.7	-4.8	-4.8	-4.9	-4.9	-5.0	-4.4	
2-Nov	-4.9	-4.9	-4.9	-4.9	-5.0	-5.1	-5.0	-5.0	-5.1	-4.9	-4.7	-4.3	-3.9	-3.6	-3.4	-3.5	-3.6	-3.5	-3.3	-3.1	-2.9	-2.7	-2.8	-2.9	-2.7	
3-Nov	-2.7	-2.8	-2.6	-2.5	-2.4	-2.3	-2.3	-2.3	-2.2	-2.2	-2.0	-1.6	-1.5	-1.5	-1.7	-1.8	-1.9	-1.9	-1.7	-1.7	-2.0	-2.4	-2.7	-3.0	-1.5	
4-Nov	-3.0	-3.0	-3.0	-3.0	-3.2	-3.4	-3.6	-3.6	-3.4	-3.3	-2.9	-2.7	-2.4	-2.0	-1.6	-1.7	-2.2	-2.3	-2.5	-2.3	-2.1	-2.0	-2.0	-2.0	-1.6	
5-Nov	-2.3	-3.1	-3.4	-3.8	-3.9	-3.9	-3.5	-3.1	-2.9	-2.9	-2.8	-2.5	-2.2	-2.2	-2.1	-2.4	-2.6	-2.7	-2.7	-2.9	-3.0	-3.2	-2.9	-3.0	-2.1	
6-Nov	-2.8	-3.1	-3.7	-3.8	-3.6	-3.5	-3.4	-3.0	-2.6	-2.2	-1.4	-0.3	1.3	1.9	2.0	2.0	0.8	0.3	0.5	0.8	0.4	0.7	0.7	0.8	2.0	
7-Nov	0.8	0.5	0.4	0.1	-0.1	-0.1	-0.3	-0.8	-0.4	-0.3	0.4	1.0	1.0	1.4	1.2	0.6	-0.6	-2.1	-3.1	-3.6	-3.2	-2.4	-1.9	-1.0	1.4	
8-Nov	-0.3	1.0	1.3	1.6	2.0	1.7	1.5	1.3	0.9	2.4	3.9	4.5	4.7	4.8	4.3	4.0	3.9	3.6	3.5	3.0	2.4	1.8	1.5	1.3	4.8	
9-Nov	0.6	0.0	-0.2	-0.6	-1.3	-1.5	-1.7	-2.4	-3.7	-3.5	-3.2	-2.4	-2.2	-1.5	-1.5	-2.7	-3.2	-3.6	-3.8	-3.9	-3.6	-3.8	-3.9	-4.1	0.6	
10-Nov	-4.8	-4.8	-5.1	-3.7	-4.7	-6.0	-6.3	-6.4	-6.8	-6.6	-6.0	-4.6	-3.6	-2.8	-3.4	-4.5	-6.9	-9.5	-10.0	-10.0	-9.3	-8.3	-7.3	-6.0	-2.8	
11-Nov	-5.8	-6.0	-6.1	-5.9	-5.8	-5.5	-5.1	-4.5	-4.0	-3.8	-3.3	-2.8	-2.6	-2.5	-2.7	-2.6	-2.6	-2.4	-2.1	-1.9	-1.8	-1.7	-1.4	-1.3	-1.3	
12-Nov	-1.3	-1.3	-1.3	-1.2	-1.1	-1.0	-1.0	-1.0	-1.2	-1.5	-1.7	-1.9	-2.7	-4.8	-5.4	-5.6	-6.0	-6.1	-6.4	-6.7	-7.1	-7.4	-7.3	-7.3	-1.0	
13-Nov	-7.6	-8.2	-8.5	-8.8	-9.0	-9.4	-9.7	-9.9	-10.3	-10.7	-10.8	-10.4	-10.1	-9.9	-9.9	-10.4	-10.4	-10.8	-10.8	-10.7	-10.4	-10.4	-10.2	-10.1	-7.6	
14-Nov	-10.2	-10.2	-9.9	-9.0	-9.3	-9.3	-9.4	-8.7	-7.8	-7.8	-7.9	-8.1	-8.2	-8.1	-8.2	-8.1	-8.0	-8.3	-8.5	-8.6	-8.8	-8.8	-8.9	-9.0	-7.8	
15-Nov	-9.3	-9.1	-8.8	-8.2	-7.6	-7.1	-6.6	-6.2	-5.9	-5.8	-5.2	-4.5	-4.4	-4.9	-4.5	-4.5	-4.4	-4.2	-4.5	-5.0	-5.2	-6.2	-6.2	-5.6	-4.2	
16-Nov	-5.5	-6.0	-7.2	-7.9	-8.4	-6.9	-5.5	-5.8	-5.3	-4.5	-3.7	-3.9	-3.1	-1.9	-1.3	-1.0	-0.9	-1.0	-0.9	-1.2	-1.2	-1.0	-0.9	-0.9	-0.9	
17-Nov	-0.7	-1.0	-1.0	-0.7	-0.7	-1.0	-1.3	-1.4	-1.4	-1.3	-1.3	-1.1	-1.0	-1.0	-1.0	-0.9	-0.9	-3.2	-5.0	-6.3	-7.3	-8.2	-8.9	-9.2	-0.7	
18-Nov	-9.5	-9.9	-10.3	-10.2	-10.2	-10.4	-10.7	-11.0	-11.1	-11.0	-11.0	-11.0	-10.3	-10.2	-11.0	-12.5	-13.4	-13.5	-13.6	-13.8	-14.5	-15.3	-15.5	-15.9	-9.5	
19-Nov	-16.3	-17.0	-17.7	-18.3	-19.5	-20.2	-20.9	-20.9	-20.7	-20.5	-20.4	-18.9	-17.7	-16.9	-16.5	-16.2	-16.4	-16.4	-16.5	-16.4	-16.3	-16.4	-16.5	-16.9	-16.2	
20-Nov	-16.9	-16.7	-16.7	-16.6	-16.5	-16.5	-16.5	-16.5	-16.7	-17.0	-16.5	-15.7	-15.4	-15.5	-15.6	-15.6	-15.9	-16.1	-16.1	-16.2	-16.3	-16.2	-16.4	-16.6	-15.4	
21-Nov	-16.7	-17.0	-17.2	-17.1	-17.1	-17.0	-16.7	-16.5	-16.1	-15.5	-15.1	-14.9	-14.9	-15.3	-15.3	-15.4	-15.5	-15.4	-15.3	-15.1	-15.0	-14.8	-14.8	-14.8	-14.8	
22-Nov	-15.0	-15.3	-15.2	-14.4	-14.3	-14.3	-14.5	-14.8	-14.9	-16.8	-17.2	-17.3	-17.7	-17.2	-17.1	-17.5	-17.8	-18.1	-18.6	-19.4	-19.7	-20.2	-20.3	-20.3	-14.3	
23-Nov	-20.6	-20.4	-19.8	-20.1	-19.3	-19.1	-18.8	-18.5	-18.4	-17.8	-17.2	-16.8	-16.5	-16.2	-15.9	-15.8	-15.7	-15.5	-15.4	-14.9	-14.6	-14.5	-14.7	-14.9	-14.5	
24-Nov	-14.9	-15.0	-15.4	-15.6	-15.4	-15.6	-16.3	-16.9	-17.5	-18.3	-18.4	-18.6	-19.0	-19.2	-19.5	-20.1	-20.2	-20.5	-21.3	-21.9	-23.3	-24.3	-24.2	-23.5	-14.9	
25-Nov	-23.3	-23.6	-24.6	-24.8	-23.2	-23.4	-23.3	-22.8	-22.3	-22.0	-19.1	-17.1	-16.7	-16.7	-17.1	-17.9	-16.8	-16.5	-16.6	-16.7	-16.6	-16.4	-15.8	-15.8	-15.8	
26-Nov	-16.0	-16.2	-15.9	-15.8	-15.6	-15.7	-15.5	-14.8	-14.5	-13.7	-13.2	-12.6	-12.3	-12.3	-12.2	-12.1	-11.9	-12.1	-12.7	-13.1	-13.4	-13.5	-13.0	-12.5	-11.9	
27-Nov	-12.8	-13.4	-13.5	-13.3	-12.9	-12.8	-13.3	-13.7	-14.0	-14.3	-14.9	-14.8	-15.0	-15.0	-15.7	-16.3	-16.8	-17.1	-17.3	-17.2	-17.3	-18.0	-19.2	-20.4	-12.8	
28-Nov	-21.1	-21.7	-22.1	-22.3	-22.9	-23.8	-24.4	-25.1	-25.9	-26.4	-26.4	-26.4	-26.2	-25.6	-25.5	-25.7	-26.1	-26.6	-27.1	-27.3	-27.2	-27.3	-27.7	-28.1	-21.1	
29-Nov	-28.3	-28.0	-28.1	-28.1	-28.4	-28.8	-29.0	-29.3	-29.4	-29.2	-28.7	-28.1	-27.2	-26.4	-26.2	-26.3	-27.7	-28.5	-28.9	-29.1	-29.4	-28.7	-27.8	-27.8	-26.2	
30-Nov	-28.0	-28.3	-28.9	-29.9	-29.4	-28.2	-27.3	-26.7	-27.4	-27.6	-27.1	-26.7	-25.8	-25.1	-24.8	-24.8	-24.8	-24.6	-24.5	-24.3	-24.6	-25.1	-25.5	-26.3	-26.5	
																								Diurnal Average		
																								Diurnal Maximum		



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 2m (AT2) - C**  
**Fort Chipewyan - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Fort Chipewyan - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	105	14.58	14.58
-20 - 0	568	78.89	93.47
0 - 10	47	6.53	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

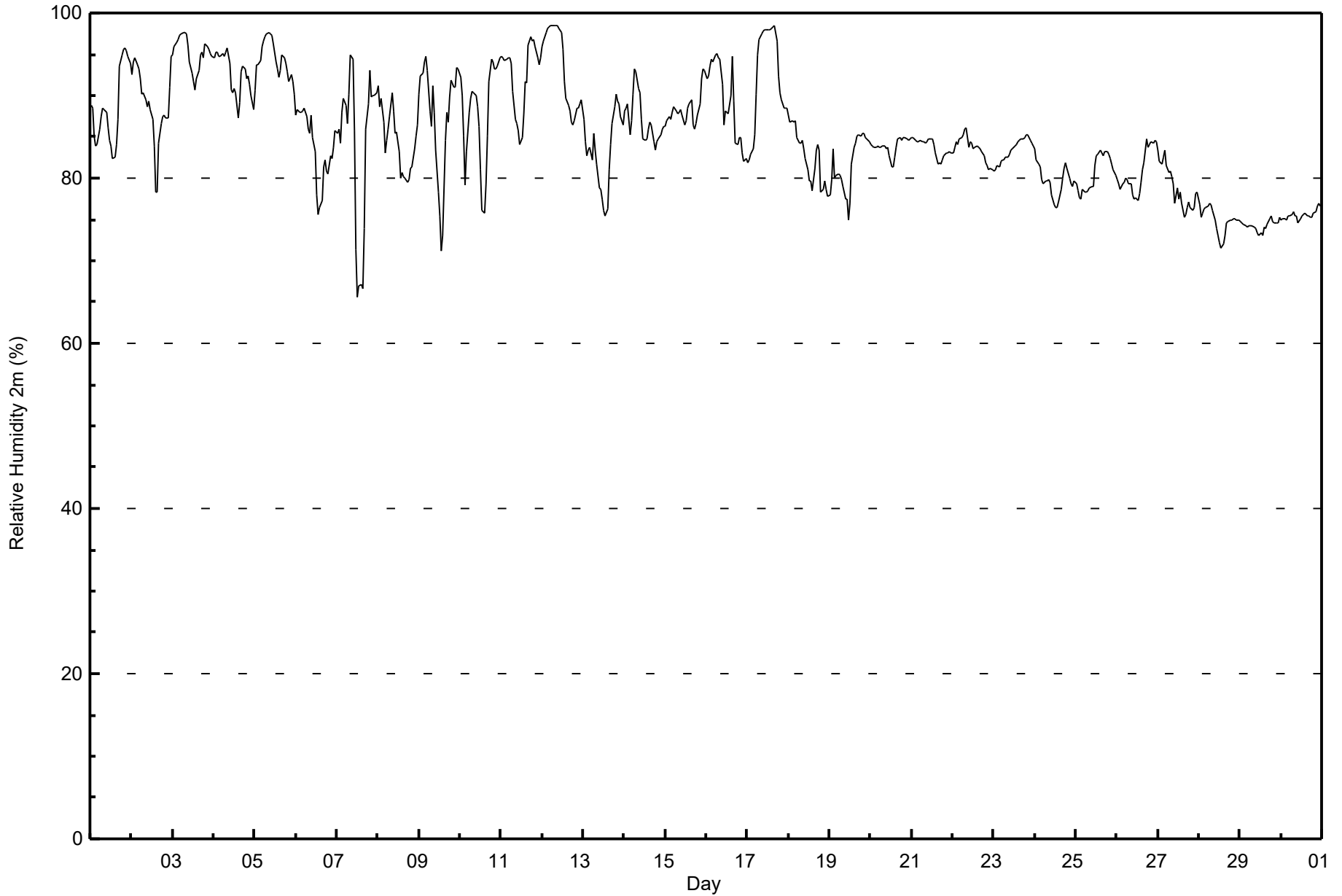
**Relative Humidity 2m (RH2) - %**  
**Fort Chipewyan - November 2024**

Maximum Value: 98.5 % on Nov 12 08:00		Maximum Daily Average: 95.2 % on Nov 3		Hours in Service: 720																																												
Minimum Value: 65.7 % on Nov 7 13:00		Minimum Daily Average: 74.3 % on Nov 29		Hours of Data: 720																																												
Maximum Diurnal Average: 86.8 % at hour 9		Minimum Diurnal Average: 81.8 % at hour 14		Hours of Missing Data: 0																																												
Monthly Average: 85.20 %		Percentiles: P <sub>1</sub> = 72.1 P <sub>10</sub> = 75.7 Q <sub>1</sub> = 80.3 Median = 84.7 Q <sub>3</sub> = 90.1 P <sub>90</sub> = 94.8 P <sub>99</sub> = 98.2		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	88.8	88.4	85.1	84.0	84.0	85.9	87.5	88.6	88.3	88.0	86.1	84.6	84.0	82.5	82.5	84.1	87.2	93.5	95.0	95.5	95.8	95.4	94.8	93.9	88.5	95.8																						
2-Nov	92.5	94.0	94.6	93.8	93.2	92.1	90.3	90.4	89.4	88.6	89.2	88.3	87.2	83.8	78.3	78.4	84.2	86.7	87.5	87.6	87.3	87.2	91.0	94.7	88.8	94.7																						
3-Nov	95.0	95.9	96.4	96.8	97.3	97.5	97.6	97.7	97.5	96.2	94.1	92.7	91.7	90.7	92.0	93.0	94.9	95.3	94.6	96.3	95.9	95.5	95.0	94.7	95.2	97.7																						
4-Nov	94.6	95.2	95.3	94.8	94.8	95.1	94.8	95.3	95.8	93.9	90.7	90.3	90.8	90.4	87.2	89.2	92.9	93.6	93.2	92.0	92.4	91.4	89.9	88.3	92.6	95.8																						
5-Nov	90.7	93.8	93.8	94.3	95.9	96.7	97.2	97.4	97.6	97.5	97.3	96.2	94.0	93.2	92.2	93.0	95.0	94.6	93.9	92.8	91.7	92.5	91.7	90.1	94.3	97.6																						
6-Nov	87.6	88.4	87.9	87.9	88.2	88.4	87.5	86.0	85.5	87.6	84.8	83.1	78.0	75.6	76.5	77.3	81.4	82.2	80.9	80.5	82.7	82.4	83.8	85.8	83.7	88.4																						
7-Nov	85.5	86.0	84.2	88.0	89.6	88.9	86.6	90.1	94.9	94.5	85.8	71.4	65.7	67.0	67.1	66.6	73.8	85.9	89.0	93.0	89.9	90.1	90.0	90.3	83.9	94.9																						
8-Nov	91.1	88.7	89.6	86.7	83.0	84.5	85.9	87.5	90.3	88.2	85.4	85.6	83.2	80.1	80.8	80.2	80.0	79.4	79.8	81.2	81.4	83.6	85.0	86.5	84.5	91.1																						
9-Nov	90.2	92.3	92.8	94.0	94.8	93.1	88.1	86.2	91.2	88.0	83.4	78.3	75.4	71.1	73.0	84.5	87.9	86.8	89.8	91.9	91.1	91.0	93.4	93.3	87.6	94.8																						
10-Nov	92.2	90.0	85.1	79.2	83.2	87.9	89.7	90.6	90.3	89.9	88.7	86.3	81.1	76.0	75.8	79.3	85.2	91.7	94.3	94.0	93.2	93.2	93.6	94.6	87.7	94.6																						
11-Nov	94.8	94.6	94.3	94.4	94.5	94.6	93.9	90.4	87.2	86.5	85.7	84.0	84.9	87.7	91.8	91.6	96.1	97.0	96.7	96.7	95.9	94.6	93.7	94.6	92.3	97.0																						
12-Nov	95.9	96.7	97.7	98.1	98.3	98.4	98.5	98.5	98.5	98.5	98.2	97.7	95.7	91.7	89.7	88.8	88.1	86.8	86.4	87.0	88.6	88.5	89.0	89.5	93.5	98.5																						
13-Nov	87.2	84.4	82.7	83.3	83.7	82.2	85.5	83.5	81.7	78.9	78.7	77.4	76.1	75.4	76.3	81.0	84.0	86.5	88.7	90.2	89.2	89.0	87.4	86.4	83.3	90.2																						
14-Nov	88.2	88.5	89.0	85.2	86.9	90.2	93.3	92.9	90.8	90.3	87.1	84.8	84.7	84.8	86.0	86.8	86.4	84.4	83.4	84.3	84.7	85.3	86.0	86.2	87.1	93.3																						
15-Nov	86.2	86.9	87.5	87.2	87.9	88.6	88.2	87.8	88.0	88.3	87.7	86.5	86.9	88.5	89.0	89.4	86.5	85.9	86.6	87.6	88.9	92.0	93.2	93.0	88.3	93.2																						
16-Nov	92.1	92.3	93.6	94.4	94.0	94.8	95.0	94.5	94.3	91.4	86.4	88.2	88.0	87.7	90.0	94.8	89.3	84.3	84.1	84.9	84.9	83.1	82.1	82.3	89.4	95.0																						
17-Nov	81.9	82.3	82.9	83.5	85.3	90.2	95.0	96.7	97.4	97.8	98.0	97.9	97.9	98.0	98.2	98.3	98.4	96.7	92.4	90.4	89.6	88.5	88.5	88.5	92.3	98.4																						
18-Nov	87.7	86.8	87.0	86.7	86.9	84.9	84.3	84.3	84.7	83.5	82.3	81.0	79.6	79.7	78.4	81.2	83.3	84.1	83.4	78.3	78.7	79.6	78.7	77.7	82.6	87.7																						
19-Nov	77.9	79.9	83.6	80.0	80.3	80.5	80.3	79.8	78.9	77.5	77.5	75.0	77.0	81.7	83.7	84.2	85.0	85.3	85.1	85.4	85.5	85.0	84.7	84.4	81.6	85.5																						
20-Nov	84.0	84.0	83.7	83.7	83.8	83.8	83.8	83.9	83.9	83.6	83.7	82.7	81.4	81.3	82.5	83.7	84.8	84.9	84.6	84.9	85.0	84.8	84.6	84.8	83.8	85.0																						
21-Nov	84.9	84.9	84.6	84.5	84.4	84.7	84.4	84.5	84.3	84.4	84.7	84.8	84.7	84.1	83.0	81.7	81.9	81.7	82.2	82.7	83.1	83.0	83.1	83.0	83.7	84.9																						
22-Nov	83.0	83.7	84.4	84.0	84.7	85.0	85.3	85.9	86.1	83.7	84.4	84.3	83.6	83.7	83.9	83.8	83.5	83.2	82.7	81.8	81.6	81.1	81.2	81.0	83.6	86.1																						
23-Nov	80.8	81.0	81.5	81.4	82.0	82.1	82.3	82.5	82.6	83.0	83.3	83.6	83.8	84.1	84.4	84.6	84.8	84.8	85.0	85.3	85.2	84.6	84.3	83.9	83.4	85.3																						
24-Nov	83.6	82.2	81.7	81.4	79.8	79.3	79.7	79.7	79.9	79.5	77.9	76.7	76.4	76.5	77.0	78.6	80.0	81.1	81.8	81.2	80.1	79.3	79.0	79.7	79.7	83.6																						
25-Nov	79.3	78.5	77.7	77.5	78.6	78.4	78.4	78.5	78.9	79.0	79.0	81.5	82.7	83.0	83.3	83.1	82.7	83.3	83.2	82.9	82.4	81.6	81.0	80.4	80.6	83.3																						
26-Nov	79.8	79.3	78.6	79.4	79.5	79.9	79.9	79.3	79.4	78.0	77.4	77.6	77.3	78.2	79.5	81.1	81.9	84.7	83.8	84.1	84.5	84.3	84.6	84.5	80.7	84.7																						
27-Nov	83.5	82.1	81.8	82.6	83.5	81.5	80.7	80.9	80.2	79.3	77.0	78.8	77.5	78.2	76.9	75.2	75.6	76.5	77.2	76.4	76.1	76.5	78.1	78.3	78.9	83.5																						
28-Nov	76.7	75.3	75.8	76.3	76.4	76.6	76.9	76.7	76.0	75.0	73.9	73.1	72.2	71.5	72.1	73.1	74.6	74.7	74.8	75.0	75.0	75.0	75.0	74.9	74.9	76.9																						
29-Nov	74.8	74.7	74.4	74.3	74.1	74.3	74.3	74.3	74.1	73.8	73.4	73.1	73.3	73.1	74.0	74.0	74.4	75.0	75.5	74.8	74.6	74.5	74.6	75.3	74.3	75.5																						
30-Nov	75.0	75.1	75.1	74.9	75.4	75.5	75.6	75.9	75.5	75.4	74.6	75.0	75.5	75.6	75.7	75.5	75.5	75.3	75.2	75.7	76.0	76.5	76.9	76.7	75.5	76.9																						
																								86.2	86.2	86.1	85.7	86.1	86.5	86.7	86.7	86.8	86.0	84.5	83.4	82.3	81.8	82.0	83.2	84.6	85.5	85.7	85.8	85.7	85.6	85.8	85.9	Diurnal Average
																								95.9	96.7	97.7	98.1	98.3	98.4	98.5	98.5	98.5	98.5	98.2	97.9	97.9	98.0	98.2	98.3	98.4	97.0	96.7	96.7	95.9	95.5	95.0	94.7	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 2m (RH2) - %**  
**Fort Chipewyan - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 2m (RH2) - %**  
**Fort Chipewyan - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	0	0.00	0.00
60 - 80	172	23.89	23.89
80 - 100	548	76.11	100.00

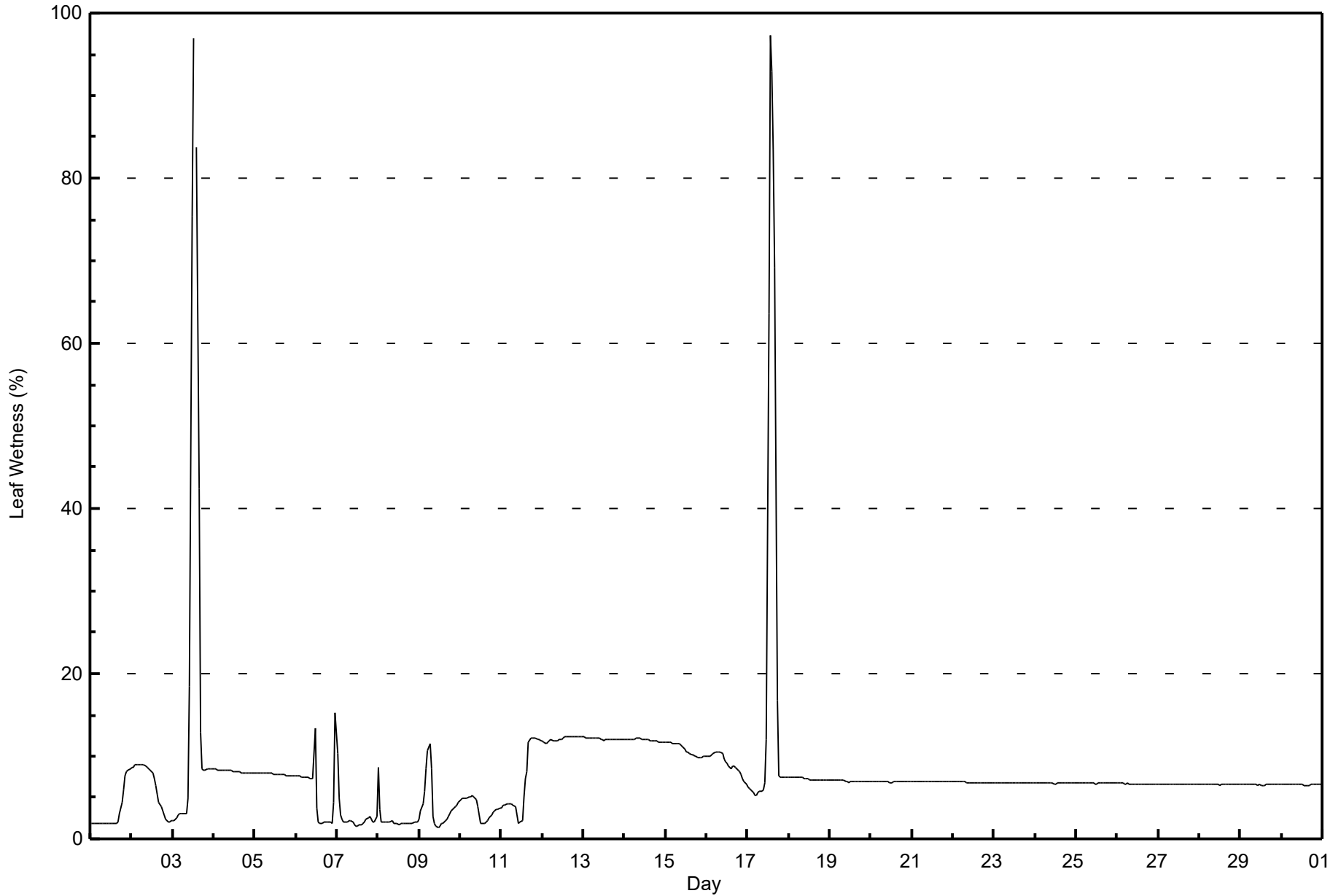
Total Number of Valid Hours: 720

Total Number of Hours: 720





Maximum Value: 97.2 % on Nov 17 14:00		Maximum Daily Average: 22.7 % on Nov 17		Hours in Service: 720																																												
Minimum Value: 1.4 % on Nov 9 12:00		Minimum Daily Average: 2.3 % on Nov 8		Hours of Data: 719																																												
Maximum Diurnal Average: 12.0 % at hour 15		Minimum Diurnal Average: 6.8 % at hour 10		Hours of Missing Data: 1																																												
Monthly Average: 7.85 %		Percentiles: P <sub>1</sub> = 1.7 P <sub>10</sub> = 2.1 Q <sub>1</sub> = 6.6 Median = 6.8 Q <sub>3</sub> = 8.1 P <sub>90</sub> = 12.0 P <sub>99</sub> = 59.8		Hours of Calibration: 0																																												
				Percent Operational Time: 99.9																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	3.1	4.4	5.9	7.7	8.1	8.3	8.5	3.3	8.5																						
2-Nov	8.6	8.7	8.9	9.0	9.0	9.0	9.0	8.9	8.9	8.7	8.5	8.3	7.9	7.4	6.5	5.3	4.4	3.9	3.4	2.9	2.4	2.1	2.1	2.1	6.5	9.0																						
3-Nov	2.2	2.3	2.5	2.8	3.0	3.0	3.1	3.1	3.1	4.8	18.4	75.4	96.9	OR	83.8	42.3	13.0	8.4	8.3	8.4	8.4	8.4	8.4	8.4	18.2	96.9																						
4-Nov	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.3	8.3	8.3	8.2	8.2	8.1	8.1	8.1	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.2	8.4																						
5-Nov	8.0	7.9	7.9	7.9	7.9	7.9	8.0	8.0	8.0	8.0	7.9	7.9	7.9	7.8	7.8	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.8	8.0																						
6-Nov	7.6	7.6	7.5	7.5	7.5	7.5	7.4	7.4	7.4	7.4	7.4	13.4	3.7	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	1.9	4.4	15.2	5.7	15.2																						
7-Nov	10.4	5.0	2.9	2.3	2.1	2.0	2.1	2.2	2.2	2.0	1.7	1.5	1.5	1.7	1.8	1.8	2.1	2.3	2.6	2.7	2.4	2.1	2.0	2.6	2.6	10.4																						
8-Nov	8.6	3.6	2.0	2.0	2.0	2.0	2.1	2.1	2.2	1.9	1.9	1.8	1.7	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.3	8.6																						
9-Nov	2.4	3.3	4.2	5.8	8.5	10.7	11.4	8.5	2.8	1.9	1.5	1.4	1.6	1.8	1.8	2.1	2.4	2.8	3.0	3.4	3.7	3.9	4.1	4.4	4.1	11.4																						
10-Nov	4.7	4.8	4.9	4.9	5.0	5.0	5.1	5.2	5.1	4.7	3.9	2.9	1.9	1.9	1.9	2.0	2.2	2.6	2.9	3.1	3.4	3.5	3.6	3.7	3.7	5.2																						
11-Nov	3.8	4.0	4.1	4.2	4.2	4.2	4.2	4.1	3.9	2.9	1.9	2.0	2.1	5.0	7.3	8.1	11.6	12.2	12.2	12.2	12.2	12.1	12.0	11.9	6.8	12.2																						
12-Nov	11.9	11.8	11.6	11.6	11.8	12.1	11.9	11.8	11.8	11.8	12.0	12.1	12.3	12.4	12.4	12.4	12.4	12.4	12.3	12.3	12.3	12.3	12.3	12.3	12.1	12.4																						
13-Nov	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.2	12.1	12.0	11.9	12.1	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.1	12.3																						
14-Nov	12.0	12.0	12.0	12.0	12.0	12.0	12.1	12.1	12.1	12.1	12.1	12.1	12.0	12.0	12.0	11.9	11.9	11.9	11.8	11.8	11.8	11.7	11.7	11.7	12.0	12.1																						
15-Nov	11.7	11.7	11.6	11.6	11.6	11.6	11.5	11.5	11.5	11.4	11.2	10.8	10.5	10.4	10.3	10.2	10.2	10.0	9.9	9.8	9.8	9.9	10.0	10.0	10.8	11.7																						
16-Nov	9.9	9.9	10.1	10.2	10.3	10.5	10.5	10.5	10.5	10.3	9.7	9.4	9.1	8.8	8.5	8.8	8.8	8.6	8.3	8.1	7.8	7.4	6.9	6.6	9.2	10.5																						
17-Nov	6.3	6.1	5.9	5.6	5.3	5.2	5.7	5.7	5.7	5.9	6.8	12.0	63.6	97.2	92.9	83.3	69.1	16.9	7.5	7.5	7.5	7.5	7.5	7.5	22.7	97.2																						
18-Nov	7.5	7.5	7.5	7.5	7.4	7.4	7.4	7.4	7.4	7.4	7.3	7.2	7.1	7.2	7.2	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.3	7.5																						
19-Nov	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.0	7.0	6.8	6.9	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.1																						
20-Nov	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.9	6.7	6.7	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	7.0																						
21-Nov	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9																						
22-Nov	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.9																						
23-Nov	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8																						
24-Nov	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8																						
25-Nov	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.7	6.6	6.6	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8																						
26-Nov	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.7																						
27-Nov	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6																						
28-Nov	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.5	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6																						
29-Nov	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6																						
30-Nov	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.5	6.6	6.6	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6																						
																								7.3	7.0	6.9	7.0	7.1	7.1	7.2	7.1	6.9	6.8	7.2	9.3	11.4	9.7	12.0	10.3	9.0	7.2	6.9	6.9	7.0	6.9	7.0	7.4	Diurnal Average
																								12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.2	18.4	75.4	96.9	97.2	92.9	83.3	69.1	16.9	12.3	12.3	12.3	12.3	12.3	15.2	Diurnal Maximum
OR - Out of Range																																																





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Leaf Wetness (LW) - %**  
**Fort Chipewyan - November 2024**

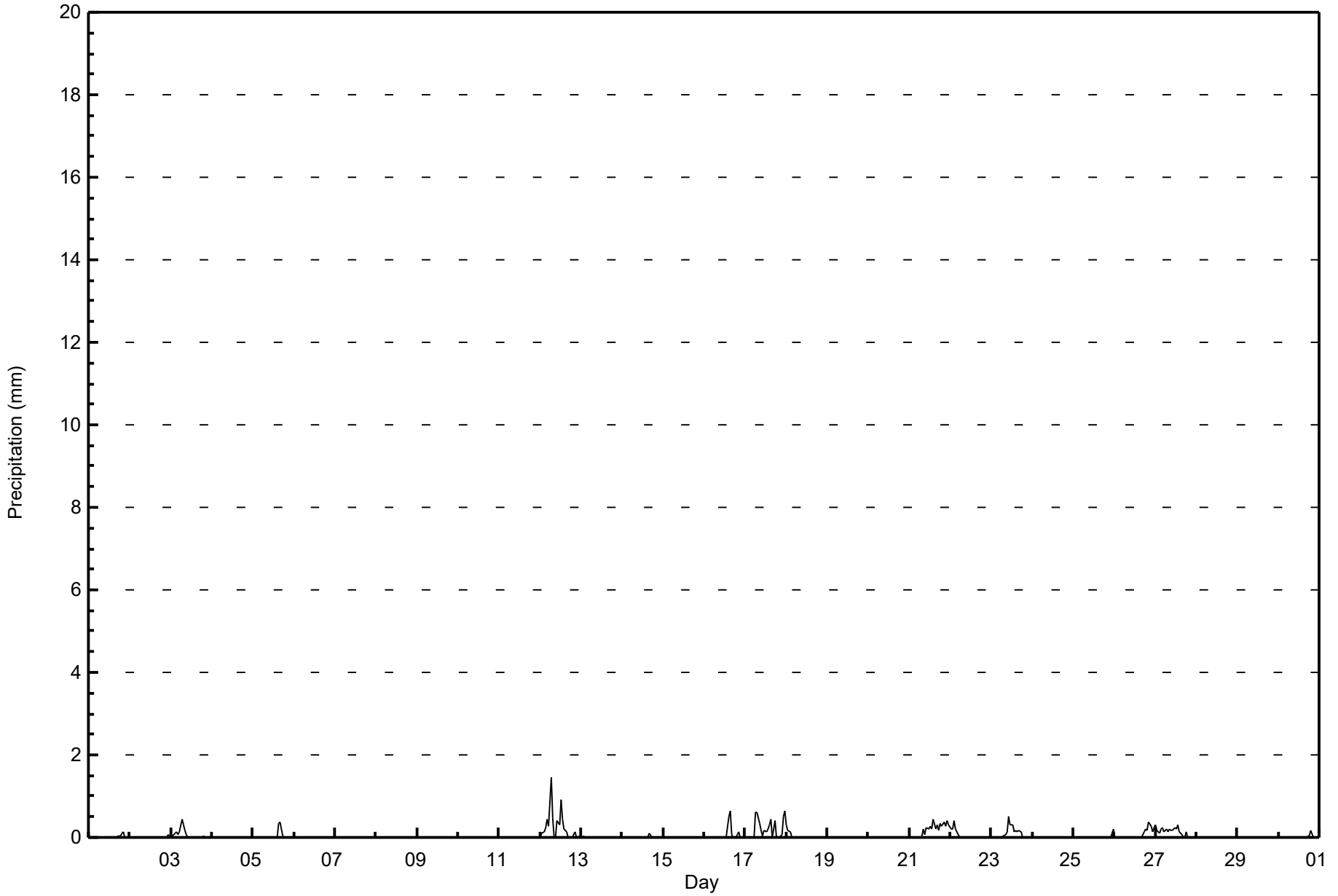
<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	0	0.00	0.00
0.4 - 0.5	0	0.00	0.00
0.6 - 0.7	0	0.00	0.00
0.8 - 1.4	1	0.14	0.14
1.5 - 10	594	82.61	82.75
> 10	124	17.25	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



Maximum Value: 1.5 mm on Nov 12 07:00      Maximum Daily Total: 5.7 mm on Nov 12		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																									
Minimum Value: 0.0 mm on Nov 1 01:00 Maximum Diurnal Total: 2.7 mm at hour 7 Monthly Total: 27.76 mm		Minimum Daily Total: 0.0 mm on Nov 4 Minimum Diurnal Total: 0.5 mm at hour 6 Percentiles: $P_1 = 0.0$ $P_{10} = 0.0$ $Q_1 = 0.0$ Median = 0.0 $Q_3 = 0.0$ $P_{90} = 0.2$ $P_{99} = 0.5$																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.3	0.1	
2-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
3-Nov	0.0	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	1.5	0.4	
4-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.4	
6-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12-Nov	0.0	0.1	0.1	0.2	0.4	0.3	1.5	0.5	0.0	0.0	0.4	0.3	0.9	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	5.7	1.5	
13-Nov	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	
14-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	
15-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	1.4	0.7	0.7	
17-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.4	0.2	0.1	0.2	0.1	0.2	0.3	0.4	0.0	0.4	0.0	0.0	0.0	0.1	0.5	4.7	0.6	0.6	
18-Nov	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.3	0.3	
19-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.3	0.2	0.3	0.2	0.4	0.2	0.3	0.2	0.3	0.3	0.4	0.3	0.4	0.3	4.3	0.4	0.4
22-Nov	0.2	0.2	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.4	0.4	
23-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	2.1	0.5	0.5	
24-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2
26-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.4	0.3	0.1	0.2	1.5	0.4	0.4	
27-Nov	0.3	0.2	0.1	0.2	0.3	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	3.1	0.3	0.3	
28-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.3	0.2	0.2	0.2
0.8 0.7 0.8 0.8 0.9 0.5 2.7 1.6 1.0 0.6 1.4 1.2 1.8 1.3 1.7 2.0 1.0 1.0 0.8 0.8 1.1 0.6 1.1 1.5																								Diurnal Average			
0.3 0.2 0.4 0.2 0.4 0.3 1.5 0.6 0.4 0.2 0.5 0.3 0.9 0.4 0.5 0.7 0.4 0.4 0.3 0.3 0.4 0.3 0.5 0.6																								Diurnal Maximum			





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Precipitation (PC) - mm**  
**Fort Chipewyan - November 2024**

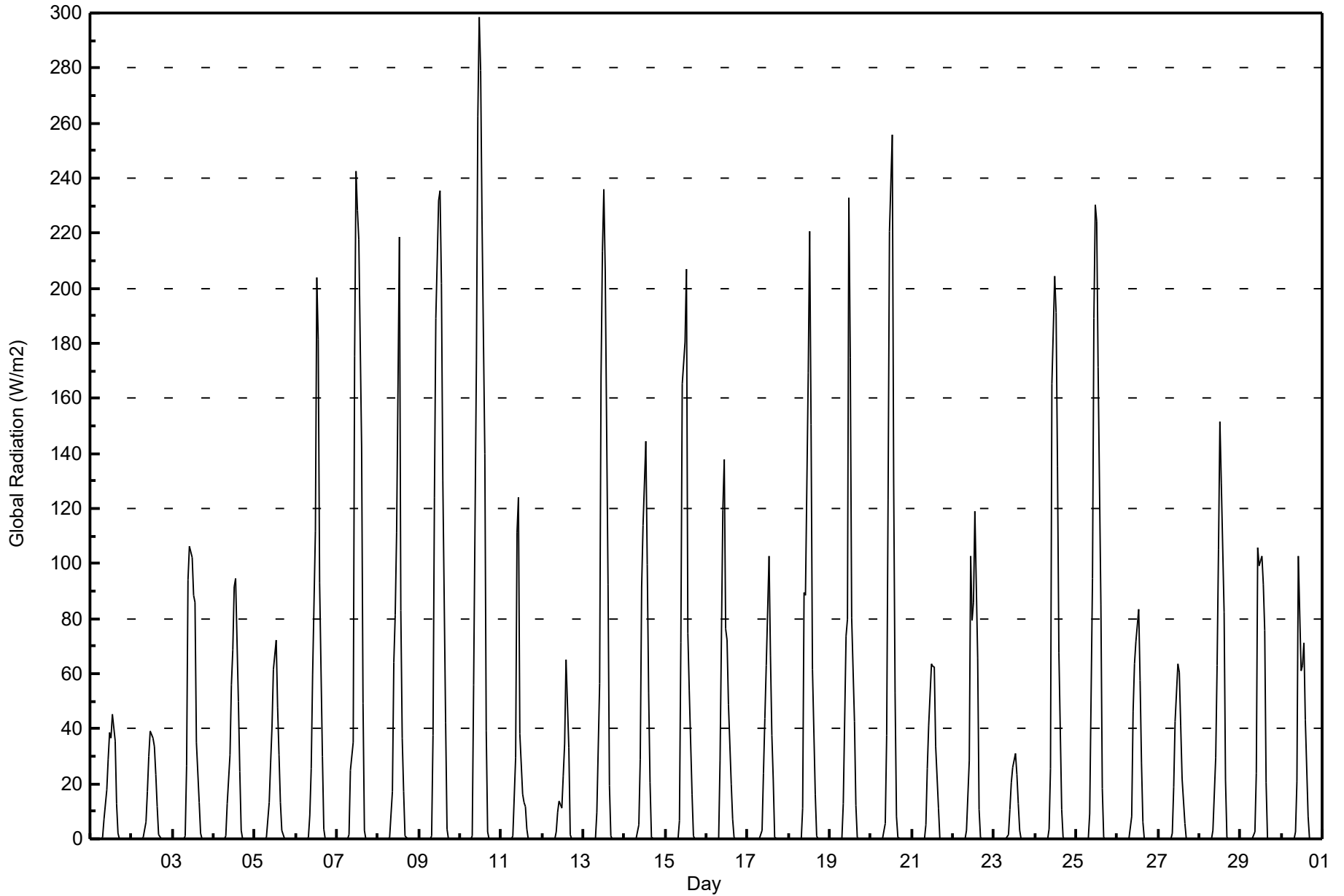
<b>Concentration Ranges (mm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	698	96.94	96.94
0.4 - 0.5	16	2.22	99.17
0.6 - 0.7	4	0.56	99.72
0.8 - 1.4	1	0.14	99.86
1.5 - 10	0	0.00	99.86
> 10	0	0.00	99.86

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Value: 298.5 W/m2 on Nov 10 12:00																						Maximum Daily Average: 61.5 W/m2 on Nov 10																						Hours in Service: 720	
Minimum Value: 0.0 W/m2 on Nov 1 01:00																						Minimum Daily Average: 5.3 W/m2 on Nov 23																						Hours of Data: 720	
Maximum Diurnal Average: 133.3 W/m2 at hour 13																						Minimum Diurnal Average: 0.0 W/m2 at hour 4																						Hours of Missing Data: 0	
Monthly Average: 24.76 W/m2																						Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 20.9 P <sub>90</sub> = 91.5 P <sub>99</sub> = 232.7																						Hours of Calibration: 0	
																																												Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																					
1-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	6.9	17.8	29.1	38.4	36.7	45.1	35.8	12.7	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4	45.1																		
2-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	6.3	17.1	30.0	39.3	36.5	33.7	23.3	11.9	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	39.3																		
3-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	26.3	94.1	106.1	102.1	88.6	85.7	34.9	13.1	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.1	106.1																		
4-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	12.9	30.6	56.2	68.6	91.5	94.8	49.6	24.4	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.0	94.8																		
5-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	13.0	27.4	40.5	61.4	72.3	47.5	30.6	13.4	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.9	72.3																		
6-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	8.4	25.5	59.3	111.9	203.8	181.7	93.3	30.2	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.9	203.8																		
7-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	24.7	34.9	175.4	242.6	228.5	217.7	142.5	49.4	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.7	242.6																		
8-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	17.4	64.3	81.5	111.6	218.8	82.8	36.6	17.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.3	218.8																		
9-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2	37.7	124.0	189.4	232.1	235.2	201.8	130.3	42.4	3.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	49.9	235.2																		
10-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	56.0	173.9	262.6	298.5	279.0	224.6	139.6	39.3	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.5	298.5																		
11-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	29.5	111.5	123.8	38.1	16.1	13.1	11.4	3.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.5	123.8																		
12-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	9.8	13.9	10.9	23.0	34.5	65.2	33.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.1	65.2																		
13-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	9.6	56.5	167.7	213.8	236.2	205.8	92.3	19.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.8	236.2																		
14-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	5.0	29.0	91.8	113.7	144.6	99.5	52.8	20.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.2	144.6																		
15-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	6.7	71.1	165.1	180.5	206.9	74.8	53.8	16.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.4	206.9																		
16-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	28.4	119.5	137.7	76.2	72.0	48.6	20.0	7.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.3	137.7																		
17-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	23.8	43.7	62.8	102.6	66.4	37.4	21.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.1	102.6																		
18-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	11.3	89.7	88.3	169.5	220.4	150.7	61.4	16.4	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.7	220.4																		
19-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	12.5	73.6	79.7	232.9	175.0	80.2	42.9	12.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.6	232.9																		
20-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	37.8	123.1	220.6	255.8	129.5	52.8	8.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.7	255.8																		
21-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	25.6	41.4	63.5	62.4	62.7	33.8	11.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.7	63.5																		
22-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	28.3	102.7	79.6	86.0	118.7	65.4	10.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.6	118.7																		
23-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	10.5	20.1	26.2	31.1	23.3	12.8	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	31.1																		
24-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	25.5	165.1	204.3	191.2	135.4	67.4	10.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.5	204.3																		
25-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	94.7	189.4	230.2	224.4	171.5	85.2	18.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.6	230.2																		
26-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.1	46.5	63.4	71.7	83.5	57.3	27.6	5.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.2	83.5																		
27-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	18.6	42.8	63.8	60.6	41.3	22.1	5.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.7	63.8																		
28-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	29.3	63.1	105.4	151.7	129.3	82.6	21.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.4	151.7																		
29-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	24.0	105.7	98.9	102.8	92.6	75.6	20.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.8	105.7																		
30-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	20.9	102.5	61.1	63.1	71.3	43.0	8.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.5	102.5																		
																								Diurnal Average																					
																								Diurnal Maximum																					







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Global Radiation (GR) - W/m2**  
**Fort Chipewyan - November 2024**

<b>Concentration Ranges (W/m2)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	539	74.86	74.86
21 - 100	118	16.39	91.25
101 - 300	63	8.75	100.00
301 - 600	0	0.00	100.00
601 - 900	0	0.00	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Speed 10m (WS10) - km/h**  
**Fort Chipewyan - November 2024**

Maximum Speed: 40 km/h on Nov 16 14:00	Maximum Daily Speed Average: 24.6 km/h on Nov 16	Hours in Service: 720
Minimum Speed Value: 1 km/h on Nov 29 19:00	Minimum Daily Speed Average: 1.2 km/h on Nov 4	Hours of Data: 718
Maximum Diurnal Speed Average: 2.6 km/h at hour 13	Minimum Diurnal Speed Average: 0.1 km/h at hour 22	Hours of Missing Data: 2
Monthly Average Velocity: 0.8 km/h 256.1 deg	Percentiles: P <sub>1</sub> = 2 P <sub>10</sub> = 5 Q <sub>1</sub> = 8 Median = 11 Q <sub>3</sub> = 16 P <sub>90</sub> = 21 P <sub>99</sub> = 34	Percent Operational Time: 99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	SSW17	W10WNNW11	W7	WSW7	WSW6	WSW6	SW6	WSW3	NW2	WNNW3	NW5	NNW5	NNE3	SE2	W2	WSW2	W3	WSW1	S5	SSW6	S7	S7	S7	WSW3.5	SSW17	
2-Nov	SSW6	SSW5	SSW5	SSW5	SW6	S7	SSE8	SE10	SE10	SE12	SE11	SE13	SE13	SE13	SE11	ESE14	ESE15	ESE14	ESE16	ESE17	E21	E21	E18	E21	ESE10.2	E21
3-Nov	E22	E20	E14	E12	E12	E10	E7	E5	SW4	W7	W6	W5	WSW6	SW7	SW7	SSW4	SSW6	SW6	WSW8	WSW10	W11	W12	W11	W12	S1.5	E22
4-Nov	W12	W11	W10	W11	WSW12	WSW10	WSW8	WSW7	SW7	SW7	S3	SSE6	SSE7	SE8	ESE6	ENE5	ENE8	NE8	NE8	NE9	E7	NE5	NE7	ENE3	WSW1.2	W12
5-Nov	W2	W6	W3	W6	WNNW7	WNNW6	W4	W6	W8	W9	W11	W9	W10	W11	W12	W14	W10	W8	W11	W10	WSW8	WSW9	SW9	SSW10	W7.9	W14
6-Nov	S13	SSE17	SSE18	S20	S22	S25	SSE29	S28	S23	SSW25	SSW25	SSW21	SSW20	SSW21	SW14	WSW11	WSW12	WSW12	W13	W10	WSW7	WSW9	W6	WNNW6	SSW14.3	SSE29
7-Nov	WNNW8	WNNW9	WNNW10	W12	W13	W14	W13	W14	W14	W15	WNNW14	WNNW14	WNNW10	W11	W11	W7	SW6	SSW4	E8	E12	E14	E17	E20	E22	W4.1	E22
8-Nov	E21	ESE24	ESE20	SE12	S16	S9	SSW10	SSW10	SW10	SW11	WSW12	W16	WSW16	W13	WSW12	WSW12	W13	WSW11	WSW13	WSW12	W13	WSW14	WSW16	W17	SW7.6	ESE24
9-Nov	W16	W17	W17	W16	W16	WNNW16	WNNW15	WNNW11	W9	WNNW8	WNNW7	W6	W7	W5	ESE3	E6	E6	E9	E9	ENE11	ENE17	ENE14	E15	E12	NW3.0	W17
10-Nov	E8	S2	SW8	WSW9	WSW8	W5	W8	WNNW9	WNNW9	WNNW10	WNNW8	W10	W10	WNNW9	NW8	NW5	NNW6	N4	N5	NE7	NE7	NNE7	NE9	E15	NW3.5	E15
11-Nov	E19	E20	E22	ENE21	ENE22	E26	ENE29	E31	E30	E27	E21	SE18	SE16	ESE19	E21	E21	E20	E17	E20	E17	E14	ENE13	ENE15	ENE14	E19.9	E31
12-Nov	ENE15	E10	E8	ENE7	E8	ENE5	E3	UO	WNNW2	W9	W12	W14	W23	W30	W29	W28	W25	W26	W27	W25	W25	W20	W17	W17	W11.9	W30
13-Nov	W17	W16	WNNW13	WNNW13	WNNW10	WNNW13	WNNW12	W13	WNNW11	WNNW13	WNNW11	W11	W9	W9	W8	WNNW5	NW6	NW8	NNW10	NW5	W1	NNW2	UO	N2	WNNW8.9	W17
14-Nov	NNE4	N4	NNE7	ESE16	E6	SE11	E12	ENE14	E23	E28	E26	E23	E20	E22	ENE21	ENE19	E26	E27	E28	E30	E26	E26	E25	E23	E18.7	E30
15-Nov	E18	E15	E11	E10	ESE11	ESE9	ESE12	SE14	ESE13	ESE14	E14	E11	E12	E16	E22	E17	E17	E15	ESE13	ESE11	SE7	ESE5	SE4	SE8	E11.8	E22
16-Nov	SE5	SSE7	SE9	ESE10	SE10	ESE11	SE11	SE16	SSE23	SSE29	SSE34	SSE36	SSE39	SSE40	SSE36	SSE28	SSE32	SSE37	SSE34	SSE35	SSE31	SSE33	SSE29	SSE27	SSE24.6	SSE40
17-Nov	S26	S23	SSE21	SSE23	SSE18	SSE17	SE15	SE15	ESE15	E17	E17	ESE16	ESE14	ESE11	ENE7	ENE4	NNW5	NNW17	NW17	NW19	NW19	WNNW18	WNNW18	WNNW17	SE4.1	S26
18-Nov	WNNW18	WNNW18	W18	W16	W17	WNNW20	W19	W18	WNNW18	WNNW17	WNNW14	WNNW12	W11	WNNW10	W10	W9	WNNW9	NW7	NW8	NW9	NW9	NW9	WNNW8	NW11	WNNW12.8	WNNW20
19-Nov	NW12	NW10	NW8	NW12	NW10	NW6	WNNW7	WNNW9	NW12	NW12	NW14	NW16	NW11	WNNW8	NW10	NW9	NW10	NNW9	NW8	WNNW9	NW10	NW9	NW9	NW10	NW9.9	NW16
20-Nov	NW9	NW8	NW7	WNNW7	NW10	NW10	NW10	NW9	NW11	NW10	N10	NNW8	NNW9	NW10	NW10	NW11	NW11	NW10	NNW10	NNW9	NNW10	NNW8	N8	NNW8	NW9.1	NW11
21-Nov	NNW8	NNW9	NNW9	NW10	WNNW10	WNNW9	WNNW9	WNNW9	NW9	NW12	NW10	NW12	NW13	NW13	NW15	NW14	NW14	NW12	NW13	WNNW12	WNNW12	WNNW12	WNNW15	WNNW17	NW11.3	WNNW17
22-Nov	WNNW16	W14	W13	NW14	NW13	NW14	NW15	NW13	WNNW14	W15	W17	W16	W15	W13	W11	W10	W9	W9	W8	W5	W5	WNNW5	NW3	W4	WNNW10.8	W17
23-Nov	WNNW5	WNNW4	W2	NW4	NW2	NW2	W4	NW2	NNW2	NNW2	NW2	WNNW2	NNW3	NNW3	NNE3	NE4	NNE4	ENE8	ENE11	ENE11	ENE13	ENE14	NE14	ENE15	NE3.7	ENE15
24-Nov	ENE17	ENE19	ENE19	ENE18	ENE19	ENE16	ENE16	ENE18	ENE20	ENE19	ENE18	ENE17	ENE15	ENE12	ENE10	ENE8	ENE8	E8	ENE7	E9	E9	E9	ENE8	ENE8	ENE13.9	ENE20
25-Nov	E8	E8	E8	E8	E7	E9	E9	E8	ESE9	E9	E9	ESE7	SSE9	SSE10	SSE12	SSE17	ESE11	SSE23	SSE26	SSE28	SSE27	SSE29	SSE28	SSE33	SE12.7	SSE33
26-Nov	SSE30	SSE22	SSE22	SSE19	SSE15	SSE14	SSE15	S18	S16	S20	S20	S15	SSW14	SSW13	SSW12	SW10	WSW8	W9	WNNW12	W14	W15	W13	W14	WNNW16	SSW10.8	SSE30
27-Nov	NW14	NW15	NW15	NW15	NW15	NW20	NW20	NW17	NW17	NW18	WNNW20	NW17	NW20	NW17	NW18	NW19	NW19	NW18	NW16	NW17	NW17	NNW14	NW13	NW13	NW16.8	NW20
28-Nov	NW14	NW16	NW16	NW18	NNW16	NNW17	NNW17	NNW15	NW16	NNW20	NNW18	NW20	NW18	NW13	NW12	NW14	NNW10	NNW8	NNW9	NW8	NW7	NW6	NW9	WNNW7	NW13.4	NNW20
29-Nov	WNNW9	NW11	WNNW8	WNNW8	WNNW9	WNNW8	W7	WNNW7	WNNW8	WNNW8	NW7	NW7	WNNW6	W4	W6	W6	W7	WNNW5	SW1	W5	WNNW4	NW2	WSW2	SE1	WNNW5.8	NW11
30-Nov	SW2	NW2	E3	E7	ENE7	ENE7	E7	E9	E8	E10	ENE10	E10	E12	ENE11	ENE13	ENE12	ENE9	ENE7	NNE3	NW2	NW3	WNNW5	WNNW6	WNNW7	ENE5.0	ENE13

S0.5	W0.6	WSW0.9	W1.0	W1.4	W1.1	WSW1.0	SW1.1	WSW1.0	W1.0	W1.0	WSW2.1	WSW2.6	SW2.3	SW1.6	W1.0	NW1.0	NNW0.6	NW0.8	NW0.4	NW0.3	W0.1	ENE0.2	SE0.3	Diurnal Average
SSE30	ESE24	E22	SSE23	ENE22	E26	SSE29	E31	E30	SSE29	SSE34	SSE36	SSE39	SSE40	SSE36	SSE28	SSE32	SSE37	SSE34	SSE35	SSE31	SSE33	SSE29	SSE33	Diurnal Maximum

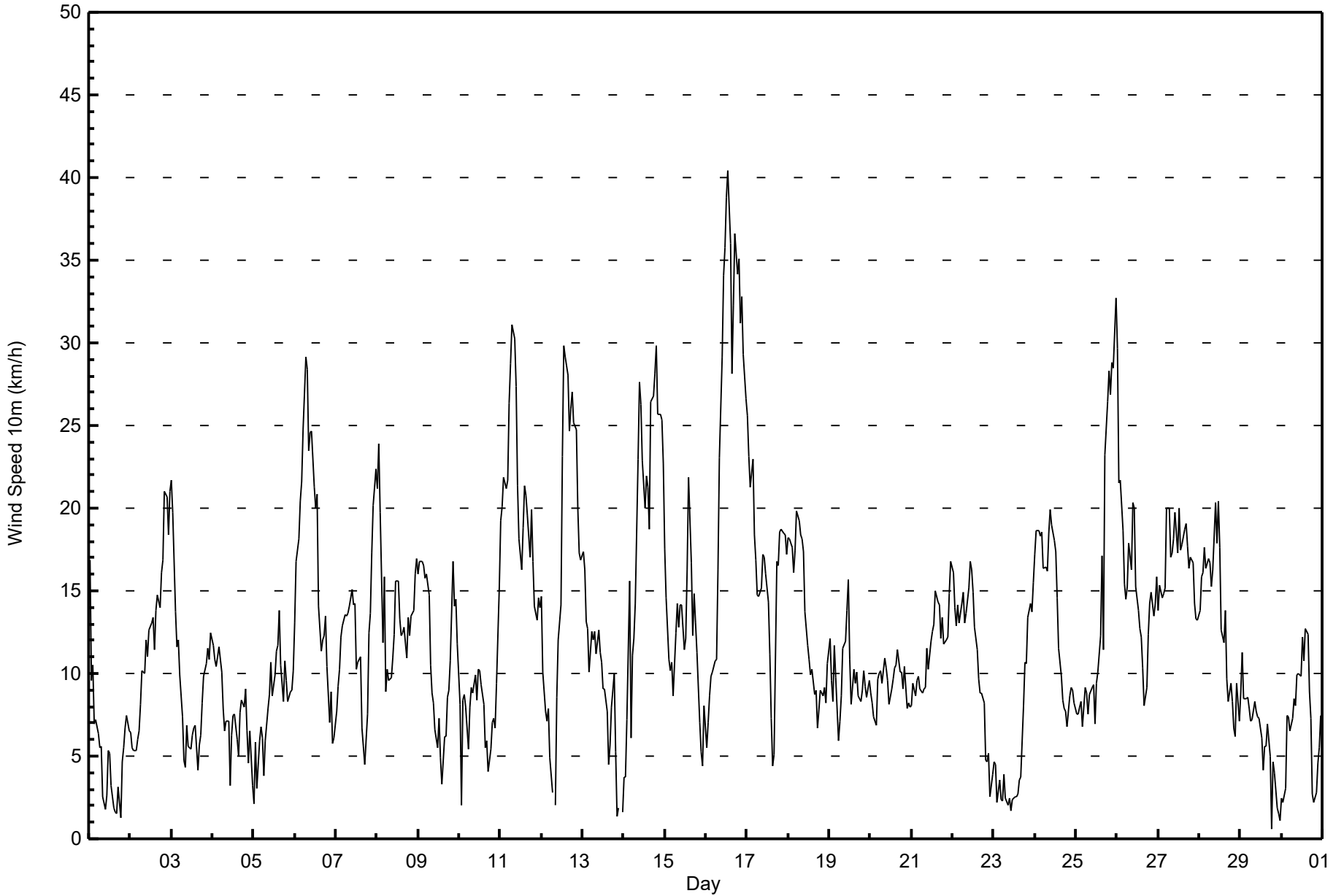
UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Fort Chipewyan - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Nov 12 13:00 Minimum Value: 0 km/h on Nov 25 11:00 Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 2 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 7																	Hours in Service: 720 Hours of Data: 718 Hours of Missing Data: 2 Hours of Calibration: 0 Percent Operational Time: 99.7								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	4	2	2	2	2	2	1	1	2	1	1	2	2	2	1	1	1	1	1	2	1	1	1	1	4
2-Nov	1	1	1	1	1	2	2	2	2	2	2	2	1	2	2	3	1	1	2	1	3	2	2	2	3
3-Nov	2	3	2	1	1	1	1	1	1	2	2	1	1	1	1	0	1	2	2	3	3	2	3	3	
4-Nov	2	2	2	2	3	2	2	1	2	1	1	2	2	1	1	2	1	1	1	2	1	1	3	3	
5-Nov	2	1	1	1	1	1	1	2	2	2	3	2	2	2	3	4	2	2	2	2	2	2	2	4	
6-Nov	3	3	2	3	3	3	4	4	4	4	4	4	3	3	3	2	2	2	3	3	1	2	2	4	
7-Nov	2	2	2	2	2	3	3	3	3	3	3	4	4	3	3	2	3	2	2	2	1	3	2	4	
8-Nov	2	3	3	2	3	2	1	2	2	2	3	4	4	3	2	3	3	2	3	3	3	4	4	4	
9-Nov	4	4	4	3	3	4	3	3	2	2	2	2	2	2	1	1	1	1	1	2	2	2	2	4	
10-Nov	1	2	1	2	2	1	1	1	2	2	2	2	2	2	3	2	3	2	2	2	2	1	2	3	
11-Nov	2	2	2	2	3	3	4	3	3	3	3	2	2	4	2	2	3	2	2	2	1	1	1	4	
12-Nov	1	3	1	1	1	2	1	UO	2	2	3	4	8	7	6	7	6	6	6	6	6	5	4	8	
13-Nov	4	4	3	4	3	3	3	3	2	3	3	2	2	2	2	1	2	2	3	4	2	3	UO	4	
14-Nov	3	3	3	4	3	3	2	4	3	3	3	2	2	2	3	3	4	3	3	3	2	2	2	4	
15-Nov	2	1	3	2	2	2	1	1	1	1	1	2	1	3	2	5	2	2	1	1	2	1	1	5	
16-Nov	2	2	2	3	2	2	2	4	4	5	5	6	6	5	4	5	5	5	5	5	5	4	3	6	
17-Nov	3	3	3	3	3	3	2	2	1	1	1	1	1	1	1	2	2	6	6	6	6	5	5	6	
18-Nov	4	4	4	3	4	5	4	4	4	4	4	3	3	3	2	2	2	2	3	3	3	2	2	5	
19-Nov	3	3	2	4	3	2	2	2	3	3	4	4	3	2	3	3	4	3	3	2	3	3	3	4	
20-Nov	2	3	2	2	3	3	3	3	3	3	3	3	3	3	4	3	3	3	4	4	4	3	3	4	
21-Nov	3	3	3	3	3	2	2	3	3	3	3	3	4	4	4	4	4	3	3	3	3	3	4	4	
22-Nov	3	3	3	4	4	4	4	4	4	3	4	4	4	3	3	2	2	2	2	1	1	1	1	4	
23-Nov	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2	1	1	3	2	2	2	2	2	3	
24-Nov	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	1	3	
25-Nov	1	1	2	1	1	1	1	1	1	1	0	1	2	2	3	4	5	3	4	4	3	3	5	5	
26-Nov	5	4	3	3	3	2	3	3	2	4	4	3	3	3	2	1	2	2	3	4	4	3	3	5	
27-Nov	5	5	4	4	5	6	6	5	6	7	7	6	7	7	6	7	7	6	6	6	5	5	5	7	
28-Nov	4	4	4	5	5	5	5	5	5	5	6	5	4	3	3	4	3	4	3	3	3	2	4	6	
29-Nov	2	3	2	2	2	2	1	2	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	3	
30-Nov	1	2	1	2	1	2	1	2	1	2	3	3	2	1	1	1	2	2	1	1	1	1	1	3	
Diurnal Maximum																								5	
UO - Unstable Operation																									





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Fort Chipewyan - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	86	11.98	11.98
6 - 11	290	40.39	52.37
12 - 19	241	33.57	85.93
20 - 28	78	10.86	96.80
29 - 38	21	2.92	99.72
> 38	2	0.28	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Fort Chipewyan - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	4	5	2	4	3	2	4	1	2	6	2	4	16	10	14	7	86
6 - 11	2	2	7	19	35	10	9	8	5	7	12	18	50	44	46	16	290
12 - 19	0	0	1	27	26	15	10	10	5	4	1	11	45	28	51	7	241
20 - 28	0	0	0	5	30	2	0	12	9	5	0	0	8	1	3	3	78
29 - 38	0	0	0	1	3	0	0	15	0	0	0	0	2	0	0	0	21
> 38	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
<b>Totals</b>	6	7	10	56	97	29	23	48	21	22	15	33	121	83	114	33	718

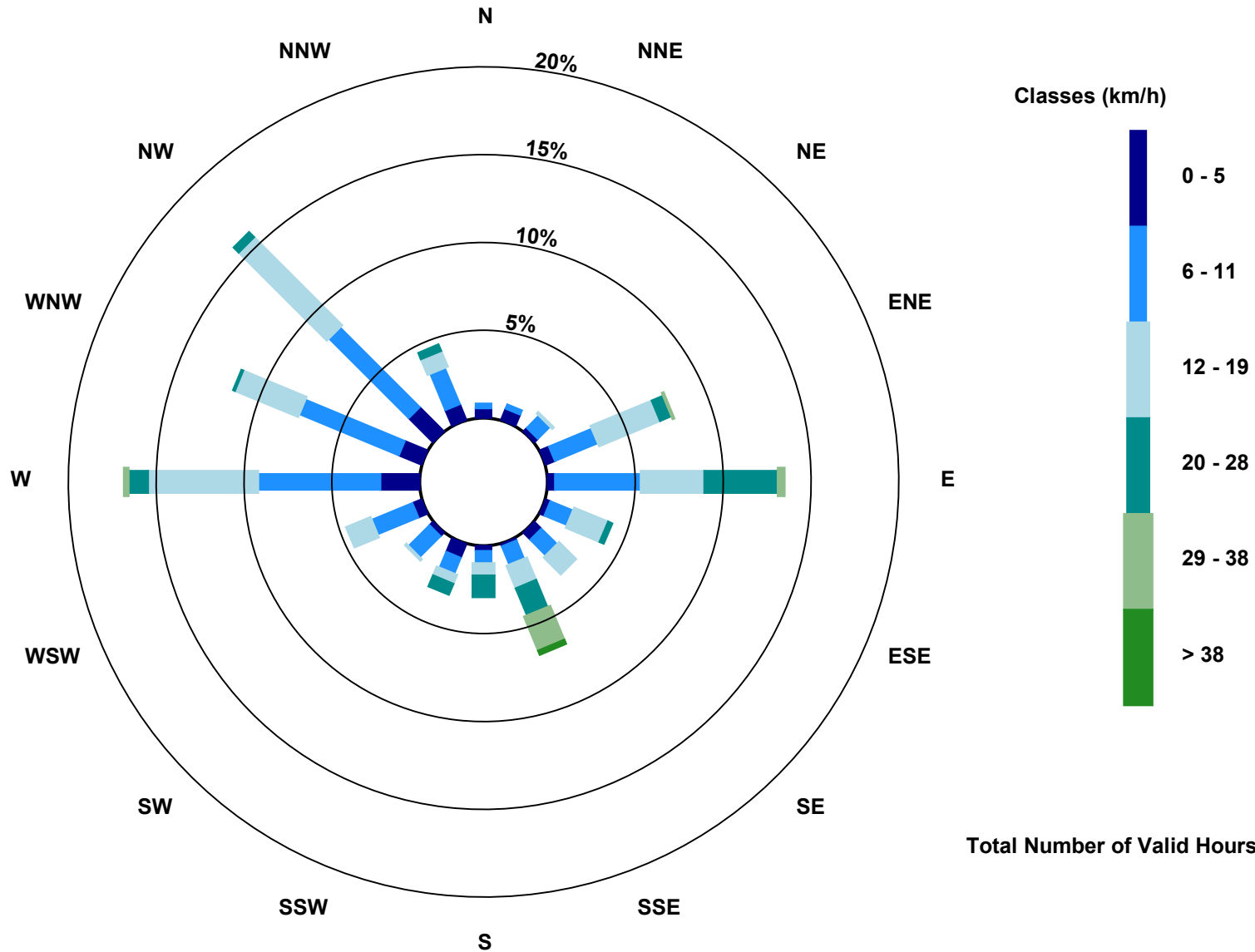
Total Number of Valid Hours: 718

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Fort Chipewyan



Total Number of Valid Hours: 718



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Fort Chipewyan - November 2024**

Direction of Maximum Speed: 167 deg on Nov 16 14:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 156.4 deg on Nov 16	Hours of Data: 718
Direction of Minimum Speed: 214 deg on Nov 29 19:00	Hours of Missing Data: 2
Direction of Minimum Daily Speed Average: 1.2 deg on Nov 4	Percent Operational Time: 99.7
Monthly Average Direction: 256.1 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	209	266	298	280	254	246	246	228	245	307	284	316	336	28	126	273	258	273	244	186	197	181	186	179	241.9
2-Nov	194	200	200	213	232	190	162	142	146	129	132	135	140	128	134	115	104	103	110	108	95	99	94	85	122.9
3-Nov	86	92	98	85	82	83	82	100	225	264	273	259	245	214	217	194	197	214	240	258	270	276	271	264	183.8
4-Nov	266	266	269	259	258	254	257	238	234	225	184	163	156	126	118	73	60	49	47	48	82	36	44	59	242.2
5-Nov	259	276	267	268	284	282	277	270	271	271	279	278	268	270	266	268	272	269	267	269	254	248	235	208	265.3
6-Nov	179	157	164	173	171	169	166	181	185	192	201	203	202	208	224	239	246	255	261	267	247	248	265	284	197.8
7-Nov	298	292	286	273	278	272	266	266	266	271	285	296	301	259	265	280	236	213	79	87	95	89	90	93	279.8
8-Nov	90	106	117	126	180	176	195	205	220	236	239	259	257	262	255	254	266	257	256	254	262	256	252	265	228.1
9-Nov	262	265	272	275	281	288	293	302	280	297	300	272	263	276	121	90	90	82	79	75	74	77	79	90	304.3
10-Nov	91	169	227	254	257	270	271	284	295	284	282	278	277	289	311	324	330	9	353	45	36	30	53	88	307.1
11-Nov	93	86	81	77	76	79	78	79	80	81	92	130	131	110	101	94	88	83	91	87	81	69	73	69	87.0
12-Nov	74	86	84	76	82	74	79	UO	288	277	274	272	265	262	262	263	264	265	263	264	262	267	269	269	266.4
13-Nov	281	280	283	293	292	291	284	281	283	288	291	281	261	267	267	293	304	322	340	326	267	333	UO	358	288.6
14-Nov	17	4	16	106	80	125	100	77	85	83	90	89	82	89	78	61	79	86	87	85	82	88	88	92	84.3
15-Nov	86	82	81	93	109	112	113	124	122	102	101	101	86	82	89	92	98	101	105	106	128	120	129	152	101.0
16-Nov	145	149	145	113	126	114	127	145	153	153	153	162	163	167	162	156	150	154	159	163	163	164	166	167	156.4
17-Nov	170	169	164	163	161	151	139	127	110	101	101	106	107	103	77	60	334	328	319	321	316	298	297	296	141.9
18-Nov	289	283	278	278	278	282	279	280	283	286	294	288	274	285	277	274	293	317	315	322	320	310	298	310	288.1
19-Nov	317	320	312	319	312	305	287	301	308	311	311	311	310	302	304	309	316	329	316	299	307	318	309	307	310.5
20-Nov	308	305	312	302	305	315	319	321	313	320	349	346	337	325	321	323	318	324	335	339	339	337	353	345	325.3
21-Nov	347	347	327	304	296	295	295	299	305	311	308	305	308	305	306	314	311	307	305	296	288	292	295	293	305.4
22-Nov	283	279	278	304	311	308	311	310	299	274	279	276	271	274	277	267	263	259	274	267	274	295	324	269	284.9
23-Nov	288	286	278	304	315	323	275	305	327	337	320	299	335	346	19	36	31	62	68	60	66	59	54	58	34.6
24-Nov	66	68	68	66	69	66	65	66	70	70	71	74	74	70	70	71	67	70	79	78	84	87	81	78	70.6
25-Nov	82	83	90	82	81	87	82	95	102	100	100	122	154	147	148	154	123	159	164	165	166	164	158	157	141.3
26-Nov	151	152	163	167	155	154	166	181	170	184	190	191	198	194	209	221	247	281	295	277	276	269	266	285	196.5
27-Nov	306	311	312	309	311	313	314	314	319	325	332	325	325	322	325	325	323	321	319	318	320	329	322	317	319.4
28-Nov	314	313	315	321	328	329	329	328	324	328	328	326	322	319	319	324	330	327	329	317	311	308	322	303	322.6
29-Nov	302	305	299	297	298	287	281	289	296	297	306	306	303	274	278	267	271	285	214	259	284	310	246	135	291.0
30-Nov	229	305	91	85	77	77	88	89	98	100	69	80	85	77	78	77	71	70	12	326	319	284	285	286	74.7

179.4 270.4 250.8 263.5 266.9 270.7 252.5 229.5 236.3 259.9 268.4 251.8 239.3 225.0 235.3 279.4 318.0 330.1 324.8 309.7 317.0 274.0 72.5 137.7

Diurnal Average

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Fort Chipewyan - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 89 deg on Nov 29 19:00	Hours of Data: 718
Minimum Value: 0 deg on Nov 12 07:00	Hours of Missing Data: 2
Percentiles: P <sub>1</sub> = 4 P <sub>10</sub> = 6 Q <sub>1</sub> = 9 Median = 14 Q <sub>3</sub> = 19 P <sub>90</sub> = 26 P <sub>99</sub> = 64	Hours of Calibration: 0
	Percent Operational Time: 99.7

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	15	20	12	15	23	15	13	14	18	41	37	24	25	48	56	51	23	17	34	21	11	12	10	12	56
2-Nov	12	12	21	30	18	25	14	15	18	11	8	10	8	7	8	14	6	6	5	4	5	4	5	5	30
3-Nov	5	5	6	7	4	5	5	29	22	15	22	19	19	14	10	28	6	14	15	16	14	14	14	14	29
4-Nov	14	15	14	14	14	15	13	15	16	14	19	12	23	21	23	15	7	8	7	9	31	30	16	31	31
5-Nov	67	18	30	18	13	14	15	14	14	14	13	16	15	14	14	15	14	14	13	15	16	14	13	12	67
6-Nov	11	9	9	7	8	8	8	11	7	8	9	9	9	8	10	12	14	12	12	14	14	12	30	21	30
7-Nov	14	14	20	14	13	13	14	14	14	15	15	18	23	20	16	20	33	27	16	8	9	7	5	6	33
8-Nov	6	6	11	28	10	15	14	10	9	19	15	15	13	13	12	12	15	15	14	13	15	15	14	15	28
9-Nov	14	14	13	12	12	15	15	20	14	21	18	25	20	33	43	6	8	6	12	7	6	5	5	7	43
10-Nov	9	70	11	14	13	21	17	11	11	13	16	14	16	26	20	24	51	75	33	21	17	13	16	13	75
11-Nov	7	8	6	6	7	5	5	4	5	5	11	9	9	15	9	5	5	6	5	5	5	5	5	5	15
12-Nov	5	11	10	11	9	6	0	UO	82	15	14	15	14	14	14	14	14	14	14	14	14	13	13	82	
13-Nov	15	14	14	16	15	16	15	15	14	15	18	15	20	21	17	26	16	16	19	64	45	24	UO	18	64
14-Nov	17	18	21	25	35	19	18	9	8	7	6	7	9	8	11	9	10	6	5	5	5	4	5	35	
15-Nov	5	5	7	6	6	6	5	6	8	6	5	11	8	4	4	5	7	6	5	6	19	14	25	33	33
16-Nov	36	28	46	13	18	15	17	10	9	9	10	10	8	8	8	9	10	9	10	9	9	7	7	7	46
17-Nov	6	7	8	8	10	11	10	7	6	5	6	4	4	6	10	40	21	25	25	25	22	15	15	15	40
18-Nov	15	14	13	13	13	14	13	13	13	14	16	16	17	20	16	14	14	19	15	20	23	15	18	15	23
19-Nov	19	24	20	21	20	19	13	14	15	17	15	17	19	17	18	21	21	29	28	17	19	27	23	20	29
20-Nov	17	19	22	16	17	23	21	21	17	22	25	30	29	25	25	23	23	27	29	31	25	28	27	26	31
21-Nov	29	25	27	20	17	16	16	17	19	19	19	16	20	18	16	20	17	17	14	16	14	15	14	13	29
22-Nov	14	12	13	17	21	17	17	17	21	13	14	14	14	14	14	16	16	14	14	24	14	19	20	18	24
23-Nov	14	30	50	51	43	67	23	37	55	43	63	21	29	28	29	13	15	13	9	10	9	8	8	67	
24-Nov	8	7	6	6	6	6	7	6	5	6	6	5	5	6	7	7	12	8	8	10	5	7	6	6	12
25-Nov	5	7	8	7	13	5	7	8	6	6	5	19	13	14	15	14	34	9	8	7	8	8	9	9	34
26-Nov	8	9	11	10	10	10	11	9	9	11	10	10	11	10	8	9	15	15	16	14	14	15	15	15	16
27-Nov	18	20	19	18	19	19	20	21	22	24	24	23	24	25	24	24	22	23	23	22	22	24	25	19	25
28-Nov	19	18	18	21	21	20	18	18	16	14	25	16	14	17	18	18	22	43	24	25	53	37	32	23	53
29-Nov	18	17	18	18	16	14	14	14	16	14	21	18	22	36	25	19	13	22	89	19	28	52	40	85	89
30-Nov	26	54	46	8	7	13	9	12	6	8	13	12	11	8	5	5	6	10	39	22	31	7	9	6	54

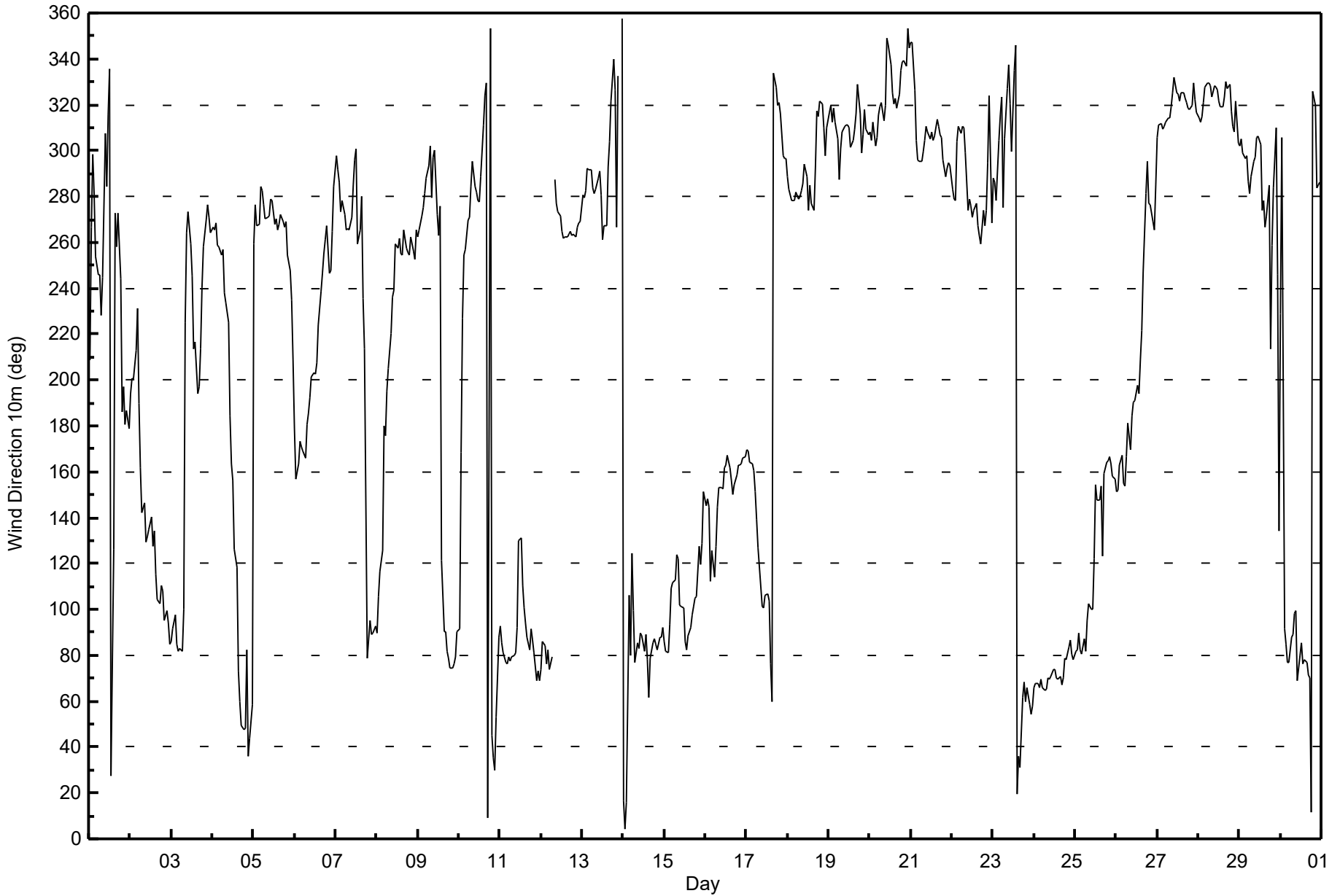
67	70	50	51	43	67	23	37	82	43	63	30	29	48	56	51	51	75	89	64	53	52	40	85	
Diurnal Maximum																								

UO - Unstable Operation



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Direction 10m (WD10) - deg**  
**Fort Chipewyan - November 2024**





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS09 BARGE LANDING NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)  
NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	685	35	35	100	10.8	0	2.2	0
TRS(ppb) Average	685	35	35	100	3.4	0	1.1	0
THC(ppm) Average	685	35	35	100	3.1	-	2.3	-
NMHC(ppm) Average	685	35	35	100	0.485	-	0.055	-
CH4(ppm) Average	685	35	35	100	2.9	-	2.3	-
NO2 (ppb) Average	685	35	35	100	34.4	0	26.7	-
NO (ppb) Average	685	35	35	100	138.3	-	32.8	-
NOX (ppb) Average	685	35	35	100	168.5	-	59.5	-
PM2.5(ug/m3) Average	718	2	2	100	41.3	0	9.6	0
Temperature (C) Average	720	0	0	100	13.2	-	6.4	-
Relative Humidity (%) Average	720	0	0	100	99.7	-	95.6	-
Barometric Pressure (inHg) Average	720	0	0	100	29.6	-	29.6	-
Wind Speed 10 m (km/h) Average	711	0	9	98.75	17	-	8	-
Wind Direction 10 m (deg) Average	711	0	9	98.75	-	-	-	-
Wind Speed 20 m (km/h) Average	715	0	5	99.31	24	-	16	-
Wind Direction 20 m (deg) Average	715	0	5	99.31	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)  
 NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Min	P10	Percentile					Max
							Q1	Median	Q3	P90		
SO2 (ppb) Average	685	0.33	0.9	-	0	0	0	0.1	0.3	0.8	10.8	
TRS(ppb) Average	685	0.45	0.4	-	0.2	0.2	0.3	0.3	0.5	0.8	3.4	
THC(ppm) Average	685	2.06	0.2	-	1.9	1.9	2	2	2.1	2.2	3.1	
NMHC(ppm) Average	685	0.007	0.034	-	0	0	0	0	0	0	0.485	
CH4(ppm) Average	685	2.05	0.1	-	1.9	1.9	2	2	2.1	2.2	2.9	
NO2 (ppb) Average	685	10.62	8	-	0.1	0.8	4.2	9	15.3	23.2	34.4	
NO (ppb) Average	685	6.65	13.5	-	0	0	0.1	1.2	6.5	21.2	138.3	
NOX (ppb) Average	685	17.26	19.2	-	0.1	0.9	4.7	10.5	23.4	39.9	168.5	
PM2.5(ug/m3) Average	718	5.67	3.6	-	0.5	2.4	3.3	4.8	7.1	10	41.3	
Temperature (C) Average	720	-7.84	8.5	-	-31.1	-18.4	-14.5	-6.2	-1.4	1.7	13.2	
Relative Humidity (%) Average	720	84.28	8.9	-	42.9	73.7	79.7	84.5	90.6	96	99.7	
Barometric Pressure (inHg) Average	720	28.96	0.4	-	28.1	28.5	28.7	28.9	29.3	29.5	29.6	
Wind Speed 10 m (km/h) Average	711	4.7	3	-	0	2	3	4	6	8	17	
Wind Direction 10 m (deg) Average	711	263.5	-	-	-	-	-	-	-	-	-	
Wind Speed 20 m (km/h) Average	715	8.8	5	-	0	3	5	8	11	15	24	
Wind Direction 20 m (deg) Average	715	265.4	-	-	-	-	-	-	-	-	-	

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)  
NOVEMBER 2024

OPERATIONAL NOTES

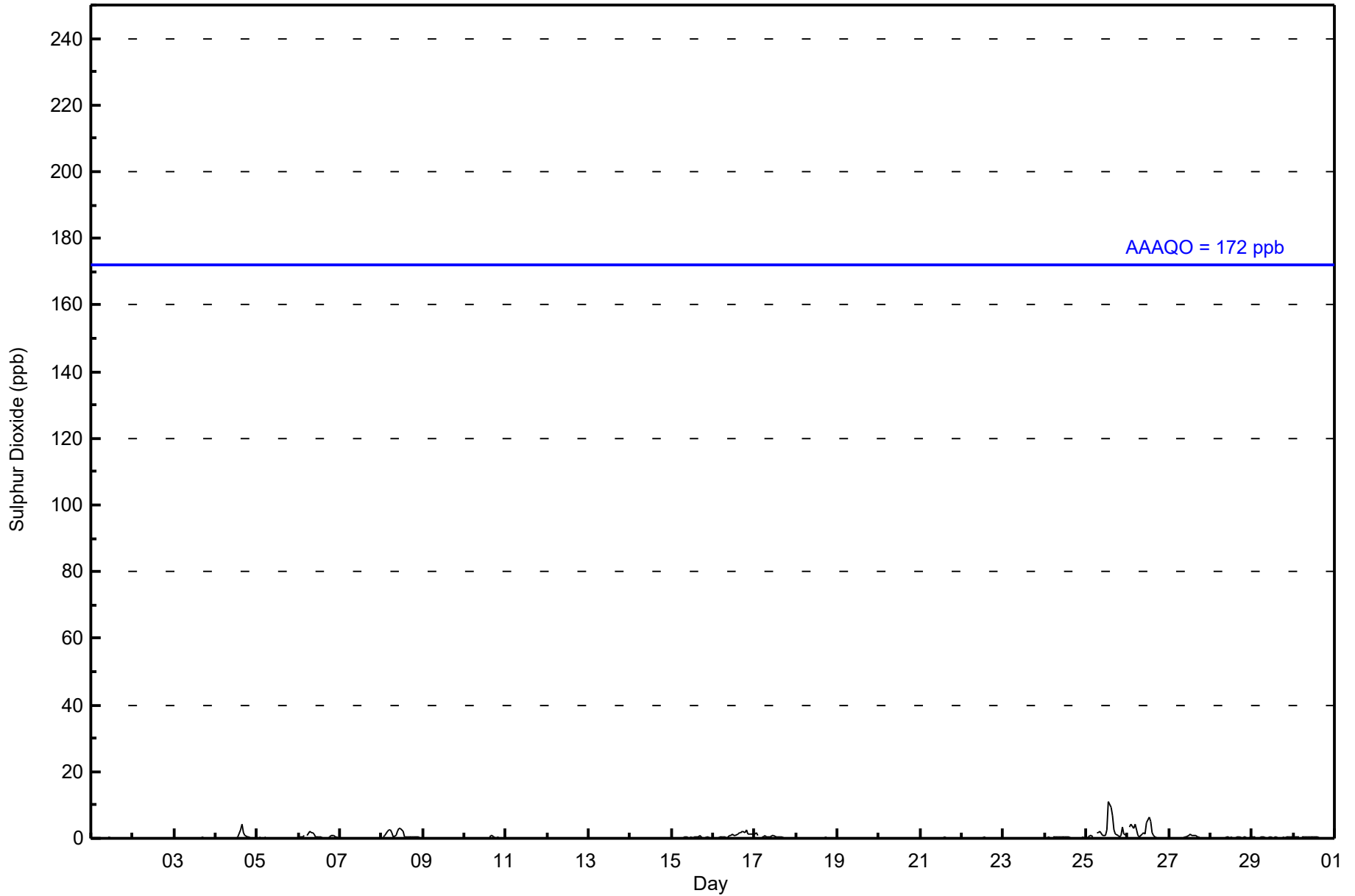
Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction 10m	21 Nov 2024 20:00	21 Nov 2024 21:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction 10m	22 Nov 2024 10:00	22 Nov 2024 10:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction 10m	24 Nov 2024 20:00	24 Nov 2024 21:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction 10m	28 Nov 2024 22:00	28 Nov 2024 23:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction 10m	30 Nov 2024 03:00	30 Nov 2024 03:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction 10m	30 Nov 2024 08:00	30 Nov 2024 08:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction 20m	03 Nov 2024 05:00	03 Nov 2024 05:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction 20m	21 Nov 2024 20:00	21 Nov 2024 20:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction 20m	22 Nov 2024 10:00	22 Nov 2024 10:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction 20m	30 Nov 2024 02:00	30 Nov 2024 03:00	2	Flat line in sensor output signal





Wood Buffalo Environmental Association  
Hourly Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Barge Landing - November 2024







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Barge Landing - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	684	99.85	99.85
11 - 20	1	0.15	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Barge Landing - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	71	56	26	22	10	20	33	85	56	46	55	38	34	26	28	73	679
11 - 20	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	71	56	26	22	10	20	33	85	57	46	55	38	34	26	28	73	680

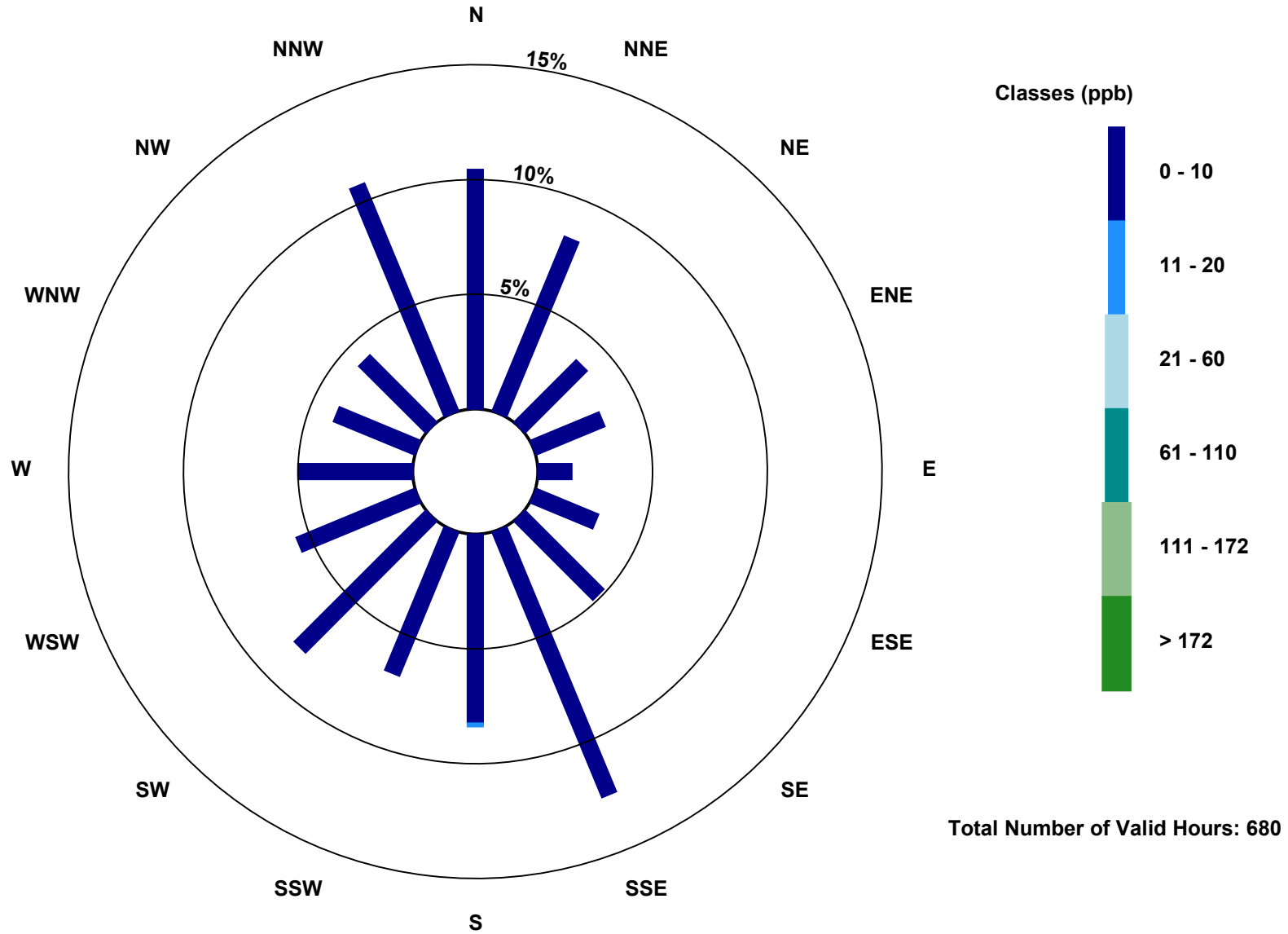
Total Number of Valid Hours: 680

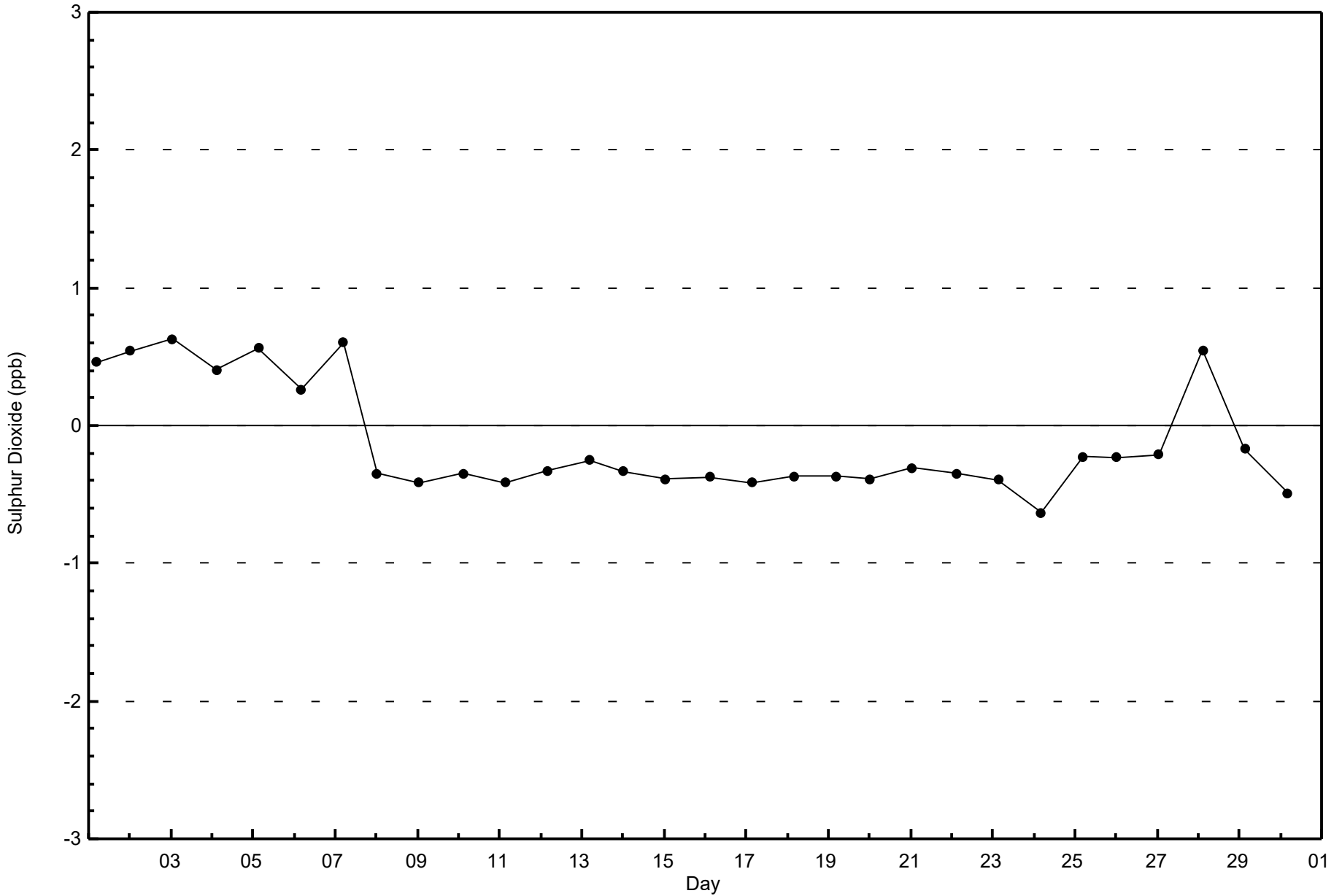
Total Number of Hours: 720

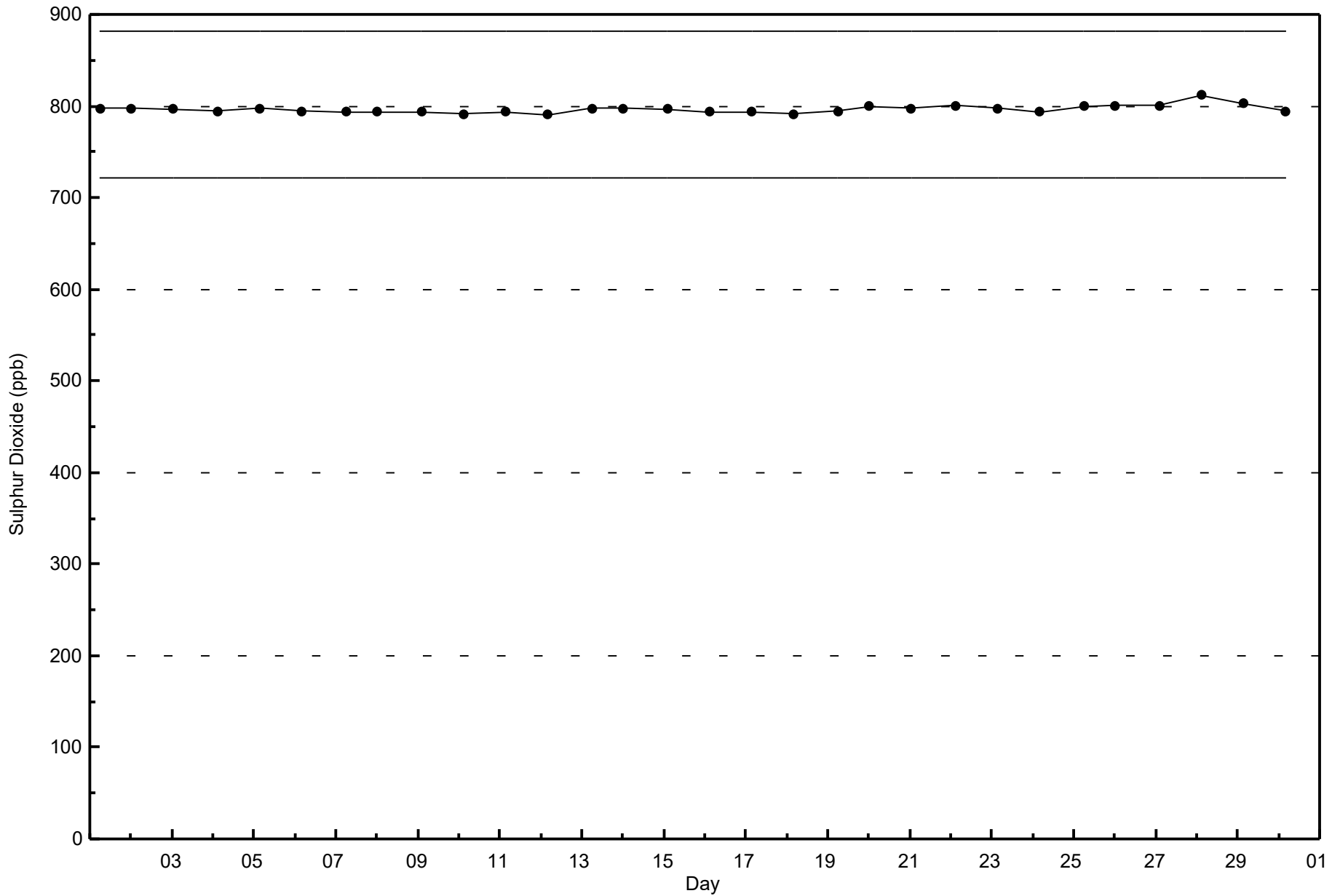


**Wood Buffalo Environmental Association**  
**Wind Rose Nov 2024**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Barge Landing**









# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Total Reduced Sulphur (TRS) - ppb

## Barge Landing - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 3.4 ppb on Nov 8 05:00	Maximum Daily Average: 1.1 ppb on Nov 8		Hours of Data:	685
Minimum Value: 0.2 ppb on Nov 13 09:00	Minimum Daily Average: 0.3 ppb on Nov 20		Hours of Missing Data:	35
Maximum Diurnal Average: 0.6 ppb at hour 4	Minimum Diurnal Average: 0.3 ppb at hour 1		Hours of Calibration:	35
Monthly Average: 0.45 ppb	Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 0.3 Median = 0.3 Q <sub>3</sub> = 0.5 P <sub>90</sub> = 0.8 P <sub>99</sub> = 1.8		Percent Operational Time:	100.0

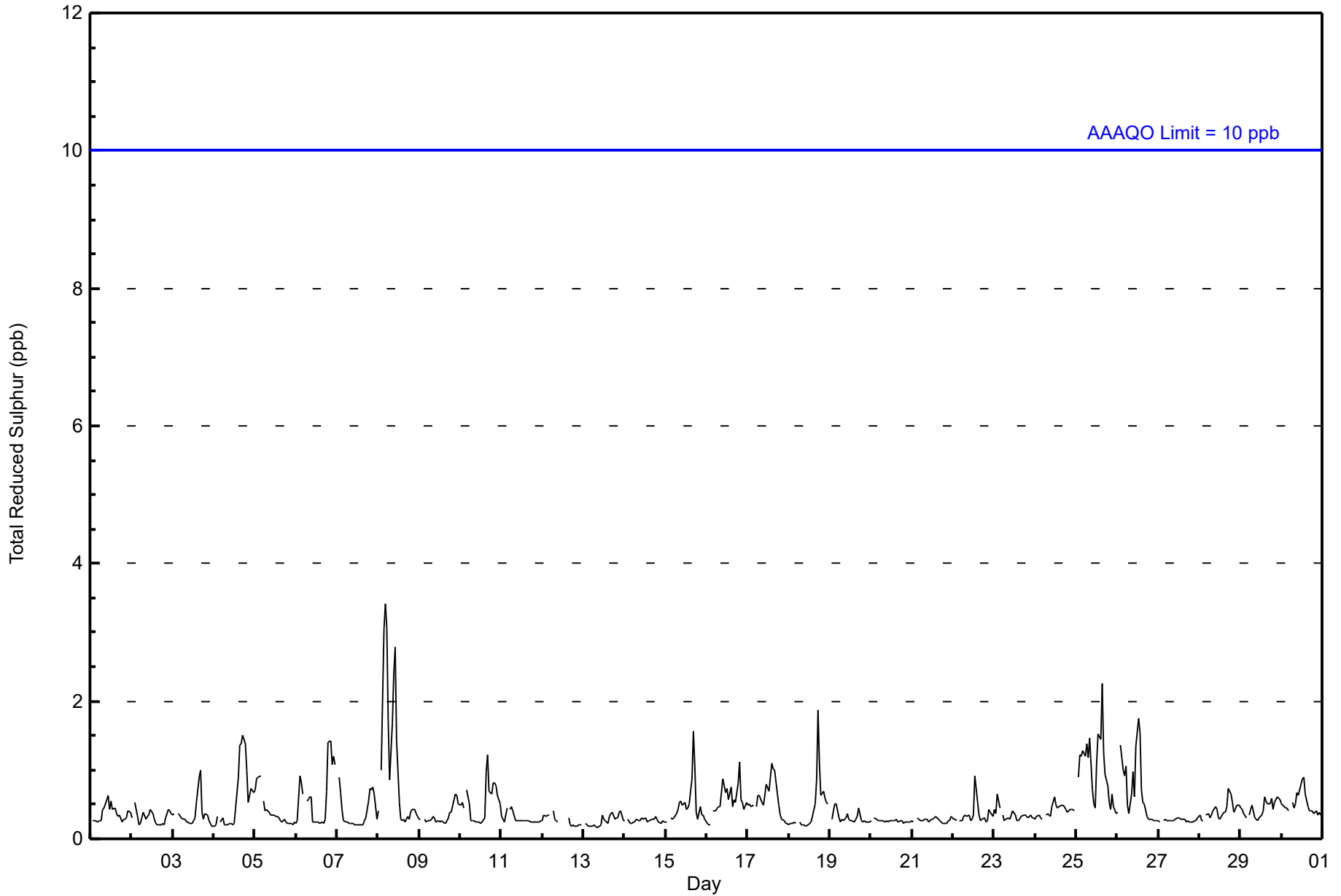
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	Z	0.3	0.3	0.3	0.2	0.3	0.3	0.4	0.5	0.6	0.6	0.4	0.5	0.4	0.5	0.4	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.5																					
2-Nov	0.3	Z	0.5	0.3	0.2	0.2	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.3	0.5																					
3-Nov	0.4	0.4	Z	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.5	0.9	1.0	0.4	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.4	1.0																						
4-Nov	0.2	0.2	0.3	Z	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.9	1.4	1.4	1.5	1.4	1.0	0.5	0.6	0.7	0.7	0.6	0.6	1.5																						
5-Nov	0.7	0.9	0.9	0.9	Z	0.6	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.9																						
6-Nov	0.2	0.3	0.9	0.8	0.6	Z	0.5	0.6	0.6	0.6	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.7	1.4	1.4	1.1	1.2	1.1	0.6	0.6	1.4																						
7-Nov	Z	0.9	0.7	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.5	0.7	0.7	0.8	0.7	0.3	0.4	0.9																							
8-Nov	0.4	Z	1.0	3.1	3.4	3.1	1.7	0.9	1.7	2.4	2.8	1.4	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	1.1	3.4																						
9-Nov	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.6	0.6	0.6	0.5	0.3	0.3	0.6																						
10-Nov	0.5	0.5	0.4	Z	0.7	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	1.0	1.2	0.7	0.7	0.8	0.8	0.8	0.6	0.5	0.5	0.5	1.2																						
11-Nov	0.3	0.3	0.2	0.4	Z	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.5																						
12-Nov	0.3	0.4	0.3	0.3	0.3	Z	0.4	0.3	0.3	0.2	C	C	C	C	C	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4																						
13-Nov	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.4																						
14-Nov	0.3	Z	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.3	0.2	0.3																						
15-Nov	0.2	0.2	Z	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.9	1.6	1.1	0.4	0.3	0.5	0.3	0.3	0.3	0.3	0.5	1.6																						
16-Nov	0.2	0.2	0.2	Z	0.4	0.4	0.4	0.5	0.5	0.9	0.8	0.7	0.7	0.6	0.8	0.5	0.6	0.5	0.8	1.1	0.6	0.5	0.4	0.5	0.6	0.6	1.1																						
17-Nov	0.5	0.5	0.5	0.5	Z	0.5	0.6	0.6	0.5	0.5	0.6	0.8	0.7	0.9	1.1	1.0	1.0	0.7	0.5	0.4	0.3	0.3	0.2	0.2	0.6	0.6	1.1																						
18-Nov	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.8	1.9	1.1	0.6	0.7	0.6	0.5	0.5	0.5	0.5	1.9																						
19-Nov	Z	0.3	0.4	0.5	0.5	0.3	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.4	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.5																						
20-Nov	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3																						
21-Nov	0.3	0.2	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3																						
22-Nov	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.9	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.9																						
23-Nov	0.4	0.4	0.6	0.4	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6																						
24-Nov	0.3	0.3	0.3	0.3	0.3	Z	0.3	0.4	0.3	0.3	0.5	0.6	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6																						
25-Nov	Z	0.9	1.2	1.2	1.3	1.2	1.4	1.2	1.5	0.7	0.5	0.5	1.1	1.5	1.5	2.3	1.3	0.9	0.8	0.5	0.4	0.6	0.5	0.4	1.0	2.3																							
26-Nov	0.4	Z	1.4	1.0	0.9	1.1	0.5	0.4	0.6	1.0	0.6	1.3	1.8	1.5	0.7	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.7	1.8																						
27-Nov	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3																						
28-Nov	0.3	0.3	0.3	Z	0.4	0.4	0.3	0.4	0.4	0.5	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.7	0.7	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.7																						
29-Nov	0.4	0.4	0.4	0.3	Z	0.4	0.4	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.6	0.5	0.5	0.6	0.4	0.5	0.6	0.6	0.6	0.4	0.6																						
30-Nov	0.5	0.5	0.4	0.4	0.4	Z	0.5	0.4	0.5	0.7	0.6	0.8	0.9	0.9	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.5	0.9																						
																								0.3	0.4	0.5	0.6	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	Diurnal Average	
																								0.7	0.9	1.4	3.1	3.4	3.1	1.7	1.2	1.7	2.4	2.8	1.4	1.8	1.5	1.5	2.3	1.6	1.9	1.4	1.4	1.4	1.1	1.2	1.1	Diurnal Maximum	

Z - zerospan      C - Calibration  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb    24-hr 3 ppb



Wood Buffalo Environmental Association  
Hourly Averages

Total Reduced Sulphur (TRS) - ppb  
Barge Landing - November 2024





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Barge Landing - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	681	99.42	99.42
3 - 4	4	0.58	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Barge Landing - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	73	55	25	23	10	20	33	85	54	46	54	38	33	27	27	73	676
3 - 4	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	4
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	73	55	25	23	10	20	33	87	56	46	54	38	33	27	27	73	680

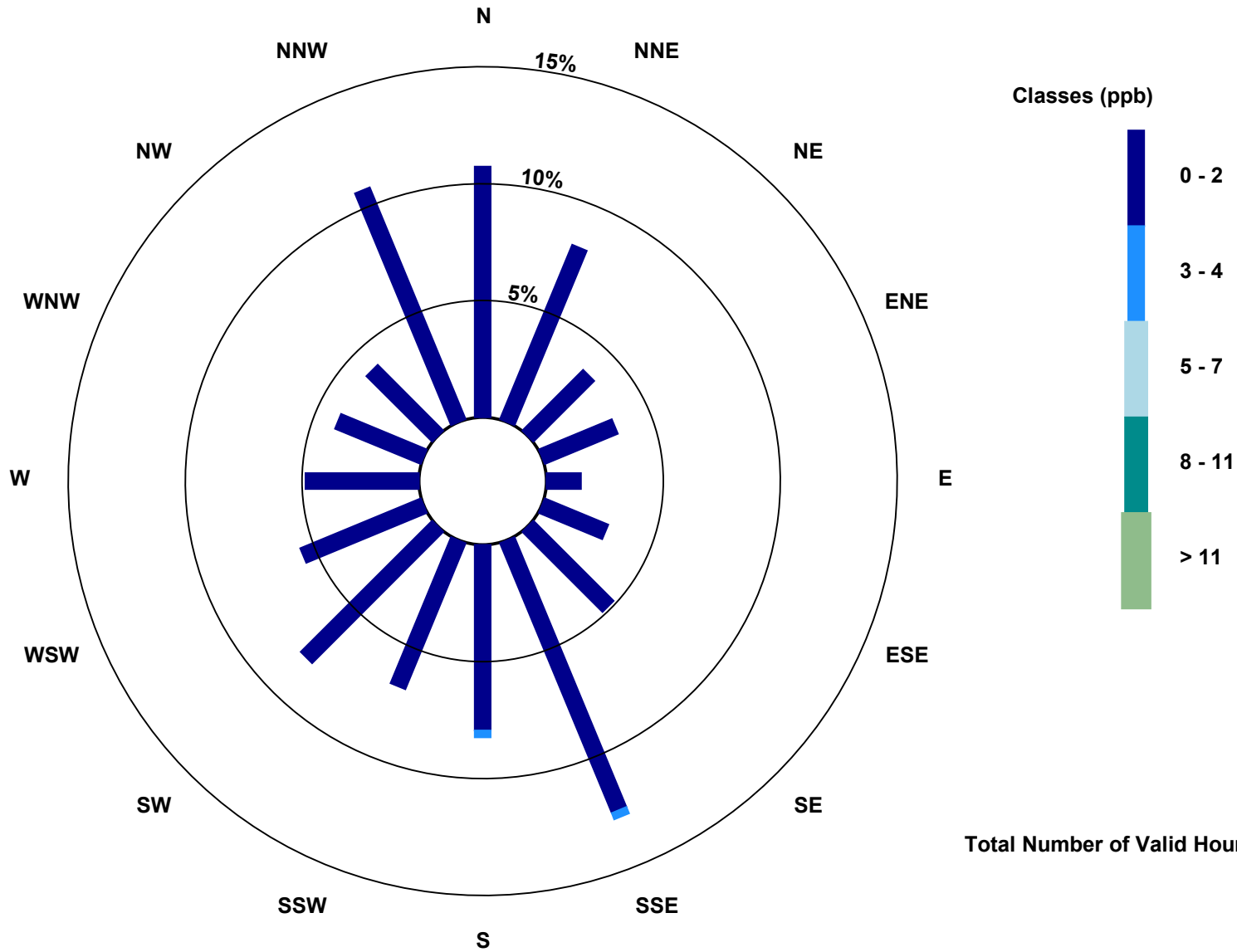
Total Number of Valid Hours: 680

Total Number of Hours: 720

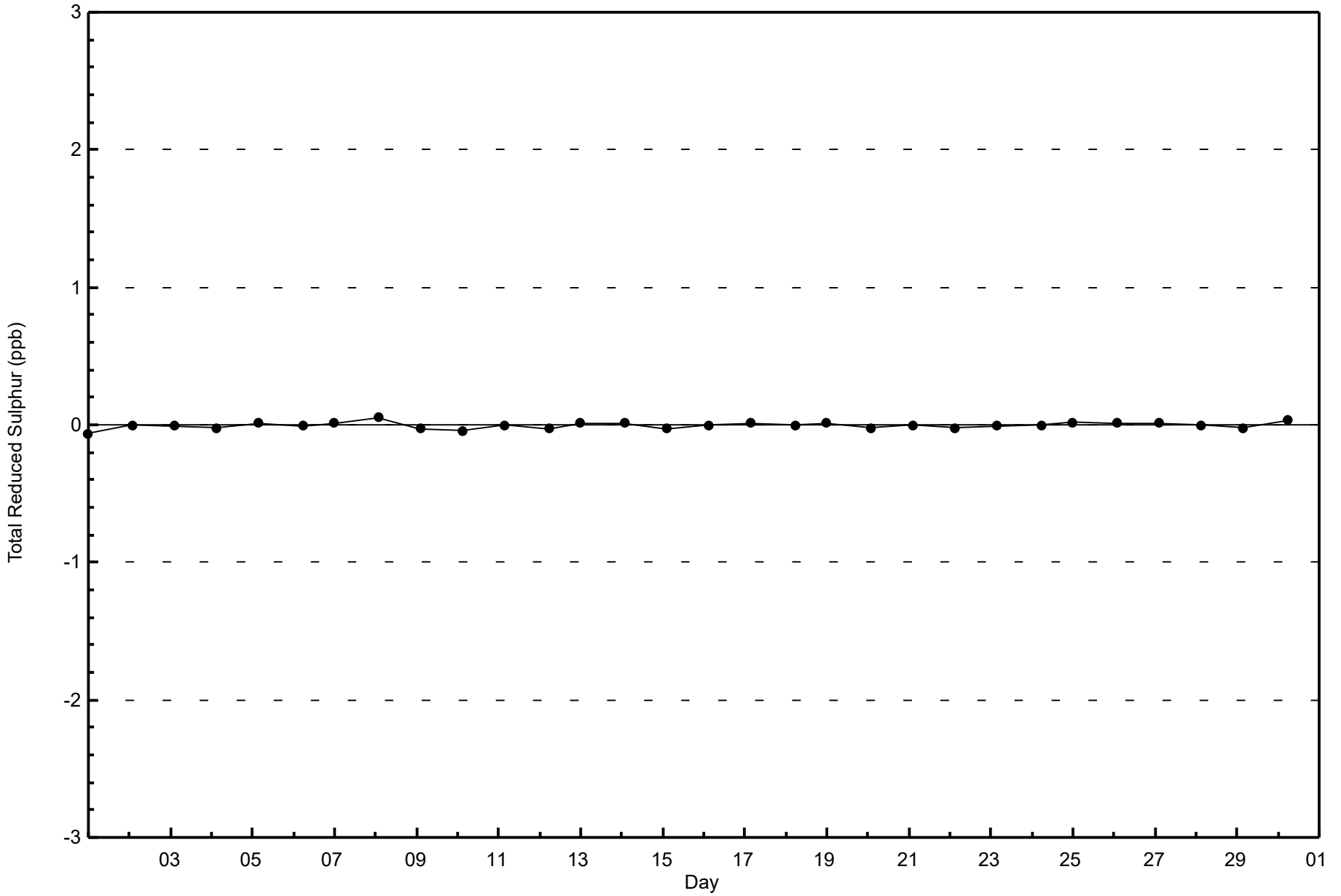


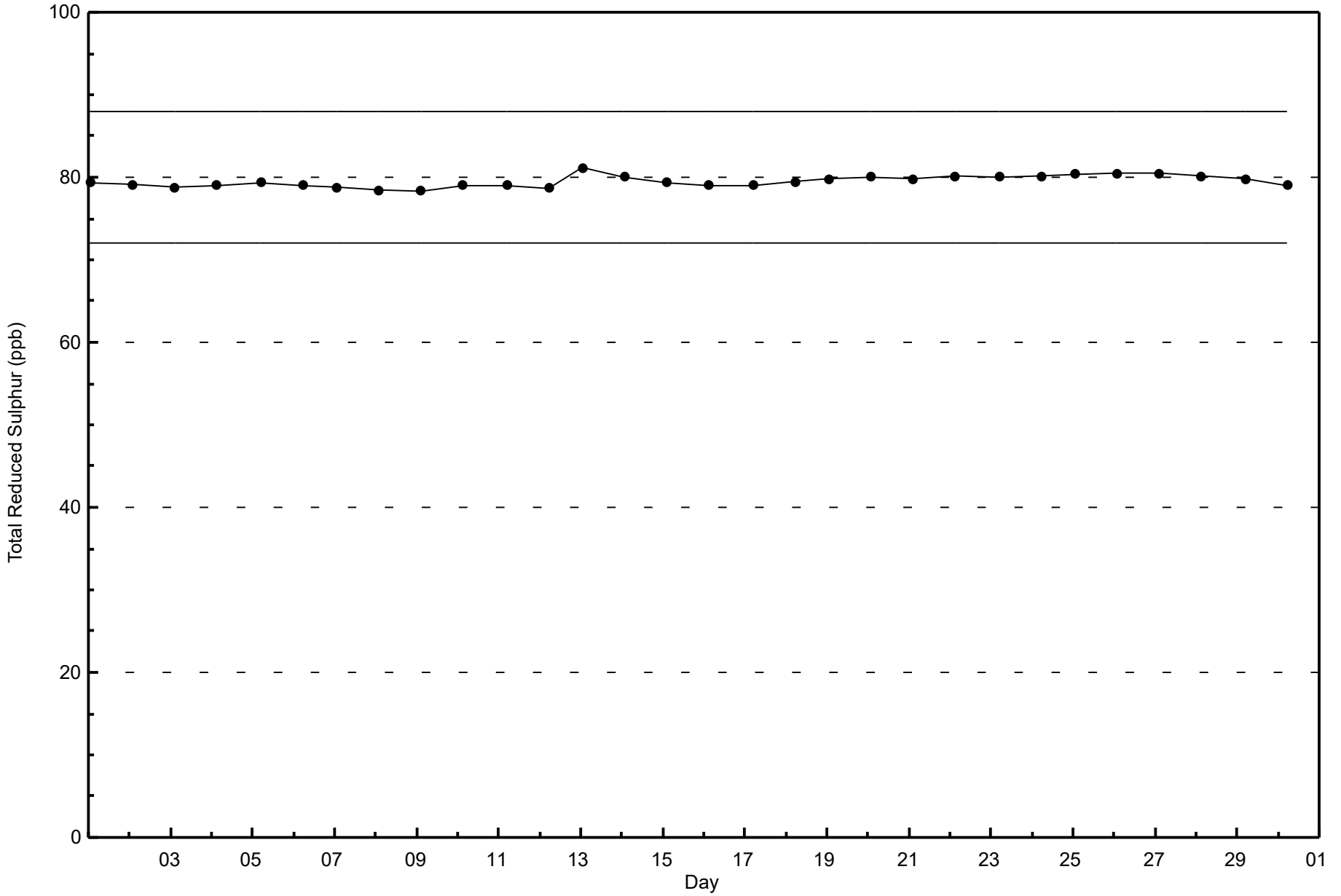
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Reduced Sulphur (TRS) - ppb  
Barge Landing



Total Number of Valid Hours: 680



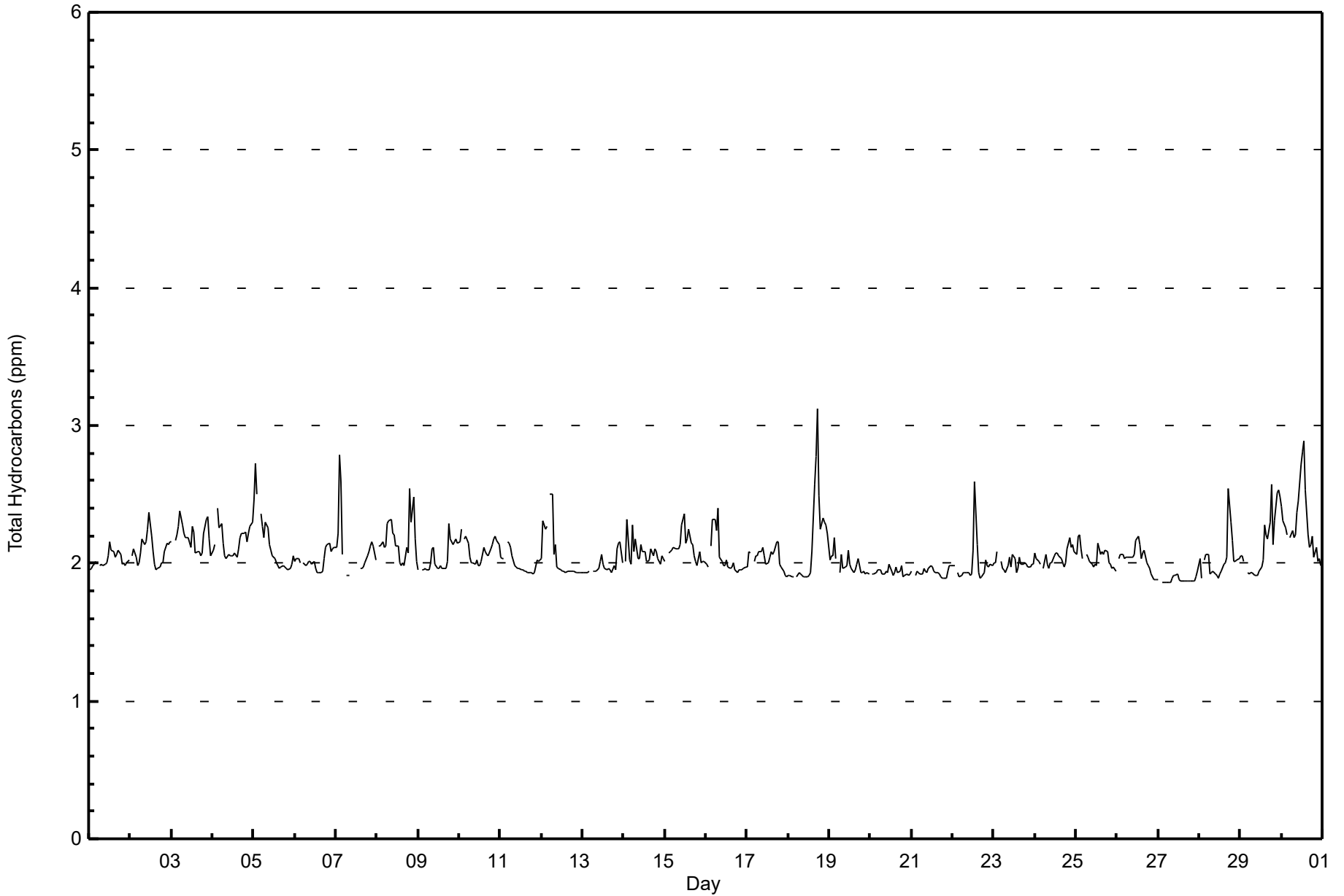






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Barge Landing - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Barge Landing - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	404	58.98	58.98
2.1 - 3.0	280	40.88	99.85
3.1 - 10.0	1	0.15	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Barge Landing - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	48	41	16	13	8	9	13	45	20	28	33	30	31	23	14	30	402
2.1 - 3.0	23	15	9	9	2	11	20	40	37	18	22	8	3	3	14	43	277
3.1 - 10.0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	71	56	26	22	10	20	33	85	57	46	55	38	34	26	28	73	680

Total Number of Valid Hours: 680

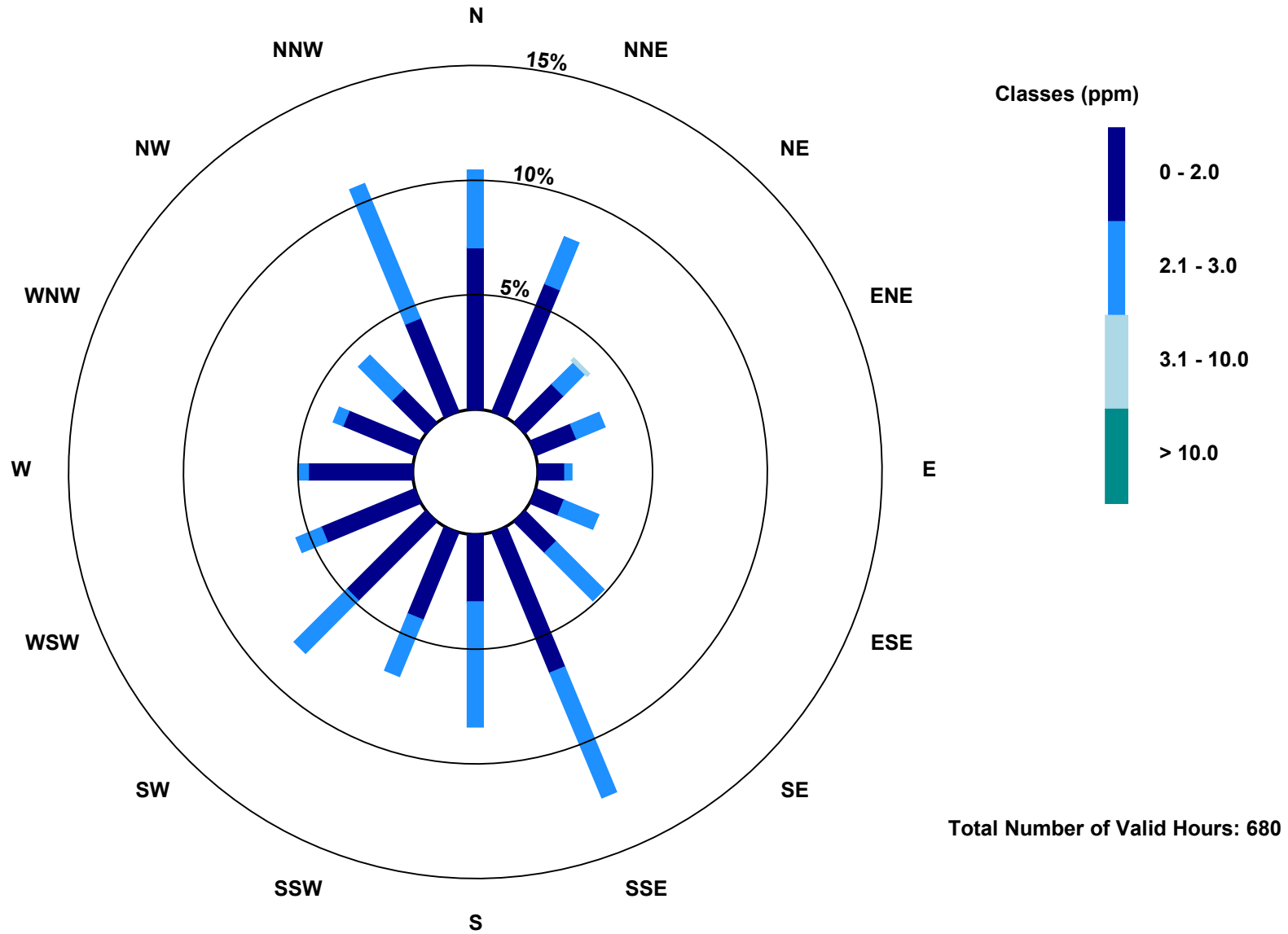
Total Number of Hours: 720





Wood Buffalo Environmental Association  
Wind Rose Nov 2024

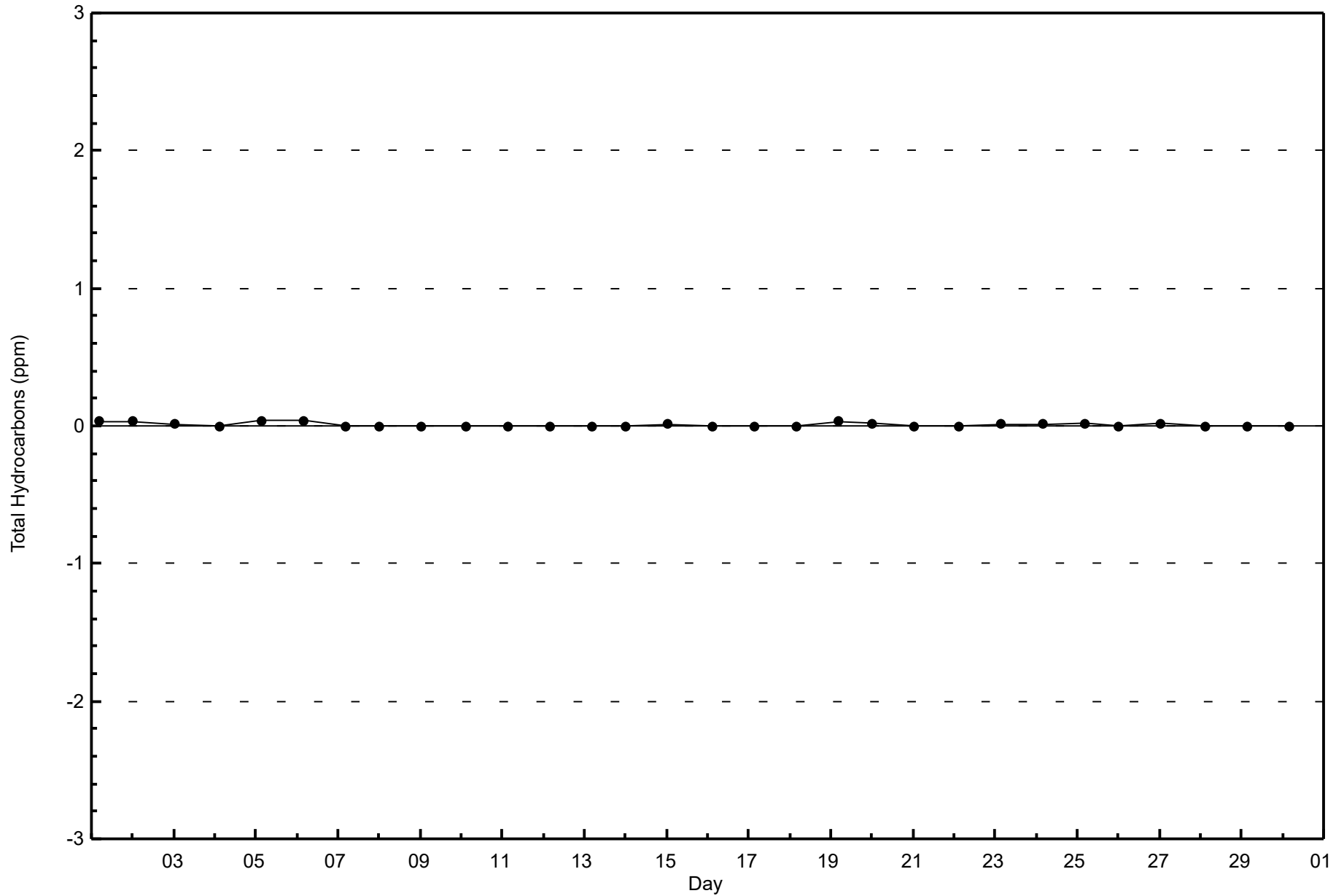
Total Hydrocarbons (THC) - ppm  
Barge Landing

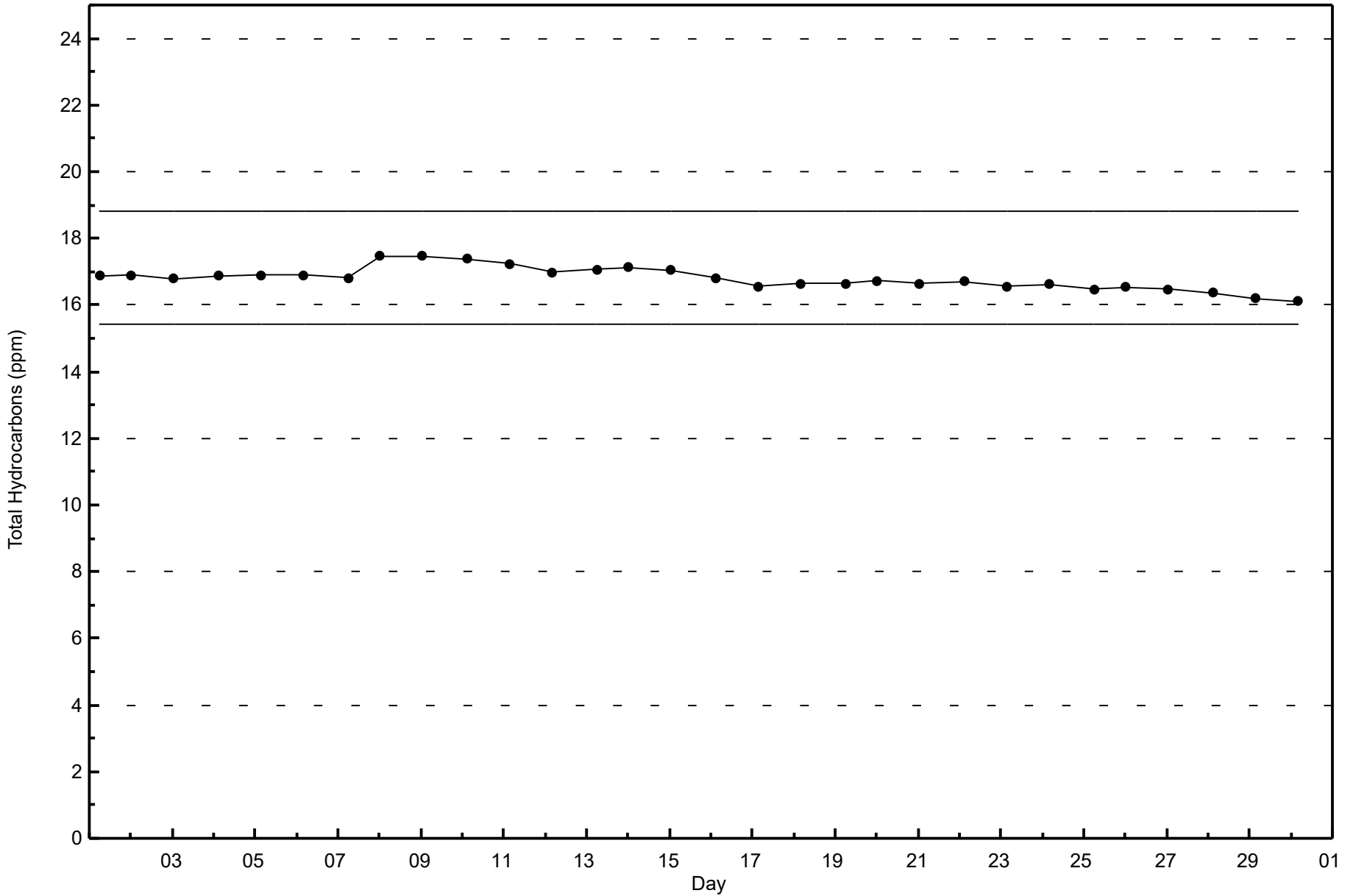




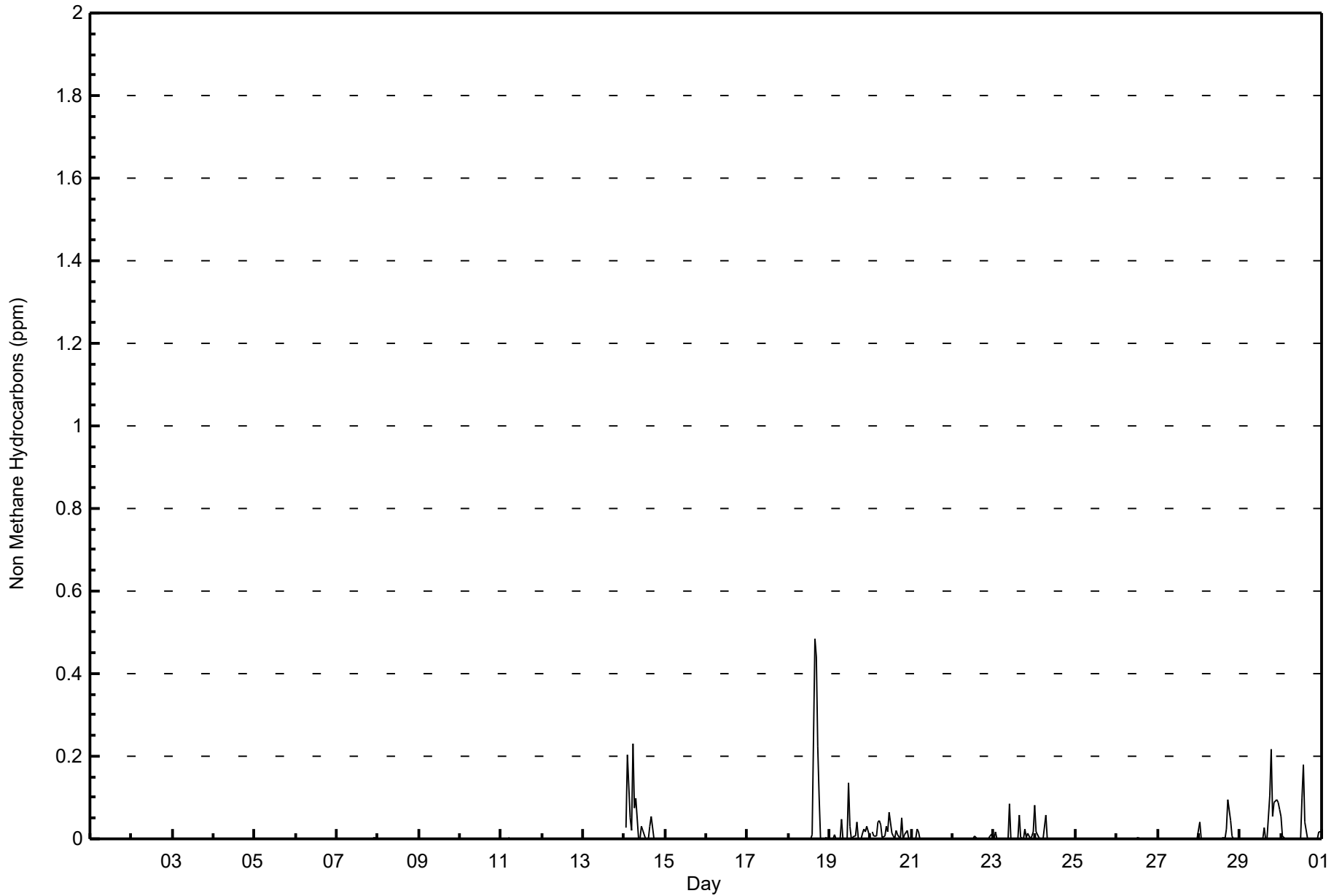
Wood Buffalo Environmental Association  
Zero Responses

Total Hydrocarbons (THC) - ppm  
Barge Landing - November 2024











**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Barge Landing - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	608	88.76	88.76
0.006 - 0.05	54	7.88	96.64
0.06 - 0.1	16	2.34	98.98
> 0.1	7	1.02	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Barge Landing - November 2024**

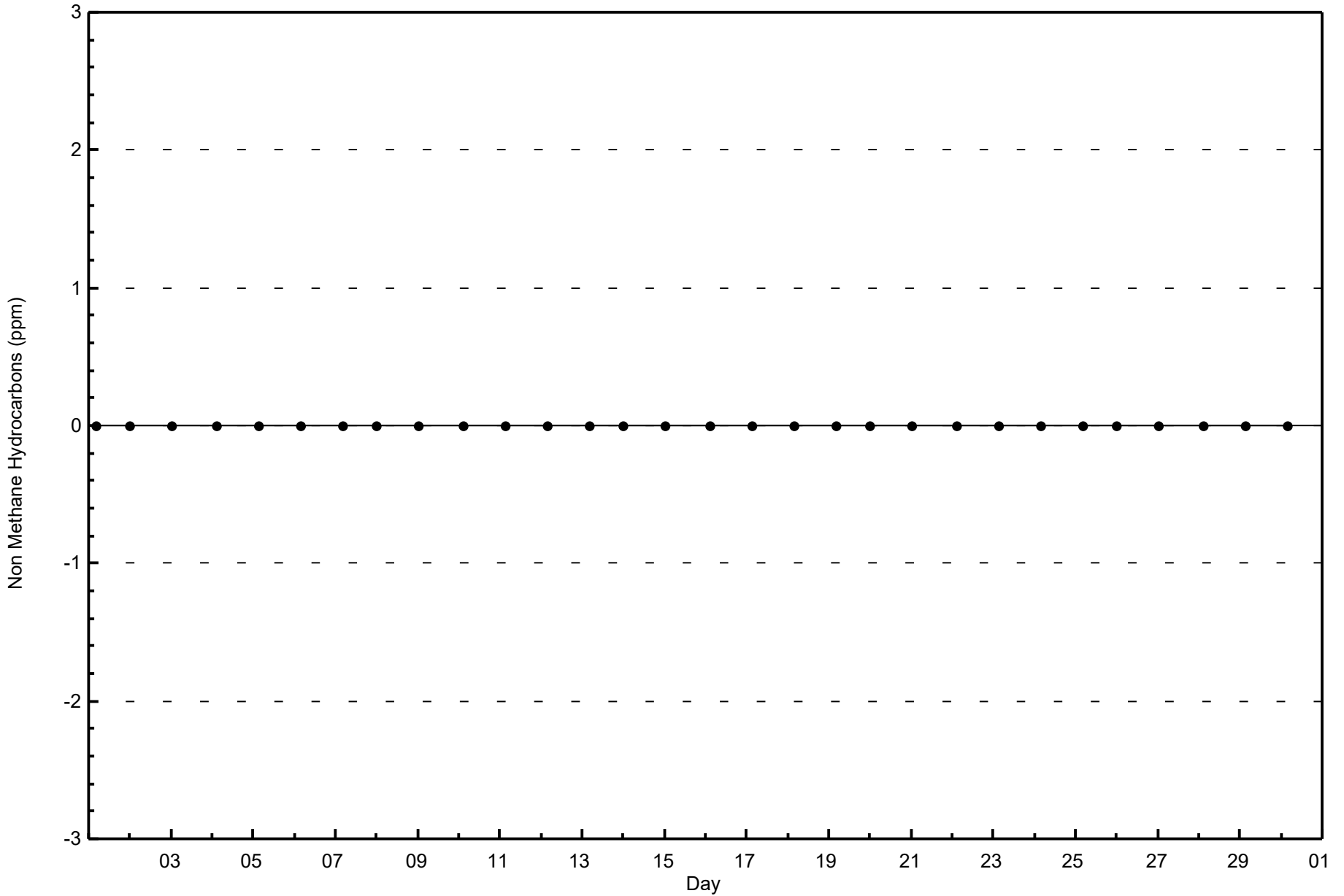
Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	32	39	23	16	10	20	33	85	57	46	55	38	34	26	28	62	604
0.006 - 0.05	29	16	0	4	0	0	0	0	0	0	0	0	0	0	0	4	53
0.06 - 0.1	7	1	1	1	0	0	0	0	0	0	0	0	0	0	0	6	16
> 0.1	3	0	2	1	0	0	0	0	0	0	0	0	0	0	0	1	7
<b>Totals</b>	71	56	26	22	10	20	33	85	57	46	55	38	34	26	28	73	680

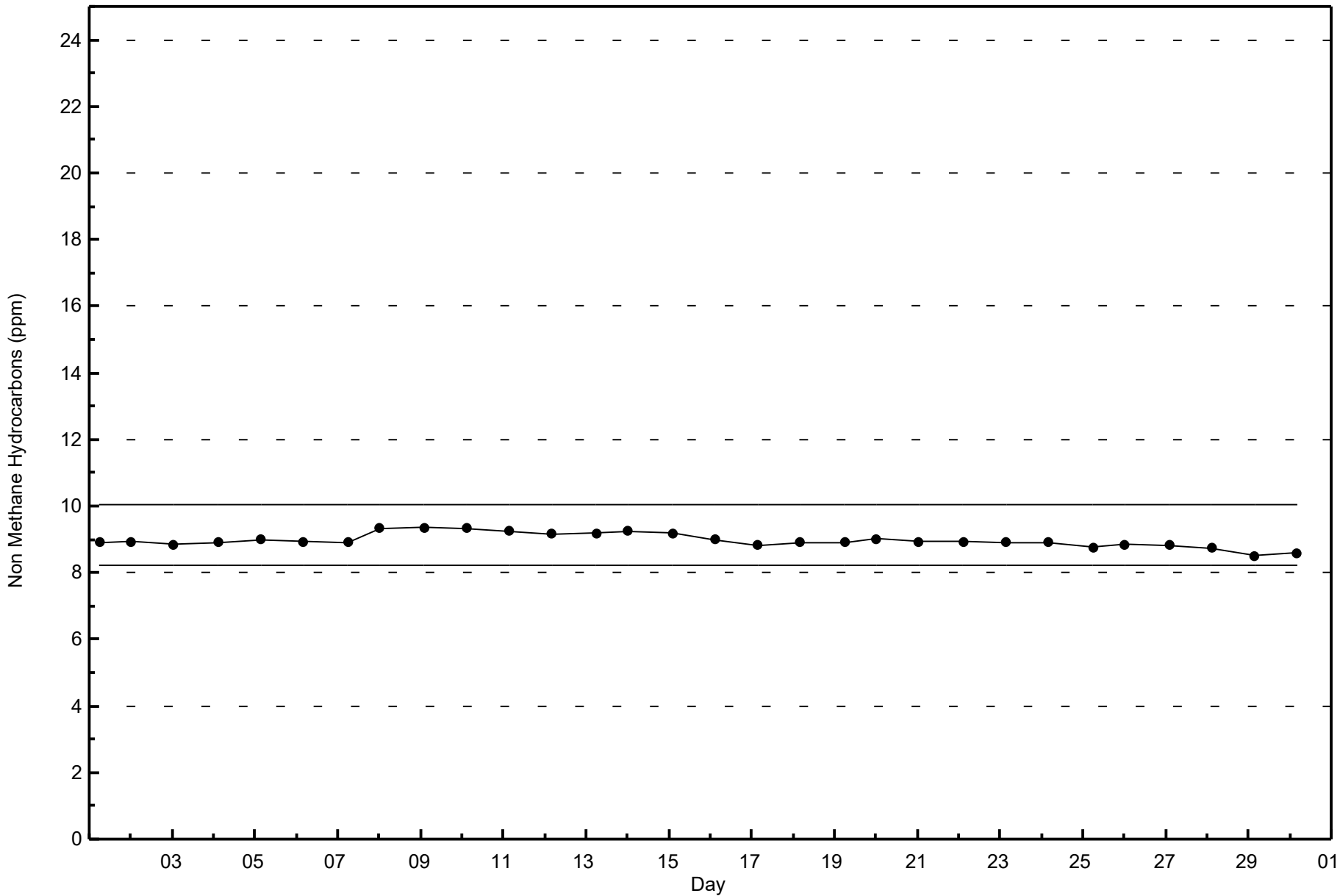
Total Number of Valid Hours: 680

Total Number of Hours: 720

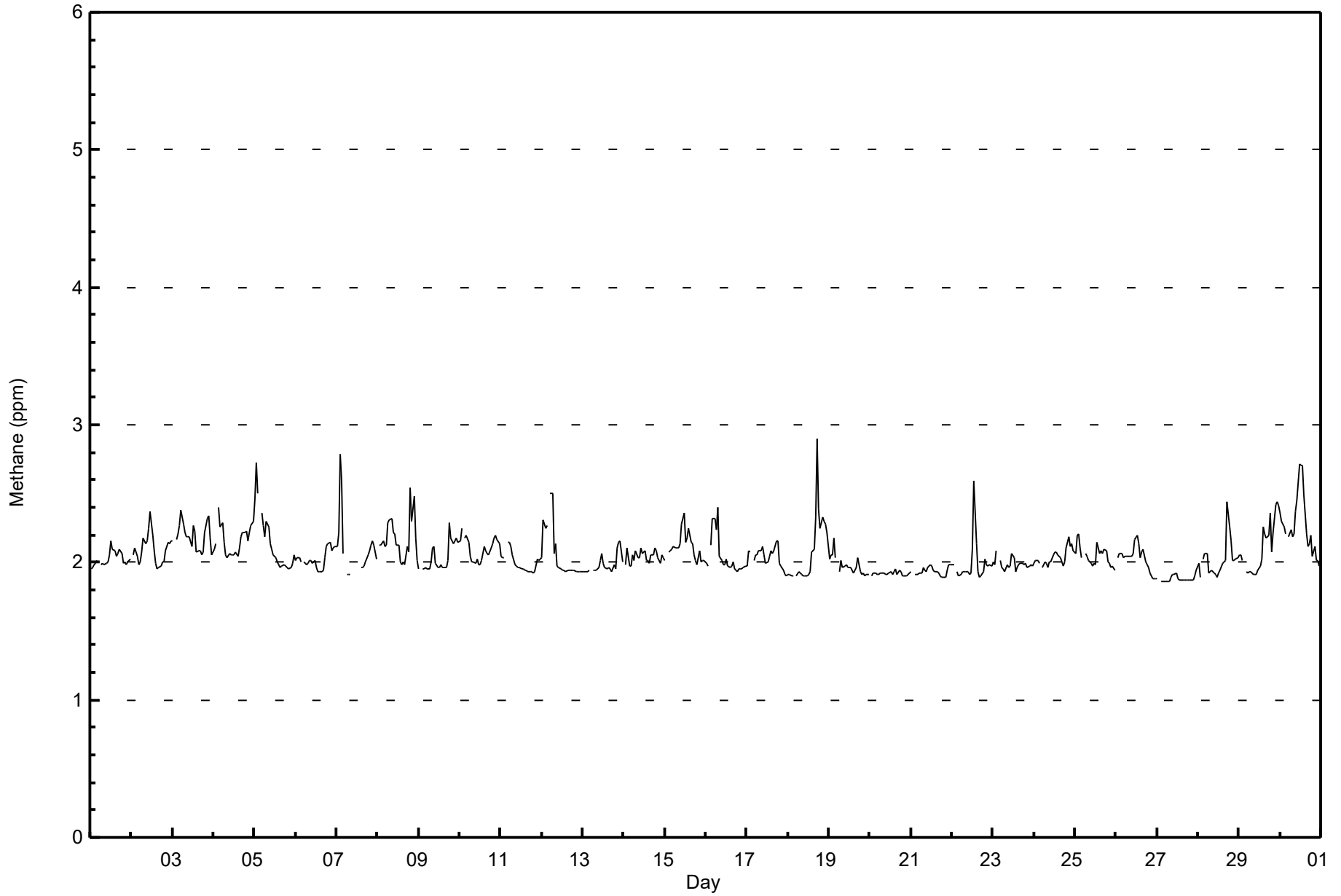














**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Barge Landing - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	409	59.71	59.71
2.1 - 3.0	276	40.29	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

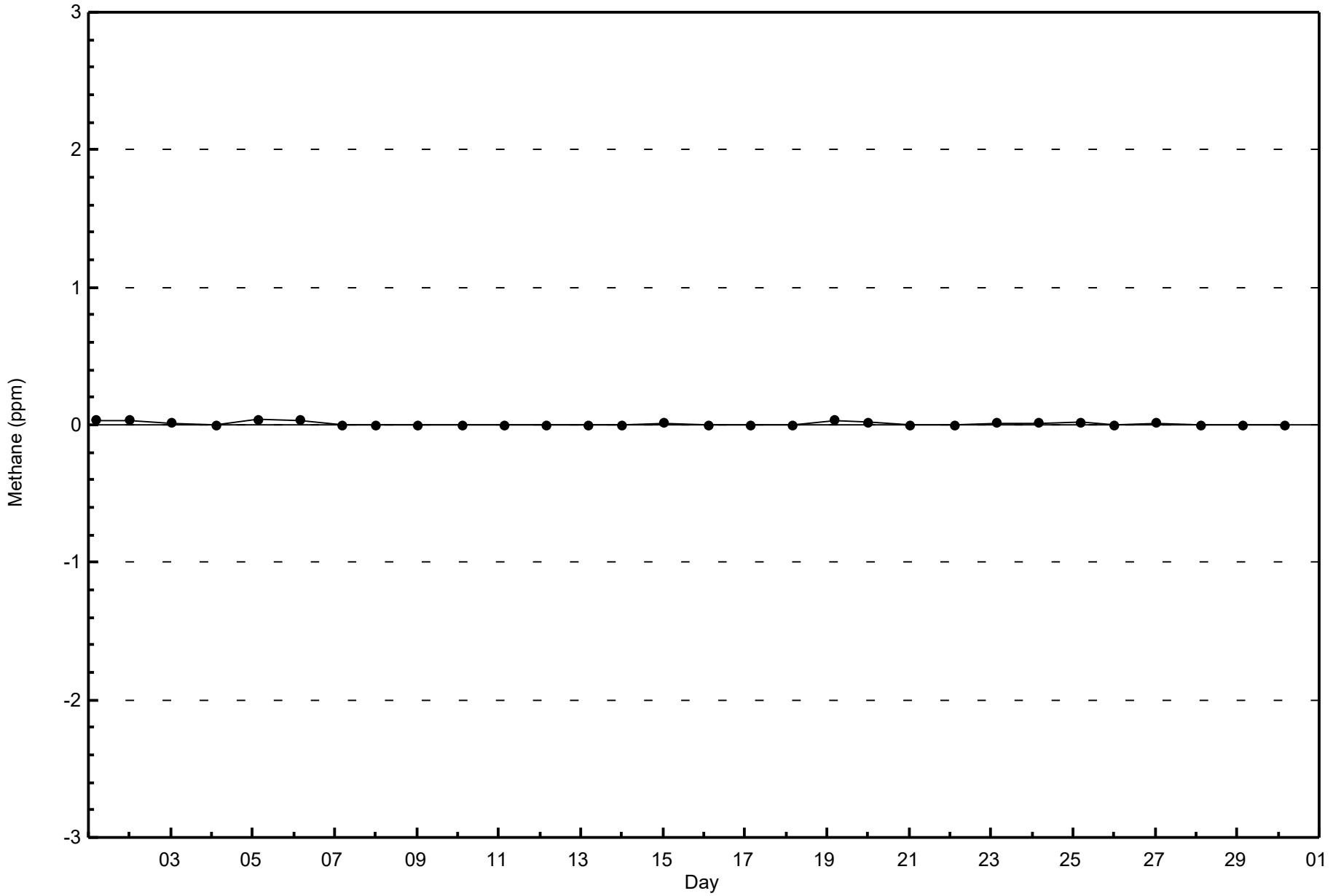
**Methane (CH<sub>4</sub>) - ppm  
Barge Landing - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	52	42	16	13	8	9	13	45	20	28	33	30	31	23	14	30	407
2.1 - 3.0	19	14	10	9	2	11	20	40	37	18	22	8	3	3	14	43	273
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	71	56	26	22	10	20	33	85	57	46	55	38	34	26	28	73	680

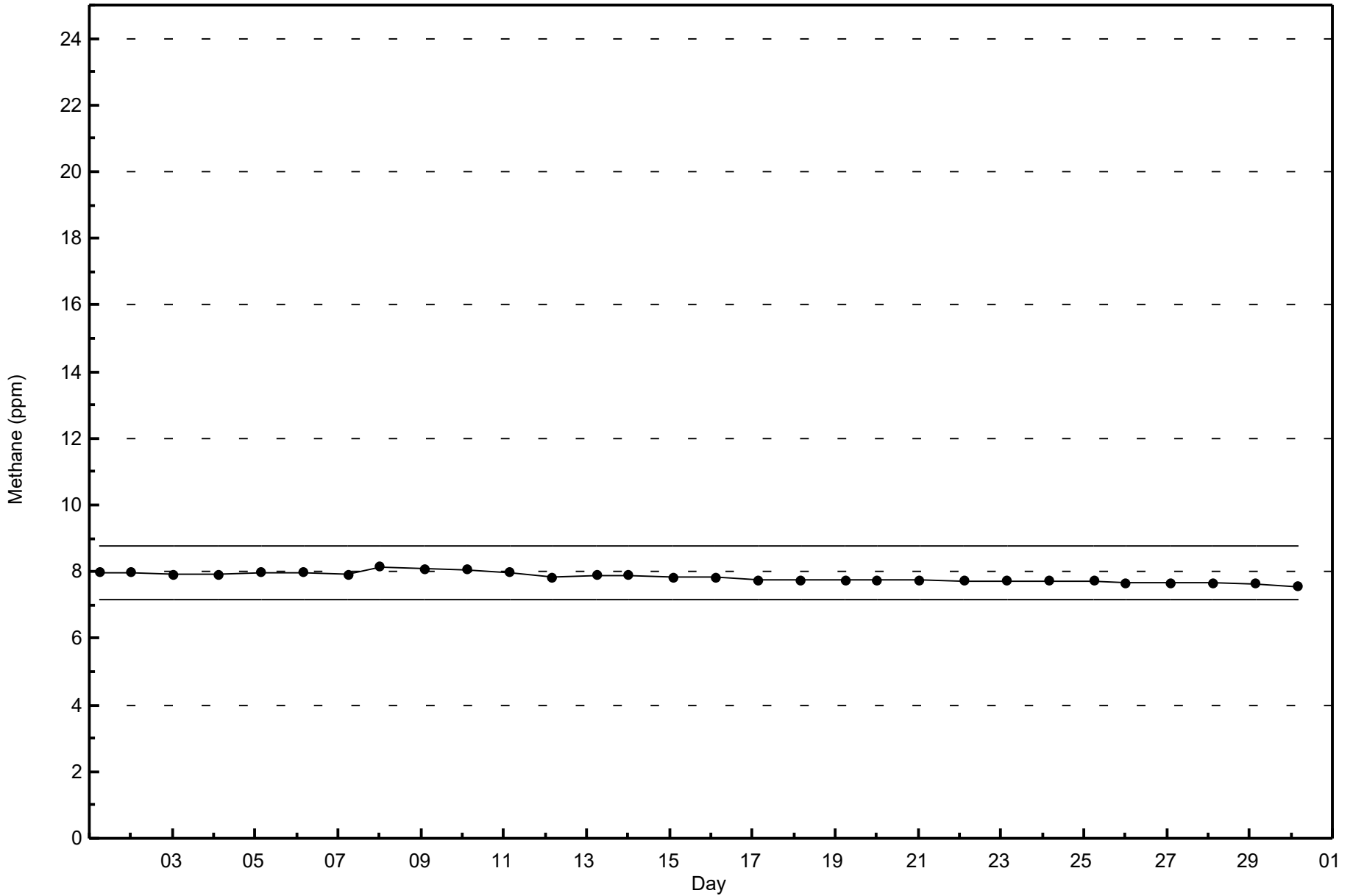
Total Number of Valid Hours: 680

Total Number of Hours: 720











Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

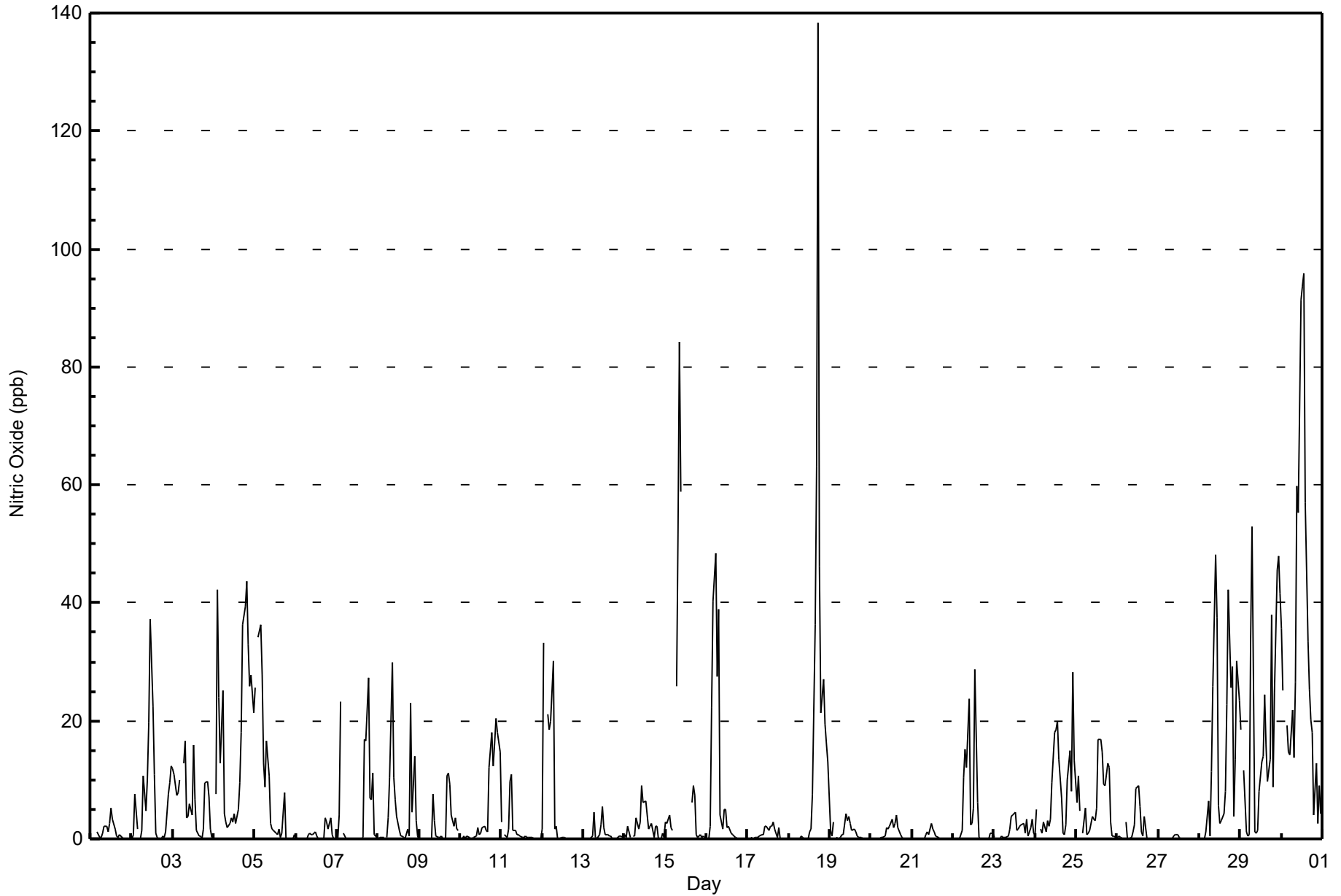
Barge Landing - November 2024

Maximum Value: 138.3 ppb on Nov 18 18:00																						Maximum Daily Average: 32.8 ppb on Nov 30																						Hours in Service: 720					
Minimum Value: 0.0 ppb on Nov 1 01:00																						Minimum Daily Average: 0.1 ppb on Nov 27																						Hours of Data: 685					
Maximum Diurnal Average: 10.9 ppb at hour 18																						Minimum Diurnal Average: 4.1 ppb at hour 2																						Hours of Missing Data: 35					
Monthly Average: 6.65 ppb																						Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.1 Median = 1.2 Q <sub>3</sub> = 6.5 P <sub>90</sub> = 21.2 P <sub>99</sub> = 58.9																						Hours of Calibration: 35					
																																												Percent Operational Time: 100.0					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	0.0	0.0	0.0	Z	1.1	0.2	0.1	1.0	2.2	2.1	1.2	2.6	5.3	3.3	1.6	0.5	0.3	0.7	0.3	0.1	0.0	0.0	0.1	0.1	1.0	5.3																							
2-Nov	0.1	0.8	7.6	1.7	Z	0.0	1.3	10.7	4.7	10.3	19.7	37.2	22.6	10.9	1.1	0.2	0.1	0.1	0.4	0.3	1.2	7.6	9.4	12.4	7.0	37.2																							
3-Nov	11.8	11.0	7.4	7.7	9.9	Z	12.9	16.7	3.5	3.9	6.0	4.2	15.8	6.7	1.4	0.5	0.5	0.0	1.8	9.5	9.7	7.2	1.5	0.2	6.5	16.7																							
4-Nov	Z	7.6	42.2	23.9	12.8	25.2	4.2	2.7	2.0	2.5	3.6	2.8	4.3	2.6	4.9	9.5	18.1	36.2	39.5	43.7	33.0	25.9	27.8	21.4	17.2	43.7																							
5-Nov	25.5	Z	34.2	36.3	27.8	12.8	8.9	16.6	10.7	2.6	1.7	1.5	1.0	0.6	1.6	0.2	0.9	7.7	0.1	0.1	0.0	0.0	0.0	0.7	8.3	36.3																							
6-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.6	1.0	0.8	0.7	1.1	0.4	0.1	0.1	0.0	0.1	3.7	3.0	1.6	3.7	0.7	0.1	0.1	0.8	3.7																							
7-Nov	0.0	4.1	23.1	Z	0.9	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.2	16.8	16.7	27.3	6.8	6.5	11.3	0.8	0.1	5.0	27.3																							
8-Nov	0.0	0.2	0.2	0.1	Z	0.3	3.5	10.5	29.9	10.5	6.5	3.8	1.3	0.5	0.5	0.3	0.0	1.7	0.6	23.1	4.5	14.1	3.0	0.5	5.0	29.9																							
9-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	7.7	3.1	0.6	0.3	0.1	0.4	0.1	0.0	10.6	11.2	9.3	4.0	2.1	3.4	1.6	1.5	2.4	11.2																							
10-Nov	Z	0.0	0.5	0.0	0.5	0.2	0.0	0.0	0.1	0.4	1.8	0.8	0.9	2.0	2.2	1.4	1.2	12.1	18.1	12.3	16.2	20.3	17.9	14.8	5.4	20.3																							
11-Nov	2.8	Z	0.7	0.2	1.6	9.8	10.9	1.5	1.5	0.7	0.6	0.4	0.3	0.2	0.4	0.2	0.2	0.1	0.3	0.1	0.0	0.0	0.0	0.0	1.4	10.9																							
12-Nov	1.6	33.1	Z	21.1	18.6	20.0	30.1	1.6	2.1	0.1	0.1	0.2	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	33.1																							
13-Nov	0.0	0.0	0.0	Z	0.0	0.5	4.5	0.2	0.0	0.6	2.3	5.4	2.0	0.8	0.8	0.4	0.4	0.1	0.1	0.0	0.3	0.4	0.4	0.2	0.8	5.4																							
14-Nov	0.7	0.3	2.1	0.2	Z	0.4	0.5	3.6	1.6	2.8	8.9	6.1	6.5	4.0	1.8	2.2	2.6	0.2	2.1	2.1	0.1	0.1	0.9	0.2	2.2	8.9																							
15-Nov	2.8	2.7	4.0	2.0	1.5	Z	25.8	51.7	84.1	58.8	C	C	C	C	C	6.3	9.1	7.3	0.8	0.3	0.6	0.3	0.5	0.3	14.4	84.1																							
16-Nov	Z	0.0	2.1	22.3	40.3	48.4	27.6	38.9	4.0	1.8	5.1	5.0	2.0	2.0	0.8	0.7	0.5	0.2	0.1	0.1	0.1	0.0	0.1	0.1	8.8	48.4																							
17-Nov	0.1	Z	0.1	0.1	0.1	0.3	0.2	0.4	0.7	0.7	2.1	2.1	1.5	2.1	2.2	2.9	1.6	0.3	2.0	0.1	0.1	0.0	0.0	0.0	0.9	2.9																							
18-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.4	0.3	0.0	0.0	0.1	1.2	1.6	7.6	36.3	63.1	138.3	46.2	21.3	27.1	19.5	16.1	13.1	17.1	138.3																								
19-Nov	1.4	0.4	2.8	Z	0.2	0.1	0.3	0.8	0.7	4.3	3.1	3.9	2.5	1.4	1.7	1.3	0.4	0.3	0.1	0.1	0.1	0.0	0.0	0.0	1.1	4.3																							
20-Nov	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.2	0.4	1.9	1.7	2.2	3.4	2.0	2.6	4.0	2.0	0.7	0.2	0.1	0.0	0.0	0.0	0.0	1.0	4.0																							
21-Nov	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.8	1.1	0.7	2.7	1.7	1.2	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.4	2.7																							
22-Nov	Z	0.0	0.0	0.0	0.0	1.3	10.4	15.1	12.0	23.8	2.5	2.6	5.2	28.8	6.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.9	0.9	4.8	28.8																							
23-Nov	0.2	Z	0.1	0.1	0.4	0.1	0.3	0.2	0.4	1.6	3.8	4.1	4.5	1.4	1.6	2.2	2.3	2.6	1.0	3.4	0.5	2.0	3.2	0.9	1.6	4.5																							
24-Nov	0.7	5.0	Z	1.7	0.9	2.8	1.3	3.0	2.0	3.3	9.6	17.9	18.5	19.9	13.6	6.8	0.9	0.7	2.4	9.9	14.8	8.0	28.2	13.3	8.1	28.2																							
25-Nov	6.1	10.8	4.8	Z	1.0	5.2	0.8	0.9	1.5	3.8	3.3	3.1	5.2	16.9	16.8	14.7	9.3	9.0	12.7	12.2	2.9	0.4	0.5	0.3	6.2	16.9																							
26-Nov	0.1	0.4	0.3	0.1	Z	2.9	0.0	0.0	0.1	1.2	2.3	8.4	9.0	5.4	1.3	0.5	3.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.6	9.0																							
27-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.6	0.6	0.6	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.6																							
28-Nov	Z	0.0	0.0	0.0	1.3	6.5	0.5	11.3	25.9	48.2	37.4	5.6	2.6	3.1	4.3	8.1	22.7	42.2	25.6	29.2	3.7	13.6	30.2	23.5	15.0	48.2																							
29-Nov	18.5	Z	11.6	1.2	0.5	0.8	33.7	52.9	1.3	0.9	1.5	8.0	12.9	14.1	24.5	15.9	9.6	13.4	38.0	8.7	24.7	45.6	47.9	41.5	18.6	52.9																							
30-Nov	35.6	25.2	Z	19.3	14.7	14.2	21.9	13.8	26.7	59.8	55.3	91.4	93.8	95.9	56.9	33.4	25.3	20.2	18.0	4.1	12.8	2.6	9.0	4.3	32.8	95.9																							
																								4.3	4.1	5.8	5.5	5.4	6.1	6.7	8.5	7.6	8.4	6.3	7.7	7.8	7.9	5.4	5.0	6.7	10.9	8.3	6.4	5.5	6.1	6.7	5.0	Diurnal Average	
																								35.6	33.1	42.2	36.3	40.3	48.4	33.7	52.9	84.1	59.8	55.3	91.4	93.8	95.9	56.9	36.3	63.1	138.3	46.2	43.7	33.0	45.6	47.9	41.5	Diurnal Maximum	
Z - zerospan																								C - Calibration																									



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Barge Landing - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Barge Landing - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	615	89.78	89.78
21 - 40	49	7.15	96.93
41 - 80	16	2.34	99.27
81 - 159	5	0.73	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Barge Landing - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	64	55	22	18	9	17	28	83	46	40	46	41	34	27	24	59	613
21 - 40	6	2	1	4	0	1	5	2	4	4	3	2	2	0	4	7	47
11 - 80	2	0	2	1	0	1	1	1	2	0	1	0	1	0	0	4	16
81 - 159	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	3	5
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	72	57	26	23	9	20	34	86	52	44	50	43	37	27	28	73	681

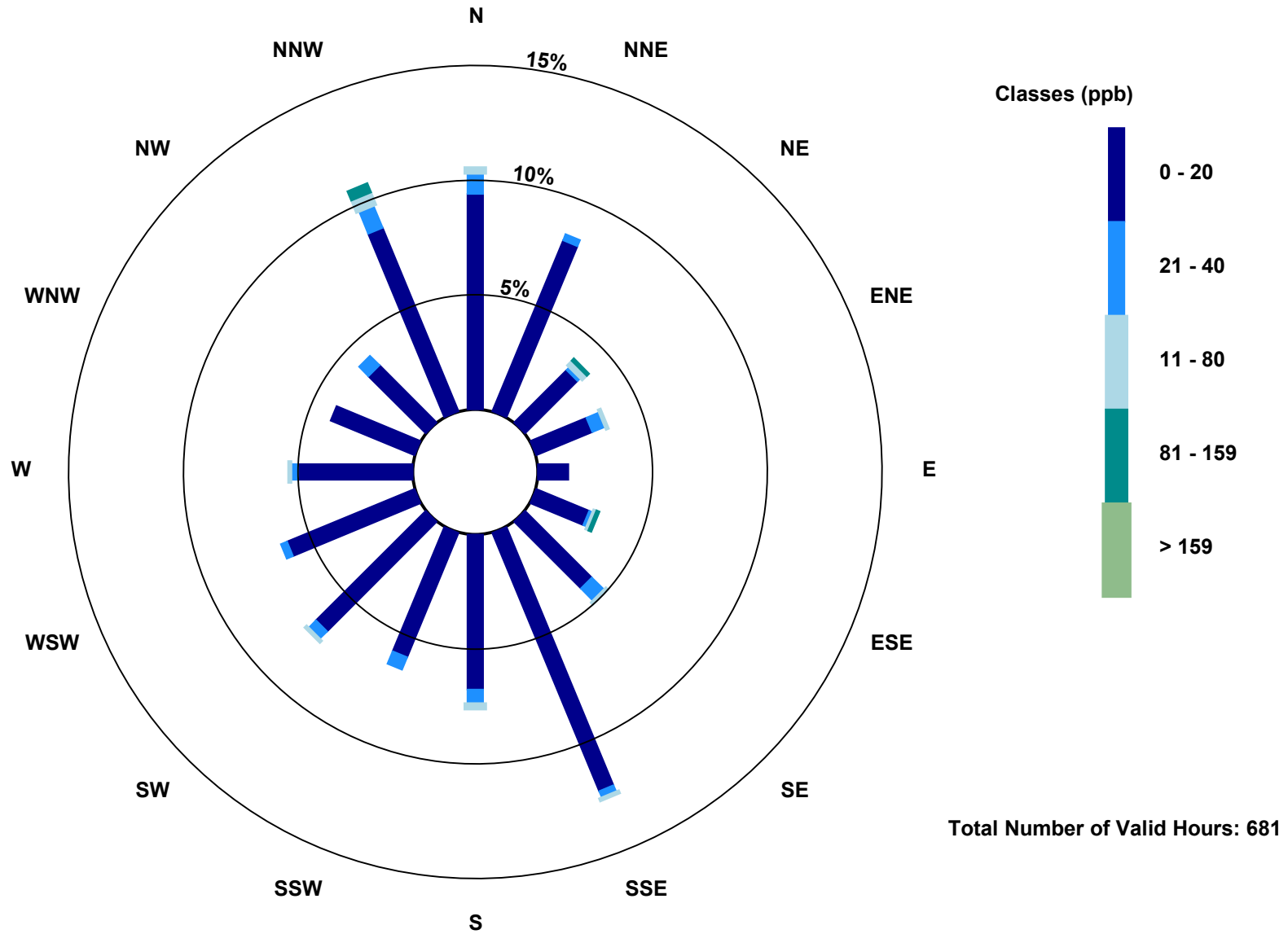
Total Number of Valid Hours: 681

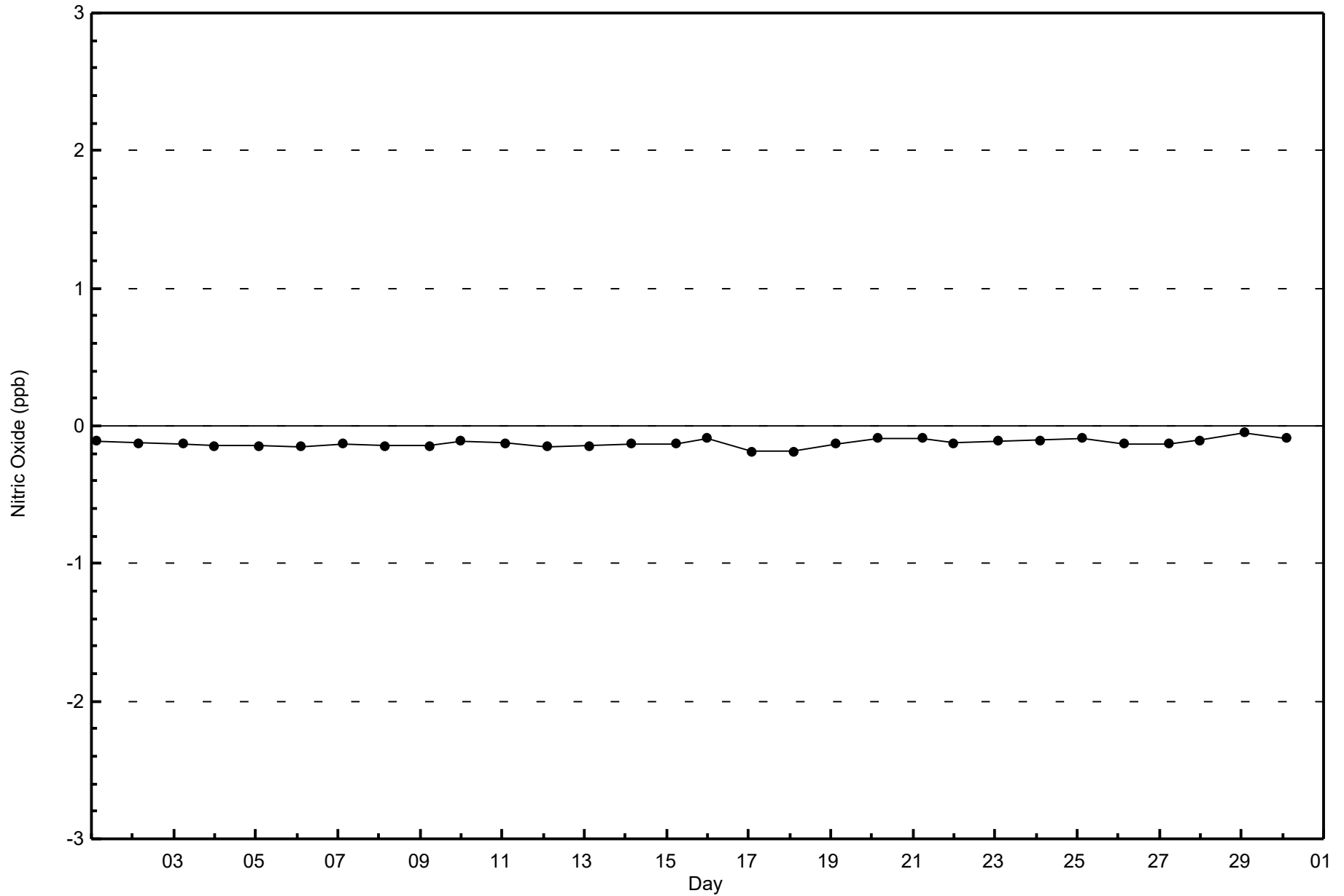
Total Number of Hours: 720

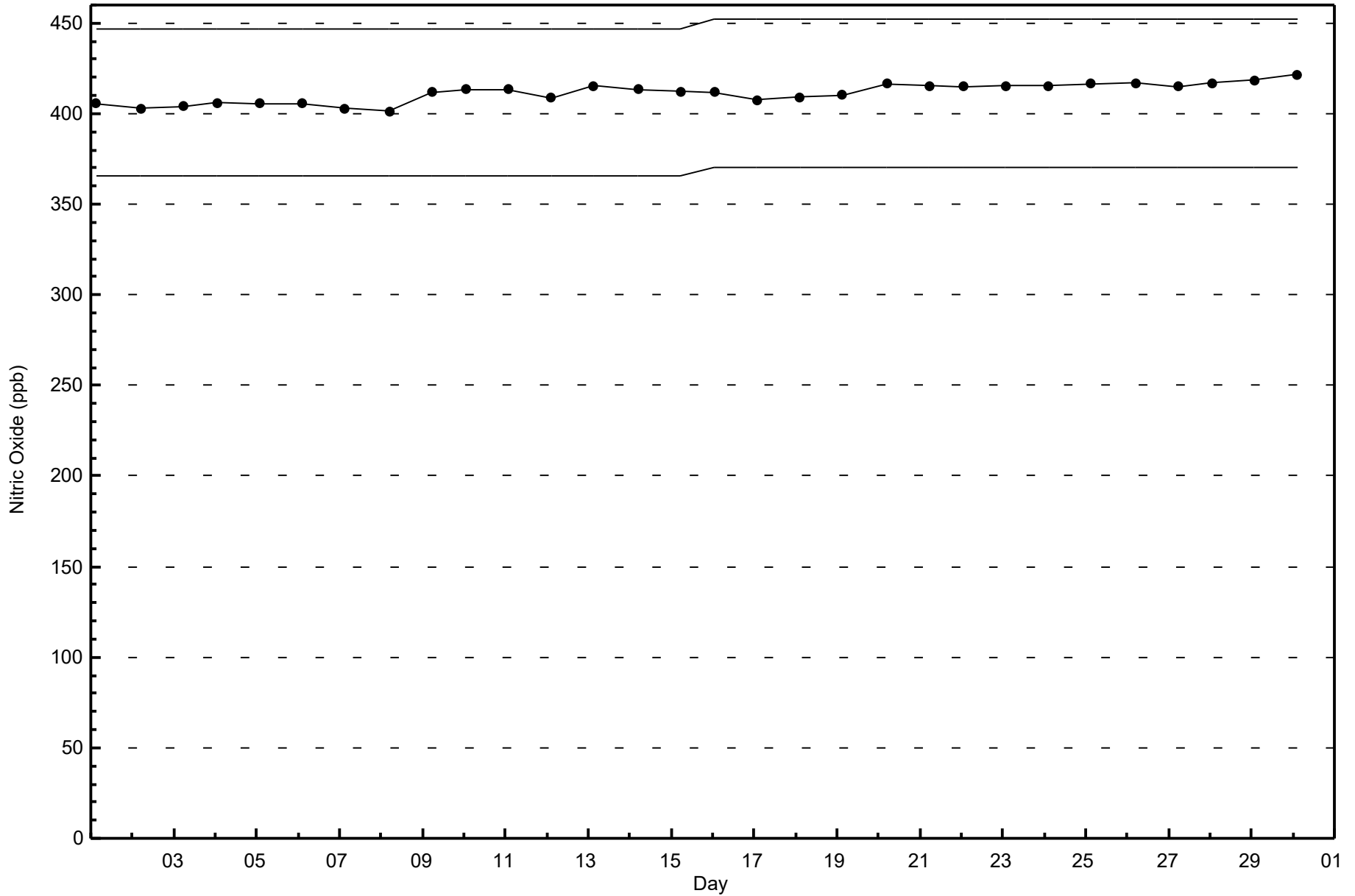


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitric Oxide (NO) - ppb  
Barge Landing











# Wood Buffalo Environmental Association

## Summary of Hour Averages

## Nitrogen Dioxide (NO<sub>2</sub>) - ppb Barge Landing - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 34.4 ppb on Nov 30 14:00	Maximum Daily Average: 26.7 ppb on Nov 30		Hours of Data:	685
Minimum Value: 0.1 ppb on Nov 7 13:00	Minimum Daily Average: 1.9 ppb on Nov 27		Hours of Missing Data:	35
Maximum Diurnal Average: 14.1 ppb at hour 18	Minimum Diurnal Average: 8.1 ppb at hour 13		Hours of Calibration:	35
Monthly Average: 10.62 ppb	Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.8 Q <sub>1</sub> = 4.2 Median = 9.0 Q <sub>3</sub> = 15.3 P <sub>90</sub> = 23.2 P <sub>99</sub> = 30.2		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	1.8	1.8	4.3	Z	10.3	7.7	4.0	8.4	11.0	9.3	6.9	9.4	13.9	12.6	11.1	7.8	10.8	14.9	9.0	6.1	5.0	3.6	7.4	10.0	8.1	14.9
2-Nov	10.5	13.4	16.9	7.8	Z	3.9	11.2	14.8	13.9	12.8	12.7	14.3	12.0	10.3	4.6	2.4	1.7	3.7	8.4	8.3	12.2	11.2	10.9	10.4	9.9	16.9
3-Nov	10.2	10.3	10.1	9.5	7.8	Z	8.3	9.0	7.6	5.8	6.4	5.4	10.2	8.5	3.8	3.2	6.7	4.1	9.1	13.1	12.1	10.7	6.2	3.6	7.9	13.1
4-Nov	Z	8.2	12.0	10.4	9.4	10.1	9.6	5.8	5.2	6.1	6.9	4.9	4.5	3.6	7.5	13.6	17.5	17.4	15.2	13.4	13.1	12.5	11.5	9.5	9.9	17.5
5-Nov	8.3	Z	14.0	14.7	14.1	13.2	13.9	13.0	11.1	7.1	4.9	4.0	3.1	2.0	2.5	1.0	2.5	8.3	2.4	0.8	0.6	1.4	2.4	14.2	6.9	14.7
6-Nov	8.3	6.7	Z	5.3	3.9	3.5	5.3	7.5	7.6	8.5	5.6	5.0	2.2	0.6	0.6	0.8	4.0	18.0	15.5	13.5	15.4	12.8	11.2	9.1	7.4	18.0
7-Nov	7.7	10.0	13.8	Z	6.2	0.8	0.4	0.3	0.3	0.4	0.3	0.2	0.1	0.1	0.2	2.7	23.2	24.4	24.3	21.6	23.0	25.8	19.2	7.2	9.2	25.8
8-Nov	11.1	13.9	11.6	12.8	Z	14.2	14.4	19.0	18.7	15.3	13.5	9.1	4.0	2.2	2.8	4.9	4.7	17.5	8.1	22.1	20.2	25.9	17.6	4.0	12.5	25.9
9-Nov	0.3	0.3	0.3	0.5	0.5	Z	1.9	6.4	14.9	11.0	2.1	0.9	0.6	2.0	0.8	0.2	15.8	27.1	24.3	18.6	16.7	20.4	16.8	11.2	8.4	27.1
10-Nov	Z	8.7	10.9	7.6	10.2	8.2	5.2	2.4	2.5	1.8	3.9	1.9	2.2	5.0	7.8	9.2	11.2	19.5	20.5	18.8	18.3	18.3	17.3	14.2	9.8	20.5
11-Nov	11.1	Z	7.7	5.9	8.0	9.3	11.7	9.8	7.3	5.4	4.1	2.3	2.0	1.6	1.4	2.0	3.0	3.1	4.2	3.2	1.9	4.1	3.9	5.7	5.2	11.7
12-Nov	7.9	15.2	Z	13.4	12.7	11.3	10.9	5.3	5.6	1.1	0.8	0.8	0.8	0.6	0.5	0.4	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	3.9	15.2
13-Nov	0.3	0.4	0.7	Z	0.3	2.0	6.4	2.0	0.8	2.2	5.1	9.7	5.8	3.8	4.2	5.3	5.6	2.1	5.5	3.1	11.8	13.1	13.6	9.2	4.9	13.6
14-Nov	18.4	11.4	22.5	10.6	Z	17.6	12.3	20.6	17.5	16.7	20.6	14.3	12.5	10.7	8.3	12.6	16.2	16.1	21.1	20.2	13.3	9.3	13.1	9.7	15.0	22.5
15-Nov	9.7	12.0	15.9	14.9	14.7	Z	13.5	15.2	16.1	12.9	Z	C	C	C	C	12.0	14.4	13.8	8.7	6.7	8.2	7.0	7.6	5.3	11.6	16.1
16-Nov	Z	2.1	6.1	8.7	10.1	9.6	9.4	12.6	9.6	7.2	11.4	12.5	7.4	8.0	5.7	8.1	11.8	8.5	6.2	4.6	5.5	4.4	4.9	5.8	7.8	12.6
17-Nov	6.8	Z	13.2	13.1	9.0	9.4	10.0	9.8	9.6	6.4	6.6	6.2	4.4	4.6	6.8	8.1	7.2	6.7	8.1	6.7	6.6	1.8	0.3	0.3	7.0	13.2
18-Nov	0.6	1.2	Z	0.3	0.3	0.3	2.8	1.8	1.9	0.4	0.2	0.3	1.7	3.6	13.6	25.2	26.3	30.2	22.3	20.8	20.5	20.2	17.6	17.5	10.0	30.2
19-Nov	9.8	12.0	18.3	Z	13.8	3.2	7.5	19.6	17.1	20.0	12.7	13.1	9.0	5.4	8.6	10.8	12.1	14.2	8.3	5.2	6.6	3.3	3.0	3.8	10.3	20.0
20-Nov	5.8	3.2	7.6	6.2	Z	5.5	6.1	5.2	5.3	5.6	4.6	5.3	9.2	6.2	7.9	14.4	9.9	8.6	6.6	2.1	3.4	2.1	4.3	7.1	6.2	14.4
21-Nov	9.5	5.0	4.5	6.7	6.6	Z	3.6	9.8	11.5	7.2	3.7	7.1	5.6	5.3	4.1	3.8	3.7	0.9	0.4	0.2	0.3	4.0	8.8	8.8	5.3	11.5
22-Nov	Z	8.9	6.9	4.0	1.2	10.3	23.6	28.9	24.2	18.8	6.1	6.6	11.5	24.7	15.0	4.1	2.9	3.2	4.1	7.7	7.8	6.4	13.6	14.7	11.1	28.9
23-Nov	10.3	Z	7.2	3.7	12.1	7.6	10.3	8.6	10.1	12.0	12.4	11.1	9.9	5.9	8.3	13.0	21.4	22.9	19.1	22.8	16.1	21.6	23.7	18.5	13.4	23.7
24-Nov	17.8	24.6	Z	21.7	20.2	23.8	22.6	22.9	18.4	16.2	18.2	20.5	21.5	23.2	23.1	23.5	22.0	20.9	24.0	27.0	26.4	24.6	20.4	20.2	21.9	27.0
25-Nov	19.6	23.2	23.8	Z	20.6	23.2	15.3	14.6	16.8	14.9	10.5	9.1	11.1	20.7	22.1	24.2	21.5	22.5	24.8	23.8	21.0	18.9	15.3	10.4	18.6	24.8
26-Nov	11.6	22.0	17.8	12.5	Z	20.9	7.0	6.2	7.2	8.5	7.6	16.7	15.9	11.9	6.7	8.6	19.6	8.8	4.3	3.7	2.3	1.0	0.8	0.8	9.7	22.0
27-Nov	0.6	0.5	0.4	0.3	0.3	Z	0.3	0.4	3.2	5.0	4.5	3.6	1.7	0.5	0.7	0.8	0.5	0.6	0.4	0.3	0.3	0.3	5.8	13.6	1.9	13.6
28-Nov	Z	2.1	2.1	12.8	18.4	24.4	5.8	21.0	27.4	24.1	25.0	10.1	5.5	7.2	14.0	19.8	29.4	32.2	30.2	28.2	22.7	23.7	23.5	22.4	18.8	32.2
29-Nov	23.1	Z	17.8	9.0	7.6	6.8	25.9	31.3	8.1	4.5	3.6	7.7	11.9	16.4	23.3	23.7	24.1	24.3	29.9	28.7	28.9	30.0	29.0	28.2	19.3	31.3
30-Nov	26.6	25.8	Z	25.0	24.0	23.5	25.4	23.4	25.9	29.7	28.2	33.2	33.8	34.4	30.2	28.9	29.1	28.2	26.5	19.8	23.9	22.3	25.3	20.8	26.7	34.4

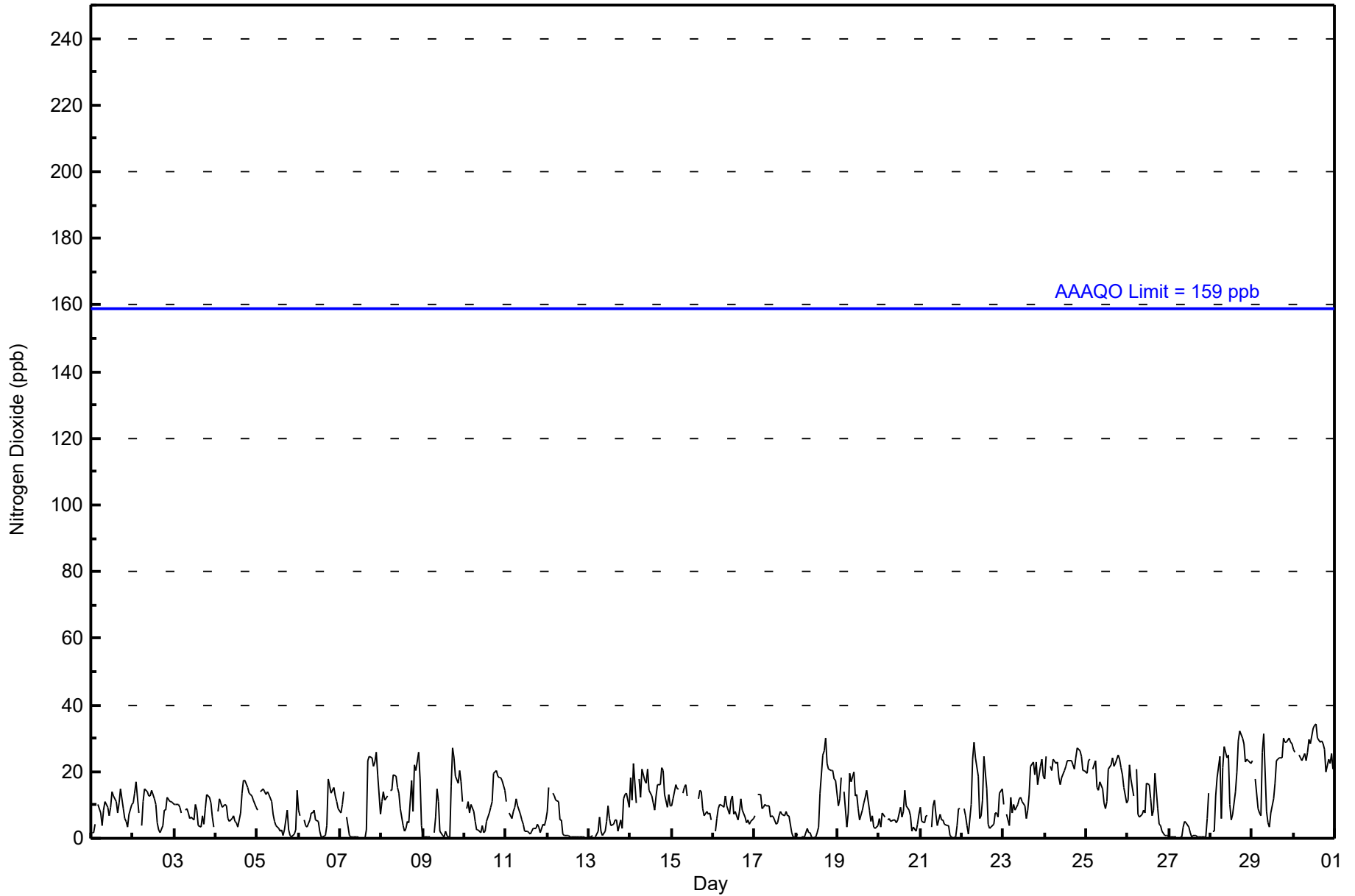
9.9	9.7	10.7	9.5	9.7	10.8	10.2	11.9	11.2	9.9	8.6	8.5	8.1	8.3	8.5	9.8	12.6	14.1	13.1	12.4	12.1	12.0	11.8	10.5	Diurnal Average	
26.6	25.8	23.8	25.0	24.0	24.4	25.9	31.3	27.4	29.7	28.2	33.2	33.8	34.4	30.2	28.9	29.4	32.2	30.2	28.7	28.9	30.0	29.0	28.2	Diurnal Maximum	

Z - zerospan      C - Calibration  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association  
Hourly Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Barge Landing - November 2024





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Barge Landing - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	577	84.23	84.23
21 - 40	108	15.77	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Barge Landing - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	48	55	22	17	8	17	29	72	45	43	46	41	34	25	25	47	574
21 - 40	24	2	4	6	1	3	5	14	7	1	4	2	3	2	3	26	107
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	72	57	26	23	9	20	34	86	52	44	50	43	37	27	28	73	681

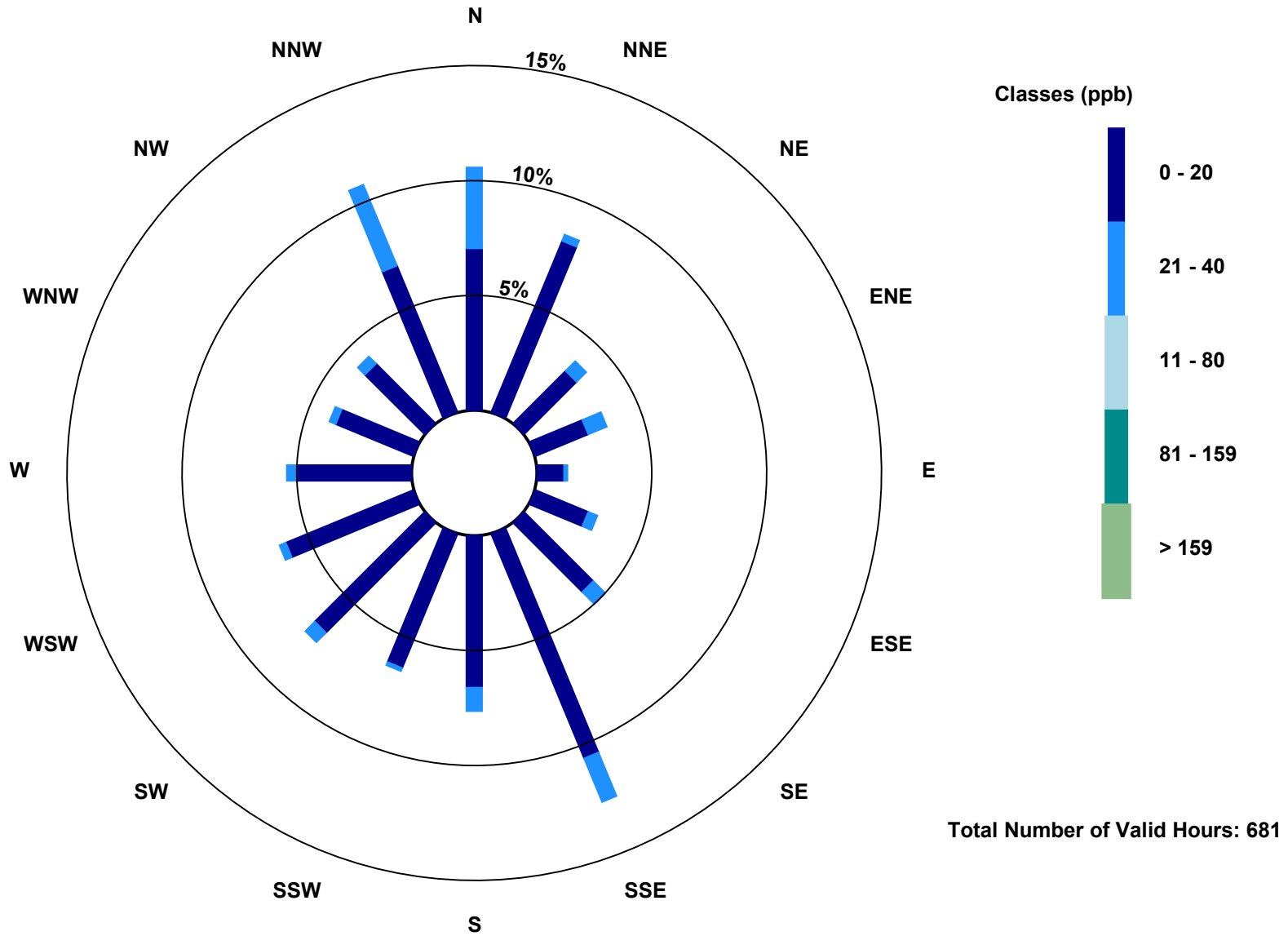
Total Number of Valid Hours: 681

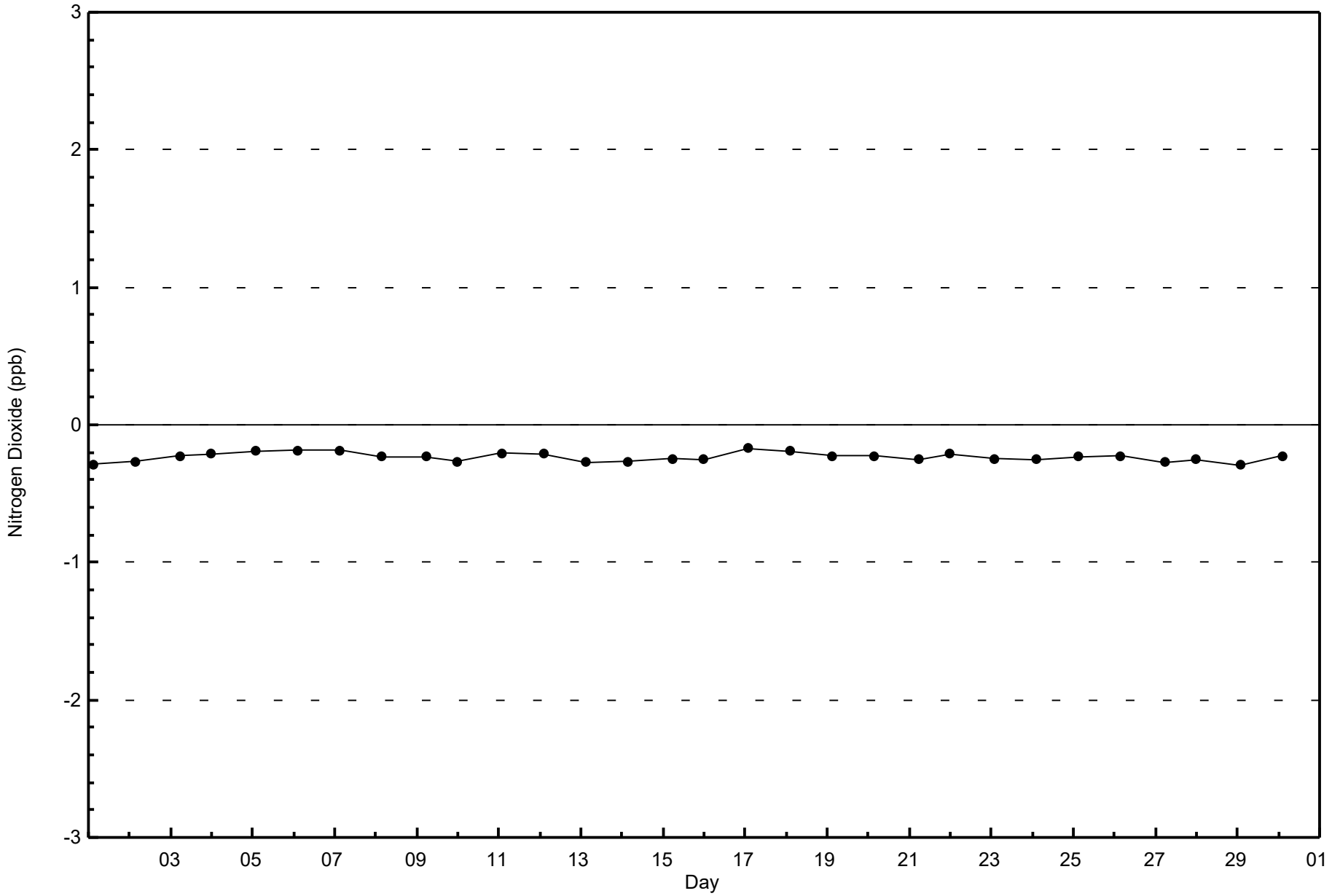
Total Number of Hours: 720

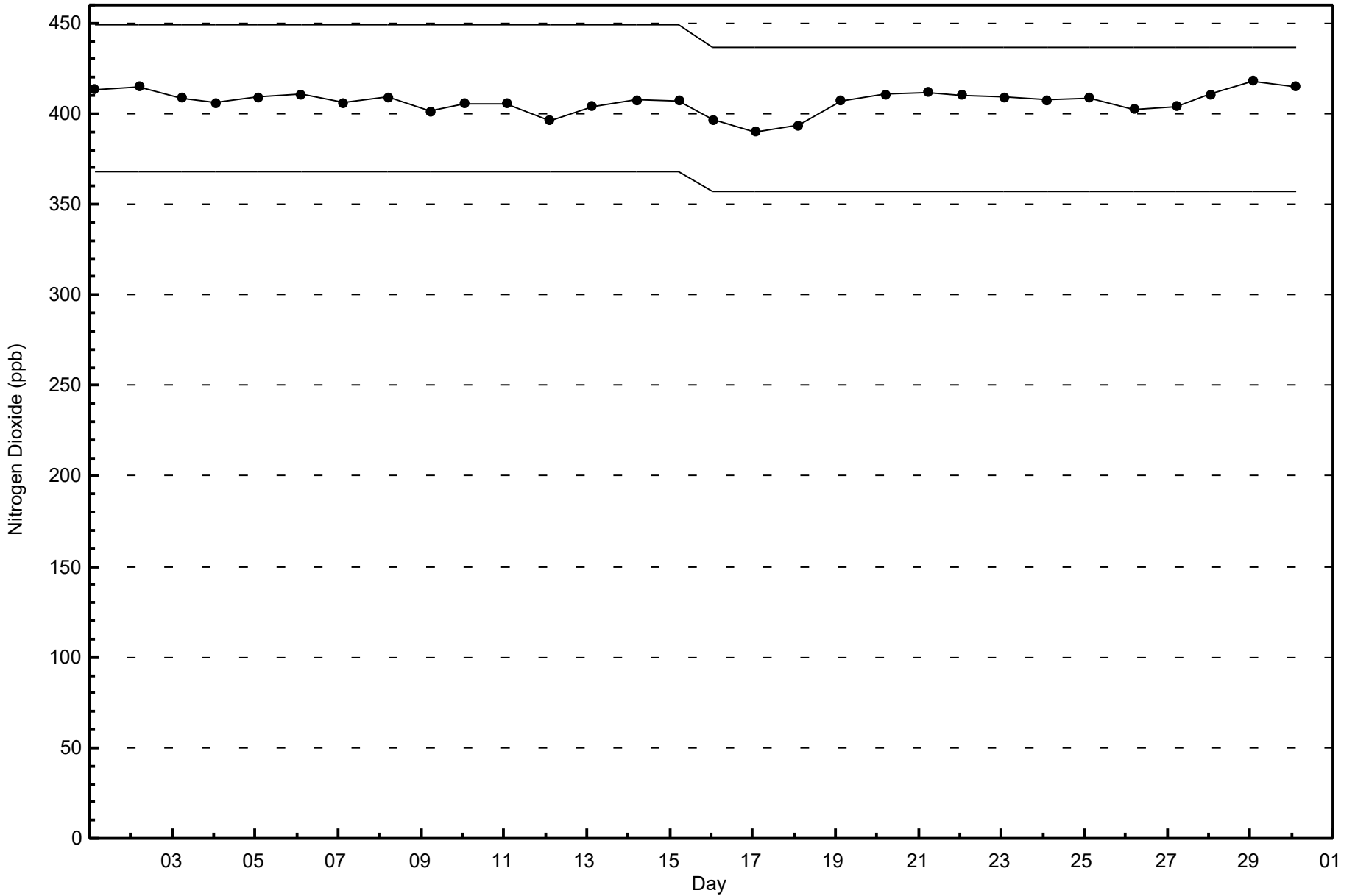


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Barge Landing







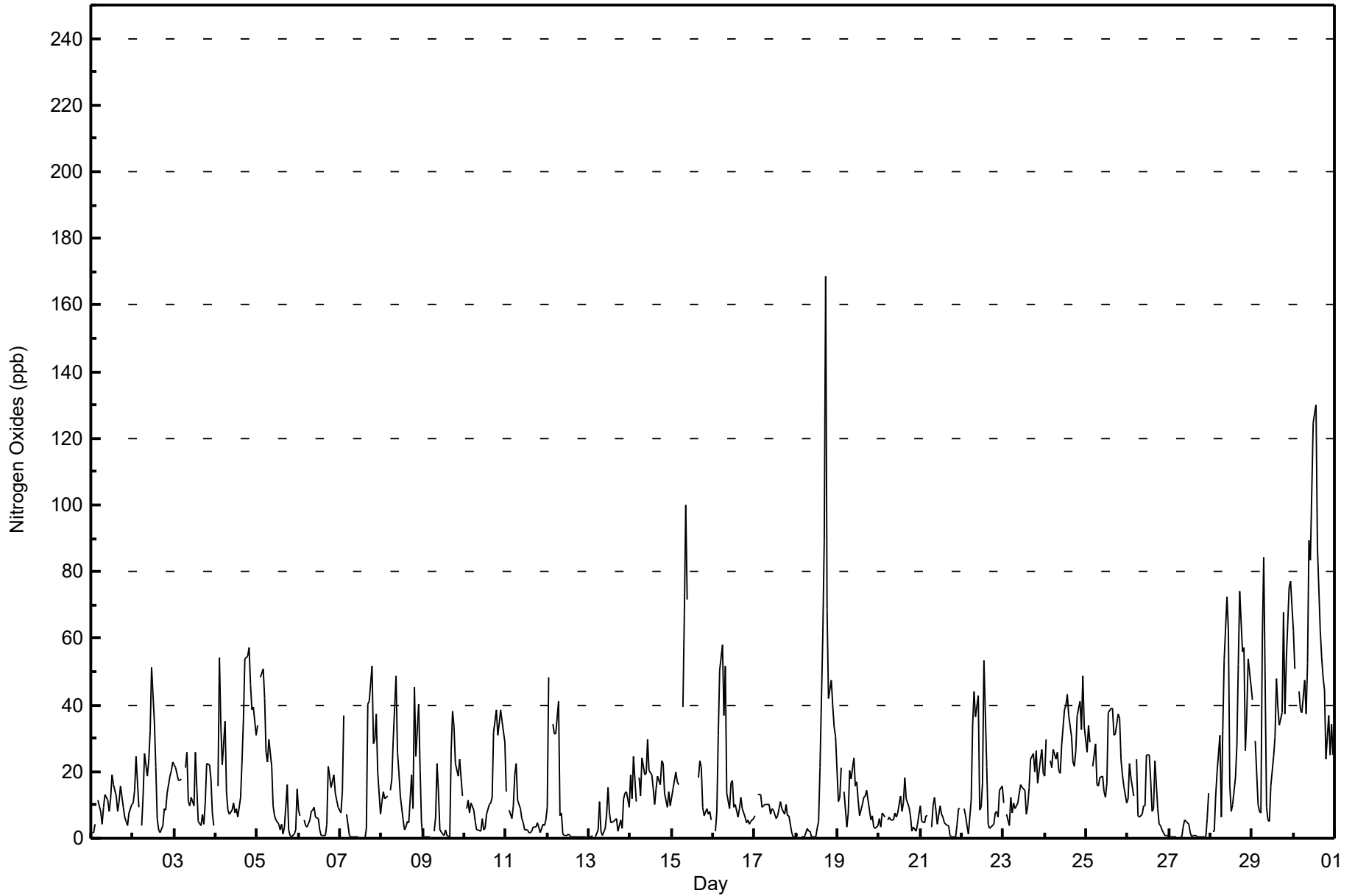


**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Barge Landing - November 2024**

Maximum Value: 168.5 ppb on Nov 18 18:00																				Maximum Daily Average: 59.5 ppb on Nov 30					Hours in Service:	720
Minimum Value: 0.1 ppb on Nov 7 13:00																				Minimum Daily Average: 2.0 ppb on Nov 27					Hours of Data:	685
Maximum Diurnal Average: 25.0 ppb at hour 18																				Minimum Diurnal Average: 13.8 ppb at hour 2					Hours of Missing Data:	35
Monthly Average: 17.26 ppb																				Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.9 Q <sub>1</sub> = 4.7 Median = 10.5 Q <sub>3</sub> = 23.4 P <sub>90</sub> = 39.9 P <sub>99</sub> = 87.5					Hours of Calibration:	35
																									Percent Operational Time:	100.0
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	1.8	1.8	4.3	Z	11.4	7.9	4.1	9.4	13.2	11.4	8.1	12.0	19.2	15.9	12.7	8.3	11.1	15.6	9.3	6.2	5.0	3.6	7.5	10.1	9.1	19.2
2-Nov	10.6	14.2	24.5	9.5	Z	3.9	12.5	25.5	18.6	23.1	32.4	51.5	34.6	21.2	5.7	2.6	1.8	3.8	8.8	8.6	13.4	18.8	20.3	22.8	16.9	51.5
3-Nov	22.0	21.3	17.5	17.3	17.7	Z	21.2	25.7	11.1	9.7	12.4	9.6	26.0	15.2	5.2	3.7	7.2	4.1	10.9	22.6	21.8	17.9	7.7	3.8	14.4	26.0
4-Nov	Z	15.8	54.2	34.3	22.2	35.3	13.8	8.5	7.2	8.6	10.5	7.7	8.8	6.2	12.4	23.1	35.6	53.6	54.7	57.1	46.1	38.4	39.3	30.9	27.1	57.1
5-Nov	33.8	Z	48.2	51.0	41.9	26.0	22.8	29.6	21.8	9.7	6.6	5.5	4.1	2.6	4.1	1.2	3.4	16.0	2.5	0.9	0.6	1.4	2.4	14.9	15.3	51.0
6-Nov	8.4	6.8	Z	5.4	4.0	3.6	5.4	8.1	8.6	9.3	6.3	6.1	2.6	0.7	0.7	0.8	4.1	21.7	18.5	15.1	19.1	13.5	11.3	9.2	8.2	21.7
7-Nov	7.7	14.1	36.9	Z	7.1	0.8	0.4	0.3	0.3	0.4	0.4	0.2	0.1	0.2	0.2	2.9	40.0	41.1	51.6	28.4	29.5	37.1	20.0	7.3	14.2	51.6
8-Nov	11.1	14.1	11.8	12.9	Z	14.5	17.9	29.5	48.6	25.8	20.0	12.9	5.3	2.7	3.3	5.2	4.7	19.2	8.7	45.2	24.7	40.0	20.6	4.5	17.5	48.6
9-Nov	0.3	0.3	0.3	0.5	0.5	Z	1.9	6.5	22.6	14.1	2.7	1.2	0.7	2.4	0.9	0.2	26.4	38.3	33.6	22.6	18.8	23.8	18.4	12.7	10.9	38.3
10-Nov	Z	8.7	11.4	7.6	10.7	8.4	5.2	2.4	2.6	2.2	5.7	2.7	3.1	7.0	10.0	10.6	12.4	31.6	38.6	31.1	34.5	38.6	35.2	29.0	15.2	38.6
11-Nov	13.9	Z	8.4	6.1	9.6	19.1	22.6	11.3	8.8	6.1	4.7	2.7	2.3	1.8	1.8	2.2	3.2	3.2	4.5	3.3	1.9	4.1	3.9	5.7	6.6	22.6
12-Nov	9.5	48.3	Z	34.5	31.3	31.3	41.0	6.9	7.7	1.2	0.9	1.0	1.1	0.8	0.5	0.4	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	9.5	48.3
13-Nov	0.3	0.4	0.7	Z	0.3	2.5	10.9	2.2	0.8	2.8	7.4	15.1	7.8	4.6	5.0	5.7	6.0	2.2	5.6	3.1	12.1	13.5	14.0	9.4	5.8	15.1
14-Nov	19.1	11.7	24.6	10.8	Z	18.0	12.8	24.2	19.1	19.5	29.5	20.4	19.0	14.7	10.1	14.8	18.8	16.3	23.2	22.3	13.4	9.4	14.0	9.9	17.2	29.5
15-Nov	12.5	14.7	19.9	16.9	16.2	Z	39.3	66.9	100.2	71.7	C	C	C	C	C	18.3	23.5	21.1	9.5	7.0	8.8	7.3	8.1	5.6	26.0	100.2
16-Nov	Z	2.1	8.2	31.0	50.4	58.0	37.0	51.5	13.6	9.0	16.5	17.5	9.4	10.0	6.5	8.8	12.3	8.7	6.3	4.7	5.6	4.4	5.0	5.9	16.6	58.0
17-Nov	6.9	Z	13.3	13.2	9.1	9.7	10.2	10.2	10.3	7.1	8.7	8.3	5.9	6.7	9.0	11.0	8.8	7.0	10.1	6.8	6.7	1.8	0.3	0.3	7.9	13.3
18-Nov	0.6	1.2	Z	0.3	0.3	0.3	2.8	2.2	2.2	0.4	0.2	0.4	2.9	5.2	21.2	61.5	89.4	168.5	68.5	42.1	47.6	39.7	33.7	30.6	27.0	168.5
19-Nov	11.2	12.4	21.1	Z	14.0	3.3	7.8	20.4	17.8	24.3	15.8	17.0	11.5	6.8	10.3	12.1	12.5	14.5	8.4	5.3	6.7	3.3	3.0	3.8	11.4	24.3
20-Nov	5.8	3.2	7.6	6.2	Z	5.6	6.3	5.4	5.7	7.5	6.3	7.5	12.6	8.2	10.5	18.4	11.9	9.3	6.8	2.2	3.4	2.1	4.3	7.1	7.1	18.4
21-Nov	9.6	5.0	4.5	6.7	6.6	Z	3.6	9.8	12.3	8.3	4.4	9.8	7.3	6.5	4.6	4.0	3.7	0.9	0.4	0.2	0.3	4.1	8.9	8.8	5.7	12.3
22-Nov	Z	8.9	6.9	4.0	1.2	11.6	34.0	44.0	36.2	42.6	8.6	9.2	16.7	53.5	21.2	4.4	3.0	3.3	4.2	7.8	7.9	6.5	14.5	15.6	15.9	53.5
23-Nov	10.5	Z	7.3	3.8	12.5	7.7	10.6	8.8	10.5	13.6	16.2	15.2	14.4	7.3	9.9	15.2	23.7	25.5	20.1	26.2	16.6	23.6	26.9	19.4	15.0	26.9
24-Nov	18.5	29.6	Z	23.4	21.1	26.6	23.9	25.9	20.4	19.5	27.8	38.4	40.0	43.1	36.7	30.3	22.9	21.6	26.4	36.9	41.2	32.6	48.6	33.5	30.0	48.6
25-Nov	25.7	34.0	28.6	Z	21.6	28.4	16.1	15.5	18.3	18.7	13.8	12.2	16.3	37.6	38.9	38.9	30.8	31.5	37.5	36.0	23.9	19.3	15.8	10.7	24.8	38.9
26-Nov	11.7	22.4	18.1	12.6	Z	23.8	7.0	6.2	7.3	9.7	9.9	25.1	24.9	17.3	8.0	9.1	23.4	8.9	4.3	3.7	2.3	1.0	0.8	0.8	11.2	25.1
27-Nov	0.6	0.5	0.4	0.3	0.3	Z	0.3	0.4	3.3	5.6	5.1	4.2	1.9	0.6	0.8	0.8	0.5	0.6	0.4	0.3	0.3	0.3	5.8	13.7	2.0	13.7
28-Nov	Z	2.1	2.1	12.8	19.7	30.9	6.3	32.3	53.3	72.3	62.4	15.7	8.1	10.3	18.3	27.9	52.1	74.4	55.8	57.4	26.4	37.3	53.7	45.9	33.8	74.4
29-Nov	41.6	Z	29.4	10.2	8.1	7.6	59.6	84.2	9.4	5.4	5.1	15.7	24.8	30.5	47.8	39.6	33.7	37.7	67.9	37.4	53.6	75.6	76.9	69.7	37.9	84.2
30-Nov	62.2	51.0	Z	44.3	38.7	37.7	47.3	37.2	52.6	89.5	83.5	124.6	127.6	130.3	87.1	62.3	54.4	48.4	44.5	23.9	36.7	24.9	34.3	25.1	59.5	130.3
																								Diurnal Average		
																								Diurnal Maximum		
14.2 13.8 16.4 15.0 15.1 16.9 16.8 20.4 18.8 18.3 14.9 16.2 15.8 16.2 13.9 14.8 19.4 25.0 21.4 18.8 17.6 18.2 18.5 15.6																										
62.2 51.0 54.2 51.0 50.4 58.0 59.6 84.2 100.2 89.5 83.5 124.6 127.6 130.3 87.1 62.3 89.4 168.5 68.5 57.4 53.6 75.6 76.9 69.7																										
Z - zerospan C - Calibration																										







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Barge Landing - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	485	70.80	70.80
21 - 40	134	19.56	90.36
41 - 80	56	8.18	98.54
81 - 159	9	1.31	99.85
> 159	1	0.15	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Barge Landing - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	44	50	20	13	8	11	21	63	32	34	43	34	33	24	19	34	483
21 - 40	19	6	2	5	1	6	7	21	14	9	2	7	1	3	6	25	134
11 - 80	8	1	2	5	0	2	6	2	6	1	5	2	2	0	3	9	54
81 - 159	1	0	1	0	0	1	0	0	0	0	0	0	1	0	0	5	9
> 159	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<b>Totals</b>	72	57	26	23	9	20	34	86	52	44	50	43	37	27	28	73	681

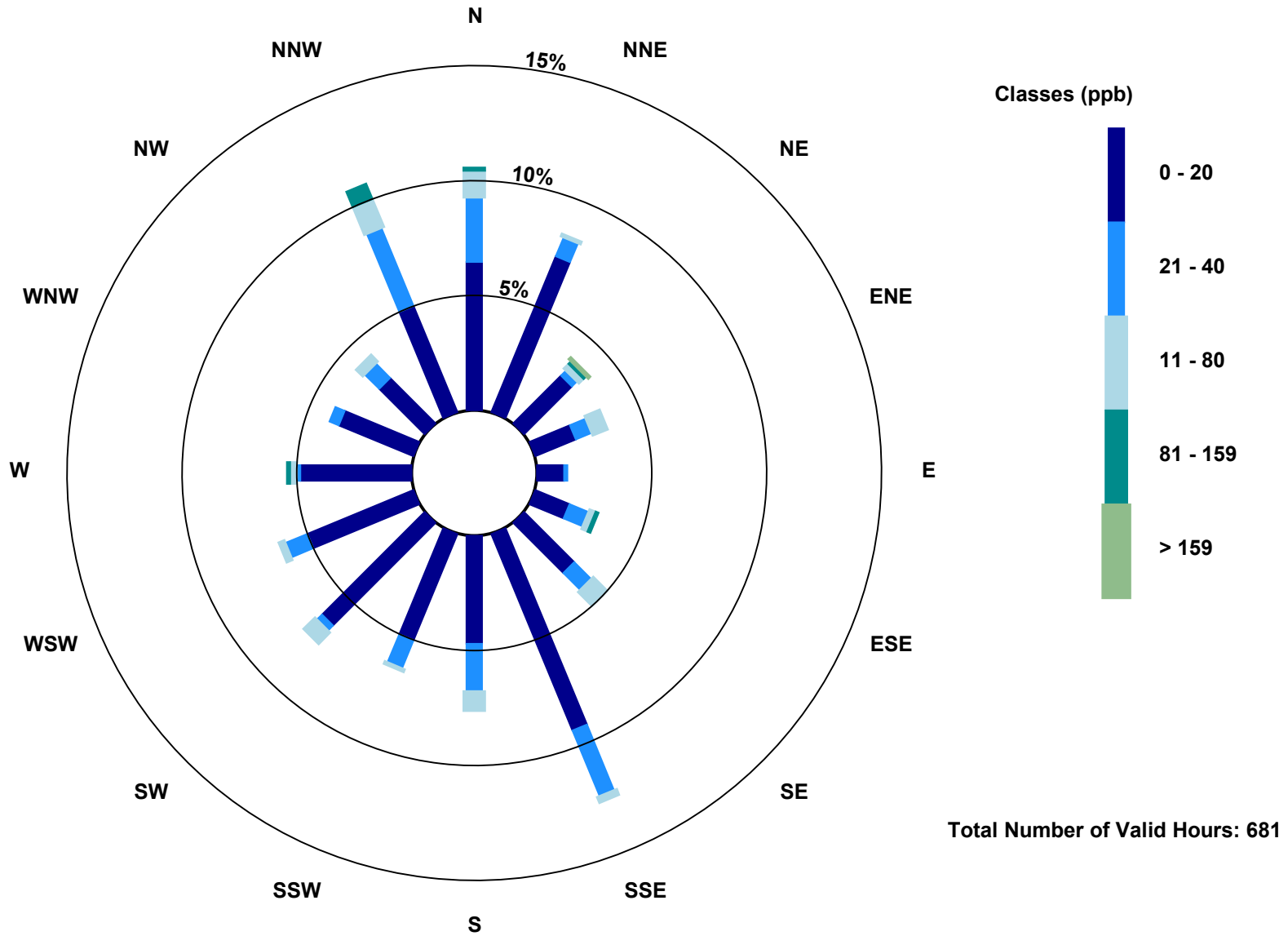
Total Number of Valid Hours: 681

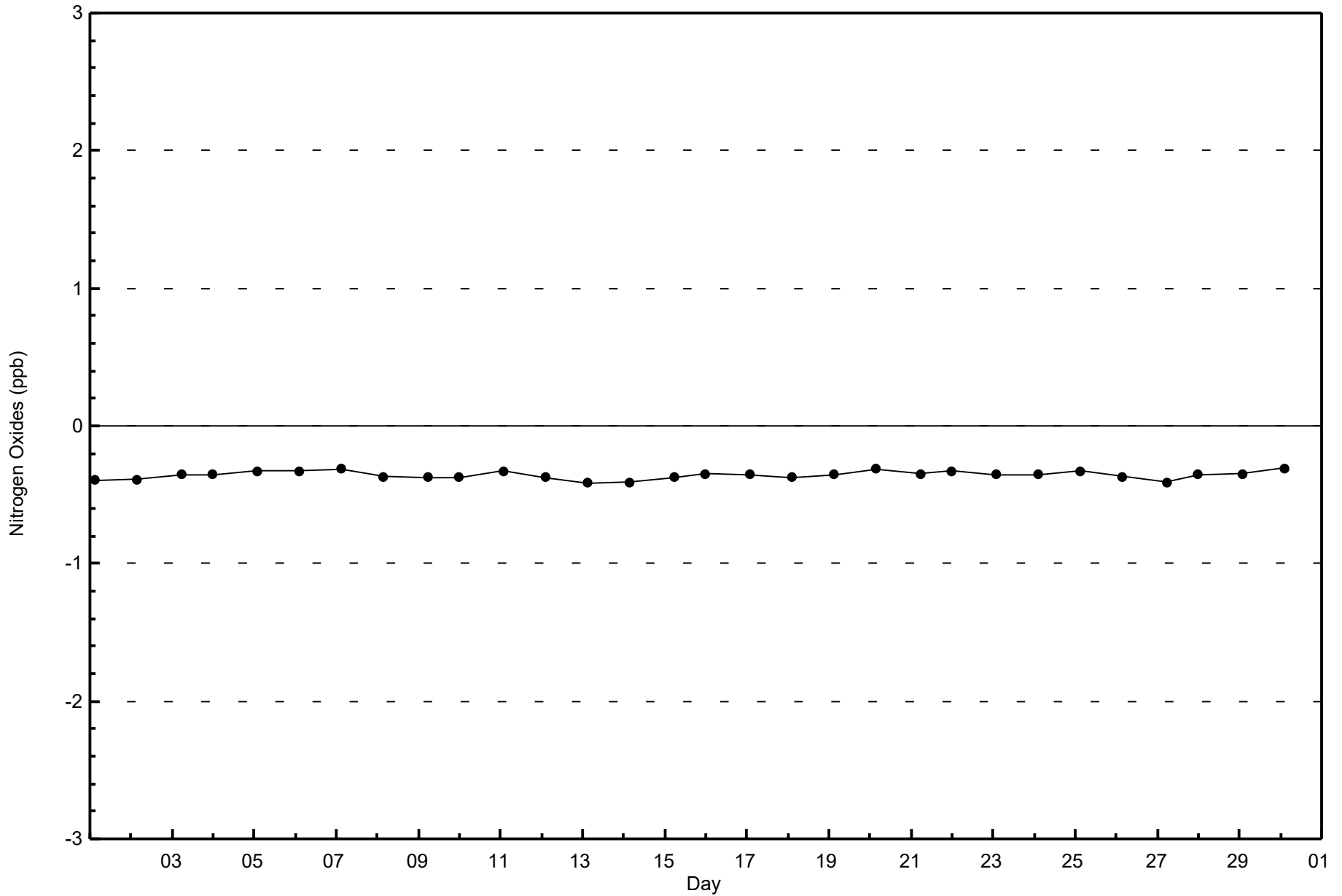
Total Number of Hours: 720

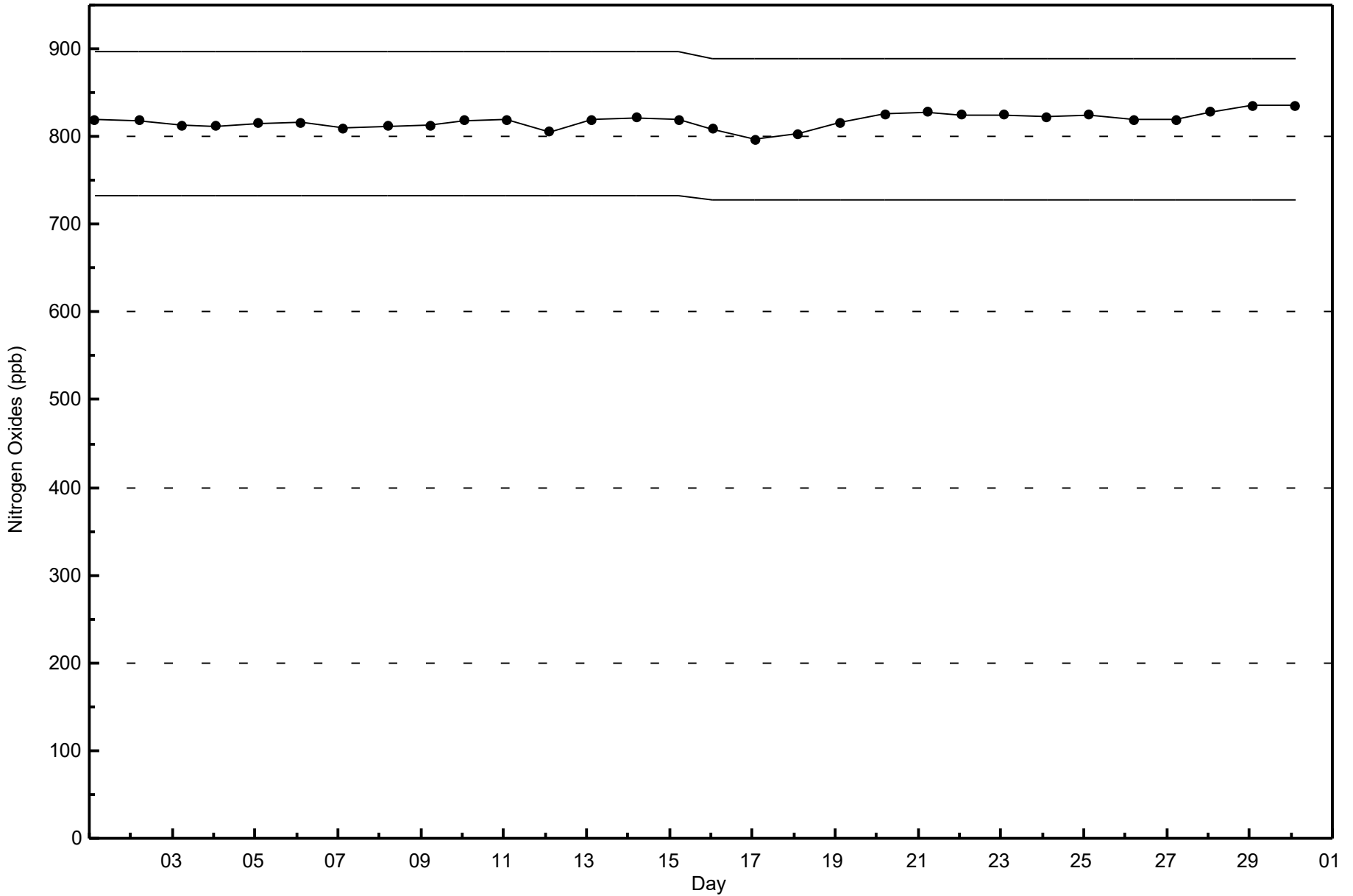


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Barge Landing









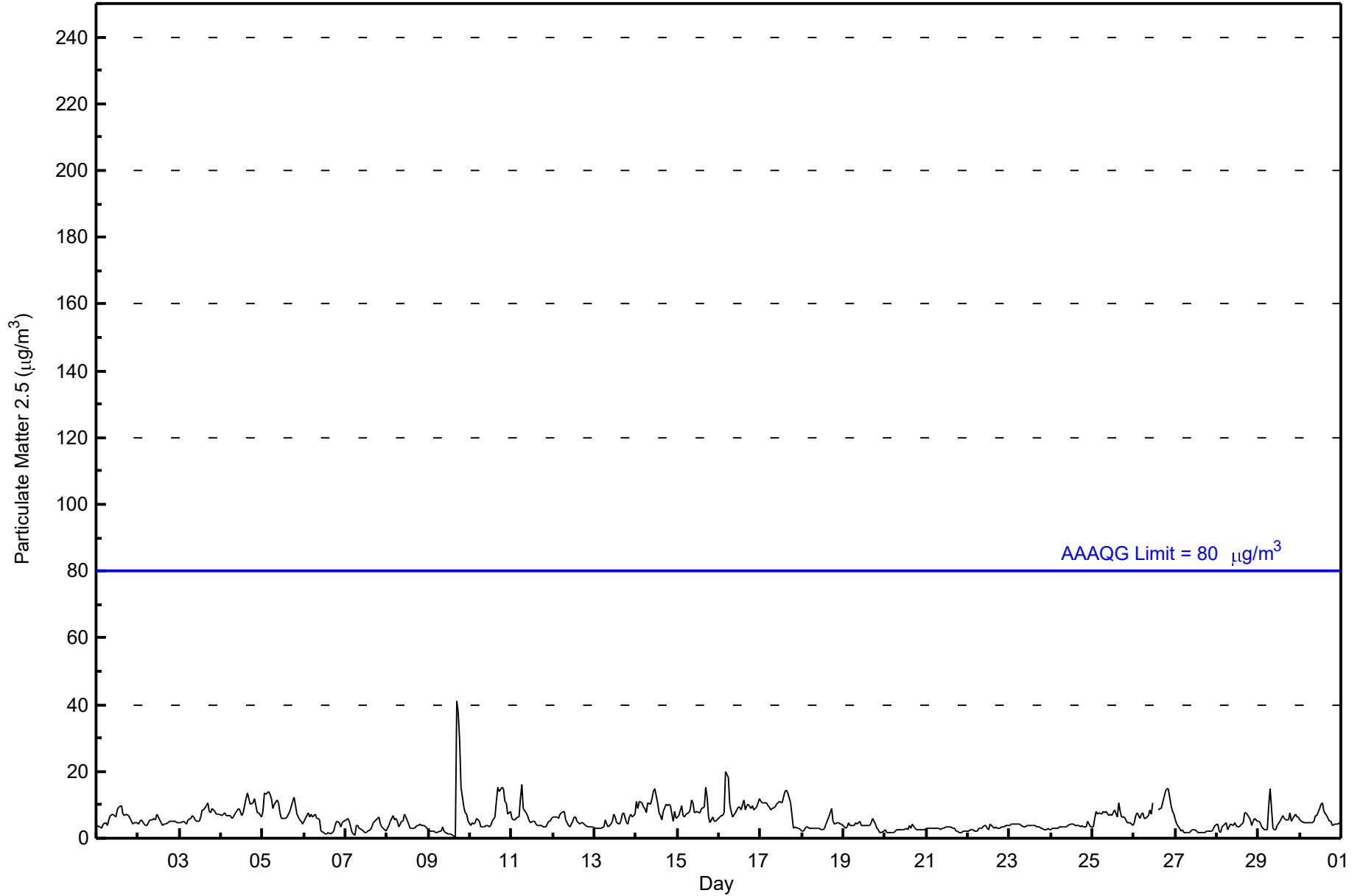
# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

## Barge Landing - November 2024

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:															720																											
Maximum Value: 41.3 µg/m <sup>3</sup> on Nov 9 17:00				Maximum Daily Average: 9.6 µg/m <sup>3</sup> on Nov 16		Hours of Data:															718																											
Minimum Value: 0.5 µg/m <sup>3</sup> on Nov 9 16:00				Minimum Daily Average: 2.4 µg/m <sup>3</sup> on Nov 27		Hours of Missing Data:															2																											
Maximum Diurnal Average: 7.9 µg/m <sup>3</sup> at hour 17				Minimum Diurnal Average: 4.8 µg/m <sup>3</sup> at hour 24		Hours of Calibration:															2																											
Monthly Average: 5.67 µg/m <sup>3</sup>				Percentiles: P <sub>1</sub> = 1.4 P <sub>10</sub> = 2.4 Q <sub>1</sub> = 3.3 Median = 4.8 Q <sub>3</sub> = 7.1 P <sub>90</sub> = 10.0 P <sub>99</sub> = 15.3		Percent Operational Time:															100.0																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	4.0	3.4	3.2	2.8	4.2	4.6	3.8	5.7	6.6	7.1	6.9	6.5	8.4	9.5	9.6	7.2	6.7	7.3	6.7	6.0	5.0	4.4	4.6	4.6	5.8	9.6																						
2-Nov	4.4	4.9	5.4	4.4	3.6	3.9	4.5	5.4	5.5	5.8	5.6	7.1	5.6	4.5	3.8	4.1	4.3	4.7	5.0	5.1	5.0	4.9	4.7	4.7	4.9	7.1																						
3-Nov	4.8	4.6	5.0	4.6	4.4	5.3	5.7	6.8	6.4	5.5	5.1	5.0	6.3	8.6	8.6	9.6	10.7	8.2	7.7	8.7	8.1	7.1	7.1	7.0	6.7	10.7																						
4-Nov	6.7	7.2	7.5	6.7	6.7	6.7	6.0	6.3	7.2	8.4	8.8	7.9	6.6	7.7	12.0	13.7	11.9	10.2	10.5	11.9	9.6	7.6	7.5	6.3	8.4	13.7																						
5-Nov	8.0	13.5	13.0	14.1	13.1	12.0	8.7	10.1	11.6	10.5	7.7	6.0	5.9	5.9	6.2	7.2	8.1	11.1	12.1	9.9	7.1	5.4	5.0	4.4	9.0	14.1																						
6-Nov	5.0	6.0	7.6	6.4	7.1	6.6	7.4	6.1	6.1	5.4	2.2	1.9	1.4	1.4	1.5	1.3	1.5	2.2	3.7	5.2	4.7	3.4	4.7	5.0	4.3	7.6																						
7-Nov	5.5	5.9	5.0	3.2	1.6	1.1	3.6	3.7	3.0	2.5	2.1	1.8	1.7	2.3	2.4	3.3	4.5	4.9	6.0	6.2	4.3	3.2	3.1	2.2	3.5	6.2																						
8-Nov	2.9	3.8	4.9	6.7	5.7	5.9	4.9	3.4	5.0	5.0	7.0	6.2	4.4	3.0	2.9	3.1	2.9	4.0	3.8	4.1	3.9	3.8	3.5	3.1	4.3	7.0																						
9-Nov	2.5	2.2	2.1	2.0	1.8	1.9	2.0	2.0	3.5	2.2	1.5	1.3	1.1	1.1	0.8	0.5	41.3	37.9	29.7	15.2	9.4	7.6	7.1	5.1	7.6	41.3																						
10-Nov	3.9	4.8	4.4	4.7	6.1	4.9	3.4	3.2	3.5	3.7	3.6	3.5	3.8	5.3	6.3	11.1	15.1	13.9	15.5	14.8	11.1	10.4	7.4	8.1	7.2	15.5																						
11-Nov	5.9	5.7	5.5	6.2	6.3	11.8	16.2	8.9	7.6	6.9	5.6	4.9	5.2	5.1	4.2	3.8	3.7	3.8	3.5	3.4	3.5	5.3	5.2	5.8	6.0	16.2																						
12-Nov	6.2	6.5	6.2	6.1	7.4	7.8	8.1	5.4	4.8	3.9	3.4	5.2	6.3	6.5	4.9	4.2	4.5	4.8	4.2	3.9	3.6	3.6	3.5	3.3	5.2	8.1																						
13-Nov	3.1	3.0	3.0	2.9	3.0	3.5	5.6	4.0	3.5	4.2	5.1	7.0	6.2	4.6	4.1	5.1	7.2	7.7	4.9	4.3	6.5	7.0	6.5	7.4	5.0	7.7																						
14-Nov	11.1	8.8	11.0	10.5	9.2	8.8	7.6	10.8	10.3	11.8	13.9	14.7	10.6	7.5	6.9	5.5	7.9	10.2	9.6	10.2	9.9	5.2	7.9	5.8	9.4	14.7																						
15-Nov	6.3	6.9	9.9	6.7	6.5	7.2	7.6	8.3	11.5	10.7	7.4	8.1	7.6	7.7	9.0	9.2	15.3	12.5	6.3	4.6	6.2	5.1	5.2	5.7	8.0	15.3																						
16-Nov	6.4	6.9	6.6	7.8	19.9	18.3	10.0	8.1	6.3	7.7	8.6	9.2	9.3	8.7	11.6	8.7	10.0	10.2	9.0	9.7	8.4	9.0	9.4	11.7	9.6	19.9																						
17-Nov	10.9	10.4	10.6	10.5	9.9	9.4	8.6	8.8	9.1	10.1	10.6	11.2	10.5	12.1	14.1	14.6	13.6	10.7	6.9	3.1	3.3	3.1	3.0	2.6	9.1	14.6																						
18-Nov	2.1	2.2	3.4	3.5	2.9	2.8	3.1	3.1	3.1	2.9	2.8	2.7	2.7	3.0	4.1	6.2	7.8	8.8	5.3	4.0	4.8	4.6	4.4	4.4	3.9	8.8																						
19-Nov	3.3	2.9	3.5	4.5	3.8	3.9	3.9	4.8	4.3	4.9	3.7	3.9	3.9	3.9	3.6	4.0	4.7	6.1	4.1	3.1	2.5	1.7	1.6	2.1	3.7	6.1																						
20-Nov	2.4	1.8	1.6	1.5	1.7	1.9	2.3	2.6	2.7	2.7	2.7	2.7	2.8	2.7	3.8	3.1	4.3	3.2	2.6	2.7	2.8	2.5	2.6	2.7	2.6	4.3																						
21-Nov	2.9	3.0	3.0	2.9	2.9	3.0	2.8	2.8	2.7	2.9	3.0	3.5	3.5	3.3	3.2	2.8	2.8	2.2	1.9	1.8	1.9	2.1	2.2	2.1	2.7	3.5																						
22-Nov	2.2	2.6	2.5	2.4	2.0	2.2	3.0	3.0	2.9	3.8	3.9	3.0	2.6	4.1	3.5	2.8	3.3	3.1	3.1	3.3	3.4	3.4	3.6	4.0	3.1	4.1																						
23-Nov	3.9	4.3	4.2	4.1	4.2	4.1	4.3	3.6	3.2	3.5	3.9	3.9	3.9	3.8	3.7	3.7	3.4	3.2	3.0	3.0	2.7	2.7	2.9	2.6	3.6	4.3																						
24-Nov	2.7	2.9	2.9	2.9	3.1	3.3	3.4	3.3	3.3	3.4	3.9	4.3	4.1	4.1	4.0	3.7	3.6	3.5	3.7	3.5	3.5	5.2	4.1	3.5	3.6	5.2																						
25-Nov	3.6	5.9	7.9	7.1	7.4	7.1	8.2	7.5	8.1	6.9	7.2	6.8	7.7	8.5	6.5	10.4	8.0	6.5	6.3	5.3	4.5	4.5	4.7	4.0	6.7	10.4																						
26-Nov	4.5	6.6	7.8	6.1	7.3	7.6	5.9	6.1	6.7	8.3	7.1	10.4	C	C	8.5	8.8	9.0	12.5	13.8	14.7	14.9	9.7	8.0	7.0	8.7	14.9																						
27-Nov	5.5	4.1	3.0	2.3	2.4	1.9	1.7	1.6	1.9	2.1	2.4	2.3	2.1	1.7	1.8	1.7	1.6	1.7	1.9	2.1	2.1	2.1	3.1	3.9	2.4	5.5																						
28-Nov	4.3	2.1	1.9	3.5	3.8	4.5	2.6	3.5	4.3	3.9	4.7	3.8	3.5	3.2	4.1	4.6	7.7	7.5	6.1	5.6	3.9	4.9	5.8	5.0	4.4	7.7																						
29-Nov	5.1	4.6	3.5	2.5	2.5	2.6	9.9	14.7	3.1	2.6	2.7	4.0	5.2	5.9	6.8	6.1	5.3	5.5	7.8	5.1	5.8	7.4	6.5	6.3	5.5	14.7																						
30-Nov	5.6	5.2	4.8	4.8	4.7	4.6	4.8	4.5	4.9	6.7	6.7	8.9	10.2	10.7	8.1	6.7	5.8	5.3	4.9	3.9	4.1	4.3	4.4	4.5	5.8	10.7																						
																								4.9	5.1	5.4	5.1	5.5	5.6	5.7	5.6	5.4	5.5	5.3	5.6	5.3	5.4	5.7	5.9	7.9	7.8	7.0	6.2	5.6	5.0	5.0	4.8	Diurnal Average
																								11.1	13.5	13.0	14.1	19.9	18.3	16.2	14.7	11.6	11.8	13.9	14.7	10.6	12.1	14.1	14.6	41.3	37.9	29.7	15.2	14.9	10.4	9.4	11.7	Diurnal Maximum
C - Calibration																																																
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m <sup>3</sup> 24-hr 29 µg/m <sup>3</sup>																																																







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Barge Landing - November 2024**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	423	58.91	58.91
6 - 15	289	40.25	99.16
16 - 25	3	0.42	99.58
26 - 80	3	0.42	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Barge Landing - November 2024**

Concentration Ranges ( $\mu\text{g}/\text{m}^3$ )	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	58	45	19	17	6	6	19	19	18	28	36	31	28	25	19	44	418
6 - 15	17	14	7	6	4	15	14	71	35	18	19	13	11	3	11	31	289
16 - 25	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	3
26 - 80	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	3
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	75	59	26	23	10	21	34	90	57	47	55	44	39	28	30	75	713

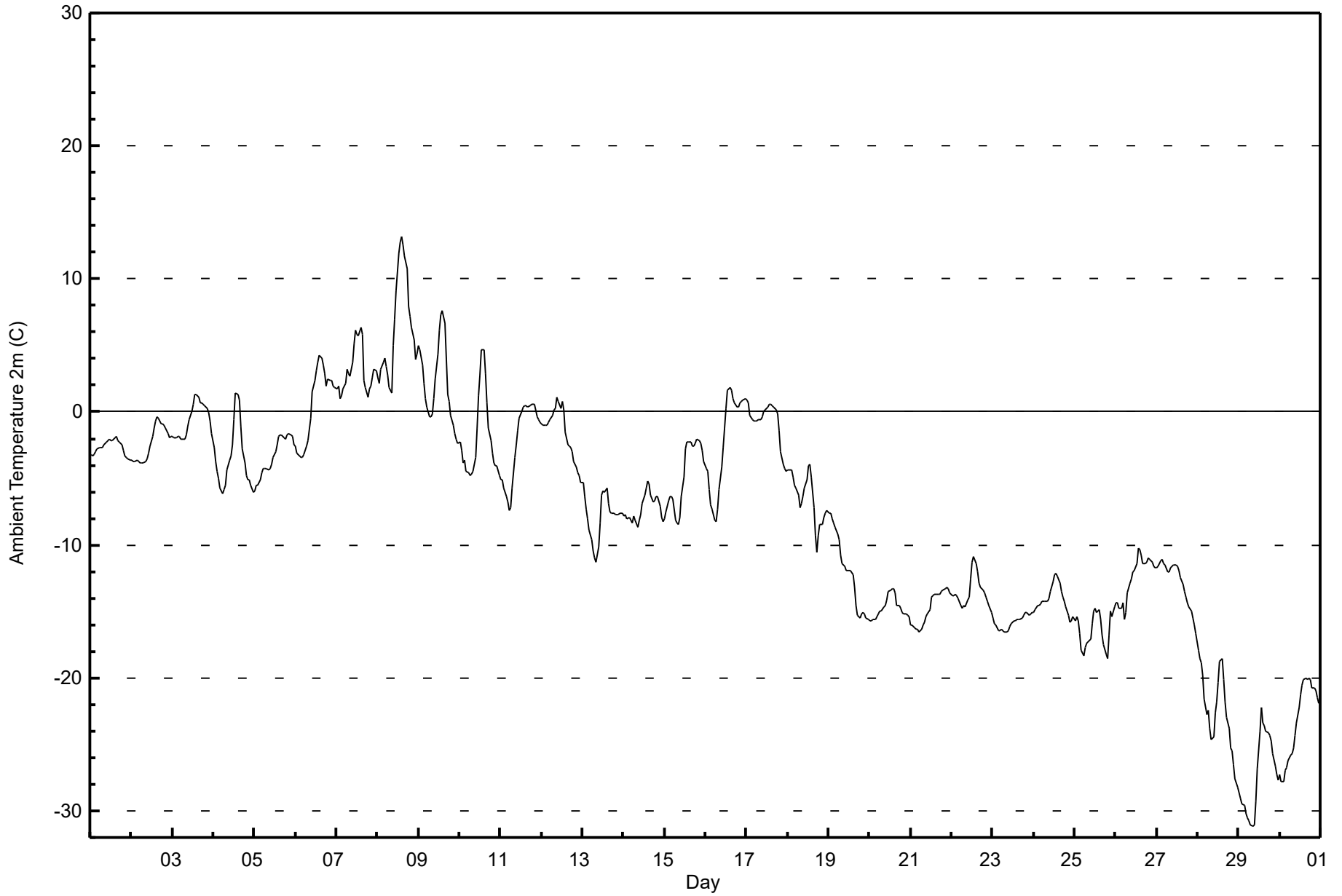
Total Number of Valid Hours: 713

Total Number of Hours: 720





Maximum Value: 13.2 C on Nov 8 15:00      Maximum Daily Average: 6.4 C on Nov 8																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: -31.1 C on Nov 29 09:00      Minimum Daily Average: -27.3 C on Nov 29 Maximum Diurnal Average: -5.4 C at hour 15      Minimum Diurnal Average: -9.3 C at hour 8 Monthly Average: -7.84 C      Percentiles: P <sub>1</sub> = -29.4 P <sub>10</sub> = -18.4 Q <sub>1</sub> = -14.5 Median = -6.2 Q <sub>3</sub> = -1.4 P <sub>90</sub> = 1.7 P <sub>99</sub> = 7.9																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	-3.3	-3.3	-3.2	-3.0	-2.7	-2.7	-2.7	-2.7	-2.5	-2.3	-2.2	-2.0	-2.2	-2.1	-2.0	-1.8	-2.2	-2.3	-2.5	-2.9	-3.3	-3.4	-3.5	-3.6	-2.7	-1.8
2-Nov	-3.7	-3.8	-3.7	-3.6	-3.7	-3.8	-3.8	-3.8	-3.8	-3.6	-3.1	-2.6	-1.8	-1.2	-0.7	-0.4	-0.5	-0.9	-0.9	-1.0	-1.2	-1.6	-1.9	-1.9	-2.4	-0.4
3-Nov	-1.9	-1.9	-1.9	-1.8	-1.8	-2.1	-2.1	-2.0	-1.7	-1.1	-0.6	0.1	0.5	1.3	1.3	1.1	0.7	0.7	0.6	0.4	0.3	0.0	-0.7	-1.7	-0.6	1.3
4-Nov	-2.7	-3.8	-4.4	-5.0	-5.7	-6.1	-5.9	-5.5	-4.4	-3.6	-3.3	-2.5	-0.5	1.4	1.3	0.9	-1.1	-2.8	-3.9	-4.8	-5.1	-5.1	-5.5	-6.0	-3.5	1.4
5-Nov	-5.9	-5.6	-5.5	-5.1	-4.6	-4.3	-4.2	-4.2	-4.4	-4.2	-3.9	-3.4	-3.0	-2.5	-1.9	-1.7	-1.7	-2.0	-2.0	-1.7	-1.7	-1.7	-1.9	-2.4	-3.3	-1.7
6-Nov	-2.6	-3.2	-3.3	-3.4	-3.5	-3.2	-2.6	-2.1	-1.4	-0.5	1.5	2.4	3.1	3.7	4.3	4.1	3.6	2.9	2.0	2.5	2.4	2.4	1.9	1.9	0.5	4.3
7-Nov	1.7	2.0	1.0	1.2	1.8	2.2	3.2	2.9	2.6	3.7	5.1	6.2	5.8	5.7	6.4	5.8	2.3	1.8	1.1	1.7	2.0	2.6	3.2	3.1	3.1	6.4
8-Nov	2.5	2.2	3.2	3.8	4.0	3.4	2.8	1.8	1.4	5.0	7.0	9.0	11.9	12.8	13.2	12.5	11.8	10.8	7.9	7.2	6.3	5.4	4.0	4.4	6.4	13.2
9-Nov	5.0	4.7	3.6	2.1	1.0	0.3	-0.3	-0.4	-0.1	1.0	2.5	4.4	6.1	7.3	7.6	6.7	3.9	1.3	0.7	-0.3	-1.0	-1.6	-2.1	-2.4	2.1	7.6
10-Nov	-2.3	-2.9	-3.9	-3.7	-4.5	-4.6	-4.7	-4.7	-4.5	-3.4	-1.2	1.2	2.7	4.7	4.7	2.9	0.7	-1.2	-2.1	-3.1	-3.8	-4.1	-4.0	-4.8	-1.9	4.7
11-Nov	-5.1	-5.2	-5.7	-6.3	-6.8	-7.4	-7.2	-5.7	-3.4	-2.5	-1.5	-0.5	0.0	0.4	0.5	0.5	0.4	0.4	0.5	0.5	0.6	-0.4	-0.6	-0.8	-2.3	0.6
12-Nov	-0.9	-1.0	-1.0	-1.0	-0.8	-0.6	-0.2	0.1	0.2	1.1	0.8	0.2	0.8	0.2	-1.5	-2.5	-2.6	-2.7	-3.0	-3.8	-4.2	-4.5	-4.8	-5.3	-1.5	1.1
13-Nov	-5.3	-6.4	-7.3	-8.1	-8.9	-9.7	-10.4	-11.0	-11.3	-10.2	-8.4	-6.2	-5.9	-6.0	-5.7	-6.9	-7.5	-7.7	-7.7	-7.7	-7.7	-7.7	-7.6	-7.6	-7.9	-5.3
14-Nov	-7.8	-7.7	-8.0	-8.0	-8.1	-8.3	-7.9	-8.2	-8.6	-8.2	-7.7	-6.9	-6.2	-5.7	-5.2	-5.4	-6.3	-6.8	-6.6	-6.4	-6.3	-7.1	-8.0	-8.3	-7.2	-5.2
15-Nov	-8.1	-7.5	-6.7	-6.4	-6.4	-6.6	-8.1	-8.4	-8.5	-7.9	-6.4	-4.9	-2.7	-2.2	-2.3	-2.2	-2.6	-2.6	-2.3	-2.1	-2.2	-2.3	-2.8	-3.7	-4.8	-2.1
16-Nov	-4.3	-4.5	-5.8	-7.0	-7.3	-8.2	-8.2	-7.3	-5.8	-4.1	-2.7	-1.3	0.3	1.6	1.9	1.6	0.9	0.7	0.3	0.3	0.7	0.8	0.9	1.0	-2.3	1.9
17-Nov	0.9	0.7	-0.3	-0.5	-0.7	-0.7	-0.7	-0.6	-0.5	-0.4	0.0	0.2	0.4	0.6	0.5	0.5	0.4	0.1	-0.1	-1.4	-3.0	-3.9	-4.2	-4.4	-0.7	0.9
18-Nov	-4.3	-4.4	-4.4	-4.9	-5.5	-5.7	-6.2	-7.1	-6.9	-6.3	-5.7	-5.1	-4.1	-4.0	-4.9	-7.2	-9.3	-10.6	-9.3	-8.4	-8.4	-7.9	-7.6	-7.5	-6.5	-4.0
19-Nov	-7.6	-7.7	-8.0	-8.3	-8.7	-9.2	-9.6	-10.8	-11.4	-11.6	-12.0	-12.0	-12.0	-12.0	-12.2	-13.2	-14.6	-15.3	-15.5	-15.2	-15.1	-15.2	-15.5	-15.6	-12.0	-7.6
20-Nov	-15.8	-15.7	-15.6	-15.6	-15.4	-15.2	-14.9	-14.9	-14.6	-14.5	-14.1	-13.5	-13.4	-13.3	-13.3	-13.6	-14.6	-14.6	-14.7	-15.1	-15.2	-15.2	-15.3	-15.4	-14.7	-13.3
21-Nov	-16.1	-16.0	-16.2	-16.4	-16.4	-16.6	-16.3	-16.0	-15.8	-15.4	-15.2	-14.9	-14.0	-13.8	-13.7	-13.8	-13.8	-13.7	-13.5	-13.4	-13.3	-13.2	-13.3	-13.6	-14.8	-13.2
22-Nov	-13.8	-13.8	-13.7	-13.8	-14.0	-14.6	-14.7	-14.6	-14.6	-14.2	-13.9	-12.6	-11.3	-10.9	-11.4	-12.0	-12.9	-13.2	-13.4	-13.6	-13.9	-14.3	-14.5	-15.1	-13.5	-10.9
23-Nov	-15.5	-15.9	-16.0	-16.4	-16.4	-16.4	-16.5	-16.6	-16.5	-16.5	-16.1	-15.9	-15.7	-15.7	-15.6	-15.6	-15.6	-15.5	-15.3	-15.1	-15.1	-15.3	-15.2	-15.1	-15.8	-15.1
24-Nov	-15.1	-14.8	-14.6	-14.6	-14.5	-14.2	-14.2	-14.2	-14.2	-14.0	-13.5	-12.8	-12.2	-12.1	-12.3	-12.9	-13.5	-13.9	-14.3	-14.7	-15.3	-15.8	-15.7	-15.4	-14.1	-12.1
25-Nov	-15.7	-15.4	-15.7	-16.7	-17.9	-18.4	-17.7	-17.4	-17.3	-17.1	-16.0	-15.0	-14.8	-15.1	-14.9	-15.7	-16.7	-17.5	-18.2	-18.5	-16.7	-15.0	-15.4	-14.6	-16.4	-14.6
26-Nov	-14.3	-14.3	-14.7	-14.8	-14.4	-15.7	-15.0	-13.6	-12.9	-12.5	-12.1	-11.9	-11.5	-10.3	-10.4	-10.7	-11.4	-11.4	-11.3	-11.0	-11.1	-11.3	-11.6	-11.7	-12.5	-10.3
27-Nov	-11.7	-11.6	-11.2	-11.1	-11.4	-11.6	-12.1	-12.1	-11.7	-11.6	-11.5	-11.5	-11.6	-11.9	-12.5	-13.0	-13.5	-13.9	-14.3	-14.7	-15.0	-15.5	-16.0	-16.7	-12.8	-11.1
28-Nov	-17.9	-18.6	-18.9	-19.8	-21.6	-22.7	-22.5	-23.8	-24.6	-24.4	-22.6	-21.8	-20.4	-18.7	-18.5	-20.2	-21.8	-23.0	-23.8	-25.3	-25.5	-26.5	-27.6	-28.2	-22.4	-17.9
29-Nov	-28.6	-29.1	-29.5	-29.6	-30.3	-30.5	-30.8	-31.1	-31.1	-31.1	-29.2	-26.8	-24.0	-22.3	-23.4	-23.6	-24.0	-24.1	-24.3	-24.7	-25.7	-26.7	-27.3	-27.7	-27.3	-22.3
30-Nov	-27.3	-27.8	-27.8	-27.0	-26.7	-26.2	-25.8	-25.7	-25.3	-24.4	-23.4	-22.2	-21.2	-20.6	-20.1	-20.1	-20.1	-20.0	-20.1	-20.7	-20.8	-21.0	-21.5	-21.9	-23.2	-20.0
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Barge Landing - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	65	9.03	9.03
-20 - 0	520	72.22	81.25
0 - 10	129	17.92	99.17
10 - 20	6	0.83	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

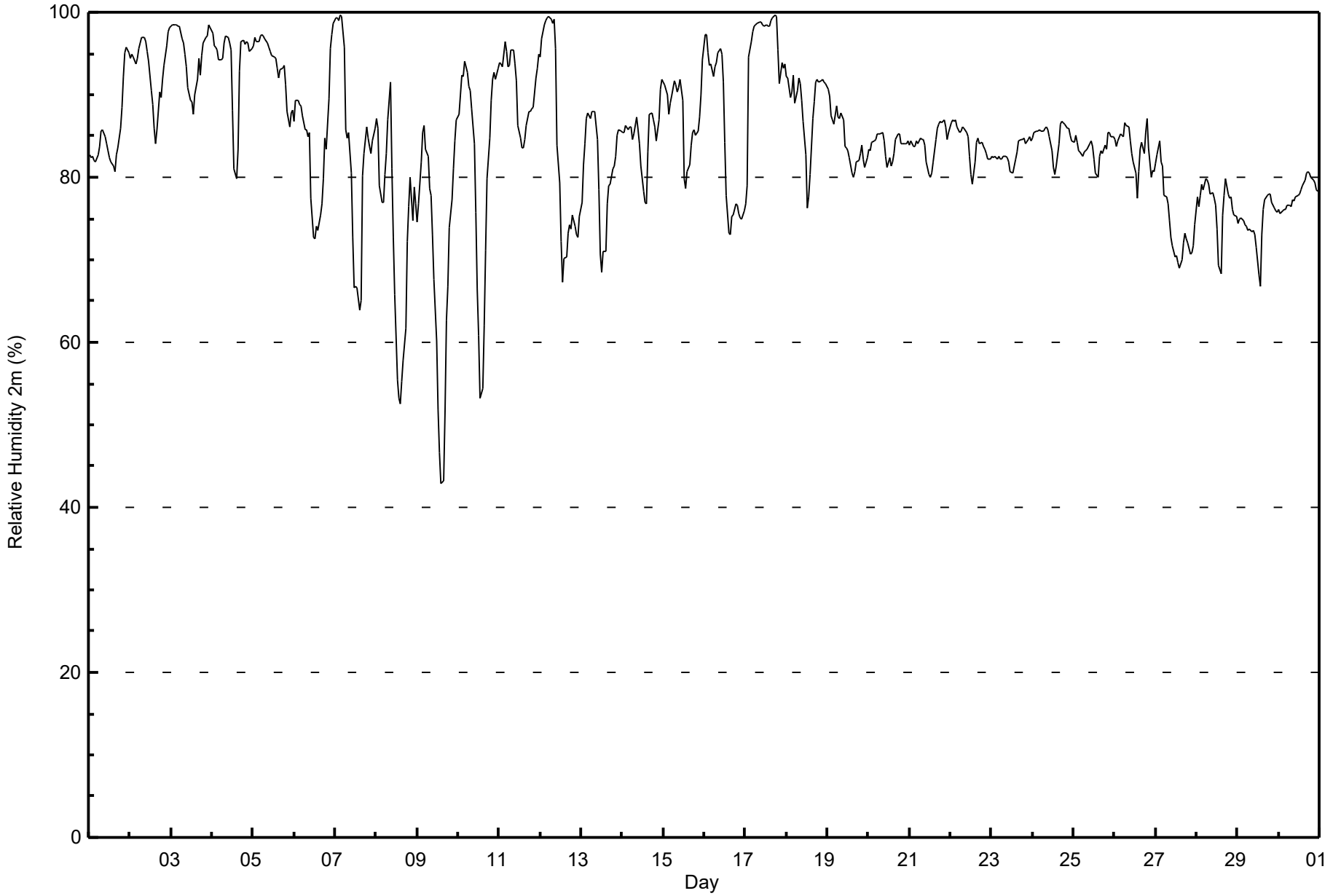
**Relative Humidity 2m (RH2) - %**  
**Barge Landing - November 2024**

Maximum Value: 99.7 % on Nov 7 04:00      Maximum Daily Average: 95.6 % on Nov 17																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: 42.9 % on Nov 9 15:00      Minimum Daily Average: 70.7 % on Nov 9 Maximum Diurnal Average: 88.0 % at hour 5      Minimum Diurnal Average: 76.2 % at hour 14 Monthly Average: 84.28 %      Percentiles: P <sub>1</sub> = 53.5 P <sub>10</sub> = 73.7 Q <sub>1</sub> = 79.7 Median = 84.5 Q <sub>3</sub> = 90.6 P <sub>90</sub> = 96.0 P <sub>99</sub> = 99.3																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	82.7	82.3	82.5	82.1	81.9	82.7	83.7	85.5	85.8	84.8	84.1	83.2	82.4	81.8	81.4	80.6	82.8	83.5	85.9	88.5	92.2	95.1	95.7	95.0	85.3	95.7
2-Nov	94.5	94.9	94.7	93.7	94.4	95.6	96.2	96.9	97.0	96.4	95.2	94.1	90.6	88.8	85.9	84.1	85.8	90.4	89.7	91.9	93.6	96.0	97.6	98.1	93.2	98.1
3-Nov	98.2	98.4	98.5	98.5	98.4	98.4	96.8	96.3	94.9	93.4	90.8	89.4	89.1	87.6	90.1	91.9	94.3	92.4	94.8	96.3	97.0	97.1	98.5	98.1	95.0	98.5
4-Nov	97.5	96.0	95.8	95.4	94.2	94.3	94.4	96.2	97.2	97.0	96.3	95.4	88.2	80.9	79.7	83.4	92.9	96.4	96.7	96.1	96.4	96.2	95.2	95.5	93.6	97.5
5-Nov	96.0	96.9	96.5	96.5	97.2	97.2	97.1	96.8	96.3	95.8	95.2	94.7	94.7	94.5	93.1	92.0	93.0	93.2	93.6	91.2	87.9	86.1	87.9	88.2	93.8	97.2
6-Nov	86.8	89.4	89.4	88.9	88.7	87.5	85.8	85.8	84.9	85.5	77.5	72.8	72.5	74.1	73.5	75.5	76.9	79.8	84.7	83.5	89.4	95.7	97.3	98.7	84.4	98.7
7-Nov	99.3	99.3	98.9	99.7	99.4	95.8	85.8	84.8	85.4	80.4	72.7	66.7	66.7	66.6	64.0	65.1	80.2	82.9	86.1	84.7	83.7	83.0	84.4	86.0	83.4	99.7
8-Nov	87.1	86.0	78.9	77.0	76.9	80.3	82.9	86.9	91.6	81.0	72.8	65.7	55.4	53.2	52.5	55.2	57.9	61.7	72.2	76.4	80.0	74.7	78.8	76.7	73.4	91.6
9-Nov	74.6	76.7	81.8	85.4	86.3	83.4	82.5	78.7	77.8	73.0	67.7	60.2	51.9	46.6	42.9	43.3	51.6	62.7	66.7	74.0	77.3	81.1	84.5	87.0	70.7	87.0
10-Nov	87.6	90.0	92.4	92.3	94.1	92.7	91.0	90.6	88.3	84.0	75.8	66.4	60.9	53.3	54.4	62.1	71.2	79.9	84.8	89.3	91.9	92.7	91.9	93.2	82.1	94.1
11-Nov	93.8	93.7	93.5	96.4	95.3	93.5	93.5	95.4	95.4	93.8	91.7	86.3	84.7	83.6	83.6	84.5	86.2	88.0	88.0	88.3	88.4	92.0	93.2	94.9	90.7	96.4
12-Nov	94.7	96.7	98.5	99.0	99.2	99.4	99.2	98.7	99.2	95.6	84.0	79.3	72.3	67.2	70.2	70.4	73.2	74.2	73.8	75.4	74.1	73.1	72.8	75.2	84.0	99.4
13-Nov	76.9	81.6	84.1	87.1	87.7	87.1	87.9	88.0	88.0	84.5	78.5	70.7	68.5	71.1	71.1	76.8	79.0	79.2	81.0	81.3	82.5	85.1	85.7	85.6	81.2	88.0
14-Nov	85.4	85.4	86.3	85.8	86.2	86.1	84.6	85.3	87.3	85.7	84.0	81.3	78.3	76.9	76.7	83.0	87.6	87.8	86.9	86.1	84.4	86.9	90.7	91.8	85.0	91.8
15-Nov	91.5	91.2	89.9	87.6	89.0	89.8	91.6	91.3	90.3	90.8	91.9	89.9	79.8	78.7	80.6	81.5	84.0	85.4	85.8	85.1	85.7	87.2	89.9	94.2	87.6	94.2
16-Nov	97.3	97.2	95.0	93.6	93.7	92.2	93.4	93.9	95.1	95.6	95.0	91.6	84.2	77.8	73.2	73.1	75.3	75.4	76.7	76.6	75.6	75.1	74.9	76.0	85.3	97.3
17-Nov	76.9	79.0	94.6	96.5	97.6	98.4	98.5	98.7	98.9	98.9	98.5	98.3	98.5	98.3	98.4	98.9	99.4	99.6	99.4	95.4	91.4	94.0	93.1	93.7	95.6	99.6
18-Nov	92.1	92.1	89.6	90.3	92.3	89.0	90.6	92.0	91.3	89.3	86.9	82.6	76.3	77.6	80.3	87.1	89.1	91.5	91.9	91.6	91.7	91.9	91.6	91.4	88.8	92.3
19-Nov	90.8	89.8	87.4	86.9	86.4	88.6	87.3	87.1	87.8	87.0	83.8	83.5	83.1	82.5	80.6	79.9	80.6	81.9	82.1	82.8	83.9	82.2	81.3	82.3	84.6	90.8
20-Nov	83.3	83.3	84.2	84.4	84.7	85.2	85.2	85.2	85.5	84.4	82.5	81.1	82.4	81.3	81.8	83.0	84.6	85.2	85.3	84.1	84.0	84.0	84.1	84.4	83.9	85.5
21-Nov	84.0	84.4	83.8	83.8	84.4	84.1	84.7	84.6	84.5	83.8	81.9	80.3	80.1	80.5	81.9	84.6	85.9	86.5	86.9	86.6	87.0	86.1	84.5	85.5	84.2	87.0
22-Nov	86.7	86.9	86.8	86.9	86.1	85.3	85.6	86.1	86.0	85.5	85.0	82.5	80.4	79.2	81.9	84.3	84.7	84.1	84.3	83.8	83.4	82.9	82.2	82.2	84.3	86.9
23-Nov	82.6	82.4	82.6	82.1	82.6	82.1	82.3	82.6	82.6	82.3	81.8	80.6	80.5	81.4	82.2	83.1	84.4	84.6	84.6	84.7	84.1	84.5	84.9	84.4	82.9	84.9
24-Nov	84.8	85.4	85.6	85.6	85.8	85.5	85.6	85.9	86.2	85.8	84.9	83.1	81.1	80.3	81.3	84.0	86.5	86.9	86.6	86.5	86.0	85.9	85.0	84.3	84.9	86.9
25-Nov	84.2	85.0	84.2	83.3	83.0	82.5	83.0	83.3	83.4	84.0	84.3	83.8	82.1	80.5	80.1	82.5	83.2	82.8	83.9	83.3	85.4	85.4	84.9	84.9	83.5	85.4
26-Nov	84.5	83.7	84.4	85.2	85.1	85.0	86.6	86.3	86.0	84.4	82.9	81.9	80.4	77.5	80.6	83.4	84.2	83.0	85.4	87.2	83.5	80.0	80.9	80.7	83.4	87.2
27-Nov	81.7	82.8	84.4	81.8	81.4	77.9	77.7	76.8	74.8	72.7	71.6	70.3	70.5	69.7	69.0	70.0	72.1	73.3	72.6	72.0	70.7	70.9	71.7	74.3	74.6	84.4
28-Nov	77.6	76.5	77.9	79.2	78.4	79.8	79.6	79.1	77.9	78.2	77.4	76.6	73.6	69.3	68.2	75.4	77.8	79.8	77.9	77.4	77.6	76.1	75.4	75.2	76.8	79.8
29-Nov	74.5	74.9	75.1	74.7	74.2	74.1	73.6	73.7	73.4	73.5	73.0	71.5	68.2	66.7	73.1	76.2	77.4	77.8	77.9	78.0	77.0	76.3	76.0	75.8	74.4	78.0
30-Nov	76.1	75.5	76.0	76.1	76.2	76.6	76.6	76.5	77.3	77.2	77.6	77.9	77.9	78.5	79.0	79.7	80.5	80.7	80.6	80.1	79.7	79.4	78.5	78.4	78.0	80.7
86.8 87.2 87.8 87.8 88.0 87.7 87.4 87.6 87.7 86.1 83.5 80.7 77.8 76.2 76.4 78.5 81.4 83.0 84.2 84.6 84.8 85.2 85.8 86.4																								Diurnal Average		
99.3 99.3 98.9 99.7 99.4 99.4 99.2 98.7 99.2 98.9 98.5 98.3 98.5 98.3 98.4 98.9 99.4 99.6 99.4 96.3 97.0 97.1 98.5 98.7																								Diurnal Maximum		



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 2m (RH2) - %**  
**Barge Landing - November 2024**



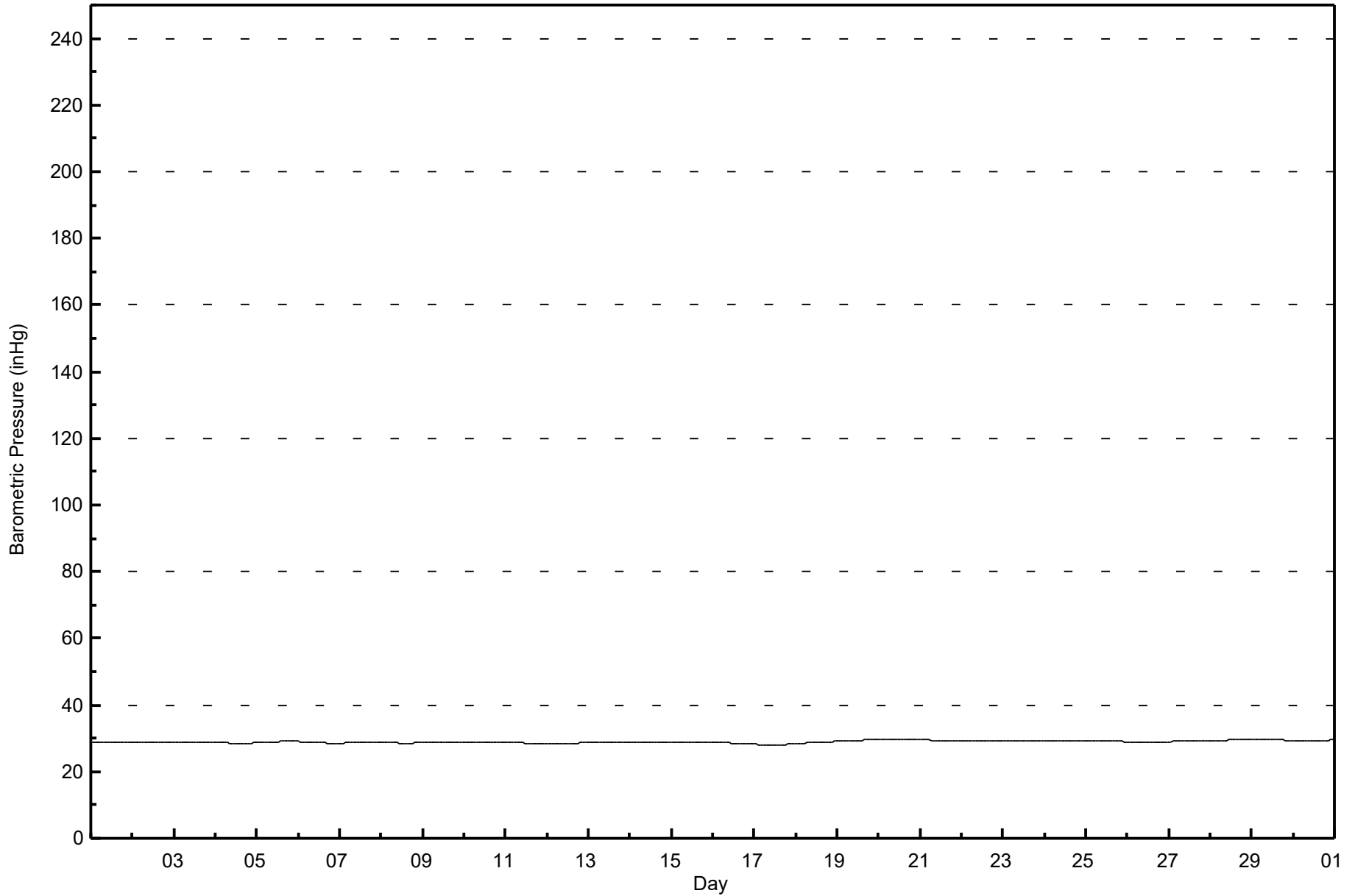






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Barometric Pressure (BP) - inHg**  
**Barge Landing - November 2024**





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Speed 10m (WS10) - km/h**  
**Barge Landing - November 2024**

Maximum Speed: 17 km/h on Nov 12 15:00	Maximum Daily Speed Average: 7.6 km/h on Nov 20	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 30 02:00	Minimum Daily Speed Average: 0.4 km/h on Nov 28	Hours of Data: 711
Maximum Diurnal Speed Average: 1.5 km/h at hour 11	Minimum Diurnal Speed Average: 0.2 km/h at hour 3	Hours of Missing Data: 9
Monthly Average Velocity: 0.2 km/h 232.2 deg	Percentiles: P <sub>1</sub> = 0 P <sub>10</sub> = 2 Q <sub>1</sub> = 3 Median = 4 Q <sub>3</sub> = 6 P <sub>90</sub> = 8 P <sub>99</sub> = 13	Percent Operational Time: 98.8

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	WSW8	SW5	S3	S4	SE3	SSE2	SE3	ESE3	E3	ESE3	WNW0	NNW2	NNW4	NNW3	N2	NE0	NNW2	SSE1	ENE3	ENE5	NE2	NE5	NE4	ENE3	E0.8	WSW8
2-Nov	ENE3	ENE3	ENE3	ENE3	ENE1	WNW2	NNW2	NNW3	N3	NNW3	NNW2	NNW3	NNE3	NE3	ESE5	ESE6	E5	NE5	NE4	ENE3	N2	NNW2	NNW3	NNW2	NE2.1	ESE6
3-Nov	NNW2	NNW2	NW2	NW1	SW1	SW2	S3	SSW3	SW4	SSW3	SSW4	SSW4	S4	SSE4	SE6	SSE5	S5	SSW3	SSE4	S3	SW3	SW4	WSW5	SSW3	SSW2.5	SE6
4-Nov	S4	SE4	SSE4	SSW4	SSW3	SE2	SSW2	SW4	SSW3	S6	SSW7	SW7	SW4	SSE5	S5	SE3	S2	SSW1	E3	ESE4	SE3	SSW3	SE4	NNW1	S2.9	SW7
5-Nov	NNW3	NW3	NW3	N3	N1	NW1	NW3	WNW3	W3	W4	W3	SW3	SW3	SW3	SW3	SW3	SSE2	S3	SW3	SW3	SW4	SW4	SSW4	SSW6	WSW1.9	SSW6
6-Nov	SSW5	SSE6	SSE8	SSE7	S8	SSE9	S9	SSE9	SSE9	SSE8	SSW10	SSW8	SSW8	SW8	SW7	S5	S5	SSE5	SE6	SE6	SE6	ESE4	N2	NNE1	S5.6	SSW10
7-Nov	WNW1	NNW5	NW2	SSW4	S3	WSW7	W8	WNW5	W6	W3	WNW6	W9	W7	W6	WSW6	SE2	ESE5	SE3	ESE5	ESE6	ESE4	SSE5	ESE5	SE4	SW1.8	W9
8-Nov	W1	S5	SSE6	SSE7	S5	SSW4	SW5	SE1	SE6	SSE8	S8	S9	S10	SSW9	SSW9	SSW8	SW8	SSW4	NNW5	NNW5	NW3	WNW2	SSW1	WSW5	SSW3.8	S10
9-Nov	WSW5	W6	WSW6	SW5	SW5	S4	S5	SSW5	SSW4	SW5	SW4	SW4	SW5	SW6	SW7	SW5	S4	SSE5	SSE4	SSE5	SSE4	SE5	SE5	SSE6	SSW3.9	SW7
10-Nov	SSE5	S4	SE1	S5	S3	SSW5	S6	SSW6	SSW6	SW5	SSW4	SSW5	SW6	S5	S5	SSE5	ESE5	ESE4	ESE4	ESE4	ESE3	ESE3	ESE3	ESE4	S3.5	S6
11-Nov	E3	ESE2	N1	N2	NW2	ESE4	SE4	ENE2	E5	ESE6	ESE9	SE15	SE12	SE10	SE12	SE8	SE8	SE5	SE4	SE3	SE2	NNW2	NNW3	NNW3	ESE4.2	SE15
12-Nov	NNW4	NNW4	NW3	NW2	WSW2	WSW3	WSW6	SW5	SW4	WSW10	W13	W10	W12	WSW15	WSW17	WSW13	WSW11	WSW13	WSW13	WSW7	WNW8	WNW7	W9	WNW3	W7.4	WSW17
13-Nov	SW4	WSW5	SW4	SW5	SW5	SW2	SSW2	W2	WSW3	W2	W3	NE5	ENE4	ENE5	NE6	NE5	NE6	NE7	NE8	NE7	NNE7	NNE7	NNE7	NNE8	NNE1.9	NE8
14-Nov	N7	NNE7	N7	N9	N9	N7	NNE7	N7	N6	N5	N6	NNE7	NNE7	NNE8	NNE7	NNE6	N5	NNW5	N4	NNW3	NNW4	N2	NNW2	W1	N5.5	N9
15-Nov	SSE1	ESE2	ESE1	SE2	SSW1	SSE3	ESE3	ESE3	ESE5	S2	SW4	SW5	SSE4	S4	S4	SSE4	SSE4	S4	S6	SSE5	SSE5	S4	WSW4	S3.0	S6	
16-Nov	WSW5	SSW3	SSE3	SE4	SE3	SE3	SW3	SW4	S5	SSE8	SSE10	SSE10	SSE11	SSE12	SSE13	SSE12	SSE12	SSE12	SSE10	SSE9	SSE9	SSE10	SSE9	SSE10	SSE7.4	SSE13
17-Nov	SSE8	SSE7	SE7	SE7	SE7	SE7	SE9	SSE6	SSE6	SSE5	SSE6	SSE7	SSE7	SSE6	SSE6	SE5	NNW1	NNW4	N7	NNW9	NW8	NW6	WNW5	W4	SSE2.7	NNW9
18-Nov	WSW2	WSW4	W6	W3	NW4	WNW4	WNW2	WNW1	SW3	W3	WNW4	NW5	NNW2	E2	ENE2	ENE1	NE2	NE3	E4	SE3	SSW1	N1	ENE1	NE1	WNW1.0	W6
19-Nov	NNE2	ENE1	NE4	NNE4	NNE5	NE5	N6	N6	NNW5	NNE5	NNE6	NNE6	NNE7	NNE8	NNE7	N5	N5	N5	N9	N11	N7	N7	N8	NNE8	NNE5.7	N11
20-Nov	NNE8	NNE9	N7	N7	N8	NNE7	NNE8	NNE8	NNE8	NNE9	NNE9	N8	N7	N6	N6	NNE6	NNE6	NNE6	NNE7	NNE9	NNE9	N8	N8	N7	NNE7.6	NNE9
21-Nov	NNE6	NNE6	NNE7	N4	NNW5	NNW5	N6	NNW4	NNW4	NNW4	WNW4	W4	NNW3	NW3	NNW3	WNW3	W2	WSW2	NW0	UO	UO	ENE3	E3	SW0	NNW2.8	NNE7
22-Nov	WSW1	W2	WSW2	WSW2	WSW1	SE1	ESE2	SE2	ESE0	UO	WSW2	ESE2	NE3	NE3	NE2	NE4	ENE3	ENE3	ENE2	ENE3	ENE4	NE3	NNE4	NNE5	NE1.3	NNE5
23-Nov	NNE5	NNE5	NE5	NNE6	NNE5	NNE6	NNE6	NNE6	NNE5	NNE6	NNE6	NNE6	NNE6	N7	N7	N7	N5	N6	N6	N5	N6	N5	N5	N5	NNE5.6	N7
24-Nov	N6	N4	N5	N5	N4	N5	N4	N4	N4	NNW3	NNW4	NNW4	N3	N4	NNW3	NNW2	NNW2	N2	N1	UO	UO	SW1	SSW2	SE3	N2.9	N6
25-Nov	SE3	SSE4	SSE4	SSE4	SSE4	SSE5	SSE4	SSE5	SSE5	SSE5	SSE4	SSE6	SSE6	S6	S5	SSE5	S4	SSE3	SSE2	SE2	SSE4	SSE5	SSE4	SSE6	SSE4.3	SSE6
26-Nov	SSE6	S6	S5	S4	S4	SSW2	SW4	SSW4	SSW4	SSW5	S5	S6	S5	S4	SSW3	W4	WSW4	WSW5	WNW3	WNW6	WNW6	WNW6	W4	W6	SW3.4	SSE6
27-Nov	W7	WSW7	W8	WNW7	WNW8	WNW7	W6	WNW5	NW8	NW9	NW9	NW10	NNW10	NNW11	NNW12	NNW11	NNW8	NNW6	NNW7	NNW8	NNW9	N8	N5	N4	NW6.8	NNW12
28-Nov	NNW3	NW4	WNW2	NW3	NNW1	W1	WNW3	NNE1	W0	SSW2	SSE1	SW2	SW3	WSW2	NE1	ESE1	ENE1	NE3	E2	ENE3	ENE1	UO	UO	SSE1	NNW0.4	NW4
29-Nov	S1	WSW1	WNW0	WSW3	WSW2	SW2	SE1	WNW1	WNW2	WSW2	SW1	SW2	W0	NNE2	N2	NW2	NW2	NNW2	N3	N4	NNW3	NNW2	N1	NNW2	NW1.0	N4
30-Nov	NE1	ESE0	UO	NW0	NNW1	NW2	WNW1	UO	N3	NNW2	NNW2	NNW3	NNW3	NNW3	NNW3	NW3	NNW3	NNW3	NW3	NNW5	N4	NNW4	N4	NNE4	NNW2.5	NNW5

W0.5	W0.4	SW0.2	SW0.4	WSW0.3	SSW0.4	SW0.7	WSW0.5	SSW0.5	SW1.1	WSW1.5	SW1.1	SW0.9	SSW0.7	SSW0.8	SSE0.7	SE0.5	ESE0.4	NE1.0	NE1.3	N1.1	N0.8	N0.9	N0.4	Diurnal Average
WSW8	NNE9	W8	N9	N9	SSE9	S9	SSE9	SSE9	WSW10	W13	SE15	W12	WSW15	WSW17	WSW13	SSE12	WSW13	WSW13	N11	NNE9	SSE10	W9	SSE10	Diurnal Maximum

UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Barge Landing - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 6 km/h on Nov 12 15:00	Hours of Data: 711
Minimum Value: 0 km/h on Nov 24 18:00	Hours of Missing Data: 9
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 1 Q <sub>3</sub> = 2 P <sub>90</sub> = 3 P <sub>99</sub> = 5	Hours of Calibration: 0
	Percent Operational Time: 98.8

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	2	2	3
2-Nov	1	1	1	2	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	2
3-Nov	1	1	0	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	2	2
4-Nov	1	1	1	1	1	1	1	2	2	2	2	1	2	2	2	1	1	1	1	1	1	1	1	1	2
5-Nov	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	2
6-Nov	2	2	2	2	3	4	3	3	3	3	4	3	3	4	3	2	2	1	1	1	1	2	1	1	4
7-Nov	1	2	1	1	1	2	3	2	2	2	2	4	3	3	2	1	1	1	1	1	1	1	1	1	4
8-Nov	1	2	2	2	1	1	1	1	2	3	3	3	4	3	3	3	3	1	2	1	1	1	1	2	4
9-Nov	2	2	2	1	2	1	1	1	2	2	1	1	2	2	2	2	1	1	1	1	1	1	1	1	2
10-Nov	1	1	1	2	1	3	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	3
11-Nov	1	1	2	1	2	1	2	1	1	1	3	5	3	3	3	3	2	2	2	1	1	1	1	1	5
12-Nov	1	1	1	1	1	1	2	2	1	3	5	4	5	5	6	5	3	4	4	3	3	3	4	2	6
13-Nov	2	1	1	2	1	2	2	2	1	1	1	2	1	1	2	2	2	3	3	2	2	2	2	2	3
14-Nov	2	3	2	2	3	2	2	2	2	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	3
15-Nov	1	1	1	1	1	1	0	1	1	1	2	2	2	2	1	1	1	1	2	2	2	1	1	1	2
16-Nov	1	1	1	1	1	1	1	1	2	3	4	4	4	5	5	4	5	4	4	3	3	4	3	4	5
17-Nov	3	2	2	2	2	2	3	2	2	2	2	2	3	2	2	1	1	1	3	3	3	2	2	1	3
18-Nov	2	2	2	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	2
19-Nov	1	1	2	1	2	2	2	2	1	2	2	2	2	2	2	2	1	2	3	3	3	2	3	3	3
20-Nov	2	3	2	2	2	2	2	2	2	3	3	3	2	2	2	2	2	2	2	3	3	3	2	2	3
21-Nov	2	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	UO	UO	1	1	1	2
22-Nov	1	1	1	1	1	1	0	1	1	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
23-Nov	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	1	2	2	1	2	2	1	2	2
24-Nov	2	1	1	1	1	2	1	1	1	1	1	1	1	1	1	0	0	1	UO	UO	1	1	1	1	2
25-Nov	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2	1	2	2
26-Nov	2	2	2	1	1	1	1	1	1	2	2	3	2	2	1	1	1	2	1	2	3	2	2	2	3
27-Nov	2	2	2	3	3	3	2	2	4	3	3	3	4	4	4	4	3	2	2	3	3	2	2	1	4
28-Nov	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	UO	UO	1	2
29-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30-Nov	1	1	UO	1	1	1	1	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	3	3	2	3	3	4	3	3	4	3	5	5	5	5	6	5	5	4	4	3	3	4	4	4	

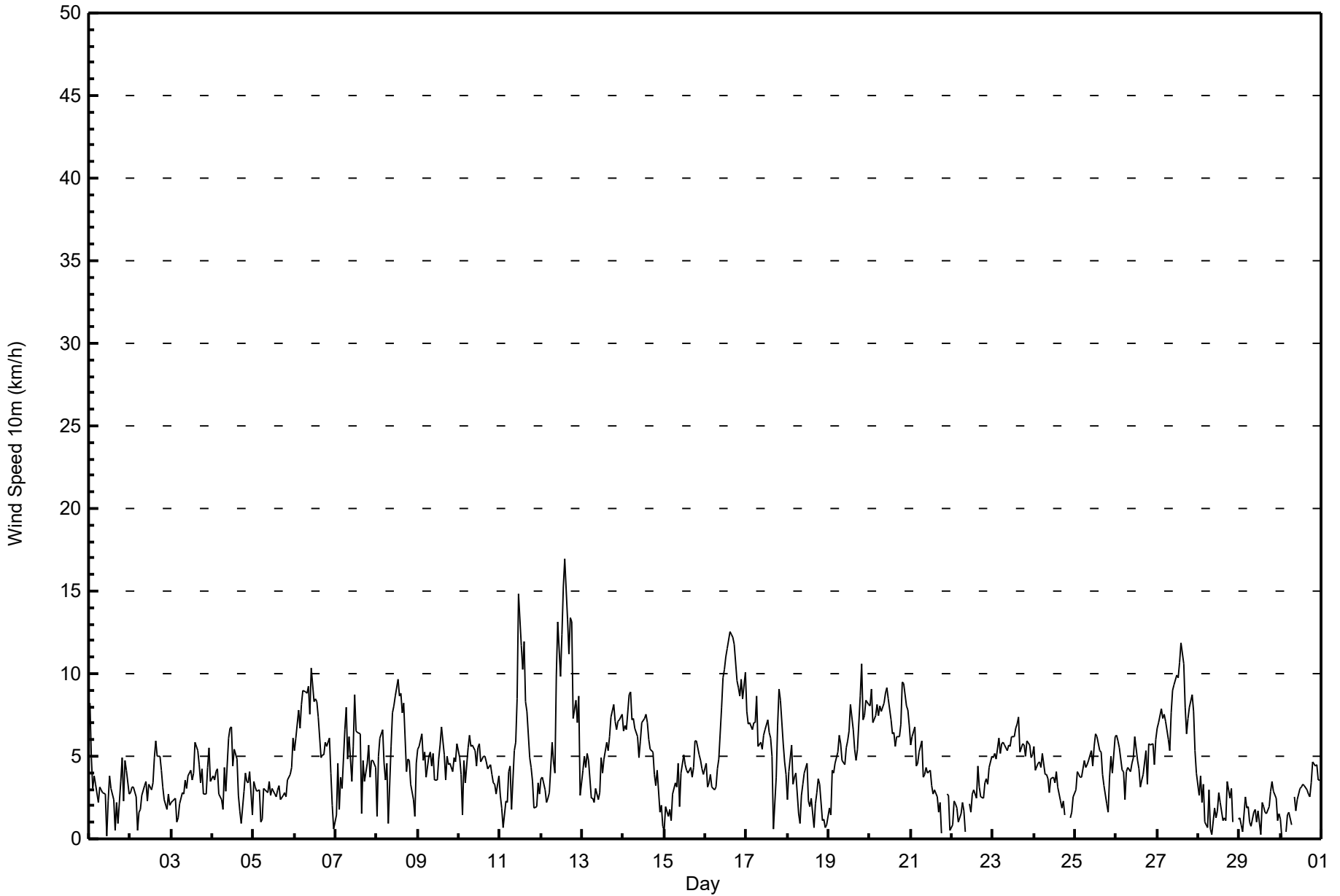
Diurnal Maximum

UO - Unstable Operation



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 10m (WS10) - km/h**  
**Barge Landing - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Barge Landing - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	486	68.35	68.35
6 - 11	209	29.40	97.75
12 - 19	16	2.25	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 711

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Barge Landing - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	42	15	23	25	9	29	31	44	37	34	46	25	19	22	22	63	486
6 - 11	35	43	5	0	0	4	13	35	11	10	7	9	13	9	6	9	209
12 - 19	0	0	0	0	0	0	3	5	0	0	0	5	2	0	0	1	16
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	77	58	28	25	9	33	47	84	48	44	53	39	34	31	28	73	711

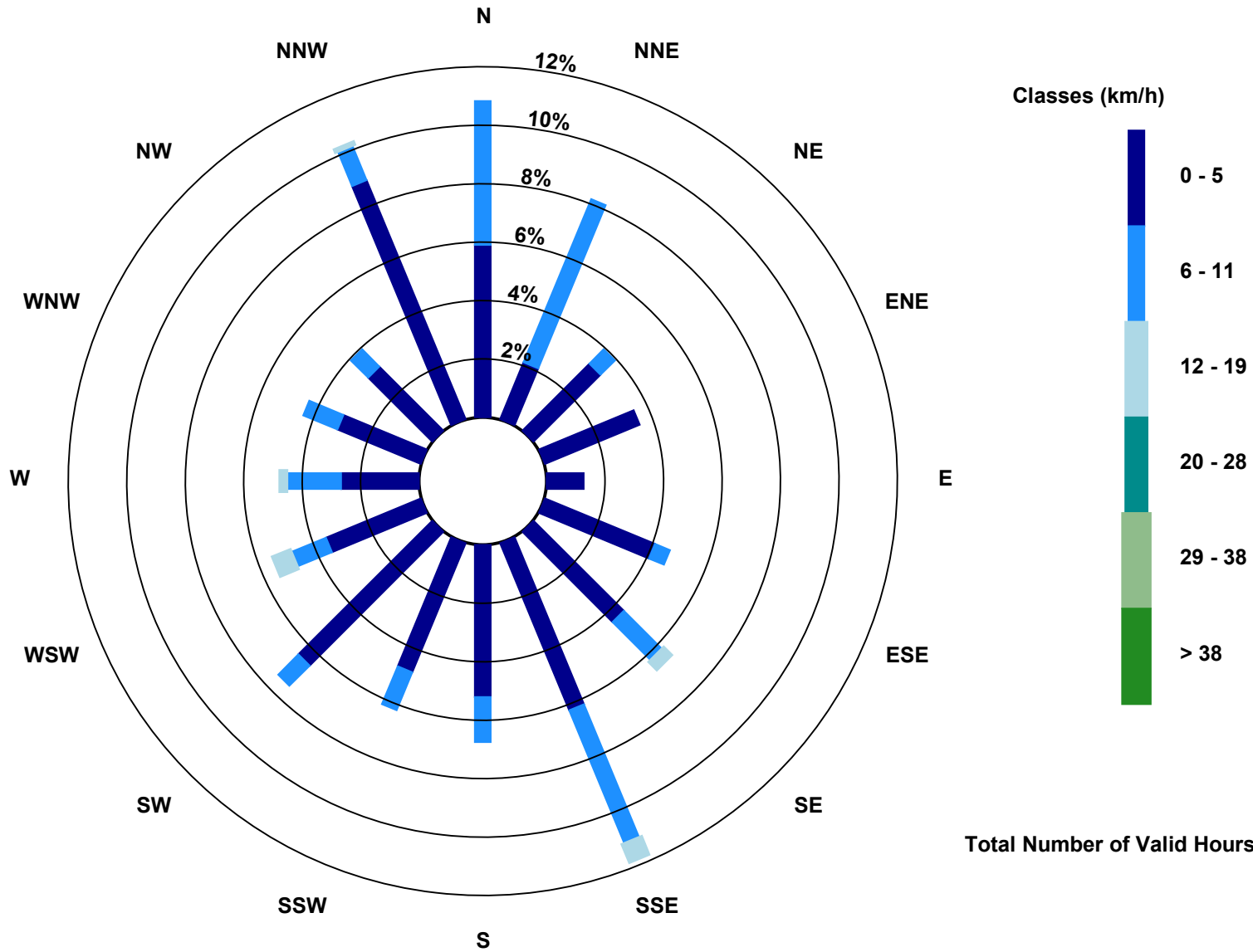
Total Number of Valid Hours: 711

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Barge Landing







**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Barge Landing - November 2024**

Direction of Maximum Speed: 255 deg on Nov 12 15:00		Hours in Service: 720
Direction of Maximum Daily Speed Average: 11.9 deg on Nov 20		Hours of Data: 711
Direction of Minimum Speed: 104 deg on Nov 30 02:00		Hours of Missing Data: 9
Direction of Minimum Daily Speed Average: 0.4 deg on Nov 28		Percent Operational Time: 98.8
Monthly Average Direction: 232.2 deg		

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	239	233	173	174	141	149	139	117	101	112	300	344	334	344	358	46	345	165	72	63	36	53	55	66	88.6
2-Nov	67	58	68	75	78	282	333	344	349	344	337	337	27	53	102	109	86	50	46	67	357	340	339	336	38.9
3-Nov	339	335	323	323	228	214	190	195	215	200	207	199	169	164	146	160	179	202	163	180	216	221	244	210	197.0
4-Nov	188	145	164	192	205	139	204	219	194	188	209	224	231	154	173	134	182	210	101	115	131	208	125	347	179.7
5-Nov	336	324	320	353	349	318	325	299	278	264	263	225	223	228	226	233	164	173	233	218	231	218	194	197	247.0
6-Nov	197	163	156	168	170	166	171	158	160	165	207	197	212	223	227	189	172	153	132	135	125	118	349	14	173.9
7-Nov	283	334	309	200	176	251	266	286	261	260	282	271	273	267	245	125	105	133	108	120	120	148	112	134	235.7
8-Nov	273	176	165	166	174	192	234	141	127	167	169	176	184	193	200	209	230	211	339	333	319	296	209	257	195.3
9-Nov	257	262	241	220	226	173	189	205	194	223	230	225	223	221	231	220	184	148	165	152	159	130	134	161	202.0
10-Nov	168	171	138	188	184	204	189	198	204	225	211	196	214	187	176	164	123	112	104	112	121	114	112	113	171.5
11-Nov	87	119	354	0	324	113	127	60	98	107	123	127	127	130	129	140	124	142	135	143	136	338	347	336	120.4
12-Nov	333	341	321	308	239	244	245	219	222	251	265	271	259	258	255	253	241	247	251	255	298	296	277	302	261.4
13-Nov	231	248	224	231	230	229	201	263	254	272	260	42	74	67	51	49	47	51	42	44	29	27	22	17	26.9
14-Nov	7	12	2	11	11	7	18	349	350	4	354	16	18	16	19	12	349	347	351	335	331	2	337	275	3.5
15-Nov	165	108	104	141	195	164	122	119	111	174	218	229	162	187	186	159	164	166	175	174	168	166	172	247	169.5
16-Nov	249	192	158	135	146	136	234	224	180	154	152	162	160	167	165	153	153	159	164	159	159	161	158	158	162.6
17-Nov	155	147	140	136	143	145	144	151	149	157	159	163	162	152	165	145	333	338	354	330	324	311	297	272	155.7
18-Nov	238	242	278	269	313	296	285	293	231	279	291	313	333	89	67	76	48	46	98	136	208	8	61	50	296.7
19-Nov	18	69	52	29	29	35	11	1	341	12	23	14	23	27	20	8	1	3	10	10	4	11	8	13	14.4
20-Nov	12	14	2	4	11	14	15	14	21	21	15	11	3	4	357	12	13	29	19	20	16	6	6	0	11.9
21-Nov	15	23	21	358	345	346	349	345	344	333	293	280	330	314	329	299	275	257	322	UO	UO	77	80	231	345.6
22-Nov	255	261	253	237	248	132	116	124	116	UO	237	110	45	44	37	53	62	75	77	73	69	35	20	17	54.6
23-Nov	29	14	39	33	25	16	16	17	14	12	25	25	18	8	9	4	355	356	1	2	1	358	3	5	12.6
24-Nov	6	354	353	355	356	4	4	4	6	343	342	347	359	354	347	335	336	350	359	UO	UO	236	193	128	355.0
25-Nov	126	161	161	153	158	149	168	168	164	168	162	165	166	174	171	168	171	148	154	128	162	167	150	148	161.0
26-Nov	161	170	178	184	180	201	216	210	211	192	188	174	180	184	198	259	239	245	283	287	285	288	274	266	216.8
27-Nov	260	250	264	283	295	287	276	288	309	314	319	325	332	338	336	336	344	344	344	340	344	351	351	6	319.0
28-Nov	338	326	302	316	344	264	289	23	275	205	149	233	234	246	47	106	68	45	97	77	67	UO	UO	153	331.4
29-Nov	172	246	291	245	252	221	129	288	289	245	226	228	271	16	350	322	313	335	353	356	346	334	359	335	310.6
30-Nov	52	104	UO	310	345	325	302	UO	358	340	331	346	333	330	335	326	342	347	324	335	349	339	360	20	342.1

278.2 267.1 232.5 219.3 236.8 205.8 225.4 243.9 211.8 222.7 236.4 225.8 215.7 208.1 203.2 165.0 135.3 104.1 50.9 43.6 5.2 1.8 10.0 5.4

Diurnal Average

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods



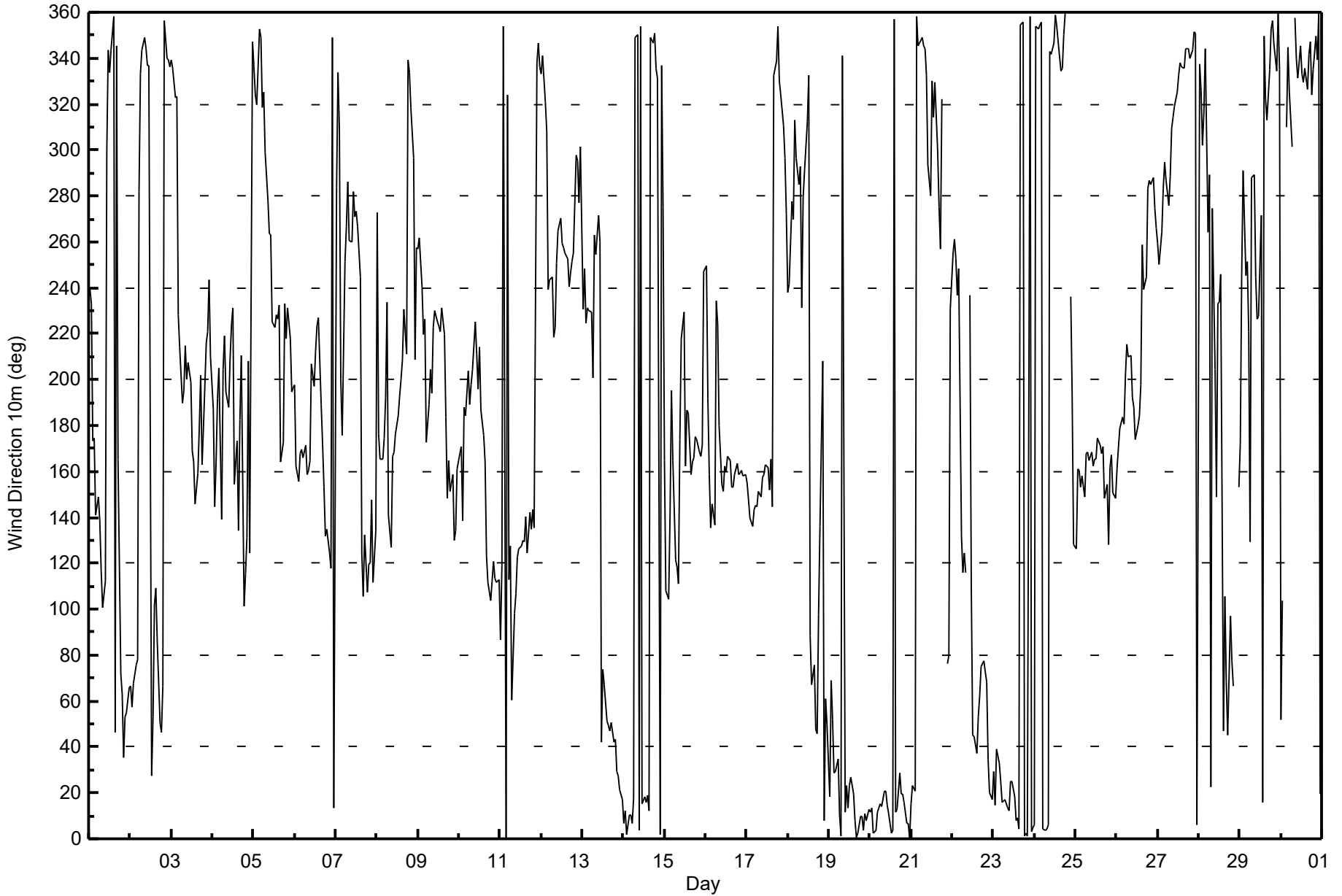
**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Barge Landing - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 100 deg on Nov 28 09:00	Hours of Data: 711
Minimum Value: 9 deg on Nov 10 18:00	Hours of Missing Data: 9
Percentiles: P <sub>1</sub> = 10 P <sub>10</sub> = 18 Q <sub>1</sub> = 20 Median = 25 Q <sub>3</sub> = 31 P <sub>90</sub> = 48 P <sub>99</sub> = 85	Hours of Calibration: 0
	Percent Operational Time: 98.8

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	21	29	28	23	17	24	38	15	26	47	97	43	18	24	39	70	27	58	32	23	52	28	31	70	97
2-Nov	28	27	22	44	90	46	45	32	15	18	38	20	26	34	25	15	21	21	30	29	31	48	20	17	90
3-Nov	12	16	15	23	45	45	35	40	25	29	26	28	35	28	20	21	26	28	20	40	34	18	14	57	57
4-Nov	30	33	21	25	45	58	28	31	51	28	29	25	32	38	33	45	46	55	26	14	28	18	29	70	70
5-Nov	15	23	22	19	60	42	19	24	27	24	25	23	25	44	33	25	16	36	28	30	33	22	28	25	60
6-Nov	30	20	22	30	26	24	26	24	25	24	25	30	30	31	34	40	27	28	12	10	10	56	39	92	92
7-Nov	73	26	56	22	41	24	26	33	19	54	33	28	30	33	23	73	14	20	13	9	20	21	14	23	73
8-Nov	68	23	21	24	26	38	20	86	19	27	24	25	31	29	26	24	20	33	23	17	25	49	80	36	86
9-Nov	29	33	20	27	30	48	28	22	41	25	37	30	29	26	19	23	25	17	17	15	20	11	15	16	48
10-Nov	27	33	77	26	32	28	24	29	24	22	28	33	29	40	30	22	20	9	15	15	26	21	26	15	77
11-Nov	38	52	63	53	47	25	24	59	17	13	15	13	16	16	15	25	14	22	18	28	68	30	21	26	68
12-Nov	21	17	37	37	34	36	20	25	26	21	27	31	25	23	22	24	20	23	22	23	26	27	30	58	58
13-Nov	21	15	25	18	20	66	53	64	47	43	44	29	39	28	25	18	18	19	24	21	18	17	19	19	66
14-Nov	21	22	18	19	21	18	21	19	18	25	20	21	20	20	20	20	17	15	17	18	20	38	37	87	87
15-Nov	73	27	43	35	32	29	10	10	9	49	34	28	37	38	32	26	29	23	23	25	23	22	18	31	73
16-Nov	18	38	30	19	23	21	33	19	29	25	25	25	25	28	27	24	24	25	25	25	27	26	26	24	38
17-Nov	23	21	19	17	18	21	20	21	21	25	27	28	27	22	25	19	89	17	22	25	20	27	28	27	89
18-Nov	60	40	31	32	19	35	70	67	25	29	28	29	54	34	23	44	22	25	38	24	72	48	66	66	72
19-Nov	22	31	22	20	22	27	21	21	20	24	21	22	19	21	18	23	22	26	21	20	20	19	19	20	31
20-Nov	18	19	21	21	19	20	19	20	19	19	19	19	20	22	20	18	18	17	19	18	19	19	20	18	22
21-Nov	19	19	18	18	18	16	17	18	19	24	29	31	27	31	27	26	24	25	42	UO	UO	18	24	84	84
22-Nov	32	18	20	40	51	26	11	9	52	UO	24	55	28	25	36	20	24	24	23	21	23	29	20	23	55
23-Nov	21	22	21	18	24	19	20	20	21	20	19	20	18	18	18	17	19	20	22	22	21	19	19	21	24
24-Nov	20	18	19	18	18	20	23	18	18	20	19	20	23	21	21	18	9	11	16	UO	UO	51	29	12	51
25-Nov	16	26	24	27	24	20	34	30	29	28	30	28	27	27	29	24	22	18	29	50	29	25	21	19	50
26-Nov	24	27	25	27	23	31	14	21	20	29	31	32	31	33	34	28	27	34	46	31	31	29	36	26	46
27-Nov	21	19	24	31	33	29	28	29	29	24	24	21	24	21	20	22	18	21	22	22	21	20	19	19	33
28-Nov	30	15	24	22	48	90	34	76	100	56	54	28	17	59	76	53	34	13	29	17	84	UO	UO	68	100
29-Nov	52	83	72	18	17	21	64	76	23	36	60	50	83	37	28	27	39	23	13	12	21	25	80	38	83
30-Nov	41	80	UO	47	27	41	57	UO	17	41	33	23	23	20	20	19	19	22	20	18	19	19	19	22	80
Diurnal Maximum																									
73 83 77 53 90 90 70 86 100 56 97 55 83 59 76 73 89 58 46 50 84 56 80 92																									

UO - Unstable Operation





Maximum Speed: 24 km/h on Nov 12 15:00	Maximum Daily Speed Average: 16.3 km/h on Nov 20	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 1 11:00	Minimum Daily Speed Average: 1.3 km/h on Nov 1	Hours of Data: 715
Maximum Diurnal Speed Average: 2.4 km/h at hour 20	Minimum Diurnal Speed Average: 0.6 km/h at hour 18	Hours of Missing Data: 5
Monthly Average Velocity: 0.4 km/h 261.6 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 3 Q <sub>1</sub> = 5 Median = 8 Q <sub>3</sub> = 11 P <sub>90</sub> = 15 P <sub>99</sub> = 22	Percent Operational Time: 99.3

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	WSW12	SW8	S6	S7	SSE6	SSE5	SE5	ESE5	E5	ESE4	W0	NNW3	NNW6	NNW5	N4	NNE2	NNW4	SE1	ENE6	NE9	NE4	NE9	NE7	NE6	E1.3	WSW12
2-Nov	ENE5	NE6	ENE6	ENE5	E1	WNW2	NNW3	NNW5	NNW6	NNW6	NNW4	NNW5	NNE5	NE6	E8	ESE9	E9	NE10	NE8	ENE6	N4	N3	NNW5	NNW3	NE3.8	NE10
3-Nov	NNW4	NNW4	NW4	NW3	UO	SW5	SSW5	SSW6	SW7	SSW5	SSW6	SSW7	S6	SSE7	SSE9	SSE10	S8	SSW7	S9	S7	SSW7	SW8	WSW10	SW7	SSW4.9	WSW10
4-Nov	SSW8	S6	S9	SSW8	SW7	SSE5	SW5	SW9	SSW5	S10	SSW10	SW10	SW6	SSE8	SSE8	SE4	S4	SSW5	S3	ESE8	SE9	SSW9	SSE7	NNE2	S5.8	SSW10
5-Nov	NNW8	NW6	NW5	N6	NNW2	NW3	NW5	WNW5	W4	WSW5	W3	SW4	SSW3	SW3	SW4	SW5	S5	S5	WSW6	SW5	WSW7	SW7	SSW8	SSW11	WSW3.3	SSW11
6-Nov	SSW10	SSE11	SSE14	SSE12	SSE14	SSE17	SSE16	SSE16	SSE16	SSE14	SSW16	SSW14	SSW13	SW12	SW11	SSW8	S10	S10	SE11	SSE10	SE11	SE8	NNE3	ENE4	S10.2	SSE17
7-Nov	W1	NNW9	NW6	SW8	SW6	WSW12	W14	WNW10	W12	W6	WNW9	W14	W11	W11	WSW8	ESE3	ESE9	SSE8	SE9	SE11	SE8	SSE10	ESE9	SE8	SW3.4	W14
8-Nov	SSW5	S12	SSE13	SSE13	S10	S8	SW9	S4	SE11	S15	SSE15	S15	S15	S14	SSW14	SSW13	SW14	SSW9	NNW10	NNW10	NW7	WNW5	WSW5	WSW9	SSW7.5	S15
9-Nov	W10	W10	WSW11	SW10	SW11	SSW7	SSW10	SSW10	SSW9	SW8	SW5	SW4	SW6	SW7	SW9	SW9	SSW8	S11	S10	S11	S10	S10	SSE10	S13	SSW7.9	S13
10-Nov	S10	S8	SSE4	S9	S7	SSW10	SSW11	SSW10	SSW10	SW9	SSW6	S8	SSW7	S7	S8	SSE9	SE9	SE8	ESE9	ESE8	ESE7	ESE7	ESE6	SE7	S6.9	SSW11
11-Nov	E7	ESE6	ESE4	NW2	NW6	ESE7	SE9	E5	E10	ESE10	SE14	SE22	SE17	SE15	SE17	SE13	SE12	SE8	SE7	SE6	SE5	WSW1	NNW7	NNW5	ESE7.1	SE22
12-Nov	NNW6	NNW7	NW5	NW3	SW4	WSW5	WSW10	SW9	SW8	WSW16	W21	W17	W18	W23	WSW24	WSW20	WSW17	WSW20	WSW20	WSW11	WNW15	WNW13	W15	WNW5	W12.0	WSW24
13-Nov	SW7	WSW9	SW8	SW10	SW9	WSW5	SW4	W5	W6	W4	W3	NE8	ENE6	ENE8	NE10	NE13	NE15	NE16	NE14	NNE14	NNE14	NNE14	NNE14	NNE14	NNE4.1	NE16
14-Nov	N12	N12	N11	N16	N16	N12	NNE14	NNW11	NNW11	N9	N10	NNE13	NNE14	NNE14	NNE13	N11	NNW10	NNW10	NNW8	NNW6	NW7	NNE5	N4	NW2	N10.1	N16
15-Nov	WSW2	ESE4	ESE2	SE2	NW3	S5	SE6	SE7	ESE9	SSE5	SSW6	SW7	SSE6	S6	S6	SSE8	SSE7	SSE8	S10	S11	SE9	SSE10	S8	WSW7	SSE5.6	S11
16-Nov	WSW7	S5	S6	S7	S6	S6	SSW6	SSW8	S9	SSE13	SSE16	SSE19	SSE20	SSE21	SSE24	SSE21	SSE22	SSE21	SSE17	SSE17	SSE16	SSE18	SSE15	SSE18	SSE13.5	SSE24
17-Nov	SSE14	SSE12	SE11	SE10	SE11	SSE12	SSE15	SSE10	SSE11	SSE10	SSE12	SSE12	SSE13	SSE11	SSE11	SSE9	SW1	NNW8	N13	NW17	NW16	WNW10	WNW8	W7	SSE4.8	NW17
18-Nov	WSW5	WSW7	W11	W6	WNW8	WNW8	WNW4	WNW4	SW6	W6	WNW7	NW8	NNW4	E3	ENE5	ENE5	NE8	NE9	ENE9	ESE5	SE2	N3	NNE1	ENE3	NW2.0	W11
19-Nov	NNE5	NE4	NE9	NNE9	NNE10	NNE11	NNE12	N11	NNW8	N9	NNE12	N11	NNE14	NNE18	NNE14	NNE12	N10	N11	N17	N21	N13	N14	N16	N16	NNE11.7	N21
20-Nov	N16	N19	N13	N14	N17	N16	NNE17	NNE17	NNE19	NNE21	NNE20	N18	N14	N13	N12	N12	NNE14	NNE16	NNE16	NNE23	NNE22	N16	N17	N14	N16.3	NNE23
21-Nov	NNE13	NNE15	NNE17	N9	NNW10	NNW11	NNW12	NNW8	NNW8	NNW8	WNW7	WNW7	NW5	NW4	NW5	WNW5	W4	WSW4	WNW1	UO	WSW0	ENE5	ENE6	SSW1	NNW5.7	NNE17
22-Nov	W3	W5	WSW4	WSW4	WSW3	SSW2	SSE3	S2	SSW1	UO	SW3	E3	NE5	NE6	NNE5	NE10	NE7	ENE5	ENE6	ENE8	ENE8	ENE7	NNE10	NNE11	NE2.5	NNE11
23-Nov	NNE11	NNE11	NNE10	NNE14	NNE11	NNE12	NNE13	NNE12	NNE11	N11	NNE13	NNE14	NNE14	N13	N14	N13	N11	N11	N10	N10	N12	N11	N9	N10	N11.5	NNE14
24-Nov	N11	N8	N9	N9	N8	N10	N7	N8	N7	NNW6	NNW6	NNW7	N6	N7	NNW5	NNW4	NNW5	NNW6	N5	E2	SE1	WSW3	SW5	SSE4	N5.2	N11
25-Nov	SSE7	SSE9	SSE9	SSE8	SSE8	SSE10	SSE9	SSE9	SSE9	SSE10	SSE8	SSE11	SSE12	S11	SSW11	SSE11	S9	SSE8	SSE6	SSE7	SSE10	SSE11	SSE10	SSE12	SSE9.3	SSE12
26-Nov	SSE14	SSE13	S12	S10	S9	S7	SSW10	SSW9	SSW8	S8	S9	SSE12	S9	S7	SSW5	WSW6	WSW7	WSW9	W6	W11	WNW11	W11	W9	W11	SSW6.6	SSE14
27-Nov	W11	WSW12	W15	W14	WNW14	WNW13	W12	WNW11	WNW15	NW17	NW18	NW18	NNW19	NNW21	NNW23	NNW20	NNW15	NNW12	NNW14	NNW15	NNW16	NNW15	N10	N9	NW13.2	NNW23
28-Nov	NNW7	NW8	NW6	NW8	NW6	WNW4	WNW8	NW4	W3	SW5	S1	SSW2	SSW3	SW2	NE2	ENE3	ENE3	NE10	ENE7	ENE9	ENE6	SW2	W4	WSW3	NNW2.0	NE10
29-Nov	SW3	SW5	WSW4	WSW6	WSW5	SW5	SW3	W4	WNW4	WSW4	SW2	SW2	WSW0	NNE3	N3	NNW3	NNW3	NNW4	N7	N8	NNW7	NNW6	N4	NNW4	WNW2.3	N8
30-Nov	N3	UO	UO	NNE2	NNW3	NNW3	N1	NNW2	N5	N3	NNW3	NNW4	NNW5	NNW5	NNW5	NNW5	NNW5	NNW5	NNW6	NNW9	NNW8	NNW9	N6	NNE7	NNW4.6	NNW9

WNW1.1	W0.8	WSW0.7	WSW1.1	WSW1.3	SW1.3	WSW1.5	WSW1.5	SW1.0	SW1.8	WSW2.1	SW1.4	SSW0.8	SW0.6	SSW0.8	SSE0.8	SE0.7	E0.6	NE2.0	NE2.4	N1.7	N1.1	NNW1.4	N0.9		Diurnal Average
N16	NNE19	NNE17	N16	N17	SSE17	NNE17	NNE17	NNE19	NNE21	W21	SE22	SSE20	W23	WSW24	SSE21	SSE22	SSE21	WSW20	NNE23	NNE22	SSE18	N17	SSE18		Diurnal Maximum

UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

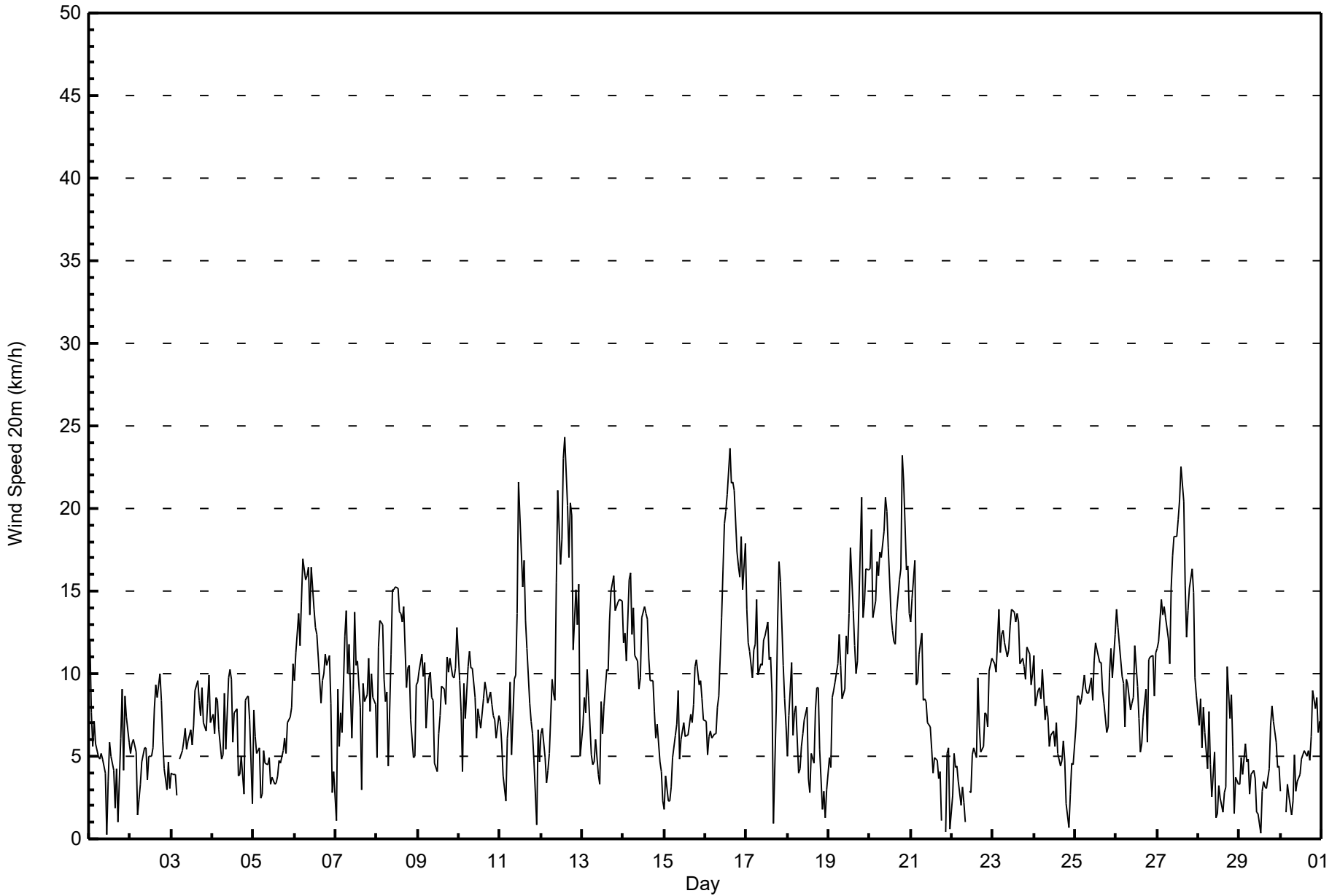
**Wind Speed 20m (WS20) - km/h**  
**Barge Landing - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Nov 19 19:00 Minimum Value: 0 km/h on Nov 22 07:00 Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 6																	Hours in Service: 720 Hours of Data: 715 Hours of Missing Data: 5 Hours of Calibration: 0 Percent Operational Time: 99.3									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	3	3	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1	3	2	2	2	3	3	3	
2-Nov	1	2	1	2	1	2	2	1	1	1	1	1	2	2	2	2	2	2	3	2	2	1	1	1	3	
3-Nov	1	1	1	1	UO	1	1	2	2	1	2	2	1	1	2	2	2	1	1	1	1	1	2	3	3	
4-Nov	1	1	1	1	2	1	1	3	2	3	3	3	1	2	2	1	1	1	1	1	1	1	2	2	3	
5-Nov	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	2	2	3	3	
6-Nov	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	3	3	2	1	1	1	3	2	2	4	
7-Nov	1	3	2	1	2	3	3	3	2	2	4	5	4	3	2	2	1	1	2	1	2	2	2	2	5	
8-Nov	1	2	2	3	2	2	2	3	3	4	3	3	4	4	4	3	3	2	3	2	2	2	2	3	4	
9-Nov	3	3	2	2	3	2	2	2	3	2	2	2	2	2	2	2	1	2	1	1	1	1	1	2	3	
10-Nov	2	2	2	2	1	3	3	2	2	3	2	2	2	2	2	1	1	1	1	1	1	1	1	1	3	
11-Nov	1	1	1	2	2	4	2	2	2	2	4	5	4	3	3	3	2	2	2	1	1	1	2	1	5	
12-Nov	1	2	1	1	1	1	2	2	2	4	6	5	5	6	7	5	4	5	6	3	4	4	6	3	7	
13-Nov	3	1	2	2	2	3	2	2	1	1	1	4	2	2	3	2	3	4	5	4	4	4	3	4	5	
14-Nov	3	4	3	3	4	3	5	3	3	3	3	4	3	3	3	3	2	2	1	1	1	1	1	2	5	
15-Nov	2	1	2	1	1	1	1	1	1	2	2	2	2	2	2	2	1	2	2	2	2	2	1	1	2	
16-Nov	1	1	1	1	1	1	2	1	2	3	3	4	4	5	6	5	5	5	4	4	4	4	4	4	6	
17-Nov	4	3	3	2	2	2	3	2	2	2	2	2	3	2	2	2	2	2	5	5	4	3	2	2	5	
18-Nov	2	3	3	1	2	2	1	1	1	1	2	2	2	1	1	1	2	3	3	1	1	1	1	2	3	
19-Nov	1	1	3	2	4	3	4	3	2	3	4	3	3	4	3	3	2	4	7	5	5	4	4	5	7	
20-Nov	5	5	4	4	4	5	5	4	4	6	5	5	4	4	4	3	3	4	5	5	5	4	5	3	6	
21-Nov	4	4	4	3	2	3	3	2	2	2	2	2	2	1	1	1	1	1	1	UO	1	3	2	1	4	
22-Nov	1	1	1	1	1	1	0	0	1	UO	1	1	1	2	2	2	2	1	2	2	2	2	3	4	4	
23-Nov	3	3	3	4	3	3	3	3	3	3	3	3	3	3	4	3	2	3	3	3	3	3	2	3	4	
24-Nov	3	2	2	2	2	3	2	2	2	1	1	1	1	1	1	1	0	1	1	1	1	2	1	1	3	
25-Nov	2	1	2	1	2	2	3	2	2	2	2	2	3	3	3	2	2	2	1	2	2	2	2	3	3	
26-Nov	2	2	2	2	2	1	1	2	2	2	2	4	2	3	2	2	1	3	2	3	4	3	3	2	4	
27-Nov	3	3	3	4	4	3	3	3	6	5	5	5	6	6	6	6	4	3	3	4	5	4	3	2	6	
28-Nov	2	2	1	2	1	2	1	2	2	2	1	1	1	2	2	2	1	3	2	2	4	1	2	1	4	
29-Nov	1	1	1	1	1	2	1	2	2	1	1	1	1	2	1	1	1	1	1	1	1	1	2	1	2	
30-Nov	2	UO	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
																	Diurnal Maximum									
																	5 5 4 4 4 5 5 4 6 6 6 5 6 6 7 6 5 5 7 5 5 4 6 5									
UO - Unstable Operation																										



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 20m (WS20) - km/h**  
**Barge Landing - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 20m (WS20) - km/h**  
**Barge Landing - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	193	26.99	26.99
6 - 11	353	49.37	76.36
12 - 19	148	20.70	97.06
20 - 28	21	2.94	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 715

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 20m (WS20) - km/h  
Barge Landing - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	12	10	4	10	6	7	7	6	9	11	24	19	13	10	14	31	193
6 - 11	34	13	18	13	4	13	21	45	44	31	29	16	15	13	11	33	353
12 - 19	28	32	4	0	0	1	5	33	6	5	2	5	9	5	5	8	148
20 - 28	1	4	0	0	0	0	1	6	0	0	0	4	2	0	0	3	21
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	75	59	26	23	10	21	34	90	59	47	55	44	39	28	30	75	715

Total Number of Valid Hours: 715

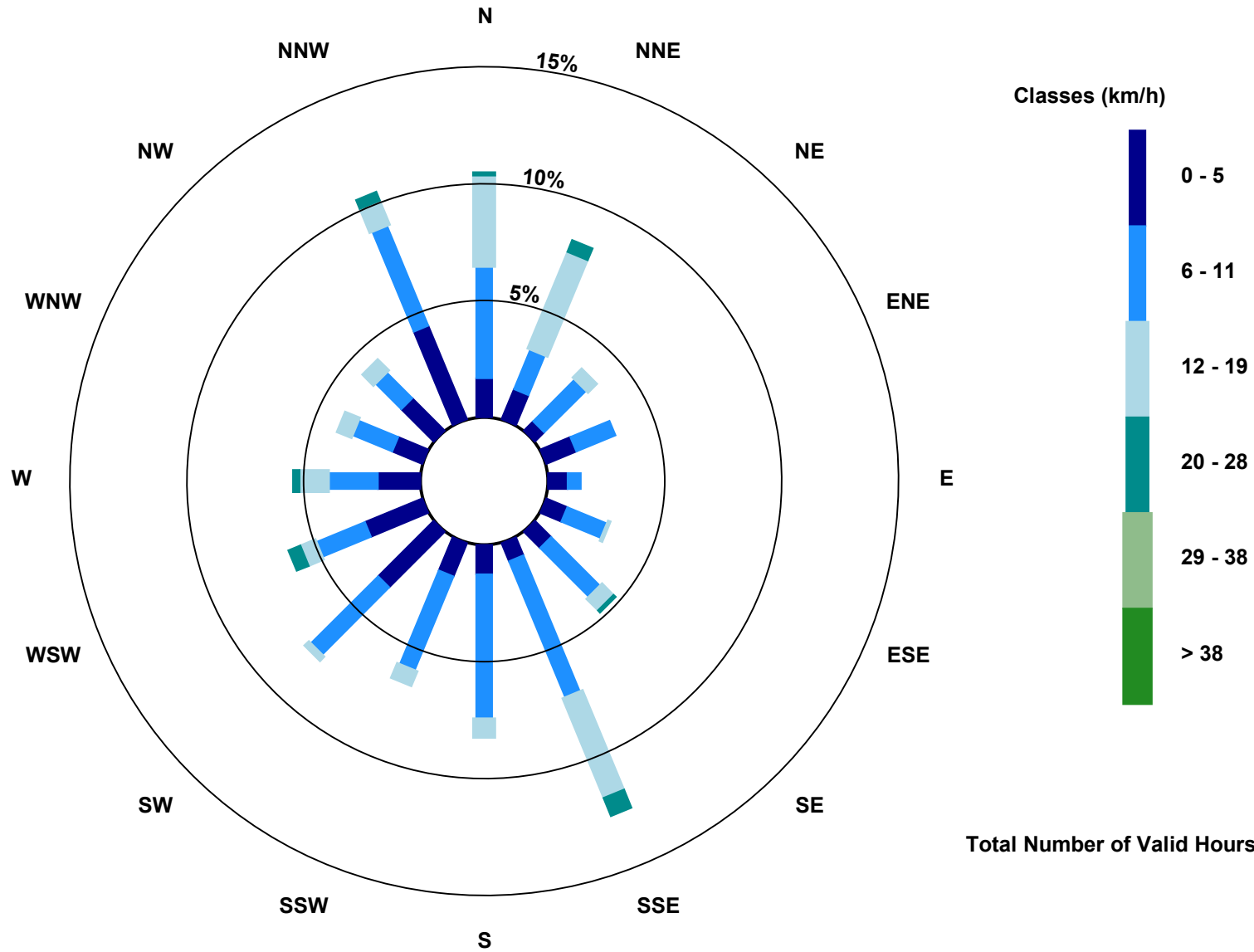
Total Number of Hours: 720





Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 20m (WS20) - km/h  
Barge Landing





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 20m (WD20) - deg**  
**Barge Landing - November 2024**

Direction of Maximum Speed: 255 deg on Nov 12 15:00																		Hours in Service: 720	
Direction of Maximum Daily Speed Average: 9.8 deg on Nov 20																		Hours of Data: 715	
Direction of Minimum Speed: 259 deg on Nov 1 11:00									Direction of Minimum Daily Speed Average: 1.3 deg on Nov 1									Hours of Missing Data: 5	
Monthly Average Direction: 261.6 deg																		Percent Operational Time: 99.3	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	238	235	176	180	154	168	142	116	99	112	259	342	328	344	357	28	346	138	60	54	43	50	49	51	78.8
2-Nov	60	53	63	75	83	285	337	342	343	343	345	340	28	49	101	109	84	49	41	58	5	4	336	347	38.7
3-Nov	337	331	320	318	UO	220	206	201	217	204	204	198	172	165	149	158	181	207	174	183	210	215	242	223	200.5
4-Nov	202	170	176	198	216	163	222	222	199	183	207	217	223	156	167	134	189	220	182	118	141	193	162	14	186.3
5-Nov	334	323	318	357	348	304	321	290	272	258	259	220	209	226	220	234	179	188	240	232	243	221	200	198	249.9
6-Nov	195	165	157	167	165	162	168	159	159	167	203	195	212	222	229	195	180	170	142	147	136	129	19	72	172.1
7-Nov	272	332	321	218	217	255	270	283	263	266	284	275	273	267	246	121	114	153	125	129	131	150	115	133	233.7
8-Nov	205	173	165	165	173	180	225	188	137	169	168	173	180	190	196	207	225	205	333	332	314	293	244	256	193.9
9-Nov	261	261	242	231	232	207	199	209	202	220	235	215	217	216	228	220	200	171	177	171	175	169	165	171	206.0
10-Nov	175	178	164	191	189	207	194	198	201	216	201	187	206	181	169	164	138	139	117	109	116	114	119	127	169.7
11-Nov	101	118	122	308	313	106	130	101	94	107	124	127	128	132	132	141	126	142	138	146	137	249	345	343	122.9
12-Nov	330	336	317	311	236	241	245	218	225	250	265	270	259	259	255	254	240	247	251	254	290	288	273	295	261.1
13-Nov	232	246	222	227	229	244	230	259	259	272	269	37	64	59	45	44	40	43	36	38	25	24	19	13	17.8
14-Nov	5	10	359	8	7	4	15	348	348	2	352	13	17	15	15	9	345	343	347	332	325	16	350	319	1.8
15-Nov	245	107	106	145	215	178	130	142	112	166	210	225	161	180	177	157	163	166	171	171	168	167	172	241	168.7
16-Nov	247	191	173	176	180	171	209	210	173	155	152	158	159	162	161	154	154	158	161	157	158	158	157	157	163.0
17-Nov	155	149	143	140	145	148	147	154	150	156	157	160	159	153	163	151	224	339	353	324	318	300	289	270	161.6
18-Nov	249	240	275	271	302	288	286	294	231	276	286	304	330	86	63	59	43	46	66	117	125	9	26	61	314.8
19-Nov	25	45	45	25	24	27	12	359	339	9	19	11	19	23	16	12	5	11	10	7	4	8	7	11	13.3
20-Nov	11	11	1	1	10	11	12	12	16	17	12	9	1	0	354	9	13	23	16	16	12	4	5	357	9.8
21-Nov	13	20	17	358	343	343	346	342	341	329	290	282	323	312	322	290	272	258	294	UO	241	64	74	197	345.6
22-Nov	259	260	256	237	247	203	160	176	196	UO	233	100	40	40	31	44	50	65	68	63	58	31	17	15	38.4
23-Nov	23	13	32	28	24	14	15	14	13	9	19	20	16	6	7	2	352	353	2	2	359	354	3	4	10.5
24-Nov	6	354	351	352	356	5	6	6	7	342	334	341	355	350	344	333	338	348	358	79	133	243	230	162	352.2
25-Nov	148	163	165	159	162	157	163	164	162	166	161	165	162	170	167	165	169	157	162	151	163	166	156	151	161.7
26-Nov	160	167	171	174	173	186	202	201	199	184	177	167	172	178	193	251	240	243	277	279	282	281	273	269	207.7
27-Nov	261	252	266	281	286	282	276	286	303	305	309	316	329	332	330	332	340	339	338	337	338	348	353	5	314.8
28-Nov	341	322	308	313	323	292	294	319	275	226	190	211	210	234	43	58	65	41	72	69	70	221	269	256	333.8
29-Nov	224	218	239	243	239	228	220	262	292	255	218	226	257	17	3	334	337	337	355	359	344	334	356	333	302.4
30-Nov	354	UO	UO	26	347	335	11	332	354	351	327	344	330	331	332	326	343	344	321	330	347	337	356	17	342.1

286.0 271.9 236.8 243.3 257.5 234.3 238.2 247.0 229.7 225.5 240.3 225.6 212.9 214.4 195.3 146.5 124.5 93.6 39.0 39.6 4.9 349.9 348.1 352.8

Diurnal Average

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

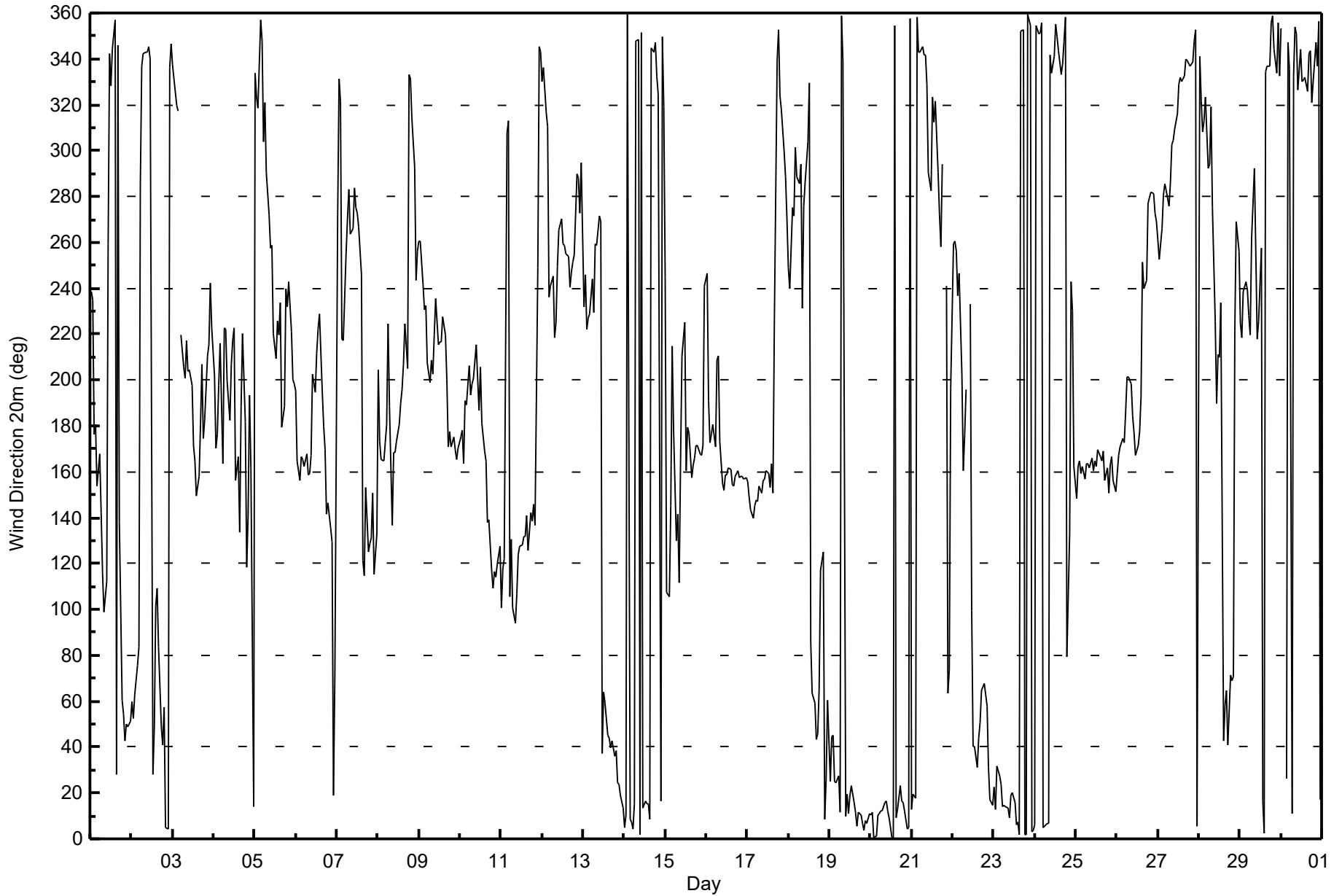
**Wind Direction 20m (WD20) - deg**  
**Barge Landing - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 100 deg on Nov 7 01:00	Hours of Data: 715
Minimum Value: 6 deg on Nov 10 21:00	Hours of Missing Data: 5
	Hours of Calibration: 0
	Percent Operational Time: 99.3
Percentiles: P <sub>1</sub> = 7 P <sub>10</sub> = 11 Q <sub>1</sub> = 13 Median = 16 Q <sub>3</sub> = 21 P <sub>90</sub> = 34 P <sub>99</sub> = 78	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	17	23	17	16	12	18	36	10	13	37	93	33	17	21	28	61	23	78	28	14	35	15	22	45	93
2-Nov	21	20	16	27	90	54	30	21	12	13	28	16	16	28	21	13	19	13	20	23	28	52	11	24	90
3-Nov	9	13	11	16	UO	10	22	24	14	17	18	17	24	16	12	11	19	15	11	17	20	11	8	39	39
4-Nov	20	31	10	19	27	34	14	15	33	17	20	19	29	30	18	37	29	20	45	9	21	7	19	75	75
5-Nov	17	18	21	19	42	38	13	19	17	14	18	14	18	35	30	16	12	24	14	16	19	13	19	16	42
6-Nov	20	11	12	14	12	11	13	12	13	16	16	18	22	23	24	24	15	20	10	6	7	29	54	26	54
7-Nov	100	30	40	14	21	17	14	18	10	36	22	17	16	21	18	60	13	11	15	7	12	15	9	17	100
8-Nov	25	11	9	13	12	18	11	55	15	11	12	13	18	17	17	16	13	23	20	13	23	35	25	17	55
9-Nov	17	16	12	12	12	38	17	13	32	18	34	34	25	19	16	14	14	8	9	7	8	8	9	7	38
10-Nov	16	22	62	16	17	16	12	16	13	17	21	21	24	28	19	11	14	10	13	11	6	10	10	7	62
11-Nov	14	26	48	91	25	35	13	35	12	9	12	10	12	12	11	17	11	14	12	19	23	78	13	19	91
12-Nov	15	12	30	33	25	23	14	16	15	14	16	17	17	16	15	17	14	15	16	17	16	16	16	39	39
13-Nov	20	10	20	9	15	54	51	28	12	29	35	24	34	21	17	12	12	14	16	14	13	12	13	14	54
14-Nov	18	17	16	14	16	15	15	15	21	16	16	14	13	14	16	13	10	11	14	15	22	46	59	59	59
15-Nov	51	17	45	36	20	22	11	7	10	34	28	24	25	24	21	15	15	13	12	13	13	10	9	26	51
16-Nov	13	31	17	16	13	13	20	10	16	14	13	12	13	14	13	12	13	13	13	13	13	13	13	12	31
17-Nov	12	11	11	11	11	12	12	12	11	11	13	12	11	11	11	10	81	12	20	23	15	17	18	18	81
18-Nov	48	33	16	20	11	19	39	29	17	18	16	22	44	57	15	21	11	12	24	17	64	18	41	56	64
19-Nov	16	20	16	14	17	18	15	18	14	20	14	15	14	13	13	15	17	19	15	16	16	15	15	15	20
20-Nov	15	14	16	18	14	15	14	14	12	13	14	15	17	17	16	13	13	12	14	13	14	17	17	15	18
21-Nov	14	13	12	15	14	12	14	13	14	21	18	19	21	23	22	15	16	12	42	UO	58	29	19	71	71
22-Nov	19	7	14	15	20	33	20	28	54	UO	22	39	17	17	25	14	16	18	15	14	16	20	14	16	54
23-Nov	15	17	14	13	16	13	14	14	17	15	12	11	12	14	14	15	14	15	16	17	17	16	16	16	17
24-Nov	15	14	14	15	14	16	15	15	14	14	13	15	15	14	15	11	7	7	13	47	88	37	12	17	88
25-Nov	11	12	10	14	10	9	19	14	16	14	14	13	13	14	13	11	11	6	15	9	12	11	9	10	19
26-Nov	11	11	11	12	10	15	6	11	13	17	17	16	18	21	24	23	16	22	31	16	16	14	17	13	31
27-Nov	12	13	13	16	17	15	13	16	18	15	15	17	16	16	15	15	13	15	15	15	16	16	16	15	18
28-Nov	23	11	25	13	13	37	23	48	34	36	77	35	18	66	75	34	21	10	13	11	21	59	27	19	77
29-Nov	23	10	18	7	8	13	10	13	23	31	25	56	84	27	28	19	37	17	11	9	11	15	39	22	84
30-Nov	24	UO	UO	28	23	38	55	23	13	37	26	18	15	14	16	13	14	16	15	12	14	14	16	16	55

100	33	62	91	90	54	55	55	54	37	93	56	84	66	75	61	81	78	45	47	88	78	54	75	
Diurnal Maximum																								

UO - Unstable Operation





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS11 LOWER CAMP NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)  
 NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	685	34	35	99.86	168.8	0	21.7	0
H2S (ppb) Average	685	34	35	99.86	23.9	6	3.4	2
THC (ppm) Average	678	34	42	98.89	4.4	-	2.5	-
CH4(ppm) Average	678	34	42	98.89	4.1	-	2.4	-
NMHC(ppm) Average	678	34	42	98.89	0.301	-	0.059	-
Temperature (C) Average	720	0	0	100	14	-	7.1	-
Relative Humidity (%) Average	720	0	0	100	98.9	-	92.9	-
Barometric Pressure (inHg) Average	720	0	0	100	29.8	-	29.8	-
Wind Speed 10 m (km/h) Average	713	0	7	99.03	27	-	17	-
Wind Direction 10 m (deg) Average	713	0	7	99.03	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)  
NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	685	3.49	13.1	-	0	0	0.1	0.3	1.1	4.9	168.8
H2S (ppb) Average	685	0.76	2.1	-	0	0.1	0.1	0.2	0.5	1.2	23.9
THC (ppm) Average	678	2.04	0.2	-	1.9	1.9	1.9	2	2.1	2.2	4.4
CH4(ppm) Average	678	2.02	0.2	-	1.9	1.9	1.9	2	2.1	2.2	4.1
NMHC(ppm) Average	678	0.019	0.028	-	0	0	0	0	0	0.1	0.301
Temperature 2 m (C) Average	720	-7.01	8.6	-	-30.3	-18.1	-13.7	-4.7	-0.5	2.5	14
Relative Humidity (%) Average	720	82.75	8.3	-	40.2	73.2	78.2	82.7	87.8	93.8	98.9
Barometric Pressure (inHg) Average	720	29.16	0.4	-	28.3	28.7	28.9	29.1	29.5	29.7	29.8
Wind Speed 10 m (km/h) Average	713	8.7	5	-	0	3	4	8	12	16	27
Wind Direction 10 m (deg) Average	713	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL GASEOUS ANALYZERS	13 Nov 2024 11:00	13 Nov 2024 11:00	1	DAS Failure - data not recorded
THC/NMHC/CH4	18 Nov 2024 04:00	18 Nov 2024 05:00	2	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	18 Nov 2024 07:00	18 Nov 2024 07:00	1	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	18 Nov 2024 09:00	18 Nov 2024 12:00	4	Unstable Operation - excessive baseline noise
Wind Speed, Wind Direction	04 Nov 2024 20:00	04 Nov 2024 20:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	04 Nov 2024 22:00	04 Nov 2024 22:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	09 Nov 2024 17:00	09 Nov 2024 17:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	24 Nov 2024 20:00	24 Nov 2024 20:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	24 Nov 2024 22:00	25 Nov 2024 00:00	3	Flat line in sensor output signal





Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb

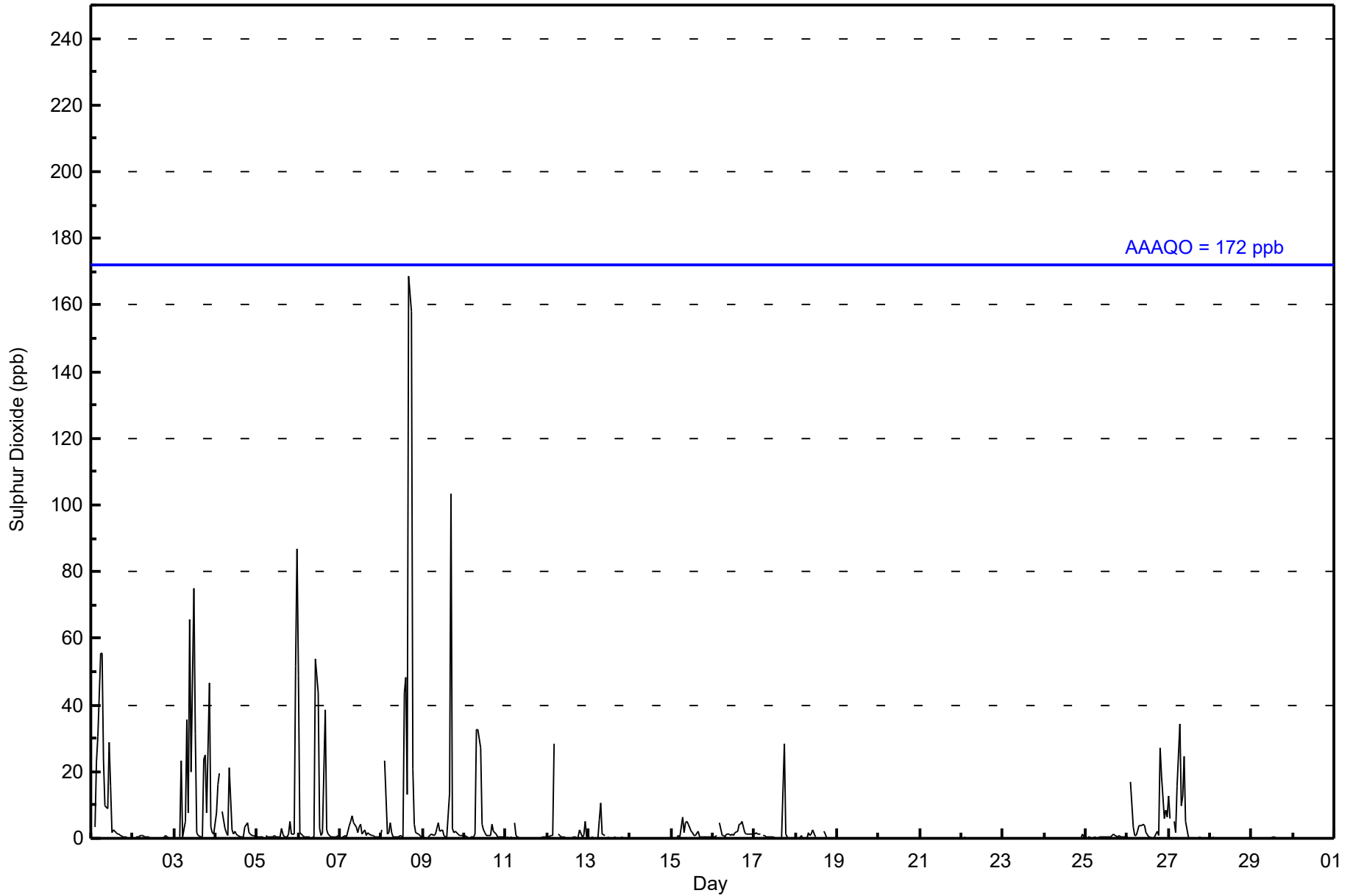
Lower Camp - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 168.8 ppb on Nov 8 17:00	Maximum Daily Average: 21.7 ppb on Nov 8		Hours of Data:	685
Minimum Value: 0.0 ppb on Nov 2 23:00	Minimum Daily Average: 0.0 ppb on Nov 19		Hours of Missing Data:	35
Maximum Diurnal Average: 9.8 ppb at hour 17	Minimum Diurnal Average: 0.6 ppb at hour 22		Hours of Calibration:	34
Monthly Average: 3.49 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.1 Median = 0.3 Q <sub>3</sub> = 1.1 P <sub>90</sub> = 4.9 P <sub>99</sub> = 55.3		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.9	Z	3.4	23.0	30.4	55.3	55.5	23.4	9.9	8.7	28.8	15.8	1.7	2.7	1.7	1.2	1.2	0.9	0.4	0.3	0.2	0.2	0.2	0.2	11.6	55.5	
2-Nov	0.2	Z	0.3	0.5	0.6	1.0	0.8	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.3	0.8	0.3	0.2	0.0	0.0	0.3	1.0	
3-Nov	0.0	0.0	Z	0.3	23.4	0.6	5.2	35.8	7.5	65.7	19.9	75.0	31.3	1.8	0.7	0.4	0.6	23.8	24.9	7.6	46.7	3.5	1.8	1.5	16.4	75.0	
4-Nov	7.8	15.9	19.7	Z	8.1	2.8	1.6	0.8	21.3	2.6	1.3	2.1	1.3	0.7	0.6	0.5	0.5	3.4	4.8	1.8	1.3	0.9	0.6	0.6	4.4	21.3	
5-Nov	0.4	0.3	0.3	0.6	Z	0.7	0.5	0.3	0.3	0.3	1.0	0.6	0.3	0.5	3.0	1.1	0.4	0.3	1.5	4.9	1.3	1.3	51.9	87.1	6.9	87.1	
6-Nov	48.8	1.5	1.0	0.6	0.5	0.5	0.5	Z	0.5	0.4	54.0	43.6	3.0	0.9	1.5	38.6	2.5	1.2	0.7	0.6	0.4	0.3	0.6	1.0	8.8	54.0	
7-Nov	Z	0.4	0.4	1.0	0.5	4.0	5.1	6.8	4.8	3.5	1.5	3.3	4.3	1.2	2.4	0.7	1.7	1.2	0.9	0.7	0.5	0.4	0.4	0.5	2.0	6.8	
8-Nov	2.5	Z	23.3	1.1	1.6	4.6	1.7	0.6	0.4	0.6	0.5	0.8	0.6	43.5	48.3	12.9	168.8	157.9	20.8	4.1	1.5	1.2	1.0	0.6	21.7	168.8	
9-Nov	0.6	0.5	Z	0.3	0.9	1.4	1.0	1.1	3.1	4.5	2.2	2.5	0.8	0.3	0.2	13.7	103.3	2.8	1.6	2.1	1.4	0.9	0.7	0.9	6.4	103.3	
10-Nov	0.6	0.4	0.3	Z	0.5	0.4	1.4	32.8	32.5	26.9	4.2	2.3	1.7	0.7	0.7	1.0	4.4	2.1	1.1	0.6	0.3	0.3	0.3	0.2	5.0	32.8	
11-Nov	0.2	0.2	0.1	0.5	Z	4.8	0.8	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.2	0.4	0.3	0.2	0.4	4.8	4.8	
12-Nov	0.3	0.5	0.8	0.8	28.6	Z	1.1	1.0	0.6	0.4	0.3	0.2	0.2	0.1	0.1	0.5	0.2	0.1	0.6	2.5	0.4	1.0	5.1	0.6	2.0	28.6	
13-Nov	Z	0.2	0.6	0.1	0.1	0.1	5.4	10.7	1.1	0.8	DF	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	1.0	10.7	
14-Nov	0.1	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15-Nov	0.1	0.1	Z	0.3	0.7	0.4	6.4	1.8	4.7	5.3	4.2	1.9	1.8	0.7	0.9	2.1	0.6	0.4	0.5	0.6	0.5	0.3	0.3	0.3	1.5	6.4	
16-Nov	0.3	0.4	1.0	Z	4.8	1.0	0.8	0.5	1.2	1.5	0.9	1.2	0.9	1.6	2.0	4.1	4.1	4.9	1.5	1.1	1.1	1.3	1.3	1.2	1.7	4.9	
17-Nov	1.5	1.9	1.2	1.4	Z	0.7	0.8	0.6	0.4	0.5	0.6	0.3	0.2	0.2	0.2	0.1	0.1	28.4	1.2	0.3	0.2	0.1	0.1	0.1	1.8	28.4	
18-Nov	0.3	0.2	0.2	0.7	0.1	Z	0.1	1.9	0.8	1.4	2.7	0.3	C	C	C	C	2.1	1.1	0.1	0.0	0.0	0.0	0.0	0.1	0.6	2.7	
19-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0
20-Nov	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1
21-Nov	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
22-Nov	0.0	0.0	0.5	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.5
23-Nov	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1
24-Nov	0.0	0.0	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	1.2	0.5	0.1	1.2	
25-Nov	Z	0.3	0.3	0.1	0.0	0.3	0.1	0.1	0.4	0.4	0.4	0.3	0.3	0.4	0.6	0.9	1.2	0.7	0.4	1.0	0.6	0.3	0.3	0.3	0.4	1.2	
26-Nov	0.5	Z	17.0	3.5	0.7	0.8	2.1	3.8	3.8	4.4	3.8	1.6	0.4	0.3	0.2	0.2	0.6	2.1	0.8	27.1	18.7	6.1	8.3	6.4	4.9	27.1	
27-Nov	12.9	5.9	Z	5.2	1.6	15.5	34.2	9.9	12.8	24.4	5.0	0.2	0.1	0.2	0.2	0.0	0.0	0.1	0.6	0.2	0.0	0.0	0.0	0.0	5.6	34.2	
28-Nov	0.0	0.0	0.5	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	
29-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.4	
30-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.2	

3.0	1.2	2.8	1.6	4.1	3.7	4.2	4.6	3.6	5.1	4.6	5.1	1.7	2.0	2.2	2.7	9.8	7.7	2.1	1.9	2.5	0.6	2.5	3.4	Diurnal Average	
48.8	15.9	23.3	23.0	30.4	55.3	55.5	35.8	32.5	65.7	54.0	75.0	31.3	43.5	48.3	38.6	168.8	157.9	24.9	27.1	46.7	6.1	51.9	87.1	Diurnal Maximum	

Z - zerospan      C - Calibration      DF - DAS Failure  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb    24-hr 48 ppb





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Lower Camp - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	637	92.99	92.99
11 - 20	12	1.75	94.74
21 - 60	30	4.38	99.12
61 - 110	4	0.58	99.71
111 - 172	2	0.29	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Lower Camp - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	73	24	11	2	11	23	134	24	3	1	14	31	36	81	108	55	631
11 - 20	0	0	0	1	0	0	1	0	1	1	4	0	0	4	0	0	12
21 - 60	0	0	0	1	0	0	1	6	3	6	8	1	0	4	0	0	30
61 - 110	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	3
111 - 172	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	73	24	11	4	11	23	136	30	8	10	28	32	36	89	108	55	678

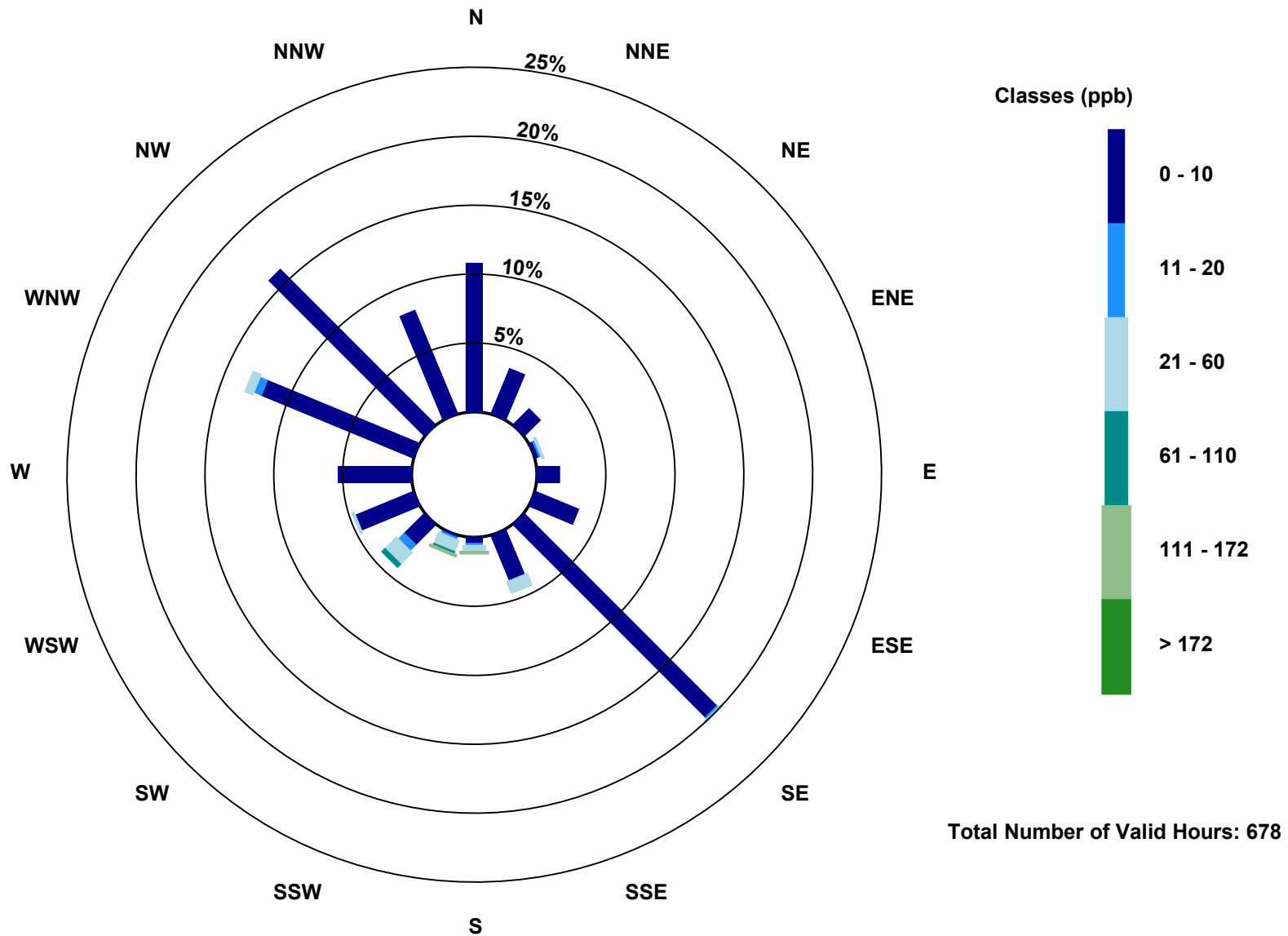
Total Number of Valid Hours: 678

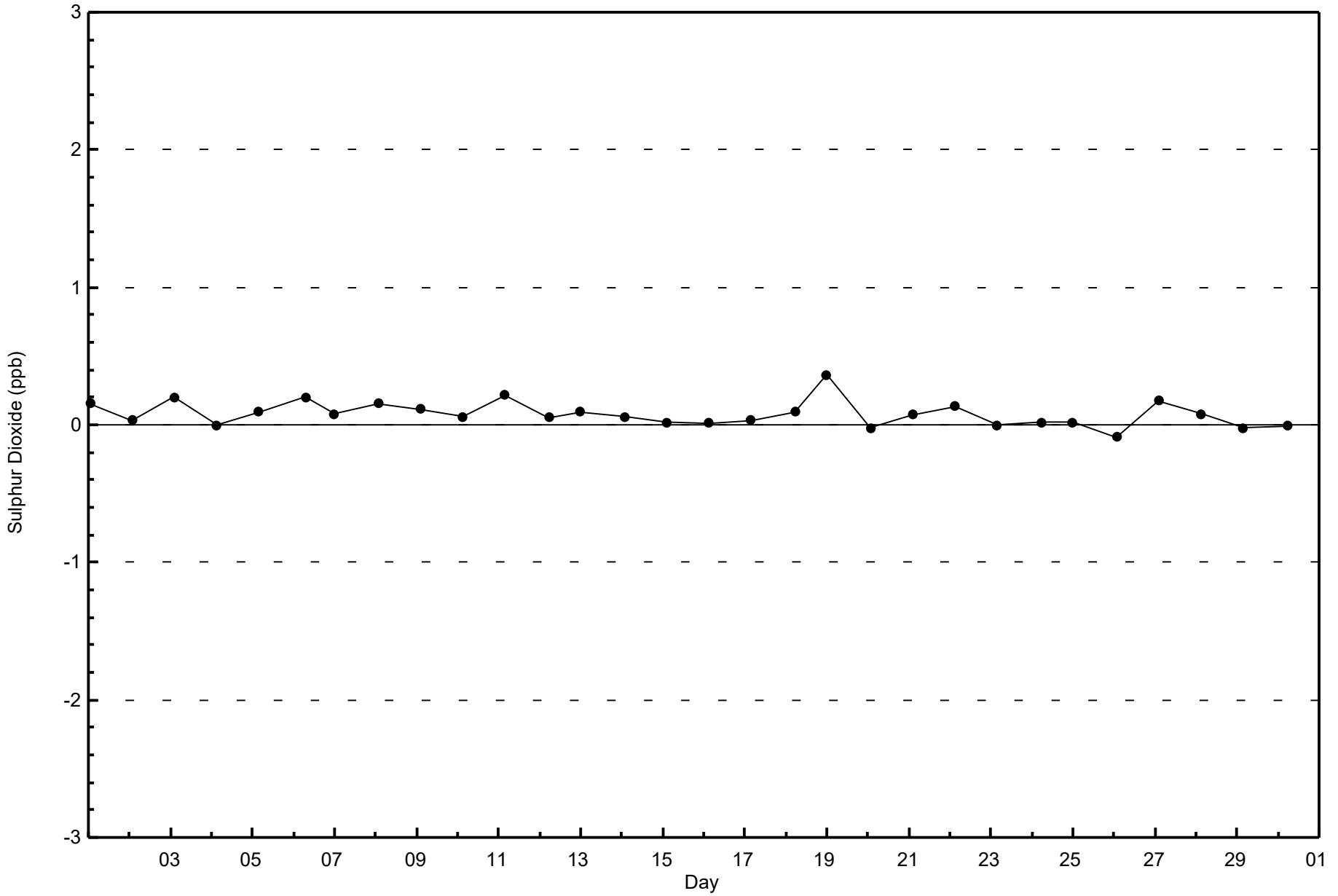
Total Number of Hours: 720

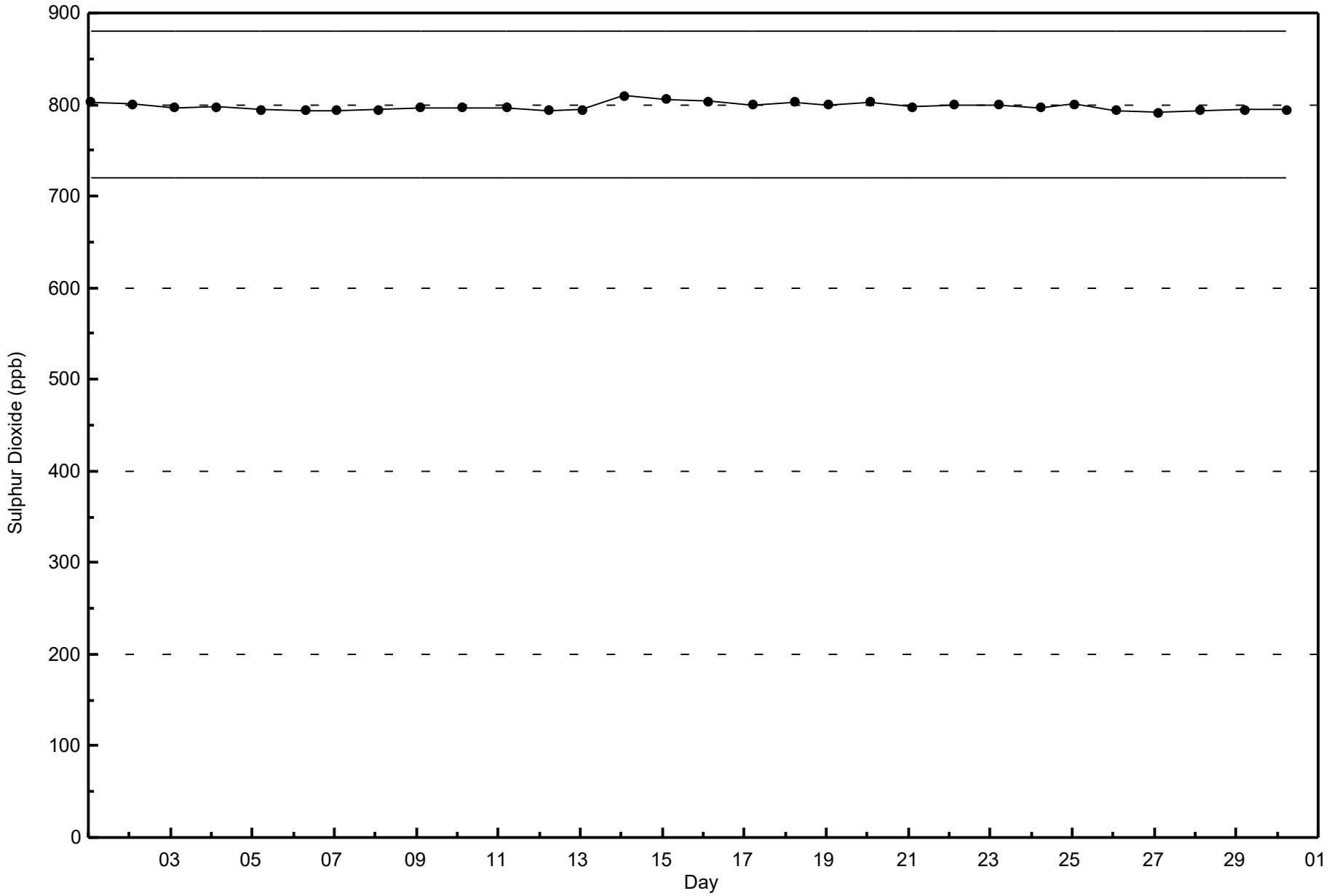


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Lower Camp









Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H<sub>2</sub>S) - ppb

Lower Camp - November 2024

Number of Exceedences (AAAQO):	1-hr: 6	24-hr: 2	Hours in Service:	720
Maximum Value: 23.9 ppb on Nov 8 17:00	Maximum Daily Average: 3.4 ppb on Nov 8		Hours of Data:	685
Minimum Value: 0.0 ppb on Nov 9 05:00	Minimum Daily Average: 0.1 ppb on Nov 20		Hours of Missing Data:	35
Maximum Diurnal Average: 1.9 ppb at hour 17	Minimum Diurnal Average: 0.4 ppb at hour 22		Hours of Calibration:	34
Monthly Average: 0.76 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.1 Median = 0.2 Q <sub>3</sub> = 0.5 P <sub>90</sub> = 1.2 P <sub>99</sub> = 9.0		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.1	0.1	Z	4.7	5.5	8.7	9.0	4.0	1.5	1.6	4.9	2.4	0.1	0.1	0.4	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.1	2.0	9.0
2-Nov	0.1	0.1	Z	0.1	0.1	0.3	0.2	0.3	0.3	0.1	0.3	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.4	0.2	0.4
3-Nov	0.4	0.2	0.3	Z	5.7	0.1	1.3	6.3	1.3	10.7	3.7	13.6	5.6	0.3	0.2	0.3	0.2	0.3	5.1	5.3	1.7	8.7	0.3	0.3	3.1	13.6
4-Nov	2.4	4.6	4.5	2.8	Z	1.2	0.3	0.1	4.3	0.4	0.4	0.3	0.2	0.5	0.3	0.2	0.4	3.0	3.8	3.1	1.9	1.8	1.5	1.9	1.7	4.6
5-Nov	1.2	0.8	0.9	1.2	0.8	Z	0.5	0.5	0.4	0.5	0.5	0.4	0.6	0.4	0.2	0.2	0.2	0.2	0.7	1.6	0.4	0.1	9.0	12.2	1.5	12.2
6-Nov	7.3	0.2	Z	0.2	0.1	0.2	0.3	0.2	0.3	0.1	7.6	5.4	0.2	0.1	0.2	5.9	0.5	0.3	0.4	0.3	0.2	0.3	0.6	1.3	1.4	7.6
7-Nov	1.4	Z	0.4	0.5	0.0	0.2	0.8	0.9	0.8	0.8	0.1	0.1	0.2	0.1	0.5	0.1	0.9	1.0	3.8	1.0	0.3	0.3	0.3	0.3	0.6	3.8
8-Nov	0.4	0.9	Z	0.4	0.3	0.9	0.6	0.3	0.4	0.5	0.3	0.5	0.4	6.1	7.3	2.4	23.9	22.1	5.3	2.5	1.3	0.5	0.7	0.7	3.4	23.9
9-Nov	0.4	0.1	0.2	Z	0.0	0.0	0.0	0.0	0.8	0.9	0.2	0.3	0.0	0.0	0.0	2.2	20.8	0.9	0.7	1.1	0.7	0.6	0.6	0.9	1.4	20.8
10-Nov	0.7	0.5	0.7	1.0	Z	0.2	0.5	5.7	4.9	3.6	0.4	0.2	0.2	0.2	0.2	0.3	1.7	1.4	0.9	0.8	0.9	2.8	1.3	0.6	1.3	5.7
11-Nov	1.1	0.8	0.8	1.1	1.7	Z	0.4	0.6	0.5	0.5	0.3	0.7	0.2	0.3	0.7	0.4	0.3	0.6	0.7	0.3	0.3	0.3	0.3	0.4	0.6	1.7
12-Nov	Z	0.3	0.4	0.7	6.8	0.8	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.5	6.8
13-Nov	0.1	Z	0.1	0.1	0.1	0.1	0.9	1.2	0.1	0.1	DF	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.2
14-Nov	0.1	0.1	Z	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.3
15-Nov	0.2	0.2	0.2	Z	0.6	0.5	1.8	1.0	1.2	1.7	2.2	1.0	0.6	0.5	0.6	0.6	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.7	0.7	2.2
16-Nov	0.4	0.5	0.5	0.4	Z	0.4	0.2	0.1	1.3	1.0	0.4	0.7	0.3	1.0	0.6	0.4	1.0	1.2	0.8	0.5	0.5	0.6	0.5	0.4	0.6	1.3
17-Nov	0.5	0.5	0.4	0.3	0.3	Z	0.4	0.2	0.3	0.4	0.5	0.3	0.2	0.2	0.2	0.3	0.4	8.5	0.8	0.4	0.2	0.2	0.2	0.1	0.7	8.5
18-Nov	Z	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.4	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.3	0.2	0.3	0.6	0.3	0.2	0.6
19-Nov	0.1	Z	0.1	0.1	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4
20-Nov	0.1	0.1	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
21-Nov	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2
22-Nov	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.8	0.5	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.8
23-Nov	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
24-Nov	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.4	0.5	0.4	0.4	0.5	0.5	0.3	0.9	0.7	0.3	0.3	0.9
25-Nov	0.5	Z	0.6	0.3	0.3	0.4	0.2	0.3	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.6
26-Nov	0.2	0.8	Z	0.5	0.2	0.3	0.6	0.8	0.6	0.5	0.5	0.3	0.2	C	C	C	C	0.5	0.1	0.2	0.2	0.1	0.2	0.1	0.4	0.8
27-Nov	0.2	0.1	0.3	Z	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3
28-Nov	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3
29-Nov	0.3	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.5	0.8	0.6	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.8
30-Nov	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.7	0.7	0.6	0.5	0.3	0.3	0.3	0.4	0.3	0.2	0.4	0.7

0.7	0.5	0.5	0.6	1.0	0.6	0.7	0.8	0.7	0.9	0.9	1.0	0.4	0.5	0.5	0.6	1.9	1.6	0.9	0.6	0.6	0.4	0.7	0.8	Diurnal Average	
7.3	4.6	4.5	4.7	6.8	8.7	9.0	6.3	4.9	10.7	7.6	13.6	5.6	6.1	7.3	5.9	23.9	22.1	5.3	3.1	8.7	2.8	9.0	12.2	Diurnal Maximum	

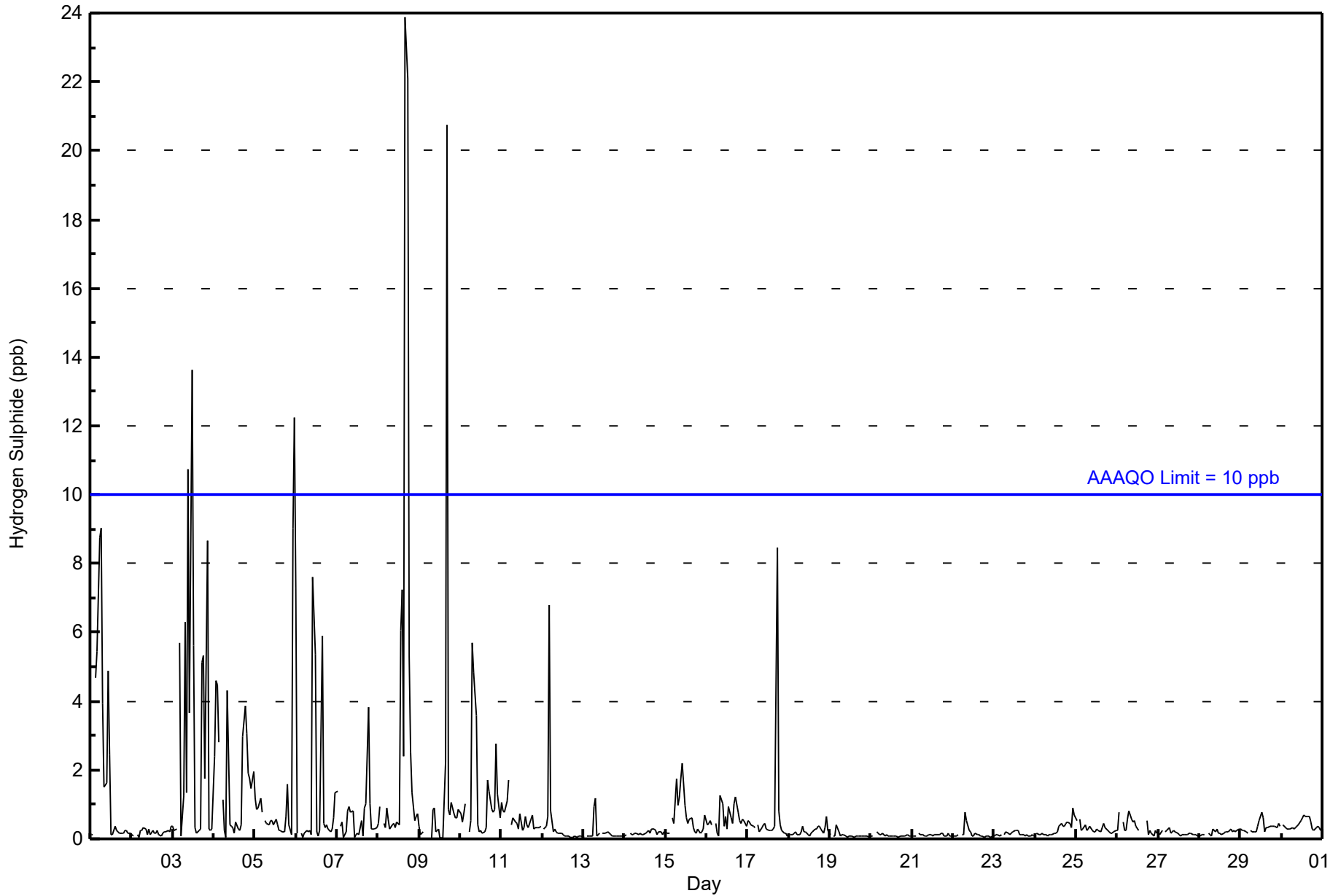
Z - zerospan      C - Calibration      DF - DAS Failure  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb    24-hr 3 ppb





Wood Buffalo Environmental Association  
Hourly Averages

Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Lower Camp - November 2024





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Lower Camp - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	643	93.87	93.87
3 - 4	12	1.75	95.62
5 - 7	18	2.63	98.25
8 - 11	6	0.88	99.12
> 11	6	0.88	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Lower Camp - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	74	23	11	2	11	23	130	23	4	1	17	35	37	86	106	55	638
3 - 4	0	0	0	1	0	0	1	1	1	2	1	0	0	3	0	1	11
5 - 7	0	0	0	1	0	0	0	6	1	2	6	1	0	1	0	0	18
8 - 11	0	0	0	0	0	0	0	0	1	3	2	0	0	0	0	0	6
> 11	0	0	0	0	0	0	0	0	1	2	2	0	0	0	0	0	5
<b>Totals</b>	74	23	11	4	11	23	131	30	8	10	28	36	37	90	106	56	678

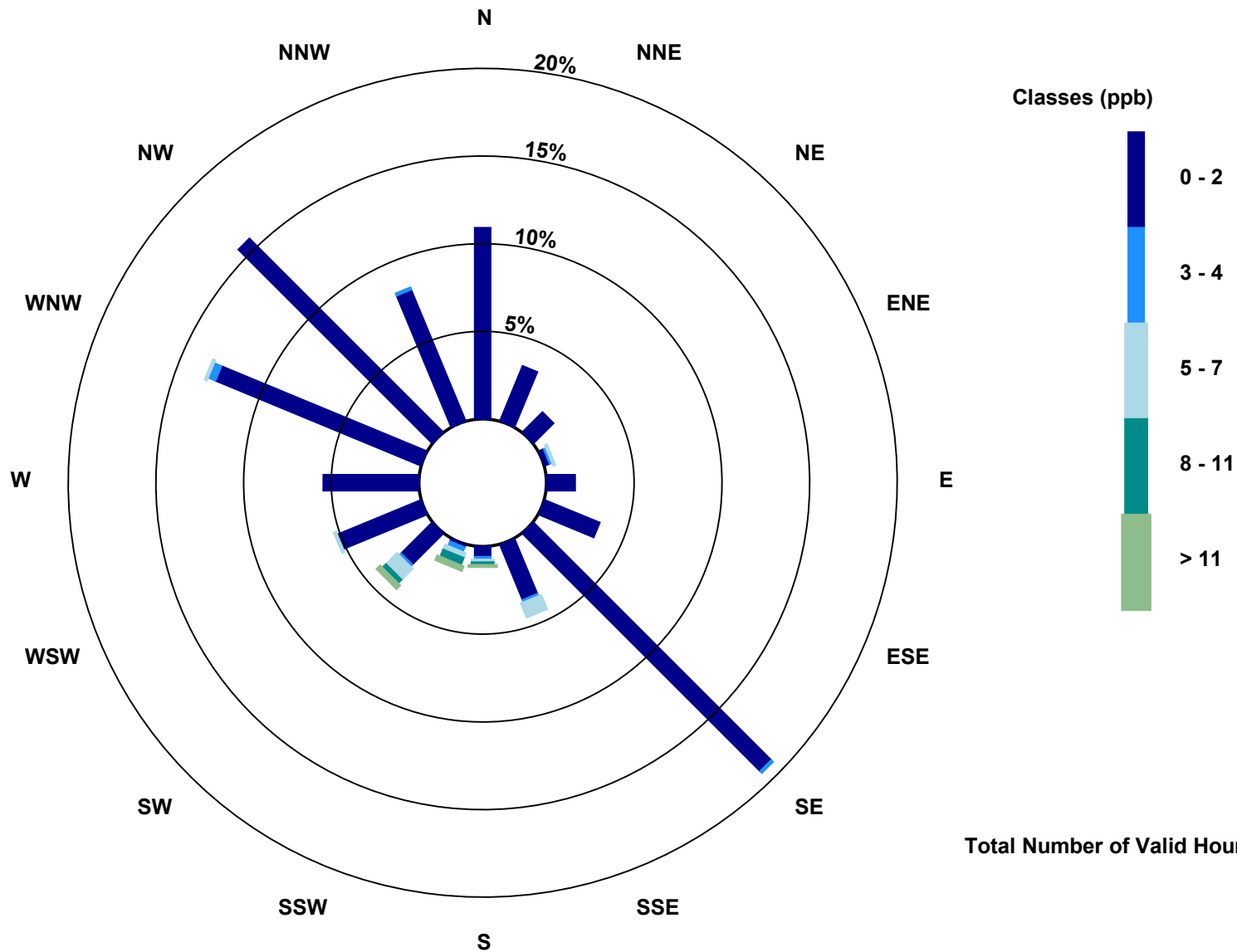
Total Number of Valid Hours: 678

Total Number of Hours: 720

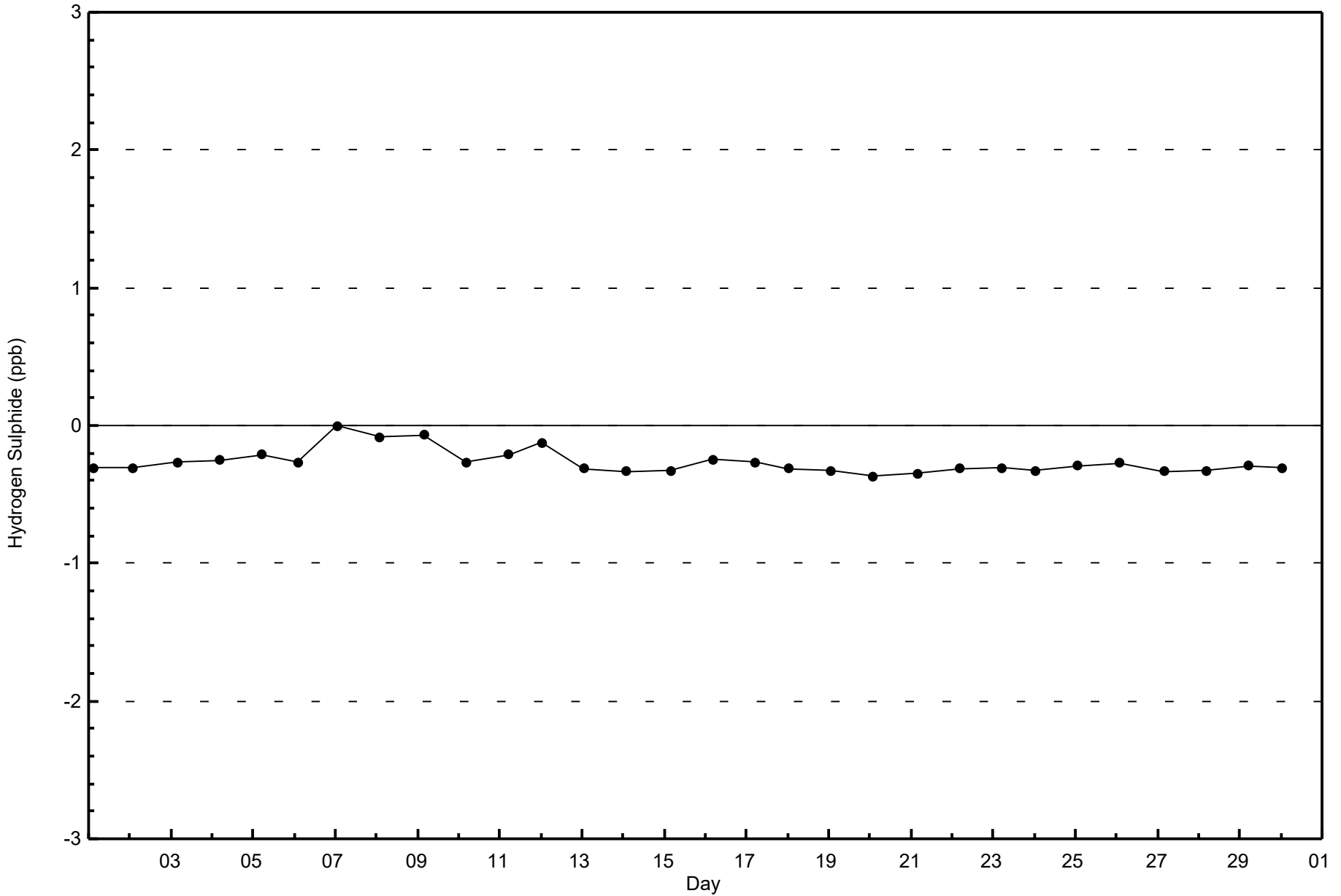


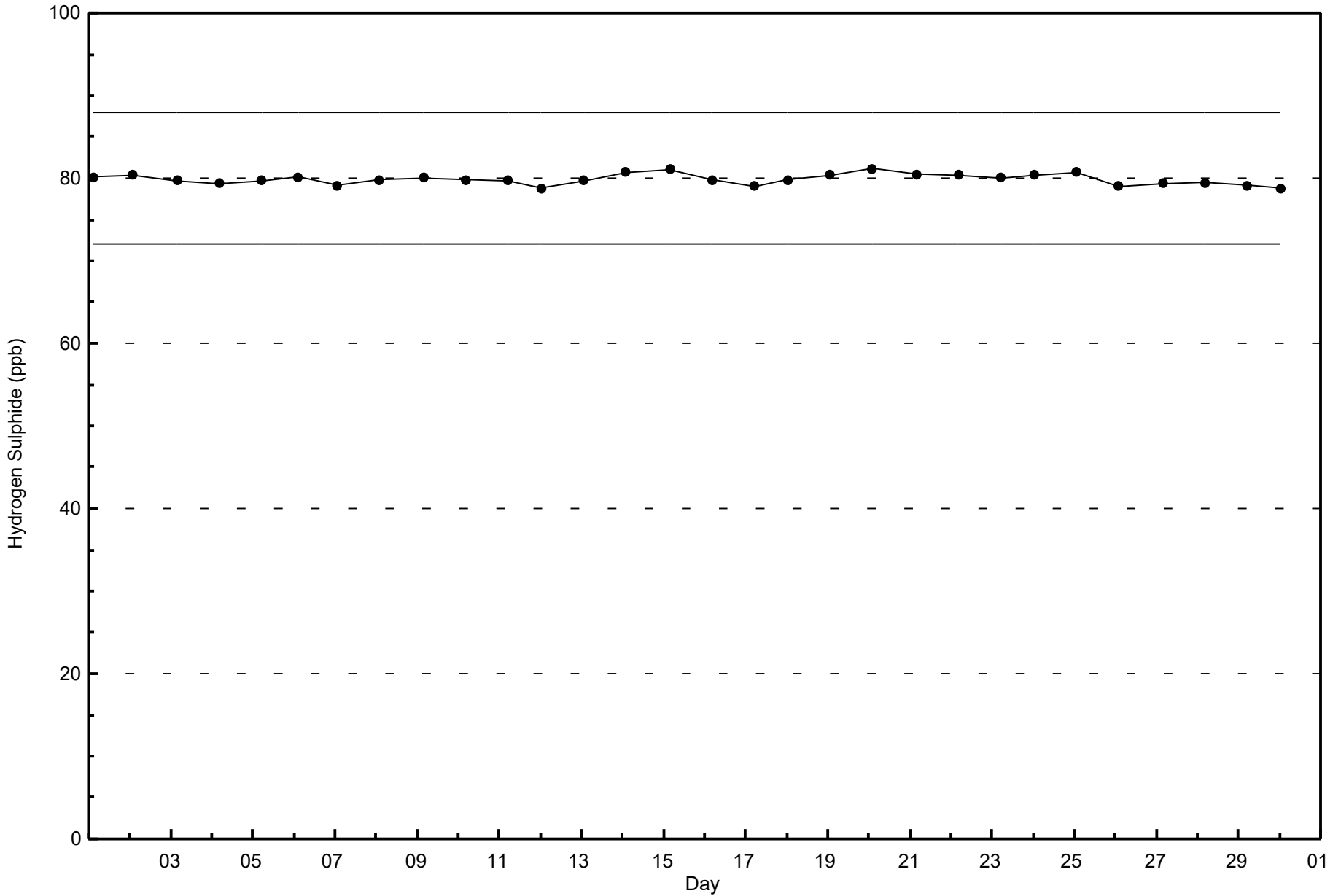
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Lower Camp



Total Number of Valid Hours: 678







**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

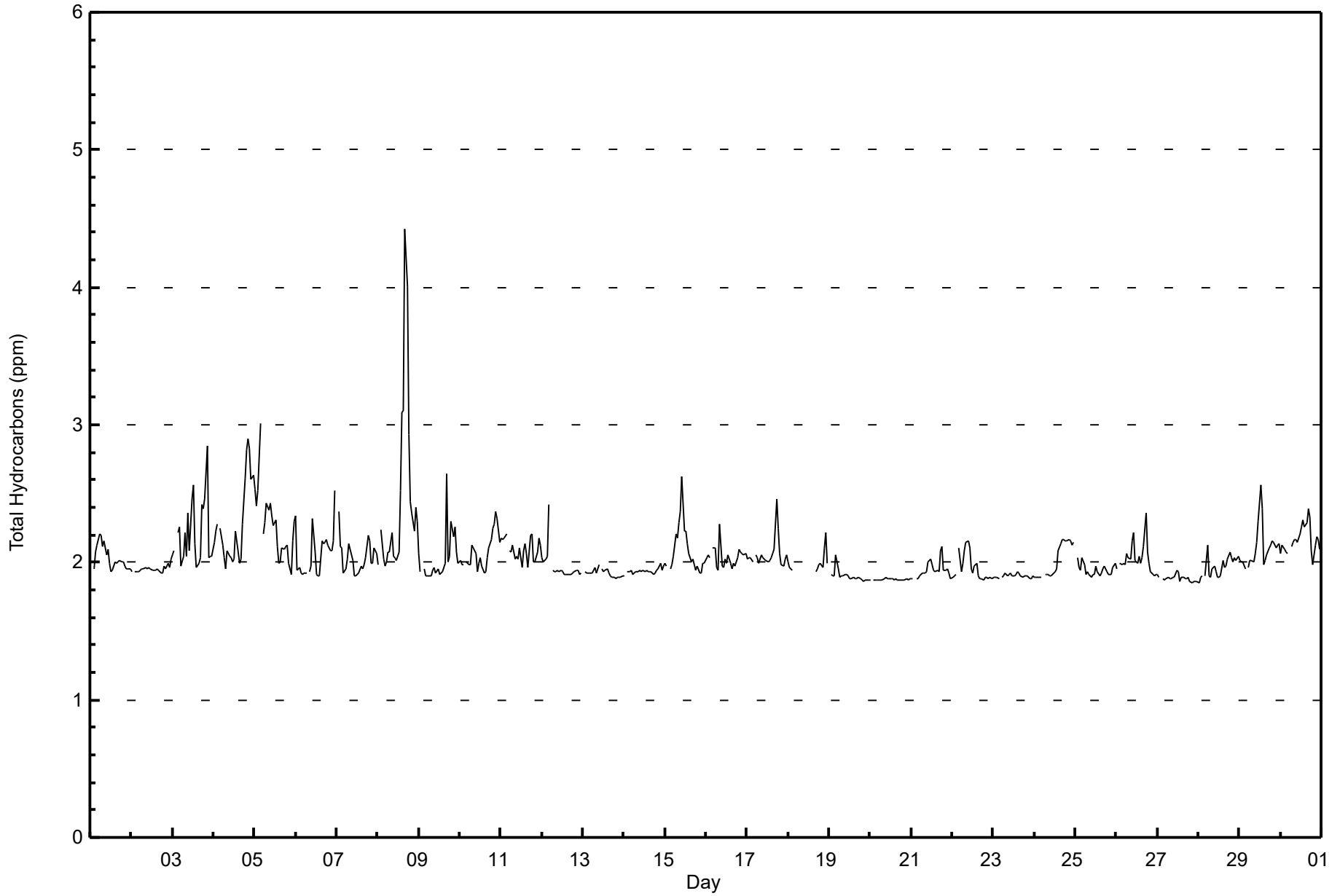
**Total Hydrocarbons (THC) - ppm**  
**Lower Camp - November 2024**

Maximum Value: 4.4 ppm on Nov 8 17:00		Maximum Daily Average: 2.5 ppm on Nov 8		Hours in Service: 720																																													
Minimum Value: 1.9 ppm on Nov 27 21:00		Minimum Daily Average: 1.9 ppm on Nov 20		Hours of Data: 678																																													
Maximum Diurnal Average: 2.1 ppm at hour 18		Minimum Diurnal Average: 2.0 ppm at hour 6		Hours of Missing Data: 42																																													
Monthly Average: 2.04 ppm		Percentiles: P <sub>1</sub> = 1.9 P <sub>10</sub> = 1.9 Q <sub>1</sub> = 1.9 Median = 2.0 Q <sub>3</sub> = 2.1 P <sub>90</sub> = 2.2 P <sub>99</sub> = 2.9		Hours of Calibration: 34																																													
				Percent Operational Time: 98.9																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	1.9	Z	2.0	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.1	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.2																							
2-Nov	1.9	Z	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																						
3-Nov	2.1	2.1	Z	2.2	2.3	2.0	2.0	2.2	2.0	2.4	2.1	2.5	2.6	2.1	2.0	2.0	2.0	2.4	2.4	2.5	2.8	2.0	2.0	2.0	2.2	2.8																							
4-Nov	2.1	2.2	2.3	Z	2.3	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.2	2.1	2.0	2.0	2.3	2.6	2.8	2.9	2.8	2.6	2.6	2.3	2.9																							
5-Nov	2.5	2.4	2.5	3.0	Z	2.2	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.0	1.9	2.2	2.3	2.3	3.0																							
6-Nov	2.3	1.9	2.0	1.9	1.9	1.9	1.9	Z	1.9	2.0	2.3	2.1	1.9	1.9	1.9	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.5	2.1	2.5																							
7-Nov	Z	2.4	2.1	2.1	1.9	2.0	2.0	2.1	2.1	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.2	2.2	2.0	2.0	2.1	2.1	2.0	2.4																							
8-Nov	2.0	Z	2.2	2.0	2.0	2.0	2.1	2.1	2.2	2.0	2.0	2.0	2.1	2.5	3.1	3.1	4.4	4.0	2.9	2.4	2.4	2.2	2.4	2.3	2.5	4.4																							
9-Nov	2.1	1.9	Z	2.0	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0	1.9	1.9	1.9	2.0	2.6	2.0	2.0	2.3	2.2	2.3	2.1	2.0	2.0	2.6																							
10-Nov	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	1.9	2.0	2.0	1.9	1.9	2.0	2.1	2.2	2.2	2.3	2.4	2.3	2.1	2.1	2.1	2.4																							
11-Nov	2.2	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.0	2.2	2.2	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.2																							
12-Nov	2.0	2.0	2.0	2.0	2.4	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.4																							
13-Nov	Z	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.0	2.0	DF	2.0	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0																							
14-Nov	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	2.0	1.9	2.0																							
15-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.2	2.2	2.3	2.4	2.6	2.2	2.2	2.1	2.1	2.0	2.0	2.0	1.9	2.0	1.9	1.9	2.0	2.0	2.1	2.6																							
16-Nov	2.0	2.1	2.0	Z	2.1	2.1	2.0	1.9	2.3	2.0	2.0	2.0	2.0	2.1	2.0	1.9	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.3																							
17-Nov	2.0	2.0	2.0	2.0	Z	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.5	2.3	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.5																							
18-Nov	2.0	2.0	1.9	UO	UO	Z	UO	2.0	UO	UO	UO	UO	C	C	C	C	1.9	2.0	2.0	2.0	2.0	2.1	2.2	2.0	--	2.2																							
19-Nov	Z	1.9	1.9	1.9	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1																							
20-Nov	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9																							
21-Nov	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.1	2.1	1.9	1.9	2.0	1.9	1.9	1.9	2.1																							
22-Nov	1.9	1.9	1.9	Z	2.1	1.9	2.0	2.1	2.1	2.2	2.1	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.2																							
23-Nov	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9																							
24-Nov	1.9	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.2																							
25-Nov	Z	2.0	2.0	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	1.9	2.0																							
26-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.2	2.2	2.0	2.0	2.0	2.0	2.1	2.4	2.1	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.4																							
27-Nov	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9																							
28-Nov	1.9	1.9	1.9	Z	1.9	2.1	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1																							
29-Nov	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.6	2.4	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.6																							
30-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.1	2.2	2.3	2.3	2.3	2.3	2.4	2.3	2.1	2.0	2.1	2.2	2.2	2.1	2.1	2.4																							
																								2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	Diurnal Average		
																								2.5	2.4	2.5	3.0	2.4	2.2	2.3	2.4	2.4	2.4	2.6	2.5	2.6	2.5	3.1	3.1	4.4	4.0	2.9	2.8	2.9	2.8	2.6	2.6	Diurnal Maximum	
Z - zerospan																								C - Calibration				DF - DAS Failure				UO - Unstable Operation																	



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Lower Camp - November 2024**







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Lower Camp - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	462	68.14	68.14
2.1 - 3.0	212	31.27	99.41
3.1 - 10.0	4	0.59	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 678

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Lower Camp - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	71	23	10	2	4	12	93	15	3	1	16	31	24	52	60	45	462
2.1 - 3.0	2	1	1	2	7	11	43	15	2	8	12	1	11	33	46	10	205
3.1 - 10.0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	4
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	73	24	11	4	11	23	136	30	8	10	28	32	35	85	106	55	671

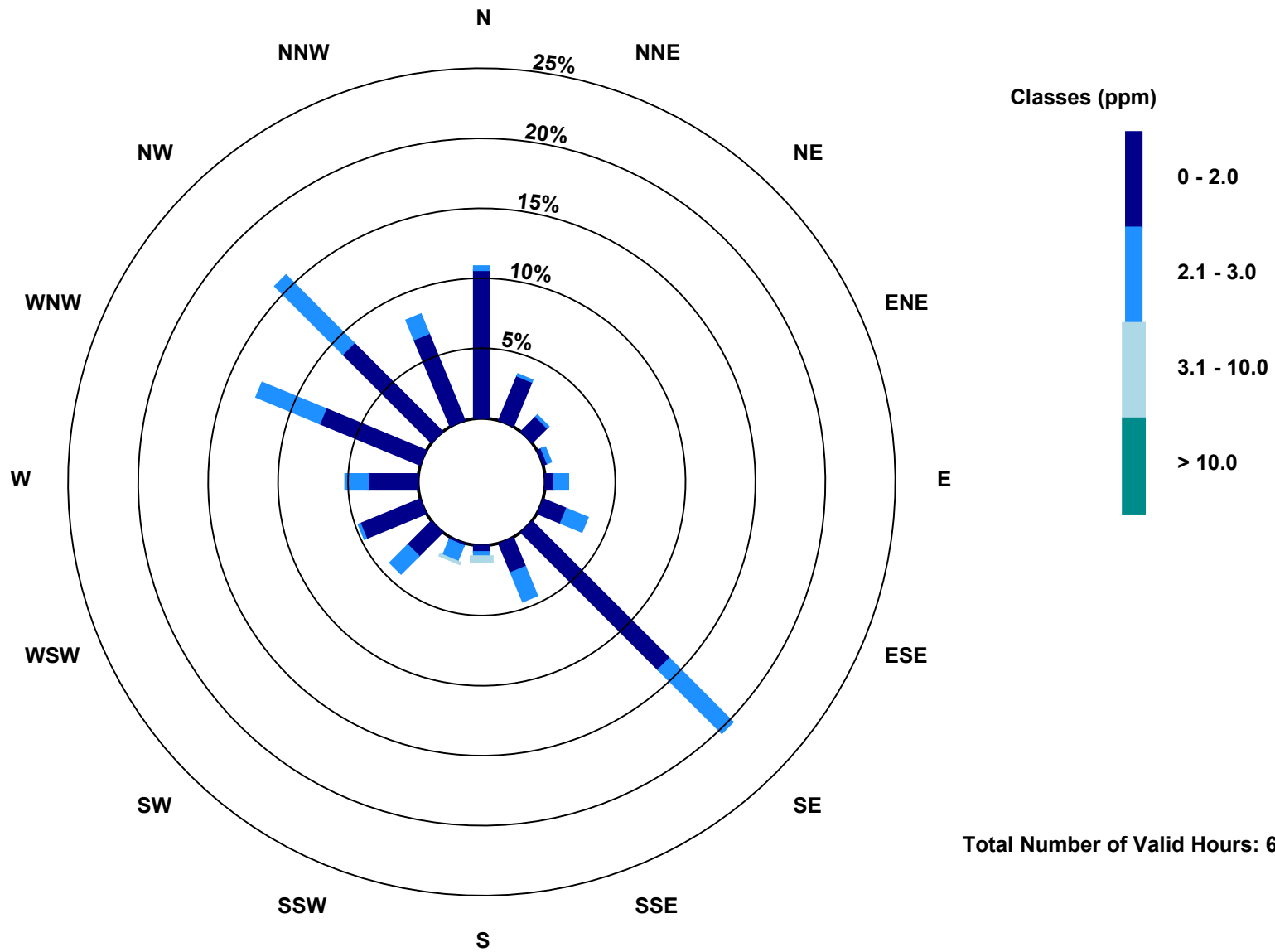
Total Number of Valid Hours: 671

Total Number of Hours: 720

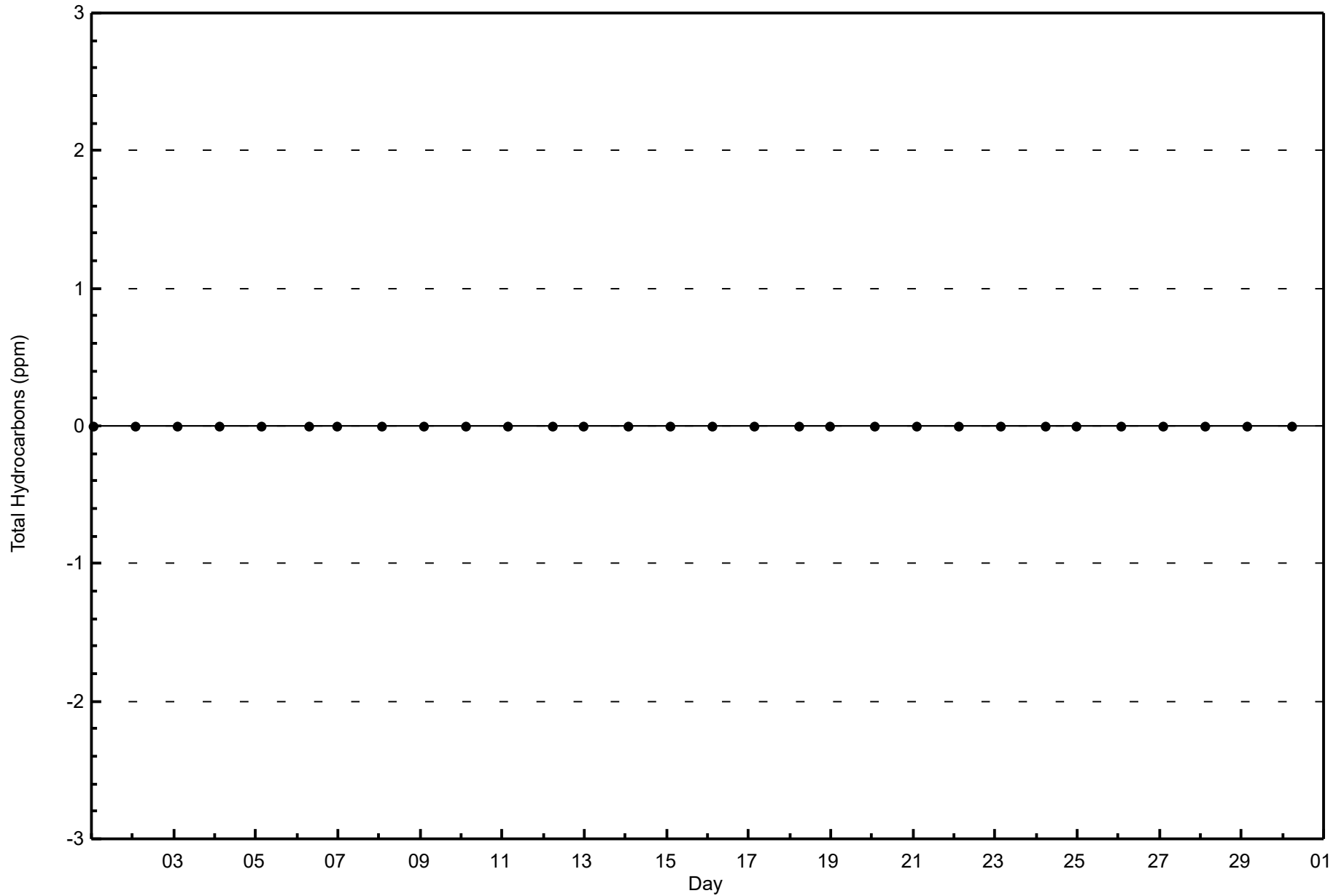


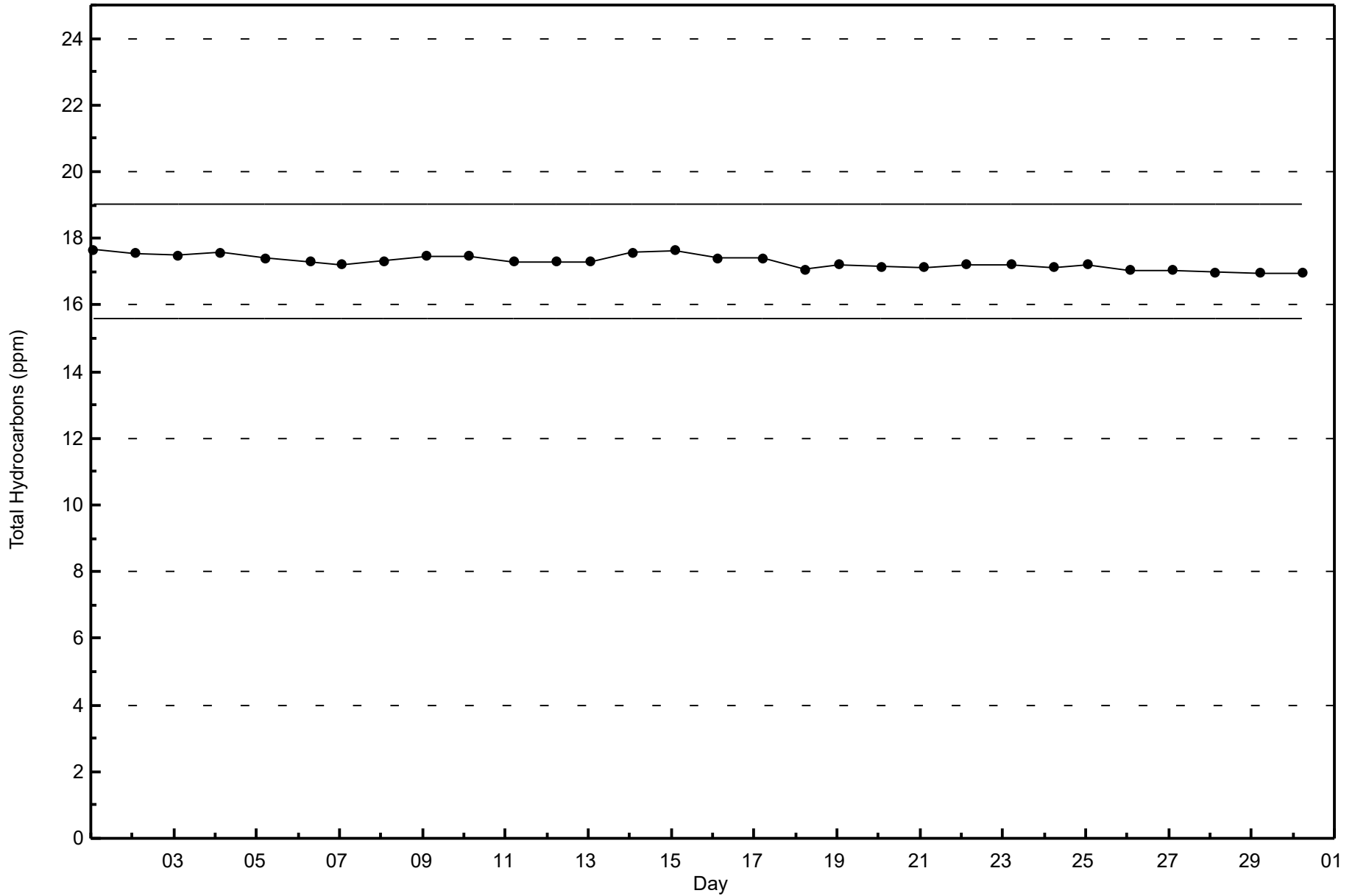
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Hydrocarbons (THC) - ppm  
Lower Camp



Total Number of Valid Hours: 671



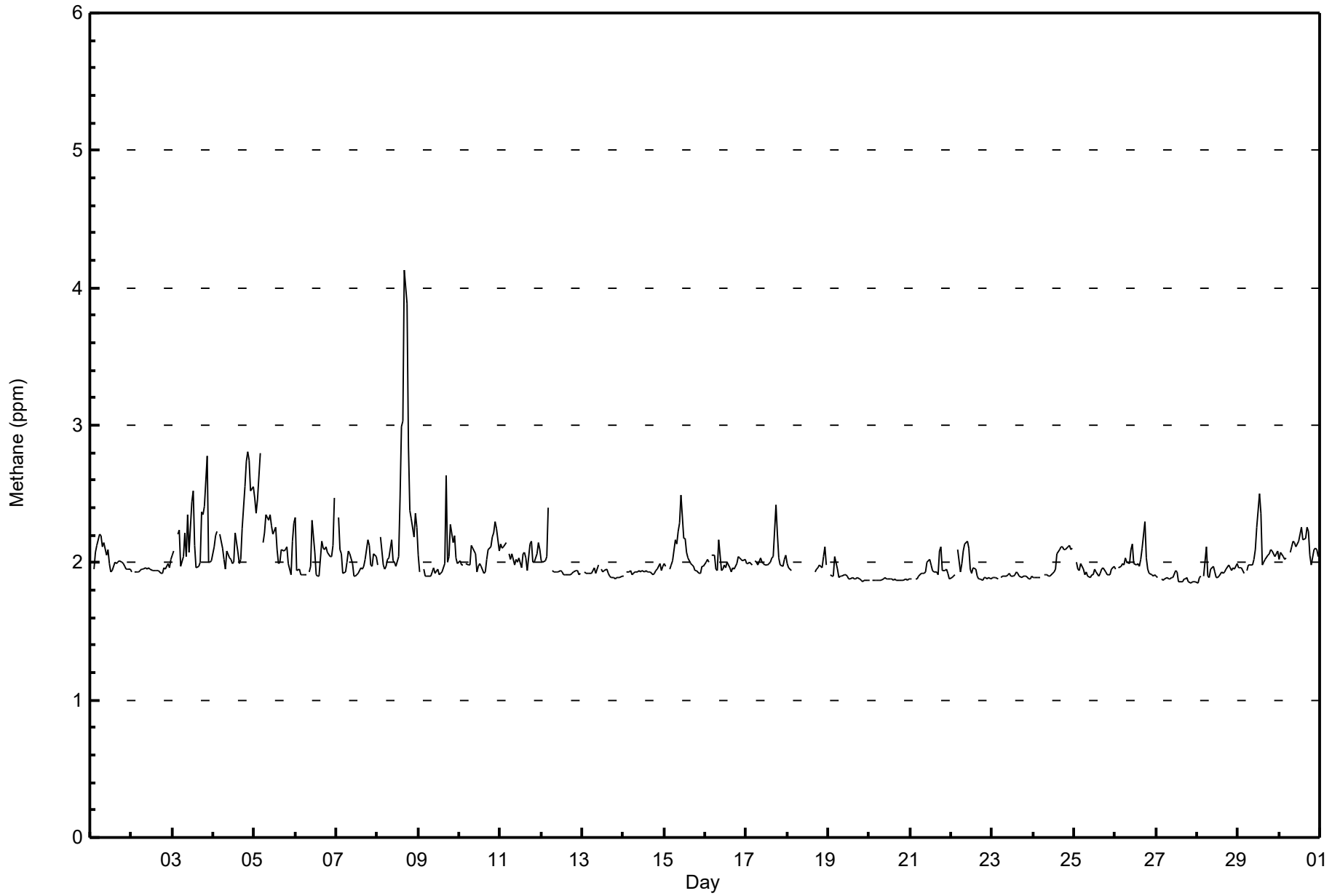






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Methane (CH<sub>4</sub>) - ppm**  
**Lower Camp - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Lower Camp - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	499	73.60	73.60
2.1 - 3.0	177	26.11	99.71
3.1 - 10.0	2	0.29	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 678

Total Number of Hours: 720





**Wood Buffalo Environmental Association  
Frequency Distribution**

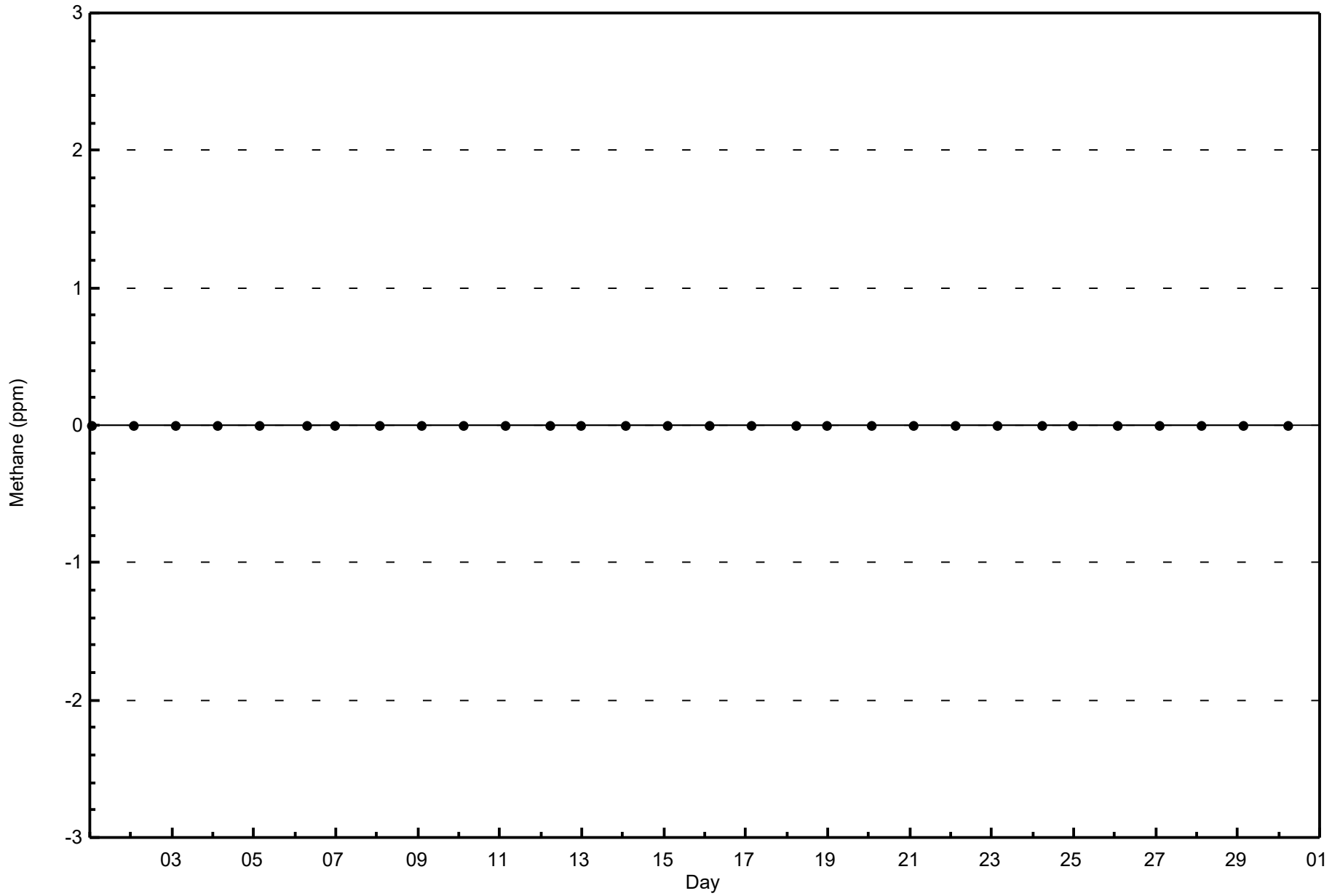
**Methane (CH<sub>4</sub>) - ppm  
Lower Camp - November 2024**

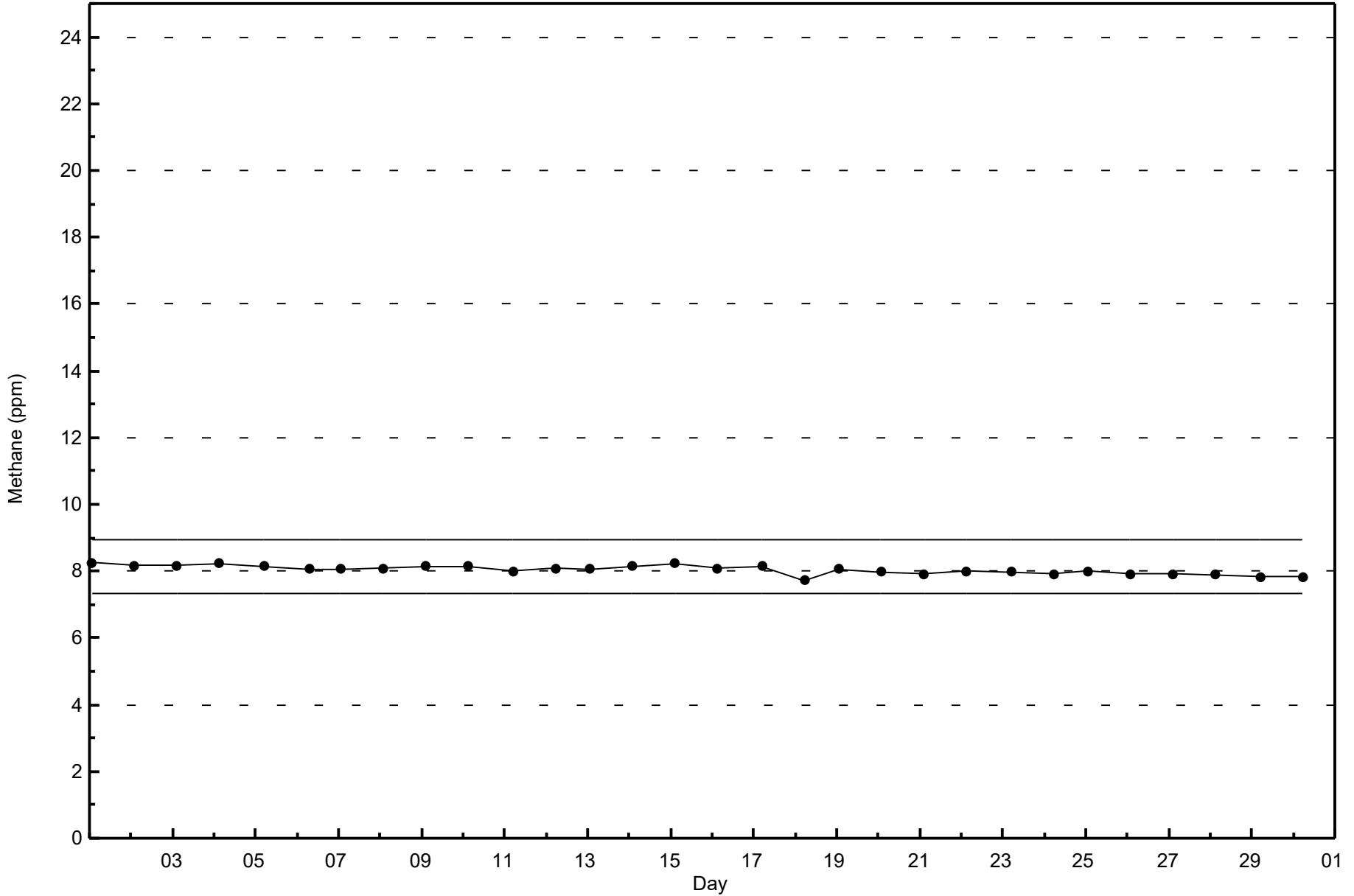
<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	72	23	10	2	4	15	110	18	3	1	16	31	26	53	68	47	499
2.1 - 3.0	1	1	1	2	7	8	26	12	4	8	12	1	9	32	38	8	170
3.1 - 10.0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	73	24	11	4	11	23	136	30	8	10	28	32	35	85	106	55	671

Total Number of Valid Hours: 671

Total Number of Hours: 720

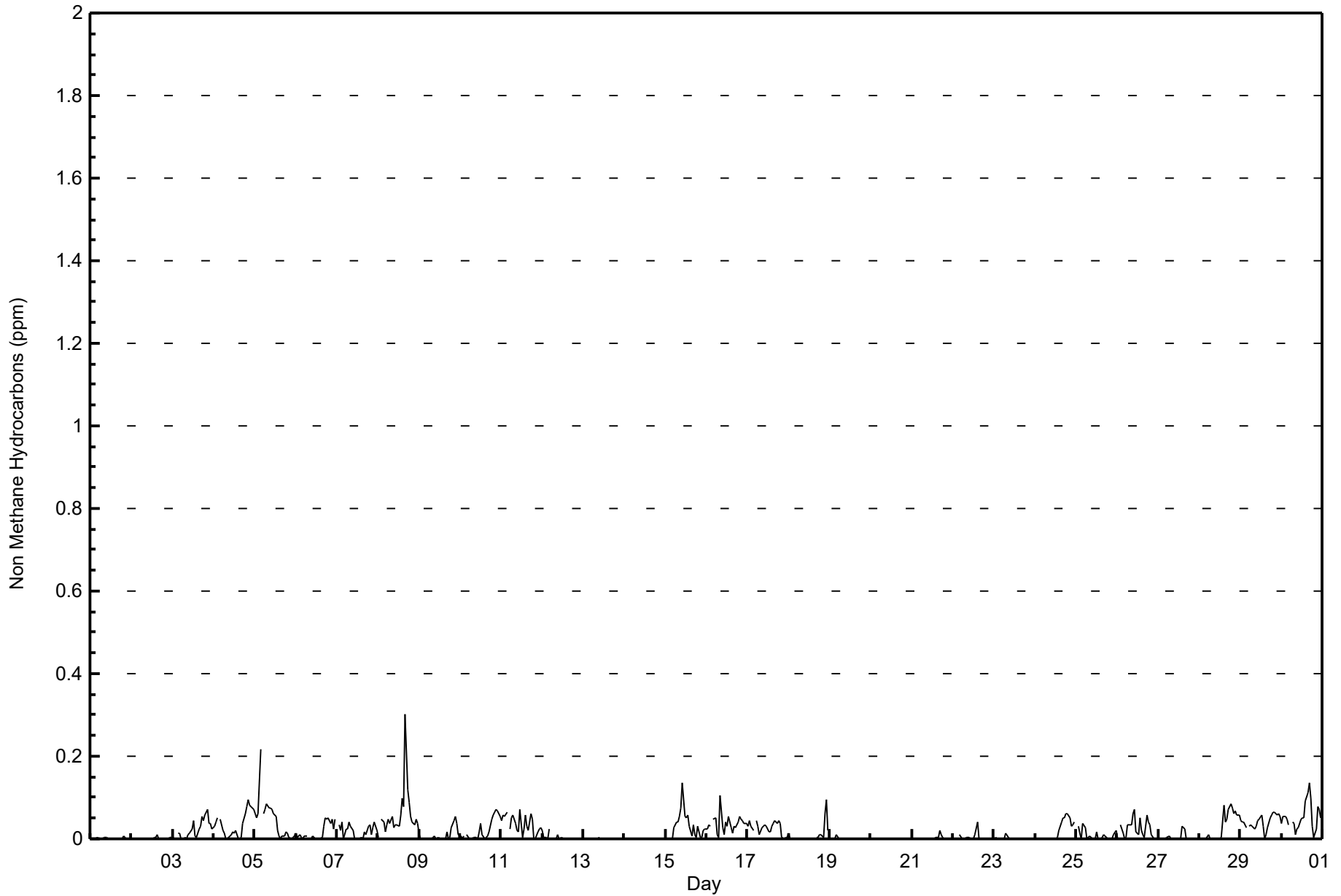








Maximum Value: 0.301 ppm on Nov 8 17:00		Maximum Daily Average: 0.059 ppm on Nov 8		Hours in Service: 720																																												
Minimum Value: 0.000 ppm on Nov 1 01:00		Minimum Daily Average: 0.000 ppm on Nov 20		Hours of Data: 678																																												
Maximum Diurnal Average: 0.028 ppm at hour 17		Minimum Diurnal Average: 0.011 ppm at hour 5		Hours of Missing Data: 42																																												
Monthly Average: 0.019 ppm		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.1 P <sub>99</sub> = 0.1		Hours of Calibration: 34																																												
				Percent Operational Time: 98.9																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	0.000	Z	0.000	0.000	0.004	0.001	0.000	0.000	0.002	0.003	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.007	0.005	0.000	0.000	0.000	0.001	0.007																						
2-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.004	0.003	0.010	0.000	0.000	0.001	0.001	0.001	0.000	0.002	0.002	0.001	0.010																						
3-Nov	0.001	0.003	Z	0.015	0.015	0.000	0.001	0.003	0.001	0.009	0.013	0.023	0.043	0.006	0.005	0.024	0.030	0.053	0.046	0.056	0.072	0.036	0.039	0.023	0.022	0.072																						
4-Nov	0.030	0.040	0.050	Z	0.049	0.021	0.013	0.000	0.000	0.008	0.012	0.016	0.015	0.020	0.000	0.000	0.004	0.038	0.060	0.079	0.093	0.082	0.078	0.072	0.034	0.093																						
5-Nov	0.059	0.050	0.062	0.217	Z	0.059	0.071	0.084	0.073	0.076	0.070	0.061	0.056	0.019	0.005	0.001	0.008	0.007	0.018	0.013	0.004	0.000	0.003	0.007	0.044	0.217																						
6-Nov	0.012	0.002	0.010	0.004	0.000	0.008	0.006	Z	0.001	0.000	0.006	0.000	0.000	0.000	0.005	0.030	0.052	0.048	0.052	0.037	0.048	0.025	0.047	0.017	0.052																							
7-Nov	Z	0.035	0.021	0.040	0.000	0.023	0.023	0.042	0.029	0.021	0.000	0.002	0.000	0.001	0.003	0.000	0.017	0.009	0.032	0.034	0.011	0.027	0.042	0.021	0.019	0.042																						
8-Nov	0.002	Z	0.049	0.041	0.016	0.034	0.047	0.039	0.053	0.028	0.033	0.033	0.030	0.058	0.099	0.078	0.301	0.117	0.087	0.055	0.039	0.036	0.048	0.039	0.059	0.301																						
9-Nov	0.014	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.003	0.008	0.001	0.005	0.000	0.000	0.000	0.000	0.016	0.000	0.004	0.028	0.044	0.056	0.038	0.009	0.010	0.056																						
10-Nov	0.006	0.000	0.007	Z	0.011	0.001	0.000	0.001	0.003	0.003	0.000	0.018	0.036	0.009	0.000	0.002	0.005	0.016	0.048	0.058	0.065	0.071	0.067	0.056	0.021	0.071																						
11-Nov	0.044	0.057	0.055	0.064	Z	0.023	0.053	0.058	0.039	0.021	0.017	0.070	0.003	0.023	0.058	0.032	0.019	0.061	0.047	0.000	0.001	0.016	0.022	0.029	0.035	0.070																						
12-Nov	0.021	0.003	0.004	0.001	0.025	Z	0.000	0.001	0.000	0.011	0.001	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.003	0.025																						
13-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	DF	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002																						
14-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001																						
15-Nov	0.000	0.000	Z	0.000	0.000	0.028	0.040	0.041	0.054	0.076	0.137	0.056	0.050	0.059	0.032	0.008	0.034	0.011	0.002	0.031	0.003	0.002	0.022	0.023	0.031	0.137																						
16-Nov	0.025	0.033	0.031	Z	0.047	0.052	0.012	0.004	0.106	0.029	0.010	0.041	0.030	0.055	0.027	0.012	0.029	0.028	0.040	0.054	0.048	0.045	0.037	0.037	0.036	0.106																						
17-Nov	0.031	0.043	0.030	0.019	Z	0.044	0.030	0.009	0.028	0.029	0.034	0.031	0.017	0.015	0.030	0.037	0.046	0.038	0.045	0.037	0.003	0.000	0.005	0.003	0.026	0.046																						
18-Nov	0.013	0.000	0.000	UO	UO	Z	UO	0.007	UO	UO	UO	UO	C	C	C	C	0.002	0.002	0.011	0.009	0.005	0.061	0.096	0.020	--	0.096																						
19-Nov	Z	0.000	0.000	0.000	0.009	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009																						
20-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																						
21-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.005	0.021	0.009	0.002	0.000	0.000	0.000	0.000	0.000	0.002	0.021																						
22-Nov	0.000	0.000	0.000	Z	0.009	0.000	0.001	0.001	0.003	0.002	0.002	0.000	0.000	0.010	0.042	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.042																						
23-Nov	0.000	0.002	0.001	0.000	Z	0.000	0.000	0.015	0.002	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.015																						
24-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.020	0.039	0.051	0.051	0.062	0.060	0.049	0.032	0.033	0.040	0.019	0.062																						
25-Nov	Z	0.030	0.012	0.001	0.038	0.027	0.000	0.004	0.007	0.002	0.000	0.000	0.018	0.000	0.000	0.005	0.009	0.005	0.001	0.002	0.000	0.000	0.011	0.019	0.008	0.038																						
26-Nov	0.000	Z	0.033	0.012	0.000	0.003	0.035	0.033	0.032	0.061	0.072	0.016	0.011	0.050	0.020	0.012	0.002	0.059	0.040	0.034	0.009	0.000	0.000	0.000	0.023	0.072																						
27-Nov	0.004	0.002	Z	0.000	0.000	0.003	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.032	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.032																						
28-Nov	0.000	0.000	0.000	Z	0.000	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.081	0.041	0.046	0.070	0.086	0.075	0.060	0.068	0.059	0.057	0.029	0.086																						
29-Nov	0.045	0.042	0.041	0.027	Z	0.029	0.034	0.030	0.024	0.031	0.043	0.046	0.059	0.031	0.000	0.009	0.028	0.050	0.056	0.065	0.064	0.058	0.062	0.056	0.040	0.065																						
30-Nov	0.038	0.054	0.053	0.048	0.034	Z	0.040	0.036	0.011	0.024	0.028	0.049	0.049	0.049	0.093	0.113	0.135	0.097	0.031	0.002	0.022	0.077	0.072	0.051	0.052	0.135																						
																								0.013	0.016	0.018	0.020	0.011	0.014	0.014	0.014	0.016	0.015	0.017	0.016	0.014	0.014	0.019	0.016	0.028	0.026	0.026	0.025	0.021	0.024	0.025	0.020	Diurnal Average
																								0.059	0.057	0.062	0.217	0.049	0.059	0.071	0.084	0.106	0.076	0.137	0.070	0.059	0.059	0.099	0.113	0.301	0.117	0.087	0.079	0.093	0.082	0.096	0.072	Diurnal Maximum
Z - zerospan																								C - Calibration				DF - DAS Failure				UO - Unstable Operation																





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Lower Camp - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	365	53.83	53.83
0.006 - 0.05	242	35.69	89.53
0.06 - 0.1	69	10.18	99.71
> 0.1	2	0.29	100.00

Total Number of Valid Hours: 678

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Lower Camp - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	69	21	8	3	3	9	31	10	3	5	20	26	21	43	49	44	365
0.006 - 0.05	3	3	2	1	5	9	100	18	2	4	6	6	10	32	30	7	238
0.06 - 0.1	1	0	1	0	3	5	5	2	2	1	2	0	4	10	26	4	66
> 0.1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2
<b>Totals</b>	73	24	11	4	11	23	136	30	8	10	28	32	35	85	106	55	671

Total Number of Valid Hours: 671

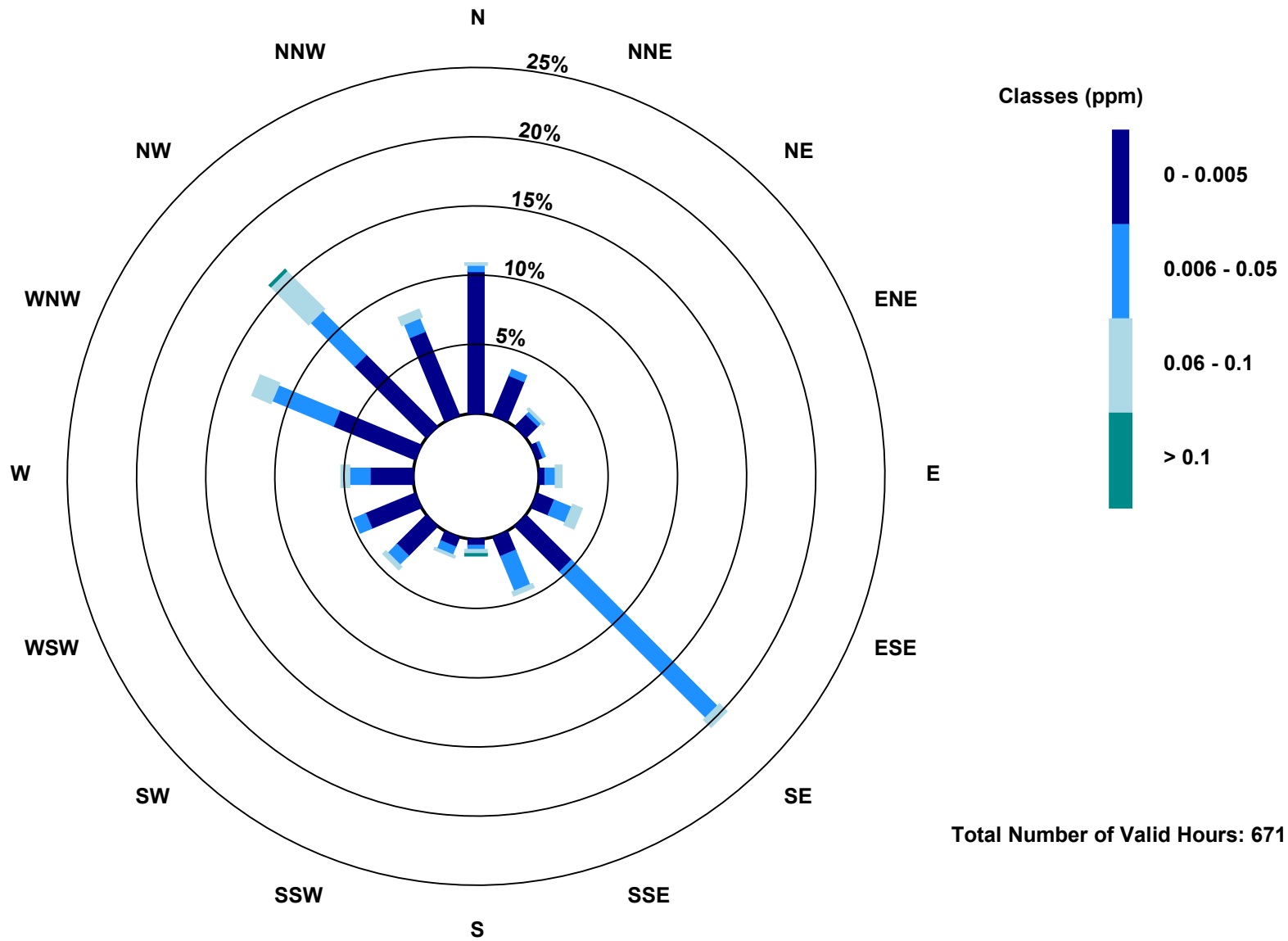
Total Number of Hours: 720

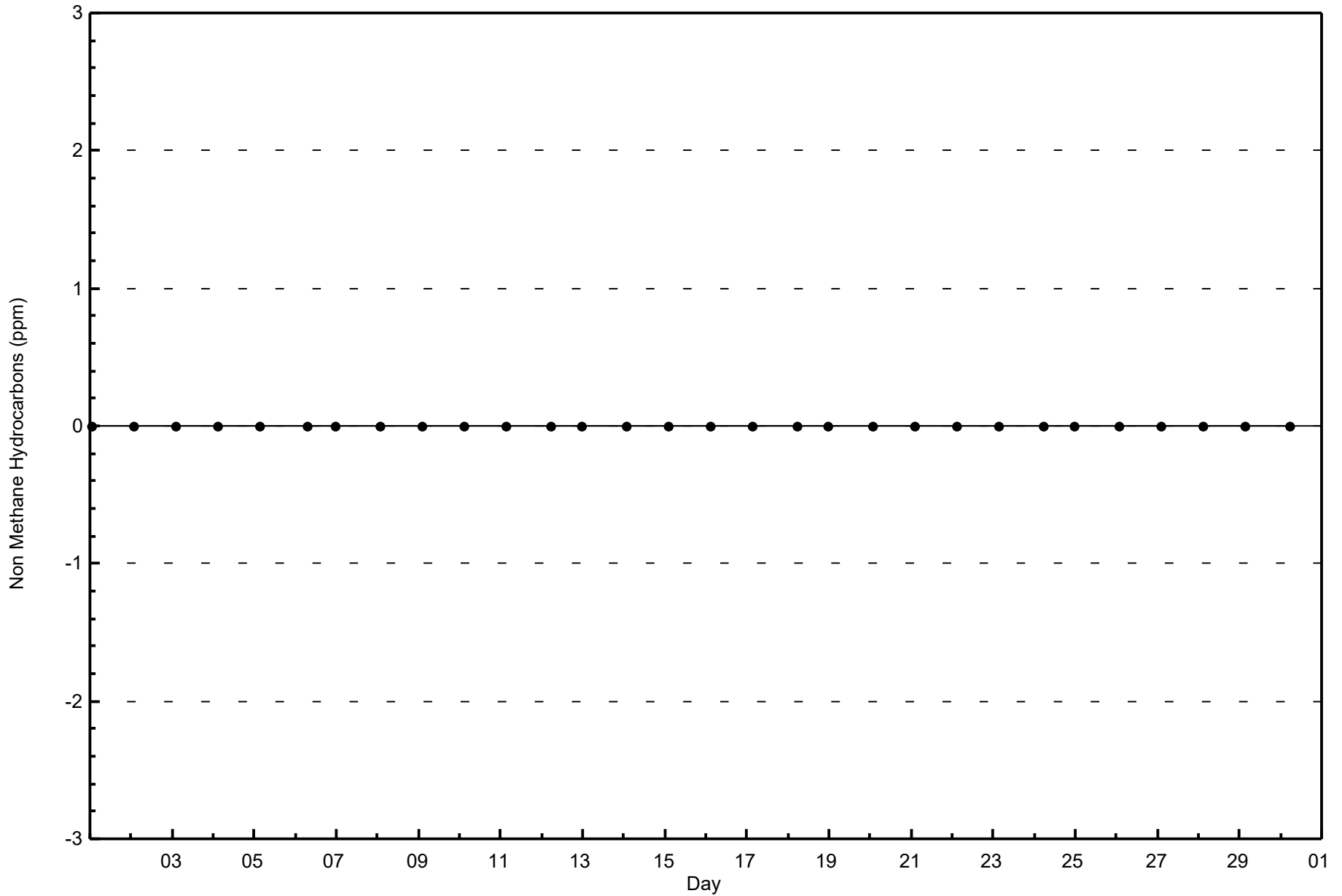


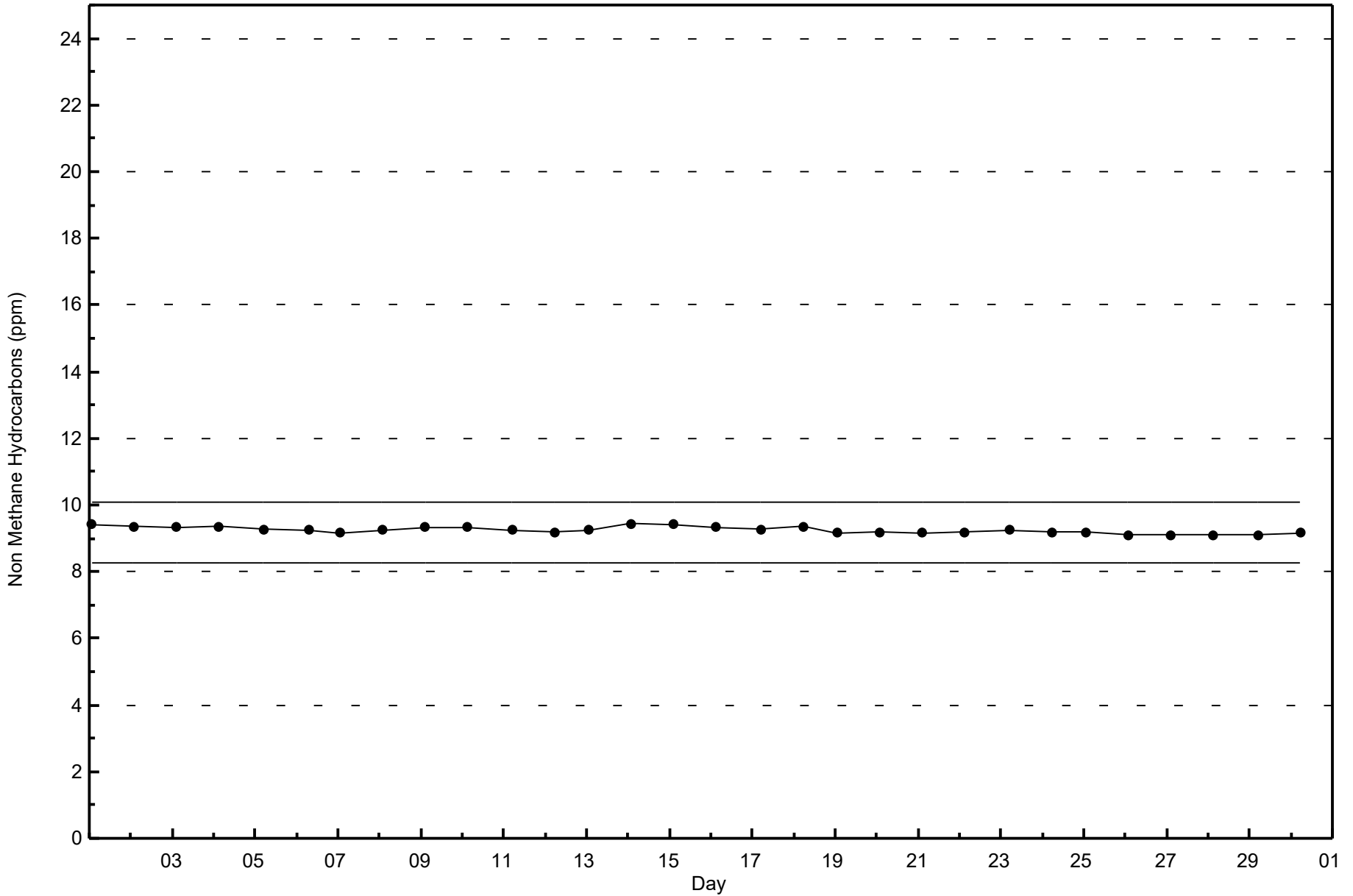


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Non Methane Hydrocarbons (NMHC) - ppm  
Lower Camp







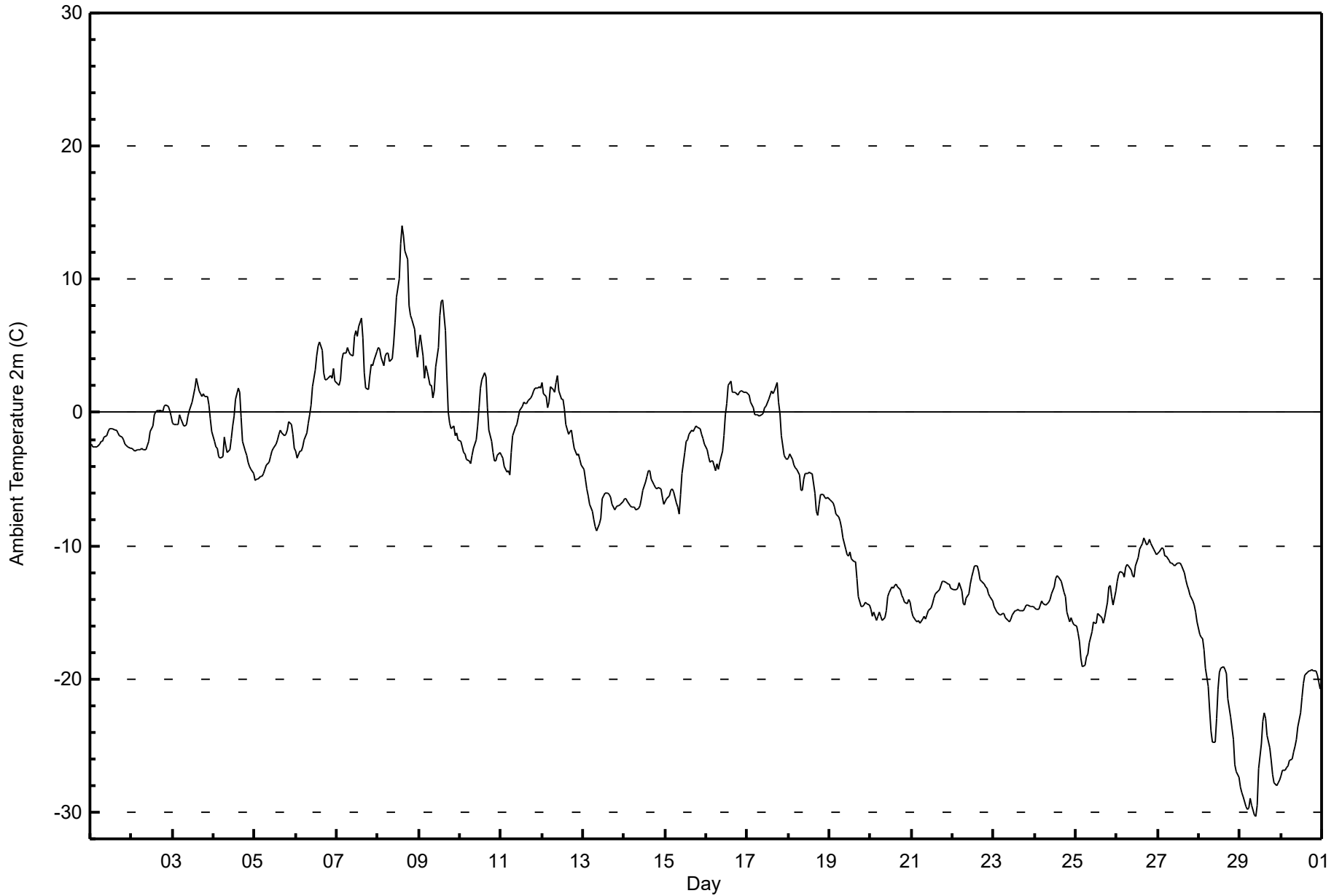


Maximum Value: 14.0 C on Nov 8 15:00      Maximum Daily Average: 7.1 C on Nov 8																						Hours in Service: 720 Hours of Data: 720				
Minimum Value: -30.3 C on Nov 29 10:00      Minimum Daily Average: -27.4 C on Nov 29 Maximum Diurnal Average: -4.9 C at hour 15      Minimum Diurnal Average: -8.1 C at hour 8 Monthly Average: -7.01 C      Percentiles: P <sub>1</sub> = -28.9 P <sub>10</sub> = -18.1 Q <sub>1</sub> = -13.7 Median = -4.7 Q <sub>3</sub> = -0.5 P <sub>90</sub> = 2.5 P <sub>99</sub> = 8.5																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	-2.4	-2.6	-2.6	-2.6	-2.6	-2.4	-2.2	-2.1	-1.9	-1.7	-1.4	-1.2	-1.2	-1.4	-1.4	-1.6	-1.7	-1.9	-2.1	-2.4	-2.5	-2.6	-2.6	-2.0	-1.2	
2-Nov	-2.7	-2.8	-2.8	-2.8	-2.8	-2.7	-2.7	-2.8	-2.8	-2.5	-2.1	-1.5	-1.0	-0.2	0.1	0.2	0.1	0.1	0.0	0.5	0.6	0.4	0.2	-0.2	-1.3	0.6
3-Nov	-0.7	-0.8	-0.9	-0.9	-0.2	-0.5	-1.0	-1.0	-0.9	-0.3	0.2	0.8	1.3	1.9	2.5	1.7	1.4	1.2	1.4	1.2	1.2	0.6	-0.4	-1.4	0.3	2.5
4-Nov	-2.1	-2.6	-2.7	-3.3	-3.4	-3.4	-1.8	-2.5	-3.0	-2.7	-1.9	-1.0	-0.3	1.0	1.8	1.6	-0.4	-2.1	-2.8	-3.2	-3.7	-4.0	-4.2	-4.5	-2.1	1.8
5-Nov	-5.1	-5.0	-4.9	-4.7	-4.8	-4.6	-4.2	-3.9	-3.7	-3.3	-2.9	-2.7	-2.4	-2.1	-1.6	-1.3	-1.5	-1.8	-1.7	-1.3	-0.7	-0.9	-1.6	-2.7	-2.9	-0.7
6-Nov	-2.9	-3.5	-2.9	-2.9	-2.6	-2.1	-1.5	-0.8	-0.2	0.5	1.9	3.2	4.2	5.0	5.3	4.7	3.0	2.5	2.4	2.6	2.8	2.6	3.3	2.4	1.1	5.3
7-Nov	2.1	2.0	2.5	4.0	4.5	4.4	4.9	4.5	4.3	4.2	5.8	6.2	5.7	6.5	7.1	5.6	3.0	1.9	1.8	2.8	3.6	3.5	4.0	4.6	4.1	7.1
8-Nov	4.9	4.8	4.1	3.5	4.2	4.5	4.4	3.8	4.1	5.2	6.8	8.7	10.1	12.7	14.0	13.3	12.2	11.5	8.1	7.3	7.0	6.2	5.0	4.1	7.1	14.0
9-Nov	5.1	5.9	4.3	2.5	3.5	3.1	2.0	2.1	1.1	1.6	3.4	4.9	7.3	8.4	8.5	6.2	2.8	0.0	-0.8	-1.3	-1.0	-1.7	-1.5	-2.0	2.7	8.5
10-Nov	-2.2	-2.5	-3.0	-3.1	-3.5	-3.7	-3.8	-3.3	-2.7	-2.0	-1.0	0.4	1.9	2.5	3.0	2.7	0.4	-1.3	-2.1	-3.0	-3.6	-3.6	-3.2	-3.0	-1.7	3.0
11-Nov	-3.3	-3.4	-4.0	-4.5	-4.4	-4.7	-3.0	-1.8	-1.1	-0.9	-0.3	0.2	0.5	0.7	0.6	0.7	0.9	1.1	1.3	1.6	1.8	1.8	2.0	1.8	-0.7	2.0
12-Nov	2.2	1.4	1.2	0.4	0.8	1.9	1.8	1.5	2.3	2.8	1.6	1.0	1.0	0.3	-0.9	-1.6	-1.5	-1.3	-2.0	-2.7	-3.2	-3.1	-3.5	-3.9	-0.1	2.8
13-Nov	-4.2	-5.0	-5.8	-6.2	-6.9	-7.4	-8.1	-8.6	-8.9	-8.3	-8.0	-6.5	-6.3	-6.1	-6.0	-6.2	-6.4	-6.9	-7.3	-7.1	-7.0	-7.0	-6.9	-6.6	-6.8	-4.2
14-Nov	-6.5	-6.5	-6.7	-7.0	-7.1	-7.1	-7.1	-7.3	-7.3	-7.0	-6.5	-5.9	-5.2	-4.8	-4.4	-4.4	-4.9	-5.4	-5.7	-5.7	-5.6	-5.7	-6.3	-6.9	-6.1	-4.4
15-Nov	-6.7	-6.4	-6.3	-5.9	-5.8	-5.9	-6.7	-7.1	-7.6	-6.1	-4.5	-3.0	-2.2	-2.1	-1.6	-1.3	-1.5	-1.2	-1.0	-1.1	-1.2	-1.6	-1.9	-2.4	-3.8	-1.0
16-Nov	-2.8	-3.3	-3.7	-3.6	-3.7	-4.4	-3.9	-4.2	-3.8	-2.9	-1.8	-0.1	0.7	2.1	2.4	1.6	1.6	1.5	1.3	1.5	1.7	1.7	1.5	1.5	-0.8	2.4
17-Nov	1.4	1.3	0.8	0.4	-0.2	-0.2	-0.2	-0.2	-0.2	0.0	0.4	0.5	1.0	1.3	1.6	1.4	1.6	2.3	0.8	0.0	-1.8	-3.3	-3.4	-3.5	0.1	2.3
18-Nov	-3.4	-3.1	-3.6	-3.9	-4.2	-4.2	-4.7	-5.9	-5.8	-5.0	-4.6	-4.6	-4.5	-4.5	-4.6	-6.0	-7.4	-7.8	-6.9	-6.1	-6.2	-6.3	-6.4	-6.4	-5.3	-3.1
19-Nov	-6.6	-6.7	-6.8	-7.1	-7.6	-7.8	-8.1	-8.7	-9.4	-10.2	-10.6	-10.8	-10.4	-11.0	-11.2	-11.2	-12.5	-13.8	-14.5	-14.6	-14.4	-14.2	-14.3	-14.4	-10.7	-6.6
20-Nov	-14.8	-15.3	-15.0	-15.6	-15.3	-15.0	-15.3	-15.6	-15.4	-14.9	-13.8	-13.5	-13.1	-13.2	-13.0	-12.9	-13.1	-13.3	-13.7	-13.9	-14.2	-14.3	-14.0	-14.2	-14.3	-12.9
21-Nov	-14.8	-15.3	-15.6	-15.7	-15.6	-15.8	-15.5	-15.3	-15.5	-15.2	-14.9	-14.7	-14.3	-13.9	-13.6	-13.4	-13.3	-13.0	-12.7	-12.7	-12.8	-12.8	-12.8	-13.1	-14.3	-12.7
22-Nov	-13.3	-13.3	-13.3	-13.2	-12.8	-13.4	-14.4	-14.4	-14.0	-13.6	-12.9	-12.3	-12.0	-11.5	-11.5	-11.9	-12.5	-12.7	-12.9	-13.1	-13.2	-13.6	-13.8	-14.2	-13.1	-11.5
23-Nov	-14.5	-14.8	-15.0	-15.2	-15.2	-15.1	-15.1	-15.3	-15.6	-15.7	-15.5	-15.2	-14.9	-14.8	-14.8	-14.8	-14.9	-14.9	-14.6	-14.4	-14.5	-14.6	-14.6	-14.5	-14.9	-14.4
24-Nov	-14.7	-14.8	-14.8	-14.4	-14.1	-14.3	-14.5	-14.4	-14.3	-14.0	-13.6	-13.0	-12.5	-12.2	-12.4	-12.6	-13.1	-13.5	-13.9	-14.9	-15.7	-15.4	-15.7	-15.9	-14.1	-12.2
25-Nov	-16.0	-16.5	-17.2	-18.5	-19.1	-19.0	-18.3	-18.1	-17.3	-16.5	-15.7	-15.9	-15.8	-15.1	-15.3	-15.4	-15.8	-15.4	-14.3	-13.1	-13.0	-13.8	-14.4	-13.4	-16.0	-13.0
26-Nov	-12.7	-12.1	-12.0	-12.0	-12.3	-11.6	-11.4	-11.5	-11.8	-12.3	-12.3	-11.6	-10.8	-10.3	-10.1	-9.9	-9.4	-9.9	-9.8	-9.5	-9.9	-10.2	-10.5	-10.7	-11.0	-9.4
27-Nov	-10.6	-10.4	-10.1	-10.3	-10.8	-10.7	-11.0	-11.3	-11.3	-11.4	-11.5	-11.3	-11.3	-11.3	-11.5	-12.0	-12.5	-12.9	-13.3	-13.7	-14.1	-14.5	-15.0	-15.7	-12.0	-10.1
28-Nov	-16.6	-16.9	-17.0	-17.8	-19.2	-20.5	-22.3	-23.9	-24.8	-24.7	-22.9	-20.8	-19.5	-19.2	-19.0	-19.3	-19.6	-21.5	-22.9	-23.7	-24.5	-26.4	-27.0	-27.4	-21.6	-16.6
29-Nov	-28.1	-28.6	-28.8	-29.5	-29.8	-29.7	-28.9	-29.5	-30.2	-30.3	-29.5	-26.7	-24.9	-23.2	-22.6	-23.0	-24.3	-25.1	-26.2	-27.2	-27.8	-28.0	-27.8	-27.6	-27.4	-22.6
30-Nov	-27.3	-26.9	-26.9	-26.6	-26.5	-26.1	-26.0	-25.5	-25.1	-24.6	-23.6	-22.6	-21.4	-20.3	-19.7	-19.5	-19.4	-19.4	-19.3	-19.4	-19.4	-19.7	-20.3	-20.7	-22.7	-19.3
																								Diurnal Average		
																								Diurnal Maximum		



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 2m (AT2) - C**  
**Lower Camp - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Lower Camp - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	54	7.50	7.50
-20 - 0	503	69.86	77.36
0 - 10	157	21.81	99.17
10 - 20	6	0.83	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

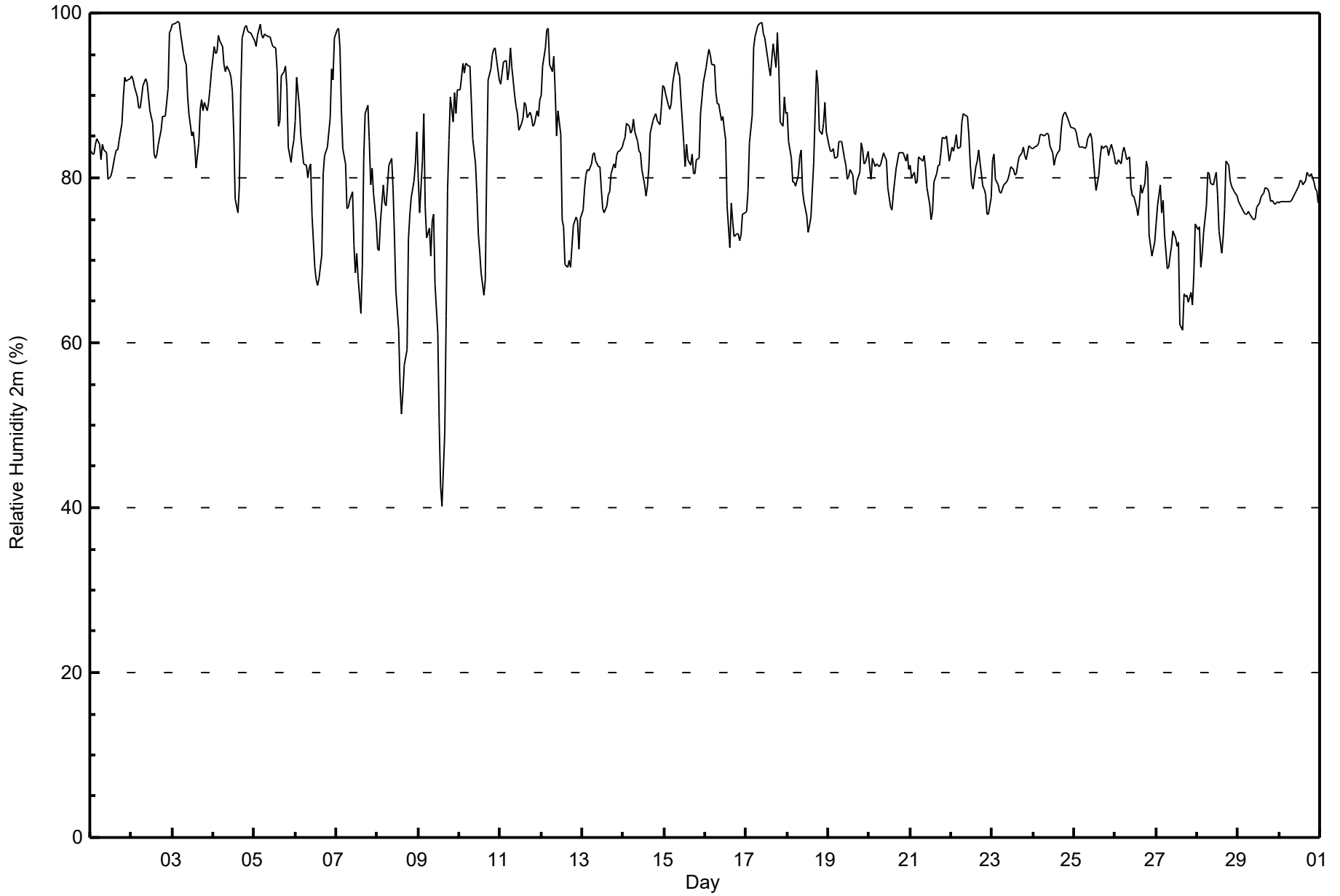
**Relative Humidity 2m (RH2) - %**  
**Lower Camp - November 2024**

Maximum Value: 98.9 % on Nov 3 04:00      Maximum Daily Average: 92.9 % on Nov 5																						Hours in Service: 720 Hours of Data: 720																										
Minimum Value: 40.2 % on Nov 9 15:00      Minimum Daily Average: 70.3 % on Nov 27 Maximum Diurnal Average: 85.7 % at hour 3      Minimum Diurnal Average: 75.4 % at hour 15 Monthly Average: 82.75 %      Percentiles: P <sub>1</sub> = 57.7 P <sub>10</sub> = 73.2 Q <sub>1</sub> = 78.2 Median = 82.7 Q <sub>3</sub> = 87.8 P <sub>90</sub> = 93.8 P <sub>99</sub> = 98.6																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	83.2	82.9	82.8	84.0	84.8	84.0	82.3	84.0	83.3	83.1	79.9	80.1	80.2	80.9	82.7	83.4	83.4	84.7	86.7	89.9	92.1	91.6	91.8	92.1	84.7	92.1																						
2-Nov	92.3	91.9	91.0	89.9	88.5	88.5	89.7	91.2	92.0	91.4	89.9	88.1	86.7	82.9	82.4	82.9	84.0	85.8	87.4	87.4	87.5	90.9	97.6	98.0	89.1	98.0																						
3-Nov	98.6	98.7	98.8	98.9	98.8	97.5	95.1	94.2	93.8	89.8	87.6	85.0	85.7	84.1	81.1	84.3	88.2	89.5	88.1	89.1	88.2	89.1	90.9	92.9	91.2	98.9																						
4-Nov	96.0	95.1	95.2	97.2	96.6	95.9	93.7	92.8	93.5	92.9	92.2	90.5	85.5	77.4	75.8	78.9	90.4	97.0	98.3	98.5	97.7	97.6	97.7	96.9	92.6	98.5																						
5-Nov	96.6	95.9	97.3	98.7	97.3	97.0	97.4	97.3	97.1	97.2	96.4	96.0	95.7	93.0	86.3	86.9	92.4	92.9	93.5	91.1	83.8	81.8	83.6	84.6	92.9	98.7																						
6-Nov	86.9	92.2	88.5	85.1	83.3	81.7	81.5	80.0	81.2	81.7	75.3	69.2	67.6	66.9	67.7	70.6	80.5	82.7	83.2	83.7	87.3	93.2	91.9	96.9	81.6	96.9																						
7-Nov	97.9	98.1	95.8	88.2	83.5	81.6	76.2	76.4	77.3	78.4	71.8	68.5	70.9	67.9	63.5	69.4	82.4	87.8	88.9	84.5	79.2	81.2	78.2	74.5	80.1	98.1																						
8-Nov	71.3	71.2	74.7	79.2	76.9	76.6	78.9	81.6	82.3	78.7	72.9	66.3	61.5	54.7	51.4	54.0	57.3	59.1	72.5	75.6	77.6	79.6	81.9	85.6	71.7	85.6																						
9-Nov	80.0	75.7	82.0	87.8	76.5	72.6	73.8	70.5	74.8	75.6	67.2	61.2	50.3	42.5	40.2	49.1	63.3	78.4	84.5	89.8	86.9	90.4	87.9	90.7	73.0	90.7																						
10-Nov	90.7	92.3	93.9	92.7	93.9	93.6	93.6	89.3	84.8	81.8	77.9	73.3	71.0	68.5	65.7	67.7	81.1	91.8	93.2	94.8	95.6	95.7	94.5	91.9	86.2	95.7																						
11-Nov	91.4	92.7	94.1	94.3	91.8	93.0	95.7	93.4	90.0	88.7	87.9	85.7	86.6	87.4	89.1	88.8	87.2	88.0	87.5	86.3	86.5	88.1	87.4	89.5	89.6	95.7																						
12-Nov	89.9	93.6	95.8	97.9	98.2	93.8	92.9	94.8	90.5	85.0	88.1	85.2	74.9	74.0	69.5	69.1	70.0	69.1	71.7	74.2	75.2	74.7	71.4	75.1	82.3	98.2																						
13-Nov	76.2	78.7	80.4	81.1	80.9	81.7	82.9	83.1	82.0	81.4	81.3	78.6	76.2	75.8	76.7	77.9	78.3	80.6	81.6	81.2	82.7	83.2	83.2	83.7	80.4	83.7																						
14-Nov	84.5	85.0	86.7	86.2	85.4	85.8	87.1	85.7	84.4	83.3	83.1	81.0	79.1	77.7	79.0	81.1	85.4	87.0	87.5	87.7	86.9	86.5	88.6	91.1	84.8	91.1																						
15-Nov	91.0	90.2	88.9	88.3	89.0	91.4	93.6	94.0	92.8	92.4	89.6	84.2	81.4	84.0	82.2	81.6	82.9	80.4	80.5	82.2	82.4	87.8	89.7	91.5	87.2	94.0																						
16-Nov	93.4	94.6	95.5	94.9	93.8	93.8	90.3	89.0	88.9	86.9	87.4	86.0	84.6	76.7	71.5	77.0	74.7	72.8	73.2	73.1	72.4	73.1	75.6	75.8	83.1	95.5																						
17-Nov	76.0	78.4	84.2	87.6	95.8	97.1	97.8	98.5	98.9	98.9	97.4	96.9	94.6	93.4	92.4	94.5	96.4	93.4	97.6	93.6	86.8	86.2	89.9	87.9	92.2	98.9																						
18-Nov	87.9	84.4	82.4	79.5	79.4	78.9	80.3	82.6	83.4	78.5	77.1	75.3	73.3	74.3	75.2	81.8	87.8	93.1	91.3	85.8	85.3	86.6	89.2	85.6	82.5	93.1																						
19-Nov	83.9	83.3	83.3	83.6	82.4	82.6	84.4	84.5	84.3	82.4	81.6	79.8	80.2	81.0	80.4	78.1	78.0	79.7	80.7	84.2	83.5	81.7	81.9	83.1	82.0	84.5																						
20-Nov	81.3	79.8	82.4	81.4	81.7	81.5	81.3	81.7	83.0	82.6	82.3	78.9	76.4	76.1	78.2	79.7	81.1	83.0	83.1	83.1	83.1	82.1	82.9	81.1	81.2	83.1																						
21-Nov	81.5	80.0	80.7	79.3	79.5	82.6	82.2	82.0	82.7	81.1	78.8	76.9	74.9	76.0	79.5	80.5	81.5	81.5	83.1	84.9	84.8	85.1	83.5	82.1	81.0	85.1																						
22-Nov	83.7	83.3	84.1	85.2	83.6	83.7	86.8	87.8	87.6	87.5	85.3	81.7	79.4	78.7	81.3	82.1	83.4	81.9	78.9	78.6	77.9	75.6	75.5	77.7	82.1	87.8																						
23-Nov	82.2	82.9	79.9	79.1	78.3	78.2	78.7	79.2	79.4	79.8	80.6	81.4	81.0	80.3	80.5	81.6	82.5	83.0	83.7	82.8	82.3	83.9	83.8	83.6	81.2	83.9																						
24-Nov	83.5	83.7	84.0	84.3	85.3	85.3	85.1	85.3	85.4	85.2	84.0	83.0	81.4	82.3	83.0	83.5	85.8	87.3	87.7	87.9	87.1	86.7	86.1	86.2	85.0	87.9																						
25-Nov	85.9	85.4	84.3	83.8	83.8	83.7	83.5	83.8	84.7	85.4	84.8	82.5	80.3	78.4	80.3	82.5	83.9	83.6	84.0	83.7	82.8	83.6	84.2	82.7	83.4	85.9																						
26-Nov	81.7	81.7	82.1	81.7	83.1	83.8	83.0	82.2	82.6	78.8	77.8	77.8	76.4	75.4	76.8	79.2	78.2	79.3	82.0	81.2	73.0	70.5	71.3	72.3	78.8	83.8																						
27-Nov	74.5	76.7	79.1	75.8	77.3	73.1	69.0	69.2	70.4	71.7	73.5	72.7	71.8	72.2	62.2	61.5	65.9	65.6	65.8	64.9	66.1	64.6	68.2	74.3	70.3	79.1																						
28-Nov	73.7	74.0	69.2	70.9	73.3	76.6	80.7	80.6	79.4	79.2	79.9	80.8	78.0	73.5	70.9	72.9	76.2	82.0	81.5	79.6	79.0	78.7	78.3	77.8	76.9	82.0																						
29-Nov	77.1	76.8	76.5	75.8	75.6	75.6	75.9	75.5	75.1	74.9	75.0	76.5	76.9	77.6	78.0	78.2	78.8	78.6	78.2	77.1	77.2	76.7	77.0	77.1	76.7	78.8																						
30-Nov	76.9	77.1	77.1	77.0	77.1	77.1	77.2	77.3	77.7	78.0	78.4	79.0	79.7	79.6	79.2	79.6	80.7	80.4	80.2	80.5	79.6	78.7	78.5	77.0	78.5	80.7																						
																								85.0	85.2	85.7	85.6	85.2	84.9	85.0	84.9	84.8	83.7	82.2	80.1	78.1	76.4	75.4	77.3	80.7	82.7	83.9	83.9	83.0	83.5	84.1	84.6	Diurnal Average
																								98.6	98.7	98.8	98.9	98.8	97.5	97.8	98.5	98.9	98.9	97.4	96.9	95.7	93.4	92.4	94.5	96.4	97.0	98.3	98.5	97.7	97.6	97.7	98.0	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 2m (RH2) - %**  
**Lower Camp - November 2024**



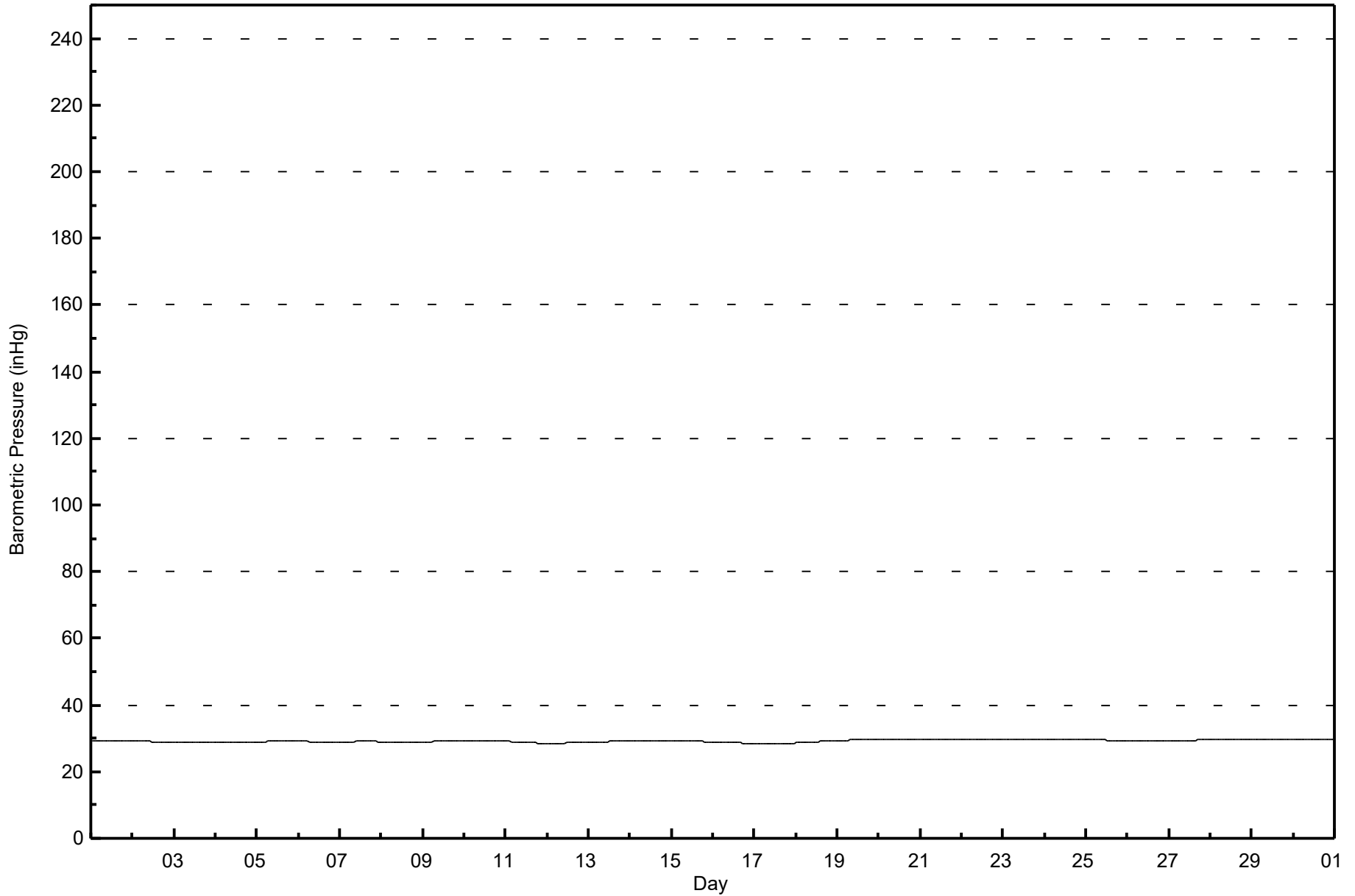






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Barometric Pressure (BP) - inHg**  
**Lower Camp - November 2024**





Maximum Speed: 27 km/h on Nov 12 16:00	Maximum Daily Speed Average: 16.5 km/h on Nov 27	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 18 18:00	Minimum Daily Speed Average: 1.5 km/h on Nov 1	Hours of Data: 713
Maximum Diurnal Speed Average: 2.1 km/h at hour 24	Minimum Diurnal Speed Average: 0.2 km/h at hour 13	Hours of Missing Data: 7
Monthly Average Velocity: 1.0 km/h 295.5 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 3 Q <sub>1</sub> = 4 Median = 8 Q <sub>3</sub> = 12 P <sub>90</sub> = 16 P <sub>99</sub> = 24	Percent Operational Time: 99.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	W10	WSW6	SW6	SW4	SW2	SSW5	SW4	ENE1	SE1	ESE2	SSW4	SW6	SW7	WNW5	NW6	N7	NNE3	NNE3	NNE5	NNE5	NNE5	N5	N3	NNW2	WNW1.5	W10	
2-Nov	NNW4	N5	N3	N2	ENE2	WNW2	NNW3	WNW5	NW5	NW5	NW5	N6	NNW6	E10	E11	E11	E11	NE6	NE3	ESE12	SE6	ESE5	ESE6	NW2	ENE2.5	ESE12	
3-Nov	WNW4	WNW4	WNW4	WNW2	WSW4	WSW5	SW3	SW4	SW6	SW4	SW6	SSW7	SSE5	SSE8	SSE9	SSE8	SSE7	SW2	SSW3	SSE5	SW3WSW11	WSW10	WSW4	SSW3.8	WSW11		
4-Nov	SE1	ENE1	SSW1	SE3	NW1	E3WSW11	WSW10	S3	SE7	SE9	SE11	SE13	SE13	SE10	SE8	SE2	WNW3	WNW3	UO	E1	UO	NNW1	NNW2	SSE3.2	SE13		
5-Nov	WNW3	WNW4	NW6	NW8	N6	WNW6	WNW5	NW4	NW4	NNW1	W7	NW4	NNW3	WNW5	W6	WNW2	E2	SE4	SE4	SSE2	WSW7	SW12	SW7	SW8	W2.9	SW12	
6-Nov	SSE7	SE15	SE20	SE17	SE17	SE16	SE18	SSE14	SE15	SSE10	S8	SW9	SW10	WSW7	SW8	SSE5	SE11	SE13	SE12	SE13	SE15	SE13	SE2	WNW3	SSE9.9	SE20	
7-Nov	WNW4	NW6	WNW7	W12	W14	W17WNW21	WNW19	WNW14	W5WSW11	W15	W8	WNW8	NW3	S1	SSE2	WNW1	SSE2	SE7	SE12	SE9	SSE4	SE8	SE8	W5.3	WNW21		
8-Nov	SE9	SSE6	SE7	SE14	SE16	SE16	SE15	SE16	SE14	SE15	SE17	SE14	SE11	SSE6	S5	S4	S5	SSW5	WNW3	WNW5	WNW5	W3	WNW4	WNW3	SE7.0	SE17	
9-Nov	W6	W8	W5	W3WSW13	WSW14	WSW9	WSW14	SW3	SW2	SW6	S4	WSW6	WSW8	WSW8	SW4	UO	N3	NNE1	WNW1	ESE3	ESE4	SE11	SE8	SW4.3	WSW14		
10-Nov	SE8	SE9	SE11	SE8	SE9	SE8	SE7	SSE4	SSE5	SSW4	SW6	S4	SE10	SE13	SE10	SE7	SE4	E1	NNE1	NW1	NW1	NNW1	E3	E6	SE5.0	SE13	
11-Nov	E1	SW1	NE2	NW1	WSW4	SE4	ESE14	ESE12	ESE14	SE22	SE25	ESE22	SE26	SE26	ESE22	ESE16	ESE10	ESE11	SE7	SE9	SE9	SE9	SE7	SE9	SE11.2	SE26	
12-Nov	SSE7	SSW1	WSW2	WNW4	SW3	SW9	WSW10	SW5	WSW12	WSW19	WSW24	W21	W23	WSW24	W26	W27	WSW25	WSW24	W18	W14	WSW15	W13	W15	W13	WSW14.1	W27	
13-Nov	W13	WSW10	WSW8	WSW11	WSW12	W7	SW4	SW8	WSW6	WNW5	NNW7	NNE11	NE10	NE10	ENE11	NE6	N7	NNE9	N8	N7	N9	N8	N9	N11	NNW4.1	W13	
14-Nov	N11	N11	N13	N12	N10	N9	N12	N9	NNW7	NNW7	N11	N10	NNE12	N9	N8	NNW8	NW8	NW6	NW6	NW7	NW7	NNW5	NNE2	WNW4	N7.8	N13	
15-Nov	N3	NNE2	N2	NE1	NW4	NE1	WNW2	WNW2	W2	W2	N1	SE4	ESE6	SE8	SE4	SE7	SE9	SSE9	SSE9	SSE9	SE11	SE12	SE11	SE9	SE3.7	SE12	
16-Nov	SSE8	SE7	SE7	SE9	SE11	SE9	SE10	SE11	SE14	SSE12	SE16	SE17	SE12	SE16	SE18	SE21	SE20	SE20	SSE14	SSE13	SE16	SE17	SE15	SE11	SE13.4	SE21	
17-Nov	SE15	SE16	SE14	SE17	SE15	SE14	SE15	SE16	SE11	SE14	SE12	SE13	SE14	SE14	SE9	SE7	SSE7	SSW3	NW12	NNW16	WNW21	WNW21	NW14	WNW13	SE5.4	WNW21	
18-Nov	WNW7	W12	W16	WNW16	NW10	WNW16	WNW11	WNW6	NW5	W10	WNW11	WNW11	WNW8	WSW4	WSW5	WSW6	WSW4	NW0	WNW2	N3	NE5	NW4	NW4	NE4	WNW6.5	WNW16	
19-Nov	NE5	NNE5	N7	N9	N7	N9	N11	N9	NNW11	N13	N13	N12	NNE16	NNE18	NNE13	N14	NNW11	N10	NNW12	N17	N11	N14	NNW14	N13	N11.0	NNE18	
20-Nov	N15	NNW13	N13	NNW9	NNW9	N10	NNW9	NNW9	NNW9	NNW9	NNW10	N15	N16	N15	N13	NNE12	N12	N12	N16	N14	N18	NNW9	NNW10	NNW14	N13	N12.0	N18
21-Nov	N14	NNW12	NNW12	NNW13	NNW9	NW8	NW10	NW9	WNW9	WNW10	WNW12	WNW12	NW9	NW9	WNW8	NW9	WNW7	NW5	NNW6	NNW4	NW5	NW5	NNE6	NNW4	NW7.9	N14	
22-Nov	WNW5	W5	WNW3	WNW3	W5	WNW4	WNW2	NW2	WNW3	WNW4	NW4	N7	NNW5	NNW6	NNE9	NNE10	NNE9	N5	NNE7	NNE8	N9	N9	N10	NNW8	NNW4.7	N10	
23-Nov	N11	N11	N11	NNE10	N9	N10	N13	N11	NNW9	N10	N9	N9	NNW9	NNW10	N12	NNW10	NNW9	NW9	NNW8	NNW8	NNW9	NNW9	NNW8	NNW9	NNW9.3	N13	
24-Nov	NW8	NW8	NW7	NW6	NW6	WNW5	WNW5	WNW5	WNW4	NW5	NW6	NW7	NW6	NW7	NW8	NW5	NW4	W3	UO	NNW1	UO	UO	UO	UO	NW5.6	NW8	
25-Nov	SE5	SE5	SE5	ESE9	SE9	SE7	SE13	SE10	SE7	SE8	SE11	SE13	SE12	SE12	SE11	SSE7	SE7	SE12	ESE19	ESE18	ESE16	ESE15	ESE16	SE10.9	ESE19		
26-Nov	SE15	SE16	SE15	SE21	SE16	SE16	SE15	SE20	SE16	SE12	SE11	SE14	SE10	SE9	SE9	SE7	SSE7	W7	W17	WNW17	WNW19	WNW19	WNW16	WNW18	SSE5.8	SE21	
27-Nov	WNW15	W16	W20	WNW21	WNW21	WNW22	WNW24	WNW21	WNW22	WNW22	WNW20	WNW20	WNW20	NW17	NW21	NW21	NW12	NW14	NW13	NW12	NW11	NNW11	NNW12	N11	WNW16.5	WNW24	
28-Nov	NNW7	NW8	NW11	NW9	WNW8	W5	WNW3	NW2	NW2	NW4	NW3	NE2	WNW4	NNW4	NW5	W4	WNW2	WNW3	WNW4	NW4	WNW3	NW3	NW3	WNW4	NW4.2	NW11	
29-Nov	NW3	NW3	WNW4	NW3	NW4	NW3	NW4	NNW3	NW3	NW3	WNW3	NNW3	NW5	NW5	NW7	NW6	NW3	WNW4	NW3	NW3	NW3	NW2	NW4	NW4	NW3.6	NW7	
30-Nov	NW4	WNW4	NW4	NW5	NW5	NW5	NW6	NW6	WNW5	WNW6	NW5	NW4	WNW4	NW6	NW7	NW8	NW6	NW6	NW7	NW6	NNW6	NW8	NW8	NNW8	NW5.8	NNW8	

NW1.4	NNW1.5	NW1.6	NW1.2	W1.4	WSW1.7	WSW1.7	WSW1.4	WSW1.3	WSW1.4	WNW0.4	N0.2	SSE0.2	N0.5	N0.7	ESE0.2	NW0.8	NW1.8	N1.7	NW1.3	NW1.9	NNW1.9	NNW2.1	Diurnal Average				
WNW15	SE16	SE20	WNW21	WNW21	WNW22	WNW24	WNW21	WNW22	SE22	SE25	ESE22	SE26	SE26	W26	W27	WSW25	WSW24	W18	ESE19	WNW21	WNW21	WNW16	WNW18	Diurnal Maximum			

UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Lower Camp - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Nov 11 09:00	Hours in Service: 720 Hours of Data: 713 Hours of Missing Data: 7 Hours of Calibration: 0 Percent Operational Time: 99.0
Minimum Value: 1 km/h on Nov 22 09:00	
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 5	

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	2	2	1	2	2	1	2	2	2	2	2	2	2	1	1	1	1	2	1	1	2	1	1	1	2	
2-Nov	2	2	1	2	2	1	1	1	1	1	1	1	1	2	2	3	2	3	2	3	4	3	3	1	4	
3-Nov	1	1	1	2	2	1	2	3	2	1	2	2	2	2	3	2	2	2	2	3	2	2	2	3	3	
4-Nov	2	1	2	1	1	2	5	4	2	3	3	2	2	2	2	2	2	1	2	UO	1	UO	1	1	5	
5-Nov	2	1	1	1	2	1	1	1	1	1	2	1	1	2	1	2	1	1	1	1	1	4	3	2	2	4
6-Nov	3	3	4	4	4	4	5	4	4	3	3	3	4	4	3	2	2	2	2	2	2	2	3	1	5	
7-Nov	1	2	3	5	3	3	4	3	4	3	3	3	2	2	2	1	1	1	2	2	2	2	2	4	5	
8-Nov	3	2	2	3	3	3	2	2	2	2	3	2	3	2	1	1	2	2	2	2	2	1	3	2	3	
9-Nov	3	3	2	3	2	3	4	3	2	2	2	2	2	2	2	2	UO	1	1	1	2	2	2	3	4	
10-Nov	2	2	2	3	2	2	2	1	2	1	2	2	3	2	2	2	2	1	1	1	1	1	1	2	3	3
11-Nov	2	1	1	2	4	4	3	4	7	4	4	3	4	3	5	4	2	3	3	2	2	2	4	2	7	
12-Nov	2	2	2	1	3	2	2	2	3	4	6	5	5	5	6	6	5	5	4	3	3	3	4	3	6	
13-Nov	3	2	2	2	3	2	2	3	2	1	2	3	2	2	3	1	2	2	2	1	2	2	2	2	3	
14-Nov	2	2	3	3	3	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	1	3	
15-Nov	1	1	1	1	1	1	2	1	1	1	2	1	1	2	2	2	3	2	3	2	3	2	2	2	3	
16-Nov	1	2	2	2	3	3	4	4	4	4	3	4	3	6	6	4	5	6	5	4	5	5	4	3	6	
17-Nov	4	4	3	3	2	3	3	3	3	3	3	3	3	4	3	2	2	3	3	5	5	4	4	4	5	
18-Nov	2	4	3	3	3	4	3	1	2	2	2	2	3	1	2	1	1	1	2	2	1	1	1	2	4	
19-Nov	2	1	2	1	3	3	3	3	3	3	2	3	5	4	3	4	3	3	3	5	3	3	3	3	5	
20-Nov	3	3	4	3	2	2	2	2	2	3	3	3	3	3	3	3	3	3	4	4	4	3	3	3	4	
21-Nov	2	3	3	3	3	1	1	2	1	2	2	2	2	2	1	1	1	1	1	2	1	1	1	1	3	
22-Nov	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	2	2	2	1	2	2	2	2	2	2	
23-Nov	3	3	3	2	2	3	2	3	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	3	
24-Nov	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	UO	1	UO	UO	UO	2	
25-Nov	1	2	2	1	2	2	2	2	2	3	2	2	2	2	2	3	3	4	3	4	4	3	3	4	4	
26-Nov	3	4	4	4	3	3	4	5	4	3	4	2	2	3	2	3	2	3	3	4	5	5	3	3	5	
27-Nov	4	3	4	5	4	5	5	4	4	4	4	4	4	4	5	5	2	3	3	3	4	3	3	2	5	
28-Nov	2	3	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	
29-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
30-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	2	2	2	2	

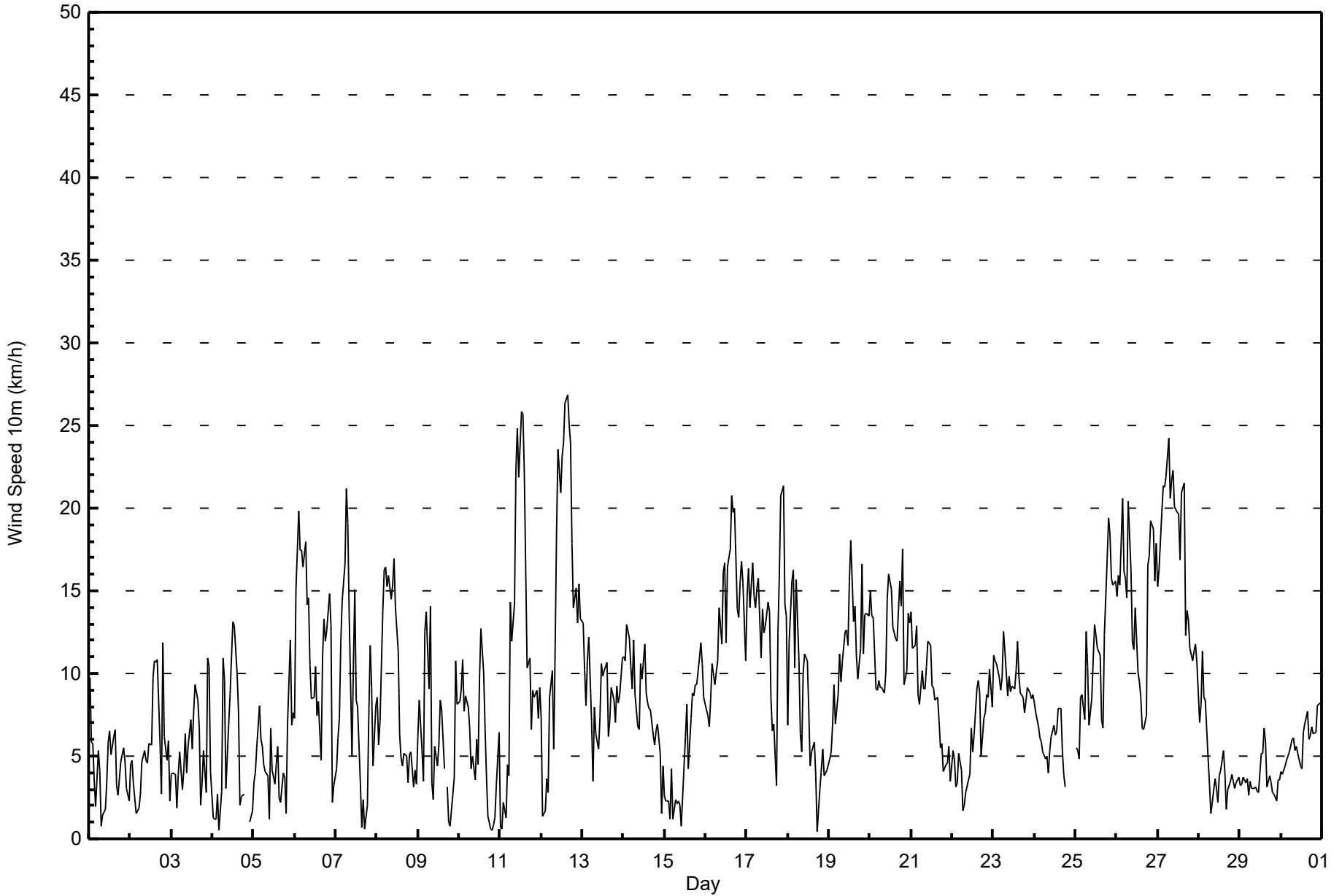
4	4	4	5	4	5	5	5	5	7	4	6	5	5	6	6	6	6	5	6	5	5	5	5	4	4
Diurnal Maximum																									

UO - Unstable Operation



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 10m (WS10) - km/h**  
**Lower Camp - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Lower Camp - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	240	33.66	33.66
6 - 11	280	39.27	72.93
12 - 19	157	22.02	94.95
20 - 28	36	5.05	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 713

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Lower Camp - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	11	10	8	3	6	4	14	9	7	9	14	8	11	54	57	15	240
6 - 11	42	9	4	1	5	6	59	17	1	1	14	18	9	15	45	34	280
12 - 19	25	5	0	0	0	11	59	6	0	0	1	7	14	13	7	9	157
20 - 28	0	0	0	0	0	2	10	0	0	0	0	4	5	13	2	0	36
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	78	24	12	4	11	23	142	32	8	10	29	37	39	95	111	58	713

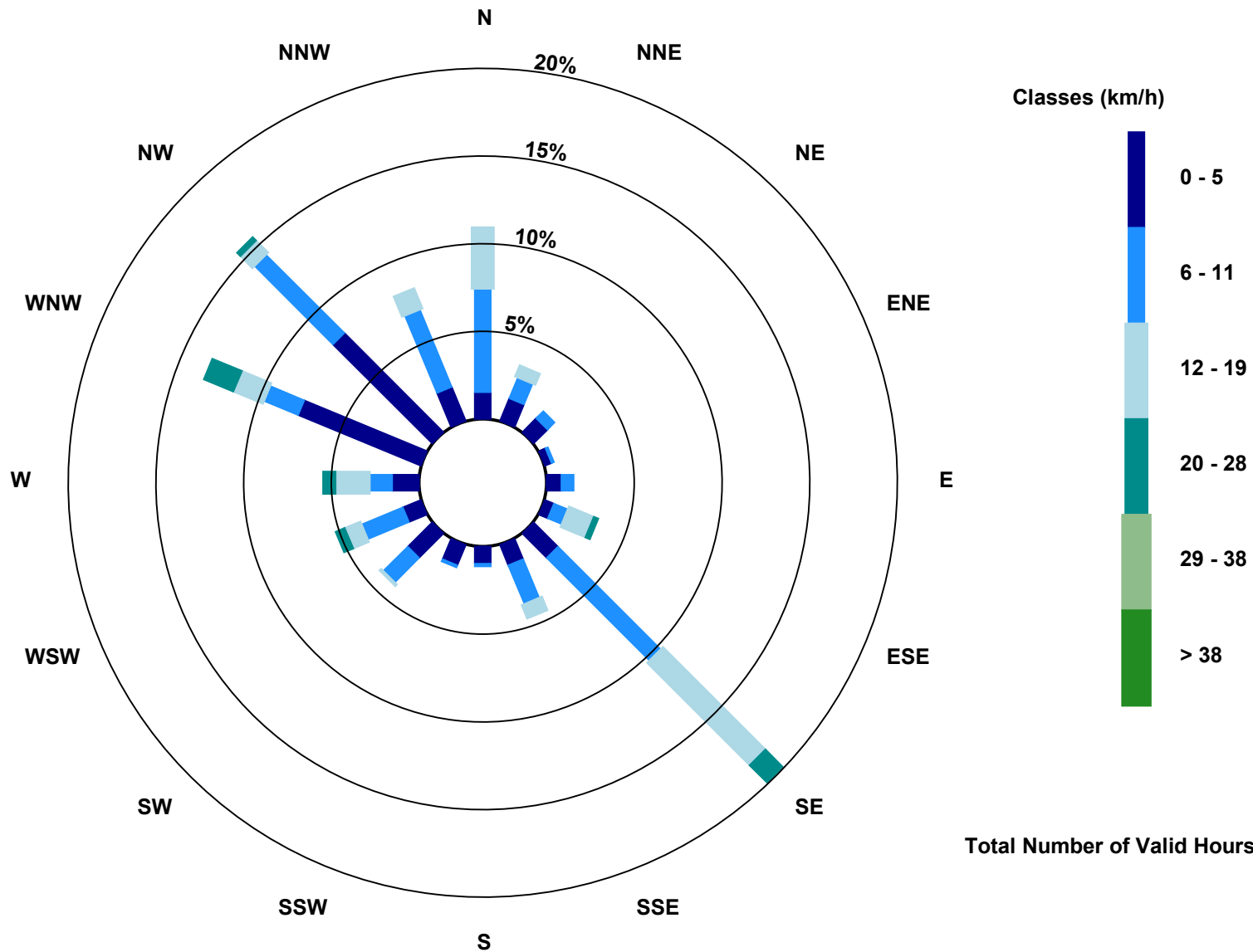
Total Number of Valid Hours: 713

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Lower Camp







**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Lower Camp - November 2024**

Direction of Maximum Speed: 271 deg on Nov 12 16:00		Hours in Service:	720
Direction of Maximum Daily Speed Average: 299.6 deg on Nov 27		Hours of Data:	713
Direction of Minimum Speed: 304 deg on Nov 18 18:00		Hours of Missing Data:	7
Direction of Minimum Daily Speed Average: 1.5 deg on Nov 1		Percent Operational Time:	99.0
Monthly Average Direction: 295.5 deg			

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	275	253	224	214	214	213	214	58	126	114	207	215	234	286	323	7	14	25	27	23	22	9	9	327	288.7
2-Nov	343	351	3	349	57	296	341	298	313	323	306	350	342	100	101	101	89	54	55	116	124	116	118	308	60.8
3-Nov	290	282	294	298	237	252	232	225	224	231	222	202	158	159	147	149	157	220	204	151	230	239	246	250	211.9
4-Nov	144	68	203	140	320	91	243	241	191	132	139	127	126	131	132	140	130	296	286	UO	90	UO	334	285	149.8
5-Nov	295	292	309	326	6	302	299	305	314	345	279	323	337	300	272	300	97	133	131	152	246	232	215	214	280.5
6-Nov	151	131	134	138	142	146	143	149	146	151	178	214	236	245	236	154	136	135	132	132	131	131	143	287	149.3
7-Nov	282	316	301	279	261	278	291	290	298	266	254	275	279	287	314	169	155	297	153	139	138	134	153	130	270.6
8-Nov	140	162	144	131	135	135	137	134	134	130	132	136	140	162	173	172	191	197	294	289	297	276	300	292	145.0
9-Nov	266	267	264	259	238	239	247	242	220	219	222	187	245	243	250	227	UO	6	33	287	107	102	135	136	231.6
10-Nov	134	136	128	137	136	137	145	166	158	193	227	189	134	135	132	138	132	84	28	323	324	344	100	101	139.3
11-Nov	87	224	52	322	247	126	121	111	121	132	124	122	124	130	123	122	111	120	143	136	140	133	138	124	125.8
12-Nov	164	211	238	285	221	228	240	234	241	252	258	267	259	258	270	271	247	248	261	262	253	269	277	268	256.7
13-Nov	263	258	258	256	248	261	232	234	247	284	335	26	50	55	65	43	9	15	349	354	357	352	352	358	328.9
14-Nov	9	3	356	0	3	9	5	349	333	344	5	9	14	350	349	331	320	309	304	310	329	22	285	349.2	
15-Nov	351	19	5	54	310	48	287	302	278	280	9	125	119	125	127	135	142	149	155	148	154	141	141	146	139.8
16-Nov	149	146	144	134	143	132	145	146	142	153	131	136	134	146	141	134	138	143	151	150	146	142	139	142	141.6
17-Nov	137	138	137	135	133	136	136	134	136	133	141	141	140	135	144	133	148	200	316	336	300	291	307	303	145.6
18-Nov	293	271	271	287	310	295	287	282	307	280	290	303	287	253	242	244	254	304	292	10	46	322	308	55	289.0
19-Nov	56	32	7	6	357	7	357	9	348	353	2	353	14	17	18	355	348	351	344	355	353	353	348	8	1.1
20-Nov	2	337	351	331	333	351	339	328	347	348	1	359	8	351	13	9	4	1	9	1	348	328	348	349	353.3
21-Nov	5	346	336	334	328	307	308	311	301	298	293	297	311	310	303	306	300	320	342	340	325	324	20	345	320.2
22-Nov	287	281	284	284	276	284	302	307	300	290	325	355	342	332	23	27	17	358	28	22	6	356	2	340	346.1
23-Nov	358	10	9	15	353	352	6	2	347	353	357	357	339	338	349	342	328	324	333	332	339	331	328	333	348.5
24-Nov	322	322	318	314	313	300	303	301	301	305	313	316	325	314	313	315	306	305	280	UO	330	UO	UO	UO	312.0
25-Nov	134	139	125	123	130	136	134	131	141	138	132	133	135	132	141	149	132	130	121	123	122	121	119	120	129.0
26-Nov	124	138	137	133	127	130	137	133	134	144	141	130	132	137	139	144	167	277	268	286	291	296	289	293	157.4
27-Nov	286	274	279	293	297	289	284	290	286	283	286	292	297	315	316	317	313	305	314	318	323	328	347	357	299.6
28-Nov	338	315	308	307	298	277	298	319	314	314	307	45	303	327	321	279	288	299	283	325	290	315	316	301	308.5
29-Nov	307	319	298	315	307	307	305	328	309	309	295	339	312	306	310	319	307	303	323	315	310	319	312	311	311.5
30-Nov	306	303	312	320	314	315	307	322	303	298	324	316	303	312	313	312	309	305	311	314	327	325	321	331	314.4

321.4 297.3 303.9 304.2 264.5 255.7 253.1 245.2 242.1 238.9 250.9 290.8 355.4 150.9 0.8 356.8 117.4 308.7 316.5 354.6 319.8 305.5 328.6 331.0

Diurnal Average

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Lower Camp - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 96 deg on Nov 11 01:00	Hours of Data: 713
Minimum Value: 4 deg on Nov 10 14:00	Hours of Missing Data: 7
	Hours of Calibration: 0
	Percent Operational Time: 99.0
Percentiles: P <sub>1</sub> = 7 P <sub>10</sub> = 11 Q <sub>1</sub> = 13 Median = 18 Q <sub>3</sub> = 27 P <sub>90</sub> = 52 P <sub>99</sub> = 91	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	14	28	17	34	72	20	22	80	74	81	39	26	21	35	15	17	39	51	18	22	30	29	35	32	81
2-Nov	23	27	29	70	77	54	52	18	26	27	20	18	32	29	16	14	11	31	82	19	62	75	32	32	82
3-Nov	16	12	13	44	45	17	79	29	18	38	26	30	38	22	18	18	26	84	75	64	82	13	12	79	84
4-Nov	91	79	84	43	92	52	63	39	62	33	18	10	7	5	9	16	94	31	35	UO	74	UO	49	87	94
5-Nov	19	28	13	14	26	20	14	16	23	53	17	33	24	30	16	58	66	23	48	86	52	14	21	23	86
6-Nov	24	10	11	13	14	16	14	18	17	20	34	33	24	35	25	30	9	7	9	7	7	8	87	18	87
7-Nov	26	22	20	14	14	12	10	10	15	46	18	12	15	20	58	83	61	76	85	17	9	13	32	33	85
8-Nov	38	38	18	7	9	9	8	6	8	6	6	8	14	34	31	29	33	56	47	38	25	31	24	36	56
9-Nov	40	20	25	42	13	12	45	13	66	68	48	53	23	15	14	37	UO	21	84	76	92	51	9	36	92
10-Nov	11	11	9	17	13	19	15	40	40	51	26	49	7	4	6	16	63	87	83	23	40	64	56	38	87
11-Nov	96	89	72	80	83	91	14	26	25	9	7	8	7	7	11	10	17	14	30	17	20	14	29	15	96
12-Nov	30	92	80	27	72	20	16	22	17	13	13	12	13	12	12	12	15	12	13	15	11	17	17	15	92
13-Nov	13	14	18	15	14	21	52	15	22	23	23	25	15	17	19	24	19	16	23	23	18	20	20	15	52
14-Nov	15	14	17	15	18	17	13	21	23	26	13	18	14	21	20	18	16	15	16	11	13	33	83	13	83
15-Nov	55	62	59	82	12	88	24	47	17	27	92	26	13	11	45	22	33	21	26	20	21	11	12	14	92
16-Nov	13	14	20	28	19	25	31	26	21	27	16	17	18	23	23	13	17	18	25	23	21	19	17	24	31
17-Nov	17	17	15	12	10	15	12	9	16	10	18	18	12	13	18	18	15	56	11	19	17	10	12	12	56
18-Nov	15	14	12	18	15	12	12	19	17	12	13	14	26	30	18	8	15	71	73	70	18	45	31	42	73
19-Nov	29	24	19	17	28	21	17	25	24	21	18	19	18	16	19	24	26	26	22	21	26	20	24	20	29
20-Nov	20	20	22	21	22	29	26	21	26	25	20	17	19	23	17	19	20	17	17	18	29	21	19	20	29
21-Nov	16	20	20	19	19	14	10	10	11	12	10	12	15	14	12	12	13	21	19	43	13	16	25	44	44
22-Nov	9	12	20	22	14	17	23	15	14	9	23	16	23	20	18	20	17	32	13	15	17	23	21	25	32
23-Nov	17	19	16	20	20	15	19	24	23	20	17	22	18	19	20	17	15	19	18	20	17	16	19	24	24
24-Nov	14	13	13	17	13	14	15	12	13	12	11	11	18	11	8	9	7	9	8	UO	48	UO	UO	UO	48
25-Nov	13	26	35	8	9	21	7	12	20	18	10	9	10	7	12	28	58	19	10	11	10	10	11	12	58
26-Nov	12	17	17	9	9	10	15	10	13	20	22	10	11	15	10	18	34	15	13	13	11	11	12	11	34
27-Nov	13	13	13	11	11	12	12	11	11	10	10	11	13	16	13	12	12	11	11	16	21	18	21	14	21
28-Nov	18	14	12	14	12	19	38	32	33	25	43	54	15	28	20	19	21	35	23	39	34	43	28	20	54
29-Nov	18	20	20	30	39	15	21	29	12	21	17	25	18	24	14	11	24	15	21	28	31	26	18	17	39
30-Nov	15	18	13	14	13	14	10	15	14	12	18	21	18	16	13	9	12	11	10	14	16	18	15	16	21

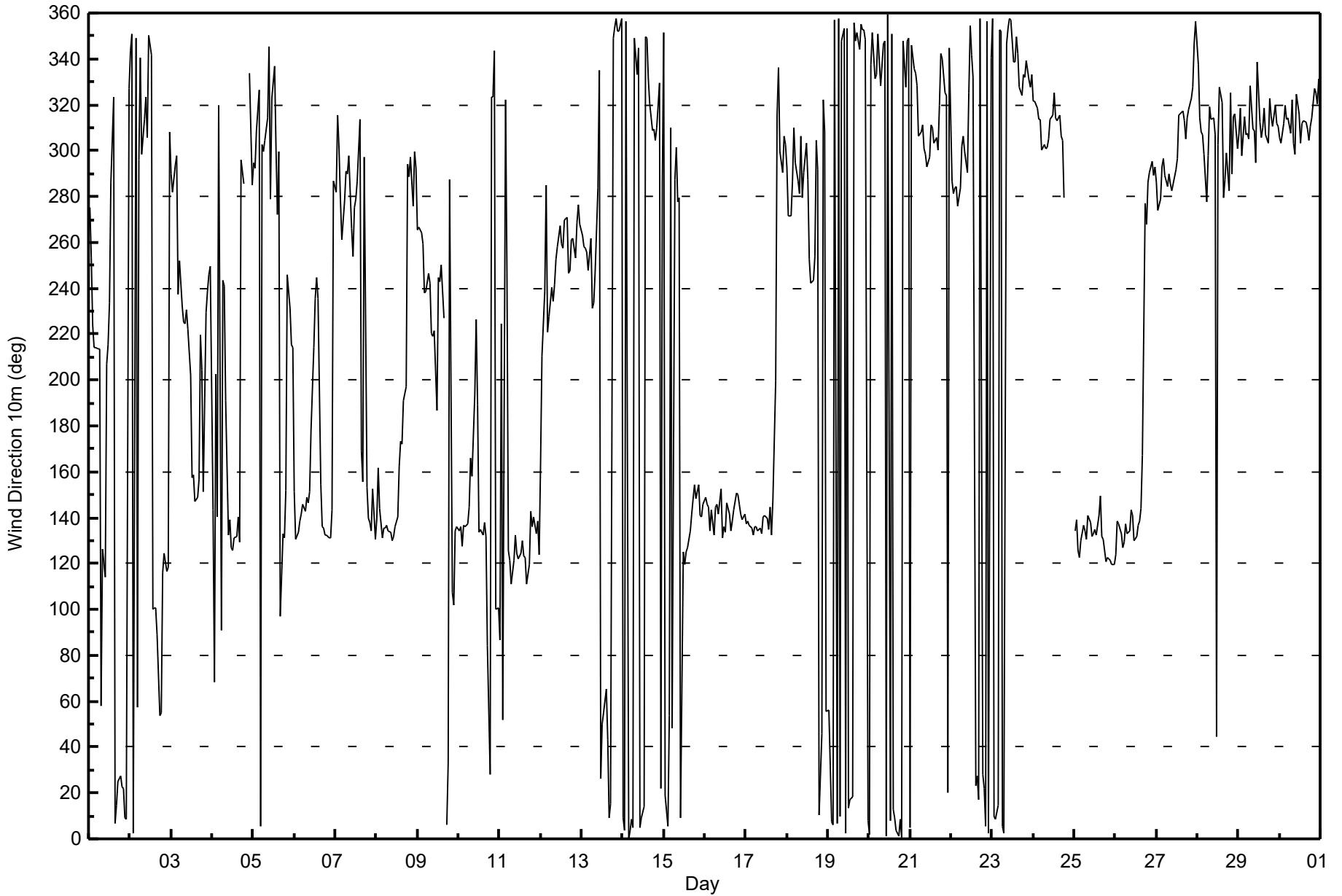
96	92	84	82	92	91	79	80	74	81	92	54	38	35	58	83	94	87	85	86	92	75	87	87	
Diurnal Maximum																								

UO - Unstable Operation



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Direction 10m (WD10) - deg**  
**Lower Camp - November 2024**





## **WOOD BUFFALO ENVIRONMENTAL ASSOCIATION**

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS13 FORT MCKAY SOUTH NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS13)  
 NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	687	33	33	100	11.6	0	2.1	0
TRS(ppb) Average	685	35	35	100	3.2	0	0.9	0
THC(ppm) Average	585	37	135	86.39	3.6	-	2.6	-
NMHC(ppm) Average	585	37	135	86.39	0.235	-	0.037	-
CH4(ppm) Average	585	37	135	86.39	3.6	-	2.6	-
O3(ppb) Average	687	33	33	100	33.9	0	30.7	-
NO2(ppb) Average	663	37	57	97.22	39.3	0	27.2	-
NO(ppb) Average	663	37	57	97.22	115.8	-	31.3	-
NOX(ppb) Average	663	37	57	97.22	155	-	58.4	-
PM2.5(ug/m3) Average	719	1	1	100	11.7	0	6.8	0
ET(C) Average	720	0	0	100	12.8	-	5.4	-
RH(%) Average	716	0	4	99.44	100	-	94.9	-
WS(km/h) Average	705	0	15	97.92	21	-	12	-
WD(deg) Average	705	0	15	97.92	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS13)  
NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	687	0.59	1	-	0	0.1	0.2	0.4	0.6	1.1	11.6
TRS(ppb) Average	685	0.5	0.3	-	0.2	0.3	0.4	0.4	0.5	0.7	3.2
THC(ppm) Average	585	2.22	0.2	-	2	2	2.1	2.2	2.3	2.5	3.6
NMHC(ppm) Average	585	0.005	0.022	-	0	0	0	0	0	0	0.235
CH4(ppm) Average	585	2.22	0.2	-	2	2	2.1	2.2	2.3	2.5	3.6
O3(ppb) Average	687	13.5	9.3	-	1.2	2	4.1	12.6	21.7	26.9	33.9
NO2(ppb) Average	663	7.92	6.8	-	0	0.3	2.9	6.2	11.7	16.5	39.3
NO(ppb) Average	663	5.35	13.2	-	0	0	0	0.6	4.2	14.9	115.8
NOX(ppb) Average	663	13.27	17.5	-	0	0.3	3.1	8.5	16.3	32.3	155
PM2.5(ug/m3) Average	719	3.25	1.9	-	0.3	1.2	1.8	2.7	4.4	5.9	11.7
Temperature 2 m (C) Average	720	-8.31	8.6	-	-33.3	-18.7	-14.5	-7.4	-1.7	1.1	12.8
Relative Humidity (%) Average	716	83.94	8.6	-	41.3	73.3	79.2	84.2	90.3	94.8	100
Wind Speed 10 m (km/h) Average	705	6.3	4	-	0	2	3	5	9	12	21
Wind Direction 10 m (deg) Average	705	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS13)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC/NMHC/CH4	17 Nov 2024 07:00	18 Nov 2024 00:00	18	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	18 Nov 2024 02:00	18 Nov 2024 11:00	10	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	18 Nov 2024 12:00	18 Nov 2024 14:00	3	Maintenance - station operator activities
THC/NMHC/CH4	21 Nov 2024 23:00	22 Nov 2024 04:00	6	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	22 Nov 2024 06:00	22 Nov 2024 10:00	5	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	22 Nov 2024 11:00	22 Nov 2024 14:00	4	Maintenance - station operator activities
THC/NMHC/CH4	23 Nov 2024 07:00	24 Nov 2024 00:00	18	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	24 Nov 2024 02:00	24 Nov 2024 10:00	9	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	24 Nov 2024 11:00	24 Nov 2024 11:00	1	Maintenance - verify daily QA response
THC/NMHC/CH4	24 Nov 2024 12:00	25 Nov 2024 01:00	14	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	25 Nov 2024 03:00	25 Nov 2024 12:00	10	Unstable Operation - excessive baseline noise
NO2	05 Nov 2024 15:00	06 Nov 2024 10:00	20	Maintenance - station operator activities
Relative Humidity	07 Nov 2024 01:00	07 Nov 2024 01:00	1	Sensor operated out of range
Relative Humidity	17 Nov 2024 09:00	17 Nov 2024 11:00	3	Sensor operated out of range
Wind Speed, Wind Direction	03 Nov 2024 02:00	03 Nov 2024 05:00	4	Unstable Operation - flatline in analyzer output signal
Wind Speed, Wind Direction	05 Nov 2024 05:00	05 Nov 2024 05:00	1	Unstable Operation - flatline in analyzer output signal
Wind Speed, Wind Direction	18 Nov 2024 16:00	18 Nov 2024 16:00	1	Unstable Operation - flatline in analyzer output signal
Wind Speed, Wind Direction	21 Nov 2024 20:00	21 Nov 2024 20:00	1	Unstable Operation - flatline in analyzer output signal
Wind Speed, Wind Direction	22 Nov 2024 08:00	22 Nov 2024 11:00	4	Unstable Operation - flatline in analyzer output signal
Wind Speed, Wind Direction	24 Nov 2024 17:00	24 Nov 2024 17:00	1	Unstable Operation - flatline in analyzer output signal
Wind Speed, Wind Direction	29 Nov 2024 04:00	29 Nov 2024 04:00	1	Unstable Operation - flatline in analyzer output signal
Wind Speed, Wind Direction	29 Nov 2024 07:00	29 Nov 2024 07:00	1	Unstable Operation - flatline in analyzer output signal
Wind Speed, Wind Direction	29 Nov 2024 22:00	29 Nov 2024 22:00	1	Unstable Operation - flatline in analyzer output signal



# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Sulphur Dioxide (SO<sub>2</sub>) - ppb

## Fort McKay South - November 2024

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Daily Average		Daily Maximum				
Maximum Value: 11.6 ppb on Nov 6 07:00		Maximum Daily Average: 2.1 ppb on Nov 6																	Hours of Data: 687		Hours of Missing Data: 33						
Minimum Value: 0.0 ppb on Nov 5 18:00		Minimum Daily Average: 0.1 ppb on Nov 7																	Hours of Calibration: 33		Percent Operational Time: 100.0						
Maximum Diurnal Average: 1.0 ppb at hour 16		Minimum Diurnal Average: 0.4 ppb at hour 18																									
Monthly Average: 0.59 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.2 Median = 0.4 Q <sub>3</sub> = 0.6 P <sub>90</sub> = 1.1 P <sub>99</sub> = 4.4																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	1.4	C	C	C	0.6	0.4	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.4	1.4	
2-Nov	0.2	Z	0.0	0.0	0.1	0.0	0.1	0.2	0.3	0.4	0.4	0.5	0.8	0.9	0.7	0.5	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.3	0.9	
3-Nov	0.5	0.5	Z	0.4	0.3	0.5	0.1	0.2	0.2	0.3	0.3	0.5	0.7	0.2	1.1	0.4	0.1	0.2	0.3	0.4	0.3	0.4	0.4	0.3	0.4	1.1	
4-Nov	0.3	0.7	1.3	Z	0.7	0.6	0.4	0.4	0.5	0.4	0.5	0.5	0.5	3.1	10.5	10.2	1.0	0.8	0.7	0.6	0.7	1.0	1.3	1.9	1.7	10.5	
5-Nov	2.3	1.8	1.7	1.4	Z	0.8	0.6	0.7	0.5	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.5	2.3	
6-Nov	0.1	5.9	4.9	3.0	3.2	Z	11.6	8.3	3.4	1.0	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.8	0.6	0.6	0.4	0.4	2.1	11.6	
7-Nov	Z	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.1	0.3	
8-Nov	0.6	Z	0.4	0.4	0.6	0.4	0.4	0.4	0.7	4.2	3.5	1.1	0.8	0.9	0.8	0.8	0.7	0.7	0.8	0.6	0.6	0.5	0.5	0.4	0.9	4.2	
9-Nov	0.4	0.4	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.4	
10-Nov	0.4	0.4	0.4	Z	0.5	0.4	0.7	0.6	0.5	0.6	0.4	0.3	0.2	0.3	1.8	5.8	0.6	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.7	5.8	
11-Nov	0.3	0.3	0.4	0.4	0.3	Z	0.1	0.3	0.2	0.2	0.3	0.3	0.5	0.7	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.7	
12-Nov	Z	0.4	0.5	0.7	0.7	1.2	1.0	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.4	1.2	
13-Nov	0.2	Z	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.4	
14-Nov	0.3	0.4	Z	0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.3	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.5	
15-Nov	0.4	0.4	0.4	Z	0.3	0.2	0.3	0.4	0.8	1.1	0.9	1.2	0.8	0.7	0.7	1.6	0.9	0.5	2.0	1.0	0.5	1.1	0.5	0.3	0.7	2.0	
16-Nov	0.3	0.3	0.3	0.9	Z	1.0	0.9	0.9	0.9	0.8	1.1	1.4	1.8	0.8	0.9	1.1	0.7	0.7	0.7	1.1	2.6	2.8	2.6	1.1	1.1	2.8	
17-Nov	0.8	3.7	4.3	3.6	2.8	Z	4.3	3.7	1.2	0.9	1.2	1.4	1.1	1.4	1.2	1.0	0.9	0.8	0.8	0.6	0.4	0.4	0.4	0.3	1.6	4.3	
18-Nov	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.6	0.6	0.4	0.4	0.2	0.6	
19-Nov	0.5	Z	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.5	
20-Nov	0.3	0.2	Z	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.3	
21-Nov	0.2	0.3	0.2	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.8	1.0	0.5	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.4	1.0	
22-Nov	0.2	0.3	0.2	0.3	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.5	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.5	
23-Nov	0.2	0.1	0.2	0.2	0.2	Z	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.3	
24-Nov	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	
25-Nov	0.3	Z	0.4	0.3	0.1	0.1	0.1	0.2	0.3	0.7	3.2	1.7	1.2	0.8	0.7	0.8	1.7	0.5	1.3	0.9	0.6	0.5	1.4	4.2	1.0	4.2	
26-Nov	0.8	0.6	Z	0.4	0.4	0.5	0.6	0.4	0.5	0.8	1.5	1.8	1.3	1.4	0.9	0.9	0.7	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.7	1.8	
27-Nov	0.4	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	1.1	0.5	0.4	0.3	0.3	0.4	1.1	
28-Nov	0.2	0.3	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.4	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.4	
29-Nov	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.4	0.9	1.0	1.2	0.9	0.5	0.4	0.4	0.5	0.6	0.7	0.9	0.8	0.8	0.8	0.8	0.6	1.2	
30-Nov	Z	0.7	0.6	0.5	0.5	0.5	0.6	0.8	0.8	1.0	1.7	2.3	2.7	2.7	2.1	1.2	0.6	0.6	0.7	0.8	0.5	0.5	0.4	0.4	1.0	2.7	
																								Diurnal Average		Diurnal Maximum	
																								0.4		2.3	
																								0.8		5.9	
																								0.7		4.9	
																								0.6		3.6	
																								0.5		3.2	
																								0.4		1.2	
																								0.8		11.6	
																								0.7		8.3	
																								0.5		3.4	
																								0.6		4.2	
																								0.7		3.5	
																								0.6		2.3	
																								0.7		2.7	
																								0.6		3.1	
																								0.7		10.5	
																								0.9		10.2	
																								1.0		1.7	
																								0.4		0.8	
																								0.4		2.0	
																								0.5		1.1	
																								0.4		2.6	
																								0.5		2.8	
																								0.5		2.6	
																								0.5		4.2	

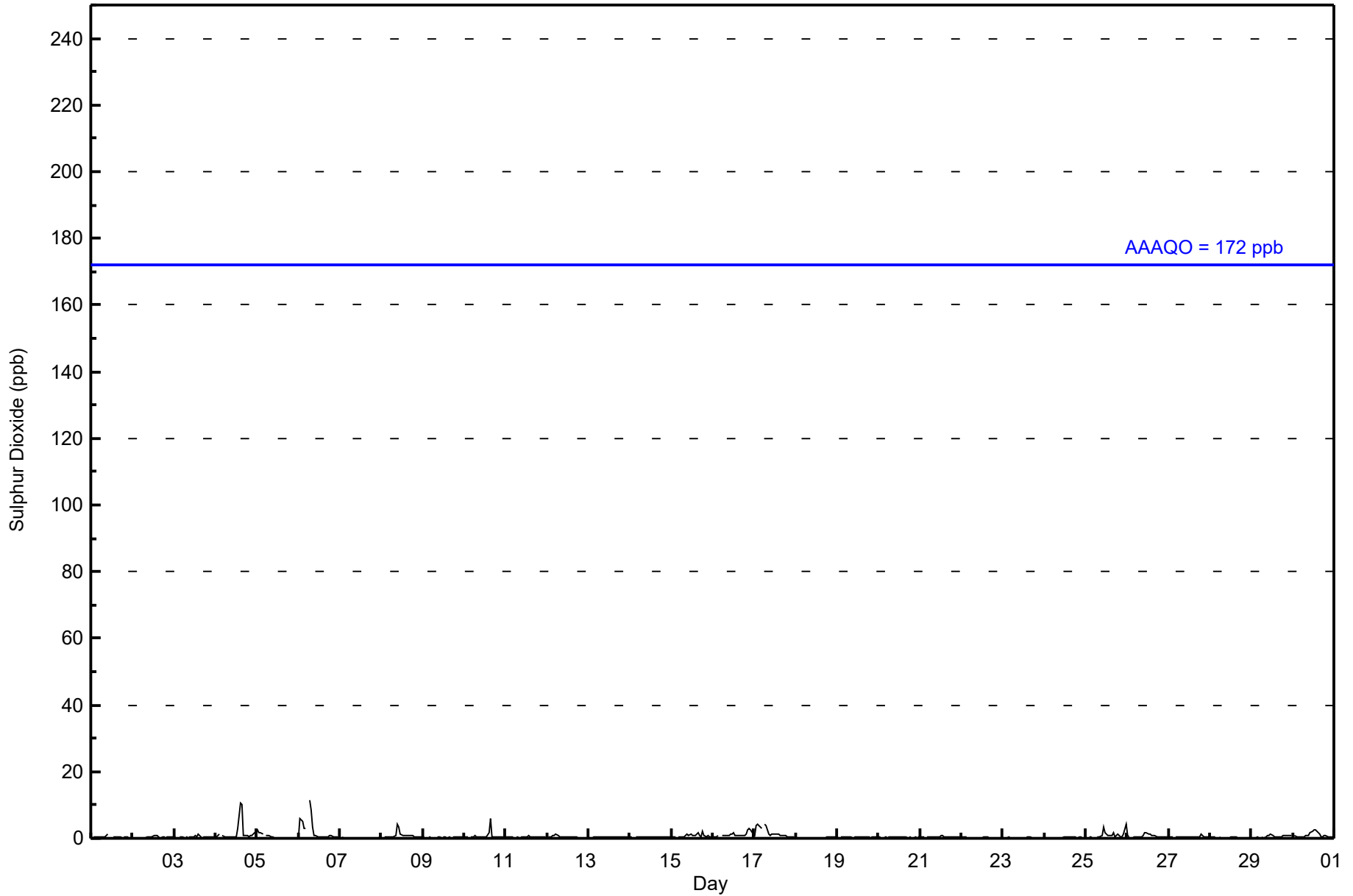
Z - zerospan      C - Calibration  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb    24-hr 48 ppb





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Fort McKay South - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Fort McKay South - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	686	99.85	99.85
11 - 20	1	0.15	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Fort McKay South - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	108	69	9	4	3	2	6	54	95	53	32	65	45	38	38	52	673
11 - 20	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	108	69	9	4	3	2	6	55	95	53	32	65	45	38	38	52	674

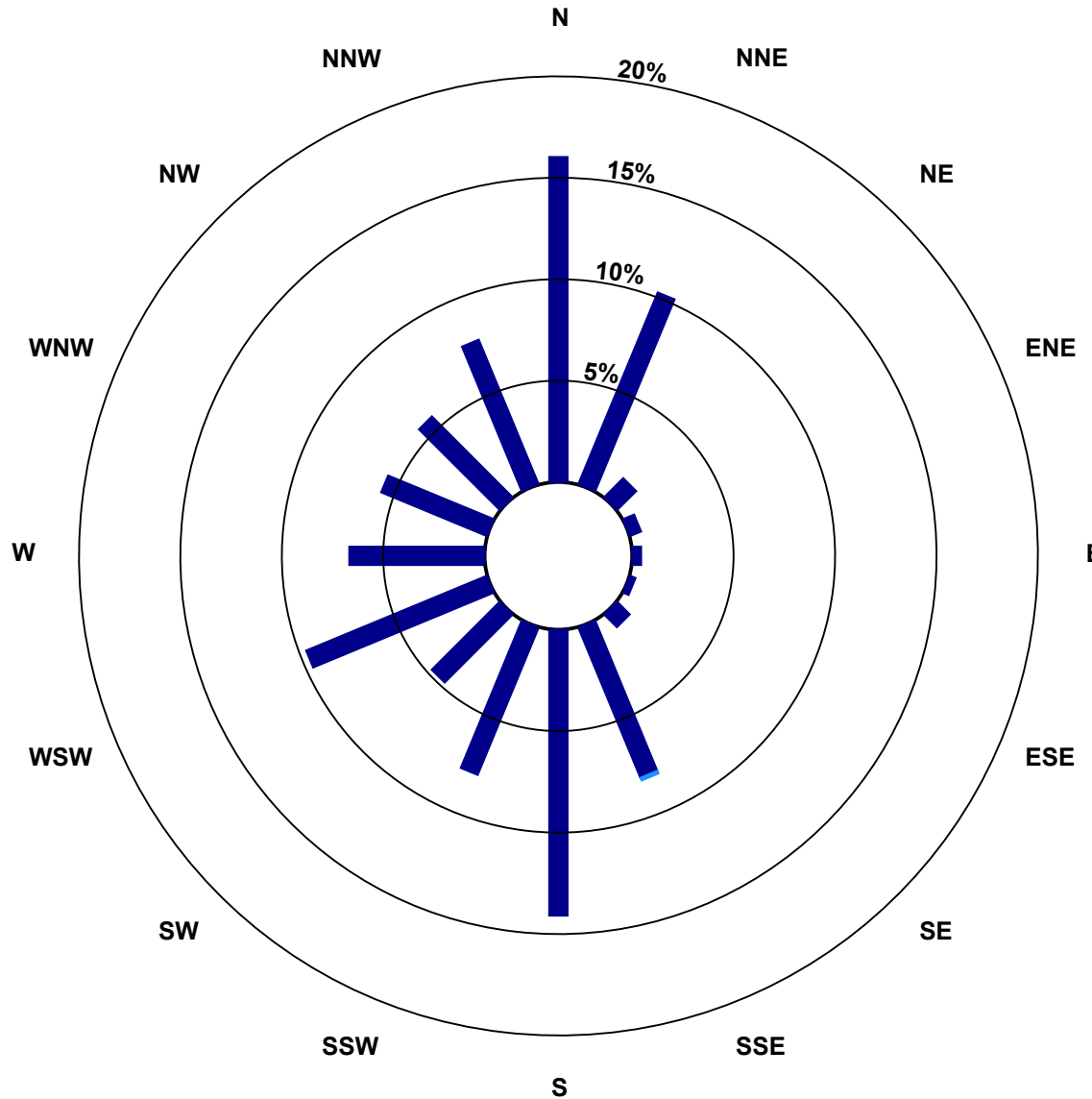
Total Number of Valid Hours: 674

Total Number of Hours: 720

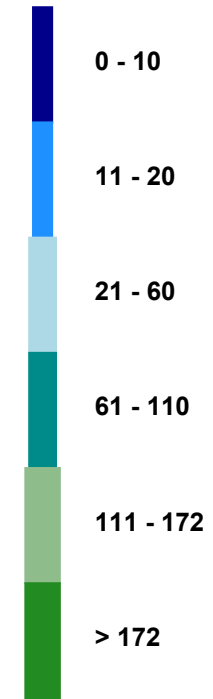


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

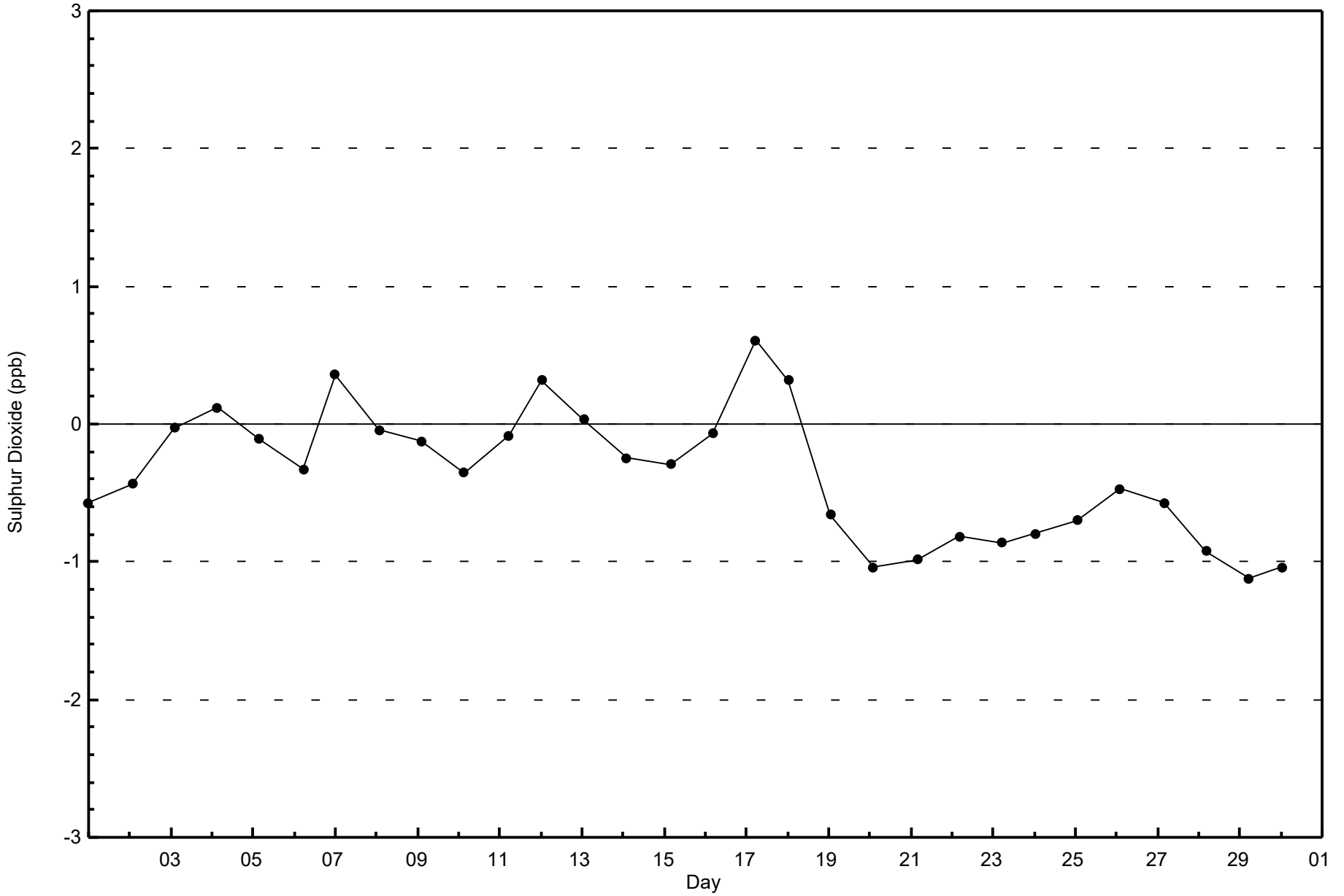
Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Fort McKay South

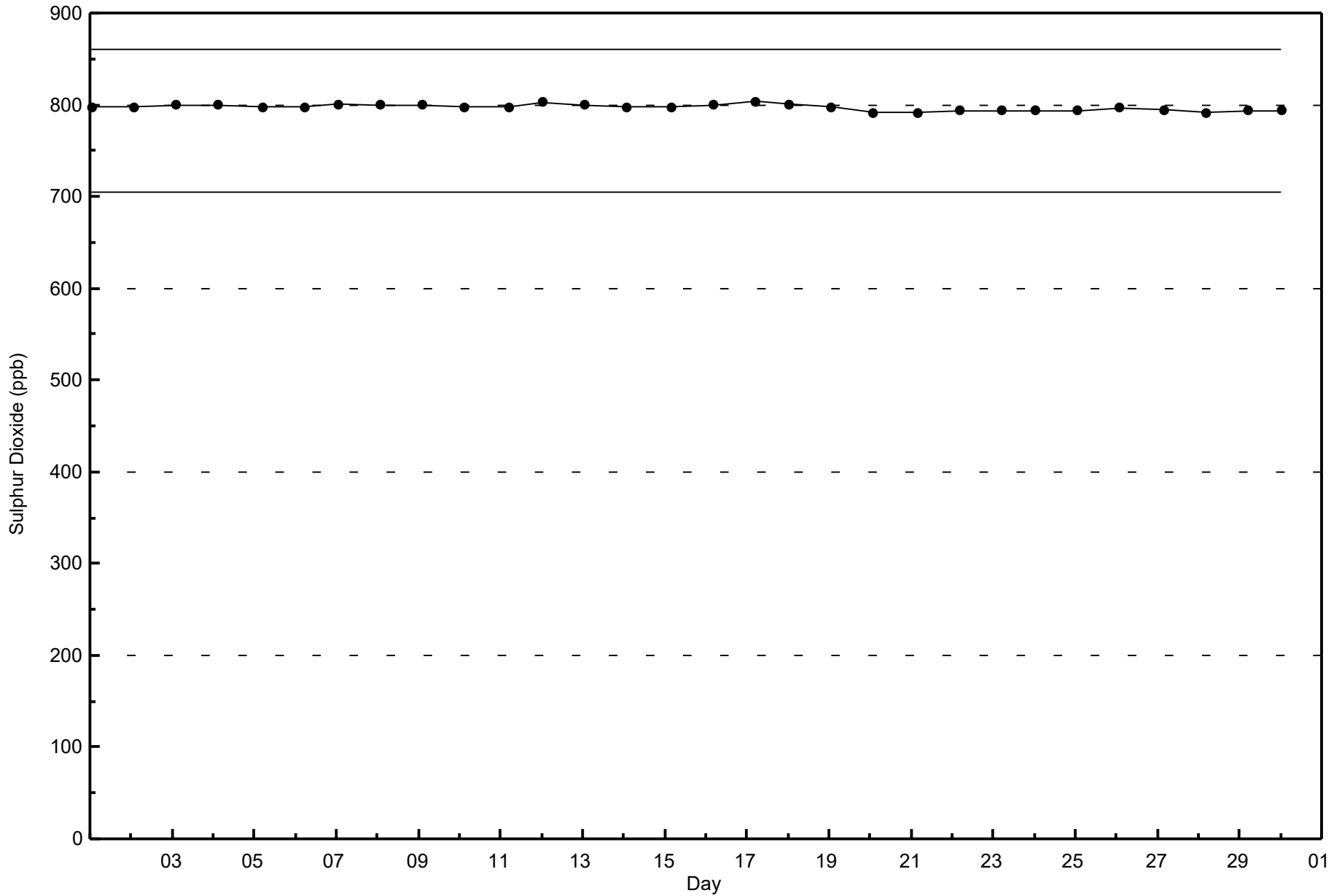


Classes (ppb)



Total Number of Valid Hours: 674



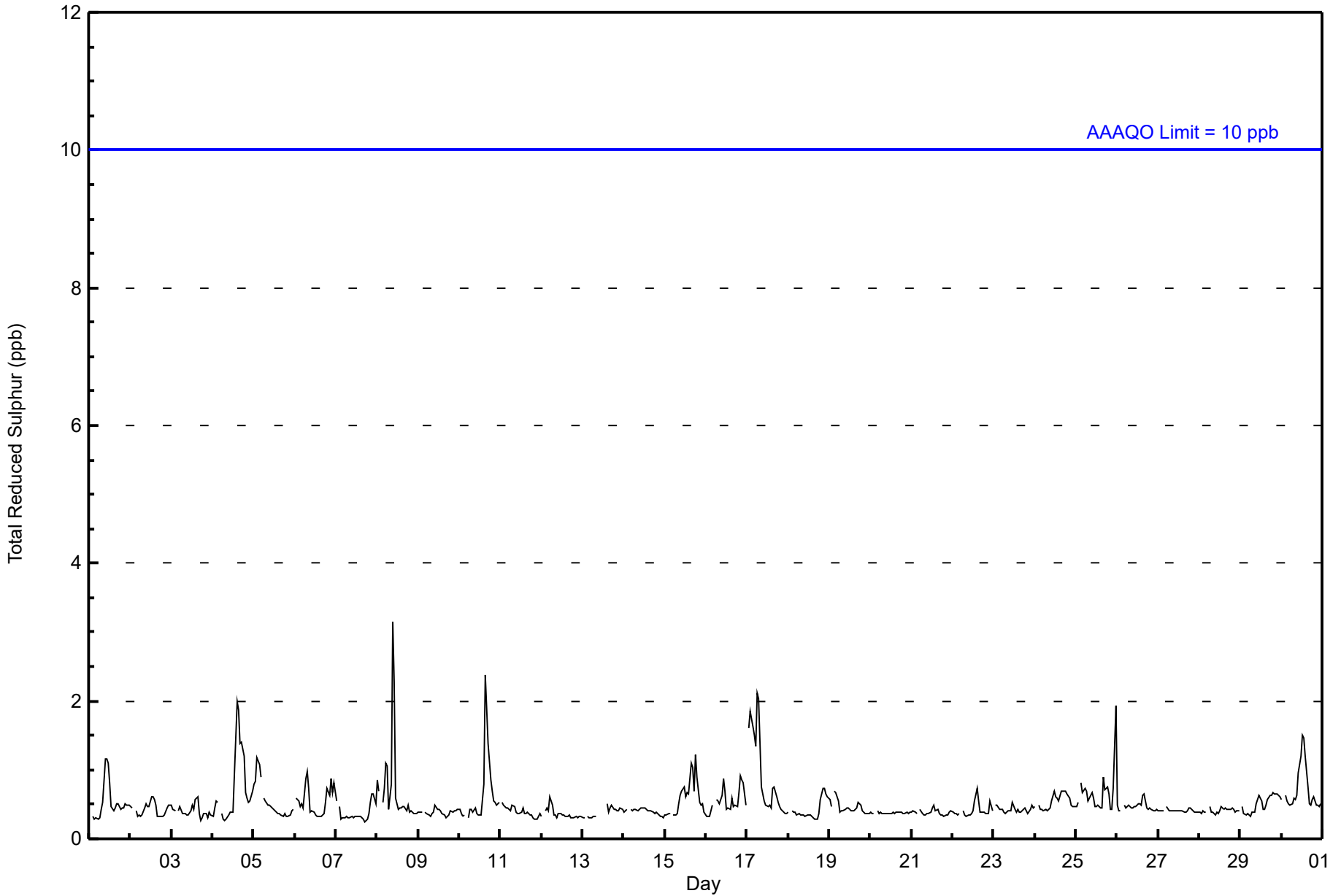






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Reduced Sulphur (TRS) - ppb**  
**Fort McKay South - November 2024**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Fort McKay South - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	684	99.85	99.85
3 - 4	1	0.15	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Fort McKay South - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	109	67	9	2	3	2	6	55	92	56	36	63	45	38	35	52	670
3 - 4	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	109	67	9	2	3	2	6	55	93	56	36	63	45	38	35	52	671

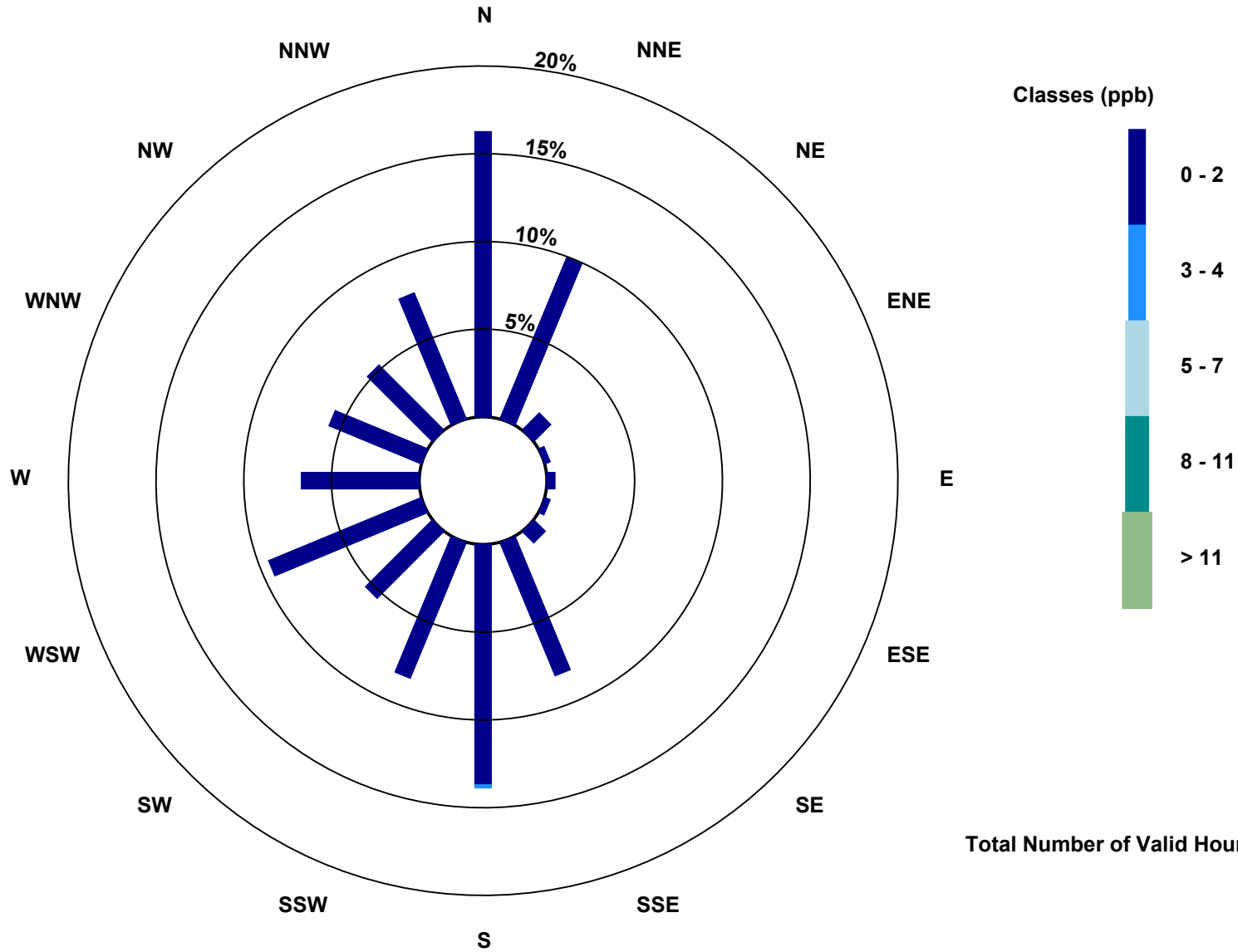
Total Number of Valid Hours: 671

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Reduced Sulphur (TRS) - ppb  
Fort McKay South

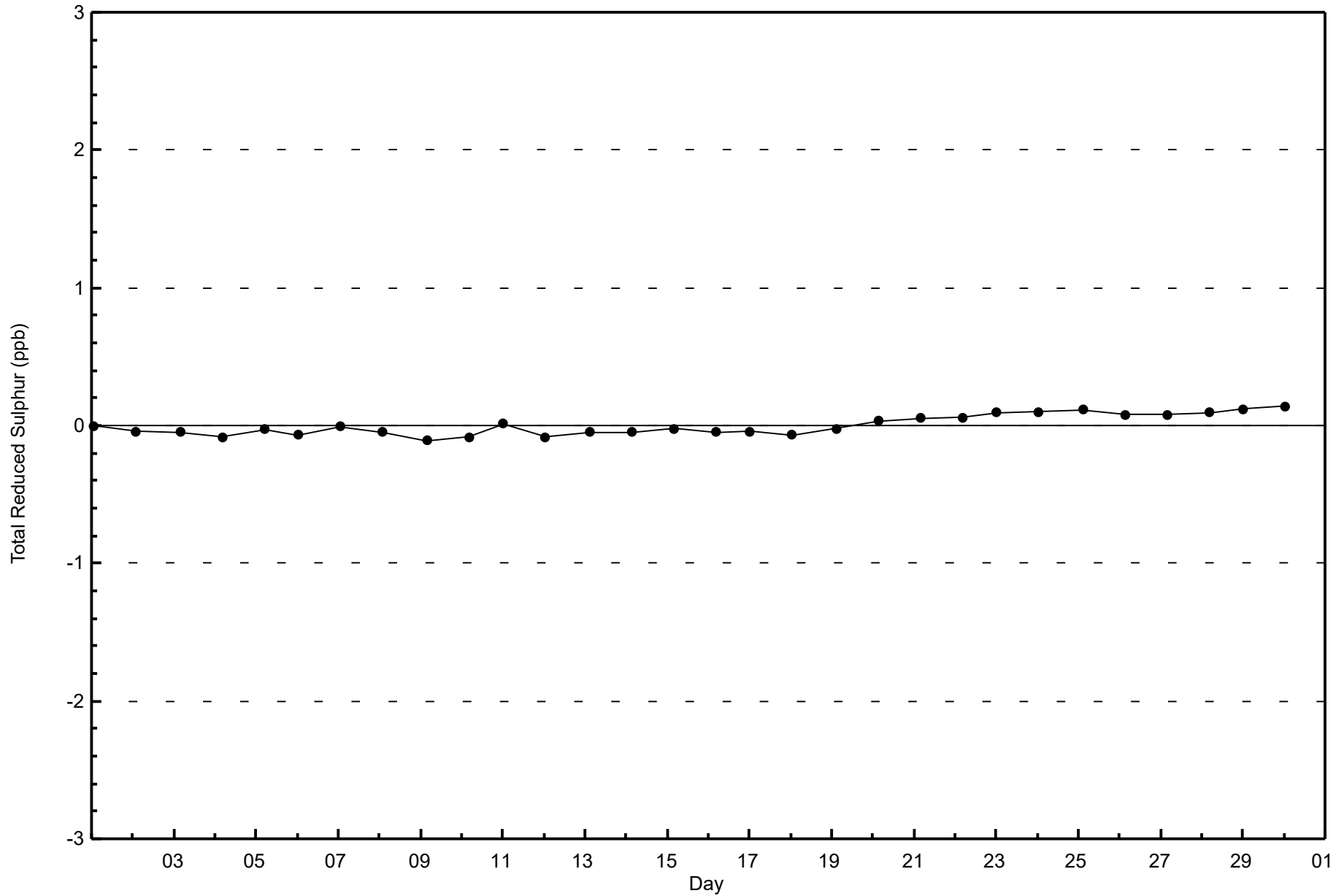


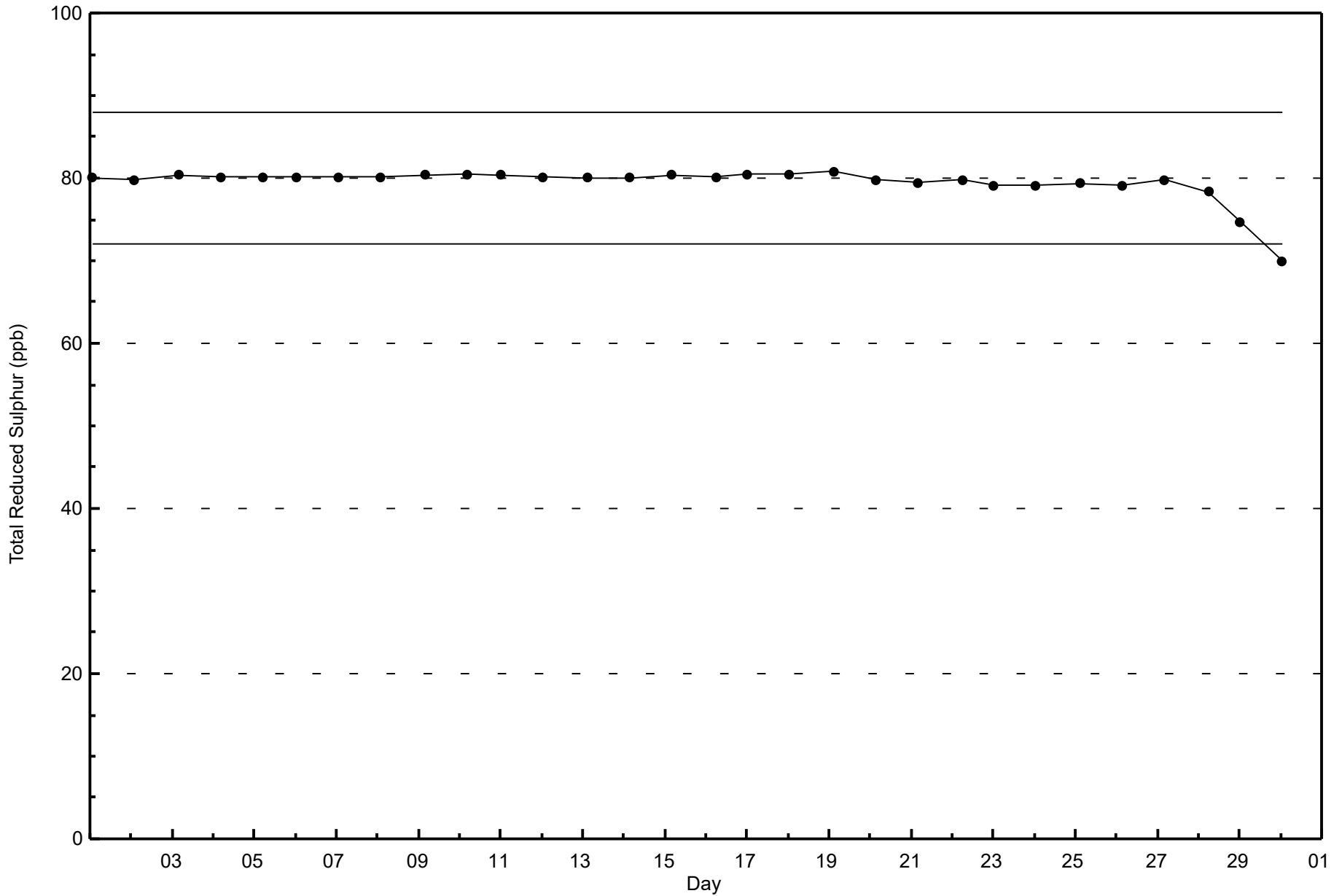
Total Number of Valid Hours: 671



Wood Buffalo Environmental Association  
Zero Responses

Total Reduced Sulphur (TRS) - ppb  
Fort McKay South - November 2024



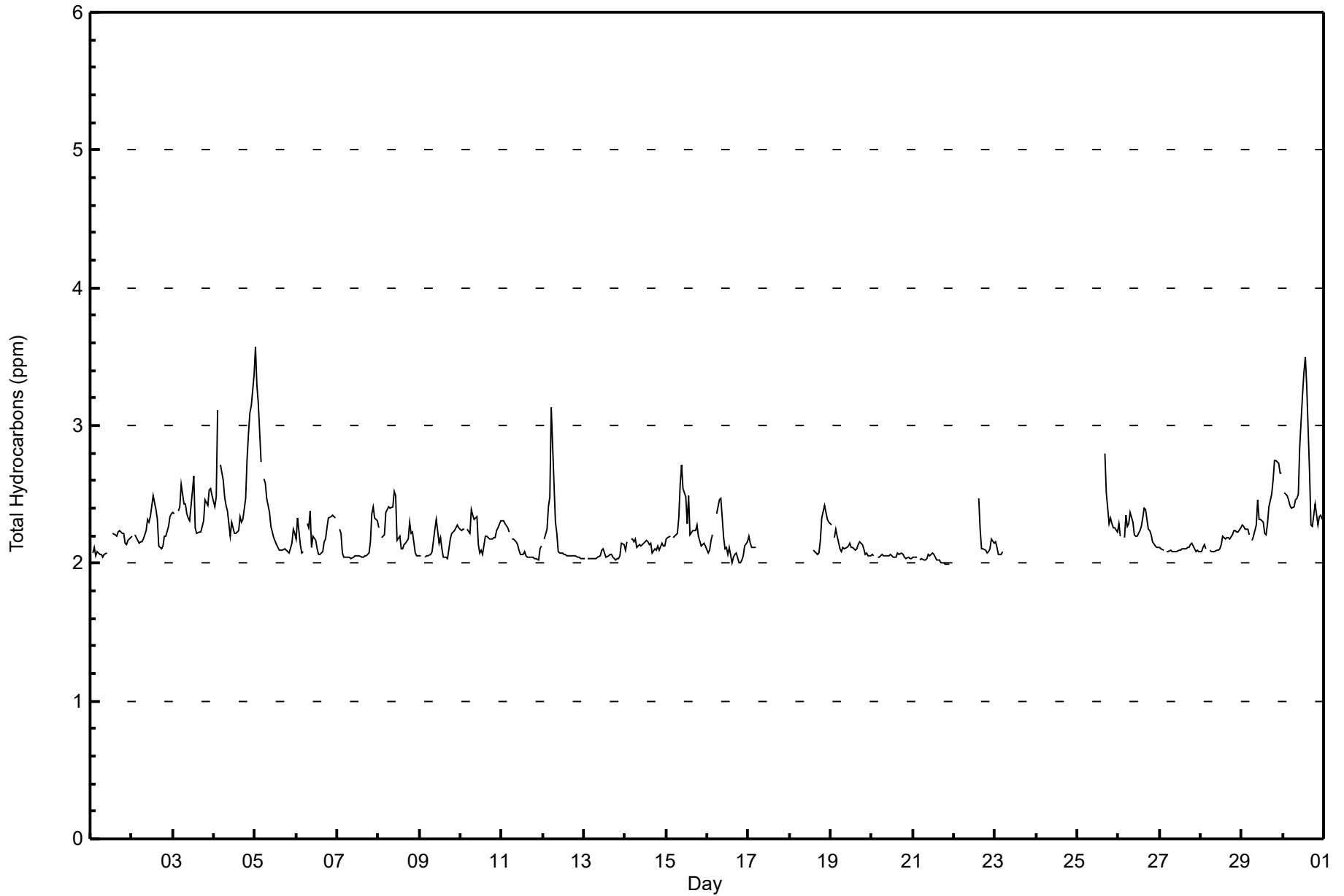






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Fort McKay South - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Fort McKay South - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	75	12.82	12.82
2.1 - 3.0	498	85.13	97.95
3.1 - 10.0	12	2.05	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 585

Total Number of Hours: 720





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Fort McKay South - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	9	8	0	1	0	0	1	7	5	1	5	7	13	5	4	8	74
2.1 - 3.0	67	51	7	2	3	2	5	38	73	50	26	48	26	27	27	39	491
3.1 - 10.0	3	1	0	0	0	0	0	0	1	0	1	1	0	1	3	1	12
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	79	60	7	3	3	2	6	45	79	51	32	56	39	33	34	48	577

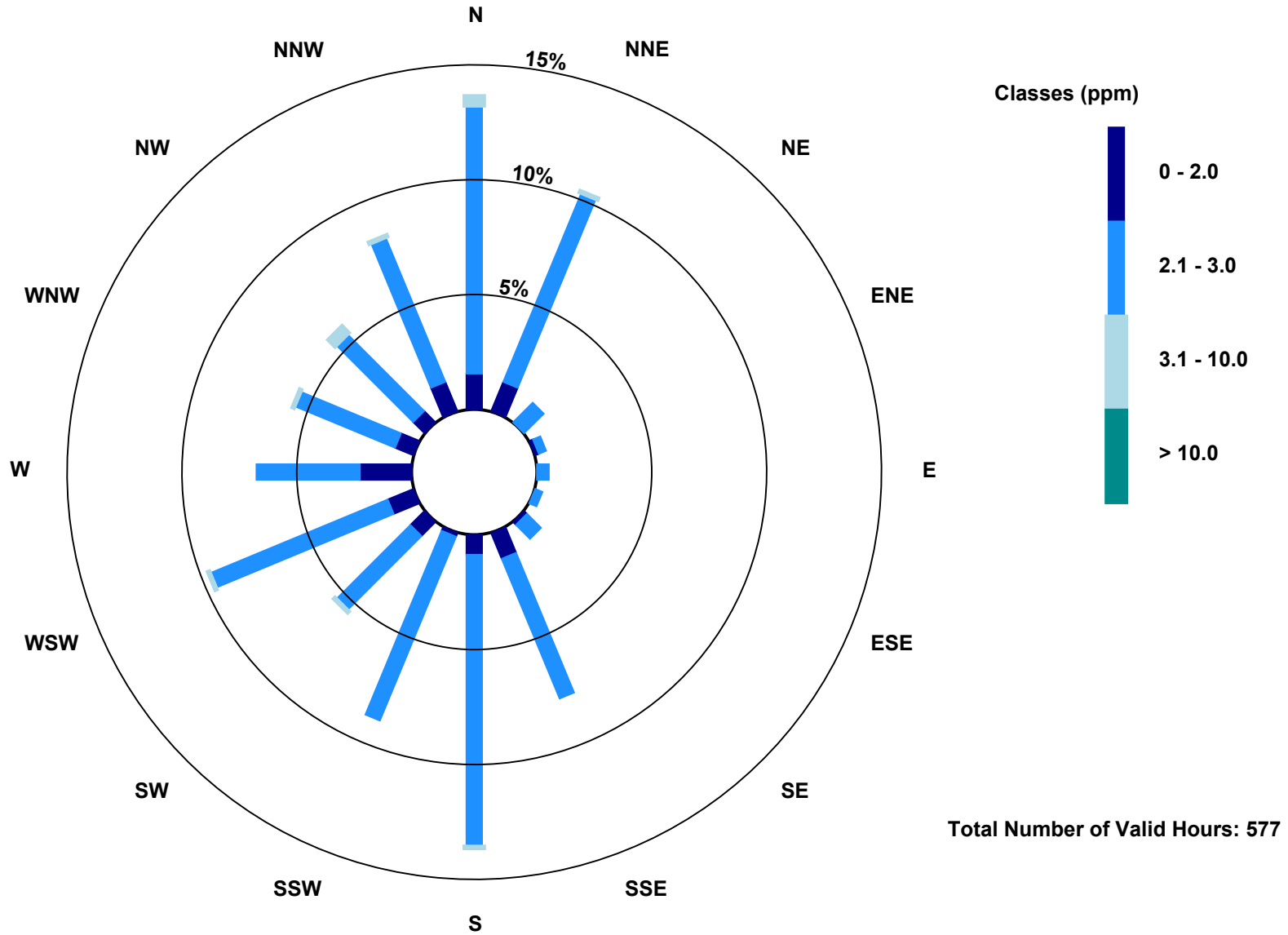
Total Number of Valid Hours: 577

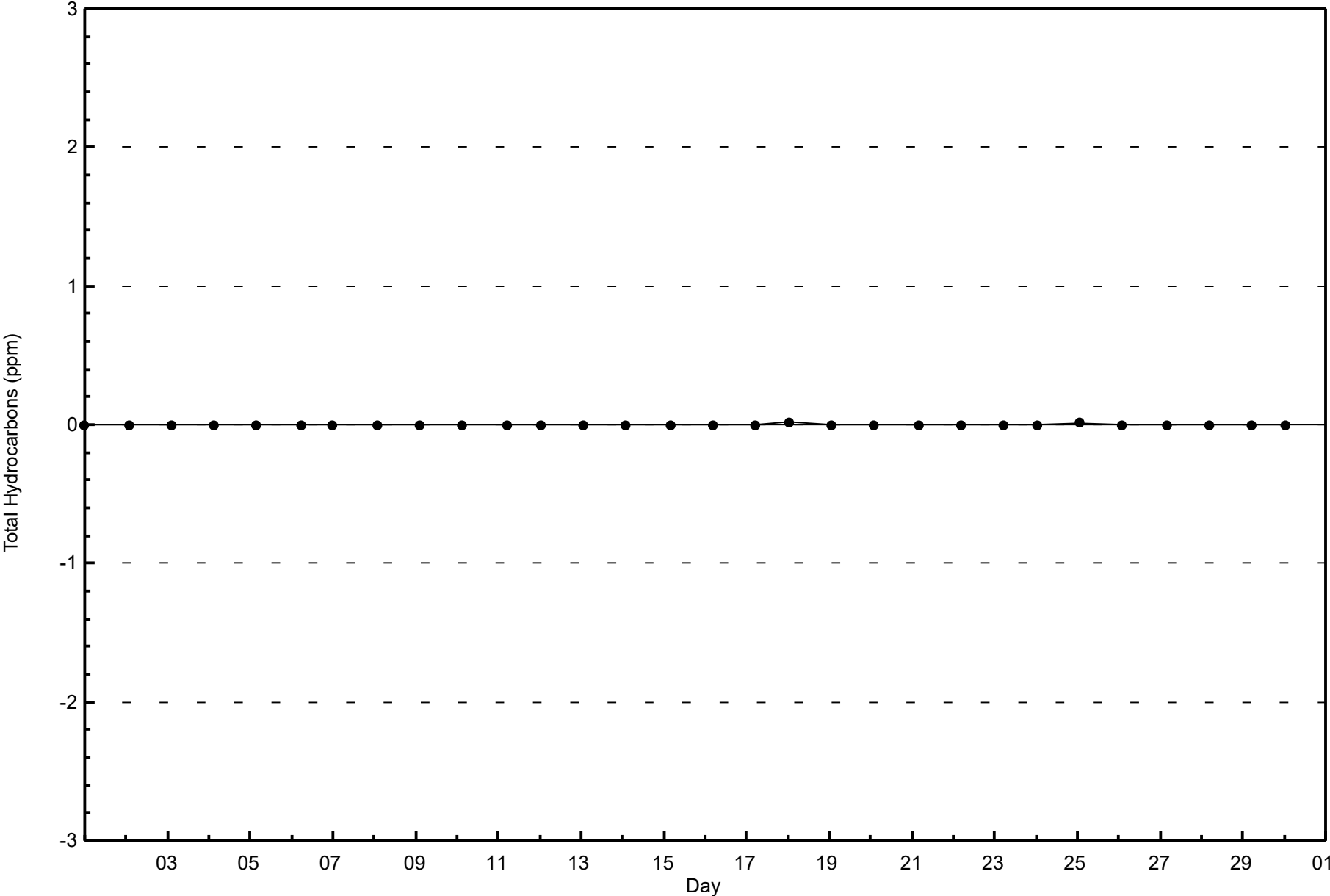
Total Number of Hours: 720

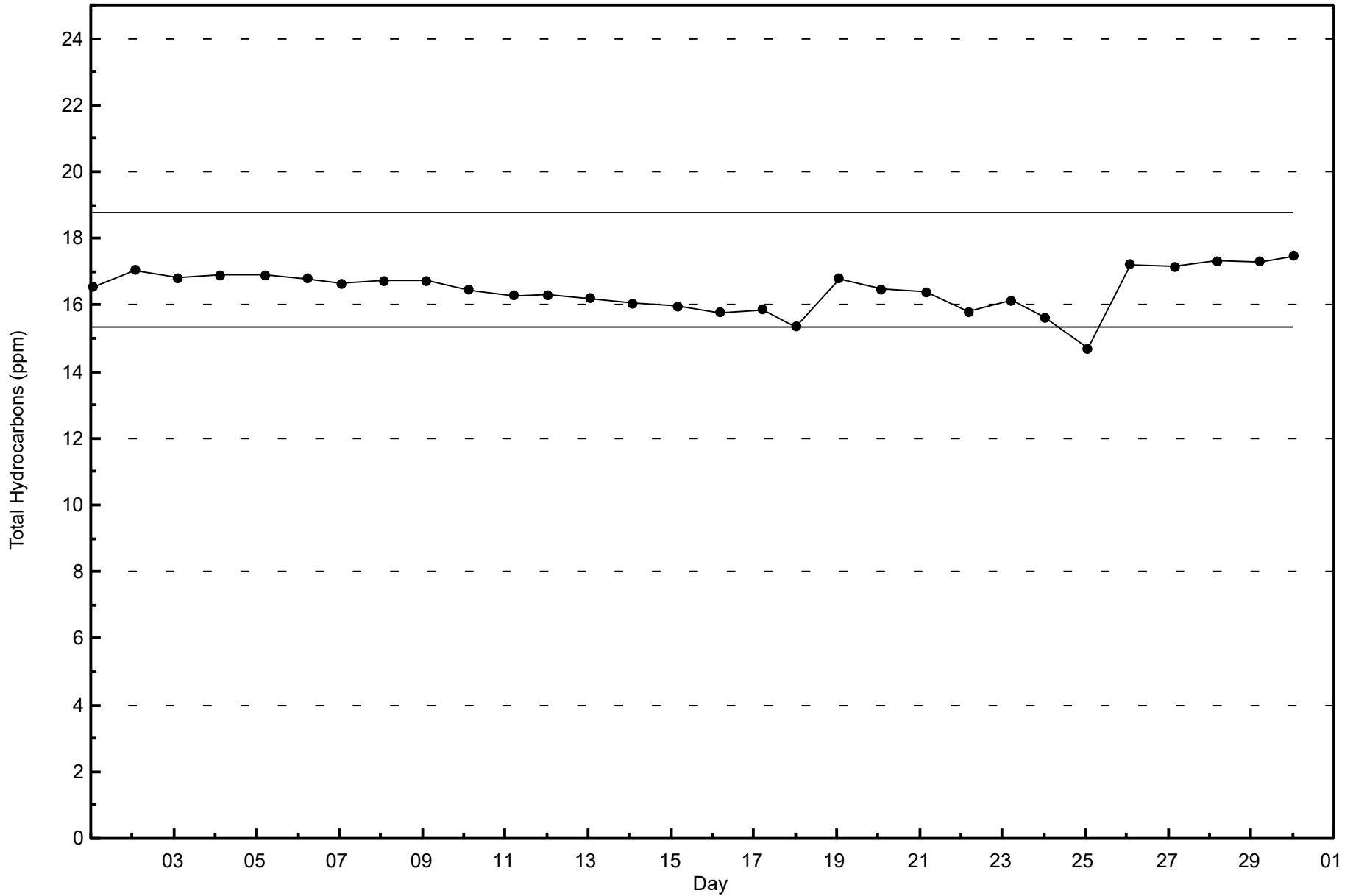


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Hydrocarbons (THC) - ppm  
Fort McKay South









Summary of Hour Averages

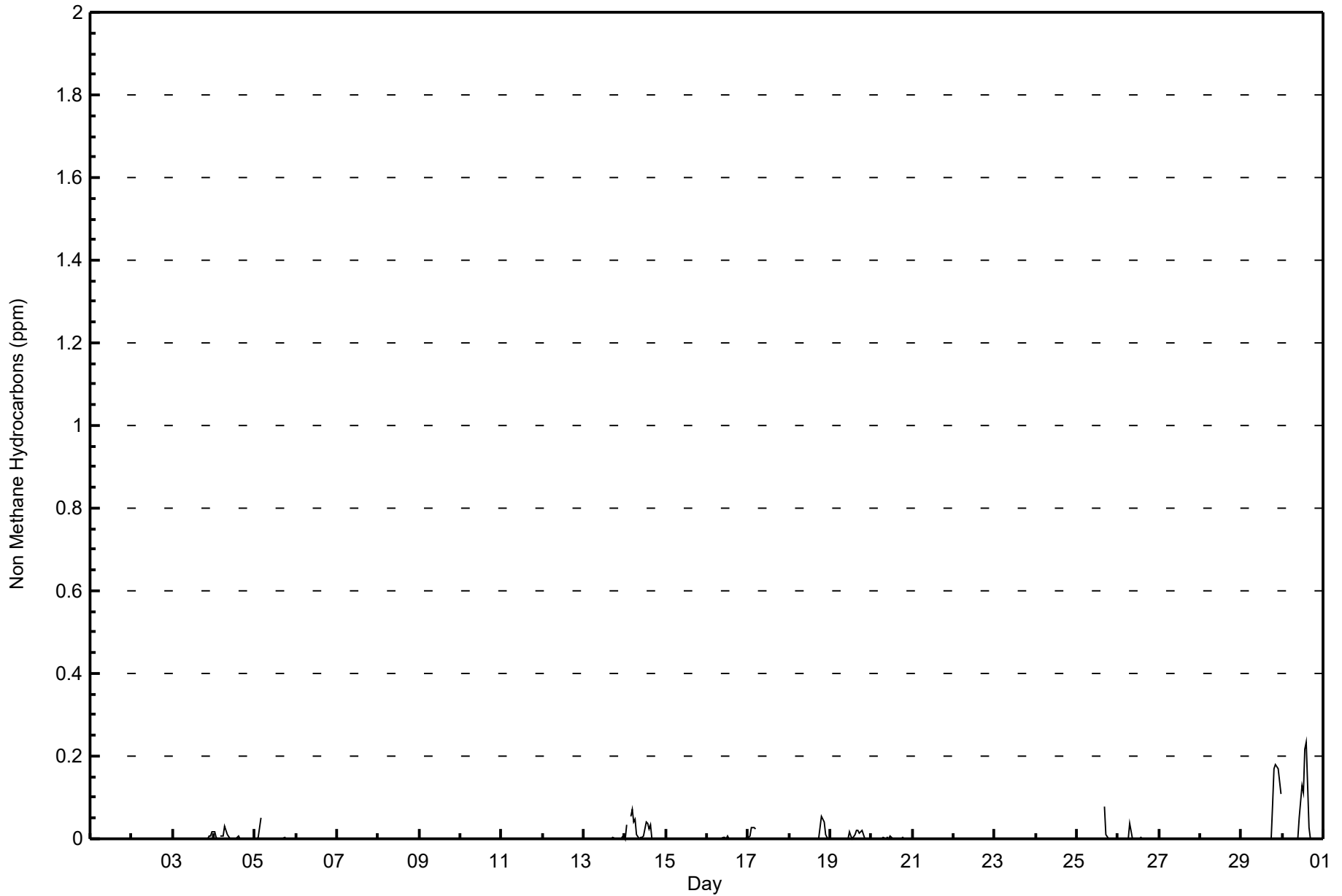
Fort McKay South - November 2024

Maximum Value: 0.235 ppm on Nov 30 15:00		Maximum Daily Average: 0.037 ppm on Nov 29		Hours in Service:	720																						
Minimum Value: 0.000 ppm on Nov 1 02:00		Minimum Daily Average: 0.000 ppm on Nov 6		Hours of Data:	585																						
Maximum Diurnal Average: 0.011 ppm at hour 14		Minimum Diurnal Average: 0.000 ppm at hour 9		Hours of Missing Data:	135																						
Monthly Average: 0.005 ppm		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.0 P <sub>99</sub> = 0.1		Hours of Calibration:	37																						
				Percent Operational Time:	86.4																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	
2-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	
3-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.008	0.016	0.001	0.016
4-Nov	0.016	0.002	0.000	Z	0.008	0.007	0.030	0.020	0.010	0.001	0.001	0.001	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.030	
5-Nov	0.000	0.001	0.003	0.050	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.003	0.050	
6-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
7-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
8-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
9-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
10-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
11-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
12-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.002	
13-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.010	0.010	0.001	0.010	
14-Nov	0.002	0.035	Z	0.053	0.071	0.040	0.048	0.009	0.000	0.002	0.005	0.006	0.039	0.038	0.025	0.034	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.071	
15-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
16-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.003	0.002	0.001	0.006	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.002	0.001	0.006	
17-Nov	0.002	0.008	0.026	0.026	0.025	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.026	
18-Nov	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	0.000	0.000	0.000	0.000	0.028	0.053	0.040	0.011	0.002	0.000	--	0.053	
19-Nov	0.001	Z	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.018	0.007	0.000	0.010	0.020	0.019	0.013	0.019	0.011	0.000	0.000	0.000	0.001	0.005	0.020	
20-Nov	0.000	0.001	Z	0.000	0.000	0.000	0.002	0.003	0.000	0.003	0.001	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.001	0.000	0.000	0.000	0.001	0.006	
21-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	UO	UO	0.000	0.000	
22-Nov	UO	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	M	M	M	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	--	0.001	
23-Nov	0.000	0.001	0.000	0.000	0.000	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.001	
24-Nov	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--	
25-Nov	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	C	0.079	0.011	0.000	0.000	0.000	0.000	0.000	0.000	--	0.079	
26-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.038	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.038	
27-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
28-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
29-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.081	0.168	0.181	0.168	0.139	0.108	0.037	0.181
30-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.052	0.128	0.110	0.216	0.235	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.235	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan																											
C - Calibration																											
M - Maintenance																											
UO - Unstable Operation																											



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Fort McKay South - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Fort McKay South - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	529	90.43	90.43
0.006 - 0.05	44	7.52	97.95
0.06 - 0.1	7	1.20	99.15
> 0.1	5	0.85	100.00

Total Number of Valid Hours: 585

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Fort McKay South - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 0.005	61	51	7	3	3	2	6	38	78	47	31	50	39	32	30	44	522
0.006 - 0.05	15	7	0	0	0	0	0	7	0	4	1	4	0	1	3	2	44
0.06 - 0.1	1	2	0	0	0	0	0	0	1	0	0	2	0	0	0	1	7
> 0.1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	4
<b>Totals</b>	79	60	7	3	3	2	6	45	79	51	32	56	39	33	34	48	577

Total Number of Valid Hours: 577

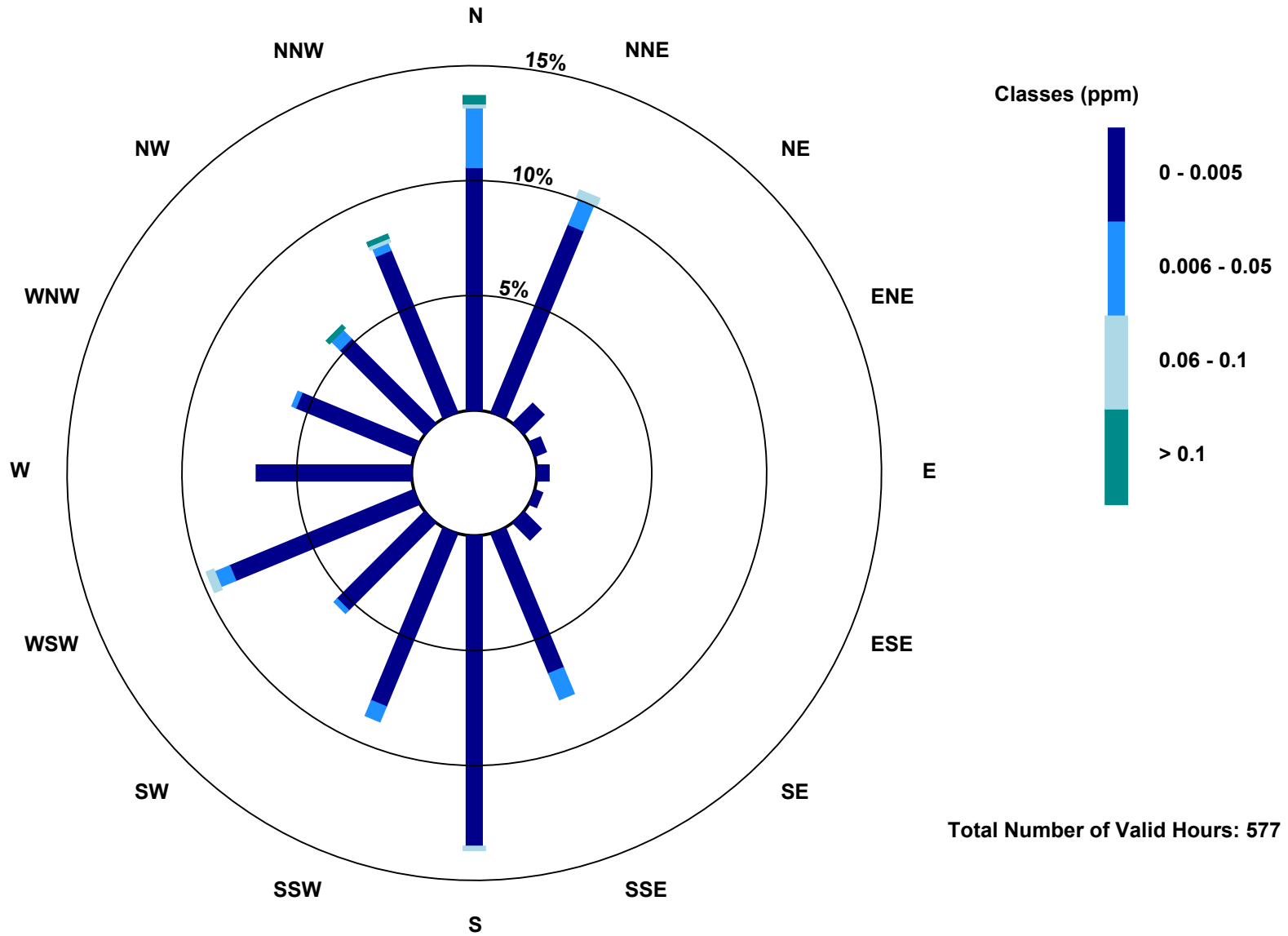
Total Number of Hours: 720

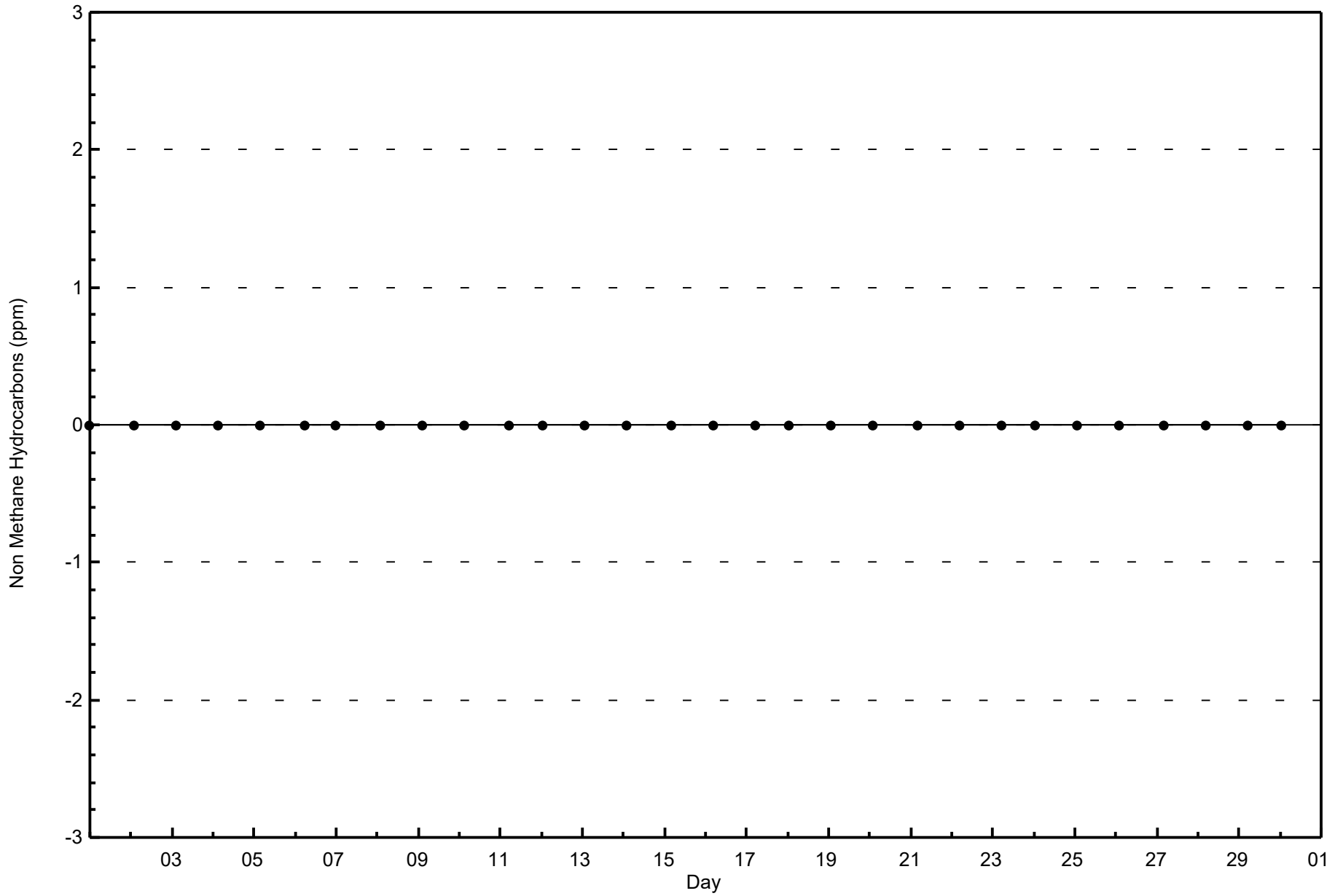


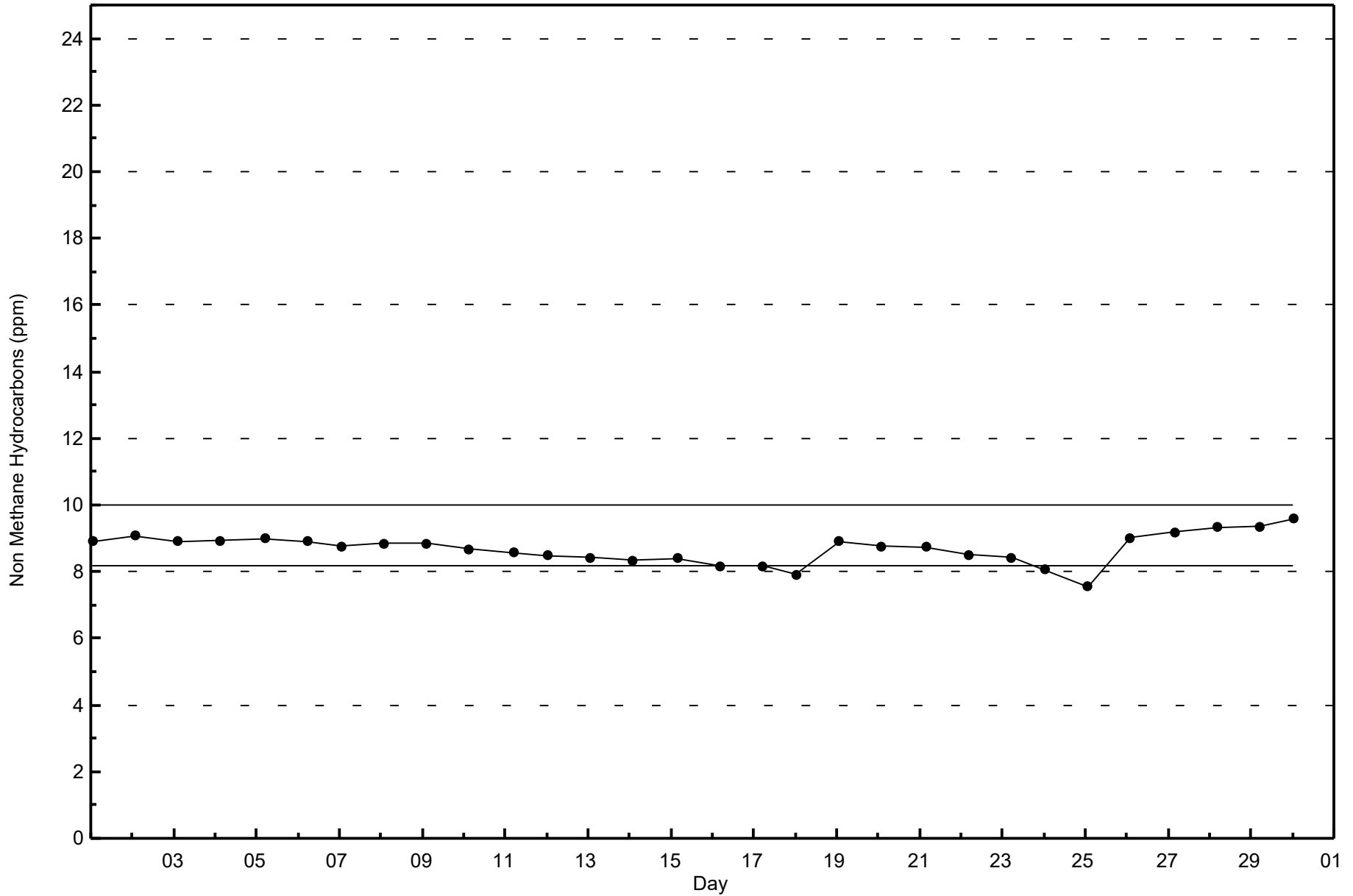


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Non Methane Hydrocarbons (NMHC) - ppm  
Fort McKay South









Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 3.6 ppm on Nov 5 01:00	Maximum Daily Average: 2.6 ppm on Nov 30		Hours of Data:	585
Minimum Value: 2.0 ppm on Nov 21 22:00	Minimum Daily Average: 2.0 ppm on Nov 21		Hours of Missing Data:	135
Maximum Diurnal Average: 2.3 ppm at hour 3	Minimum Diurnal Average: 2.2 ppm at hour 18		Hours of Calibration:	37
Monthly Average: 2.22 ppm	Percentiles: P <sub>1</sub> = 2.0 P <sub>10</sub> = 2.0 Q <sub>1</sub> = 2.1 Median = 2.2 Q <sub>3</sub> = 2.3 P <sub>90</sub> = 2.5 P <sub>99</sub> = 3.1		Percent Operational Time:	86.4

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24						
1-Nov	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	C	C	C	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.2	2.1	2.2			
2-Nov	2.2	Z	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.5	2.4	2.4	2.3	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.4	2.2	2.5	2.2	2.5		
3-Nov	2.4	2.4	Z	2.4	2.4	2.6	2.4	2.4	2.4	2.3	2.3	2.5	2.6	2.3	2.2	2.2	2.2	2.3	2.3	2.5	2.4	2.5	2.5	2.5	2.4	2.6	2.4	2.6		
4-Nov	2.4	2.5	3.1	Z	2.7	2.6	2.5	2.4	2.4	2.2	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.5	2.8	2.9	3.1	3.1	3.4	2.5	3.4	2.5	3.4		
5-Nov	3.6	3.3	3.2	2.7	Z	2.6	2.6	2.5	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.4	2.4	2.4	3.6		
6-Nov	2.2	2.3	2.1	2.1	2.1	Z	2.3	2.3	2.4	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.4	2.2	2.4		
7-Nov	Z	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.4	2.4	2.3	2.3	2.1	2.4	2.1	2.4		
8-Nov	2.3	Z	2.2	2.2	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.2	2.5	2.2	2.5	
9-Nov	2.1	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.1	2.2	2.1	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.1	2.3	2.1	2.3	
10-Nov	2.2	2.2	2.2	Z	2.2	2.2	2.4	2.4	2.3	2.3	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.4	2.2	2.4		
11-Nov	2.3	2.3	2.3	2.3	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.3	
12-Nov	Z	2.2	2.2	2.4	2.5	3.1	2.6	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.2	3.1	2.2	3.1		
13-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
14-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
15-Nov	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.3	2.6	2.7	2.5	2.5	2.3	2.5	2.2	2.2	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.7	2.7	
16-Nov	2.1	2.1	2.2	2.2	Z	2.4	2.4	2.5	2.5	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.5	2.1	2.5	2.5	
17-Nov	2.2	2.1	2.1	2.1	2.1	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	
18-Nov	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	2.1	2.1	2.1	2.1	2.1	2.3	2.4	2.4	2.3	2.3	UO	2.4	UO	2.4	2.4	
19-Nov	2.3	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
20-Nov	2.1	2.1	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1
21-Nov	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1
22-Nov	UO	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	M	M	M	M	2.5	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.5
23-Nov	2.2	2.1	2.1	2.1	2.1	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO
24-Nov	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO
25-Nov	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	C	2.7	2.5	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.7
26-Nov	2.3	2.2	Z	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.4
27-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
28-Nov	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
29-Nov	2.3	2.3	2.2	2.2	2.2	Z	2.2	2.2	2.3	2.5	2.3	2.3	2.3	2.2	2.2	2.3	2.4	2.5	2.5	2.6	2.6	2.6	2.6	2.5	2.6	2.4	2.6	2.4	2.6	2.6
30-Nov	Z	2.5	2.5	2.5	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.8	3.1	3.3	3.3	3.0	2.6	2.3	2.3	2.3	2.4	2.3	2.3	2.4	2.3	2.3	2.4	2.3	2.3	3.3

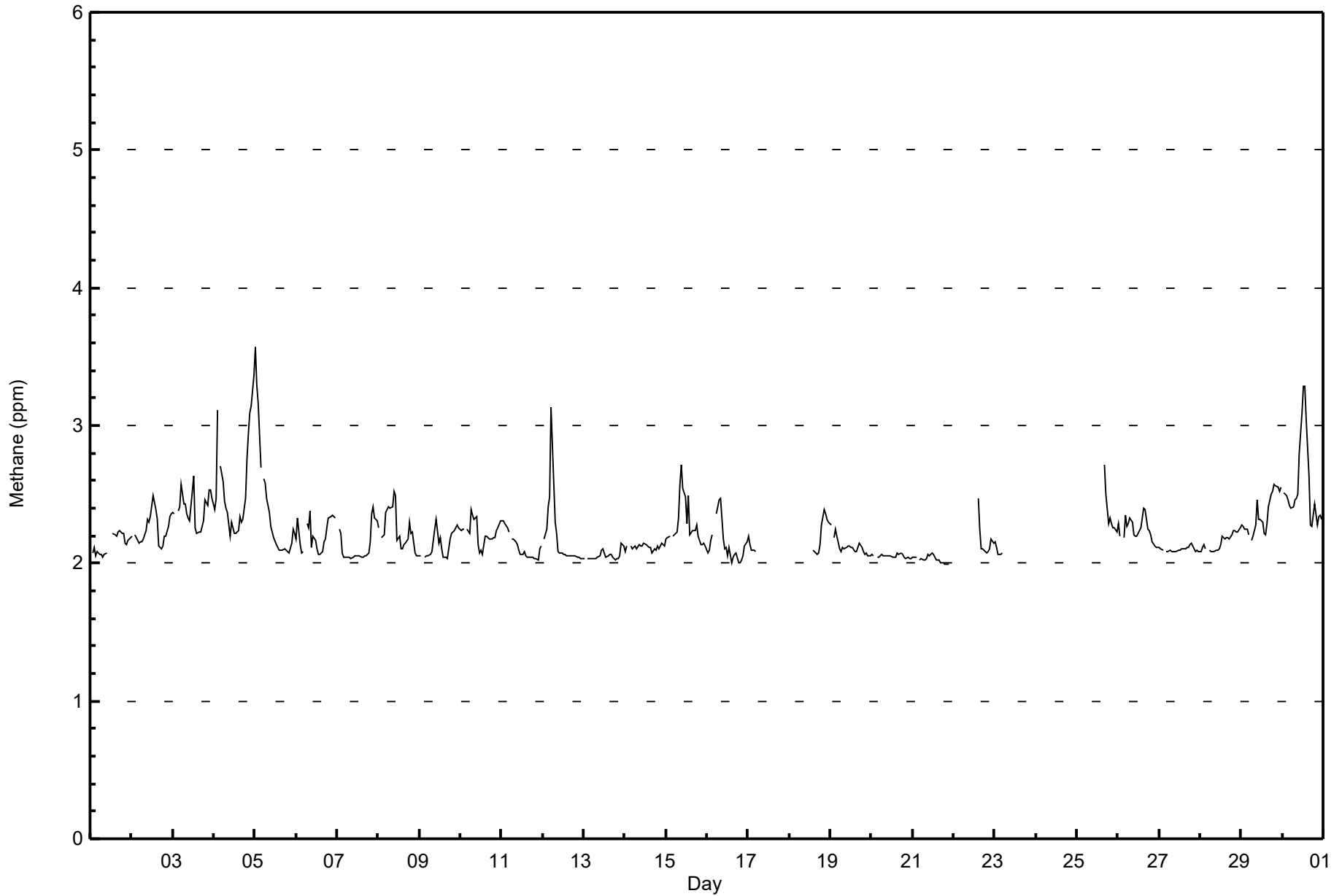
2.2	2.2	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	Diurnal Average	
3.6	3.3	3.2	2.7	2.7	3.1	2.6	2.5	2.6	2.7	2.8	3.1	3.3	3.3	3.3	3.0	2.6	2.7	2.5	2.5	2.8	2.9	3.1	3.1	3.4	2.6	2.6	2.6	2.6	3.4	3.4	Diurnal Maximum

Z - zerospan      C - Calibration      M - Maintenance      UO - Unstable Operation



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Methane (CH<sub>4</sub>) - ppm**  
**Fort McKay South - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Fort McKay South - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	75	12.82	12.82
2.1 - 3.0	499	85.30	98.12
3.1 - 10.0	11	1.88	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 585

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Fort McKay South - November 2024**

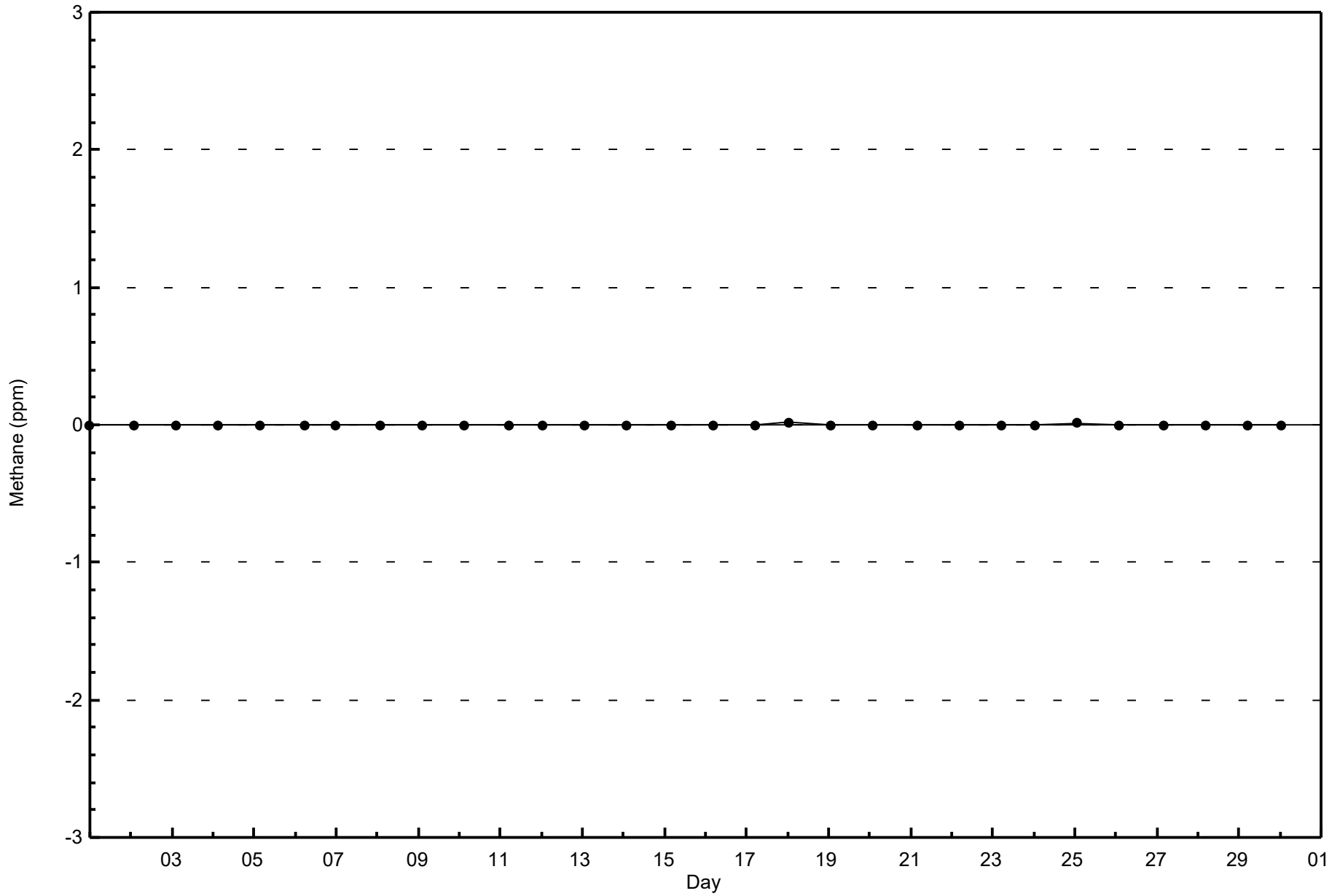
Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	9	8	0	1	0	0	1	7	5	1	5	7	13	5	4	8	74
2.1 - 3.0	68	51	7	2	3	2	5	38	73	50	26	48	26	27	27	39	492
3.1 - 10.0	2	1	0	0	0	0	0	0	1	0	1	1	0	1	3	1	11
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	79	60	7	3	3	2	6	45	79	51	32	56	39	33	34	48	577

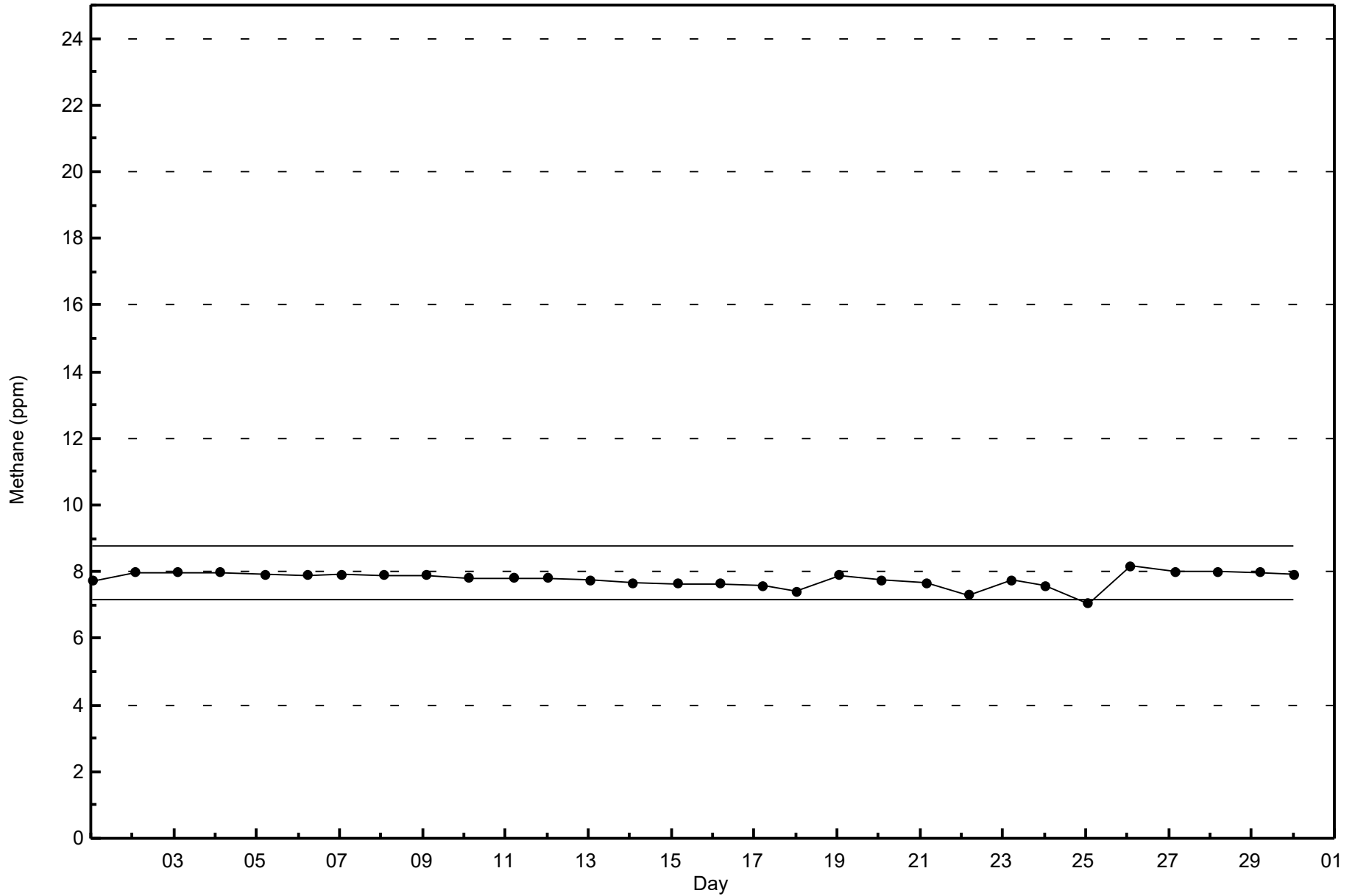
Total Number of Valid Hours: 577

Total Number of Hours: 720











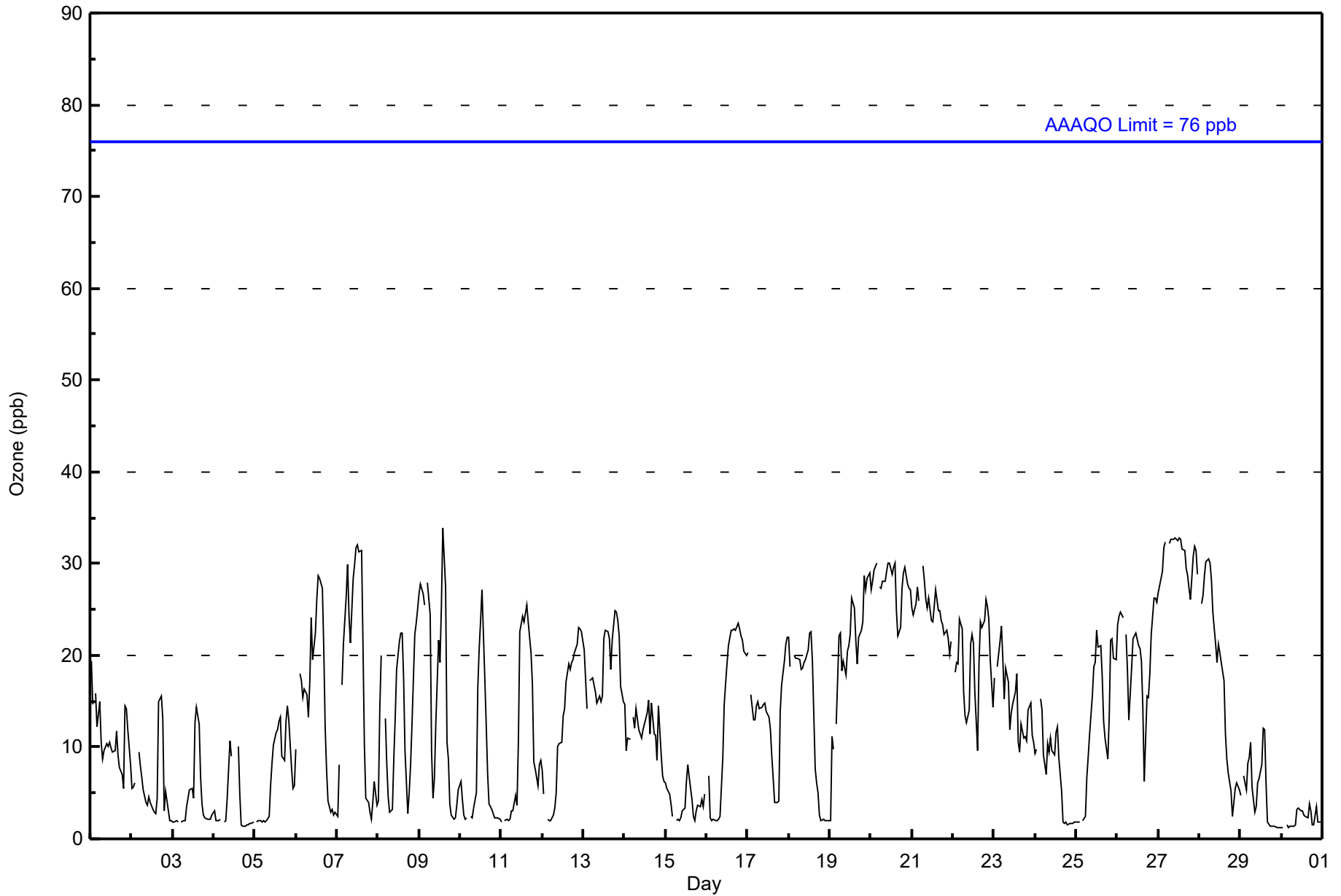
Summary of Hour Averages

Fort McKay South - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 33.9 ppb on Nov 9 15:00	Maximum Daily Average: 30.7 ppb on Nov 27		Hours of Data:	687
Minimum Value: 1.2 ppb on Nov 30 02:00	Minimum Daily Average: 2.1 ppb on Nov 30		Hours of Missing Data:	33
Maximum Diurnal Average: 18.8 ppb at hour 14	Minimum Diurnal Average: 10.9 ppb at hour 20		Hours of Calibration:	33
Monthly Average: 13.50 ppb	Percentiles: P <sub>1</sub> = 1.3 P <sub>10</sub> = 2.0 Q <sub>1</sub> = 4.1 Median = 12.6 Q <sub>3</sub> = 21.7 P <sub>90</sub> = 26.9 P <sub>99</sub> = 32.6		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	19.4	14.6	Z	15.8	12.2	15.0	10.6	8.6	9.7	10.4	10.0	10.6	10.0	9.4	9.6	11.7	9.2	7.7	7.0	5.5	14.5	14.1	11.8	8.1	11.1	19.4
2-Nov	5.5	5.7	6.0	Z	9.4	7.9	6.7	5.3	3.9	3.6	4.5	3.9	3.1	3.0	2.8	4.4	14.9	15.6	13.1	3.0	5.1	3.0	2.0	2.0	5.8	15.6
3-Nov	1.9	1.8	2.0	1.9	Z	1.8	1.9	2.0	3.5	4.4	5.3	5.6	4.4	12.6	14.3	12.6	6.7	3.8	2.6	2.3	2.2	2.2	2.1	2.6	4.4	14.3
4-Nov	3.0	2.0	2.0	2.0	2.1	Z	1.9	2.0	4.4	10.7	8.9	Z	Z	Z	10.0	4.9	1.5	1.4	1.4	1.5	1.5	1.7	1.7	1.8	3.3	10.7
5-Nov	Z	1.8	2.0	2.0	1.8	2.0	1.8	1.9	2.4	5.8	8.3	10.2	11.5	11.9	12.8	13.2	9.1	8.5	12.8	14.5	13.0	7.6	5.5	5.8	7.2	14.5
6-Nov	9.8	Z	17.9	17.2	15.4	16.3	15.8	13.2	17.1	24.1	19.5	22.4	26.1	28.7	28.4	27.4	20.6	12.0	7.4	4.1	2.9	3.2	2.5	2.9	15.4	28.7
7-Nov	2.5	8.1	Z	16.7	21.2	26.3	29.9	24.5	21.3	28.3	29.9	31.8	32.1	31.3	31.4	21.1	10.2	4.4	3.9	2.9	2.1	4.0	6.3	3.6	17.1	32.1
8-Nov	4.1	14.2	20.0	Z	13.2	8.1	4.5	2.9	3.1	8.7	13.1	18.4	21.5	22.5	22.5	17.5	9.6	2.8	5.0	8.1	12.6	22.3	23.4	25.1	13.2	25.1
9-Nov	26.7	27.8	26.7	25.5	Z	27.9	24.5	9.5	4.4	6.6	12.6	21.7	19.2	25.3	33.9	27.5	10.5	8.8	3.9	2.5	2.2	2.4	3.6	5.3	15.6	33.9
10-Nov	6.3	4.3	2.6	2.2	2.3	Z	2.4	2.2	3.3	5.1	16.5	20.7	23.9	27.1	17.6	12.5	7.1	3.9	3.1	2.8	2.3	2.3	2.3	2.1	7.6	27.1
11-Nov	1.9	Z	1.9	2.1	2.0	2.2	3.1	3.0	4.8	3.7	10.7	22.6	24.3	23.6	24.6	25.4	23.6	20.2	16.9	8.5	7.6	5.8	8.1	8.6	11.1	25.4
12-Nov	7.4	4.9	Z	2.1	2.0	2.0	2.5	3.4	5.0	10.1	10.4	10.5	13.4	14.1	17.1	19.0	18.4	19.2	19.5	20.3	21.2	23.0	22.9	22.5	12.7	23.0
13-Nov	20.6	17.4	14.2	Z	17.3	17.5	16.7	16.0	14.8	15.5	15.0	15.6	21.9	22.7	22.6	21.8	18.5	21.6	24.9	24.7	23.7	22.1	16.7	14.9	19.0	24.9
14-Nov	14.7	9.6	11.1	10.8	Z	13.3	12.1	14.2	11.9	11.4	11.1	11.9	13.1	13.7	15.0	11.5	14.8	11.5	11.3	8.6	14.5	9.2	6.9	6.3	11.7	15.0
15-Nov	6.1	5.4	4.9	3.8	2.5	Z	1.9	2.1	2.0	2.2	3.1	3.4	6.2	8.0	6.8	4.3	2.5	2.0	3.0	3.6	3.5	4.2	3.5	4.8	3.9	8.0
16-Nov	Z	6.8	2.3	2.0	2.2	2.0	2.0	2.1	2.4	8.9	14.6	16.9	19.1	21.0	22.7	22.7	22.8	22.7	23.5	22.9	22.1	21.7	20.4	20.1	14.1	23.5
17-Nov	20.3	Z	15.7	12.9	12.9	14.5	14.9	14.1	14.3	14.7	14.9	13.9	13.2	11.9	9.1	6.6	3.9	4.0	4.1	13.9	16.8	19.4	21.1	22.0	13.4	22.0
18-Nov	22.0	18.8	Z	20.0	19.7	19.7	19.5	18.5	18.6	19.2	19.6	20.6	22.4	22.6	19.3	7.6	6.1	5.0	2.6	2.0	2.1	2.0	2.0	2.0	13.6	22.6
19-Nov	2.0	11.2	9.8	Z	12.5	22.1	22.5	18.3	19.4	17.8	20.5	21.0	22.3	26.2	25.2	21.7	19.1	22.0	22.7	23.6	28.7	27.1	28.4	28.9	20.6	28.9
20-Nov	27.1	28.1	29.3	30.1	Z	27.5	27.3	28.0	28.0	29.2	30.0	30.0	28.8	29.5	30.0	24.8	22.1	23.0	27.3	29.0	29.6	27.8	27.3	27.2	27.9	30.1
21-Nov	25.1	24.4	25.6	27.4	25.9	Z	29.7	28.1	26.0	25.1	26.2	23.7	23.6	25.3	27.1	24.9	24.9	23.8	23.3	22.3	22.7	21.9	20.1	21.5	24.7	29.7
22-Nov	Z	18.2	19.2	19.0	23.9	22.8	16.0	13.4	12.7	14.1	21.2	22.3	21.3	16.0	9.6	19.2	23.6	23.0	23.8	26.0	25.3	23.9	19.5	14.3	19.5	26.0
23-Nov	17.6	Z	18.8	21.6	23.2	19.7	15.2	18.6	17.0	11.9	13.7	14.6	16.1	17.9	10.5	9.4	12.5	11.0	11.2	10.6	14.1	14.7	11.3	10.5	14.9	23.2
24-Nov	9.4	9.7	Z	15.3	14.1	9.2	7.0	10.3	9.4	10.9	9.6	9.2	11.6	12.1	8.8	5.3	1.9	1.7	1.8	1.6	1.7	1.7	1.6	1.8	7.2	15.3
25-Nov	1.8	1.8	1.8	Z	2.0	2.5	6.7	9.1	11.4	15.7	18.8	19.1	22.8	20.9	21.1	17.7	12.8	11.0	8.7	13.2	21.7	21.8	19.6	19.5	13.1	22.8
26-Nov	23.3	24.2	24.7	24.2	Z	22.3	18.4	12.9	18.6	21.8	22.2	22.4	21.1	20.7	19.3	14.3	6.2	15.5	15.3	18.0	22.3	26.2	26.2	25.7	20.3	26.2
27-Nov	26.8	27.6	29.2	31.7	32.4	Z	32.1	32.6	32.6	32.7	32.8	32.6	32.8	32.6	31.6	31.4	29.5	28.7	27.4	26.1	30.8	31.8	31.4	28.8	30.7	32.8
28-Nov	Z	25.6	26.5	28.6	30.3	30.5	30.1	28.2	24.7	21.2	19.2	21.2	20.3	19.2	17.2	11.5	8.7	7.2	5.1	2.4	3.9	5.5	6.1	5.3	17.3	30.5
29-Nov	4.7	Z	6.9	5.4	8.3	8.9	10.5	5.7	2.9	3.5	6.1	6.6	8.1	12.0	11.8	6.0	1.8	1.4	1.3	1.4	1.4	1.3	1.3	1.2	5.1	12.0
30-Nov	1.2	1.2	Z	1.5	1.2	1.3	1.3	1.4	1.5	3.2	3.3	3.1	3.0	2.6	2.4	2.4	3.8	3.0	1.5	1.6	3.6	1.8	1.8	1.8	2.1	3.8
12.0 12.6 13.4 13.7 12.4 13.7 13.0 11.7 11.7 13.3 15.0 16.8 17.8 18.8 17.8 15.3 12.6 11.6 11.2 10.9 12.5 12.5 11.9 11.6																								Diurnal Average		
27.1 28.1 29.3 31.7 32.4 30.5 32.1 32.6 32.6 32.7 32.8 32.6 32.8 32.6 33.9 31.4 29.5 28.7 27.4 29.0 30.8 31.8 31.4 28.9																								Diurnal Maximum		

Z - zerospan      C - Calibration  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Fort McKay South - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	490	71.32	71.32
21 - 50	197	28.68	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Fort McKay South - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	85	35	5	1	3	3	6	38	72	49	24	53	27	17	24	36	478
21 - 50	23	34	4	3	0	0	0	16	21	4	12	9	19	20	13	17	195
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	108	69	9	4	3	3	6	54	93	53	36	62	46	37	37	53	673

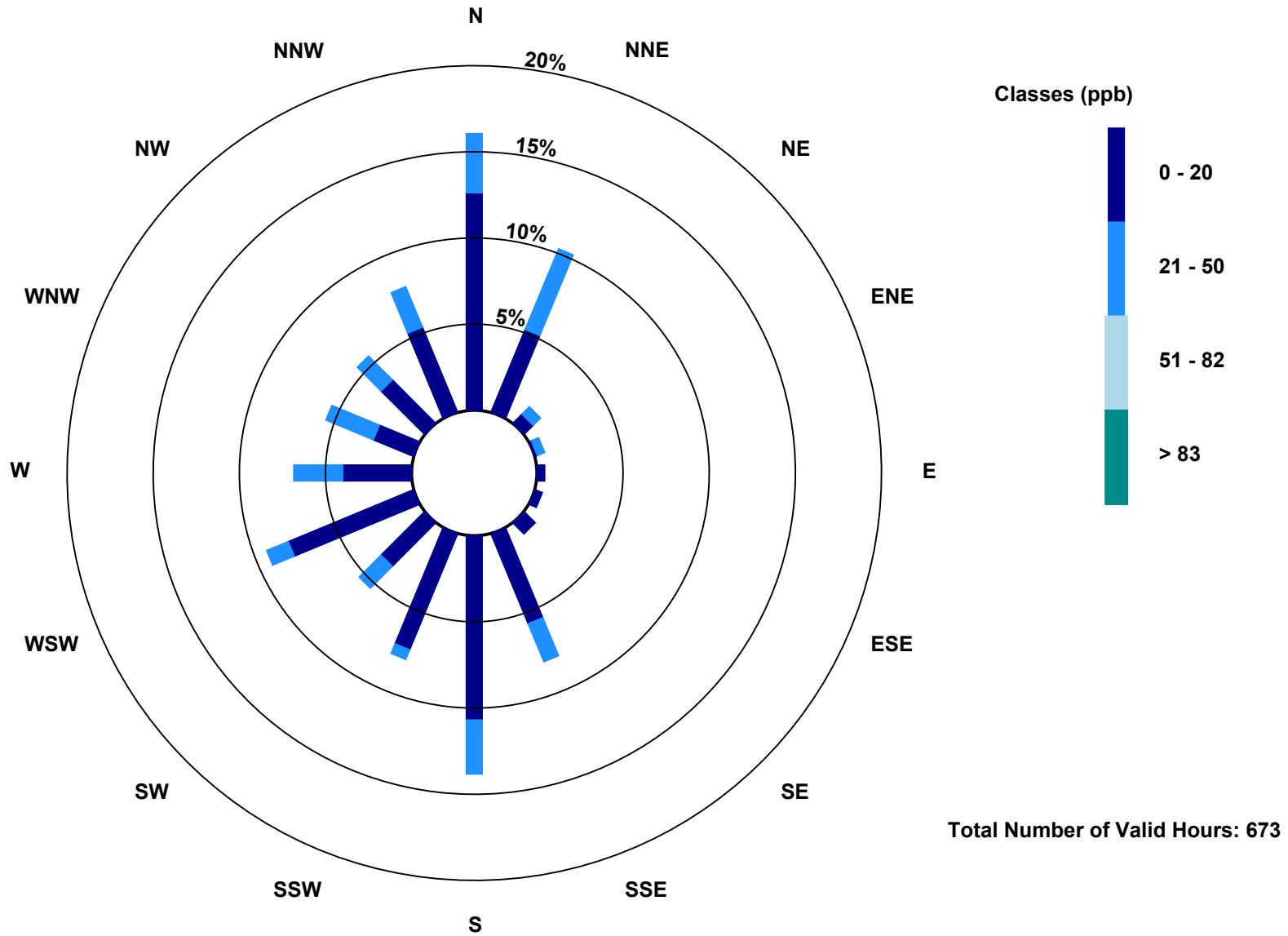
Total Number of Valid Hours: 673

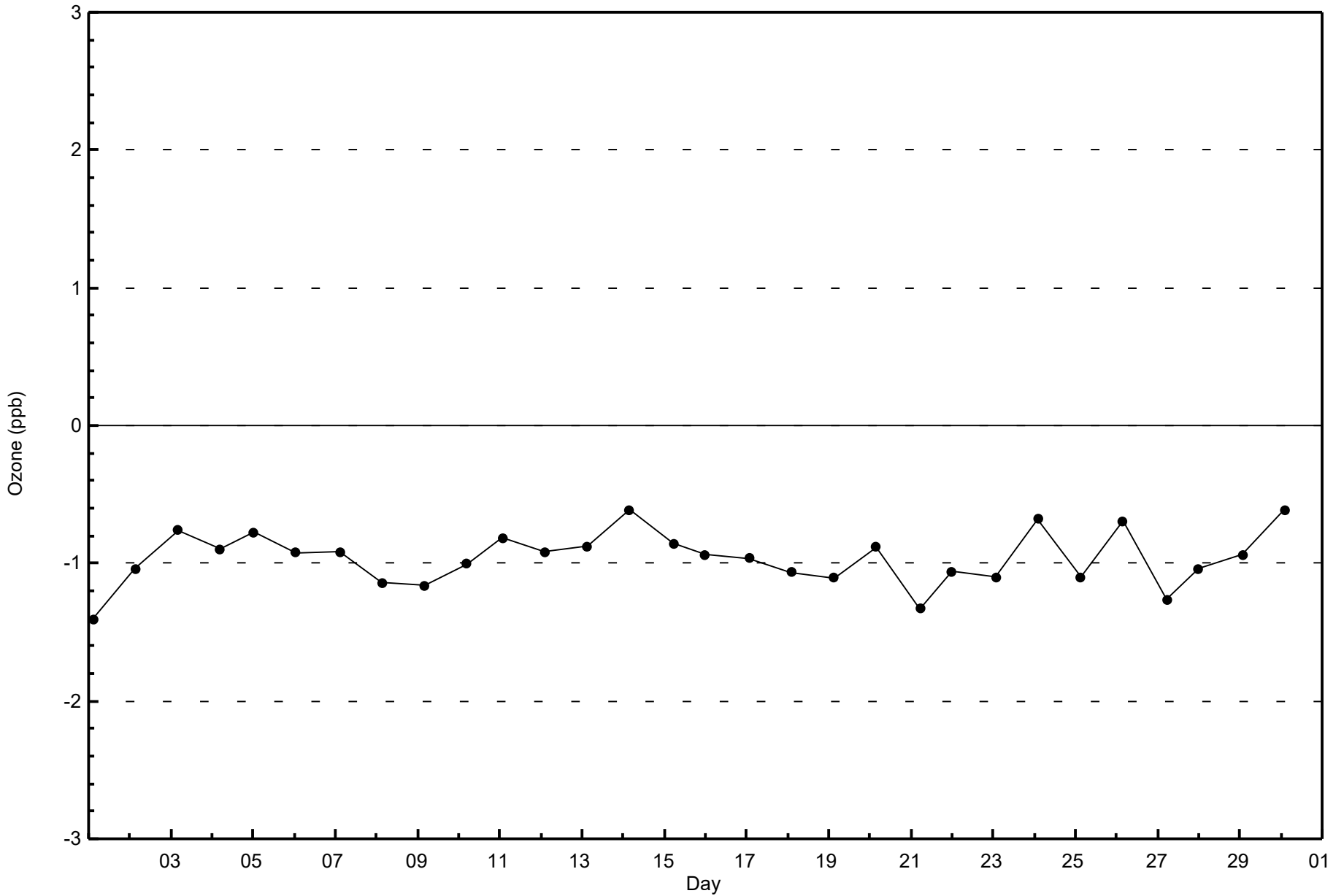
Total Number of Hours: 720



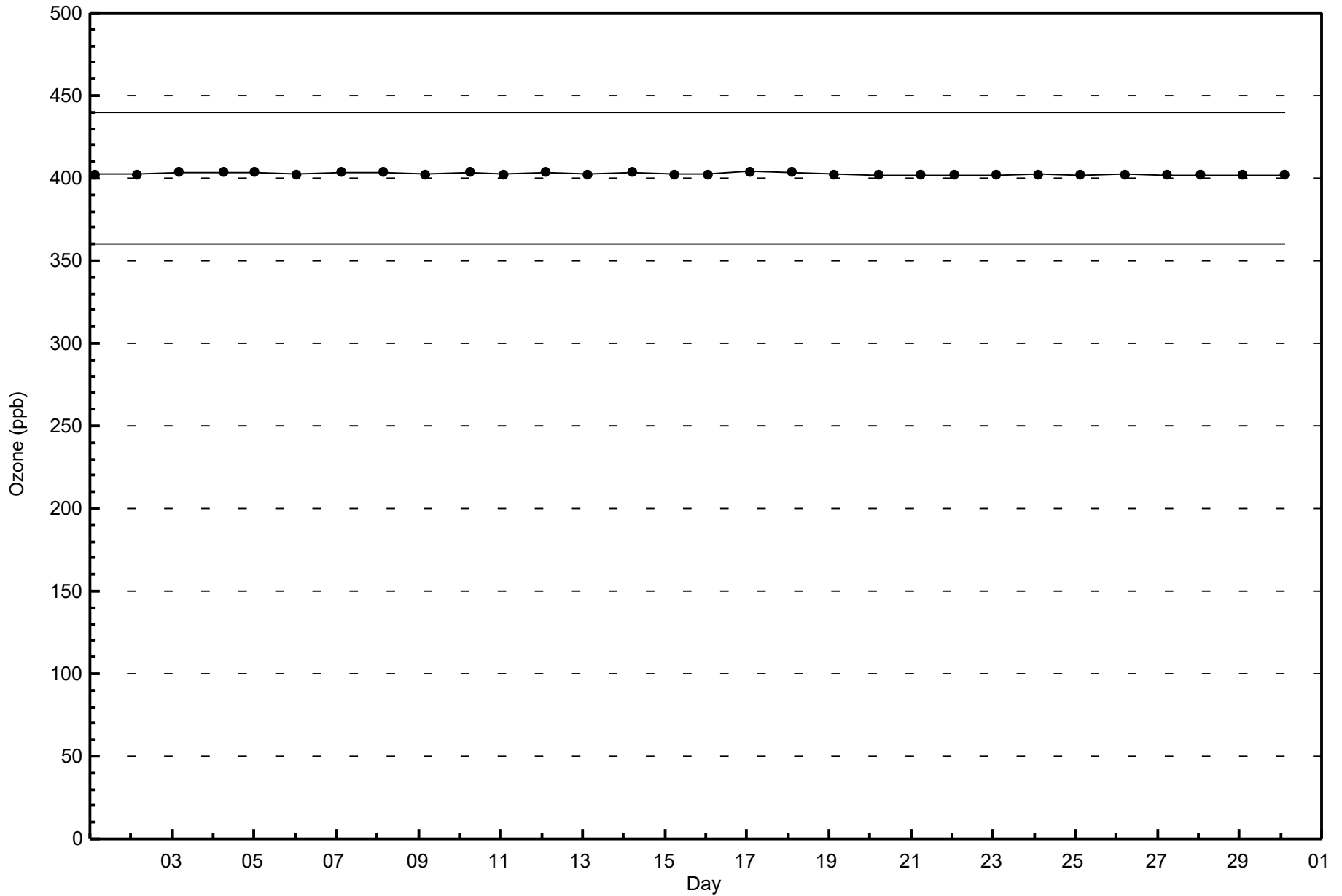
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Ozone (O<sub>3</sub>) - ppb  
Fort McKay South









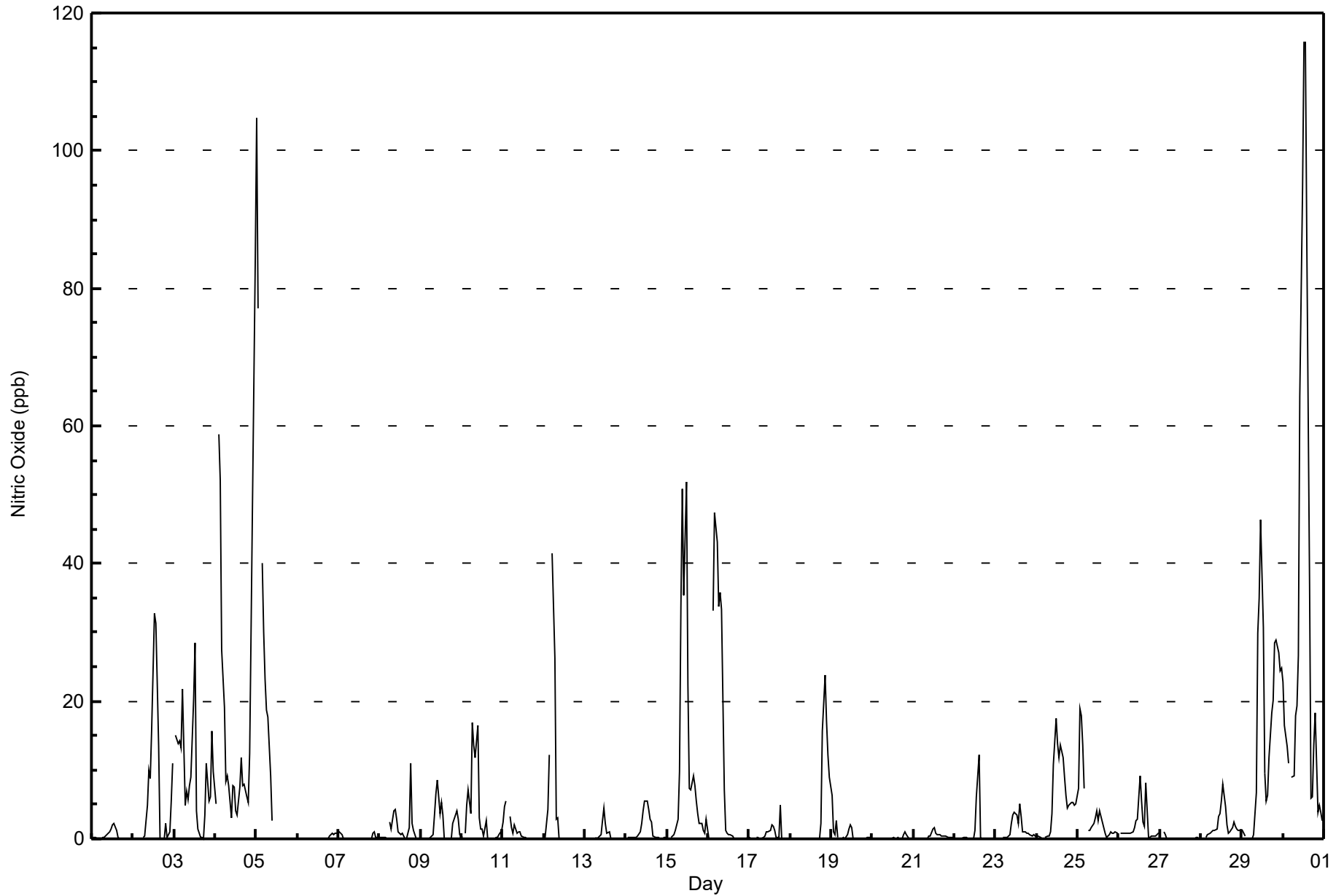


Maximum Value: 115.8 ppb on Nov 30 13:00		Maximum Daily Average: 31.3 ppb on Nov 30		Hours in Service: 720																																												
Minimum Value: 0.0 ppb on Nov 1 18:00		Minimum Daily Average: 0.1 ppb on Nov 20		Hours of Data: 663																																												
Maximum Diurnal Average: 10.5 ppb at hour 13		Minimum Diurnal Average: 1.7 ppb at hour 18		Hours of Missing Data: 57																																												
Monthly Average: 5.35 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.6 Q <sub>3</sub> = 4.2 P <sub>90</sub> = 14.9 P <sub>99</sub> = 69.1		Hours of Calibration: 37																																												
				Percent Operational Time: 97.2																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	0.1	0.1	0.1	0.1	Z	0.1	0.2	0.1	0.4	0.7	0.9	1.3	2.0	2.3	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.3																						
2-Nov	0.0	0.0	0.1	0.0	0.0	Z	0.2	0.4	4.9	10.1	8.8	15.9	32.8	31.4	22.6	13.4	0.0	0.0	0.0	2.2	0.3	1.0	5.4	10.9	7.0	32.8																						
3-Nov	Z	15.1	13.9	14.3	13.3	21.7	4.8	6.9	5.8	7.7	8.9	20.3	28.5	4.1	1.4	0.3	0.2	0.0	3.5	11.0	5.5	6.0	15.7	9.8	9.5	28.5																						
4-Nov	5.0	Z	58.8	52.1	27.4	19.1	8.4	9.2	7.7	3.1	7.7	7.6	4.1	3.5	7.5	11.9	7.7	8.0	6.2	5.2	12.3	30.0	48.5	84.0	18.9	84.0																						
5-Nov	104.7	77.2	Z	40.1	30.2	23.3	18.6	17.8	9.1	2.6	C	C	C	C	M	M	M	M	M	M	M	M	M	M	--	104.7																						
6-Nov	M	M	M	M	M	M	M	M	M	M	C	C	C	C	0.0	0.0	0.0	0.0	0.1	0.4	0.8	0.7	0.8	0.9	--	0.9																						
7-Nov	1.1	0.9	0.5	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.1	0.1	0.2	0.2	1.1																						
8-Nov	0.2	0.1	0.1	0.1	0.1	Z	2.4	1.4	4.0	4.3	2.9	1.0	0.6	0.8	0.4	0.0	0.0	1.7	10.9	2.2	1.2	0.0	0.0	0.0	1.5	10.9																						
9-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.4	0.5	3.5	6.5	8.5	3.7	5.4	3.4	0.0	0.0	0.0	0.0	0.0	2.2	3.4	4.2	2.9	0.6	2.0	8.5																						
10-Nov	0.2	Z	0.8	4.8	7.1	3.7	16.8	13.6	11.8	16.6	3.0	1.5	1.5	0.4	2.5	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.6	1.3	3.8	16.8																						
11-Nov	2.4	4.6	5.5	Z	3.2	1.6	0.8	2.0	0.8	1.0	0.9	0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	1.0	5.5																						
12-Nov	0.0	0.3	4.3	12.2	Z	41.4	26.3	2.9	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	41.4																						
13-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.2	0.6	2.7	4.5	2.2	0.8	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.5	4.5																						
14-Nov	Z	0.1	0.1	0.2	0.3	0.2	0.2	0.5	1.0	2.2	4.0	5.4	5.5	4.3	2.9	2.3	0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.2	1.3	5.5																						
15-Nov	0.1	Z	0.3	0.3	0.6	1.3	2.8	9.8	33.7	50.8	35.3	51.9	22.4	7.4	7.0	9.2	7.8	5.4	3.7	2.3	2.3	1.3	0.8	2.9	11.3	51.9																						
16-Nov	0.0	0.0	Z	33.1	47.4	43.1	33.7	35.9	33.4	7.1	1.2	0.9	0.7	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	10.3	47.4																						
17-Nov	0.2	0.0	0.0	Z	0.2	0.2	0.0	0.0	0.1	0.4	0.9	0.9	1.2	2.0	1.8	1.3	0.2	0.1	4.9	0.0	0.0	0.0	0.0	0.0	0.6	4.9																						
18-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	15.6	23.9	17.1	12.2	8.9	3.5	23.9																						
19-Nov	6.4	1.0	0.6	2.6	0.3	Z	0.1	0.1	0.0	0.5	1.4	2.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.8	6.4																						
20-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.1	0.0	0.0	0.5	1.0	0.5	0.0	0.0	0.0	0.1	1.0																						
21-Nov	0.0	Z	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.3	0.4	1.5	1.7	0.9	0.6	0.6	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.4	1.7																						
22-Nov	0.1	0.0	Z	0.0	0.1	0.1	0.2	0.3	0.1	0.0	0.0	0.0	1.2	6.1	12.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	12.1																						
23-Nov	0.0	0.0	0.0	Z	0.1	0.2	0.2	0.2	0.7	2.3	3.4	3.8	3.4	2.3	5.0	3.2	1.0	0.9	0.8	0.7	0.6	0.5	0.5	0.4	1.3	5.0																						
24-Nov	0.5	0.3	0.2	0.1	Z	0.3	0.3	0.3	0.9	3.7	10.7	17.5	13.8	11.9	13.7	11.8	8.9	6.3	4.5	4.9	5.3	5.2	4.9	5.1	5.7	17.5																						
25-Nov	7.4	19.0	17.8	13.7	7.4	Z	1.2	1.2	1.7	2.3	3.1	4.0	2.6	4.0	2.5	1.6	0.7	0.3	0.7	0.9	0.9	0.9	0.9	0.8	4.2	19.0																						
26-Nov	Z	0.9	0.9	0.8	0.8	0.8	0.8	0.9	1.0	1.7	2.7	2.8	9.1	5.4	2.4	1.9	8.1	0.2	0.3	0.4	0.4	0.5	0.6	0.8	1.9	9.1																						
27-Nov	0.8	Z	1.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.1	1.0																						
28-Nov	0.0	0.0	Z	0.2	0.7	0.8	1.0	1.3	1.3	1.3	3.3	3.6	5.5	8.0	4.6	2.0	0.7	1.1	1.6	2.4	1.9	1.5	1.2	1.2	2.0	8.0																						
29-Nov	1.2	0.9	0.5	Z	0.0	0.0	0.0	0.5	6.8	30.0	35.0	46.4	30.7	9.6	5.4	6.3	11.7	18.3	20.2	28.5	28.8	27.1	24.5	24.7	15.5	46.4																						
30-Nov	22.7	16.6	13.3	11.0	Z	8.9	9.2	18.0	19.2	26.7	64.2	94.6	115.8	115.7	87.2	36.9	5.8	6.1	13.6	18.3	3.8	4.9	3.8	2.6	31.3	115.8																						
																								6.4	5.7	4.8	7.5	6.0	7.0	4.4	4.3	5.2	6.3	7.5	10.4	10.5	8.0	6.3	3.6	1.9	1.7	2.6	3.4	3.2	3.5	4.3	5.4	Diurnal Average
																								104.7	77.2	58.8	52.1	47.4	43.1	33.7	35.9	33.7	50.8	64.2	94.6	115.8	115.7	87.2	36.9	11.7	18.3	20.2	28.5	28.8	30.0	48.5	84.0	Diurnal Maximum
Z - zerospan																								C - Calibration				M - Maintenance																				



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Fort McKay South - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Fort McKay South - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	616	92.91	92.91
21 - 40	30	4.52	97.44
41 - 80	11	1.66	99.10
81 - 159	6	0.90	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 663

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Fort McKay South - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	101	66	9	3	3	2	5	51	81	42	28	60	39	36	30	48	604
21 - 40	3	1	0	0	0	1	1	0	4	3	2	5	0	0	3	5	28
11 - 80	1	0	0	1	0	0	0	0	1	3	2	1	0	1	1	0	11
81 - 159	3	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	6
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	108	68	9	4	3	3	6	51	86	48	32	66	39	37	35	54	649

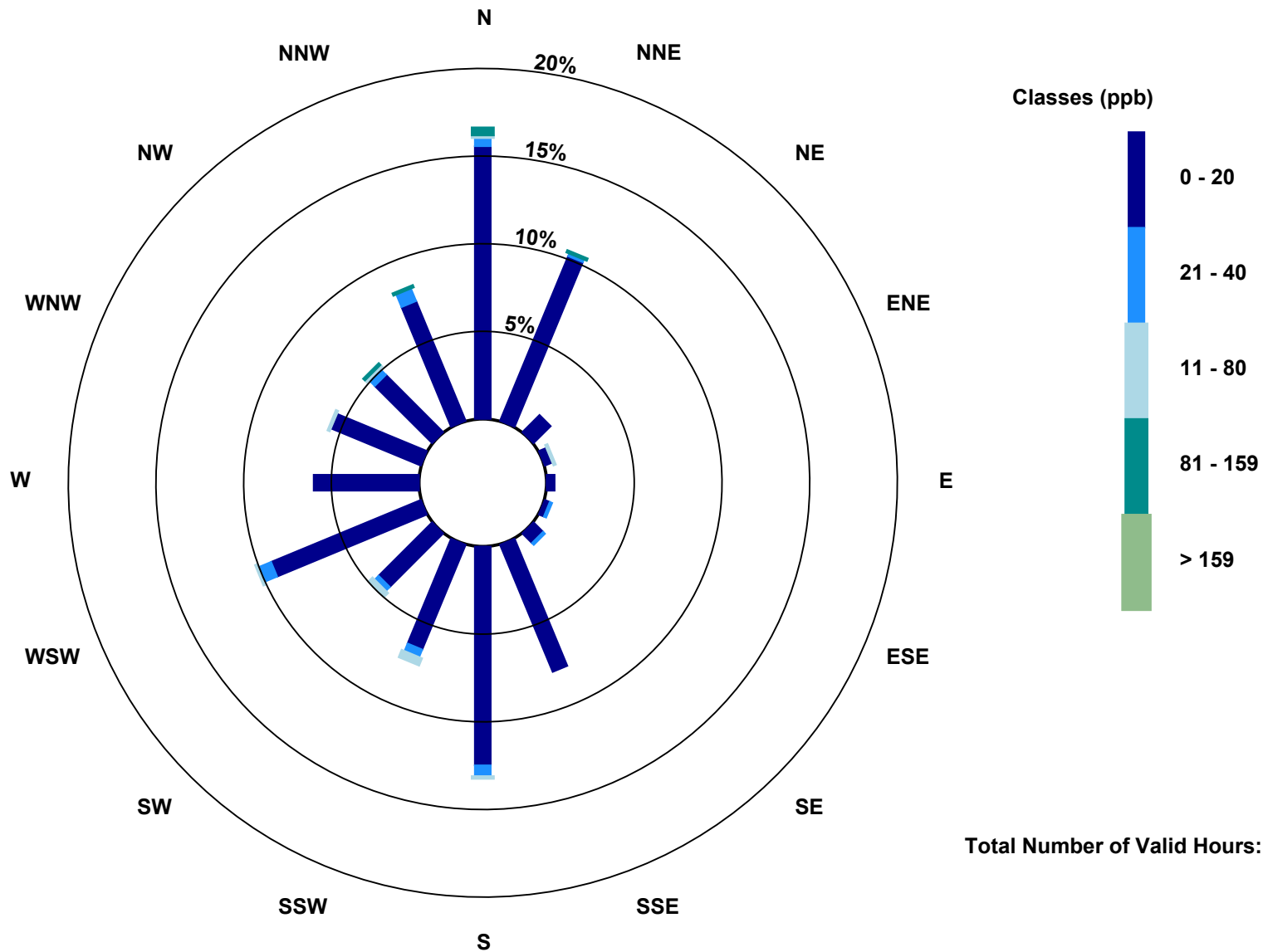
Total Number of Valid Hours: 649

Total Number of Hours: 720

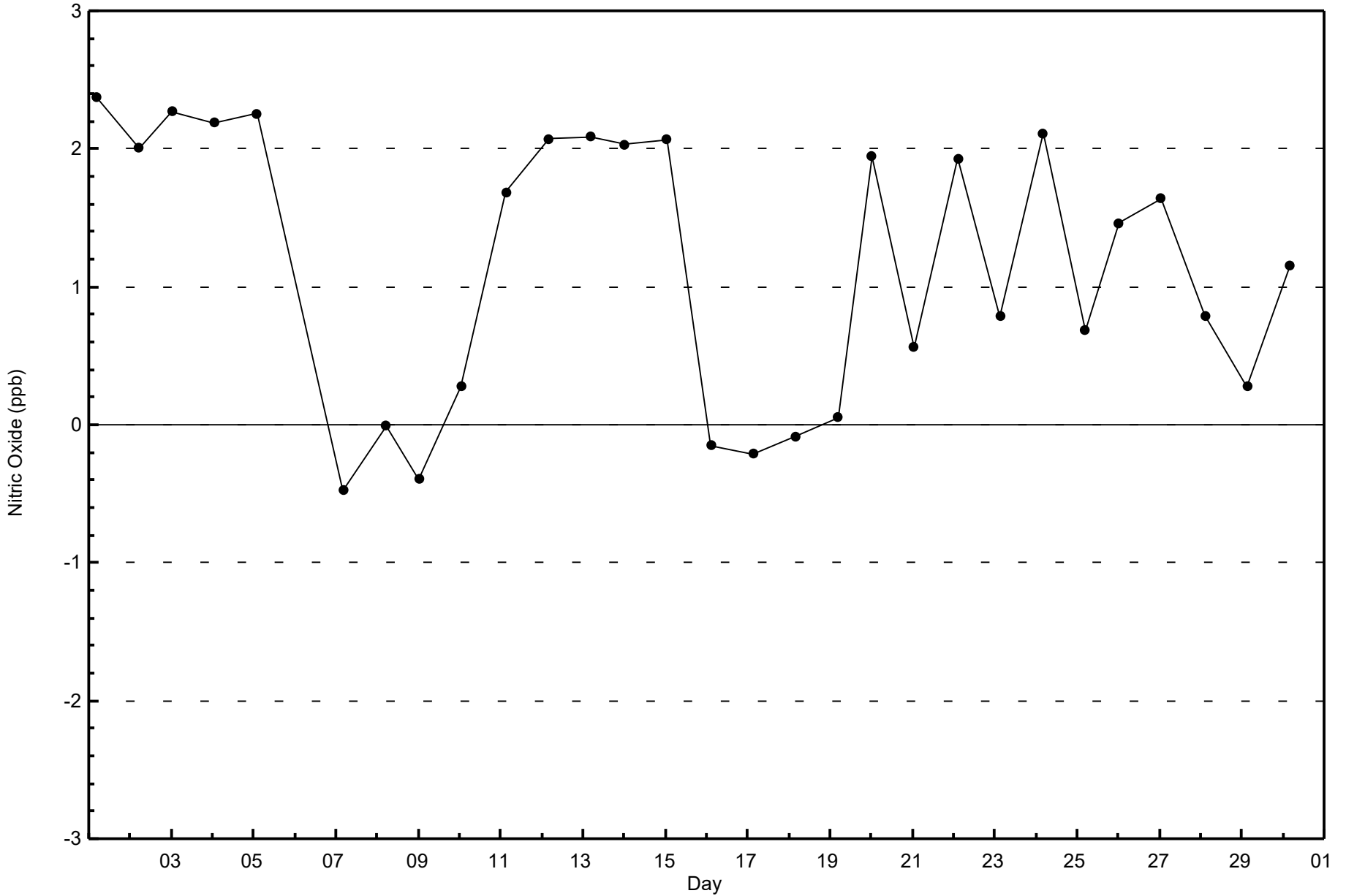


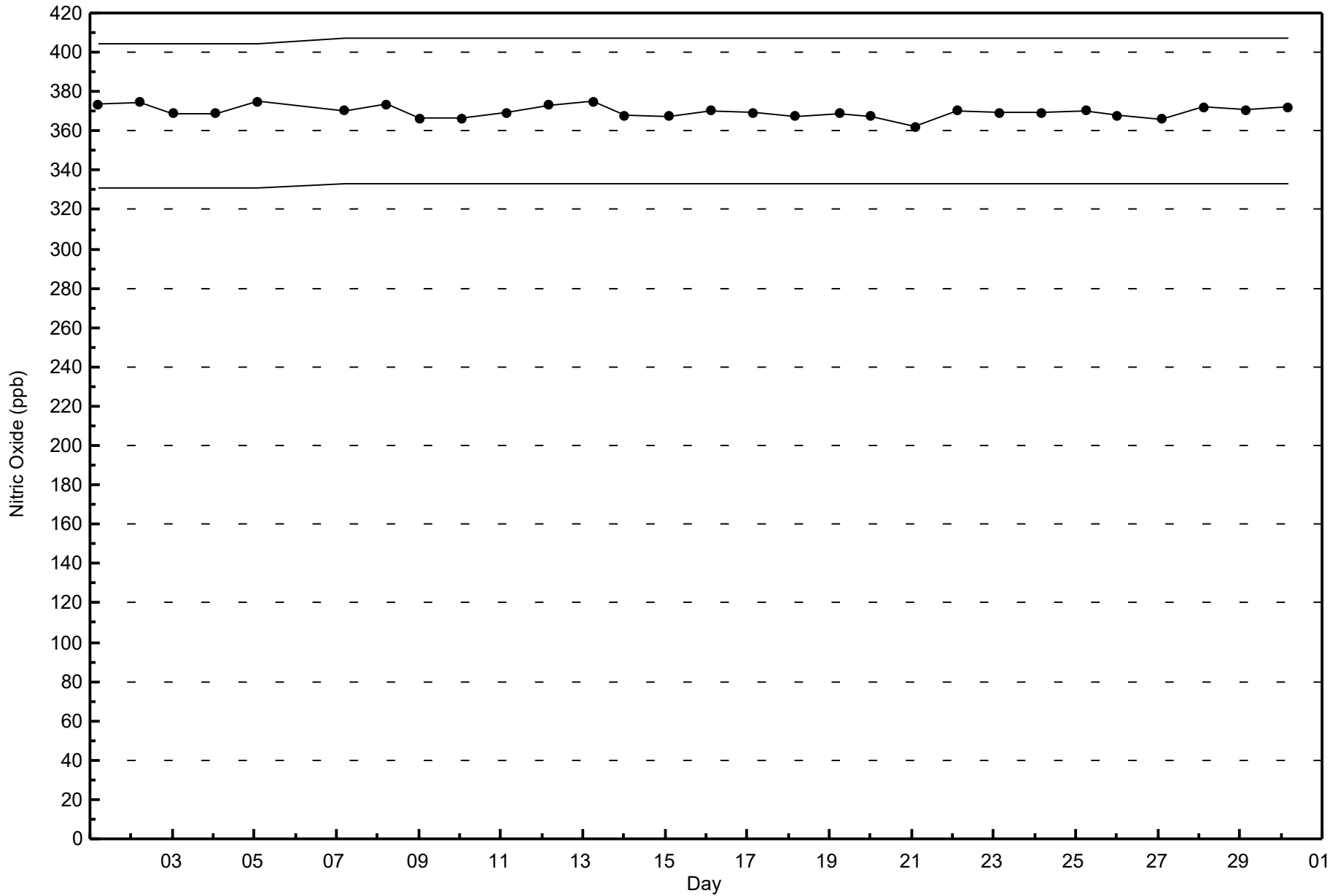
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitric Oxide (NO) - ppb  
Fort McKay South



Total Number of Valid Hours: 649









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb

Fort McKay South - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 39.3 ppb on Nov 30 14:00	Maximum Daily Average: 27.2 ppb on Nov 30		Hours of Data:	663
Minimum Value: 0.0 ppb on Nov 7 13:00	Minimum Daily Average: 1.1 ppb on Nov 27		Hours of Missing Data:	57
Maximum Diurnal Average: 9.5 ppb at hour 20	Minimum Diurnal Average: 6.4 ppb at hour 5		Hours of Calibration:	37
Monthly Average: 7.92 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.3 Q <sub>1</sub> = 2.9 Median = 6.2 Q <sub>3</sub> = 11.7 P <sub>90</sub> = 16.5 P <sub>99</sub> = 28.6		Percent Operational Time:	97.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	4.1	8.4	8.5	4.1	Z	4.1	4.3	5.4	4.6	5.6	7.0	7.2	8.7	11.2	11.6	9.7	11.5	11.4	12.4	14.5	4.9	4.0	5.6	9.9	7.8	14.5
2-Nov	13.3	12.3	11.2	7.1	4.3	Z	4.1	7.8	11.8	14.0	12.8	12.6	14.6	14.4	13.3	12.8	4.0	2.2	3.3	13.1	10.7	12.5	12.4	10.0	10.2	14.6
3-Nov	Z	6.9	5.8	5.2	6.2	10.5	9.8	10.1	9.9	8.7	8.2	10.9	14.4	6.5	4.5	3.9	6.9	3.3	8.0	9.5	7.7	8.2	9.9	9.3	8.0	14.4
4-Nov	11.2	Z	10.9	8.8	10.3	7.0	4.5	4.8	4.9	6.2	9.5	7.1	4.4	4.1	8.9	13.2	6.3	5.5	4.5	3.4	3.7	4.4	5.0	5.3	6.7	13.2
5-Nov	6.4	7.7	Z	15.1	13.1	12.9	13.7	13.6	12.2	8.2	C	C	C	C	M	M	M	M	M	M	M	M	M	M	--	15.1
6-Nov	M	M	M	M	M	M	M	M	M	M	C	C	C	C	0.4	1.3	7.6	14.5	10.8	10.1	6.0	5.7	2.7	4.3	--	14.5
7-Nov	1.9	3.5	2.9	0.3	Z	0.3	0.2	0.2	0.1	0.1	0.4	0.1	0.0	0.0	0.0	0.0	0.4	0.5	1.3	2.6	6.0	8.4	6.5	3.9	1.7	8.4
8-Nov	9.6	6.0	3.7	2.7	2.7	Z	8.5	8.4	5.6	10.8	8.1	4.3	3.7	4.5	4.3	6.0	10.2	10.6	15.4	10.6	9.7	1.2	0.3	0.4	6.4	15.4
9-Nov	Z	0.2	0.2	0.2	0.3	0.2	1.4	4.7	7.4	7.2	12.9	6.4	11.0	7.5	0.0	0.0	0.0	2.6	9.3	15.5	13.6	13.9	13.0	8.5	5.9	15.5
10-Nov	6.8	Z	6.8	8.2	7.5	6.3	13.3	11.9	9.4	10.6	4.6	2.4	2.8	1.4	7.7	7.3	5.2	5.6	9.1	8.8	7.5	7.1	5.9	6.1	7.1	13.3
11-Nov	4.7	4.7	4.6	Z	5.2	5.7	5.5	6.6	6.1	4.5	4.0	3.1	2.5	3.7	2.3	0.8	1.9	2.1	2.2	1.5	1.5	1.7	3.5	3.4	3.6	6.6
12-Nov	3.0	6.2	10.7	12.6	Z	11.4	9.6	6.2	5.3	0.5	0.7	0.8	0.9	0.6	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.2	0.2	3.1	12.6
13-Nov	0.0	0.1	0.1	0.2	0.2	Z	0.2	0.2	0.5	1.3	5.8	6.8	6.1	3.5	4.5	4.6	7.1	4.6	1.9	2.2	2.5	4.0	9.4	11.1	3.3	11.1
14-Nov	Z	16.4	14.8	15.6	15.7	13.3	14.8	12.2	15.2	15.7	16.3	15.1	13.3	12.6	11.2	14.6	9.6	12.3	12.1	14.4	7.6	6.7	5.7	5.4	12.6	16.4
15-Nov	9.0	Z	11.7	12.7	10.4	8.2	7.8	7.4	7.1	8.1	11.6	16.5	12.8	10.4	11.1	13.5	14.4	12.0	9.1	8.0	7.0	7.8	5.9	5.2	9.9	16.5
16-Nov	2.1	1.9	Z	5.7	5.4	4.2	4.7	6.4	7.8	6.1	4.2	4.1	3.7	3.2	3.2	3.0	2.2	2.5	2.2	2.4	2.8	2.8	2.9	2.9	3.8	7.8
17-Nov	2.3	3.8	5.3	Z	6.8	4.8	4.4	4.5	4.7	3.9	3.8	4.0	3.5	4.2	5.3	5.8	4.3	7.4	9.4	2.7	0.4	0.2	0.0	0.0	4.0	9.4
18-Nov	0.1	0.2	0.3	0.3	Z	0.3	0.1	0.0	0.3	0.3	0.0	0.1	0.2	0.2	0.3	0.2	0.0	1.3	6.7	11.1	15.3	18.5	16.7	16.4	3.9	18.5
19-Nov	15.9	10.0	13.5	23.8	15.7	Z	4.3	11.7	10.8	14.1	12.6	12.1	10.3	5.0	6.9	11.0	12.8	9.8	9.0	8.7	4.4	5.3	4.4	3.7	10.3	23.8
20-Nov	Z	3.4	1.5	0.7	3.7	4.1	4.8	4.4	4.5	3.7	2.8	2.6	3.9	3.3	2.5	8.1	9.9	8.5	5.5	3.5	3.0	4.4	4.0	4.1	4.2	9.9
21-Nov	5.3	Z	5.9	3.1	3.5	2.6	0.7	1.8	2.2	2.8	1.9	4.7	5.3	3.7	1.9	3.1	1.4	0.4	0.3	0.4	0.2	0.5	6.0	7.5	2.8	7.5
22-Nov	6.6	5.6	Z	1.8	0.3	0.3	0.5	0.6	0.3	0.0	0.0	2.9	6.3	13.9	22.8	11.9	5.9	7.6	6.6	3.6	4.1	5.2	10.0	15.3	5.7	22.8
23-Nov	11.0	9.2	8.8	Z	3.8	7.9	12.3	8.8	10.8	16.1	13.4	11.8	9.7	7.8	15.9	16.8	13.4	15.6	15.4	16.0	12.1	11.4	15.2	16.3	12.2	16.8
24-Nov	17.4	17.1	15.4	11.4	Z	17.8	20.6	16.9	17.5	16.5	19.2	21.3	19.2	19.3	23.6	27.2	26.8	25.3	22.4	20.5	18.8	16.2	17.3	16.5	19.3	27.2
25-Nov	16.3	18.3	19.5	19.4	18.1	Z	13.7	12.6	13.1	9.0	7.4	8.2	4.9	7.7	6.6	8.1	10.3	11.6	17.2	13.3	6.1	6.1	8.2	9.3	11.5	19.5
26-Nov	Z	4.4	3.8	3.6	3.8	4.0	6.1	6.1	7.6	6.1	6.0	6.1	10.3	7.6	8.4	12.3	20.5	5.1	4.2	3.6	2.2	0.9	0.8	0.7	5.8	20.5
27-Nov	0.6	Z	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	1.4	2.2	3.6	3.9	4.8	4.3	0.9	0.5	0.3	0.4	1.1	4.8
28-Nov	0.2	1.3	Z	2.0	0.7	0.2	0.2	0.2	0.2	0.3	4.3	4.5	6.6	11.7	10.8	11.5	11.3	11.7	15.3	18.3	15.9	12.9	11.5	12.8	7.1	18.3
29-Nov	11.5	10.3	9.4	Z	8.5	6.2	4.9	10.0	14.2	16.1	17.4	20.3	16.3	10.2	12.0	17.5	21.8	23.0	23.4	24.8	23.9	22.3	21.8	22.9	16.0	24.8
30-Nov	21.4	22.0	20.8	20.3	Z	23.0	23.0	24.6	24.2	24.3	30.3	35.5	38.8	39.3	36.8	31.5	26.5	28.0	29.3	28.1	22.5	24.9	25.0	25.2	27.2	39.3

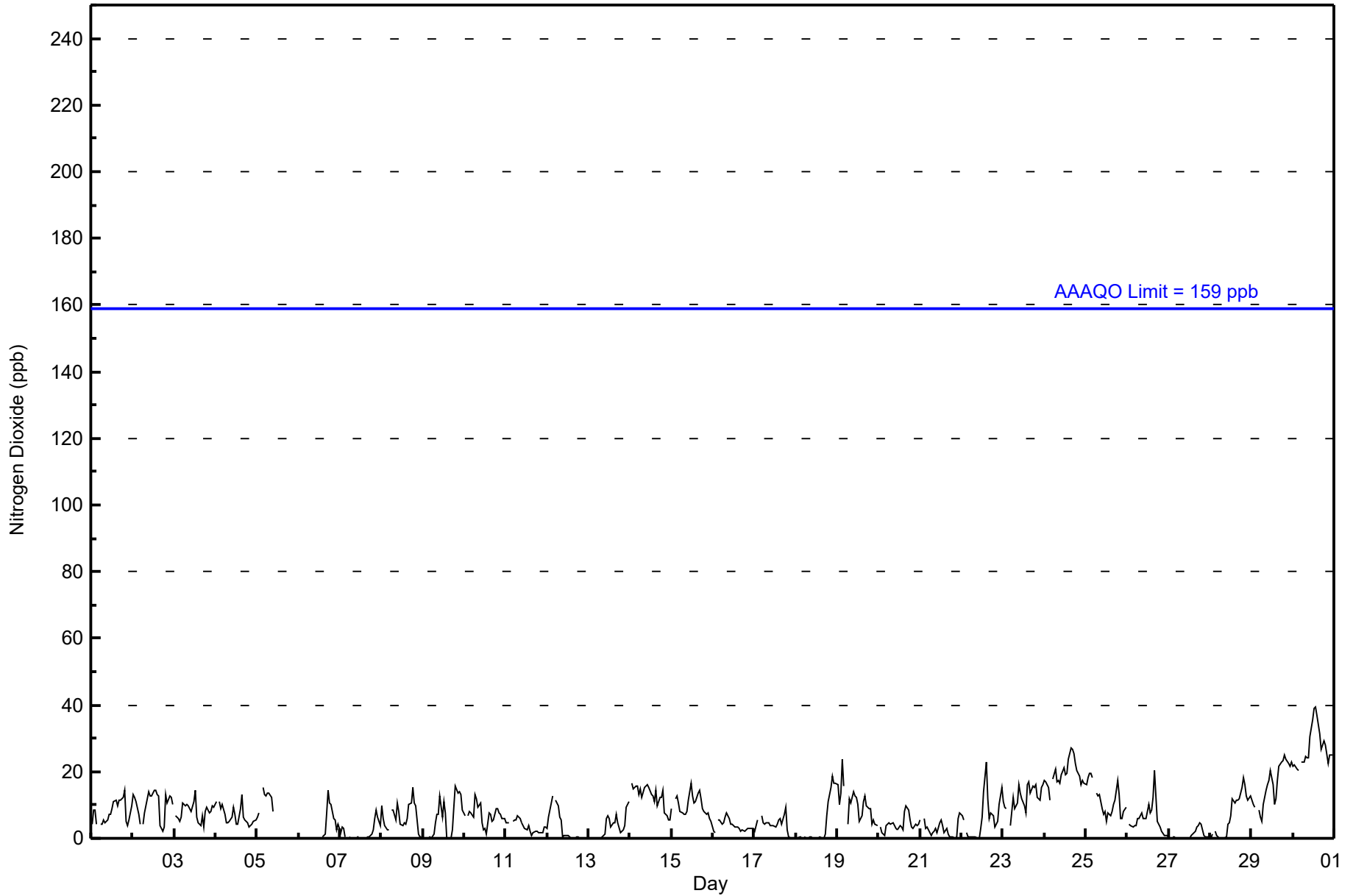
7.5	7.5	7.9	7.4	6.4	6.5	6.8	7.2	7.5	7.6	8.0	8.3	8.4	7.8	8.2	8.9	8.8	8.6	9.4	9.5	7.6	7.5	7.9	8.2	Diurnal Average	
21.4	22.0	20.8	23.8	18.1	23.0	23.0	24.6	24.2	24.3	30.3	35.5	38.8	39.3	36.8	31.5	26.8	28.0	29.3	28.1	23.9	24.9	25.0	25.2	Diurnal Maximum	

Z - zerspan      C - Calibration      M - Maintenance  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Fort McKay South - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort McKay South - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	622	93.82	93.82
21 - 40	41	6.18	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 663

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort McKay South - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 20	92	64	9	4	3	3	6	51	86	48	32	61	38	36	34	43	610
21 - 40	16	4	0	0	0	0	0	0	0	0	0	5	1	1	1	11	39
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	108	68	9	4	3	3	6	51	86	48	32	66	39	37	35	54	649

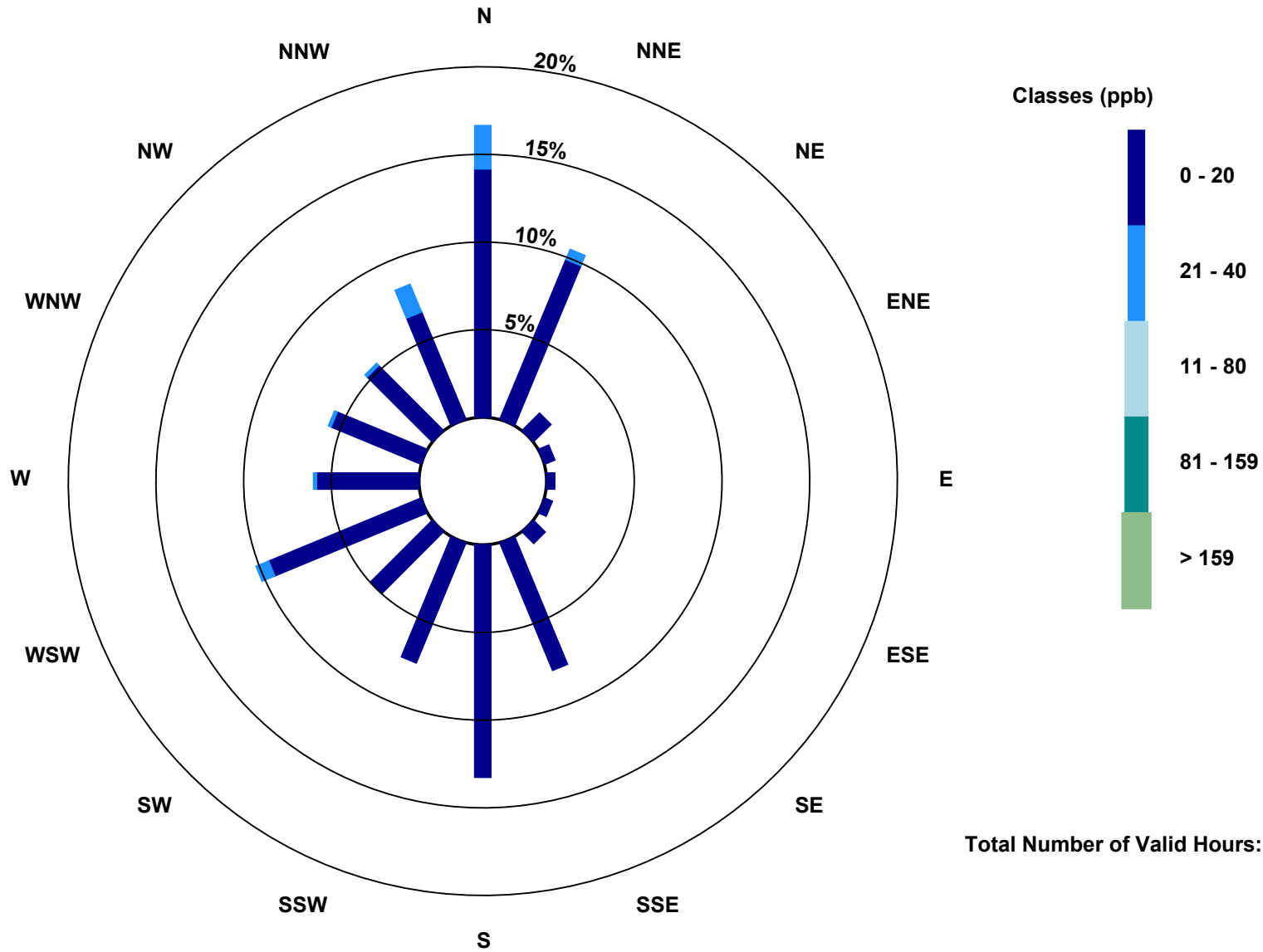
Total Number of Valid Hours: 649

Total Number of Hours: 720

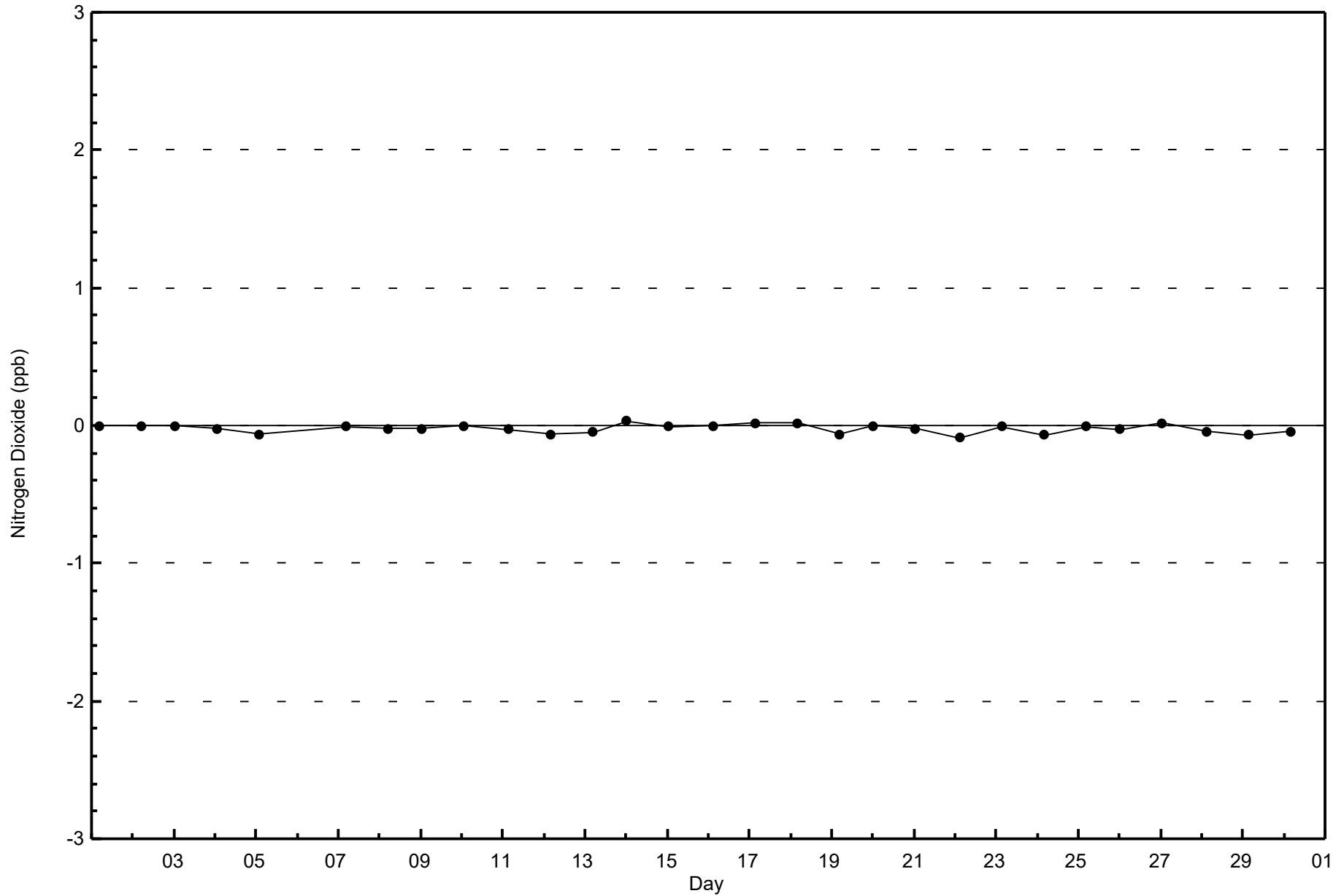


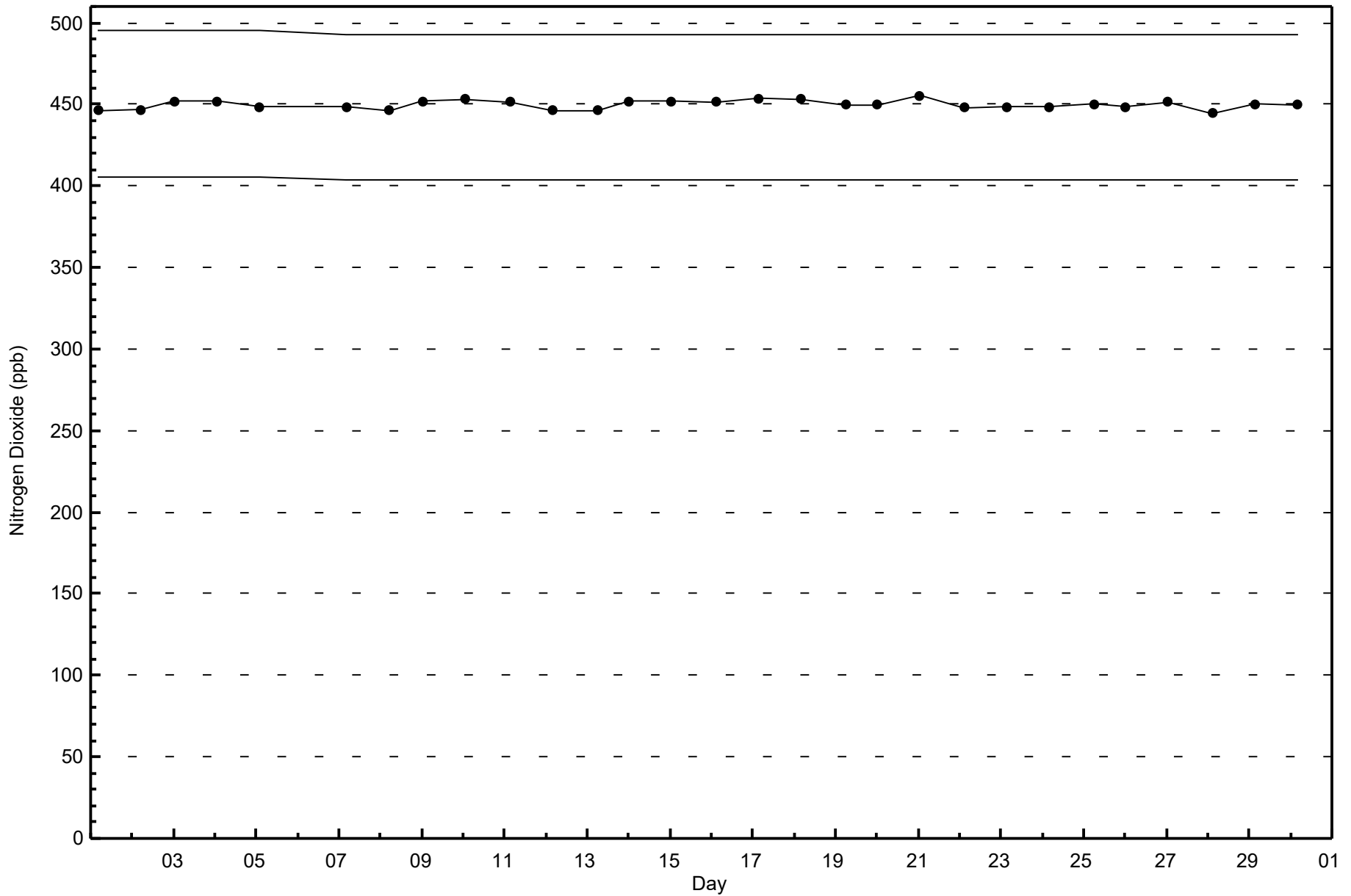
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort McKay South



Total Number of Valid Hours: 649





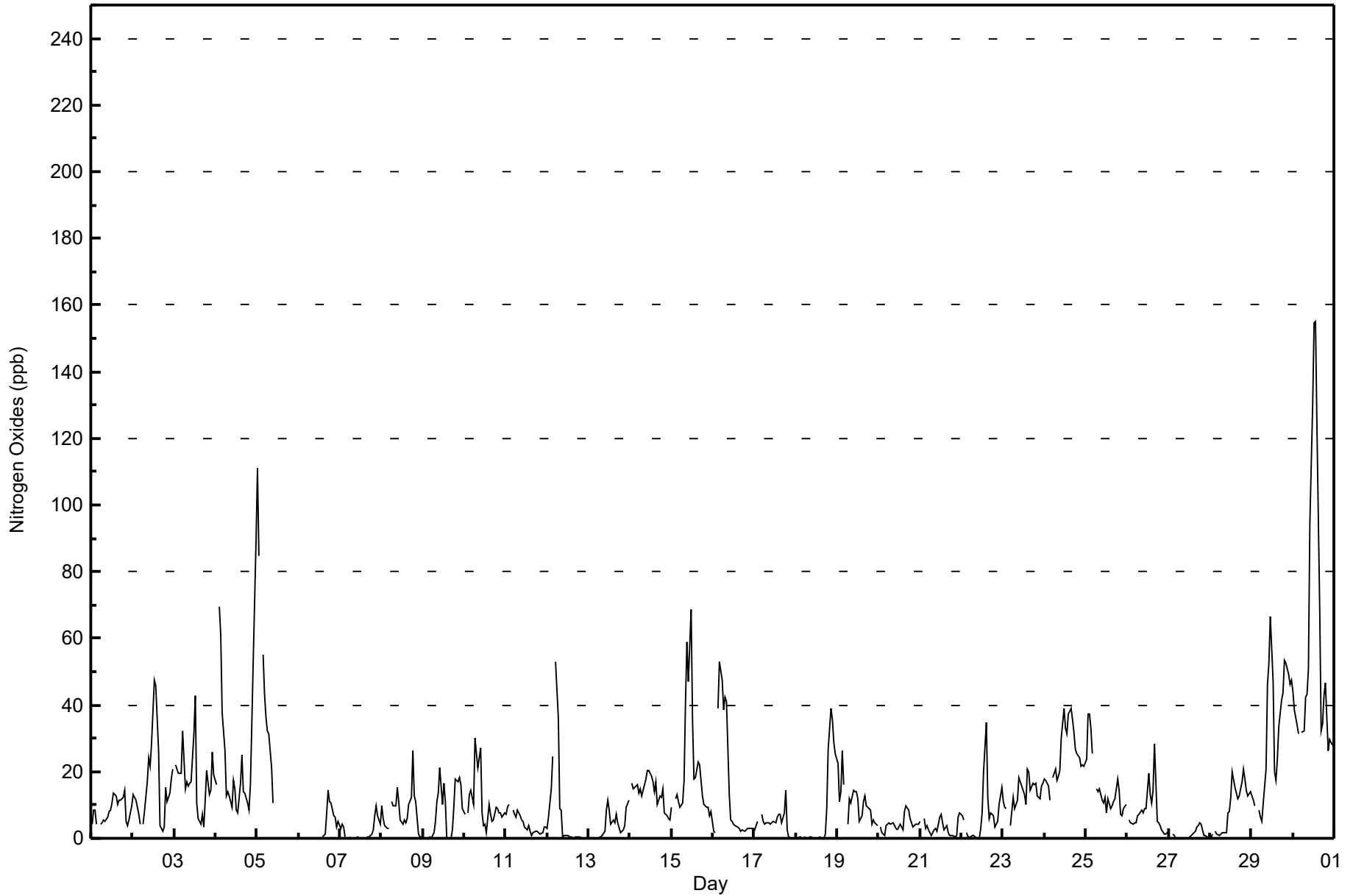


**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Fort McKay South - November 2024**

Maximum Value: 155.0 ppb on Nov 30 14:00      Maximum Daily Average: 58.4 ppb on Nov 30 Minimum Value: 0.0 ppb on Nov 7 13:00      Minimum Daily Average: 1.2 ppb on Nov 27 Maximum Diurnal Average: 18.8 ppb at hour 13      Minimum Diurnal Average: 10.3 ppb at hour 18 Monthly Average: 13.27 ppb      Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.3 Q <sub>1</sub> = 3.1 Median = 8.5 Q <sub>3</sub> = 16.3 P <sub>90</sub> = 32.3 P <sub>99</sub> = 86.6																						Hours in Service:	720																								
																						Hours of Data:	663																								
																						Hours of Missing Data:	57																								
																						Hours of Calibration:	37																								
																						Percent Operational Time:	97.2																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Nov	4.2	8.5	8.6	4.2	Z	4.2	4.5	5.5	5.0	6.3	7.9	8.5	10.7	13.5	12.9	10.0	11.5	11.4	12.4	14.5	4.9	4.0	5.6	9.9	8.2	14.5																					
2-Nov	13.3	12.3	11.3	7.1	4.3	Z	4.3	8.2	16.7	24.1	21.6	28.5	47.4	45.8	35.9	26.2	4.0	2.2	3.3	15.3	11.0	13.5	17.8	20.9	17.2	47.4																					
3-Nov	Z	22.0	19.7	19.5	19.5	32.2	14.6	17.0	15.7	16.4	17.1	31.2	42.9	10.6	5.9	4.2	7.1	3.3	11.5	20.5	13.2	14.2	25.6	19.1	17.5	42.9																					
4-Nov	16.2	Z	69.7	60.9	37.7	26.1	12.9	14.0	12.6	9.3	17.2	14.7	8.5	7.6	16.4	25.1	14.0	13.5	10.7	8.6	16.0	34.4	53.5	89.3	25.6	89.3																					
5-Nov	111.1	84.9	Z	55.2	43.3	36.2	32.3	31.4	21.3	10.8	C	C	C	C	M	M	M	M	M	M	M	M	M	M	--	111.1																					
6-Nov	M	M	M	M	M	M	M	M	M	M	C	C	C	C	0.4	1.3	7.6	14.5	10.9	10.5	6.8	6.4	3.5	5.2	--	14.5																					
7-Nov	3.0	4.4	3.4	0.3	Z	0.3	0.2	0.2	0.1	0.1	0.4	0.1	0.0	0.0	0.0	0.0	0.4	0.5	1.3	2.6	6.7	9.5	6.6	4.1	1.9	9.5																					
8-Nov	9.8	6.1	3.8	2.8	2.8	Z	10.9	9.8	9.6	15.1	11.0	5.3	4.3	5.3	4.7	6.0	10.2	12.3	26.3	12.8	10.9	1.2	0.3	0.4	7.9	26.3																					
9-Nov	Z	0.2	0.2	0.2	0.3	0.2	1.8	5.2	10.9	13.7	21.4	10.1	16.4	10.9	0.0	0.0	0.0	2.6	9.3	17.7	17.0	18.1	15.9	9.1	7.9	21.4																					
10-Nov	7.0	Z	7.6	13.0	14.6	10.0	30.1	25.5	21.2	27.2	7.6	3.9	4.3	1.8	10.2	7.3	5.2	5.6	9.1	8.8	7.7	7.4	6.5	7.4	10.8	30.1																					
11-Nov	7.1	9.3	10.1	Z	8.4	7.3	6.3	8.6	6.9	5.5	4.9	3.5	2.7	3.9	2.3	0.8	1.9	2.1	2.2	1.5	1.5	1.7	3.6	3.5	4.6	10.1																					
12-Nov	3.0	6.5	15.0	24.8	Z	52.8	35.9	9.1	8.4	0.5	0.7	0.8	0.9	0.6	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.2	0.2	7.0	52.8																					
13-Nov	0.0	0.1	0.1	0.2	0.2	Z	0.3	0.3	0.7	1.9	8.5	11.3	8.3	4.3	5.5	4.7	7.1	4.6	1.9	2.2	2.5	4.0	9.5	11.2	3.9	11.3																					
14-Nov	Z	16.5	14.9	15.8	16.0	13.5	15.0	12.7	16.2	17.9	20.3	20.5	18.8	16.9	14.1	16.9	10.1	12.5	12.3	14.6	7.7	6.8	5.8	5.6	14.0	20.5																					
15-Nov	9.1	Z	12.0	13.0	11.0	9.5	10.6	17.2	40.8	58.9	46.9	68.4	35.2	17.8	18.1	22.7	22.2	17.4	12.8	10.3	9.3	9.1	6.7	8.1	21.2	68.4																					
16-Nov	2.1	1.9	Z	38.8	52.8	47.3	38.4	42.3	41.2	13.2	5.4	5.0	4.4	3.7	3.5	3.0	2.2	2.5	2.2	2.4	2.8	2.8	3.0	3.1	14.1	52.8																					
17-Nov	2.5	3.8	5.3	Z	7.0	5.0	4.4	4.5	4.8	4.3	4.7	4.9	4.7	6.2	7.1	7.1	4.5	7.5	14.3	2.7	0.4	0.2	0.0	0.0	4.6	14.3																					
18-Nov	0.1	0.2	0.3	0.3	Z	0.3	0.1	0.0	0.3	0.3	0.0	0.1	0.2	0.2	0.3	0.2	0.0	1.3	9.0	26.7	39.2	35.6	28.9	25.3	7.3	39.2																					
19-Nov	22.3	11.0	14.1	26.4	16.0	Z	4.4	11.8	10.8	14.6	14.0	14.1	12.0	5.0	6.9	11.0	12.8	9.8	9.0	8.7	4.4	5.4	4.7	3.9	11.0	26.4																					
20-Nov	Z	3.4	1.5	0.7	3.7	4.1	4.8	4.4	4.5	3.7	2.8	2.6	4.2	3.3	2.5	8.2	9.9	8.5	6.0	4.5	3.5	4.4	4.0	4.1	4.3	9.9																					
21-Nov	5.3	Z	5.9	3.1	3.6	2.7	0.7	1.8	2.3	3.1	2.3	6.2	7.0	4.6	2.5	3.7	1.8	0.8	0.6	0.7	0.5	0.7	6.2	7.7	3.2	7.7																					
22-Nov	6.7	5.6	Z	1.8	0.4	0.4	0.7	0.9	0.4	0.0	0.0	2.9	7.5	20.0	34.9	12.1	5.9	7.6	6.6	3.6	4.1	5.2	10.0	15.3	6.6	34.9																					
23-Nov	11.0	9.2	8.8	Z	3.9	8.1	12.5	9.0	11.5	18.4	16.8	15.6	13.1	10.1	20.9	20.0	14.4	16.5	16.2	16.7	12.7	11.9	15.7	16.7	13.5	20.9																					
24-Nov	17.9	17.4	15.6	11.5	Z	18.1	20.9	17.2	18.4	20.2	29.9	38.8	33.0	31.2	37.3	39.0	35.7	31.6	26.9	25.4	24.1	21.4	22.2	21.6	25.0	39.0																					
25-Nov	23.7	37.3	37.3	33.1	25.5	Z	14.9	13.8	14.8	11.3	10.5	12.2	7.5	11.7	9.1	9.7	11.0	11.9	17.9	14.2	7.0	7.0	9.1	10.1	15.7	37.3																					
26-Nov	Z	5.3	4.7	4.4	4.6	4.8	6.9	7.0	8.6	7.8	8.7	8.9	19.4	13.0	10.8	14.2	28.6	5.3	4.5	4.0	2.6	1.4	1.4	1.5	7.8	28.6																					
27-Nov	1.4	Z	1.4	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	1.4	2.2	3.6	3.9	4.8	4.3	0.9	0.7	0.4	0.4	1.2	4.8																					
28-Nov	0.2	1.3	Z	2.2	1.4	1.0	1.2	1.5	1.5	1.6	7.6	8.1	12.1	19.7	15.4	13.5	12.0	12.8	16.9	20.7	17.8	14.4	12.7	14.0	9.1	20.7																					
29-Nov	12.7	11.2	9.9	Z	8.5	6.2	4.9	10.5	21.0	46.1	52.4	66.7	47.0	19.8	17.4	23.8	33.5	41.3	43.6	53.3	52.7	49.4	46.3	47.6	31.6	66.7																					
30-Nov	44.1	38.6	34.1	31.3	Z	31.9	32.2	42.6	43.4	51.0	94.5	130.1	154.6	155.0	124.0	68.4	32.3	34.1	42.9	46.4	26.3	29.8	28.8	27.8	58.4	155.0																					
																						13.9	13.2	12.6	14.9	12.4	13.4	11.3	11.4	12.8	13.9	15.5	18.7	18.8	15.8	14.5	12.5	10.7	10.3	11.9	12.9	10.8	11.1	12.2	13.5	Diurnal Average	
																						111.1	84.9	69.7	60.9	52.8	52.8	38.4	42.6	43.4	58.9	94.5	130.1	154.6	155.0	124.0	68.4	35.7	41.3	43.6	53.3	52.7	49.4	53.5	89.3	Diurnal Maximum	
Z - zerspan      C - Calibration      M - Maintenance																																															







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Fort McKay South - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	544	82.05	82.05
21 - 40	76	11.46	93.51
41 - 80	35	5.28	98.79
81 - 159	8	1.21	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 663

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Fort McKay South - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 20	82	63	8	3	2	2	5	47	73	39	27	53	36	32	27	35	534
21 - 40	18	3	1	0	1	0	1	4	9	4	2	10	3	4	5	9	74
11 - 80	4	1	0	1	0	1	0	0	4	5	3	3	0	1	1	9	33
81 - 159	4	1	0	0	0	0	0	0	0	0	0	0	0	0	2	1	8
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	108	68	9	4	3	3	6	51	86	48	32	66	39	37	35	54	649

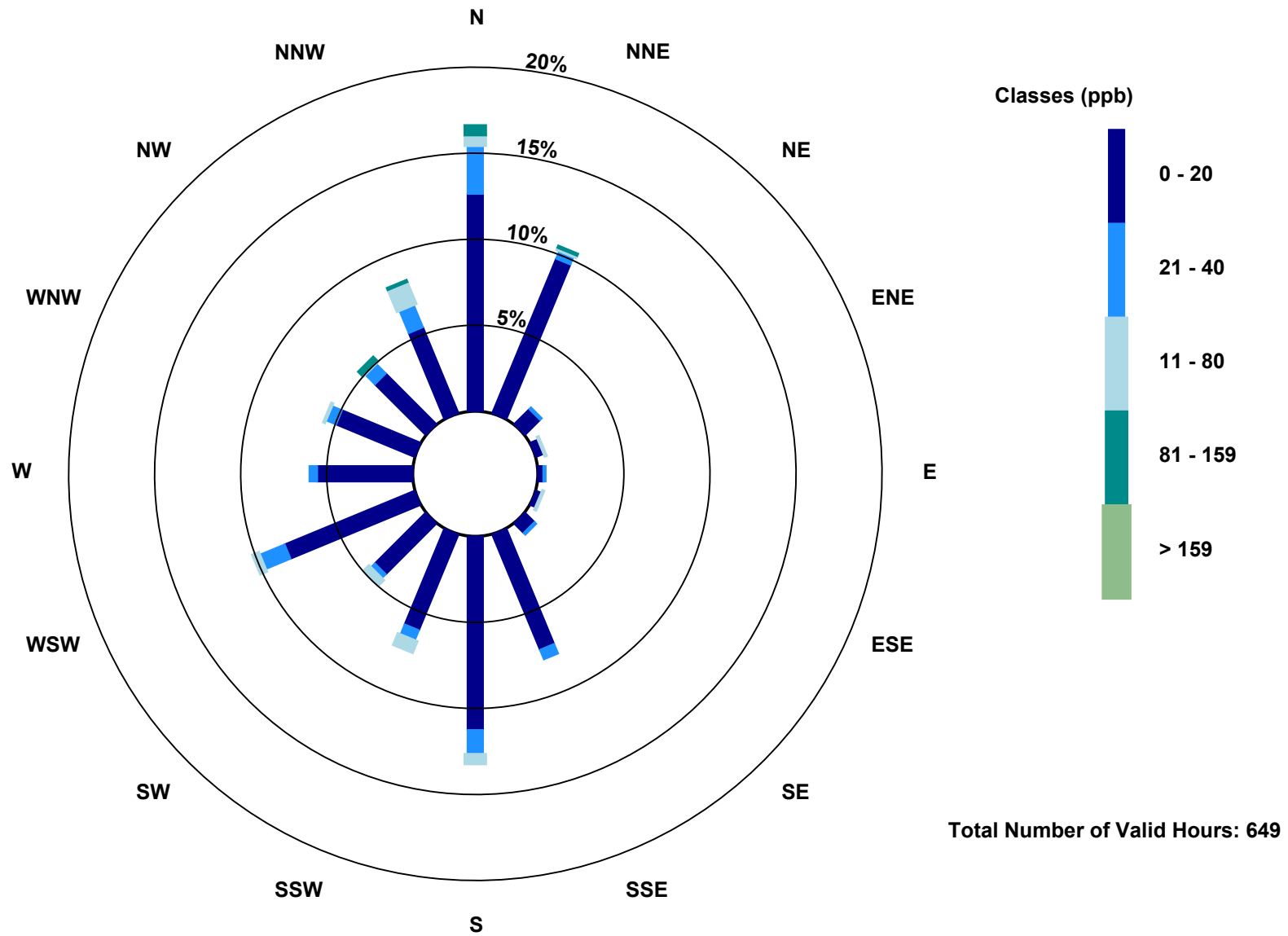
Total Number of Valid Hours: 649

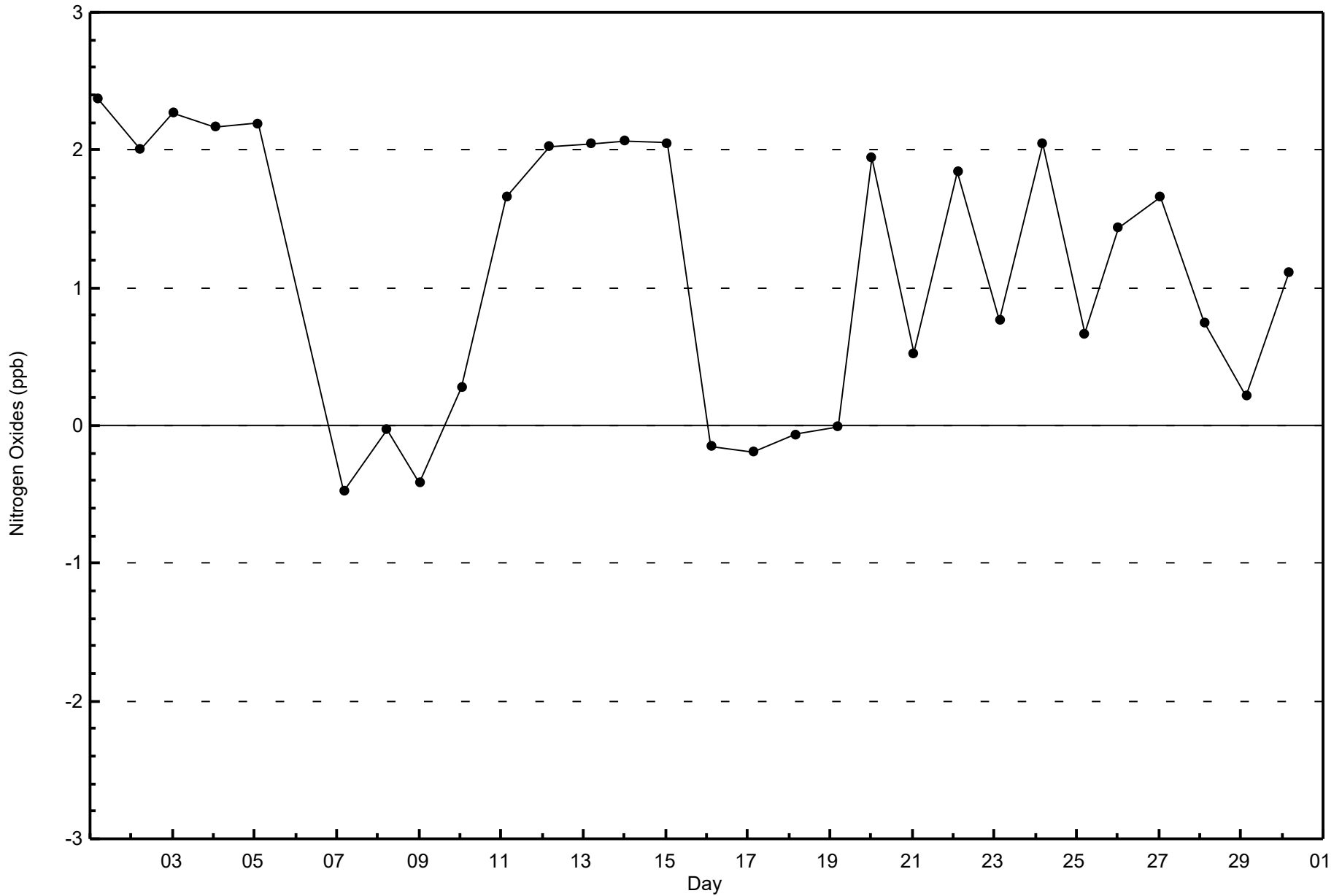
Total Number of Hours: 720

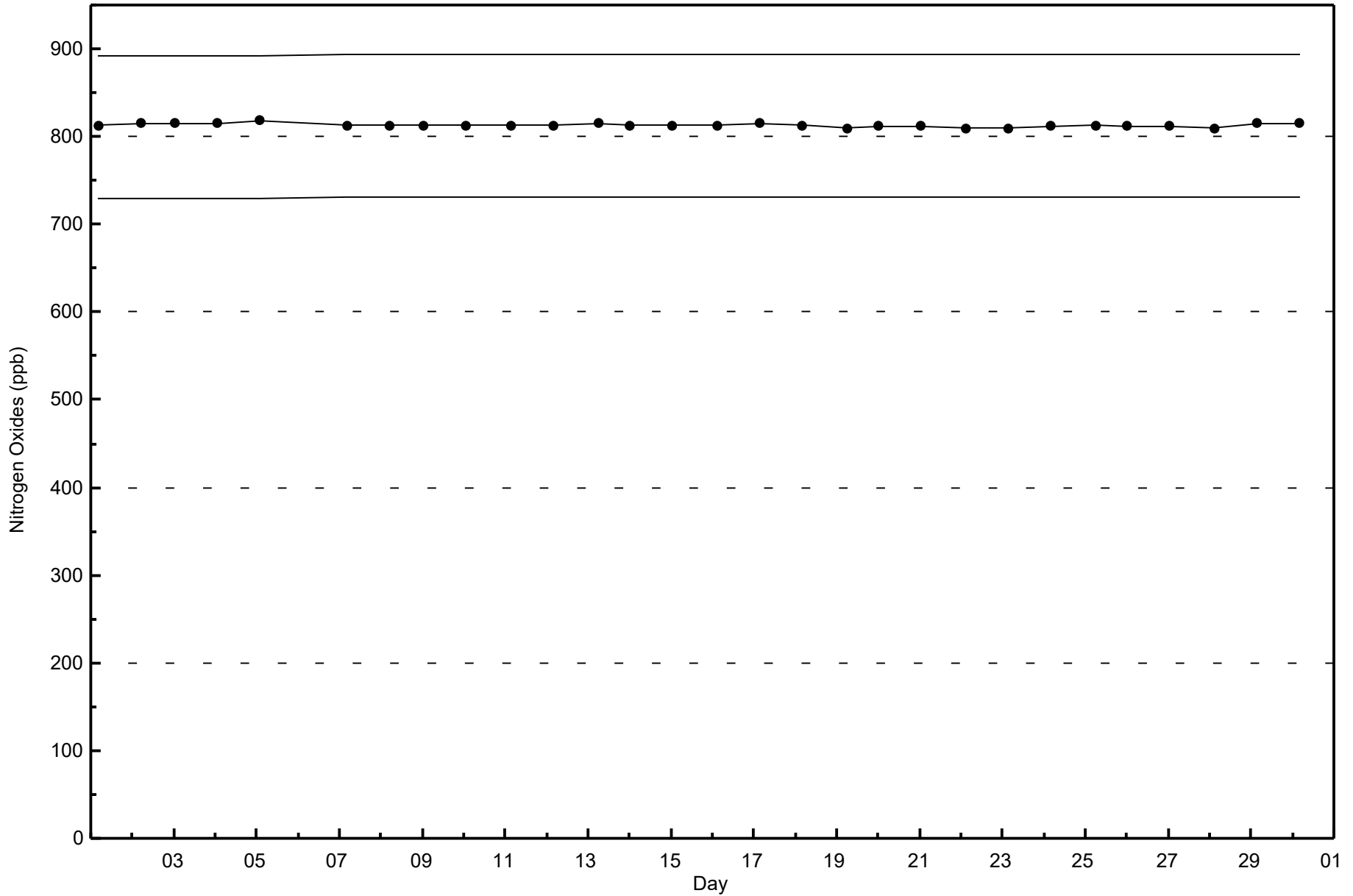


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Fort McKay South





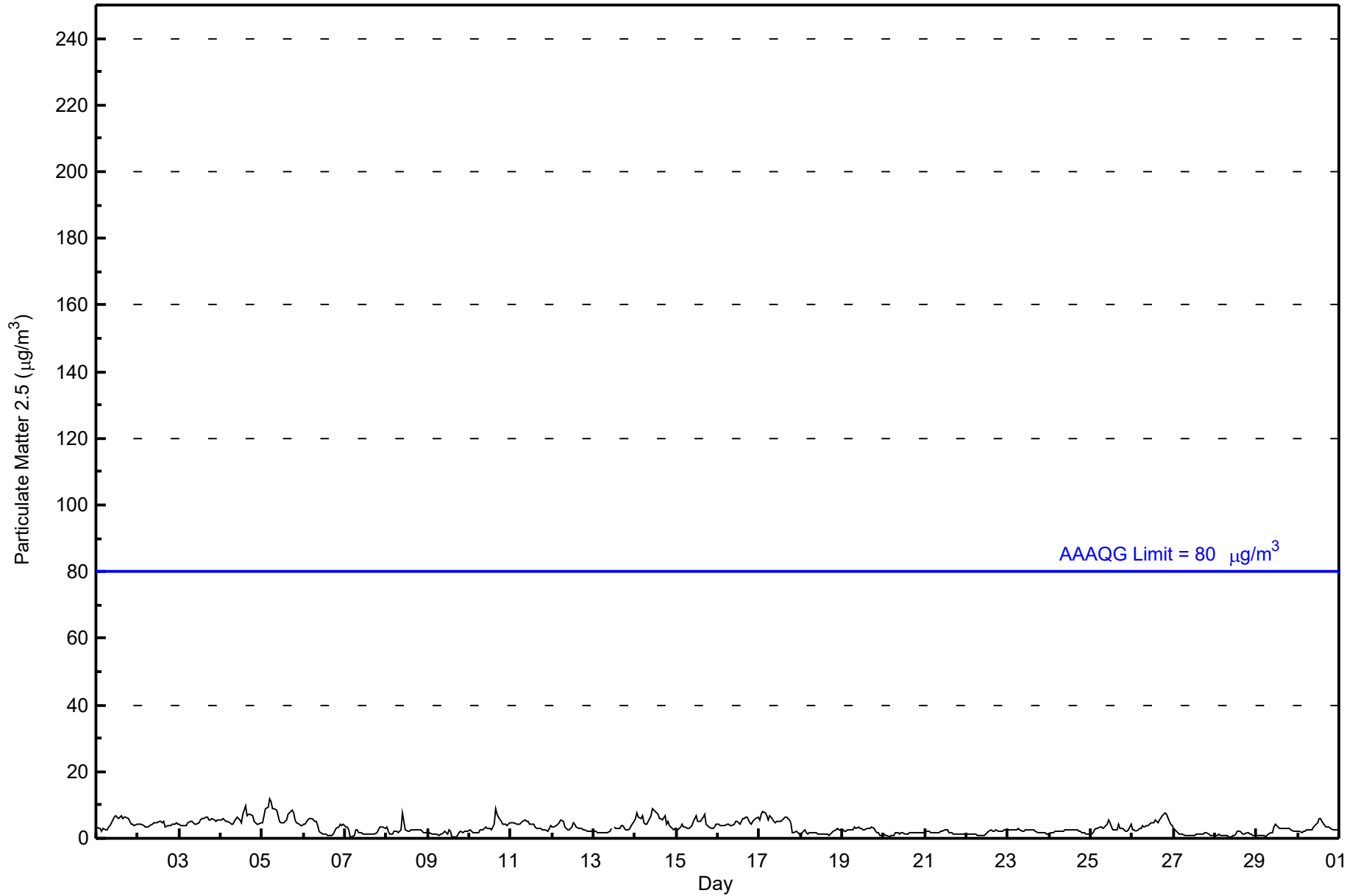




Summary of Hour Averages

Fort McKay South - November 2024

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720				
Maximum Value: 11.7 µg/m <sup>3</sup> on Nov 5 05:00		Maximum Daily Average: 6.8 µg/m <sup>3</sup> on Nov 5															Hours of Data:	719								
Minimum Value: 0.3 µg/m <sup>3</sup> on Nov 7 05:00		Minimum Daily Average: 1.2 µg/m <sup>3</sup> on Nov 28															Hours of Missing Data:	1								
Maximum Diurnal Average: 3.7 µg/m <sup>3</sup> at hour 17		Minimum Diurnal Average: 2.8 µg/m <sup>3</sup> at hour 23															Hours of Calibration:	1								
Monthly Average: 3.25 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 0.6 P <sub>10</sub> = 1.2 Q <sub>1</sub> = 1.8 Median = 2.7 Q <sub>3</sub> = 4.4 P <sub>90</sub> = 5.9 P <sub>99</sub> = 8.9															Percent Operational Time:	100.0								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	3.4	3.2	2.8	2.2	3.2	2.7	2.7	3.5	3.9	5.5	6.4	6.6	6.2	6.0	6.7	6.0	6.4	6.4	6.1	5.0	4.3	4.2	3.9	4.1	4.6	6.7
2-Nov	4.3	4.4	4.4	4.0	3.6	3.5	3.6	3.9	4.3	4.7	4.7	4.8	5.2	5.2	4.7	4.9	3.4	3.7	3.8	4.0	4.1	4.4	4.6	4.3	4.3	5.2
3-Nov	4.1	3.9	3.7	3.7	3.9	4.7	5.1	5.1	4.6	4.3	4.4	4.7	5.6	6.1	6.0	6.3	6.3	5.4	5.5	5.8	5.3	5.1	5.3	5.5	5.0	6.3
4-Nov	5.5	5.9	5.6	5.3	5.1	4.7	4.2	4.4	4.9	6.4	6.0	5.7	4.7	7.4	9.5	6.8	7.2	7.3	6.6	5.2	4.6	4.1	4.2	4.5	5.7	9.5
5-Nov	4.7	7.0	8.8	9.3	11.7	10.9	9.0	8.9	8.3	6.9	5.2	4.5	4.6	5.2	5.7	7.2	7.5	8.5	7.7	5.6	4.6	4.3	3.8	3.8	6.8	11.7
6-Nov	4.4	4.4	5.5	5.8	5.9	5.9	5.1	5.1	3.8	1.9	1.6	1.3	1.2	1.1	1.0	1.0	1.0	1.1	2.3	3.0	3.3	4.1	3.8	4.1	3.2	5.9
7-Nov	3.5	3.3	2.6	0.5	0.3	1.0	2.6	2.6	1.8	1.5	1.4	1.1	1.2	1.4	1.3	1.2	1.4	1.3	1.8	2.7	3.5	3.5	3.4	2.9	2.0	3.5
8-Nov	3.3	2.2	1.4	1.3	2.1	1.9	2.0	1.5	2.7	7.6	4.9	2.7	2.3	2.2	2.4	2.4	2.5	2.5	2.6	2.4	2.4	1.8	1.5	1.9	2.5	7.6
9-Nov	1.7	1.5	1.4	1.3	1.2	1.1	1.0	1.1	1.4	1.7	2.3	1.4	2.7	2.3	0.4	0.4	0.4	0.7	1.8	2.3	1.7	2.0	2.0	2.3	1.5	2.7
10-Nov	2.4	2.0	1.8	1.7	1.7	1.6	2.5	2.7	2.7	3.2	2.9	2.9	2.8	2.6	4.4	9.1	7.4	6.4	5.0	4.4	4.0	4.1	4.0	4.7	3.6	9.1
11-Nov	4.7	4.8	4.5	4.2	4.4	4.4	4.5	5.0	5.4	5.1	5.0	4.3	4.0	4.2	3.5	3.1	2.9	2.9	2.7	2.6	2.6	2.2	2.9	3.6	3.9	5.4
12-Nov	3.2	3.5	3.8	4.2	4.5	5.4	5.0	3.5	3.0	2.7	2.5	3.3	4.7	4.4	3.3	3.1	3.0	2.8	2.6	2.4	2.2	2.3	2.1	2.1	3.3	5.4
13-Nov	2.0	1.9	1.9	1.8	1.9	1.8	1.8	1.8	1.8	2.1	3.1	C	3.6	3.1	2.9	3.1	3.9	3.8	2.6	2.6	2.7	2.8	3.7	4.9	2.7	4.9
14-Nov	5.8	7.6	6.4	5.8	6.7	4.8	4.3	4.2	5.9	7.0	8.9	8.3	7.8	7.3	5.9	5.9	5.6	6.8	4.3	5.2	3.7	2.8	2.5	2.9	5.7	8.9
15-Nov	3.0	2.7	3.6	4.0	3.4	3.2	3.0	2.9	3.3	3.8	5.2	6.6	5.2	5.3	5.1	6.2	7.3	4.4	3.7	3.3	2.9	3.0	3.3	4.1	4.1	7.3
16-Nov	4.3	4.0	3.9	3.8	4.0	4.1	4.3	3.9	3.8	4.3	4.9	5.0	4.8	4.4	6.1	5.7	6.3	6.3	4.7	4.4	5.2	5.5	5.9	6.4	4.8	6.4
17-Nov	5.4	7.2	8.2	7.8	6.7	5.6	6.6	6.3	5.0	4.8	5.1	5.2	5.2	5.6	5.8	6.2	6.2	5.7	4.5	1.8	1.9	2.0	1.9	1.3	5.1	8.2
18-Nov	1.0	1.5	2.4	1.7	1.4	1.5	1.6	1.6	1.6	1.6	1.5	1.4	1.4	1.4	1.4	1.2	1.0	1.1	1.7	2.3	2.6	3.0	2.7	2.7	1.7	3.0
19-Nov	2.5	2.0	1.9	2.7	2.4	2.7	2.7	3.3	3.1	3.3	2.9	2.8	2.7	2.5	2.8	2.9	2.8	3.3	2.9	2.1	1.6	1.7	1.0	1.0	2.5	3.3
20-Nov	1.3	1.0	0.7	0.6	0.7	0.8	1.0	1.5	1.5	1.5	1.6	1.6	1.5	1.4	1.4	1.6	1.8	1.8	1.6	1.5	1.6	1.5	1.5	1.7	1.4	1.8
21-Nov	1.8	2.0	2.1	1.9	1.8	1.8	1.6	1.6	1.8	2.0	2.1	2.5	2.5	2.4	1.8	1.8	1.4	1.1	1.1	1.1	1.2	1.3	1.4	1.3	1.7	2.5
22-Nov	1.3	1.3	1.2	1.2	1.2	1.1	1.0	0.9	0.8	0.8	1.0	1.2	1.9	2.1	2.7	2.1	2.3	2.5	2.3	2.0	2.2	2.2	2.4	2.7	1.7	2.7
23-Nov	2.6	2.7	2.7	2.6	2.6	2.7	2.9	2.7	2.0	2.3	2.5	2.6	2.6	2.6	2.4	2.0	1.8	1.7	1.6	1.5	1.5	1.4	1.4	2.3	2.9	2.9
24-Nov	1.4	1.6	1.7	2.0	2.0	2.2	2.1	2.1	2.2	2.4	2.5	2.7	2.7	2.6	2.7	2.6	2.3	2.0	1.7	1.6	1.2	1.3	1.3	2.1	2.7	2.7
25-Nov	1.3	1.7	2.6	3.0	2.8	3.2	3.3	3.0	3.3	4.1	5.4	4.5	3.3	2.7	2.3	2.3	4.0	3.1	2.8	2.7	2.0	2.0	2.4	4.1	3.0	5.4
26-Nov	2.6	2.4	2.3	2.6	3.0	3.1	3.8	3.6	3.8	4.0	4.4	4.7	4.6	5.3	4.9	4.8	5.3	6.7	7.4	7.5	7.1	5.2	4.3	3.8	4.5	7.5
27-Nov	3.1	2.5	1.8	1.4	1.4	1.1	1.0	0.9	0.8	0.8	0.8	0.8	0.9	1.1	1.1	1.2	1.3	1.4	1.6	1.6	1.1	1.0	1.0	1.0	1.3	3.1
28-Nov	0.9	1.0	1.2	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.8	0.9	1.3	2.3	2.1	1.6	1.3	1.4	1.6	1.8	1.3	1.1	1.0	1.1	1.2	2.3
29-Nov	0.9	0.8	0.7	0.9	0.8	0.6	0.9	1.2	1.6	1.8	3.6	4.2	3.5	2.9	2.9	3.0	3.0	2.9	2.9	3.1	2.7	2.3	2.1	2.3	2.1	4.2
30-Nov	2.0	2.1	1.9	1.9	2.1	2.5	2.5	2.7	2.7	3.3	4.0	4.8	6.0	5.8	5.2	4.0	3.3	3.2	3.2	2.9	2.5	2.6	2.6	2.6	3.2	6.0
																								Diurnal Average		
																								Diurnal Maximum		
C - Calibration																										
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m <sup>3</sup> 24-hr 29 µg/m <sup>3</sup>																										







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Fort McKay South - November 2024**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	626	87.07	87.07
6 - 15	93	12.93	100.00
16 - 25	0	0.00	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>**  
**Fort McKay South - November 2024**

Concentration Ranges (μg/m <sup>3</sup> )	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	96	66	9	4	3	2	6	39	80	50	35	60	41	37	34	50	612
6 - 15	16	5	0	0	0	1	0	17	18	8	2	7	6	3	4	5	92
16 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	112	71	9	4	3	3	6	56	98	58	37	67	47	40	38	55	704

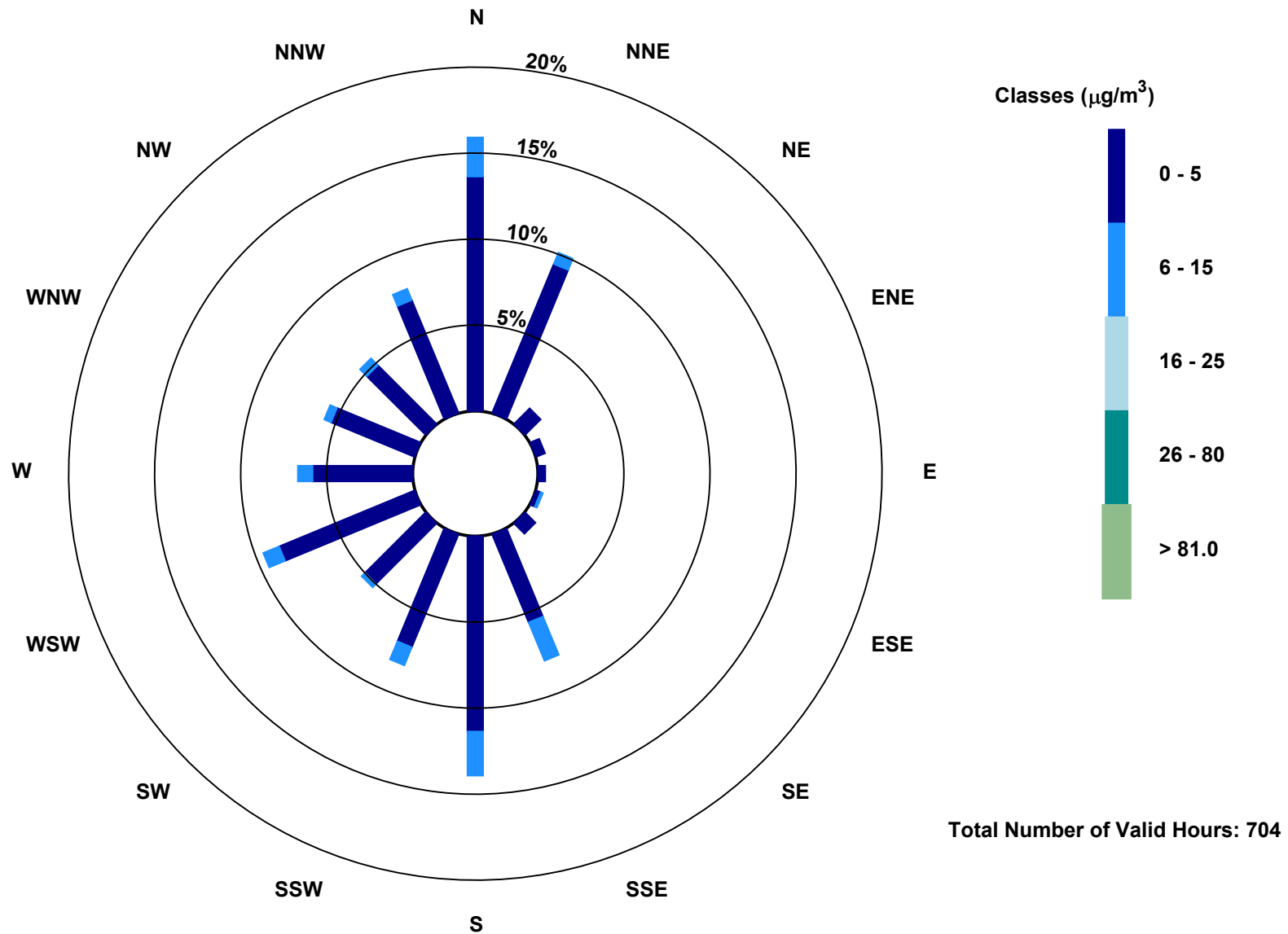
Total Number of Valid Hours: 704

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Fort McKay South





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

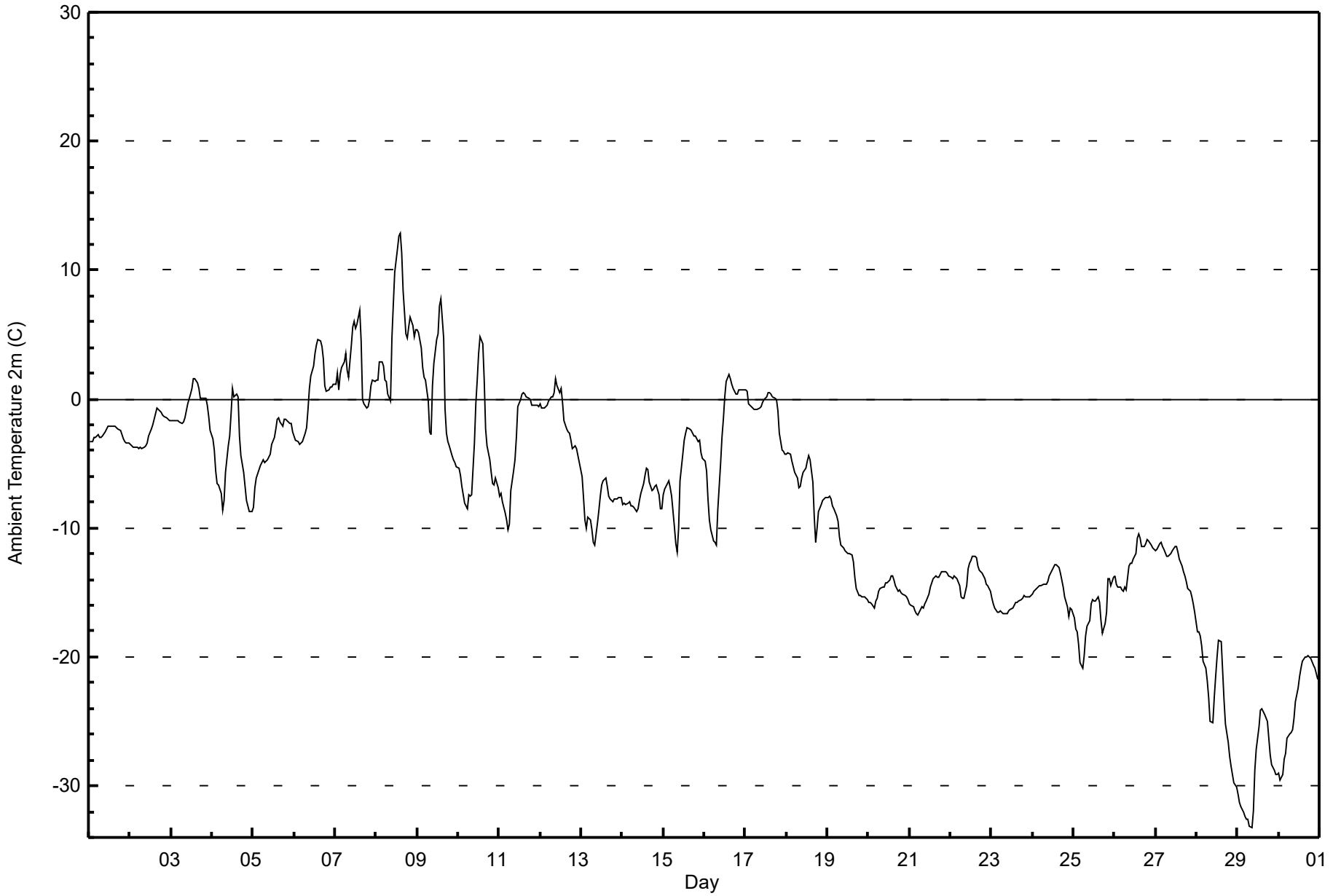
**Ambient Temperature 2m (AT2) - C**  
**Fort McKay South - November 2024**

Maximum Value: 12.8 C on Nov 8 15:00      Maximum Daily Average: 5.4 C on Nov 8																				Hours in Service: 720 Hours of Data: 720						
Minimum Value: -33.3 C on Nov 29 09:00      Minimum Daily Average: -28.9 C on Nov 29 Maximum Diurnal Average: -5.5 C at hour 15      Minimum Diurnal Average: -10.1 C at hour 8 Monthly Average: -8.31 C      Percentiles: P <sub>1</sub> = -31.6 P <sub>10</sub> = -18.7 Q <sub>1</sub> = -14.5 Median = -7.4 Q <sub>3</sub> = -1.7 P <sub>90</sub> = 1.1 P <sub>99</sub> = 7.3																				Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	-3.3	-3.3	-3.3	-3.0	-3.0	-2.8	-3.0	-3.0	-2.9	-2.6	-2.3	-2.1	-2.1	-2.1	-2.1	-2.2	-2.4	-2.5	-2.7	-3.1	-3.3	-3.4	-3.4	-2.7	-2.1	
2-Nov	-3.5	-3.6	-3.7	-3.7	-3.8	-3.8	-3.8	-3.8	-3.8	-3.6	-3.4	-2.8	-2.3	-2.0	-1.6	-1.1	-0.7	-1.0	-1.0	-1.2	-1.3	-1.5	-1.6	-1.7	-2.5	-0.7
3-Nov	-1.7	-1.7	-1.7	-1.7	-1.7	-1.8	-1.9	-1.8	-1.4	-0.9	-0.4	0.3	0.8	1.6	1.6	1.3	0.8	0.1	0.0	0.1	0.1	-0.5	-1.4	-2.5	-0.6	1.6
4-Nov	-3.1	-4.0	-5.5	-6.6	-6.7	-7.3	-8.6	-7.9	-5.7	-3.6	-2.9	-1.1	0.8	0.1	0.4	0.1	-2.9	-4.4	-5.7	-6.8	-7.8	-8.3	-8.7	-8.7	-4.8	0.8
5-Nov	-8.4	-6.9	-6.1	-5.5	-5.1	-4.9	-4.8	-4.9	-4.7	-4.5	-4.3	-3.5	-2.9	-2.1	-1.6	-1.5	-1.8	-2.1	-1.6	-1.6	-1.7	-1.9	-1.9	-2.6	-3.6	-1.5
6-Nov	-2.9	-3.1	-3.3	-3.5	-3.5	-3.3	-2.7	-2.2	-0.8	0.8	1.8	2.5	3.5	4.1	4.7	4.5	4.0	3.1	1.0	0.6	0.7	1.0	1.0	1.2	0.4	4.7
7-Nov	1.2	2.0	0.7	1.9	2.5	2.9	3.5	2.3	1.7	4.2	5.6	6.0	5.5	5.8	6.9	4.5	0.0	-0.4	-0.7	-0.6	-0.1	1.0	1.5	1.3	2.5	6.9
8-Nov	1.4	1.5	2.9	2.9	2.6	1.5	1.4	0.4	-0.1	4.7	7.3	9.8	11.7	12.6	12.8	11.3	8.5	5.0	4.7	5.6	6.3	5.8	4.8	5.4	5.4	12.8
9-Nov	5.4	5.1	3.9	2.5	1.7	1.4	-0.2	-2.5	-2.7	1.1	2.8	4.6	5.0	7.2	7.8	4.8	-0.8	-2.6	-3.3	-3.6	-4.3	-4.7	-4.9	-5.3	0.8	7.8
10-Nov	-5.3	-5.9	-6.8	-7.4	-8.0	-8.5	-7.4	-7.5	-7.4	-3.4	-0.4	1.4	3.6	4.8	4.3	1.5	-2.3	-3.7	-4.7	-5.7	-6.6	-6.7	-6.1	-6.9	-4.0	4.8
11-Nov	-7.6	-7.3	-8.0	-8.8	-9.3	-10.1	-9.7	-7.1	-5.6	-4.7	-3.0	-0.6	-0.1	0.4	0.5	0.4	0.2	0.1	-0.1	-0.4	-0.5	-0.5	-0.5	-0.6	-3.5	0.5
12-Nov	-0.4	-0.7	-0.6	-0.6	-0.4	-0.1	0.1	0.2	0.4	1.6	1.0	0.5	0.9	-0.3	-1.7	-2.3	-2.5	-2.6	-3.2	-3.9	-3.6	-3.9	-4.4	-4.9	-1.3	1.6
13-Nov	-6.0	-7.6	-9.4	-10.0	-9.2	-9.4	-10.2	-11.1	-11.3	-9.6	-8.6	-7.6	-6.7	-6.3	-6.1	-6.8	-7.5	-7.8	-8.0	-7.7	-7.8	-7.8	-7.6	-7.7	-8.2	-6.0
14-Nov	-8.2	-8.1	-8.1	-8.1	-8.0	-8.3	-8.3	-8.4	-8.7	-8.5	-7.9	-7.4	-6.6	-5.9	-5.3	-5.5	-6.4	-7.1	-7.0	-6.8	-6.7	-7.5	-8.5	-8.5	-7.5	-5.3
15-Nov	-7.4	-7.0	-6.6	-6.4	-6.9	-7.6	-9.9	-11.3	-11.9	-10.0	-6.3	-4.3	-3.2	-2.6	-2.2	-2.3	-2.5	-2.7	-2.9	-2.8	-3.3	-3.2	-4.2	-4.6	-5.5	-2.2
16-Nov	-4.8	-5.5	-7.7	-9.4	-10.1	-11.0	-11.2	-11.3	-8.6	-5.1	-3.0	-1.5	0.2	1.4	2.0	1.6	1.1	0.8	0.4	0.4	0.7	0.7	0.7	0.8	-3.3	2.0
17-Nov	0.7	0.6	-0.4	-0.6	-0.7	-0.8	-0.8	-0.8	-0.7	-0.6	-0.3	-0.1	0.1	0.5	0.5	0.4	0.1	0.1	0.0	-1.0	-2.7	-3.9	-4.1	-4.3	-0.8	0.7
18-Nov	-4.2	-4.1	-4.3	-4.9	-5.3	-5.7	-6.1	-6.9	-6.8	-6.2	-5.6	-5.4	-4.8	-4.4	-4.7	-6.5	-9.1	-11.1	-10.0	-8.7	-8.1	-7.8	-7.7	-7.6	-6.5	-4.1
19-Nov	-7.6	-7.6	-7.8	-8.3	-8.6	-9.1	-9.5	-10.7	-11.3	-11.5	-11.8	-11.8	-11.9	-11.9	-12.1	-12.6	-13.8	-14.7	-15.2	-15.3	-15.3	-15.4	-15.4	-15.6	-11.9	-7.6
20-Nov	-15.8	-15.7	-15.9	-16.2	-15.6	-15.4	-14.9	-14.7	-14.6	-14.6	-14.2	-14.3	-14.0	-13.8	-13.7	-14.0	-14.5	-14.9	-14.8	-15.0	-15.1	-15.2	-15.3	-15.6	-14.9	-13.7
21-Nov	-15.9	-16.0	-16.1	-16.4	-16.7	-16.7	-16.3	-16.1	-16.2	-15.9	-15.7	-15.1	-14.6	-14.2	-13.9	-13.8	-13.8	-13.8	-13.6	-13.4	-13.4	-13.4	-13.5	-13.7	-14.9	-13.4
22-Nov	-13.8	-13.9	-13.8	-13.8	-14.0	-14.5	-15.3	-15.5	-15.5	-14.4	-13.2	-12.8	-12.5	-12.2	-12.2	-12.3	-13.0	-13.3	-13.5	-13.7	-14.0	-14.4	-14.4	-14.9	-13.8	-12.2
23-Nov	-15.4	-15.9	-16.2	-16.6	-16.5	-16.4	-16.5	-16.7	-16.6	-16.6	-16.4	-16.2	-16.0	-15.8	-15.8	-15.7	-15.6	-15.4	-15.3	-15.3	-15.3	-15.3	-15.3	-15.2	-16.0	-15.2
24-Nov	-15.1	-14.9	-14.7	-14.6	-14.5	-14.4	-14.4	-14.4	-14.3	-14.2	-13.8	-13.3	-13.1	-12.9	-12.8	-13.0	-13.5	-14.0	-14.6	-15.3	-16.2	-16.9	-16.2	-16.3	-14.5	-12.8
25-Nov	-17.0	-17.8	-18.1	-19.0	-20.5	-20.9	-19.9	-18.3	-17.6	-17.2	-15.8	-15.6	-15.7	-15.7	-15.4	-15.8	-17.2	-18.2	-17.4	-16.5	-14.0	-13.9	-14.4	-13.8	-16.9	-13.8
26-Nov	-13.7	-14.4	-14.6	-14.6	-14.8	-14.9	-14.6	-14.9	-13.0	-12.8	-12.8	-12.4	-11.9	-10.8	-10.4	-10.7	-11.5	-11.5	-11.2	-10.9	-11.0	-11.3	-11.6	-11.7	-12.6	-10.4
27-Nov	-11.7	-11.6	-11.3	-11.2	-11.5	-11.6	-12.2	-12.2	-12.1	-12.0	-11.7	-11.4	-11.5	-11.8	-12.4	-13.0	-13.3	-13.7	-14.2	-14.7	-14.9	-15.3	-15.9	-16.5	-12.8	-11.2
28-Nov	-18.1	-18.0	-18.4	-19.2	-20.3	-20.9	-21.9	-23.1	-25.0	-25.1	-23.1	-21.5	-20.0	-18.7	-18.8	-21.1	-23.3	-25.2	-26.6	-27.7	-28.5	-29.1	-29.7	-30.1	-23.1	-18.0
29-Nov	-30.6	-31.2	-31.6	-32.1	-32.3	-32.6	-32.6	-33.1	-33.3	-31.9	-28.8	-27.2	-25.4	-24.1	-24.0	-24.3	-24.5	-25.0	-26.3	-27.6	-28.4	-28.8	-29.1	-29.1	-28.9	-24.0
30-Nov	-29.0	-29.6	-29.1	-27.9	-27.5	-26.3	-26.0	-25.9	-25.7	-24.8	-23.5	-22.4	-21.5	-20.8	-20.3	-20.0	-20.0	-19.9	-20.0	-20.1	-20.6	-20.9	-21.4	-21.8	-23.5	-19.9
																								Diurnal Average		
																								Diurnal Maximum		



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 2m (AT2) - C**  
**Fort McKay South - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Fort McKay South - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	64	8.89	8.89
-20 - 0	535	74.31	83.19
0 - 10	117	16.25	99.44
10 - 20	4	0.56	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

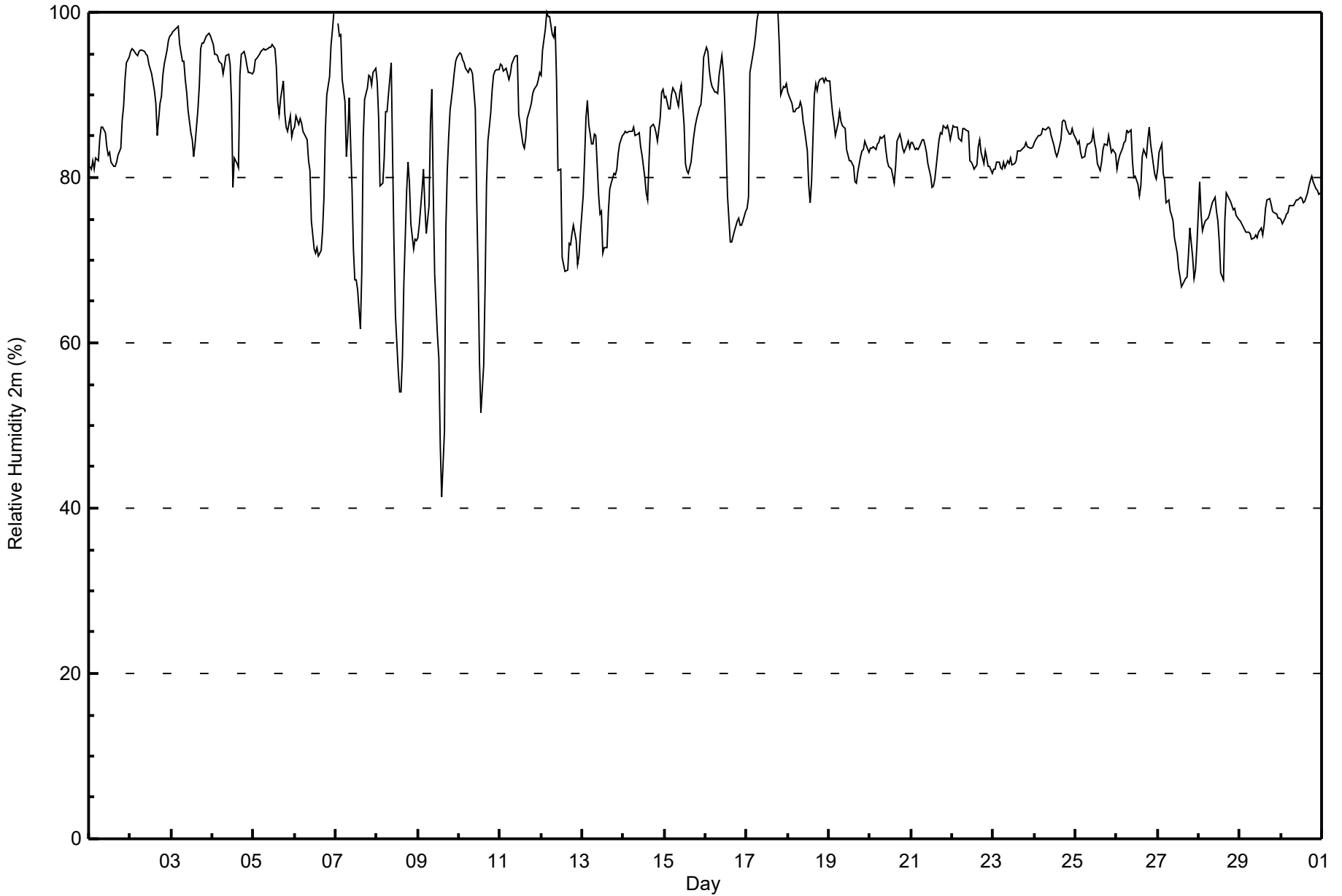
Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Relative Humidity 2m (RH2) - %**  
**Fort McKay South - November 2024**

Maximum Value: 100.0 % on Nov 17 08:00      Maximum Daily Average: 94.9 % on Nov 17																						Hours in Service: 720 Hours of Data: 716				
Minimum Value: 41.3 % on Nov 9 15:00      Minimum Daily Average: 73.4 % on Nov 27 Maximum Diurnal Average: 87.1 % at hour 8      Minimum Diurnal Average: 76.0 % at hour 15 Monthly Average: 83.94 %      Percentiles: P <sub>1</sub> = 57.3 P <sub>10</sub> = 73.3 Q <sub>1</sub> = 79.2 Median = 84.2 Q <sub>3</sub> = 90.3 P <sub>90</sub> = 94.8 P <sub>99</sub> = 100.0																						Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.4				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	81.3	81.1	82.0	81.0	82.3	82.1	84.7	86.2	86.1	85.5	83.8	82.7	83.0	81.8	81.4	81.4	81.9	82.7	83.6	86.9	88.7	91.9	94.0	94.6	84.6	94.6
2-Nov	95.3	95.5	95.4	94.9	94.7	95.2	95.4	95.4	95.3	94.8	94.7	93.8	92.5	91.6	90.6	89.0	85.1	89.1	89.9	92.3	93.8	95.4	96.6	97.1	93.5	97.1
3-Nov	97.2	97.6	97.9	98.1	98.3	96.0	94.0	94.0	91.9	90.4	88.2	85.4	82.5	84.0	88.1	91.1	95.6	96.3	96.3	97.1	97.4	97.5	97.1	93.2	98.3	
4-Nov	96.1	95.0	94.9	94.8	94.0	93.7	92.5	93.5	94.8	95.0	93.7	89.2	78.9	82.3	81.7	81.1	92.4	94.9	95.3	94.5	93.5	92.8	92.7	92.5	91.7	96.1
5-Nov	92.9	94.2	94.4	95.0	95.2	95.5	95.6	95.5	95.6	95.7	95.8	96.1	95.6	93.4	89.2	87.7	89.5	91.6	87.9	86.1	85.6	87.5	84.9	85.7	91.9	96.1
6-Nov	86.1	87.5	86.4	87.1	86.6	85.6	84.9	84.7	82.0	80.8	74.7	71.4	70.9	71.5	70.5	71.1	73.6	77.7	85.7	89.9	92.1	95.9	97.8	99.8	83.1	99.8
7-Nov	OR	98.7	97.1	97.3	91.8	89.1	82.6	85.0	89.7	78.9	71.4	67.6	67.6	66.4	61.7	68.6	84.8	89.5	90.9	92.4	92.2	91.1	92.6	93.2	84.4	98.7
8-Nov	91.5	87.4	78.9	79.3	82.3	88.0	87.9	90.0	93.8	82.4	71.5	63.4	56.6	54.1	54.0	58.3	67.2	78.4	81.9	79.4	74.4	71.4	72.6	72.5	75.7	93.8
9-Nov	72.7	74.2	78.5	81.1	76.6	73.3	76.5	86.5	90.7	78.2	68.3	60.9	58.1	47.6	41.3	49.3	74.0	80.8	85.0	88.2	90.9	92.7	94.1	94.6	75.6	94.6
10-Nov	95.1	94.9	94.3	93.9	93.2	92.8	93.3	93.0	92.5	88.3	77.3	68.7	57.6	51.6	57.3	66.9	79.2	84.4	87.8	90.6	92.4	92.8	93.1	93.1	84.3	95.1
11-Nov	93.7	93.6	92.9	93.1	92.6	91.9	92.6	93.8	94.5	94.8	94.7	87.7	85.3	84.1	83.5	84.7	87.2	88.3	89.0	90.3	90.7	91.2	91.9	92.7	90.6	94.8
12-Nov	92.4	95.4	98.0	99.9	99.6	99.5	97.2	97.0	98.2	91.7	80.8	81.0	70.4	69.5	68.7	68.9	72.1	71.9	73.1	74.3	72.4	69.5	70.5	73.2	82.7	99.9
13-Nov	77.8	82.1	87.3	89.3	86.4	84.1	84.1	85.2	85.0	77.9	75.5	76.0	70.9	71.6	71.6	75.9	78.7	79.3	80.4	80.3	81.0	82.9	84.1	85.1	80.5	89.3
14-Nov	85.3	85.6	85.5	85.7	85.6	85.6	86.1	85.1	85.2	85.4	83.8	82.7	80.0	78.1	77.2	82.0	86.1	86.5	86.0	85.4	84.5	87.3	90.3	90.8	84.8	90.8
15-Nov	89.7	89.9	88.3	88.4	89.9	90.9	90.1	89.2	88.7	90.3	91.2	86.4	81.6	80.9	80.6	81.9	83.5	85.1	86.4	87.1	88.4	88.7	90.8	94.7	87.6	94.7
16-Nov	95.8	95.2	93.1	91.7	91.0	90.3	90.3	90.1	92.4	94.8	92.8	89.3	83.8	77.7	72.1	72.2	72.9	73.5	74.8	75.1	74.3	74.3	74.7	75.9	83.7	95.8
17-Nov	76.2	77.6	92.7	94.8	95.7	97.1	98.9	100.0	OR	OR	OR	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	95.9	90.0	91.0	90.8	91.3	94.9	100.0
18-Nov	90.3	89.8	89.0	87.9	88.0	88.3	88.6	89.1	88.5	86.8	85.7	83.2	78.9	76.9	79.5	89.9	91.4	90.5	91.6	91.9	92.0	91.5	92.0	91.8	88.0	92.0
19-Nov	91.6	89.5	87.8	86.6	85.1	86.7	87.9	86.8	86.2	85.9	83.4	82.6	82.1	82.0	81.3	79.4	79.3	80.7	82.6	83.2	83.4	84.4	83.9	83.1	84.4	91.6
20-Nov	83.6	83.5	83.7	83.3	84.0	84.3	84.9	84.8	85.0	83.4	82.0	81.4	81.1	80.1	79.3	81.4	84.5	85.2	84.5	83.6	83.1	83.9	84.3	83.6	83.3	85.2
21-Nov	84.2	84.2	83.3	83.6	83.4	83.7	84.6	84.6	83.9	83.1	81.6	80.1	78.8	79.0	79.8	83.1	84.6	85.4	85.3	86.3	85.9	86.2	85.5	84.6	83.5	86.3
22-Nov	86.3	86.1	86.0	86.1	84.8	84.4	86.0	86.0	85.8	85.6	82.0	81.8	81.6	81.0	81.5	83.8	84.6	83.1	81.8	83.2	82.3	81.4	81.3	80.5	83.6	86.3
23-Nov	81.1	81.0	81.8	81.8	81.1	80.9	81.9	81.2	82.0	81.7	82.3	81.6	81.6	82.1	83.2	83.3	83.3	83.6	83.7	84.2	83.7	83.6	83.6	83.7	82.4	84.2
24-Nov	84.2	84.5	85.0	85.1	85.2	85.9	85.8	86.0	86.1	85.9	85.0	84.0	83.1	82.5	83.1	84.5	86.7	87.0	86.8	86.0	85.3	85.2	86.0	85.2	85.2	87.0
25-Nov	84.6	84.1	84.5	83.1	82.4	82.5	83.6	84.1	84.1	84.5	85.5	84.2	83.3	81.8	80.8	81.9	83.5	84.1	83.9	85.0	84.1	83.0	83.4	82.8	83.5	85.5
26-Nov	81.0	82.0	82.7	83.6	84.2	84.4	85.8	85.3	85.8	82.0	80.1	80.1	79.2	77.7	79.0	82.5	83.3	82.5	84.5	86.2	84.0	81.6	80.4	79.8	82.4	86.2
27-Nov	81.0	83.0	84.1	80.5	79.7	77.0	77.2	75.9	75.4	74.7	72.7	70.8	69.0	68.1	66.7	67.4	67.9	67.9	70.7	73.8	70.4	67.8	68.8	71.6	73.4	84.1
28-Nov	79.6	75.7	73.6	74.2	74.7	75.2	75.7	76.2	77.0	77.7	75.9	74.7	72.3	68.5	67.7	74.9	78.2	77.8	77.1	76.6	76.2	76.2	75.5	74.9	75.2	79.6
29-Nov	74.8	74.3	74.0	73.5	73.4	73.4	73.3	72.5	72.7	73.1	72.7	73.4	74.0	73.1	74.3	76.3	77.3	77.5	76.7	75.9	75.8	75.5	75.2	75.1	74.5	77.5
30-Nov	74.9	74.5	75.0	75.5	75.8	76.6	76.5	76.6	76.9	77.2	77.3	77.5	77.4	77.0	77.1	78.1	79.0	79.6	80.2	79.4	78.7	78.6	77.9	78.1	77.3	80.2
																								Diurnal Average		
																								Diurnal Maximum		
OR - Out of Range																										









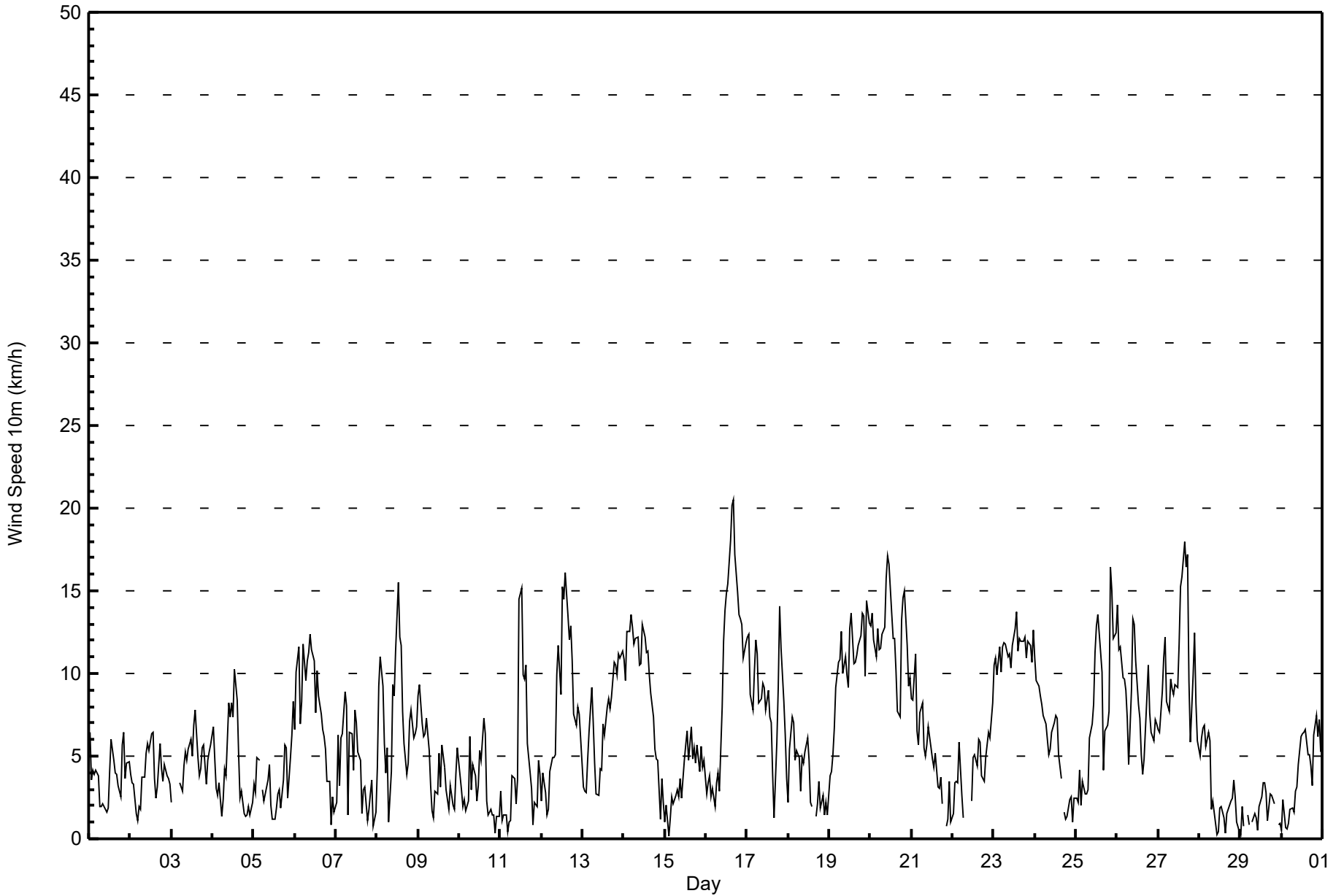
**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Fort McKay South - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 3 km/h on Nov 1 01:00	Hours of Data: 74
Minimum Value: 1 km/h on Nov 2 23:00	Hours of Missing Data: 646
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 1 Q <sub>3</sub> = 1 P <sub>90</sub> = 2 P <sub>99</sub> = 3	Hours of Calibration: 0
	Percent Operational Time: 10.3

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	3	1	1	1	1	2	1	2	2	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	
2-Nov	1	1	1	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	
3-Nov	1	UO	UO	UO	UO	2	2	2	1	1	1	2	1	2	2	1	2	1	1	1	1	1	1	1	
4-Nov	1	1	1	2	1	1	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
5-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
6-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
7-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
8-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
9-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
10-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
11-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
12-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
13-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
14-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
15-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
16-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
17-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
18-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
19-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
20-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
21-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
22-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
23-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
24-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
25-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
26-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
27-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
28-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
29-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
30-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	
	3	1	1	2	1	2	2	2	2	2	1	2	1	2	2	1	2	1	2	1	2	1	1	1	
	Diurnal Maximum																								

UO - Unstable Operation    NF - Not Flagged





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Fort McKay South - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	355	50.35	50.35
6 - 11	250	35.46	85.82
12 - 19	98	13.90	99.72
20 - 28	2	0.28	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Fort McKay South - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	33	19	7	2	3	3	5	14	46	41	31	46	25	19	27	34	355
6 - 11	50	32	2	2	0	0	1	25	35	17	6	15	22	19	10	14	250
12 - 19	29	21	0	0	0	0	0	15	17	0	0	6	0	2	1	7	98
20 - 28	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	112	72	9	4	3	3	6	56	98	58	37	67	47	40	38	55	705

Total Number of Valid Hours: 705

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Fort McKay South - November 2024**

Direction of Maximum Speed: 166 deg on Nov 16 17:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 6.1 deg on Nov 20	Hours of Data: 705
Direction of Minimum Speed: 206 deg on Nov 15 03:00	Hours of Missing Data: 15
Direction of Minimum Daily Speed Average: 0.9 deg on Nov 1	Percent Operational Time: 97.9
Monthly Average Direction: 302.8 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	222	234	182	178	186	186	169	142	130	178	175	109	12	13	18	7	339	352	25	35	28	11	356	9	22.7
2-Nov	27	31	19	15	312	309	340	350	355	11	6	2	9	4	342	53	88	27	11	14	359	351	1	348	7.5
3-Nov	351	UO	UO	UO	UO	239	221	226	241	221	220	206	191	174	151	176	205	186	186	194	220	224	242	245	207.1
4-Nov	242	233	176	208	208	195	316	243	205	192	205	199	175	149	154	162	250	253	209	218	253	282	314	201.1	
5-Nov	328	312	323	332	UO	304	311	290	282	264	294	202	267	284	266	260	169	209	263	256	231	235	199	199	260.8
6-Nov	182	182	174	180	173	169	166	163	170	189	201	192	199	234	234	219	204	174	184	192	178	279	306	342	189.0
7-Nov	261	333	295	251	235	261	299	242	259	280	339	305	302	266	256	176	206	203	215	198	188	193	165	210	266.7
8-Nov	208	196	189	193	200	188	249	271	203	185	177	179	187	191	185	190	204	204	298	326	311	287	258	268	207.6
9-Nov	269	270	250	239	235	247	234	191	210	142	94	189	97	220	239	219	220	202	194	200	173	172	164	190	223.6
10-Nov	190	198	247	223	263	210	185	179	190	166	156	185	232	214	157	174	202	241	244	215	286	212	326	200	197.2
11-Nov	345	292	279	303	257	211	183	351	349	320	129	148	153	157	147	159	150	170	160	167	336	316	11	355	150.3
12-Nov	345	14	5	4	196	255	244	189	225	257	289	268	253	254	252	254	241	252	257	256	288	290	269	261	260.1
13-Nov	227	231	186	238	258	264	265	270	281	317	317	13	59	60	42	30	19	31	26	27	31	25	18	6	6.1
14-Nov	359	359	0	7	13	9	3	355	355	357	2	2	1	6	6	2	348	343	340	323	322	342	307	263	357.2
15-Nov	236	207	206	238	236	202	247	242	213	227	174	228	143	156	158	153	188	174	168	174	190	180	191	257	189.1
16-Nov	237	207	175	182	193	213	240	219	188	162	169	169	165	168	170	165	166	168	170	165	166	168	166	162	170.7
17-Nov	167	166	162	165	165	164	165	173	168	171	171	168	171	171	177	180	246	343	1	347	323	300	304	286	179.8
18-Nov	224	262	278	285	350	303	281	257	259	276	293	314	304	1	45	UO	292	280	300	332	322	320	340	273	294.2
19-Nov	347	19	24	22	28	23	22	359	357	2	24	18	11	21	25	16	3	21	12	4	1	350	357	3	10.7
20-Nov	14	7	354	351	356	3	12	12	18	20	16	14	5	1	360	353	354	7	19	16	15	352	346	349	6.1
21-Nov	4	19	14	344	328	341	344	333	312	310	288	281	322	337	344	315	277	248	294	UO	273	351	56	69	335.4
22-Nov	242	253	260	239	264	258	186	UO	UO	UO	UO	37	22	14	21	26	33	47	29	40	23	20	26	17	10.3
23-Nov	20	11	24	27	14	8	13	11	10	10	14	20	13	13	8	4	3	5	8	9	1	2	4	4	10.5
24-Nov	8	4	358	356	359	356	355	353	357	353	358	7	6	9	1	20	UO	329	327	245	255	245	168	191	357.2
25-Nov	191	221	184	183	192	166	198	189	162	176	165	156	165	168	170	173	183	166	157	170	173	177	181	177	172.6
26-Nov	176	180	180	184	191	196	193	199	180	173	171	176	178	191	191	256	264	256	264	272	288	280	285	286	205.1
27-Nov	273	260	275	294	299	291	286	298	299	306	311	322	331	336	338	340	339	344	339	334	350	351	353	347	322.1
28-Nov	320	312	312	297	301	282	280	295	277	223	170	158	138	156	54	25	252	291	306	273	258	251	258	323	289.8
29-Nov	108	244	253	UO	334	193	UO	257	346	201	114	63	33	11	344	326	288	342	336	321	333	UO	259	255	332.5
30-Nov	336	253	249	247	327	10	340	341	336	341	351	15	11	1	1	352	350	0	328	350	357	353	354	355	352.6

297.2 284.9 289.4 290.0 287.6 283.3 293.4 306.4 283.6 256.3 282.0 209.0 115.2 303.8 255.0 281.3 290.3 312.2 328.7 337.4 335.8 316.5 326.0 313.8

Diurnal Average

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

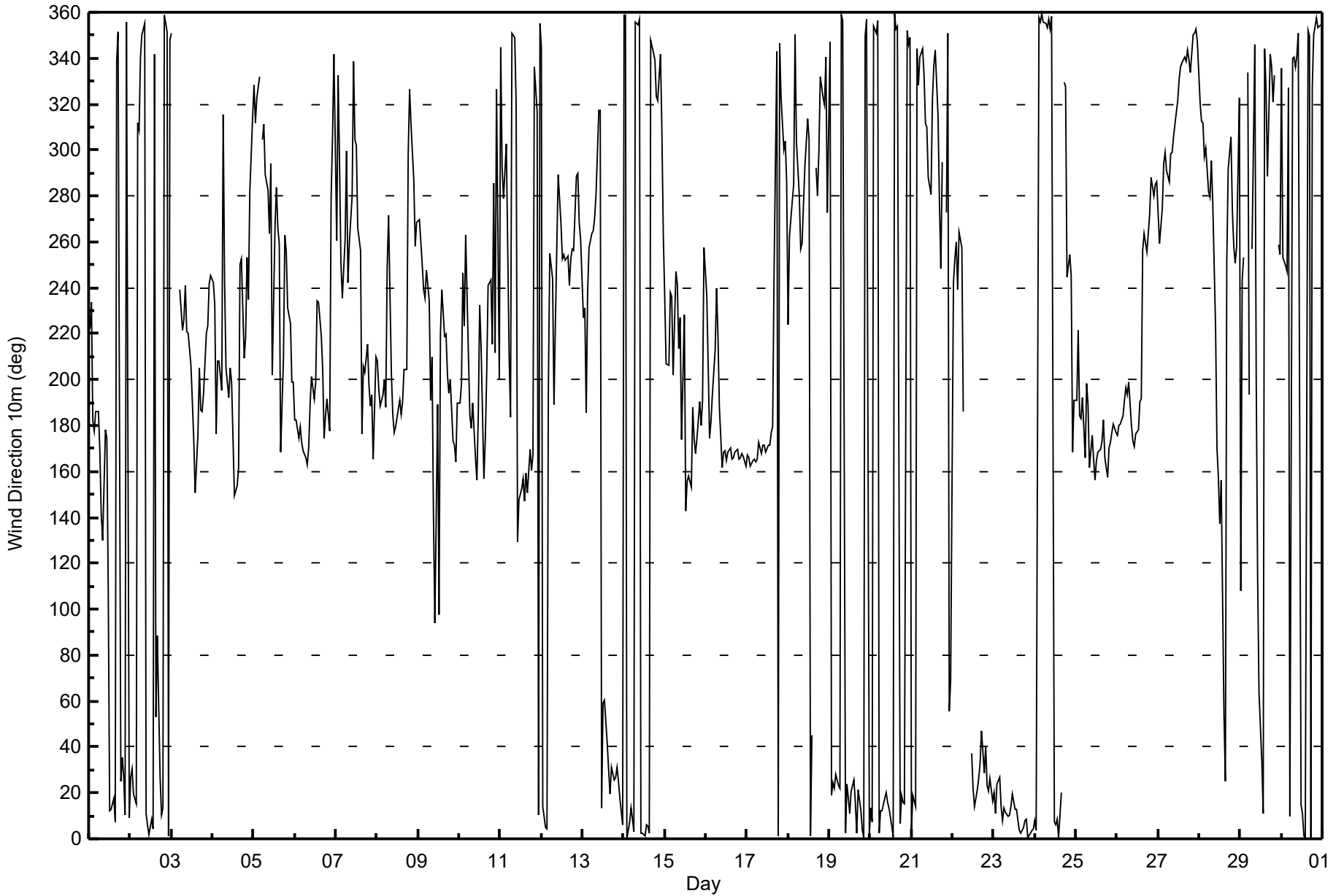
**Wind Direction 10m (WD10) - deg**  
**Fort McKay South - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 81 deg on Nov 4 06:00	Hours of Data: 74
Minimum Value: 8 deg on Nov 3 20:00	Hours of Missing Data: 646
Percentiles: P <sub>1</sub> = 9 P <sub>10</sub> = 12 Q <sub>1</sub> = 16 Median = 22 Q <sub>3</sub> = 35 P <sub>90</sub> = 53 P <sub>99</sub> = 76	Hours of Calibration: 0
	Percent Operational Time: 10.3

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	27	48	33	23	21	22	74	60	73	69	52	38	20	14	16	29	22	26	46	17	23	25	22	20	74
2-Nov	16	24	22	53	55	26	55	15	25	17	13	16	15	14	22	49	36	20	46	15	18	22	11	15	55
3-Nov	15	UO	UO	UO	UO	26	43	28	20	23	20	19	19	12	12	23	25	14	10	8	46	12	11	10	46
4-Nov	10	29	31	41	41	81	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	81	
5-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
6-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
7-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
8-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
9-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
10-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
11-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
12-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
13-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
14-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
15-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
16-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
17-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
18-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
19-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
20-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
21-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
22-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
23-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
24-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
25-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
26-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
27-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
28-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
29-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
30-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
	27	48	33	53	55	81	74	60	73	69	52	38	20	14	22	49	36	26	46	17	46	25	22	20	
	Diurnal Maximum																								

UO - Unstable Operation    NF - Not Flagged







## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

**AMS14  
ANZAC  
NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)  
NOVEMBER 2024

MONTHLY SUMMARY for  
AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	686	34	34	100	8	0	2.2	0
TRS(ppb) Average	684	36	36	100	0.7	0	0.3	0
THC(ppm) Average	646	33	74	94.31	2.8	-	2.2	-
NMHC(ppm) Average	646	33	74	94.31	0.206	-	0.025	-
CH4(ppm) Average	646	33	74	94.31	2.6	-	2.2	-
NO2(ppb) Average	684	36	36	100	28.3	0	7.6	-
NO(ppb) Average	684	36	36	100	25.8	-	4.3	-
NOX(ppb) Average	684	36	36	100	46.2	-	10.6	-
O3(ppb) Average	682	33	38	99.31	37.6	0	32.4	-
PM2.5(ug/m3) Average	719	1	1	100	21.1	0	6.1	0
AT 2m(C) Average	720	0	0	100	14.6	-	9.1	-
RH(%) Average	720	0	0	100	100	-	95.9	-
WS(km/h) Average	720	0	0	100	32	-	19	-
WD(deg) Average	720	0	0	100	-	-	-	-
Leaf Wetness (% of range) Average	720	0	0	100	86.5	-	17.6	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)  
NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	686	0.45	0.9	-	0	0	0.1	0.2	0.4	1	8
TRS(ppb) Average	684	0.16	0.1	-	0	0.1	0.1	0.1	0.2	0.2	0.7
THC(ppm) Average	646	2.04	0.1	-	1.9	1.9	2	2	2.1	2.2	2.8
NMHC (ppm) Average	646	0.002	0.014	-	0	0	0	0	0	0	0.206
CH4(ppm) Average	646	2.04	0.1	-	1.9	1.9	2	2	2.1	2.2	2.6
NO2(ppb) Average	684	2.72	3.4	-	0.1	0.4	0.7	1.4	3.4	7	28.3
NO(ppb) Average	684	0.73	2.3	-	0	0	0	0.1	0.4	1.5	25.8
NOX(ppb) Average	684	3.44	5.1	-	0.1	0.4	0.8	1.6	4.1	8.1	46.2
O3(ppb) Average	682	21.03	6.7	-	1.1	12.4	17.1	21.3	25.5	29.5	37.6
PM2.5(ug/m3) Average	719	3.22	2.3	-	0.2	1.1	1.9	2.7	4	5.7	21.1
Temperature 2 m (C) Average	720	-7.8	8.8	-	-28.9	-20.1	-15.2	-5.7	-1.6	2.8	14.6
Relative Humidity (%) Average	720	83.07	9.8	-	39.3	70.6	79.2	83.9	89.8	95.4	100
Wind Speed 20 m (km/h) Average	720	10.6	5	-	1	4	7	10	14	18	32
Wind Direction 20 m (deg) Average	720	228.5	-	-	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	720	2.22	6.7	-	0	0	0	0.3	1.4	6.2	86.5

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)  
NOVEMBER 2024

Parameter	OPERATIONAL NOTES			
	Period Start	Period End	Duration (Hours)	Notes
THC/NMHC/CH4	20 Nov 2024 02:00	21 Nov 2024 12:00	35	Analyzer Failure - sample pump failure
THC/NMHC/CH4	21 Nov 2024 13:00	21 Nov 2024 18:00	6	Maintenance - sample pump replaced
O3	05 Nov 2024 07:00	05 Nov 2024 08:00	2	Unstable Operation - excessive baseline drift
O3	30 Nov 2024 22:00	01 Dec 2024 00:00	3	Unstable Operation - excessive baseline drift



# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Sulphur Dioxide (SO<sub>2</sub>) - ppb

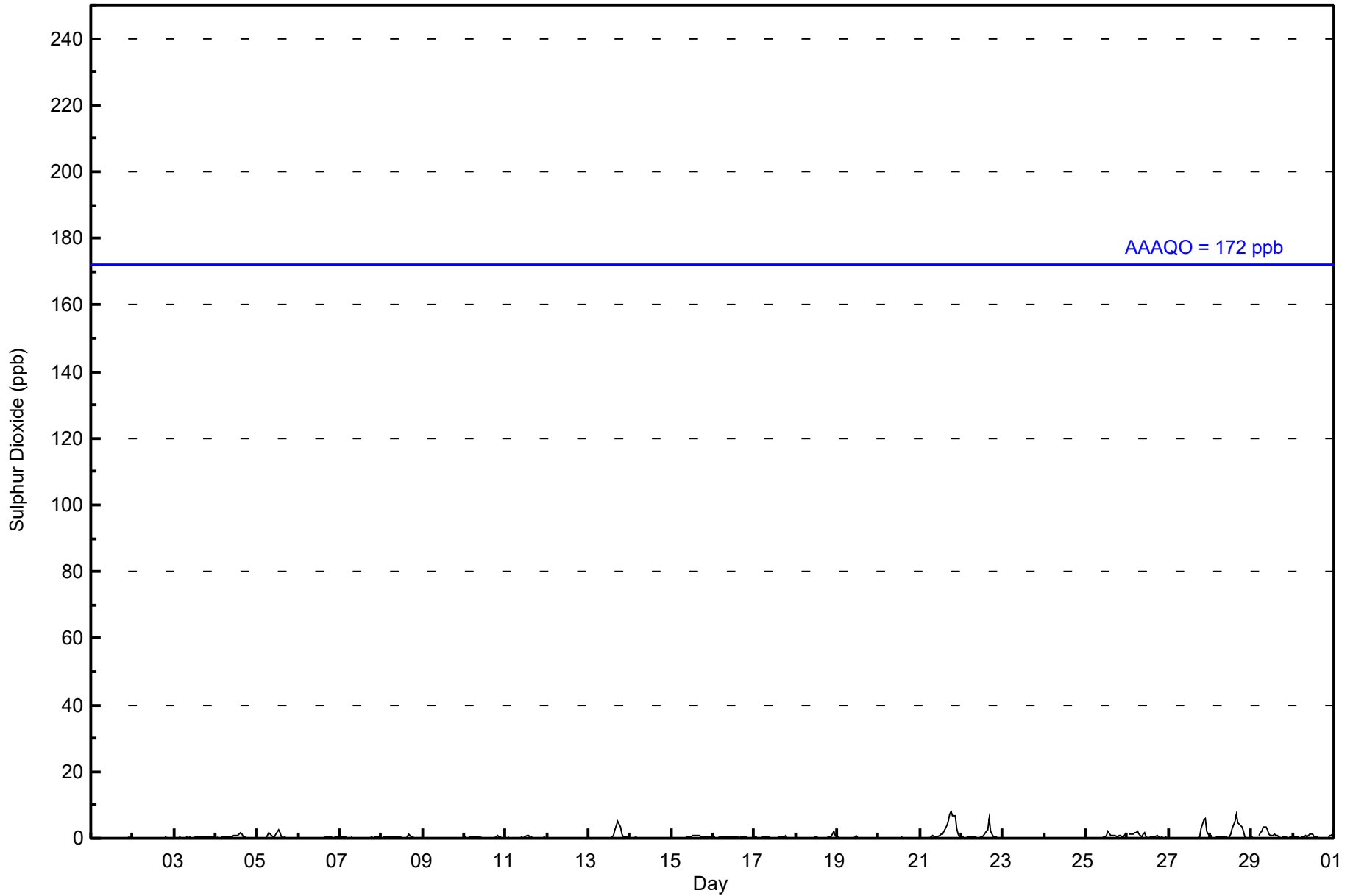
## Anzac - November 2024

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																																									
Maximum Value: 8.0 ppb on Nov 21 19:00		Maximum Daily Average: 2.2 ppb on Nov 21		Hours of Data:		686		Hours of Missing Data:		34																																							
Minimum Value: 0.0 ppb on Nov 1 04:00		Minimum Daily Average: 0.0 ppb on Nov 12		Hours of Calibration:		34		Percent Operational Time:		100.0																																							
Maximum Diurnal Average: 0.9 ppb at hour 17		Minimum Diurnal Average: 0.2 ppb at hour 3		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.1 Median = 0.2 Q <sub>3</sub> = 0.4 P <sub>90</sub> = 1.0 P <sub>99</sub> = 5.7																																													
Monthly Average: 0.45 ppb																																																	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	0.1	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.2																							
2-Nov	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.3	0.2	0.2	0.1	0.1	0.1	0.1																						
3-Nov	0.2	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.5	0.3	0.3	0.2	0.4	0.4	0.5	0.4	0.3	0.4	0.3	0.5																						
4-Nov	0.2	0.3	Z	0.3	0.4	0.4	0.4	0.3	0.5	0.4	0.4	0.7	0.9	1.0	0.8	1.6	1.2	0.5	0.2	0.2	0.0	0.0	0.1	0.1	0.1	0.1	0.1																						
5-Nov	0.2	0.1	0.2	Z	0.1	0.2	0.7	1.6	0.7	0.3	0.6	1.4	2.6	1.7	0.4	0.2	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5																						
6-Nov	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.6	0.5	0.3	0.2	0.3	0.2	0.3	0.4	0.4	0.2	0.2	0.6																						
7-Nov	0.3	0.3	0.4	0.3	0.3	Z	0.2	0.2	0.1	0.2	0.1	C	C	C	C	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.4	0.5	0.2	0.2	0.5																						
8-Nov	Z	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.2	0.5	0.3	0.4	0.1	0.2	0.1	0.3	1.3	0.4	0.3	0.1	0.1	0.1	0.1	0.0	0.3	0.3	1.3																						
9-Nov	0.0	Z	0.0	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.2	0.2	0.1	0.1	0.2																						
10-Nov	0.3	0.6	Z	0.6	0.5	0.6	0.3	0.3	0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.3	0.9	0.3	0.3	0.2	0.1	0.3	0.3	0.9																						
11-Nov	0.1	0.1	0.3	Z	0.2	0.1	0.1	0.2	0.0	0.3	0.1	0.4	0.9	1.0	0.1	0.5	0.1	0.0	0.0	0.0	0.1	0.0	0.5	0.0	0.2	0.2	1.0																						
12-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																						
13-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.0	0.2	0.0	0.0	0.0	0.6	2.5	3.9	5.2	3.4	1.1	0.5	0.4	0.4	0.3	0.8	0.8	5.2																						
14-Nov	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2																						
15-Nov	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.6	0.7	0.7	0.8	0.6	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.8																						
16-Nov	0.3	0.2	Z	0.2	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.3	0.3	0.4																						
17-Nov	0.2	0.3	0.1	Z	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.5	0.3	0.3	0.6	0.7	0.1	0.1	0.1	0.1	0.0	0.3	0.3	0.7																						
18-Nov	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.5	1.3	2.1	1.0	0.3	0.3	2.1																						
19-Nov	0.2	0.2	0.1	0.2	0.2	Z	0.1	0.1	0.1	0.2	0.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.7																						
20-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3																						
21-Nov	0.2	Z	0.1	0.1	0.0	0.0	0.5	0.9	0.3	0.3	0.3	0.9	1.1	1.2	2.2	3.6	5.0	7.2	8.0	6.7	6.6	2.9	1.2	0.6	2.2	2.2	8.0																						
22-Nov	0.5	0.4	Z	0.4	0.4	0.4	0.3	0.2	0.3	0.1	0.2	0.4	0.3	0.7	2.3	2.7	6.0	2.1	0.5	0.3	0.3	0.1	0.2	0.1	0.8	0.8	6.0																						
23-Nov	0.2	0.1	0.1	Z	0.2	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.2																						
24-Nov	0.1	0.2	0.1	0.1	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
25-Nov	0.1	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.1	0.1	0.2	0.3	0.9	1.9	0.9	0.8	1.0	0.7	0.6	0.8	0.9	0.2	0.4	1.6	0.5	0.5	1.9																						
26-Nov	Z	1.4	1.5	1.5	1.8	1.7	2.3	1.4	0.6	1.1	1.7	0.5	0.2	0.3	0.3	0.3	0.5	0.7	0.4	0.2	0.3	0.2	0.2	0.1	0.8	0.8	2.3																						
27-Nov	0.1	Z	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.6	2.8	5.7	5.8	2.1	1.2	0.9	0.9	5.8																						
28-Nov	0.8	0.1	Z	0.2	0.3	0.6	0.4	0.3	0.2	0.2	0.2	0.3	1.2	2.8	5.3	7.1	4.5	4.4	3.5	1.9	0.5	0.2	0.2	0.4	1.6	1.6	7.1																						
29-Nov	0.3	0.2	0.1	Z	0.8	1.8	2.2	3.4	3.4	2.7	1.5	0.8	1.0	1.1	0.9	1.0	0.3	0.2	0.3	0.3	0.3	0.2	0.4	0.4	1.0	1.0	3.4																						
30-Nov	0.4	0.3	0.3	0.4	Z	0.5	0.6	0.8	0.5	0.7	1.3	1.1	0.5	0.3	0.4	0.2	0.2	0.1	0.2	0.2	0.2	0.7	1.0	1.3	0.5	0.5	1.3																						
																								0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.8	0.9	0.8	0.7	0.6	0.6	0.5	0.4	0.3	Diurnal Average	
																								0.8	1.4	1.5	1.5	1.8	1.8	2.3	3.4	3.4	2.7	1.7	1.4	2.6	2.8	5.3	7.1	6.0	7.2	8.0	6.7	6.6	5.8	2.1	1.6	Diurnal Maximum	
Z - zerospan												C - Calibration																																					
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb												24-hr 48 ppb																																					



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Anzac - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Anzac - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	686	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Anzac - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	16	21	13	21	36	48	54	75	37	23	23	19	59	120	95	26	686
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	16	21	13	21	36	48	54	75	37	23	23	19	59	120	95	26	686

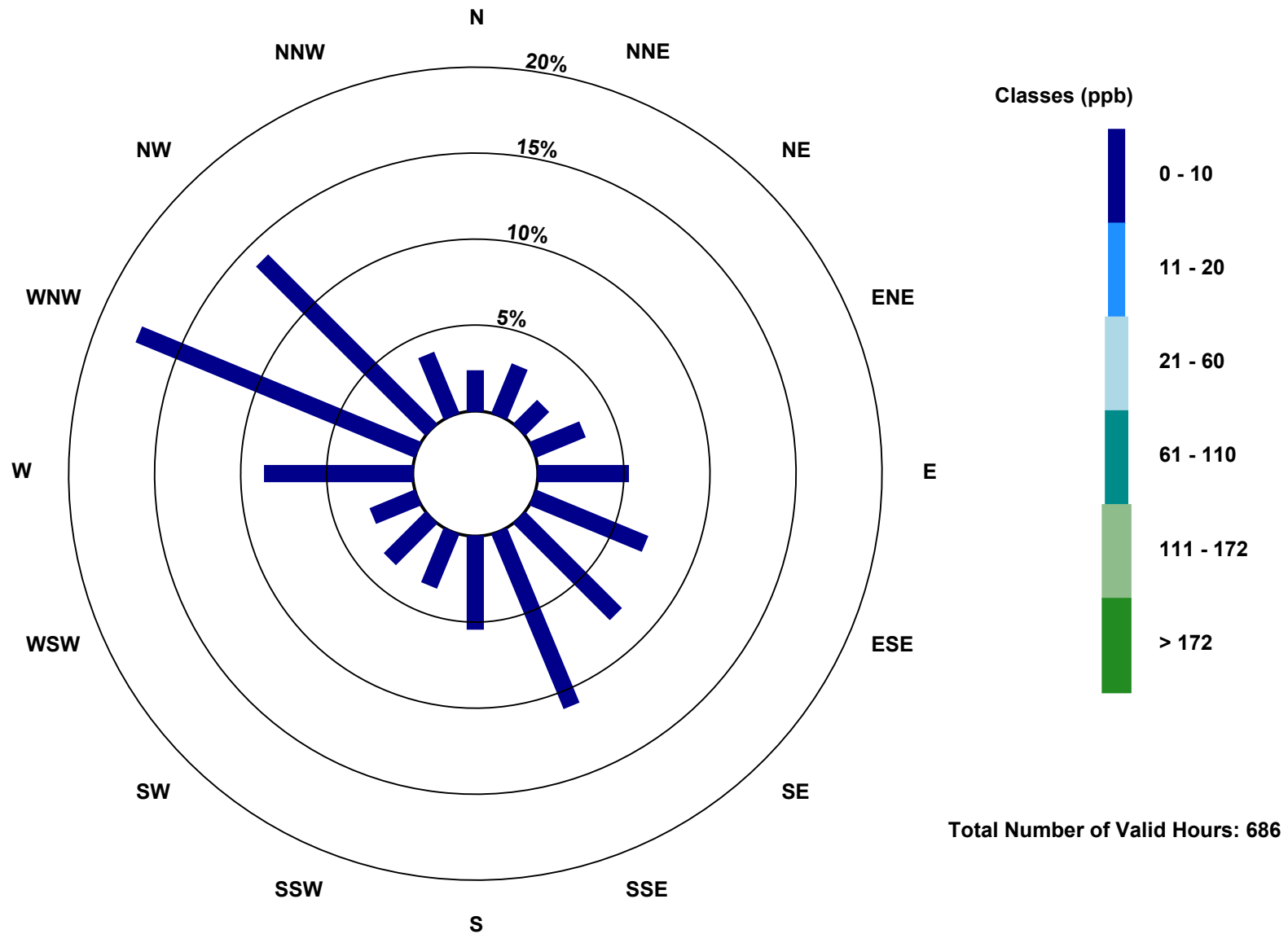
Total Number of Valid Hours: 686

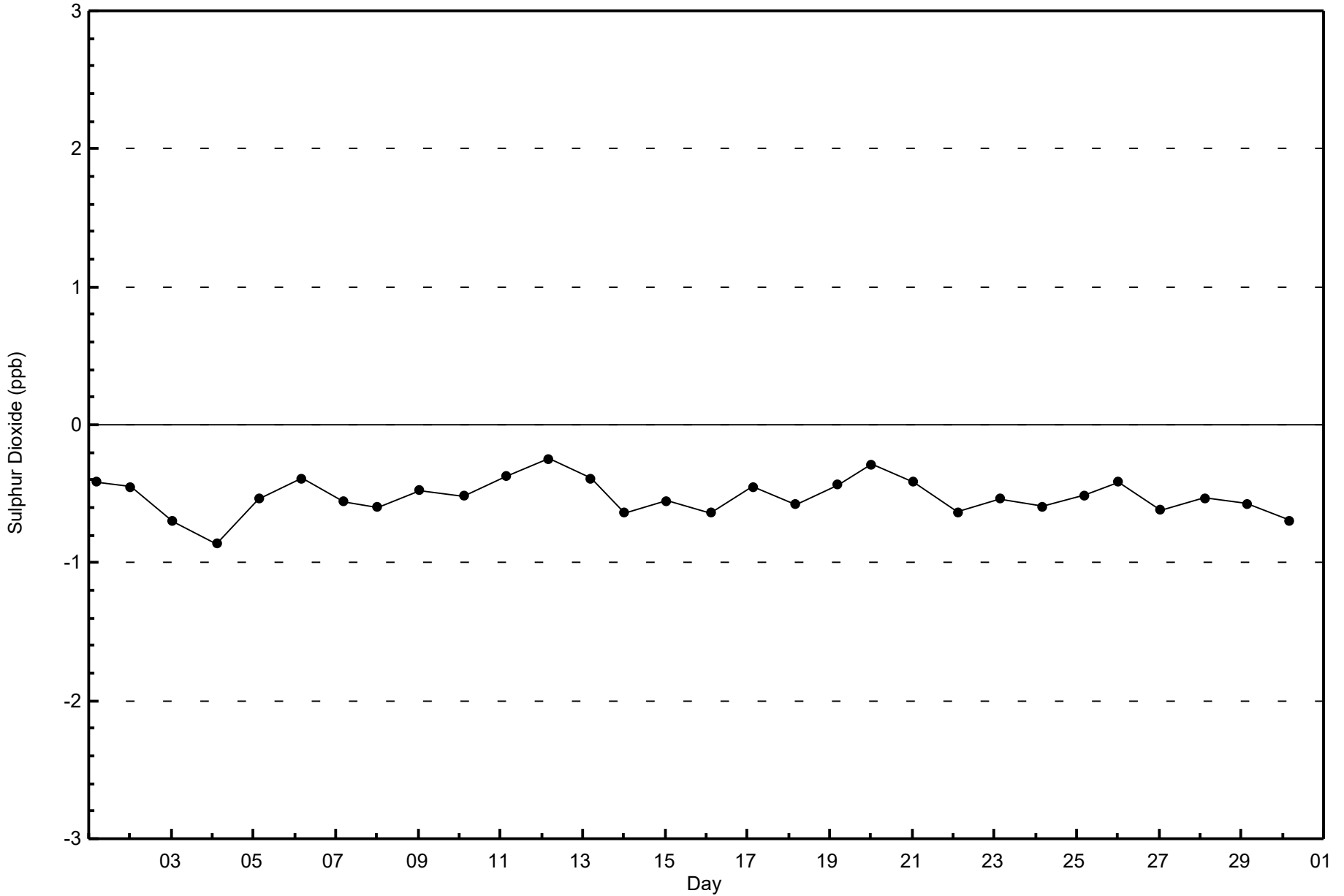
Total Number of Hours: 720

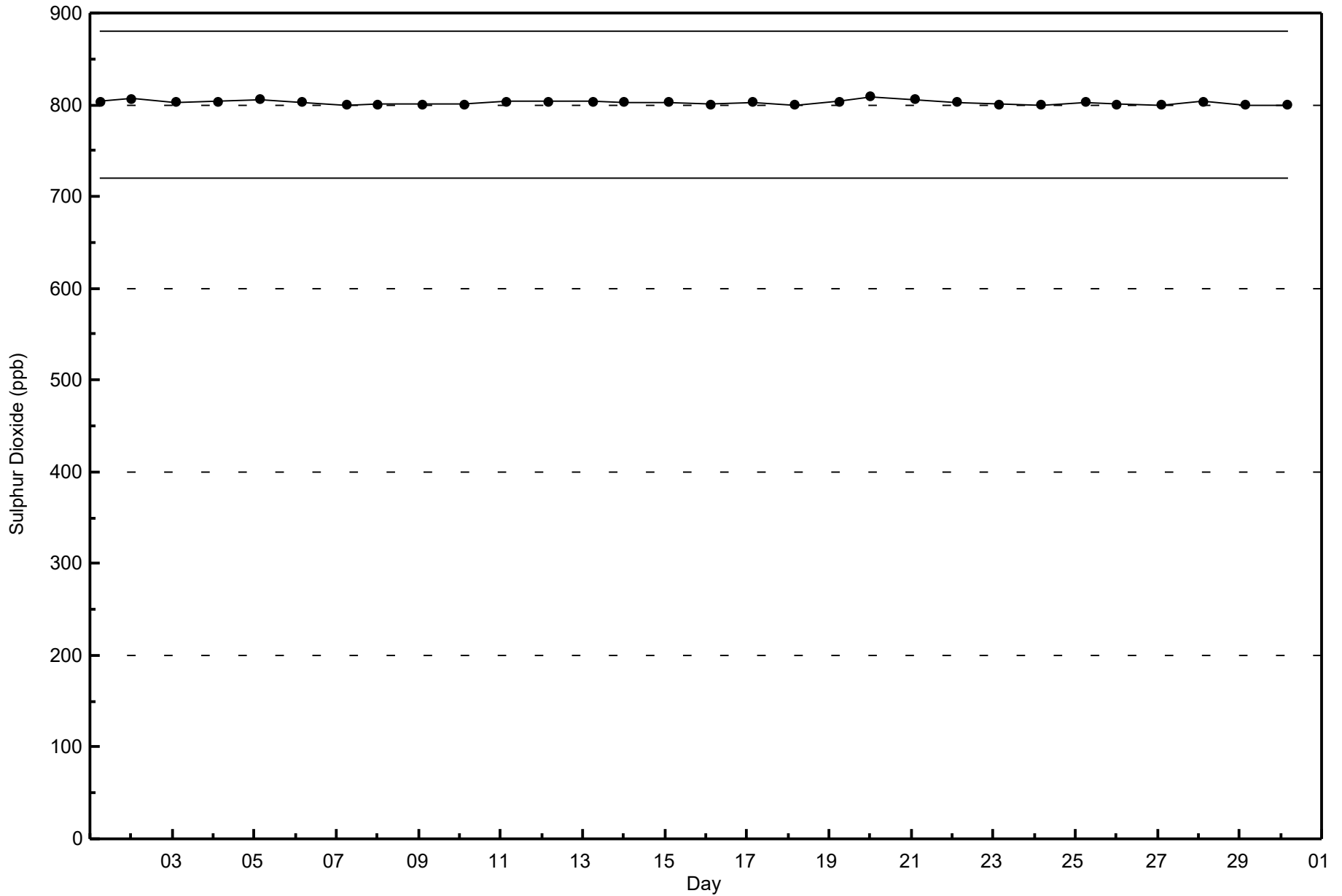


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

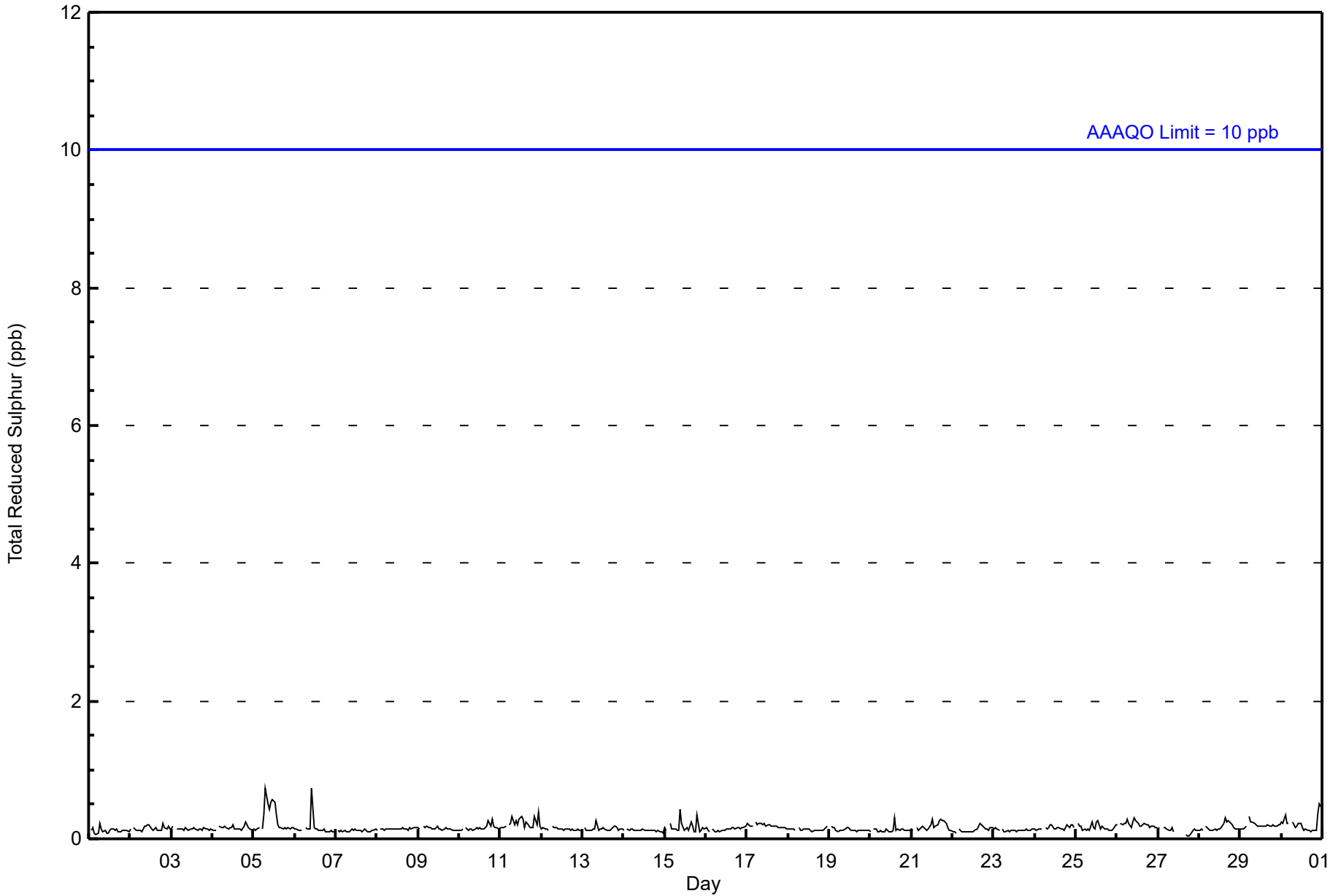
Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Anzac













**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb**  
**Anzac - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	684	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Anzac - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	16	20	14	22	35	47	57	71	39	23	24	19	59	117	94	27	684
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	16	20	14	22	35	47	57	71	39	23	24	19	59	117	94	27	684

Total Number of Valid Hours: 684

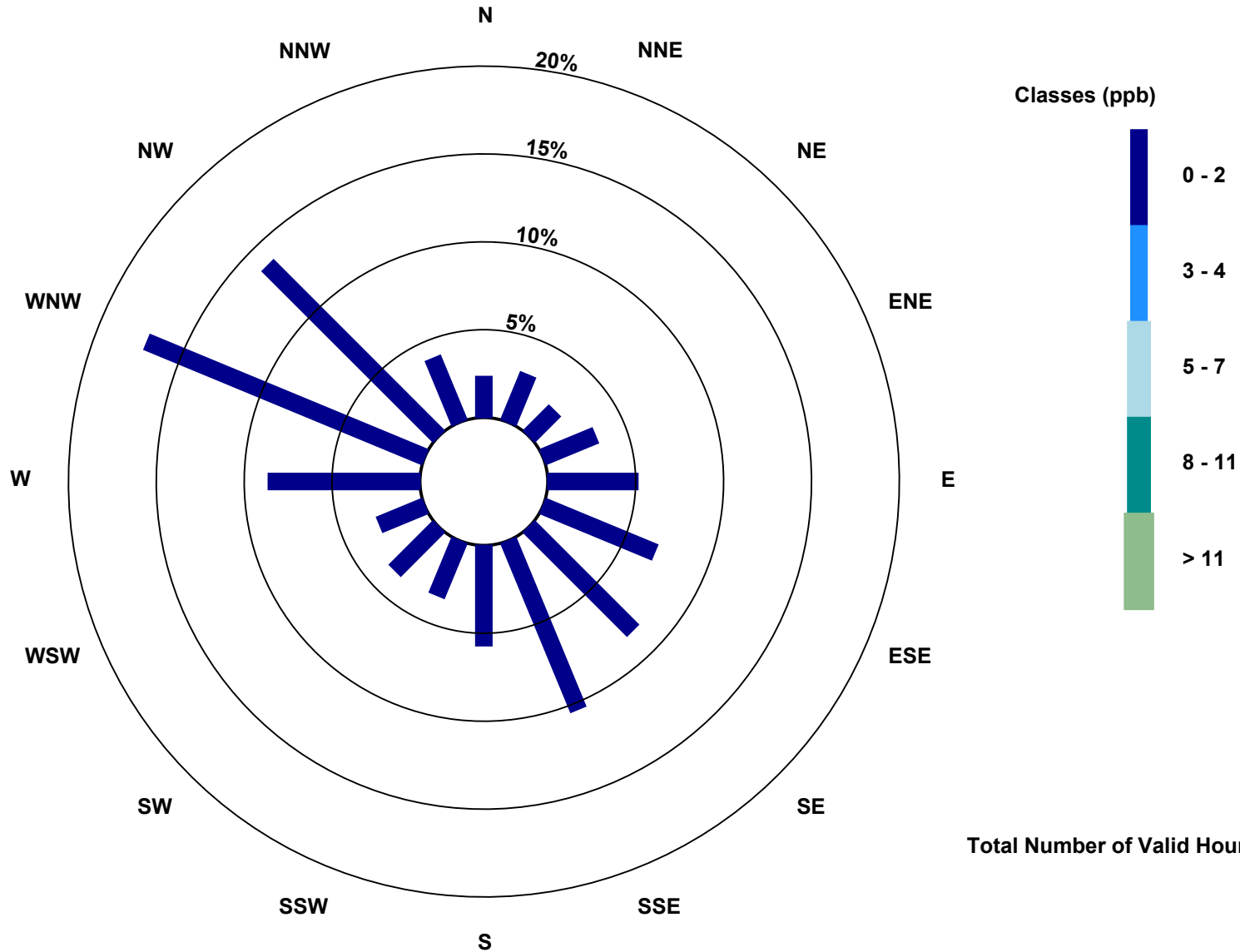
Total Number of Hours: 720



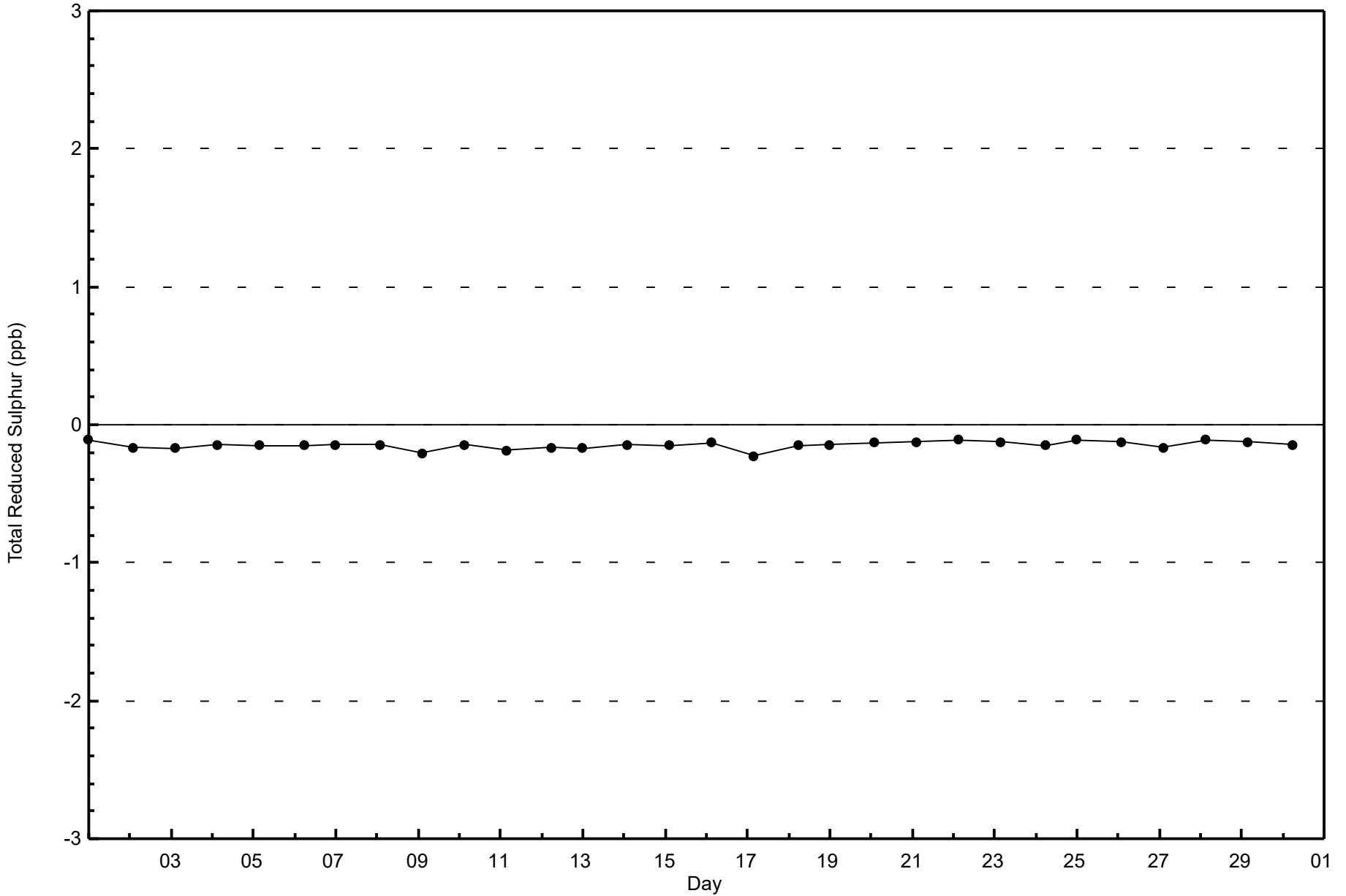


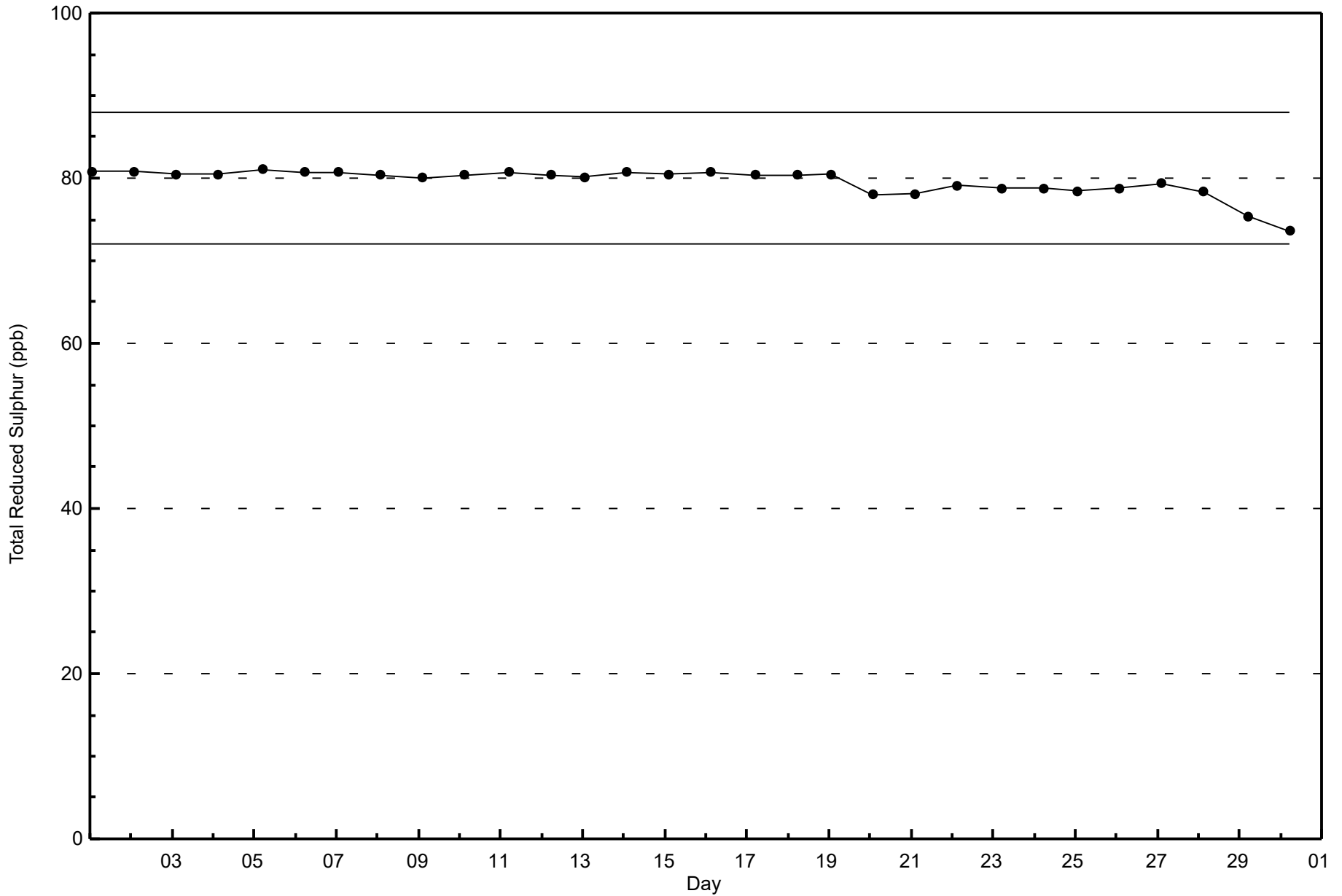
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Reduced Sulphur (TRS) - ppb  
Anzac



Total Number of Valid Hours: 684



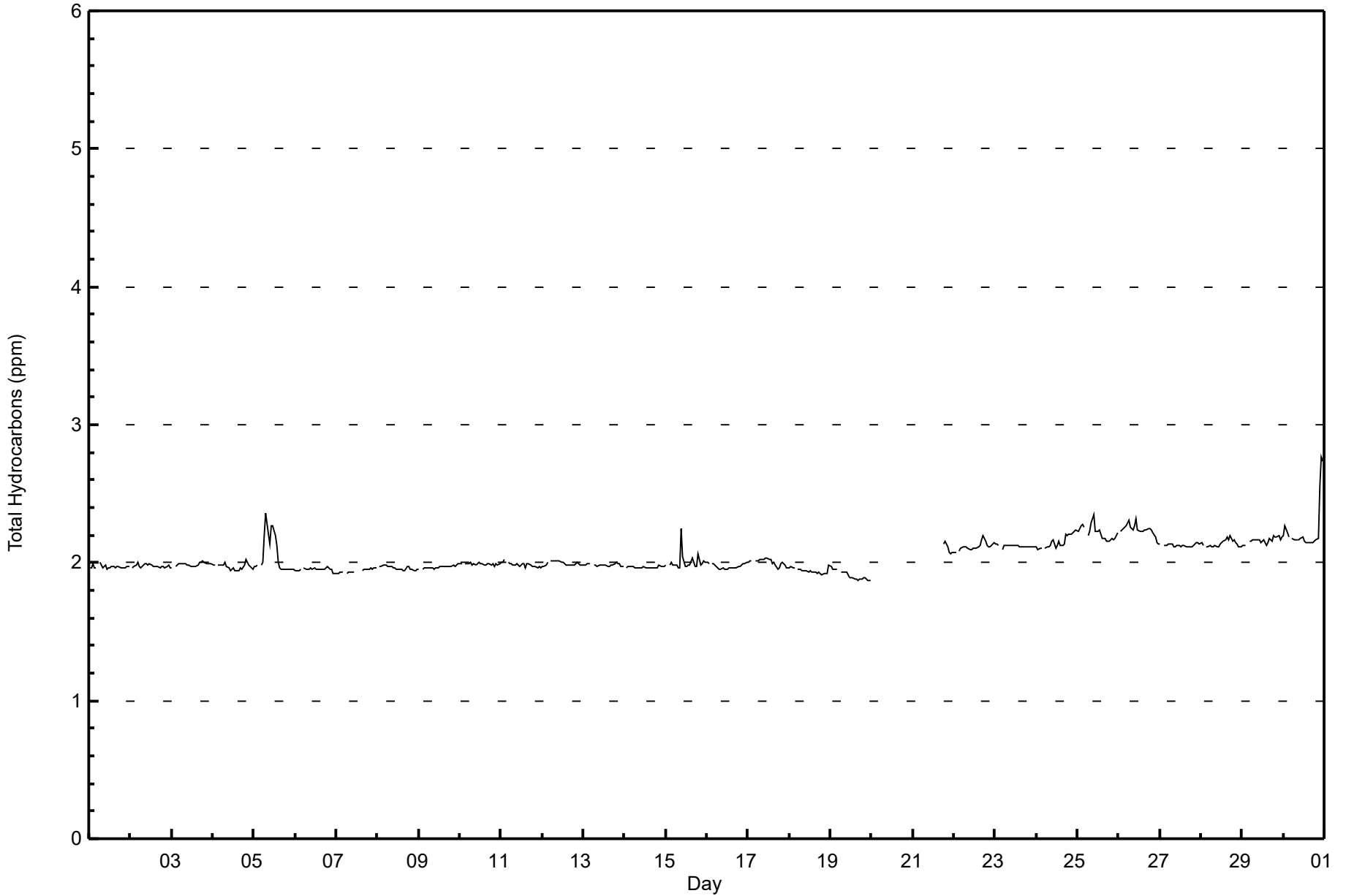






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Anzac - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Anzac - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	423	65.48	65.48
2.1 - 3.0	223	34.52	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 646

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Anzac - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	10	7	9	13	29	23	40	60	32	20	21	18	55	53	24	9	423
2.1 - 3.0	4	14	4	8	7	25	14	15	5	3	2	1	4	65	39	13	223
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	14	21	13	21	36	48	54	75	37	23	23	19	59	118	63	22	646

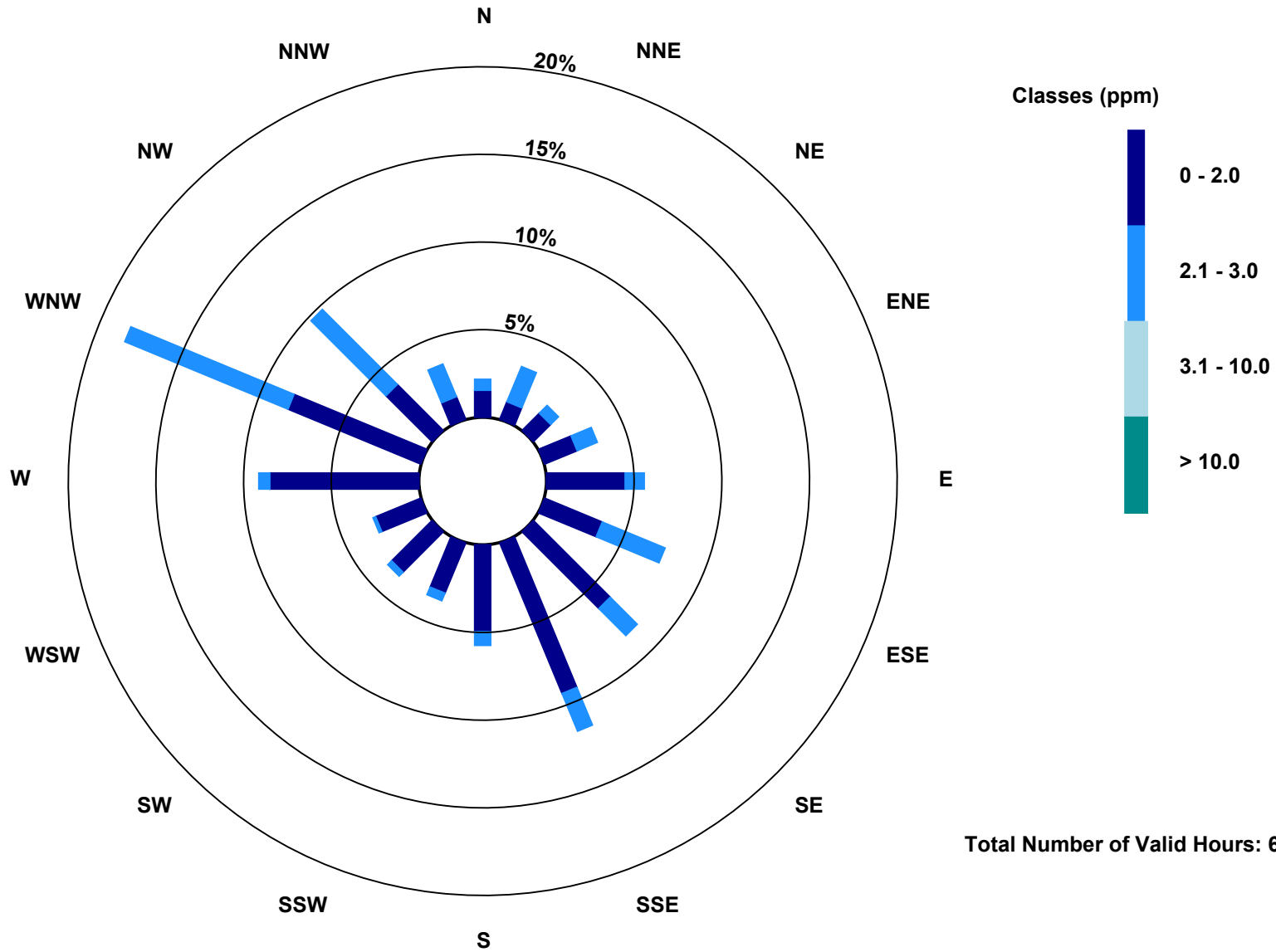
Total Number of Valid Hours: 646

Total Number of Hours: 720

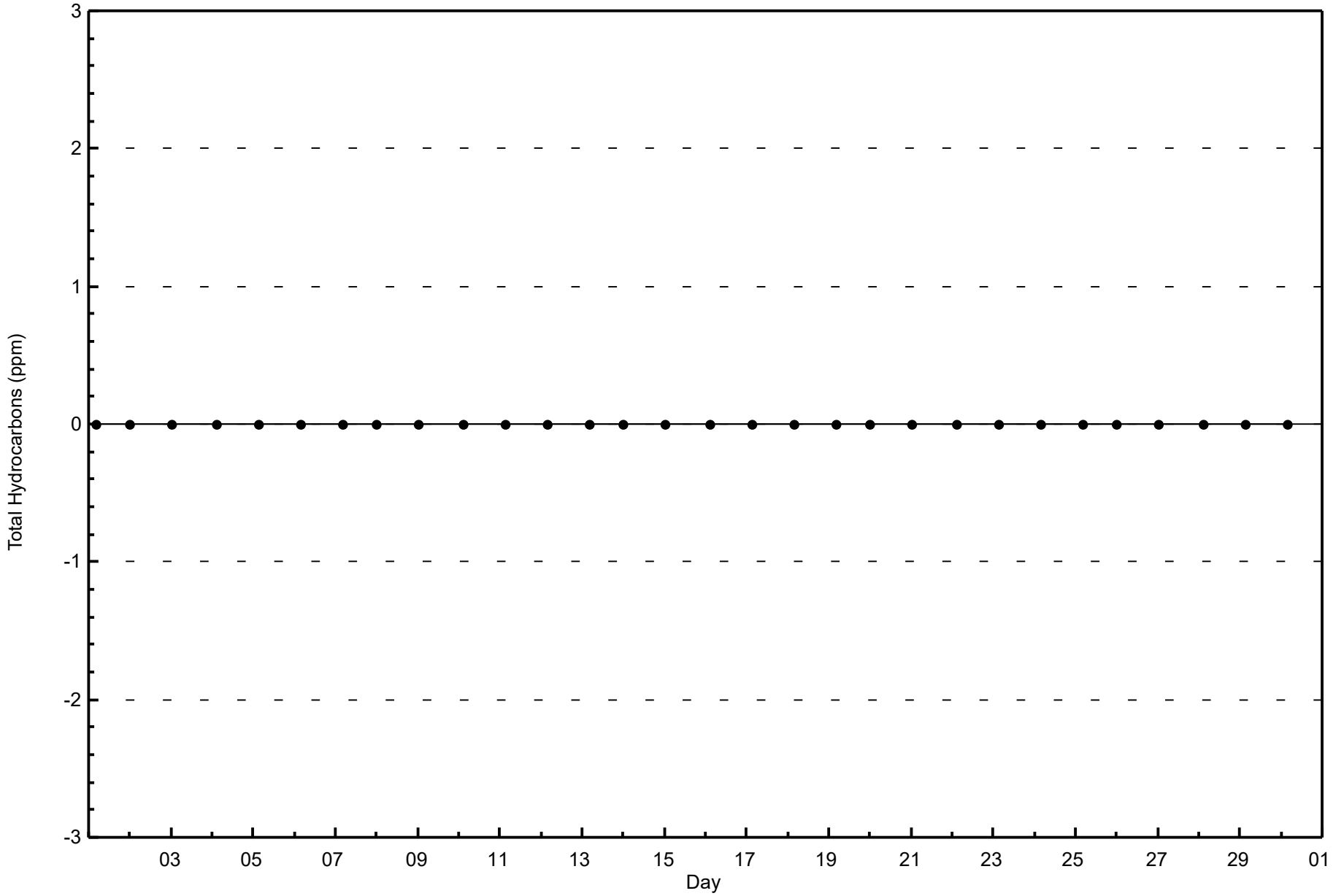


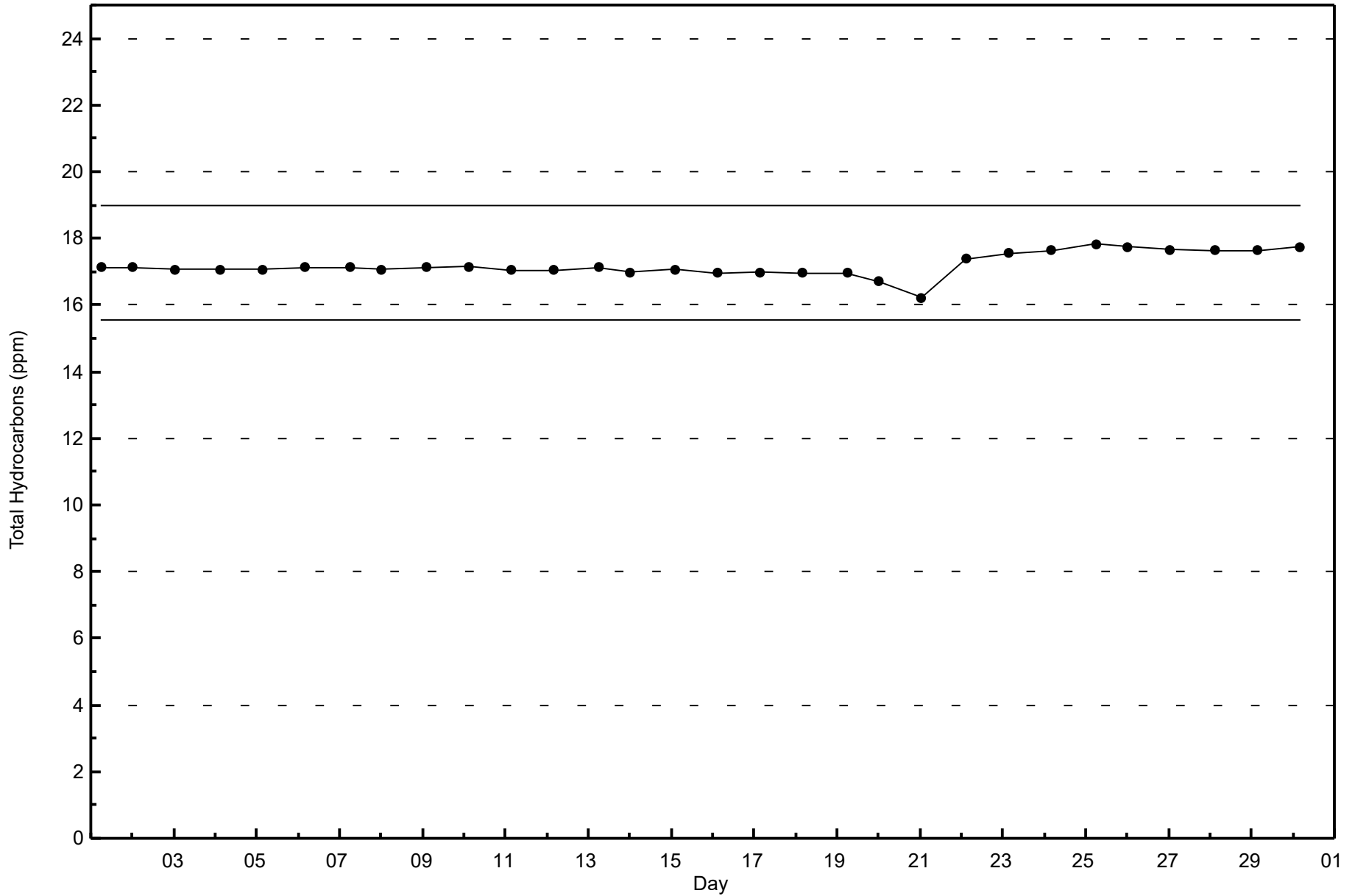
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Hydrocarbons (THC) - ppm  
Anzac



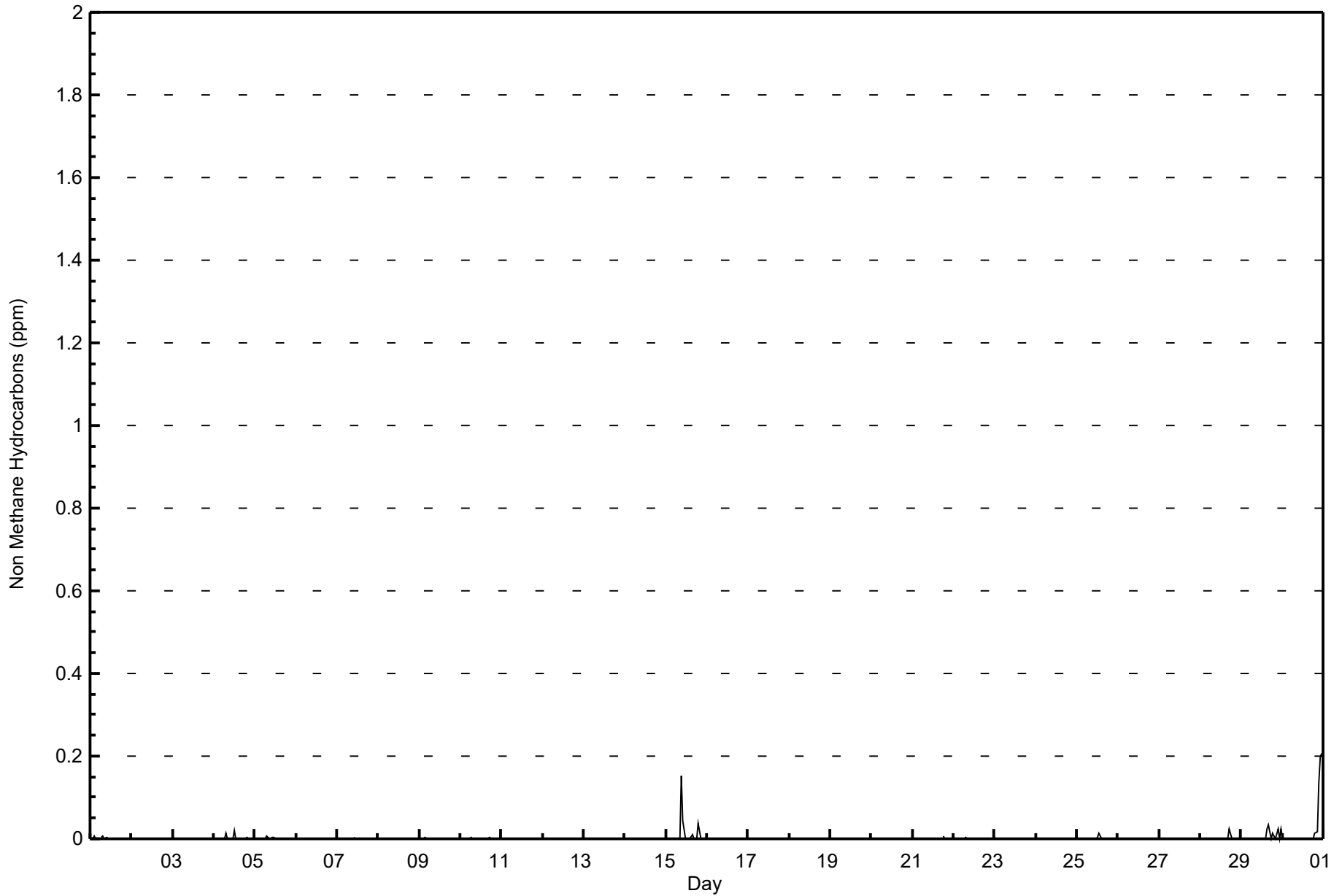








Maximum Value: 0.206 ppm on Dec 1 00:00																								Hours in Service: 720			
Maximum Daily Average: 0.025 ppm on Nov 30																								Hours of Data: 646			
Minimum Value: 0.000 ppm on Nov 1 01:00																								Hours of Missing Data: 74			
Minimum Daily Average: 0.000 ppm on Nov 2																								Hours of Calibration: 33			
Maximum Diurnal Average: 0.008 ppm at hour 24																								Percent Operational Time: 94.3			
Minimum Diurnal Average: 0.000 ppm at hour 2																											
Monthly Average: 0.002 ppm																											
Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.0 P <sub>99</sub> = 0.0																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.000	0.000	0.006	0.000	0.000	Z	0.005	0.007	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.007	
2-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.002	0.020	
5-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.008	0.000	0.000	0.002	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.008	
6-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
7-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.004	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	
8-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
9-Nov	0.000	Z	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	
10-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	
11-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
12-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
13-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
14-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
15-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.151	0.045	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.037	0.000	0.000	0.000	0.000	0.011	0.151	
16-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
17-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
18-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
19-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
20-Nov	Z	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
21-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	M	M	M	0.007	0.000	0.000	0.000	0.000	0.000	--	0.007	
22-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	
23-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
24-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
25-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.001	0.000	0.000	0.003	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.015	
26-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
27-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
28-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.000	0.000	0.000	0.000	0.000	0.001	0.024		
29-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.035	0.000	0.015	0.006	0.000	0.023	0.000	0.024	0.005	0.035		
30-Nov	0.002	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.016	0.135	0.198	0.206	0.025	0.206		
0.000																								Diurnal Average			
0.002																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure																											





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Anzac - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	623	96.44	96.44
0.006 - 0.05	19	2.94	99.38
0.06 - 0.1	1	0.15	99.54
> 0.1	3	0.46	100.00

Total Number of Valid Hours: 646

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Anzac - November 2024**

<b>Concentration</b> <b>Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	14	19	13	21	36	43	51	73	37	23	23	19	57	114	60	20	623
0.006 - 0.05	0	2	0	0	0	5	2	2	0	0	0	0	2	1	3	2	19
0.06 - 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
> 0.1	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	3
<b>Totals</b>	14	21	13	21	36	48	54	75	37	23	23	19	59	118	63	22	646

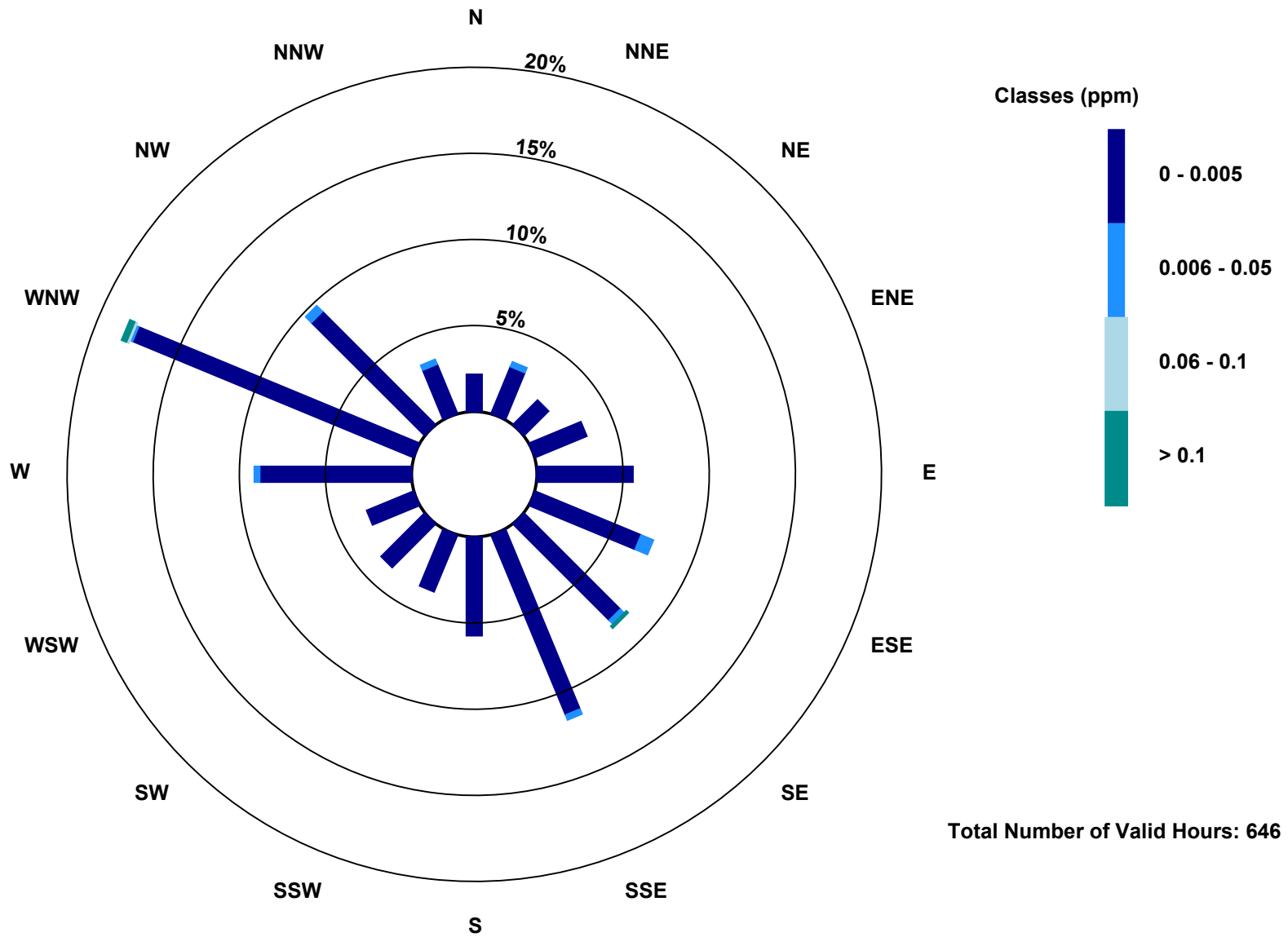
Total Number of Valid Hours: 646

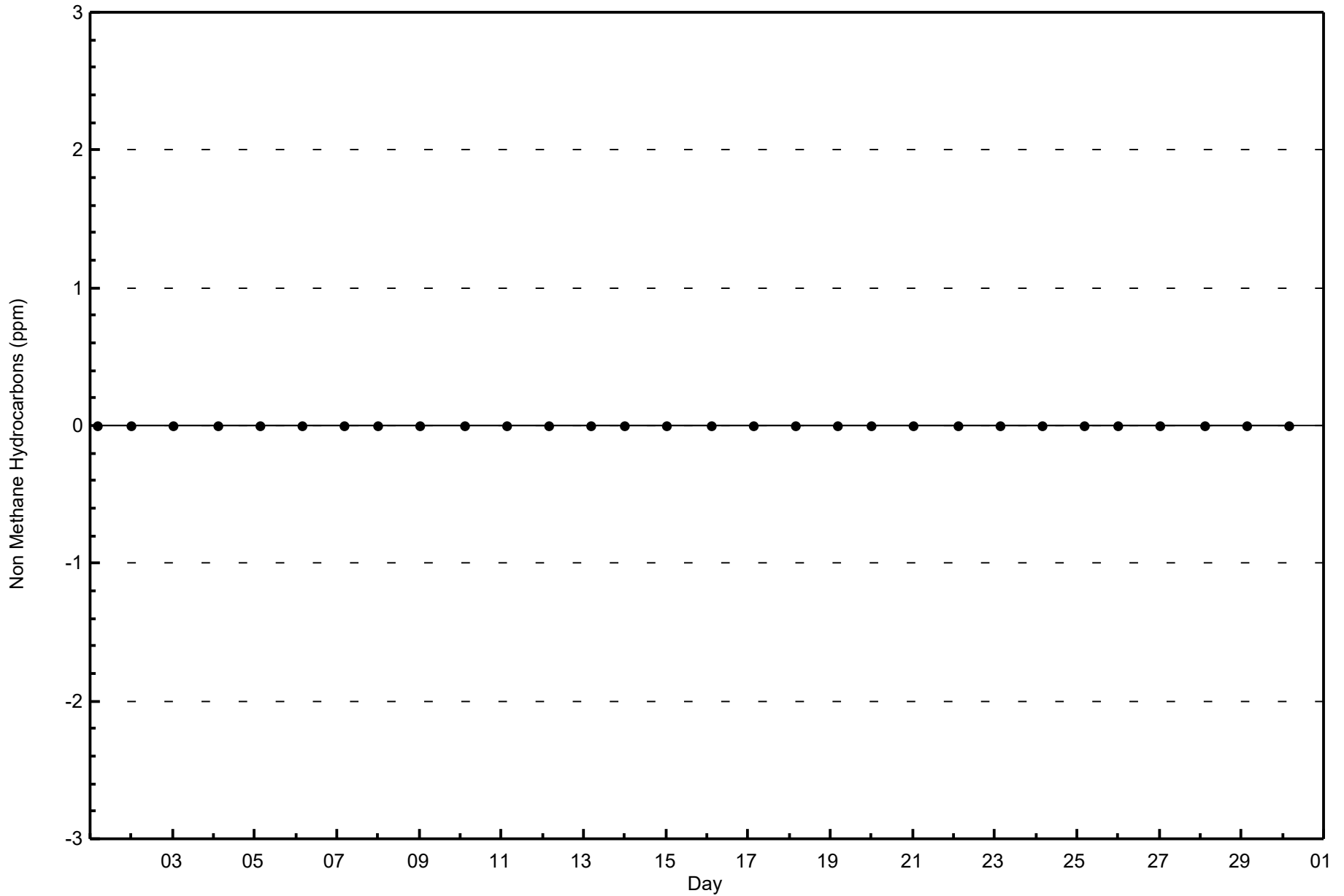
Total Number of Hours: 720



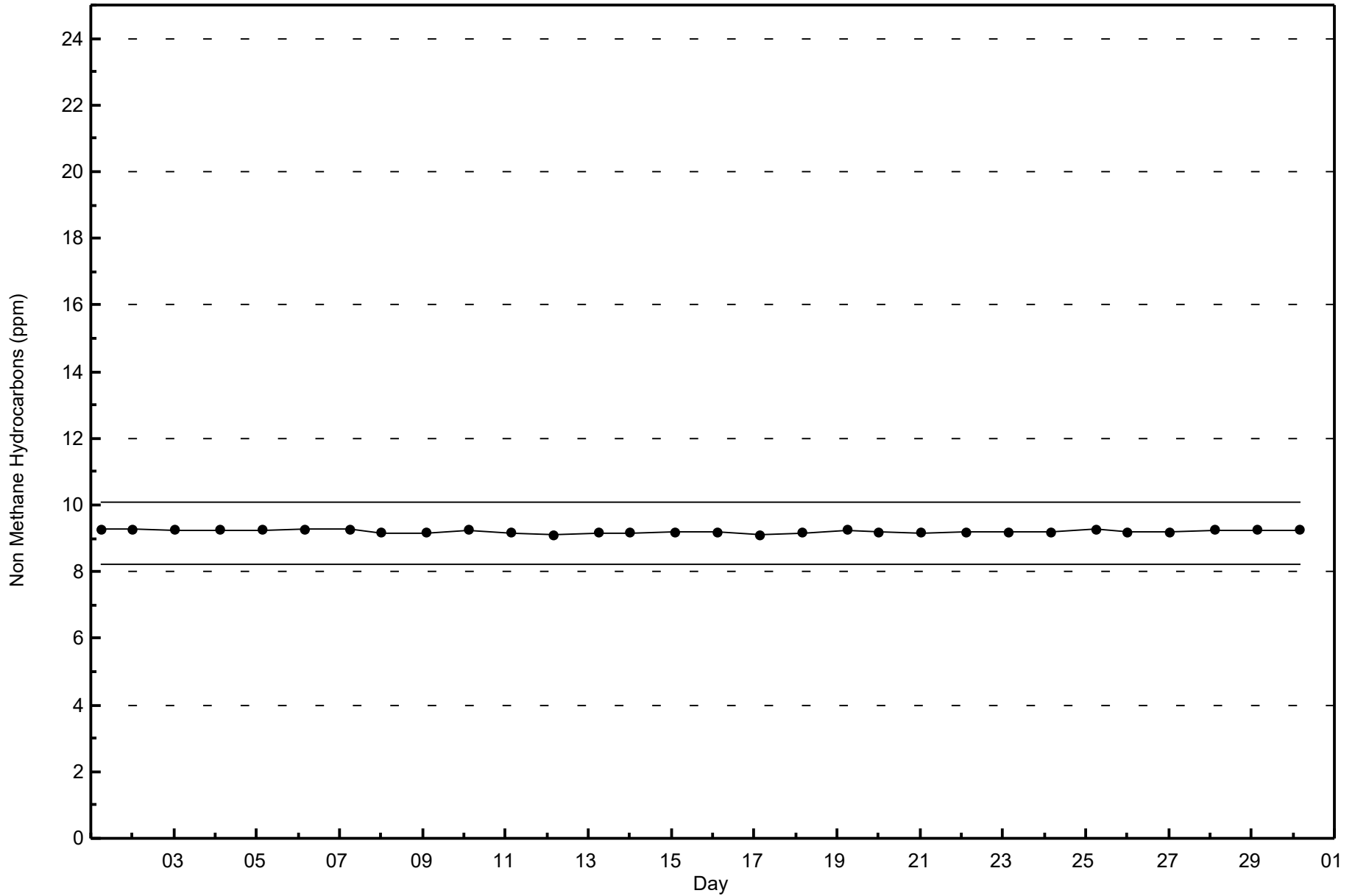
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Non Methane Hydrocarbons (NMHC) - ppm  
Anzac







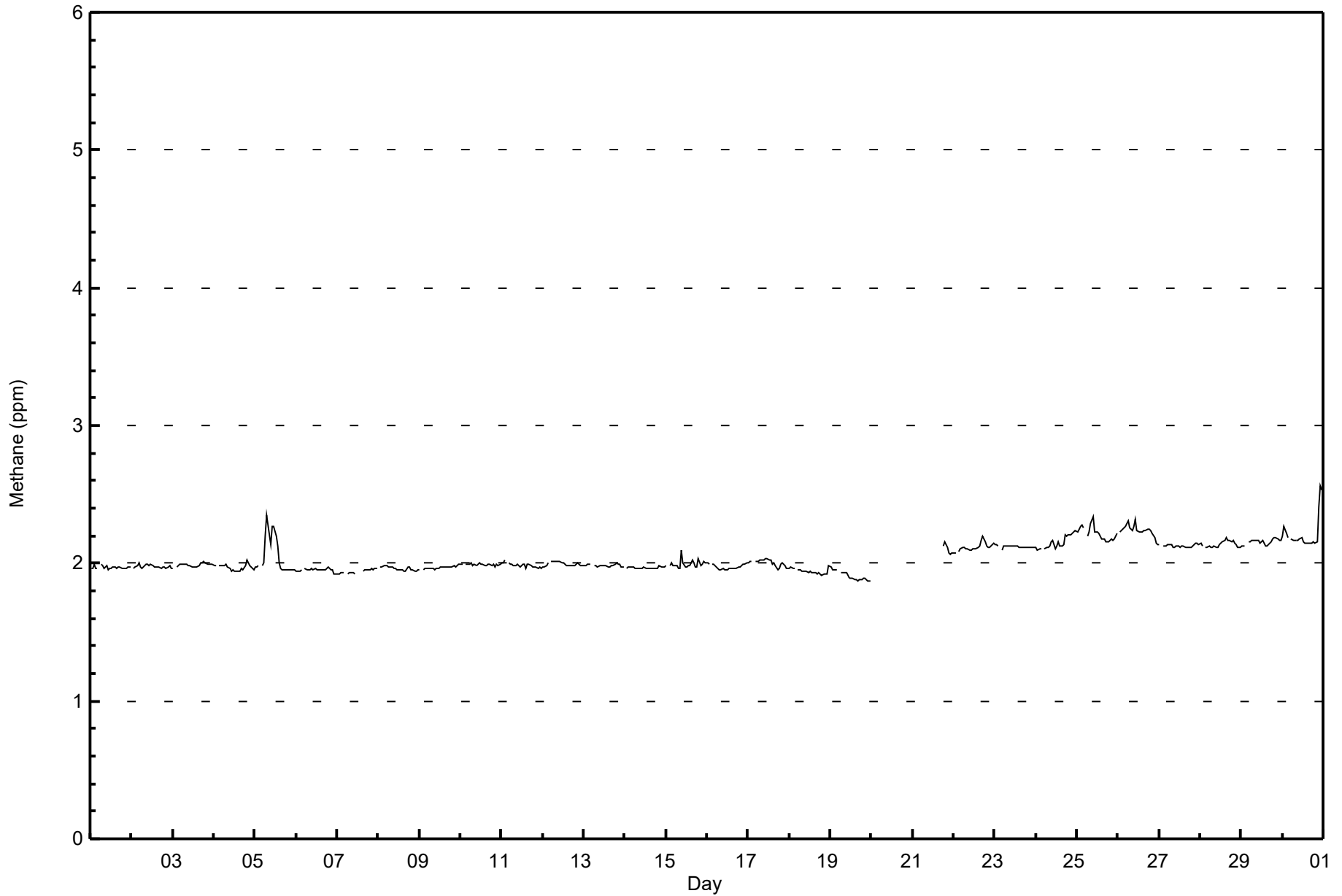






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Methane (CH<sub>4</sub>) - ppm**  
**Anzac - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Anzac - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	424	65.63	65.63
2.1 - 3.0	222	34.37	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 646

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Anzac - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	10	7	9	13	29	23	40	61	32	20	21	18	55	53	24	9	424
2.1 - 3.0	4	14	4	8	7	25	14	14	5	3	2	1	4	65	39	13	222
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	14	21	13	21	36	48	54	75	37	23	23	19	59	118	63	22	646

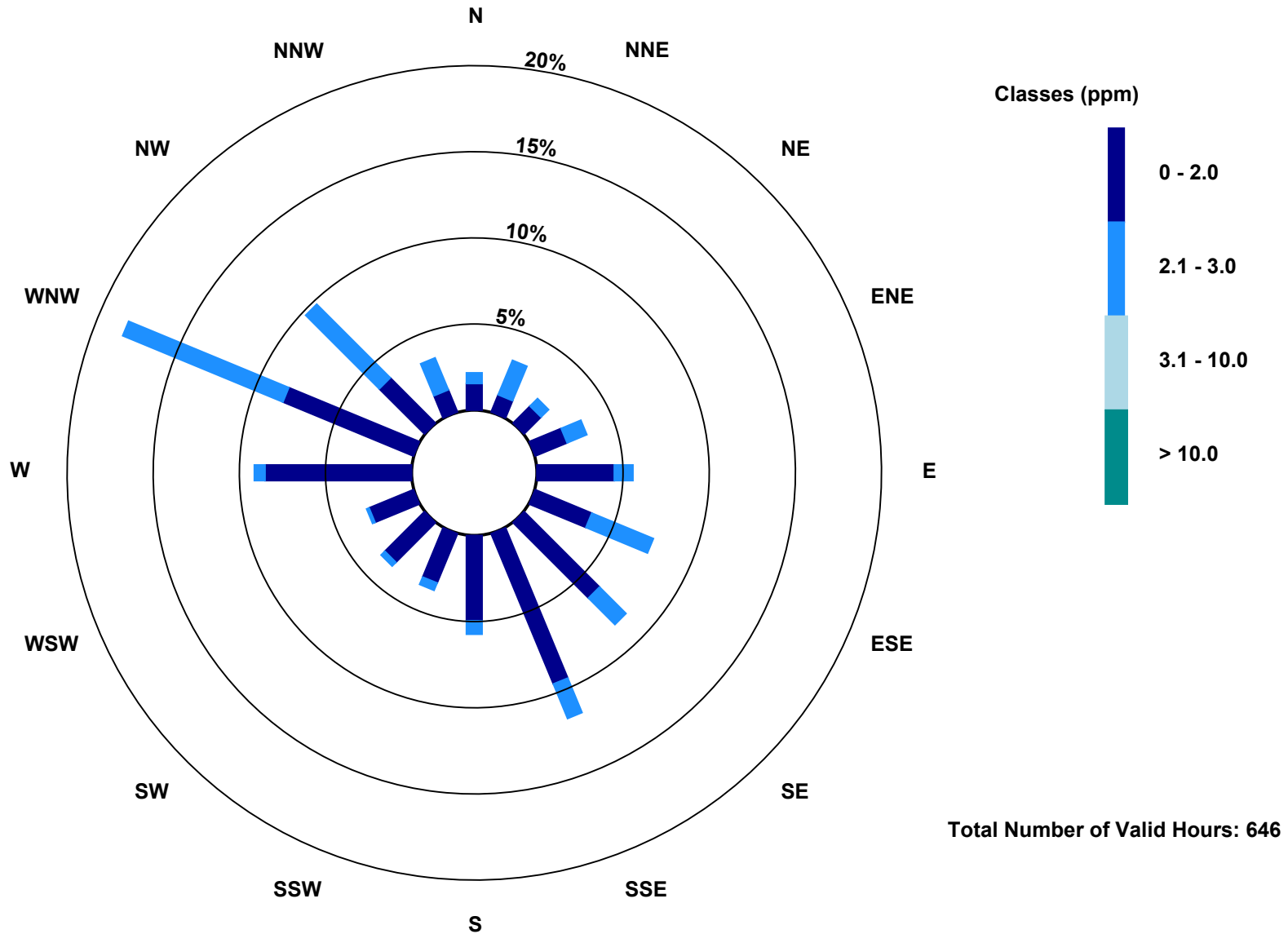
Total Number of Valid Hours: 646

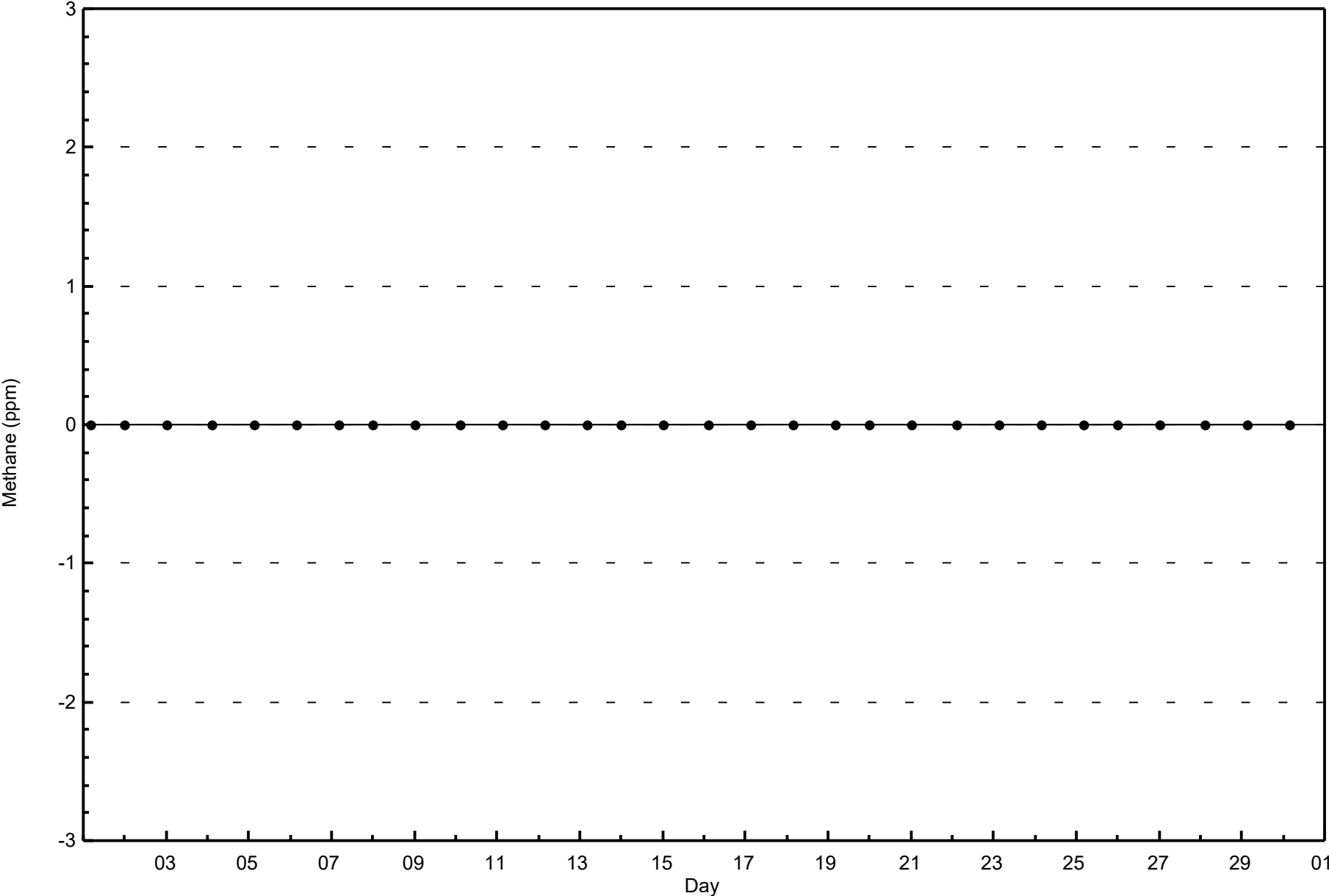
Total Number of Hours: 720

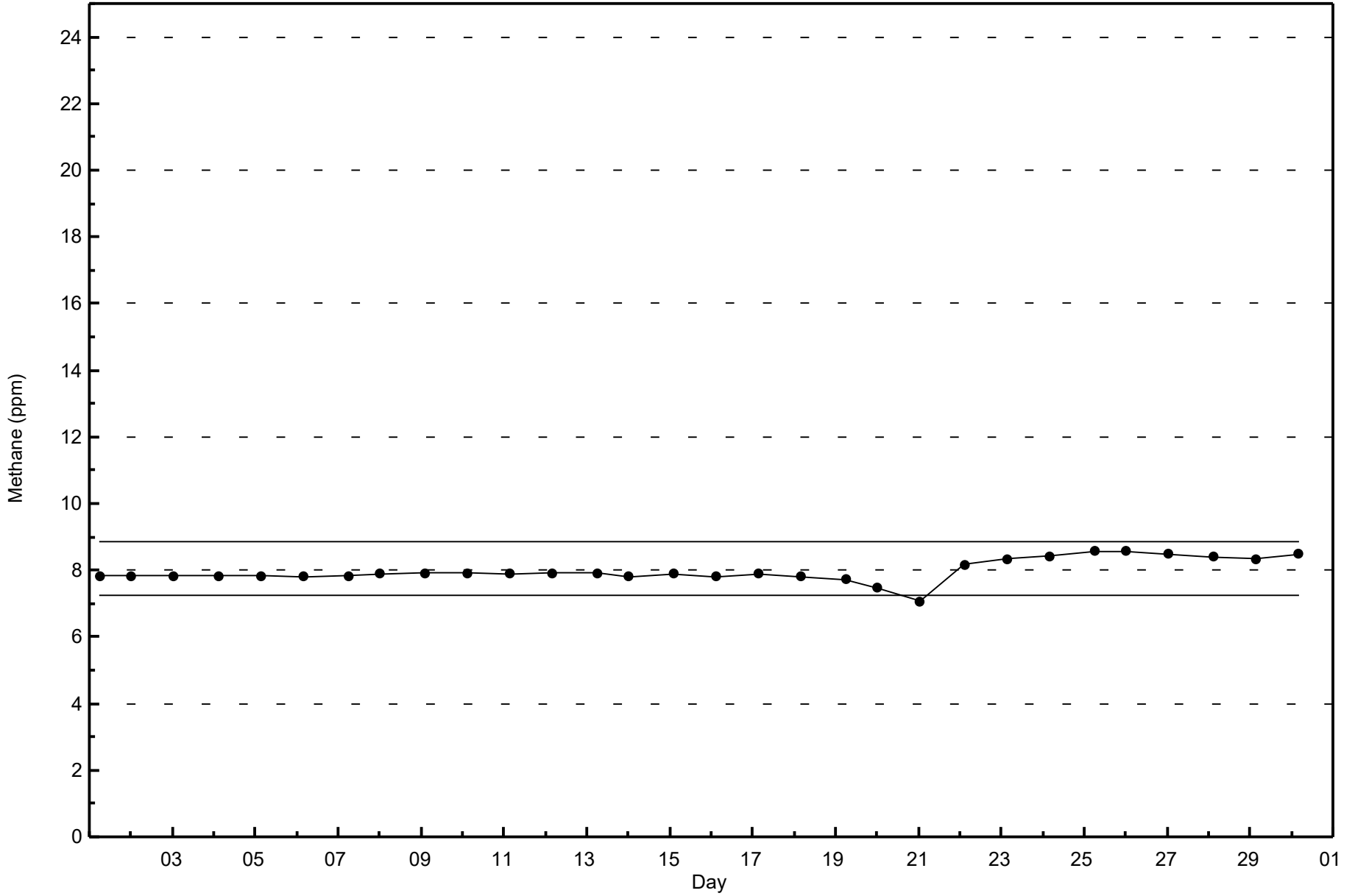


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Methane (CH<sub>4</sub>) - ppm  
Anzac







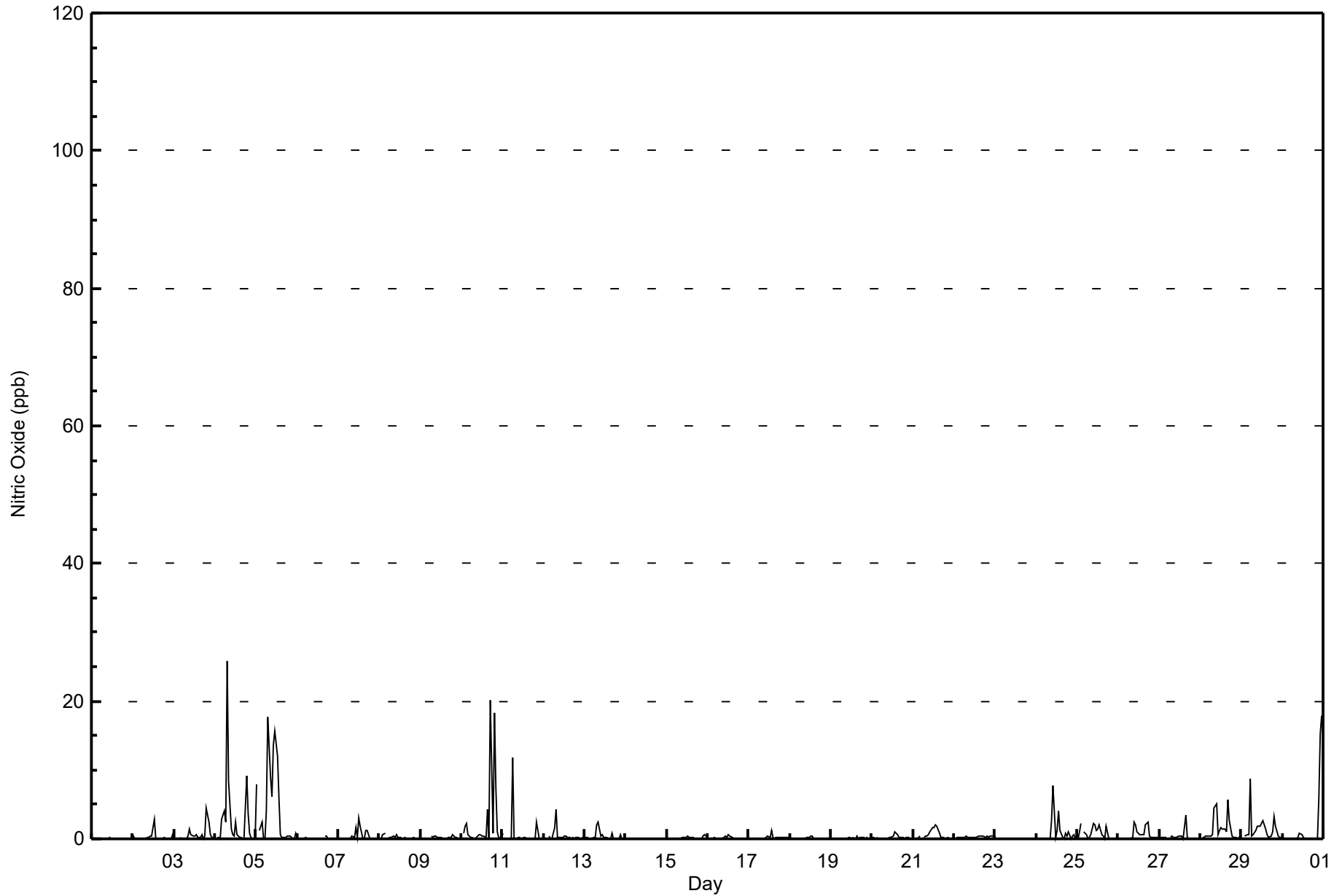






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Anzac - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Anzac - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	683	99.85	99.85
21 - 40	1	0.15	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Anzac - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 20	15	21	14	23	35	47	55	76	38	20	24	14	58	122	94	27	683
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	15	21	14	23	35	47	55	76	38	20	24	14	59	122	94	27	684

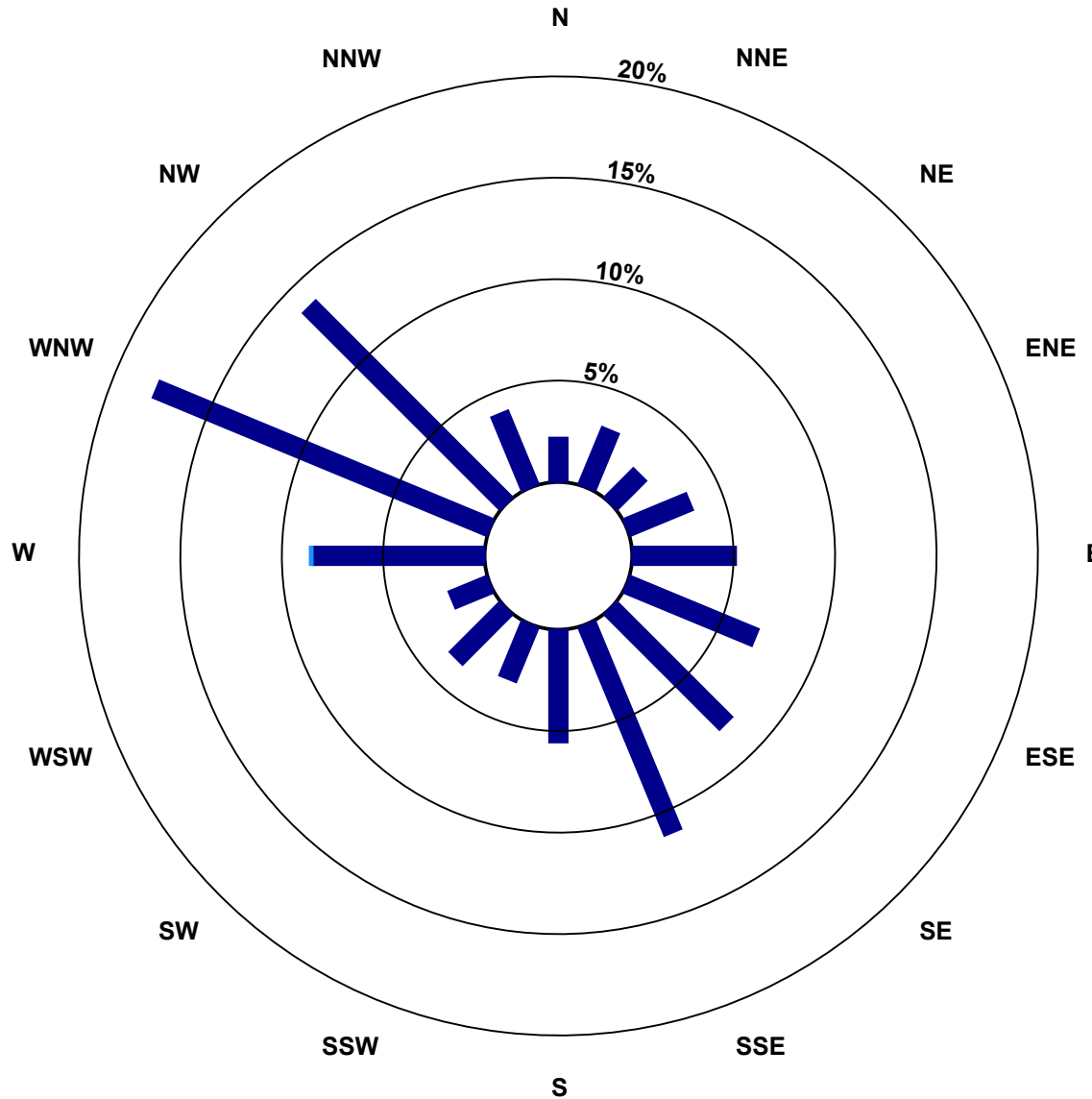
Total Number of Valid Hours: 684

Total Number of Hours: 720

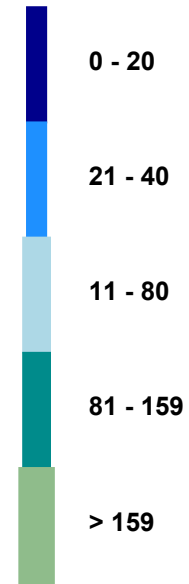


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

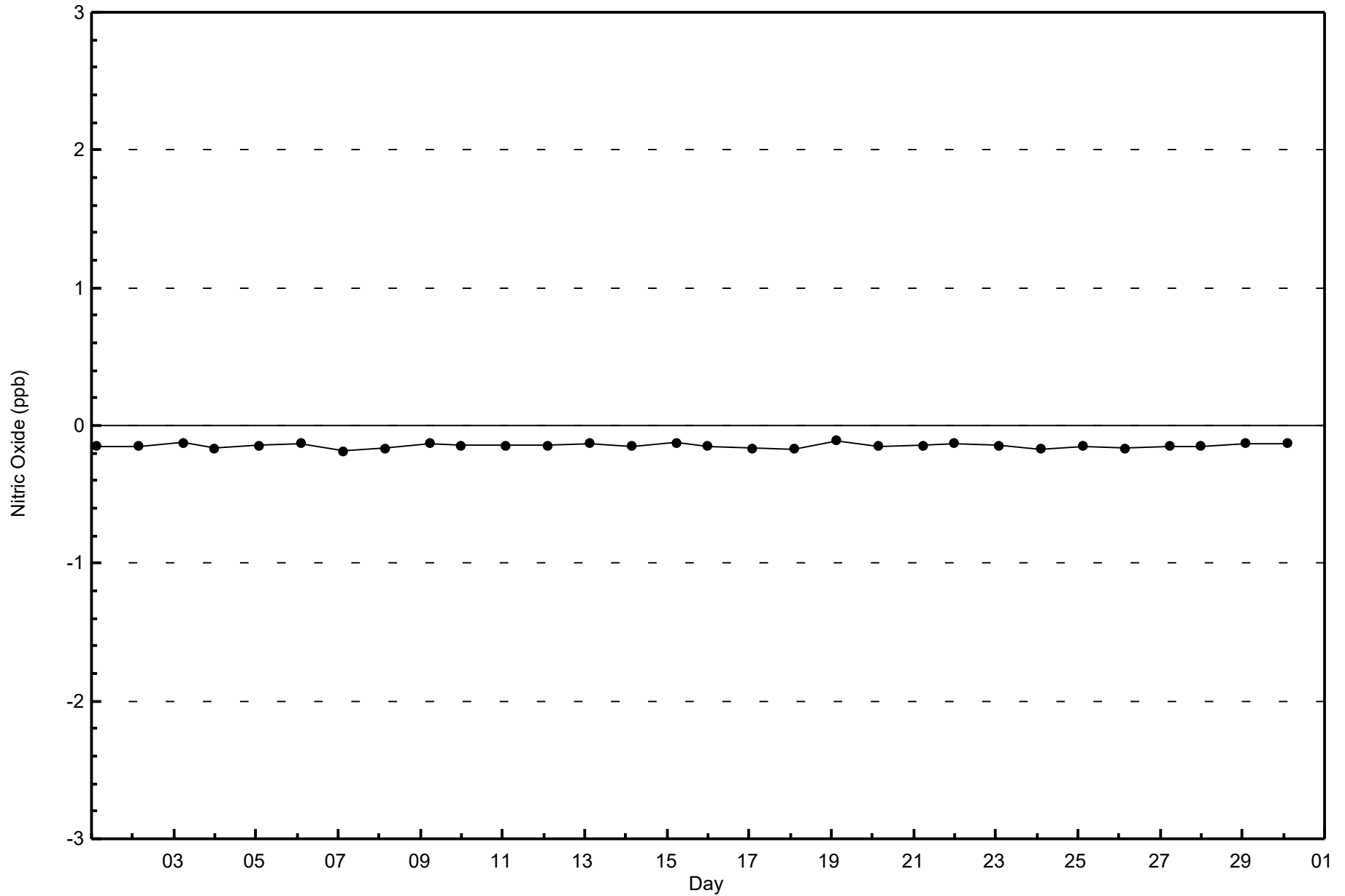
Nitric Oxide (NO) - ppb  
Anzac

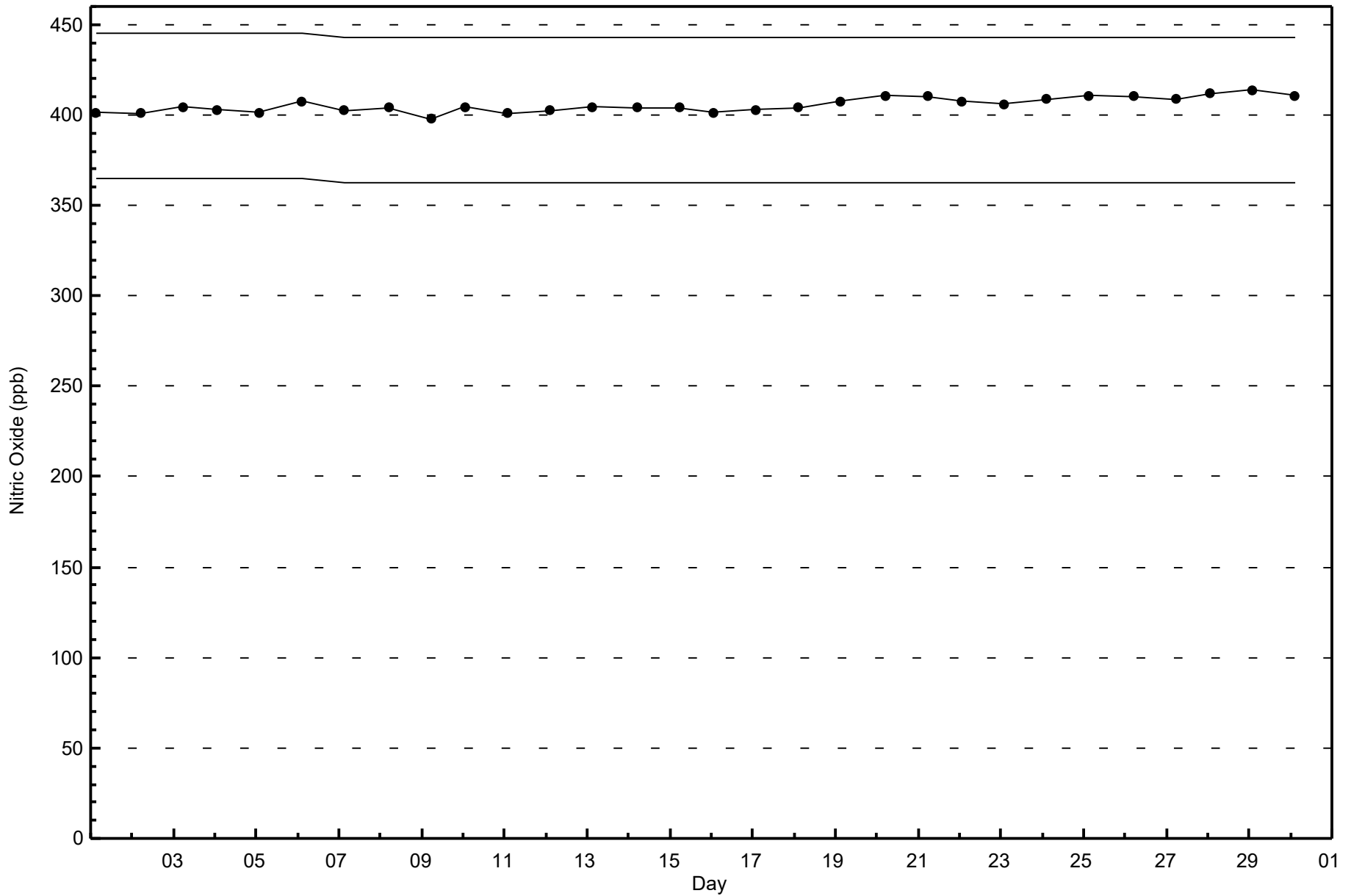


Classes (ppb)



Total Number of Valid Hours: 684







Wood Buffalo Environmental Association

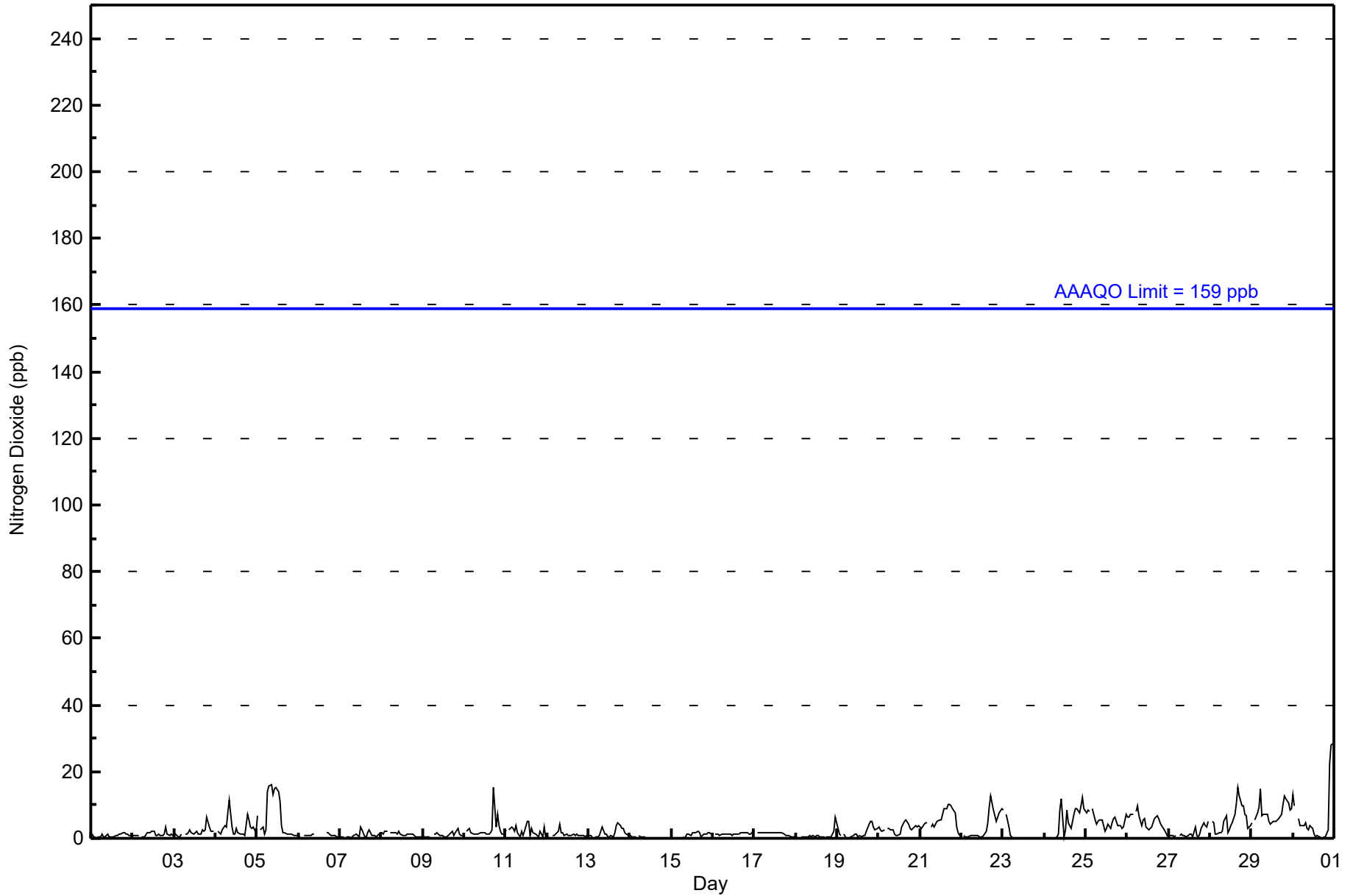
Summary of Hour Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb

Anzac - November 2024

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														720						
Maximum Value: 28.3 ppb on Dec 1 00:00		Maximum Daily Average: 7.6 ppb on Nov 29		Hours of Data:														684								
Minimum Value: 0.1 ppb on Nov 14 11:00		Minimum Daily Average: 0.2 ppb on Nov 14		Hours of Missing Data:														36								
Maximum Diurnal Average: 3.7 ppb at hour 18		Minimum Diurnal Average: 1.9 ppb at hour 5		Hours of Calibration:														36								
Monthly Average: 2.72 ppb		Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 0.7 Median = 1.4 Q <sub>3</sub> = 3.4 P <sub>90</sub> = 7.0 P <sub>99</sub> = 15.2		Percent Operational Time:														100.0								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	1.2	0.6	0.6	Z	0.5	0.5	1.3	0.6	0.6	1.1	0.5	0.3	0.6	0.6	0.8	0.8	1.1	1.3	1.8	1.5	1.3	1.1	0.9	0.9	0.9	1.8
2-Nov	1.0	0.7	0.7	0.7	Z	0.5	0.5	0.4	1.5	1.5	1.8	2.1	2.2	0.9	0.9	1.1	0.8	0.7	1.4	3.4	1.3	0.7	1.3	1.0	1.2	3.4
3-Nov	0.7	1.4	0.5	0.5	1.3	Z	1.1	1.2	1.5	2.7	1.5	1.4	1.8	2.0	1.4	1.2	2.5	2.1	2.7	6.2	3.3	2.3	2.0	2.1	1.9	6.2
4-Nov	Z	2.0	1.7	1.4	2.5	3.9	3.2	7.8	11.5	3.4	1.4	1.1	3.0	1.5	1.1	1.3	1.1	0.9	7.2	5.4	3.4	2.9	3.5	1.8	3.2	11.5
5-Nov	6.9	Z	2.5	3.6	1.2	2.5	13.9	15.5	16.2	13.0	14.9	15.1	14.0	11.0	3.8	1.5	1.5	1.4	1.3	1.3	1.1	0.8	0.7	0.8	6.3	16.2
6-Nov	0.8	0.6	Z	0.8	0.8	1.0	0.7	1.0	1.1	1.3	C	C	C	C	C	C	1.8	1.6	1.3	1.0	0.9	1.0	0.6	0.5	--	1.8
7-Nov	0.5	0.4	0.5	Z	0.4	0.3	0.2	0.3	0.9	1.1	0.7	0.6	3.5	2.6	0.3	0.5	1.6	2.7	0.9	0.7	1.0	0.6	1.0	1.7	1.0	3.5
8-Nov	1.6	1.4	2.1	2.2	Z	1.6	1.7	1.7	1.7	1.3	2.3	1.1	0.9	0.7	0.7	1.4	1.2	1.2	1.1	0.9	0.6	0.6	0.4	0.4	1.3	2.3
9-Nov	0.4	0.4	0.5	0.6	0.6	Z	1.1	1.1	1.6	1.2	0.9	0.9	0.6	0.4	0.5	1.4	1.9	2.0	0.7	1.5	3.0	1.4	0.9	1.0	1.1	3.0
10-Nov	Z	2.1	2.6	3.0	1.6	1.2	1.2	1.3	1.2	1.5	1.5	1.5	1.5	1.4	1.2	1.9	2.6	15.4	3.5	7.0	4.0	2.0	1.3	1.2	2.7	15.4
11-Nov	2.5	Z	2.4	3.4	2.8	2.3	3.8	1.8	0.6	2.2	0.7	2.1	5.1	5.2	1.0	2.8	1.5	1.1	0.7	0.6	2.2	0.6	3.4	0.5	2.1	5.2
12-Nov	0.4	0.5	Z	0.9	0.9	1.1	2.0	4.2	1.6	1.5	1.0	1.2	1.0	1.0	0.9	1.2	0.9	1.3	0.8	0.9	0.9	0.7	0.6	0.7	1.1	4.2
13-Nov	0.7	0.7	0.6	Z	0.6	0.6	0.9	2.3	3.4	1.2	1.2	0.6	0.5	0.7	0.6	1.7	3.7	4.7	4.0	3.0	2.8	1.9	1.2	0.9	1.7	4.7
14-Nov	0.7	0.5	0.4	0.4	Z	0.7	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.7
15-Nov	0.4	0.1	0.2	0.2	0.2	Z	0.3	0.1	0.3	1.2	1.1	0.9	1.5	1.7	1.7	2.1	1.5	0.6	0.7	1.3	1.2	1.5	1.6	1.4	0.9	2.1
16-Nov	Z	1.3	1.2	1.1	1.0	1.3	1.4	1.2	1.2	1.1	1.1	0.8	1.2	1.3	1.3	1.2	1.5	1.6	1.6	1.7	1.7	1.3	1.4	2.3	1.3	2.3
17-Nov	2.1	Z	1.9	1.7	1.7	1.7	1.8	1.8	1.8	1.9	1.6	1.8	1.5	1.8	1.5	1.9	1.8	1.1	0.8	0.9	0.7	0.6	0.6	0.5	1.5	2.1
18-Nov	0.6	0.5	Z	0.4	0.4	0.4	0.3	0.4	0.7	0.5	0.8	0.6	0.9	0.9	0.5	0.3	0.4	0.2	0.3	0.4	0.6	1.3	2.2	6.5	0.9	6.5
19-Nov	3.1	1.1	0.8	Z	1.4	0.2	0.2	0.2	0.3	0.8	1.3	1.3	0.6	0.7	0.5	1.0	0.7	2.1	4.4	5.2	4.9	3.2	2.4	3.0	1.7	5.2
20-Nov	3.3	2.7	2.2	2.5	Z	2.8	3.0	2.6	2.4	1.3	1.0	0.9	1.4	3.3	4.2	5.2	5.3	4.1	2.9	2.4	2.8	3.7	3.5	4.0	2.9	5.3
21-Nov	3.6	3.0	4.4	4.5	4.6	Z	3.2	4.2	3.3	4.3	5.2	5.4	5.7	7.4	9.0	9.0	10.1	10.2	9.8	8.7	7.6	3.6	1.5	1.0	5.6	10.2
22-Nov	Z	0.9	0.6	0.5	0.6	0.7	0.9	1.0	0.9	0.7	0.5	0.4	0.5	0.9	2.3	4.6	9.4	12.8	8.4	6.7	5.2	6.5	7.8	8.7	3.5	12.8
23-Nov	8.3	Z	7.4	3.6	0.9	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0	8.3
24-Nov	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.5	1.4	8.3	11.8	0.6	2.5	8.3	4.5	2.8	5.0	7.4	8.7	8.7	7.6	9.9	12.3	8.9	4.8	12.3
25-Nov	7.7	8.5	8.0	Z	8.7	5.5	4.4	5.0	5.3	5.5	3.8	2.1	3.1	4.4	3.0	4.7	5.8	6.4	3.7	4.0	4.0	2.9	3.2	7.0	5.1	8.7
26-Nov	6.4	6.4	7.2	7.3	Z	7.9	9.8	6.6	4.0	5.5	6.1	3.4	2.7	2.8	3.2	4.8	5.8	6.8	6.1	4.8	3.8	2.6	1.7	0.8	5.1	9.8
27-Nov	0.8	0.8	0.8	0.6	0.7	Z	0.9	1.3	0.9	0.7	0.6	0.9	1.1	1.3	0.5	3.4	1.0	0.6	1.3	3.1	4.7	3.9	3.4	5.2	1.7	5.2
28-Nov	Z	5.0	4.8	1.1	1.1	1.7	1.9	2.1	4.9	6.8	1.6	2.5	3.8	4.5	7.0	10.8	15.4	12.5	9.9	9.8	7.4	6.7	2.9	3.8	5.6	15.4
29-Nov	4.8	Z	5.6	7.5	9.3	14.7	6.8	7.1	7.0	7.1	4.9	4.4	5.1	5.0	4.9	5.6	5.8	7.2	10.1	12.5	11.7	10.8	8.3	9.1	7.6	14.7
30-Nov	13.3	9.6	Z	6.0	3.9	4.0	3.8	4.8	3.0	2.5	3.8	3.1	1.3	0.5	0.9	0.4	0.2	0.2	0.5	0.3	2.7	22.3	28.1	28.3	6.2	28.3
																								Diurnal Average		
																								Diurnal Maximum		
																								2.9 2.1 2.4 2.2 1.9 2.3 2.4 2.6 2.7 2.7 2.5 2.0 2.3 2.5 2.0 2.6 3.1 3.7 3.2 3.5 3.1 3.3 3.3 3.5		
																								13.3 9.6 8.0 7.5 9.3 14.7 13.9 15.5 16.2 13.0 14.9 15.1 14.0 11.0 9.0 10.8 15.4 15.4 10.1 12.5 11.7 22.3 28.1 28.3		
Z - zerospan C - Calibration																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																										







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Anzac - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	681	99.56	99.56
21 - 40	3	0.44	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Anzac - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	15	21	14	23	35	47	55	76	38	20	24	14	59	119	94	27	681
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	15	21	14	23	35	47	55	76	38	20	24	14	59	122	94	27	684

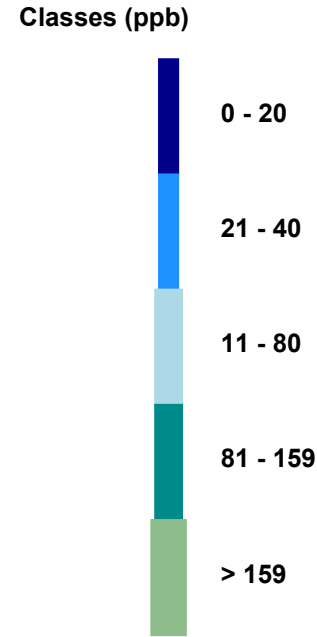
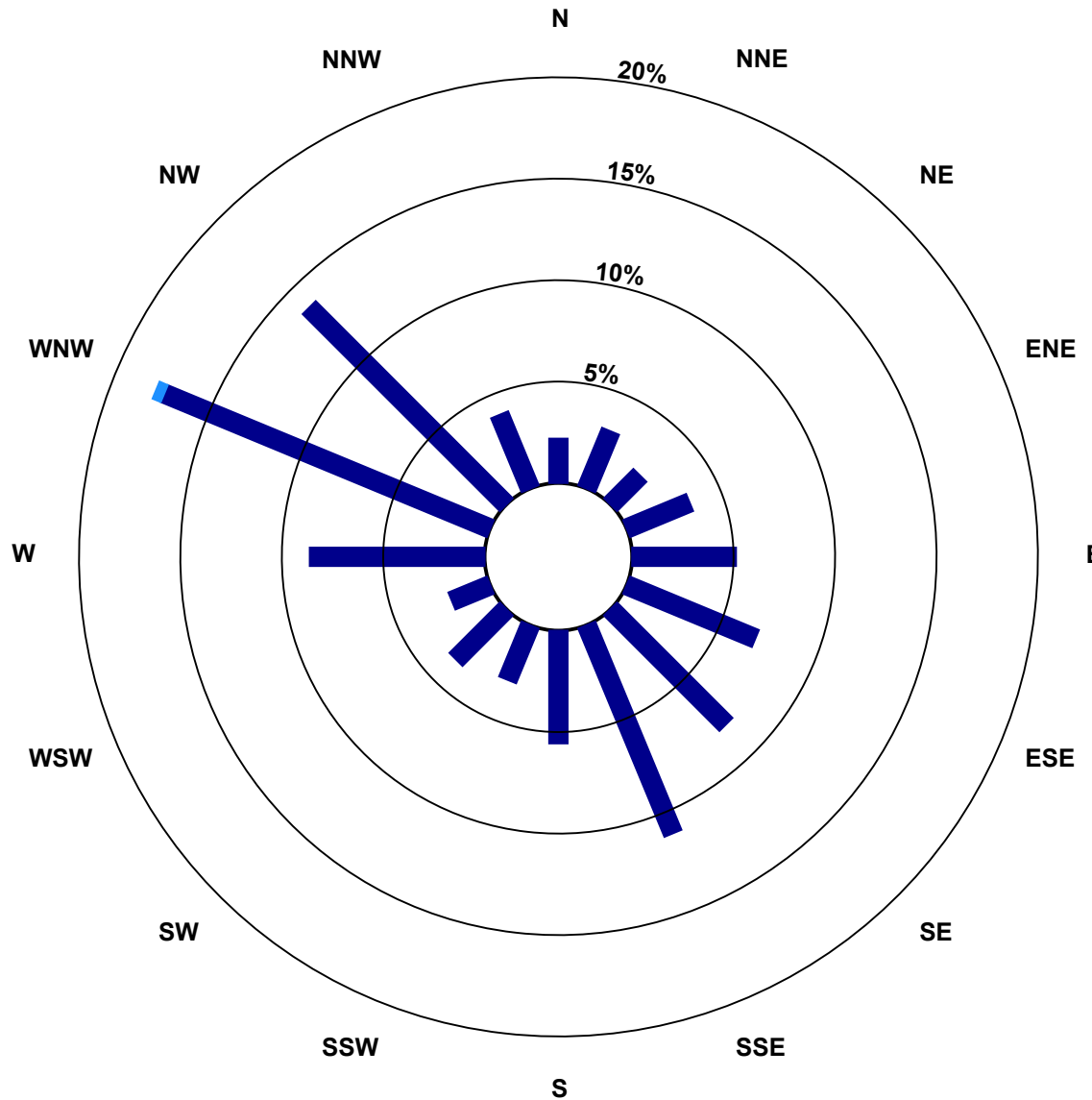
Total Number of Valid Hours: 684

Total Number of Hours: 720

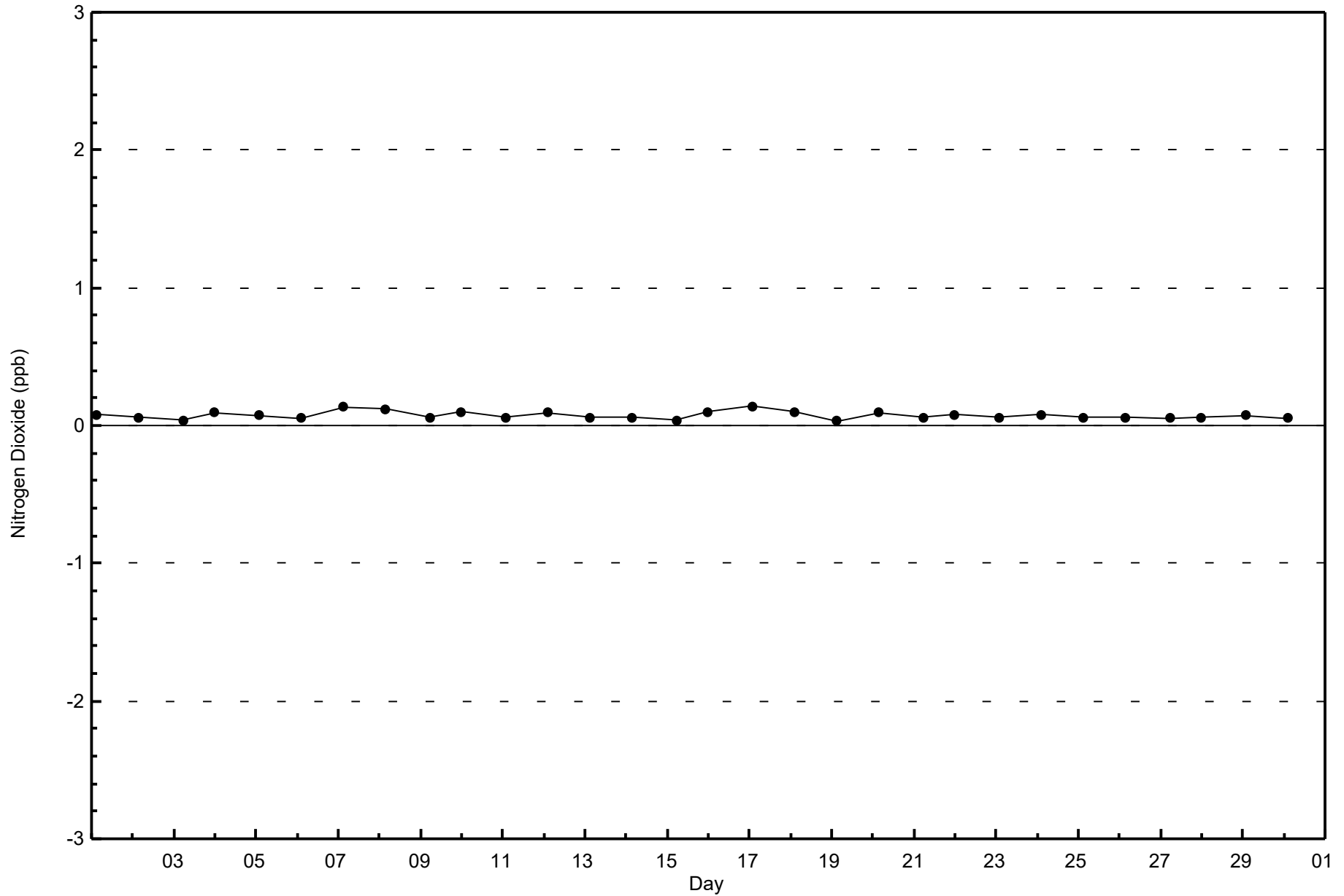


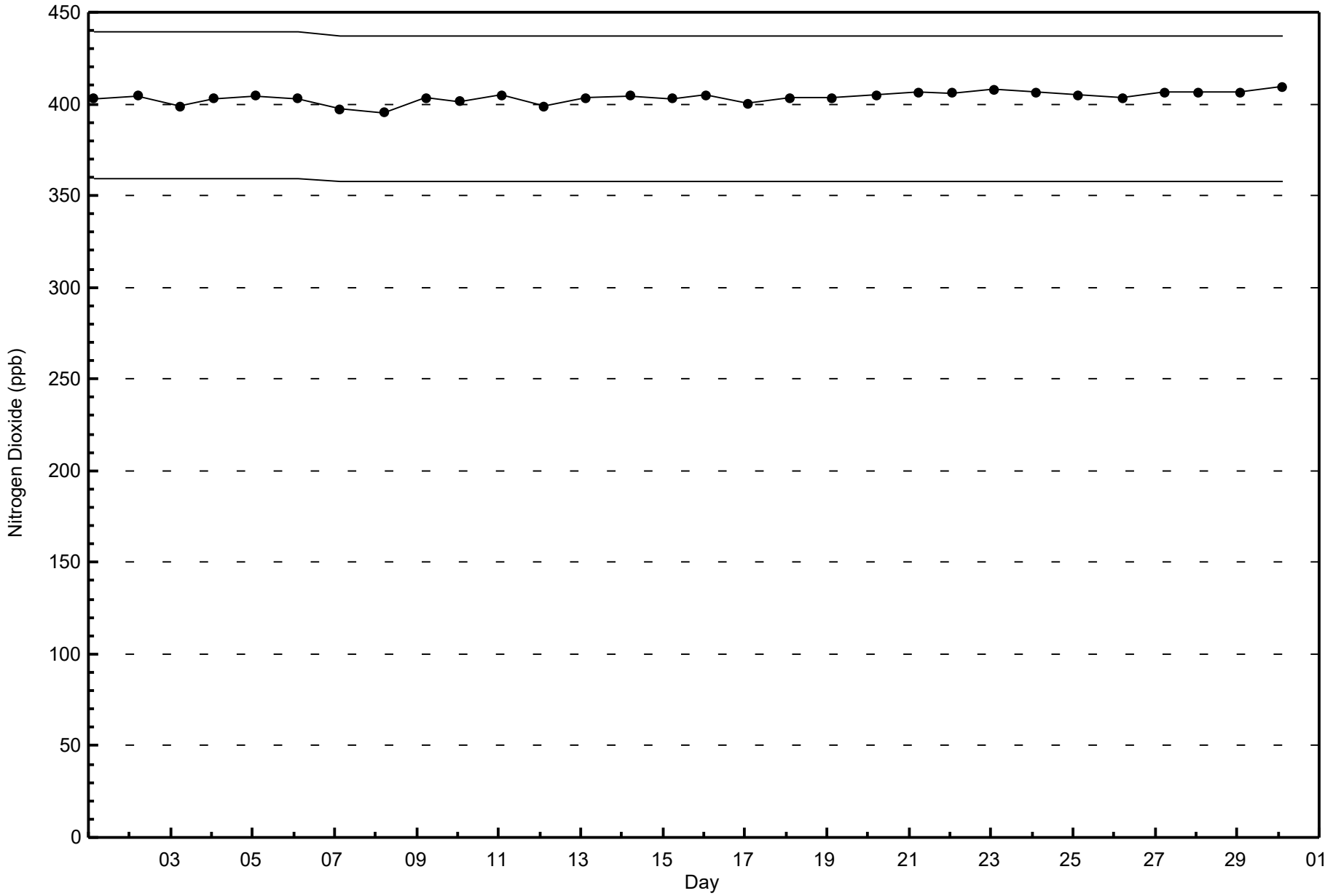
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Anzac



Total Number of Valid Hours: 684







**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

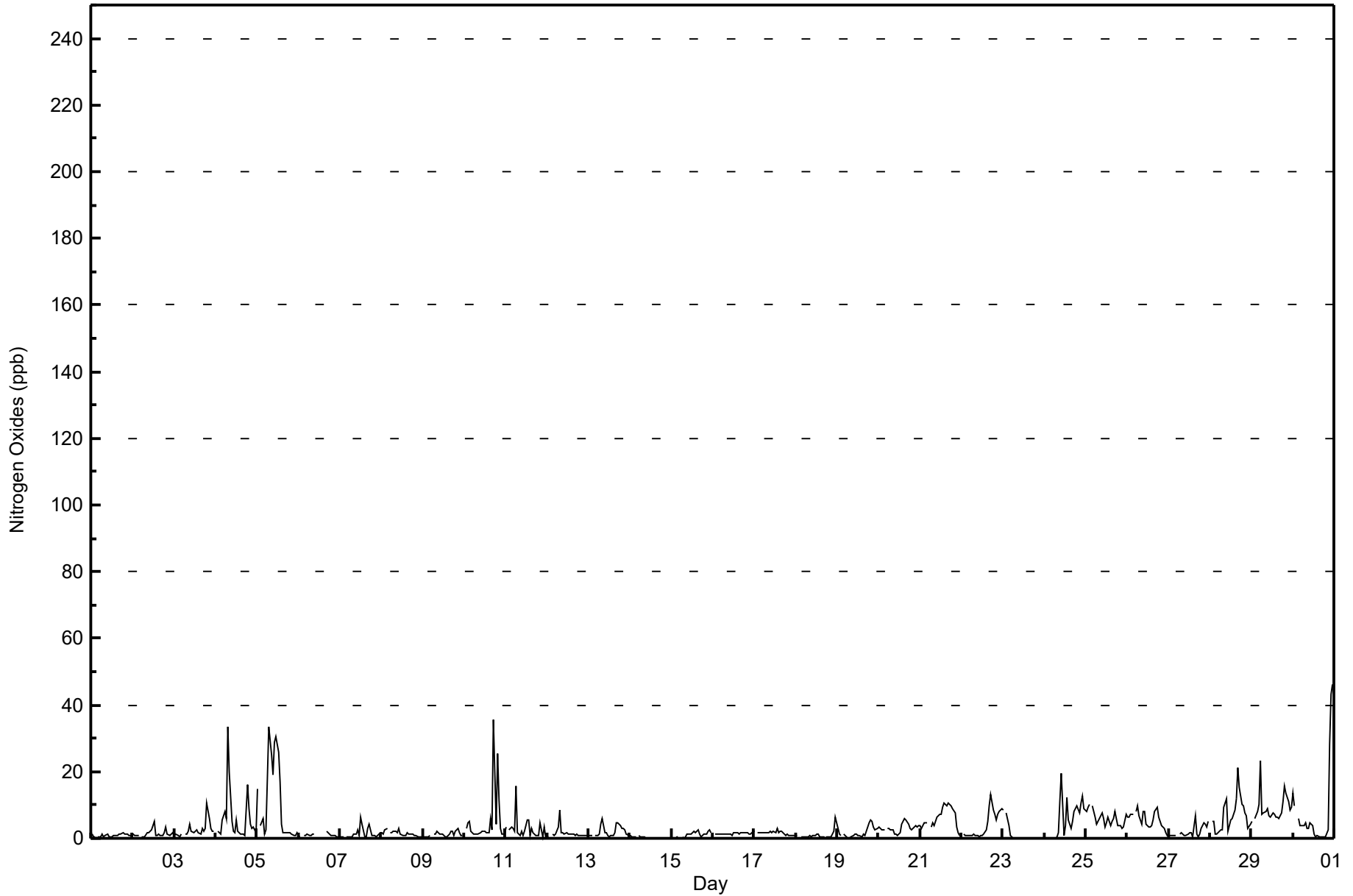
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Anzac - November 2024**

Maximum Value: 46.2 ppb on Dec 1 00:00		Maximum Daily Average: 10.6 ppb on Nov 5		Hours in Service: 720																						
Minimum Value: 0.1 ppb on Nov 23 23:00		Minimum Daily Average: 0.2 ppb on Nov 14		Hours of Data: 684																						
Maximum Diurnal Average: 4.7 ppb at hour 18		Minimum Diurnal Average: 2.2 ppb at hour 2		Hours of Missing Data: 36																						
Monthly Average: 3.44 ppb		Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 0.8 Median = 1.6 Q <sub>3</sub> = 4.1 P <sub>90</sub> = 8.1 P <sub>99</sub> = 28.3		Hours of Calibration: 36																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	1.2	0.6	0.6	Z	0.5	0.5	1.3	0.6	0.7	1.2	0.6	0.4	0.6	0.7	0.9	0.8	1.2	1.3	1.8	1.5	1.3	1.1	0.9	0.9	0.9	1.8
2-Nov	1.3	0.7	0.7	0.7	Z	0.5	0.5	0.4	1.6	1.7	2.3	2.6	5.1	1.0	0.9	1.1	0.8	0.7	1.5	3.5	1.3	0.7	1.3	1.6	1.4	5.1
3-Nov	0.7	1.4	0.6	0.5	1.5	Z	1.1	1.3	2.0	4.2	2.0	1.8	2.2	2.5	1.7	1.3	3.0	2.2	3.2	10.7	5.7	3.0	2.3	2.3	2.5	10.7
4-Nov	Z	2.2	1.9	1.4	5.4	8.0	5.7	33.6	19.8	4.9	2.0	1.6	5.5	2.0	1.4	1.4	1.1	0.9	16.3	9.1	4.3	3.0	3.5	1.8	5.9	33.6
5-Nov	14.9	Z	3.7	6.0	1.2	2.5	17.9	33.3	25.1	19.0	28.6	30.7	26.0	16.8	4.4	1.7	1.8	1.6	1.6	1.7	1.4	0.9	0.7	1.6	10.6	33.3
6-Nov	0.9	0.6	Z	0.8	0.8	1.1	0.7	1.0	1.2	1.3	C	C	C	C	C	C	2.3	1.9	1.3	1.0	0.9	1.0	0.6	0.5	--	2.3
7-Nov	0.5	0.4	0.5	Z	0.5	0.3	0.3	0.3	1.2	1.4	2.4	0.8	6.5	4.4	0.4	0.6	2.9	4.0	0.9	0.7	1.0	0.6	1.0	1.7	1.5	6.5
8-Nov	1.6	1.4	2.8	2.9	Z	1.7	1.9	2.0	2.0	1.5	2.9	1.3	1.0	0.8	0.8	1.5	1.2	1.2	1.1	0.9	0.7	0.6	0.4	0.4	1.4	2.9
9-Nov	0.4	0.4	0.5	0.6	0.6	Z	1.4	1.3	2.0	1.5	1.2	1.2	0.7	0.4	0.6	1.4	2.1	2.2	0.9	2.0	3.2	1.5	0.9	1.0	1.2	3.2
10-Nov	Z	3.0	4.5	5.2	2.1	1.3	1.3	1.3	1.3	1.9	2.1	2.1	2.0	1.8	1.5	6.1	2.6	35.5	4.2	25.3	11.4	3.1	1.4	1.2	5.3	35.5
11-Nov	3.3	Z	2.4	3.4	2.8	2.3	15.7	1.8	0.6	2.3	0.9	2.2	5.4	5.4	1.0	2.8	1.5	1.1	0.7	0.6	4.6	0.6	3.4	0.5	2.8	15.7
12-Nov	0.4	0.5	Z	1.3	1.0	1.2	3.6	8.5	1.7	1.6	1.2	1.5	1.4	1.4	1.1	1.3	0.9	1.4	0.8	1.0	1.0	0.7	0.7	1.0	1.5	8.5
13-Nov	0.9	0.9	0.8	Z	0.7	0.7	1.1	4.3	5.8	1.7	1.7	0.7	0.6	0.9	0.6	1.8	4.5	4.7	4.0	3.0	2.8	2.6	1.2	0.9	2.0	5.8
14-Nov	0.7	0.5	0.4	0.4	Z	0.7	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.7
15-Nov	0.4	0.1	0.2	0.2	0.2	Z	0.3	0.1	0.3	1.4	1.4	1.1	1.8	2.0	1.9	2.3	1.5	0.6	0.7	1.3	1.2	2.0	2.3	1.8	1.1	2.3
16-Nov	Z	1.4	1.2	1.2	1.3	1.3	1.4	1.2	1.3	1.3	1.4	1.1	1.8	1.6	1.5	1.3	1.6	1.6	1.6	1.8	1.7	1.3	1.4	2.3	1.5	2.3
17-Nov	2.1	Z	1.9	1.7	1.7	1.7	1.8	1.8	1.8	2.0	1.8	2.2	1.8	3.0	1.7	2.0	2.0	1.2	1.0	1.2	0.8	0.8	0.8	0.7	1.6	3.0
18-Nov	0.8	0.7	Z	0.5	0.5	0.4	0.3	0.4	0.7	0.6	1.0	0.8	1.2	1.3	0.5	0.3	0.4	0.2	0.3	0.4	0.6	1.3	2.3	6.5	1.0	6.5
19-Nov	3.1	1.1	0.8	Z	1.4	0.2	0.2	0.2	0.3	0.8	1.4	1.4	0.7	0.8	0.6	1.4	0.7	2.3	4.7	5.4	4.9	3.4	2.4	3.0	1.8	5.4
20-Nov	3.4	2.9	2.3	2.6	Z	2.9	3.0	2.6	2.4	1.4	1.1	1.0	1.8	4.4	5.0	5.7	5.5	4.2	3.0	2.4	2.9	3.9	3.5	4.0	3.1	5.7
21-Nov	3.6	3.0	4.5	4.7	4.9	Z	3.5	4.5	3.6	5.0	6.3	7.0	7.4	9.4	10.8	9.8	10.4	10.3	10.0	8.8	7.7	3.6	1.5	1.0	6.1	10.8
22-Nov	Z	1.1	0.8	0.8	0.8	0.9	1.1	1.5	1.0	0.8	0.6	0.6	0.7	1.1	2.7	4.9	9.8	13.3	8.5	7.1	5.5	7.0	8.1	9.1	3.8	13.3
23-Nov	8.5	Z	7.4	3.6	0.9	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0	8.5
24-Nov	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.5	1.5	10.9	19.5	0.7	3.8	12.4	5.7	3.0	5.1	8.1	9.1	9.7	7.7	10.4	12.9	9.0	5.7	19.5
25-Nov	7.8	9.5	10.3	Z	9.6	6.2	4.4	5.2	6.0	7.7	5.8	3.3	4.6	6.3	3.7	5.1	5.8	8.3	3.7	4.0	4.0	2.9	3.2	7.0	5.9	10.3
26-Nov	6.4	6.4	7.2	7.3	Z	7.9	9.9	6.6	4.1	8.0	8.2	4.4	3.3	3.5	3.9	5.4	7.8	9.2	6.6	5.1	4.0	2.8	1.9	0.9	5.7	9.9
27-Nov	1.0	1.0	1.0	0.8	0.9	Z	1.1	1.7	1.2	0.9	0.8	1.3	1.6	1.7	0.6	6.9	1.2	0.6	1.3	3.1	4.7	4.0	3.4	5.2	2.0	6.9
28-Nov	Z	5.1	5.0	1.4	1.4	2.0	2.4	2.6	9.3	11.9	2.3	3.6	5.4	5.9	8.4	11.8	21.0	15.2	10.2	9.9	7.7	6.9	3.0	4.2	6.8	21.0
29-Nov	5.2	Z	6.1	8.0	10.0	23.4	7.3	7.7	8.1	8.8	6.7	6.3	7.7	7.1	6.3	6.2	6.0	7.7	11.1	15.8	13.5	11.1	8.6	9.2	9.0	23.4
30-Nov	13.5	9.6	Z	6.0	3.9	4.0	3.8	4.8	3.0	2.8	4.5	3.8	1.5	0.5	1.0	0.4	0.2	0.2	0.5	0.3	2.7	28.3	43.4	46.2	8.0	46.2
																								Diurnal Average		
																								Diurnal Maximum		
																								3.3 2.2 2.7 2.5 2.2 2.9 3.1 4.4 3.7 3.6 3.8 3.0 3.5 3.4 2.4 3.1 3.5 4.7 3.7 4.6 3.7 3.6 3.9 4.2		
																								14.9 9.6 10.3 8.0 10.0 23.4 17.9 33.6 25.1 19.0 28.6 30.7 26.0 16.8 10.8 11.8 21.0 35.5 16.3 25.3 13.5 28.3 43.4 46.2		
Z - zerospan C - Calibration																										



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Anzac - November 2024**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Anzac - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	671	98.10	98.10
21 - 40	11	1.61	99.71
41 - 80	2	0.29	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Anzac - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	15	21	14	23	35	47	55	76	37	20	23	14	58	117	89	27	671
21 - 40	0	0	0	0	0	0	0	0	1	0	1	0	1	3	5	0	11
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	15	21	14	23	35	47	55	76	38	20	24	14	59	122	94	27	684

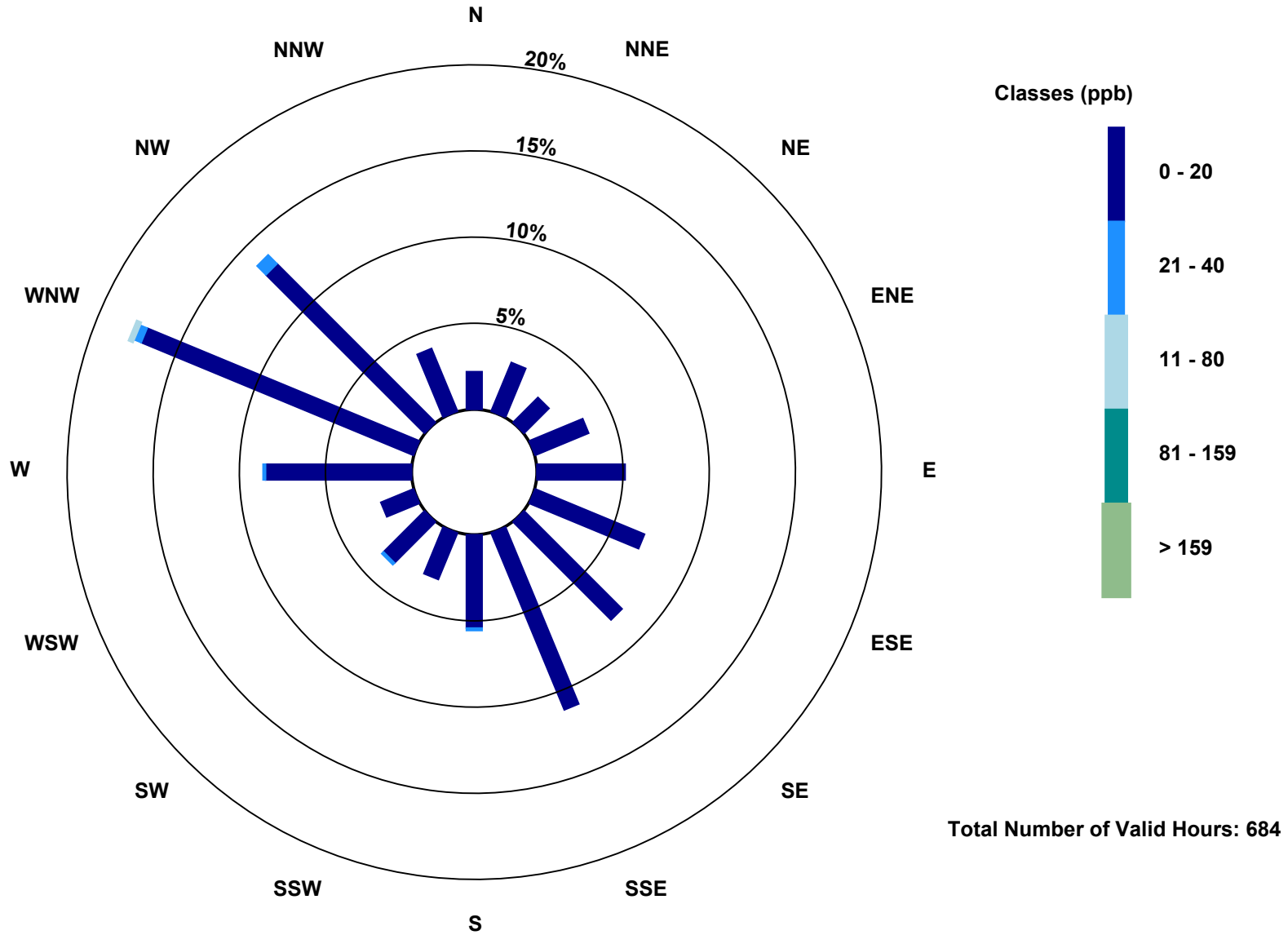
Total Number of Valid Hours: 684

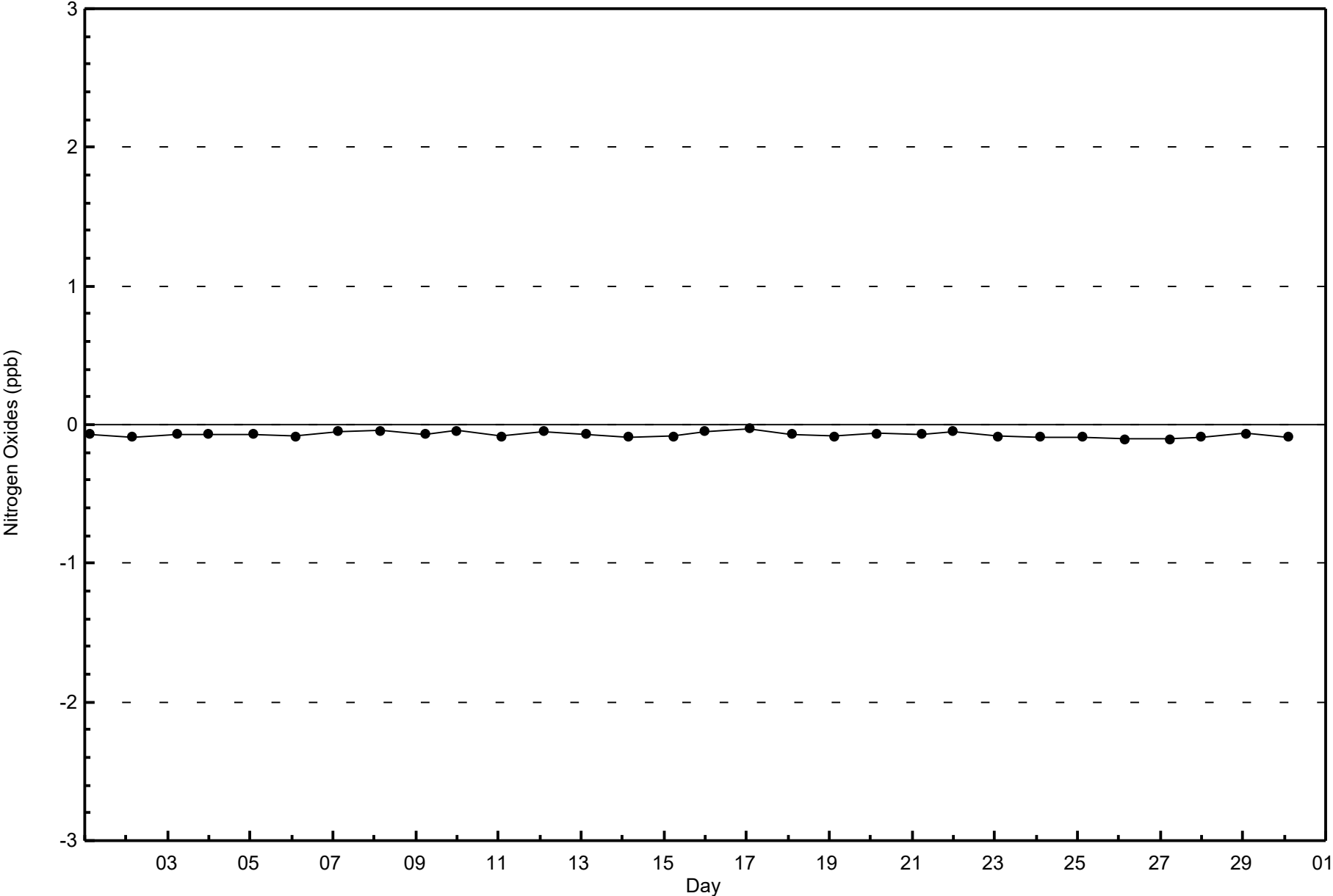
Total Number of Hours: 720

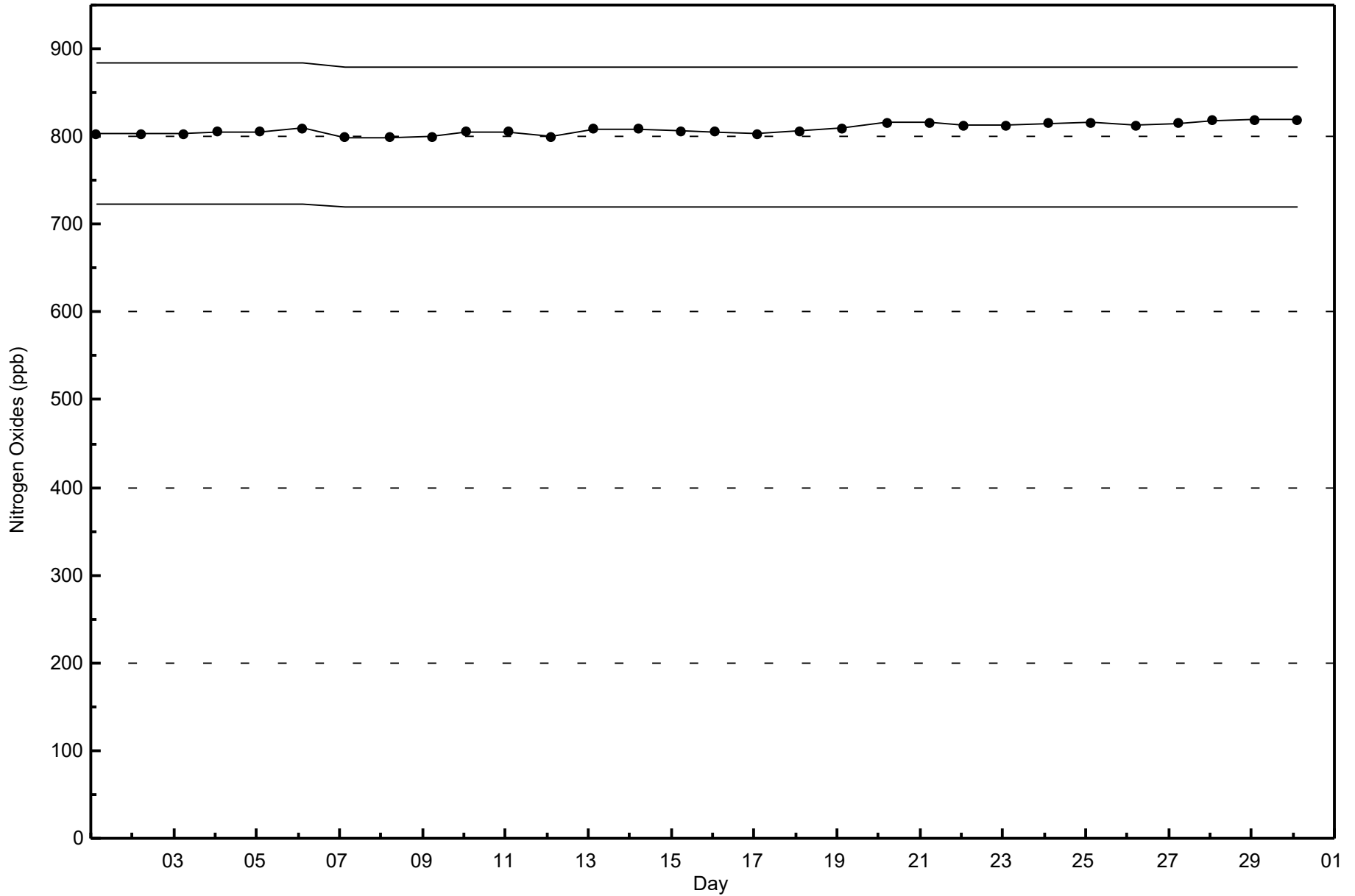


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Anzac









# Wood Buffalo Environmental Association

## Summary of Hour Averages

Ozone (O<sub>3</sub>) - ppb

Anzac - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 37.6 ppb on Nov 7 16:00	Maximum Daily Average: 32.4 ppb on Nov 7		Hours of Data:	682
Minimum Value: 1.1 ppb on Nov 5 09:00	Minimum Daily Average: 11.7 ppb on Nov 15		Hours of Missing Data:	38
Maximum Diurnal Average: 24.5 ppb at hour 15	Minimum Diurnal Average: 18.9 ppb at hour 4		Hours of Calibration:	33
Monthly Average: 21.03 ppb	Percentiles: P <sub>1</sub> = 3.9 P <sub>10</sub> = 12.4 Q <sub>1</sub> = 17.1 Median = 21.3 Q <sub>3</sub> = 25.5 P <sub>90</sub> = 29.5 P <sub>99</sub> = 35.0		Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	20.9	Z	21.1	20.3	21.1	20.4	18.7	18.5	18.4	18.1	20.0	19.6	19.1	18.6	18.2	17.5	16.1	15.9	14.2	14.1	14.3	14.1	14.6	14.5	17.8	21.1	
2-Nov	14.4	14.7	Z	13.9	11.9	11.8	12.8	11.8	10.8	11.8	11.6	14.7	16.3	17.1	17.1	17.1	17.5	17.8	16.0	14.6	16.8	16.8	15.8	16.0	14.7	17.8	
3-Nov	15.9	15.1	14.8	Z	10.8	10.5	11.5	12.3	13.7	17.6	19.1	20.4	21.4	20.9	20.1	18.3	14.6	14.1	13.4	13.3	15.1	15.2	15.2	16.0	15.6	21.4	
4-Nov	17.3	16.8	14.2	13.6	Z	11.7	15.3	16.2	15.2	16.3	21.6	22.9	24.4	24.8	25.4	25.0	21.9	13.0	7.3	8.4	10.1	7.0	6.3	8.6	15.8	25.4	
5-Nov	1.3	10.2	16.0	15.5	18.5	Z	UO	UO	1.1	4.9	2.7	2.2	3.6	5.0	14.7	16.3	17.2	17.2	17.4	18.6	19.3	20.1	19.1	20.6	12.5	20.6	
6-Nov	Z	21.8	20.8	20.1	20.7	22.0	24.4	25.2	26.7	28.5	30.3	29.0	29.5	29.7	29.5	28.7	27.5	26.3	23.7	21.5	23.9	24.4	30.9	31.7	25.9	31.7	
7-Nov	30.4	Z	25.8	25.1	24.7	31.7	34.9	33.4	32.9	32.7	34.9	36.1	35.3	35.9	37.5	37.6	33.8	31.2	31.7	31.1	31.5	33.4	31.8	30.7	32.4	37.6	
8-Nov	29.2	26.7	Z	23.4	23.5	23.2	23.4	23.1	23.8	25.0	25.1	30.0	30.7	31.5	32.1	31.3	30.0	25.2	24.2	29.6	30.6	28.7	31.1	32.6	27.6	32.6	
9-Nov	31.9	31.6	31.3	Z	29.5	28.7	30.2	31.8	32.2	33.2	33.8	34.2	34.3	37.0	37.2	34.2	30.3	28.2	26.4	26.2	24.1	27.7	26.0	24.0	30.6	37.2	
10-Nov	22.6	21.9	21.6	18.6	Z	20.9	18.5	20.3	23.5	24.0	24.1	24.2	25.7	27.5	29.2	28.6	25.3	21.9	19.3	17.3	15.3	22.0	21.5	17.9	22.2	29.2	
11-Nov	22.5	21.3	17.6	16.1	20.3	Z	21.0	23.3	26.1	25.0	27.4	26.8	23.2	22.4	25.2	21.8	21.2	20.5	20.2	20.0	18.8	19.1	14.9	16.1	21.3	27.4	
12-Nov	Z	13.9	12.5	10.6	8.9	10.9	9.8	10.6	12.7	11.7	13.9	14.6	14.2	16.1	18.7	17.3	14.5	14.2	14.7	15.2	15.1	15.3	16.1	18.0	13.9	18.7	
13-Nov	18.8	Z	19.5	19.4	19.2	19.7	19.9	19.3	17.7	20.8	21.1	21.6	21.9	21.8	21.6	19.1	15.3	13.4	13.3	13.3	14.8	16.0	17.9	18.6	18.4	21.9	
14-Nov	18.5	19.0	Z	20.1	20.1	19.4	19.8	20.3	20.0	20.5	20.8	21.1	21.4	22.1	22.0	22.0	21.9	20.9	20.4	19.1	18.0	19.3	18.9	18.2	20.2	22.1	
15-Nov	17.4	18.1	16.4	Z	15.4	15.0	15.1	14.7	13.5	12.7	12.1	12.4	12.9	14.2	12.9	11.8	10.1	8.0	7.1	6.6	6.3	5.1	5.1	5.9	11.7	18.1	
16-Nov	6.0	9.3	9.9	10.2	Z	14.7	14.7	16.6	18.4	20.0	21.7	23.0	22.7	22.6	23.0	25.0	24.3	23.8	23.5	22.6	21.8	21.7	20.9	18.7	18.9	25.0	
17-Nov	18.4	18.3	18.3	18.7	18.9	Z	17.9	17.6	17.0	16.5	16.5	16.5	17.4	19.3	23.6	23.3	24.3	27.3	25.0	13.4	14.0	16.5	21.6	20.6	19.2	27.3	
18-Nov	Z	18.6	19.2	20.4	19.0	19.7	19.9	20.0	20.1	20.5	20.8	21.7	22.2	22.5	21.3	21.7	22.0	22.1	22.0	22.0	21.6	21.2	19.7	10.1	20.4	22.5	
19-Nov	13.9	Z	19.0	19.5	23.2	26.5	25.2	24.8	24.0	22.4	21.8	23.1	25.0	26.7	28.1	28.0	28.3	26.3	23.7	24.8	24.9	27.3	28.1	27.1	24.4	28.3	
20-Nov	26.8	27.0	Z	27.6	27.6	27.8	26.7	27.0	27.7	29.0	29.2	29.7	29.4	29.0	26.9	25.6	24.8	25.7	26.8	26.7	25.8	25.0	25.4	25.0	27.0	29.7	
21-Nov	24.9	25.0	23.1	Z	23.0	23.9	24.9	23.8	25.1	24.3	23.2	23.0	22.8	21.3	19.7	19.5	18.4	17.9	17.4	18.3	18.9	22.0	24.1	23.0	22.1	25.1	
22-Nov	21.5	20.7	20.5	19.8	Z	22.5	23.7	23.7	24.1	24.8	24.9	26.3	27.1	27.5	27.2	24.7	19.9	15.0	19.0	21.0	22.8	21.7	19.9	18.7	22.5	27.5	
23-Nov	19.5	18.4	18.9	22.6	24.2	Z	26.1	25.7	25.5	25.5	25.5	25.9	26.4	26.6	26.9	27.2	27.1	26.6	26.9	26.6	27.2	27.2	27.4	28.0	25.3	28.0	
24-Nov	Z	29.1	30.1	30.6	30.4	29.1	29.4	27.3	24.9	14.7	13.0	30.8	27.3	18.7	25.1	26.2	20.4	13.3	10.7	7.3	6.0	4.0	4.3	6.1	20.0	30.8	
25-Nov	8.0	Z	5.5	1.8	3.2	7.0	9.2	12.2	11.9	14.5	18.1	21.2	Z	C	C	C	21.8	21.6	20.6	23.7	23.9	24.0	25.0	25.1	21.3	16.0	25.1
26-Nov	21.5	21.5	Z	20.3	19.4	19.7	17.6	19.9	22.3	21.1	21.8	25.9	26.7	25.0	24.4	22.6	20.2	18.3	17.1	17.3	19.2	21.5	27.1	28.7	21.7	28.7	
27-Nov	28.4	28.3	28.3	Z	30.1	30.3	30.7	30.7	31.4	31.5	31.6	31.4	31.1	31.4	31.1	30.1	29.7	30.0	30.5	28.1	26.5	27.1	27.0	24.6	29.6	31.6	
28-Nov	23.6	26.0	25.9	26.9	Z	26.8	27.5	27.8	27.9	27.9	28.3	27.7	26.0	25.8	23.8	20.5	19.4	17.0	19.2	19.0	20.7	21.2	25.0	24.5	24.3	28.3	
29-Nov	23.4	22.8	22.4	19.6	17.0	Z	19.4	19.1	19.1	19.7	22.2	23.4	22.6	22.4	22.2	19.7	15.4	11.4	8.6	6.3	5.9	5.7	8.9	8.0	16.8	23.4	
30-Nov	Z	12.2	12.9	16.9	19.6	19.2	19.1	18.5	20.3	21.7	21.1	21.9	23.9	24.8	24.6	25.4	25.4	24.8	22.5	22.9	20.4	UO	UO	UO	20.9	25.4	

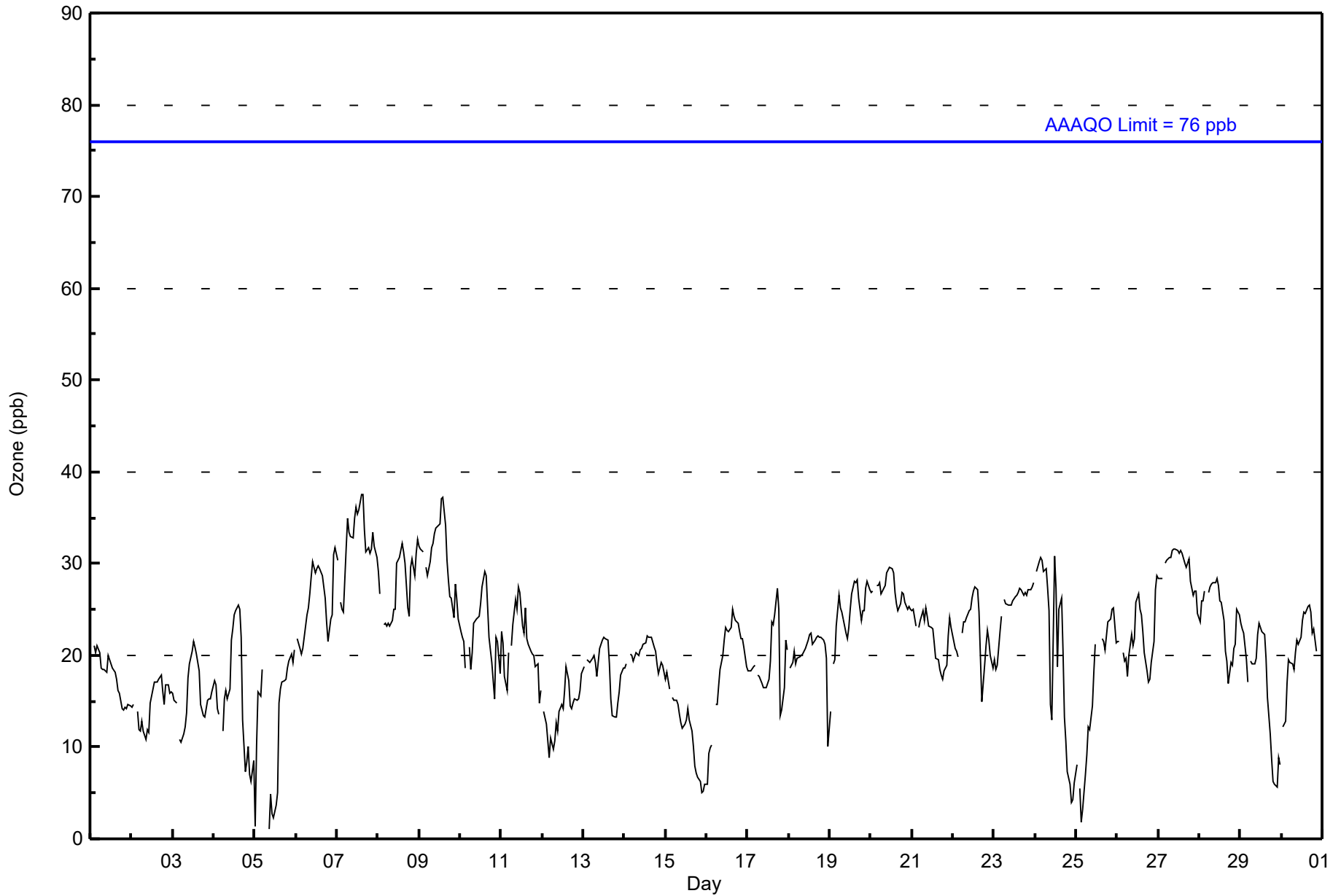
19.9	20.4	19.4	18.9	20.0	20.5	20.9	21.2	20.9	21.2	21.9	23.4	23.6	23.7	24.5	23.6	21.9	20.3	19.5	19.0	19.1	19.7	20.3	19.8	Diurnal Average	
31.9	31.6	31.3	30.6	30.4	31.7	34.9	33.4	32.9	33.2	34.9	36.1	35.3	37.0	37.5	37.6	33.8	31.2	31.7	31.1	31.5	33.4	31.8	32.6	Diurnal Maximum	

Z - zeronspan      C - Calibration      UO - Unstable Operation  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb



Wood Buffalo Environmental Association  
Hourly Averages

Ozone (O<sub>3</sub>) - ppb  
Anzac - November 2024





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Anzac - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	312	45.75	45.75
21 - 50	370	54.25	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb  
Anzac - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 20	4	8	4	8	23	32	37	43	17	6	8	8	31	47	30	6	312
21 - 50	11	13	10	13	13	14	18	30	20	15	17	11	28	73	63	21	370
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	15	21	14	21	36	46	55	73	37	21	25	19	59	120	93	27	682

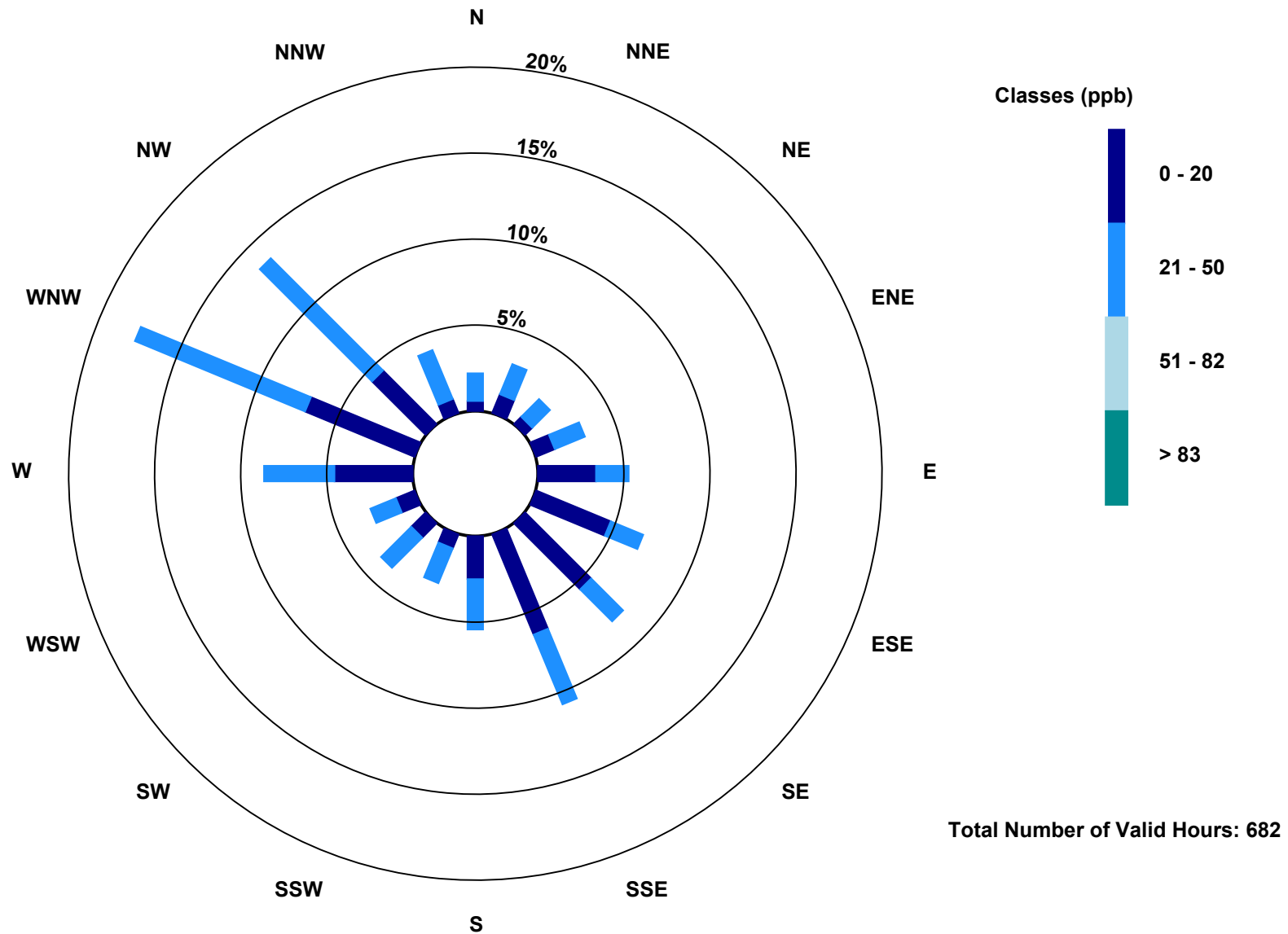
Total Number of Valid Hours: 682

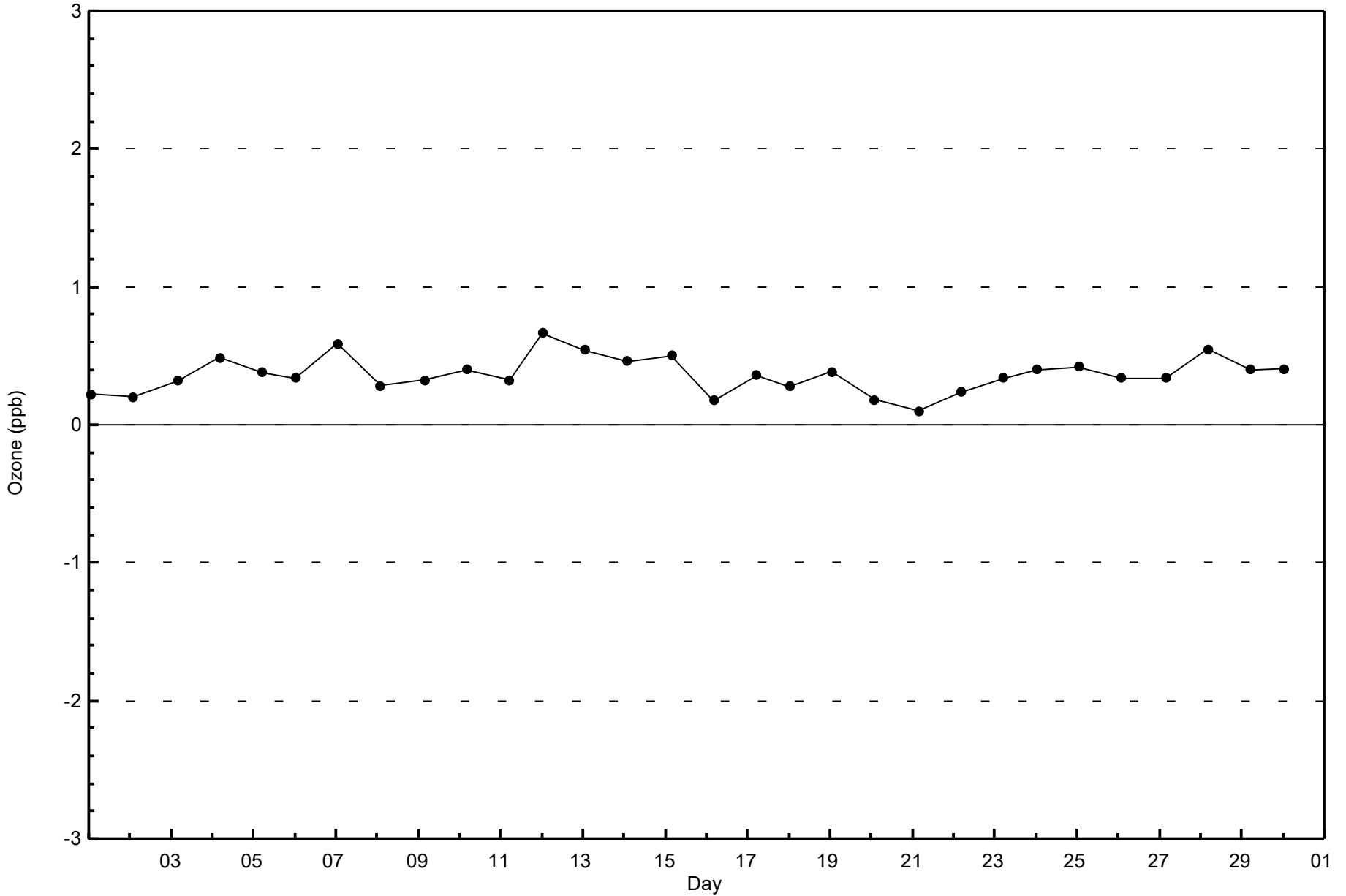
Total Number of Hours: 720

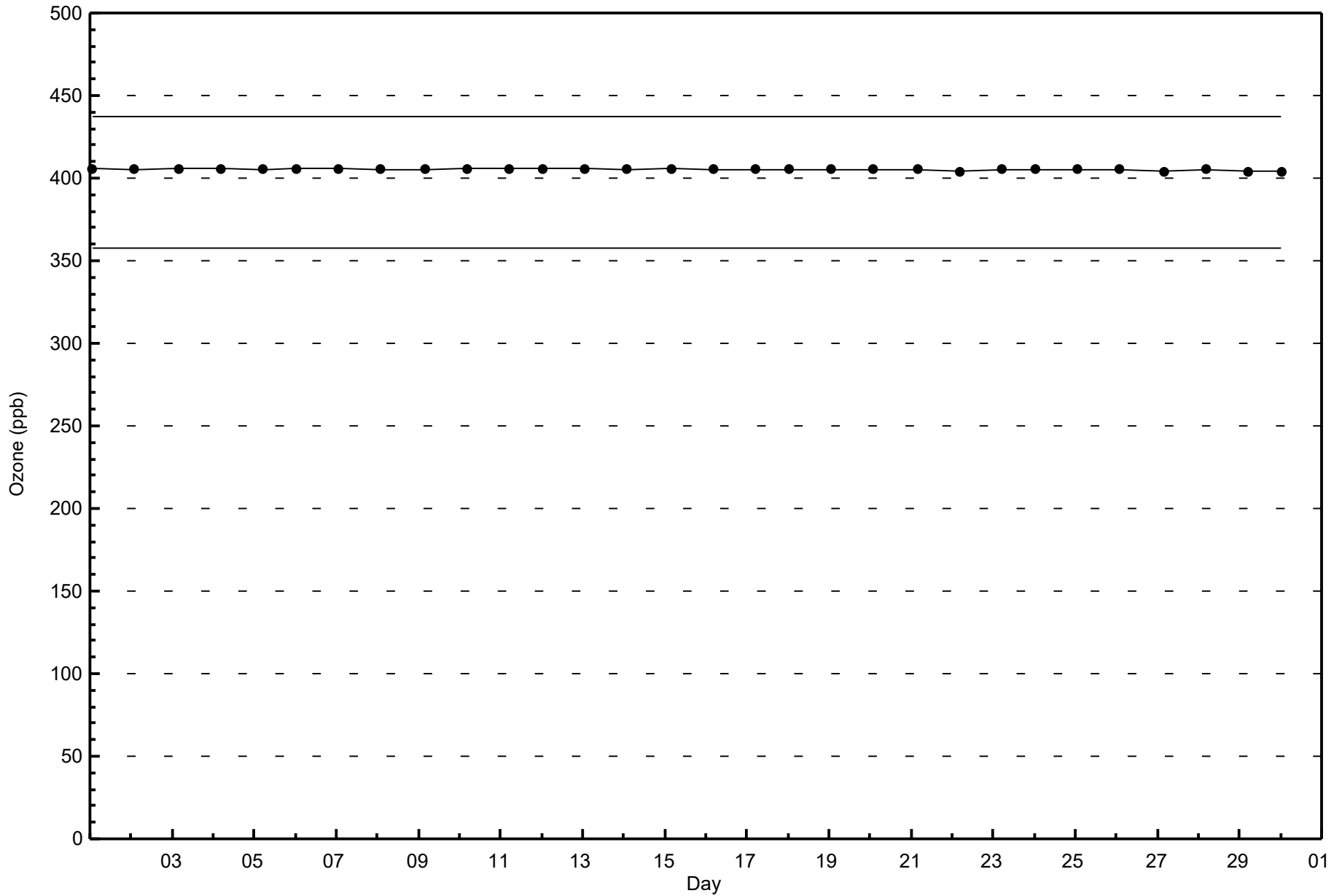


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Ozone (O<sub>3</sub>) - ppb  
Anzac









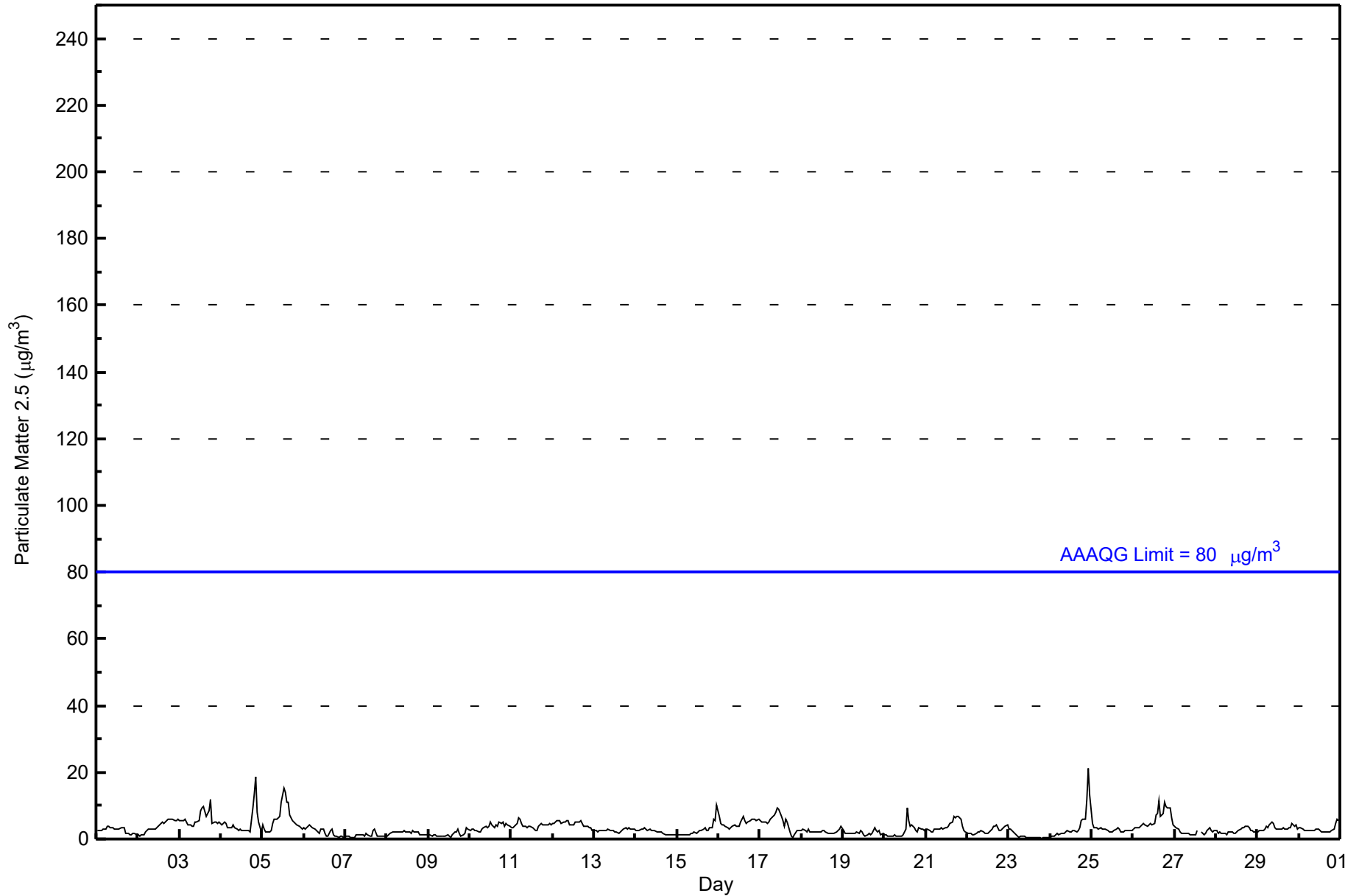
Wood Buffalo Environmental Association

Summary of Hour Averages

Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

Anzac - November 2024

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	720																												
Maximum Value: 21.1 µg/m <sup>3</sup> on Nov 24 23:00		Maximum Daily Average: 6.1 µg/m <sup>3</sup> on Nov 3																	Hours of Data: 719																														
Minimum Value: 0.2 µg/m <sup>3</sup> on Nov 23 20:00		Minimum Daily Average: 0.8 µg/m <sup>3</sup> on Nov 23																	Hours of Missing Data: 1																														
Maximum Diurnal Average: 3.8 µg/m <sup>3</sup> at hour 23		Minimum Diurnal Average: 2.7 µg/m <sup>3</sup> at hour 6																	Hours of Calibration: 1																														
Monthly Average: 3.22 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 1.1 Q <sub>1</sub> = 1.9 Median = 2.7 Q <sub>3</sub> = 4.0 P <sub>90</sub> = 5.7 P <sub>99</sub> = 11.8																	Percent Operational Time: 100.0																														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	2.5	2.5	2.5	2.7	3.1	3.2	3.9	3.7	3.3	3.3	3.1	3.0	3.0	3.2	3.5	3.5	3.5	1.8	1.6	1.4	1.5	1.8	1.6	1.4	2.7	3.9																							
2-Nov	1.2	1.0	1.1	1.4	2.1	2.6	2.8	3.1	3.1	2.9	2.9	3.3	4.3	4.6	5.0	4.8	5.0	6.0	5.8	5.9	5.9	5.7	5.7	5.9	3.8	6.0																							
3-Nov	5.6	5.7	5.7	5.7	5.2	4.3	4.3	3.8	3.9	5.1	5.3	5.7	8.3	9.1	9.7	6.7	7.5	8.5	11.9	4.8	4.9	4.9	4.8	5.0	6.1	11.9																							
4-Nov	4.3	4.5	5.1	4.6	3.6	3.3	3.2	4.2	3.5	3.0	2.7	2.9	2.7	2.4	2.5	2.6	2.5	2.3	9.5	13.7	18.6	8.1	4.9	2.3	4.9	18.6																							
5-Nov	4.4	2.9	2.3	2.2	2.2	2.4	4.5	5.7	6.1	6.4	6.6	10.9	15.4	14.1	11.0	10.9	7.1	5.3	4.9	4.6	4.2	3.9	3.5	3.2	6.0	15.4																							
6-Nov	3.2	3.1	3.7	4.1	3.8	3.3	2.8	2.5	2.2	1.9	3.1	2.8	1.7	1.0	1.0	2.5	3.0	1.3	0.9	0.7	0.6	0.7	0.7	0.6	2.1	4.1																							
7-Nov	0.6	0.7	0.8	0.5	0.4	0.6	1.1	1.2	1.2	1.3	1.1	1.0	1.7	1.1	0.7	0.8	2.5	3.0	1.0	0.8	0.7	0.7	0.9	0.8	1.0	3.0																							
8-Nov	0.9	1.1	1.8	2.0	2.1	2.2	2.3	2.3	2.3	2.3	2.5	2.2	2.0	1.9	1.8	2.5	2.0	2.3	2.2	1.4	1.1	1.1	1.2	1.1	1.9	2.5																							
9-Nov	1.3	1.3	1.1	1.1	1.1	1.1	1.0	0.9	1.0	0.8	0.9	1.1	1.0	0.5	1.1	2.2	2.3	2.8	1.6	0.9	1.4	1.6	3.3	3.1	1.4	3.3																							
10-Nov	2.5	3.0	2.8	2.5	2.6	2.3	2.3	2.9	3.3	3.7	3.6	3.9	5.0	4.4	3.5	4.2	4.0	4.9	4.8	5.1	4.0	4.5	4.3	3.8	3.7	5.1																							
11-Nov	3.2	3.4	3.7	4.7	6.4	5.8	4.7	4.0	3.6	3.6	3.7	3.7	3.3	2.9	2.6	2.6	3.9	4.8	4.0	4.1	4.2	4.4	4.6	4.4	4.0	6.4																							
12-Nov	4.6	4.8	5.4	5.6	5.5	4.7	5.2	5.2	5.6	5.4	4.2	4.3	4.1	5.0	5.2	5.3	5.7	4.7	3.9	4.0	4.0	3.5	3.5	2.7	4.7	5.7																							
13-Nov	2.6	2.5	2.3	2.4	2.4	2.4	2.6	2.5	3.1	2.7	2.6	2.5	2.2	2.1	1.9	2.1	2.5	3.0	3.2	3.1	3.2	3.0	2.9	2.8	2.6	3.2																							
14-Nov	2.7	2.7	2.7	2.9	3.2	3.3	3.0	2.7	2.8	2.6	2.5	2.4	2.2	2.0	2.0	1.9	1.6	1.4	1.2	1.2	1.3	1.3	1.3	1.3	2.2	3.3																							
15-Nov	1.4	1.4	1.5	1.5	1.4	1.3	1.4	1.5	1.5	1.8	2.0	1.9	2.2	2.5	2.6	2.9	3.2	2.7	2.7	3.4	3.3	5.9	5.6	10.1	2.7	10.1																							
16-Nov	7.0	4.7	4.3	4.3	3.9	3.4	3.2	3.2	3.7	4.1	4.0	3.8	3.7	4.9	6.9	5.4	4.6	4.9	5.3	5.9	5.8	5.8	5.6	5.9	4.8	7.0																							
17-Nov	5.7	4.9	5.2	5.3	4.7	5.0	5.7	6.5	7.2	8.3	9.4	8.7	6.8	5.7	3.9	5.9	4.9	2.3	0.8	0.6	1.1	2.4	2.5	2.5	4.8	9.4																							
18-Nov	2.5	2.8	2.5	2.2	2.8	2.2	2.0	2.0	2.0	2.2	2.2	2.1	2.6	2.4	2.0	1.7	1.7	1.6	1.6	1.7	1.9	2.6	3.0	3.8	2.3	3.8																							
19-Nov	2.6	1.7	1.5	1.6	1.8	1.7	1.7	1.8	2.0	1.6	2.4	2.1	1.1	1.0	1.4	1.5	1.5	1.9	3.2	2.6	2.3	2.4	1.4	1.5	1.8	3.2																							
20-Nov	1.4	1.2	0.9	0.9	0.9	0.7	1.1	1.0	0.9	0.9	1.0	1.3	2.8	9.5	5.6	4.0	4.1	3.2	2.6	2.1	3.2	2.8	2.8	2.7	2.4	9.5																							
21-Nov	2.8	2.8	2.6	2.2	2.3	2.8	2.8	3.2	3.1	3.2	3.2	3.3	3.3	3.8	4.5	5.1	6.8	6.3	6.6	6.9	6.0	3.9	2.6	2.1	3.8	6.9																							
22-Nov	1.8	1.8	1.5	1.5	1.4	1.7	2.0	2.1	2.4	2.1	1.9	1.8	1.9	2.1	2.8	3.7	3.8	4.3	2.5	2.7	3.0	3.5	3.8	4.1	2.5	4.3																							
23-Nov	2.8	2.8	2.5	1.7	1.1	0.8	0.6	0.6	0.7	0.6	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.8	2.8																							
24-Nov	0.5	0.6	1.0	1.3	1.5	1.4	1.6	1.6	1.7	2.1	2.6	2.2	2.3	2.7	2.5	2.3	2.4	3.4	5.4	5.9	6.0	11.9	21.1	13.3	4.1	21.1																							
25-Nov	4.8	3.4	3.5	3.6	2.9	3.6	2.9	2.9	3.0	2.5	2.2	2.1	2.2	2.5	2.9	3.4	2.8	2.3	2.3	2.6	2.6	2.7	2.7	2.7	2.9	4.8																							
26-Nov	2.8	3.4	3.4	3.6	3.8	4.3	4.6	4.1	3.9	4.3	4.6	4.1	4.7	7.1	7.8	11.5	6.9	7.6	11.2	9.8	9.3	9.3	6.3	4.3	5.9	11.5																							
27-Nov	3.7	3.3	2.9	2.2	1.7	1.7	1.6	1.6	1.7	1.3	1.3	1.1	1.3	2.5	C	2.1	1.8	1.4	1.5	2.4	3.5	2.6	2.2	2.4	2.1	3.7																							
28-Nov	2.4	1.9	2.3	1.6	1.5	1.8	1.4	2.3	1.9	2.1	1.5	1.9	2.2	2.5	3.2	3.4	3.5	4.0	3.7	3.2	2.7	2.6	2.1	2.3	2.4	4.0																							
29-Nov	2.2	2.4	2.4	2.7	3.1	3.9	3.2	4.2	5.1	4.6	3.3	2.9	3.0	2.9	2.8	3.5	2.8	3.0	3.3	3.4	4.7	3.8	4.0	3.0	3.3	5.1																							
30-Nov	3.4	3.2	3.1	2.6	2.5	2.4	2.3	2.5	2.4	2.5	2.9	2.8	2.4	2.2	2.3	2.2	2.2	2.2	2.3	2.5	3.0	4.7	5.9	5.4	2.9	5.9																							
																								2.9	2.7	2.7	2.7	2.7	2.7	2.9	2.9	3.0	3.0	3.1	3.3	3.6	3.5	3.7	3.5	3.4	3.7	3.6	3.8	3.8	3.8	3.5	Diurnal Average		
																								7.0	5.7	5.7	5.7	6.4	5.8	5.7	6.5	7.2	8.3	9.4	10.9	15.4	14.1	11.0	11.5	7.5	8.5	11.9	13.7	18.6	11.9	21.1	13.3	Diurnal Maximum	
C - Calibration																																																	
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m <sup>3</sup> 24-hr 29 µg/m <sup>3</sup>																																																	





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Anzac - November 2024**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	637	88.60	88.60
6 - 15	80	11.13	99.72
16 - 25	2	0.28	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>**  
**Anzac - November 2024**

Concentration Ranges (µg/m <sup>3</sup> )	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	16	21	15	23	37	47	51	62	25	18	19	18	57	114	87	27	637
6 - 15	0	0	0	0	0	3	7	15	15	5	5	1	4	14	11	0	80
16 - 25	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	16	21	15	23	37	50	58	78	40	23	25	19	61	128	98	27	719

Total Number of Valid Hours: 719

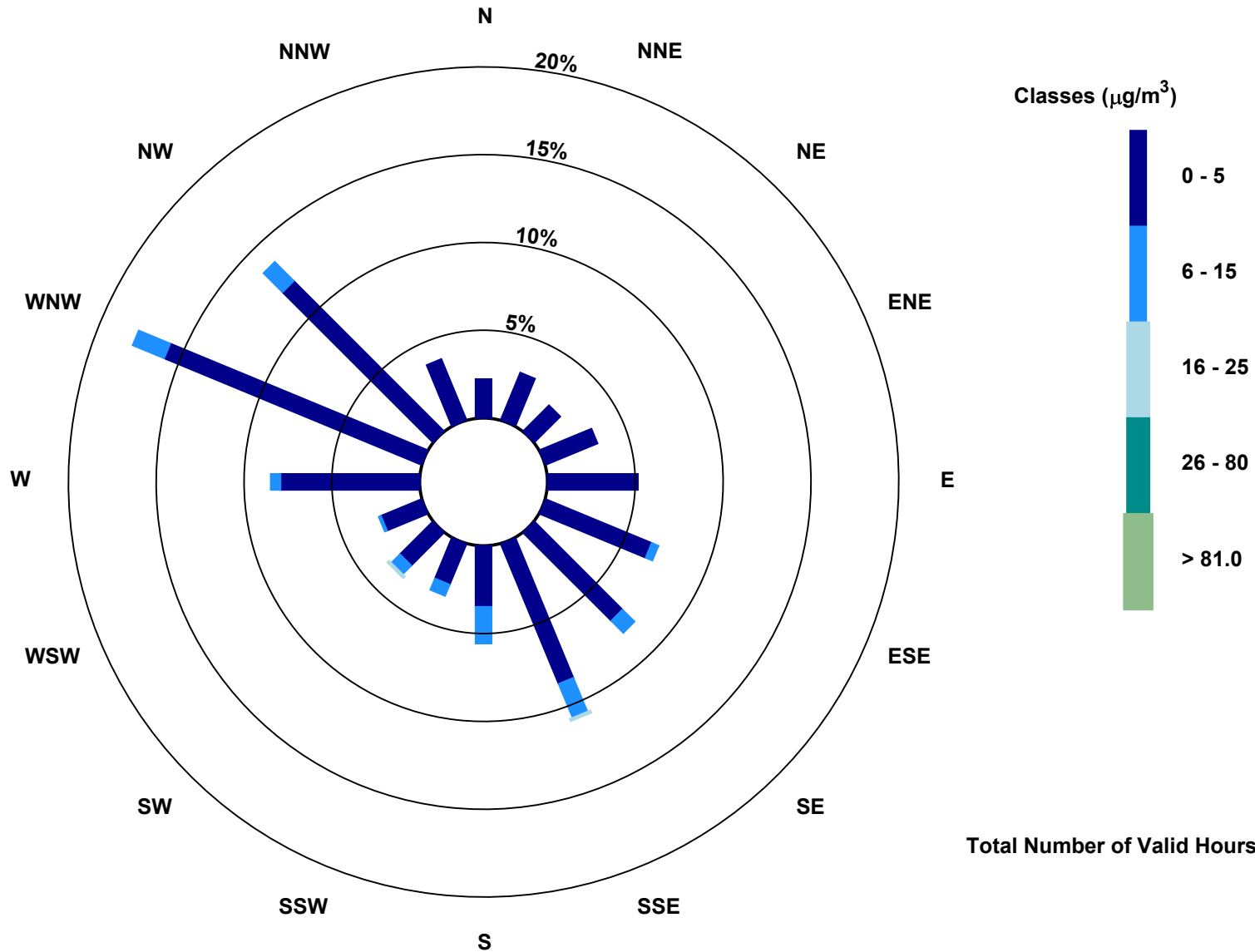
Total Number of Hours: 720





Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Anzac

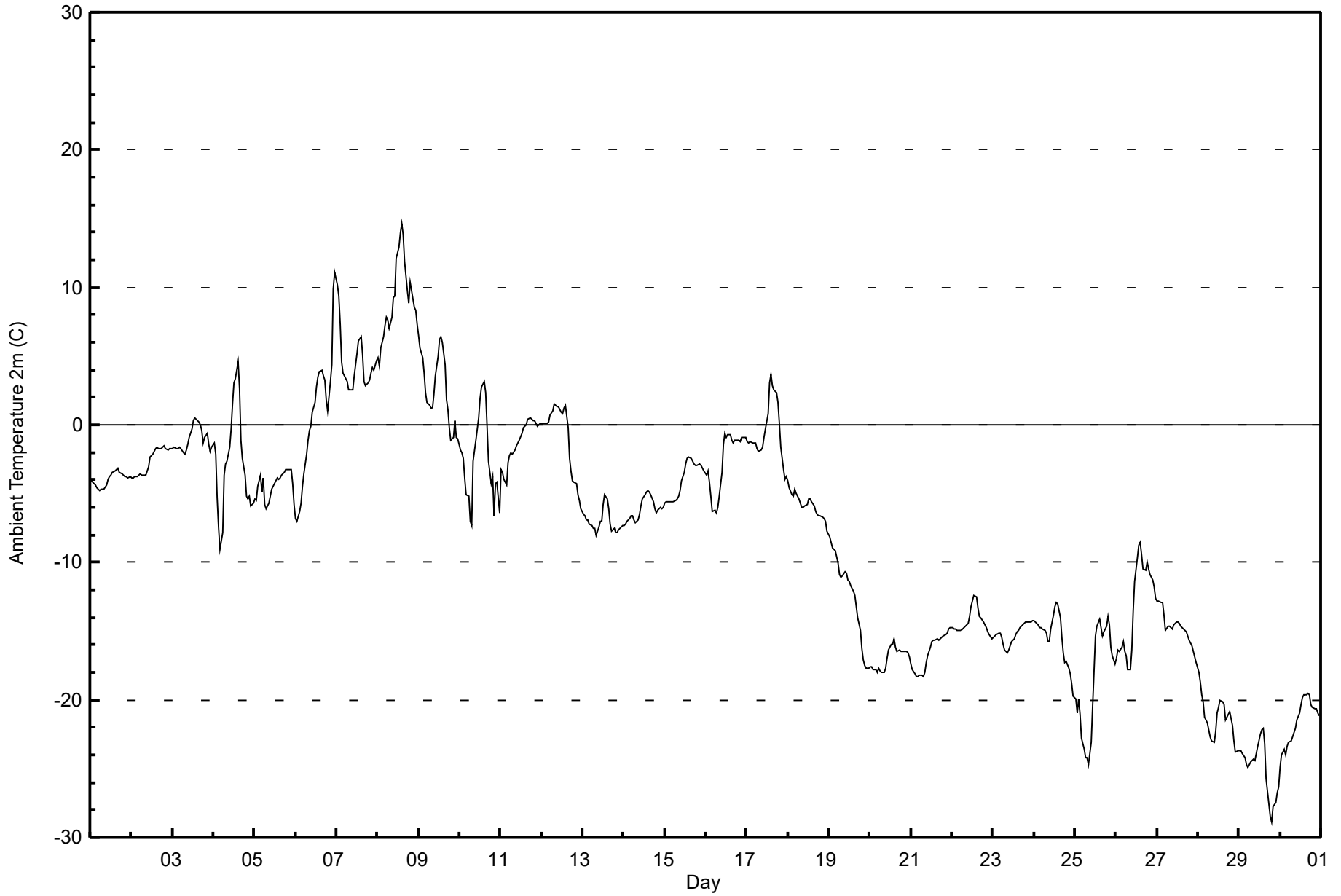




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Ambient Temperature 2m (AT2) - C**  
**Anzac - November 2024**

Maximum Value: 14.6 C on Nov 8 15:00      Maximum Daily Average: 9.1 C on Nov 8																						Hours in Service: 720 Hours of Data: 720																										
Minimum Value: -28.9 C on Nov 29 20:00      Minimum Daily Average: -25.0 C on Nov 29 Maximum Diurnal Average: -5.6 C at hour 15      Minimum Diurnal Average: -9.1 C at hour 8 Monthly Average: -7.80 C      Percentiles: P <sub>1</sub> = -25.5 P <sub>10</sub> = -20.1 Q <sub>1</sub> = -15.2 Median = -5.7 Q <sub>3</sub> = -1.6 P <sub>90</sub> = 2.8 P <sub>99</sub> = 10.4																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-4.1	-4.2	-4.3	-4.3	-4.6	-4.8	-4.7	-4.7	-4.7	-4.4	-4.0	-3.8	-3.6	-3.5	-3.3	-3.2	-3.2	-3.5	-3.6	-3.7	-3.8	-3.8	-3.8	-3.8	-4.0	-3.2																						
2-Nov	-3.9	-3.8	-3.8	-3.8	-3.7	-3.6	-3.7	-3.7	-3.6	-3.4	-3.0	-2.4	-2.2	-1.9	-1.7	-1.7	-1.7	-1.8	-1.6	-1.6	-1.7	-1.8	-1.8	-1.8	-2.6	-1.6																						
3-Nov	-1.7	-1.6	-1.7	-1.7	-1.6	-1.8	-2.1	-2.1	-1.9	-1.4	-1.0	-0.3	0.3	0.6	0.4	0.2	0.0	-0.4	-1.3	-0.9	-0.6	-1.4	-1.9	-1.7	-1.1	0.6																						
4-Nov	-1.3	-2.2	-5.3	-7.4	-9.1	-7.8	-3.7	-2.9	-2.6	-1.7	-0.3	1.5	3.1	3.4	4.6	2.6	-1.1	-2.4	-3.6	-5.2	-5.4	-5.2	-5.9	-5.7	-2.6	4.6																						
5-Nov	-5.4	-5.5	-4.5	-3.6	-4.9	-3.9	-5.8	-6.1	-5.7	-5.2	-4.7	-4.5	-4.1	-3.9	-4.0	-3.9	-3.6	-3.4	-3.2	-3.2	-3.2	-3.3	-4.3	-5.8	-4.4	-3.2																						
6-Nov	-6.8	-7.0	-6.3	-5.6	-4.5	-3.6	-2.2	-1.2	-0.4	-0.1	0.9	1.6	2.8	3.5	3.9	4.0	3.5	3.2	1.9	1.0	3.1	4.4	9.8	11.1	0.7	11.1																						
7-Nov	10.2	9.3	7.3	4.5	3.8	3.4	3.1	2.5	2.5	2.5	3.6	4.4	5.2	6.1	6.4	5.1	3.1	2.9	3.1	3.2	3.7	4.2	3.9	4.7	4.5	10.2																						
8-Nov	4.9	4.3	5.6	6.4	7.2	7.8	7.7	7.0	7.8	9.2	9.3	12.1	12.9	14.0	14.6	13.8	11.9	9.7	8.9	10.4	9.7	8.6	8.3	7.3	9.1	14.6																						
9-Nov	6.6	5.6	4.9	3.7	2.4	1.6	1.4	1.2	1.2	2.2	3.5	5.0	6.2	6.4	6.0	4.3	1.9	1.1	-0.2	-1.1	-1.0	0.3	-0.9	-1.0	2.6	6.6																						
10-Nov	-1.8	-2.1	-2.4	-3.9	-5.1	-5.2	-7.0	-7.3	-2.6	-1.1	-0.3	0.5	1.9	2.8	3.2	2.3	-0.1	-2.7	-4.3	-3.8	-6.6	-4.3	-4.2	-6.4	-2.5	3.2																						
11-Nov	-3.3	-3.4	-3.9	-4.3	-2.7	-2.3	-2.0	-2.1	-1.9	-1.5	-1.3	-1.1	-0.6	-0.2	-0.1	0.0	0.4	0.5	0.4	0.3	0.3	-0.1	0.0	0.1	-1.2	0.5																						
12-Nov	0.1	0.1	0.1	0.1	0.2	0.7	1.0	1.6	1.4	1.3	1.3	0.9	0.8	1.2	1.5	-0.2	-2.4	-3.3	-4.1	-4.2	-4.3	-5.0	-5.5	-6.1	-1.0	1.6																						
13-Nov	-6.5	-6.7	-6.9	-6.9	-7.2	-7.3	-7.6	-7.5	-8.1	-7.4	-7.1	-7.0	-5.8	-5.1	-5.4	-6.1	-7.2	-7.7	-7.5	-7.8	-7.9	-7.7	-7.5	-7.4	-7.0	-5.1																						
14-Nov	-7.3	-7.2	-7.0	-6.9	-6.6	-6.6	-6.9	-7.1	-6.9	-6.5	-5.9	-5.4	-5.1	-4.8	-4.8	-4.9	-5.1	-5.6	-6.2	-6.4	-6.2	-6.0	-6.1	-6.0	-6.1	-4.8																						
15-Nov	-5.7	-5.6	-5.6	-5.6	-5.6	-5.6	-5.4	-5.4	-5.2	-4.8	-4.1	-3.5	-2.9	-2.5	-2.4	-2.4	-2.7	-2.9	-2.9	-3.0	-2.9	-3.0	-3.2	-3.4	-4.0	-2.4																						
16-Nov	-3.6	-3.4	-4.2	-5.2	-6.3	-6.2	-6.4	-6.0	-5.2	-3.5	-1.5	-0.6	-0.9	-0.7	-0.8	-1.2	-1.3	-1.1	-1.1	-1.1	-1.2	-0.9	-0.9	-0.9	-2.7	-0.6																						
17-Nov	-1.2	-1.3	-1.2	-1.3	-1.3	-1.3	-1.7	-1.9	-1.9	-1.6	-0.9	-0.3	0.8	3.1	3.7	2.9	2.6	2.4	1.6	0.1	-1.6	-3.3	-3.9	-3.8	-0.5	3.7																						
18-Nov	-4.1	-4.5	-5.1	-5.2	-4.6	-5.0	-5.3	-5.7	-6.0	-6.0	-5.9	-5.8	-5.4	-5.4	-5.6	-5.9	-6.3	-6.5	-6.6	-6.6	-6.7	-6.8	-7.0	-7.8	-5.8	-4.1																						
19-Nov	-8.1	-8.6	-8.9	-9.0	-9.2	-10.0	-10.9	-11.0	-10.9	-10.7	-10.7	-11.3	-11.4	-11.7	-12.1	-12.4	-13.3	-14.0	-15.0	-16.2	-17.1	-17.5	-17.7	-17.7	-12.3	-8.1																						
20-Nov	-17.6	-17.6	-17.8	-17.8	-18.0	-17.7	-17.9	-18.0	-18.0	-17.7	-17.0	-16.4	-16.0	-16.0	-15.5	-16.2	-16.5	-16.4	-16.4	-16.5	-16.5	-16.5	-16.5	-16.9	-17.0	-15.5																						
21-Nov	-17.4	-17.8	-18.1	-18.3	-18.3	-18.2	-18.2	-18.3	-18.0	-17.3	-16.7	-16.2	-15.8	-15.7	-15.6	-15.6	-15.6	-15.5	-15.5	-15.4	-15.3	-15.1	-14.8	-14.7	-16.6	-14.7																						
22-Nov	-14.7	-14.8	-14.8	-15.0	-15.0	-15.0	-14.8	-14.8	-14.6	-14.4	-13.9	-13.2	-12.8	-12.4	-12.5	-13.3	-13.9	-14.0	-14.3	-14.5	-14.8	-15.0	-15.2	-15.5	-14.3	-12.4																						
23-Nov	-15.5	-15.4	-15.2	-15.2	-15.2	-15.5	-15.9	-16.4	-16.5	-16.3	-16.1	-15.8	-15.6	-15.3	-15.0	-14.9	-14.8	-14.6	-14.4	-14.3	-14.3	-14.3	-14.3	-14.3	-15.2	-14.3																						
24-Nov	-14.2	-14.3	-14.6	-14.7	-14.7	-14.8	-14.9	-15.2	-15.7	-15.8	-14.9	-13.8	-13.2	-12.9	-13.0	-14.0	-15.4	-16.6	-17.3	-17.2	-17.7	-18.1	-18.8	-19.7	-15.5	-12.9																						
25-Nov	-19.9	-20.9	-20.0	-21.0	-22.7	-23.6	-24.2	-24.2	-24.7	-23.1	-20.5	-17.9	-15.3	-14.6	-14.1	-14.7	-15.4	-15.1	-14.7	-14.0	-14.5	-16.1	-16.7	-17.4	-18.6	-14.0																						
26-Nov	-17.0	-16.4	-16.5	-16.2	-15.8	-16.5	-16.8	-17.8	-17.8	-16.3	-13.5	-11.4	-9.7	-8.8	-8.5	-9.5	-10.5	-10.6	-9.9	-10.4	-10.8	-11.3	-11.7	-12.6	-13.2	-8.5																						
27-Nov	-12.9	-12.8	-12.9	-12.9	-13.8	-14.9	-14.7	-14.6	-14.8	-14.9	-14.5	-14.4	-14.3	-14.4	-14.7	-14.8	-14.9	-15.1	-15.4	-15.7	-16.1	-16.5	-16.9	-17.3	-14.8	-12.8																						
28-Nov	-18.0	-18.7	-19.6	-20.1	-21.3	-21.7	-22.2	-22.7	-23.0	-23.1	-22.3	-21.0	-20.5	-20.0	-20.1	-20.4	-21.4	-21.3	-20.8	-21.4	-21.9	-22.9	-23.8	-23.7	-21.3	-18.0																						
29-Nov	-23.7	-23.7	-23.9	-24.2	-24.8	-24.9	-24.8	-24.5	-24.3	-24.4	-23.9	-23.4	-22.4	-22.2	-22.1	-23.1	-25.7	-27.5	-28.5	-28.9	-27.8	-27.5	-26.7	-26.3	-25.0	-22.1																						
30-Nov	-24.9	-24.0	-23.6	-24.0	-23.4	-23.1	-23.0	-22.7	-22.4	-22.1	-21.5	-20.9	-20.4	-19.9	-19.6	-19.6	-19.6	-19.6	-20.4	-20.5	-20.6	-20.6	-21.0	-21.2	-21.6	-19.6																						
																								-8.0	-8.1	-8.3	-8.6	-8.9	-8.9	-9.0	-9.1	-8.8	-8.3	-7.6	-6.8	-6.1	-5.7	-5.6	-6.1	-6.9	-7.4	-7.8	-7.9	-8.1	-8.2	-8.3	-8.5	Diurnal Average
																								10.2	9.3	7.3	6.4	7.2	7.8	7.7	7.0	7.8	9.2	9.3	12.1	12.9	14.0	14.6	13.8	11.9	9.7	8.9	10.4	9.7	8.6	9.8	11.1	Diurnal Maximum





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Anzac - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	73	10.14	10.14
-20 - 0	521	72.36	82.50
0 - 10	117	16.25	98.75
10 - 20	9	1.25	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

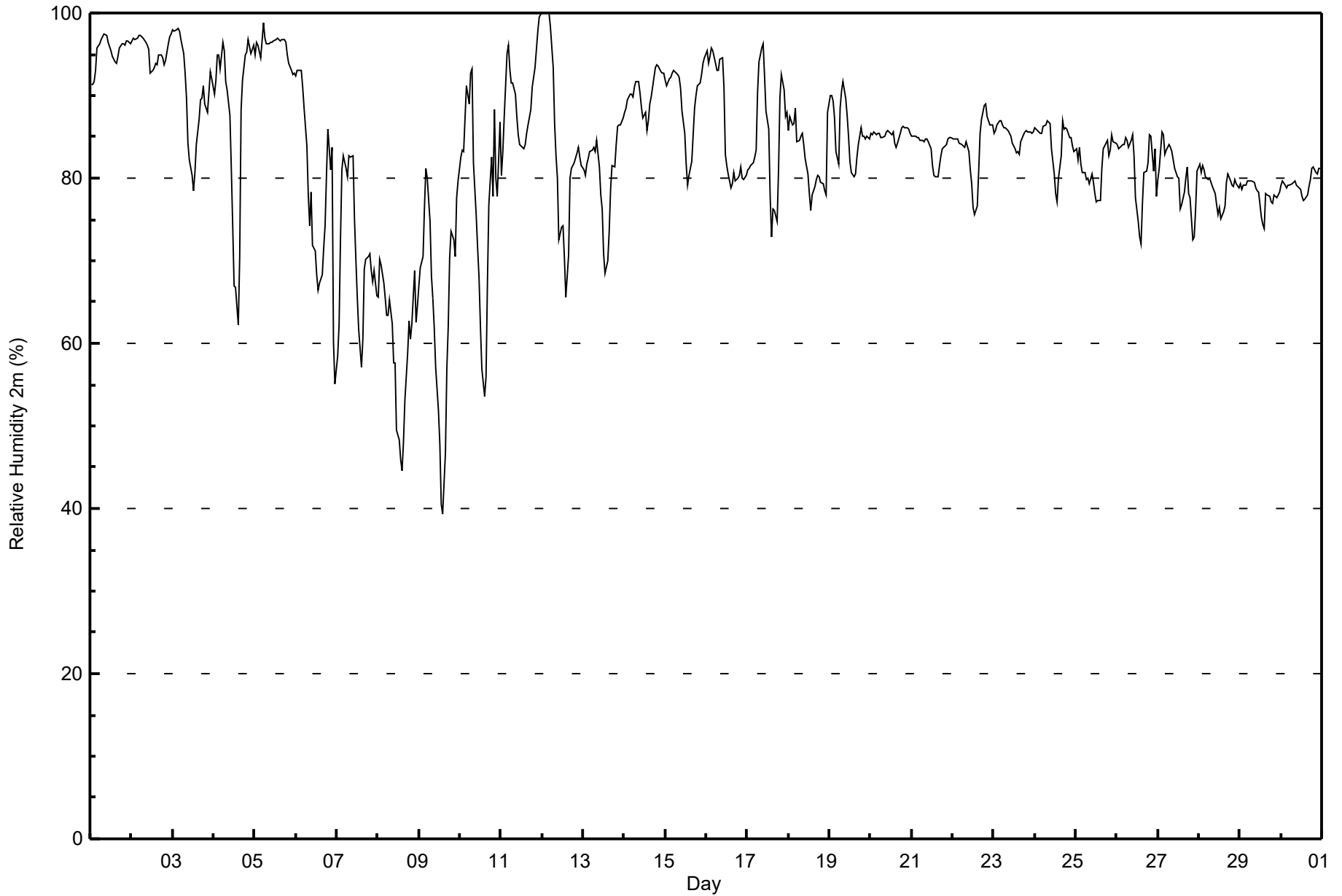
Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Relative Humidity 2m (RH2) - %**  
**Anzac - November 2024**

Maximum Value: 100.0 % on Nov 12 01:00      Maximum Daily Average: 95.9 % on Nov 5																						Hours in Service:	720			
Minimum Value: 39.3 % on Nov 9 15:00      Minimum Daily Average: 59.9 % on Nov 8																						Hours of Data:	720			
Maximum Diurnal Average: 87.3 % at hour 5      Minimum Diurnal Average: 74.9 % at hour 15																						Hours of Missing Data:	0			
Monthly Average: 83.07 %      Percentiles: P <sub>1</sub> = 48.5 P <sub>10</sub> = 70.6 Q <sub>1</sub> = 79.2 Median = 83.9 Q <sub>3</sub> = 89.8 P <sub>90</sub> = 95.4 P <sub>99</sub> = 98.7																						Hours of Calibration:	0			
																						Percent Operational Time:	100.0			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	91.4	91.3	91.7	93.0	95.8	96.2	96.8	97.1	97.5	97.3	96.5	95.9	95.5	94.8	94.1	94.0	94.7	95.7	96.3	96.2	96.2	96.6	96.6	96.3	95.3	97.5
2-Nov	96.6	97.0	96.8	97.0	97.3	97.3	97.1	97.0	96.4	96.1	95.5	92.8	93.0	93.4	93.9	93.7	94.9	94.9	94.5	93.8	94.3	96.3	97.1	97.4	95.6	97.4
3-Nov	97.9	97.8	97.9	98.1	97.8	96.8	95.0	92.7	89.6	84.3	82.3	80.4	78.5	80.6	84.1	87.1	89.4	89.6	91.1	89.1	87.9	90.4	93.0	92.0	90.1	98.1
4-Nov	90.2	91.9	95.0	94.9	93.2	96.5	95.5	91.8	90.6	87.6	81.2	74.2	66.9	66.7	62.2	70.5	88.2	91.8	94.9	95.3	96.7	96.0	95.1	96.2	87.6	96.7
5-Nov	94.9	96.5	96.1	94.5	96.6	98.8	97.0	96.3	96.3	96.4	96.4	96.6	96.7	97.0	96.7	96.7	96.8	96.8	96.5	95.0	93.9	93.0	92.6	92.7	95.9	98.8
6-Nov	92.4	93.0	93.1	93.1	91.1	88.5	83.9	77.9	74.2	78.4	71.8	71.2	68.3	66.5	67.3	68.3	71.6	74.3	80.4	86.0	81.0	83.8	60.2	55.1	78.0	93.1
7-Nov	58.5	62.2	72.5	81.0	82.7	81.2	80.1	82.7	82.6	82.6	75.0	70.2	65.6	61.7	57.1	60.4	69.0	70.1	70.5	70.8	68.9	67.4	68.8	65.7	71.1	82.7
8-Nov	65.6	70.1	69.5	67.2	65.5	63.3	63.5	65.3	62.3	57.6	57.6	49.5	48.3	46.0	44.7	48.0	53.0	58.8	62.6	60.6	62.4	68.7	62.6	64.6	59.9	70.1
9-Nov	67.0	69.2	70.6	76.5	81.2	80.0	74.8	68.1	65.5	61.9	57.1	51.9	47.8	40.4	39.3	46.9	56.9	62.0	70.3	73.6	72.6	70.6	77.6	79.7	65.1	81.2
10-Nov	82.6	83.3	83.2	87.3	91.1	89.0	92.7	93.2	81.9	75.5	71.5	67.9	62.0	57.0	53.5	55.9	67.2	76.8	82.6	77.8	88.4	80.1	77.7	86.8	77.7	93.2
11-Nov	80.3	83.2	87.4	95.1	96.2	93.3	91.5	91.5	90.2	87.4	85.3	84.1	83.7	83.6	84.1	85.5	86.5	88.2	90.9	92.2	93.4	97.8	99.4	99.8	89.6	99.8
12-Nov	100.0	100.0	100.0	100.0	100.0	98.3	93.4	86.7	82.7	80.0	72.6	74.0	74.2	70.4	65.5	70.7	80.0	81.2	81.6	81.9	83.0	83.7	82.6	81.6	84.3	100.0
13-Nov	81.0	80.4	81.8	82.4	83.3	83.5	83.7	83.2	84.5	81.3	77.9	76.3	70.9	68.5	70.0	73.5	78.6	81.5	81.4	84.0	86.3	86.5	86.4	87.3	80.6	87.3
14-Nov	87.9	88.4	89.5	90.2	90.1	89.8	91.0	91.8	91.7	90.3	88.7	87.3	88.0	85.8	87.0	89.0	89.9	92.2	93.3	93.8	93.6	92.9	92.6	92.7	90.3	93.8
15-Nov	91.9	91.3	92.0	92.2	92.8	93.0	92.7	92.5	92.2	90.8	88.1	85.5	81.7	79.2	80.4	82.1	85.3	88.5	90.0	91.2	91.6	92.5	93.8	94.5	89.4	94.5
16-Nov	95.4	93.8	94.8	95.7	95.5	93.8	93.1	93.0	94.4	94.5	91.0	82.9	81.6	80.4	78.9	79.3	80.7	79.7	80.0	80.4	81.3	80.0	79.8	80.3	86.7	95.7
17-Nov	81.0	81.2	81.6	81.8	82.6	83.3	90.3	94.0	95.8	96.3	92.4	88.1	85.9	77.8	72.9	76.2	76.0	74.7	80.9	89.9	92.6	90.6	87.5	88.0	85.1	96.3
18-Nov	85.8	87.4	86.4	86.7	88.4	84.4	84.6	85.2	85.4	84.1	82.3	80.5	78.1	76.1	78.0	79.1	79.8	80.3	80.1	79.6	79.3	78.6	77.9	88.0	82.3	88.4
19-Nov	89.9	89.9	89.3	87.3	83.2	81.7	88.5	90.5	91.7	89.6	87.7	85.1	82.0	80.6	80.1	80.6	82.5	84.1	86.1	85.2	85.2	84.7	85.1	84.8	85.6	91.7
20-Nov	85.4	85.3	85.6	85.2	85.4	85.5	84.9	84.9	85.0	85.6	85.8	85.7	85.2	85.6	84.3	83.8	84.2	85.5	86.1	86.3	86.0	86.0	86.0	85.4	85.4	86.3
21-Nov	85.2	85.1	85.0	85.0	84.9	84.6	84.6	84.4	84.8	84.8	84.4	83.5	81.6	80.4	80.2	80.1	81.4	82.8	83.5	83.7	84.0	84.7	84.9	84.9	83.7	85.2
22-Nov	84.8	84.8	84.8	84.7	84.3	84.0	83.9	83.8	84.4	83.2	81.0	79.3	76.5	75.7	76.6	80.9	85.4	87.2	88.9	89.0	87.4	87.0	86.5	86.4	83.8	89.0
23-Nov	85.4	85.8	86.5	86.9	86.9	86.4	86.1	86.0	85.8	85.5	85.0	84.2	83.6	83.0	83.2	82.9	84.3	85.2	85.6	85.8	85.5	85.6	85.4	85.6	85.2	86.9
24-Nov	86.1	86.0	85.6	85.4	85.4	86.3	86.5	86.9	86.8	86.5	83.6	80.4	78.1	77.2	80.0	82.7	86.9	86.0	86.1	86.0	84.9	84.9	83.9	83.1	84.4	86.9
25-Nov	83.6	82.2	83.7	81.7	80.7	80.6	79.8	80.1	79.3	80.5	79.5	78.1	77.1	77.2	77.3	81.2	83.6	83.9	84.5	82.8	83.4	85.2	84.4	84.2	81.4	85.2
26-Nov	84.1	83.6	83.7	84.1	84.2	84.8	84.5	83.8	84.6	85.2	82.8	77.7	74.8	72.9	72.0	76.9	80.7	80.8	81.9	85.3	85.0	80.9	83.6	77.8	81.5	85.3
27-Nov	79.9	81.2	85.6	85.2	82.9	83.4	84.1	83.8	83.3	82.3	81.1	80.2	80.0	76.3	76.8	78.3	80.0	81.4	78.2	77.6	72.5	72.9	76.2	80.9	80.2	85.6
28-Nov	81.7	80.8	81.5	81.1	80.1	79.9	80.0	79.6	78.9	78.2	76.8	75.6	76.4	75.0	75.9	76.6	79.4	80.5	79.6	79.2	79.0	79.9	79.3	78.7	78.9	81.7
29-Nov	79.4	78.7	79.2	79.2	79.6	79.7	79.7	79.7	79.5	78.9	78.5	78.2	75.3	74.4	73.9	78.1	78.0	77.7	77.1	76.9	78.0	77.7	77.9	78.4	78.1	79.7
30-Nov	79.1	79.7	79.1	78.8	79.1	79.1	79.3	79.5	79.7	79.2	79.0	78.7	77.8	77.3	77.4	78.0	78.9	79.8	81.2	81.3	80.7	80.5	81.2	81.1	79.4	81.3
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 2m (RH2) - %**  
**Anzac - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	1	0.14	0.14
40 - 60	21	2.92	3.06
60 - 80	193	26.81	29.86
80 - 100	500	69.44	99.31

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Leaf Wetness (LW) - %**  
**Anzac - November 2024**

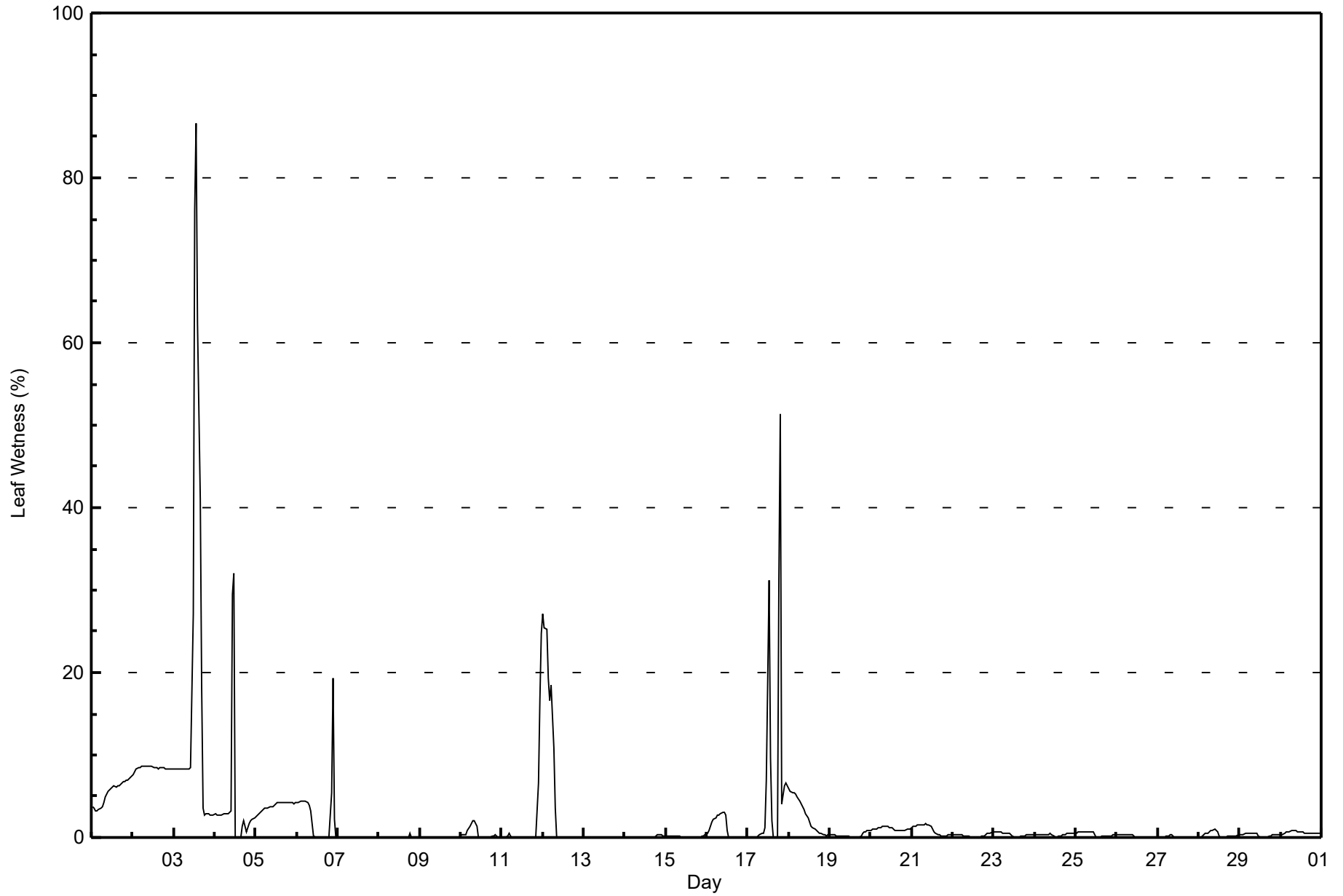
Maximum Value: 86.5 % on Nov 3 14:00 Minimum Value: 0.0 % on Nov 4 13:00 Maximum Diurnal Average: 4.4 % at hour 13 Monthly Average: 2.22 %		Maximum Daily Average: 17.6 % on Nov 3 Minimum Daily Average: 0.0 % on Nov 7 Minimum Diurnal Average: 0.9 % at hour 18 Percentiles: $P_1 = 0.0$ $P_{10} = 0.0$ $Q_1 = 0.0$ Median = 0.3 $Q_3 = 1.4$ $P_{90} = 6.2$ $P_{99} = 30.9$		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	3.8	3.5	3.3	3.2	3.4	3.6	3.8	4.2	5.0	5.6	5.7	5.9	6.2	6.2	6.2	6.2	6.2	6.4	6.7	6.8	6.9	7.0	7.2	7.4	5.4	7.4
2-Nov	7.6	7.9	8.2	8.4	8.5	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.5	8.5	8.4	8.4	8.4	8.5	8.4	8.4	8.3	8.3	8.3	8.3	8.4	8.6
3-Nov	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.4	27.1	76.1	86.5	62.3	41.1	17.9	3.5	2.8	2.8	2.8	2.8	2.8	2.8	17.6	86.5
4-Nov	2.8	2.8	2.8	2.8	2.8	2.8	2.9	3.0	3.0	3.0	29.5	32.0	0.0	0.0	0.0	0.0	1.4	2.1	0.7	1.1	1.6	2.0	2.2	2.4	4.3	32.0
5-Nov	2.5	2.7	2.9	3.2	3.4	3.5	3.5	3.6	3.7	3.7	3.7	3.9	4.2	4.2	4.3	4.3	4.3	4.3	4.3	4.2	4.2	4.2	4.1	4.2	3.8	4.3
6-Nov	4.2	4.3	4.3	4.3	4.3	4.3	4.2	3.9	3.2	1.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	19.4	2.2	0.0	2.8	19.4
7-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6
9-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-Nov	0.4	0.4	0.4	0.4	0.8	1.3	1.6	2.0	2.1	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.1	0.0	0.0	0.5	2.1
11-Nov	0.0	0.0	0.0	0.2	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	16.8	24.7	2.0	24.7
12-Nov	27.1	25.4	25.2	19.3	16.6	18.4	10.9	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	27.1
13-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.3
15-Nov	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.1	0.4
16-Nov	0.6	0.9	1.3	1.8	2.2	2.5	2.6	2.8	2.9	3.0	3.0	2.7	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	3.0
17-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.4	0.6	1.2	7.0	31.2	9.7	2.1	0.0	0.0	0.0	31.3	51.4	4.1	6.4	6.6	6.3	6.6	51.4
18-Nov	5.9	5.6	5.5	5.5	5.3	4.9	4.4	4.0	3.7	3.3	2.9	2.4	1.9	1.4	1.2	0.9	0.8	0.6	0.5	0.4	0.4	0.3	0.3	0.3	2.6	5.9
19-Nov	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.7	0.7	0.8	0.9	0.3	0.9
20-Nov	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.3	1.1	1.0	0.8	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.4
21-Nov	1.2	1.3	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.6	1.5	1.3	1.0	0.7	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.9	1.6
22-Nov	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.4	0.5	0.6	0.7	0.2	0.7
23-Nov	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.2	0.1	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.7
24-Nov	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.3	0.5
25-Nov	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.4	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.3	0.4	0.4	0.7
26-Nov	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.4
27-Nov	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
28-Nov	0.0	0.0	0.2	0.3	0.4	0.6	0.7	0.8	0.9	1.0	0.9	0.6	0.3	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	1.0
29-Nov	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.6
30-Nov	0.4	0.4	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.8
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Leaf Wetness (LW) - %**  
**Anzac - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Leaf Wetness (LW) - %**  
**Anzac - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	381	52.92	52.92
0.4 - 0.5	64	8.89	61.81
0.6 - 0.7	43	5.97	67.78
0.8 - 1.4	53	7.36	75.14
1.5 - 10	156	21.67	96.81
> 10	21	2.92	99.72

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Speed: 32 km/h on Nov 7 00:00	Maximum Daily Speed Average: 17.8 km/h on Nov 27	Hours in Service: 720
Minimum Speed Value: 1 km/h on Nov 4 15:00	Minimum Daily Speed Average: 2.2 km/h on Nov 26	Hours of Data: 720
Maximum Diurnal Speed Average: 4.2 km/h at hour 11	Minimum Diurnal Speed Average: 1.7 km/h at hour 17	Hours of Missing Data: 0
Monthly Average Velocity: 2.9 km/h 268.1 deg	Percentiles: P <sub>1</sub> = 2 P <sub>10</sub> = 4 Q <sub>1</sub> = 7 Median = 10 Q <sub>3</sub> = 14 P <sub>90</sub> = 18 P <sub>99</sub> = 25	Percent Operational Time: 100.0

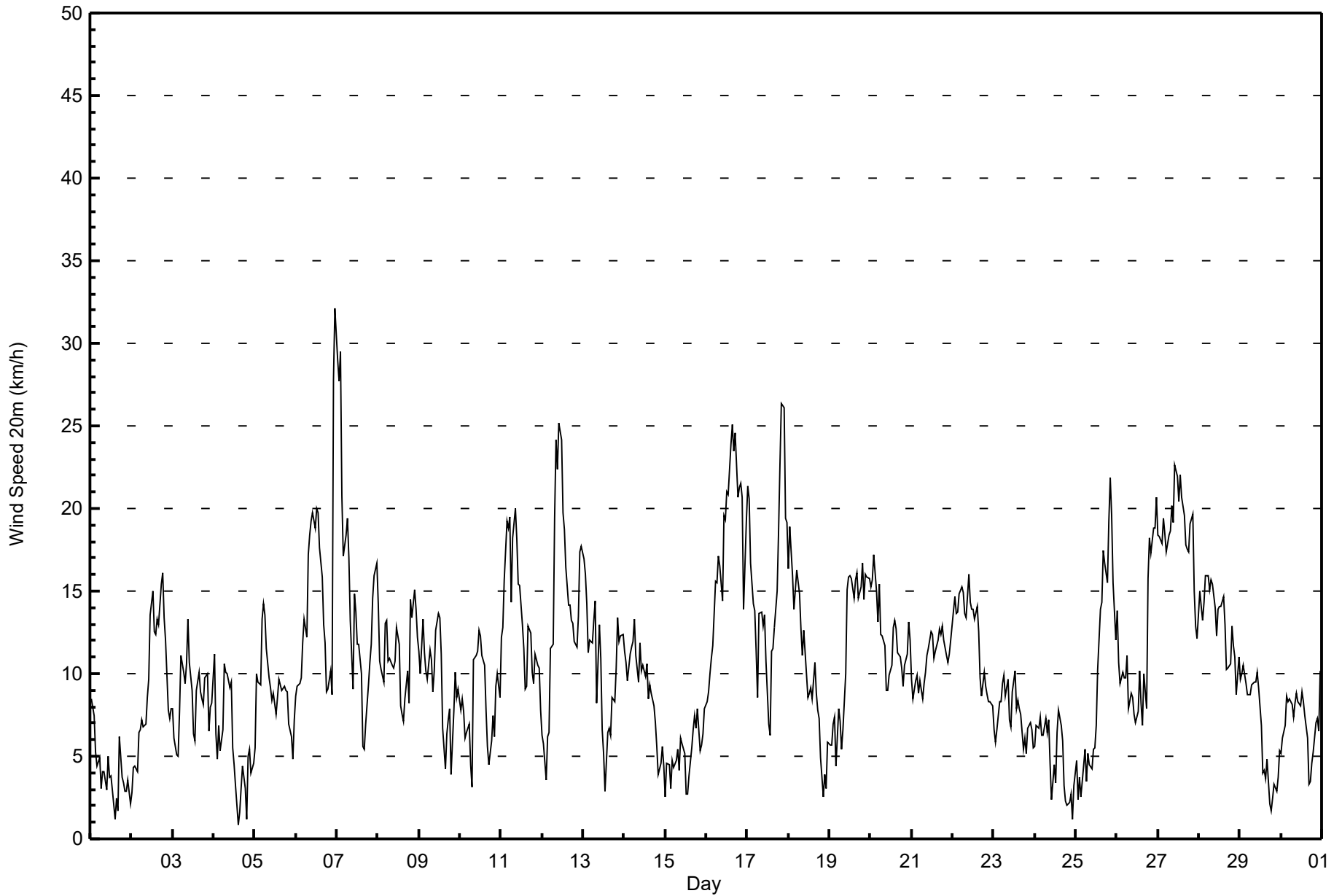
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	SE8	SE8	ESE7	SSE5	SE4	ESE5	SE3	ESE4	SE4	ESE3	E5	ESE4	E4	E3	SE1	E2	NNW2	N6	NNE4	NNE3	NNE3	NE3	E4	E2	ESE2.9	SE8	
2-Nov	ENE3	ENE4	ENE4	E4	ESE6	ESE7	ESE7	ESE7	ESE7	ESE9	ESE10	SE14	SSE15	SE13	SE12	SE13	ESE13	ESE15	SE16	SE13	ESE12	SE8	SE7	ESE8	SE9.0	SE16	
3-Nov	SE8	SE6	SSE5	S5	W8WNW11	W10	W9	W11	W13	W11	W9	W6	SSW6	S9	S10	S9	SSW8	SW8WSW10	W10	WSW7	W8	W8			WSW6.0	W13	
4-Nov	W11	W6	S5	SSE7	SSE5	WSW7	W11	W10WSW10	W9	W9	WSW5	W4	WNW3	SSE1	SSE2	E3	ENE4	SSE3	S1	SW5	SW5	WNW4	NNW5		WSW3.8	W11	
5-Nov	WSW6	NW10WNW10	WNW9	NW13	NW14	NW14	NW12	NW10	NW9	NW8	WNW9	NW8	WNW9WNW10	WNW9	WNW9	WNW9	WNW9	WNW9	WNW9	W9	W7	W6	SSW5	SSW7	WNW8.3	NW14	
6-Nov	S9	SSE9	SSE9	SSE10	SSE12	S13	S12	S17	SSW18	SSW19	SSW20	WSW19	WSW20	WSW20	WSW18	WSW16	SW13	SW12	SSW9	S9	S10	S9	WSW28	W32	SW12.6	W32	
7-Nov	W29	W28	NW30	WNW21	WNW17	WNW18	WNW19	WNW17	WNW13	W9	WNW15	W14	WNW12	WNW12	W10	W6	S5	S7	S9	SSE11	SSE12	SSE15	SE16	SE17	W8.9	NW30	
8-Nov	SSE14	SSE11	SSW10	SW9	SW13	SW13	SW11	SW11	SW10	SW10	WSW11	W13	WNW12	W8	W8	WSW7	SSW8	S10	S8	W14	W13	WNW15	NW14	NW12	WSW8.0	WNW15	
9-Nov	NW11	WNW10	WNW13	WNW11	W10	W10	W11	W11	W9	W10	WNW13	W14	W13	WNW11	WNW7	WSW4	SSW6	SSW7	S8	SSE4	SW8	SW10	SSW9	SSW9	W7.9	W14	
10-Nov	SSW8	SW8	SW8	SW6	SSW6	SSW7	S5	W3	WNW11	W11	W11	WNW13	W12	WNW11	WNW11	W8	W6	SW5	SW6	S7	SSE6	SSE9	SSE10	SE9	WSW5.5	WNW13	
11-Nov	SSE12	SE13	SE16	SE19	SSE19	SSE19	SSE14	SE18	SE20	SE18	SE15	SE15	SE13	SE12	ESE9	ESE9	SSE13	SSE12	SE10	SE9	SE11	SE11	SE10	SE8	SE13.5	SE20	
12-Nov	SE6	SSE6	SE4	S6	SW6	W12	WSW12	W19	W24	W22	W25	WNW24	WNW20	WNW19	WNW16	NW14	NW14	WNW13	WNW13	W12	WNW12	WNW13	WNW17	WNW18	W12.5	W25	
13-Nov	WNW17	W16	WNW14	WNW11	WNW12	WNW12	WNW13	W14	W8	WNW13	WNW11	NW7	NW5	NW3	NE6	NE7	NNE6	NE9	ENE8	ENE10	ENE13	E12	E12	E12	NW4.1	WNW17	
14-Nov	E11	E11	ENE10	ENE11	E12	E12	E13	E11	E9	E12	E10	E11	E10	E11	ENE8	ENE9	ENE9	ENE8	ENE7	E6	E4	E5	E6	ESE4	E9.0	E13	
15-Nov	SSE3	SSE5	ESE4	ESE3	ESE5	ESE4	SSE5	SSE5	SE4	SE6	SSE6	SSE5	ESE3	SSW3	SE4	SE6	SE7	SSE7	SE7	SSE8	SE5	SSE6	SSE6	SSE8	SE4.9	SSE8	
16-Nov	S8	S9	S10	SSE11	S12	SSE16	SSE15	SSE17	SSE17	SSE14	SSE20	SSE19	SSE21	SSE21	SSE24	S25	SSE23	SSE25	S21	SSE21	S21	S21	S14	S19	SSE17.5	S25	
17-Nov	SSE21	S21	SSE17	SSE14	SSE14	SSE11	SE9	SSE14	SSE14	SSE13	S14	S11	SSE7	SSW6	SW11	SSW12	SW13	SW15	WSW19	WSW23	W26	WNW26	WNW19	WNW19	SSW9.2	W26	
18-Nov	WNW16	WNW19	WNW16	WNW14	WNW15	NW16	NW15	NW13	NW11	WNW13	NW11	WNW9	WNW9	NW9	NNW8	NNW11	N9	N8	NNE7	NNE5	NNE3	N4	N3	N6	NW9.3	WNW19	
19-Nov	NE6	NE6	E7	E7	E4	ENE8	NE7	NE5	NE7	N10	N15	N16	N16	NNW16	NNW15	NNW16	NNW16	NW15	NW15	NW17	NW14	NW16	NW16	NW16	NNW9.4	NW17	
20-Nov	NNW15	NW16	NW17	NW15	NW13	NNW15	NW12	NW12	NNW12	N9	N9	NNW10	NW10	NW13	NW13	NW13	NW11	NW11	NW10	NNW9	NW11	NW11	NW13	NW12	NW12.0	NW17	
21-Nov	NW10	NW8	NW10	NW10	NW9	NW10	NW8	NW9	WNW10	NW11	NW12	NW13	NW12	NW11	NW11	NW12	NW13	WNW12	NW13	NW12	NW11	NW11	WNW11	WNW12	NW10.8	WNW13	
22-Nov	WNW14	WNW15	NW14	WNW14	WNW15	WNW15	WNW15	WNW14	WNW13	WNW16	WNW14	WNW14	WNW14	NW13	NW14	NW13	NW10	WNW9	NNW10	WNW9	WNW9	WNW8	NW8	NW8	NW12.2	WNW16	
23-Nov	NW7	N6	NNE7	NE8	E8	E9	E10	ENE9	E10	E7	E7	ENE9	ENE10	ENE8	ENE8	ENE8	ENE8	ENE5	NE6	NNE5	NNE7	NNE7	NNE7	NNE5	ENE6.5	ENE10	
24-Nov	N6	NNE7	NE7	NE7	NE6	NNE6	NNE6	N7	NNW5	NW2	NE5	NNW3	W6	NNW8	NNW7	NW6	WNW3	W2	WNW2	WNW2	WSW3	SSE1	S3		N3.3	NNW8	
25-Nov	SSE5	SSE2	SSW4	SSW3	S4	S5	SSE3	SSE5	SE5	SSE4	SSE5	SE5	ESE7	ESE10	SE14	SE14	SSE17	SSE17	SSE19	SSE22	SSE20	SE15	ESE12		SSE9.4	SSE22	
26-Nov	ESE14	ESE11	ESE9	ESE10	ESE10	ESE10	ESE11	ESE8	ESE9	ESE9	ESE8	SE7	S8	S10	S8	SSW7	SW10	SW8	W16	WNW18	WNW17	NW19	WNW19	WNW21	SSW2.2	WNW21	
27-Nov	WNW18	WNW18	WNW18	WNW19	WNW18	W17	WNW18	WNW19	WNW20	WNW19	WNW23	WNW22	WNW20	WNW22	WNW21	WNW20	NW18	NW18	NW17	NW19	NW20	NNW15	NNW13	NNW12	WNW17.8	WNW23	
28-Nov	NW15	NW14	NW13	WNW14	WNW16	WNW16	WNW15	WNW16	WNW15	WNW14	WNW12	NW14	WNW14	NW14	NW15	NW13	NW10	NW10	NW11	NNW13	NW12	NNW11	NW9	WNW11	NW12.9	WNW16	
29-Nov	WNW10	WNW10	WNW10	WNW9	WNW9	WNW9	WNW9	WNW9	WNW9	WNW10	WNW10	NW10	NW9	WNW7	NW4	W4	NNW4	NNE5	NNE2	NNE2	ESE2	SE3	SE3	SSE4	ESE5	NW4.7	WNW10
30-Nov	SE5	SE6	SE7	ESE9	SE8	ESE8	ESE8	ESE7	ESE8	SE9	SE8	ESE8	ESE9	ESE8	ESE7	ESE6	E3	NNE3	N5	NNW5	NW7	WNW7	WNW7	WNW10	ESE3.7	WNW10	

W2.7	W2.9	WNW2.3	W1.9	WSW2.5	W3.0	W3.2	W3.2	W3.4	W3.7	W4.2	W3.9	W3.9	W3.8	WNW3.2	WNW2.0	WSW1.7	WSW1.8	WSW2.3	W2.8	W3.1	W3.2	W3.2	W3.5		Diurnal Average
W29	W28	NW30	WNW21	SSE19	SSE19	WNW19	W19	W24	W22	W25	WNW24	SSE21	WNW22	SSE24	S25	SSE23	SSE25	S21	WSW23	W26	WNW26	WSW28	W32		Diurnal Maximum

All monthly, daily, and diurnal averages have been calculated using vector methods



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Nov 7 00:00 Minimum Value: 0 km/h on Nov 25 04:00 Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 2 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 6																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0										
Day	Hourly Period Ending At (MST)																								Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	2	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2		
2-Nov	1	1	1	1	1	2	2	1	2	2	2	4	4	3	3	3	3	4	4	4	3	2	2	2	4		
3-Nov	2	1	1	1	3	2	2	2	3	4	3	2	2	2	2	2	2	2	2	2	3	2	3	3	4		
4-Nov	3	2	1	1	1	3	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	2	3		
5-Nov	2	2	2	2	4	3	3	3	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	1	4		
6-Nov	1	1	1	2	1	4	3	4	5	5	5	5	5	5	4	4	3	2	1	2	2	3	8	9	9		
7-Nov	8	7	8	5	4	5	5	4	4	2	4	3	3	3	3	3	1	1	1	1	2	3	3	3	8		
8-Nov	3	3	3	3	4	3	2	2	2	2	2	3	3	2	2	2	2	1	2	5	4	4	4	4	5		
9-Nov	3	3	4	3	3	2	3	2	2	2	3	4	4	3	2	1	1	1	2	2	3	3	1	2	4		
10-Nov	1	1	1	1	1	2	1	2	3	3	3	3	3	2	2	2	2	1	1	1	1	1	1	2	3		
11-Nov	2	2	3	4	4	4	4	4	4	4	4	3	4	3	2	2	4	3	2	2	3	2	3	2	4		
12-Nov	2	1	1	2	2	4	5	5	6	6	8	6	5	5	4	3	3	4	4	3	3	4	5	5	8		
13-Nov	5	5	4	3	4	3	3	3	3	3	3	2	2	2	1	2	2	2	2	2	3	3	3	3	5		
14-Nov	3	2	2	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	1	1	1	1	2	2	3		
15-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	1	2	1	1	1	1	2		
16-Nov	1	1	1	1	1	2	2	2	3	3	4	5	4	4	5	5	5	5	5	5	5	5	5	4	5		
17-Nov	4	4	4	3	3	3	2	3	3	2	3	2	2	3	4	2	4	4	5	6	7	6	5	5	7		
18-Nov	4	4	3	4	4	4	4	3	3	3	3	3	3	2	2	2	2	2	2	2	1	2	2	1	4		
19-Nov	1	1	2	2	2	2	3	1	2	3	3	4	4	3	3	3	4	3	3	4	3	3	4	3	4		
20-Nov	4	4	4	3	3	4	3	3	3	2	2	2	3	3	3	3	2	2	2	2	2	2	3	3	4		
21-Nov	2	2	2	2	2	2	2	2	2	2	3	3	3	2	3	3	3	3	3	2	3	2	3	3	3		
22-Nov	3	3	3	3	4	3	4	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	4		
23-Nov	2	1	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2		
24-Nov	2	1	2	2	1	1	1	1	1	1	1	1	2	2	3	2	1	1	1	1	1	1	1	1	3		
25-Nov	1	1	1	0	1	1	2	1	1	2	2	1	2	2	3	3	4	4	3	4	4	4	3	2	4		
26-Nov	3	3	2	2	2	2	2	2	2	1	1	2	3	3	2	1	2	2	5	5	5	5	5	6	6		
27-Nov	5	5	5	5	4	4	4	4	5	5	5	5	5	6	5	5	4	4	4	4	4	4	3	3	6		
28-Nov	3	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3	2	2	2	3	3	2	2	2	4		
29-Nov	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	1	1	2	1	1	1	1	1	1	2		
30-Nov	1	1	1	2	2	2	2	2	2	2	2	1	2	2	2	2	1	1	1	1	2	2	2	2	2		
																	8 7 8 5 4 5 5 5 6 6 8 6 5 6 5 5 5 5 5 5 6 7 6 8 9										
Diurnal Maximum																											





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 20m (WS20) - km/h**  
**Anzac - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	116	16.11	16.11
6 - 11	330	45.83	61.94
12 - 19	232	32.22	94.17
20 - 28	39	5.42	99.58
29 - 38	3	0.42	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 20m (WS20) - km/h  
Anzac - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	3	11	3	5	12	12	13	20	8	4	3	3	4	5	3	7	116
6 - 11	10	10	12	17	18	33	24	20	21	15	16	7	36	39	43	9	330
12 - 19	3	0	0	1	7	5	20	28	6	3	6	5	14	73	50	11	232
20 - 28	0	0	0	0	0	0	1	10	5	1	0	4	5	12	1	0	39
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	16	21	15	23	37	50	58	78	40	23	25	19	61	129	98	27	720

Total Number of Valid Hours: 720

Total Number of Hours: 720







**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 20m (WD20) - deg**  
**Anzac - November 2024**

Direction of Maximum Speed: 267 deg on Nov 7 00:00 Direction of Maximum Daily Speed Average: 300.0 deg on Nov 27	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0
Direction of Minimum Speed: 148 deg on Nov 4 15:00 Direction of Minimum Daily Speed Average: 2.2 deg on Nov 26	Percent Operational Time: 100.0
Monthly Average Direction: 268.1 deg	

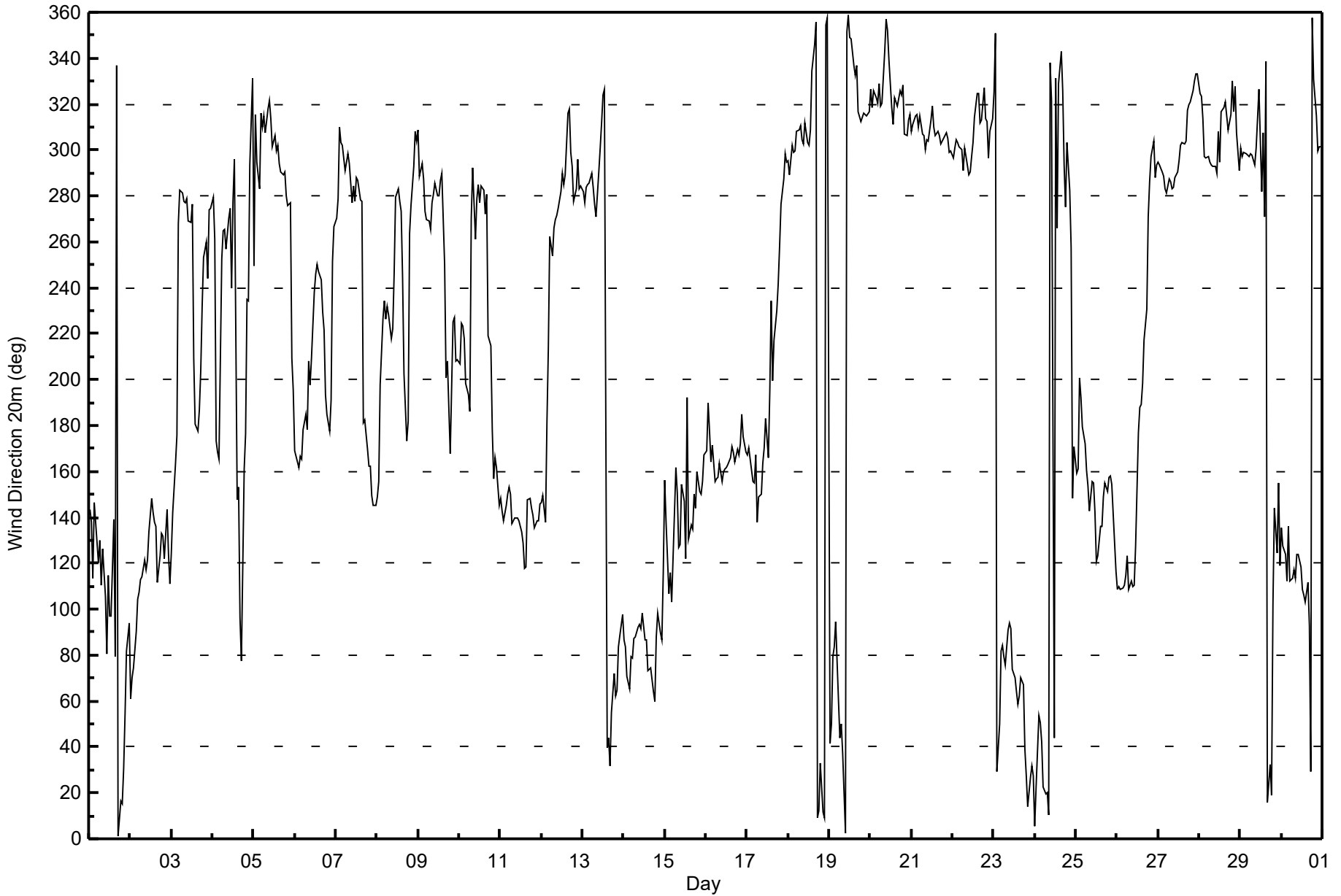
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	143	138	114	147	138	120	130	110	126	105	80	115	97	97	139	79	337	1	17	15	30	54	82	94	102.5
2-Nov	61	70	74	90	104	107	113	114	121	117	121	134	149	142	138	136	112	123	133	132	122	143	124	111	124.0
3-Nov	124	142	164	176	268	282	281	278	277	279	269	269	276	209	181	178	187	204	232	253	260	244	274	274	244.4
4-Nov	280	261	173	168	165	252	265	266	257	270	275	240	278	296	148	153	96	77	161	176	235	234	293	331	252.1
5-Nov	250	316	295	283	316	310	315	308	318	321	314	301	306	300	302	294	291	289	290	280	276	277	210	195	297.1
6-Nov	169	167	161	166	165	178	185	178	208	197	209	238	246	250	247	243	229	222	193	185	178	191	251	267	215.6
7-Nov	270	279	310	303	302	291	295	299	294	277	284	278	288	287	278	278	181	183	170	162	162	149	145	145	271.5
8-Nov	149	156	198	226	234	226	232	228	218	222	246	280	283	278	274	245	203	173	182	264	276	293	308	304	241.8
9-Nov	309	288	294	287	273	269	269	265	277	281	286	280	280	287	290	250	201	208	188	168	225	227	208	209	264.5
10-Nov	207	224	223	218	198	194	186	270	292	261	279	285	277	284	282	272	281	219	215	178	157	166	161	145	236.5
11-Nov	148	143	139	145	150	153	150	137	140	140	140	139	134	129	118	118	147	148	144	141	136	139	138	146	141.0
12-Nov	146	149	138	181	214	262	254	266	270	272	274	282	290	285	289	316	318	299	293	278	283	296	283	284	278.5
13-Nov	282	277	284	285	285	290	284	276	271	291	301	312	324	326	40	44	32	55	72	62	65	83	88	98	321.6
14-Nov	87	83	71	65	79	79	87	88	92	93	91	98	86	87	73	74	64	60	88	98	90	87	116	116	82.9
15-Nov	156	138	107	116	103	123	162	151	127	128	154	147	122	192	131	137	135	150	144	160	151	150	156	167	143.4
16-Nov	169	190	178	164	172	156	157	157	163	156	160	161	161	163	166	171	168	164	169	167	172	185	175	169	166.7
17-Nov	167	170	165	156	155	167	138	149	150	163	170	183	166	195	235	200	217	230	241	258	277	288	298	295	208.1
18-Nov	295	289	302	299	300	308	308	311	304	302	312	303	302	309	334	346	355	9	12	33	12	9	354	358	315.7
19-Nov	41	50	79	83	95	60	44	50	37	2	351	359	349	348	337	333	337	316	312	315	316	316	315	317	345.2
20-Nov	327	319	326	323	321	329	319	320	343	357	352	340	318	311	323	321	319	326	324	328	307	306	313	316	323.6
21-Nov	308	311	315	316	310	315	307	306	300	304	304	313	319	310	306	308	306	302	304	305	308	305	299	300	307.4
22-Nov	296	301	305	303	302	300	291	301	297	289	291	297	303	314	325	325	312	313	327	314	312	297	308	314	304.5
23-Nov	325	351	29	50	82	84	79	76	91	94	92	74	70	64	59	62	70	67	39	28	14	27	31	28	58.2
24-Nov	5	22	54	50	42	22	19	20	10	338	322	44	331	266	329	343	326	293	275	303	283	257	148	171	359.2
25-Nov	159	161	200	192	179	172	161	154	143	155	155	142	121	123	136	136	149	155	151	158	158	154	141	116	148.7
26-Nov	109	110	108	109	111	115	123	109	112	110	110	128	177	188	189	198	217	231	271	286	297	304	288	293	194.0
27-Nov	294	293	290	288	283	281	287	286	283	284	288	291	295	302	303	303	304	317	320	321	326	330	333	333	300.0
28-Nov	325	324	314	297	297	297	295	294	293	293	290	308	295	316	319	321	315	309	316	330	317	328	308	291	307.3
29-Nov	301	297	299	298	298	297	299	298	293	301	314	326	282	307	271	339	16	32	19	103	144	124	155	119	303.9
30-Nov	136	128	124	112	136	112	113	117	113	124	124	118	109	106	103	111	93	29	358	331	315	300	301	302	107.5

260.3 266.9 283.1 263.0 255.3 265.1 269.8 262.9 261.9 262.3 269.4 277.6 280.8 280.6 285.0 282.4 253.6 237.0 250.7 260.7 264.7 267.3 269.6 273.4  
 Diurnal Average

All monthly, daily, and diurnal averages have been calculated using vector methods



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 87 deg on Nov 4 15:00 Minimum Value: 4 deg on Nov 4 04:00 Percentiles: P <sub>1</sub> = 7 P <sub>10</sub> = 11 Q <sub>1</sub> = 13 Median = 15 Q <sub>3</sub> = 17 P <sub>90</sub> = 24 P <sub>99</sub> = 61																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	12	13	14	20	27	16	33	21	35	39	27	38	26	28	77	39	79	19	25	15	13	38	34	46	79	
2-Nov	46	22	14	21	15	17	16	18	16	15	15	17	15	16	15	16	15	16	16	16	15	22	18	14	46	
3-Nov	13	15	27	11	24	15	14	14	15	17	17	18	23	26	12	12	12	14	19	13	17	21	21	20	27	
4-Nov	14	19	28	4	10	36	13	15	11	13	18	27	25	57	87	53	21	16	25	60	7	14	26	23	87	
5-Nov	22	8	17	11	12	17	13	16	16	14	15	15	17	17	17	18	16	15	17	18	26	22	10	26		
6-Nov	7	5	8	8	9	10	13	17	19	15	18	16	16	14	14	14	13	14	14	8	13	30	16	17	30	
7-Nov	17	18	16	13	16	17	16	15	17	18	15	17	17	16	19	20	18	8	7	6	10	13	12	13	20	
8-Nov	15	17	18	19	14	16	17	15	14	15	19	14	16	17	17	25	15	7	17	20	19	19	14	17	25	
9-Nov	16	17	16	17	17	14	15	15	15	15	16	17	16	17	18	24	15	13	12	39	20	12	10	13	39	
10-Nov	11	11	14	11	16	19	29	64	22	18	19	17	14	15	16	13	14	22	13	9	9	5	8	13	64	
11-Nov	11	11	12	14	12	13	15	14	13	14	15	14	18	18	19	16	17	14	15	14	13	17	18	16	19	
12-Nov	16	14	62	14	33	19	17	16	16	16	17	17	16	16	16	17	14	14	17	15	17	14	16	16	62	
13-Nov	17	18	19	19	16	17	15	14	26	16	19	22	39	61	20	15	12	14	14	14	14	14	15	14	61	
14-Nov	15	15	14	15	14	16	15	14	15	14	16	14	17	17	18	12	15	12	13	14	16	18	14	24	24	
15-Nov	28	17	19	36	17	23	16	14	31	21	17	23	47	33	32	17	21	17	19	14	14	9	10	6	47	
16-Nov	5	11	8	6	7	9	9	8	9	11	10	13	11	11	12	11	11	11	12	14	14	15	19	11	19	
17-Nov	12	11	12	15	12	14	16	12	12	11	14	18	23	36	21	15	17	16	15	18	17	15	15	16	36	
18-Nov	16	15	13	14	15	15	15	15	16	14	18	21	26	19	18	12	14	16	17	19	70	41	47	19	70	
19-Nov	18	24	14	17	42	16	19	20	19	17	16	17	17	16	16	14	13	13	12	12	13	12	13	13	42	
20-Nov	15	14	14	14	13	13	14	15	18	16	17	17	16	14	14	12	11	13	12	22	14	14	13	13	22	
21-Nov	13	12	11	11	14	12	14	14	13	14	15	14	16	15	17	15	14	14	14	13	13	14	14	14	17	
22-Nov	15	13	13	13	12	12	15	12	13	14	15	17	13	15	15	11	13	13	12	17	18	14	15	13	18	
23-Nov	19	22	21	15	16	14	14	15	17	19	18	17	15	20	16	15	14	21	17	15	15	15	16	22	22	
24-Nov	15	15	19	17	14	10	11	11	10	24	52	24	54	21	36	10	10	16	14	61	27	12	54	14	61	
25-Nov	7	28	22	17	11	9	13	9	30	14	14	19	16	18	12	13	12	12	12	11	9	11	15	14	30	
26-Nov	14	16	16	16	16	13	12	16	11	11	14	21	30	16	18	14	15	21	16	16	15	15	16	17	30	
27-Nov	15	15	16	15	15	14	15	15	15	15	14	16	15	15	15	14	14	13	12	12	12	13	13	14	16	
28-Nov	11	12	15	13	12	13	12	12	12	13	13	15	15	15	12	12	11	12	14	13	15	19	22	13	22	
29-Nov	14	13	14	13	14	13	13	13	13	13	16	16	16	47	26	26	16	87	57	42	22	21	17	14	87	
30-Nov	27	15	14	14	15	12	13	13	12	13	16	16	14	16	18	20	26	37	14	22	17	16	15	13	37	
																	46 28 62 36 42 36 33 64 35 39 52 38 54 61 87 53 79 87 57 61 70 41 54 46									
Diurnal Maximum																										





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS17 WAPASU NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)  
NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	685	35	35	100	20.4	0	5.7	0
H2S (ppb) Average	685	35	35	100	0.9	0	0.4	0
THC (ppm) Average	685	35	35	100	3.1	-	2.5	-
O3 (ppb) Average	686	34	34	100	38.9	0	35.8	-
NO2 (ppb) Average	685	35	35	100	27.6	0	8.7	-
NO (ppb) Average	685	35	35	100	20.9	-	3.6	-
NOX (ppb) Average	685	35	35	100	36.7	-	12.3	-
PM2.5 (ug/m3) Average	718	2	2	100	11.3	0	6	0
Temperature 2 m (C) Average	720	0	0	100	11.6	-	6.7	-
Relative Humidity (%) Average	712	0	8	98.89	100	-	97.5	-
Wind Speed 10 m (km/h) Average	707	0	13	98.19	23	-	15	-
Wind Direction 10 m (deg) Average	707	0	13	98.19	-	-	-	-
Precipitation (mm) Total	720	0	0	100	1.6	-	9.4	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)  
NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	685	0.63	2	-	0	0	0	0	0.2	1.6	20.4
H2S (ppb) Average	685	0.13	0.1	-	0	0	0	0.1	0.2	0.3	0.9
THC (ppm) Average	685	2.31	0.1	-	2.2	2.2	2.3	2.3	2.3	2.4	3.1
O3 (ppb) Average	686	24.95	7.5	-	3	14.3	19.9	26.1	30.7	34.4	38.9
NO2 (ppb) Average	685	3.55	4.1	-	0.1	0.2	0.6	1.9	5.6	9.2	27.6
NO (ppb) Average	685	0.5	1.6	-	0	0	0	0	0.2	1.3	20.9
NOX (ppb) Average	685	4.03	5.1	-	0.1	0.2	0.6	2.1	6.1	10.3	36.7
PM2.5 (ug/m3) Average	718	2.89	1.8	-	0.3	1.2	1.6	2.3	3.7	5.9	11.3
Temperature 2 m (C) Average	720	-8.7	8.4	-	-29	-19	-15.7	-6.6	-1.9	0.7	11.6
Relative Humidity (%) Average	712	88.09	8.1	-	47.2	78.6	85.5	87.8	94.2	97.5	100
Wind Speed 10 m (km/h) Average	707	7.2	4	-	1	3	4	7	9	12	23
Wind Direction 10 m (deg) Average	707	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	720	-	-	31.14	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Relative Humidity	07 Nov 2024 05:00	07 Nov 2024 05:00	1	Sensor operated out of range
Relative Humidity	12 Nov 2024 05:00	12 Nov 2024 11:00	7	Sensor operated out of range
Wind Speed, Wind Direction	02 Nov 2024 03:00	02 Nov 2024 12:00	10	Flat line in sensor output signal
Wind Speed, Wind Direction	29 Nov 2024 22:00	29 Nov 2024 22:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	30 Nov 2024 02:00	30 Nov 2024 02:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	30 Nov 2024 11:00	30 Nov 2024 11:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb

Wapasu - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 20.4 ppb on Nov 6 12:00	Maximum Daily Average: 5.7 ppb on Nov 10		Hours of Data:	685
Minimum Value: 0.0 ppb on Nov 1 01:00	Minimum Daily Average: 0.0 ppb on Nov 19		Hours of Missing Data:	35
Maximum Diurnal Average: 1.8 ppb at hour 12	Minimum Diurnal Average: 0.1 ppb at hour 3		Hours of Calibration:	35
Monthly Average: 0.63 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 1.6 P <sub>99</sub> = 10.6		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.0	1.5	0.2	0.5	1.7	Z	2.3	4.0	9.3	3.6	5.7	6.4	3.5	2.3	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	9.3
2-Nov	Z	0.0	0.0	0.2	1.6	0.8	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.6
3-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.3	0.0	0.2	1.0	1.8	2.9	0.8	6.0	5.8	0.7	0.3	3.5	2.3	2.9	3.2	2.0	1.1	0.4	1.5	6.0
4-Nov	0.3	0.2	Z	1.8	5.1	2.9	1.3	1.0	2.0	4.0	4.8	8.8	C	C	C	C	C	1.7	0.4	0.5	1.9	2.3	1.4	0.5	2.3	8.8
5-Nov	0.3	0.3	0.3	Z	1.7	1.8	1.8	1.4	0.6	0.4	0.3	0.2	0.2	0.1	0.3	0.2	0.2	0.2	0.1	0.0	0.3	0.3	0.6	3.0	0.6	3.0
6-Nov	1.0	1.0	0.0	0.3	Z	0.3	0.2	0.2	0.2	0.2	2.7	20.4	9.2	12.7	5.6	13.8	3.0	1.9	0.8	0.5	0.4	0.3	0.8	3.4	3.4	20.4
7-Nov	1.1	0.6	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.0	0.0	0.1	0.4	0.7	0.1	0.2	0.0	0.1	2.7	1.0	0.3	0.1	0.0	0.0	0.3	2.7
8-Nov	Z	0.1	0.2	0.1	0.1	0.1	0.0	0.3	0.9	3.0	3.3	2.7	1.6	3.4	13.1	11.3	3.2	1.7	1.2	0.4	0.2	0.1	0.1	0.1	2.0	13.1
9-Nov	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.3	0.9	0.3	0.2	0.1	0.1	0.8	1.3	0.2	1.3
10-Nov	1.0	1.8	Z	4.3	8.6	8.9	5.2	4.6	5.5	9.1	9.7	10.4	8.9	5.8	4.3	6.9	13.7	12.1	6.0	1.8	0.6	0.6	0.4	0.4	5.7	13.7
11-Nov	0.3	0.2	0.4	Z	0.3	0.4	0.2	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
12-Nov	0.0	0.1	0.1	0.0	Z	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.3	0.1	0.1	0.8
13-Nov	0.1	0.0	0.0	0.0	0.1	Z	0.2	0.2	0.2	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
14-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
15-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.4
16-Nov	0.0	0.1	Z	0.0	0.0	0.3	0.6	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.6
17-Nov	0.3	0.2	0.2	Z	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3
18-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-Nov	0.0	Z	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1
22-Nov	0.1	0.0	Z	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
23-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
24-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.1	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
25-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.3	0.3	0.1	0.0	0.0	0.2	0.4	0.2	0.3	0.1	0.3	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.4
26-Nov	Z	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.1	1.6	0.4	0.1	0.0	0.0	0.0	0.6	1.6	
27-Nov	0.2	Z	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
28-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2
30-Nov	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7

0.2	0.2	0.1	0.3	0.8	0.7	0.4	0.4	0.7	0.8	1.0	1.8	0.9	1.1	1.1	1.2	0.7	0.8	0.5	0.3	0.3	0.2	0.2	0.3	Diurnal Average	
1.1	1.8	0.4	4.3	8.6	8.9	5.2	4.6	9.3	9.1	9.7	20.4	9.2	12.7	13.1	13.8	13.7	12.1	6.0	2.9	3.2	2.3	1.4	3.4	Diurnal Maximum	

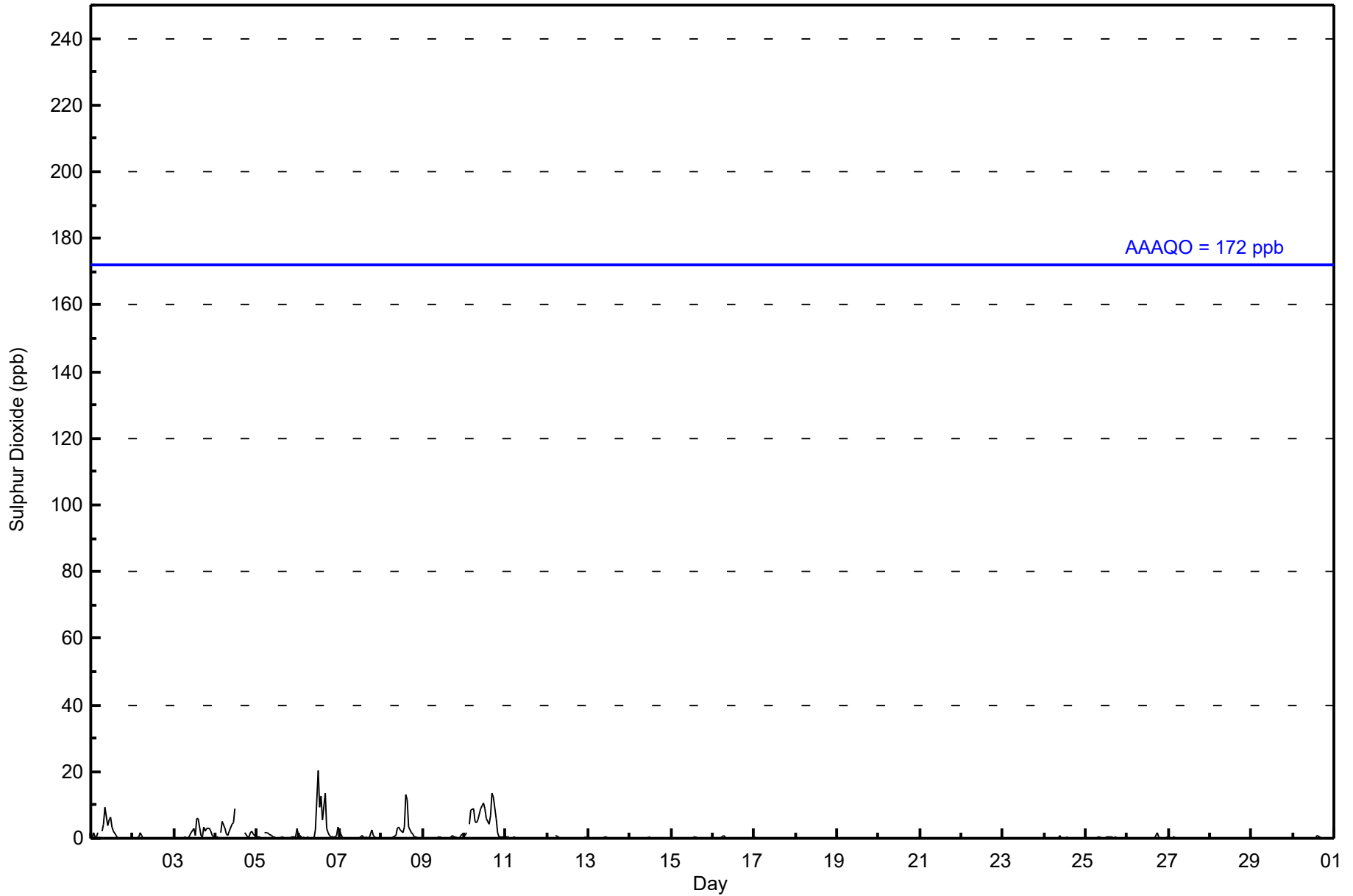
Z - zerospan      C - Calibration  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb    24-hr 48 ppb





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Wapasu - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Wapasu - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	678	98.98	98.98
11 - 20	7	1.02	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Wapasu - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	73	61	41	28	6	11	23	111	86	31	47	39	22	15	11	60	665
11 - 20	0	0	0	0	0	0	0	1	1	2	3	0	0	0	0	0	7
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	73	61	41	28	6	11	23	112	87	33	50	39	22	15	11	60	672

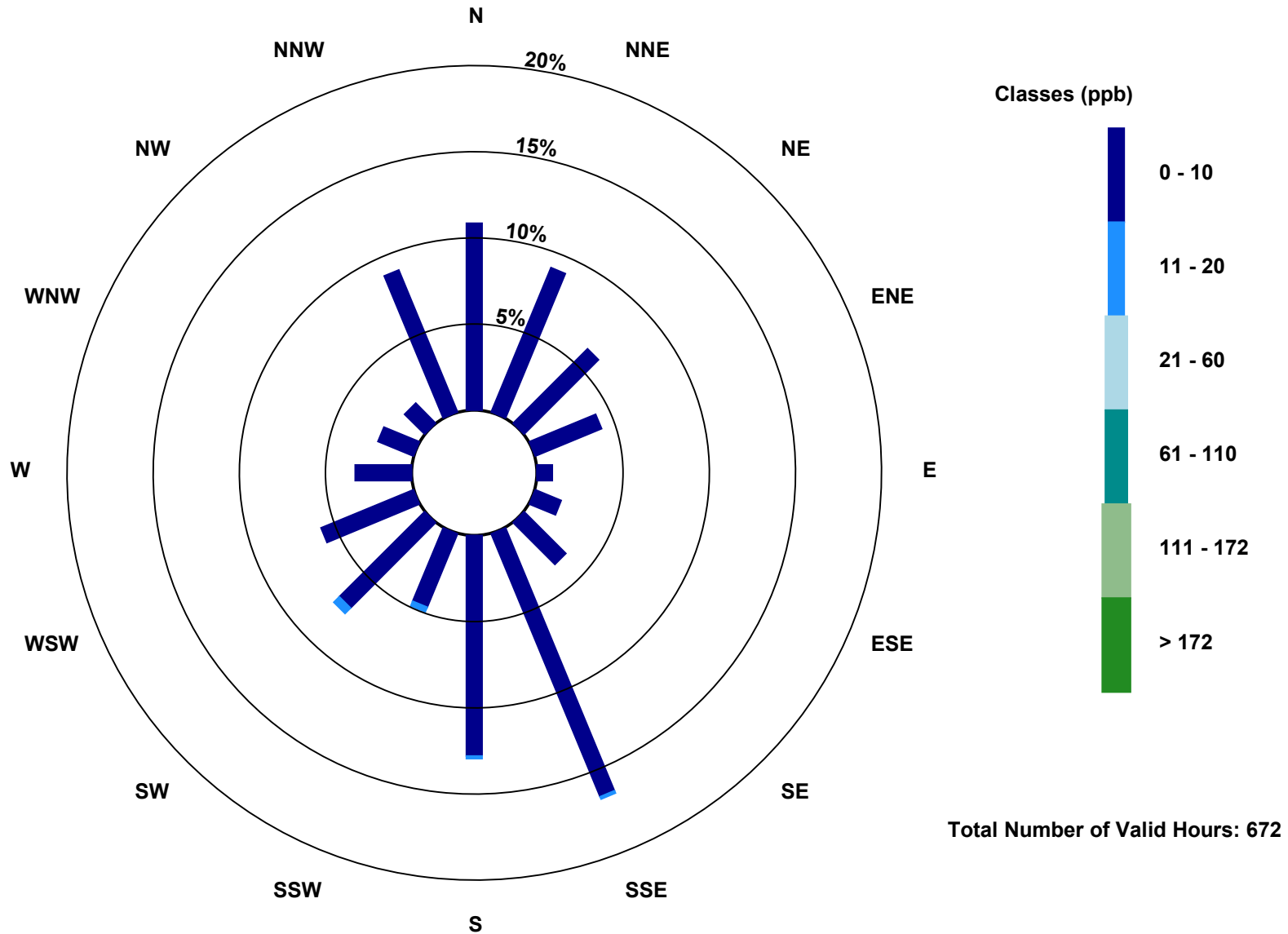
Total Number of Valid Hours: 672

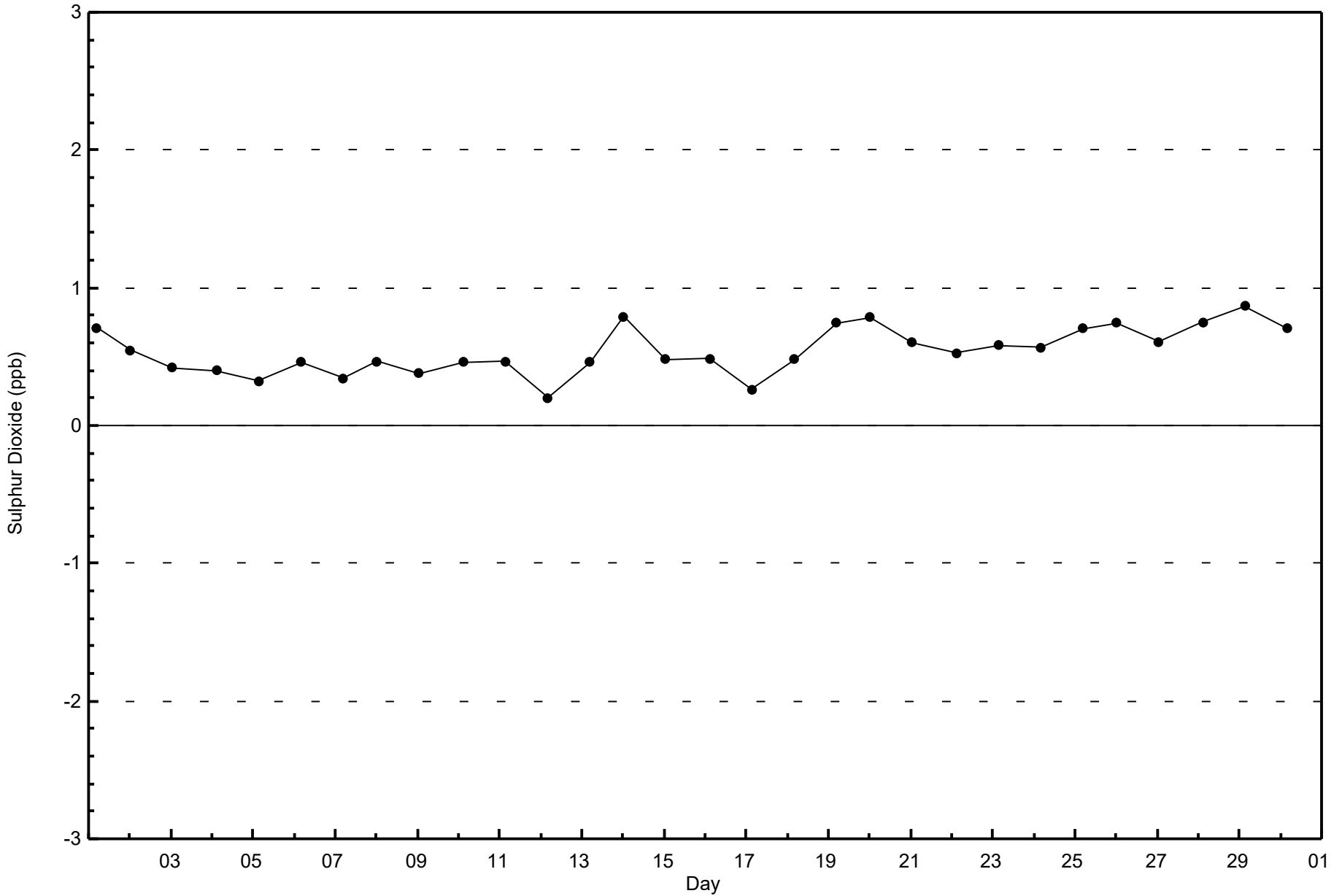
Total Number of Hours: 720

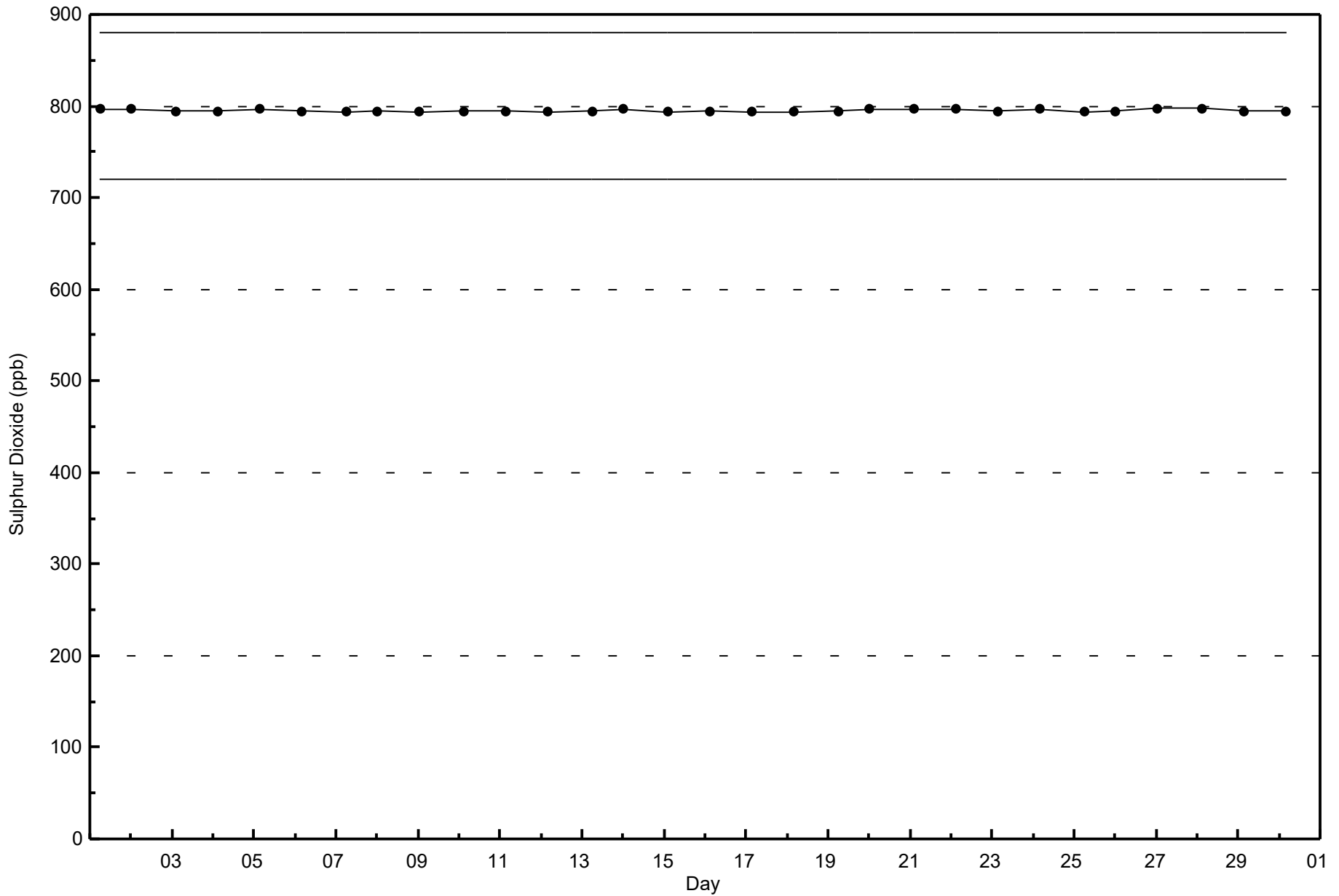


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

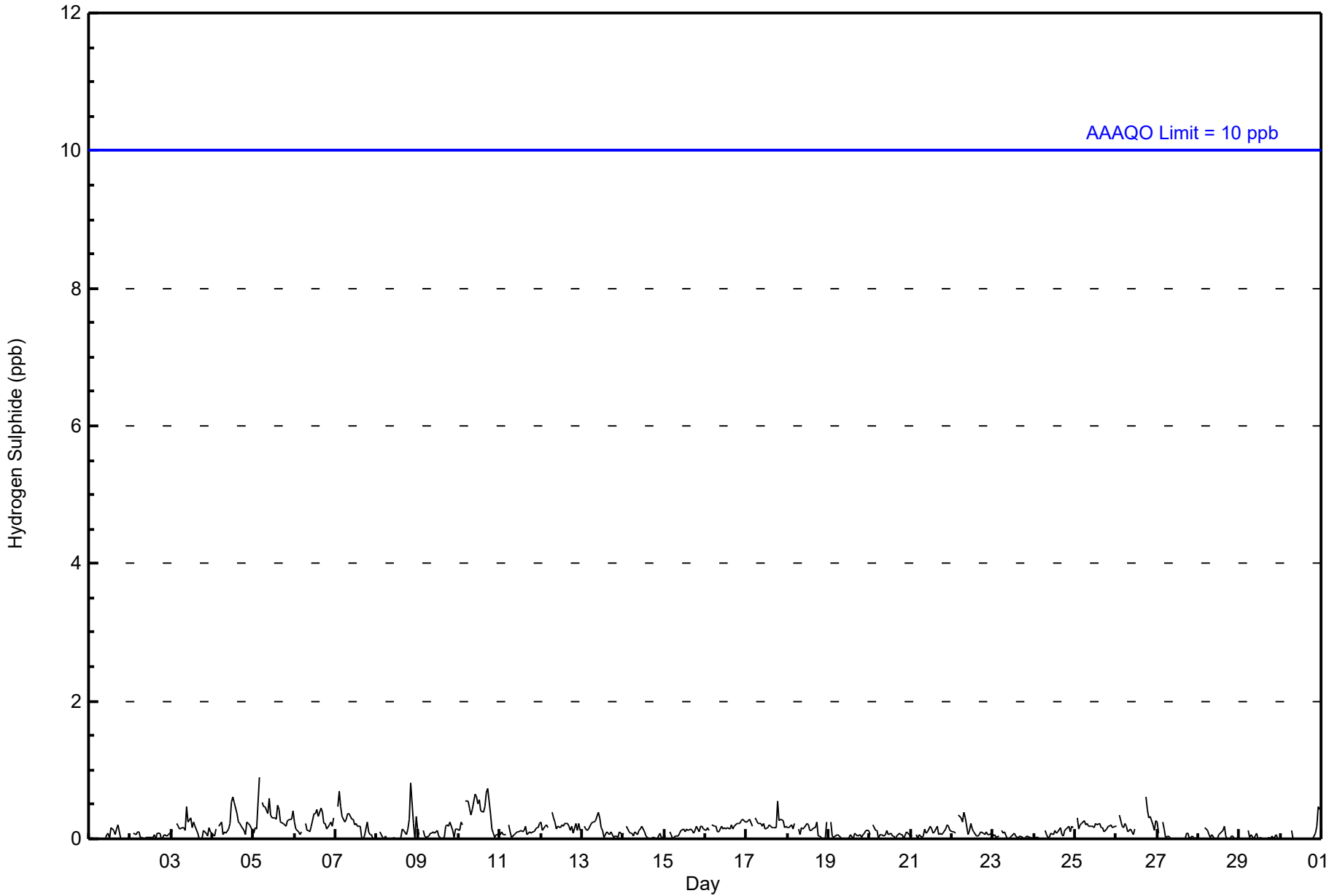
Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Wapasu















**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Wapasu - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	685	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Wapasu - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	72	61	40	29	6	10	24	112	87	33	50	37	23	15	12	61	672
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	72	61	40	29	6	10	24	112	87	33	50	37	23	15	12	61	672

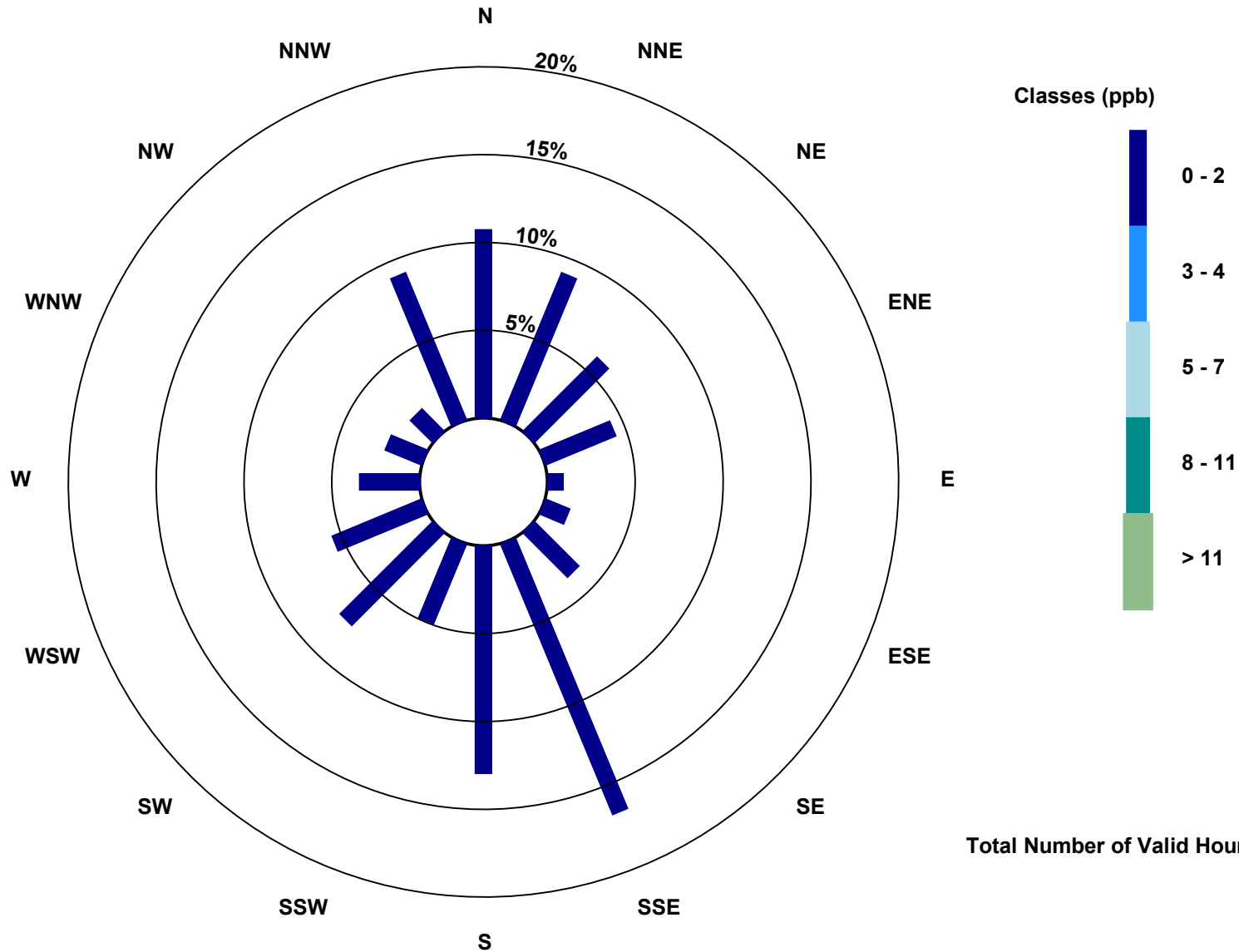
Total Number of Valid Hours: 672

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Wapasu

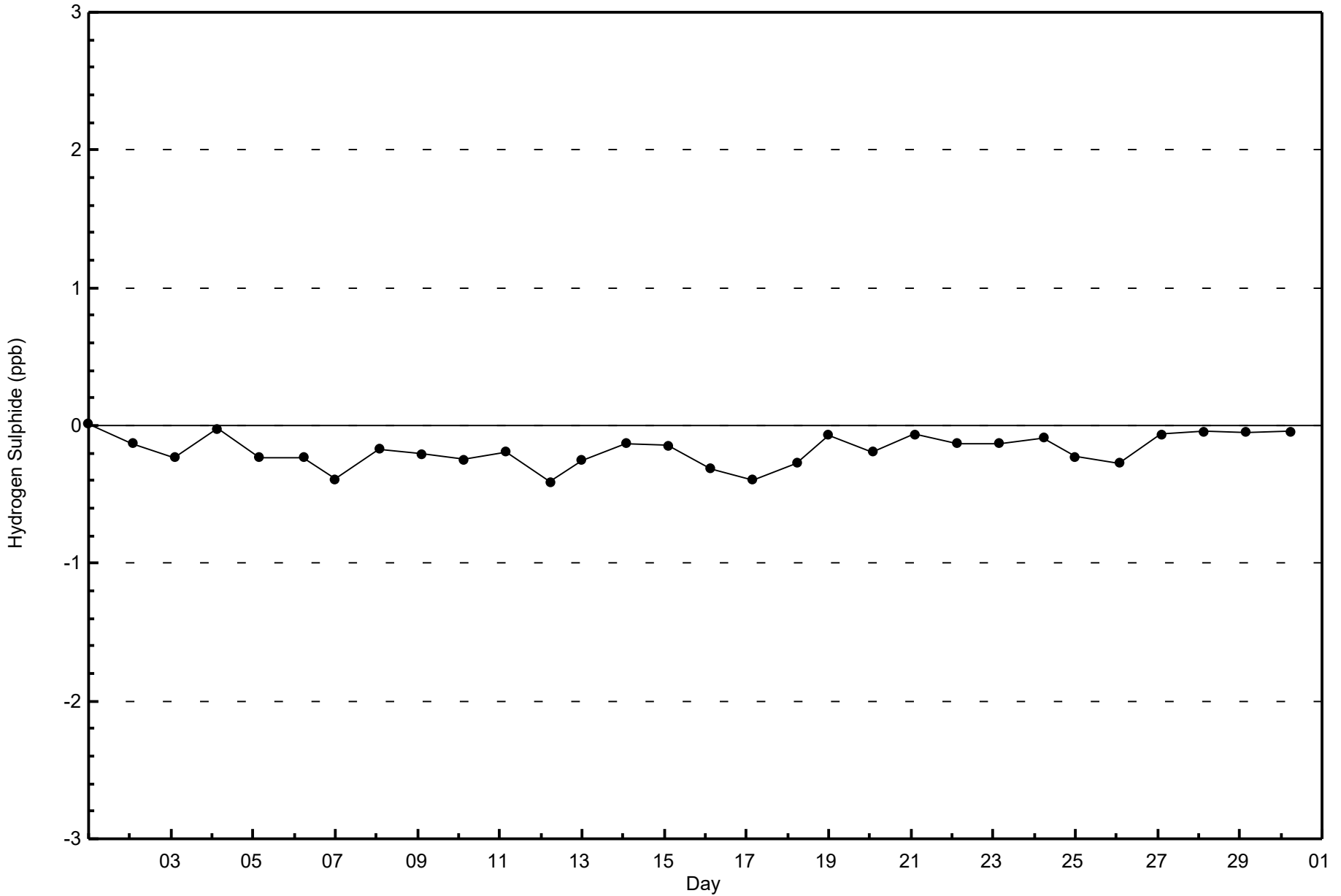


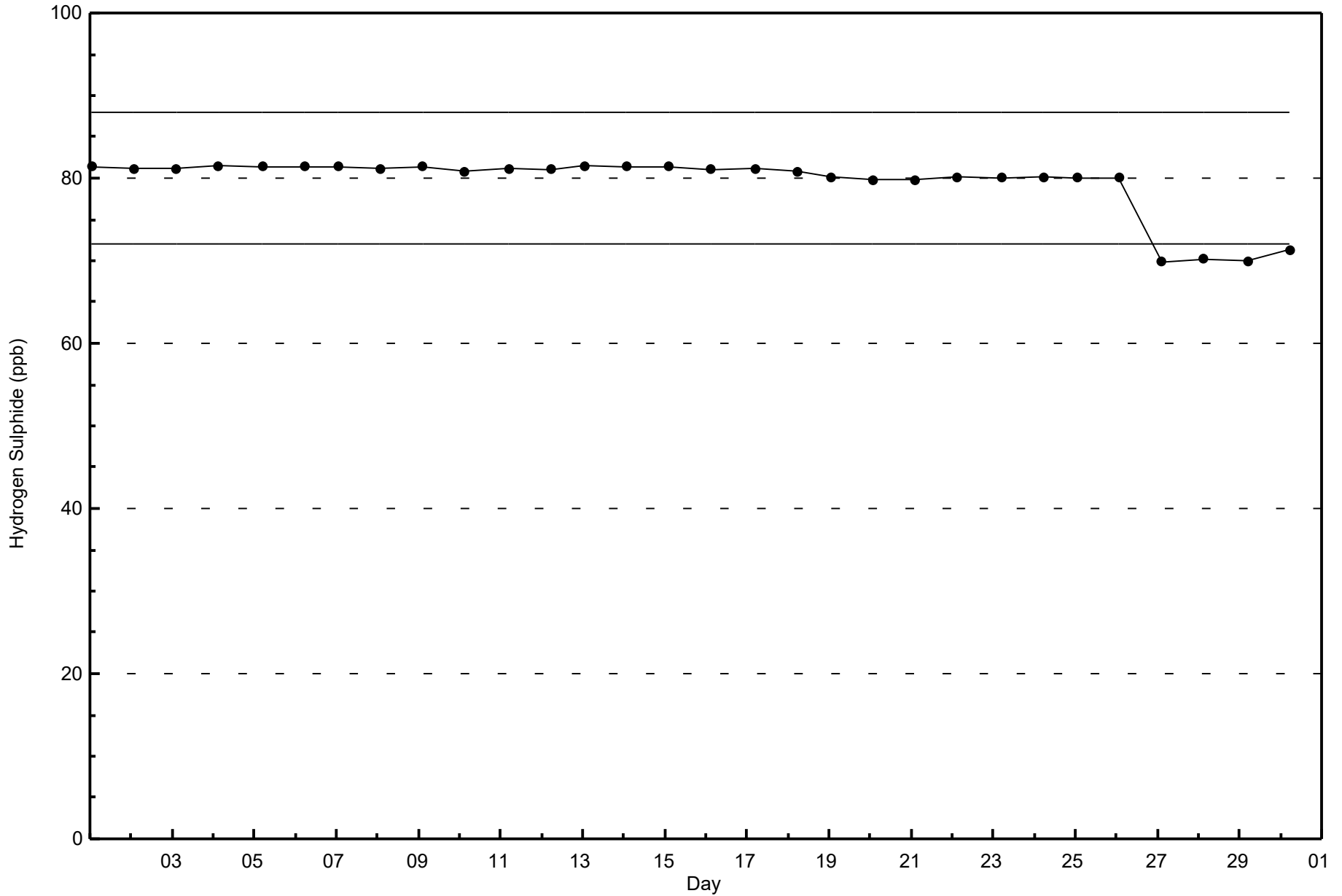
Total Number of Valid Hours: 672



**Wood Buffalo Environmental Association**  
**Zero Responses**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Wapasu - November 2024**



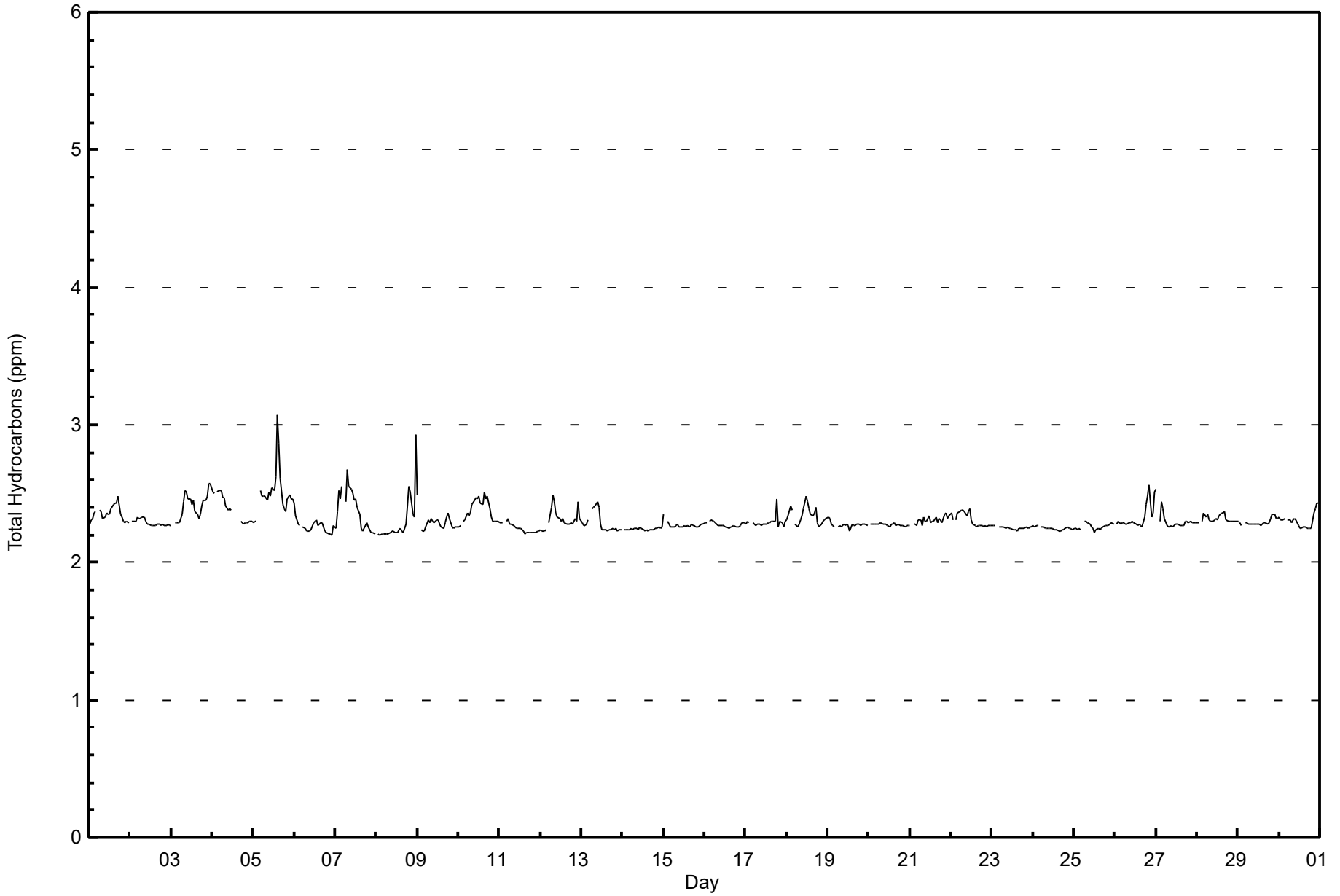






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Wapasu - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Wapasu - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	0	0.00	0.00
2.1 - 3.0	684	99.85	99.85
3.1 - 10.0	1	0.15	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Wapasu - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	73	61	41	28	6	11	23	112	87	33	50	39	21	15	11	60	671
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	73	61	41	28	6	11	23	112	87	33	50	39	22	15	11	60	672

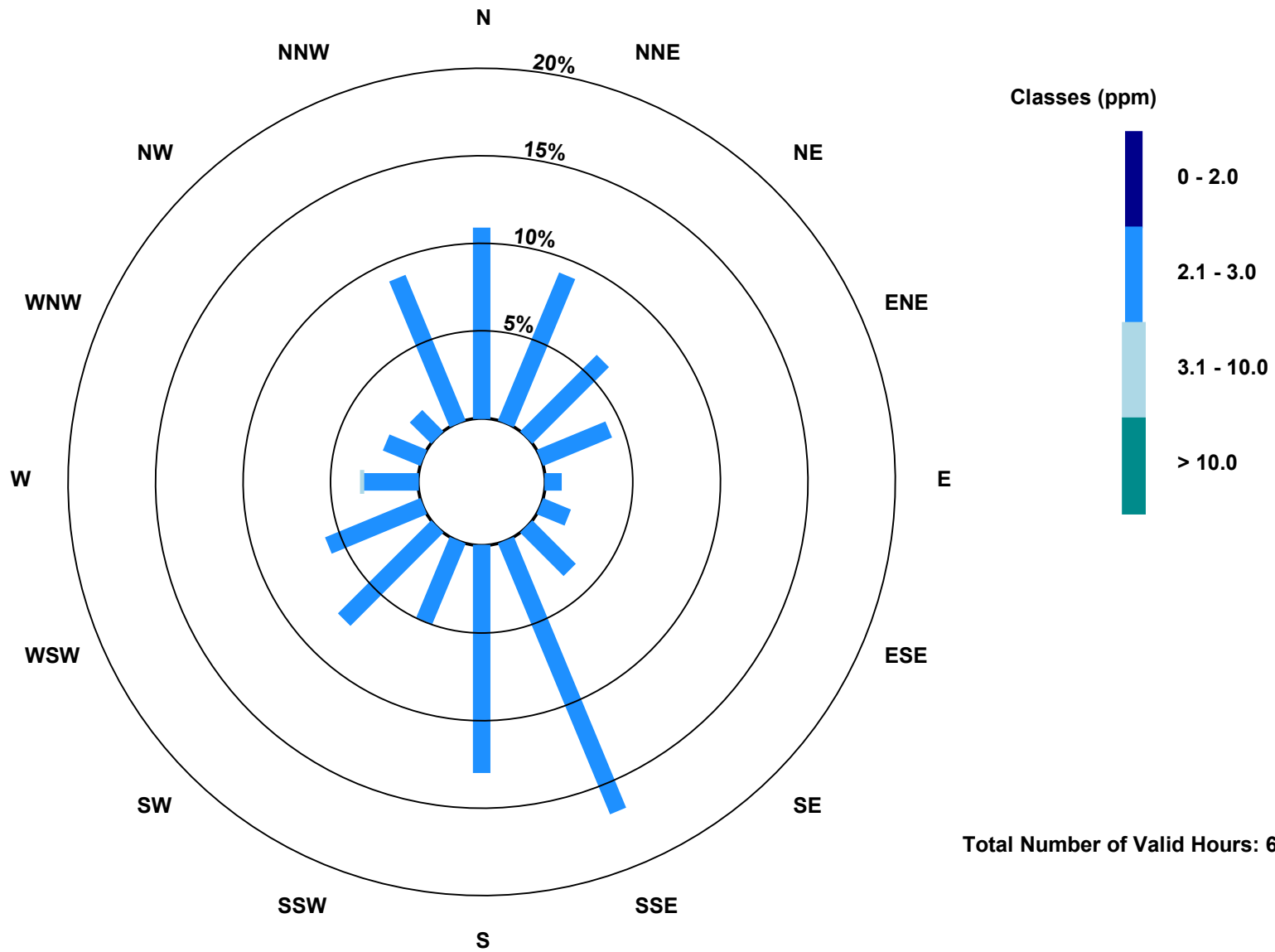
Total Number of Valid Hours: 672

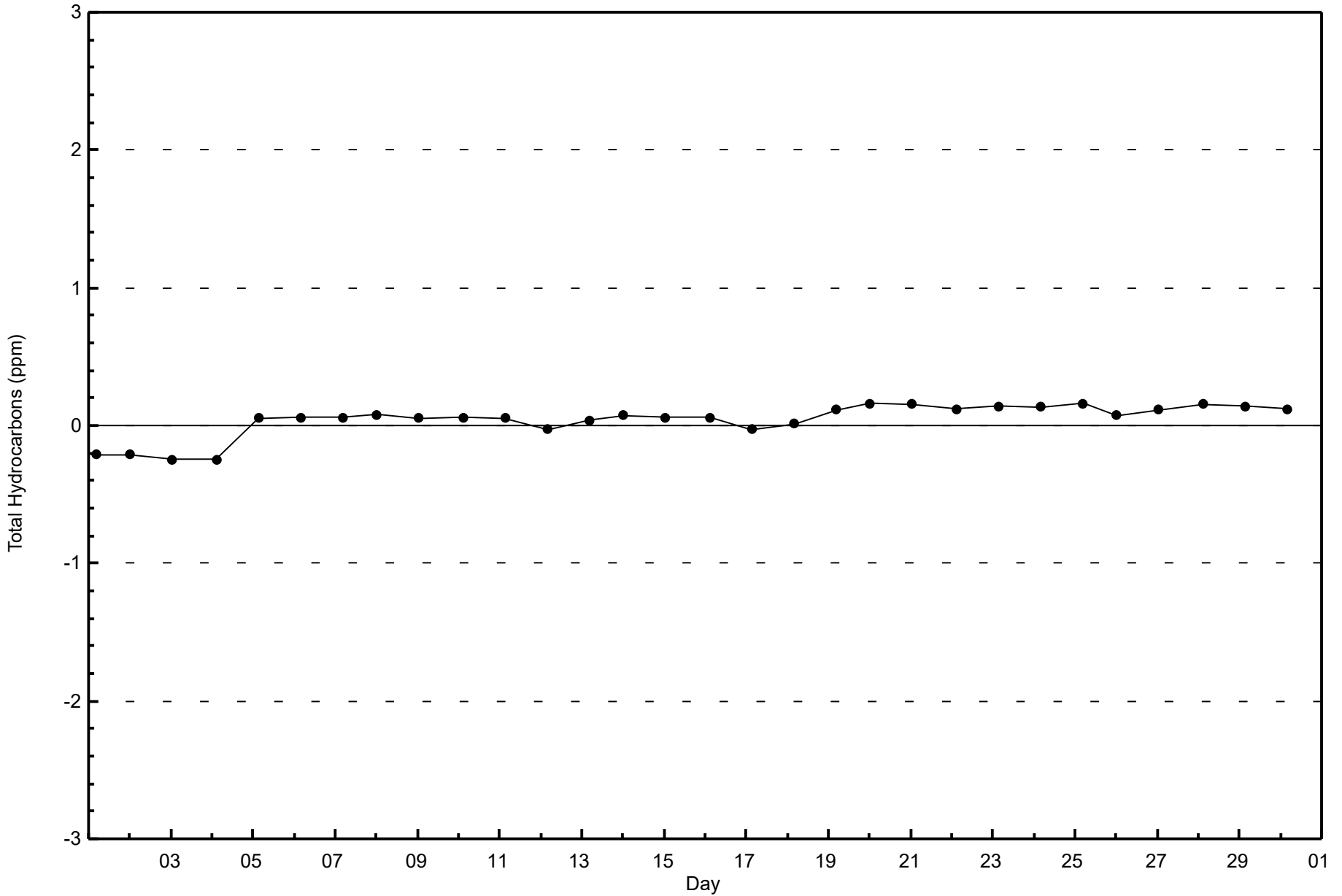
Total Number of Hours: 720

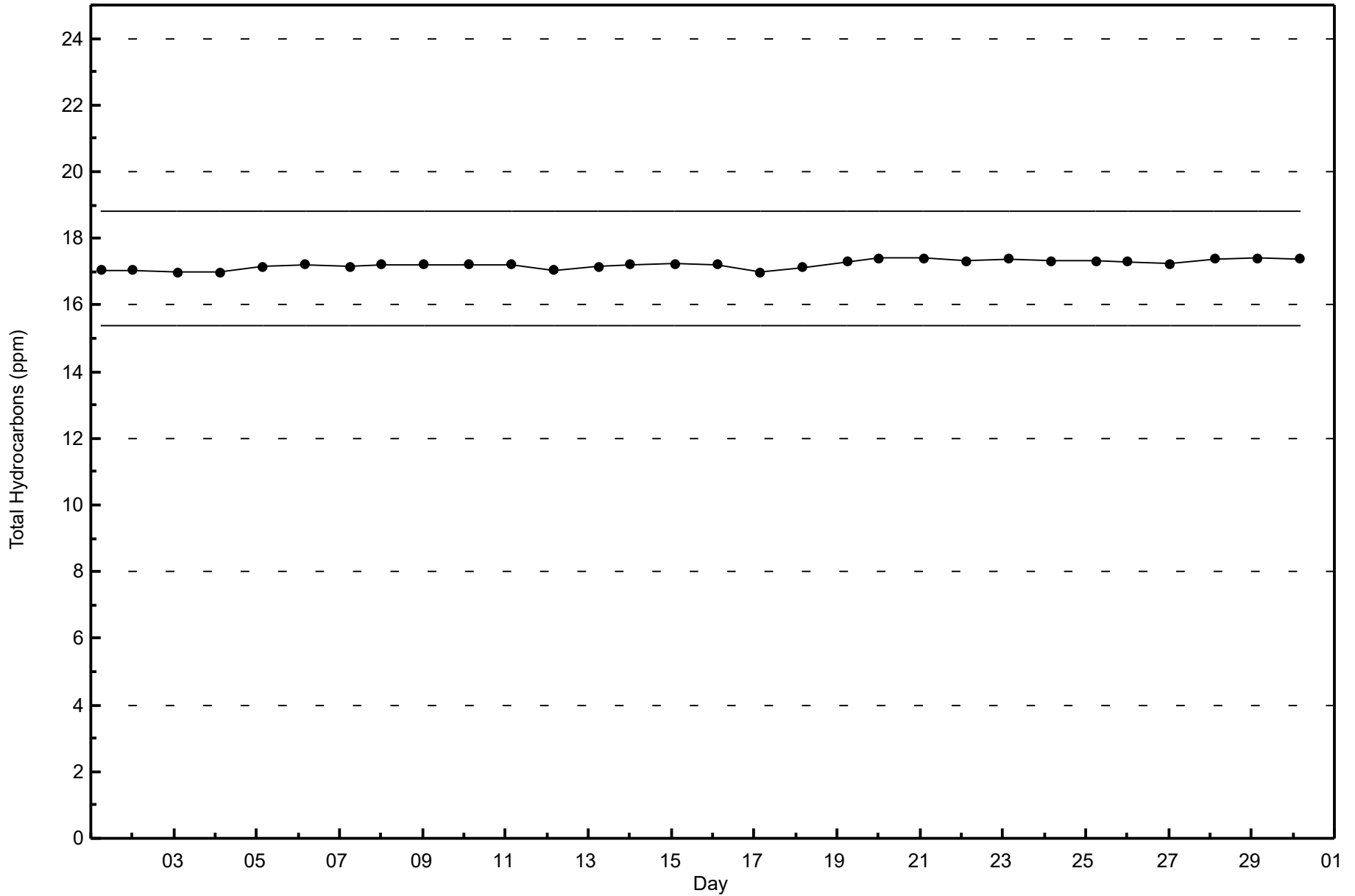


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Hydrocarbons (THC) - ppm  
Wapasu









# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Ozone (O<sub>3</sub>) - ppb

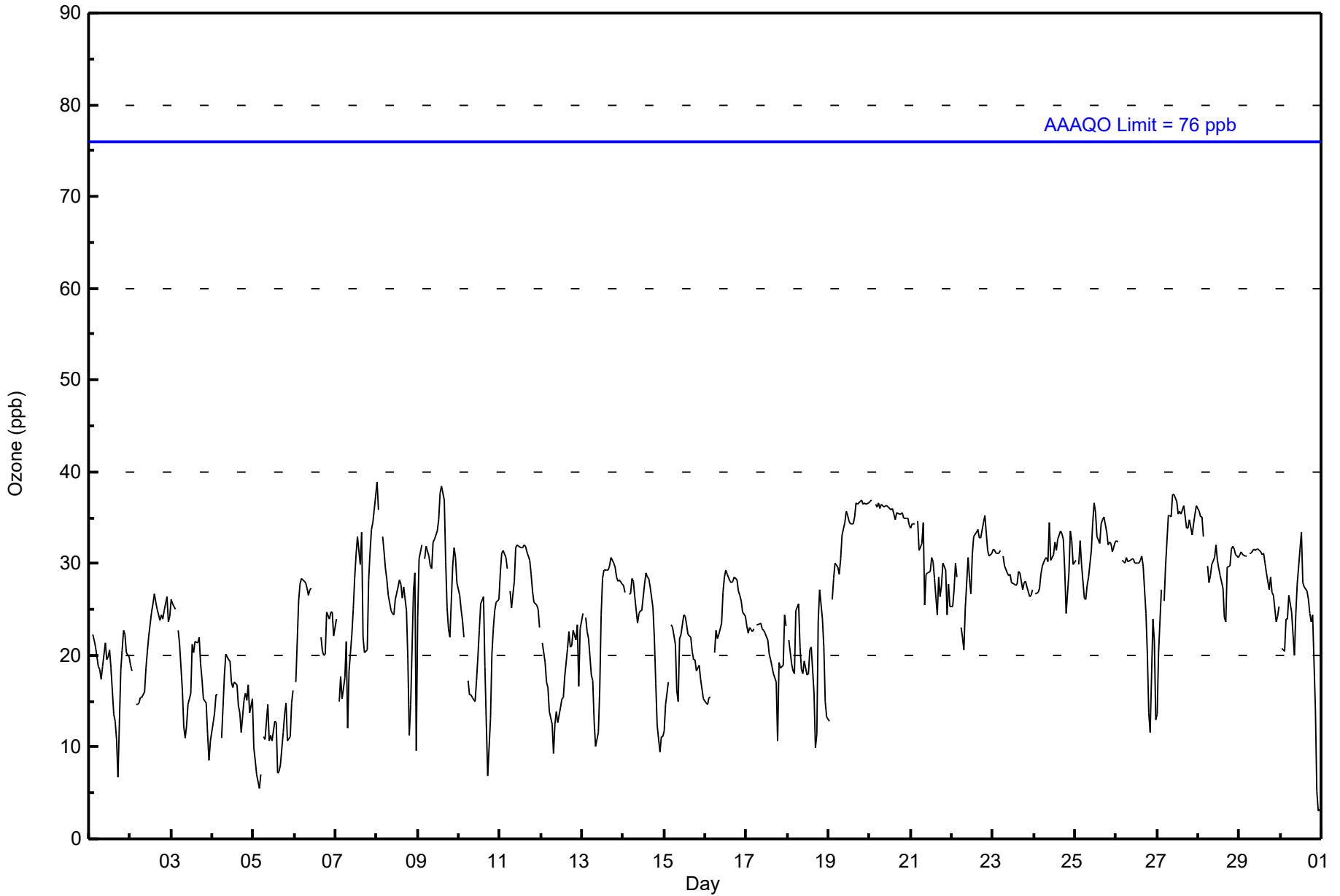
## Wapasu - November 2024

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720																											
Maximum Value: 38.9 ppb on Nov 8 01:00		Maximum Daily Average: 35.8 ppb on Nov 20																	Hours of Data:	686																													
Minimum Value: 3.0 ppb on Nov 30 23:00		Minimum Daily Average: 10.8 ppb on Nov 5																	Hours of Missing Data:	34																													
Maximum Diurnal Average: 27.4 ppb at hour 14		Minimum Diurnal Average: 23.2 ppb at hour 24																	Hours of Calibration:	34																													
Monthly Average: 24.95 ppb		Percentiles: P <sub>1</sub> = 7.0 P <sub>10</sub> = 14.3 Q <sub>1</sub> = 19.9 Median = 26.1 Q <sub>3</sub> = 30.7 P <sub>90</sub> = 34.4 P <sub>99</sub> = 36.9																	Percent Operational Time:	100.0																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	23.9	Z	22.3	21.6	20.9	18.8	18.4	17.3	18.8	21.4	19.6	19.9	20.5	18.6	13.6	12.8	10.8	6.7	18.3	20.6	22.8	22.2	20.3	19.8	18.7	23.9																							
2-Nov	19.0	18.3	Z	14.6	14.7	14.8	15.4	15.3	15.9	18.6	20.4	22.2	24.7	25.6	26.7	25.8	25.1	23.9	24.5	23.9	24.8	26.3	23.6	24.3	21.2	26.7																							
3-Nov	26.0	25.6	25.0	Z	22.7	21.2	16.2	12.2	11.0	12.4	14.6	15.9	21.2	20.3	21.5	21.3	21.9	19.1	17.4	15.3	14.8	11.4	8.5	10.6	17.7	26.0																							
4-Nov	12.6	13.7	15.7	15.7	Z	11.0	14.3	17.8	20.1	19.5	19.4	17.1	16.4	17.1	16.8	14.4	13.7	11.6	15.0	15.9	15.1	16.8	13.7	15.2	15.6	20.1																							
5-Nov	9.9	8.5	7.0	5.5	7.0	Z	11.2	10.9	14.6	10.7	11.3	10.7	12.9	12.6	7.2	7.3	8.0	11.6	13.6	14.8	10.7	11.2	14.8	16.1	10.8	16.1																							
6-Nov	Z	17.1	25.9	27.8	28.4	28.2	27.9	27.3	26.5	27.2	27.3	C	C	C	C	21.9	20.5	20.0	20.2	24.6	23.9	24.7	24.7	22.1	24.5	28.4																							
7-Nov	24.0	Z	15.0	17.7	15.3	17.5	21.6	12.0	18.3	22.2	25.0	28.3	31.0	32.9	29.8	33.5	22.0	20.2	20.6	28.1	31.2	33.8	34.5	37.4	24.9	37.4																							
8-Nov	38.9	35.9	Z	33.0	31.2	29.4	28.3	26.5	24.9	24.5	24.5	26.0	27.4	28.2	27.7	26.2	27.4	24.9	19.6	11.3	14.7	27.0	29.0	9.7	25.9	38.9																							
9-Nov	24.1	30.5	32.1	Z	30.6	32.0	30.8	29.8	29.5	32.4	32.6	33.5	34.7	37.6	38.4	37.0	30.3	25.2	22.9	21.9	29.7	31.8	30.7	27.9	30.7	38.4																							
10-Nov	26.5	25.0	23.8	22.0	Z	17.2	15.7	15.7	15.4	14.9	17.2	19.9	22.8	25.6	26.4	18.8	12.6	6.8	13.1	20.2	22.9	24.8	25.8	26.1	20.0	26.5																							
11-Nov	29.0	31.1	31.5	30.7	29.5	Z	27.1	25.2	28.0	31.7	32.1	31.9	31.7	31.8	32.1	31.9	31.3	30.4	28.9	26.9	25.8	25.5	25.0	23.1	29.2	32.1																							
12-Nov	Z	21.3	19.2	17.1	16.5	14.0	12.5	9.4	12.5	13.8	12.7	14.4	15.2	15.3	17.7	20.8	22.5	21.0	21.1	22.7	21.6	23.4	16.6	22.9	17.6	23.4																							
13-Nov	24.6	Z	24.1	22.6	21.7	17.9	17.2	12.8	10.0	11.6	16.3	24.4	28.4	29.3	29.3	29.8	29.8	30.6	30.0	29.6	28.6	28.1	28.3	27.8	24.0	30.6																							
14-Nov	27.6	26.9	Z	26.7	26.7	28.4	28.1	26.4	23.6	24.6	24.9	24.8	27.8	29.0	28.6	28.4	27.5	25.1	21.8	16.9	12.4	9.5	11.1	11.1	23.4	29.0																							
15-Nov	11.7	14.7	17.1	Z	23.3	23.1	21.1	16.2	14.9	21.8	22.3	24.4	24.3	23.4	22.2	22.0	20.4	19.5	19.5	18.3	19.0	17.4	16.4	15.2	19.5	24.4																							
16-Nov	14.7	14.7	15.4	15.4	Z	20.3	22.7	21.9	22.3	23.6	26.9	28.6	29.2	28.8	28.1	27.9	28.0	28.4	28.3	27.1	26.6	25.9	24.7	24.3	24.1	29.2																							
17-Nov	23.1	22.4	23.1	22.5	22.9	Z	23.3	23.3	23.5	22.9	22.7	22.4	21.7	20.1	19.6	18.7	18.0	17.2	10.7	19.2	18.6	18.9	24.5	23.2	21.0	24.5																							
18-Nov	Z	21.7	19.1	18.2	18.0	24.9	25.6	21.0	18.4	18.0	19.3	17.8	18.1	20.6	20.9	15.8	9.9	11.4	23.8	27.2	23.9	20.9	14.9	13.2	19.2	27.2																							
19-Nov	12.8	Z	26.1	28.4	30.1	29.6	28.8	30.4	33.1	34.4	35.7	35.2	34.6	34.3	34.3	35.1	36.6	36.4	36.8	36.9	36.5	36.6	36.5	36.6	32.9	36.9																							
20-Nov	36.8	36.9	Z	36.4	36.2	36.5	36.0	36.4	36.2	36.3	36.3	36.1	35.8	36.1	35.3	34.7	35.5	35.4	35.4	35.6	34.9	34.9	34.9	34.1	35.8	36.9																							
21-Nov	33.9	34.3	34.3	Z	34.7	31.4	32.2	34.5	25.5	28.8	29.0	29.1	30.7	30.3	28.4	24.4	28.5	26.4	27.6	30.1	29.3	24.4	27.7	25.4	29.6	34.7																							
22-Nov	25.4	27.1	30.1	28.6	Z	23.1	21.9	20.6	25.1	30.7	28.3	26.7	30.9	33.0	33.4	33.7	32.8	32.8	34.4	35.2	33.3	31.4	30.9	31.1	29.6	35.2																							
23-Nov	31.5	31.4	31.1	31.1	31.4	Z	30.8	29.8	29.0	28.7	28.8	27.9	27.7	27.6	27.7	29.1	29.0	27.2	27.9	28.0	27.4	26.4	26.5	27.1	28.8	31.5																							
24-Nov	Z	26.7	26.9	27.3	28.9	29.7	30.4	30.7	30.2	34.5	30.3	31.0	32.4	31.4	32.7	33.5	33.3	32.7	29.3	24.6	29.0	33.6	32.4	29.8	30.5	34.5																							
25-Nov	30.4	Z	29.9	32.5	30.0	26.2	26.1	27.6	28.6	31.5	34.5	36.6	35.5	32.9	32.2	34.3	34.8	35.0	33.4	32.1	32.4	32.1	31.2	32.3	31.8	36.6																							
26-Nov	32.5	32.3	Z	30.4	30.3	30.0	30.7	30.2	30.4	30.4	30.4	30.1	30.1	30.1	30.4	30.8	29.8	24.6	20.1	13.8	11.6	23.9	21.6	13.0	26.8	32.5																							
27-Nov	13.6	20.3	27.1	Z	25.9	29.7	35.2	35.3	35.1	37.5	37.5	36.7	35.4	35.7	35.5	36.3	35.1	33.8	33.8	34.7	33.1	34.4	35.4	36.3	32.8	37.5																							
28-Nov	35.8	35.0	35.0	32.9	Z	29.7	27.9	28.7	29.9	30.7	32.0	30.4	29.5	28.8	27.4	24.1	23.7	29.5	29.8	31.6	31.9	31.6	31.0	30.7	30.3	35.8																							
29-Nov	30.9	31.3	31.0	30.7	30.7	Z	31.1	31.2	31.6	31.4	31.6	31.6	31.3	30.9	31.1	30.1	28.9	27.2	28.5	26.8	26.5	23.6	24.2	25.3	29.5	31.6																							
30-Nov	Z	20.8	20.4	24.0	24.0	26.6	24.7	22.3	20.0	24.5	27.8	31.6	33.4	28.0	27.5	27.0	26.0	24.5	23.7	24.3	14.0	5.2	3.0	3.2	22.0	33.4																							
																								24.8	24.9	24.3	24.5	25.3	24.4	24.4	23.3	23.4	25.0	25.7	26.4	27.4	27.4	27.0	26.2	25.1	24.0	24.3	24.6	24.2	24.6	24.1	23.2	Diurnal Average	
																								38.9	36.9	35.0	36.4	36.2	36.5	36.0	36.4	36.2	37.5	37.5	36.7	35.8	37.6	38.4	37.0	36.6	36.4	36.8	36.9	36.5	36.6	36.5	37.4	Diurnal Maximum	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb																																																	



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ozone (O<sub>3</sub>) - ppb**  
**Wapasu - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Wapasu - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	189	27.55	27.55
21 - 50	497	72.45	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb  
Wapasu - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	11	3	5	4	2	3	5	19	33	15	27	15	14	8	4	13	181
21 - 50	62	58	37	23	4	8	21	89	60	17	21	24	7	7	8	47	493
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	73	61	42	27	6	11	26	108	93	32	48	39	21	15	12	60	674

Total Number of Valid Hours: 674

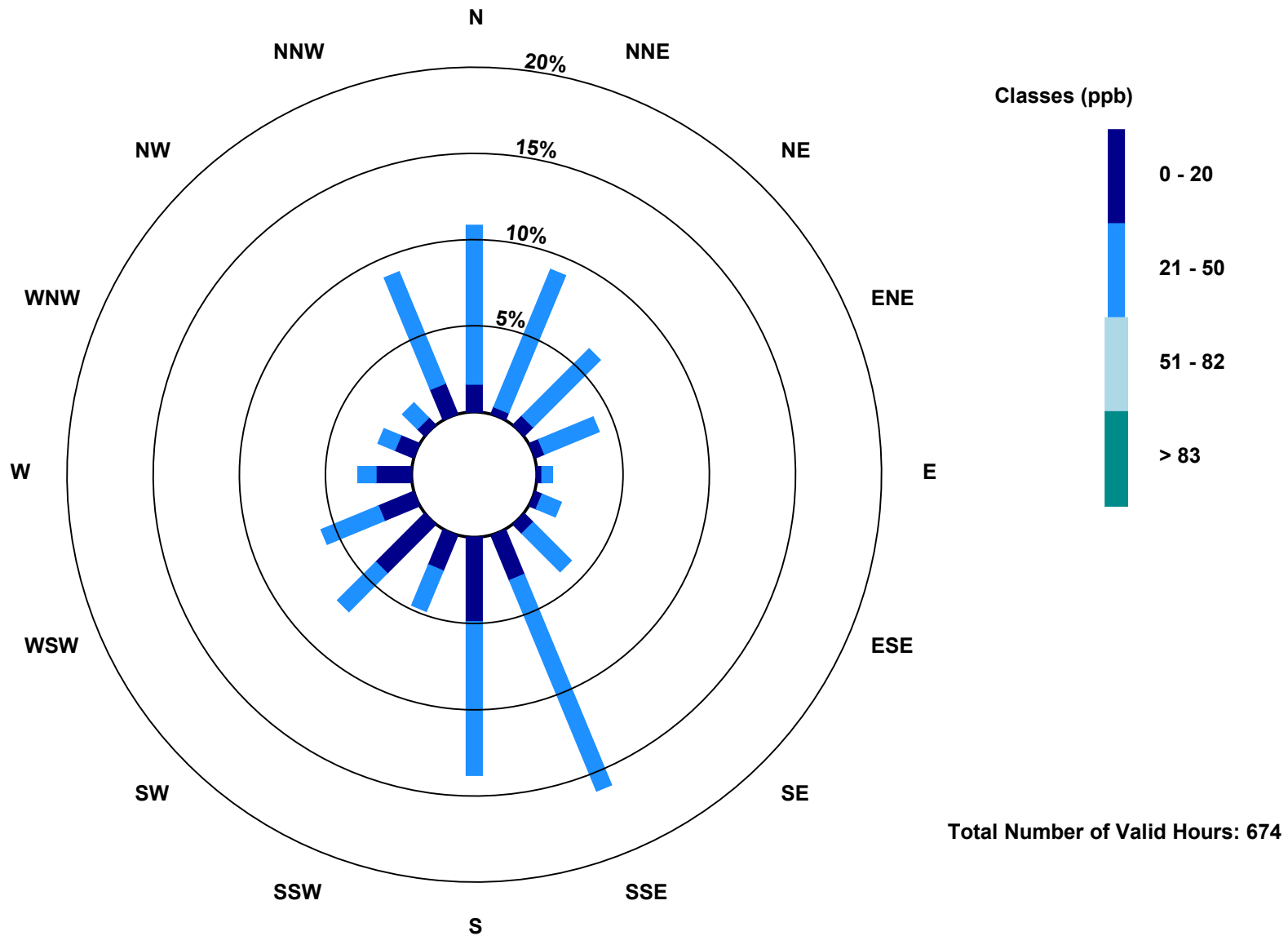
Total Number of Hours: 720

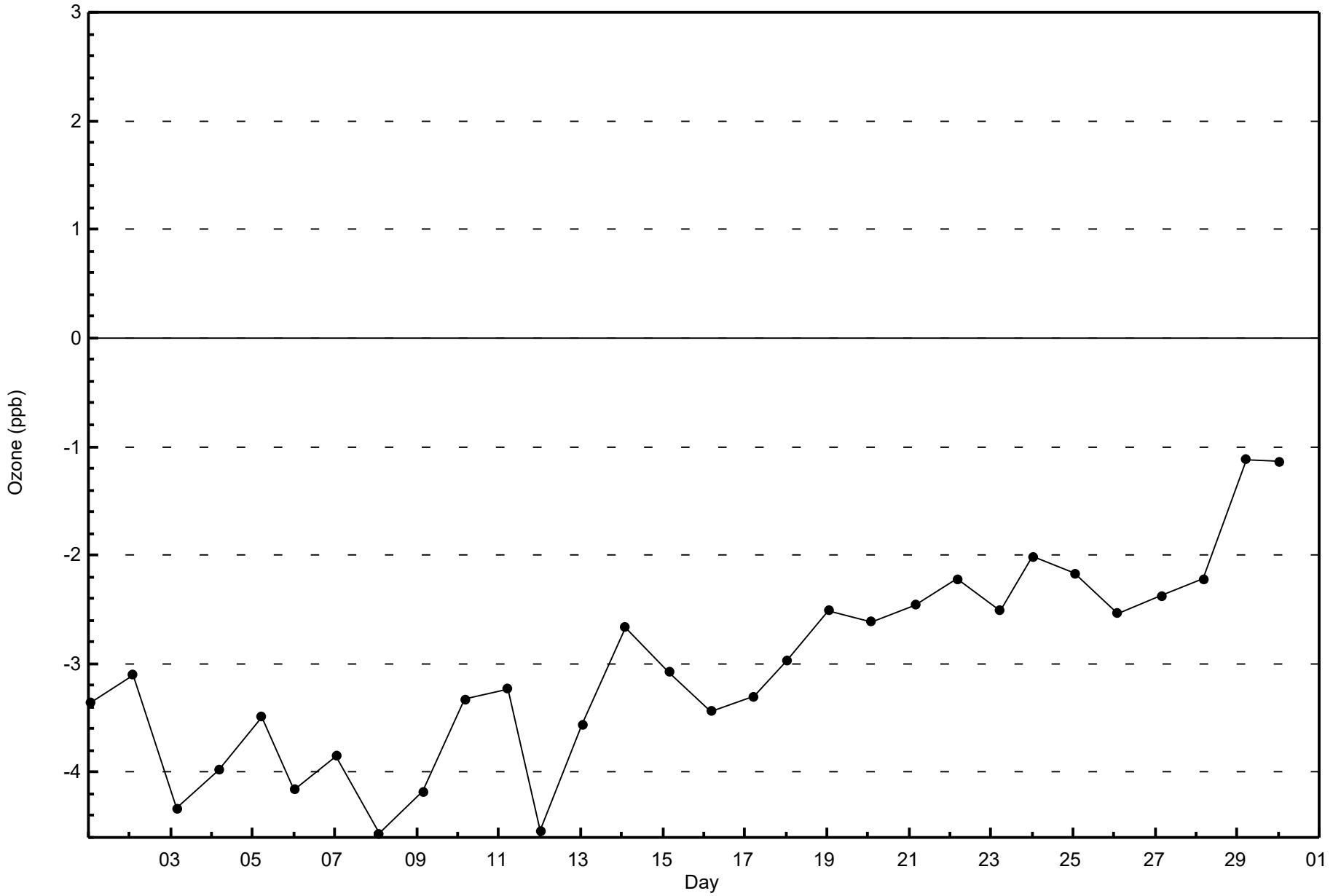


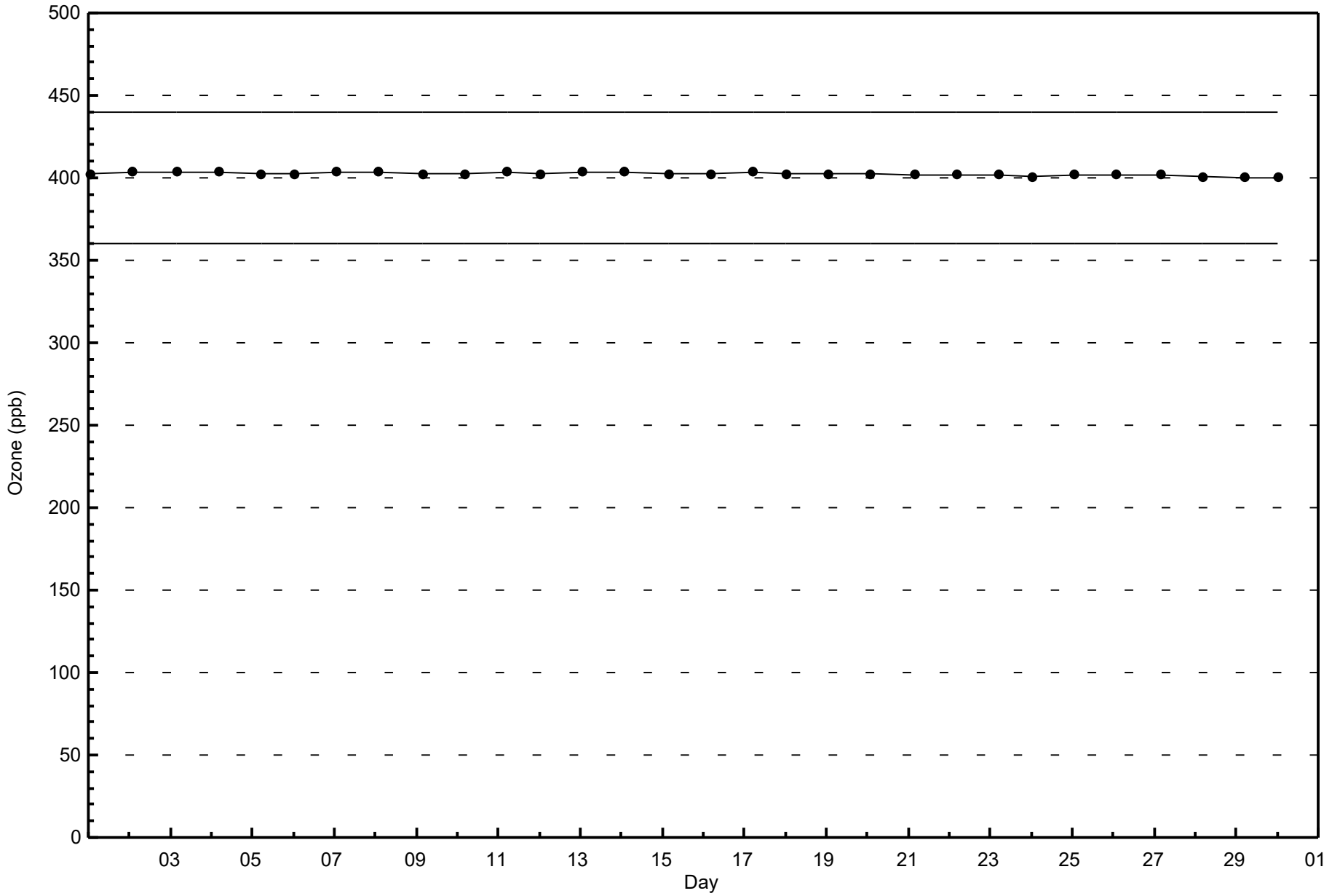


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Ozone (O<sub>3</sub>) - ppb  
Wapasu







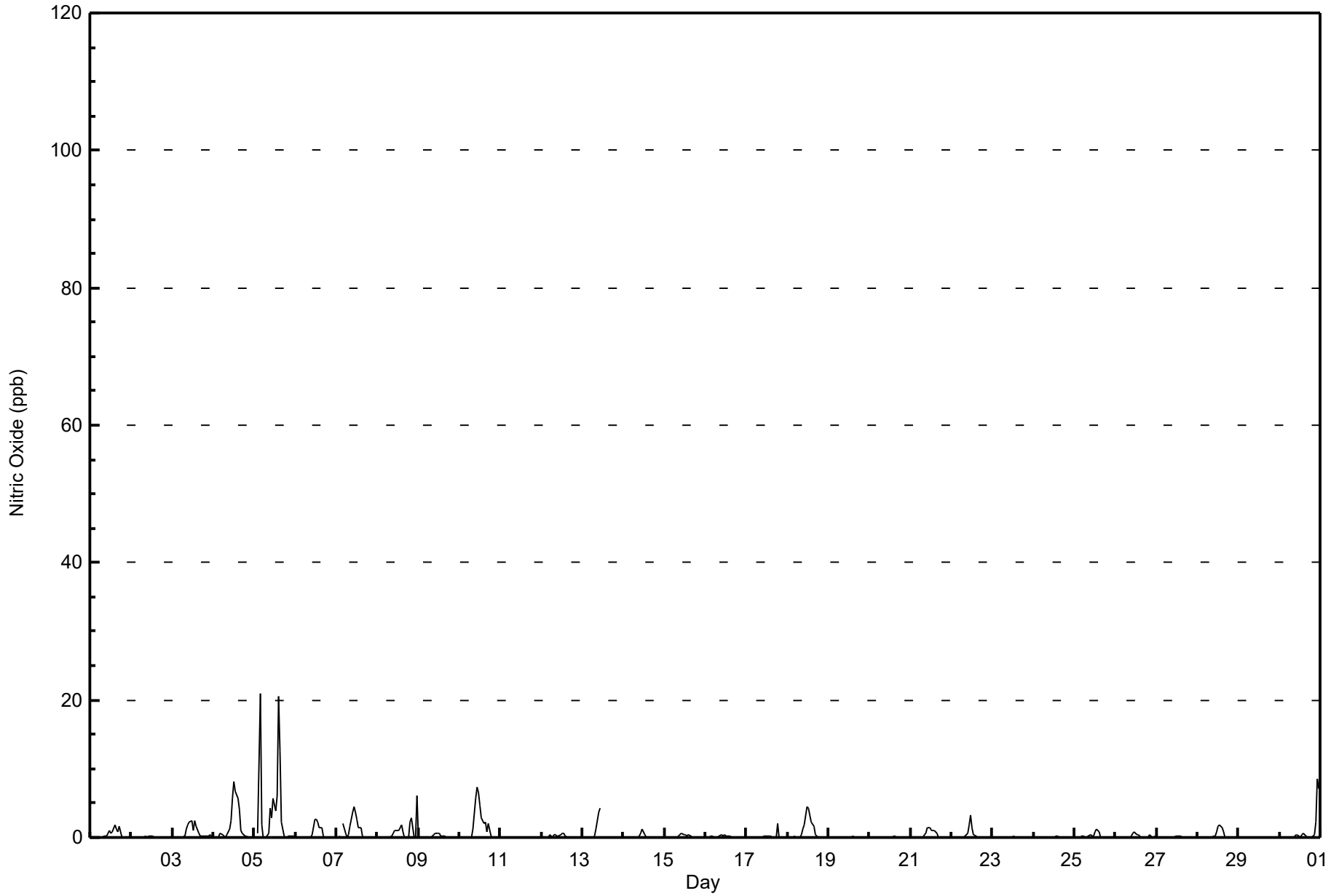


Maximum Value: 20.9 ppb on Nov 5 04:00																				Maximum Daily Average: 3.6 ppb on Nov 5					Hours in Service: 720	
Minimum Value: 0.0 ppb on Nov 1 22:00																				Minimum Daily Average: 0.0 ppb on Nov 11					Hours of Data: 685	
Maximum Diurnal Average: 1.5 ppb at hour 15																				Minimum Diurnal Average: 0.0 ppb at hour 1					Hours of Missing Data: 35	
Monthly Average: 0.50 ppb																				Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 1.3 P <sub>99</sub> = 6.7					Hours of Calibration: 35	
																									Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.0	0.1	0.0	Z	0.0	0.0	0.0	0.1	0.3	0.3	0.7	1.0	0.7	0.9	1.9	1.3	0.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.9
2-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
3-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.2	1.2	1.8	2.2	2.5	1.1	2.4	1.5	0.5	0.1	0.3	0.2	0.2	0.2	0.1	0.4	0.1	0.7	2.5
4-Nov	Z	0.1	0.1	0.1	0.5	0.3	0.1	0.1	0.4	1.3	2.4	5.8	8.1	6.6	5.7	4.1	1.0	0.6	0.2	0.1	0.1	0.0	0.0	0.0	1.6	8.1
5-Nov	0.0	Z	0.6	20.9	1.8	0.1	0.0	0.1	0.5	4.2	2.8	5.7	4.0	6.1	20.6	12.7	2.2	0.2	0.1	0.0	0.2	0.2	0.1	0.1	3.6	20.9
6-Nov	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	2.5	2.6	2.3	1.5	1.4	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.5	2.6
7-Nov	0.0	0.0	0.1	Z	2.0	0.7	0.0	0.4	1.5	3.7	4.4	3.6	2.6	1.4	1.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	4.4
8-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.7	1.0	1.1	1.1	1.5	1.7	0.9	0.1	0.0	0.1	2.2	2.8	0.0	0.0	6.1	0.8	6.1
9-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.2	0.4	0.6	0.6	0.7	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7
10-Nov	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.1	1.3	5.6	7.2	6.6	4.7	2.8	1.9	2.2	0.8	2.1	0.1	0.0	0.0	0.0	0.0	0.0	1.6	7.2
11-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12-Nov	0.0	0.0	Z	0.0	0.0	0.4	0.1	0.5	0.4	0.2	0.3	0.4	0.6	0.5	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.6
13-Nov	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.2	1.3	3.6	4.2	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	4.2
14-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.7	1.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	1.1
15-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.3	0.3	0.6	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.6
16-Nov	Z	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.1	0.4	0.3	0.4	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
17-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.2	2.1
18-Nov	0.0	0.0	Z	0.0	0.2	0.0	0.0	0.0	0.3	1.3	1.9	4.4	4.4	3.3	2.3	1.6	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.9	4.4
19-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
20-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
21-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.3	0.7	1.4	1.5	1.0	0.9	0.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.5
22-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.6	1.9	3.2	1.4	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.2
23-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
24-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2
25-Nov	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.4	0.2	0.2	0.9	1.1	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.1
26-Nov	0.0	0.0	0.1	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.6	0.7	0.5	0.5	0.3	0.1	0.0	0.1	0.0	0.0	0.4	0.0	0.0	0.1	0.2	0.7
27-Nov	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
28-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.8	1.5	1.9	1.4	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.9
29-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
30-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.2	0.1	0.5	0.5	0.2	0.0	0.0	0.0	0.0	0.4	2.2	8.5	7.1	0.9	8.5
																								Diurnal Average		
																								Diurnal Maximum		
0.0 0.0 0.0 0.9 0.2 0.1 0.0 0.1 0.3 0.9 1.2 1.5 1.3 1.2 1.5 0.9 0.2 0.2 0.1 0.1 0.1 0.1 0.3 0.5																										
0.1 0.1 0.6 20.9 2.0 0.7 0.1 0.5 1.5 5.6 7.2 6.6 8.1 6.6 20.6 12.7 2.2 2.1 2.1 2.2 2.8 2.2 8.5 7.1																										
Z - zerospan C - Calibration																										



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Wapasu - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Wapasu - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	683	99.71	99.71
21 - 40	2	0.29	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Wapasu - November 2024**

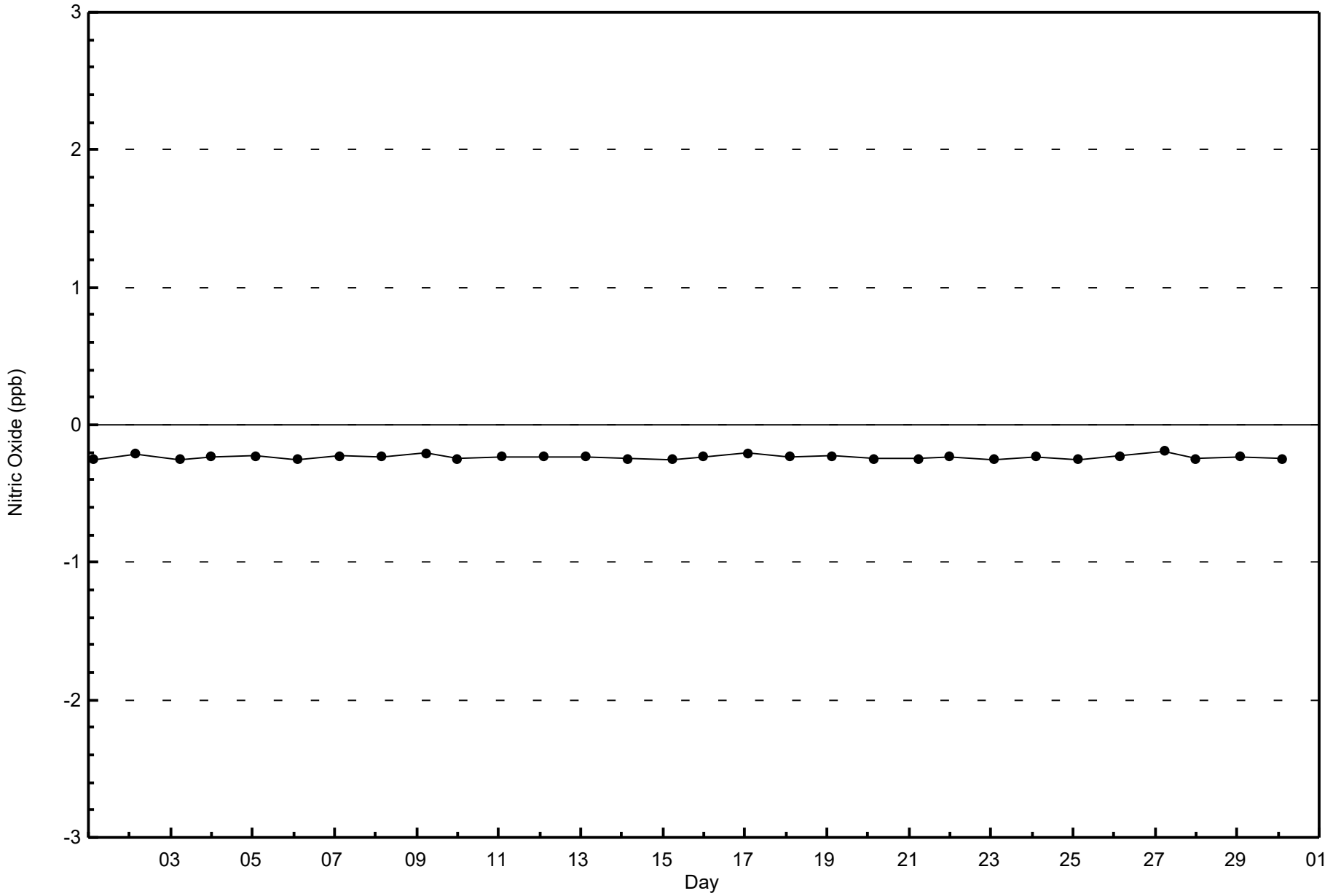
<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	74	56	42	26	6	10	24	113	91	33	48	41	21	13	12	61	671
21 - 40	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	74	57	42	26	6	10	24	113	91	33	48	41	22	13	12	61	673

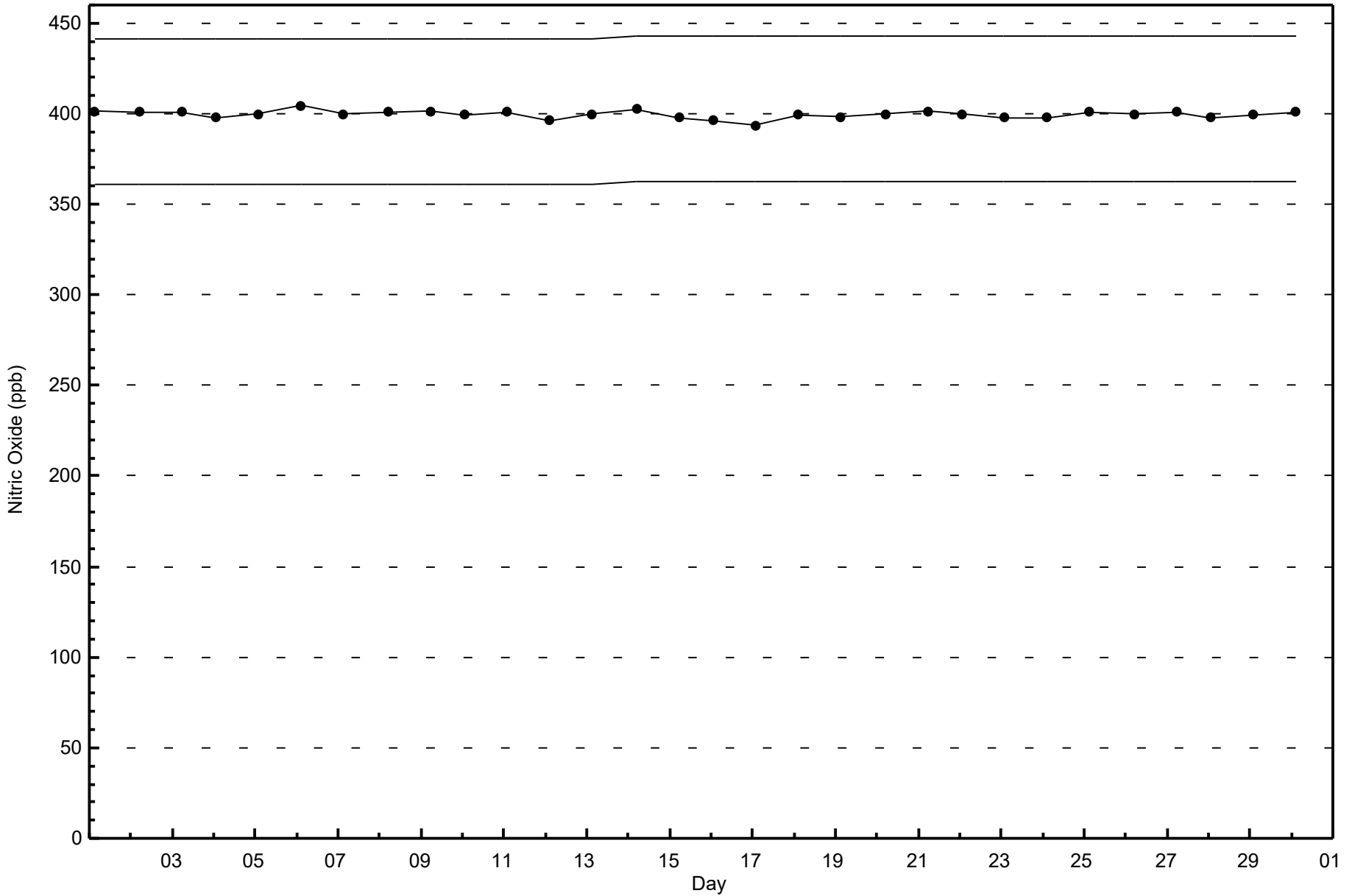
Total Number of Valid Hours: 673

Total Number of Hours: 720











# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Nitrogen Dioxide (NO<sub>2</sub>) - ppb

## Wapasu - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 27.6 ppb on Nov 9 00:00	Maximum Daily Average: 8.7 ppb on Nov 5		Hours of Data:	685
Minimum Value: 0.1 ppb on Nov 13 23:00	Minimum Daily Average: 0.2 ppb on Nov 23		Hours of Missing Data:	35
Maximum Diurnal Average: 4.4 ppb at hour 18	Minimum Diurnal Average: 2.5 ppb at hour 3		Hours of Calibration:	35
Monthly Average: 3.55 ppb	Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 0.6 Median = 1.9 Q <sub>3</sub> = 5.6 P <sub>90</sub> = 9.2 P <sub>99</sub> = 18.4		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	1.9	2.3	2.1	Z	3.2	4.7	4.4	5.0	6.6	3.5	5.1	5.8	4.4	5.8	10.5	10.8	12.9	17.5	3.6	1.9	0.7	0.6	0.6	0.7	5.0	17.5
2-Nov	0.5	0.5	1.0	0.9	Z	2.1	2.1	2.5	1.8	1.1	1.0	0.8	0.8	0.7	0.8	0.9	0.9	1.0	0.8	0.9	1.4	0.9	1.3	0.5	1.1	2.5
3-Nov	0.5	0.4	0.5	2.1	1.1	Z	3.3	5.5	6.0	4.8	4.5	4.4	3.2	6.5	6.4	4.0	2.7	4.7	5.8	6.6	6.2	8.6	9.8	7.3	4.6	9.8
4-Nov	Z	4.9	5.4	5.2	10.6	10.1	8.4	6.3	4.8	5.3	5.4	8.3	9.1	8.2	8.2	9.7	9.3	10.4	6.2	6.4	7.2	5.0	4.3	4.0	7.1	10.6
5-Nov	3.9	Z	2.1	12.1	13.3	10.9	9.4	9.1	7.2	10.2	6.8	8.2	7.8	10.8	16.1	15.0	11.6	6.1	4.1	3.2	8.4	8.6	7.9	8.0	8.7	16.1
6-Nov	10.0	8.0	Z	0.5	0.6	1.0	0.9	1.0	1.1	1.2	2.7	7.3	7.4	6.5	5.7	8.8	7.0	6.2	6.0	2.4	2.9	1.6	1.6	4.9	4.1	10.0
7-Nov	3.5	7.6	18.1	Z	11.9	11.5	9.7	20.9	14.6	12.1	10.0	8.0	6.9	5.2	6.1	2.4	2.7	1.7	5.7	3.8	1.5	0.9	1.6	0.6	7.3	20.9
8-Nov	0.8	1.6	1.2	1.1	Z	1.5	1.6	2.2	2.9	3.8	4.6	4.1	3.4	4.8	7.6	8.8	6.4	8.3	11.3	19.2	18.2	6.3	4.4	27.6	6.6	27.6
9-Nov	11.6	3.0	1.0	1.0	1.2	Z	3.3	3.1	3.9	2.5	2.5	2.1	2.2	1.3	1.6	3.0	5.6	9.7	10.4	11.1	4.2	2.1	2.1	3.4	4.0	11.6
10-Nov	Z	3.5	4.2	5.1	7.6	9.4	9.3	9.2	9.4	11.4	10.6	9.6	8.2	6.6	7.2	13.4	17.8	22.6	15.1	6.3	3.5	2.0	1.1	0.8	8.4	22.6
11-Nov	0.8	Z	1.0	1.1	1.2	1.7	2.0	1.6	1.2	0.7	0.6	0.5	0.5	0.5	0.5	0.6	0.4	0.4	0.4	1.0	0.9	0.9	0.7	0.9	0.9	2.0
12-Nov	0.6	1.0	Z	1.2	1.3	4.2	5.8	8.3	5.7	2.5	2.0	1.8	1.5	2.3	1.2	0.8	1.2	2.3	2.2	0.8	3.4	2.6	9.3	2.9	2.8	9.3
13-Nov	1.4	1.1	1.3	Z	3.0	5.6	5.7	6.2	6.9	9.1	8.9	C	C	C	C	C	0.2	0.2	0.3	0.2	0.4	0.3	0.1	0.1	2.8	9.1
14-Nov	0.1	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	1.1	3.6	4.3	1.4	0.2	0.2	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.5	0.6	0.7	4.3
15-Nov	1.4	0.5	0.3	0.4	0.5	Z	1.1	1.4	3.3	2.1	2.5	1.6	1.5	1.2	1.5	1.2	2.7	2.4	1.5	2.0	1.1	1.0	1.0	1.1	1.4	3.3
16-Nov	Z	1.2	1.3	2.3	3.4	1.5	1.1	1.4	1.7	1.8	1.2	1.2	1.3	1.1	1.5	1.2	1.3	1.6	1.9	2.1	2.1	2.2	2.5	2.2	1.7	3.4
17-Nov	2.5	Z	1.9	1.9	1.7	1.8	1.7	1.5	1.0	1.6	1.6	1.2	1.4	1.6	1.7	2.1	2.0	2.6	9.2	3.1	4.9	6.1	1.4	2.2	2.5	9.2
18-Nov	1.8	3.7	Z	5.2	6.6	1.6	2.1	5.8	5.9	6.3	6.2	9.1	9.0	6.8	6.1	8.6	8.7	11.1	2.3	0.3	0.7	0.9	0.6	0.9	4.8	11.1
19-Nov	1.2	1.1	0.8	Z	0.2	0.1	0.1	0.2	1.0	1.0	0.2	0.2	0.3	0.3	1.3	0.9	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.4	1.3
20-Nov	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.9	1.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	1.4
21-Nov	0.4	0.4	0.5	0.3	0.6	Z	2.8	0.7	9.2	5.9	5.9	5.8	4.1	4.8	6.7	10.4	5.8	8.2	7.2	3.8	5.9	10.7	6.9	9.5	5.1	10.7
22-Nov	Z	6.9	4.1	5.5	9.8	12.1	13.3	14.4	10.2	4.2	6.7	8.7	4.8	2.1	1.1	0.7	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.3	4.6	14.4
23-Nov	0.2	Z	0.2	0.2	0.3	0.2	0.2	0.2	0.4	0.2	0.2	0.3	0.9	0.3	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.9
24-Nov	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.4	0.6	0.3	0.3	0.4	1.0	0.8	0.2	0.2	0.2	0.2	0.5	0.7	0.4	1.2	6.3	0.6	6.3
25-Nov	6.0	6.4	6.3	Z	6.7	7.3	6.6	4.4	3.9	2.7	1.1	0.6	2.3	3.2	3.2	1.3	1.0	0.9	1.3	1.7	1.6	2.2	2.8	2.2	3.3	7.3
26-Nov	2.6	2.4	3.1	3.1	Z	3.0	2.4	3.0	2.8	2.5	2.4	2.6	2.1	2.2	2.2	2.3	2.9	6.2	8.1	10.1	13.3	3.4	6.4	16.8	4.6	16.8
27-Nov	16.1	9.4	3.6	12.0	8.8	Z	1.9	1.7	1.9	0.4	0.3	1.1	2.0	1.5	1.8	1.4	2.3	3.4	3.1	2.1	3.7	3.0	2.1	1.8	3.7	16.1
28-Nov	Z	1.9	1.7	3.8	5.6	5.2	6.3	4.6	3.2	2.5	1.5	3.0	4.5	5.2	6.5	9.8	10.2	2.8	1.7	0.3	0.3	0.2	0.3	0.3	3.5	10.2
29-Nov	0.2	Z	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.6	0.5	2.6	2.8	2.4	1.5	0.9	0.7	2.8
30-Nov	1.0	1.2	Z	0.9	1.2	1.2	1.5	2.1	1.8	1.9	1.9	0.8	0.4	1.9	3.8	2.9	0.6	0.2	0.2	0.2	12.7	21.7	24.0	22.9	4.7	24.0

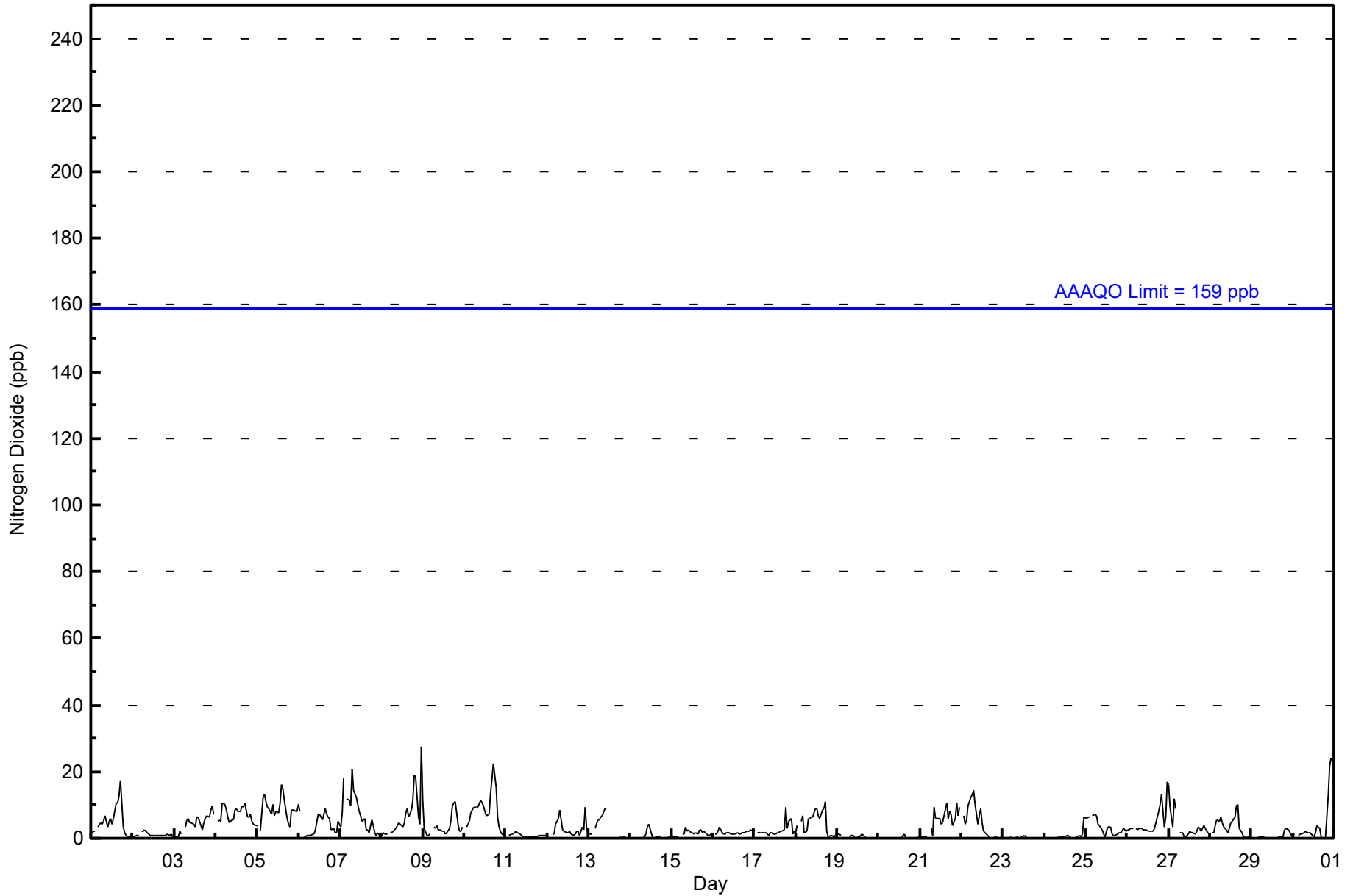
2.8	2.8	2.5	2.7	4.0	3.9	3.6	4.1	4.0	3.4	3.4	3.5	3.2	3.2	3.8	4.2	3.9	4.4	3.7	3.1	3.7	3.2	3.2	4.3	Diurnal Average	
16.1	9.4	18.1	12.1	13.3	12.1	13.3	20.9	14.6	12.1	10.6	9.6	9.1	10.8	16.1	15.0	17.8	22.6	15.1	19.2	18.2	21.7	24.0	27.6	Diurnal Maximum	

Z - zerospan      C - Calibration  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association  
Hourly Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Wapasu - November 2024





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Wapasu - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	679	99.12	99.12
21 - 40	6	0.88	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Wapasu - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	72	57	42	26	6	10	24	112	91	33	48	40	21	13	12	60	667
21 - 40	2	0	0	0	0	0	0	1	0	0	0	1	1	0	0	1	6
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	74	57	42	26	6	10	24	113	91	33	48	41	22	13	12	61	673

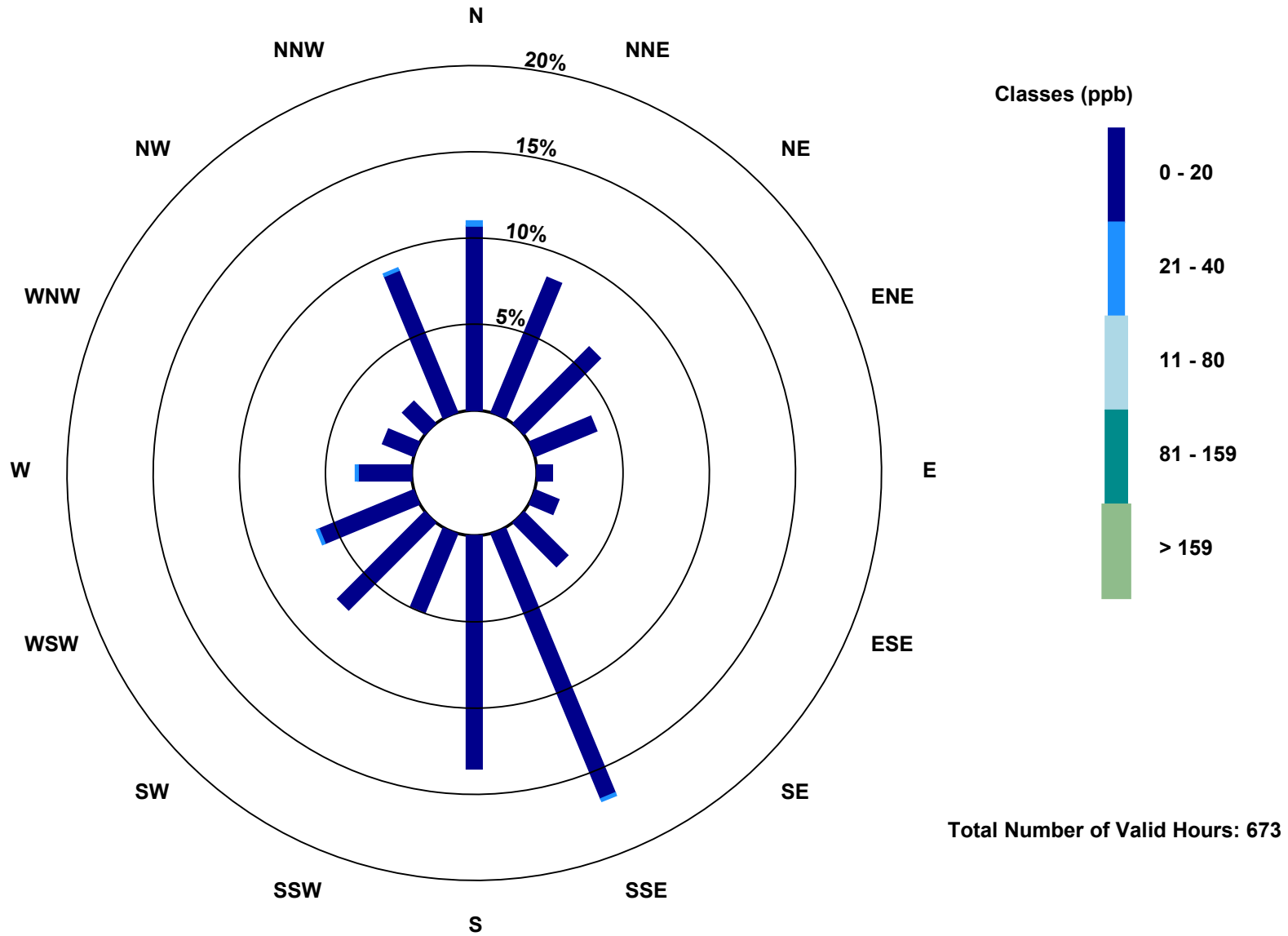
Total Number of Valid Hours: 673

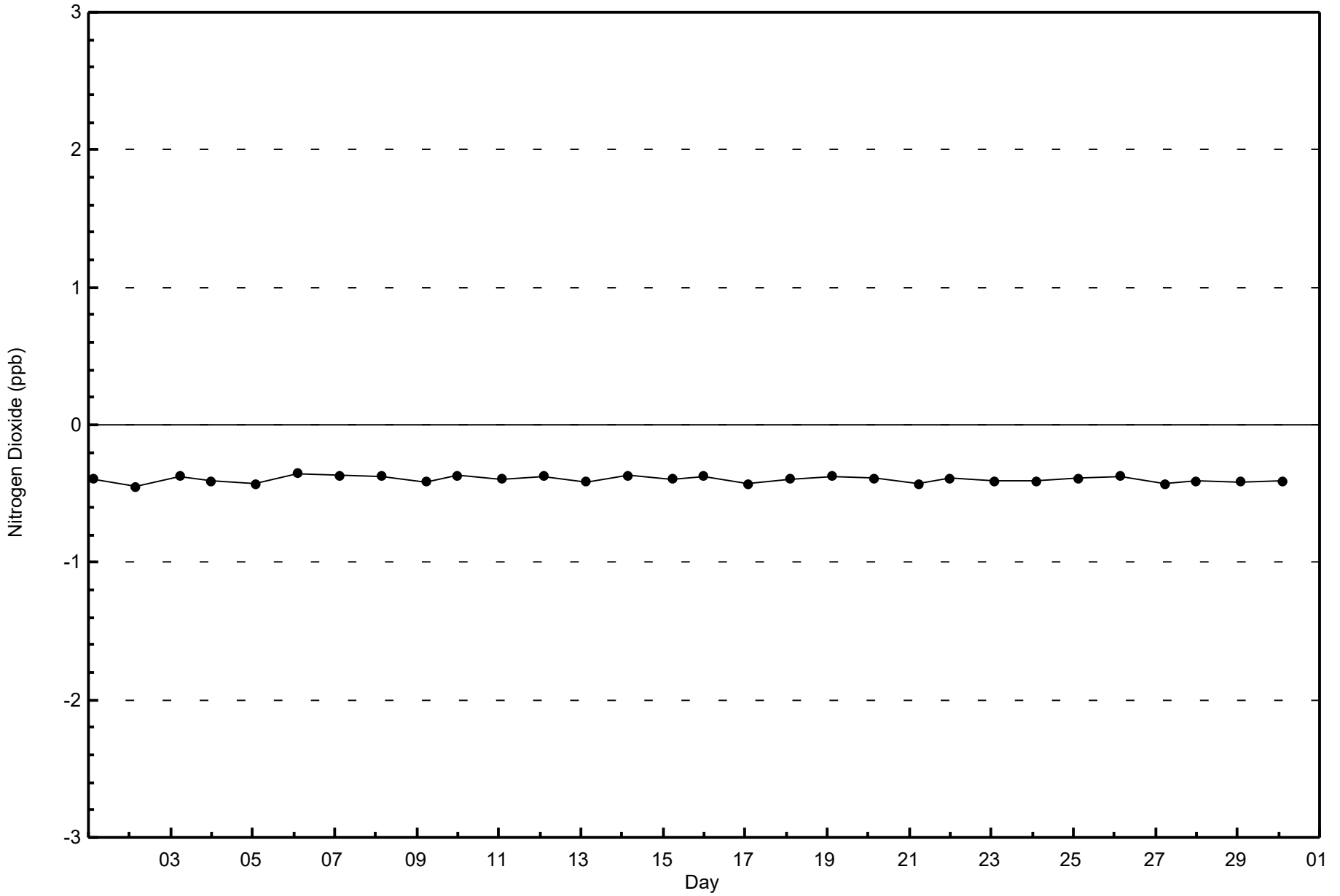
Total Number of Hours: 720



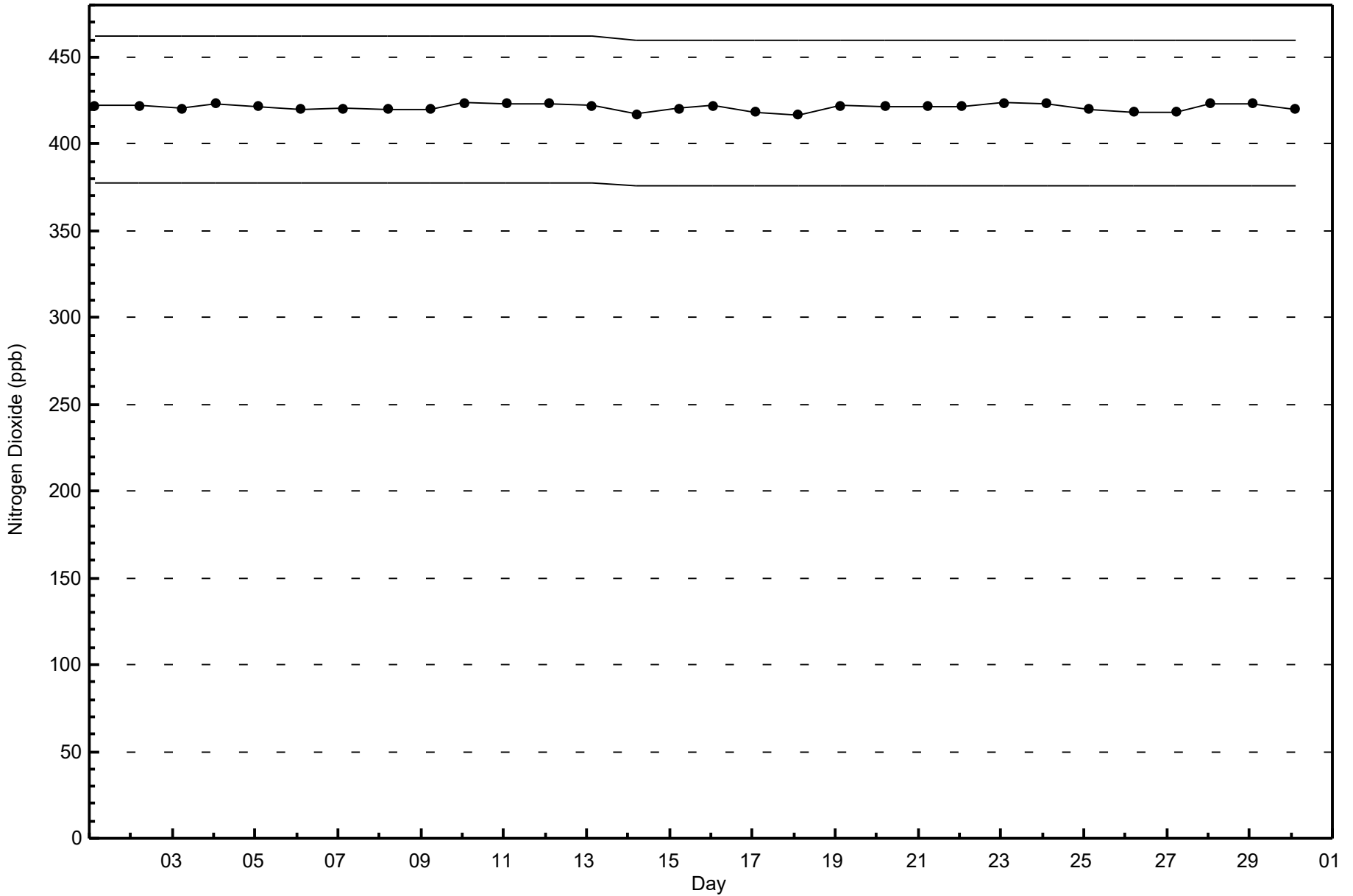
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Wapasu











**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

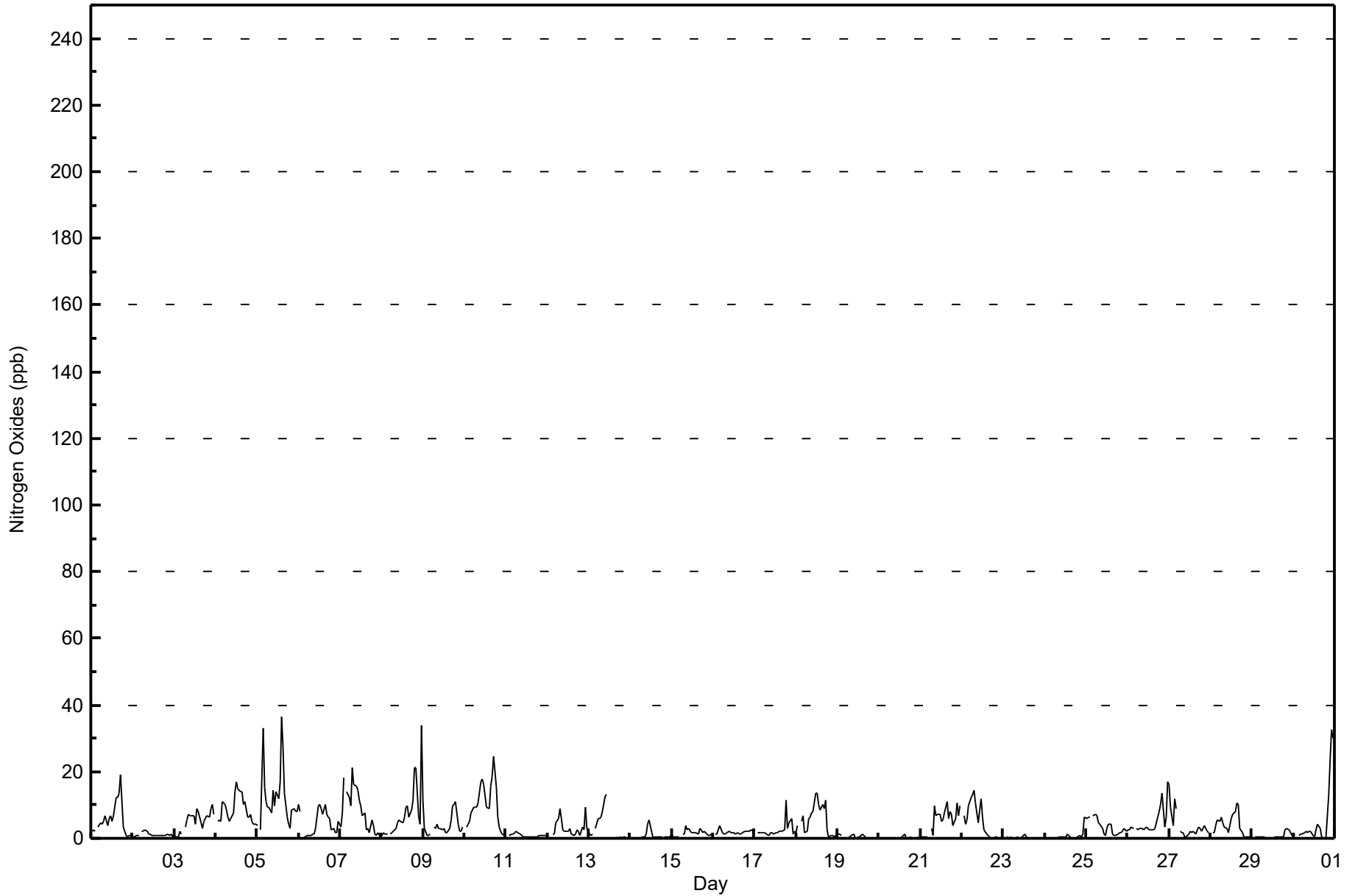
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Wapasu - November 2024**

Maximum Value: 36.7 ppb on Nov 5 15:00		Maximum Daily Average: 12.3 ppb on Nov 5		Hours in Service: 720																																												
Minimum Value: 0.1 ppb on Nov 19 20:00		Minimum Daily Average: 0.2 ppb on Nov 23		Hours of Data: 685																																												
Maximum Diurnal Average: 5.4 ppb at hour 15		Minimum Diurnal Average: 2.5 ppb at hour 3		Hours of Missing Data: 35																																												
Monthly Average: 4.03 ppb		Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 0.6 Median = 2.1 Q <sub>3</sub> = 6.1 P <sub>90</sub> = 10.3 P <sub>99</sub> = 24.1		Hours of Calibration: 35																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	1.9	2.4	2.1	Z	3.2	4.7	4.4	5.1	6.9	3.8	5.8	6.8	5.1	6.7	12.4	12.1	13.6	19.2	3.6	1.9	0.7	0.6	0.6	0.7	5.4	19.2																						
2-Nov	0.5	0.5	1.0	0.9	Z	2.1	2.1	2.5	1.9	1.2	1.1	0.9	0.9	0.8	0.8	0.9	0.9	1.0	0.8	0.9	1.4	0.9	1.3	0.5	1.1	2.5																						
3-Nov	0.5	0.4	0.5	2.1	1.1	Z	3.4	5.7	7.2	6.6	6.7	6.9	4.3	8.9	7.9	4.5	2.8	5.0	6.0	6.8	6.4	8.7	10.2	7.4	5.2	10.2																						
4-Nov	Z	5.0	5.5	5.3	11.1	10.4	8.5	6.4	5.2	6.6	7.8	14.1	17.2	14.8	13.9	13.8	10.3	11.0	6.4	6.5	7.3	5.0	4.3	4.0	8.7	17.2																						
5-Nov	3.9	Z	2.7	33.0	15.1	11.0	9.4	9.2	7.7	14.4	9.6	13.9	11.8	16.9	36.7	27.7	13.8	6.3	4.2	3.2	8.6	8.8	8.0	8.1	12.3	36.7																						
6-Nov	10.1	8.0	Z	0.5	0.6	1.0	0.9	1.0	1.1	1.3	3.1	9.8	10.0	8.8	7.2	10.2	7.2	6.2	6.1	2.4	2.9	1.6	1.6	5.0	4.6	10.2																						
7-Nov	3.5	7.6	18.2	Z	13.9	12.2	9.7	21.3	16.1	15.8	14.4	11.6	9.5	6.6	7.5	2.6	2.8	1.7	5.7	3.8	1.5	0.9	1.6	0.6	8.2	21.3																						
8-Nov	0.8	1.6	1.2	1.1	Z	1.5	1.6	2.2	3.1	4.5	5.6	5.2	4.5	6.3	9.3	9.7	6.5	8.3	11.4	21.4	21.0	6.3	4.4	33.7	7.4	33.7																						
9-Nov	11.6	3.0	1.0	1.0	1.2	Z	3.3	3.1	4.1	2.9	3.1	2.7	2.9	1.6	1.8	3.1	5.6	9.7	10.4	11.1	4.2	2.1	2.1	3.4	4.1	11.6																						
10-Nov	Z	3.5	4.2	5.1	7.6	9.5	9.3	9.3	10.7	17.0	17.8	16.2	12.9	9.4	9.1	15.6	18.6	24.7	15.2	6.3	3.5	2.0	1.1	0.8	10.0	24.7																						
11-Nov	0.8	Z	1.0	1.1	1.2	1.7	2.0	1.6	1.2	0.7	0.6	0.5	0.5	0.5	0.5	0.6	0.4	0.4	0.4	1.0	0.9	0.9	0.7	0.9	0.9	2.0																						
12-Nov	0.6	1.0	Z	1.2	1.3	4.6	5.9	8.8	6.1	2.7	2.3	2.2	2.1	2.8	1.4	0.9	1.2	2.4	2.2	0.8	3.4	2.6	9.4	2.9	3.0	9.4																						
13-Nov	1.4	1.1	1.3	Z	3.0	5.7	5.8	6.4	8.2	12.7	13.1	C	C	C	C	C	0.2	0.2	0.3	0.2	0.4	0.3	0.1	0.1	3.4	13.1																						
14-Nov	0.1	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	1.2	4.3	5.4	1.7	0.2	0.2	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.6	0.6	0.8	5.4																						
15-Nov	1.4	0.5	0.3	0.4	0.5	Z	1.1	1.4	3.6	2.4	3.1	1.9	1.8	1.5	1.8	1.3	2.8	2.5	1.5	2.1	1.1	1.0	1.0	1.1	1.6	3.6																						
16-Nov	Z	1.2	1.3	2.4	3.7	1.5	1.1	1.4	1.8	2.2	1.5	1.6	1.6	1.3	1.7	1.2	1.3	1.6	1.9	2.1	2.1	2.2	2.5	2.2	1.8	3.7																						
17-Nov	2.5	Z	1.9	1.9	1.7	1.8	1.7	1.5	1.0	1.7	1.7	1.4	1.6	1.8	1.9	2.2	2.0	2.6	11.3	3.1	4.9	6.1	1.4	2.2	2.6	11.3																						
18-Nov	1.8	3.7	Z	5.2	6.8	1.6	2.1	5.8	6.2	7.6	8.1	13.5	13.4	10.1	8.4	10.2	9.0	11.3	2.3	0.3	0.7	0.9	0.6	0.9	5.7	13.5																						
19-Nov	1.2	1.1	0.8	Z	0.2	0.1	0.1	0.2	1.0	1.1	0.2	0.2	0.3	0.3	1.4	1.0	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.5	1.4																						
20-Nov	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	1.0	1.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	1.5																						
21-Nov	0.4	0.4	0.5	0.3	0.6	Z	2.8	0.7	9.5	6.6	7.3	7.3	5.1	5.7	7.6	11.1	5.8	8.2	7.2	3.8	5.9	10.7	6.9	9.5	5.4	11.1																						
22-Nov	Z	6.9	4.1	5.5	9.8	12.1	13.3	14.5	10.4	4.8	8.6	11.9	6.2	2.5	1.2	0.7	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.3	5.0	14.5																						
23-Nov	0.2	Z	0.2	0.2	0.3	0.2	0.2	0.2	0.4	0.2	0.2	0.3	1.1	0.3	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	1.1																						
24-Nov	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.4	0.6	0.4	0.4	0.5	1.2	0.9	0.2	0.2	0.2	0.2	0.5	0.7	0.4	1.2	6.4	0.7	6.4																						
25-Nov	6.1	6.5	6.4	Z	6.8	7.4	6.7	4.5	4.1	3.1	1.3	0.8	3.2	4.3	4.0	1.4	1.0	0.9	1.3	1.7	1.6	2.2	2.8	2.2	3.5	7.4																						
26-Nov	2.6	2.4	3.2	3.1	Z	3.0	2.4	3.0	2.9	2.7	3.0	3.3	2.6	2.7	2.5	2.4	2.9	6.3	8.1	10.1	13.7	3.4	6.4	16.9	4.8	16.9																						
27-Nov	16.2	9.4	3.6	12.0	8.8	Z	1.9	1.7	1.9	0.4	0.3	1.2	2.3	1.7	1.9	1.4	2.3	3.4	3.1	2.1	3.7	3.0	2.1	1.8	3.8	16.2																						
28-Nov	Z	1.9	1.7	3.8	5.6	5.2	6.3	4.6	3.3	2.8	1.8	3.8	6.0	7.1	7.9	10.5	10.3	2.8	1.7	0.3	0.3	0.2	0.3	0.3	3.8	10.5																						
29-Nov	0.2	Z	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.6	0.5	2.6	2.8	2.4	1.5	0.9	0.7	2.8																						
30-Nov	1.0	1.2	Z	0.9	1.2	1.2	1.5	2.1	1.9	2.1	2.2	1.0	0.5	2.4	4.3	3.1	0.6	0.2	0.2	0.2	13.1	23.9	32.5	30.0	5.5	32.5																						
																								2.8	2.8	2.5	3.5	4.2	4.0	3.6	4.2	4.3	4.3	4.5	5.0	4.5	4.4	5.4	5.2	4.1	4.6	3.8	3.2	3.8	3.3	3.5	4.8	Diurnal Average
																								16.2	9.4	18.2	33.0	15.1	12.2	13.3	21.3	16.1	17.0	17.8	16.2	17.2	16.9	36.7	27.7	18.6	24.7	15.2	21.4	21.0	23.9	32.5	33.7	Diurnal Maximum
Z - zerspan C - Calibration																																																



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Wapasu - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Wapasu - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	674	98.39	98.39
21 - 40	11	1.61	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Wapasu - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	72	56	42	26	6	10	24	112	91	33	48	39	20	13	12	58	662
21 - 40	2	1	0	0	0	0	0	1	0	0	0	2	2	0	0	3	11
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	74	57	42	26	6	10	24	113	91	33	48	41	22	13	12	61	673

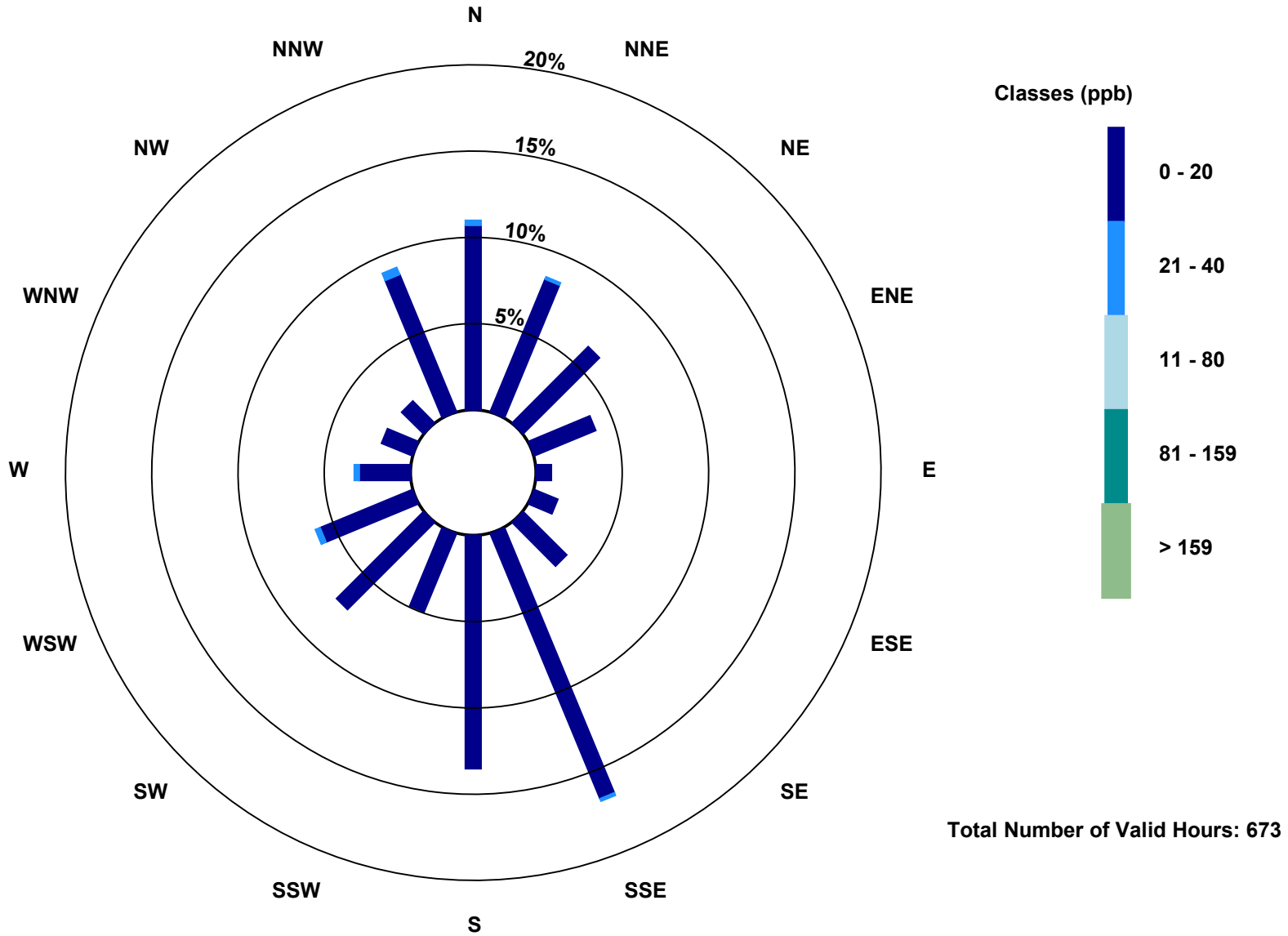
Total Number of Valid Hours: 673

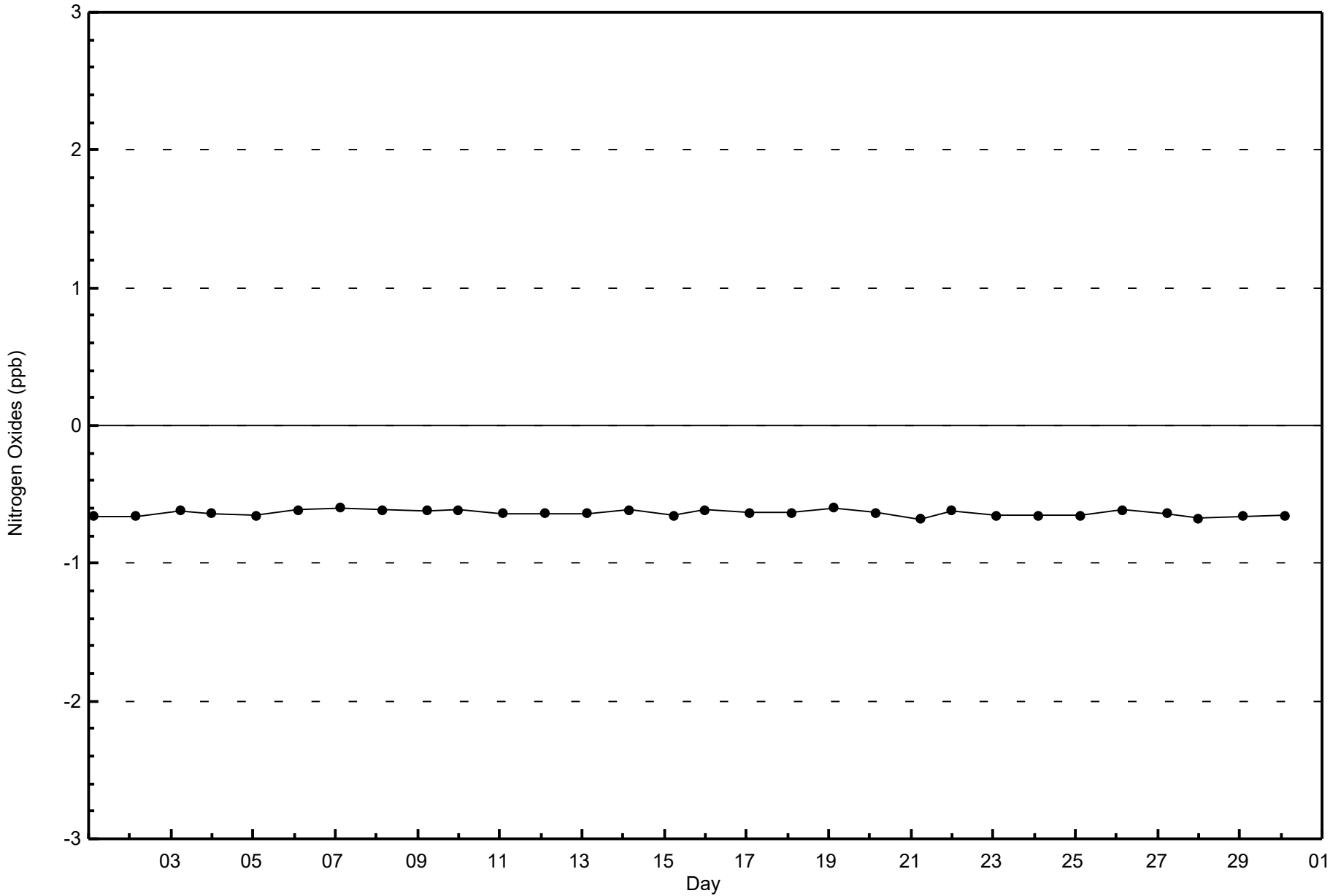
Total Number of Hours: 720

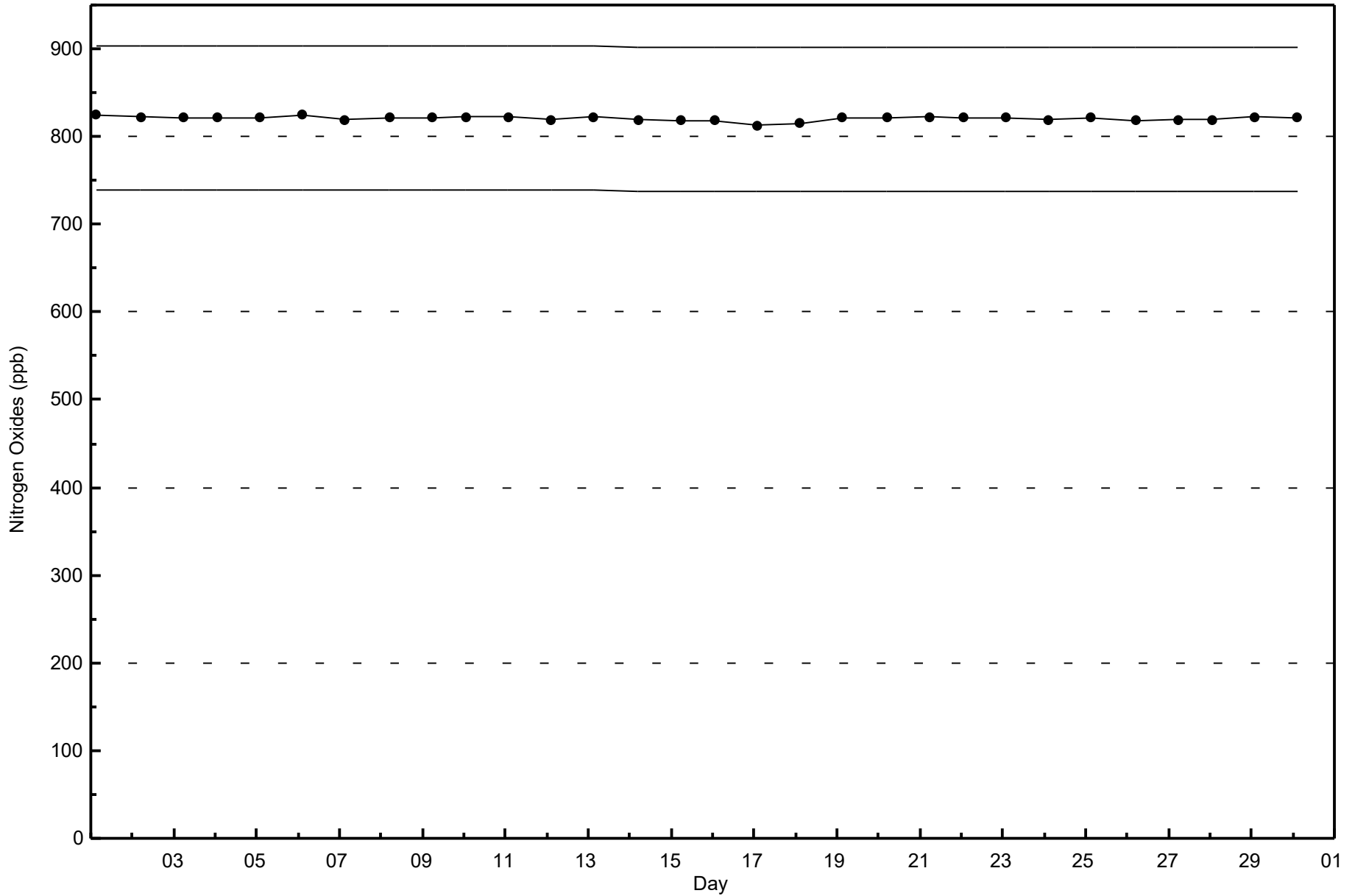


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Wapasu



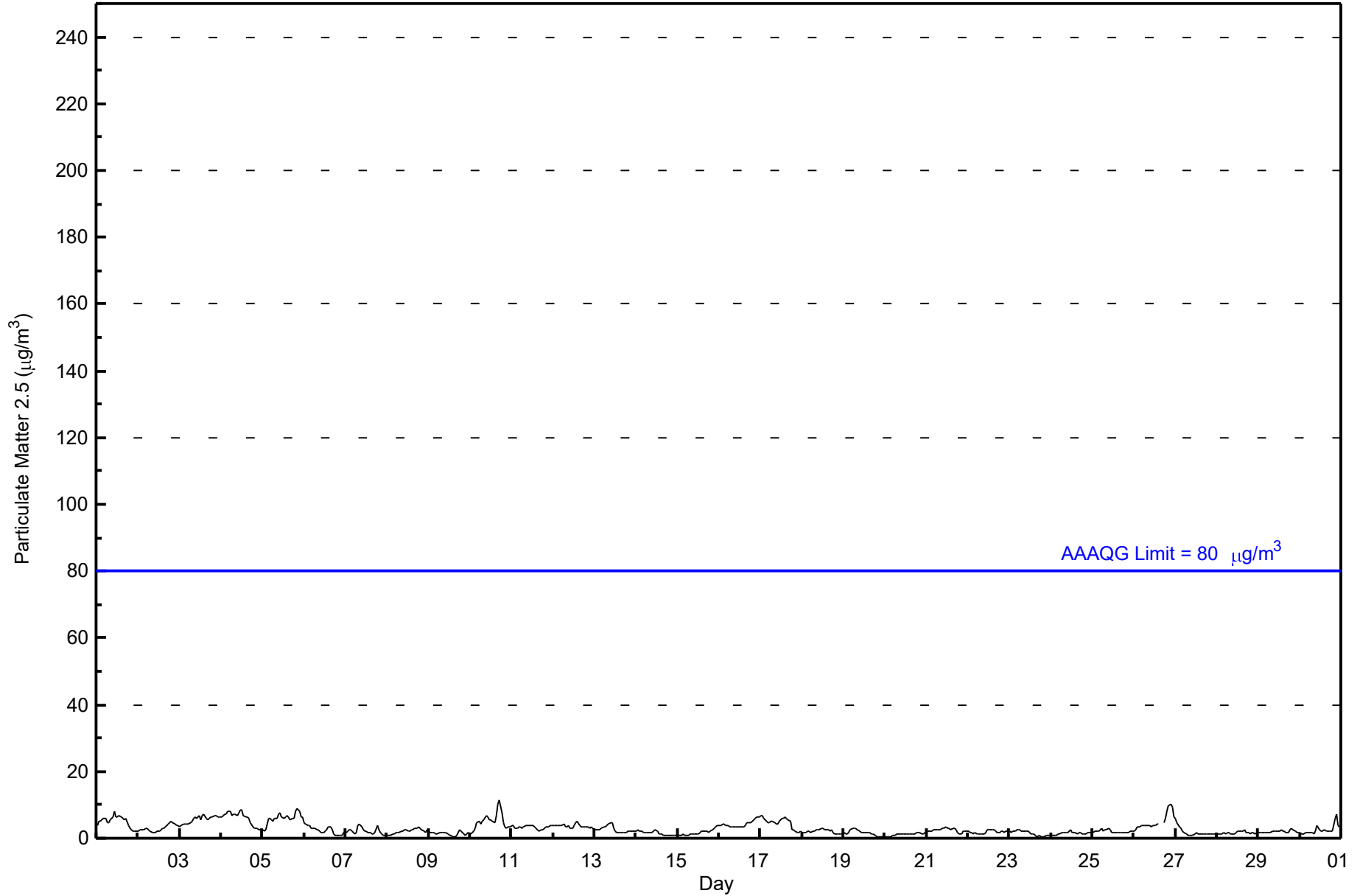








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720															Daily Average		Daily Maximum																										
Maximum Value: 11.3 µg/m <sup>3</sup> on Nov 10 18:00		Maximum Daily Average: 6.0 µg/m <sup>3</sup> on Nov 5		Hours of Data: 718															5.0		8.2																												
Minimum Value: 0.3 µg/m <sup>3</sup> on Nov 20 02:00		Minimum Daily Average: 1.1 µg/m <sup>3</sup> on Nov 20		Hours of Missing Data: 2															3.0		5.0																												
Maximum Diurnal Average: 3.2 µg/m <sup>3</sup> at hour 11		Minimum Diurnal Average: 2.6 µg/m <sup>3</sup> at hour 1		Hours of Calibration: 2															5.6		7.2																												
Monthly Average: 2.89 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 0.5 P <sub>10</sub> = 1.2 Q <sub>1</sub> = 1.6 Median = 2.3 Q <sub>3</sub> = 3.7 P <sub>90</sub> = 5.9 P <sub>99</sub> = 8.3		Percent Operational Time: 100.0															6.0		8.4																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	3.6	4.9	5.2	5.4	6.0	5.9	4.8	4.8	5.6	6.3	8.2	6.5	6.4	6.7	6.2	6.1	5.6	5.9	3.8	2.9	2.5	2.2	2.1	1.9	5.0	8.2																							
2-Nov	2.2	2.6	2.6	2.5	2.9	2.8	2.5	2.3	1.7	1.5	1.9	2.2	2.3	2.5	3.0	3.1	3.4	4.3	4.8	5.0	4.6	4.0	3.9	3.7	3.0	5.0																							
3-Nov	3.6	3.8	4.1	4.4	4.4	4.2	4.6	5.2	5.9	6.4	5.8	6.8	5.3	7.0	7.2	5.8	5.4	6.1	6.3	6.3	6.8	6.9	6.5	6.4	5.6	7.2																							
4-Nov	6.4	6.6	7.1	7.3	8.0	8.1	6.9	7.2	7.0	6.7	7.7	8.4	8.4	6.8	6.3	6.5	5.7	4.5	3.5	3.1	2.9	2.8	2.6	2.6	6.0	8.4																							
5-Nov	2.4	2.3	2.7	5.9	5.9	5.4	5.3	5.8	6.0	7.1	7.5	6.3	5.9	6.3	7.0	6.2	5.7	5.7	5.9	8.1	9.1	7.9	6.5	6.2	6.0	9.1																							
6-Nov	4.8	4.3	3.8	3.6	3.1	2.9	2.9	2.7	2.5	2.1	1.5	1.7	2.2	2.7	3.3	3.2	2.6	1.4	1.0	0.8	0.8	0.8	0.8	1.6	2.4	4.8																							
7-Nov	1.7	1.9	2.4	2.5	2.0	1.4	1.5	3.7	4.3	3.3	2.7	2.2	2.0	1.7	1.6	1.4	1.5	1.6	3.9	2.6	1.8	1.3	0.9	0.8	2.1	4.3																							
8-Nov	0.7	0.8	0.9	1.1	1.4	1.5	1.7	1.9	2.1	2.3	2.4	2.5	2.3	2.1	2.6	2.6	3.0	3.1	3.4	2.9	2.6	2.0	1.8	2.4	2.1	3.4																							
9-Nov	2.2	1.8	1.7	1.5	1.3	1.2	1.6	1.6	1.7	1.6	1.5	1.4	1.0	0.8	0.5	0.5	0.8	1.7	2.5	2.3	1.2	1.0	1.3	1.5	1.4	2.5																							
10-Nov	1.4	1.6	2.2	3.1	4.8	4.9	4.4	4.9	5.7	6.8	6.3	5.4	5.6	4.9	4.5	6.8	10.0	11.3	7.5	4.5	3.3	3.0	3.2	3.4	5.0	11.3																							
11-Nov	3.7	3.7	3.1	3.0	3.3	3.2	3.1	3.4	3.7	3.7	3.7	3.7	3.6	3.3	2.9	2.4	2.2	2.3	2.7	2.8	3.3	3.5	3.8	4.0	3.3	4.0																							
12-Nov	3.9	3.9	4.0	3.8	3.9	3.6	4.2	3.6	3.6	3.8	3.1	2.9	3.6	4.6	4.9	4.0	3.5	3.4	3.2	3.5	3.3	2.9	3.5	2.9	3.6	4.9																							
13-Nov	2.6	2.5	2.5	2.6	2.9	3.2	3.4	3.6	4.1	4.6	4.7	3.2	2.1	1.8	1.7	1.7	1.7	1.7	1.8	1.9	2.0	2.0	2.0	2.2	2.6	4.7																							
14-Nov	2.1	2.4	2.1	2.1	1.9	1.7	1.6	1.7	1.7	1.7	2.2	2.6	1.9	1.3	1.3	1.2	1.1	1.0	1.0	0.9	0.8	0.9	0.9	0.9	1.5	2.6																							
15-Nov	1.1	1.0	1.0	1.1	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.3	1.7	2.2	2.0	2.3	2.0	1.9	2.0	2.6	3.1	3.4	3.6	1.7	3.6																							
16-Nov	3.9	4.0	4.2	4.1	4.0	3.8	3.5	3.4	3.3	3.2	3.5	3.6	3.6	3.5	3.3	3.6	4.5	4.8	4.7	5.3	5.6	5.9	6.4	6.5	4.3	6.5																							
17-Nov	6.6	6.9	5.7	5.2	4.6	4.5	5.0	5.0	4.6	4.3	4.3	5.2	5.9	5.8	6.3	5.9	5.7	5.2	2.4	2.4	2.1	1.7	1.7	2.0	4.5	6.9																							
18-Nov	1.7	1.6	1.9	1.9	2.3	1.6	1.9	2.3	2.4	2.5	2.7	2.8	2.8	2.6	2.5	2.4	2.1	2.5	1.6	1.1	1.1	1.2	1.2	1.4	2.0	2.8																							
19-Nov	1.6	1.4	1.4	1.5	2.6	2.8	3.0	3.0	2.4	2.0	1.6	1.6	1.5	1.6	1.7	1.5	1.3	1.3	0.9	0.6	0.6	0.6	0.6	0.5	1.6	3.0																							
20-Nov	0.4	0.3	0.4	0.6	0.7	0.7	1.0	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.3	1.4	1.4	1.7	1.5	1.6	1.5	1.4	1.7	1.1	1.7																							
21-Nov	1.9	2.1	2.2	2.2	2.5	2.5	2.5	2.4	2.6	2.8	3.0	3.2	3.0	2.8	2.8	2.9	2.8	2.5	1.8	1.3	1.5	2.1	2.0	2.1	2.4	3.2																							
22-Nov	2.0	1.7	1.5	1.4	1.6	1.3	1.2	1.2	1.3	1.2	1.7	2.3	2.6	2.6	2.6	2.5	2.1	1.9	1.7	2.3	2.0	1.8	2.1	1.9	1.9	2.6																							
23-Nov	2.0	1.9	2.0	2.3	2.5	2.5	2.4	2.3	2.0	2.1	2.1	2.0	1.3	1.4	1.4	0.7	0.5	0.9	0.6	0.5	0.6	0.9	0.8	0.7	1.5	2.5																							
24-Nov	0.8	0.9	0.9	1.0	1.2	1.4	1.7	1.8	1.8	1.8	1.9	2.4	1.7	1.6	1.5	1.5	1.5	1.6	1.4	1.3	1.4	1.6	1.5	1.7	1.5	2.4																							
25-Nov	1.9	1.9	2.0	2.1	2.3	2.9	2.3	2.6	2.8	3.0	2.4	1.8	1.7	1.6	1.7	1.5	1.5	1.6	1.6	1.6	1.6	1.7	1.9	2.1	2.0	3.0																							
26-Nov	2.1	2.5	3.2	3.6	3.7	3.8	3.8	3.9	3.8	3.7	3.6	3.7	3.9	4.1	4.1	C	C	4.9	5.9	8.1	9.6	10.3	9.1	6.5	4.9	10.3																							
27-Nov	5.8	4.6	3.4	2.8	2.2	1.8	1.3	1.0	0.9	1.0	1.0	1.3	1.6	1.3	1.3	1.1	1.3	1.4	1.4	1.3	1.3	1.4	1.2	1.1	1.8	5.8																							
28-Nov	1.1	1.3	1.2	1.2	1.6	1.5	1.7	1.5	1.5	1.5	1.4	1.6	2.0	2.2	2.1	2.3	2.5	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.6	2.5																							
29-Nov	1.5	1.5	1.6	1.6	1.8	1.8	1.8	1.9	2.1	2.1	2.2	2.2	2.1	2.4	2.2	2.0	1.9	1.8	2.4	2.8	2.5	2.0	1.7	1.6	2.0	2.8																							
30-Nov	1.6	1.3	1.2	1.5	1.5	1.8	1.8	1.6	1.4	2.1	3.7	2.7	2.2	2.1	2.4	2.3	2.0	2.0	2.0	2.1	5.9	7.3	3.9	3.5	2.5	7.3																							
																								2.6	2.6	2.6	2.8	2.9	2.9	2.8	3.0	3.0	3.1	3.2	3.2	3.0	3.0	3.1	2.9	2.9	3.0	2.8	2.8	2.9	2.9	2.7	2.6	Diurnal Average	
																								6.6	6.9	7.1	7.3	8.0	8.1	6.9	7.2	7.0	7.1	8.2	8.4	8.4	7.0	7.2	6.8	10.0	11.3	7.5	8.1	9.6	10.3	9.1	6.5	Diurnal Maximum	
C - Calibration																																																	
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m <sup>3</sup> 24-hr 29 µg/m <sup>3</sup>																																																	





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Wapasu - November 2024**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	627	87.33	87.33
6 - 15	91	12.67	100.00
16 - 25	0	0.00	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>**  
**Wapasu - November 2024**

Concentration Ranges (μg/m <sup>3</sup> )	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	69	60	44	29	6	11	26	112	75	19	28	36	18	10	10	61	614
6 - 15	6	2	1	0	0	0	0	5	19	15	24	5	5	5	2	2	91
16 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	75	62	45	29	6	11	26	117	94	34	52	41	23	15	12	63	705

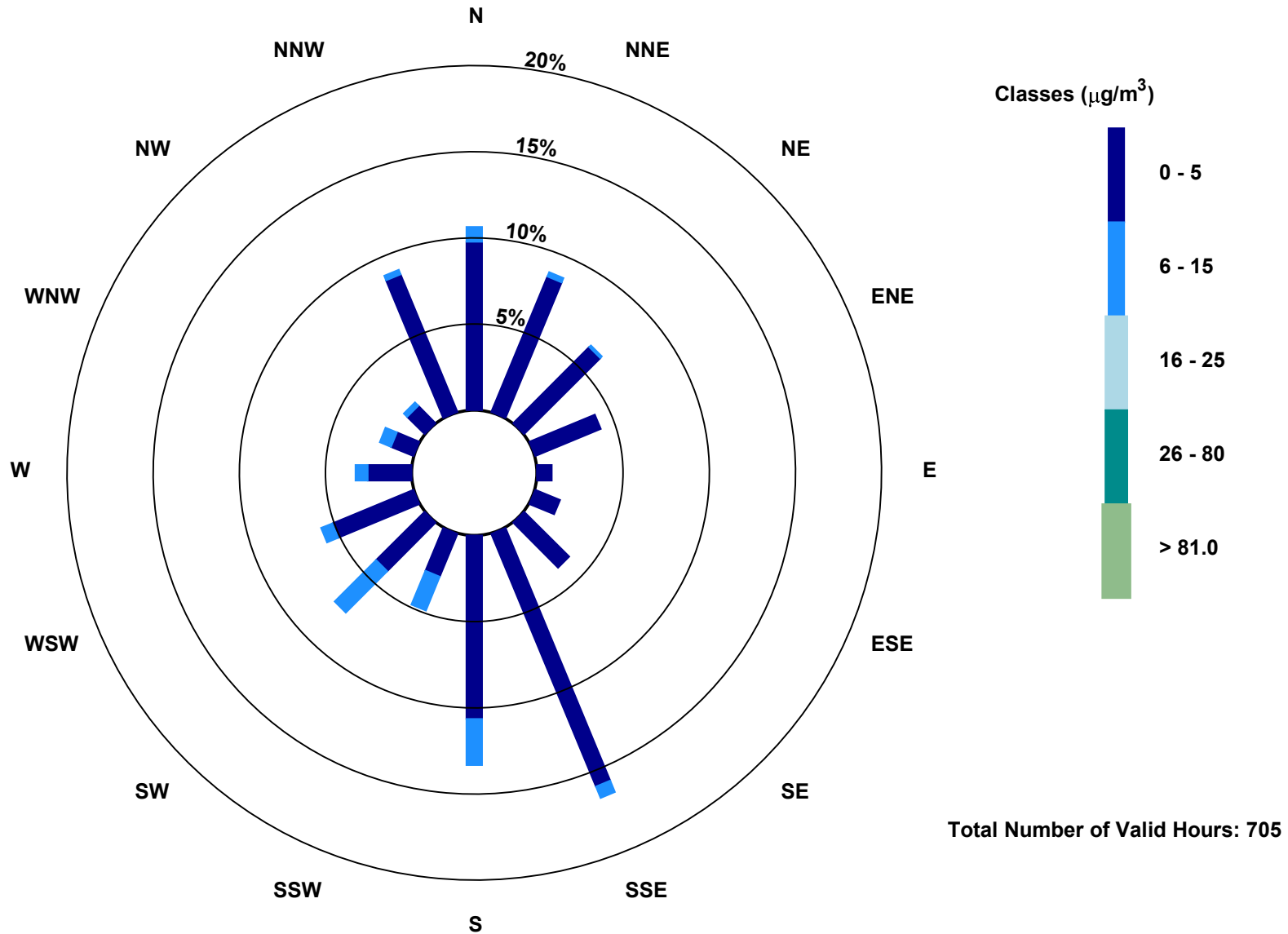
Total Number of Valid Hours: 705

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Wapasu



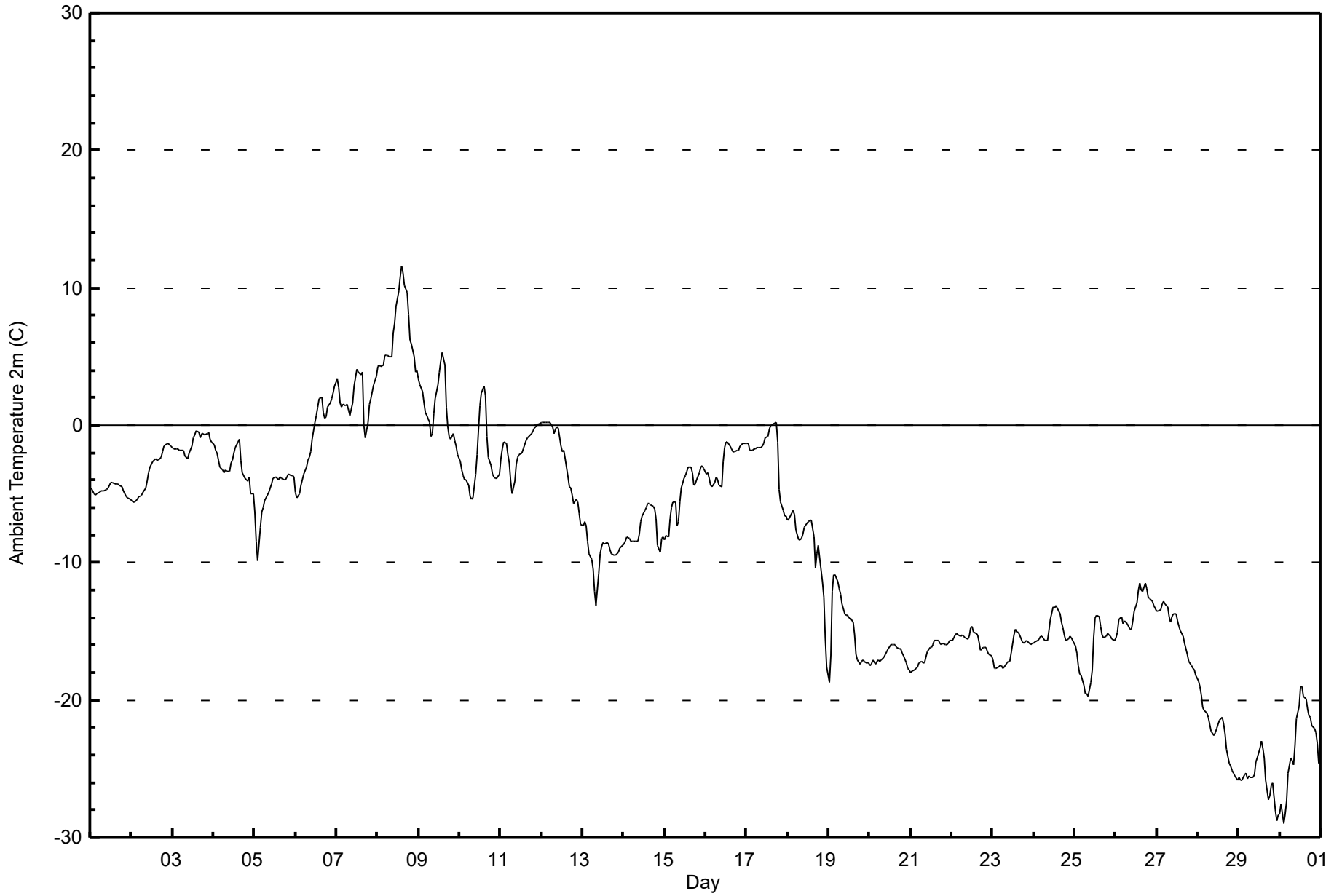


Maximum Value: 11.6 C on Nov 8 15:00																						Maximum Daily Average: 6.7 C on Nov 8					Hours in Service: 720																					
Minimum Value: -29.0 C on Nov 30 03:00																						Minimum Daily Average: -25.7 C on Nov 29					Hours of Data: 720																					
Maximum Diurnal Average: -7.0 C at hour 15																						Minimum Diurnal Average: -9.7 C at hour 24					Hours of Missing Data: 0																					
Monthly Average: -8.70 C																						Percentiles: P <sub>1</sub> = -27.3 P <sub>10</sub> = -19.0 Q <sub>1</sub> = -15.7 Median = -6.6 Q <sub>3</sub> = -1.9 P <sub>90</sub> = 0.7 P <sub>99</sub> = 7.9					Hours of Calibration: 0																					
																											Percent Operational Time: 100.0																					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-4.5	-4.7	-4.9	-5.1	-5.0	-4.9	-4.8	-4.8	-4.8	-4.7	-4.6	-4.4	-4.1	-4.1	-4.2	-4.3	-4.3	-4.3	-4.5	-4.8	-5.0	-5.2	-5.3	-5.4	-4.7	-4.1																						
2-Nov	-5.5	-5.6	-5.6	-5.4	-5.2	-5.2	-5.0	-4.8	-4.6	-4.1	-3.4	-3.0	-2.7	-2.6	-2.5	-2.5	-2.5	-2.3	-1.9	-1.5	-1.4	-1.3	-1.4	-1.5	-3.4	-1.3																						
3-Nov	-1.6	-1.7	-1.7	-1.7	-1.8	-1.8	-1.9	-2.2	-2.4	-2.4	-2.0	-1.6	-1.0	-0.7	-0.4	-0.5	-1.0	-0.6	-0.6	-0.7	-0.6	-0.5	-1.0	-1.2	-1.3	-0.4																						
4-Nov	-1.5	-1.8	-2.0	-2.5	-3.1	-3.3	-3.4	-3.2	-3.4	-3.4	-2.8	-2.6	-2.0	-1.6	-1.3	-1.1	-2.6	-3.5	-3.9	-4.0	-4.1	-3.7	-4.9	-5.0	-2.9	-1.1																						
5-Nov	-6.4	-8.4	-9.9	-7.5	-6.4	-6.0	-5.5	-5.2	-4.9	-4.6	-4.3	-3.9	-3.7	-3.8	-3.9	-3.8	-3.8	-4.0	-3.8	-3.6	-3.7	-3.7	-3.7	-3.8	-4.9	-3.6																						
6-Nov	-4.9	-5.3	-5.0	-4.4	-4.0	-3.6	-3.0	-2.6	-2.3	-1.9	-1.0	0.2	0.7	1.4	2.0	2.0	0.9	0.5	0.6	1.3	1.6	1.9	2.4	2.9	-0.8	2.9																						
7-Nov	3.4	2.7	1.7	1.3	1.5	1.5	1.6	1.1	0.7	1.6	2.9	3.5	4.1	3.9	3.7	3.9	0.0	-0.9	0.2	1.5	2.0	2.5	2.9	3.6	2.1	4.1																						
8-Nov	4.2	4.4	4.2	4.4	5.1	5.1	5.1	5.0	5.0	6.7	7.4	8.7	9.8	10.8	11.6	11.1	10.1	9.7	8.0	6.2	5.9	5.0	3.9	3.9	6.7	11.6																						
9-Nov	3.4	3.0	2.4	1.6	0.9	0.7	0.2	-0.8	-0.6	0.8	1.9	2.9	3.9	4.7	5.3	4.4	1.4	-0.1	-0.8	-1.0	-0.7	-1.2	-1.5	-2.1	1.2	5.3																						
10-Nov	-2.7	-3.3	-3.7	-3.9	-3.9	-4.4	-5.2	-5.4	-5.3	-3.5	-2.1	-0.3	1.5	2.3	2.8	2.1	-0.8	-2.4	-3.0	-3.5	-3.8	-3.9	-3.9	-3.5	-2.5	2.8																						
11-Nov	-2.4	-1.7	-1.3	-1.3	-2.1	-2.8	-4.0	-5.0	-4.1	-2.8	-2.3	-2.1	-2.0	-1.7	-1.4	-1.1	-0.9	-0.7	-0.6	-0.4	-0.2	0.0	0.1	0.1	-1.7	0.1																						
12-Nov	0.2	0.2	0.2	0.2	0.2	0.2	-0.1	-0.6	-0.3	-0.1	-0.2	-1.5	-1.9	-1.8	-2.5	-3.8	-4.5	-4.6	-5.1	-5.7	-5.4	-5.6	-6.4	-7.2	-2.3	0.2																						
13-Nov	-7.3	-7.1	-7.3	-8.5	-9.4	-9.7	-10.4	-12.1	-13.1	-10.8	-9.4	-8.8	-8.5	-8.6	-8.6	-8.7	-9.0	-9.4	-9.5	-9.5	-9.4	-9.2	-9.0	-8.8	-9.2	-7.1																						
14-Nov	-8.6	-8.4	-8.2	-8.2	-8.4	-8.5	-8.4	-8.4	-8.4	-7.9	-7.0	-6.6	-6.2	-6.0	-5.7	-5.7	-5.8	-5.9	-6.1	-6.8	-8.8	-9.2	-8.3	-8.2	-7.5	-5.7																						
15-Nov	-8.4	-8.1	-8.1	-6.8	-6.0	-5.6	-5.6	-7.3	-7.0	-5.6	-4.6	-3.9	-3.7	-3.4	-3.1	-3.1	-3.5	-4.4	-4.3	-4.0	-3.5	-3.0	-2.9	-3.1	-5.0	-2.9																						
16-Nov	-3.6	-3.5	-3.8	-4.4	-4.5	-4.2	-3.8	-4.0	-4.4	-4.5	-2.7	-1.6	-1.2	-1.2	-1.5	-1.7	-2.0	-1.9	-1.8	-1.8	-1.6	-1.4	-1.3	-1.3	-2.7	-1.2																						
17-Nov	-1.3	-1.3	-1.8	-1.8	-1.7	-1.7	-1.7	-1.6	-1.6	-1.5	-1.4	-0.9	-0.8	-0.4	0.0	0.0	0.1	0.2	-1.2	-4.7	-5.6	-6.2	-6.6	-6.7	-2.1	0.2																						
18-Nov	-6.9	-6.8	-6.4	-6.2	-6.5	-7.7	-8.4	-8.4	-8.2	-7.9	-7.4	-7.2	-7.0	-6.9	-6.9	-8.2	-10.4	-9.4	-8.8	-9.7	-11.3	-12.5	-15.5	-17.6	-8.8	-6.2																						
19-Nov	-18.7	-16.8	-12.1	-10.9	-10.9	-11.4	-11.9	-12.3	-13.0	-13.7	-13.9	-13.8	-14.0	-14.0	-14.3	-15.3	-16.7	-17.1	-17.3	-17.2	-17.1	-17.2	-17.3	-17.3	-14.8	-10.9																						
20-Nov	-17.5	-17.4	-17.1	-17.4	-17.2	-17.1	-17.1	-17.1	-16.9	-16.6	-16.4	-16.3	-16.0	-15.9	-15.9	-16.0	-16.2	-16.3	-16.3	-16.6	-16.8	-17.3	-17.7	-17.8	-16.8	-15.9																						
21-Nov	-18.0	-17.9	-17.8	-17.7	-17.6	-17.3	-17.2	-17.3	-17.3	-16.9	-16.5	-16.2	-16.1	-15.9	-15.7	-15.6	-15.7	-15.8	-15.9	-15.9	-16.0	-16.0	-15.8	-15.7	-16.6	-15.6																						
22-Nov	-15.6	-15.5	-15.3	-15.2	-15.2	-15.4	-15.3	-15.3	-15.4	-15.5	-15.4	-14.7	-14.7	-15.0	-15.2	-15.3	-15.7	-16.3	-16.2	-16.1	-16.1	-16.4	-16.7	-16.8	-15.6	-14.7																						
23-Nov	-17.1	-17.7	-17.7	-17.6	-17.5	-17.7	-17.6	-17.3	-17.1	-17.2	-16.6	-15.3	-14.8	-15.1	-15.2	-15.8	-15.9	-15.7	-15.7	-15.7	-15.9	-15.9	-15.9	-15.9	-16.5	-14.8																						
24-Nov	-15.8	-15.7	-15.7	-15.6	-15.3	-15.4	-15.6	-15.7	-15.7	-14.9	-14.1	-13.2	-13.3	-13.1	-13.3	-13.7	-14.3	-14.7	-15.2	-15.7	-15.5	-15.3	-15.4	-15.7	-14.9	-13.1																						
25-Nov	-16.1	-16.6	-17.5	-18.1	-18.2	-18.9	-19.5	-19.5	-19.7	-18.8	-17.8	-15.4	-14.0	-13.8	-13.9	-14.6	-15.2	-15.4	-15.2	-15.3	-15.4	-15.6	-15.6	-16.5	-13.8	-13.8																						
26-Nov	-15.5	-15.0	-14.1	-13.9	-14.4	-14.3	-14.4	-14.5	-14.9	-14.8	-14.2	-13.5	-12.9	-12.0	-11.5	-12.0	-12.1	-11.5	-11.9	-12.5	-12.6	-12.8	-13.1	-13.4	-13.4	-11.5																						
27-Nov	-13.5	-13.5	-13.4	-13.0	-12.8	-13.1	-13.3	-13.9	-14.4	-13.9	-13.8	-13.7	-14.3	-14.7	-15.0	-15.3	-15.9	-16.3	-16.7	-17.2	-17.5	-17.7	-17.8	-18.2	-14.9	-12.8																						
28-Nov	-18.6	-19.0	-19.6	-20.5	-20.7	-21.0	-21.3	-21.8	-22.3	-22.6	-22.4	-22.0	-21.8	-21.5	-21.3	-21.8	-22.4	-23.6	-24.6	-24.8	-25.1	-25.3	-25.5	-25.8	-22.3	-18.6																						
29-Nov	-25.7	-25.9	-25.9	-25.4	-25.4	-25.7	-25.5	-25.6	-25.6	-25.4	-24.5	-24.2	-23.5	-23.0	-23.5	-24.2	-25.9	-27.2	-26.9	-26.2	-26.0	-28.1	-28.8	-28.4	-25.7	-23.0																						
30-Nov	-28.3	-27.6	-29.0	-28.2	-27.4	-25.4	-24.2	-24.4	-24.7	-23.3	-21.4	-20.4	-19.0	-19.0	-19.7	-19.9	-20.6	-21.1	-21.3	-21.9	-22.1	-22.4	-23.2	-24.6	-23.3	-19.0																						
																								-9.2	-9.2	-9.2	-9.1	-9.1	-9.1	-9.2	-9.5	-9.6	-9.0	-8.3	-7.8	-7.3	-7.1	-7.0	-7.3	-8.1	-8.5	-8.7	-8.9	-9.0	-9.2	-9.5	-9.7	Diurnal Average
																								4.2	4.4	4.2	4.4	5.1	5.1	5.1	5.0	5.0	6.7	7.4	8.7	9.8	10.8	11.6	11.1	10.1	9.7	8.0	6.2	5.9	5.0	3.9	3.9	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 2m (AT2) - C**  
**Wapasu - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C**  
**Wapasu - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	65	9.03	9.03
-20 - 0	565	78.47	87.50
0 - 10	86	11.94	99.44
10 - 20	4	0.56	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

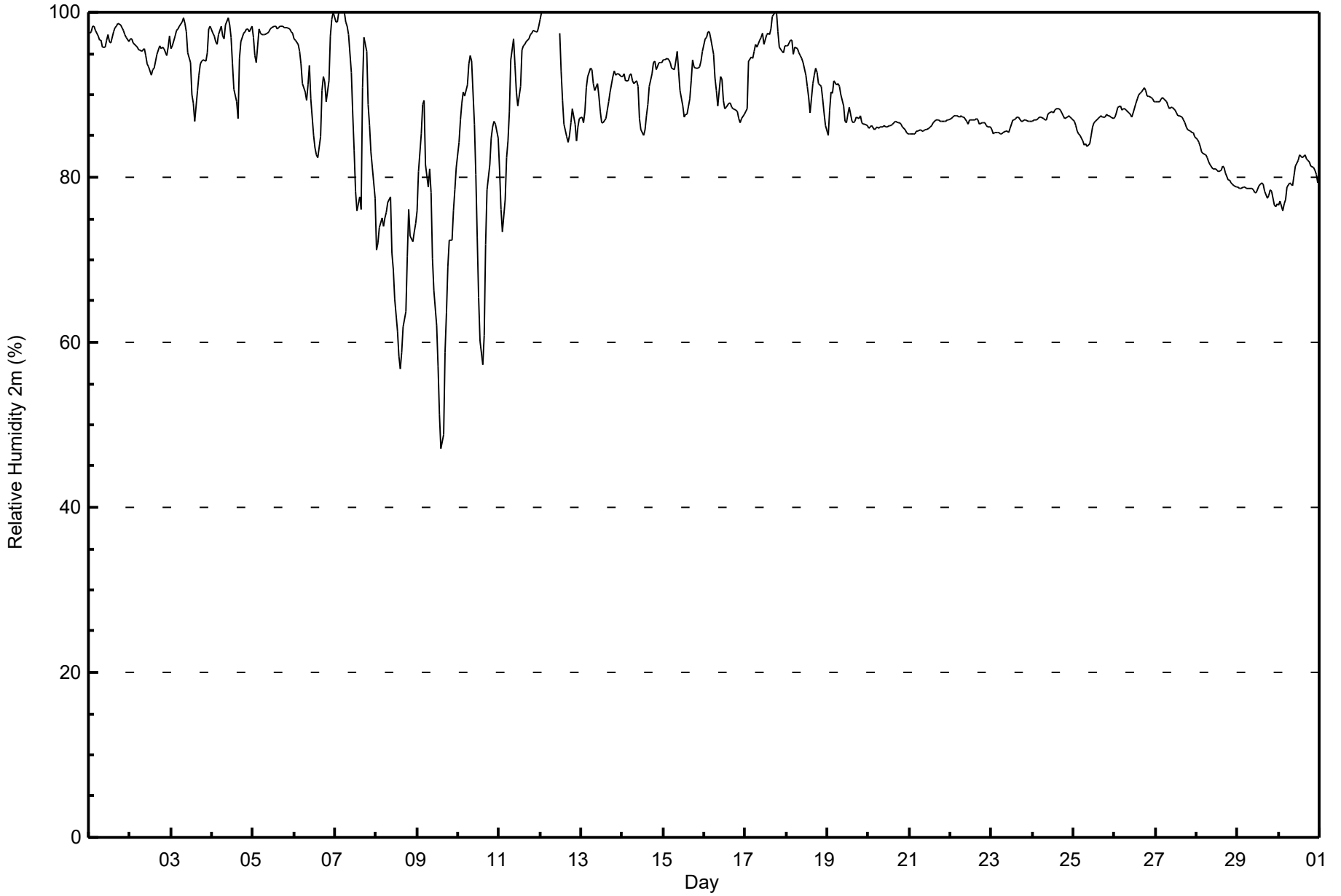




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Relative Humidity 2m (RH2) - %**  
**Wapasu - November 2024**

Maximum Value: 100.0 % on Nov 7 00:00		Maximum Daily Average: 97.5 % on Nov 5		Hours in Service: 720																																												
Minimum Value: 47.2 % on Nov 9 15:00		Minimum Daily Average: 69.9 % on Nov 8		Hours of Data: 712																																												
Maximum Diurnal Average: 90.1 % at hour 4		Minimum Diurnal Average: 84.5 % at hour 15		Hours of Missing Data: 8																																												
Monthly Average: 88.09 %		Percentiles: P <sub>1</sub> = 58.8 P <sub>10</sub> = 78.6 Q <sub>1</sub> = 85.5 Median = 87.8 Q <sub>3</sub> = 94.2 P <sub>90</sub> = 97.5 P <sub>99</sub> = 100.0		Hours of Calibration: 0																																												
				Percent Operational Time: 98.9																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	97.5	97.6	98.3	98.3	97.9	97.2	96.7	96.6	95.8	95.7	96.6	97.2	96.4	96.4	97.6	98.1	98.4	98.6	98.5	98.1	97.9	97.2	97.0	96.5	97.3	98.6																						
2-Nov	96.7	96.7	96.3	96.0	95.7	95.5	95.5	95.3	95.5	94.8	93.7	93.3	92.4	93.1	93.3	94.1	94.9	95.9	95.6	95.7	95.7	94.8	95.8	97.1	95.1	97.1																						
3-Nov	95.6	95.9	97.1	97.8	98.0	98.3	98.7	99.3	98.7	97.6	95.1	93.9	90.0	89.0	86.8	90.5	92.4	93.7	94.0	94.2	94.0	95.1	97.9	98.3	95.1	99.3																						
4-Nov	97.4	97.1	96.4	96.1	97.3	98.4	97.1	96.9	98.6	99.3	98.4	97.0	93.7	90.7	89.1	87.2	94.4	96.4	97.4	97.7	97.9	97.9	97.6	98.2	96.2	99.3																						
5-Nov	97.0	94.8	93.9	98.1	97.5	97.2	97.3	97.4	97.5	97.6	98.0	98.2	93.7	98.3	98.2	98.0	98.2	98.3	98.2	98.1	98.2	98.2	98.0	97.6	97.5	98.3																						
6-Nov	96.7	96.5	96.2	95.3	93.7	91.4	90.4	89.2	91.1	93.6	89.6	85.1	83.6	82.7	82.4	85.0	90.6	92.3	91.6	89.2	91.7	97.1	99.2	100.0	91.4	100.0																						
7-Nov	98.9	98.7	100.0	100.0	OR	100.0	98.8	98.3	97.3	92.7	87.7	83.3	78.4	76.0	77.6	76.1	90.8	97.0	95.2	88.7	86.2	83.1	81.2	77.4	89.7	100.0																						
8-Nov	71.3	71.9	74.0	75.0	74.1	75.1	75.8	77.0	77.7	70.9	68.8	65.3	61.3	58.3	56.7	58.8	61.8	63.7	70.3	76.1	72.9	72.3	73.4	74.4	69.9	77.7																						
9-Nov	75.9	80.7	85.2	88.8	89.3	81.6	78.9	81.0	78.1	70.2	66.2	62.1	57.0	51.2	47.2	48.8	58.9	63.5	69.1	72.4	72.5	76.0	78.5	81.3	71.4	89.3																						
10-Nov	84.2	86.9	89.0	90.3	89.8	91.1	93.8	94.8	94.0	86.4	80.4	72.8	65.4	60.2	57.3	60.8	71.9	78.4	81.6	84.7	86.1	86.8	86.4	84.8	81.6	94.8																						
11-Nov	80.8	76.1	73.3	77.4	82.4	84.4	88.0	94.2	96.8	93.5	90.4	88.7	91.0	95.4	96.0	96.1	96.5	96.8	97.3	97.5	97.8	97.7	97.7	98.3	91.0	98.3																						
12-Nov	99.2	99.9	100.0	100.0	OR	OR	OR	OR	OR	OR	OR	97.5	92.8	89.3	86.4	84.9	84.2	85.0	86.6	88.2	86.5	84.4	86.1	87.2	--	100.0																						
13-Nov	87.3	86.7	87.9	90.8	92.3	93.1	93.1	91.4	90.5	91.4	89.8	88.0	86.6	86.7	87.2	88.1	89.2	90.4	92.2	92.9	92.5	92.6	92.6	92.3	90.2	93.1																						
14-Nov	92.2	92.6	91.7	91.8	92.3	92.5	91.7	91.3	91.7	90.9	87.2	85.8	85.2	85.8	87.4	88.8	91.0	92.5	93.9	94.1	93.1	93.8	93.9	93.8	91.0	94.1																						
15-Nov	94.2	94.2	94.3	94.3	93.9	93.2	93.0	94.1	95.2	92.8	90.6	88.7	87.2	87.6	87.7	89.5	91.7	94.2	93.4	93.2	93.2	93.4	94.1	95.2	92.5	95.2																						
16-Nov	96.8	97.0	97.6	97.6	96.8	94.9	92.0	90.5	88.6	92.3	91.8	89.3	88.3	88.5	88.9	89.0	88.5	88.4	88.1	87.9	87.2	86.7	87.0	87.7	90.9	97.6																						
17-Nov	88.0	88.4	94.0	94.5	94.5	95.3	96.1	95.7	96.6	96.9	97.4	96.1	97.2	97.5	97.2	98.0	99.5	100.0	100.0	97.7	95.8	95.2	95.1	95.9	95.9	100.0																						
18-Nov	96.0	96.0	96.6	96.6	94.8	95.7	95.5	95.0	94.7	94.4	93.9	92.4	91.0	89.7	87.8	91.3	92.4	93.3	92.7	91.4	91.0	89.5	87.8	86.2	92.7	96.6																						
19-Nov	85.1	88.2	90.4	90.2	91.7	91.2	91.4	91.0	90.1	88.7	86.7	86.6	87.6	88.4	86.9	86.6	86.8	87.2	87.2	87.4	86.6	86.4	86.4	86.2	88.1	91.7																						
20-Nov	86.0	86.1	86.2	85.8	86.0	86.1	86.0	86.1	86.2	86.2	86.1	86.0	86.2	86.3	86.4	86.6	86.7	86.6	86.7	86.4	86.2	85.8	85.3	85.3	86.1	86.7																						
21-Nov	85.2	85.2	85.3	85.3	85.5	85.7	85.7	85.6	85.7	85.7	85.7	86.0	86.1	86.3	86.6	86.9	87.0	86.9	86.8	86.8	86.7	86.8	87.0	87.0	86.1	87.0																						
22-Nov	87.1	87.3	87.4	87.5	87.4	87.4	87.4	87.3	87.2	86.8	86.5	86.9	87.0	87.0	86.9	87.2	86.9	86.5	86.7	86.6	86.6	86.3	86.2	86.1	86.9	87.5																						
23-Nov	85.8	85.3	85.4	85.4	85.4	85.3	85.3	85.4	85.6	85.6	85.5	85.9	86.9	87.0	87.1	87.3	87.2	86.8	86.8	87.0	86.9	86.7	86.8	86.8	86.2	87.3																						
24-Nov	86.8	86.9	87.0	87.1	87.3	87.2	87.1	87.0	87.0	87.6	87.7	87.9	87.8	88.1	88.3	88.4	88.1	87.8	87.4	87.1	87.3	87.4	87.3	87.1	87.4	88.4																						
25-Nov	86.7	86.3	85.6	85.3	85.1	84.5	84.0	84.0	83.7	84.1	85.0	86.0	86.6	86.9	87.1	87.3	87.4	87.3	87.4	87.6	87.4	87.4	87.2	87.2	86.1	87.6																						
26-Nov	87.3	87.7	88.4	88.6	88.2	88.4	88.3	88.1	87.8	87.7	87.2	87.8	88.9	89.5	89.9	90.1	90.3	90.8	90.4	89.9	89.9	89.6	89.4	89.2	88.9	90.8																						
27-Nov	89.1	89.1	89.2	89.5	89.6	89.5	89.2	88.6	88.3	88.6	88.4	88.2	87.7	87.4	87.4	87.3	86.9	86.6	86.1	85.8	85.6	85.5	85.4	85.0	87.7	89.6																						
28-Nov	84.6	84.3	83.7	83.1	82.9	82.6	82.4	81.9	81.5	81.1	81.1	81.0	80.9	80.7	80.9	81.4	81.2	80.5	79.7	79.6	79.4	79.2	79.0	78.7	81.3	84.6																						
29-Nov	78.8	78.6	78.6	78.8	78.7	78.6	78.7	78.6	78.6	78.5	78.1	78.2	79.0	79.1	79.2	79.1	78.3	77.4	77.9	78.4	78.3	76.6	76.4	76.7	78.3	79.2																						
30-Nov	76.7	77.1	75.9	76.7	77.3	78.9	79.4	79.1	79.0	80.2	81.4	82.0	82.8	82.5	82.4	82.7	82.2	82.0	81.8	81.4	81.3	80.9	80.3	79.3	80.1	82.8																						
																								88.8	89.0	89.5	90.1	89.5	89.7	89.6	89.7	89.6	88.7	87.4	86.6	85.4	84.8	84.5	85.1	87.1	88.2	88.7	88.7	88.4	88.3	88.5	88.6	Diurnal Average
																								99.2	99.9	100.0	100.0	98.0	100.0	98.8	99.3	98.7	99.3	98.4	98.2	98.3	98.2	98.0	98.2	99.5	100.0	100.0	98.2	98.2	98.0	99.2	100.0	Diurnal Maximum
OR - Out of Range																																																





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 2m (RH2) - %**  
**Wapasu - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	9	1.26	1.26
60 - 80	87	12.22	13.48
80 - 100	608	85.39	98.88

Total Number of Valid Hours: 712

Total Number of Hours: 720



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Precipitation (PC) - mm**

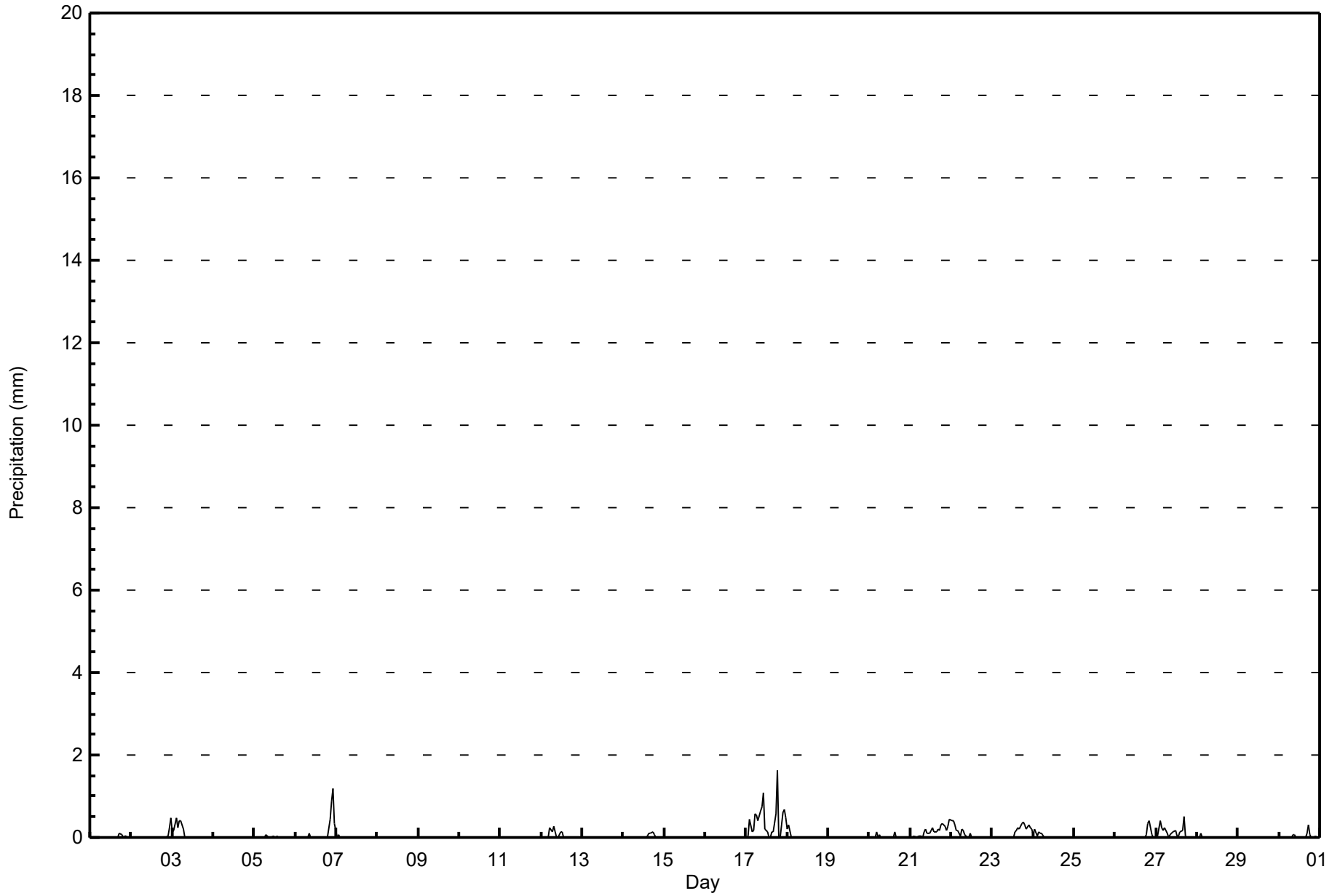
**Wapasu - November 2024**

Maximum Value: 1.6 mm on Nov 17 19:00		Maximum Daily Total: 9.4 mm on Nov 17		Hours in Service: 720																																												
Minimum Value: 0.0 mm on Nov 1 01:00		Minimum Daily Total: 0.0 mm on Nov 4		Hours of Data: 720																																												
Maximum Diurnal Total: 2.7 mm at hour 23		Minimum Diurnal Total: 0.5 mm at hour 14		Hours of Missing Data: 0																																												
Monthly Total: 31.14 mm		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.1 P <sub>99</sub> = 0.6		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.3	0.1																						
2-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.5	0.8	0.5																						
3-Nov	0.2	0.2	0.5	0.2	0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.5																						
4-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																					
5-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1																						
6-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.9	1.2	0.4	3.0	1.2																						
7-Nov	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1																						
8-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																					
9-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																					
10-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																					
11-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																					
12-Nov	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.3	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.3																						
13-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																					
14-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.5	0.1																						
15-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																					
16-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																					
17-Nov	0.0	0.1	0.4	0.1	0.2	0.6	0.5	0.4	0.7	0.8	1.1	0.2	0.2	0.0	0.0	0.1	0.1	0.6	1.6	0.0	0.0	0.6	0.7	0.5	9.4	1.6																						
18-Nov	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.3																						
19-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																					
20-Nov	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1																						
21-Nov	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.4	3.5	0.4																						
22-Nov	0.4	0.4	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.4																						
23-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.4	0.4	0.3	0.2	0.3	0.3	0.2	2.8	0.4																							
24-Nov	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.2																							
25-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																						
26-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.1	0.0	0.0	0.9	0.4																							
27-Nov	0.0	0.1	0.4	0.3	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.5	0.1	0.0	0.0	0.0	0.0	0.0	2.6	0.5																							
28-Nov	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1																							
29-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																						
30-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.1	0.0	0.0	0.7	0.3																							
																								0.8	1.2	1.8	0.9	1.1	1.7	1.3	0.9	1.2	1.1	1.3	0.7	0.5	0.5	0.9	1.3	1.7	2.6	1.0	1.4	2.2	2.7	2.0	Diurnal Average	
																								0.4	0.4	0.5	0.3	0.4	0.6	0.5	0.4	0.7	0.8	1.1	0.2	0.2	0.2	0.2	0.5	0.6	1.6	0.3	0.5	0.9	1.2	0.5	Diurnal Maximum	



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Precipitation (PC) - mm**  
**Wapasu - November 2024**





Maximum Speed: 23 km/h on Nov 16 18:00	Maximum Daily Speed Average: 15.1 km/h on Nov 16	Hours in Service: 720
Minimum Speed Value: 1 km/h on Nov 30 07:00	Minimum Daily Speed Average: 1.1 km/h on Nov 1	Hours of Data: 707
Maximum Diurnal Speed Average: 2.3 km/h at hour 11	Minimum Diurnal Speed Average: 0.7 km/h at hour 22	Hours of Missing Data: 13
Monthly Average Velocity: 1.4 km/h 191.2 deg	Percentiles: $P_1 = 1$ $P_{10} = 3$ $Q_1 = 4$ Median = 7 $Q_3 = 9$ $P_{90} = 12$ $P_{99} = 18$	Percent Operational Time: 98.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	SW9	SW9	WSW5	SW3	SSW3	SW3	WSW3	WSW3	SW4	SW3	SW4	SW4	WNW4	NNW5	N5	N4	N4	N4	NNE4	NE5	NE5	NE4	NE5	NE3	WNW1.1	SW9	
2-Nov	NNW3	NE3	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	SSE8	SSE9	SE9	SSE8	SE7	ESE8	ESE9	S6	SSE8	SSE5	SSE4	SE8	---	ESE9	
3-Nov	SSE10	SE10	SSE8	SSE7	S6	SSW5	SW9	SW7	SW8	SW9	SW8	SW8	SW8	SW6	SW7	S6	SSW7	SW11	SW9	SSW6	SW7	SW7	SW7	WSW7	SSW6.5	SW11	
4-Nov	SW7	SW6	SSW5	SSW5	SSW6	SW8	SW7	SW8	SW10	SSW6	S7	SSW9	S7	S8	S7	S5	S6	SSE6	SSE6	SSE6	SSE6	SSE5	SSE4	SSE5	SSW5.7	SW10	
5-Nov	SE2	ESE2	NE3	NNE4	NE4	NNE4	N3	N4	NNW3	WNW3	WNW4	NW4	WNW4	W4	W4	WSW3	WSW4	SW4	SSW3	SSW4	SW5	SW5	SSW5	SSW6	W1.4	SSW6	
6-Nov	S6	S6	S9	S10	S9	S11	S12	S12	S13	SSW13	SSW14	SW15	SW17	SSW11	SW14	SSW11	S8	S9	S9	S7	S8	S7	S6	SSW6	SSW9.6	SW17	
7-Nov	WSW5	NNW12	NNW11	WNW6	W5	W7	W9	W7	W7	W8	WSW7	WSW9	W9	W7	WSW6	SW7	SSE4	SSE6	SSE7	SSE10	SSE10	SSE12	SSE13	SSE17	SW3.8	SSE17	
8-Nov	SSE17	SSE15	S12	S12	S10	S11	S9	S7	S7	SSW8	SSW8	SSW9	SSW9	SW10	SW13	SW11	SW10	SW8	NW6	NNW6	NNW8	NW5	WSW4	WSW8	SSW6.8	SSE17	
9-Nov	WSW6	WSW10	WSW8	WSW8	SW11	SW11	WSW9	SW9	SW10	WSW11	WSW12	WSW10	WSW10	WSW11	WSW9	WSW7	SSW5	S5	S6	SSE6	S8	S7	S8	S7	SW7.5	WSW12	
10-Nov	S7	S7	S7	S7	S8	S7	S7	S6	S6	S6	SSW7	SSW7	SSW7	SW7	SW7	SSW5	S4	SSE5	SSE6	SSE6	SSE6	SE7	SE6	SE7	S6.0	S8	
11-Nov	SSE10	SE11	SE12	SSE13	SE12	SSE9	SSE9	SSE15	SSE13	SSE15	SSE18	SE18	SSE15	SE14	SSE12	SSE11	SSE10	SSE10	SSE9	SSE8	SSE8	S7	S6	SSE6	SSE11.2	SE18	
12-Nov	SSE7	SSE7	SSE6	SSW2	S6	SW10	WSW11	WSW11	WSW11	WSW11	WSW13	W13	WSW11	W12	W14	W15	WSW12	WSW11	WSW12	WSW8	WNW8	WNW8	W8	WSW8	WSW8.5	W15	
13-Nov	WSW7	WSW6	SW7	SW7	SW7	SW9	SW6	SSE4	SSE4	SSE2	N3	NNE6	NNE5	ENE5	ENE6	ENE6	NE7	NE9	ENE9	ENE7	ENE5	ENE9	ENE8	ENE6	ENE1.6	ENE9	
14-Nov	ENE6	NE6	ENE5	NE6	NE8	E8	ENE6	ENE3	NNE3	ENE4	ENE5	ENE6	ENE7	ENE6	ENE5	E4	ENE4	NE2	N2	NNW1	NNW1	ESE3	ENE3	ENE1	ENE4.1	NE8	
15-Nov	E4	SE4	SE3	SSE4	SE6	SSE4	SSW4	S2	SE4	SE5	SSE6	SSW8	SSW8	SSW7	S7	S6	S7	SSE7	S9	S9	S9	S9	S9	S9	S5.9	S9	
16-Nov	S8	S9	S9	S9	SSE11	SSE12	SSE13	SSE14	SSE14	SSE14	SSE14	SSE14	SSE12	SSE12	S11	S11	S11	S10	S9	S8	S6	SSW5	NNW14	NNW18	SSE15.1	SSE23	
17-Nov	SSE13	SSE14	SSE14	SSE14	SSE13	SSE14	SSE14	SSE14	SSE14	SSE12	SSE12	S11	S11	S11	S10	S9	S8	S6	SSW5	NNW14	NNW18	N13	NNW11	NNW11	NW8	S5.4	NNW18
18-Nov	W5	W4	W5	W6	NW8	N6	NNE4	SE2	WNW2	NNW3	NW3	WNW6	WNW5	WNW3	NNW5	N2	E1	ENE4	E5	ESE5	ESE4	ESE4	SE2	SE3	NW1.3	NW8	
19-Nov	ESE3	ENE4	E4	NE5	NNE5	NE6	NNE6	N6	N7	N8	N7	N8	N10	N9	N10	N10	N11	N11	N11	N10	NNE9	NNE10	N11	N10	NNE7.5	N11	
20-Nov	N10	N8	N10	NNE8	N8	NNE8	N8	N8	NNE8	NNE8	NNE8	NNE8	N7	N8	N6	N6	N7	NNE7	NNE7	N8	NNE7	NNE6	NNE6	N6	NNE7.5	N10	
21-Nov	N5	N5	N5	N5	N5	N6	N5	N7	NNW6	NNW6	NNW6	NNW7	NNW8	NNW7	NNW6	NNW6	NNW6	NNW7	N7	N5	N7	NNW7	NNW7	NNW7	N6.1	NNW8	
22-Nov	NNW8	NNW7	NNW6	NNW7	NNW8	NNW7	NNW7	NNW7	NNW8	N7	N6	N5	N7	N7	N7	N7	NNE4	NE3	NNE3	NNE4	NNE3	NNE3	N2	NNE3	N5.5	NNW8	
23-Nov	NNE3	NNE3	NE3	NE5	NE5	NE3	NE3	NE3	NE3	N3	NNE3	NE3	NE3	NNE3	NNE3	NE4	NNE3	NNE3	NE4	NNE4	NNE4	NNE4	NNE3	NNE4	NNE3.3	NE5	
24-Nov	NE4	NE3	NNE4	NE3	NE3	NE3	NE3	NE3	ENE2	ESE1	NW1	NNW2	N3	N3	N3	N3	N2	NE1	ENE1	SSE2	SE4	SSE4	SSE4	SSE4	NE1.4	SSE4	
25-Nov	S4	SSE4	SSE4	S4	SSE5	SSE4	SSE4	S5	S5	S5	S5	S4	S5	S5	S5	SSE6	SSE7	SSE8	SSE10	SSE11	SSE11	SSE11	SSE11	SSE11	SSE6.7	SSE11	
26-Nov	SSE11	SSE10	SSE10	SSE10	SSE11	SSE11	S10	SSE11	SSE10	S9	S9	S9	S8	S8	S7	S6	S6	SW6	WSW7	WSW6	WNW7	NW6	W4	W5	S6.4	SSE11	
27-Nov	W5	WSW6	WSW6	W7	WNW8	WNW8	NNW9	WNW7	NW7	NW11	NW11	NNW14	NNW16	NNW16	NNW15	NNW15	NNW15	NNW15	NNW15	NNW15	NNW15	NNW15	NNW15	NNW15	NNW11.0	NNW18	
28-Nov	NNW16	NNW14	NNW16	NNW13	NNW11	NNW12	N13	N11	N9	N10	N9	N8	NNW9	NNW8	NNW7	NNW6	N5	N7	NNE5	NNE5	NNE5	NNE4	NNE4	NE5	N8.5	NNW16	
29-Nov	NE5	NE6	NE5	NE5	NE4	NE4	NE5	NE5	NNE4	NNE4	NNE4	NNE5	NNE4	N4	NNE3	NNE3	NE3	ENE4	ESE4	SE4	SSE3	UO	ESE3	SE3	NE3.3	NE6	
30-Nov	SSE3	UO	SE3	SE3	SE3	SE3	SSE1	ENE2	ENE3	NNE2	UO	SSE3	SE1	NNE3	NNE3	NNE3	NNW4	NNE3	N2	N3	NNE2	N3	NNW3	NE1.3	NNW4		

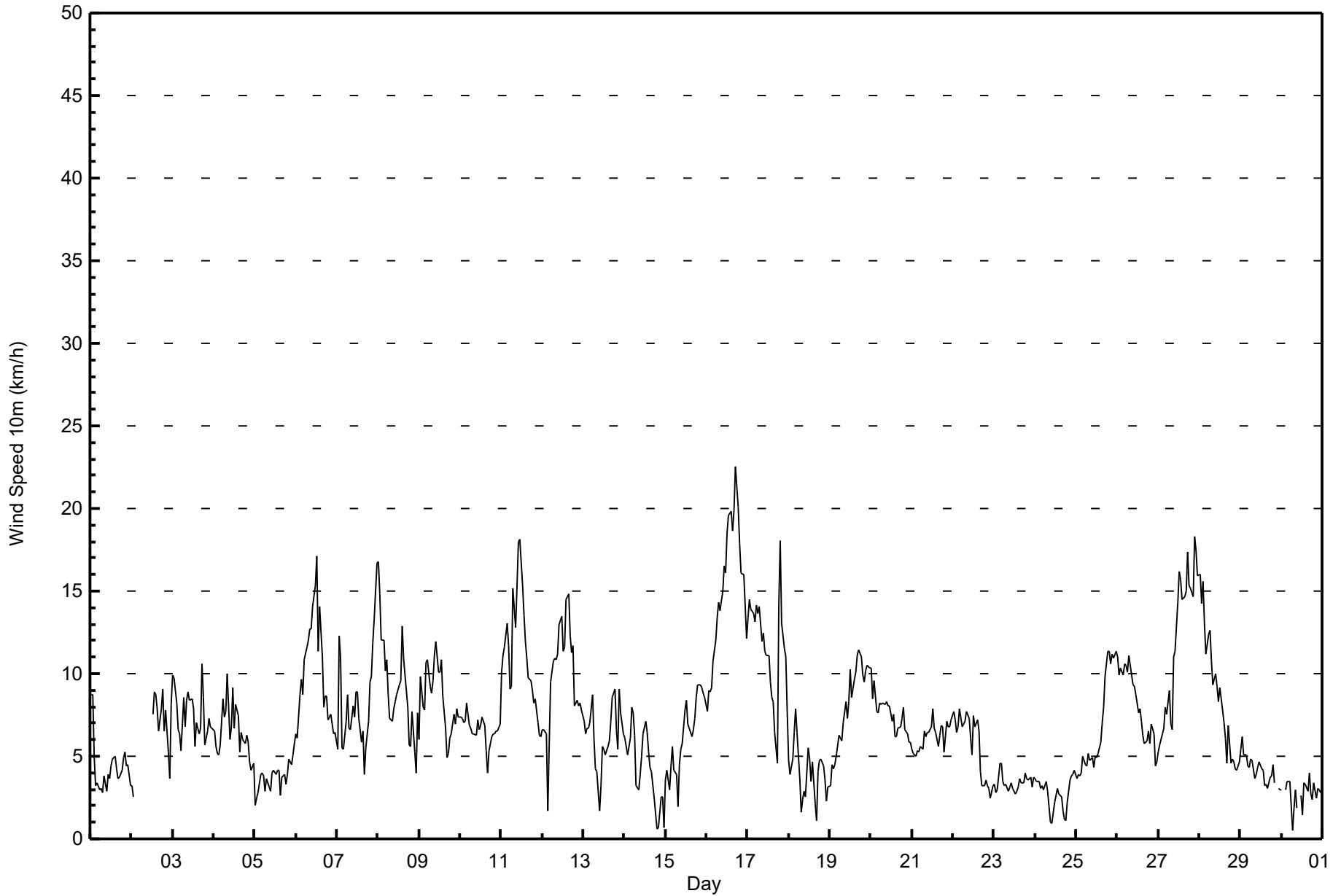
S1.9	S1.7	S1.6	S1.8	S1.8	S1.9	SSW1.7	SSW1.9	SSW2.0	SSW2.0	SSW2.3	SW2.3	SW2.1	SW1.6	SW1.7	SSW1.5	S1.3	SSE1.3	SE1.0	SE1.0	SE0.9	SSE0.7	SSE1.0	S1.4	Diurnal Average
SSE17	SSE15	NNW16	SSE14	SSE13	SSE14	SSE14	SSE15	SSE14	SSE15	SSE18	SE18	SSE19	SSE20	SSE20	SSE19	SSE20	SSE23	SSE20	NNW18	S16	NNW18	NNW17	SSE17	Diurnal Maximum

UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 10m (WS10) - km/h**  
**Wapasu - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Wapasu - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	256	36.21	36.21
6 - 11	364	51.49	87.69
12 - 19	82	11.60	99.29
20 - 28	5	0.71	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Wapasu - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	29	46	38	17	5	9	13	28	13	12	9	7	9	7	4	10	256
6 - 11	44	16	7	12	1	2	9	53	73	20	39	30	10	8	8	32	364
12 - 19	2	0	0	0	0	0	4	31	10	2	4	4	4	0	0	21	82
20 - 28	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	5
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	75	62	45	29	6	11	26	117	96	34	52	41	23	15	12	63	707

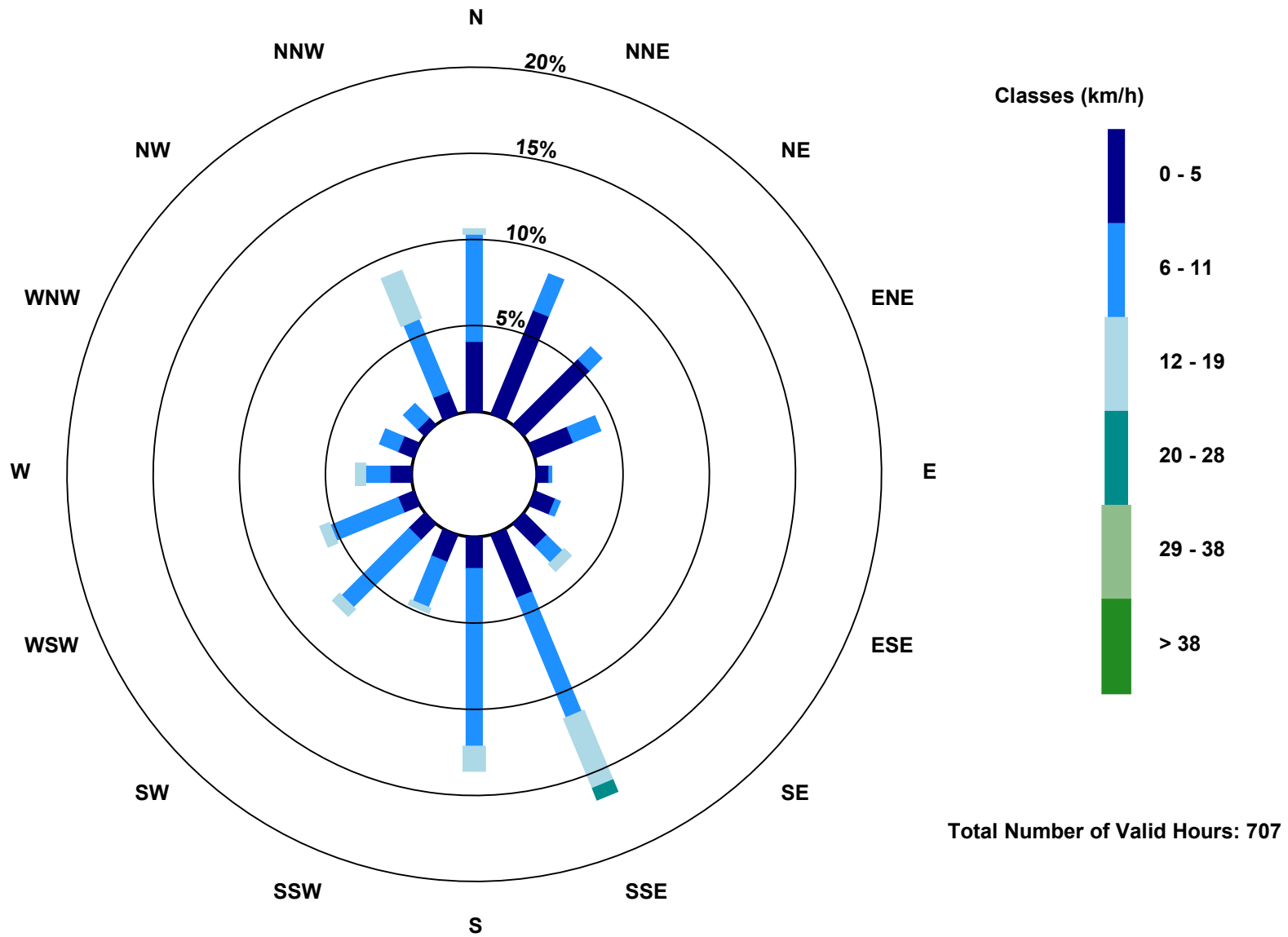
Total Number of Valid Hours: 707

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Wapasu





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Wapasu - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 7 km/h on Nov 16 18:00	Hours of Data: 707
Minimum Value: 0 km/h on Nov 30 05:00	Hours of Missing Data: 13
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 6	Hours of Calibration: 0
	Percent Operational Time: 98.2

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	3	2	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	1	1	2	1	1	3
2-Nov	1	1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2	3	3	2	2	2	4	3	3	3	1	3	4
3-Nov	2	2	2	2	2	1	2	2	2	2	2	2	2	3	3	2	2	3	2	2	2	2	1	2	3
4-Nov	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	1	1	1	1	1	2	1	1	3
5-Nov	2	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
6-Nov	2	2	3	3	3	4	4	4	4	4	4	5	5	4	4	4	2	3	3	2	2	2	2	2	5
7-Nov	2	6	4	2	2	3	3	2	2	2	3	3	3	3	2	2	1	1	2	2	2	3	3	5	6
8-Nov	5	5	4	4	4	3	3	2	2	3	2	3	3	3	4	3	3	2	2	3	3	2	2	2	5
9-Nov	2	3	2	2	2	3	2	2	3	3	3	3	3	3	3	2	1	1	1	1	2	2	2	2	3
10-Nov	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2
11-Nov	2	3	3	3	3	4	3	5	4	5	6	6	5	4	3	3	3	2	3	2	2	3	2	1	6
12-Nov	2	2	2	2	2	3	3	3	3	3	4	4	4	4	5	6	4	3	3	3	3	3	3	2	6
13-Nov	2	2	2	1	2	2	2	1	1	1	1	2	2	2	2	2	2	3	3	2	2	3	3	2	3
14-Nov	2	2	2	2	3	3	2	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	2	3
15-Nov	1	1	1	1	1	1	1	1	1	2	2	2	3	2	2	2	2	2	3	3	3	3	3	3	3
16-Nov	2	3	3	3	3	3	3	4	4	5	6	5	6	7	6	6	6	7	6	6	6	6	6	4	7
17-Nov	4	4	4	4	4	4	4	4	3	4	4	4	4	3	3	3	2	2	6	4	3	3	3	2	6
18-Nov	2	1	1	2	2	2	2	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2
19-Nov	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	4	4	3	3	3	3	3	4
20-Nov	3	3	3	3	2	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	3
21-Nov	2	2	1	2	2	1	2	2	1	1	1	2	2	1	2	1	1	2	2	1	2	2	2	2	2
22-Nov	2	1	1	1	2	2	2	2	2	2	1	2	2	2	2	2	2	1	1	1	1	1	1	1	2
23-Nov	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
24-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1
25-Nov	1	1	1	1	1	1	1	2	2	2	1	2	2	2	2	2	2	3	3	3	3	3	3	3	3
26-Nov	4	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	2	2	2	2	2	2	2	1	4
27-Nov	2	2	2	2	3	3	3	2	2	4	3	4	4	4	5	4	5	5	5	5	5	4	5	5	5
28-Nov	4	4	4	3	3	3	4	4	3	3	3	2	2	2	2	1	1	2	1	1	1	1	1	1	4
29-Nov	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	UO	0	2
30-Nov	0	UO	1	1	0	1	1	1	1	1	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	5	6	4	4	4	4	4	5	4	5	6	6	6	7	6	6	6	7	6	6	6	6	6	5	

Diurnal Maximum

UO - Unstable Operation



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Wapasu - November 2024**

Direction of Maximum Speed: 159 deg on Nov 16 18:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 164.9 deg on Nov 16	Hours of Data: 707
Direction of Minimum Speed: 158 deg on Nov 30 07:00	Hours of Missing Data: 13
Direction of Minimum Daily Speed Average: 1.1 deg on Nov 1	Percent Operational Time: 98.2
Monthly Average Direction: 191.2 deg	

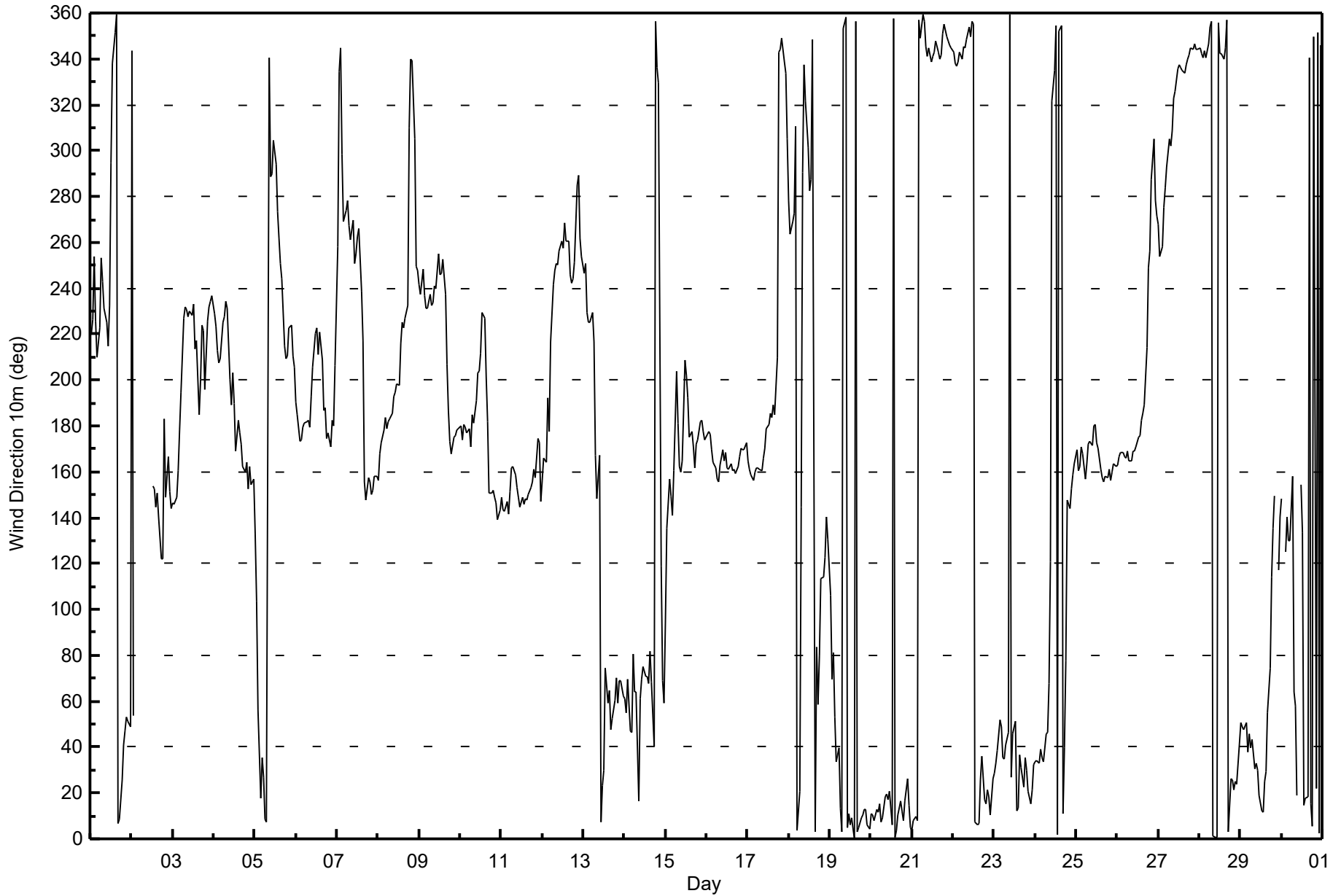
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	220	226	254	226	210	223	253	243	231	225	215	233	295	338	352	359	7	9	25	41	47	53	51	49	287.1
2-Nov	344	54	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	154	153	144	151	140	122	122	183	149	166	152	144	--
3-Nov	147	146	149	160	178	194	227	232	231	227	230	228	233	214	217	185	200	224	222	196	226	232	234	237	208.2
4-Nov	229	223	213	207	209	225	227	234	231	200	189	203	190	169	182	177	172	162	160	164	153	162	154	157	194.5
5-Nov	133	103	56	18	35	27	8	8	341	288	290	304	294	273	262	251	244	215	209	210	223	224	210	206	265.0
6-Nov	190	185	174	174	180	181	182	182	180	193	206	220	222	211	221	209	187	188	174	177	171	183	180	206	193.5
7-Nov	258	334	345	298	269	274	278	267	261	270	251	255	262	266	238	217	155	148	157	155	150	152	158	158	228.0
8-Nov	156	168	173	178	183	179	182	183	186	193	194	198	198	216	225	223	227	233	310	340	339	305	249	248	201.2
9-Nov	242	238	248	237	231	231	238	232	234	241	240	255	246	247	253	238	207	187	173	168	175	176	178	178	225.9
10-Nov	180	174	180	179	177	179	171	185	181	191	203	204	212	230	227	201	182	151	151	152	149	146	139	143	179.0
11-Nov	149	143	143	147	142	152	162	162	159	153	149	144	149	146	148	148	150	153	156	161	158	175	172	147	151.7
12-Nov	156	166	164	192	177	217	242	247	251	250	256	261	257	269	261	261	246	242	244	252	285	289	262	254	247.1
13-Nov	246	251	229	225	225	230	216	167	148	167	7	23	30	75	59	64	48	52	60	70	59	69	69	62	75.9
14-Nov	61	55	70	47	47	81	64	64	16	61	70	75	71	71	68	82	69	40	356	336	330	119	69	59	63.3
15-Nov	95	135	157	150	141	161	204	181	162	160	165	209	202	192	175	177	171	162	172	174	182	182	177	174	173.2
16-Nov	176	177	176	170	164	162	157	156	163	170	165	168	162	161	163	160	161	159	162	166	170	169	170	172	164.9
17-Nov	165	161	159	156	160	162	162	161	160	166	170	179	181	185	184	189	185	210	343	344	349	339	334	305	174.1
18-Nov	278	263	269	273	311	4	21	145	291	337	322	302	282	287	348	3	84	58	80	113	114	123	140	131	325.5
19-Nov	106	70	81	53	33	40	13	3	353	358	5	11	6	9	0	357	3	5	9	10	13	13	6	4	12.1
20-Nov	11	10	8	13	11	15	7	9	18	20	17	21	6	358	1	4	10	16	12	8	17	26	15	5	11.7
21-Nov	4	8	10	8	357	349	360	357	345	341	345	339	341	343	348	343	340	341	351	355	349	348	346	345	349.6
22-Nov	343	338	337	339	343	340	345	345	348	354	350	356	355	7	6	7	26	36	17	15	21	18	11	26	355.4
23-Nov	28	33	38	52	49	35	35	41	46	359	27	46	52	12	14	37	31	22	35	30	21	15	21	32	31.8
24-Nov	34	34	33	39	35	34	46	47	68	121	322	335	354	2	352	354	11	40	77	147	144	152	159	164	50.1
25-Nov	170	161	162	171	168	157	164	172	173	172	180	180	173	170	161	158	156	158	157	161	156	160	163	162	163.4
26-Nov	163	166	168	168	166	166	169	165	165	169	169	171	175	176	182	185	189	214	249	257	287	305	278	272	183.5
27-Nov	268	254	258	275	284	293	305	302	309	323	326	335	337	336	335	334	338	340	342	345	344	347	344	344	328.4
28-Nov	345	342	341	343	341	346	354	357	2	1	1	356	342	342	340	345	357	3	26	26	21	25	24	41	353.6
29-Nov	50	49	47	50	38	46	40	43	30	33	30	19	12	11	25	29	55	75	114	135	150	UO	117	140	51.3
30-Nov	148	UO	125	140	130	130	158	64	58	19	UO	154	133	15	17	19	340	15	6	350	22	351	2	346	44.0

172.8 173.0 171.0 173.7 177.9 187.1 208.0 193.8 204.1 212.3 213.0 227.5 230.3 226.9 228.2 206.4 176.1 158.6 134.4 142.3 134.8 147.1 162.4 173.3

Diurnal Average

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Wapasu - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 93 deg on Nov 15 00:00	Hours of Data: 707
Minimum Value: 8 deg on Nov 24 20:00	Hours of Missing Data: 13
Percentiles: P <sub>1</sub> = 10 P <sub>10</sub> = 17 Q <sub>1</sub> = 20 Median = 25 Q <sub>3</sub> = 29 P <sub>90</sub> = 32 P <sub>99</sub> = 58	Hours of Calibration: 0
	Percent Operational Time: 98.2

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	26	18	28	29	23	24	26	25	27	30	24	52	33	30	22	25	27	29	33	26	23	25	31	38	52
2-Nov	35	45	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	22	25	24	23	23	21	41	34	26	35	25	19	45
3-Nov	19	18	19	20	29	31	16	16	16	16	18	17	17	27	24	27	30	16	20	26	19	18	15	17	31
4-Nov	16	23	24	26	29	15	16	16	17	33	29	26	31	26	29	27	16	15	12	10	8	34	19	15	34
5-Nov	53	34	33	36	33	33	38	34	25	38	31	28	32	33	29	32	29	21	19	17	16	22	22	53	
6-Nov	28	29	25	25	29	27	30	30	29	29	25	21	18	24	19	26	26	27	28	30	24	29	25	22	30
7-Nov	33	26	16	31	31	27	27	27	25	26	26	27	29	29	22	22	29	11	16	19	17	19	20	21	33
8-Nov	21	28	26	28	31	26	27	28	27	29	28	27	27	29	18	20	15	17	33	24	17	28	34	25	34
9-Nov	24	18	23	18	15	17	17	14	16	18	19	24	24	24	20	19	20	14	15	20	22	22	23	24	
10-Nov	25	24	28	24	23	27	20	24	22	26	24	27	23	16	20	26	17	11	8	9	11	9	11	10	28
11-Nov	16	17	17	18	19	36	26	23	22	22	21	21	22	20	20	22	22	21	23	23	21	30	29	19	36
12-Nov	22	23	23	82	28	24	20	22	23	23	25	27	28	31	26	26	22	19	18	24	31	30	26	24	82
13-Nov	20	26	17	16	17	13	18	21	12	34	45	36	38	39	40	32	29	26	27	27	22	22	26	24	45
14-Nov	24	26	27	25	25	29	23	25	40	36	27	26	27	25	21	24	25	29	29	41	43	12	28	93	93
15-Nov	29	12	27	17	21	21	27	33	26	26	28	23	26	30	25	26	24	25	27	27	27	28	28	26	33
16-Nov	25	27	25	23	22	22	20	19	22	26	25	26	25	25	25	25	23	22	24	25	28	27	27	29	29
17-Nov	26	23	21	22	23	22	22	22	23	23	29	30	27	28	29	28	31	54	19	18	20	19	17	25	54
18-Nov	29	28	28	31	29	27	28	69	50	20	37	24	32	45	17	58	65	25	25	17	15	25	37	29	69
19-Nov	24	19	20	25	25	28	29	28	22	24	27	30	28	32	25	24	27	27	29	32	29	30	27	28	32
20-Nov	31	31	30	31	32	32	29	32	31	34	33	32	28	27	26	29	31	30	30	28	31	31	32	31	34
21-Nov	29	31	32	31	26	20	26	25	19	17	20	19	18	18	19	18	16	18	22	23	19	20	18	18	32
22-Nov	16	15	16	15	19	18	18	18	21	24	20	25	26	30	29	29	34	31	34	29	34	32	36	33	36
23-Nov	33	32	32	26	25	30	29	28	26	36	33	27	27	28	29	29	29	35	32	30	31	31	32	30	36
24-Nov	31	31	30	35	30	32	24	26	24	79	83	34	28	24	22	26	30	37	37	8	12	17	20	22	83
25-Nov	22	18	20	23	23	18	23	26	26	29	27	27	27	27	23	20	19	20	20	20	22	22	24	23	29
26-Nov	25	24	25	27	25	24	24	24	25	26	28	29	29	30	30	30	29	31	23	26	28	25	28	29	31
27-Nov	29	25	26	28	28	28	26	26	26	21	20	19	19	18	18	18	20	19	19	19	19	20	19	19	29
28-Nov	20	18	17	15	17	16	24	25	26	27	26	26	18	18	18	17	23	27	25	24	29	27	19	22	29
29-Nov	17	15	18	21	23	21	26	24	28	28	32	27	27	29	26	28	17	18	14	15	31	UO	14	22	32
30-Nov	13	UO	12	8	11	13	66	15	15	38	UO	35	39	31	28	27	16	30	26	16	28	21	25	23	66
	53	45	33	82	33	36	66	69	50	79	83	52	39	45	40	58	65	54	41	41	43	35	37	93	

Diurnal Maximum

UO - Unstable Operation



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS18 STONY MOUNTAIN NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)  
NOVEMBER 2024

MONTHLY SUMMARY for  
AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	681	36	39	99.58	7	0	1.4	0
TRS(ppb) Average	682	37	38	99.86	0.6	0	0.4	0
THC(ppm) Average	672	36	48	98.33	2.2	-	2.2	-
NMHC(ppm) Average	672	36	48	98.33	0.088	-	0.033	-
CH4(ppm) Average	672	36	48	98.33	2.2	-	2.1	-
O3 (ppb) Average	682	35	38	99.58	40.3	0	33.9	-
NO2 (ppb) Average	682	37	38	99.86	8.6	0	3.3	-
NO (ppb) Average	682	37	38	99.86	2.8	-	1.2	-
NOX (ppb) Average	682	37	38	99.86	9.1	-	3.9	-
PM2.5 (ug/m3) Average	718	2	2	100	11.8	0	5.6	0
CO(ppm) Average	683	34	37	99.58	0.4	0	0.2	0
CO2(ppm) Average	682	34	38	99.44	460.5	0	443.3	0
Temperature 2 m (C) Average	720	0	0	100	13.3	-	6.7	-
Relative Humidity (%) Average	713	0	7	99.03	100	-	97	-
Wind Speed 10 m (km/h) Average	720	0	0	100	19	-	12	-
Wind Speed 20 m (km/h) Average	411	0	309	57.08	21	-	16	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	0	-
Wind Direction 20 m (deg) Average	411	0	309	57.08	-	-	0	-
Precipitation (mm) Total	695	0	25	96.53	1.2	-	3.9	-
Leaf Wetness (% of range) Average	720	0	0	100	52	-	9.1	-
Global Solar Radiation (W/m2) Average	720	0	0	100	363	-	73.5	-

Note : Operational time includes periods of data collection and instrument calibration



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)  
 NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	681	0.32	0.6	-	0	0	0	0.1	0.3	0.7	7
TRS (ppb) Average	682	0.36	0	-	0.3	0.3	0.3	0.4	0.4	0.4	0.6
THC (ppm) Average	672	2.06	0	-	1.9	2	2	2.1	2.1	2.1	2.2
NMHC(ppm) Average	672	0.008	0.012	-	0	0	0	0	0	0	0.088
CH4(ppm) Average	672	2.05	0	-	1.9	2	2	2.1	2.1	2.1	2.2
O3 (ppb) Average	682	24.31	5.7	-	8.8	17.2	20.9	24.5	28.4	31.1	40.3
NO2 (ppb) Average	682	1.01	1.1	-	0	0	0.3	0.7	1.4	2.3	8.6
NO (ppb) Average	682	0.34	0.5	-	0	0	0	0	0.6	1	2.8
NOX (ppb) Average	682	1.35	1.3	-	0	0.1	0.5	1	1.8	3.1	9.1
PM2.5 (ug/m3) Average	718	2.88	1.9	-	0.3	1.1	1.6	2.4	3.8	5.3	11.8
CO(ppm) Average	683	0.16	0	-	0.1	0.1	0.2	0.2	0.2	0.2	0.4
CO2(ppm) Average	682	438.5	3.5	-	430.8	434.2	435.7	438.3	441	442.5	460.5
Temperature 2 m (C) Average	720	-7.49	8.7	-	-24.6	-19.6	-15.9	-4.9	-1.2	3.4	13.3
Relative Humidity (%) Average	713	81.34	10.6	-	43.5	66.6	77	82.3	88.3	95.2	100
Wind Speed 10 m (km/h) Average	720	6.6	3	-	0	3	4	6	9	11	19
Wind Speed 20 m (km/h) Average	411	9.5	4	-	1	4	6	9	12	16	21
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-
Wind Direction 20 m (deg) Average	411	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	695	-	-	10.8	-	-	-	-	-	-	-
Surface Wetness (% of range) Average	720	3.92	4.1	-	1	1.9	2	2.5	4	8.8	52
Global Solar Radiation (W/m2) Average	720	28.72	62.3	-	0	0	0	0.4	26.8	97	363

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)  
NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Period Start	Period End	Duration (Hours)	Notes
All Gaseous Analyzers (except CO)	07 Nov 2024 13:00	07 Nov 2024 13:00	1	Maintenance - sample manifold cleaned
THC/NMHC/CH4	10 Nov 2024 14:00	10 Nov 2024 21:00	8	Unstable Operations - excessive baseline noise
CO, CO2, THC/NMHC/CH4	28 Nov 2024 16:00	28 Nov 2024 18:00	3	Maintenance - sample manifold cleaned
O3, SO2	28 Nov 2024 16:00	28 Nov 2024 17:00	2	Maintenance - sample manifold cleaned
Relative Humidity	11 Nov 2024 22:00	12 Nov 2024 04:00	7	Sensor operated out of range
Wind Speed, Wind Direction 20m	01 Nov 2024 01:00	13 Nov 2024 11:00	299	Sensor Failure - inconsistent response
Wind Speed, Wind Direction 20m	13 Nov 2024 12:00	13 Nov 2024 13:00	2	Maintenance - sensor replaced
Wind Speed, Wind Direction 20m	15 Nov 2024 01:00	15 Nov 2024 08:00	8	Flat line in sensor output signal - Sensor frozen
Precipitation Collector	07 Nov 2024 14:00	08 Nov 2024 12:00	23	DAS Failure - data not recorded
Precipitation Collector	13 Nov 2024 12:00	13 Nov 2024 13:00	2	DAS Failure - data not recorded



# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Sulphur Dioxide (SO<sub>2</sub>) - ppb

## Stony Mountain - November 2024

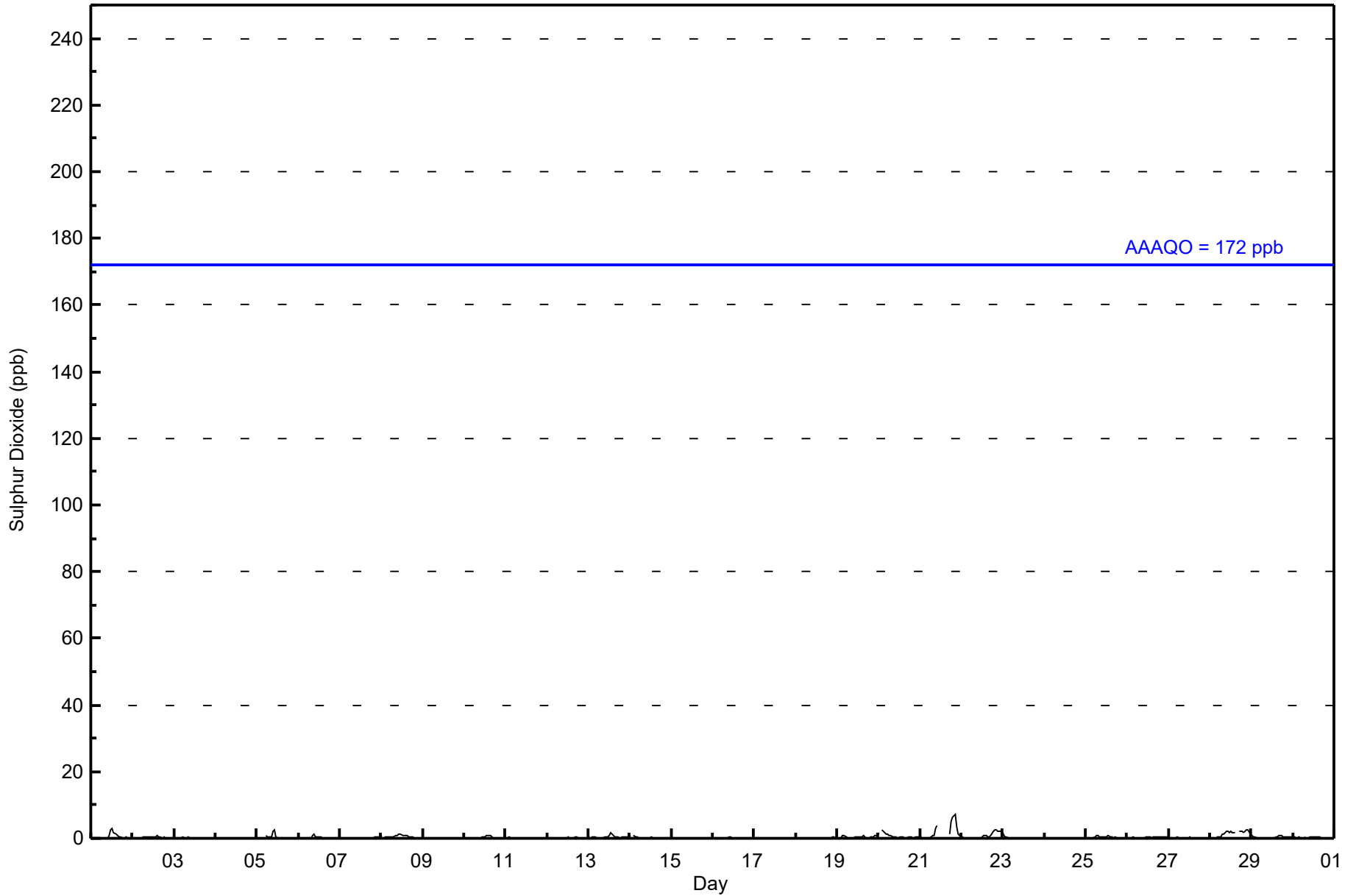
Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Hours of Data: 681						
Maximum Value: 7.0 ppb on Nov 21 21:00		Maximum Daily Average: 1.4 ppb on Nov 28		Hours of Missing Data: 39																	Hours of Calibration: 36						
Minimum Value: 0.0 ppb on Nov 1 03:00		Minimum Daily Average: 0.0 ppb on Nov 17		Hours of Calibration: 36																	Percent Operational Time: 99.6						
Maximum Diurnal Average: 0.5 ppb at hour 21		Minimum Diurnal Average: 0.1 ppb at hour 2		Percent Operational Time: 99.6																							
Monthly Average: 0.32 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.1 Q <sub>3</sub> = 0.3 P <sub>90</sub> = 0.7 P <sub>99</sub> = 2.7																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.7	2.5	3.1	1.6	1.1	0.7	0.5	0.3	0.1	0.2	0.2	0.1	0.1	0.0	0.5	3.1	
2-Nov	0.0	Z	0.1	0.1	0.1	0.1	0.4	0.6	0.6	0.5	0.6	0.5	0.5	0.7	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.7		
3-Nov	0.2	0.2	Z	0.2	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.3		
4-Nov	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1		
5-Nov	0.1	0.2	0.2	0.1	Z	0.7	0.5	0.2	0.3	1.9	2.6	0.6	0.2	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.4		
6-Nov	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.7	1.1	0.6	0.5	0.5	0.3	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	1.1		
7-Nov	Z	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	M	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.3	0.4	0.4		
8-Nov	0.6	Z	0.4	0.5	0.5	0.6	0.5	0.6	0.7	0.9	1.3	1.4	1.0	0.8	0.9	0.7	0.5	0.5	0.4	0.2	0.1	0.1	0.0	0.0	1.4		
9-Nov	0.1	0.0	Z	0.1	0.1	0.0	0.1	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2		
10-Nov	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.7	0.8	0.8	0.3	0.2	0.1	0.1	0.0	0.1	0.2	0.0	0.8		
11-Nov	0.0	0.1	0.3	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.3		
12-Nov	0.0	0.0	0.0	0.0	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2		
13-Nov	Z	0.2	0.2	0.4	0.5	0.1	0.2	0.1	0.1	0.3	0.3	0.5	0.7	1.7	0.7	0.5	0.6	0.4	0.2	0.3	0.3	0.4	0.4	0.5	1.7		
14-Nov	1.0	Z	0.7	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	1.0		
15-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
16-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3		
17-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
18-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.3	0.2	0.1	0.0	0.3		
19-Nov	Z	0.0	0.2	0.8	0.7	0.4	0.2	0.1	0.1	0.1	0.3	0.3	0.5	0.6	0.4	0.9	0.4	0.1	0.1	0.5	0.6	0.5	1.0	0.9	1.0		
20-Nov	1.5	Z	2.6	1.5	1.4	1.5	0.9	0.6	0.5	0.2	0.2	0.2	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.5	0.6	0.4	2.6		
21-Nov	0.3	0.3	Z	0.1	0.1	0.2	0.3	0.7	1.0	3.1	3.8	C	C	C	C	C	C	1.4	5.0	6.2	7.0	3.4	1.2	0.8	7.0		
22-Nov	0.2	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.7	0.8	0.3	0.4	0.9	2.1	2.4	2.5	2.0	2.2	2.0	2.5		
23-Nov	1.4	0.5	0.2	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4		
24-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1		
25-Nov	Z	0.1	0.0	0.1	0.1	0.2	0.6	0.8	0.4	0.3	0.6	0.6	0.6	0.8	0.5	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.8		
26-Nov	0.3	Z	0.2	0.3	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.4	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.5		
27-Nov	0.2	0.1	Z	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.3		
28-Nov	0.1	0.1	0.0	Z	0.3	0.3	0.5	1.2	1.3	2.2	1.9	1.9	2.1	1.6	1.7	M	M	2.1	2.2	1.6	2.0	2.7	2.5	1.5	2.7		
29-Nov	0.7	0.5	0.4	0.2	Z	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.4	0.6	1.1	0.8	0.6	0.5	0.4	0.5	0.3	0.3	1.1		
30-Nov	0.2	0.2	0.2	0.2	0.6	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.5	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6		
																								Diurnal Average			
																								Diurnal Maximum			
																								0.3 0.1 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.4 0.5 0.4 0.4 0.4 0.3 0.2 0.2 0.3 0.4 0.5 0.5 0.4 0.3 0.3			
																								1.5 0.5 2.6 1.5 1.4 1.5 0.9 1.2 1.3 3.1 3.8 2.5 3.1 1.7 1.7 0.9 1.1 2.1 5.0 6.2 7.0 3.4 2.5 2.0			

Z - zerospan      C - Calibration      M - Maintenance  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb    24-hr 48 ppb



Wood Buffalo Environmental Association  
Hourly Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Stony Mountain - November 2024





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Stony Mountain - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	681	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Stony Mountain - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	27	35	39	40	14	2	0	5	46	21	21	5	4	42	44	42	387
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	27	35	39	40	14	2	0	5	46	21	21	5	4	42	44	42	387

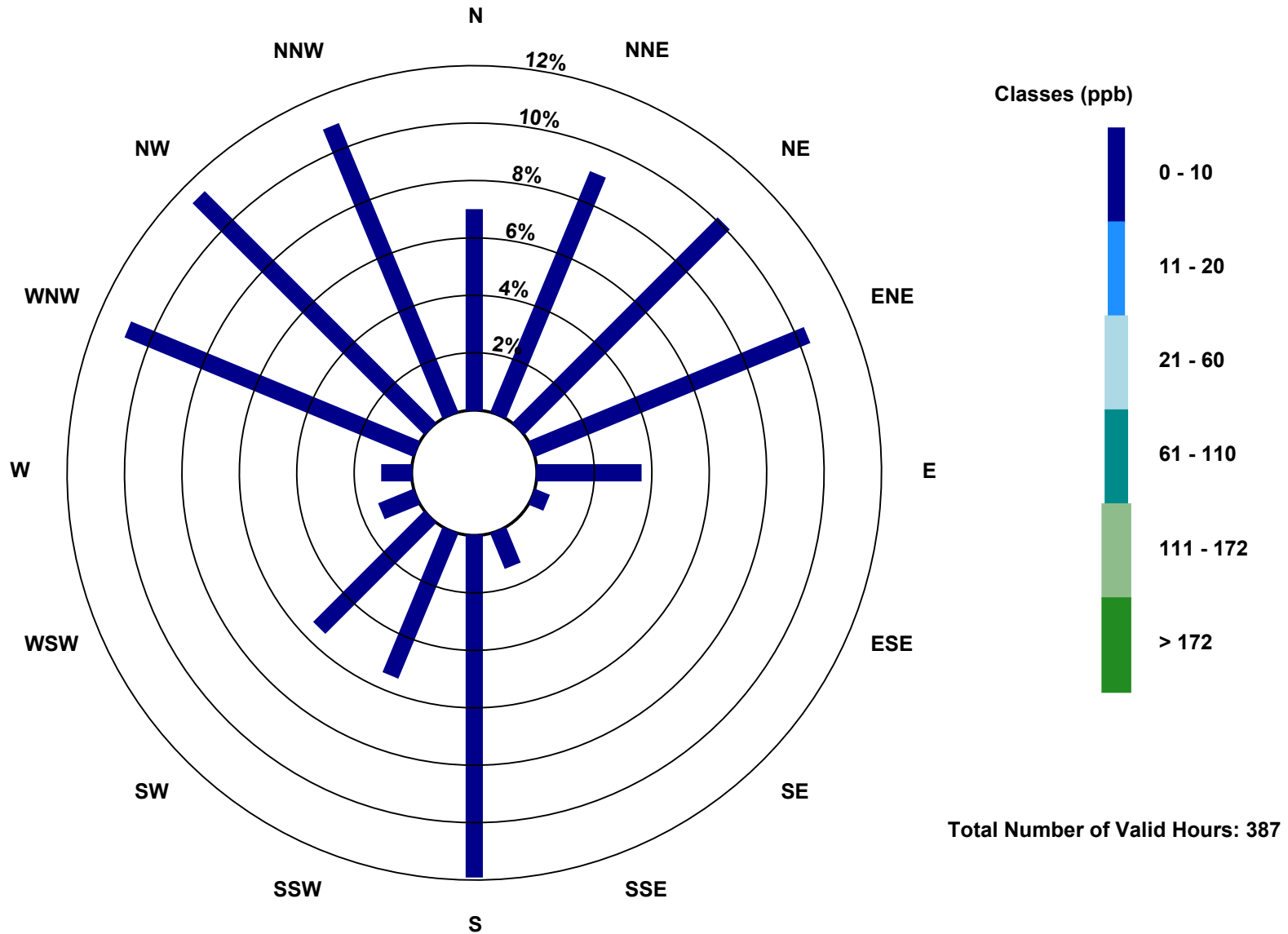
Total Number of Valid Hours: 387

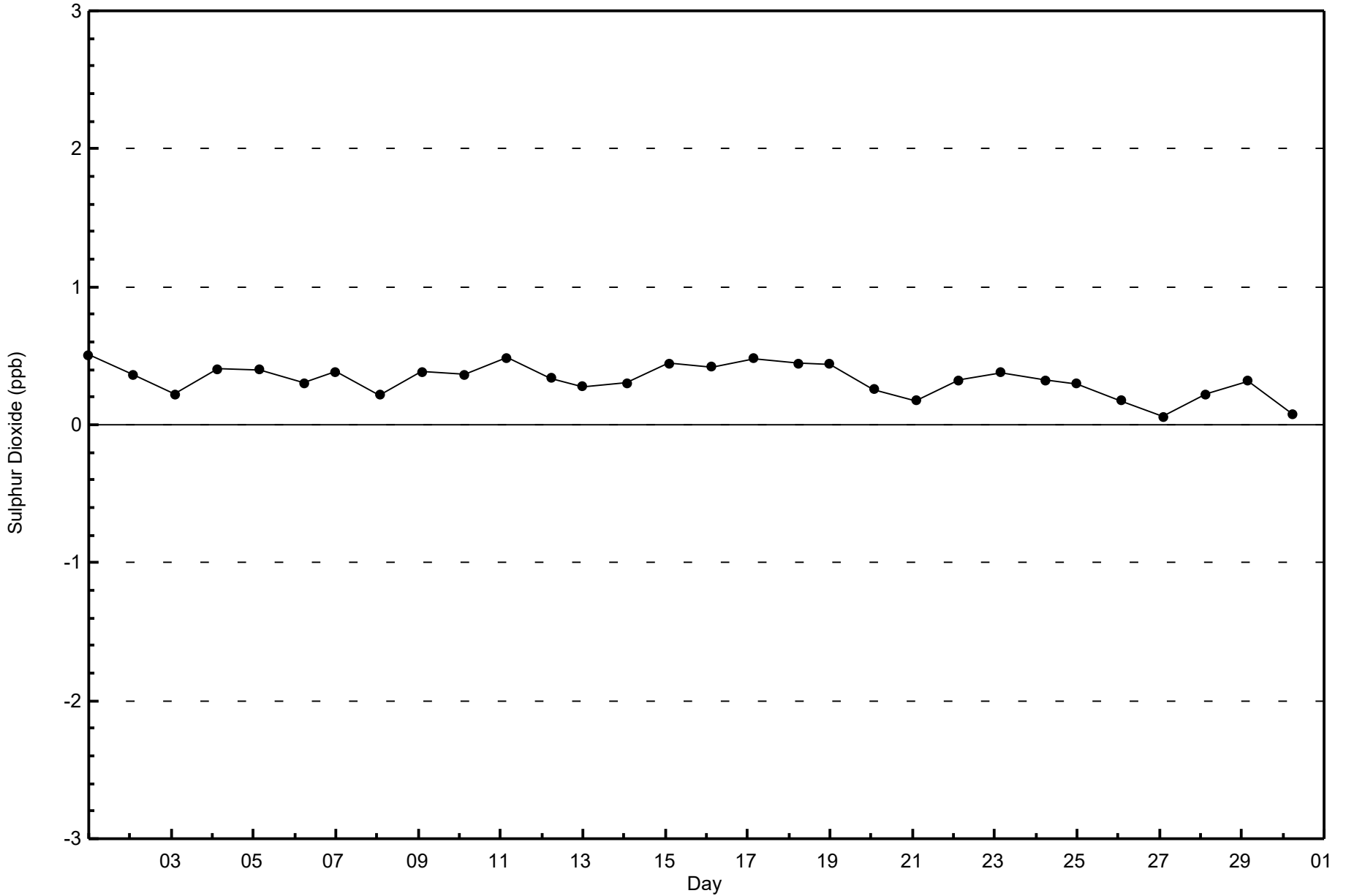
Total Number of Hours: 720



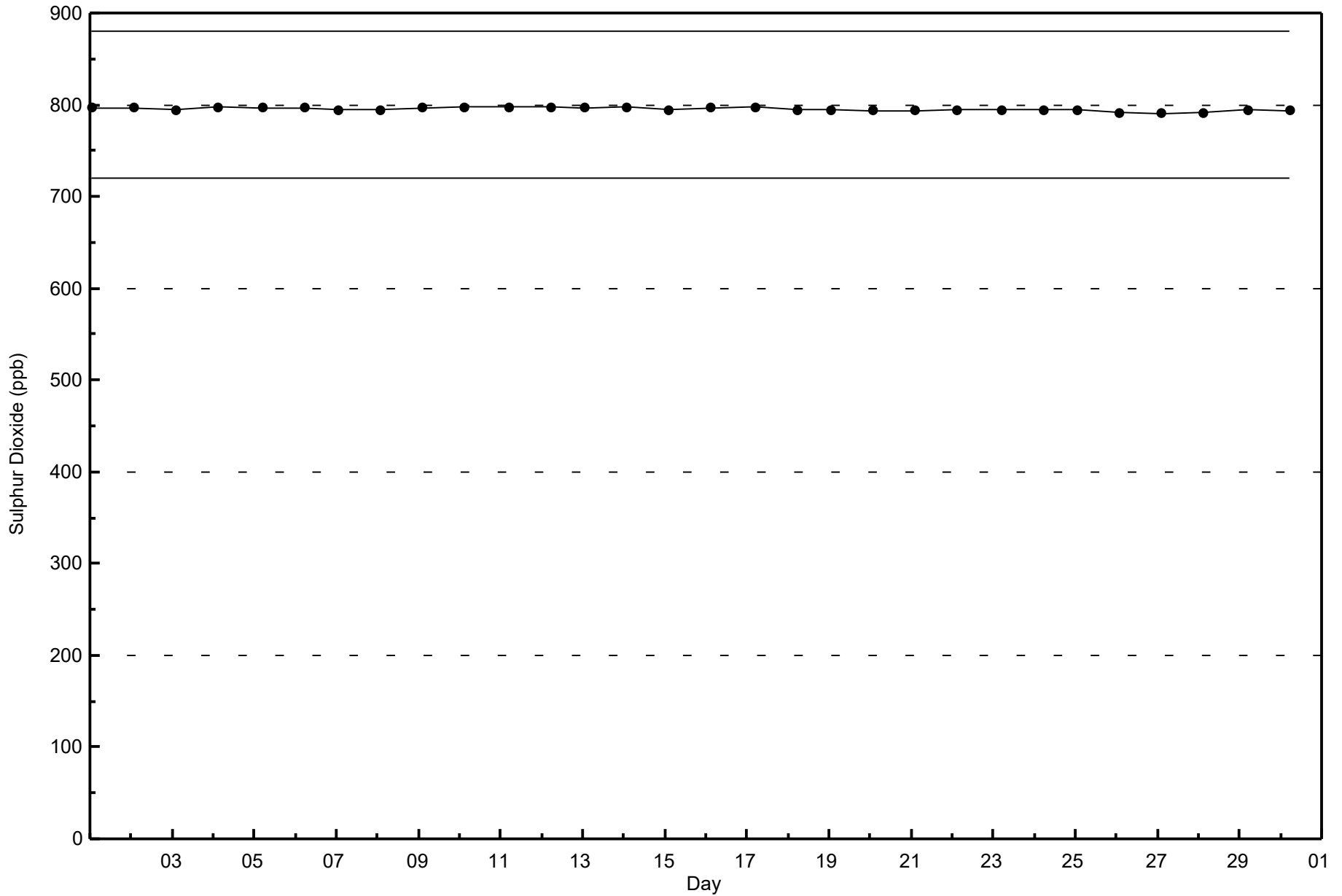
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Stony Mountain











# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Total Reduced Sulphur (TRS) - ppb

## Stony Mountain - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 0.6 ppb on Nov 21 13:00	Maximum Daily Average: 0.4 ppb on Nov 21		Hours of Data:	682
Minimum Value: 0.3 ppb on Nov 10 08:00	Minimum Daily Average: 0.3 ppb on Nov 20		Hours of Missing Data:	38
Maximum Diurnal Average: 0.4 ppb at hour 13	Minimum Diurnal Average: 0.4 ppb at hour 8		Hours of Calibration:	37
Monthly Average: 0.36 ppb	Percentiles: $P_1 = 0.3$ $P_{10} = 0.3$ $Q_1 = 0.3$ Median = 0.4 $Q_3 = 0.4$ $P_{90} = 0.4$ $P_{99} = 0.5$		Percent Operational Time:	99.9

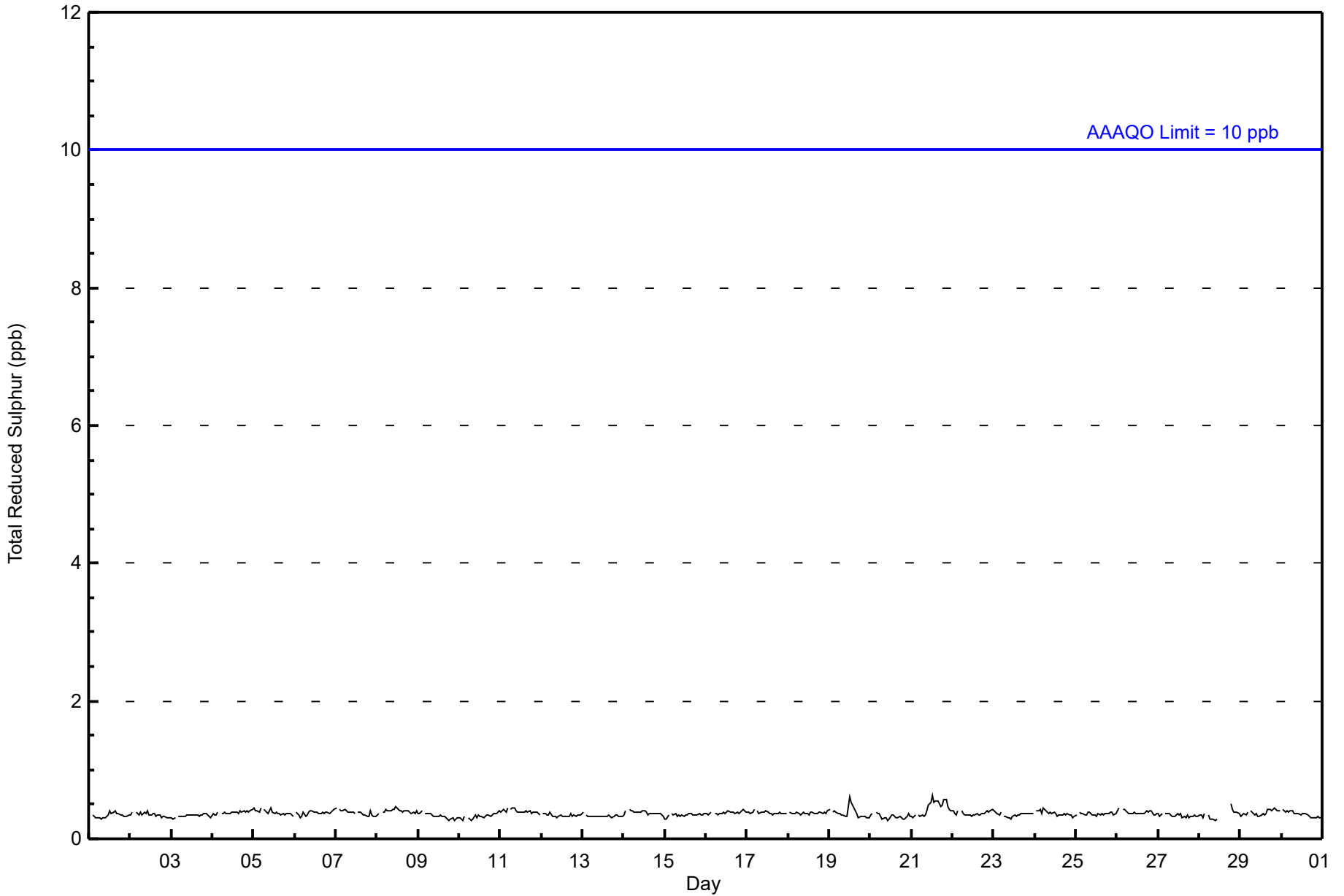
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.4	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.4	
2-Nov	0.3	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
3-Nov	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4
4-Nov	0.4	0.4	0.3	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
5-Nov	0.4	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4
6-Nov	Z	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
7-Nov	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	M	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.4
8-Nov	0.3	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
9-Nov	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10-Nov	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.4
11-Nov	0.4	0.4	0.4	0.4	0.5	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.5
12-Nov	Z	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
13-Nov	0.4	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
14-Nov	0.3	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4
15-Nov	0.3	0.3	0.4	Z	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.4
16-Nov	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
17-Nov	0.4	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
18-Nov	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
19-Nov	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.5	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
20-Nov	0.3	0.4	Z	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4
21-Nov	0.3	0.3	0.3	Z	0.3	0.3	0.4	0.3	0.3	0.4	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.4	0.4	0.4	0.6
22-Nov	0.4	0.4	0.3	0.4	Z	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
23-Nov	0.4	0.4	0.4	0.3	0.4	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4
24-Nov	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4
25-Nov	0.3	Z	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
26-Nov	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
27-Nov	0.4	0.3	0.4	Z	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
28-Nov	0.3	0.3	0.3	0.4	Z	0.3	0.3	0.3	0.3	0.3	0.3	C	C	C	C	C	C	C	C	0.5	0.4	0.4	0.4	0.4	0.4	0.4	--
29-Nov	0.3	0.4	0.4	0.3	0.4	Z	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
30-Nov	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
																								Diurnal Average			
																								Diurnal Maximum			

Z - zerospan      C - Calibration      M - Maintenance  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb    24-hr 3 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Reduced Sulphur (TRS) - ppb**  
**Stony Mountain - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Stony Mountain - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	682	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Stony Mountain - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	28	35	39	39	15	2	0	5	46	21	21	5	4	43	42	43	388
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	28	35	39	39	15	2	0	5	46	21	21	5	4	43	42	43	388

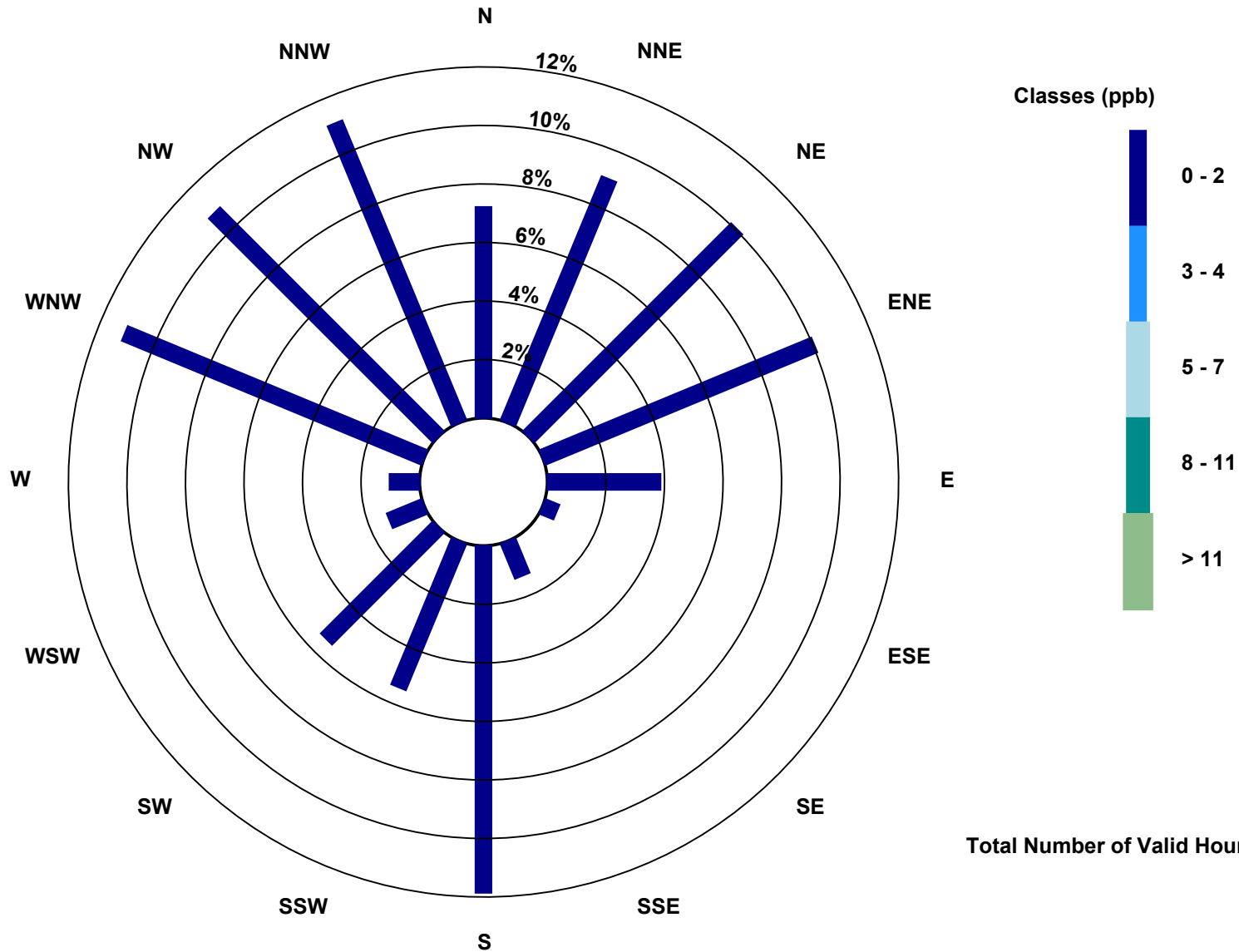
Total Number of Valid Hours: 388

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Reduced Sulphur (TRS) - ppb  
Stony Mountain

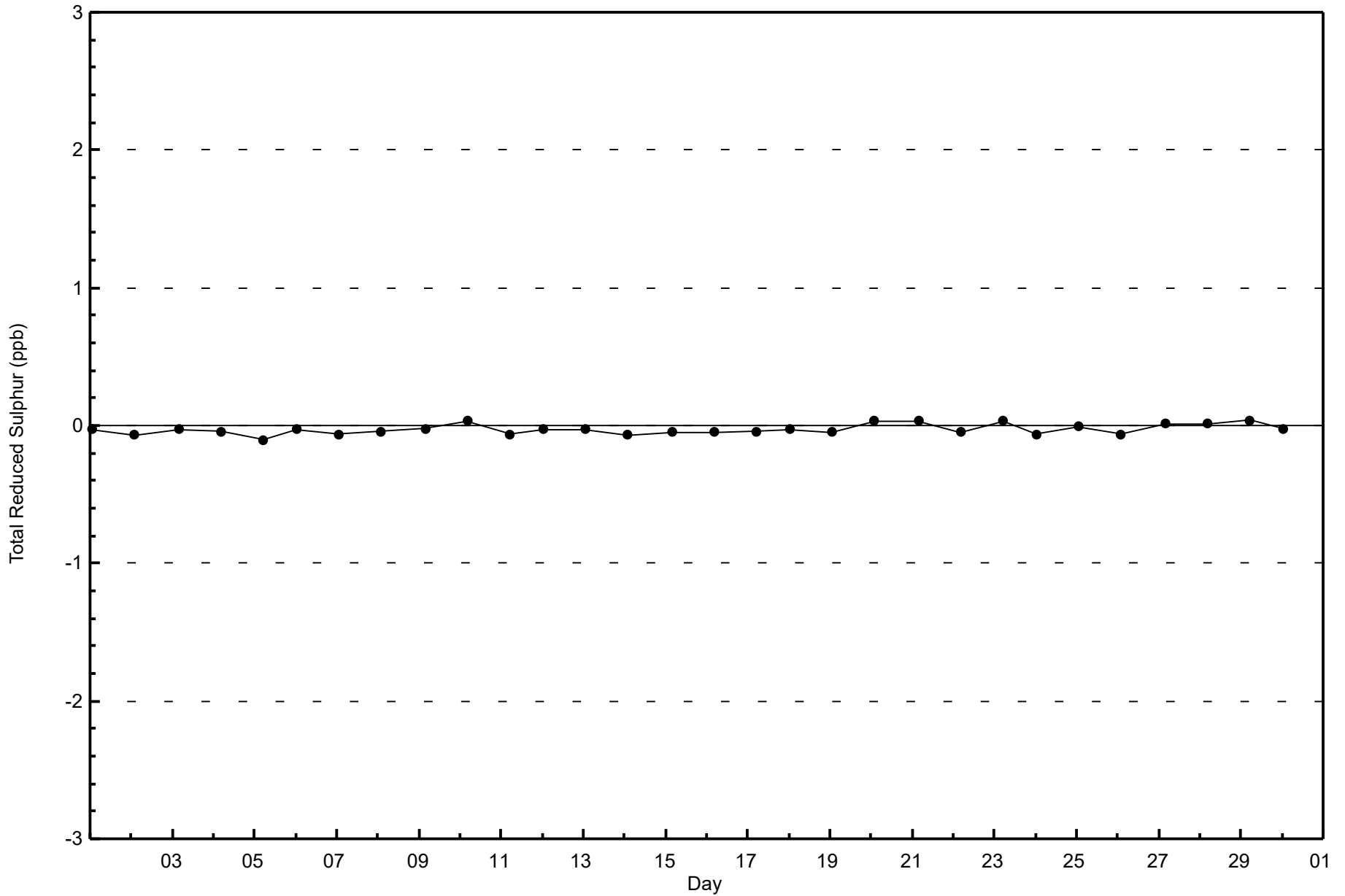


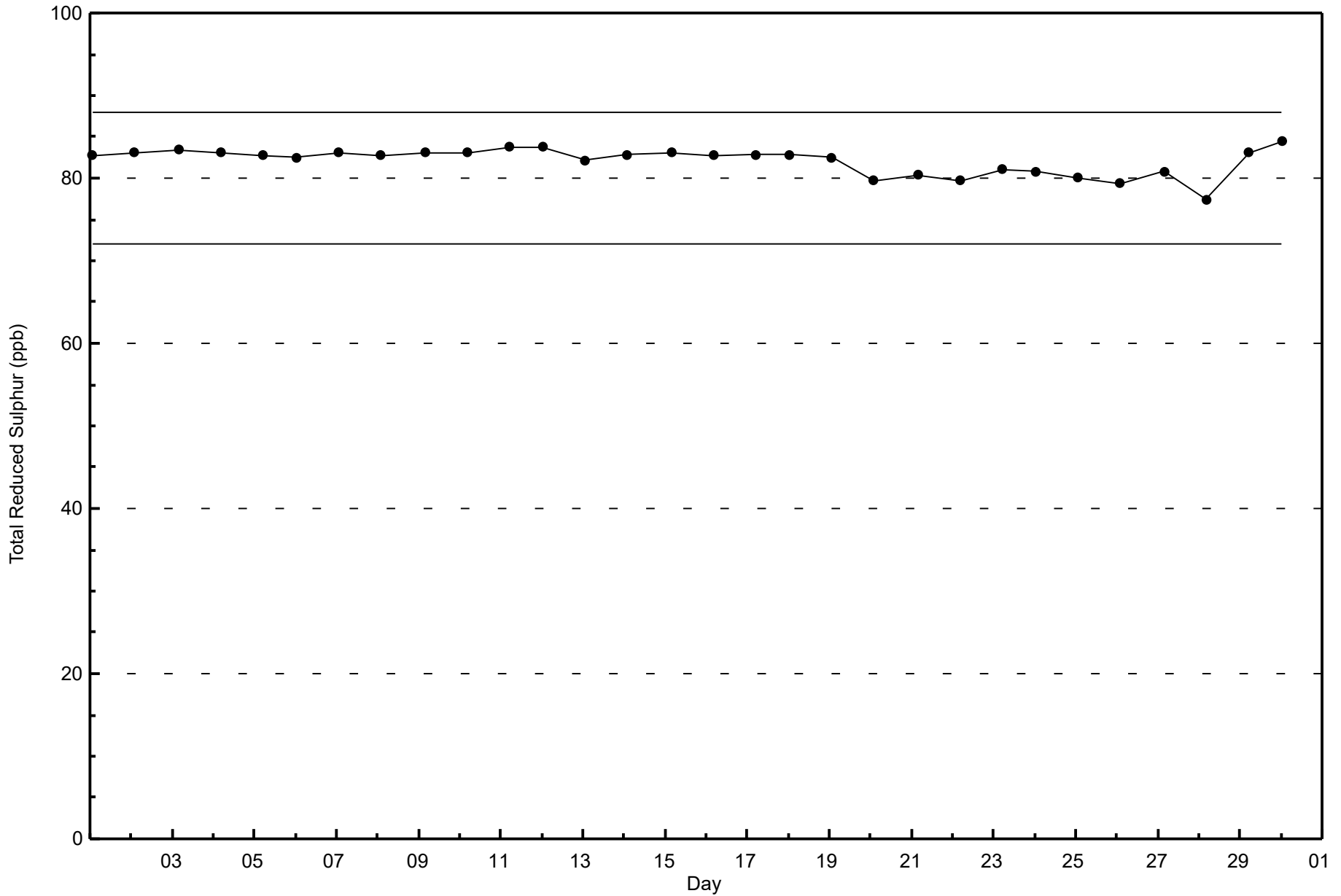
Total Number of Valid Hours: 388



Wood Buffalo Environmental Association  
Zero Responses

Total Reduced Sulphur (TRS) - ppb  
Stony Mountain - November 2024









**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

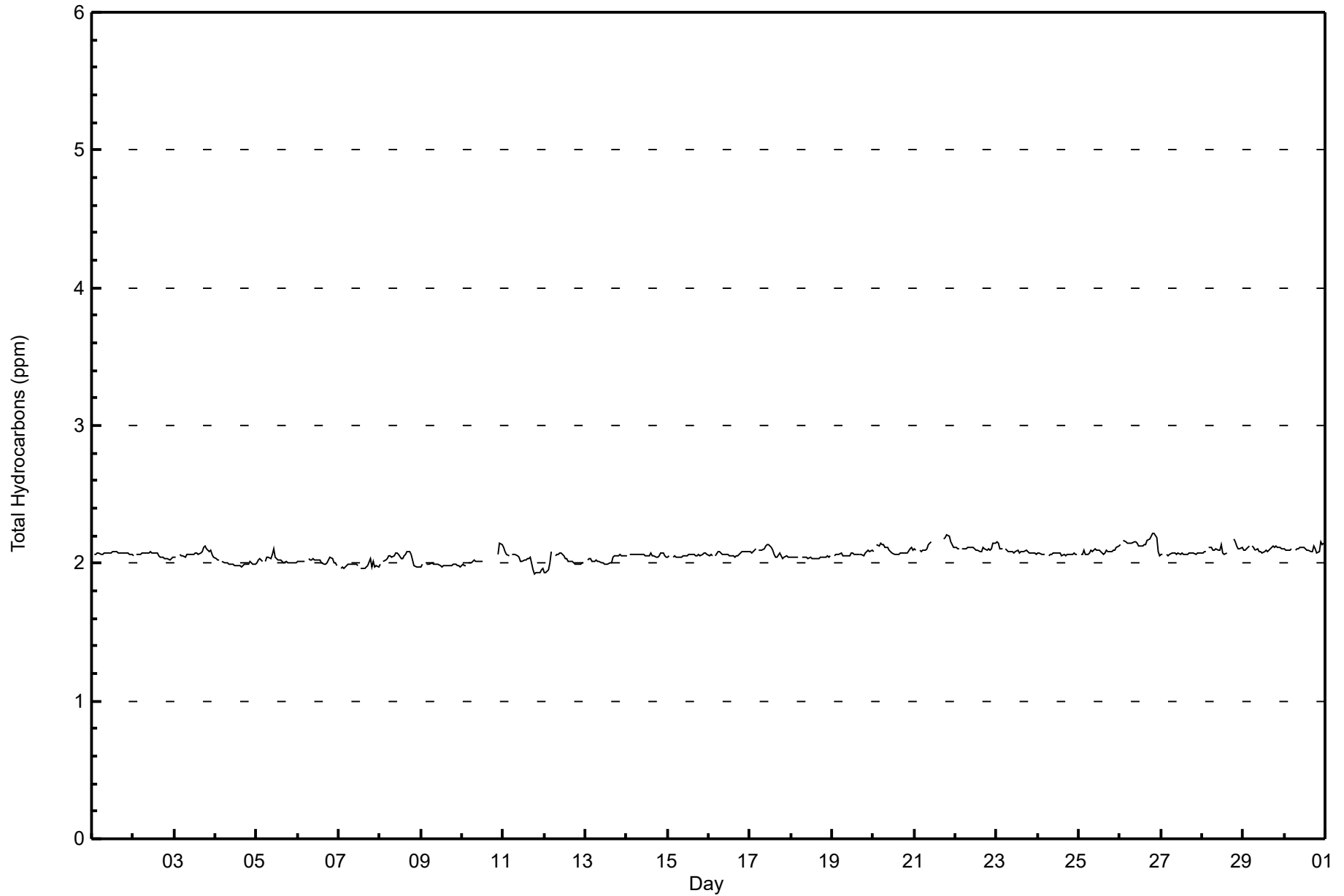
**Total Hydrocarbons (THC) - ppm**  
**Stony Mountain - November 2024**

Maximum Value: 2.2 ppm on Nov 26 21:00		Maximum Daily Average: 2.2 ppm on Nov 26		Hours in Service: 720																								
Minimum Value: 1.9 ppm on Nov 11 19:00		Minimum Daily Average: 2.0 ppm on Nov 7		Hours of Data: 672																								
Maximum Diurnal Average: 2.1 ppm at hour 10		Minimum Diurnal Average: 2.0 ppm at hour 16		Hours of Missing Data: 48																								
Monthly Average: 2.06 ppm		Percentiles: P <sub>1</sub> = 2.0 P <sub>10</sub> = 2.0 Q <sub>1</sub> = 2.0 Median = 2.1 Q <sub>3</sub> = 2.1 P <sub>90</sub> = 2.1 P <sub>99</sub> = 2.2		Hours of Calibration: 36																								
				Percent Operational Time: 98.3																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Nov	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
2-Nov	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
3-Nov	2.0	2.0	Z	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	
4-Nov	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
5-Nov	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
6-Nov	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
7-Nov	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
8-Nov	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
9-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
10-Nov	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	UO	UO	UO	UO	UO	UO	UO	UO	2.1	2.1	2.1	--	2.1	2.1	
11-Nov	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1	
12-Nov	1.9	1.9	2.0	2.0	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
13-Nov	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
14-Nov	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	
15-Nov	2.0	2.0	Z	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
16-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
17-Nov	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	
18-Nov	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	
19-Nov	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
20-Nov	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
21-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	C	C	C	C	C	C	2.2	2.2	2.2	2.2	2.2	2.1	2.1	--	2.2		
22-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
23-Nov	2.2	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	
24-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
25-Nov	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
26-Nov	2.1	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	
27-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
28-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	M	M	M	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	
29-Nov	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
30-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	
																								Diurnal Average				
																								Diurnal Maximum				
Z - zerospan																												
C - Calibration																												
M - Maintenance																												
UO - Unstable Operation																												



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Stony Mountain - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Stony Mountain - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	239	35.57	35.57
2.1 - 3.0	433	64.43	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Stony Mountain - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	4	5	1	4	0	0	0	0	3	1	1	2	2	10	4	3	40
2.1 - 3.0	23	30	38	36	14	2	0	5	43	20	20	3	2	32	40	38	346
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	27	35	39	40	14	2	0	5	46	21	21	5	4	42	44	41	386

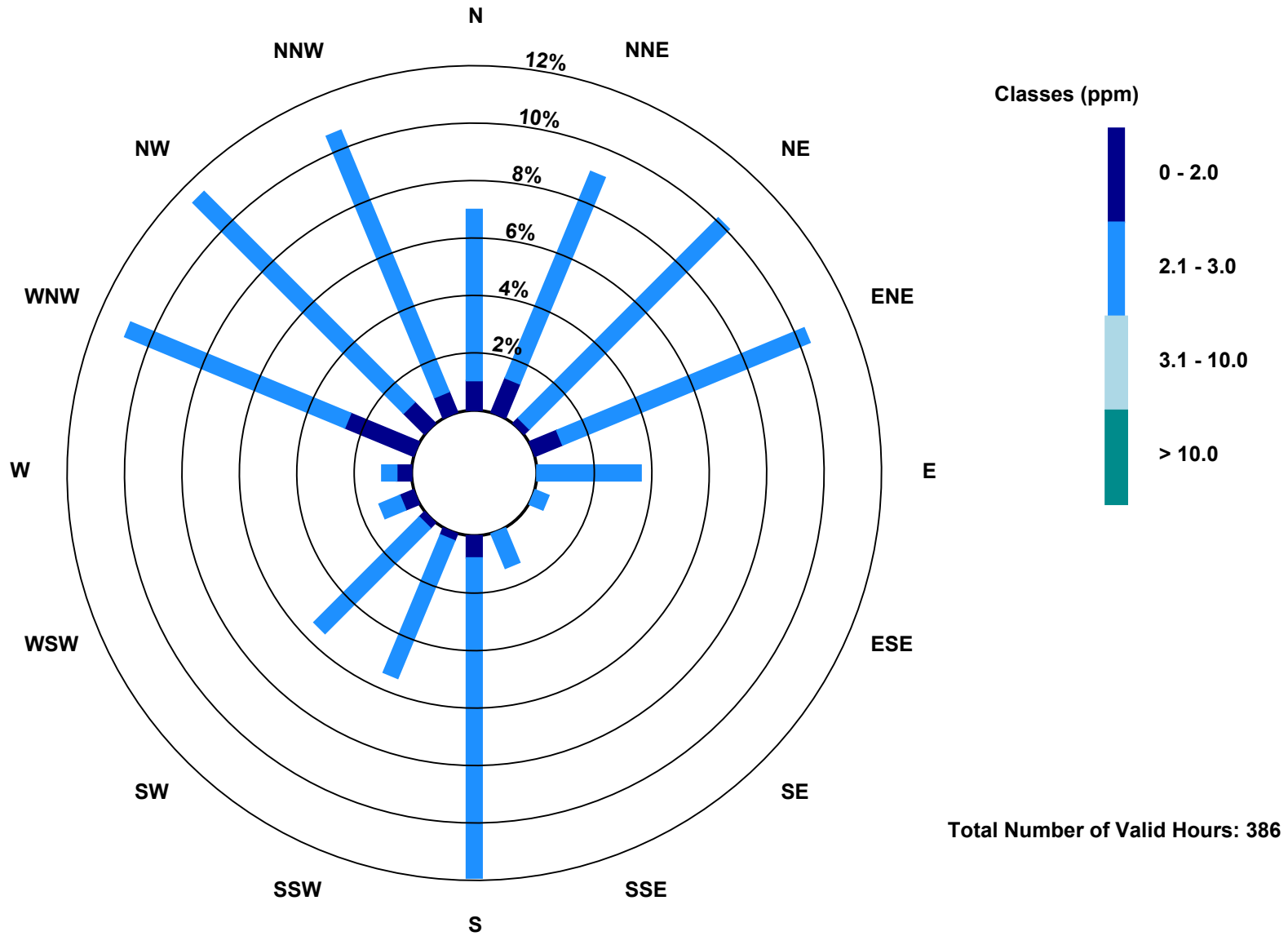
Total Number of Valid Hours: 386

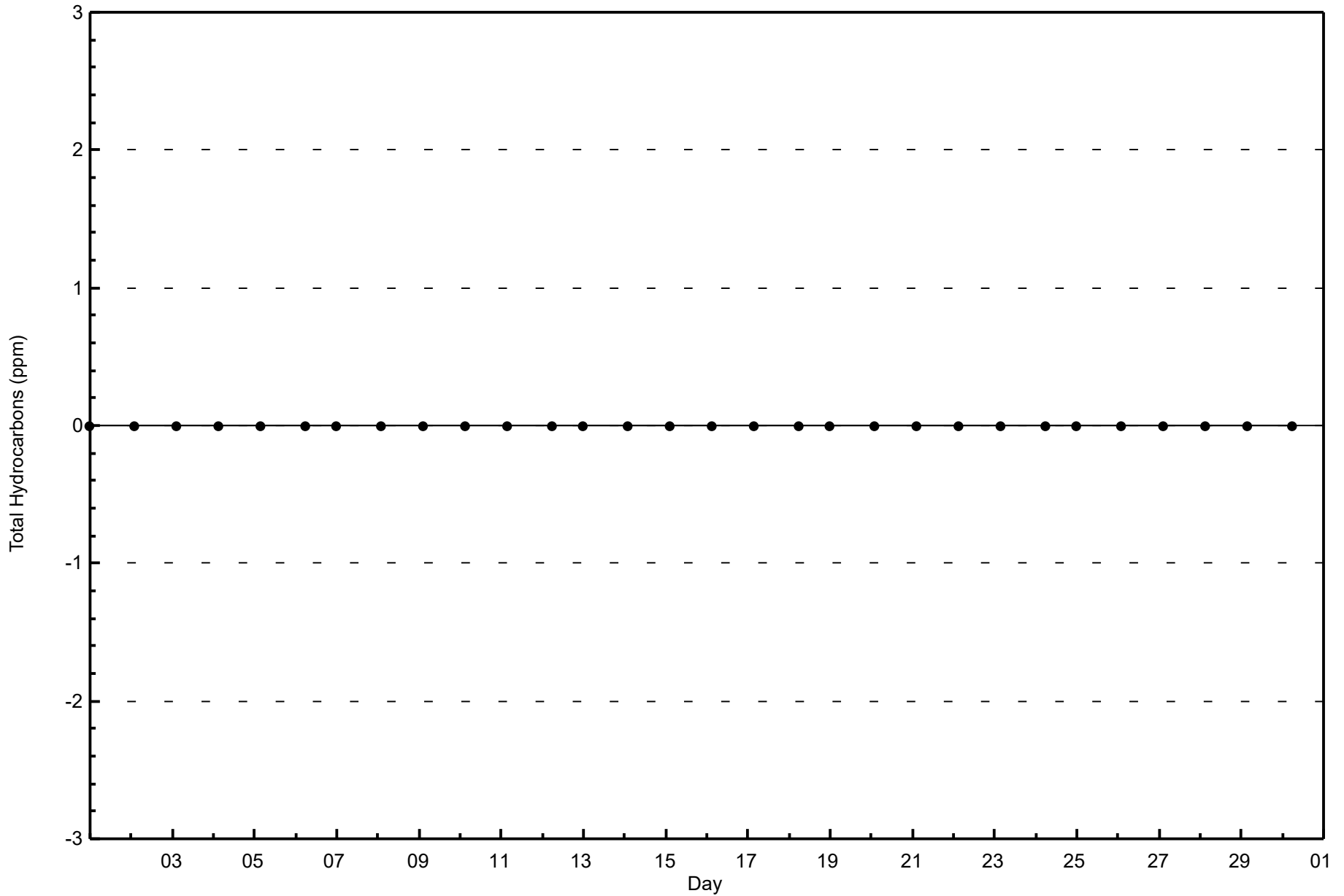
Total Number of Hours: 720

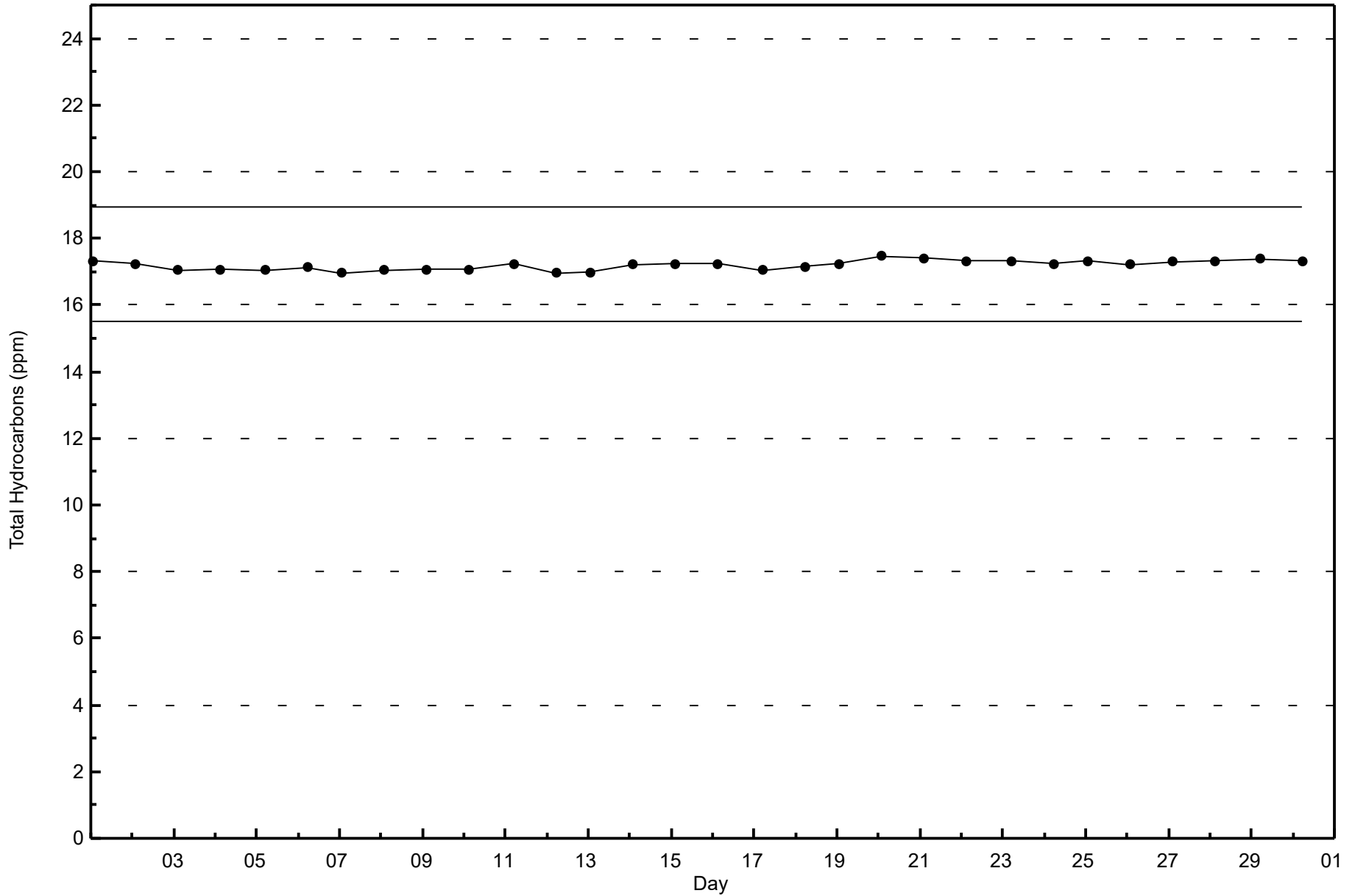


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Hydrocarbons (THC) - ppm  
Stony Mountain







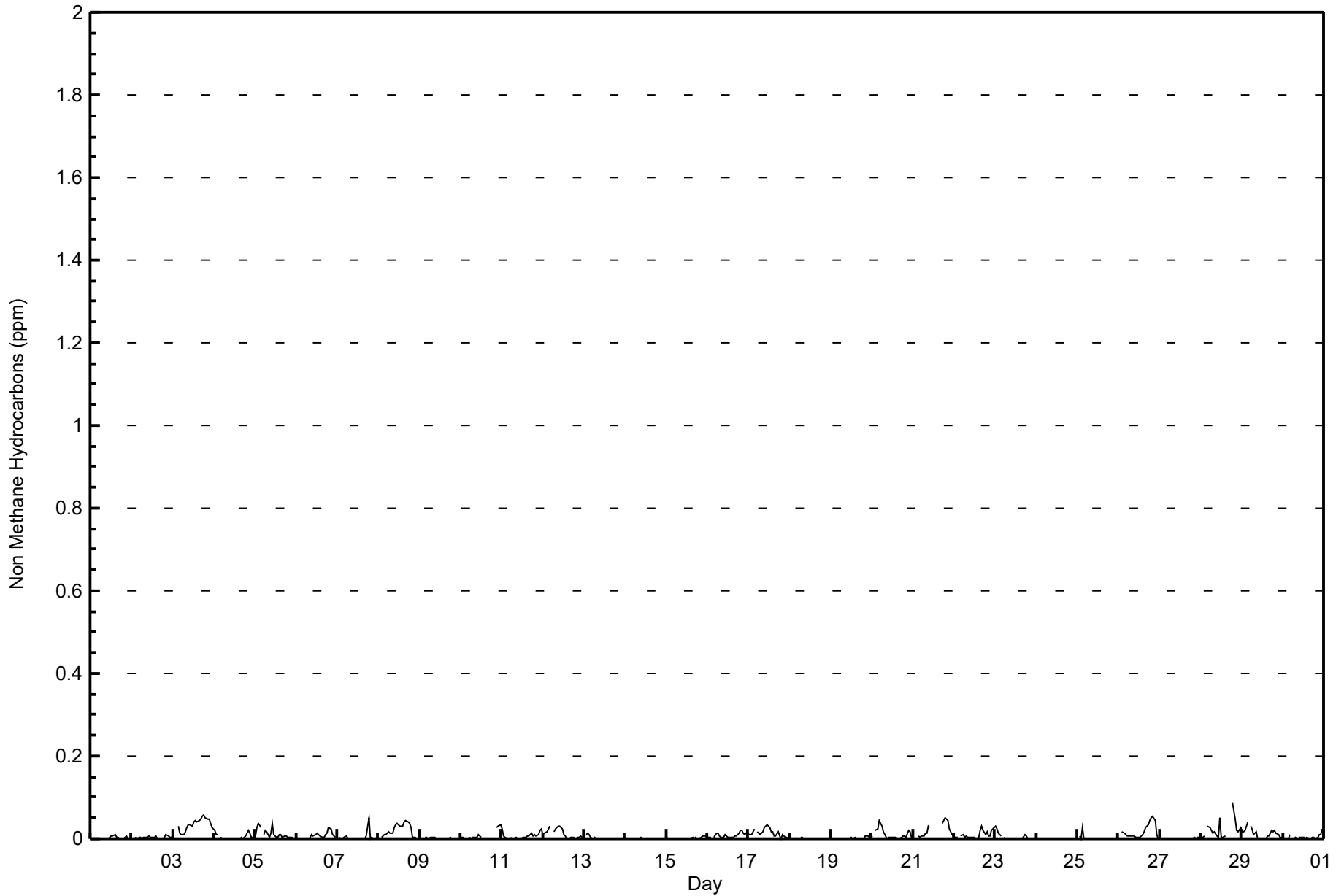


Summary of Hour Averages

Stony Mountain - November 2024

Maximum Value: 0.088 ppm on Nov 28 19:00		Maximum Daily Average: 0.033 ppm on Nov 3		Hours in Service:	720																								
Minimum Value: 0.000 ppm on Nov 1 05:00		Minimum Daily Average: 0.000 ppm on Nov 24		Hours of Data:	672																								
Maximum Diurnal Average: 0.015 ppm at hour 19		Minimum Diurnal Average: 0.005 ppm at hour 14		Hours of Missing Data:	48																								
Monthly Average: 0.008 ppm		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.0 P <sub>99</sub> = 0.1		Hours of Calibration:	36																								
				Percent Operational Time:	98.3																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Nov	Z	0.000	0.001	0.001	0.000	0.001	0.000	0.001	0.001	0.001	0.000	0.003	0.006	0.006	0.010	0.005	0.003	0.000	0.001	0.001	0.004	0.005	0.000	0.001	0.002	0.010			
2-Nov	0.001	Z	0.002	0.001	0.002	0.002	0.000	0.002	0.002	0.004	0.006	0.003	0.002	0.003	0.006	0.000	0.000	0.002	0.000	0.005	0.009	0.006	0.003	0.004	0.003	0.009			
3-Nov	0.008	0.009	Z	0.031	0.015	0.009	0.010	0.018	0.026	0.033	0.035	0.032	0.042	0.044	0.040	0.043	0.048	0.055	0.056	0.052	0.046	0.047	0.038	0.027	0.033	0.056			
4-Nov	0.022	0.010	0.009	Z	0.003	0.001	0.001	0.000	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.002	0.002	0.006	0.013	0.019	0.014	0.003	0.003	0.005	0.022			
5-Nov	0.007	0.028	0.039	0.028	Z	0.009	0.020	0.018	0.002	0.012	0.037	0.011	0.004	0.005	0.009	0.009	0.004	0.007	0.006	0.002	0.003	0.003	0.001	0.000	0.011	0.039			
6-Nov	0.000	0.000	0.001	0.002	0.001	Z	0.001	0.001	0.002	0.009	0.006	0.009	0.014	0.011	0.006	0.004	0.003	0.009	0.014	0.028	0.023	0.009	0.008	0.003	0.007	0.028			
7-Nov	Z	0.002	0.001	0.000	0.004	0.006	0.001	0.001	0.000	0.000	0.000	0.001	M	0.000	0.000	0.000	0.000	0.008	0.049	0.001	0.003	0.001	0.001	0.003	0.004	0.049			
8-Nov	0.004	Z	0.004	0.009	0.009	0.014	0.019	0.015	0.014	0.027	0.035	0.038	0.031	0.029	0.032	0.042	0.043	0.040	0.038	0.026	0.005	0.002	0.002	0.000	0.021	0.043			
9-Nov	0.002	0.004	Z	0.002	0.002	0.001	0.004	0.005	0.003	0.002	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.003	0.000	0.001	0.000	0.002	0.000	0.001	0.005			
10-Nov	0.003	0.002	0.001	Z	0.000	0.003	0.002	0.004	0.002	0.002	0.009	0.008	0.005	UO	UO	UO	UO	UO	UO	UO	UO	0.025	0.029	0.035	--	0.035			
11-Nov	0.023	0.008	0.002	0.001	Z	0.002	0.001	0.001	0.002	0.001	0.001	0.002	0.005	0.003	0.005	0.006	0.006	0.013	0.006	0.010	0.008	0.011	0.020	0.025	0.007	0.025			
12-Nov	0.010	0.013	0.016	0.025	0.032	Z	0.016	0.024	0.027	0.031	0.032	0.023	0.011	0.008	0.001	0.001	0.004	0.002	0.002	0.002	0.004	0.004	0.006	0.004	0.013	0.032			
13-Nov	Z	0.009	0.013	0.010	0.004	0.001	0.004	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.002	0.013			
14-Nov	0.000	Z	0.000	0.001	0.001	0.002	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.002			
15-Nov	0.001	0.002	Z	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.002	0.002	0.002	0.001	0.002	0.002	0.006	0.005	0.006	0.001	0.006			
16-Nov	0.002	0.004	0.002	Z	0.004	0.015	0.015	0.008	0.004	0.005	0.010	0.005	0.003	0.003	0.003	0.003	0.007	0.008	0.014	0.021	0.020	0.014	0.012	0.015	0.009	0.021			
17-Nov	0.009	0.009	0.009	0.024	Z	0.017	0.014	0.011	0.018	0.027	0.032	0.033	0.028	0.018	0.016	0.008	0.007	0.017	0.008	0.000	0.009	0.005	0.005	0.001	0.014	0.033			
18-Nov	0.002	0.001	0.000	0.000	0.002	Z	0.002	0.004	0.002	0.000	0.001	0.001	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.004			
19-Nov	Z	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.002	0.001	0.002	0.000	0.001	0.001	0.000	0.002	0.006	0.006	0.006	0.001	0.001	0.006			
20-Nov	0.005	Z	0.021	0.022	0.044	0.036	0.031	0.019	0.004	0.001	0.002	0.004	0.003	0.003	0.002	0.002	0.001	0.002	0.007	0.006	0.004	0.021	0.018	0.004	0.011	0.044			
21-Nov	0.004	0.001	Z	0.007	0.002	0.008	0.005	0.012	0.014	0.032	0.026	C	C	C	C	C	C	0.036	0.043	0.050	0.043	0.024	0.017	0.009	--	0.050			
22-Nov	0.005	0.004	0.003	Z	0.006	0.009	0.003	0.006	0.002	0.003	0.005	0.004	0.004	0.001	0.002	0.020	0.031	0.019	0.010	0.016	0.006	0.008	0.021	0.029	0.009	0.031			
23-Nov	0.031	0.022	0.012	0.008	Z	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.007	0.000	0.001	0.000	0.000	0.000	0.004	0.031			
24-Nov	0.000	0.000	0.001	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.002			
25-Nov	Z	0.006	0.000	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.002	0.029			
26-Nov	0.002	Z	0.018	0.014	0.010	0.008	0.007	0.006	0.006	0.006	0.005	0.004	0.004	0.006	0.012	0.017	0.027	0.032	0.045	0.051	0.054	0.045	0.009	0.000	0.017	0.054			
27-Nov	0.001	0.001	Z	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.002	0.001	0.001	0.002	0.001	0.002	0.001	0.002	0.002	0.001	0.002			
28-Nov	0.003	0.002	0.007	Z	0.030	0.027	0.019	0.013	0.018	0.005	0.004	0.051	0.003	0.005	0.008	M	M	M	0.088	0.068	0.047	0.020	0.017	0.028	0.023	0.088			
29-Nov	0.017	0.017	0.021	0.042	Z	0.031	0.024	0.010	0.017	0.001	0.001	0.000	0.000	0.001	0.000	0.007	0.007	0.022	0.018	0.021	0.014	0.010	0.005	0.002	0.012	0.042			
30-Nov	0.002	0.000	0.000	0.001	0.009	Z	0.000	0.003	0.001	0.001	0.003	0.005	0.003	0.001	0.003	0.000	0.001	0.002	0.003	0.000	0.004	0.009	0.009	0.023	0.004	0.023			
																								Diurnal Average					
																								Diurnal Maximum					
Z - zerospan																								C - Calibration		M - Maintenance		UO - Unstable Operation	







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Stony Mountain - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	429	63.84	63.84
0.006 - 0.05	240	35.71	99.55
0.06 - 0.1	3	0.45	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Stony Mountain - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 0.005	23	33	35	33	8	1	0	4	22	12	11	3	1	31	23	17	257
0.006 - 0.05	4	2	4	7	6	1	0	1	24	9	10	2	3	11	21	22	127
0.06 - 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	27	35	39	40	14	2	0	5	46	21	21	5	4	42	44	41	386

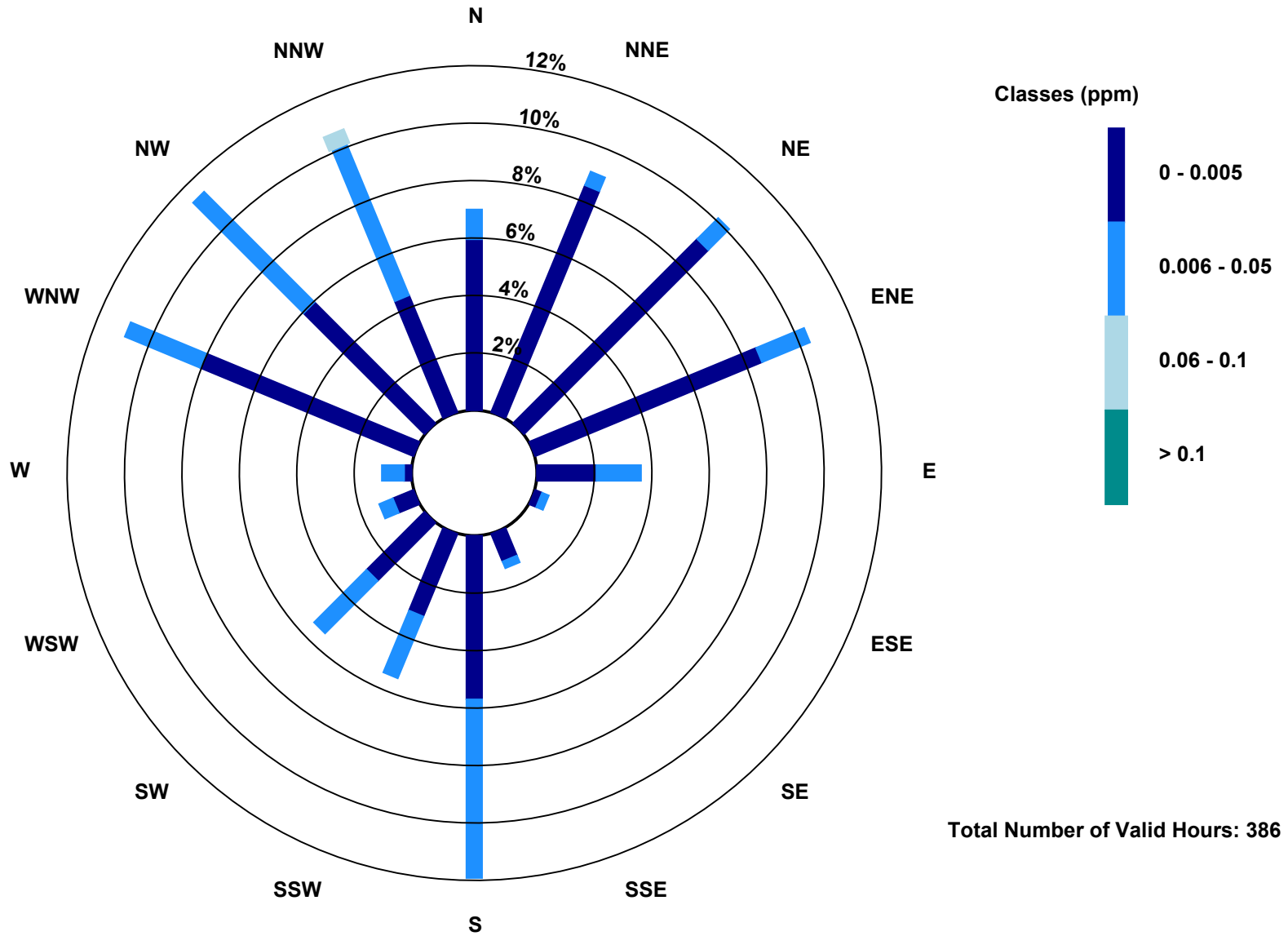
Total Number of Valid Hours: 386

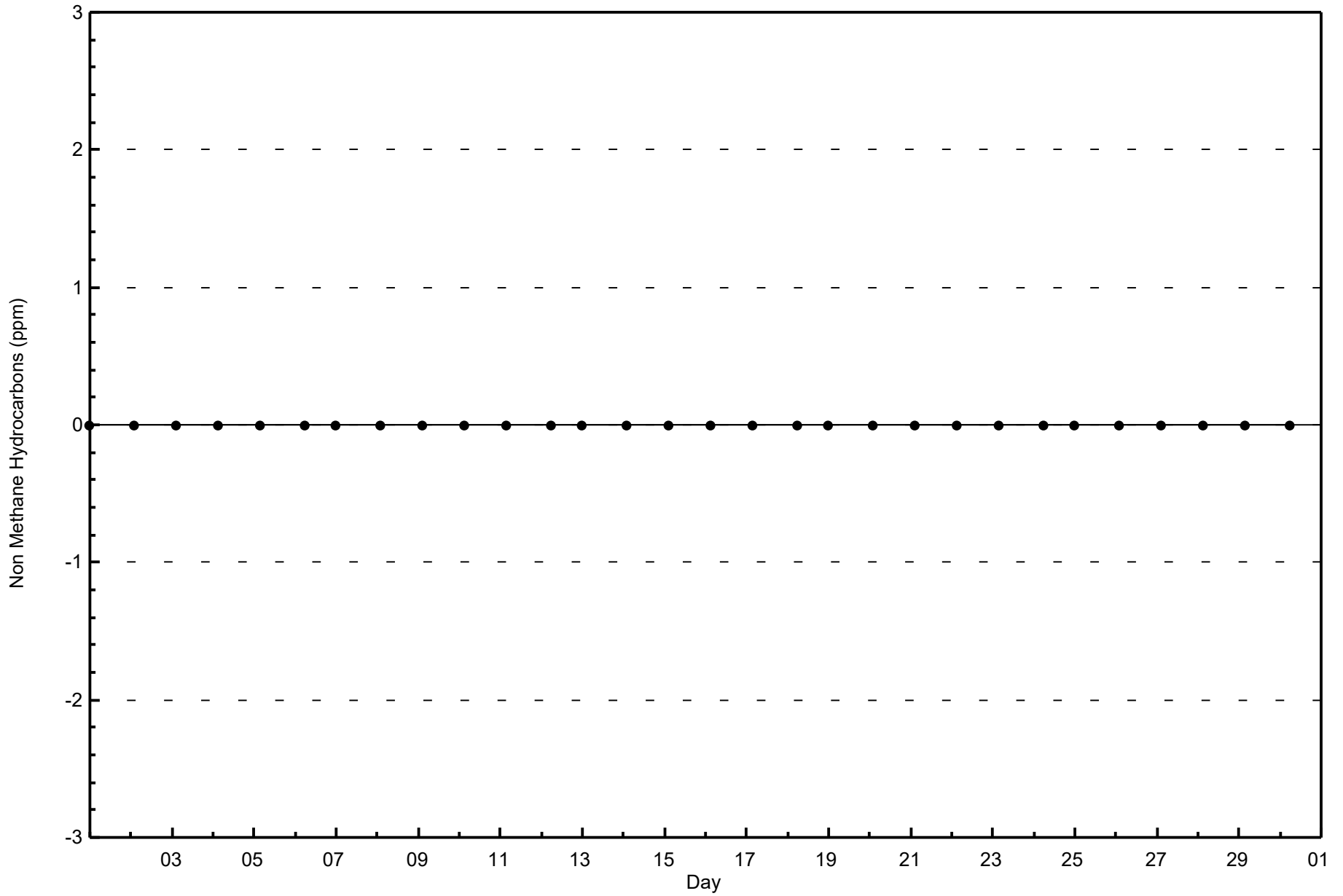
Total Number of Hours: 720

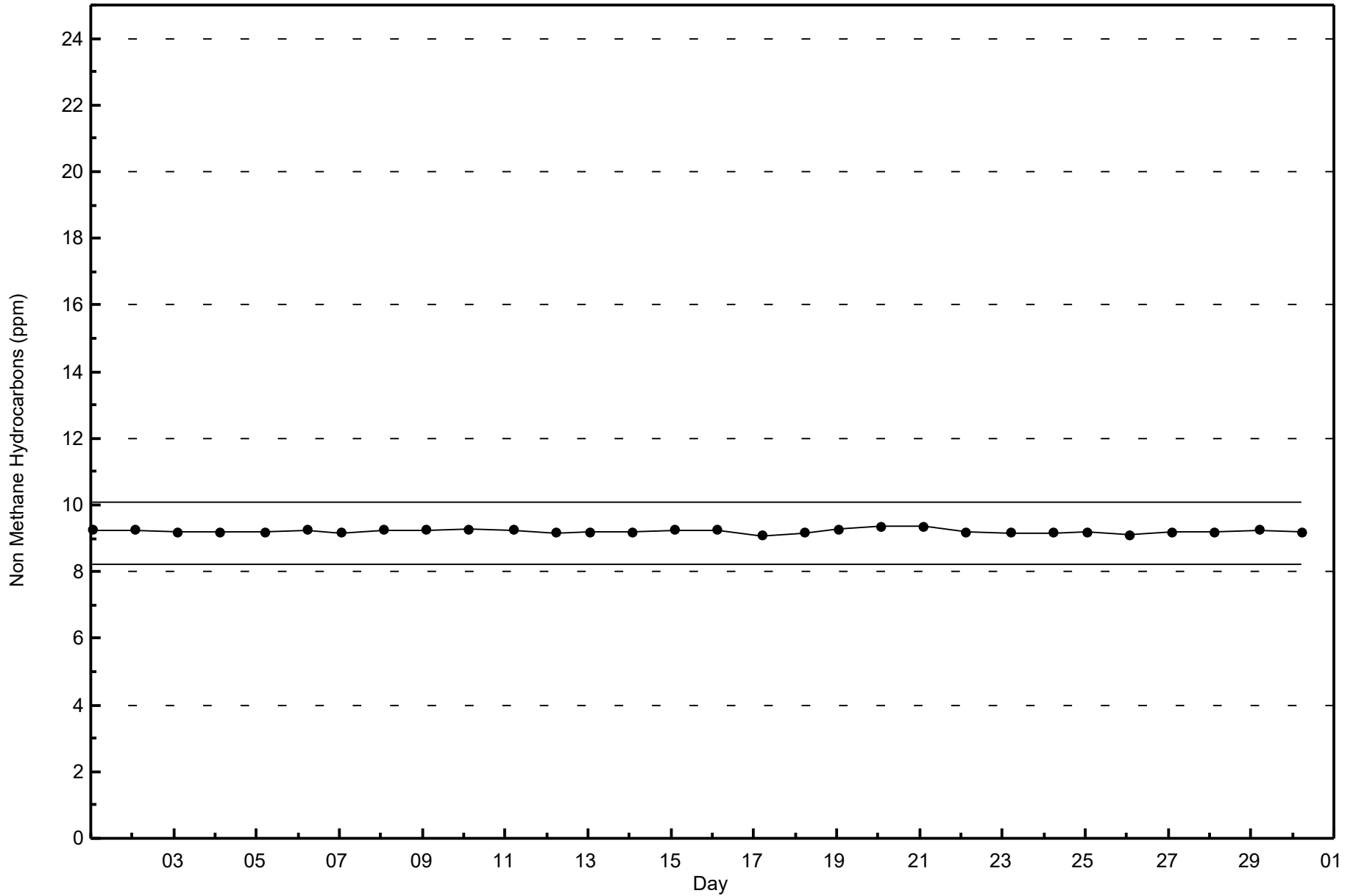


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

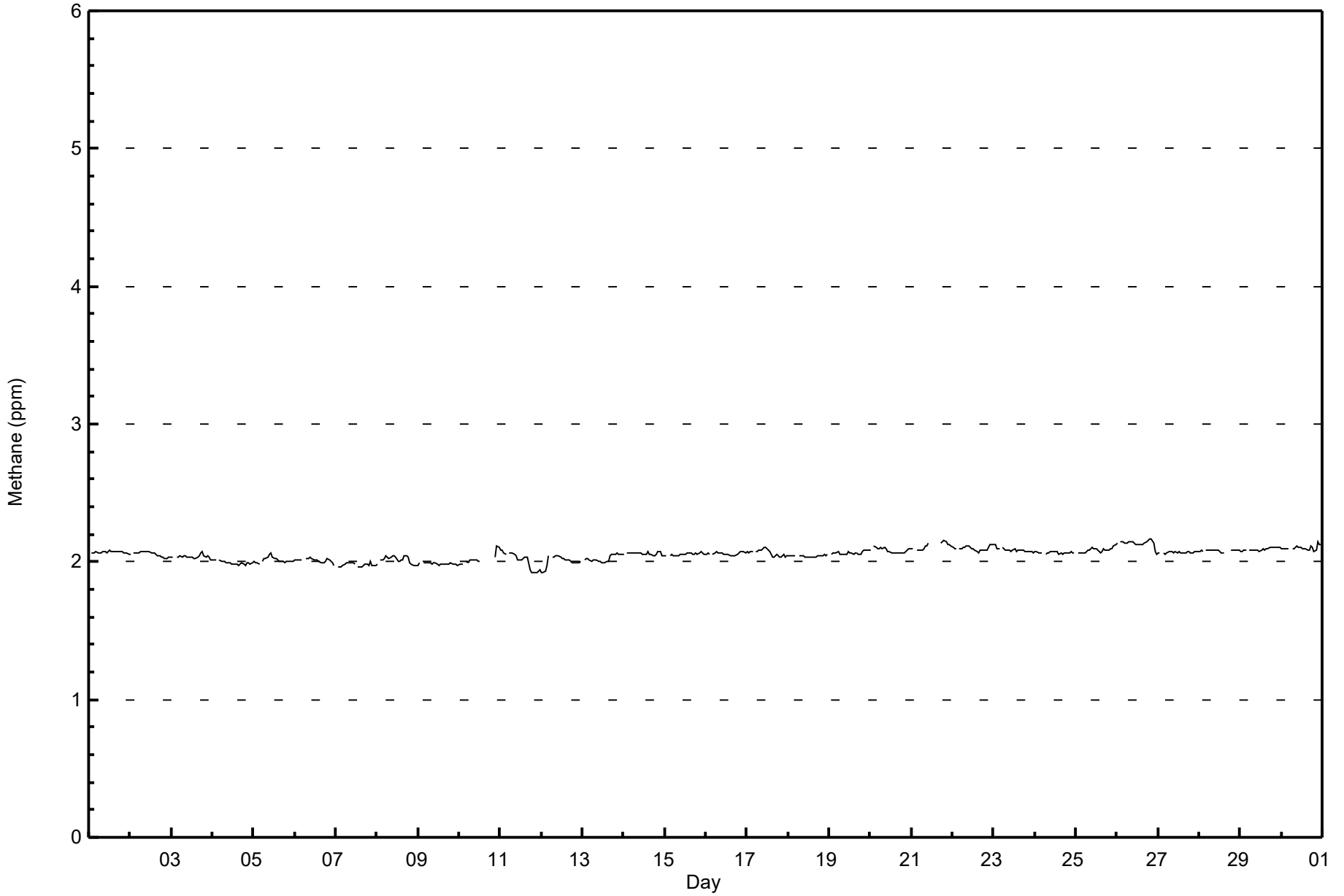
Non Methane Hydrocarbons (NMHC) - ppm  
Stony Mountain















**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Stony Mountain - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	277	41.22	41.22
2.1 - 3.0	395	58.78	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Stony Mountain - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	4	5	1	4	0	0	0	0	5	2	2	2	2	10	4	3	44
2.1 - 3.0	23	30	38	36	14	2	0	5	41	19	19	3	2	32	40	38	342
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	27	35	39	40	14	2	0	5	46	21	21	5	4	42	44	41	386

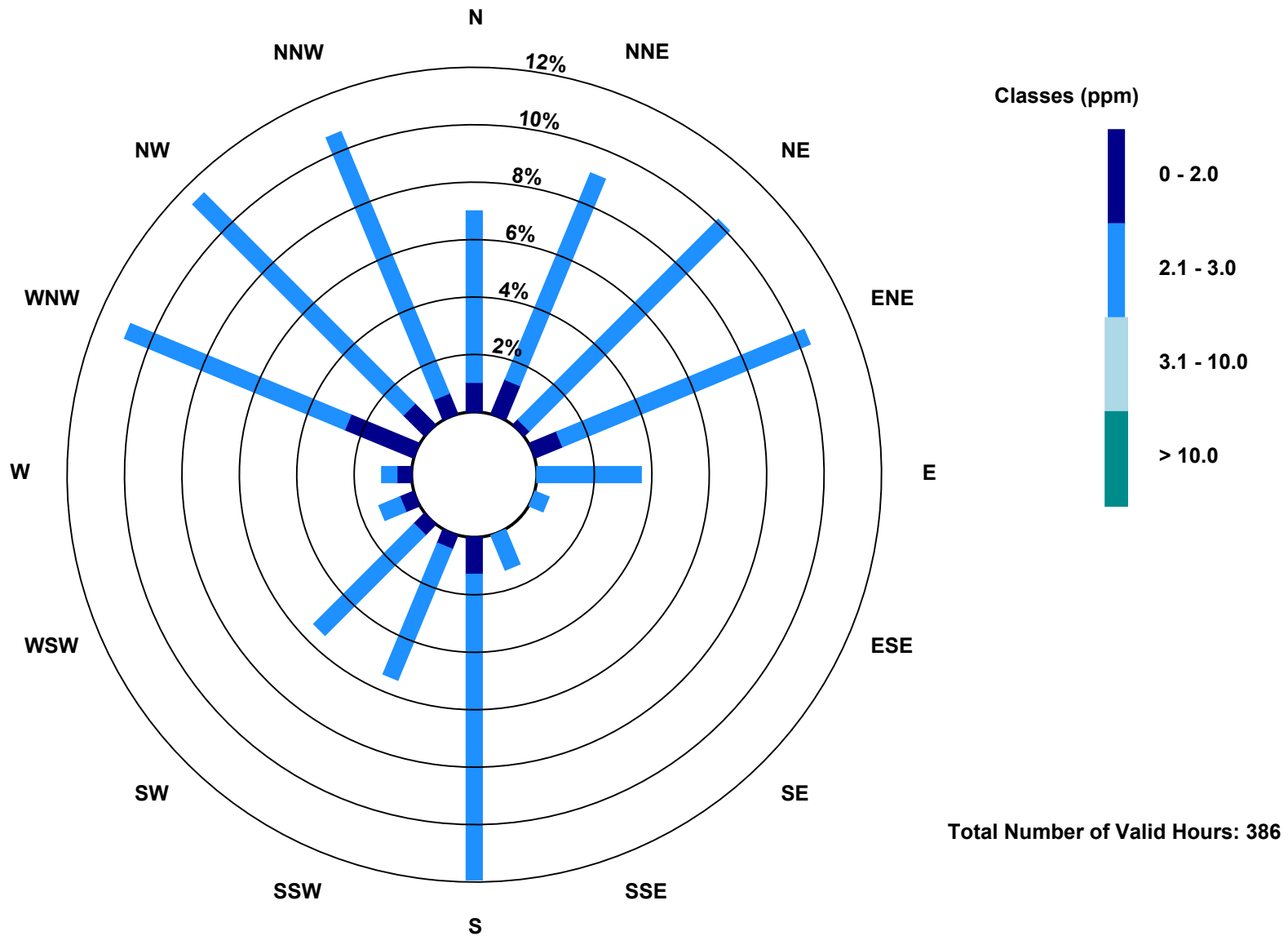
Total Number of Valid Hours: 386

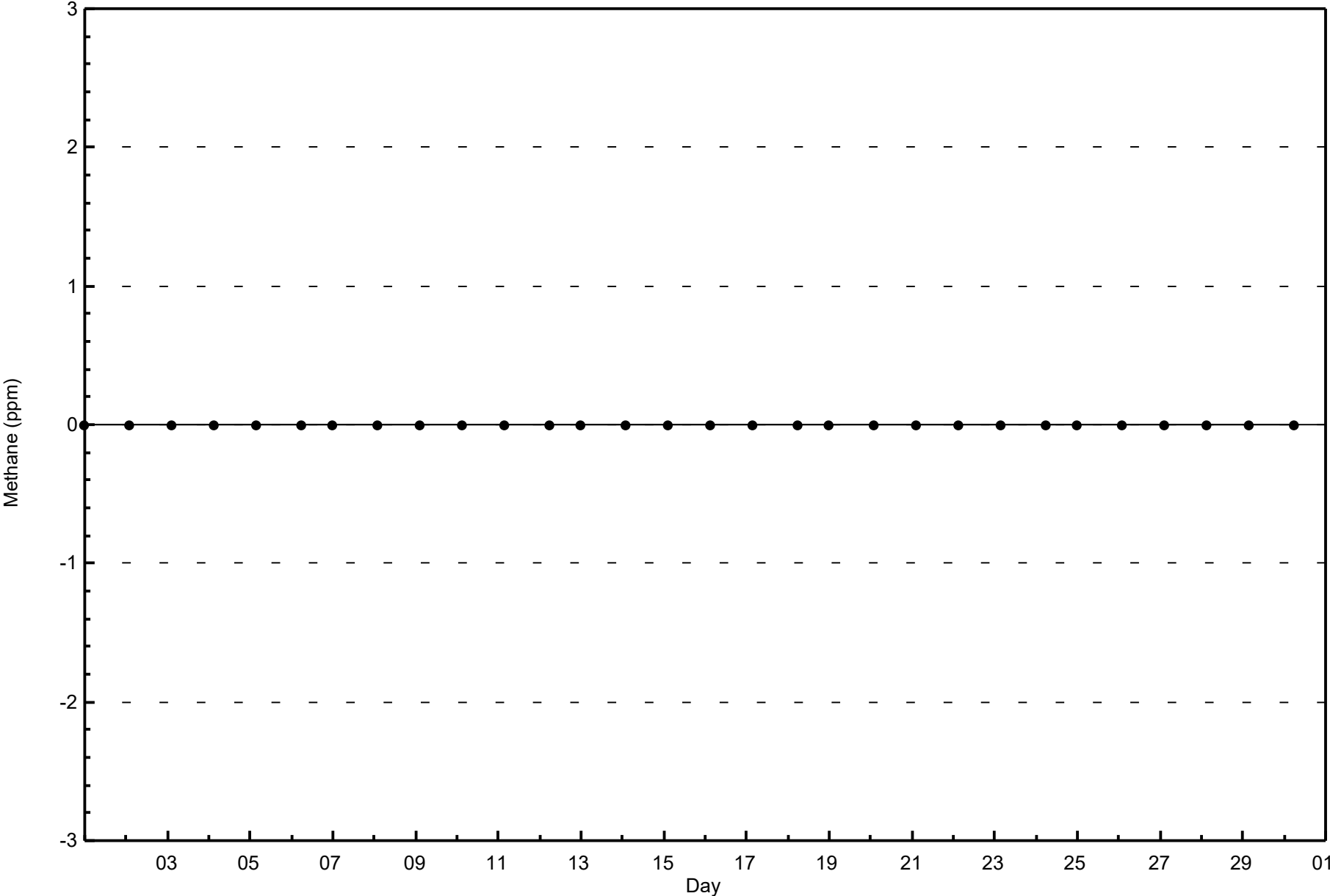
Total Number of Hours: 720

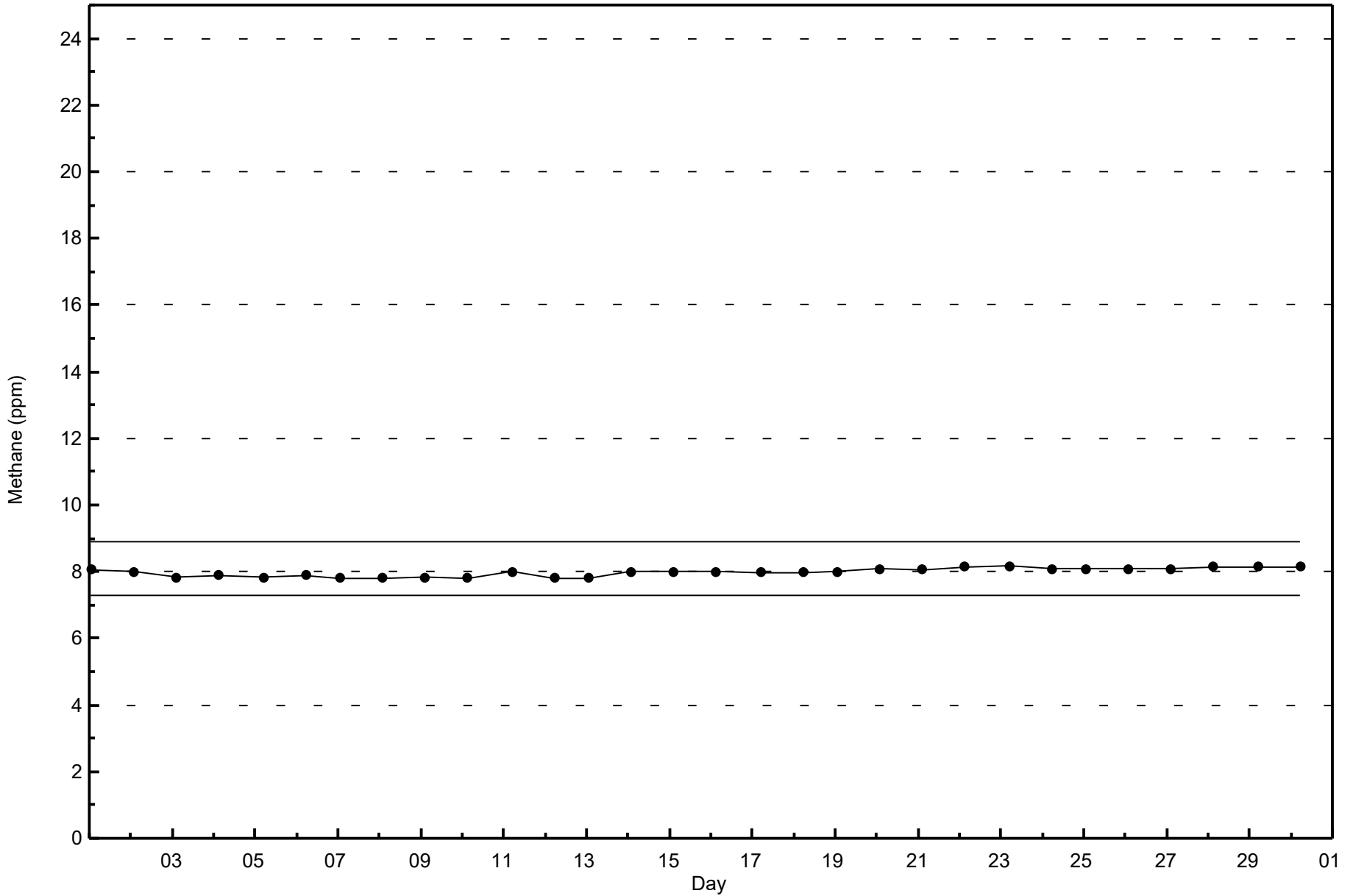


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Methane (CH<sub>4</sub>) - ppm  
Stony Mountain







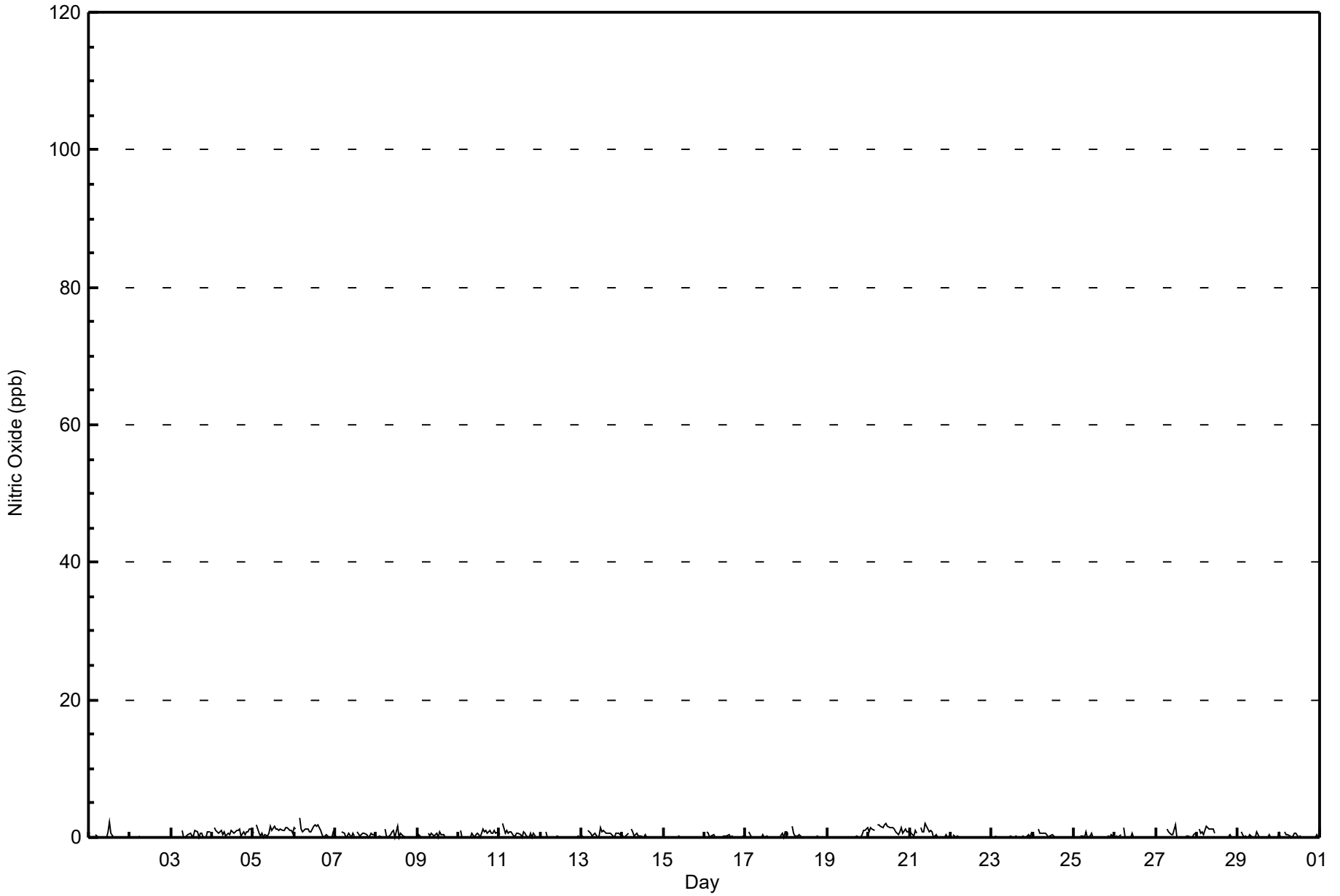


Maximum Value: 2.8 ppb on Nov 6 04:00																				Maximum Daily Average: 1.2 ppb on Nov 20					Hours in Service: 720																									
Minimum Value: 0.0 ppb on Nov 1 01:00																				Minimum Daily Average: 0.0 ppb on Nov 2					Hours of Data: 682																									
Maximum Diurnal Average: 0.5 ppb at hour 6																				Minimum Diurnal Average: 0.2 ppb at hour 20					Hours of Missing Data: 38																									
Monthly Average: 0.34 ppb																				Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.6 P <sub>90</sub> = 1.0 P <sub>99</sub> = 1.8					Hours of Calibration: 37																									
																				Percent Operational Time: 99.9																														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Nov	0.0	0.0	0.0	Z	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.1																								
2-Nov	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																								
3-Nov	0.1	0.0	0.0	0.0	0.0	Z	1.1	0.0	0.0	0.2	0.3	0.5	0.2	0.2	0.9	0.8	0.1	0.5	0.6	0.0	0.0	0.8	0.9	0.9	0.4	1.1																								
4-Nov	Z	1.3	1.0	0.8	0.6	1.1	0.3	0.8	0.3	0.5	0.5	1.1	0.9	0.7	1.0	0.9	1.1	0.3	0.8	0.4	0.7	0.9	1.2	1.3	0.8	1.3																								
5-Nov	0.7	Z	1.8	0.6	0.3	0.5	0.0	0.5	0.2	0.6	1.6	1.0	1.7	1.3	1.2	1.0	1.2	1.1	1.0	1.4	1.4	1.1	1.0	0.6	0.9	1.8																								
6-Nov	1.4	1.2	Z	2.8	1.2	0.8	1.1	1.3	1.1	0.8	0.7	1.6	1.9	1.6	1.8	1.0	0.5	0.0	0.3	0.3	0.0	0.0	0.0	0.9	1.0	2.8																								
7-Nov	0.0	0.0	0.0	Z	0.9	0.6	0.0	0.2	0.7	0.1	0.7	0.3	M	0.8	0.2	0.4	0.5	0.7	0.4	0.0	0.3	0.6	0.3	0.4	0.4	0.9																								
8-Nov	0.0	0.0	0.2	0.0	Z	1.1	0.2	0.0	0.3	0.9	1.1	0.0	1.7	0.0	0.7	0.4	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	1.7																								
9-Nov	0.0	0.3	0.0	0.0	0.0	Z	0.6	0.2	0.6	0.5	0.2	0.5	0.0	0.8	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8																								
10-Nov	Z	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.4	0.7	0.3	0.0	1.2	0.8	0.9	0.7	1.0	0.6	0.6	1.0	0.7	0.9	0.5	1.2																								
11-Nov	0.5	Z	2.0	0.6	1.0	0.7	0.9	0.7	0.2	0.3	0.6	0.5	0.5	0.0	0.9	0.6	0.1	0.0	0.7	0.0	0.6	0.0	0.0	0.0	0.5	2.0																								
12-Nov	0.0	0.0	Z	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.8																								
13-Nov	0.3	0.0	0.0	Z	0.9	0.7	0.1	0.4	0.7	0.0	0.3	1.4	0.9	1.0	0.7	0.6	0.5	0.6	0.1	0.0	0.6	0.5	0.7	0.2	0.5	1.4																								
14-Nov	0.3	0.0	0.1	0.6	Z	1.2	0.8	0.3	0.5	0.2	0.2	0.2	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.2																								
15-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2																								
16-Nov	Z	0.8	0.5	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.1	0.4	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.8																								
17-Nov	0.0	Z	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.8	0.1	0.8																								
18-Nov	0.9	0.4	Z	1.6	0.6	0.2	0.2	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.6																								
19-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.5	1.1	1.0	1.4	0.2	1.4																								
20-Nov	0.8	1.3	1.1	1.0	Z	1.7	1.9	1.6	1.4	1.8	2.0	1.6	1.5	1.4	1.5	1.2	0.9	0.5	0.8	1.3	0.6	1.2	0.9	0.7	1.2	2.0																								
21-Nov	1.0	0.7	0.2	0.9	0.6	Z	1.4	0.7	0.9	2.1	1.6	0.8	1.0	0.8	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.1	0.6	2.1																								
22-Nov	Z	0.5	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5																								
23-Nov	0.0	Z	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.4	0.0	0.6	0.1	0.6																								
24-Nov	0.2	0.4	Z	1.2	0.7	0.6	0.6	0.5	0.1	0.2	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.2																								
25-Nov	0.0	0.0	0.0	Z	0.1	0.1	0.0	0.8	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.5	0.0	0.1	0.8																								
26-Nov	0.0	0.1	0.0	0.3	Z	1.5	0.1	0.0	0.0	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.5																								
27-Nov	0.0	0.0	0.0	0.0	0.0	Z	1.2	0.7	0.6	0.4	0.4	1.7	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.2	0.0	0.1	0.3	0.6	0.3	1.7																								
28-Nov	Z	1.2	0.7	0.9	0.4	1.7	1.4	1.2	1.2	1.2	0.7	C	C	C	C	C	C	C	0.3	0.4	0.0	0.0	0.0	0.1	--	1.7																								
29-Nov	0.0	Z	0.9	0.0	0.2	0.0	0.0	0.4	0.0	0.1	0.0	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.1	0.0	0.0	0.0	0.1	0.9																								
30-Nov	0.5	0.0	Z	0.9	0.4	0.3	0.2	0.0	0.2	0.6	0.6	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.2	0.9																								
																								Diurnal Average																										
																								Diurnal Maximum																										
Z - zerospan      C - Calibration      M - Maintenance																																																		



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Stony Mountain - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Stony Mountain - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	682	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Stony Mountain - November 2024**

<b>Concentration</b> <b>Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	28	35	40	39	14	2	0	5	46	22	20	6	4	42	43	42	388
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	28	35	40	39	14	2	0	5	46	22	20	6	4	42	43	42	388

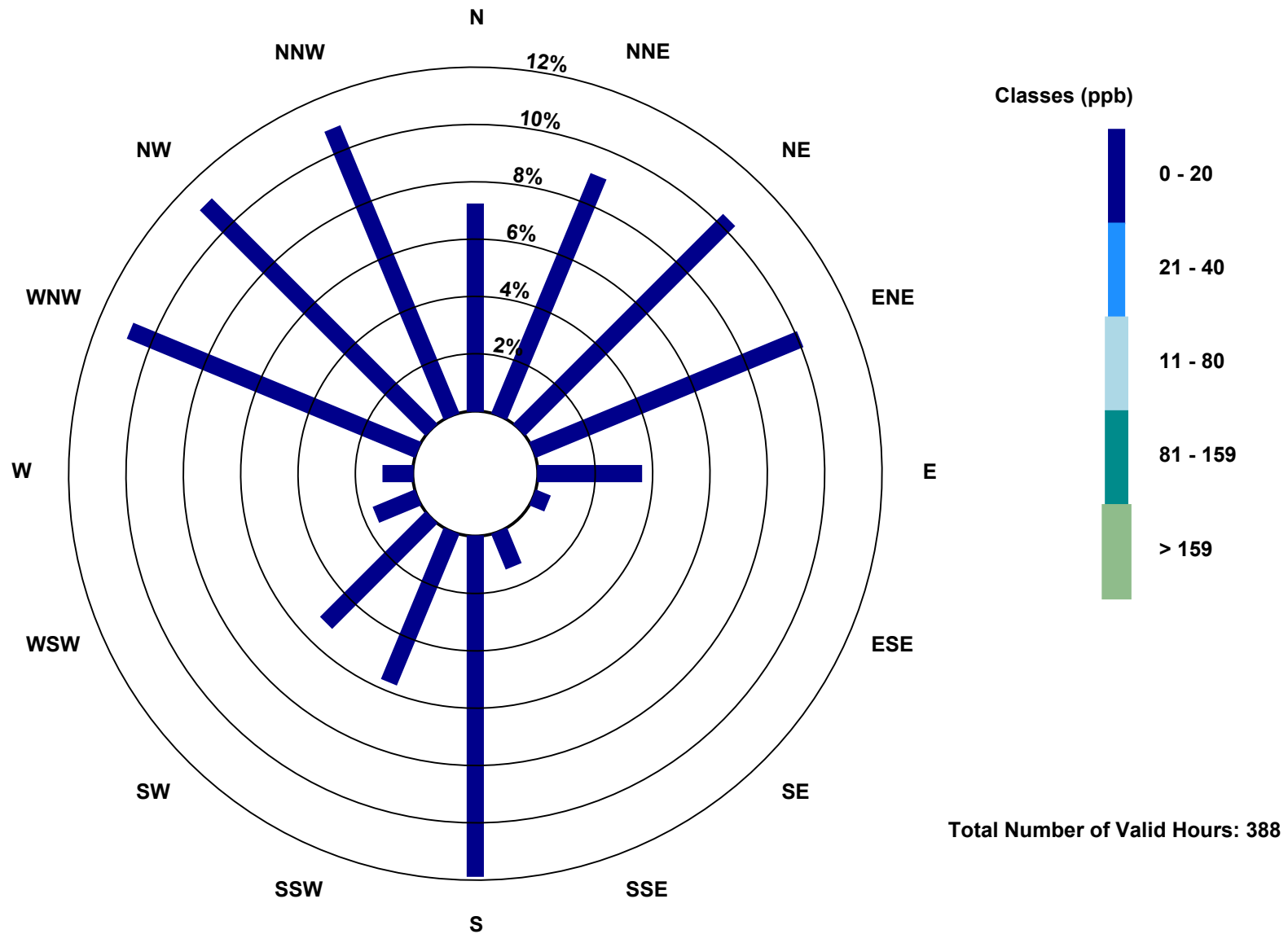
Total Number of Valid Hours: 388

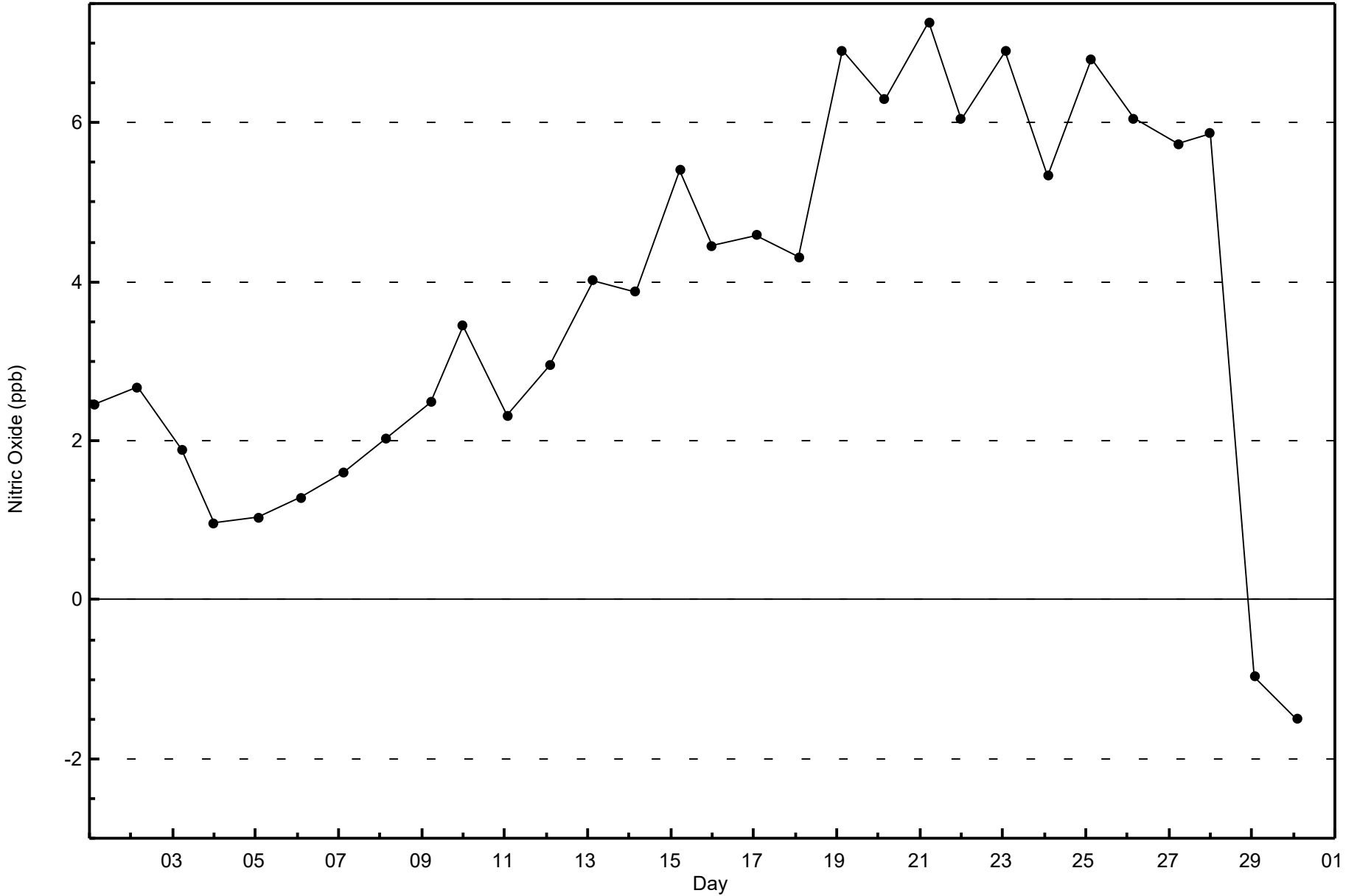
Total Number of Hours: 720

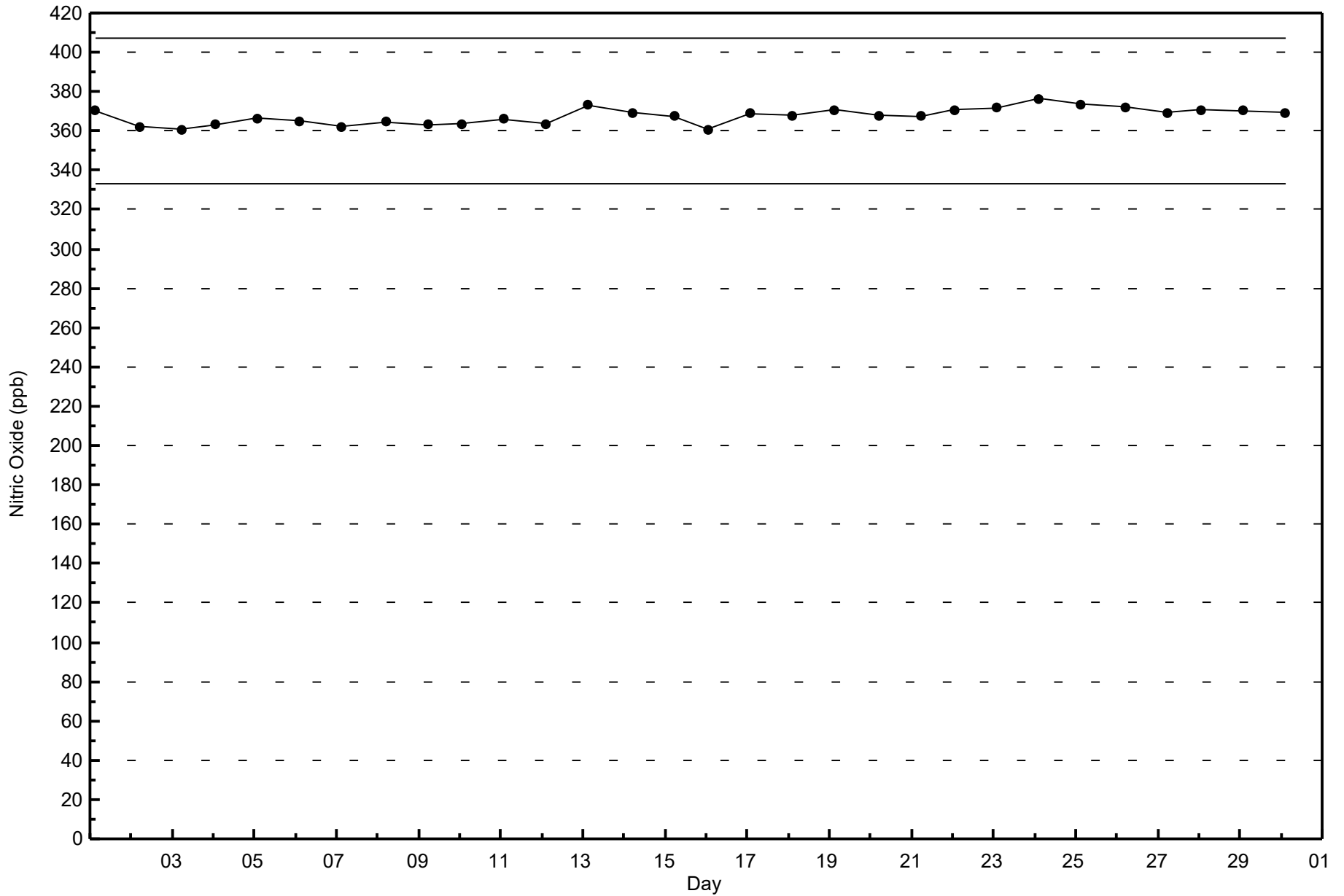


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitric Oxide (NO) - ppb  
Stony Mountain









Wood Buffalo Environmental Association

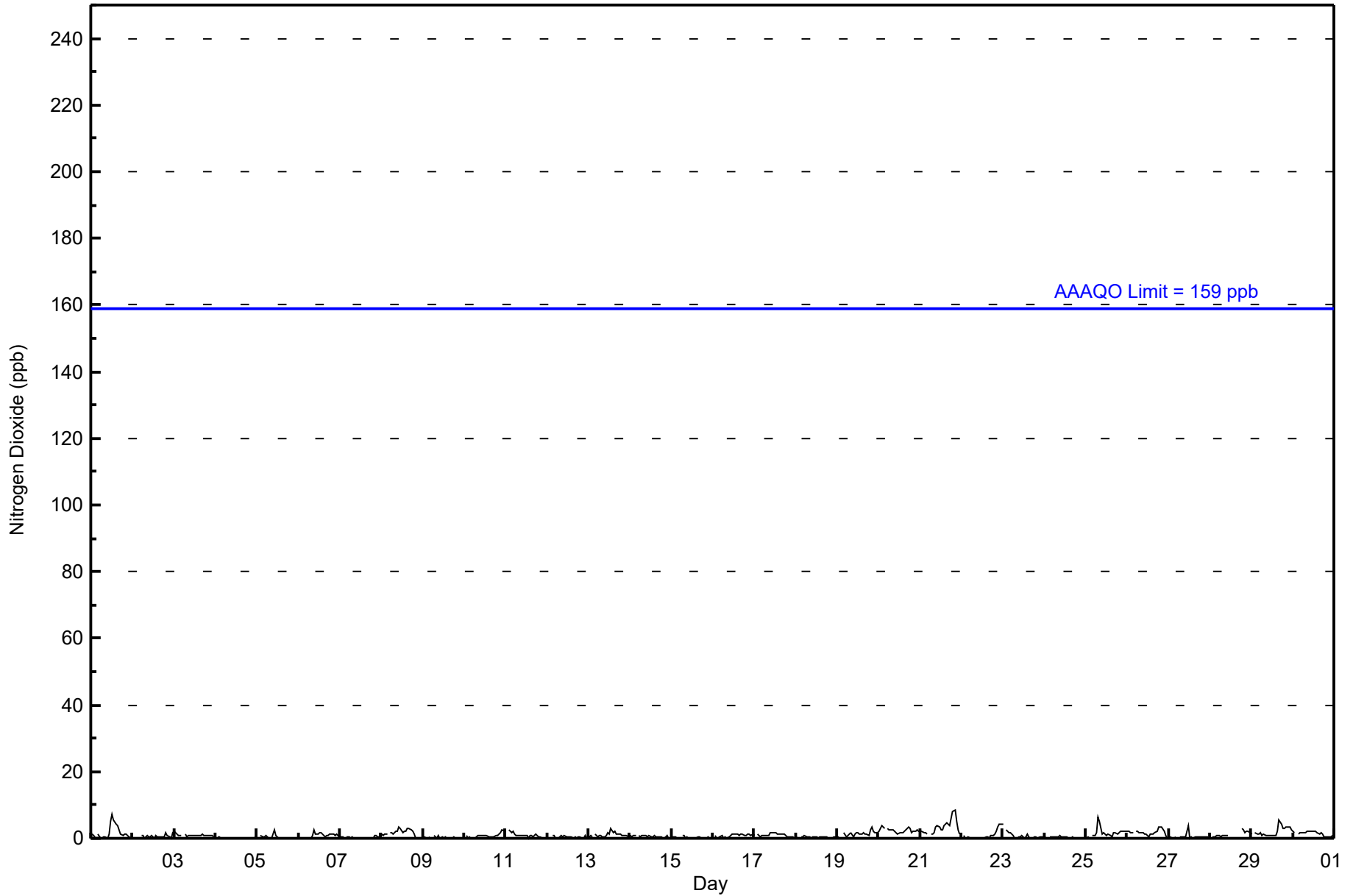
Summary of Hour Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb

Stony Mountain - November 2024

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720																Daily Average		Daily Maximum			
Maximum Value: 8.6 ppb on Nov 21 21:00		Maximum Daily Average: 3.3 ppb on Nov 21		Hours of Data: 682																0.5		1.5					
Minimum Value: 0.0 ppb on Nov 2 00:00		Minimum Daily Average: 0.1 ppb on Nov 4		Hours of Missing Data: 38																1.0		2.0					
Maximum Diurnal Average: 1.3 ppb at hour 21		Minimum Diurnal Average: 0.8 ppb at hour 4		Hours of Calibration: 37																0.1		0.5					
Monthly Average: 1.01 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.3 Median = 0.7 Q <sub>3</sub> = 1.4 P <sub>90</sub> = 2.3 P <sub>99</sub> = 5.2		Percent Operational Time: 99.9																0.3		2.7					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	1.3	0.7	0.6	Z	1.4	0.2	0.2	0.4	0.6	0.2	1.2	5.1	7.0	5.3	4.1	3.9	2.7	1.4	0.7	1.3	1.3	0.7	0.4	0.0	1.8	7.0	
2-Nov	0.0	0.0	0.0	0.0	Z	0.9	0.7	0.0	0.8	0.5	0.4	0.7	0.1	0.8	0.4	0.3	0.6	0.6	0.5	1.5	0.8	0.5	0.2	1.5	0.5	1.5	
3-Nov	2.0	1.6	1.0	0.8	0.7	Z	1.2	0.6	1.0	0.8	1.0	0.9	0.9	0.9	1.0	0.9	1.1	0.7	1.0	0.8	1.0	0.7	0.8	0.6	1.0	2.0	
4-Nov	Z	0.5	0.4	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.1	0.1	0.3	0.1	0.5	
5-Nov	0.2	Z	0.7	0.3	0.3	0.7	0.3	0.0	0.1	1.3	2.7	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.7	
6-Nov	0.0	0.1	Z	0.0	0.0	0.1	0.0	0.0	0.9	2.4	1.3	1.4	1.7	1.5	1.1	0.6	0.7	0.8	1.3	1.3	1.4	0.9	1.1	1.0	0.9	2.4	
7-Nov	0.5	0.5	0.4	Z	0.6	0.5	0.1	0.4	0.1	0.1	0.1	0.1	M	0.1	0.0	0.0	0.1	0.0	0.2	0.2	0.8	0.9	0.4	0.4	0.3	0.9	
8-Nov	1.1	1.0	1.1	1.2	Z	1.8	1.7	1.4	2.0	2.2	3.2	2.8	1.9	2.0	2.3	2.9	3.1	2.5	2.3	1.3	0.0	0.0	0.0	0.0	1.6	3.2	
9-Nov	0.0	0.5	0.1	0.1	0.3	Z	0.8	0.4	0.2	0.9	0.1	0.3	0.0	0.3	0.1	0.0	0.1	0.0	0.3	0.1	0.0	0.2	0.1	0.0	0.2	0.9	
10-Nov	Z	0.9	0.0	0.3	0.2	0.0	0.0	0.5	0.8	0.9	1.0	0.9	0.8	0.8	0.6	0.3	0.4	0.4	0.7	1.0	1.4	1.8	2.6	2.3	0.8	2.6	
11-Nov	2.3	Z	2.4	1.7	2.0	1.1	0.8	0.7	0.7	0.9	0.7	1.0	0.8	0.1	0.9	0.9	0.6	1.1	1.0	0.4	0.6	0.0	0.0	0.0	0.9	2.4	
12-Nov	0.5	0.1	Z	1.0	1.0	0.2	0.0	0.3	0.7	0.3	0.9	0.6	0.5	0.4	0.3	0.2	0.3	0.2	0.3	0.5	0.1	0.0	0.8	0.2	0.4	1.0	
13-Nov	0.5	0.8	0.5	Z	1.4	0.6	0.9	0.7	0.6	0.3	0.7	1.6	1.2	2.8	1.7	2.1	1.2	1.4	1.3	0.7	1.0	0.8	0.9	0.6	1.1	2.8	
14-Nov	0.7	0.6	0.9	0.8	Z	0.7	0.5	0.7	0.7	0.7	0.5	0.7	0.4	0.6	0.8	0.6	0.4	0.4	0.4	0.0	0.0	0.7	0.1	0.1	0.5	0.9	
15-Nov	0.0	0.3	0.6	0.0	0.0	Z	0.7	0.8	0.2	0.6	0.2	0.0	0.0	0.0	0.0	0.4	0.4	0.0	0.1	0.0	0.0	0.3	0.2	0.2	0.2	0.8	
16-Nov	Z	0.7	0.2	0.0	0.3	0.7	0.2	0.5	0.2	0.5	0.9	1.3	1.2	1.1	1.1	0.8	1.2	1.1	0.9	0.8	1.4	1.3	0.8	1.2	0.8	1.4	
17-Nov	0.9	Z	1.3	0.4	0.7	1.0	0.9	0.8	0.9	1.6	1.7	1.8	1.5	1.4	1.3	1.3	1.4	1.2	0.8	0.5	0.6	0.4	0.4	0.1	1.0	1.8	
18-Nov	0.5	0.6	Z	0.5	0.4	0.7	0.4	0.5	0.4	0.2	0.4	0.4	0.3	0.2	0.6	0.6	0.3	0.5	0.6	0.2	0.1	0.0	0.6	0.4	0.4	0.7	
19-Nov	0.3	0.1	0.0	Z	1.9	0.5	0.9	1.1	1.5	0.6	1.1	1.5	1.7	1.1	1.4	1.9	1.1	1.1	0.7	2.4	3.5	2.0	1.8	1.5	1.3	3.5	
20-Nov	2.3	2.9	3.7	2.8	Z	2.8	2.7	2.4	2.4	2.2	1.9	1.4	1.5	1.8	1.8	2.1	2.5	3.5	2.8	1.6	2.2	2.1	2.4	2.3	2.4	3.7	
21-Nov	2.2	2.0	1.9	1.5	1.4	Z	1.4	1.4	1.7	3.2	3.8	3.3	2.7	2.7	3.7	4.7	4.3	3.8	5.8	7.9	8.6	5.1	2.4	1.4	3.3	8.6	
22-Nov	Z	0.8	0.2	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.1	0.9	1.0	1.1	2.0	3.3	4.3	4.1	0.8	4.3	
23-Nov	4.2	Z	2.4	1.9	1.8	1.2	0.8	0.0	0.2	0.6	0.3	0.7	0.1	0.4	1.2	0.3	0.2	0.2	0.6	0.6	0.0	0.3	0.4	0.3	0.8	4.2	
24-Nov	0.3	0.3	Z	0.5	0.5	0.5	0.6	0.5	0.5	0.7	0.6	0.6	0.6	0.3	0.1	0.2	0.4	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.3	0.7	
25-Nov	0.0	0.4	0.0	Z	0.7	0.8	1.9	6.3	5.2	1.4	1.5	1.1	1.0	1.4	0.9	0.6	1.5	1.8	1.3	1.9	2.2	2.1	2.2	2.0	1.7	6.3	
26-Nov	2.3	2.0	1.8	1.9	Z	2.1	2.0	1.9	1.7	1.6	1.3	1.3	0.5	1.1	1.3	1.1	1.8	2.1	3.5	3.5	3.5	2.3	0.7	0.0	1.8	3.5	
27-Nov	0.1	0.6	0.0	0.0	0.3	Z	0.6	0.5	0.4	0.5	0.3	3.8	0.0	0.3	0.2	0.4	0.5	0.4	0.4	0.4	0.6	0.4	0.6	0.5	0.5	3.8	
28-Nov	Z	0.6	0.4	0.5	0.9	0.7	0.6	1.0	0.9	0.9	0.8	C	C	C	C	C	C	C	C	2.8	2.4	1.9	2.2	2.3	1.8	--	2.8
29-Nov	1.4	Z	1.6	1.3	1.4	1.9	0.9	1.2	0.7	0.9	1.0	0.7	0.8	0.8	1.0	2.2	5.3	4.4	3.1	2.8	3.6	3.5	3.2	2.6	2.0	5.3	
30-Nov	2.1	1.8	Z	1.2	1.6	1.6	1.6	1.5	2.0	2.2	2.1	2.1	2.0	2.1	1.7	1.2	1.7	1.1	0.5	0.3	0.6	0.4	0.4	0.8	1.4	2.2	
																								Diurnal Average		Diurnal Maximum	
																								1.0		4.2	
																								0.8		2.9	
																								0.9		3.7	
																								0.8		2.8	
																								0.8		2.0	
																								0.9		2.8	
																								0.8		2.7	
																								0.9		6.3	
																								0.9		5.2	
																								1.0		3.2	
																								1.1		3.8	
																								1.3		5.1	
																								1.0		7.0	
																								1.0		5.3	
																								1.0		4.1	
																								1.1		4.7	
																								1.2		5.3	
																								1.1		4.4	
																								1.2		5.8	
																								1.2		7.9	
																								1.3		8.6	
																								1.1		5.1	
																								1.0		4.3	
																								0.9		4.1	

Z - zerospan      C - Calibration      M - Maintenance  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Stony Mountain - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	682	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Stony Mountain - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	28	35	40	39	14	2	0	5	46	22	20	6	4	42	43	42	388
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	28	35	40	39	14	2	0	5	46	22	20	6	4	42	43	42	388

Total Number of Valid Hours: 388

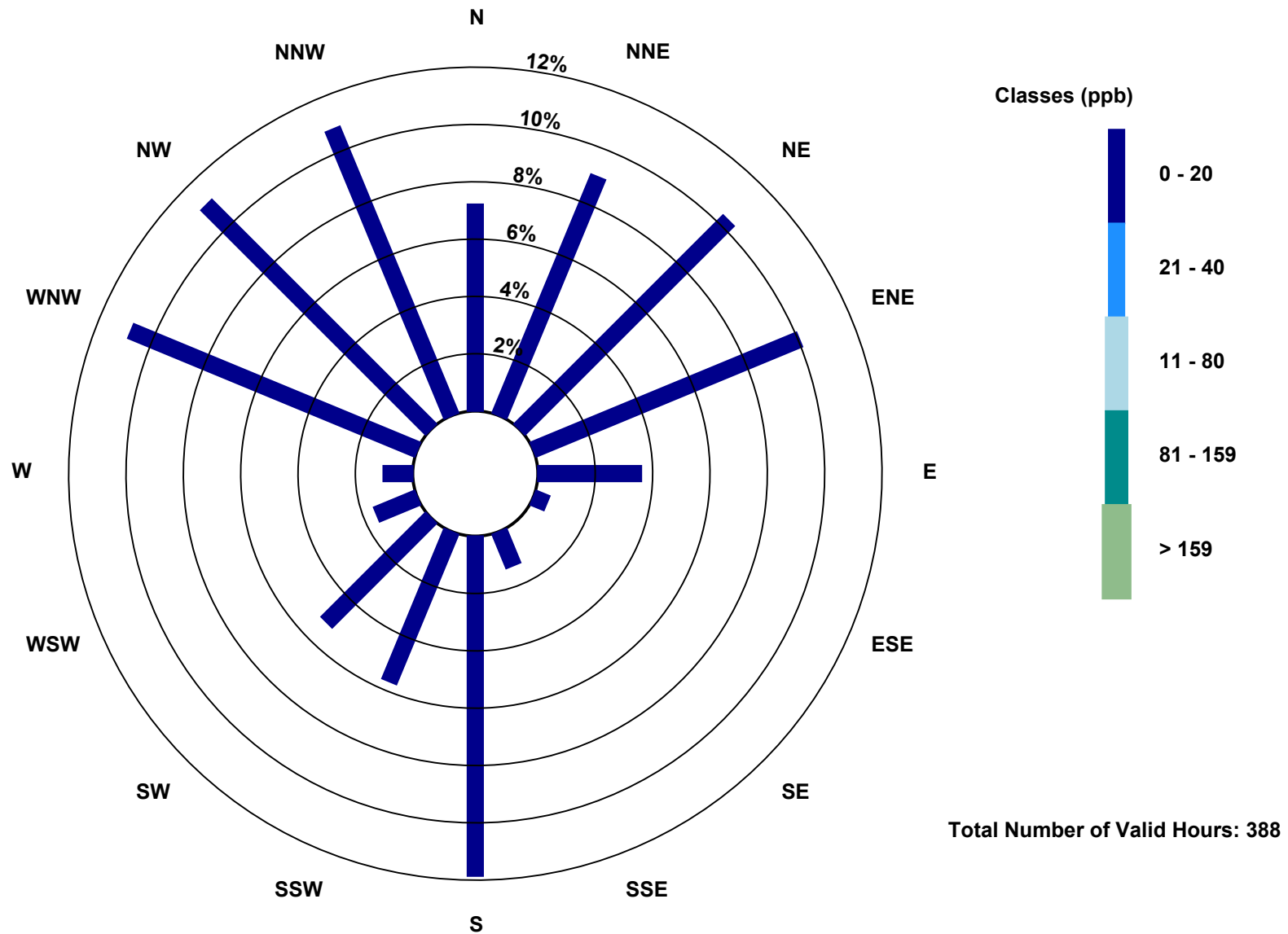
Total Number of Hours: 720

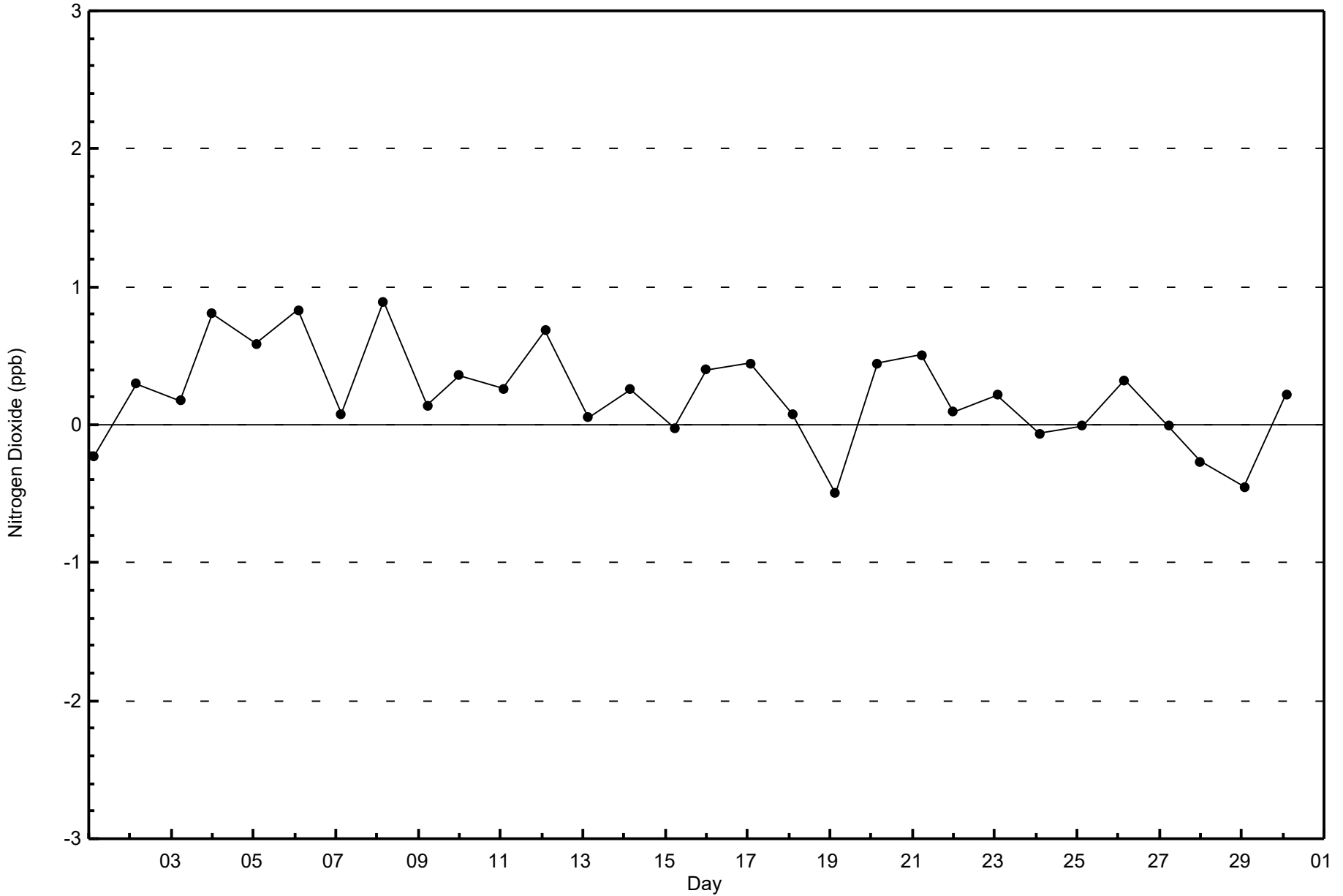


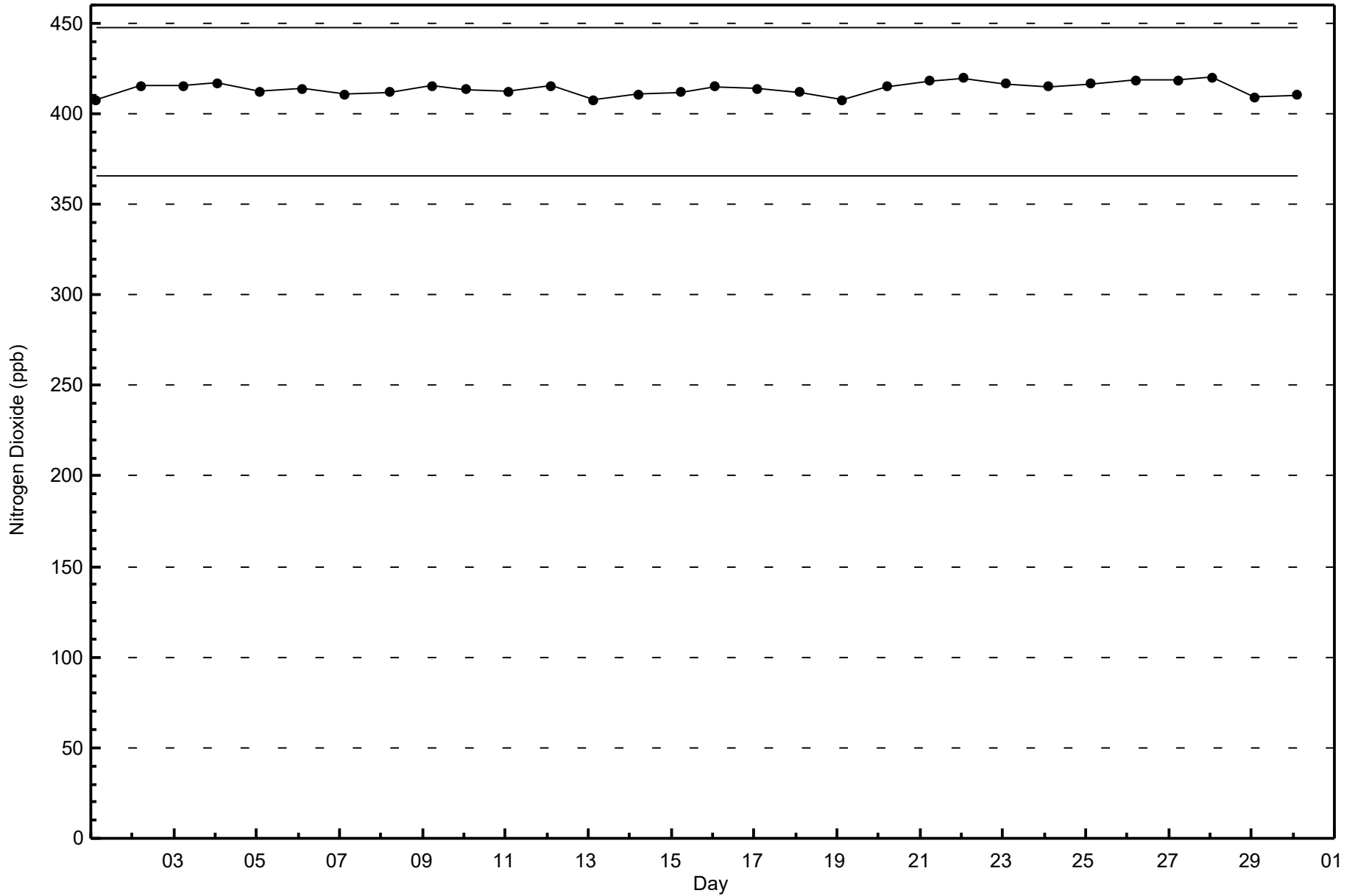


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Stony Mountain









**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

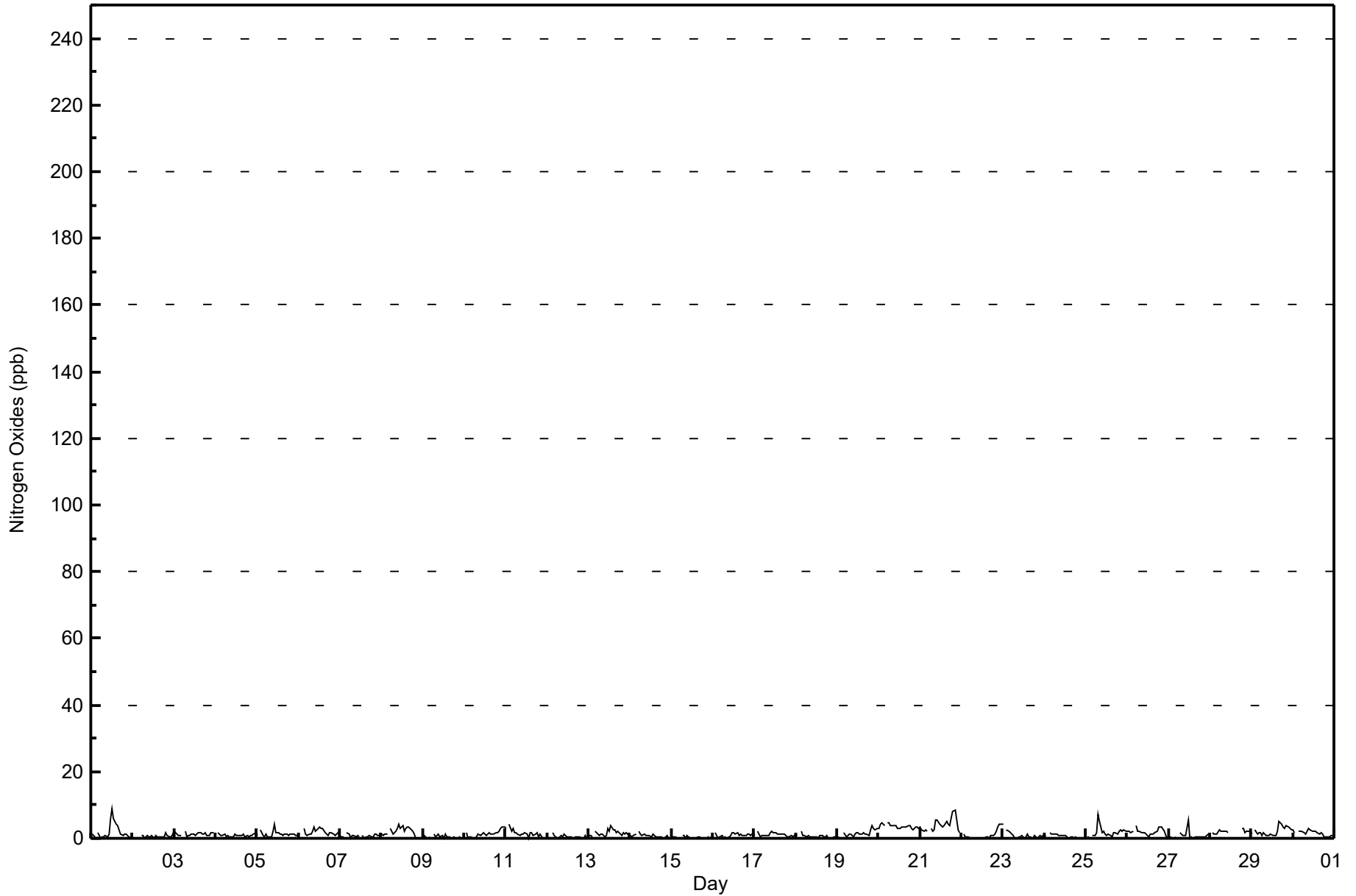
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Stony Mountain - November 2024**

Maximum Value: 9.1 ppb on Nov 1 13:00      Maximum Daily Average: 3.9 ppb on Nov 21																				Hours in Service: 720 Hours of Data: 682							
Minimum Value: 0.0 ppb on Nov 2 00:00      Minimum Daily Average: 0.2 ppb on Nov 15 Maximum Diurnal Average: 1.8 ppb at hour 12      Minimum Diurnal Average: 1.2 ppb at hour 5 Monthly Average: 1.35 ppb      Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.5 Median = 1.0 Q <sub>3</sub> = 1.8 P <sub>90</sub> = 3.1 P <sub>99</sub> = 5.5																				Hours of Missing Data: 38 Hours of Calibration: 37 Percent Operational Time: 99.9							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	1.3	0.7	0.6	Z	1.7	0.2	0.2	0.4	0.6	0.2	1.2	6.0	9.1	6.0	4.1	3.9	2.7	1.4	0.7	1.3	1.3	0.7	0.4	0.0	1.9	9.1	
2-Nov	0.0	0.0	0.0	0.0	Z	1.0	0.7	0.0	0.8	0.5	0.4	0.7	0.1	0.8	0.4	0.3	0.6	0.6	0.5	1.5	0.8	0.5	0.2	1.5	0.5	1.5	
3-Nov	2.1	1.6	1.0	0.8	0.7	Z	2.3	0.6	1.0	1.0	1.3	1.4	1.1	1.1	1.9	1.7	1.2	1.2	1.6	0.8	1.0	1.5	1.7	1.5	1.3	2.3	
4-Nov	Z	1.8	1.4	0.9	0.8	1.1	0.3	0.8	0.3	0.5	0.5	1.1	0.9	0.7	1.0	0.9	1.1	0.4	0.9	0.4	0.9	1.0	1.3	1.6	0.9	1.8	
5-Nov	0.9	Z	2.5	0.9	0.6	1.2	0.3	0.5	0.3	1.9	4.3	1.9	1.7	1.3	1.2	1.0	1.2	1.1	1.0	1.4	1.4	1.1	1.0	0.6	1.3	4.3	
6-Nov	1.4	1.3	Z	2.8	1.2	0.9	1.1	1.3	2.0	3.2	2.0	3.0	3.6	3.1	2.9	1.6	1.2	0.8	1.6	1.6	1.4	0.9	1.1	1.9	1.8	3.6	
7-Nov	0.5	0.5	0.4	Z	1.5	1.1	0.1	0.6	0.8	0.2	0.8	0.4	M	0.9	0.2	0.4	0.6	0.7	0.6	0.2	1.1	1.5	0.7	0.8	0.7	1.5	
8-Nov	1.1	1.0	1.3	1.2	Z	2.9	1.9	1.4	2.3	3.1	4.3	2.8	3.6	2.0	3.0	3.3	3.4	2.5	2.3	1.3	0.0	0.1	0.0	0.0	1.9	4.3	
9-Nov	0.0	0.8	0.1	0.1	0.3	Z	1.4	0.6	0.8	1.4	0.3	0.8	0.0	1.1	0.5	0.4	0.1	0.0	0.3	0.1	0.0	0.2	0.1	0.0	0.4	1.4	
10-Nov	Z	1.8	0.0	0.3	0.2	0.0	0.0	0.5	1.3	0.9	1.4	1.6	1.1	0.8	1.8	1.1	1.3	1.1	1.7	1.6	2.0	2.8	3.3	3.2	1.3	3.3	
11-Nov	2.8	Z	4.4	2.3	3.0	1.8	1.7	1.4	0.9	1.2	1.3	1.5	1.3	0.1	1.8	1.5	0.7	1.1	1.7	0.4	1.2	0.0	0.0	0.0	1.4	4.4	
12-Nov	0.5	0.1	Z	1.8	1.0	0.2	0.0	0.3	0.7	0.3	1.2	0.6	0.6	0.4	0.3	0.2	0.3	0.2	0.3	0.5	0.1	0.0	1.0	0.2	0.5	1.8	
13-Nov	0.8	0.8	0.5	Z	2.3	1.3	1.0	1.1	1.3	0.3	1.0	3.0	2.1	3.8	2.4	2.7	1.7	2.0	1.4	0.7	1.6	1.3	1.6	0.8	1.5	3.8	
14-Nov	1.0	0.6	1.0	1.4	Z	1.9	1.3	1.0	1.2	0.9	0.7	0.9	0.4	1.1	0.8	0.6	0.4	0.4	0.4	0.0	0.0	0.7	0.1	0.1	0.7	1.9	
15-Nov	0.0	0.3	0.6	0.0	0.0	Z	0.7	0.8	0.2	0.8	0.2	0.0	0.0	0.0	0.0	0.4	0.4	0.0	0.1	0.0	0.0	0.3	0.2	0.2	0.2	0.8	
16-Nov	Z	1.5	0.7	0.0	0.5	1.0	0.2	0.5	0.2	0.5	0.9	1.5	1.5	1.2	1.5	0.8	1.4	1.1	0.9	0.8	1.4	1.3	0.8	1.6	0.9	1.6	
17-Nov	0.9	Z	2.0	0.4	0.7	1.0	0.9	0.8	0.9	1.6	2.1	1.8	1.7	1.4	1.3	1.3	1.4	1.2	0.8	0.5	0.6	1.0	0.4	0.9	1.1	2.1	
18-Nov	1.4	1.0	Z	2.1	1.0	0.9	0.6	0.9	0.5	0.2	0.4	0.4	0.3	0.2	0.7	0.6	0.3	0.5	0.7	0.2	0.1	0.0	0.6	0.4	0.6	2.1	
19-Nov	0.3	0.1	0.0	Z	1.9	0.5	0.9	1.1	1.5	0.6	1.1	1.5	1.7	1.1	1.4	1.9	1.1	1.3	0.7	2.4	4.0	3.1	2.8	2.9	1.5	4.0	
20-Nov	3.1	4.2	4.8	3.8	Z	4.5	4.6	4.0	3.8	4.0	3.9	3.0	3.0	3.2	3.3	3.3	3.4	4.0	3.6	2.9	2.8	3.3	3.3	3.0	3.6	4.8	
21-Nov	3.2	2.7	2.1	2.4	2.0	Z	2.8	2.1	2.6	5.3	5.4	4.1	3.7	3.5	3.7	5.0	4.3	3.8	5.8	7.9	8.6	5.5	2.4	1.5	3.9	8.6	
22-Nov	Z	1.3	0.5	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.1	0.9	1.0	1.1	2.0	3.3	4.3	4.1	0.9	4.3	
23-Nov	4.2	Z	2.7	1.9	1.8	1.2	0.8	0.0	0.2	0.6	0.3	0.9	0.1	0.4	1.4	0.3	0.2	0.2	0.8	0.6	0.0	0.7	0.4	0.9	0.9	4.2	
24-Nov	0.5	0.7	Z	1.7	1.2	1.1	1.2	1.1	1.0	0.8	0.8	1.0	0.8	0.3	0.1	0.2	0.4	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.6	1.7	
25-Nov	0.0	0.4	0.0	Z	0.8	0.9	1.9	7.1	5.2	1.7	2.0	1.1	1.0	1.4	0.9	0.6	1.5	1.8	1.3	1.9	2.4	2.1	2.7	2.0	1.8	7.1	
26-Nov	2.3	2.1	1.8	2.2	Z	3.6	2.1	1.9	1.7	1.7	1.8	1.3	0.5	1.1	1.3	1.1	1.8	2.1	3.5	3.5	3.5	2.3	0.7	0.0	1.9	3.6	
27-Nov	0.1	0.6	0.0	0.0	0.3	Z	1.8	1.2	1.0	0.9	0.7	5.5	0.0	0.3	0.2	0.4	0.6	0.4	0.6	0.6	0.6	0.5	0.9	1.1	0.8	5.5	
28-Nov	Z	1.8	1.1	1.4	1.3	2.4	2.0	2.2	2.1	2.1	1.5	C	C	C	C	C	C	C	C	3.1	2.8	1.9	2.2	2.3	1.9	--	3.1
29-Nov	1.4	Z	2.5	1.3	1.6	1.9	0.9	1.6	0.7	1.0	1.0	1.5	0.9	0.8	1.0	2.2	5.3	4.4	3.5	2.8	3.7	3.5	3.2	2.6	2.1	5.3	
30-Nov	2.6	1.8	Z	2.1	2.0	1.9	1.8	1.5	2.2	2.8	2.7	2.1	2.2	2.1	1.7	1.2	1.7	1.1	0.5	0.3	0.6	0.4	0.8	0.8	1.6	2.8	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerspan      C - Calibration      M - Maintenance																											



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Stony Mountain - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Stony Mountain - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	682	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Stony Mountain - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 20	28	35	40	39	14	2	0	5	46	22	20	6	4	42	43	42	388
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	28	35	40	39	14	2	0	5	46	22	20	6	4	42	43	42	388

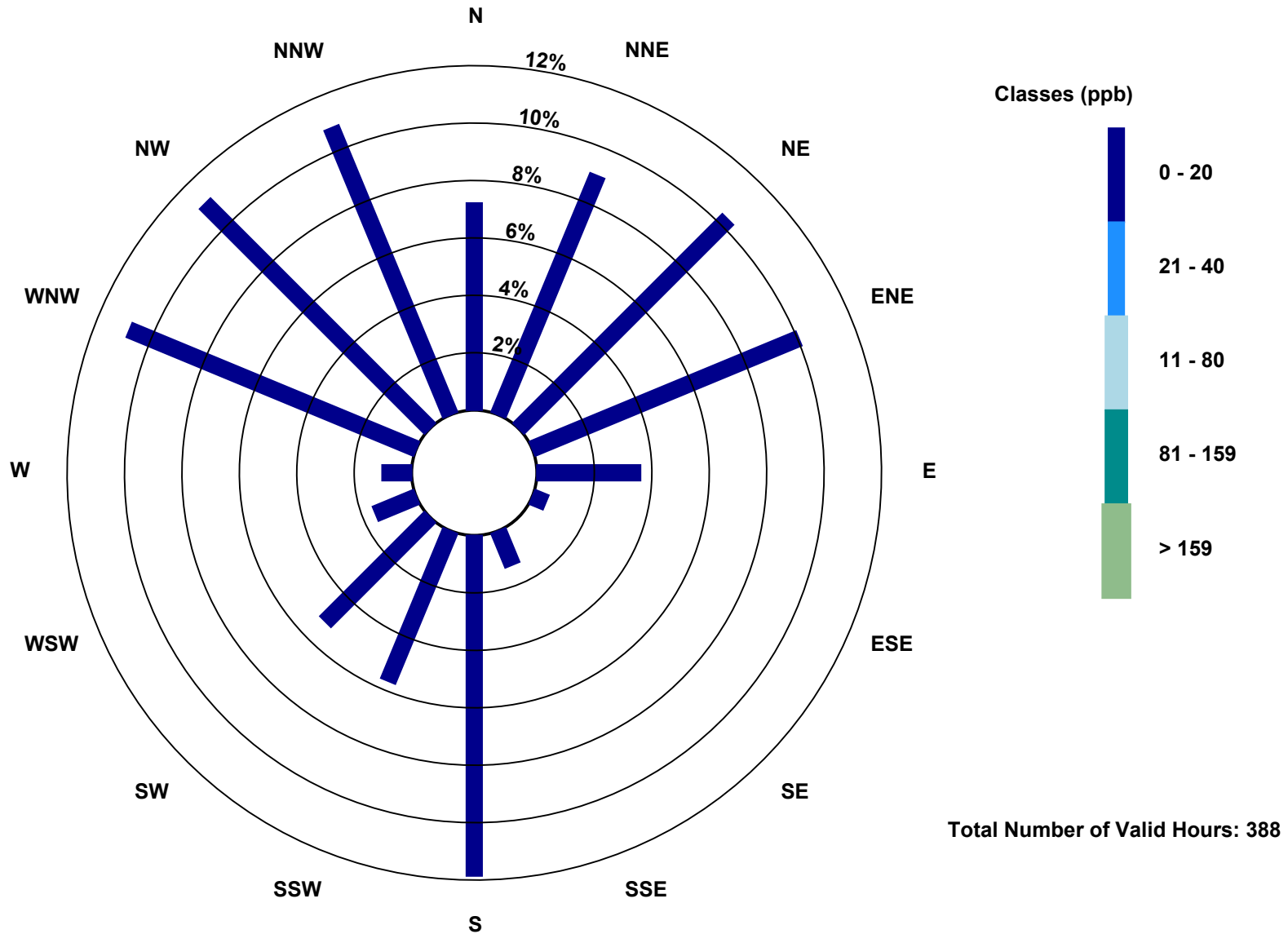
Total Number of Valid Hours: 388

Total Number of Hours: 720

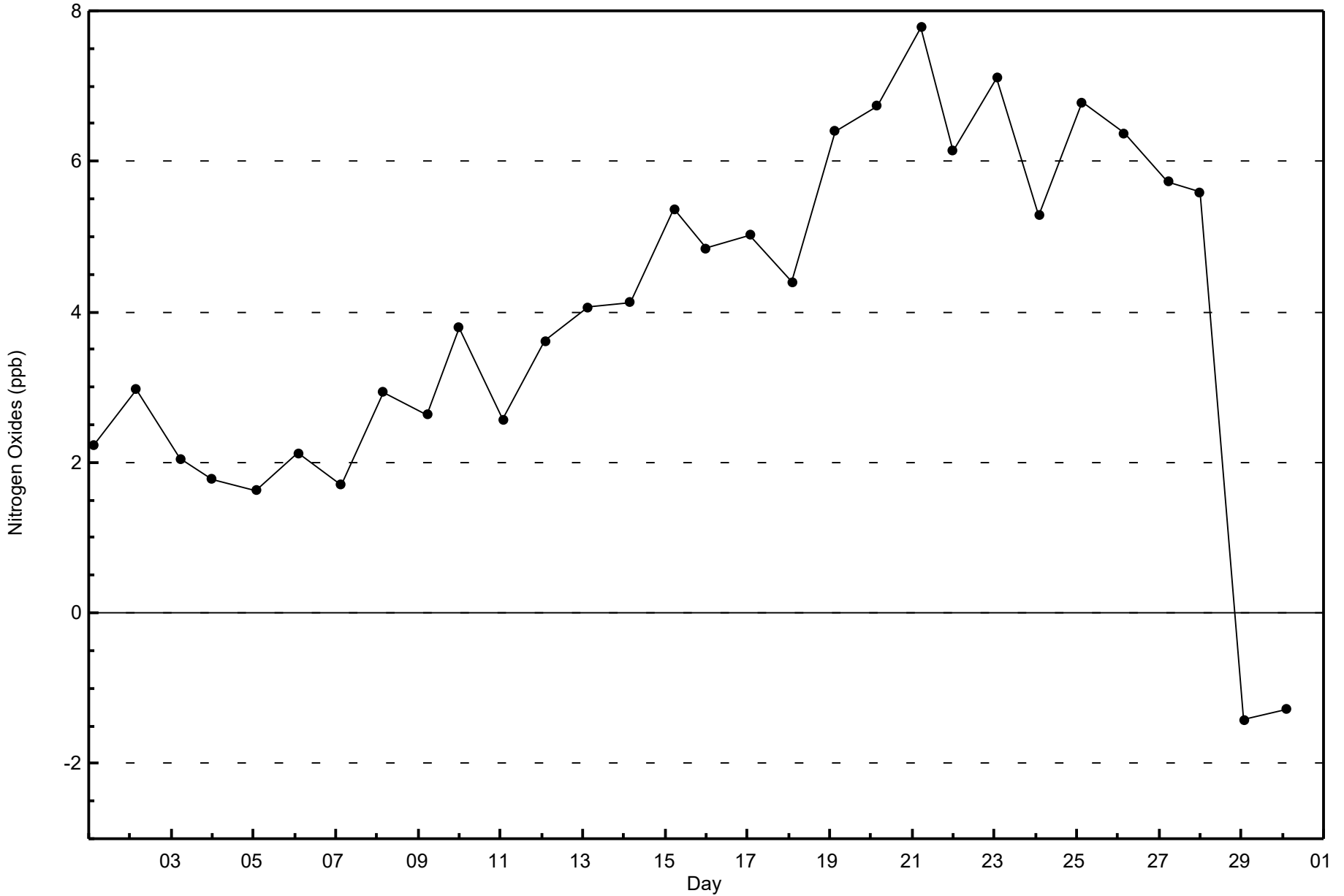


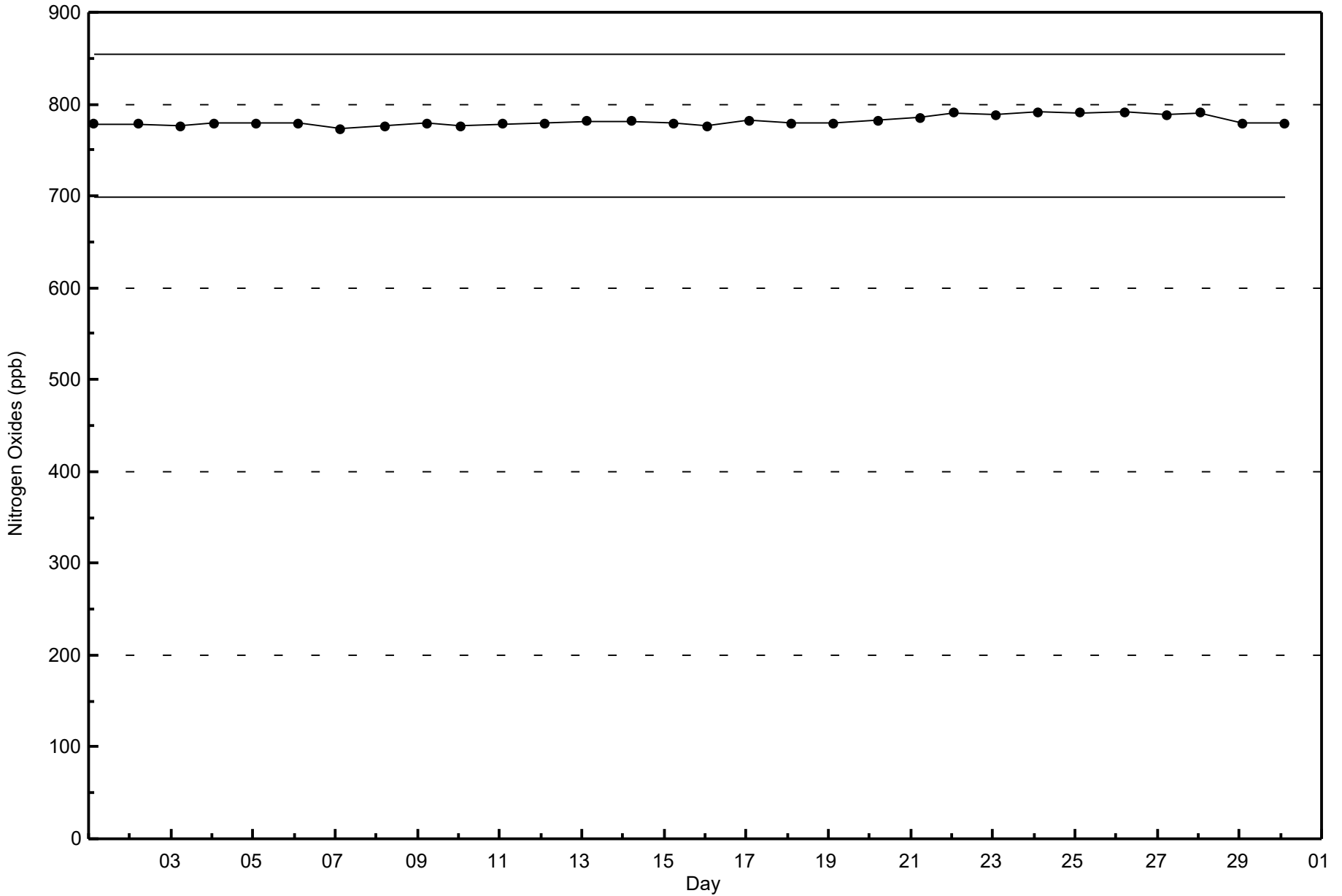
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Stony Mountain











Wood Buffalo Environmental Association

Summary of Hour Averages

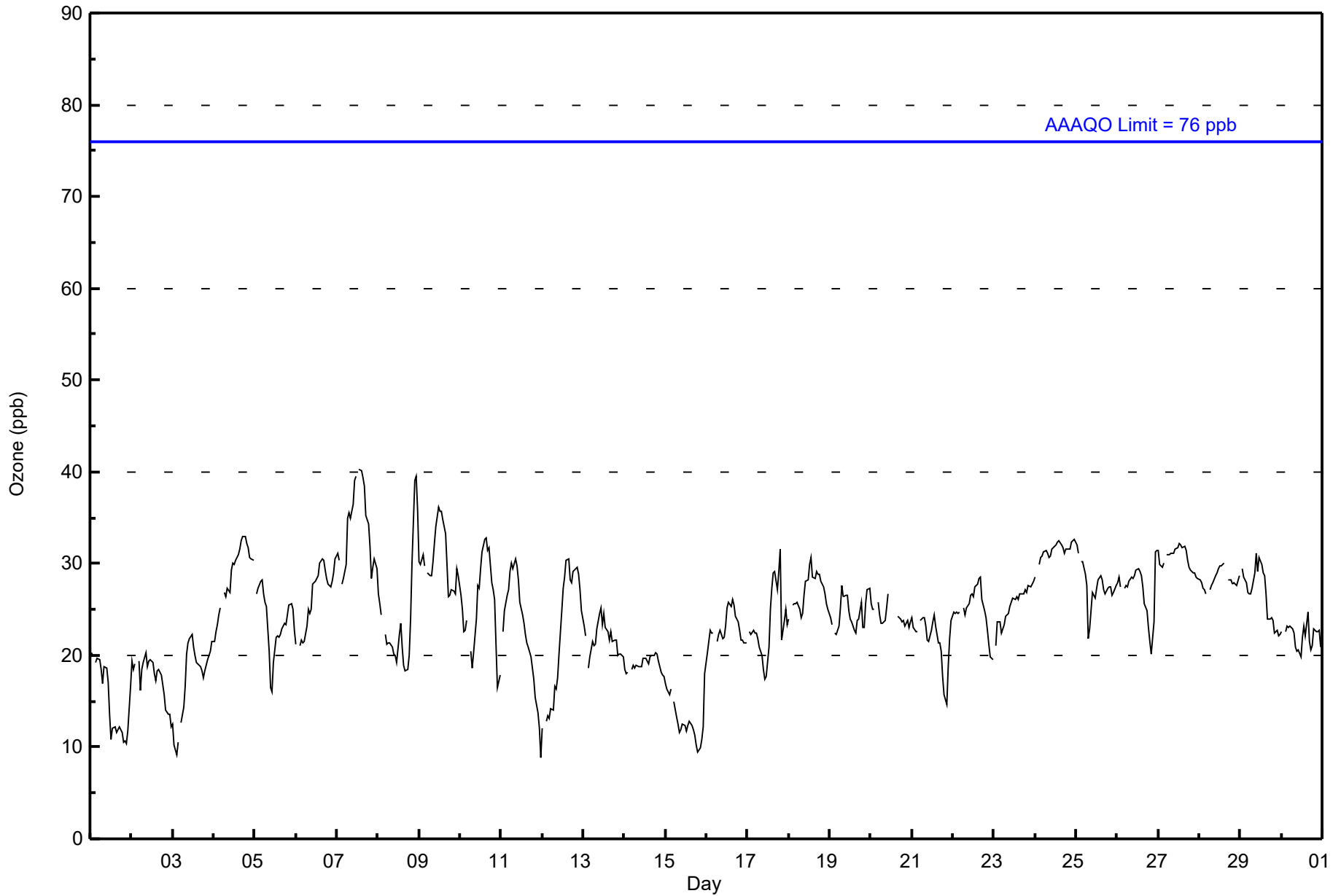
Ozone (O<sub>3</sub>) - ppb

Stony Mountain - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 40.3 ppb on Nov 7 14:00	Maximum Daily Average: 33.9 ppb on Nov 7		Hours of Data:	682
Minimum Value: 8.8 ppb on Nov 12 00:00	Minimum Daily Average: 12.9 ppb on Nov 15		Hours of Missing Data:	38
Maximum Diurnal Average: 26.1 ppb at hour 14	Minimum Diurnal Average: 23.2 ppb at hour 3		Hours of Calibration:	35
Monthly Average: 24.31 ppb	Percentiles: P <sub>1</sub> = 10.5 P <sub>10</sub> = 17.2 Q <sub>1</sub> = 20.9 Median = 24.5 Q <sub>3</sub> = 28.4 P <sub>90</sub> = 31.1 P <sub>99</sub> = 38.6		Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	20.2	20.0	Z	19.2	19.6	19.5	18.4	16.9	18.7	18.6	17.1	13.5	10.9	12.0	12.3	11.6	12.0	12.2	11.5	10.5	10.7	10.3	11.8	16.7	15.0	20.2																						
2-Nov	19.4	18.4	19.0	Z	19.4	16.2	18.4	19.2	20.2	18.7	19.4	19.5	19.3	18.0	17.2	18.3	18.5	17.8	16.9	15.6	14.1	13.6	13.5	12.3	17.5	20.2																						
3-Nov	12.6	10.2	9.1	10.6	Z	12.7	14.3	16.6	20.2	21.4	21.8	22.2	20.9	20.0	19.2	19.0	18.7	18.3	17.5	18.3	19.6	19.9	20.4	21.5	17.6	22.2																						
4-Nov	21.6	22.6	23.3	24.5	25.2	Z	26.8	26.4	27.3	26.9	29.3	30.0	29.9	30.3	31.0	31.6	32.5	33.0	33.0	32.2	31.7	30.7	30.5	30.3	28.7	33.0																						
5-Nov	Z	26.8	27.3	28.0	28.3	26.6	25.7	25.4	20.5	16.4	16.0	19.2	21.9	22.1	22.0	22.3	22.9	23.5	23.4	24.3	25.4	25.6	25.0	22.8	23.5	28.3																						
6-Nov	21.2	Z	21.1	21.6	21.4	21.4	23.2	25.0	24.6	25.0	27.8	28.0	28.3	28.7	30.0	30.5	30.3	29.4	28.3	27.7	27.5	28.1	29.0	30.5	26.5	30.5																						
7-Nov	31.1	30.4	Z	27.8	28.4	29.9	35.0	35.6	35.0	36.5	39.1	39.4	M	40.3	40.1	39.4	38.5	35.3	34.3	31.9	28.3	29.6	30.5	29.4	33.9	40.3																						
8-Nov	26.8	25.6	24.5	Z	22.3	21.3	21.3	21.4	20.9	20.1	20.0	19.3	22.2	23.5	20.9	18.9	18.2	18.5	19.9	24.0	30.0	39.1	39.6	35.9	24.1	39.6																						
9-Nov	30.3	30.0	31.0	29.7	Z	29.0	28.7	28.6	30.3	32.1	34.1	36.1	35.6	35.8	34.8	33.2	29.8	26.3	26.5	27.1	27.0	26.7	29.4	28.7	30.5	36.1																						
10-Nov	26.6	25.1	22.6	22.7	23.8	Z	20.5	18.5	20.2	24.0	27.6	27.3	29.4	31.3	32.6	32.8	31.4	31.8	27.9	27.1	26.1	21.2	16.5	17.8	25.4	32.8																						
11-Nov	Z	22.6	24.9	26.6	27.2	29.2	30.1	29.4	30.5	29.7	28.2	25.8	24.4	23.4	22.3	21.4	20.9	19.8	18.6	17.3	15.4	13.8	12.0	8.8	22.7	30.5																						
12-Nov	12.0	Z	12.7	13.4	13.1	14.1	14.1	16.6	16.3	17.6	20.2	24.9	27.3	28.6	30.4	30.5	28.2	27.9	29.2	29.2	29.6	28.8	27.2	24.9	22.5	30.5																						
13-Nov	23.2	22.2	Z	18.5	19.8	21.5	21.1	21.2	22.8	24.6	25.2	23.3	24.6	23.0	22.6	21.6	22.7	21.6	21.7	21.6	20.0	20.2	20.2	19.8	21.9	25.2																						
14-Nov	18.4	18.0	18.2	Z	18.5	18.9	18.5	18.9	18.8	18.7	18.8	19.6	19.7	19.4	19.0	19.8	20.0	19.9	20.3	20.1	19.4	18.2	17.8	17.7	19.0	20.3																						
15-Nov	16.9	16.3	15.7	16.3	Z	14.9	13.2	12.5	11.5	12.0	12.6	12.4	11.8	12.4	12.8	12.3	11.9	11.3	10.2	9.5	9.9	10.8	12.2	18.0	12.9	18.0																						
16-Nov	20.3	21.5	22.8	22.5	22.4	Z	21.6	22.3	22.7	21.9	22.0	23.2	25.2	25.8	25.4	26.1	25.5	24.3	23.6	22.7	21.6	21.6	21.4	21.4	22.9	26.1																						
17-Nov	Z	22.5	22.2	22.7	22.5	22.4	21.8	20.9	20.0	18.5	17.5	17.8	21.0	25.0	27.3	29.0	29.1	27.2	29.1	31.6	21.7	23.8	25.0	23.4	23.6	31.6																						
18-Nov	24.0	Z	25.5	25.7	25.7	25.8	25.1	24.1	24.5	26.5	28.1	28.3	30.0	30.7	28.5	28.4	29.2	28.8	28.8	28.1	27.4	26.7	25.6	25.0	27.0	30.7																						
19-Nov	24.1	23.4	Z	22.4	22.3	23.1	25.2	27.5	26.4	26.6	26.6	24.9	24.0	23.7	22.8	22.5	23.9	23.9	25.8	23.1	23.0	25.6	27.2	27.3	24.6	27.5																						
20-Nov	25.7	25.1	25.0	Z	25.8	24.4	23.5	23.4	23.8	25.2	26.8	C	C	C	C	C	24.2	23.9	23.6	23.8	23.1	23.8	23.0	23.7	24.3	26.8																						
21-Nov	24.1	23.0	22.6	22.6	Z	23.8	24.0	24.1	23.2	21.7	21.5	22.8	23.6	24.4	23.2	21.4	21.3	20.5	17.7	15.6	14.6	18.8	21.8	23.7	21.7	24.4																						
22-Nov	24.6	24.5	24.7	24.6	24.7	Z	25.1	24.5	25.1	25.6	26.6	26.7	26.5	27.4	27.8	28.3	28.5	26.1	24.8	24.1	22.8	21.2	19.8	19.5	24.9	28.5																						
23-Nov	Z	21.0	23.6	23.6	22.4	22.9	23.3	24.2	24.5	25.2	25.7	26.2	26.2	26.4	26.1	26.7	26.7	26.7	27.1	26.8	27.6	27.5	27.7	28.1	25.5	28.1																						
24-Nov	28.6	Z	29.9	30.6	30.8	31.3	31.4	31.1	30.7	30.8	31.6	31.8	32.1	32.3	32.5	32.1	31.8	31.1	31.6	31.5	31.6	32.3	32.5	32.6	31.4	32.6																						
25-Nov	32.1	31.2	Z	30.2	30.2	28.9	27.6	21.8	22.8	26.9	26.5	26.2	27.3	28.2	28.7	28.2	27.2	26.7	27.3	27.5	27.5	26.6	26.8	27.7	27.6	32.1																						
26-Nov	28.0	28.5	27.5	Z	27.3	27.6	27.5	28.1	28.5	28.4	28.6	29.3	29.4	29.2	28.6	27.5	25.6	24.9	23.1	21.5	20.2	23.6	31.2	31.4	27.2	31.4																						
27-Nov	31.4	29.9	29.5	30.0	Z	30.9	31.0	31.1	31.1	31.2	31.5	31.7	32.2	32.1	31.8	31.8	31.5	30.4	29.7	29.2	29.0	28.9	28.5	28.4	30.6	32.2																						
28-Nov	28.2	27.9	27.3	27.1	26.7	Z	27.1	27.6	28.0	28.7	29.1	29.4	29.7	29.8	30.1	M	M	28.2	28.2	27.8	27.9	27.7	27.7	28.7	28.2	30.1																						
29-Nov	Z	29.4	28.5	28.0	26.8	26.7	26.8	27.3	29.0	31.1	29.2	30.6	30.0	29.0	28.6	26.7	24.0	24.0	24.2	23.8	22.4	22.7	22.1	22.3	26.7	31.1																						
30-Nov	22.5	Z	22.6	23.2	23.0	23.2	22.9	22.4	20.9	20.4	20.6	19.8	21.9	23.2	22.1	24.8	21.5	20.6	21.1	22.9	22.6	22.6	22.8	20.9	22.1	24.8																						
																								23.8	23.8	23.2	23.7	23.9	23.5	23.8	23.8	24.0	24.4	25.0	25.2	25.2	26.1	25.9	25.6	25.0	24.5	24.2	23.9	23.3	23.7	24.0	24.0	Diurnal Average
																								32.1	31.2	31.0	30.6	30.8	31.3	35.0	35.6	35.0	36.5	39.1	39.4	35.6	40.3	40.1	39.4	38.5	35.3	34.3	32.2	31.7	39.1	39.6	35.9	Diurnal Maximum

Z - zerospan      C - Calibration      M - Maintenance  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Stony Mountain - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	163	23.90	23.90
21 - 50	519	76.10	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Stony Mountain - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	2	3	11	14	1	0	0	0	1	9	10	1	1	2	1	2	58
21 - 50	22	31	29	24	14	2	0	5	44	13	10	5	3	42	41	45	330
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	24	34	40	38	15	2	0	5	45	22	20	6	4	44	42	47	388

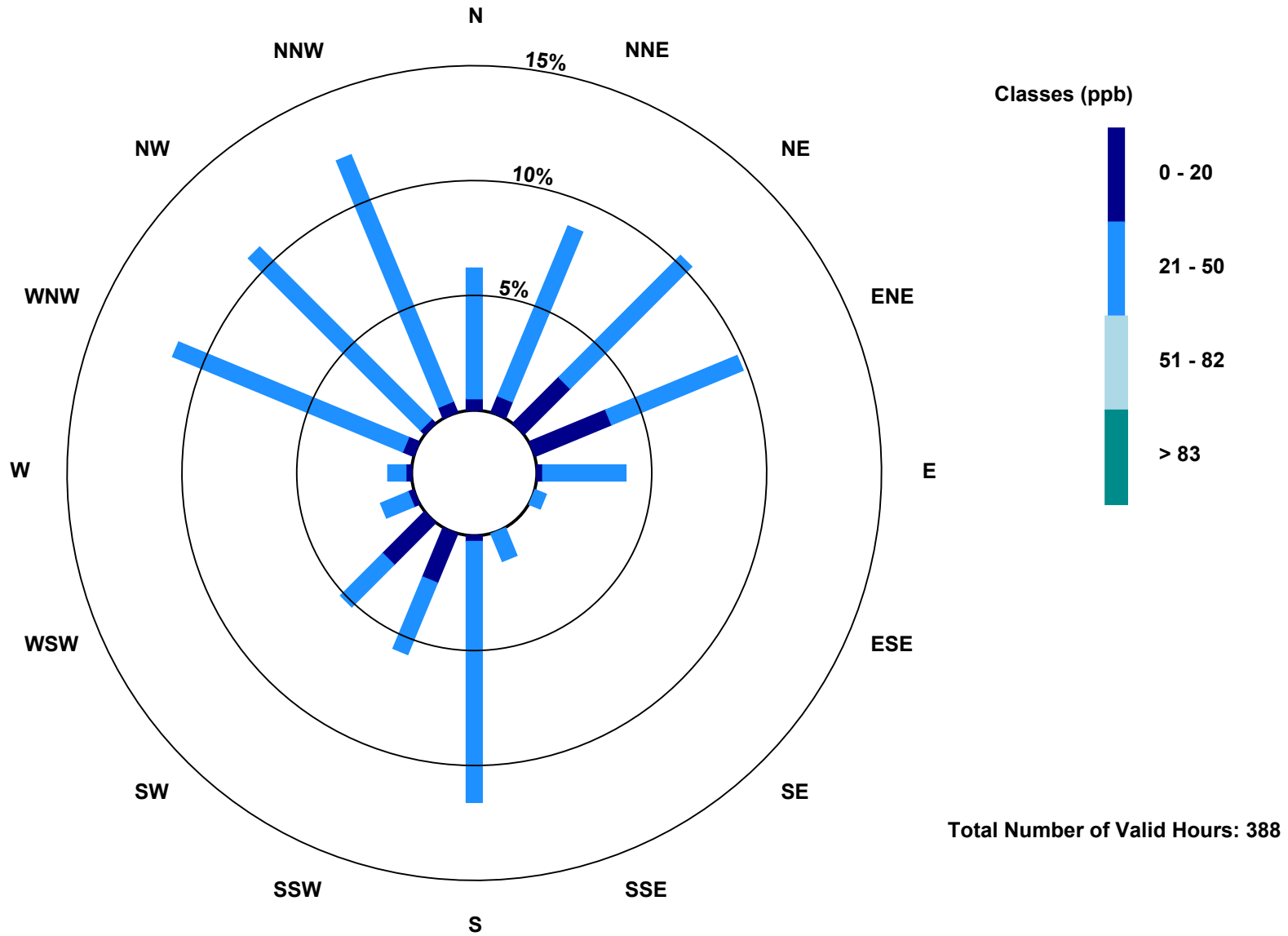
Total Number of Valid Hours: 388

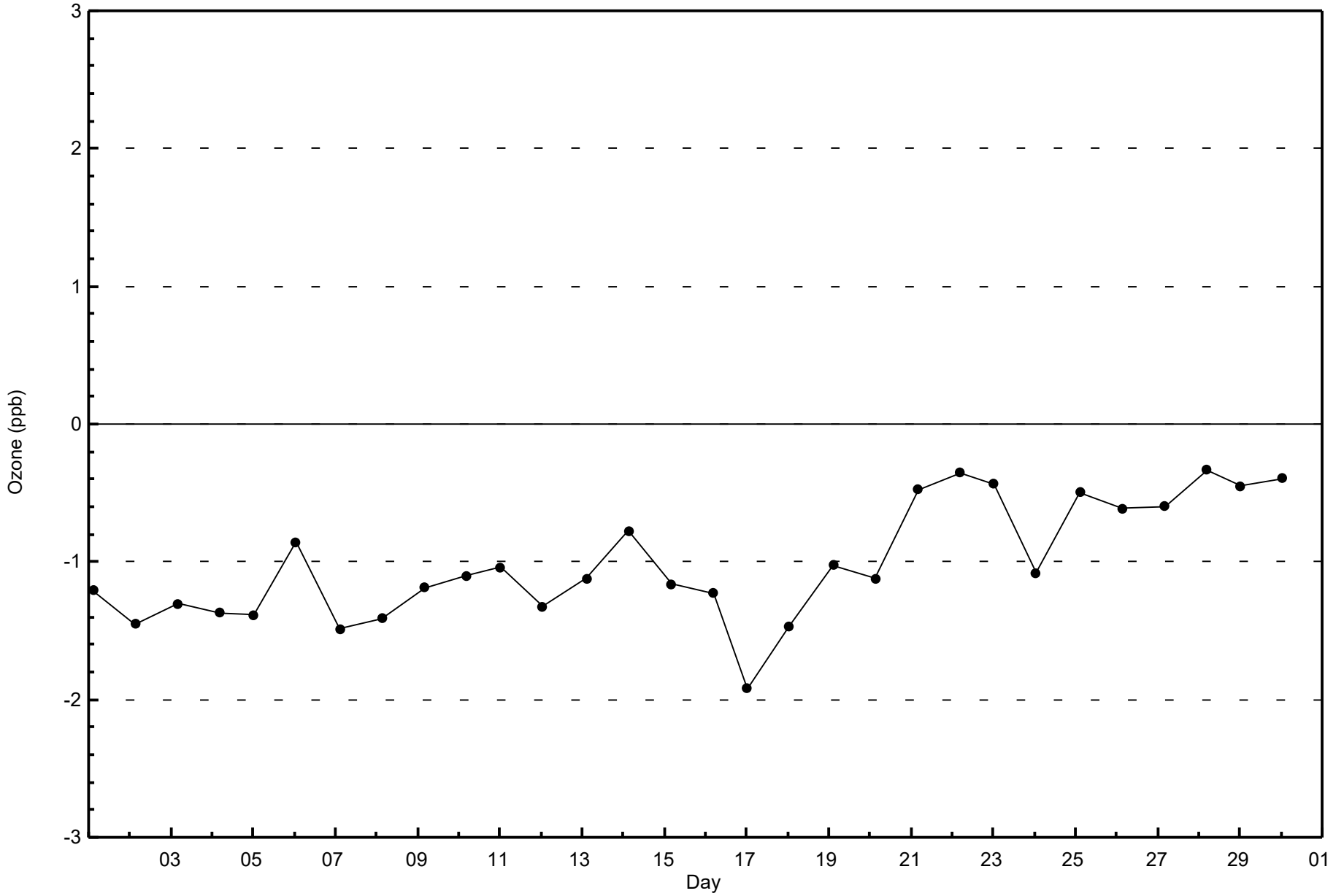
Total Number of Hours: 720



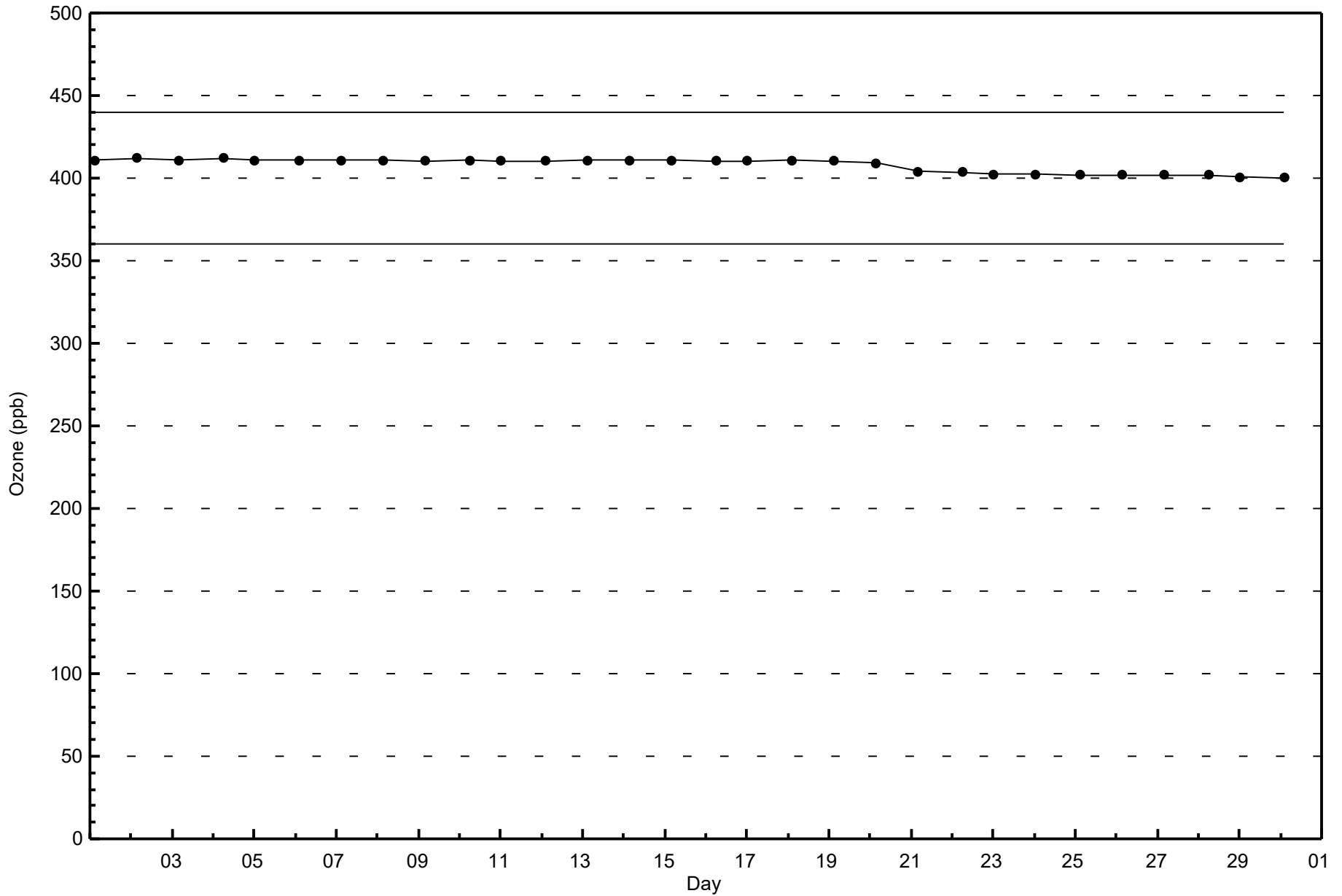
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Ozone (O<sub>3</sub>) - ppb  
Stony Mountain









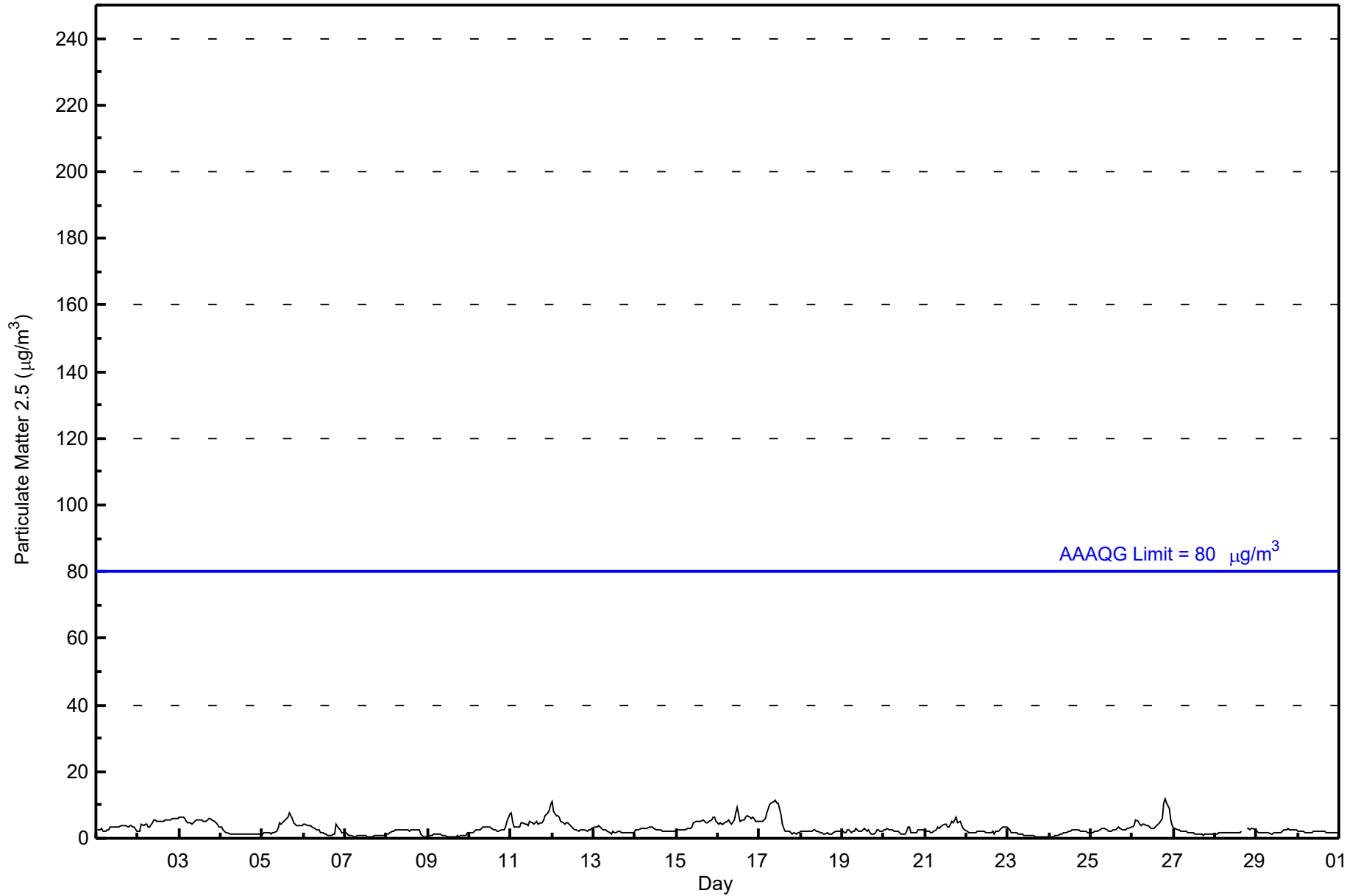


Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																		
Maximum Value: 11.8 µg/m <sup>3</sup> on Nov 26 20:00		Maximum Daily Average: 5.6 µg/m <sup>3</sup> on Nov 16				Hours of Data:		718																		
Minimum Value: 0.3 µg/m <sup>3</sup> on Nov 23 20:00		Minimum Daily Average: 0.8 µg/m <sup>3</sup> on Nov 7				Hours of Missing Data:		2																		
Maximum Diurnal Average: 3.1 µg/m <sup>3</sup> at hour 21		Minimum Diurnal Average: 2.7 µg/m <sup>3</sup> at hour 14				Hours of Calibration:		2																		
Monthly Average: 2.88 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 1.1 Q <sub>1</sub> = 1.6 Median = 2.4 Q <sub>3</sub> = 3.8 P <sub>90</sub> = 5.3 P <sub>99</sub> = 10.4				Percent Operational Time:		100.0																		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	2.5	2.6	2.7	2.8	2.3	2.1	2.3	2.7	3.3	3.5	3.3	3.4	3.4	3.6	3.7	4.0	4.0	3.9	3.5	3.8	3.8	3.5	3.2	2.3	3.2	4.0
2-Nov	2.1	2.3	4.2	4.0	4.4	4.4	3.4	3.3	4.5	5.6	5.5	5.3	5.0	5.2	5.0	5.1	5.6	5.5	5.3	5.6	6.0	5.9	6.1	6.0	4.8	6.1
3-Nov	6.4	6.3	6.3	5.8	5.1	4.5	4.6	4.2	4.5	5.1	5.4	5.5	5.4	5.3	5.0	5.3	5.5	5.9	5.7	5.4	5.0	4.7	4.2	3.6	5.2	6.4
4-Nov	3.2	2.6	2.2	1.7	1.6	1.4	1.2	1.1	1.1	1.1	1.2	1.2	1.3	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.3	1.3	1.4	1.4	3.2
5-Nov	1.4	1.7	1.6	1.6	1.5	1.4	1.5	1.5	1.9	3.1	4.5	4.3	5.1	5.5	6.1	6.5	7.8	5.7	4.7	4.2	3.9	3.8	3.6	3.8	3.6	7.8
6-Nov	4.2	4.2	3.9	4.0	3.9	3.6	3.0	2.5	2.5	2.6	1.7	1.5	1.4	1.2	1.0	0.8	0.8	1.1	1.2	4.0	3.0	2.5	1.8	1.8	2.4	4.2
7-Nov	1.5	1.2	0.8	0.8	0.7	0.5	0.6	0.8	0.8	0.9	0.9	0.9	0.8	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.7	0.8	1.0	0.8	1.5
8-Nov	1.1	1.3	1.7	1.9	2.3	2.5	2.5	2.4	2.6	2.7	2.7	2.7	2.4	2.3	2.4	2.5	2.5	2.5	2.5	2.4	1.4	0.5	0.5	0.6	2.0	2.7
9-Nov	0.8	0.9	0.9	1.1	1.2	1.1	1.1	1.1	0.9	0.8	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.7	0.6	0.6	0.7	0.8	0.8	1.6	0.8	1.6
10-Nov	1.6	1.9	1.9	2.3	2.7	2.7	2.7	2.8	3.3	3.3	3.3	3.5	3.5	3.0	2.7	2.4	2.3	2.1	2.4	2.5	2.6	3.4	5.0	7.1	3.0	7.1
11-Nov	7.5	5.3	3.5	3.4	3.4	3.5	4.7	4.7	4.3	4.1	3.9	4.9	4.5	4.1	4.8	4.9	4.3	4.5	4.8	5.3	6.7	7.5	8.6	10.1	5.1	10.1
12-Nov	10.9	7.9	6.6	6.8	6.4	5.2	4.7	4.2	4.5	4.5	4.2	3.5	3.0	2.7	2.3	2.1	2.3	2.6	2.5	2.4	2.3	2.4	2.6	3.0	4.2	10.9
13-Nov	3.3	3.5	3.6	3.8	3.2	2.6	2.5	2.5	2.2	1.9	1.5	1.9	1.8	1.6	2.0	2.2	1.6	1.8	1.6	1.6	1.8	1.9	1.8	1.9	2.2	3.8
14-Nov	2.4	2.7	2.7	3.0	3.0	2.9	3.0	3.1	3.3	3.2	3.3	3.0	2.7	2.7	2.5	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.6	3.3
15-Nov	2.4	2.4	2.5	2.5	2.4	2.7	3.1	3.1	3.0	3.5	4.6	5.0	5.0	4.9	5.1	5.5	5.3	4.7	4.8	5.1	5.6	6.2	6.2	4.9	4.2	6.2
16-Nov	4.4	4.5	4.1	4.2	4.6	5.2	5.5	4.5	4.3	5.4	7.5	9.5	7.1	5.3	5.7	5.4	6.2	6.9	6.3	6.0	6.3	5.9	5.0	5.0	5.6	9.5
17-Nov	5.3	5.1	5.0	6.0	7.7	9.0	10.0	10.8	10.9	11.2	10.5	10.4	7.4	4.3	3.0	2.3	2.2	2.1	1.8	1.3	1.6	1.3	1.5	1.8	5.5	11.2
18-Nov	2.2	2.0	1.9	2.0	2.3	2.2	2.3	2.4	2.4	2.2	1.9	1.8	1.5	1.3	1.4	1.5	1.3	1.3	1.1	1.5	1.9	1.9	2.1	2.1	1.9	2.4
19-Nov	2.1	1.8	1.8	2.4	2.3	1.8	2.0	2.2	2.8	2.2	2.2	2.2	2.6	3.1	2.2	2.4	1.5	1.5	1.2	1.9	2.4	2.4	2.3	2.1	2.1	3.1
20-Nov	2.4	2.6	2.9	2.5	2.3	2.3	2.2	2.1	2.2	1.7	1.2	1.1	1.1	2.2	3.5	3.3	1.5	1.5	1.6	1.6	2.6	2.6	2.5	2.5	2.2	3.5
21-Nov	2.3	2.2	2.2	1.9	1.8	2.1	2.7	3.2	2.9	3.2	3.9	4.3	4.4	3.2	3.4	5.0	4.8	5.3	6.3	4.8	5.0	3.7	2.9	2.4	3.5	6.3
22-Nov	2.0	1.7	1.6	1.8	1.7	1.7	1.9	1.9	2.0	2.2	2.0	1.8	1.7	1.6	1.7	1.9	1.4	2.1	2.2	2.6	3.2	3.4	3.5	3.3	2.1	3.5
23-Nov	2.9	2.4	1.7	1.8	1.8	1.5	1.3	1.1	1.1	1.0	0.9	1.0	1.0	0.8	0.7	0.7	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.4	1.0	2.9
24-Nov	0.4	0.4	0.5	0.7	0.8	1.0	1.2	1.4	1.6	1.8	1.9	2.1	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.2	2.1	2.0	1.9	1.9	1.7	2.4
25-Nov	1.9	1.9	2.0	1.9	2.3	2.5	3.0	3.1	2.9	2.4	2.1	2.2	2.3	2.4	2.4	2.8	3.2	2.9	2.6	2.4	2.5	2.9	3.0	3.2	2.5	3.2
26-Nov	3.4	3.8	5.4	5.0	4.1	3.9	4.1	4.0	3.9	3.8	3.4	3.1	3.1	3.5	4.0	4.1	4.7	5.9	10.4	11.8	10.6	8.7	5.4	3.9	5.2	11.8
27-Nov	3.0	2.9	2.4	2.3	2.1	2.0	2.0	1.9	1.7	1.7	1.6	1.5	1.2	1.1	1.1	1.3	1.1	1.0	1.1	1.3	1.3	1.2	1.3	1.3	1.6	3.0
28-Nov	1.3	1.4	1.5	1.5	1.6	1.6	1.6	1.5	1.5	1.7	1.6	1.7	1.8	1.7	1.7	2.2	C	C	2.8	2.8	2.7	2.8	2.8	2.4	1.9	2.8
29-Nov	2.0	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.4	1.3	1.5	1.7	1.6	1.8	1.9	2.1	2.5	2.7	2.9	2.7	2.7	2.7	2.7	2.4	2.0	2.9
30-Nov	2.2	2.1	2.0	2.0	1.8	1.7	1.8	1.8	1.9	2.0	2.0	2.1	2.1	2.1	2.0	2.0	1.8	1.7	1.7	1.6	1.7	1.7	1.7	1.8	1.9	2.2
																								Diurnal Average		
																								Diurnal Maximum		
																								3.0 2.8 2.7 2.8 2.8 2.7 2.8 2.8 2.9 3.0 3.0 3.1 2.9 2.7 2.7 2.8 2.8 2.8 2.9 3.1 3.1 3.0 2.9 2.9 2.9 2.9 2.9		
																								10.9 7.9 6.6 6.8 7.7 9.0 10.0 10.8 10.9 11.2 10.5 10.4 7.4 5.5 6.1 6.5 7.8 6.9 10.4 11.8 10.6 8.7 8.6 10.1		
C - Calibration																										
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m <sup>3</sup> 24-hr 29 µg/m <sup>3</sup>																										



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Stony Mountain - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Stony Mountain - November 2024**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	657	91.50	91.50
6 - 15	61	8.50	100.00
16 - 25	0	0.00	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 718

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>**  
**Stony Mountain - November 2024**

Concentration Ranges (μg/m <sup>3</sup> )	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	28	36	40	42	15	2	0	4	34	18	14	6	2	45	46	47	379
6 - 15	0	0	0	0	0	0	0	1	14	4	7	0	2	1	0	1	30
16 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	28	36	40	42	15	2	0	5	48	22	21	6	4	46	46	48	409

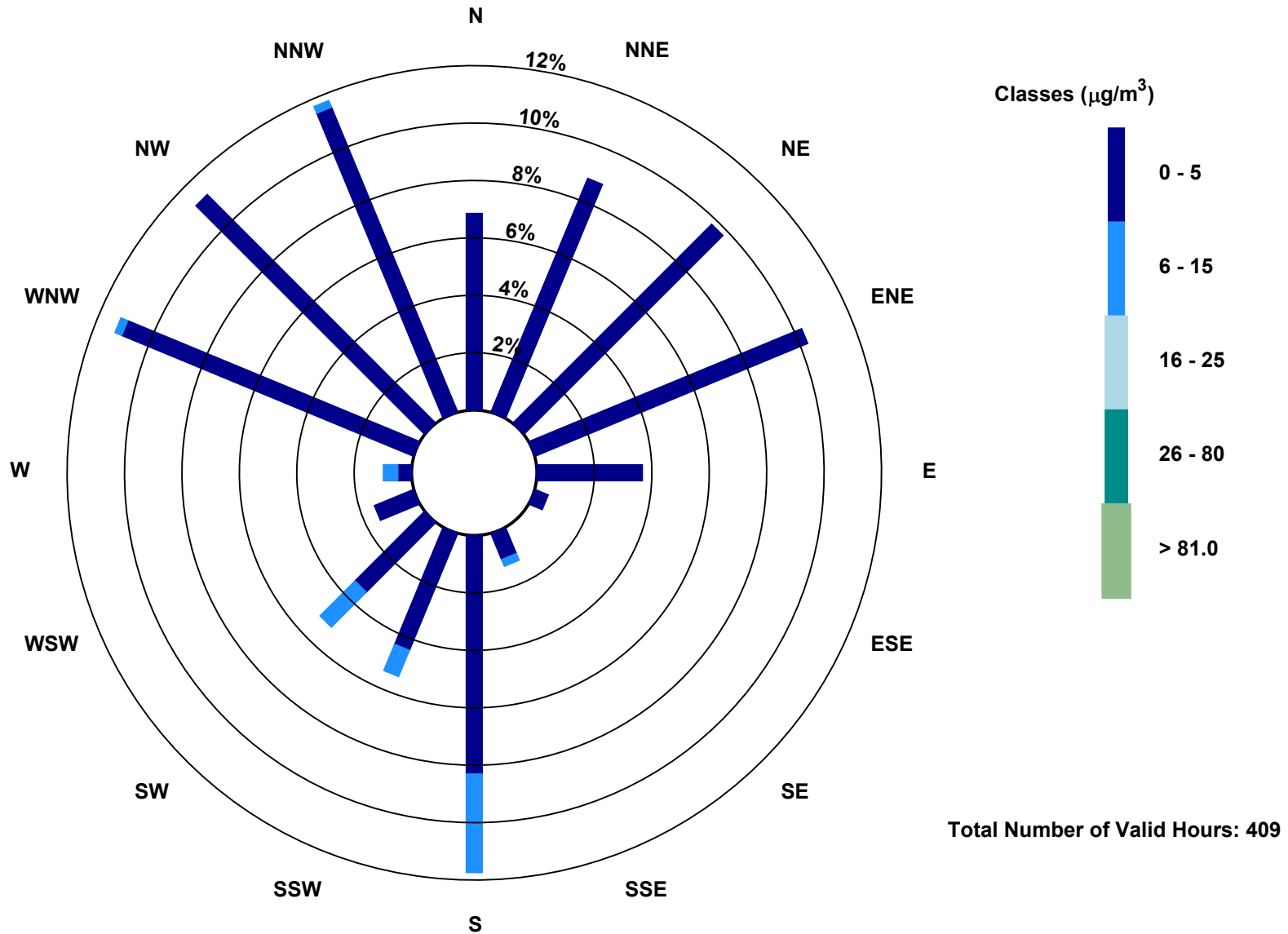
Total Number of Valid Hours: 409

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Stony Mountain

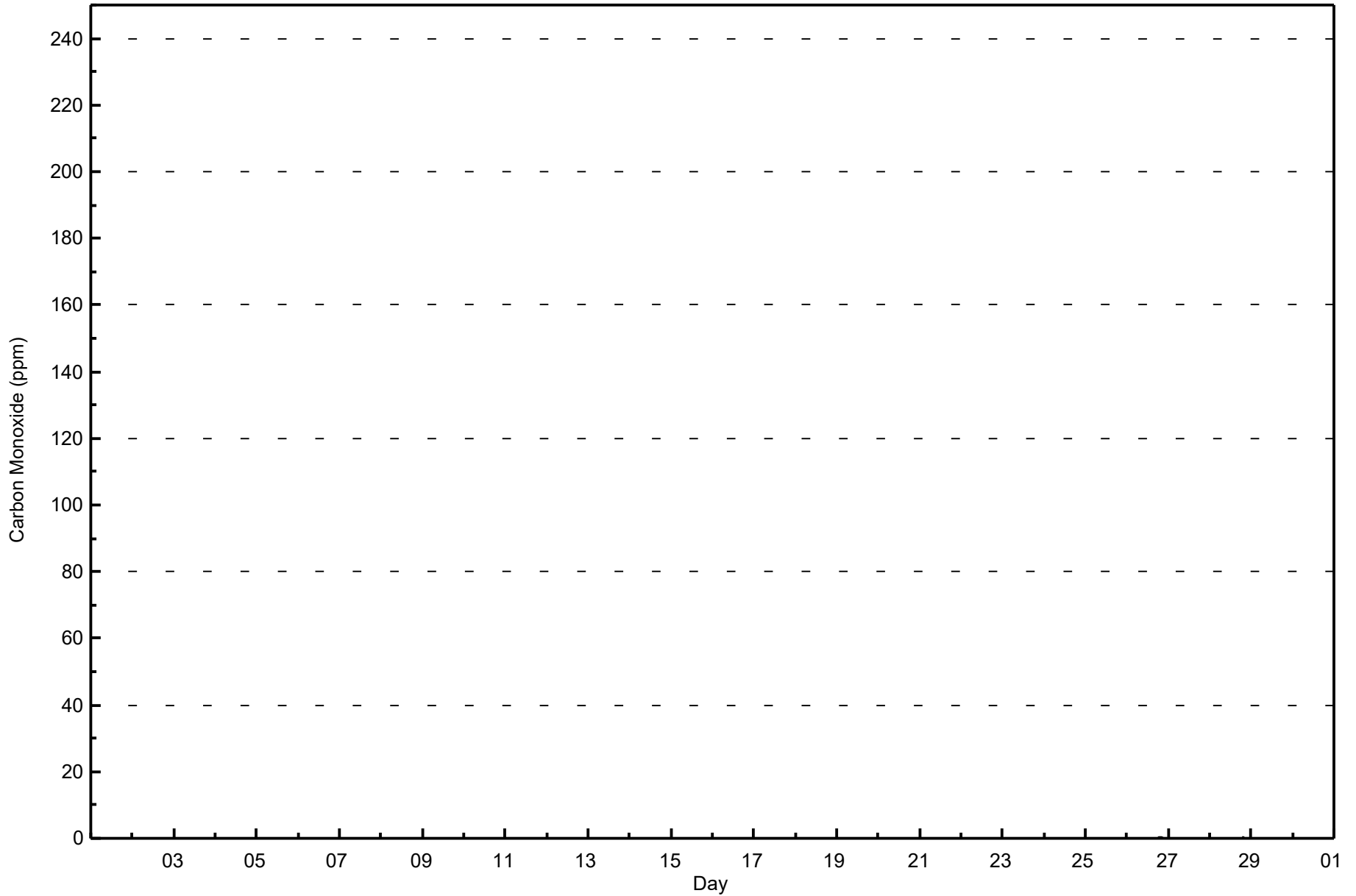






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Carbon Monoxide (CO) - ppm**  
**Stony Mountain - November 2024**







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Carbon Monoxide (CO) - ppm**  
**Stony Mountain - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	682	99.85	99.85
0.4 - 0.5	1	0.15	100.00
0.6 - 0.7	0	0.00	100.00
0.8 - 1.4	0	0.00	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Carbon Monoxide (CO) - ppm  
Stony Mountain - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.3	28	35	40	39	15	1	0	5	46	21	20	6	4	42	45	44	391
0.4 - 0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
0.6 - 0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.8 - 1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	28	35	40	39	15	1	0	5	46	21	20	6	4	42	45	45	392

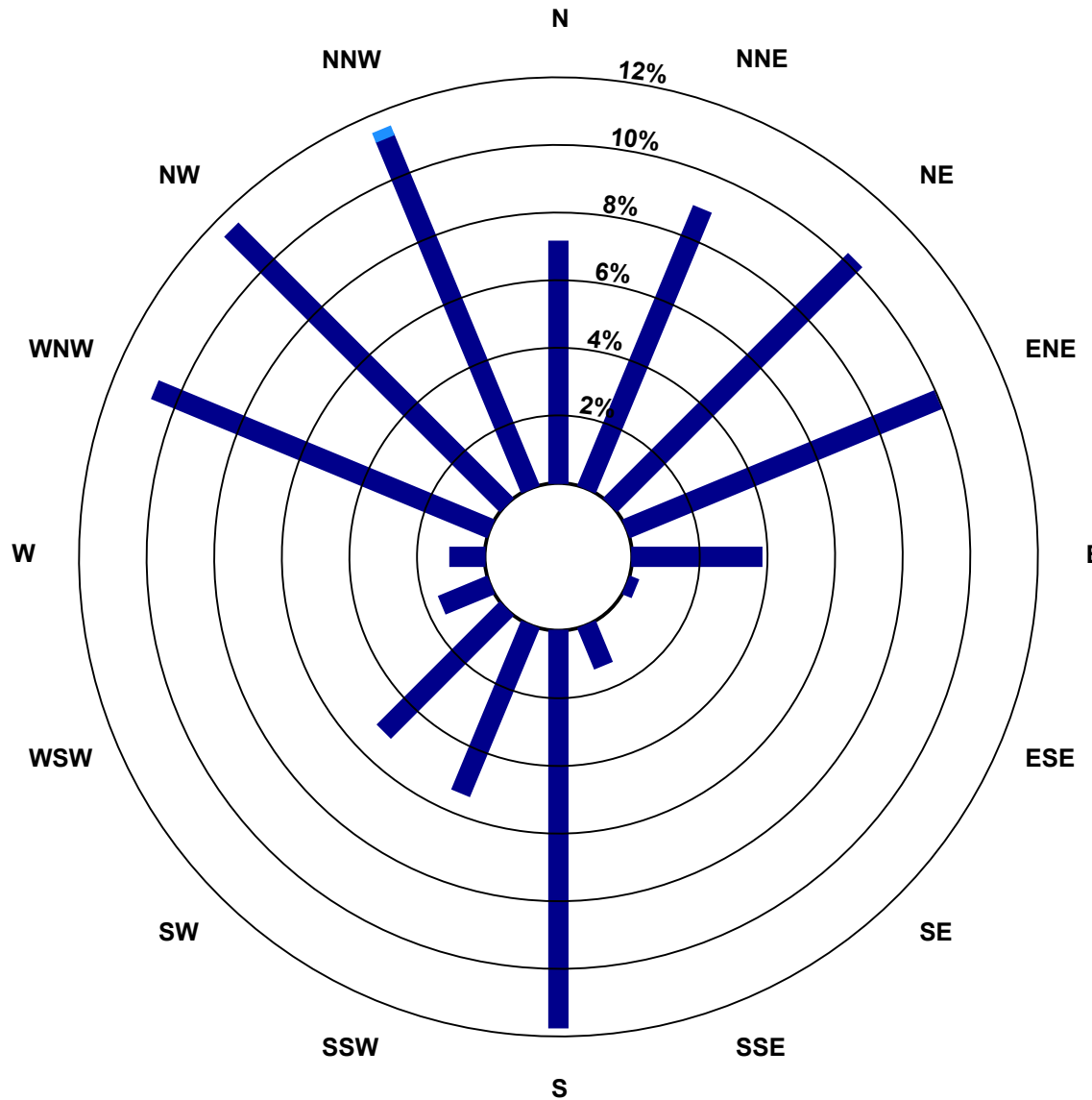
Total Number of Valid Hours: 392

Total Number of Hours: 720

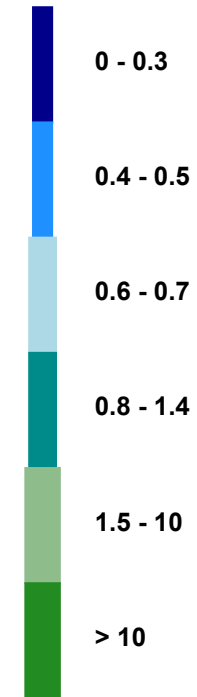


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Carbon Monoxide (CO) - ppm  
Stony Mountain



Classes (ppm)



Total Number of Valid Hours: 392

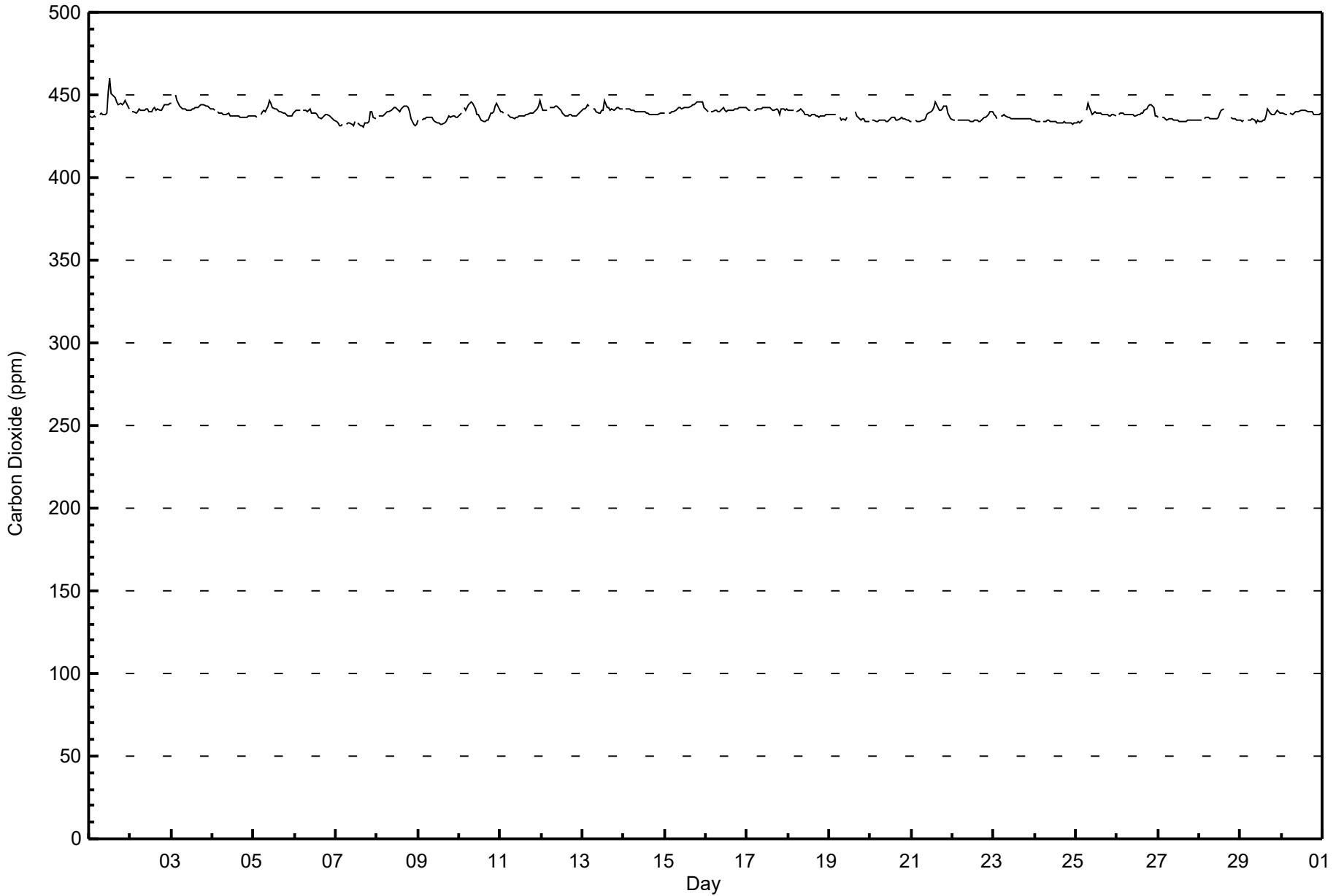


Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:																720				
Maximum Value: 460.5 ppm on Nov 1 13:00				Maximum Daily Average: 443.3 ppm on Nov 1		Hours of Data:																682				
Minimum Value: 430.8 ppm on Nov 7 17:00				Minimum Daily Average: 433.4 ppm on Nov 7		Hours of Missing Data:																38				
Maximum Diurnal Average: 439.1 ppm at hour 21				Minimum Diurnal Average: 437.8 ppm at hour 5		Hours of Calibration:																34				
Monthly Average: 438.50 ppm				Percentiles: P <sub>1</sub> = 431.7 P <sub>10</sub> = 434.2 Q <sub>1</sub> = 435.7 Median = 438.3 Q <sub>3</sub> = 441.0 P <sub>90</sub> = 442.5 P <sub>99</sub> = 446.9		Percent Operational Time:																99.4				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	437.0	436.9	436.4	437.1	436.8	Z	438.4	438.8	438.0	437.9	439.2	451.7	460.5	451.1	449.4	448.6	446.0	444.1	444.9	444.4	445.0	446.5	445.0	441.4	443.3	460.5
2-Nov	Z	440.2	439.9	439.1	439.7	441.8	441.0	441.0	440.4	441.5	441.1	439.7	439.9	441.2	442.1	440.7	441.3	440.5	440.9	442.7	443.9	444.5	444.2	444.9	441.4	444.9
3-Nov	445.0	Z	449.7	446.8	445.0	443.6	441.9	441.7	441.1	441.0	440.8	440.9	441.6	441.8	442.0	442.2	442.8	443.8	444.3	443.9	443.2	443.4	442.8	441.9	443.1	449.7
4-Nov	441.6	440.8	Z	439.5	439.3	438.6	438.0	438.3	438.0	438.6	437.1	436.9	437.2	437.3	437.1	436.9	436.3	436.1	436.1	436.4	436.5	437.0	437.0	437.2	437.7	441.6
5-Nov	437.2	437.4	436.9	Z	438.2	439.9	440.4	439.7	443.4	446.3	445.3	442.3	441.4	441.3	440.9	440.2	439.6	439.0	438.9	438.1	437.2	436.9	437.5	438.9	439.9	446.3
6-Nov	440.2	440.6	440.7	440.6	Z	441.0	440.4	439.5	440.5	441.2	439.3	439.0	438.8	438.0	436.6	435.9	436.1	437.0	437.9	438.0	437.7	436.8	435.6	434.4	438.5	441.2
7-Nov	433.5	432.8	431.4	431.2	432.2	Z	432.4	432.7	432.7	432.0	431.1	434.0	M	433.4	431.3	431.1	430.8	432.8	432.9	434.0	439.4	439.8	436.8	435.6	433.4	439.8
8-Nov	Z	437.4	437.1	437.6	438.2	438.9	439.5	439.6	440.3	441.7	442.3	442.5	440.6	439.5	441.2	442.7	443.4	443.2	442.5	439.9	435.9	431.8	431.5	432.6	439.1	443.4
9-Nov	434.4	Z	435.2	435.5	435.5	436.5	436.7	436.8	436.1	435.1	433.9	432.7	432.7	432.3	432.5	433.1	434.1	435.6	437.0	436.4	437.2	437.6	436.3	436.4	435.2	437.6
10-Nov	438.5	439.2	Z	442.3	440.9	444.2	444.6	446.2	444.9	441.3	438.1	438.2	436.1	434.9	434.1	433.8	434.6	434.8	438.7	439.2	440.2	443.0	445.0	441.4	439.8	446.2
11-Nov	440.1	439.4	439.0	Z	438.0	436.9	436.4	436.5	435.8	436.5	436.5	437.1	437.2	437.1	437.6	438.0	438.1	439.0	439.2	439.4	440.1	441.5	443.6	447.0	438.7	447.0
12-Nov	443.2	440.6	440.5	441.0	Z	442.1	442.5	442.5	442.9	442.8	442.3	440.6	439.3	438.5	437.5	437.3	437.9	438.2	437.5	437.6	437.6	438.1	438.8	440.0	440.0	443.2
13-Nov	441.2	441.7	442.5	444.4	442.8	Z	441.3	441.3	440.0	439.3	438.8	440.6	440.4	446.5	442.0	442.2	441.0	441.3	441.0	441.5	442.1	442.5	441.9	441.7	441.6	446.5
14-Nov	Z	441.8	441.3	441.1	441.0	440.6	440.3	440.0	440.1	440.0	439.8	440.0	440.1	439.2	438.7	438.1	438.0	437.9	437.7	437.9	438.2	438.9	438.7	438.6	439.5	441.8
15-Nov	439.0	Z	439.4	439.3	439.6	440.2	441.1	441.6	442.2	442.0	441.8	442.2	442.3	442.2	442.5	443.6	444.0	444.2	444.9	445.7	446.0	446.0	445.6	442.2	442.5	446.0
16-Nov	440.8	440.0	Z	439.7	439.8	440.3	440.4	439.7	439.7	441.9	442.0	440.9	439.9	440.5	441.0	440.4	440.7	441.4	441.6	442.2	442.8	442.6	442.2	442.1	441.0	442.8
17-Nov	441.5	440.9	441.0	Z	441.0	441.1	441.1	441.8	441.8	442.2	442.6	442.7	442.3	442.0	441.3	440.6	440.8	441.8	440.8	438.5	441.8	441.7	440.8	441.2	441.4	442.7
18-Nov	441.0	440.4	440.4	440.4	Z	440.2	440.7	441.2	441.0	439.6	438.6	438.3	437.5	437.1	438.0	437.8	437.4	437.5	436.8	437.2	437.4	437.6	438.1	438.3	438.8	441.2
19-Nov	438.3	438.2	438.0	438.0	438.1	Z	436.3	434.9	435.2	435.1	436.1	C	C	C	C	439.8	437.5	436.4	434.9	435.8	435.7	434.1	433.9	433.9	436.3	439.8
20-Nov	Z	435.0	434.9	433.8	433.8	434.5	434.8	434.8	434.6	433.7	433.5	434.6	436.8	436.3	436.0	435.2	435.1	435.5	436.0	436.0	435.4	434.7	434.4	434.3	435.0	436.8
21-Nov	434.1	Z	434.8	434.3	434.2	433.8	434.5	434.7	435.5	438.0	439.1	439.4	440.3	442.1	445.5	442.2	441.0	440.9	441.8	443.4	443.3	439.4	437.0	436.0	438.5	445.5
22-Nov	434.9	434.7	Z	434.6	434.5	434.6	434.4	435.1	434.7	434.4	434.0	434.3	434.2	434.5	435.1	434.1	434.1	434.9	436.0	436.8	437.4	438.0	440.0	440.2	435.5	440.2
23-Nov	438.4	437.7	435.9	Z	437.3	437.2	437.9	437.1	436.4	436.4	435.7	435.9	436.0	435.8	435.8	435.6	435.7	435.6	435.6	435.7	435.4	435.7	435.1	435.1	436.2	438.4
24-Nov	434.8	434.3	434.0	434.0	Z	434.1	434.3	434.4	434.5	434.3	433.9	433.7	433.6	433.4	433.3	433.4	433.4	433.6	433.3	433.3	433.4	433.1	432.6	432.8	433.7	434.8
25-Nov	433.1	433.6	433.4	434.2	434.4	Z	440.5	444.7	442.2	438.6	439.3	439.8	438.6	439.2	438.6	437.7	438.1	438.5	438.0	437.7	437.7	438.4	438.2	437.4	437.9	444.7
26-Nov	Z	437.7	438.7	438.8	438.6	438.2	438.3	438.1	438.1	437.7	437.6	437.8	438.4	438.8	439.1	440.4	441.4	443.2	444.1	444.4	442.2	437.7	437.1	439.3	444.4	437.1
27-Nov	436.4	Z	436.7	436.1	435.5	435.0	435.3	435.4	435.3	435.1	434.5	435.1	434.2	434.2	434.2	434.2	434.3	434.6	434.7	434.8	434.6	434.7	434.5	434.6	435.0	436.7
28-Nov	434.8	434.9	Z	435.4	436.1	436.2	435.8	435.7	435.8	435.8	435.4	436.4	439.2	440.9	441.4	M	M	M	436.5	435.7	435.5	435.2	435.0	434.7	436.3	441.4
29-Nov	434.5	434.2	434.3	Z	435.1	435.1	435.1	435.2	434.4	433.4	434.4	433.6	433.8	434.4	434.8	437.3	441.3	439.0	437.8	438.0	438.6	440.5	439.4	438.7	436.2	441.3
30-Nov	438.7	438.8	438.3	438.3	Z	439.0	438.5	438.9	439.5	439.9	440.1	440.9	440.7	440.6	441.0	439.5	440.2	440.0	439.5	438.5	438.3	438.5	437.8	439.0	439.3	441.0
438.1 438.0 438.0 438.1 437.8 438.6 438.4 438.6 438.5 438.5 438.1 438.7 439.0 438.7 438.6 438.3 438.4 438.6 438.7 438.8 439.1 439.0 438.6 438.3																								Diurnal Average		
445.0 441.8 449.7 446.8 445.0 444.2 444.6 446.2 444.9 446.3 445.3 451.7 460.5 451.1 449.4 448.6 446.0 444.2 444.9 445.7 446.0 446.5 445.6 447.0																								Diurnal Maximum		
Z - zerspan		C - Calibration				M - Maintenance																				



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Carbon Dioxide (CO<sub>2</sub>) - ppm**  
**Stony Mountain - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Carbon Dioxide (CO<sub>2</sub>) - ppm  
Stony Mountain - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
400 - 420	0	0.00	0.00
420 - 440	479	70.23	70.23
440 - 460	202	29.62	99.85
460 - 480	1	0.15	100.00
480 - 500	0	0.00	100.00
> 500	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Carbon Dioxide (CO<sub>2</sub>) - ppm  
Stony Mountain - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
400 - 420	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420 - 440	24	33	36	25	13	1	0	4	24	10	4	3	1	34	43	38	293
440 - 460	1	0	4	15	2	0	0	0	22	11	17	3	3	10	1	6	95
460 - 480	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480 - 500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	25	33	40	40	15	1	0	4	46	21	21	6	4	44	44	44	388

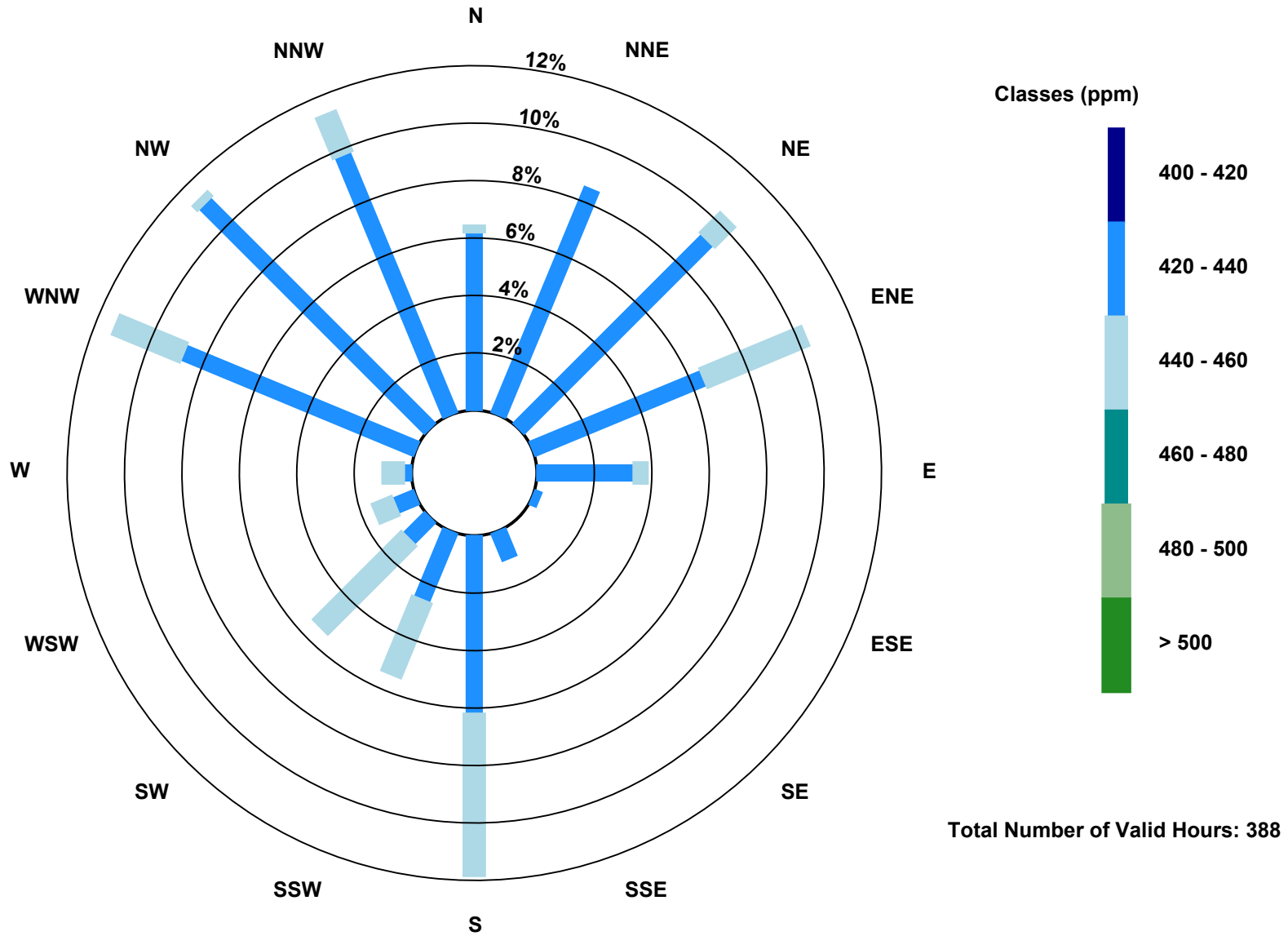
Total Number of Valid Hours: 388

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Carbon Dioxide (CO<sub>2</sub>) - ppm  
Stony Mountain







**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

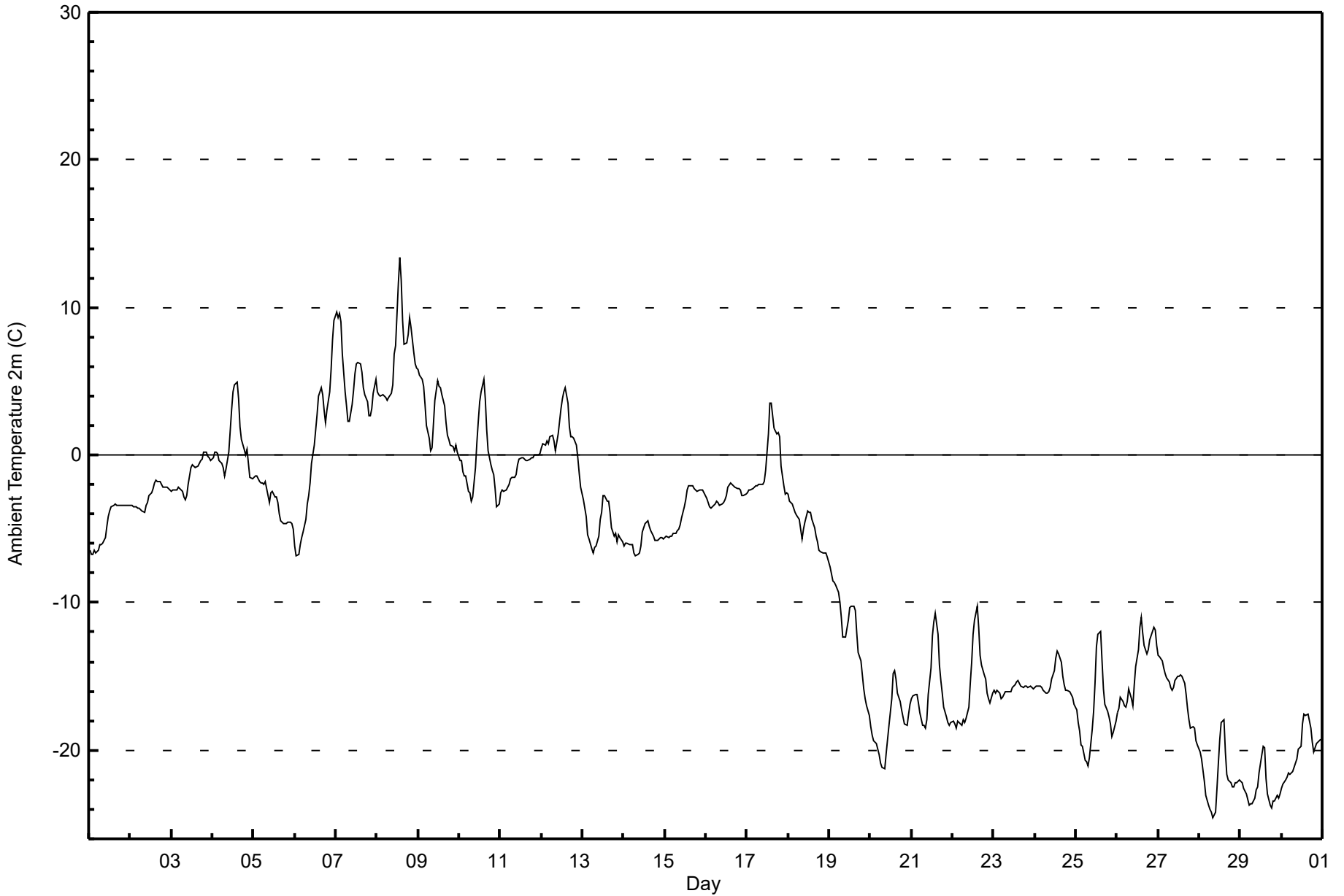
**Ambient Temperature 2m (AT2) - C**  
**Stony Mountain - November 2024**

Maximum Value: 13.3 C on Nov 8 14:00		Maximum Daily Average: 6.7 C on Nov 8		Hours in Service: 720																																												
Minimum Value: -24.6 C on Nov 28 09:00		Minimum Daily Average: -22.6 C on Nov 29		Hours of Data: 720																																												
Maximum Diurnal Average: -5.0 C at hour 15		Minimum Diurnal Average: -9.0 C at hour 9		Hours of Missing Data: 0																																												
Monthly Average: -7.49 C		Percentiles: P <sub>1</sub> = -23.7 P <sub>10</sub> = -19.6 Q <sub>1</sub> = -15.9 Median = -4.9 Q <sub>3</sub> = -1.2 P <sub>90</sub> = 3.4 P <sub>99</sub> = 9.1		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-6.5	-6.8	-6.7	-6.5	-6.6	-6.4	-6.0	-6.1	-5.9	-5.6	-4.9	-4.2	-3.8	-3.5	-3.4	-3.3	-3.4	-3.4	-3.4	-3.4	-3.4	-3.4	-3.4	-3.4	-4.7	-3.3																						
2-Nov	-3.4	-3.4	-3.5	-3.5	-3.6	-3.6	-3.7	-3.8	-3.8	-3.4	-3.2	-2.7	-2.6	-2.3	-1.8	-1.7	-1.8	-1.8	-2.0	-2.1	-2.1	-2.2	-2.3	-2.3	-2.8	-1.7																						
3-Nov	-2.5	-2.3	-2.3	-2.4	-2.2	-2.3	-2.5	-2.8	-3.0	-2.8	-1.9	-0.8	-0.7	-0.8	-0.8	-0.7	-0.6	-0.4	-0.3	0.2	0.2	-0.1	-0.2	-0.3	-1.3	0.2																						
4-Nov	-0.2	0.2	0.2	0.1	-0.3	-0.6	-0.8	-1.4	-0.9	0.2	1.6	3.1	4.3	4.7	4.9	3.8	1.9	1.1	0.4	0.0	0.4	-0.6	-1.5	-1.6	0.8	4.9																						
5-Nov	-1.5	-1.4	-1.5	-1.8	-1.9	-1.9	-2.0	-1.8	-2.7	-3.2	-2.5	-2.4	-2.8	-2.8	-3.2	-4.0	-4.5	-4.7	-4.7	-4.6	-4.6	-4.6	-4.6	-5.0	-3.1	-1.4																						
6-Nov	-6.1	-6.8	-6.8	-6.1	-5.6	-5.2	-4.3	-3.3	-2.7	-1.9	-0.6	0.7	1.8	2.8	4.0	4.5	4.1	3.0	2.2	3.0	4.2	5.8	7.8	9.2	0.2	9.2																						
7-Nov	9.7	9.3	9.6	9.0	6.8	4.3	3.4	2.3	2.3	3.4	4.3	5.5	6.2	6.2	6.1	5.6	4.6	4.1	3.6	2.7	2.6	3.2	4.2	5.1	5.2	9.7																						
8-Nov	4.3	4.1	4.0	4.1	4.0	3.9	3.7	3.9	4.2	4.7	6.9	7.4	11.6	13.3	11.9	9.1	7.5	7.6	8.1	9.3	8.6	7.0	6.2	5.9	6.7	13.3																						
9-Nov	5.8	5.5	5.1	4.6	3.4	2.0	1.1	0.3	0.5	2.1	3.7	5.1	4.7	4.5	4.1	3.3	2.2	1.3	1.0	0.7	0.6	0.3	0.6	0.2	2.6	5.8																						
10-Nov	-0.4	-0.4	-1.2	-1.4	-1.4	-2.5	-2.6	-3.1	-2.8	-0.8	0.8	2.3	3.6	4.2	5.2	3.8	1.7	0.3	-0.7	-1.0	-1.3	-2.3	-3.5	-3.3	-0.3	5.2																						
11-Nov	-2.5	-2.4	-2.5	-2.4	-2.2	-2.0	-1.7	-1.5	-1.6	-1.4	-0.7	-0.3	-0.2	-0.2	-0.3	-0.4	-0.4	-0.3	-0.2	-0.1	0.0	0.0	0.0	0.1	-1.0	0.1																						
12-Nov	0.5	0.7	0.7	0.9	0.8	1.3	1.3	0.9	0.3	0.9	1.5	3.1	3.8	4.2	4.5	3.5	1.9	1.2	1.2	1.2	0.7	-0.2	-1.2	-2.2	1.3	4.5																						
13-Nov	-3.0	-3.6	-4.2	-5.4	-5.7	-6.3	-6.7	-6.2	-6.1	-5.5	-4.4	-3.9	-2.7	-2.8	-3.1	-3.1	-3.9	-4.9	-5.5	-5.3	-5.8	-5.4	-5.6	-5.9	-4.8	-2.7																						
14-Nov	-6.1	-6.0	-6.0	-6.0	-6.1	-6.1	-6.6	-6.8	-6.7	-6.7	-6.1	-5.2	-4.6	-4.5	-4.4	-4.8	-5.1	-5.5	-5.7	-5.8	-5.7	-5.6	-5.6	-5.7	-5.7	-4.4																						
15-Nov	-5.6	-5.5	-5.6	-5.5	-5.5	-5.3	-5.3	-5.2	-5.1	-4.8	-4.2	-3.5	-3.0	-2.4	-2.1	-2.0	-2.1	-2.2	-2.3	-2.4	-2.4	-2.4	-2.4	-2.6	-3.7	-2.0																						
16-Nov	-2.9	-3.2	-3.6	-3.6	-3.5	-3.3	-3.1	-3.2	-3.4	-3.4	-3.2	-3.1	-2.7	-2.2	-1.9	-2.0	-2.1	-2.2	-2.3	-2.3	-2.4	-2.7	-2.8	-2.7	-2.8	-1.9																						
17-Nov	-2.6	-2.4	-2.4	-2.3	-2.1	-2.1	-2.1	-2.0	-2.0	-2.0	-1.8	-1.1	1.5	3.5	3.5	2.6	1.8	1.4	1.6	1.2	-0.7	-2.1	-2.7	-2.5	-0.7	3.5																						
18-Nov	-2.6	-3.1	-3.3	-3.6	-3.9	-4.1	-4.3	-5.0	-5.7	-5.0	-4.5	-3.8	-3.8	-3.9	-4.3	-5.0	-5.5	-5.9	-6.4	-6.6	-6.7	-6.6	-6.6	-7.0	-4.9	-2.6																						
19-Nov	-7.6	-8.1	-8.5	-8.6	-8.9	-9.3	-10.0	-11.0	-12.4	-12.3	-11.8	-11.2	-10.4	-10.2	-10.2	-10.6	-12.0	-13.4	-14.0	-14.9	-15.9	-16.5	-17.0	-17.7	-11.8	-7.6																						
20-Nov	-18.4	-19.0	-19.3	-19.6	-19.9	-20.3	-20.9	-21.2	-21.3	-20.2	-19.3	-18.3	-16.5	-14.8	-14.7	-15.2	-16.1	-16.7	-17.2	-17.8	-18.2	-18.3	-17.6	-16.9	-18.2	-14.7																						
21-Nov	-16.5	-16.4	-16.2	-16.2	-16.8	-17.5	-18.3	-18.3	-18.5	-17.9	-16.2	-14.4	-12.3	-11.3	-10.7	-12.1	-14.2	-15.3	-16.1	-17.1	-17.8	-18.1	-18.3	-18.1	-16.0	-10.7																						
22-Nov	-18.1	-18.2	-18.5	-18.0	-18.1	-18.3	-17.9	-18.1	-17.9	-17.1	-15.4	-14.0	-12.1	-11.2	-10.2	-11.7	-13.6	-14.2	-14.9	-15.2	-16.1	-16.5	-16.8	-16.2	-15.8	-10.2																						
23-Nov	-15.9	-16.1	-16.0	-16.2	-16.5	-16.4	-16.3	-16.0	-16.0	-16.0	-16.0	-15.7	-15.6	-15.4	-15.3	-15.5	-15.7	-15.8	-15.7	-15.6	-15.7	-15.7	-15.8	-15.8	-15.9	-15.3																						
24-Nov	-15.8	-15.7	-15.6	-15.7	-15.7	-15.9	-16.1	-16.2	-16.1	-15.7	-15.2	-14.6	-13.7	-13.3	-13.4	-14.1	-15.0	-15.6	-15.9	-15.9	-16.0	-16.2	-16.4	-16.9	-15.4	-13.3																						
25-Nov	-17.3	-18.1	-18.7	-19.6	-19.7	-20.7	-20.8	-21.0	-20.5	-18.6	-17.4	-15.5	-13.0	-12.2	-11.9	-13.9	-15.8	-16.8	-17.4	-17.8	-18.2	-19.0	-18.7	-18.0	-17.5	-11.9																						
26-Nov	-17.5	-17.2	-16.4	-16.7	-17.0	-17.0	-16.7	-15.9	-16.5	-17.0	-15.5	-14.3	-13.2	-11.7	-11.0	-12.0	-12.9	-13.5	-13.2	-12.6	-12.3	-11.7	-11.9	-12.9	-14.4	-11.0																						
27-Nov	-13.6	-13.7	-14.0	-14.4	-14.8	-15.1	-15.3	-15.7	-16.0	-15.7	-15.2	-15.0	-14.9	-14.9	-15.0	-15.4	-16.2	-17.2	-17.9	-18.5	-18.4	-18.5	-19.3	-19.6	-16.0	-13.6																						
28-Nov	-20.1	-20.6	-21.3	-22.1	-23.0	-23.7	-24.0	-24.2	-24.6	-24.2	-22.6	-20.9	-19.2	-18.1	-18.0	-20.1	-21.7	-22.1	-22.2	-22.5	-22.5	-22.2	-22.2	-22.0	-21.8	-18.0																						
29-Nov	-22.1	-22.2	-22.6	-23.0	-23.4	-23.7	-23.6	-23.6	-23.3	-22.6	-22.5	-21.5	-20.3	-19.8	-19.9	-21.9	-22.9	-23.7	-23.9	-23.4	-23.5	-23.0	-23.3	-23.0	-22.6	-19.8																						
30-Nov	-22.6	-22.3	-22.0	-21.8	-21.5	-21.6	-21.4	-21.2	-20.9	-20.6	-20.0	-19.7	-18.2	-17.6	-17.7	-17.5	-18.0	-18.5	-19.4	-20.1	-19.5	-19.5	-19.4	-19.3	-20.0	-17.5																						
																								-7.7	-7.8	-8.0	-8.1	-8.4	-8.7	-8.8	-8.9	-9.0	-8.4	-7.5	-6.6	-5.6	-5.1	-5.0	-5.7	-6.6	-7.1	-7.4	-7.6	-7.7	-7.9	-8.0	-8.0	Diurnal Average
																								9.7	9.3	9.6	9.0	6.8	4.3	3.7	3.9	4.2	4.7	6.9	7.4	11.6	13.3	11.9	9.1	7.5	7.6	8.1	9.3	8.6	7.0	7.8	9.2	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 2m (AT2) - C**  
**Stony Mountain - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Stony Mountain - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	63	8.75	8.75
-20 - 0	517	71.81	80.56
0 - 10	137	19.03	99.58
10 - 20	3	0.42	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



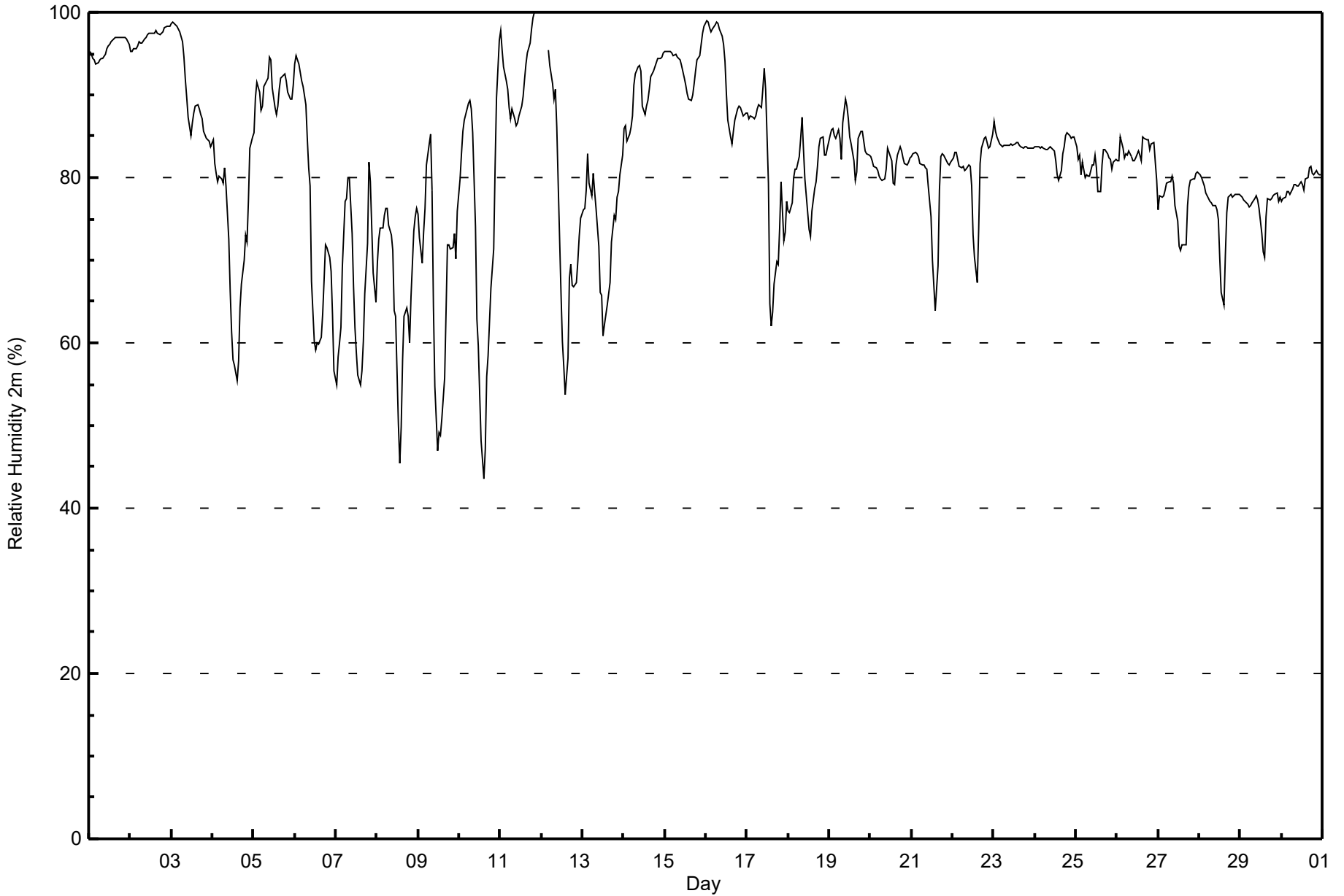
**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Relative Humidity 2m (RH2) - %**  
**Stony Mountain - November 2024**

Maximum Value: 100.0 % on Nov 11 21:00	Maximum Daily Average: 97.0 % on Nov 2	Hours in Service: 720
Minimum Value: 43.5 % on Nov 10 15:00	Minimum Daily Average: 67.0 % on Nov 8	Hours of Data: 713
Maximum Diurnal Average: 85.3 % at hour 7	Minimum Diurnal Average: 73.4 % at hour 15	Hours of Missing Data: 7
Monthly Average: 81.34 %	Percentiles: P <sub>1</sub> = 49.9 P <sub>10</sub> = 66.6 Q <sub>1</sub> = 77.0 Median = 82.3 Q <sub>3</sub> = 88.3 P <sub>90</sub> = 95.2 P <sub>99</sub> = 98.6	Hours of Calibration: 0
		Percent Operational Time: 99.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	95.3	94.9	94.4	94.3	93.7	93.8	94.2	94.4	94.4	95.0	95.6	95.9	96.2	96.5	96.7	97.0	97.0	97.0	97.0	96.9	97.0	96.9	96.7	96.0	95.7	97.0																							
2-Nov	95.3	95.2	95.5	95.5	95.9	96.5	96.3	96.2	96.7	97.0	97.2	97.4	97.4	97.4	97.5	97.7	97.4	97.3	97.5	97.7	98.2	98.2	98.3	98.4	97.0	98.4																							
3-Nov	98.6	98.8	98.5	98.2	98.0	97.7	96.5	94.5	91.9	89.7	87.3	85.1	86.7	87.8	88.6	88.7	88.3	87.7	87.2	85.7	84.7	84.7	84.4	83.7	90.5	98.8																							
4-Nov	84.6	81.7	80.4	79.5	80.2	79.8	79.3	81.2	79.0	72.6	66.3	61.3	57.9	57.4	55.4	57.8	64.3	67.1	70.0	73.0	72.3	77.1	83.5	84.8	72.8	84.8																							
5-Nov	85.5	89.6	91.5	90.3	88.1	88.6	91.1	91.4	92.1	94.7	94.3	90.9	88.5	87.7	88.7	90.7	92.0	92.3	92.6	91.7	90.3	89.6	89.4	91.1	90.5	94.7																							
6-Nov	93.7	94.7	93.8	92.8	91.8	91.1	88.8	84.8	81.1	78.9	67.5	60.1	59.1	60.1	59.8	60.6	63.5	67.6	71.8	71.6	70.3	68.6	63.3	56.7	74.7	94.7																							
7-Nov	54.8	58.3	60.0	61.9	69.2	77.1	77.4	80.0	80.0	73.2	66.8	61.8	58.7	56.0	55.0	56.6	60.2	65.9	72.0	81.9	79.5	73.9	68.5	64.8	67.2	81.9																							
8-Nov	69.7	72.6	73.8	73.9	75.4	76.2	76.3	74.3	73.1	71.2	63.8	63.3	50.2	45.5	49.8	58.0	63.3	64.2	63.2	60.0	65.5	73.5	75.2	76.2	67.0	76.3																							
9-Nov	75.7	72.8	69.6	73.4	76.3	81.5	84.0	85.2	78.5	64.4	54.7	46.9	49.1	48.8	50.8	55.7	63.8	71.8	71.8	71.3	71.6	73.3	70.2	76.0	68.2	85.2																							
10-Nov	79.9	82.9	85.7	86.9	87.7	89.0	89.2	88.3	85.5	74.2	62.9	59.6	53.7	48.1	43.5	47.1	55.9	58.5	66.5	69.0	71.4	81.3	89.6	96.6	73.0	96.6																							
11-Nov	97.7	95.4	93.4	91.8	90.6	88.4	87.2	88.4	87.1	86.2	86.6	87.4	88.7	89.9	91.8	93.8	95.2	96.3	97.9	99.4	100.0	OR	OR	OR	92.1	100.0																							
12-Nov	OR	OR	OR	OR	95.3	93.5	91.3	89.4	90.7	86.1	79.3	66.1	60.2	57.1	53.7	58.1	67.9	69.5	66.9	66.7	67.3	69.8	73.0	75.1	73.8	95.3																							
13-Nov	76.2	76.3	78.4	82.9	79.3	77.9	80.5	78.3	76.2	71.6	66.1	65.7	60.9	62.2	64.7	65.9	67.3	72.3	75.5	75.0	77.7	78.3	80.4	82.8	73.8	82.9																							
14-Nov	85.9	86.3	84.4	85.3	86.2	87.4	91.1	92.5	93.4	93.6	92.8	88.7	87.7	88.6	89.3	90.8	92.2	92.9	93.3	94.0	94.5	94.4	94.5	95.0	90.6	95.0																							
15-Nov	95.2	95.2	95.3	95.2	95.1	94.7	94.9	94.6	94.5	94.2	93.5	92.0	91.2	90.1	89.4	89.3	90.0	91.4	93.0	94.2	94.8	96.2	97.5	98.3	93.7	98.3																							
16-Nov	99.0	98.9	98.1	97.6	98.0	98.4	98.8	98.7	98.0	97.2	96.0	94.0	90.2	86.9	84.9	84.1	85.5	86.9	88.3	88.6	88.5	87.9	87.4	87.8	92.5	99.0																							
17-Nov	87.8	87.1	87.4	87.3	87.1	87.4	88.4	88.8	88.4	90.7	93.3	90.7	79.2	64.7	62.0	63.7	67.2	69.9	69.5	74.0	79.4	72.4	73.4	77.1	79.9	93.3																							
18-Nov	75.9	75.7	77.0	79.9	81.0	81.1	82.5	84.7	87.4	83.5	79.9	75.7	73.7	72.9	75.9	78.6	79.5	81.4	83.8	84.7	84.9	82.7	82.8	83.5	80.4	87.4																							
19-Nov	85.0	85.7	85.9	85.1	84.8	85.7	84.7	82.2	86.6	89.4	88.6	87.2	84.8	84.1	82.0	79.6	80.6	84.7	85.5	85.6	84.5	83.2	82.9	82.7	84.6	89.4																							
20-Nov	82.5	82.0	81.4	81.2	80.9	80.3	79.8	79.6	79.8	81.0	83.5	83.1	82.0	79.3	79.1	81.5	82.6	83.7	83.3	82.3	81.8	81.6	81.9	82.4	81.5	83.7																							
21-Nov	82.5	82.9	83.1	82.8	82.5	81.7	81.5	81.5	81.2	81.0	79.0	75.3	70.1	66.9	64.0	69.3	78.4	82.6	82.9	82.7	82.0	81.7	81.5	81.8	79.1	83.1																							
22-Nov	82.4	83.1	83.1	82.2	81.3	81.2	81.4	80.9	81.1	81.5	81.4	79.1	73.0	70.3	67.2	73.8	81.7	83.5	84.8	85.0	84.2	83.6	83.8	85.3	80.6	85.3																							
23-Nov	86.7	85.6	84.9	84.1	83.9	83.8	83.9	84.0	83.9	83.8	84.0	83.8	84.0	84.2	84.2	83.9	83.7	83.6	83.7	83.7	83.6	83.6	83.5	83.6	84.1	86.7																							
24-Nov	83.7	83.7	83.8	83.5	83.7	83.5	83.4	83.5	83.5	83.7	83.5	83.2	82.0	80.3	79.6	80.9	82.9	83.8	85.0	85.3	85.0	84.7	85.0	84.8	83.4	85.3																							
25-Nov	83.7	82.3	82.6	80.3	81.9	80.0	80.4	80.1	80.2	81.4	81.5	82.8	81.2	78.3	78.2	81.5	83.5	83.4	83.0	82.4	82.2	81.0	81.9	82.2	81.5	83.7																							
26-Nov	82.1	82.0	84.8	83.5	82.4	82.9	82.7	83.2	82.5	82.0	82.1	82.4	83.2	82.7	82.1	84.9	84.8	84.6	84.6	83.4	84.1	84.3	81.8	79.6	83.0	84.9																							
27-Nov	76.1	77.7	77.7	77.7	78.4	79.4	79.6	79.5	80.1	79.3	76.7	74.8	71.7	71.2	71.8	71.9	71.9	76.6	78.7	79.6	79.8	79.8	80.5	80.7	77.1	80.7																							
28-Nov	80.4	79.9	79.6	78.9	78.1	77.5	77.2	77.0	76.6	76.6	76.1	75.0	70.2	66.2	64.6	70.6	75.8	77.6	77.9	77.7	77.8	77.9	78.0	78.0	76.0	80.4																							
29-Nov	77.8	77.7	77.3	77.0	76.8	76.5	76.6	76.9	77.4	77.8	77.3	76.2	73.3	71.0	70.4	75.2	77.5	77.3	77.4	77.9	77.9	78.1	77.1	77.7	76.5	78.1																							
30-Nov	77.2	77.5	77.7	78.2	78.4	78.0	78.7	79.1	79.2	79.0	78.9	79.5	79.2	78.4	79.9	80.0	81.2	81.4	80.5	80.3	80.9	80.5	80.3	80.4	79.4	81.4																							
																								83.8	84.0	84.1	84.2	84.7	85.0	85.3	85.1	84.7	83.0	80.6	78.2	75.5	73.7	73.4	75.6	78.5	80.4	81.5	82.0	82.4	82.0	82.3	82.9	Diurnal Average	
																								99.0	98.9	98.5	98.2	98.0	98.4	98.8	98.7	98.0	97.2	97.2	97.4	97.4	97.4	97.4	97.5	97.7	97.4	97.3	97.9	99.4	100.0	98.2	98.3	98.4	Diurnal Maximum

OR - Out of Range



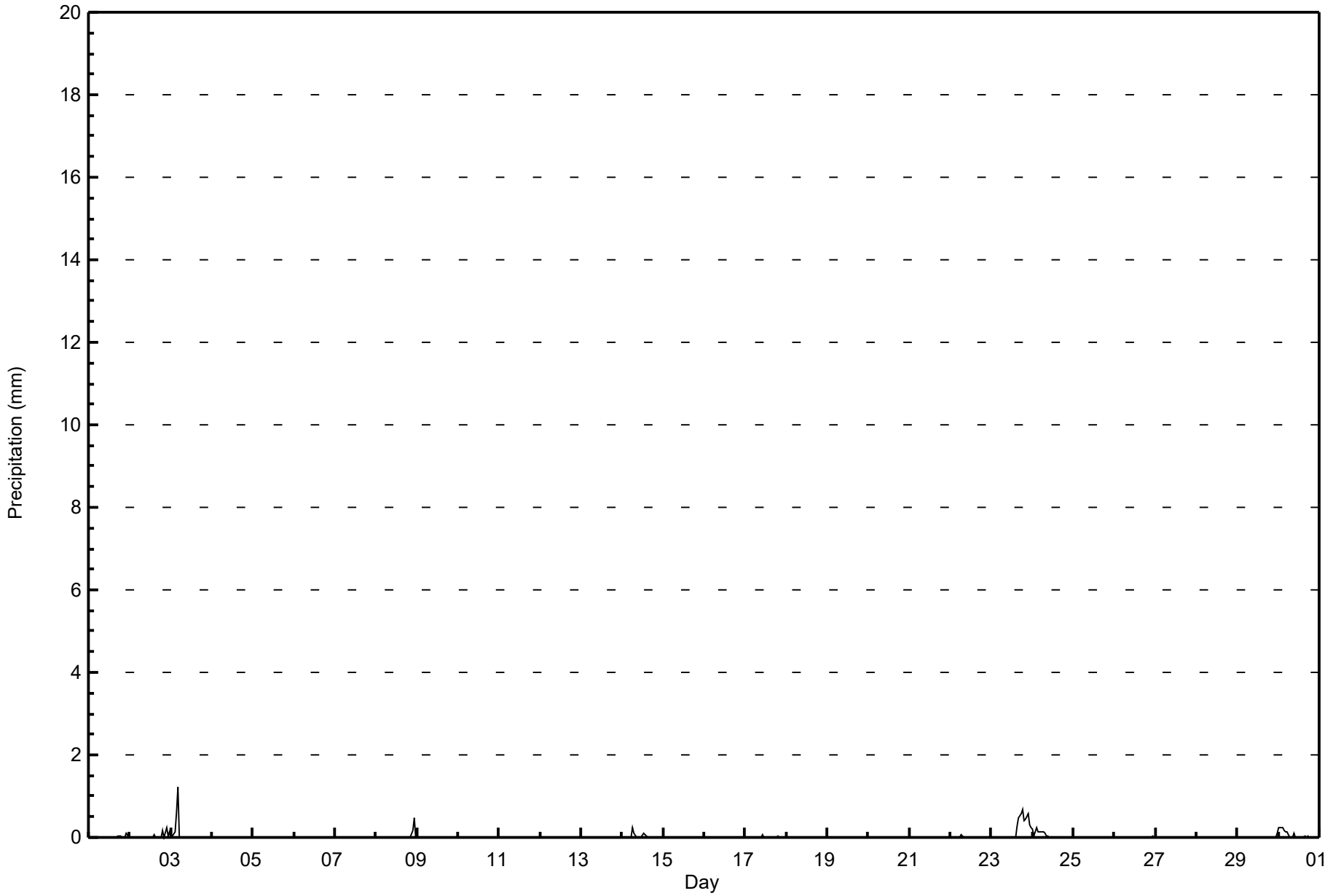


Maximum Value: 1.2 mm on Nov 3 05:00		Maximum Daily Total: 3.9 mm on Nov 23		Hours in Service: 720																						
Minimum Value: 0.0 mm on Nov 1 01:00		Minimum Daily Total: 0.0 mm on Nov 4		Hours of Data: 695																						
Maximum Diurnal Total: 1.5 mm at hour 5		Minimum Diurnal Total: 0.0 mm at hour 12		Hours of Missing Data: 25																						
Monthly Total: 10.80 mm		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.0 P <sub>99</sub> = 0.4		Hours of Calibration: 0																						
				Percent Operational Time: 96.5																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.2	0.1
2-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.1	0.1	0.6	0.2
3-Nov	0.0	0.1	0.1	0.6	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	1.2
4-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	0.0
8-Nov	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.0	--	0.5
9-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DF	DF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.2
15-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1
18-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
23-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.6	0.7	0.4	0.4	0.6	0.3	0.3	3.9	0.7	
24-Nov	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.2	
25-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	
27-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
30-Nov	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.2	0.2
																								Diurnal Average		
																								Diurnal Maximum		
DF - DAS Failure																										



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Precipitation (PC) - mm**  
**Stony Mountain - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Precipitation (PC) - mm**  
**Stony Mountain - November 2024**

<b>Concentration Ranges (mm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	686	98.71	98.71
0.4 - 0.5	4	0.58	99.28
0.6 - 0.7	4	0.58	99.86
0.8 - 1.4	1	0.14	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 695

Total Number of Hours: 720



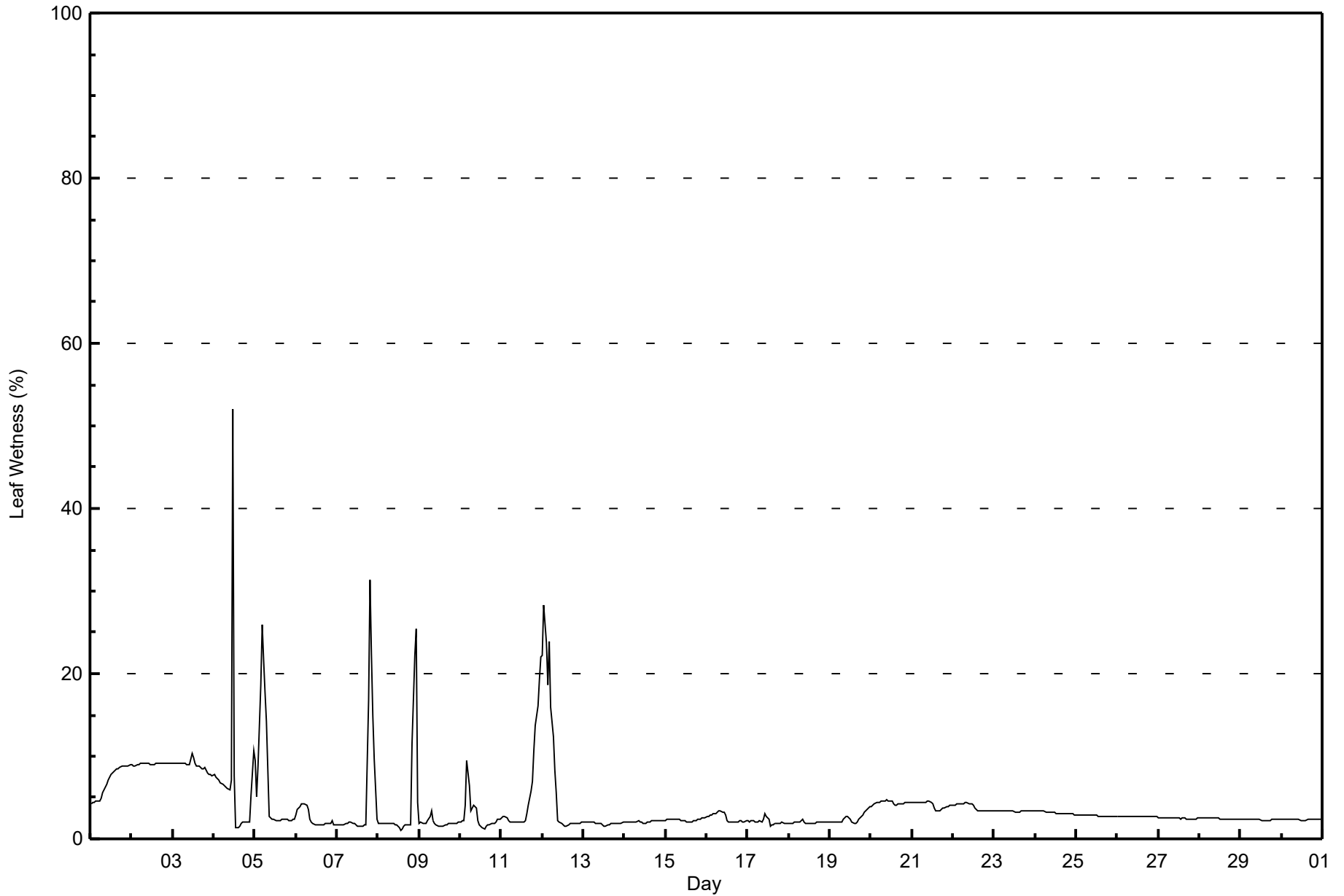


Maximum Value: 52.0 % on Nov 4 12:00      Maximum Daily Average: 9.1 % on Nov 2																				Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0							
Minimum Value: 1.0 % on Nov 8 14:00      Minimum Daily Average: 1.9 % on Nov 13 Maximum Diurnal Average: 5.0 % at hour 5      Minimum Diurnal Average: 2.9 % at hour 15 Monthly Average: 3.92 %      Percentiles: $P_1 = 1.5$ $P_{10} = 1.9$ $Q_1 = 2.0$ Median = 2.5 $Q_3 = 4.0$ $P_{90} = 8.8$ $P_{99} = 22.3$																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	4.2	4.4	4.5	4.5	4.5	4.5	5.0	5.5	5.9	6.6	7.2	7.5	7.8	8.0	8.3	8.4	8.5	8.7	8.8	8.8	8.8	8.9	8.9	8.9	7.0	8.9	
2-Nov	8.9	8.9	8.9	8.9	9.0	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.0	8.9	9.1	9.2	9.1	9.1	9.1	9.1	9.1	9.1	9.2	9.2	9.1	9.1	9.2
3-Nov	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.0	9.0	10.3	9.8	9.2	8.9	8.7	8.6	8.6	8.5	8.6	8.0	7.9	7.8	7.7	8.9	10.3	
4-Nov	7.7	7.5	7.3	7.1	6.8	6.6	6.4	6.3	6.2	6.0	7.2	52.0	7.6	1.4	1.3	1.5	1.9	2.0	2.0	2.0	2.0	2.1	5.3	10.6	7.0	52.0	
5-Nov	9.4	5.1	8.9	18.6	25.9	21.7	17.9	14.3	2.7	2.6	2.4	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	6.6	25.9	
6-Nov	3.0	3.6	4.0	4.2	4.2	4.2	4.0	3.5	2.4	2.0	1.9	1.8	1.7	1.7	1.6	1.7	1.8	1.8	1.9	1.8	1.8	2.3	1.7	1.7	2.5	4.2	
7-Nov	1.7	1.7	1.7	1.7	1.8	1.9	1.9	2.1	2.0	1.9	1.9	1.7	1.6	1.5	1.5	1.6	1.6	1.7	16.8	31.3	22.3	14.9	9.7	2.4	5.4	31.3	
8-Nov	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.7	1.7	1.3	1.0	1.2	1.5	1.6	1.7	1.7	1.6	11.6	22.3	25.3	4.4	4.1	25.3	
9-Nov	1.9	2.0	1.8	1.8	1.9	2.2	2.6	3.5	2.2	1.9	1.7	1.6	1.5	1.5	1.5	1.6	1.7	1.8	1.9	1.9	1.9	1.9	1.9	2.0	1.9	3.5	
10-Nov	2.0	2.1	2.2	4.1	9.5	6.5	3.4	3.8	4.1	3.7	2.2	1.8	1.6	1.3	1.2	1.5	1.7	1.8	1.8	1.9	1.9	2.0	2.3	2.4	2.8	9.5	
11-Nov	2.6	2.7	2.7	2.6	2.3	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.3	3.1	4.1	5.8	6.9	10.8	13.7	16.1	19.4	22.1	5.6	22.1	
12-Nov	22.2	28.3	23.7	18.6	24.0	15.9	12.4	8.3	5.6	2.1	2.0	1.9	1.7	1.5	1.4	1.7	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.0	7.8	28.3	
13-Nov	2.0	2.0	2.0	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.8	1.7	1.6	1.6	1.6	1.7	1.8	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.1	
14-Nov	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	1.9	1.9	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.1	2.3	
15-Nov	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.4	2.4	2.5	2.6	2.3	2.6	
16-Nov	2.7	2.8	2.8	2.9	3.0	3.1	3.2	3.3	3.3	3.3	3.2	2.8	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.6	3.3	
17-Nov	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	3.1	2.7	2.4	1.6	1.6	1.8	1.8	1.9	1.9	1.9	2.0	1.9	1.9	1.9	2.1	3.1	
18-Nov	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.2	2.4	2.1	1.9	1.9	1.8	1.8	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	
19-Nov	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	2.7	2.6	2.5	2.3	2.0	1.9	1.9	2.0	2.3	2.6	2.9	3.2	3.4	3.6	3.8	2.4	3.8	
20-Nov	4.0	4.1	4.2	4.3	4.4	4.5	4.5	4.6	4.7	4.7	4.6	4.6	4.5	4.3	4.1	4.1	4.2	4.2	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.7	
21-Nov	4.4	4.4	4.4	4.4	4.4	4.4	4.5	4.5	4.5	4.5	4.5	4.4	4.3	3.8	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.9	4.0	4.1	4.1	4.5	
22-Nov	4.1	4.1	4.2	4.2	4.2	4.3	4.3	4.3	4.3	4.3	4.3	4.2	4.1	3.7	3.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.3	3.4	3.8	4.3	
23-Nov	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	
24-Nov	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.2	3.2	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.1	3.3	
25-Nov	3.0	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.8	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.8	3.0	
26-Nov	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.6	2.6	2.7	2.7	
27-Nov	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.5	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.6	
28-Nov	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	
29-Nov	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	
30-Nov	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	
4.1 4.2 4.2 4.5 5.0 4.6 4.2 4.0 3.5 3.4 3.3 4.8 3.2 2.9 2.9 2.9 3.0 3.1 3.7 4.3 4.5 4.7 4.8 4.2																								Diurnal Average			
22.2 28.3 23.7 18.6 25.9 21.7 17.9 14.3 9.1 9.1 9.1 52.0 9.8 9.2 9.1 9.2 9.1 9.1 16.8 31.3 22.3 22.3 25.3 22.1																								Diurnal Maximum			



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Leaf Wetness (LW) - %**  
**Stony Mountain - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Leaf Wetness (LW) - %**  
**Stony Mountain - November 2024**

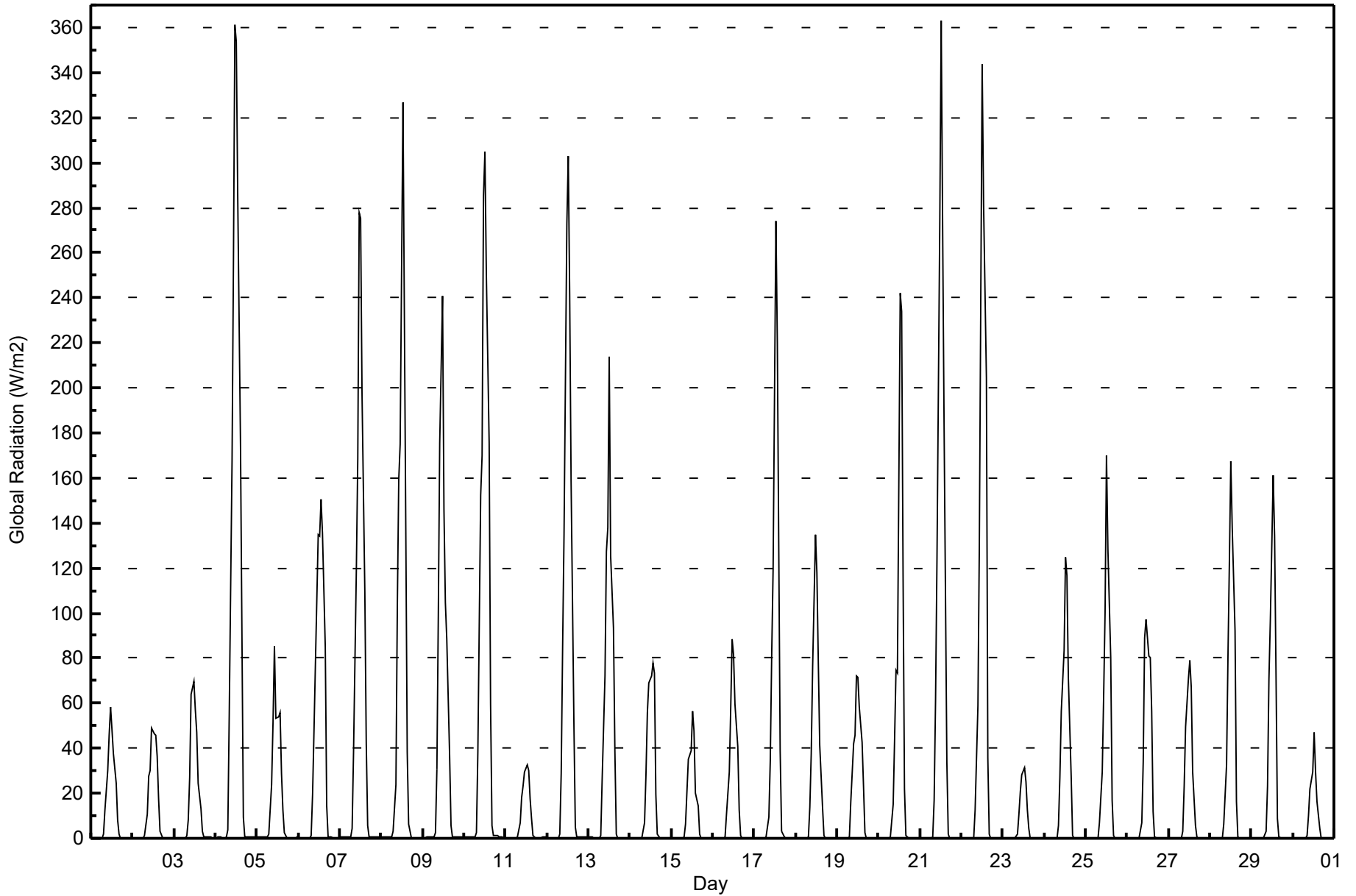
<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	0	0.00	0.00
0.4 - 0.5	0	0.00	0.00
0.6 - 0.7	0	0.00	0.00
0.8 - 1.4	8	1.11	1.11
1.5 - 10	681	94.58	95.69
> 10	27	3.75	99.44

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Value: 363.0 W/m2 on Nov 21 13:00      Maximum Daily Average: 73.5 W/m2 on Nov 4																							Hours in Service: 720 Hours of Data: 720			
Minimum Value: 0.0 W/m2 on Nov 13 05:00      Minimum Daily Average: 5.7 W/m2 on Nov 23 Maximum Diurnal Average: 159.3 W/m2 at hour 13      Minimum Diurnal Average: 0.2 W/m2 at hour 5 Monthly Average: 28.72 W/m2      Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.4 Q <sub>3</sub> = 26.8 P <sub>90</sub> = 97.0 P <sub>99</sub> = 285.8																							Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.0	0.0	0.1	0.1	0.1	0.1	0.1	2.0	12.6	29.8	45.9	58.1	48.6	37.5	24.6	8.3	1.7	0.3	0.2	0.2	0.2	0.2	0.2	0.2	11.3	58.1
2-Nov	0.2	0.1	0.2	0.2	0.2	0.1	0.2	1.3	10.7	27.6	29.8	49.1	46.7	45.7	36.5	17.6	3.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	11.3	49.1
3-Nov	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.0	8.1	26.8	64.2	69.8	57.4	46.8	24.6	13.0	2.9	0.6	0.6	0.6	0.5	0.4	0.3	0.2	13.3	69.8
4-Nov	0.3	0.4	0.4	0.4	0.3	0.3	0.3	3.8	54.3	167.7	257.4	361.1	353.5	285.8	173.4	90.4	9.7	0.9	0.8	0.7	0.5	0.7	0.8	0.7	73.5	361.1
5-Nov	0.8	0.8	0.7	0.4	0.3	0.4	0.5	2.2	23.5	51.6	85.4	53.2	53.8	55.5	28.9	12.7	2.2	0.1	0.1	0.1	0.1	0.2	0.3	0.5	15.6	85.4
6-Nov	0.6	0.3	0.2	0.2	0.2	0.1	0.2	1.3	19.4	47.8	77.1	134.9	134.0	150.4	135.7	84.4	14.7	0.8	0.8	0.5	0.3	0.1	0.2	0.3	33.5	150.4
7-Nov	0.5	0.7	0.7	0.7	0.7	0.8	0.8	4.2	38.1	120.1	168.7	277.5	275.2	197.3	109.1	42.0	5.7	0.8	0.8	0.7	0.7	0.8	0.8	0.8	52.0	277.5
8-Nov	0.8	0.8	0.8	0.8	0.8	0.8	0.8	2.9	24.0	103.1	159.1	175.1	326.9	230.7	136.3	38.3	6.5	0.3	0.1	0.0	0.2	0.2	0.2	0.2	50.4	326.9
9-Nov	0.2	0.3	0.4	0.3	0.5	0.5	0.4	2.4	30.9	98.5	175.8	240.9	146.2	104.6	88.3	37.1	5.4	0.8	0.8	0.8	0.8	0.8	0.8	0.8	39.1	240.9
10-Nov	0.8	0.8	0.8	0.9	0.8	0.8	0.8	2.4	38.4	152.3	169.8	285.5	304.8	250.8	175.7	59.4	5.9	1.1	1.0	1.0	0.8	0.7	0.5	0.2	60.7	304.8
11-Nov	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.3	7.0	18.0	23.2	29.6	32.6	29.8	17.8	8.8	1.1	0.2	0.3	0.2	0.3	0.3	0.4	0.3	7.1	32.6
12-Nov	0.3	0.1	0.1	0.0	0.1	0.1	0.1	1.9	28.5	84.6	134.8	272.6	302.7	241.5	158.5	50.8	5.2	0.7	0.8	0.8	0.8	0.8	0.7	0.7	53.6	302.7
13-Nov	0.6	0.5	0.4	0.1	0.0	0.1	0.1	1.0	26.4	72.1	127.2	137.9	213.8	125.4	93.2	39.1	2.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	35.0	213.8
14-Nov	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.3	6.6	27.9	55.7	68.8	71.9	77.8	73.2	19.5	1.9	0.0	0.0	0.1	0.0	0.1	0.1	0.1	16.8	77.8
15-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	6.4	20.4	35.2	38.6	56.5	47.7	20.2	14.5	1.8	0.2	0.2	0.2	0.2	0.2	0.1	0.1	10.1	56.5
16-Nov	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	10.7	29.5	57.6	88.5	81.8	59.5	40.6	12.7	1.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	16.0	88.5
17-Nov	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.4	9.1	34.8	80.9	118.9	273.9	220.2	129.3	38.6	3.3	0.6	0.2	0.0	0.2	0.1	0.0	0.0	38.0	273.9
18-Nov	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.7	13.6	37.4	76.3	134.6	118.0	78.6	41.4	14.1	1.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	21.5	134.6
19-Nov	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.3	16.4	42.3	45.7	72.0	71.4	58.3	42.7	22.9	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.6	72.0
20-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	14.7	43.8	74.6	73.5	242.1	234.2	117.2	21.8	1.4	0.0	0.0	0.1	0.0	0.0	0.1	0.0	34.3	242.1
21-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	17.0	61.5	123.7	274.3	363.0	272.3	186.3	34.2	2.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	55.6	363.0
22-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	12.3	59.0	130.9	238.0	343.7	281.4	204.5	35.6	1.9	0.0	0.0	0.1	0.1	0.1	0.1	0.0	54.5	343.7
23-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	10.6	21.0	28.2	31.6	25.3	12.7	4.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7	31.6
24-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	26.9	56.2	83.4	124.7	116.8	71.5	27.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.4	124.7
25-Nov	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	7.0	29.6	63.5	100.4	170.2	128.7	80.4	17.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.9	170.2
26-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	6.9	33.9	89.3	97.0	80.7	80.1	56.4	11.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.0	97.0
27-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	23.1	49.8	71.1	78.8	66.9	29.5	5.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.7	78.8
28-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	32.6	81.1	123.0	167.4	138.0	92.1	16.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.4	167.4
29-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	23.4	70.6	97.5	161.0	134.2	73.3	8.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.9	161.0
30-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	10.1	21.7	29.8	47.2	29.8	16.3	4.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	47.2
																							Diurnal Average			
																							Diurnal Maximum			





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Global Radiation (GR) - W/m2**  
**Stony Mountain - November 2024**

<b>Concentration Ranges (W/m2)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	526	73.06	73.06
21 - 100	125	17.36	90.42
101 - 300	62	8.61	99.03
301 - 600	7	0.97	100.00
601 - 900	0	0.00	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

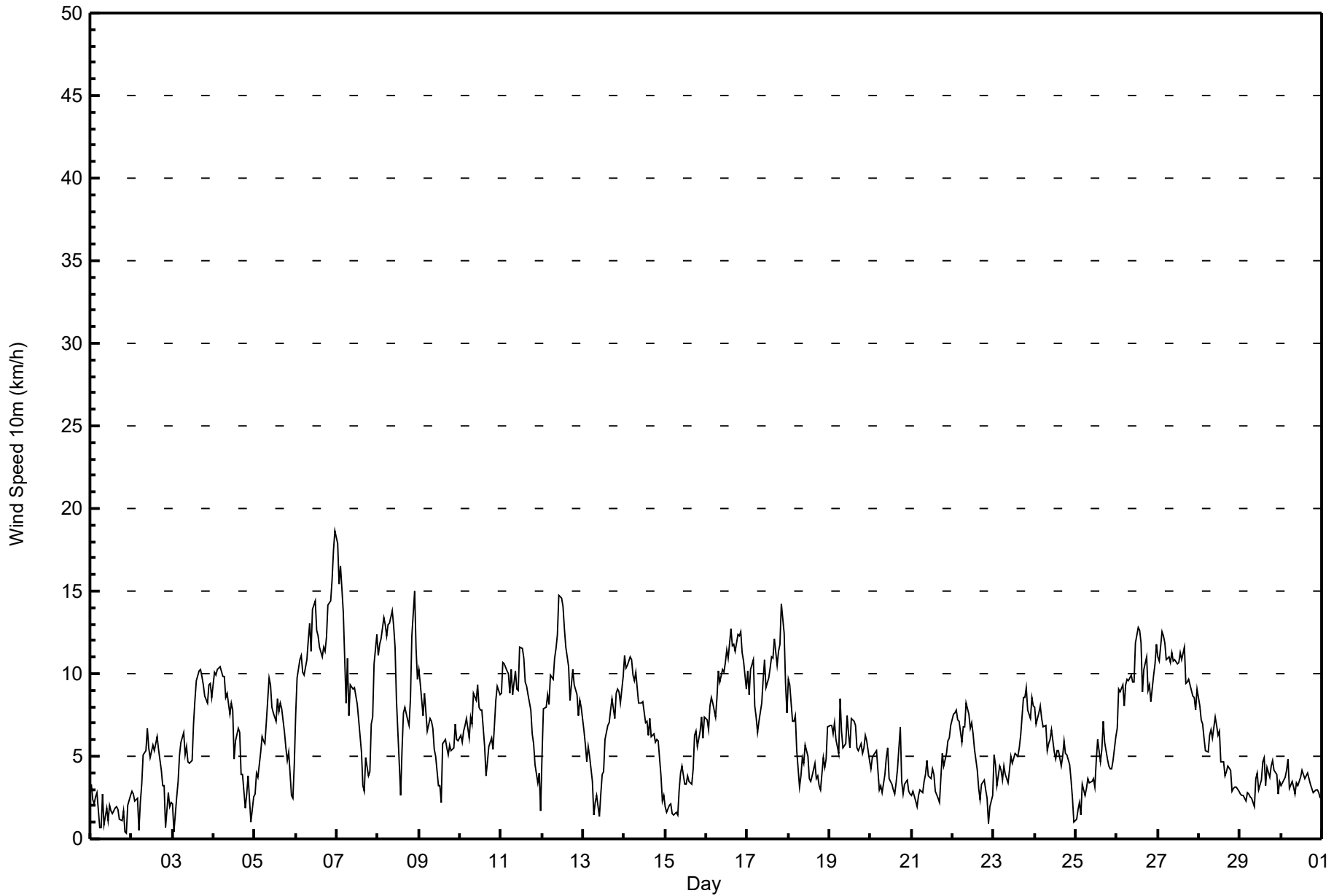


Maximum Speed: 19 km/h on Nov 7 00:00	Maximum Daily Speed Average: 12.1 km/h on Nov 6	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 1 22:00	Minimum Daily Speed Average: 0.9 km/h on Nov 1	Hours of Data: 720
Maximum Diurnal Speed Average: 2.6 km/h at hour 9	Minimum Diurnal Speed Average: 1.3 km/h at hour 20	Hours of Missing Data: 0
Monthly Average Velocity: 1.9 km/h 248.5 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 3 Q <sub>1</sub> = 4 Median = 6 Q <sub>3</sub> = 9 P <sub>90</sub> = 11 P <sub>99</sub> = 15	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	NNE3	NNE2	N2	NE3	E3	ENE1	S1	NNW3	ESE1	S2	SSE1	E2	ESE2	E2	E2	E2	NE2	ENE1	ESE1	ESE2	E0	SE0	S2	SSW3	E0.9	NNE3	
2-Nov	WSW3	SSW3	SW2	SW2	NE1	ESE2	ESE3	ESE5	ESE5	ESE7	SE6	ESE5	ESE6	ESE5	E6	E6	E5	ENE4	NE3	NNE3	NW1	NE3	NE2	NE2	ESE2.6	ESE7	
3-Nov	NE2	E0	WNW3	WNW3	WNW5	WNW6	WNW6	WNW5	W6	W5	SW5	WSW5	SW7	SW8	SSW10	SSW10	SSW10	SSW10	SSW9	SW9	SW8	WSW9	WSW9	WSW9	SSW5.5	SSW10	
4-Nov	WSW10	WSW10	WSW10	WSW10	WSW10	WSW10	WSW10	WSW9	WSW9	WSW8	W8	W8	W5	SW6	SSW7	SW6	WSW4	WSW4	NW2	N3	NNE4	NE2	ESE1	NW3	WSW5.6	WSW10	
5-Nov	NW3	NW4	WNW4	WNW5	NW6	NW6	WNW6	WNW7	WNW10	NW9	NW8	NW8	NW7	NW8	NW8	NW8	NW8	NW6	NW6	NW5	WNW5	NW3	SW2	SSW5	WNW5.7	WNW10	
6-Nov	S8	SSW10	SSW11	SSW11	S10	S10	S11	SSW12	SSW13	S11	SSW14	SSW14	SW13	SW12	WSW12	SW11	SW12	SSW11	SSW12	SSW14	SSW14	SSW16	SW17	SW19	SSW12.1	SW19	
7-Nov	WSW18	W15	W17	WNW15	NW14	NW8	NW11	WNW7	WNW9	WNW9	WNW9	W9	W8	WNW7	W5	SW3	SSE3	S5	S4	SE4	SSE7	SSE7	S11	S12	W5.9	WSW18	
8-Nov	S11	S12	SSW12	SSW13	SSW13	SSW12	SSW13	SSW13	SSW14	SSW13	SSW12	SSW8	SW5	SW3	S5	SSW8	SSW8	SW7	SW7	W8	WNW12	WNW15	WNW12	W10	SW8.4	WNW15	
9-Nov	W10	W9	WNW7	WNW9	WNW8	WNW7	WNW7	WNW7	W7	W5	WNW5	WNW3	WSW3	W2	SSW6	SSW6	SSW6	SSW5	SSW6	SSW5	SSW6	SSW7	SW6	SW6	WSW4.9	W10	
10-Nov	SW6	SW6	SSW6	SW7	SW7	SSW6	SW7	SW7	SW9	SW8	W9	W8	W8	W8	W6	WSW4	SW5	SSW6	SSW6	SSW5	S7	SSW8	S9	SSE9	SW6.0	W9	
11-Nov	SSE9	SE11	SSE11	SE10	SE10	SSE9	SSE10	SE9	SE10	SE9	SSE9	SSE12	SSE11	SSE11	SSE9	SSE9	SSE9	SE8	SE6	SE6	SE4	SE3	SE4	WSW2	SSE8.2	SSE12	
12-Nov	SW5	WSW8	WSW8	WSW9	WSW8	WSW10	SW10	WSW11	WSW12	WSW12	WSW15	W15	W14	W13	W12	WSW10	SW8	WSW9	WSW10	W9	WSW9	W7	WNW8	WNW8	WSW9.7	WSW15	
13-Nov	WNW7	WNW6	WNW5	NW6	NW5	NW4	NW1	N2	NNW3	NNE1	NE3	E4	E4	NE6	NE7	ENE7	NE8	NE8	NE7	ENE9	NE9	ENE9	ENE8	ENE10	NE3.8	ENE10	
14-Nov	ENE11	NE10	ENE11	ENE11	ENE11	ENE10	NE10	NE10	NE8	NE8	ENE8	ENE7	NE7	NE6	NNE7	NNE6	NNE6	NNE6	NE6	NE6	NE4	N2	NNE3	NE7.4	ENE11		
15-Nov	N2	NNW2	N2	NNE2	NNE1	SW1	SSE2	SSE1	SSE3	S4	SSW4	SSW3	S3	SW4	SW3	SW3	SSW4	SSW6	SSW7	SSW6	SSW6	SSW7	SW6	SW7	SSW3.0	SSW7	
16-Nov	SSW7	SSW7	SSW8	SSW9	S8	S7	S9	S10	S10	S10	S10	S11	S11	S11	S13	S12	S12	SSE11	SSE12	SSE12	SSE13	S11	S11	SSE9	S9.9	S13	
17-Nov	SSE10	S9	SSE10	SSE11	S8	S7	S6	S7	S8	SSW10	SSW11	SSW9	SW10	SW10	SW11	SW11	SW12	SW11	SW11	WSW12	W14	WNW12	WNW9	WNW8	SSW7.7	W14	
18-Nov	WNW10	WNW9	WNW7	WNW7	WNW7	WNW5	WNW3	WNW4	W5	W5	W6	WNW5	WNW4	WNW3	NNW4	NNW5	NNW4	NNW4	NNE3	N3	NE5	NNE4	NNE5	NE7	NW3.8	WNW10	
19-Nov	NE7	NE7	NE6	ENE7	ENE6	NNE5	NE8	NE7	NNE5	NNE6	NNE7	NNE6	N5	N7	N7	N7	NNW5	NNW5	N6	NNW5	NW6	NW6	NW6	NNW5	NNE5.3	NE8	
20-Nov	NNW4	NW5	NW5	NW5	NW4	NNW3	NW3	NNW3	N4	N5	NNE5	N4	N3	NNW3	N3	NNE3	NNE4	NNE7	N3	NNW3	NNW3	NW4	NNW3	NNW3	NNW3.6	NNE7	
21-Nov	NNW3	NNW3	NW2	NW2	N3	NNW3	NNW3	NW3	NW4	NW5	WNW4	NW4	NNW4	NNW4	NNW3	W2	NW2	NW4	NW5	NW4	WNW5	WNW6	WNW6	WNW7	NW3.6	WNW7	
22-Nov	WNW8	WNW8	WNW8	WNW7	WNW7	WNW6	WNW7	WNW7	WNW8	WNW8	NW7	NW7	NW6	NW5	NW4	NW3	NW2	NNW3	N4	N3	NNE2	ENE1	ENE2	ENE3	NW4.6	WNW8	
23-Nov	NE5	NE4	ENE3	ENE4	NE4	ENE4	ENE4	ENE4	NE3	NE4	NE5	NE5	NE5	NE5	NE5	NE6	NE6	NE9	NE9	NNE9	NNE8	NNE7	NE9	NNE8	NE5.5	NNE9	
24-Nov	NNE8	NNE7	NNE8	NNE8	NNE7	NNE7	NNE7	NNE5	NNE6	NNE6	NNE7	NNE5	NNE5	NNE5	NNE5	NNE4	NNE5	NE6	NNE5	NNE5	NNE4	NE4	NE2	ENE1	NNE5.5	NNE8	
25-Nov	WSW1	WSW2	SW2	WNW1	SSW3	SSE3	S3	S4	SSW3	SSW3	S4	S3	S5	S6	SSE5	SSE5	SSE7	SSE6	SSE5	SSE4	SSE4	SSE4	SSE5	S6	S3.6	SSE7	
26-Nov	S7	S9	S9	S9	S8	S9	S10	S10	S10	S9	S10	S12	S13	S13	SSW12	SSW9	SSW10	SSW11	SW9	WSW9	W8	WNW10	WNW11	WNW12	SSW8.1	S13	
27-Nov	WNW11	WNW11	WNW13	WNW12	WNW12	WNW11	WNW11	WNW11	WNW11	WNW11	WNW11	WNW11	WNW11	WNW11	WNW11	NW11	WNW11	NW12	WNW9	WNW9	WNW10	WNW9	WNW9	WNW8	WNW9	WNW10.4	WNW13
28-Nov	NW8	WNW7	NW7	NW6	NW5	NW5	WNW6	NW7	NW6	WNW7	NW7	NW6	NW7	NW5	NW5	NW4	NW4	NNW4	NNW4	NNW3	NW3	NNW3	NW3	NW3	NW5.1	NW8	
29-Nov	NW3	NW3	NW3	NW2	NNW3	NW3	NW3	NNW2	N2	NE4	NE4	ENE3	NE4	NE5	ENE5	ENE3	ENE4	E4	E4	E5	E4	E4	E3	ENE3	NE2.3	ENE5	
30-Nov	ENE3	ENE3	E4	ESE4	E5	E3	ENE3	E3	ENE3	ENE3	NE3	NE4	ENE4	ENE4	NNE4	ENE4	NNE4	N3	NNW3	N3	NNW3	NW3	NW3	NW2	NE2.4	E5	

WSW2.2	WSW2.4	WSW2.4	WSW2.3	W1.9	WSW1.9	WSW2.0	WSW2.0	WSW2.0	WSW2.2	WSW2.3	WSW2.1	WSW2.0	WSW1.9	WSW1.6	SW1.6	SSW1.5	SW1.3	SW1.3	WSW1.3	W1.6	W1.9	WSW2.0	WSW2.1	Diurnal Average	
WSW18	W15	W17	WNW15	NW14	SSW12	SSW13	SSW13	SSW14	SSW13	WSW15	W15	W14	W13	S13	S12	SW12	SSW11	SSE12	SSW14	SSW14	SSW16	SW17	SW19	Diurnal Maximum	

All monthly, daily, and diurnal averages have been calculated using vector methods







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Stony Mountain - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	312	43.33	43.33
6 - 11	348	48.33	91.67
12 - 19	60	8.33	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Stony Mountain - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	19	30	30	25	20	12	5	13	13	12	14	9	8	19	48	35	312
6 - 11	4	22	26	16	2	2	10	20	40	39	30	24	19	64	30	0	348
12 - 19	0	0	0	0	0	0	0	4	6	20	6	6	7	9	2	0	60
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	23	52	56	41	22	14	15	37	59	71	50	39	34	92	80	35	720

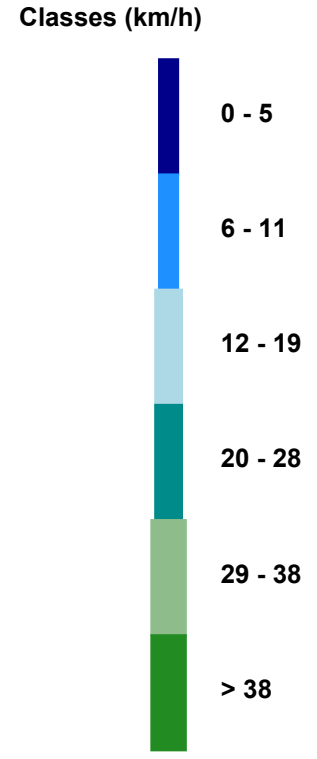
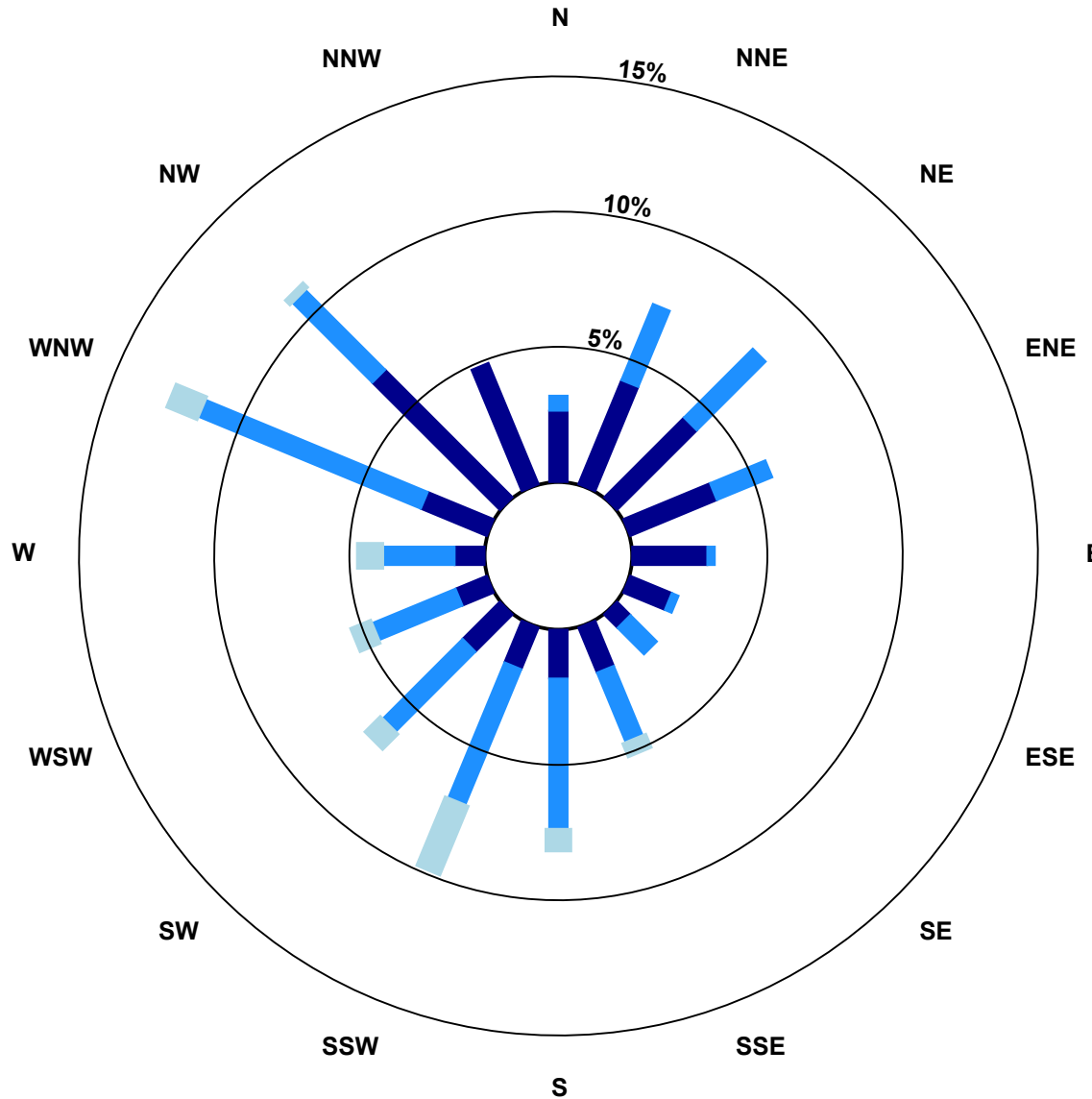
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Stony Mountain



Total Number of Valid Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Stony Mountain - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Nov 7 01:00 Minimum Value: 0 km/h on Nov 5 00:00 Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 6														Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0												
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2-Nov	1	1	1	1	1	1	1	2	2	3	2	2	2	2	2	3	2	1	1	1	1	1	1	1	1	3
3-Nov	1	1	1	1	2	2	3	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	4	3	4	
4-Nov	4	4	4	4	4	4	4	3	3	3	3	2	2	3	2	1	1	1	1	1	1	1	1	0	4	
5-Nov	1	1	1	1	2	2	2	3	3	3	3	3	3	3	3	3	3	3	2	2	2	1	1	1	3	
6-Nov	3	3	3	3	3	3	3	4	4	4	5	5	5	5	5	4	4	3	4	5	4	5	7	7	7	
7-Nov	7	7	7	6	6	4	5	3	4	3	4	4	3	3	2	1	1	2	1	1	2	3	4	4	7	
8-Nov	3	3	3	4	4	4	4	4	4	4	4	3	2	2	2	2	2	2	2	4	5	5	5	4	5	
9-Nov	4	4	3	4	3	2	2	3	2	2	2	1	2	1	2	2	1	1	2	1	2	2	2	2	4	
10-Nov	2	2	2	2	2	2	2	2	3	3	4	3	3	3	2	1	1	1	2	1	2	3	3	3	4	
11-Nov	3	4	4	4	4	3	4	3	4	4	4	4	5	4	4	4	4	3	2	2	2	2	1	1	5	
12-Nov	2	3	3	4	3	4	4	4	4	5	6	6	6	6	5	4	3	4	4	4	4	3	3	3	6	
13-Nov	2	2	2	2	2	2	1	1	1	1	1	1	1	2	2	2	2	3	2	3	3	3	3	3	3	
14-Nov	3	3	3	4	4	3	3	3	2	2	2	3	3	2	2	2	2	2	2	2	2	2	1	1	4	
15-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	
16-Nov	3	3	3	3	3	3	3	4	4	4	4	4	4	5	5	5	5	5	5	5	5	4	4	3	5	
17-Nov	4	3	4	4	3	3	3	3	3	3	4	3	4	4	5	4	4	4	4	5	6	5	4	3	6	
18-Nov	4	3	3	3	3	2	1	1	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	4	
19-Nov	2	3	3	2	2	2	3	2	2	3	3	2	2	3	3	3	2	2	2	2	2	2	2	1	3	
20-Nov	1	2	2	2	1	1	1	1	2	2	2	1	1	1	1	1	2	2	2	1	1	1	1	1	2	
21-Nov	1	1	1	1	1	1	1	1	1	2	1	2	2	2	1	1	0	1	2	1	2	2	2	2	2	
22-Nov	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	3	
23-Nov	2	2	1	2	1	1	2	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	2	3	
24-Nov	3	2	3	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	1	1	3	
25-Nov	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	2	2	2	2	2	2	2	3	
26-Nov	2	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	3	3	4	3	4	5	5	5	
27-Nov	5	4	5	5	5	4	4	4	5	4	4	4	4	4	5	4	4	4	4	3	3	3	3	3	5	
28-Nov	3	2	2	2	1	1	2	2	1	2	2	2	2	2	1	1	1	2	1	1	1	1	1	1	3	
29-Nov	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	2	2	1	1	2	
30-Nov	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
														Diurnal Maximum												



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Stony Mountain - November 2024**

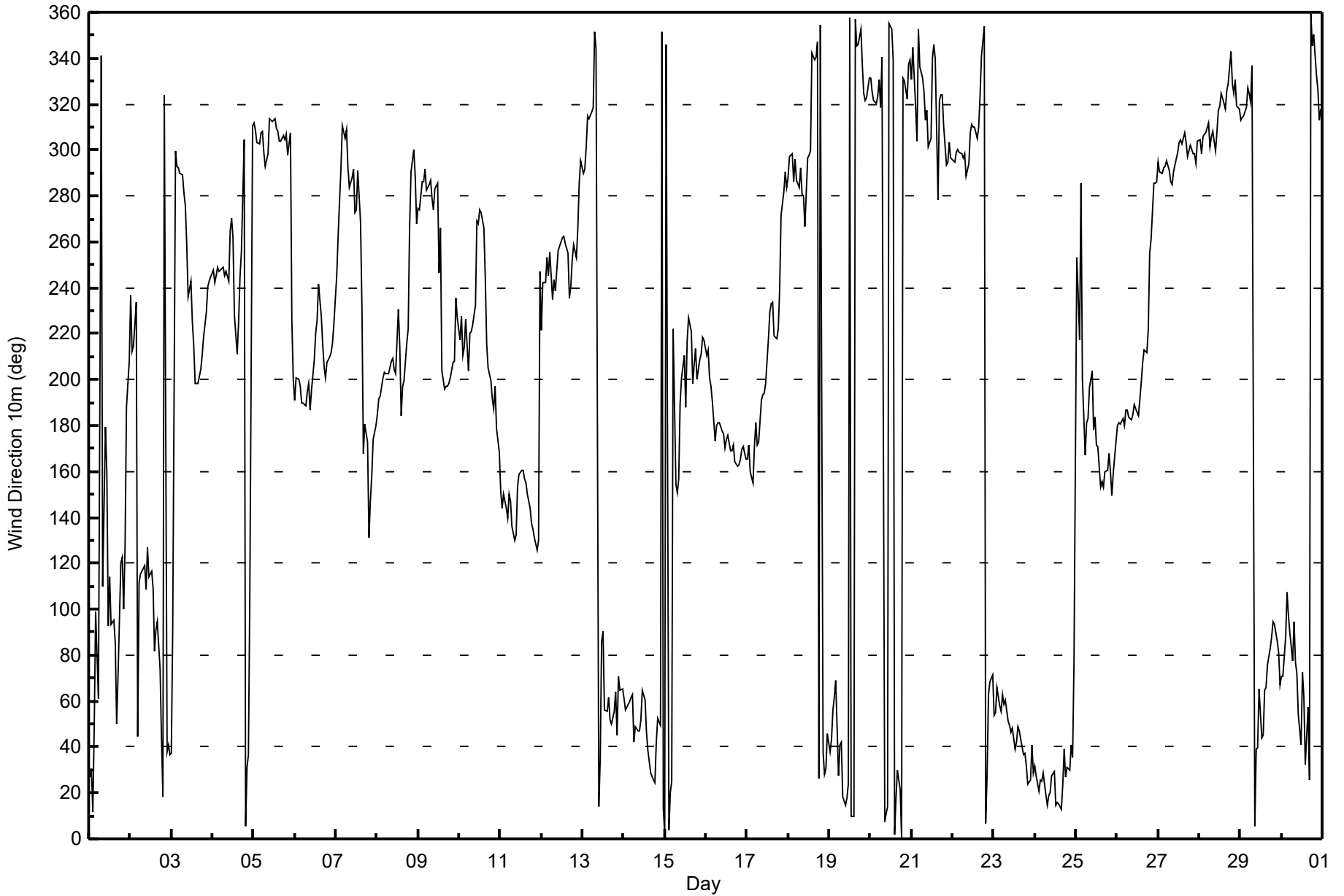
Direction of Maximum Speed: 225 deg on Nov 7 00:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 207.2 deg on Nov 6	Hours of Data: 720
Direction of Minimum Speed: 127 deg on Nov 1 22:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 0.9 deg on Nov 1	Percent Operational Time: 100.0
Monthly Average Direction: 248.5 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	27	31	11	49	99	61	187	341	110	179	159	93	114	93	95	86	50	71	120	123	100	127	188	208	85.0
2-Nov	237	213	215	234	45	112	115	116	119	108	127	114	116	109	82	91	94	74	43	18	324	38	41	36	101.9
3-Nov	37	91	300	293	292	290	289	282	276	259	236	243	225	215	198	198	201	205	211	218	229	241	243	245	234.9
4-Nov	248	242	245	249	247	248	249	245	247	243	265	270	262	228	211	225	245	256	304	5	31	37	106	311	250.1
5-Nov	312	309	303	303	307	308	299	293	298	314	313	313	314	310	308	304	304	307	305	307	298	308	225	200	303.3
6-Nov	191	201	200	197	190	190	189	195	198	187	195	208	220	226	241	228	216	206	201	207	210	212	216	225	207.2
7-Nov	245	262	278	292	310	305	309	292	283	288	292	272	274	291	269	231	168	181	172	131	147	158	174	180	262.6
8-Nov	185	191	193	201	203	202	203	202	208	209	204	202	230	214	184	197	200	216	222	267	291	300	288	268	218.2
9-Nov	274	274	286	286	292	283	285	287	279	274	283	286	247	266	204	196	197	197	198	201	208	208	236	227	253.4
10-Nov	217	228	210	214	226	204	220	221	224	233	269	268	274	273	266	244	216	205	199	192	187	197	179	168	221.9
11-Nov	151	144	150	144	140	150	147	136	130	132	153	158	160	160	157	155	150	144	137	135	131	125	130	247	146.8
12-Nov	221	242	242	253	245	256	235	243	239	248	256	260	262	262	259	255	235	241	252	259	253	266	285	296	253.3
13-Nov	290	292	302	315	314	317	318	352	344	14	35	86	90	56	62	52	50	55	64	45	71	64	65	65	38.3
14-Nov	61	56	58	60	62	63	42	49	47	47	52	64	61	46	38	33	29	26	24	42	52	50	352	13	48.9
15-Nov	2	346	4	20	25	222	154	151	157	190	201	211	188	216	227	221	198	207	213	200	209	211	218	217	208.0
16-Nov	210	213	201	197	190	173	180	181	182	177	176	170	174	175	169	169	171	164	163	163	165	169	171	165	175.7
17-Nov	166	171	160	155	171	181	172	172	191	194	194	198	218	230	233	233	219	218	222	239	271	282	291	284	212.9
18-Nov	288	297	298	286	296	287	284	292	281	280	267	297	298	299	342	339	340	347	26	354	38	28	30	46	314.1
19-Nov	38	43	56	62	69	27	41	42	18	14	17	24	358	10	10	357	345	346	352	337	325	322	323	332	13.4
20-Nov	331	325	322	320	324	331	319	340	7	11	14	355	353	339	2	18	30	22	0	332	330	322	337	340	347.2
21-Nov	331	345	319	304	352	336	332	325	313	317	301	305	340	346	340	279	322	324	324	311	293	294	303	297	316.3
22-Nov	296	294	299	300	299	299	297	298	289	294	308	311	310	310	305	310	324	341	354	7	28	63	68	71	308.4
23-Nov	53	55	66	58	56	63	59	60	51	49	46	48	39	42	49	47	43	36	37	32	24	26	41	29	43.0
24-Nov	32	28	21	26	25	28	19	15	19	20	27	29	15	16	15	13	24	39	27	31	30	41	36	77	25.1
25-Nov	253	237	217	286	200	167	181	183	196	204	178	183	171	171	153	156	153	160	160	168	160	149	159	173	172.6
26-Nov	180	182	181	183	180	186	186	184	183	185	189	188	184	191	199	208	213	212	222	255	261	286	286	286	205.9
27-Nov	295	290	290	292	293	295	291	286	285	290	293	299	303	304	302	308	303	297	300	302	299	298	294	304	296.2
28-Nov	305	298	306	307	307	312	301	306	308	300	308	318	319	325	320	318	326	329	343	329	325	330	319	318	313.1
29-Nov	313	314	315	319	327	325	321	337	6	39	40	65	44	45	64	66	76	83	88	94	94	86	81	67	46.2
30-Nov	71	71	88	108	97	90	78	95	77	72	55	41	73	62	32	57	26	359	346	350	333	326	313	318	51.2

257.1 256.1 254.0 258.3 261.6 252.3 249.1 243.8 243.6 244.6 250.9 246.2 247.0 254.5 240.9 230.6 212.0 221.1 229.7 247.3 261.3 264.2 253.7 253.0

Diurnal Average

All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Stony Mountain - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 97 deg on Nov 1 06:00 Minimum Value: 8 deg on Nov 5 02:00 Percentiles: P <sub>1</sub> = 14 P <sub>10</sub> = 19 Q <sub>1</sub> = 22 Median = 26 Q <sub>3</sub> = 31 P <sub>90</sub> = 36 P <sub>99</sub> = 75																			Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0						
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	22	24	36	31	31	97	80	29	64	32	71	39	42	47	30	27	40	53	54	44	91	68	43	34	97
2-Nov	36	32	28	29	83	32	28	32	32	26	32	30	29	30	24	29	25	21	30	34	78	33	22	24	83
3-Nov	32	94	16	22	26	24	27	33	32	35	36	40	35	31	23	24	22	22	23	22	25	27	31	31	94
4-Nov	31	29	30	30	30	32	29	29	30	34	29	34	44	41	30	26	21	25	42	19	20	40	56	12	56
5-Nov	24	8	10	12	15	14	17	18	21	20	23	27	26	24	28	28	25	28	24	35	32	50	42	21	50
6-Nov	21	21	21	22	21	20	22	22	26	26	27	26	31	31	32	29	26	22	20	23	21	23	25	29	32
7-Nov	30	29	27	26	27	28	25	26	24	25	29	33	29	28	35	34	28	24	22	20	21	23	23	21	35
8-Nov	18	20	20	20	21	21	20	21	21	21	22	28	39	61	26	19	20	19	19	29	27	24	30	30	61
9-Nov	25	27	27	25	22	21	21	21	23	25	32	50	49	48	26	21	19	19	20	18	20	22	25	22	50
10-Nov	22	24	20	22	23	20	23	21	22	28	31	30	32	30	32	34	17	19	19	19	22	20	24	26	34
11-Nov	25	24	24	26	26	29	31	26	27	32	30	30	29	32	35	32	30	28	26	24	23	37	21	53	53
12-Nov	29	33	29	35	35	32	30	33	30	32	32	32	35	34	31	31	30	30	31	30	31	31	25	21	35
13-Nov	22	28	32	21	31	45	79	53	35	74	50	30	32	24	19	18	18	15	18	21	18	19	17	19	79
14-Nov	17	16	18	17	19	20	18	17	18	18	19	20	21	21	21	19	22	23	22	21	18	35	40	33	40
15-Nov	46	43	34	33	41	58	35	33	24	22	26	32	33	30	29	29	22	23	23	22	24	22	26	25	58
16-Nov	26	31	24	25	29	29	27	27	26	28	28	31	29	32	29	30	30	31	27	29	28	29	28	27	32
17-Nov	30	29	27	27	34	34	33	33	30	25	24	26	29	31	30	30	26	26	29	33	27	30	26	27	34
18-Nov	27	26	28	27	27	26	32	24	26	31	32	34	58	50	49	34	38	41	45	44	27	32	26	20	58
19-Nov	21	23	26	19	23	36	20	19	23	26	26	31	35	26	27	29	28	23	23	19	18	17	15	18	36
20-Nov	19	21	19	18	18	22	18	25	29	28	30	36	48	42	45	32	22	22	34	37	17	21	25	27	48
21-Nov	36	24	32	34	25	28	19	23	24	22	38	50	44	43	49	25	13	17	20	20	18	18	18	20	50
22-Nov	22	21	21	21	21	21	21	20	22	23	23	23	26	30	29	20	23	21	26	47	50	75	32	24	75
23-Nov	20	22	25	24	22	26	24	23	25	23	21	21	21	21	19	20	19	19	21	21	22	18	22	26	26
24-Nov	26	24	21	22	20	22	23	23	22	23	30	31	32	29	27	21	16	19	20	24	26	48	67	67	67
25-Nov	36	36	42	35	38	21	21	19	19	25	29	36	40	35	36	33	26	25	28	27	33	27	35	34	42
26-Nov	29	29	27	26	28	29	30	28	26	28	28	28	26	25	27	28	26	21	31	31	33	27	27	29	33
27-Nov	28	27	25	26	26	25	26	25	25	25	27	28	27	28	28	23	26	25	23	24	23	22	23	23	28
28-Nov	21	22	20	18	16	14	17	16	14	19	20	23	23	34	26	14	20	20	24	25	21	17	27	26	34
29-Nov	22	32	27	25	26	25	27	33	47	24	25	42	53	31	18	23	17	14	18	22	18	26	22	20	53
30-Nov	20	19	23	23	19	20	23	27	25	23	31	26	27	28	27	18	24	23	17	16	20	23	24	29	31
																			46 94 42 35 83 97 80 53 64 74 71 50 58 61 49 34 40 53 54 47 91 75 56 67						
Diurnal Maximum																									



Maximum Speed: 21 km/h on Nov 16 20:00	Maximum Daily Speed Average: 16.2 km/h on Nov 27	Hours in Service: 720
Minimum Speed Value: 1 km/h on Nov 25 00:00	Minimum Daily Speed Average: 3.6 km/h on Nov 30	Hours of Data: 411
Maximum Diurnal Speed Average: 3.2 km/h at hour 2	Minimum Diurnal Speed Average: 1.3 km/h at hour 17	Hours of Missing Data: 309
Monthly Average Velocity: 2.1 km/h 322.0 deg	Percentiles: P <sub>1</sub> = 3 P <sub>10</sub> = 4 Q <sub>1</sub> = 6 Median = 9 Q <sub>3</sub> = 12 P <sub>90</sub> = 16 P <sub>99</sub> = 20	Percent Operational Time: 57.1

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	---	---	
2-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	---	---	
3-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	---	---	
4-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	---	---	
5-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	---	---	
6-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	---	---	
7-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	---	---	
8-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	---	---	
9-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	---	---	
10-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	---	---	
11-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	---	---	
12-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	---	---	
13-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	ENE8	ENE9	ENE11	ENE11	NE12	ENE11	ENE14	NE12	ENE15	ENE13	ENE15	---	ENE15	
14-Nov	ENE17	ENE15	ENE15	ENE17	ENE17	ENE15	NE13	NE14	NE11	NE11	ENE11	ENE12	ENE10	NE9	NE8	NE9	NNE8	NNE8	NNE7	NE8	ENE8	NE6	N4	N4	NE10.3	ENE17	
15-Nov	UO	UO	UO	UO	UO	UO	UO	UO	S5	SSW5	SSW6	SW4	SSW4	SW5	WSW5	SW5	SSW6	SW9	SW9	SSW8	SW9	SW10	SW9	SW10	---	SW10	
16-Nov	SW10	SW9	SSW11	SSW12	SSW11	S11	S13	S15	S13	S15	S14	S16	S16	S16	S20	S18	S18	S18	S20	S21	S20	S18	S17	S15	S15.0	S21	
17-Nov	S17	S14	S17	S18	S13	S11	S10	S11	SSW12	SSW14	SSW15	SSW13	SW13	SW15	WSW16	WSW16	SW17	SW15	SW16	WSW17	W20	WNW19	WNW14	WNW11	SW11.4	W20	
18-Nov	WNW14	NW14	WNW11	WNW10	NW12	WNW8	WNW5	WNW6	WNW7	WNW6	W8	WNW7	NW6	NW5	NNW6	NNW8	NNW6	N6	NNE5	N5	NE6	NNE6	NNE7	NE9	NW6.1	NW14	
19-Nov	NE9	NE9	ENE9	ENE10	ENE9	NNE7	NE11	NE9	NNE8	NNE8	NNE10	NNE9	N9	N11	N11	N12	NNW11	N12	N12	NNW13	NNW13	NW13	NNW13	NNW12	N8.9	NW13	
20-Nov	NNW10	NNW11	NW11	NW11	NNW9	NNW7	NW7	NNW6	N7	N7	N8	N5	N5	NNW4	N3	NNE4	NE5	NNE7	N5	NNW5	NNW6	NNW6	NNW5	NNW4	NNW6.1	NNW11	
21-Nov	NNW4	NNW4	NNW3	NW3	N5	NNW5	NNW5	NNW5	NW6	NW6	NW4	NW3	NNW5	N5	NNW4	WNW4	NNW5	NNW9	NNW11	NW9	WNW9	WNW10	WNW11	WNW11	NW5.8	WNW11	
22-Nov	WNW13	WNW13	WNW13	WNW12	WNW11	WNW10	WNW11	WNW11	WNW13	WNW12	NW11	NW11	NW10	NW8	NW7	NW6	NNW6	N8	N8	NNE6	NE5	NE3	ENE4	ENE4	NW7.5	WNW13	
23-Nov	ENE6	ENE6	ENE5	ENE7	ENE6	ENE6	ENE7	ENE6	ENE5	NE6	NE7	NE6	NE6	NE6	NE7	NE7	NE9	NE11	NE11	NNE12	NNE10	NNE10	NE12	NNE11	NE7.5	NNE12	
24-Nov	NNE11	NNE10	NNE10	NNE11	NNE10	NNE9	NNE10	NNE8	NNE8	NNE8	NNE7	N7	N7	N8	N7	NNE7	NE9	NNE8	NNE7	NNE6	NE5	NE3	E1		NNE7.6	NNE11	
25-Nov	WSW2	WSW3	SW3	WNW2	SSW4	S4	S4	SSW4	SSW4	SW4	S4	S3	S4	S6	SSE7	SSE9	SSE13	S12	S10	S9	S9	SSE9	S9	S10	S5.8	SSE13	
26-Nov	S10	S12	S12	S12	S11	S12	SSW12	S12	S13	SSW12	SSW11	SSW12	S16	SSW17	SSW16	SSW12	SW14	SW15	SW12	W13	W12	WNW14	WNW16	WNW17	SSW10.6	SSW17	
27-Nov	WNW17	WNW16	WNW18	WNW18	WNW18	WNW17	WNW17	WNW17	WNW16	WNW17	WNW16	WNW16	NW16	NW17	NW18	NW18	NW19	NW15	NW15	NW16	NW15	NW14	NW14	WNW12	WNW16.2	NW19	
28-Nov	NW14	NW12	NW12	NW10	NW10	NW10	WNW11	NW11	NW11	WNW12	NW11	NW10	NNW10	NNW8	NNW8	NNW8	NNW10	NNW10	NNW9	NNW7	NNW7	NNW7	NNW6	NNW6	NNW6	NW9.2	NW14
29-Nov	NW5	NW5	NW5	NNW5	NNW5	NNW5	NNW4	N4	NNE4	NE4	NE5	ENE4	NE4	NE6	ENE7	ENE5	E8	E7	E8	E8	E7	E6	E5	ENE6	NE3.6	E8	
30-Nov	ENE5	ENE5	E6	ESE6	ESE7	E5	E5	E5	E5	E5	ENE4	NE4	E6	ENE5	NE4	ENE6	NNE5	N5	N6	N6	NNW6	NNW5	NW4	NW5	NE3.6	ESE7	

NNW2.9 NW3.2 NW2.3 NW1.9NNW1.9NNW1.8 NW2.1 NW1.6NNW1.9NNW2.1 NW1.8 NW1.4 NW1.8 NW1.8 NW1.6NNW1.9NNW1.3NNW2.0NNW2.0NNW2.1 NW2.8 NW3.0 NW2.9NNW2.9	Diurnal Average
WNW17WNW16WNW18WNW18WNW18WNW17WNW17WNW16WNW17WNW16WNW16WNW16 NW16 NW17 NW18 S20 NW19 S18 S18 S20 S21 S20WNW19 S17WNW17	Diurnal Maximum

M - Maintenance AF - Analyzer Failure UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

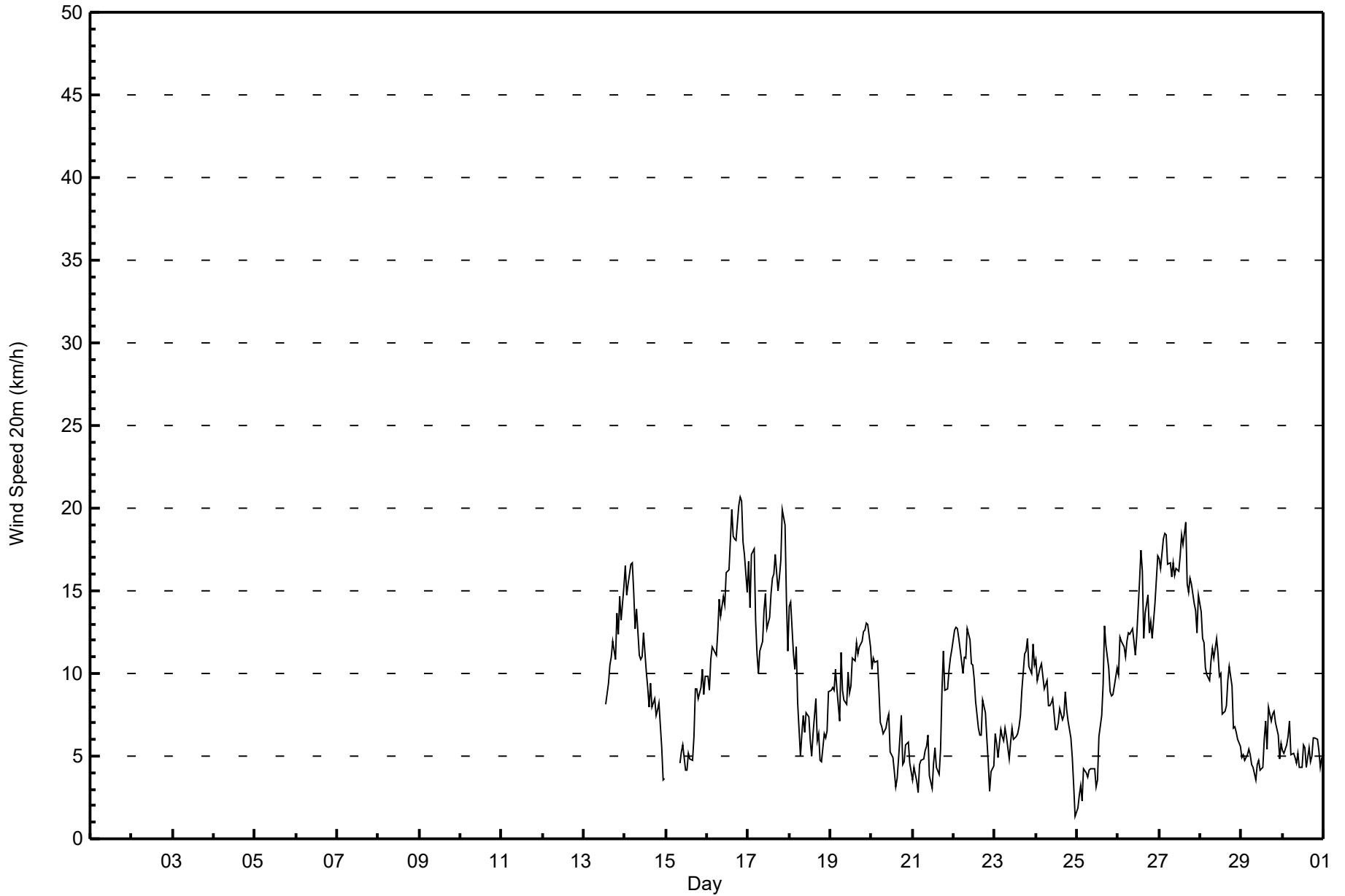
**Wind Speed 20m (WS20) - km/h**  
**Stony Mountain - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Nov 17 21:00	Hours in Service: 720 Hours of Data: 411 Hours of Missing Data: 309 Hours of Calibration: 0 Percent Operational Time: 57.1
Minimum Value: 0 km/h on Nov 25 06:00	
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 2 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 5 P <sub>99</sub> = 6	

Day	Hourly Period Ending At (MST)																								Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	
2-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
3-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
4-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
5-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
6-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
7-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
8-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
9-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
10-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
11-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
12-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
13-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	2	2	2	3	3	3	4	3	4	3	3	3	4	4
14-Nov	4	4	4	4	4	4	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	1	1	1	4
15-Nov	UO	UO	UO	UO	UO	UO	UO	UO	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3
16-Nov	3	3	3	3	3	3	3	4	4	4	4	5	5	5	6	5	6	5	5	6	5	6	5	4	4	6	6
17-Nov	5	4	4	4	4	4	3	4	4	4	4	4	4	4	5	5	5	5	5	6	7	6	5	4	4	7	7
18-Nov	4	4	4	3	4	3	1	1	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	4
19-Nov	2	3	3	3	3	2	3	3	2	3	3	3	3	3	4	4	3	3	3	3	3	3	3	3	3	3	4
20-Nov	2	2	2	2	2	2	1	2	2	3	3	2	2	1	1	1	1	2	1	1	1	1	1	1	1	1	3
21-Nov	1	1	1	1	1	1	1	1	1	2	1	1	2	2	2	1	1	2	3	2	2	2	2	2	3	3	3
22-Nov	3	3	3	3	3	2	3	2	3	3	2	3	3	2	2	1	1	2	2	2	2	2	2	1	1	1	3
23-Nov	2	2	1	2	2	2	2	1	1	1	2	2	1	2	2	2	2	3	3	3	3	3	3	3	3	3	3
24-Nov	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	1	2	1	3
25-Nov	1	0	1	1	1	0	1	1	1	1	1	1	1	1	2	2	2	3	2	2	2	2	2	2	2	2	3
26-Nov	3	3	3	3	3	3	3	3	3	3	3	3	4	5	5	4	4	4	4	4	4	4	5	6	6	6	6
27-Nov	6	5	6	6	6	5	5	5	5	5	5	5	6	6	6	6	6	5	5	5	5	4	4	4	4	4	6
28-Nov	3	3	3	3	2	2	2	2	2	2	2	3	3	3	2	2	2	2	3	2	1	1	1	1	1	1	3
29-Nov	1	1	1	1	1	1	1	1	2	2	1	1	2	2	1	2	2	1	1	2	2	2	1	2	2	2	2
30-Nov	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2

6	5	6	6	6	5	5	5	5	5	5	5	5	6	6	6	6	6	6	5	5	6	7	6	6	6	6	
Diurnal Maximum																											

M - Maintenance      AF - Analyzer Failure      UO - Unstable Operation





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 20m (WS20) - km/h  
Stony Mountain - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	91	22.14	22.14
6 - 11	196	47.69	69.83
12 - 19	119	28.95	98.78
20 - 28	5	1.22	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 411

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 20m (WS20) - km/h  
Stony Mountain - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	11	4	10	10	7	0	0	0	6	5	5	3	0	3	9	18	91
6 - 11	15	31	25	21	8	2	0	3	12	6	8	0	1	17	20	27	196
12 - 19	2	1	5	11	0	0	0	2	26	11	8	3	2	26	17	5	119
20 - 28	0	0	0	0	0	0	0	0	4	0	0	0	1	0	0	0	5
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	28	36	40	42	15	2	0	5	48	22	21	6	4	46	46	50	411

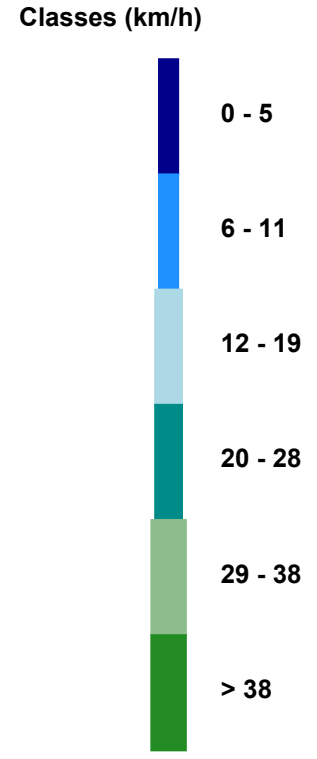
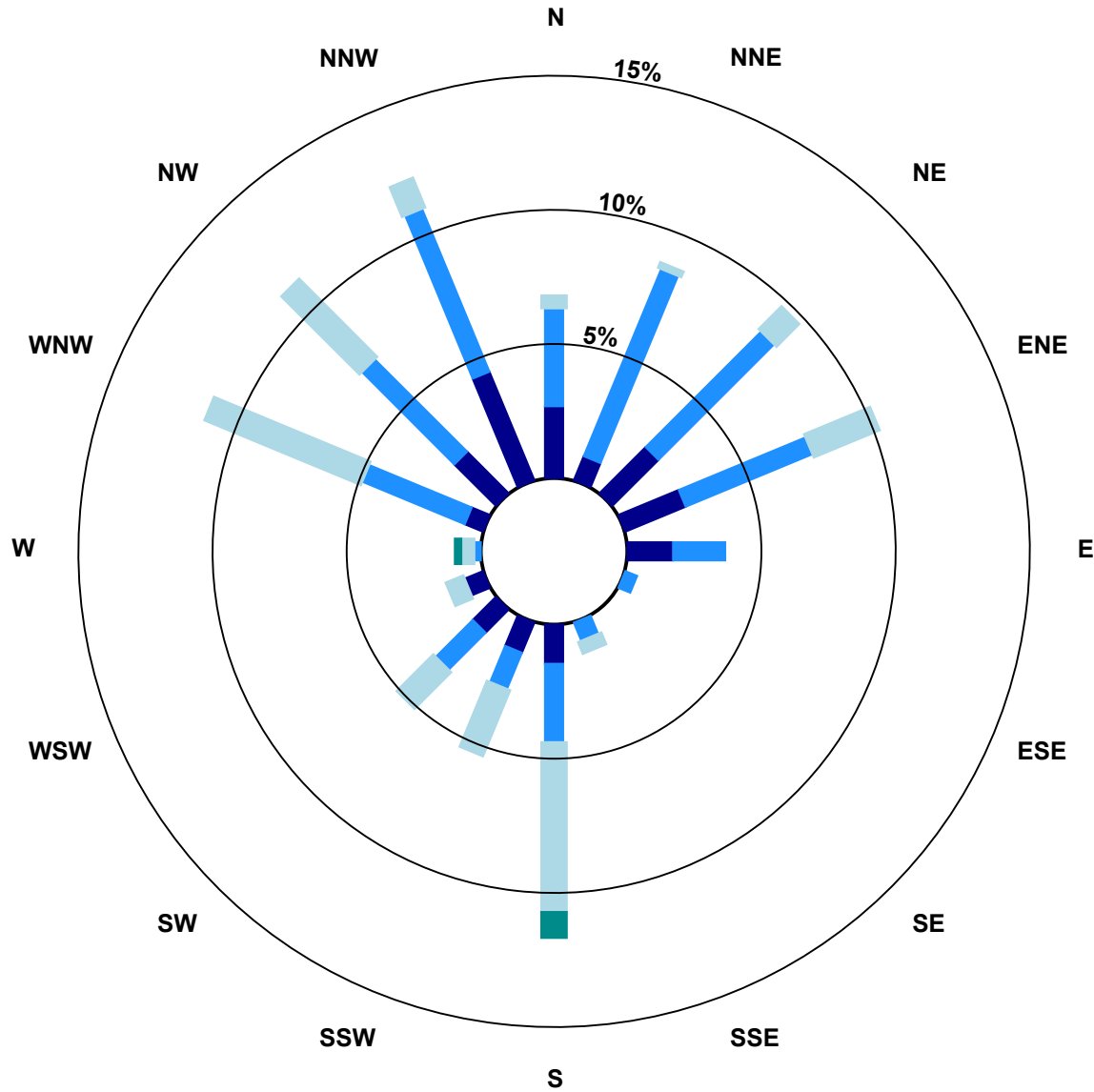
Total Number of Valid Hours: 411

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 20m (WS20) - km/h  
Stony Mountain



Total Number of Valid Hours: 411



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 20m (WD20) - deg**  
**Stony Mountain - November 2024**

Direction of Maximum Speed: 173 deg on Nov 16 20:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 303.1 deg on Nov 27	Hours of Data: 411
Direction of Minimum Speed: 85 deg on Nov 25 00:00	Direction of Minimum Daily Speed Average: 3.6 deg on Nov 30
Direction of Minimum Speed: 85 deg on Nov 25 00:00	Hours of Missing Data: 309
Monthly Average Direction: 322.0 deg	Percent Operational Time: 57.1

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
2-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
3-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
4-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
5-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
6-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
7-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
8-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
9-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
10-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
11-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
12-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
13-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	60	61	68	57	56	63	70	51	75	72	69	--
14-Nov	68	62	64	65	67	69	48	55	52	50	57	70	67	50	41	36	31	27	29	45	59	56	0	11	54.5
15-Nov	UO	UO	UO	UO	UO	UO	UO	UO	173	199	210	224	201	230	237	232	210	216	223	210	219	221	229	227	--
16-Nov	219	225	211	204	197	183	185	189	188	186	184	177	183	182	178	178	174	173	173	173	177	179	175	183.5	
17-Nov	173	178	171	169	177	187	184	175	196	200	203	206	225	236	241	240	226	223	232	245	277	288	299	291	218.7
18-Nov	293	304	303	291	305	300	296	299	285	288	273	303	307	310	340	340	341	350	29	3	40	30	32	49	319.5
19-Nov	39	46	62	67	72	26	41	45	20	15	15	21	353	7	8	357	347	349	356	341	331	326	329	335	8.6
20-Nov	335	329	326	326	328	337	326	344	7	11	11	354	350	338	355	13	35	22	3	338	336	327	341	343	345.0
21-Nov	337	345	328	318	351	340	335	332	319	325	315	309	341	349	344	289	335	333	331	317	297	296	303	297	321.2
22-Nov	298	295	300	300	299	299	297	296	289	295	313	318	318	319	317	322	337	351	5	20	38	55	69	76	314.7
23-Nov	58	57	70	62	59	65	64	66	57	56	49	53	41	45	53	50	48	39	39	33	22	23	46	28	46.4
24-Nov	31	28	20	26	25	26	17	14	19	17	27	25	10	11	8	6	25	43	33	33	31	43	44	85	24.2
25-Nov	256	246	225	283	213	169	188	192	207	217	190	190	172	176	165	167	165	170	171	178	173	166	173	179	180.3
26-Nov	186	187	187	190	186	190	193	189	189	193	193	193	189	197	203	213	218	220	233	260	269	293	292	293	213.7
27-Nov	302	296	297	298	299	301	298	291	293	296	301	305	311	311	309	317	311	304	308	307	306	304	300	309	303.1
28-Nov	310	304	310	311	310	313	303	308	310	303	314	323	329	333	330	328	336	336	347	340	333	339	328	328	319.7
29-Nov	323	318	325	330	335	335	333	354	28	41	36	69	41	44	69	75	81	86	92	100	98	93	83	73	48.4
30-Nov	76	76	94	115	104	93	84	100	82	81	63	49	80	70	36	65	24	1	353	359	340	332	320	325	53.6
	324.5	317.6	313.2	319.2	326.4	327.2	322.5	314.7	294.6	296.0	309.0	315.9	310.2	321.6	324.4	329.9	338.2	344.3	342.8	332.1	324.0	321.7	323.7	327.6	

Diurnal Average

M - Maintenance      AF - Analyzer Failure      UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 20m (WD20) - deg**  
**Stony Mountain - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 76 deg on Nov 25 00:00	Hours of Data: 411
Minimum Value: 11 deg on Nov 29 18:00	Hours of Missing Data: 309
Percentiles: P <sub>1</sub> = 13 P <sub>10</sub> = 15 Q <sub>1</sub> = 17 Median = 19 Q <sub>3</sub> = 22 P <sub>90</sub> = 26 P <sub>99</sub> = 37	Hours of Calibration: 0
	Percent Operational Time: 57.1

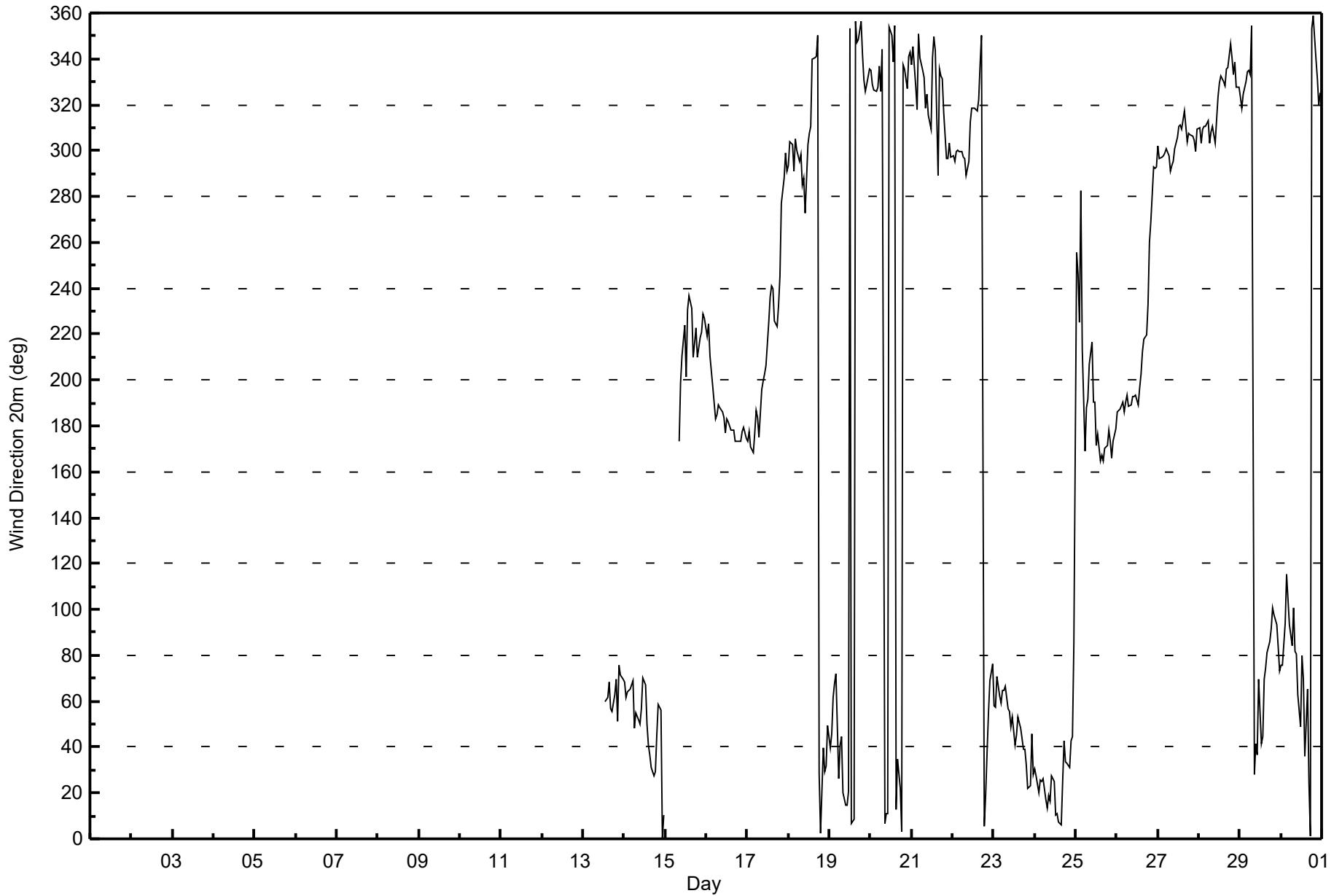
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	
2-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
3-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
4-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
5-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
6-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
7-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
8-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
9-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
10-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
11-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
12-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
13-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	20	16	16	17	15	17	18	17	17	16	16	20	
14-Nov	15	14	17	16	16	18	17	16	16	17	18	18	18	20	18	23	20	22	19	15	28	30	30	30	30	
15-Nov	UO	UO	UO	UO	UO	UO	UO	UO	14	16	21	22	29	25	24	21	16	17	17	16	19	18	21	22	29	
16-Nov	21	22	21	21	22	20	20	20	21	20	21	21	22	22	20	20	22	20	18	18	19	20	19	18	22	
17-Nov	20	20	17	18	23	25	24	23	23	20	19	21	23	22	23	23	20	22	22	26	22	24	21	21	26	
18-Nov	20	19	21	22	20	20	22	18	20	23	23	27	39	36	32	21	25	30	37	35	23	27	23	20	39	
19-Nov	21	22	22	16	20	32	20	17	20	23	20	26	25	22	20	22	19	19	18	17	14	14	13	16	32	
20-Nov	16	15	15	14	16	18	15	18	19	21	24	27	30	26	31	28	20	19	26	24	15	17	19	19	31	
21-Nov	22	18	20	20	19	20	16	16	19	17	26	35	27	30	35	22	17	15	15	16	15	15	14	16	35	
22-Nov	18	17	17	16	17	16	16	16	17	18	17	18	19	21	22	15	16	16	20	16	13	50	14	20	50	
23-Nov	16	17	20	17	17	19	18	17	21	19	19	18	19	19	18	16	18	18	20	20	21	17	21	21	21	
24-Nov	24	23	19	19	19	21	19	19	20	20	20	26	23	26	20	20	19	15	16	19	23	23	34	76	76	
25-Nov	29	25	28	26	32	12	12	14	12	16	21	31	35	26	22	21	15	13	13	14	15	14	16	19	35	
26-Nov	20	20	20	19	19	23	21	21	20	19	23	20	20	20	21	22	20	18	23	24	23	22	21	22	24	
27-Nov	20	21	21	20	18	20	20	19	19	20	20	22	20	20	20	19	20	18	18	19	17	17	20	17	22	
28-Nov	16	18	16	15	14	13	15	14	13	15	16	17	19	24	20	13	16	15	17	19	17	14	17	16	24	
29-Nov	16	18	16	13	17	17	18	21	21	23	26	35	46	28	17	24	13	11	14	16	15	18	18	16	46	
30-Nov	17	17	19	18	15	17	22	19	20	18	30	23	23	24	24	16	23	19	16	14	16	17	17	18	30	
Diurnal Maximum																										
29	25	28	26	32	32	24	23	23	23	30	35	46	36	35	28	25	30	37	35	23	50	34	76			

M - Maintenance      AF - Analyzer Failure      UO - Unstable Operation



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Direction 20m (WD20) - deg**  
**Stony Mountain - November 2024**







## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS19 FIREBAG NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)  
NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	680	34	40	99.17	15.5	0	4.9	0
H2S (ppb) Average	658	36	62	96.39	2.8	0	0.4	0
THC (ppm) Average	680	34	40	99.17	2.7	-	2.4	-
NO2 (ppb) Average	678	35	42	99.03	20.5	0	8.3	-
NO (ppb) Average	678	35	42	99.03	13.9	-	2.3	-
NOX (ppb) Average	678	35	42	99.03	30.5	-	10.6	-
Temperature 2 m (C) Average	720	0	0	100	10.4	-	6.1	-
Relative Humidity (%) Average	720	0	0	100	97.8	-	93.9	-
Wind Speed 10 m (km/h) Average	700	0	20	97.22	36	-	25	-
Wind Direction 10 m (deg) Average	700	0	20	97.22	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)  
NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	680	0.72	1.8	-	0	0	0	0.1	0.4	1.8	15.5
H2S (ppb) Average	658	0.13	0.2	-	0	0	0	0.1	0.1	0.3	2.8
THC (ppm) Average	680	2.27	0.1	-	2.2	2.2	2.2	2.3	2.3	2.4	2.7
NO2 (ppb) Average	678	3.26	3.6	-	0.1	0.2	0.7	2.1	4.5	7.9	20.5
NO (ppb) Average	678	0.8	1.4	-	0	0	0	0.3	0.9	2.4	13.9
NOX (ppb) Average	678	4.06	4.4	-	0.1	0.2	0.8	2.7	5.8	9.7	30.5
Temperature 2 m (C) Average	720	-9.03	8.3	-	-27.7	-19.5	-16.1	-6.9	-2.5	0.4	10.4
Relative Humidity (%) Average	720	85.71	7.9	-	48.3	75.7	82.2	85.9	92.2	94.3	97.8
Wind Speed 10 m (km/h) Average	700	11	6	-	1	5	7	10	14	20	36
Wind Direction 10 m (deg) Average	700	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	27 Nov 2024 10:00	27 Nov 2024 15:00	6-7	Station power failure
H2S	25 Nov 2024 17:00	26 Nov 2024 12:00	20	Maintenance - adjust converter temperature
Wind Speed, Wind Direction	02 Nov 2024 01:00	02 Nov 2024 19:00	19	Flat line in sensor output signal
Wind Speed, Wind Direction	19 Nov 2024 00:00	19 Nov 2024 00:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb

Firebag - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 15.5 ppb on Nov 4 16:00	Maximum Daily Average: 4.9 ppb on Nov 10		Hours of Data:	680
Minimum Value: 0.0 ppb on Nov 3 00:00	Minimum Daily Average: 0.0 ppb on Nov 21		Hours of Missing Data:	40
Maximum Diurnal Average: 1.5 ppb at hour 13	Minimum Diurnal Average: 0.2 ppb at hour 3		Hours of Calibration:	34
Monthly Average: 0.72 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.1 Q <sub>3</sub> = 0.4 P <sub>90</sub> = 1.8 P <sub>99</sub> = 10.3		Percent Operational Time:	99.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	Z	0.2	0.5	0.9	0.4	1.7	4.3	5.7	6.2	12.8	6.5	6.4	6.7	4.9	3.6	1.8	1.1	0.6	0.2	0.3	0.2	0.2	0.1	0.2	2.8	12.8
2-Nov	0.4	Z	0.4	0.7	0.9	0.6	0.3	0.2	0.2	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.2	0.9
3-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.0	1.6	3.0	4.6	1.8	1.7	4.0	0.8	0.2	1.1	2.0	1.0	1.7	2.7	1.1	0.5	1.2	4.6
4-Nov	0.6	1.5	0.3	Z	3.8	3.2	2.3	0.8	0.4	1.2	2.6	4.0	13.4	10.8	10.3	15.5	9.1	1.2	0.1	0.1	0.8	2.6	4.1	1.5	3.9	15.5
5-Nov	1.4	1.6	1.7	1.3	Z	3.0	2.2	1.1	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.3	0.0	0.1	0.3	0.3	2.9	0.7	3.0
6-Nov	0.2	1.7	0.0	0.3	0.3	Z	0.2	0.1	0.2	0.1	0.1	0.3	1.7	3.0	2.5	2.3	1.8	1.2	0.3	0.2	0.2	0.2	0.5	1.8	0.8	3.0
7-Nov	Z	0.7	0.1	0.1	0.2	0.2	0.1	0.2	0.7	0.8	0.6	2.5	2.3	1.9	0.5	0.2	0.1	1.3	5.3	2.7	1.2	0.5	0.3	0.3	1.0	5.3
8-Nov	0.4	Z	0.4	0.4	0.5	0.4	0.3	0.3	0.5	1.1	0.6	0.5	0.4	0.2	2.2	4.2	2.8	1.9	2.0	0.6	0.4	0.3	0.2	2.1	1.0	4.2
9-Nov	2.0	0.3	Z	0.1	0.0	0.1	0.1	0.2	0.2	0.5	0.6	1.2	1.7	0.2	0.4	0.6	0.2	0.2	0.9	0.3	0.2	0.2	0.2	0.6	0.5	2.0
10-Nov	0.2	0.4	0.6	Z	5.9	9.9	7.9	5.8	10.4	10.0	6.1	7.2	4.3	4.6	2.8	3.4	13.5	15.5	2.4	0.7	0.6	0.7	0.5	0.3	4.9	15.5
11-Nov	0.3	0.4	0.3	0.3	Z	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.4
12-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.4	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.1	0.0	0.2	0.1	0.1	0.1	0.4	0.3	0.4	0.3	0.1	0.4
13-Nov	Z	0.3	0.2	0.2	0.1	0.5	0.8	1.0	0.7	0.6	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.5	1.8	0.5	0.4	0.5	0.4	1.8	
14-Nov	0.2	Z	0.2	0.1	0.0	0.1	0.1	3.5	2.2	4.7	3.2	3.9	0.2	0.1	0.4	0.4	0.4	1.3	1.8	0.1	0.1	0.1	0.0	0.0	1.0	4.7
15-Nov	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.4
16-Nov	0.0	0.0	0.0	Z	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2
17-Nov	0.1	0.1	0.1	0.2	Z	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.2
18-Nov	0.1	0.0	0.2	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2
19-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
23-Nov	0.0	0.1	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.5	0.8	0.6	0.4	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.8
24-Nov	0.1	0.1	0.1	0.2	0.1	Z	0.1	0.1	5.3	0.3	0.2	0.1	6.3	2.1	0.6	0.8	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	6.3
25-Nov	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.1	0.4	0.4	0.3	0.4	0.4	0.5	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.5
26-Nov	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.5	1.1	0.4	0.5	0.1	0.1	0.5	0.3	1.1
27-Nov	0.8	0.8	Z	0.5	0.2	0.1	0.0	0.1	0.3	PF	PF	PF	PF	PF	PF	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	--	0.8
28-Nov	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
29-Nov	0.1	0.1	0.1	0.0	Z	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.3	0.3	0.3	0.4	0.4
30-Nov	0.4	0.4	0.4	0.3	0.1	Z	0.2	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.4

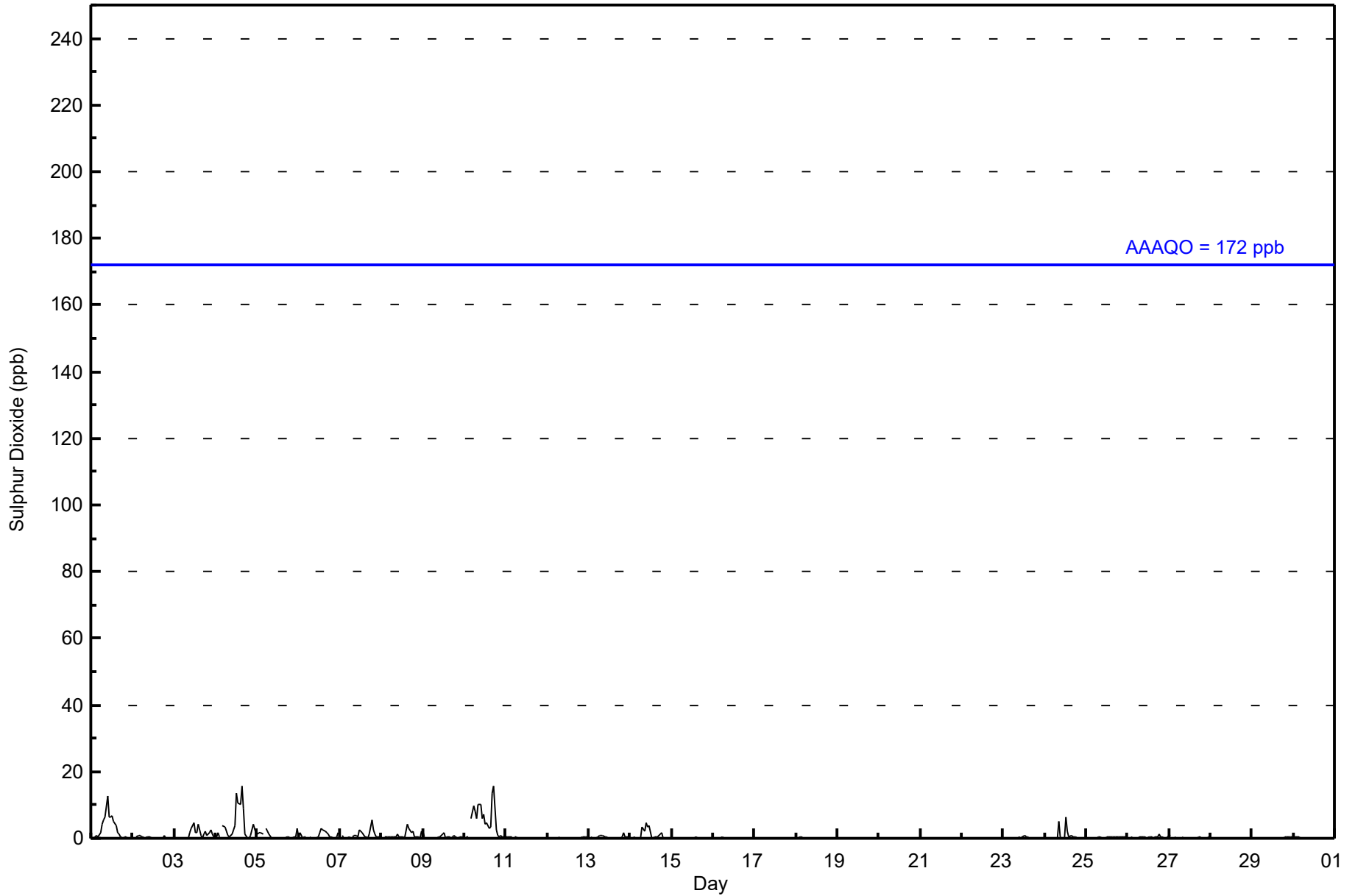
0.3	0.3	0.2	0.2	0.5	0.8	0.7	0.7	1.0	1.2	0.9	1.2	1.5	1.1	1.1	1.1	1.0	0.9	0.6	0.3	0.3	0.3	0.3	0.4	Diurnal Average	
2.0	1.7	1.7	1.3	5.9	9.9	7.9	5.8	10.4	12.8	6.5	7.2	13.4	10.8	10.3	15.5	13.5	15.5	5.3	2.7	1.8	2.7	4.1	2.9	Diurnal Maximum	

Z - zerospan      C - Calibration      PF - Power Failure  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb    24-hr 48 ppb



Wood Buffalo Environmental Association  
Hourly Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Firebag - November 2024





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Firebag - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	674	99.12	99.12
11 - 20	6	0.88	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Firebag - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	71	40	31	25	23	15	24	40	98	55	50	48	42	25	18	50	655
11 - 20	0	0	0	0	0	0	0	0	1	2	2	1	0	0	0	0	6
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	71	40	31	25	23	15	24	40	99	57	52	49	42	25	18	50	661

Total Number of Valid Hours: 661

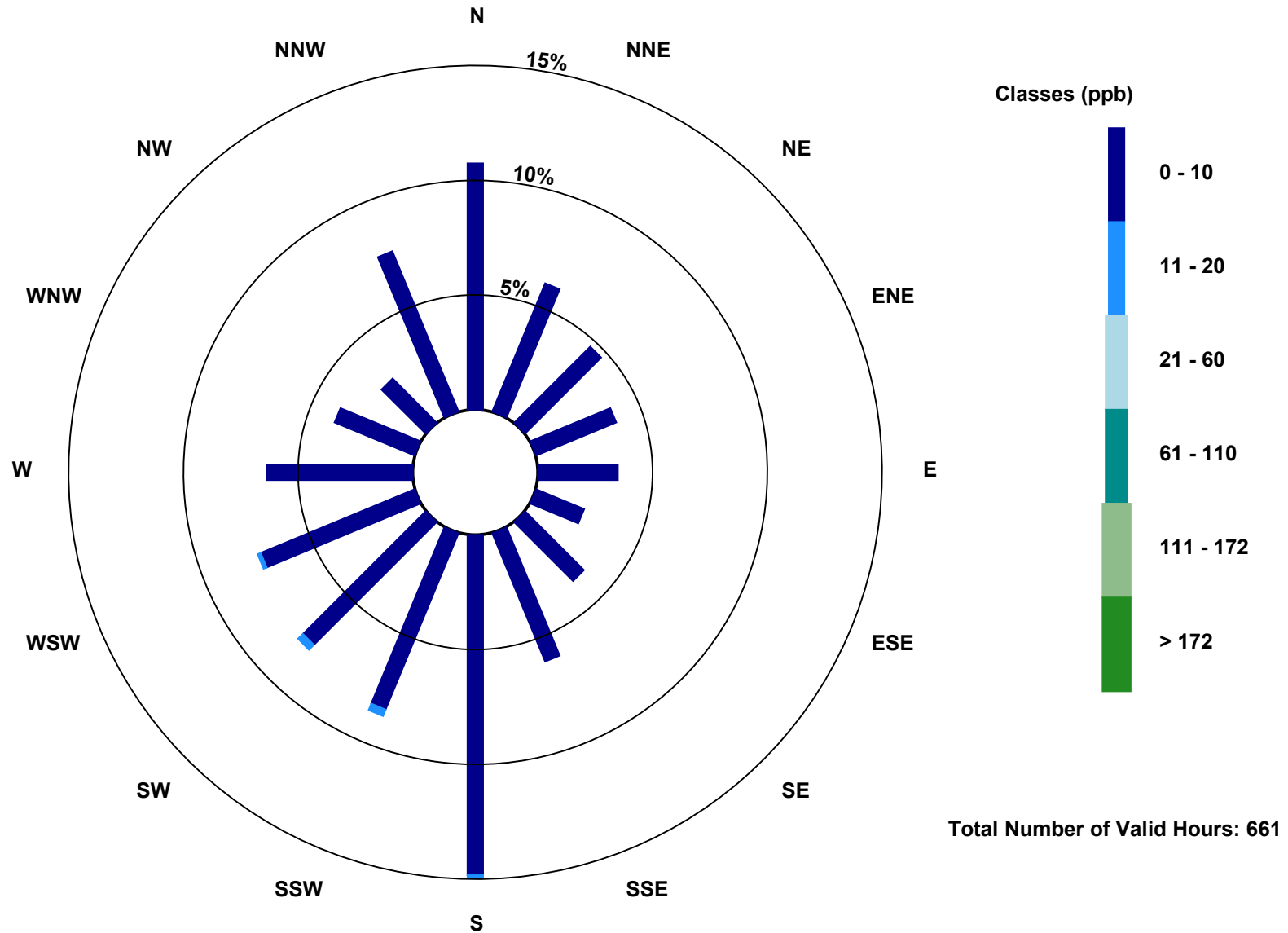
Total Number of Hours: 720

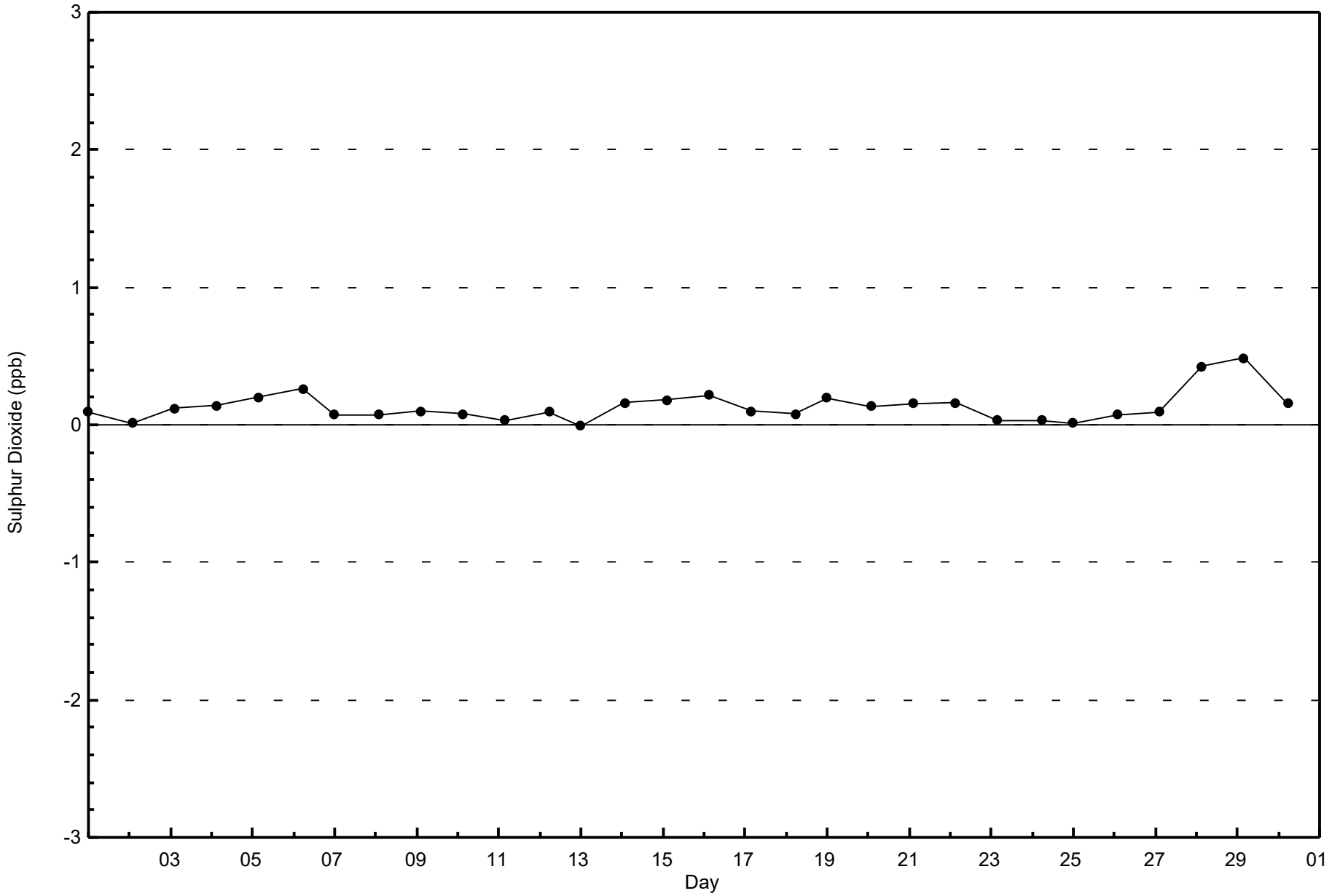


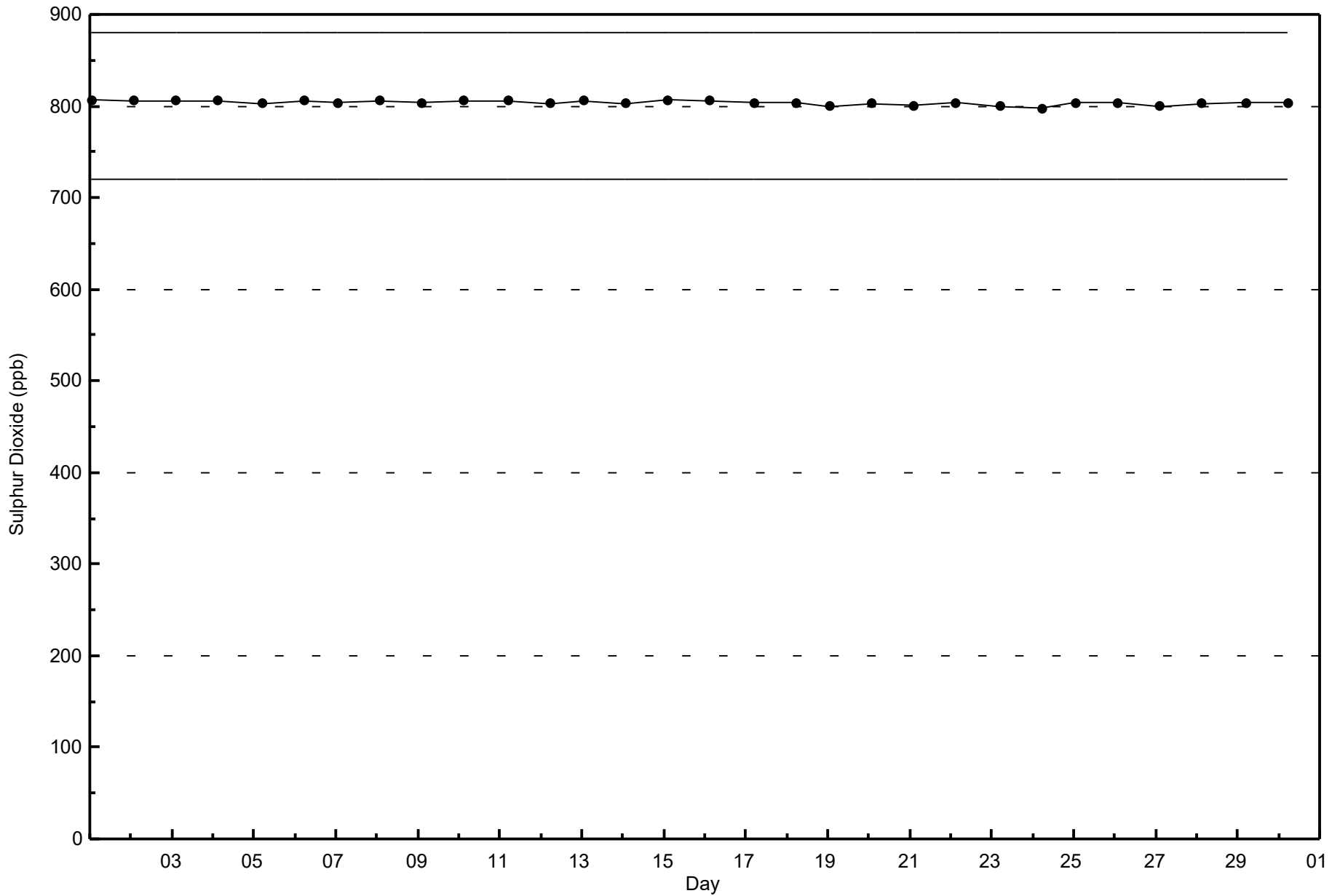


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Firebag









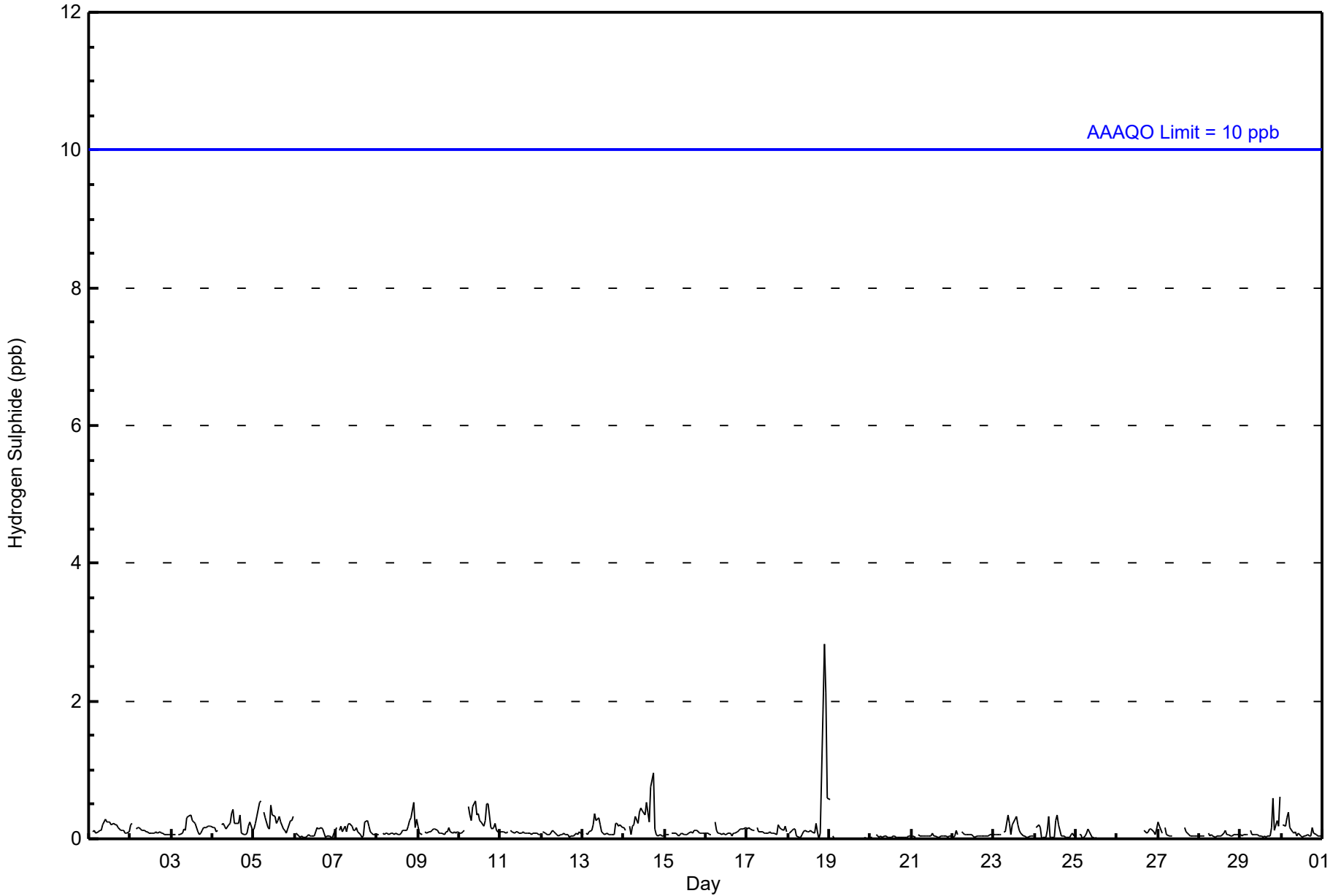
# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Hydrogen Sulphide (H<sub>2</sub>S) - ppb

## Firebag - November 2024

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Hours of Data: 658																												
Maximum Value: 2.8 ppb on Nov 18 22:00		Maximum Daily Average: 0.4 ppb on Nov 18																	Hours of Missing Data: 62																														
Minimum Value: 0.0 ppb on Nov 18 19:00		Minimum Daily Average: 0.0 ppb on Nov 19																	Hours of Calibration: 36																														
Maximum Diurnal Average: 0.2 ppb at hour 22		Minimum Diurnal Average: 0.1 ppb at hour 19																	Percent Operational Time: 96.4																														
Monthly Average: 0.13 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.1 Q <sub>3</sub> = 0.1 P <sub>90</sub> = 0.3 P <sub>99</sub> = 0.6																																															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3																							
2-Nov	0.2	0.2	Z	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
3-Nov	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4																						
4-Nov	0.2	0.2	0.1	0.1	Z	0.2	0.2	0.2	0.1	0.2	0.2	0.4	0.4	0.2	0.2	0.2	0.3	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.4																							
5-Nov	0.1	0.2	0.3	0.5	0.5	Z	0.4	0.3	0.2	0.1	0.5	0.3	0.3	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.5																							
6-Nov	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2																							
7-Nov	0.2	Z	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.3																							
8-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.5	0.2	0.3	0.1	0.5																							
9-Nov	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2																							
10-Nov	0.1	0.1	0.1	0.1	Z	0.5	0.3	0.3	0.5	0.6	0.4	0.4	0.3	0.2	0.2	0.3	0.5	0.5	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.6																							
11-Nov	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
12-Nov	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
13-Nov	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.4																							
14-Nov	0.2	0.1	Z	0.2	0.1	0.2	0.2	0.3	0.2	0.4	0.4	0.4	0.3	0.5	0.4	0.3	0.8	1.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	1.0																							
15-Nov	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																							
16-Nov	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2																							
17-Nov	0.1	0.2	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.2																							
18-Nov	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.1	1.9	2.8	2.1	0.6	0.4	2.8																							
19-Nov	0.6	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6																							
20-Nov	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																							
21-Nov	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																							
22-Nov	0.0	0.0	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1																							
23-Nov	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.3	0.2	0.1	0.2	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3																							
24-Nov	Z	0.2	0.2	0.2	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.3	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.4																							
25-Nov	0.1	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	M	M	M	M	M	M	M	0.1																							
26-Nov	M	M	M	M	M	M	M	M	M	M	M	M	C	C	C	C	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2																							
27-Nov	0.2	0.2	0.1	Z	0.2	0.1	0.0	0.0	0.0	0.0	PF	PF	PF	PF	PF	PF	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2																							
28-Nov	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1																							
29-Nov	0.1	0.0	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.1	0.3	0.2	0.6	0.6																								
30-Nov	Z	0.2	0.2	0.3	0.4	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.4																							
																								0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	Diurnal Average		
																								0.6	0.2	0.3	0.5	0.5	0.5	0.4	0.4	0.5	0.6	0.5	0.4	0.4	0.5	0.4	0.3	0.8	1.0	0.3	0.6	1.9	2.8	2.1	0.6	Diurnal Maximum	
Z - zerspan C - Calibration M - Maintenance PF - Power Failure																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																																																	





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Firebag - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	657	99.85	99.85
3 - 4	1	0.15	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 658

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Firebag - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	69	43	31	25	23	14	25	41	70	58	52	49	44	24	21	49	638
3 - 4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	69	43	31	25	23	15	25	41	70	58	52	49	44	24	21	49	639

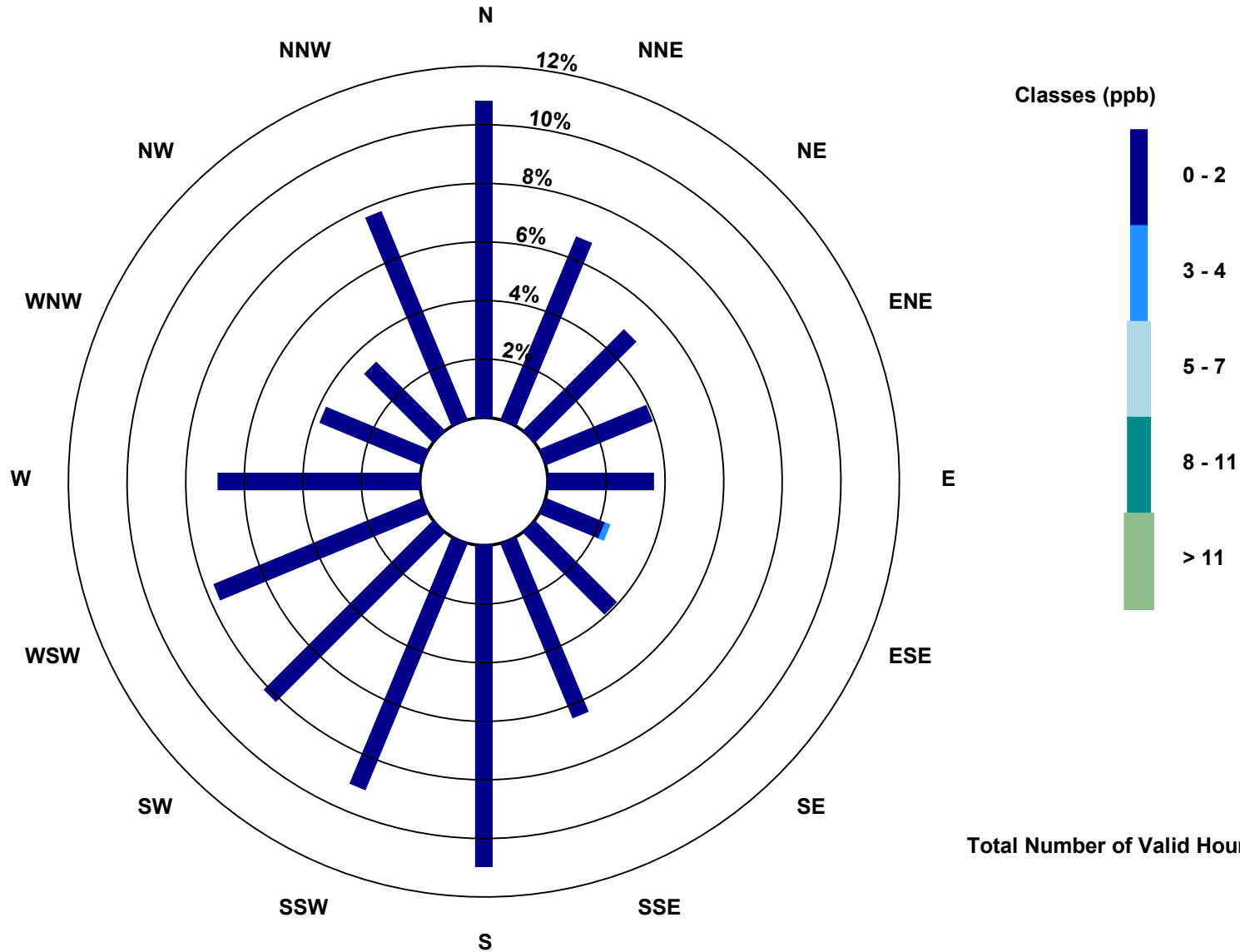
Total Number of Valid Hours: 639

Total Number of Hours: 720



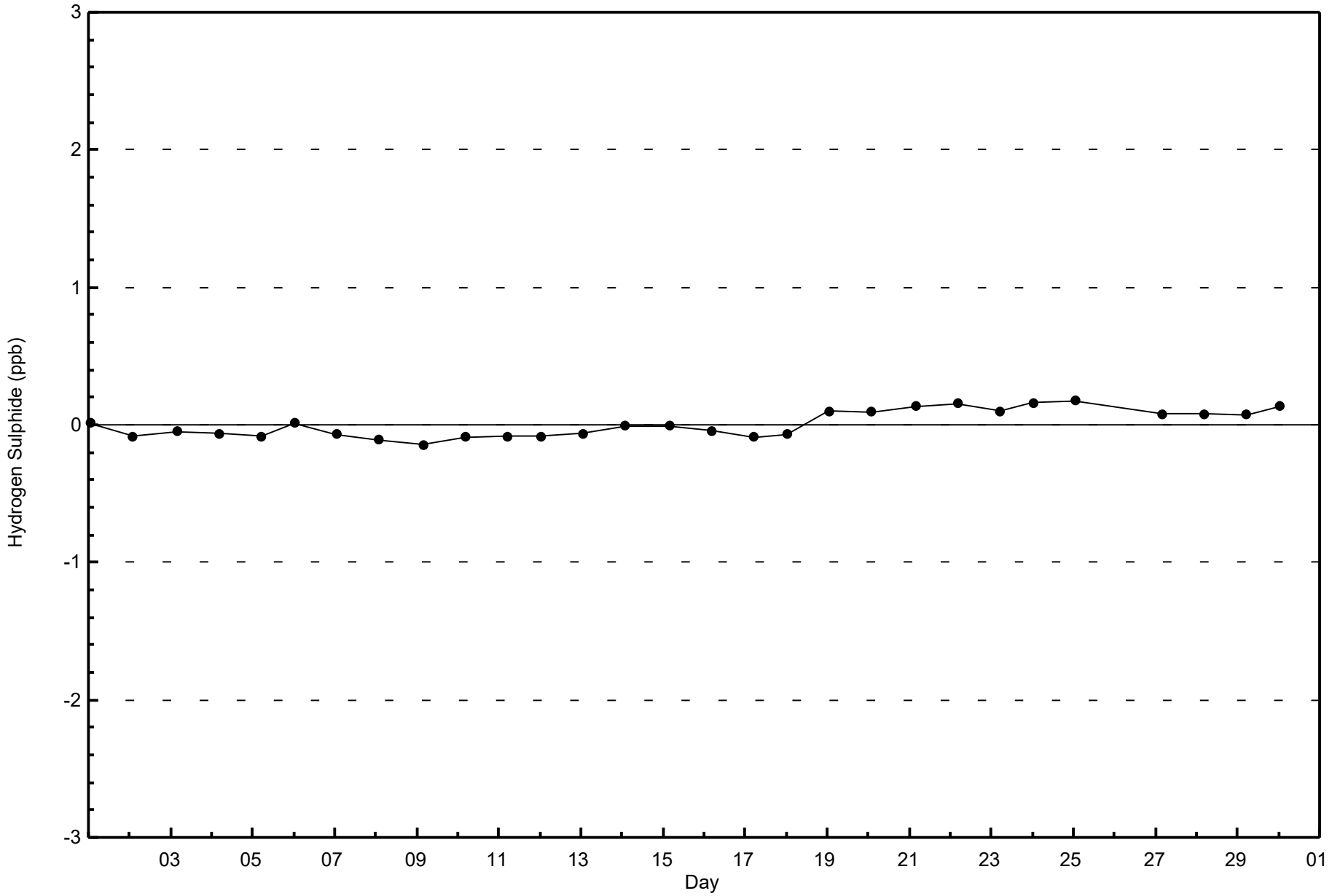
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

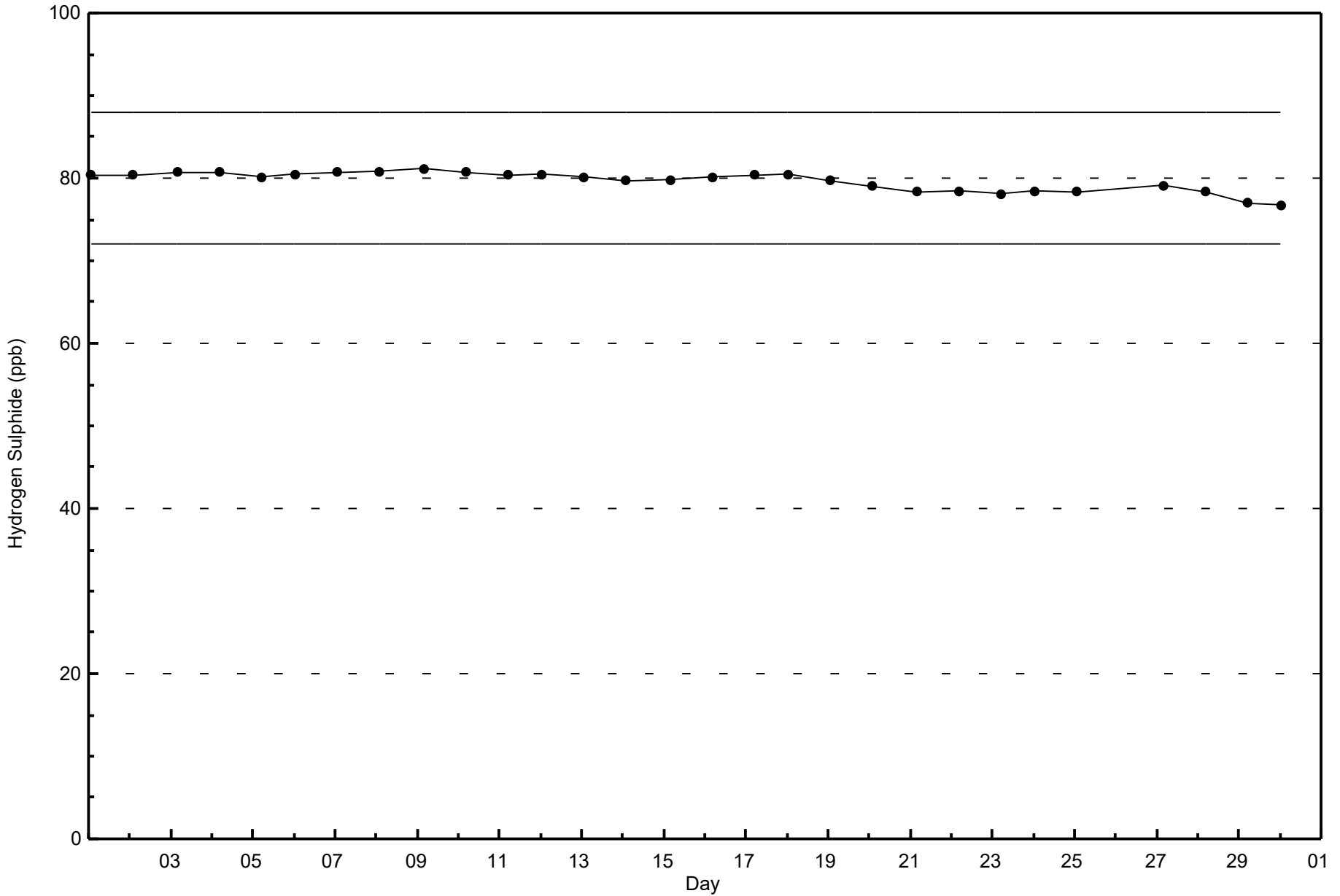
Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Firebag



Total Number of Valid Hours: 639





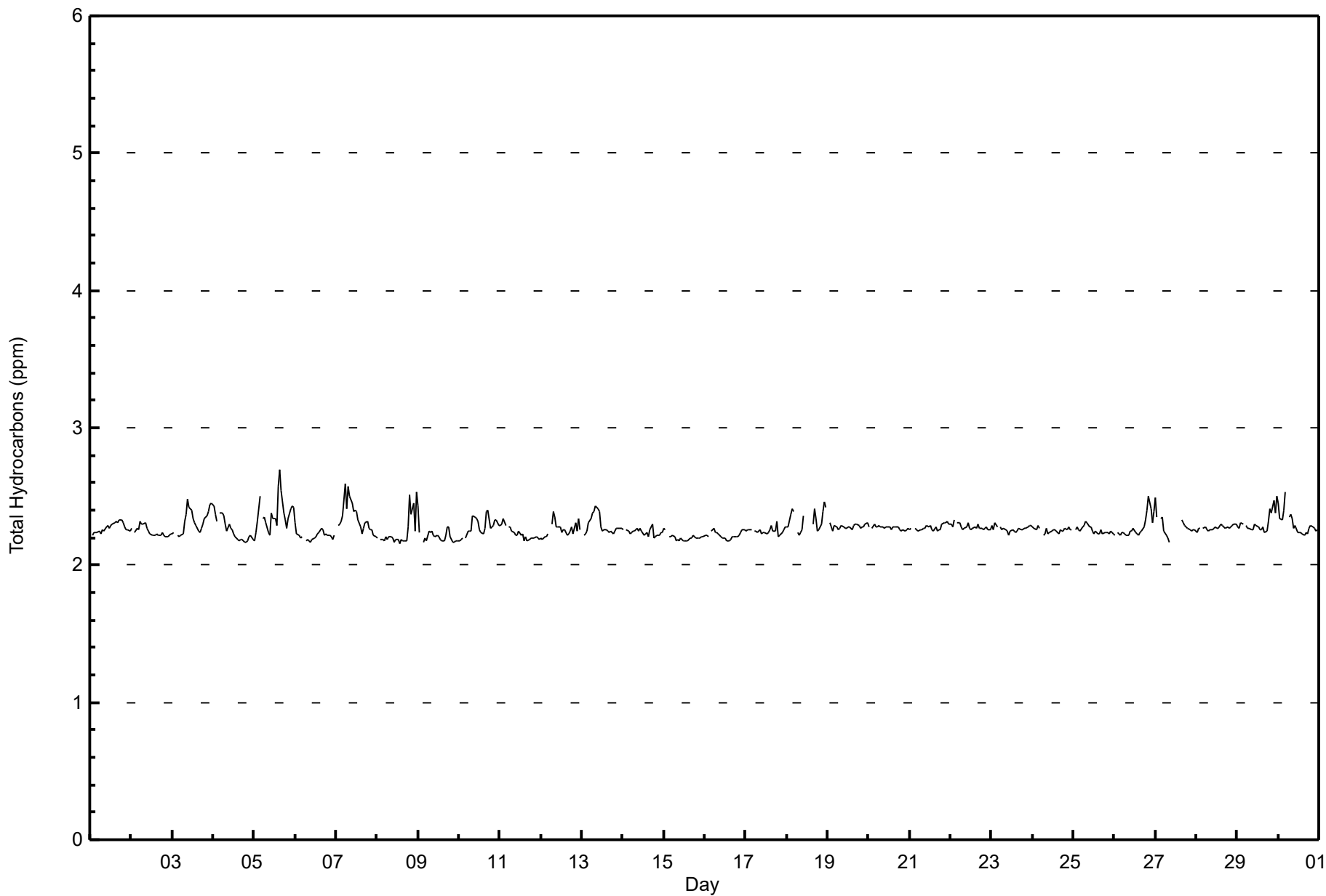




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Total Hydrocarbons (THC) - ppm**  
**Firebag - November 2024**

Maximum Value: 2.7 ppm on Nov 5 16:00		Maximum Daily Average: 2.4 ppm on Nov 5		Hours in Service: 720																							
Minimum Value: 2.2 ppm on Nov 8 14:00		Minimum Daily Average: 2.2 ppm on Nov 15		Hours of Data: 680																							
Maximum Diurnal Average: 2.3 ppm at hour 24		Minimum Diurnal Average: 2.2 ppm at hour 14		Hours of Missing Data: 40																							
Monthly Average: 2.27 ppm		Percentiles: P <sub>1</sub> = 2.2 P <sub>10</sub> = 2.2 Q <sub>1</sub> = 2.2 Median = 2.3 Q <sub>3</sub> = 2.3 P <sub>90</sub> = 2.4 P <sub>99</sub> = 2.5		Hours of Calibration: 34																							
				Percent Operational Time: 99.2																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	
2-Nov	2.3	Z	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
3-Nov	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.4	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.5	2.3
4-Nov	2.4	2.4	2.3	Z	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4
5-Nov	2.2	2.2	2.3	2.5	Z	2.3	2.3	2.3	2.2	2.2	2.4	2.3	2.3	2.3	2.6	2.7	2.5	2.4	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.7
6-Nov	2.3	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
7-Nov	Z	2.3	2.3	2.3	2.4	2.6	2.4	2.6	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.6
8-Nov	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5	2.4	2.5	2.2	2.5	2.2	2.5	2.2
9-Nov	2.4	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4
10-Nov	2.2	2.2	2.2	Z	2.2	2.3	2.3	2.2	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4
11-Nov	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
12-Nov	2.2	2.2	2.2	2.2	2.2	Z	2.3	2.4	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.4
13-Nov	Z	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4
14-Nov	2.3	Z	2.3	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
15-Nov	2.3	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
16-Nov	2.2	2.2	2.2	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.3
17-Nov	2.2	2.3	2.3	2.3	Z	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.3
18-Nov	2.3	2.3	2.4	2.4	2.4	Z	2.2	2.2	2.2	2.3	2.4	C	C	C	C	2.3	2.4	2.3	2.2	2.3	2.3	2.4	2.5	2.4	2.3	2.5	2.3
19-Nov	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
20-Nov	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3
21-Nov	2.3	2.3	Z	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
22-Nov	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
23-Nov	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
24-Nov	2.3	2.3	2.3	2.3	2.3	Z	2.2	2.2	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3
25-Nov	Z	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
26-Nov	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.5	2.4	2.3	2.4	2.3	2.4	2.5
27-Nov	2.5	2.3	Z	2.3	2.4	2.2	2.2	2.2	2.2	2.2	PF	PF	PF	PF	PF	PF	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5
28-Nov	2.2	2.3	2.3	Z	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
29-Nov	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.4	2.4	2.5	2.4	2.5	2.5	2.3
30-Nov	2.5	2.3	2.3	2.4	2.5	Z	2.3	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan      C - Calibration      PF - Power Failure																											





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Firebag - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	0	0.00	0.00
2.1 - 3.0	680	100.00	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Firebag - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	71	40	31	25	23	15	24	40	99	57	52	49	42	25	18	50	661
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	71	40	31	25	23	15	24	40	99	57	52	49	42	25	18	50	661

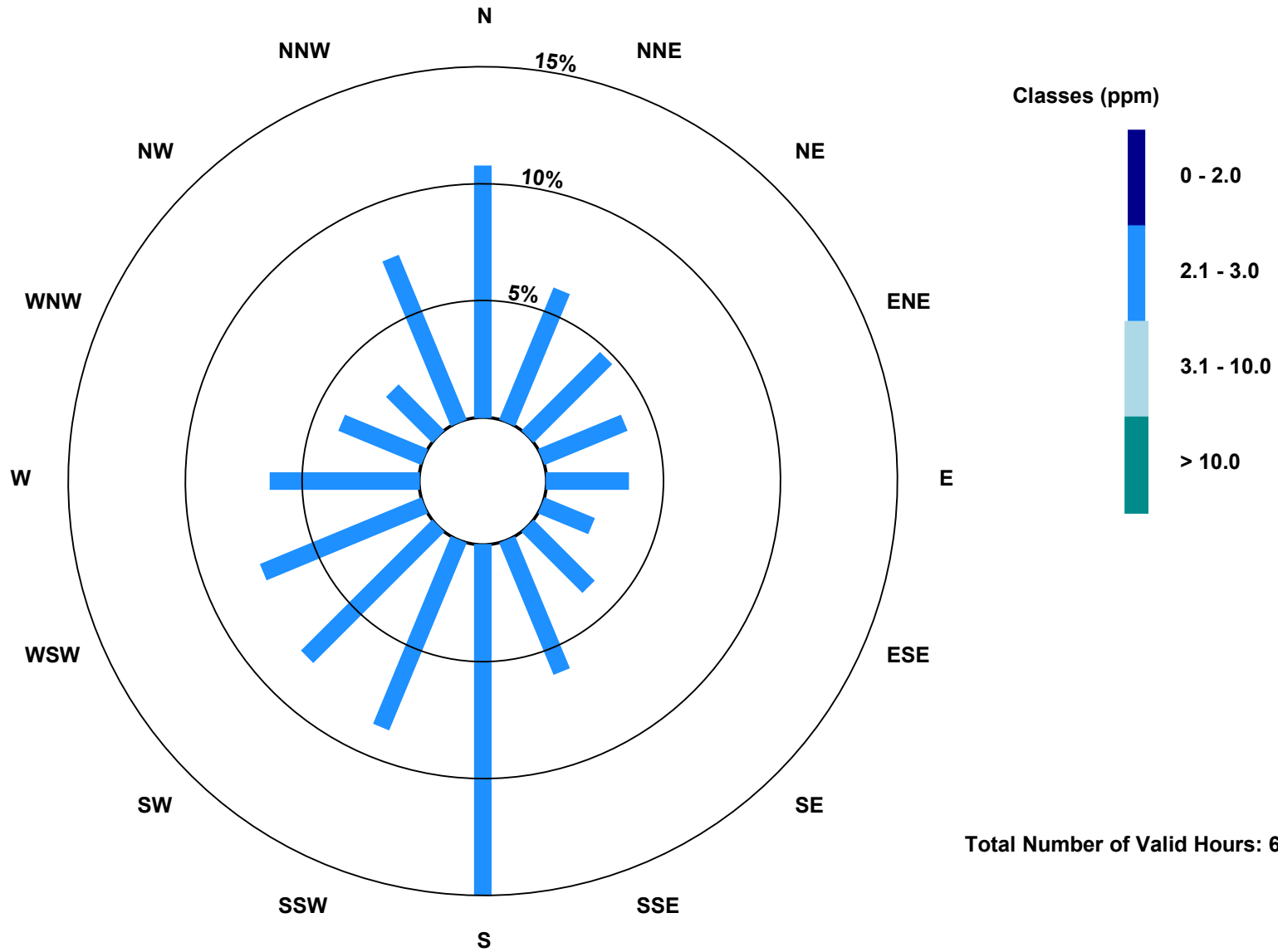
Total Number of Valid Hours: 661

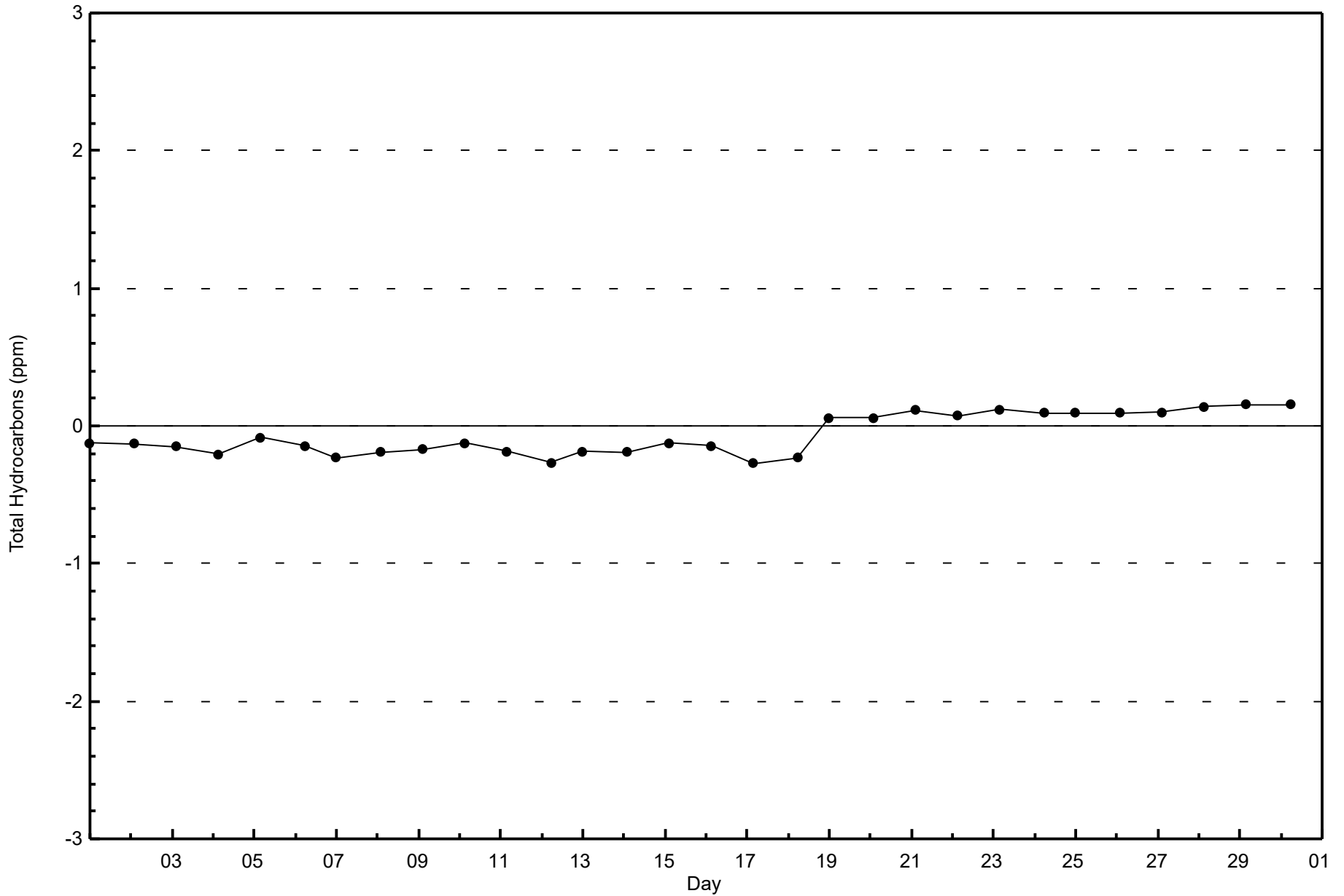
Total Number of Hours: 720



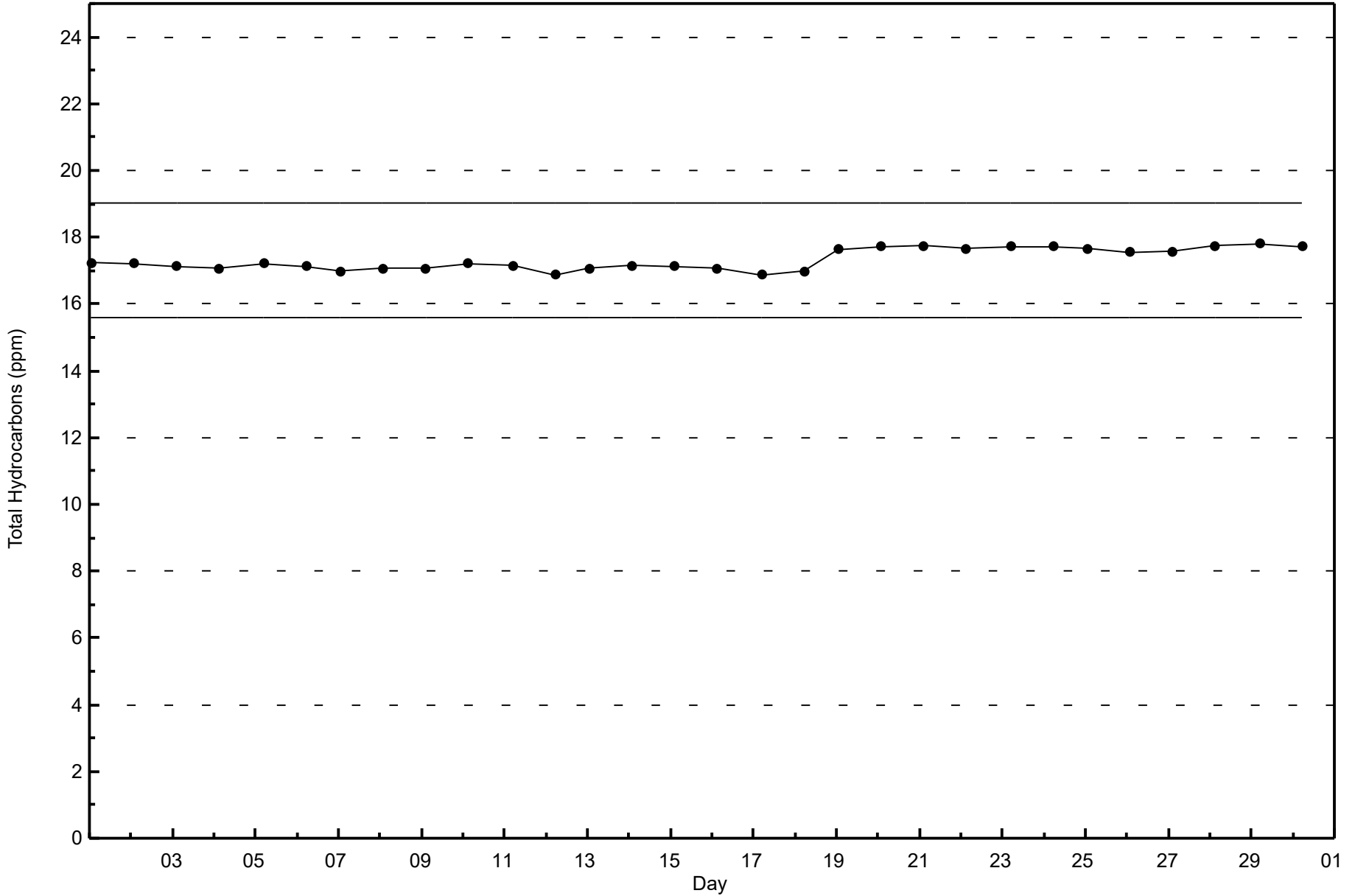
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Hydrocarbons (THC) - ppm  
Firebag











**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

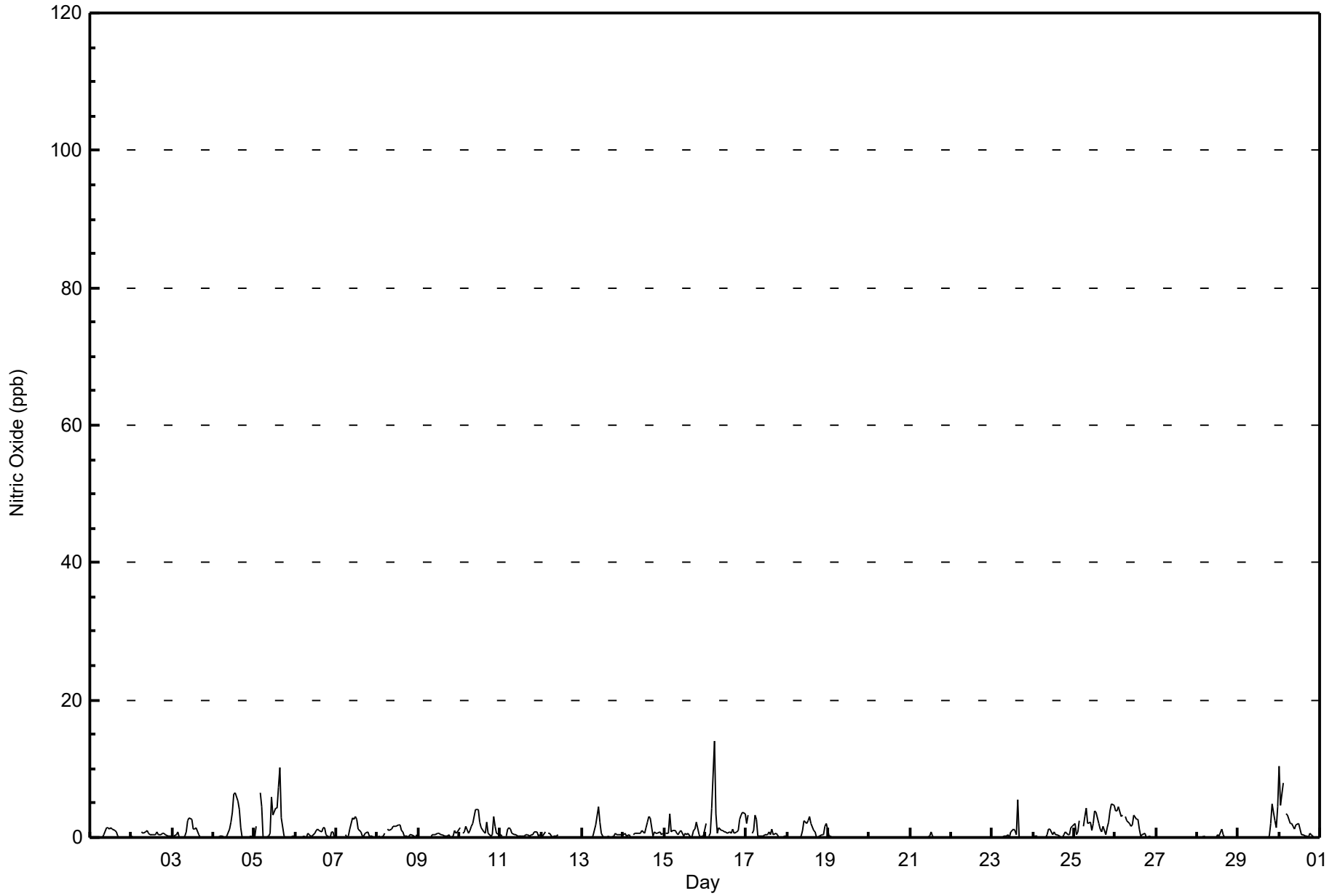
**Nitric Oxide (NO) - ppb**  
**Firebag - November 2024**

Maximum Value: 13.9 ppb on Nov 16 06:00		Maximum Daily Average: 2.3 ppb on Nov 25		Hours in Service: 720																							
Minimum Value: 0.0 ppb on Nov 12 17:00		Minimum Daily Average: 0.0 ppb on Nov 20		Hours of Data: 678																							
Maximum Diurnal Average: 1.4 ppb at hour 13		Minimum Diurnal Average: 0.3 ppb at hour 19		Hours of Missing Data: 42																							
Monthly Average: 0.80 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.3 Q <sub>3</sub> = 0.9 P <sub>90</sub> = 2.4 P <sub>99</sub> = 6.4		Hours of Calibration: 35																							
				Percent Operational Time: 99.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.0	0.0	0.1	0.0	Z	0.0	0.0	0.1	0.4	1.4	1.4	1.2	1.5	1.2	0.9	0.7	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.4	1.5	
2-Nov	0.1	0.0	0.0	0.0	0.0	Z	0.8	0.6	0.8	1.0	0.6	0.4	0.4	0.4	0.8	0.3	0.5	0.6	0.6	0.3	0.3	0.2	0.2	0.4	1.0		
3-Nov	Z	0.2	0.4	0.8	0.1	0.0	0.0	0.1	0.7	2.5	2.8	2.7	1.3	1.2	1.4	0.5	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.6	2.8	
4-Nov	0.0	Z	0.0	0.0	0.2	0.2	0.0	0.0	0.3	1.3	2.2	3.7	6.4	6.4	5.3	4.0	1.4	0.1	0.0	0.0	0.1	0.1	0.2	0.0	1.4	6.4	
5-Nov	0.0	1.6	Z	6.6	4.5	0.1	0.0	0.1	0.1	0.6	5.8	3.3	4.2	4.2	7.2	10.2	2.7	0.1	0.1	0.0	0.0	0.1	0.2	0.2	2.3	10.2	
6-Nov	0.0	0.0	0.0	Z	0.0	0.2	0.0	0.7	0.4	0.1	0.2	0.7	1.1	1.1	1.1	0.9	1.3	1.5	0.4	0.1	0.0	0.8	0.8	0.1	0.5	1.5	
7-Nov	0.0	0.1	0.0	0.1	Z	0.4	0.0	0.2	1.2	2.8	2.6	3.1	2.6	1.3	0.8	0.3	0.3	0.7	0.7	0.1	0.2	0.3	0.1	0.1	0.8	3.1	
8-Nov	0.0	0.2	0.0	0.2	0.7	Z	1.2	1.1	1.2	1.6	1.5	1.6	1.7	1.8	1.0	0.8	0.2	0.3	0.1	0.5	0.4	0.1	0.0	0.5	0.7	1.8	
9-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.5	0.6	0.6	0.4	0.3	0.2	0.1	0.2	0.3	0.1	0.3	1.0	0.6	0.7	0.3	1.0	
10-Nov	1.3	Z	0.5	0.8	1.7	0.5	1.0	1.6	2.1	4.1	4.2	4.0	2.2	1.5	0.9	0.7	2.3	0.6	0.2	0.5	3.0	1.7	0.5	0.5	1.6	4.2	
11-Nov	0.4	0.3	Z	0.3	1.2	1.3	1.1	0.6	0.4	0.4	0.2	0.3	0.3	0.3	0.2	0.4	0.3	0.2	0.4	0.4	0.7	0.7	0.2	0.4	0.5	1.3	
12-Nov	0.5	0.2	0.9	Z	0.5	0.6	0.1	0.2	0.3	0.2	0.3	C	C	C	C	C	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	
13-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.2	0.9	1.7	4.5	2.2	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0.4	0.3	0.6	4.5	
14-Nov	0.3	0.6	0.3	0.4	0.1	Z	0.4	0.6	0.5	0.6	0.7	0.9	0.6	1.4	2.3	3.1	2.8	0.2	0.8	0.5	0.6	0.7	0.4	0.7	0.9	3.1	
15-Nov	Z	0.6	0.7	3.5	0.8	0.9	1.0	0.6	0.4	0.8	1.1	0.2	0.6	0.5	0.6	0.1	0.2	1.0	1.3	2.2	0.5	0.1	0.1	0.2	0.8	3.5	
16-Nov	2.0	Z	0.1	0.6	4.2	13.9	3.4	0.5	1.4	1.0	1.1	0.9	0.7	0.7	0.8	0.6	1.2	0.6	0.8	1.0	2.7	3.2	3.6	3.4	2.1	13.9	
17-Nov	2.1	3.2	Z	0.6	0.9	3.3	2.7	0.2	0.2	0.1	0.3	0.3	0.3	0.8	0.4	1.2	0.5	0.6	0.5	0.0	0.0	0.1	0.2	0.2	0.8	3.3	
18-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	1.1	2.4	2.1	2.4	3.0	2.0	1.1	0.8	0.1	0.0	0.1	0.4	0.4	1.6	2.1	0.9	3.0	
19-Nov	0.1	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
20-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.8	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	
22-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
23-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.2	0.4	0.0	0.8	1.3	1.1	0.4	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	5.5	
24-Nov	0.0	0.2	0.3	Z	0.0	0.0	0.0	0.1	0.4	1.1	1.1	0.5	0.8	0.5	0.3	0.2	0.1	0.0	0.4	0.8	0.5	0.4	1.3	1.7	0.5	1.7	
25-Nov	2.0	0.4	0.8	2.4	Z	1.7	3.0	4.2	2.0	2.2	1.0	2.1	3.8	3.6	2.0	1.3	0.9	1.7	0.5	1.3	2.3	3.8	5.0	4.8	2.3	5.0	
26-Nov	3.8	3.9	4.4	3.0	3.2	Z	3.0	2.3	2.1	1.6	1.8	3.3	2.7	2.5	1.2	0.3	0.4	0.7	0.0	0.0	0.1	0.0	0.0	0.0	1.8	4.4	
27-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	PF	PF	PF	PF	PF	PF	PF	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.1	
28-Nov	0.0	Z	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.3	1.2	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2	
29-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.0	4.9	2.4	1.4	4.4	0.7	4.9	
30-Nov	10.3	4.7	7.8	Z	3.5	3.2	2.0	2.0	1.6	1.2	1.9	2.1	1.3	0.5	0.4	0.3	0.3	0.0	0.6	0.5	0.1	0.0	0.0	0.0	1.9	10.3	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.9 0.7 0.7 0.8 0.9 1.1 0.7 0.6 0.6 1.1 1.2 1.3 1.4 1.2 1.1 1.2 0.6 0.3 0.3 0.4 0.6 0.6 0.6 0.7			
																								10.3 4.7 7.8 6.6 4.5 13.9 3.4 4.2 2.1 4.5 5.8 4.0 6.4 6.4 7.2 10.2 2.8 1.7 1.3 2.2 4.9 3.8 5.0 4.8			
																								Z - zerospan C - Calibration PF - Power Failure			



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Firebag - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Firebag - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	678	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 678

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Firebag - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	71	43	31	25	23	15	23	41	99	56	54	47	40	22	22	47	659
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	71	43	31	25	23	15	23	41	99	56	54	47	40	22	22	47	659

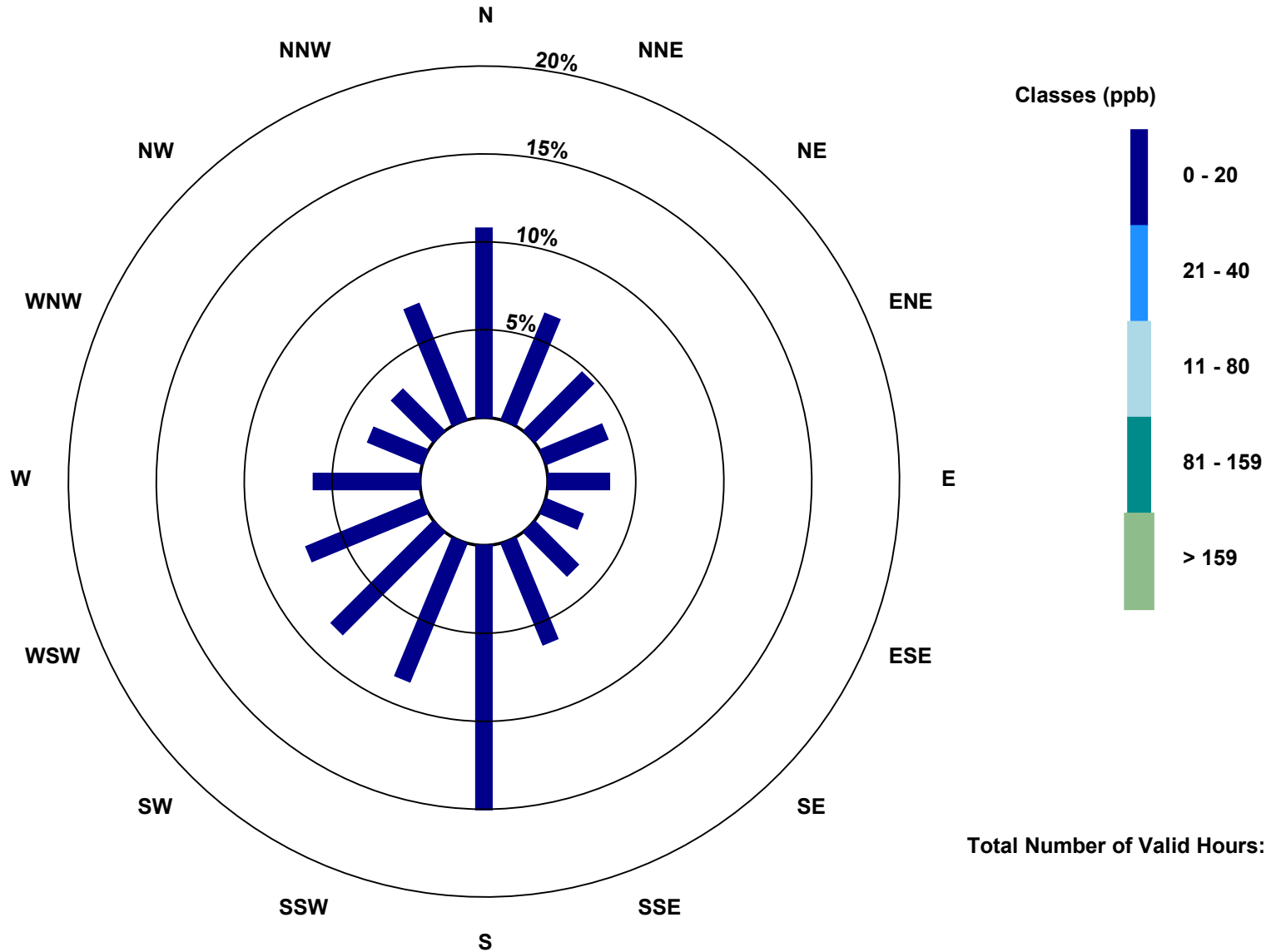
Total Number of Valid Hours: 659

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitric Oxide (NO) - ppb  
Firebag

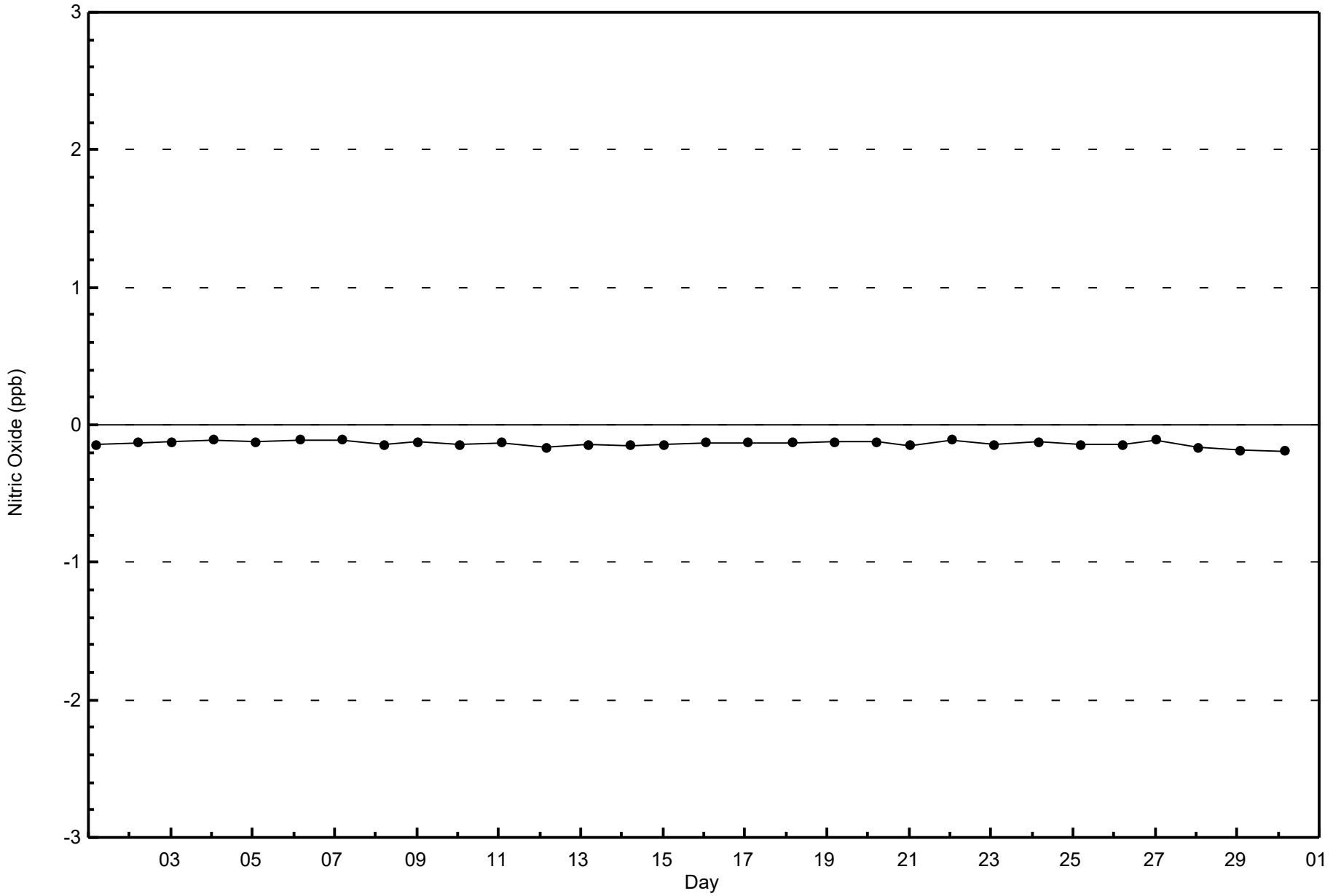


Total Number of Valid Hours: 659



**Wood Buffalo Environmental Association**  
**Zero Responses**

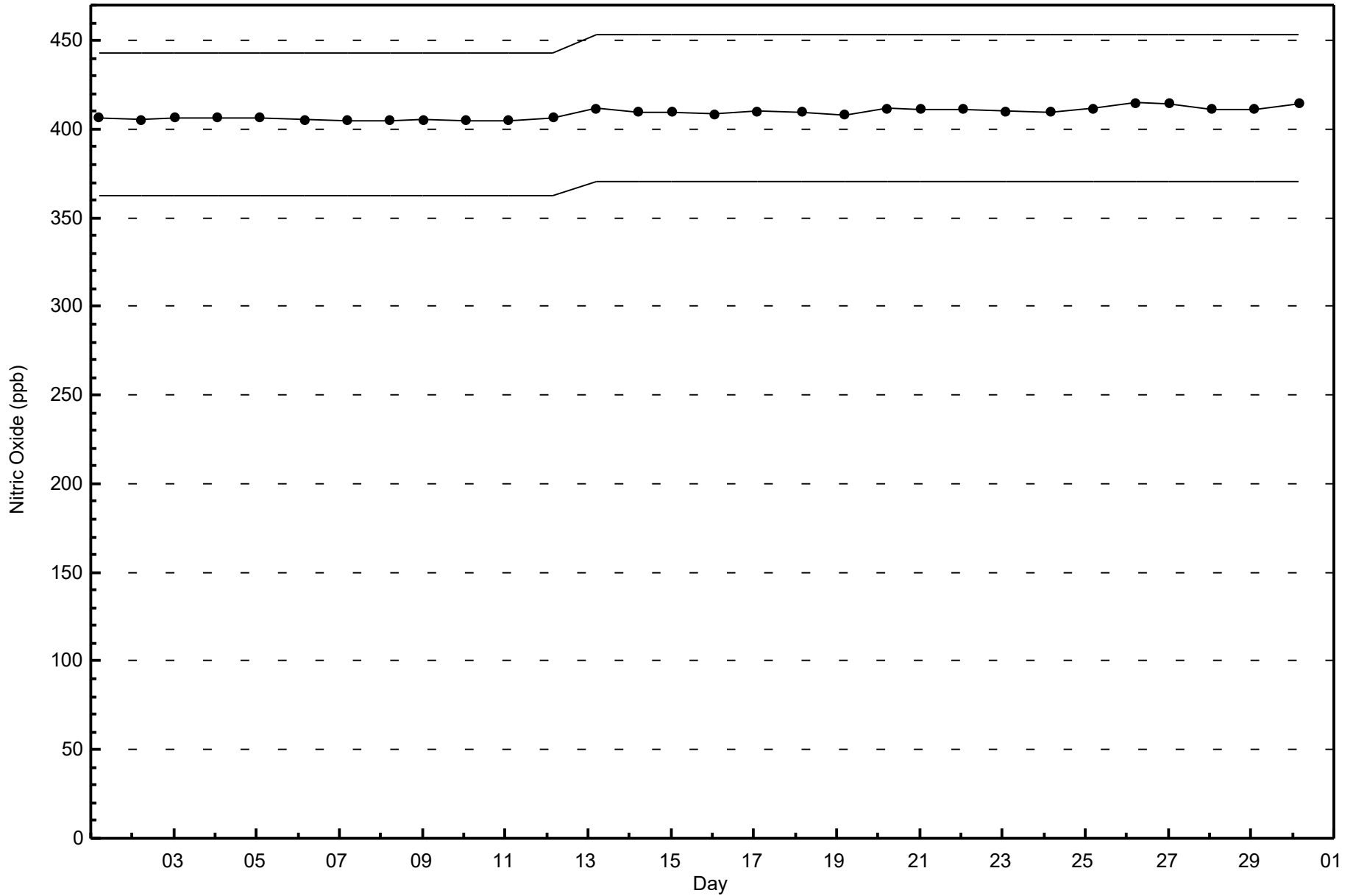
**Nitric Oxide (NO) - ppb**  
**Firebag - November 2024**





Wood Buffalo Environmental Association  
Span Responses

Nitric Oxide (NO) - ppb  
Firebag - November 2024







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb

Firebag - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 20.5 ppb on Nov 10 18:00	Maximum Daily Average: 8.3 ppb on Nov 5		Hours of Data:	678
Minimum Value: 0.1 ppb on Nov 19 16:00	Minimum Daily Average: 0.1 ppb on Nov 20		Hours of Missing Data:	42
Maximum Diurnal Average: 4.2 ppb at hour 6	Minimum Diurnal Average: 2.5 ppb at hour 14		Hours of Calibration:	35
Monthly Average: 3.26 ppb	Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 0.7 Median = 2.1 Q <sub>3</sub> = 4.5 P <sub>90</sub> = 7.9 P <sub>99</sub> = 18.1		Percent Operational Time:	99.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	1.0	2.7	3.0	2.5	Z	2.6	3.8	4.2	4.4	7.1	4.9	4.5	5.7	5.2	5.9	7.0	7.9	7.6	5.4	2.6	1.2	0.6	0.6	0.6	4.0	7.9	
2-Nov	1.9	2.5	0.8	0.9	1.4	Z	4.3	3.6	3.0	2.7	1.3	1.0	1.1	1.0	1.3	2.1	1.7	1.8	1.5	1.3	1.0	1.1	0.9	0.9	1.7	4.3	
3-Nov	Z	1.1	1.3	2.4	0.8	0.5	1.1	3.7	4.2	5.6	4.7	4.7	3.2	3.3	4.7	3.0	1.4	3.4	3.9	4.0	5.5	8.7	7.7	6.1	3.7	8.7	
4-Nov	5.1	Z	2.2	3.4	11.6	11.8	8.4	5.0	3.0	4.1	4.1	4.5	6.4	5.6	6.3	8.8	10.0	3.2	1.5	1.1	4.1	5.4	4.9	2.2	5.3	11.8	
5-Nov	3.2	8.7	Z	12.0	14.5	11.2	9.6	6.0	2.0	2.6	9.2	5.1	7.3	6.3	12.2	15.4	14.3	7.9	5.2	2.3	5.8	8.2	10.6	11.3	8.3	15.4	
6-Nov	8.7	4.0	0.6	Z	1.1	1.2	0.9	2.1	2.7	1.4	1.3	2.2	3.2	3.3	3.6	6.3	6.6	5.4	2.9	1.5	1.6	1.5	1.5	2.8	2.9	8.7	
7-Nov	2.9	6.0	4.3	8.0	Z	14.6	8.3	15.7	12.1	10.1	6.9	6.8	6.1	4.3	3.5	0.8	2.3	4.4	8.1	4.0	2.5	1.6	0.7	0.5	5.8	15.7	
8-Nov	0.8	1.1	1.3	1.3	1.7	Z	2.2	2.4	2.7	2.9	2.5	3.0	3.5	3.4	4.0	6.0	5.7	6.6	8.7	18.9	15.7	20.2	3.9	18.1	5.9	20.2	
9-Nov	Z	3.0	0.9	0.5	0.6	1.5	2.3	2.1	4.4	1.9	1.7	1.9	1.9	1.4	2.1	2.8	5.1	6.4	9.5	5.7	1.9	1.6	1.5	3.0	2.8	9.5	
10-Nov	1.9	Z	3.1	2.4	5.7	9.4	9.9	9.1	11.1	9.9	7.0	6.3	4.9	4.4	4.0	6.0	19.7	20.5	6.9	5.2	10.2	6.9	3.6	2.8	7.4	20.5	
11-Nov	1.7	1.7	Z	1.8	3.8	4.1	3.7	2.0	1.4	1.1	0.9	0.9	0.9	0.9	0.9	1.2	1.2	1.0	1.3	1.2	1.9	1.8	0.9	1.3	1.6	4.1	
12-Nov	1.3	0.8	2.2	Z	1.5	1.4	4.6	5.9	4.1	2.0	2.4	C	C	C	C	C	0.8	1.7	2.7	1.6	3.5	1.9	7.4	3.0	2.7	7.4	
13-Nov	2.0	1.8	1.2	1.7	Z	5.2	5.7	12.3	9.2	10.6	6.2	1.9	1.0	0.4	0.3	0.4	0.2	0.3	0.3	4.0	2.7	2.5	1.9	1.7	3.2	12.3	
14-Nov	1.3	1.8	1.1	1.6	0.2	Z	1.4	2.1	2.2	2.7	2.2	2.4	1.2	2.4	3.1	3.5	4.4	3.3	3.0	2.0	3.2	2.8	2.0	3.1	2.3	4.4	
15-Nov	Z	2.8	3.1	6.6	2.3	2.4	2.9	1.2	1.0	1.8	2.4	0.6	0.6	0.8	1.2	0.9	1.5	2.9	3.0	3.8	1.7	1.1	1.2	1.3	2.0	6.6	
16-Nov	3.0	Z	1.3	1.4	5.1	11.5	5.0	2.5	2.6	1.8	1.8	1.6	1.5	1.6	2.0	1.4	2.4	2.5	2.7	3.0	4.7	5.1	5.8	5.7	3.3	11.5	
17-Nov	4.7	5.9	Z	2.6	2.5	4.4	3.9	1.1	1.0	1.0	1.1	1.4	1.6	1.9	2.1	2.5	2.8	2.6	5.8	0.8	0.6	1.7	4.5	4.6	2.7	5.9	
18-Nov	2.9	1.6	6.5	Z	6.7	0.6	0.5	2.0	3.3	5.7	7.4	5.3	5.7	6.6	5.6	7.5	18.5	8.9	0.4	0.9	2.9	4.1	5.4	9.3	5.1	18.5	
19-Nov	5.6	1.8	0.3	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	5.6	
20-Nov	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
21-Nov	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.5	2.9	0.5	0.5	0.5	0.8	1.6	0.8	0.2	0.2	0.5	0.6	0.7	0.5	2.9	
22-Nov	0.6	Z	4.3	1.7	0.3	0.6	0.7	0.6	0.9	0.4	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.6	4.3	
23-Nov	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.7	2.1	2.3	0.2	3.1	4.4	3.9	1.9	1.6	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0	4.4	
24-Nov	0.1	1.3	3.0	Z	0.3	0.1	0.1	1.0	3.8	3.5	3.2	1.5	2.7	1.8	1.8	1.9	1.1	0.3	2.4	4.4	2.4	2.1	4.6	5.3	2.1	5.3	
25-Nov	6.3	2.1	5.1	9.0	Z	5.9	8.4	9.7	5.8	3.6	1.8	2.7	2.8	3.9	3.0	2.7	2.5	3.6	1.6	2.9	4.6	5.9	6.8	6.6	4.7	9.7	
26-Nov	5.2	5.8	5.9	4.7	5.2	Z	4.8	3.9	3.6	2.8	2.6	4.1	3.6	3.8	3.0	2.9	2.7	3.4	6.9	10.0	14.0	8.0	4.0	11.9	5.3	14.0	
27-Nov	Z	9.4	4.3	9.1	10.0	4.4	1.0	0.4	0.6	PF	PF	PF	PF	PF	PF	PF	1.9	1.2	1.1	0.5	0.5	0.4	0.4	0.4	--	10.0	
28-Nov	0.4	Z	0.7	0.7	1.8	1.7	0.4	0.2	0.2	0.2	0.2	0.2	1.1	0.8	5.2	5.0	4.1	0.5	0.2	0.2	0.2	0.2	0.2	0.2	1.1	5.2	
29-Nov	0.2	0.2	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	2.9	10.5	11.0	10.4	11.6	17.2	2.9	17.2
30-Nov	20.2	13.3	18.1	Z	10.1	9.5	6.5	6.2	5.1	2.6	4.0	4.2	2.6	1.5	1.5	1.9	1.7	0.4	5.2	3.6	2.0	0.3	0.1	0.1	5.2	20.2	

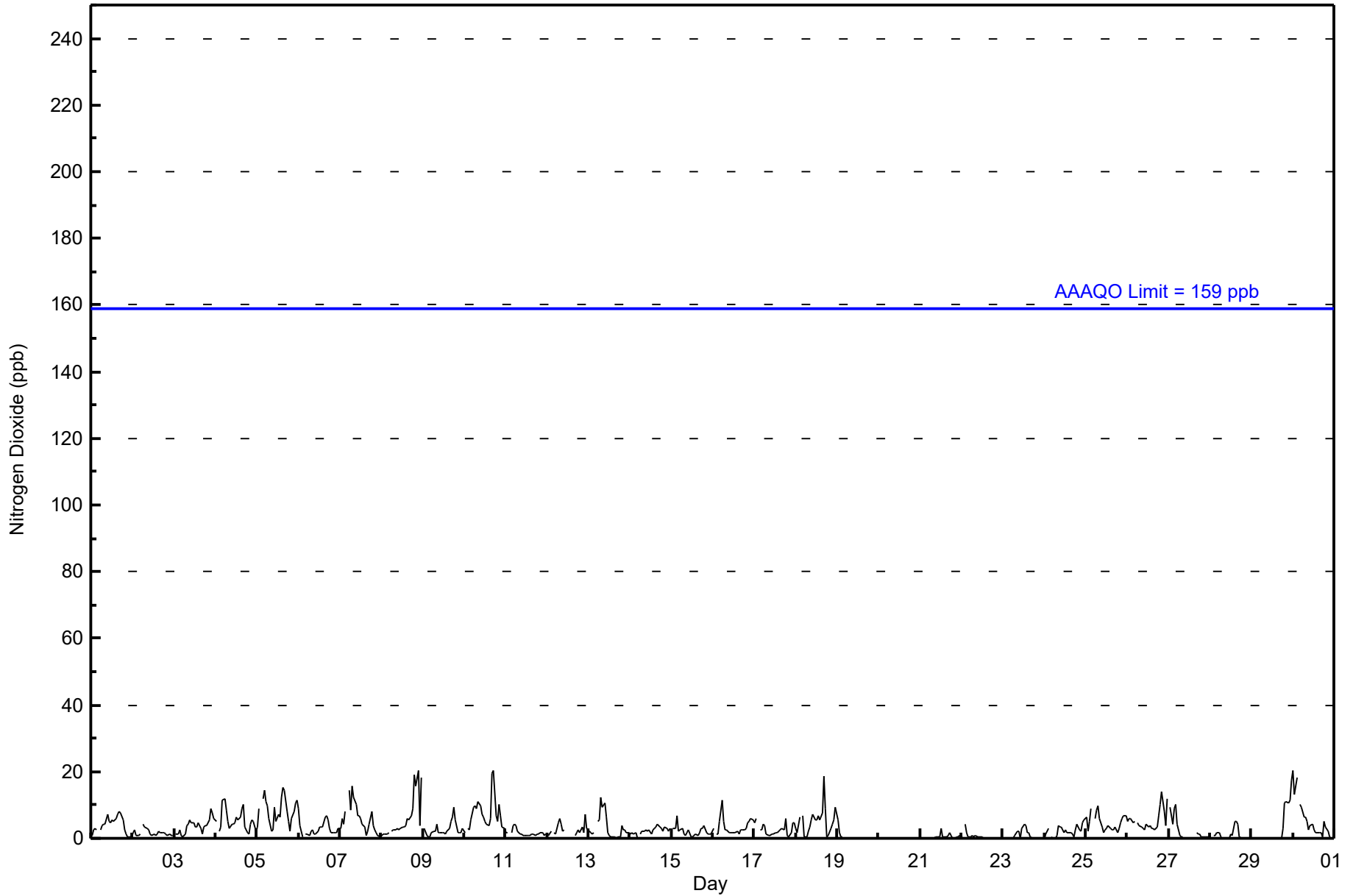
3.2	3.2	3.0	3.0	3.5	4.2	3.4	3.5	3.2	3.1	2.8	2.5	2.7	2.5	2.9	3.3	4.1	3.4	3.1	3.2	3.5	3.5	3.1	4.0	Diurnal Average	
20.2	13.3	18.1	12.0	14.5	14.6	9.9	15.7	12.1	10.6	9.2	6.8	7.3	6.6	12.2	15.4	19.7	20.5	9.5	18.9	15.7	20.2	11.6	18.1	Diurnal Maximum	

Z - zerospan      C - Calibration      PF - Power Failure  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Firebag - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Firebag - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	677	99.85	99.85
21 - 40	1	0.15	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 678

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Firebag - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	71	43	31	25	23	15	23	41	99	55	54	47	40	22	22	47	658
21 - 40	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	71	43	31	25	23	15	23	41	99	56	54	47	40	22	22	47	659

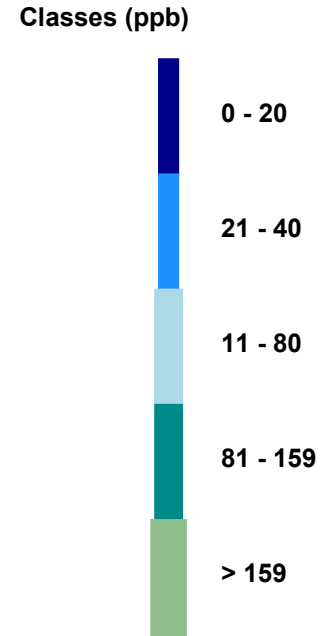
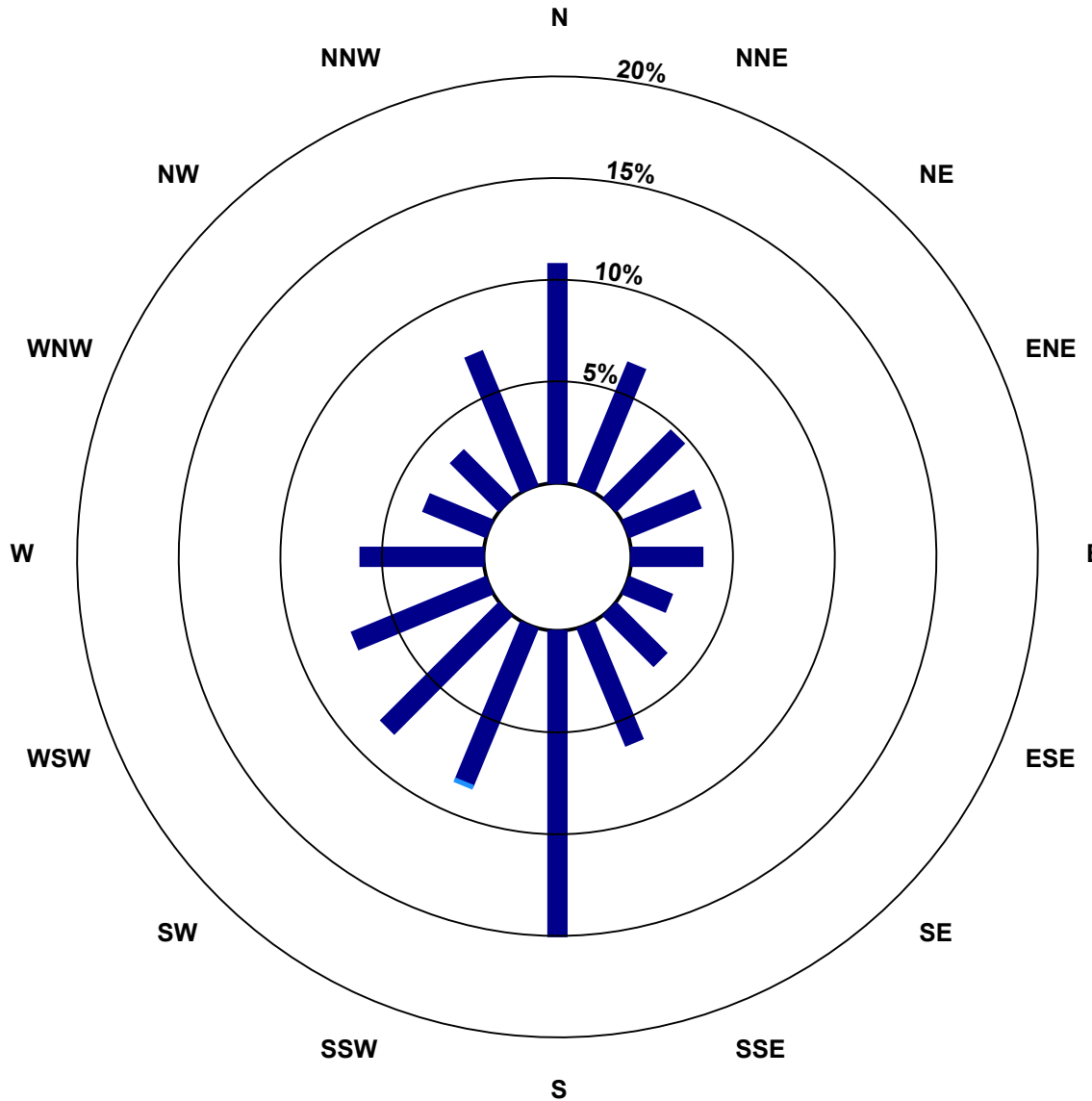
Total Number of Valid Hours: 659

Total Number of Hours: 720

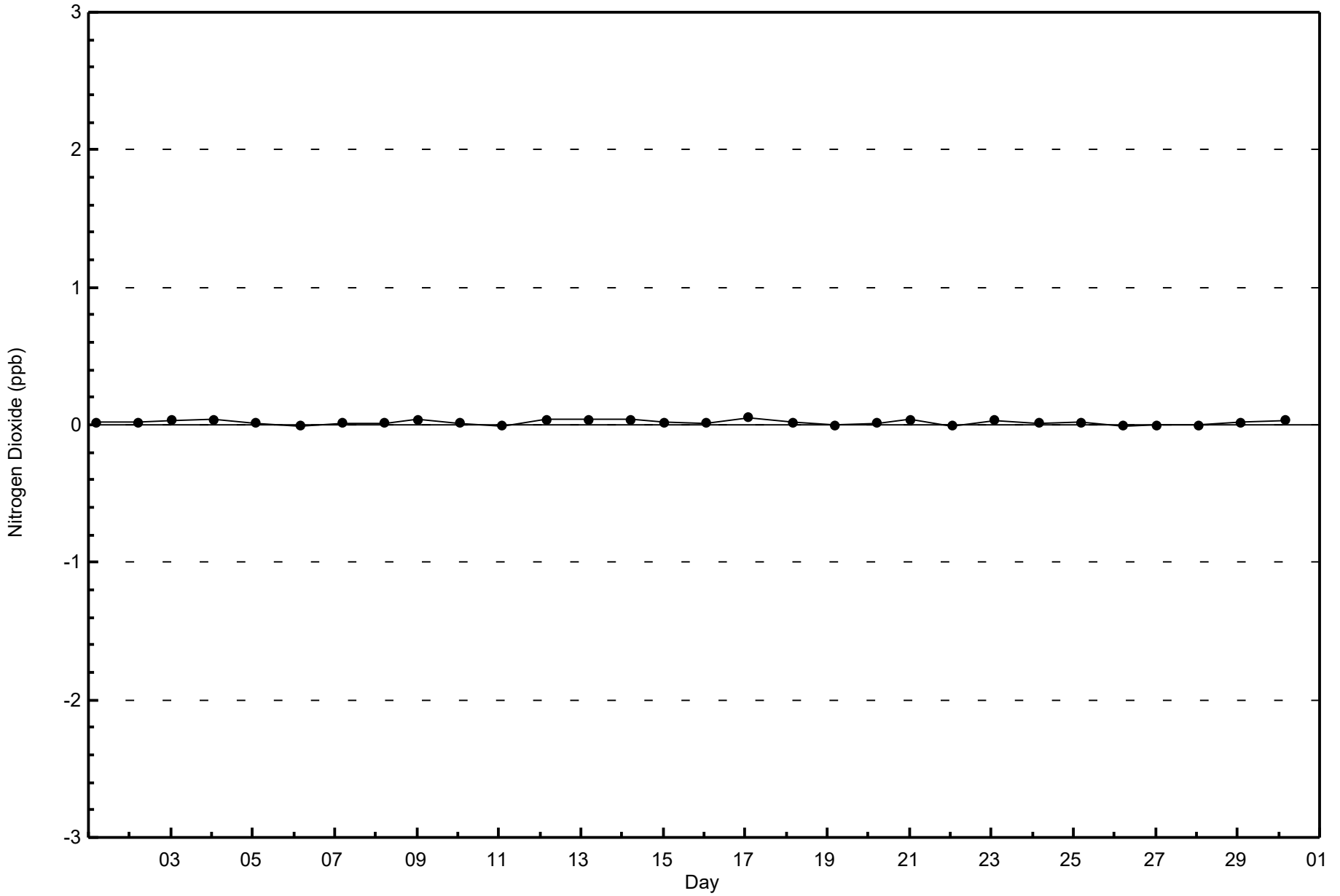


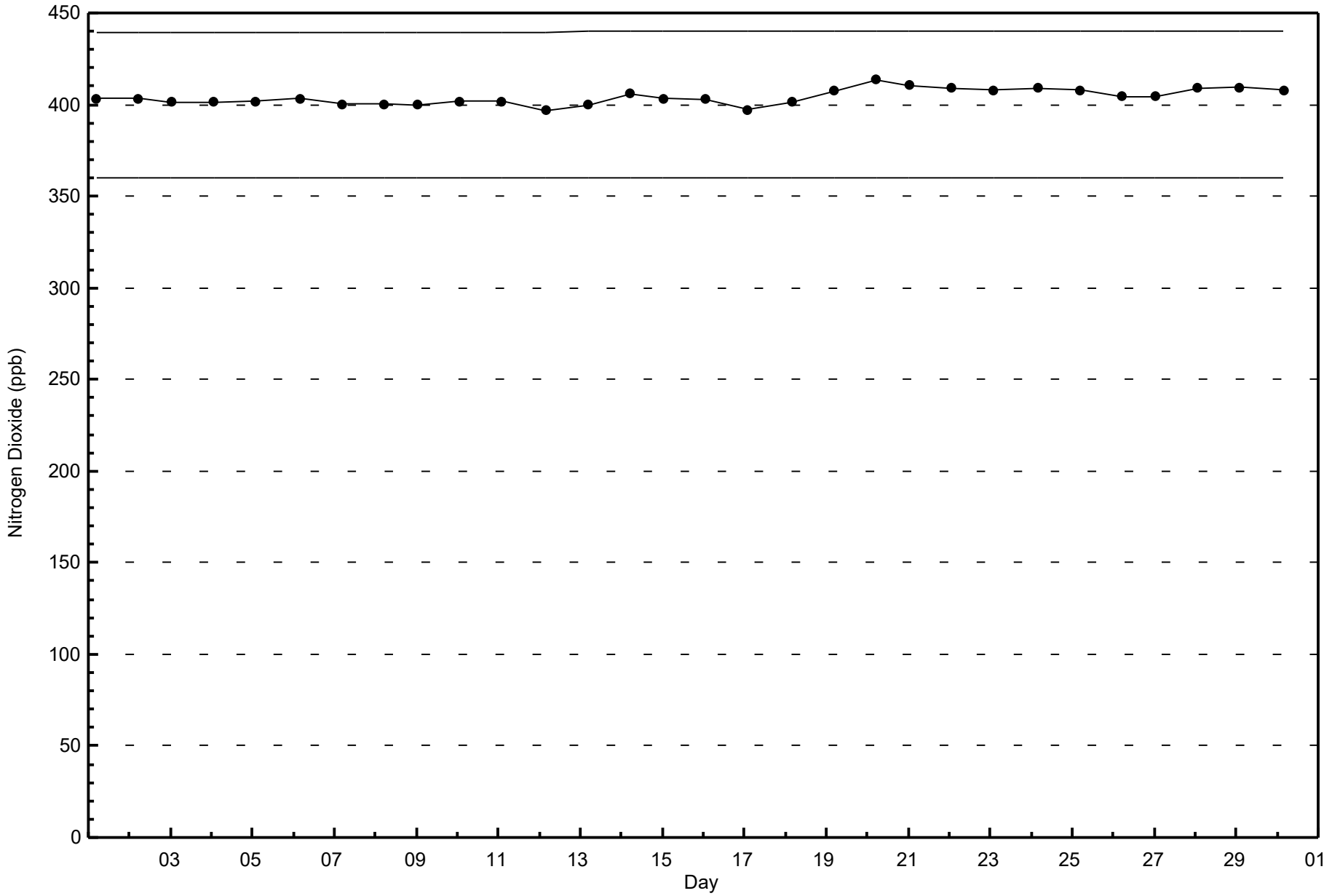
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Firebag



Total Number of Valid Hours: 659







**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Firebag - November 2024**

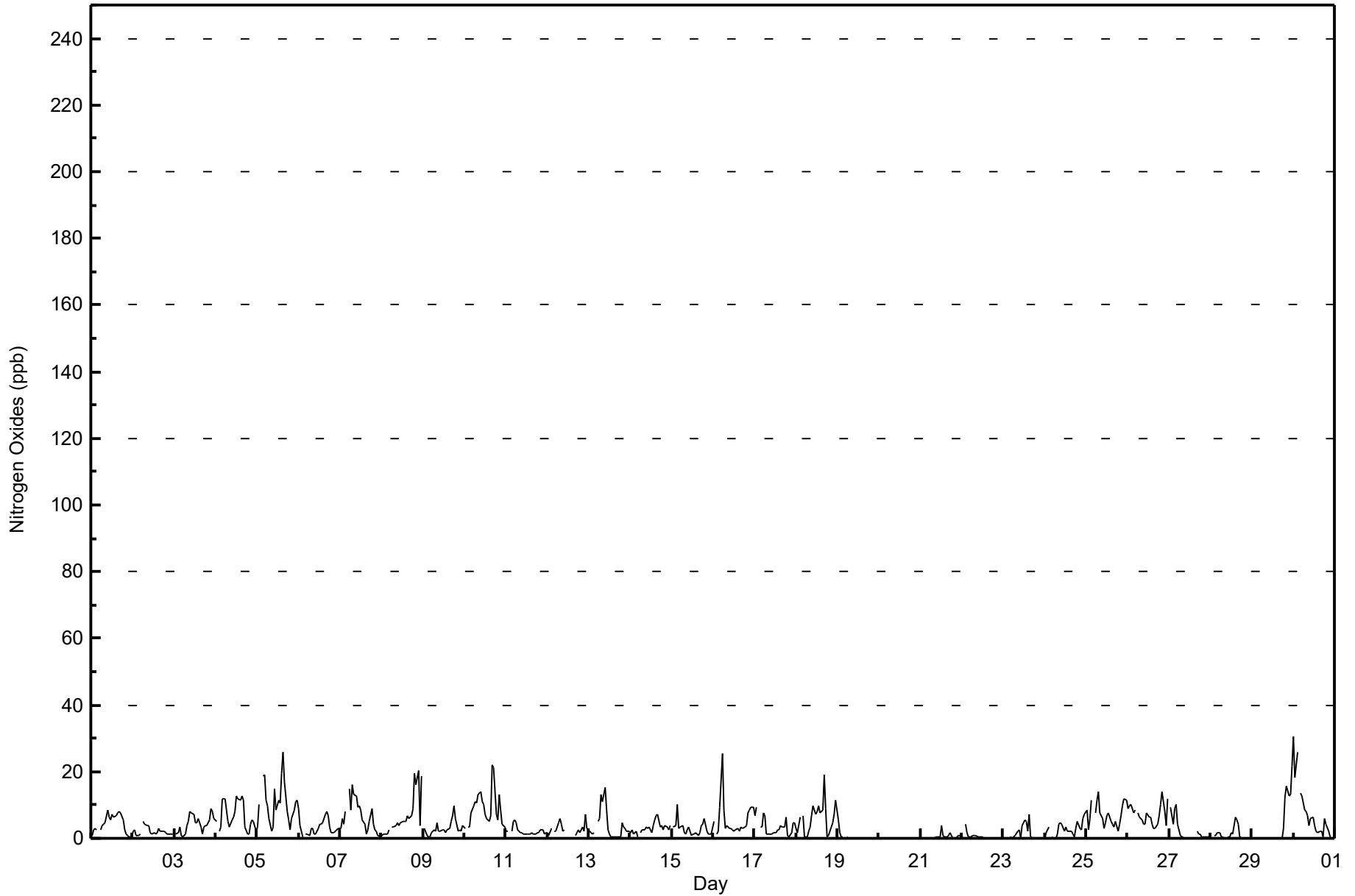
Maximum Value: 30.5 ppb on Nov 30 01:00		Maximum Daily Average: 10.6 ppb on Nov 5		Hours in Service: 720																							
Minimum Value: 0.1 ppb on Nov 24 00:00		Minimum Daily Average: 0.1 ppb on Nov 20		Hours of Data: 678																							
Maximum Diurnal Average: 5.3 ppb at hour 6		Minimum Diurnal Average: 3.4 ppb at hour 19		Hours of Missing Data: 42																							
Monthly Average: 4.06 ppb		Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 0.8 Median = 2.7 Q <sub>3</sub> = 5.8 P <sub>90</sub> = 9.7 P <sub>99</sub> = 20.5		Hours of Calibration: 35																							
				Percent Operational Time: 99.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	1.0	2.7	3.1	2.5	Z	2.6	3.8	4.3	4.8	8.5	6.3	5.7	7.2	6.4	6.8	7.7	8.2	7.7	5.5	2.7	1.2	0.6	0.6	0.6	4.4	8.5	
2-Nov	2.0	2.5	0.8	0.9	1.4	Z	5.1	4.2	3.8	3.7	1.9	1.4	1.5	1.4	1.7	2.9	2.0	2.3	2.1	1.9	1.3	1.4	1.1	1.1	2.1	5.1	
3-Nov	Z	1.3	1.7	3.2	0.9	0.5	1.1	3.8	4.9	8.1	7.5	7.4	4.5	4.5	6.1	3.5	1.5	3.5	3.9	4.0	5.5	8.8	7.8	6.1	4.3	8.8	
4-Nov	5.1	Z	2.2	3.4	11.8	12.0	8.4	5.0	3.3	5.4	6.3	8.2	12.8	12.0	11.6	12.8	11.4	3.3	1.5	1.1	4.2	5.5	5.1	2.2	6.7	12.8	
5-Nov	3.2	10.3	Z	18.6	19.0	11.3	9.6	6.1	2.1	3.2	15.0	8.4	11.5	10.5	19.4	25.6	17.0	8.0	5.3	2.3	5.8	8.3	10.8	11.5	10.6	25.6	
6-Nov	8.7	4.0	0.6	Z	1.1	1.4	0.9	2.8	3.1	1.5	1.5	2.9	4.3	4.4	4.7	7.2	7.9	6.9	3.3	1.6	1.6	2.3	2.3	2.9	3.4	8.7	
7-Nov	2.9	6.1	4.3	8.1	Z	15.0	8.3	15.9	13.3	12.9	9.5	9.9	8.7	5.6	4.3	1.1	2.6	5.1	8.8	4.1	2.7	1.9	0.8	0.6	6.6	15.9	
8-Nov	0.8	1.3	1.3	1.5	2.4	Z	3.4	3.5	3.9	4.5	4.0	4.6	5.2	5.2	5.0	6.8	5.9	6.9	8.8	19.4	16.1	20.3	3.9	18.6	6.7	20.3	
9-Nov	Z	3.0	0.9	0.5	0.6	1.5	2.3	2.1	4.7	2.2	2.2	2.5	2.5	1.8	2.4	3.0	5.2	6.6	9.8	5.8	2.2	2.6	2.1	3.7	3.1	9.8	
10-Nov	3.2	Z	3.6	3.2	7.4	9.9	10.9	10.7	13.2	14.0	11.2	10.3	7.1	5.9	4.9	6.7	22.0	21.1	7.1	5.7	13.2	8.6	4.1	3.3	9.0	22.0	
11-Nov	2.1	2.0	Z	2.1	5.0	5.4	4.8	2.6	1.8	1.5	1.1	1.2	1.2	1.2	1.1	1.6	1.5	1.2	1.7	1.6	2.6	2.5	1.1	1.7	2.1	5.4	
12-Nov	1.8	1.0	3.1	Z	2.0	2.0	4.7	6.1	4.4	2.2	2.7	C	C	C	C	C	0.8	1.8	2.7	1.6	3.5	1.9	7.4	3.0	2.9	7.4	
13-Nov	2.0	1.8	1.2	1.7	Z	5.2	5.9	13.2	10.9	15.1	8.4	2.4	1.3	0.5	0.4	0.5	0.3	0.4	0.4	4.5	3.2	3.0	2.3	2.0	3.8	15.1	
14-Nov	1.6	2.4	1.4	2.0	0.3	Z	1.8	2.7	2.7	3.3	2.9	3.3	1.8	3.8	5.4	6.6	7.2	3.5	3.8	2.5	3.8	3.5	2.4	3.8	3.1	7.2	
15-Nov	Z	3.4	3.8	10.1	3.1	3.3	3.9	1.8	1.4	2.6	3.5	0.8	1.2	1.3	1.8	1.0	1.7	3.9	4.3	6.0	2.2	1.2	1.3	1.5	2.8	10.1	
16-Nov	5.0	Z	1.4	2.0	9.3	25.4	8.4	3.0	4.0	2.8	2.9	2.5	2.2	2.3	2.8	2.0	3.6	3.1	3.5	4.0	7.4	8.3	9.4	9.1	5.4	25.4	
17-Nov	6.8	9.1	Z	3.2	3.4	7.7	6.6	1.3	1.2	1.1	1.4	1.7	1.9	2.7	2.5	3.7	3.3	3.2	6.3	0.8	0.6	1.8	4.7	4.8	3.5	9.1	
18-Nov	2.9	1.6	6.5	Z	6.7	0.6	0.5	2.0	3.4	6.8	9.8	7.4	8.1	9.6	7.6	8.6	19.3	9.0	0.4	1.0	3.3	4.5	7.0	11.4	6.0	19.3	
19-Nov	5.7	1.9	0.3	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	5.7	
20-Nov	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
21-Nov	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.4	0.5	0.6	3.7	0.6	0.6	0.5	0.8	1.6	0.8	0.2	0.2	0.5	0.6	0.7	0.6	3.7	
22-Nov	0.6	Z	4.3	1.7	0.3	0.6	0.7	0.6	0.9	0.5	0.4	0.5	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.6	4.3	
23-Nov	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.9	2.3	2.7	0.2	3.9	5.7	5.0	2.3	7.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.4	7.1	
24-Nov	0.1	1.5	3.3	Z	0.3	0.1	0.1	1.1	4.2	4.6	4.3	2.0	3.5	2.3	2.1	2.1	1.2	0.3	2.8	5.2	2.9	2.5	5.9	7.0	2.6	7.0	
25-Nov	8.3	2.5	5.9	11.4	Z	7.6	11.4	13.9	7.8	5.8	2.8	4.8	6.6	7.5	5.0	4.0	3.4	5.3	2.1	4.2	6.9	9.7	11.8	11.4	7.0	13.9	
26-Nov	9.0	9.7	10.3	7.7	8.4	Z	7.8	6.2	5.7	4.4	4.4	7.4	6.3	6.3	4.2	3.2	3.1	4.1	6.9	10.0	14.1	8.0	4.0	11.9	7.1	14.1	
27-Nov	Z	9.4	4.3	9.1	10.0	4.4	1.0	0.4	0.6	PF	PF	PF	PF	PF	PF	PF	2.0	1.2	1.1	0.5	0.5	0.4	0.4	0.4	--	10.0	
28-Nov	0.4	Z	0.7	0.8	1.9	1.8	0.4	0.2	0.2	0.2	0.2	0.3	1.6	1.1	6.4	5.4	4.2	0.5	0.2	0.2	0.2	0.2	0.2	0.2	1.2	6.4	
29-Nov	0.2	0.2	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	3.0	12.5	15.9	12.8	13.0	21.6	3.5	21.6
30-Nov	30.5	18.0	25.9	Z	13.6	12.7	8.5	8.2	6.7	3.8	5.9	6.3	3.9	2.0	1.9	2.2	2.0	0.4	5.8	4.1	2.1	0.3	0.1	0.1	7.2	30.5	
		4.2	3.8	3.7	3.8	4.4	5.3	4.0	4.1	3.9	4.2	4.0	3.8	4.1	3.7	4.0	4.5	4.6	3.7	3.4	3.6	4.1	4.1	3.7	4.7	Diurnal Average	
		30.5	18.0	25.9	18.6	19.0	25.4	11.4	15.9	13.3	15.1	15.0	10.3	12.8	12.0	19.4	25.6	22.0	21.1	9.8	19.4	16.1	20.3	13.0	21.6	Diurnal Maximum	
Z - zerspan		C - Calibration				PF - Power Failure																					





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Firebag - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Firebag - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	671	98.97	98.97
21 - 40	7	1.03	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 678

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Firebag - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	71	43	31	25	23	15	23	38	98	55	53	47	40	21	22	47	652
21 - 40	0	0	0	0	0	0	0	3	1	1	1	0	0	1	0	0	7
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	71	43	31	25	23	15	23	41	99	56	54	47	40	22	22	47	659

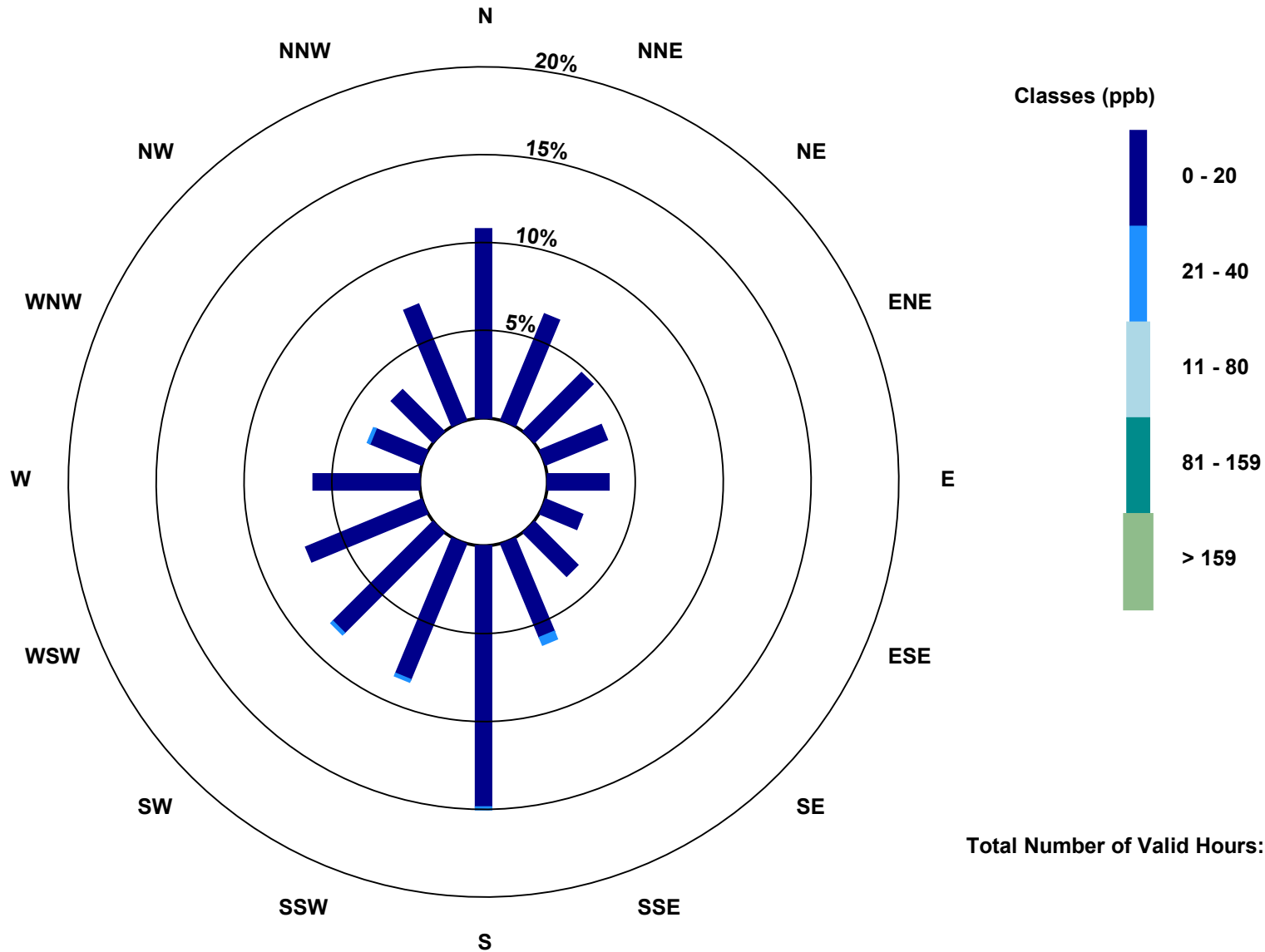
Total Number of Valid Hours: 659

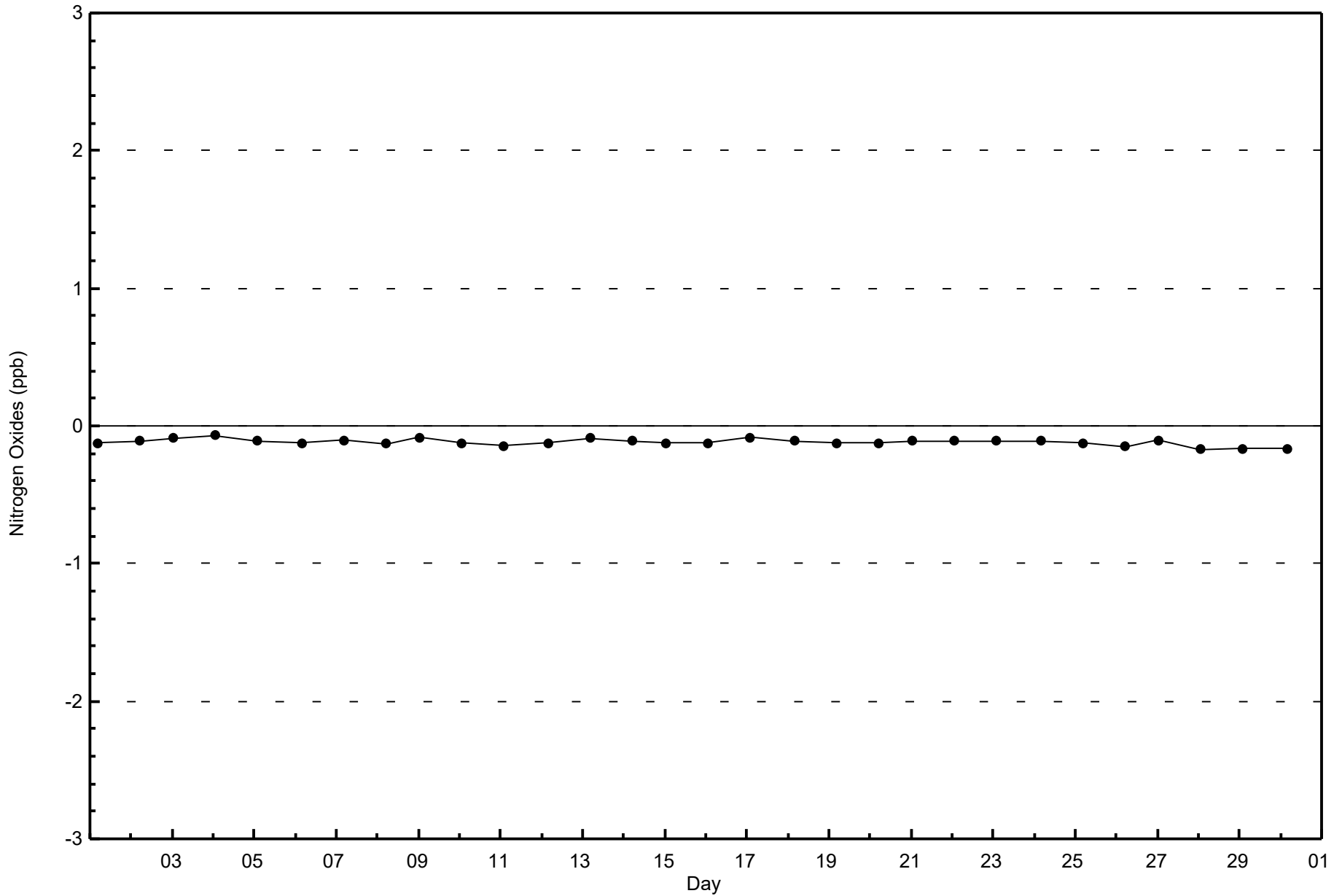
Total Number of Hours: 720

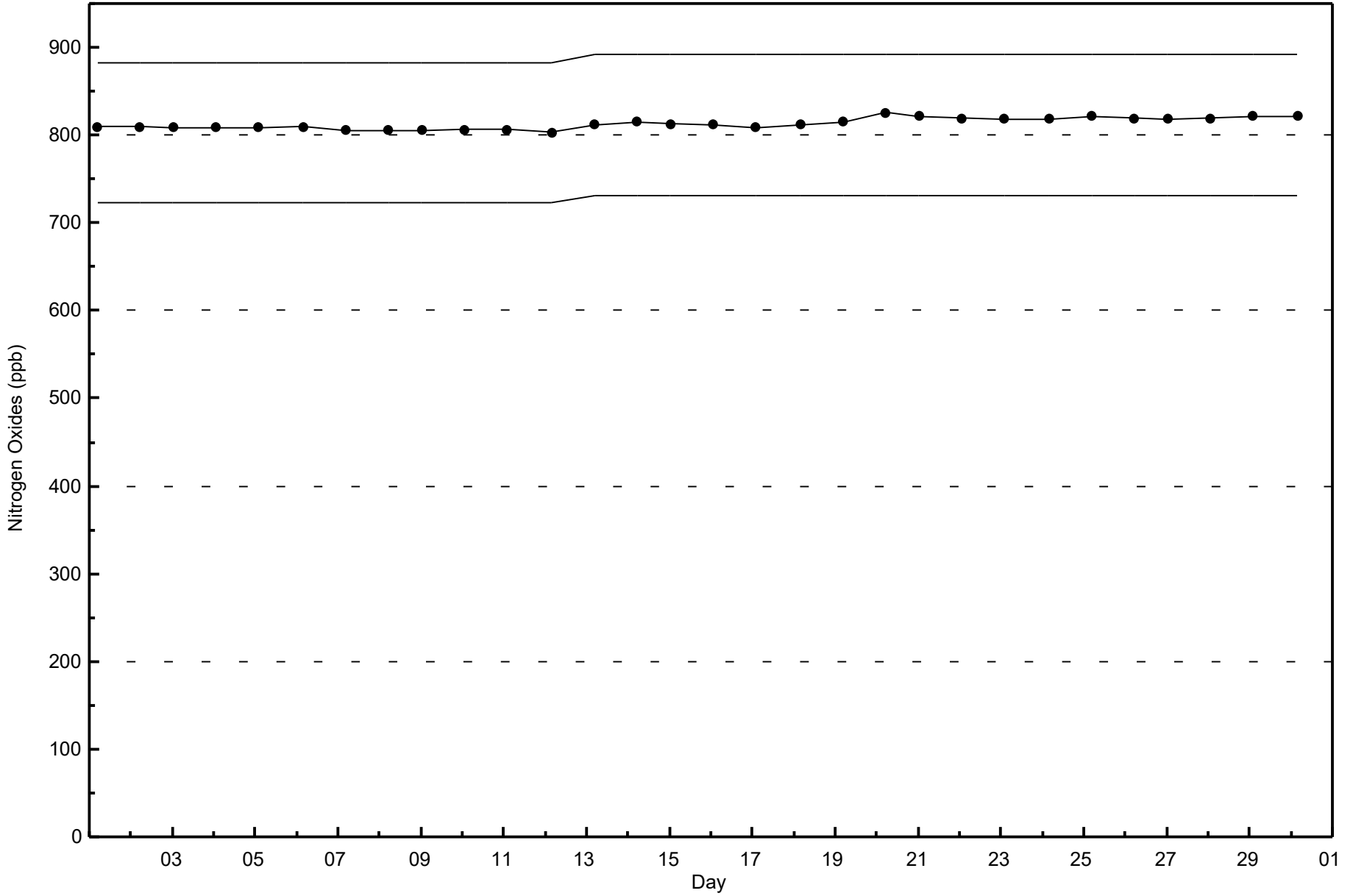


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Firebag





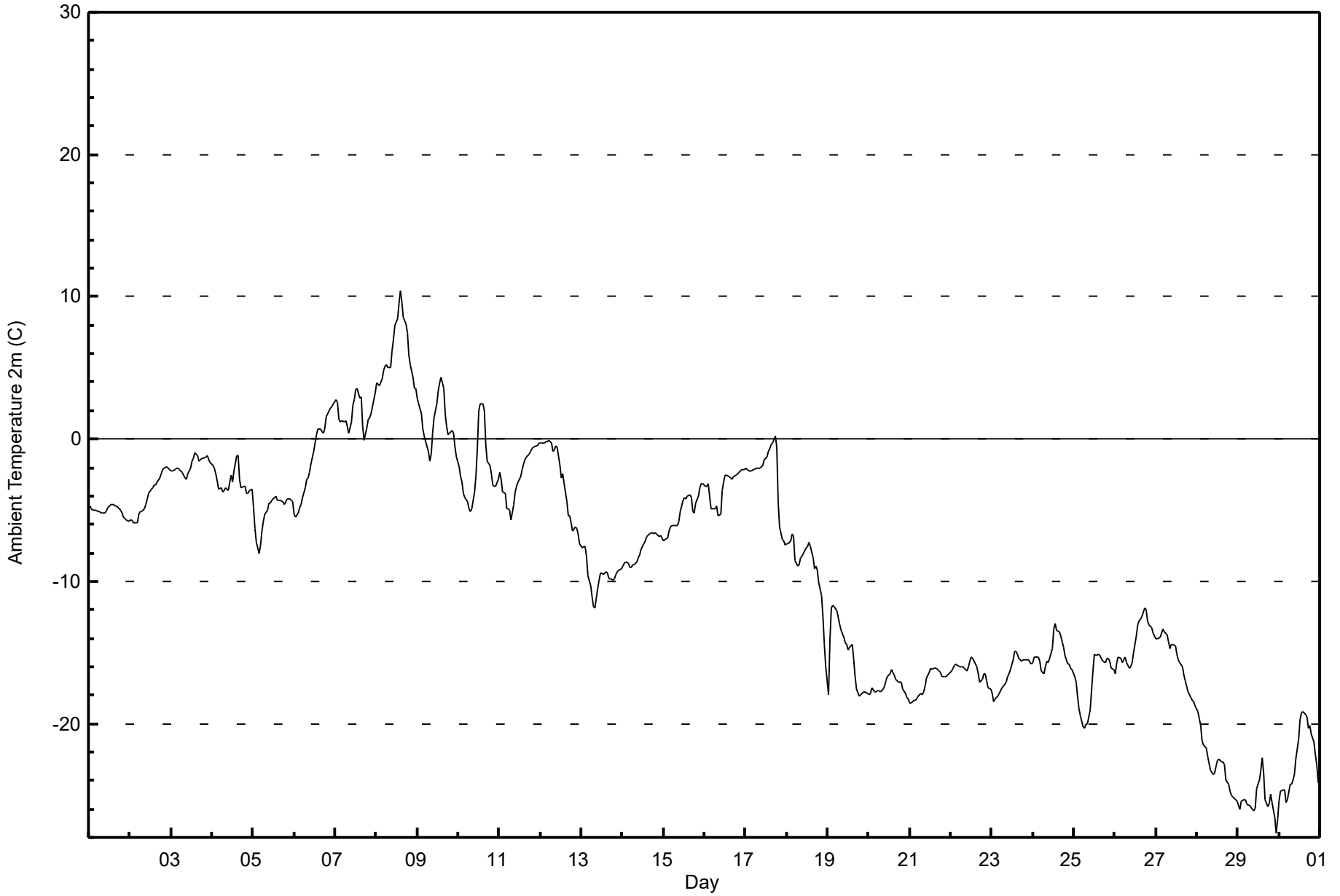




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Ambient Temperature 2m (AT2) - C**  
**Firebag - November 2024**

Maximum Value: 10.4 C on Nov 8 15:00		Maximum Daily Average: 6.1 C on Nov 8		Hours in Service: 720																																												
Minimum Value: -27.7 C on Nov 29 23:00		Minimum Daily Average: -25.4 C on Nov 29		Hours of Data: 720																																												
Maximum Diurnal Average: -7.6 C at hour 15		Minimum Diurnal Average: -9.8 C at hour 8		Hours of Missing Data: 0																																												
Monthly Average: -9.03 C		Percentiles: P <sub>1</sub> = -25.8 P <sub>10</sub> = -19.5 Q <sub>1</sub> = -16.1 Median = -6.9 Q <sub>3</sub> = -2.5 P <sub>90</sub> = 0.4 P <sub>99</sub> = 7.4		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-4.7	-4.9	-5.0	-5.0	-5.0	-5.0	-5.1	-5.2	-5.2	-5.2	-5.0	-4.8	-4.7	-4.6	-4.6	-4.7	-4.7	-4.8	-5.0	-5.2	-5.4	-5.6	-5.7	-5.8	-5.0	-4.6																						
2-Nov	-5.7	-5.6	-5.9	-5.9	-5.9	-5.3	-5.1	-5.1	-4.9	-4.7	-4.2	-3.8	-3.5	-3.4	-3.2	-3.2	-3.0	-2.8	-2.5	-2.1	-2.0	-2.0	-2.1	-2.2	-3.9	-2.0																						
3-Nov	-2.3	-2.2	-2.2	-2.1	-2.1	-2.2	-2.3	-2.5	-2.7	-2.8	-2.4	-2.0	-1.5	-1.3	-1.0	-1.2	-1.6	-1.4	-1.3	-1.4	-1.3	-1.1	-1.4	-1.6	-1.8	-1.0																						
4-Nov	-1.8	-2.1	-2.5	-2.9	-3.5	-3.5	-3.7	-3.6	-3.4	-3.6	-3.0	-2.6	-3.1	-2.3	-1.1	-1.1	-2.8	-3.4	-3.4	-3.3	-3.8	-3.8	-3.6	-3.5	-3.0	-1.1																						
5-Nov	-4.8	-6.3	-7.3	-8.0	-7.4	-6.5	-5.7	-5.3	-5.0	-4.5	-4.6	-4.3	-4.1	-4.0	-4.3	-4.3	-4.3	-4.4	-4.6	-4.4	-4.2	-4.2	-4.3	-4.4	-5.1	-4.0																						
6-Nov	-5.3	-5.5	-5.2	-4.8	-4.6	-4.2	-3.4	-2.9	-2.7	-2.3	-1.8	-0.9	-0.3	0.3	0.7	0.7	0.5	0.4	0.8	1.6	2.0	2.2	2.3	2.5	-1.2	2.5																						
7-Nov	2.7	2.5	1.4	1.2	1.2	1.2	0.9	0.4	1.2	2.3	2.8	3.5	3.5	2.9	3.0	0.9	-0.1	0.8	1.4	1.5	1.8	2.3	3.2	1.8	3.5																							
8-Nov	4.0	3.9	3.7	4.2	4.8	5.2	5.2	5.0	5.0	6.3	7.0	8.0	8.4	9.5	10.4	9.6	8.6	8.1	7.5	5.9	5.2	4.4	3.6	3.5	6.1	10.4																						
9-Nov	2.9	2.5	1.8	0.7	0.2	-0.1	-0.9	-1.5	-1.1	0.4	1.5	2.4	3.4	3.9	4.4	3.5	1.8	0.9	0.3	0.4	0.6	0.4	-0.5	-1.3	1.1	4.4																						
10-Nov	-2.0	-2.6	-3.0	-3.8	-4.1	-4.4	-4.9	-5.1	-4.9	-3.7	-2.5	-0.6	2.0	2.5	2.5	1.9	-0.4	-1.5	-1.8	-2.4	-3.2	-3.3	-3.3	-2.9	-2.2	2.5																						
11-Nov	-2.4	-2.9	-3.8	-3.8	-4.9	-4.9	-5.0	-5.7	-4.6	-3.7	-3.3	-3.1	-2.6	-2.2	-1.8	-1.5	-1.2	-1.0	-0.8	-0.7	-0.6	-0.5	-0.5	-0.3	-2.6	-0.3																						
12-Nov	-0.3	-0.3	-0.3	-0.2	-0.2	-0.1	-0.3	-0.9	-0.7	-0.5	-0.6	-1.9	-2.7	-2.5	-3.1	-4.4	-5.4	-5.4	-5.8	-6.5	-6.2	-6.3	-6.6	-7.3	-2.9	-0.1																						
13-Nov	-7.7	-7.6	-7.6	-8.3	-9.6	-10.3	-11.1	-11.8	-11.9	-10.5	-9.9	-9.5	-9.4	-9.5	-9.4	-9.8	-9.8	-10.0	-9.8	-9.5	-9.3	-9.2	-9.1	-9.1	-9.6	-7.6																						
14-Nov	-8.9	-8.7	-8.7	-8.7	-9.0	-9.0	-8.8	-8.9	-8.7	-8.4	-8.1	-7.8	-7.4	-7.2	-6.9	-6.8	-6.7	-6.6	-6.6	-6.6	-6.7	-6.8	-6.8	-7.0	-7.7	-6.6																						
15-Nov	-7.1	-7.1	-7.0	-6.4	-6.2	-6.1	-6.0	-6.0	-6.0	-5.8	-5.1	-4.3	-4.2	-4.0	-3.9	-3.9	-4.1	-5.1	-5.1	-4.5	-4.0	-3.4	-3.1	-3.1	-5.1	-3.1																						
16-Nov	-3.4	-3.3	-3.2	-4.0	-4.9	-4.9	-4.9	-4.7	-5.4	-5.3	-3.6	-3.0	-2.6	-2.5	-2.7	-2.7	-2.8	-2.7	-2.5	-2.5	-2.3	-2.2	-2.1	-2.1	-3.3	-2.1																						
17-Nov	-2.1	-2.1	-2.3	-2.2	-2.1	-2.1	-2.0	-2.0	-2.0	-1.9	-1.8	-1.4	-1.3	-0.9	-0.6	-0.4	-0.2	0.2	-0.6	-4.4	-6.2	-7.1	-7.2	-7.4	-2.5	0.2																						
18-Nov	-7.4	-7.4	-7.1	-6.6	-6.9	-8.5	-8.9	-8.8	-8.4	-8.2	-8.0	-7.7	-7.6	-7.2	-7.5	-8.3	-9.2	-8.9	-9.2	-10.1	-11.0	-12.4	-14.5	-16.0	-9.0	-6.6																						
19-Nov	-18.0	-14.2	-11.9	-11.7	-11.8	-12.1	-12.6	-13.1	-13.5	-13.9	-14.3	-14.4	-14.8	-14.7	-14.5	-15.6	-16.7	-17.6	-18.1	-18.0	-17.9	-17.8	-17.8	-17.9	-15.1	-11.7																						
20-Nov	-18.0	-17.8	-17.5	-17.7	-17.7	-17.7	-17.7	-17.8	-17.6	-17.3	-17.0	-16.7	-16.5	-16.2	-16.4	-16.6	-16.9	-17.1	-17.1	-17.1	-17.6	-17.9	-18.2	-18.3	-17.3	-16.2																						
21-Nov	-18.6	-18.5	-18.4	-18.4	-18.3	-18.1	-17.9	-17.9	-17.8	-17.4	-16.8	-16.4	-16.1	-16.2	-16.1	-16.2	-16.2	-16.3	-16.4	-16.7	-16.7	-16.7	-16.6	-16.5	-17.1	-16.1																						
22-Nov	-16.3	-16.1	-15.9	-15.8	-15.9	-16.0	-16.0	-16.0	-16.1	-16.3	-16.0	-15.6	-15.3	-15.5	-15.8	-16.0	-16.5	-17.1	-16.9	-16.5	-16.5	-17.0	-17.5	-17.6	-16.3	-15.3																						
23-Nov	-17.9	-18.5	-18.2	-18.1	-17.8	-17.6	-17.5	-17.4	-17.1	-16.7	-16.5	-16.2	-15.5	-14.9	-14.9	-15.1	-15.5	-15.6	-15.5	-15.5	-15.5	-15.6	-15.8	-15.9	-16.5	-14.9																						
24-Nov	-15.7	-15.3	-15.4	-15.3	-15.6	-16.3	-16.5	-16.0	-15.6	-15.7	-15.4	-14.7	-13.3	-13.0	-13.4	-13.6	-13.9	-14.3	-14.6	-15.3	-15.8	-15.9	-16.1	-16.2	-15.1	-13.0																						
25-Nov	-16.6	-17.1	-18.1	-19.0	-19.5	-20.2	-20.3	-20.1	-20.1	-19.1	-17.6	-16.3	-15.1	-15.2	-15.2	-15.2	-15.4	-15.6	-15.7	-15.4	-15.4	-15.6	-16.1	-16.2	-17.1	-15.1																						
26-Nov	-16.5	-15.7	-15.4	-15.5	-15.7	-15.5	-15.4	-15.7	-16.1	-16.0	-15.7	-15.0	-13.9	-13.1	-12.7	-12.7	-12.5	-11.9	-11.9	-12.8	-13.1	-13.3	-13.7	-13.9	-14.3	-11.9																						
27-Nov	-14.0	-14.0	-14.0	-13.6	-13.4	-13.5	-13.7	-14.2	-14.7	-14.4	-14.4	-14.5	-15.1	-15.5	-15.7	-16.0	-16.6	-17.0	-17.4	-17.8	-18.2	-18.4	-18.5	-18.7	-15.6	-13.4																						
28-Nov	-19.2	-19.6	-20.2	-21.2	-21.5	-21.7	-22.3	-22.8	-23.3	-23.6	-23.4	-23.0	-22.6	-22.5	-22.6	-22.7	-22.9	-24.0	-24.2	-24.8	-25.1	-25.2	-25.3	-25.4	-22.9	-19.2																						
29-Nov	-25.7	-26.0	-25.5	-25.4	-25.3	-25.6	-25.8	-25.8	-26.0	-26.1	-25.9	-24.6	-24.0	-23.3	-22.4	-23.5	-25.3	-25.8	-25.6	-25.0	-25.5	-26.6	-27.7	-26.7	-25.4	-22.4																						
30-Nov	-25.5	-24.7	-24.7	-24.7	-25.6	-25.4	-24.2	-24.2	-24.0	-23.5	-22.5	-21.1	-19.7	-19.2	-19.2	-19.3	-19.6	-20.3	-20.2	-20.8	-21.3	-22.2	-22.8	-24.2	-22.5	-19.2																						
																								-9.3	-9.2	-9.3	-9.4	-9.6	-9.7	-9.7	-9.8	-9.8	-9.4	-9.0	-8.4	-8.0	-7.7	-7.6	-7.9	-8.4	-8.7	-8.8	-9.0	-9.2	-9.4	-9.6	-9.7	Diurnal Average
																								4.0	3.9	3.7	4.2	4.8	5.2	5.2	5.0	5.0	6.3	7.0	8.0	8.4	9.5	10.4	9.6	8.6	8.1	7.5	5.9	5.2	4.4	3.6	3.5	Diurnal Maximum







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Firebag - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	69	9.58	9.58
-20 - 0	570	79.17	88.75
0 - 10	80	11.11	99.86
10 - 20	1	0.14	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Relative Humidity 2m (RH2) - %**

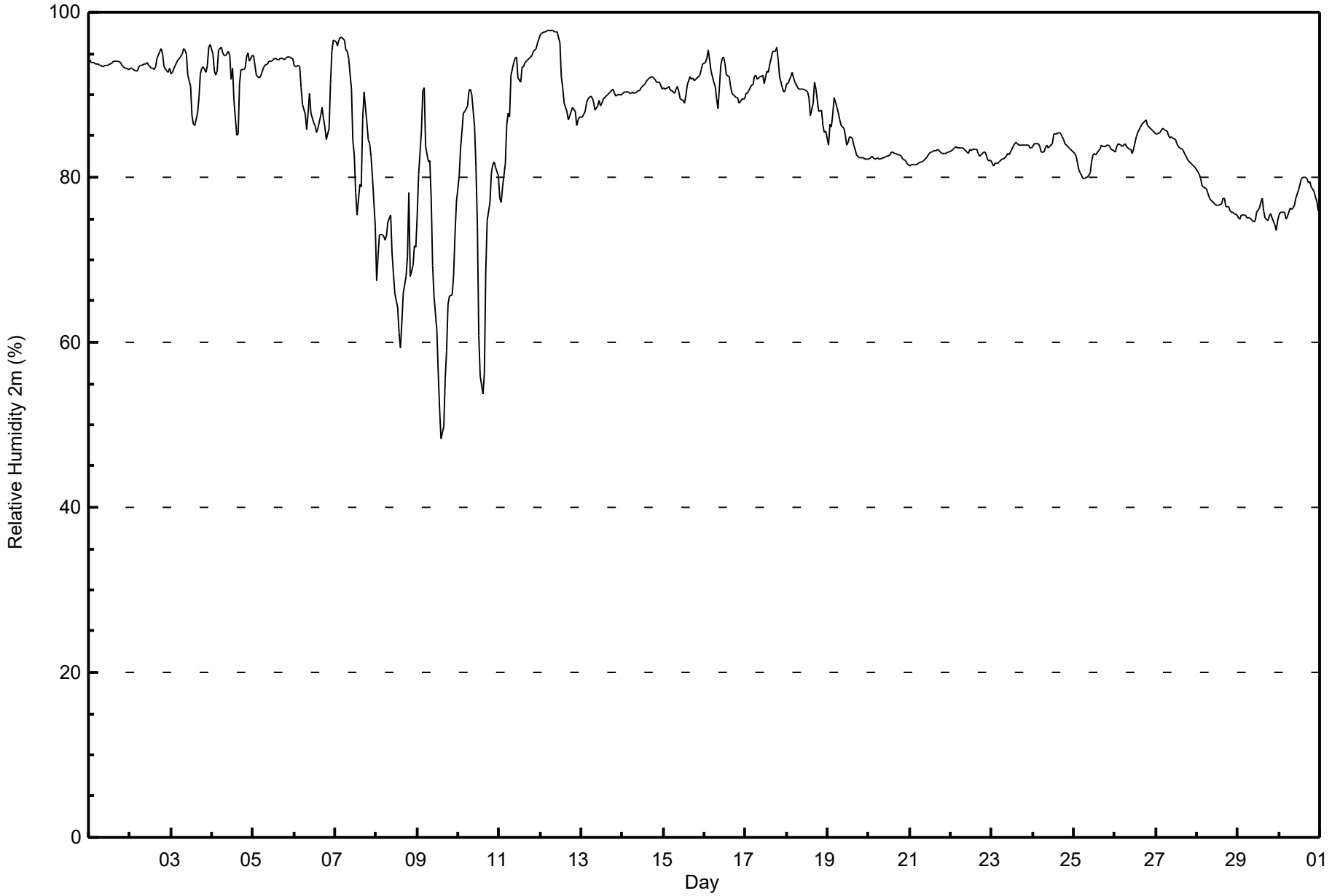
**Firebag - November 2024**

Maximum Value: 97.8 % on Nov 12 06:00      Maximum Daily Average: 93.9 % on Nov 5																						Hours in Service: 720 Hours of Data: 720																										
Minimum Value: 48.3 % on Nov 9 15:00      Minimum Daily Average: 69.5 % on Nov 8 Maximum Diurnal Average: 87.4 % at hour 5      Minimum Diurnal Average: 83.3 % at hour 15 Monthly Average: 85.71 %      Percentiles: P <sub>1</sub> = 56.9 P <sub>10</sub> = 75.7 Q <sub>1</sub> = 82.2 Median = 85.9 Q <sub>3</sub> = 92.2 P <sub>90</sub> = 94.3 P <sub>99</sub> = 97.7																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	94.3	94.0	93.9	93.8	93.8	93.7	93.6	93.5	93.5	93.5	93.5	93.6	93.7	93.8	94.0	94.2	94.1	94.0	93.8	93.6	93.4	93.2	93.2	93.0	93.7	94.3																						
2-Nov	93.2	93.2	93.0	92.9	93.0	93.5	93.6	93.6	93.8	93.8	93.8	93.6	93.2	93.3	93.0	93.4	94.5	95.2	95.5	94.9	93.4	92.8	92.8	93.2	93.6	95.5																						
3-Nov	92.6	92.8	93.6	93.9	94.3	94.4	94.9	95.6	95.5	94.8	92.3	91.0	87.4	86.4	86.2	87.8	89.6	92.5	93.3	93.4	92.8	93.5	95.8	96.1	92.5	96.1																						
4-Nov	95.0	92.9	92.3	92.9	95.5	95.8	95.2	94.8	94.8	95.3	94.7	91.9	93.3	89.4	85.2	85.3	91.3	93.0	93.1	93.2	94.5	95.1	94.1	94.7	93.0	95.8																						
5-Nov	94.7	93.5	92.3	92.0	92.2	92.8	93.3	93.6	93.8	94.1	94.0	94.1	94.3	94.5	94.3	94.3	94.4	94.4	94.2	94.4	94.5	94.6	94.5	94.4	93.9	94.7																						
6-Nov	93.6	93.5	93.6	93.4	90.8	88.9	87.6	85.8	87.7	90.2	87.8	86.6	86.2	85.4	86.0	87.5	88.4	87.2	86.1	84.6	85.9	91.3	95.3	96.7	89.2	96.7																						
7-Nov	96.5	95.9	96.6	96.9	96.9	96.6	95.5	95.2	94.5	90.7	84.4	82.7	78.2	75.4	79.1	78.8	86.9	90.4	86.6	84.6	84.0	82.6	80.0	74.0	87.6	96.9																						
8-Nov	67.5	70.4	73.0	73.0	72.9	72.4	72.9	74.5	75.4	70.8	68.3	66.0	64.2	61.2	59.3	62.3	66.0	67.9	70.4	78.1	68.0	69.4	71.7	71.5	69.5	78.1																						
9-Nov	75.4	80.3	85.7	90.4	90.8	83.7	81.9	82.0	77.2	69.4	65.6	61.5	56.4	51.8	48.3	49.8	55.5	59.0	64.6	65.6	65.8	68.2	73.0	76.9	70.0	90.8																						
10-Nov	80.1	83.6	85.5	87.8	88.0	88.7	90.5	90.7	90.1	86.1	81.2	74.0	60.8	55.9	53.8	56.3	68.6	74.8	76.9	80.6	81.6	81.8	81.1	80.1	78.3	90.7																						
11-Nov	77.5	76.9	78.9	81.7	86.4	87.8	87.3	92.4	93.9	94.5	94.6	92.1	91.6	93.4	93.4	93.9	94.1	94.5	94.6	94.8	95.2	95.7	96.3	96.8	90.7	96.8																						
12-Nov	97.3	97.5	97.6	97.7	97.8	97.8	97.8	97.8	97.7	97.7	97.7	96.3	92.2	90.9	89.0	88.0	87.0	87.5	87.9	88.6	88.0	86.2	87.0	87.3	92.9	97.8																						
13-Nov	87.3	87.6	88.0	88.9	89.5	89.8	89.6	89.2	88.2	88.7	89.4	88.7	89.0	89.5	89.8	90.0	90.1	90.3	90.7	90.2	89.9	89.9	90.0	90.1	89.4	90.7																						
14-Nov	90.2	90.4	90.4	90.4	90.1	90.1	90.3	90.2	90.4	90.5	90.6	90.8	91.1	91.4	91.8	91.9	92.1	92.1	92.0	91.8	91.5	91.5	91.1	90.8	91.0	92.1																						
15-Nov	90.8	90.7	90.8	91.0	90.5	90.5	90.1	90.7	91.1	90.4	89.4	89.3	89.0	89.8	91.3	92.2	91.9	92.0	91.7	91.9	92.2	92.4	93.0	93.7	91.1	93.7																						
16-Nov	93.9	94.4	95.4	94.2	92.8	91.5	91.0	89.6	88.3	93.6	94.4	94.6	93.7	92.3	92.2	91.0	90.2	90.0	89.7	89.6	88.9	89.1	89.5	89.6	91.7	95.4																						
17-Nov	90.2	90.2	90.4	91.2	91.2	92.2	92.3	91.8	92.3	92.2	92.4	91.4	92.9	92.7	93.8	94.5	95.2	95.2	95.8	94.3	92.2	90.8	90.3	90.5	92.3	95.8																						
18-Nov	91.4	91.4	92.1	92.7	92.1	91.5	90.8	90.6	90.7	90.7	90.7	90.5	90.4	89.6	87.4	88.9	91.6	90.7	89.3	87.9	88.1	86.3	85.4	85.7	89.9	92.7																						
19-Nov	83.9	86.5	86.2	87.6	89.7	88.4	87.9	87.0	86.3	85.9	85.0	83.9	84.2	85.0	84.7	83.9	83.5	82.7	82.4	82.4	82.3	82.3	82.3	82.2	84.8	89.7																						
20-Nov	82.1	82.3	82.5	82.3	82.3	82.3	82.3	82.2	82.4	82.4	82.5	82.6	82.7	83.0	83.1	83.0	82.9	82.7	82.8	82.6	82.3	82.0	81.7	81.6	82.4	83.1																						
21-Nov	81.4	81.5	81.5	81.6	81.5	81.7	81.9	81.8	82.0	82.2	82.4	82.8	83.0	83.0	83.1	83.2	83.3	83.2	83.1	82.9	82.9	82.9	83.0	83.1	82.5	83.3																						
22-Nov	83.2	83.5	83.6	83.7	83.6	83.6	83.5	83.5	83.4	83.0	82.9	83.3	83.2	83.4	83.4	83.3	83.0	82.5	82.8	83.0	83.0	82.5	82.1	82.1	83.1	83.7																						
23-Nov	81.7	81.3	81.6	81.7	81.9	82.1	82.2	82.3	82.6	82.8	82.8	83.1	83.7	84.2	84.2	84.1	83.9	83.8	83.9	83.9	83.9	83.8	83.6	83.6	83.0	84.2																						
24-Nov	83.8	84.1	84.0	84.1	83.7	83.1	83.1	83.6	83.8	83.6	83.7	84.0	85.3	85.3	85.2	85.4	85.2	84.9	84.6	84.1	83.7	83.6	83.5	83.3	84.1	85.4																						
25-Nov	82.9	82.6	81.6	80.9	80.5	79.8	79.9	80.0	80.0	80.4	81.9	82.6	82.8	82.8	83.2	83.4	83.9	83.7	83.7	84.0	83.9	83.7	83.4	83.3	82.3	84.0																						
26-Nov	83.0	83.8	84.1	84.0	83.8	84.0	84.1	83.7	83.4	83.4	82.9	83.4	84.8	85.4	85.8	86.1	86.4	86.8	86.9	86.2	86.0	85.8	85.6	85.4	84.8	86.9																						
27-Nov	85.3	85.3	85.4	85.7	85.9	85.7	85.6	85.1	84.7	84.9	84.8	84.5	84.0	83.8	83.6	83.5	83.1	82.7	82.4	82.0	81.7	81.5	81.4	81.1	83.9	85.9																						
28-Nov	80.7	80.4	79.9	79.1	78.8	78.6	78.1	77.7	77.3	76.9	76.8	76.7	76.7	76.6	76.8	77.5	77.4	76.4	76.4	75.9	75.7	75.7	75.5	75.4	77.4	80.7																						
29-Nov	75.2	74.9	75.4	75.4	75.4	75.2	75.0	75.0	74.8	74.6	74.7	75.8	76.2	76.9	77.5	75.9	75.1	74.8	75.2	75.6	75.1	74.2	73.5	74.7	75.3	77.5																						
30-Nov	75.4	75.8	75.8	75.8	75.0	75.3	76.2	76.0	76.3	76.6	77.4	78.4	79.1	79.8	79.9	80.0	79.8	79.3	79.4	78.9	78.4	77.7	77.1	76.0	77.5	80.0																						
																								86.0	86.4	86.8	87.2	87.4	87.0	86.9	87.0	86.9	86.5	85.8	85.0	84.1	83.5	83.3	83.6	85.0	85.5	85.7	85.8	85.3	85.3	85.6	85.6	Diurnal Average
																								97.3	97.5	97.6	97.7	97.8	97.8	97.8	97.8	97.7	97.7	97.7	96.3	94.3	94.5	94.3	94.5	95.2	95.2	95.8	94.9	95.2	95.7	96.3	96.8	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 2m (RH2) - %**  
**Firebag - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 2m (RH2) - %**  
**Firebag - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	10	1.39	1.39
60 - 80	120	16.67	18.06
80 - 100	590	81.94	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



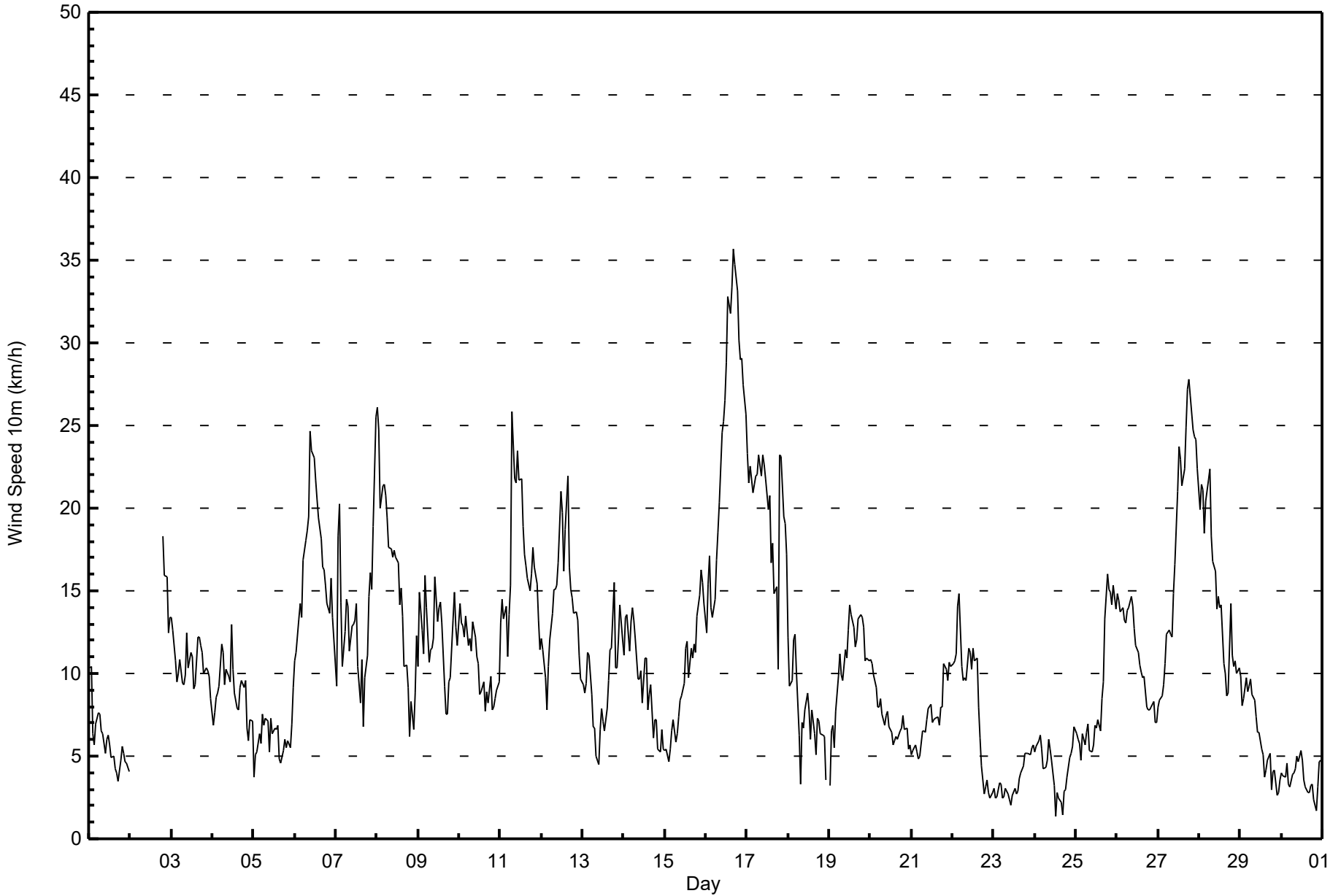
Maximum Speed: 36 km/h on Nov 16 17:00	Maximum Daily Speed Average: 24.4 km/h on Nov 16	Hours in Service: 720
Minimum Speed Value: 1 km/h on Nov 24 13:00	Minimum Daily Speed Average: 2.2 km/h on Nov 13	Hours of Data: 700
Maximum Diurnal Speed Average: 4.0 km/h at hour 12	Minimum Diurnal Speed Average: 1.8 km/h at hour 20	Hours of Missing Data: 20
Monthly Average Velocity: 2.8 km/h 224.5 deg	Percentiles: P <sub>1</sub> = 2 P <sub>10</sub> = 5 Q <sub>1</sub> = 7 Median = 10 Q <sub>3</sub> = 14 P <sub>90</sub> = 20 P <sub>99</sub> = 29	Percent Operational Time: 97.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	SW10	SW10	SW6	WSW6	SW7	SW8	WSW8	WSW7	SW6	WSW5	SW6	WSW6	W6	NNW5	NNW5	N4	N4	NE3	NE5	NNE6	NE5	NE5	NE5	ENE4	W2.4	SW10	
2-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	SE18	SSE16	SE16	SSE12	SE13	---	SE18	
3-Nov	SE13	SSE13	SSE11	S9	SSW10	SSW11	SW9	WSW9	WSW10	WSW12	WSW10	WSW11	WSW11	WSW9	SW9	SSW12	SSW12	WSW12	WSW11	SW10	SW10	WSW10	W10	W8	SW8.7	SE13	
4-Nov	WSW7	WSW8	SW9	SW9	WSW9	WSW12	WSW11	WSW9	WSW10	SW10	SW9	SW13	SSW10	S9	SSW8	SW8	SSW9	SW10	SW9	SW10	SSW7	SW6	W7	WSW7	SW8.5	SW13	
5-Nov	WSW4	NNW5	NNW5	N6	NNE6	N8	NNE7	N7	N7	NNW5	NW7	NW6	NW7	NW7	WNNW7	WNNW5	W5	WSW5	WSW6	WSW6	WSW6	SW5	SW7	WSW9	NW3.7	SW9	
6-Nov	SSW11	SSW11	SSW13	SSW14	S13	SSW17	SSW18	SSW19	S19	SSW25	SW24	SW23	SW22	SW20	SW19	SW18	SW16	SW16	SSW15	SSW14	SSW14	SW16	SW13	WSW12	SSW16.3	SSW25	
7-Nov	W9	NNW18	NNW20	NW14	WNNW10	WNNW13	WNNW15	WNNW14	W11	W13	WNNW13	W13	W14	WNNW10	WSW8	SW11	SSW7	S10	S11	S15	SSE16	SSE15	S19	S25	WSW6.9	S25	
8-Nov	S26	S25	S20	SSW21	SSW21	SSW21	SW19	SW18	SW18	SW17	SW17	SSW17	SSW17	SW14	SW15	SW13	WSW10	SW11	WNNW9	NW6	NNW8	WNNW7	W9	W12	SW13.1	S26	
9-Nov	W10	W15	W13	W11	WSW16	W14	W11	W11	WSW12	WSW12	W16	W13	W14	W14	W13	WSW9	WSW8	SSW8	SSW9	SSW10	SSW13	SSW15	SSW13	SSW12	WSW11.0	WSW16	
10-Nov	SW14	SSW13	SSW13	SSW12	SW13	SW12	SW12	SW11	SW13	SW12	WSW11	WSW11	W9	W9	WSW10	WSW8	SW9	SSW8	SSW10	S8	S8	S9	SSE9	SSE10	SW9.5	SW14	
11-Nov	SSE13	SE15	SE13	SE14	SE11	SE14	SSE15	SSE26	SSE22	SSE22	SSE24	SSE22	SSE22	SSE19	SSE17	SSE17	SSE16	SSE15	S16	S18	S16	S15	S13	SSE11	SSE16.4	SSE26	
12-Nov	S12	S11	S10	S8	S10	SW12	WSW14	W15	W15	W15	W17	W21	W20	W16	W19	W22	W16	W15	W15	W14	WNNW14	WNNW13	W11	W10	W12.2	W22	
13-Nov	W9	W9	WSW9	WSW11	WSW11	WSW9	WSW7	WSW7	WSW5	WNNW4	N7	NNE8	NE7	NE7	NE8	NE10	NE11	ENE12	ENE15	E10	ESE10	E12	E14	E12	NE2.2	ENE15	
14-Nov	E11	E13	E14	E11	ENE13	E14	E13	ESE12	ESE10	ESE10	E10	E8	ENE11	ENE11	E8	E9	ESE9	E6	SE7	SE7	SSE5	SSE5	SE7	SE5	E9.0	E14	
15-Nov	SSE5	SSE5	SSE5	S5	SSE7	SSE7	SSE6	SSW6	SSW7	S8	S9	S9	SW12	SW12	SSW10	S12	S11	S12	S11	S13	SSW15	SSW16	SSW16	SSW14	S9.3	SSW16	
16-Nov	SSW12	SSW15	SSW17	SSW14	S13	S14	S17	S19	S20	S25	S25	S27	S29	S33	S32	S33	S36	S35	S33	S30	S29	S29	S27	S26	S24.4	S36	
17-Nov	S23	S22	S23	SSE21	S21	S22	S22	S23	SSE22	S23	S23	S22	SSW20	SSW21	SSW17	SW18	SSW15	SSW15	NW10	NNW23	NNW23	NNW19	NNW19	NNW17	SSW11.1	S23	
18-Nov	NW12	WNNW9	WNNW10	WNNW12	NW12	NNE10	N6	W3	WNNW7	NW7	NW8	NW9	NW8	NW6	NW8	NNW6	N5	NNE7	NE7	ENE6	ESE6	ESE6	SE4	UO	NNW4.9	NW12	
19-Nov	NE3	ENE6	NE7	NE6	NE8	NE10	NNE11	N10	N10	N11	NNE11	N13	NNE14	N14	N13	N12	N12	N13	N14	NNE13	NNE13	NNE11	N11	NNE11	NNE10.3	NNE14	
20-Nov	N11	NNE11	N10	N9	N8	N8	NNE9	NNE8	N7	NNE7	NNE8	NNE7	NNE6	N6	N6	N6	NNE6	NNE7	NNE7	NNE7	NNE7	NNE7	NNE7	NNE5	N6	NNE7.3	N11
21-Nov	N5	N5	N6	N5	N5	N5	N7	N7	N6	NNW7	N8	N8	NNW7	NNW7	N7	NNW7	NNW7	NNW8	NNW8	N11	N10	NNW10	NNW11	NNW10	N7.3	NNW11	
22-Nov	NNW11	NNW11	NNW11	N14	N15	NNW10	NNW10	NNW10	NNW10	N12	NNW11	NNW10	N12	N11	N11	N8	N6	N4	N3	N3	NNE4	NNE3	N2	NNE3	N8.3	N15	
23-Nov	NNE3	NNE2	NE3	ENE3	ENE3	NE2	ENE3	ENE3	E3	ENE2	NE2	E3	E3	E3	ENE3	ENE4	ENE4	NE4	NE5	NE5	NE5	NE5	NE5	NE6	NE3.4	NE6	
24-Nov	NE5	ENE6	ENE6	ENE6	NE5	NE4	ENE4	E5	ESE6	ESE5	ESE5	ESE3	ENE1	ENE3	E2	ESE2	ENE1	ENE3	E3	SE4	SSE5	SSE5	S6	S7	E3.2	S7	
25-Nov	S6	S6	S6	S5	S6	S6	S6	S7	S5	S5	S6	S7	S7	S7	S7	S8	S9	S13	S16	S15	S15	S14	S15	S14	S8.8	S16	
26-Nov	S15	S14	S14	S14	S13	S13	S14	S14	S15	S14	S13	S12	S11	S10	S10	SSW10	SSW10	SW8	WSW8	W8	WNNW8	NW8	WNNW7	WNNW7	SSW8.8	S15	
27-Nov	WNNW8	W8	W9	WNNW9	WNNW11	WNNW12	NW13	NW12	NW12	NW15	NW17	NNW21	NNW24	NNW23	NNW21	NNW22	NNW25	NNW27	NNW28	NNW27	NNW25	N24	NNW24	N22	NNW17.2	NNW28	
28-Nov	NNW20	NNW21	NNW21	NNW19	NNW20	NNW22	N22	N18	N17	N16	N14	NNW15	NNW14	NNW14	NW11	NNW10	NNW9	N9	N14	N11	N10	N11	N10	N10	NNW14.7	N22	
29-Nov	N10	NNE8	N8	N10	N9	N9	N10	NNE9	NNE8	NNE7	NNE6	NNE6	NNE5	NE5	NE4	NNE4	NE5	ENE5	E3	ESE4	SE4	SSE3	SSE3	SSE4	NNE4.9	N10	
30-Nov	SSE4	S4	SSE4	SE5	SE3	SE3	SE4	SE4	ESE4	ESE5	SSE5	SSE5	SSE5	SE4	SE3	SE3	E3	ENE3	SE3	SE2	NE2	NNE3	NE5	NNE5	SE2.8	SSE5	

SSW3.2	SW2.9	SSW2.5	SW2.6	SW3.0	SW2.7	SW2.9	SW3.6	SW3.6	SW3.8	SW3.9	WSW4.0	WSW3.8	WSW3.1	WSW3.6	SW3.6	SW2.8	SSW2.6	SW1.9	S1.8	SSW1.9	SSW1.9	SW2.3	SSW2.5	Diurnal Average
S26	S25	S23	SSW21	SSW21	S22	N22	SSE26	SSE22	SSW25	S25	S27	S29	S33	S32	S33	S36	S35	S33	S30	S29	S29	S27	S26	Diurnal Maximum

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Firebag - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	125	17.86	17.86
6 - 11	307	43.86	61.71
12 - 19	195	27.86	89.57
20 - 28	63	9.00	98.57
29 - 38	10	1.43	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 700

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Firebag - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	12	11	22	16	9	7	14	15	5	0	1	4	2	2	2	3	125
6 - 11	44	29	11	7	8	7	4	7	33	22	26	37	20	14	14	24	307
12 - 19	15	3	0	3	7	1	8	12	35	32	24	8	21	9	8	9	195
20 - 28	3	0	0	0	0	0	0	8	20	6	4	0	3	0	0	19	63
29 - 38	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	10
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	74	43	33	26	24	15	26	42	103	60	55	49	46	25	24	55	700

Total Number of Valid Hours: 700

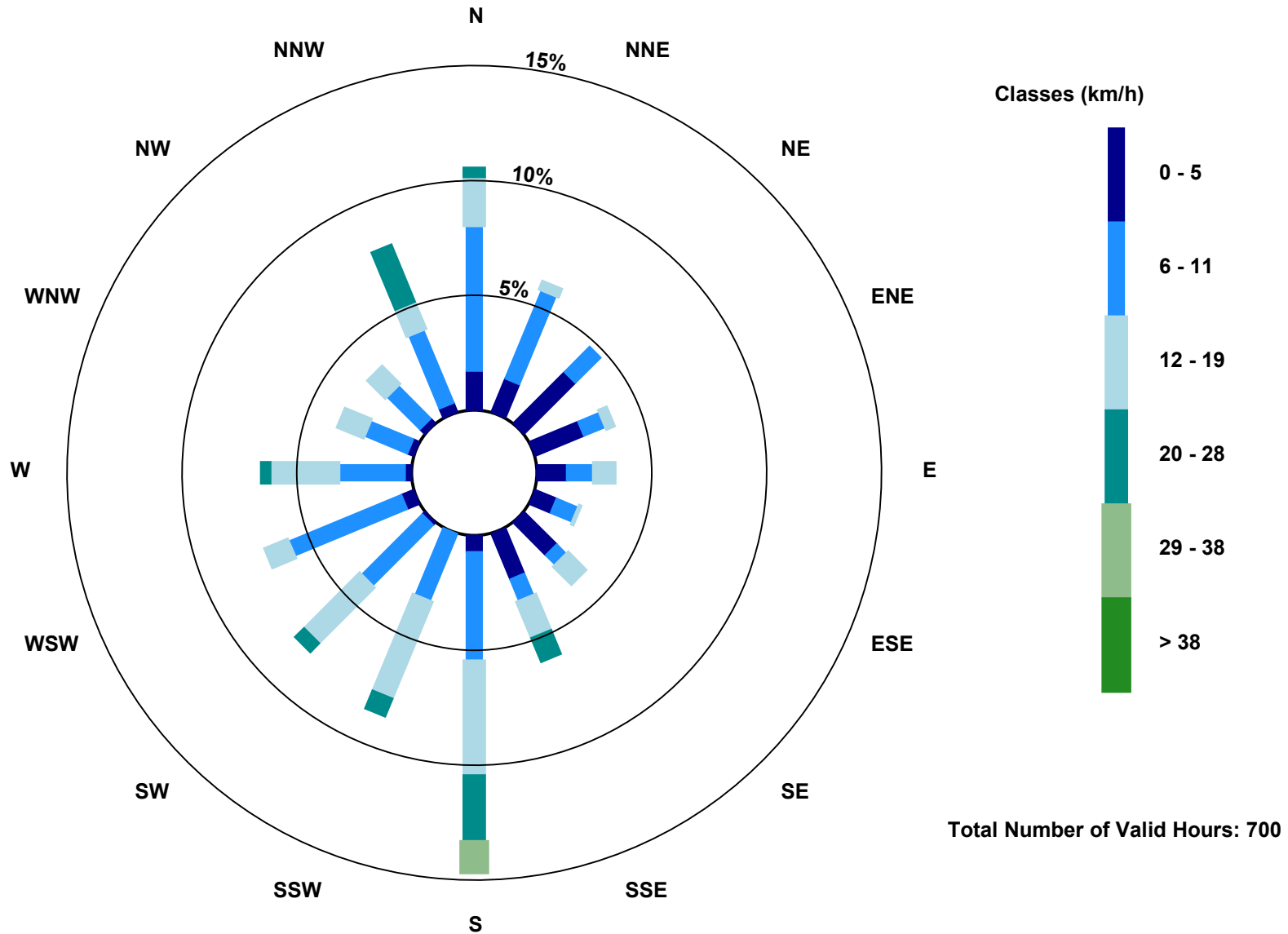
Total Number of Hours: 720





Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Firebag





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Firebag - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Nov 27 18:00	Hours in Service: 720 Hours of Data: 700 Hours of Missing Data: 20 Hours of Calibration: 0 Percent Operational Time: 97.2
Minimum Value: 0 km/h on Nov 23 13:00	
Percentiles: P <sub>1</sub> = 0 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 6	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	2	2	2	2	2	2	2	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2
2-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	4	3	3	3	2	4
3-Nov	2	2	2	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2
4-Nov	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2	1	2	2
5-Nov	1	1	0	1	1	2	1	1	1	2	1	1	1	1	2	1	1	1	1	1	1	1	2	1	2
6-Nov	2	2	2	2	2	2	3	2	3	4	5	4	4	3	3	3	2	2	2	2	2	2	2	2	5
7-Nov	2	6	5	3	3	4	4	4	3	3	3	3	3	3	2	2	1	1	2	2	2	3	3	4	6
8-Nov	4	4	3	4	3	3	3	2	2	3	3	2	3	3	3	2	1	2	2	2	3	2	2	2	4
9-Nov	2	4	3	2	3	3	2	2	2	3	4	3	4	3	3	1	1	2	2	1	2	2	2	2	4
10-Nov	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2
11-Nov	2	2	2	2	2	3	3	5	4	4	4	5	4	4	3	3	3	3	3	3	3	3	3	2	5
12-Nov	2	2	1	1	2	2	3	3	3	4	4	6	5	5	5	5	4	3	3	3	4	3	3	2	6
13-Nov	2	2	2	2	1	2	1	2	2	1	2	2	2	2	2	2	2	3	4	2	3	2	4	3	4
14-Nov	2	4	3	2	2	3	3	3	2	2	2	1	2	2	1	1	1	2	1	1	1	1	2	1	4
15-Nov	2	1	2	1	1	1	1	1	1	1	2	1	2	2	2	2	2	2	1	2	2	2	2	2	2
16-Nov	2	2	2	2	2	2	2	3	3	3	4	4	4	5	5	5	5	6	6	5	5	5	4	5	6
17-Nov	4	4	3	3	4	3	3	3	3	4	3	4	3	3	3	3	2	3	5	4	5	6	5	4	6
18-Nov	3	2	2	4	3	2	1	1	2	2	2	2	2	2	2	1	2	2	2	1	1	1	1	UO	4
19-Nov	2	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	2	3	2	3
20-Nov	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
21-Nov	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	1	1	2	2	2	2	2	2	2	2
22-Nov	2	2	2	3	4	2	2	2	2	3	2	2	3	3	2	2	1	1	1	1	1	1	0	0	4
23-Nov	1	1	0	1	1	1	0	0	0	1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
24-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1
25-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
26-Nov	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2	2	2	2	2	2	2
27-Nov	2	2	2	2	3	3	3	3	3	4	4	6	5	5	5	5	6	7	6	6	6	5	6	6	7
28-Nov	4	5	5	4	5	5	5	4	4	3	3	3	3	3	2	2	2	1	4	2	2	2	2	2	5
29-Nov	2	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2
30-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1
	4	6	5	4	5	5	5	5	4	4	5	6	5	5	5	5	6	7	6	6	6	6	6	6	

Diurnal Maximum

UO - Unstable Operation



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 10m (WD10) - deg

Firebag - November 2024

Direction of Maximum Speed: 177 deg on Nov 16 17:00		Hours in Service:	720
Direction of Maximum Daily Speed Average: 178.4 deg on Nov 16		Hours of Data:	700
Direction of Minimum Speed: 67 deg on Nov 24 13:00		Hours of Missing Data:	20
Direction of Minimum Daily Speed Average: 2.2 deg on Nov 13		Percent Operational Time:	97.2
Monthly Average Direction: 224.5 deg			

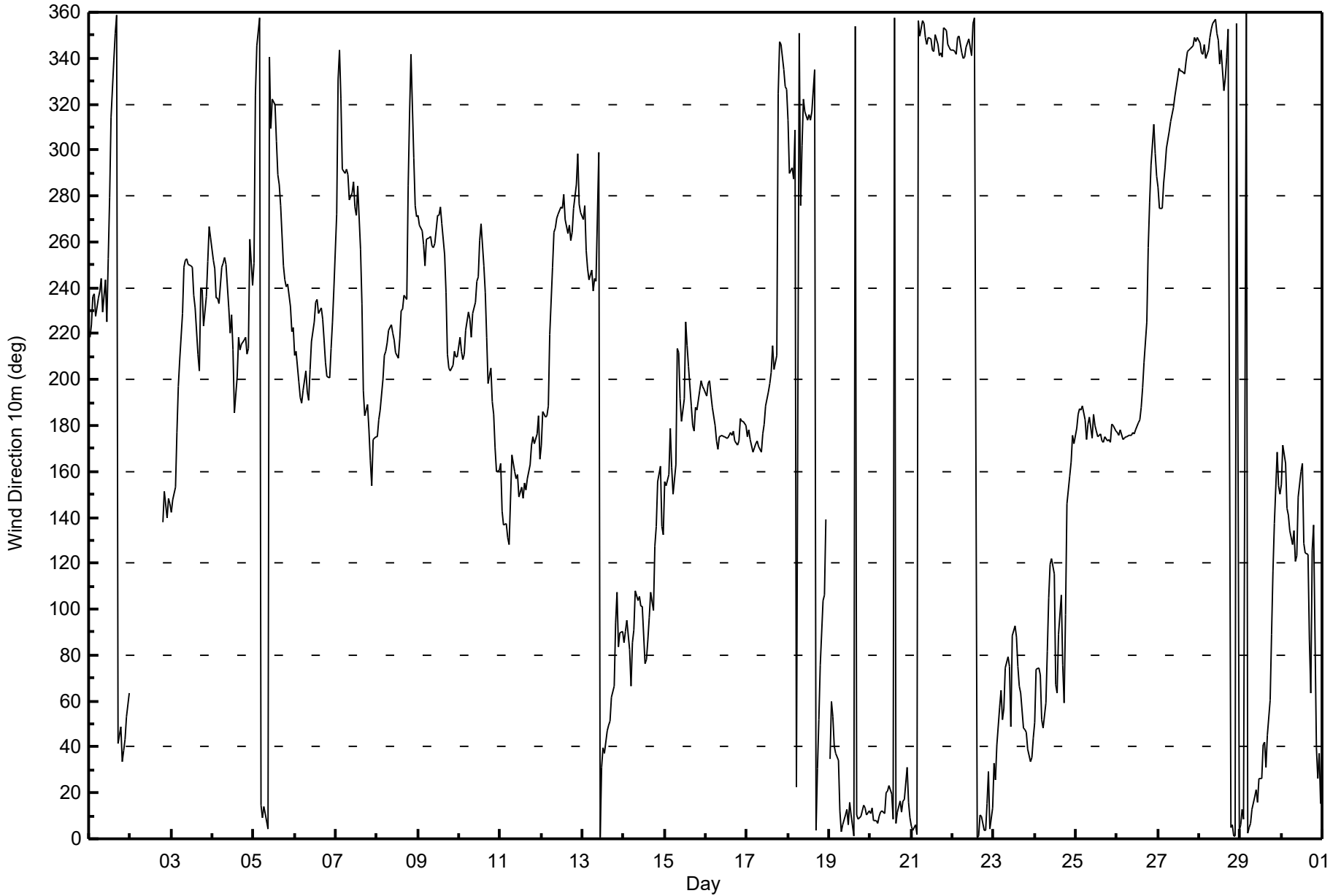
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	218	224	236	237	228	236	238	244	230	244	225	252	280	314	339	351	359	42	49	33	38	43	53	64	259.0
2-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	138	151	140	148	146	--
3-Nov	142	148	153	177	197	209	229	249	252	253	250	250	249	237	231	211	204	240	239	224	236	251	267	262	224.1
4-Nov	252	248	235	236	233	249	251	253	250	232	220	228	213	185	201	219	213	216	217	219	211	214	261	241	229.4
5-Nov	251	324	346	358	15	9	14	11	4	341	309	322	320	304	289	285	276	250	243	240	241	232	221	223	304.1
6-Nov	210	212	199	192	190	195	204	194	191	205	216	225	234	235	229	231	226	217	208	201	201	214	225	240	212.9
7-Nov	272	331	343	322	292	290	291	289	278	281	286	275	271	284	257	233	195	184	189	178	165	154	174	175	253.7
8-Nov	175	182	187	200	210	213	216	222	224	220	217	212	210	218	230	231	237	235	284	316	342	297	276	271	218.4
9-Nov	272	267	265	259	250	261	262	262	258	258	259	271	271	275	268	255	238	211	205	204	206	212	210	210	248.5
10-Nov	218	212	208	211	221	229	226	218	229	234	243	244	260	268	249	238	218	198	205	190	185	170	160	160	218.1
11-Nov	164	143	136	137	131	128	148	167	160	157	158	149	153	148	155	152	157	163	171	175	172	177	184	166	156.9
12-Nov	172	186	184	184	189	220	249	264	266	270	272	275	274	281	270	264	267	261	265	274	285	299	276	273	259.0
13-Nov	270	276	256	248	243	248	238	244	243	299	1	31	40	37	47	49	51	62	67	94	108	83	90	90	52.5
14-Nov	85	90	95	82	66	86	91	108	104	106	101	101	76	78	87	96	108	99	128	136	156	162	136	133	98.6
15-Nov	156	154	159	179	162	150	163	213	212	191	182	191	225	215	206	188	180	177	188	187	195	200	197	196	190.1
16-Nov	193	198	199	194	188	180	173	170	175	175	175	175	175	175	177	176	177	173	172	173	183	182	182	180	178.4
17-Nov	175	178	174	168	170	172	173	171	168	177	180	188	194	199	203	215	204	211	325	347	346	335	328	327	193.5
18-Nov	313	290	292	287	309	22	351	276	302	322	317	313	316	313	317	335	4	31	52	76	104	106	139	UO	328.8
19-Nov	35	60	53	40	37	34	12	3	6	10	13	6	16	11	1	354	11	8	10	12	15	14	10	12	14.3
20-Nov	11	13	8	8	7	10	12	12	11	20	21	23	19	8	358	7	12	17	12	16	17	31	16	9	13.1
21-Nov	5	3	6	2	356	349	356	355	349	346	349	349	344	343	350	346	341	342	340	353	352	346	345	344	349.5
22-Nov	343	343	342	349	350	342	340	341	345	349	345	341	355	357	1	1	10	10	4	4	16	29	4	13	350.9
23-Nov	33	26	41	57	65	52	57	75	79	75	49	88	93	88	75	66	64	48	48	47	39	34	35	44	54.6
24-Nov	51	74	75	71	52	48	59	82	105	119	122	115	67	64	89	106	76	59	98	146	158	164	176	172	99.6
25-Nov	179	185	187	187	188	183	174	180	184	175	185	180	178	175	176	174	173	175	173	174	173	181	180	177	177.8
26-Nov	177	176	178	174	175	175	175	175	176	177	176	178	181	182	188	197	208	225	257	277	294	311	298	289	192.4
27-Nov	284	275	275	286	292	301	308	313	315	319	323	331	335	334	334	333	339	343	343	344	345	349	347	349	330.6
28-Nov	347	342	342	346	340	343	349	353	355	357	351	348	338	343	326	331	340	353	5	6	1	1	355	3	348.4
29-Nov	6	13	8	360	3	5	7	13	18	22	16	26	26	41	42	31	45	61	89	117	137	168	154	150	24.8
30-Nov	155	172	164	144	141	134	128	134	121	123	149	160	164	129	124	124	86	64	126	137	40	26	37	15	125.3

206.9 214.3 213.0 218.9 226.1 227.5 234.3 225.4 225.3 227.4 232.9 241.1 248.9 248.2 244.6 233.3 215.8 208.5 214.9 188.0 197.8 204.1 215.8 211.3

Diurnal Average

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Firebag - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 53 deg on Nov 17 19:00	Hours of Data: 700
Minimum Value: 5 deg on Nov 10 20:00	Hours of Missing Data: 20
Percentiles: P <sub>1</sub> = 6 P <sub>10</sub> = 8 Q <sub>1</sub> = 10 Median = 13 Q <sub>3</sub> = 16 P <sub>90</sub> = 19 P <sub>99</sub> = 34	Hours of Calibration: 0
	Percent Operational Time: 97.2

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	12	11	15	21	15	19	16	13	21	18	15	23	20	28	23	19	19	21	14	15	15	15	14	15	28
2-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	18	12	11	14	11	18
3-Nov	11	11	11	11	8	11	11	12	11	11	12	11	12	14	11	13	11	11	12	10	13	12	14	13	14
4-Nov	16	13	13	17	13	10	11	13	13	15	12	11	13	12	16	8	6	8	9	8	5	24	27	15	27
5-Nov	19	12	6	13	15	14	16	14	16	25	15	17	18	22	20	23	24	15	11	11	10	11	10	9	25
6-Nov	10	9	8	8	9	9	10	10	8	13	11	11	10	10	11	9	9	8	9	8	8	11	10	10	13
7-Nov	19	21	13	16	17	17	16	16	15	16	17	16	17	18	18	12	22	6	8	11	9	10	9	9	22
8-Nov	8	8	8	12	10	9	10	9	8	10	9	10	10	10	11	10	11	11	34	26	18	18	18	14	34
9-Nov	14	14	15	13	11	12	12	13	12	13	14	16	17	17	15	12	9	11	8	6	9	9	8	8	17
10-Nov	8	8	8	9	8	10	11	9	9	10	10	12	16	16	13	14	9	8	6	5	11	7	9	9	16
11-Nov	8	11	11	10	11	12	20	11	11	11	11	11	11	12	14	11	11	9	8	9	10	9	9	9	20
12-Nov	11	8	11	8	9	15	12	14	15	15	17	16	16	19	15	14	16	13	14	15	19	16	16	16	19
13-Nov	15	17	14	10	9	13	12	10	13	42	21	22	26	24	18	17	13	15	15	17	15	13	12	12	42
14-Nov	13	12	10	14	10	16	11	15	15	14	13	16	10	10	15	15	9	14	14	15	17	15	17	19	19
15-Nov	19	11	20	11	15	18	27	19	12	10	13	17	12	15	12	9	12	9	10	8	8	7	7	7	27
16-Nov	8	8	8	7	8	8	7	8	8	8	10	9	9	9	8	9	9	9	9	9	9	9	9	9	10
17-Nov	8	9	8	10	10	8	8	8	9	9	8	9	9	10	9	10	9	10	53	13	13	12	12	11	53
18-Nov	16	15	16	17	27	12	19	32	18	17	16	14	17	24	22	20	17	18	24	20	10	10	32	UO	32
19-Nov	40	19	15	21	16	14	14	15	15	14	14	16	16	16	16	14	16	15	16	15	15	15	16	16	40
20-Nov	16	15	16	15	17	15	16	16	17	15	15	16	17	16	18	17	15	14	14	14	15	14	17	17	18
21-Nov	17	16	17	16	17	15	16	16	15	15	15	17	14	14	14	14	13	13	13	14	14	13	12	13	17
22-Nov	13	14	13	14	13	13	13	13	13	13	14	14	16	15	16	15	14	15	19	14	14	16	24	21	24
23-Nov	14	19	13	11	11	11	11	11	13	26	18	13	10	15	17	11	11	11	10	10	11	11	11	13	26
24-Nov	11	11	11	13	10	9	9	19	14	12	15	21	43	16	21	26	22	14	24	18	10	10	8	8	43
25-Nov	9	8	8	9	6	8	8	7	10	9	10	8	8	8	8	9	9	9	8	9	9	9	8	8	10
26-Nov	9	9	9	9	9	9	8	8	7	7	8	8	8	8	8	9	10	11	16	15	18	14	18	17	18
27-Nov	16	15	14	17	17	16	15	13	13	14	13	13	12	13	12	12	13	13	13	13	13	14	13	13	17
28-Nov	13	12	12	12	12	13	14	13	14	14	14	14	14	15	14	13	13	14	13	15	13	13	14	13	15
29-Nov	14	12	13	14	14	14	13	14	12	12	14	17	16	13	16	17	11	7	14	15	20	17	14	11	20
30-Nov	13	11	11	10	19	16	12	12	13	17	17	13	15	24	22	39	39	24	18	30	40	17	10	16	40

40	21	20	21	27	19	27	32	21	42	21	23	43	28	23	39	39	24	53	30	40	24	32	21	
Diurnal Maximum																								

UO - Unstable Operation



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS20 MACKAY RIVER NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS20)  
NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	687	33	33	100	59.5	0	13.3	0
H2S (ppb) Average	685	35	35	100	0.7	0	0.4	0
THC (ppm) Average	687	33	33	100	3.2	-	2.8	-
NO2 (ppb) Average	685	35	35	100	29.7	0	25.2	-
NO (ppb) Average	685	35	35	100	27.7	-	12.4	-
NOX (ppb) Average	685	35	35	100	53	-	37.7	-
Temperature 2 m (C) Average	720	0	0	100	12.9	-	7.6	-
Relative Humidity (%) Average	720	0	0	100	98.9	-	93.1	-
Wind Speed 10 m (km/h) Average	660	0	60	91.67	14	-	11	-
Wind Direction 10 m (deg) Average	660	0	60	91.67	-	-	-	-
Precipitation (mm) Total	720	0	0	100	1.5	-	5.5	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS20)  
 NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	687	1.08	4.7	-	0	0	0	0.1	0.5	1.6	59.5
H2S (ppb) Average	685	0.11	0.1	-	0	0	0.1	0.1	0.1	0.2	0.7
THC (ppm) Average	687	2.37	0.1	-	2.1	2.2	2.3	2.3	2.4	2.5	3.2
NO2 (ppb) Average	685	3.99	6.3	-	0.1	0.3	0.5	1	4.1	12.8	29.7
NO (ppb) Average	685	0.71	2.9	-	0	0	0	0	0.1	0.7	27.7
NOX (ppb) Average	685	4.69	8.5	-	0.2	0.3	0.5	1	4.6	14.2	53
Temperature 2 m (C) Average	720	-8.74	8.8	-	-34	-20.7	-15.3	-7.4	-2.4	2.1	12.9
Relative Humidity (%) Average	720	84.23	8.7	-	38.4	74	80.1	84.8	90.7	94.1	98.9
Wind Speed 10 m (km/h) Average	660	5.9	3	-	0	2	4	5	8	10	14
Wind Direction 10 m (deg) Average	660	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	720	-	-	16.44	-	-	-	-	-	-	-



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -MACKAY RIVER (AMS20)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction	01 Nov 2024 18:00	01 Nov 2024 18:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	01 Nov 2024 20:00	01 Nov 2024 20:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	04 Nov 2024 18:00	04 Nov 2024 18:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	05 Nov 2024 03:00	05 Nov 2024 04:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	15 Nov 2024 03:00	15 Nov 2024 04:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	15 Nov 2024 07:00	15 Nov 2024 07:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	17 Nov 2024 19:00	19 Nov 2024 08:00	38	Flat line in sensor output signal
Wind Speed, Wind Direction	24 Nov 2024 17:00	24 Nov 2024 21:00	5	Flat line in sensor output signal
Wind Speed, Wind Direction	28 Nov 2024 19:00	28 Nov 2024 20:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	28 Nov 2024 22:00	28 Nov 2024 22:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	29 Nov 2024 00:00	29 Nov 2024 00:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	29 Nov 2024 08:00	29 Nov 2024 12:00	5	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb

Mackay River - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 59.5 ppb on Nov 29 15:00	Maximum Daily Average: 13.3 ppb on Nov 29		Hours of Data:	687
Minimum Value: 0.0 ppb on Nov 2 04:00	Minimum Daily Average: 0.0 ppb on Nov 4		Hours of Missing Data:	33
Maximum Diurnal Average: 3.2 ppb at hour 15	Minimum Diurnal Average: 0.3 ppb at hour 22		Hours of Calibration:	33
Monthly Average: 1.08 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.1 Q <sub>3</sub> = 0.5 P <sub>90</sub> = 1.6 P <sub>99</sub> = 13.2		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Nov	0.1	0.1	0.0	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.0	0.1	0.3		
2-Nov	Z	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
3-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1
4-Nov	0.0	0.0	Z	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-Nov	0.0	0.0	0.0	Z	0.0	0.1	0.6	0.5	0.3	1.0	0.8	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.0
6-Nov	0.1	0.0	0.1	0.2	Z	0.1	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
7-Nov	0.0	5.5	7.2	0.1	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.3	0.7	7.2	
8-Nov	0.2	Z	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
9-Nov	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.2
10-Nov	0.0	0.0	0.1	Z	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
11-Nov	0.1	0.3	0.9	0.4	Z	0.0	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9
12-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
13-Nov	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.4	4.3	18.6	9.0	7.4	6.3	6.1	7.6	3.3	3.2	2.8	3.0	3.2	18.6	18.6
14-Nov	3.3	Z	6.5	3.8	4.6	5.7	6.0	6.6	2.3	1.8	1.2	1.9	3.1	3.0	2.8	2.0	1.6	0.3	0.4	0.6	0.8	1.4	1.1	1.1	2.7	6.6	6.6	
15-Nov	0.9	0.4	Z	0.2	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9	0.9
16-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.2	0.1	0.0	0.0	0.2	0.2
17-Nov	0.1	0.1	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	1.0	1.0
18-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.5	0.2	0.1	0.0	0.0	0.0	1.1	0.6	0.5	0.3	0.3	0.3	0.2	1.2	1.2
19-Nov	Z	0.5	0.4	0.3	2.9	1.0	0.8	0.7	C	C	C	2.9	0.8	1.2	0.2	0.2	0.1	0.2	1.2	0.5	0.2	0.3	0.8	1.5	0.8	2.9	2.9	
20-Nov	1.3	Z	0.2	0.2	0.1	0.5	0.8	0.4	0.3	0.0	0.0	0.0	0.0	0.1	0.5	0.8	0.5	0.9	0.6	0.0	0.0	0.0	0.1	0.5	0.3	1.3	1.3	
21-Nov	1.0	0.7	Z	0.7	1.8	2.0	1.7	1.6	1.3	0.7	1.1	0.6	0.2	0.9	0.7	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.0	
22-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.7	0.3	0.0	0.0	0.0	0.1	0.6	2.3	1.1	0.8	0.8	0.5	0.4	2.3	2.3	
23-Nov	0.1	0.3	2.6	12.4	Z	8.8	12.1	10.1	9.0	8.4	5.6	5.0	8.2	7.6	8.9	6.8	2.3	0.9	2.5	5.0	5.2	1.2	1.0	0.6	5.4	12.4	12.4	
24-Nov	1.0	0.9	0.3	0.5	2.3	Z	1.0	0.9	1.0	1.3	1.2	1.4	1.5	9.0	2.8	0.7	0.6	0.4	0.3	0.3	0.3	0.2	0.3	0.2	1.2	9.0	9.0	
25-Nov	Z	0.4	0.4	0.2	0.4	1.5	0.8	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.4	0.7	0.5	0.4	0.3	0.1	0.0	0.0	0.0	0.4	1.5	1.5	
26-Nov	0.1	Z	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.3	0.3	
27-Nov	0.0	0.0	Z	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.8	1.1	0.2	1.2	3.8	0.0	0.0	0.0	1.0	0.0	0.6	1.4	0.5	3.8	3.8	
28-Nov	0.1	0.5	2.0	Z	1.5	0.2	0.0	0.0	0.0	0.0	0.4	3.1	1.7	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.5	3.1	3.1	
29-Nov	0.0	0.1	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.4	12.1	48.2	52.8	59.5	54.8	41.7	19.2	8.3	3.3	1.8	0.9	0.9	1.6	13.3	59.5	59.5	
30-Nov	1.4	1.5	1.1	0.8	0.7	Z	0.5	0.7	0.9	1.0	0.9	0.7	0.7	0.7	0.7	0.7	0.6	0.5	0.5	0.7	0.9	0.6	0.6	0.6	0.8	1.5	1.5	

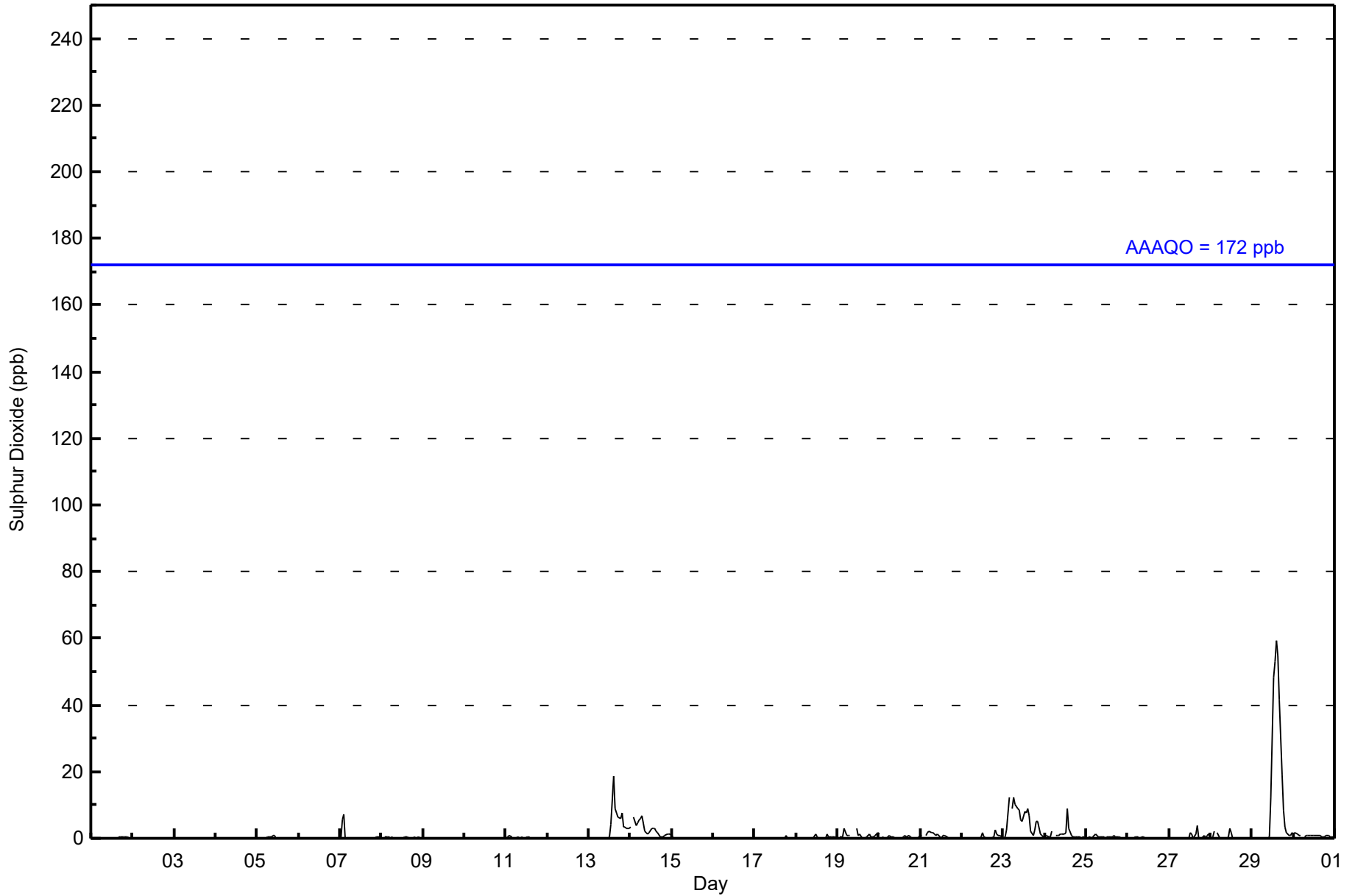
0.4	0.5	0.9	0.8	0.6	0.9	0.9	0.8	0.6	0.5	0.5	1.0	2.4	2.8	3.2	2.6	2.0	1.0	0.8	0.7	0.6	0.3	0.4	0.4	Diurnal Average	
3.3	5.5	7.2	12.4	4.6	8.8	12.1	10.1	9.0	8.4	5.6	12.1	48.2	52.8	59.5	54.8	41.7	19.2	8.3	7.6	5.2	3.2	2.8	3.0	Diurnal Maximum	

Z - zerospan      C - Calibration  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb    24-hr 48 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Mackay River - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Mackay River - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	677	98.54	98.54
11 - 20	5	0.73	99.27
21 - 60	5	0.73	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Mackay River - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	25	56	51	3	6	30	29	51	93	52	35	39	45	60	21	26	622
11 - 20	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	4
21 - 60	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	5
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	26	58	55	5	6	30	29	51	93	52	35	39	45	60	21	26	631

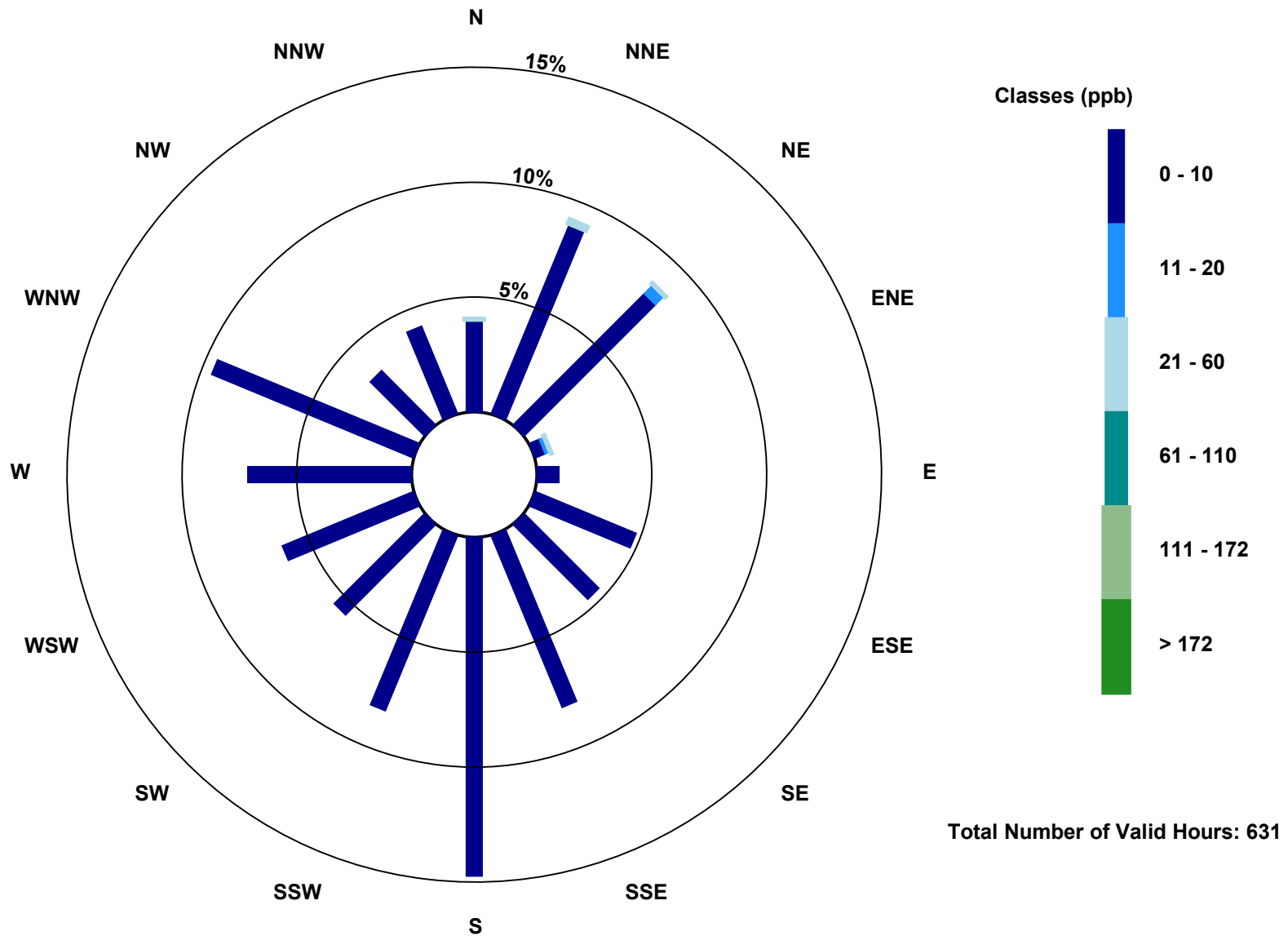
Total Number of Valid Hours: 631

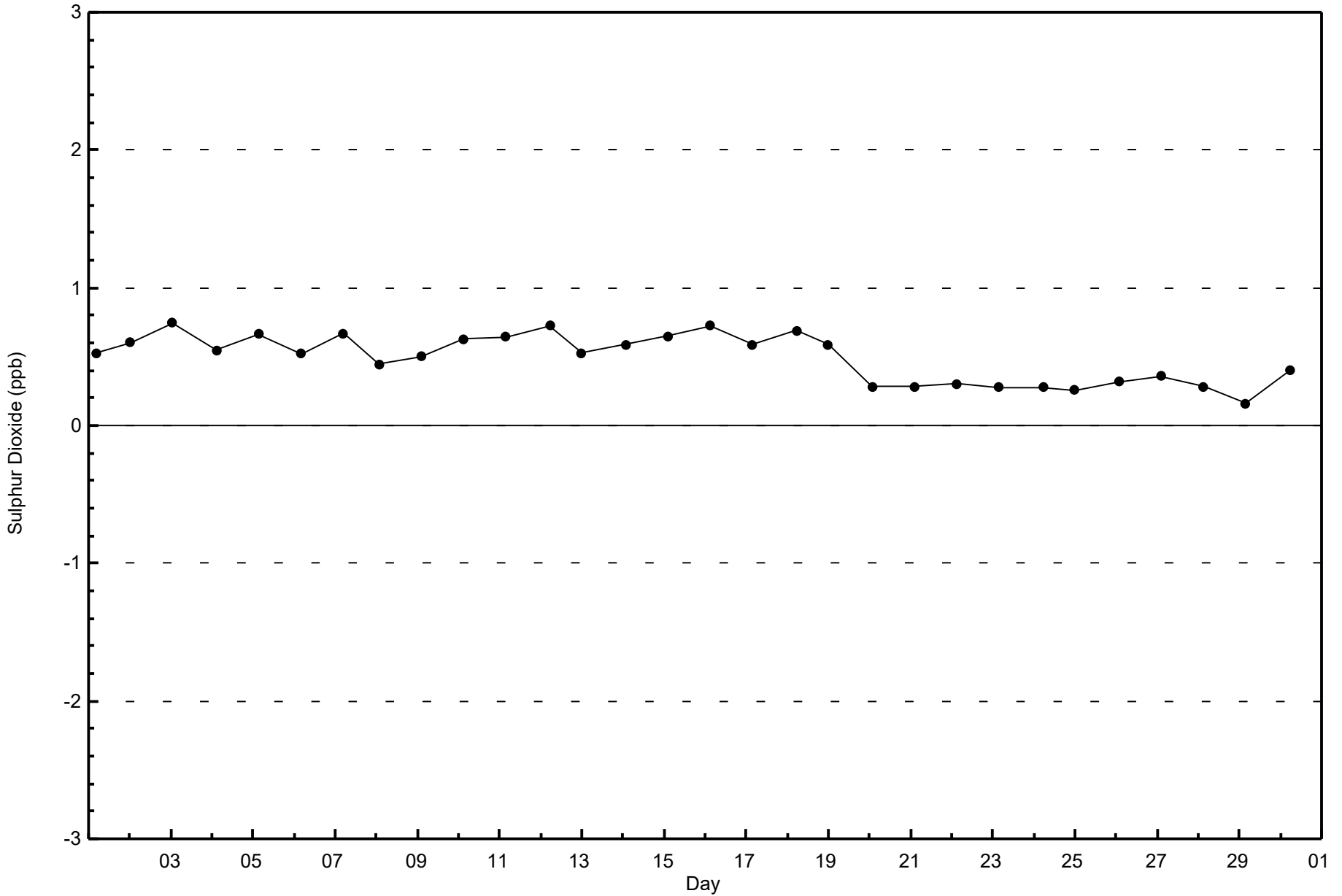
Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Mackay River

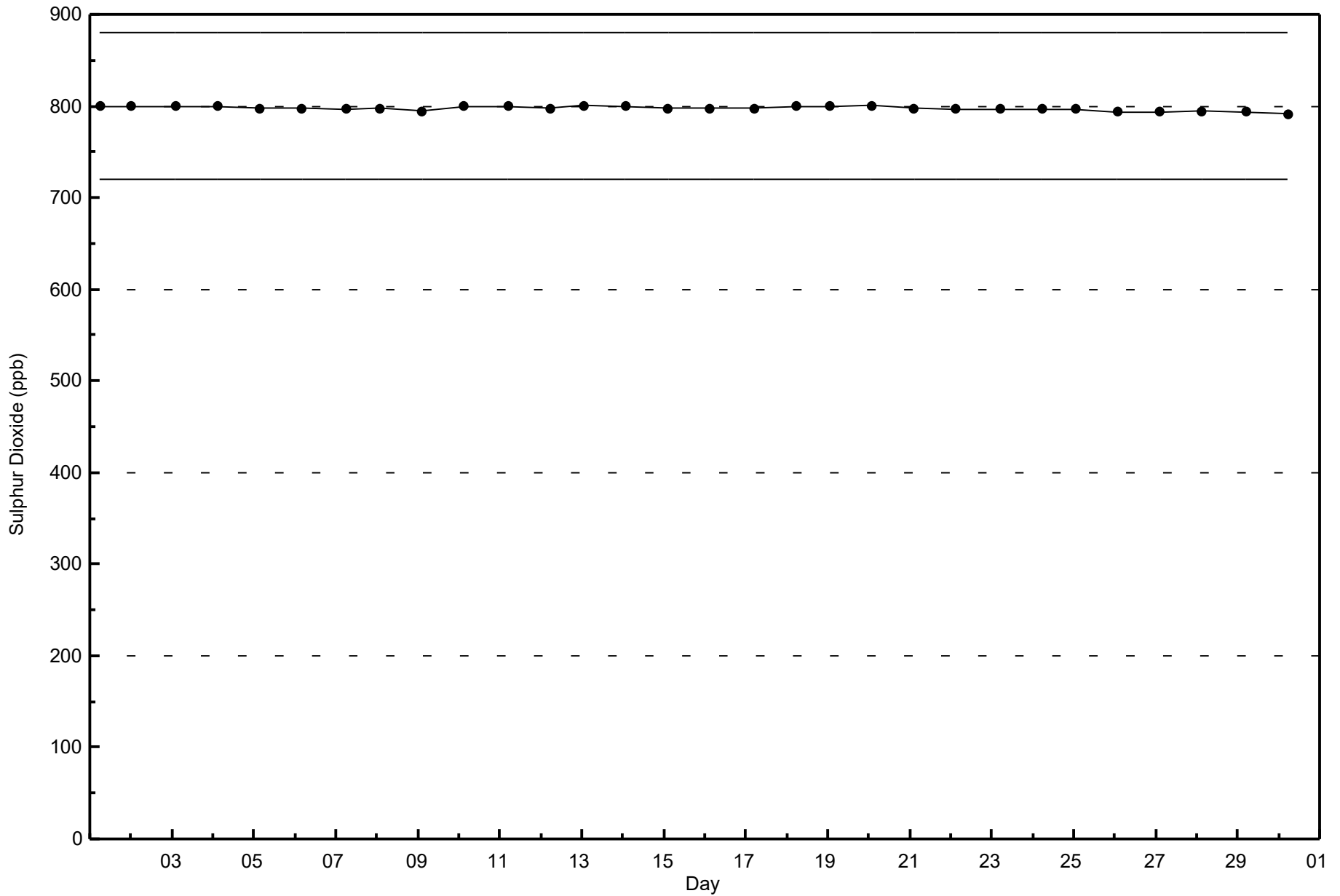






Wood Buffalo Environmental Association  
Span Responses

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Mackay River - November 2024



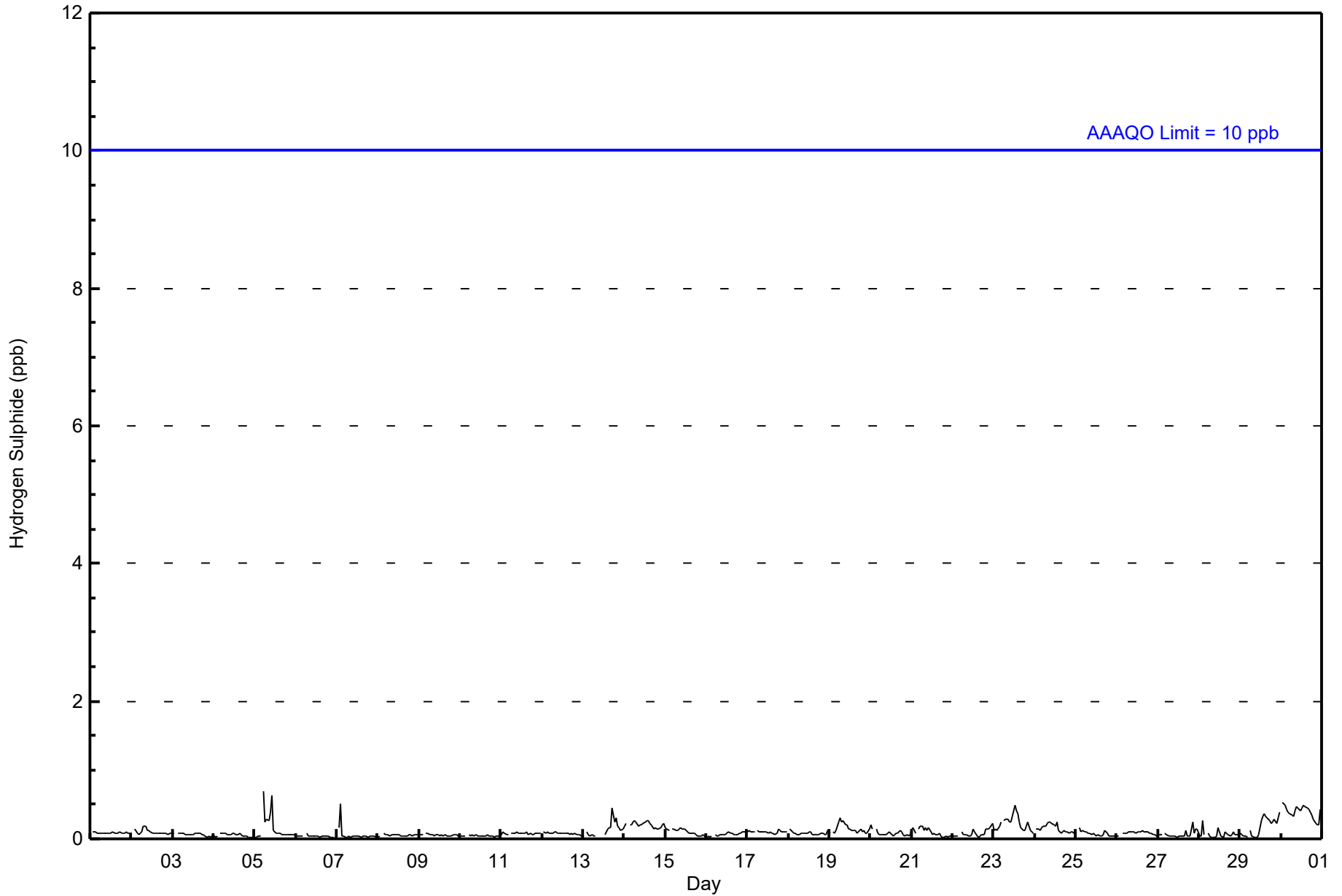






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Mackay River - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Mackay River - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	685	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Mackay River - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	26	60	55	4	6	30	28	50	96	53	33	38	44	60	20	25	628
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	26	60	55	4	6	30	28	50	96	53	33	38	44	60	20	25	628

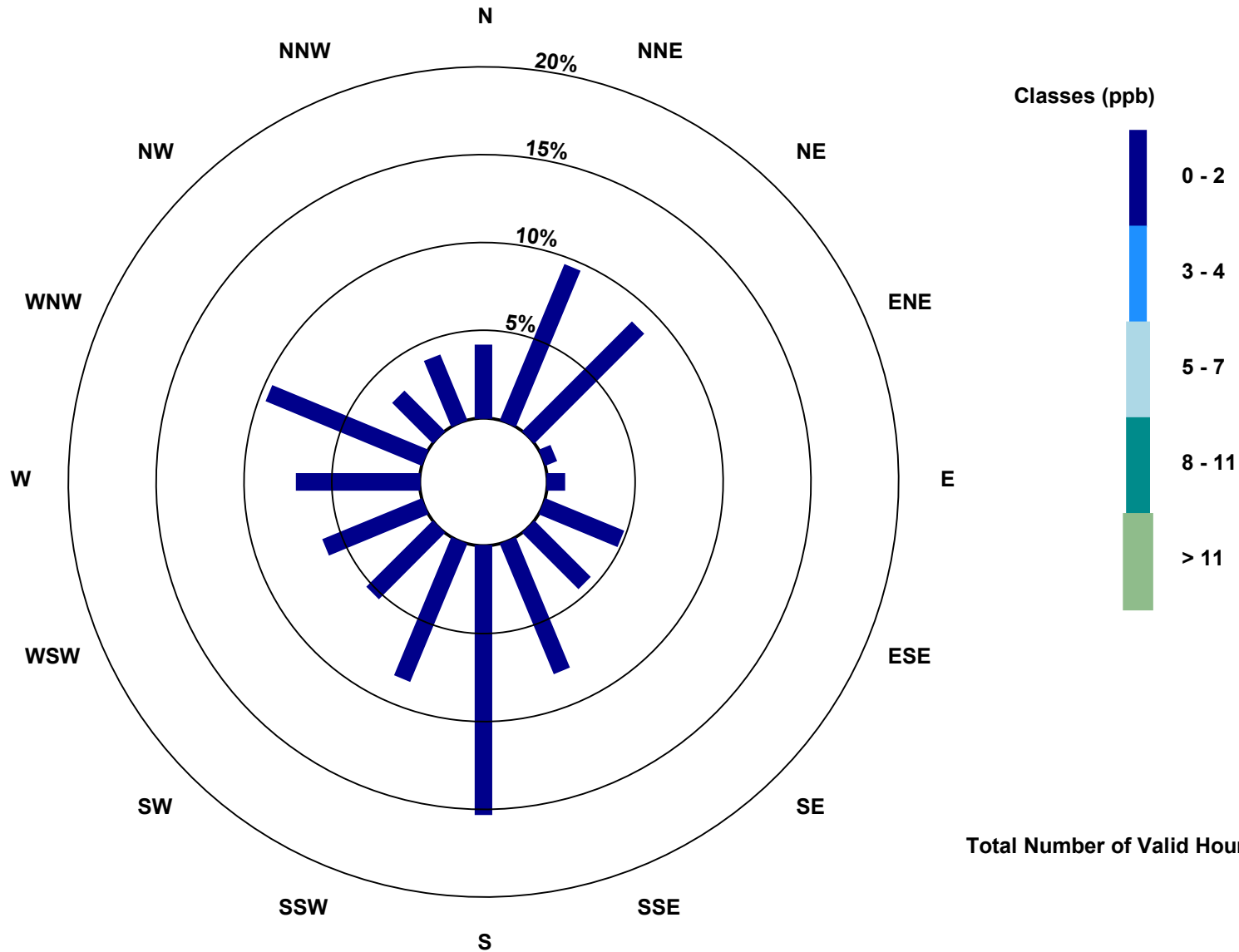
Total Number of Valid Hours: 628

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Mackay River

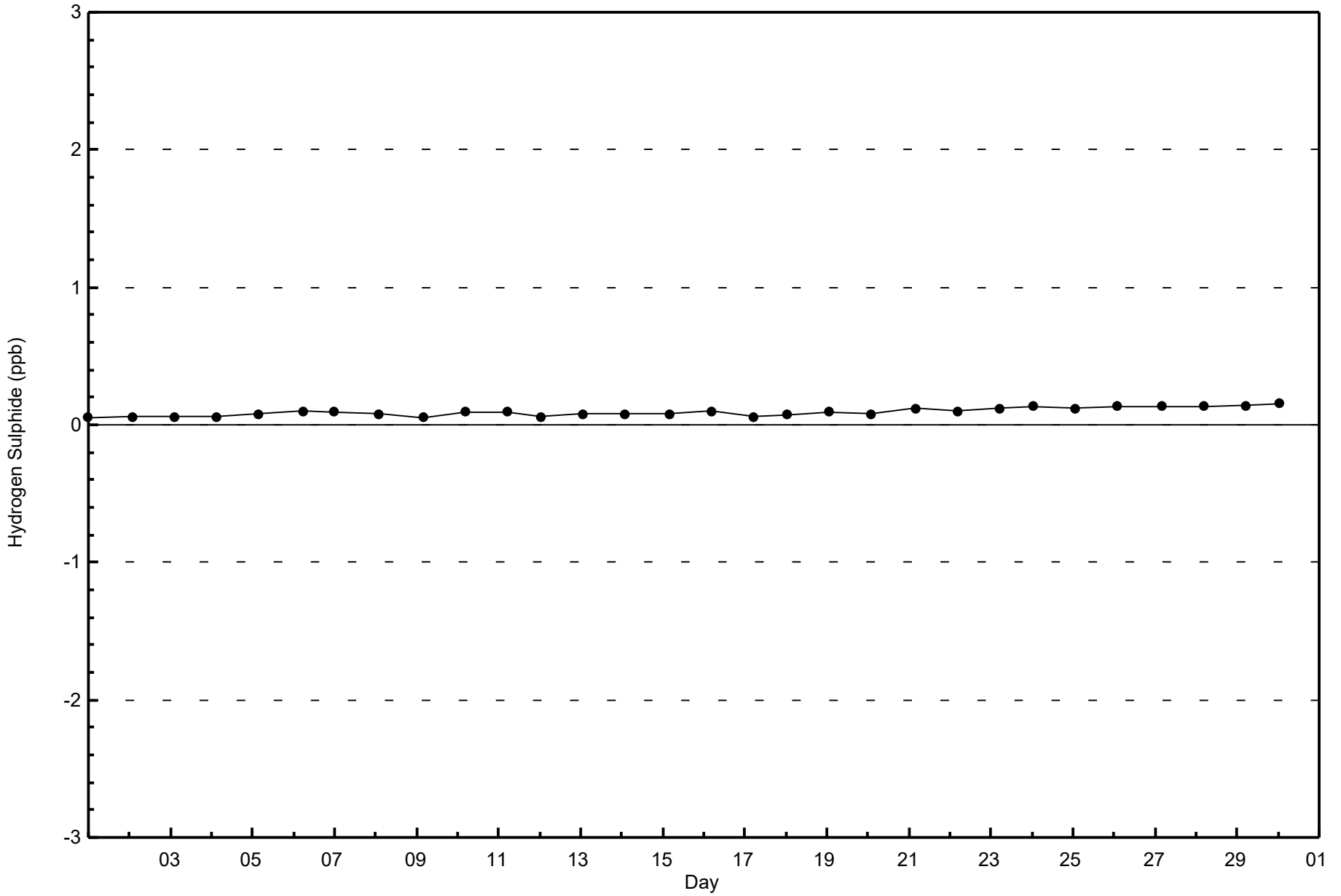


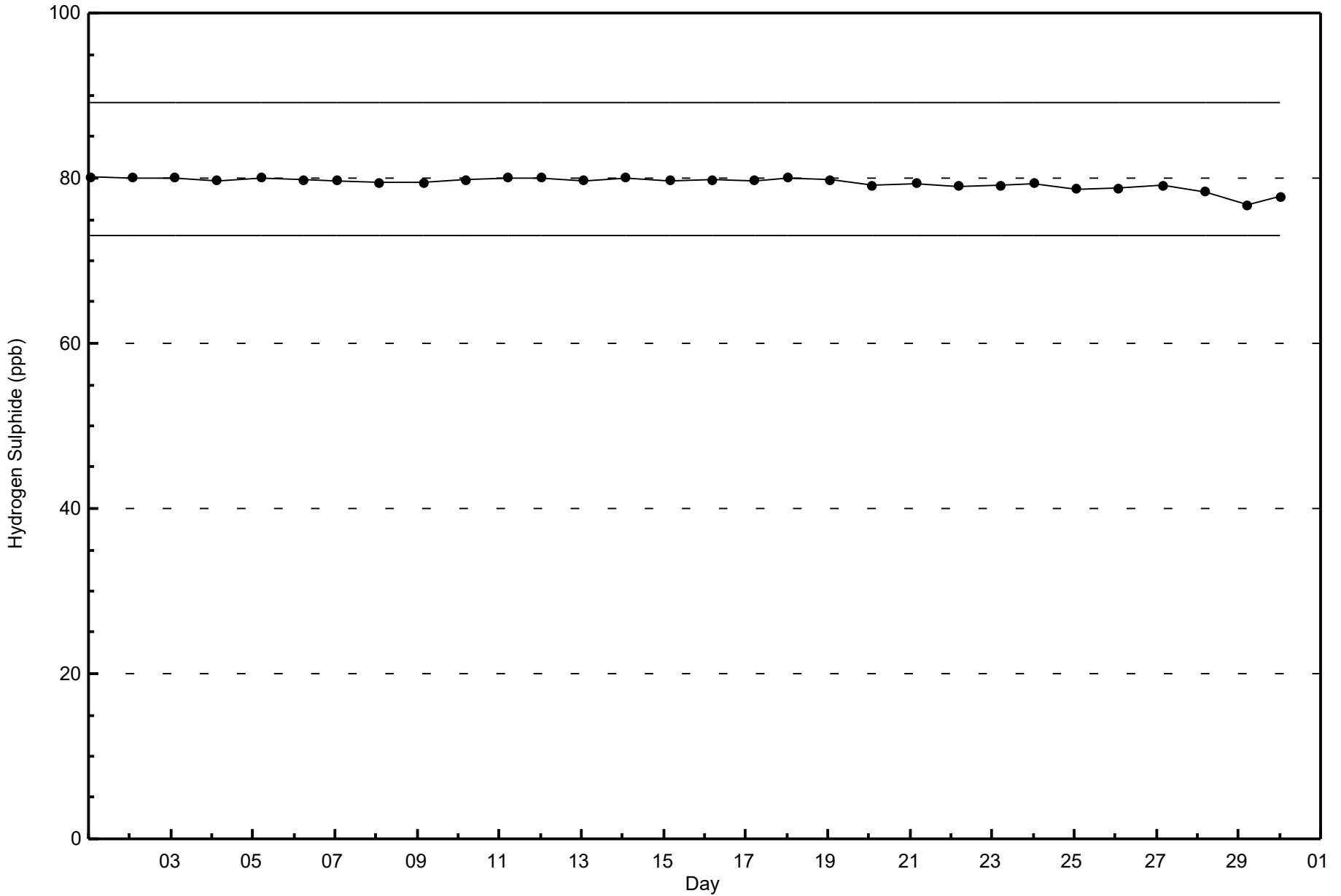
Total Number of Valid Hours: 628



Wood Buffalo Environmental Association  
Zero Responses

Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Mackay River - November 2024





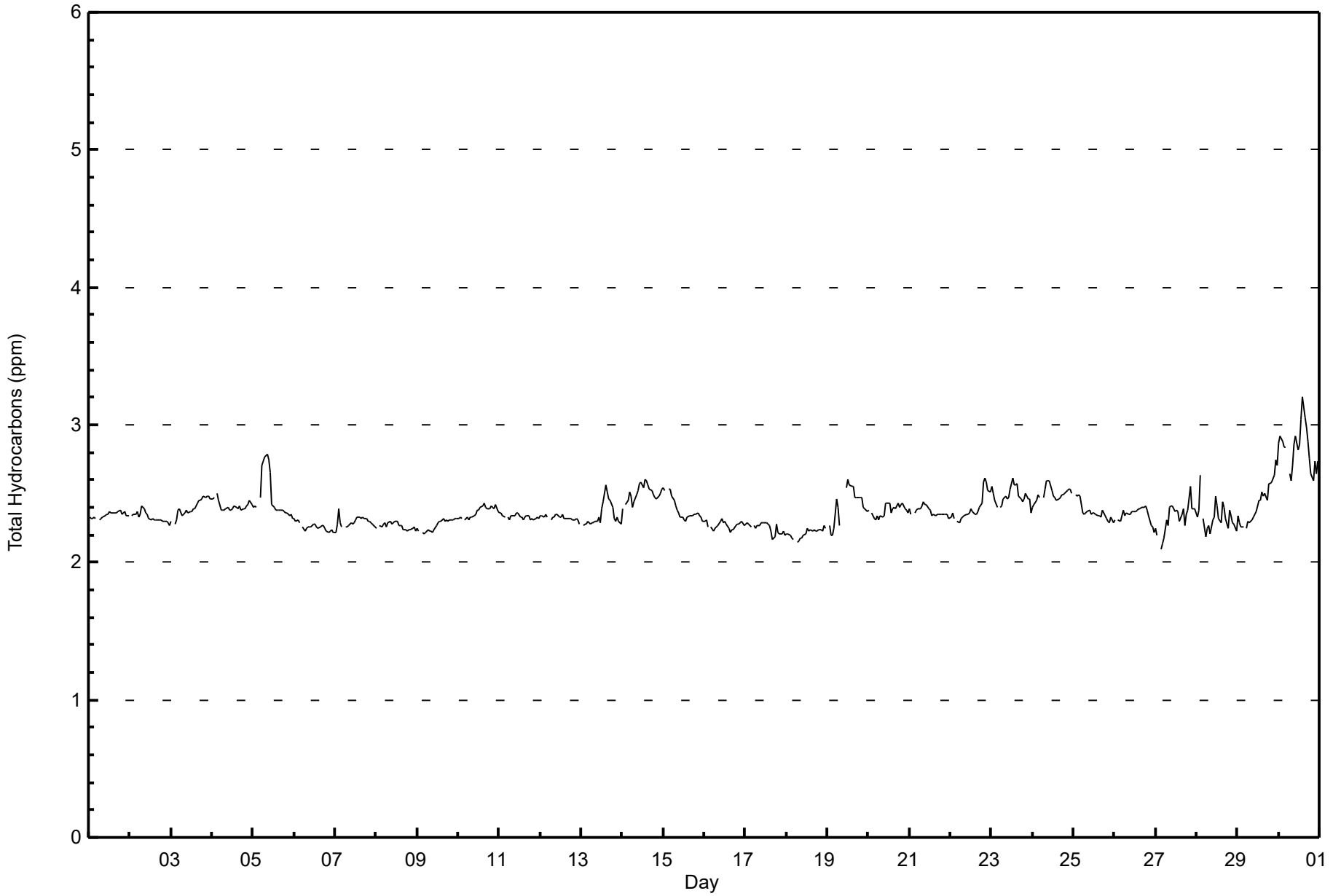






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Mackay River - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Mackay River - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	0	0.00	0.00
2.1 - 3.0	685	99.71	99.71
3.1 - 10.0	2	0.29	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 687

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Mackay River - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	25	57	55	5	6	30	29	51	93	52	35	39	45	60	21	26	629
3.1 - 10.0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	26	58	55	5	6	30	29	51	93	52	35	39	45	60	21	26	631

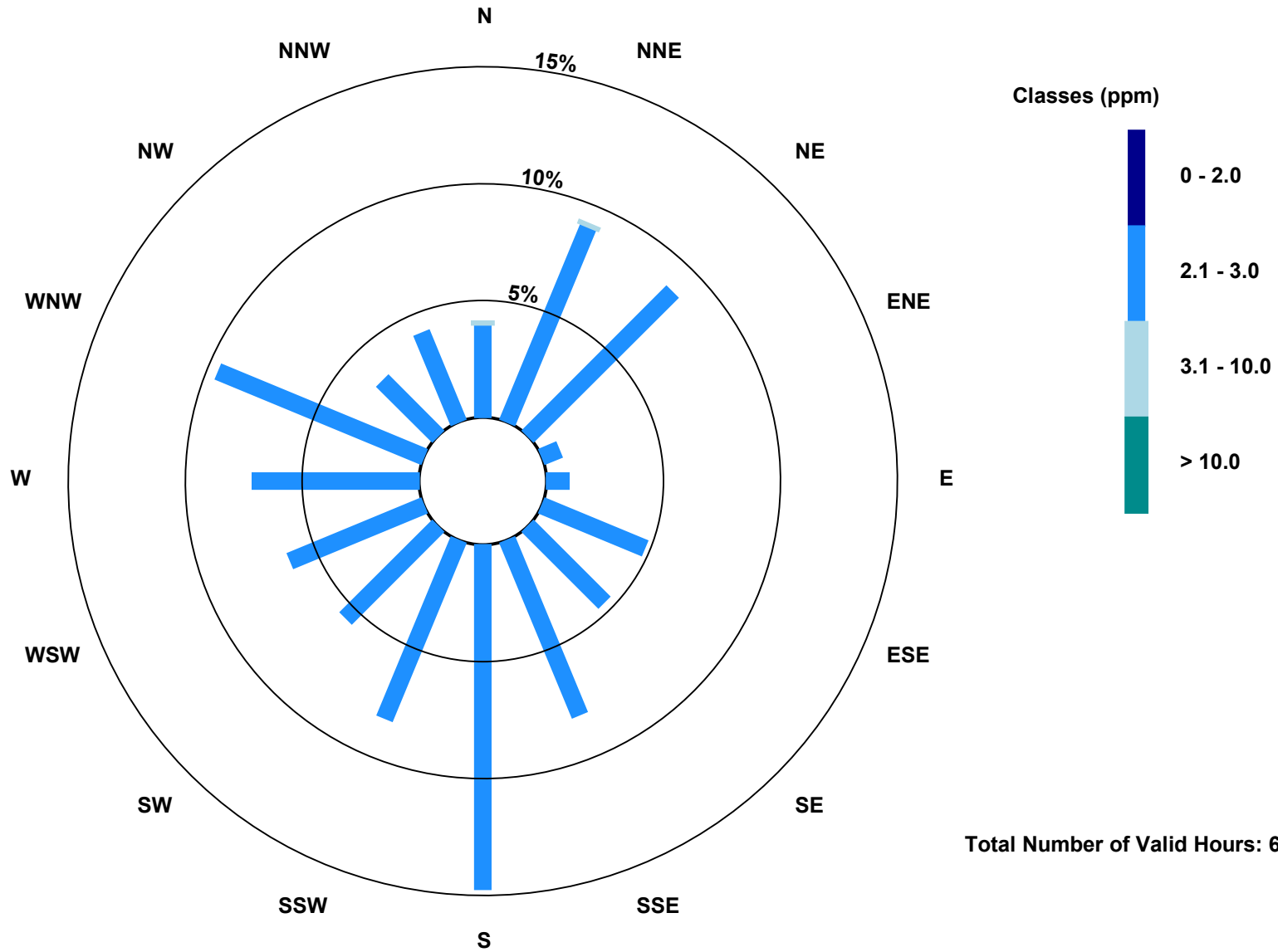
Total Number of Valid Hours: 631

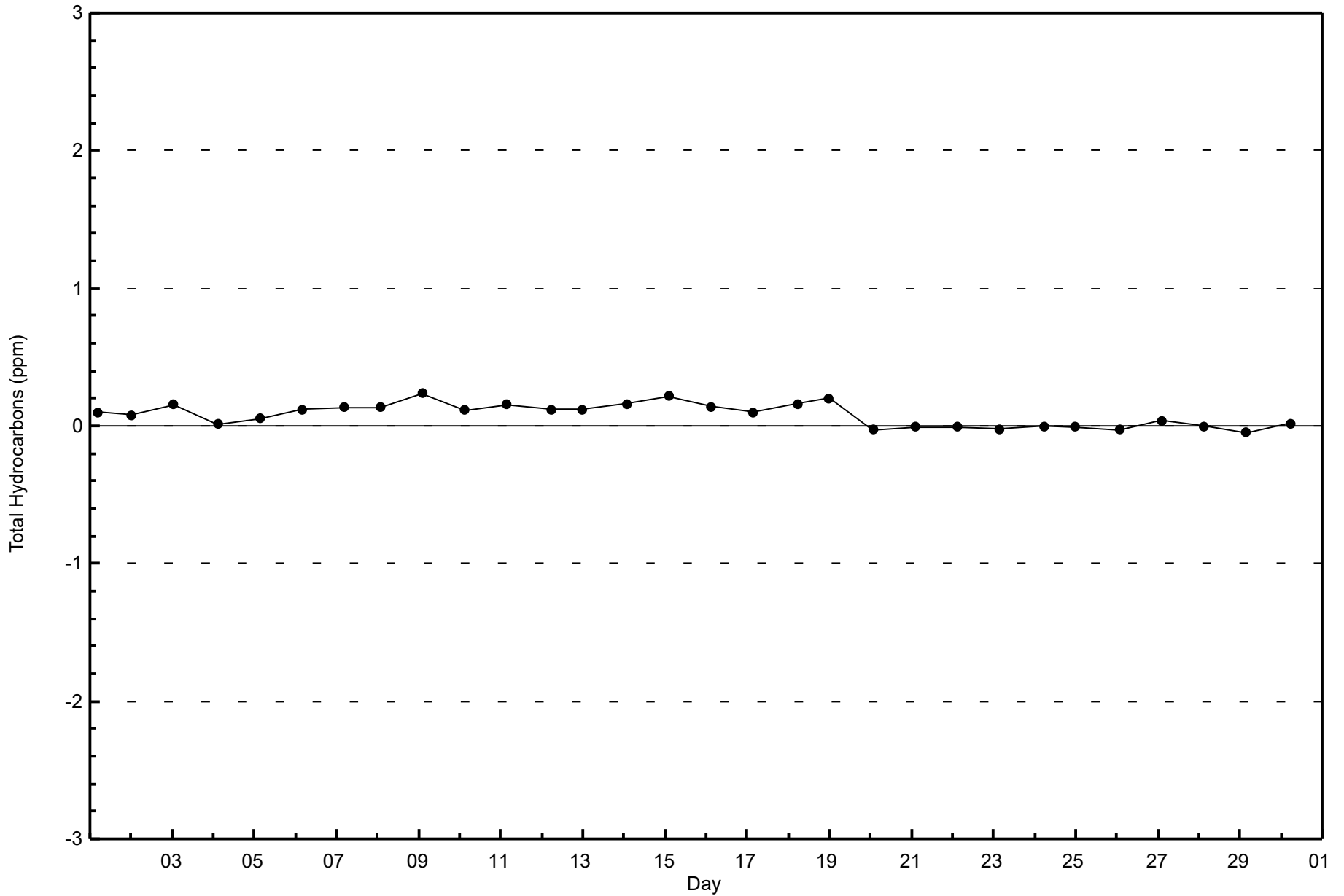
Total Number of Hours: 720

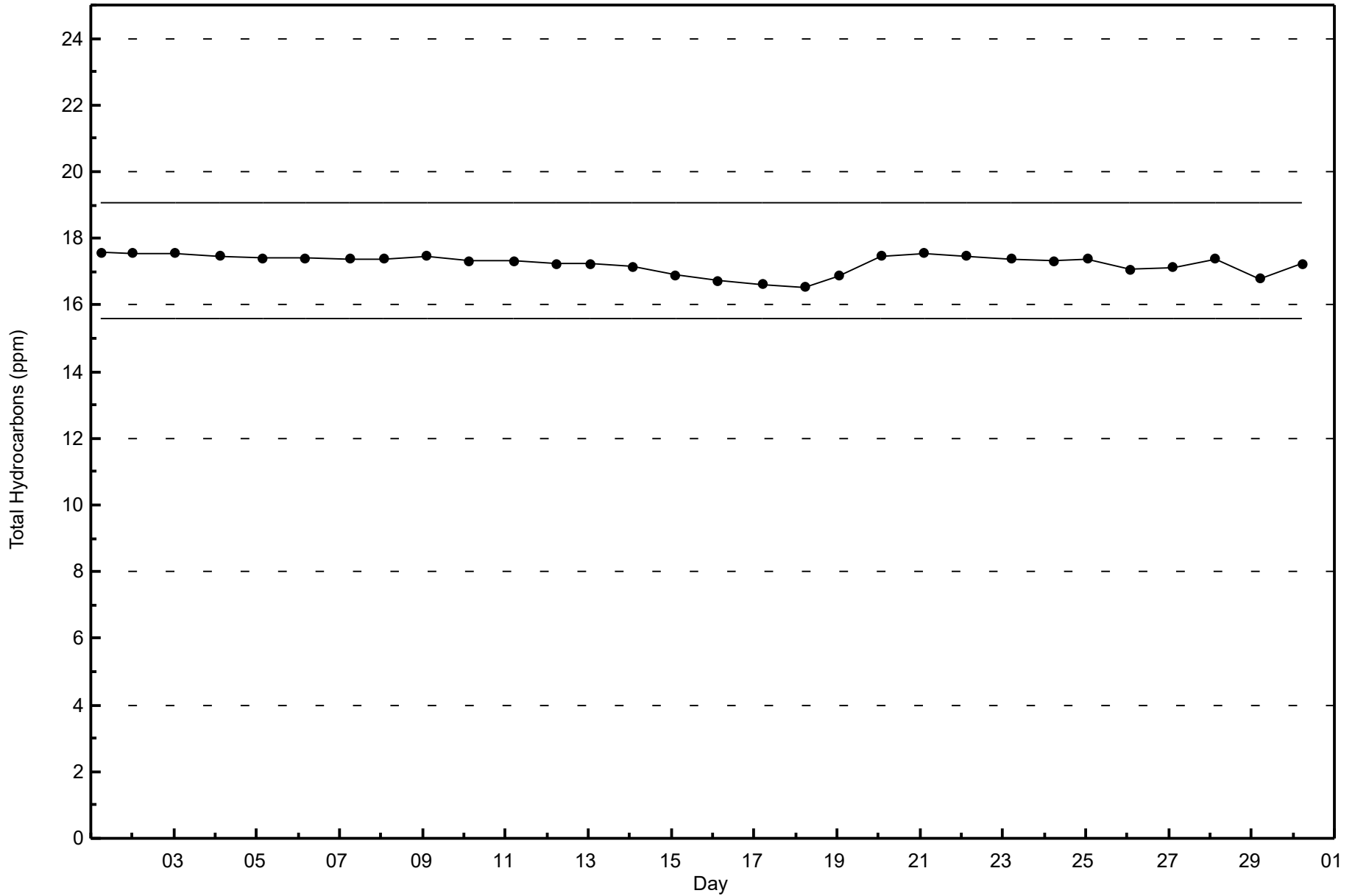


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Hydrocarbons (THC) - ppm  
Mackay River









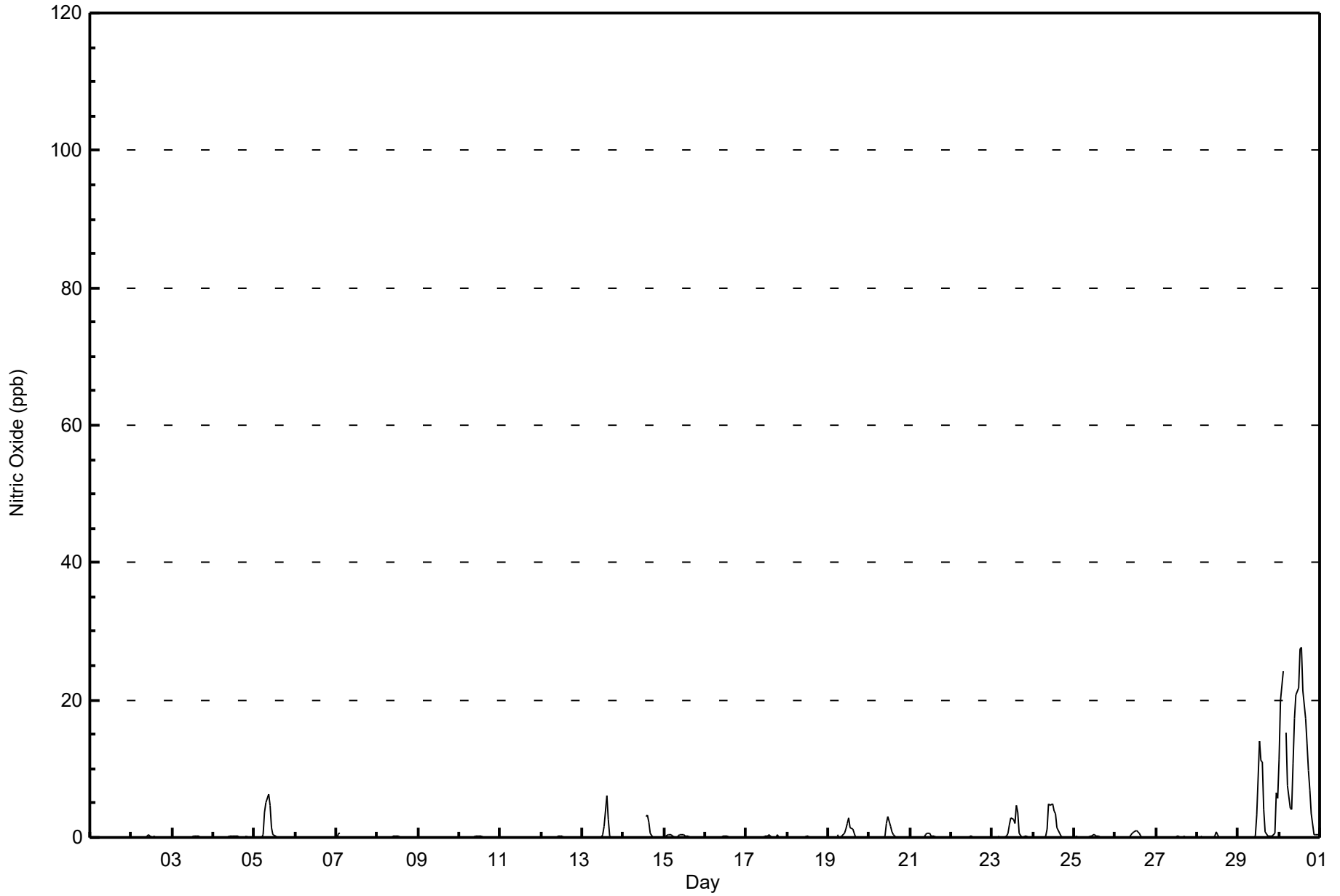
Maximum Value: 27.7 ppb on Nov 30 14:00																								Maximum Daily Average: 12.4 ppb on Nov 30																								Hours in Service: 720	
Minimum Value: 0.0 ppb on Nov 1 01:00																								Minimum Daily Average: 0.0 ppb on Nov 1																								Hours of Data: 685	
Maximum Diurnal Average: 2.0 ppb at hour 13																								Minimum Diurnal Average: 0.0 ppb at hour 21																								Hours of Missing Data: 35	
Monthly Average: 0.71 ppb																								Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.1 P <sub>90</sub> = 0.7 P <sub>99</sub> = 17.7																								Hours of Calibration: 35	
																																																Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
2-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.4	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4												
3-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3											
4-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2												
5-Nov	0.0	Z	0.1	0.0	0.1	0.4	3.7	5.2	6.4	4.6	1.4	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	6.4												
6-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1												
7-Nov	0.0	0.6	0.7	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7												
8-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2											
9-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0											
10-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2											
11-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1											
12-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2												
13-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.4	1.6	6.1	2.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	6.1													
14-Nov	0.0	0.0	0.0	0.1	0.1	Z	0.0	0.0	0.0	C	C	C	C	C	3.1	3.3	2.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	3.3														
15-Nov	Z	0.2	0.4	0.4	0.3	0.1	0.0	0.0	0.1	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4														
16-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3												
17-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.2	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4													
18-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2											
19-Nov	0.0	0.0	0.0	0.0	Z	0.3	0.1	0.0	0.2	0.6	1.1	2.1	2.8	1.5	1.3	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.8													
20-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.3	2.1	3.0	1.7	0.8	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.0													
21-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.7	0.5	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7												
22-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.3	0.3												
23-Nov	0.0	0.0	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.6	1.8	2.9	2.6	2.0	4.6	3.6	0.6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	4.6													
24-Nov	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	1.3	5.0	4.8	4.8	3.9	3.5	1.3	0.6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.1	5.0													
25-Nov	0.1	0.1	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4													
26-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.3	0.7	0.8	1.0	0.8	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0													
27-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.3	0.3													
28-Nov	0.0	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.8	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	0.8													
29-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	3.2	14.0	11.3	11.0	4.0	0.8	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7	6.6	5.8	2.5	14.0	14.0	14.0	14.0	14.0														
30-Nov	11.4	19.9	24.2	Z	15.3	7.4	4.3	4.2	10.7	17.2	20.7	21.7	27.5	27.7	21.4	17.2	13.7	9.7	6.8	3.5	0.5	0.5	0.4	0.4																									
	0.5	0.8	1.0	0.0	0.6	0.3	0.3	0.3	0.7	1.1	1.2	1.5	2.0	1.8	1.7	1.1	0.6	0.3	0.3	0.1	0.0	0.1	0.2	0.2												Diurnal Average													
	11.4	19.9	24.2	0.4	15.3	7.4	4.3	5.2	10.7	17.2	20.7	21.7	27.5	27.7	21.4	17.2	13.7	9.7	6.8	3.5	0.5	0.7	6.6	5.8												Diurnal Maximum													

Z - zerospan C - Calibration



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Mackay River - November 2024**







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Mackay River - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	679	99.12	99.12
21 - 40	6	0.88	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Mackay River - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	25	59	51	4	6	29	29	52	97	50	32	40	45	59	21	22	621
21 - 40	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	3	6
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	26	60	51	4	6	29	29	52	97	50	32	40	45	59	22	25	627

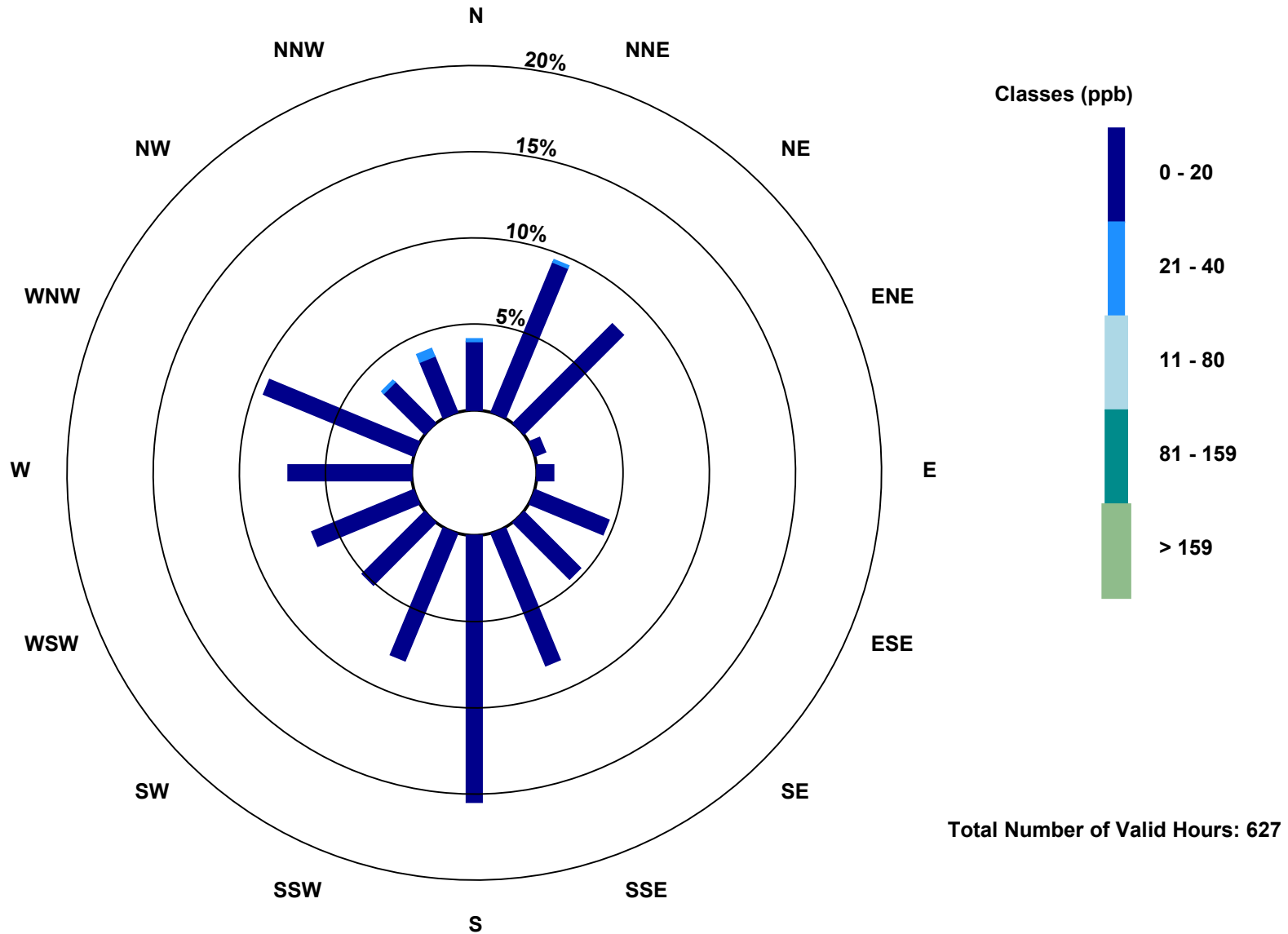
Total Number of Valid Hours: 627

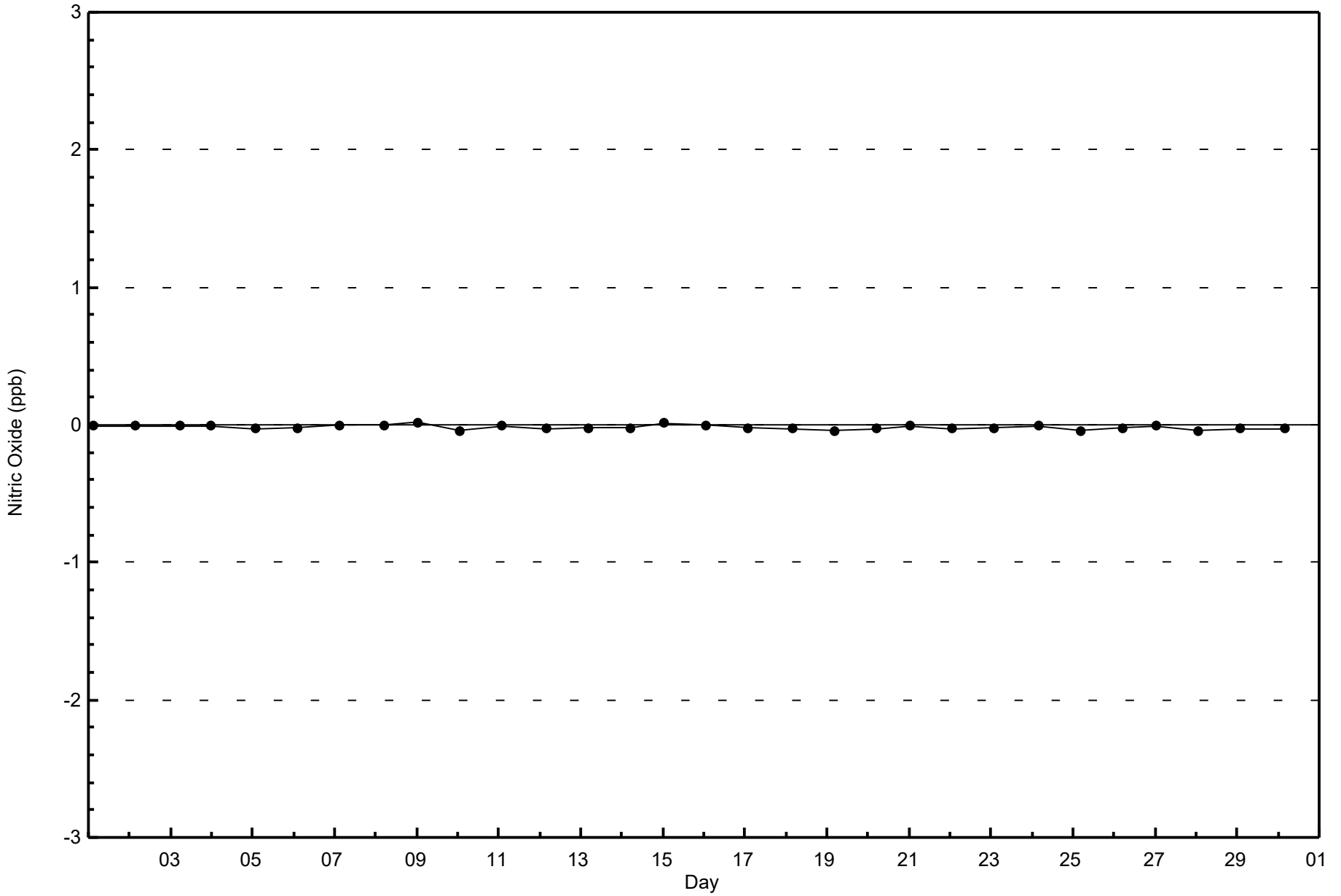
Total Number of Hours: 720

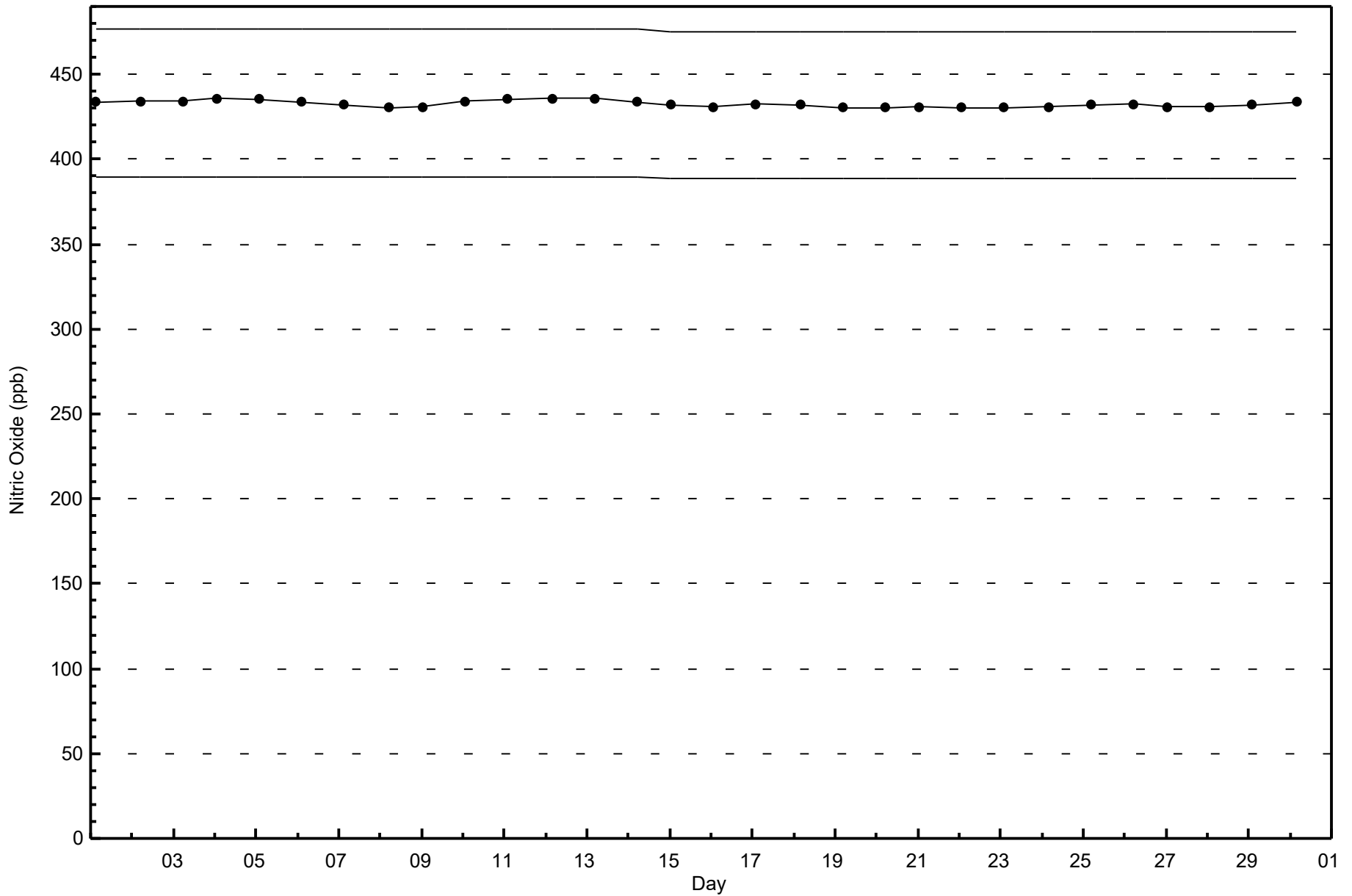


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitric Oxide (NO) - ppb  
Mackay River









# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Nitrogen Dioxide (NO<sub>2</sub>) - ppb Mackay River - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 29.7 ppb on Nov 30 01:00	Maximum Daily Average: 25.2 ppb on Nov 30		Hours of Data:	685
Minimum Value: 0.1 ppb on Nov 4 21:00	Minimum Daily Average: 0.3 ppb on Nov 9		Hours of Missing Data:	35
Maximum Diurnal Average: 4.8 ppb at hour 17	Minimum Diurnal Average: 2.6 ppb at hour 4		Hours of Calibration:	35
Monthly Average: 3.99 ppb	Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.3 Q <sub>1</sub> = 0.5 Median = 1.0 Q <sub>3</sub> = 4.1 P <sub>90</sub> = 12.8 P <sub>99</sub> = 27.4		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.8	0.8	0.7	Z	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.8	
2-Nov	0.5	0.5	0.5	0.4	Z	0.6	1.3	2.9	2.4	1.9	2.1	1.1	0.8	1.3	1.2	1.2	1.4	1.7	1.3	1.2	1.1	1.0	0.9	0.8	1.2	2.9	
3-Nov	0.8	0.8	0.8	1.0	3.0	Z	1.3	0.8	0.8	0.7	0.7	0.7	0.8	0.8	1.2	1.4	1.6	1.1	0.8	1.1	1.0	0.6	0.6	0.5	1.0	3.0	
4-Nov	Z	0.5	0.5	0.4	0.5	0.9	1.1	0.9	0.5	0.6	0.6	0.6	0.6	0.7	0.6	0.5	0.3	0.3	0.2	0.2	0.1	0.1	0.2	0.1	0.5	1.1	
5-Nov	0.2	Z	0.4	1.0	1.3	3.4	11.7	12.2	10.2	10.3	4.9	1.8	1.0	0.8	0.6	0.5	0.5	0.4	0.4	0.3	0.2	0.2	0.3	0.2	2.7	12.2	
6-Nov	0.3	0.3	Z	0.5	0.7	0.7	0.6	0.7	0.6	0.6	0.8	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.6	0.8	0.8	0.7	0.6	0.8	
7-Nov	0.6	2.5	3.2	Z	0.4	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.4	0.5	3.2	
8-Nov	0.4	0.6	1.0	1.3	1.3	Z	1.2	1.2	1.2	1.0	0.9	0.8	0.8	0.7	0.6	0.6	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.7	1.3	
9-Nov	Z	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.4	
10-Nov	0.4	Z	0.5	0.4	0.5	0.5	0.8	0.9	0.9	0.8	0.8	0.7	0.6	0.6	0.4	0.6	0.5	0.4	0.4	0.4	0.4	0.5	0.6	0.7	0.6	0.9	
11-Nov	0.9	1.3	Z	1.1	1.0	1.1	1.3	1.6	2.1	1.8	1.5	1.2	1.0	0.9	0.7	0.9	0.7	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1.1	2.1	
12-Nov	1.0	1.0	1.0	Z	1.0	1.0	1.1	1.3	1.2	0.9	1.6	1.0	0.9	0.7	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.7	1.6	
13-Nov	0.2	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.3	0.3	0.2	1.0	4.4	14.3	13.1	12.0	13.0	9.6	8.0	4.1	4.3	3.5	3.8	4.1	14.3	
14-Nov	6.7	8.7	9.2	14.6	14.0	Z	8.6	10.2	C	C	C	C	C	10.4	12.0	15.3	17.1	14.7	15.2	13.3	13.8	14.3	15.3	16.9	12.8	17.1	
15-Nov	Z	13.4	10.0	8.7	7.7	6.9	5.4	4.1	3.6	3.0	2.1	1.7	1.2	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	3.4	13.4	
16-Nov	1.0	Z	0.9	0.9	0.8	0.7	0.7	1.1	1.4	1.6	1.7	2.0	1.7	1.5	1.4	1.1	0.8	0.8	1.1	1.4	1.6	1.8	2.0	2.0	1.3	2.0	
17-Nov	2.0	1.8	Z	1.6	1.6	1.5	1.5	1.6	1.5	1.6	1.6	1.7	1.8	1.7	1.8	1.5	1.0	0.9	1.7	0.6	0.4	0.4	0.4	0.4	1.3	2.0	
18-Nov	0.3	0.3	0.3	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.6	0.4	0.3	0.2	0.2	0.2	0.2	0.8	0.5	0.5	0.4	0.3	0.4	0.3	0.8
19-Nov	0.5	1.1	0.6	0.5	Z	17.9	12.2	8.1	12.5	8.6	8.0	10.7	12.3	8.5	9.7	10.5	7.0	6.0	7.0	8.7	8.7	4.5	3.5	4.6	7.5	17.9	
20-Nov	4.9	3.3	2.0	1.2	0.7	Z	2.1	1.6	1.6	2.4	7.5	8.7	5.3	3.5	3.3	3.7	4.0	5.5	5.8	6.8	5.4	5.1	3.4	3.4	4.0	8.7	
21-Nov	Z	3.6	3.8	3.6	5.8	5.1	4.8	5.0	5.7	4.9	3.2	2.2	1.1	1.4	1.3	1.1	0.9	0.8	0.6	0.3	0.2	0.2	0.2	0.2	2.4	5.8	
22-Nov	0.3	Z	0.9	0.7	0.6	0.6	0.3	0.8	0.5	0.2	0.2	0.5	1.0	0.3	0.2	0.2	1.3	4.0	5.7	10.8	11.2	9.4	9.1	17.0	3.3	17.0	
23-Nov	14.9	13.8	Z	11.2	12.8	10.8	12.1	16.3	12.0	11.4	12.4	12.6	11.1	10.7	17.0	20.0	17.1	13.1	12.8	17.4	20.6	12.6	10.0	5.5	13.4	20.6	
24-Nov	7.2	9.4	10.9	Z	15.0	16.9	17.3	20.7	22.6	19.8	14.4	11.8	10.0	10.7	7.6	8.7	10.7	9.8	8.9	8.7	8.1	8.1	8.2	8.2	11.9	22.6	
25-Nov	8.4	8.5	7.3	6.1	Z	3.1	2.2	2.0	2.0	1.6	1.3	1.2	1.1	1.1	1.1	1.4	2.6	3.7	2.8	1.9	1.7	1.5	1.9	2.0	2.9	8.5	
26-Nov	1.9	2.0	2.3	2.8	3.7	Z	4.4	4.6	4.6	4.3	4.0	4.0	3.7	4.0	4.3	4.7	5.4	5.7	5.1	4.1	2.5	1.0	0.9	0.8	3.5	5.7	
27-Nov	Z	0.9	0.8	0.6	0.4	0.4	0.3	0.4	0.3	0.7	0.3	0.4	0.9	0.7	0.5	0.9	2.4	0.3	0.3	0.3	1.5	0.3	1.1	1.4	0.7	2.4	
28-Nov	0.4	Z	2.6	0.9	1.8	0.6	0.3	0.2	0.2	0.2	0.5	2.1	1.1	0.4	0.3	0.8	0.7	0.4	0.4	0.5	0.4	0.6	2.3	2.9	0.9	2.9	
29-Nov	3.1	2.8	Z	2.2	1.6	1.2	1.0	0.8	0.7	0.5	0.6	4.4	15.2	17.5	21.5	20.7	23.5	22.0	17.8	18.3	19.6	25.0	29.4	29.2	12.1	29.4	
30-Nov	29.7	29.6	28.8	Z	27.0	26.4	26.1	25.5	25.8	24.2	22.6	21.7	22.7	23.8	24.0	25.8	27.4	27.4	27.6	27.2	23.2	24.3	21.4	17.9	25.2	29.7	

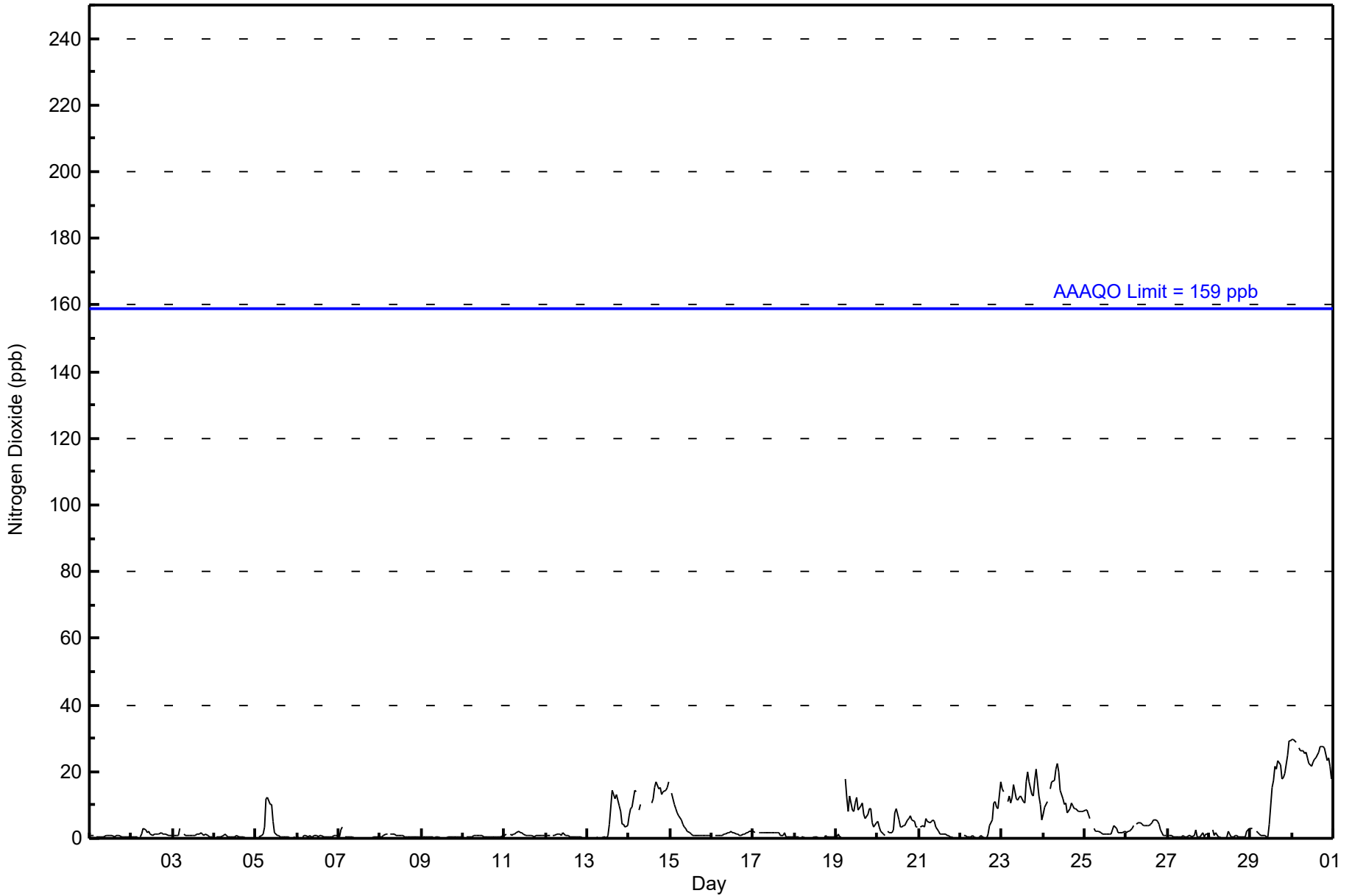
3.5	4.3	3.6	2.6	4.0	4.1	4.0	4.2	4.0	3.6	3.3	3.3	3.4	3.7	4.3	4.6	4.8	4.5	4.3	4.5	4.3	4.0	4.0	4.1	Diurnal Average	
29.7	29.6	28.8	14.6	27.0	26.4	26.1	25.5	25.8	24.2	22.6	21.7	22.7	23.8	24.0	25.8	27.4	27.4	27.6	27.2	23.2	25.0	29.4	29.2	Diurnal Maximum	

Z - zerospan      C - Calibration  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Mackay River - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Mackay River - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	653	95.33	95.33
21 - 40	32	4.67	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Mackay River - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	23	47	46	3	6	29	29	52	97	50	32	40	45	58	19	19	595
21 - 40	3	13	5	1	0	0	0	0	0	0	0	0	0	1	3	6	32
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	26	60	51	4	6	29	29	52	97	50	32	40	45	59	22	25	627

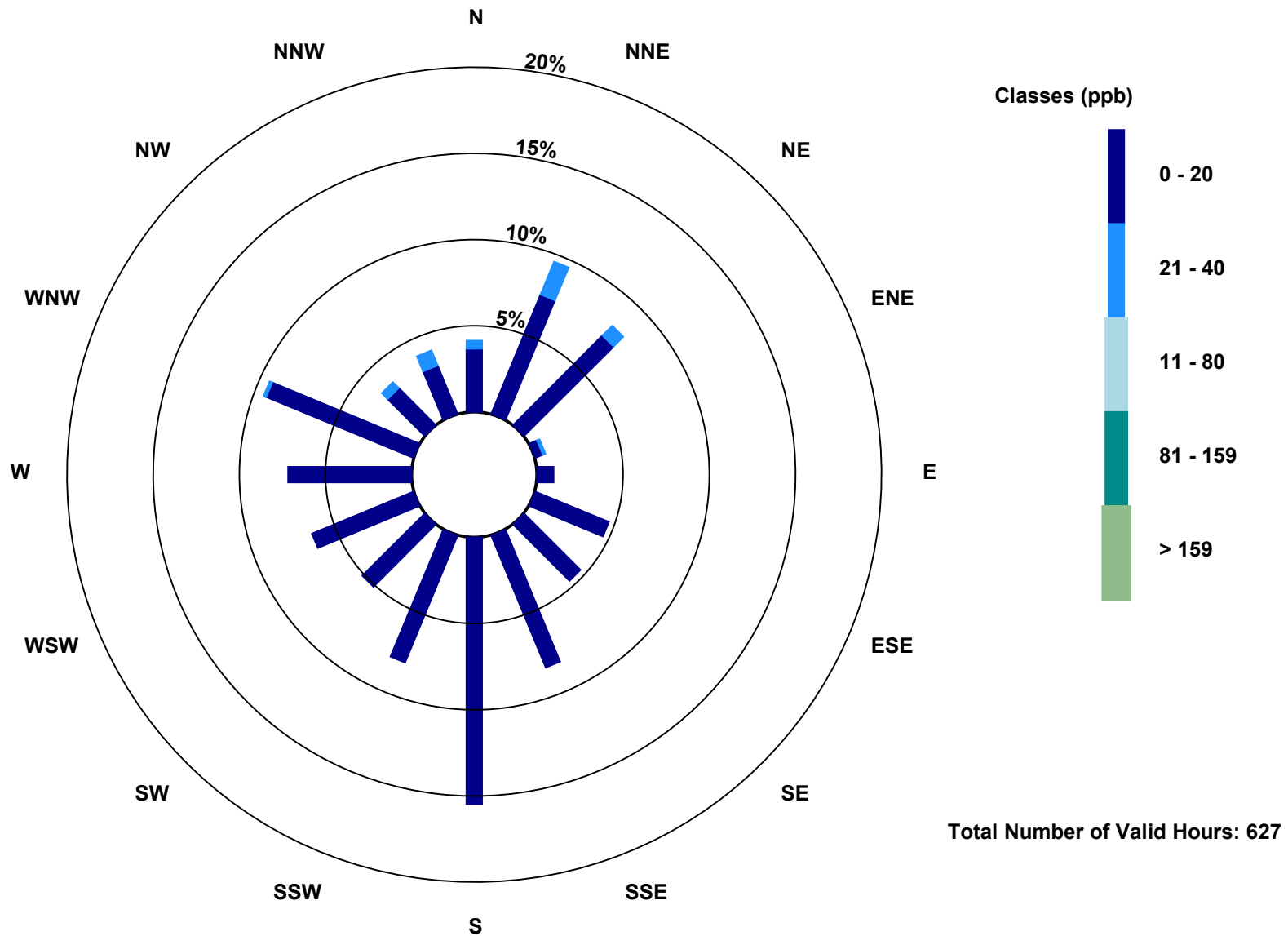
Total Number of Valid Hours: 627

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

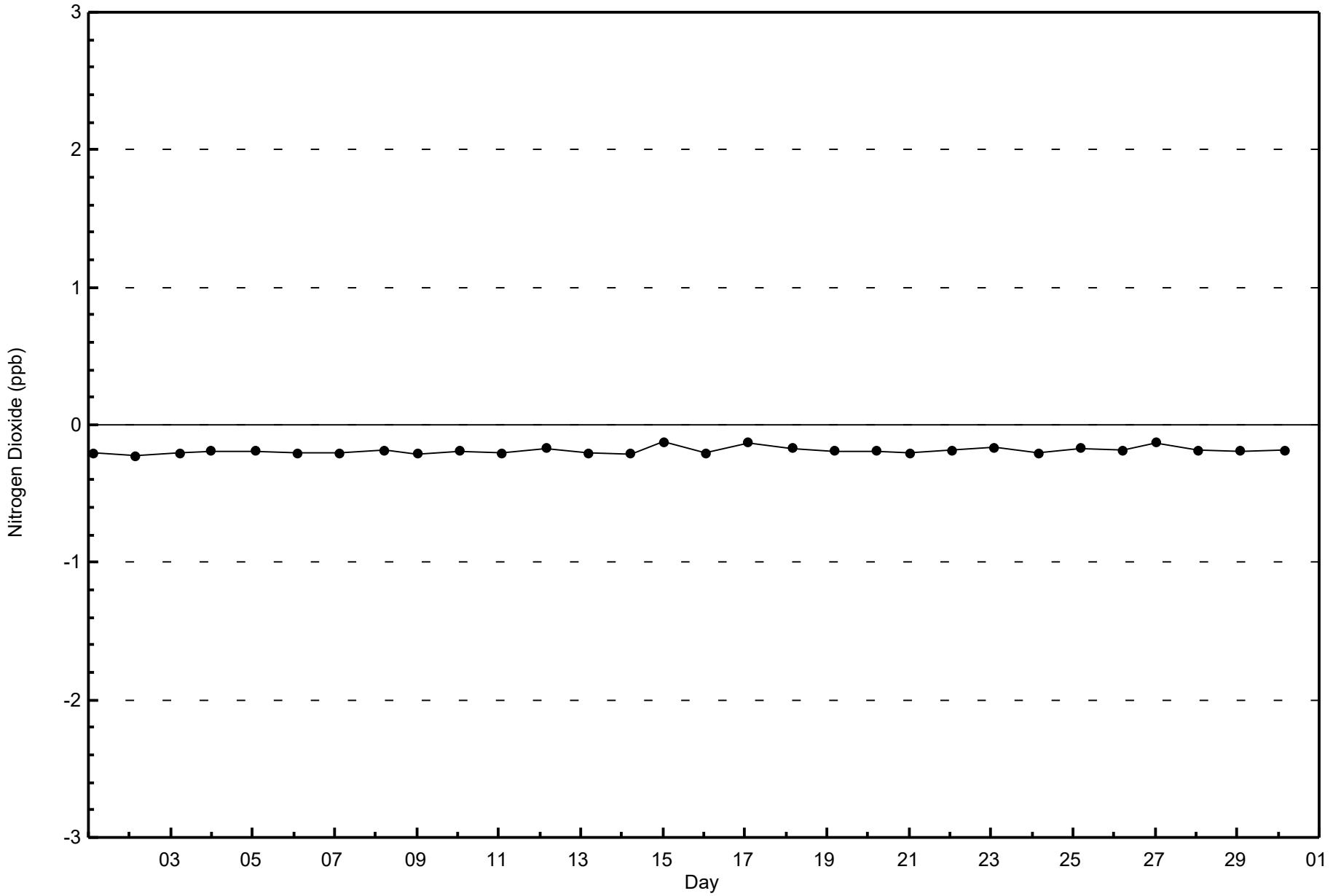
Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Mackay River

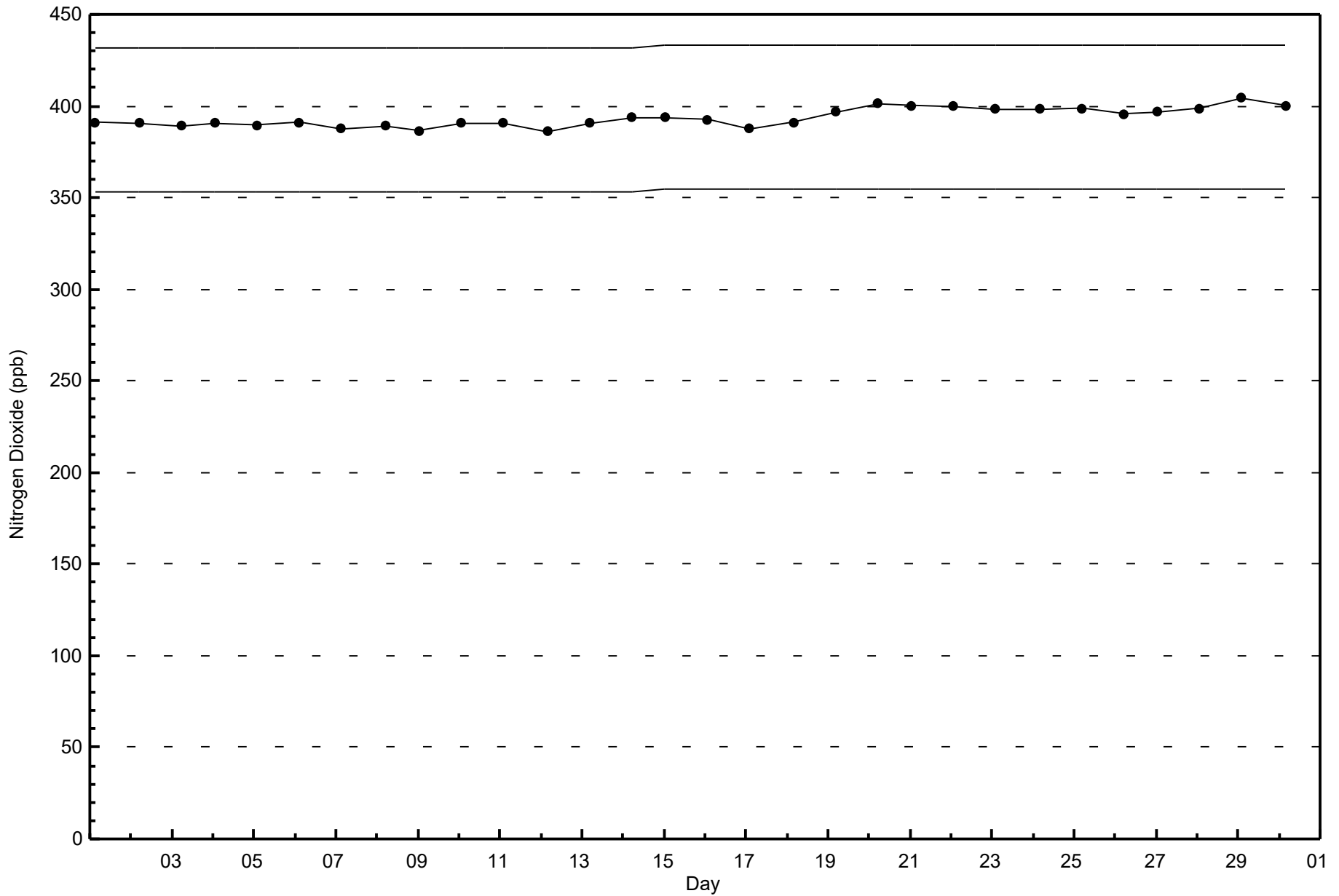




Wood Buffalo Environmental Association  
Zero Responses

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Mackay River - November 2024







**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

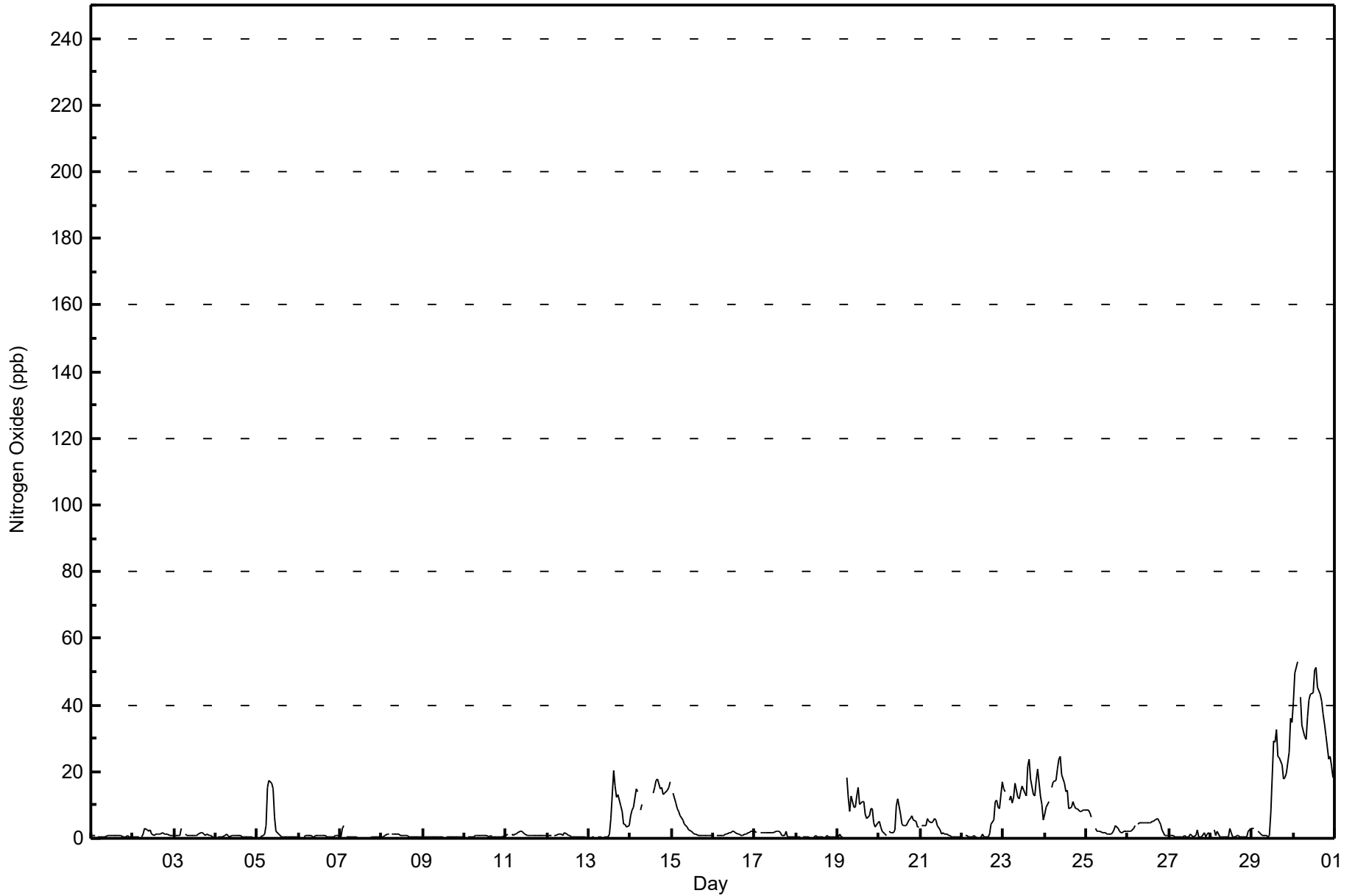
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Mackay River - November 2024**

Maximum Value: 53.0 ppb on Nov 30 03:00      Maximum Daily Average: 37.7 ppb on Nov 30																					Hours in Service: 720 Hours of Data: 685						
Minimum Value: 0.2 ppb on Nov 22 10:00      Minimum Daily Average: 0.3 ppb on Nov 9 Maximum Diurnal Average: 6.0 ppb at hour 15      Minimum Diurnal Average: 2.6 ppb at hour 4 Monthly Average: 4.69 ppb      Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.3 Q <sub>1</sub> = 0.5 Median = 1.0 Q <sub>3</sub> = 4.6 P <sub>90</sub> = 14.2 P <sub>99</sub> = 43.1																					Hours of Missing Data: 35 Hours of Calibration: 35 Percent Operational Time: 100.0						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.8	0.8	0.7	Z	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.8	
2-Nov	0.5	0.5	0.5	0.4	Z	0.6	1.3	2.9	2.5	2.1	2.5	1.2	0.9	1.4	1.3	1.2	1.4	1.7	1.3	1.2	1.1	1.0	0.9	0.8	1.3	2.9	
3-Nov	0.8	0.8	0.8	1.0	3.0	Z	1.3	0.8	0.8	0.8	0.8	0.8	0.9	1.0	1.4	1.7	1.7	1.1	0.8	1.1	1.0	0.6	0.6	0.5	1.1	3.0	
4-Nov	Z	0.5	0.5	0.4	0.5	0.9	1.1	0.9	0.6	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.6	1.1	
5-Nov	0.2	Z	0.5	1.0	1.4	3.8	15.4	17.4	16.6	14.9	6.3	2.2	1.1	0.9	0.6	0.5	0.5	0.4	0.4	0.3	0.2	0.2	0.3	0.2	3.7	17.4	
6-Nov	0.3	0.3	Z	0.5	0.7	0.7	0.6	0.7	0.6	0.6	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.6	0.8	0.8	0.7	0.6	0.8	
7-Nov	0.6	3.1	3.9	Z	0.4	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.4	0.6	3.9	
8-Nov	0.4	0.6	1.0	1.3	1.3	Z	1.2	1.2	1.2	1.1	1.1	0.9	0.9	0.8	0.7	0.6	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.8	1.3	
9-Nov	Z	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.4
10-Nov	0.4	Z	0.5	0.4	0.5	0.5	0.8	0.9	0.9	1.0	1.0	0.9	0.8	0.7	0.5	0.7	0.5	0.4	0.4	0.4	0.4	0.5	0.6	0.7	0.6	1.0	
11-Nov	0.9	1.3	Z	1.1	1.0	1.1	1.3	1.6	2.1	1.9	1.6	1.2	1.0	0.9	0.7	0.9	0.7	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1.1	2.1	
12-Nov	1.0	1.0	1.0	Z	1.0	1.0	1.1	1.4	1.3	1.0	1.8	1.2	1.0	0.8	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.8	1.8	
13-Nov	0.2	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.3	0.4	0.3	1.4	6.0	20.4	15.7	12.3	13.0	9.6	8.0	4.1	4.3	3.5	3.8	4.6	20.4	
14-Nov	6.7	8.7	9.2	14.7	14.1	Z	8.6	10.2	C	C	C	C	C	13.5	15.3	17.5	17.8	14.7	15.2	13.3	13.8	14.3	15.4	17.0	13.3	17.8	
15-Nov	Z	13.6	10.4	9.1	8.0	7.0	5.4	4.1	3.7	3.3	2.4	2.0	1.5	1.2	1.1	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	3.5	13.6	
16-Nov	1.0	Z	0.9	0.9	0.8	0.7	0.7	1.1	1.4	1.7	1.8	2.2	2.0	1.8	1.5	1.1	0.8	0.8	1.1	1.4	1.6	1.8	2.0	2.0	1.4	2.2	
17-Nov	2.0	1.8	Z	1.6	1.6	1.5	1.5	1.6	1.5	1.6	1.7	1.9	2.1	2.1	2.0	1.6	1.0	0.9	2.0	0.6	0.4	0.4	0.4	0.4	1.4	2.1	
18-Nov	0.3	0.3	0.3	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.8	0.5	0.4	0.2	0.2	0.2	0.2	0.8	0.5	0.5	0.4	0.3	0.4	0.3	0.8
19-Nov	0.5	1.1	0.6	0.5	Z	18.2	12.3	8.1	12.7	9.2	9.1	12.8	15.1	10.0	11.0	11.1	7.1	6.0	7.0	8.7	8.7	4.5	3.5	4.6	7.9	18.2	
20-Nov	4.9	3.3	2.0	1.2	0.7	Z	2.1	1.6	1.6	2.7	9.6	11.7	7.0	4.3	3.7	4.0	4.0	5.5	5.8	6.8	5.4	5.1	3.4	3.4	4.3	11.7	
21-Nov	Z	3.6	3.8	3.6	5.8	5.1	4.8	5.0	5.8	5.3	3.9	2.7	1.3	1.7	1.4	1.1	0.9	0.8	0.6	0.3	0.2	0.2	0.2	0.2	2.5	5.8	
22-Nov	0.3	Z	0.9	0.7	0.6	0.6	0.3	0.8	0.5	0.2	0.2	0.6	1.3	0.4	0.2	0.2	1.3	4.0	5.7	10.9	11.3	9.4	9.1	17.1	3.3	17.1	
23-Nov	14.9	13.8	Z	11.3	12.9	10.8	12.2	16.4	12.1	12.0	14.2	15.5	13.7	12.7	21.6	23.6	17.7	13.2	12.9	17.5	20.7	12.7	10.0	5.5	14.3	23.6	
24-Nov	7.2	9.4	10.9	Z	15.1	17.0	17.4	20.8	23.9	24.8	19.2	16.6	13.9	14.2	8.9	9.3	10.8	9.9	9.0	8.8	8.2	8.2	8.3	8.3	13.1	24.8	
25-Nov	8.5	8.6	7.4	6.2	Z	3.1	2.2	2.0	2.0	1.7	1.6	1.6	1.4	1.4	1.3	1.5	2.6	3.7	2.8	1.9	1.7	1.5	1.9	2.0	3.0	8.6	
26-Nov	1.9	2.0	2.3	2.8	3.7	Z	4.4	4.6	4.7	4.6	4.7	4.8	4.7	4.8	4.9	5.0	5.4	5.7	5.1	4.1	2.5	1.0	0.9	0.8	3.7	5.7	
27-Nov	Z	0.9	0.8	0.6	0.4	0.4	0.3	0.4	0.3	0.7	0.3	0.4	1.2	0.9	0.5	1.0	2.6	0.3	0.3	0.3	1.6	0.3	1.2	1.5	0.7	2.6	
28-Nov	0.4	Z	2.7	0.9	1.9	0.6	0.3	0.2	0.2	0.2	0.6	2.9	1.5	0.4	0.3	0.9	0.7	0.4	0.4	0.5	0.4	0.6	2.3	2.9	1.0	2.9	
29-Nov	3.1	2.8	Z	2.2	1.6	1.2	1.0	0.8	0.7	0.6	0.9	7.6	29.2	28.8	32.5	24.7	24.3	22.2	17.9	18.4	19.7	25.7	36.0	35.0	14.7	36.0	
30-Nov	41.1	49.5	53.0	Z	42.3	33.8	30.4	29.7	36.5	41.4	43.3	43.4	50.2	51.5	45.4	43.0	41.1	37.1	34.4	30.7	23.7	24.8	21.8	18.3	37.7	53.0	
																								Diurnal Average			
																								Diurnal Maximum			
4.0 5.2 4.6 2.6 4.6 4.4 4.3 4.6 4.7 4.7 4.6 4.8 5.4 5.5 6.0 5.7 5.3 4.9 4.6 4.7 4.4 4.1 4.2 4.3      Diurnal Average 41.1 49.5 53.0 14.7 42.3 33.8 30.4 29.7 36.5 41.4 43.3 43.4 50.2 51.5 45.4 43.0 41.1 37.1 34.4 30.7 23.7 25.7 36.0 35.0      Diurnal Maximum																											
Z - zerospan      C - Calibration																											



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Mackay River - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Mackay River - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	648	94.60	94.60
21 - 40	25	3.65	98.25
41 - 80	12	1.75	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Mackay River - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	22	46	44	2	6	29	29	52	97	50	32	40	45	58	19	19	590
21 - 40	1	11	5	2	0	0	0	0	0	0	0	0	0	1	2	3	25
11 - 80	3	3	2	0	0	0	0	0	0	0	0	0	0	0	1	3	12
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	26	60	51	4	6	29	29	52	97	50	32	40	45	59	22	25	627

Total Number of Valid Hours: 627

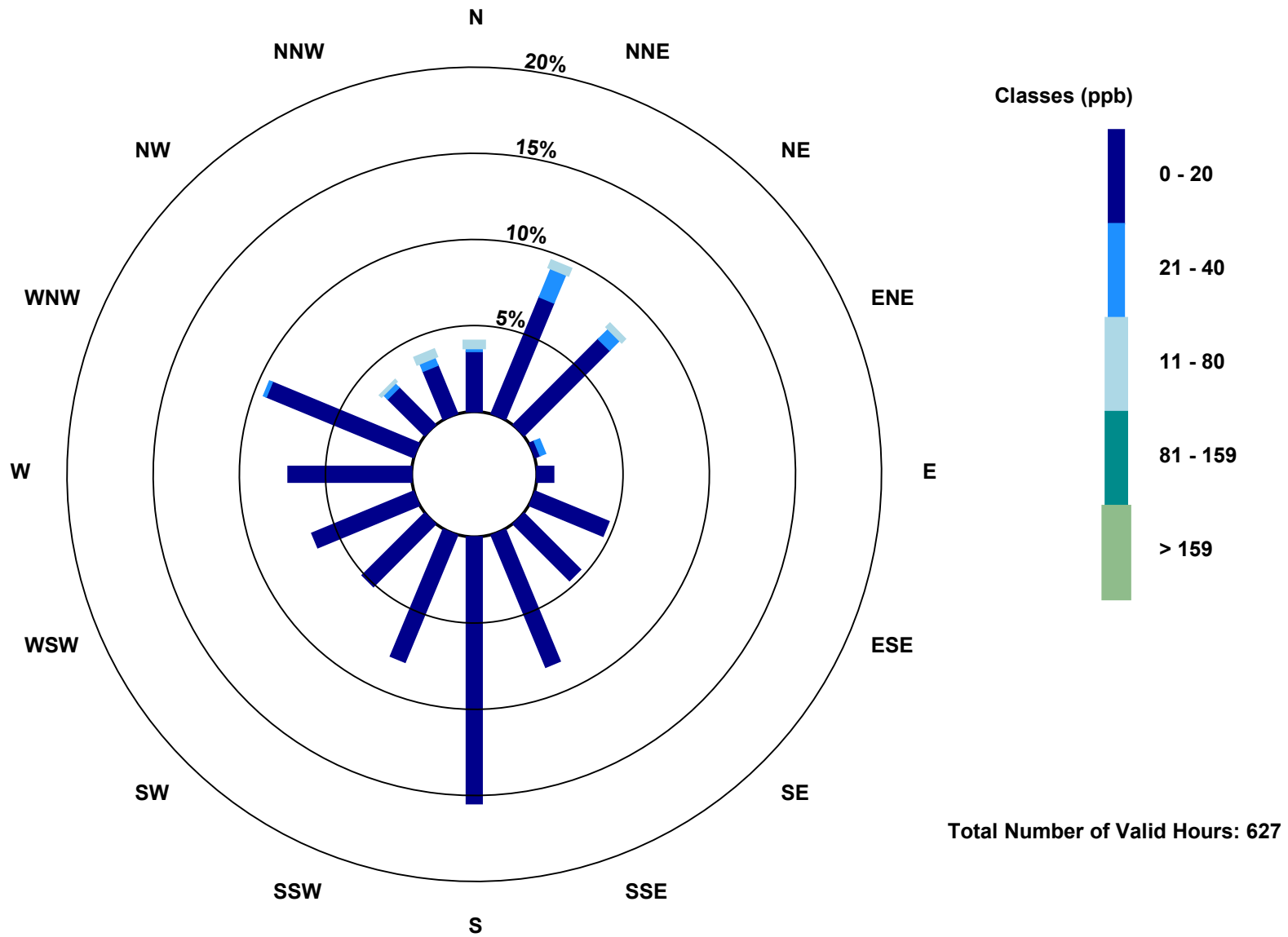
Total Number of Hours: 720

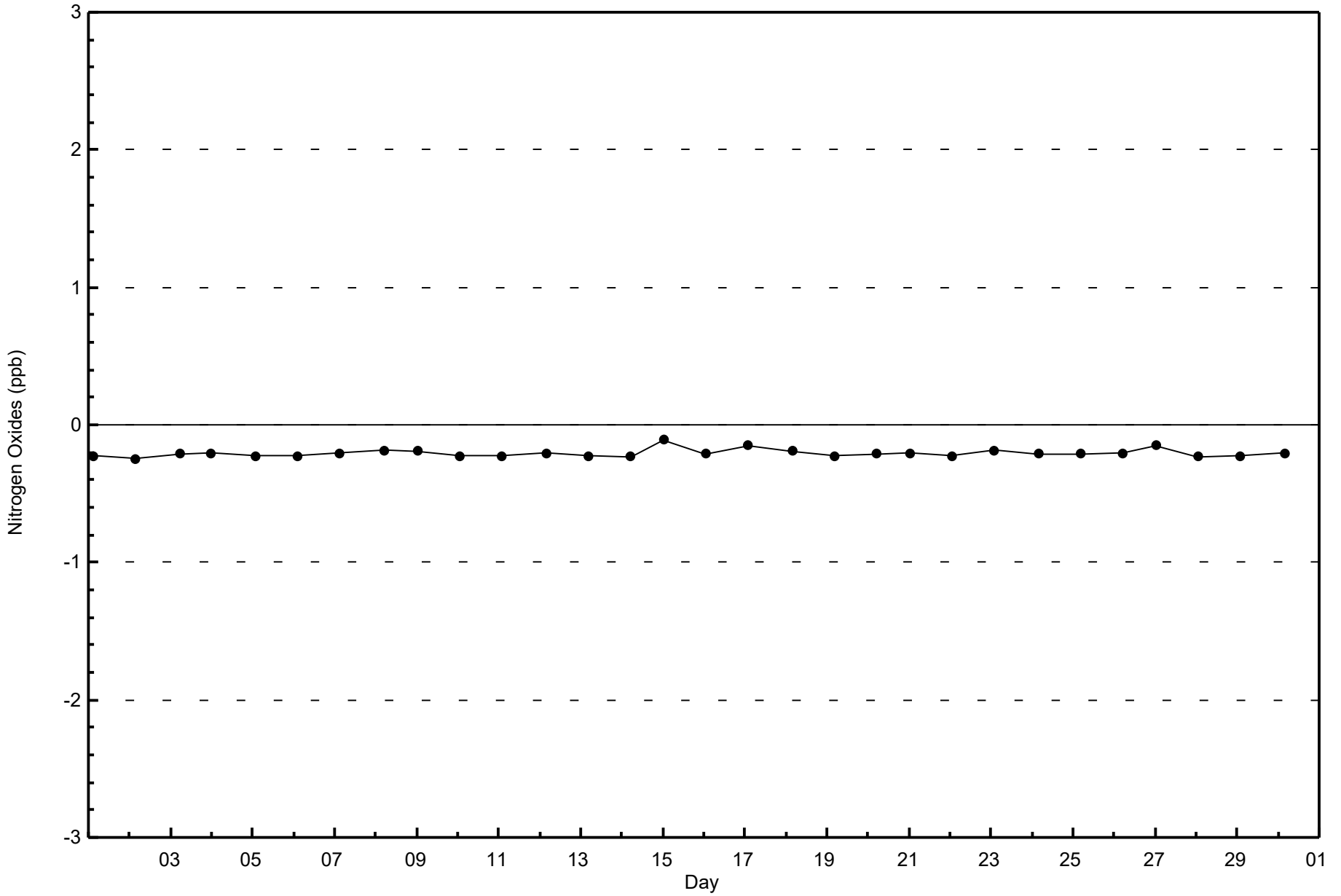


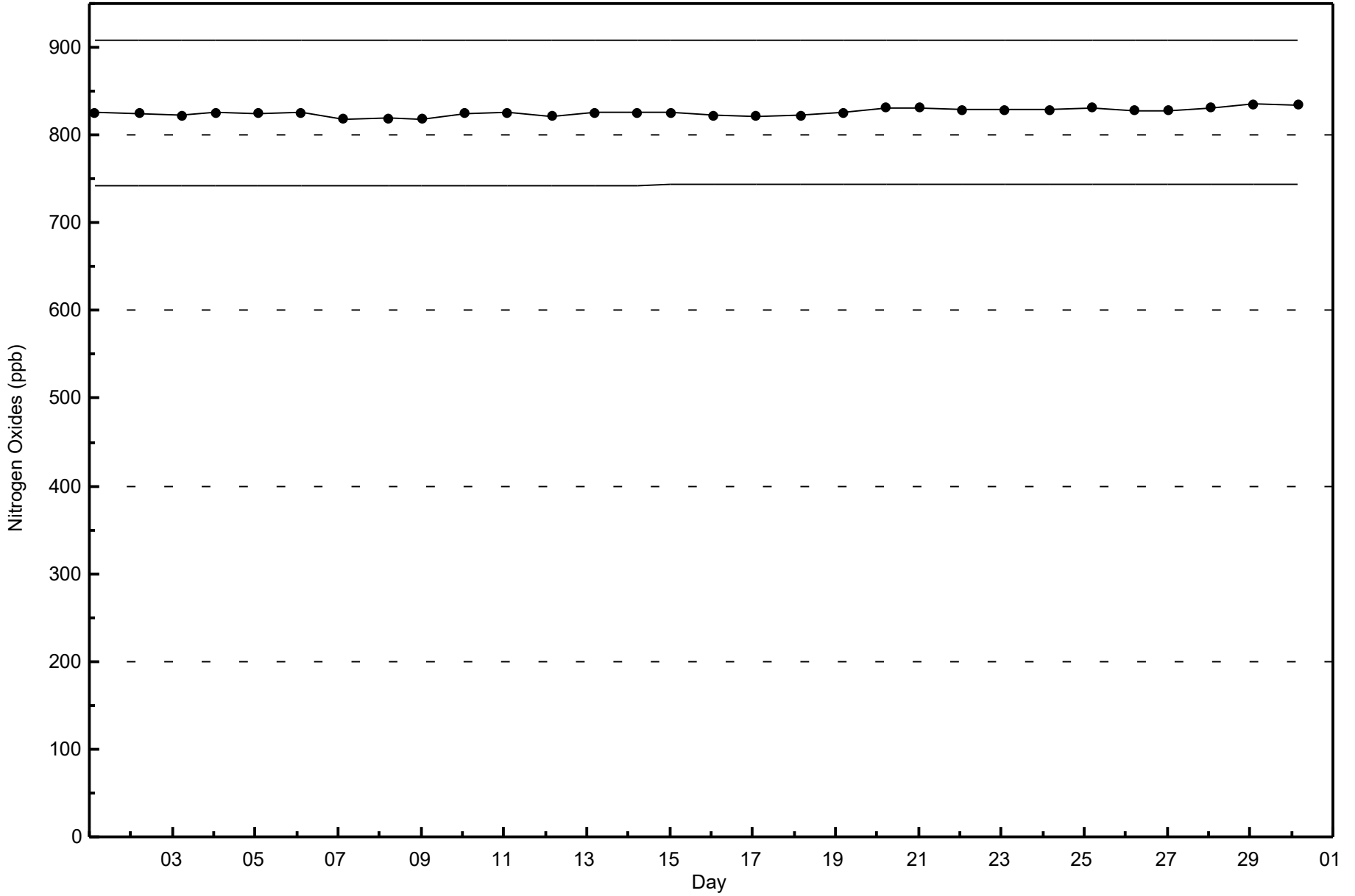


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Mackay River









**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

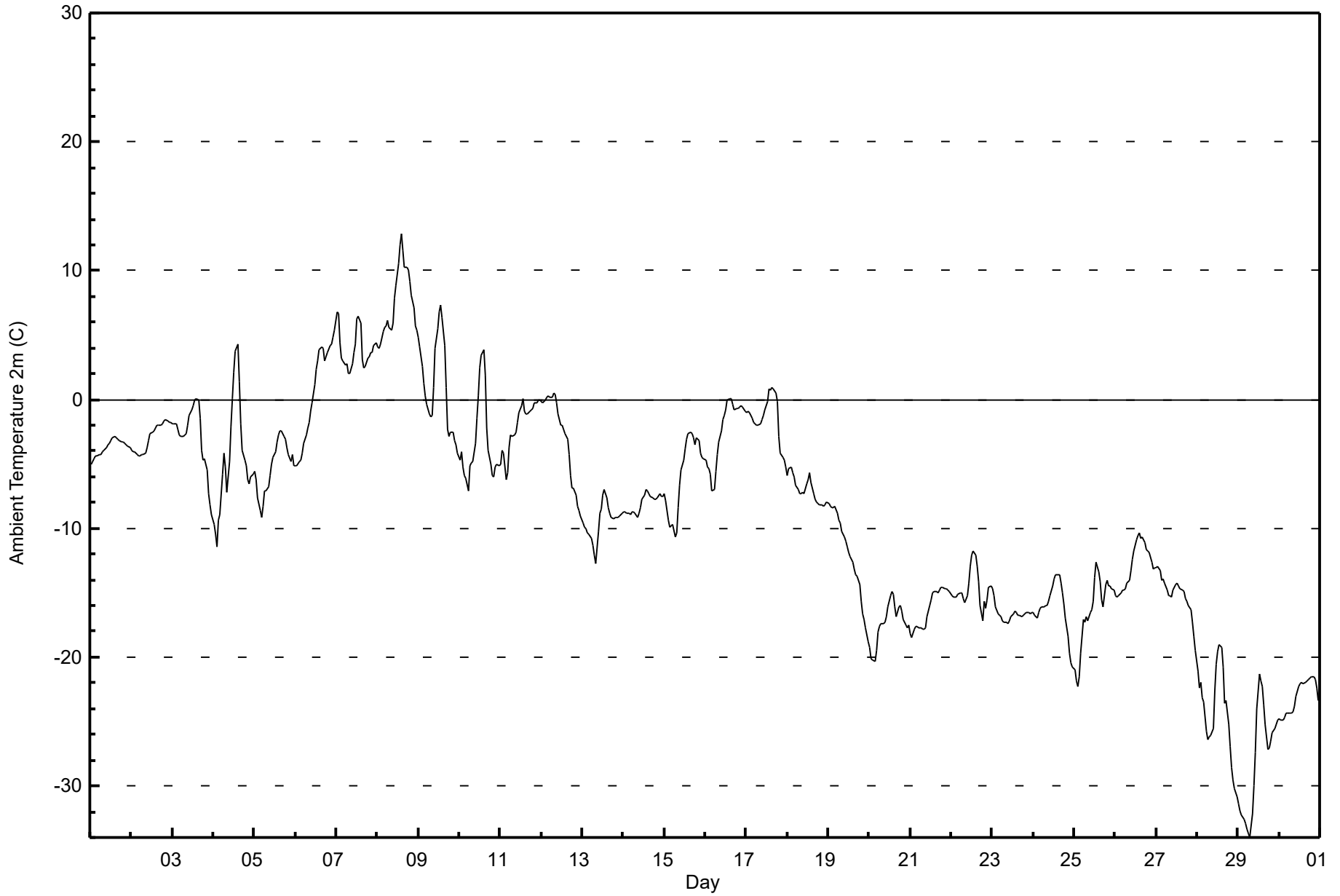
**Ambient Temperature 2m (AT2) - C**  
**Mackay River - November 2024**

Maximum Value: 12.9 C on Nov 8 15:00		Maximum Daily Average: 7.6 C on Nov 8		Hours in Service: 720																																												
Minimum Value: -34.0 C on Nov 29 08:00		Minimum Daily Average: -28.0 C on Nov 29		Hours of Data: 720																																												
Maximum Diurnal Average: -6.0 C at hour 14		Minimum Diurnal Average: -10.1 C at hour 4		Hours of Missing Data: 0																																												
Monthly Average: -8.74 C		Percentiles: P <sub>1</sub> = -31.8 P <sub>10</sub> = -20.7 Q <sub>1</sub> = -15.3 Median = -7.4 Q <sub>3</sub> = -2.4 P <sub>90</sub> = 2.1 P <sub>99</sub> = 9.2		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-5.0	-4.9	-4.7	-4.4	-4.4	-4.3	-4.2	-4.1	-4.0	-3.7	-3.6	-3.4	-3.2	-3.0	-2.9	-3.0	-3.1	-3.2	-3.3	-3.3	-3.4	-3.5	-3.6	-3.8	-3.7	-2.9																						
2-Nov	-3.9	-4.0	-4.1	-4.3	-4.4	-4.3	-4.3	-4.3	-4.1	-3.8	-3.2	-2.7	-2.6	-2.4	-2.2	-2.0	-2.0	-2.0	-1.9	-1.7	-1.6	-1.7	-1.7	-1.8	-3.0	-1.6																						
3-Nov	-1.9	-1.9	-1.9	-2.3	-2.7	-2.9	-2.8	-2.8	-2.6	-2.0	-1.2	-0.8	-0.4	0.0	0.1	0.0	-1.5	-3.9	-4.7	-4.6	-5.4	-7.3	-8.2	-8.9	-3.0	0.1																						
4-Nov	-9.7	-10.5	-11.4	-9.3	-9.0	-5.8	-4.2	-5.3	-7.2	-4.8	-2.1	0.1	2.1	3.8	4.3	1.4	-1.9	-3.9	-4.7	-5.1	-6.2	-6.5	-6.0	-5.8	-4.5	4.3																						
5-Nov	-5.6	-6.3	-7.6	-8.6	-9.1	-8.3	-7.1	-7.1	-6.8	-5.9	-5.1	-4.5	-4.0	-3.3	-2.8	-2.5	-2.5	-2.9	-3.0	-3.7	-4.3	-4.9	-4.3	-5.2	-5.2	-2.5																						
6-Nov	-5.1	-5.1	-4.9	-4.7	-4.1	-3.4	-2.8	-2.2	-1.7	-0.9	-0.2	1.1	2.3	3.0	3.8	4.1	4.0	3.0	3.3	3.6	4.2	4.3	4.8	5.4	0.5	5.4																						
7-Nov	6.8	6.6	4.4	3.2	3.0	2.6	2.7	2.0	2.0	2.8	3.7	4.3	6.2	6.5	6.0	3.1	2.4	2.6	3.2	3.3	3.6	3.6	4.1	4.3	3.9	6.8																						
8-Nov	4.1	4.0	4.3	5.2	5.6	5.7	6.1	5.6	5.4	5.9	7.9	8.9	10.6	12.0	12.9	11.5	10.2	10.2	10.1	9.2	8.1	7.2	5.7	5.4	7.6	12.9																						
9-Nov	4.8	4.0	2.5	1.3	0.3	-0.3	-1.1	-1.3	-1.2	1.0	4.0	5.5	6.8	7.3	6.4	4.2	0.9	-2.3	-2.9	-2.6	-2.5	-3.2	-3.5	-4.2	1.0	7.3																						
10-Nov	-4.7	-4.1	-5.3	-5.9	-6.1	-7.1	-5.2	-4.9	-4.8	-3.4	-1.4	0.3	2.4	3.4	3.9	1.9	-2.2	-4.0	-5.0	-5.9	-6.0	-5.3	-5.1	-5.1	-3.3	3.9																						
11-Nov	-5.1	-3.9	-4.2	-6.2	-5.6	-3.7	-2.7	-2.9	-2.8	-2.5	-1.8	-1.1	-0.5	0.1	-0.9	-1.1	-1.1	-1.0	-0.8	-0.7	-0.3	-0.2	-0.1	0.0	-2.1	0.1																						
12-Nov	-0.2	-0.3	-0.1	0.1	0.3	0.1	0.2	0.5	0.4	-0.3	-1.1	-2.0	-2.0	-2.4	-2.6	-3.1	-4.2	-5.9	-6.8	-6.9	-7.4	-8.3	-8.7	-9.1	-2.9	0.5																						
13-Nov	-9.6	-9.9	-10.0	-10.4	-10.5	-10.8	-11.4	-12.1	-12.8	-10.3	-8.8	-8.5	-7.4	-7.0	-7.7	-8.4	-8.8	-9.1	-9.2	-9.1	-9.2	-9.2	-9.1	-8.9	-9.5	-7.0																						
14-Nov	-8.7	-8.7	-8.9	-8.9	-8.9	-8.8	-8.8	-8.8	-9.1	-8.8	-8.4	-7.8	-7.4	-7.0	-7.1	-7.3	-7.5	-7.7	-7.7	-7.8	-7.6	-7.3	-7.5	-7.5	-8.1	-7.0																						
15-Nov	-7.3	-7.8	-9.3	-9.9	-9.8	-9.7	-10.7	-10.3	-8.4	-6.6	-5.4	-4.7	-3.9	-3.1	-2.6	-2.5	-2.7	-3.0	-3.6	-3.0	-3.2	-4.2	-4.5	-4.6	-5.9	-2.5																						
16-Nov	-4.8	-5.3	-5.4	-5.8	-7.1	-6.9	-5.5	-4.3	-3.3	-2.4	-1.6	-1.3	-0.8	0.0	0.1	0.1	-0.3	-0.8	-0.7	-0.6	-0.6	-0.4	-0.6	-0.9	-2.5	0.1																						
17-Nov	-1.0	-0.9	-1.0	-1.5	-1.8	-1.9	-2.0	-2.0	-1.9	-1.5	-1.3	-0.8	-0.2	0.8	0.7	0.9	0.9	0.5	-0.2	-2.9	-4.2	-4.5	-4.7	-5.3	-1.5	0.9																						
18-Nov	-5.9	-5.3	-5.3	-5.7	-6.0	-6.6	-7.0	-7.3	-7.3	-7.2	-7.3	-6.6	-6.2	-5.6	-6.5	-7.3	-7.8	-7.9	-8.1	-8.1	-8.2	-8.3	-8.2	-7.9	-7.0	-5.3																						
19-Nov	-8.1	-8.3	-8.4	-8.4	-8.3	-8.8	-9.3	-9.6	-10.3	-10.7	-11.0	-11.5	-11.8	-12.2	-12.6	-13.2	-13.6	-13.7	-14.4	-15.6	-16.7	-17.1	-17.7	-18.8	-12.1	-8.1																						
20-Nov	-19.3	-20.1	-20.2	-20.3	-19.5	-18.0	-17.6	-17.4	-17.4	-17.3	-16.9	-16.1	-15.3	-14.9	-15.1	-16.1	-16.8	-16.1	-16.0	-16.4	-17.1	-17.5	-17.8	-17.5	-17.4	-14.9																						
21-Nov	-18.1	-18.5	-17.8	-17.6	-17.6	-17.7	-17.8	-17.9	-17.9	-17.8	-16.9	-16.0	-15.5	-15.0	-14.9	-14.9	-15.0	-14.8	-14.6	-14.6	-14.7	-14.7	-14.8	-14.9	-16.2	-14.6																						
22-Nov	-15.2	-15.3	-15.4	-15.4	-15.1	-15.0	-15.1	-15.4	-15.7	-15.2	-14.2	-13.0	-12.1	-11.8	-12.1	-12.9	-14.1	-16.0	-17.2	-15.7	-16.2	-15.5	-14.6	-14.5	-14.7	-11.8																						
23-Nov	-14.7	-15.2	-16.1	-16.7	-16.7	-16.9	-17.2	-17.3	-17.3	-17.4	-17.2	-16.9	-16.6	-16.4	-16.5	-16.7	-16.8	-16.9	-16.7	-16.6	-16.6	-16.5	-16.6	-16.6	-16.6	-16.6	-14.7																					
24-Nov	-16.6	-16.8	-16.9	-16.6	-16.2	-16.1	-16.1	-16.0	-16.0	-15.7	-15.2	-14.5	-13.9	-13.6	-13.6	-13.6	-14.2	-15.0	-15.9	-16.9	-18.4	-19.7	-20.4	-20.7	-16.2	-13.6																						
25-Nov	-21.0	-21.8	-22.2	-21.6	-19.7	-17.1	-17.3	-16.9	-17.1	-16.5	-16.3	-15.7	-13.8	-12.7	-13.3	-14.2	-15.6	-16.1	-14.4	-14.0	-14.5	-14.5	-14.7	-14.8	-16.5	-12.7																						
26-Nov	-15.3	-15.3	-15.2	-15.0	-14.9	-14.8	-14.7	-14.2	-14.1	-13.3	-12.5	-11.8	-10.9	-10.6	-10.4	-10.7	-10.7	-11.1	-11.7	-11.8	-11.9	-12.7	-13.1	-13.1	-12.9	-10.4																						
27-Nov	-13.1	-13.0	-13.3	-14.0	-13.9	-14.2	-14.9	-15.2	-15.3	-15.3	-14.8	-14.4	-14.3	-14.5	-14.7	-14.9	-14.9	-15.4	-15.6	-16.0	-16.3	-17.2	-18.4	-19.5	-15.1	-13.0																						
28-Nov	-21.1	-22.4	-22.0	-23.2	-23.4	-25.7	-26.5	-26.2	-26.1	-25.6	-22.6	-20.6	-19.5	-19.0	-19.3	-20.8	-23.6	-23.4	-25.2	-27.0	-28.5	-29.5	-30.2	-30.9	-24.3	-19.0																						
29-Nov	-31.4	-31.9	-32.3	-32.6	-33.0	-33.3	-33.7	-34.0	-32.1	-30.0	-27.4	-24.0	-21.3	-21.9	-22.3	-23.7	-25.2	-27.2	-27.1	-26.5	-25.8	-25.5	-25.2	-24.9	-28.0	-21.3																						
30-Nov	-24.8	-24.9	-24.9	-24.7	-24.3	-24.3	-24.3	-24.3	-24.3	-23.8	-23.0	-22.3	-22.1	-22.0	-22.1	-21.9	-21.8	-21.7	-21.6	-21.5	-21.5	-21.7	-22.4	-23.4	-23.1	-21.5																						
																								-9.4	-9.6	-9.9	-10.1	-10.1	-9.9	-9.8	-9.9	-9.8	-9.1	-8.2	-7.4	-6.5	-6.0	-6.1	-6.8	-7.7	-8.3	-8.6	-8.8	-9.1	-9.4	-9.6	-9.8	Diurnal Average
																								6.8	6.6	4.4	5.2	5.6	5.7	6.1	5.6	5.4	5.9	7.9	8.9	10.6	12.0	12.9	11.5	10.2	10.2	10.1	9.2	8.1	7.2	5.7	5.4	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 2m (AT2) - C**  
**Mackay River - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Mackay River - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	78	10.83	10.83
-20 - 0	543	75.42	86.25
0 - 10	92	12.78	99.03
10 - 20	7	0.97	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

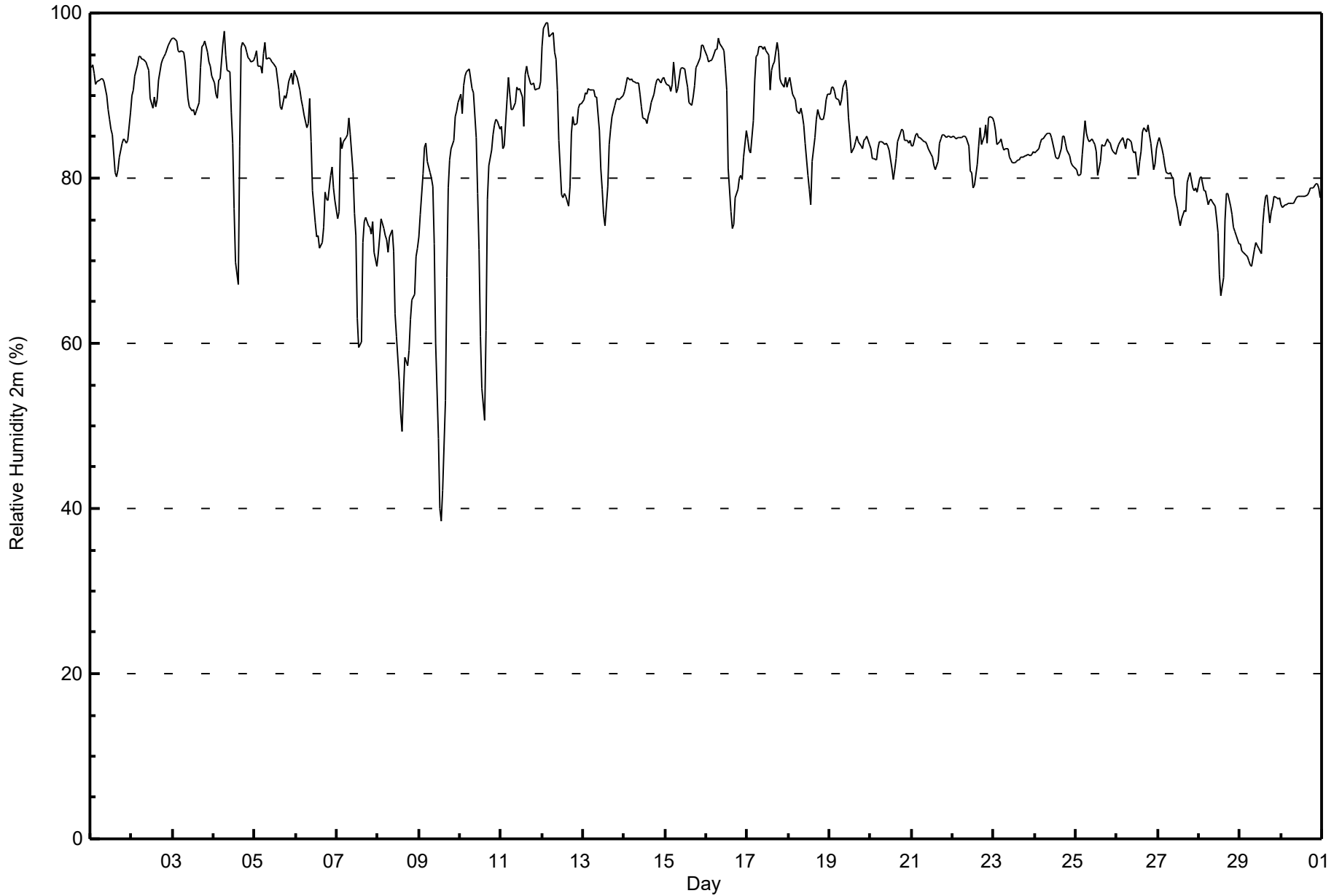
**Relative Humidity 2m (RH2) - %**  
**Mackay River - November 2024**

Maximum Value: 98.9 % on Nov 12 03:00      Maximum Daily Average: 93.1 % on Nov 3																						Hours in Service: 720 Hours of Data: 720																										
Minimum Value: 38.4 % on Nov 9 14:00      Minimum Daily Average: 65.5 % on Nov 8 Maximum Diurnal Average: 87.4 % at hour 6      Minimum Diurnal Average: 77.0 % at hour 14 Monthly Average: 84.23 %      Percentiles: P <sub>1</sub> = 53.2 P <sub>10</sub> = 74.0 Q <sub>1</sub> = 80.1 Median = 84.8 Q <sub>3</sub> = 90.7 P <sub>90</sub> = 94.1 P <sub>99</sub> = 97.0																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	93.4	93.8	92.7	91.3	91.7	91.8	92.0	92.0	91.8	90.1	88.3	87.1	86.0	85.2	80.7	80.2	81.1	82.5	84.2	84.7	84.6	84.2	84.6	88.0	87.6	93.8																						
2-Nov	90.0	90.7	92.5	93.8	94.7	94.7	94.4	94.4	94.0	93.6	93.0	89.7	88.5	89.9	88.7	89.5	91.9	93.9	94.5	94.8	95.1	96.1	96.5	96.8	93.0	96.8																						
3-Nov	97.0	97.0	96.7	95.4	95.3	95.4	95.2	94.1	91.9	89.7	88.7	88.2	88.2	87.6	88.1	89.2	93.3	96.0	96.1	96.6	95.2	94.1	93.5	92.4	93.1	97.0																						
4-Nov	91.6	90.2	89.6	91.8	92.1	96.3	97.9	94.9	93.1	93.0	88.0	84.2	76.3	69.9	67.2	83.9	95.8	96.4	96.0	95.3	94.7	94.4	94.1	94.3	90.0	97.9																						
5-Nov	94.7	95.4	93.6	93.6	92.7	95.0	96.5	94.4	94.5	94.3	94.0	93.4	92.0	90.7	88.7	88.3	90.0	89.6	90.5	91.6	92.7	91.3	93.0	92.7	96.5	96.5																						
6-Nov	92.5	92.3	90.7	89.5	88.7	87.6	86.1	86.6	89.7	84.3	78.4	74.5	72.8	73.0	71.5	72.3	74.0	78.2	77.4	77.4	80.3	81.4	78.7	77.4	81.5	92.5																						
7-Nov	75.1	75.9	85.0	83.6	84.4	84.9	85.2	87.3	85.3	80.6	75.7	73.1	63.0	59.5	60.3	72.1	74.7	75.2	74.2	74.1	73.2	74.8	71.0	69.3	75.7	87.3																						
8-Nov	70.8	72.9	75.1	73.9	73.0	72.5	71.0	72.9	73.7	71.2	63.6	60.8	55.4	51.4	49.4	54.2	58.3	57.3	59.2	62.9	65.3	65.9	70.5	71.5	65.5	75.1																						
9-Nov	72.8	75.6	80.5	83.8	84.2	82.0	80.7	80.1	78.9	72.0	60.0	48.5	40.0	38.4	42.1	53.0	67.9	78.7	82.2	83.5	84.6	87.4	88.1	89.2	72.3	89.2																						
10-Nov	90.2	87.8	91.1	92.5	92.8	93.1	92.1	90.8	90.3	84.9	78.1	71.3	60.8	54.6	50.7	61.5	77.4	81.5	83.4	85.2	86.4	87.1	86.9	85.9	81.5	93.1																						
11-Nov	86.3	83.6	83.9	89.6	92.3	90.2	88.3	88.3	89.2	91.0	90.6	90.8	89.8	86.4	92.5	93.6	92.6	91.4	91.3	91.5	90.7	90.9	90.9	91.7	89.9	93.6																						
12-Nov	95.9	98.2	98.9	98.9	97.1	97.3	97.6	95.3	94.5	90.7	84.6	77.9	77.6	78.1	77.8	76.6	79.0	85.4	87.5	86.5	86.6	88.6	88.9	89.0	88.7	98.9																						
13-Nov	89.6	90.3	90.2	90.9	90.7	90.6	90.7	89.9	89.8	85.7	81.1	78.7	75.5	74.2	79.0	84.1	86.0	87.5	88.8	89.5	89.6	89.5	89.7	90.0	86.7	90.9																						
14-Nov	90.6	91.3	92.2	91.8	92.0	91.7	91.7	91.5	91.5	90.2	88.7	87.3	87.1	86.6	87.6	88.1	89.2	90.1	91.2	91.9	92.0	91.6	92.1	92.1	90.4	92.2																						
15-Nov	91.8	91.4	91.2	90.5	91.4	94.1	90.3	90.9	92.0	93.1	93.4	93.2	92.1	91.0	89.1	88.9	89.8	91.3	93.4	93.8	94.6	96.1	96.0	95.6	92.3	96.1																						
16-Nov	94.7	94.1	94.2	94.2	94.6	95.6	95.6	96.9	96.3	95.8	95.5	93.2	90.7	81.2	75.9	73.9	74.5	77.6	78.6	80.0	80.3	79.9	82.5	85.8	87.6	96.9																						
17-Nov	84.8	83.5	83.0	87.0	91.9	94.8	94.9	96.0	95.9	95.5	95.9	95.5	94.9	90.7	93.1	93.7	94.1	96.5	95.3	92.1	91.6	91.0	92.2	91.0	92.3	96.5																						
18-Nov	91.7	92.2	90.2	89.9	89.5	88.2	87.8	88.5	87.6	86.4	84.2	80.4	78.7	76.9	82.1	84.9	87.1	88.3	87.7	87.2	87.1	88.0	89.6	90.1	86.8	92.2																						
19-Nov	90.1	91.0	91.1	90.5	89.7	89.4	88.9	89.4	91.1	91.8	90.5	87.4	85.2	83.1	83.7	84.4	85.1	84.5	83.9	83.5	84.5	84.8	85.1	84.1	87.2	91.8																						
20-Nov	83.5	82.4	82.4	82.2	83.5	84.4	84.3	84.5	84.1	84.3	83.9	83.4	81.2	79.8	81.0	82.4	84.4	85.5	85.9	85.7	84.6	84.5	84.3	84.5	83.6	85.9																						
21-Nov	83.9	83.8	85.2	85.5	84.9	84.9	84.6	84.4	84.4	84.1	83.6	82.8	82.5	81.5	81.1	82.0	84.3	84.8	85.3	85.3	85.0	85.0	85.1	84.8	84.1	85.5																						
22-Nov	85.1	84.9	84.7	84.8	84.9	84.9	85.0	85.0	85.0	83.9	80.9	80.7	78.8	79.2	81.7	83.9	86.1	84.1	85.0	86.4	84.2	87.3	87.4	87.3	84.2	87.4																						
23-Nov	86.8	85.8	84.1	84.4	84.7	84.0	83.5	83.5	83.5	82.5	82.2	81.9	81.8	82.1	82.2	82.3	82.5	82.6	82.7	82.7	83.0	82.7	82.9	83.2	83.2	86.8																						
24-Nov	83.1	83.2	83.6	84.2	84.7	84.8	85.3	85.4	85.4	84.9	83.3	82.6	82.4	82.4	83.5	85.0	85.0	85.0	84.3	83.4	82.7	81.8	81.5	81.3	83.7	85.4																						
25-Nov	81.1	80.4	80.3	80.5	82.9	86.9	85.4	84.8	84.3	84.8	84.4	84.0	83.3	80.3	82.1	84.1	84.0	83.9	84.8	84.3	84.3	83.6	83.2	83.0	83.4	86.9																						
26-Nov	83.6	84.0	84.4	85.0	84.2	83.6	84.7	84.5	83.4	83.1	83.3	80.3	82.0	83.3	85.5	86.1	85.6	86.4	85.3	84.3	81.0	81.7	83.5	83.9	86.4	86.4																						
27-Nov	84.4	84.8	83.6	82.7	81.5	80.7	80.5	80.6	80.2	79.9	77.9	76.3	75.1	74.2	75.2	76.1	75.9	79.5	80.2	80.7	78.8	78.5	78.9	78.4	79.4	84.8																						
28-Nov	80.0	80.2	79.3	78.5	78.4	76.8	77.3	77.4	77.1	76.7	75.1	73.4	68.3	65.8	68.0	74.9	78.2	78.1	76.6	75.6	74.1	73.5	73.1	72.1	75.4	80.2																						
29-Nov	72.0	71.3	71.1	70.6	70.5	70.0	69.5	69.3	71.4	72.3	71.9	71.6	70.9	74.4	76.4	77.8	78.0	74.6	76.0	76.6	77.8	77.7	77.5	77.6	73.6	78.0																						
30-Nov	76.8	76.5	76.7	76.7	76.9	77.0	77.0	76.9	77.3	77.6	77.8	77.8	77.8	77.8	77.8	77.9	78.3	78.8	78.8	78.8	79.3	79.2	78.9	77.6	77.8	79.3																						
																								86.1	86.1	86.6	86.9	87.2	87.4	87.1	87.0	86.9	85.6	83.3	81.1	78.6	77.0	77.4	80.1	82.8	84.2	84.7	84.9	84.9	85.1	85.2	85.4	Diurnal Average
																								97.0	98.2	98.9	98.9	97.1	97.3	97.9	96.9	96.3	95.8	95.9	95.5	94.9	92.0	93.1	93.7	95.8	96.5	96.1	96.6	95.2	96.1	96.5	96.8	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 2m (RH2) - %**  
**Mackay River - November 2024**







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 2m (RH2) - %**  
**Mackay River - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	2	0.28	0.28
40 - 60	13	1.81	2.08
60 - 80	165	22.92	25.00
80 - 100	540	75.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Precipitation (PC) - mm**

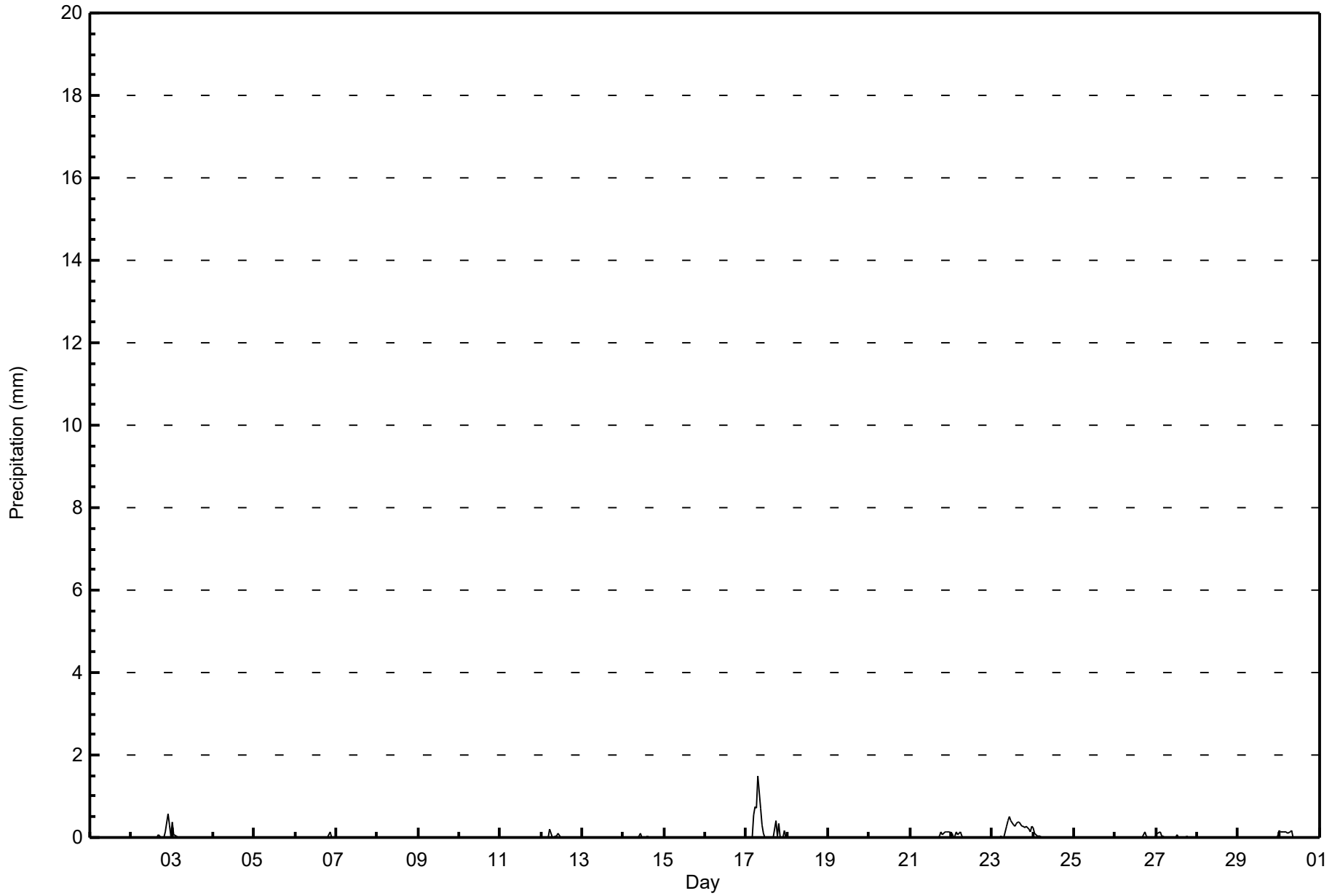
**Mackay River - November 2024**

Maximum Value: 1.5 mm on Nov 17 08:00		Maximum Daily Total: 5.5 mm on Nov 17		Hours in Service: 720																																														
Minimum Value: 0.0 mm on Nov 1 01:00		Minimum Daily Total: 0.0 mm on Nov 1		Hours of Data: 720																																														
Maximum Diurnal Total: 1.7 mm at hour 8		Minimum Diurnal Total: 0.3 mm at hour 14		Hours of Missing Data: 0																																														
Monthly Total: 16.44 mm		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.1 P <sub>99</sub> = 0.4		Hours of Calibration: 0																																														
				Percent Operational Time: 100.0																																														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																
2-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.6																
3-Nov	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4																	
4-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
5-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
6-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1																	
7-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
8-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
9-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
10-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
11-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
12-Nov	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2																	
13-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
14-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1																	
15-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
16-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
17-Nov	0.0	0.0	0.0	0.0	0.5	0.7	0.7	1.5	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.3	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	1.5																		
18-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
19-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
20-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
21-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7	0.1																	
22-Nov	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1																	
23-Nov	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.4	0.5	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.3	0.2	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.5																		
24-Nov	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.2	0.0																		
25-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
26-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0																		
27-Nov	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.0																		
28-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
29-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1																	
30-Nov	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.2	0.0	0.0																	
																								1.0	0.4	0.4	0.4	0.9	1.2	0.9	1.7	1.0	0.8	0.8	0.4	0.4	0.3	0.4	0.4	0.5	0.9	0.5	0.6	0.7	0.9	0.7	0.5	Diurnal Average		
																								0.4	0.2	0.1	0.1	0.5	0.7	0.7	1.5	0.7	0.4	0.5	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.6	0.3	0.3	Diurnal Maximum	



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Precipitation (PC) - mm**  
**Mackay River - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Precipitation (PC) - mm**  
**Mackay River - November 2024**

<b>Concentration Ranges (mm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	707	98.19	98.19
0.4 - 0.5	8	1.11	99.31
0.6 - 0.7	4	0.56	99.86
0.8 - 1.4	0	0.00	99.86
1.5 - 10	0	0.00	99.86
> 10	0	0.00	99.86

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Speed 10m (WS10) - km/h**  
**Mackay River - November 2024**

Maximum Speed: 14 km/h on Nov 7 02:00	Maximum Daily Speed Average: 10.8 km/h on Nov 16	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 29 05:00	Minimum Daily Speed Average: 1.6 km/h on Nov 1	Hours of Data: 660
Maximum Diurnal Speed Average: 2.0 km/h at hour 10	Minimum Diurnal Speed Average: 0.3 km/h at hour 16	Hours of Missing Data: 60
Monthly Average Velocity: 1.0 km/h 220.7 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 2 Q <sub>1</sub> = 4 Median = 5 Q <sub>3</sub> = 8 P <sub>90</sub> = 10 P <sub>99</sub> = 13	Percent Operational Time: 91.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	S2	SSE1	SSW3	S3	SSE2	S3	S3	SSE3	SSE2	SSW3	WNW2	SW3	SW3	W3	NW4	N4	SSW2	UO	E2	UO	S2	SSE4	SSW4	S2	SSW1.6	SSW4	
2-Nov	S3	ENE1	E1	SE3	ESE4	ESE5	ESE5	ESE4	E3	E4	E5	ESE7	ESE8	ESE8	ESE7	E7	ENE6	E6	ESE7	ESE7	ESE5	ESE5	ESE5	SE5	ESE4.9	ESE8	
3-Nov	SE4	S3	SW3	W4	WSW4	SW3	SSW4	SSW6	SSW5	SSW4	SSW4	S6	S8	S9	SSW9	SSW7	SSW3	SSE1	SSE3	S5	SSW4	SW1	WSW2	WSW3	SSW4.0	S9	
4-Nov	SW2	SSE2	S2	SW3	SW3	WSW3	W3	WSW2	S2	SSW4	SW3	WSW3	SW4	SSW3	SSW1	S4	S3	UO	SE2	SE2	SSE2	SE2	SSE1	W1	SSW2.0	SSW4	
5-Nov	W1	WNW3	UO	UO	WNW1	NW3	NNW1	NE1	SW1	WNW3	NW4	WNW4	WNW5	WNW5	W5	WNW6	W3	WSW4	SW5	SW5	SW4	SW5	SSW4	S6	W2.8	S6	
6-Nov	S10	S10	S10	S10	S11	S12	S10	S11	S11	SSW12	SSW11	SSW10	SW10	SW11	SW9	SW7	SSW6	S6	S9	S9	S10	S9	SSW9	SW8	SSW9.2	SSW12	
7-Nov	W8	WNW14	NW13	WNW11	W12	WNW11	WNW10	W7	W6	WSW6	WSW6	W6	WSW7	SW7	SW5	SSE3	S4	S4	S5	SE5	SSE7	SE8	SE9	SSE9	WSW4.4	WNW14	
8-Nov	S8	S9	S10	SSW12	SSW12	SSW12	SSW11	SSW8	SSW9	SSW11	SSW10	SSW9	SSW8	SSW10	SW7	SW5	SW5	SW6	WSW7	W6	WNW7	WNW6	W3	W6	SSW7.1	SSW12	
9-Nov	W6	W5	W5	WSW5	WSW6	WSW5	WSW5	SW5	SW5	WSW6	WSW5	WSW5	W6	WSW5	SW5	SSW5	S3	SSE3	S4	S6	S6	S6	SSW5	SSW4	SW4.3	S6	
10-Nov	SW5	SSW5	S5	S4	S4	SSW3	WSW5	WSW5	WSW6	WSW6	WSW5	WSW5	SW4	SW5	SSW5	SSW6	SSE3	SE3	SSE5	SSE4	SSE4	SSE4	SE4	SE5	SSW3.4	WSW6	
11-Nov	ESE6	ESE8	SE6	SE2	SE3	SE9	SE12	ESE9	ESE9	SE8	ESE9	ESE8	SE8	SE9	ESE10	ESE8	ESE7	ESE6	ESE4	ESE5	SE5	ESE4	ESE4	ESE4	ESE6.6	SE12	
12-Nov	SE4	SSE3	SSW3	SW4	SW7	WSW5	SW7	WSW8	WSW9	W10	W13	W14	W11	WNW11	WNW11	WNW10	WNW8	WSW3	WSW4	W5	W5	W5	W5	W5	W6.3	W14	
13-Nov	WSW5	WSW4	WSW5	WSW4	W5	W4	W4	W3	WSW2	W3	NW7	NNW6	NNE5	NNE7	NE7	NE7	NE5	NE9	NE7	NE9	NE10	NE9	NE9	NE8	NNE3.1	NE10	
14-Nov	NE8	NE9	NE11	NE9	NE9	NE8	NE8	NE8	NE8	NE8	NE8	NE8	NE7	NE7	NNE7	NNE7	NNE6	NE6	NE5	NNE5	NE5	NNE2	NNW3	NNW3	NE6.6	NE11	
15-Nov	ENE2	N1	UO	UO	S0	S1	UO	SE1	SE3	S2	SW3	SSE2	S4	SSW4	S4	SSE4	SSE4	SSE4	SSE4	S6	S6	S6	S7	S8	S3.4	S8	
16-Nov	S7	S8	S8	S7	SSE8	S9	S10	S10	S10	S10	S12	S13	S12	S13	S12	S14	S14	S12	S13	S12	S12	S12	S12	S10	S10.8	S14	
17-Nov	S9	S9	SSE9	SSE8	SSE8	SSE9	SSE8	S7	S9	S9	SSW9	S9	SSW8	S8	SSW8	SSW9	SW9	WSW9	UO	UO	UO	UO	UO	UO	S7.8	S9	
18-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
19-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	NNE7	NNE7	NE7	NNE8	NE8	NE8	NE8	NNE8	NNE7	NE6	NE7	NNE8	NNE6	NNE7	NNW6	NNW6	---	NE8
20-Nov	NNW6	NW5	NW5	NNW5	NNW5	N8	NNW7	N8	NNE8	NNE9	NNE8	NNE8	NNE8	NNE7	N6	NNE4	NNE4	NNE7	NNE10	NNE9	NNE7	N5	N5	N7	N6.4	NNE10	
21-Nov	NNW5	NNW4	N5	N6	N6	N5	N4	NW2	NW3	WNW4	NW4	NNW5	N5	N5	N4	NNW3	W2	W3	W3	WNW4	WNW5	WNW4	WNW4	WNW6	NNW3.7	N6	
22-Nov	WNW4	WNW4	W5	WNW5	WNW6	WNW6	WNW5	WNW5	W4	W5	W4	WNW6	NW6	NNW6	N5	NNE3	NE2	SE1	NNE2	NNW1	NNW1	N3	NNE4	NNE4	NW3.0	NNW6	
23-Nov	NNE6	NNE6	NE9	NE9	NE7	NE8	NE9	NE8	NE6	NE8	NE7	NE8	NE8	NE8	NE8	NNE8	NNE8	NE8	NE7	NNE8	NNE9	NNE9	NNE8	NNE8	NE7.7	NE9	
24-Nov	NNE7	NNE8	NNE6	NNE7	NNE6	NNE7	NNE6	NNE5	NNE5	NNE5	NNE5	N5	N5	N5	N4	N3	UO	UO	UO	UO	UO	SSE2	SE3	SSE3	NNE4.3	NNE8	
25-Nov	SSE3	SSE4	S4	SSE3	SSW2	SSW5	S5	SE2	SE2	S4	SSE5	S5	S5	SSE6	SSE7	SE7	SE7	SE8	SSE8	SSE8	SSE7	SSE8	SSE9	SSE8	SSE5.2	SSE9	
26-Nov	SSE7	SSE8	S7	S7	S7	S8	S7	S9	S9	S10	S10	SSW9	SSW10	SSW8	SSW6	SW4	W5	W7	WNW7	WNW9	WNW9	WNW12	WNW9	WNW8	SW5.5	WNW12	
27-Nov	WNW7	W8	WNW9	WNW8	WNW10	WNW11	WNW11	WNW10	WNW10	WNW10	WNW10	WNW11	WNW12	WNW14	WNW13	WNW11	WNW8	NW8	WNW8	WNW8	WNW6	NW8	NW6	NW6	WNW6	WNW9.0	WNW14
28-Nov	WNW5	WNW5	NW6	WNW5	WNW5	W3	W4	W4	W4	W4	WNW4	NW6	NNW7	NNW7	NNW6	NW4	S1	WSW1	UO	UO	ESE1	UO	S1	UO	WNW3.6	NNW7	
29-Nov	SSE1	SSE1	SSE2	SSE1	SSW0	SSE1	SE2	UO	UO	UO	UO	UO	ENE2	N5	NNE5	NNE5	NE3	ENE1	NE3	NE3	NNE4	NNE4	NE4	NE5	NE2.1	NNE5	
30-Nov	NE5	NE4	NNE3	NNE3	NNE4	NNE4	NNE4	NNE4	NNE4	N3	NNW3	NW3	NNW5	NNW5	N5	NNE4	N3	NNW4	NNW4	NNW3	NW2	WNW3	NW3	NW2	N3.2	N5	

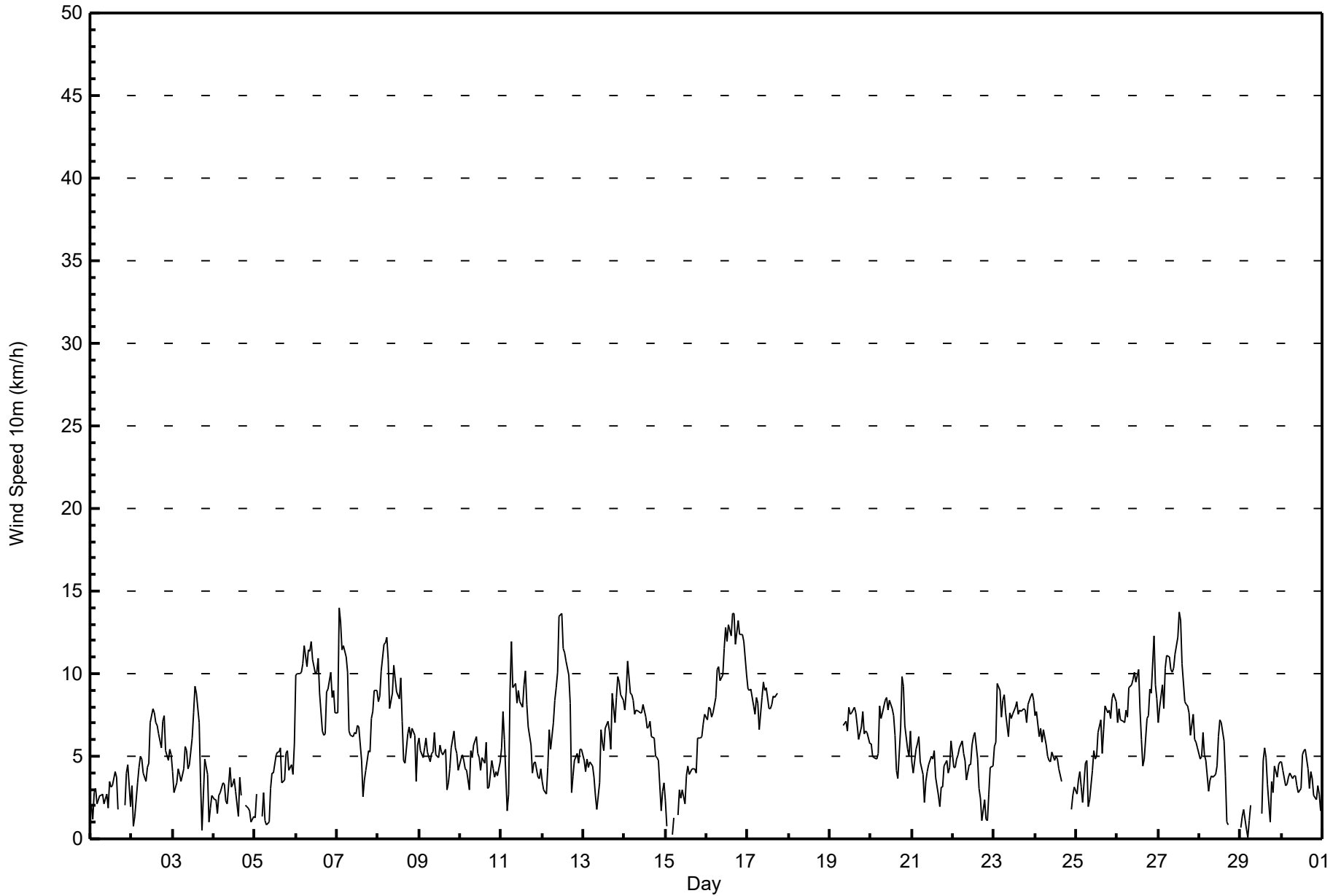
SSW1.1 SW1.1 SW1.2 SW1.4 SW1.6 SW1.4 SW1.7 SW1.6SSW1.5 SW2.0WSW1.8WSW1.7WSW1.4WSW1.3 W0.7 S0.3 S0.6 SSE0.6 SE0.9 S0.8 S0.7 S0.6SSW0.9 SW0.9	Diurnal Average
S10WNW14 NW13 SSW12 SSW12 SSW12 SE12 S11 S11 SSW12 W13 W14WNW14WNW13 S12 S14 S14 S12 S13 S12 S12 S12 S12 S10	Diurnal Maximum

UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 10m (WS10) - km/h**  
**Mackay River - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Mackay River - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	333	50.45	50.45
6 - 11	299	45.30	95.76
12 - 19	28	4.24	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 660

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Mackay River - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	21	25	12	4	4	14	21	35	33	25	25	29	31	24	13	17	333
6 - 11	6	37	46	1	2	16	8	19	54	24	10	12	12	35	8	9	299
12 - 19	0	0	0	0	0	0	1	0	14	4	0	0	3	5	1	0	28
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	27	62	58	5	6	30	30	54	101	53	35	41	46	64	22	26	660

Total Number of Valid Hours: 660

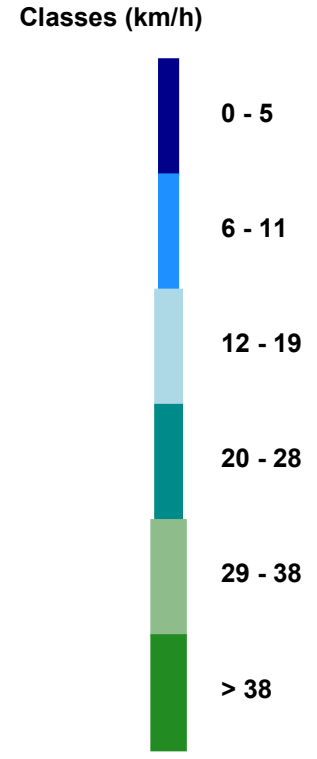
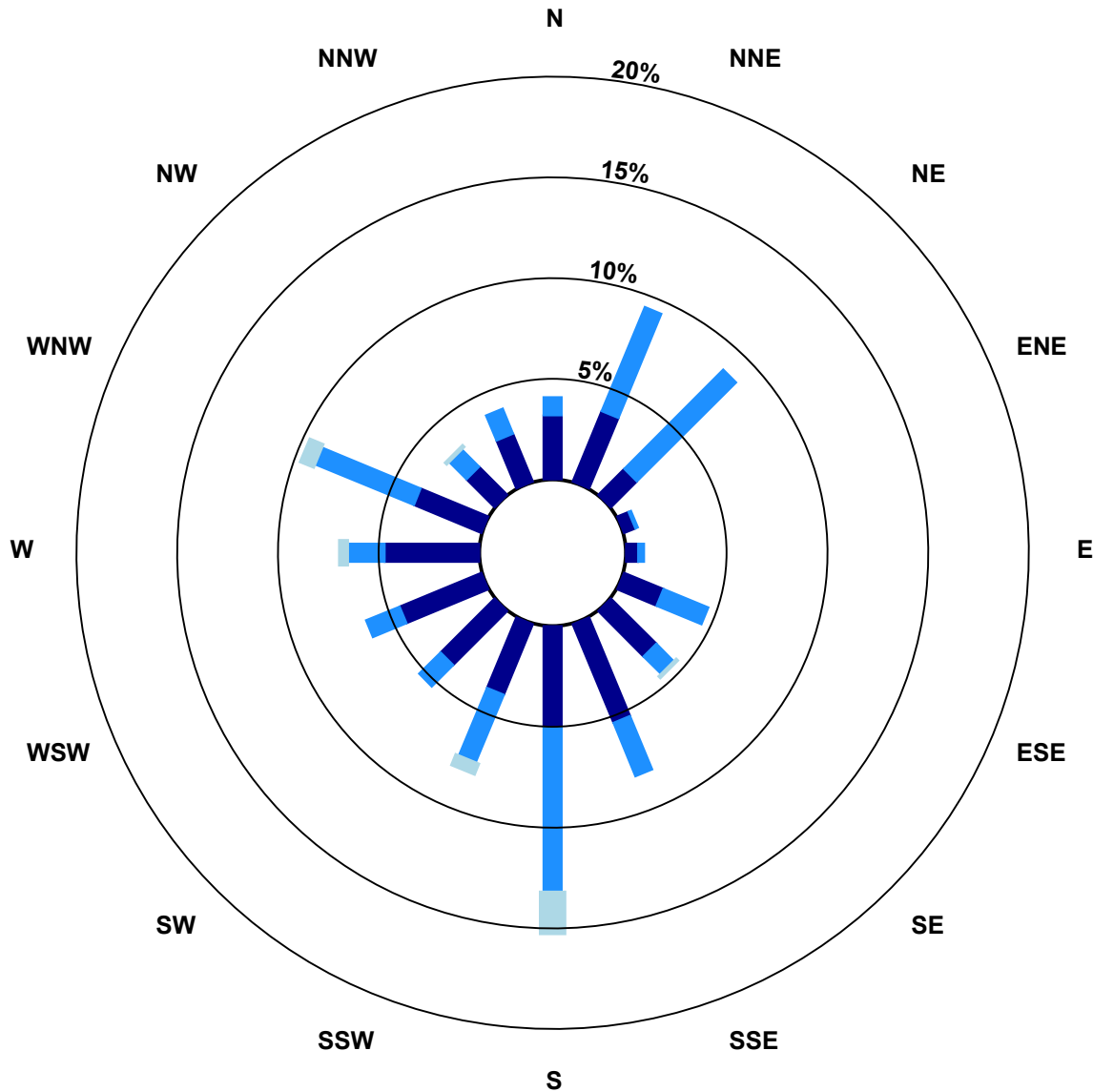
Total Number of Hours: 720





Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Mackay River



Total Number of Valid Hours: 660



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Mackay River - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 6 km/h on Nov 7 02:00	Hours of Data: 660
Minimum Value: 0 km/h on Nov 24 23:00	Hours of Missing Data: 60
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 3 P <sub>99</sub> = 5	Hours of Calibration: 0
	Percent Operational Time: 91.7

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	2	1	2	1	1	2	1	1	1	2	2	2	1	1	2	2	2	UO	1	UO	2	2	2	1	2	2
2-Nov	1	1	1	1	1	1	1	1	1	2	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2
3-Nov	1	1	1	2	1	1	1	1	1	1	1	2	2	3	3	2	2	1	2	1	1	1	1	1	1	3
4-Nov	1	1	1	1	1	1	1	1	1	2	1	1	2	2	1	1	2	UO	1	1	1	1	1	1	1	2
5-Nov	1	1	UO	UO	1	1	1	1	1	1	1	2	2	2	2	2	1	2	2	2	1	1	1	1	2	2
6-Nov	3	3	3	3	3	3	3	3	3	4	4	3	4	4	3	2	2	2	2	2	3	2	2	3	4	4
7-Nov	3	6	5	4	4	4	4	2	3	2	3	3	3	3	2	1	1	1	1	1	2	2	3	3	6	
8-Nov	2	2	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	3	3	2	2	2	2	3	3
9-Nov	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2
10-Nov	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2
11-Nov	1	2	2	2	2	3	3	3	3	2	2	3	2	3	3	2	2	2	1	2	1	1	1	1	3	3
12-Nov	1	1	1	2	2	2	3	3	4	4	6	6	5	4	4	4	3	1	1	2	2	2	2	2	6	6
13-Nov	2	1	2	2	2	2	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3
14-Nov	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2	2	2	2	1	1	2	1	1	3	3
15-Nov	1	1	UO	UO	1	1	UO	2	1	1	2	2	1	1	1	1	1	1	1	2	1	1	1	2	2	2
16-Nov	2	2	2	2	2	2	3	3	3	3	4	4	4	4	4	5	4	4	4	4	4	4	4	4	5	5
17-Nov	3	3	3	2	2	3	3	2	3	3	3	3	3	2	2	3	3	4	UO	UO	UO	UO	UO	UO	4	4
18-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
19-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	2	3	2	2	3	3	3	3	2	2	3	3	2	2	2	1	3
20-Nov	2	1	1	1	1	2	3	2	3	3	3	3	3	3	2	1	1	3	4	3	3	2	2	2	4	4
21-Nov	1	1	2	2	2	1	1	1	2	1	1	1	1	2	1	2	1	1	2	2	1	1	1	2	2	2
22-Nov	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	1	1	1	2	2	2
23-Nov	2	2	3	3	2	3	3	3	2	3	2	2	2	3	2	3	3	3	3	2	2	3	3	3	3	3
24-Nov	3	2	2	2	2	2	2	1	1	1	1	1	1	2	1	1	UO	UO	UO	UO	UO	1	0	1	3	3
25-Nov	1	1	1	1	1	2	2	2	1	2	2	1	2	2	2	2	1	2	2	2	2	3	3	3	3	3
26-Nov	2	2	2	2	2	2	2	3	3	3	3	3	3	3	2	1	3	3	3	3	3	5	4	3	5	5
27-Nov	3	3	3	3	4	4	4	4	4	4	4	4	5	5	3	3	3	3	3	2	3	2	2	3	5	5
28-Nov	1	2	2	1	2	1	1	2	1	1	1	2	2	2	1	2	1	1	UO	UO	1	UO	1	UO	2	2
29-Nov	1	1	1	1	1	1	1	UO	UO	UO	UO	UO	2	1	2	2	2	1	1	1	1	1	1	2	2	2
30-Nov	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	1	1	1	1	1	1	1	1	1	2	2
	3	6	5	4	4	4	4	4	4	4	6	6	5	5	4	5	4	4	4	4	4	5	4	3		

Diurnal Maximum

UO - Unstable Operation



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Mackay River - November 2024**

Direction of Maximum Speed: 299 deg on Nov 7 02:00		Hours in Service: 720
Direction of Maximum Daily Speed Average: 179.8 deg on Nov 16		Hours of Data: 660
Direction of Minimum Speed: 199 deg on Nov 29 05:00	Direction of Minimum Daily Speed Average: 1.6 deg on Nov 1	Hours of Missing Data: 60
Monthly Average Direction: 220.7 deg		Percent Operational Time: 91.7

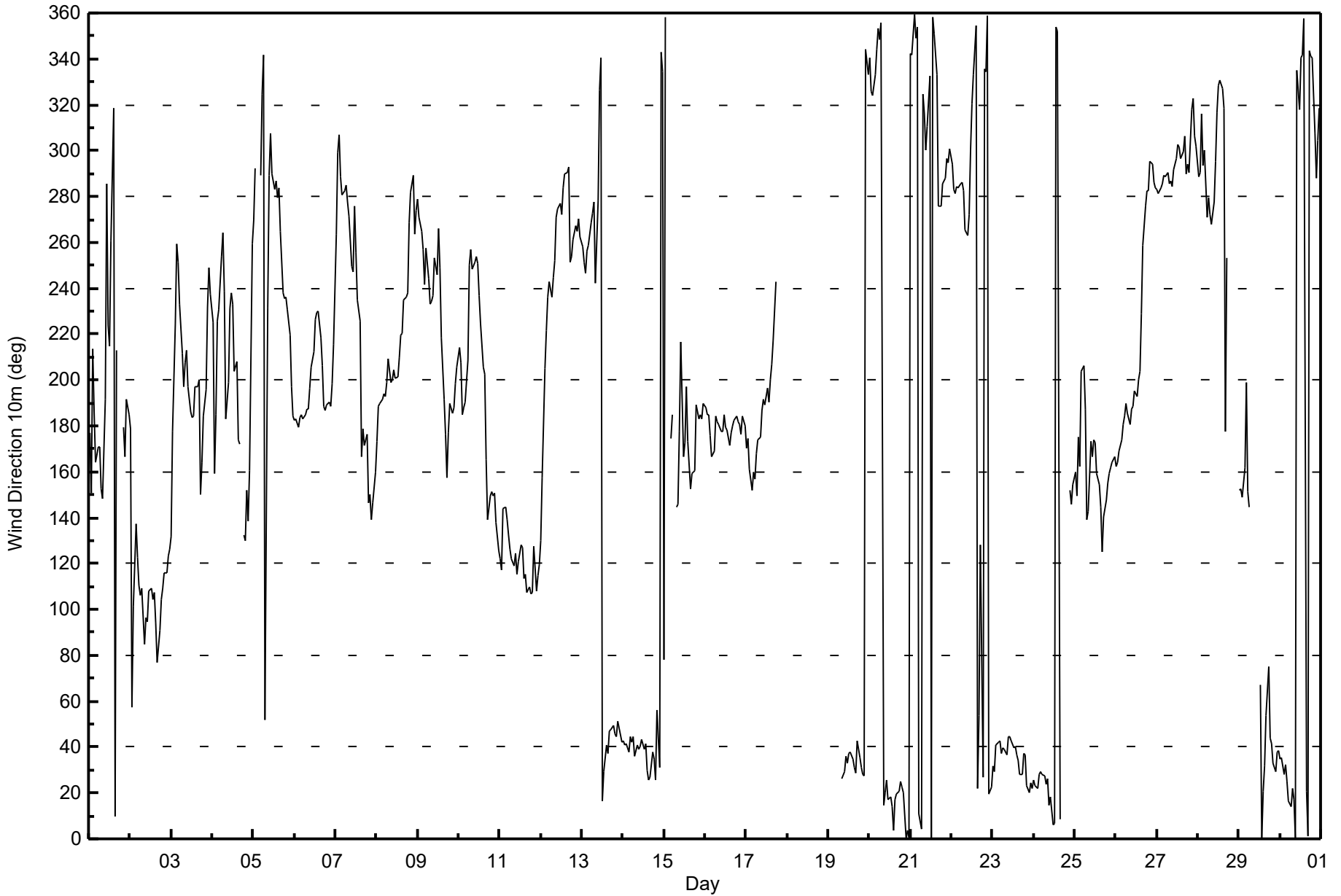
Day	Hourly Period Ending At (MST)																								Daily Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	177	151	213	186	164	171	171	152	149	192	286	224	215	260	318	10	213	UO	100	UO	179	166	192	185	193.6	
2-Nov	179	57	101	137	122	110	106	109	85	97	94	108	109	104	107	94	77	91	105	109	116	116	123	126	107.5	
3-Nov	132	177	224	260	252	233	212	197	207	213	197	186	184	184	197	197	200	150	164	185	196	232	249	237	200.1	
4-Nov	225	159	185	226	231	254	264	239	183	199	231	238	233	204	208	174	172	UO	132	130	152	139	161	259	206.7	
5-Nov	270	292	UO	UO	289	325	341	52	231	289	307	290	283	287	279	284	265	238	236	236	231	220	197	184	261.2	
6-Nov	183	183	179	184	185	183	185	187	187	197	205	212	226	229	230	219	206	188	187	189	191	189	198	215	196.6	
7-Nov	264	299	307	288	281	282	285	278	272	250	247	276	256	235	226	167	179	171	177	146	150	139	146	160	250.4	
8-Nov	173	189	190	192	194	193	199	209	199	200	204	201	202	210	219	220	235	236	238	269	282	289	264	274	211.4	
9-Nov	279	271	265	257	242	258	244	233	234	237	253	246	266	249	218	192	176	158	177	190	185	188	198	206	229.0	
10-Nov	214	207	185	188	191	209	250	257	248	251	254	251	236	224	206	203	166	139	149	151	150	150	138	126	203.4	
11-Nov	122	117	144	144	139	132	126	122	119	125	115	121	128	127	113	116	108	110	107	107	128	108	115	120	121.0	
12-Nov	130	157	205	222	236	243	236	245	252	271	274	277	272	284	290	290	293	251	254	261	268	265	271	262	264.4	
13-Nov	258	252	247	256	259	268	273	278	242	278	326	341	17	29	41	37	47	48	50	46	44	51	48	42	14.7	
14-Nov	43	41	41	38	45	42	44	36	41	39	40	43	39	41	30	26	27	38	35	26	56	31	343	335	36.9	
15-Nov	78	358	UO	UO	175	185	UO	145	146	177	217	166	173	197	173	153	159	160	161	189	183	185	183	190	175.3	
16-Nov	188	185	185	176	166	169	185	182	181	178	177	185	180	178	172	177	180	182	184	182	181	177	184	180	179.8	
17-Nov	170	174	161	152	160	157	168	174	175	187	192	189	196	191	200	207	217	243	UO	UO	UO	UO	UO	UO	183.9	
18-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
19-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	26	29	36	33	37	38	35	31	29	43	35	31	28	27	344	333	--
20-Nov	340	326	324	333	344	353	348	356	14	20	25	17	18	14	4	17	19	21	25	22	20	0	3	1	6.2	
21-Nov	342	342	359	349	354	11	4	324	316	300	311	332	0	358	351	333	276	276	276	286	288	297	295	301	327.1	
22-Nov	294	283	281	284	284	285	286	282	266	263	272	300	320	333	355	22	54	128	27	336	334	359	19	23	309.6	
23-Nov	32	29	41	42	43	37	40	39	37	45	44	42	40	40	37	34	28	28	37	37	23	20	24	22	35.1	
24-Nov	26	23	22	28	29	28	28	24	27	15	18	6	6	354	352	9	UO	UO	UO	UO	UO	152	146	154	22.7	
25-Nov	160	150	175	162	204	206	187	139	143	174	167	174	173	159	154	145	125	140	147	155	159	162	164	167	160.3	
26-Nov	162	164	169	174	181	184	190	185	181	187	188	195	193	200	204	229	259	276	283	283	295	294	286	283	215.7	
27-Nov	283	281	284	285	290	289	290	285	287	285	292	296	302	301	297	300	306	290	294	291	318	323	306	302	294.2	
28-Nov	288	291	316	293	300	271	280	272	268	278	295	316	328	331	327	318	177	253	UO	UO	123	UO	182	UO	301.4	
29-Nov	152	153	149	162	199	151	145	UO	UO	UO	UO	UO	67	0	21	32	54	75	44	42	33	29	38	39	43.5	
30-Nov	35	35	28	33	25	17	14	22	17	0	335	318	341	342	357	21	1	343	341	341	308	288	305	319	358.4	

201.9 222.1 225.6 228.4 233.3 223.6 221.3 217.5 208.5 224.1 243.2 251.4 252.4 255.2 261.1 191.1 170.2 166.4 144.0 170.5 175.4 184.3 195.4 218.1

Diurnal Average

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Mackay River - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 86 deg on Nov 15 05:00	Hours of Data: 660
Minimum Value: 8 deg on Nov 10 19:00	Hours of Missing Data: 60
Percentiles: P <sub>1</sub> = 13 P <sub>10</sub> = 19 Q <sub>1</sub> = 23 Median = 26 Q <sub>3</sub> = 33 P <sub>90</sub> = 46 P <sub>99</sub> = 73	Hours of Calibration: 0
	Percent Operational Time: 91.7

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	32	77	36	34	30	27	23	24	54	58	60	46	32	51	52	30	69	UO	37	UO	57	25	53	24	77	
2-Nov	25	56	48	27	24	19	22	28	29	25	29	24	23	26	24	30	36	30	21	21	19	17	18	19	56	
3-Nov	20	41	41	46	48	30	26	18	24	33	26	22	22	22	23	21	22	74	47	15	16	54	12	15	74	
4-Nov	24	29	45	24	23	37	39	27	41	24	33	49	44	37	52	23	32	UO	29	50	61	35	62	37	62	
5-Nov	21	15	UO	UO	27	18	73	77	46	22	23	29	28	33	33	27	36	41	36	35	35	26	25	19	77	
6-Nov	21	21	22	21	21	22	21	23	22	27	27	28	34	31	34	25	22	21	19	17	19	20	21	26	34	
7-Nov	44	29	24	26	32	31	28	33	39	41	45	44	45	45	37	29	15	20	21	25	24	22	23	26	45	
8-Nov	24	23	19	18	20	20	21	27	20	21	23	24	26	27	29	32	40	43	41	42	30	27	30	41	43	
9-Nov	32	40	41	46	41	47	36	29	32	32	52	44	47	51	29	19	23	14	13	14	12	16	17	20	52	
10-Nov	18	17	16	18	18	25	41	47	46	47	52	47	46	37	36	21	19	18	8	12	17	15	17	19	52	
11-Nov	15	15	28	61	58	20	22	21	21	23	17	22	25	22	18	24	21	20	20	22	24	22	25	18	61	
12-Nov	25	35	41	45	39	44	36	45	46	43	36	39	42	35	30	30	28	35	33	48	45	40	37	38	48	
13-Nov	36	41	38	43	42	37	44	33	47	43	25	29	34	30	24	23	27	22	27	23	22	26	27	25	47	
14-Nov	24	24	23	23	28	23	27	24	23	24	23	25	25	24	23	22	23	22	23	27	24	27	67	40	32	67
15-Nov	44	47	UO	UO	86	66	UO	51	26	29	29	51	32	26	28	27	25	25	20	19	16	14	14	17	86	
16-Nov	14	16	18	22	23	24	24	24	26	25	25	26	26	25	25	25	25	27	25	24	26	26	24	25	27	
17-Nov	24	27	25	24	24	25	26	24	25	23	21	21	25	24	22	24	26	40	UO	UO	UO	UO	UO	UO	40	
18-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
19-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	25	24	25	27	30	28	26	26	29	24	23	24	27	26	24	19	30
20-Nov	20	15	15	18	21	24	26	27	28	25	29	26	26	29	25	19	17	24	26	29	25	24	25	26	29	
21-Nov	20	27	28	25	25	25	25	28	24	33	30	30	31	34	33	30	28	30	35	26	25	24	29	20	35	
22-Nov	29	35	34	27	28	30	26	25	47	47	47	33	33	24	27	42	36	43	20	50	56	30	22	26	56	
23-Nov	26	25	24	24	25	24	25	27	23	23	22	23	24	23	24	26	24	24	24	26	23	24	26	26	27	
24-Nov	26	24	27	25	25	21	22	22	23	26	24	26	26	28	25	24	UO	UO	UO	UO	UO	57	17	14	57	
25-Nov	13	12	16	19	29	26	25	39	27	29	28	28	29	25	24	22	19	21	23	25	27	26	26	27	39	
26-Nov	27	26	28	26	24	23	22	23	25	26	23	25	23	26	24	29	46	41	33	32	24	30	32	33	46	
27-Nov	39	38	33	35	26	27	26	29	32	31	29	26	26	27	26	23	25	25	25	25	20	16	21	24	39	
28-Nov	18	21	20	19	23	39	36	46	49	44	27	24	20	19	18	25	47	60	UO	UO	46	UO	68	UO	68	
29-Nov	66	33	22	78	86	32	24	UO	UO	UO	UO	UO	75	29	25	22	49	63	15	24	23	22	22	22	86	
30-Nov	21	19	20	23	20	22	26	22	20	27	26	54	25	25	27	28	34	23	23	22	29	23	17	25	54	

66	77	48	78	86	66	73	77	54	58	60	54	75	51	52	42	69	74	47	50	61	67	68	41	
Diurnal Maximum																								

UO - Unstable Operation



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS21 CONKLIN NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS21)  
 NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	686	34	34	100	3.4	0	1.2	0
TRS(ppb) Average	677	40	43	99.58	0.5	0	0.3	0
THC(ppm) Average	606	34	114	88.89	2.2	-	2.1	-
NMHC(ppm) Average	606	34	114	88.89	0.11	-	0.019	-
CH4(ppm) Average	606	34	114	88.89	2.1	-	2.1	-
O3 (ppb) Average	648	33	72	94.58	39.3	0	31.7	-
NO2 (ppb) Average	683	36	37	99.86	11.5	0	4	-
NO (ppb) Average	683	36	37	99.86	18	-	1.4	-
NOX (ppb) Average	683	36	37	99.86	26.4	-	5.5	-
PM2.5 (ug/m3) Average	719	1	1	100	62.1	0	6.9	0
Temperature 2 m (C) Average	720	0	0	100	12.5	-	6.5	-
Relative Humidity (%) Average	720	0	0	100	97.9	-	95.5	-
Wind Speed 10 m (km/h) Average	712	0	8	98.89	21	-	12	-
Wind Direction 10 m (deg) Average	712	0	8	98.89	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS21)  
 NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	686	0.26	0.4	-	0	0	0.1	0.2	0.3	0.6	3.4
TRS (ppb) Average	677	0.17	0.1	-	0	0.1	0.1	0.2	0.2	0.3	0.5
THC (ppm) Average	606	2.02	0.1	-	1.9	1.9	2	2	2.1	2.1	2.2
NMHC(ppm) Average	606	0.004	0.01	-	0	0	0	0	0	0	0.11
CH4(ppm) Average	606	2.02	0.1	-	1.9	1.9	2	2	2.1	2.1	2.1
O3 (ppb) Average	648	21.58	7.2	-	1.6	11.5	17.3	22.3	26.8	30.1	39.3
NO2 (ppb) Average	683	1.81	1.4	-	0.1	0.5	0.9	1.5	2.3	3.3	11.5
NO (ppb) Average	683	0.33	1.1	-	0	0	0	0.1	0.3	0.6	18
NOX (ppb) Average	683	2.14	2.2	-	0.1	0.5	1	1.7	2.6	3.8	26.4
PM2.5 (ug/m3) Average	719	4.64	4.6	-	0.4	1.5	2.3	3.5	5.5	8.6	62.1
Temperature 2 m (C) Average	720	-7.28	8.8	-	-26.7	-19.9	-15.3	-4.7	-1.1	3.6	12.5
Relative Humidity (%) Average	720	80.88	10.1	-	46	66.9	77	82.4	86.9	93.2	97.9
Wind Speed 10 m (km/h) Average	712	6.1	3	-	0	2	4	6	8	11	21
Wind Direction 10 m (deg) Average	712	-	-	-	-	-	-	-	-	-	-



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS 21)  
NOVEMBER 2024

OPERATIONAL NOTES

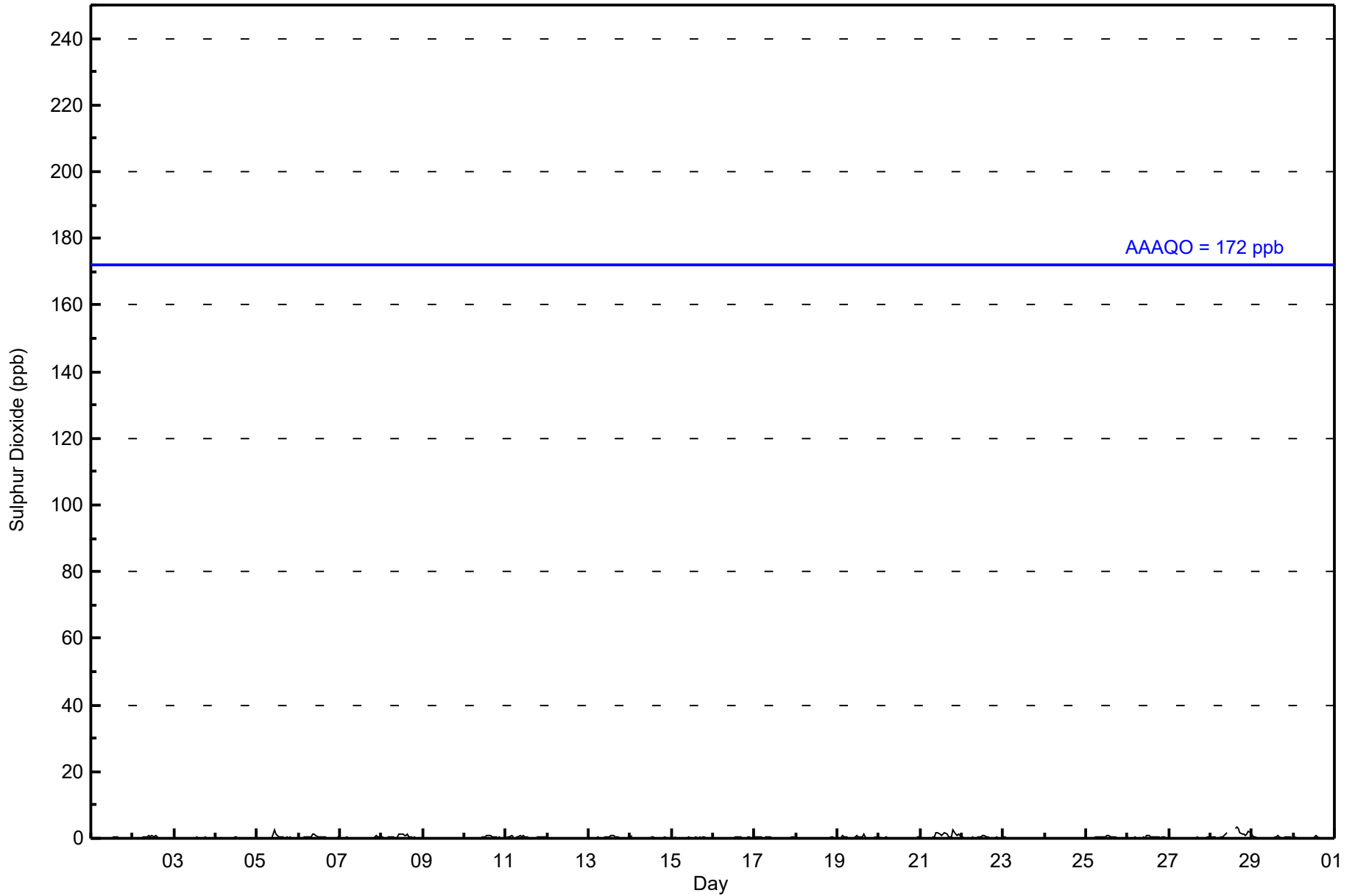
Parameter	Period Start	Period End	Duration (Hours)	Notes
TRS	26 Nov 2024 15:00	26 Nov 2024 16:00	2	Unstable Operation - flatline in analyzer output signal
NO2, O3, THC/NMHC/CH4, TRS	28 Nov 2024 12:00	28 Nov 2024 12:00	1	Maintenance - sample manifold cleaned
THC/NMHC/CH4	05 Nov 2024 13:00	05 Nov 2024 14:00	2	Maintenance - replaced support gas cylinder
THC/NMHC/CH4	15 Nov 2024 05:00	16 Nov 2024 09:00	29	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	16 Nov 2024 10:00	16 Nov 2024 12:00	3	Maintenance - remote troubleshooting
THC/NMHC/CH4	16 Nov 2024 17:00	18 Nov 2024 12:00	44	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	18 Nov 2024 13:00	18 Nov 2024 13:00	1	Maintenance - analyzer replaced
O3	05 Nov 2024 05:00	05 Nov 2024 13:00	9	Unstable Operation - flatline in analyzer output signal
O3	05 Nov 2024 14:00	05 Nov 2024 14:00	1	Maintenance - analyzer rebooted
O3	06 Nov 2024 09:00	07 Nov 2024 12:00	28	Unstable Operation - flatline in analyzer output signal
Wind Speed, Wind Direction	03 Nov 2024 01:00	03 Nov 2024 01:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	04 Nov 2024 20:00	04 Nov 2024 20:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	04 Nov 2024 22:00	05 Nov 2024 03:00	6	Flat line in sensor output signal - Sensor frozen





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Conklin - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Conklin - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	686	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

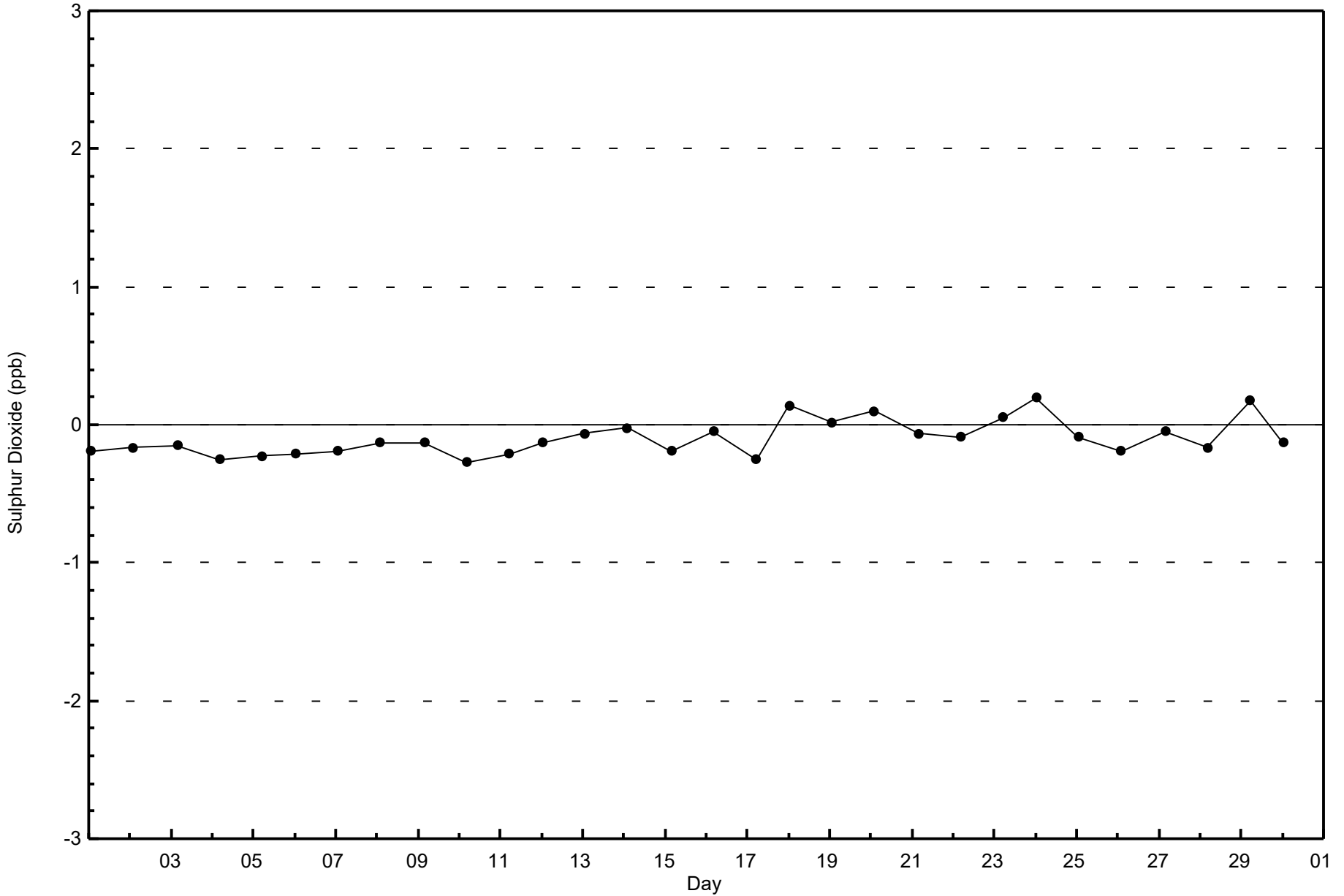
**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Conklin - November 2024**

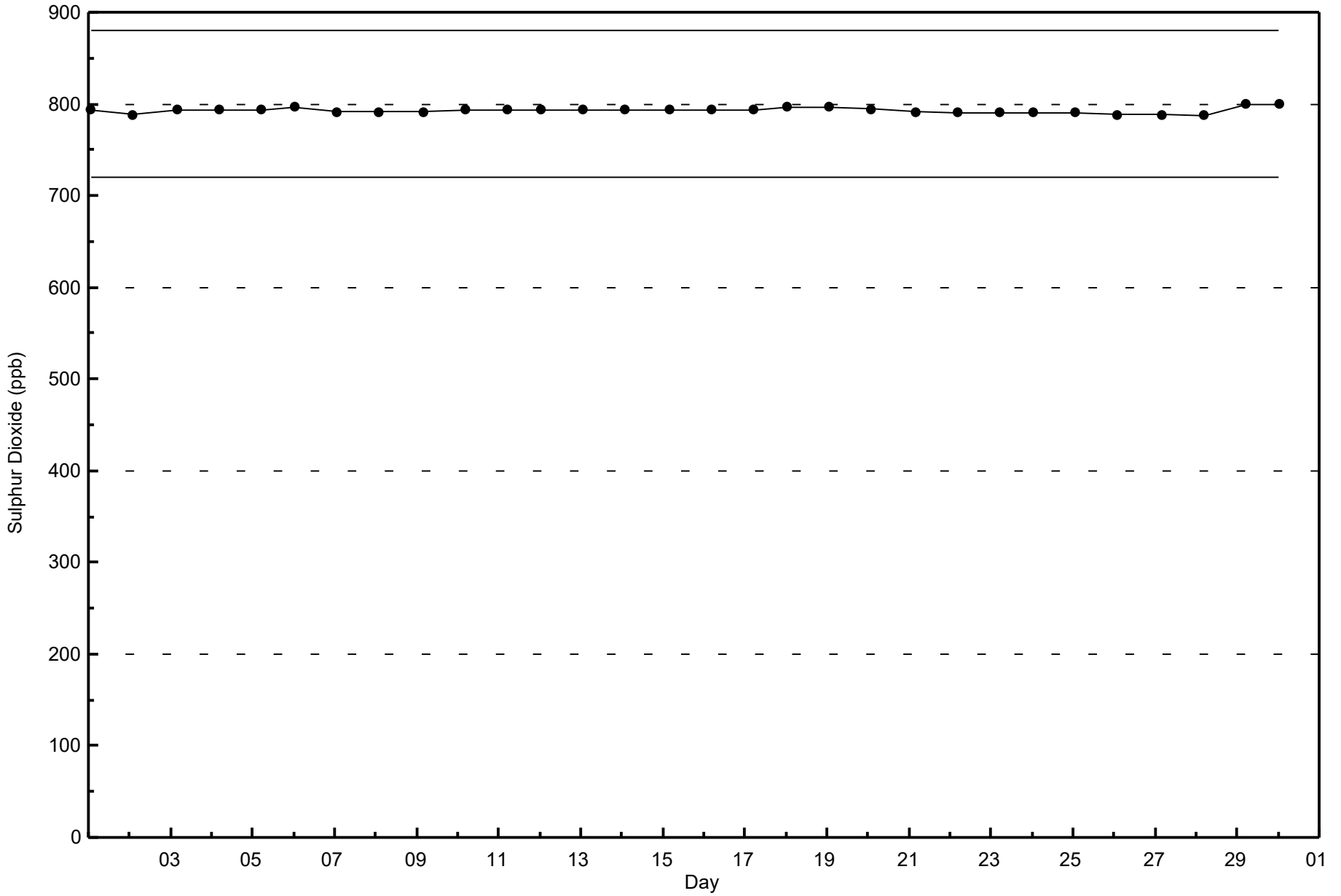
<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	53	47	38	16	5	4	29	44	54	59	51	29	26	60	88	75	678
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	53	47	38	16	5	4	29	44	54	59	51	29	26	60	88	75	678

Total Number of Valid Hours: 678

Total Number of Hours: 720

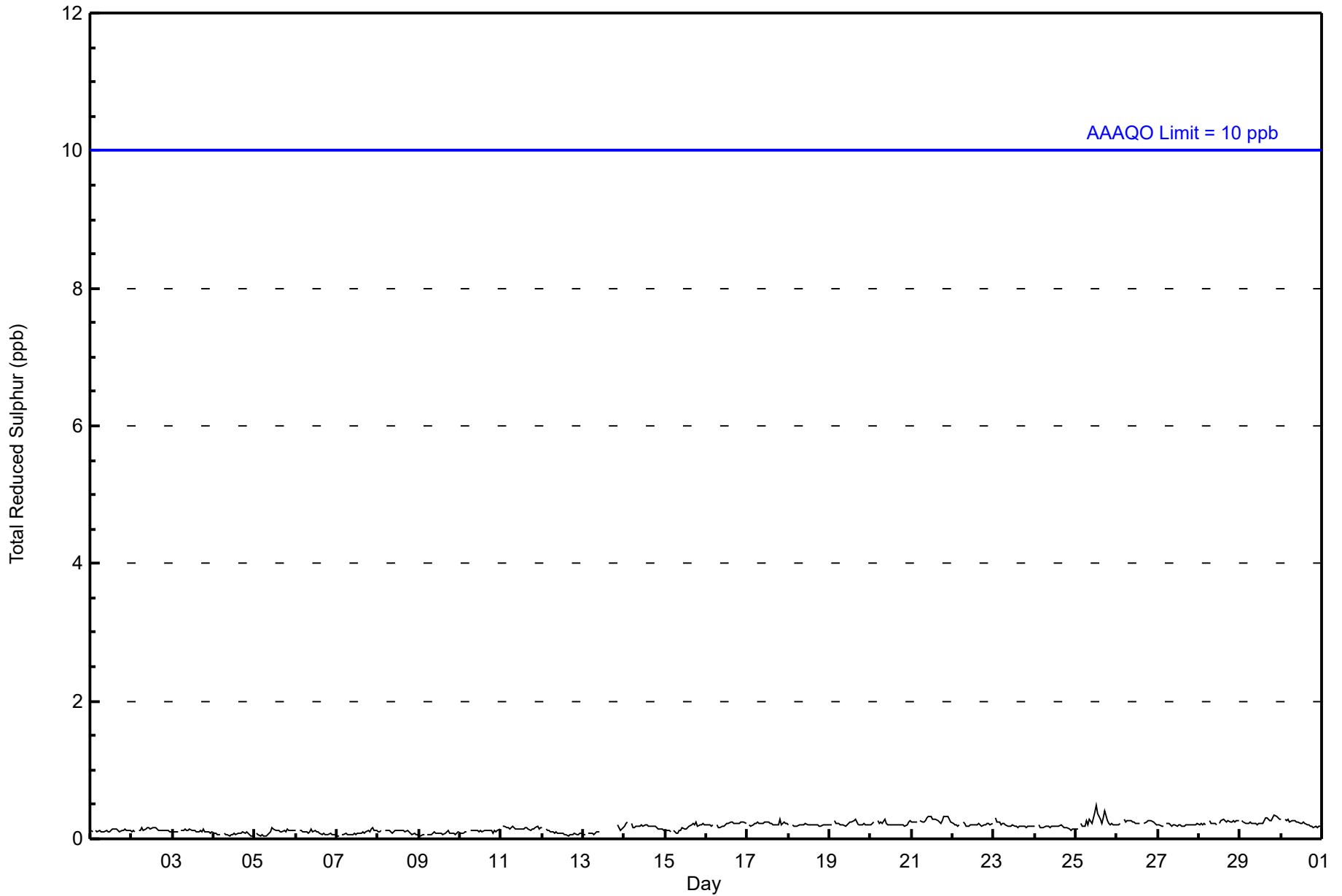














**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb**  
**Conklin - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	677	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 677

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Conklin - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	52	46	34	13	5	4	27	44	54	60	50	28	27	61	90	75	670
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	52	46	34	13	5	4	27	44	54	60	50	28	27	61	90	75	670

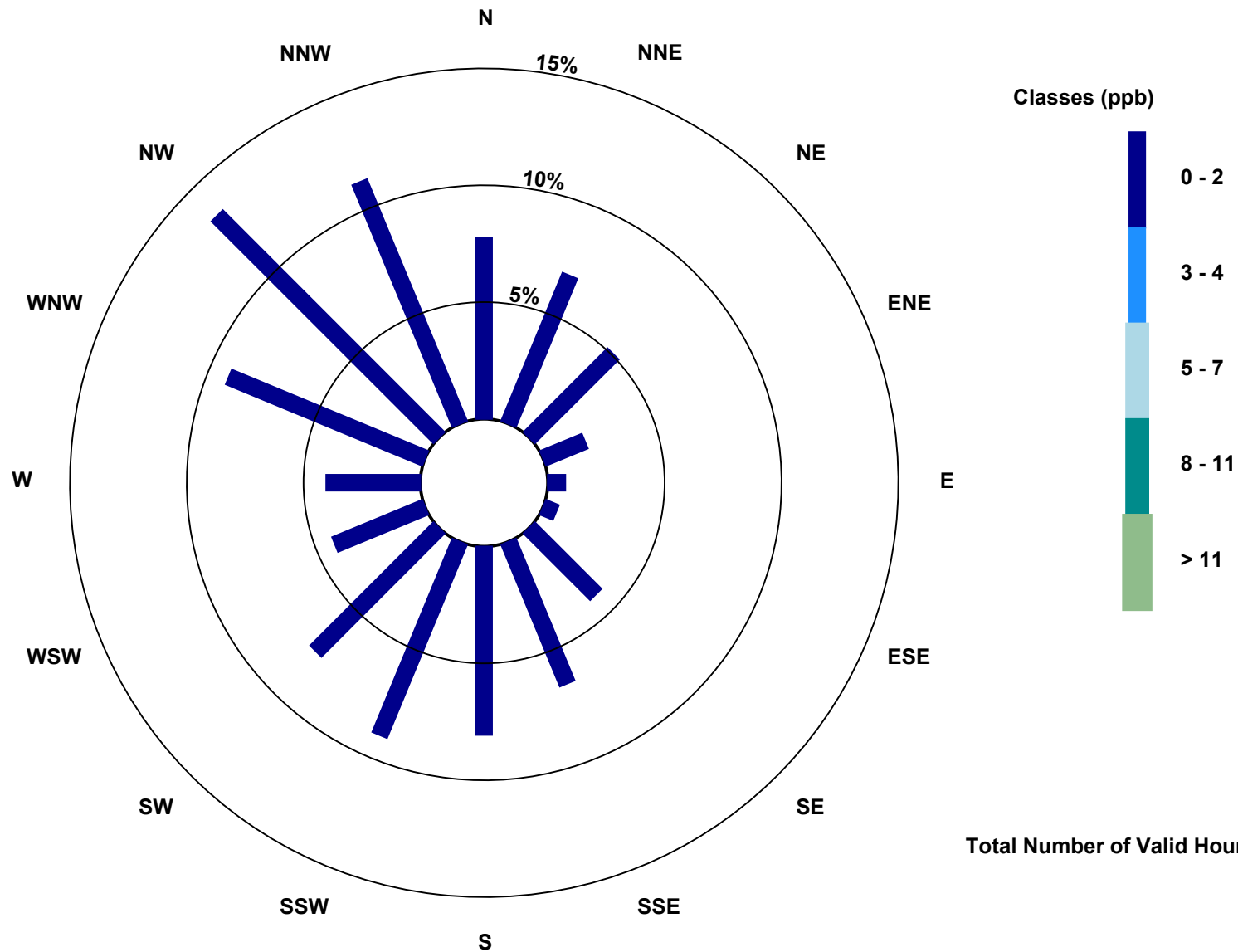
Total Number of Valid Hours: 670

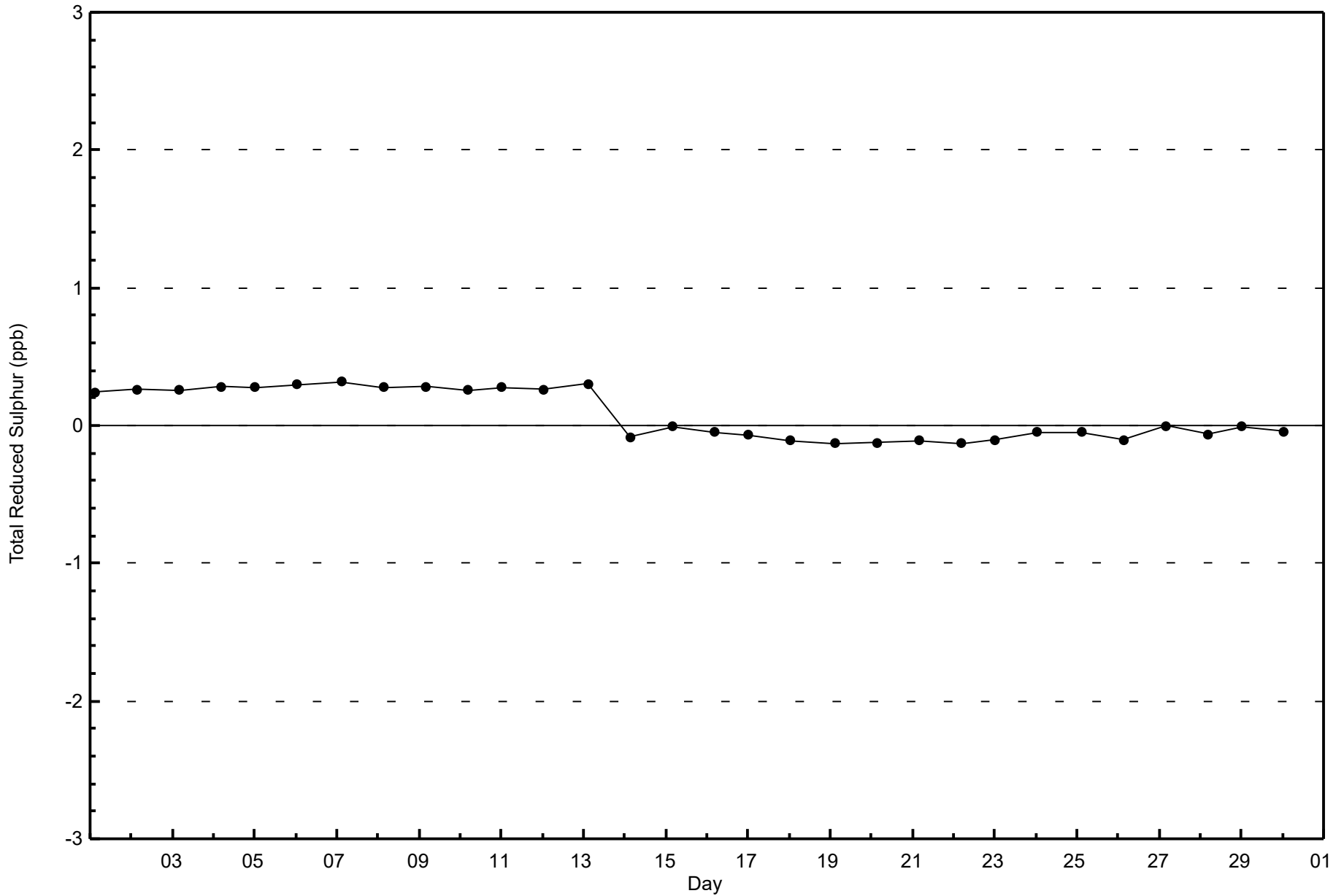
Total Number of Hours: 720

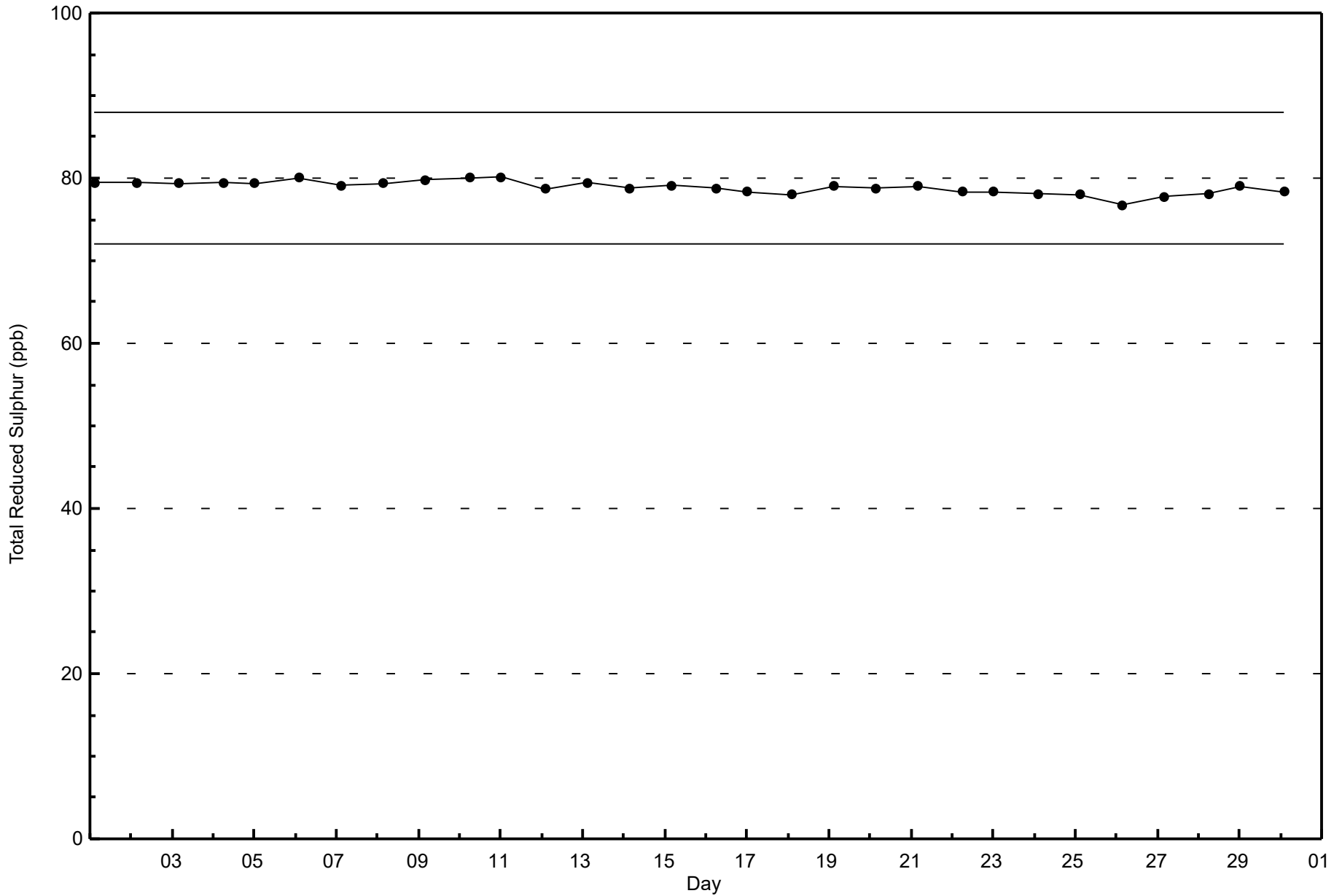


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Reduced Sulphur (TRS) - ppb  
Conklin









Wood Buffalo Environmental Association

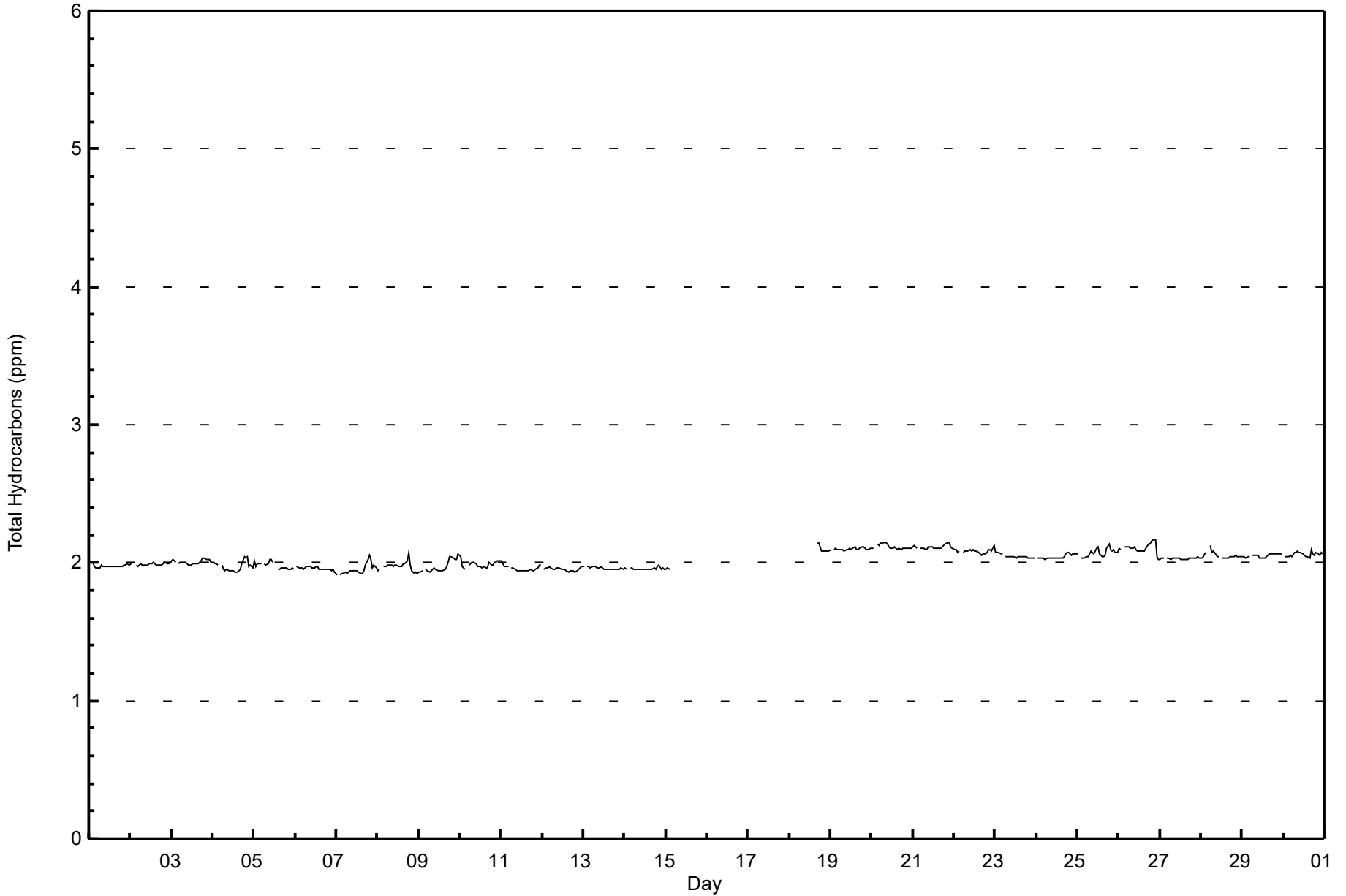
Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Conklin - November 2024

Maximum Value: 2.2 ppm on Nov 26 21:00																				Maximum Daily Average: 2.1 ppm on Nov 20					Hours in Service:	720	
Minimum Value: 1.9 ppm on Nov 7 03:00																				Minimum Daily Average: 2.0 ppm on Nov 7					Hours of Data:	606	
Maximum Diurnal Average: 2.0 ppm at hour 19																				Minimum Diurnal Average: 2.0 ppm at hour 16					Hours of Missing Data:	114	
Monthly Average: 2.02 ppm																				Percentiles: P <sub>1</sub> = 1.9 P <sub>10</sub> = 1.9 Q <sub>1</sub> = 2.0 Median = 2.0 Q <sub>3</sub> = 2.1 P <sub>90</sub> = 2.1 P <sub>99</sub> = 2.1					Hours of Calibration:	34	
																									Percent Operational Time:	88.9	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
2-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
3-Nov	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
4-Nov	2.0	2.0	2.0	2.0	Z	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
5-Nov	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	M	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
6-Nov	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0
7-Nov	1.9	Z	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
8-Nov	1.9	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.1
9-Nov	1.9	1.9	1.9	Z	2.0	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1
10-Nov	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
11-Nov	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0
12-Nov	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0
13-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0
14-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
15-Nov	2.0	2.0	1.9	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	2.0
16-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	C	C	C	C	UO	UO	UO	UO	UO	UO	UO	UO	--	--
17-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--
18-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	C	C	C	C	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	--	2.1
19-Nov	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
20-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
21-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2
22-Nov	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
23-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
24-Nov	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1
25-Nov	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
26-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.0	2.0	2.0	2.1	2.2
27-Nov	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
28-Nov	2.0	2.0	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1
29-Nov	2.0	2.0	2.0	2.0	2.0	Z	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
30-Nov	Z	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan                      C - Calibration                      M - Maintenance                      UO - Unstable Operation																											







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Conklin - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	420	69.31	69.31
2.1 - 3.0	186	30.69	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 606

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Conklin - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	29	30	28	12	4	2	23	26	22	44	35	23	17	45	43	29	412
2.1 - 3.0	23	16	9	4	1	2	6	12	7	6	3	1	6	9	37	44	186
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	52	46	37	16	5	4	29	38	29	50	38	24	23	54	80	73	598

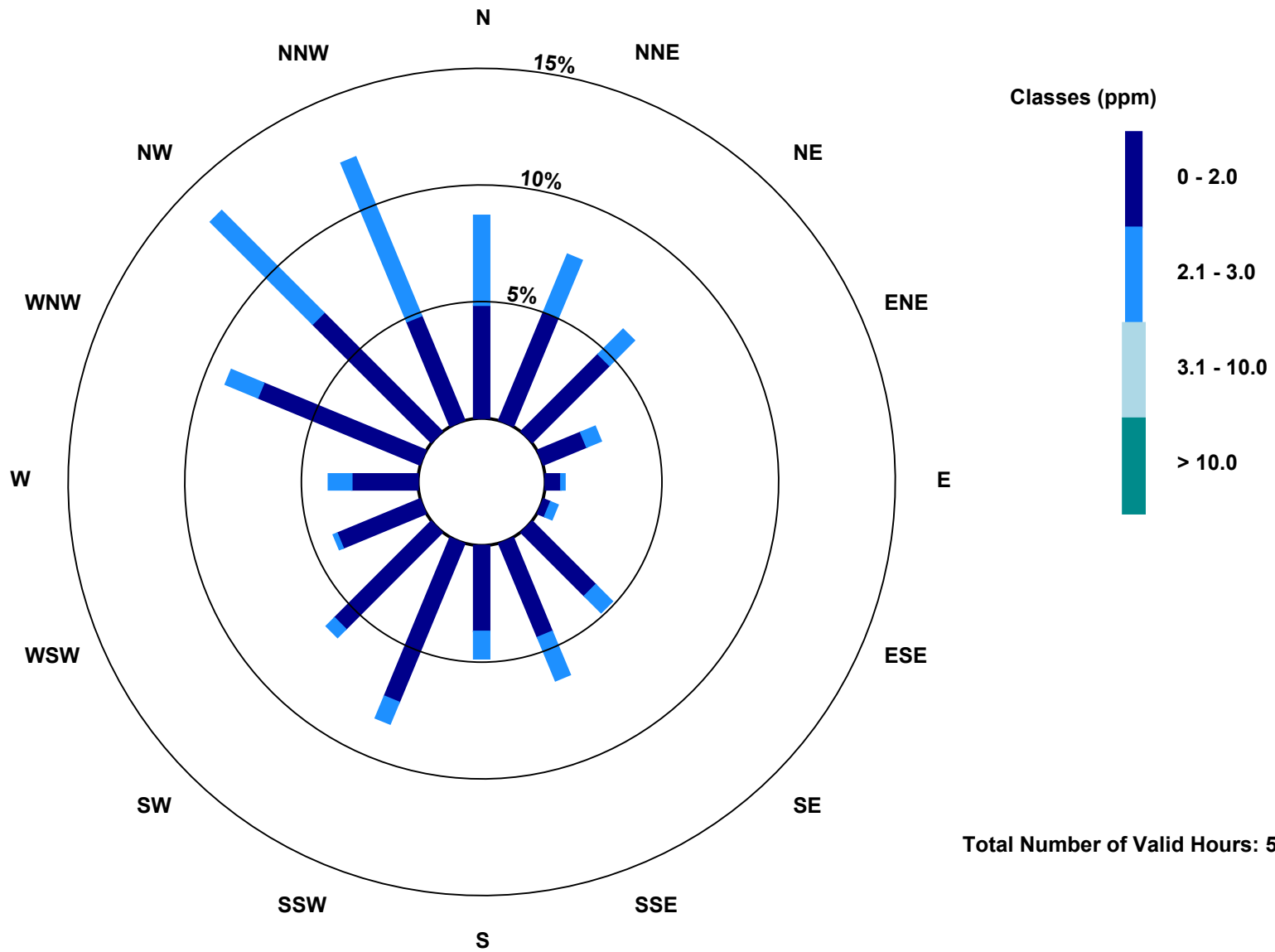
Total Number of Valid Hours: 598

Total Number of Hours: 720

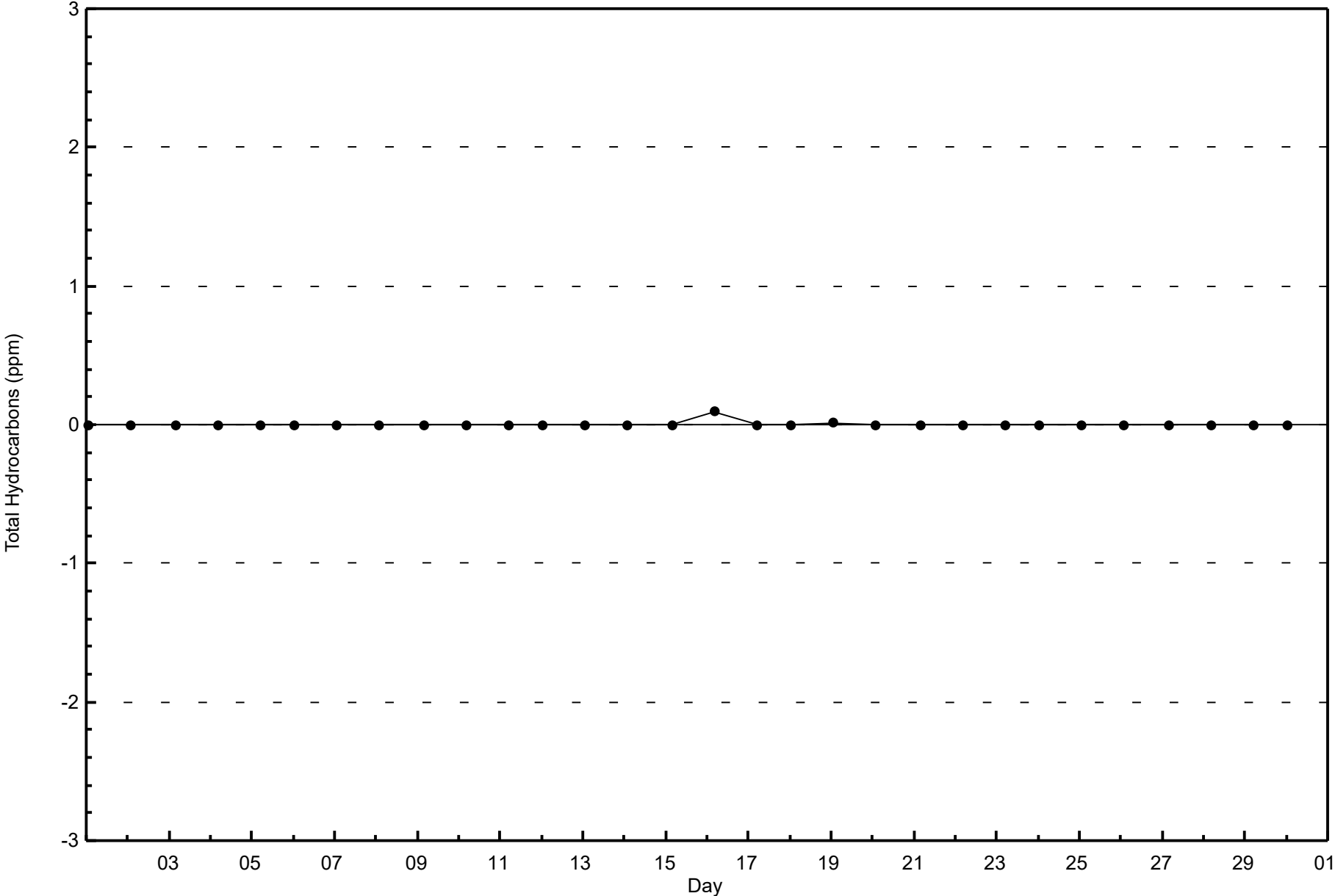


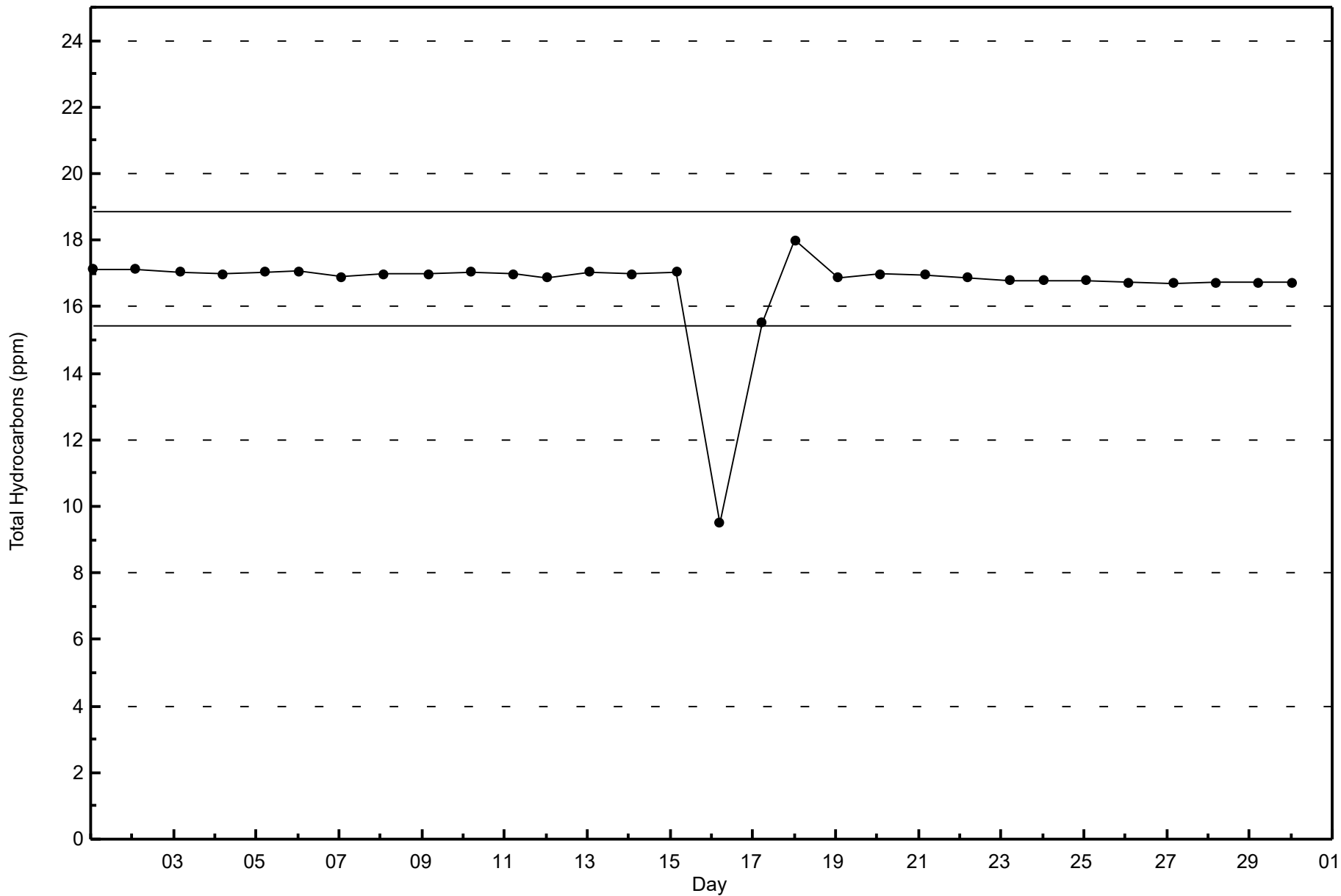
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Hydrocarbons (THC) - ppm  
Conklin



Total Number of Valid Hours: 598



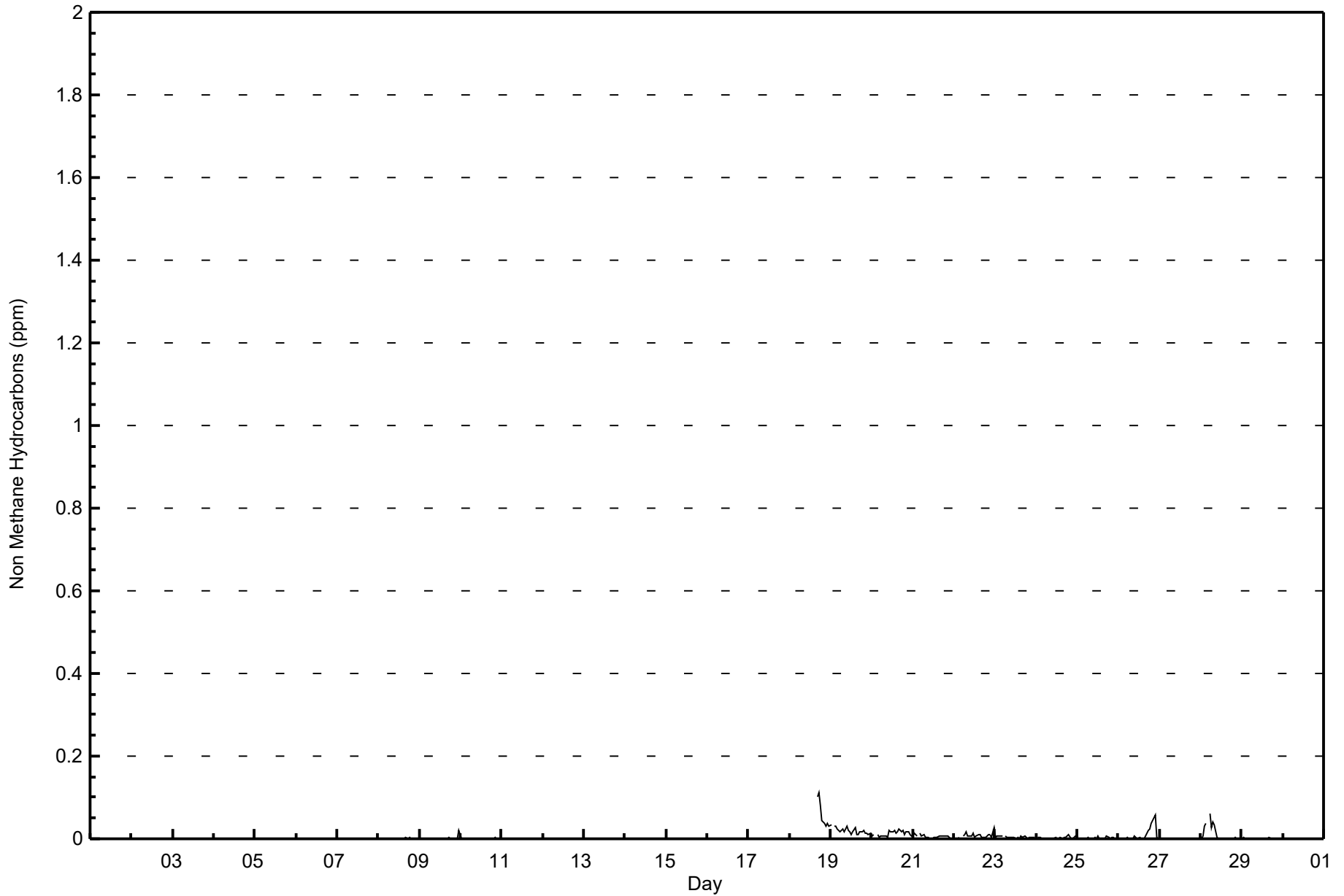




Summary of Hour Averages

Conklin - November 2024

Maximum Value: 0.110 ppm on Nov 18 18:00		Maximum Daily Average: 0.019 ppm on Nov 19		Hours in Service:	720																																												
Minimum Value: 0.000 ppm on Nov 1 01:00		Minimum Daily Average: 0.000 ppm on Nov 1		Hours of Data:	606																																												
Maximum Diurnal Average: 0.007 ppm at hour 18		Minimum Diurnal Average: 0.002 ppm at hour 13		Hours of Missing Data:	114																																												
Monthly Average: 0.004 ppm		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.0 P <sub>99</sub> = 0.0		Hours of Calibration:	34																																												
				Percent Operational Time:	88.9																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																
2-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																
3-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																
4-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																
5-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	M	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																
6-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																
7-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																
8-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																
9-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000															
10-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000															
11-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000															
12-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000															
13-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000															
14-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000															
15-Nov	0.000	0.000	0.000	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO														
16-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	C	C	C	C	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO														
17-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO														
18-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	C	C	C	0.103	0.110	0.081	0.043	0.038	0.032	0.037	0.031																							
19-Nov	0.035	Z	0.030	0.030	0.024	0.018	0.021	0.024	0.017	0.029	0.021	0.018	0.010	0.015	0.028	0.010	0.010	0.016	0.018	0.022	0.013	0.013	0.010	0.013																									
20-Nov	0.008	0.009	Z	0.011	0.004	0.008	0.008	0.005	0.006	0.005	0.019	0.018	0.018	0.020	0.013	0.017	0.024	0.016	0.021	0.012	0.015	0.017	0.011	0.008																									
21-Nov	0.006	0.012	0.008	Z	0.012	0.007	0.009	0.003	0.004	0.005	0.001	0.001	0.003	0.003	0.005	0.006	0.007	0.008	0.006	0.007	0.006	0.003	0.000	0.001																									
22-Nov	0.001	0.000	0.001	0.002	Z	0.006	0.009	0.016	0.008	0.008	0.007	0.014	0.004	0.008	0.009	0.009	0.004	0.005	0.004	0.008	0.010	0.010	0.004	0.027																									
23-Nov	0.003	0.007	0.008	0.005	0.006	Z	0.005	0.004	0.005	0.002	0.003	0.002	0.000	0.004	0.000	0.005	0.003	0.005	0.004	0.001	0.003	0.004	0.003	0.003																									
24-Nov	Z	0.004	0.003	0.002	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.004	0.001	0.000	0.002	0.001	0.003	0.005	0.007	0.010	0.002	0.000	0.003	0.005																									
25-Nov	0.002	Z	0.000	0.000	0.000	0.001	0.002	0.001	0.000	0.000	0.002	0.001	0.006	0.000	0.000	0.000	0.000	0.007	0.005	0.000	0.002	0.004	0.001	0.001																									
26-Nov	0.001	0.001	Z	0.002	0.001	0.002	0.001	0.001	0.001	0.006	0.002	0.000	0.002	0.002	0.001	0.001	0.008	0.020	0.022	0.037	0.045	0.057	0.003	0.000																									
27-Nov	0.001	0.000	0.000	Z	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																									
28-Nov	0.000	0.008	0.030	0.037	Z	0.060	0.028	0.042	0.032	0.004	0.001	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																									
29-Nov	0.000	0.002	0.000	0.000	0.000	Z	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																									
30-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																									
																								0.003	0.002	0.004	0.004	0.002	0.005	0.003	0.004	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.006	0.007	0.006	0.005	0.005	0.005	0.003	0.004	Diurnal Average	
																								0.035	0.012	0.030	0.037	0.024	0.060	0.028	0.042	0.032	0.029	0.021	0.018	0.018	0.020	0.028	0.017	0.103	0.110	0.081	0.043	0.045	0.057	0.037	0.031	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance				UO - Unstable Operation																	







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Conklin - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	508	83.83	83.83
0.006 - 0.05	93	15.35	99.17
0.06 - 0.1	5	0.83	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 606

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Conklin - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	34	34	33	14	5	4	29	37	26	50	35	23	17	48	61	50	500
0.006 - 0.05	17	12	4	2	0	0	0	1	3	0	3	1	5	6	18	21	93
0.06 - 0.1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	5
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	52	46	37	16	5	4	29	38	29	50	38	24	23	54	80	73	598

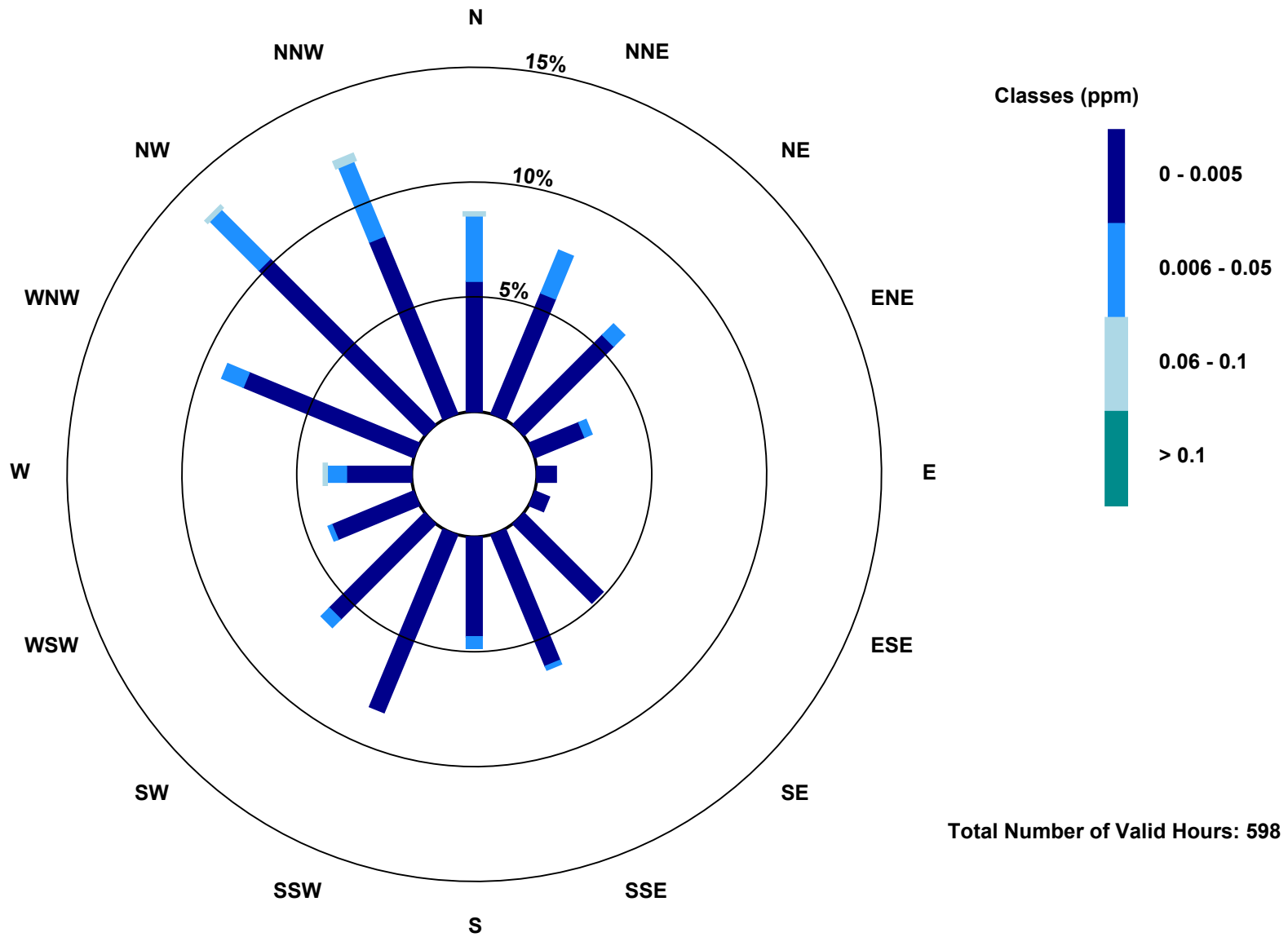
Total Number of Valid Hours: 598

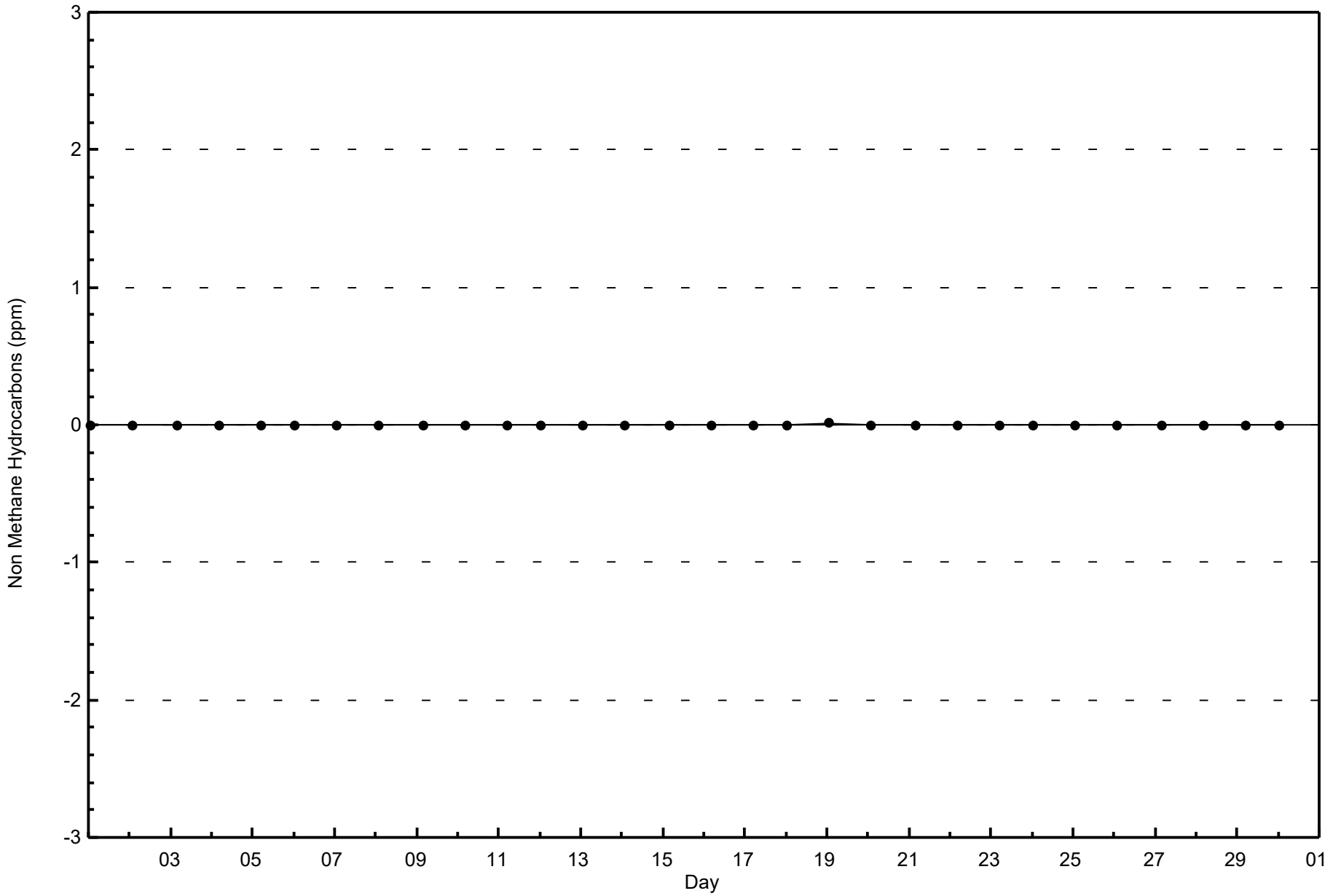
Total Number of Hours: 720

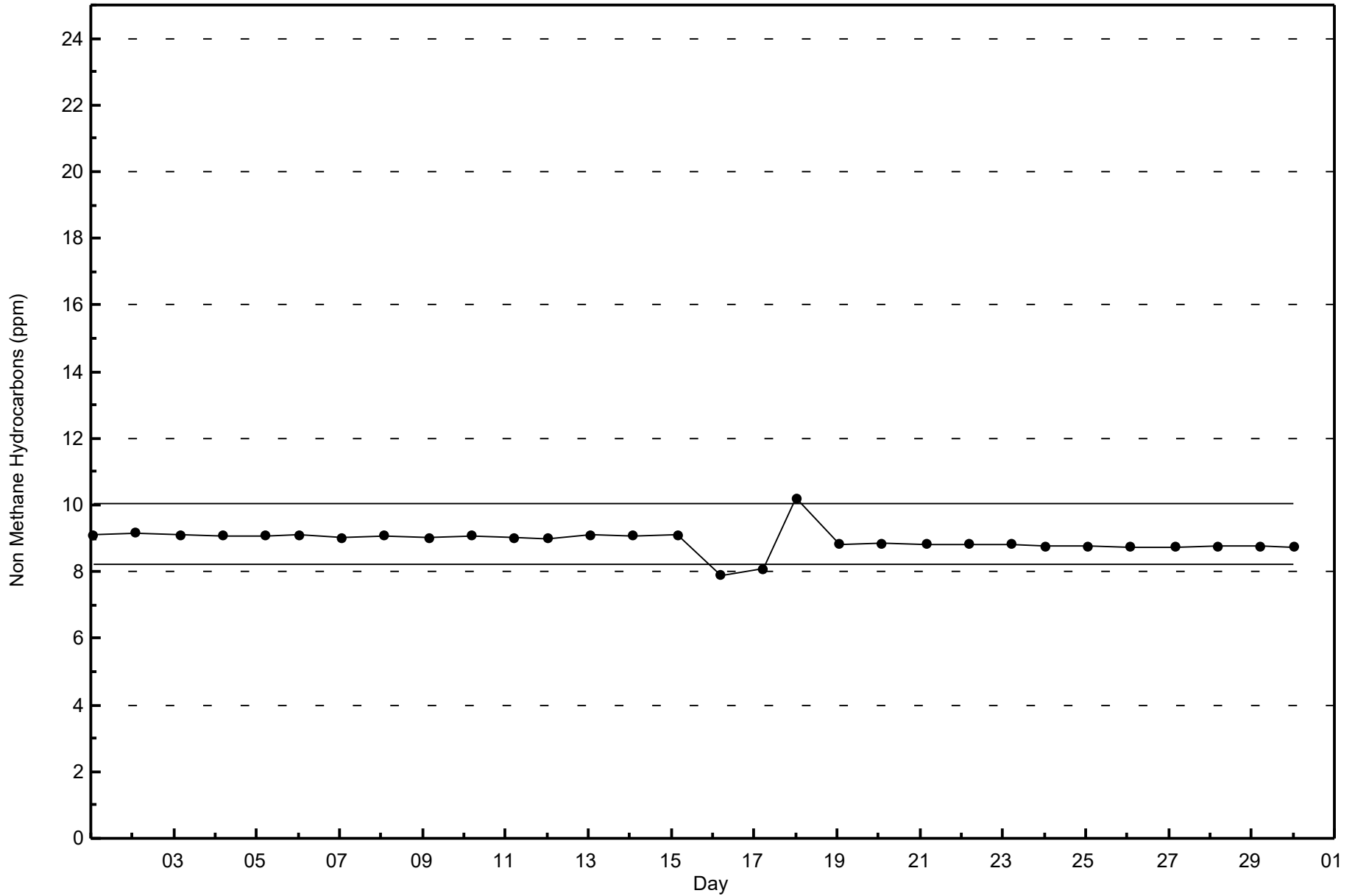


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

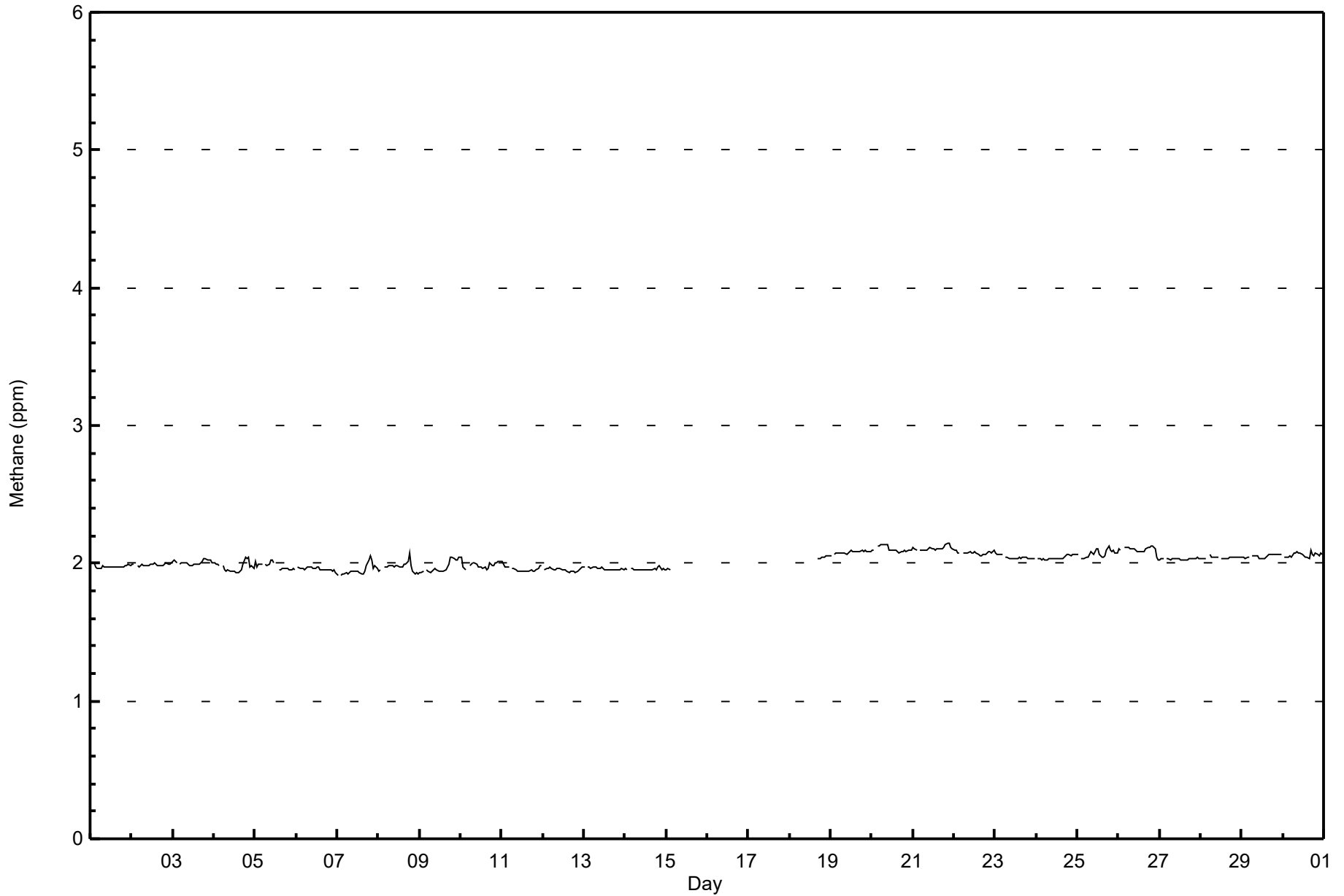
Non Methane Hydrocarbons (NMHC) - ppm  
Conklin













**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Conklin - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	432	71.29	71.29
2.1 - 3.0	174	28.71	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 606

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Conklin - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	30	33	28	12	4	2	23	27	22	44	35	23	17	45	48	31	424
2.1 - 3.0	22	13	9	4	1	2	6	11	7	6	3	1	6	9	32	42	174
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	52	46	37	16	5	4	29	38	29	50	38	24	23	54	80	73	598

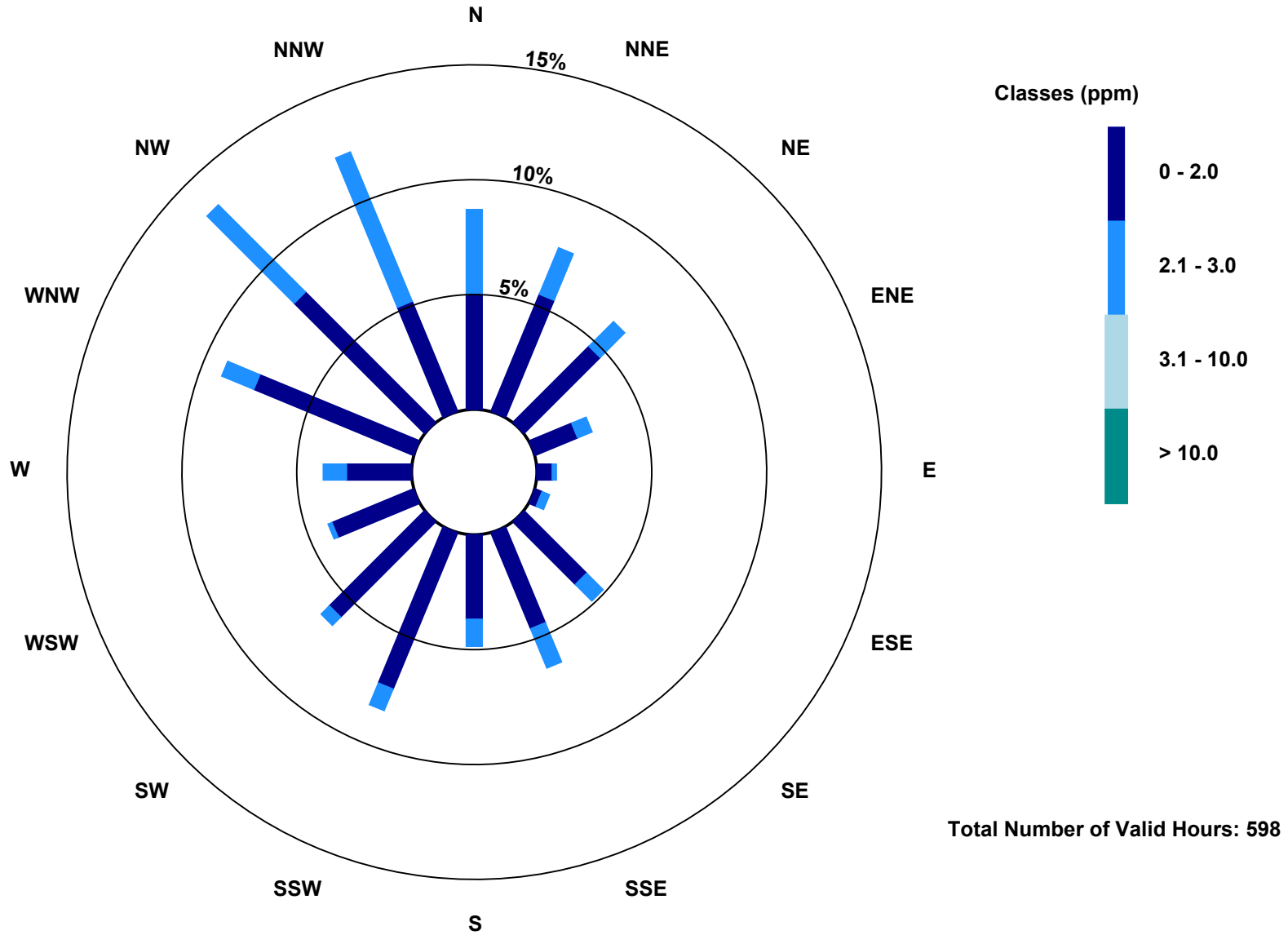
Total Number of Valid Hours: 598

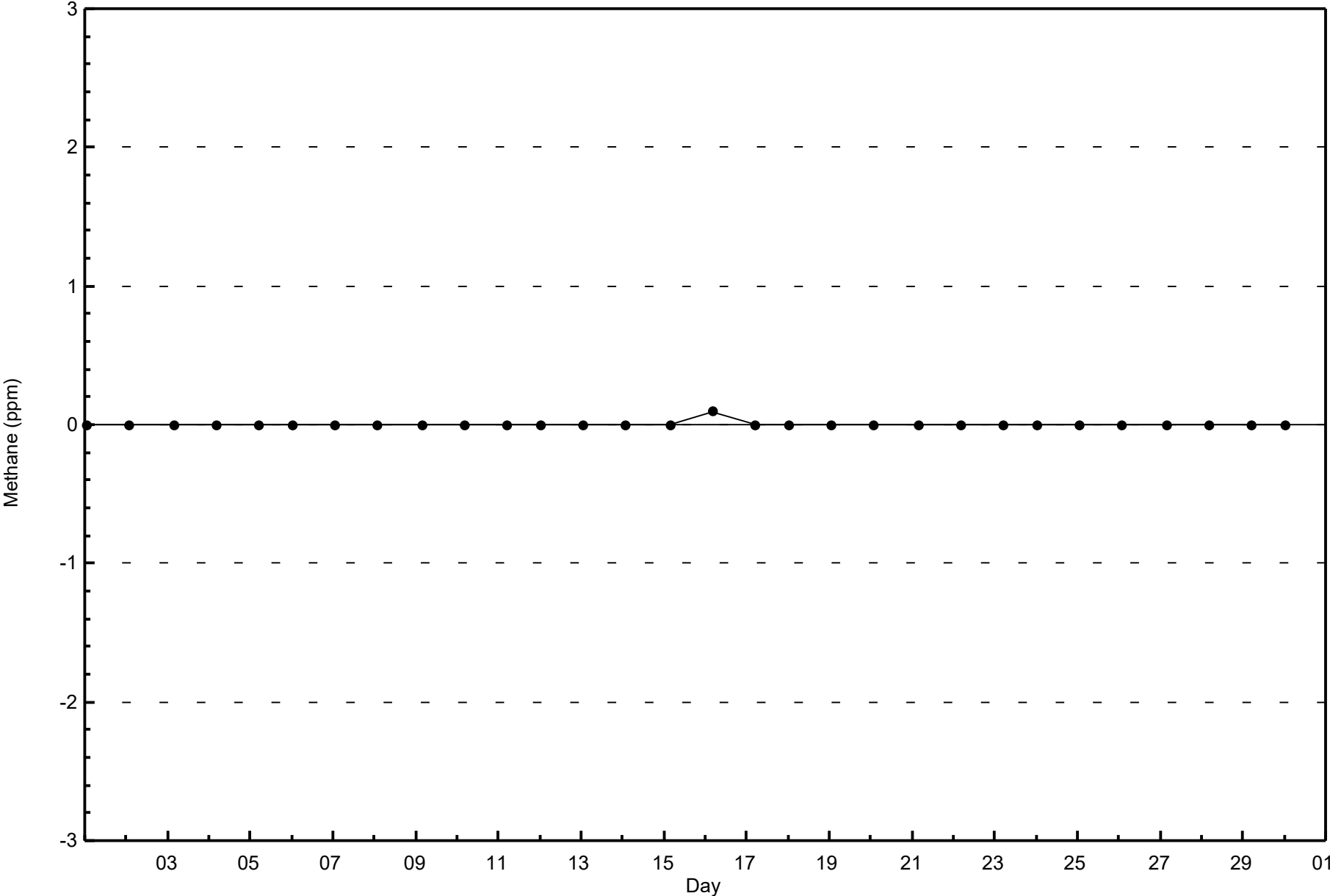
Total Number of Hours: 720

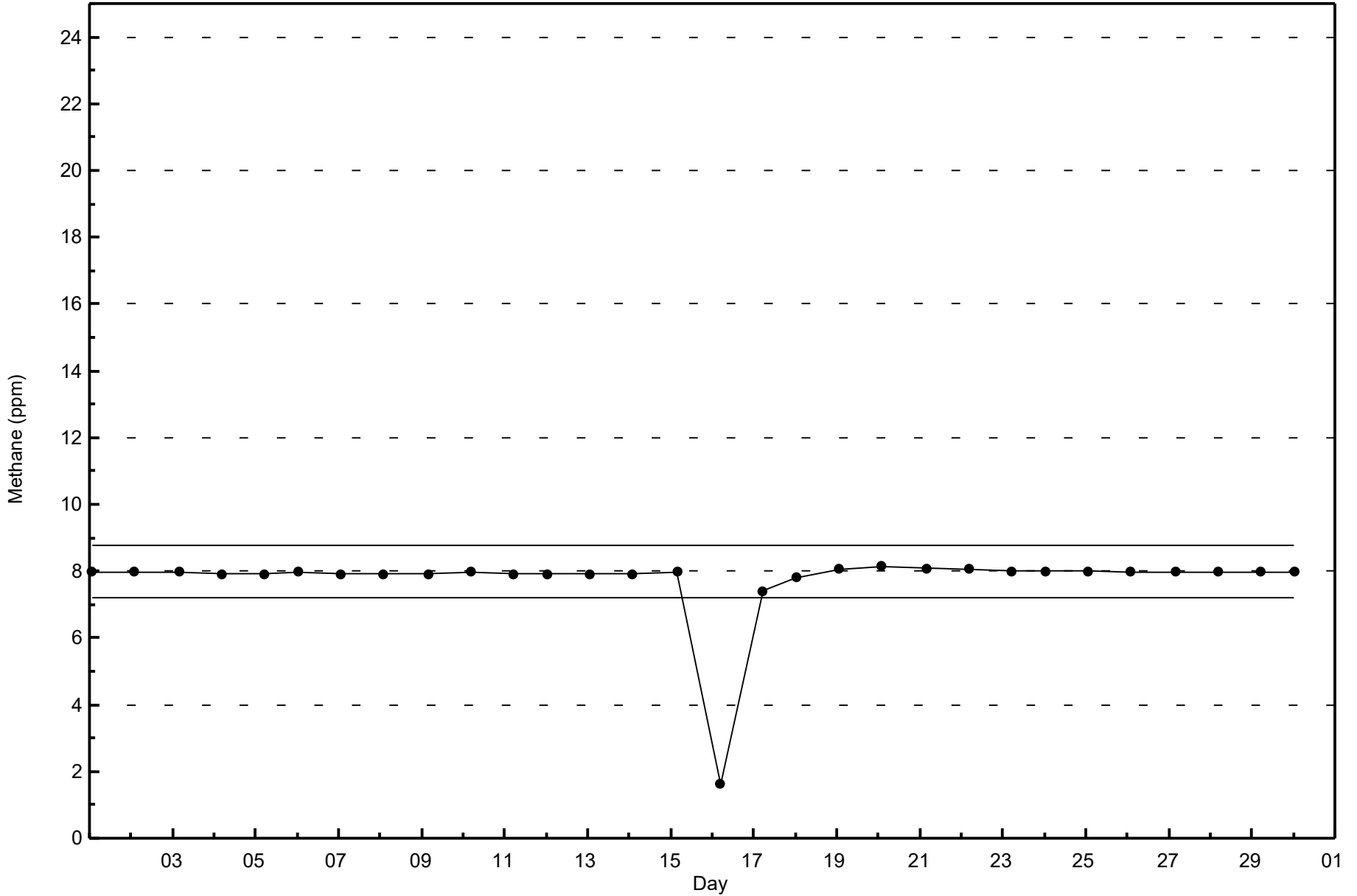


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Methane (CH<sub>4</sub>) - ppm  
Conklin









**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

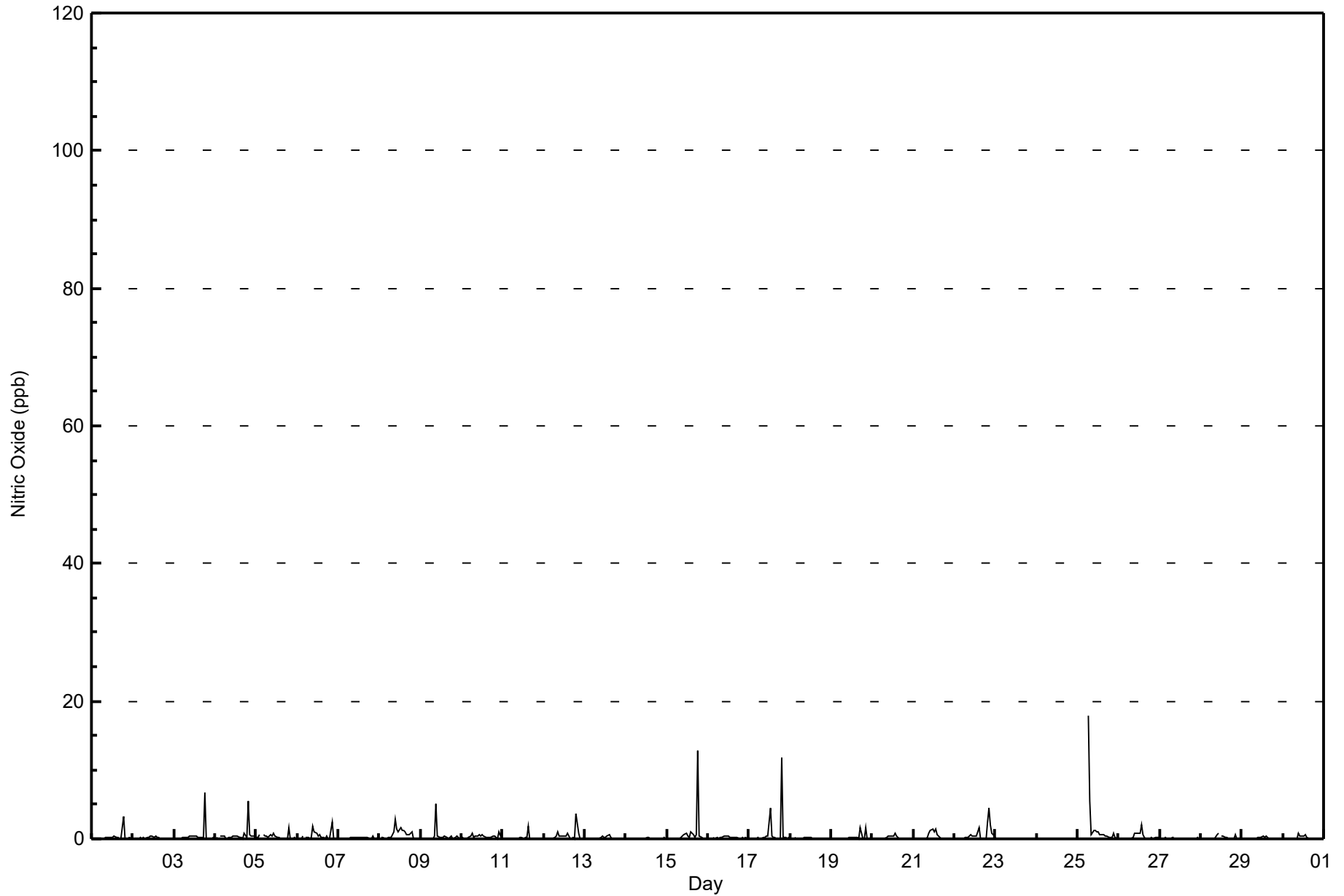
**Nitric Oxide (NO) - ppb**  
**Conklin - November 2024**

Maximum Value: 18.0 ppb on Nov 25 07:00																				Maximum Daily Average: 1.4 ppb on Nov 25					Hours in Service: 720		
Minimum Value: 0.0 ppb on Nov 1 01:00										Minimum Daily Average: 0.0 ppb on Nov 23					Hours of Data: 683												
Maximum Diurnal Average: 0.9 ppb at hour 20										Minimum Diurnal Average: 0.1 ppb at hour 2					Hours of Missing Data: 37												
Monthly Average: 0.33 ppb										Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.1 Q <sub>3</sub> = 0.3 P <sub>90</sub> = 0.6 P <sub>99</sub> = 4.6					Hours of Calibration: 36												
															Percent Operational Time: 99.9												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.0	3.2	0.0	0.1	0.0	0.1	0.1	0.2	3.2	
2-Nov	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.3	0.2	0.5	0.3	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.5
3-Nov	0.1	Z	0.0	0.0	0.1	0.2	0.1	0.2	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.2	0.1	0.2	6.8	0.1	0.1	0.0	0.0	0.1	0.5	6.8	
4-Nov	0.0	0.3	Z	0.3	0.4	0.4	0.1	0.1	0.3	0.2	0.5	0.4	0.4	0.4	0.2	0.1	0.9	0.2	5.5	0.6	0.3	0.4	0.5	0.5	5.5	5.5	
5-Nov	0.3	0.2	0.5	Z	0.5	0.5	0.5	0.3	0.6	0.3	0.9	0.5	0.3	0.1	0.0	0.0	0.1	0.1	0.0	1.6	0.1	0.0	0.1	0.0	0.3	1.6	
6-Nov	0.1	0.1	0.1	0.4	Z	0.1	0.3	0.0	0.2	1.8	0.9	0.9	0.5	0.5	0.3	0.2	0.0	0.3	0.0	0.0	2.4	0.0	0.0	0.0	0.4	2.4	
7-Nov	0.0	0.0	0.1	0.0	0.0	Z	0.0	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.3	0.1	0.0	0.3	0.0	0.0	0.1	0.1	0.3	
8-Nov	Z	0.2	0.3	0.1	0.0	0.1	0.1	0.2	0.9	2.9	1.4	1.1	1.6	1.3	1.3	1.0	0.7	0.5	0.8	1.1	0.1	0.0	0.0	0.0	0.7	2.9	
9-Nov	0.1	Z	0.0	0.1	0.1	0.0	0.0	0.0	0.5	5.0	0.4	0.2	0.2	0.1	0.4	0.2	0.1	0.1	0.5	0.1	0.2	0.3	0.2	0.1	0.4	5.0	
10-Nov	0.2	0.1	Z	0.1	0.1	0.4	0.8	0.1	0.4	0.4	0.5	0.5	0.5	0.5	0.3	0.2	0.3	0.2	0.4	0.5	0.3	0.0	1.1	0.1	0.3	1.1	
11-Nov	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.2	1.8	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.8	
12-Nov	0.0	0.1	0.0	0.1	Z	0.1	0.2	0.4	1.0	0.4	0.4	0.4	0.3	0.3	0.8	0.1	0.0	0.2	0.0	3.7	0.7	0.0	0.0	0.0	0.4	3.7	
13-Nov	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.2	0.5	0.2	0.3	0.4	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	
14-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	
15-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.5	0.8	0.3	0.2	1.1	0.5	0.2	0.6	12.7	0.3	0.2	0.0	0.1	0.0	0.8	12.7	
16-Nov	0.0	0.1	Z	0.1	0.1	0.2	0.1	0.1	0.1	0.4	0.4	0.3	0.4	0.2	0.2	0.1	0.2	0.1	0.0	0.0	0.2	0.0	0.1	0.1	0.2	0.4	
17-Nov	0.1	0.0	0.0	Z	0.0	0.1	0.0	0.0	0.2	0.2	0.4	0.5	4.5	0.4	0.2	0.1	0.1	0.0	0.0	11.8	0.1	0.1	0.0	0.1	0.8	11.8	
18-Nov	0.1	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.2	0.2	0.2	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
19-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.3	0.2	0.2	0.0	1.6	0.0	0.0	1.7	0.1	0.0	0.0	0.2	1.7	
20-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.4	0.5	0.7	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	
21-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.2	1.4	1.0	1.5	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.5	
22-Nov	0.0	0.0	Z	0.0	0.0	0.1	0.2	0.1	0.1	0.5	0.4	0.3	0.4	0.5	1.7	0.1	0.0	0.0	0.0	2.4	4.4	2.0	0.8	0.4	0.6	4.4	
23-Nov	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
24-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	
25-Nov	0.1	0.1	0.1	0.1	0.1	Z	18.0	5.4	0.5	1.3	1.1	1.0	1.0	0.6	0.6	0.5	0.4	0.4	0.3	0.2	0.1	0.8	0.3	0.1	1.4	18.0	
26-Nov	Z	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.8	0.9	0.7	0.9	2.0	0.6	0.2	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.3	2.0	
27-Nov	0.0	Z	0.1	0.1	0.1	0.0	0.0	0.1	0.1	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	--	0.2	
28-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.9	M	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.2	0.9	
29-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
30-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.8	0.3	0.4	0.4	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan      C - Calibration      M - Maintenance																											



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Conklin - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Conklin - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	683	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Conklin - November 2024**

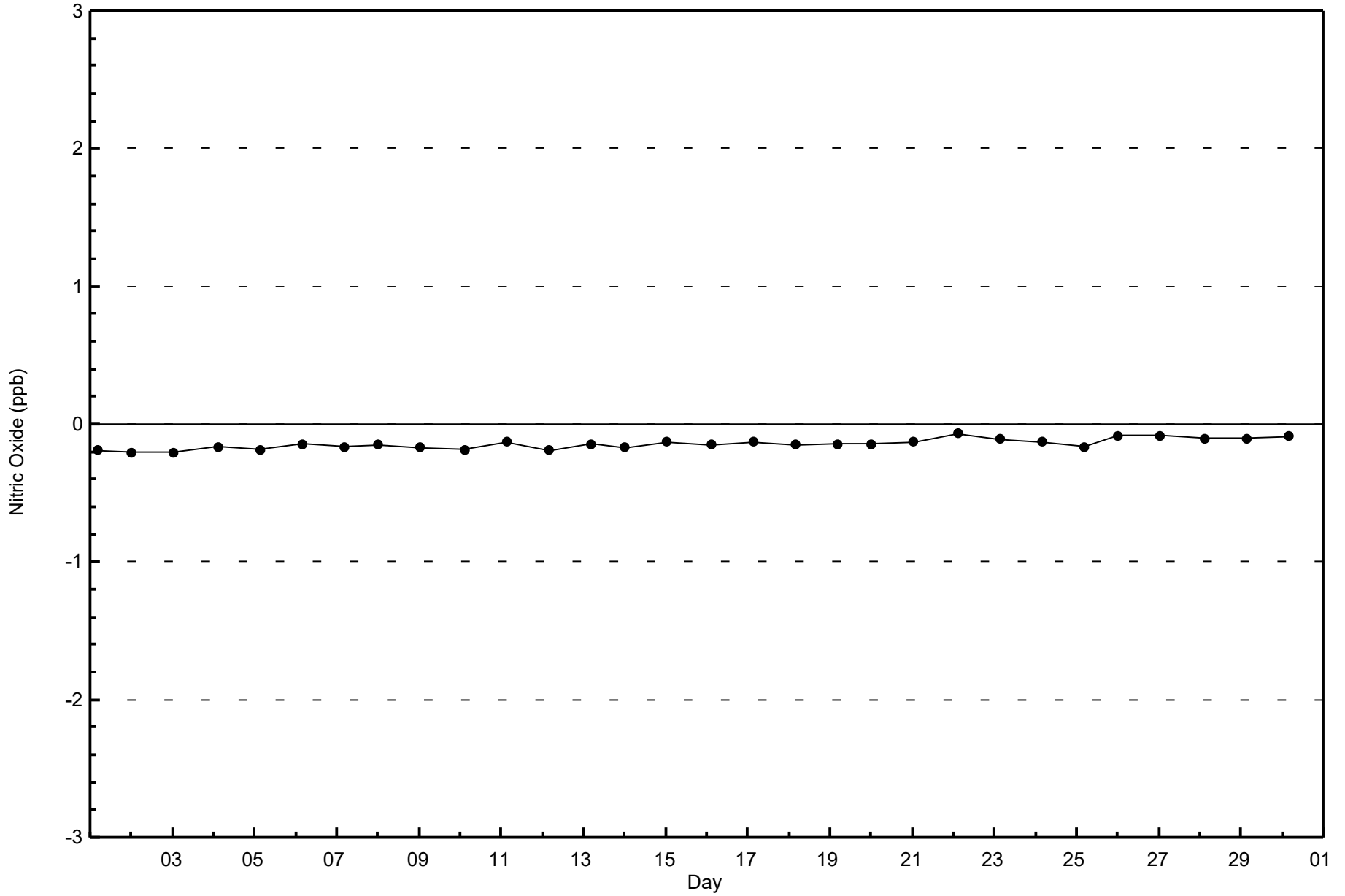
<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	52	46	40	15	5	4	28	43	56	61	51	28	25	62	85	74	675
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	52	46	40	15	5	4	28	43	56	61	51	28	25	62	85	74	675

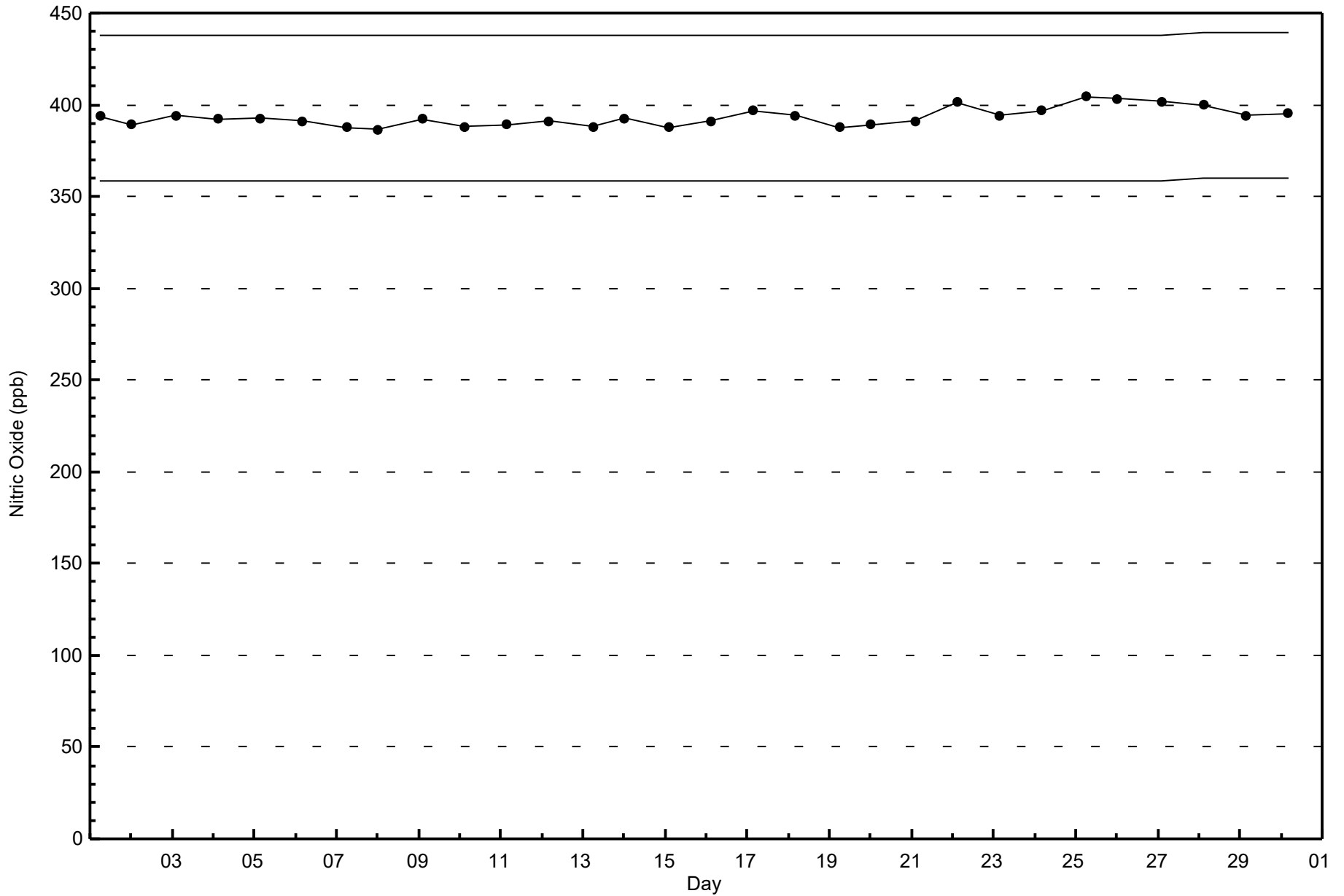
Total Number of Valid Hours: 675

Total Number of Hours: 720











Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb

Conklin - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 11.5 ppb on Nov 25 08:00	Maximum Daily Average: 4.0 ppb on Nov 25		Hours of Data:	683
Minimum Value: 0.1 ppb on Nov 23 20:00	Minimum Daily Average: 0.5 ppb on Nov 14		Hours of Missing Data:	37
Maximum Diurnal Average: 2.8 ppb at hour 21	Minimum Diurnal Average: 1.3 ppb at hour 4		Hours of Calibration:	36
Monthly Average: 1.81 ppb	Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.9 Median = 1.5 Q <sub>3</sub> = 2.3 P <sub>90</sub> = 3.3 P <sub>99</sub> = 8.3		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.3	0.3	0.5	0.3	0.4	Z	0.4	1.0	1.5	1.9	0.8	1.0	1.3	2.0	1.8	1.7	1.5	1.4	2.2	1.4	1.3	1.2	1.7	1.2	1.2	2.2
2-Nov	Z	1.1	1.0	1.3	1.3	0.9	2.1	1.4	1.8	2.3	2.0	1.8	1.2	2.1	1.6	1.0	1.2	1.2	1.3	1.5	1.8	1.2	0.7	1.0	1.4	2.3
3-Nov	0.6	Z	0.8	1.3	1.6	1.2	1.5	2.3	1.7	1.5	1.1	1.0	1.1	1.4	1.4	1.6	1.8	1.8	6.4	4.8	1.7	1.7	1.6	1.6	1.8	6.4
4-Nov	1.4	1.5	Z	1.5	1.2	1.0	0.9	1.0	0.8	0.6	0.8	1.0	1.0	0.6	0.6	1.2	1.8	5.5	3.0	6.5	3.8	4.0	3.5	3.1	2.0	6.5
5-Nov	2.3	2.2	2.1	Z	1.6	1.5	2.1	1.9	1.6	1.8	3.3	2.2	1.1	0.7	0.6	0.7	0.8	1.0	0.7	1.4	0.6	0.5	0.6	0.7	1.4	3.3
6-Nov	0.7	1.3	1.0	2.4	Z	1.7	1.3	1.5	2.8	3.9	2.6	2.2	2.2	2.2	1.6	1.4	1.3	1.6	1.6	1.8	4.1	1.6	1.5	1.2	1.9	4.1
7-Nov	0.8	0.7	0.7	0.6	0.5	Z	0.6	1.9	1.4	1.3	1.1	0.8	0.6	0.6	0.8	1.8	2.7	3.2	1.8	1.3	2.4	1.4	1.3	2.1	1.3	3.2
8-Nov	Z	1.9	2.2	2.6	2.6	2.6	3.4	3.1	3.3	4.1	3.8	4.2	3.4	3.3	3.5	5.2	4.7	4.7	3.6	3.6	1.2	0.3	0.7	0.5	3.0	5.2
9-Nov	0.9	Z	1.1	1.0	1.2	1.1	0.6	1.4	2.7	9.5	1.6	0.9	1.2	1.0	1.0	1.3	1.4	2.2	2.4	2.6	3.1	3.0	2.0	1.2	1.9	9.5
10-Nov	0.9	0.8	Z	0.8	1.0	1.6	1.9	1.9	1.6	1.1	1.4	1.4	1.6	1.6	1.6	3.5	4.3	2.4	2.4	2.4	1.5	1.2	2.7	2.6	1.8	4.3
11-Nov	3.2	2.8	2.0	Z	2.1	1.2	1.1	1.0	1.6	0.9	1.5	1.2	1.4	1.4	1.6	1.8	1.2	1.2	1.6	1.3	1.6	2.0	2.1	2.2	1.7	3.2
12-Nov	2.1	1.4	1.3	1.3	Z	1.3	1.1	1.5	1.9	1.7	1.3	1.1	1.0	1.0	1.2	0.8	0.9	1.2	1.0	2.7	5.1	1.1	1.3	1.3	1.5	5.1
13-Nov	1.5	1.1	1.4	0.7	0.6	Z	1.4	1.2	0.7	1.2	1.4	0.7	1.0	1.6	2.9	1.3	0.9	0.7	0.7	0.8	0.6	0.4	0.5	0.5	1.0	2.9
14-Nov	Z	1.0	0.8	0.7	0.6	0.5	0.4	0.4	0.4	0.5	0.4	0.6	0.9	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.7	0.3	0.5	1.0
15-Nov	0.2	Z	0.5	0.3	0.4	0.9	1.9	1.0	1.8	2.0	1.9	1.6	1.0	1.0	2.0	1.6	1.8	2.2	4.5	1.6	1.3	1.2	1.2	1.0	1.4	4.5
16-Nov	0.8	0.7	Z	0.9	0.8	1.3	1.3	1.1	0.9	1.1	1.4	1.5	1.6	1.8	2.0	2.0	2.3	2.2	2.2	2.2	2.8	3.0	2.0	1.9	1.6	3.0
17-Nov	2.1	1.6	1.6	Z	2.2	2.0	1.8	2.0	2.2	2.7	2.7	2.4	2.2	2.1	1.9	1.8	1.5	1.6	1.6	3.1	1.3	1.3	0.8	1.2	1.9	3.1
18-Nov	1.1	0.6	0.6	1.1	Z	0.5	0.6	0.5	2.3	1.1	1.0	0.8	0.5	0.7	0.8	1.3	0.6	0.4	0.3	0.4	0.3	0.4	0.5	0.6	0.7	2.3
19-Nov	0.6	0.5	0.6	1.4	1.0	Z	0.9	0.4	0.3	0.3	1.9	1.9	1.9	2.1	2.2	2.3	1.5	2.9	1.8	2.4	4.2	2.6	1.7	1.6	1.6	4.2
20-Nov	Z	1.8	2.2	2.7	2.6	2.4	2.5	4.4	3.2	3.7	2.7	2.3	1.9	2.4	2.7	2.3	1.7	1.8	2.2	3.2	2.4	3.5	3.4	2.8	2.6	4.4
21-Nov	2.9	Z	2.5	2.6	1.9	2.1	1.6	1.7	2.3	3.7	3.1	3.1	2.5	3.0	2.9	3.5	3.0	2.9	3.5	5.9	6.5	6.6	4.4	2.9	3.3	6.6
22-Nov	1.6	1.2	Z	0.9	0.8	1.2	1.6	2.0	1.4	2.1	1.3	0.9	1.2	1.4	1.9	1.9	3.8	2.5	3.1	3.6	8.9	9.5	9.6	8.3	3.1	9.6
23-Nov	4.9	3.0	2.4	Z	2.0	1.2	0.6	0.4	0.2	0.3	0.3	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.8	4.9
24-Nov	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.6	1.2	2.5	3.2	2.3	2.7	0.7	3.2
25-Nov	1.9	1.4	0.5	0.9	1.1	Z	8.4	11.5	5.4	3.8	2.7	1.9	2.1	1.6	1.7	2.7	4.2	3.5	2.8	5.2	7.0	7.8	8.4	6.5	4.0	11.5
26-Nov	Z	3.8	3.0	2.2	2.4	1.9	2.5	2.6	2.3	2.7	2.4	2.2	2.8	2.9	2.9	2.9	3.3	3.2	3.3	4.1	4.6	4.0	1.8	1.3	2.8	4.6
27-Nov	0.9	Z	1.1	1.0	1.0	0.9	1.3	1.4	1.2	C	C	C	C	C	C	0.2	0.6	1.2	1.0	1.1	0.8	1.1	1.5	1.0	--	1.5
28-Nov	1.0	1.0	Z	1.0	1.2	2.1	2.0	2.9	2.5	3.3	2.7	M	1.2	1.3	1.4	2.0	1.8	1.6	2.2	2.2	7.5	3.3	3.1	3.3	2.3	7.5
29-Nov	2.0	1.3	1.2	Z	2.0	1.9	3.0	2.6	3.2	2.5	0.9	0.6	0.9	1.0	1.9	3.8	4.2	3.3	2.8	3.2	3.1	3.0	2.7	2.3	2.3	4.2
30-Nov	2.1	2.1	1.8	1.7	Z	1.5	1.9	1.8	2.0	1.9	1.6	1.5	1.6	2.6	1.9	1.1	0.9	0.7	0.5	0.8	1.1	1.5	0.6	0.4	1.5	2.6

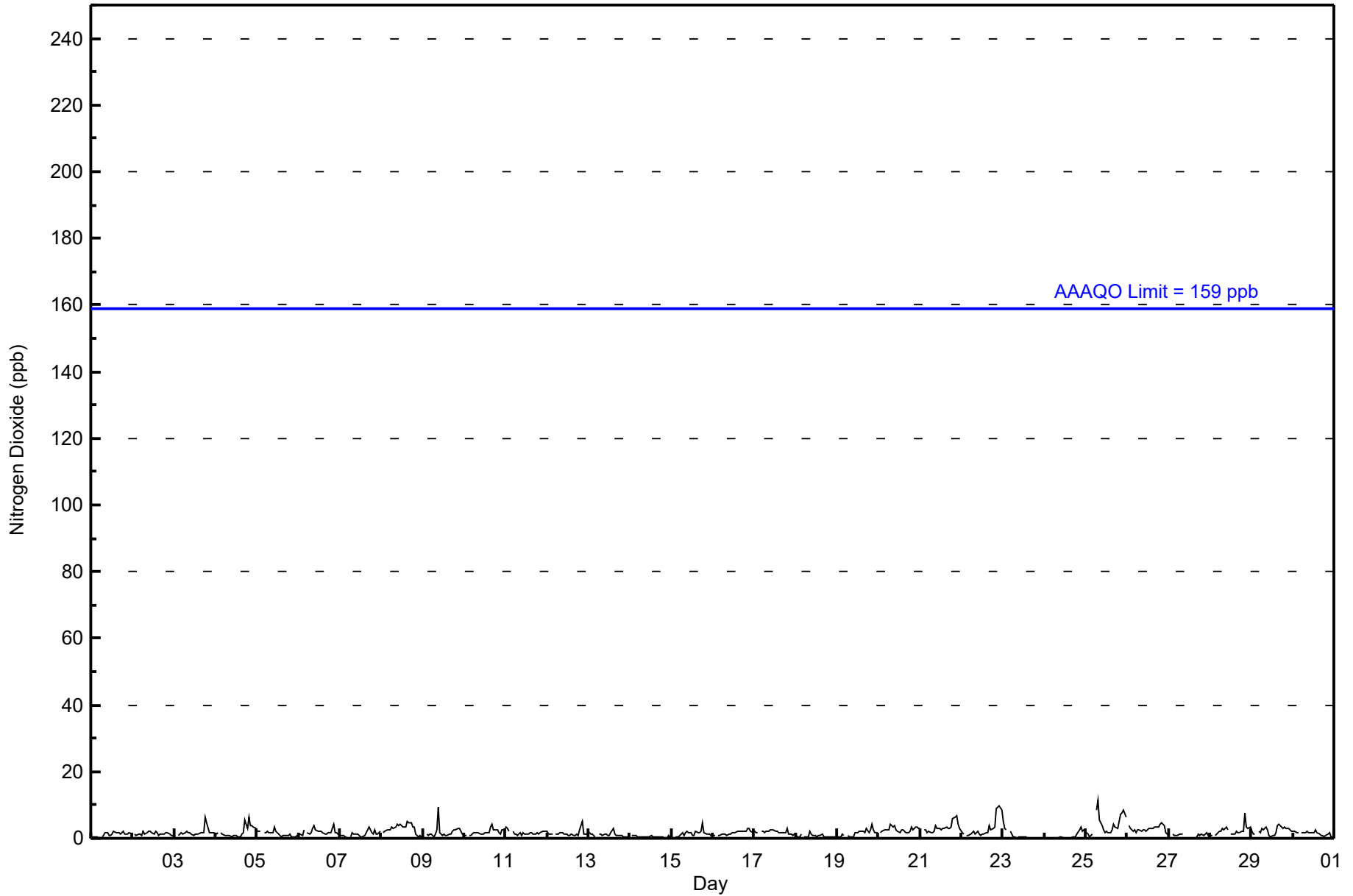
1.5	1.4	1.3	1.3	1.4	1.4	1.7	1.9	1.8	2.2	1.7	1.5	1.4	1.5	1.6	1.8	1.9	2.0	2.1	2.4	2.8	2.4	2.2	1.9	Diurnal Average	
4.9	3.8	3.0	2.7	2.6	2.6	8.4	11.5	5.4	9.5	3.8	4.2	3.4	3.3	3.5	5.2	4.7	5.5	6.4	6.5	8.9	9.5	9.6	8.3	Diurnal Maximum	

Z - zerspan      C - Calibration      M - Maintenance  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Conklin - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Conklin - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	683	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Conklin - November 2024**

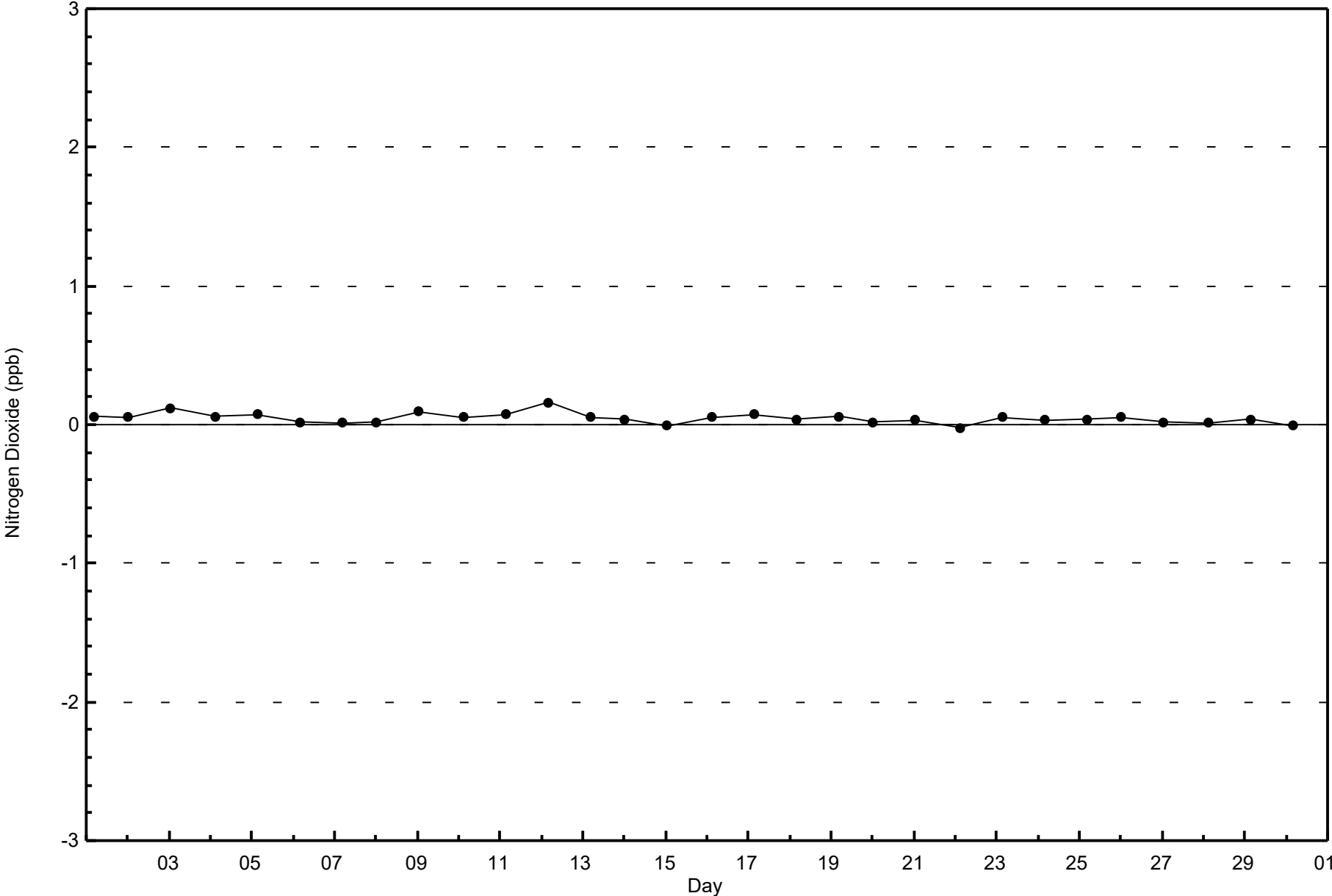
<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 20	52	46	40	15	5	4	28	43	56	61	51	28	25	62	85	74	675
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	52	46	40	15	5	4	28	43	56	61	51	28	25	62	85	74	675

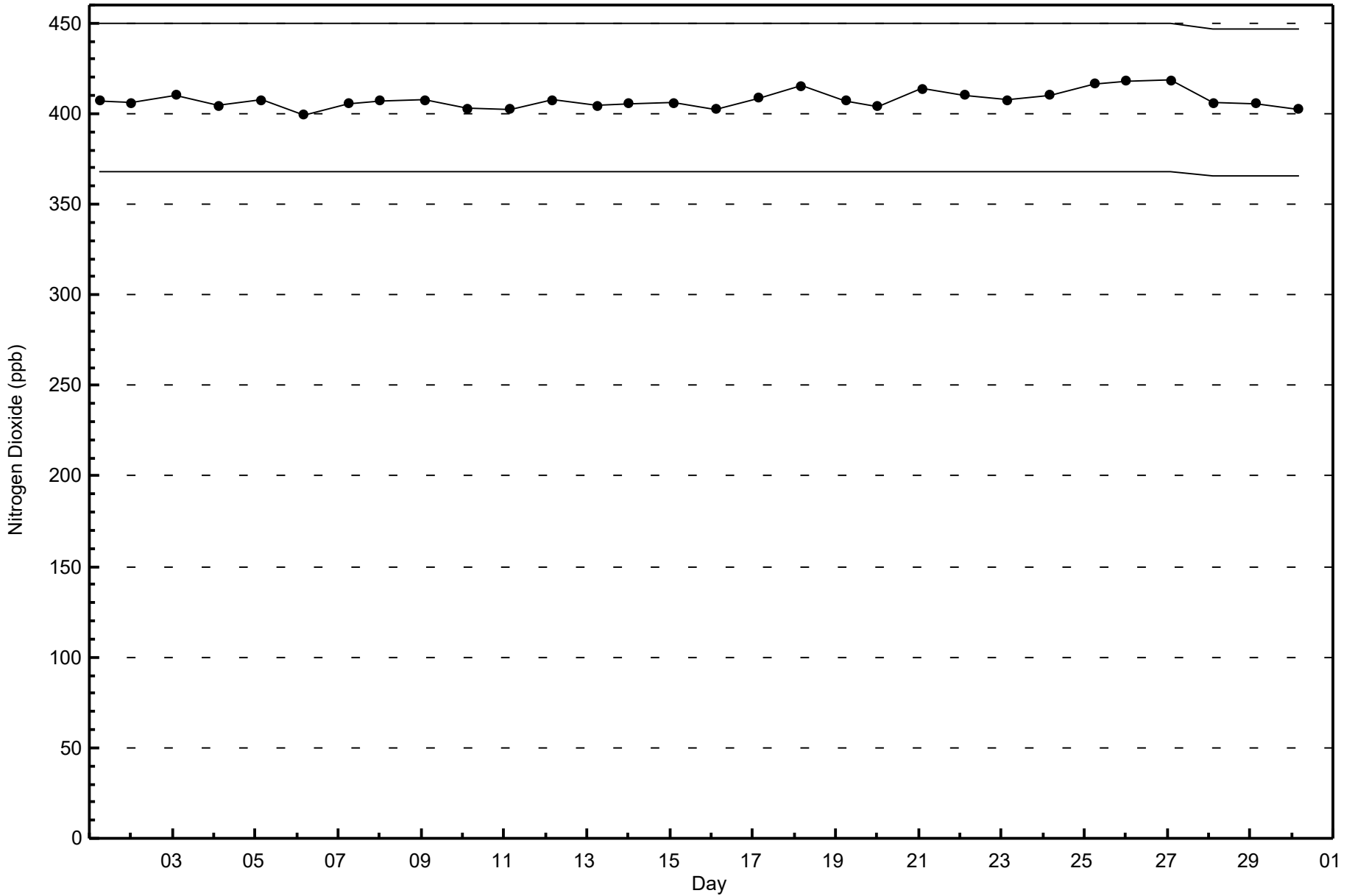
Total Number of Valid Hours: 675

Total Number of Hours: 720











**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

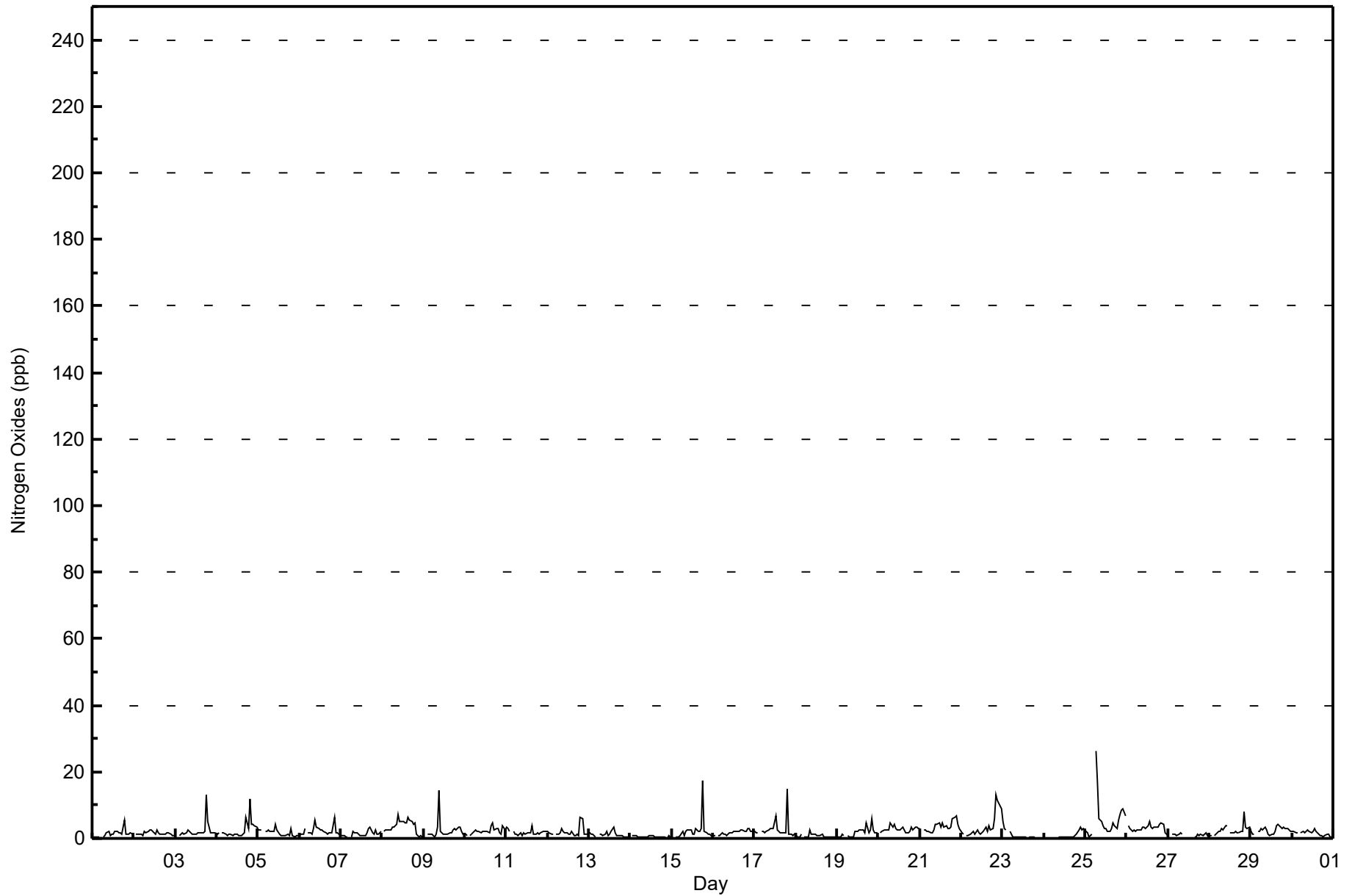
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Conklin - November 2024**

Maximum Value: 26.4 ppb on Nov 25 07:00		Maximum Daily Average: 5.5 ppb on Nov 25		Hours in Service: 720																							
Minimum Value: 0.1 ppb on Nov 24 04:00		Minimum Daily Average: 0.5 ppb on Nov 14		Hours of Data: 683																							
Maximum Diurnal Average: 3.3 ppb at hour 20		Minimum Diurnal Average: 1.3 ppb at hour 4		Hours of Missing Data: 37																							
Monthly Average: 2.14 ppb		Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 1.0 Median = 1.7 Q <sub>3</sub> = 2.6 P <sub>90</sub> = 3.8 P <sub>99</sub> = 12.2		Hours of Calibration: 36																							
				Percent Operational Time: 99.9																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.3	0.3	0.5	0.3	0.4	Z	0.4	1.0	1.7	2.2	1.0	1.2	1.5	2.3	2.0	1.8	1.6	1.4	5.4	1.4	1.4	1.2	1.8	1.3	1.4	5.4	
2-Nov	Z	1.2	1.1	1.4	1.4	1.0	2.2	1.5	1.9	2.6	2.4	2.1	1.4	2.6	1.9	1.1	1.2	1.2	1.3	1.6	1.8	1.2	0.7	1.0	1.6	2.6	
3-Nov	0.7	Z	0.8	1.3	1.7	1.4	1.6	2.5	2.0	1.8	1.4	1.4	1.4	1.8	1.7	1.8	1.9	2.0	13.2	4.9	1.8	1.7	1.6	1.7	2.3	13.2	
4-Nov	1.4	1.8	Z	1.8	1.6	1.4	1.0	1.1	1.1	0.8	1.3	1.4	1.4	1.0	0.8	1.4	1.9	6.4	3.2	12.0	4.4	4.3	3.9	3.6	2.5	12.0	
5-Nov	2.6	2.4	2.6	Z	2.1	2.0	2.6	2.2	2.2	2.1	4.2	2.7	1.4	0.8	0.6	0.7	0.9	1.1	0.7	3.0	0.7	0.5	0.7	0.7	1.7	4.2	
6-Nov	0.8	1.4	1.1	2.8	Z	1.8	1.6	1.5	3.0	5.7	3.5	3.1	2.7	2.7	1.9	1.6	1.3	1.9	1.6	1.8	6.5	1.6	1.5	1.2	2.3	6.5	
7-Nov	0.8	0.7	0.8	0.6	0.5	Z	0.6	2.1	1.5	1.5	1.3	1.0	0.7	0.7	1.0	1.9	2.9	3.5	1.9	1.3	2.7	1.4	1.3	2.2	1.4	3.5	
8-Nov	Z	2.1	2.5	2.7	2.6	2.7	3.5	3.3	4.2	7.0	5.2	5.3	5.0	4.6	4.8	6.2	5.4	5.2	4.4	4.7	1.3	0.3	0.7	0.5	3.7	7.0	
9-Nov	1.0	Z	1.1	1.1	1.3	1.1	0.6	1.4	3.2	14.5	2.0	1.1	1.4	1.1	1.4	1.5	1.5	2.3	2.9	2.7	3.3	3.3	2.2	1.3	2.3	14.5	
10-Nov	1.1	0.9	Z	0.9	1.1	2.0	2.7	2.0	2.0	1.5	1.9	1.9	2.1	2.1	1.9	3.7	4.6	2.6	2.8	2.9	1.8	1.2	3.8	2.7	2.2	4.6	
11-Nov	3.2	2.8	2.0	Z	2.1	1.3	1.1	1.0	1.7	1.0	1.6	1.4	1.5	1.5	1.8	3.6	1.2	1.3	1.6	1.3	1.6	2.0	2.1	2.2	1.8	3.6	
12-Nov	2.1	1.5	1.3	1.4	Z	1.4	1.3	1.9	2.9	2.1	1.7	1.5	1.3	1.3	2.0	0.9	0.9	1.4	1.0	6.4	5.8	1.1	1.3	1.3	1.9	6.4	
13-Nov	1.6	1.1	1.4	0.7	0.6	Z	1.4	1.3	0.7	1.4	1.9	0.9	1.3	2.0	3.5	1.5	0.9	0.7	0.7	0.8	0.6	0.4	0.5	0.5	1.1	3.5	
14-Nov	Z	1.0	0.8	0.7	0.6	0.5	0.4	0.4	0.4	0.5	0.5	0.7	1.0	0.7	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.8	0.3	0.5	1.0	
15-Nov	0.2	Z	0.5	0.3	0.4	0.9	1.9	1.0	1.9	2.4	2.4	2.4	1.3	1.2	3.1	2.1	2.0	2.8	17.2	1.9	1.5	1.2	1.3	1.0	2.2	17.2	
16-Nov	0.8	0.8	Z	1.0	0.9	1.5	1.4	1.2	1.0	1.5	1.8	1.8	2.0	2.0	2.2	2.1	2.5	2.3	2.2	2.2	3.0	3.0	2.1	2.0	1.8	3.0	
17-Nov	2.2	1.6	1.6	Z	2.2	2.1	1.8	2.0	2.4	2.9	3.1	2.9	6.7	2.5	2.1	1.9	1.6	1.6	1.6	14.9	1.4	1.4	0.8	1.3	2.7	14.9	
18-Nov	1.2	0.6	0.6	1.2	Z	0.5	0.6	0.5	2.5	1.3	1.2	1.1	0.6	0.7	0.9	1.3	0.6	0.4	0.3	0.4	0.3	0.4	0.5	0.6	0.8	2.5	
19-Nov	0.6	0.5	0.6	1.4	1.0	Z	0.9	0.4	0.3	0.3	2.1	2.2	2.2	2.4	2.4	2.5	1.5	4.5	1.8	2.4	5.9	2.7	1.7	1.6	1.8	5.9	
20-Nov	Z	1.8	2.2	2.7	2.6	2.4	2.5	4.5	3.4	4.1	3.2	2.7	2.4	3.1	3.2	2.5	1.7	1.8	2.2	3.2	2.4	3.5	3.4	2.8	2.8	4.5	
21-Nov	2.9	Z	2.5	2.6	1.9	2.1	1.6	1.7	2.5	4.4	4.3	4.5	3.5	4.5	3.5	3.7	3.0	2.9	3.5	5.9	6.5	6.6	4.4	2.9	3.6	6.6	
22-Nov	1.6	1.2	Z	0.9	0.8	1.3	1.8	2.1	1.5	2.6	1.7	1.2	1.6	1.9	3.6	2.0	3.8	2.5	3.1	6.0	13.3	11.5	10.4	8.7	3.7	13.3	
23-Nov	5.0	3.0	2.4	Z	2.0	1.2	0.6	0.4	0.2	0.3	0.3	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.8	5.0	
24-Nov	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.4	0.6	1.3	2.6	3.3	2.4	2.8	0.7	3.3	
25-Nov	2.0	1.5	0.6	1.0	1.2	Z	26.4	16.9	5.9	5.1	3.8	2.9	3.1	2.2	2.3	3.2	4.6	3.9	3.1	5.4	7.1	8.6	8.7	6.6	5.5	26.4	
26-Nov	Z	3.8	3.1	2.2	2.4	1.9	2.5	2.6	2.4	3.5	3.3	2.9	3.7	4.9	3.5	3.1	3.3	3.2	3.3	4.2	4.6	4.1	1.9	1.4	3.1	4.9	
27-Nov	0.9	Z	1.2	1.1	1.1	0.9	1.3	1.5	1.3	C	C	C	C	C	C	0.2	0.6	1.2	1.0	1.1	0.8	1.1	1.7	1.0	--	1.7	
28-Nov	1.0	1.0	Z	1.0	1.2	2.1	2.0	2.9	2.6	3.9	3.6	M	1.6	1.6	1.6	2.1	1.8	1.6	2.2	2.2	8.0	3.3	3.1	3.3	2.4	8.0	
29-Nov	2.0	1.3	1.2	Z	2.0	1.9	3.0	2.6	3.3	2.7	1.1	0.8	1.2	1.3	2.3	4.0	4.2	3.3	2.8	3.2	3.1	3.0	2.7	2.3	2.4	4.2	
30-Nov	2.1	2.1	1.8	1.7	Z	1.5	1.9	1.8	2.0	2.7	1.9	1.9	2.0	3.2	2.1	1.1	0.9	0.7	0.5	0.8	1.1	1.5	0.6	0.4	1.6	3.2	
		1.5	1.5	1.4	1.3	1.4	1.5	2.4	2.2	2.1	2.9	2.2	1.9	2.0	2.0	2.0	2.0	2.0	2.2	2.9	3.3	3.2	2.5	2.3	2.0	Diurnal Average	
		5.0	3.8	3.1	2.8	2.6	2.7	26.4	16.9	5.9	14.5	5.2	5.3	6.7	4.9	4.8	6.2	5.4	6.4	17.2	14.9	13.3	11.5	10.4	8.7	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance																					



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Conklin - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Conklin - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	682	99.85	99.85
21 - 40	1	0.15	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Conklin - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	52	46	40	15	5	4	28	43	56	60	51	28	25	62	85	74	674
21 - 40	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	52	46	40	15	5	4	28	43	56	61	51	28	25	62	85	74	675

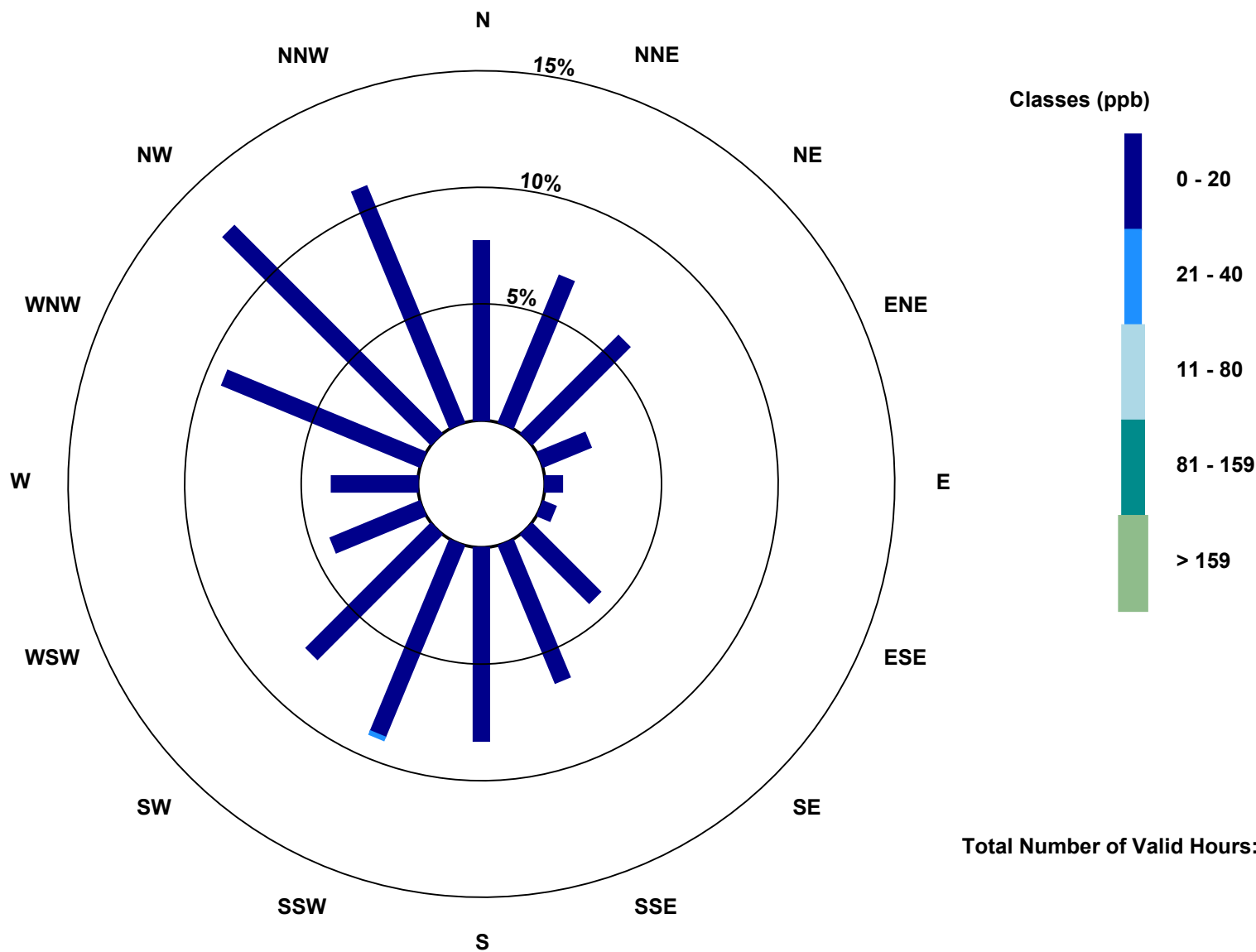
Total Number of Valid Hours: 675

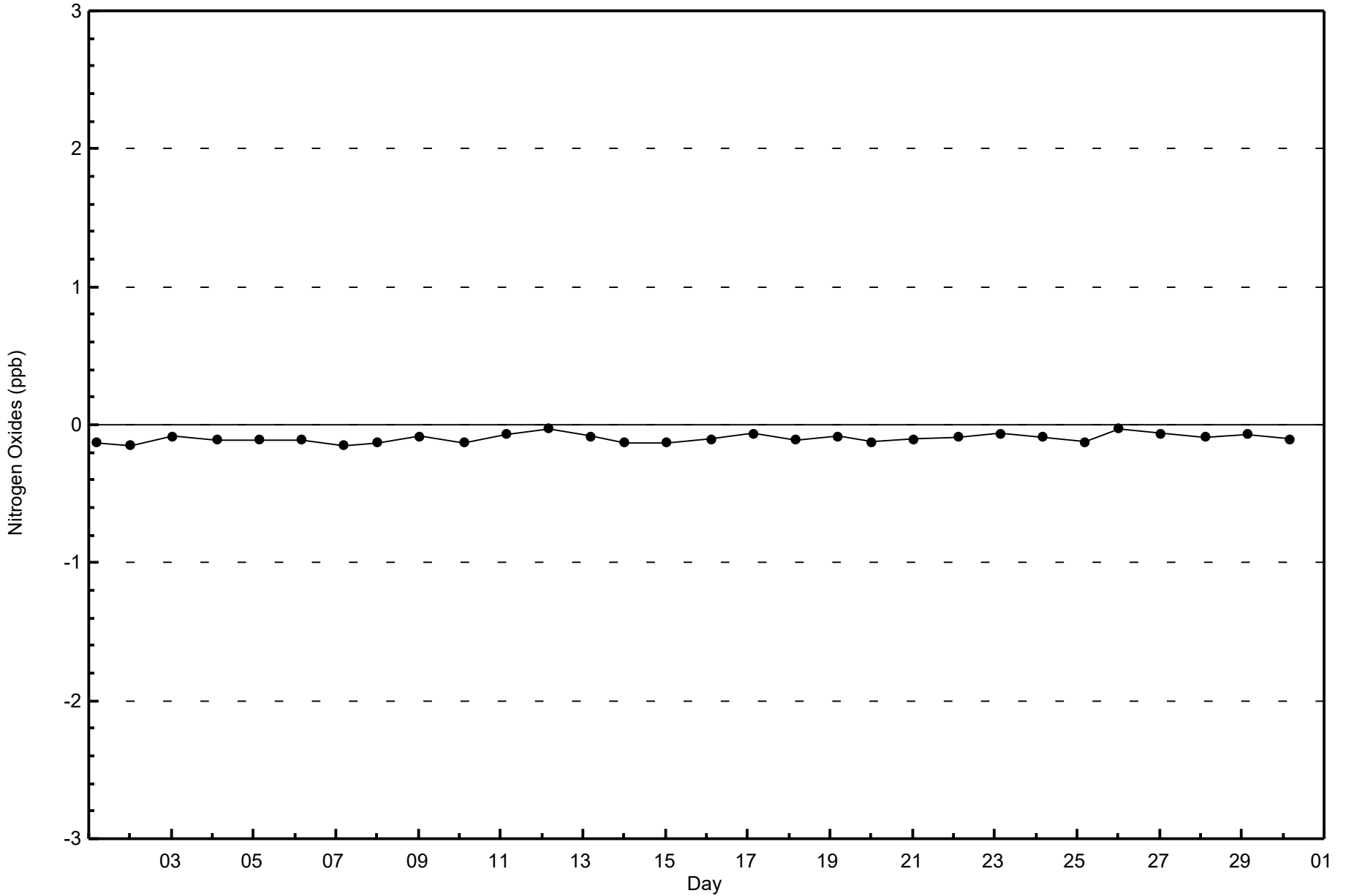
Total Number of Hours: 720



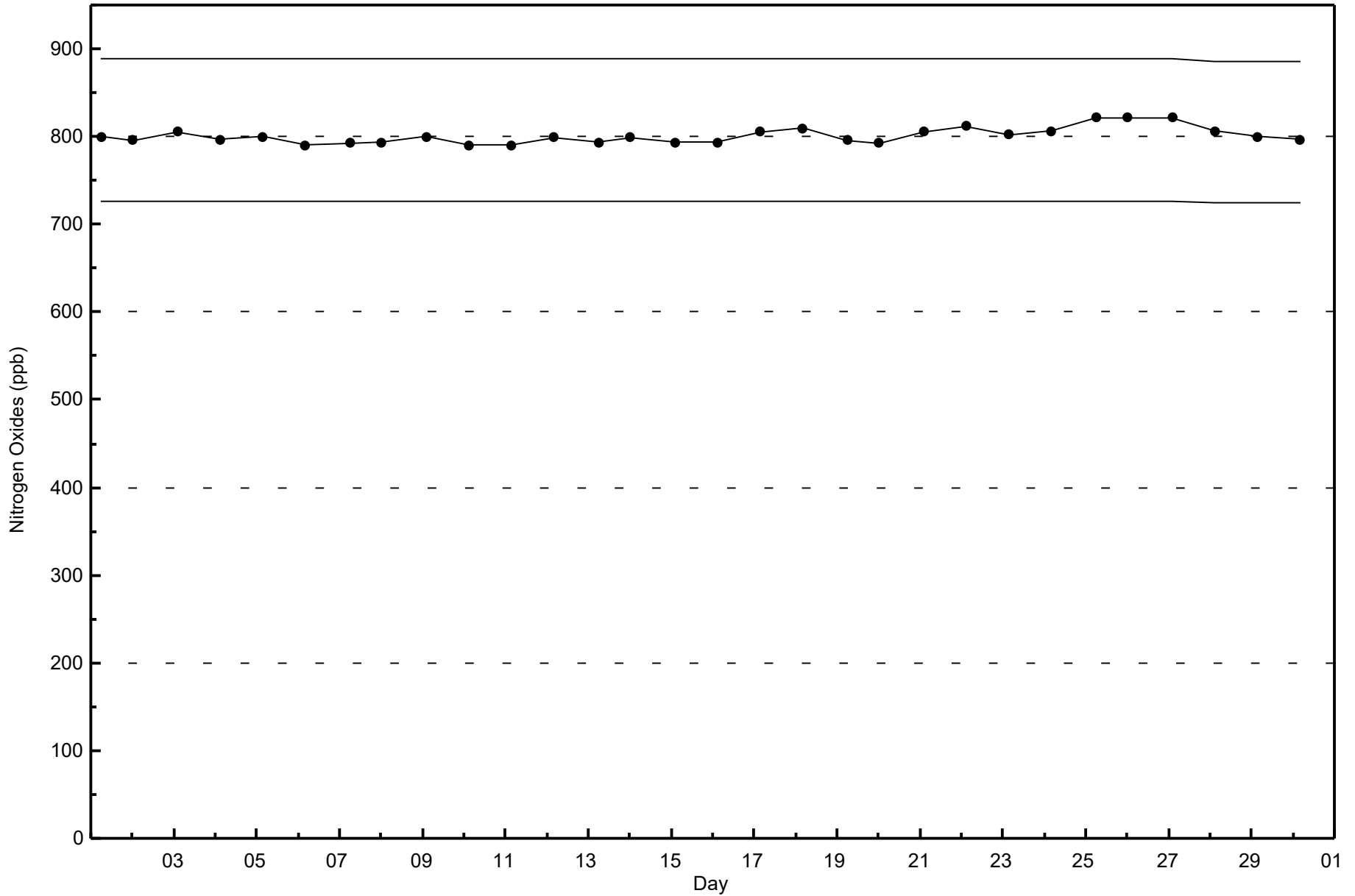
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Conklin











# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Ozone (O<sub>3</sub>) - ppb

## Conklin - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 39.3 ppb on Nov 8 23:00	Maximum Daily Average: 31.7 ppb on Nov 27		Hours of Data:	648
Minimum Value: 1.6 ppb on Nov 22 23:00	Minimum Daily Average: 10.6 ppb on Nov 15		Hours of Missing Data:	72
Maximum Diurnal Average: 26.3 ppb at hour 15	Minimum Diurnal Average: 17.5 ppb at hour 21		Hours of Calibration:	33
Monthly Average: 21.58 ppb	Percentiles: P <sub>1</sub> = 4.1 P <sub>10</sub> = 11.5 Q <sub>1</sub> = 17.3 Median = 22.3 Q <sub>3</sub> = 26.8 P <sub>90</sub> = 30.1 P <sub>99</sub> = 34.4		Percent Operational Time:	94.6

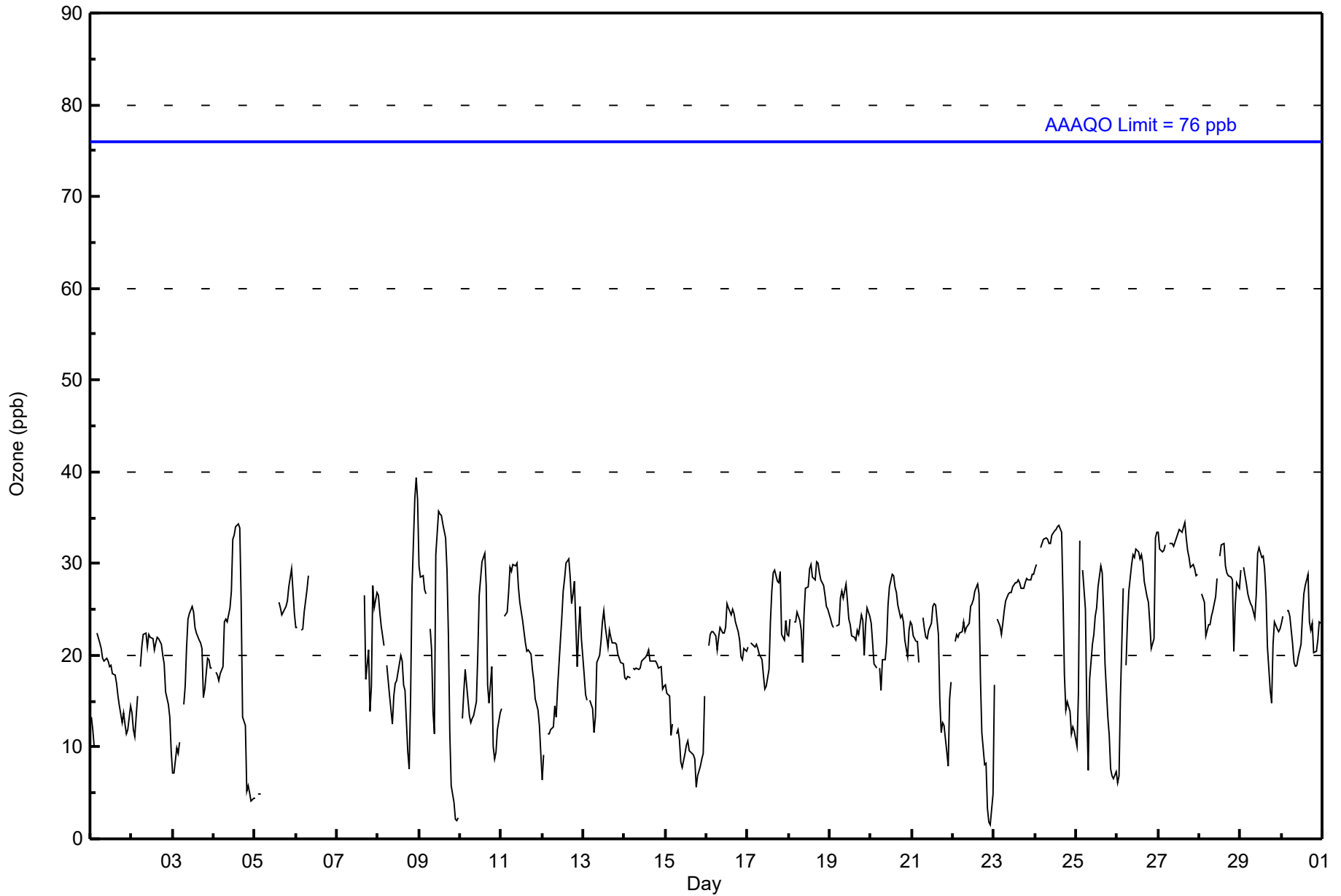
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	13.2	11.9	10.1	Z	22.4	21.4	20.7	19.7	19.4	19.7	19.3	18.8	18.9	18.0	17.8	16.9	15.6	14.5	12.6	13.8	12.5	11.5	11.9	14.5	16.3	22.4
2-Nov	13.7	11.9	11.2	15.5	Z	18.7	20.9	22.3	22.5	20.9	22.2	22.0	21.9	20.6	21.4	22.0	21.9	21.1	20.0	19.1	16.0	14.6	13.2	9.5	18.4	22.5
3-Nov	7.2	7.2	10.0	9.3	10.5	Z	14.6	16.7	21.0	23.9	24.6	25.3	24.7	23.0	22.5	21.6	21.3	20.8	15.4	16.3	19.7	19.6	18.7	18.6	17.9	25.3
4-Nov	Z	18.2	17.8	17.3	18.0	18.7	23.7	24.0	23.6	25.2	27.0	33.1	33.9	34.4	33.9	25.6	13.3	12.3	5.1	5.9	5.0	4.2	4.4	19.9	34.4	
5-Nov	4.4	Z	4.8	4.9	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	25.7	25.2	24.4	25.1	25.4	26.0	27.5	29.4	26.9	24.5	--	29.4
6-Nov	23.0	23.0	Z	22.8	22.9	24.8	27.2	28.7	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	28.7
7-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	C	26.6	17.4	20.7	13.9	16.7	27.6	25.2	26.9	--	27.6
8-Nov	26.5	24.7	23.2	21.0	Z	18.9	17.2	15.5	12.5	15.6	17.0	17.2	19.1	20.1	19.4	16.7	16.1	9.4	7.7	15.4	27.2	37.0	39.3	37.0	20.6	39.3
9-Nov	29.8	28.5	28.6	27.1	26.8	Z	23.0	20.6	13.9	11.4	31.0	35.7	35.4	35.3	34.3	32.9	29.2	22.3	11.5	5.8	4.0	2.1	2.0	2.3	21.5	35.7
10-Nov	Z	13.1	16.0	18.5	16.7	13.4	12.6	13.1	13.4	15.0	20.1	26.5	28.4	30.2	31.2	27.6	16.8	14.8	18.7	10.1	8.8	9.4	11.8	13.7	17.4	31.2
11-Nov	14.3	Z	24.3	24.7	26.9	29.6	29.2	29.9	29.8	30.1	27.4	25.8	23.9	22.6	21.4	20.5	20.6	20.1	18.4	17.2	15.3	14.0	12.4	9.3	22.1	30.1
12-Nov	6.4	9.2	Z	11.5	11.5	12.0	12.2	14.5	13.3	16.4	19.1	24.0	27.1	28.4	30.0	30.6	28.5	25.6	26.6	28.1	18.8	22.5	25.3	21.9	20.1	30.6
13-Nov	17.8	15.7	15.1	Z	15.2	14.3	11.6	13.3	19.3	19.9	21.5	23.6	24.8	23.1	20.9	22.7	22.0	21.3	21.3	21.2	20.1	19.6	19.2	19.1	19.2	24.8
14-Nov	17.6	17.3	17.7	17.6	Z	18.7	18.4	18.6	18.5	18.6	19.4	19.6	19.8	20.1	20.6	19.4	19.3	19.3	19.3	19.1	18.6	18.8	16.4	16.6	18.7	20.6
15-Nov	16.7	15.8	15.6	11.3	12.5	Z	11.4	11.9	10.9	8.5	7.9	9.3	10.3	10.6	9.6	9.3	9.1	8.6	5.7	6.9	8.0	8.6	9.4	15.6	10.6	16.7
16-Nov	Z	21.0	22.3	22.6	22.5	22.1	20.6	22.0	23.0	22.3	22.4	23.1	25.6	25.2	24.5	25.0	24.6	23.6	22.6	21.7	19.8	19.6	20.7	20.5	22.5	25.6
17-Nov	20.9	Z	21.3	21.1	20.9	21.3	20.8	20.1	19.5	17.9	16.4	16.7	18.5	23.6	27.1	28.9	29.3	28.1	27.9	29.1	22.3	21.7	23.9	22.3	22.6	29.3
18-Nov	22.1	23.9	Z	23.7	23.6	24.7	23.7	22.8	19.2	24.4	27.3	27.5	29.5	30.0	28.6	28.3	30.2	30.1	29.0	28.2	27.6	26.6	25.3	25.0	26.1	30.2
19-Nov	23.9	23.3	23.1	Z	23.2	23.4	26.3	26.9	26.3	27.8	25.9	24.0	23.3	22.1	21.9	21.7	22.7	22.3	24.4	23.8	19.9	23.4	25.1	24.2	23.9	27.8
20-Nov	23.4	21.3	19.1	18.6	Z	18.7	16.1	19.5	19.6	21.4	25.5	27.5	28.9	28.7	27.5	26.9	25.5	24.0	24.5	23.7	21.6	19.9	22.7	23.6	23.0	28.9
21-Nov	23.3	22.2	21.6	21.6	19.3	Z	24.1	22.9	22.0	21.8	22.7	23.6	25.3	25.6	25.5	22.3	15.0	11.6	12.7	12.3	9.5	8.0	15.3	17.1	19.4	25.6
22-Nov	Z	21.4	22.3	22.0	22.4	22.6	23.7	22.5	23.1	23.5	25.3	25.6	26.1	26.9	27.8	26.7	17.6	11.5	8.0	8.2	3.4	1.9	1.6	4.8	18.2	27.8
23-Nov	16.8	Z	23.9	23.2	22.3	23.5	24.9	25.9	26.6	26.8	26.8	27.5	27.9	27.8	28.2	28.0	27.4	27.3	27.9	28.4	28.2	28.2	28.8	28.9	26.3	28.9
24-Nov	29.4	29.9	Z	31.7	32.2	32.7	32.8	32.6	32.1	32.2	33.1	33.6	33.7	34.1	34.1	33.3	26.4	17.8	14.0	15.0	13.9	11.4	12.2	11.7	26.5	34.1
25-Nov	10.1	15.9	32.5	Z	29.2	25.1	13.8	7.4	17.3	21.2	22.2	24.3	25.2	27.5	29.8	29.0	24.6	19.1	13.3	11.3	7.6	6.9	6.5	7.3	18.6	32.5
26-Nov	6.1	6.9	15.3	27.3	Z	18.9	23.6	27.0	29.8	30.9	30.7	31.6	31.2	30.6	30.9	30.0	28.0	26.4	25.7	23.5	20.7	21.8	32.8	33.5	25.4	33.5
27-Nov	33.3	31.6	31.2	31.4	32.0	Z	32.2	32.3	32.3	31.9	32.3	33.3	33.7	33.5	33.4	34.4	32.8	31.4	30.6	29.6	29.9	29.4	28.6	28.8	31.7	34.4
28-Nov	Z	26.7	26.2	25.8	22.1	23.3	23.3	24.2	24.9	26.4	28.3	M	30.8	32.1	32.2	29.7	29.0	28.7	28.6	28.2	20.5	25.4	27.9	27.3	26.9	32.2
29-Nov	29.3	Z	29.6	27.8	26.7	26.1	25.6	25.3	24.1	26.5	31.1	31.7	30.6	30.8	29.4	26.6	20.9	16.2	14.8	21.2	23.7	22.8	22.6	22.9	25.5	31.7
30-Nov	23.4	24.3	Z	24.9	24.8	24.3	21.1	19.2	18.7	19.0	19.9	21.2	24.3	26.6	27.6	28.8	23.7	22.7	23.5	20.3	20.5	21.7	23.6	23.5	22.9	28.8
18.9 19.4 20.1 20.9 21.9 21.6 21.3 21.4 21.3 22.2 23.9 25.1 26.0 26.3 26.3 25.7 23.3 20.5 19.4 18.7 17.5 18.2 19.1 19.1																								Diurnal Average		
33.3 31.6 32.5 31.7 32.2 32.7 32.8 32.6 32.3 32.2 33.1 35.7 35.4 35.3 34.4 34.4 32.8 31.4 30.6 29.6 29.9 37.0 39.3 37.0																								Diurnal Maximum		

Z - zerospan      C - Calibration      M - Maintenance      UO - Unstable Operation  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb



Wood Buffalo Environmental Association  
Hourly Averages

Ozone (O<sub>3</sub>) - ppb  
Conklin - November 2024





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Conklin - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	248	38.27	38.27
21 - 50	400	61.73	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 648

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Conklin - November 2024**

<b>Concentration</b> <b>Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	19	12	18	3	0	1	10	19	24	37	21	12	4	11	22	28	241
21 - 50	32	37	20	12	4	3	18	25	28	21	19	12	19	45	58	47	400
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	51	49	38	15	4	4	28	44	52	58	40	24	23	56	80	75	641

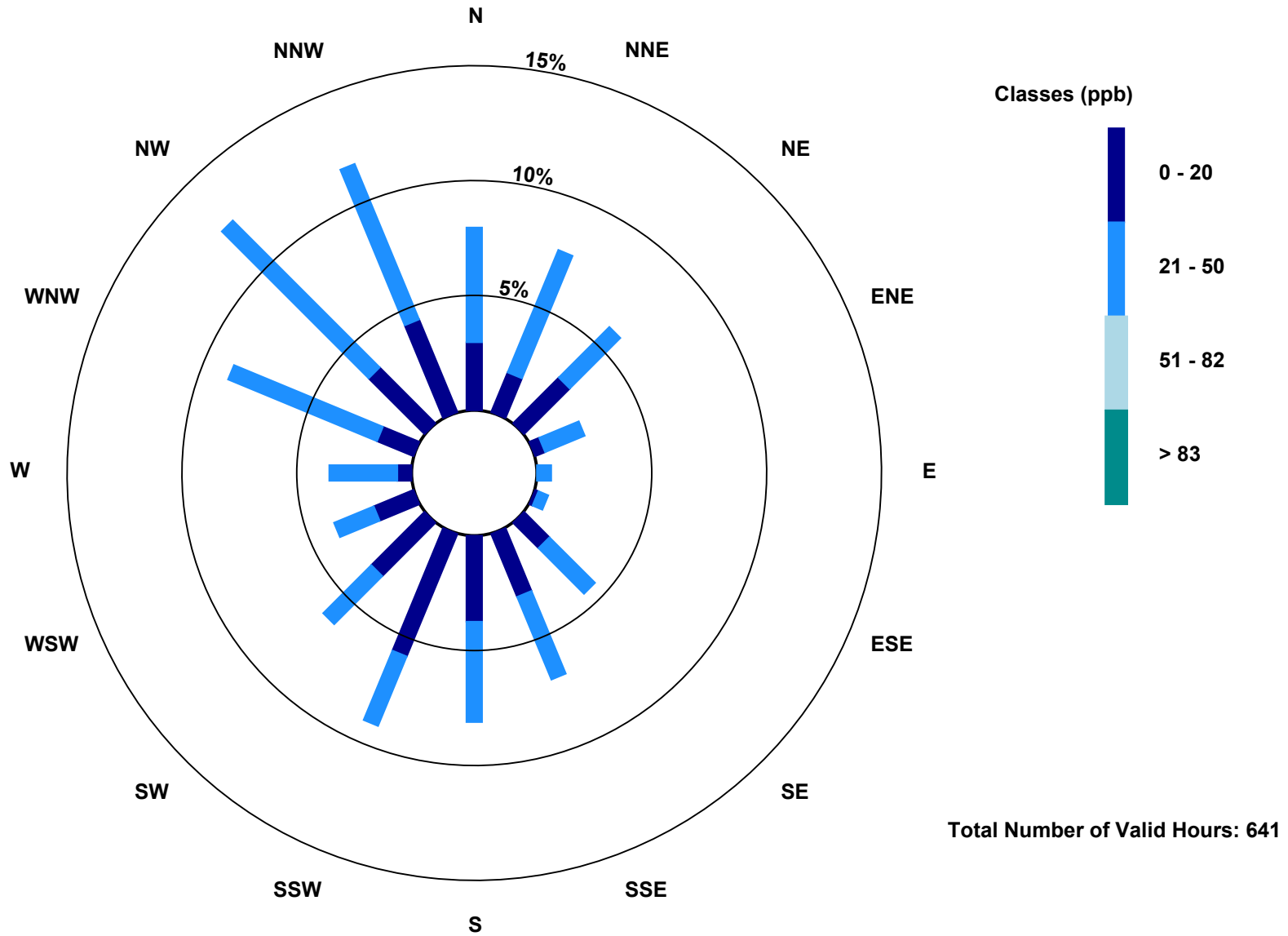
Total Number of Valid Hours: 641

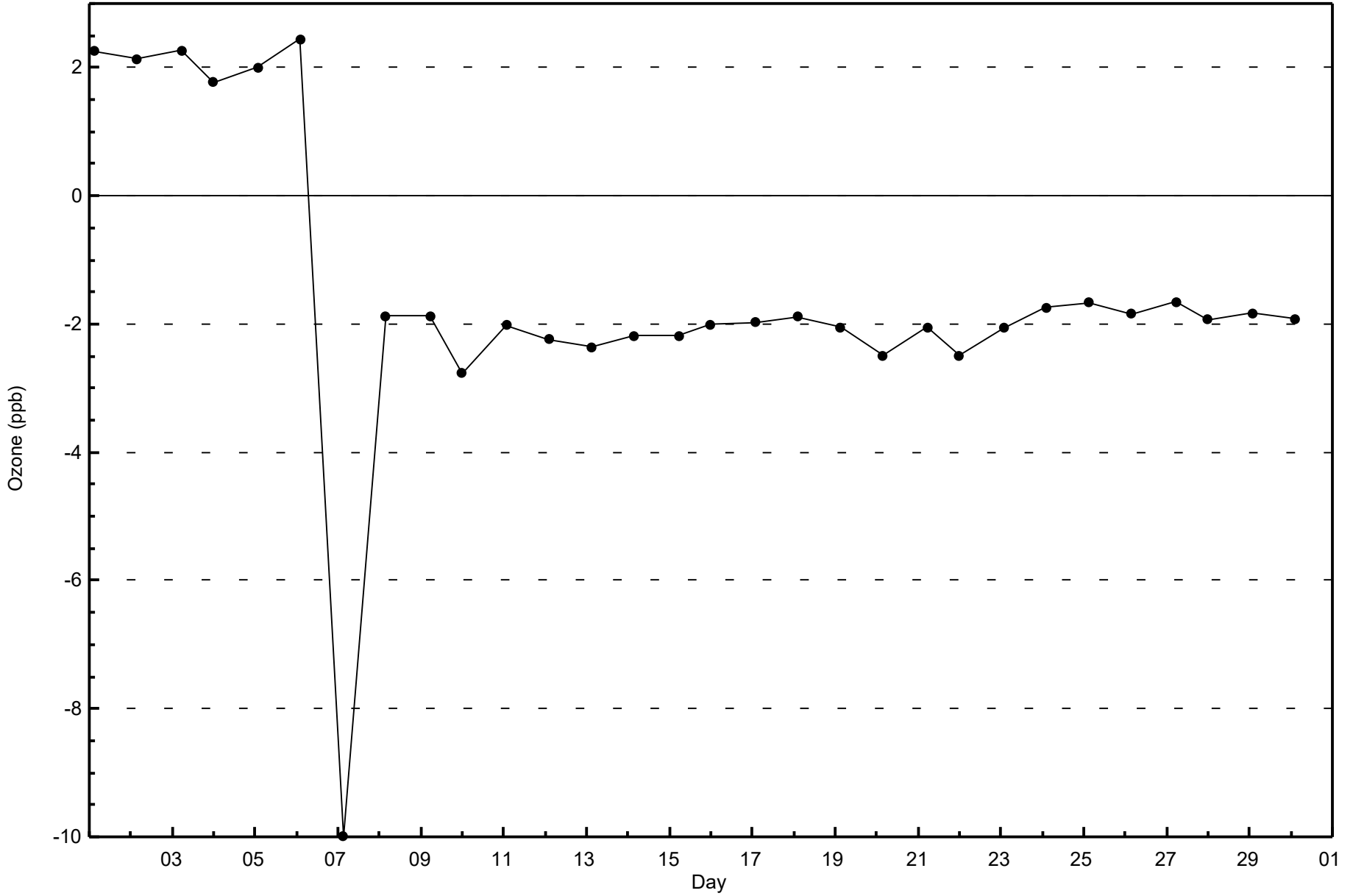
Total Number of Hours: 720

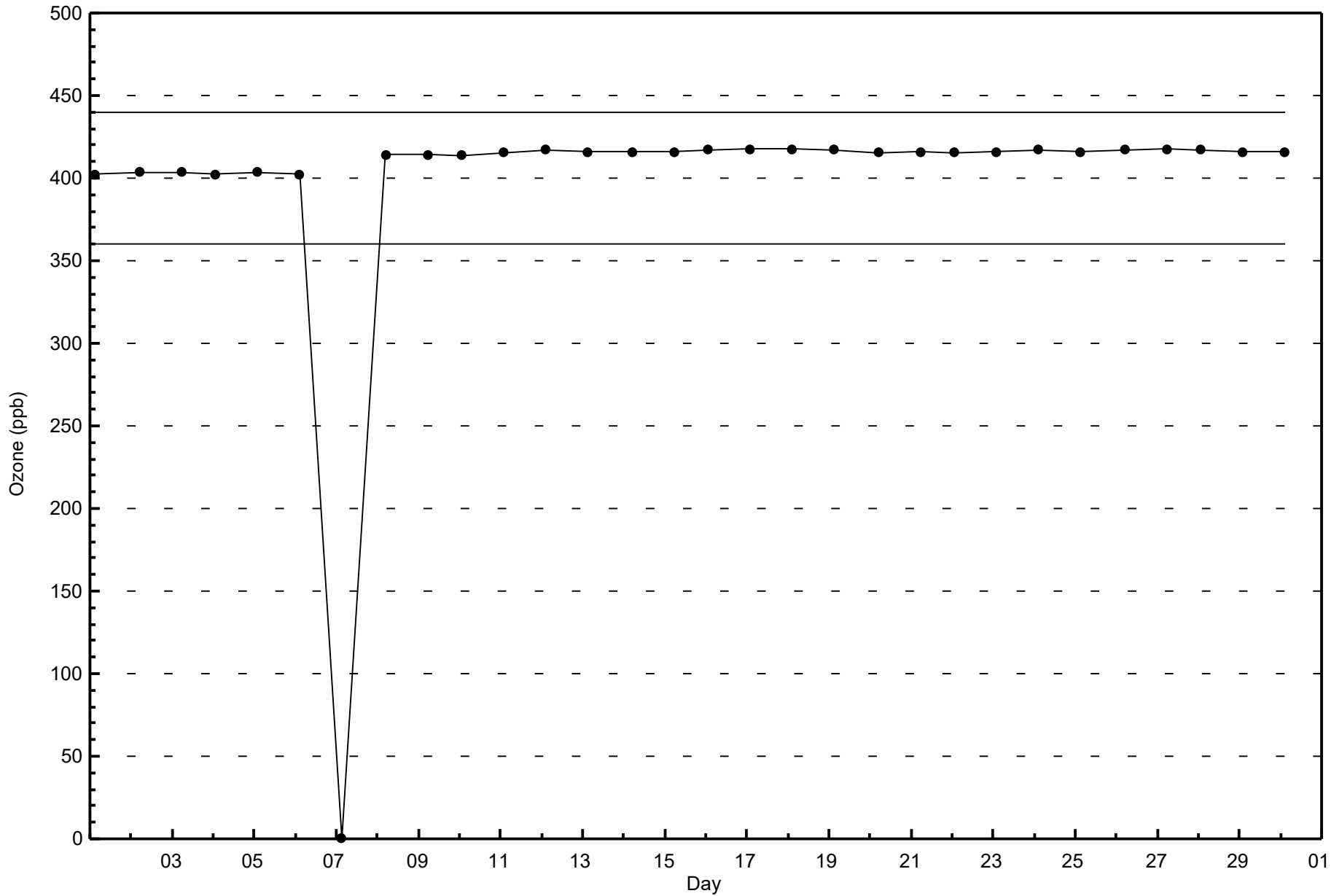


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Ozone (O<sub>3</sub>) - ppb  
Conklin







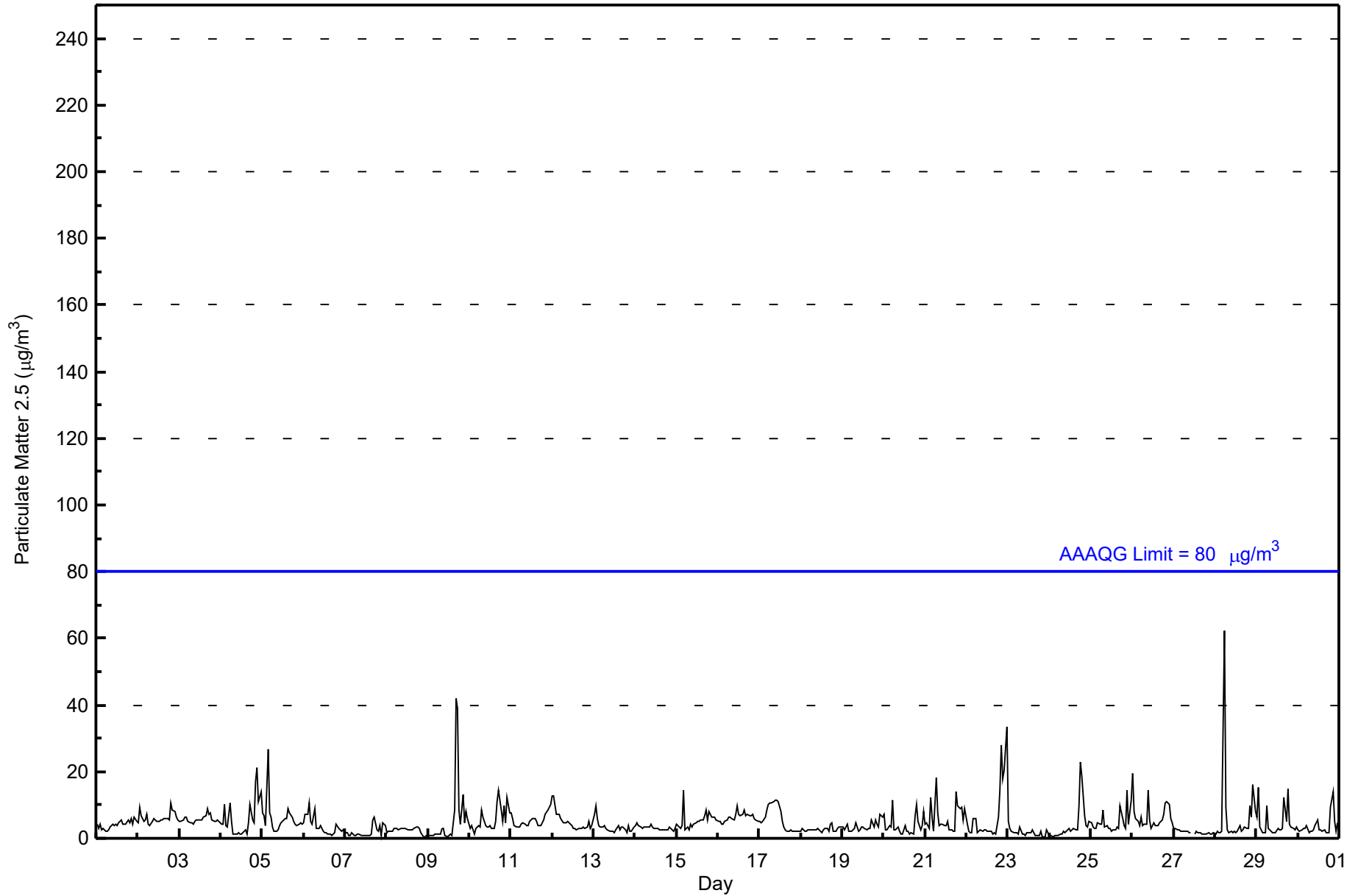




Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:															720						
Maximum Value: 62.1 µg/m <sup>3</sup> on Nov 28 06:00		Maximum Daily Average: 6.9 µg/m <sup>3</sup> on Nov 22															Hours of Data:		719								
Minimum Value: 0.4 µg/m <sup>3</sup> on Nov 23 22:00		Minimum Daily Average: 1.7 µg/m <sup>3</sup> on Nov 23															Hours of Missing Data:		1								
Maximum Diurnal Average: 6.8 µg/m <sup>3</sup> at hour 21		Minimum Diurnal Average: 3.3 µg/m <sup>3</sup> at hour 14															Hours of Calibration:		1								
Monthly Average: 4.64 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 0.6 P <sub>10</sub> = 1.5 Q <sub>1</sub> = 2.3 Median = 3.5 Q <sub>3</sub> = 5.5 P <sub>90</sub> = 8.6 P <sub>99</sub> = 21.1															Percent Operational Time:		100.0								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	4.4	3.0	4.3	2.5	2.9	2.0	2.1	2.6	3.4	4.3	3.8	4.0	4.0	4.5	5.5	4.4	4.2	4.3	5.4	4.8	6.0	4.1	6.4	5.0	4.1	6.4	
2-Nov	4.8	9.5	6.9	5.0	5.7	7.0	4.1	3.6	5.1	6.1	5.3	5.1	5.3	5.4	5.3	5.9	5.8	5.8	5.7	10.7	8.4	7.9	6.5	5.7	6.1	10.7	
3-Nov	5.3	5.2	5.6	6.2	6.3	4.9	4.5	4.6	4.4	5.0	5.5	5.7	5.6	5.4	6.4	6.8	8.9	7.1	7.6	5.5	5.2	5.0	5.3	5.1	5.7	8.9	
4-Nov	4.1	4.2	10.3	3.9	3.2	10.7	5.2	1.4	1.5	1.4	1.7	1.3	1.3	1.6	2.7	1.4	4.6	10.1	5.4	4.8	17.0	21.2	11.1	13.9	6.0	21.2	
5-Nov	7.8	6.9	3.9	26.8	7.5	6.5	3.3	2.2	2.2	2.7	3.9	4.6	5.5	5.9	6.1	8.9	7.5	6.2	5.0	4.3	4.0	4.4	4.6	4.4	6.0	26.8	
6-Nov	4.5	7.0	7.3	10.6	4.9	4.1	8.8	2.9	2.9	3.1	3.9	2.0	1.7	1.5	1.2	1.1	0.9	1.2	1.7	4.1	2.8	2.6	2.2	2.4	3.6	10.6	
7-Nov	1.8	1.5	0.9	0.9	1.9	0.7	0.6	1.1	1.2	0.9	1.0	0.9	0.8	0.7	0.7	1.3	5.5	6.2	2.5	2.1	3.9	1.0	4.7	3.8	1.9	6.2	
8-Nov	1.8	2.2	1.9	2.0	2.9	2.8	3.1	2.7	2.9	3.0	3.1	3.0	2.7	2.7	2.6	2.6	2.8	3.5	3.5	3.1	1.6	0.5	0.5	0.9	2.4	3.5	
9-Nov	0.8	1.0	0.9	1.0	1.2	1.1	1.1	1.2	2.8	2.8	0.8	0.6	0.9	1.5	1.0	8.5	41.9	39.1	8.3	4.4	13.0	4.7	8.2	6.0	6.4	41.9	
10-Nov	2.9	3.8	2.4	1.3	2.9	3.7	3.4	8.7	6.3	3.7	3.5	3.6	3.6	3.2	2.9	5.2	10.8	14.6	8.4	5.1	9.8	4.8	12.1	7.5	5.6	14.6	
11-Nov	7.5	5.8	3.7	3.5	3.4	3.4	4.4	4.7	4.1	3.8	3.9	4.9	5.8	5.8	6.1	4.9	3.9	3.6	4.5	5.7	7.4	8.7	9.1	10.0	5.4	10.0	
12-Nov	12.9	12.8	7.2	7.1	7.2	5.8	4.9	4.6	4.7	4.9	4.8	3.8	3.1	2.9	2.8	3.1	3.0	2.9	3.4	3.2	3.4	5.0	3.0	3.7	5.0	12.9	
13-Nov	7.0	9.8	5.9	3.9	3.6	3.4	3.8	3.0	2.5	2.2	2.1	2.0	1.8	2.5	3.9	2.4	3.6	3.5	2.4	1.9	3.9	2.2	2.3	3.3	3.4	9.8	
14-Nov	3.7	4.5	4.0	3.4	3.2	3.2	3.3	3.3	3.5	4.4	3.5	3.1	3.0	2.8	2.6	2.7	2.6	2.5	2.4	2.4	3.3	2.5	2.1	3.1	3.1	4.5	
15-Nov	4.3	4.0	3.1	3.6	14.4	2.5	3.2	2.4	4.0	3.4	4.1	4.5	5.0	5.0	5.5	5.7	6.9	8.5	5.6	8.2	6.2	6.5	6.4	5.6	5.4	14.4	
16-Nov	4.9	4.9	4.3	4.4	4.9	5.5	6.2	6.6	6.0	5.4	7.2	9.8	7.3	6.7	7.0	8.6	6.8	7.0	6.8	6.6	7.0	6.0	5.3	5.3	6.3	9.8	
17-Nov	5.2	4.7	5.0	6.3	8.5	10.3	10.5	10.6	11.1	11.5	11.4	11.0	8.1	5.0	3.3	2.6	2.0	2.2	2.3	2.1	2.2	2.3	2.0	2.3	5.9	11.5	
18-Nov	2.3	3.0	2.2	2.1	2.4	2.4	2.3	2.5	2.5	2.4	2.9	2.0	1.8	2.6	3.1	2.8	2.0	4.3	4.7	2.0	2.1	3.0	3.6	3.2	2.7	4.7	
19-Nov	3.2	2.4	3.3	4.1	2.3	2.0	2.7	3.0	4.8	2.3	2.8	3.2	3.5	2.8	2.3	2.8	2.8	5.6	3.5	5.4	4.4	3.3	7.4	6.5	3.6	7.4	
20-Nov	7.1	2.6	2.6	3.7	3.5	11.5	2.5	2.6	3.2	2.0	1.3	1.1	3.8	2.3	2.0	1.2	1.5	1.1	6.8	10.2	5.1	2.6	4.0	8.0	3.8	11.5	
21-Nov	4.1	4.6	2.8	12.3	6.5	2.0	18.1	7.4	3.9	4.2	4.2	3.7	3.9	5.0	2.5	2.4	2.3	2.3	13.8	9.9	9.1	9.4	5.3	9.0	6.2	18.1	
22-Nov	4.2	2.1	1.6	1.7	5.8	6.0	1.8	1.9	2.5	2.3	2.5	2.4	2.0	2.2	2.2	1.4	1.6	1.5	6.2	14.5	27.8	17.7	20.4	33.5	6.9	33.5	
23-Nov	5.3	2.8	2.1	1.8	1.6	1.5	1.5	3.5	1.4	1.3	1.0	1.7	1.6	1.6	2.4	1.5	0.8	0.6	1.0	2.0	0.4	0.4	2.5	1.5	1.7	5.3	
24-Nov	0.6	0.7	0.6	0.7	0.8	0.9	1.2	1.5	2.0	1.9	2.2	2.8	2.2	2.5	3.0	2.3	2.6	9.8	22.7	18.8	6.6	3.8	3.6	4.9	4.1	22.7	
25-Nov	4.5	3.6	2.8	2.8	4.8	4.4	4.3	8.3	3.4	3.6	2.8	3.1	2.3	2.5	2.6	3.2	3.2	9.5	5.9	3.9	3.1	14.2	4.3	11.3	4.8	14.2	
26-Nov	19.4	7.9	5.9	5.1	3.7	6.5	3.9	4.2	4.2	14.4	5.6	3.1	4.8	3.9	3.9	3.8	4.5	5.6	7.2	10.4	11.2	10.1	6.1	4.5	6.7	19.4	
27-Nov	3.2	3.0	2.7	2.5	2.3	2.0	2.1	2.0	2.0	1.8	1.8	C	1.3	1.9	1.8	1.9	1.3	1.2	1.3	1.4	1.5	1.4	1.4	1.5	1.9	3.2	
28-Nov	1.4	2.3	1.8	1.6	2.0	62.1	9.5	2.7	1.8	2.2	1.7	1.9	1.7	2.2	3.7	2.3	2.6	3.2	3.2	3.0	9.7	6.3	16.1	7.9	6.4	62.1	
29-Nov	6.5	15.3	3.5	1.8	1.7	1.7	9.6	2.9	2.3	1.7	1.8	1.7	3.0	2.4	2.5	2.9	12.4	5.2	14.7	4.1	3.4	2.9	2.5	3.3	4.6	15.3	
30-Nov	2.6	2.0	2.4	2.8	3.0	3.7	1.9	2.0	2.1	2.5	3.9	5.4	2.4	2.7	2.3	2.4	1.9	1.7	1.8	9.5	13.9	4.9	2.0	4.6	3.5	13.9	
																								Diurnal Average			
																								Diurnal Maximum			
																								4.9 19.4			
																								4.8 15.3			
																								3.7 10.3			
																								4.5 26.8			
																								4.2 14.4			
																								6.1 62.1			
																								4.5 18.1			
																								3.7 10.6			
																								3.5 11.1			
																								3.7 14.4			
																								3.5 11.4			
																								3.5 11.0			
																								3.3 8.1			
																								3.3 6.7			
																								3.3 7.0			
																								3.6 8.9			
																								5.4 41.9			
																								6.0 39.1			
																								5.8 22.7			
																								5.8 18.8			
																								6.8 27.8			
																								5.7 21.2			
																								5.7 20.4			
																								6.2 33.5			

C - Calibration

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m<sup>3</sup> 24-hr 29 µg/m<sup>3</sup>





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Conklin - November 2024**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	538	74.83	74.83
6 - 15	166	23.09	97.91
16 - 25	9	1.25	99.17
26 - 80	6	0.83	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>**  
**Conklin - November 2024**

Concentration Ranges (μg/m <sup>3</sup> )	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	49	48	38	15	3	4	22	29	23	40	41	20	22	58	67	56	535
6 - 15	5	1	3	1	2	0	7	17	31	24	11	9	4	5	22	20	162
16 - 25	0	0	0	0	0	0	0	0	1	0	0	0	0	1	3	3	8
26 - 80	0	0	0	0	0	0	0	0	2	0	0	0	1	1	2	0	6
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	54	49	41	16	5	4	29	46	57	64	52	29	27	65	94	79	711

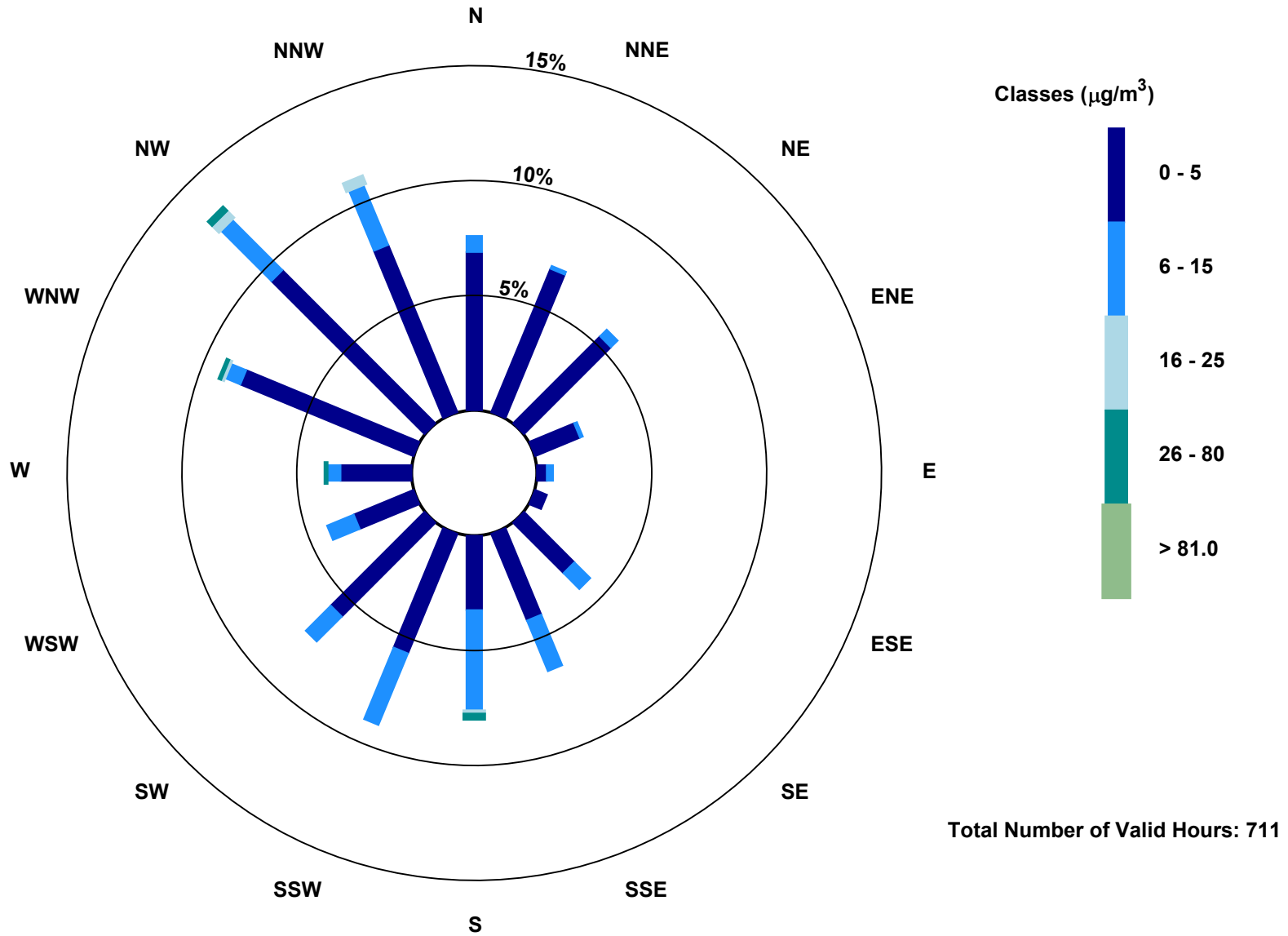
Total Number of Valid Hours: 711

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Wind Rose Nov 2024**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Conklin**



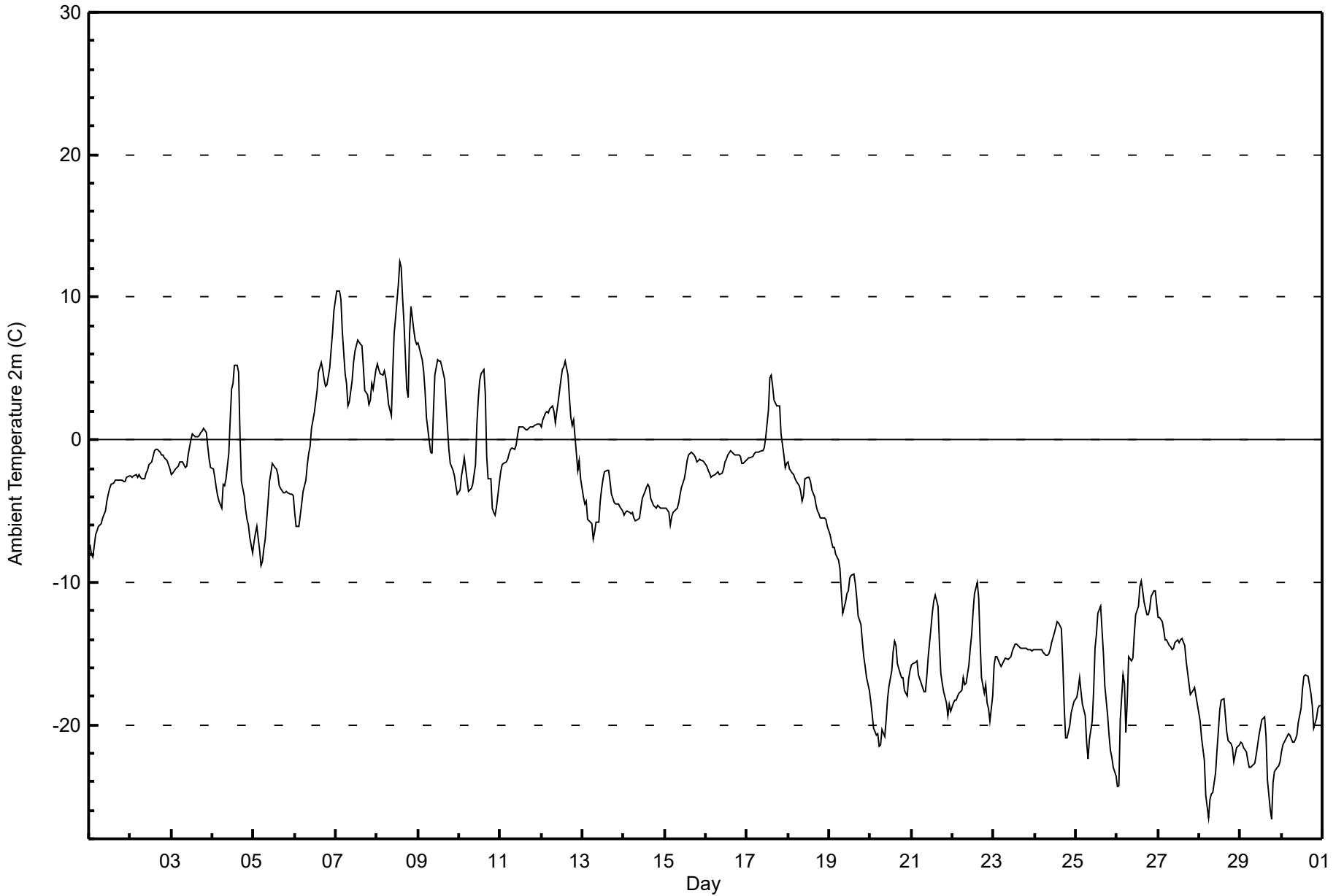


Maximum Value: 12.5 C on Nov 8 14:00      Maximum Daily Average: 6.5 C on Nov 8																						Hours in Service:	720																									
Minimum Value: -26.7 C on Nov 29 19:00      Minimum Daily Average: -22.3 C on Nov 29																						Hours of Data:	720																									
Maximum Diurnal Average: -4.3 C at hour 15      Minimum Diurnal Average: -8.7 C at hour 8																						Hours of Missing Data:	0																									
Monthly Average: -7.28 C      Percentiles: P <sub>1</sub> = -24.4 P <sub>10</sub> = -19.9 Q <sub>1</sub> = -15.3 Median = -4.7 Q <sub>3</sub> = -1.1 P <sub>90</sub> = 3.6 P <sub>99</sub> = 9.7																						Hours of Calibration:	0																									
																						Percent Operational Time:	100.0																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-7.3	-8.0	-8.2	-7.5	-6.6	-6.1	-6.0	-5.9	-5.5	-5.0	-4.3	-3.8	-3.5	-3.1	-3.0	-2.8	-2.8	-2.9	-2.9	-2.8	-2.9	-2.9	-2.6	-2.5	-4.5	-2.5																						
2-Nov	-2.5	-2.7	-2.5	-2.5	-2.6	-2.5	-2.6	-2.8	-2.7	-2.3	-2.1	-1.8	-1.6	-1.1	-0.7	-0.7	-0.7	-0.9	-1.0	-1.1	-1.2	-1.5	-1.7	-2.0	-1.8	-0.7																						
3-Nov	-2.5	-2.3	-2.0	-2.0	-1.8	-1.6	-1.6	-1.8	-1.9	-1.9	-1.1	0.0	0.4	0.3	0.2	0.2	0.3	0.5	0.6	0.8	0.5	-0.5	-1.3	-2.0	-0.8	0.8																						
4-Nov	-2.0	-2.7	-3.4	-3.9	-4.3	-4.8	-3.1	-3.2	-2.7	-1.0	1.4	3.5	3.9	5.2	5.2	4.8	0.3	-2.9	-3.9	-4.9	-5.6	-6.0	-6.8	-7.9	-1.9	5.2																						
5-Nov	-7.1	-6.6	-6.1	-7.8	-8.9	-8.5	-7.7	-7.0	-4.4	-2.9	-2.4	-1.6	-1.9	-2.0	-2.4	-3.2	-3.5	-3.7	-3.8	-3.7	-3.7	-3.8	-3.8	-3.9	-4.6	-1.6																						
6-Nov	-5.0	-6.0	-6.1	-5.2	-4.5	-3.6	-2.8	-1.8	-0.9	-0.4	0.8	1.9	2.6	3.5	4.7	5.4	4.9	4.2	3.7	3.8	5.0	6.3	7.5	9.1	1.1	9.1																						
7-Nov	10.4	10.4	10.4	9.8	7.6	4.7	4.0	2.4	2.6	4.1	5.4	6.2	6.6	7.0	6.7	6.6	5.1	3.5	3.2	2.5	2.8	4.0	3.6	4.9	5.6	10.4																						
8-Nov	5.3	5.0	4.7	4.6	4.8	4.4	3.5	2.4	1.7	4.9	7.5	8.6	10.9	12.5	12.1	10.0	8.2	3.6	2.9	7.5	9.3	7.7	7.0	6.7	6.5	12.5																						
9-Nov	6.8	6.4	5.7	4.9	3.5	1.6	-0.1	-0.9	-0.9	2.0	4.6	5.6	5.5	5.5	5.2	4.3	2.6	0.9	-0.7	-1.6	-2.1	-2.6	-3.2	-3.8	2.0	6.8																						
10-Nov	-3.5	-2.5	-1.9	-1.3	-2.1	-3.6	-3.5	-3.4	-3.1	-1.7	1.1	2.9	4.2	4.7	4.9	3.3	-1.2	-2.7	-2.7	-4.8	-5.1	-5.3	-4.7	-3.0	-1.5	4.9																						
11-Nov	-2.3	-1.8	-1.6	-1.5	-1.3	-1.0	-0.7	-0.6	-0.6	-0.3	0.3	0.9	0.9	0.9	0.8	0.7	0.7	0.9	0.9	0.9	1.0	1.1	1.1	1.1	0.0	1.1																						
12-Nov	0.9	1.4	1.9	2.0	1.9	2.2	2.3	2.0	1.2	1.9	2.7	4.3	5.0	5.1	5.5	4.5	2.9	1.5	1.0	1.4	-0.9	-2.1	-1.4	-2.7	1.8	5.5																						
13-Nov	-4.0	-4.5	-4.3	-5.6	-5.7	-5.9	-7.0	-6.5	-5.8	-5.8	-4.3	-3.4	-2.7	-2.2	-2.1	-2.1	-2.9	-3.8	-4.4	-4.5	-4.5	-4.5	-4.7	-5.0	-4.4	-2.1																						
14-Nov	-5.3	-5.1	-5.0	-5.1	-5.2	-5.1	-5.4	-5.7	-5.6	-5.5	-4.8	-4.2	-3.6	-3.3	-3.1	-3.4	-4.1	-4.6	-4.7	-4.8	-4.6	-4.8	-4.8	-4.8	-4.7	-3.1																						
15-Nov	-4.8	-4.8	-5.1	-6.0	-5.4	-5.0	-4.9	-4.8	-4.4	-3.9	-3.3	-2.7	-2.1	-1.5	-1.1	-0.9	-1.0	-1.1	-1.3	-1.5	-1.4	-1.5	-1.4	-1.5	-3.0	-0.9																						
16-Nov	-1.8	-2.1	-2.4	-2.6	-2.6	-2.4	-2.3	-2.3	-2.4	-2.3	-2.0	-1.5	-1.3	-1.1	-0.8	-0.8	-1.0	-1.1	-1.1	-1.1	-1.2	-1.7	-1.6	-1.4	-1.7	-0.8																						
17-Nov	-1.4	-1.2	-1.3	-1.2	-1.0	-0.9	-0.9	-0.9	-0.8	-0.7	-0.6	0.2	2.0	4.3	4.6	3.7	2.8	2.4	2.3	2.4	0.4	-1.1	-1.9	-1.6	0.4	4.6																						
18-Nov	-1.5	-2.0	-2.4	-2.4	-2.7	-3.0	-3.2	-3.7	-4.3	-3.9	-2.7	-2.6	-2.7	-3.0	-3.5	-4.1	-4.6	-5.0	-5.2	-5.5	-5.5	-5.5	-5.6	-6.1	-3.8	-1.5																						
19-Nov	-6.7	-7.2	-7.5	-7.6	-8.0	-8.5	-9.1	-10.7	-12.1	-11.4	-10.8	-10.6	-9.7	-9.5	-9.4	-10.1	-11.1	-12.4	-13.0	-14.1	-15.2	-15.9	-16.7	-17.5	-11.0	-6.7																						
20-Nov	-18.4	-19.3	-20.2	-20.7	-20.6	-21.5	-21.4	-20.4	-20.8	-19.6	-18.1	-17.3	-16.2	-14.8	-14.1	-14.5	-15.7	-16.4	-16.7	-16.7	-17.6	-17.9	-16.8	-16.2	-18.0	-14.1																						
21-Nov	-15.8	-15.7	-15.6	-15.6	-16.5	-16.8	-17.3	-17.6	-17.6	-16.6	-15.2	-13.2	-12.1	-11.3	-10.9	-11.7	-14.3	-16.4	-17.1	-17.7	-18.5	-19.3	-18.6	-19.0	-15.8	-10.9																						
22-Nov	-18.4	-18.3	-18.3	-18.0	-17.8	-17.6	-16.7	-17.2	-17.1	-15.8	-14.6	-13.7	-12.1	-10.8	-10.0	-11.1	-14.2	-16.7	-17.8	-17.2	-18.5	-18.9	-19.7	-18.0	-16.2	-10.0																						
23-Nov	-15.8	-15.2	-15.2	-15.8	-15.9	-15.7	-15.5	-15.4	-15.4	-15.3	-15.2	-14.9	-14.4	-14.3	-14.4	-14.6	-14.7	-14.6	-14.6	-14.6	-14.7	-14.8	-14.8	-14.7	-15.0	-14.3																						
24-Nov	-14.7	-14.7	-14.7	-14.7	-14.7	-14.9	-15.1	-15.1	-15.1	-14.8	-14.2	-13.6	-13.1	-12.8	-12.9	-13.2	-15.7	-18.7	-20.9	-20.9	-20.1	-19.2	-18.8	-18.4	-15.9	-12.8																						
25-Nov	-18.1	-17.4	-16.7	-17.6	-18.6	-19.4	-21.2	-22.4	-21.0	-19.8	-17.7	-14.7	-13.6	-12.2	-11.7	-13.4	-15.0	-17.3	-19.3	-20.7	-21.8	-22.3	-23.0	-23.6	-18.3	-11.7																						
26-Nov	-24.4	-24.2	-19.6	-16.5	-17.1	-20.5	-18.2	-15.2	-15.5	-15.4	-13.6	-12.3	-11.7	-10.4	-9.9	-10.6	-11.4	-12.3	-12.3	-11.8	-11.0	-10.6	-10.6	-11.5	-14.4	-9.9																						
27-Nov	-12.5	-12.5	-12.8	-13.4	-14.0	-14.1	-14.4	-14.5	-14.7	-14.6	-14.2	-14.0	-14.2	-14.0	-14.0	-14.4	-15.5	-16.3	-17.1	-17.9	-17.6	-17.4	-17.9	-18.5	-15.0	-12.5																						
28-Nov	-19.8	-20.9	-21.7	-22.5	-24.9	-26.6	-25.3	-24.9	-24.7	-23.4	-21.8	-20.4	-19.0	-18.3	-18.2	-19.3	-20.5	-21.1	-21.3	-21.6	-22.6	-22.1	-21.6	-21.4	-21.8	-18.2																						
29-Nov	-21.2	-21.3	-21.6	-21.9	-22.4	-23.0	-23.0	-22.9	-22.7	-22.1	-21.4	-20.7	-19.7	-19.6	-19.5	-20.9	-23.9	-25.9	-26.7	-24.1	-23.3	-23.0	-22.9	-22.6	-22.3	-19.5																						
30-Nov	-21.9	-21.4	-21.0	-20.8	-20.6	-20.8	-21.2	-21.2	-21.1	-20.7	-19.8	-18.9	-17.5	-16.6	-16.5	-16.6	-17.2	-17.8	-18.6	-20.2	-19.5	-18.8	-18.7	-18.6	-19.4	-16.5																						
																								-7.9	-7.9	-7.8	-7.9	-8.3	-8.7	-8.7	-8.7	-8.6	-7.8	-6.7	-5.7	-5.0	-4.4	-4.3	-4.8	-6.1	-7.2	-7.7	-7.8	-8.0	-8.2	-8.2	-8.2	Diurnal Average
																								10.4	10.4	10.4	9.8	7.6	4.7	4.0	2.4	2.6	4.9	7.5	8.6	10.9	12.5	12.1	10.0	8.2	4.2	3.7	7.5	9.3	7.7	7.5	9.1	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 2m (AT2) - C**  
**Conklin - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Conklin - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	72	10.00	10.00
-20 - 0	504	70.00	80.00
0 - 10	138	19.17	99.17
10 - 20	6	0.83	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720





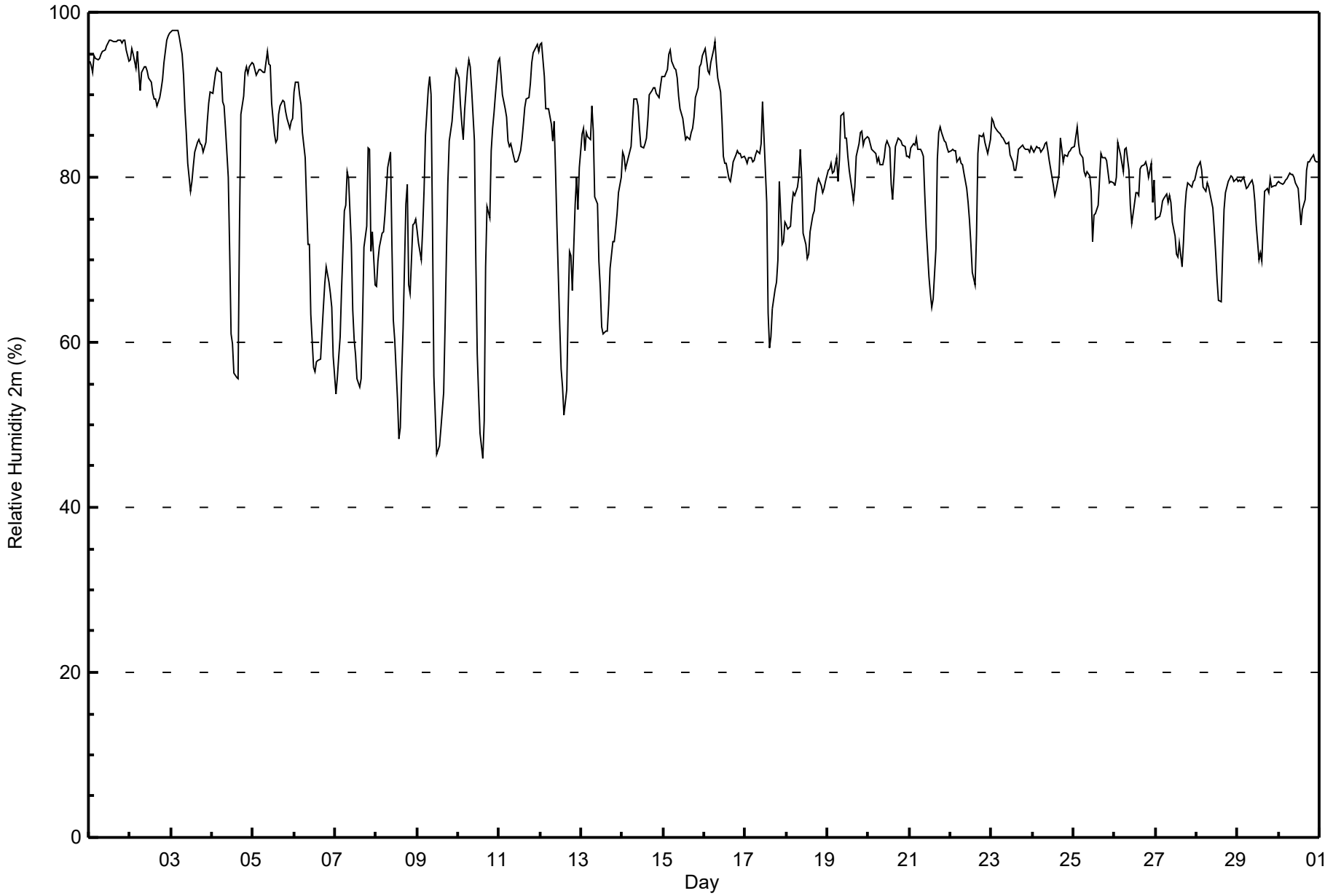
**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Relative Humidity 2m (RH2) - %**

**Conklin - November 2024**

<b>Maximum Value: 97.9 % on Nov 3 03:00</b> <b>Maximum Daily Average: 95.5 % on Nov 1</b>																						<b>Hours in Service: 720</b> <b>Hours of Data: 720</b>																											
<b>Minimum Value: 46.0 % on Nov 10 15:00</b> <b>Minimum Daily Average: 67.3 % on Nov 7</b>																						<b>Hours of Missing Data: 0</b> <b>Hours of Calibration: 0</b>																											
<b>Maximum Diurnal Average: 85.2 % at hour 7</b> <b>Minimum Diurnal Average: 71.1 % at hour 15</b>																						<b>Percent Operational Time: 100.0</b>																											
<b>Monthly Average: 80.88 %</b> <b>Percentiles: P<sub>1</sub> = 49.8 P<sub>10</sub> = 66.9 Q<sub>1</sub> = 77.0 Median = 82.4 Q<sub>3</sub> = 86.9 P<sub>90</sub> = 93.2 P<sub>99</sub> = 97.0</b>																																																	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	94.1	93.6	92.8	94.8	94.5	94.3	94.4	95.0	95.2	95.4	95.9	96.3	96.6	96.6	96.5	96.5	96.5	96.6	96.6	96.3	96.6	96.7	95.5	94.1	95.5	96.7																							
2-Nov	94.2	95.7	95.0	93.2	95.2	92.9	90.5	92.6	93.3	93.3	92.9	92.1	91.5	90.2	89.5	89.4	88.7	89.6	90.7	91.8	93.9	96.7	97.1	97.5	92.8	97.5																							
3-Nov	97.7	97.9	97.9	97.8	97.8	97.0	94.9	92.5	88.2	85.2	81.8	78.2	79.5	81.4	83.1	84.2	84.5	84.0	83.9	83.0	84.2	86.9	89.0	90.4	88.4	97.9																							
4-Nov	90.1	91.5	92.7	93.2	92.9	92.7	89.1	88.6	86.0	80.0	71.1	61.0	59.8	56.2	55.8	55.7	73.7	87.6	89.9	92.7	93.5	92.5	93.3	93.9	82.2	93.9																							
5-Nov	93.7	93.0	92.4	93.1	93.1	92.8	92.7	92.8	95.2	93.7	93.5	89.0	85.2	84.3	84.6	87.7	88.7	89.3	89.1	87.9	87.1	85.9	86.8	87.1	89.9	95.2																							
6-Nov	90.4	91.6	91.6	89.9	88.8	85.5	82.4	77.0	71.8	71.9	63.5	56.9	56.4	57.7	57.9	57.9	61.1	64.2	67.1	69.1	67.2	66.0	64.2	58.3	71.2	91.6																							
7-Nov	53.7	55.8	58.3	60.7	66.4	76.0	76.6	80.7	79.8	71.9	63.8	60.3	58.4	55.7	54.6	55.6	62.7	71.6	74.1	83.5	83.4	71.0	73.4	67.0	67.3	83.5																							
8-Nov	66.8	69.8	71.5	73.2	73.4	75.4	78.3	81.2	83.0	71.8	62.7	60.3	53.0	48.3	49.6	56.3	61.7	76.8	79.1	67.0	65.9	74.2	74.4	74.9	68.7	83.0																							
9-Nov	73.6	72.0	70.1	73.8	78.4	85.1	90.7	92.2	90.0	74.5	55.9	46.4	46.9	47.4	49.4	53.9	61.8	70.9	79.3	84.3	86.8	89.1	91.6	93.1	73.2	93.1																							
10-Nov	92.1	88.8	86.4	84.5	88.1	92.9	94.2	93.4	90.7	84.4	69.9	58.7	53.5	48.9	46.0	50.5	69.1	76.4	75.2	83.2	85.9	87.9	90.0	94.1	78.5	94.2																							
11-Nov	94.5	92.4	90.1	88.3	87.3	84.5	83.7	84.0	82.5	81.9	81.9	82.0	83.2	84.6	86.5	88.5	89.6	89.7	91.3	94.0	95.0	95.8	96.1	95.3	88.4	96.1																							
12-Nov	96.1	96.4	92.2	88.3	88.3	88.2	86.5	84.3	86.8	80.9	74.1	62.1	56.8	54.6	51.2	54.3	63.8	71.0	70.5	66.2	76.6	79.9	76.1	81.2	76.1	96.4																							
13-Nov	85.3	85.9	83.3	85.5	84.8	84.5	88.6	85.7	77.6	76.8	69.8	66.5	61.9	61.1	61.3	61.3	64.5	69.1	72.2	72.3	73.7	75.6	78.1	79.9	75.2	88.6																							
14-Nov	83.0	82.5	81.1	82.3	83.0	83.8	86.7	89.4	89.4	88.7	85.9	83.8	83.6	84.0	84.7	86.9	90.0	90.5	90.9	90.9	90.2	89.7	91.0	92.3	86.8	92.3																							
15-Nov	92.3	92.2	93.0	95.0	95.5	94.1	93.2	93.0	92.0	89.8	88.3	87.1	85.7	84.7	84.8	84.5	85.4	86.0	87.3	89.7	90.9	93.4	93.7	94.8	90.3	95.5																							
16-Nov	95.7	94.2	92.8	92.6	93.9	95.5	96.5	94.0	92.0	90.4	86.9	82.6	81.6	81.7	79.8	79.4	80.5	81.8	82.7	83.3	82.9	82.9	82.4	82.5	87.0	96.5																							
17-Nov	82.3	81.7	82.3	82.3	81.9	82.0	82.7	83.2	82.8	84.1	89.2	85.0	76.9	63.5	59.3	60.7	64.0	66.5	67.3	70.1	79.5	71.8	72.3	74.5	76.1	89.2																							
18-Nov	74.2	73.7	74.1	76.6	78.2	77.7	78.9	80.2	83.4	79.8	73.2	71.8	70.2	70.6	73.4	75.3	76.0	77.8	79.2	79.9	79.0	78.1	78.7	79.5	76.6	83.4																							
19-Nov	80.8	81.1	81.6	80.4	80.7	82.4	79.5	82.1	87.5	87.9	84.8	84.8	82.6	80.9	78.4	77.1	78.9	82.6	84.1	85.4	85.6	84.0	84.6	85.0	82.6	87.9																							
20-Nov	84.8	84.0	83.4	83.0	82.8	81.8	82.4	81.5	81.5	82.4	83.9	84.4	83.6	79.2	77.4	80.1	83.8	84.8	84.6	84.4	83.8	83.7	82.5	82.5	82.8	84.8																							
21-Nov	82.4	83.5	84.0	83.9	84.8	83.3	83.3	83.0	82.5	78.0	73.9	68.0	66.0	64.3	65.3	71.3	82.2	85.4	86.2	85.5	84.4	84.3	83.6	83.1	79.7	86.2																							
22-Nov	83.2	83.3	83.2	83.3	81.9	82.4	81.7	81.5	80.5	78.6	77.0	74.8	71.9	68.5	66.9	73.1	82.8	85.1	84.9	85.2	84.2	83.6	82.9	84.6	80.2	85.2																							
23-Nov	87.0	86.8	86.1	85.7	85.5	85.2	84.9	84.7	84.2	84.2	84.2	82.8	81.8	80.9	80.8	81.9	83.3	83.7	83.8	83.5	83.4	83.4	83.1	83.7	83.9	87.0																							
24-Nov	83.4	83.0	83.8	83.6	83.6	83.1	83.5	84.1	84.2	83.2	82.0	79.9	79.0	77.9	78.4	80.4	84.8	83.3	81.9	82.7	82.5	83.1	83.3	83.6	82.4	84.8																							
25-Nov	83.8	85.0	86.1	84.0	82.9	82.4	80.7	80.1	80.7	80.2	78.3	72.1	75.5	75.6	76.6	79.9	82.9	82.4	82.4	82.0	80.7	79.4	79.5	79.3	80.5	86.1																							
26-Nov	78.9	79.9	84.3	82.7	81.6	80.6	83.4	83.5	80.8	76.7	74.5	75.6	78.2	78.1	77.8	81.0	81.4	81.6	81.8	81.3	80.0	81.7	77.0	79.6	80.1	84.3																							
27-Nov	75.0	75.1	75.2	75.9	77.2	77.4	77.9	77.0	77.8	76.9	74.5	72.9	70.7	70.3	72.0	69.1	72.1	76.1	78.2	79.4	78.9	78.7	79.6	79.6	75.7	79.6																							
28-Nov	81.2	81.6	81.8	80.8	78.8	78.4	79.4	78.8	77.9	76.3	73.7	70.8	67.7	65.0	64.9	70.8	76.1	78.2	79.5	79.9	80.2	80.0	79.5	79.7	76.7	81.8																							
29-Nov	79.5	79.7	79.5	79.9	79.3	78.7	78.8	79.1	79.6	79.0	77.2	74.2	69.9	70.9	69.8	74.3	78.3	78.7	78.2	79.8	78.9	79.0	79.0	79.3	77.5	79.9																							
30-Nov	79.5	79.3	79.1	79.3	79.7	79.8	80.5	80.3	80.3	80.0	79.3	78.6	76.5	74.2	76.1	77.3	80.9	81.9	81.9	82.3	82.7	82.0	81.8	81.9	79.8	82.7																							
																								84.3	84.4	84.2	84.3	84.7	85.0	85.2	85.2	84.6	81.9	78.1	74.6	72.8	71.2	71.1	73.2	77.7	80.8	81.8	82.5	83.3	83.2	83.3	83.7	Diurnal Average	
																								97.7	97.9	97.9	97.8	97.8	97.0	96.5	95.0	95.2	95.4	95.9	96.3	96.6	96.6	96.5	96.5	96.5	96.6	96.6	96.6	96.3	96.6	96.7	97.1	97.5	Diurnal Maximum



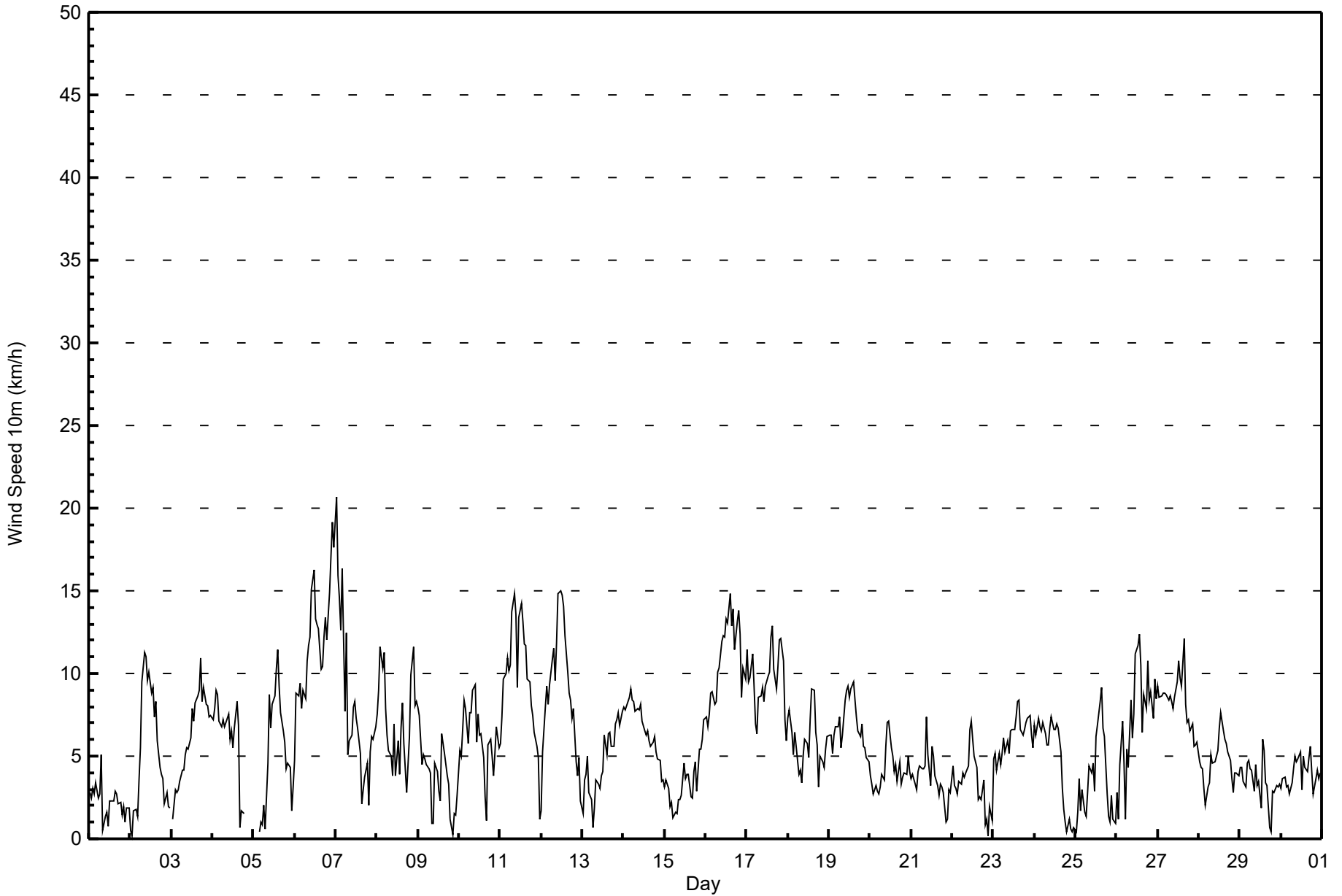


Maximum Speed: 21 km/h on Nov 7 01:00	Maximum Daily Speed Average: 11.6 km/h on Nov 6	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 2 02:00	Minimum Daily Speed Average: 1.4 km/h on Nov 1	Hours of Data: 712
Maximum Diurnal Speed Average: 2.7 km/h at hour 12	Minimum Diurnal Speed Average: 0.9 km/h at hour 6	Hours of Missing Data: 8
Monthly Average Velocity: 1.5 km/h 261.5 deg	Percentiles: P <sub>1</sub> = 0 P <sub>10</sub> = 2 Q <sub>1</sub> = 4 Median = 6 Q <sub>3</sub> = 8 P <sub>90</sub> = 11 P <sub>99</sub> = 15	Percent Operational Time: 98.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	NNW3	NNW2	NNW3	N3	ESE3	N2	NNW3	N5	SE0	SSW1	WSW2	WNW1	NE2	NNE2	N2	NE3	NNE3	N2	NNE2	NNE1	N2	N1	SSW2	S2	N1.4	N5
2-Nov	SSE1	W0	SSW2	SSW2	E1	SE4	SE6	SE9	SE11	SE11	SE10	SE10	SE9	SE9	E7	E8	ENE6	NE4	NNE4	N4	NW2	N3	NW2	NNW2	ESE3.6	SE11
3-Nov	UO	NW1	NNW3	NW3	NW3	NW3	WNW4	WNW4	WNW5	W5	SW5	WSW6	WSW8	SW7	SSW8	SSW9	SSW9	SSW11	SSW8	SW9	SW8	SW8	SW7	SW7	SW5.1	SSW11
4-Nov	SW7	SSW8	SSW9	SSW9	SSW7	SW7	SW7	SW7	SW7	SW8	SW6	W7	WNW6	SW7	SW8	SW7	WSW1	SSW2	SSE2	UO	NW1	UO	UO	UO	SW5.4	SSW9
5-Nov	UO	UO	UO	W0	SSE1	S1	S2	SSW1	NW5	NW9	NNW7	NW8	NW9	NW10	NW11	NW9	NW8	NW7	NW6	WNW4	WNW5	NW4	S2	SSW3	NW4.5	NW11
6-Nov	S5	S9	S9	SSW9	SSW8	SSW9	S8	SSW11	SW12	SSW12	SSW15	SSW16	SW13	SW13	WSW13	WSW10	SW10	SW12	SSW13	SW12	SW15	SW17	SW19	SW18	SSW11.6	SW19
7-Nov	WSW21	W16	WNW15	WNW13	NW16	NW8	NW12	WNW5	WNW6	WNW6	WNW8	WNW8	WNW7	W7	W5	WSW2	SSE3	SSE4	SSE5	SE2	SSE5	SSE6	SSE6	S7	W5.3	WSW21
8-Nov	S8	SSW9	SSW12	SSW10	SSW11	SSW8	S6	S5	S5	SSW4	SW7	WSW4	SW6	SSW4	S7	SSW8	SSW6	SE3	SSE5	WSW6	WNW10	NW12	WNW8	W8	SW5.3	NW12
9-Nov	WNW8	W7	WNW4	WNW5	WNW5	NW5	NW4	NNW4	ESE1	SSW1	WNW5	WNW4	NW3	WNW2	SSW6	SSW5	S4	S4	S3	SSE1	WSW0	S2	SSW1	SSE3	W2.2	WNW8
10-Nov	S5	S5	SSW7	SW8	SSW8	S6	SSW8	SSW8	SSW9	SW9	WSW6	W8	W6	WNW6	WNW5	WNW3	SSE1	SSW6	SSW6	SSW5	S4	S5	S7	SSE6	SSW4.8	SW9
11-Nov	SE6	SSE7	SSE10	SE10	SE11	SSE10	SSE11	SE14	SE15	SE14	SSE9	SSE13	SSE14	SSE13	SSE12	SSE12	SSE10	SSE9	SE8	SE7	SE6	SE6	SE5	SSW1	SSE9.4	SE15
12-Nov	WNW2	WSW5	WSW8	WSW9	WSW8	WSW9	WSW11	WSW12	SW10	WSW12	W15	W15	W15	W14	W12	W10	WSW9	SW8	WSW7	WSW8	SW5	WNW4	WNW5	WNW2	WSW8.6	W15
13-Nov	WNW1	NW4	NW4	NNW5	NW3	NNW2	NNW1	NNW2	N4	N3	NNW3	SE4	ENE4	NE6	NE5	ENE6	NNE6	NNE6	NE6	NE7	NE7	ENE8	NE7	NE8	NNE3.6	NE8
14-Nov	NE8	NE8	NE8	NE9	NE9	NE8	NNE8	NNE8	SE8	NNE8	NE8	ENE7	NE7	NE6	ENE7	NNE6	N6	N6	N6	NNE5	NE5	NE5	N3	N4	NE6.4	NE9
15-Nov	N3	N4	N3	NNW2	NNW2	NW1	NNE2	NE2	SSE2	S2	SSW3	SW5	SW4	SW4	SW4	SW3	S2	SSW4	SSW5	S3	SSW5	SW5	SW6	SW7	SW2.0	SW7
16-Nov	SW7	SW7	SW8	SSW9	SSW9	S8	SSE8	S10	S10	S12	S12	S12	S13	S13	S15	S13	S14	S11	S13	S14	S12	S9	S10	S10	S10.5	S15
17-Nov	SSE11	S9	SSE10	SSE11	SSE9	S7	S6	S9	S9	SSW9	SSW8	SSW9	SW10	WSW10	WSW12	WSW13	SW10	SW9	WSW10	WSW12	W12	WNW11	NW7	WNW6	SW7.1	WSW13
18-Nov	WNW7	NW8	NW6	WNW5	NW6	NW6	NW4	NW4	WNW3	W5	W6	WNW6	WNW5	N7	NNW9	NNW9	NNW6	NNW6	N3	NNE5	NNE5	NNE4	NNE5	NE6	NNW4.6	NNW9
19-Nov	NNE6	NE6	ENE5	NE6	NE7	NNE7	NNE7	NNE6	N6	NNE8	N9	N9	N9	N9	N10	N8	NNW7	NNW7	N6	NNW7	NW6	NW5	NNW5	NNW5	N6.4	N10
20-Nov	NNW4	N3	NNE3	N3	N3	N3	NNW3	NNW4	NNW4	NNW6	N7	N7	NNW5	NNW5	N4	NNE5	NNE3	N5	NNW3	NNW4	NNW4	NNW4	NNW5	NW4	NNW4.0	N7
21-Nov	NNW4	NNW4	NW3	NNW3	N4	N4	NNW4	NW4	NW4	NW7	NW5	WNW3	NNW6	NNW5	N4	NNW3	NW3	NW3	NNW3	NW3	W1	SSW1	NW3	NNW3	NNW3.5	NW7
22-Nov	NW4	NW3	NW3	NW3	NW4	WNW3	W4	W4	W4	WNW4	NW7	NW7	NW6	WNW5	NW4	NW2	NW3	NNW2	NW4	WNW1	WNW1	S0	NW2	NW1	NW3.2	NW7
23-Nov	NE5	NE5	ENE4	NNE5	NNE5	NE5	NE6	ENE5	NE6	NE5	NNE7	NE7	NNE7	NNE7	NE8	NE8	NE7	NNE6	NNE7	NNE7	NEE7	NEE7	NNE6	NNE5	NE6.0	NNE8
24-Nov	N7	NNE6	N7	N7	NNE7	NNE7	N6	N6	N6	N7	NNE7	N7	N7	NNE7	N7	N5	NNW3	NW2	NW1	WNW0	NNW1	WNW1	N0	SSW1	N4.6	NNE7
25-Nov	NW0	SW2	SW4	W2	SSW3	SSE2	SSW1	S3	SSE4	SSE4	SE5	ESE3	ESE6	SE7	SSE8	SSE9	SSE7	S6	SSE3	SSE1	SSE1	SSE3	S1	SSE1	SSE3.0	SSE9
26-Nov	NNW3	NW1	SSE4	SSE7	SE5	SE1	SE5	SE4	SSE8	S6	S8	SSW11	S12	SSW12	SSW11	SSW6	SW9	SW8	SW11	WSW8	W9	W7	WNW10	WNW8	SSW4.9	SSW12
27-Nov	NW9	WNW9	WNW9	WNW9	WNW9	WNW9	WNW8	WNW9	WNW8	WNW8	WNW9	NW10	NW11	NW10	NW9	NW12	NW8	WNW7	NW7	NW7	NW7	NW6	WNW6	NW6	WNW8.2	NW12
28-Nov	NW5	NW4	NW4	NW3	NW2	NW3	NW3	NW5	NW5	NW5	WNW5	NW5	NW7	NNW8	NNW7	NW6	NNW6	NW5	NNW5	NW4	NNW3	NNW4	NNW4	NW4	NW4.5	NNW8
29-Nov	NNW4	NNW4	NNW3	NNW3	NNW5	NW5	NNW4	NNW4	NNW3	N4	NNE3	N3	N2	N6	NNE5	E3	NE3	WNW1	NW0	ENE3	NE3	NNE3	NNE3	NNE3	N2.9	N6
30-Nov	NNE3	NE4	ENE4	ENE3	ENE3	NE3	NNW3	NNW4	NNW5	NNW5	NNW5	NNW5	NE3	E5	ENE4	ENE4	N5	NNW6	NNW4	NNW3	NNW4	NW4	NW4	NNW4	N3.0	NNW6
W1.7 W1.6WSW1.4WSW1.4 W1.0 W0.9 W1.0WSW1.0 SW1.5WSW1.7 W2.1 W2.7 W2.3 W1.9 W1.7WSW1.1WSW1.2WSW1.5WSW1.4WSW1.5 W1.7WNW1.5 W1.7 W1.6																										
WSW21 W16WNW15WNW13 NW16 SSE10 NW12 SE14 SE15 SE14 SSW15 SSW16 W15 W14 S15WSW13 S14 SW12 SSW13 S14 SW15 SW17 SW19 SW18																										
Diurnal Average																										
Diurnal Maximum																										

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Conklin - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	343	48.17	48.17
6 - 11	314	44.10	92.28
12 - 19	54	7.58	99.86
20 - 28	1	0.14	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 712

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Conklin - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	29	23	17	10	3	3	10	21	21	23	9	6	10	33	60	65	343
6 - 11	25	26	24	6	2	1	16	20	24	35	34	16	10	30	31	14	314
12 - 19	0	0	0	0	0	0	3	5	12	6	9	6	7	2	4	0	54
20 - 28	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	54	49	41	16	5	4	29	46	57	64	52	29	27	65	95	79	712

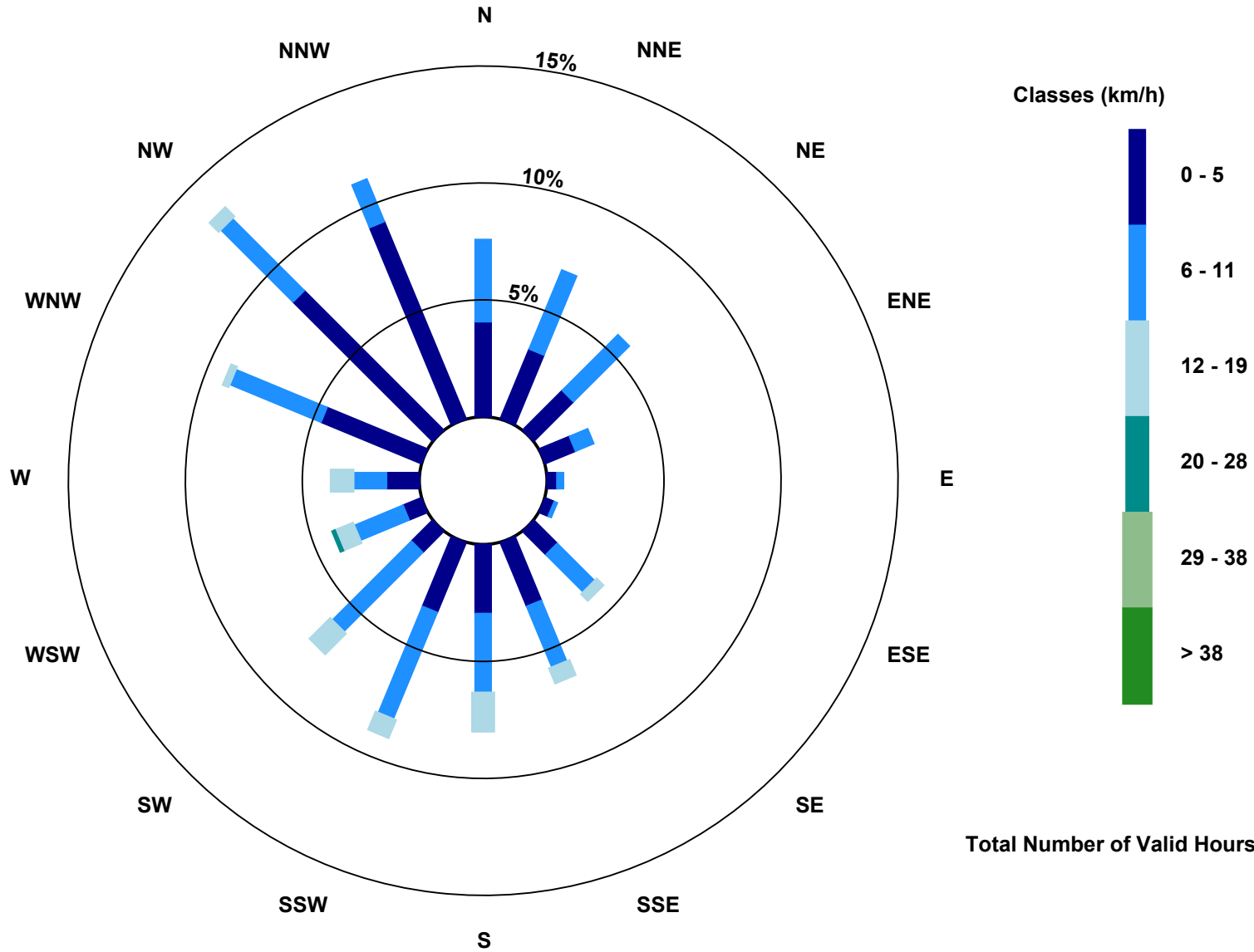
Total Number of Valid Hours: 712

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Conklin





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Conklin - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 8 km/h on Nov 7 05:00	Hours of Data: 712
Minimum Value: 0 km/h on Nov 1 02:00	Hours of Missing Data: 8
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 6	Hours of Calibration: 0
	Percent Operational Time: 98.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	1	0	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
2-Nov	1	1	1	1	1	2	2	2	3	3	3	2	2	3	3	3	3	1	1	1	1	1	1	1	3
3-Nov	UO	1	1	1	1	1	2	2	2	2	2	3	3	3	3	2	3	2	3	2	2	2	2	3	
4-Nov	2	2	1	2	1	1	2	2	2	2	2	3	2	3	2	2	1	1	1	UO	1	UO	UO	UO	3
5-Nov	UO	UO	UO	1	1	1	1	1	3	3	3	3	4	4	4	3	3	3	2	2	2	2	1	1	4
6-Nov	2	2	2	2	2	2	2	3	4	4	5	5	4	3	4	3	3	3	3	3	4	5	5	5	5
7-Nov	7	6	6	6	8	3	6	2	2	3	3	4	3	3	3	1	1	1	1	2	2	1	1	2	8
8-Nov	2	2	3	3	3	2	2	1	3	2	4	2	2	2	2	2	2	2	2	4	4	5	4	3	5
9-Nov	3	3	2	2	2	1	1	1	1	1	2	1	1	1	2	2	1	1	1	1	1	1	1	1	3
10-Nov	1	2	1	2	2	1	2	2	3	3	3	3	3	3	2	1	1	2	1	1	1	1	1	1	3
11-Nov	1	2	3	3	3	3	3	4	4	4	3	5	4	4	3	3	2	3	2	2	1	2	2	1	5
12-Nov	1	2	3	3	3	4	3	4	3	4	6	6	7	6	5	3	3	2	2	3	2	2	2	1	7
13-Nov	1	2	2	1	1	1	1	1	1	1	1	1	1	2	1	2	2	2	2	2	2	3	2	3	3
14-Nov	3	3	2	3	3	3	3	2	3	2	3	2	2	2	2	2	1	1	2	2	1	2	1	1	3
15-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2
16-Nov	3	2	3	3	3	3	2	3	3	4	3	4	4	4	5	4	4	4	4	4	4	3	3	3	5
17-Nov	4	3	2	3	2	2	2	3	3	3	3	3	3	4	4	4	3	3	4	6	5	5	3	2	6
18-Nov	3	3	2	2	3	2	1	2	2	2	2	3	2	2	2	2	3	2	2	2	2	2	2	2	3
19-Nov	2	2	2	2	2	3	3	2	1	3	3	3	3	3	3	3	3	2	2	2	2	2	1	1	3
20-Nov	1	1	1	1	0	1	1	2	1	2	2	2	2	2	2	1	2	1	2	1	1	1	1	1	2
21-Nov	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	1	2
22-Nov	1	1	2	1	1	2	2	1	1	2	2	3	2	2	2	2	1	2	1	1	1	1	2	1	3
23-Nov	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
24-Nov	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2
25-Nov	1	1	1	1	1	1	2	1	1	1	1	2	2	2	3	2	1	1	1	1	1	1	1	1	3
26-Nov	1	1	3	1	1	1	1	2	2	2	4	4	4	3	4	3	3	3	3	3	3	3	4	4	4
27-Nov	4	4	4	4	4	4	4	3	3	3	4	4	5	4	4	4	3	3	3	2	3	2	2	3	5
28-Nov	2	1	1	1	1	1	1	1	1	2	2	2	3	3	3	2	1	2	1	1	1	1	1	1	3
29-Nov	1	1	1	1	1	1	1	1	1	2	1	2	1	2	2	1	1	1	1	1	1	1	1	1	2
30-Nov	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2

Diurnal Maximum

UO - Unstable Operation





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Conklin - November 2024**

Direction of Maximum Speed: 247 deg on Nov 7 01:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 213.0 deg on Nov 6	Hours of Data: 712
Direction of Minimum Speed: 273 deg on Nov 2 02:00	Hours of Missing Data: 8
Direction of Minimum Daily Speed Average: 1.4 deg on Nov 1	Percent Operational Time: 98.9
Monthly Average Direction: 261.5 deg	

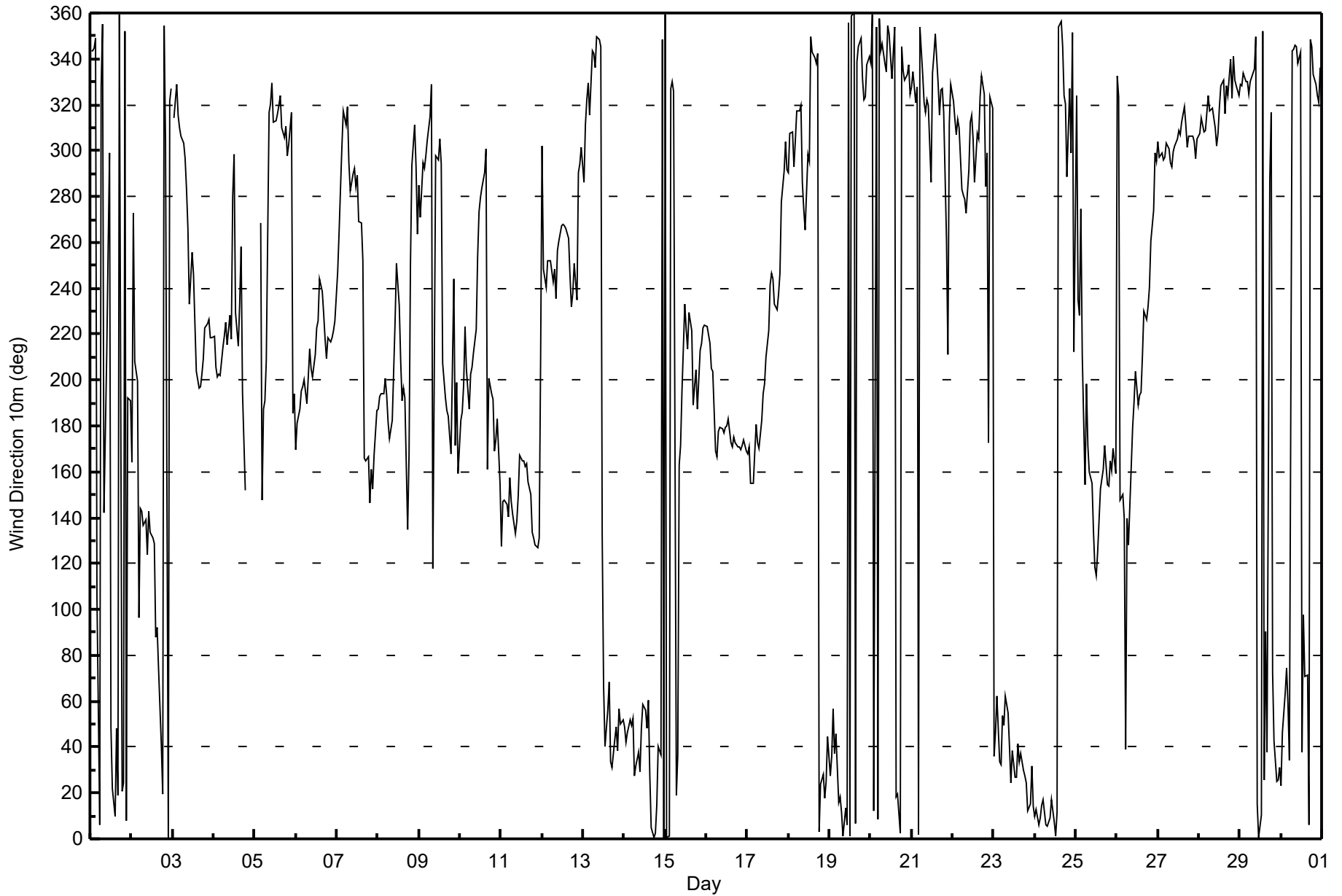
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	344	343	345	349	105	6	328	355	142	212	257	299	49	22	10	48	19	359	21	24	352	8	192	191	4.6
2-Nov	164	273	208	200	96	144	142	137	139	124	143	134	131	129	88	92	75	41	19	354	304	0	322	327	117.5
3-Nov	UO	314	329	316	310	306	303	296	283	266	233	256	246	224	204	197	197	203	209	223	224	226	218	219	233.0
4-Nov	219	206	201	203	202	214	219	225	215	228	218	280	298	229	215	234	258	195	152	UO	315	UO	UO	UO	221.3
5-Nov	UO	UO	UO	268	148	187	191	209	317	320	329	312	313	316	320	324	310	305	311	298	303	317	185	194	310.5
6-Nov	170	181	187	195	197	200	190	201	214	205	201	211	223	226	244	239	229	218	209	218	216	218	221	226	213.0
7-Nov	247	264	283	301	318	311	319	295	283	290	292	284	289	269	269	252	166	165	166	146	161	153	167	187	271.4
8-Nov	187	193	194	194	201	193	182	175	182	204	225	251	232	209	191	196	192	135	168	250	294	311	293	263	214.7
9-Nov	285	271	295	292	298	305	315	329	118	203	298	296	305	294	208	192	187	184	176	168	244	172	199	159	263.0
10-Nov	183	186	198	223	204	188	203	206	212	222	254	273	279	284	290	301	161	201	194	192	169	174	183	155	212.8
11-Nov	128	147	148	146	140	158	147	142	133	138	149	167	165	164	162	163	156	150	134	131	128	127	131	209	148.4
12-Nov	302	249	240	252	252	252	243	248	236	257	260	267	268	267	266	262	245	232	238	251	235	290	294	301	255.8
13-Nov	286	311	322	330	316	344	342	336	349	349	345	133	67	40	56	68	33	31	43	49	39	57	50	52	30.9
14-Nov	49	42	46	52	50	52	28	31	38	29	48	59	56	48	60	28	5	1	3	15	40	37	349	0	36.9
15-Nov	359	1	1	327	330	326	19	37	163	172	196	233	222	214	229	221	189	197	205	187	213	216	223	224	223.3
16-Nov	224	220	216	205	204	169	166	178	179	179	177	179	180	183	173	171	175	173	171	171	170	171	174	169	179.8
17-Nov	168	171	155	155	168	180	172	170	182	194	199	210	222	242	246	244	233	230	237	246	278	291	304	291	216.1
18-Nov	291	307	308	293	305	317	317	320	286	274	266	299	295	349	343	340	338	342	3	24	28	18	25	45	327.4
19-Nov	28	36	57	37	46	16	18	12	1	14	6	356	1	359	360	6	338	345	349	331	322	323	337	341	3.4
20-Nov	338	359	12	354	9	358	344	347	338	334	355	351	331	343	354	18	20	3	345	335	331	333	337	324	347.8
21-Nov	327	334	321	328	2	354	333	321	317	322	320	286	334	342	351	330	315	326	327	317	261	211	312	329	327.3
22-Nov	321	313	307	313	310	283	281	279	273	292	312	315	305	286	307	305	324	333	325	284	299	173	323	319	304.2
23-Nov	36	46	62	33	32	54	49	62	55	40	24	39	27	27	41	34	37	30	27	24	12	15	32	14	34.4
24-Nov	10	13	6	9	15	17	6	6	7	9	17	7	1	12	354	356	345	324	320	289	327	299	352	212	5.3
25-Nov	324	235	228	275	211	154	199	172	160	155	134	118	114	125	153	157	161	171	154	154	165	160	170	159	157.6
26-Nov	333	323	148	150	140	39	140	128	162	179	191	204	189	194	195	210	230	226	232	241	260	274	299	296	210.6
27-Nov	304	297	299	296	297	303	301	295	293	300	302	305	309	307	312	319	311	301	306	306	306	304	296	305	303.5
28-Nov	307	314	311	308	309	324	317	318	319	310	302	307	319	328	330	316	328	324	340	323	341	331	328	324	320.3
29-Nov	329	328	334	330	330	325	330	332	336	350	15	0	11	352	26	90	38	287	316	72	43	25	26	31	358.0
30-Nov	23	46	63	74	59	34	344	344	346	345	338	343	38	98	71	71	6	348	346	333	329	324	321	336	8.1

280.6 273.3 252.3 254.4 264.2 277.0 271.9 245.8 220.0 253.2 261.4 265.7 268.7 271.0 263.8 256.7 252.5 242.6 237.9 256.0 271.0 282.4 271.5 264.0

Diurnal Average

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Conklin - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 96 deg on Nov 22 22:00	Hours of Data: 712
Minimum Value: 9 deg on Nov 7 22:00	Hours of Missing Data: 8
Percentiles: P <sub>1</sub> = 12 P <sub>10</sub> = 17 Q <sub>1</sub> = 20 Median = 25 Q <sub>3</sub> = 32 P <sub>90</sub> = 52 P <sub>99</sub> = 89	Hours of Calibration: 0
	Percent Operational Time: 98.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	13	15	16	38	43	63	26	23	78	66	64	87	30	44	38	34	30	47	60	66	36	65	47	38	87
2-Nov	93	92	60	39	56	30	25	18	16	19	18	16	19	20	37	32	37	28	31	29	37	32	20	16	93
3-Nov	UO	37	14	19	25	34	37	36	33	24	33	28	30	28	23	18	16	22	20	19	18	17	18	37	
4-Nov	20	14	10	11	13	16	19	17	18	20	30	36	30	33	24	23	90	40	64	UO	81	UO	UO	UO	90
5-Nov	UO	UO	UO	89	55	85	21	78	71	21	25	25	28	22	20	18	27	29	26	36	33	29	44	39	89
6-Nov	25	16	17	16	16	15	16	19	24	23	19	20	24	22	21	24	21	19	17	21	18	19	19	20	25
7-Nov	21	25	31	32	24	22	23	30	31	35	35	36	33	38	30	43	19	17	17	60	17	9	16	18	60
8-Nov	17	18	15	17	15	19	27	19	56	71	63	61	37	48	19	16	18	34	27	57	32	25	33	26	71
9-Nov	30	25	28	29	25	19	18	19	73	86	34	38	48	45	16	20	14	12	20	53	89	70	66	52	89
10-Nov	14	25	19	20	19	15	20	18	22	20	33	36	40	36	31	64	71	12	10	11	25	13	14	26	71
11-Nov	15	17	18	17	15	18	16	15	14	16	18	18	18	20	20	18	17	17	16	14	14	22	15	72	72
12-Nov	47	28	22	22	31	27	22	21	18	28	26	28	31	31	29	24	20	19	22	24	40	40	30	46	47
13-Nov	68	28	34	17	37	52	81	52	21	18	39	29	40	30	27	32	24	26	30	32	27	32	31	29	81
14-Nov	30	27	31	28	30	31	22	23	25	20	29	33	34	31	34	25	21	18	20	24	31	29	22	22	34
15-Nov	29	22	24	23	22	61	58	69	24	30	39	21	26	26	25	24	24	24	23	30	20	22	22	22	69
16-Nov	25	23	24	22	25	21	18	20	22	19	20	22	20	21	19	20	20	20	18	19	20	22	19	17	25
17-Nov	16	20	16	16	19	24	24	20	19	21	21	22	22	27	22	20	21	24	20	30	31	33	32	31	33
18-Nov	30	30	27	30	29	22	29	24	30	30	33	34	52	24	18	17	30	28	71	27	29	35	24	32	71
19-Nov	30	33	36	30	31	25	25	21	17	23	24	21	24	24	23	19	22	21	16	15	15	20	17	18	36
20-Nov	21	27	20	16	20	28	19	31	28	21	23	20	38	36	39	22	20	16	38	33	17	26	22	21	39
21-Nov	23	22	23	23	15	23	18	25	27	21	42	73	38	38	48	37	23	25	20	31	59	56	34	27	73
22-Nov	21	45	63	40	34	44	40	35	35	40	29	26	34	35	37	30	28	29	30	68	62	96	59	87	96
23-Nov	25	31	35	24	26	33	32	31	35	27	28	27	27	20	25	19	23	29	21	25	19	22	22	23	35
24-Nov	23	22	21	21	20	20	18	20	20	22	22	26	22	24	21	18	13	26	35	71	69	88	67	69	88
25-Nov	72	44	28	58	29	63	62	32	25	18	24	44	19	20	21	14	9	13	17	26	67	64	52	76	76
26-Nov	25	61	56	13	22	77	19	20	15	20	23	21	21	20	23	30	25	25	21	23	25	31	32	31	77
27-Nov	29	31	30	30	31	30	31	32	31	34	32	29	26	27	27	20	22	28	28	26	28	30	28	29	34
28-Nov	25	21	19	22	35	16	28	19	18	30	30	31	29	25	24	18	16	17	19	18	24	17	17	20	35
29-Nov	18	18	27	20	16	16	17	16	26	27	41	52	91	37	31	31	28	61	89	43	34	26	22	27	91
30-Nov	24	28	31	38	32	32	19	14	13	15	17	20	60	29	35	31	23	20	22	15	17	20	18	19	60

93	92	63	89	56	85	81	78	78	86	64	87	91	48	48	64	90	61	89	71	89	96	67	87	
Diurnal Maximum																								

UO - Unstable Operation



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

**AMS22  
JANVIER  
NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)  
NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	685	35	35	100	7.5	0	1.7	0
TRS(ppb) Average	684	36	36	100	0.5	0	0.2	0
THC(ppm) Average	685	35	35	100	2.3	-	2.1	-
NMHC(ppm) Average	685	35	35	100	0.011	-	0	-
CH4(ppm) Average	685	35	35	100	2.3	-	2.1	-
O3 (ppb) Average	653	32	67	95.14	42	0	36.1	-
NO2 (ppb) Average	658	34	62	96.11	12.7	0	4.2	-
NO (ppb) Average	658	34	62	96.11	6.4	-	1.3	-
NOX (ppb) Average	658	34	62	96.11	19.1	-	5.1	-
PM2.5 (ug/m3) Average	717	3	3	100	64.4	0	9.1	0
Temperature 2 m (C) Average	720	0	0	100	12.1	-	6.8	-
Relative Humidity (%) Average	720	0	0	100	99.2	-	96.3	-
Wind Speed 10 m (km/h) Average	717	0	3	99.58	16	-	10	-
Wind Speed 20 m (km/h) Average	714	0	6	99.17	21	-	13	-
Wind Direction 10 m (deg) Average	717	0	3	99.58	-	-	-	-
Wind Direction 20 m (deg) Average	714	0	6	99.17	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)  
NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	685	0.3	0.7	-	0	0	0	0.1	0.2	0.8	7.5
TRS (ppb) Average	684	0.17	0	-	0.1	0.1	0.1	0.2	0.2	0.2	0.5
THC (ppm) Average	685	2.04	0	-	2	2	2	2	2.1	2.1	2.3
NMHC(ppm) Average	685	0	0.001	-	0	0	0	0	0	0	0.011
CH4(ppm) Average	685	2.04	0	-	2	2	2	2	2.1	2.1	2.3
O3 (ppb) Average	653	24.92	7	-	5	15.5	20.9	25.6	29.9	33.2	42
NO2 (ppb) Average	658	1.52	1.7	-	0	0	0.3	1	2.3	3.5	12.7
NO (ppb) Average	658	0.38	0.6	-	0	0	0	0.2	0.5	1	6.4
NOX (ppb) Average	658	1.9	2.1	-	0	0.1	0.5	1.2	2.7	4.4	19.1
PM2.5 (ug/m3) Average	717	3.33	3.1	-	0.4	1.2	1.9	2.8	3.9	5.5	64.4
Temperature 2 m (C) Average	720	-7.03	8.6	-	-26	-18.7	-15	-4.6	-0.8	3.6	12.1
Relative Humidity (%) Average	720	81.6	10.1	-	46.8	67.5	77	82.2	88.4	94.3	99.2
Wind Speed 10 m (km/h) Average	717	5.9	3	-	0	2	4	6	8	10	16
Wind Speed 20 m (km/h) Average	714	8	4	-	0	3	5	8	11	13	21
Wind Direction 10 m (deg) Average	717	-	-	-	-	-	-	-	-	-	-
Wind Direction 20 m (deg) Average	714	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
O3	12 Nov 2024 02:00	13 Nov 2024 08:00	31	Analyzer Failure - UV lamp failure
O3	13 Nov 2024 09:00	13 Nov 2024 12:00	4	Maintenance - UV lamp replaced
NO2	12 Nov 2024 12:00	13 Nov 2024 14:00	27	Unstable Operation - flatline in analyzer output signal
NO2	13 Nov 2024 15:00	13 Nov 2024 15:00	1	Maintenance - analyzer rebooted
Wind Speed, Wind Direction 10m	01 Nov 2024 02:00	01 Nov 2024 02:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction 10m	03 Nov 2024 03:00	03 Nov 2024 04:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction 20m	01 Nov 2024 06:00	01 Nov 2024 07:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction 20m	01 Nov 2024 09:00	01 Nov 2024 09:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction 20m	04 Nov 2024 21:00	04 Nov 2024 21:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction 20m	24 Nov 2024 22:00	24 Nov 2024 22:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction 20m	25 Nov 2024 09:00	25 Nov 2024 09:00	1	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb

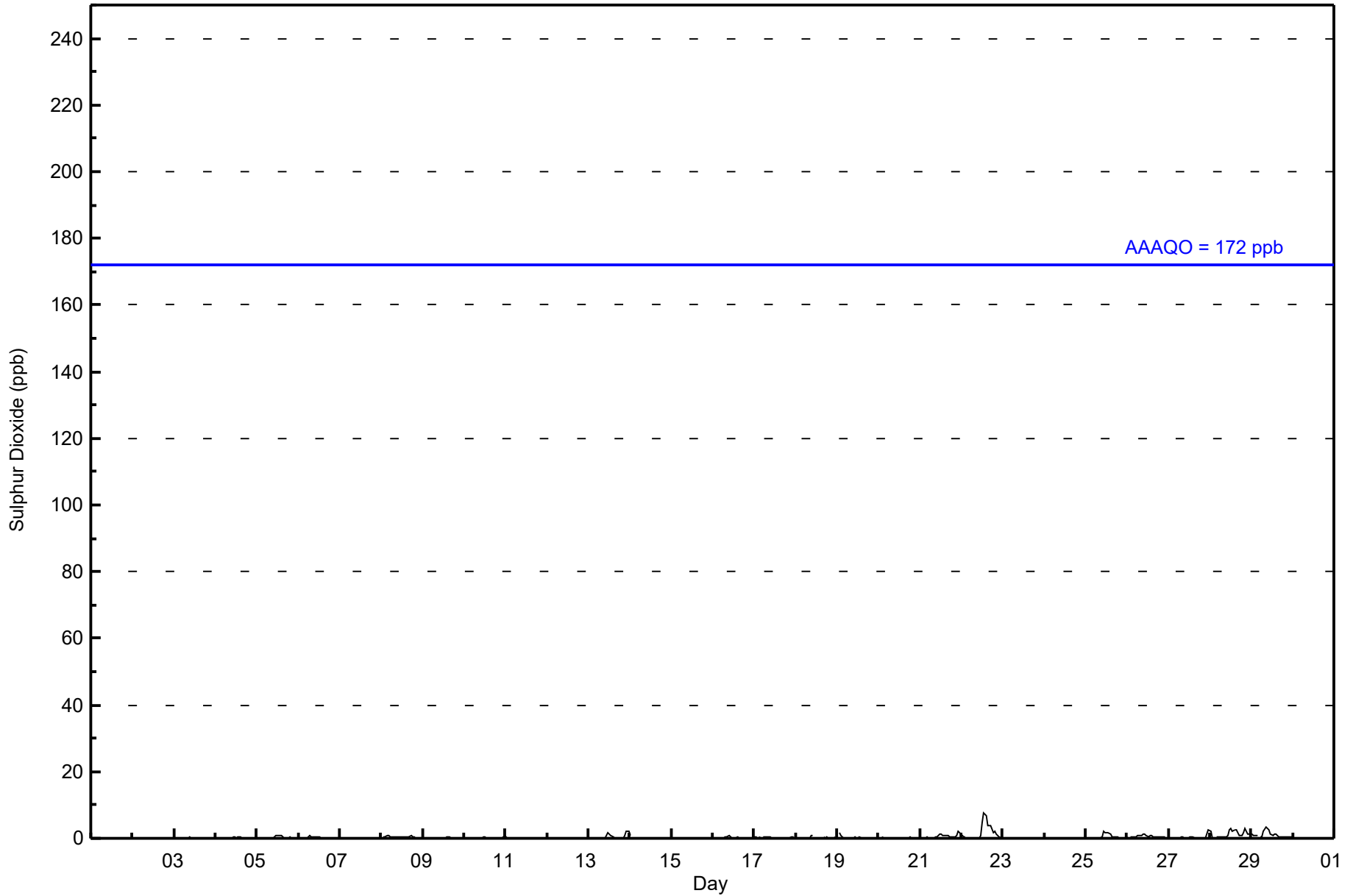
Janvier - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 7.5 ppb on Nov 22 14:00	Maximum Daily Average: 1.7 ppb on Nov 22		Hours of Data:	685
Minimum Value: 0.0 ppb on Nov 1 01:00	Minimum Daily Average: 0.0 ppb on Nov 15		Hours of Missing Data:	35
Maximum Diurnal Average: 0.7 ppb at hour 14	Minimum Diurnal Average: 0.1 ppb at hour 6		Hours of Calibration:	35
Monthly Average: 0.30 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.1 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 0.8 P <sub>99</sub> = 3.1		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1																							
2-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1																						
3-Nov	0.1	Z	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
4-Nov	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																						
5-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.2	0.0	0.4	0.8	1.0	0.9	0.6	0.6	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.2	0.2	1.0																						
6-Nov	0.0	0.0	0.1	0.1	Z	0.2	0.7	0.3	0.3	0.5	0.6	0.3	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7																						
7-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.2																						
8-Nov	Z	0.3	0.5	0.7	0.8	0.5	0.3	0.4	0.5	0.3	0.4	0.5	0.5	0.5	0.4	0.3	0.7	0.6	0.4	0.1	0.1	0.0	0.0	0.0	0.4	0.8	0.8																						
9-Nov	0.0	Z	0.1	0.1	0.0	0.0	0.1	0.2	0.0	0.1	0.2	0.2	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4																						
10-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	0.1	0.8																							
11-Nov	0.3	0.1	0.0	Z	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3																						
12-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																						
13-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.0	0.1	1.1	1.9	1.2	0.7	0.3	0.2	0.0	0.1	0.0	0.1	0.1	0.7	2.2	2.2	0.5	2.2																							
14-Nov	1.0	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0																							
15-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																						
16-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.5	0.8	0.3	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.8																						
17-Nov	0.3	0.3	0.2	0.4	Z	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.4																						
18-Nov	0.2	0.1	0.1	0.0	0.2	Z	0.1	0.1	0.1	0.6	0.7	C	C	C	C	C	0.3	0.1	0.3	0.1	0.2	0.2	0.1	0.6	0.2	0.7																							
19-Nov	Z	1.7	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.5	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.2	1.7																							
20-Nov	0.0	Z	0.3	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.3	0.1	0.0	0.1	0.2	0.2	0.1	0.3																							
21-Nov	0.2	0.1	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.6	1.1	1.1	1.0	0.8	1.0	0.8	0.6	0.5	0.6	0.5	0.7	2.1	1.7	0.6	2.1																							
22-Nov	0.9	0.3	0.4	Z	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.7	4.5	7.5	6.8	3.8	3.8	3.9	1.7	2.1	1.3	0.7	0.3	0.1	1.7	7.5																							
23-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
24-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1																							
25-Nov	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.4	2.0	1.9	1.5	1.8	1.2	0.4	0.4	0.4	0.3	0.1	0.1	0.1	0.1	0.5	2.0																							
26-Nov	0.4	Z	0.4	0.5	0.4	0.4	0.7	0.8	0.9	1.2	1.3	0.8	0.3	0.7	0.8	0.6	0.3	0.3	0.4	0.4	0.4	0.3	0.2	0.2	0.6	1.3																							
27-Nov	0.2	0.2	Z	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.6	0.3	0.2	0.1	0.1	0.0	0.1	0.1	0.2	1.5	2.4	0.4	2.4																							
28-Nov	2.2	0.1	0.2	Z	0.2	0.2	0.3	0.3	0.3	0.3	0.9	2.5	2.8	2.2	2.4	2.6	1.6	1.0	0.7	1.5	2.8	2.0	1.1	1.3	1.3	2.8																							
29-Nov	1.2	0.9	0.7	0.7	Z	0.4	0.5	1.9	3.3	3.0	2.4	1.2	1.0	1.3	1.2	0.8	0.6	0.5	0.4	0.3	0.2	0.3	0.3	0.2	1.0	3.3																							
30-Nov	0.3	0.2	0.2	0.2	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3																							
																								0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.6	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.4	Diurnal Average		
																								2.2	1.7	0.8	0.7	0.8	0.5	0.7	1.9	3.3	3.0	2.4	2.5	4.5	7.5	6.8	3.8	3.8	3.9	1.7	2.1	2.8	2.0	2.2	2.4	Diurnal Maximum	

Z - zerospan      C - Calibration  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb    24-hr 48 ppb







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Janvier - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	685	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

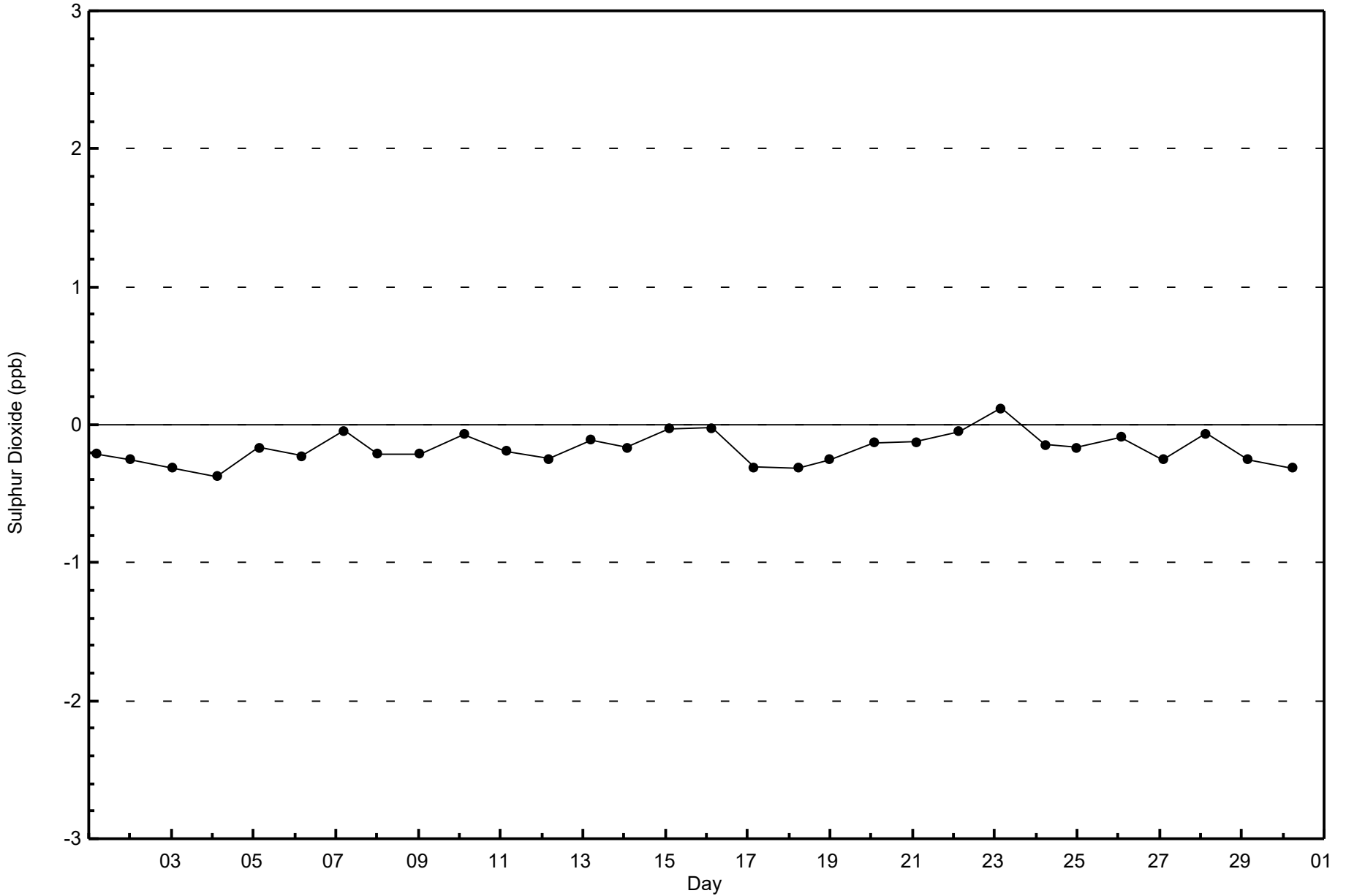
**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Janvier - November 2024**

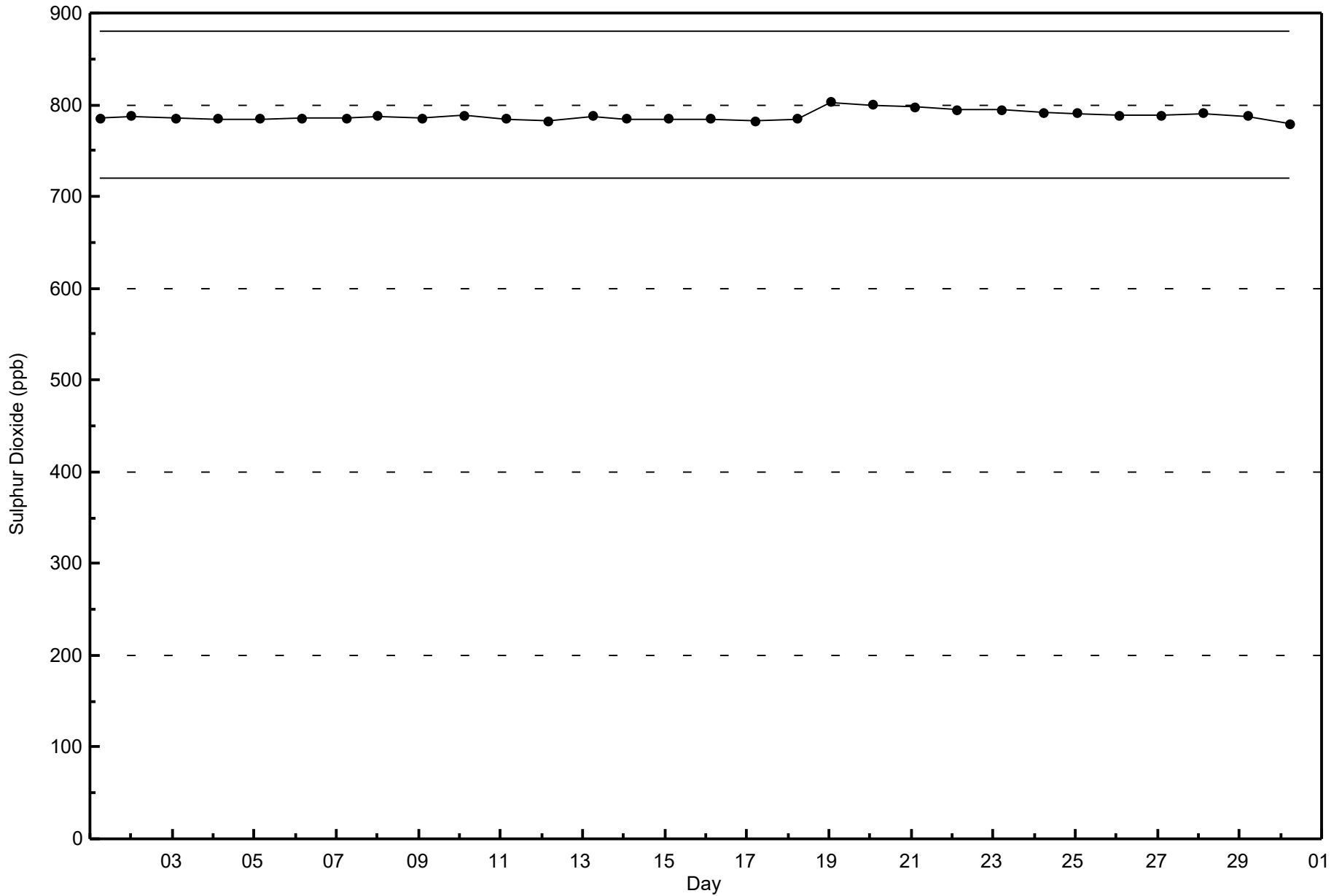
<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	72	117	47	10	3	8	18	18	49	89	95	32	37	38	31	16	680
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	72	117	47	10	3	8	18	18	49	89	95	32	37	38	31	16	680

Total Number of Valid Hours: 680

Total Number of Hours: 720





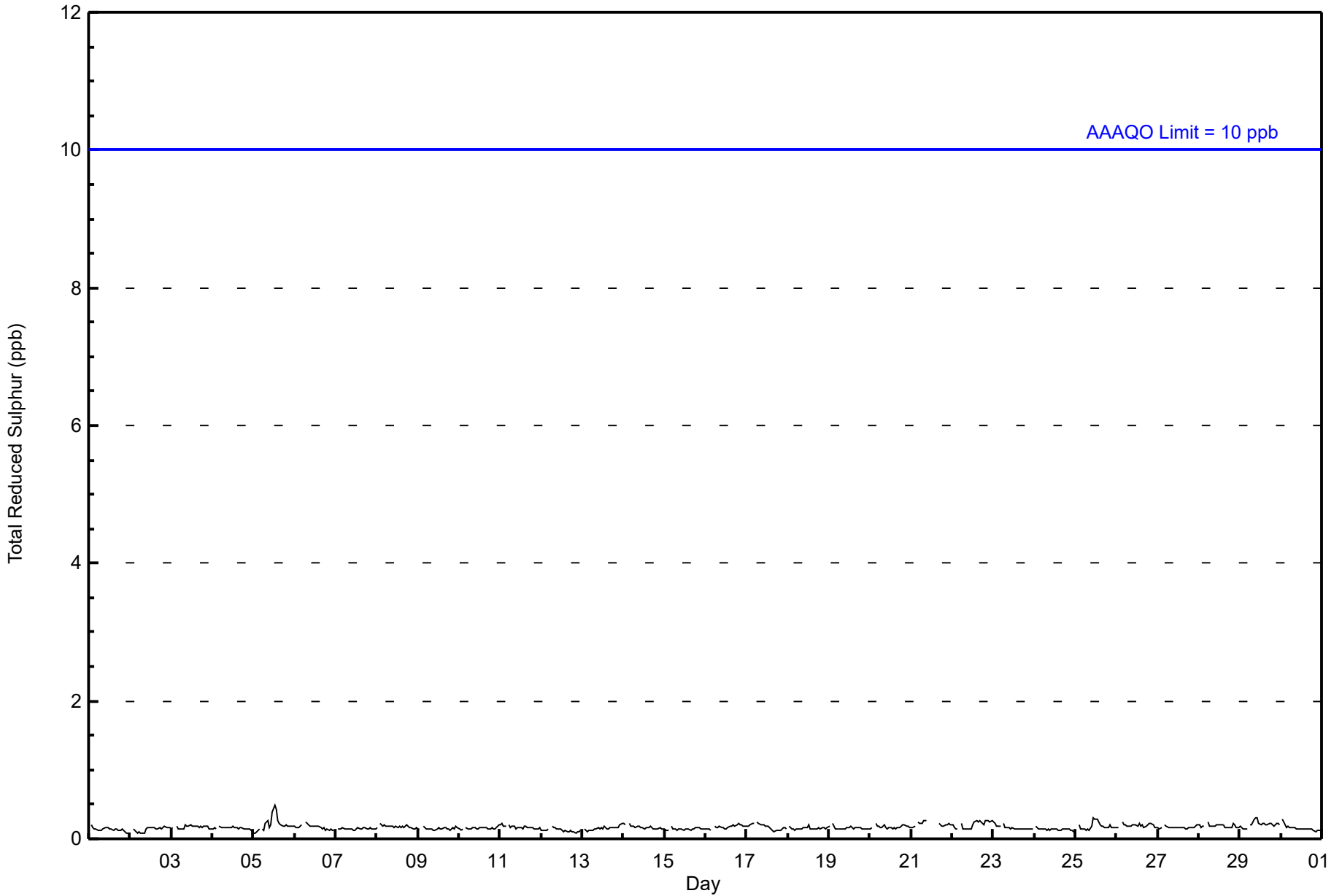






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Reduced Sulphur (TRS) - ppb**  
**Janvier - November 2024**







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb**  
**Janvier - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	684	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb**  
**Janvier - November 2024**

<b>Concentration</b> <b>Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 2	72	116	45	10	3	8	18	18	48	88	97	31	34	40	32	18	678
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	72	116	45	10	3	8	18	18	48	88	97	31	34	40	32	18	678

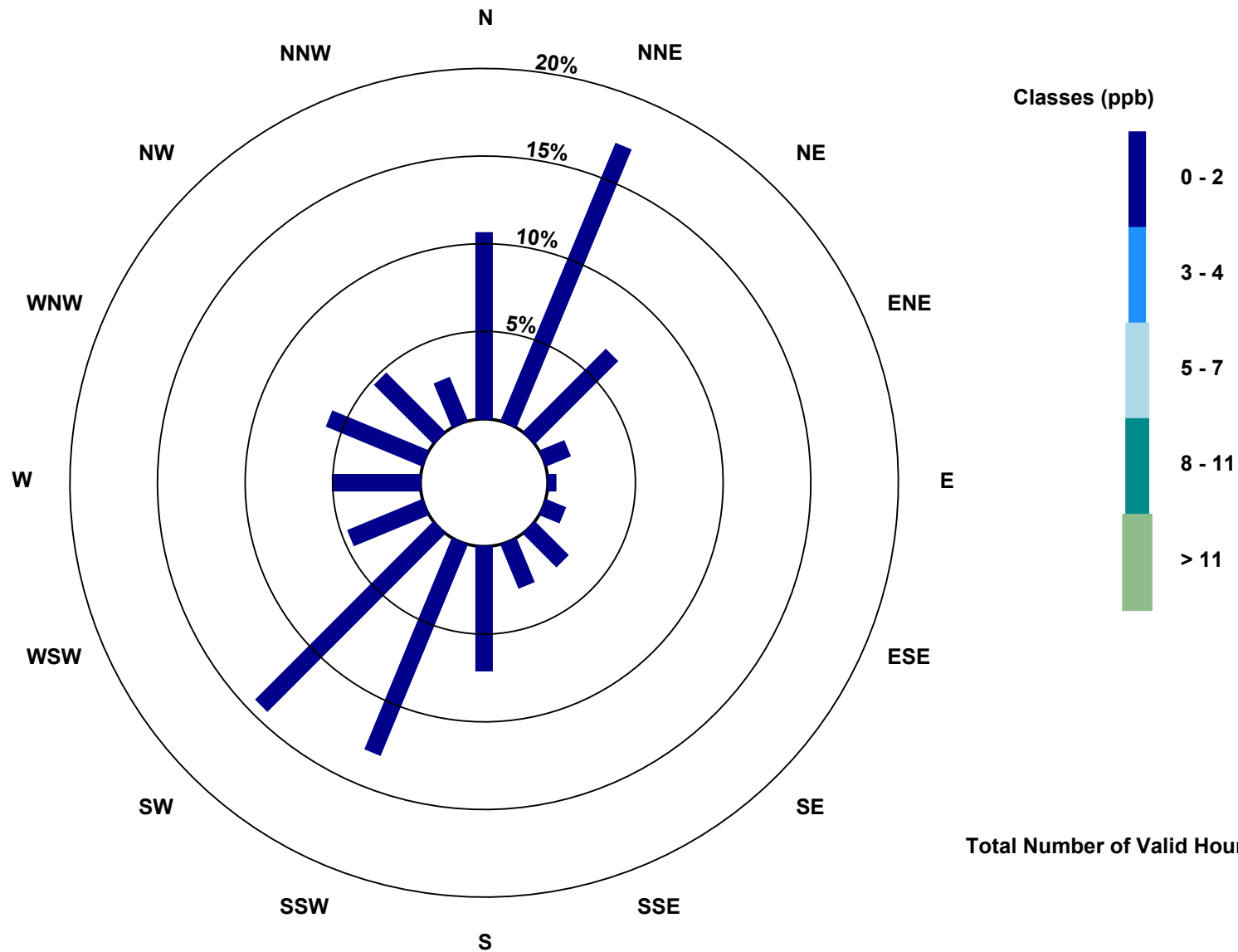
Total Number of Valid Hours: 678

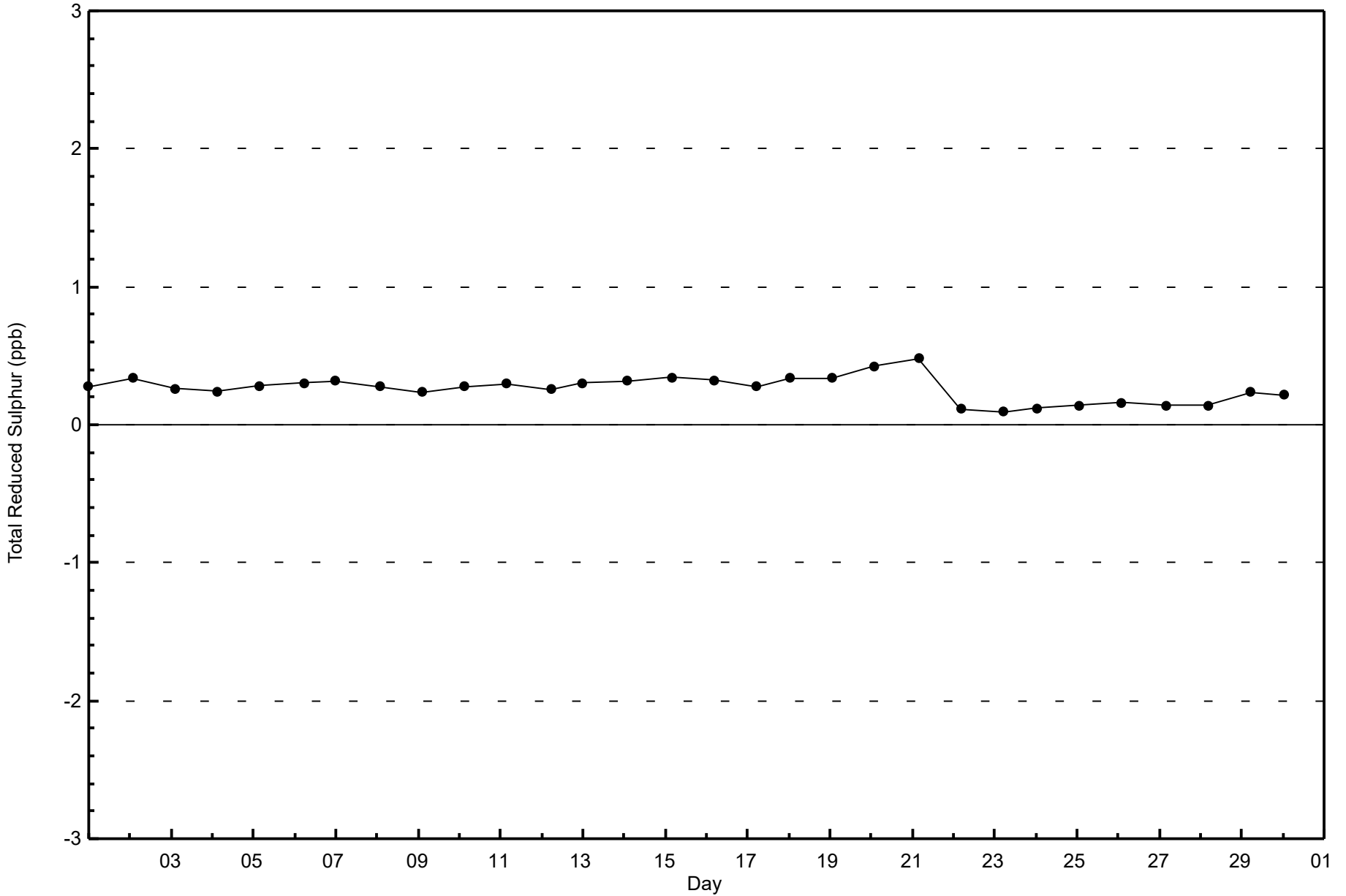
Total Number of Hours: 720

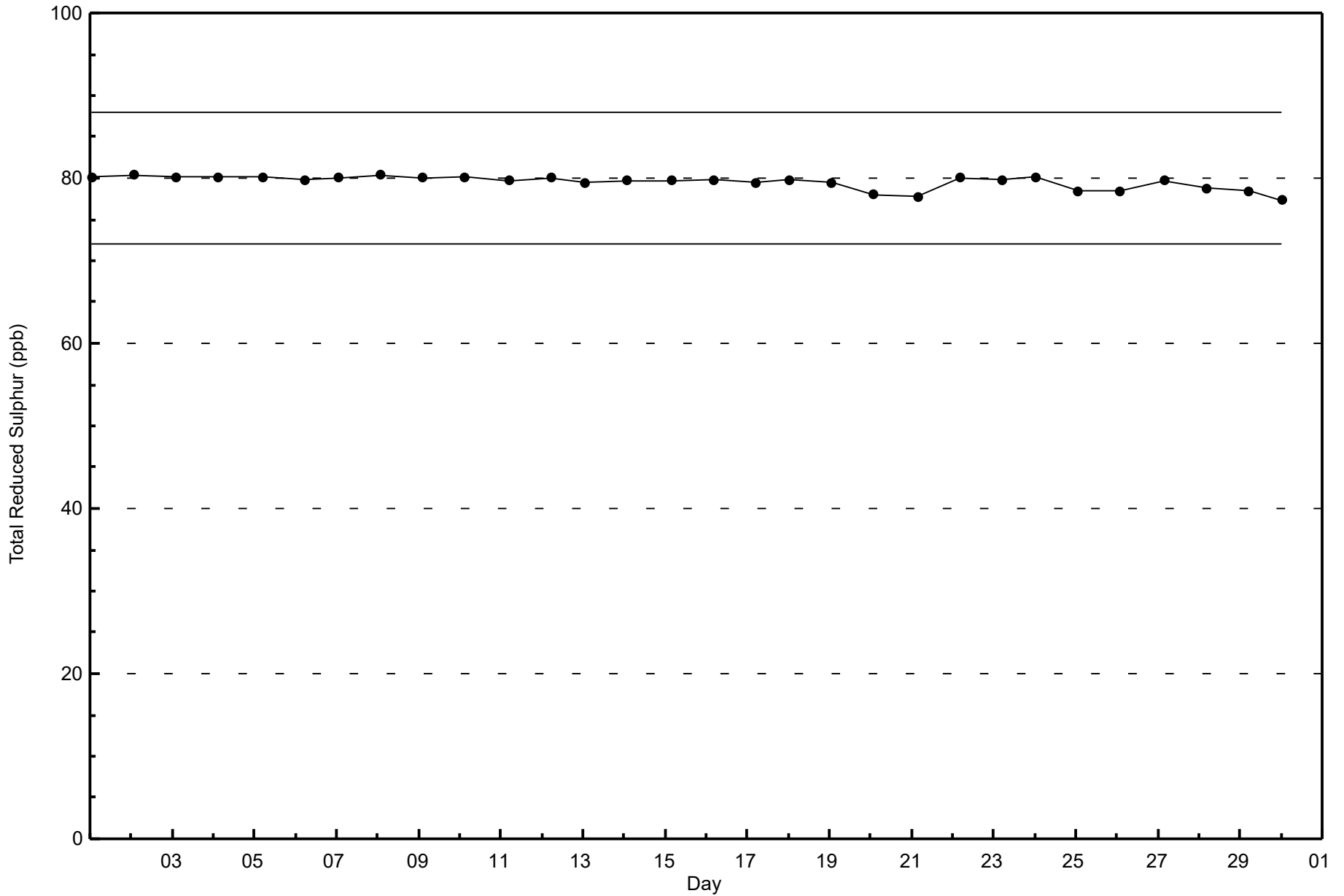


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Reduced Sulphur (TRS) - ppb  
Janvier

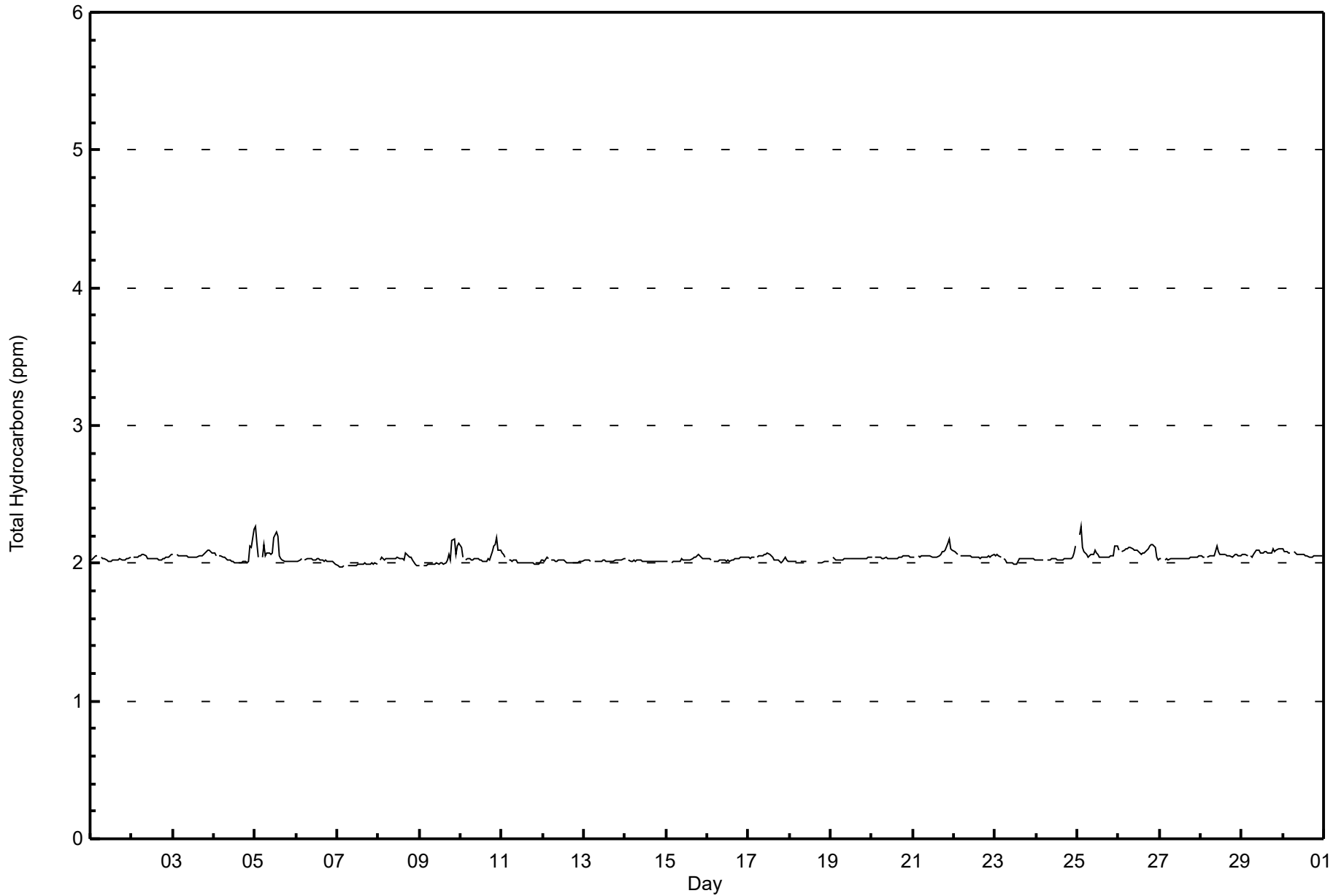








Maximum Value: 2.3 ppm on Nov 5 01:00		Maximum Daily Average: 2.1 ppm on Nov 26		Hours in Service: 720																									
Minimum Value: 2.0 ppm on Nov 7 03:00		Minimum Daily Average: 2.0 ppm on Nov 7		Hours of Data: 685																									
Maximum Diurnal Average: 2.1 ppm at hour 24		Minimum Diurnal Average: 2.0 ppm at hour 16		Hours of Missing Data: 35																									
Monthly Average: 2.04 ppm		Percentiles: P <sub>1</sub> = 2.0 P <sub>10</sub> = 2.0 Q <sub>1</sub> = 2.0 Median = 2.0 Q <sub>3</sub> = 2.1 P <sub>90</sub> = 2.1 P <sub>99</sub> = 2.2		Hours of Calibration: 35																									
				Percent Operational Time: 100.0																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Nov	2.0	2.0	2.0	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1
2-Nov	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1
3-Nov	2.1	Z	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
4-Nov	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.0	2.2	2.2	
5-Nov	2.3	2.1	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.3	
6-Nov	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
7-Nov	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
8-Nov	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1
9-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.2	2.2	2.1	2.1	2.1	2.0	2.2	2.2	2.2	
10-Nov	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2
11-Nov	2.1	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1
12-Nov	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
13-Nov	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
14-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
15-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1
16-Nov	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
17-Nov	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1
18-Nov	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	C	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
19-Nov	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
20-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1
21-Nov	2.0	2.0	Z	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.2
22-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1
23-Nov	2.1	2.1	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
24-Nov	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1
25-Nov	Z	2.2	2.3	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
26-Nov	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1
27-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1
28-Nov	2.1	2.0	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
29-Nov	2.1	2.1	2.1	2.1	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
30-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1
																								Diurnal Average					
																								Diurnal Maximum					
Z - zerospan C - Calibration																													





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Janvier - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	484	70.66	70.66
2.1 - 3.0	201	29.34	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Janvier - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	45	86	37	7	2	7	16	16	26	50	63	23	35	34	25	8	480
2.1 - 3.0	27	31	10	3	1	1	2	2	23	39	32	9	2	4	6	8	200
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	72	117	47	10	3	8	18	18	49	89	95	32	37	38	31	16	680

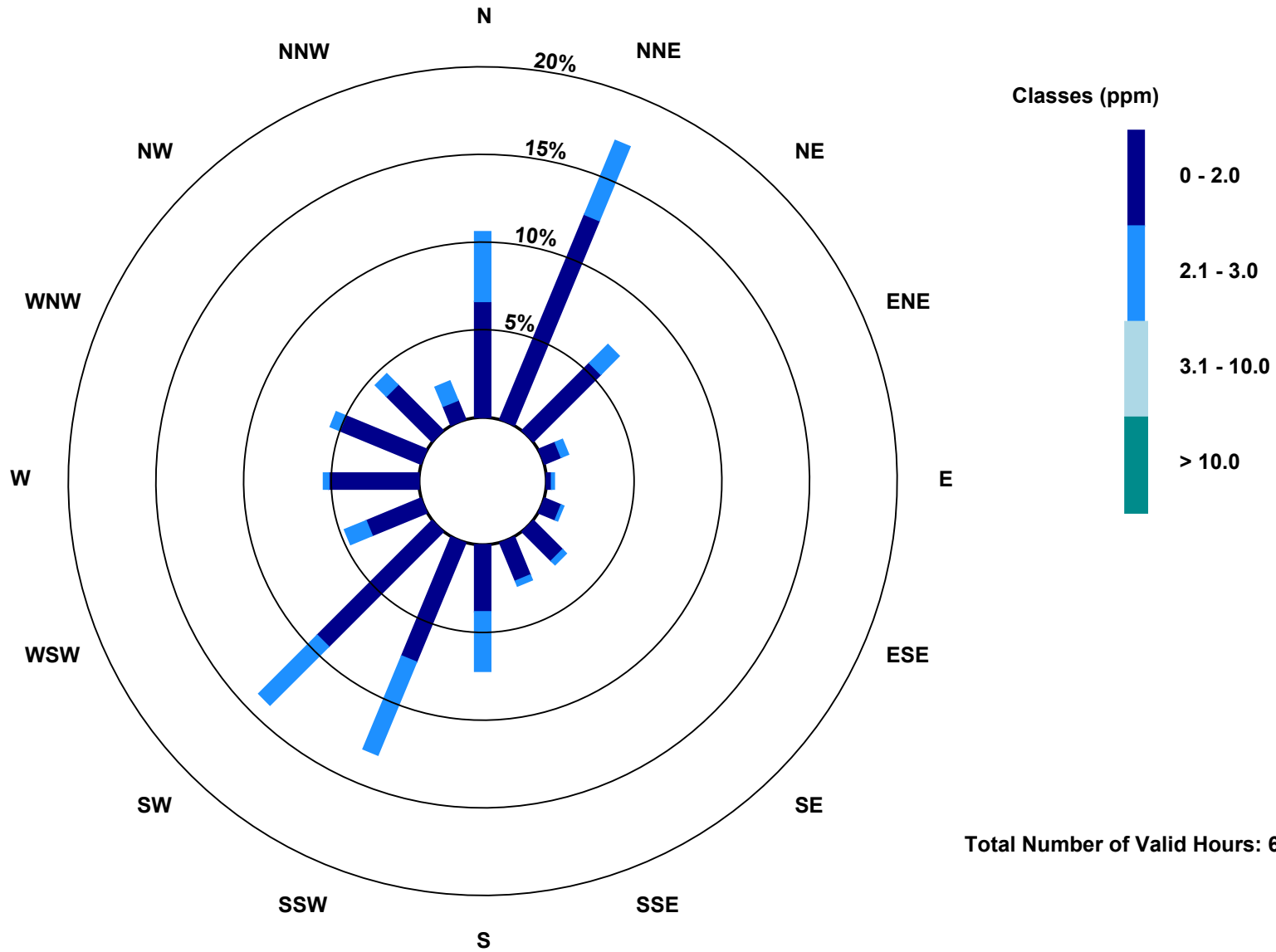
Total Number of Valid Hours: 680

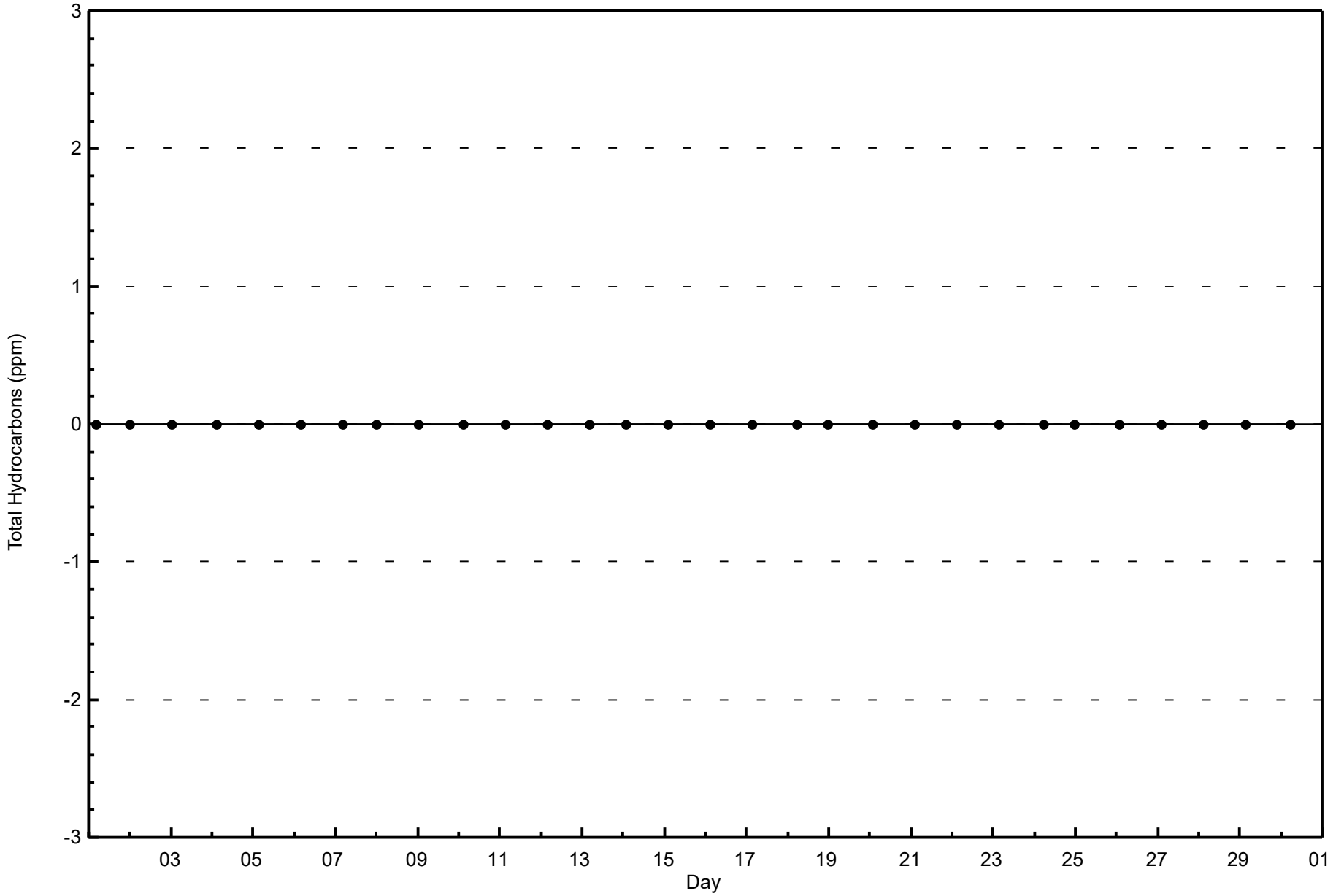
Total Number of Hours: 720

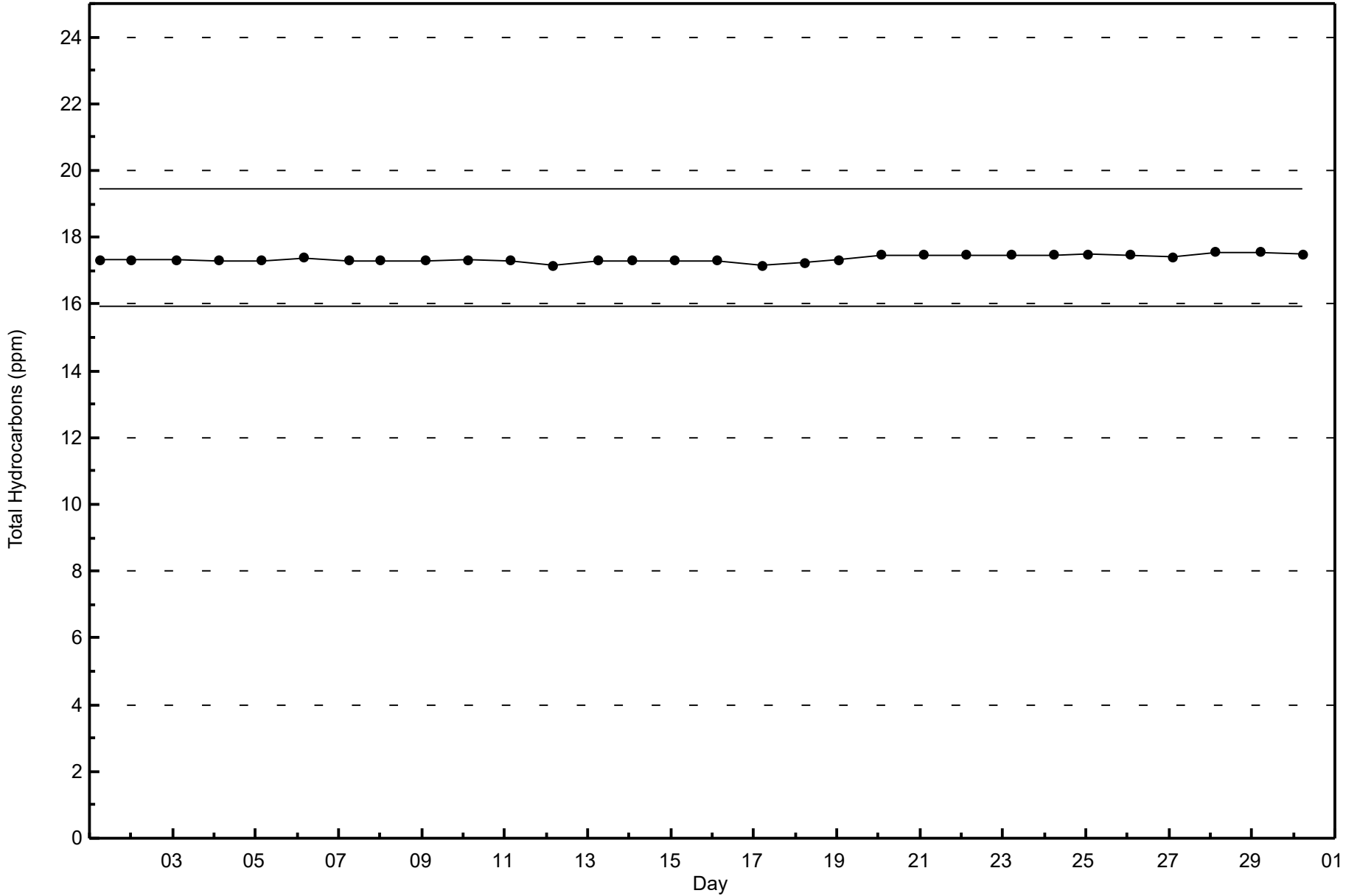


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

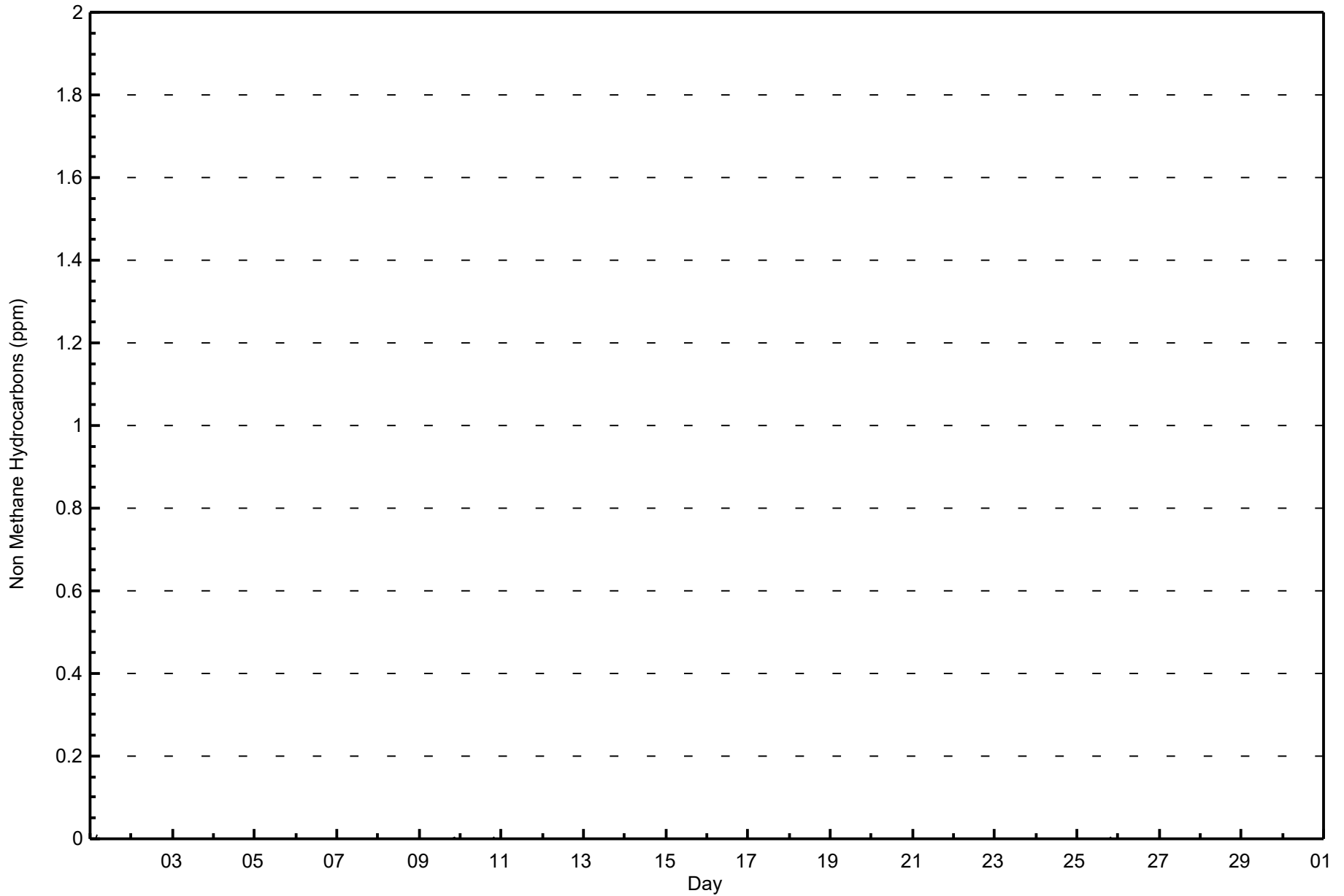
Total Hydrocarbons (THC) - ppm  
Janvier













**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Janvier - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	684	99.85	99.85
0.006 - 0.05	1	0.15	100.00
0.06 - 0.1	0	0.00	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Janvier - November 2024**

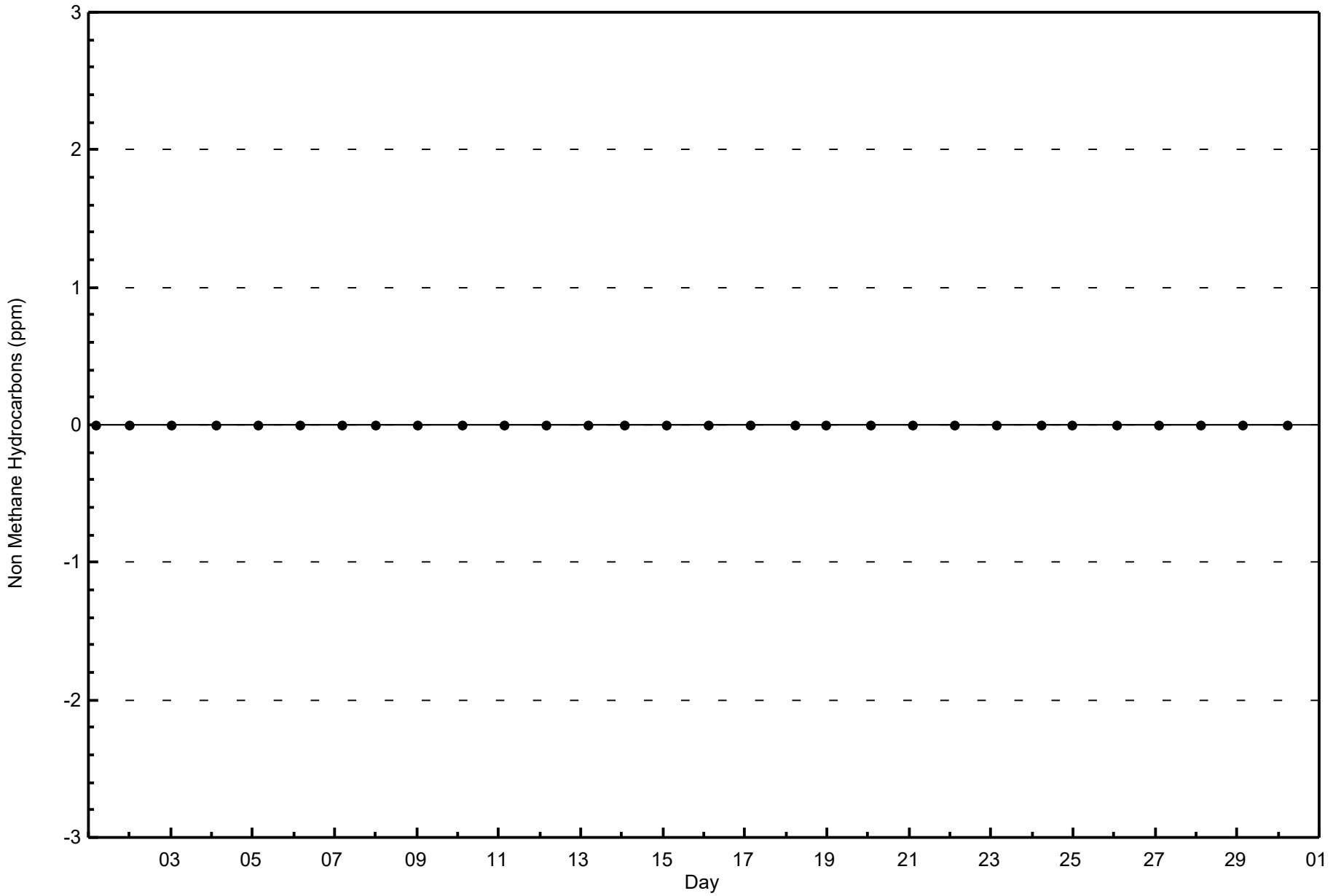
<b>Concentration</b> <b>Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	72	117	46	10	3	8	18	18	49	89	95	32	37	38	31	16	679
0.006 - 0.05	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0.06 - 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	72	117	47	10	3	8	18	18	49	89	95	32	37	38	31	16	680

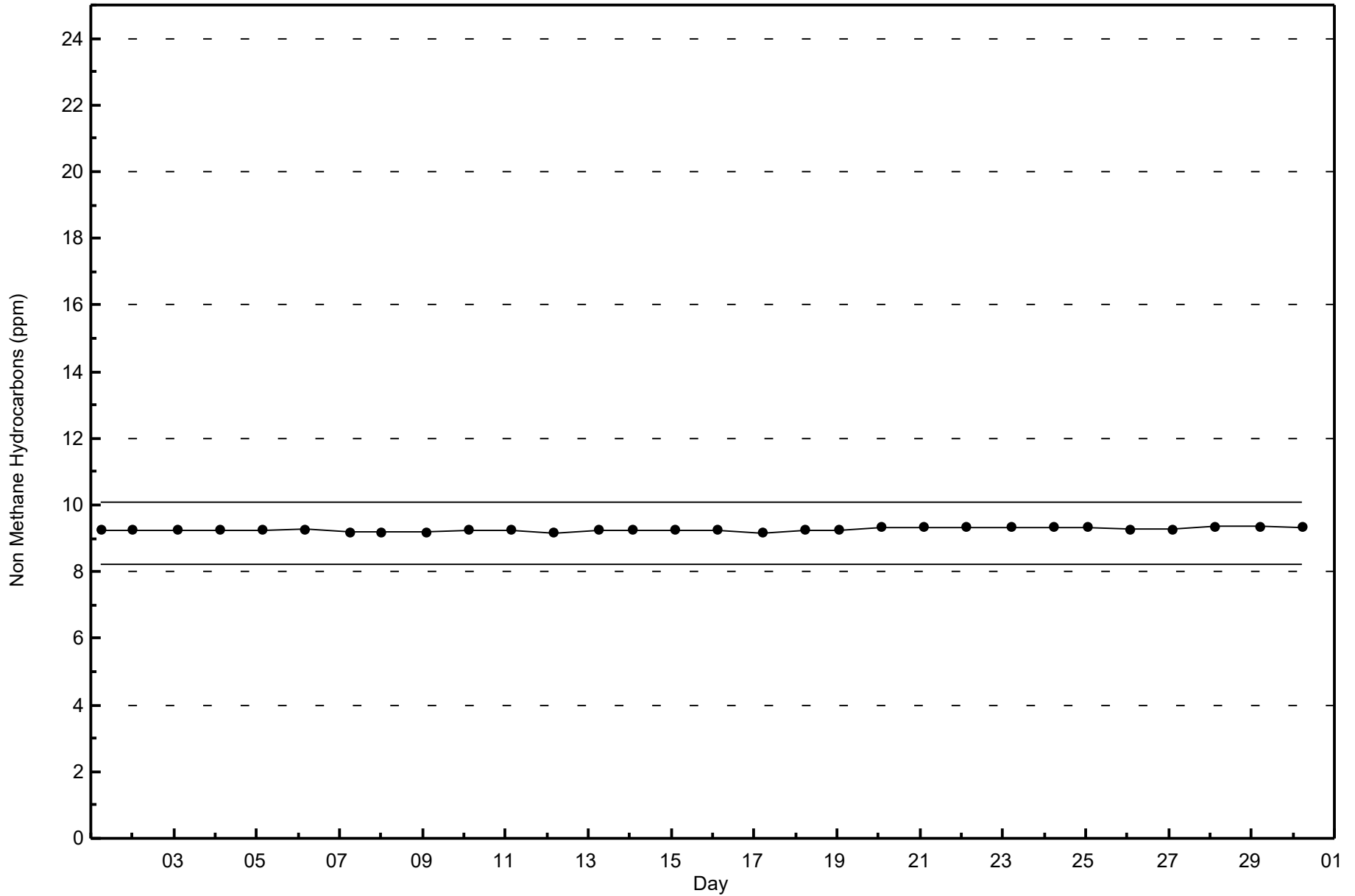
Total Number of Valid Hours: 680

Total Number of Hours: 720











Wood Buffalo Environmental Association

Summary of Hour Averages

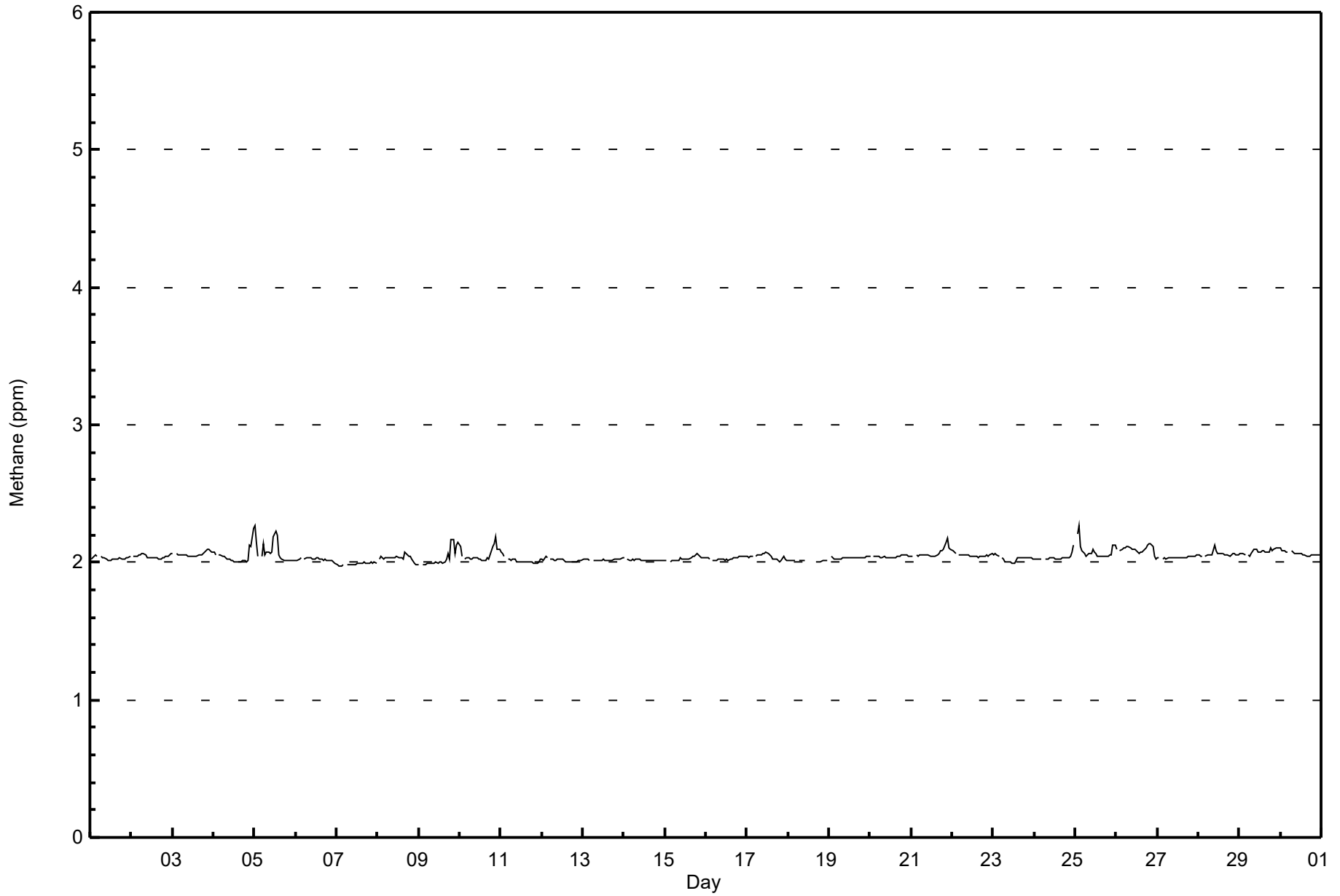
Methane (CH<sub>4</sub>) - ppm  
Janvier - November 2024

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 2.3 ppm on Nov 5 01:00 Maximum Daily Average: 2.1 ppm on Nov 26		Hours in Service: 720 Hours of Data: 685 Hours of Missing Data: 35 Hours of Calibration: 35 Percent Operational Time: 100.0																																																
Minimum Value: 2.0 ppm on Nov 7 03:00 Maximum Diurnal Average: 2.1 ppm at hour 24 Monthly Average: 2.04 ppm		Minimum Daily Average: 2.0 ppm on Nov 7 Minimum Diurnal Average: 2.0 ppm at hour 16 Percentiles: P <sub>1</sub> = 2.0 P <sub>10</sub> = 2.0 Q <sub>1</sub> = 2.0 Median = 2.0 Q <sub>3</sub> = 2.1 P <sub>90</sub> = 2.1 P <sub>99</sub> = 2.2																																																
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Nov	2.0	2.0	2.0	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																							
2-Nov	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1																							
3-Nov	2.1	Z	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																							
4-Nov	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.0	2.2	2.2																							
5-Nov	2.3	2.1	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3																							
6-Nov	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																							
7-Nov	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																							
8-Nov	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																							
9-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.2	2.2	2.1	2.1	2.1	2.0	2.2																								
10-Nov	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2																								
11-Nov	2.1	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																							
12-Nov	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																							
13-Nov	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																							
14-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																							
15-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1																							
16-Nov	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																							
17-Nov	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																							
18-Nov	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	C	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																							
19-Nov	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																							
20-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1																							
21-Nov	2.0	2.0	Z	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2																							
22-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1																							
23-Nov	2.1	2.1	2.1	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																							
24-Nov	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1																							
25-Nov	Z	2.2	2.3	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.3																							
26-Nov	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1																							
27-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1																							
28-Nov	2.1	2.0	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																							
29-Nov	2.1	2.1	2.1	2.1	Z	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																							
30-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1																							
																								2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	Diurnal Average			
																								2.3	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2	Diurnal Maximum	
Z - zerospan C - Calibration																																																		



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Methane (CH<sub>4</sub>) - ppm**  
**Janvier - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Janvier - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	486	70.95	70.95
2.1 - 3.0	199	29.05	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Janvier - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	45	86	38	7	2	7	16	16	27	50	63	23	35	34	25	8	482
2.1 - 3.0	27	31	9	3	1	1	2	2	22	39	32	9	2	4	6	8	198
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	72	117	47	10	3	8	18	18	49	89	95	32	37	38	31	16	680

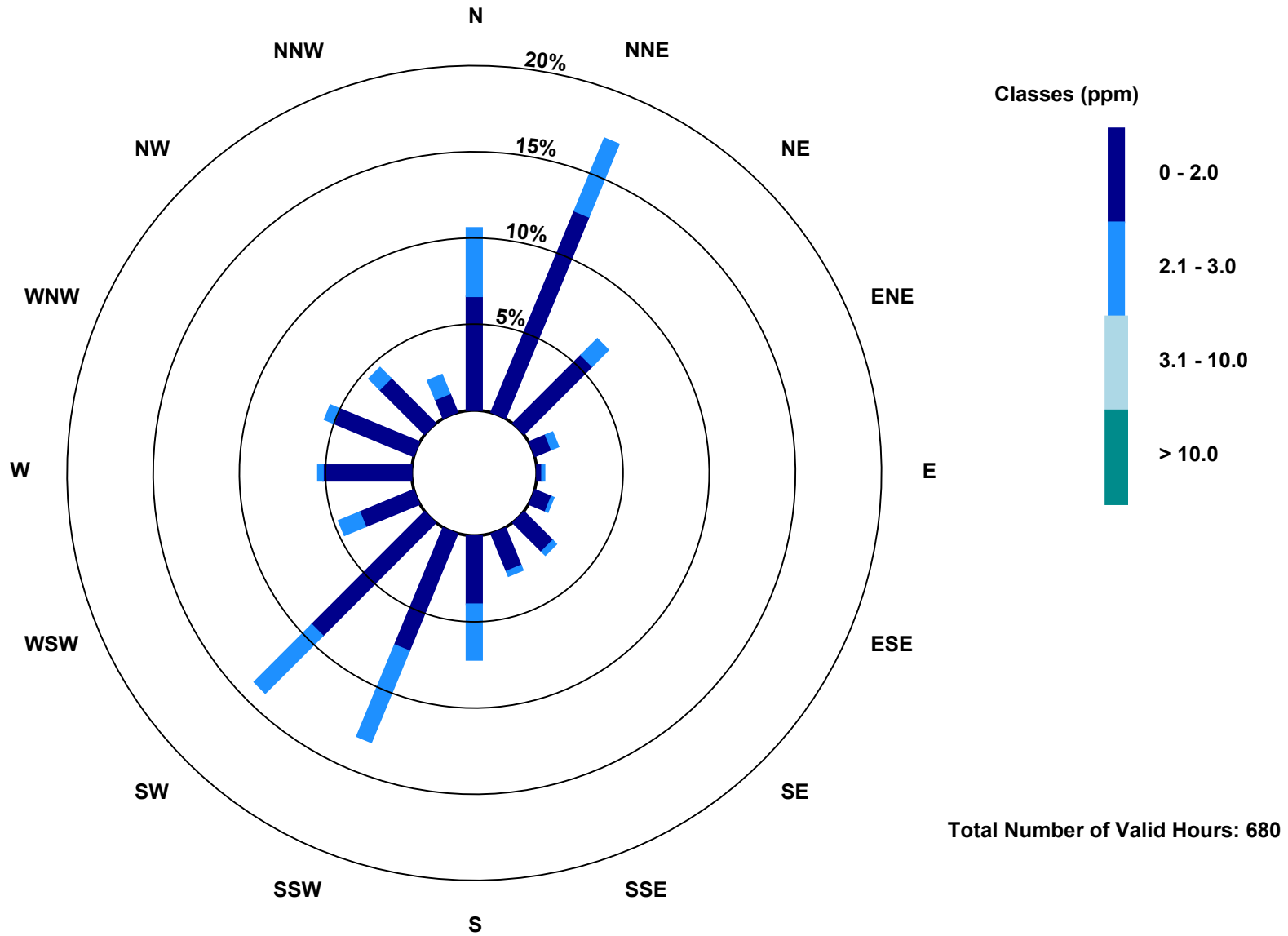
Total Number of Valid Hours: 680

Total Number of Hours: 720

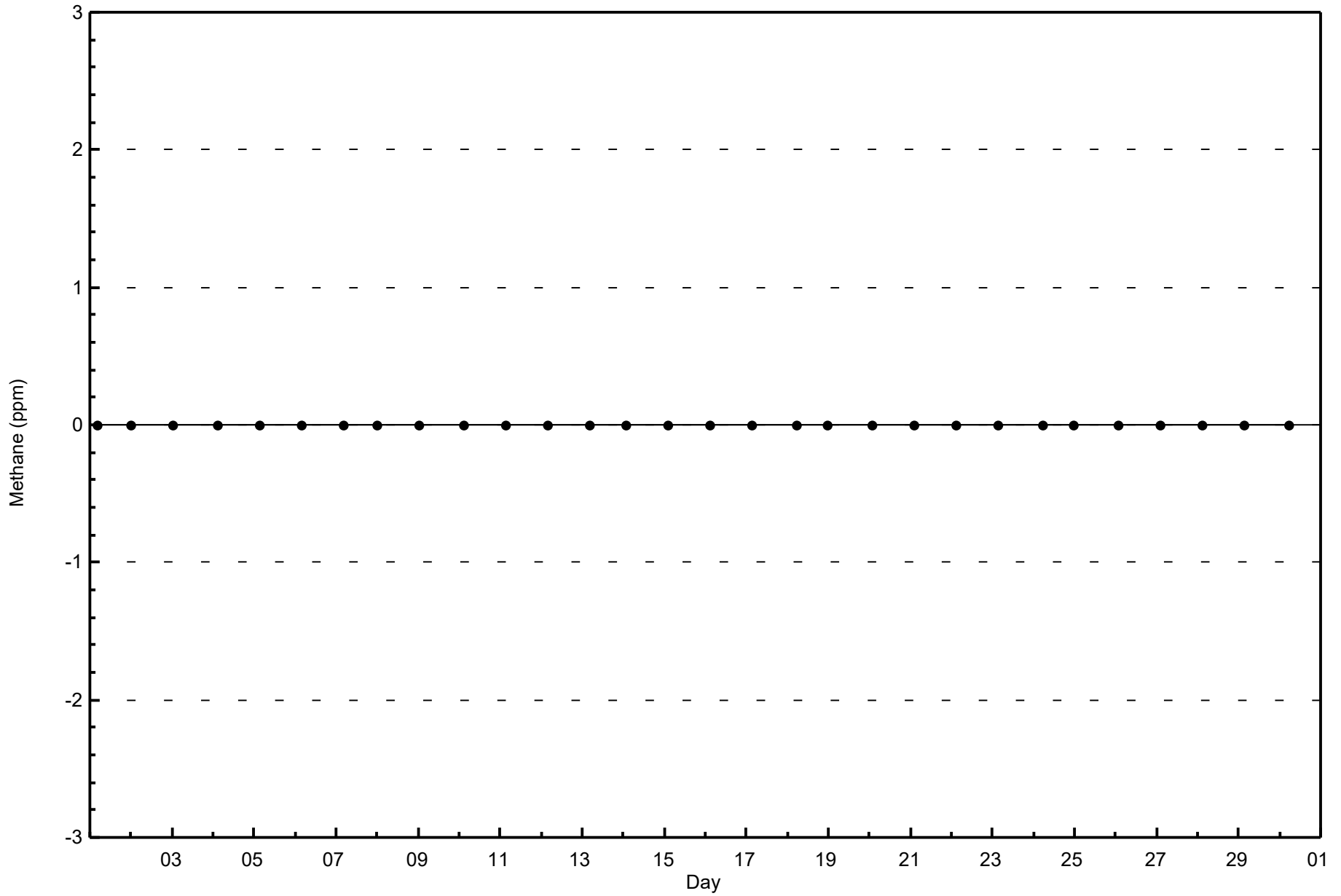


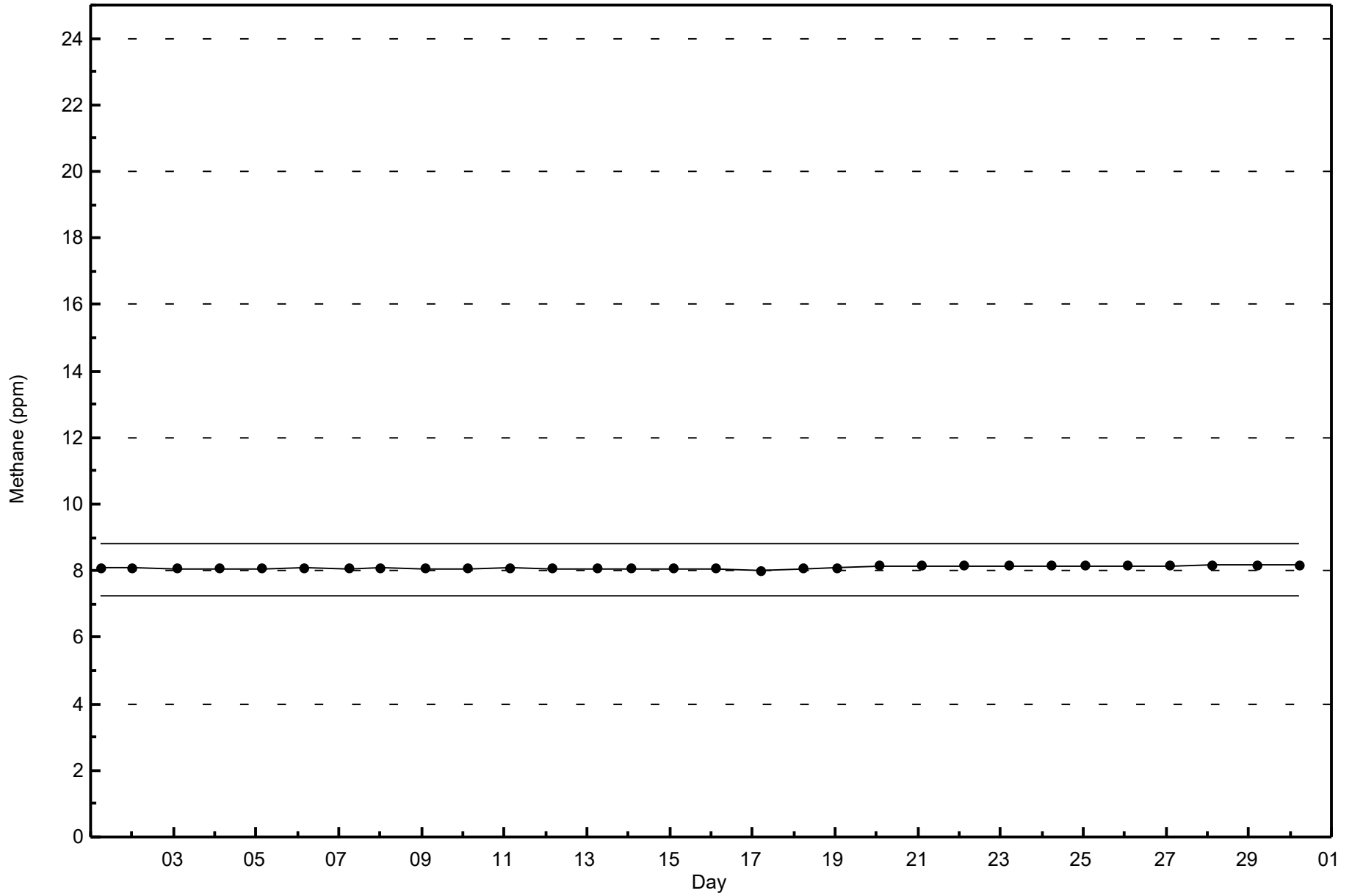
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Methane (CH<sub>4</sub>) - ppm  
Janvier











Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

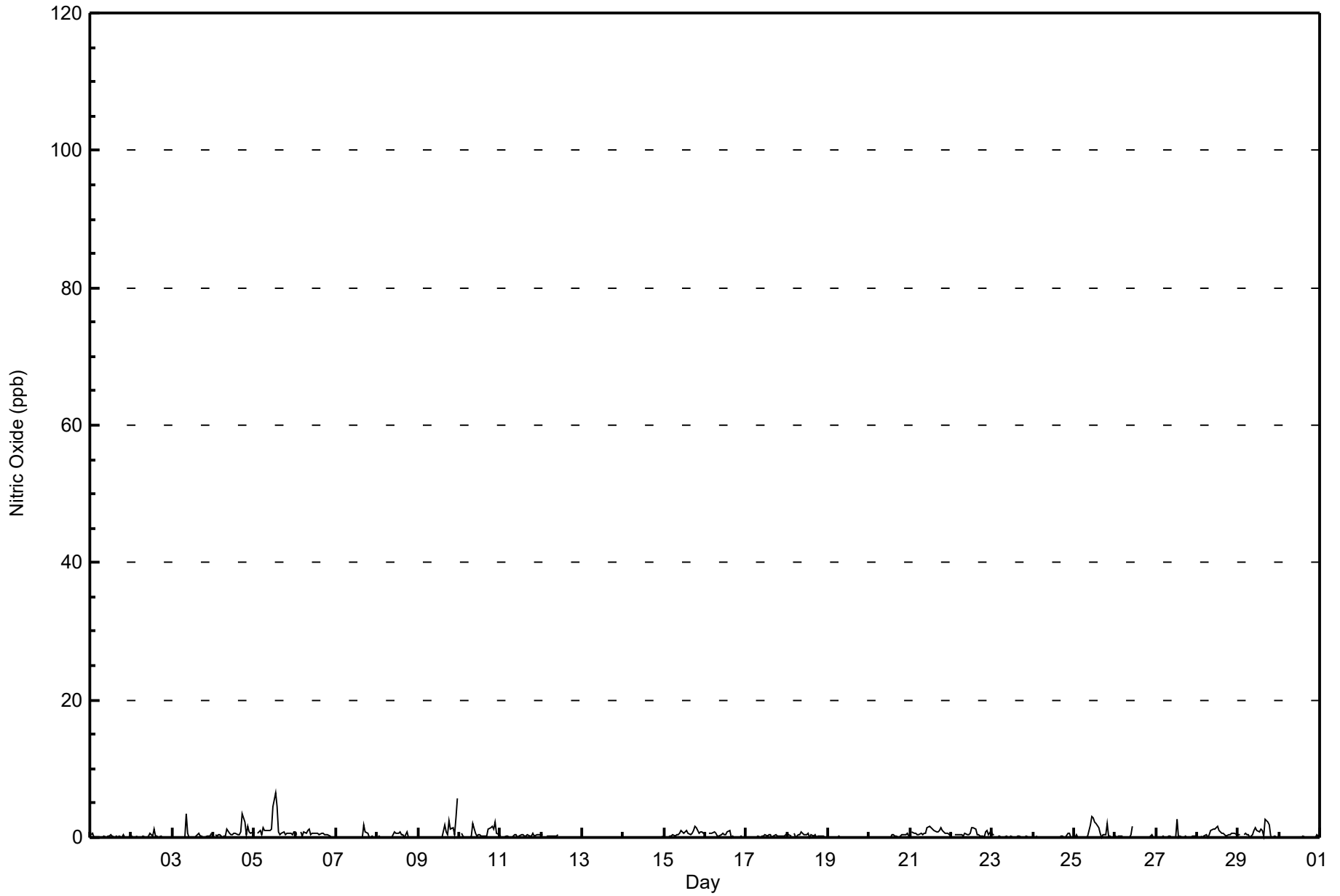
Janvier - November 2024

Maximum Value: 6.4 ppb on Nov 5 13:00																				Maximum Daily Average: 1.3 ppb on Nov 5					Hours in Service: 720	
Minimum Value: 0.0 ppb on Nov 1 05:00																				Minimum Daily Average: 0.0 ppb on Nov 14					Hours of Data: 658	
Maximum Diurnal Average: 0.8 ppb at hour 13																				Minimum Diurnal Average: 0.1 ppb at hour 3					Hours of Missing Data: 62	
Monthly Average: 0.38 ppb																				Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.2 Q <sub>3</sub> = 0.5 P <sub>90</sub> = 1.0 P <sub>99</sub> = 3.0					Hours of Calibration: 34	
																									Percent Operational Time: 96.1	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.4	0.5	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.2	0.4	0.3	0.0	0.2	0.0	0.3	0.0	0.4	0.0	0.1	0.0	0.1	0.1	0.5
2-Nov	0.2	0.0	0.1	0.2	Z	0.1	0.1	0.1	0.1	0.0	0.2	0.5	0.2	1.2	0.2	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.2
3-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	3.4	0.6	0.0	0.0	0.0	0.0	0.2	0.5	0.2	0.1	0.0	0.1	0.3	0.3	0.2	0.6	0.3	3.4
4-Nov	Z	0.4	0.2	0.4	0.4	0.0	0.1	0.2	1.1	0.7	0.5	0.4	0.7	0.7	0.5	0.5	0.8	3.4	2.3	0.3	1.6	0.8	0.7	0.7	0.8	3.4
5-Nov	0.6	Z	0.6	1.0	0.4	1.5	1.0	1.0	1.1	1.1	1.3	4.4	6.4	4.4	0.8	0.4	0.7	0.8	0.4	0.6	0.6	0.7	0.5	0.7	1.3	6.4
6-Nov	0.8	0.4	Z	0.8	0.2	0.9	0.7	0.9	1.3	0.4	0.6	0.6	0.6	0.7	0.3	0.6	0.6	0.3	0.4	0.3	0.3	0.1	0.0	0.1	0.5	1.3
7-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.9	0.6	0.0	0.0	0.2	0.0	0.0	0.2	1.8
8-Nov	0.0	0.2	0.0	0.0	Z	0.0	0.1	0.1	0.1	0.3	0.7	0.7	0.7	0.7	0.4	0.4	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
9-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.7	0.5	2.4	1.2	1.4	0.4	2.9	5.6	0.7	5.6
10-Nov	Z	0.7	0.1	0.0	0.0	0.0	0.0	0.1	2.1	0.7	0.3	0.3	0.5	0.2	0.1	0.2	0.3	1.2	1.3	1.6	1.3	2.3	0.6	0.3	0.6	2.3
11-Nov	0.1	Z	0.0	0.3	0.3	0.0	0.1	0.1	0.4	0.5	0.1	0.1	0.5	0.4	0.1	0.2	0.4	0.1	0.1	0.7	0.3	0.4	0.4	0.4	0.3	0.7
12-Nov	0.4	0.5	Z	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.3	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.5
13-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0
14-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.2	
15-Nov	Z	0.0	0.0	0.1	0.1	0.4	0.1	0.3	0.4	0.5	1.0	0.6	0.7	1.0	0.6	0.5	0.6	1.0	1.5	1.4	0.5	0.8	0.8	0.5	0.6	1.5
16-Nov	0.6	Z	0.6	0.6	0.6	0.8	0.5	0.3	0.2	0.4	0.6	0.4	0.5	0.8	1.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.4	1.1
17-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.1	0.4	0.1	0.5	0.4	0.0	0.3	0.4	0.2	0.3	0.2	0.2	0.1	0.4	0.2	0.5
18-Nov	0.5	0.4	0.2	Z	0.6	0.1	0.5	0.5	0.8	0.6	0.4	0.5	0.6	0.0	0.3	0.2	0.5	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.3	0.8
19-Nov	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
20-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.3	0.2	0.1	0.1	0.3	0.4	0.5	0.6	0.3	0.1	0.6
21-Nov	Z	0.8	0.7	0.6	0.4	0.4	0.5	0.4	0.6	0.6	1.4	1.7	1.4	1.3	1.0	0.9	0.9	0.9	1.5	1.1	0.7	0.6	0.6	0.4	0.8	1.7
22-Nov	0.5	Z	0.3	0.3	0.4	0.3	0.3	0.2	0.5	0.4	0.5	0.6	1.3	1.5	1.2	0.4	0.3	0.2	0.3	0.1	0.8	1.0	0.4	0.9	0.6	1.5
23-Nov	0.3	0.5	Z	0.2	0.2	0.0	0.0	0.0	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.5	0.1	0.5
24-Nov	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.1	0.7	0.6	0.0	0.0	0.1	0.7
25-Nov	0.0	0.4	0.0	0.0	Z	0.0	0.0	0.0	0.3	1.7	3.0	2.9	2.2	2.1	1.4	0.7	0.0	0.5	0.5	2.1	0.2	0.1	0.0	0.1	0.8	3.0
26-Nov	0.2	0.0	0.2	0.2	0.1	Z	0.0	0.0	0.0	0.4	1.5	C	C	C	C	C	0.0	0.1	0.0	0.0	0.0	0.4	0.0	0.0	0.2	1.5
27-Nov	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	2.7	0.0	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.3	0.1	0.2	0.2	2.7
28-Nov	0.0	Z	0.2	0.1	0.2	0.3	0.1	0.4	0.9	1.2	1.3	1.4	1.7	1.0	0.6	0.5	0.5	0.2	0.3	0.5	0.6	0.5	0.6	0.4	0.6	1.7
29-Nov	0.4	0.5	Z	0.3	0.5	0.4	0.4	0.0	0.4	0.9	1.5	1.0	0.8	1.1	1.0	0.3	2.6	2.3	1.8	0.3	0.0	0.2	0.0	0.0	0.7	2.6
30-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.0	0.4	
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan																										
C - Calibration																										
M - Maintenance																										
UO - Unstable Operation																										



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Janvier - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Janvier - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	658	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 658

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Janvier - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	74	118	43	9	3	8	18	18	46	85	94	26	27	37	29	17	652
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	74	118	43	9	3	8	18	18	46	85	94	26	27	37	29	17	652

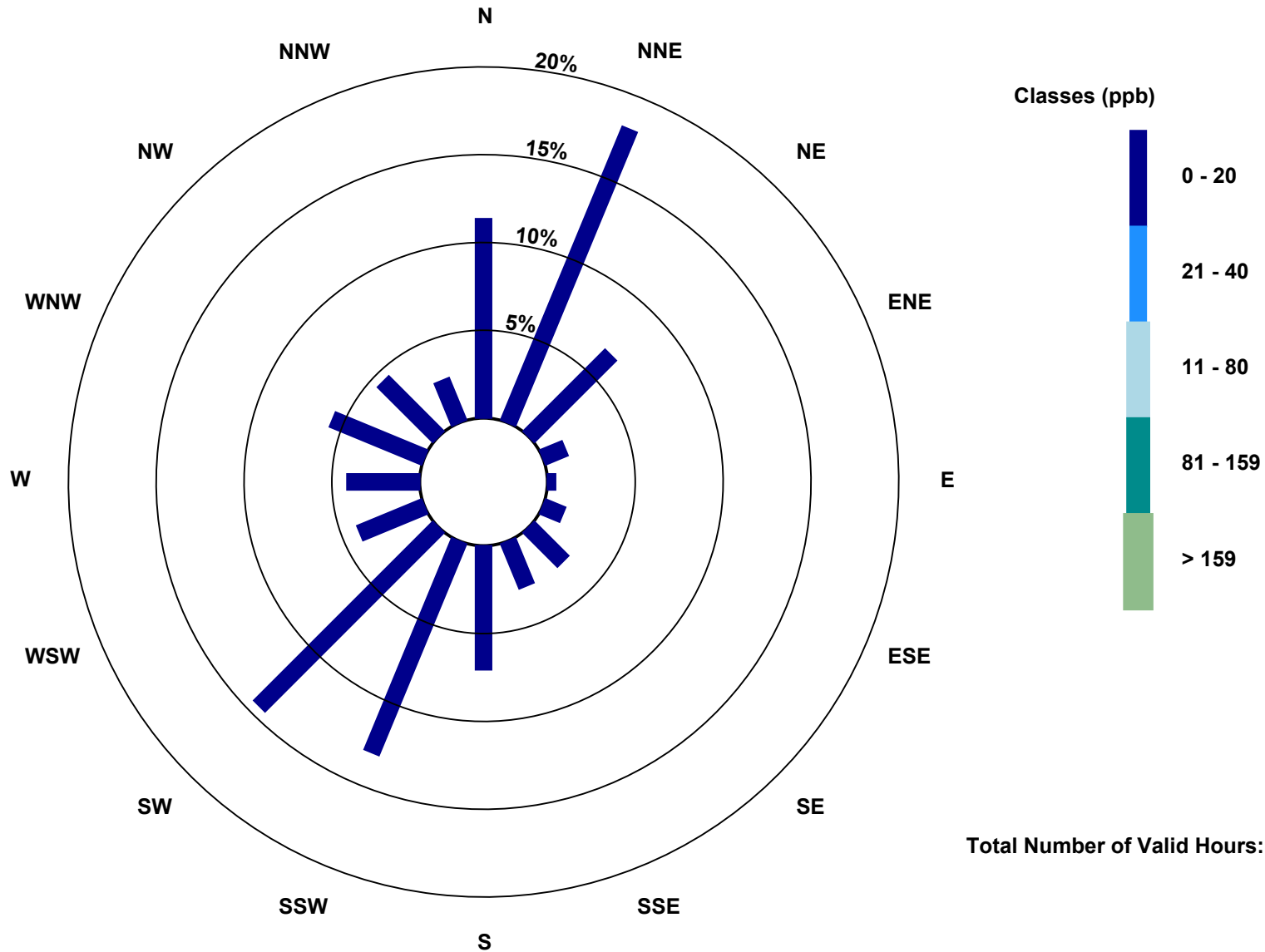
Total Number of Valid Hours: 652

Total Number of Hours: 720

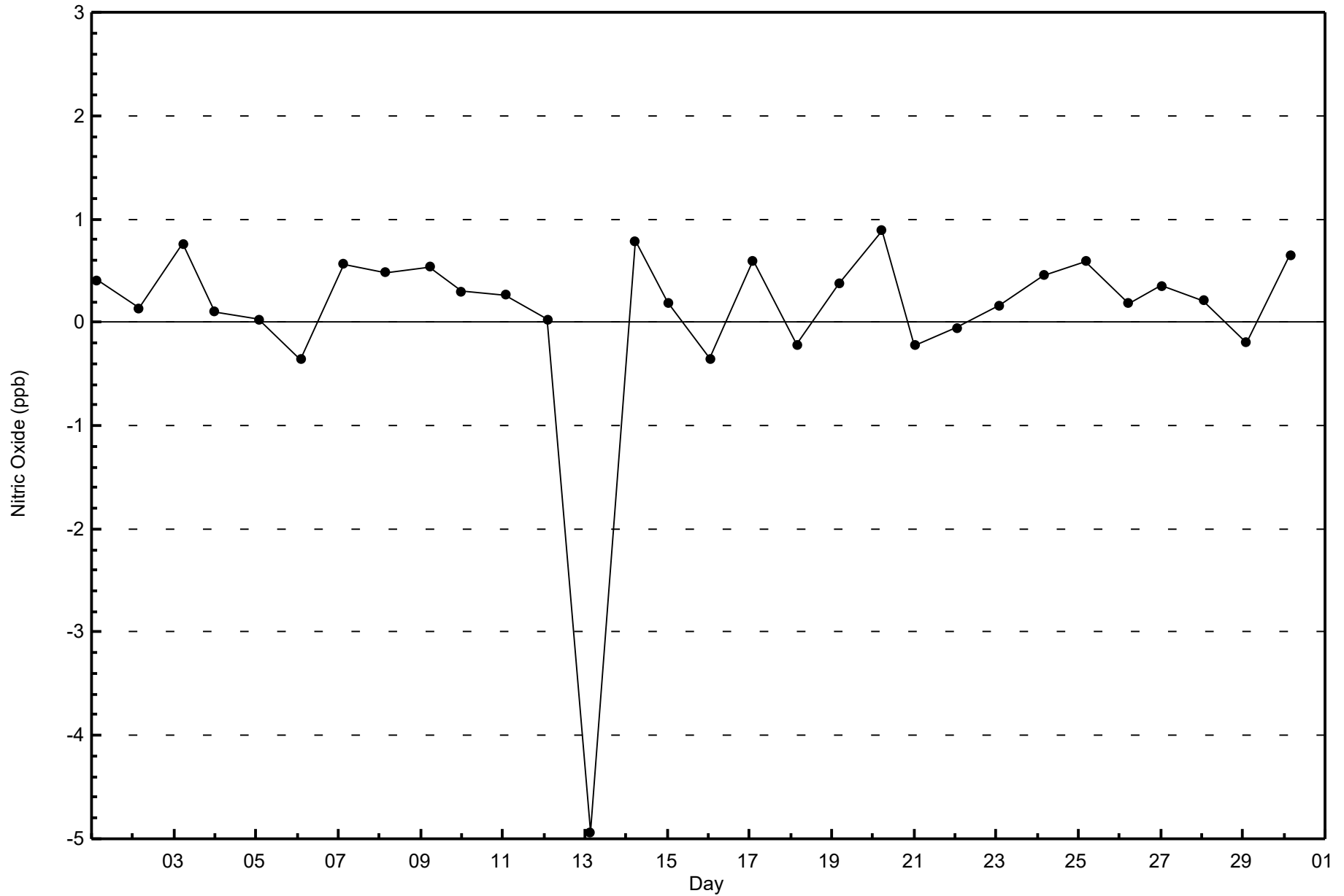


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

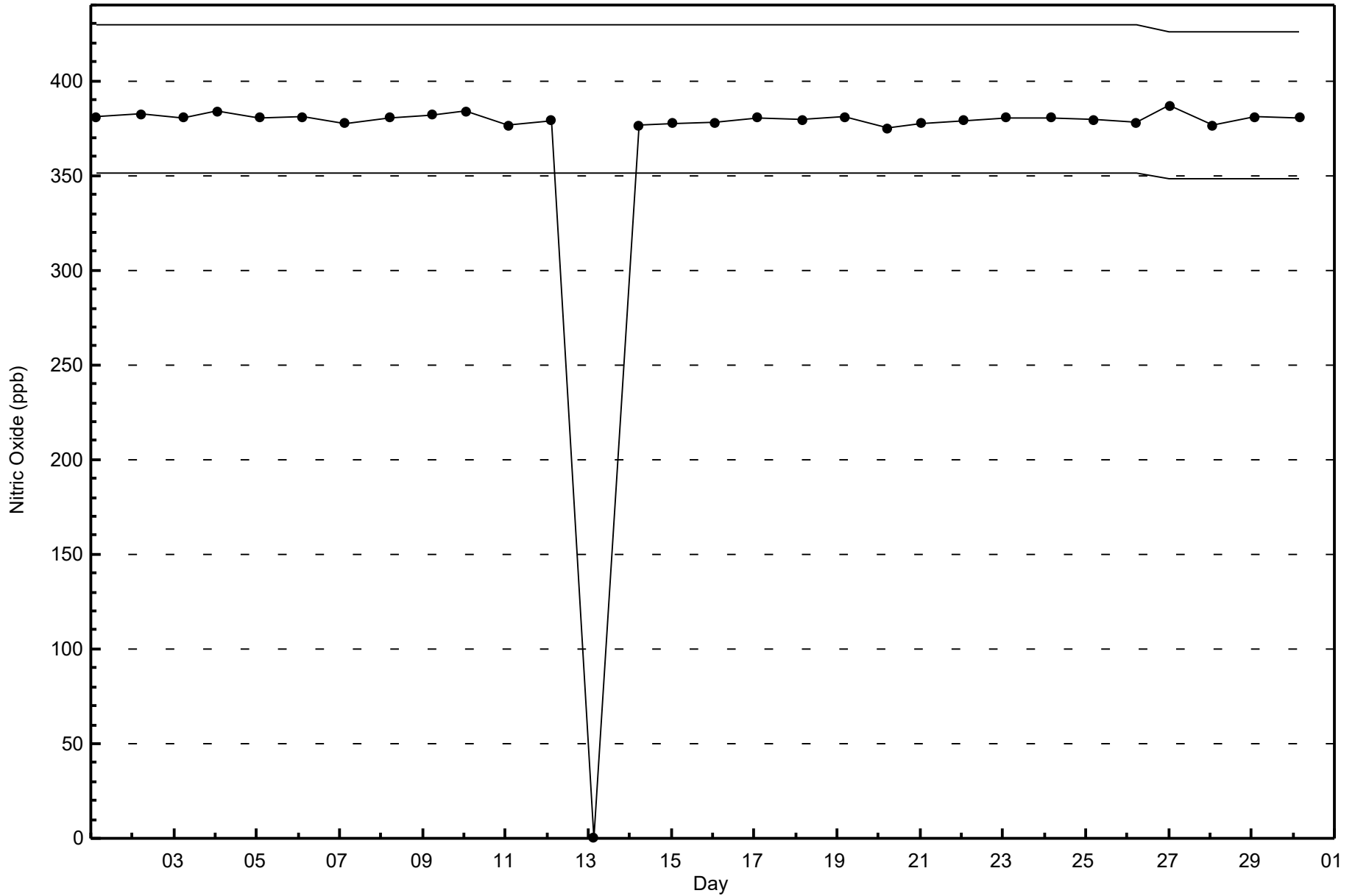
Nitric Oxide (NO) - ppb  
Janvier



Total Number of Valid Hours: 652









# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Nitrogen Dioxide (NO<sub>2</sub>) - ppb

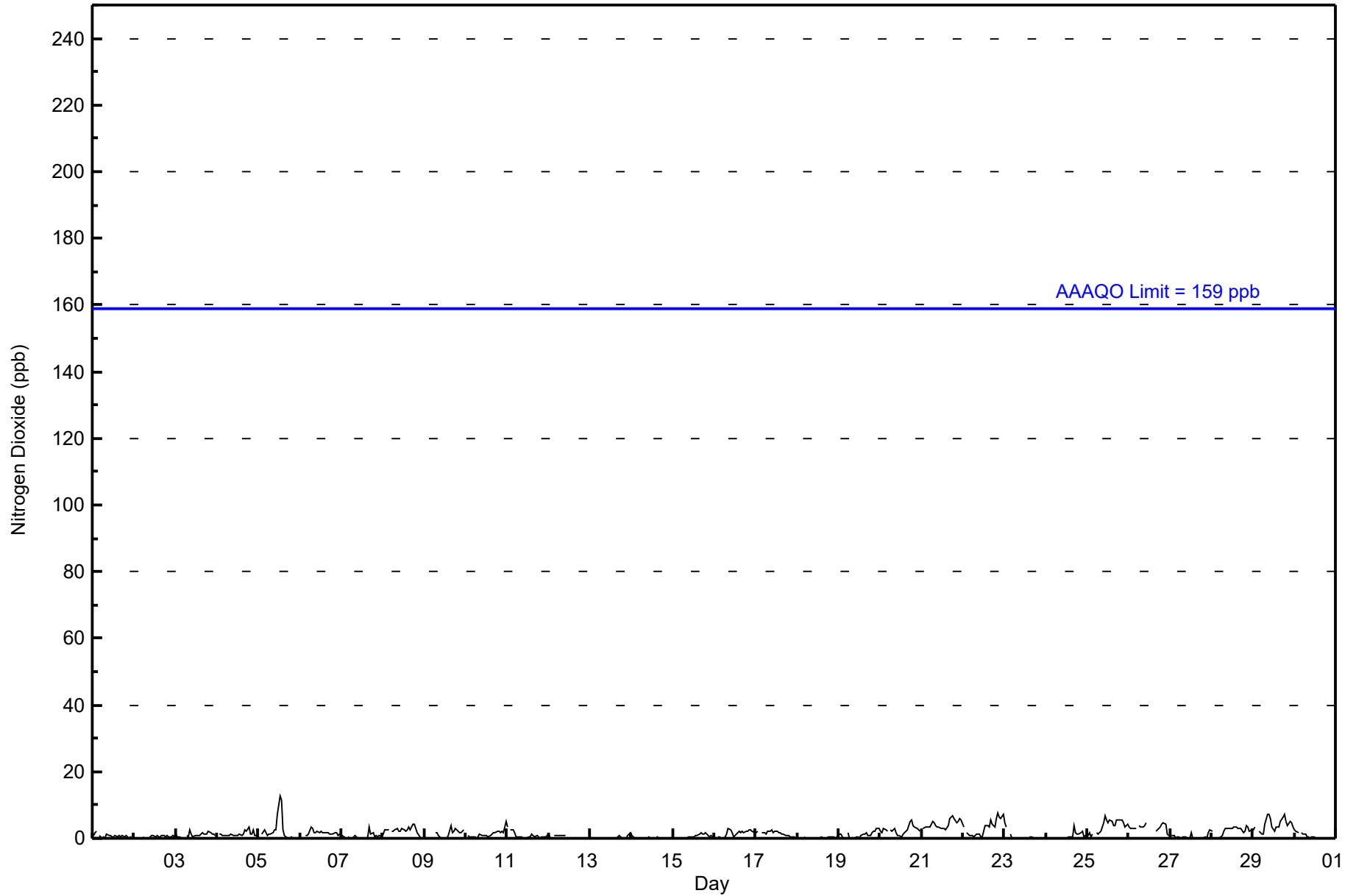
## Janvier - November 2024

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Daily Average		Daily Maximum																										
Maximum Value: 12.7 ppb on Nov 5 13:00		Maximum Daily Average: 4.2 ppb on Nov 21																	Hours of Data: 658		Hours of Missing Data: 62																												
Minimum Value: 0.0 ppb on Nov 2 01:00		Minimum Daily Average: 0.1 ppb on Nov 14																	Hours of Calibration: 34		Percent Operational Time: 96.1																												
Maximum Diurnal Average: 2.1 ppb at hour 19		Minimum Diurnal Average: 0.9 ppb at hour 6																																															
Monthly Average: 1.52 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.3 Median = 1.0 Q <sub>3</sub> = 2.3 P <sub>90</sub> = 3.5 P <sub>99</sub> = 7.0																																															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	1.0	1.6	2.2	Z	1.0	0.2	0.3	0.2	1.1	0.9	0.7	0.6	0.5	0.7	0.4	0.8	0.6	0.8	0.6	0.9	0.5	0.1	0.4	0.1	0.7	2.2																							
2-Nov	0.0	0.0	0.0	0.0	Z	0.3	0.0	0.0	0.0	0.5	0.8	0.8	0.4	1.0	0.5	0.5	0.7	0.7	0.4	0.7	0.6	0.4	0.9	0.5	0.4	1.0																							
3-Nov	1.6	0.4	0.5	0.1	0.0	Z	0.8	0.3	2.6	1.3	0.6	0.9	0.7	0.8	0.7	1.5	1.4	1.2	1.1	2.1	1.7	1.4	1.3	1.0	1.0	2.6																							
4-Nov	Z	1.3	1.1	1.0	0.7	1.0	0.8	1.0	1.4	0.9	0.7	0.7	0.8	1.3	1.0	1.2	2.6	2.3	3.3	1.1	1.2	2.5	1.0	0.9	1.3	3.3																							
5-Nov	0.4	Z	1.4	2.6	1.6	0.9	1.2	1.4	1.6	2.4	2.4	7.0	12.7	11.3	2.6	1.0	0.4	0.2	0.1	0.6	0.1	0.0	0.0	0.1	2.3	12.7																							
6-Nov	0.0	0.1	Z	0.8	0.8	1.4	3.5	2.8	1.9	1.6	2.1	1.6	2.1	1.8	1.9	1.7	1.8	1.2	1.1	1.3	1.6	1.5	1.0	1.3	1.5	3.5																							
7-Nov	0.7	0.5	0.4	Z	0.6	0.1	0.0	0.5	0.7	0.0	0.1	0.0	0.0	0.0	0.0	0.4	3.2	1.2	1.8	0.5	0.7	0.4	0.7	0.4	0.6	3.2																							
8-Nov	1.1	2.4	2.6	2.7	Z	2.2	2.3	2.7	2.8	2.0	2.3	3.0	2.4	2.2	2.7	3.3	2.5	4.3	4.1	3.1	1.9	0.5	0.0	0.0	2.3	4.3																							
9-Nov	0.1	0.0	0.0	0.0	0.1	Z	1.6	1.8	0.9	0.6	0.2	0.0	0.0	0.0	0.7	3.9	1.8	2.3	3.1	2.4	1.6	1.7	2.0	2.5	1.2	3.9																							
10-Nov	Z	1.0	0.6	0.4	0.5	0.4	0.0	0.4	1.1	0.8	0.7	0.7	0.7	0.6	0.8	1.1	1.6	1.6	2.3	2.3	1.5	2.3	1.6	5.1	1.2	5.1																							
11-Nov	3.3	Z	2.5	2.6	1.5	0.5	0.4	0.4	0.3	0.2	0.1	0.1	0.5	0.6	1.2	1.0	0.6	0.8	0.6	0.2	0.4	0.3	0.4	0.7	0.8	3.3																							
12-Nov	1.1	0.5	Z	0.8	1.0	1.0	1.0	0.7	0.7	0.8	0.7	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	1.1																							
13-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	0.1	0.6	0.7	0.2	0.1	0.0	0.0	0.9	1.6	--	1.6																							
14-Nov	1.0	0.5	0.0	0.0	0.0	Z	0.2	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.3	0.1	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.1	1.0																							
15-Nov	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.4	0.4	0.5	0.5	0.7	0.9	1.4	1.6	1.2	1.3	1.5	0.9	0.6	0.7	0.5	0.6	1.6																							
16-Nov	0.5	Z	0.5	0.3	0.2	0.0	0.6	1.2	2.8	2.6	1.5	0.3	0.8	1.2	2.2	1.7	2.1	1.8	2.0	2.2	2.5	2.6	2.0	1.8	1.5	2.8																							
17-Nov	1.9	2.2	Z	1.9	1.6	1.7	1.4	2.3	2.0	2.6	1.9	2.1	2.2	1.7	1.5	1.2	1.2	0.9	1.0	0.7	0.5	0.6	0.3	0.2	1.5	2.6																							
18-Nov	0.0	0.0	0.0	Z	0.3	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.3	0.0	0.1	0.1	0.3	0.5	0.5	0.5	0.0	0.5	0.2	0.5																							
19-Nov	1.3	1.4	0.6	0.2	Z	1.5	0.0	0.0	0.0	0.0	0.6	0.3	0.0	1.0	1.1	1.3	1.8	0.9	1.0	1.7	2.0	2.2	3.1	3.1	1.1	3.1																							
20-Nov	2.2	1.9	2.8	2.4	2.1	Z	2.5	2.3	3.1	1.9	0.9	0.8	0.5	1.3	1.6	2.0	2.6	4.9	5.5	3.8	3.5	2.8	2.5	2.1	2.4	5.5																							
21-Nov	Z	2.8	3.2	3.3	3.2	3.5	4.9	4.6	3.7	3.5	3.2	3.1	2.9	2.9	2.7	3.9	6.0	6.2	6.6	6.0	4.8	4.9	5.9	5.7	4.2	6.6																							
22-Nov	3.4	Z	1.7	1.1	0.9	0.7	0.6	0.9	1.3	1.2	0.4	0.6	2.3	3.7	3.7	3.4	5.3	4.4	3.4	6.1	7.5	6.4	6.0	7.1	3.1	7.5																							
23-Nov	4.7	3.6	Z	1.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.3	0.5	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.5	4.7																							
24-Nov	0.0	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3	0.3	0.4	3.9	1.7	1.4	1.4	1.8	2.2	0.6	1.0	0.7	3.9																							
25-Nov	0.8	1.8	0.5	1.1	Z	1.6	1.2	1.5	2.3	4.7	6.7	5.3	4.8	5.3	5.1	3.7	3.8	5.7	5.7	5.3	5.5	4.5	3.5	4.1	3.7	6.7																							
26-Nov	3.4	3.1	3.1	2.8	3.1	Z	3.7	3.5	3.5	4.0	4.6	C	C	C	C	C	2.2	2.8	3.5	4.1	4.8	4.1	1.2	0.7	3.2	4.8																							
27-Nov	Z	0.9	0.7	0.1	0.4	0.3	0.2	0.4	0.4	0.4	0.1	0.1	1.8	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.5	0.2	1.9	2.5	0.5	2.5																							
28-Nov	2.2	Z	0.1	0.2	0.1	0.5	0.8	2.1	3.0	3.0	3.1	2.8	2.9	3.2	3.2	3.1	3.0	2.9	1.9	2.2	3.8	3.5	2.1	2.5	2.3	3.8																							
29-Nov	2.7	3.5	Z	2.3	1.9	1.4	1.4	4.3	7.1	7.0	6.0	3.5	2.3	3.5	3.4	3.2	5.1	6.4	7.0	5.2	4.0	5.1	4.7	3.3	4.1	7.1																							
30-Nov	2.5	2.2	1.7	Z	1.5	1.2	1.2	0.3	0.5	0.1	0.3	0.3	0.0	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.2	0.6	2.5																							
																								1.5	1.3	1.1	1.2	0.9	0.9	1.1	1.2	1.5	1.5	1.4	1.3	1.6	1.7	1.4	1.5	2.0	2.0	2.1	1.9	1.9	1.8	1.5	1.7	Diurnal Average	
																								4.7	3.6	3.2	3.3	3.2	3.5	4.9	4.6	7.1	7.0	6.7	7.0	12.7	11.3	5.1	3.9	6.0	6.4	7.0	6.1	7.5	6.4	6.0	7.1	Diurnal Maximum	
Z - zerspan C - Calibration M - Maintenance UO - Unstable Operation																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																	



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Janvier - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Janvier - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	658	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 658

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Janvier - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 20	74	118	43	9	3	8	18	18	46	85	94	26	27	37	29	17	652
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	74	118	43	9	3	8	18	18	46	85	94	26	27	37	29	17	652

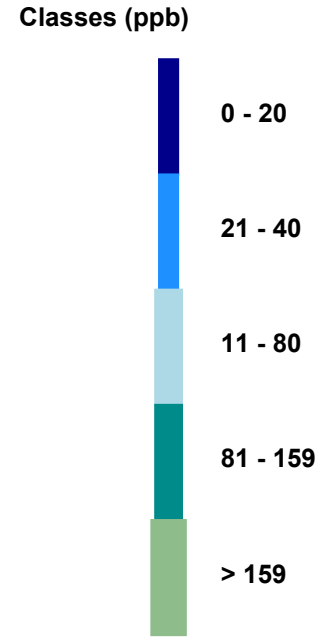
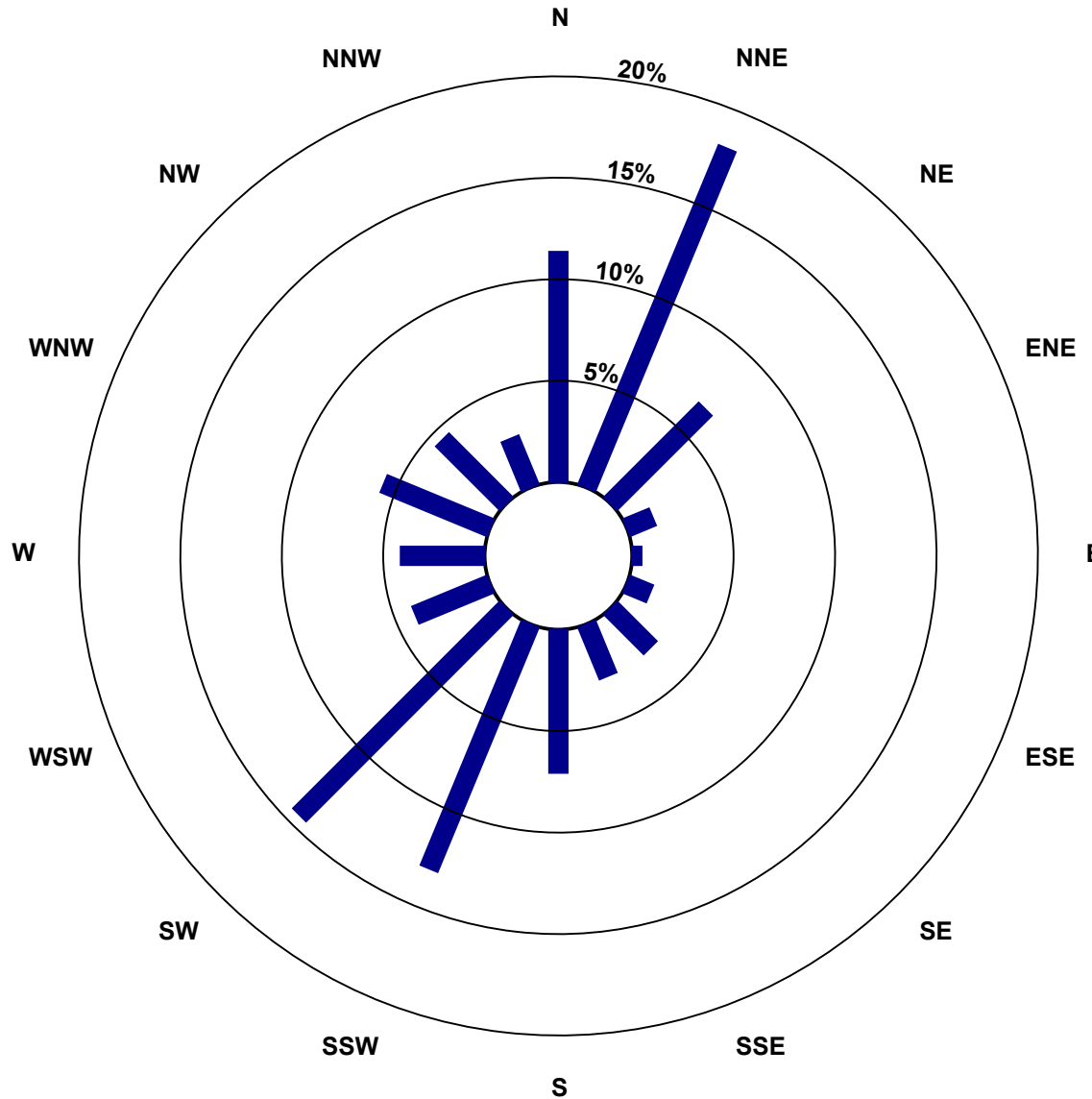
Total Number of Valid Hours: 652

Total Number of Hours: 720

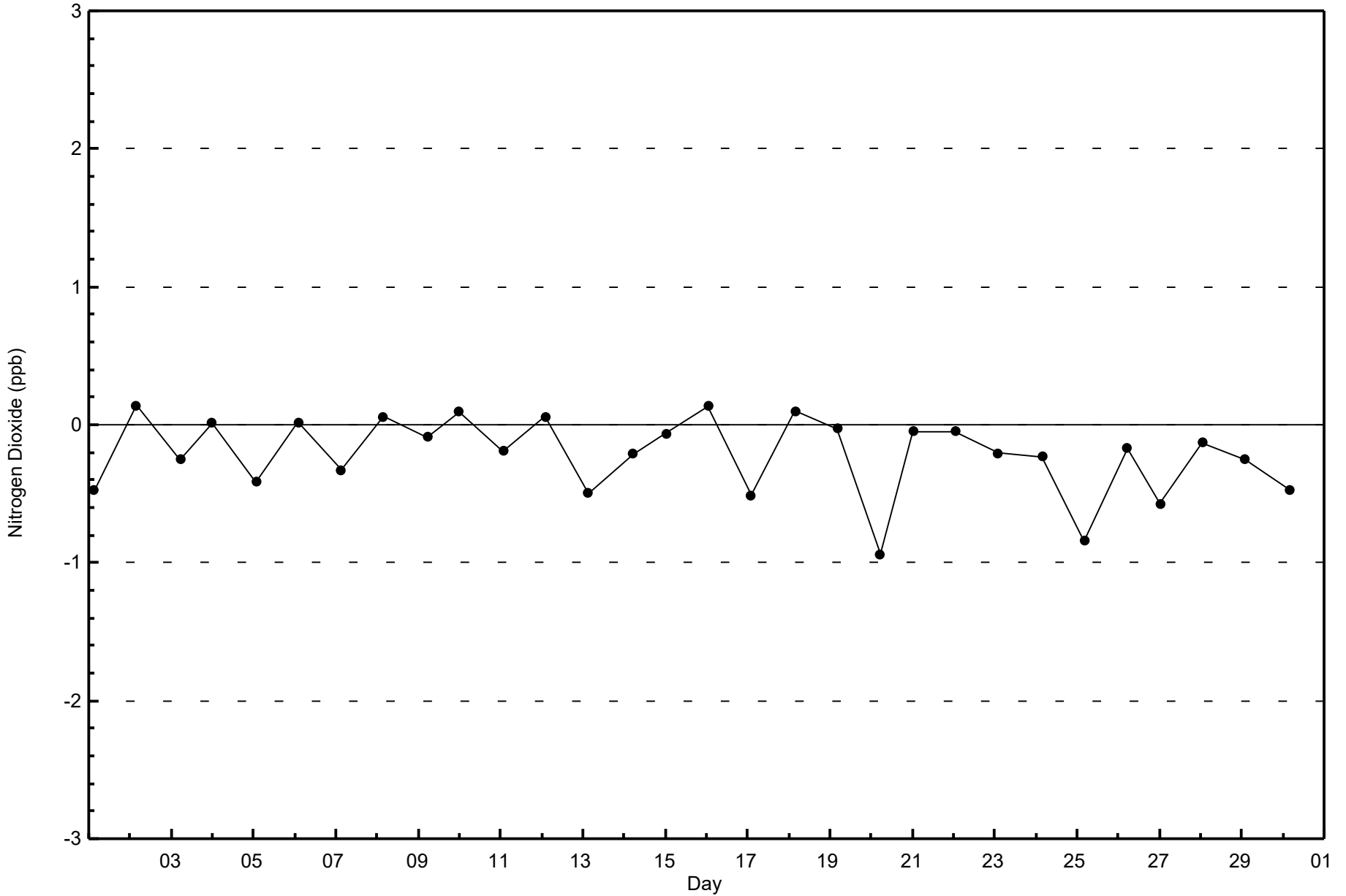


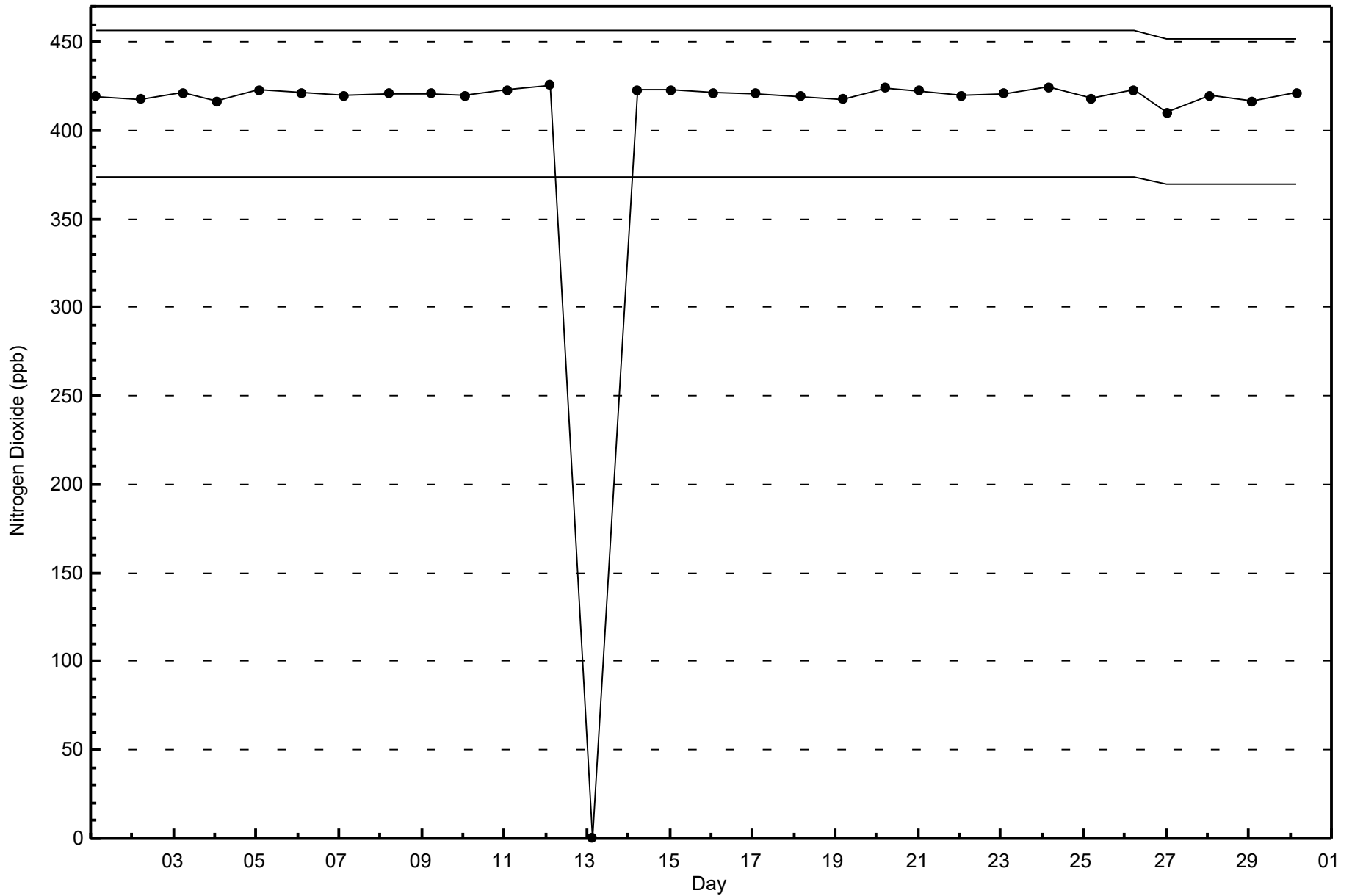
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Janvier



Total Number of Valid Hours: 652









**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

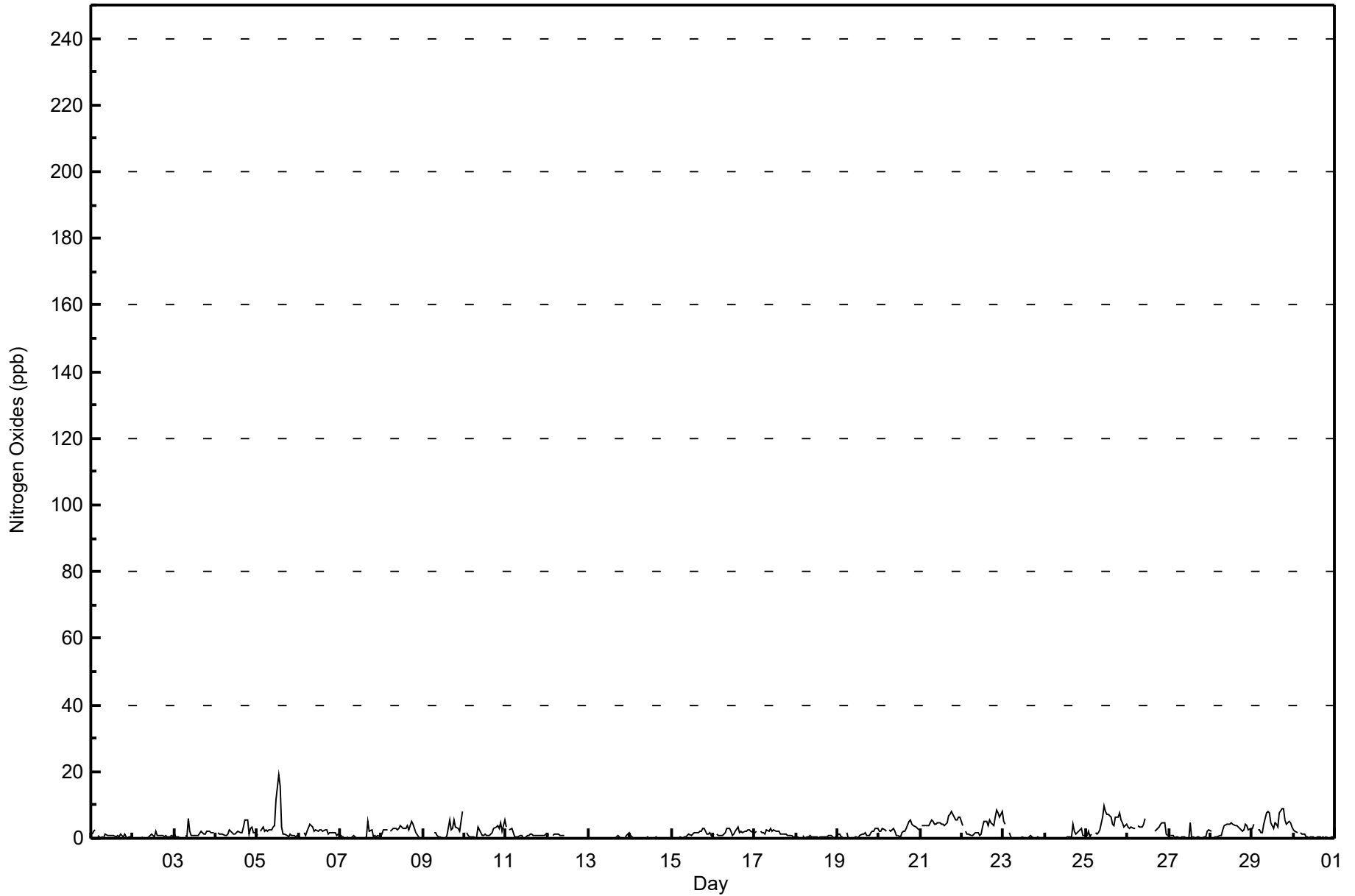
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Janvier - November 2024**

Maximum Value: 19.1 ppb on Nov 5 13:00		Maximum Daily Average: 5.1 ppb on Nov 21		Hours in Service: 720																						
Minimum Value: 0.0 ppb on Nov 3 05:00		Minimum Daily Average: 0.1 ppb on Nov 14		Hours of Data: 658																						
Maximum Diurnal Average: 2.5 ppb at hour 19		Minimum Diurnal Average: 1.1 ppb at hour 6		Hours of Missing Data: 62																						
Monthly Average: 1.90 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.5 Median = 1.2 Q <sub>3</sub> = 2.7 P <sub>90</sub> = 4.4 P <sub>99</sub> = 8.2		Hours of Calibration: 34																						
				Percent Operational Time: 96.1																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	1.4	2.1	2.3	Z	1.0	0.2	0.3	0.2	1.2	0.9	1.0	0.8	0.9	1.0	0.4	1.0	0.6	1.1	0.6	1.3	0.5	0.2	0.4	0.2	0.8	2.3
2-Nov	0.2	0.0	0.1	0.2	Z	0.4	0.1	0.1	0.1	0.5	1.0	1.3	0.6	2.2	0.7	0.7	0.8	0.9	0.4	0.7	0.6	0.4	0.9	0.5	0.6	2.2
3-Nov	1.6	0.4	0.5	0.1	0.0	Z	0.8	0.3	6.0	1.9	0.6	0.9	0.7	0.8	0.9	2.0	1.6	1.3	1.1	2.2	2.0	1.7	1.5	1.6	1.3	6.0
4-Nov	Z	1.7	1.3	1.4	1.1	1.0	0.9	1.2	2.5	1.6	1.2	1.1	1.5	2.0	1.5	1.7	3.4	5.7	5.6	1.4	2.8	3.3	1.7	1.6	2.1	5.7
5-Nov	1.0	Z	2.0	3.6	2.0	2.4	2.2	2.4	2.7	3.5	3.7	11.4	19.1	15.7	3.4	1.4	1.1	1.0	0.5	1.2	0.7	0.7	0.5	0.8	3.6	19.1
6-Nov	0.8	0.5	Z	1.6	1.0	2.3	4.2	3.7	3.2	2.0	2.7	2.2	2.7	2.5	2.2	2.3	2.4	1.5	1.5	1.6	1.9	1.6	1.0	1.4	2.0	4.2
7-Nov	0.7	0.5	0.4	Z	0.6	0.1	0.0	0.5	0.8	0.0	0.1	0.0	0.0	0.0	0.0	0.4	5.0	2.1	2.4	0.5	0.7	0.6	0.7	0.4	0.7	5.0
8-Nov	1.1	2.6	2.6	2.7	Z	2.2	2.4	2.8	2.9	2.3	3.0	3.7	3.1	2.9	3.1	3.7	2.5	5.1	4.1	3.1	1.9	0.5	0.0	0.0	2.5	5.1
9-Nov	0.1	0.0	0.0	0.0	0.1	Z	1.6	1.9	0.9	0.6	0.2	0.0	0.0	0.0	0.7	5.6	2.5	2.8	5.5	3.6	3.0	2.1	4.9	8.1	1.9	8.1
10-Nov	Z	1.7	0.7	0.4	0.5	0.4	0.0	0.5	3.2	1.5	1.0	1.0	1.2	0.8	0.9	1.3	1.9	2.8	3.6	3.9	2.8	4.6	2.2	5.4	1.8	5.4
11-Nov	3.4	Z	2.5	2.9	1.8	0.5	0.5	0.5	0.7	0.7	0.2	0.2	1.0	1.0	1.3	1.2	1.0	0.9	0.7	0.9	0.7	0.7	0.8	1.1	1.1	3.4
12-Nov	1.5	1.0	Z	0.9	1.2	1.1	1.1	0.8	0.9	0.9	1.0	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	1.5
13-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	0.1	0.6	0.7	0.2	0.1	0.0	0.0	0.9	1.6	--	1.6
14-Nov	1.0	0.5	0.0	0.0	0.0	Z	0.2	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.3	0.1	0.2	0.0	0.2	0.0	0.1	0.0	0.2	0.1	1.0
15-Nov	Z	0.1	0.0	0.1	0.1	0.5	0.1	0.4	0.4	0.9	1.4	1.1	1.2	1.7	1.5	1.9	2.2	2.2	2.8	2.9	1.4	1.4	1.5	1.0	1.2	2.9
16-Nov	1.1	Z	1.1	0.9	0.8	0.8	1.1	1.5	3.0	3.0	2.1	0.7	1.3	2.0	3.3	1.7	2.2	1.8	2.1	2.2	2.5	2.7	2.0	1.8	1.8	3.3
17-Nov	1.9	2.2	Z	1.9	1.6	1.7	1.4	2.5	2.0	2.8	2.0	2.5	2.3	2.2	1.9	1.2	1.5	1.3	1.2	1.0	0.7	0.8	0.4	0.6	1.6	2.8
18-Nov	0.5	0.4	0.2	Z	0.9	0.1	0.6	0.5	0.8	0.6	0.6	0.5	0.6	0.2	0.6	0.2	0.6	0.2	0.5	0.7	0.7	0.6	0.1	0.5	0.5	0.9
19-Nov	1.3	1.4	0.6	0.2	Z	1.6	0.2	0.1	0.0	0.0	0.6	0.3	0.0	1.0	1.1	1.3	1.8	0.9	1.0	1.7	2.0	2.2	3.1	3.1	1.1	3.1
20-Nov	2.2	1.9	2.8	2.4	2.1	Z	2.5	2.3	3.1	1.9	0.9	0.8	0.5	1.6	2.0	2.3	2.8	5.0	5.6	4.1	3.9	3.3	3.1	2.4	2.6	5.6
21-Nov	Z	3.6	3.9	3.9	3.6	3.9	5.4	5.0	4.3	4.1	4.6	4.8	4.3	4.2	3.7	4.8	6.9	7.1	8.1	7.1	5.5	5.5	6.5	6.1	5.1	8.1
22-Nov	3.9	Z	2.0	1.4	1.3	1.0	0.9	1.1	1.8	1.6	0.9	1.2	3.6	5.2	4.9	3.8	5.6	4.6	3.7	6.2	8.3	7.4	6.4	8.0	3.7	8.3
23-Nov	5.0	4.1	Z	1.6	0.4	0.1	0.0	0.0	0.2	0.0	0.1	0.4	0.1	0.0	0.0	0.4	0.7	0.0	0.1	0.0	0.3	0.0	0.0	0.1	0.6	5.0
24-Nov	0.0	0.0	0.1	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3	0.3	0.4	4.1	1.9	1.4	1.5	2.5	2.8	0.6	1.0	0.8	4.1
25-Nov	0.8	2.2	0.5	1.1	Z	1.6	1.2	1.5	2.6	6.4	9.7	8.2	7.0	7.4	6.5	4.4	3.8	6.2	6.2	7.4	5.7	4.6	3.5	4.2	4.5	9.7
26-Nov	3.6	3.1	3.3	3.0	3.2	Z	3.7	3.5	3.5	4.4	6.1	C	C	C	C	C	2.2	2.9	3.5	4.1	4.8	4.5	1.2	0.7	3.4	6.1
27-Nov	Z	0.9	0.7	0.1	0.5	0.3	0.2	0.5	0.5	0.4	0.1	0.2	4.5	0.2	0.4	0.2	0.3	0.3	0.0	0.0	0.5	0.5	2.0	2.7	0.7	4.5
28-Nov	2.2	Z	0.3	0.3	0.3	0.8	0.9	2.5	3.9	4.2	4.4	4.2	4.6	4.2	3.8	3.6	3.5	3.1	2.2	2.7	4.4	4.0	2.7	2.9	2.9	4.6
29-Nov	3.1	4.0	Z	2.6	2.4	1.8	1.8	4.3	7.5	7.9	7.5	4.5	3.1	4.6	4.4	3.5	7.7	8.7	8.8	5.5	4.0	5.3	4.7	3.3	4.8	8.8
30-Nov	2.5	2.2	1.7	Z	1.5	1.2	1.2	0.3	0.5	0.1	0.3	0.3	0.0	0.1	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.4	0.4	0.6	2.5
																								Diurnal Average		
																								Diurnal Maximum		
																								1.7 1.5 1.2 1.4 1.1 1.1 1.2 1.4 2.0 1.9 2.0 1.9 2.4 2.4 1.8 1.8 2.4 2.5 2.5 2.3 2.2 2.2 1.8 2.1		
																								5.0 4.1 3.9 3.9 3.6 3.9 5.4 5.0 7.5 7.9 9.7 11.4 19.1 15.7 6.5 5.6 7.7 8.7 8.8 7.4 8.3 7.4 6.5 8.1		
																								Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation		



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Janvier - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Janvier - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	658	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 658

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

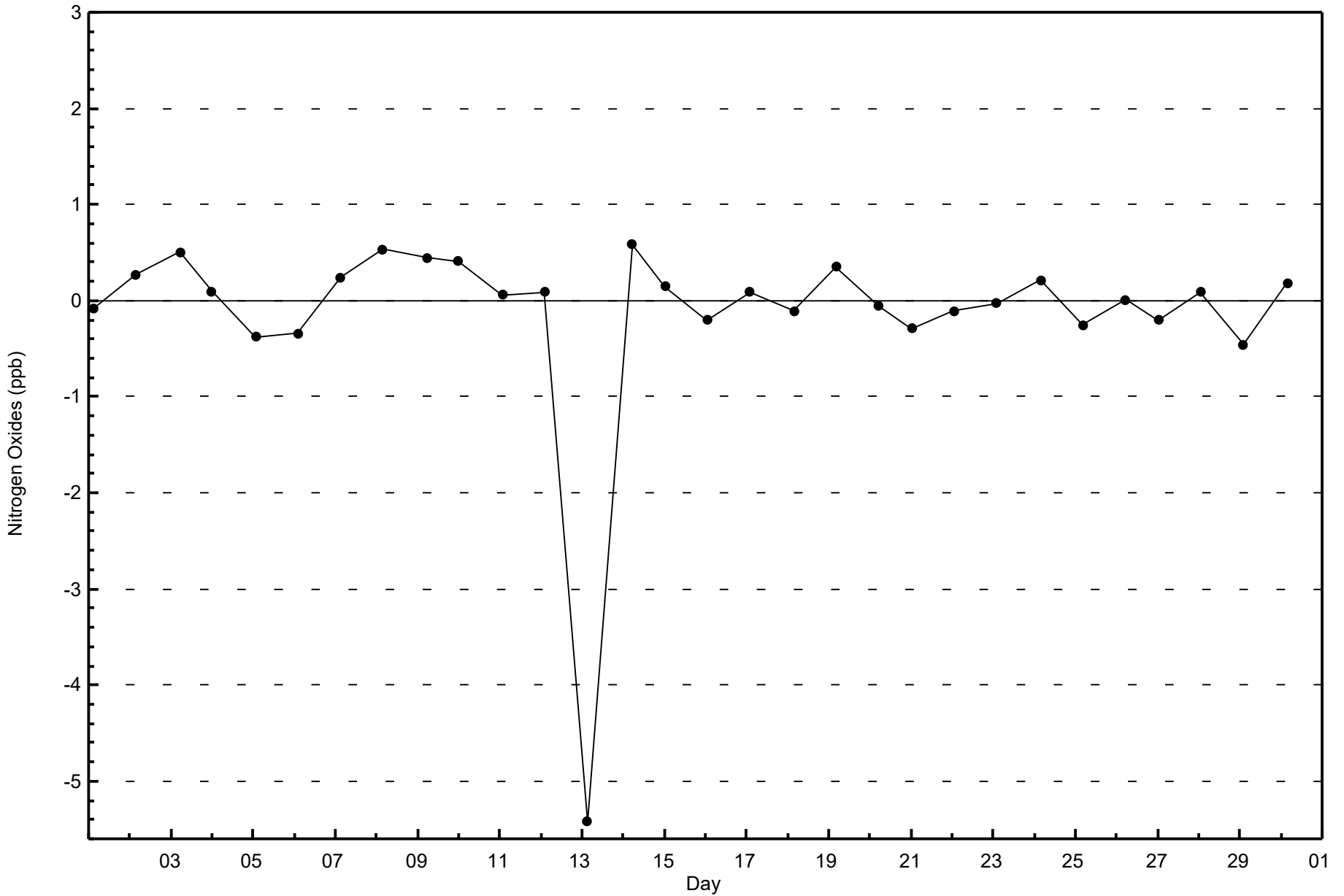
**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Janvier - November 2024**

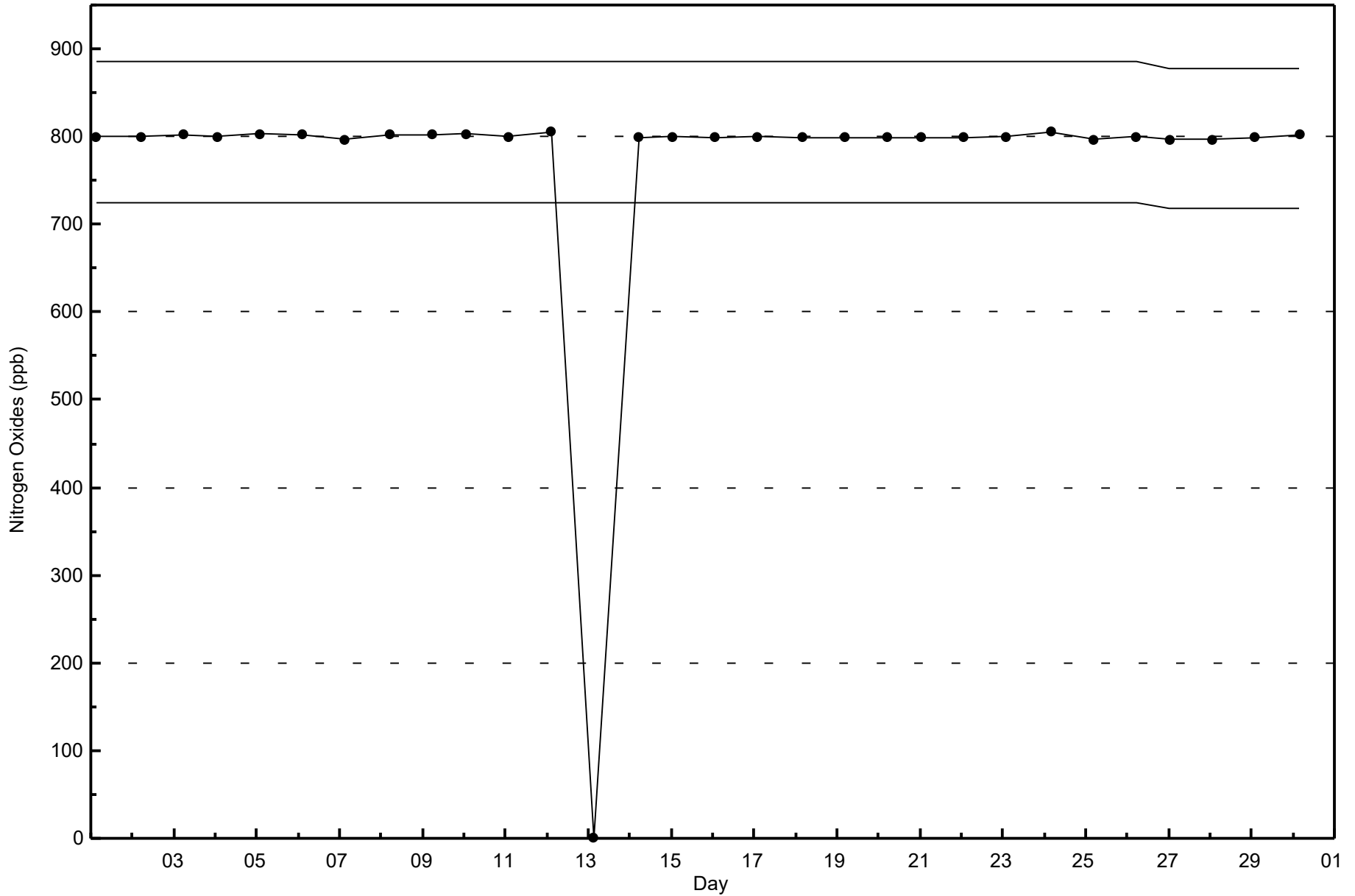
<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 20	74	118	43	9	3	8	18	18	46	85	94	26	27	37	29	17	652
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	74	118	43	9	3	8	18	18	46	85	94	26	27	37	29	17	652

Total Number of Valid Hours: 652

Total Number of Hours: 720









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O<sub>3</sub>) - ppb

Janvier - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 42.0 ppb on Nov 7 12:00	Maximum Daily Average: 36.1 ppb on Nov 7		Hours of Data:	653
Minimum Value: 5.0 ppb on Nov 5 02:00	Minimum Daily Average: 15.2 ppb on Nov 1		Hours of Missing Data:	67
Maximum Diurnal Average: 28.3 ppb at hour 15	Minimum Diurnal Average: 22.6 ppb at hour 22		Hours of Calibration:	32
Monthly Average: 24.92 ppb	Percentiles: P <sub>1</sub> = 7.4 P <sub>10</sub> = 15.5 Q <sub>1</sub> = 20.9 Median = 25.6 Q <sub>3</sub> = 29.9 P <sub>90</sub> = 33.2 P <sub>99</sub> = 39.4		Percent Operational Time:	95.1

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	14.2	Z	10.9	7.4	10.5	9.9	12.7	14.3	16.4	19.0	22.0	21.3	21.1	19.2	19.1	19.8	19.2	17.6	16.2	15.0	11.7	10.3	10.6	11.0	15.2	22.0	
2-Nov	11.3	10.6	Z	9.2	9.2	7.5	7.4	5.9	7.4	20.5	21.5	21.9	23.2	21.7	21.6	21.8	22.2	21.6	21.9	20.5	17.8	15.2	15.6	11.8	16.0	23.2	
3-Nov	7.6	11.6	11.9	Z	10.8	10.3	10.3	11.2	12.2	18.7	22.0	22.1	23.8	23.7	22.0	18.9	18.4	18.2	17.6	16.5	16.4	15.5	16.2	16.5	16.2	23.8	
4-Nov	17.3	17.1	16.8	16.2	Z	16.8	17.8	18.9	20.0	21.2	23.0	25.2	26.3	27.7	30.4	30.6	26.6	20.7	18.0	17.6	12.6	10.6	9.9	7.7	19.5	30.6	
5-Nov	5.5	5.0	9.2	6.1	6.7	Z	10.6	14.0	7.2	10.8	14.0	7.6	8.0	9.8	21.9	22.3	23.4	23.6	24.2	24.8	25.3	27.0	27.4	26.5	15.7	27.4	
6-Nov	Z	26.2	24.4	23.3	22.1	20.0	18.6	20.6	25.3	27.3	30.4	30.6	29.9	30.0	30.0	30.4	29.1	29.2	30.3	29.7	29.1	28.0	28.4	29.5	27.1	30.6	
7-Nov	31.2	Z	31.4	29.6	30.2	33.0	38.4	38.1	38.5	38.0	40.8	42.0	41.7	41.9	41.4	39.1	35.9	35.3	35.9	35.0	34.2	35.5	32.2	30.8	36.1	42.0	
8-Nov	29.8	27.4	Z	22.9	22.9	22.4	20.0	19.9	19.9	20.5	20.9	20.2	20.9	22.1	22.5	21.3	21.8	19.0	18.7	18.4	22.0	31.7	40.8	39.7	23.7	40.8	
9-Nov	34.0	33.3	34.2	Z	33.0	32.8	29.4	27.3	26.8	27.5	30.0	35.6	37.1	36.3	34.5	29.6	30.0	29.2	26.3	16.9	17.7	17.7	17.6	12.8	28.2	37.1	
10-Nov	15.5	17.9	19.6	20.5	Z	18.3	18.6	18.3	18.4	19.3	22.5	25.9	28.9	33.3	33.9	33.2	31.1	27.4	20.0	23.7	18.4	13.8	18.5	15.1	22.3	33.9	
11-Nov	16.8	19.4	22.7	26.8	28.8	Z	30.8	30.1	31.7	33.4	32.7	31.2	29.2	27.8	25.5	24.8	24.8	24.5	23.6	23.1	22.5	20.9	19.7	15.7	25.5	33.4	
12-Nov	Z	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--	
13-Nov	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	M	C	C	C	26.1	25.1	24.8	23.1	21.6	22.2	22.4	20.9	19.1	--	26.1
14-Nov	19.3	20.2	21.3	Z	24.1	24.6	24.4	24.6	24.9	24.6	24.8	25.3	25.8	25.8	25.6	25.4	24.8	24.6	24.1	24.6	24.3	22.3	22.2	22.2	23.9	25.8	
15-Nov	22.5	22.5	23.4	22.6	Z	18.4	18.7	18.5	19.0	19.3	18.2	16.8	15.8	15.3	15.3	14.4	12.8	12.4	11.0	10.5	12.4	12.9	13.3	13.8	16.5	23.4	
16-Nov	15.8	19.8	23.6	25.4	26.6	Z	26.4	25.6	24.3	25.2	26.8	27.9	27.9	29.2	29.0	28.9	27.9	28.0	26.4	24.8	24.4	24.5	24.7	24.7	25.6	29.2	
17-Nov	Z	24.9	25.6	26.2	25.7	25.5	24.8	24.1	23.6	22.9	23.0	22.0	22.7	24.6	26.5	32.3	32.4	32.7	33.8	34.9	24.9	21.5	27.4	28.2	26.5	34.9	
18-Nov	28.2	Z	27.1	26.6	26.4	26.2	26.5	26.0	25.5	24.9	24.7	25.5	26.2	26.7	26.2	28.1	27.9	27.9	27.4	26.9	27.1	27.0	27.1	26.7	26.6	28.2	
19-Nov	25.1	24.5	Z	28.0	29.8	26.2	30.7	30.0	28.4	26.8	26.9	27.2	27.3	27.2	28.2	28.7	29.1	30.9	30.1	30.2	30.7	32.5	30.8	31.1	28.7	32.5	
20-Nov	31.9	31.6	30.5	Z	31.0	31.2	31.6	31.3	30.4	32.0	33.2	33.0	33.3	32.9	32.0	31.7	31.0	27.9	27.3	28.1	27.6	28.6	29.2	29.5	30.7	33.3	
21-Nov	29.2	28.3	27.3	27.2	Z	26.8	25.2	25.0	25.2	25.7	26.5	28.1	28.3	27.8	28.2	26.9	23.4	20.1	16.7	15.6	14.7	15.6	18.6	18.9	23.9	29.2	
22-Nov	20.7	22.0	23.0	23.1	23.1	Z	22.3	21.8	21.9	22.7	25.0	26.7	29.0	28.6	28.7	29.6	26.3	26.3	25.6	23.1	18.9	18.6	16.8	14.9	23.4	29.6	
23-Nov	Z	16.5	24.6	26.5	28.2	28.8	29.5	29.9	29.8	29.5	29.5	29.3	29.8	30.3	30.5	29.9	30.2	30.6	30.3	30.5	30.2	30.3	30.6	31.0	29.0	31.0	
24-Nov	32.4	Z	34.1	34.9	35.0	34.5	33.7	33.3	33.7	33.9	34.5	35.1	35.3	35.2	35.4	34.6	31.1	31.5	31.5	30.7	29.5	21.6	24.5	20.8	32.0	35.4	
25-Nov	21.6	21.1	Z	21.9	21.0	25.1	24.1	24.4	15.3	17.9	22.6	25.0	26.7	26.2	26.8	28.4	27.9	25.4	24.7	23.0	24.0	23.7	21.3	23.2	23.5	28.4	
26-Nov	28.9	29.5	29.9	Z	29.5	29.0	29.0	29.1	29.9	30.8	30.4	31.7	33.9	34.3	33.6	32.8	31.1	28.7	27.0	25.2	23.3	24.4	35.0	37.0	30.2	37.0	
27-Nov	34.2	32.7	32.8	33.4	Z	34.6	34.2	34.2	34.4	34.9	35.6	35.5	35.1	35.9	35.8	35.3	34.7	34.2	33.7	33.2	32.1	31.8	31.9	30.6	33.9	35.9	
28-Nov	30.0	33.0	32.9	31.6	29.7	Z	27.3	24.9	23.8	22.2	26.1	29.9	31.7	32.4	32.3	32.1	31.1	30.6	31.5	30.4	28.2	27.1	27.1	26.5	29.2	33.0	
29-Nov	Z	26.0	29.0	29.2	28.4	30.0	31.2	27.5	23.9	23.7	25.0	28.9	30.0	27.9	27.5	27.0	25.4	20.5	18.9	18.9	15.0	17.3	18.9	18.8	24.7	31.2	
30-Nov	20.0	Z	21.3	22.1	21.7	21.3	20.8	21.4	22.4	22.8	23.5	24.4	25.1	26.0	26.8	27.0	27.5	27.9	27.3	26.9	26.8	26.5	26.4	26.8	24.5	27.9	

22.6	22.7	24.5	23.5	24.1	24.0	24.1	23.9	23.6	24.9	26.3	27.0	27.6	27.9	28.3	28.0	27.0	25.9	24.9	24.1	22.9	22.6	23.6	22.8	Diurnal Average	
34.2	33.3	34.2	34.9	35.0	34.6	38.4	38.1	38.5	38.0	40.8	42.0	41.7	41.9	41.4	39.1	35.9	35.3	35.9	35.0	34.2	35.5	40.8	39.7	Diurnal Maximum	

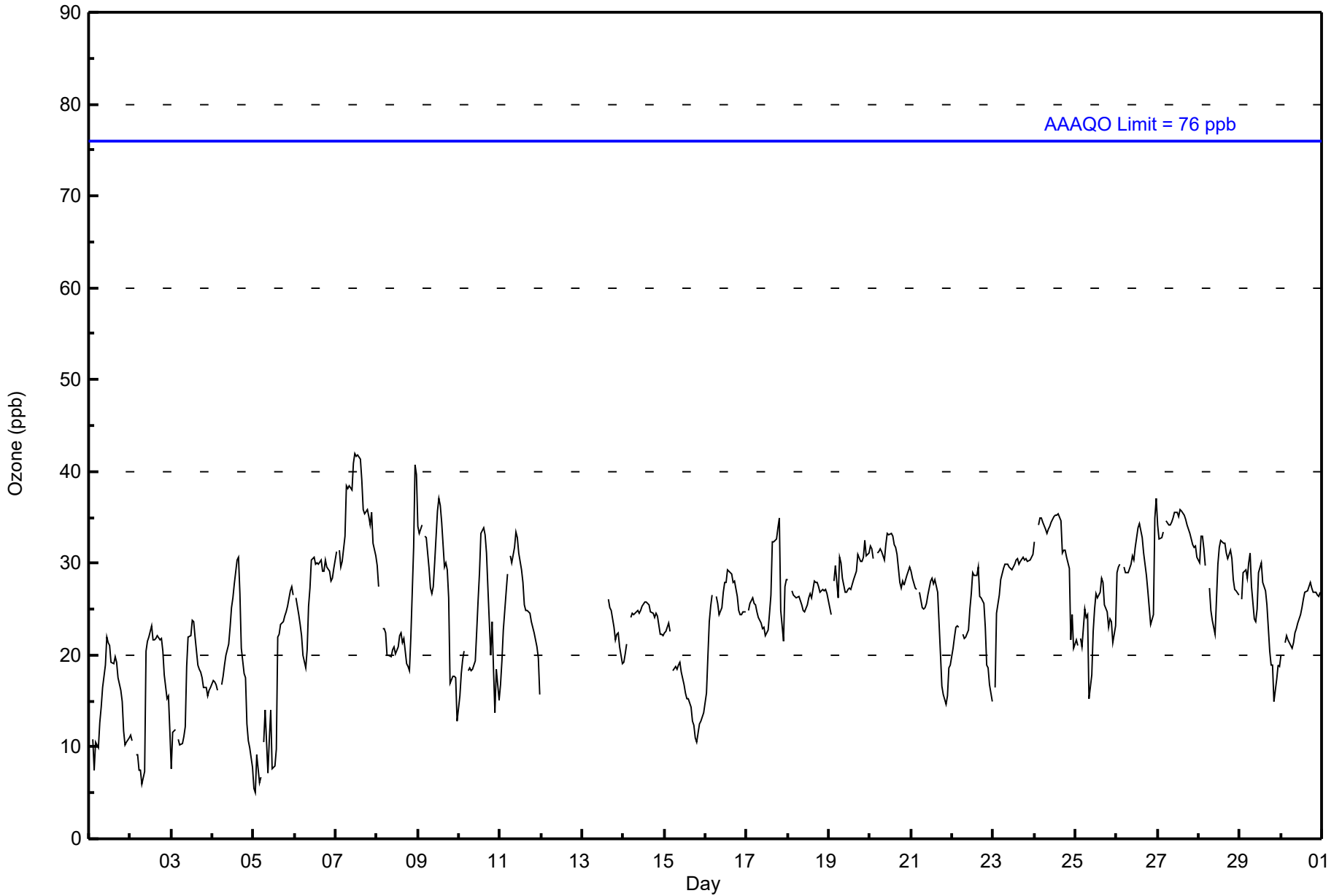
Z - zerospan      C - Calibration      M - Maintenance      AF - Analyzer Failure  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ozone (O<sub>3</sub>) - ppb**  
**Janvier - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb**  
**Janvier - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	156	23.89	23.89
21 - 50	497	76.11	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 653

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb  
Janvier - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	8	27	7	2	3	4	1	2	10	34	36	6	2	3	2	4	151
21 - 50	65	91	39	7	0	4	15	17	38	53	56	19	20	32	29	11	496
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	73	118	46	9	3	8	16	19	48	87	92	25	22	35	31	15	647

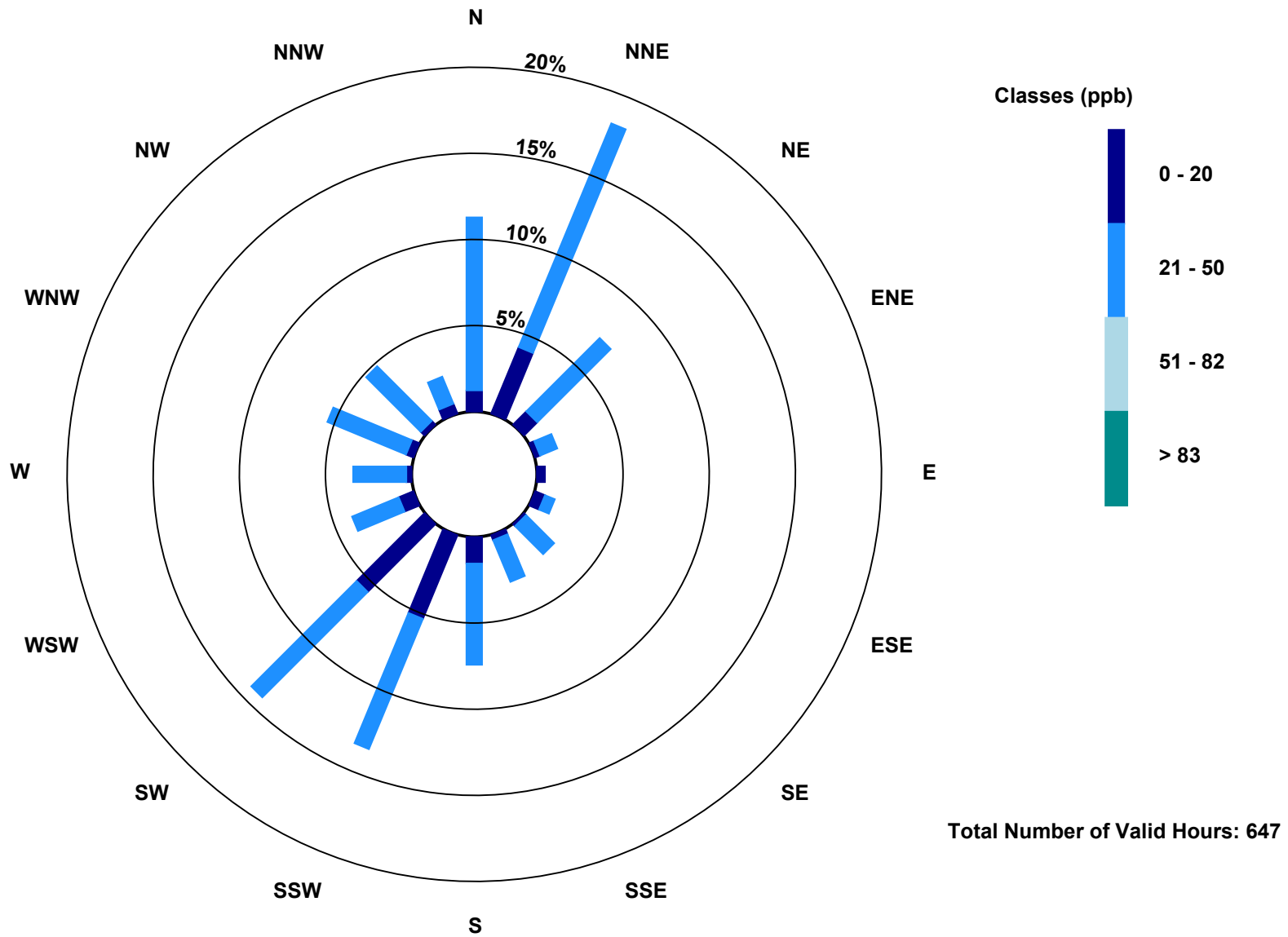
Total Number of Valid Hours: 647

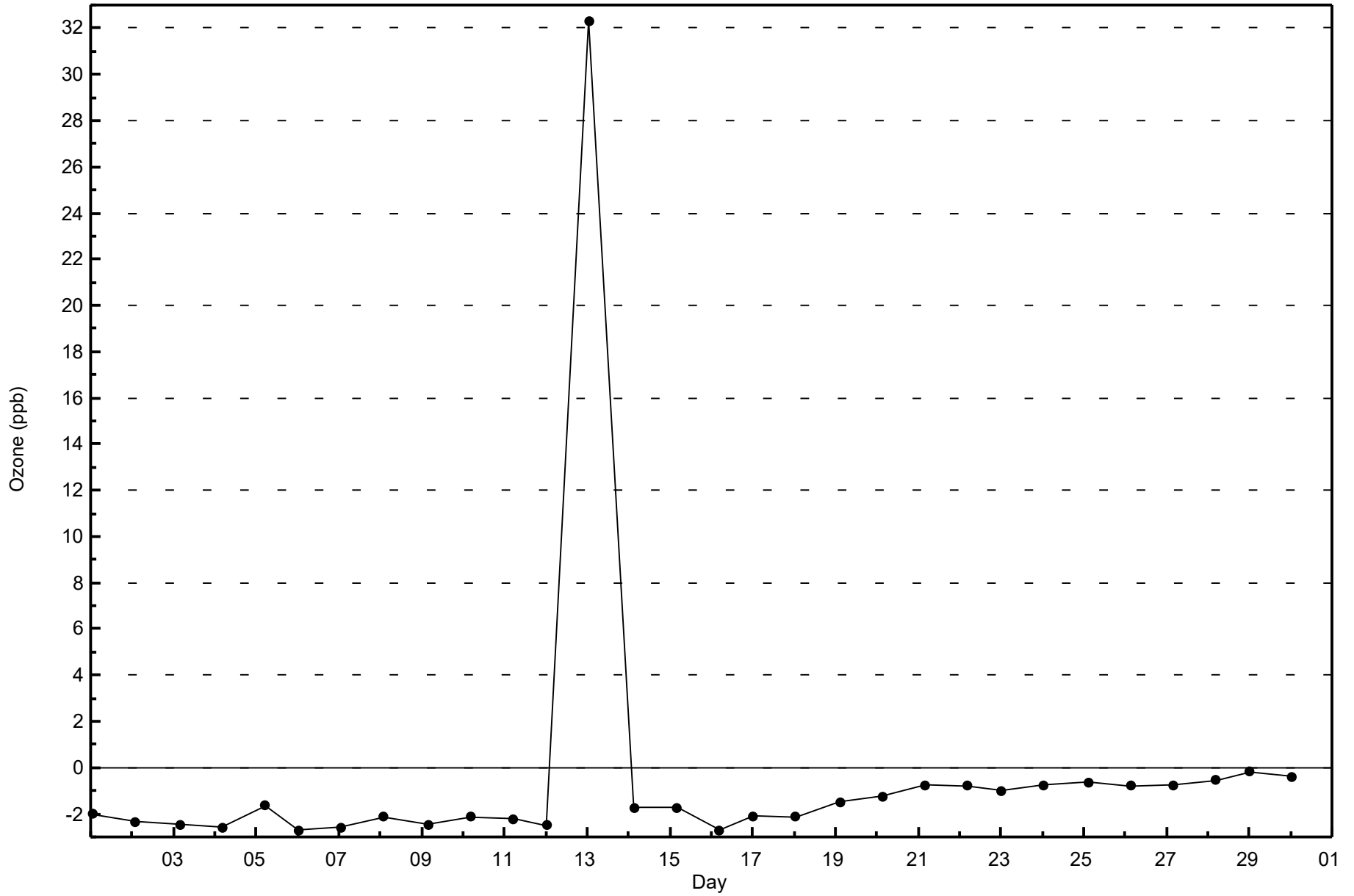
Total Number of Hours: 720

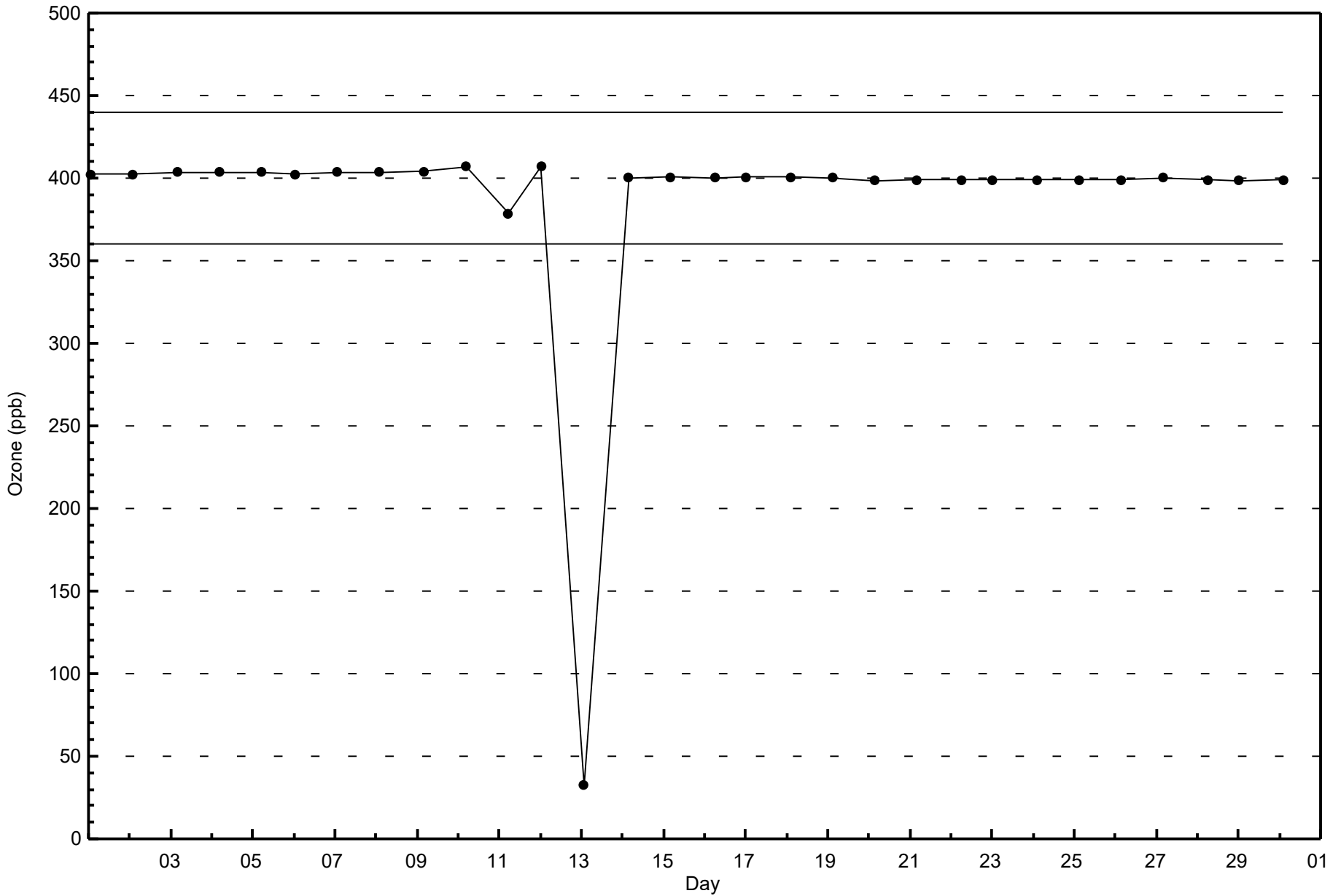


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Ozone (O<sub>3</sub>) - ppb  
Janvier

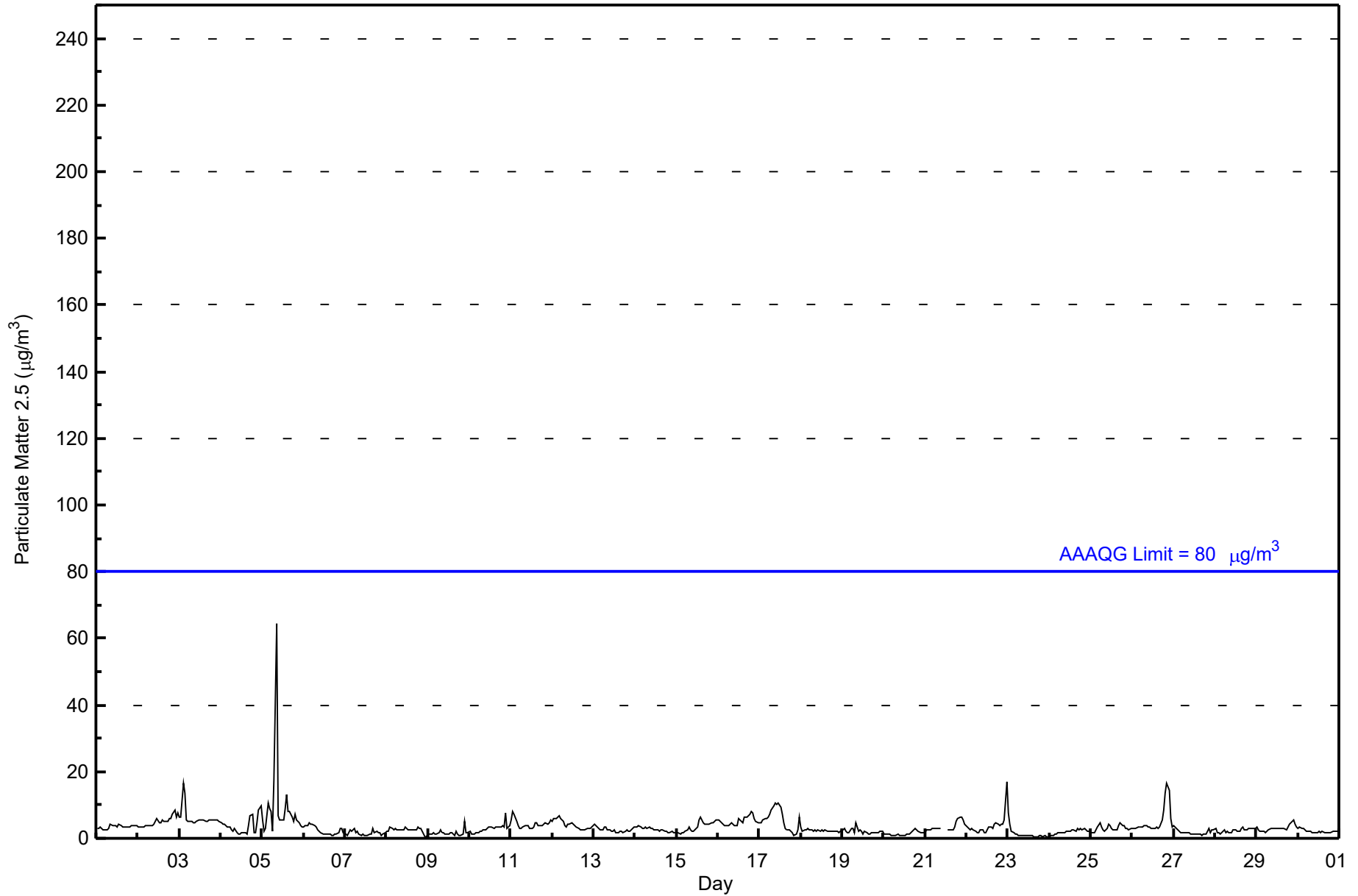








Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720																										
Maximum Value: 64.4 µg/m <sup>3</sup> on Nov 5 09:00		Maximum Daily Average: 9.1 µg/m <sup>3</sup> on Nov 5															Hours of Data:	717																														
Minimum Value: 0.4 µg/m <sup>3</sup> on Nov 23 23:00		Minimum Daily Average: 1.3 µg/m <sup>3</sup> on Nov 23															Hours of Missing Data:	3																														
Maximum Diurnal Average: 5.0 µg/m <sup>3</sup> at hour 9		Minimum Diurnal Average: 2.8 µg/m <sup>3</sup> at hour 7															Hours of Calibration:	3																														
Monthly Average: 3.33 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 0.6 P <sub>10</sub> = 1.2 Q <sub>1</sub> = 1.9 Median = 2.8 Q <sub>3</sub> = 3.9 P <sub>90</sub> = 5.5 P <sub>99</sub> = 13.3															Percent Operational Time:	100.0																														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	2.9	3.1	3.3	2.9	2.6	2.4	2.5	3.0	4.2	3.7	3.7	3.6	3.5	4.1	3.7	3.6	3.5	3.4	3.4	3.6	3.7	3.6	3.7	3.8	3.4	4.2																						
2-Nov	3.5	3.4	3.6	3.5	3.8	3.7	4.0	3.9	3.7	4.1	5.0	5.7	4.8	4.5	5.4	5.1	5.0	5.2	5.8	6.1	7.1	8.6	6.2	7.6	5.0	8.6																						
3-Nov	6.2	6.2	16.4	13.4	5.4	5.2	5.0	5.2	4.7	4.7	5.0	5.3	5.5	5.4	5.4	5.2	4.9	5.3	5.4	5.5	5.6	5.5	5.5	5.3	6.1	16.4																						
4-Nov	4.8	4.3	4.0	3.8	3.5	3.5	2.4	1.9	2.9	1.8	1.3	1.2	1.8	1.7	1.6	1.4	3.8	6.7	7.3	1.8	1.7	4.7	8.6	9.7	3.6	9.7																						
5-Nov	5.4	2.1	3.0	10.5	8.9	8.2	2.2	17.5	64.4	6.8	5.7	5.4	5.7	8.8	13.0	8.2	7.9	6.2	5.2	7.1	5.5	4.5	3.7	3.3	9.1	64.4																						
6-Nov	3.2	3.7	3.9	4.5	4.1	4.1	4.0	3.5	2.6	2.1	1.7	1.3	1.4	1.3	1.3	1.1	0.8	0.8	1.2	1.4	1.5	3.2	3.1	1.9	2.4	4.5																						
7-Nov	1.4	1.0	1.5	2.6	2.3	2.9	1.5	2.1	1.4	1.0	1.1	0.9	0.8	0.8	1.2	1.3	2.8	1.9	2.1	1.7	1.8	0.9	1.2	1.6	1.6	2.9																						
8-Nov	2.1	1.9	3.2	2.9	2.7	3.0	2.5	2.6	2.6	2.5	2.5	3.2	2.6	2.7	2.7	2.7	2.5	2.5	3.2	3.1	2.9	1.4	0.5	0.6	2.5	3.2																						
9-Nov	1.4	1.5	1.2	1.7	1.1	1.3	1.7	2.4	1.8	1.8	1.1	1.1	1.4	1.9	1.8	1.0	2.2	1.2	0.8	0.9	1.4	5.1	1.5	1.5	1.6	5.1																						
10-Nov	2.3	1.5	1.1	1.3	1.5	1.8	2.0	2.3	2.6	2.7	3.0	3.3	3.3	3.2	3.0	3.4	3.2	3.4	3.2	3.6	3.3	7.7	3.1	3.7	2.9	7.7																						
11-Nov	5.6	8.0	7.1	5.1	3.7	3.0	3.0	3.6	3.6	3.8	3.8	3.0	2.9	3.4	4.5	4.5	3.9	3.9	4.0	4.3	4.5	4.1	4.8	5.4	4.3	8.0																						
12-Nov	4.9	5.8	5.8	6.5	6.7	6.1	5.2	3.6	3.5	4.2	4.2	4.6	4.4	3.8	3.4	2.9	2.6	2.5	2.4	2.6	3.1	2.9	3.0	3.3	4.1	6.7																						
13-Nov	4.1	3.8	3.5	3.2	2.6	2.5	3.3	3.5	2.7	2.7	2.2	2.2	2.4	1.8	1.8	2.0	2.0	1.9	2.2	2.3	2.3	2.1	2.7	3.2	2.6	4.1																						
14-Nov	3.5	3.5	3.6	3.2	3.1	3.0	3.3	3.2	3.3	3.0	2.8	2.6	2.5	2.5	2.2	2.4	2.4	2.2	2.1	1.8	1.7	2.2	1.9	1.8	2.6	3.6																						
15-Nov	1.7	1.9	1.4	1.6	1.9	2.3	2.7	3.2	2.5	2.1	2.0	2.8	3.6	5.5	6.2	4.8	4.2	4.3	4.2	4.3	4.7	4.7	5.1	5.4	3.5	6.2																						
16-Nov	5.6	5.2	4.6	4.2	3.9	3.8	3.9	4.2	4.5	3.9	3.8	3.8	5.8	5.5	4.8	6.2	6.3	6.3	7.4	8.0	7.6	6.0	5.2	4.8	5.2	8.0																						
17-Nov	4.5	4.5	5.3	5.9	6.0	6.5	7.3	8.4	9.8	10.5	10.2	10.6	9.3	7.3	4.9	2.8	2.5	2.6	2.0	1.6	1.1	1.1	2.4	6.5	5.6	10.6																						
18-Nov	3.4	1.9	2.4	2.6	2.8	2.7	2.4	2.3	2.4	2.3	2.3	2.3	2.4	2.2	2.5	2.2	2.3	2.0	2.3	2.2	2.3	2.1	1.7	2.0	2.3	3.4																						
19-Nov	2.6	2.8	2.2	1.6	1.7	3.0	3.0	1.5	4.5	2.0	2.6	2.2	1.2	2.1	1.6	1.1	1.2	1.6	1.5	1.6	1.8	1.7	2.0	2.0	2.1	4.5																						
20-Nov	1.4	1.4	1.4	1.3	1.1	1.0	0.9	0.9	1.2	0.9	0.9	0.9	0.9	1.1	1.2	1.4	1.7	2.6	2.8	2.5	2.0	1.9	1.7	1.6	1.5	2.8																						
21-Nov	1.7	2.5	2.7	2.6	2.8	2.9	2.9	2.9	2.9	3.0	C	C	C	2.5	2.5	2.5	2.7	3.4	4.9	5.8	6.3	6.4	5.4	4.4	3.5	6.4																						
22-Nov	3.3	2.8	2.5	3.0	2.6	2.1	1.7	1.8	2.5	2.5	1.8	1.8	2.4	3.3	3.4	2.9	4.1	4.8	4.4	3.7	4.2	4.1	5.7	16.8	3.7	16.8																						
23-Nov	7.6	4.3	2.1	1.7	1.2	1.2	0.9	0.8	0.8	0.7	0.9	1.0	1.0	0.8	0.7	0.5	0.4	0.6	0.9	0.7	0.5	0.7	0.4	0.4	1.3	7.6																						
24-Nov	0.6	0.8	0.9	1.1	1.3	1.7	1.7	1.6	1.6	1.7	2.1	2.2	2.2	2.3	2.4	2.3	2.8	2.7	3.1	2.5	2.9	2.6	2.2	2.0	2.0	3.1																						
25-Nov	1.8	1.8	1.7	2.7	3.4	4.5	3.3	2.6	2.2	3.1	4.3	3.7	3.0	2.5	2.5	2.5	4.0	4.5	3.7	4.0	3.1	2.9	2.6	2.9	3.1	4.5																						
26-Nov	3.1	3.0	3.1	3.4	3.4	3.6	3.6	3.7	3.7	3.3	3.3	3.1	2.9	3.1	3.2	2.9	3.5	5.4	8.5	13.5	16.5	14.2	5.9	3.5	5.1	16.5																						
27-Nov	3.7	3.4	2.7	2.2	1.8	1.7	1.8	1.7	1.7	1.6	1.3	1.2	1.2	1.1	1.1	1.2	1.0	1.4	1.2	1.1	3.0	1.8	2.4	2.6	1.8	3.7																						
28-Nov	2.8	1.5	1.5	1.4	1.8	2.7	1.7	2.0	1.7	1.7	2.3	2.4	2.4	2.0	2.2	2.9	3.6	2.7	2.5	2.9	3.1	2.9	2.8	2.8	2.4	3.6																						
29-Nov	3.4	2.5	2.2	2.1	2.0	1.8	1.9	2.6	3.0	3.1	3.0	3.0	2.9	3.0	3.1	2.8	2.8	2.7	3.6	4.0	4.8	5.4	4.4	3.4	3.1	5.4																						
30-Nov	3.1	3.3	2.9	3.1	2.4	2.2	1.9	2.0	1.8	1.9	1.9	1.9	1.9	1.8	1.9	1.7	1.8	1.7	1.8	1.8	2.0	2.0	2.1	2.1	2.1	3.3																						
																								3.4	3.1	3.4	3.5	3.1	3.1	2.8	3.3	5.0	3.0	3.0	3.0	3.0	3.1	3.2	2.8	3.1	3.2	3.4	3.5	3.7	3.9	3.4	3.9	Diurnal Average
																								7.6	8.0	16.4	13.4	8.9	8.2	7.3	17.5	64.4	10.5	10.2	10.6	9.3	8.8	13.0	8.2	7.9	6.7	8.5	13.5	16.5	14.2	8.6	16.8	Diurnal Maximum
C - Calibration																																																
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m <sup>3</sup> 24-hr 29 µg/m <sup>3</sup>																																																







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Janvier - November 2024**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	644	89.82	89.82
6 - 15	68	9.48	99.30
16 - 25	4	0.56	99.86
26 - 80	1	0.14	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>**  
**Janvier - November 2024**

Concentration Ranges (µg/m <sup>3</sup> )	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	75	118	43	9	2	8	17	18	36	79	88	32	35	36	28	14	638
6 - 15	1	5	4	1	0	0	1	1	15	13	12	0	2	6	3	4	68
16 - 25	0	1	0	0	1	0	0	0	0	0	1	0	0	0	1	0	4
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	76	124	47	10	3	8	18	19	51	92	101	32	37	42	33	18	711

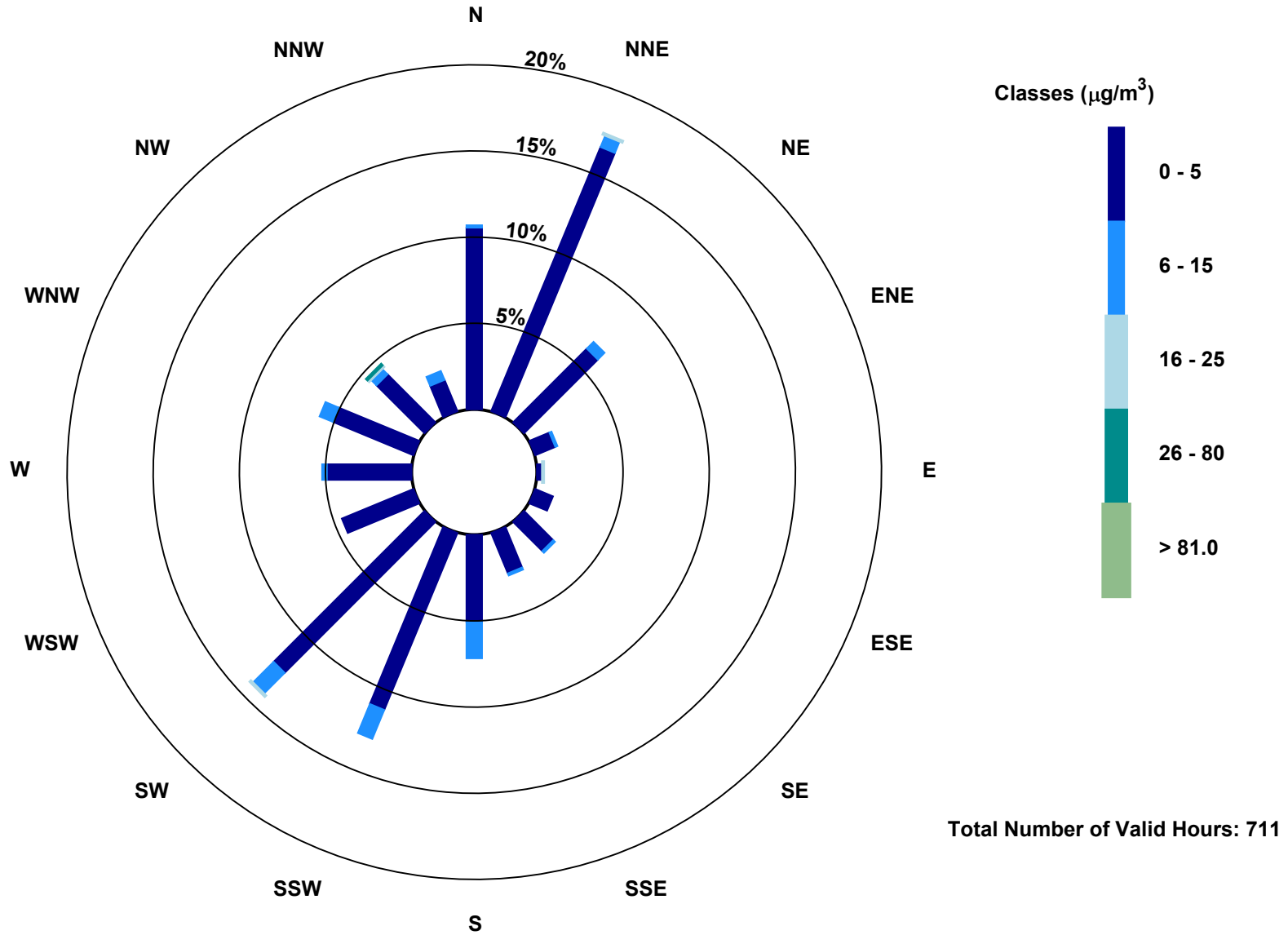
Total Number of Valid Hours: 711

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Janvier



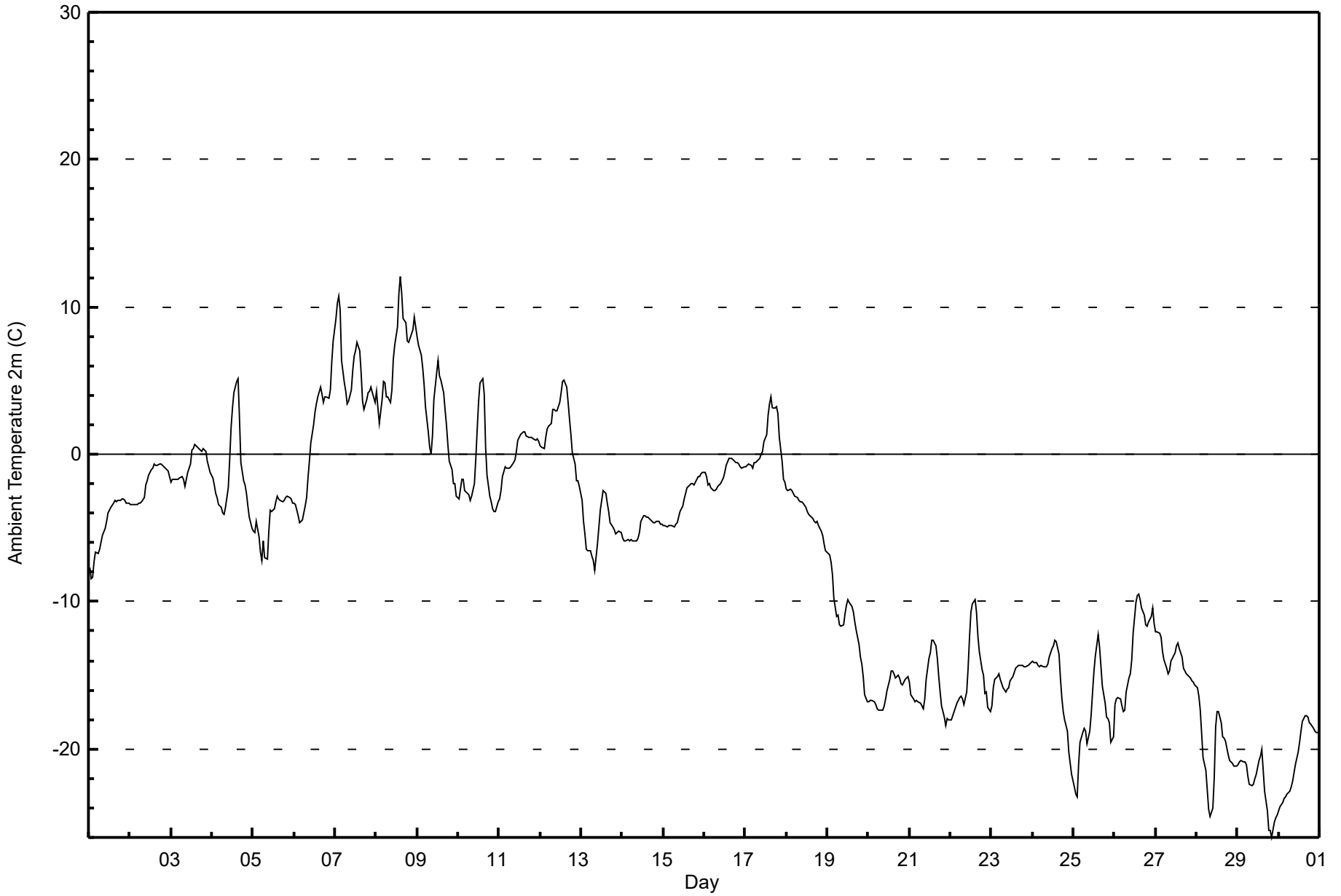


Maximum Value: 12.1 C on Nov 8 15:00      Maximum Daily Average: 6.8 C on Nov 8																				Hours in Service: 720 Hours of Data: 720																												
Minimum Value: -26.0 C on Nov 29 21:00      Minimum Daily Average: -22.5 C on Nov 29 Maximum Diurnal Average: -4.6 C at hour 15      Minimum Diurnal Average: -8.5 C at hour 8 Monthly Average: -7.03 C      Percentiles: P <sub>1</sub> = -24.2 P <sub>10</sub> = -18.7 Q <sub>1</sub> = -15.0 Median = -4.6 Q <sub>3</sub> = -0.8 P <sub>90</sub> = 3.6 P <sub>99</sub> = 9.2																				Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-7.7	-8.5	-8.4	-7.3	-6.7	-6.7	-6.4	-6.0	-5.5	-5.0	-4.6	-4.0	-3.8	-3.6	-3.4	-3.1	-3.2	-3.2	-3.1	-3.0	-3.1	-3.2	-3.3	-3.3	-4.8	-3.0																						
2-Nov	-3.4	-3.4	-3.4	-3.4	-3.4	-3.3	-3.3	-3.3	-3.0	-2.1	-1.8	-1.4	-1.1	-0.9	-0.7	-0.7	-0.8	-0.7	-0.7	-0.7	-0.8	-1.0	-1.2	-1.5	-1.9	-0.7																						
3-Nov	-1.9	-1.7	-1.7	-1.7	-1.7	-1.6	-1.5	-1.7	-2.2	-1.7	-1.3	-0.6	0.3	0.4	0.6	0.5	0.4	0.3	0.2	0.4	0.2	-0.5	-0.9	-1.3	-0.8	0.6																						
4-Nov	-1.6	-2.1	-2.6	-3.0	-3.4	-3.6	-4.0	-4.0	-3.6	-2.3	-0.4	1.8	3.1	4.2	4.9	5.1	2.5	-0.5	-1.8	-2.1	-2.7	-3.5	-4.3	-5.0	-1.2	5.1																						
5-Nov	-5.2	-5.3	-4.6	-5.6	-6.6	-7.2	-5.8	-7.0	-7.1	-5.2	-3.8	-3.9	-3.7	-3.2	-2.8	-3.0	-3.1	-3.2	-3.1	-2.9	-2.8	-3.0	-3.1	-3.4	-4.4	-2.8																						
6-Nov	-3.3	-3.5	-4.2	-4.6	-4.6	-4.5	-3.5	-2.9	-1.6	-0.5	0.7	2.0	2.8	3.4	3.9	4.6	4.1	3.5	3.9	3.9	3.8	4.4	6.2	7.7	0.9	7.7																						
7-Nov	9.3	10.3	10.8	9.8	6.4	4.8	4.3	3.5	3.6	4.4	5.7	6.6	7.0	7.6	7.1	5.5	3.6	3.0	3.7	4.2	4.3	4.6	4.2	3.6	5.7	10.8																						
8-Nov	4.2	3.2	2.1	3.8	5.0	4.9	3.9	3.9	3.6	4.3	6.4	7.4	8.7	10.9	12.1	10.9	9.2	8.9	7.7	7.6	7.9	8.5	9.3	8.6	6.8	12.1																						
9-Nov	8.0	7.4	6.7	5.9	4.7	3.2	1.6	0.4	0.0	1.2	3.7	5.5	6.4	5.3	5.1	4.2	3.0	2.0	0.7	-0.5	-1.0	-2.0	-2.0	-2.8	2.8	8.0																						
10-Nov	-3.1	-2.4	-1.7	-1.7	-2.5	-2.6	-2.7	-3.1	-2.8	-2.0	-0.3	1.7	3.6	4.8	5.1	4.1	0.5	-1.4	-2.8	-3.2	-3.7	-3.9	-3.9	-3.2	-1.1	5.1																						
11-Nov	-3.0	-2.4	-1.5	-0.9	-0.9	-0.9	-1.0	-0.8	-0.6	-0.3	0.2	1.0	1.4	1.5	1.6	1.5	1.3	1.1	1.1	1.1	1.0	1.0	1.0	0.9	0.1	1.6																						
12-Nov	0.6	0.5	0.4	1.1	1.7	1.9	2.1	3.0	3.0	2.9	2.9	3.6	4.1	4.9	5.1	4.5	3.5	2.4	1.3	0.1	-0.6	-1.8	-1.8	-2.2	1.8	5.1																						
13-Nov	-3.1	-4.5	-5.4	-6.4	-6.5	-6.6	-6.9	-7.3	-7.8	-6.0	-4.9	-3.8	-3.1	-2.5	-2.7	-3.3	-3.8	-4.6	-4.9	-5.1	-5.4	-5.3	-5.2	-5.3	-5.0	-2.5																						
14-Nov	-5.7	-5.8	-5.9	-5.7	-5.8	-5.8	-5.9	-5.9	-5.8	-5.7	-5.3	-4.6	-4.1	-4.1	-4.2	-4.3	-4.3	-4.5	-4.6	-4.6	-4.5	-4.6	-4.7	-4.8	-5.1	-4.1																						
15-Nov	-4.8	-4.9	-4.9	-4.9	-4.9	-4.8	-4.9	-4.8	-4.6	-4.3	-3.9	-3.5	-3.1	-2.6	-2.3	-2.1	-2.0	-2.0	-2.0	-1.9	-1.5	-1.5	-1.4	-1.3	-3.3	-1.3																						
16-Nov	-1.3	-1.5	-2.1	-2.0	-2.2	-2.5	-2.4	-2.4	-2.1	-2.0	-1.8	-1.6	-1.2	-0.8	-0.3	-0.2	-0.3	-0.4	-0.6	-0.6	-0.6	-0.9	-0.9	-0.9	-1.3	-0.2																						
17-Nov	-0.8	-0.7	-0.6	-0.8	-1.0	-0.6	-0.5	-0.5	-0.3	0.0	0.2	0.9	1.3	2.6	3.5	3.9	3.2	3.2	3.3	2.7	1.2	-0.5	-1.7	-1.8	0.7	3.9																						
18-Nov	-2.3	-2.5	-2.4	-2.5	-2.6	-2.9	-3.0	-3.1	-3.2	-3.2	-3.4	-3.6	-3.9	-4.1	-4.2	-4.3	-4.6	-4.6	-4.6	-4.9	-5.2	-5.5	-6.1	-6.6	-3.9	-2.3																						
19-Nov	-6.8	-6.8	-7.3	-8.2	-9.8	-11.0	-10.9	-11.6	-11.6	-11.5	-10.8	-10.2	-9.9	-10.1	-10.3	-10.7	-11.3	-11.9	-12.9	-13.7	-14.3	-15.1	-16.3	-16.8	-11.2	-6.8																						
20-Nov	-16.8	-16.7	-16.7	-16.8	-17.0	-17.2	-17.4	-17.3	-17.4	-17.1	-16.6	-16.0	-15.3	-14.7	-14.7	-14.9	-15.2	-15.0	-15.2	-15.5	-15.7	-15.3	-15.2	-15.1	-16.0	-14.7																						
21-Nov	-15.5	-16.3	-16.6	-16.8	-16.7	-16.8	-16.9	-17.1	-17.2	-16.6	-15.3	-13.9	-13.5	-12.6	-12.6	-13.0	-13.9	-15.1	-16.1	-17.1	-17.8	-18.4	-18.0	-18.1	-15.9	-12.6																						
22-Nov	-18.1	-17.8	-17.4	-17.2	-16.9	-16.5	-16.4	-16.6	-16.9	-16.1	-14.5	-12.4	-10.8	-10.2	-9.8	-10.7	-12.4	-13.4	-14.6	-15.0	-16.2	-16.1	-17.1	-17.5	-15.0	-9.8																						
23-Nov	-17.1	-15.8	-15.3	-15.1	-14.9	-15.3	-15.6	-15.9	-16.1	-16.0	-15.8	-15.3	-15.0	-14.8	-14.5	-14.4	-14.3	-14.3	-14.3	-14.4	-14.4	-14.3	-14.2	-14.1	-15.1	-14.1																						
24-Nov	-14.1	-14.1	-14.1	-14.3	-14.4	-14.4	-14.4	-14.4	-14.4	-14.2	-13.7	-13.2	-13.0	-12.6	-12.7	-13.5	-15.2	-16.5	-17.5	-18.0	-18.8	-20.2	-21.0	-21.8	-15.4	-12.6																						
25-Nov	-22.6	-23.1	-23.2	-21.1	-19.5	-18.8	-18.6	-18.8	-19.6	-18.8	-17.6	-16.1	-14.7	-13.7	-12.3	-13.1	-14.4	-15.7	-16.9	-17.8	-17.9	-18.2	-19.6	-19.2	-18.0	-12.3																						
26-Nov	-16.9	-16.6	-16.5	-16.6	-17.0	-17.4	-17.3	-16.2	-15.2	-14.9	-14.0	-12.2	-10.0	-9.6	-9.5	-9.8	-10.4	-10.9	-11.6	-11.6	-11.4	-11.0	-10.5	-11.5	-13.3	-9.5																						
27-Nov	-12.0	-12.1	-12.1	-12.4	-13.4	-14.0	-14.6	-14.9	-14.7	-14.0	-13.9	-13.4	-13.0	-12.8	-13.2	-13.8	-14.5	-14.7	-14.9	-15.0	-15.2	-15.3	-15.5	-15.7	-14.0	-12.0																						
28-Nov	-15.8	-16.5	-17.4	-19.0	-20.6	-21.4	-22.8	-24.1	-24.6	-24.0	-21.9	-18.5	-17.4	-17.5	-18.2	-19.2	-19.3	-19.4	-20.4	-20.7	-20.9	-21.0	-21.1	-21.2	-20.1	-15.8																						
29-Nov	-21.0	-20.8	-20.8	-20.9	-20.8	-21.1	-21.8	-22.4	-22.5	-22.4	-22.0	-21.7	-20.8	-20.5	-20.1	-21.4	-22.9	-24.2	-25.5	-25.5	-26.0	-24.9	-24.6	-24.5	-22.5	-20.1																						
30-Nov	-24.2	-23.9	-23.6	-23.4	-23.2	-23.1	-22.9	-22.5	-22.2	-21.7	-21.1	-20.3	-19.5	-18.7	-18.1	-17.8	-17.8	-17.8	-18.2	-18.3	-18.6	-18.7	-18.9	-18.9	-20.6	-17.8																						
																								-7.5	-7.6	-7.7	-7.7	-8.0	-8.2	-8.3	-8.5	-8.4	-7.8	-7.0	-6.0	-5.3	-4.8	-4.6	-5.0	-5.7	-6.3	-6.8	-7.1	-7.4	-7.6	-7.7	-7.9	Diurnal Average
																								9.3	10.3	10.8	9.8	6.4	4.9	4.3	3.9	3.6	4.4	6.4	7.4	8.7	10.9	12.1	10.9	9.2	8.9	7.7	7.6	7.9	8.5	9.3	8.6	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 2m (AT2) - C**  
**Janvier - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C**  
**Janvier - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	56	7.78	7.78
-20 - 0	517	71.81	79.58
0 - 10	142	19.72	99.31
10 - 20	5	0.69	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



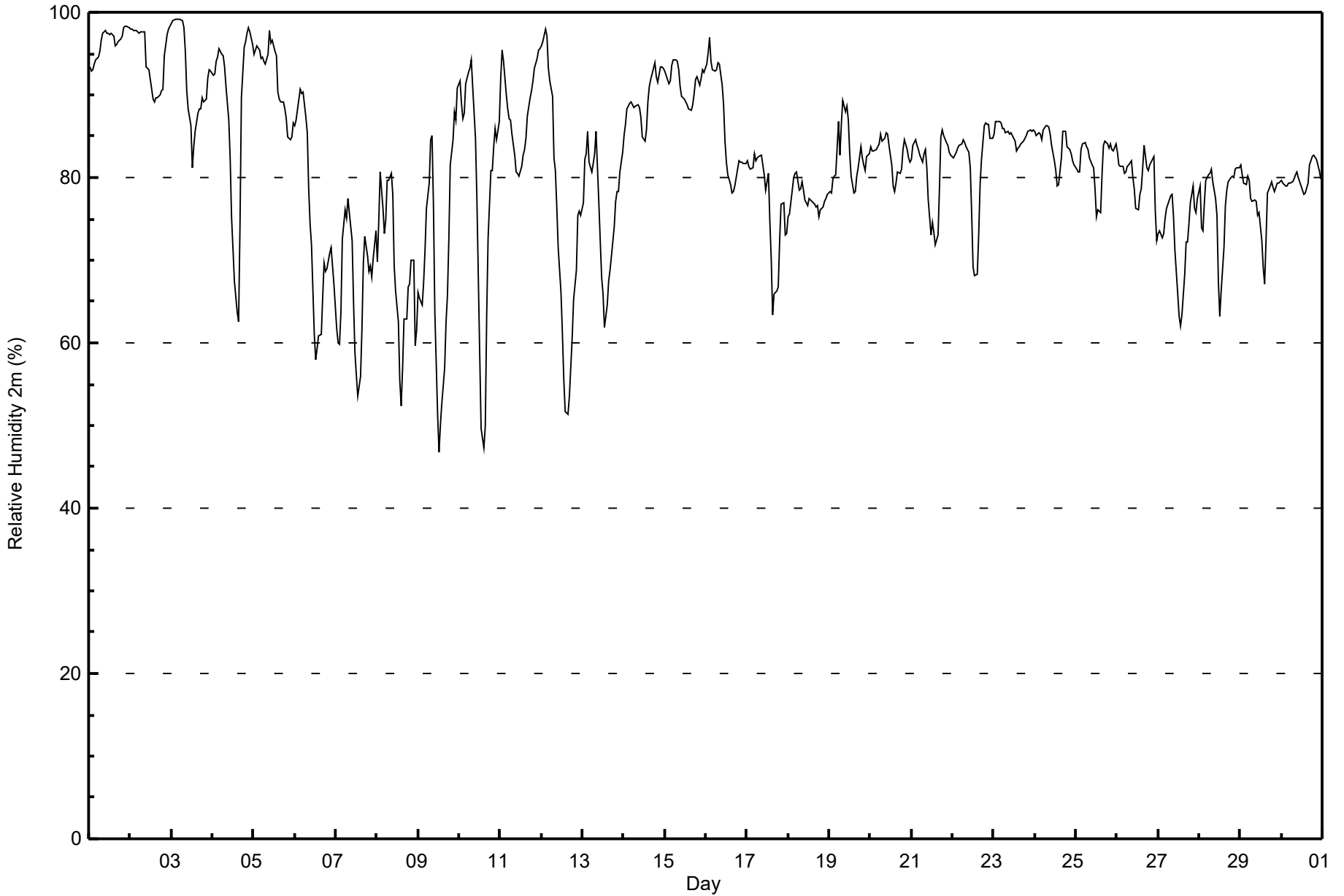
**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Relative Humidity 2m (RH2) - %**

**Janvier - November 2024**

<b>Maximum Value: 99.2 % on Nov 3 06:00</b> <b>Maximum Daily Average: 96.3 % on Nov 1</b>																						Hours in Service:	720																							
<b>Minimum Value: 46.8 % on Nov 9 13:00</b> <b>Minimum Daily Average: 67.0 % on Nov 7</b>																						Hours of Data:	720																							
<b>Maximum Diurnal Average: 86.0 % at hour 8</b> <b>Minimum Diurnal Average: 73.1 % at hour 15</b>																						Hours of Missing Data:	0																							
<b>Monthly Average: 81.60 %</b> <b>Percentiles: P<sub>1</sub> = 51.8 P<sub>10</sub> = 67.5 Q<sub>1</sub> = 77.0 Median = 82.2 Q<sub>3</sub> = 88.4 P<sub>90</sub> = 94.3 P<sub>99</sub> = 98.4</b>																						Hours of Calibration:	0																							
																						Percent Operational Time:	100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																						
1-Nov	93.4	92.8	93.1	93.8	94.3	94.6	95.2	96.5	97.5	97.9	97.4	97.5	97.2	97.4	97.1	96.0	96.0	96.4	96.8	97.1	98.1	98.3	98.3	98.2	96.3	98.3																				
2-Nov	98.0	97.9	97.8	97.9	97.7	97.5	97.7	97.7	97.7	93.4	93.3	93.0	90.6	89.5	89.2	89.7	89.7	90.0	90.5	90.7	94.8	97.2	98.0	98.4	94.5	98.4																				
3-Nov	98.7	99.1	99.1	99.1	99.2	99.2	99.0	98.2	95.2	90.5	88.4	86.3	81.2	83.8	85.6	87.7	88.3	88.3	89.6	89.2	89.5	92.0	93.1	92.8	92.2	99.2																				
4-Nov	92.4	92.5	94.0	94.5	95.5	94.9	94.7	93.5	91.0	87.0	82.2	75.1	71.4	67.5	63.7	62.6	74.2	89.7	95.8	96.4	97.4	98.2	97.7	96.1	87.4	98.2																				
5-Nov	95.0	95.4	95.9	95.4	94.5	94.6	94.1	93.7	95.0	97.8	96.3	96.7	95.2	94.7	90.4	89.5	89.1	89.2	88.3	87.0	85.0	84.6	84.9	86.5	92.0	97.8																				
6-Nov	86.2	86.9	89.6	90.7	90.2	90.3	87.3	85.4	78.7	74.4	71.9	61.0	57.9	59.3	60.8	61.0	65.6	69.7	68.6	69.0	70.9	71.5	69.4	67.1	74.3	90.7																				
7-Nov	61.6	60.0	59.8	63.7	72.5	76.0	75.2	77.4	75.8	72.4	64.9	58.8	56.1	53.5	55.9	61.7	69.6	73.0	70.5	68.6	69.4	68.0	70.1	73.5	67.0	77.4																				
8-Nov	69.9	74.7	80.7	76.4	73.2	75.0	79.7	79.7	80.6	77.9	69.3	66.3	62.5	55.4	52.4	56.9	62.9	62.8	66.7	67.0	70.0	69.9	59.6	61.6	68.8	80.7																				
9-Nov	66.1	65.4	64.7	67.3	71.2	76.3	79.4	84.6	85.0	76.8	63.7	51.2	46.8	50.1	52.7	57.0	62.6	65.8	72.5	81.6	84.5	88.0	86.9	90.8	70.5	90.8																				
10-Nov	91.7	88.9	87.2	87.8	91.4	92.7	93.3	94.3	91.0	84.8	77.4	68.2	58.8	49.7	47.3	50.0	63.4	72.6	80.8	80.8	83.8	86.0	84.5	86.7	78.9	94.3																				
11-Nov	92.1	95.5	94.1	90.0	88.4	87.2	87.0	85.3	82.6	80.6	80.6	80.2	81.3	82.7	83.4	84.7	87.5	89.7	90.5	91.8	93.2	94.3	95.4	95.5	88.1	95.5																				
12-Nov	95.9	96.5	98.0	97.1	93.2	91.7	89.8	82.4	80.8	76.5	71.6	66.2	61.3	55.6	51.6	51.3	53.6	57.0	60.6	65.2	68.8	75.5	76.0	75.5	74.6	98.0																				
13-Nov	77.0	82.1	82.9	85.5	81.9	80.7	81.7	82.9	85.6	77.0	72.4	67.9	66.0	61.9	64.6	67.4	68.9	70.5	74.1	77.2	78.4	78.4	80.7	83.1	76.2	85.6																				
14-Nov	85.1	86.5	88.2	89.1	89.1	88.8	88.5	88.7	88.9	88.4	87.3	85.0	84.4	85.8	89.1	91.1	91.9	93.2	93.8	92.2	91.6	93.5	93.3	93.2	89.4	93.8																				
15-Nov	92.9	92.4	91.4	91.7	93.6	94.2	94.0	93.1	91.0	89.8	89.5	89.2	88.9	88.9	88.3	88.2	88.8	90.1	91.9	92.2	91.2	92.1	93.1	92.8	91.4	94.2																				
16-Nov	93.7	95.1	96.9	94.0	93.0	92.9	93.0	94.0	93.7	91.3	88.7	84.4	81.9	80.4	79.1	78.2	78.4	79.0	81.1	82.0	81.9	81.8	81.8	81.8	86.6	96.9																				
17-Nov	82.0	81.4	81.0	81.3	82.8	82.0	82.4	82.6	82.7	81.5	80.3	78.5	80.4	74.7	70.1	63.4	65.9	66.3	66.7	72.4	76.7	77.0	73.1	73.2	76.6	82.8																				
18-Nov	75.3	75.7	78.5	80.1	80.6	80.7	78.5	78.6	79.4	78.5	77.3	76.7	77.4	77.3	77.1	76.8	76.5	76.6	75.3	76.0	76.5	77.1	77.5	78.0	77.6	80.7																				
19-Nov	78.3	78.1	79.9	80.2	80.3	86.8	82.7	86.5	89.3	88.0	88.6	87.0	82.9	80.2	78.2	78.3	80.1	81.2	83.7	82.3	81.5	80.9	82.6	82.9	82.5	89.3																				
20-Nov	83.7	83.3	83.2	83.4	83.8	84.0	85.2	84.5	84.7	85.4	85.3	84.0	81.5	79.0	78.3	79.4	80.8	80.6	81.0	83.4	84.5	83.4	82.4	81.8	82.8	85.4																				
21-Nov	82.2	83.9	84.6	83.9	83.3	82.7	81.9	82.9	83.4	81.2	77.3	73.1	74.5	73.3	71.9	73.1	78.7	84.8	85.8	85.2	84.3	83.9	83.0	82.6	80.9	85.8																				
22-Nov	82.4	82.8	83.0	83.6	84.0	84.1	84.5	84.2	83.7	83.0	81.2	75.6	69.2	68.1	68.3	73.0	79.2	82.2	86.2	86.6	86.5	86.5	84.8	84.8	81.1	86.6																				
23-Nov	85.3	86.7	86.7	86.7	86.5	85.9	85.9	85.4	85.6	85.3	85.4	85.1	84.4	83.2	83.6	83.8	84.0	84.4	84.8	85.0	85.7	85.7	85.6	85.7	85.3	86.7																				
24-Nov	85.5	85.1	85.4	85.2	84.6	85.8	86.3	86.2	86.1	85.3	83.9	82.0	80.9	79.0	79.1	82.4	85.7	85.7	85.6	83.8	83.4	82.9	82.0	81.6	83.9	86.3																				
25-Nov	81.0	80.6	80.6	83.4	84.0	84.2	83.7	83.5	82.4	81.5	81.2	78.6	75.3	76.2	75.8	80.4	83.9	84.4	84.1	83.5	84.1	83.4	83.3	84.1	81.8	84.4																				
26-Nov	83.0	81.6	81.3	81.3	80.5	80.7	81.3	81.6	82.0	80.0	78.7	76.3	76.0	78.0	78.7	81.2	83.9	81.1	80.8	81.6	81.9	82.5	75.9	72.3	80.1	83.9																				
27-Nov	73.3	73.6	72.7	73.2	75.0	76.2	77.3	77.7	78.0	75.2	71.1	65.9	63.3	62.1	63.4	68.3	72.1	72.2	74.4	77.0	79.0	76.4	75.8	77.4	72.9	79.0																				
28-Nov	79.0	73.8	73.6	77.0	79.7	80.3	80.6	81.0	79.4	77.4	75.4	67.5	63.2	66.3	71.5	76.7	78.5	79.5	80.1	80.2	80.1	81.1	81.3	81.1	76.8	81.3																				
29-Nov	81.5	80.4	79.4	79.2	80.1	79.7	77.5	77.2	77.3	77.1	75.5	75.8	72.3	69.2	67.1	72.4	78.2	78.9	79.6	78.7	78.4	79.4	79.2	79.6	77.2	81.5																				
30-Nov	79.7	79.3	79.0	79.0	79.3	79.4	79.5	79.9	80.3	80.7	79.9	79.0	78.4	77.9	78.2	79.3	81.5	82.1	82.5	82.7	82.3	81.5	80.9	79.9	80.1	82.7																				
																						84.1	84.3	84.7	85.0	85.4	86.0	85.9	86.0	85.6	83.2	80.5	77.1	74.7	73.3	73.1	74.7	78.0	79.9	81.4	82.2	83.1	83.7	83.0	83.3	Diurnal Average
																						98.7	99.1	99.1	99.1	99.2	99.2	99.0	98.2	97.7	97.9	97.4	97.5	97.2	97.4	97.1	96.0	96.0	96.4	96.8	97.1	98.1	98.3	98.3	98.4	Diurnal Maximum





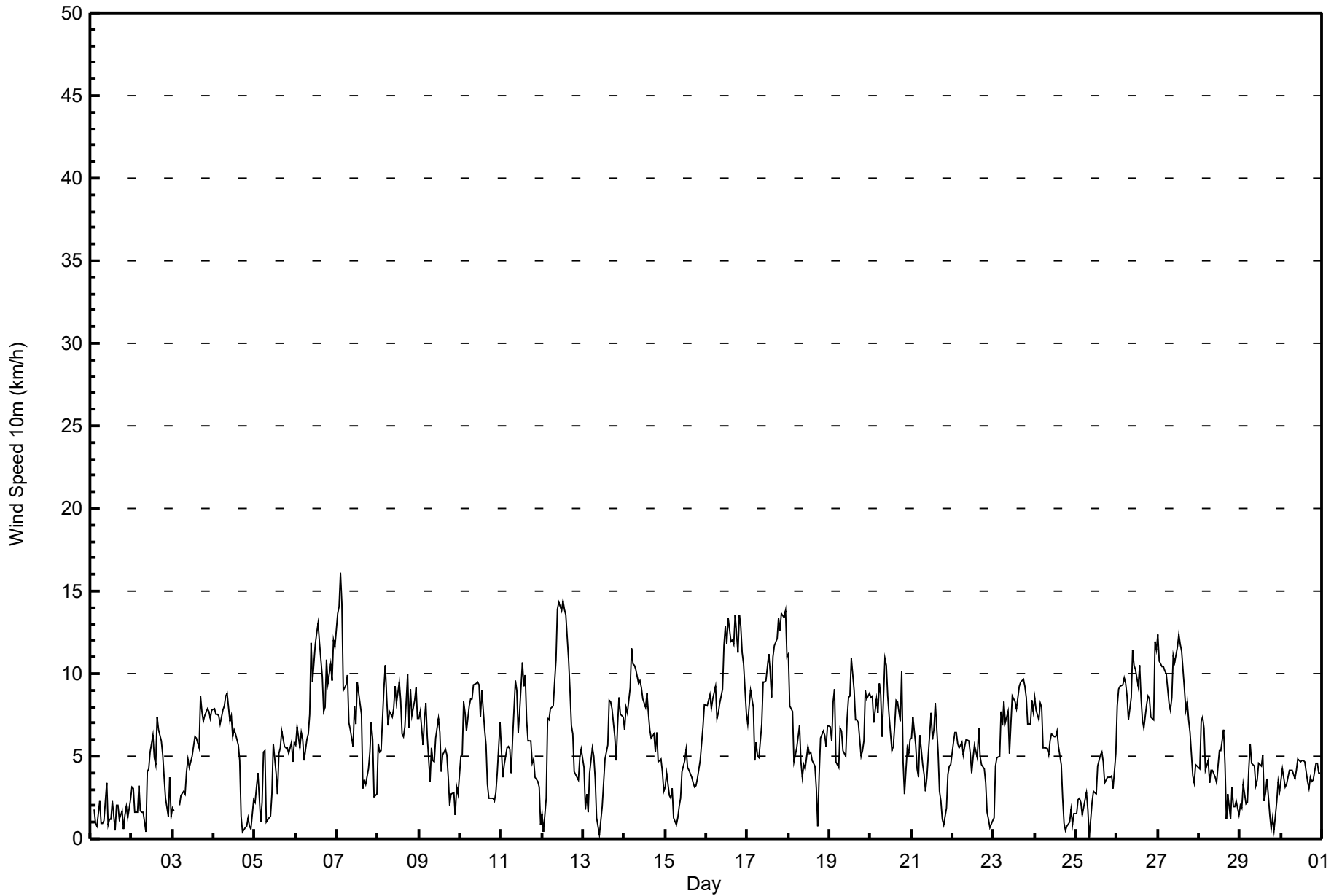


Maximum Speed: 16 km/h on Nov 7 03:00	Maximum Daily Speed Average: 10.2 km/h on Nov 16	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 25 09:00	Minimum Daily Speed Average: 0.4 km/h on Nov 1	Hours of Data: 717
Maximum Diurnal Speed Average: 2.1 km/h at hour 10	Minimum Diurnal Speed Average: 0.6 km/h at hour 17	Hours of Missing Data: 3
Monthly Average Velocity: 1.4 km/h 248.9 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 2 Q <sub>1</sub> = 4 Median = 6 Q <sub>3</sub> = 8 P <sub>90</sub> = 10 P <sub>99</sub> = 14	Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	SW0	UO	NE2	ENE1	NNW1	WSW2	W1	NW1	WNW1	NNE3	NNW1	WNW1	SSE1	WSW2	W1	ESE2	SSE2	SE1	E2	ENE1	N1	N2	NNW1	N2	N0.4	NNE3
2-Nov	N3	N3	NNW2	NNW2	NNE3	NNW2	N2	NNE2	ENE0	ESE4	ESE4	ESE5	ESE6	ESE5	E5	NE7	ENE7	ENE6	NE5	NNE4	N2	NNW1	NNE4	N1	ENE2.5	NE7
3-Nov	N2	N2	UO	UO	WSW2	SSW3	SW3	SW3	WSW4	W5	SW4	SW5	SW6	SSW6	S6	S5	SSW9	SSW8	SSW7	SSW7	SSW8	SSW8	SSW7	SSW8	SSW4.8	SSW9
4-Nov	SSW8	SSW8	SSW8	SSW7	SSW7	SW8	SW8	SW9	SW9	SW7	SW7	SW6	SSW7	SSW6	SW6	SSW5	NW1	S0	E1	ENE1	S1	W1	SW1	SSW2	SSW4.9	SW9
5-Nov	SSW2	SSW3	SSW4	N1	S2	SSW5	S5	NNW1	WNW1	SSW1	NE3	NNE6	NNE4	W3	NW5	WNW6	W7	W6	WSW6	W6	W5	W6	SW5	SSW6	WSW2.3	W7
6-Nov	SSW6	SSW7	S6	S6	SSW6	SSW5	S6	SSW6	S8	SSW12	SSW9	SW12	SW12	SW13	SW12	SSW10	S8	S8	SSW11	SSW9	SSW11	SSW10	SW12	SW12	SSW8.7	SW13
7-Nov	WSW14	W14	W16	WNW14	WNW9	WNW9	WNW10	WNW7	W7	WSW6	WNW8	WNW7	W10	W9	W8	SW3	SE4	SSE3	SSE4	SE5	SE7	SSE6	SSE3	S3	W5.2	W16
8-Nov	S6	SSW5	SSW5	SSW9	SSW11	SSW9	SSW7	SSW8	SSW7	SSW8	SSW9	SSW8	SSW9	SW8	SW6	SSW6	SSW7	SSW10	SSW7	SSW9	SW7	SW8	WSW9	W7	SSW7.5	SSW11
9-Nov	W7	W8	W6	W7	W8	W6	WSW4	SW5	SW5	SW5	SW6	W7	W6	WSW4	SSW5	SSW5	SSW5	S4	S2	S3	S3	SSE1	SSE3	SSW3	WSW3.9	WNW8
10-Nov	SSW5	SSW5	SSW8	SSW8	SSW7	SSW8	SSW8	SSW8	SSW9	SW9	SW10	SW9	WSW7	W9	WSW7	SW6	S3	SSE2	S2	S2	S2	SSW3	SSE4	S7	SSW5.7	SW10
11-Nov	S5	S4	SSE4	SSE5	SSE6	SE5	SE4	SE6	SE10	SE9	SE6	SSE8	SSE11	SSE9	S10	S7	SSE6	SSE6	SE5	SE5	ESE4	E3	E3	ENE1	SSE5.4	SSE11
12-Nov	SE1	N0	S2	SW7	SW7	SW8	SW8	WSW10	WSW11	WSW14	WSW14	W14	W14	W14	W14	W11	WSW9	WSW7	W6	WSW4	WSW4	SW4	WSW5	WSW5	WSW7.5	W14
13-Nov	W4	WNW2	W3	WSW2	SW4	SW6	SSW5	SW4	NW1	N0	N1	NE2	NE3	NE5	NNE6	NNE8	NNE8	NNE8	NNE6	N5	NNE7	NNE9	NNE8	NNE7	NNE2.6	NNE9
14-Nov	NNE7	NNE8	NNE8	NNE9	NNE12	NNE11	NNE11	NNE10	NNE9	NNE10	NNE9	NNE8	NNE9	NNE8	NNE7	NNE6	NNE6	NNE5	NNE6	NNE5	NNE5	NNE4	NNE3	NNE7	NNE7.6	NNE12
15-Nov	N3	NNE4	NNE3	N2	NNE3	NNE1	NW1	WSW1	SSW2	SSW2	SSW4	SW5	SSW5	SSW4	SSW4	SSW4	SSE3	SSE3	S3	S4	SSW5	SSW6	SSW7	SSW8	SSW2.2	SSW8
16-Nov	SSW8	SW8	SW9	SSW8	SSW8	SSW9	SSW7	SSW8	S8	S9	S12	S13	S12	S13	S12	S12	S12	S14	S11	S14	S13	S11	S11	S8	SSW10.2	S14
17-Nov	S7	S8	S9	S8	S5	S6	S5	SSE5	S7	SSW9	SSW10	SSW10	SSW11	SSW10	SSW9	SW11	SSW12	SW12	SW13	WSW13	W14	W13	W14	W11	SW8.0	W14
18-Nov	WNW11	WNW8	WNW8	WNW5	NW5	WNW5	WNW7	WNW5	WNW4	NW4	N4	N6	NNW5	N5	N5	NNW4	N3	NNW1	NE4	NE6	NE7	NE6	N6	NE7	NNW3.9	WNW11
19-Nov	NNE7	NNE6	NE8	NE9	NNE5	NNE4	NE7	NE6	N5	NNE5	NNE7	NNE9	NNE9	NNE11	NNE9	N7	N7	N7	N5	N5	N6	N9	N8	NNE9	NNE6.9	NNE11
20-Nov	N9	N9	N7	N8	N8	N9	N9	N6	NNE11	NNE10	NNE9	N7	NNW5	N6	NNE7	N8	N8	N7	NNE10	N5	NW3	N6	N5	N6	N7.3	NNE11
21-Nov	N6	NNE7	N6	N4	N4	N6	N5	N4	NNW3	WNW4	N5	NNE8	NNE6	NNE7	NNE8	NNE5	NNE3	N2	NE1	SSE1	SSE2	SSW4	SW4	SW4	N3.1	NNE8
22-Nov	SW6	SW6	SW6	SSW6	SSW6	SSW6	SSW5	SSW6	SSW6	SW6	SW5	WSW4	N5	N6	NNE5	NNE7	NNE5	NNE5	NNE4	N3	NE2	S1	SSW1	ENE1	WSW1.4	NNE7
23-Nov	WNW1	NNE4	NE5	NE5	NNE8	NNE7	NNE8	NNE7	NNE8	NNE5	NNE7	NNE9	NNE8	NNE8	NNE9	NNE9	NNE10	NNE10	NNE9	NNE9	NNE7	NNE7	NNE8	NNE8	NNE7.2	NNE10
24-Nov	NNE9	NNE8	NNE7	NNE8	NNE8	NNE6	N6	N5	N5	NNE6	NNE6	NNE6	N6	NNE7	NNE6	N5	NNE2	NNE1	NE1	ENE1	ESE1	S2	S1	S2	NNE4.3	NNE9
25-Nov	SSW2	SSE2	S2	S2	SE1	SSE2	SSE3	SSE2	E0	SSE2	S3	SE3	SE3	SE4	SSE5	SSE5	SE5	SE3	SE4	SE4	SE4	SSE4	SSE3	SSW5	SSE2.9	SSE5
26-Nov	SSW8	S9	S9	S9	S10	S9	S9	S7	S9	S11	SSW10	SSW10	SSW9	SSW11	SSW9	SSW7	SW7	SW8	SW9	SW8	SW7	WSW7	WNW12	WNW11	SSW7.8	WNW12
27-Nov	W12	W11	W10	WNW10	WNW10	WNW10	WNW8	W8	W9	W11	WNW11	WNW12	WNW12	WNW12	WNW11	WNW9	WNW8	WNW8	WNW7	WNW6	WNW4	NW3	N4	N4	WNW8.5	W12
28-Nov	NW4	WNW7	WNW7	W7	WSW4	WSW5	SW3	SW4	SSW4	SSW4	SW3	NW4	NW5	N5	NNE7	N5	WNW1	NNW3	NW1	NNW3	NNW2	WSW2	WSW2	W1	WNW2.4	WNW7
29-Nov	W2	NNW2	NNE3	N2	N2	N4	N6	N5	N4	NNW3	NNE4	NNE5	NE4	NNE5	NE2	ENE3	ENE4	NE1	SSE1	ENE1	WSW1	NE2	N3	N3	NNE2.6	N6
30-Nov	N4	NNE4	N3	N3	N4	N4	N4	N4	N4	N4	N4	N5	NNE5	NNE5	N5	N5	N3	N3	N4	N4	N4	N5	N4	N4	N4.0	N5

W2.1	W1.8	WSW1.8	WSW1.8	WSW1.3	WSW1.7	WSW1.3	WSW1.4	SW1.6	SW2.1	WSW1.8	W1.8	WSW1.8	WSW1.7	W1.4	W0.8	SSW0.6	SSW0.8	SW0.8	SW0.9	SW1.1	WSW1.1	W1.4	W1.5	Diurnal Average
WSW14	WSW14	W16	WNW14	NNE12	NNE11	NNE11	NNE10	NNE11	WSW14	WSW14	W14	W14	W14	W14	S12	S12	S14	SW13	S14	W14	W13	W14	SW12	Diurnal Maximum

UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Janvier - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	340	47.42	47.42
6 - 11	337	47.00	94.42
12 - 19	40	5.58	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Janvier - November 2024**

<b>Wind Speed</b> <b>Ranges (km/h)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	67	36	16	10	6	7	17	27	27	34	21	19	9	12	13	19	340
6 - 11	30	78	9	2	0	1	5	7	32	76	34	13	24	26	0	0	337
12 - 19	0	1	0	0	0	0	0	0	10	2	8	5	9	5	0	0	40
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	97	115	25	12	6	8	22	34	69	112	63	37	42	43	13	19	717

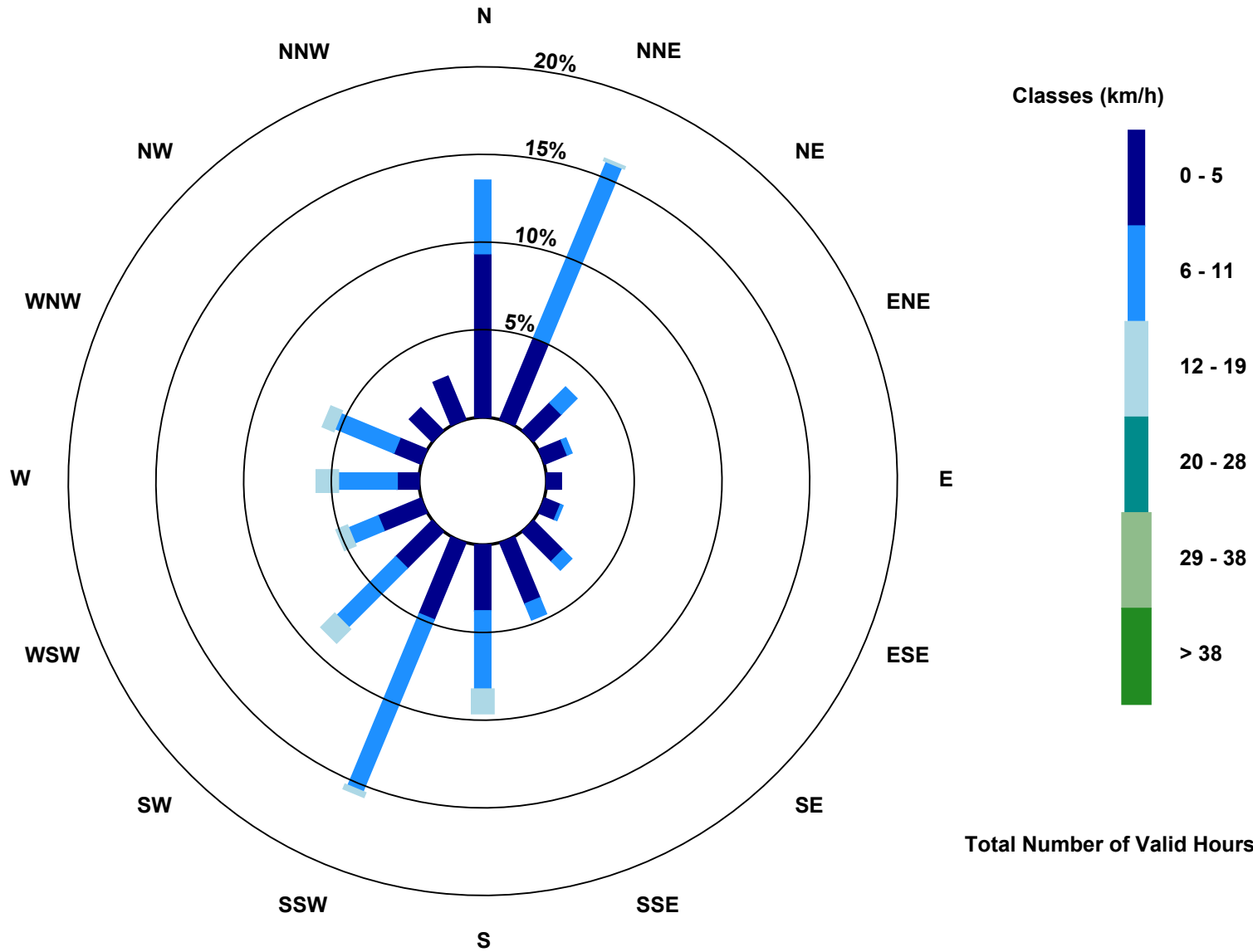
Total Number of Valid Hours: 717

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Janvier





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Janvier - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 6 km/h on Nov 7 04:00	Hours of Data: 717
Minimum Value: 0 km/h on Nov 21 21:00	Hours of Missing Data: 3
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 3 P <sub>99</sub> = 5	Hours of Calibration: 0
	Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	1	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2-Nov	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	2	1	1	1	1	1	1	3
3-Nov	1	1	UO	UO	1	1	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2
4-Nov	2	2	1	1	2	2	2	2	3	3	2	2	2	2	2	2	1	1	1	1	1	1	1	1	3	
5-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	1	2	
6-Nov	2	2	2	2	2	1	2	3	2	3	3	4	4	4	4	3	2	3	3	3	2	2	4	4	4	
7-Nov	5	5	6	6	5	5	4	3	3	2	3	3	3	3	2	1	1	1	1	2	2	2	1	1	6	
8-Nov	2	2	2	2	3	2	2	2	2	2	3	3	3	3	2	2	2	2	2	2	2	4	4	3	4	
9-Nov	2	3	2	2	3	2	1	1	1	1	2	3	3	1	2	1	1	1	1	1	1	1	1	1	3	
10-Nov	1	1	2	2	2	2	2	2	3	3	3	3	2	3	2	2	1	0	1	1	1	1	1	3	3	
11-Nov	2	1	2	3	2	2	2	3	4	3	3	3	4	3	3	3	2	2	1	2	1	1	1	1	4	
12-Nov	1	1	2	2	2	3	3	4	4	6	5	5	5	5	6	4	3	3	2	1	1	1	1	1	6	
13-Nov	2	1	1	1	1	2	1	1	1	1	1	1	1	2	2	2	2	2	2	1	2	2	2	2	2	
14-Nov	2	2	2	2	4	3	3	3	3	2	3	2	2	3	2	2	2	2	1	1	1	2	1	1	4	
15-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	
16-Nov	2	3	3	3	3	3	2	2	3	3	4	4	3	4	4	4	4	4	4	4	4	4	4	3	4	
17-Nov	2	2	3	2	2	2	2	2	2	3	3	3	4	3	2	4	4	4	4	5	5	5	5	5	5	
18-Nov	4	3	4	2	2	2	3	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	4	
19-Nov	3	2	2	2	2	1	2	2	2	2	3	3	3	4	3	3	3	3	2	2	3	4	3	3	4	
20-Nov	4	3	3	3	3	4	3	3	4	4	3	3	2	2	2	3	3	3	3	2	1	2	2	2	4	
21-Nov	2	2	2	2	1	3	2	1	1	1	2	2	2	2	2	2	1	1	1	1	0	1	1	1	3	
22-Nov	1	1	2	1	1	1	1	1	1	2	2	2	2	2	2	2	1	2	2	2	1	1	1	1	2	
23-Nov	1	3	2	1	2	2	3	2	2	2	2	2	2	3	2	2	2	2	3	2	2	2	3	3	3	
24-Nov	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	3	
25-Nov	1	1	1	0	1	1	1	1	1	1	1	1	2	1	2	2	2	1	1	1	1	1	1	2	2	
26-Nov	2	2	3	3	3	2	2	2	3	3	3	3	3	3	3	2	2	3	3	3	2	3	5	4	5	
27-Nov	5	4	3	4	3	3	3	3	3	3	4	4	5	4	4	4	3	3	3	3	2	2	2	2	5	
28-Nov	3	3	3	2	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	2	1	1	1	3	
29-Nov	1	1	1	1	1	1	2	2	2	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2	
30-Nov	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	

Diurnal Maximum

UO - Unstable Operation



# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Wind Direction 10m (WD10) - deg

## Janvier - November 2024

Direction of Maximum Speed: 270 deg on Nov 7 03:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 191.7 deg on Nov 16	Hours of Data: 717
Direction of Minimum Speed: 82 deg on Nov 25 09:00	Hours of Missing Data: 3
Direction of Minimum Daily Speed Average: 0.4 deg on Nov 1	Percent Operational Time: 99.6
Monthly Average Direction: 248.9 deg	

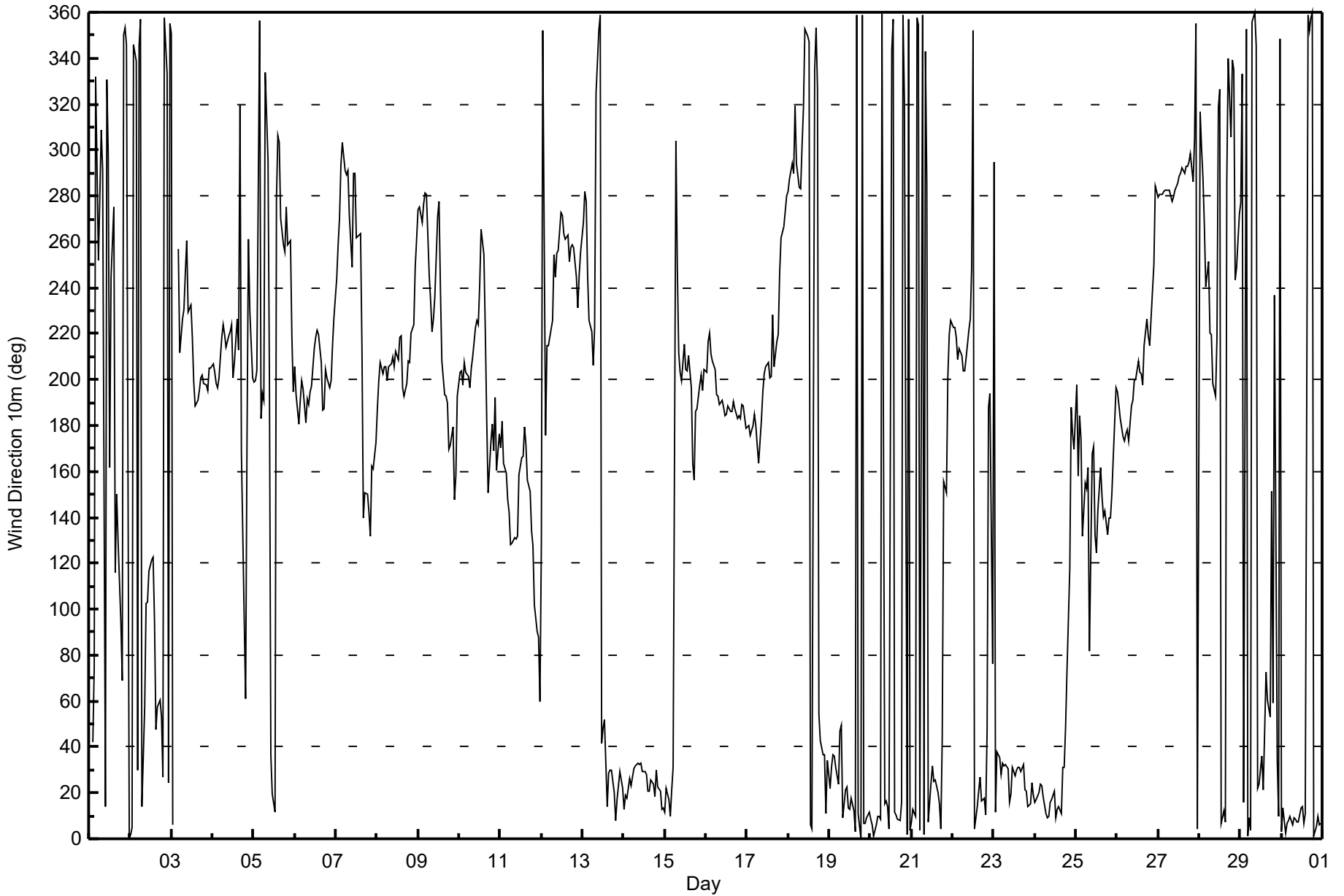
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	229	UO	42	74	332	252	280	309	291	14	330	298	162	245	275	116	150	130	95	69	350	354	346	0	353.3
2-Nov	2	5	346	339	30	345	357	14	57	103	103	116	122	123	95	47	57	60	53	27	357	333	24	355	57.2
3-Nov	351	6	UO	UO	257	212	226	231	246	260	229	232	219	199	189	191	195	201	202	199	197	196	205	205	209.7
4-Nov	207	203	198	196	201	218	224	220	214	219	221	224	201	207	226	213	320	169	96	61	174	261	230	200	211.7
5-Nov	199	200	204	356	183	194	191	334	295	199	37	20	12	278	306	303	270	259	256	275	259	260	219	194	253.9
6-Nov	205	194	180	191	200	196	181	192	189	195	197	214	219	221	220	207	187	187	205	201	196	199	215	227	203.4
7-Nov	244	259	270	294	303	291	289	291	271	249	290	290	262	262	263	214	140	151	150	142	132	162	161	172	260.6
8-Nov	187	200	207	202	206	206	199	205	207	210	206	212	209	219	219	196	193	198	208	207	220	224	249	261	210.6
9-Nov	274	275	269	276	281	281	245	235	221	226	236	271	277	239	208	193	193	190	169	172	179	148	158	193	241.6
10-Nov	203	204	198	207	203	201	197	205	210	222	226	224	241	265	255	222	183	151	173	180	169	192	161	176	210.1
11-Nov	170	182	164	159	147	142	128	129	131	130	132	159	166	167	179	172	156	151	134	128	102	90	88	60	148.1
12-Nov	129	352	176	214	215	218	226	254	244	255	256	273	272	263	261	263	251	257	259	257	245	231	246	256	251.2
13-Nov	268	282	278	245	226	221	206	223	325	352	359	41	48	52	14	29	30	30	20	8	17	23	29	22	12.8
14-Nov	13	19	18	26	23	27	31	32	33	32	33	29	29	28	21	21	26	24	18	30	23	21	13	13	25.5
15-Nov	11	22	17	10	21	31	304	248	212	203	200	215	205	204	210	196	164	156	186	188	198	202	195	204	199.7
16-Nov	203	217	221	211	208	204	194	193	189	191	188	184	185	189	186	186	191	187	183	184	183	189	189	179	191.7
17-Nov	179	180	176	180	185	180	171	164	183	195	203	206	207	201	201	228	205	217	220	246	262	267	273	280	215.7
18-Nov	282	287	294	290	319	294	284	283	302	319	353	350	347	6	4	335	354	327	54	43	37	36	11	34	334.3
19-Nov	22	31	37	36	31	24	47	49	9	21	23	14	13	18	12	3	359	11	0	359	7	6	9	12	17.8
20-Nov	8	6	2	6	9	10	9	360	15	16	14	4	344	357	12	10	9	8	16	359	322	2	357	3	6.7
21-Nov	7	13	9	357	354	4	359	2	343	285	7	24	32	25	26	20	15	4	44	156	151	201	220	226	7.3
22-Nov	223	222	218	208	213	210	204	204	209	221	226	249	352	4	14	20	27	16	18	10	47	188	194	76	241.1
23-Nov	295	12	38	36	28	33	32	32	30	16	19	31	28	30	31	31	29	32	21	21	14	15	24	19	26.1
24-Nov	16	17	20	24	23	19	11	9	10	16	17	21	9	13	14	11	31	31	49	73	118	188	177	170	18.3
25-Nov	198	158	184	174	132	155	152	162	82	168	171	133	124	142	162	149	140	143	132	140	140	150	166	196	154.0
26-Nov	194	189	183	175	173	176	178	173	188	191	199	200	208	203	203	197	215	226	219	215	227	250	284	282	205.1
27-Nov	280	281	281	282	283	283	282	280	278	279	283	285	289	290	293	290	293	293	295	298	286	304	355	4	288.1
28-Nov	317	301	288	267	240	251	221	220	198	193	219	319	326	7	12	7	286	340	306	339	335	243	249	272	290.3
29-Nov	277	333	16	353	1	9	3	356	360	345	22	24	36	21	47	73	60	53	151	59	237	34	9	349	15.0
30-Nov	3	14	3	6	8	10	6	9	9	8	7	14	14	7	11	359	352	358	360	1	6	10	6	6	6.6

261.3 270.6 256.9 255.3 257.0 245.8 238.9 240.9 234.3 231.6 241.7 265.2 257.7 258.7 267.4 262.0 202.4 209.2 214.6 223.0 221.0 242.3 266.1 263.2

Diurnal Average

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods







**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Janvier - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 99 deg on Nov 25 09:00		Hours in Service: 720 Hours of Data: 717 Hours of Missing Data: 3 Hours of Calibration: 0 Percent Operational Time: 99.6																							
Minimum Value: 10 deg on Nov 5 07:00																									
Percentiles: P <sub>1</sub> = 11 P <sub>10</sub> = 16 Q <sub>1</sub> = 19 Median = 23 Q <sub>3</sub> = 31 P <sub>90</sub> = 48 P <sub>99</sub> = 86																									
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	65	UO	22	65	71	24	52	57	59	32	73	61	69	48	94	50	37	50	66	85	67	40	76	33	94
2-Nov	36	35	52	64	24	55	29	22	79	30	35	26	30	30	35	22	29	29	28	23	37	45	13	35	79
3-Nov	24	25	UO	UO	40	25	19	19	25	21	26	29	29	21	19	19	16	19	17	13	13	11	14	13	40
4-Nov	14	14	11	10	12	17	18	18	18	25	23	24	27	26	34	31	64	85	89	45	78	37	66	23	89
5-Nov	25	31	17	69	40	10	10	86	56	84	47	17	31	32	44	40	23	23	24	24	24	26	28	17	86
6-Nov	24	20	16	13	15	21	20	16	28	17	21	24	21	22	20	19	15	18	18	18	14	14	20	23	28
7-Nov	24	20	21	36	42	36	30	37	26	32	32	41	25	23	22	37	15	20	19	22	15	24	46	37	46
8-Nov	17	19	16	13	16	14	16	15	17	20	20	20	19	25	24	13	11	12	19	16	22	42	26	22	42
9-Nov	18	19	20	19	22	20	39	20	17	20	26	22	27	25	18	12	12	19	19	18	20	79	20	45	79
10-Nov	16	20	11	15	19	14	12	17	19	20	22	22	29	24	22	21	25	18	18	16	34	25	23	19	34
11-Nov	24	35	41	37	31	36	41	29	26	25	28	28	25	24	19	25	26	25	30	24	23	25	25	78	78
12-Nov	57	87	28	21	24	22	30	24	25	24	24	25	23	26	23	23	22	19	19	20	22	15	17	18	87
13-Nov	33	67	53	64	19	22	19	30	64	98	89	89	47	36	24	17	14	15	17	22	17	15	17	16	98
14-Nov	21	16	19	16	16	16	16	16	17	16	16	17	19	18	21	18	17	15	17	14	17	16	29	27	29
15-Nov	21	20	31	22	22	55	32	15	22	29	22	24	22	24	27	18	20	25	19	18	15	17	16	16	55
16-Nov	18	21	24	24	21	20	20	17	17	19	18	20	19	18	20	19	19	20	18	17	19	20	18	23	24
17-Nov	23	19	19	18	20	18	22	24	20	19	21	23	24	21	18	23	17	22	24	32	22	22	21	23	32
18-Nov	21	24	31	33	48	32	24	28	44	49	47	42	44	31	33	50	48	77	35	17	16	22	32	23	77
19-Nov	24	21	15	15	27	14	25	26	33	25	24	30	31	21	27	42	37	27	31	36	33	28	26	24	42
20-Nov	29	28	32	28	31	28	28	37	23	21	24	36	46	42	25	24	24	32	20	31	50	33	44	29	50
21-Nov	25	21	30	35	39	31	36	30	39	30	41	25	29	35	18	20	18	26	61	74	14	18	15	17	74
22-Nov	17	16	19	15	17	17	14	15	16	20	23	50	51	31	30	15	16	25	26	34	68	55	71	81	81
23-Nov	49	24	22	15	16	20	17	20	16	26	19	15	17	18	16	14	15	14	16	18	20	19	15	19	49
24-Nov	18	18	16	16	16	20	20	22	23	19	20	22	25	22	21	20	18	47	76	60	31	48	58	38	76
25-Nov	31	29	23	30	58	32	29	53	99	38	31	60	56	32	28	22	22	20	13	13	16	19	25	15	99
26-Nov	17	17	17	18	19	17	17	20	17	15	19	20	26	19	21	16	20	23	22	21	25	30	23	23	30
27-Nov	20	19	21	24	21	20	21	25	18	20	23	29	28	30	32	30	30	29	28	32	30	52	40	34	52
28-Nov	47	33	26	16	24	19	20	15	11	11	28	46	55	38	23	25	46	47	63	39	44	27	27	46	63
29-Nov	28	33	21	28	23	25	28	37	33	44	36	32	48	26	55	23	14	22	73	57	85	50	30	30	85
30-Nov	26	20	34	21	25	20	22	23	24	22	22	24	20	21	23	28	31	34	30	28	23	25	25	30	34
Diurnal Maximum																									
UO - Unstable Operation																									



Maximum Speed: 21 km/h on Nov 7 04:00	Maximum Daily Speed Average: 12.6 km/h on Nov 27	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 15 07:00	Minimum Daily Speed Average: 1.1 km/h on Nov 1	Hours of Data: 714
Maximum Diurnal Speed Average: 3.0 km/h at hour 10	Minimum Diurnal Speed Average: 1.0 km/h at hour 17	Hours of Missing Data: 6
Monthly Average Velocity: 2.1 km/h 264.3 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 3 Q <sub>1</sub> = 5 Median = 8 Q <sub>3</sub> = 11 P <sub>90</sub> = 13 P <sub>99</sub> = 19	Percent Operational Time: 99.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	NNE2	N3	NNE4	NE3	NE2	UO	UO	N1	UO	NNE4	NNE1	WNW1	SSE1	WSW3	WNW1	ESE2	SSE2	SE1	ESE3	E1	NNE1	N2	N1	N3	NE1.1	NNE4
2-Nov	NNE4	N4	N2	N2	NE4	NNE2	NNE2	NE2	ESE2	ESE5	ESE5	SE6	SE8	SE6	ESE5	ENE9	ENE8	ENE8	ENE6	NE5	NNE3	NNW3	NE5	NE2	ENE3.4	ENE9
3-Nov	NNE3	NNE3	NW1	NW2	W4	SW4	WSW4	WSW5	WSW7	W7	WSW6	WSW7	SW7	SSW7	SSW8	SSW7	SSW11	SSW10	SW10	SW10	SSW10	SW10	SW10	SW11	SW5.8	SSW11
4-Nov	SW11	SW10	SW10	SSW10	SSW10	SW12	SW13	SW13	SW12	SW10	SW10	SW8	SW8	SW7	WSW7	SW6	NW4	N1	NNE1	NNE3	UO	SW2	SSW2	SSW4	SW6.8	SW13
5-Nov	SSW4	SSW5	SW6	WNW1	SSW3	SSW7	SSW7	NNE1	NW2	SW2	NE3	NNE7	NNE5	WNW3	NW8	NW8	WNW9	W8	W7	WNW8	W7	W8	SW6	SSW7	W3.3	WNW9
6-Nov	SW7	SSW9	S8	SSW9	SSW8	SSW7	S8	SSW9	SSW10	SSW15	SSW12	SW15	SW16	SW17	SW16	SW13	SSW11	SSW12	SW14	SSW12	SSW14	SSW13	SW17	WSW17	SSW11.7	SW17
7-Nov	WSW19	W19	W21	NW21	NW14	NW15	NW15	NW11	WNW9	W8	NW11	WNW10	W13	W11	W10	SW4	S5	S6	S7	SSE8	SE10	SSE9	SSE4	S5	W7.3	NW21
8-Nov	SSW9	SSW9	SSW9	SW12	SSW14	SW12	SSW10	SW11	SW11	SW11	SW11	SW11	SW12	SW11	SW8	SSW8	SSW9	SSW13	SW9	SW12	SW11	WSW11	W13	W10	SW10.3	SSW14
9-Nov	WNW10	WNW11	W8	WNW11	WNW13	WNW10	W6	WSW8	WSW8	WSW7	WSW8	W10	WNW9	WSW6	SW7	SSW8	SSW8	SSW7	SSW5	SSW6	SSW5	SSW5	SSW6	SSW6	WSW6.2	WNW13
10-Nov	SSW8	SW8	SSW11	SW11	SW9	SW11	SSW11	SW11	SW12	SW12	SW13	SW12	WSW9	W11	W8	SW8	SW6	SSW5	S4	SSW4	S4	SSW4	S6	S10	SW8.0	SW13
11-Nov	S7	S5	SSE6	SSE7	SSE7	SE7	SE5	SE8	SE12	SE11	SE8	SSE10	S13	S12	S13	S9	SSE8	SSE8	SE6	SE6	ESE5	ESE5	E4	E1	SSE7.2	SSE13
12-Nov	SE2	NNW1	S3	SW10	SW10	SW11	SW11	W12	WSW14	W18	W19	WNW19	W20	W18	W17	W15	WSW12	W10	W10	W7	WSW6	WSW6	WSW7	W8	W10.4	W20
13-Nov	W7	NW4	WNW4	W3	WSW6	SW8	SW7	WSW6	WNW3	NNW1	N2	NNE2	NE4	ENE6	NNE7	NE10	NE10	NE10	NNE8	NNE7	NNE9	NE11	NE9	NNE9	NNE3.3	NNE11
14-Nov	NNE9	NNE10	NNE10	NNE11	NNE14	NNE13	NE13	NE12	NE11	NE11	NE10	NE10	NE10	NE10	NNE9	NNE8	NNE7	NNE8	NNE7	NE8	NNE6	NNE6	NNE5	N3	NNE9.1	NNE14
15-Nov	NNE4	NNE5	NNE3	NNE3	NNE4	NNE1	NNW0	WSW1	SW2	SSW3	SSW5	SW6	SSW6	SW5	SW5	SSW5	S5	SSE5	SSW5	SSW5	SSW7	SSW8	SSW9	SSW10	SSW2.9	SSW10
16-Nov	SSW10	SW11	SW11	SW10	SW10	SSW11	SSW9	SSW9	SSW10	SSW11	SSW14	S15	S14	SSW16	SSW14	S15	SSW14	S17	S14	S16	S16	SSW14	SSW13	S10	SSW12.4	SSW17
17-Nov	S9	S10	S11	S10	S7	S8	S7	S7	S9	SSW11	SSW12	SW12	SW14	SSW12	SSW11	SW15	SW15	SW16	SW18	WSW17	W18	W18	WNW19	WNW16	SW10.2	WNW19
18-Nov	WNW16	WNW12	NW12	NW7	NNW8	NW8	WNW9	WNW7	NW6	NW7	NNW6	N8	NNW7	N6	N6	NNW6	N4	NW2	ENE5	NE7	NE8	NE8	NNE7	NE8	NNW5.8	WNW16
19-Nov	NNE9	NE7	NE10	NE11	NE6	NNE7	NE9	NE8	N7	NNE6	NNE9	NNE11	N11	NNE14	NNE12	N10	N10	N9	N7	N8	N8	N13	N11	NNE12	NNE8.9	NNE14
20-Nov	N11	N11	N10	N11	N10	N12	N11	N9	NNE14	NNE14	NNE11	N10	NNW7	N7	NNE9	N11	N11	N9	NNE13	N7	NNW5	N8	N7	N8	N9.7	NNE14
21-Nov	N8	NNE10	NNE8	N6	N5	N8	N6	N5	N4	WNW5	N6	NNE8	NE7	NNE8	NNE9	NNE7	NNE5	NNE5	NNE4	NNW2	SW3	SW6	SW7	WSW7	N4.3	NNE10
22-Nov	SW9	SW9	SW9	SW7	SW7	SW7	SW7	SW7	SW8	SW8	SW7	W5	N7	N7	NNE6	NNE8	NNE7	NNE7	NNE7	NNE6	NNE4	SW2	S1	E1	W2.0	SW9
23-Nov	NNW1	NNE6	NE7	NE6	NE9	NE8	NE10	NE8	NE9	NNE6	NNE8	NE10	NNE10	NE9	NE10	NE11	NE12	NE11	NNE11	NNE11	NNE9	NNE9	NNE10	NNE10	NNE8.8	NE12
24-Nov	NNE11	NNE10	NNE9	NNE10	NNE10	NNE7	NNE8	NNE8	NNE7	NNE7	NNE8	NNE7	N7	NNE8	NNE7	NNE7	NNE5	NNE3	N3	NNE3	NNE2	UO	SW2	S2	NNE6.2	NNE11
25-Nov	SW3	S3	SSW4	SSW4	SSE2	S3	S4	S3	UO	S3	S3	SE3	SE3	SSE5	SSE6	SSE7	SSE7	SE6	SE6	S6	SSE6	S6	SSW9	S4.3	SSW9	
26-Nov	SSW11	S12	S12	S12	S13	S12	S12	S10	SSW11	SSW14	SSW13	SSW12	SW11	SSW13	SSW11	SSW9	SW9	SW11	SW12	SW11	SW10	W10	WNW18	WNW16	SSW9.8	WNW18
27-Nov	WNW17	WNW15	WNW15	WNW15	WNW15	WNW15	WNW13	WNW12	WNW12	WNW15	WNW15	WNW16	NW18	NW17	NW17	NW14	NW12	NW13	NW12	NW10	NW6	NW6	N6	N6	WNW12.6	NW18
28-Nov	NW6	NW11	NW11	WNW9	W6	W7	WSW6	WSW7	SW6	SW5	WSW5	NNW7	NNW7	N7	NNE8	N7	NW2	NNW4	NW3	N5	N3	WSW2	WSW2	NW1	NW4.1	NW11
29-Nov	WNW3	NNW3	NNE4	N2	N3	NNE6	N8	N7	N6	NNW4	NNE4	NNE5	NE5	NNE6	NE3	ENE4	ENE6	ENE3	NNW2	NNE3	NNE2	NNE4	NNE5	N3	NNE3.8	N8
30-Nov	N4	NNE5	N3	NNE4	N4	N5	N5	NNE5	N4	NNE5	N6	NNE5	NNE5	N6	NNE6	N5	N4	N5	N5	N5	NNE6	NNE6	NNE5	N5	N5.0	NNE6

W2.9	W2.8	W2.5	W2.4	W2.1	W2.6	WSW2.3	WSW2.2	WSW2.6	WSW3.0	WSW2.6	W2.6	W2.8	W2.5	W2.2	W1.4	WSW1.0	SW1.2	WSW1.1	WSW1.2	WSW1.6	WSW1.9	W2.3	W2.3	Diurnal Average	
WSW19	W19	W21	NW21	WNW15	NW15	WNW15	SW13	WSW14	W18	W19	WNW19	W20	W18	W17	SW15	SW15	SSW17	SW18	WSW17	W18	W18	WNW19	WSW17	Diurnal Maximum	

UO - Unstable Operation  
All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

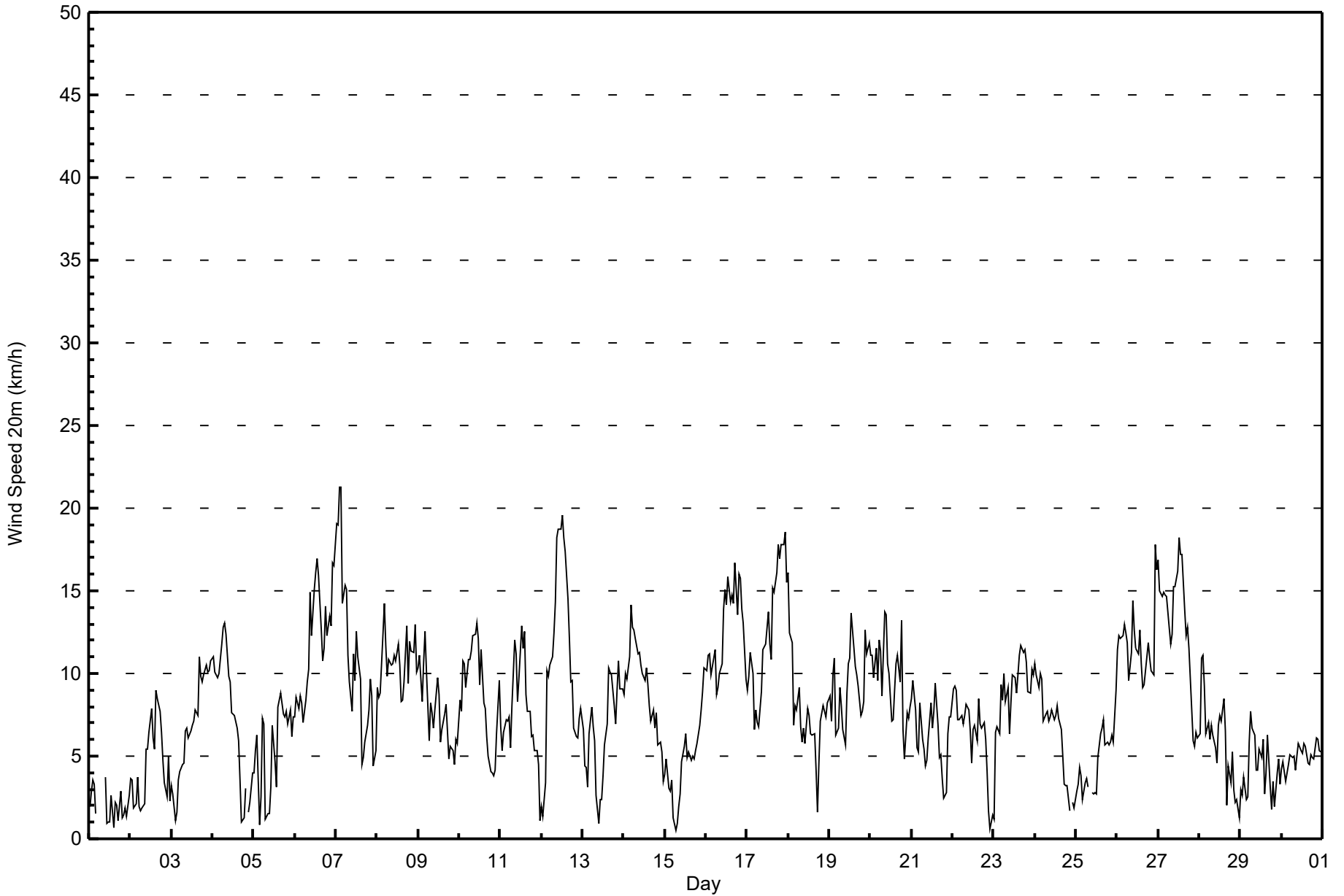
**Wind Speed 20m (WS20) - km/h**  
**Janvier - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 8 km/h on Nov 7 04:00	Hours of Data: 714
Minimum Value: 1 km/h on Nov 25 04:00	Hours of Missing Data: 6
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 6	Hours of Calibration: 0
	Percent Operational Time: 99.2

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	1	1	1	1	1	UO	UO	1	UO	1	1	1	1	1	1	1	1	1	2	2	1	2	2	1	2
2-Nov	1	1	1	1	1	1	1	1	2	2	2	2	3	2	2	3	3	3	2	1	1	1	1	1	2
3-Nov	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	3
4-Nov	2	2	2	2	2	3	3	3	3	3	2	2	2	2	2	2	1	1	1	1	UO	1	1	1	3
5-Nov	1	2	1	1	2	1	2	2	2	2	1	1	2	2	3	3	2	2	2	2	2	2	2	2	3
6-Nov	2	2	2	2	2	1	2	3	2	4	4	5	5	5	4	3	2	2	3	3	3	2	5	4	5
7-Nov	5	5	6	8	6	7	5	4	4	3	4	4	3	3	3	1	1	1	1	2	2	2	1	1	8
8-Nov	2	2	2	2	3	2	2	2	2	3	3	3	3	3	3	2	2	2	2	3	3	4	4	3	4
9-Nov	3	3	2	3	3	3	2	2	1	2	2	3	3	1	2	1	1	2	1	1	1	1	2	2	3
10-Nov	1	2	2	2	2	2	2	2	3	4	3	3	3	4	2	2	1	1	1	1	1	1	1	3	4
11-Nov	2	2	2	3	3	3	2	3	5	4	3	3	4	4	4	3	2	3	2	2	1	1	1	1	5
12-Nov	2	1	3	3	3	3	3	5	5	7	6	6	6	6	7	5	3	3	3	1	1	1	1	2	7
13-Nov	2	2	2	1	1	2	2	1	2	1	2	1	1	2	2	3	2	2	2	2	2	2	2	2	3
14-Nov	2	2	2	2	4	3	3	3	2	2	3	2	3	3	2	2	2	2	1	1	1	2	1	1	4
15-Nov	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	2	2	2
16-Nov	2	3	4	3	3	3	2	2	3	3	4	4	4	4	4	4	4	5	4	4	5	4	3	3	5
17-Nov	3	3	3	3	2	2	2	2	2	3	3	4	4	3	3	5	4	5	5	5	5	5	5	4	5
18-Nov	5	4	5	3	3	3	3	2	3	3	2	2	3	2	2	3	2	2	2	2	2	2	2	2	5
19-Nov	3	2	2	2	2	2	2	3	2	2	3	4	4	4	4	4	3	3	3	2	3	4	4	4	4
20-Nov	4	3	3	4	4	4	4	3	4	4	3	3	3	2	3	3	3	3	4	2	2	3	3	3	4
21-Nov	3	3	2	2	2	3	2	2	2	1	2	2	2	2	2	2	1	1	2	1	1	1	1	1	3
22-Nov	2	1	2	1	1	1	1	1	2	2	2	2	3	3	2	2	2	2	2	2	2	1	1	1	3
23-Nov	2	2	3	1	2	2	3	3	2	2	2	2	3	3	2	2	2	2	3	3	3	2	3	3	3
24-Nov	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	3
25-Nov	1	1	1	1	1	1	1	1	UO	1	1	1	1	2	2	2	2	2	1	1	1	1	1	2	2
26-Nov	2	2	3	3	3	3	3	2	3	3	4	4	4	4	3	2	2	3	3	3	3	3	4	6	6
27-Nov	5	4	4	4	4	4	3	3	3	4	5	5	6	5	6	5	4	4	3	3	2	2	2	2	6
28-Nov	4	3	3	2	2	1	2	1	1	1	1	3	3	2	2	2	1	2	1	2	2	1	1	2	4
29-Nov	1	1	1	1	2	2	2	2	2	1	1	1	2	1	1	1	1	2	1	1	2	1	2	1	2
30-Nov	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	1	2	2	2	2	2	2

Diurnal Maximum

UO - Unstable Operation





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 20m (WS20) - km/h**  
**Janvier - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	197	27.59	27.59
6 - 11	391	54.76	82.35
12 - 19	123	17.23	99.58
20 - 28	3	0.42	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 714

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Wind Speed 20m (WS20) - km/h**  
**Janvier - November 2024**

<b>Wind Speed</b> <b>Ranges (km/h)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	31	47	11	4	3	8	5	6	15	17	12	7	3	9	8	11	197
6 - 11	44	70	34	6	0	0	12	12	22	53	64	19	22	12	14	7	391
12 - 19	2	8	3	0	0	0	1	1	14	22	25	6	10	21	10	0	123
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	77	125	48	10	3	8	18	19	51	92	101	32	37	42	33	18	714

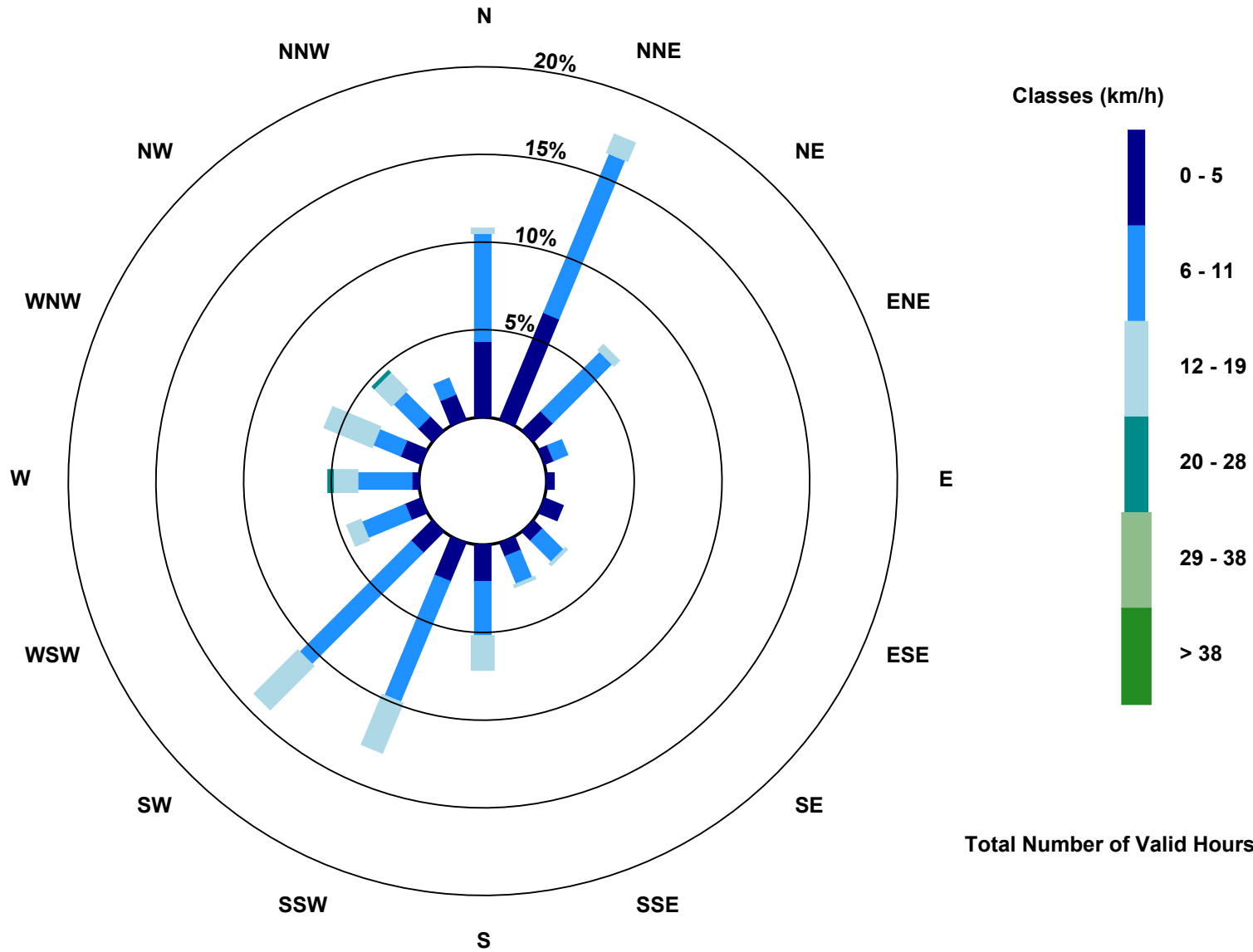
Total Number of Valid Hours: 714

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 20m (WS20) - km/h  
Janvier





# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Wind Direction 20m (WD20) - deg

## Janvier - November 2024

Direction of Maximum Speed: 307 deg on Nov 7 04:00																						Hours in Service: 720				
Direction of Maximum Daily Speed Average: 301.7 deg on Nov 27																						Hours of Data: 714				
Direction of Minimum Speed: 329 deg on Nov 15 07:00											Direction of Minimum Daily Speed Average: 1.1 deg on Nov 1											Hours of Missing Data: 6				
Monthly Average Direction: 264.3 deg																						Percent Operational Time: 99.2				
Day	Hourly Period Ending At (MST)																								Daily Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	16	10	24	56	40	UO	UO	357	UO	21	12	297	158	258	301	123	151	131	109	90	23	6	6	4	35.6	
2-Nov	13	6	11	349	41	20	17	53	108	115	111	124	131	127	103	63	72	75	69	45	25	341	34	35	71.6	
3-Nov	21	12	318	307	271	230	241	243	255	270	242	243	230	211	197	201	205	212	215	214	UO	212	214	220	220	224.7
4-Nov	221	220	215	213	213	233	234	232	226	231	232	232	214	221	237	229	313	11	12	33	UO	234	212	207	226.6	
5-Nov	193	210	214	299	202	206	207	16	313	214	44	27	15	296	317	316	282	268	268	290	273	273	234	206	264.9	
6-Nov	218	202	191	200	206	201	188	199	197	204	204	223	229	231	231	219	198	199	217	213	211	212	226	237	213.5	
7-Nov	251	264	280	307	318	310	304	309	284	259	304	302	268	269	269	229	170	178	172	155	144	167	166	186	270.6	
8-Nov	193	204	211	214	212	215	211	219	220	222	216	221	219	227	228	208	204	210	220	220	235	237	259	268	220.7	
9-Nov	284	286	278	287	295	297	278	254	240	240	248	280	285	250	221	203	201	204	207	198	193	208	198	210	252.4	
10-Nov	211	222	212	220	217	214	209	217	221	231	235	232	248	273	262	234	214	204	172	205	171	192	170	182	220.2	
11-Nov	174	181	167	166	149	145	138	136	138	136	138	160	169	170	181	175	162	154	142	133	113	103	101	79	152.2	
12-Nov	126	341	178	223	225	228	235	262	253	262	264	282	277	271	269	270	257	262	265	265	257	245	252	268	259.0	
13-Nov	279	314	302	275	244	232	222	238	293	348	358	22	54	61	17	37	40	39	32	21	25	34	43	32	12.2	
14-Nov	22	30	27	33	30	31	37	39	41	39	41	38	35	34	28	25	30	30	27	41	33	28	20	9	32.4	
15-Nov	15	29	25	13	25	33	329	245	216	209	206	226	211	214	214	202	175	164	195	197	206	210	203	212	205.6	
16-Nov	210	225	229	219	217	211	199	197	196	197	193	189	188	193	192	189	195	191	186	188	187	195	193	182	197.1	
17-Nov	180	186	176	182	190	186	182	171	187	203	210	215	217	211	212	236	217	226	227	254	269	276	284	291	224.3	
18-Nov	294	299	306	304	327	306	295	300	314	324	346	352	344	0	359	340	356	324	64	53	46	43	16	38	337.0	
19-Nov	28	37	46	46	41	27	54	56	8	21	26	14	6	20	13	357	353	11	360	355	1	7	9	13	18.7	
20-Nov	7	4	4	3	8	8	8	2	18	19	14	8	347	357	14	8	8	8	21	4	332	3	353	3	7.1	
21-Nov	6	15	13	358	351	6	357	360	357	296	6	25	37	27	30	27	22	14	18	345	230	225	233	237	2.6	
22-Nov	233	231	226	218	225	221	216	217	222	232	236	262	355	8	12	27	30	25	27	18	31	215	184	81	260.1	
23-Nov	348	30	42	44	37	41	39	42	38	21	24	36	32	35	37	35	39	28	28	28	20	22	31	26	33.0	
24-Nov	20	24	25	30	31	25	17	16	15	20	22	21	11	14	15	13	26	26	6	21	28	UO	233	183	20.3	
25-Nov	217	181	211	206	152	175	176	180	UO	170	185	140	133	150	167	158	148	145	134	170	171	168	186	199	169.9	
26-Nov	196	190	184	174	175	180	180	179	192	196	210	211	215	213	211	206	225	233	227	224	234	262	298	295	212.3	
27-Nov	292	291	295	296	295	295	293	291	288	291	297	300	304	304	308	306	307	309	308	316	305	325	356	358	301.7	
28-Nov	326	312	305	283	267	264	253	255	228	224	244	330	333	4	14	10	318	345	318	351	358	249	249	304	304.2	
29-Nov	300	338	19	0	5	15	2	352	1	347	28	29	39	22	45	76	62	57	341	29	14	26	21	360	17.3	
30-Nov	6	18	3	12	11	11	8	13	10	14	10	16	14	10	14	6	355	1	5	6	14	14	12	10	10.0	
270.6 280.7 270.3 271.8 272.0 262.0 256.4 257.2 248.1 245.8 258.4 279.7 272.0 273.6 280.6 279.4 240.2 233.5 245.3 257.3 244.7 257.3 269.6 268.2																										
Diurnal Average																										
UO - Unstable Operation																										
All monthly, daily, and diurnal averages have been calculated using vector methods																										





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

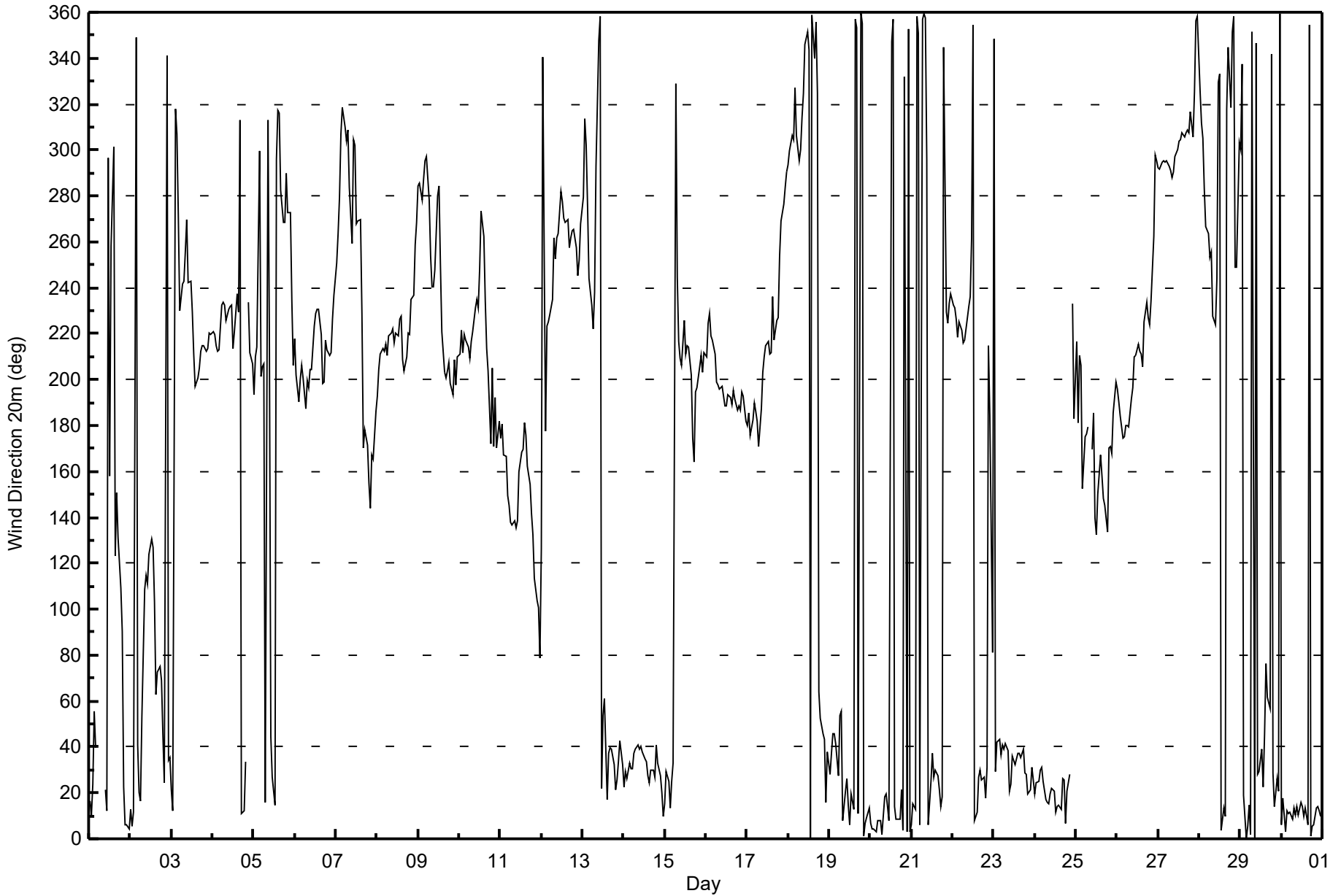
**Wind Direction 20m (WD20) - deg**  
**Janvier - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 88 deg on Nov 5 10:00	Hours of Data: 714
Minimum Value: 5 deg on Nov 10 18:00	Hours of Missing Data: 6
Percentiles: P <sub>1</sub> = 10 P <sub>10</sub> = 13 Q <sub>1</sub> = 15 Median = 19 Q <sub>3</sub> = 25 P <sub>90</sub> = 34 P <sub>99</sub> = 77	Hours of Calibration: 0
	Percent Operational Time: 99.2

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	13	10	12	26	70	UO	UO	68	UO	24	83	51	69	47	77	47	33	68	35	74	77	43	71	30	83
2-Nov	27	39	41	56	21	40	16	26	49	24	26	24	24	28	30	21	24	26	25	21	29	32	11	17	56
3-Nov	17	17	23	25	13	20	16	14	19	18	21	25	26	20	18	16	14	17	16	13	12	11	13	11	26
4-Nov	13	13	11	10	12	14	13	13	15	21	20	19	28	22	31	28	50	77	56	17	UO	55	25	20	77
5-Nov	16	11	10	55	79	10	11	87	69	88	43	16	31	28	29	30	20	20	21	18	21	23	26	15	88
6-Nov	22	18	14	12	13	18	16	13	24	15	21	20	18	18	17	17	12	15	16	16	13	13	17	17	24
7-Nov	19	18	18	26	28	23	22	23	22	26	24	33	22	21	20	29	17	13	17	19	13	21	22	24	33
8-Nov	12	12	11	11	14	12	13	13	14	16	18	17	17	21	20	13	10	11	15	14	16	34	22	19	34
9-Nov	16	16	18	16	16	14	29	15	13	17	22	19	22	22	17	11	9	9	12	11	14	26	12	22	29
10-Nov	13	13	11	13	16	13	12	15	17	17	17	18	25	22	23	16	14	5	17	17	26	20	19	15	26
11-Nov	21	30	30	30	27	29	32	24	23	21	23	24	23	22	18	23	23	21	27	21	18	19	20	76	76
12-Nov	55	67	24	18	20	18	25	20	21	21	21	22	20	22	21	19	19	17	15	15	15	11	13	15	67
13-Nov	23	43	32	45	15	17	17	22	48	85	67	74	42	30	23	15	12	11	12	17	14	13	15	14	85
14-Nov	17	13	17	13	14	15	14	13	15	14	14	15	16	14	16	17	16	13	15	12	15	14	22	22	22
15-Nov	15	18	27	22	18	42	61	40	24	30	21	21	19	21	22	16	14	19	13	13	14	15	15	15	61
16-Nov	16	19	21	21	19	19	18	17	17	19	17	18	18	17	18	17	17	18	17	15	18	17	17	20	21
17-Nov	19	17	19	17	16	15	17	18	17	19	19	21	20	20	17	20	16	19	19	28	20	20	17	18	28
18-Nov	17	19	20	23	34	23	19	19	31	36	38	31	34	28	29	38	40	66	30	16	14	20	26	22	66
19-Nov	20	20	12	13	21	11	19	24	26	24	21	27	28	20	22	30	31	23	24	28	27	23	22	21	31
20-Nov	24	23	25	26	26	23	25	28	20	18	25	25	38	35	21	21	22	26	16	25	36	28	32	25	38
21-Nov	22	19	24	31	27	24	27	25	34	26	36	22	25	26	15	15	13	15	20	44	21	11	11	14	44
22-Nov	13	11	16	15	14	15	12	14	14	18	20	45	42	31	25	14	13	16	12	13	14	56	74	77	77
23-Nov	65	14	15	12	13	15	14	20	13	25	16	12	16	18	12	12	12	11	14	15	17	15	14	16	65
24-Nov	17	15	14	13	14	16	17	16	19	19	18	20	21	19	18	18	9	19	15	14	10	UO	36	27	36
25-Nov	14	15	25	18	33	19	23	19	UO	24	31	52	50	30	28	21	17	15	15	14	12	16	15	11	52
26-Nov	13	14	16	16	17	14	16	16	15	13	20	19	23	19	21	15	17	18	18	18	20	29	17	18	29
27-Nov	16	15	16	19	17	16	16	17	15	15	18	21	21	21	22	21	20	20	19	23	22	35	27	27	35
28-Nov	29	24	20	14	16	13	14	15	9	13	27	34	40	32	21	20	33	30	23	27	37	35	29	47	47
29-Nov	24	31	22	26	24	18	24	26	27	38	34	24	43	22	52	18	10	29	50	16	39	12	23	25	52
30-Nov	21	24	30	19	20	19	19	22	23	18	18	20	20	18	19	23	25	27	29	25	18	19	22	22	30

65	67	41	56	79	42	61	87	69	88	83	74	69	47	77	47	50	77	56	74	77	56	74	77	
Diurnal Maximum																								

UO - Unstable Operation





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS23 FORT HILLS NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)  
NOVEMBER 2024

MONTHLY SUMMARY for  
AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	686	32	34	99.72	11.7	0	2.2	0
TRS(ppb) Average	684	34	36	99.72	3.9	0	0.8	0
THC(ppm) Average	686	32	34	99.72	4.7	-	2.7	-
NMHC(ppm) Average	686	32	34	99.72	0.741	-	0.128	-
CH4(ppm) Average	686	32	34	99.72	4.4	-	2.6	-
NO2 (ppb) Average	685	34	35	99.86	42.9	0	25.1	-
NO (ppb) Average	685	34	35	99.86	177.5	-	42.9	-
NOX (ppb) Average	685	34	35	99.86	220.4	-	66.6	-
PM2.5 (ug/m3) Average	717	2	3	99.86	68.7	0	16	0
Temperature 2 m (C) Average	719	0	1	99.86	12	-	6.1	-
Relative Humidity (%) Average	719	0	1	99.86	99.4	-	94.6	-
Wind Speed 10 m (km/h) Average	719	0	1	99.86	27	-	21	-
Wind Direction 10 m (deg) Average	719	0	1	99.86	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)  
NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	686	0.46	1	-	0	0	0	0.1	0.4	1.3	11.7
TRS (ppb) Average	684	0.48	0.3	-	0.1	0.3	0.3	0.4	0.5	0.7	3.9
THC (ppm) Average	686	2.29	0.4	-	2	2	2.1	2.2	2.4	2.7	4.7
NMHC(ppm) Average	686	0.029	0.079	-	0	0	0	0	0	0.1	0.741
CH4(ppm) Average	686	2.27	0.3	-	2	2	2.1	2.2	2.3	2.6	4.4
NO2 (ppb) Average	685	12.84	8.5	-	0.1	1.7	5.6	12	18.7	24.8	42.9
NO (ppb) Average	685	13.15	24.4	-	0	0	0.6	3.4	13.4	40.1	177.5
NOX (ppb) Average	685	25.99	30.4	-	0.1	1.8	6.8	17.3	33.1	59.7	220.4
PM2.5 (ug/m3) Average	717	5.44	5.3	-	0.5	1.8	2.7	4.2	6.5	10	68.7
Temperature 2 m (C) Average	719	-7.95	8.4	-	-31.1	-18.6	-14.5	-6.2	-1.7	1.9	12
Relative Humidity (%) Average	719	82.32	9	-	43.8	71	77.5	83	88	94.3	99.4
Wind Speed 10 m (km/h) Average	719	10.2	6	-	1	4	6	9	14	19	27
Wind Direction 10 m (deg) Average	719	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)  
NOVEMBER 2024

OPERATIONAL NOTES

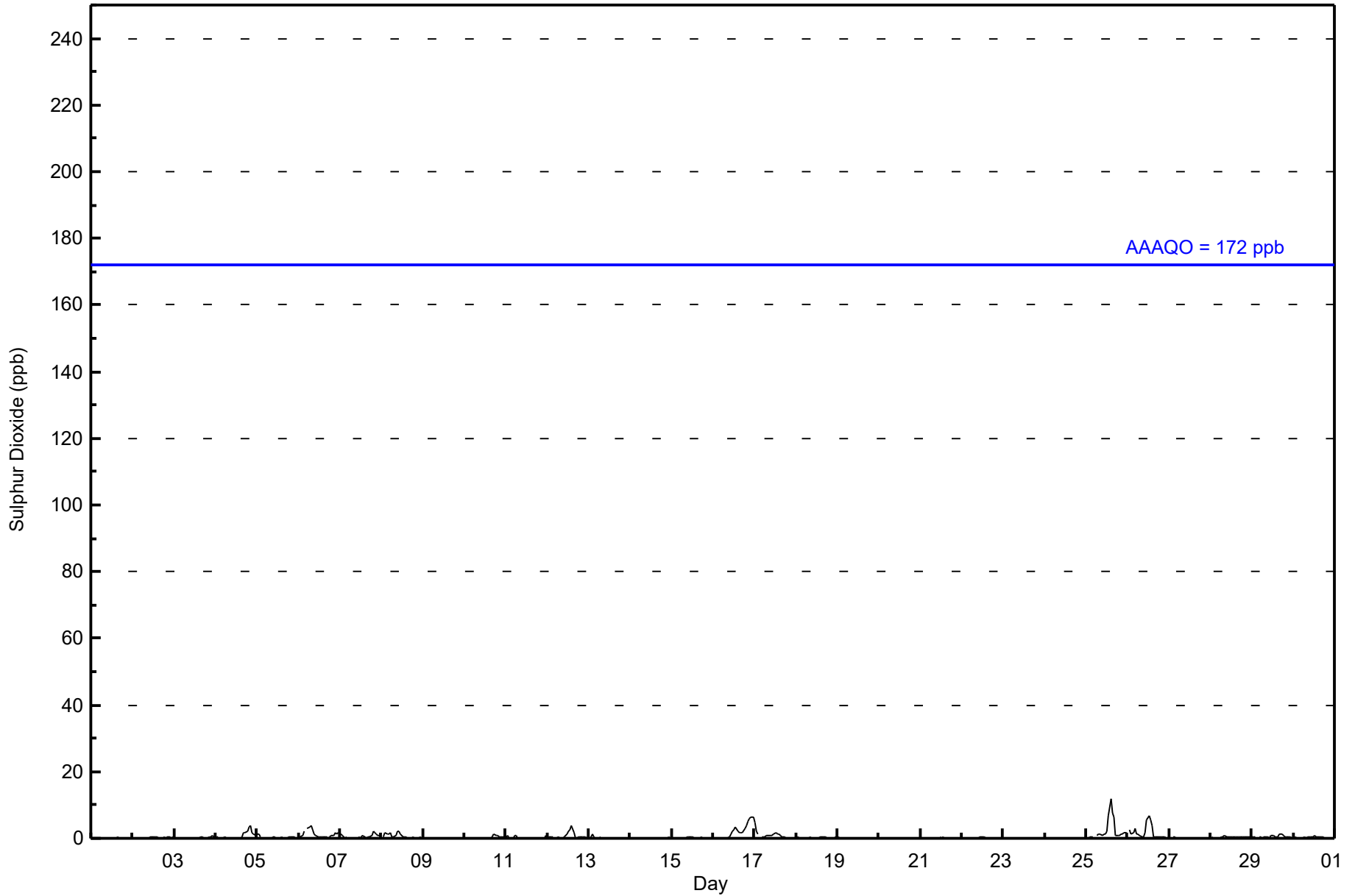
Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	21 Nov 2024 06:00	21 Nov 2024 06:00	1	DAS Failure - data not recorded
ALL GASEOUS ANALYZERS	21 Nov 2024 09:00	21 Nov 2024 09:00	1	Maintenance - sample manifold cleaned





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Fort Hills - November 2024**







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Fort Hills - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	685	99.85	99.85
11 - 20	1	0.15	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Fort Hills - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	136	60	18	6	4	14	37	89	88	57	33	25	22	19	22	55	685
11 - 20	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	136	60	18	6	4	14	37	89	89	57	33	25	22	19	22	55	686

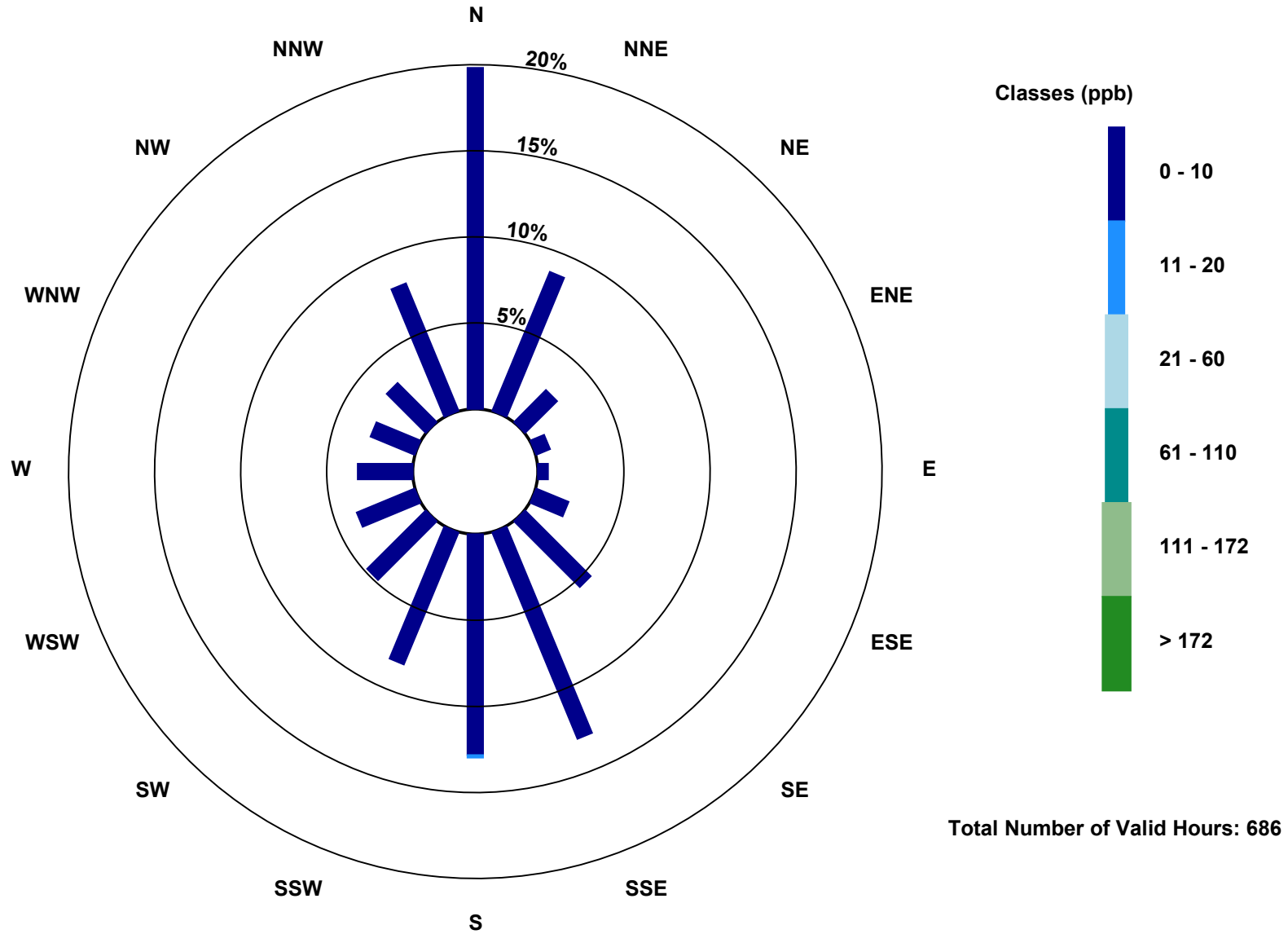
Total Number of Valid Hours: 686

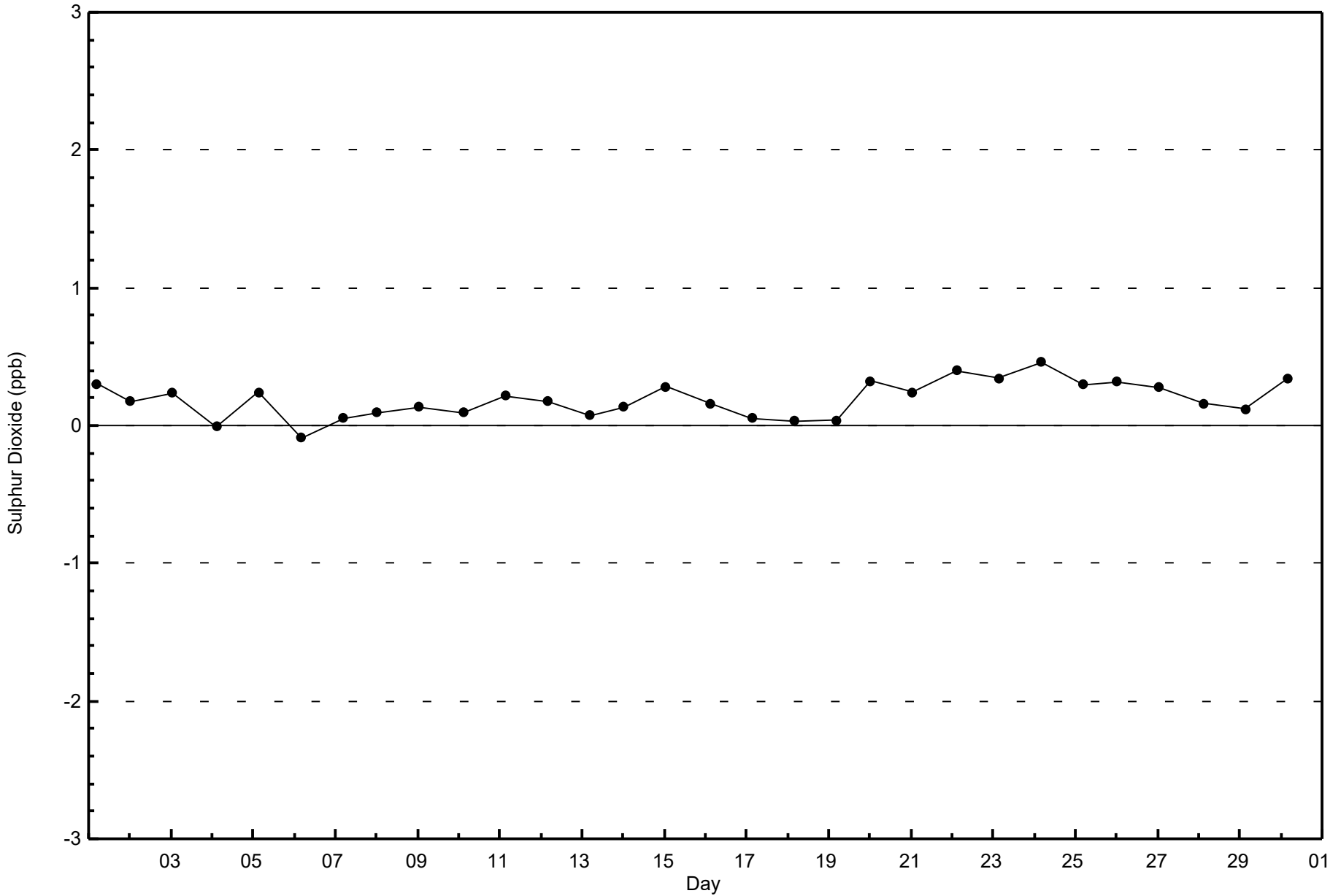
Total Number of Hours: 720

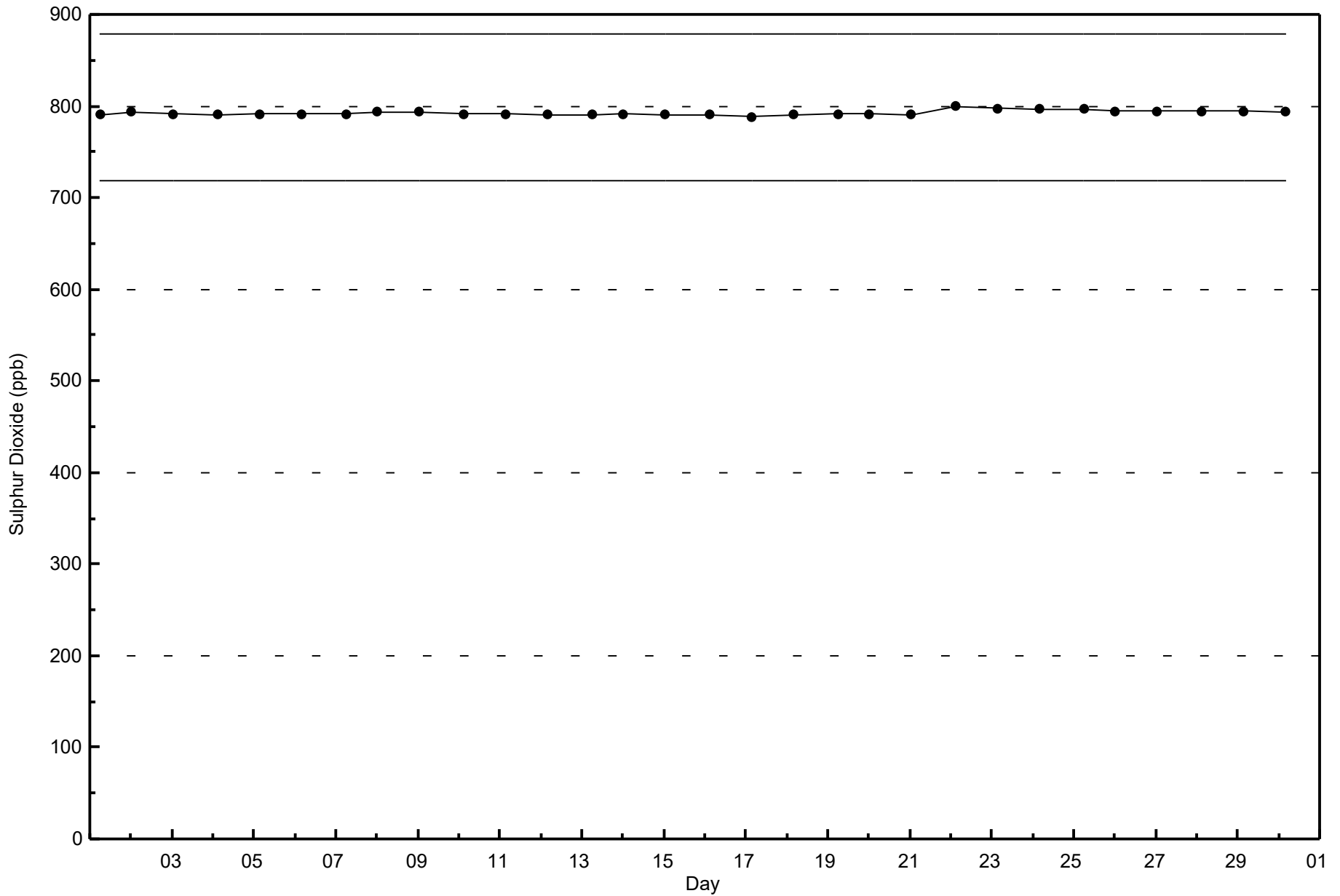


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Fort Hills









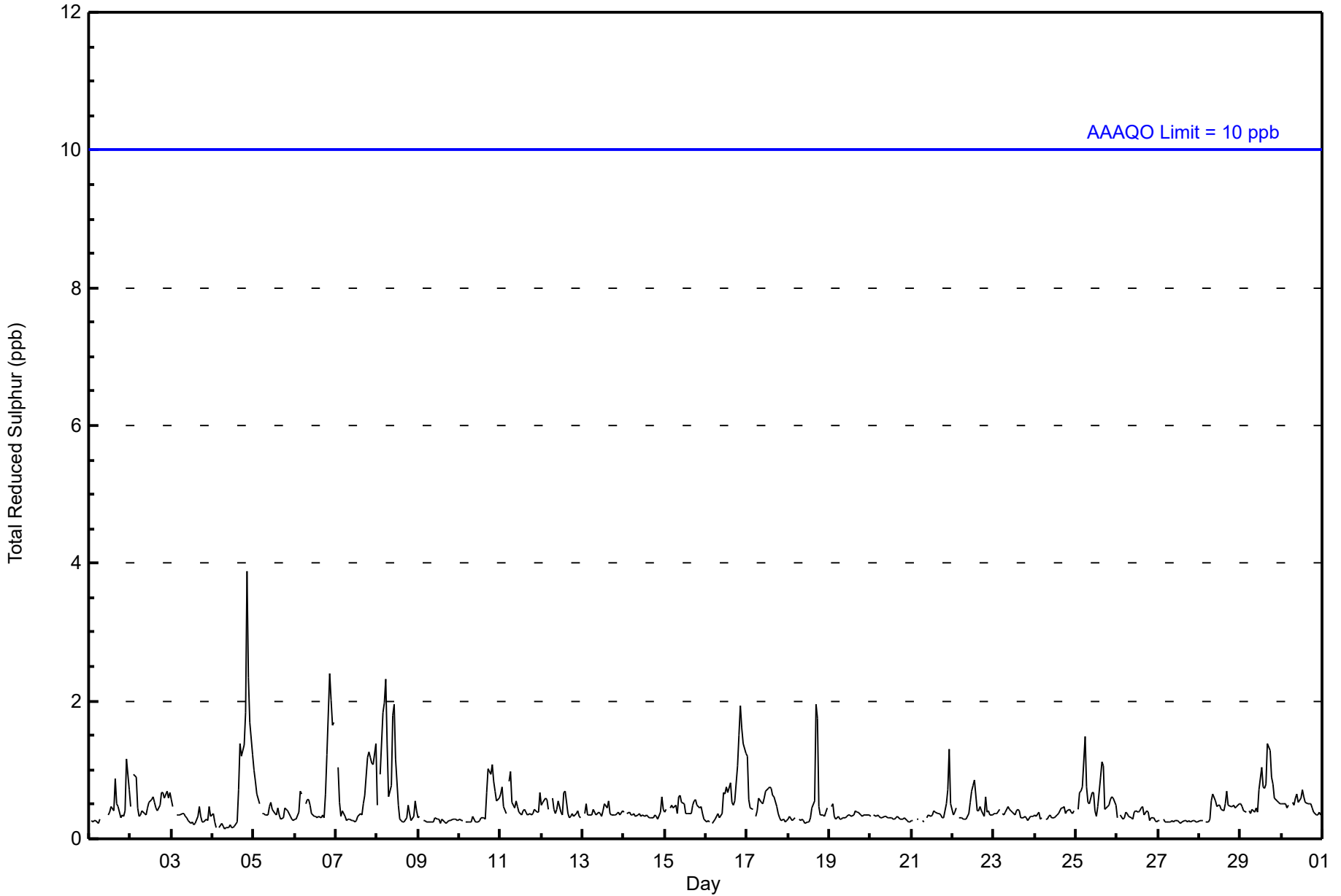
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Fort Hills - November 2024

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720														Daily Average		Daily Maximum					
Maximum Value: 3.9 ppb on Nov 4 21:00		Maximum Daily Average: 0.8 ppb on Nov 8		Hours of Data: 684														Hours of Missing Data: 36		Hours of Calibration: 34							
Minimum Value: 0.1 ppb on Nov 4 08:00		Minimum Daily Average: 0.3 ppb on Nov 27		Hours of Missing Data: 36														Hours of Calibration: 34		Percent Operational Time: 99.7							
Maximum Diurnal Average: 0.7 ppb at hour 21		Minimum Diurnal Average: 0.4 ppb at hour 8		Hours of Calibration: 34														Hours of Calibration: 34		Percent Operational Time: 99.7							
Monthly Average: 0.48 ppb		Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.3 Q <sub>1</sub> = 0.3 Median = 0.4 Q <sub>3</sub> = 0.5 P <sub>90</sub> = 0.7 P <sub>99</sub> = 1.9		Hours of Calibration: 34														Hours of Calibration: 34		Percent Operational Time: 99.7							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	Z	0.3	0.3	0.3	0.3	0.2	0.3	C	C	C	C	0.4	0.4	0.5	0.4	0.9	0.5	0.5	0.3	0.3	0.3	0.4	1.2	0.7	0.4	1.2	
2-Nov	0.5	Z	0.9	0.9	0.4	0.3	0.3	0.4	0.4	0.3	0.4	0.5	0.6	0.6	0.5	0.5	0.4	0.5	0.7	0.7	0.6	0.7	0.6	0.7	0.5	0.9	
3-Nov	0.6	0.5	Z	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.5	0.3	0.3	0.2	0.3	0.3	0.5	0.3	0.3	0.6	
4-Nov	0.4	0.2	0.2	Z	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.7	1.4	1.2	1.4	1.8	3.9	2.3	1.7	1.2	0.8	3.9	
5-Nov	1.0	0.8	0.7	0.5	Z	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.5	0.4	0.4	0.3	0.3	0.3	0.4	1.0	
6-Nov	0.3	0.3	0.4	0.7	0.6	Z	0.5	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.7	1.2	2.4	2.0	1.7	1.7	0.7	2.4	
7-Nov	Z	1.0	0.5	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.5	0.6	1.2	1.3	1.2	1.1	1.1	1.4	0.6	1.4	
8-Nov	0.5	Z	0.9	1.8	2.0	2.3	1.4	0.6	0.8	1.8	2.0	1.2	0.5	0.3	0.3	0.2	0.2	0.3	0.5	0.4	0.3	0.3	0.6	0.4	0.8	2.3	
9-Nov	0.3	0.3	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
10-Nov	0.3	0.3	0.3	Z	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.7	1.0	0.9	1.1	0.8	0.7	0.5	0.6	0.5	1.1	
11-Nov	0.7	0.8	0.5	0.4	Z	0.8	1.0	0.5	0.4	0.5	0.5	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.7	0.5	1.0	
12-Nov	0.5	0.5	0.6	0.6	0.4	Z	0.6	0.4	0.4	0.4	0.5	0.4	0.4	0.7	0.7	0.4	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.4	0.7	
13-Nov	Z	0.4	0.5	0.4	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.5	0.4	0.6	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.6	
14-Nov	0.4	Z	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.4	0.4	0.6	
15-Nov	0.4	0.4	Z	0.4	0.5	0.4	0.5	0.4	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.5	0.4	0.5	0.4	0.3	0.5	0.6	
16-Nov	0.2	0.3	0.2	Z	0.2	0.3	0.3	0.4	0.3	0.4	0.7	0.6	0.8	0.7	0.8	0.5	0.5	0.5	1.1	1.5	1.9	1.6	1.4	1.2	0.7	1.9	
17-Nov	1.2	0.6	0.4	0.4	Z	0.3	0.4	0.6	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.2	0.3	0.5	1.2	
18-Nov	0.3	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.5	0.6	1.9	1.8	0.5	0.3	0.3	0.3	0.4	0.5	0.5	1.9	
19-Nov	Z	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.5	
20-Nov	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	
21-Nov	0.3	0.3	Z	0.3	0.3	DF	0.3	0.2	M	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.5	0.7	1.3	0.5	0.4	1.3	
22-Nov	0.3	0.4	0.4	Z	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.7	0.8	0.9	0.4	0.4	0.5	0.4	0.3	0.6	0.4	0.4	0.3	0.3	0.4	0.9	
23-Nov	0.4	0.4	0.4	0.4	Z	0.4	0.3	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	
24-Nov	0.3	0.3	0.4	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	
25-Nov	Z	0.4	0.7	0.7	1.5	0.8	0.5	0.5	0.7	0.7	0.4	0.3	0.5	0.9	1.1	1.1	0.4	0.5	0.5	0.6	0.6	0.6	0.5	0.7	0.7	1.5	
26-Nov	0.3	Z	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.5	
27-Nov	0.3	0.3	Z	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	
28-Nov	0.3	0.3	0.3	Z	0.2	0.2	0.3	0.5	0.7	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.7	
29-Nov	0.5	0.5	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.7	1.0	0.7	0.7	0.8	1.4	1.3	0.9	0.8	0.6	0.6	0.5	0.5	0.6	1.4	
30-Nov	0.5	0.5	0.5	0.5	0.5	Z	0.5	0.5	0.6	0.6	0.5	0.6	0.7	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.5	0.7	
																								Diurnal Average		Diurnal Maximum	
0.4 0.4 0.5 0.5 0.4 0.5 0.4 0.4 0.4 0.4 0.5 0.4 0.4 0.4 0.4 0.5 0.6 0.5 0.5 0.6 0.7 0.6 0.6 0.5																								0.4		0.5	
1.2 1.0 0.9 1.8 2.0 2.3 1.4 0.6 0.8 1.8 2.0 1.2 1.0 0.9 0.9 1.1 1.9 1.8 1.4 1.8 3.9 2.3 1.7 1.7																								1.2		1.7	
Z - zerospan C - Calibration M - Maintenance DF - DAS Failure																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																											





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb**  
**Fort Hills - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	683	99.85	99.85
3 - 4	1	0.15	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb**  
**Fort Hills - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	135	58	18	6	4	14	36	88	92	54	34	26	22	20	23	53	683
3 - 4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	135	58	18	6	4	14	37	88	92	54	34	26	22	20	23	53	684

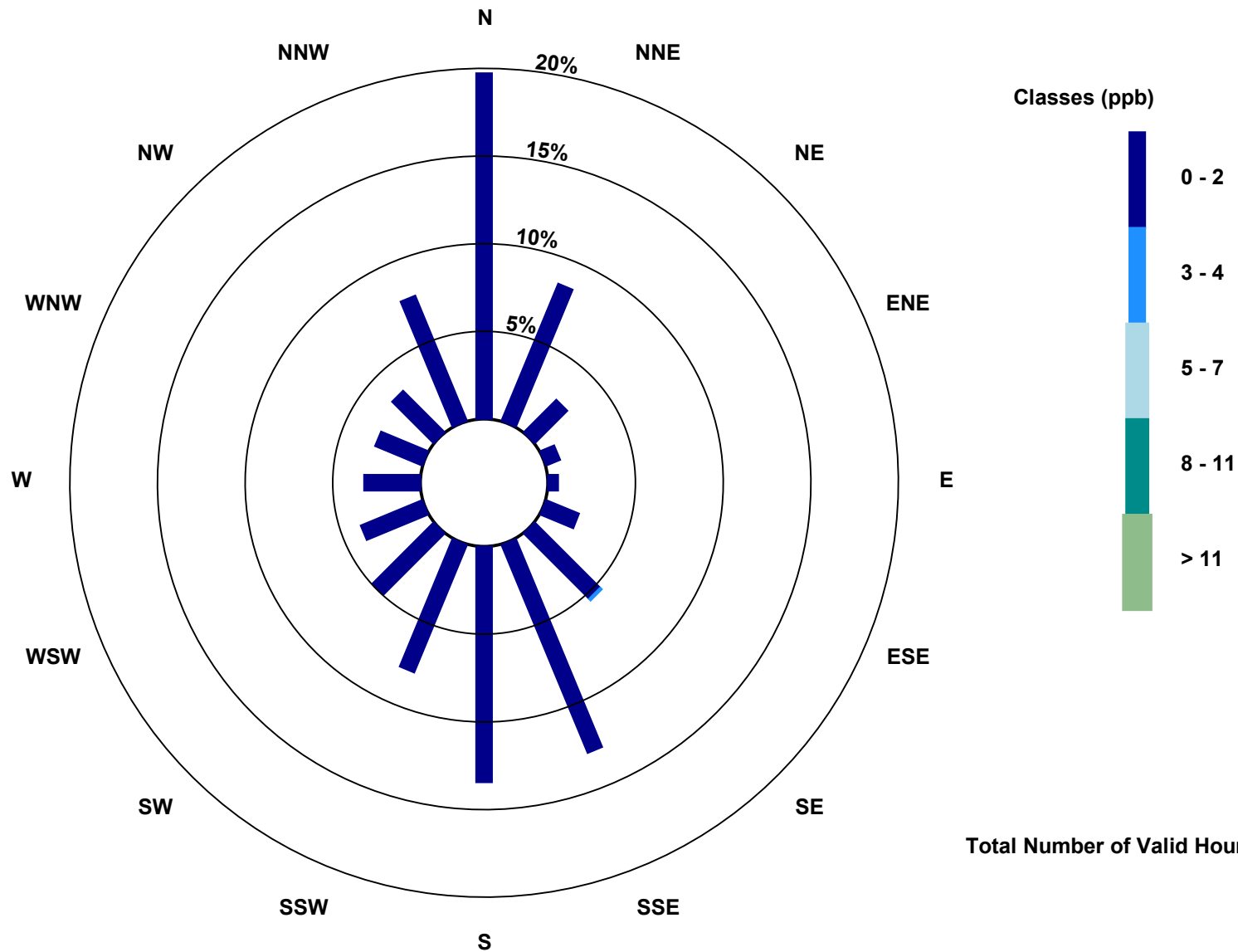
Total Number of Valid Hours: 684

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

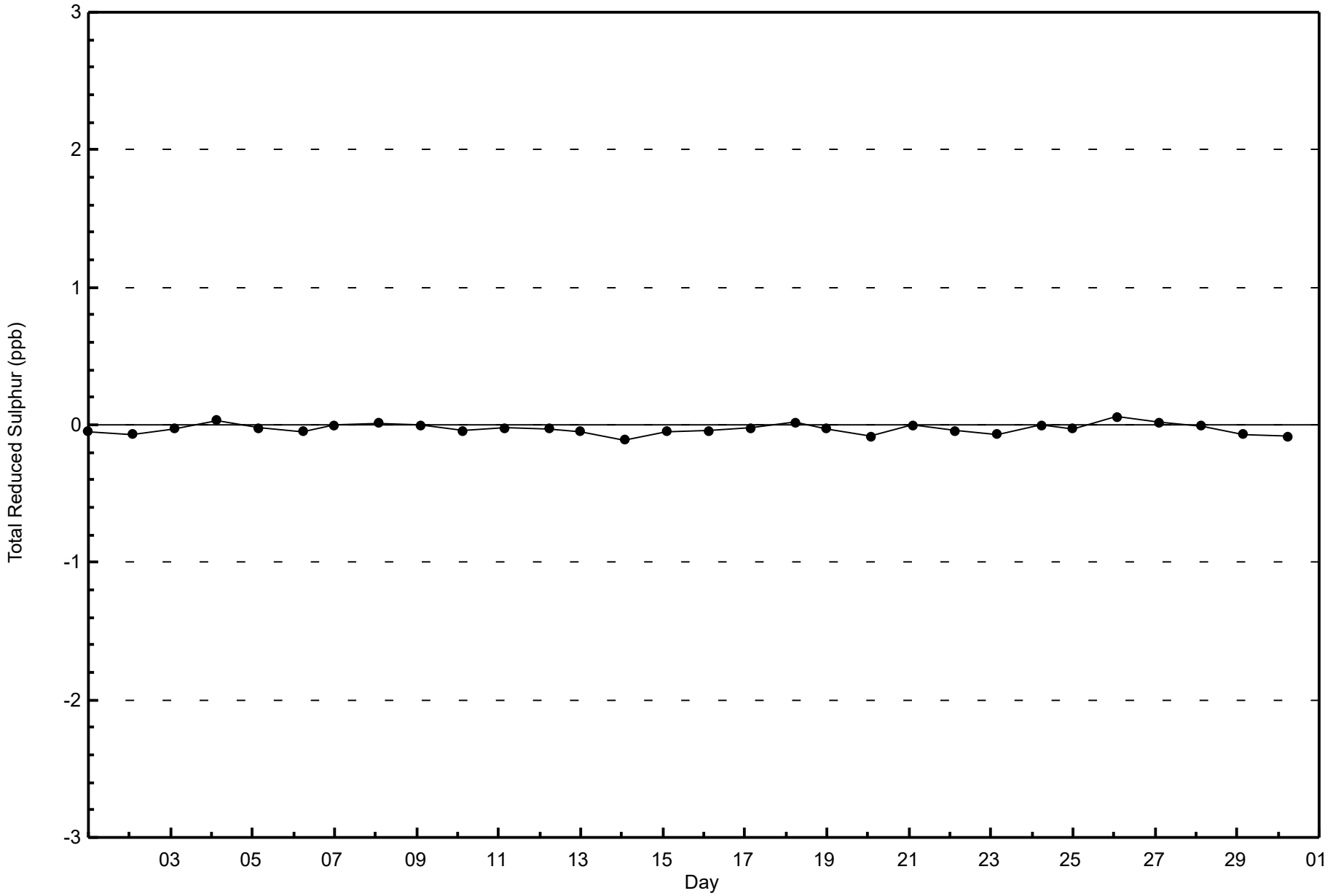
Total Reduced Sulphur (TRS) - ppb  
Fort Hills

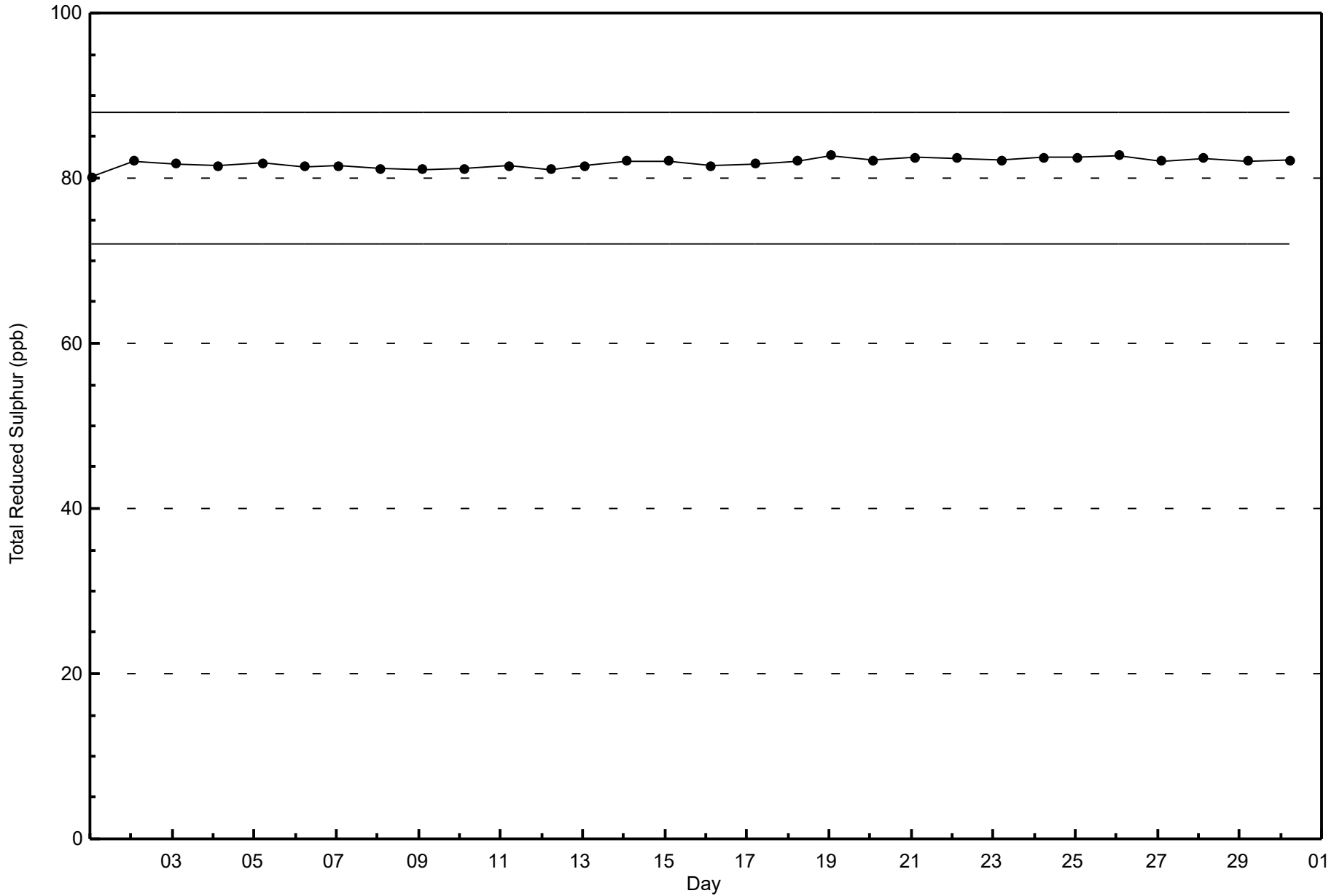




Wood Buffalo Environmental Association  
Zero Responses

Total Reduced Sulphur (TRS) - ppb  
Fort Hills - November 2024



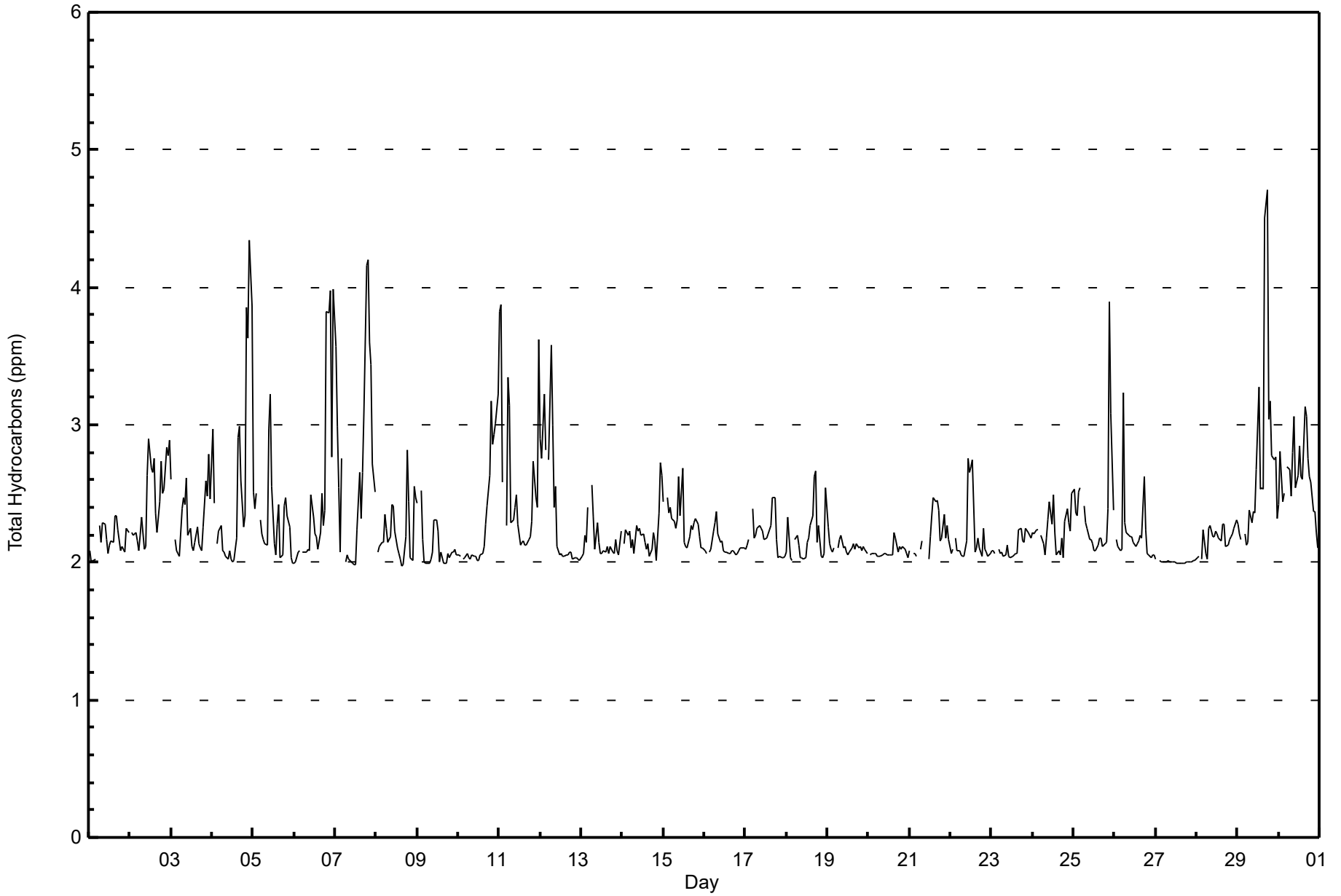






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Fort Hills - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Fort Hills - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	112	16.33	16.33
2.1 - 3.0	540	78.72	95.04
3.1 - 10.0	34	4.96	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Fort Hills - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	6	6	1	2	1	2	4	7	17	10	3	4	16	10	10	13	112
2.1 - 3.0	121	54	17	4	2	8	25	79	71	44	30	21	6	9	11	38	540
3.1 - 10.0	9	0	0	0	1	4	8	3	1	3	0	0	0	0	1	4	34
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	136	60	18	6	4	14	37	89	89	57	33	25	22	19	22	55	686

Total Number of Valid Hours: 686

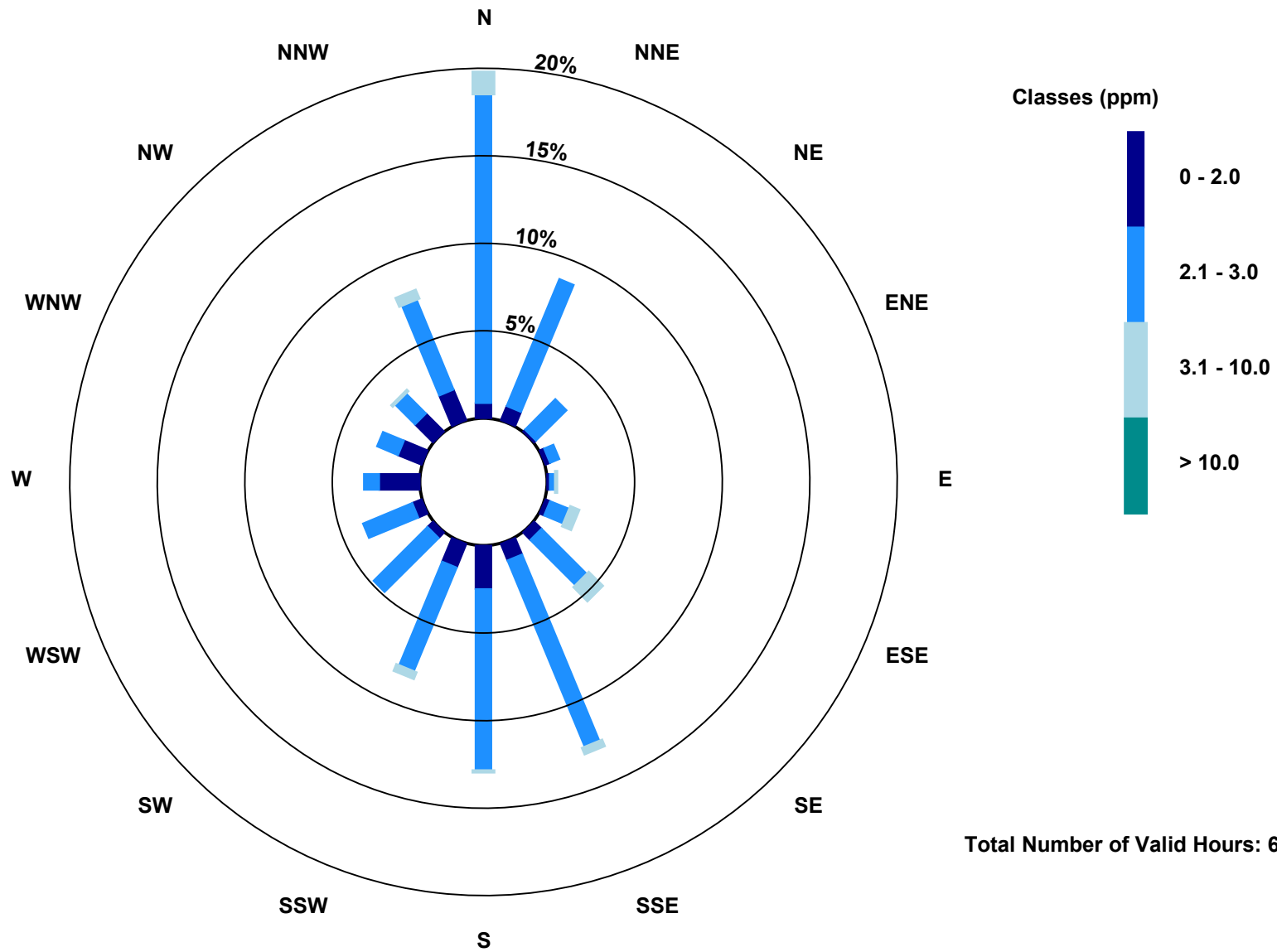
Total Number of Hours: 720



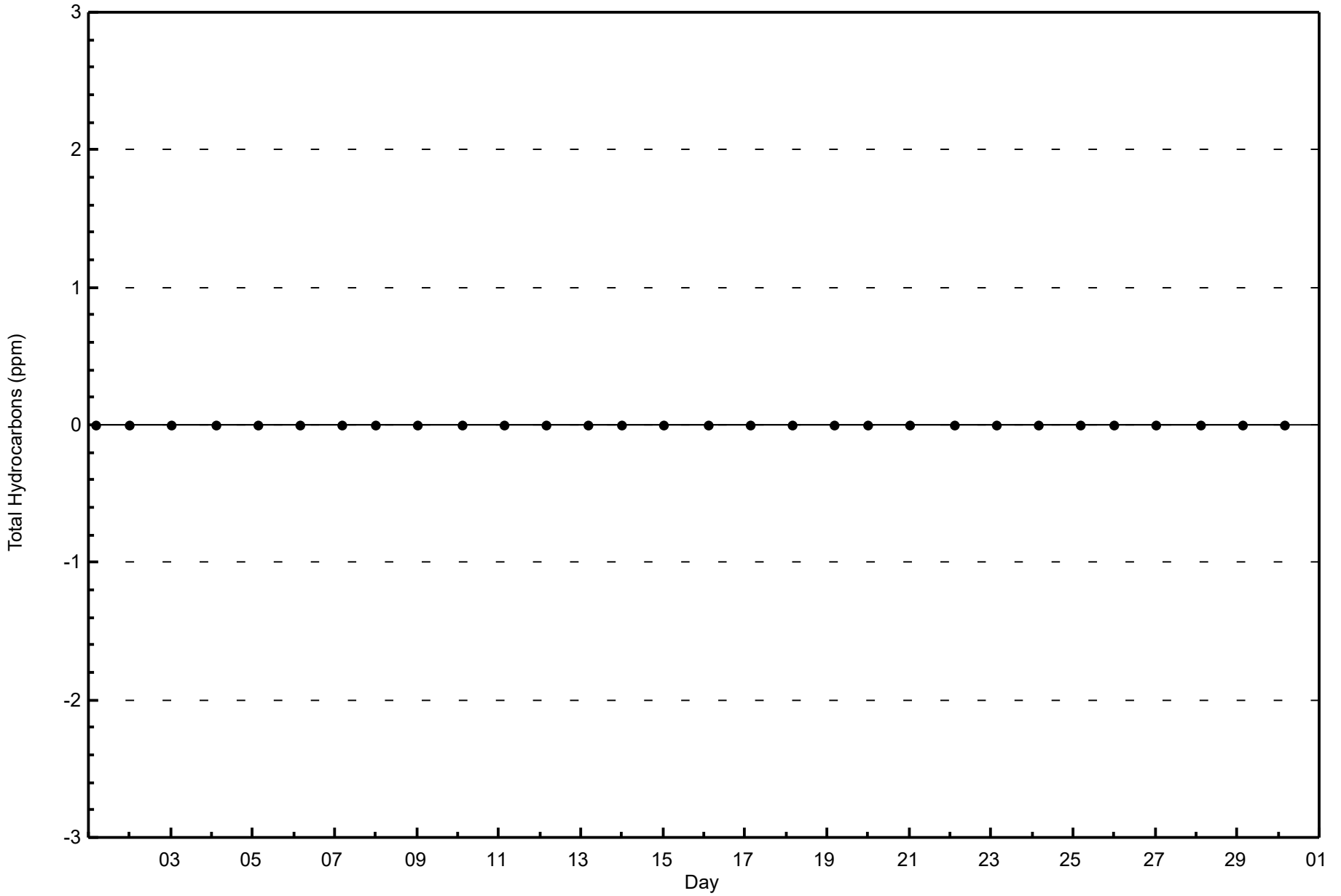


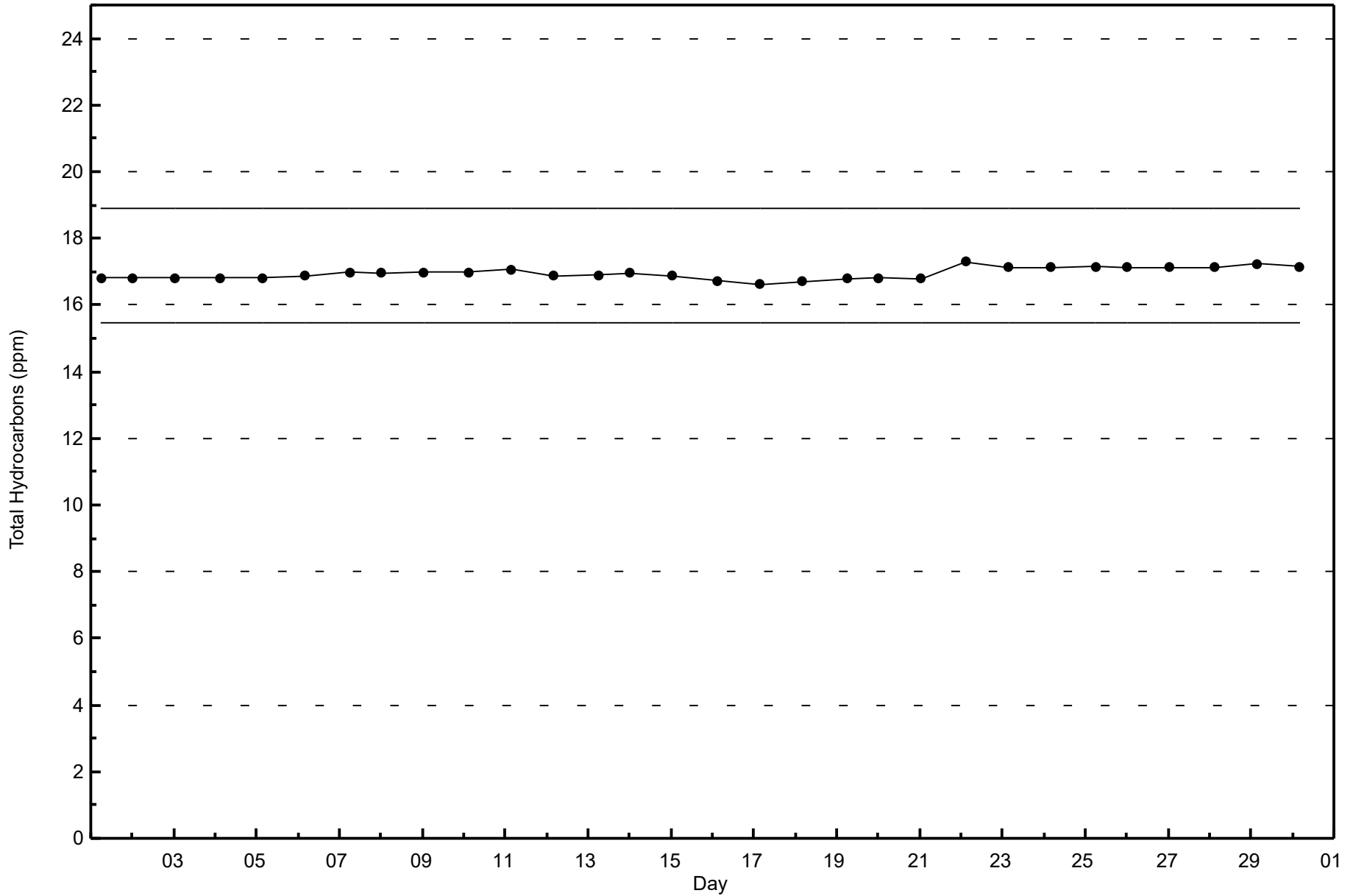
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Hydrocarbons (THC) - ppm  
Fort Hills



Total Number of Valid Hours: 686







Summary of Hour Averages

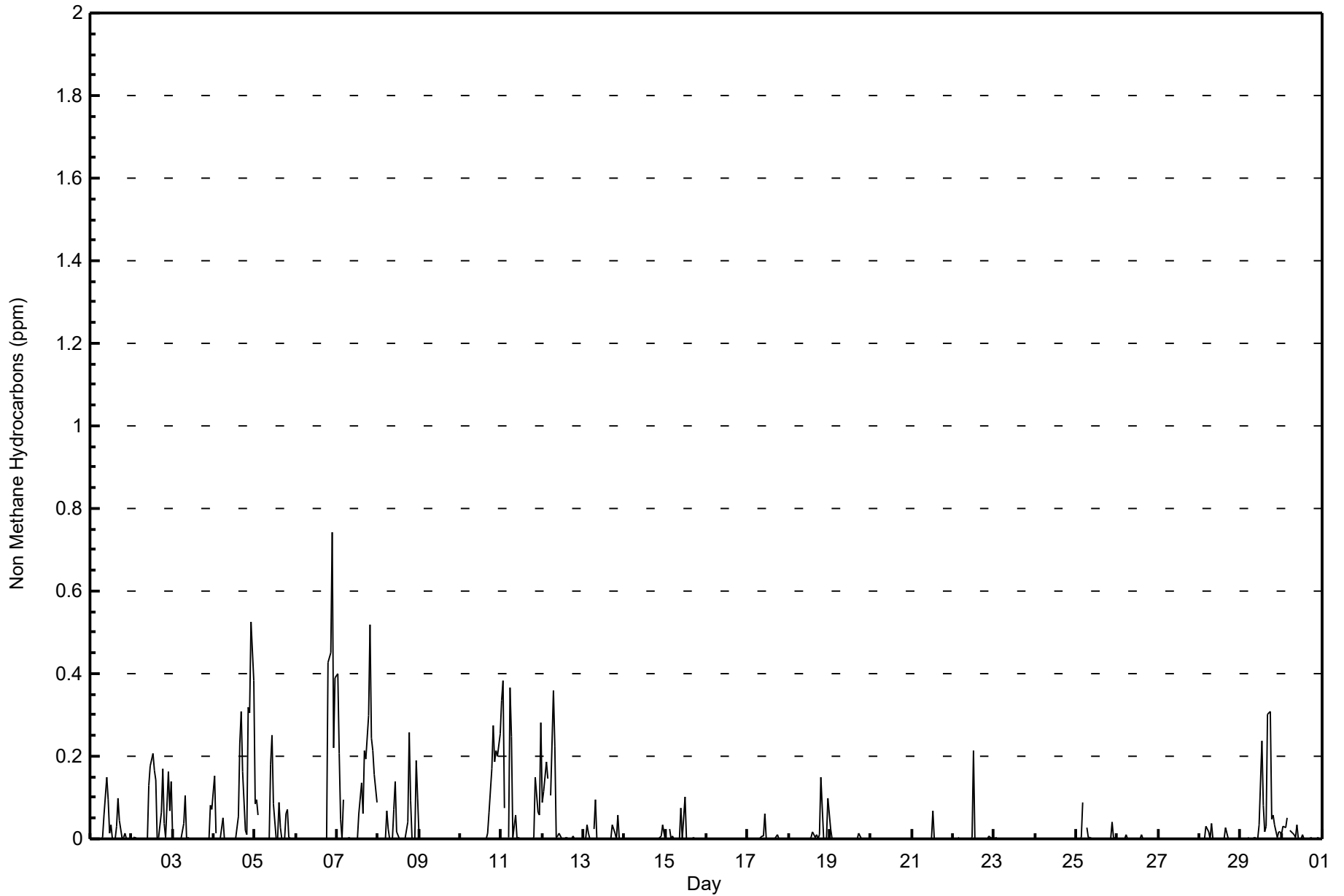
Fort Hills - November 2024

Maximum Value: 0.741 ppm on Nov 6 22:00		Maximum Daily Average: 0.128 ppm on Nov 7		Hours in Service: 720																						
Minimum Value: 0.000 ppm on Nov 1 01:00		Minimum Daily Average: 0.000 ppm on Nov 16		Hours of Data: 686																						
Maximum Diurnal Average: 0.061 ppm at hour 24		Minimum Diurnal Average: 0.005 ppm at hour 9		Hours of Missing Data: 34																						
Monthly Average: 0.029 ppm		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.1 P <sub>99</sub> = 0.4		Hours of Calibration: 32																						
				Percent Operational Time: 99.7																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.004	0.056	0.150	0.095	0.013	0.033	0.000	0.000	0.031	0.099	0.043	0.000	0.005	0.013	0.000	0.000	0.000	0.024	0.150
2-Nov	Z	0.005	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.130	0.177	0.208	0.166	0.144	0.000	0.004	0.065	0.168	0.038	0.003	0.163	0.066	0.139	0.064	0.208
3-Nov	0.008	Z	0.000	0.000	0.000	0.000	0.037	0.106	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.070	0.013	0.106
4-Nov	0.153	0.014	Z	0.000	0.000	0.050	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.055	0.230	0.308	0.164	0.019	0.010	0.320	0.306	0.525	0.383	0.110	0.525
5-Nov	0.084	0.094	0.057	Z	0.000	0.000	0.000	0.000	0.000	0.179	0.249	0.086	0.000	0.000	0.090	0.027	0.000	0.000	0.061	0.071	0.003	0.000	0.000	0.000	0.044	0.249
6-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.427	0.451	0.741	0.219	0.390	0.097	0.741
7-Nov	0.401	0.206	0.049	0.001	0.095	Z	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.063	0.136	0.060	0.214	0.194	0.298	0.518	0.245	0.213	0.155	0.089	0.128	0.518
8-Nov	Z	0.000	0.000	0.000	0.000	0.069	0.024	0.000	0.000	0.071	0.140	0.016	0.000	0.000	0.000	0.000	0.001	0.041	0.257	0.090	0.000	0.000	0.189	0.099	0.043	0.257
9-Nov	0.006	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
10-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.065	0.168	0.274	0.186	0.214	0.200	0.253	0.060	0.274
11-Nov	0.336	0.382	0.075	Z	0.003	0.367	0.249	0.003	0.057	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.149	0.063	0.058	0.281	0.088	0.382
12-Nov	0.089	0.115	0.187	0.145	Z	0.104	0.360	0.223	0.002	0.005	0.013	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.054	0.360
13-Nov	0.000	0.000	0.033	0.013	0.000	Z	0.022	0.095	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.034	0.014	0.000	0.057	0.000	0.000	0.012	0.095	
14-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.033	0.013	0.002	0.033
15-Nov	0.000	Z	0.023	0.000	0.008	0.000	0.000	0.000	0.000	0.076	0.000	0.102	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.102
16-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.002	0.008	0.008	0.059	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.059
18-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.015	0.003	0.009	0.000	0.011	0.148	0.000	0.000	0.000	0.097	0.012	0.148
19-Nov	0.023	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.023
20-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
21-Nov	0.000	Z	0.000	0.000	0.000	DF	0.000	0.000	M	C	C	0.000	0.067	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.067
22-Nov	0.000	0.000	Z	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.214	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.002	0.000	0.010	0.214
23-Nov	0.000	0.003	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
24-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25-Nov	0.000	0.000	0.000	0.005	0.088	Z	0.028	0.002	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.042	0.004	0.000	0.000	0.008	0.088
26-Nov	Z	0.000	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.011
27-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28-Nov	0.000	0.000	Z	0.000	0.031	0.015	0.000	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.037
29-Nov	0.000	0.000	0.000	Z	0.002	0.000	0.000	0.000	0.003	0.000	0.000	0.033	0.239	0.081	0.015	0.032	0.301	0.309	0.049	0.058	0.033	0.004	0.017	0.017	0.052	0.309
30-Nov	0.010	0.031	0.027	0.049	Z	0.020	0.012	0.011	0.004	0.033	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.003	0.000	0.000	0.009	0.049
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan		C - Calibration				M - Maintenance				DF - DAS Failure																



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Fort Hills - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Fort Hills - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	521	75.95	75.95
0.006 - 0.05	66	9.62	85.57
0.06 - 0.1	49	7.14	92.71
> 0.1	50	7.29	100.00

Total Number of Valid Hours: 686  
Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Fort Hills - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	104	48	14	3	2	3	21	74	81	48	17	19	22	16	18	31	521
0.006 - 0.05	11	7	4	2	0	2	4	7	4	3	6	3	0	2	3	8	66
0.06 - 0.1	7	4	0	0	1	1	3	4	3	3	8	3	0	1	0	11	49
> 0.1	14	1	0	1	1	8	9	4	1	3	2	0	0	0	1	5	50
<b>Totals</b>	136	60	18	6	4	14	37	89	89	57	33	25	22	19	22	55	686

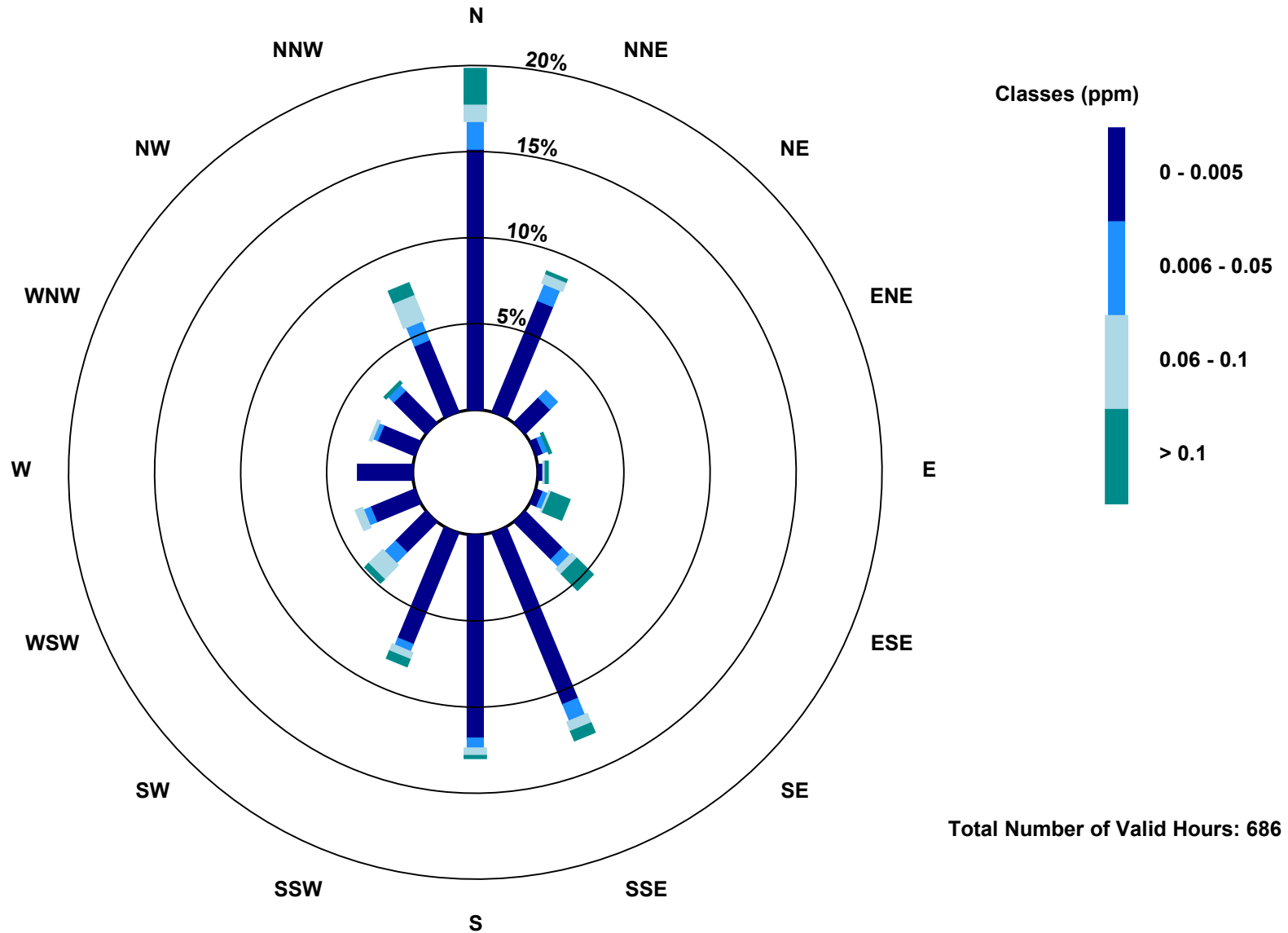
Total Number of Valid Hours: 686

Total Number of Hours: 720

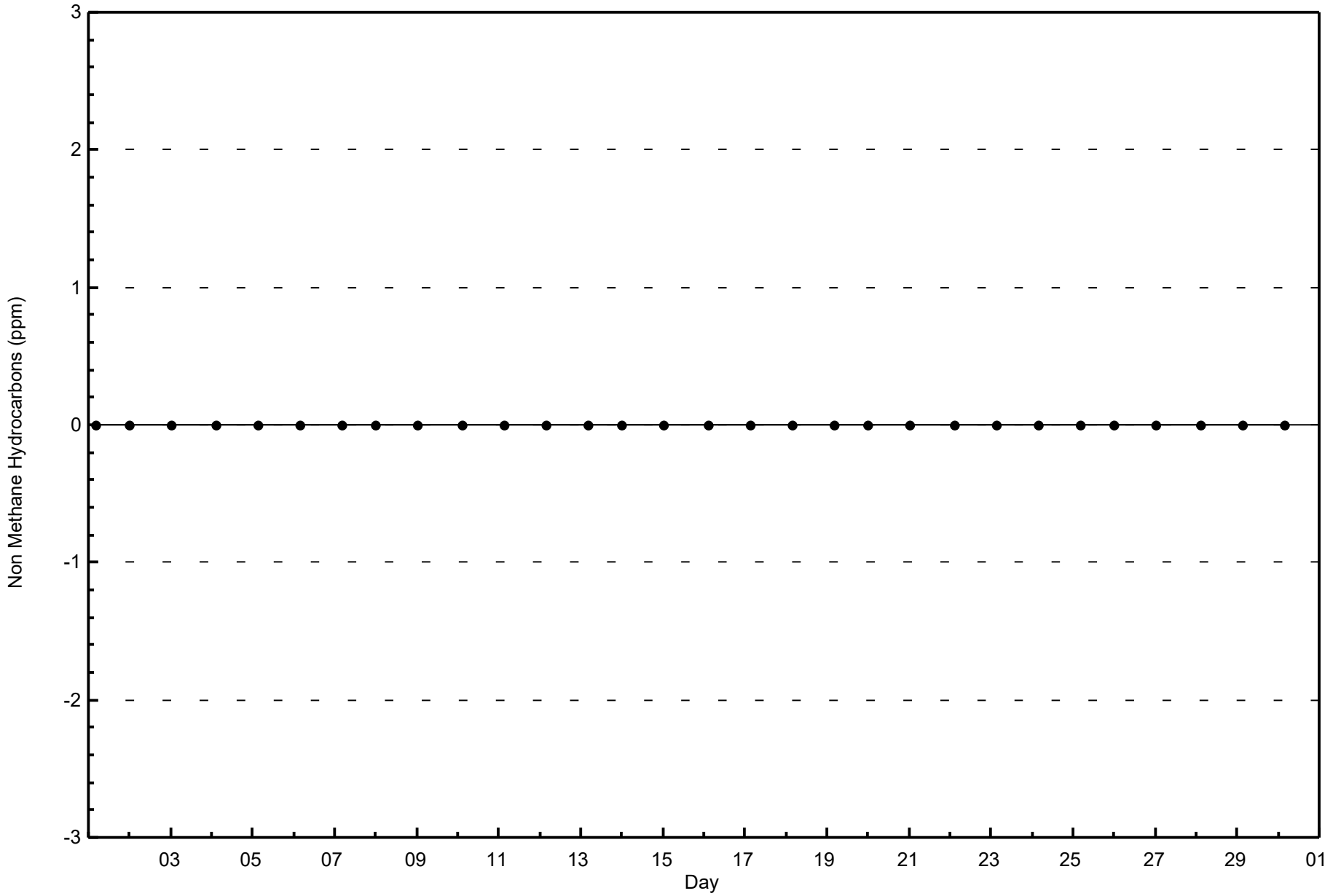


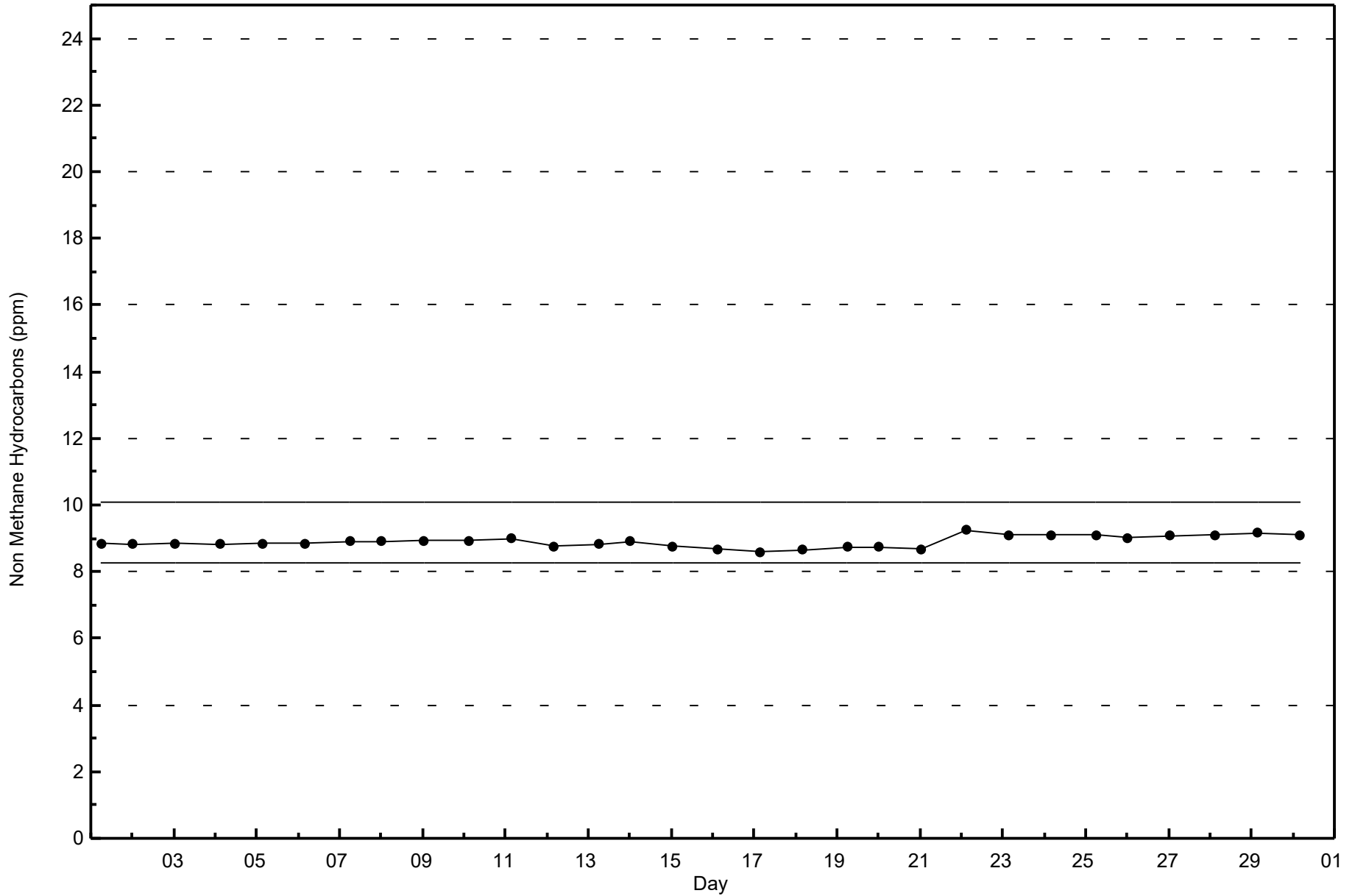
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Non Methane Hydrocarbons (NMHC) - ppm  
Fort Hills

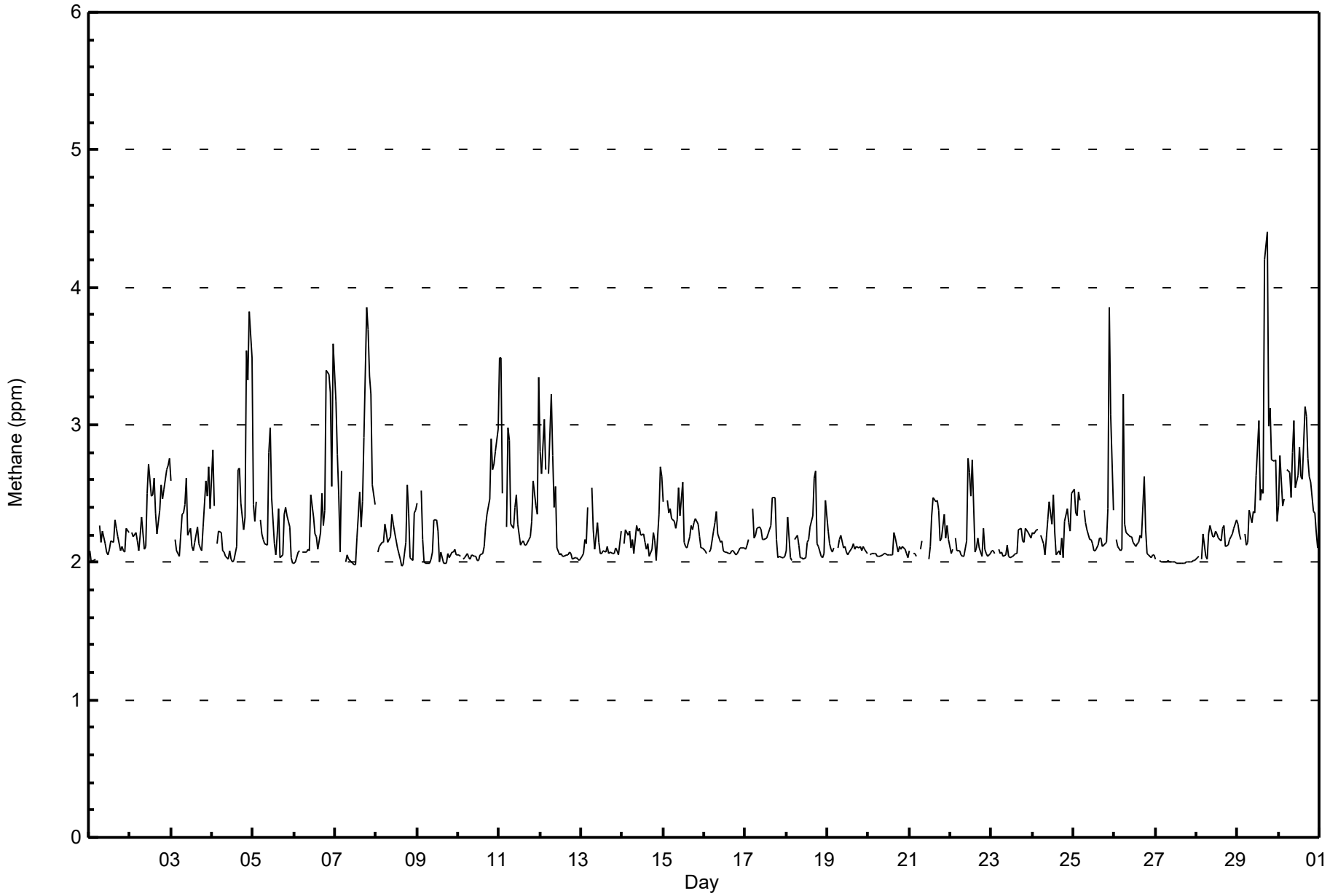














**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Fort Hills - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	113	16.47	16.47
2.1 - 3.0	548	79.88	96.36
3.1 - 10.0	25	3.64	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Fort Hills - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	6	6	1	2	1	2	4	7	17	10	3	5	16	10	10	13	113
2.1 - 3.0	123	54	17	4	3	10	26	80	71	45	30	20	6	9	11	39	548
3.1 - 10.0	7	0	0	0	0	2	7	2	1	2	0	0	0	0	1	3	25
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	136	60	18	6	4	14	37	89	89	57	33	25	22	19	22	55	686

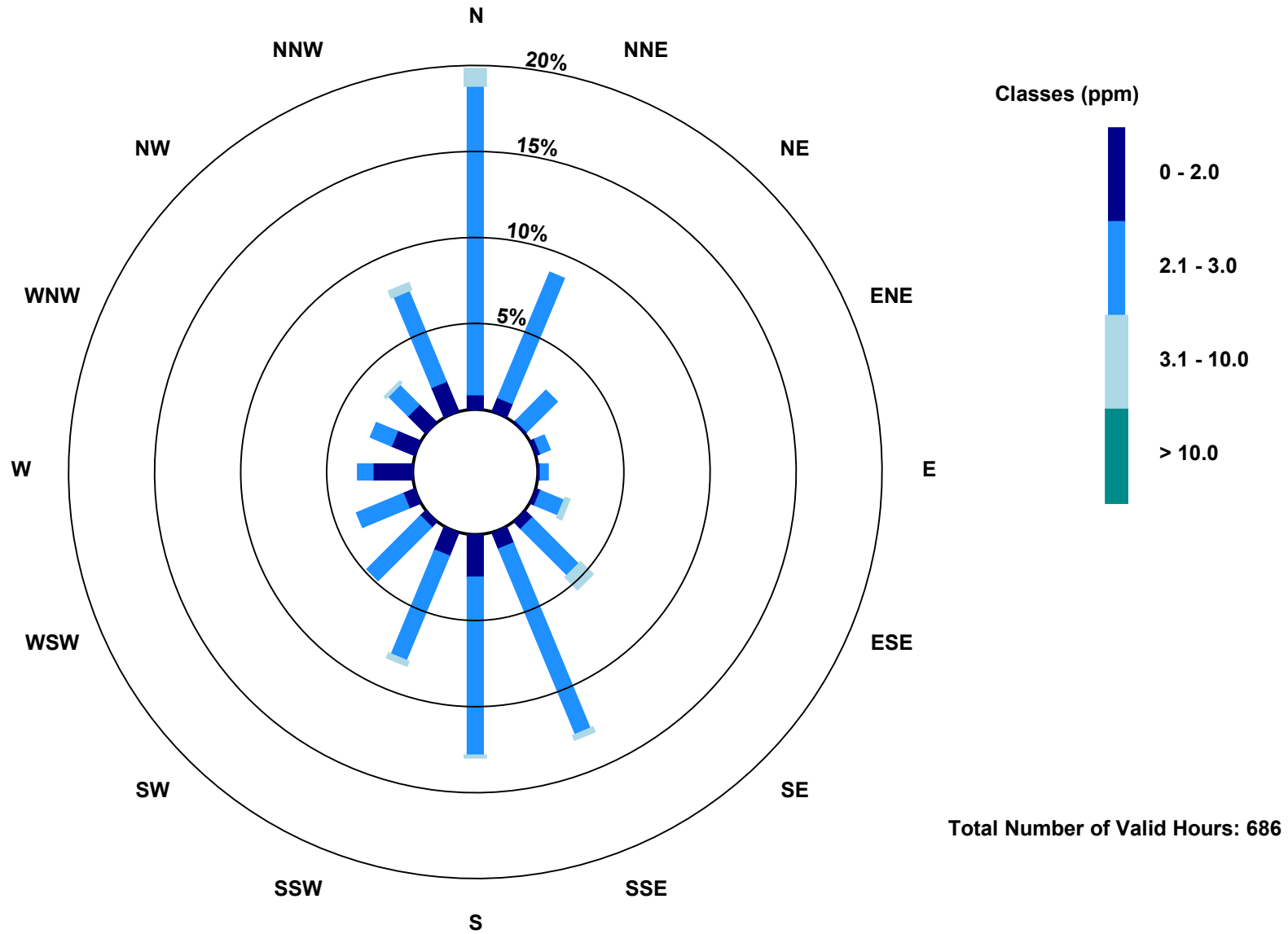
Total Number of Valid Hours: 686

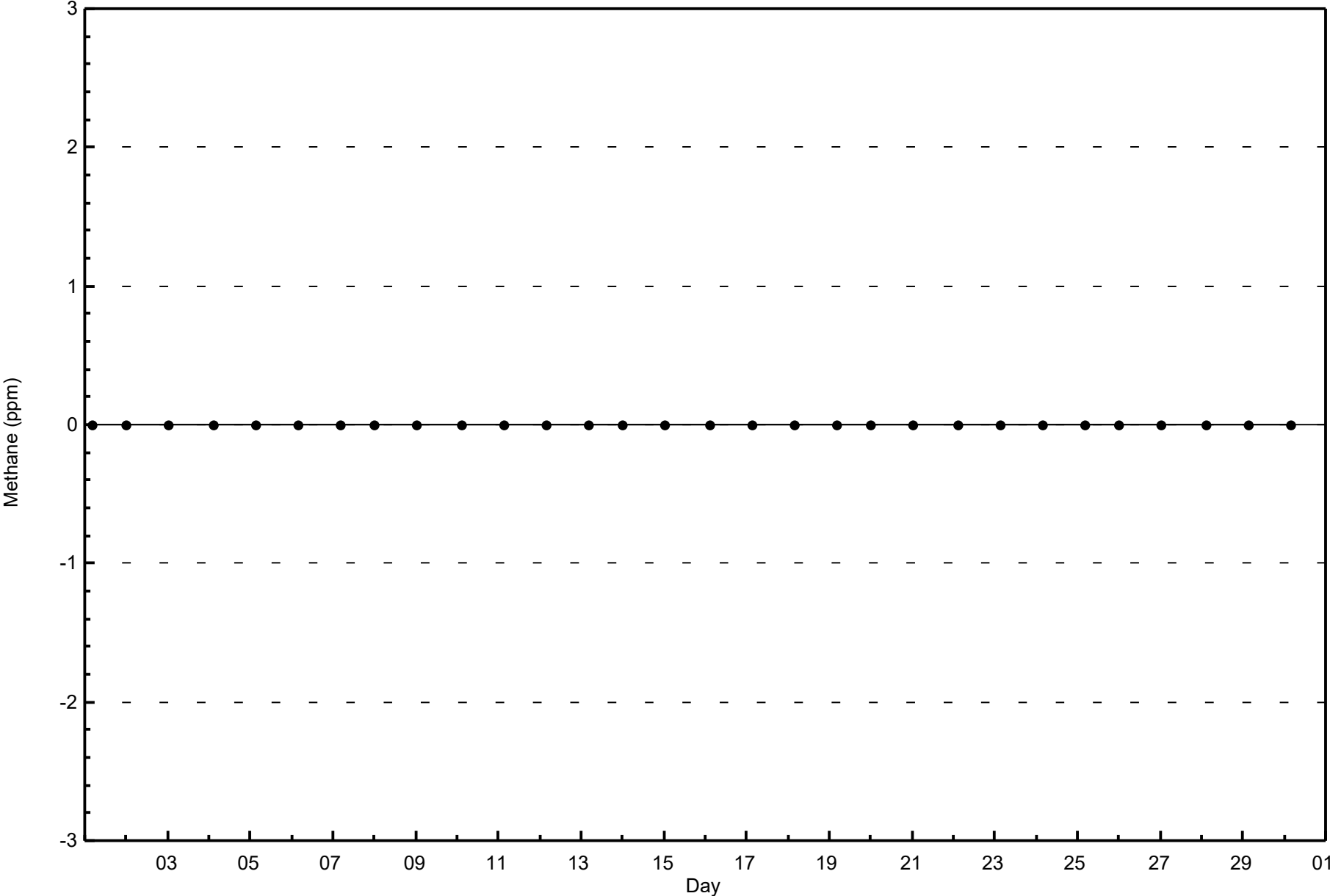
Total Number of Hours: 720



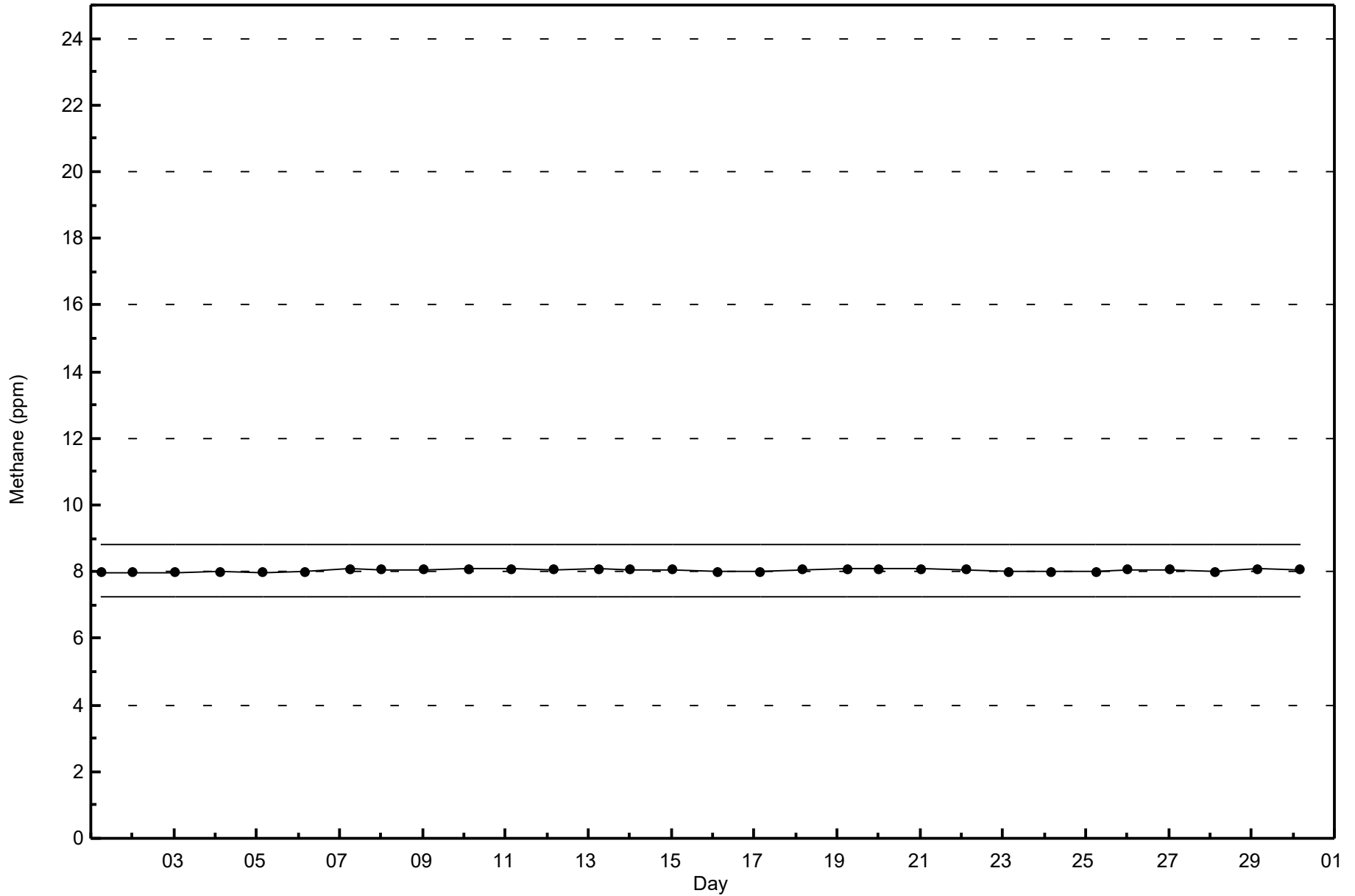
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Methane (CH<sub>4</sub>) - ppm  
Fort Hills











Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Fort Hills - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 177.5 ppb on Nov 29 18:00	Maximum Daily Average: 42.9 ppb on Nov 29		Hours of Data:	685
Minimum Value: 0.0 ppb on Nov 1 01:00	Minimum Daily Average: 0.2 ppb on Nov 27		Hours of Missing Data:	35
Maximum Diurnal Average: 22.3 ppb at hour 24	Minimum Diurnal Average: 5.4 ppb at hour 3		Hours of Calibration:	34
Monthly Average: 13.15 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.6 Median = 3.4 Q <sub>3</sub> = 13.4 P <sub>90</sub> = 40.1 P <sub>99</sub> = 127.1		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.0	0.0	0.0	Z	0.0	0.0	2.5	5.5	19.3	7.4	8.7	13.9	13.6	19.5	9.1	5.2	9.2	4.3	4.4	3.4	2.0	1.6	2.6	5.1	6.0	19.5
2-Nov	6.2	3.7	8.2	8.4	Z	0.1	7.6	14.7	0.9	5.7	41.6	53.2	49.3	41.6	40.0	22.5	12.6	19.9	37.3	29.9	38.4	68.9	38.8	61.4	26.6	68.9
3-Nov	41.3	23.9	6.4	3.0	1.5	Z	12.6	10.8	11.7	19.7	5.7	8.4	1.5	0.8	2.4	4.5	0.0	0.0	0.0	8.0	23.9	15.0	44.6	18.7	11.5	44.6
4-Nov	Z	8.6	0.4	1.5	2.5	11.9	0.3	0.7	C	C	C	C	0.0	0.2	11.6	57.5	37.2	31.9	11.2	23.1	145.3	91.2	137.6	106.0	35.7	145.3
5-Nov	45.6	Z	22.9	12.8	18.7	2.4	0.7	0.4	0.9	37.1	41.6	16.7	2.4	0.4	10.0	10.1	0.0	0.1	20.8	17.1	20.3	2.1	0.2	0.0	12.3	45.6
6-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.3	13.4	4.8	3.0	4.5	4.9	4.2	5.1	0.7	10.1	86.0	55.5	49.9	12.9	109.5	15.9	109.5
7-Nov	70.4	38.5	7.4	Z	13.4	0.9	0.0	0.0	0.0	0.1	0.0	0.0	0.0	5.1	13.9	4.7	66.6	67.5	95.9	153.9	89.7	130.4	36.0	21.4	35.5	153.9
8-Nov	4.6	0.1	0.0	0.0	Z	0.0	0.0	0.7	1.3	8.4	4.0	1.9	2.3	2.0	0.7	0.0	0.0	1.8	32.1	19.6	0.1	0.0	40.2	21.4	6.1	40.2
9-Nov	1.4	1.2	1.0	0.0	0.0	Z	0.0	0.0	0.2	1.8	6.3	7.1	4.6	0.7	1.8	0.0	0.0	0.0	0.0	0.0	0.5	0.6	0.1	0.0	1.2	7.1
10-Nov	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.8	0.5	0.0	0.5	1.5	0.7	0.7	10.0	35.0	74.1	41.0	61.8	59.7	68.8	15.5	74.1
11-Nov	93.9	Z	41.0	7.3	13.0	163.4	124.1	11.1	11.6	27.0	23.4	8.5	0.7	1.0	4.7	0.6	3.8	4.3	6.8	17.9	42.1	27.7	33.3	126.5	34.5	163.4
12-Nov	55.6	58.6	Z	66.5	19.5	27.1	44.6	14.4	5.6	19.9	2.2	0.4	1.2	0.6	0.8	1.0	1.2	3.2	1.3	0.0	0.0	0.0	0.0	0.0	14.1	66.5
13-Nov	0.0	0.6	4.8	Z	1.8	8.8	27.9	20.7	6.0	20.7	12.5	4.7	2.3	1.8	2.1	0.7	2.8	1.3	0.6	1.8	2.1	1.6	1.5	2.9	5.7	27.9
14-Nov	3.2	1.6	3.0	4.3	Z	1.7	2.5	0.5	6.6	5.3	5.2	4.7	5.6	3.7	2.7	3.1	3.3	2.3	7.5	3.3	0.4	19.7	43.1	39.5	7.5	43.1
15-Nov	26.1	30.0	15.3	20.6	19.6	Z	6.4	2.3	11.3	45.6	20.4	20.6	3.0	1.9	1.3	5.3	4.1	3.9	14.2	15.2	11.1	4.0	0.4	0.2	12.3	45.6
16-Nov	Z	0.0	0.0	0.2	0.3	8.8	12.7	24.5	3.9	4.0	3.0	2.8	2.1	1.0	0.4	0.2	3.0	1.3	0.0	0.0	0.0	0.0	1.9	0.3	3.1	24.5
17-Nov	0.3	Z	6.7	3.5	3.7	3.3	5.2	4.4	5.3	2.6	2.4	1.7	1.8	1.3	0.9	0.4	10.6	20.1	2.5	0.0	0.0	0.0	0.0	0.0	3.3	20.1
18-Nov	0.6	5.1	Z	0.0	0.4	5.8	8.7	1.7	0.0	0.1	0.1	0.3	4.5	9.5	14.3	29.7	81.2	28.1	5.8	6.9	7.9	2.7	8.6	17.0	10.4	81.2
19-Nov	24.4	12.7	2.8	Z	0.9	1.6	0.9	0.6	1.2	4.9	4.2	2.6	2.3	3.0	4.3	4.1	5.6	1.8	2.6	0.6	0.6	0.7	0.4	1.5	3.7	24.4
20-Nov	1.3	0.6	0.5	1.2	Z	0.4	0.6	1.0	1.0	1.4	1.9	2.4	1.7	0.7	1.6	5.3	3.9	1.8	0.6	1.6	1.7	0.4	0.7	0.7	1.4	5.3
21-Nov	1.1	0.8	0.6	1.2	1.1	Z	1.6	0.6	M	0.1	0.1	0.2	9.2	13.6	8.0	3.9	0.7	0.5	0.0	0.1	4.5	3.1	1.3	1.1	2.4	13.6
22-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	14.0	56.4	59.1	78.9	63.4	5.7	7.7	2.1	0.6	0.0	1.1	1.9	2.0	1.7	1.5	12.9	78.9
23-Nov	1.2	Z	1.0	1.5	0.7	0.8	1.7	3.9	3.4	3.2	3.7	5.5	6.7	6.9	3.9	3.9	2.9	3.2	4.7	4.6	1.1	6.6	3.9	7.7	3.6	7.7
24-Nov	5.5	7.3	Z	4.8	6.7	5.2	5.7	4.8	11.0	15.4	16.1	15.0	15.9	12.5	13.3	10.9	9.7	8.7	13.8	23.9	17.7	14.0	6.4	13.7	11.2	23.9
25-Nov	14.8	7.1	10.7	Z	11.1	0.2	6.3	2.0	0.3	1.6	2.8	2.2	1.3	2.7	6.6	2.8	0.8	0.5	1.0	0.1	6.9	53.4	28.4	4.6	7.3	53.4
26-Nov	0.3	1.6	0.0	0.0	Z	27.8	3.3	5.8	1.5	3.7	5.6	4.8	5.0	4.1	1.9	1.1	0.4	19.0	12.4	0.2	0.0	0.0	0.0	0.0	4.3	27.8
27-Nov	0.0	0.1	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.3	0.1	0.4	0.0	0.0	0.1	0.1	0.5	0.2	0.3	0.2	0.0	0.6	0.5	0.1	0.2	0.6
28-Nov	Z	0.5	1.5	0.0	0.2	0.1	0.0	44.6	68.7	37.9	19.7	24.4	19.1	12.1	6.4	28.2	20.2	10.3	8.4	11.2	8.3	6.8	5.9	21.0	15.5	68.7
29-Nov	31.3	Z	0.8	1.7	2.1	1.1	0.3	7.4	4.4	19.0	13.0	65.0	110.2	49.8	37.6	42.5	150.1	177.5	95.1	79.2	34.3	29.7	24.3	10.1	42.9	177.5
30-Nov	20.9	28.8	Z	2.4	19.7	20.5	35.9	20.4	54.5	89.4	45.7	67.9	103.9	68.3	49.6	44.7	45.9	35.3	15.6	16.7	9.9	7.3	8.2	7.4	35.6	103.9

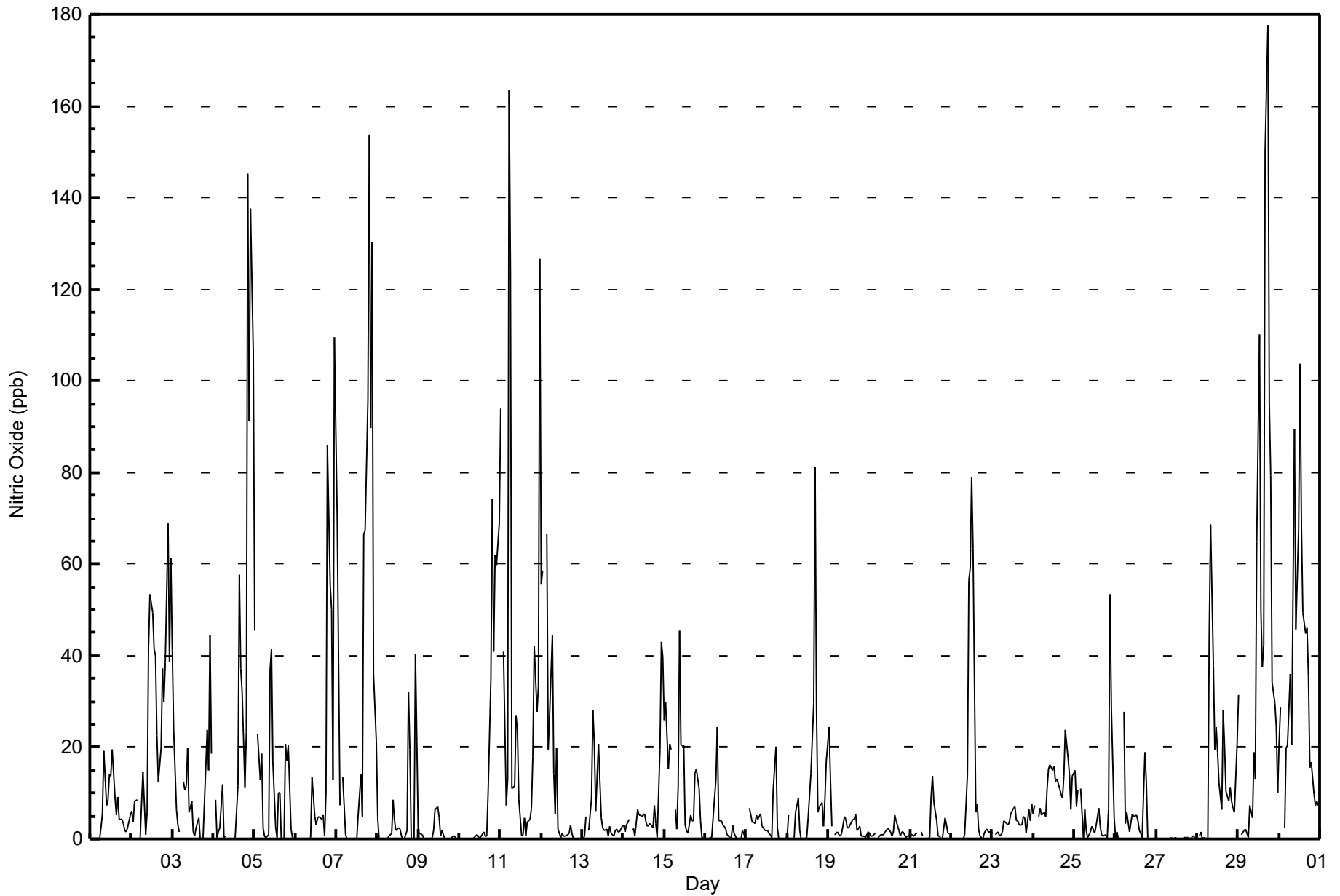
18.0	9.3	5.4	5.6	5.5	11.7	10.4	6.8	8.3	13.7	12.4	13.8	15.1	11.1	8.7	10.2	16.1	15.3	14.7	20.0	18.9	20.1	18.1	22.3	Diurnal Average	
93.9	58.6	41.0	66.5	19.7	163.4	124.1	44.6	68.7	89.4	56.4	67.9	110.2	68.3	49.6	57.5	150.1	177.5	95.9	153.9	145.3	130.4	137.6	126.5	Diurnal Maximum	

Z - zerspan C - Calibration M - Maintenance



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Fort Hills - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Fort Hills - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	562	82.04	82.04
21 - 40	55	8.03	90.07
41 - 80	47	6.86	96.93
81 - 159	18	2.63	99.56
> 159	2	0.29	99.85

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Fort Hills - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	107	54	17	4	3	6	23	77	81	47	28	26	22	16	20	31	562
21 - 40	10	2	1	1	0	1	5	8	2	6	5	0	0	2	2	10	55
11 - 80	14	2	0	1	0	5	4	1	2	3	1	0	0	0	1	13	47
81 - 159	5	0	0	0	0	2	6	2	0	0	0	0	0	0	0	3	18
> 159	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
<b>Totals</b>	137	58	18	6	4	14	38	88	85	56	34	26	22	18	23	57	684

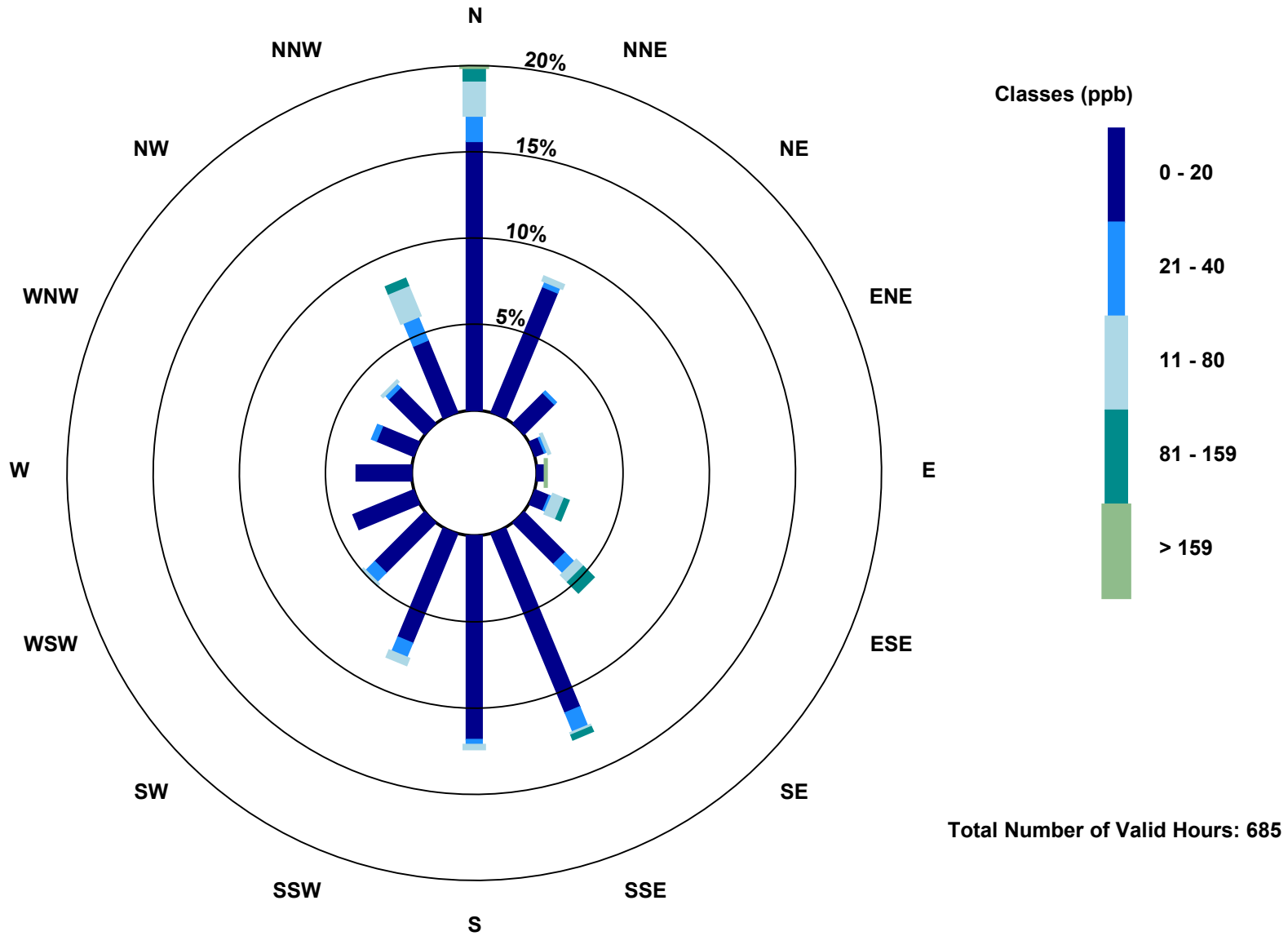
Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

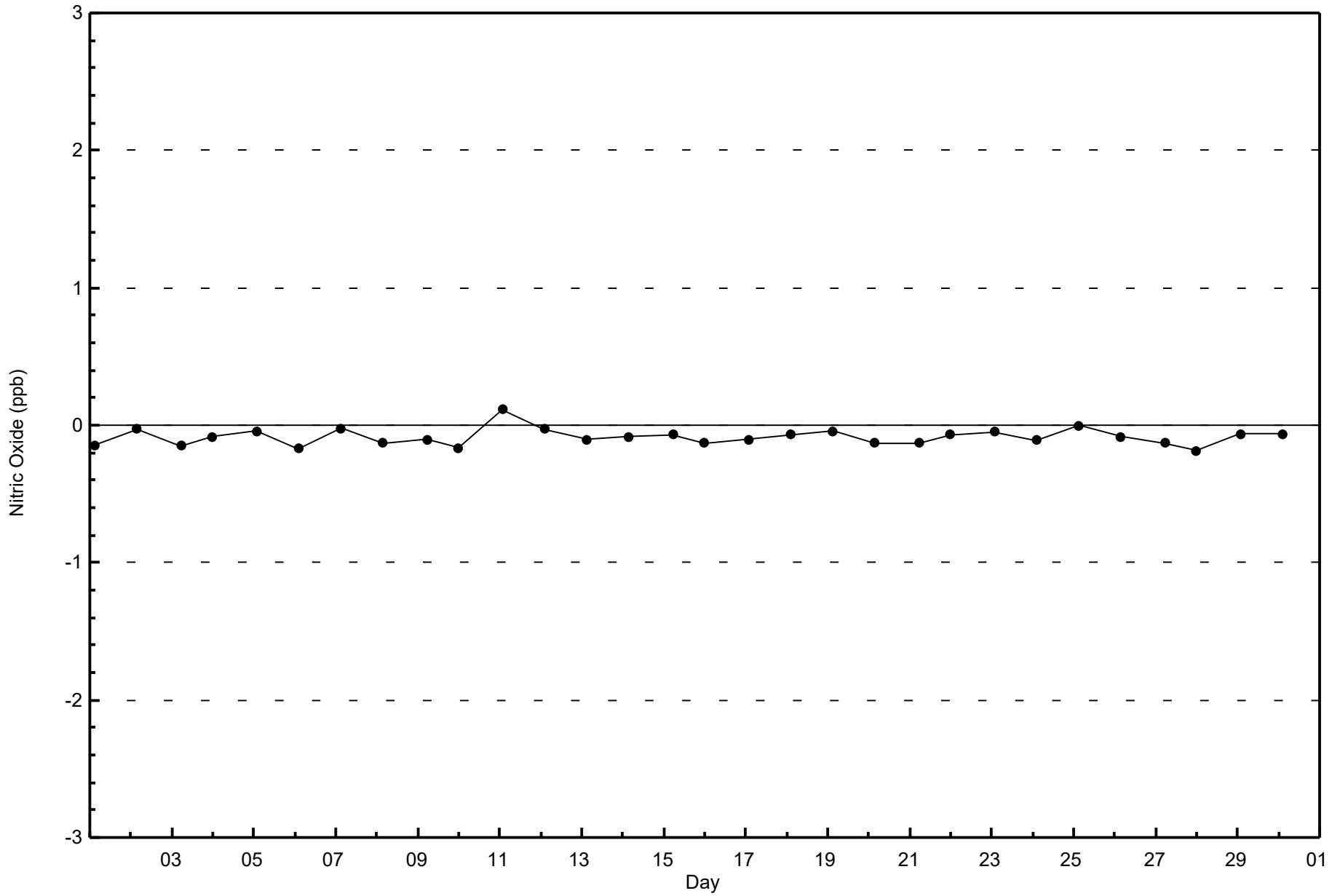
Nitric Oxide (NO) - ppb  
Fort Hills





**Wood Buffalo Environmental Association**  
**Zero Responses**

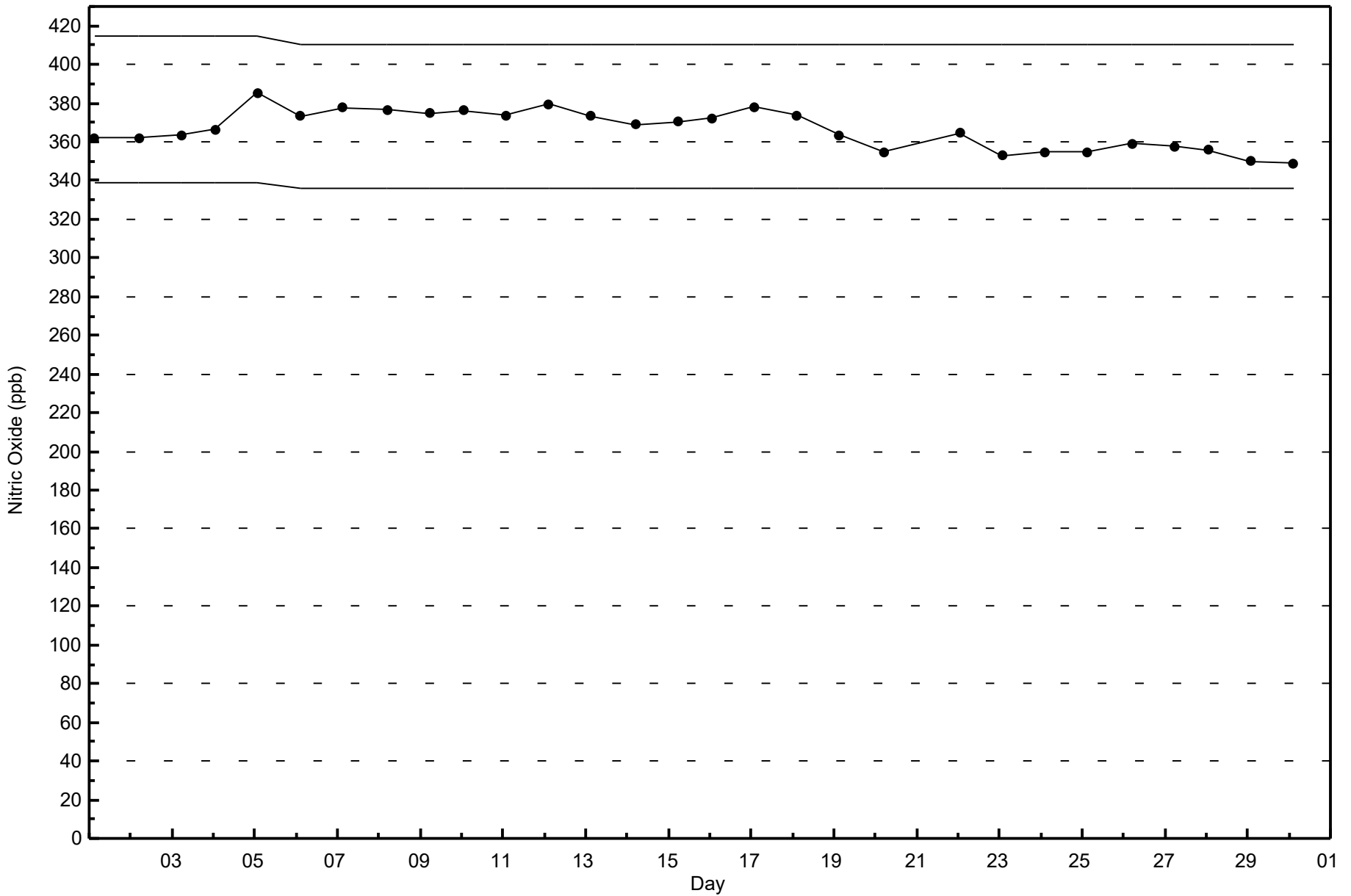
**Nitric Oxide (NO) - ppb**  
**Fort Hills - November 2024**





Wood Buffalo Environmental Association  
Span Responses

Nitric Oxide (NO) - ppb  
Fort Hills - November 2024







**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

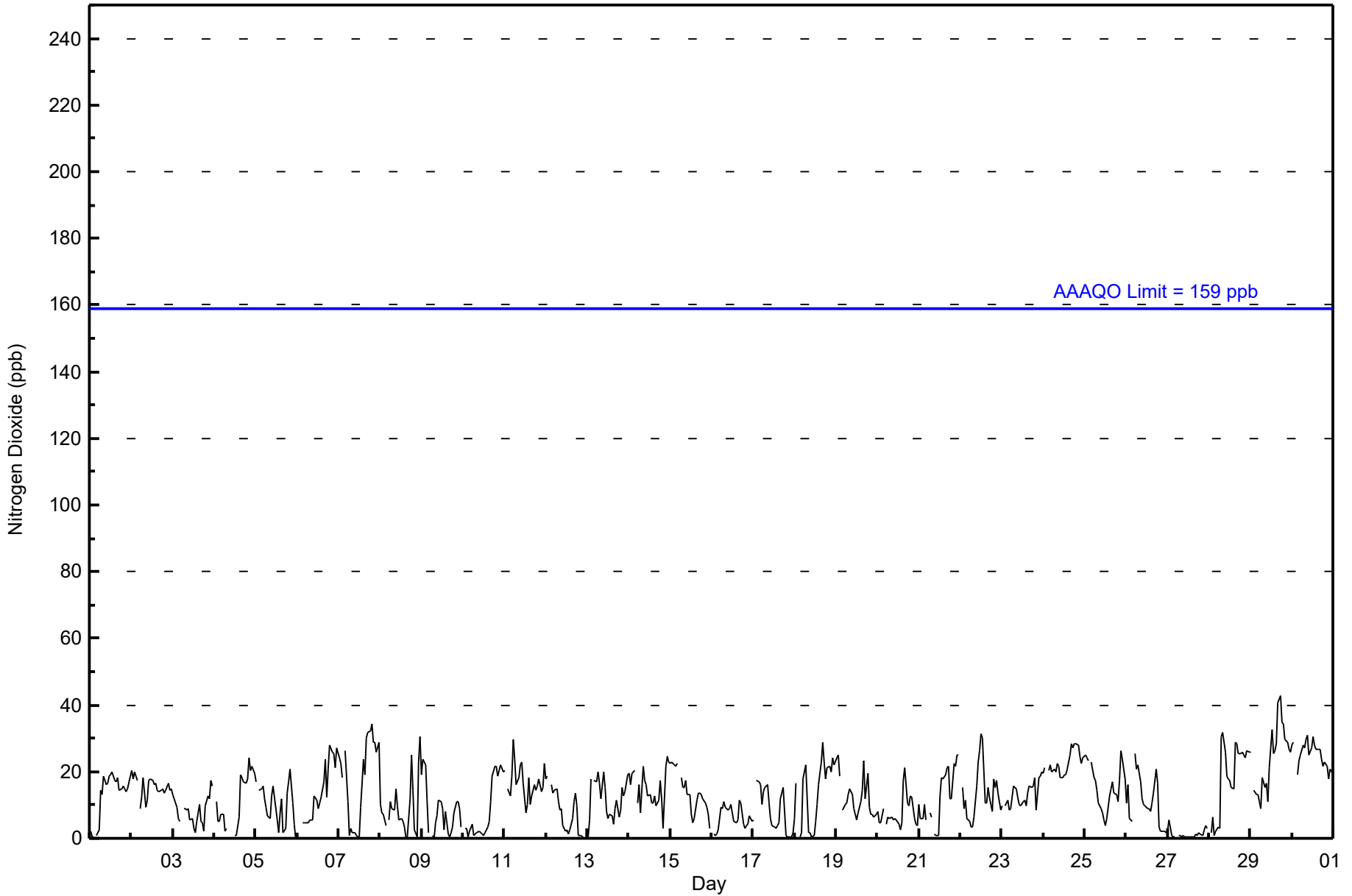
**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Fort Hills - November 2024**

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	720																											
Maximum Value: 42.9 ppb on Nov 29 18:00		Maximum Daily Average: 25.1 ppb on Nov 30																			Hours of Data:	685																											
Minimum Value: 0.1 ppb on Nov 6 00:00		Minimum Daily Average: 1.3 ppb on Nov 27																			Hours of Missing Data:	35																											
Maximum Diurnal Average: 16.1 ppb at hour 17		Minimum Diurnal Average: 9.8 ppb at hour 14																			Hours of Calibration:	34																											
Monthly Average: 12.84 ppb		Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 1.7 Q <sub>1</sub> = 5.6 Median = 12.0 Q <sub>3</sub> = 18.7 P <sub>90</sub> = 24.8 P <sub>99</sub> = 31.8																			Percent Operational Time:	99.9																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	2.3	0.4	0.5	Z	0.9	2.4	14.3	13.0	18.7	16.1	16.7	18.6	18.9	19.8	17.5	17.1	18.4	14.4	14.9	15.7	14.7	13.9	14.8	18.7	13.2	19.8																							
2-Nov	20.2	17.9	20.0	17.4	Z	9.1	12.2	18.2	9.2	11.4	17.4	17.6	17.5	16.1	16.5	14.5	14.1	14.3	14.7	13.7	14.3	16.4	14.3	14.9	15.3	20.2																							
3-Nov	13.3	11.9	9.4	6.1	5.0	Z	9.1	8.8	8.4	8.9	5.4	5.9	3.0	1.7	5.2	10.0	5.0	4.5	2.2	9.6	12.8	11.8	17.2	15.7	8.3	17.2																							
4-Nov	Z	11.0	5.2	5.0	7.4	7.2	2.3	2.9	C	C	C	C	0.7	0.8	6.2	19.0	18.3	17.1	16.4	17.8	24.2	20.4	21.4	19.4	11.7	24.2																							
5-Nov	17.1	Z	14.5	14.8	15.7	11.9	9.2	6.9	6.1	12.6	15.7	12.2	5.4	1.7	7.7	11.9	1.8	3.0	13.5	16.8	20.9	10.7	4.2	0.1	10.2	20.9																							
6-Nov	0.9	1.0	Z	4.5	4.5	4.5	4.6	5.6	5.4	5.3	12.9	11.4	9.0	10.7	12.3	16.9	23.9	12.3	20.8	28.1	26.0	25.3	21.0	27.2	12.8	28.1																							
7-Nov	24.2	22.4	18.3	Z	26.4	10.9	0.9	3.0	1.5	1.8	0.7	0.5	0.3	9.3	23.7	19.2	30.0	31.6	32.0	34.3	28.7	28.9	26.0	28.9	17.5	34.3																							
8-Nov	10.1	7.8	7.4	3.9	Z	5.4	11.1	9.0	8.5	15.0	9.8	5.7	6.0	5.1	3.5	0.5	0.6	11.7	25.0	14.5	2.6	0.6	22.8	30.7	9.4	30.7																							
9-Nov	18.9	23.7	22.2	11.6	1.5	Z	1.0	0.2	4.5	6.6	11.3	11.2	8.7	2.7	8.1	1.1	0.3	1.7	3.2	7.7	11.0	10.9	9.1	3.6	7.9	23.7																							
10-Nov	Z	2.8	3.0	0.5	2.2	4.4	0.8	1.1	1.8	2.0	1.9	1.2	0.7	1.8	3.2	5.1	11.1	18.8	21.6	21.7	18.7	20.2	22.0	20.1	8.1	22.0																							
11-Nov	20.5	Z	15.0	12.9	18.7	29.8	23.6	15.9	18.3	21.9	23.0	16.7	7.7	10.2	18.2	10.3	12.7	15.9	14.5	15.7	17.6	14.0	15.2	22.4	17.0	29.8																							
12-Nov	17.8	18.6	Z	16.0	13.5	14.2	15.0	11.1	8.5	9.0	3.7	2.1	2.5	1.4	2.5	6.0	11.1	13.5	9.6	0.7	0.8	0.3	0.2	0.2	7.8	18.6																							
13-Nov	0.4	5.7	17.6	Z	17.4	16.9	19.8	16.4	12.0	20.0	15.4	8.1	5.8	7.0	6.6	4.3	8.9	11.4	6.4	8.6	15.1	12.8	14.1	19.0	11.7	20.0																							
14-Nov	19.5	16.3	19.3	20.4	Z	10.6	16.1	7.7	21.8	17.4	15.9	12.9	13.3	10.8	10.7	12.8	9.6	11.6	17.5	12.0	2.8	21.5	24.5	23.0	15.1	24.5																							
15-Nov	22.4	22.9	22.0	21.6	Z	18.3	15.4	15.2	17.4	13.2	13.2	7.0	4.8	6.1	11.4	13.5	13.6	13.0	11.9	10.8	9.3	7.4	3.0	13.7	13.7	22.9																							
16-Nov	Z	1.3	1.0	1.3	2.5	9.3	9.1	11.2	9.2	8.5	9.0	10.0	7.5	5.0	4.5	5.4	11.6	10.4	4.3	2.8	4.0	4.1	6.9	5.2	6.3	11.6																							
17-Nov	5.3	Z	17.4	17.1	15.9	10.1	14.0	15.4	16.2	10.6	6.1	3.8	3.6	3.1	3.9	4.6	12.0	15.4	8.1	0.7	0.5	0.3	0.6	1.7	8.1	17.4																							
18-Nov	5.8	16.6	Z	0.4	1.8	18.0	22.1	11.8	1.7	1.5	0.6	0.7	4.9	10.0	16.0	22.8	28.9	22.9	17.8	21.0	21.8	20.1	24.0	22.0	13.6	28.9																							
19-Nov	24.0	25.1	18.8	Z	8.4	10.2	10.5	13.1	15.0	13.3	9.1	7.1	5.3	7.6	11.1	14.3	23.2	11.7	19.6	9.2	7.1	7.4	6.4	7.3	12.4	25.1																							
20-Nov	8.1	4.7	4.7	8.8	Z	4.2	6.2	6.0	6.2	5.5	6.1	5.7	4.3	2.6	4.7	17.5	21.1	10.6	9.8	12.8	12.4	6.0	4.2	3.7	7.6	21.1																							
21-Nov	10.3	6.0	6.1	10.0	5.4	Z	7.6	6.2	M	1.1	1.0	0.8	12.9	18.2	17.9	19.2	21.0	21.6	11.7	12.0	22.5	21.7	24.8	25.0	12.9	25.0																							
22-Nov	Z	15.2	8.9	11.4	5.8	5.2	3.5	3.5	6.2	15.7	22.7	26.1	31.4	30.2	10.6	10.8	15.4	12.4	7.9	17.9	15.4	17.2	13.6	8.3	13.7	31.4																							
23-Nov	9.6	Z	9.7	11.4	8.3	8.7	12.2	15.5	14.8	12.1	10.1	9.9	11.1	11.6	9.8	13.5	15.8	15.2	15.8	18.4	8.6	18.1	18.5	20.1	13.0	20.1																							
24-Nov	19.3	21.3	Z	20.2	22.2	20.1	20.9	20.1	22.5	21.4	18.3	18.4	18.9	18.9	20.8	25.0	28.6	27.3	28.3	28.6	27.8	24.4	22.3	24.0	22.6	28.6																							
25-Nov	25.2	24.3	23.2	Z	23.0	18.3	17.3	14.5	10.8	9.1	7.6	5.5	3.9	6.0	12.9	14.9	16.9	13.4	13.2	11.2	17.4	26.1	23.9	17.7	15.5	26.1																							
26-Nov	10.8	16.1	5.9	5.2	Z	25.4	20.9	22.0	16.9	12.0	10.2	9.7	8.9	9.0	7.9	10.8	13.4	20.8	16.4	3.2	2.2	2.0	2.1	1.8	11.0	25.4																							
27-Nov	2.1	5.4	1.0	0.5	0.3	Z	0.9	0.8	0.5	0.7	0.4	0.6	0.4	0.4	0.5	0.6	1.2	0.9	1.6	1.1	0.8	2.7	3.7	2.8	1.3	5.4																							
28-Nov	Z	1.8	6.5	0.7	2.2	3.2	3.0	30.5	31.8	25.9	18.6	18.0	17.2	15.2	14.9	28.7	28.2	25.6	25.4	25.9	24.8	24.3	26.4	25.9	18.5	31.8																							
29-Nov	25.8	Z	14.2	13.3	13.1	11.2	8.7	18.3	15.1	16.4	11.2	21.2	32.8	25.5	26.1	28.2	40.5	42.9	34.8	34.5	29.7	28.7	26.8	25.8	23.7	42.9																							
30-Nov	27.8	28.7	Z	18.9	23.1	24.9	27.8	27.2	29.5	30.9	25.2	27.1	30.4	28.1	26.8	26.5	26.6	23.6	21.6	23.0	21.7	17.9	20.8	19.8	25.1	30.9																							
																								14.5	13.2	11.7	10.2	10.7	11.8	11.4	11.7	12.0	12.1	11.0	10.4	10.0	9.8	11.2	13.4	16.1	15.7	15.4	15.0	14.6	14.6	15.3	15.3	Diurnal Average	
																								27.8	28.7	23.2	21.6	26.4	29.8	27.8	30.5	31.8	30.9	25.2	27.1	32.8	30.2	26.8	28.7	40.5	42.9	34.8	34.5	29.7	28.9	26.8	30.7	Diurnal Maximum	
Z - zerospan      C - Calibration      M - Maintenance																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																	



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Fort Hills - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort Hills - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	547	79.85	79.85
21 - 40	136	19.85	99.71
41 - 80	2	0.29	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort Hills - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	103	49	11	4	2	6	25	72	82	44	27	23	22	15	20	42	547
21 - 40	33	10	7	2	2	8	13	16	3	12	7	3	0	3	3	14	136
11 - 80	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	137	59	18	6	4	14	38	88	85	56	34	26	22	18	23	57	685

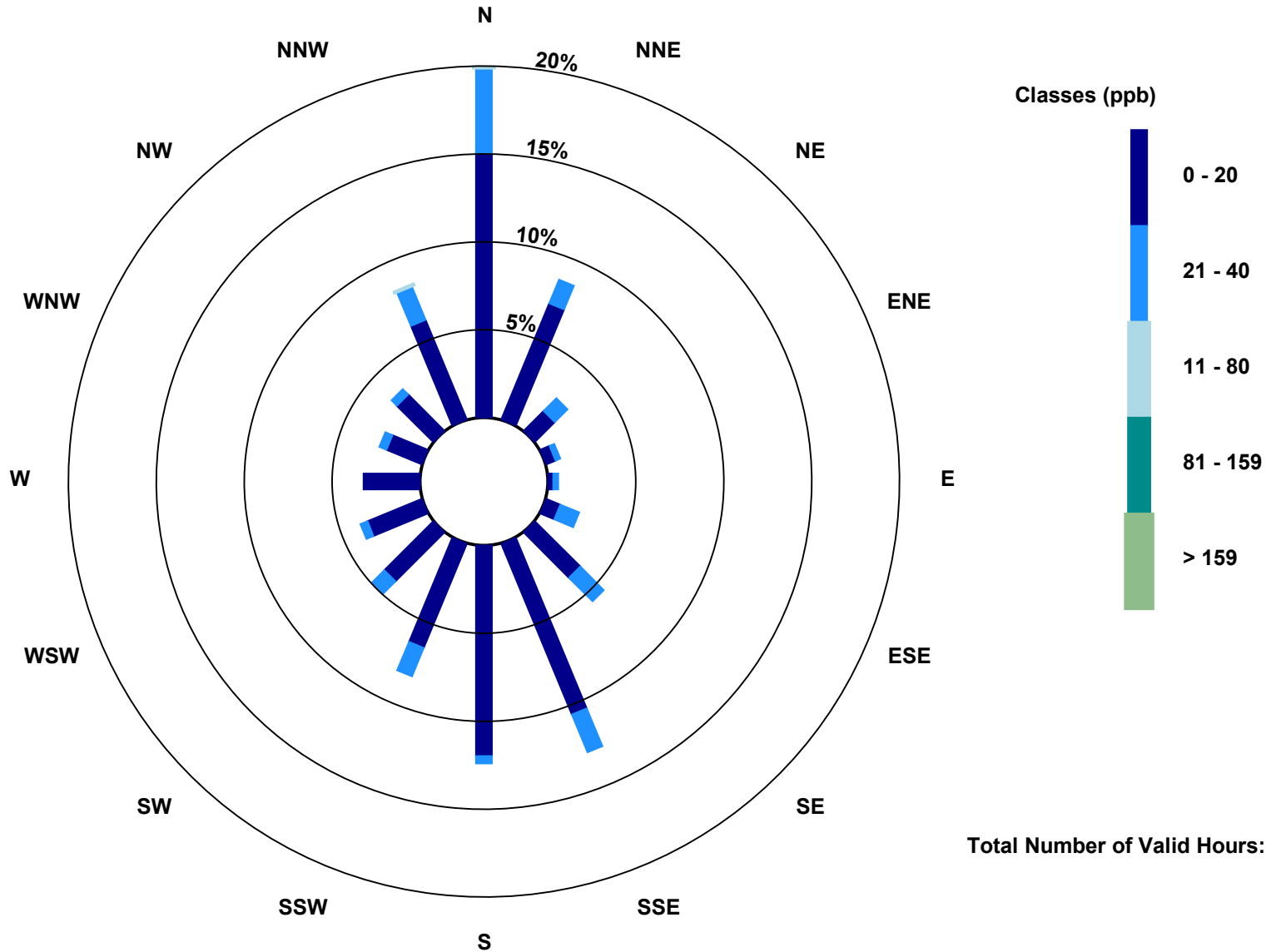
Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

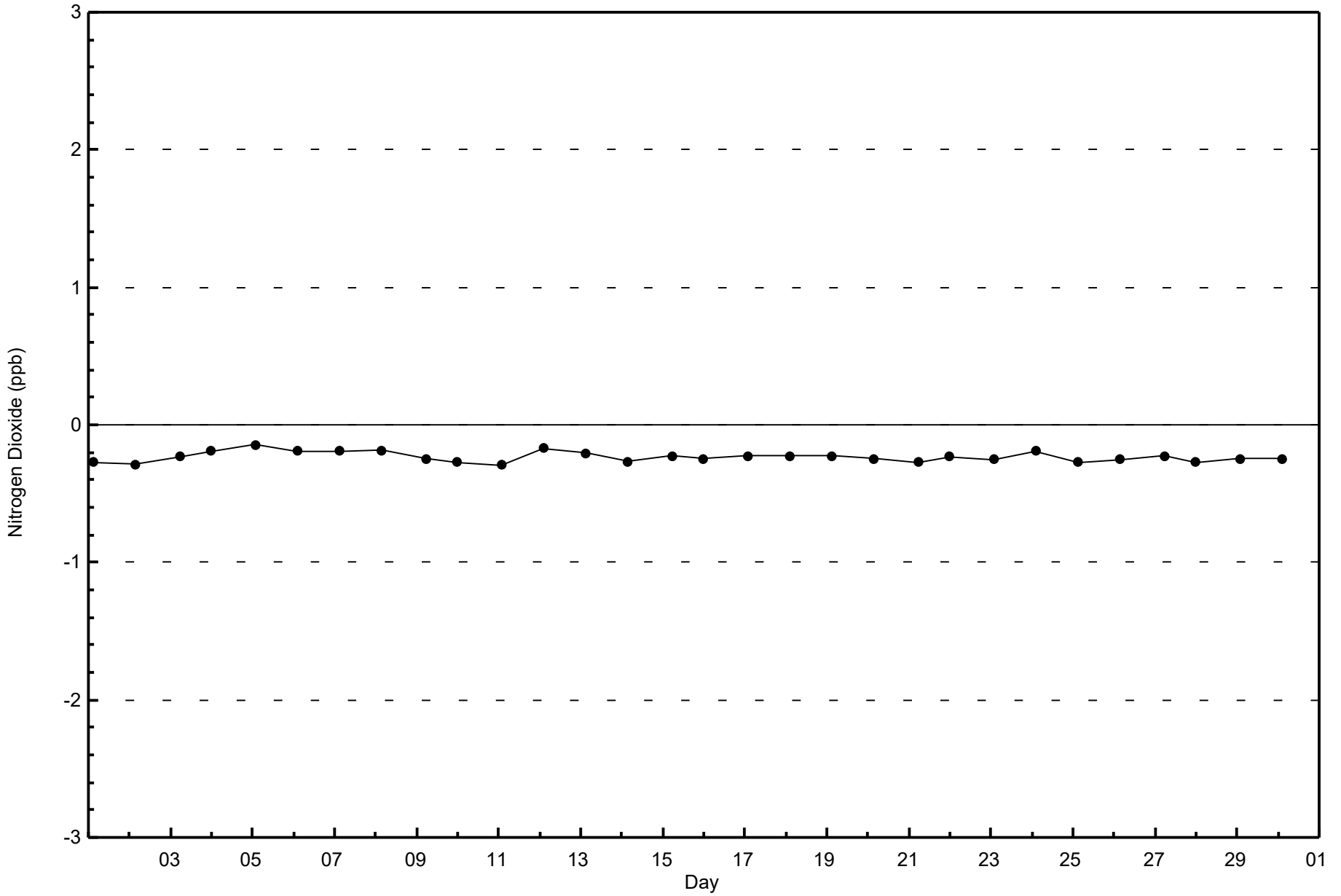
Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort Hills

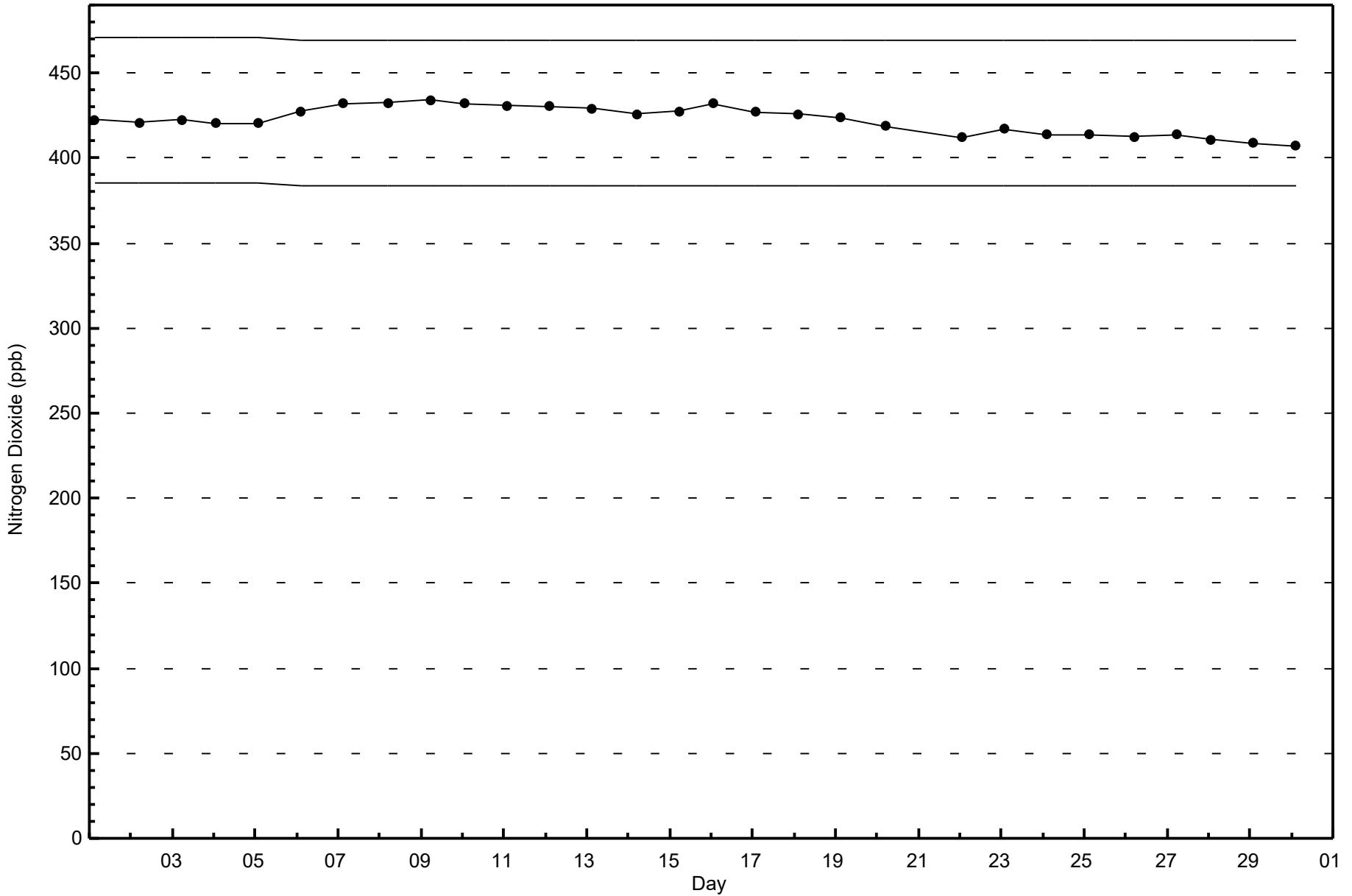




Wood Buffalo Environmental Association  
Zero Responses

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort Hills - November 2024







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO<sub>x</sub>) - ppb

Fort Hills - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 220.4 ppb on Nov 29 18:00	Maximum Daily Average: 66.6 ppb on Nov 29		Hours of Data:	685
Minimum Value: 0.1 ppb on Nov 6 00:00	Minimum Daily Average: 1.5 ppb on Nov 27		Hours of Missing Data:	35
Maximum Diurnal Average: 37.5 ppb at hour 24	Minimum Diurnal Average: 15.8 ppb at hour 4		Hours of Calibration:	34
Monthly Average: 25.99 ppb	Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 1.8 Q <sub>1</sub> = 6.8 Median = 17.3 Q <sub>3</sub> = 33.1 P <sub>90</sub> = 59.7 P <sub>99</sub> = 150.5		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	2.3	0.4	0.5	Z	0.9	2.4	16.8	18.5	38.0	23.5	25.4	32.5	32.5	39.3	26.6	22.3	27.6	18.7	19.3	19.1	16.7	15.5	17.4	23.8	19.1	39.3
2-Nov	26.4	21.6	28.2	25.8	Z	9.2	19.8	32.9	10.1	17.1	59.0	70.8	66.8	57.7	56.5	37.0	26.7	34.2	52.0	43.6	52.7	85.3	53.1	76.3	41.9	85.3
3-Nov	54.6	35.8	15.8	9.1	6.5	Z	21.7	19.6	20.1	28.6	11.1	14.3	4.5	2.5	7.6	14.5	5.0	4.5	2.2	17.6	36.7	26.8	61.8	34.4	19.8	61.8
4-Nov	Z	19.6	5.6	6.5	9.9	19.1	2.6	3.6	C	C	C	C	0.7	1.0	17.8	76.5	55.5	49.0	27.6	40.9	169.5	111.6	159.0	125.4	47.4	169.5
5-Nov	62.7	Z	37.4	27.6	34.4	14.3	9.9	7.3	7.0	49.7	57.3	28.9	7.8	2.1	17.7	22.0	1.8	3.1	34.3	33.9	41.2	12.8	4.4	0.1	22.5	62.7
6-Nov	0.9	1.0	Z	4.5	4.5	4.5	4.6	5.6	5.4	5.6	26.3	16.2	12.0	15.2	17.2	21.1	29.0	13.0	30.9	114.1	81.5	75.2	33.9	136.7	28.6	136.7
7-Nov	94.6	60.9	25.7	Z	39.8	11.8	0.9	3.0	1.5	1.9	0.7	0.5	0.3	14.4	37.6	23.9	96.6	99.1	127.9	188.2	118.4	159.3	62.0	50.3	53.0	188.2
8-Nov	14.7	7.9	7.4	3.9	Z	5.4	11.1	9.7	9.8	23.4	13.8	7.6	8.3	7.1	4.2	0.5	0.6	13.5	57.1	34.1	2.7	0.6	63.0	52.1	15.6	63.0
9-Nov	20.3	24.9	23.2	11.6	1.5	Z	1.0	0.2	4.7	8.4	17.6	18.3	13.3	3.4	9.9	1.1	0.3	1.7	3.2	7.7	11.5	11.5	9.2	3.6	9.1	24.9
10-Nov	Z	2.9	3.0	0.5	2.2	4.4	0.8	1.1	1.8	2.7	2.7	1.7	0.7	2.3	4.7	5.8	11.8	28.8	56.6	95.8	59.7	82.0	81.7	88.9	23.6	95.8
11-Nov	114.4	Z	56.0	20.2	31.7	193.2	147.7	27.0	29.9	48.9	46.4	25.2	8.4	11.2	22.9	10.9	16.5	20.2	21.3	33.6	59.7	41.7	48.5	148.9	51.5	193.2
12-Nov	73.4	77.2	Z	82.5	33.0	41.3	59.6	25.5	14.1	28.9	5.9	2.5	3.7	2.0	3.3	7.0	12.3	16.7	10.9	0.7	0.8	0.3	0.2	0.2	21.8	82.5
13-Nov	0.4	6.3	22.4	Z	19.2	25.7	47.7	37.1	18.0	40.7	27.9	12.8	8.1	8.8	8.7	5.0	11.7	12.7	7.0	10.4	17.2	14.4	15.6	21.9	17.4	47.7
14-Nov	22.7	17.9	22.3	24.7	Z	12.3	18.6	8.2	28.4	22.7	21.1	17.6	18.9	14.5	13.4	15.9	12.9	13.9	25.0	15.3	3.2	41.2	67.6	62.5	22.6	67.6
15-Nov	48.5	52.9	37.3	42.2	41.9	Z	24.7	17.7	26.5	63.0	33.6	33.8	10.0	6.7	7.4	16.7	17.6	17.5	27.2	27.1	21.9	13.3	7.8	3.2	26.0	63.0
16-Nov	Z	1.3	1.0	1.5	2.8	18.1	21.8	35.7	13.1	12.5	12.0	12.8	9.6	6.0	4.9	5.6	14.6	11.7	4.3	2.8	4.0	4.1	8.8	5.5	9.3	35.7
17-Nov	5.6	Z	24.1	20.6	19.6	13.4	19.2	19.8	21.5	13.2	8.5	5.5	5.4	4.4	4.8	5.0	22.6	35.5	10.6	0.7	0.5	0.3	0.6	1.7	11.4	35.5
18-Nov	6.4	21.7	Z	0.4	2.2	23.8	30.8	13.5	1.7	1.6	0.7	1.0	9.4	19.5	30.3	52.5	110.1	51.0	23.6	27.9	29.7	22.8	32.6	39.0	24.0	110.1
19-Nov	48.4	37.8	21.6	Z	9.3	11.8	11.4	13.7	16.2	18.2	13.3	9.7	7.6	10.6	15.4	18.4	28.8	13.5	22.2	9.8	7.7	8.1	6.8	8.8	16.0	48.4
20-Nov	9.4	5.3	5.2	10.0	Z	4.6	6.8	7.0	7.2	6.9	8.0	8.1	6.0	3.3	6.3	22.8	25.0	12.4	10.4	14.4	14.1	6.4	4.9	4.4	9.1	25.0
21-Nov	11.4	6.8	6.7	11.2	6.5	Z	9.2	6.8	M	1.2	1.1	1.0	22.1	31.8	25.9	23.1	21.7	22.1	11.7	12.1	27.0	24.8	26.1	26.1	15.3	31.8
22-Nov	Z	15.2	8.9	11.4	5.8	5.2	3.5	3.5	7.2	29.7	79.1	85.2	110.3	93.6	16.3	18.5	17.5	13.0	7.9	19.0	17.3	19.2	15.3	9.8	26.6	110.3
23-Nov	10.8	Z	10.7	12.9	9.0	9.5	13.9	19.4	18.2	15.3	13.8	15.4	17.8	18.5	13.7	17.4	18.7	18.4	20.5	23.0	9.7	24.7	22.4	27.8	16.6	27.8
24-Nov	24.8	28.6	Z	25.0	28.9	25.3	26.6	24.9	33.5	36.8	34.4	33.4	34.8	31.4	34.1	35.9	38.3	36.0	42.1	52.5	45.5	38.4	28.7	37.7	33.8	52.5
25-Nov	40.0	31.4	33.9	Z	34.1	18.5	23.6	16.5	11.1	10.7	10.4	7.7	5.2	8.7	19.5	17.7	17.7	13.9	14.2	11.3	24.3	79.5	52.3	22.3	22.8	79.5
26-Nov	11.1	17.7	5.9	5.2	Z	53.2	24.2	27.8	18.4	15.7	15.8	14.5	13.9	13.1	9.8	11.9	13.8	39.8	28.8	3.4	2.2	2.0	2.1	1.8	15.3	53.2
27-Nov	2.1	5.5	1.0	0.5	0.3	Z	1.0	0.9	0.6	1.0	0.5	1.0	0.4	0.4	0.6	0.7	1.7	1.1	1.9	1.3	0.8	3.3	4.2	2.9	1.5	5.5
28-Nov	Z	2.3	8.0	0.7	2.4	3.3	3.0	75.1	100.5	63.8	38.3	42.4	36.3	27.3	21.3	56.9	48.4	35.9	33.8	37.1	33.1	31.1	32.3	46.9	33.9	100.5
29-Nov	57.1	Z	15.0	15.0	15.2	12.3	9.0	25.7	19.5	35.4	24.2	86.2	143.0	75.3	63.7	70.7	190.6	220.4	129.9	113.7	64.0	58.4	51.1	35.9	66.6	220.4
30-Nov	48.7	57.5	Z	21.3	42.8	45.4	63.7	47.6	84.0	120.3	70.9	95.0	134.3	96.4	76.4	71.2	72.5	58.9	37.2	39.7	31.6	25.2	29.0	27.2	60.7	134.3

32.5	22.4	17.1	15.8	16.2	23.5	21.8	18.5	20.3	25.8	23.4	24.2	25.1	21.0	20.0	23.6	32.3	31.0	30.1	35.0	33.5	34.7	33.4	37.5	Diurnal Average	
114.4	77.2	56.0	82.5	42.8	193.2	147.7	75.1	100.5	120.3	79.1	95.0	143.0	96.4	76.4	76.5	190.6	220.4	129.9	188.2	169.5	159.3	159.0	148.9	Diurnal Maximum	

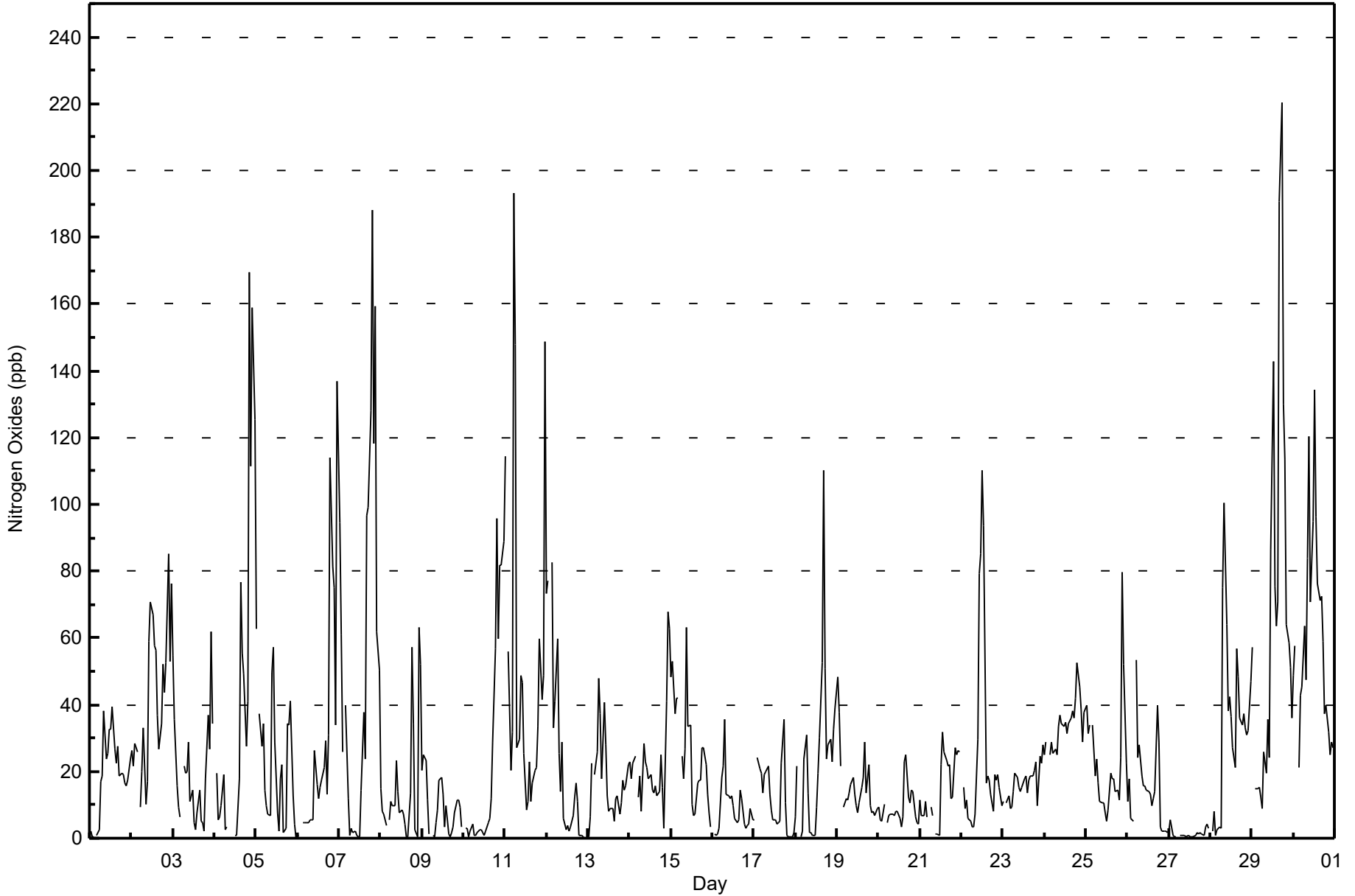
Z - zerspan      C - Calibration      M - Maintenance





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Fort Hills - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Fort Hills - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	395	57.66	57.66
21 - 40	167	24.38	82.04
41 - 80	83	12.12	94.16
81 - 159	34	4.96	99.12
> 159	5	0.73	99.85

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Fort Hills - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	56	40	9	1	2	3	16	60	72	30	16	18	21	13	15	23	395
21 - 40	51	14	6	3	1	3	7	16	10	19	12	8	1	4	5	7	167
11 - 80	19	2	3	1	0	3	7	9	3	7	6	0	0	1	3	19	83
81 - 159	10	3	0	1	0	4	6	3	0	0	0	0	0	0	0	7	34
> 159	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	5
<b>Totals</b>	137	59	18	6	4	14	37	88	85	56	34	26	22	18	23	57	684

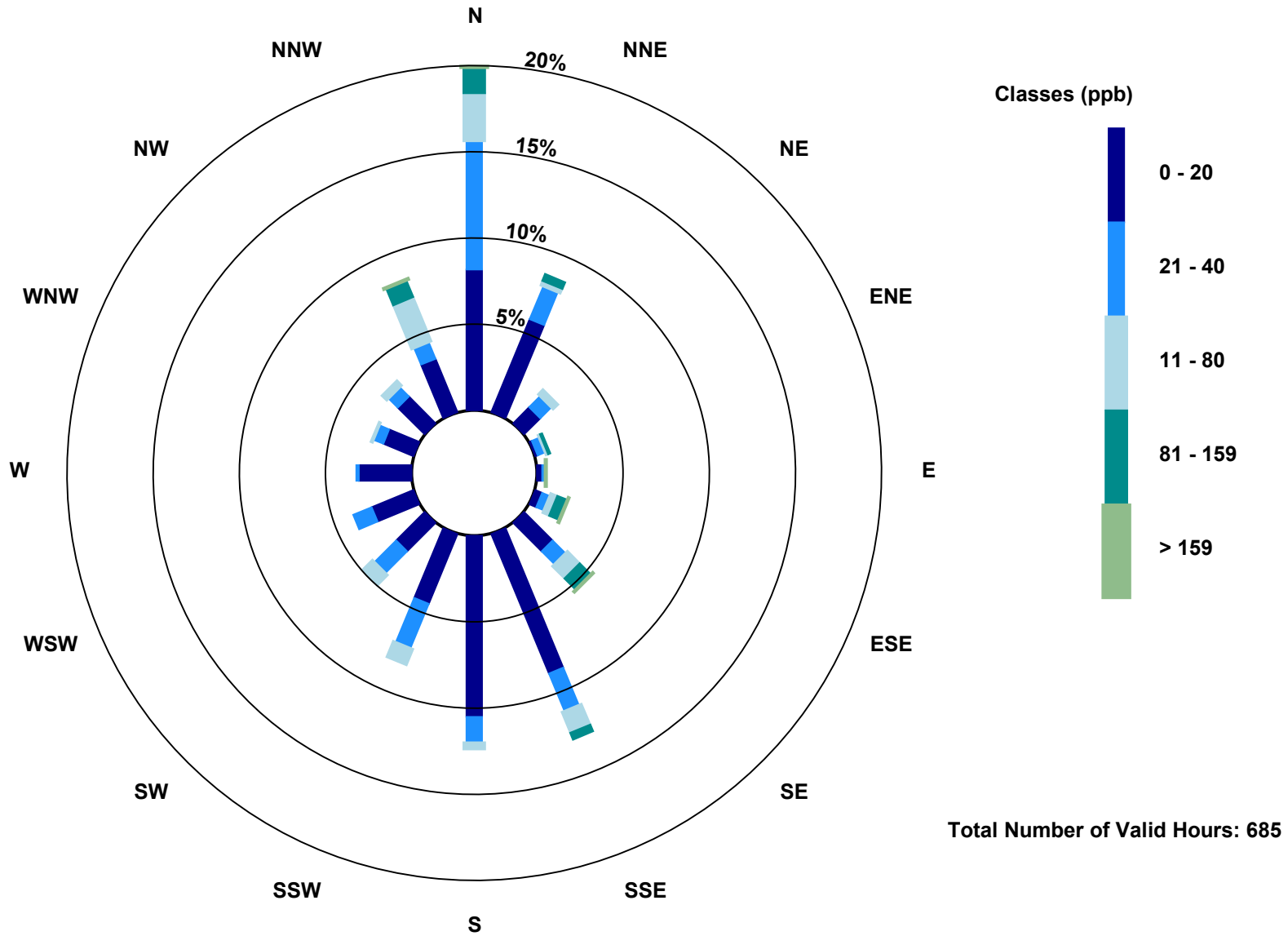
Total Number of Valid Hours: 685

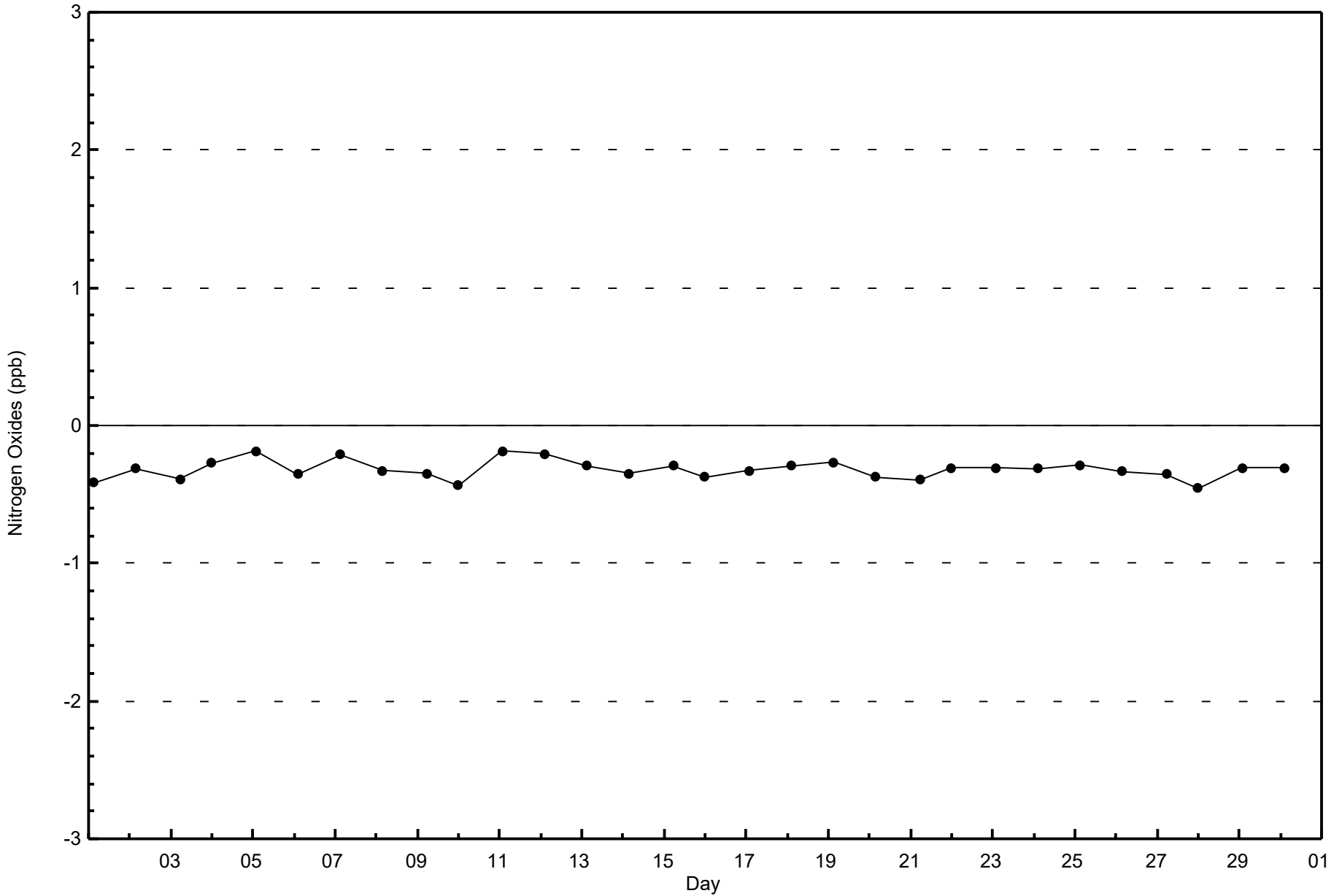
Total Number of Hours: 720

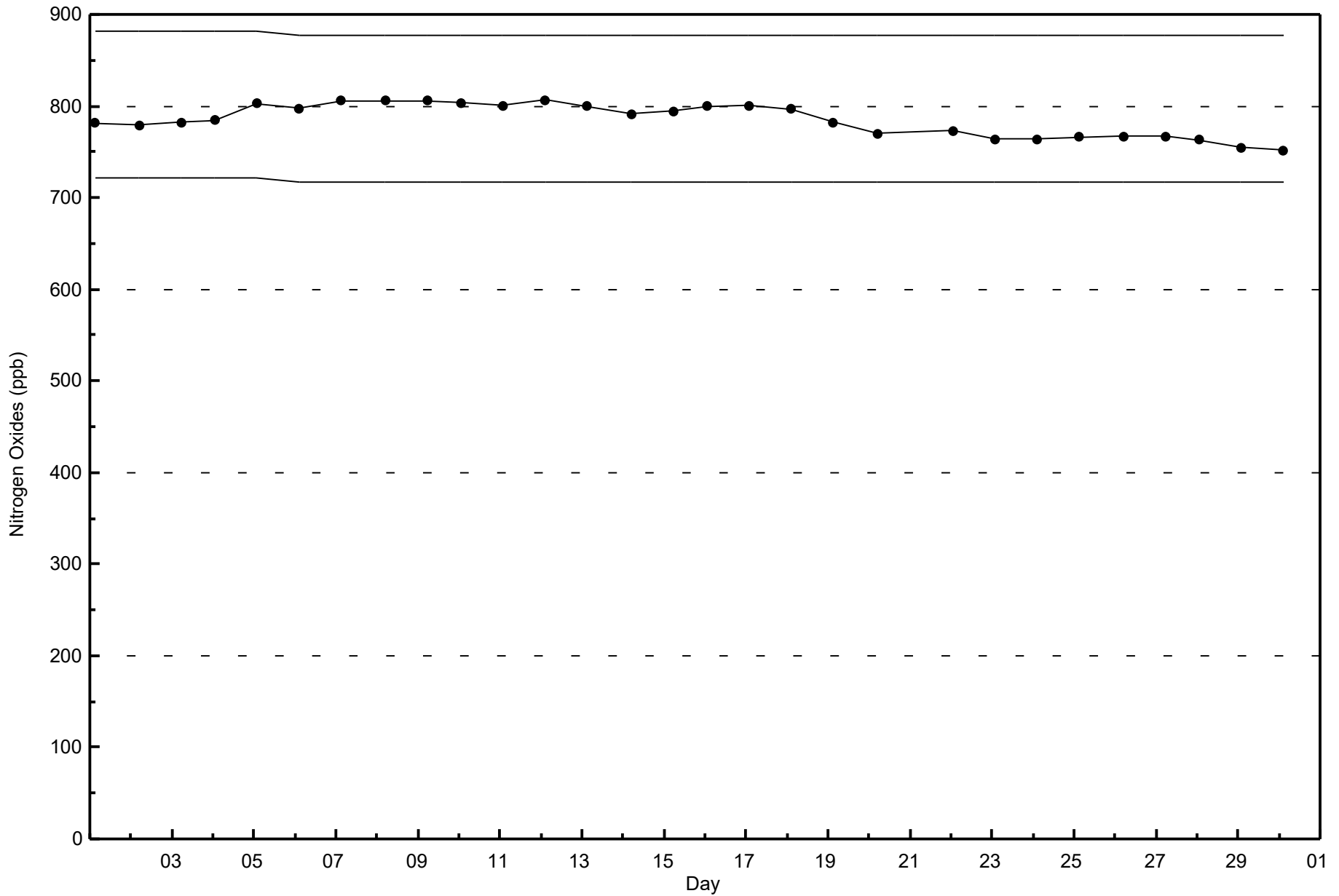


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Fort Hills





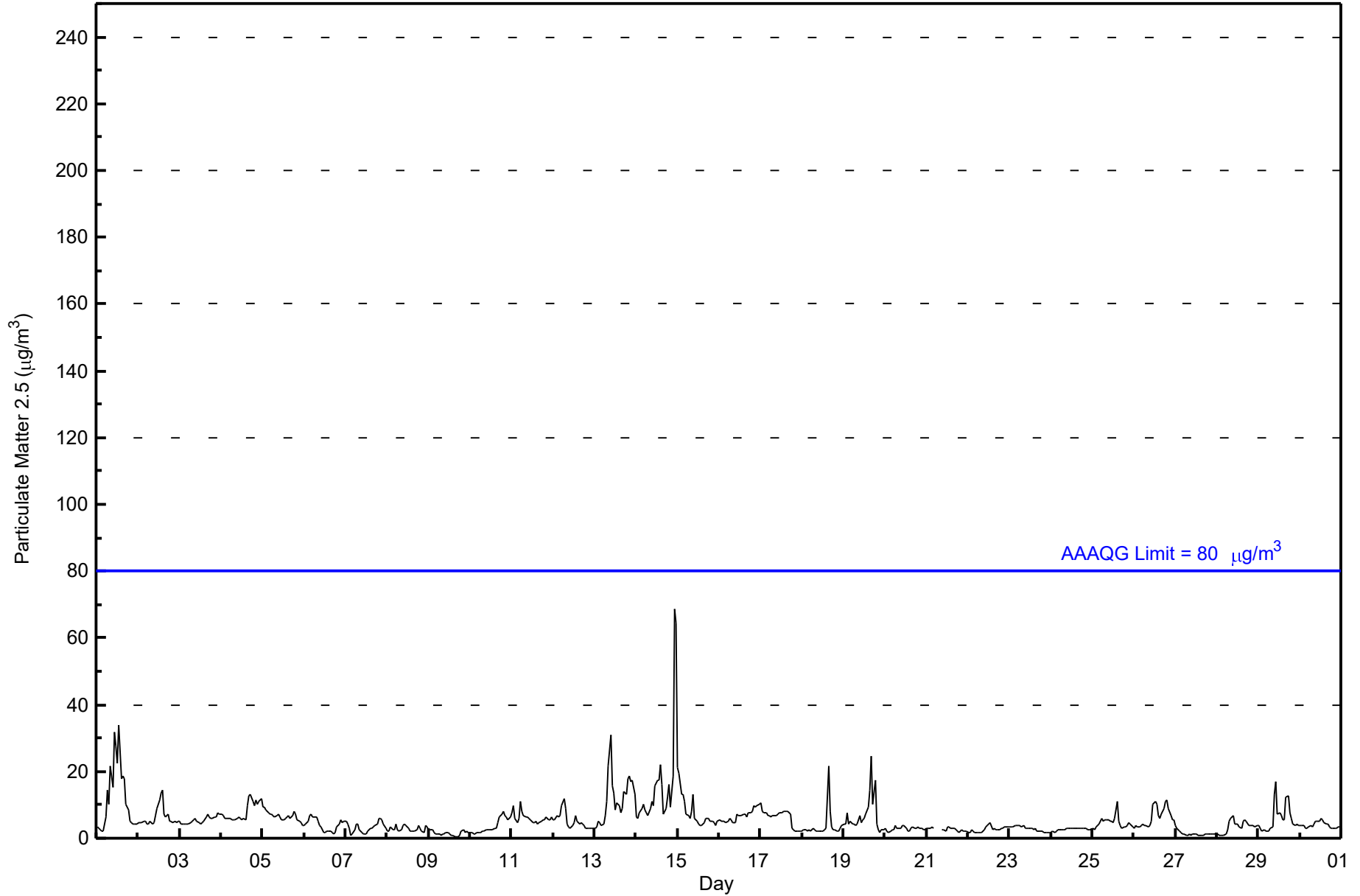




Summary of Hour Averages

Fort Hills - November 2024

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:																720																										
Maximum Value: 68.7 µg/m <sup>3</sup> on Nov 14 23:00				Maximum Daily Average: 16.0 µg/m <sup>3</sup> on Nov 14		Hours of Data:																717																										
Minimum Value: 0.5 µg/m <sup>3</sup> on Nov 9 16:00				Minimum Daily Average: 1.4 µg/m <sup>3</sup> on Nov 27		Hours of Missing Data:																3																										
Maximum Diurnal Average: 6.8 µg/m <sup>3</sup> at hour 23				Minimum Diurnal Average: 4.1 µg/m <sup>3</sup> at hour 4		Hours of Calibration:																2																										
Monthly Average: 5.44 µg/m <sup>3</sup>				Percentiles: P <sub>1</sub> = 0.9 P <sub>10</sub> = 1.8 Q <sub>1</sub> = 2.7 Median = 4.2 Q <sub>3</sub> = 6.5 P <sub>90</sub> = 10.0 P <sub>99</sub> = 22.3		Percent Operational Time:																99.9																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	3.6	2.9	2.5	2.1	2.0	6.5	14.3	10.1	21.7	15.1	31.9	27.7	22.4	33.8	17.6	18.4	17.7	10.0	8.5	5.1	4.6	4.3	4.0	4.0	12.1	33.8																						
2-Nov	4.7	4.8	4.7	5.1	4.9	4.3	4.4	5.0	4.1	4.5	6.8	9.1	11.2	13.4	14.3	7.1	6.4	7.1	5.2	5.1	4.7	5.1	4.7	5.1	6.3	14.3																						
3-Nov	4.9	4.4	4.2	4.2	4.2	4.2	4.8	5.3	5.5	5.9	5.0	4.7	4.4	4.5	5.1	6.4	7.0	6.5	6.1	6.1	6.5	6.4	7.7	7.1	5.5	7.7																						
4-Nov	7.3	6.7	6.0	5.9	5.9	6.0	5.4	5.3	5.3	5.9	6.3	5.8	5.6	5.9	5.6	9.9	12.8	13.2	10.9	9.5	11.5	10.1	11.0	12.0	7.9	13.2																						
5-Nov	9.5	9.1	8.3	7.5	7.4	7.2	6.9	6.4	6.8	7.2	6.5	5.7	5.6	6.0	6.5	6.8	6.1	6.8	8.0	7.0	5.6	5.0	4.5	3.7	6.7	9.5																						
6-Nov	3.7	4.3	5.0	6.9	7.3	6.4	6.4	6.4	5.2	4.0	3.2	1.8	1.6	1.9	2.1	2.0	1.9	1.3	1.6	3.2	4.3	5.7	4.9	4.9	4.0	7.3																						
7-Nov	5.0	4.3	2.8	0.8	1.3	2.4	4.2	4.3	2.7	1.8	1.4	1.5	1.4	2.1	3.0	3.0	3.3	3.6	4.1	6.1	6.1	5.4	4.2	3.2	3.3	6.1																						
8-Nov	2.0	2.0	3.2	2.6	2.7	4.3	2.5	2.0	2.6	3.6	4.1	3.8	2.8	2.2	2.2	1.9	2.0	2.5	3.9	3.0	1.9	1.6	3.7	3.4	2.8	4.3																						
9-Nov	2.5	2.7	2.4	1.9	1.3	1.2	1.1	1.1	1.2	1.2	1.5	1.5	1.4	0.8	0.8	0.5	0.5	0.6	0.7	1.9	2.5	1.9	2.0	1.5	1.4	2.7																						
10-Nov	1.5	1.5	1.4	1.5	1.5	1.8	1.9	2.0	2.3	2.4	2.5	2.7	2.7	2.7	3.1	2.9	4.5	6.5	7.2	8.2	6.8	6.5	5.7	6.2	3.6	8.2																						
11-Nov	7.5	9.9	5.9	4.5	5.9	10.9	8.1	6.8	6.5	6.2	5.7	5.3	4.8	4.7	5.1	4.2	4.7	4.9	5.5	5.5	6.2	5.7	5.7	6.5	6.1	10.9																						
12-Nov	5.5	5.7	6.6	6.3	6.9	9.6	12.0	8.9	4.3	3.6	3.0	3.6	4.6	6.6	4.9	4.4	4.5	4.4	4.0	3.1	3.1	3.1	3.0	3.0	5.2	12.0																						
13-Nov	3.2	3.4	5.0	4.5	3.7	4.4	6.9	11.0	21.7	31.1	15.5	13.4	8.3	10.4	9.8	7.7	8.9	13.8	13.1	17.8	18.8	17.0	17.3	13.2	11.7	31.1																						
14-Nov	6.5	5.7	7.5	8.9	10.2	8.6	7.5	6.6	8.9	10.8	9.7	15.8	17.2	17.5	22.0	16.2	7.3	9.1	12.1	15.9	9.1	18.5	68.7	64.6	16.0	68.7																						
15-Nov	21.1	19.4	13.2	13.0	11.0	7.0	6.9	5.8	8.2	13.1	5.9	5.2	4.4	4.0	3.8	4.7	6.0	6.0	5.7	5.2	4.9	4.5	3.9	5.1	7.8	21.1																						
16-Nov	5.3	5.3	4.9	5.1	4.7	5.2	5.8	5.3	4.6	4.9	7.1	6.8	6.9	6.8	7.3	7.4	6.4	7.5	7.6	8.1	9.9	9.2	9.9	10.2	6.8	10.2																						
17-Nov	10.8	8.1	7.7	7.6	6.9	6.7	6.5	6.9	6.6	6.8	7.3	7.5	7.6	8.2	8.2	8.0	8.1	7.2	2.9	2.4	2.2	2.1	2.2	2.3	6.3	10.8																						
18-Nov	2.1	2.6	2.6	2.3	2.5	2.3	2.8	2.6	2.3	2.1	2.0	2.2	2.3	2.4	3.0	21.5	8.1	3.2	2.4	2.5	2.2	2.2	2.8	3.6	3.5	21.5																						
19-Nov	4.4	4.2	7.5	4.4	5.1	4.1	4.0	3.7	4.1	7.0	4.7	5.5	5.7	7.4	9.4	14.6	24.8	10.0	17.2	4.2	2.5	1.8	2.4	2.5	6.7	24.8																						
20-Nov	2.9	2.3	1.7	2.0	2.6	2.4	3.6	3.0	2.8	3.1	4.0	3.7	2.8	2.3	2.2	3.2	3.5	3.1	2.9	3.4	3.1	2.8	2.5	2.4	2.8	4.0																						
21-Nov	3.0	3.0	2.9	3.3	2.8	DF	2.6	C	C	2.3	2.4	2.3	3.2	3.5	3.2	2.9	2.8	2.7	2.1	1.9	2.6	2.1	2.2	2.2	2.7	3.5																						
22-Nov	1.8	1.6	2.4	2.1	1.7	1.6	1.5	1.5	1.5	2.4	3.3	3.9	4.4	4.5	2.7	2.9	2.7	2.7	2.7	3.1	2.8	3.4	3.5	3.3	2.7	4.5																						
23-Nov	3.5	3.6	3.5	3.8	3.6	3.6	3.7	3.5	3.7	2.9	3.1	3.0	3.1	3.1	2.6	2.8	2.3	2.3	2.2	2.0	1.6	1.7	1.5	1.7	2.9	3.8																						
24-Nov	1.8	2.1	1.9	2.2	2.4	2.4	2.6	2.7	2.7	2.8	2.8	2.8	2.8	2.8	3.0	3.0	3.0	3.0	2.8	3.1	3.0	2.8	2.4	2.6	2.6	3.1																						
25-Nov	2.8	2.7	3.5	3.9	4.3	5.8	5.2	5.5	5.6	5.5	5.3	5.0	4.5	5.9	11.2	5.0	4.0	3.1	3.3	3.2	3.7	4.6	4.2	3.3	4.6	11.2																						
26-Nov	2.9	3.9	3.4	3.5	3.9	4.2	4.0	3.8	3.6	3.9	4.9	10.2	11.2	10.0	6.6	5.8	7.2	8.8	10.9	11.5	8.8	6.6	5.7	5.3	6.3	11.5																						
27-Nov	3.9	3.0	2.3	1.8	1.4	1.1	1.1	0.9	1.1	1.0	1.1	1.3	1.2	1.0	1.0	1.0	0.9	1.2	1.2	1.2	1.1	1.1	1.3	1.3	1.4	3.9																						
28-Nov	1.1	1.0	0.9	0.9	1.0	1.3	2.4	5.2	6.1	6.8	4.1	4.3	4.3	3.4	3.0	5.1	5.4	5.2	4.0	3.6	3.8	3.6	3.6	3.7	3.5	6.8																						
29-Nov	3.6	2.9	2.3	2.6	2.2	2.1	2.1	2.8	3.2	12.9	17.0	7.2	7.8	6.6	5.4	5.7	12.4	12.7	7.6	6.0	4.4	3.9	4.1	4.0	5.9	17.0																						
30-Nov	3.6	3.7	3.7	3.0	3.2	3.3	3.8	3.6	4.3	5.0	4.9	5.1	5.9	5.7	4.7	4.3	4.1	3.6	2.8	3.1	3.1	2.9	3.4	3.5	3.9	5.9																						
																								4.7	4.6	4.3	4.1	4.2	4.5	4.8	4.8	5.5	6.2	6.1	5.9	5.8	6.3	6.0	6.3	6.3	5.8	5.6	5.4	5.0	5.1	6.8	6.5	Diurnal Average
																								21.1	19.4	13.2	13.0	11.0	10.9	14.3	11.0	21.7	31.1	31.9	27.7	22.4	33.8	22.0	21.5	24.8	13.8	17.2	17.8	18.8	18.5	68.7	64.6	Diurnal Maximum
C - Calibration DF - DAS Failure																																																
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m <sup>3</sup> 24-hr 29 µg/m <sup>3</sup>																																																







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Fort Hills - November 2024**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	475	66.25	66.25
6 - 15	213	29.71	95.96
16 - 25	23	3.21	99.16
26 - 80	6	0.84	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Fort Hills - November 2024**

Concentration Ranges ( $\mu\text{g}/\text{m}^3$ )	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	91	35	13	6	3	8	21	52	63	44	24	19	20	16	21	39	475
6 - 15	39	17	3	0	1	6	17	41	28	15	11	7	4	4	3	17	213
16 - 25	7	9	2	0	0	0	0	2	1	0	0	0	0	0	0	2	23
26 - 80	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	6
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	141	61	18	6	4	14	38	95	92	59	35	26	24	21	24	59	717

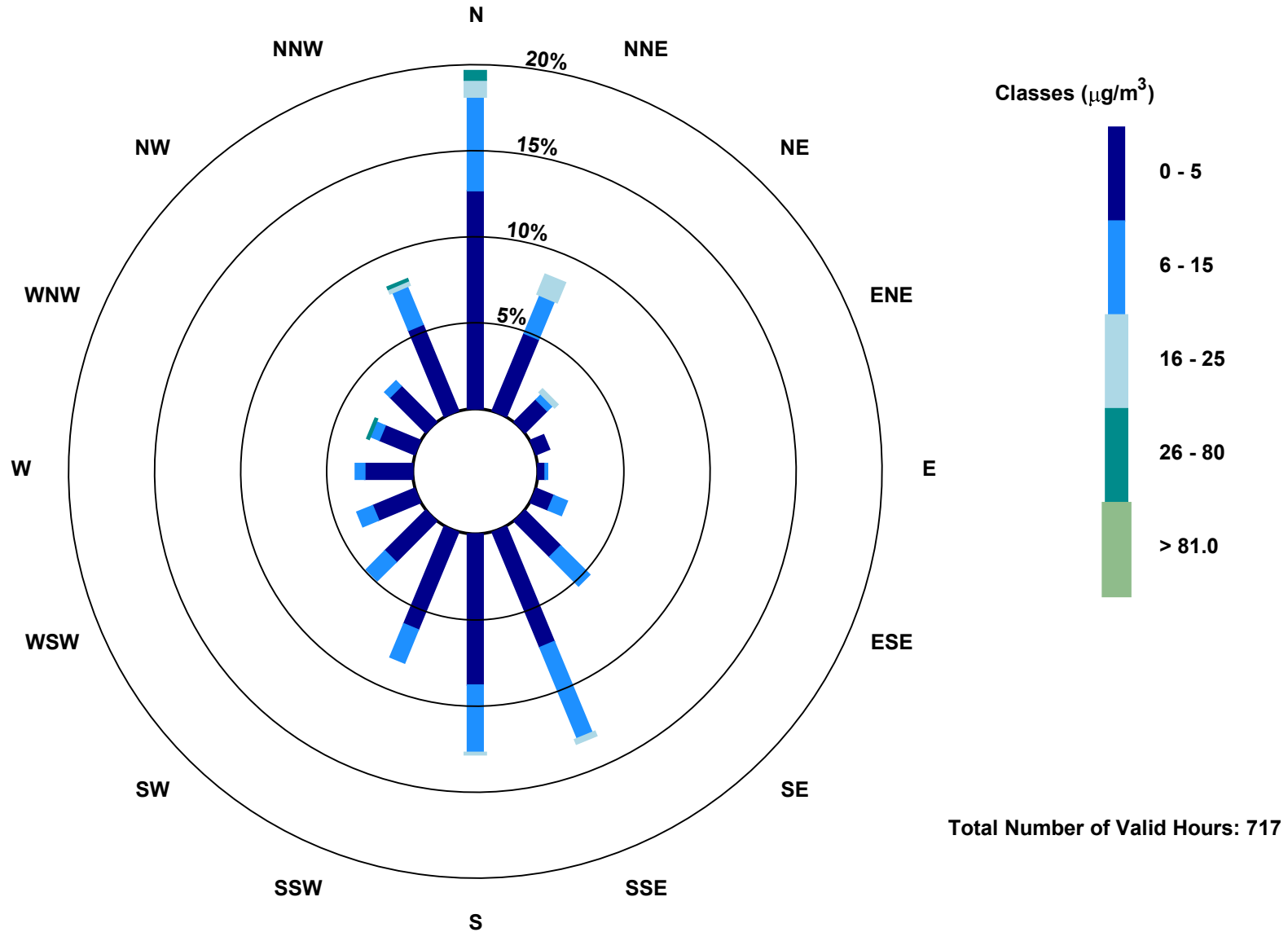
Total Number of Valid Hours: 717

Total Number of Hours: 720



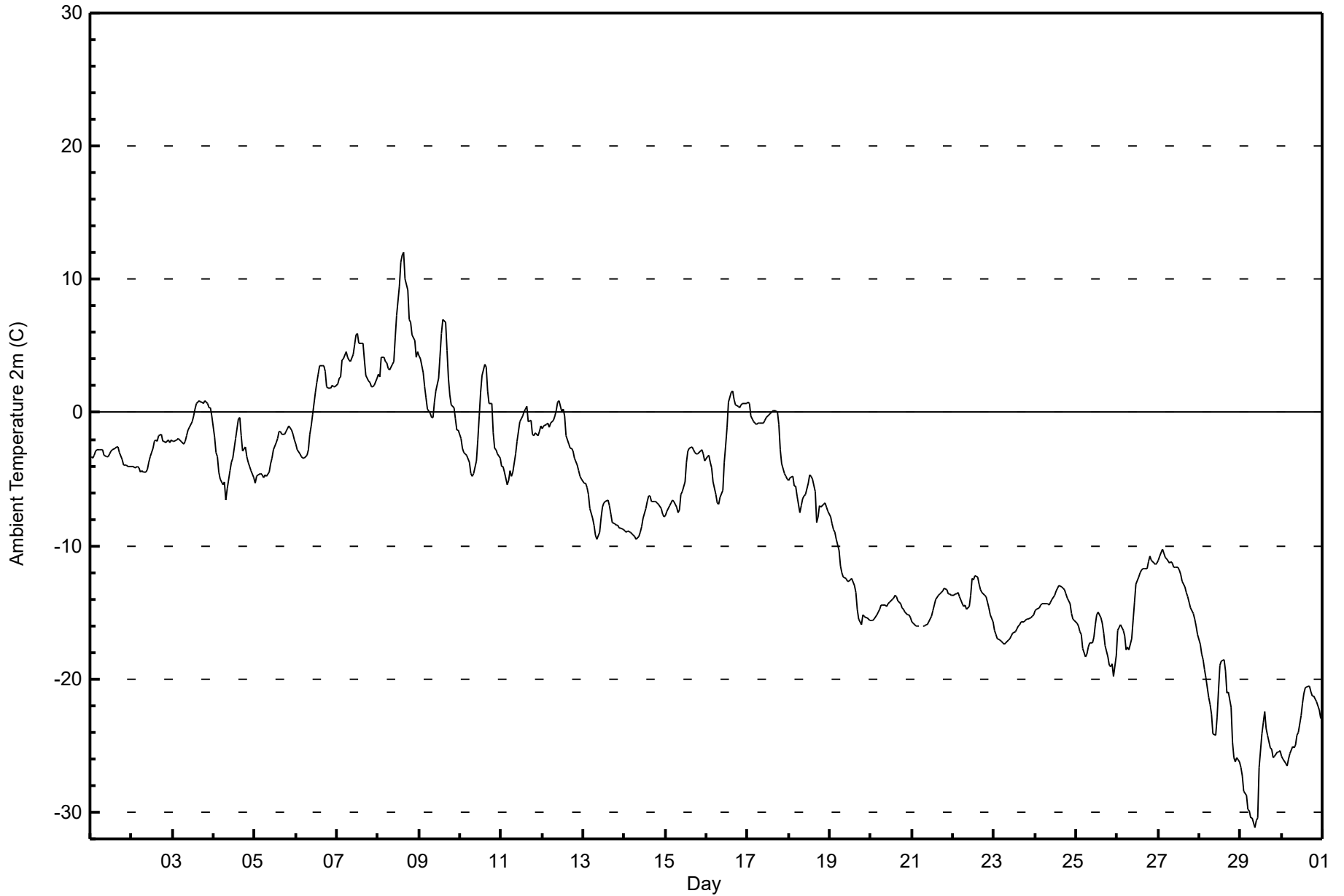
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Fort Hills





Maximum Value: 12.0 C on Nov 8 16:00		Maximum Daily Average: 6.1 C on Nov 8		Hours in Service: 720																						
Minimum Value: -31.1 C on Nov 29 09:00		Minimum Daily Average: -26.9 C on Nov 29		Hours of Data: 719																						
Maximum Diurnal Average: -6.0 C at hour 15		Minimum Diurnal Average: -9.3 C at hour 8		Hours of Missing Data: 1																						
Monthly Average: -7.95 C		Percentiles: P <sub>1</sub> = -28.7 P <sub>10</sub> = -18.6 Q <sub>1</sub> = -14.5 Median = -6.2 Q <sub>3</sub> = -1.7 P <sub>90</sub> = 1.9 P <sub>99</sub> = 7.0		Hours of Calibration: 0																						
				Percent Operational Time: 99.9																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	-3.3	-3.4	-3.2	-2.9	-2.8	-2.7	-2.8	-2.8	-3.2	-3.3	-3.3	-3.1	-2.9	-2.7	-2.6	-2.5	-2.6	-3.0	-3.5	-3.9	-3.9	-3.9	-4.0	-4.0	-3.2	-2.5
2-Nov	-4.1	-4.1	-4.1	-4.0	-4.1	-4.4	-4.4	-4.4	-4.5	-4.2	-3.7	-3.3	-2.7	-2.1	-2.0	-2.1	-1.7	-1.7	-2.1	-2.2	-2.2	-2.0	-2.2	-2.1	-3.1	-1.7
3-Nov	-2.1	-2.2	-2.1	-2.0	-2.0	-2.1	-2.3	-2.1	-1.7	-1.3	-1.1	-0.6	-0.2	0.2	0.7	0.9	0.8	0.8	0.7	0.9	0.7	0.4	0.4	-0.3	-0.7	0.9
4-Nov	-1.9	-2.9	-3.4	-4.4	-4.9	-5.4	-5.2	-6.6	-5.7	-4.4	-3.7	-3.4	-2.7	-1.9	-0.5	-0.4	-1.7	-2.9	-2.5	-3.3	-3.7	-4.0	-4.3	-4.9	-3.5	-0.4
5-Nov	-5.3	-4.8	-4.6	-4.6	-4.7	-4.9	-4.7	-4.8	-4.4	-3.9	-3.4	-2.7	-2.3	-2.0	-1.5	-1.4	-1.6	-1.7	-1.4	-1.2	-1.0	-1.3	-1.6	-2.1	-3.0	-1.0
6-Nov	-2.4	-2.8	-3.0	-3.3	-3.4	-3.4	-3.2	-2.8	-1.7	-1.0	-0.1	1.6	2.2	2.9	3.5	3.5	3.5	3.1	1.9	1.8	1.9	2.0	2.0	1.9	0.2	3.5
7-Nov	2.1	2.6	2.7	4.0	4.1	4.5	4.2	3.9	3.8	4.4	5.1	5.8	5.9	5.2	5.2	5.2	4.0	2.7	2.3	2.3	1.9	2.0	2.1	2.6	3.7	5.9
8-Nov	2.9	2.7	4.2	4.2	3.8	3.7	3.3	3.2	3.6	3.8	5.6	7.3	9.5	11.3	11.8	12.0	10.1	9.2	7.0	6.8	5.8	5.4	4.2	4.6	6.1	12.0
9-Nov	4.2	4.0	3.0	1.9	1.1	0.3	-0.1	-0.4	-0.4	0.8	1.6	2.6	4.3	5.9	7.0	6.7	4.6	2.5	1.3	0.6	0.3	-0.5	-1.3	-1.3	2.0	7.0
10-Nov	-1.9	-2.7	-3.0	-3.1	-3.2	-3.7	-4.5	-4.8	-4.6	-3.6	-2.1	-0.3	1.5	2.8	3.6	3.4	1.6	0.7	0.7	-1.5	-2.7	-2.8	-3.1	-3.4	-1.5	3.6
11-Nov	-4.0	-4.0	-4.5	-5.4	-5.1	-4.4	-4.8	-4.5	-3.1	-2.2	-1.4	-0.7	-0.3	0.0	0.3	0.4	-0.6	-0.6	-1.6	-1.7	-1.5	-1.7	-1.5	-1.0	-2.2	0.4
12-Nov	-1.2	-1.0	-0.9	-0.8	-1.1	-0.8	-0.5	-0.2	0.2	0.8	0.9	0.0	0.2	-0.3	-1.8	-2.4	-2.7	-2.7	-2.9	-3.4	-4.0	-4.3	-4.8	-5.0	-1.6	0.9
13-Nov	-5.3	-5.3	-5.6	-6.2	-7.2	-7.9	-8.4	-9.2	-9.5	-9.0	-8.0	-7.1	-6.7	-6.6	-6.5	-7.0	-7.6	-8.2	-8.4	-8.5	-8.5	-8.6	-8.7	-8.8	-7.6	-5.3
14-Nov	-8.9	-8.9	-8.9	-9.0	-9.1	-9.2	-9.3	-9.5	-9.3	-9.0	-8.5	-7.9	-7.2	-6.7	-6.2	-6.2	-6.6	-6.7	-6.7	-6.8	-6.9	-7.2	-7.6	-7.9	-7.9	-6.2
15-Nov	-7.7	-7.4	-7.0	-6.7	-6.5	-6.7	-7.1	-7.5	-7.3	-6.1	-5.9	-5.2	-3.7	-2.9	-2.7	-2.6	-2.8	-2.9	-3.1	-3.1	-2.9	-2.8	-3.1	-3.7	-4.9	-2.6
16-Nov	-3.3	-3.2	-3.7	-4.1	-5.2	-6.2	-6.8	-6.9	-6.3	-5.8	-3.7	-2.5	-1.1	0.8	1.6	1.6	1.0	0.6	0.5	0.4	0.5	0.6	0.7	0.7	-2.1	1.6
17-Nov	0.8	0.6	-0.3	-0.7	-0.8	-0.9	-0.8	-0.8	-0.8	-0.8	-0.6	-0.4	-0.2	-0.1	0.1	0.2	0.1	0.1	-0.9	-2.8	-3.8	-4.5	-4.8	-5.0	-1.1	0.8
18-Nov	-5.1	-4.9	-4.8	-5.5	-5.5	-6.2	-7.5	-7.0	-6.5	-6.3	-6.2	-5.4	-4.7	-4.8	-5.0	-5.9	-8.2	-7.8	-7.0	-7.1	-6.9	-6.8	-7.1	-7.4	-6.2	-4.7
19-Nov	-7.8	-8.4	-8.7	-9.0	-9.5	-10.4	-11.5	-12.1	-12.4	-12.5	-12.7	-12.7	-12.5	-12.5	-13.0	-13.5	-14.8	-15.5	-15.9	-15.2	-15.3	-15.4	-15.4	-15.6	-12.6	-7.8
20-Nov	-15.6	-15.6	-15.5	-15.2	-14.9	-14.7	-14.5	-14.5	-14.5	-14.5	-14.3	-14.3	-14.1	-13.9	-13.7	-13.8	-14.2	-14.4	-14.7	-14.8	-15.0	-15.2	-15.2	-15.4	-14.7	-13.7
21-Nov	-15.7	-15.9	-16.1	-16.0	-16.0	DF	-16.1	-16.0	-16.0	-15.9	-15.8	-15.3	-14.8	-14.5	-14.0	-13.7	-13.6	-13.5	-13.4	-13.2	-13.3	-13.6	-13.7	-13.7	-14.8	-13.2
22-Nov	-13.7	-13.7	-13.6	-13.5	-13.8	-14.4	-14.5	-14.4	-14.7	-14.6	-13.7	-12.4	-12.6	-12.2	-12.3	-12.8	-13.3	-13.5	-13.7	-13.8	-14.3	-14.7	-15.2	-15.7	-13.8	-12.2
23-Nov	-16.3	-16.7	-17.0	-17.1	-17.1	-17.3	-17.4	-17.3	-17.1	-17.0	-16.8	-16.6	-16.4	-16.2	-16.0	-15.9	-15.7	-15.7	-15.6	-15.5	-15.5	-15.4	-15.3	-15.2	-16.3	-15.2
24-Nov	-14.9	-14.7	-14.7	-14.5	-14.3	-14.3	-14.3	-14.4	-14.4	-14.2	-14.1	-13.7	-13.4	-13.1	-13.0	-13.1	-13.2	-13.3	-13.7	-14.0	-14.4	-15.1	-15.5	-15.6	-14.2	-13.0
25-Nov	-15.8	-16.1	-16.4	-16.7	-17.7	-18.3	-18.2	-17.6	-17.3	-17.3	-16.9	-16.0	-15.2	-15.0	-15.4	-15.8	-16.6	-17.5	-18.3	-18.9	-19.0	-18.9	-19.8	-18.3	-17.2	-15.0
26-Nov	-16.3	-16.2	-15.9	-16.4	-16.7	-17.8	-17.6	-17.8	-16.9	-15.6	-14.3	-12.9	-12.3	-12.1	-11.8	-11.8	-11.8	-11.7	-11.2	-10.8	-11.1	-11.3	-11.4	-11.3	-13.9	-10.8
27-Nov	-11.1	-10.8	-10.3	-10.6	-10.9	-11.0	-11.3	-11.2	-11.3	-11.6	-11.6	-11.6	-11.8	-12.1	-12.6	-13.1	-13.5	-13.8	-14.2	-14.7	-15.1	-15.5	-16.0	-16.6	-12.6	-10.3
28-Nov	-17.4	-18.1	-18.6	-19.2	-19.9	-21.4	-21.9	-22.6	-24.1	-24.2	-22.9	-20.9	-19.0	-18.6	-18.5	-19.3	-21.1	-21.0	-22.1	-24.8	-25.9	-26.2	-25.9	-26.2	-21.7	-17.4
29-Nov	-26.6	-27.3	-28.4	-28.7	-29.8	-29.9	-30.4	-30.4	-31.1	-30.7	-30.4	-26.7	-24.1	-23.3	-22.5	-23.7	-24.2	-25.2	-25.2	-25.9	-25.8	-25.4	-25.5	-25.4	-26.9	-22.5
30-Nov	-25.8	-26.0	-26.3	-26.5	-26.0	-25.6	-25.0	-25.2	-24.9	-24.3	-24.0	-22.8	-21.8	-21.1	-20.7	-20.5	-20.6	-21.0	-21.3	-21.2	-21.7	-22.1	-22.4	-22.9	-23.3	-20.5
																								Diurnal Average		
																								Diurnal Maximum		
DF - DAS Failure																										





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Fort Hills - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	63	8.76	8.76
-20 - 0	535	74.41	83.17
0 - 10	117	16.27	99.44
10 - 20	4	0.56	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

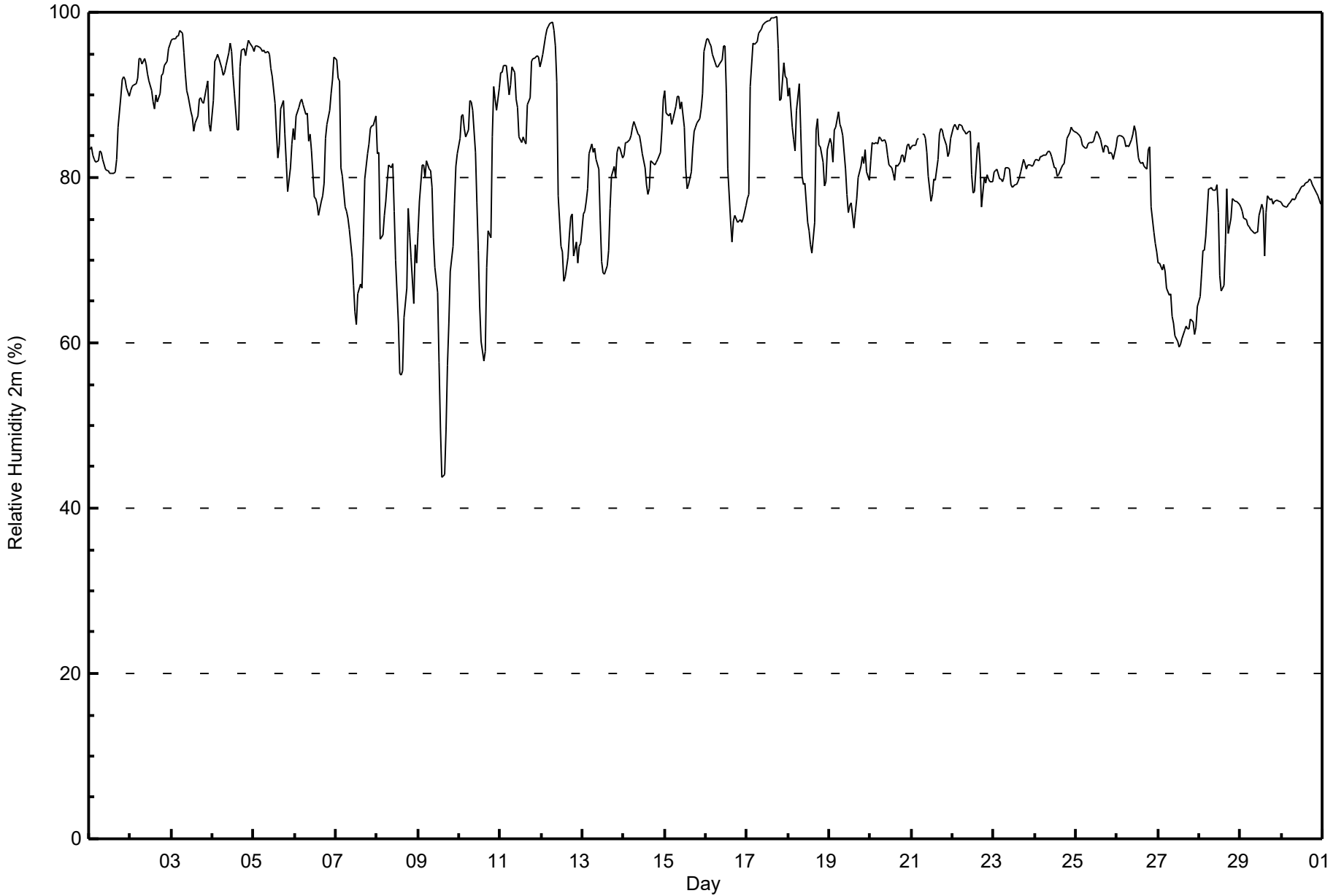
**Relative Humidity 2m (RH2) - %**  
**Fort Hills - November 2024**

Maximum Value: 99.4 % on Nov 17 18:00		Maximum Daily Average: 94.6 % on Nov 17		Hours in Service: 720																							
Minimum Value: 43.8 % on Nov 9 15:00		Minimum Daily Average: 63.8 % on Nov 27		Hours of Data: 719																							
Maximum Diurnal Average: 85.8 % at hour 7		Minimum Diurnal Average: 75.6 % at hour 15		Hours of Missing Data: 1																							
Monthly Average: 82.32 %		Percentiles: P <sub>1</sub> = 57.4 P <sub>10</sub> = 71.0 Q <sub>1</sub> = 77.5 Median = 83.0 Q <sub>3</sub> = 88.0 P <sub>90</sub> = 94.3 P <sub>99</sub> = 98.8		Hours of Calibration: 0																							
				Percent Operational Time: 99.9																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	83.5	83.8	82.6	82.2	81.9	82.0	83.2	83.1	82.1	81.0	80.9	80.9	80.5	80.6	80.5	80.7	82.3	86.1	89.8	91.8	92.2	91.9	90.9	89.9	84.3	92.2	
2-Nov	90.6	91.0	91.2	91.4	92.1	94.4	94.4	93.8	94.4	93.7	92.6	91.7	90.5	89.1	88.3	89.9	89.2	90.2	92.5	92.6	93.6	94.1	95.7	96.2	92.2	96.2	
3-Nov	96.6	96.8	96.8	97.1	97.2	97.8	97.4	95.1	92.6	90.5	89.8	88.0	87.3	85.7	86.7	87.5	89.5	89.7	89.1	89.0	90.9	91.7	86.4	85.6	91.4	97.8	
4-Nov	89.4	94.1	94.3	94.9	94.4	93.3	92.4	92.7	93.5	95.1	96.3	95.2	92.3	90.2	85.7	85.8	93.3	95.4	95.6	94.8	95.8	96.7	96.2	95.7	93.5	96.7	
5-Nov	95.3	95.9	95.9	95.8	95.6	95.3	95.4	95.1	95.3	94.9	93.3	92.2	88.9	85.5	82.4	83.9	88.3	89.3	85.3	81.9	78.3	81.2	84.1	85.9	89.8	95.9	
6-Nov	84.6	87.4	88.5	89.1	89.5	88.8	87.7	87.9	84.4	85.3	83.3	77.7	77.5	76.7	75.5	77.1	77.9	79.4	84.8	86.4	88.1	90.2	91.9	94.5	84.8	94.5	
7-Nov	94.2	92.1	91.7	81.1	80.2	76.5	75.9	75.2	73.7	70.4	66.9	63.7	62.2	66.0	67.1	66.7	72.7	79.9	82.9	84.1	85.9	86.3	86.3	87.4	77.9	94.2	
8-Nov	82.9	83.1	72.5	73.1	75.4	77.1	79.5	81.5	81.2	81.7	75.9	70.1	62.4	56.2	56.1	56.6	63.1	66.6	76.3	73.4	70.3	64.7	71.9	69.7	71.7	83.1	
9-Nov	73.4	77.0	81.5	81.4	80.1	82.0	81.0	80.9	78.8	72.8	69.2	66.0	57.7	49.6	43.8	44.0	49.5	57.3	62.3	68.6	71.7	76.8	81.4	82.9	69.6	82.9	
10-Nov	84.7	87.5	87.6	85.9	85.0	85.7	89.3	89.2	88.2	83.1	76.9	71.1	64.4	60.2	57.8	59.0	69.1	73.5	72.7	84.9	90.9	89.5	88.1	90.8	79.8	90.9	
11-Nov	92.7	92.7	93.6	93.6	91.9	90.0	91.2	93.3	92.7	89.5	88.5	85.0	84.2	84.9	84.5	84.1	88.8	89.7	94.0	94.4	94.5	94.7	94.6	93.3	90.7	94.7	
12-Nov	94.0	94.9	97.2	98.0	98.4	98.7	98.9	97.8	95.9	91.4	77.7	71.6	71.0	67.5	67.9	70.4	73.1	75.3	75.5	70.6	72.1	69.7	71.6	72.1	82.1	98.9	
13-Nov	75.6	76.0	77.1	78.7	83.0	84.0	83.1	83.5	82.2	81.1	74.7	69.8	68.4	68.3	69.3	71.2	76.3	80.2	81.4	80.0	83.0	83.7	83.5	82.4	78.2	84.0	
14-Nov	82.8	84.2	84.2	84.7	85.2	86.2	86.8	86.3	85.3	85.1	84.0	82.9	81.2	79.1	77.9	78.7	82.0	81.7	81.6	81.9	82.1	83.0	85.7	89.5	83.4	89.5	
15-Nov	90.5	87.8	87.5	87.8	86.4	87.2	88.6	89.9	89.8	88.4	89.1	86.2	81.0	78.6	79.2	80.7	83.6	85.7	86.1	86.6	87.1	88.3	90.2	95.2	86.7	95.2	
16-Nov	96.8	96.7	96.3	96.0	95.0	94.0	93.5	93.4	93.7	94.2	95.9	96.0	90.1	81.1	74.8	72.1	74.8	75.3	74.6	74.8	74.9	74.6	75.1	76.7	85.8	96.8	
17-Nov	77.4	77.9	90.9	96.3	96.2	96.2	96.5	97.4	98.0	98.4	98.7	98.8	98.9	99.1	99.2	99.4	99.4	99.4	95.6	89.3	89.5	94.0	92.2	92.0	94.6	99.4	
18-Nov	89.9	90.9	86.1	84.7	83.3	88.1	91.3	86.0	80.3	79.1	79.3	74.6	73.5	71.8	70.9	74.6	85.8	87.1	83.9	83.7	81.8	79.1	79.6	83.4	82.0	91.3	
19-Nov	84.7	84.0	81.9	85.8	86.1	87.9	86.5	85.9	85.2	81.1	78.0	75.7	76.6	76.9	74.0	75.8	77.5	80.0	81.4	82.6	81.7	83.3	80.7	79.7	81.4	87.9	
20-Nov	82.0	84.2	84.1	84.3	84.1	84.9	84.8	84.4	84.6	84.1	82.7	81.5	81.2	80.5	79.7	81.6	81.4	81.9	82.6	82.7	81.9	83.9	84.0	83.3	82.9	84.9	
21-Nov	83.8	83.9	83.9	84.5	84.8	DF	85.2	85.2	84.7	83.0	80.1	77.1	78.0	79.8	79.7	82.2	85.3	85.9	85.8	85.0	83.9	82.6	83.1	84.8	83.1	85.9	
22-Nov	86.1	86.4	86.2	85.8	86.4	86.3	85.8	85.6	85.3	85.7	85.6	80.3	78.2	78.3	83.5	84.3	81.6	76.5	80.0	79.3	80.3	79.8	79.5	79.4	82.8	86.4	
23-Nov	80.7	80.8	81.0	79.8	79.8	79.5	80.0	81.1	81.2	81.0	79.2	78.8	79.2	79.1	79.5	80.0	80.7	82.2	81.7	81.1	81.6	81.6	81.4	81.5	80.5	82.2	
24-Nov	82.0	82.2	82.1	82.5	82.5	82.6	82.8	83.1	83.3	83.0	82.6	81.3	81.2	80.2	80.4	81.2	81.5	81.6	83.0	84.8	85.5	86.1	85.8	85.7	82.8	86.1	
25-Nov	85.4	85.2	85.0	84.7	83.9	83.5	83.6	84.1	84.2	84.2	84.4	85.1	85.6	85.5	84.6	83.7	83.0	83.9	83.7	82.8	83.0	82.9	82.2	83.7	84.1	85.6	
26-Nov	85.0	85.1	85.2	84.9	84.5	83.8	84.0	83.8	84.5	85.3	86.2	85.6	82.4	81.8	81.7	81.9	81.3	81.0	83.5	83.8	76.5	73.4	72.0	71.0	82.0	86.2	
27-Nov	69.6	69.7	68.7	69.4	68.6	66.7	65.7	65.9	63.2	62.3	60.9	60.1	59.6	59.8	60.5	61.5	62.0	61.8	61.6	62.9	62.5	61.1	61.9	64.4	63.8	69.7	
28-Nov	65.7	68.3	71.2	71.2	72.8	78.6	78.6	78.8	78.5	78.5	79.1	75.7	68.1	66.2	67.0	71.9	78.6	73.3	75.1	77.5	77.3	77.0	77.2	76.9	74.3	79.1	
29-Nov	76.5	75.9	75.1	74.9	74.2	74.1	73.7	73.6	73.2	73.4	73.4	75.4	76.8	76.2	70.6	75.8	77.8	77.3	77.5	76.8	77.0	77.2	77.2	77.1	75.4	77.8	
30-Nov	77.0	76.7	76.5	76.4	76.9	77.0	77.4	77.3	77.5	77.9	78.1	78.8	78.9	79.0	79.3	79.6	79.8	79.6	79.1	78.7	78.2	77.8	77.2	76.9	78.0	79.8	
		84.4	85.1	85.2	85.2	85.2	85.6	85.8	85.7	84.9	83.8	82.1	79.9	77.9	76.5	75.6	76.7	79.6	80.9	82.0	82.2	82.4	82.6	82.9	83.6	Diurnal Average	
		96.8	96.8	97.2	98.0	98.4	98.7	98.9	97.8	98.0	98.4	98.7	98.8	98.9	99.1	99.2	99.4	99.4	99.4	95.6	94.8	95.8	96.7	96.2	96.2	Diurnal Maximum	
DF - DAS Failure																											



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 2m (RH2) - %**  
**Fort Hills - November 2024**







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 2m (RH2) - %**  
**Fort Hills - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	13	1.81	1.81
60 - 80	232	32.27	34.08
80 - 100	474	65.92	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



Maximum Speed: 27 km/h on Nov 20 10:00	Maximum Daily Speed Average: 20.6 km/h on Nov 20	Hours in Service: 720
Minimum Speed Value: 1 km/h on Nov 11 18:00	Minimum Daily Speed Average: 0.5 km/h on Nov 29	Hours of Data: 719
Maximum Diurnal Speed Average: 3.4 km/h at hour 20	Minimum Diurnal Speed Average: 0.2 km/h at hour 8	Hours of Missing Data: 1
Monthly Average Velocity: 0.8 km/h 328.2 deg	Percentiles: $P_1 = 2$ $P_{10} = 4$ $Q_1 = 6$ Median = 9 $Q_3 = 14$ $P_{90} = 19$ $P_{99} = 24$	Percent Operational Time: 99.9

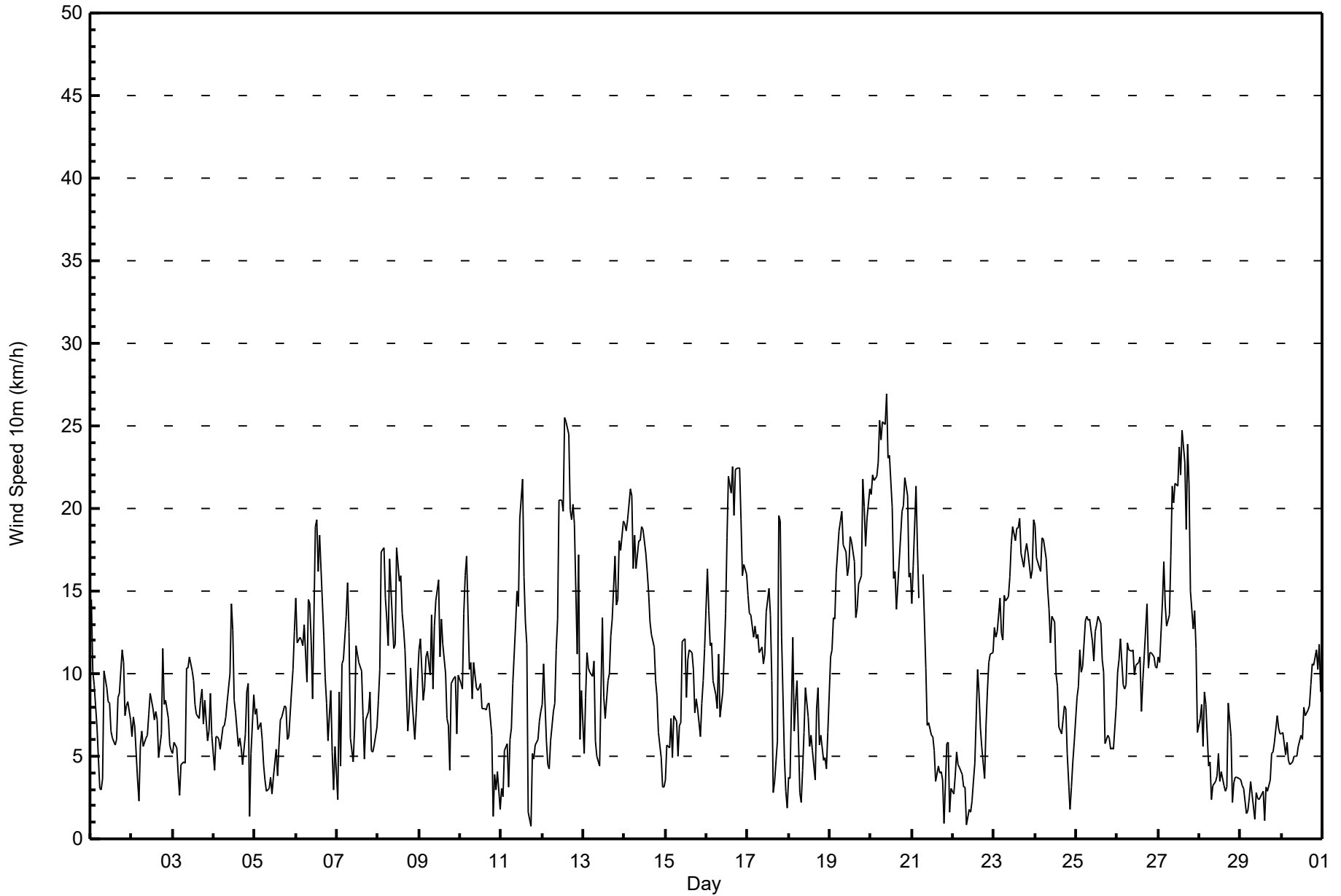
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	SSW15	S10	S9	S8	S7	SW3	WNW3	NNW4	N10	NNE9	N8	N8	N7	N6	NNE6	NE6	NNE9	NNE9	N11	NNE11	NNE7	NNE8	NE8	NNE7	NNE3.4	SSW15
2-Nov	N6	NNE7	NNE7	ENE4	NNW2	NW6	NNW6	NW6	NNW6	NNW6	N8	NNW9	N8	N7	NNW8	NW7	N5	NNE6	N12	N8	N8	N7	NNW6	NNW5	N6.3	N12
3-Nov	NNW5	NNW6	NNW5	NNW4	W3	S4	SSE5	S5	SSW10	SSW10	SSW11	SSW10	S10	S8	SSE8	SSE7	S8	S9	S7	SW8	SSW6	SSW7	SW9	SW6	SSW5.2	SSW11
4-Nov	S4	S6	S6	SSE6	SSE5	ESE7	SE7	SE7	SSE8	S10	S14	SSW13	S8	SE8	SE6	ESE6	SSE5	SE4	SSE6	SE9	SSE1	N5	N9	SSE5.6	S14	
5-Nov	NNW8	N8	N7	NNW7	NNW6	NW5	WNW4	W3	WSW3	SW4	SSW3	SW4	WSW5	WSW4	SW6	SSW7	S7	SSW8	SW8	SW6	SW6	S9	S10	SSW13	SW3.2	SSW13
6-Nov	SSW15	S12	SSE12	SSE12	SSE12	SSE13	S9	S15	S14	SSE12	SSW8	SSW19	SW19	SSW16	SW18	SSW14	SSW12	S10	SSE8	SE6	SE9	SE5	ESE3	SE6	S10.4	SW19
7-Nov	NNW2	NNW9	WNW4	W11	WSW11	W13	W16	W13	WNW6	SW5	WNW7	W12	WSW11	SW11	SW10	SW7	ESE5	ESE7	ESE8	ESE9	SE5	SE5	SSE6	SSE7	WSW4.2	W16
8-Nov	SSE8	SSE10	SSE17	SSE18	SSE15	S13	SSE12	SE17	SSE13	SE12	SSE12	S18	S16	S16	S14	S13	SSW11	WSW7	N8	NNW10	WNW9	W6	SW8	SSW10	S8.9	SSE18
9-Nov	SW11	SSW12	SSW8	S9	SSW11	SSE11	SSE10	SSW14	S9	SSW13	SW14	SSW16	SSW11	SSW13	SSW12	SSW10	S7	S7	S4	S9	SSE10	SSE10	SE6	SSE10	SSW9.7	SSW16
10-Nov	SSE9	SSE9	S14	SSW16	SSW17	S10	SE11	SE8	SE11	SE9	SSE9	SSE9	S9	SSE8	S8	SSE8	SE8	SE8	ESE6	ESE1	N4	N3	NNW4	N2	SSE6.7	SSW17
11-Nov	N3	NW3	NNW5	NNW6	NNW3	E6	SSE7	SSE9	ESE13	SE15	SE14	SE19	SE22	SE16	SE13	SSE12	NNW2	WNW1	NNW5	NW5	NNW6	NW6	N7	N8	ESE3.9	SE22
12-Nov	NNW8	N11	N6	NNW4	W4	SSW6	SSW8	SSW8	SSW11	SW13	WSW20	WSW21	WSW20	WSW26	WSW25	WSW24	SW20	SW19	SW20	W19	W11	W17	W6	WNW9	WSW11.8	WSW26
13-Nov	W5	WSW9	SW11	SW10	SSW10	SW10	SW11	WNW6	NNW5	NNW4	N9	NNE13	NNE9	NE7	NE10	NE10	NNE12	NNE13	NNE17	NNE14	NNE15	NNE18	NNE17	N19	N5.8	N19
14-Nov	N19	N19	N19	N21	N21	N16	N18	N16	N18	N18	N19	N19	N17	N16	N15	N13	N12	N12	N10	NNW9	NNW6	NE5	N3	WNW3	N14.2	N21
15-Nov	SSE4	SSE6	SSE6	SSE7	SSE5	SSE7	SSE7	SSE5	SE7	S7	SSW12	SSW12	S9	S11	S11	SSE11	SSE10	S8	S8	S8	S6	SSE8	N10	S12	S7.8	SSW12
16-Nov	S16	S14	S12	SSE12	SSE10	SSE9	S8	S11	SSW7	SSE9	S11	S14	SSE18	S22	S21	SSE23	SSE20	SSE22	SSE22	SSE22	SSE19	SSE16	SSE17	SSE16	SSE15.2	SSE23
17-Nov	SSE15	SSE14	SSE14	SE12	SE13	SE12	SE12	SSE11	SE12	SSE11	SSE11	S14	SSE15	S14	S10	S3	N3	N6	N20	NNW19	NW12	W5	SW3	ESE2	SSE5.4	N20
18-Nov	SSE4	SSW4	WNW12	W7	NW8	NNW10	SSW3	SW2	SW4	WNW6	WNW9	NW7	N6	NE6	NE5	NNE4	NNE8	NE9	ENE6	E6	NE5	ENE5	NE4	NNE6	N2.7	WNW12
19-Nov	N11	N11	NNE13	NNE13	NNE16	N19	N19	N20	N18	NNE17	NNE16	NNE17	NNE18	NNE18	NNE17	NNE13	NNE14	NNE15	NNE16	N22	N20	N18	N19	N21	N16.6	N22
20-Nov	N21	N22	N22	N22	N23	N25	NNE24	N25	N25	N27	N23	N23	N20	N16	N16	N14	N15	NNE18	N20	N20	N22	N21	N16	N16	N20.6	N27
21-Nov	N14	N17	N21	N18	N15	DF	N16	N13	NNW10	WNW7	WNW7	W6	WSW6	SW5	WSW3	WSW4	WSW4	SW4	S4	E1	NE6	NE6	NNE2	WNW3	NNW5.5	N21
22-Nov	W3	WSW4	SSW5	SSW4	S4	SSE4	SE3	ESE3	ENE1	NW2	SSW2	SE2	ENE3	NNE5	NNE10	NE9	NE7	NNE5	E4	NE7	NE9	NNE11	NNE11	NNE11	NE2.8	NNE11
23-Nov	NNE13	NNE12	NNE13	NNE15	NNE12	NNE12	NNE15	NNE14	N15	N16	NNE18	NNE19	NNE18	N19	N19	N19	N17	N16	N17	N18	N17	N16	N16	N19	NNE16.0	N19
24-Nov	N19	N17	N16	N16	N18	N18	N17	N15	N14	N12	N13	N13	N10	N9	N7	N6	N7	N8	N8	NNE5	NW2	SW3	SSW5	S6	N9.9	N19
25-Nov	SSE9	SSE9	S11	S10	SSE10	SSE13	S13	S13	SSE13	S12	SSE11	S13	S13	SSE13	S13	S11	S10	S6	S6	S6	SSW5	S5	SSE5	SSE8	S9.9	S13
26-Nov	SSE10	SSE11	S12	S9	SSW9	SSW9	SSW12	SSW11	SSW11	SSW11	S10	S11	S11	S11	SSW8	SSW10	SSW11	SW14	WSW10	WNW11	W11	W11	WSW10	WSW10	SSW8.8	SW14
27-Nov	WSW11	WSW11	W14	W17	W14	WNW13	NW14	NW17	NW21	NW20	NW22	NW21	NNW24	NNW22	NNW25	NW23	NW19	NNW24	NNW21	NNW15	NNW13	NNW14	NNW12	NNW6	NW15.7	NNW25
28-Nov	WNW7	NW8	NW6	WNW9	NW8	WSW4	W5	ESE2	NNE3	SSW3	SSE4	S5	SSE3	SSE4	ESE3	ENE3	NE3	NNE8	NNE6	WNW2	WSW3	SSW4	SSE4	SE4	WNW1.0	WNW9
29-Nov	SSE4	SSW3	S3	SSE2	SW2	S2	S4	S3	SSE1	SSE3	S3	SSE2	SE3	SE3	SW1	N3	NNW3	N4	N5	NNW5	NNW6	NNW7	N7	N6	NNW0.5	NNW7
30-Nov	NNW6	N6	NNW5	NW6	NNW5	NW4	NNW5	NNW5	NNW5	NNW5	NW6	N6	NNW6	N8	NNW7	N8	N8	N9	N11	N10	N11	N10	N12	N9	N7.1	N12
NW0.9NNW1.0 NW0.7NNW0.7NNW0.9 SW0.3NNW0.4NSW0.2NNE0.7 W0.3 W1.5WSW1.6 SW1.4SSW1.4 SW1.0 SW0.7NNE0.5NNE1.5 N3.0 N3.4 N3.2NNW2.7 N2.3NNW2.0																								Diurnal Average		
N21 N22 N22 N22 N23 N25 NNE24 N25 N25 N27 N23 N23 NNW24 WSW26WSW25WSW24 SW20NNW24 SSE22 SSE22 N22 N21 N19 N21																								Diurnal Maximum		

DF - DAS Failure  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 10m (WS10) - km/h**  
**Fort Hills - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Fort Hills - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	153	21.28	21.28
6 - 11	313	43.53	64.81
12 - 19	202	28.09	92.91
20 - 28	51	7.09	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Fort Hills - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	11	6	5	5	2	7	9	19	14	11	12	9	7	7	6	23	153
6 - 11	47	20	13	1	2	6	17	45	51	29	15	11	8	12	10	26	313
12 - 19	60	34	0	0	0	1	11	26	25	19	6	0	9	2	4	5	202
20 - 28	24	1	0	0	0	0	1	5	2	0	2	6	0	0	4	6	51
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	142	61	18	6	4	14	38	95	92	59	35	26	24	21	24	60	719

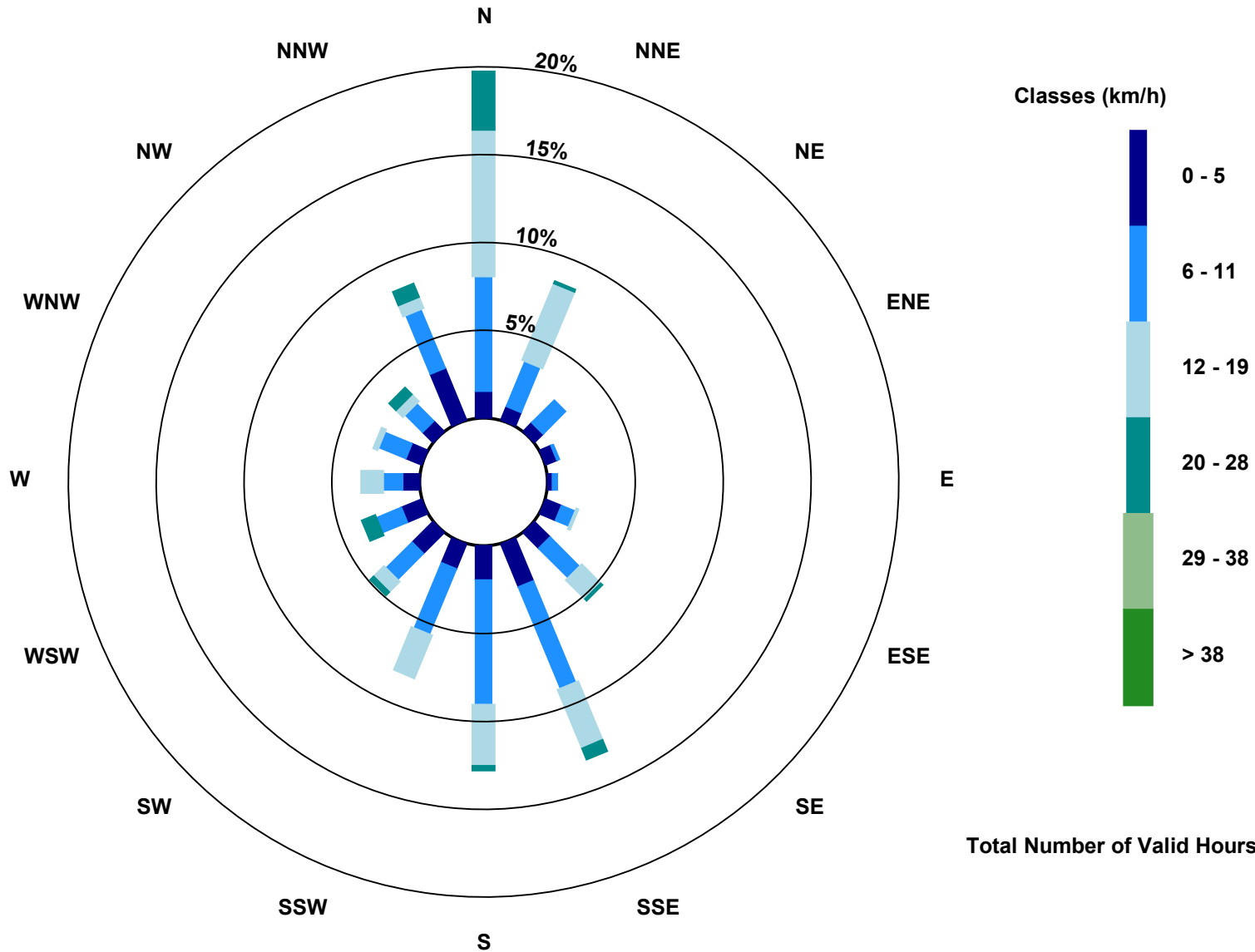
Total Number of Valid Hours: 719

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Fort Hills



Total Number of Valid Hours: 719



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Fort Hills - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Nov 12 15:00	Hours in Service: 720 Hours of Data: 719 Hours of Missing Data: 1 Hours of Calibration: 0 Percent Operational Time: 99.9
Minimum Value: 0 km/h on Nov 24 22:00	
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 5	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	3	1	1	1	1	1	1	2	2	2	1	2	1	1	1	1	1	2	2	2	2	2	2	1	3
2-Nov	1	1	2	1	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	2	1	1	1	2
3-Nov	0	1	1	1	1	1	1	2	1	1	1	2	2	2	1	1	2	1	1	1	2	1	2	1	2
4-Nov	2	1	1	1	1	1	1	1	2	2	2	3	2	2	2	1	1	1	2	2	1	2	1	2	3
5-Nov	2	2	1	1	2	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	1	1	2	2
6-Nov	2	2	1	2	2	2	3	3	3	2	4	3	3	3	3	3	2	1	2	2	2	2	2	1	4
7-Nov	2	2	1	3	3	3	3	3	3	2	2	3	3	3	2	5	2	1	1	2	2	1	1	2	5
8-Nov	3	2	2	2	2	1	1	4	4	3	4	3	3	2	2	2	1	2	2	2	2	2	2	3	4
9-Nov	2	1	3	2	3	3	3	2	3	2	2	2	2	2	2	2	2	2	1	1	3	1	1	1	3
10-Nov	1	1	1	2	2	4	1	2	1	1	1	1	2	1	1	1	1	1	2	1	1	2	1	2	4
11-Nov	1	2	1	1	2	3	2	4	3	2	2	4	3	4	2	3	2	2	1	2	1	1	2	1	4
12-Nov	1	2	2	1	1	1	1	2	2	3	5	4	6	5	7	4	4	4	5	4	4	5	4	3	7
13-Nov	2	2	2	2	1	2	2	1	2	3	4	2	2	2	2	2	2	3	4	3	3	3	3	4	4
14-Nov	3	3	3	3	4	3	3	3	3	3	3	3	3	3	3	2	2	2	2	1	1	1	1	2	4
15-Nov	2	1	1	2	1	1	1	2	1	2	2	2	1	2	1	1	2	1	1	2	1	1	1	2	2
16-Nov	2	2	2	2	2	2	1	1	1	3	2	3	3	3	4	4	3	3	3	4	3	3	2	2	4
17-Nov	3	3	1	1	1	1	1	1	1	1	2	2	2	2	1	2	1	4	4	5	3	1	2	1	5
18-Nov	1	3	2	1	2	3	1	1	1	2	2	2	1	1	1	1	2	1	2	2	2	1	1	2	3
19-Nov	2	2	2	3	4	3	3	3	3	3	3	3	3	4	3	3	3	3	4	5	4	4	5	4	5
20-Nov	4	4	4	4	5	5	5	5	5	5	5	4	4	3	3	3	3	3	4	4	5	4	4	3	5
21-Nov	3	3	4	4	3	DF	3	3	2	2	1	2	1	1	1	1	1	1	1	1	2	1	2	0	4
22-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	2	1	2	2	2	2	2	2
23-Nov	3	3	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
24-Nov	3	3	3	3	3	3	3	2	2	2	2	2	2	2	1	1	1	1	1	2	1	0	1	1	3
25-Nov	1	1	1	1	2	1	2	2	2	1	2	2	2	2	2	1	1	1	1	1	1	2	1	2	2
26-Nov	1	1	1	1	1	1	1	1	1	1	2	2	1	2	1	1	1	3	3	3	2	2	2	2	3
27-Nov	2	3	3	4	3	3	3	4	5	5	5	6	6	6	5	4	5	5	5	3	4	4	3	2	6
28-Nov	1	2	1	1	1	1	1	2	1	2	1	1	2	1	1	1	3	2	2	2	1	1	1	1	3
29-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	2	2
30-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	4	4

4	4	4	4	5	5	5	5	5	5	5	5	6	6	6	7	5	5	5	5	5	5	5	5	4	
Diurnal Maximum																									

DF - DAS Failure



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Fort Hills - November 2024**

Direction of Maximum Speed: 6 deg on Nov 20 10:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 5.5 deg on Nov 20	Hours of Data: 719
Direction of Minimum Speed: 286 deg on Nov 11 18:00	Hours of Missing Data: 1
Direction of Minimum Daily Speed Average: 0.5 deg on Nov 29	Percent Operational Time: 99.9
Monthly Average Direction: 328.2 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	203	176	173	181	176	214	295	327	8	12	360	2	0	356	18	41	30	27	3	12	15	28	36	23	16.8
2-Nov	7	19	28	61	329	323	342	320	328	340	358	345	353	355	345	326	11	15	360	353	351	357	342	345	352.6
3-Nov	336	332	327	330	273	177	165	172	204	200	200	202	188	182	166	168	175	176	178	220	208	210	233	236	201.5
4-Nov	185	174	181	166	168	122	140	137	159	172	190	192	176	142	122	157	145	158	144	142	156	358	349		158.9
5-Nov	346	2	351	347	346	310	295	267	247	228	203	220	237	253	217	199	180	196	219	217	216	190	191	194	230.9
6-Nov	196	170	157	163	166	166	182	170	173	164	202	207	220	207	215	212	212	169	150	131	143	146	103	144	182.7
7-Nov	328	348	288	259	251	270	266	261	290	228	302	266	254	232	220	223	105	121	120	110	127	146	162	160	241.2
8-Nov	165	154	163	162	168	169	161	144	150	139	157	173	183	184	183	191	195	246	355	330	302	276	228	213	176.5
9-Nov	215	212	201	181	195	167	156	197	183	212	222	211	203	206	212	202	191	181	186	183	159	161	146	165	192.8
10-Nov	167	156	180	192	198	188	136	141	130	143	162	153	185	153	169	150	131	126	121	120	355	353	337	360	160.2
11-Nov	10	312	340	337	335	100	156	148	120	126	129	135	141	143	146	151	337	286	327	326	348	326	358	349	123.1
12-Nov	340	356	356	337	263	210	210	196	206	223	253	252	255	256	256	240	229	225	236	267	279	276	276	283	252.3
13-Nov	259	242	234	235	209	218	232	289	344	347	357	12	30	45	38	45	33	28	21	18	20	15	12	3	2.0
14-Nov	359	358	2	3	6	358	360	357	359	358	359	6	7	10	9	358	352	355	0	331	339	34	356	300	359.9
15-Nov	153	152	158	166	167	148	147	161	125	182	208	209	183	180	177	161	168	183	177	169	170	161	174	184	172.6
16-Nov	181	181	174	158	163	149	178	174	198	147	174	179	167	170	175	163	155	158	163	161	165	164	155	159	166.3
17-Nov	162	152	148	138	140	145	146	151	146	155	159	169	168	174	173	190	359	359	358	328	310	276	228	117	156.8
18-Nov	153	206	283	279	320	347	195	230	234	296	299	312	5	38	46	18	25	46	70	94	52	64	52	14	354.1
19-Nov	6	4	15	27	20	4	2	0	2	13	12	17	16	13	16	20	16	20	14	1	356	356	4	3	9.1
20-Nov	4	5	2	5	6	4	13	5	8	6	7	11	4	354	7	5	9	14	4	11	8	1	356	357	5.5
21-Nov	5	360	10	10	0	DF	357	355	344	284	284	277	243	227	253	252	239	217	180	79	36	42	17	301	344.7
22-Nov	274	245	206	206	183	160	130	114	58	325	206	129	72	29	30	39	41	31	95	48	41	13	19	26	42.3
23-Nov	23	20	23	21	18	18	12	14	11	9	14	14	17	11	9	8	7	2	5	9	359	7	10	4	11.3
24-Nov	4	4	3	3	7	5	7	1	1	359	1	359	359	9	4	4	9	10	2	16	318	231	198	184	2.8
25-Nov	159	162	170	174	155	161	177	174	164	171	164	170	172	164	171	180	174	170	177	182	204	175	166	166	170.0
26-Nov	165	168	179	188	193	198	193	198	201	199	185	174	174	184	202	198	204	225	239	288	276	268	253	251	207.0
27-Nov	253	252	272	278	279	298	305	311	318	321	322	326	329	331	331	326	326	332	341	337	334	344	347	336	318.5
28-Nov	299	326	310	301	317	258	280	109	14	206	152	173	162	163	109	70	37	29	18	294	244	204	164	130	303.1
29-Nov	154	193	178	155	231	184	180	169	155	156	172	152	136	146	230	3	345	353	353	336	336	345	353	359	347.3
30-Nov	339	349	340	319	335	321	337	334	342	346	319	352	342	349	348	355	354	351	356	357	358	5	7	1	349.1

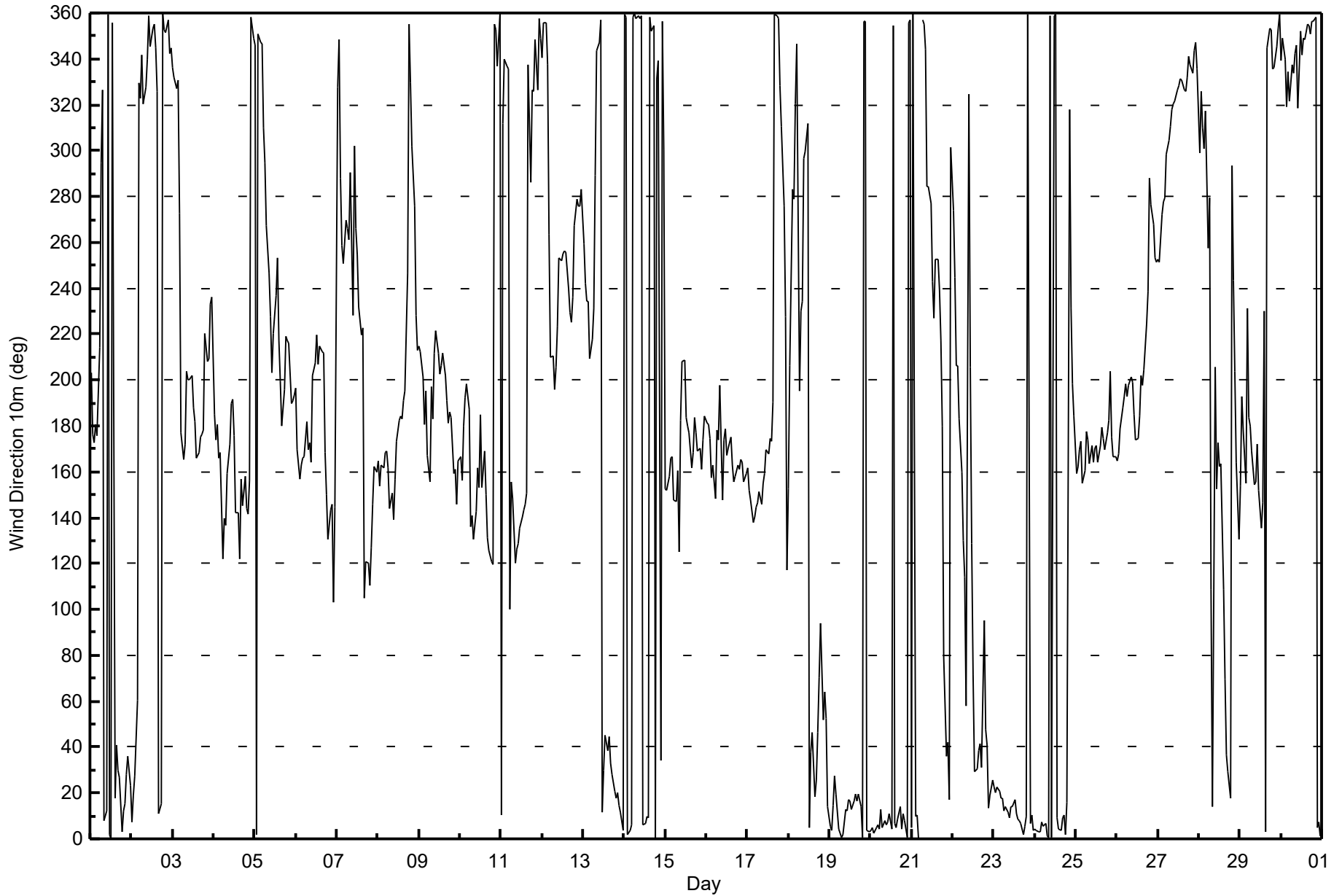
307.1 346.2 309.6 294.7 287.8 221.2 300.0 240.9 14.4 272.8 275.6 241.2 218.6 205.6 231.7 214.1 26.0 18.2 4.6 349.6 348.9 348.3 357.6 346.8

Diurnal Average

DF - DAS Failure

All monthly, daily, and diurnal averages have been calculated using vector methods







**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Fort Hills - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 93 deg on Nov 4 22:00	Hours of Data: 719
Minimum Value: 3 deg on Nov 26 07:00	Hours of Missing Data: 1
Percentiles: P <sub>1</sub> = 6 P <sub>10</sub> = 8 Q <sub>1</sub> = 10 Median = 13 Q <sub>3</sub> = 18 P <sub>90</sub> = 31 P <sub>99</sub> = 72	Hours of Calibration: 0
	Percent Operational Time: 99.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	15	12	10	11	14	54	28	54	11	12	12	13	12	18	20	16	13	19	12	10	17	18	13	14	54
2-Nov	19	14	14	33	80	11	17	27	17	18	12	12	13	12	26	15	49	28	10	11	11	14	11	12	80
3-Nov	12	9	7	16	33	18	16	33	6	6	7	8	17	15	9	10	9	9	15	9	14	13	7	22	33
4-Nov	41	17	17	27	31	16	14	12	15	17	10	12	17	22	38	23	9	14	9	14	6	93	17	10	93
5-Nov	15	17	16	14	17	15	16	19	13	16	17	18	11	22	15	18	11	19	11	19	22	9	8	7	22
6-Nov	8	9	8	7	9	10	14	14	14	9	17	10	9	13	10	10	11	22	8	13	7	13	50	25	50
7-Nov	84	13	25	18	26	15	13	13	56	64	31	18	15	16	11	39	19	15	13	19	17	18	27	23	84
8-Nov	17	11	7	7	6	7	8	6	15	11	21	10	8	9	11	8	8	53	18	13	19	20	18	15	53
9-Nov	9	9	28	14	12	12	24	12	35	11	8	7	11	13	10	6	6	6	10	14	8	5	22	9	35
10-Nov	16	10	8	7	7	31	13	19	8	11	11	18	16	20	21	20	14	13	15	90	18	45	14	60	90
11-Nov	39	53	21	34	43	26	22	20	14	8	9	10	9	9	9	16	73	92	13	19	15	14	15	13	92
12-Nov	12	12	12	24	29	15	12	11	8	10	12	11	14	12	13	12	9	10	15	13	21	14	76	18	76
13-Nov	32	15	15	22	7	7	12	27	32	42	37	14	15	21	12	9	13	10	11	10	11	8	11	13	42
14-Nov	13	14	14	12	12	13	13	13	14	13	14	12	13	13	13	12	13	13	13	13	19	14	32	42	42
15-Nov	42	35	31	19	14	11	12	22	13	19	15	16	11	15	9	9	10	9	8	10	11	8	14	15	42
16-Nov	8	11	12	8	7	10	9	9	23	17	17	10	9	10	11	10	9	8	8	8	8	9	7	8	23
17-Nov	10	12	6	7	7	7	7	6	7	6	8	8	10	8	7	42	24	25	17	12	14	30	47	66	66
18-Nov	44	49	11	13	24	13	64	58	32	13	9	14	22	16	13	18	12	8	27	28	40	20	37	16	64
19-Nov	11	11	12	12	11	16	13	14	13	11	13	10	11	12	10	9	9	10	10	15	14	14	15	15	16
20-Nov	15	14	16	14	14	16	11	16	14	15	13	14	14	14	13	12	12	13	13	14	13	15	14	15	16
21-Nov	13	14	12	12	14	DF	13	13	15	20	12	18	14	15	31	14	15	21	14	61	18	13	52	15	61
22-Nov	19	19	9	16	12	16	17	20	48	45	53	32	36	24	15	13	19	41	20	9	14	13	15	13	53
23-Nov	11	11	11	10	11	12	11	11	12	11	10	9	9	10	11	11	13	13	12	11	13	11	10	12	13
24-Nov	12	12	13	12	10	10	10	12	11	12	13	11	12	11	11	11	8	7	8	24	35	26	6	8	35
25-Nov	9	6	6	7	4	6	8	9	6	8	10	7	8	9	10	7	7	15	14	7	13	28	13	7	28
26-Nov	5	9	5	7	6	7	3	6	6	7	14	7	8	9	12	20	10	7	16	13	13	12	10	11	20
27-Nov	9	12	14	12	12	14	14	14	12	12	12	14	12	14	11	11	10	11	12	11	14	13	13	14	14
28-Nov	10	10	29	21	7	32	22	69	36	48	29	21	36	12	27	30	79	11	16	44	20	30	36	21	79
29-Nov	32	23	19	55	51	32	22	42	64	45	20	26	19	36	69	21	63	16	18	18	13	15	28	24	69
30-Nov	16	14	20	9	11	19	26	17	19	26	23	11	18	13	17	11	12	11	11	12	13	12	12	16	26

84	53	31	55	80	54	64	69	64	64	64	53	32	36	36	69	42	79	92	27	90	40	93	76	66	
Diurnal Maximum																									

DF - DAS Failure



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS25 WASKŌW OHCI PIMÂTISIWIN NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMÂTISIWIN (AMS25)  
 NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	686	33	34	99.86	11.4	0	1.1	0
H2S(ppb) Average	683	36	37	99.86	2.2	0	0.5	0
Temperature 2 m (C) Average	720	0	0	100	12.6	0	5.7	0
Relative Humidity (%) Average	720	0	0	100	100	-	96.1	-
Wind Speed 10 m (km/h) Average	663	0	57	92.08	16	0	10	0
Wind Direction 10 m (deg) Average	663	0	57	92.08	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMĀTISIWIN (AMS25)  
 NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	686	0.28	0.7	-	0	0	0	0.1	0.2	0.7	11.4
H2S (ppb) Average	683	0.24	0.3	-	0	0	0.1	0.1	0.3	0.5	2.2
Temperature 2 m (C) Average	720	-8.08	8.5	-	-31.9	-18.6	-14.5	-6.5	-1.7	1.3	12.6
Relative Humidity (%) Average	720	84.21	9.1	-	40.8	73.6	79.3	84.4	90.6	96.2	100
Wind Speed 10 m (km/h) Average	663	4.6	3	-	0	1	2	4	6	9	16
Wind Direction 10 m (deg) Average	663	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMĀTISIWIN (AMS25)

NOVEMBER 2024

OPERATIONAL NOTES

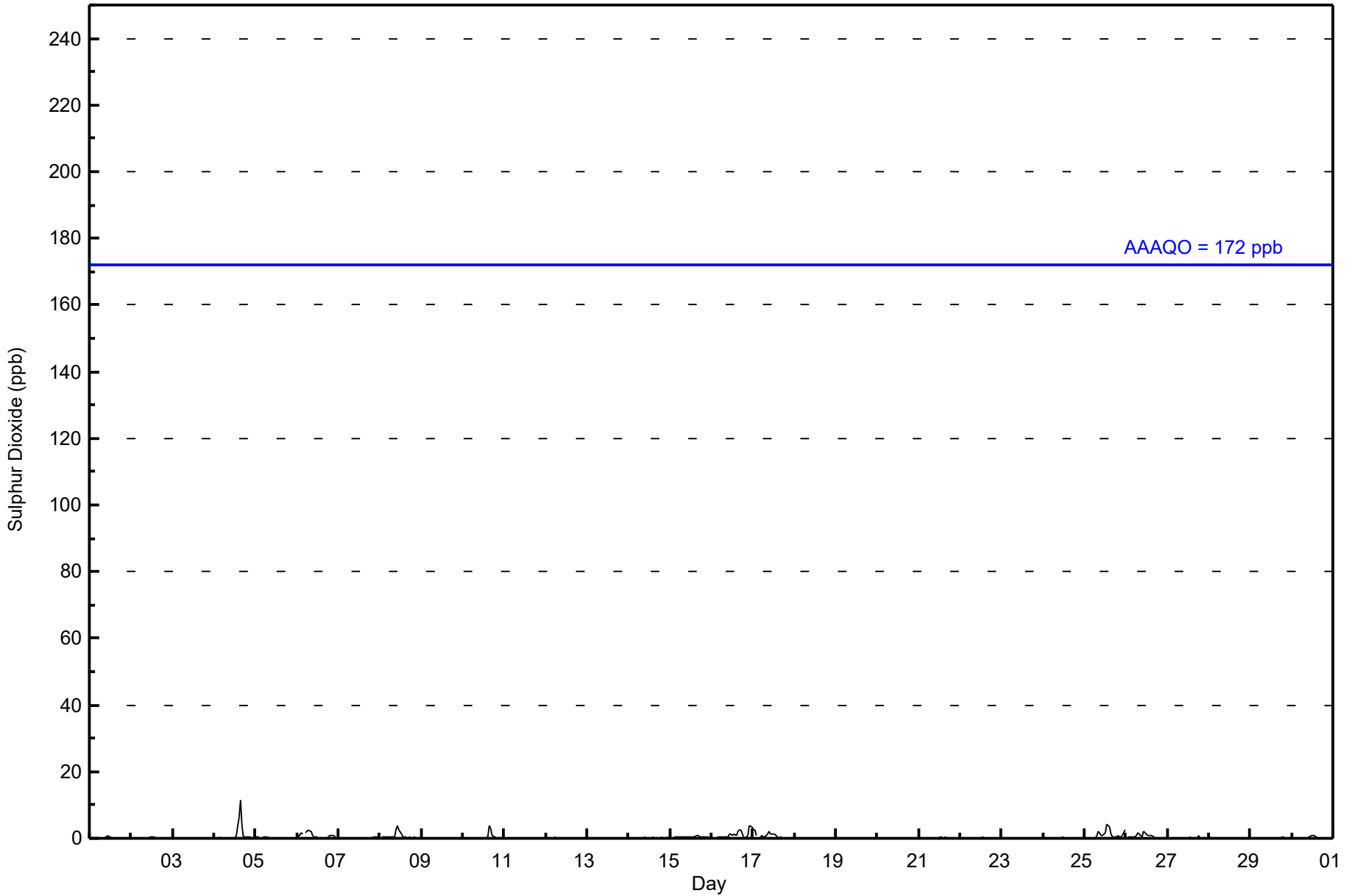
Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL GASEOUS ANALYZERS	28 Nov 2024 08:00	28 Nov 2024 08:00	1	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	01 Nov 2024 07:00	01 Nov 2024 07:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	03 Nov 2024 03:00	03 Nov 2024 05:00	3	Flat line in sensor output signal
Wind Speed, Wind Direction	04 Nov 2024 19:00	04 Nov 2024 20:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	04 Nov 2024 22:00	04 Nov 2024 22:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	07 Nov 2024 01:00	07 Nov 2024 01:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	07 Nov 2024 19:00	07 Nov 2024 19:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	11 Nov 2024 00:00	11 Nov 2024 01:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	11 Nov 2024 03:00	11 Nov 2024 03:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	11 Nov 2024 20:00	11 Nov 2024 21:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	15 Nov 2024 03:00	15 Nov 2024 03:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	15 Nov 2024 08:00	15 Nov 2024 08:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	16 Nov 2024 06:00	16 Nov 2024 06:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	18 Nov 2024 00:00	18 Nov 2024 03:00	4	Flat line in sensor output signal
Wind Speed, Wind Direction	18 Nov 2024 14:00	19 Nov 2024 02:00	13	Flat line in sensor output signal
Wind Speed, Wind Direction	21 Nov 2024 21:00	21 Nov 2024 21:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	22 Nov 2024 06:00	22 Nov 2024 10:00	5	Flat line in sensor output signal
Wind Speed, Wind Direction	24 Nov 2024 20:00	24 Nov 2024 20:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	28 Nov 2024 09:00	28 Nov 2024 09:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	28 Nov 2024 16:00	28 Nov 2024 17:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	29 Nov 2024 01:00	29 Nov 2024 03:00	3	Flat line in sensor output signal
Wind Speed, Wind Direction	29 Nov 2024 07:00	29 Nov 2024 07:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	29 Nov 2024 10:00	29 Nov 2024 12:00	3	Flat line in sensor output signal
Wind Speed, Wind Direction	30 Nov 2024 00:00	30 Nov 2024 04:00	5	Flat line in sensor output signal
Wind Speed, Wind Direction	30 Nov 2024 08:00	30 Nov 2024 08:00	1	Flat line in sensor output signal





Wood Buffalo Environmental Association  
Hourly Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Waskow ohci Pimatisiwin - November 2024







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Waskow ohci Pimatisiwin - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	685	99.85	99.85
11 - 20	1	0.15	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Waskow ohci Pimatisiwin - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	88	29	23	7	4	6	27	128	42	24	27	34	43	42	42	63	629
11 - 20	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	88	29	23	7	4	6	27	129	42	24	27	34	43	42	42	63	630

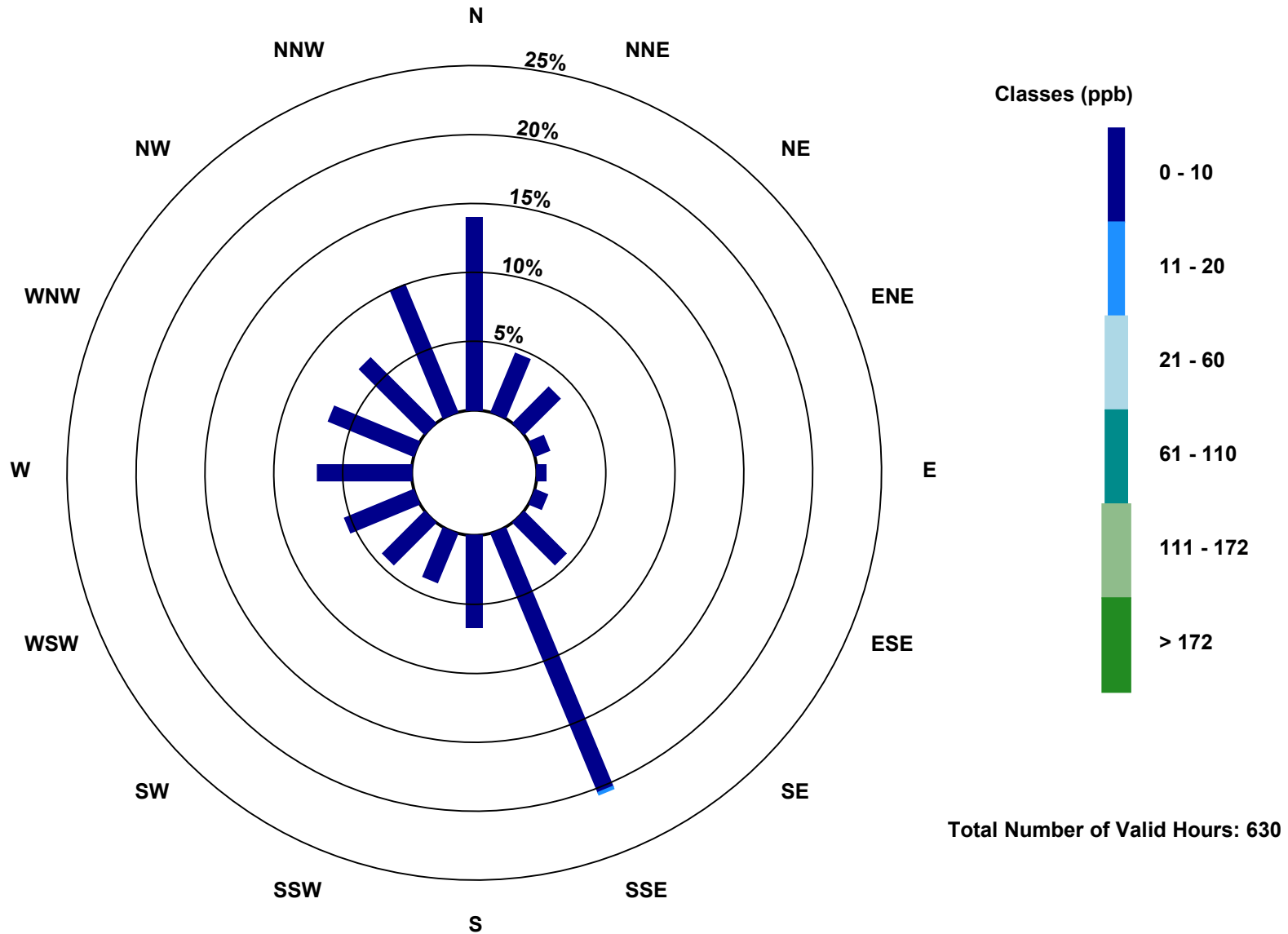
Total Number of Valid Hours: 630

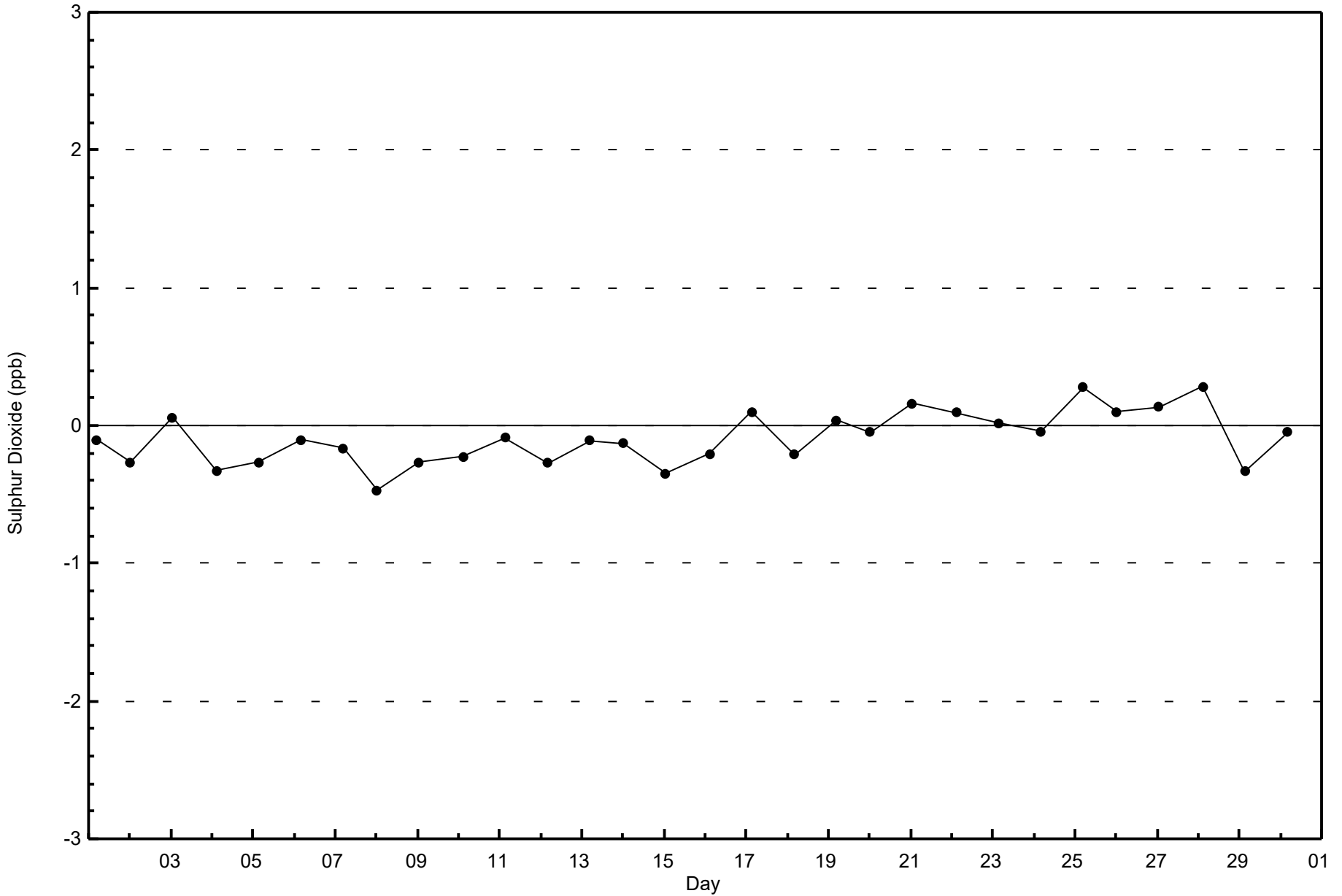
Total Number of Hours: 720

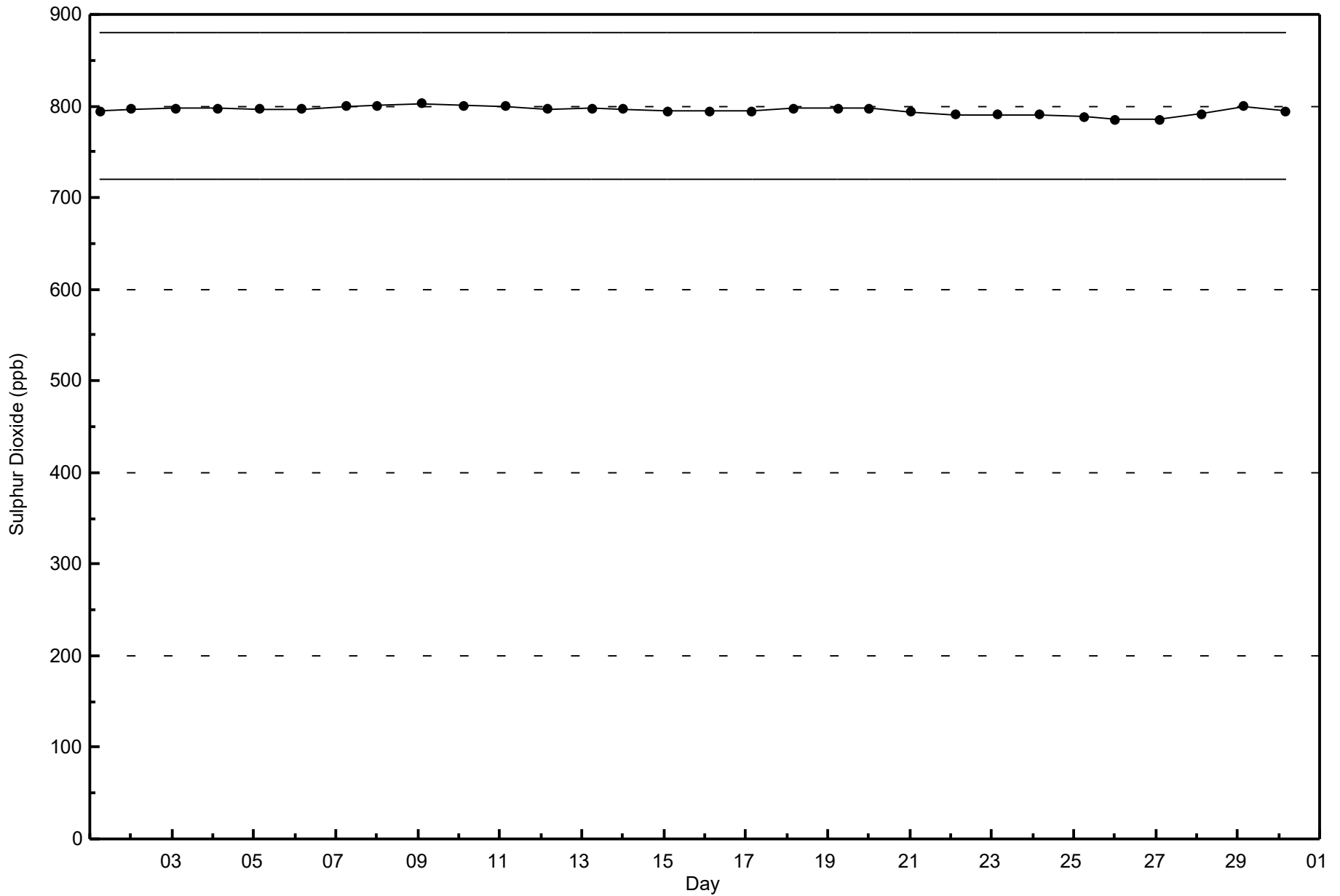


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Waskow ohci Pimatisiwin









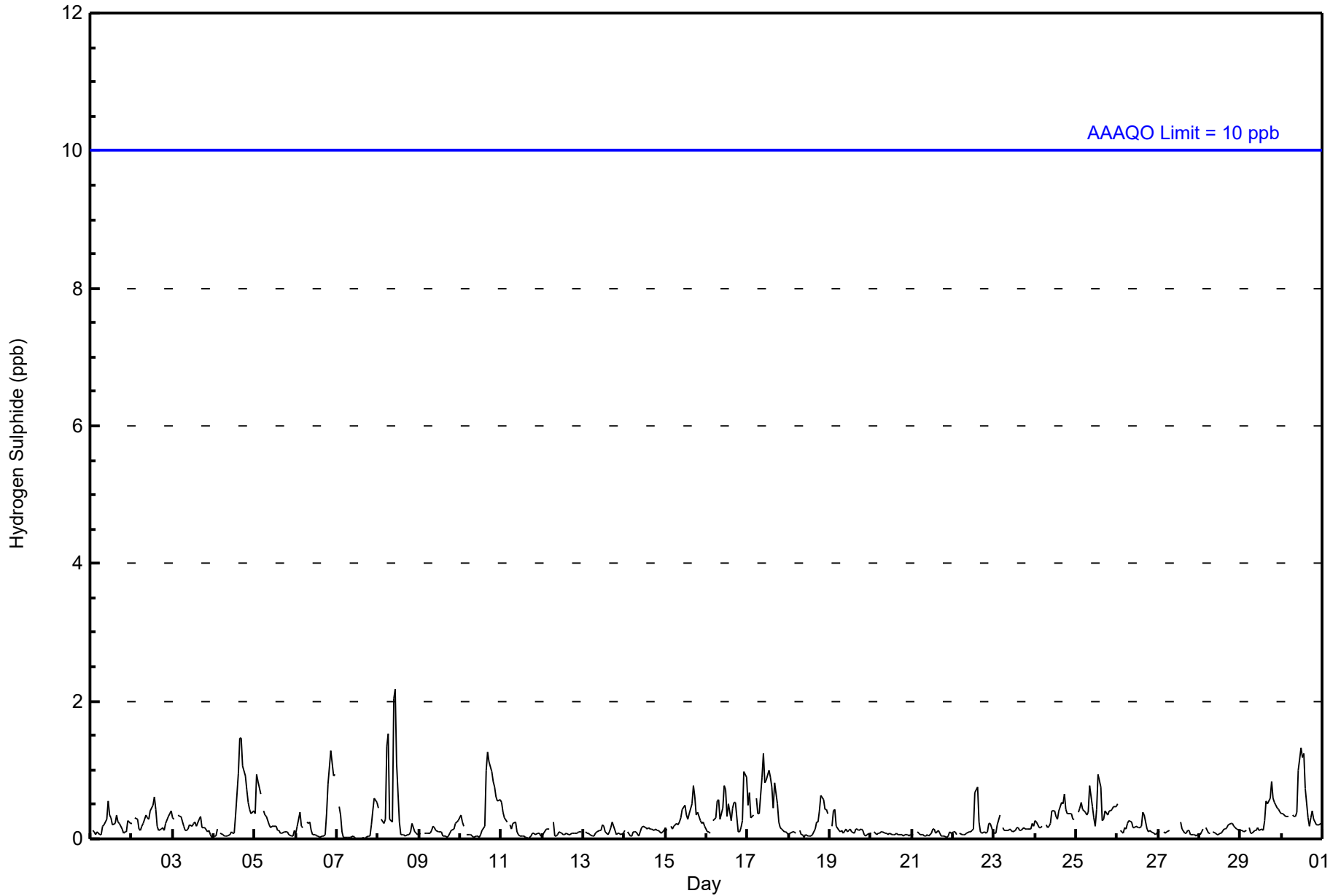
# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Hydrogen Sulphide (H<sub>2</sub>S) - ppb

## Waskow ohci Pimatisiwin - November 2024

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:		720																				
Maximum Value: 2.2 ppb on Nov 8 11:00		Maximum Daily Average: 0.5 ppb on Nov 17				Hours of Data:		683																		
Minimum Value: 0.0 ppb on Nov 7 12:00		Minimum Daily Average: 0.1 ppb on Nov 21				Hours of Missing Data:		37																		
Maximum Diurnal Average: 0.3 ppb at hour 11		Minimum Diurnal Average: 0.2 ppb at hour 5				Hours of Calibration:		36																		
Monthly Average: 0.24 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.1 Median = 0.1 Q <sub>3</sub> = 0.3 P <sub>90</sub> = 0.5 P <sub>99</sub> = 1.3				Percent Operational Time:		99.9																		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.6	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.2	0.2	0.6
2-Nov	0.2	Z	0.3	0.3	0.1	0.1	0.2	0.2	0.4	0.3	0.3	0.4	0.5	0.6	0.4	0.2	0.1	0.1	0.2	0.1	0.2	0.3	0.4	0.4	0.3	0.6
3-Nov	0.3	0.3	Z	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.2	0.3
4-Nov	0.0	0.0	0.2	Z	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3	1.0	1.5	1.5	1.0	0.9	0.7	0.5	0.4	0.4	0.4	0.4	1.5
5-Nov	0.4	0.9	0.8	0.7	Z	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.9
6-Nov	0.1	0.2	0.4	0.2	0.2	Z	0.2	0.2	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.8	1.3	1.1	0.9	0.9	0.3	1.3
7-Nov	Z	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.6	0.5	0.1	0.6
8-Nov	0.4	Z	0.3	0.2	0.3	1.3	1.5	0.3	0.2	2.0	2.2	1.1	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.5	2.2
9-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.1	0.3
10-Nov	0.3	0.2	0.2	Z	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	1.0	1.3	1.1	1.0	0.8	0.7	0.6	0.5	0.6	0.4	1.3
11-Nov	0.5	0.4	0.3	0.3	Z	0.2	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.5
12-Nov	0.0	0.1	0.2	0.2	0.1	Z	0.2	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
13-Nov	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
14-Nov	0.1	Z	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
15-Nov	0.2	0.1	Z	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.4	0.3	0.4	0.5	0.8	0.6	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.8
16-Nov	0.1	0.1	0.1	Z	0.3	0.3	0.5	0.6	0.3	0.5	0.8	0.7	0.3	0.5	0.3	0.4	0.5	0.5	0.1	0.1	0.2	0.3	1.0	0.9	0.4	1.0
17-Nov	0.5	0.7	0.3	0.3	Z	0.6	0.4	0.4	0.9	1.2	0.8	0.8	1.0	0.9	0.7	0.4	0.8	0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.5	1.2
18-Nov	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.6	0.6	0.4	0.4	0.4	0.4	0.2	0.6
19-Nov	Z	0.2	0.4	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.4
20-Nov	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1
21-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
22-Nov	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.7	0.8	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.8
23-Nov	0.1	0.1	0.2	0.3	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.3
24-Nov	0.3	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.4	0.4	0.3	0.3	0.4	0.5	0.5	0.7	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.7
25-Nov	Z	0.4	0.5	0.5	0.4	0.4	0.3	0.4	0.8	0.5	0.3	0.2	0.4	0.9	0.7	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.5	0.5	0.4	0.9
26-Nov	0.5	Z	0.1	0.1	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5
27-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	C	C	C	C	C	C	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	--	0.3
28-Nov	0.1	0.1	0.1	Z	0.2	0.1	0.1	M	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2
29-Nov	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.3	0.5	0.5	0.6	0.8	0.6	0.5	0.4	0.4	0.4	0.8
30-Nov	0.4	0.4	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.4	1.0	1.3	1.2	1.2	0.7	0.3	0.2	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.5	1.3
																								Diurnal Average		
																								Diurnal Maximum		
																								0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.3 0.3 0.3 0.2 0.3 0.3 0.3 0.3 0.3 0.2 0.2 0.2 0.2 0.3 0.3		
																								0.5 0.9 0.8 0.7 0.4 1.3 1.5 0.6 0.9 2.0 2.2 1.3 1.2 1.2 1.0 1.5 1.5 1.1 1.0 0.8 1.3 1.1 1.0 0.9		
Z - zerospan C - Calibration M - Maintenance																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																										





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Waskow ohci Pimatisiwin - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	683	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Waskow ohci Pimatisiwin - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	89	29	23	7	4	6	29	129	42	26	23	35	44	39	42	63	630
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	89	29	23	7	4	6	29	129	42	26	23	35	44	39	42	63	630

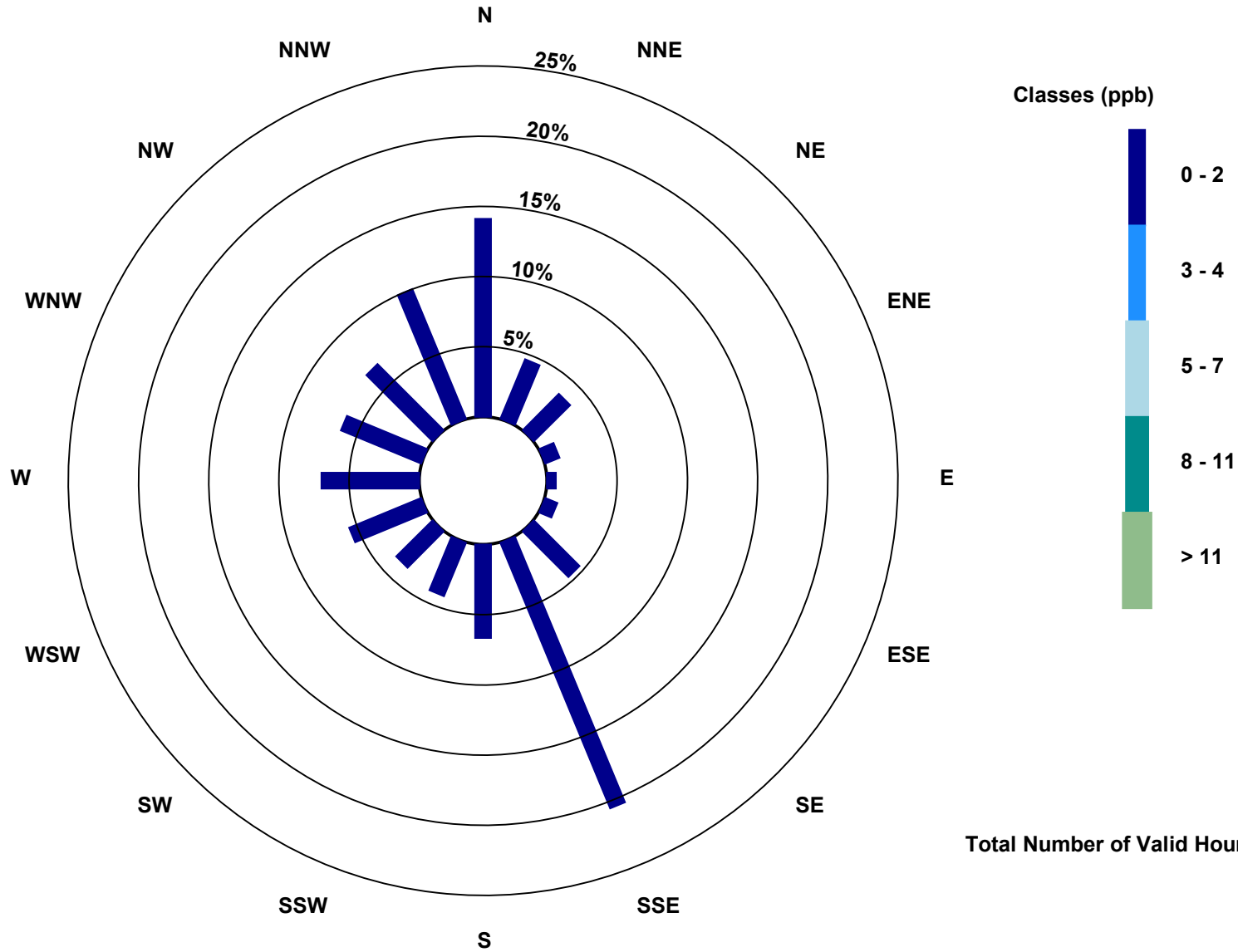
Total Number of Valid Hours: 630

Total Number of Hours: 720

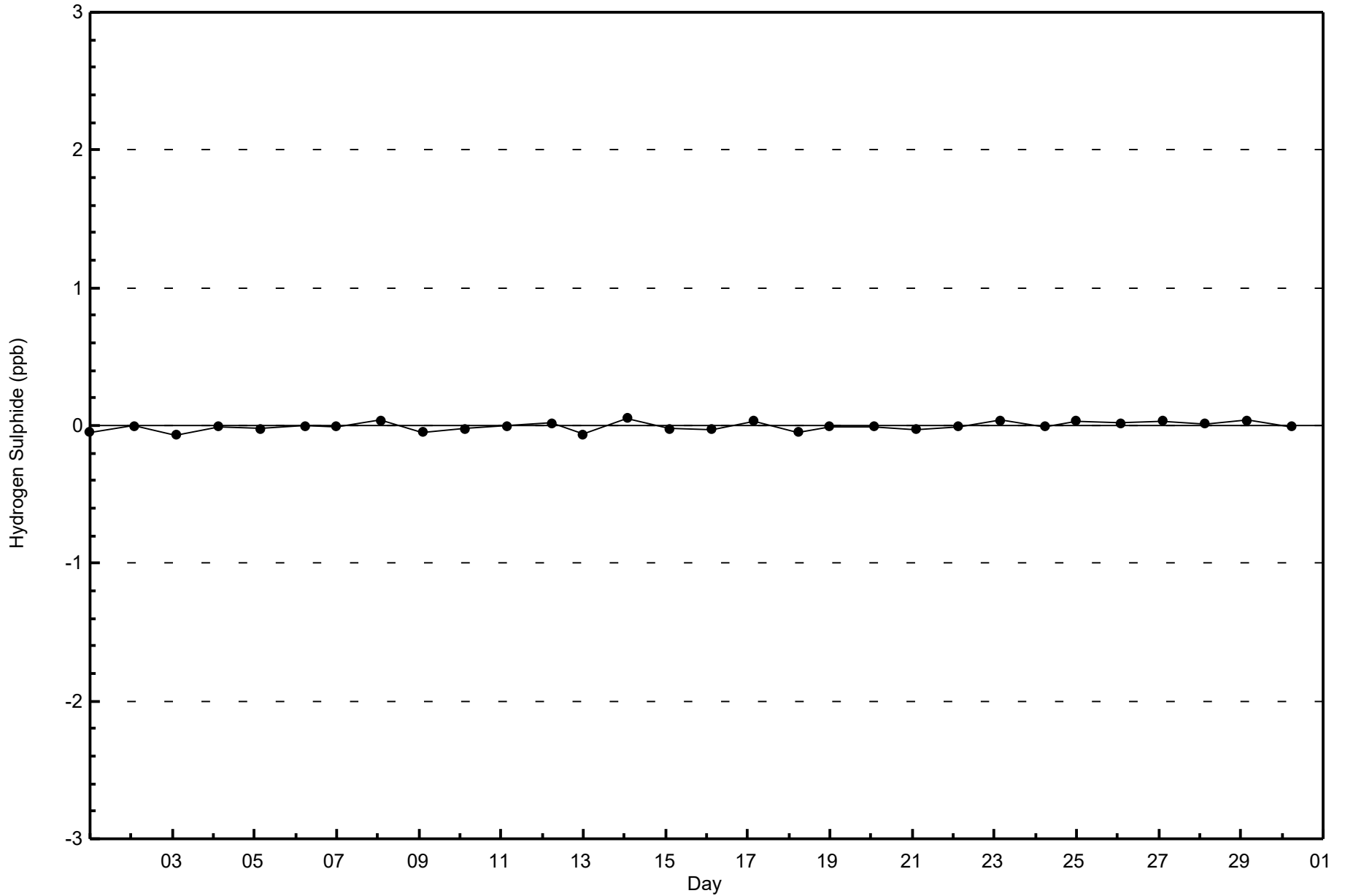


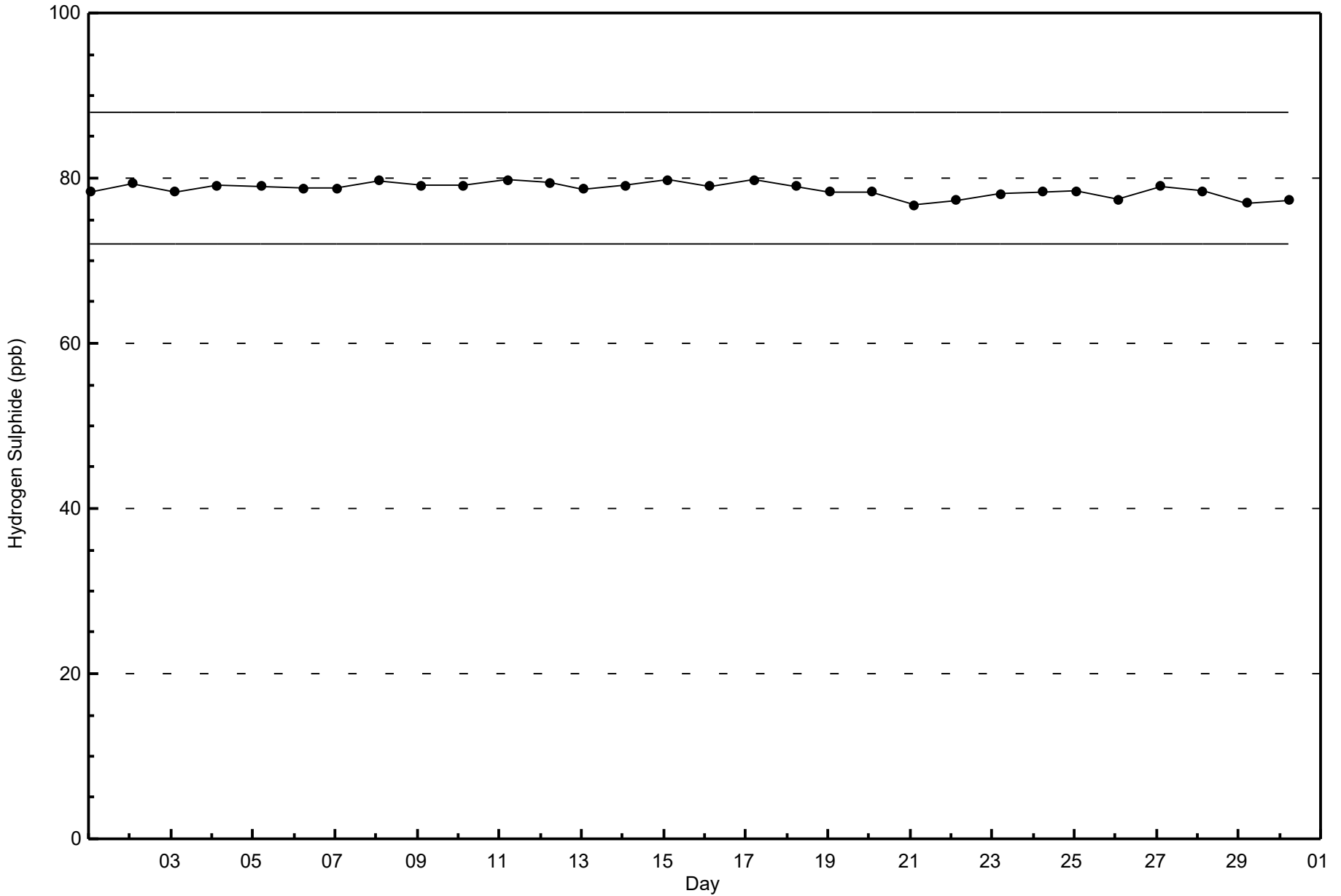
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Waskow ohci Pimatisiwin



Total Number of Valid Hours: 630







**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

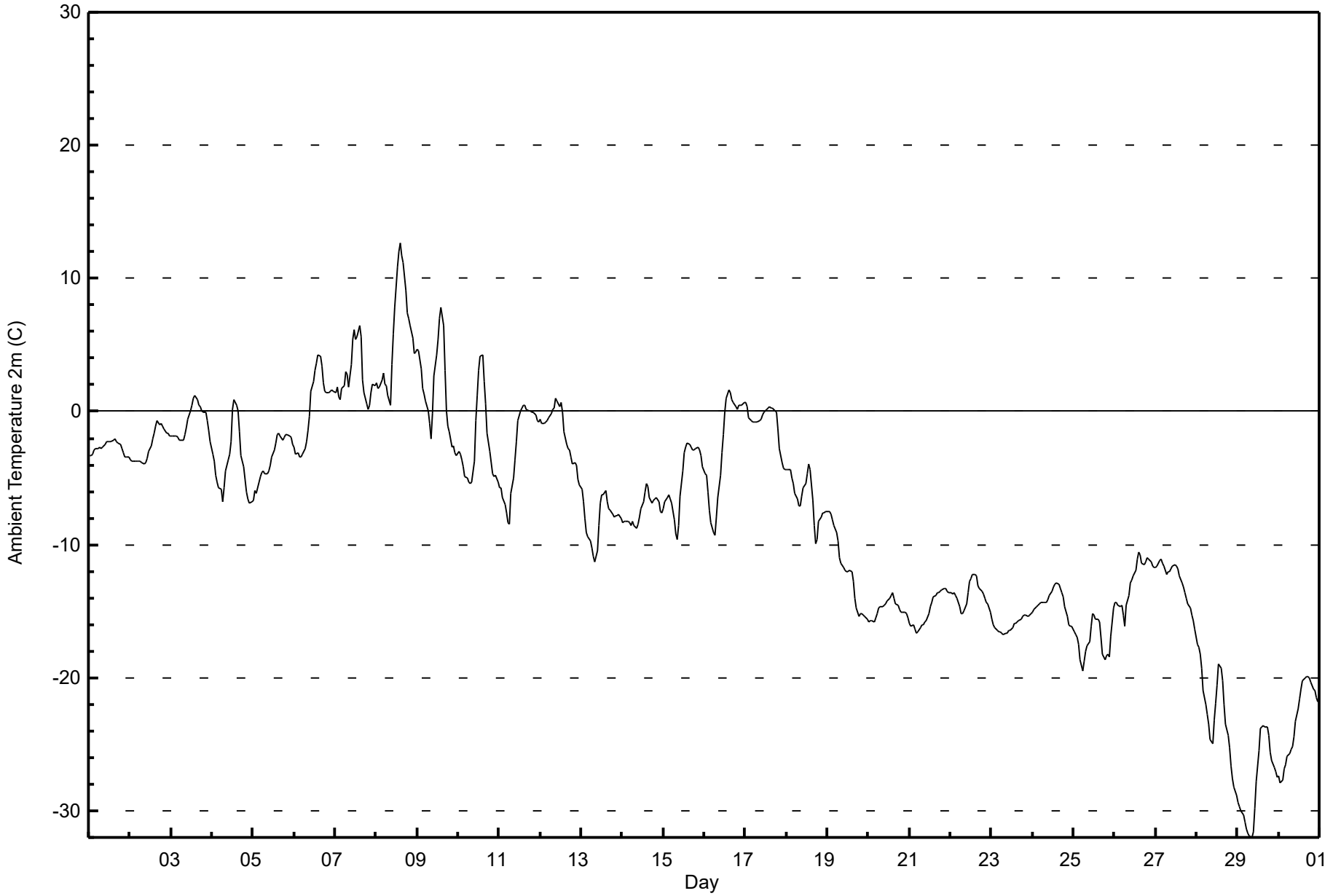
**Ambient Temperature 2m (AT2) - C**  
**Waskow ohci Pimatisiwin - November 2024**

Maximum Value: 12.6 C on Nov 8 15:00		Maximum Daily Average: 5.7 C on Nov 8		Hours in Service: 720																																												
Minimum Value: -31.9 C on Nov 29 09:00		Minimum Daily Average: -27.8 C on Nov 29		Hours of Data: 720																																												
Maximum Diurnal Average: -5.6 C at hour 15		Minimum Diurnal Average: -9.6 C at hour 7		Hours of Missing Data: 0																																												
Monthly Average: -8.08 C		Percentiles: P <sub>1</sub> = -29.9 P <sub>10</sub> = -18.6 Q <sub>1</sub> = -14.5 Median = -6.5 Q <sub>3</sub> = -1.7 P <sub>90</sub> = 1.3 P <sub>99</sub> = 7.7		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-3.3	-3.4	-3.2	-2.9	-2.8	-2.8	-2.7	-2.8	-2.7	-2.4	-2.3	-2.2	-2.3	-2.2	-2.2	-2.1	-2.2	-2.3	-2.4	-2.8	-3.1	-3.4	-3.4	-3.5	-2.7	-2.1																						
2-Nov	-3.6	-3.8	-3.8	-3.8	-3.7	-3.7	-3.7	-3.8	-3.9	-3.8	-3.5	-3.0	-2.5	-2.1	-1.7	-1.1	-0.7	-1.0	-0.9	-1.1	-1.3	-1.6	-1.7	-1.8	-2.6	-0.7																						
3-Nov	-1.8	-1.9	-1.8	-1.8	-1.9	-2.2	-2.2	-2.1	-1.7	-1.2	-0.6	0.1	0.5	1.0	1.2	0.9	0.5	0.3	0.0	-0.1	-0.1	-0.7	-1.4	-2.3	-0.8	1.2																						
4-Nov	-3.2	-3.7	-4.8	-5.4	-5.8	-5.8	-6.8	-5.8	-4.5	-3.6	-3.2	-2.2	0.2	0.9	0.4	0.1	-1.5	-3.3	-4.2	-5.1	-6.1	-6.5	-6.9	-6.7	-3.9	0.9																						
5-Nov	-6.7	-5.9	-6.2	-5.3	-4.9	-4.6	-4.5	-4.6	-4.7	-4.4	-4.0	-3.4	-2.9	-2.3	-1.7	-1.6	-1.8	-2.1	-1.9	-1.8	-1.8	-1.8	-2.0	-2.5	-3.5	-1.6																						
6-Nov	-2.7	-3.2	-3.1	-3.4	-3.4	-3.3	-2.8	-2.3	-1.4	-0.3	1.5	2.3	3.1	3.7	4.2	4.1	3.4	2.1	1.6	1.5	1.4	1.5	1.6	1.5	0.3	4.2																						
7-Nov	1.4	1.8	1.1	0.9	1.8	1.9	3.0	2.7	1.9	3.5	5.4	6.1	5.4	5.6	6.5	5.6	2.4	1.4	0.6	0.1	0.5	1.4	2.0	2.0	2.7	6.5																						
8-Nov	2.2	1.7	1.9	2.4	2.9	2.1	1.9	1.2	0.5	3.5	5.8	7.8	10.9	12.0	12.6	11.7	11.2	9.1	7.4	7.0	6.5	5.5	4.3	4.4	5.7	12.6																						
9-Nov	4.6	4.5	3.2	1.7	1.3	0.8	0.1	-0.9	-2.1	-0.2	2.7	4.3	5.4	7.0	7.8	6.5	3.1	0.1	-1.1	-1.6	-2.7	-2.6	-3.1	-3.4	1.5	7.8																						
10-Nov	-3.0	-3.2	-3.6	-4.1	-4.9	-4.9	-5.3	-5.4	-5.3	-3.8	-0.7	1.2	3.1	4.2	4.2	2.3	0.5	-1.6	-3.0	-3.8	-4.6	-4.9	-4.8	-5.3	-2.4	4.2																						
11-Nov	-5.8	-5.8	-6.5	-7.0	-7.6	-8.3	-8.5	-6.1	-5.0	-3.6	-2.3	-0.6	0.0	0.2	0.5	0.4	0.1	0.0	0.0	-0.1	0.0	-0.3	-0.7	-0.8	-2.8	0.5																						
12-Nov	-0.6	-0.9	-0.9	-0.8	-0.6	-0.5	-0.1	0.1	0.3	1.0	0.7	0.4	0.7	0.0	-1.5	-2.5	-2.8	-2.9	-3.4	-4.0	-3.8	-4.1	-5.1	-5.5	-1.5	1.0																						
13-Nov	-5.9	-6.8	-8.0	-9.1	-9.4	-9.7	-10.2	-10.9	-11.3	-10.5	-8.6	-6.9	-6.3	-6.2	-5.9	-6.8	-7.3	-7.4	-7.8	-7.9	-7.8	-7.8	-7.7	-8.0	-8.1	-5.9																						
14-Nov	-8.3	-8.3	-8.3	-8.3	-8.4	-8.6	-8.3	-8.6	-8.8	-8.4	-8.0	-7.4	-6.7	-6.0	-5.4	-5.6	-6.5	-6.9	-6.7	-6.5	-6.5	-6.8	-7.5	-7.7	-7.4	-5.4																						
15-Nov	-7.3	-6.8	-6.5	-6.2	-6.6	-6.9	-8.2	-9.2	-9.6	-8.5	-6.4	-4.5	-3.1	-2.7	-2.4	-2.4	-2.7	-2.9	-2.9	-2.8	-2.7	-2.8	-3.3	-4.2	-5.1	-2.4																						
16-Nov	-4.6	-4.8	-6.1	-7.4	-8.3	-9.1	-9.3	-7.9	-6.5	-4.8	-3.1	-1.7	-0.1	1.0	1.6	1.4	0.9	0.7	0.3	0.2	0.4	0.5	0.5	0.7	-2.7	1.6																						
17-Nov	0.7	0.4	-0.5	-0.7	-0.8	-0.8	-0.8	-0.8	-0.7	-0.6	-0.2	0.0	0.2	0.3	0.3	0.3	0.3	0.1	0.0	-1.3	-2.8	-3.9	-4.2	-4.4	-0.8	0.7																						
18-Nov	-4.3	-4.3	-4.4	-5.0	-5.4	-6.1	-6.6	-7.1	-7.1	-6.3	-5.8	-5.4	-4.7	-4.0	-4.4	-6.6	-8.5	-9.9	-9.6	-8.2	-7.9	-7.7	-7.6	-7.5	-6.4	-4.0																						
19-Nov	-7.5	-7.5	-7.7	-8.1	-8.5	-9.1	-9.7	-11.0	-11.4	-11.7	-11.9	-12.0	-12.1	-11.9	-12.1	-12.8	-14.0	-14.7	-15.4	-15.2	-15.2	-15.3	-15.4	-15.6	-11.9	-7.5																						
20-Nov	-15.8	-15.7	-15.7	-15.8	-15.5	-15.2	-14.8	-14.7	-14.7	-14.5	-14.5	-14.3	-14.0	-13.8	-13.6	-14.0	-14.4	-14.6	-14.9	-15.1	-15.1	-15.1	-15.1	-15.5	-14.8	-13.6																						
21-Nov	-16.0	-16.1	-16.1	-16.4	-16.6	-16.6	-16.3	-16.0	-16.0	-15.8	-15.7	-15.2	-14.6	-14.3	-14.0	-13.8	-13.7	-13.6	-13.5	-13.4	-13.3	-13.3	-13.5	-13.6	-14.9	-13.3																						
22-Nov	-13.6	-13.7	-13.6	-13.8	-14.0	-14.7	-15.2	-15.2	-15.0	-14.5	-13.7	-12.7	-12.6	-12.2	-12.2	-12.4	-13.1	-13.3	-13.5	-13.7	-14.0	-14.3	-14.5	-15.0	-13.8	-12.2																						
23-Nov	-15.6	-16.0	-16.2	-16.5	-16.6	-16.6	-16.7	-16.7	-16.7	-16.5	-16.4	-16.2	-15.9	-15.9	-15.8	-15.7	-15.6	-15.4	-15.3	-15.3	-15.4	-15.3	-15.4	-15.2	-16.0	-15.2																						
24-Nov	-15.1	-14.9	-14.7	-14.6	-14.5	-14.4	-14.3	-14.3	-14.3	-14.2	-13.8	-13.5	-13.2	-12.9	-12.9	-13.0	-13.3	-13.6	-13.9	-14.6	-15.4	-16.0	-16.1	-16.1	-14.3	-12.9																						
25-Nov	-16.5	-16.7	-17.0	-17.5	-18.7	-19.5	-18.7	-18.0	-17.6	-17.3	-16.2	-15.2	-15.3	-15.6	-15.6	-15.9	-17.0	-18.3	-18.6	-18.4	-18.3	-18.4	-16.9	-14.8	-17.2	-14.8																						
26-Nov	-14.3	-14.4	-14.6	-14.7	-14.5	-15.3	-16.1	-14.5	-13.8	-12.9	-12.6	-12.4	-11.9	-11.1	-10.5	-10.7	-11.4	-11.5	-11.3	-11.0	-11.0	-11.3	-11.6	-11.7	-12.7	-10.5																						
27-Nov	-11.7	-11.6	-11.2	-11.1	-11.4	-11.6	-12.2	-12.1	-12.0	-11.8	-11.6	-11.5	-11.6	-11.8	-12.3	-12.8	-13.2	-13.6	-14.0	-14.5	-14.8	-15.2	-15.7	-16.4	-12.7	-11.1																						
28-Nov	-17.5	-17.7	-18.2	-19.3	-21.0	-22.1	-22.8	-23.5	-24.7	-25.0	-23.2	-21.9	-20.5	-18.9	-19.3	-20.2	-22.0	-23.5	-24.4	-25.2	-26.6	-27.6	-28.2	-28.8	-22.6	-17.5																						
29-Nov	-29.4	-29.7	-30.0	-30.4	-30.8	-31.4	-31.7	-31.9	-31.9	-31.6	-29.8	-27.8	-25.5	-23.8	-23.7	-23.5	-23.7	-23.7	-24.3	-25.5	-26.2	-26.7	-27.1	-27.4	-27.8	-23.5																						
30-Nov	-27.3	-27.9	-27.7	-26.8	-26.6	-25.9	-25.7	-25.4	-25.2	-24.5	-23.3	-22.3	-21.6	-20.9	-20.2	-20.0	-19.9	-19.9	-20.0	-20.4	-20.9	-21.0	-21.5	-21.8	-23.2	-19.9																						
																								-8.4	-8.5	-8.8	-9.0	-9.2	-9.5	-9.6	-9.6	-9.5	-8.8	-7.8	-7.0	-6.3	-5.8	-5.6	-6.0	-6.8	-7.4	-7.8	-8.0	-8.3	-8.5	-8.7	-8.9	Diurnal Average
																								4.6	4.5	3.2	2.4	2.9	2.1	3.0	2.7	1.9	3.5	5.8	7.8	10.9	12.0	12.6	11.7	11.2	9.1	7.4	7.0	6.5	5.5	4.3	4.4	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 2m (AT2) - C**  
**Waskow ohci Pimatisiwin - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Waskow ohci Pimatisiwin - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	62	8.61	8.61
-20 - 0	531	73.75	82.36
0 - 10	122	16.94	99.31
10 - 20	5	0.69	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**

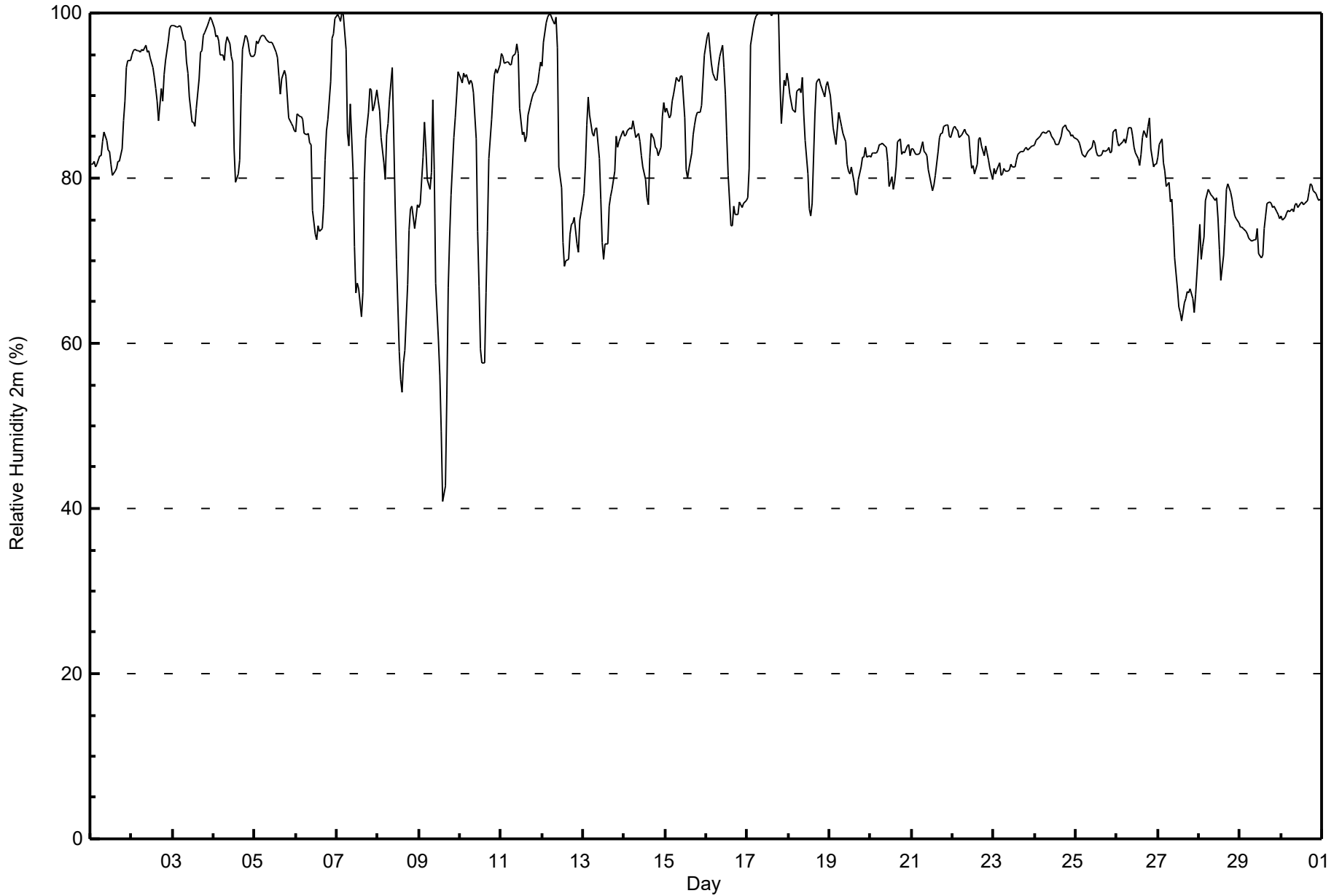
**Summary of Hour Averages**

**Relative Humidity 2m (RH2) - %**

**Waskow ohci Pimatisiwin - November 2024**

Maximum Value: 100.0 % on Nov 7 04:00		Maximum Daily Average: 96.1 % on Nov 17		Hours in Service: 720																																												
Minimum Value: 40.8 % on Nov 9 15:00		Minimum Daily Average: 71.8 % on Nov 27		Hours of Data: 720																																												
Maximum Diurnal Average: 88.0 % at hour 9		Minimum Diurnal Average: 76.5 % at hour 15		Hours of Missing Data: 0																																												
Monthly Average: 84.21 %		Percentiles: P <sub>1</sub> = 57.6 P <sub>10</sub> = 73.6 Q <sub>1</sub> = 79.3 Median = 84.4 Q <sub>3</sub> = 90.6 P <sub>90</sub> = 96.2 P <sub>99</sub> = 100.0		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	81.7	81.7	82.1	81.3	81.7	82.7	82.7	84.5	85.6	84.5	83.4	83.3	81.7	80.4	80.8	81.2	82.0	82.1	83.5	86.9	89.3	93.4	94.2	94.3	84.4	94.3																						
2-Nov	95.0	95.3	95.6	95.5	95.4	95.3	95.7	95.4	96.1	95.2	95.5	94.6	93.3	92.2	90.9	89.3	86.9	90.9	89.3	92.6	94.2	96.6	98.2	98.4	94.1	98.4																						
3-Nov	98.4	98.4	98.3	98.2	98.5	98.4	96.8	96.6	94.0	92.7	89.9	86.8	86.8	86.3	88.5	92.0	95.3	95.4	97.3	97.6	98.5	99.0	99.4	99.2	95.1	99.4																						
4-Nov	98.1	97.2	97.2	96.6	94.9	94.9	94.3	96.3	97.1	96.4	94.7	94.0	83.5	79.5	80.5	82.2	90.1	95.7	97.4	97.1	96.4	95.3	94.7	94.7	93.3	98.1																						
5-Nov	95.1	96.7	96.3	97.1	97.4	97.4	97.1	96.7	96.5	96.5	96.4	96.1	95.2	94.5	92.4	90.3	92.0	93.1	92.4	89.9	87.3	86.7	86.3	85.8	93.5	97.4																						
6-Nov	85.6	87.8	87.5	87.4	87.2	85.5	85.2	85.4	84.3	84.0	76.2	73.2	72.5	74.3	73.5	73.9	76.8	82.2	85.8	87.0	91.7	96.9	97.4	99.4	84.2	99.4																						
7-Nov	99.9	99.5	99.0	100.0	99.8	95.6	85.5	83.9	89.0	80.8	71.6	66.1	67.3	66.6	63.2	66.1	79.7	84.8	88.0	90.8	90.7	88.1	88.6	90.6	84.8	100.0																						
8-Nov	89.3	88.2	84.9	81.9	79.8	85.3	86.6	89.6	93.4	85.6	77.2	70.1	58.9	55.6	54.1	57.6	59.2	67.0	73.8	76.2	76.6	73.9	75.3	76.8	75.7	93.4																						
9-Nov	76.4	77.0	82.5	86.7	83.8	79.9	78.6	80.7	89.4	81.0	67.3	60.3	56.2	49.3	40.8	42.7	53.7	66.7	72.8	78.0	84.9	87.3	90.1	92.9	73.3	92.9																						
10-Nov	92.0	91.6	92.8	92.2	92.5	91.3	91.9	91.6	90.3	84.7	73.5	67.0	59.2	57.6	57.7	66.1	73.6	82.3	87.1	90.1	92.6	93.2	92.7	93.8	83.2	93.8																						
11-Nov	95.0	94.8	94.0	94.1	94.0	93.7	93.7	94.8	95.0	96.3	95.1	88.5	85.2	85.5	84.5	85.2	87.7	89.2	89.8	90.4	90.6	91.5	92.8	94.1	91.5	96.3																						
12-Nov	93.6	96.5	98.9	99.5	99.8	99.8	99.0	98.7	99.5	95.7	81.3	78.8	72.1	69.3	69.9	70.1	73.3	74.4	74.6	75.3	72.0	71.1	75.0	76.0	83.9	99.8																						
13-Nov	78.1	81.5	86.4	89.8	87.6	85.4	85.0	85.9	86.2	82.4	77.5	72.1	70.3	72.1	72.1	76.7	77.9	78.7	80.9	85.2	83.8	84.4	84.9	85.7	81.3	89.8																						
14-Nov	85.1	85.3	85.8	86.2	86.0	87.0	85.9	84.9	85.4	84.4	82.8	81.4	79.8	77.7	76.8	82.5	85.4	84.8	83.8	83.6	82.7	83.7	87.4	89.1	84.1	89.1																						
15-Nov	88.0	88.4	87.2	87.6	89.4	90.1	92.1	91.8	91.6	92.3	92.3	87.3	80.9	80.1	81.2	83.1	85.3	86.5	87.4	88.0	88.0	88.9	91.8	94.9	88.1	94.9																						
16-Nov	97.2	97.7	95.6	93.9	92.8	91.9	91.9	93.6	94.7	96.1	93.4	90.1	85.0	80.3	74.3	74.2	76.5	75.6	75.6	77.2	76.8	76.4	77.0	77.2	85.6	97.7																						
17-Nov	77.6	81.1	96.1	98.3	99.1	99.6	99.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	91.9	86.6	91.9	91.2	92.7	96.1	100.0																						
18-Nov	91.7	90.2	88.3	88.1	87.9	90.6	90.8	90.3	92.2	87.7	84.6	80.5	76.2	75.3	77.0	87.8	91.5	91.9	92.0	91.4	90.3	89.8	91.2	91.6	87.9	92.2																						
19-Nov	90.0	88.1	86.2	85.1	84.0	88.0	87.2	86.3	85.4	84.5	81.6	80.9	80.5	81.3	79.5	78.1	77.9	79.9	81.3	82.6	82.6	83.8	82.6	82.8	83.3	90.0																						
20-Nov	82.5	83.0	83.1	83.0	83.4	84.0	84.1	84.3	84.0	83.8	82.0	79.0	80.1	78.7	79.7	81.4	84.5	84.7	82.9	83.3	83.0	83.9	84.1	82.7	82.7	84.7																						
21-Nov	83.6	83.6	82.9	82.9	82.9	83.1	84.3	83.3	83.1	82.6	81.1	79.3	78.4	79.1	80.4	83.3	84.9	85.5	85.4	86.3	86.5	86.5	85.1	84.9	83.3	86.5																						
22-Nov	86.1	86.2	85.9	85.8	85.0	85.2	85.7	85.9	85.5	85.1	82.8	81.2	81.5	80.4	81.7	84.7	85.0	83.8	82.7	83.8	83.0	82.2	81.1	79.8	83.8	86.2																						
23-Nov	81.1	80.5	81.0	81.9	80.4	80.4	81.2	80.9	80.9	81.0	81.7	81.4	81.4	82.2	82.8	83.0	83.2	83.3	83.5	83.7	83.4	83.7	83.9	83.9	82.1	83.9																						
24-Nov	84.0	84.6	85.0	85.1	85.4	85.6	85.4	85.7	85.8	85.7	85.2	84.6	84.1	84.1	84.0	85.0	86.2	86.2	86.4	86.0	85.6	85.1	85.2	84.8	85.2	86.4																						
25-Nov	84.8	84.5	84.3	83.6	82.9	82.5	82.9	83.2	83.4	83.7	84.5	84.3	83.3	82.7	82.9	83.5	83.3	83.4	83.7	83.1	83.2	85.6	85.9	83.7	83.7	85.9																						
26-Nov	84.6	83.8	84.0	84.4	84.7	84.3	85.1	86.1	86.2	85.1	83.7	83.1	82.4	81.6	82.9	84.9	85.8	85.0	86.3	87.4	83.6	81.4	81.7	81.7	84.2	87.4																						
27-Nov	82.5	84.1	84.8	81.9	80.9	79.0	79.6	77.2	77.4	74.2	70.4	66.6	64.4	63.7	62.7	64.9	65.4	66.3	66.0	66.7	65.5	63.7	65.8	68.6	71.8	84.8																						
28-Nov	74.3	70.1	71.6	72.8	77.3	78.7	78.2	77.9	77.9	77.3	77.6	75.0	71.3	67.6	70.6	74.3	78.6	79.3	78.3	77.4	76.2	75.4	75.1	74.6	75.3	79.3																						
29-Nov	74.1	74.0	74.0	73.5	73.2	72.7	72.5	72.3	72.5	72.5	73.9	70.9	70.4	70.6	73.9	75.4	76.9	77.1	77.0	76.4	76.5	75.9	75.6	75.1	74.0	77.1																						
30-Nov	75.4	74.9	75.2	75.8	76.1	75.9	76.2	75.9	76.8	76.9	76.4	77.0	77.0	76.7	76.9	77.3	78.4	79.4	79.1	78.4	78.1	77.6	77.3	77.5	76.9	79.4																						
																								86.7	86.9	87.5	87.7	87.5	87.5	87.2	87.3	88.0	86.3	83.1	80.4	78.0	76.8	76.5	78.5	81.2	83.2	84.1	84.8	84.7	85.0	85.7	86.3	Diurnal Average
																								99.9	99.5	99.0	100.0	99.8	99.8	99.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	100.0	100.0	100.0	100.0	97.6	98.5	99.0	99.4	99.4	Diurnal Maximum







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 2m (RH2) - %**  
**Waskow ohci Pimatisiwin - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	13	1.81	1.81
60 - 80	179	24.86	26.67
80 - 100	518	71.94	98.61

Total Number of Valid Hours: 720

Total Number of Hours: 720

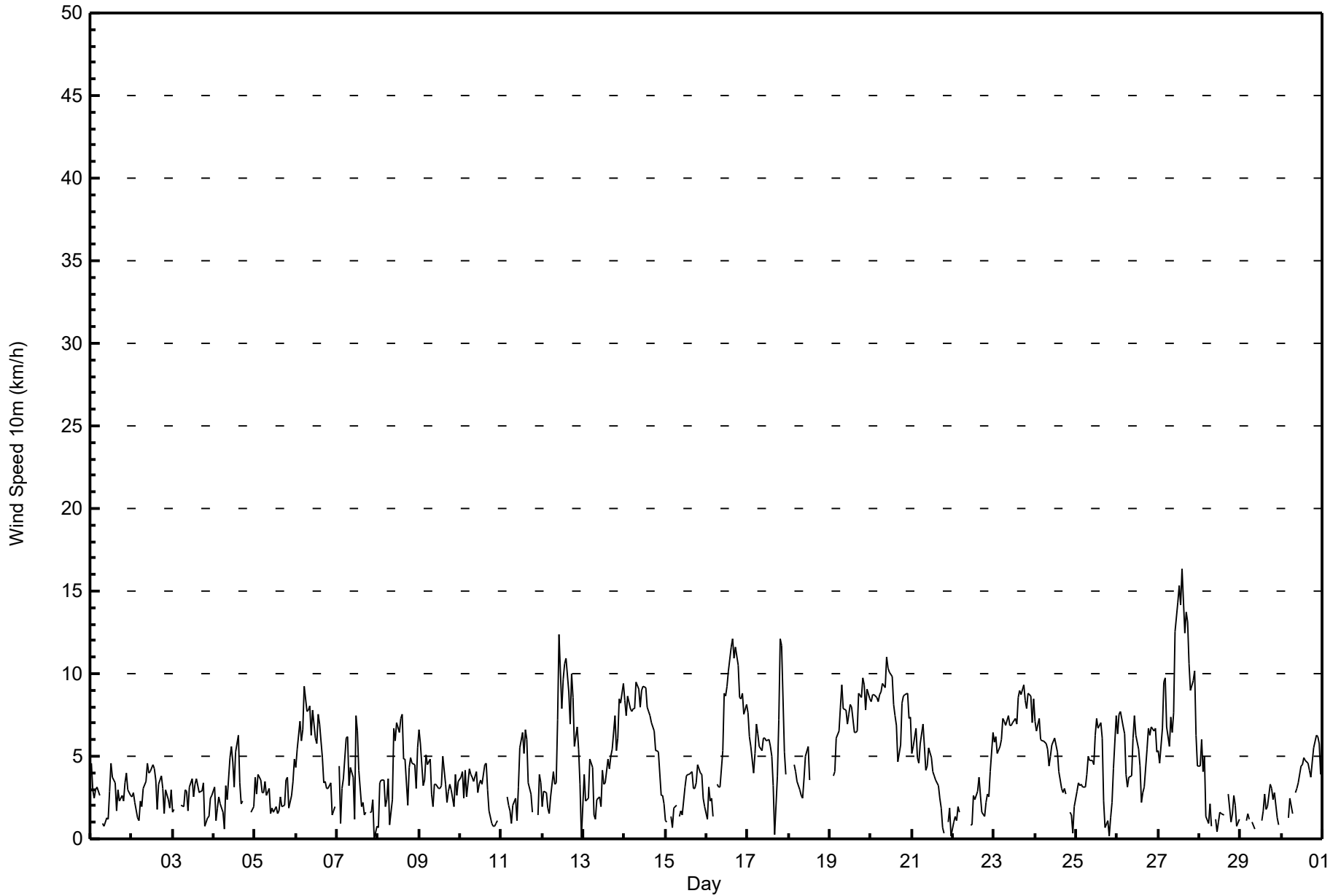


Maximum Speed: 16 km/h on Nov 27 15:00	Maximum Daily Speed Average: 9.0 km/h on Nov 27	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 7 23:00	Minimum Daily Speed Average: 0.9 km/h on Nov 1	Hours of Data: 663
Maximum Diurnal Speed Average: 2.2 km/h at hour 21	Minimum Diurnal Speed Average: 0.2 km/h at hour 16	Hours of Missing Data: 57
Monthly Average Velocity: 0.9 km/h 318.3 deg	Percentiles: P <sub>1</sub> = 0 P <sub>10</sub> = 1 Q <sub>1</sub> = 2 Median = 4 Q <sub>3</sub> = 6 P <sub>90</sub> = 9 P <sub>99</sub> = 12	Percent Operational Time: 92.1

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	SW5	SW3	SSE2	SSE3	SSE3	SSE3	UO	ESE1	NE1	S1	SSE1	N3	N5	NNE4	NNE3	N2	NNW3	NW2	NE3	NNE2	ENE3	NE4	NE3	ENE3	NE0.9	SW5
2-Nov	NE3	NE3	NE2	N1	NW1	WNW2	NNW2	N3	N3	N5	N4	N4	N4	N4	NNW4	ENE2	E3	NE4	NE3	NE2	N3	NNW2	NNW2	NNW3	N2.4	N5
3-Nov	NW2	NW2	UO	UO	UO	SSE2	SSE2	SSW3	SW3	S2	SSW3	SSW4	SE3	SE3	SE4	SSE3	SSE3	SSE3	SSE3	SSE1	SSE1	S1	SW2	SW3	S1.8	SE4
4-Nov	SW3	SSE1	S2	S3	SSW2	S2	WSW1	SSW3	SW2	SSE5	SSW6	S5	SSW3	SE5	SSE6	SSE3	SSW2	WSW2	UO	UO	SSW2	UO	SSW2	NW2	S2.4	SSE6
5-Nov	WNW4	WNW3	WNW4	NW4	NW3	NW3	NW3	W3	W3	WSW2	W2	S2	SSW2	SSW2	SW2	SW3	SSE2	S2	WSW4	WSW4	WSW2	SW3	S4	S5	WSW1.7	S5
6-Nov	SSE4	SSE5	SSE7	SSE6	SSE7	SSE9	SSE8	SSE8	SSE8	SSE6	S8	SSE6	S6	SW8	SW7	SSW5	SSE3	SSE3	SSE3	SSE3	SSE3	S1	NW2	NW2	SSE4.6	SSE9
7-Nov	UO	NW4	WSW1	SSW3	SW4	W6	W6	WNW3	W4	WNW4	NW1	W7	W7	WSW4	W2	SE2	SSE1	SSE2	UO	SSE2	SE2	SSE2	SE0	WSW1	WSW2.1	W7
8-Nov	WSW1	SSE3	SSE4	SSE4	SSE2	WSW2	WSW4	S1	SSE2	SSE7	SSE6	SSE7	SSE6	SSE7	SSE8	S5	S5	SSE2	WNW4	NW5	WNW5	W4	W3	W6	S2.6	SSE8
9-Nov	W7	W6	SW3	S4	SW5	SW4	SW5	S3	S2	SW3	SW3	WSW3	ESE3	SSE3	SW5	SSW3	S2	SSE3	S3	SSE3	SSE2	S4	SSE3	S4	SSW2.9	W7
10-Nov	S4	S4	SSE2	SSE4	S3	SSE4	SSE4	SSE4	SSE3	SSW4	SSW3	S3	SSW4	SE3	SSE4	SSE5	SSE3	S2	W1	S1	W1	W1	W1	UO	S2.6	SSE5
11-Nov	UO	W2	UO	WNW3	W2	SW2	W1	N2	NNW2	N1	ESE3	SE6	SE6	SE5	SE7	SE6	SE3	SE3	SE2	UO	UO	NNW1	N4	NNW3	ESE1.2	SE7
12-Nov	NNW2	N3	NW3	NNW2	SSW2	WSW3	WSW4	S3	SSW3	WSW7	W12	W8	WSW10	WSW11	WSW11	WSW9	WSW7	WSW10	WSW9	WSW6	NW7	WNW5	W3	E0	WSW5.0	W12
13-Nov	SW4	S2	SSE2	S2	WSW5	W4	WNW1	S1	NNW2	W3	WSW2	NNE4	ENE3	NE3	NE5	NE4	NE5	NE5	NNE7	NE5	NNE6	NNE8	N8	N9	NNE2.2	N9
14-Nov	N8	N7	N9	N8	N8	N8	N8	NNW9	N9	N8	N9	N9	N9	N8	N8	NNW7	NNW7	NNW6	NNW5	NW5	NW5	N3	NW3	W2	NNW6.8	NNW9
15-Nov	W1	S1	UO	S1	SSW1	SSE2	S2	UO	SSE1	SSW2	S1	SSW3	SE4	SSE4	SSE4	SE4	SE3	SSE3	SSE3	SSE5	SSE4	SSE4	S2	SW2	SSE2.4	SSE5
16-Nov	SW1	S3	SSE2	SSE2	S1	UO	WSW3	SSW3	SSE3	SSE5	SSE9	SSE9	SSE9	SSE10	SSE12	SSE12	SSE11	SSE12	SSE11	SSE9	SSE8	SSE9	SSE8	SSE8	SSE6.7	SSE12
17-Nov	SSE8	SSE6	SE6	SE4	SE5	SSE7	SE6	SSE6	SSE5	SSE6	SSE6	SSE6	SSE6	SSE6	SSE5	SSE3	W0	NNW4	N7	NW12	NW12	WNW5	WNW4	UO	SSE2.1	NW12
18-Nov	UO	UO	UO	WNW4	NW4	W3	WNW3	WNW3	WNW2	WNW4	W5	NW6	WNW4	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	NW6
19-Nov	UO	UO	NNE4	NNE4	NNE6	NNE7	N8	NNW9	NNW8	N8	NNE7	N8	N8	NNE8	NNE6	N6	N7	N9	N9	N10	N9	NNW8	N9	N8	N7.3	N10
20-Nov	N8	N9	NNW9	NNW9	N8	N9	N9	N9	N9	NNE11	NNE10	N10	N10	N8	N7	N7	NNW5	N6	N8	NNE9	NNE9	N9	NNW7	NNW7	N8.3	NNE11
21-Nov	N5	N6	NNE7	NNW5	NW5	NNW6	NNW7	NNW6	NW4	WNW4	WNW6	WNW5	WNW4	WNW4	NW4	WNW3	W2	WSW2	NNW1	SE0	UO	NE1	NE2	SW0	NW3.2	NNW7
22-Nov	WSW1	WSW1	SW1	SW2	WNW2	UO	UO	UO	UO	UO	WNW1	NNE1	NNE3	NE2	NNE3	NE4	NE3	E2	NE1	ENE2	ENE3	NE3	NNE4	N6	NNE1.5	N6
23-Nov	NNE6	N6	NNE5	NNE6	NNE6	N7	N7	NNE7	N7	N7	NNE7	NNE7	N7	N7	N9	N9	N9	N9	N8	N8	N9	N9	N7	N8	N7.2	N9
24-Nov	N7	N7	N7	N6	N6	N6	N6	NNW5	NNW4	NNW5	NNW6	NNW6	NNW5	N4	NNW3	NNW3	NNW3	NNW3	UO	W2	W1	SSE0	SSE2	NNW4.1	N7	
25-Nov	S3	SSE3	SSE3	SSE3	SSE3	SE3	SSE4	SSE5	SSE5	SSE5	SSE5	SE6	SSE7	SSE7	SSE7	SSE6	SSE2	ESE1	SSE1	NW0	E1	ESE2	S4	SSE7	SSE3.9	SSE7
26-Nov	SSE6	SSE8	SSE8	SSE7	SSE6	S4	WSW3	SW4	SSW4	S6	SSE7	SSE6	SE5	SSE4	SSE2	W3	WSW3	WSW5	W7	W6	WNW7	W7	W7	W5	SSW3.3	SSE8
27-Nov	W5	W5	W7	WNW10	WNW10	WNW7	W6	WNW7	WNW6	WNW8	NW13	NW14	NW15	NW14	NW16	NW12	NW14	NW13	NNW11	NNW9	NNW10	NNW10	NNW6	NNW4	NNW9.0	NW16
28-Nov	NW4	WNW6	NW4	WNW5	SSE1	NE1	NW2	SE1	UO	SSW1	SE0	SE1	SE2	SE1	ESE1	UO	UO	NW3	NW1	WNW2	W3	W2	W1	WSW1	WNW1.2	WNW6
29-Nov	UO	UO	UO	WNW1	WNW2	WSW1	UO	W1	NW1	UO	UO	UO	ENE1	NNE2	NNW3	NNW2	WNW2	NNW3	NW3	NW2	NW3	WNW1	WNW1	UO	---	NNW3
30-Nov	UO	UO	UO	UO	NNW1	NNW2	NNW2	UO	NNW3	NNW3	NNW3	N4	N4	NNW5	N5	NNW5	NNW4	NNW4	NW5	NNW6	NNW6	NNW6	NNW6	NNW4	NNW4.1	NNW6

WNW1.0WNW0.6 N0.4WNW0.5WNW0.7WNW0.9 NW1.3 NW0.9 NW0.9 W0.6 W0.8 NW0.7NNW0.6 NE0.3 NW0.2WNW0.2 NW0.5NNW1.0NNW1.6NNW1.9NNW2.2NNW1.7NNW1.5NNW1.4  
N8 N9 NNW9WNW10WNW10 SSE9 N9 NNW9 N9 NNE11 NW13 NW14 NW15 NW14 NW16 NW12 NW14 NW13NNW11 NW12 NW12NNW10 N9 N9 Diurnal Average  
Diurnal Maximum

UO - Unstable Operation  
All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Waskow ohci Pimatisiwin - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	439	66.21	66.21
6 - 11	210	31.67	97.89
12 - 19	14	2.11	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 663

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Waskow ohci Pimatisiwin - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	22	12	24	7	4	6	24	83	41	25	25	27	32	35	34	38	439
6 - 11	70	19	0	0	0	0	7	48	3	1	2	9	14	9	2	26	210
12 - 19	0	0	0	0	0	0	0	3	0	0	0	0	1	0	10	0	14
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	92	31	24	7	4	6	31	134	44	26	27	36	47	44	46	64	663

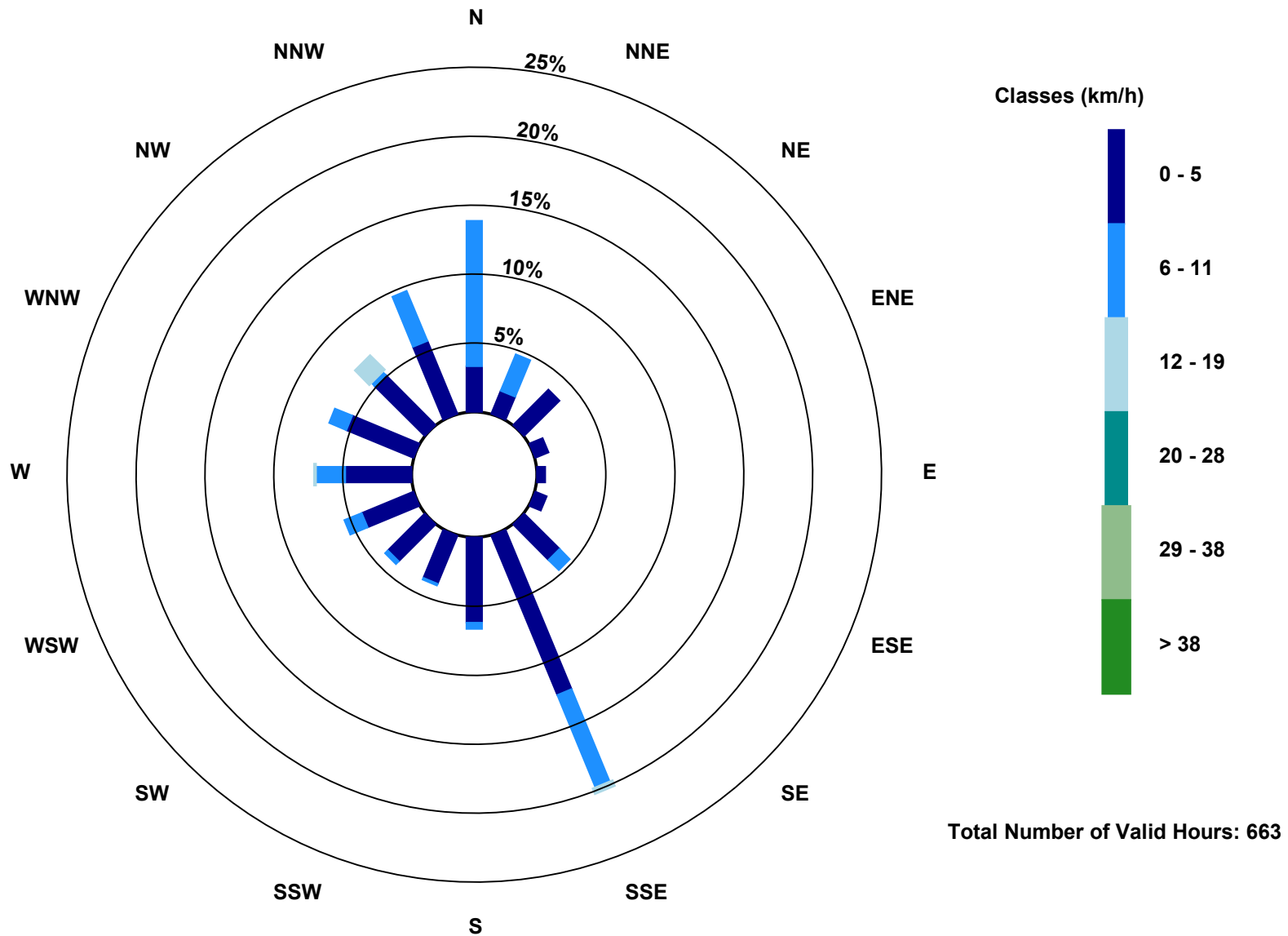
Total Number of Valid Hours: 663

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Waskow ohci Pimatisiwin





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Waskow ohci Pimatisiwin - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 5 km/h on Nov 12 11:00	Hours of Data: 541
Minimum Value: 0 km/h on Nov 15 07:00	Hours of Missing Data: 179
Percentiles: P <sub>1</sub> = 0 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 1 Q <sub>3</sub> = 2 P <sub>90</sub> = 3 P <sub>99</sub> = 4	Hours of Calibration: 0
	Percent Operational Time: 75.1

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	2	1	1	1	1	1	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
2-Nov	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
3-Nov	1	1	UO	UO	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4-Nov	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	UO	UO	1	UO	1	1
5-Nov	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	2	2	1	2	2
6-Nov	1	2	2	2	2	3	2	2	3	3	3	2	2	3	3	3	1	1	1	1	1	1	1	1	3
7-Nov	UO	2	1	1	1	2	2	2	1	2	2	3	4	3	2	1	1	1	UO	1	1	1	1	1	4
8-Nov	1	2	1	1	1	1	1	1	2	2	2	2	3	2	3	2	2	1	2	2	2	2	1	2	3
9-Nov	2	2	1	1	2	2	2	1	1	1	2	2	1	2	2	2	0	1	1	1	1	1	1	1	2
10-Nov	1	1	2	1	1	1	1	1	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	UO	2
11-Nov	UO	1	UO	1	2	1	1	1	1	1	2	2	3	2	2	2	1	1	1	UO	UO	1	2	1	3
12-Nov	1	1	1	1	1	2	2	1	2	4	5	3	5	5	5	4	3	4	4	2	3	2	2	1	5
13-Nov	1	1	1	1	2	2	1	1	1	1	2	1	1	2	2	2	2	2	3	2	2	3	3	3	3
14-Nov	3	2	2	2	2	2	2	2	2	2	3	3	3	3	2	2	2	1	1	1	1	1	1	1	3
15-Nov	1	1	UO	0	1	1	0	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16-Nov	1	1	1	1	1	UO	1	1	1	2	3	3	3	3	4	4	4	4	3	3	3	3	2	3	4
17-Nov	3	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	1	1	4	5	4	3	2	UO	5
18-Nov	UO	UO	UO	2	1	1	1	1	1	1	2	2	1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2
19-Nov	UO	UO	2	2	3	3	3	2	2	2	3	3	3	3	3	2	2	3	3	4	4	2	3	3	4
20-Nov	3	3	3	3	2	3	3	4	3	4	4	3	3	3	2	2	1	2	3	3	3	2	2	3	4
21-Nov	2	2	2	1	1	1	2	1	1	1	2	2	1	1	1	1	1	1	1	1	UO	1	1	1	2
22-Nov	1	1	1	1	1	UO	UO	UO	UO	UO	1	1	1	1	1	2	1	1	1	1	1	1	2	2	2
23-Nov	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	2	2	2	2	3	3
24-Nov	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	0	0	UO	1	1	1	1	1	2
25-Nov	1	1	1	1	1	1	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	1
26-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
27-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
28-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
29-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
30-Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
	3	3	3	3	3	3	3	4	3	4	5	3	5	5	5	4	4	4	4	4	5	4	3	3	3
	Diurnal Maximum																								

UO - Unstable Operation    NF - Not Flagged





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

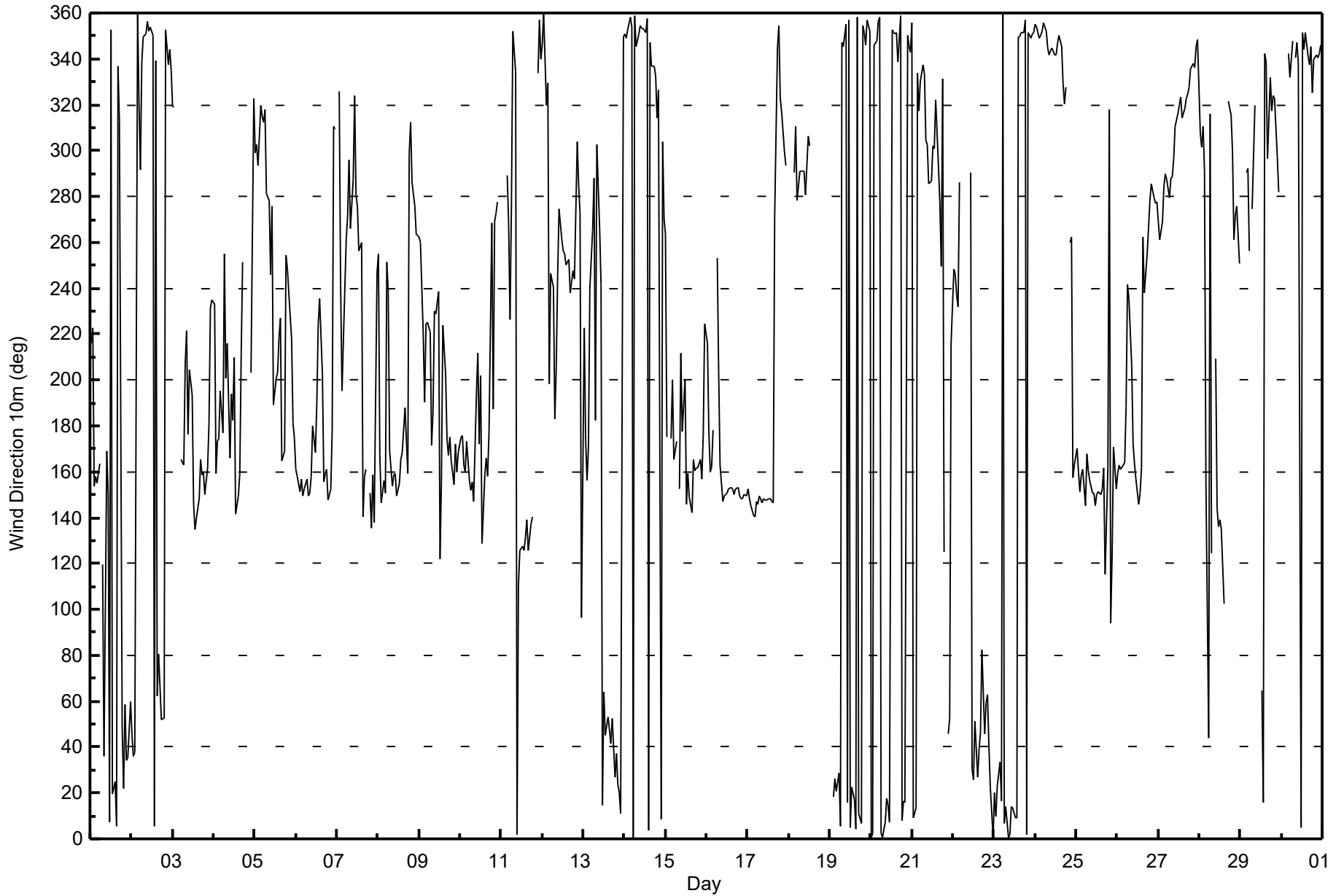
**Wind Direction 10m (WD10) - deg**  
**Waskow ohci Pimatisiwin - November 2024**

Direction of Maximum Speed: 314 deg on Nov 27 15:00		Hours in Service: 720
Direction of Maximum Daily Speed Average: 312.2 deg on Nov 27		Hours of Data: 663
Direction of Minimum Speed: 138 deg on Nov 7 23:00	Direction of Minimum Daily Speed Average: 0.9 deg on Nov 1	Hours of Missing Data: 57
Monthly Average Direction: 318.3 deg		Percent Operational Time: 92.1

Day	Hourly Period Ending At (MST)																								Daily Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	216	223	154	158	155	163	UO	120	36	169	150	7	353	20	25	5	337	313	48	22	59	34	35	60	43.1	
2-Nov	45	36	38	359	321	292	338	349	351	356	352	354	350	5	340	62	81	52	52	52	353	337	344	335	5.6	
3-Nov	319	319	UO	UO	UO	165	163	207	221	177	204	193	146	135	139	148	165	159	160	150	162	181	231	235	178.7	
4-Nov	233	159	173	174	195	177	255	201	216	166	194	183	210	141	149	159	212	252	UO	UO	204	UO	203	323	186.0	
5-Nov	299	303	294	320	315	312	318	281	278	246	276	189	201	203	218	227	165	169	255	248	238	218	181	175	254.8	
6-Nov	161	158	152	157	149	152	157	149	151	158	180	168	190	224	236	202	155	159	161	148	152	179	311	309	168.7	
7-Nov	UO	326	242	195	218	261	272	296	266	287	324	280	276	256	260	140	158	161	UO	150	135	158	138	246	258.5	
8-Nov	255	167	147	156	151	251	238	169	154	158	159	150	155	165	168	178	188	159	299	312	286	276	264	263	189.4	
9-Nov	262	260	220	190	225	225	221	171	187	230	229	239	122	156	224	203	174	167	175	165	154	172	160	169	204.2	
10-Nov	175	176	163	160	173	156	152	155	147	194	212	172	202	129	158	166	158	178	268	187	269	273	278	UO	170.9	
11-Nov	UO	275	UO	289	269	226	277	352	334	2	110	126	128	125	131	139	126	137	140	UO	UO	334	357	340	121.1	
12-Nov	346	360	319	330	198	246	240	183	206	245	275	261	256	255	250	253	238	243	248	244	304	285	273	96	257.9	
13-Nov	222	174	156	171	240	265	288	182	303	266	241	14	64	45	53	48	42	53	27	37	24	20	11	350	17.6	
14-Nov	351	349	353	358	354	0	359	345	351	355	353	353	352	358	3	347	337	337	333	314	326	8	304	270	348.4	
15-Nov	264	175	UO	175	200	165	173	UO	153	212	177	200	146	159	149	142	165	161	162	162	166	157	176	224	167.0	
16-Nov	216	177	160	163	178	UO	253	204	163	147	150	150	151	152	153	153	150	152	153	150	148	148	150	150	154.6	
17-Nov	153	149	145	141	140	147	146	149	147	149	148	148	148	148	147	147	271	345	355	323	316	299	294	UO	151.2	
18-Nov	UO	UO	UO	290	310	278	291	291	291	291	281	306	302	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
19-Nov	UO	UO	18	26	21	29	5	347	345	355	16	357	5	23	17	4	358	11	7	355	352	346	357	352	3.1	
20-Nov	1	3	346	348	357	358	2	0	7	17	15	7	353	351	351	351	338	359	8	17	16	350	345	343	359.6	
21-Nov	356	9	14	333	317	330	337	333	305	302	286	287	302	301	322	293	277	249	331	125	UO	46	52	216	324.3	
22-Nov	248	246	236	232	286	UO	UO	UO	UO	UO	290	31	25	51	27	39	46	83	46	59	63	41	23	1	25.5	
23-Nov	20	10	23	33	17	360	7	14	1	2	14	13	9	9	350	349	352	352	357	2	351	349	351	352	2.3	
24-Nov	355	354	349	350	352	356	352	345	342	344	344	341	342	346	350	345	329	321	328	UO	260	263	158	163	344.7	
25-Nov	170	160	151	159	161	145	168	161	156	151	151	145	150	152	150	153	162	116	162	318	94	123	171	152	153.3	
26-Nov	159	163	161	163	164	189	241	235	207	172	164	157	146	150	162	262	238	254	266	278	285	280	277	278	205.5	
27-Nov	269	261	269	284	290	288	280	288	289	297	310	316	320	324	314	318	323	325	328	335	338	336	345	348	312.2	
28-Nov	308	301	311	291	156	44	316	124	UO	209	144	136	139	135	102	UO	UO	322	315	300	261	272	276	251	291.9	
29-Nov	UO	UO	UO	290	292	256	UO	275	319	UO	UO	UO	64	16	343	338	297	332	317	324	323	297	282	UO	--	
30-Nov	UO	UO	UO	UO	342	332	348	UO	340	347	338	5	352	344	352	341	337	346	325	340	342	341	342	346	343.2	

293.3	303.6	354.0	281.5	287.0	291.3	304.6	310.6	307.7	279.1	276.7	313.8	336.6	41.4	310.9	287.6	315.0	329.2	335.1	336.1	335.5	331.5	331.3	326.6
Diurnal Average																							

UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Waskow ohci Pimatisiwin - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 109 deg on Nov 13 00:00	Hours of Data: 663
Minimum Value: 0 deg on Nov 18 09:00	Hours of Missing Data: 57
Percentiles: P <sub>1</sub> = 13 P <sub>10</sub> = 19 Q <sub>1</sub> = 22 Median = 27 Q <sub>3</sub> = 41 P <sub>90</sub> = 61 P <sub>99</sub> = 92	Hours of Calibration: 0
	Percent Operational Time: 92.1

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	43	49	41	31	25	29	UO	70	72	80	63	41	18	28	23	61	30	46	29	48	23	25	37	30	80
2-Nov	22	33	38	60	49	37	59	35	23	20	22	24	24	23	25	67	17	18	40	68	27	39	28	22	68
3-Nov	20	25	UO	UO	UO	33	31	37	53	51	50	35	43	24	22	36	22	22	18	79	81	32	29	26	81
4-Nov	44	71	26	30	59	41	72	42	68	31	36	39	60	26	25	35	30	25	UO	UO	19	UO	56	75	75
5-Nov	13	25	22	19	18	25	17	28	34	67	42	31	40	54	65	51	28	24	26	25	71	50	32	28	71
6-Nov	30	21	22	20	21	23	23	21	21	30	31	34	45	47	48	54	38	27	38	31	17	81	61	66	81
7-Nov	UO	42	94	27	27	27	38	64	25	62	107	39	71	61	89	47	48	43	UO	45	52	46	84	86	107
8-Nov	88	46	28	27	45	30	25	91	68	20	24	19	42	27	27	30	30	37	44	35	24	27	26	21	91
9-Nov	30	38	50	39	36	44	39	42	62	39	55	83	43	49	44	34	15	24	11	26	26	16	33	23	83
10-Nov	31	30	67	20	48	25	22	30	33	40	50	46	61	28	23	21	31	42	74	72	89	67	64	UO	89
11-Nov	UO	39	UO	54	61	39	68	32	17	58	45	31	28	25	27	26	33	38	43	UO	UO	57	25	33	68
12-Nov	28	27	42	60	69	54	45	37	37	39	35	37	40	40	41	45	48	34	36	46	29	30	53	109	109
13-Nov	35	45	35	20	38	42	88	83	65	53	59	51	33	35	26	23	21	27	25	27	24	22	24	20	88
14-Nov	21	21	19	22	21	24	22	18	18	20	22	21	20	22	24	20	18	18	19	16	22	24	34	43	43
15-Nov	90	63	UO	49	82	22	18	UO	28	53	58	49	34	31	29	22	33	26	20	17	20	22	31	72	90
16-Nov	92	34	34	19	39	UO	25	41	27	23	24	22	21	22	22	22	23	24	22	21	23	24	23	21	92
17-Nov	21	20	20	22	23	22	24	24	23	25	24	23	24	22	22	27	94	18	23	21	18	27	25	UO	94
18-Nov	UO	UO	UO	36	15	21	0	0	0	10	27	20	22	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	36
19-Nov	UO	UO	38	21	27	23	26	19	17	20	29	29	25	26	29	25	22	25	23	26	23	19	23	22	38
20-Nov	22	24	19	21	22	23	23	23	23	23	24	24	21	24	22	18	20	22	21	24	24	20	18	18	24
21-Nov	21	22	25	23	15	16	19	18	19	24	32	37	32	31	20	26	35	41	73	66	UO	30	20	92	92
22-Nov	56	41	41	48	71	UO	UO	UO	UO	UO	39	49	35	33	30	24	33	23	28	19	26	33	30	24	71
23-Nov	27	23	30	25	24	22	24	26	24	20	24	22	23	22	17	19	19	20	21	23	19	19	19	19	30
24-Nov	19	22	20	21	20	21	19	16	16	16	16	19	19	18	21	16	13	15	12	UO	45	48	86	20	86
25-Nov	16	19	24	16	19	31	32	24	28	28	27	24	25	23	23	23	34	51	32	94	72	43	27	27	94
26-Nov	24	19	20	19	21	32	37	31	43	26	26	25	26	28	40	40	37	44	40	36	31	39	35	39	44
27-Nov	45	46	36	31	30	32	37	30	29	32	21	17	17	18	16	17	17	18	17	18	20	19	20	19	46
28-Nov	25	19	38	31	51	68	54	90	UO	75	88	75	27	53	42	UO	UO	18	35	43	19	21	65	68	90
29-Nov	UO	UO	UO	43	33	42	UO	23	64	UO	UO	UO	55	23	31	39	29	19	20	21	19	55	60	UO	64
30-Nov	UO	UO	UO	UO	41	34	42	UO	22	29	24	23	21	20	23	18	22	23	21	18	22	20	18	26	42

	92	71	94	60	82	68	88	91	72	80	107	83	71	61	89	67	94	51	74	94	89	81	86	109	
	Diurnal Maximum																								

UO - Unstable Operation



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS26 CHRISTINA LAKE NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)  
 NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	123	8	8	100	3.5	0	0.9	0
H2S (ppb) Average	106	7	7	100	1.1	0	0.2	0
NO2 (ppb) Average	103	9	9	100	16.8	0	4.7	-
NO (ppb) Average	103	9	9	100	12.8	-	2.1	-
NOX (ppb) Average	103	9	9	100	29.6	-	6.8	-
Temperature 2 m (C) Average	131	0	0	100	5.3	-	-0.2	-
Relative Humidity (%) Average	132	0	0	100	98.3	-	96.5	-
Wind Speed 10 m (km/h) Average	108	2	3	99.1	17	-	10	-
Wind Direction 10 m (deg) Average	108	2	3	99.1	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)  
 NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile							
					Min	P10	Q1	Median	Q3	P90	Max	
SO2 (ppb) Average	123	0.31	0.5	-	0	0	0	0.1	0.2	0.7	3.5	
H2S (ppb) Average	106	0.21	0.2	-	0	0.1	0.1	0.1	0.3	0.5	1.1	
NO2 (ppb) Average	103	3.09	2.9	-	0.7	1	1.3	2	3.8	6.1	16.8	
NO (ppb) Average	103	1.28	2.3	-	0	0	0.1	0.4	1	3.8	12.8	
NOX (ppb) Average	103	4.37	5	-	0.7	1.2	1.5	2.6	5	10.4	29.6	
Temperature 2 m (C) Average	131	-2.11	2.4	-	-7.5	-5.1	-3.6	-2.2	-0.6	0.4	5.3	
Relative Humidity (%) Average	132	87.75	9.7	-	52.4	79.8	83.6	90	94.7	97.5	98.3	
Wind Speed 10 m (km/h) Average	108	7.5	4	-	0	3	4	7	11	12	17	
Wind Direction 10 m (deg) Average	108	-	-	-	-	-	-	-	-	-	-	

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction	03 Nov 2024 02:00	03 Nov 2024 02:00	1	Flat line in sensor output signal - Sensor frozen



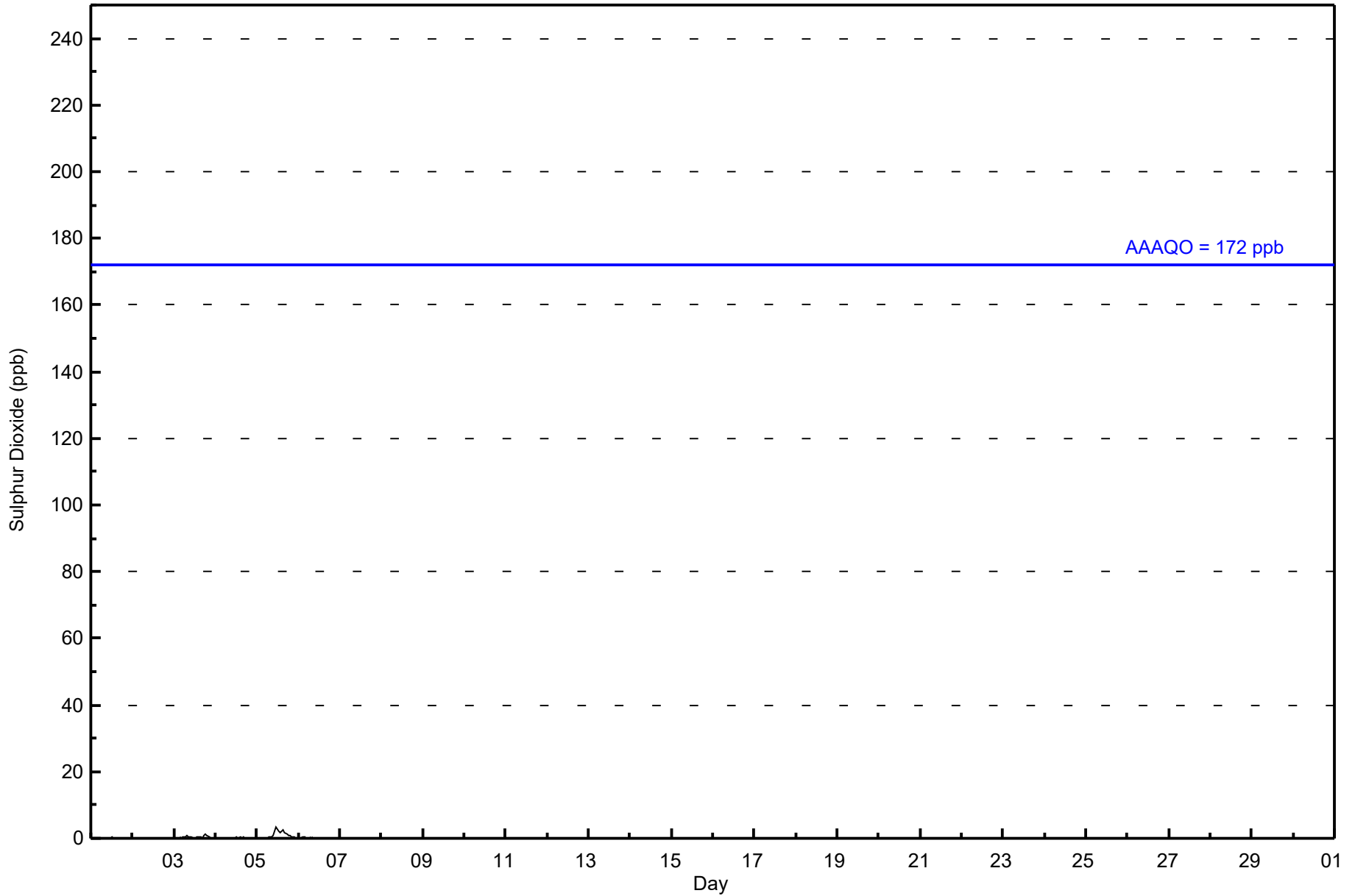
Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														131									
Maximum Value: 3.5 ppb on Nov 5 12:00		Maximum Daily Average: 0.9 ppb on Nov 5														Hours of Data:		123											
Minimum Value: 0.0 ppb on Nov 1 03:00		Minimum Daily Average: 0.1 ppb on Nov 1														Hours of Missing Data:		8											
Maximum Diurnal Average: 0.8 ppb at hour 12		Minimum Diurnal Average: 0.1 ppb at hour 2														Hours of Calibration:		8											
Monthly Average: 0.31 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.1 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 0.7 P <sub>99</sub> = 2.6														Percent Operational Time:		100.0											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.2			
2-Nov	0.0	Z	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.2	0.2	0.2	0.2	0.1	0.1	0.2			
3-Nov	0.1	0.2	Z	0.2	0.2	0.2	0.5	0.8	0.3	0.3	0.3	0.1	0.1	0.4	0.3	0.2	0.2	0.7	1.1	0.7	0.3	0.2	0.1	0.0	0.3	1.1			
4-Nov	0.0	0.0	0.2	Z	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.2	0.3	0.1	0.2	0.5	0.2	0.5	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.5			
5-Nov	0.1	0.1	0.1	0.1	Z	0.1	0.2	0.3	0.5	0.9	2.1	3.5	1.9	1.5	2.3	2.7	1.6	1.1	0.8	0.7	0.3	0.2	0.2	0.2	0.9	3.5			
6-Nov	0.2	0.1	0.2	0.5	0.5	Z	0.3	0.1	0.5	C	C	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	0.5			
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
8-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
9-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
10-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
11-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
12-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
13-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
14-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
15-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
16-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
17-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
18-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
19-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
20-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
21-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
22-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
23-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
24-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
25-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
26-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
27-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
28-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
29-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
30-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--			
		0.1 0.1 0.1 0.2 0.2 0.1 0.2 0.2 0.2 0.3 0.5 0.8 0.5 0.5 0.6 0.7 0.5 0.4 0.4 0.4 0.2 0.2 0.1 0.1																								Diurnal Average			
		0.2 0.2 0.2 0.5 0.5 0.2 0.5 0.8 0.5 0.9 2.1 3.5 1.9 1.5 2.3 2.7 1.6 1.1 1.1 0.7 0.3 0.2 0.2 0.2																								Diurnal Maximum			
Z - zerospan		C - Calibration		NS - Not in Service																									
Alberta Ambient Air Quality Objectives (AAAQO):		1-hr 172 ppb		24-hr 48 ppb																									





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Christina Lake - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Christina Lake - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	123	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 123

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Christina Lake - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	0	0	2	4	10	10	10	2	7	12	18	15	9	0	4	0	103
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	0	0	2	4	10	10	10	2	7	12	18	15	9	0	4	0	103

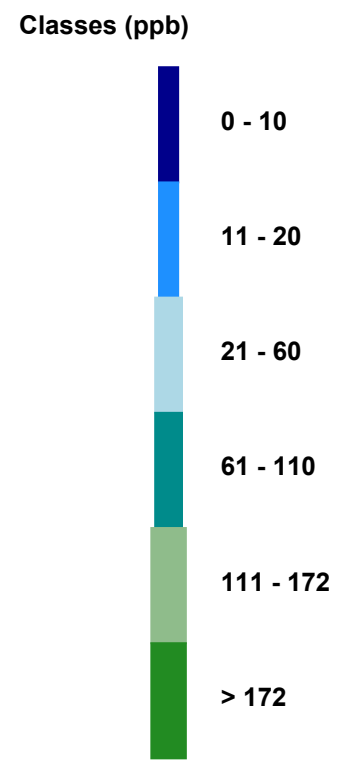
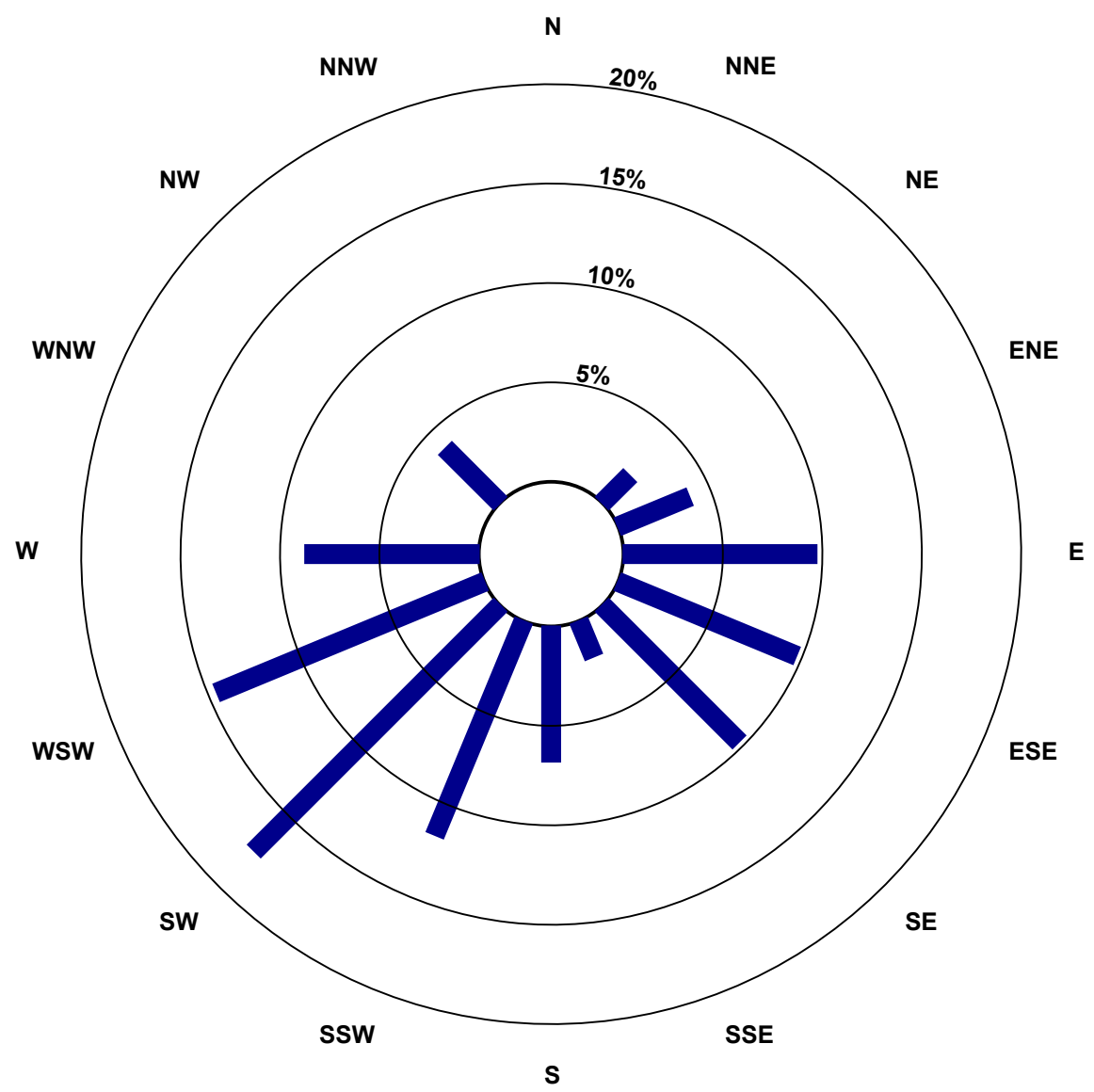
Total Number of Valid Hours: 103

Total Number of Hours: 720

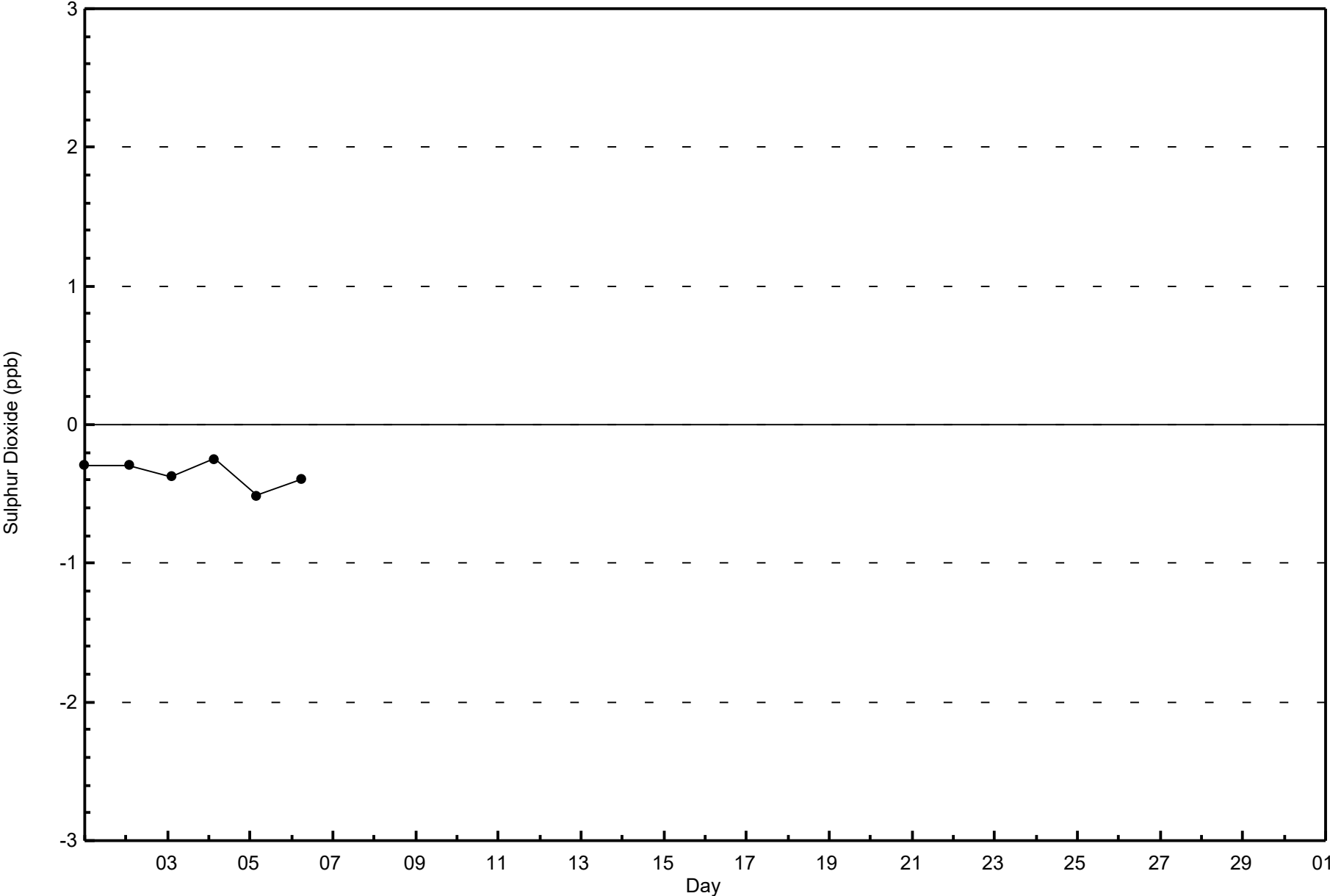


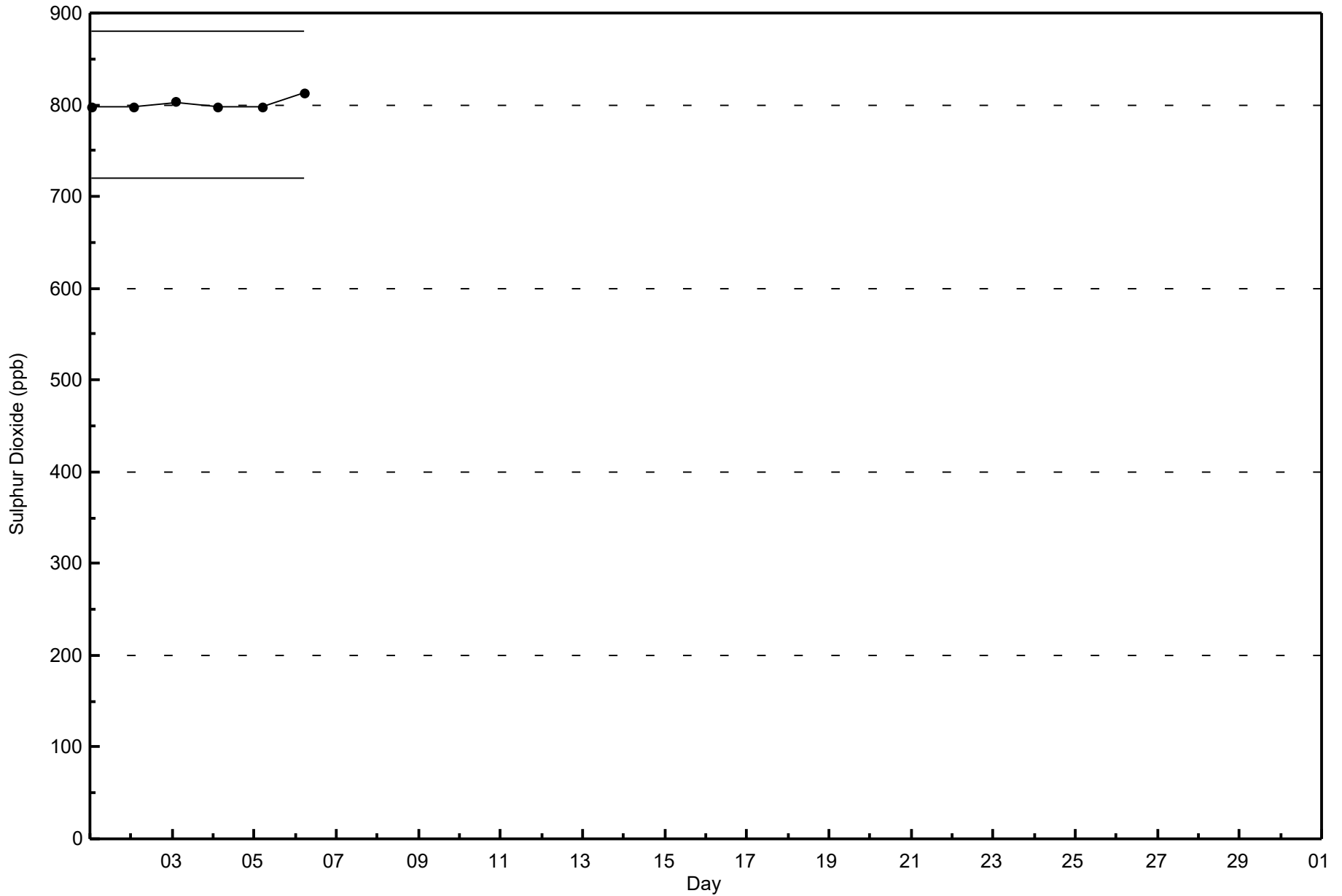
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Christina Lake



Total Number of Valid Hours: 103







# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Hydrogen Sulphide (H<sub>2</sub>S) - ppb

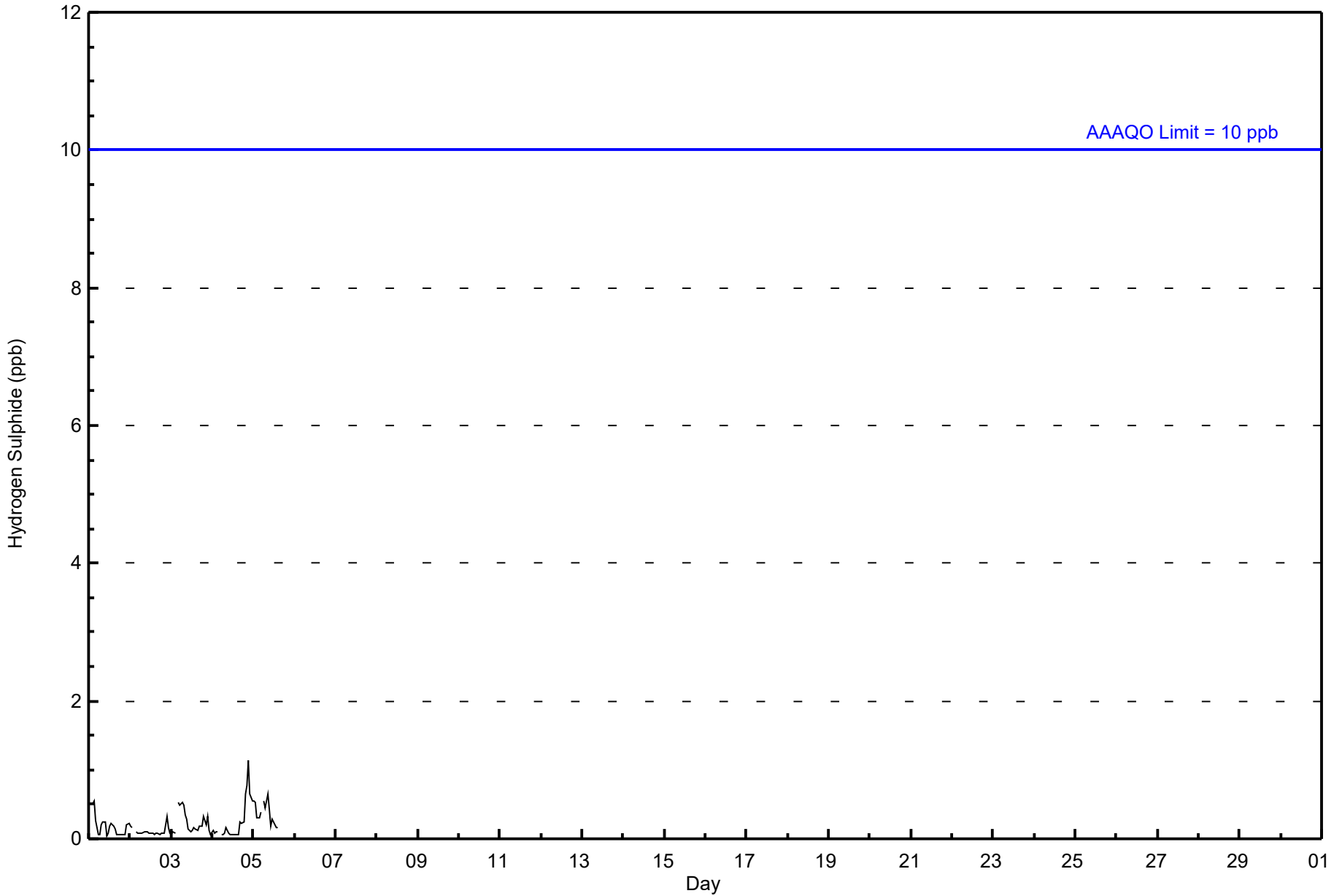
## Christina Lake - November 2024

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		113																			
Maximum Value: 1.1 ppb on Nov 4 22:00		Maximum Daily Average: 0.2 ppb on Nov 4				Hours of Data:		106																			
Minimum Value: 0.0 ppb on Nov 1 01:00		Minimum Daily Average: 0.1 ppb on Nov 2				Hours of Missing Data:		7																			
Maximum Diurnal Average: 0.5 ppb at hour 22		Minimum Diurnal Average: 0.1 ppb at hour 11				Hours of Calibration:		7																			
Monthly Average: 0.21 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.1 Median = 0.1 Q <sub>3</sub> = 0.3 P <sub>90</sub> = 0.5 P <sub>99</sub> = 0.8				Percent Operational Time:		100.0																			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.0	Z	0.5	0.6	0.3	0.1	0.1	0.2	0.3	0.2	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.6	
2-Nov	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.3	
3-Nov	0.1	0.1	0.1	Z	0.5	0.5	0.5	0.5	0.3	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.3	0.1	0.1	0.2	0.5	
4-Nov	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.7	0.8	1.1	0.6	0.5	0.2	1.1	
5-Nov	0.6	0.5	0.3	0.3	0.4	Z	0.5	0.4	0.7	0.4	0.2	0.3	0.2	0.2	0.2	C	C	NS	NS	NS	NS	NS	NS	NS	--	0.7	
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
8-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
9-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
10-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
11-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
12-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
13-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
14-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
15-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
16-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
17-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
18-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
19-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
20-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
21-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
22-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
23-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
24-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
25-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
26-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
27-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
28-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
29-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
30-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
		0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.5	0.3	0.2	Diurnal Average		
		0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.7	0.4	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.7	0.8	1.1	0.6	0.5	Diurnal Maximum	
Z - zerospan		C - Calibration		NS - Not in Service																							
Alberta Ambient Air Quality Objectives (AAAQO):		1-hr 10 ppb		24-hr 3 ppb																							



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Christina Lake - November 2024**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Christina Lake - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	106	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 106

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Christina Lake - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 2	0	0	2	5	10	10	10	2	7	12	18	15	8	0	4	0	103
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	0	0	2	5	10	10	10	2	7	12	18	15	8	0	4	0	103

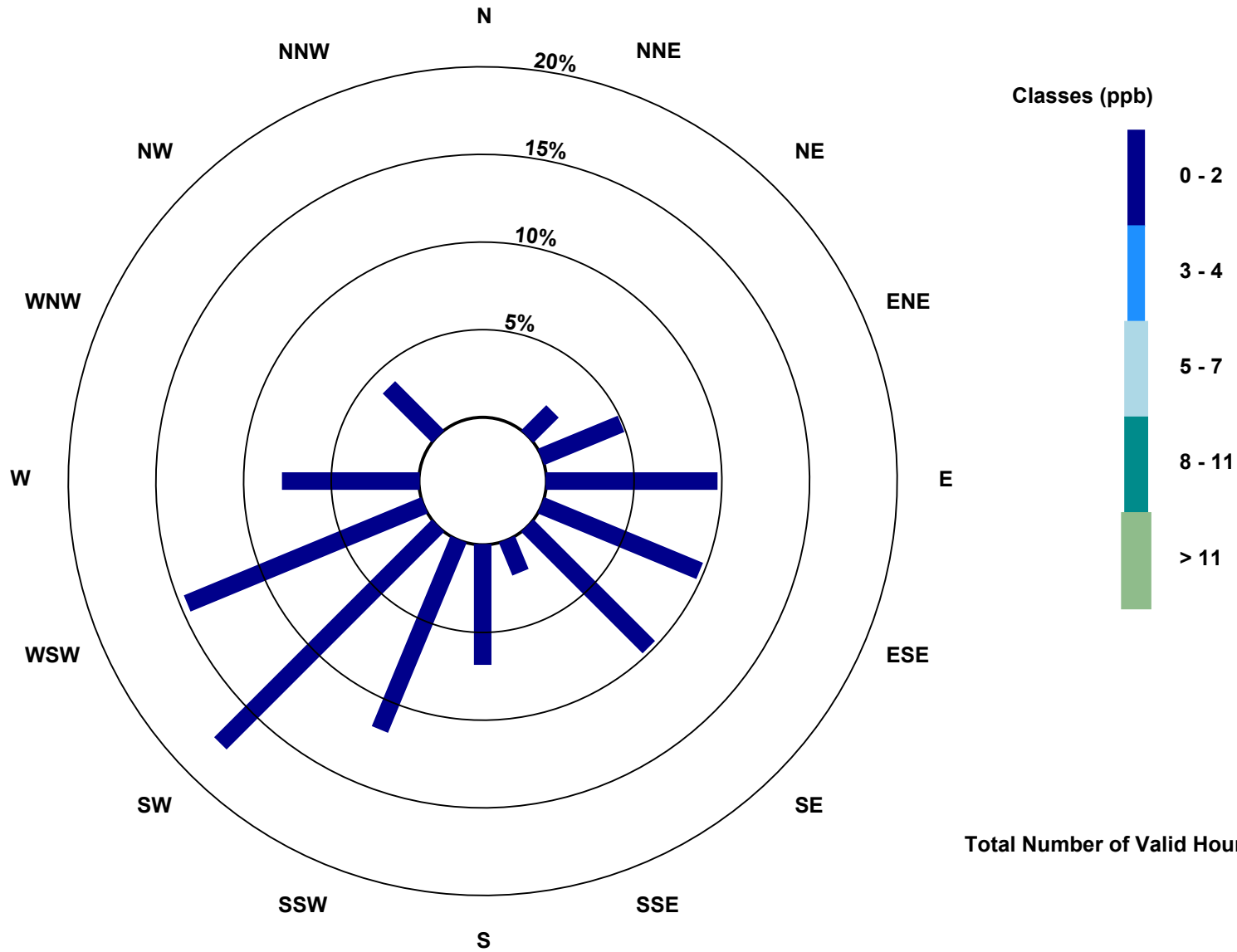
Total Number of Valid Hours: 103

Total Number of Hours: 720

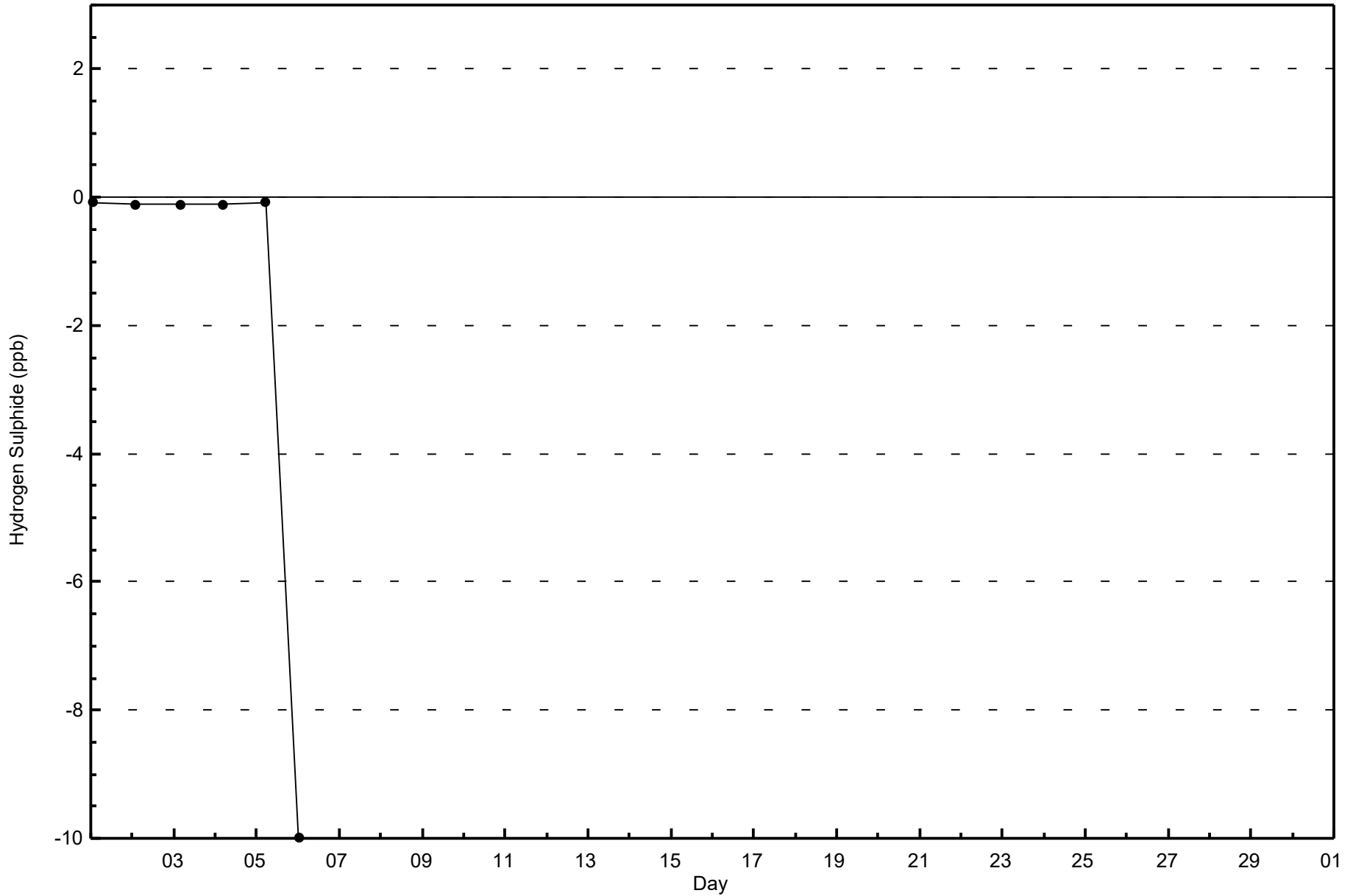


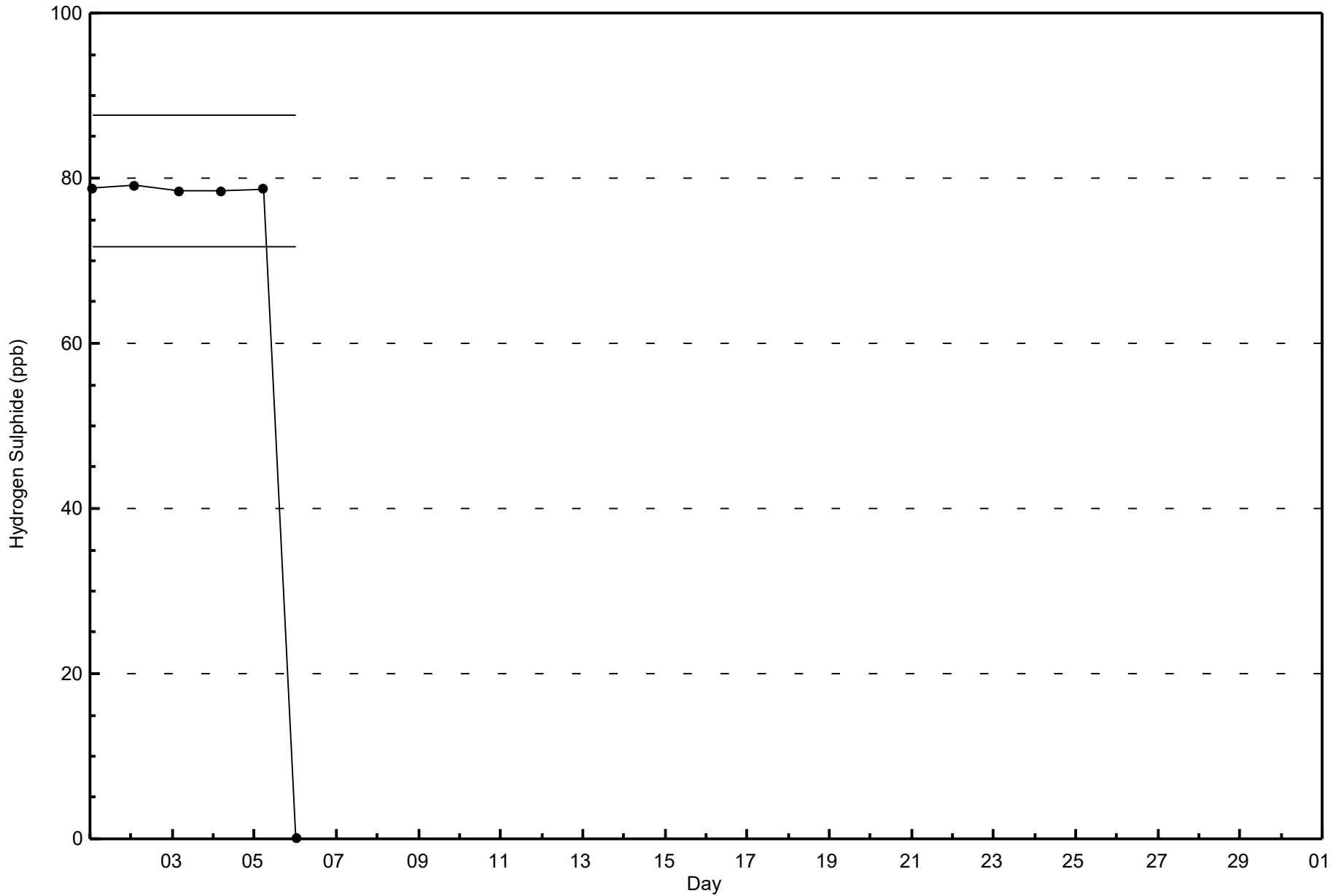
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Christina Lake



Total Number of Valid Hours: 103





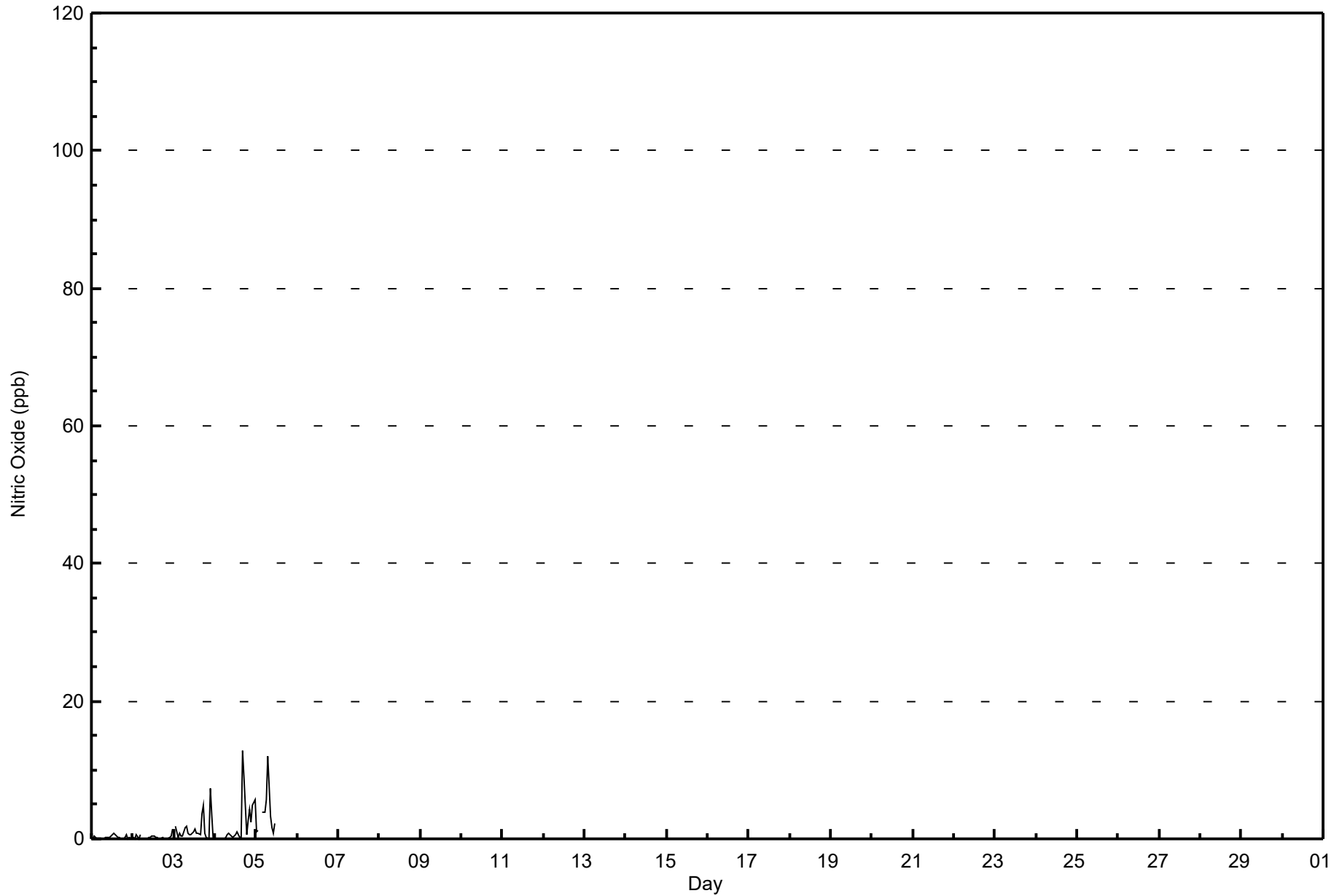


Maximum Value: 12.8 ppb on Nov 4 17:00																				Maximum Daily Average: 2.1 ppb on Nov 4					Hours in Service:	112																						
Minimum Value: 0.0 ppb on Nov 1 01:00																				Minimum Daily Average: 0.2 ppb on Nov 1					Hours of Data:	103																						
Maximum Diurnal Average: 4.2 ppb at hour 17																				Minimum Diurnal Average: 0.3 ppb at hour 16					Hours of Missing Data:	9																						
Monthly Average: 1.28 ppb																				Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.1 Median = 0.4 Q <sub>3</sub> = 1.0 P <sub>90</sub> = 3.8 P <sub>99</sub> = 11.9					Hours of Calibration:	9																						
																									Percent Operational Time:	100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	0.0	0.5	0.2	0.0	Z	0.0	0.0	0.0	0.2	0.2	0.1	0.3	0.7	0.7	0.4	0.3	0.3	0.0	0.0	0.2	0.6	0.0	0.1	0.1	0.2	0.7																						
2-Nov	0.1	0.0	0.7	0.0	0.6	Z	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.2	0.3	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.4	1.4	0.2	1.4																						
3-Nov	Z	1.9	0.2	0.8	0.4	0.5	1.7	1.8	0.7	0.6	0.6	1.1	1.5	0.9	0.9	0.5	3.7	4.8	0.7	0.2	0.0	7.4	3.4	0.1	1.5	7.4																						
4-Nov	0.0	Z	0.0	0.1	0.0	0.1	0.1	0.6	0.9	0.5	0.3	0.4	0.7	1.0	0.2	0.1	12.8	9.0	0.5	2.7	4.4	2.5	4.9	5.7	2.1	12.8																						
5-Nov	1.0	1.2	Z	3.9	3.8	3.8	5.8	12.0	3.3	1.6	0.7	2.3	C	C	C	C	NS	NS	NS	NS	NS	NS	NS	NS	--	12.0																						
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
8-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
9-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
10-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
11-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
12-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
13-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
14-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
15-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
16-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
17-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
18-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
19-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
20-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
21-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
22-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
23-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
24-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
25-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
26-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
27-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
28-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
29-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
30-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
																								0.3	0.9	0.3	1.0	1.2	1.1	1.5	2.9	1.0	0.6	0.4	0.9	0.8	0.7	0.4	0.3	4.2	3.5	0.3	0.8	1.3	2.5	2.2	1.8	Diurnal Average
																								1.0	1.9	0.7	3.9	3.8	3.8	5.8	12.0	3.3	1.6	0.7	2.3	1.5	1.0	0.9	0.5	12.8	9.0	0.7	2.7	4.4	7.4	4.9	5.7	Diurnal Maximum
Z - zerospan			C - Calibration			NS - Not in Service																																										



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Christina Lake - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Christina Lake - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	103	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 103

Total Number of Hours: 720





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Christina Lake - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 20	0	0	2	4	10	9	9	2	8	12	20	14	9	0	3	0	102
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	0	0	2	4	10	9	9	2	8	12	20	14	9	0	3	0	102

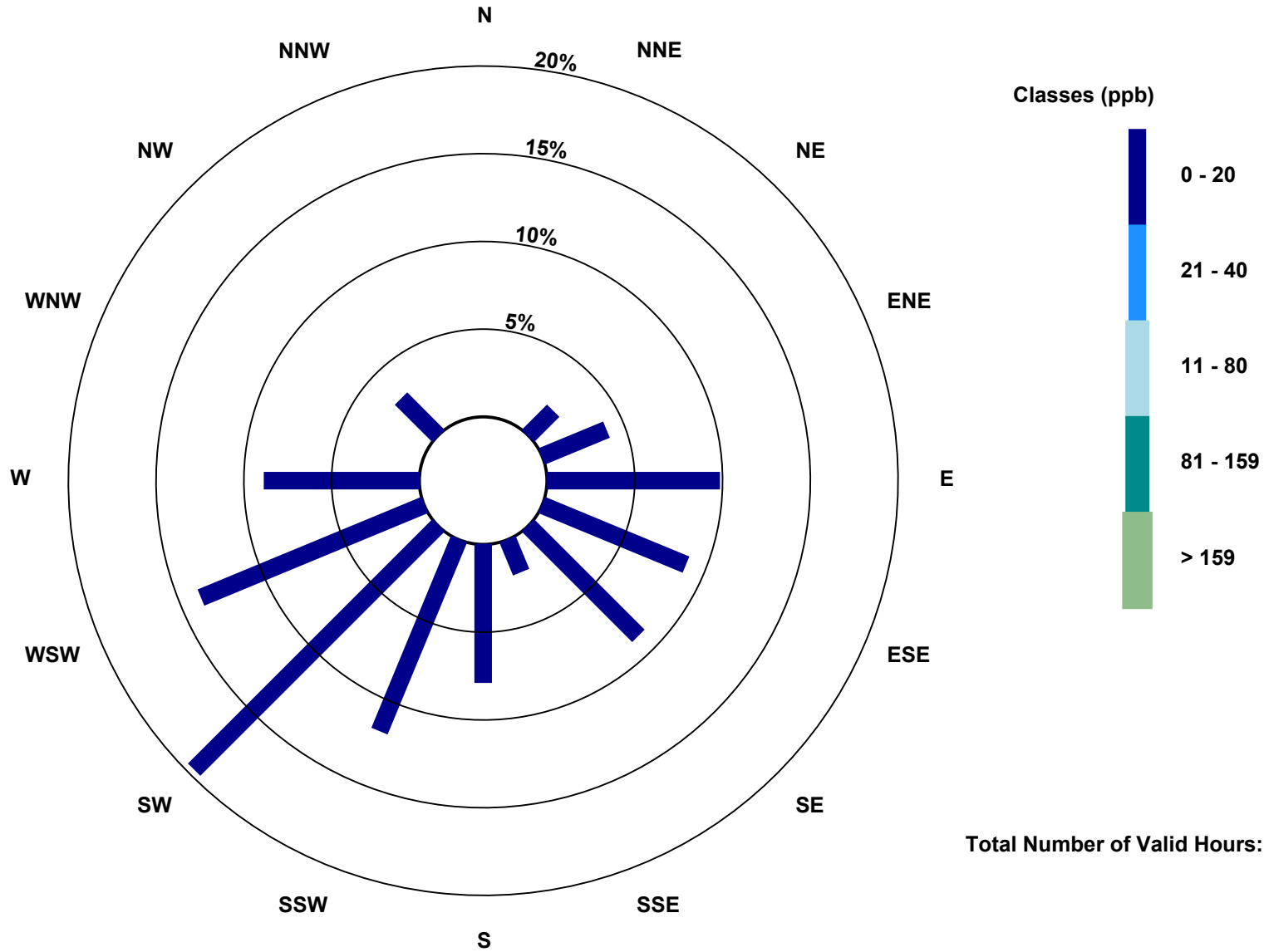
Total Number of Valid Hours: 102

Total Number of Hours: 720

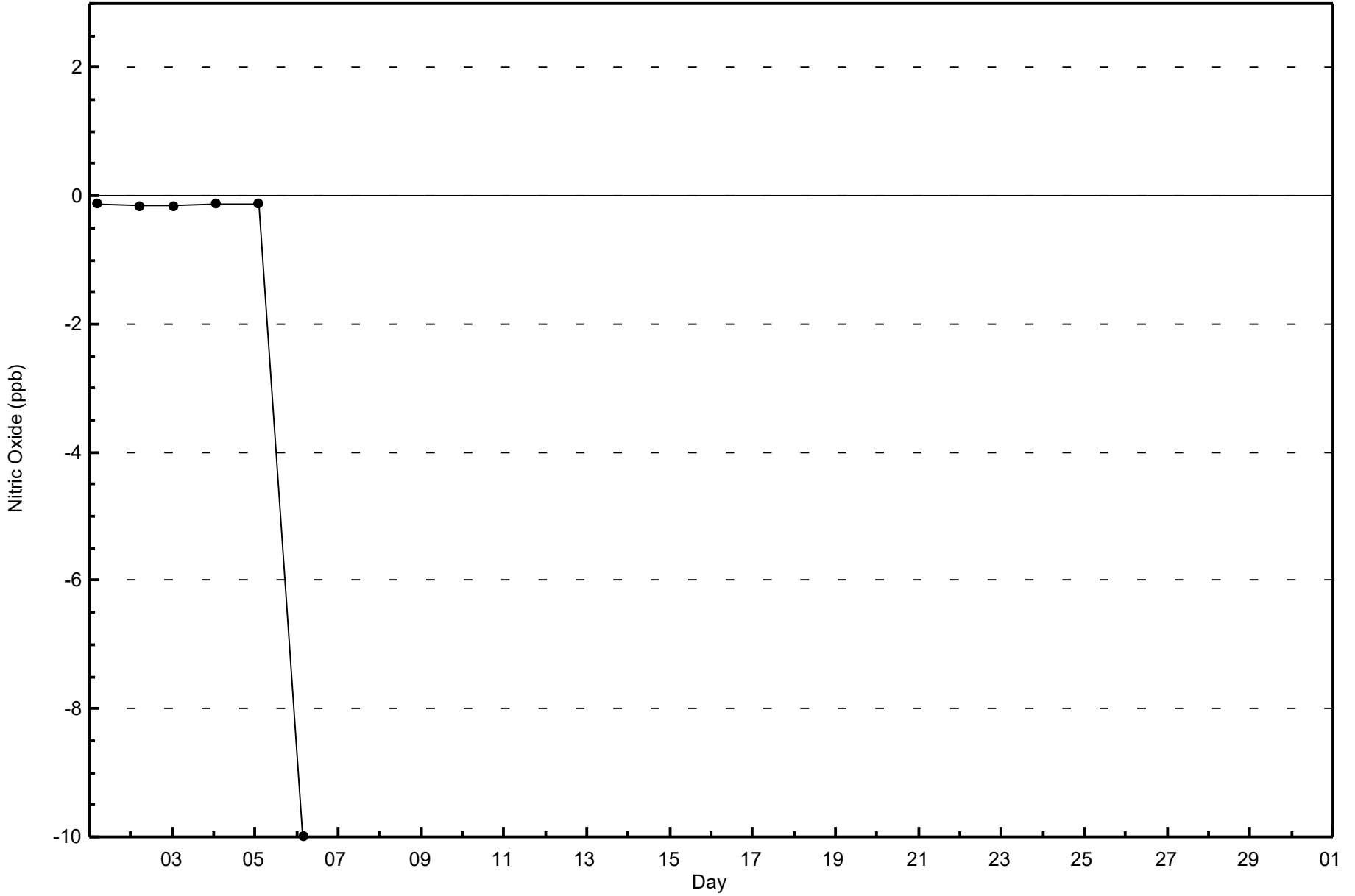


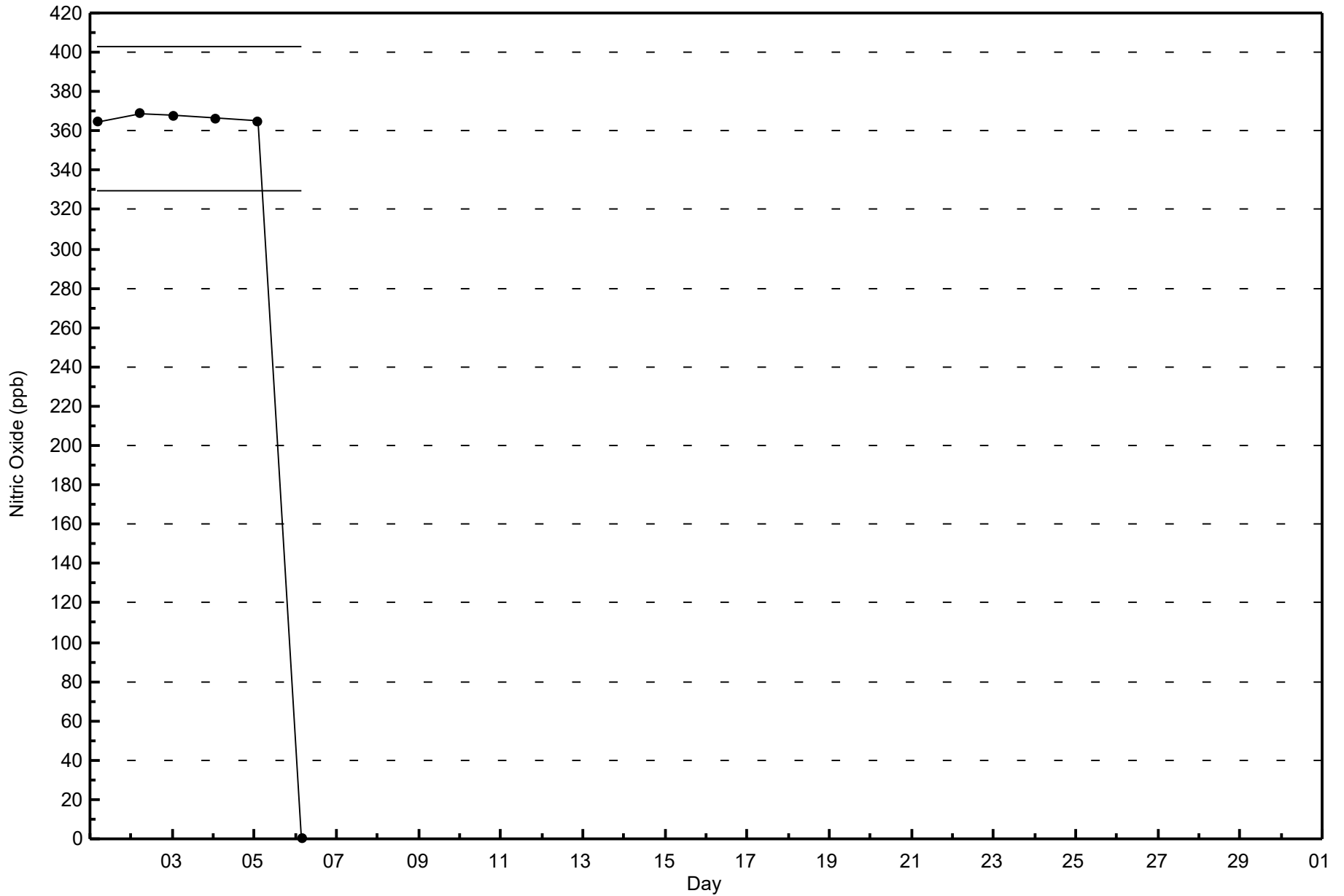
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitric Oxide (NO) - ppb  
Christina Lake



Total Number of Valid Hours: 102







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb

Christina Lake - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	112
Maximum Value: 16.8 ppb on Nov 4 17:00	Maximum Daily Average: 4.7 ppb on Nov 4		Hours of Data:	103
Minimum Value: 0.7 ppb on Nov 2 07:00	Minimum Daily Average: 1.5 ppb on Nov 2		Hours of Missing Data:	9
Maximum Diurnal Average: 6.3 ppb at hour 17	Minimum Diurnal Average: 1.3 ppb at hour 11		Hours of Calibration:	9
Monthly Average: 3.09 ppb	Percentiles: P <sub>1</sub> = 0.7 P <sub>10</sub> = 1.0 Q <sub>1</sub> = 1.3 Median = 2.0 Q <sub>3</sub> = 3.8 P <sub>90</sub> = 6.1 P <sub>99</sub> = 14.6		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	1.6	3.1	2.6	1.4	Z	1.1	1.1	1.8	2.5	2.0	1.1	1.7	3.0	3.6	3.4	2.8	2.3	1.3	1.6	1.2	1.2	1.3	1.4	1.4	1.9	3.6
2-Nov	1.5	1.2	2.1	1.0	1.8	Z	0.7	1.1	1.5	1.4	0.9	0.9	1.3	1.1	0.9	1.0	1.0	1.1	1.0	1.2	1.6	5.0	2.0	2.2	1.5	5.0
3-Nov	Z	4.2	4.0	4.2	1.8	1.8	2.4	3.4	2.4	2.2	1.7	1.6	2.0	2.1	2.4	2.5	4.9	5.6	4.7	2.6	2.4	5.4	3.6	2.1	3.0	5.6
4-Nov	1.9	Z	1.5	1.8	1.3	2.1	3.1	5.8	3.3	1.3	0.7	0.8	1.2	1.9	1.0	1.4	16.8	14.6	10.1	12.0	7.3	6.2	6.6	6.2	4.7	16.8
5-Nov	3.9	4.4	Z	5.3	4.4	4.0	10.1	13.4	7.0	2.5	2.0	4.1	C	C	C	C	NS	NS	NS	NS	NS	NS	NS	NS	--	13.4
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
8-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
9-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
10-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
11-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
12-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
13-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
14-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
15-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
16-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
17-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
18-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
19-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
20-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
21-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
22-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
23-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
24-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
25-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
26-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
27-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
28-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
29-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
30-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--

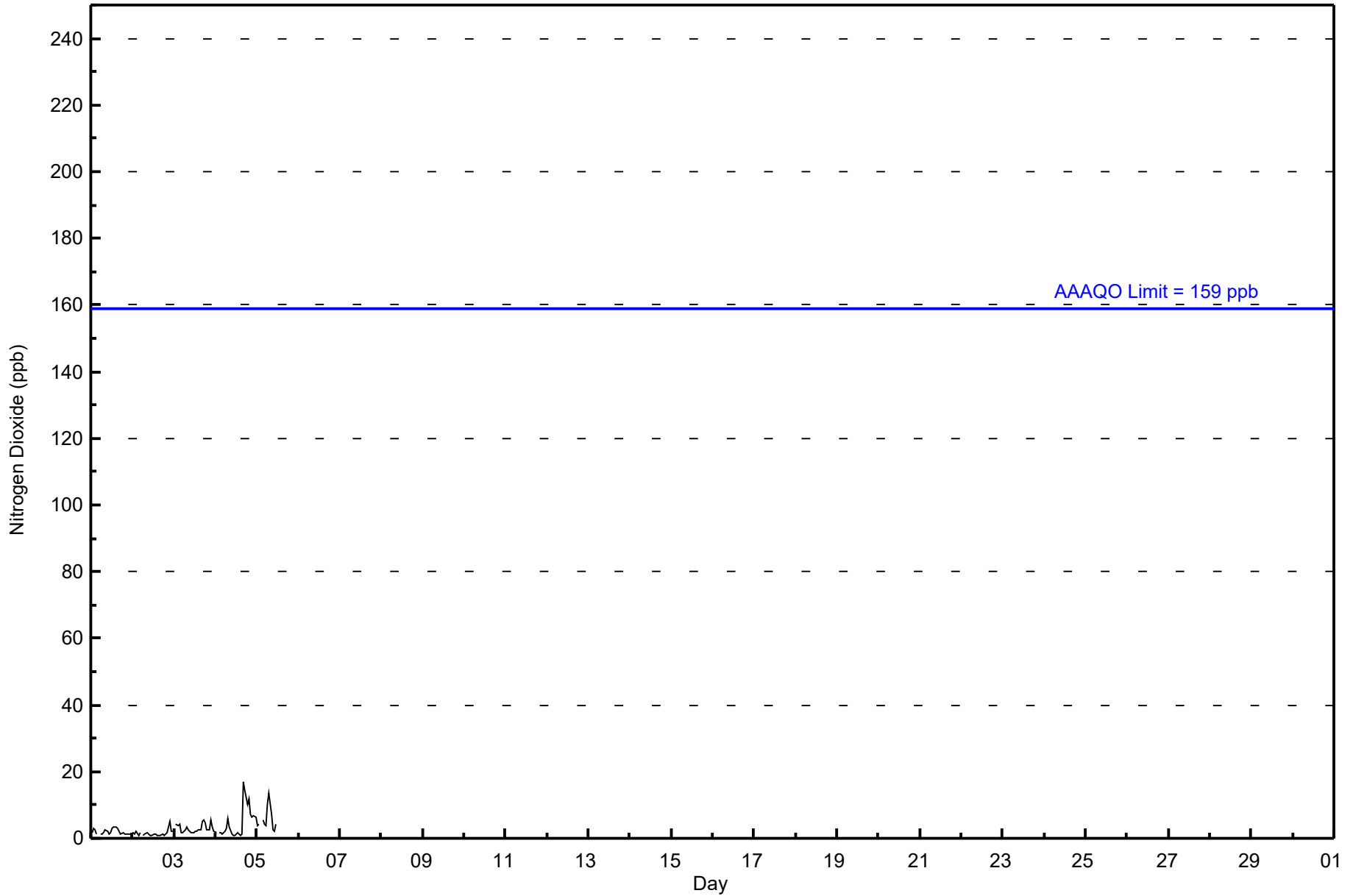
2.2	3.2	2.6	2.7	2.3	2.3	3.5	5.1	3.3	1.9	1.3	1.8	1.9	2.2	1.9	1.9	6.3	5.7	4.4	4.3	3.1	4.5	3.4	3.0	Diurnal Average	
3.9	4.4	4.0	5.3	4.4	4.0	10.1	13.4	7.0	2.5	2.0	4.1	3.0	3.6	3.4	2.8	16.8	14.6	10.1	12.0	7.3	6.2	6.6	6.2	Diurnal Maximum	

Z - zerospan                      C - Calibration                      NS - Not in Service  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Christina Lake - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Christina Lake - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	103	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 103

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Christina Lake - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 20	0	0	2	4	10	9	9	2	8	12	20	14	9	0	3	0	102
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	0	0	2	4	10	9	9	2	8	12	20	14	9	0	3	0	102

Total Number of Valid Hours: 102

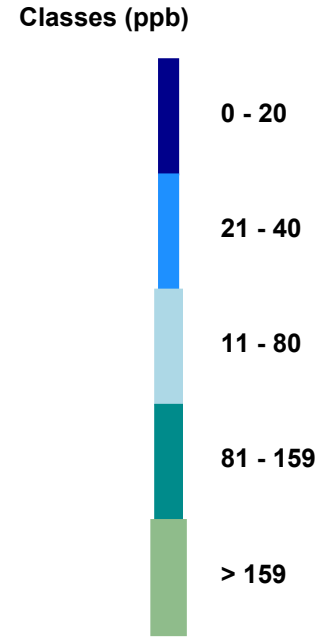
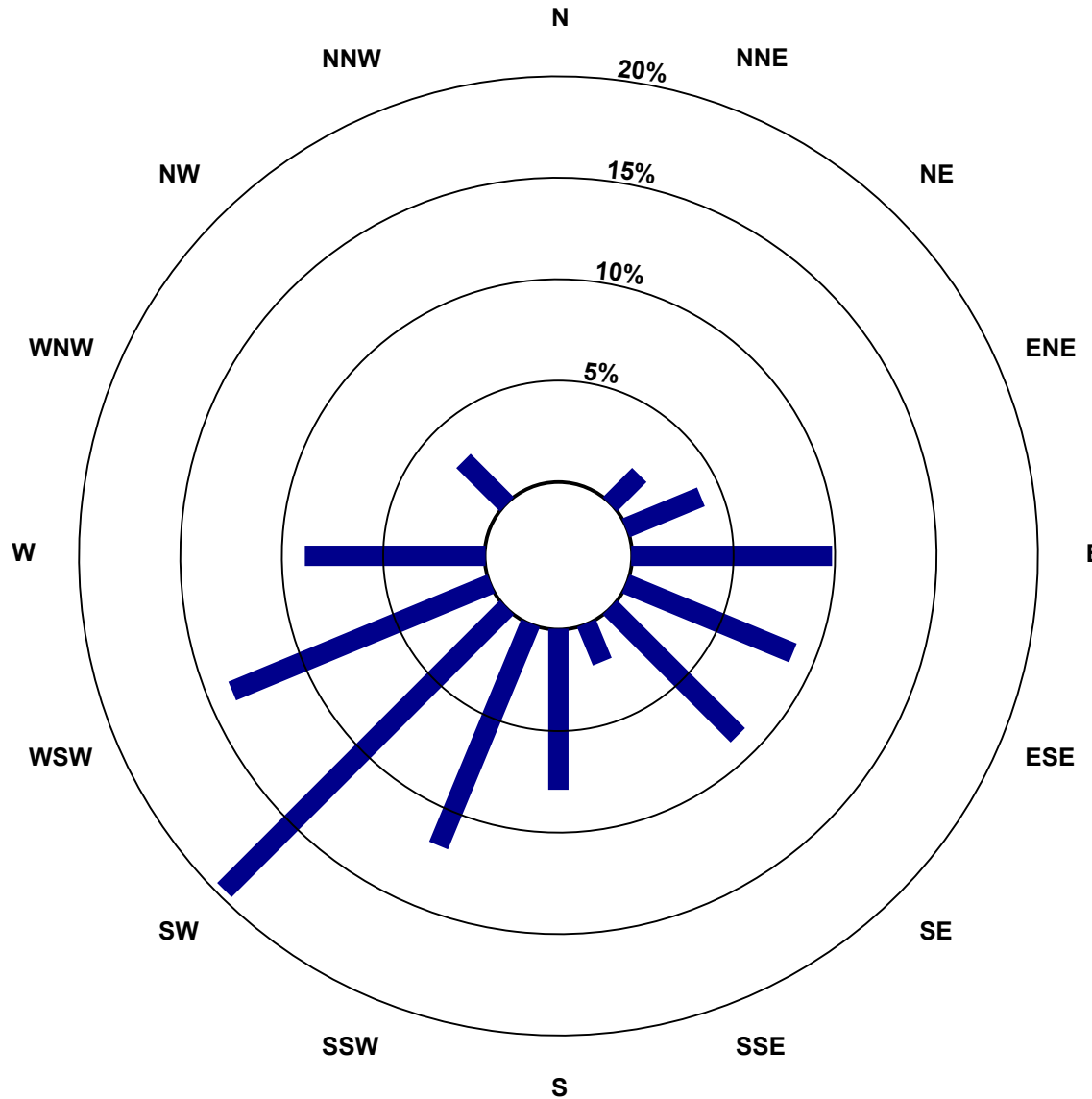
Total Number of Hours: 720



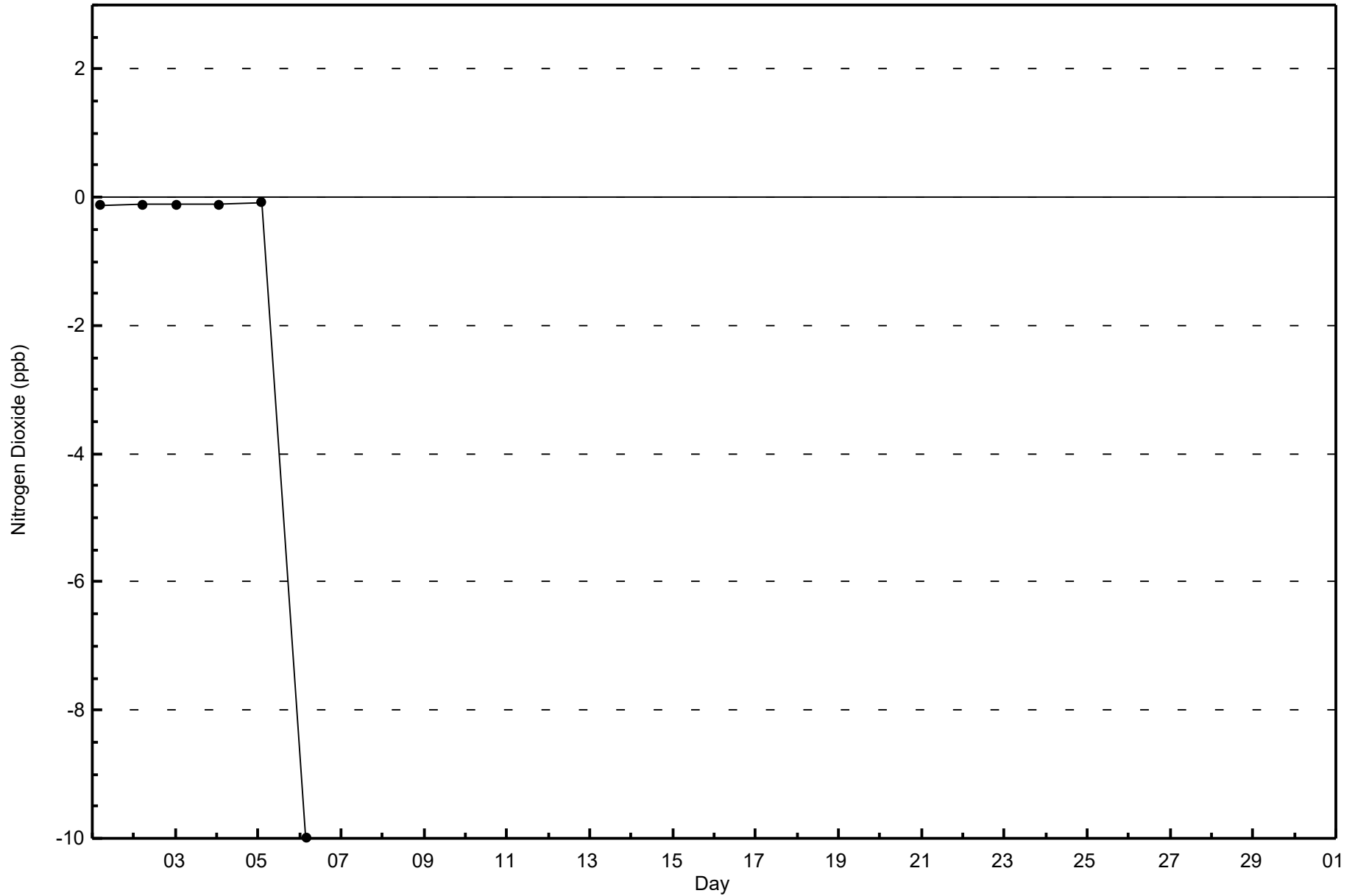


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Christina Lake



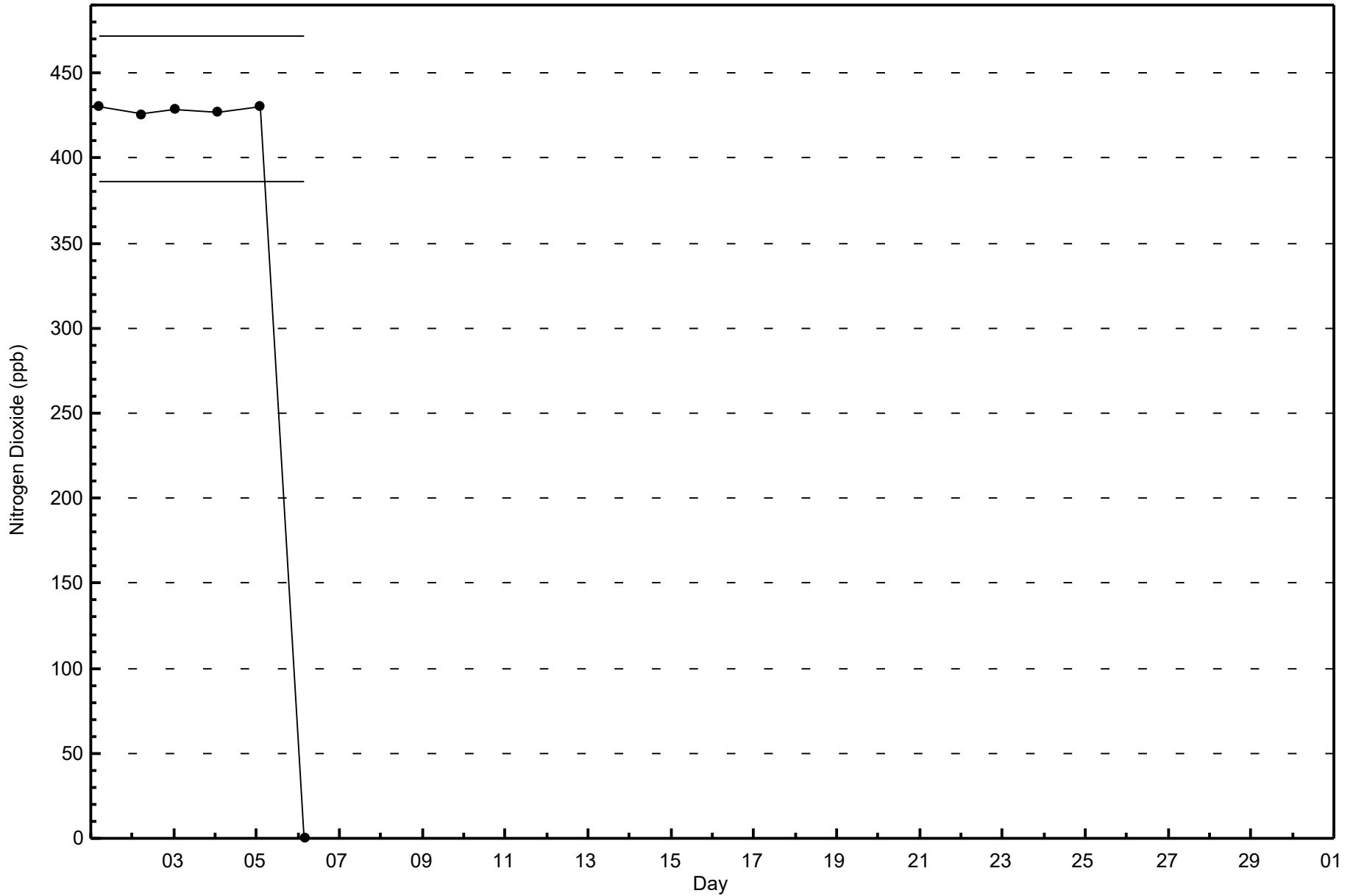
Total Number of Valid Hours: 102





**Wood Buffalo Environmental Association**  
**Span Responses**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Christina Lake - November 2024**





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

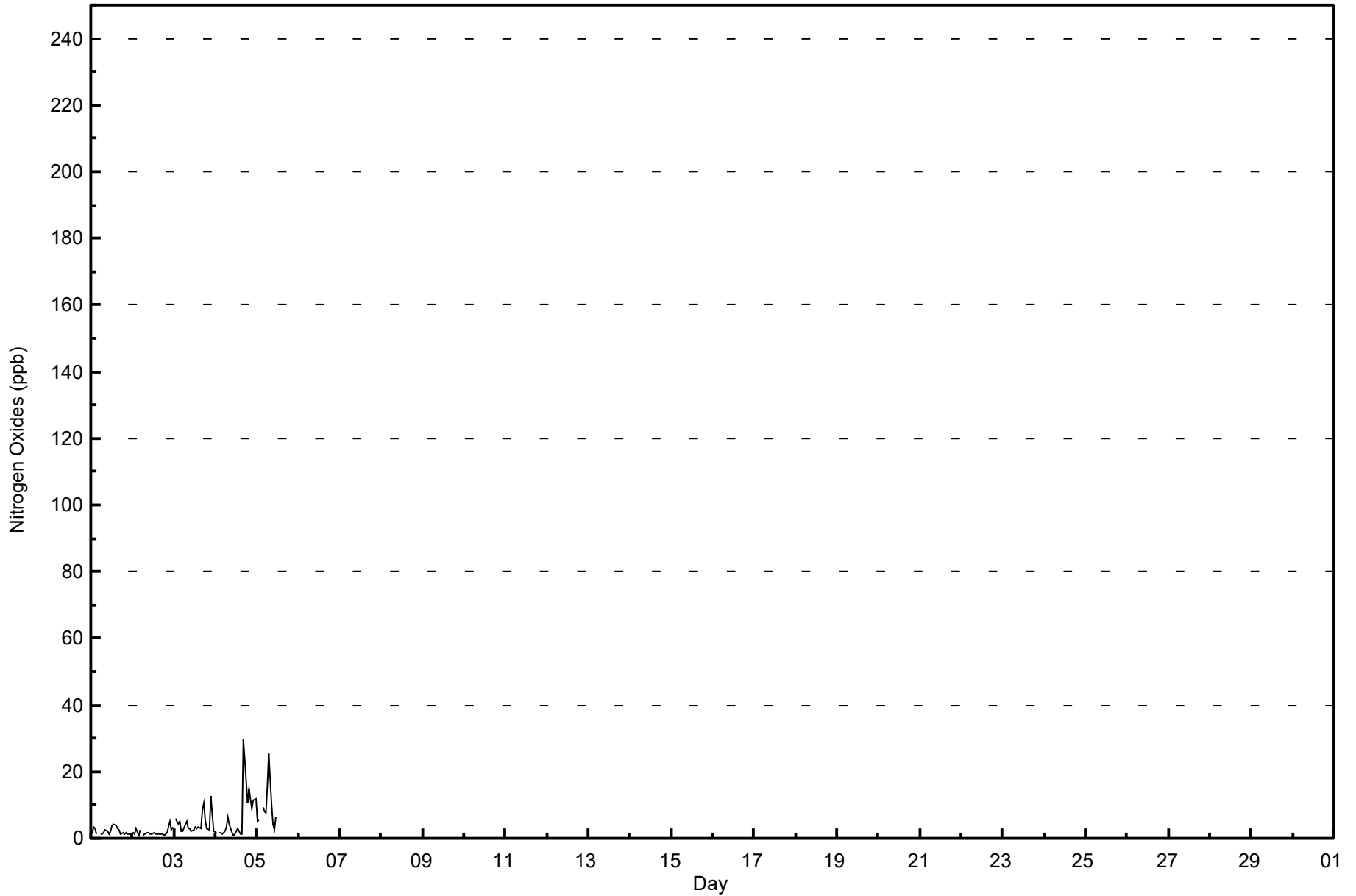
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Christina Lake - November 2024**

Maximum Value: 29.6 ppb on Nov 4 17:00 Minimum Value: 0.7 ppb on Nov 2 07:00 Maximum Diurnal Average: 10.5 ppb at hour 17 Monthly Average: 4.37 ppb		Maximum Daily Average: 6.8 ppb on Nov 4 Minimum Daily Average: 1.7 ppb on Nov 2 Minimum Diurnal Average: 1.7 ppb at hour 11 Percentiles: P <sub>1</sub> = 1.0 P <sub>10</sub> = 1.2 Q <sub>1</sub> = 1.5 Median = 2.6 Q <sub>3</sub> = 5.0 P <sub>90</sub> = 10.4 P <sub>99</sub> = 25.4		Hours in Service: 112 Hours of Data: 103 Hours of Missing Data: 9 Hours of Calibration: 9 Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	1.6	3.6	2.8	1.4	Z	1.1	1.1	1.8	2.7	2.2	1.2	2.0	3.7	4.3	3.8	3.1	2.6	1.3	1.6	1.4	1.8	1.3	1.5	1.5	2.1	4.3
2-Nov	1.6	1.2	2.8	1.0	2.4	Z	0.7	1.2	1.6	1.6	1.1	1.2	1.7	1.3	1.2	1.1	1.1	1.2	1.0	1.2	1.7	5.2	2.4	3.6	1.7	5.2
3-Nov	Z	6.1	4.2	5.0	2.2	2.3	4.1	5.2	3.1	2.8	2.3	2.7	3.5	3.0	3.3	3.0	8.6	10.4	5.4	2.8	2.4	12.8	7.0	2.2	4.5	12.8
4-Nov	1.9	Z	1.5	1.9	1.3	2.2	3.2	6.4	4.2	1.8	1.0	1.2	1.9	2.9	1.2	1.5	29.6	23.6	10.6	14.7	11.7	8.7	11.5	11.9	6.8	29.6
5-Nov	4.9	5.6	Z	9.2	8.2	7.8	15.9	25.4	10.3	4.1	2.7	6.4	C	C	C	C	NS	NS	NS	NS	NS	NS	NS	NS	--	25.4
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
8-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
9-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
10-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
11-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
12-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
13-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
14-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
15-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
16-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
17-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
18-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
19-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
20-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
21-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
22-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
23-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
24-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
25-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
26-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
27-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
28-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
29-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
30-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan      C - Calibration      NS - Not in Service																										



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Christina Lake - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Christina Lake - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	100	97.09	97.09
21 - 40	3	2.91	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 103

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Christina Lake - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	0	0	2	4	10	9	9	2	8	10	19	14	9	0	3	0	99
21 - 40	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	3
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	0	0	2	4	10	9	9	2	8	12	20	14	9	0	3	0	102

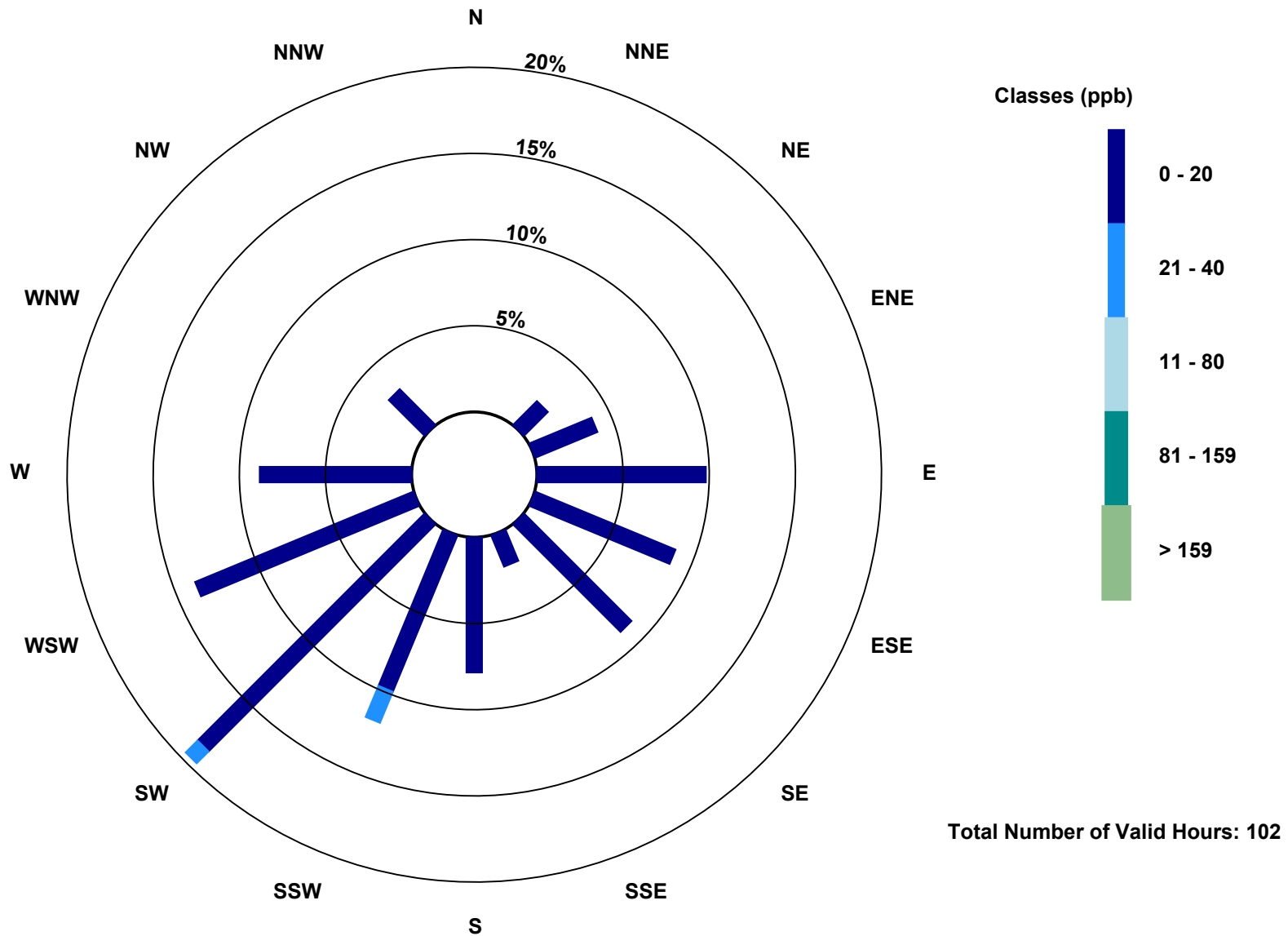
Total Number of Valid Hours: 102

Total Number of Hours: 720

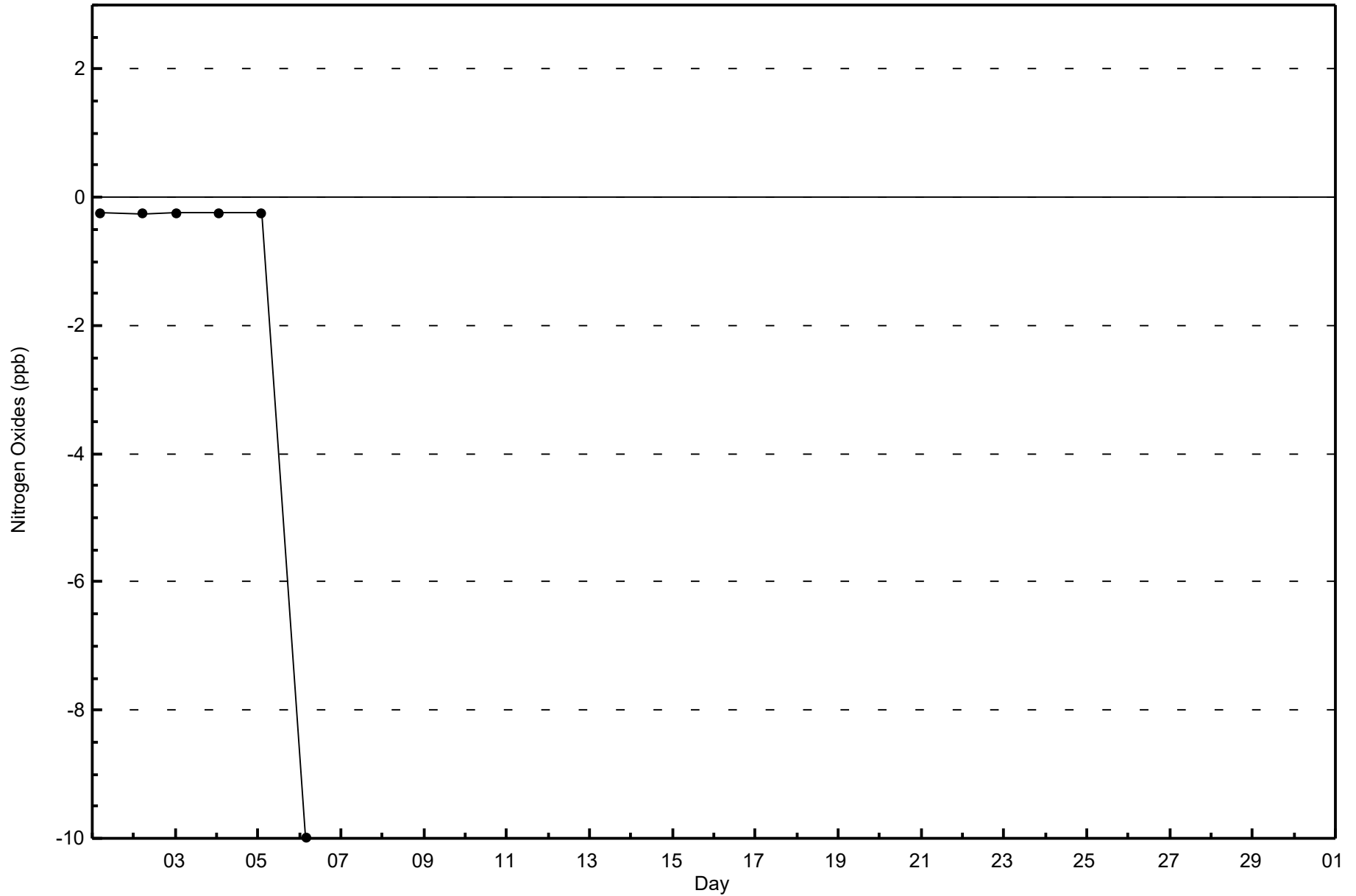


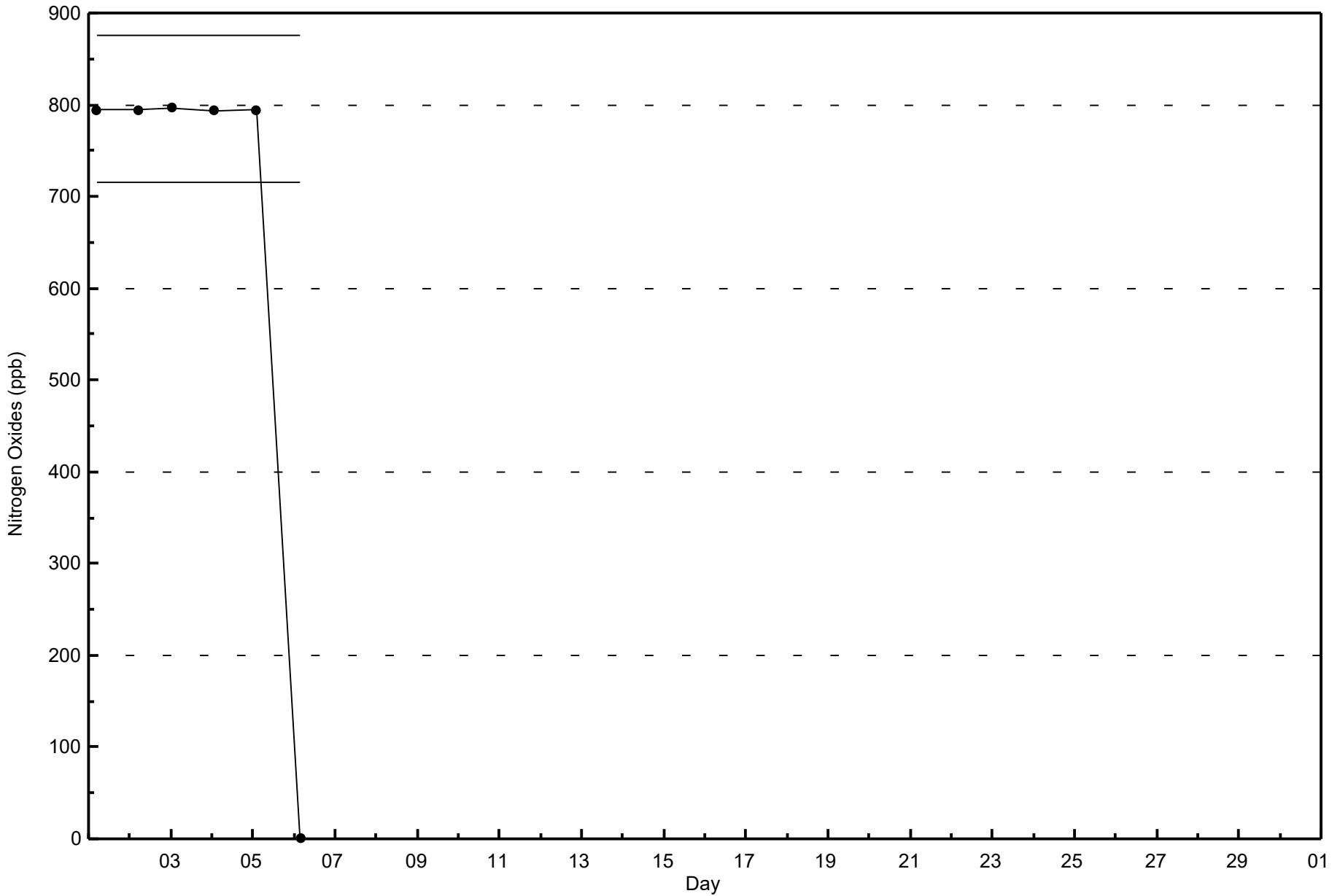
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Christina Lake











**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

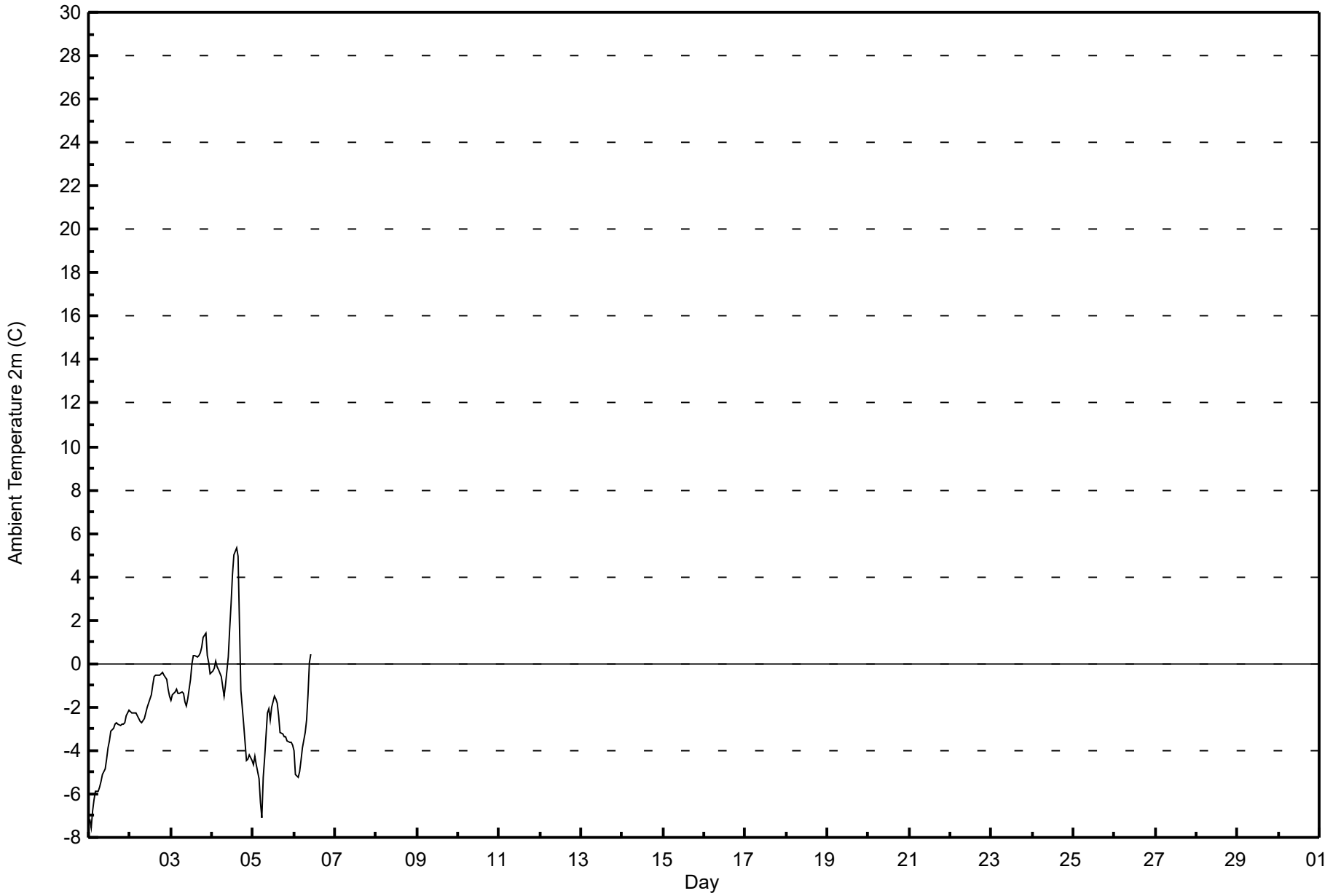
**Ambient Temperature 2m (AT2) - C**  
**Christina Lake - November 2024**

Maximum Value: 5.3 C on Nov 4 15:00		Maximum Daily Average: -0.2 C on Nov 4		Hours in Service: 131																						
Minimum Value: -7.5 C on Nov 1 02:00		Minimum Daily Average: -4.3 C on Nov 1		Hours of Data: 131																						
Maximum Diurnal Average: 0.1 C at hour 15		Minimum Diurnal Average: -3.6 C at hour 6		Hours of Missing Data: 0																						
Monthly Average: -2.11 C		Percentiles: P <sub>1</sub> = -7.2 P <sub>10</sub> = -5.1 Q <sub>1</sub> = -3.6 Median = -2.2 Q <sub>3</sub> = -0.6 P <sub>90</sub> = 0.4 P <sub>99</sub> = 5.0		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	-7.2	-7.5	-6.8	-6.3	-5.9	-5.9	-5.7	-5.4	-5.1	-4.9	-4.4	-3.9	-3.5	-3.1	-3.0	-2.8	-2.7	-2.8	-2.8	-2.8	-2.8	-2.7	-2.4	-2.1	-4.3	-2.1
2-Nov	-2.2	-2.3	-2.3	-2.3	-2.4	-2.5	-2.7	-2.7	-2.5	-2.3	-2.0	-1.8	-1.4	-1.0	-0.6	-0.5	-0.5	-0.5	-0.5	-0.4	-0.5	-0.7	-1.2	-1.5	-1.6	-0.4
3-Nov	-1.7	-1.4	-1.3	-1.2	-1.3	-1.4	-1.3	-1.4	-1.8	-2.0	-1.6	-0.7	0.0	0.4	0.4	0.3	0.4	0.5	0.8	1.2	1.4	0.3	0.1	-0.4	-0.5	1.4
4-Nov	-0.3	-0.2	0.1	-0.1	-0.3	-0.6	-1.0	-1.5	-1.0	0.3	1.6	2.8	4.1	5.0	5.3	5.0	1.8	-1.3	-2.8	-3.6	-4.5	-4.4	-4.2	-4.5	-0.2	5.3
5-Nov	-4.7	-4.3	-4.6	-5.3	-6.4	-7.1	-5.2	-4.3	-2.3	-2.1	-2.6	-2.0	-1.5	-1.6	-1.8	-2.4	-3.2	-3.2	-3.4	-3.4	-3.5	-3.6	-3.6	-3.8	-3.6	-1.5
6-Nov	-4.0	-5.1	-5.2	-5.0	-4.5	-3.9	-3.2	-2.6	-1.4	0.0	0.5	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	0.5
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
8-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
9-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
10-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
11-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
12-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
13-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
14-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
15-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
16-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
17-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
18-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
19-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
20-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
21-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
22-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
23-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
24-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
25-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
26-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
27-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
28-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
29-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
30-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
																								Diurnal Average		
																								Diurnal Maximum		
-3.3 -3.5 -3.3 -3.4 -3.5 -3.6 -3.2 -3.0 -2.3 -1.8 -1.4 -1.1 -0.5 -0.1 0.1 -0.1 -0.8 -1.5 -1.7 -1.8 -2.0 -2.2 -2.3 -2.4																										
-0.3 -0.2 0.1 -0.1 -0.3 -0.6 -1.0 -1.4 -1.0 0.3 1.6 2.8 4.1 5.0 5.3 5.0 1.8 0.5 0.8 1.2 1.4 0.3 0.1 -0.4																										
NS - Not in Service																										



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 2m (AT2) - C**  
**Christina Lake - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Christina Lake - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	0	0.00	0.00
-20 - 0	110	83.97	83.97
0 - 10	21	16.03	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 131

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

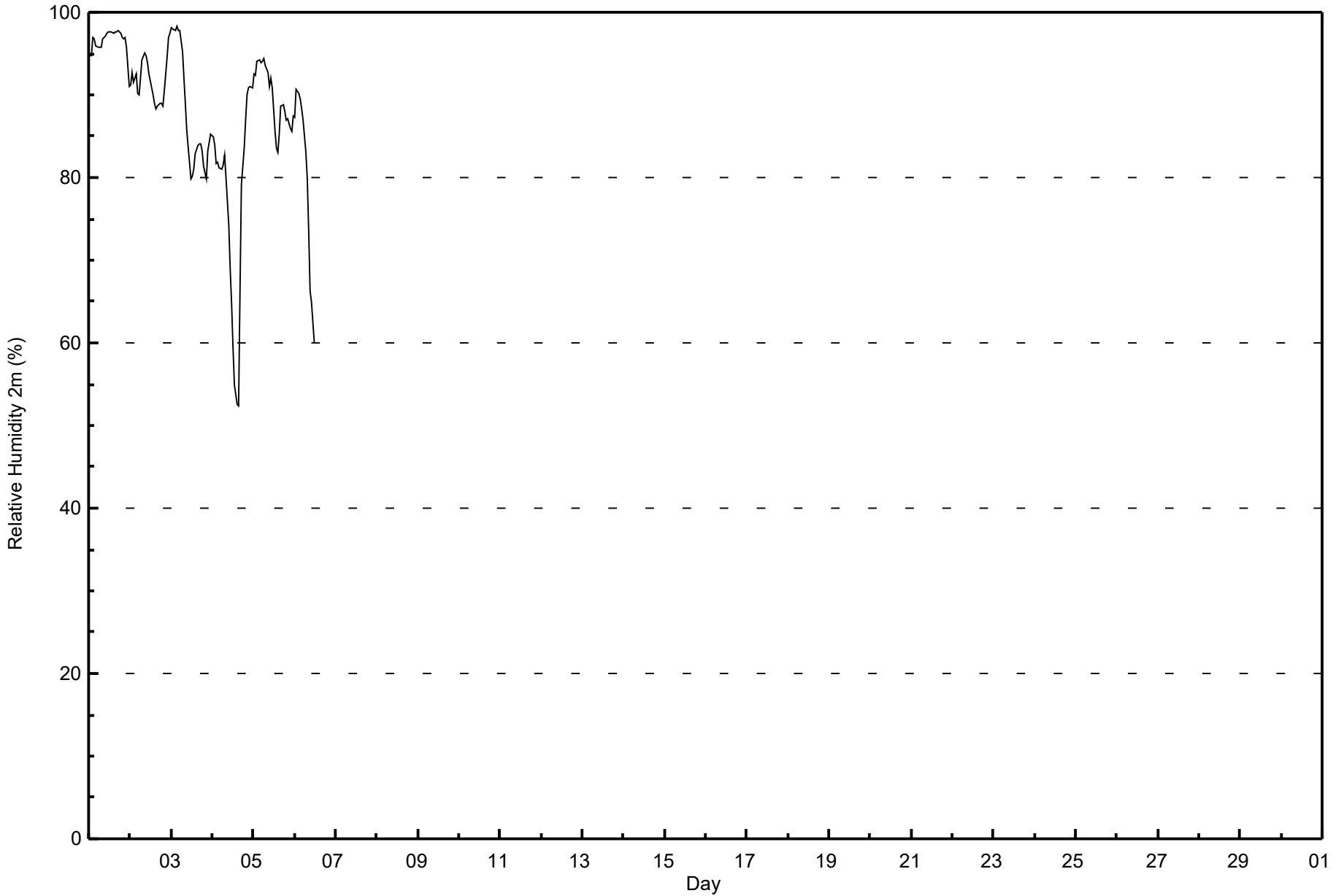
**Relative Humidity 2m (RH2) - %**  
**Christina Lake - November 2024**

Maximum Value: 98.3 % on Nov 3 04:00      Maximum Daily Average: 96.5 % on Nov 1																						Hours in Service: 132 Hours of Data: 132				
Minimum Value: 52.4 % on Nov 4 16:00      Minimum Daily Average: 76.8 % on Nov 4 Maximum Diurnal Average: 92.2 % at hour 4      Minimum Diurnal Average: 80.9 % at hour 12 Monthly Average: 87.75 %      Percentiles: P <sub>1</sub> = 53.2 P <sub>10</sub> = 79.8 Q <sub>1</sub> = 83.6 Median = 90.0 Q <sub>3</sub> = 94.7 P <sub>90</sub> = 97.5 P <sub>99</sub> = 98.1																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	94.8	94.7	96.9	96.9	95.9	95.8	95.7	95.8	96.8	97.1	97.4	97.6	97.7	97.5	97.6	97.6	97.7	97.5	96.9	96.8	97.0	95.7	91.1	96.5	97.7	
2-Nov	91.2	92.8	91.5	92.5	90.1	90.0	92.1	94.2	95.1	94.7	93.9	92.5	90.8	90.0	89.0	88.4	88.6	88.9	89.0	88.6	90.6	94.5	96.9	97.4	91.8	97.4
3-Nov	98.1	97.9	97.8	98.3	97.7	97.8	95.2	92.1	89.0	85.8	83.7	79.8	80.2	81.1	82.9	83.9	84.2	84.1	83.2	81.3	79.8	83.3	84.2	85.2	87.8	98.3
4-Nov	84.8	83.9	81.7	81.8	81.2	81.1	81.5	82.7	80.0	74.3	68.9	64.7	59.5	54.9	52.5	52.4	66.2	79.1	83.6	86.9	89.9	90.8	91.1	90.9	76.8	91.1
5-Nov	92.5	92.3	94.0	94.2	93.9	94.0	94.4	93.5	92.8	91.1	92.0	90.9	85.6	83.5	83.1	85.3	88.7	88.8	88.1	86.9	87.2	86.0	85.6	87.4	89.7	94.4
6-Nov	87.3	90.7	90.3	89.5	88.3	87.0	83.1	79.8	73.6	66.2	65.0	60.1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	90.7
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
8-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
9-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
10-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
11-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
12-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
13-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
14-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
15-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
16-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
17-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
18-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
19-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
20-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
21-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
22-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
23-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
24-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
25-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
26-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
27-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
28-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
29-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
30-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
91.5 92.1 92.0 92.2 91.2 90.9 90.3 89.7 87.9 84.9 83.5 80.9 82.7 81.4 81.0 81.5 85.1 87.7 88.3 88.1 88.9 90.3 90.7 90.4																						Diurnal Average				
98.1 97.9 97.8 98.3 97.7 97.8 95.7 95.8 96.8 97.1 97.4 97.6 97.6 97.7 97.5 97.6 97.6 97.7 97.5 96.9 96.8 97.0 96.9 97.4																						Diurnal Maximum				
NS - Not in Service																										



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 2m (RH2) - %**  
**Christina Lake - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 2m (RH2) - %**  
**Christina Lake - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	4	3.03	3.03
60 - 80	13	9.85	12.88
80 - 100	115	87.12	100.00

Total Number of Valid Hours: 132

Total Number of Hours: 720





# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Wind Speed 10m (WS10) - km/h

## Christina Lake - November 2024

Maximum Speed: 17 km/h on Nov 5 13:00	Maximum Daily Speed Average: 8.8 km/h on Nov 3	Hours in Service: 111
Minimum Speed Value: 0 km/h on Nov 2 21:00	Minimum Daily Speed Average: 3.1 km/h on Nov 1	Hours of Data: 108
Maximum Diurnal Speed Average: 5.2 km/h at hour 22	Minimum Diurnal Speed Average: 2.2 km/h at hour 20	Hours of Missing Data: 3
Monthly Average Velocity: 3.5 km/h 214.3 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 3 Q <sub>1</sub> = 4 Median = 7 Q <sub>3</sub> = 11 P <sub>90</sub> = 12 P <sub>99</sub> = 16	Percent Operational Time: 99.1

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	ENE5	S3	WSW4	NE1	ENE4	ENE5	SE4	E3	ESE3	SSE4	E4	E6	E5	ENE4	ESE4	ESE4	ESE5	ESE7	ESE7	ESE4	ESE3	S4	SSW5	SSW5	ESE3.1	ESE7
2-Nov	SSW5	S5	S7	S6	SSE6	SE5	SE8	SE9	ESE6	SE12	SE12	SE11	SE11	SE10	E12	E12	E10	E9	E7	NE7	S0	W2	E5	E5	ESE6.1	E12
3-Nov	ESE3	UO	S1	W3	W8	W10	W10	W10	W11	W12	WSW10	WSW10	SW11	SW11	SSW10	SSW9	SSW9	SW12	SW11	SW12	SW13	SW13	SW12	WSW10	WSW8.8	SW13
4-Nov	SW11	WSW11	SW13	SW14	SW13	WSW11	WSW10	SW9	SW9	WSW13	WSW12	WSW11	WSW10	WSW10	WSW11	WSW9	SSW6	SSW6	SE2	SSW3	SSW3	SSW4	SW3	SW3	SW8.4	SW14
5-Nov	SSW2	S2	S4	SW4	SW3	SW4	WSW4	SW6	W8	NW16	NW16	NW12	NW17	C	C	NS	NS	NS	NS	NS	NS	NS	NS	---	NW17	
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
8-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
9-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
10-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
11-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
12-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
13-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
14-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
15-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
16-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
17-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
18-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
19-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
20-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
21-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
22-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
23-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
24-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
25-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
26-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
27-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
28-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
29-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	
30-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---	

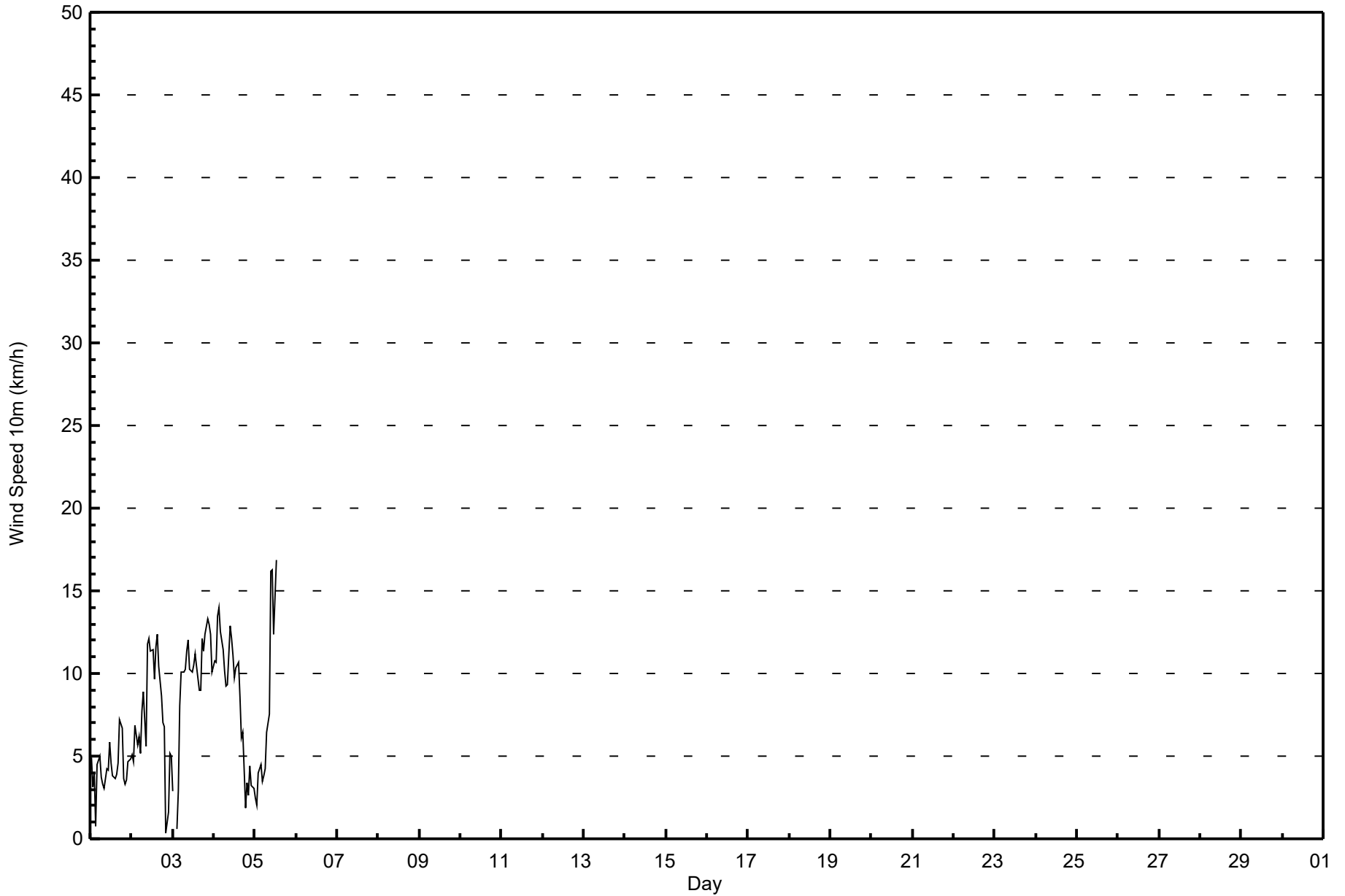
SSW2.7	SSW4.3	SW5.1	SW4.8	SW4.2	SW3.7	SW4.0	SW4.0	WSW4.1	WSW4.9	WSW3.8	WSW2.5	WSW3.9	SSW4.7	S4.1	SSE3.8	SSE4.1	SSE4.3	SE3.5	S2.2	SSW3.9	SW5.2	SW3.9	SSW3.7	Diurnal Average
SW11	WSW11	SW13	SW14	SW13	WSW11	WSW10	W10	W11	NW16	NW16	NW12	NW17	SW11	E12	E12	E10	SW12	SW11	SW12	SW13	SW13	SW12	WSW10	Diurnal Maximum

C - Calibration      UO - Unstable Operation      NS - Not in Service  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 10m (WS10) - km/h**  
**Christina Lake - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Christina Lake - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	44	40.74	40.74
6 - 11	45	41.67	82.41
12 - 19	19	17.59	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 108

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Christina Lake - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	0	0	1	5	4	7	3	1	7	7	5	2	2	0	0	0	44
6 - 11	0	0	1	0	4	3	5	1	2	5	7	11	6	0	0	0	45
12 - 19	0	0	0	0	2	0	2	0	0	0	8	2	1	0	4	0	19
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	0	0	2	5	10	10	10	2	9	12	20	15	9	0	4	0	108

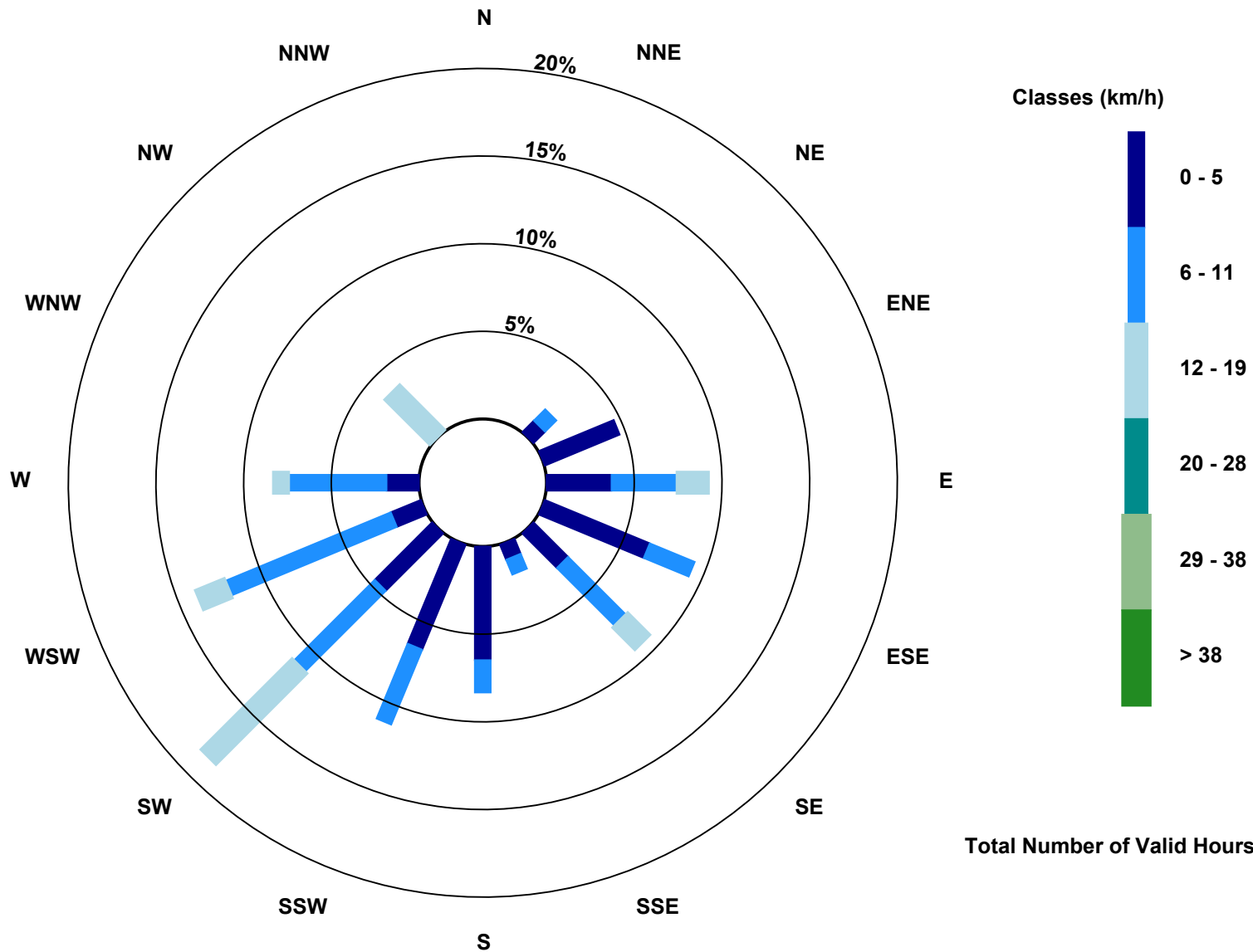
Total Number of Valid Hours: 108

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Christina Lake



Total Number of Valid Hours: 108



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Christina Lake - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 111
Maximum Value: 5 km/h on Nov 5 10:00	Hours of Data: 108
Minimum Value: 1 km/h on Nov 3 01:00	Hours of Missing Data: 3
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 3 P <sub>99</sub> = 4	Hours of Calibration: 2
	Percent Operational Time: 99.1

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	2	3	1	1	1	1	1	3
2-Nov	1	1	2	1	1	1	2	2	2	3	3	2	3	2	3	3	3	1	1	1	2	2	1	1	3
3-Nov	1	UO	1	3	2	3	3	3	3	3	2	2	3	2	3	2	2	3	2	2	2	2	2	2	3
4-Nov	2	3	2	2	2	2	2	2	2	3	3	3	3	3	3	2	1	2	1	1	2	2	2	1	3
5-Nov	1	1	1	1	1	1	2	2	4	5	3	3	4	C	C	NS	NS	NS	NS	NS	NS	NS	NS	5	
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
8-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
9-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
10-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
11-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
12-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
13-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
14-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
15-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
16-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
17-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
18-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
19-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
20-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
21-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
22-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
23-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
24-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
25-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
26-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
27-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
28-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
29-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	
30-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	

2	3	2	3	2	3	3	3	3	4	5	3	3	4	3	3	3	3	3	3	3	2	2	2	2	2
Diurnal Maximum																									

C - Calibration      UO - Unstable Operation      NS - Not in Service



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Christina Lake - November 2024**

Direction of Maximum Speed: 309 deg on Nov 5 13:00	Hours in Service: 111
Direction of Maximum Daily Speed Average: 237.3 deg on Nov 3	Hours of Data: 108
Direction of Minimum Speed: 172 deg on Nov 2 21:00	Direction of Minimum Daily Speed Average: 3.1 deg on Nov 1
Direction of Minimum Speed: 172 deg on Nov 2 21:00	Hours of Missing Data: 3
Monthly Average Direction: 214.3 deg	Percent Operational Time: 99.1

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	73	172	244	37	60	74	139	95	112	152	100	92	101	72	114	115	116	109	105	108	123	178	200	199	115.9
2-Nov	196	182	179	184	166	141	132	137	117	125	134	124	134	130	93	91	88	81	80	48	172	263	79	98	120.9
3-Nov	108	UO	189	261	261	264	273	278	269	264	246	241	233	227	208	206	212	214	214	224	230	228	236	239	237.3
4-Nov	233	244	236	233	236	245	249	235	229	242	249	247	248	241	240	240	205	211	141	193	193	194	234	227	235.4
5-Nov	208	188	191	218	231	221	238	229	274	313	320	323	309	C	C	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
8-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
9-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
10-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
11-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
12-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
13-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
14-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
15-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
16-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
17-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
18-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
19-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
20-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
21-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
22-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
23-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
24-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
25-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
26-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
27-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
28-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
29-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
30-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
	196.2	213.3	217.2	223.9	227.8	232.3	228.4	221.3	242.3	253.8	254.1	242.2	245.4	199.3	177.8	162.2	154.3	162.2	144.5	185.4	210.6	215.9	217.6	210.6	

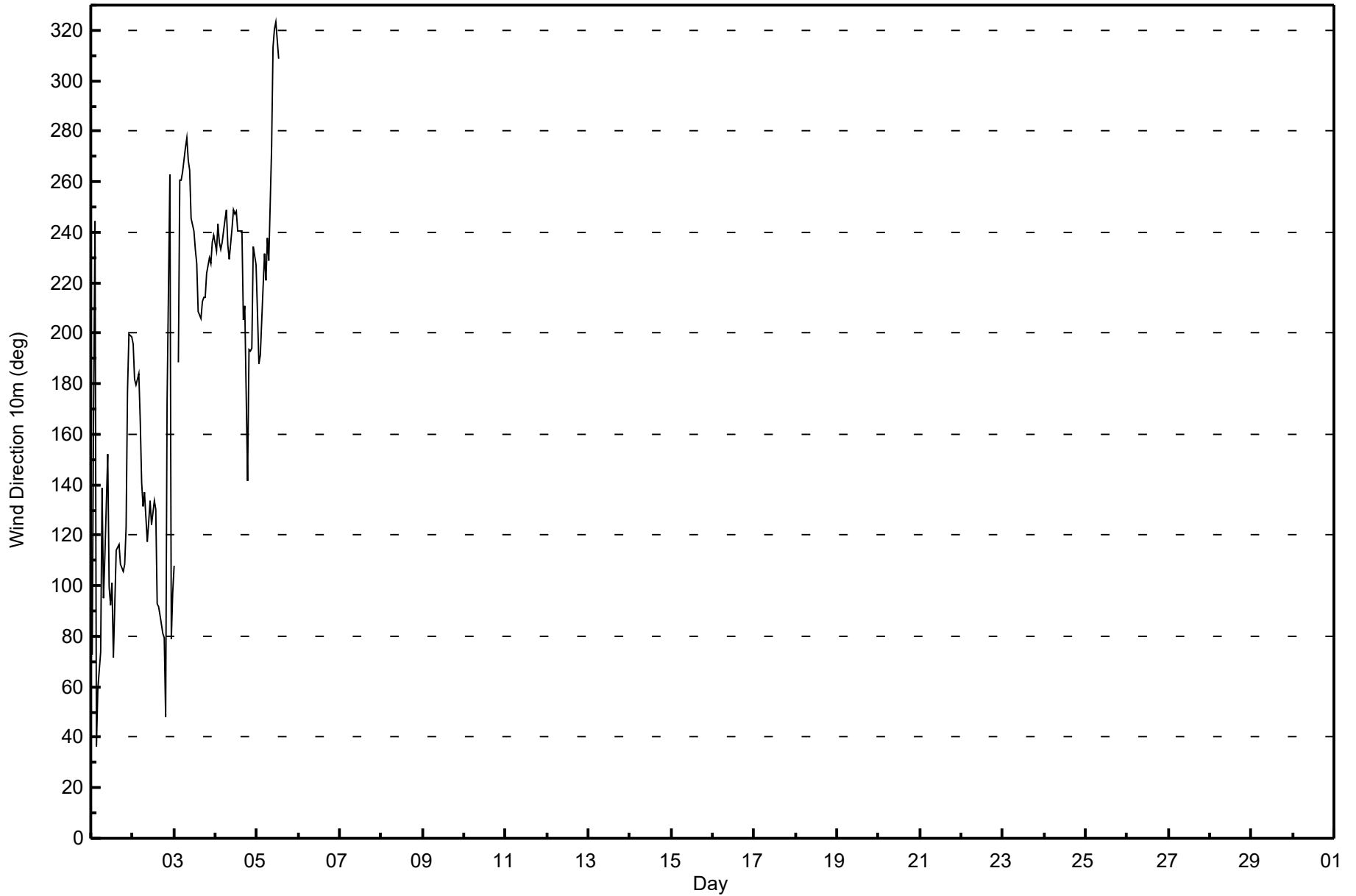
Diurnal Average

C - Calibration      UO - Unstable Operation      NS - Not in Service  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Direction 10m (WD10) - deg**  
**Christina Lake - November 2024**







**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Christina Lake - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 111
Maximum Value: 83 deg on Nov 1 04:00	Hours of Data: 108
Minimum Value: 5 deg on Nov 3 00:00	Hours of Missing Data: 3
Percentiles: P <sub>1</sub> = 9 P <sub>10</sub> = 11 Q <sub>1</sub> = 14 Median = 18 Q <sub>3</sub> = 26 P <sub>90</sub> = 37 P <sub>99</sub> = 82	Hours of Calibration: 2
	Percent Operational Time: 99.1

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	14	27	24	83	32	26	26	32	43	20	23	16	20	27	28	21	27	11	33	31	36	17	18	16	83
2-Nov	30	12	10	10	16	28	19	22	20	14	14	14	15	18	17	14	13	11	10	15	83	64	12	5	83
3-Nov	40	UO	53	79	18	18	22	23	20	18	17	17	16	18	17	17	16	12	12	11	10	9	11	12	79
4-Nov	12	15	10	9	9	13	14	11	10	14	15	16	19	18	18	25	35	38	21	51	20	22	25	51	
5-Nov	20	39	16	28	28	26	32	16	42	17	13	17	18	C	C	NS	NS	NS	NS	NS	NS	NS	NS	42	
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
8-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
9-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
10-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
11-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
12-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
13-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
14-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
15-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
16-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
17-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
18-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
19-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
20-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
21-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
22-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
23-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
24-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
25-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
26-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
27-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
28-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
29-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
30-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--

40	39	53	83	32	28	32	32	32	43	20	23	17	20	27	28	21	27	35	38	31	83	64	22	25
Diurnal Maximum																								

C - Calibration      UO - Unstable Operation      NS - Not in Service



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS27 JACKFISH 2/3 NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)  
 NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	683	34	37	99.58	13.3	0	5.1	0
H2S (ppb) Average	675	39	45	99.17	1.9	0	0.4	0
NO2 (ppb) Average	681	36	39	99.58	14.9	0	3.6	-
NO (ppb) Average	681	36	39	99.58	2.2	-	0.5	-
NOX (ppb) Average	681	36	39	99.58	14.9	-	3.9	-
Temperature 2 m (C) Average	717	0	3	99.58	9.2	-	5.9	-
Relative Humidity (%) Average	717	0	3	99.58	97.8	-	95	-
Wind Speed 10 m (km/h) Average	710	0	10	98.61	21	-	12	-
Wind Direction 10 m (deg) Average	710	0	10	98.61	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)  
 NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	683	0.72	1.5	-	0	0	0.1	0.2	0.6	1.9	13.3
H2S (ppb) Average	675	0.18	0.2	-	0	0	0	0.1	0.3	0.4	1.9
NO2 (ppb) Average	681	1.69	1.4	-	0	0.5	0.7	1.3	2.3	3.3	14.9
NO (ppb) Average	681	0.14	0.3	-	0	0	0	0	0.2	0.4	2.2
NOX (ppb) Average	681	1.83	1.6	-	0	0.5	0.8	1.4	2.4	3.8	14.9
Temperature 2 m (C) Average	717	-7.6	8.6	-	-23.8	-19.1	-16	-4.6	-1.7	3	9.2
Relative Humidity (%) Average	717	82.39	9.7	-	46.7	67.4	79	83.8	88.5	94.2	97.8
Wind Speed 10 m (km/h) Average	710	6.3	3	-	0	3	4	6	8	10	21
Wind Direction 10 m (deg) Average	710	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	14 Nov 2024 09:00	14 Nov 2024 09:00	1	DAS Failure - data not recorded
ALL PARAMETERS	15 Nov 2024 18:00	15 Nov 2024 18:00	1	DAS Failure - data not recorded
ALL PARAMETERS	16 Nov 2024 23:00	16 Nov 2024 23:00	1	Maintenance - station logger/modem reset
H2S	19 Nov 2024 21:00	19 Nov 2024 23:00	3	Stabilization after routine calibration
Wind Speed, Wind Direction	01 Nov 2024 01:00	01 Nov 2024 04:00	4	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	01 Nov 2024 07:00	01 Nov 2024 07:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	03 Nov 2024 02:00	03 Nov 2024 02:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	04 Nov 2024 23:00	04 Nov 2024 23:00	1	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb

Jackfish 2/3 - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 13.3 ppb on Nov 27 06:00	Maximum Daily Average: 5.1 ppb on Nov 27		Hours of Data:	683
Minimum Value: 0.0 ppb on Nov 2 02:00	Minimum Daily Average: 0.0 ppb on Nov 2		Hours of Missing Data:	37
Maximum Diurnal Average: 1.5 ppb at hour 23	Minimum Diurnal Average: 0.2 ppb at hour 17		Hours of Calibration:	34
Monthly Average: 0.72 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.1 Median = 0.2 Q <sub>3</sub> = 0.6 P <sub>90</sub> = 1.9 P <sub>99</sub> = 8.2		Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.1	0.1	0.4	0.6	0.5	Z	0.4	0.3	0.1	0.5	0.6	0.7	0.7	0.8	0.7	0.5	0.3	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.4	0.8
2-Nov	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
3-Nov	0.0	Z	0.0	0.0	0.4	1.1	1.2	2.3	0.5	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	2.3
4-Nov	0.3	0.3	Z	0.2	0.2	0.1	0.0	0.1	0.3	0.4	0.2	0.0	0.2	0.3	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.4
5-Nov	0.2	0.2	0.2	Z	0.0	0.0	0.4	0.3	0.0	3.0	2.2	1.6	0.6	0.1	1.6	1.5	1.0	0.9	0.6	1.2	1.0	0.5	0.6	0.1	0.8	3.0
6-Nov	0.1	0.1	0.1	0.1	Z	0.0	0.1	0.4	1.0	0.6	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.2	0.1	0.2	1.0
7-Nov	0.2	0.1	0.1	8.2	3.5	Z	0.1	5.3	3.2	4.2	2.5	1.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.5	0.5	1.3	8.2
8-Nov	Z	0.9	0.9	0.9	0.2	0.2	0.5	0.6	0.4	0.5	1.6	1.5	1.0	0.7	0.5	0.3	0.2	0.2	0.2	0.2	4.3	3.5	7.3	0.3	1.2	7.3
9-Nov	0.1	Z	1.8	0.0	1.7	1.8	2.0	1.2	0.9	2.1	0.6	0.1	0.0	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.6	2.1
10-Nov	0.2	0.2	Z	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.4	0.4	0.4	0.5	0.5	0.5	0.3	0.2	0.1	0.2	0.4	0.8	0.2	0.2	0.3	0.8
11-Nov	0.1	0.1	0.2	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.2
12-Nov	0.0	0.0	0.0	0.1	Z	0.0	0.3	0.3	0.3	0.4	0.4	C	C	C	C	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.4
13-Nov	0.0	0.0	0.1	0.2	0.2	Z	0.4	0.2	0.1	0.3	0.9	1.8	1.5	1.6	0.5	0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.7	0.5	0.5	1.8
14-Nov	Z	0.7	0.4	0.3	0.2	0.1	0.2	0.1	DF	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.7
15-Nov	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DF	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2
16-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1
17-Nov	0.1	0.2	0.2	Z	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	1.6	M	3.1	0.9	12.9
18-Nov	1.7	3.1	2.2	3.6	Z	0.9	0.5	0.4	0.3	0.2	0.9	1.1	0.6	1.9	0.1	0.1	0.1	0.2	0.3	0.5	0.2	0.7	0.5	0.5	0.9	3.6
19-Nov	0.7	0.7	0.9	1.0	0.5	Z	0.1	0.0	0.0	0.0	0.1	0.7	0.7	0.3	0.4	0.6	0.6	0.2	0.4	1.1	0.2	0.2	0.2	0.3	0.4	1.1
20-Nov	Z	0.2	1.1	0.8	0.6	0.4	0.4	0.4	0.1	0.1	0.1	0.1	0.4	0.4	0.7	0.2	0.1	0.2	0.2	0.2	0.3	0.4	0.5	0.7	0.4	1.1
21-Nov	0.5	Z	0.2	0.3	0.0	0.1	0.1	0.8	0.2	0.3	1.2	1.5	2.0	1.6	1.5	0.3	0.2	0.3	3.1	5.6	5.0	5.2	5.3	3.2	1.7	5.6
22-Nov	3.0	2.6	Z	5.2	5.3	4.8	3.9	0.2	0.1	2.2	5.2	0.2	0.7	0.6	0.4	0.2	0.1	0.2	0.4	1.8	2.0	1.6	0.9	1.0	1.9	5.3
23-Nov	0.7	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.3	0.1	0.0	0.2	0.3	0.1	0.7
24-Nov	0.2	0.1	0.0	0.1	Z	0.2	0.1	0.0	0.0	0.0	0.0	0.3	0.7	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.1	0.1	3.1	0.3	3.1
25-Nov	3.5	2.6	1.9	1.8	1.2	Z	0.4	0.2	0.0	0.0	0.1	0.7	0.8	1.1	0.3	0.1	0.0	0.2	0.2	0.1	0.1	0.0	0.1	0.2	0.7	3.5
26-Nov	Z	0.6	0.6	0.2	0.5	0.1	0.9	0.3	0.3	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.2	0.9	0.2	0.9
27-Nov	7.9	Z	10.8	9.0	9.7	13.3	7.5	0.5	1.1	3.1	10.4	6.8	3.6	1.1	2.3	0.4	0.5	8.1	6.0	1.1	3.3	1.6	8.2	1.1	5.1	13.3
28-Nov	0.5	3.8	Z	3.0	0.9	0.5	1.4	1.9	1.6	2.6	3.5	2.2	2.3	1.9	2.0	1.7	1.9	2.2	1.2	1.2	1.8	2.1	2.2	2.2	1.9	3.8
29-Nov	1.5	0.9	0.5	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.5	1.1	0.9	1.7	1.3	0.6	0.3	0.5	0.2	0.4	0.5	0.4	0.3	0.2	0.6	1.7
30-Nov	0.3	0.3	0.3	0.2	Z	0.2	0.3	0.3	0.4	0.3	0.5	0.5	0.4	0.5	0.4	0.1	0.2	0.2	0.3	0.3	0.6	0.7	0.4	0.2	0.3	0.7

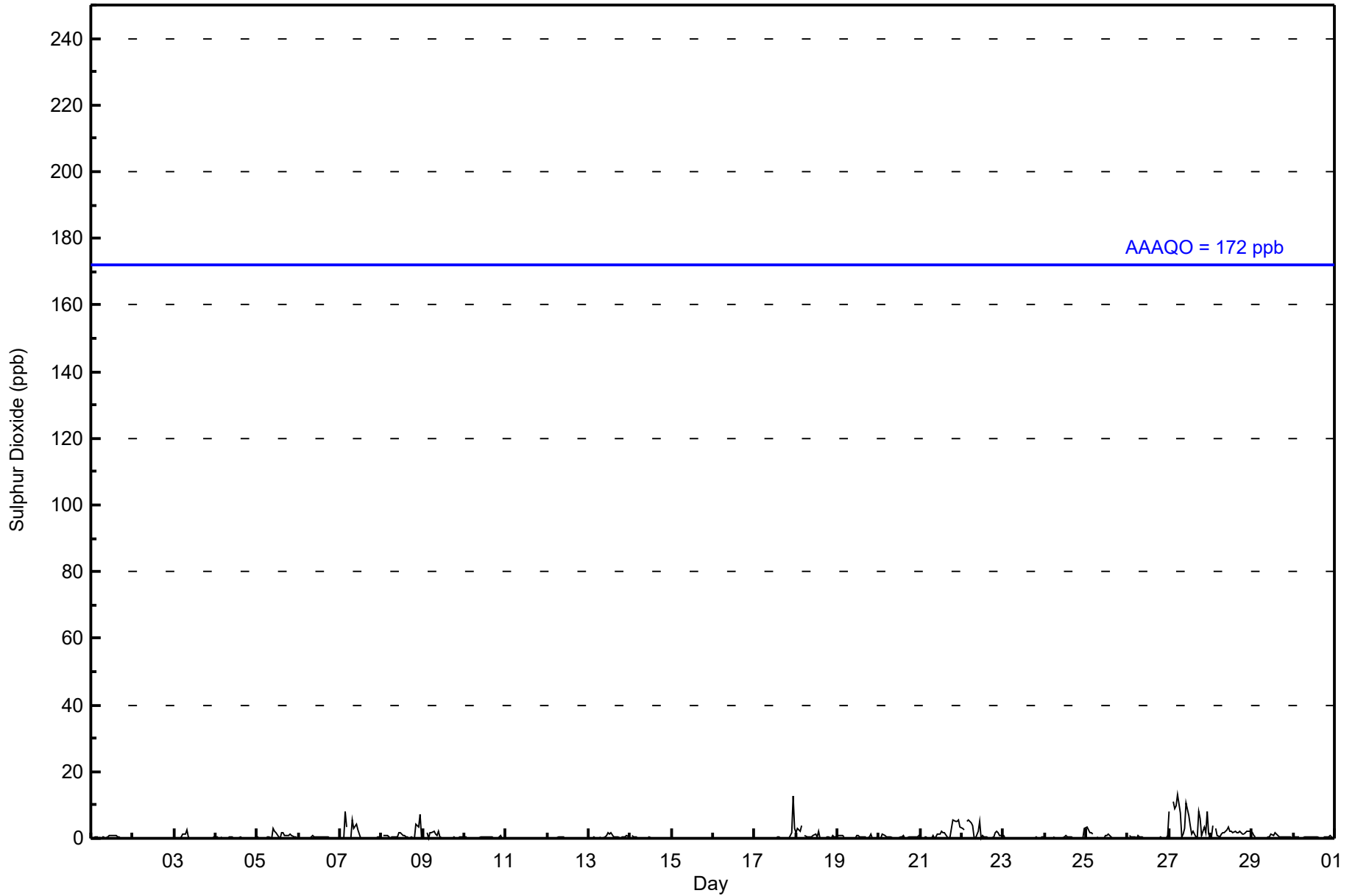
0.9	0.7	0.9	1.4	1.0	1.0	0.7	0.6	0.4	0.7	1.1	0.8	0.6	0.6	0.5	0.3	0.2	0.5	0.5	0.5	0.7	0.7	1.5	0.7	Diurnal Average	
7.9	3.8	10.8	9.0	9.7	13.3	7.5	5.3	3.2	4.2	10.4	6.8	3.6	1.9	2.3	1.7	1.9	8.1	6.0	5.6	5.0	5.2	12.9	3.2	Diurnal Maximum	

Z - zerspan      C - Calibration      M - Maintenance      DF - DAS Failure  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb      24-hr 48 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Jackfish 2/3 - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Jackfish 2/3 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	680	99.56	99.56
11 - 20	3	0.44	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Jackfish 2/3 - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	0	0	2	4	10	10	10	2	9	11	18	15	9	0	4	0	104
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	0	0	2	4	10	10	10	2	9	11	18	15	9	0	4	0	104

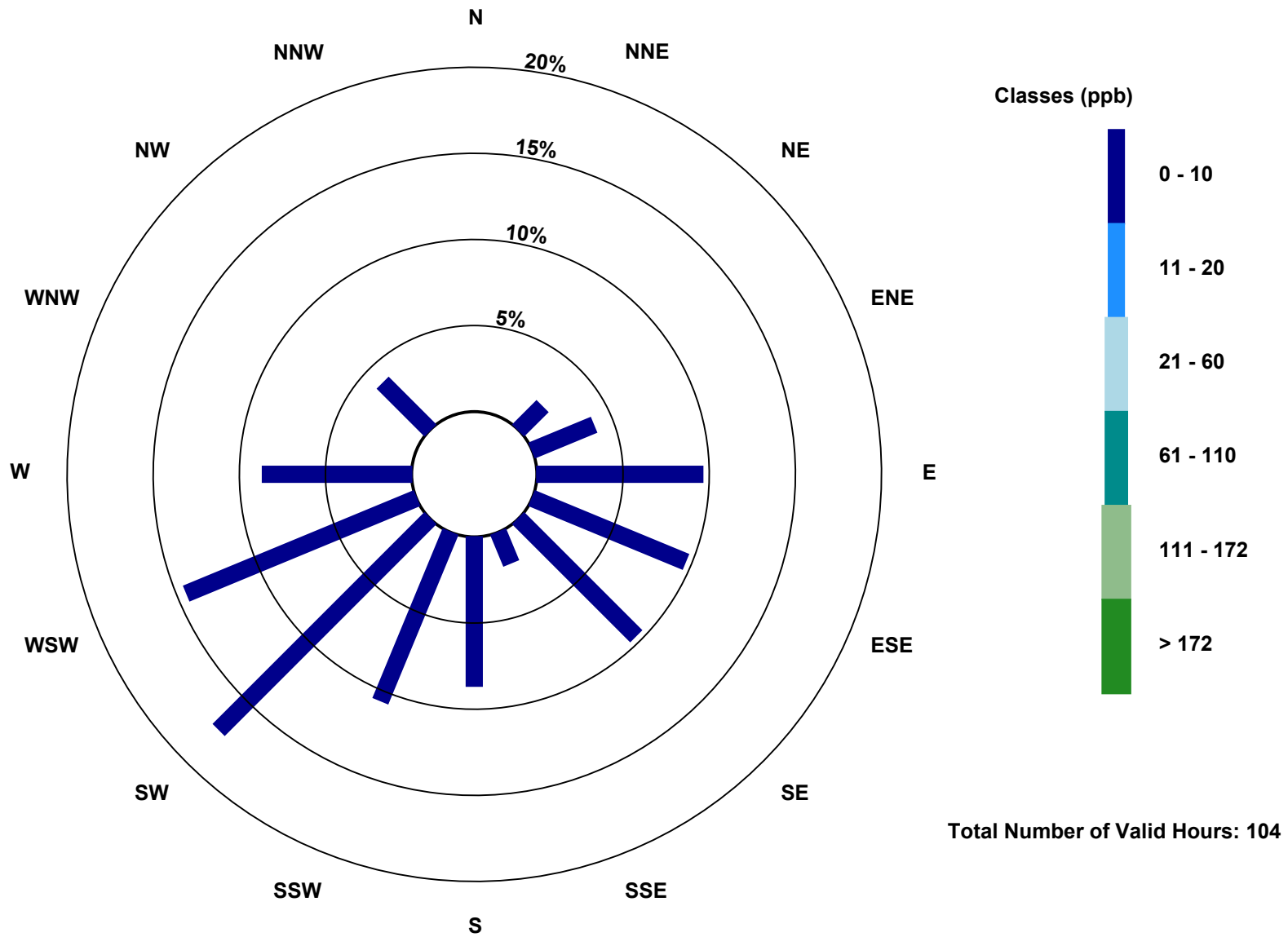
Total Number of Valid Hours: 104

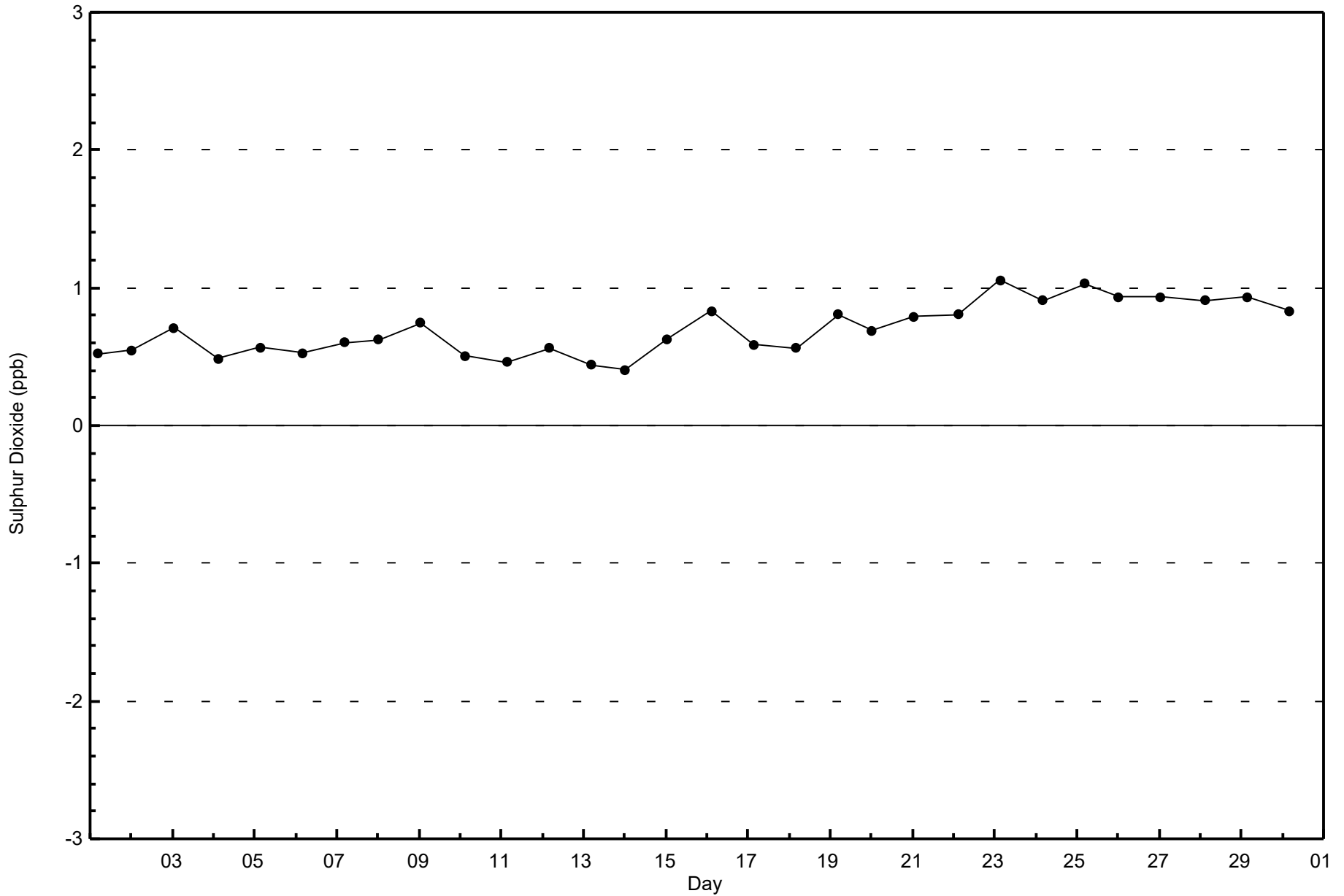
Total Number of Hours: 720

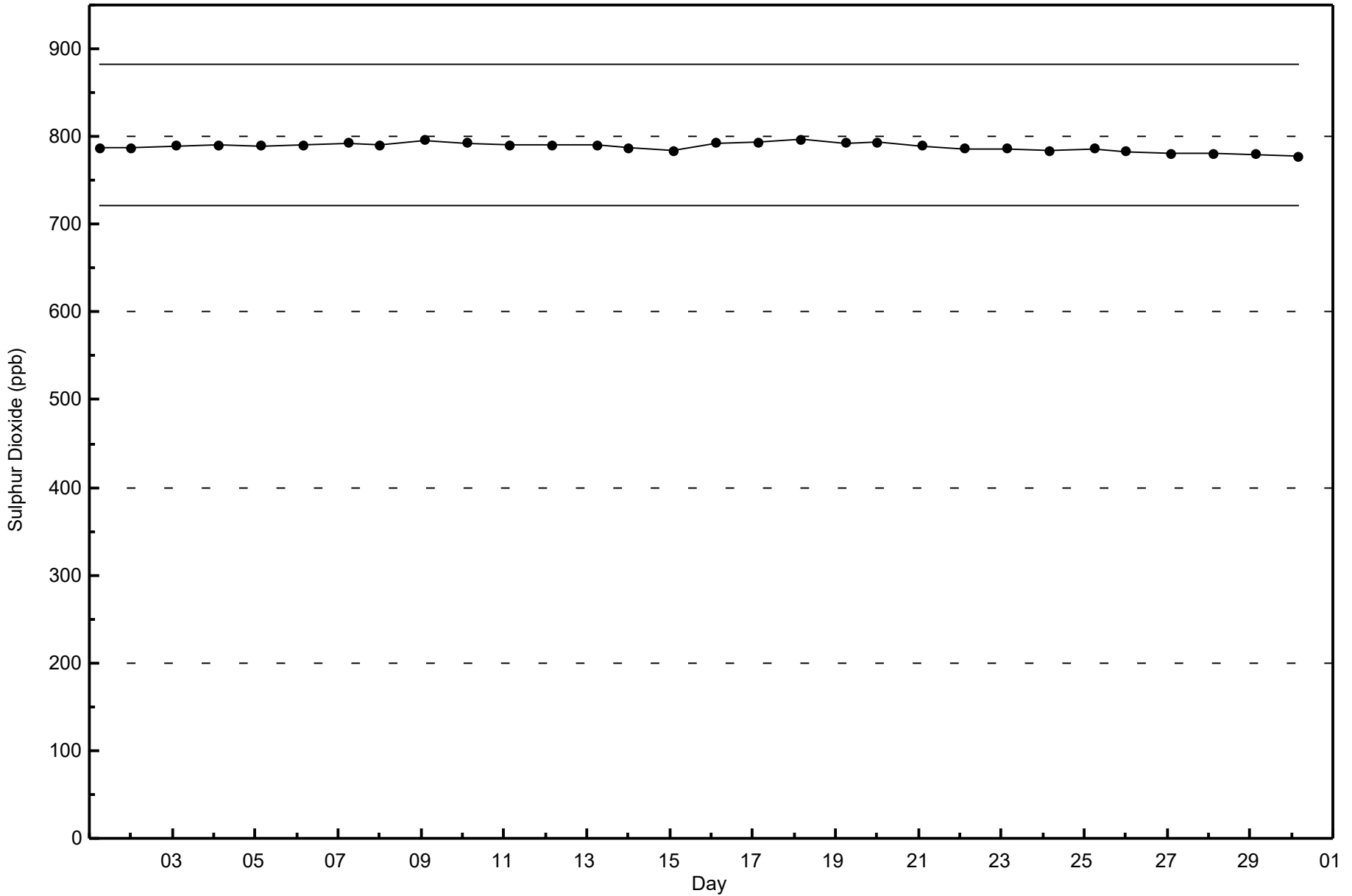


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

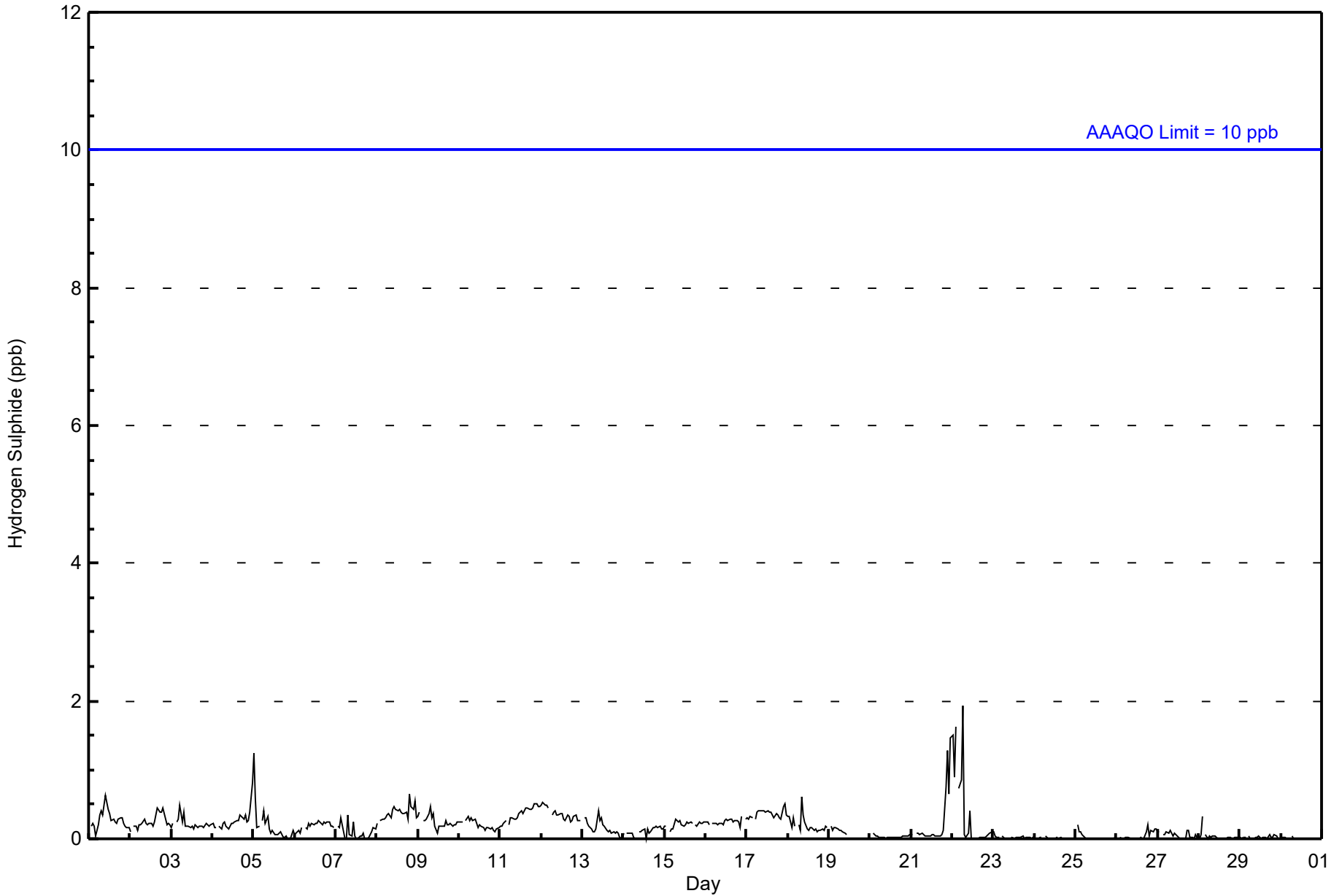
Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Jackfish 2/3













**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Jackfish 2/3 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	675	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 675

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Jackfish 2/3 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 2	35	51	61	55	8	8	13	14	55	84	55	75	40	43	45	27	669
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	<b>35</b>	<b>51</b>	<b>61</b>	<b>55</b>	<b>8</b>	<b>8</b>	<b>13</b>	<b>14</b>	<b>55</b>	<b>84</b>	<b>55</b>	<b>75</b>	<b>40</b>	<b>43</b>	<b>45</b>	<b>27</b>	<b>669</b>

Total Number of Valid Hours: 669

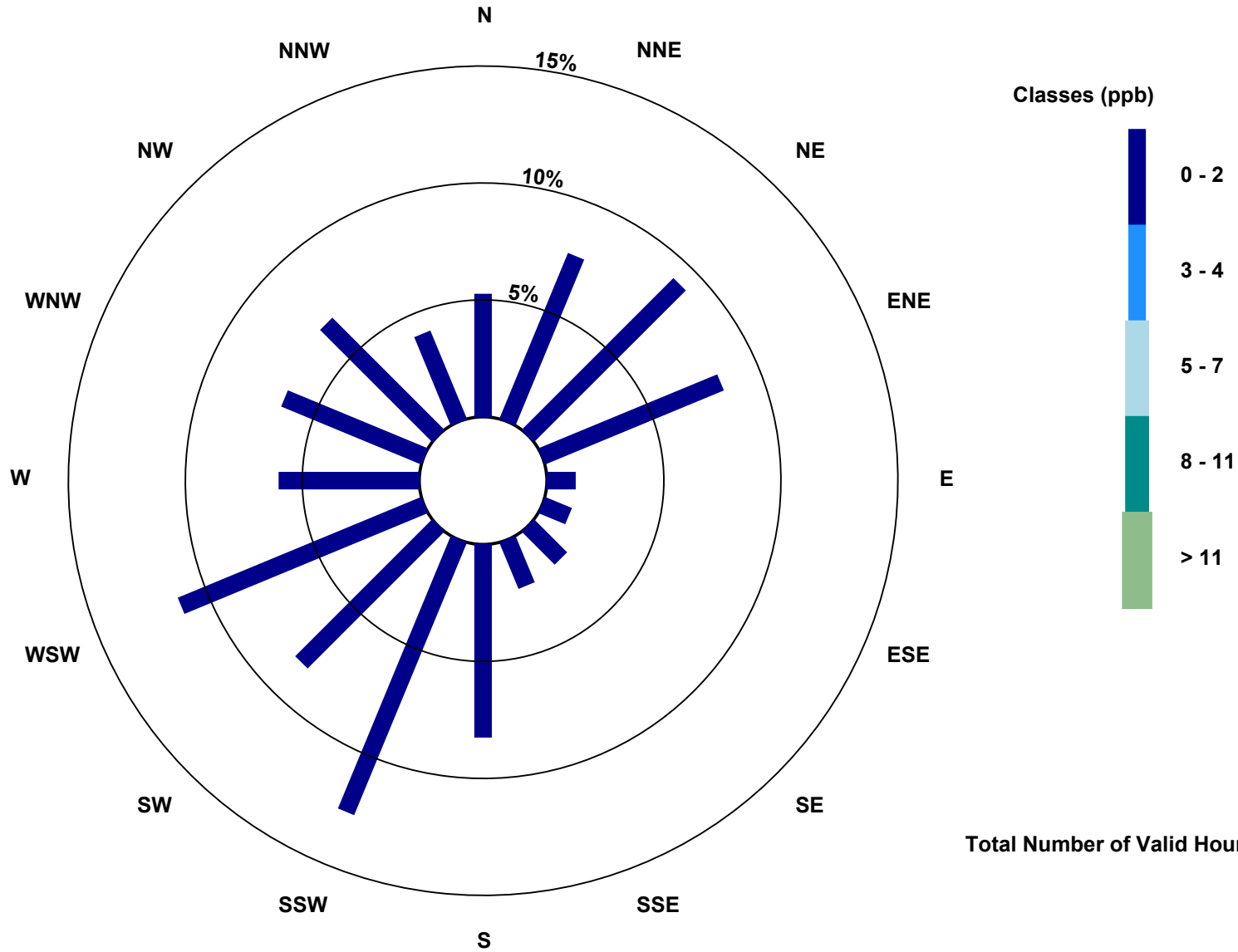
Total Number of Hours: 720



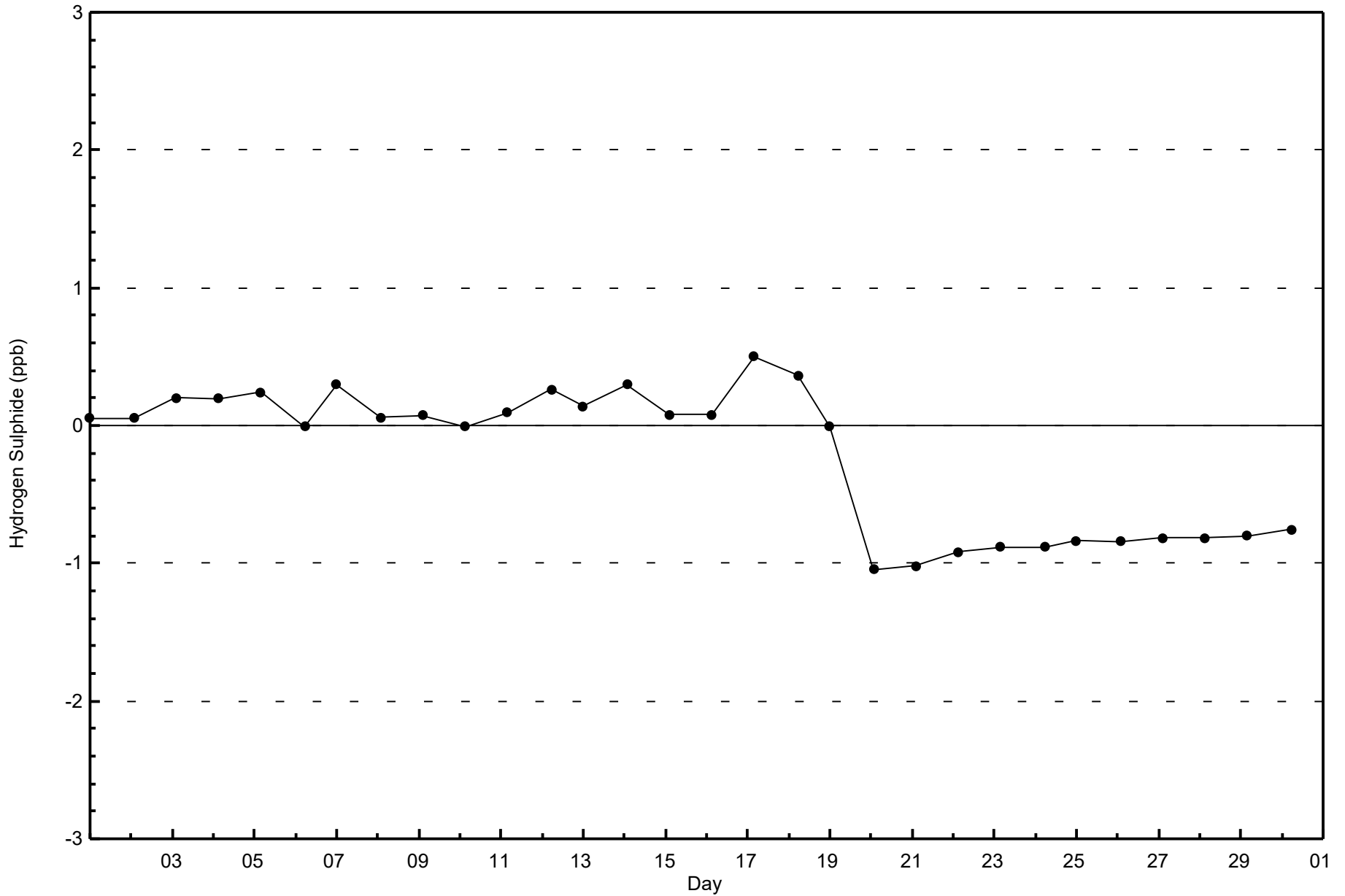


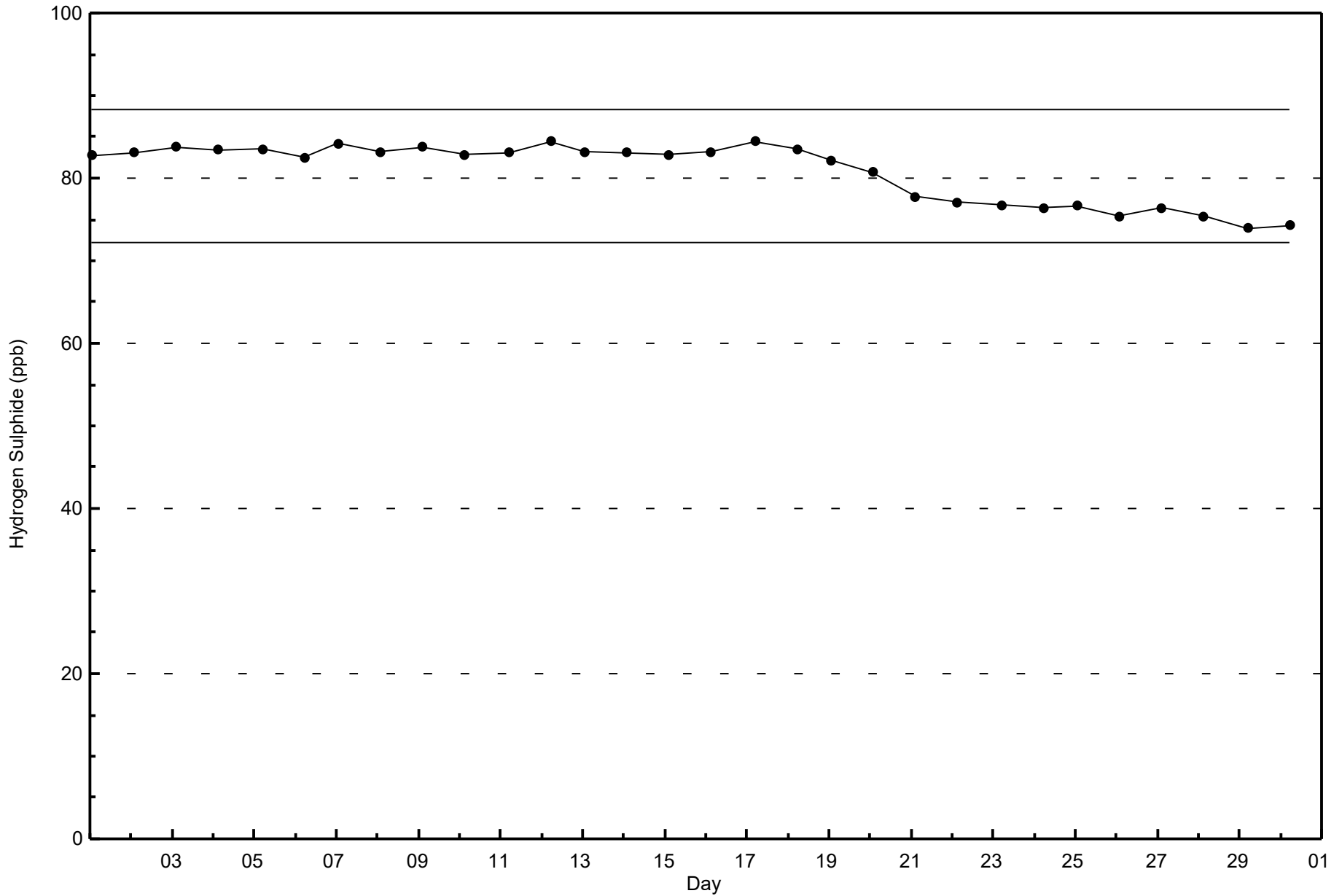
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Jackfish 2/3



Total Number of Valid Hours: 669





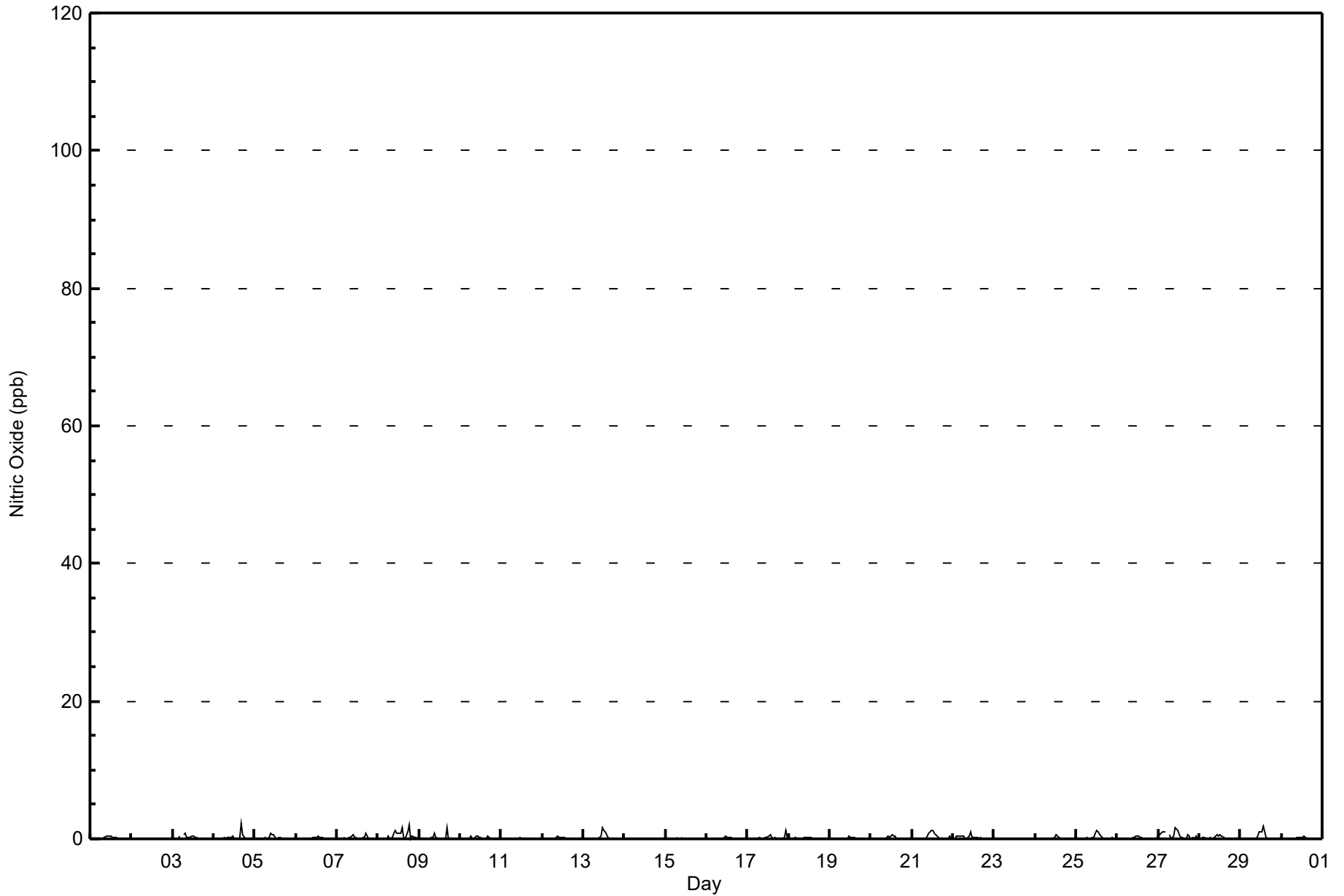


Maximum Value: 2.2 ppb on Nov 4 17:00																				Maximum Daily Average: 0.5 ppb on Nov 8					Hours in Service: 720				
Minimum Value: 0.0 ppb on Nov 1 01:00																				Minimum Daily Average: 0.0 ppb on Nov 14					Hours of Data: 681				
Maximum Diurnal Average: 0.4 ppb at hour 12																				Minimum Diurnal Average: 0.0 ppb at hour 20					Hours of Missing Data: 39				
Monthly Average: 0.14 ppb																				Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 0.4 P <sub>99</sub> = 1.3					Hours of Calibration: 36				
																									Percent Operational Time: 99.6				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.4	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5			
2-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1		
3-Nov	0.0	0.0	0.0	0.0	0.3	Z	0.6	0.9	0.2	0.2	0.2	0.5	0.4	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9			
4-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.3	0.2	0.3	0.0	0.0	0.1	0.1	2.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.2			
5-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.0	0.3	0.8	0.5	0.6	0.1	0.0	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8			
6-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4			
7-Nov	0.0	0.0	0.0	Z	0.2	0.0	0.0	0.2	0.3	0.5	0.3	0.1	0.0	0.0	0.0	0.2	0.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7			
8-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.4	0.1	0.2	0.9	1.2	0.7	0.8	0.9	1.7	0.2	0.1	0.9	2.1	0.1	0.5	0.1	0.2	0.0	0.5	2.1			
9-Nov	0.0	0.0	0.1	0.0	0.1	Z	0.2	0.3	0.2	0.9	0.2	0.0	0.0	0.1	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.6			
10-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.4	0.5	0.2	0.2	0.1	0.1	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5			
11-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1		
12-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.3	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4			
13-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.5	1.7	1.3	1.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.7			
14-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	DF	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1		
15-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.2	0.0	0.1	0.0	0.2	C	C	C	C	C	C	DF	0.0	0.0	0.0	0.0	0.0	0.0	--	0.2			
16-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.4	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4			
17-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.3	0.3	0.4	0.5	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	1.3	0.2	1.3			
18-Nov	0.2	0.2	Z	0.2	0.3	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3			
19-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3		
20-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.6	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6			
21-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.3	0.8	1.2	1.3	0.8	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	1.3			
22-Nov	Z	0.3	0.5	0.5	0.5	0.4	0.4	0.0	0.1	0.5	1.1	0.2	0.2	0.2	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.1			
23-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1		
24-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.6			
25-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.9	1.1	0.9	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	1.1			
26-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3			
27-Nov	0.7	0.5	1.1	1.0	1.0	Z	0.7	0.0	0.1	0.4	1.6	1.2	0.5	0.1	0.2	0.0	0.0	0.6	0.4	0.0	0.2	0.1	0.5	0.0	0.5	1.6			
28-Nov	Z	0.2	0.3	0.2	0.0	0.0	0.1	0.0	0.1	0.4	0.7	0.4	0.5	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7			
29-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	1.0	1.1	1.8	1.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.8			
30-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4			
																								Diurnal Average					
																								Diurnal Maximum					
Z - zerospan      C - Calibration      M - Maintenance      DF - DAS Failure																													



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Jackfish 2/3 - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Jackfish 2/3 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	681	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Jackfish 2/3 - November 2024**

<b>Concentration</b> <b>Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 20	41	54	60	56	7	8	14	15	54	83	51	76	42	39	45	30	675
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	41	54	60	56	7	8	14	15	54	83	51	76	42	39	45	30	675

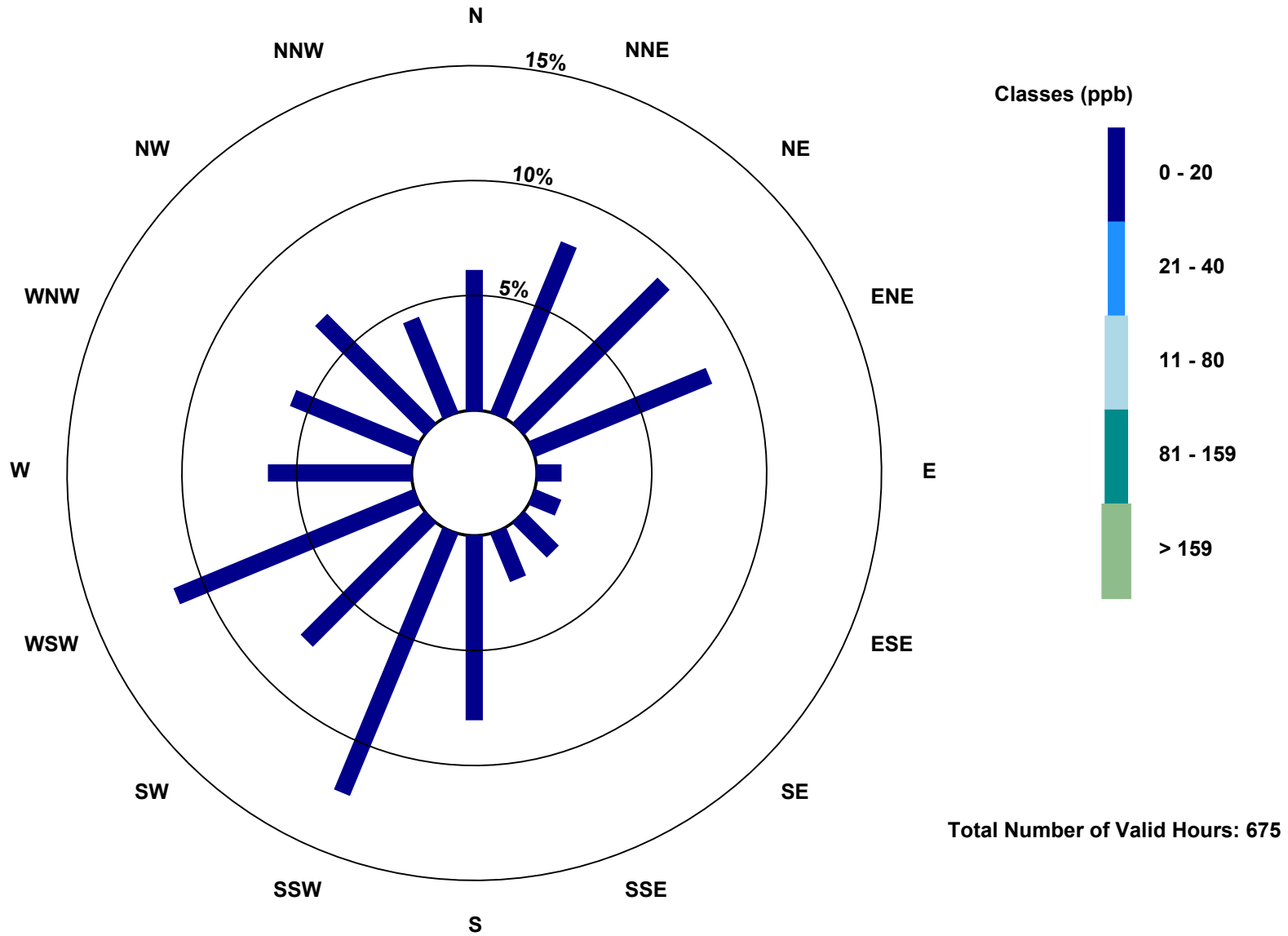
Total Number of Valid Hours: 675

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitric Oxide (NO) - ppb  
Jackfish 2/3

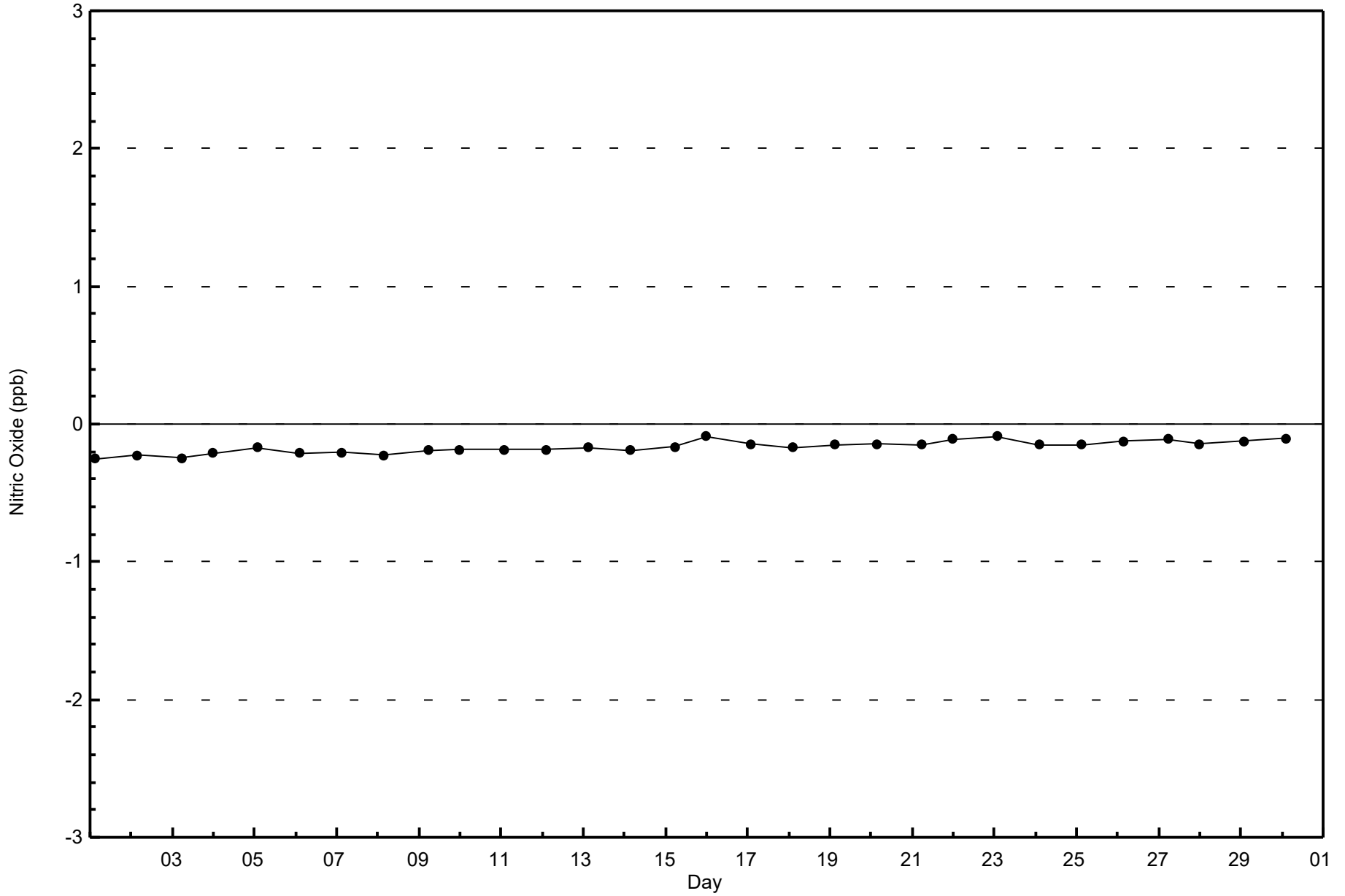


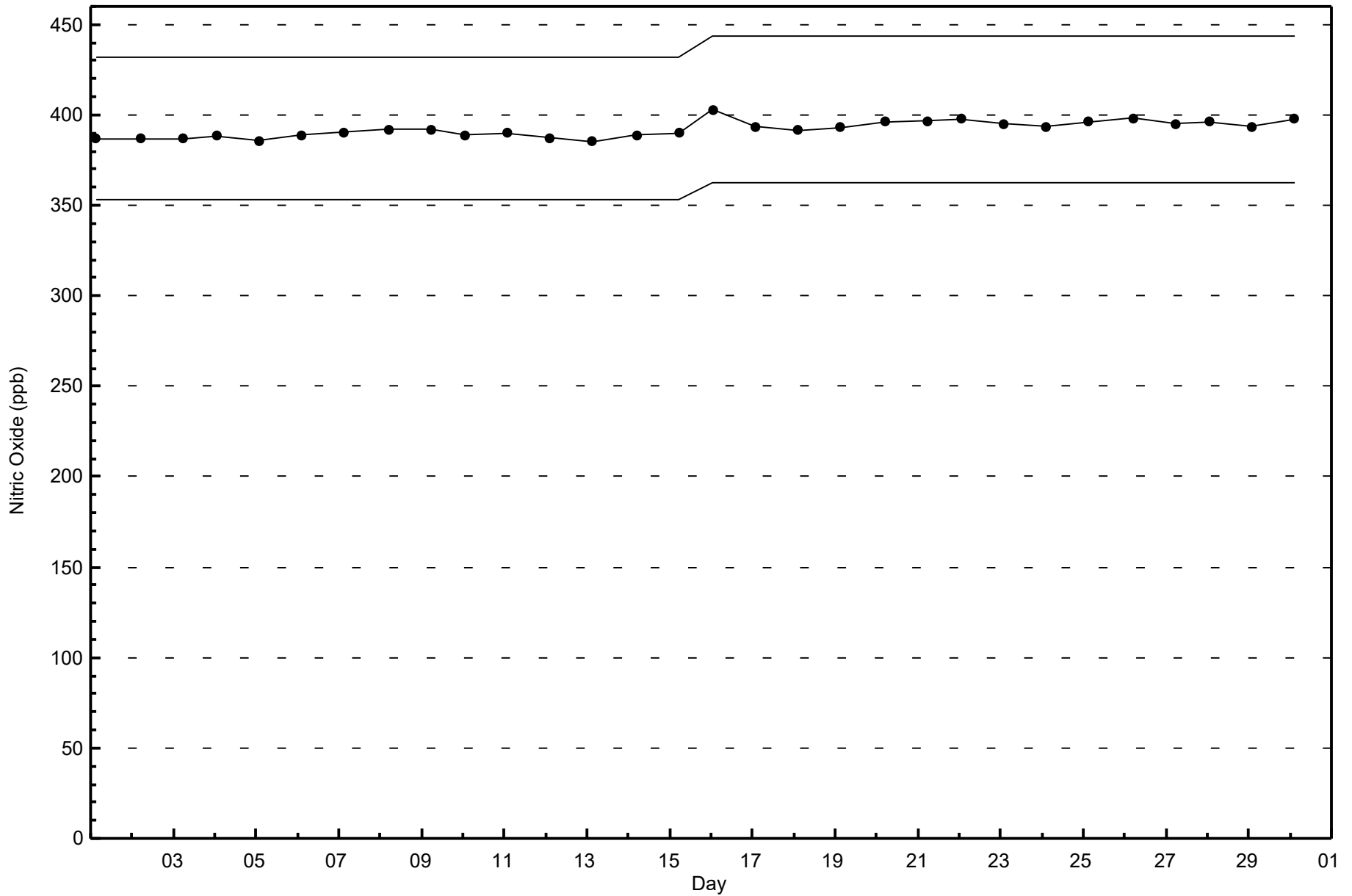




**Wood Buffalo Environmental Association**  
**Zero Responses**

**Nitric Oxide (NO) - ppb**  
**Jackfish 2/3 - November 2024**







# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Nitrogen Dioxide (NO<sub>2</sub>) - ppb

## Jackfish 2/3 - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 14.9 ppb on Nov 25 01:00	Maximum Daily Average: 3.6 ppb on Nov 21		Hours of Data:	681
Minimum Value: 0.0 ppb on Nov 23 22:00	Minimum Daily Average: 0.5 ppb on Nov 14		Hours of Missing Data:	39
Maximum Diurnal Average: 2.1 ppb at hour 1	Minimum Diurnal Average: 1.4 ppb at hour 6		Hours of Calibration:	36
Monthly Average: 1.69 ppb	Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.7 Median = 1.3 Q <sub>3</sub> = 2.3 P <sub>90</sub> = 3.3 P <sub>99</sub> = 6.3		Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.6	1.5	3.3	Z	1.2	1.1	3.1	2.0	1.7	2.4	2.6	2.1	1.8	1.8	1.9	2.7	3.1	2.7	1.9	1.5	1.2	0.9	0.7	0.6	1.8	3.3
2-Nov	0.5	0.6	0.7	0.6	Z	1.1	0.5	1.0	2.0	1.2	0.8	0.7	0.9	0.9	1.1	1.1	1.0	0.9	0.9	1.1	0.7	0.5	0.7	0.7	0.9	2.0
3-Nov	0.7	0.8	1.1	1.2	2.1	Z	2.4	3.4	1.5	1.3	0.9	1.2	1.2	1.0	1.1	1.2	1.4	1.3	1.2	1.4	1.5	1.7	1.8	1.8	1.4	3.4
4-Nov	Z	1.6	1.2	1.1	1.1	0.8	0.6	1.3	1.2	1.0	0.6	0.7	0.4	0.6	0.6	1.2	2.5	2.0	0.5	0.6	0.5	0.6	0.5	0.8	1.0	2.5
5-Nov	1.0	Z	0.7	0.6	1.0	0.8	2.2	1.9	1.7	3.0	2.7	3.1	0.9	0.5	1.7	1.4	1.2	1.1	0.9	1.2	0.9	0.8	0.6	0.3	1.3	3.1
6-Nov	0.3	0.2	Z	0.9	0.6	0.6	0.5	0.6	1.5	1.3	1.4	1.4	1.8	2.0	1.9	1.3	1.0	1.4	1.5	1.9	2.0	1.6	1.2	0.9	1.2	2.0
7-Nov	0.8	0.5	0.4	Z	2.0	0.5	0.5	4.4	2.8	3.0	1.4	0.7	0.2	0.2	0.2	1.2	3.8	3.6	0.1	0.2	0.1	0.4	1.5	2.0	1.3	4.4
8-Nov	2.8	4.0	4.0	4.1	Z	2.5	4.5	3.8	2.6	2.6	3.7	3.9	3.0	3.1	3.2	2.7	2.8	3.6	4.1	3.8	4.2	2.4	4.8	0.3	3.3	4.8
9-Nov	0.3	0.3	1.8	0.3	1.6	Z	2.4	2.2	2.0	2.8	1.0	0.6	0.5	0.9	0.3	0.2	4.0	1.3	0.7	0.6	0.5	0.5	0.7	0.9	1.1	4.0
10-Nov	Z	1.0	0.9	1.0	1.3	1.5	1.9	1.7	1.6	1.6	1.6	1.0	0.9	0.7	0.6	0.6	1.9	1.2	0.9	0.9	2.1	3.7	2.5	2.8	1.5	3.7
11-Nov	2.7	Z	1.9	2.4	1.0	0.9	0.9	0.6	0.6	0.6	0.7	1.2	1.2	1.3	1.0	0.9	1.1	1.0	0.8	1.0	1.0	1.1	1.0	1.0	1.1	2.7
12-Nov	1.4	1.5	Z	1.4	1.6	1.4	1.8	1.8	1.5	1.5	1.1	0.9	0.7	0.7	0.5	0.5	0.6	0.6	0.8	0.5	0.4	0.4	0.3	0.4	1.0	1.8
13-Nov	0.4	0.4	0.4	Z	0.9	1.0	0.8	0.7	0.6	1.1	1.5	4.7	3.7	3.3	1.6	1.2	1.2	0.9	0.8	0.8	0.7	1.0	1.4	0.2	1.3	4.7
14-Nov	0.5	1.2	0.6	0.6	Z	0.7	0.5	0.5	DF	0.3	0.4	0.6	0.5	0.3	0.5	0.4	0.3	0.2	0.6	0.6	0.3	0.2	0.2	0.3	0.5	1.2
15-Nov	0.3	0.2	0.1	0.2	0.3	Z	0.8	0.5	0.6	0.5	0.5	C	C	C	C	C	C	DF	0.4	0.4	0.7	0.9	0.9	1.5	--	1.5
16-Nov	Z	0.5	0.3	0.3	0.3	0.5	0.8	1.0	1.5	1.2	0.9	1.5	1.6	1.8	1.9	1.9	1.8	2.1	1.9	2.0	1.9	1.6	M	1.4	1.3	2.1
17-Nov	1.1	Z	1.3	1.7	1.7	1.9	2.3	2.5	1.9	2.0	2.1	2.0	1.8	2.1	1.6	1.7	2.2	2.1	1.5	0.9	0.7	1.1	5.0	1.3	1.8	5.0
18-Nov	0.9	1.6	Z	2.0	2.5	0.5	1.0	0.5	0.9	1.1	0.7	0.6	0.5	1.0	0.3	0.4	0.5	0.5	0.8	0.9	0.4	1.7	1.6	2.0	1.0	2.5
19-Nov	2.5	2.8	1.1	Z	1.4	2.0	1.1	1.3	0.3	0.2	0.5	2.1	1.9	1.7	2.0	2.4	2.5	1.7	1.7	3.3	2.3	2.3	1.5	1.4	1.7	3.3
20-Nov	2.1	2.3	3.5	2.7	Z	2.8	2.9	2.8	2.2	1.8	1.7	1.2	1.6	1.7	2.0	1.4	2.0	2.0	2.8	3.5	4.2	4.0	3.5	3.3	2.5	4.2
21-Nov	2.9	2.3	2.1	2.3	1.9	Z	2.5	2.7	1.7	1.9	2.4	2.7	3.1	2.6	2.7	2.1	2.3	3.3	5.0	7.2	8.6	8.5	7.5	4.7	3.6	8.6
22-Nov	Z	2.4	3.4	2.9	3.1	2.7	2.9	0.4	0.6	1.6	2.9	0.7	0.7	0.9	1.0	1.4	4.4	2.3	2.9	4.8	4.3	5.5	6.1	6.1	2.8	6.1
23-Nov	5.7	Z	2.1	1.8	2.3	1.7	1.1	0.9	0.6	0.7	1.2	1.3	1.2	1.5	1.6	1.0	1.5	2.1	1.3	1.9	0.5	0.0	1.0	1.7	1.5	5.7
24-Nov	1.2	0.2	Z	0.3	0.6	1.5	0.9	0.4	0.1	0.5	0.5	1.3	2.4	1.7	0.9	0.9	0.4	0.4	0.7	0.8	0.1	0.1	11.0	11.0	1.2	11.0
25-Nov	14.9	11.1	6.1	Z	4.2	3.6	2.5	1.8	0.5	0.6	0.8	1.8	2.1	2.6	2.0	2.2	2.8	2.8	3.1	2.3	2.4	2.7	2.4	2.7	3.4	14.9
26-Nov	2.4	3.3	3.3	2.3	Z	2.3	4.6	2.6	2.5	1.4	1.2	1.2	1.3	1.4	1.5	2.2	2.7	3.1	3.5	3.9	4.1	4.0	2.3	1.1	2.5	4.6
27-Nov	4.6	3.7	5.4	4.3	5.0	Z	3.9	0.4	0.9	1.7	4.9	3.3	1.7	0.7	1.3	0.7	0.6	4.5	3.4	0.8	1.8	0.8	4.1	0.6	2.6	5.4
28-Nov	Z	2.3	2.3	1.9	0.9	0.6	1.7	1.8	2.9	2.7	2.5	1.4	1.5	1.2	1.3	1.6	2.5	2.0	1.7	1.7	2.1	2.7	3.0	2.9	2.0	3.0
29-Nov	2.3	Z	1.4	0.9	0.5	0.5	0.6	0.6	0.7	0.9	1.7	3.5	3.1	4.7	4.8	4.1	3.7	2.6	2.6	4.3	3.1	2.2	1.3	0.9	2.2	4.8
30-Nov	0.7	0.7	Z	0.7	0.7	0.9	1.5	1.4	1.3	1.1	1.0	1.2	1.1	1.6	1.5	0.3	0.3	0.4	0.5	0.9	0.8	0.9	0.8	0.8	0.9	1.6

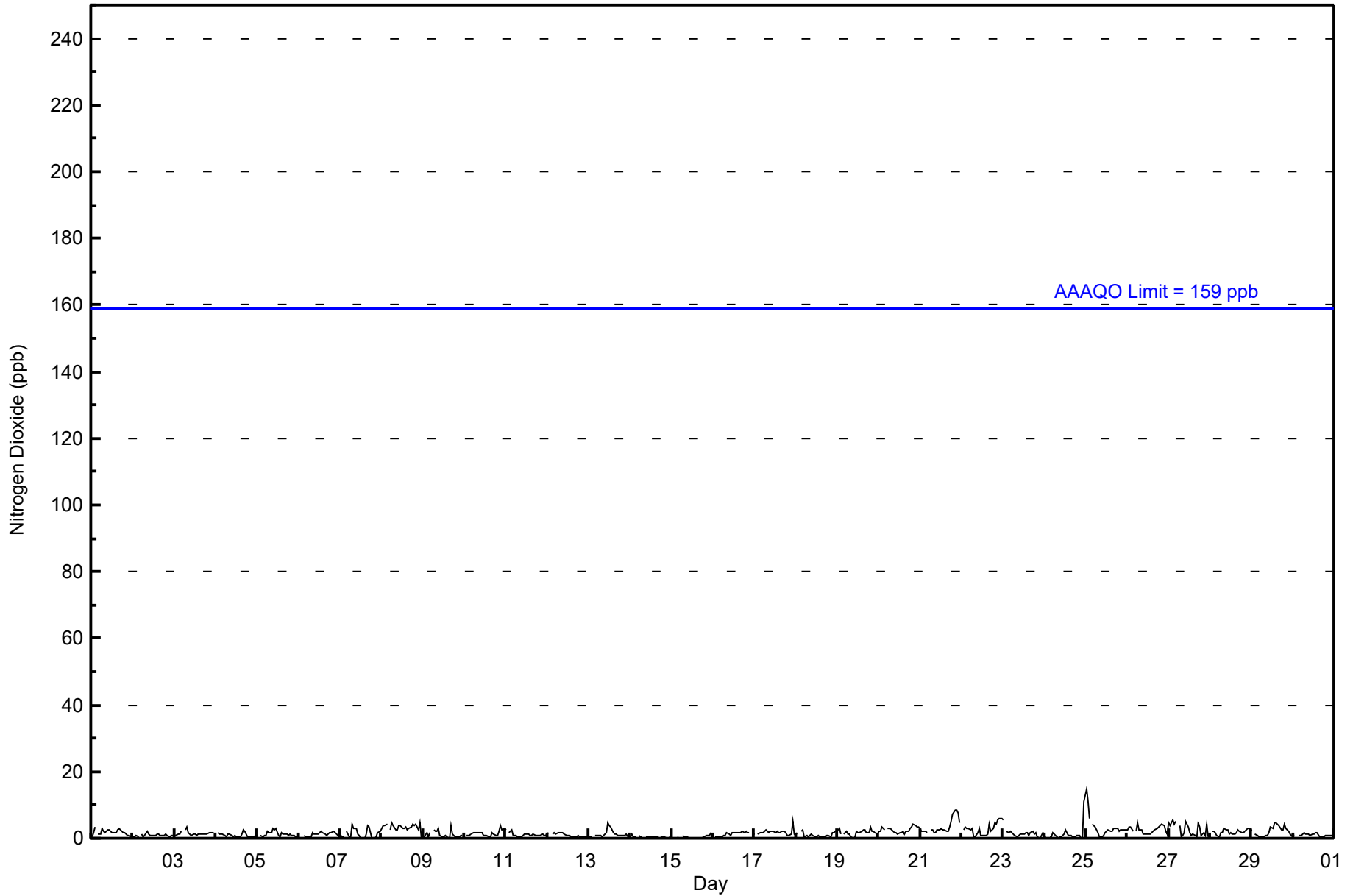
2.1	1.9	2.0	1.5	1.6	1.4	1.8	1.6	1.4	1.5	1.5	1.7	1.5	1.5	1.5	1.4	1.9	1.9	1.6	1.9	1.8	1.8	2.0	1.9	Diurnal Average	
14.9	11.1	6.1	4.3	5.0	3.6	4.6	4.4	2.9	3.0	4.9	4.7	3.7	4.7	4.8	4.1	4.4	4.5	5.0	7.2	8.6	8.5	7.5	11.0	Diurnal Maximum	

Z - zerspan      C - Calibration      M - Maintenance      DF - DAS Failure  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Jackfish 2/3 - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Jackfish 2/3 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	681	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Jackfish 2/3 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 20	41	54	60	56	7	8	14	15	54	83	51	76	42	39	45	30	675
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	41	54	60	56	7	8	14	15	54	83	51	76	42	39	45	30	675

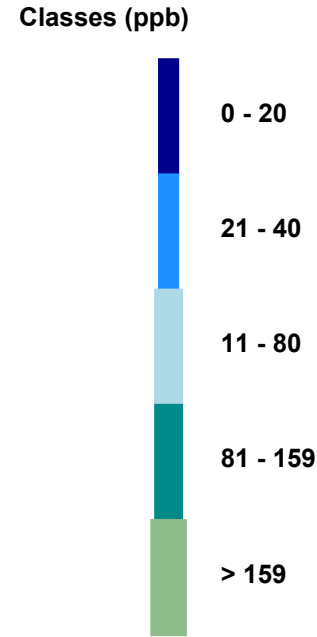
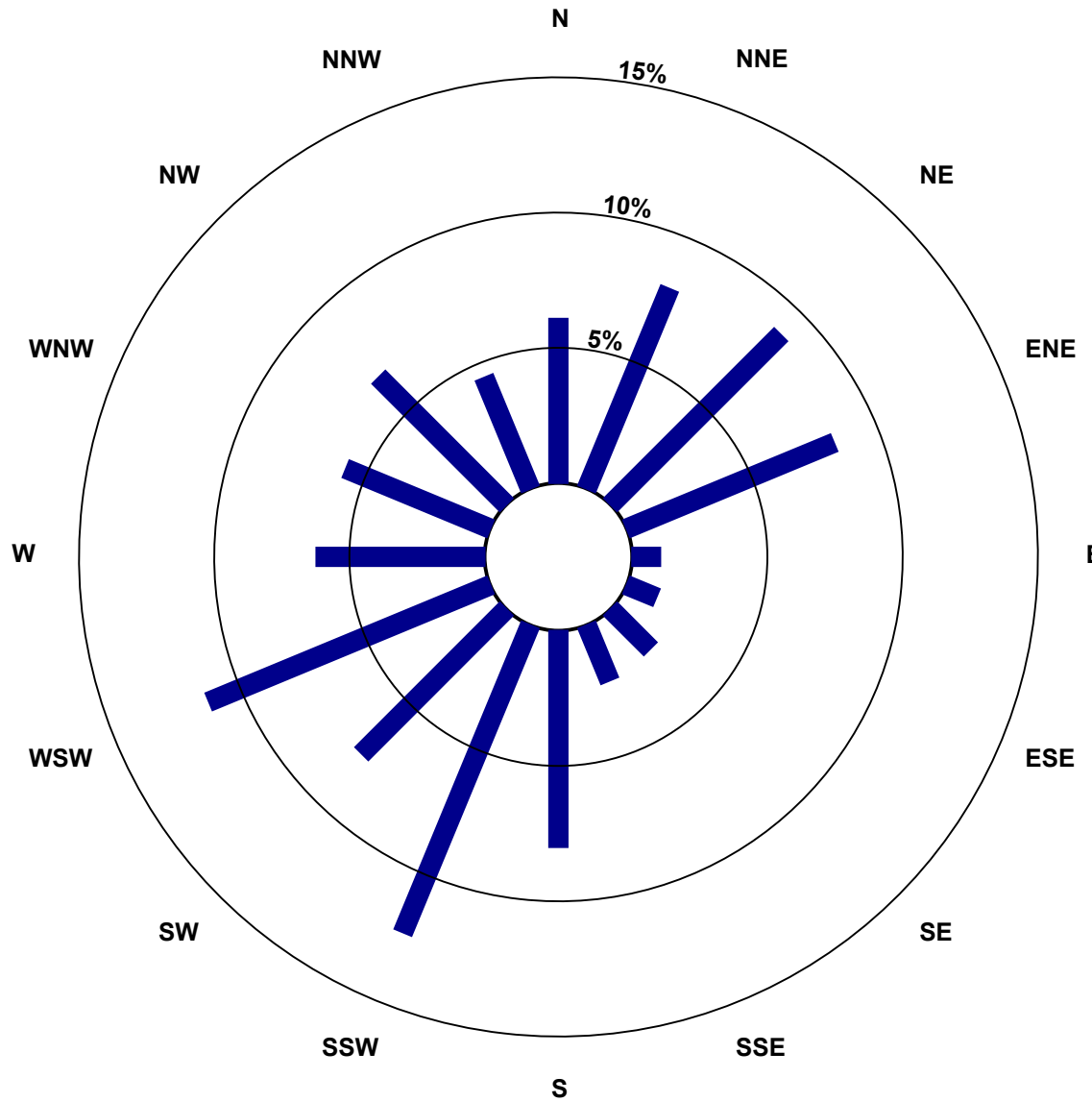
Total Number of Valid Hours: 675

Total Number of Hours: 720

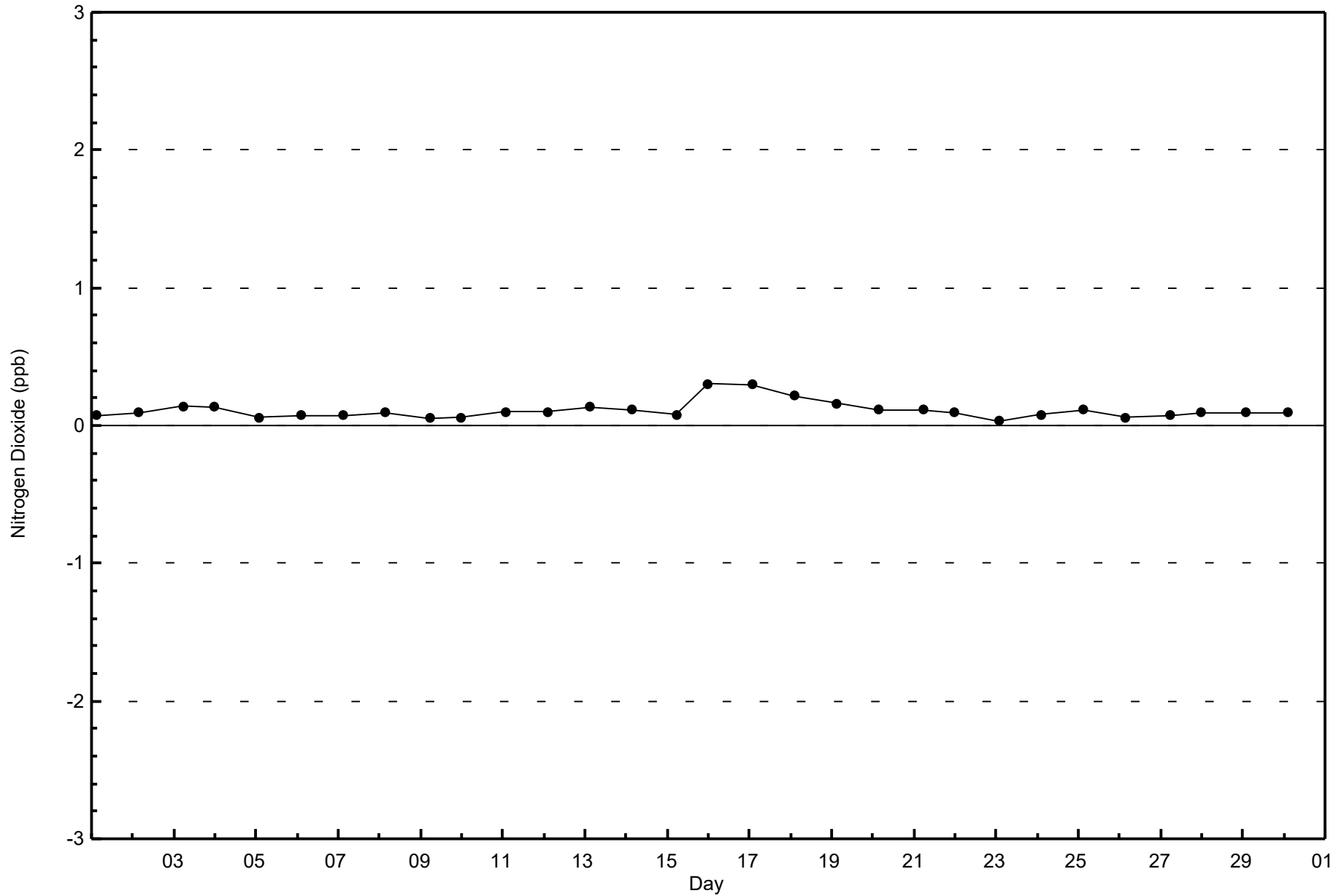


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

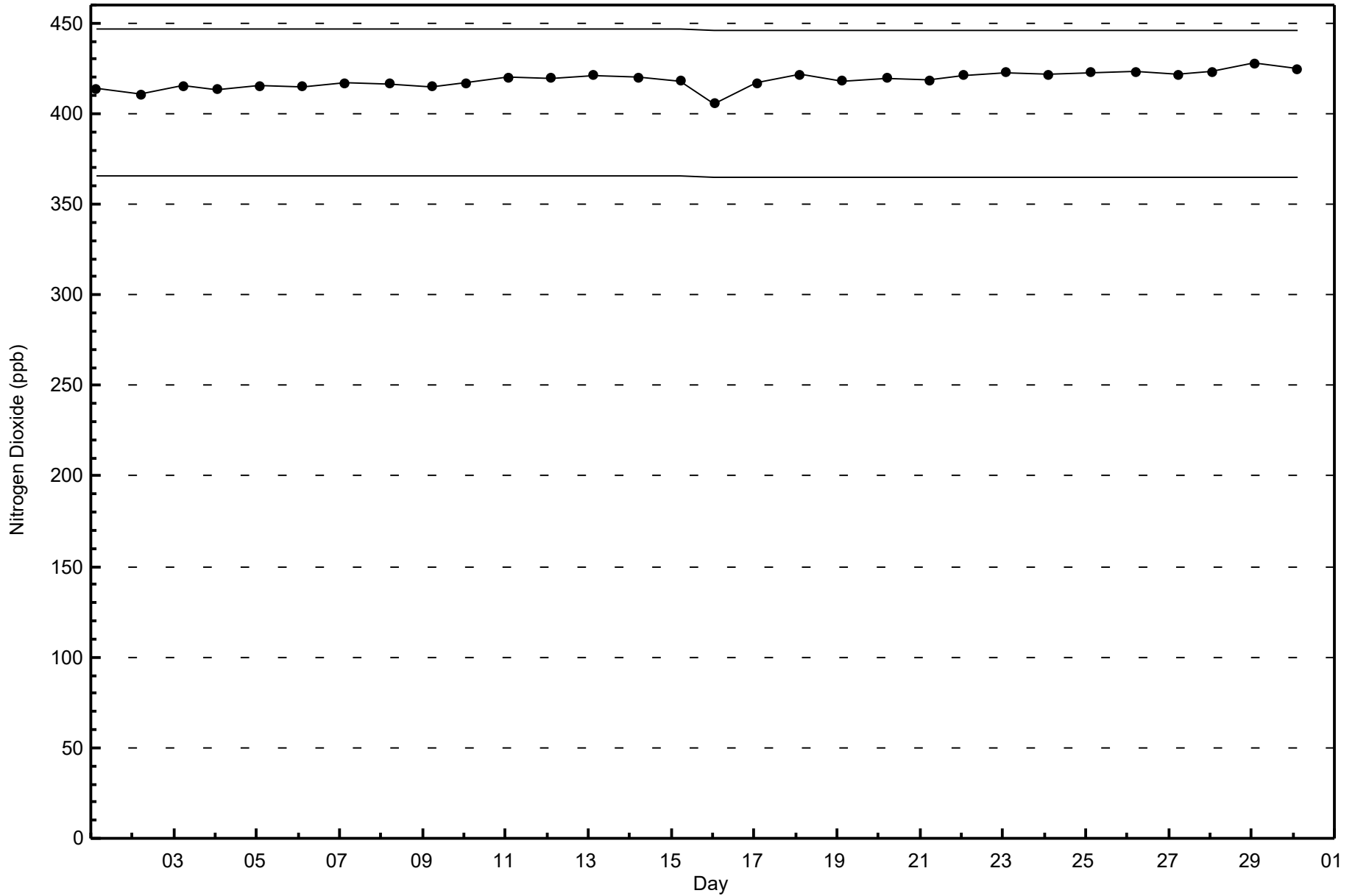
Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Jackfish 2/3



Total Number of Valid Hours: 675









**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

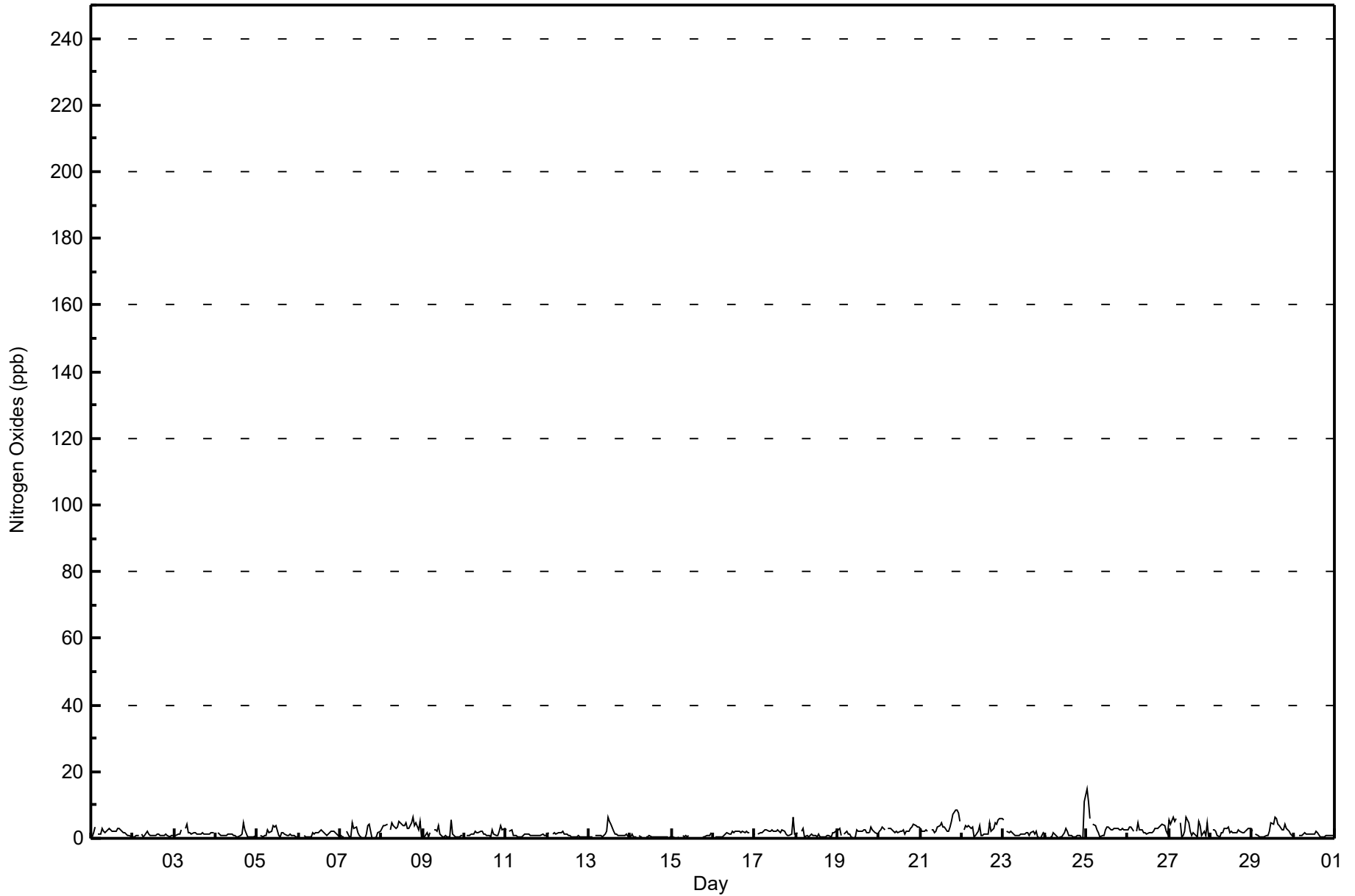
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Jackfish 2/3 - November 2024**

Maximum Value: 14.9 ppb on Nov 25 01:00																					Maximum Daily Average: 3.9 ppb on Nov 21					Hours in Service: 720	
Minimum Value: 0.0 ppb on Nov 23 22:00																					Minimum Daily Average: 0.5 ppb on Nov 14					Hours of Data: 681	
Maximum Diurnal Average: 2.2 ppb at hour 1																					Minimum Diurnal Average: 1.4 ppb at hour 6					Hours of Missing Data: 39	
Monthly Average: 1.83 ppb																					Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.8 Median = 1.4 Q <sub>3</sub> = 2.4 P <sub>90</sub> = 3.8 P <sub>99</sub> = 6.6					Hours of Calibration: 36	
																										Percent Operational Time: 99.6	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.6	1.5	3.3	Z	1.2	1.1	3.1	2.0	1.8	2.7	3.1	2.5	2.2	2.1	2.1	2.8	3.1	2.7	1.9	1.5	1.2	0.9	0.7	0.6	1.9	3.3	
2-Nov	0.5	0.6	0.7	0.6	Z	1.1	0.5	1.0	2.0	1.3	0.8	0.8	1.0	0.9	1.1	1.1	1.0	0.9	0.9	1.1	0.7	0.5	0.7	0.7	0.9	2.0	
3-Nov	0.7	0.8	1.1	1.2	2.4	Z	3.0	4.3	1.7	1.5	1.1	1.7	1.6	1.2	1.2	1.5	1.3	1.2	1.4	1.5	1.7	1.8	1.8	1.6	4.3		
4-Nov	Z	1.6	1.2	1.1	1.1	0.8	0.8	1.3	1.3	0.8	1.0	0.4	0.6	0.7	1.3	4.7	2.6	0.5	0.6	0.5	0.6	0.5	0.8	1.1	4.7		
5-Nov	1.0	Z	0.7	0.6	1.0	0.8	2.4	1.9	2.0	3.8	3.2	3.7	1.0	0.5	1.9	1.6	1.3	1.1	0.9	1.2	0.9	0.8	0.6	0.3	1.4	3.8	
6-Nov	0.3	0.2	Z	0.9	0.6	0.6	0.5	0.6	1.5	1.4	1.6	1.6	2.1	2.4	2.2	1.4	1.0	1.4	1.5	1.9	2.0	1.6	1.2	0.9	1.3	2.4	
7-Nov	0.8	0.5	0.4	Z	2.2	0.5	0.5	4.6	3.1	3.5	1.7	0.8	0.2	0.2	0.2	1.4	4.0	4.3	0.1	0.2	0.1	0.4	1.5	2.0	1.5	4.6	
8-Nov	2.8	4.0	4.0	4.1	Z	2.5	4.9	3.9	2.8	3.5	4.9	4.6	3.8	4.0	4.9	2.9	2.9	4.5	6.2	3.9	4.7	2.5	5.0	0.3	3.8	6.2	
9-Nov	0.3	0.3	1.9	0.3	1.7	Z	2.6	2.5	2.2	3.7	1.2	0.6	0.5	1.0	0.3	0.2	5.6	1.3	0.7	0.6	0.5	0.5	0.7	0.9	1.3	5.6	
10-Nov	Z	1.0	0.9	1.0	1.3	1.5	2.2	1.7	1.7	2.0	2.1	1.2	1.1	0.8	0.7	0.6	2.4	1.4	0.9	0.9	2.1	3.7	2.5	2.8	1.6	3.7	
11-Nov	2.7	Z	1.9	2.4	1.0	0.9	0.9	0.6	0.6	0.6	0.7	1.3	1.2	1.3	1.0	0.9	1.1	1.0	0.8	1.0	1.0	1.1	1.0	1.0	1.1	2.7	
12-Nov	1.4	1.5	Z	1.4	1.6	1.4	1.8	1.8	1.6	1.9	1.4	1.1	0.9	0.9	0.6	0.5	0.6	0.6	0.8	0.5	0.4	0.4	0.3	0.4	1.0	1.9	
13-Nov	0.4	0.4	0.4	Z	0.9	1.0	0.8	0.7	0.6	1.3	2.0	6.4	5.0	4.3	1.9	1.2	1.2	0.9	0.8	0.8	0.7	1.0	1.4	0.2	1.5	6.4	
14-Nov	0.5	1.2	0.6	0.6	Z	0.7	0.5	0.5	DF	0.3	0.4	0.7	0.5	0.3	0.5	0.4	0.3	0.2	0.6	0.6	0.3	0.2	0.2	0.3	0.5	1.2	
15-Nov	0.3	0.2	0.1	0.2	0.3	Z	1.0	0.5	0.7	0.5	0.7	C	C	C	C	C	C	DF	0.4	0.4	0.7	0.9	0.9	1.5	--	1.5	
16-Nov	Z	0.5	0.3	0.3	0.3	0.5	0.8	1.1	1.5	1.3	1.1	1.9	1.8	2.0	2.1	2.0	1.8	2.1	1.9	2.0	1.9	1.6	M	1.4	1.4	2.1	
17-Nov	1.1	Z	1.3	1.7	1.7	1.9	2.4	2.6	1.9	2.1	2.4	2.3	2.2	2.6	1.9	1.8	2.3	2.1	1.5	0.9	0.7	1.3	6.3	1.5	2.0	6.3	
18-Nov	1.1	1.8	Z	2.2	2.8	0.5	1.0	0.5	1.0	1.2	0.8	0.8	0.6	1.2	0.3	0.4	0.5	0.5	0.8	0.9	0.4	1.7	1.6	2.0	1.1	2.8	
19-Nov	2.5	2.8	1.1	Z	1.4	2.0	1.1	1.3	0.3	0.2	0.5	2.4	2.1	1.9	2.2	2.5	2.5	1.7	1.7	3.3	2.3	2.3	1.5	1.4	1.8	3.3	
20-Nov	2.1	2.3	3.5	2.7	Z	2.8	2.9	2.8	2.2	1.9	2.0	1.5	2.2	2.1	2.3	1.5	2.0	2.0	2.8	3.5	4.2	4.0	3.5	3.3	2.6	4.2	
21-Nov	2.9	2.3	2.1	2.3	1.9	Z	2.5	2.7	1.8	2.2	3.2	3.9	4.4	3.4	3.4	2.3	2.3	3.3	5.0	7.2	8.6	8.5	7.8	5.0	3.9	8.6	
22-Nov	Z	2.7	3.9	3.4	3.6	3.1	3.3	0.4	0.7	2.1	4.0	0.9	0.9	1.1	1.1	1.4	4.6	2.3	2.9	4.8	4.3	5.5	6.1	6.1	3.0	6.1	
23-Nov	5.7	Z	2.1	1.8	2.3	1.7	1.1	0.9	0.6	0.7	1.3	1.4	1.3	1.6	1.6	1.0	1.5	2.1	1.3	1.9	0.5	0.0	1.0	1.7	1.5	5.7	
24-Nov	1.2	0.2	Z	0.3	0.6	1.5	0.9	0.4	0.1	0.5	0.5	1.6	3.0	2.1	1.0	0.9	0.4	0.4	0.7	0.8	0.1	0.1	11.1	11.1	1.3	11.1	
25-Nov	14.9	11.1	6.1	Z	4.2	3.6	2.6	1.9	0.5	0.7	1.0	2.7	3.2	3.5	2.5	2.4	2.8	2.8	3.1	2.3	2.4	2.8	2.4	2.7	3.6	14.9	
26-Nov	2.4	3.3	3.3	2.3	Z	2.3	4.6	2.6	2.5	1.6	1.5	1.5	1.6	1.7	1.7	2.3	2.8	3.1	3.5	3.9	4.1	4.0	2.3	1.2	2.6	4.6	
27-Nov	5.3	4.2	6.5	5.3	6.0	Z	4.6	0.4	1.0	2.1	6.5	4.5	2.2	0.8	1.5	0.7	0.6	5.1	3.8	0.8	2.0	0.9	4.6	0.6	3.1	6.5	
28-Nov	Z	2.5	2.6	2.1	0.9	0.6	1.8	1.8	3.0	3.1	3.2	1.8	2.0	1.6	1.5	1.7	2.5	2.0	1.7	1.7	2.1	2.7	3.0	2.9	2.1	3.2	
29-Nov	2.3	Z	1.4	0.9	0.5	0.5	0.6	0.6	0.7	1.0	2.0	4.5	4.2	6.5	5.9	4.4	3.7	2.6	2.6	4.3	3.1	2.2	1.3	0.9	2.5	6.5	
30-Nov	0.7	0.7	Z	0.7	0.7	0.9	1.6	1.4	1.3	1.2	1.2	1.4	1.4	2.0	1.6	0.3	0.3	0.4	0.5	0.9	0.8	0.9	0.8	0.8	1.0	2.0	
																					Diurnal Average						
																					Diurnal Maximum						
																					2.2 1.9 2.1 1.6 1.7 1.4 1.9 1.6 1.5 1.7 1.9 2.1 1.9 1.9 1.7 1.5 2.1 2.0 1.7 1.9 1.8 1.9 2.1 1.9						
																					14.9 11.1 6.5 5.3 6.0 3.6 4.9 4.6 3.1 3.8 6.5 6.4 5.0 6.5 5.9 4.4 5.6 5.1 6.2 7.2 8.6 8.5 7.8 11.1						
Z - zerospan																					C - Calibration						
M - Maintenance																					DF - DAS Failure						



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Jackfish 2/3 - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Jackfish 2/3 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	681	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Jackfish 2/3 - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	41	54	60	56	7	8	14	15	54	83	51	76	42	39	45	30	675
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	41	54	60	56	7	8	14	15	54	83	51	76	42	39	45	30	675

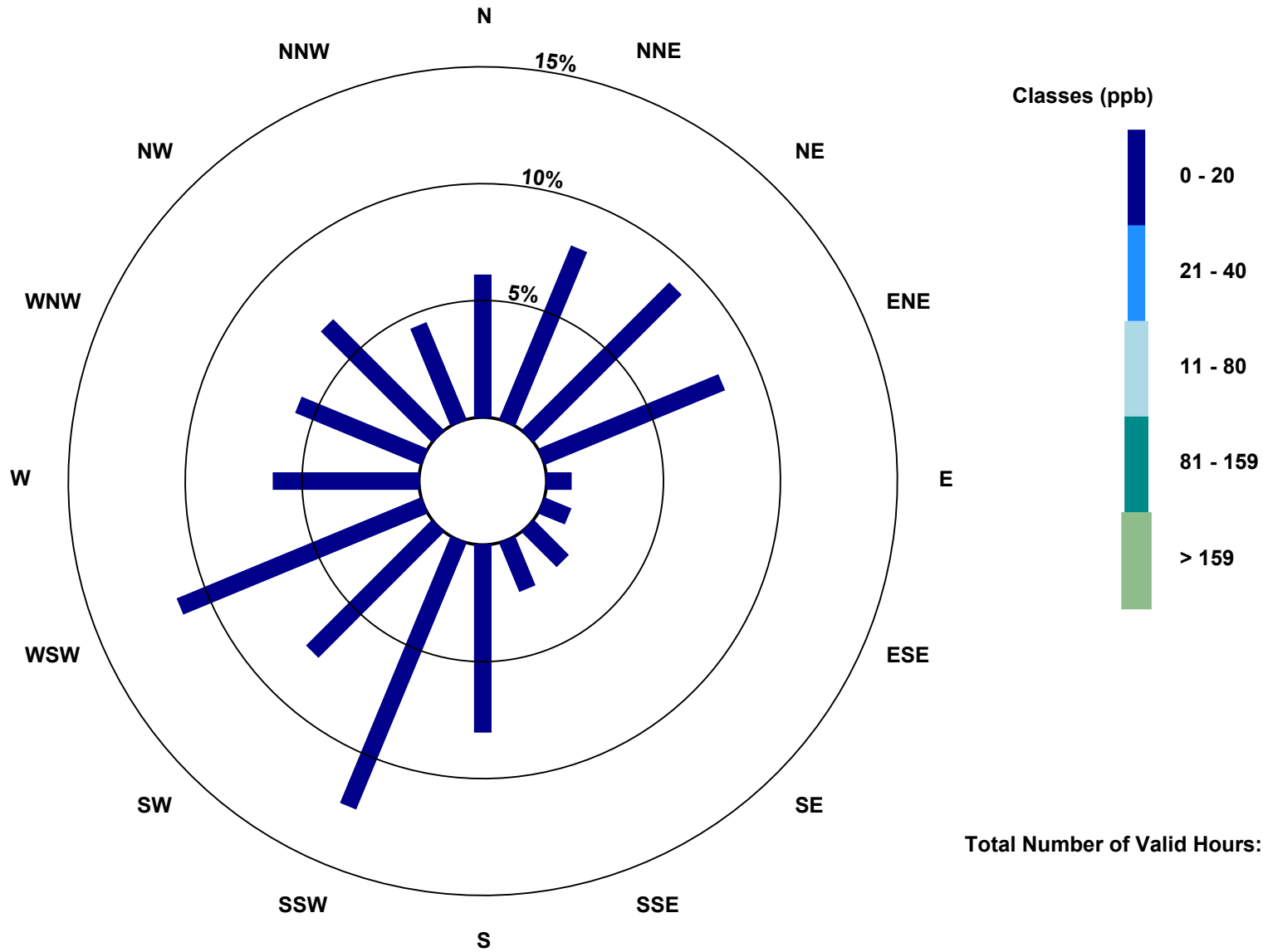
Total Number of Valid Hours: 675

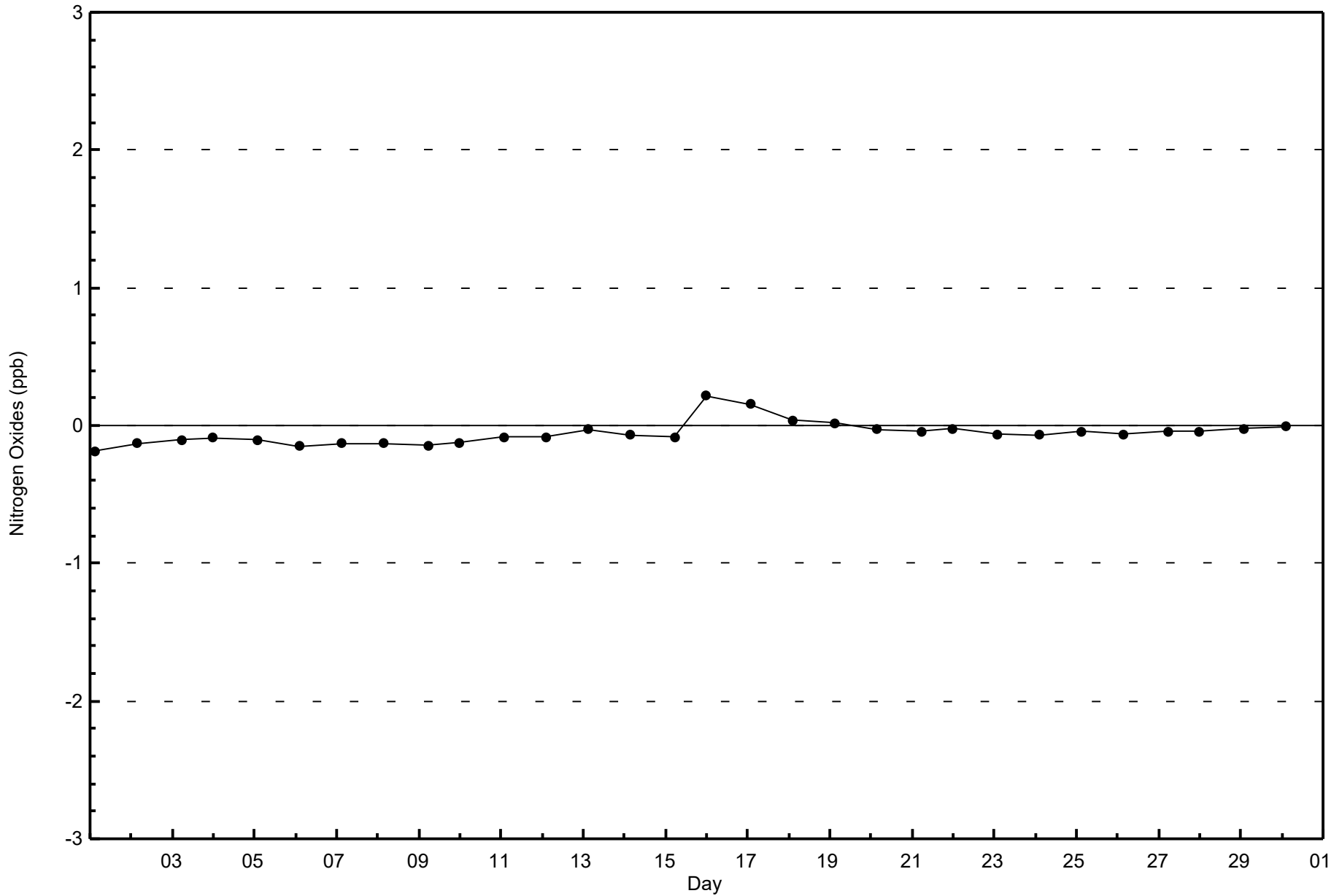
Total Number of Hours: 720

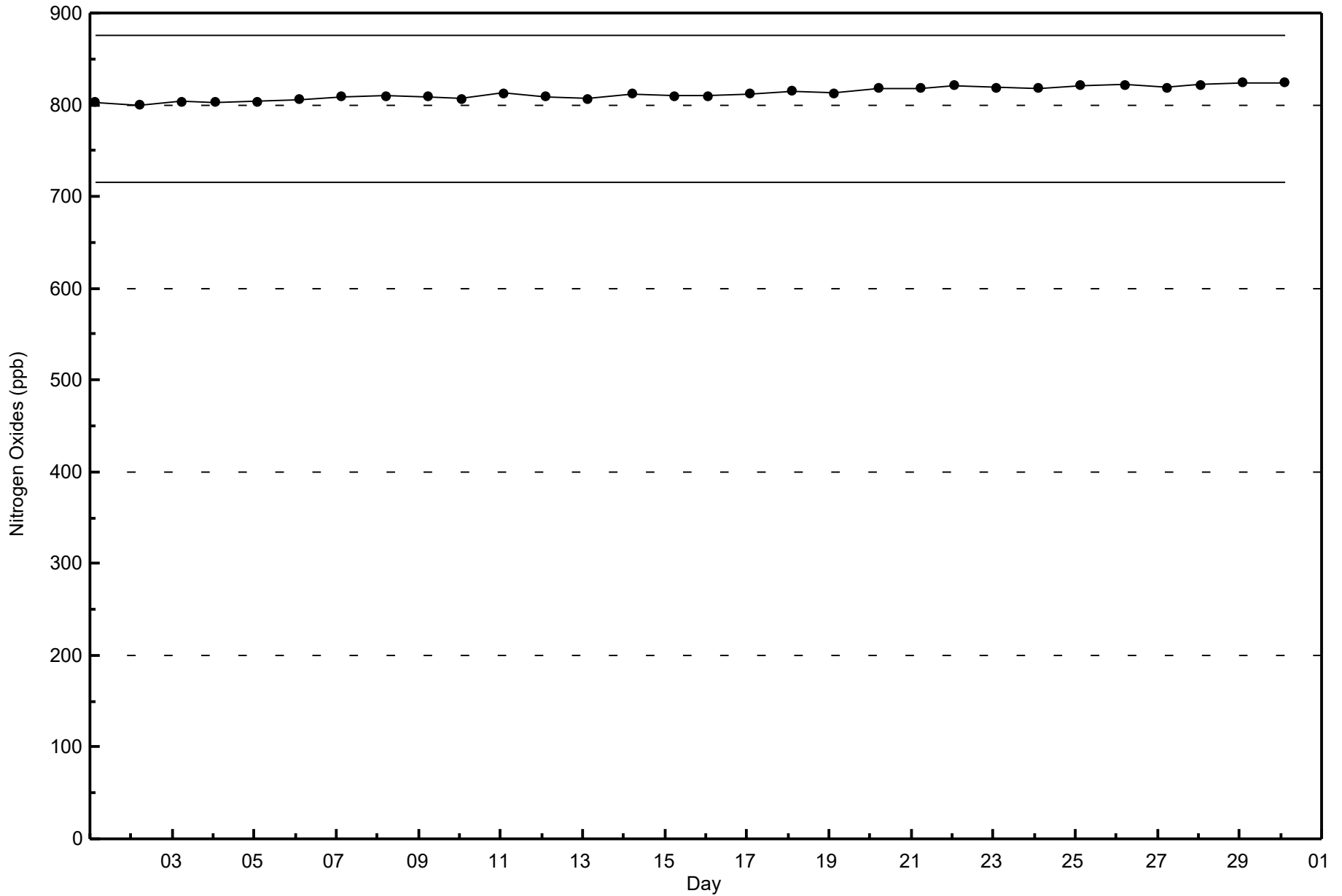


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Jackfish 2/3











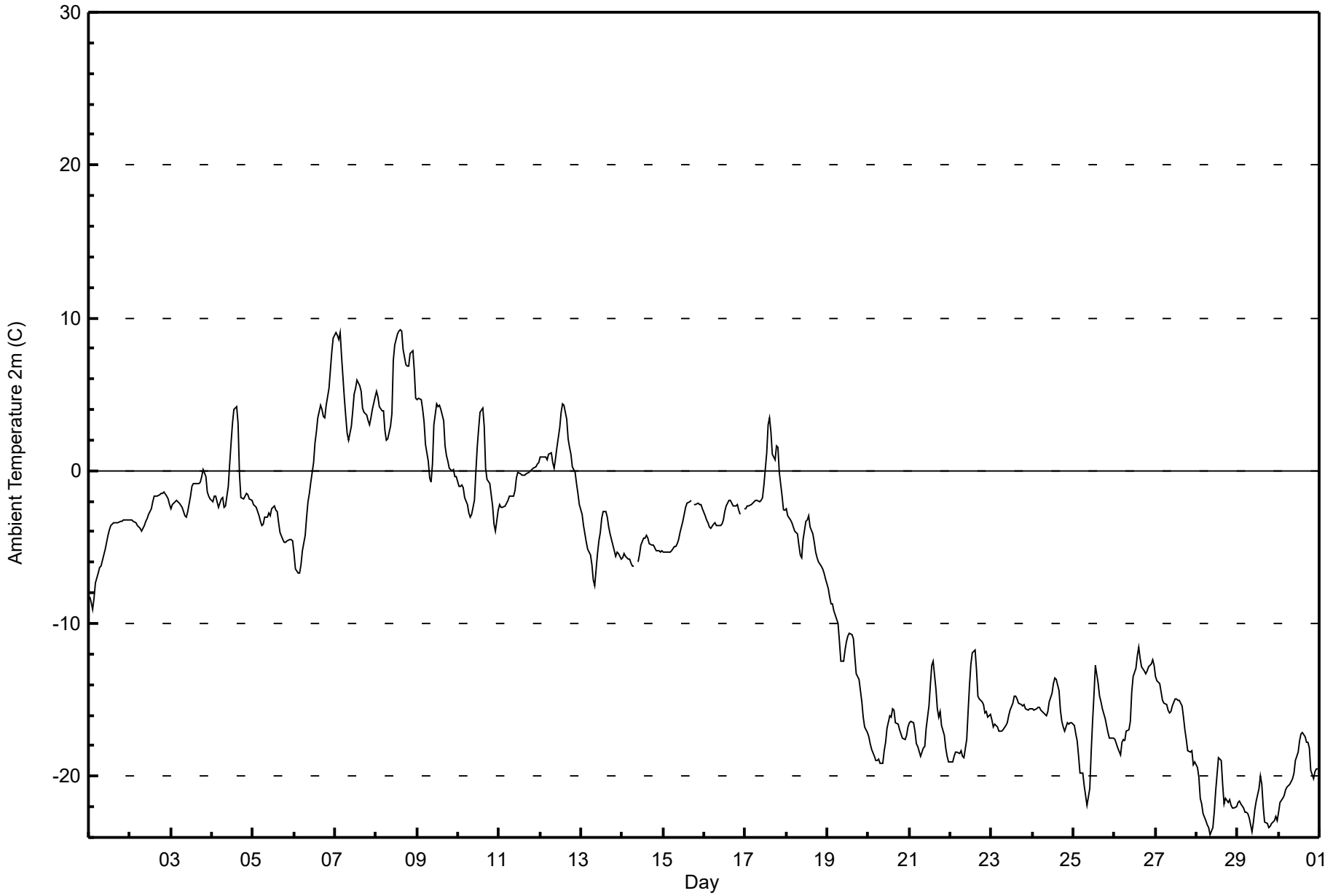
Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 2m (AT2) - C

Jackfish 2/3 - November 2024

Maximum Value: 9.2 C on Nov 8 15:00		Maximum Daily Average: 5.9 C on Nov 8		Hours in Service: 720																																												
Minimum Value: -23.8 C on Nov 28 09:00		Minimum Daily Average: -22.3 C on Nov 29		Hours of Data: 717																																												
Maximum Diurnal Average: -5.4 C at hour 15		Minimum Diurnal Average: -9.2 C at hour 9		Hours of Missing Data: 3																																												
Monthly Average: -7.60 C		Percentiles: P <sub>1</sub> = -23.1 P <sub>10</sub> = -19.1 Q <sub>1</sub> = -16.0 Median = -4.6 Q <sub>3</sub> = -1.7 P <sub>90</sub> = 3.0 P <sub>99</sub> = 8.6		Hours of Calibration: 0																																												
				Percent Operational Time: 99.6																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-8.3	-8.6	-9.1	-8.3	-7.3	-6.7	-6.4	-6.3	-5.9	-5.1	-4.7	-4.2	-3.9	-3.6	-3.4	-3.4	-3.4	-3.4	-3.3	-3.4	-3.2	-3.2	-3.2	-3.2	-5.1	-3.2																						
2-Nov	-3.2	-3.3	-3.3	-3.4	-3.6	-3.7	-3.8	-3.9	-3.6	-3.3	-3.1	-2.9	-2.5	-2.1	-1.7	-1.7	-1.6	-1.6	-1.5	-1.5	-1.4	-1.6	-1.8	-2.2	-2.6	-1.4																						
3-Nov	-2.5	-2.2	-2.0	-2.0	-2.0	-2.1	-2.4	-2.7	-3.0	-3.1	-2.6	-1.7	-1.0	-0.8	-0.8	-0.8	-0.8	-0.8	-0.4	0.1	-0.4	-1.4	-1.7	-1.8	-1.6	0.1																						
4-Nov	-2.0	-1.7	-1.7	-2.0	-2.4	-1.9	-1.7	-2.4	-2.3	-1.1	0.4	1.8	3.1	4.0	4.2	3.1	-0.2	-1.8	-1.9	-1.6	-1.5	-1.6	-1.8	-1.9	-0.6	4.2																						
5-Nov	-2.3	-2.3	-2.4	-3.0	-3.3	-3.6	-3.5	-3.0	-3.1	-2.8	-2.9	-2.5	-2.3	-2.5	-2.6	-3.4	-4.1	-4.5	-4.7	-4.6	-4.6	-4.5	-4.5	-4.6	-3.4	-2.3																						
6-Nov	-5.4	-6.4	-6.7	-6.7	-6.2	-5.2	-4.2	-3.1	-2.0	-1.5	-0.8	0.5	1.8	2.5	3.5	4.2	4.0	3.6	3.4	4.3	5.4	6.6	7.7	8.7	0.3	8.7																						
7-Nov	9.0	8.9	8.6	9.0	7.5	4.8	3.5	2.4	2.0	2.9	3.9	5.0	5.4	5.9	5.5	5.2	4.1	3.8	3.6	3.2	3.0	3.5	4.0	4.8	5.0	9.0																						
8-Nov	5.2	4.8	4.2	3.9	3.9	2.7	2.0	2.1	2.9	3.7	7.2	8.2	8.9	9.1	9.2	9.2	8.0	6.9	6.8	6.8	7.6	7.8	6.5	4.7	5.9	9.2																						
9-Nov	4.7	4.7	4.6	4.0	3.2	1.7	0.6	-0.5	-0.8	0.4	3.0	4.4	4.2	4.3	4.0	3.3	1.6	1.0	0.6	0.2	0.0	0.1	-0.4	-0.4	2.0	4.7																						
10-Nov	-1.0	-1.0	-0.9	-1.2	-1.8	-2.3	-2.8	-3.1	-2.9	-1.9	-0.1	1.5	2.7	3.8	4.1	2.9	0.2	-0.6	-0.9	-1.5	-2.3	-3.5	-3.9	-2.6	-0.8	4.1																						
11-Nov	-2.2	-2.4	-2.4	-2.3	-2.1	-2.0	-1.6	-1.7	-1.7	-1.3	-0.5	-0.1	-0.2	-0.3	-0.3	-0.2	-0.1	-0.1	0.0	0.2	0.3	0.4	0.5	-0.8	0.5																							
12-Nov	0.9	0.9	0.9	0.9	0.7	1.1	1.2	0.5	0.2	0.8	1.5	2.8	3.8	4.3	4.3	3.4	2.1	1.5	1.1	0.2	-0.1	-0.8	-1.5	-2.2	1.2	4.3																						
13-Nov	-2.9	-3.6	-4.1	-4.7	-5.2	-5.5	-6.2	-7.2	-7.5	-5.4	-4.6	-4.0	-3.1	-2.7	-2.7	-3.0	-3.7	-4.1	-4.8	-5.3	-5.6	-5.3	-5.4	-5.8	-4.7	-2.7																						
14-Nov	-5.7	-5.5	-5.6	-5.8	-5.8	-6.0	-6.2	-6.2	DF	-5.9	-5.5	-4.8	-4.5	-4.4	-4.3	-4.4	-4.7	-4.8	-4.9	-5.1	-5.2	-5.3	-5.3	-5.3	-5.3	-4.3																						
15-Nov	-5.3	-5.3	-5.4	-5.4	-5.4	-5.3	-5.0	-4.9	-4.7	-4.5	-4.0	-3.3	-2.8	-2.4	-2.1	-2.0	-2.0	DF	-2.2	-2.2	-2.2	-2.2	-2.2	-2.5	-3.6	-2.0																						
16-Nov	-2.9	-3.2	-3.4	-3.7	-3.7	-3.5	-3.4	-3.6	-3.6	-3.5	-3.2	-2.7	-2.3	-1.9	-2.0	-2.2	-2.2	-2.3	-2.3	-2.2	-2.6	-2.9	M	-2.5	-2.9	-1.9																						
17-Nov	-2.5	-2.3	-2.3	-2.2	-2.1	-2.0	-2.0	-1.9	-2.0	-2.0	-1.8	-0.9	1.1	3.0	3.5	2.6	1.1	0.7	1.6	1.6	-0.1	-1.7	-2.6	-2.6	-0.7	3.5																						
18-Nov	-2.5	-3.0	-3.2	-3.4	-3.7	-4.0	-4.2	-4.8	-5.5	-5.7	-4.5	-3.3	-3.2	-2.9	-3.7	-4.1	-4.7	-5.3	-5.7	-6.0	-6.3	-6.5	-6.7	-7.1	-4.6	-2.5																						
19-Nov	-7.7	-8.3	-8.7	-8.7	-9.2	-9.7	-10.0	-11.2	-12.5	-12.4	-11.7	-11.2	-10.8	-10.6	-10.7	-11.0	-12.2	-13.3	-13.7	-14.4	-15.2	-16.1	-16.7	-17.2	-11.8	-7.7																						
20-Nov	-17.4	-17.9	-18.3	-18.6	-18.9	-19.0	-18.8	-19.1	-19.1	-18.3	-17.8	-16.9	-16.0	-16.1	-15.6	-15.7	-16.5	-16.6	-16.9	-17.2	-17.5	-17.6	-17.3	-16.7	-17.5	-15.6																						
21-Nov	-16.5	-16.4	-16.5	-17.0	-17.9	-18.1	-18.7	-18.4	-18.2	-18.0	-16.9	-15.4	-14.0	-12.8	-12.5	-14.3	-15.5	-16.1	-15.8	-16.7	-17.4	-18.1	-18.7	-19.1	-16.6	-12.5																						
22-Nov	-19.1	-19.1	-18.7	-18.4	-18.4	-18.5	-18.3	-18.7	-18.8	-17.6	-15.7	-14.0	-12.7	-12.0	-11.8	-13.0	-14.7	-14.9	-15.1	-15.3	-15.9	-15.8	-16.1	-15.9	-16.2	-11.8																						
23-Nov	-16.3	-16.8	-16.6	-16.8	-17.0	-17.0	-17.1	-16.9	-16.7	-16.5	-16.0	-15.7	-15.2	-14.8	-14.8	-14.9	-15.2	-15.3	-15.4	-15.3	-15.6	-15.7	-15.6	-15.6	-15.9	-14.8																						
24-Nov	-15.6	-15.7	-15.6	-15.5	-15.5	-15.7	-15.8	-16.0	-16.1	-15.7	-15.2	-14.5	-14.0	-13.6	-13.7	-14.4	-15.7	-16.4	-16.8	-17.1	-16.5	-16.6	-16.5	-16.5	-15.6	-13.6																						
25-Nov	-16.7	-17.2	-17.7	-18.7	-19.8	-19.8	-20.6	-21.3	-21.9	-20.8	-18.4	-16.4	-14.7	-12.7	-14.0	-14.8	-15.1	-15.6	-16.2	-16.7	-17.2	-17.5	-17.5	-17.5	-17.4	-12.7																						
26-Nov	-17.6	-17.8	-18.1	-18.6	-17.8	-17.6	-17.7	-17.1	-17.0	-16.4	-14.5	-13.4	-12.9	-12.1	-11.5	-12.3	-12.8	-13.1	-13.3	-13.1	-12.8	-12.7	-12.3	-12.7	-14.8	-11.5																						
27-Nov	-13.5	-13.8	-13.9	-14.5	-15.1	-15.2	-15.3	-15.7	-15.9	-15.7	-15.4	-14.9	-14.9	-15.1	-15.0	-15.4	-16.1	-16.9	-17.6	-18.3	-18.4	-18.4	-19.3	-19.0	-16.0	-13.5																						
28-Nov	-19.4	-20.1	-21.4	-21.8	-22.4	-22.9	-23.2	-23.4	-23.8	-23.4	-22.4	-21.0	-19.9	-18.8	-18.9	-20.5	-21.8	-21.5	-21.7	-21.6	-21.9	-22.0	-22.1	-22.0	-21.6	-18.8																						
29-Nov	-21.7	-21.6	-21.8	-22.1	-22.3	-22.4	-22.4	-22.7	-23.7	-23.0	-22.1	-21.6	-20.8	-20.0	-20.5	-22.0	-23.0	-23.1	-23.4	-23.3	-23.1	-22.9	-22.6	-22.9	-22.3	-20.0																						
30-Nov	-22.3	-21.7	-21.5	-21.3	-20.9	-20.7	-20.5	-20.3	-20.2	-19.8	-19.0	-18.4	-17.7	-17.2	-17.1	-17.5	-17.8	-17.8	-18.1	-19.6	-20.1	-19.7	-19.5	-19.5	-19.5	-17.1																						
																								-7.8	-7.9	-8.1	-8.3	-8.5	-8.7	-8.8	-9.0	-9.2	-8.6	-7.6	-6.7	-6.0	-5.4	-5.4	-5.9	-6.8	-7.3	-7.3	-7.5	-7.7	-7.8	-8.2	-8.0	Diurnal Average
																								9.0	8.9	8.6	9.0	7.5	4.8	3.5	2.4	2.9	3.7	7.2	8.2	8.9	9.1	9.2	9.2	8.0	6.9	6.8	6.8	7.6	7.8	7.7	8.7	Diurnal Maximum
M - Maintenance																								DF - DAS Failure																								





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C**  
**Jackfish 2/3 - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	57	7.95	7.95
-20 - 0	534	74.48	82.43
0 - 10	126	17.57	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

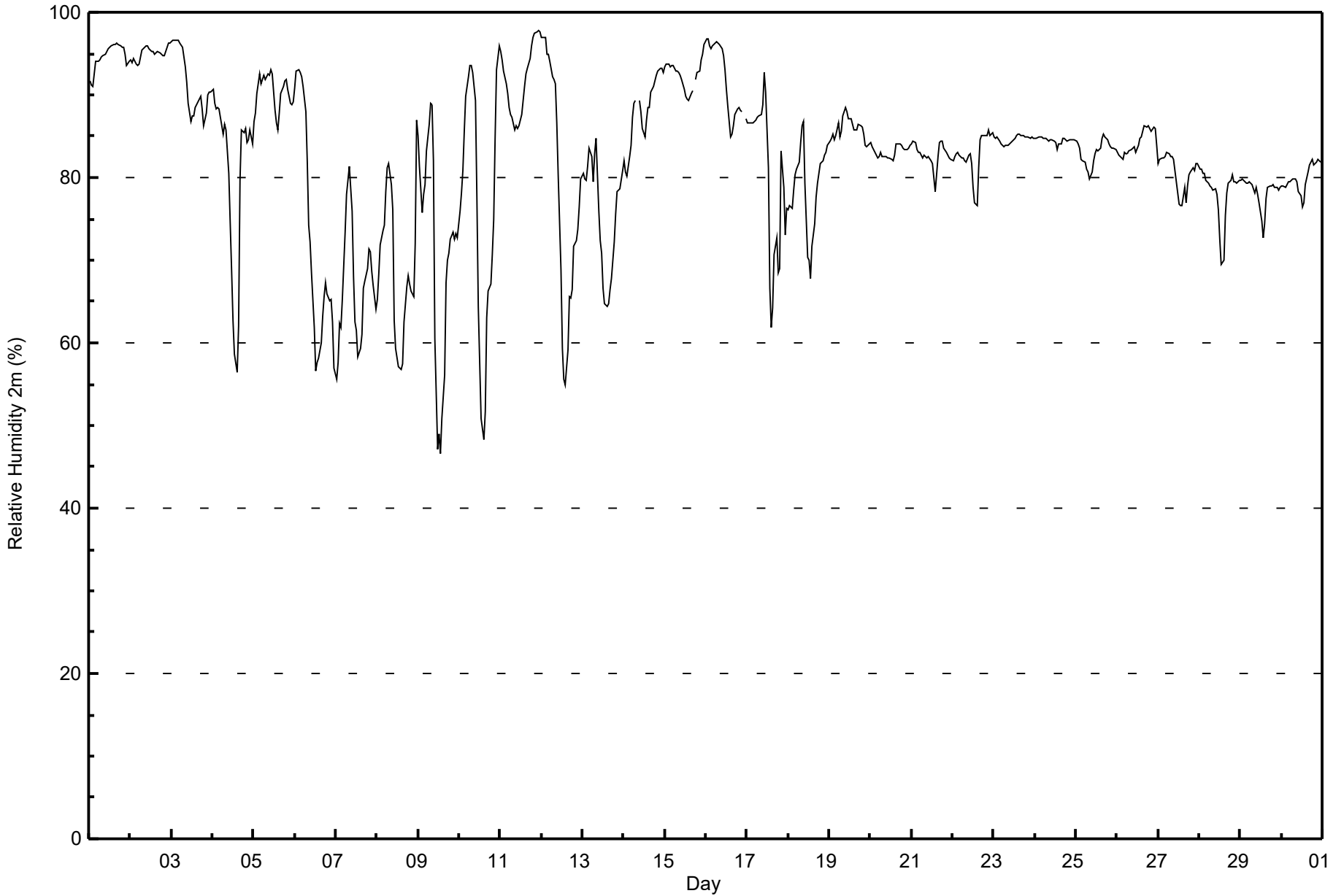
**Relative Humidity 2m (RH2) - %**  
**Jackfish 2/3 - November 2024**

Maximum Value: 97.8 % on Nov 11 23:00      Maximum Daily Average: 95.0 % on Nov 2																						Hours in Service:	720																								
Minimum Value: 46.7 % on Nov 9 14:00      Minimum Daily Average: 67.0 % on Nov 7																						Hours of Data:	717																								
Maximum Diurnal Average: 86.2 % at hour 8      Minimum Diurnal Average: 75.4 % at hour 14																						Hours of Missing Data:	3																								
Monthly Average: 82.39 %      Percentiles: P <sub>1</sub> = 55.0 P <sub>10</sub> = 67.4 Q <sub>1</sub> = 79.0 Median = 83.8 Q <sub>3</sub> = 88.5 P <sub>90</sub> = 94.2 P <sub>99</sub> = 96.9																						Hours of Calibration:	0																								
																						Percent Operational Time:	99.6																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Nov	91.8	91.2	91.0	92.5	94.0	94.1	94.3	94.5	94.7	94.8	95.2	95.5	95.8	96.0	96.1	96.2	96.2	96.1	95.9	95.8	95.8	95.0	93.5	94.1	94.6	96.2																					
2-Nov	94.2	93.9	94.4	93.7	93.5	93.7	94.6	95.4	95.7	95.9	96.0	95.6	95.3	95.3	94.9	95.1	95.2	95.1	94.9	94.7	94.7	95.7	96.3	96.3	95.0	96.3																					
3-Nov	96.5	96.6	96.6	96.6	96.6	96.4	95.7	94.5	93.3	91.5	89.0	86.8	87.4	87.4	88.4	89.2	89.4	89.9	88.3	86.2	87.7	90.0	90.4	90.3	91.4	96.6																					
4-Nov	90.6	89.1	88.4	88.5	88.4	86.2	85.3	86.4	85.8	80.5	74.5	68.7	62.7	58.7	56.4	62.0	79.7	85.8	85.5	85.9	84.2	84.5	85.8	84.0	80.3	90.6																					
5-Nov	86.8	87.7	90.1	92.5	91.3	91.9	92.3	91.9	92.5	92.3	93.1	92.5	88.2	86.6	85.8	87.8	90.2	90.9	91.8	91.8	90.6	89.0	88.8	89.2	90.2	93.1																					
6-Nov	90.8	92.9	93.0	92.8	92.2	91.0	88.0	81.9	74.2	72.1	68.5	61.9	56.7	57.7	58.1	60.0	63.3	65.7	67.2	65.9	65.2	65.2	62.5	56.9	72.6	93.0																					
7-Nov	55.6	57.6	62.3	61.9	65.2	73.4	77.9	79.7	81.3	76.0	68.0	62.5	61.6	58.3	59.4	61.1	66.6	67.5	69.0	71.4	71.1	68.6	67.0	64.0	67.0	81.3																					
8-Nov	65.2	68.4	71.8	73.6	74.2	78.4	81.3	81.6	79.2	76.1	62.7	59.4	57.1	57.0	56.7	57.5	62.5	66.8	68.1	67.1	66.3	65.5	72.0	86.9	69.0	86.9																					
9-Nov	85.0	81.4	75.7	77.9	79.1	83.2	86.4	89.0	88.9	82.1	60.5	47.1	48.9	46.7	50.9	56.1	67.2	70.0	70.8	72.6	73.4	72.5	73.2	72.7	71.3	89.0																					
10-Nov	76.0	78.2	80.9	85.6	89.9	92.3	93.5	93.6	92.8	89.3	77.6	64.4	57.6	50.9	48.3	51.7	63.1	66.3	67.1	70.7	74.9	84.7	93.1	95.9	76.6	95.9																					
11-Nov	95.2	94.2	92.8	91.4	90.1	88.5	87.6	87.3	85.8	86.3	85.9	86.3	87.6	89.3	91.0	92.5	93.3	94.3	95.9	96.9	97.4	97.7	97.8	97.6	91.8	97.8																					
12-Nov	97.0	97.0	96.9	94.8	95.0	94.1	92.2	91.8	91.3	86.7	80.3	68.7	59.3	55.6	54.9	59.1	65.6	65.5	66.5	71.7	72.4	73.8	76.4	79.8	78.6	97.0																					
13-Nov	80.5	79.9	79.6	81.3	83.6	82.5	79.4	82.8	84.8	75.9	72.4	70.8	66.6	64.7	64.4	64.7	66.4	67.8	72.3	75.5	78.3	78.5	78.7	80.9	75.5	84.8																					
14-Nov	82.1	80.7	80.2	82.6	83.9	87.2	89.0	89.4	DF	89.4	88.0	85.9	85.0	87.0	88.4	88.4	90.3	91.1	91.6	92.4	92.9	93.2	93.2	92.8	88.0	93.2																					
15-Nov	93.4	93.8	93.7	93.5	93.5	93.5	93.0	92.9	92.7	92.4	91.9	90.8	89.9	89.5	89.3	90.1	90.4	DF	91.9	92.7	92.8	94.2	95.0	96.1	92.5	96.1																					
16-Nov	96.9	96.8	96.0	95.7	96.0	96.3	96.4	96.2	96.0	95.6	94.7	93.1	90.7	88.6	85.0	85.2	86.3	87.6	88.3	88.5	88.1	88.1	M	87.1	91.9	96.9																					
17-Nov	86.6	86.6	86.6	86.7	86.8	87.0	87.3	87.5	87.6	88.9	92.7	90.4	81.1	66.5	61.8	64.2	70.6	72.7	68.5	68.9	83.2	78.9	73.1	76.3	80.0	92.7																					
18-Nov	76.1	76.6	76.3	78.5	80.3	81.0	81.8	84.3	86.3	86.7	79.3	70.4	69.9	67.7	71.7	74.4	77.6	79.2	80.5	81.6	82.1	82.7	83.1	83.9	78.8	86.7																					
19-Nov	84.4	84.8	85.3	84.5	85.1	86.7	84.9	85.5	87.5	88.4	87.9	87.2	87.1	87.1	85.8	85.7	85.8	86.5	86.3	86.1	85.2	84.0	83.8	84.0	85.8	88.4																					
20-Nov	84.2	83.8	83.4	82.7	82.3	82.5	83.0	82.6	82.5	82.5	82.3	82.4	82.3	82.0	82.8	84.0	84.1	84.1	83.9	83.5	83.5	83.4	83.6	84.0	83.1	84.2																					
21-Nov	84.1	84.4	84.2	83.4	83.0	83.0	82.4	82.7	82.5	82.4	82.6	82.1	81.7	80.0	78.3	82.5	84.3	84.4	84.4	83.5	83.1	82.8	82.3	82.1	82.8	84.4																					
22-Nov	82.1	82.5	83.0	83.0	82.6	82.4	82.4	82.0	81.9	82.7	83.0	81.7	78.9	76.9	76.7	81.1	84.5	85.2	85.0	85.1	85.2	85.8	85.2	85.3	82.7	85.8																					
23-Nov	84.9	84.8	84.9	84.4	84.1	84.0	83.8	83.9	84.0	84.0	84.2	84.3	84.7	85.1	85.3	85.2	85.1	85.0	84.9	85.0	84.8	84.8	84.8	84.8	84.6	85.3																					
24-Nov	84.8	84.8	84.9	84.9	84.9	84.7	84.7	84.6	84.5	84.6	84.5	84.5	84.3	83.4	84.0	84.1	84.7	84.8	84.6	84.4	84.6	84.6	84.5	84.7	84.5	84.9																					
25-Nov	84.5	84.0	83.5	82.2	82.0	81.8	81.0	80.7	79.9	80.7	82.0	82.8	83.4	83.3	83.5	84.8	85.3	84.9	84.5	84.1	83.7	83.5	83.5	83.3	83.0	85.3																					
26-Nov	83.0	82.8	82.5	82.3	83.1	82.9	83.0	83.2	83.4	83.6	83.8	83.0	83.9	84.8	84.9	85.6	86.3	86.1	86.3	86.0	85.7	86.1	85.9	83.9	84.2	86.3																					
27-Nov	81.6	82.3	82.4	82.3	82.6	83.0	82.9	82.5	82.5	82.2	80.9	78.1	76.8	76.6	76.6	78.9	77.0	79.1	80.4	80.6	81.1	80.8	81.8	81.7	80.6	83.0																					
28-Nov	81.0	81.0	80.5	80.4	79.7	79.4	78.9	78.8	78.4	78.7	78.1	76.2	72.6	69.5	70.0	75.5	78.2	79.2	79.7	80.3	79.6	79.5	79.4	79.6	78.1	81.0																					
29-Nov	79.7	79.8	79.6	79.3	79.3	79.5	79.4	79.2	78.1	78.9	78.0	77.0	74.8	72.7	74.4	77.5	78.8	79.0	79.0	79.1	78.9	78.8	78.4	78.8	78.2	79.8																					
30-Nov	78.9	79.1	78.8	79.2	79.4	79.4	79.7	79.8	79.8	79.6	78.3	77.8	76.4	77.0	79.2	80.8	81.5	81.9	82.2	81.5	81.8	82.2	82.0	81.9	79.9	82.2																					
																						84.5	84.5	84.6	84.9	85.4	86.0	86.1	86.2	85.8	84.7	81.9	78.9	76.9	75.4	75.4	77.4	80.3	81.1	81.8	82.3	82.9	83.1	83.3	84.0	Diurnal Average	
																						97.0	97.0	96.9	96.6	96.6	96.4	96.4	96.2	96.0	95.9	96.0	95.6	95.8	96.0	96.1	96.2	96.2	96.1	95.9	96.9	97.4	97.7	97.8	97.6	Diurnal Maximum	
M - Maintenance      DF - DAS Failure																																															



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 2m (RH2) - %**  
**Jackfish 2/3 - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 2m (RH2) - %**  
**Jackfish 2/3 - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	28	3.91	3.91
60 - 80	192	26.78	30.68
80 - 100	497	69.32	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



Maximum Speed: 21 km/h on Nov 7 00:00	Maximum Daily Speed Average: 11.6 km/h on Nov 12	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 21 16:00	Minimum Daily Speed Average: 1.2 km/h on Nov 1	Hours of Data: 710
Maximum Diurnal Speed Average: 2.9 km/h at hour 9	Minimum Diurnal Speed Average: 1.0 km/h at hour 19	Hours of Missing Data: 10
Monthly Average Velocity: 1.9 km/h 249.9 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 3 Q <sub>1</sub> = 4 Median = 6 Q <sub>3</sub> = 8 P <sub>90</sub> = 10 P <sub>99</sub> = 17	Percent Operational Time: 98.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	UO	UO	UO	UO	ENE3	ENE2	UO	ENE3	ENE1	SSE1	NE2	NE3	ENE3	ENE3	ENE2	ENE3	NE3	ENE2	ENE1	NNW0	SSW2	SW3	SSW3	SW2	ENE1.2	ENE3	
2-Nov	S2	SSW2	SSW2	SSW2	S2	SE2	ESE4	ESE5	ESE5	ESE6	SE6	SE6	SE4	ESE5	E7	E8	E6	E5	E5	ENE3	SSW1	NE1	NNE1	NE1	ESE3.0	E8	
3-Nov	N1	UO	WSW1	W2	WNW4	W5	WNW6	WNW5	W6	W6	WSW7	WSW7	WSW8	SW9	SW8	SSW8	SSW8	SSW7	SW7	SW8	SW7	SW8	WSW8	WSW8	WSW5.7	SW9	
4-Nov	SW8	WSW9	SW8	SW7	SW8	WSW11	WSW12	WSW9	WSW11	WSW10	WSW9	WSW9	WSW7	WSW8	WSW9	SW6	SW4	SSW4	SSW1	ENE1	NE1	SSE1	UO	WSW3	WSW6.4	WSW12	
5-Nov	N1	NE1	NE1	WSW3	WSW3	WSW3	WSW3	WSW4	W6	NW6	NNW6	NW5	NW7	NNW6	NW7	NW8	NW7	NW7	NW5	NW4	WNW5	W5	WSW2	SW4	WNW3.8	NW8	
6-Nov	SSW5	SSW8	SSW7	S5	S6	SSW7	SSW8	SSW9	SSW13	SW13	SSW12	SW13	SW14	SW13	WSW12	WSW13	SW13	SW12	SW13	SW15	WSW15	SW18	WSW20	WSW21	SW11.4	WSW21	
7-Nov	WSW20	WSW17	W12	WNW14	NW11	NNW8	NW9	NW8	WNW8	WNW9	NW7	W9	W9	W8	WSW6	SW5	S2	S4	S4	SSE5	SSE6	S8	S8	S8	W5.9	WSW20	
8-Nov	S9	S7	S7	SSW8	SSW8	S8	S8	S8	SSW9	SSW9	SW11	SW11	SW9	SSW7	SSW6	SW6	SSW7	SW6	SW6	W7	WNW9	NW11	WNW10	WSW7	SW6.5	SW11	
9-Nov	WSW8	W7	W7	W6	WNW7	WNW5	W6	W5	W5	W4	WNW3	NNW2	WSW3	SW2	SSW4	SW4	SSW3	S4	SSW4	SSW4	SSW4	SSW5	SSW5	SSW6	WSW3.8	WSW8	
10-Nov	SW5	SSW7	SW7	SW8	SW8	SW7	SSW7	SW7	SW9	SW9	WSW9	WSW8	WSW10	WSW9	WSW9	WSW7	SSW5	SSW6	SSW6	SSW6	SSW6	S7	S8	S8	SW6.8	WSW10	
11-Nov	S8	S10	SSE10	SSE10	SSE9	S9	SSE8	SSE9	SE9	SSE9	S9	S10	S11	S9	S10	S8	S9	SSE6	SSE5	SSE5	SSE4	SSE4	S3	SW4	SSE7.7	S11	
12-Nov	WSW6	WSW10	WSW12	WSW11	WSW10	WSW13	WSW15	WSW14	WSW16	WSW19	WSW17	WSW17	W17	W14	W14	W12	WSW12	WSW12	WSW10	W7	WSW7	WSW7	WSW5	WSW6	WSW11.6	WSW19	
13-Nov	W5	WSW6	WNW4	WNW4	NNW3	N4	N4	NNE2	NE2	E2	SE3	ENE3	ENE5	NE7	ENE7	ENE8	NE8	ENE8	ENE8	ENE7	NE8	ENE9	ENE9	ENE10	NE3.8	ENE10	
14-Nov	ENE10	ENE10	ENE9	ENE9	ENE9	ENE10	ENE10	ENE11	DF	ENE10	ENE10	ENE9	ENE8	ENE8	NE7	NE8	ENE7	NE7	NE6	NE5	ENE5	NE5	N3	N2	ENE7.7	ENE11	
15-Nov	NNE3	NNE2	NNE3	N2	NNE2	NNE1	WSW1	WSW0	S2	SSW3	SSW4	WSW5	SW5	SW6	SW7	SW6	SW6	DF	SW6	SW6	SW7	WSW7	WSW8	WSW9	SW3.3	WSW9	
16-Nov	SW9	SW9	SW9	SW9	SW10	SSW7	SSW8	SSW9	SSW8	SSW8	SSW9	S10	SSW10	SSW9	S10	SSW10	SSW11	S10	S10	S11	S11	S11	M	S10	SSW9.2	S11	
17-Nov	S9	S9	S8	S9	S9	SSW8	SSW6	SSW7	SSW9	SSW9	SSW9	SW10	SW10	WSW13	WSW14	WSW12	SW10	SW11	WSW13	WSW15	W14	WNW13	WNW11	W7	SW8.7	WSW15	
18-Nov	WNW9	WNW9	WNW7	WNW6	WNW6	W6	WNW4	NW3	W4	W6	NW5	NW5	WNW5	NW4	NW4	NNW4	NNW4	NNW4	NNW4	NNE4	N4	NE5	NE5	NNE6	NE7	NW3.8	WNW9
19-Nov	NE7	ENE8	ENE8	NE8	ENE7	NE7	NE7	NE5	NNE5	NE8	NNE8	NNE8	NNE7	NNE7	N7	N6	N6	N5	N7	N6	N6	NNW6	NNW5	N6	NNE6.0	ENE8	
20-Nov	NNE6	N5	N4	NNW5	N4	NNE5	N7	N7	NNE7	NNE6	NNE7	N6	NNW5	NNW5	NNE5	NNE5	NNE6	NE8	NNE6	N4	N4	N4	N4	N5	NNE5.2	NE8	
21-Nov	N4	NNE6	NNE3	NW1	N2	NNE3	NNE3	N4	NW3	NNW4	NW3	N3	N3	N3	NNW2	NNE0	SSW1	NW0	NNW4	NNW3	WNW3	WNW4	WNW4	W4	NNW2.4	NNE6	
22-Nov	W4	W5	W5	W5	W5	W5	W4	W4	W4	W5	WNW4	NW4	NNW4	NNW3	NW3	WNW1	SSW1	NNE2	NE3	NE3	NNE3	NE4	NE4	ENE3	NW2.3	W5	
23-Nov	ENE6	NE7	ENE5	ENE5	NE6	NE6	NE6	NE6	NE5	NE5	NE5	NE5	NE5	NE6	NE6	NE6	NE7	NE8	NE10	NE9	NE7	NE7	NE8	NE9	NE6.3	NE10	
24-Nov	NNE6	NE6	NNE7	NE7	NE7	NE7	NE6	NNE6	NE5	NNE5	NNE6	NNE5	NNE5	NNE5	N4	NNE3	NNE4	NNE4	NE3	NNE3	NNE2	NW1	NE1	NE1	NNE4.6	NE7	
25-Nov	NNW1	WNW0	SSW2	SSW1	SSW3	SSW3	S3	S5	S5	SSW4	S3	SSW3	SSW3	SSW5	SSW4	S4	S5	S4	S5	S4	S4	S4	S4	S6	S3.5	S6	
26-Nov	SSW6	SSW6	SSW5	SSW5	SSW6	SSW7	SSW6	SSW7	SSW7	SSW8	SSW8	SSW8	SSW8	SSW9	SSW10	SSW11	SW9	SW10	SW9	WSW10	WSW9	WSW9	W9	W11	SW7.4	SSW11	
27-Nov	WNW10	WNW10	WNW11	WNW12	WNW12	WNW11	WNW9	W9	W10	WNW11	WNW10	WNW10	NW9	NW8	NW8	NW7	NW8	WNW9	NW8	NW7	NW7	NW8	WNW7	NW8	WNW8.9	WNW12	
28-Nov	NW8	WNW6	WNW6	NW6	NW4	NW4	NW5	NW5	NW5	NW5	NW5	NNW5	NNW5	NNW4	NNW4	NW2	WNW3	NNW4	N4	N4	NNW4	N3	NNW3	NNW3	NW4.1	NW8	
29-Nov	N3	N3	N3	NNE3	NNE4	NNE5	NNE4	NE3	NNE1	NNE2	NNE3	NNE2	NE3	NE5	NE5	NE3	ENE5	E4	ENE4	ENE4	ENE4	ENE4	ENE3	NE4	NE3.2	NE5	
30-Nov	ENE4	ENE3	E4	ESE3	ESE4	SE3	ESE3	SE4	SE4	SE4	SE4	SE4	SE4	SE3	ENE4	ENE4	ENE4	NE4	NNE3	NNE2	N2	N3	NNW3	N3	E2.3	ENE4	

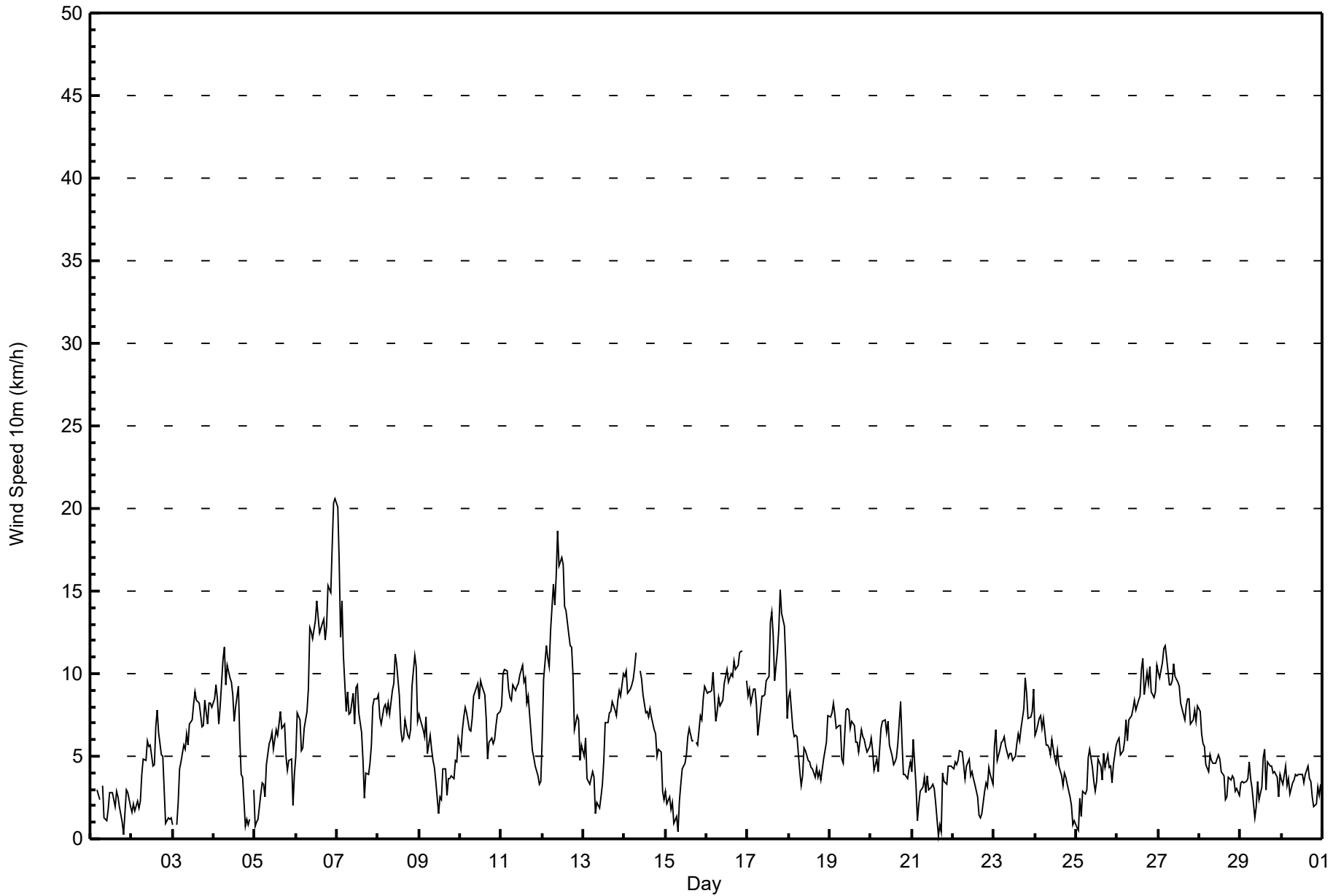
WSW2.1	WSW2.3	WSW2.0	WSW2.1	WSW1.7	WSW1.5	WSW1.7	WSW1.7	SW2.9	WSW2.6	WSW2.3	WSW2.4	WSW2.8	WSW2.3	WSW2.3	WSW1.9	SW1.5	SW1.1	WSW1.0	WSW1.4	W1.7	W1.9	W2.2	WSW2.1	Diurnal Average
WSW20	WSW17	W12	WNW14	WNW12	WSW13	WSW15	WSW14	WSW16	WSW19	WSW17	WSW17	W17	W14	W14	WSW13	SW13	SW12	SW13	SW15	WSW15	SW18	WSW20	WSW21	Diurnal Maximum

M - Maintenance      DF - DAS Failure      UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 10m (WS10) - km/h**  
**Jackfish 2/3 - November 2024**







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Jackfish 2/3 - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	323	45.49	45.49
6 - 11	343	48.31	93.80
12 - 19	41	5.77	99.58
20 - 28	3	0.42	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Jackfish 2/3 - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 5	33	39	31	30	5	7	11	7	21	32	10	13	19	16	23	26	323
6 - 11	10	18	33	26	3	1	3	8	36	53	39	43	19	24	23	4	343
12 - 19	0	0	0	0	0	0	0	0	0	2	9	20	6	4	0	0	41
20 - 28	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	<b>43</b>	<b>57</b>	<b>64</b>	<b>56</b>	<b>8</b>	<b>8</b>	<b>14</b>	<b>15</b>	<b>57</b>	<b>87</b>	<b>58</b>	<b>79</b>	<b>44</b>	<b>44</b>	<b>46</b>	<b>30</b>	<b>710</b>

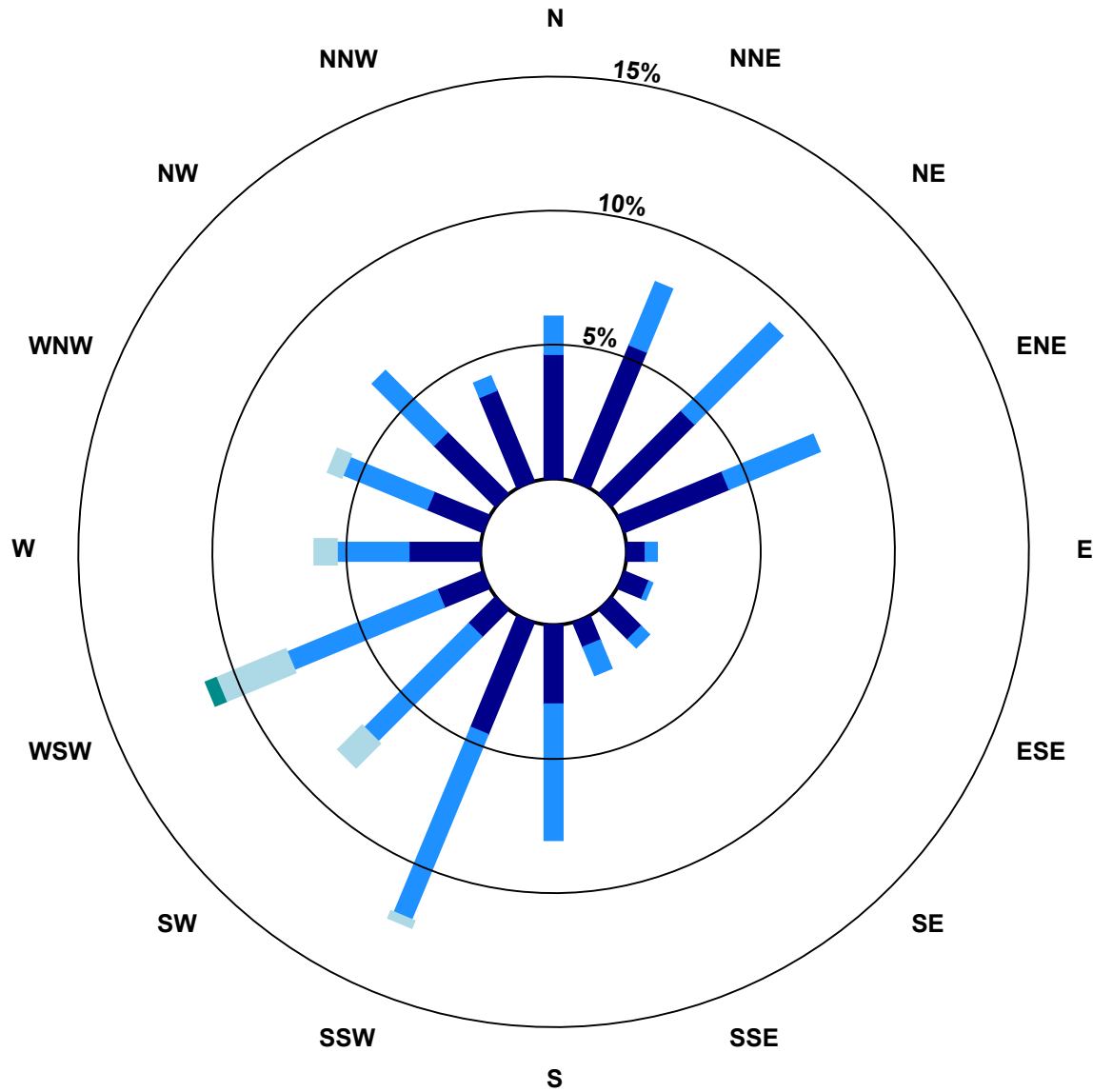
Total Number of Valid Hours: 710

Total Number of Hours: 720

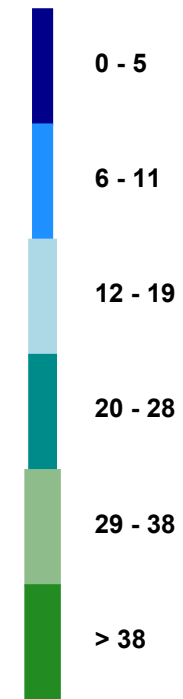


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Jackfish 2/3



Classes (km/h)



Total Number of Valid Hours: 710



**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Jackfish 2/3 - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 6 km/h on Nov 7 00:00	Hours of Data: 710
Minimum Value: 1 km/h on Nov 7 17:00	Hours of Missing Data: 10
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 6	Hours of Calibration: 0
	Percent Operational Time: 98.6

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	UO	UO	UO	UO	1	1	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2-Nov	1	1	1	1	1	1	2	2	2	3	2	2	2	2	3	3	2	1	2	1	1	1	1	1	1	3
3-Nov	1	UO	1	1	1	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2	3
4-Nov	2	2	2	2	2	3	3	2	3	2	2	3	2	3	3	2	1	1	1	1	1	1	1	UO	1	3
5-Nov	1	1	1	1	1	1	1	1	2	2	3	2	3	3	3	3	3	3	2	2	2	2	2	1	1	3
6-Nov	2	2	2	1	2	2	3	3	4	5	4	4	4	4	4	4	3	3	4	5	4	6	6	6	6	6
7-Nov	6	5	4	6	5	3	4	3	3	4	3	3	3	3	2	1	1	1	1	2	2	3	3	3	6	
8-Nov	3	2	2	2	2	2	2	2	2	2	3	3	3	3	2	2	2	2	2	2	4	5	4	2	5	
9-Nov	2	3	3	2	3	2	2	1	1	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	2	3
10-Nov	1	2	2	2	2	2	1	2	2	2	3	3	3	3	3	2	1	1	2	2	2	2	3	3	3	
11-Nov	3	4	4	4	4	3	4	4	4	4	4	4	4	4	3	4	3	3	2	2	2	2	2	1	4	
12-Nov	2	3	3	3	3	4	4	4	5	5	6	6	6	6	4	4	3	3	3	2	2	2	1	1	6	
13-Nov	2	2	1	2	2	1	1	1	1	1	1	2	2	2	2	2	2	3	2	2	2	3	3	3	3	
14-Nov	3	3	2	3	3	3	3	4	DF	3	3	3	3	2	2	2	2	2	2	2	2	2	1	1	4	
15-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	DF	2	2	2	2	2	3	3	
16-Nov	3	3	3	3	3	2	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	M	4	4	
17-Nov	3	4	3	3	3	3	2	3	3	3	3	3	3	4	4	4	3	3	3	4	5	5	5	3	5	
18-Nov	4	4	3	2	2	2	2	1	1	2	2	2	2	2	1	2	2	1	2	2	1	2	2	2	4	
19-Nov	2	2	3	2	2	2	3	2	2	3	3	3	2	3	3	2	2	2	3	2	2	2	2	2	3	
20-Nov	2	2	2	2	2	3	3	3	3	3	3	2	2	2	2	2	2	3	3	1	1	1	2	2	3	
21-Nov	2	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	2	1	1	1	1	2	
22-Nov	1	2	1	2	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
23-Nov	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	2	3	3	2	2	2	3	3	
24-Nov	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	3	
25-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	2	2	1	2	1	2	2	2	
26-Nov	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	2	3	2	3	2	2	4	4	4	
27-Nov	5	4	4	4	5	4	4	4	4	4	4	4	4	3	4	3	4	4	4	3	3	3	3	3	5	
28-Nov	3	3	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	1	2	2	1	1	1	1	3	
29-Nov	1	1	1	1	1	2	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	2	
30-Nov	1	1	1	1	2	1	1	1	2	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2	

6	5	4	6	5	4	4	4	4	5	5	6	6	6	6	4	4	4	4	4	4	5	5	6	6	6
Diurnal Maximum																									

M - Maintenance      DF - DAS Failure      UO - Unstable Operation



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 10m (WD10) - deg

Jackfish 2/3 - November 2024

Direction of Maximum Speed: 239 deg on Nov 7 00:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 253.5 deg on Nov 12	Hours of Data: 710
Direction of Minimum Speed: 22 deg on Nov 21 16:00	Hours of Missing Data: 10
Direction of Minimum Daily Speed Average: 1.2 deg on Nov 1	Percent Operational Time: 98.6
Monthly Average Direction: 249.9 deg	

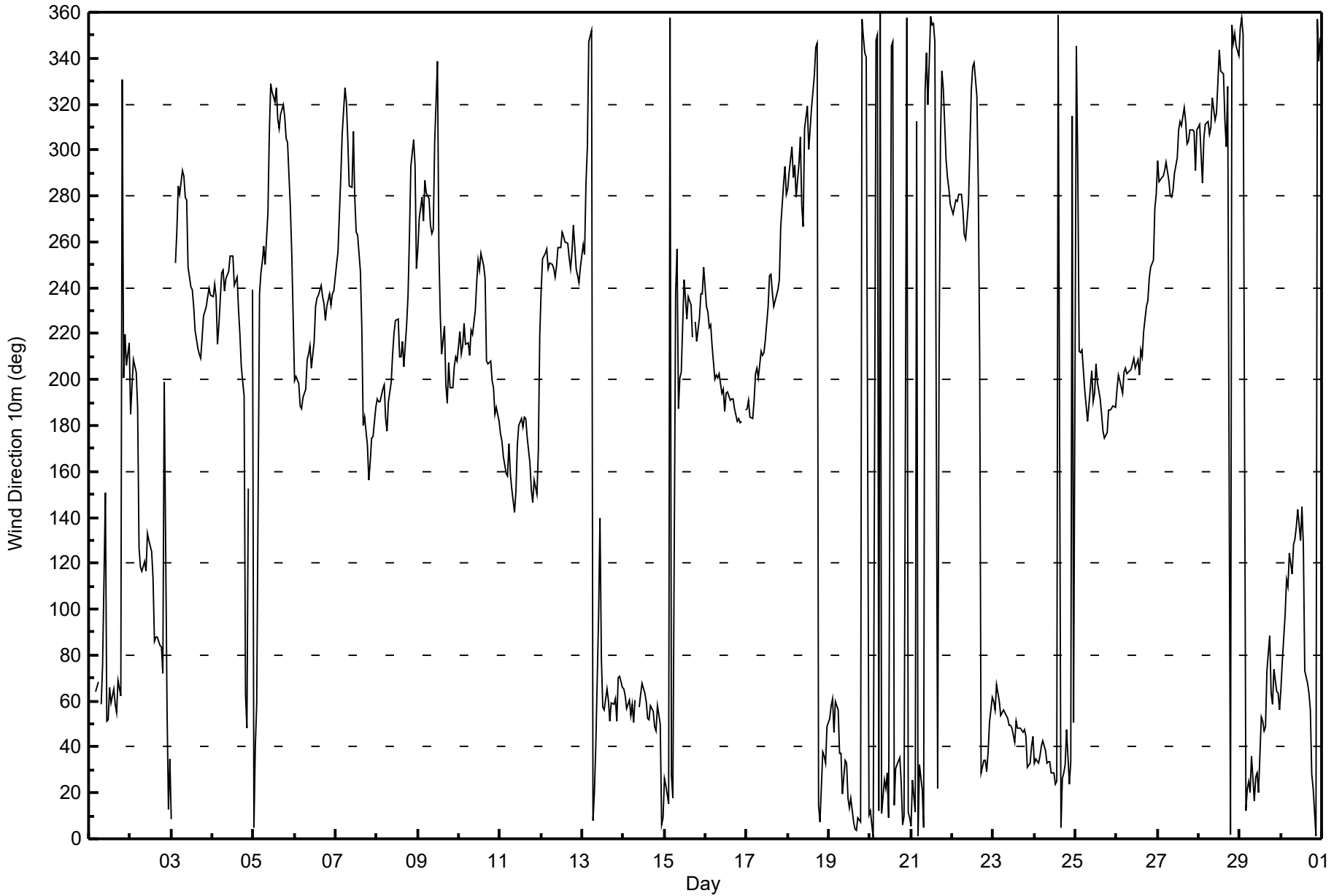
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	UO	UO	UO	UO	64	69	UO	59	76	151	51	52	66	59	65	59	55	69	62	331	201	220	206	216	74.8
2-Nov	185	198	209	203	188	127	118	116	121	116	133	130	125	114	86	88	88	84	83	72	199	56	13	35	111.1
3-Nov	9	UO	251	265	285	281	291	288	279	278	249	240	239	232	222	213	211	209	218	228	232	236	240	237	241.7
4-Nov	236	242	236	215	224	246	248	239	244	247	254	254	241	244	231	219	205	193	63	48	153	UO	239	239.8	
5-Nov	5	40	59	237	246	251	258	250	273	308	329	325	321	327	314	309	316	320	314	305	303	275	255	227	300.3
6-Nov	200	202	198	189	187	192	196	209	211	215	205	217	232	235	237	241	236	233	226	232	237	232	237	239	223.9
7-Nov	250	256	272	288	307	327	321	304	284	284	308	279	264	263	247	223	180	184	172	156	164	174	175	188	259.8
8-Nov	191	191	190	196	198	183	178	190	199	211	220	226	226	210	210	217	206	224	236	262	293	305	293	249	220.6
9-Nov	257	270	280	269	287	282	279	267	264	265	303	338	258	228	211	223	198	189	208	196	197	205	210	208	248.6
10-Nov	221	211	215	225	215	216	211	222	220	230	242	252	248	255	250	244	208	207	208	200	196	185	188	182	221.1
11-Nov	176	173	167	159	158	172	159	153	142	151	171	180	183	179	184	183	175	164	152	147	156	150	169	219	167.7
12-Nov	239	253	255	257	248	251	250	248	245	250	257	257	264	263	260	259	254	248	256	267	248	245	242	249	253.5
13-Nov	259	255	286	301	347	352	8	20	40	97	140	78	58	56	65	60	51	59	59	61	51	70	71	66	51.1
14-Nov	65	62	57	60	54	58	50	60	DF	58	63	68	64	60	52	52	58	56	49	47	58	50	6	9	56.4
15-Nov	26	23	16	358	27	18	238	257	187	201	203	243	236	226	236	232	219	DF	225	217	227	237	237	249	234.0
16-Nov	232	230	223	224	215	200	202	201	202	194	196	186	194	194	191	192	192	187	182	183	181	182	M	187	197.5
17-Nov	187	191	184	183	191	202	205	201	212	210	212	217	232	245	246	238	232	236	239	243	266	285	293	281	230.0
18-Nov	283	291	302	288	293	279	294	306	276	267	310	319	300	309	318	333	345	347	15	7	38	36	33	49	318.9
19-Nov	53	58	61	46	60	56	37	37	20	34	33	17	13	18	7	4	4	9	8	357	349	342	340	11	24.4
20-Nov	12	6	1	348	350	12	360	11	26	22	29	9	345	347	15	30	32	35	25	6	10	358	11	9	12.3
21-Nov	6	26	12	313	1	32	21	5	325	342	320	358	354	355	347	22	206	304	335	327	296	288	283	276	339.9
22-Nov	272	275	278	277	281	281	274	263	261	277	301	326	336	338	324	285	208	29	34	34	29	38	51	62	307.7
23-Nov	60	56	67	60	54	55	56	55	53	49	50	48	42	51	48	48	48	47	48	44	31	33	40	45	48.6
24-Nov	33	35	33	36	40	43	38	33	34	33	28	29	24	25	359	5	26	29	32	48	23	33	315	51	30.8
25-Nov	346	292	213	212	213	195	189	182	189	204	190	194	207	199	192	185	178	174	177	187	187	187	189	188	190.8
26-Nov	196	202	199	194	203	205	203	203	205	207	210	205	209	202	213	210	221	232	234	244	249	252	275	281	221.1
27-Nov	296	286	288	288	291	295	287	280	280	283	290	297	308	313	311	318	312	302	304	309	309	308	291	309	296.9
28-Nov	311	298	285	305	311	313	307	310	323	313	316	329	343	335	333	313	302	328	2	354	347	351	346	341	321.1
29-Nov	353	357	350	12	22	25	20	36	16	27	29	20	53	51	47	49	73	89	63	59	74	64	64	56	41.7
30-Nov	65	77	98	113	110	124	115	128	131	136	144	130	145	128	73	68	64	56	28	22	1	357	339	349	90.9

254.5 251.4 250.3 252.3 255.6 256.0 258.1 238.6 235.9 242.6 248.2 252.8 255.7 254.2 252.2 241.7 222.5 228.5 244.4 250.3 260.3 259.7 266.6 250.9

Diurnal Average

M - Maintenance      DF - DAS Failure      UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Jackfish 2/3 - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 98 deg on Nov 25 02:00	Hours of Data: 710
Minimum Value: 9 deg on Nov 5 05:00	Hours of Missing Data: 10
Percentiles: P <sub>1</sub> = 16 P <sub>10</sub> = 19 Q <sub>1</sub> = 24 Median = 32 Q <sub>3</sub> = 41 P <sub>90</sub> = 48 P <sub>99</sub> = 80	Hours of Calibration: 0
	Percent Operational Time: 98.6

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	UO	UO	UO	UO	31	34	UO	22	56	57	48	37	37	40	57	31	40	52	62	94	30	27	40	35	94
2-Nov	24	29	42	41	45	44	40	36	40	40	46	40	46	45	30	27	27	27	28	43	67	72	27	30	72
3-Nov	14	UO	52	28	33	35	42	38	36	40	28	23	23	23	22	23	23	24	20	18	17	16	17	52	
4-Nov	19	16	18	21	19	19	17	16	17	19	22	29	31	24	20	23	23	21	78	27	16	42	UO	11	78
5-Nov	73	62	70	14	9	12	45	16	28	45	39	41	47	47	40	44	43	41	42	51	47	37	64	30	73
6-Nov	23	17	16	21	22	27	29	25	27	29	28	25	23	21	20	19	20	20	22	23	20	22	21	21	29
7-Nov	21	19	32	37	43	41	43	37	33	36	48	39	31	31	21	20	21	22	27	34	38	36	29	28	48
8-Nov	24	26	26	23	19	17	17	20	19	16	19	18	22	33	17	16	16	20	22	26	37	36	36	25	37
9-Nov	25	30	29	25	33	24	24	17	18	23	53	85	44	70	24	18	23	24	22	28	22	21	24	21	85
10-Nov	19	19	20	20	20	17	17	18	18	17	20	25	21	28	23	18	19	20	19	22	19	22	27	28	28
11-Nov	32	34	38	38	42	45	44	46	41	41	41	42	35	48	38	41	40	47	45	50	45	52	54	36	54
12-Nov	24	19	22	23	21	19	18	19	19	19	26	24	32	33	28	25	19	19	21	28	19	22	30	19	33
13-Nov	22	20	40	41	58	39	40	83	46	44	48	35	25	27	26	22	26	24	23	25	26	28	26	83	
14-Nov	24	26	24	23	23	24	25	26	DF	26	27	28	30	28	27	25	29	27	26	28	29	27	46	42	46
15-Nov	34	43	39	51	40	80	61	86	31	42	27	23	20	24	18	20	19	DF	22	22	19	17	19	19	86
16-Nov	22	22	25	25	22	28	28	29	30	34	32	36	36	36	35	32	32	36	33	32	38	35	M	36	38
17-Nov	35	35	35	37	39	37	31	34	27	25	22	25	25	21	21	22	22	20	20	20	31	35	40	36	40
18-Nov	36	38	44	37	41	36	39	37	26	32	40	51	48	57	45	53	47	50	49	46	33	34	32	28	57
19-Nov	29	29	28	27	32	29	36	31	42	36	38	45	42	44	43	43	41	39	40	41	35	47	38	42	47
20-Nov	42	48	43	37	45	42	45	44	43	43	41	45	43	44	44	37	28	26	40	38	46	37	39	37	48
21-Nov	47	37	43	50	50	26	32	42	46	55	57	59	48	51	57	80	49	96	48	42	40	31	26	23	96
22-Nov	22	25	27	30	27	26	25	37	23	30	47	42	51	44	52	60	50	90	37	26	31	26	23	30	90
23-Nov	25	24	32	26	22	25	25	25	26	23	29	27	26	25	22	24	25	24	23	27	31	31	24	24	32
24-Nov	36	28	34	31	26	25	32	34	35	35	37	42	48	37	51	41	28	24	23	22	40	44	68	58	68
25-Nov	73	98	25	50	27	27	57	17	14	20	25	37	34	40	46	40	32	46	35	37	33	41	34	33	98
26-Nov	31	28	31	30	28	28	31	27	27	27	25	26	26	28	24	24	20	18	19	19	16	18	32	38	38
27-Nov	38	33	35	36	35	37	37	39	34	34	40	39	41	41	44	47	40	35	36	40	40	36	31	39	47
28-Nov	36	35	24	36	38	45	35	37	40	43	37	40	54	55	43	70	71	41	43	44	40	38	37	48	71
29-Nov	40	36	44	44	39	45	40	33	67	71	46	63	49	40	29	28	22	21	19	27	25	31	39	21	71
30-Nov	27	39	24	40	45	58	50	44	38	37	40	48	52	49	36	29	26	27	40	46	54	45	56	43	58

73	98	70	51	58	80	61	86	67	71	57	85	54	70	57	80	71	96	78	94	67	72	68	58	
Diurnal Maximum																								

M - Maintenance      DF - DAS Failure      UO - Unstable Operation



## **WOOD BUFFALO ENVIRONMENTAL ASSOCIATION**

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS29 SURMONT 2 NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT2 (AMS29)  
NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	686	33	34	99.86	6.7	0	2.1	0
H2S (ppb) Average	684	36	36	100	0.3	0	0.1	0
THC(ppm) Average	686	33	34	99.86	2.6	-	2.4	-
NO2 (ppb) Average	682	37	38	99.86	12.3	0	6	-
NO (ppb) Average	682	37	38	99.86	6.8	-	0.8	-
NOX (ppb) Average	682	37	38	99.86	19.1	-	6.4	-
PM2.5 (ug/m3) Average	697	1	23	96.94	12.4	0	6.6	0
Temperature 2 m (C) Average	720	0	0	100	13.7	-	8.5	-
Relative Humidity (%) Average	720	0	0	100	100.1	-	96.1	-
Wind Speed 10 m (km/h) Average	715	0	5	99.31	17	-	11	-
Wind Direction 10 m (deg) Average	715	0	5	99.31	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT 2 (AMS29)  
 NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	686	0.45	0.9	-	0	0	0.1	0.2	0.4	1.1	6.7
H2S (ppb) Average	684	0.07	0	-	0	0	0.1	0.1	0.1	0.1	0.3
THC (ppm) Average	686	2.32	0	-	2.2	2.3	2.3	2.3	2.3	2.4	2.6
NO2 (ppb) Average	682	2	2	-	0.2	0.4	0.6	1.2	2.6	4.5	12.3
NO (ppb) Average	682	0.14	0.4	-	0	0	0	0	0.1	0.3	6.8
NOX (ppb) Average	682	2.13	2.2	-	0.2	0.4	0.7	1.3	2.8	5	19.1
PM2.5 (ug/m3) Average	697	3.44	1.9	-	0.4	1.3	2.2	3	4.4	6	12.4
Temperature 2 m (C) Average	720	-7.8	8.6	-	-28.4	-19.6	-15.1	-5.4	-1.8	2.2	13.7
Relative Humidity (%) Average	720	83.34	9.8	-	42	71.6	77.9	84.2	90.6	95.9	100.1
Wind Speed 10 m (km/h) Average	715	5.4	3	-	0	2	3	5	7	9	17
Wind Direction 10 m (deg) Average	715	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT 2 (AMS29)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2, SO2, THC	05 Nov 2024 14:00	05 Nov 2024 14:00	1	Maintenance - sample manifold cleaned
PM2.5	12 Nov 2024 12:00	13 Nov 2024 09:00	22	Unstable Operation - flatline in analyzer output signal
Wind Speed, Wind Direction	03 Nov 2024 04:00	03 Nov 2024 05:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	05 Nov 2024 00:00	05 Nov 2024 00:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	05 Nov 2024 04:00	05 Nov 2024 04:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	15 Nov 2024 03:00	15 Nov 2024 03:00	1	Flat line in sensor output signal - Sensor frozen



# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Sulphur Dioxide (SO<sub>2</sub>) - ppb

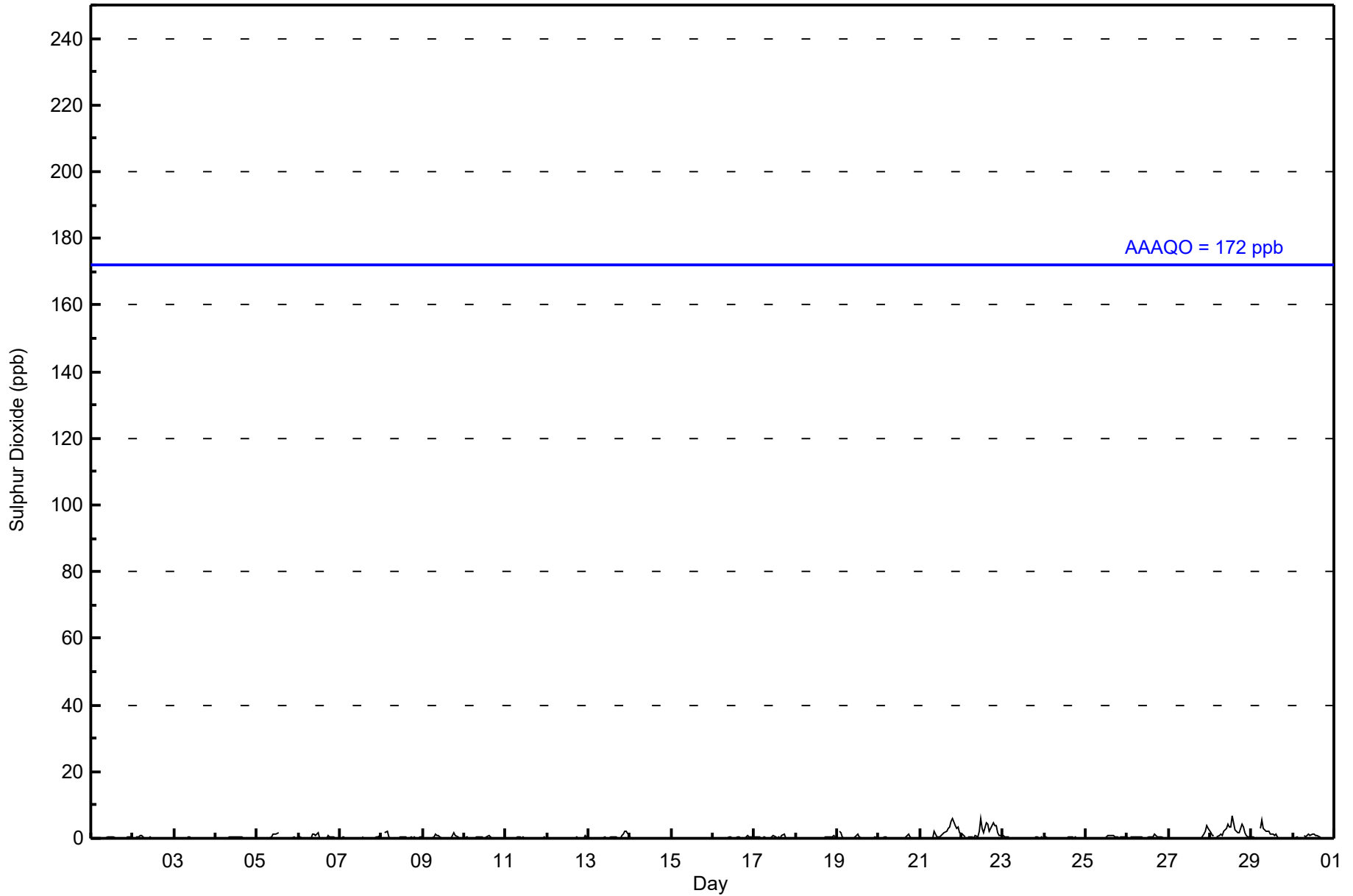
## Surmont 2 - November 2024

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																				
Maximum Value: 6.7 ppb on Nov 28 14:00		Maximum Daily Average: 2.1 ppb on Nov 28				Hours of Data:		686																				
Minimum Value: 0.0 ppb on Nov 2 21:00		Minimum Daily Average: 0.1 ppb on Nov 15				Hours of Missing Data:		34																				
Maximum Diurnal Average: 0.7 ppb at hour 12		Minimum Diurnal Average: 0.2 ppb at hour 5				Hours of Calibration:		33																				
Monthly Average: 0.45 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.1 Median = 0.2 Q <sub>3</sub> = 0.4 P <sub>90</sub> = 1.1 P <sub>99</sub> = 4.2				Percent Operational Time:		99.9																				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Nov	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.5	0.6	0.4	0.2	0.6	
2-Nov	0.2	Z	0.4	0.6	0.8	0.8	0.4	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.0	0.2	0.8	
3-Nov	0.0	0.0	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.6	0.5	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.6	
4-Nov	0.0	0.1	0.1	Z	0.1	0.0	0.1	0.1	0.1	0.3	0.6	0.5	0.5	0.4	0.4	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.6	
5-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.5	1.3	1.3	1.3	1.7	M	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.3	0.2	0.1	0.3	1.7
6-Nov	0.2	0.2	0.2	0.1	0.1	Z	0.1	0.1	1.3	1.4	0.7	1.6	0.2	0.2	0.1	0.1	0.2	0.9	0.6	0.3	0.3	0.2	0.2	0.2	0.2	0.4	1.6	
7-Nov	Z	0.2	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	C	C	C	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6	0.8	0.2	0.8		
8-Nov	0.8	Z	1.7	2.1	0.6	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.3	0.2	0.1	0.3	0.2	0.2	0.1	0.2	0.4	0.4	0.4	2.1	
9-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.3	1.1	0.8	0.8	0.6	0.1	0.2	0.1	0.1	0.1	0.1	0.7	1.7	0.7	0.5	0.2	0.2	0.1	0.4	1.7		
10-Nov	0.2	0.3	0.2	Z	0.2	0.1	0.2	0.2	0.5	0.3	0.2	0.2	0.1	0.5	1.0	0.4	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	
11-Nov	0.0	0.0	0.1	0.1	Z	0.2	0.1	0.3	0.4	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.1	0.1	0.3	0.0	0.1	0.4		
12-Nov	0.0	0.0	0.0	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.7	0.5	0.1	0.7		
13-Nov	Z	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.6	0.3	0.2	0.3	0.1	0.0	0.6	1.2	2.1	2.2	1.1	0.4	2.2	
14-Nov	0.6	Z	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	
15-Nov	0.0	0.0	Z	0.0	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.2	
16-Nov	0.0	0.1	0.1	Z	0.1	0.1	0.0	0.0	0.1	0.6	0.5	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.4	0.8	0.5	0.3	0.3	0.2	0.2	0.8	
17-Nov	0.3	0.4	0.3	0.3	Z	0.3	0.2	0.2	0.1	0.1	0.3	0.8	0.5	0.2	0.2	0.2	0.8	1.1	0.1	0.1	0.2	0.2	0.0	0.0	0.3	1.1		
18-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.3	0.5	0.7	0.6	0.2	0.7		
19-Nov	Z	2.0	1.7	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.5	0.9	1.3	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.4	0.0	0.4	2.0		
20-Nov	0.2	Z	0.2	0.2	0.3	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.4	1.2	0.4	0.0	0.0	0.0	0.0	0.0	0.1	1.2		
21-Nov	0.0	0.2	Z	0.2	0.0	0.0	0.0	0.2	2.3	1.1	0.4	0.4	0.7	1.4	1.6	2.0	3.0	3.2	5.1	5.9	3.8	3.1	3.3	1.7	1.7	5.9		
22-Nov	1.2	0.7	0.3	Z	0.4	0.4	0.2	0.2	0.8	0.5	2.1	5.8	3.1	1.7	4.6	4.1	2.3	2.9	4.5	3.9	4.0	1.7	0.8	0.8	2.0	5.8		
23-Nov	0.8	0.6	0.5	0.3	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.2	0.8		
24-Nov	0.1	0.3	0.2	0.2	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.6	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.2	0.6		
25-Nov	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.5	0.7	0.8	0.9	0.7	0.4	0.3	0.2	0.3	0.3	0.6	0.4	0.3	0.9		
26-Nov	0.3	Z	0.3	0.4	0.3	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.3	0.4	0.3	0.5	1.1	0.3	0.3	0.6	0.3	0.2	0.2	0.1	0.3	1.1		
27-Nov	0.2	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	1.1	2.2	3.8	2.9	0.5	3.8		
28-Nov	1.5	1.0	0.7	Z	0.3	1.0	1.1	0.7	2.0	3.1	4.1	3.3	3.5	6.7	2.4	2.1	1.6	1.9	4.1	3.5	1.7	0.7	0.6	0.3	2.1	6.7		
29-Nov	0.3	0.2	0.2	0.2	Z	2.9	5.4	3.1	2.3	2.3	2.0	1.4	1.1	1.0	1.1	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	5.4		
30-Nov	0.0	0.1	0.3	0.0	0.1	Z	0.7	0.6	0.8	1.4	0.7	1.2	1.3	0.6	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.4		
																								Diurnal Average				
																								Diurnal Maximum				
																								0.3 0.3 0.3 0.2 0.2 0.3 0.3 0.3 0.5 0.5 0.6 0.7 0.6 0.6 0.5 0.5 0.4 0.5 0.6 0.6 0.5 0.5 0.6 0.4				
																								1.5 2.0 1.7 2.1 0.8 2.9 5.4 3.1 2.3 3.1 4.1 5.8 3.5 6.7 4.6 4.1 3.0 3.2 5.1 5.9 4.0 3.1 3.8 2.9				
Z - zerospan      C - Calibration      M - Maintenance																												
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb      24-hr 48 ppb																												



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Surmont 2 - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Surmont 2 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	686	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Surmont 2 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 10	24	28	13	20	28	66	75	45	13	16	33	56	57	65	44	99	682
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	<b>24</b>	<b>28</b>	<b>13</b>	<b>20</b>	<b>28</b>	<b>66</b>	<b>75</b>	<b>45</b>	<b>13</b>	<b>16</b>	<b>33</b>	<b>56</b>	<b>57</b>	<b>65</b>	<b>44</b>	<b>99</b>	<b>682</b>

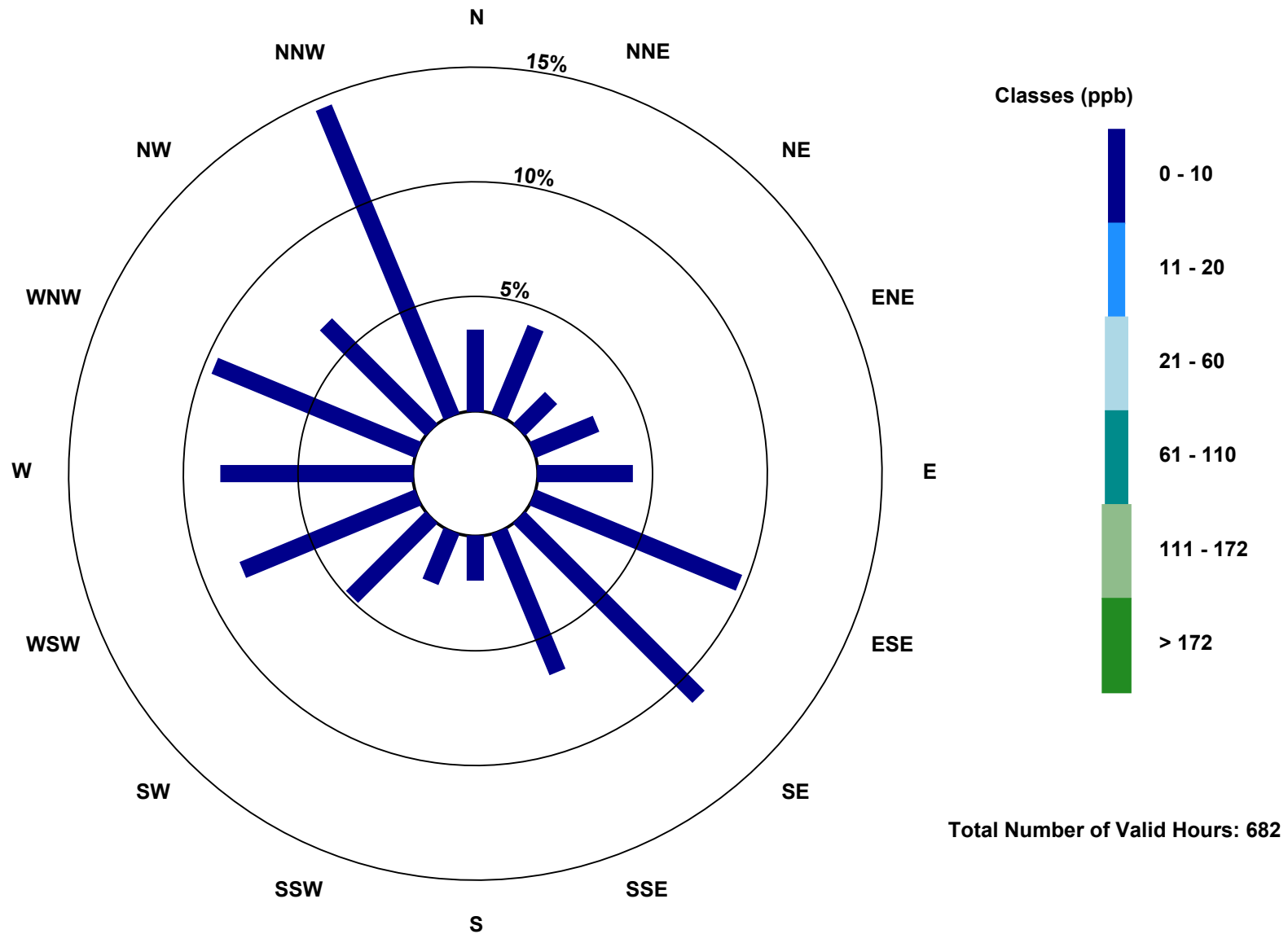
Total Number of Valid Hours: 682

Total Number of Hours: 720

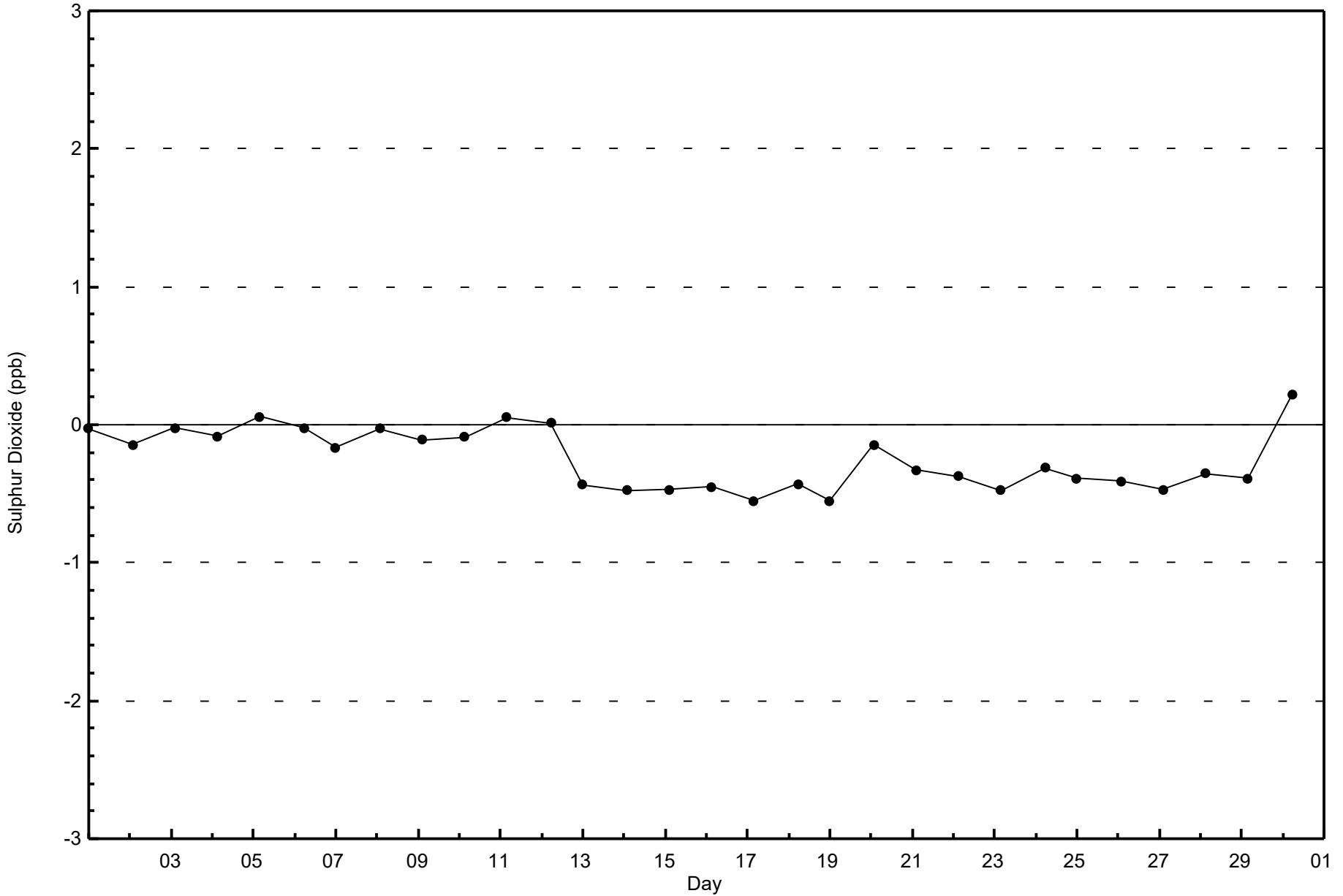


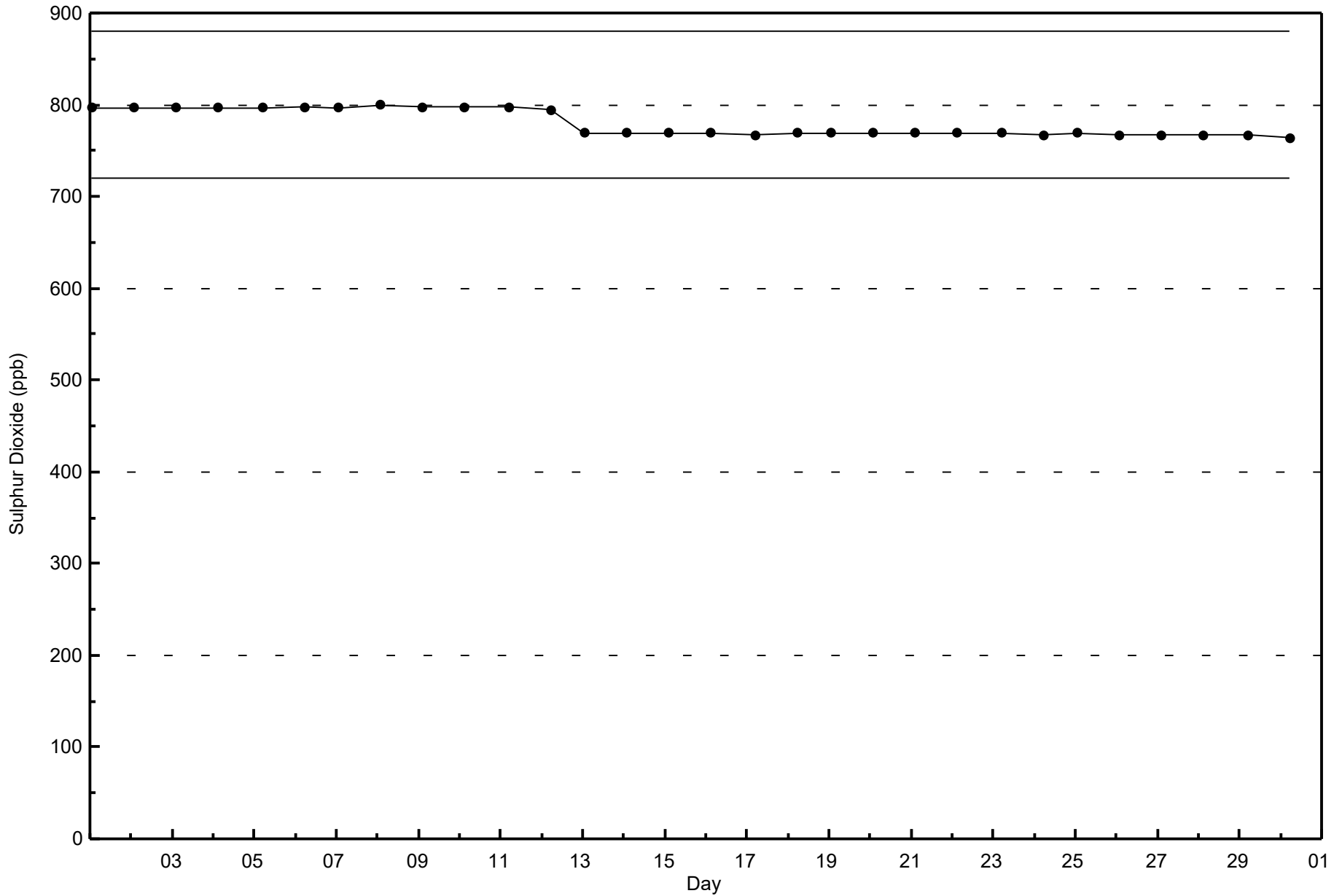
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Surmont 2







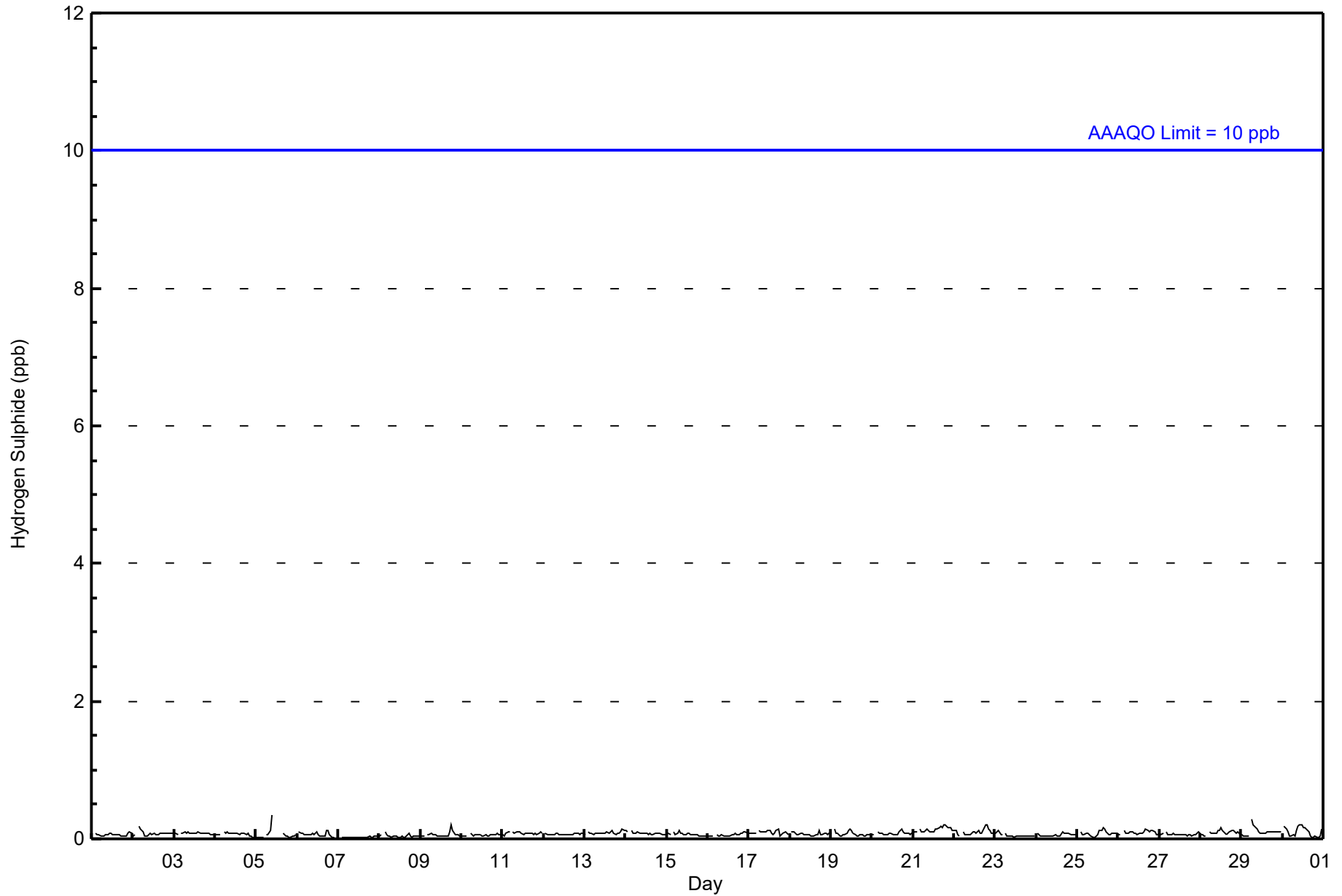






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Surmont 2 - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Surmont 2 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	684	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

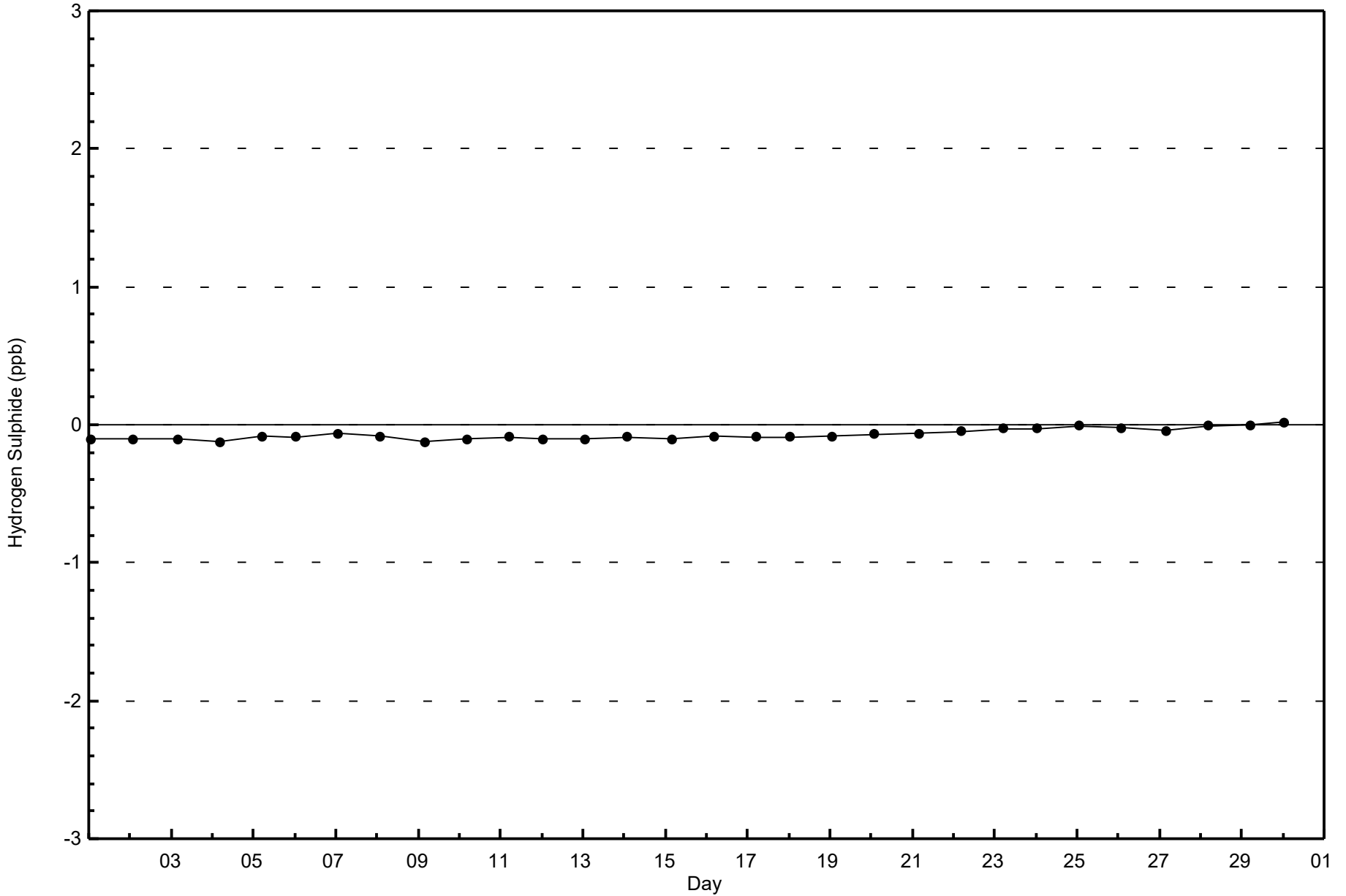
**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Surmont 2 - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	25	27	15	19	28	66	75	45	13	17	31	58	57	64	43	97	680
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	25	27	15	19	28	66	75	45	13	17	31	58	57	64	43	97	680

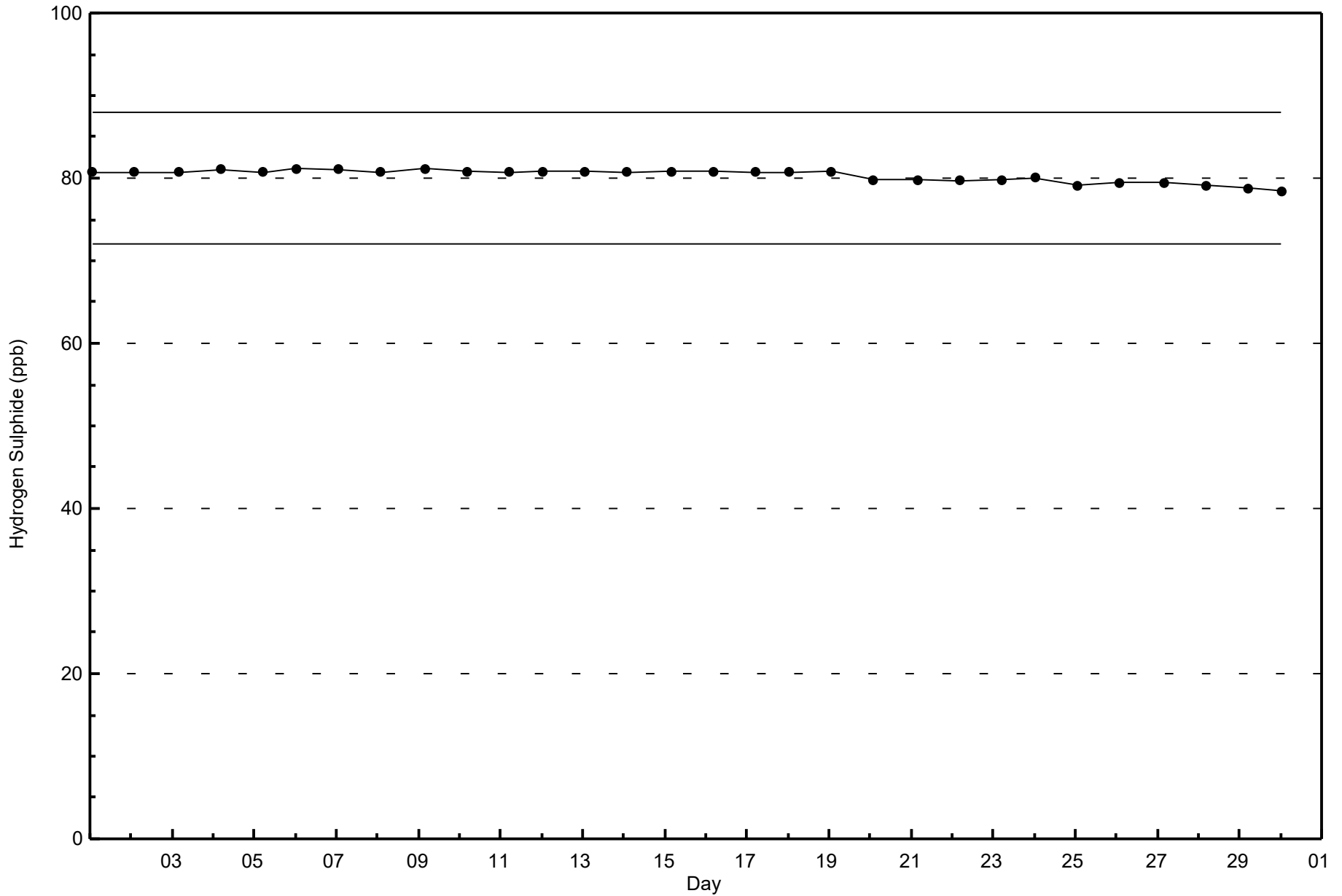
Total Number of Valid Hours: 680

Total Number of Hours: 720







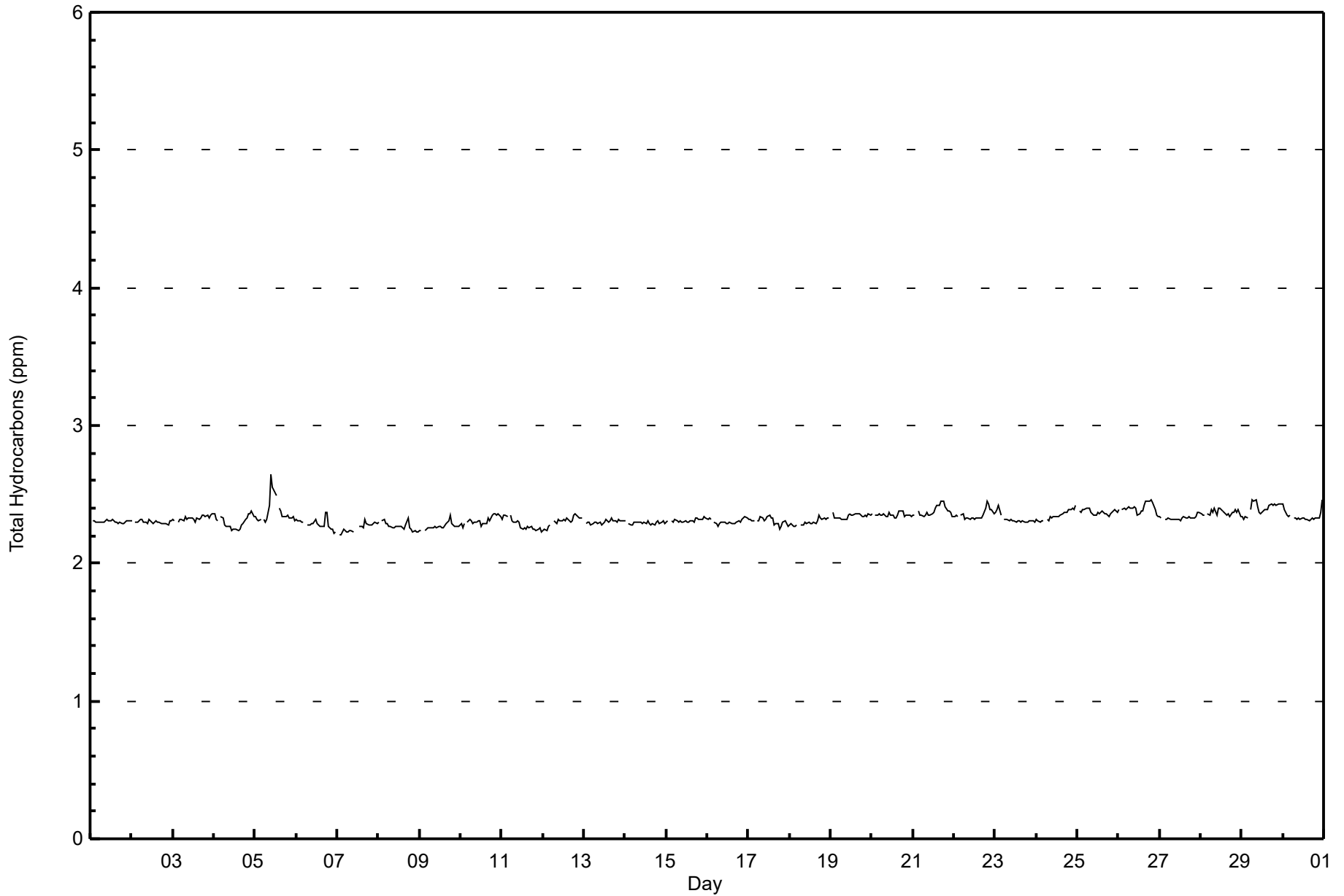






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Surmont 2 - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Surmont 2 - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	0	0.00	0.00
2.1 - 3.0	686	100.00	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 686

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

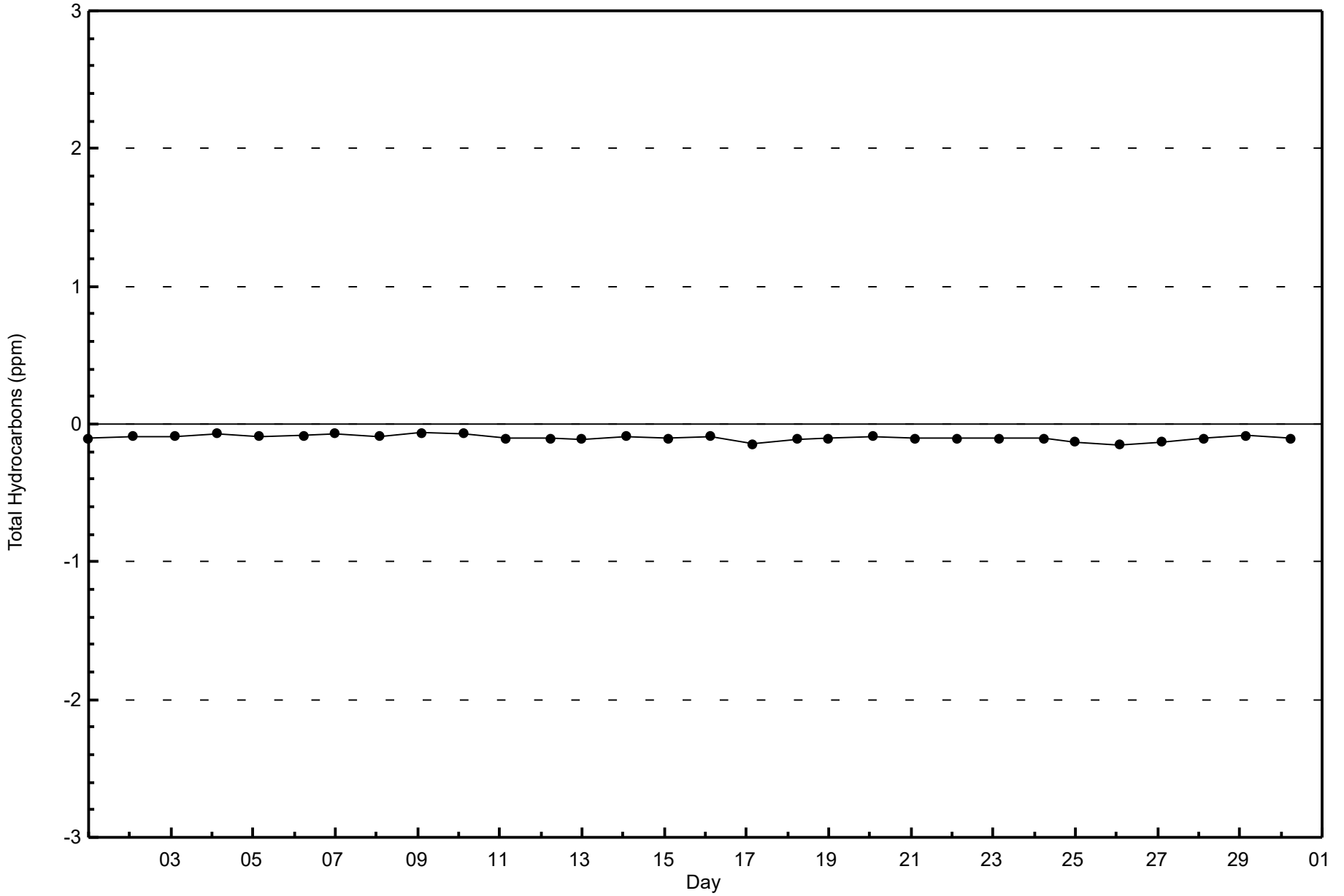
**Total Hydrocarbons (THC) - ppm  
Surmont 2 - November 2024**

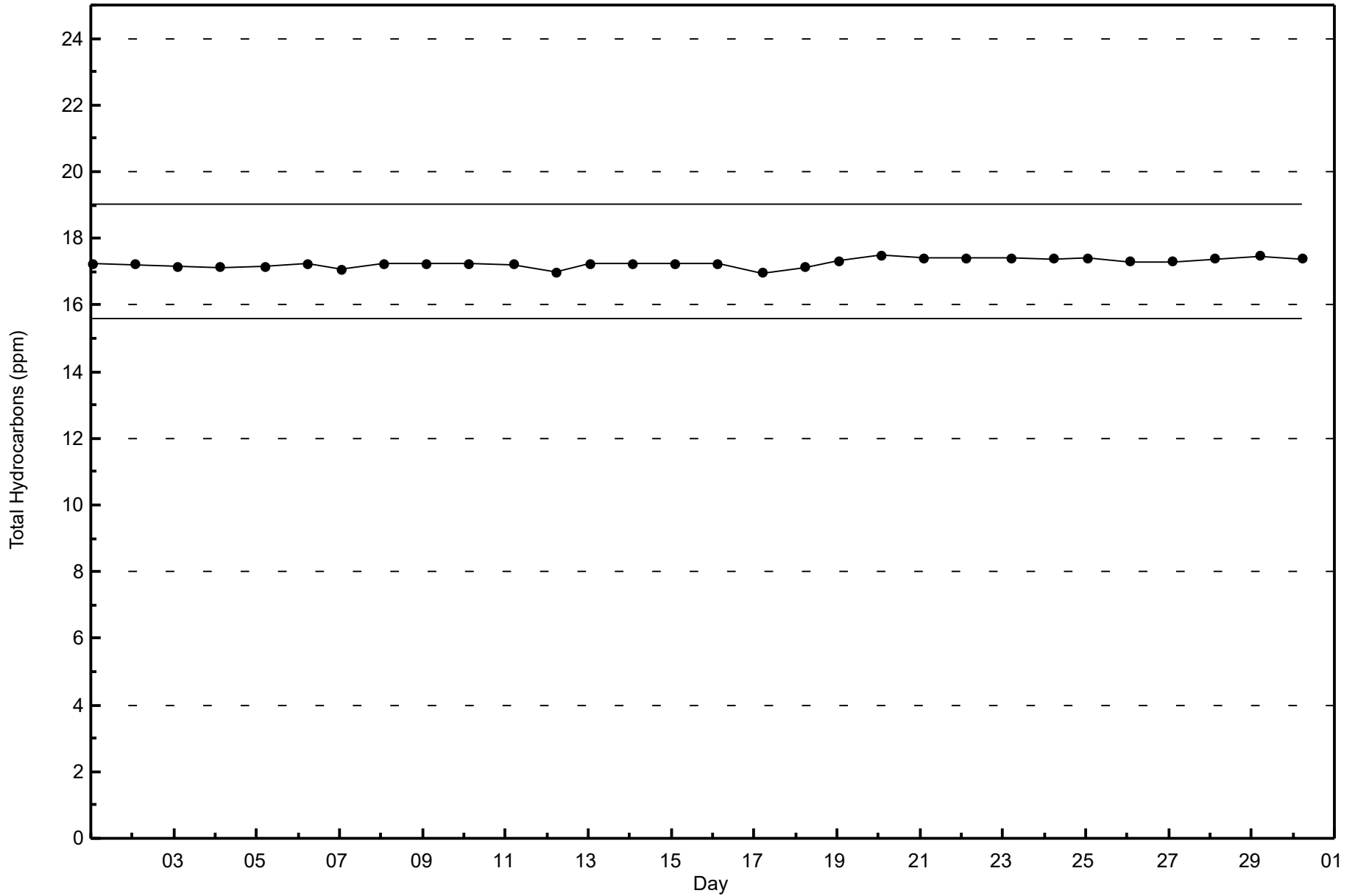
<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	24	28	13	20	28	66	75	45	13	16	33	56	57	65	44	99	682
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	24	28	13	20	28	66	75	45	13	16	33	56	57	65	44	99	682

Total Number of Valid Hours: 682

Total Number of Hours: 720







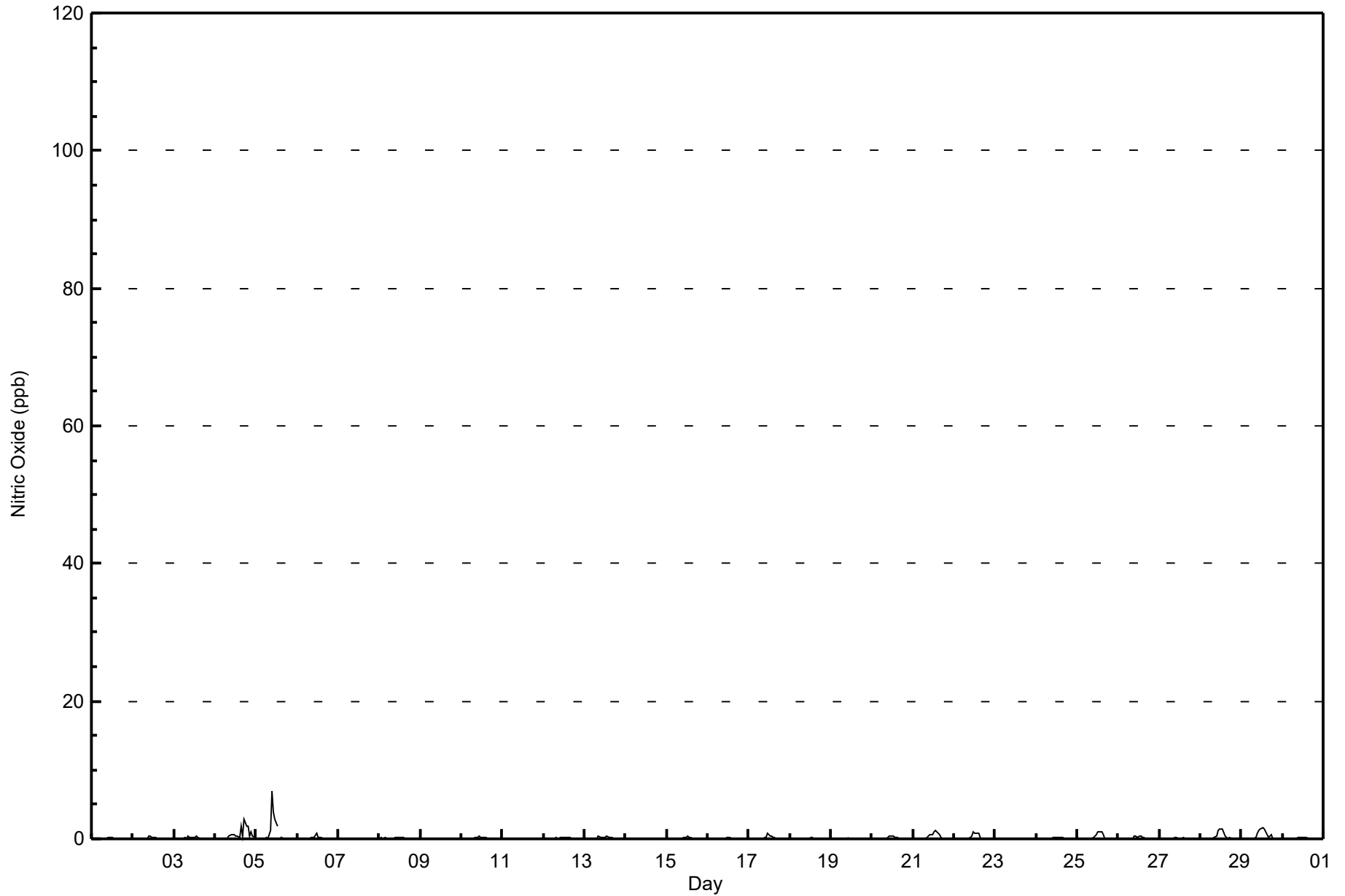






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Surmont 2 - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Surmont 2 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	682	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Surmont 2 - November 2024**

<b>Concentration</b> <b>Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	21	25	16	20	28	63	79	45	11	18	31	58	57	68	43	94	677
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	21	25	16	20	28	63	79	45	11	18	31	58	57	68	43	94	677

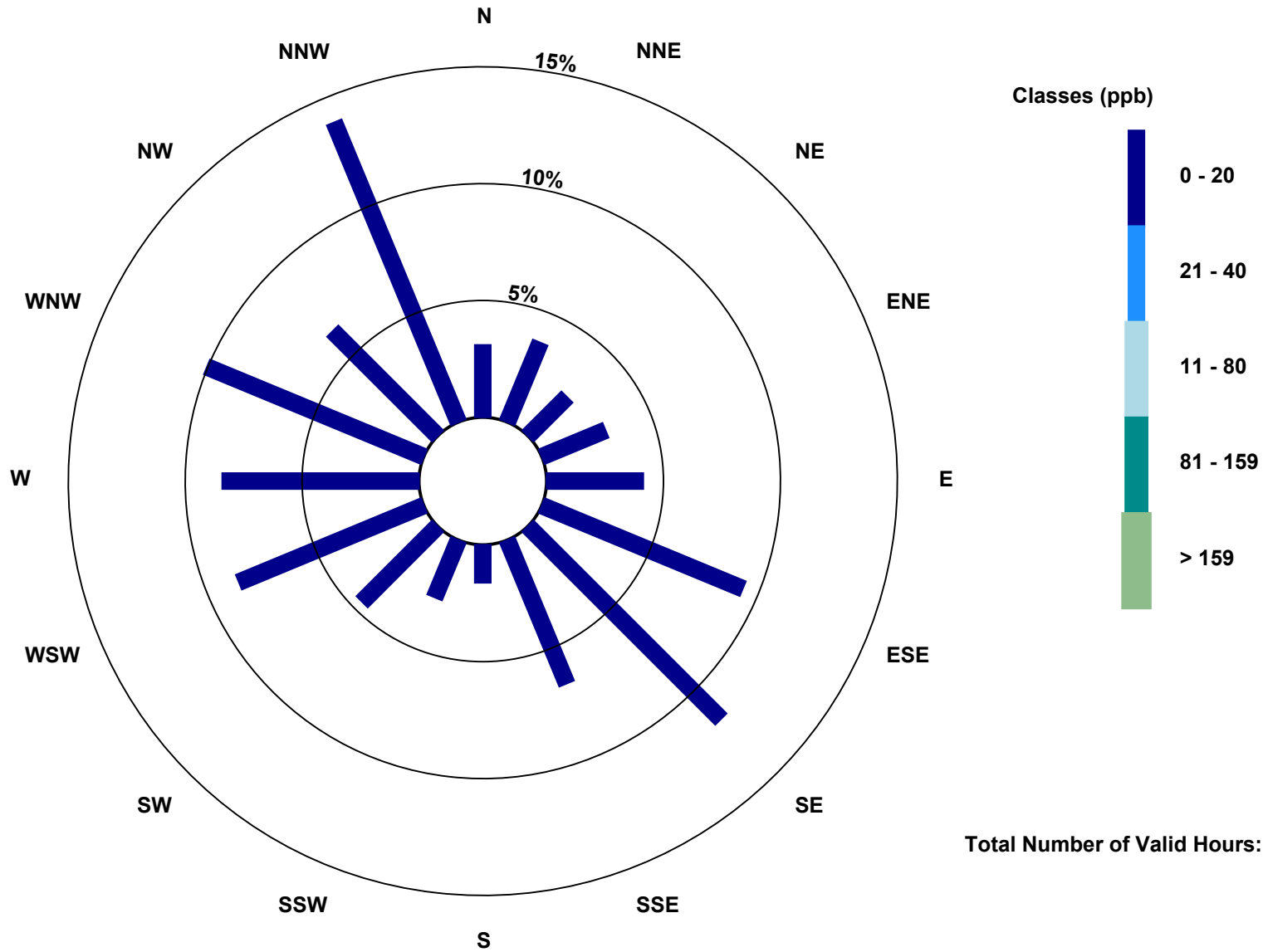
Total Number of Valid Hours: 677

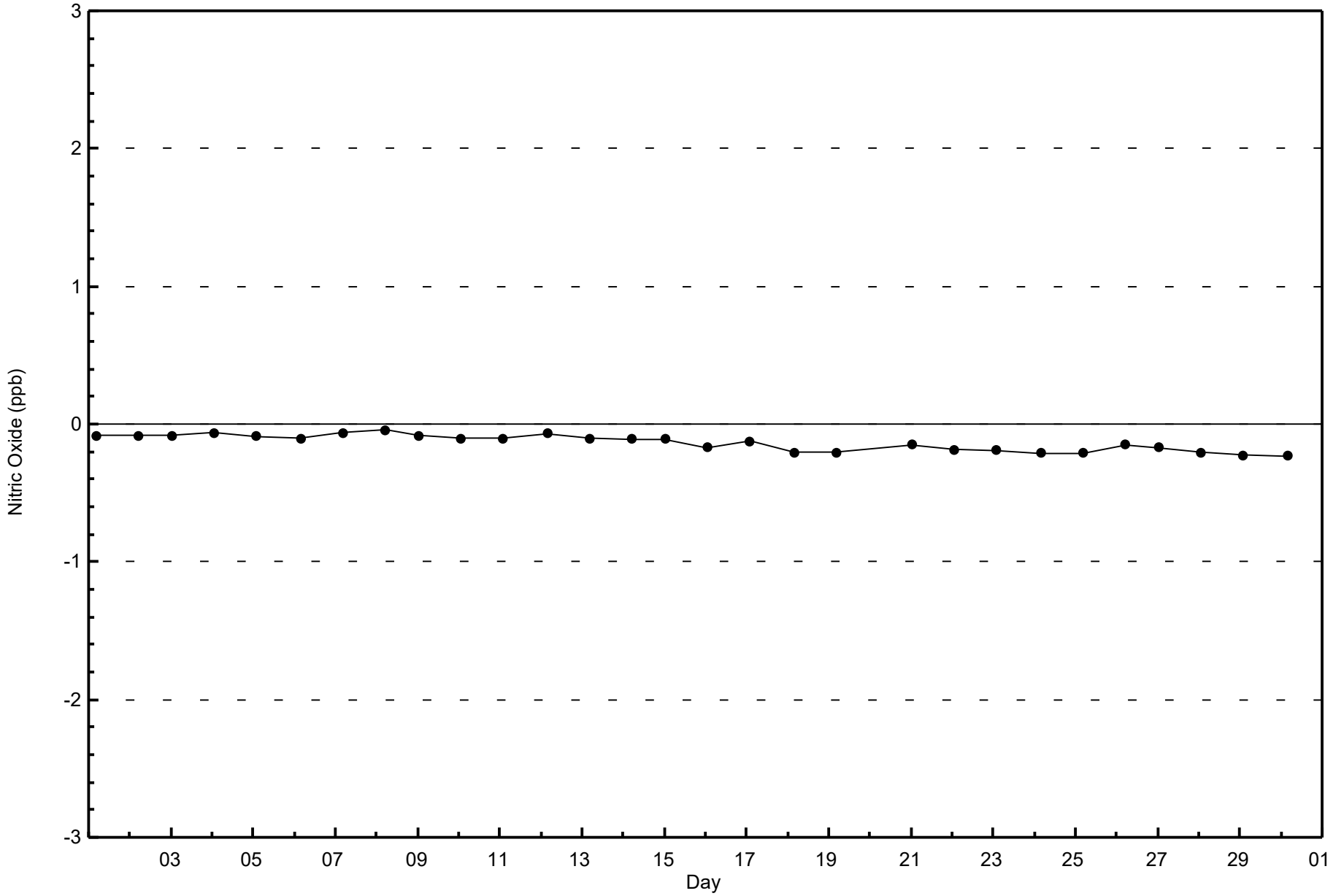
Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitric Oxide (NO) - ppb  
Surmont 2

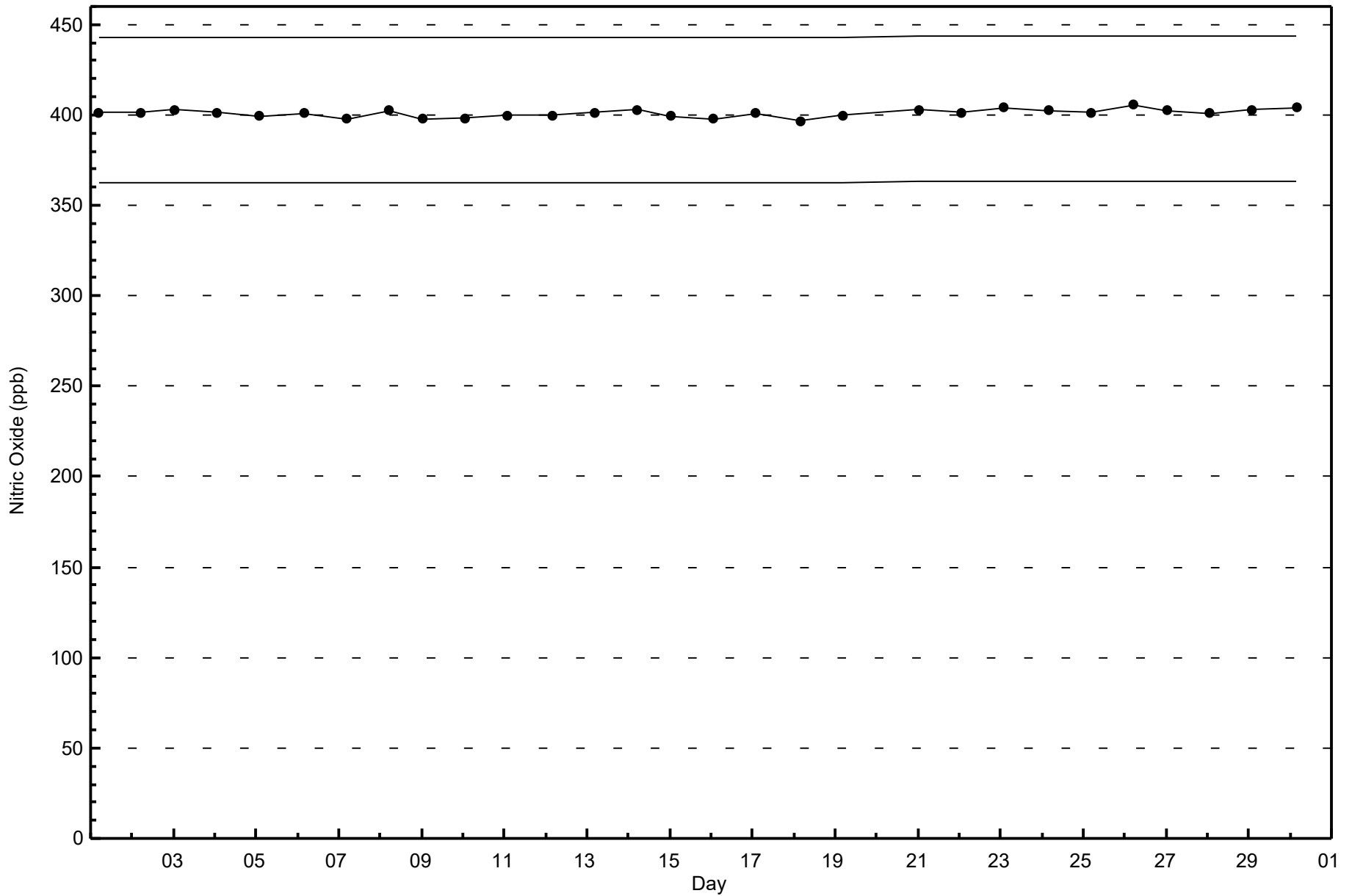






**Wood Buffalo Environmental Association**  
**Span Responses**

**Nitric Oxide (NO) - ppb**  
**Surmont 2 - November 2024**





# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Nitrogen Dioxide (NO<sub>2</sub>) - ppb

## Surmont 2 - November 2024

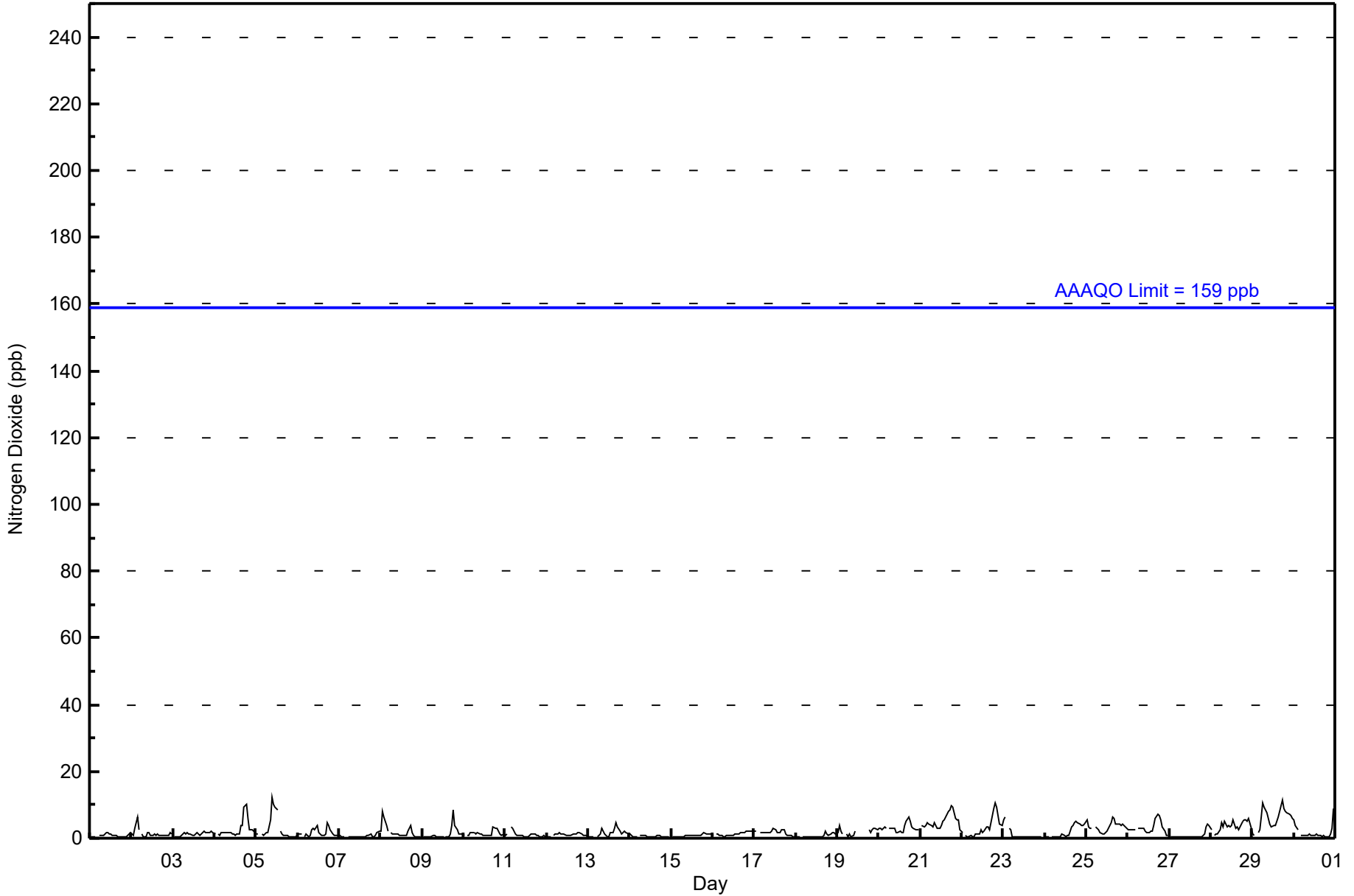
Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																																									
Maximum Value: 12.3 ppb on Nov 5 10:00		Maximum Daily Average: 6.0 ppb on Nov 29		Minimum Value: 0.2 ppb on Nov 9 14:00		Minimum Daily Average: 0.6 ppb on Nov 14		Hours of Data: 682																																									
Maximum Diurnal Average: 3.3 ppb at hour 19		Minimum Diurnal Average: 1.5 ppb at hour 5		Hours of Missing Data: 38		Hours of Calibration: 37		Percent Operational Time: 99.9																																									
Monthly Average: 2.00 ppb		Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 0.6 Median = 1.2 Q <sub>3</sub> = 2.6 P <sub>90</sub> = 4.5 P <sub>99</sub> = 9.6																																															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	0.5	0.3	0.4	0.6	Z	0.9	0.9	0.9	1.0	1.6	1.5	1.1	1.2	0.9	0.7	0.8	0.5	0.5	0.5	0.4	0.4	0.5	0.8	1.6	0.8	1.6																							
2-Nov	1.1	1.0	3.1	6.3	2.6	Z	1.4	0.5	0.4	1.8	1.6	1.0	1.0	1.1	0.9	1.1	0.9	0.9	0.8	0.8	0.8	0.8	1.9	1.2	1.4	6.3																							
3-Nov	Z	0.6	0.5	0.5	0.4	1.0	1.5	1.3	1.9	1.2	1.2	1.0	1.0	1.3	1.5	1.0	1.2	1.9	2.1	1.9	1.5	1.8	2.3	1.9	1.3	2.3																							
4-Nov	1.3	Z	1.3	1.0	1.6	1.8	1.5	1.8	1.8	1.6	1.2	1.1	1.0	1.2	1.1	3.8	3.8	9.2	10.2	6.1	2.6	2.4	2.4	1.9	2.7	10.2																							
5-Nov	1.2	1.2	Z	1.1	0.8	1.3	1.6	1.7	5.4	12.3	10.3	9.3	8.3	M	2.0	1.1	0.8	0.7	0.7	0.5	0.5	0.4	0.4	2.8	2.8	12.3																							
6-Nov	1.2	1.1	1.1	Z	0.4	1.2	0.6	0.8	2.6	3.1	2.5	3.9	1.6	1.1	0.9	0.9	1.1	4.5	3.7	2.5	1.1	0.9	0.9	0.7	1.7	4.5																							
7-Nov	0.7	0.6	0.5	0.4	Z	0.4	0.3	0.4	0.5	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.9	0.7	1.1	0.4	0.4	0.9	1.8	2.3	0.6	2.3																							
8-Nov	2.1	8.0	6.2	3.8	2.1	Z	1.5	1.4	1.4	1.3	1.1	0.9	0.9	0.9	0.8	0.9	2.0	3.7	1.5	0.9	0.5	0.5	0.5	0.5	1.9	8.0																							
9-Nov	Z	0.4	0.4	0.4	0.4	0.4	0.8	0.7	0.5	0.5	0.4	0.3	0.3	0.2	0.3	0.3	1.3	3.8	8.3	3.8	2.7	1.4	1.3	1.2	1.3	8.3																							
10-Nov	1.0	Z	1.0	0.9	1.5	1.8	1.7	1.3	1.5	1.3	1.2	0.8	0.8	0.9	1.0	0.8	1.0	3.4	3.0	2.8	2.0	1.3	0.9	1.2	1.4	3.4																							
11-Nov	1.0	1.4	Z	3.3	2.9	2.3	1.3	0.8	0.8	0.7	0.8	0.4	0.3	0.5	0.8	1.2	1.4	1.1	1.0	0.9	0.6	0.6	0.7	0.5	1.1	3.3																							
12-Nov	0.5	0.5	0.5	Z	0.9	1.2	1.4	1.5	1.2	1.3	1.3	1.0	1.0	1.0	0.9	1.2	1.3	1.1	1.7	1.7	1.2	0.8	1.0	0.8	1.1	1.7																							
13-Nov	0.4	0.3	0.5	0.3	Z	0.6	1.0	1.4	3.0	1.1	0.7	0.5	0.6	1.7	1.6	3.1	4.7	3.3	2.2	1.4	1.7	2.1	1.9	1.3	1.5	4.7																							
14-Nov	1.2	0.9	0.6	0.4	0.6	Z	0.9	1.0	0.7	0.7	0.6	0.5	0.5	0.4	0.5	0.6	0.9	0.7	0.5	0.3	0.4	0.4	0.2	0.2	0.6	1.2																							
15-Nov	Z	0.3	0.3	0.4	0.4	0.5	0.6	0.5	0.8	0.7	0.7	0.9	0.9	0.8	0.7	0.8	0.7	1.0	1.3	1.5	1.3	1.2	1.2	1.1	0.8	1.5																							
16-Nov	0.9	Z	1.1	1.2	0.9	0.9	0.5	0.6	0.8	0.8	0.7	0.8	0.7	1.2	1.3	1.4	1.6	1.7	1.8	2.1	2.2	2.2	2.3	2.1	1.3	2.3																							
17-Nov	2.0	2.0	Z	1.6	1.9	1.9	1.9	1.8	1.9	1.8	2.3	3.0	2.4	1.9	1.7	1.8	2.5	2.4	1.1	0.8	0.7	0.8	0.4	0.4	1.7	3.0																							
18-Nov	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.4	0.5	0.8	2.0	1.4	0.9	1.3	1.5	1.7	1.4	0.7	2.0																							
19-Nov	1.7	4.0	2.1	1.2	Z	1.1	0.5	1.1	0.6	0.8	2.1	C	C	C	C	C	C	C	2.5	1.8	2.7	3.0	3.1	2.4	--	4.0																							
20-Nov	2.9	2.8	2.7	3.2	3.0	Z	3.1	2.8	3.0	2.8	1.9	1.9	2.2	1.6	1.9	3.7	5.1	6.4	5.1	3.5	3.0	2.4	2.4	2.6	3.0	6.4																							
21-Nov	Z	3.8	3.6	3.8	4.6	4.2	4.0	3.6	4.5	4.0	3.1	3.1	4.0	4.9	5.6	7.2	8.2	8.6	9.8	9.2	6.1	5.5	5.3	2.6	5.2	9.8																							
22-Nov	1.7	Z	0.7	0.4	0.5	0.7	0.5	0.4	1.3	1.1	1.4	2.6	1.9	2.3	3.6	3.5	2.6	4.5	8.9	10.8	9.5	6.6	4.3	4.0	3.2	10.8																							
23-Nov	5.4	6.5	Z	3.1	2.5	0.5	0.3	0.3	0.3	0.4	0.5	0.4	0.3	0.3	0.3	0.5	0.5	0.6	0.4	0.3	0.6	0.3	0.2	0.2	1.1	6.5																							
24-Nov	0.2	0.3	0.3	Z	0.3	0.4	0.6	0.5	0.6	0.6	1.1	0.7	0.6	0.7	0.9	3.5	3.9	4.5	4.9	4.7	4.2	3.8	3.7	4.1	2.0	4.9																							
25-Nov	5.3	3.3	2.8	3.1	Z	3.5	3.0	2.4	1.9	1.4	1.4	1.5	2.2	3.0	4.5	6.2	5.9	4.2	4.2	4.1	4.0	4.4	3.7	2.9	3.4	6.2																							
26-Nov	2.6	2.6	2.5	2.7	2.6	Z	2.9	2.8	3.0	2.8	2.3	1.5	1.7	2.3	2.0	3.7	6.0	7.0	6.8	5.6	3.4	2.3	1.0	0.7	3.1	7.0																							
27-Nov	Z	0.6	0.4	0.4	0.5	0.4	0.4	0.5	0.4	0.6	0.6	0.4	0.4	0.3	0.5	0.3	0.4	0.3	0.3	0.4	1.4	3.2	4.3	3.8	0.9	4.3																							
28-Nov	2.4	Z	1.0	1.1	1.1	2.7	4.8	3.3	5.2	3.4	3.9	3.6	3.9	5.6	3.1	3.2	2.4	3.4	5.1	5.6	5.5	5.2	6.0	2.9	3.7	6.0																							
29-Nov	1.3	1.0	Z	1.5	2.4	6.4	10.8	9.5	7.7	5.8	4.1	3.4	3.9	4.0	5.0	6.4	8.0	11.4	8.7	8.2	7.8	7.1	6.6	6.1	6.0	11.4																							
30-Nov	5.3	3.9	2.6	Z	1.0	0.9	0.9	0.8	1.0	1.3	0.9	1.0	1.0	1.2	1.0	0.7	0.4	0.7	0.4	0.5	0.4	1.2	2.8	9.0	1.7	9.0																							
																								1.8	1.9	1.5	1.7	1.5	1.5	1.7	1.6	1.9	1.9	1.7	1.6	1.6	1.5	1.6	2.1	2.4	3.2	3.3	2.8	2.4	2.2	2.2	2.1	Diurnal Average	
																								5.4	8.0	6.2	6.3	4.6	6.4	10.8	9.5	7.7	12.3	10.3	9.3	8.3	5.6	5.6	7.2	8.2	11.4	10.2	10.8	9.5	7.1	6.6	9.0	Diurnal Maximum	
Z - zerspan      C - Calibration      M - Maintenance																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																	





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Surmont 2 - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Surmont 2 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	682	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Surmont 2 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	21	25	16	20	28	63	79	45	11	18	31	58	57	68	43	94	677
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	21	25	16	20	28	63	79	45	11	18	31	58	57	68	43	94	677

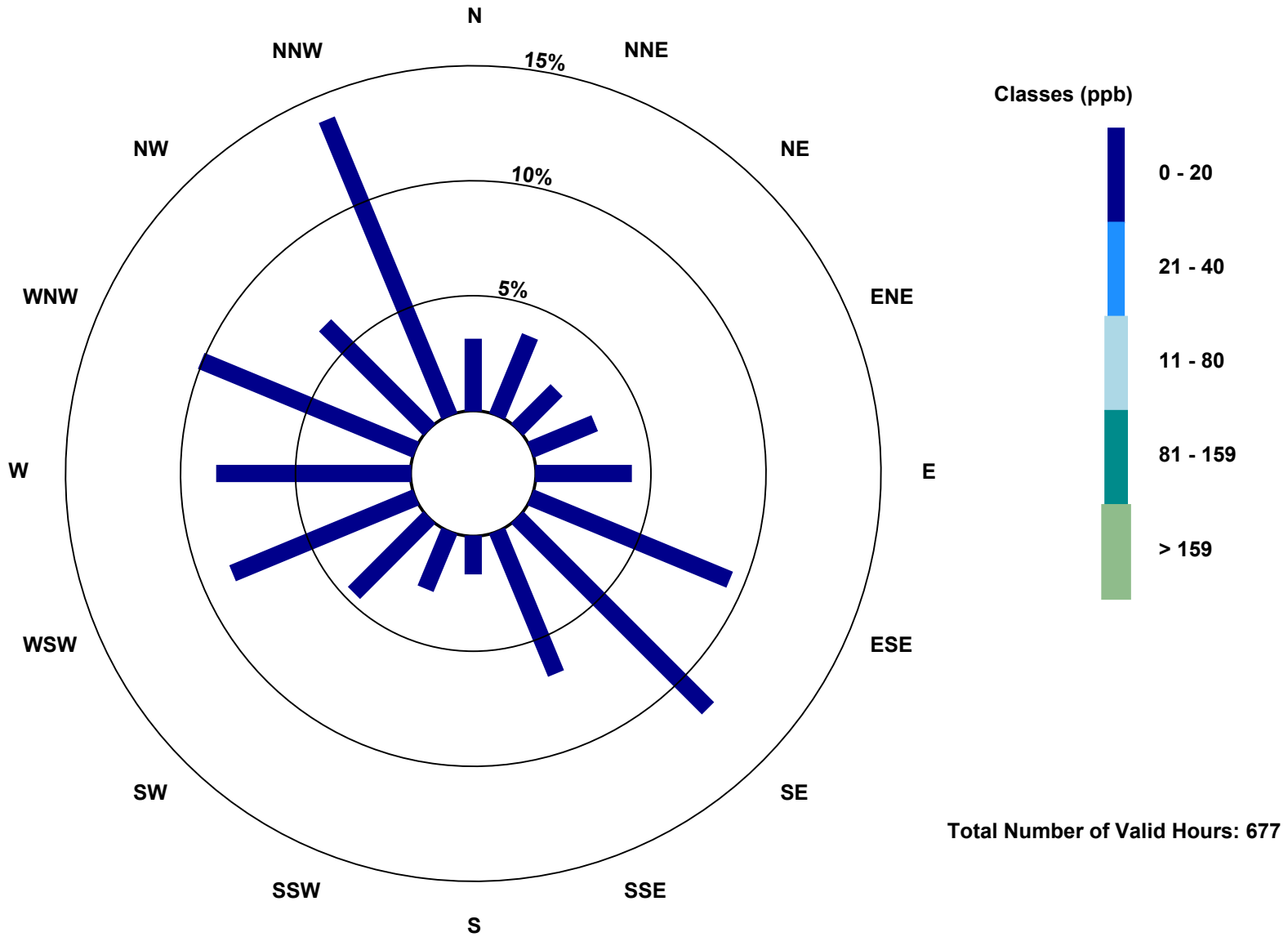
Total Number of Valid Hours: 677

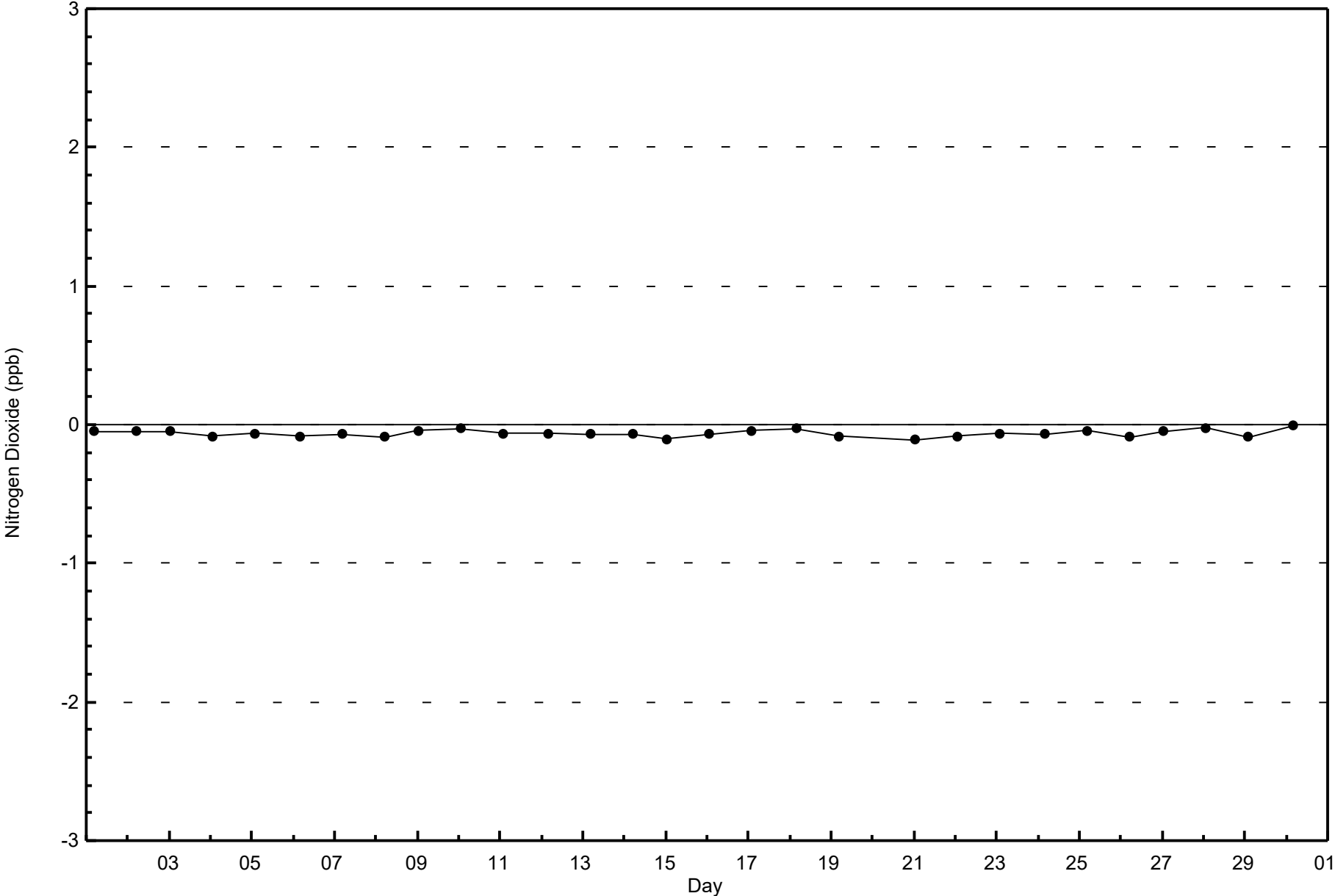
Total Number of Hours: 720

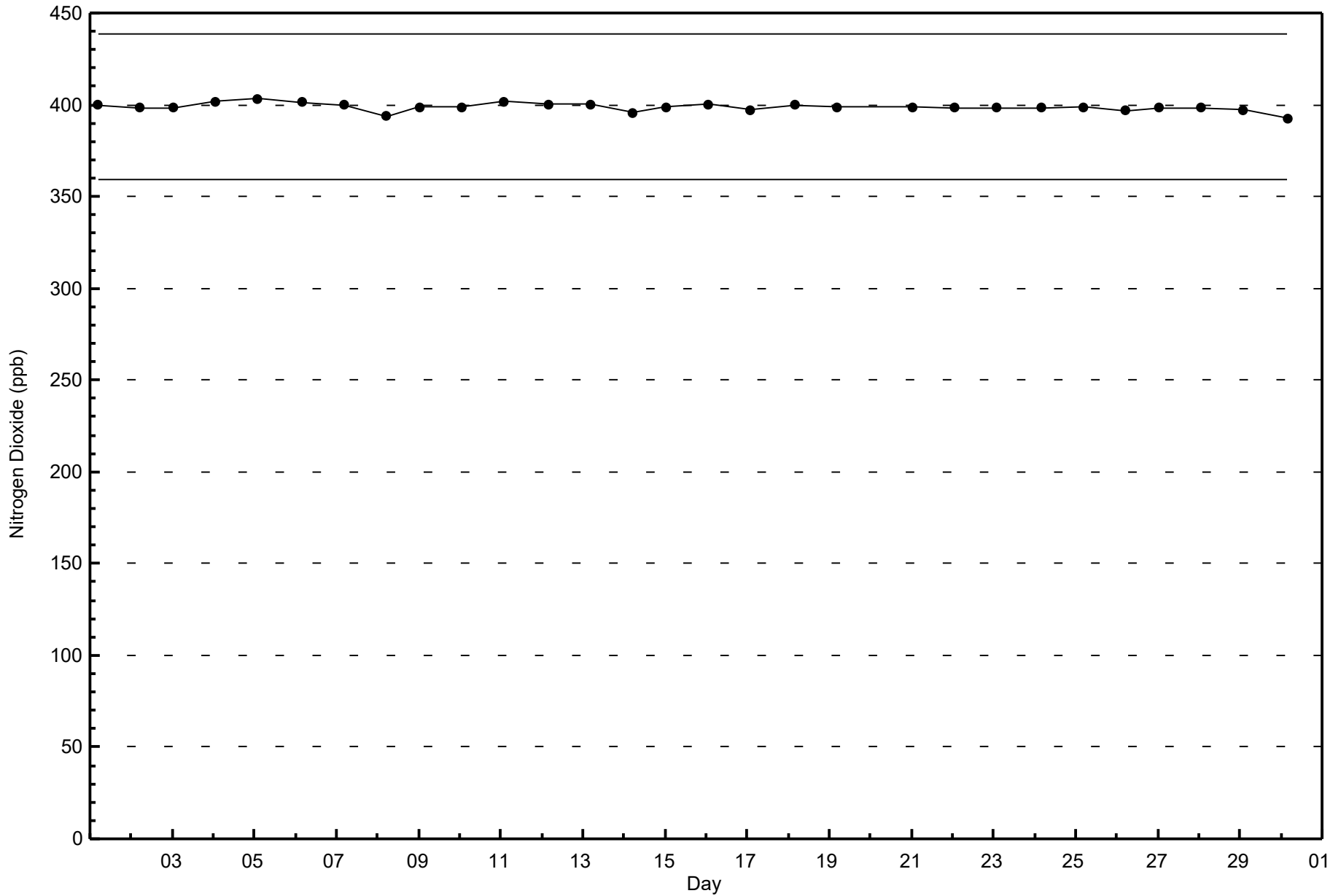


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Surmont 2









**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

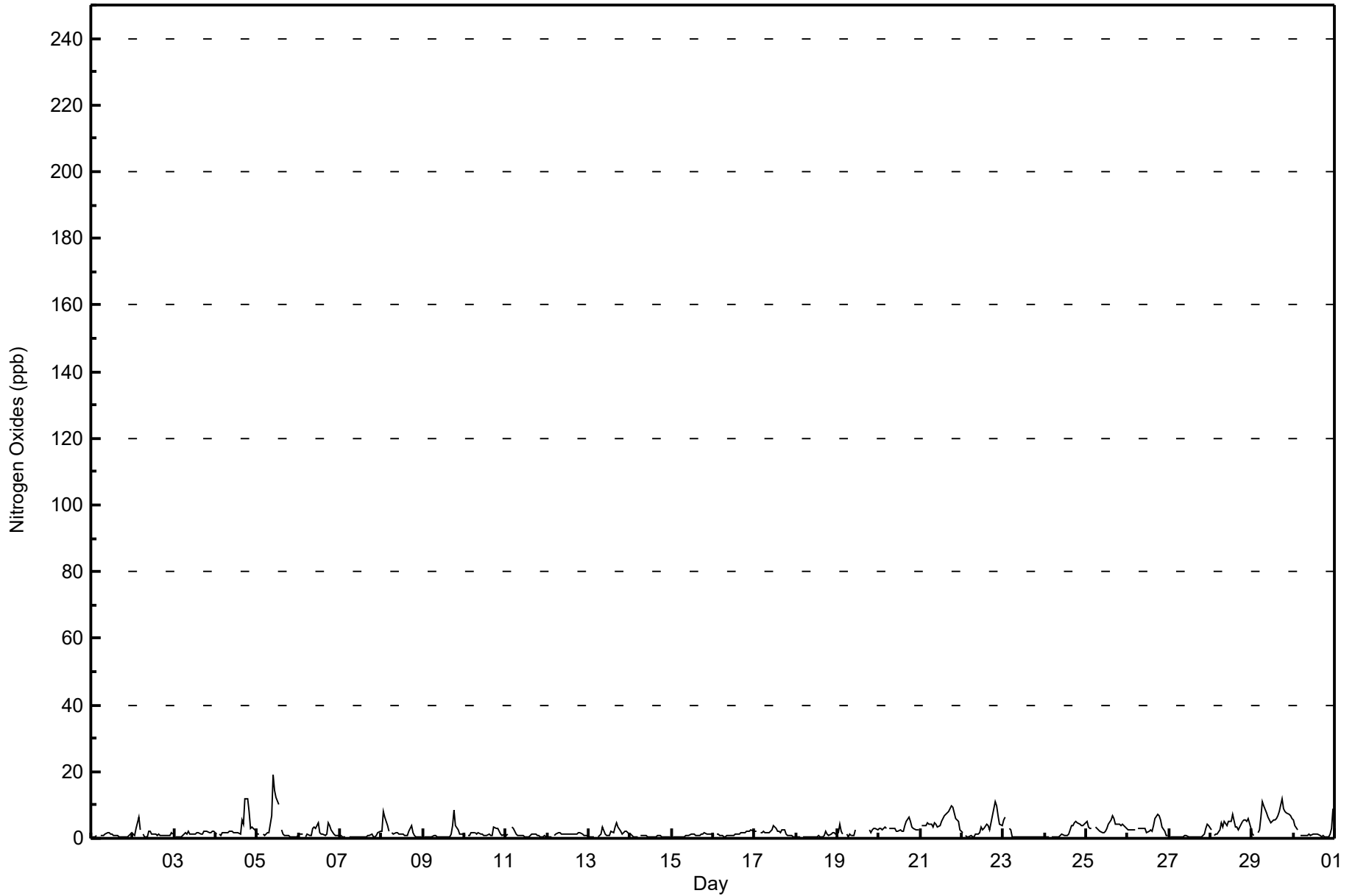
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Surmont 2 - November 2024**

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																		
Maximum Value: 19.1 ppb on Nov 5 10:00		Maximum Daily Average: 6.4 ppb on Nov 29				Hours of Data:		682																		
Minimum Value: 0.2 ppb on Nov 15 00:00		Minimum Daily Average: 0.6 ppb on Nov 14				Hours of Missing Data:		38																		
Maximum Diurnal Average: 3.4 ppb at hour 19		Minimum Diurnal Average: 1.5 ppb at hour 5				Hours of Calibration:		37																		
Monthly Average: 2.13 ppb		Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 0.7 Median = 1.3 Q <sub>3</sub> = 2.8 P <sub>90</sub> = 5.0 P <sub>99</sub> = 10.8				Percent Operational Time:		99.9																		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.5	0.3	0.4	0.6	Z	0.9	0.9	0.9	1.1	1.8	1.7	1.3	1.3	1.0	0.8	0.8	0.5	0.5	0.5	0.4	0.4	0.5	0.8	1.6	0.9	1.8
2-Nov	1.1	1.0	3.1	6.3	Z	2.6	Z	1.4	0.5	0.4	2.2	2.0	1.2	1.1	1.2	1.0	1.2	0.9	0.9	0.8	0.8	0.8	1.9	1.2	1.5	6.3
3-Nov	Z	0.6	0.5	0.5	0.4	1.0	1.7	1.3	2.3	1.4	1.4	1.3	1.3	1.6	1.7	1.1	1.3	1.9	2.1	1.9	1.5	1.8	2.3	1.9	1.4	2.3
4-Nov	1.3	Z	1.3	1.0	1.6	1.8	1.6	1.9	2.1	2.3	1.7	1.6	1.5	1.6	1.4	5.7	4.3	12.0	12.1	8.0	3.0	3.4	2.8	2.0	3.3	12.1
5-Nov	1.2	1.2	Z	1.1	0.8	1.3	1.7	1.8	6.6	19.1	14.2	12.1	10.1	M	2.3	1.3	0.9	0.8	0.7	0.5	0.5	0.4	0.4	0.4	3.6	19.1
6-Nov	1.2	1.1	1.1	Z	0.4	1.2	0.6	0.8	2.8	3.4	2.8	4.7	1.9	1.3	1.1	1.0	1.1	4.5	3.7	2.5	1.1	0.9	0.9	0.7	1.8	4.7
7-Nov	0.7	0.6	0.5	0.4	Z	0.4	0.3	0.4	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.9	0.7	1.1	0.4	0.4	0.9	1.8	2.3	0.6	2.3	
8-Nov	2.1	8.2	6.3	3.9	2.1	Z	1.5	1.4	1.5	1.5	1.3	1.1	1.1	1.0	0.9	1.0	2.0	3.7	1.5	1.0	0.5	0.6	0.5	0.5	2.0	8.2
9-Nov	Z	0.4	0.4	0.4	0.4	0.4	0.8	0.7	0.5	0.6	0.5	0.3	0.4	0.2	0.3	0.3	1.3	3.8	8.3	3.8	2.7	1.4	1.3	1.2	1.3	8.3
10-Nov	1.0	Z	1.0	0.9	1.5	1.8	1.7	1.3	1.6	1.5	1.5	1.0	1.0	1.0	1.1	0.8	1.0	3.4	3.0	2.8	2.0	1.3	0.9	1.2	1.5	3.4
11-Nov	1.0	1.4	Z	3.3	2.9	2.3	1.3	0.8	0.8	0.7	0.9	0.4	0.3	0.5	0.8	1.2	1.4	1.1	1.0	0.9	0.6	0.6	0.7	0.5	1.1	3.3
12-Nov	0.5	0.5	0.5	Z	1.0	1.2	1.5	1.6	1.2	1.4	1.4	1.2	1.2	1.3	1.1	1.4	1.3	1.1	1.7	1.7	1.2	0.8	1.0	0.8	1.1	1.7
13-Nov	0.4	0.3	0.5	0.3	Z	0.6	1.0	1.4	3.4	1.3	0.8	0.6	0.8	2.2	1.8	3.3	4.8	3.3	2.2	1.4	1.7	2.1	1.9	1.3	1.6	4.8
14-Nov	1.2	0.9	0.6	0.4	0.6	Z	0.9	1.0	0.7	0.7	0.6	0.5	0.4	0.5	0.6	0.9	0.7	0.5	0.3	0.4	0.4	0.4	0.2	0.2	0.6	1.2
15-Nov	Z	0.3	0.3	0.4	0.4	0.5	0.6	0.5	0.9	0.8	0.9	1.2	1.2	1.1	0.9	0.9	0.8	1.1	1.4	1.6	1.3	1.2	1.2	1.1	0.9	1.6
16-Nov	0.9	Z	1.1	1.2	0.9	0.9	0.5	0.6	0.8	0.8	0.7	0.9	0.8	1.3	1.4	1.4	1.6	1.7	1.8	2.1	2.2	2.2	2.3	2.1	1.3	2.3
17-Nov	2.0	2.0	Z	1.6	1.9	1.9	1.9	1.8	1.9	1.9	2.6	3.8	2.9	2.3	2.0	1.9	2.5	2.5	1.1	0.8	0.7	0.8	0.4	0.4	1.8	3.8
18-Nov	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.3	0.3	0.4	0.5	0.4	0.6	0.7	0.5	0.6	0.8	2.0	1.4	0.9	1.4	1.5	1.7	1.4	0.8	2.0
19-Nov	1.7	4.0	2.1	1.2	Z	1.1	0.5	1.1	0.6	0.9	2.4	C	C	C	C	C	C	C	2.5	1.8	2.7	3.0	3.1	2.4	--	4.0
20-Nov	2.9	2.8	2.7	3.2	3.0	Z	3.1	2.8	3.0	3.0	2.3	2.3	2.7	1.9	2.2	3.9	5.1	6.4	5.1	3.5	3.0	2.4	2.4	2.6	3.1	6.4
21-Nov	Z	3.8	3.6	3.8	4.6	4.2	4.0	3.6	4.7	4.3	3.6	3.8	5.0	6.1	6.7	7.8	8.3	8.7	9.9	9.2	6.1	5.5	5.3	2.6	5.4	9.9
22-Nov	1.7	Z	0.7	0.4	0.5	0.7	0.5	0.4	1.3	1.3	1.8	3.6	2.7	3.0	4.4	3.8	2.6	4.5	8.9	10.8	9.5	6.6	4.3	4.0	3.4	10.8
23-Nov	5.4	6.5	Z	3.1	2.5	0.5	0.3	0.3	0.3	0.4	0.5	0.4	0.3	0.3	0.3	0.5	0.5	0.6	0.4	0.3	0.6	0.3	0.2	0.2	1.1	6.5
24-Nov	0.2	0.3	0.3	Z	0.3	0.4	0.6	0.5	0.6	0.7	1.3	0.9	0.8	0.9	1.1	3.8	3.9	4.5	4.9	4.7	4.2	3.8	3.7	4.1	2.0	4.9
25-Nov	5.3	3.3	2.8	3.1	Z	3.5	3.0	2.4	2.0	1.6	1.8	2.1	3.1	4.1	5.6	6.7	5.9	4.2	4.2	4.1	4.0	4.4	3.7	2.9	3.7	6.7
26-Nov	2.6	2.6	2.5	2.7	2.6	Z	2.9	2.8	3.0	3.1	2.8	1.8	2.0	2.7	2.2	3.9	6.1	7.1	6.8	5.6	3.4	2.3	1.0	0.7	3.2	7.1
27-Nov	Z	0.6	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.8	0.9	0.5	0.5	0.3	0.6	0.3	0.5	0.4	0.3	0.4	1.4	3.2	4.3	3.8	1.0	4.3
28-Nov	2.4	Z	1.0	1.1	1.1	2.7	4.8	3.3	5.3	3.8	5.0	4.9	5.3	7.0	3.5	3.4	2.4	3.5	5.1	5.6	5.5	5.2	6.1	2.9	4.0	7.0
29-Nov	1.3	1.0	Z	1.5	2.4	6.4	10.9	9.6	7.8	6.5	5.3	4.8	5.5	5.4	6.0	7.0	8.1	12.1	8.8	8.2	7.8	7.1	6.6	6.1	6.4	12.1
30-Nov	5.3	3.9	2.6	Z	1.0	0.9	0.9	0.8	1.0	1.4	1.0	1.2	1.3	1.4	1.1	0.7	0.4	0.7	0.4	0.5	0.4	1.2	2.8	9.0	1.7	9.0
																								Diurnal Average		
																								Diurnal Maximum		
																								1.8 1.9 1.5 1.7 1.5 1.5 1.7 1.6 2.0 2.3 2.1 2.1 2.0 1.9 1.9 2.3 2.5 3.4 3.4 2.9 2.4 2.2 2.2 2.1		
																								5.4 8.2 6.3 6.3 4.6 6.4 10.9 9.6 7.8 19.1 14.2 12.1 10.1 7.0 6.7 7.8 8.3 12.1 12.1 10.8 9.5 7.1 6.6 9.0		
																								Z - zerspan C - Calibration M - Maintenance		



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Surmont 2 - November 2024**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Surmont 2 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	682	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Surmont 2 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	21	25	16	20	28	63	79	45	11	18	31	58	57	68	43	94	677
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	21	25	16	20	28	63	79	45	11	18	31	58	57	68	43	94	677

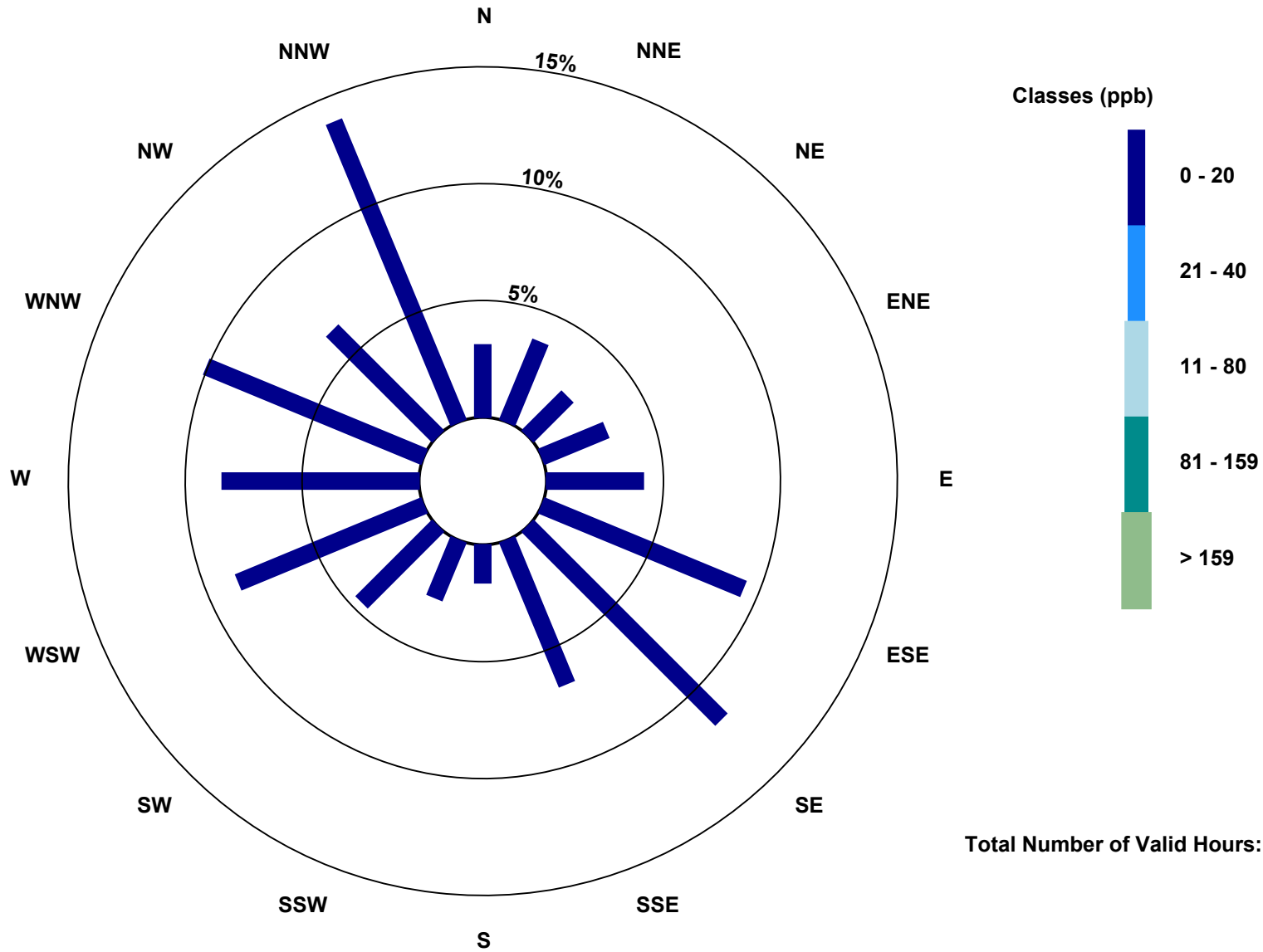
Total Number of Valid Hours: 677

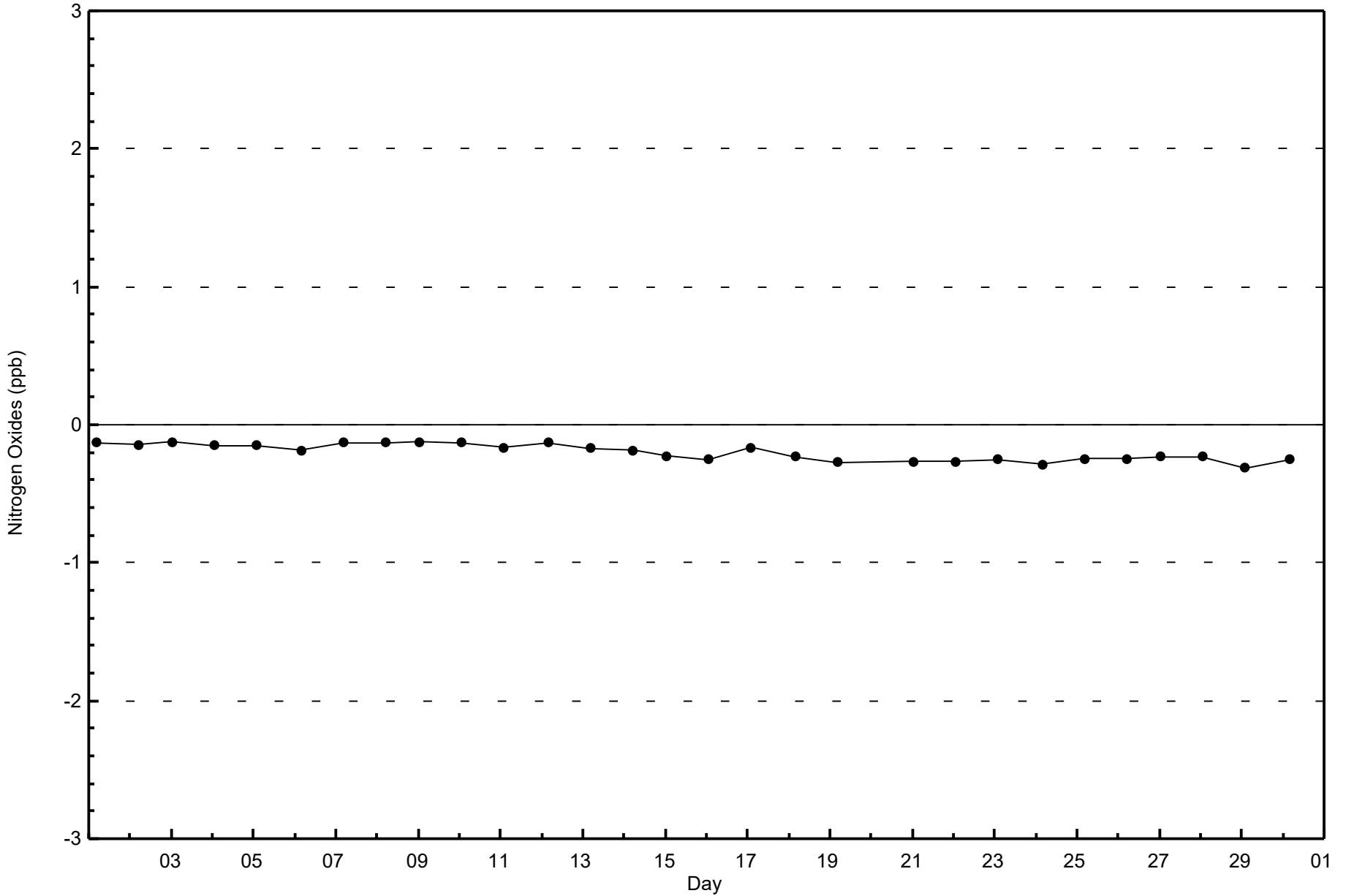
Total Number of Hours: 720

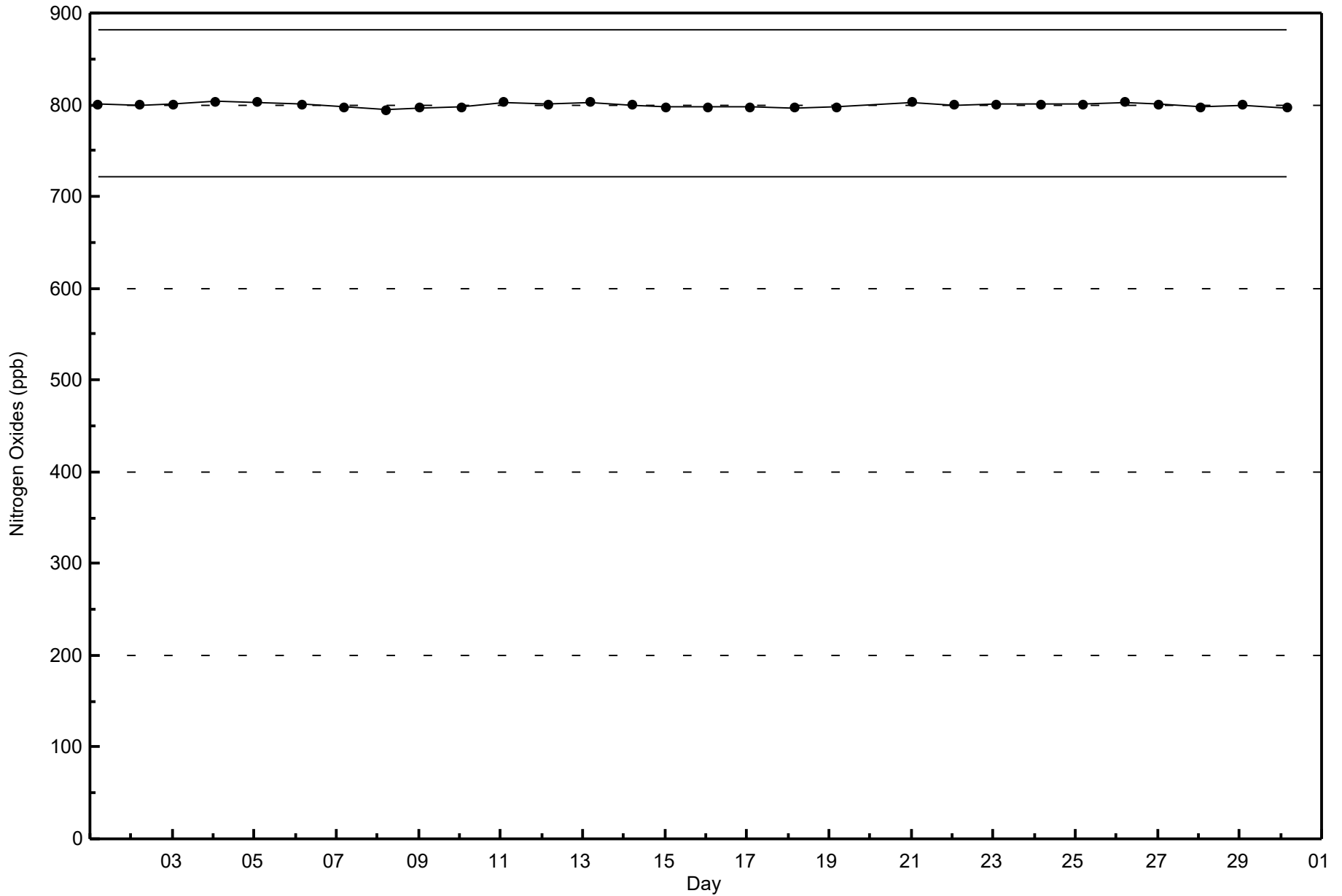


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Surmont 2









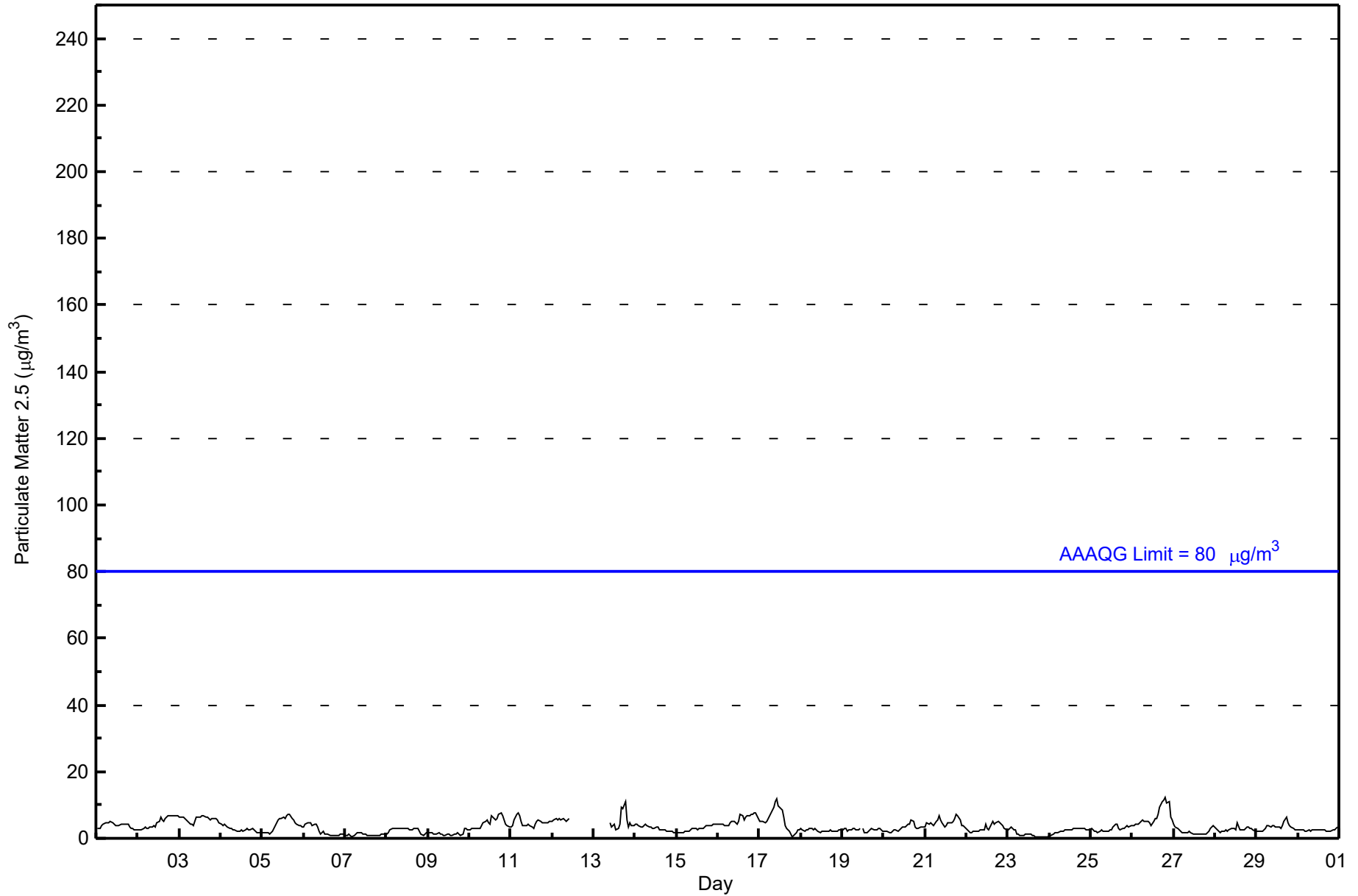
Summary of Hour Averages

Surmont 2 - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 12.4 µg/m <sup>3</sup> on Nov 26 20:00	Maximum Daily Average: 6.6 µg/m <sup>3</sup> on Nov 26		Hours of Data:	697
Minimum Value: 0.4 µg/m <sup>3</sup> on Nov 23 21:00	Minimum Daily Average: 1.1 µg/m <sup>3</sup> on Nov 7		Hours of Missing Data:	23
Maximum Diurnal Average: 4.1 µg/m <sup>3</sup> at hour 18	Minimum Diurnal Average: 3.0 µg/m <sup>3</sup> at hour 1		Hours of Calibration:	1
Monthly Average: 3.44 µg/m <sup>3</sup>	Percentiles: P <sub>1</sub> = 0.5 P <sub>10</sub> = 1.3 Q <sub>1</sub> = 2.2 Median = 3.0 Q <sub>3</sub> = 4.4 P <sub>90</sub> = 6.0 P <sub>99</sub> = 10.5		Percent Operational Time:	96.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	2.9	2.9	3.1	3.6	4.2	4.5	4.6	4.7	5.1	4.8	4.1	3.9	3.8	3.9	4.1	4.1	4.1	4.3	4.2	3.5	3.0	3.0	2.7	2.4	3.8	5.1																						
2-Nov	2.5	2.5	2.7	3.0	3.3	3.1	3.0	3.5	3.5	3.6	3.5	4.5	5.2	6.2	5.3	5.1	6.0	6.7	6.8	6.6	6.8	6.8	6.6	6.6	4.7	6.8																						
3-Nov	6.6	6.4	6.2	5.9	5.5	5.0	4.3	4.0	3.7	5.2	6.2	6.4	6.5	6.7	6.6	6.5	6.4	6.0	5.7	5.9	6.1	5.8	5.6	4.6	5.7	6.7																						
4-Nov	4.1	4.0	4.1	3.6	3.4	3.0	2.8	2.7	2.6	2.3	2.2	2.3	2.4	2.3	2.4	2.8	2.7	2.6	3.0	2.7	2.2	1.9	1.7	1.6	2.7	4.1																						
5-Nov	1.5	1.7	1.5	1.6	1.5	1.5	2.0	3.1	4.5	5.3	5.7	6.1	6.4	6.1	6.9	7.1	7.1	6.1	5.4	4.5	4.1	3.9	3.6	3.3	4.2	7.1																						
6-Nov	3.6	4.3	4.6	4.6	4.5	4.0	4.4	4.4	3.2	2.0	1.4	2.2	1.4	1.2	1.1	1.0	1.0	1.0	0.8	0.7	0.8	1.1	1.4	1.2	2.3	4.6																						
7-Nov	1.0	1.0	1.1	0.8	0.5	0.8	1.4	1.7	1.6	1.6	1.4	1.2	1.1	1.1	0.9	0.9	1.0	0.9	0.9	0.8	1.0	1.2	1.2	1.1	1.1	1.7																						
8-Nov	1.3	1.7	2.6	2.9	3.1	3.1	3.0	3.1	3.0	3.1	2.9	2.9	2.8	2.7	2.6	2.6	2.9	3.1	3.0	2.3	1.4	1.0	1.2	1.6	2.5	3.1																						
9-Nov	1.8	1.8	1.7	1.4	1.5	1.5	1.5	1.3	1.1	1.0	1.0	1.1	1.3	1.0	1.0	1.1	1.3	1.5	1.4	1.0	1.2	2.9	2.9	2.6	1.5	2.9																						
10-Nov	2.6	3.0	3.0	3.0	2.8	2.9	2.9	3.8	4.7	5.0	5.3	4.7	4.4	6.7	5.8	5.5	6.1	7.0	7.6	6.8	5.6	4.4	3.8	3.2	4.6	7.6																						
11-Nov	3.5	3.8	5.4	7.2	7.7	6.9	5.0	3.7	3.9	4.0	4.1	4.0	3.3	3.1	4.1	4.9	5.5	4.9	4.6	4.7	4.5	4.6	5.2	4.9	4.7	7.7																						
12-Nov	5.1	5.5	5.8	5.5	5.8	5.4	6.1	5.6	5.0	5.5	6.1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	6.1																						
13-Nov	UO	UO	UO	UO	UO	UO	UO	UO	UO	4.8	3.4	3.9	4.2	2.7	3.0	4.1	9.3	8.9	10.8	5.6	3.5	4.5	3.8	4.0	--	10.8																						
14-Nov	4.2	4.3	3.9	3.5	3.4	3.8	4.1	3.6	3.5	3.4	3.0	3.1	3.2	3.3	2.6	2.5	2.5	2.4	2.3	2.0	1.9	2.0	1.7	1.8	3.0	4.3																						
15-Nov	1.9	1.8	1.8	1.9	1.9	2.0	2.1	2.3	2.5	3.0	3.1	2.8	2.7	2.8	2.8	2.8	3.3	3.6	3.7	3.9	3.9	4.2	4.3	4.3	2.9	4.3																						
16-Nov	4.2	4.3	4.4	4.1	3.8	3.8	4.0	4.6	4.9	5.2	4.6	4.3	5.1	7.3	7.0	5.6	6.3	6.7	6.7	7.0	7.2	7.6	7.7	6.0	5.5	7.7																						
17-Nov	4.9	5.1	5.2	4.8	5.1	6.1	6.9	7.8	9.4	10.9	11.8	9.8	8.7	8.3	6.5	3.6	3.0	2.3	1.1	0.6	1.0	1.9	2.7	2.6	5.4	11.8																						
18-Nov	2.8	2.6	2.3	2.5	2.4	3.0	2.9	2.7	2.9	2.6	2.1	1.9	2.1	2.0	2.2	2.2	2.3	2.4	2.2	2.1	2.2	2.3	2.4	2.4	2.4	3.0																						
19-Nov	2.7	3.1	3.1	2.2	2.4	2.6	2.8	3.0	2.6	2.7	2.8	C	3.0	1.8	1.8	2.2	2.5	2.8	2.7	2.7	2.6	2.9	3.0	1.9	2.6	3.1																						
20-Nov	2.0	2.0	1.9	1.8	1.8	2.0	2.3	2.5	2.3	2.3	2.9	3.6	3.5	3.6	4.1	4.3	5.4	5.3	3.5	2.9	3.0	3.2	3.3	3.5	3.0	5.4																						
21-Nov	3.4	4.5	4.1	4.7	4.2	4.0	4.9	5.5	6.9	5.6	4.5	3.5	3.9	4.7	4.7	4.7	5.2	5.9	7.2	6.6	5.4	3.9	3.7	3.2	4.8	7.2																						
22-Nov	2.7	2.3	1.9	1.9	2.1	2.3	2.3	2.2	2.6	2.4	2.7	4.2	3.2	2.4	4.3	5.0	4.4	4.5	5.2	4.5	4.4	3.7	2.8	2.5	3.2	5.2																						
23-Nov	2.7	3.1	3.4	2.7	2.6	1.4	1.2	0.9	0.7	0.9	1.1	1.1	1.1	1.3	1.0	0.8	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.6	1.2	3.4																						
24-Nov	0.7	1.0	1.3	1.5	1.7	1.8	2.0	2.1	2.2	2.3	2.4	2.6	2.8	2.8	2.8	3.0	3.0	3.0	3.2	3.1	2.8	2.7	2.6	2.6	2.3	3.2																						
25-Nov	2.8	2.4	2.2	2.0	1.9	2.2	2.4	2.2	2.0	2.0	2.2	2.4	2.7	3.5	4.0	4.0	3.0	2.7	3.0	3.0	3.2	3.8	3.3	3.6	2.8	4.0																						
26-Nov	3.9	4.0	4.2	4.3	4.5	5.3	5.4	5.2	5.1	5.0	4.8	4.0	5.0	6.0	5.8	7.0	9.5	11.1	11.4	12.4	10.5	11.2	6.3	5.4	6.6	12.4																						
27-Nov	4.4	3.5	2.9	2.5	2.1	1.8	1.8	1.9	1.8	1.9	1.6	1.4	1.3	1.3	1.3	1.2	1.1	1.2	1.1	1.1	2.1	3.0	3.4	3.9	2.1	4.4																						
28-Nov	3.1	2.7	2.1	1.8	1.9	2.1	2.5	2.2	2.7	2.8	3.1	2.8	2.6	4.6	2.7	2.7	2.6	2.7	3.6	3.4	3.0	2.8	2.7	2.3	2.7	4.6																						
29-Nov	2.0	2.1	2.1	2.2	2.5	3.0	3.9	3.7	3.6	4.0	3.8	3.4	3.3	3.2	3.0	3.9	5.2	6.5	4.6	3.9	3.3	3.1	2.7	2.6	3.4	6.5																						
30-Nov	2.5	2.6	2.6	2.5	2.3	2.3	2.4	2.2	2.5	2.7	2.7	2.6	2.5	2.6	2.6	2.3	2.1	2.1	2.2	2.2	2.3	2.4	2.8	3.6	2.5	3.6																						
																								3.0	3.1	3.1	3.1	3.1	3.1	3.3	3.3	3.5	3.6	3.5	3.5	3.4	3.6	3.6	3.6	4.0	4.1	4.1	3.7	3.4	3.5	3.3	3.1	Diurnal Average
																								6.6	6.4	6.2	7.2	7.7	6.9	6.9	7.8	9.4	10.9	11.8	9.8	8.7	8.3	7.0	7.1	9.5	11.1	11.4	12.4	10.5	11.2	7.7	6.6	Diurnal Maximum

C - Calibration      UO - Unstable Operation  
 Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m<sup>3</sup>    24-hr 29 µg/m<sup>3</sup>





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Surmont 2 - November 2024**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	605	86.80	86.80
6 - 15	92	13.20	100.00
16 - 25	0	0.00	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 697

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>**  
**Surmont 2 - November 2024**

Concentration Ranges (μg/m <sup>3</sup> )	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	24	28	15	17	27	58	66	31	8	16	26	49	46	53	40	97	601
6 - 15	0	0	1	2	2	11	13	15	4	2	7	8	8	9	4	5	91
16 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	24	28	16	19	29	69	79	46	12	18	33	57	54	62	44	102	692

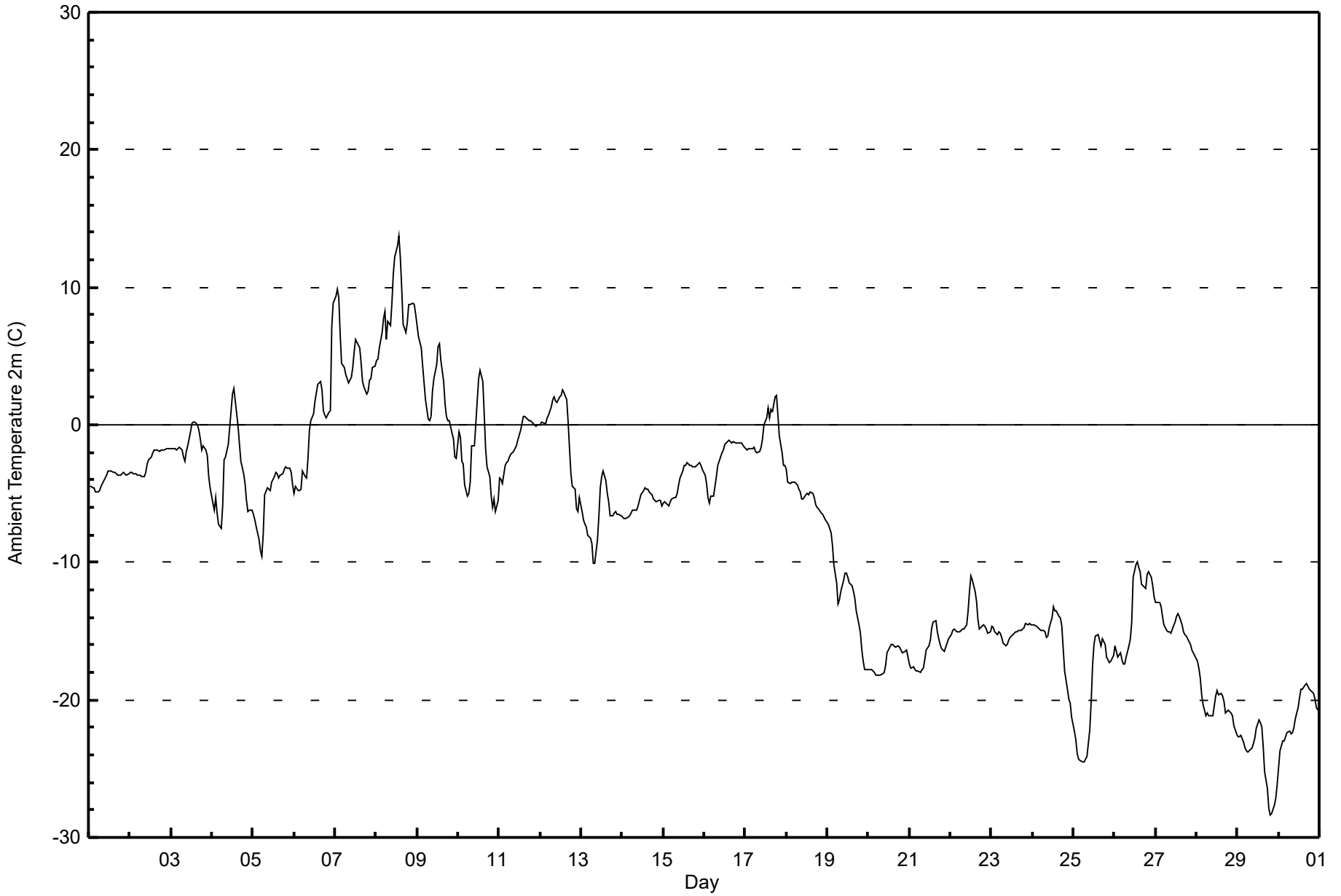
Total Number of Valid Hours: 692

Total Number of Hours: 720





Maximum Value: 13.7 C on Nov 8 14:00		Maximum Daily Average: 8.5 C on Nov 8		Hours in Service: 720																						
Minimum Value: -28.4 C on Nov 29 20:00		Minimum Daily Average: -24.3 C on Nov 29		Hours of Data: 720																						
Maximum Diurnal Average: -5.6 C at hour 14		Minimum Diurnal Average: -9.1 C at hour 7		Hours of Missing Data: 0																						
Monthly Average: -7.80 C		Percentiles: P <sub>1</sub> = -25.1 P <sub>10</sub> = -19.6 Q <sub>1</sub> = -15.1 Median = -5.4 Q <sub>3</sub> = -1.8 P <sub>90</sub> = 2.2 P <sub>99</sub> = 9.3		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	-4.5	-4.5	-4.6	-4.6	-4.9	-4.9	-4.7	-4.5	-4.3	-3.9	-3.7	-3.4	-3.3	-3.4	-3.4	-3.4	-3.6	-3.7	-3.7	-3.5	-3.5	-3.5	-3.6	-3.6	-3.9	-3.3
2-Nov	-3.5	-3.4	-3.5	-3.6	-3.6	-3.7	-3.7	-3.8	-3.7	-3.4	-2.9	-2.6	-2.3	-2.1	-1.9	-1.8	-1.9	-1.9	-1.8	-1.8	-1.9	-1.8	-1.8	-1.7	-2.7	-1.7
3-Nov	-1.7	-1.7	-1.8	-1.8	-1.7	-1.7	-1.8	-2.3	-2.6	-2.0	-1.6	-0.5	0.1	0.2	0.2	0.0	-0.4	-1.0	-1.8	-1.5	-1.9	-2.3	-3.8	-4.6	-1.6	0.2
4-Nov	-5.7	-6.2	-5.3	-6.4	-7.2	-7.5	-5.9	-2.6	-2.4	-1.5	-0.2	1.0	2.2	2.6	0.9	-0.1	-1.4	-2.6	-3.6	-4.3	-5.5	-6.3	-6.2	-6.2	-3.3	2.6
5-Nov	-6.5	-6.9	-7.4	-8.3	-9.2	-9.6	-8.0	-5.0	-4.5	-4.7	-4.8	-4.2	-3.8	-3.4	-3.5	-3.9	-3.7	-3.5	-3.3	-3.1	-3.1	-3.2	-3.4	-4.4	-5.1	-3.1
6-Nov	-5.0	-4.5	-4.8	-4.7	-4.6	-3.3	-3.8	-3.9	-2.4	-0.4	0.3	0.8	1.7	2.3	2.9	3.2	2.6	1.0	0.7	0.5	0.9	1.0	7.1	8.8	-0.1	8.8
7-Nov	9.4	9.9	9.3	6.6	4.5	4.2	3.7	3.3	3.1	3.5	4.2	5.3	6.2	6.0	5.6	4.4	3.1	2.7	2.2	2.4	3.2	3.3	4.2	4.2	4.8	9.9
8-Nov	4.7	4.8	5.6	6.7	7.7	8.3	6.2	7.5	7.2	8.8	10.9	12.2	13.1	13.7	12.3	9.9	7.3	6.7	7.4	8.8	8.8	8.9	8.8	8.1	8.5	13.7
9-Nov	7.2	6.4	5.6	4.2	3.0	1.9	0.5	0.3	0.6	2.4	3.4	4.4	5.6	5.9	4.7	3.1	1.5	0.6	0.3	0.3	-0.7	-1.0	-2.3	-2.4	2.3	7.2
10-Nov	-0.6	-0.9	-2.6	-2.9	-4.3	-5.2	-5.0	-4.2	-1.5	-1.5	0.2	1.8	3.4	4.0	3.2	0.8	-1.7	-3.1	-3.7	-5.2	-6.0	-5.4	-6.3	-5.5	-2.2	4.0
11-Nov	-3.8	-4.0	-4.3	-2.9	-2.7	-2.7	-2.3	-2.1	-2.0	-1.8	-1.5	-1.1	-0.4	0.1	0.6	0.6	0.5	0.3	0.3	0.2	0.1	-0.1	0.0	0.0	-1.2	0.6
12-Nov	0.0	0.2	0.1	0.1	0.5	0.7	1.3	1.9	2.1	1.7	1.6	2.0	2.1	2.5	2.3	1.9	0.2	-1.7	-3.5	-4.5	-4.7	-6.1	-6.3	-5.3	-0.5	2.5
13-Nov	-6.3	-6.9	-7.2	-7.4	-8.1	-8.3	-8.7	-10.0	-10.0	-8.3	-6.6	-4.6	-3.8	-3.4	-4.0	-5.0	-5.6	-6.6	-6.6	-6.4	-6.3	-6.5	-6.5	-6.6	-6.7	-3.4
14-Nov	-6.7	-6.8	-6.8	-6.7	-6.6	-6.4	-6.2	-6.2	-6.2	-5.9	-5.5	-5.1	-4.8	-4.6	-4.7	-4.7	-4.9	-5.1	-5.4	-5.5	-5.6	-5.5	-5.5	-5.9	-5.7	-4.6
15-Nov	-5.7	-5.6	-5.8	-5.9	-5.6	-5.4	-5.3	-5.3	-5.0	-4.4	-3.8	-3.3	-2.9	-2.9	-2.7	-2.9	-3.0	-3.0	-3.0	-3.0	-2.8	-2.8	-3.0	-3.3	-4.0	-2.7
16-Nov	-3.7	-4.2	-5.3	-5.7	-5.2	-5.1	-4.5	-3.7	-2.9	-2.3	-2.0	-1.8	-1.4	-1.3	-1.1	-1.2	-1.3	-1.2	-1.3	-1.3	-1.4	-1.3	-1.4	-1.6	-2.6	-1.1
17-Nov	-1.8	-1.8	-1.7	-1.7	-1.7	-1.7	-2.0	-2.1	-2.0	-1.7	-1.0	0.0	0.5	1.2	0.5	1.2	0.9	2.0	2.2	0.7	-0.9	-2.0	-3.0	-3.0	-0.8	2.2
18-Nov	-3.3	-4.2	-4.3	-4.2	-4.2	-4.2	-4.4	-4.7	-4.9	-5.4	-5.4	-5.1	-4.9	-5.1	-4.9	-5.0	-5.3	-5.8	-6.0	-6.1	-6.4	-6.5	-6.7	-6.9	-5.2	-3.3
19-Nov	-7.2	-7.5	-7.8	-8.8	-10.2	-11.5	-13.0	-12.8	-12.1	-11.3	-10.8	-10.8	-11.1	-11.5	-11.7	-12.1	-12.6	-13.5	-14.6	-15.2	-16.3	-17.2	-17.8	-17.8	-12.3	-7.2
20-Nov	-17.8	-17.8	-17.8	-18.0	-18.2	-18.2	-18.2	-18.2	-18.2	-18.0	-17.5	-16.6	-16.2	-15.9	-15.9	-16.1	-16.2	-16.1	-16.2	-16.4	-16.6	-16.4	-16.3	-16.9	-17.1	-15.9
21-Nov	-17.4	-17.7	-17.6	-17.8	-17.9	-17.9	-18.0	-17.8	-17.7	-17.1	-16.4	-16.0	-15.6	-14.8	-14.3	-14.3	-15.1	-15.5	-15.9	-16.2	-16.5	-16.1	-15.9	-15.5	-16.5	-14.3
22-Nov	-15.3	-14.9	-14.8	-15.0	-15.0	-15.0	-14.9	-14.9	-14.9	-14.5	-13.6	-12.1	-11.0	-11.2	-12.1	-12.8	-14.1	-14.8	-14.6	-14.5	-14.6	-14.8	-15.1	-15.0	-14.2	-11.0
23-Nov	-14.6	-14.7	-15.1	-15.2	-15.1	-15.1	-15.4	-15.9	-16.0	-16.0	-15.7	-15.4	-15.3	-15.1	-15.1	-15.0	-14.9	-14.9	-14.8	-14.7	-14.5	-14.5	-14.4	-14.5	-15.1	-14.4
24-Nov	-14.5	-14.6	-14.6	-14.7	-14.8	-14.9	-14.9	-15.1	-15.5	-15.4	-14.7	-14.1	-13.2	-13.5	-13.5	-14.0	-14.1	-14.6	-16.3	-17.9	-19.2	-19.9	-20.3	-21.2	-15.7	-13.2
25-Nov	-22.3	-22.9	-23.9	-24.3	-24.4	-24.5	-24.4	-24.1	-22.2	-20.2	-17.5	-16.0	-15.4	-15.2	-15.6	-16.1	-15.5	-15.9	-16.9	-17.1	-17.3	-17.2	-16.8	-19.6	-15.2	
26-Nov	-16.1	-16.5	-16.9	-16.6	-17.1	-17.4	-17.4	-16.9	-16.1	-15.6	-14.3	-11.0	-10.2	-10.0	-10.4	-10.7	-11.6	-11.8	-11.8	-10.9	-10.7	-11.1	-11.7	-12.5	-13.6	-10.0
27-Nov	-12.9	-12.9	-13.0	-13.2	-14.0	-14.6	-15.0	-15.1	-15.1	-14.8	-14.4	-13.9	-13.7	-13.9	-14.5	-15.0	-15.3	-15.4	-15.6	-15.9	-16.3	-16.6	-16.8	-16.8	-14.7	-12.9
28-Nov	-17.2	-17.7	-18.4	-19.6	-20.3	-21.1	-21.0	-21.1	-21.1	-21.1	-20.5	-19.7	-19.3	-19.6	-19.5	-19.7	-20.1	-20.9	-20.8	-20.9	-21.0	-21.1	-21.9	-22.5	-20.3	-17.2
29-Nov	-22.7	-22.6	-22.6	-23.0	-23.5	-23.7	-23.8	-23.7	-23.5	-23.2	-22.8	-22.0	-21.5	-21.7	-21.9	-23.4	-25.2	-26.5	-27.8	-28.4	-28.3	-27.7	-27.1	-26.1	-24.3	-21.5
30-Nov	-24.9	-23.7	-23.0	-23.0	-22.6	-22.4	-22.3	-22.5	-22.3	-22.0	-21.4	-20.5	-19.8	-19.3	-19.2	-18.9	-18.8	-19.0	-19.2	-19.3	-19.5	-19.9	-20.6	-20.8	-21.0	-18.8
	-8.0	-8.1	-8.3	-8.6	-8.9	-9.0	-9.1	-8.9	-8.6	-8.1	-7.4	-6.5	-5.9	-5.6	-5.9	-6.3	-7.0	-7.5	-7.8	-8.0	-8.3	-8.5	-8.5	-8.5	Diurnal Average	
	9.4	9.9	9.3	6.7	7.7	8.3	6.2	7.5	7.2	8.8	10.9	12.2	13.1	13.7	12.3	9.9	7.3	6.7	7.4	8.8	8.8	8.9	8.8	8.8	Diurnal Maximum	





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C**  
**Surmont 2 - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	66	9.17	9.17
-20 - 0	525	72.92	82.08
0 - 10	124	17.22	99.31
10 - 20	5	0.69	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Relative Humidity 2m (RH2) - %**

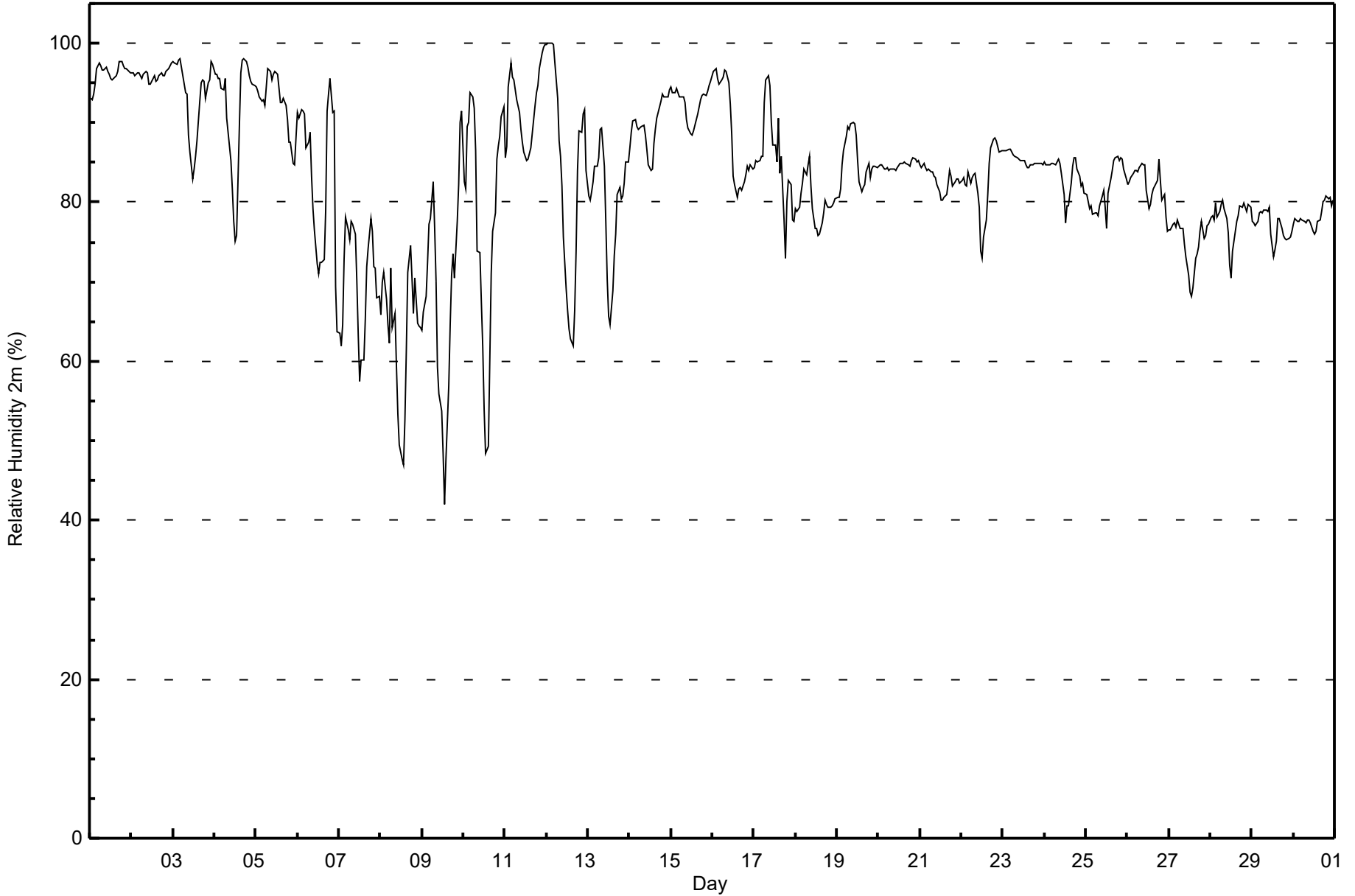
**Surmont 2 - November 2024**

Maximum Value: 100.1 % on Nov 12 04:00      Maximum Daily Average: 96.1 % on Nov 1																						Hours in Service:	720																							
Minimum Value: 42.0 % on Nov 9 14:00      Minimum Daily Average: 63.4 % on Nov 8																						Hours of Data:	720																							
Maximum Diurnal Average: 86.7 % at hour 7      Minimum Diurnal Average: 76.3 % at hour 14																						Hours of Missing Data:	0																							
Monthly Average: 83.34 %      Percentiles: P <sub>1</sub> = 50.1 P <sub>10</sub> = 71.6 Q <sub>1</sub> = 77.9 Median = 84.2 Q <sub>3</sub> = 90.6 P <sub>90</sub> = 95.9 P <sub>99</sub> = 98.7																						Hours of Calibration:	0																							
																						Percent Operational Time:	100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																						
1-Nov	93.0	92.8	93.6	94.8	96.8	97.6	97.2	96.6	96.7	97.0	96.4	96.0	95.5	95.4	95.7	95.9	96.5	97.7	97.6	97.1	96.8	96.9	96.6	96.3	96.1	97.7																				
2-Nov	96.2	96.3	96.0	96.3	96.2	95.9	95.5	96.1	96.5	96.3	94.9	94.8	95.6	96.0	95.2	95.4	95.9	96.3	95.9	95.9	96.5	96.8	97.2	97.5	96.0	97.5																				
3-Nov	97.7	97.5	97.3	97.9	98.0	97.1	94.8	93.8	93.7	88.5	86.4	83.0	84.2	85.7	87.7	92.7	95.1	95.5	95.2	93.2	95.1	95.4	97.7	97.4	93.4	98.0																				
4-Nov	96.2	96.1	95.5	95.6	94.4	94.1	95.5	90.6	88.7	85.3	81.6	77.7	75.2	75.8	89.7	96.3	97.9	98.0	97.7	96.9	96.0	95.1	94.9	94.7	91.6	98.0																				
5-Nov	94.5	94.0	93.3	92.7	92.8	92.1	94.5	96.9	96.5	95.4	96.1	96.4	96.1	94.3	92.6	92.6	93.1	92.2	90.4	87.6	87.5	84.9	84.7	88.0	92.5	96.9																				
6-Nov	91.2	90.6	91.6	91.6	91.2	86.9	87.5	88.7	83.4	79.2	76.5	72.2	71.0	72.4	72.5	72.8	79.0	91.5	93.6	95.6	91.3	91.5	69.4	63.7	83.1	95.6																				
7-Nov	63.5	61.9	64.7	72.8	78.2	76.6	75.3	77.6	77.2	76.0	70.0	63.3	57.4	60.2	60.2	65.3	72.0	74.3	77.9	76.3	71.9	71.7	68.0	68.1	70.0	78.2																				
8-Nov	65.9	69.9	71.2	67.7	64.5	62.2	71.7	64.3	66.0	59.4	53.4	49.5	47.7	46.9	52.6	61.4	71.2	74.5	70.5	66.1	70.4	64.9	64.4	64.2	63.4	74.5																				
9-Nov	64.0	66.2	68.1	72.4	77.2	78.0	82.7	76.9	70.2	59.3	55.9	53.7	48.4	42.0	47.7	56.9	64.7	70.7	73.4	70.5	77.6	82.2	90.1	91.6	68.4	91.6																				
10-Nov	82.7	81.8	89.5	90.1	93.8	93.3	91.9	86.5	73.8	73.7	67.6	61.9	53.9	48.4	49.4	60.2	71.0	76.4	78.6	85.3	87.0	88.2	90.7	92.0	77.8	93.8																				
11-Nov	85.7	87.1	94.5	97.6	95.7	95.3	94.2	92.9	91.3	89.2	87.6	86.3	85.2	85.5	86.1	86.9	88.6	92.1	93.8	94.7	96.8	98.9	99.5	99.8	91.9	99.8																				
12-Nov	99.9	100.0	100.0	100.1	99.9	97.6	93.0	87.7	85.8	82.0	75.6	69.0	66.4	64.0	62.8	61.8	66.4	73.9	83.9	89.0	88.7	91.2	91.7	84.0	83.9	100.1																				
13-Nov	80.8	80.2	81.3	82.5	84.6	84.5	85.5	89.2	89.3	84.5	77.6	70.3	65.7	64.5	68.8	73.3	75.9	80.9	82.0	80.5	80.9	82.4	85.0	85.1	79.8	89.3																				
14-Nov	86.8	88.8	90.3	90.4	89.5	89.2	89.4	89.6	89.7	88.4	86.7	84.7	84.0	84.2	87.4	89.2	90.6	92.1	92.7	93.6	93.3	93.3	93.3	94.1	89.6	94.1																				
15-Nov	94.4	93.9	93.7	94.4	93.8	93.2	93.2	93.3	92.5	90.5	89.4	88.4	89.1	89.6	91.2	92.0	92.9	93.4	93.6	93.5	93.9	94.6	95.3	92.4	92.4	95.3																				
16-Nov	96.4	96.6	96.7	95.5	94.9	95.4	95.7	96.6	96.4	95.0	92.3	88.6	83.2	82.1	80.5	81.6	81.9	81.5	82.5	83.5	84.6	84.1	84.8	84.2	88.9	96.7																				
17-Nov	84.4	85.3	85.1	85.2	85.8	85.7	92.5	95.4	96.0	94.8	90.1	87.2	87.2	85.0	90.5	83.7	85.8	77.8	73.0	80.1	82.8	82.3	77.8	77.6	85.5	96.0																				
18-Nov	79.2	78.9	79.3	81.2	82.4	84.2	83.6	84.7	85.8	82.0	79.3	76.7	76.7	75.8	75.9	77.5	78.6	80.3	79.7	79.4	79.4	79.6	79.9	80.4	80.0	85.8																				
19-Nov	80.7	80.5	81.6	84.7	86.6	88.2	89.5	89.1	89.8	90.0	89.9	88.4	85.2	82.6	81.4	81.8	82.2	83.9	84.9	83.1	84.1	84.5	84.5	84.4	85.1	90.0																				
20-Nov	84.6	84.8	84.6	84.3	84.2	84.4	84.1	84.2	84.1	84.1	84.1	84.4	85.0	85.0	84.9	85.0	84.9	84.7	84.6	85.2	85.5	85.4	85.1	85.2	84.7	85.5																				
21-Nov	84.7	84.4	84.8	84.4	84.0	84.2	83.9	83.8	83.3	83.0	82.2	81.3	80.2	80.3	80.6	80.9	82.4	84.0	83.3	82.0	82.6	83.0	83.0	82.5	82.9	84.8																				
22-Nov	82.8	83.2	82.3	82.1	83.8	82.4	83.1	83.5	83.6	81.2	79.3	73.9	73.0	75.7	77.8	80.9	84.9	86.9	87.9	88.1	87.8	87.0	86.3	86.5	82.7	88.1																				
23-Nov	86.6	86.5	86.5	86.6	86.6	86.3	85.9	85.8	85.6	85.4	85.3	85.3	84.8	84.4	84.4	84.7	84.8	84.8	84.9	84.9	84.9	84.8	84.8	84.7	85.4	86.6																				
24-Nov	85.0	84.8	84.8	84.7	84.9	85.0	84.7	85.1	85.4	84.9	83.7	80.9	77.4	79.5	79.6	82.5	84.5	85.6	85.7	84.2	83.3	82.1	82.3	81.2	83.4	85.7																				
25-Nov	81.0	80.0	79.1	79.5	78.5	78.7	78.6	78.3	79.6	80.7	81.5	79.4	76.8	81.2	82.9	84.0	85.2	85.5	85.7	85.3	85.7	85.4	84.2	83.0	81.7	85.7																				
26-Nov	82.3	82.6	83.2	83.7	83.9	83.9	83.8	84.4	84.9	84.7	84.7	81.6	79.2	79.7	80.9	81.7	82.1	82.7	85.5	82.7	80.2	81.0	78.1	76.3	82.2	85.5																				
27-Nov	76.6	76.5	77.3	77.4	76.9	77.7	76.8	76.7	76.6	74.7	73.2	70.7	68.7	68.1	69.2	73.0	73.6	74.5	76.4	77.6	75.5	75.8	77.1	77.2	74.9	77.7																				
28-Nov	78.2	78.2	77.7	79.8	78.0	78.9	79.7	80.3	79.2	78.0	76.2	72.1	70.4	73.9	76.4	77.5	78.4	79.6	79.4	80.0	79.4	78.8	79.7	79.3	77.9	80.3																				
29-Nov	77.6	77.4	77.1	77.5	78.6	78.8	78.6	79.0	79.0	78.9	79.4	76.0	73.1	74.1	75.1	78.0	78.0	76.7	75.7	75.5	75.3	75.4	75.7	76.4	77.0	79.4																				
30-Nov	77.2	77.9	77.6	77.6	77.9	77.7	77.6	77.4	77.8	77.8	77.4	76.3	76.1	76.3	77.6	77.8	78.9	80.1	80.2	80.7	80.4	80.7	79.6	80.2	78.3	80.7																				
																						84.3	84.5	85.3	86.0	86.4	86.2	86.7	86.2	85.3	83.3	81.1	78.3	76.4	76.3	77.9	80.1	82.5	84.3	84.9	84.9	85.2	85.2	84.7	84.4	Diurnal Average
																						99.9	100.0	100.0	100.1	99.9	97.6	97.2	96.9	96.7	97.0	96.4	96.4	96.1	96.0	95.7	96.3	97.9	98.0	97.7	97.1	96.8	98.9	99.5	99.8	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 2m (RH2) - %**  
**Surmont 2 - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 2m (RH2) - %**  
**Surmont 2 - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	17	2.36	2.36
60 - 80	219	30.42	32.78
80 - 100	481	66.81	99.58

Total Number of Valid Hours: 720

Total Number of Hours: 720



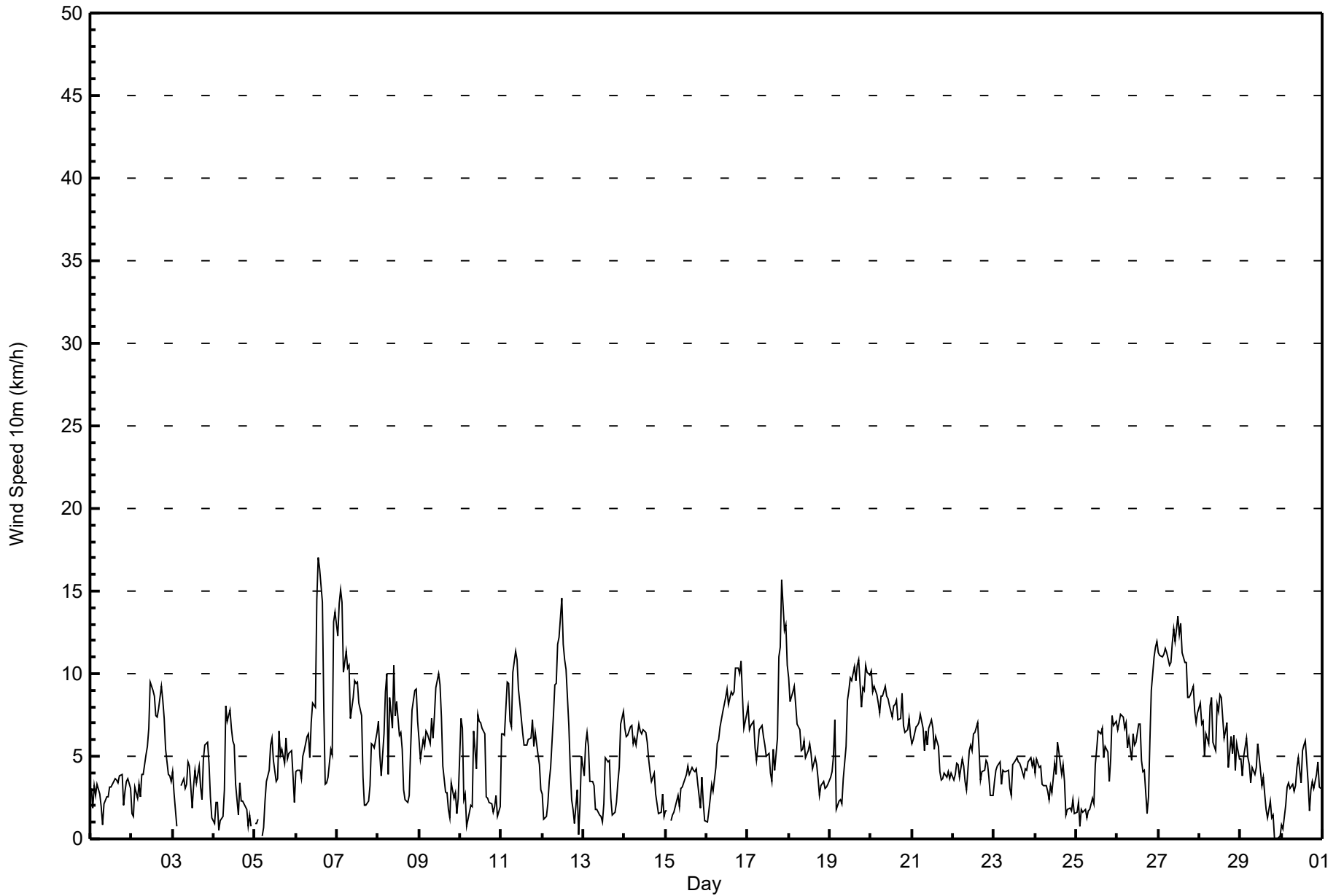


Maximum Speed: 17 km/h on Nov 6 14:00	Maximum Daily Speed Average: 10.0 km/h on Nov 27	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 29 21:00	Minimum Daily Speed Average: 0.6 km/h on Nov 13	Hours of Data: 715
Maximum Diurnal Speed Average: 1.8 km/h at hour 11	Minimum Diurnal Speed Average: 0.2 km/h at hour 18	Hours of Missing Data: 5
Monthly Average Velocity: 1.2 km/h 295.4 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 2 Q <sub>1</sub> = 3 Median = 5 Q <sub>3</sub> = 7 P <sub>90</sub> = 9 P <sub>99</sub> = 14	Percent Operational Time: 99.3

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	ESE3	ESE2	ESE3	ENE3	ESE3	ESE3	ESE2	E1	ENE2	ENE3	E3	E3	ESE3	E3	E4	ESE4	ESE3	ESE4	ESE4	SE2	ESE3	ESE4	ESE4	ESE3	ESE2.8	ESE4	
2-Nov	E1	ESE1	ESE3	ESE2	ESE3	ESE3	ESE4	ESE4	ESE5	ESE6	ESE7	ESE9	ESE9	ESE9	ESE7	ESE7	ESE8	ESE9	ESE8	ESE7	ESE5	ESE4	ESE4	ESE4	ESE5.4	ESE9	
3-Nov	ESE4	ESE3	SSE1	UO	UO	WNW3	WNW4	W3	WSW3	W5	W4	WSW2	WSW3	WSW4	SSE3	SSE4	SSE3	S2	WSW5	W6	WSW6	W5	WSW3	SSW1	WSW2.4	WSW6	
4-Nov	SSE1	SW2	W2	SSW0	SW1	W1	WNW3	W8	W7	WNW8	W7	W6	WSW6	WNW3	W1	WSW3	WSW2	WSW2	WSW2	WSW2	SW1	SW1	WSW1	UO	W2.9	W8	
5-Nov	SW1	SW1	W1	UO	NE0	W1	WNW2	NW3	NNW4	N6	NNW6	NNW5	NNW3	NW4	WNW7	WNW5	WNW5	WNW5	W6	W5	WSW5	WSW5	WSW4	SSW2	WNW3.0	WNW7	
6-Nov	SSW4	SSE4	SSE4	ESE4	ESE5	SSE5	SE6	SE6	S5	SSW7	S8	SW8	WSW14	WSW17	WSW16	WSW14	WSW8	SW3	SSW3	SSE4	SE5	SE5	WSW13	W14	SW5.3	WSW17	
7-Nov	W12	W14	WNW15	NW14	NW10	WNW11	WNW10	WNW11	WNW7	WNW9	WNW10	WNW9	W9	W8	W7	WSW4	SSW2	SSW2	SSE2	SE3	SE6	ESE6	SSE6	SE6	W5.5	WNW15	
8-Nov	SE7	SE5	SSE4	WSW6	WSW9	W10	WSW4	WSW9	WSW7	WSW10	W7	W8	W6	WSW6	WSW5	WSW3	SW2	S2	SW3	W5	WSW8	W9	WNW9	WNW7	WSW5.2	WSW10	
9-Nov	WNW6	WNW5	WNW6	WNW6	WNW6	W6	W6	W7	W6	W7	W9	WSW10	W9	WNW7	WSW4	WSW3	WSW3	SW2	SW1	SW3	SSW2	WSW3	SSE2	SW2	W4.8	WSW10	
10-Nov	WSW7	WSW7	WSW2	WSW3	SW1	SSW2	SW2	NW2	WNW7	WNW4	W8	W7	W7	WNW7	WNW6	WSW3	SW2	SW2	SW2	SW2	SW2	SW2	SW3	SW1	S2	W3.3	W8
11-Nov	SE6	SSE6	SSE6	SE10	SE9	SE7	SE7	ESE10	ESE11	ESE11	ESE9	ESE8	SE6	SE6	SE6	SE6	SE6	SE6	SE7	SE6	ESE6	SE5	SE4	SSE3	SE6.9	ESE11	
12-Nov	SE3	E1	SE1	S2	W3	WSW4	W7	W9	W9	W12	W12	W15	WNW12	W11	W10	W7	WNW4	NW2	ENE2	SSE1	WSW3	S0	WNW2	WNW5	W5.0	W15	
13-Nov	WNW4	WNW6	WSW6	W6	NW3	NW3	WNW3	WNW2	W2	NNW1	W1	SE1	SE2	ESE5	ENE5	ENE5	NE2	ENE1	ENE2	E2	ENE3	E4	E7	ESE8	NE0.6	ESE8	
14-Nov	E7	E6	E6	E7	E7	E6	E6	E6	E7	E7	E6	E7	E6	E6	ENE5	ENE4	ENE3	ENE4	ENE3	NE2	NE1	NE2	NE3	NNE1	E4.7	E7	
15-Nov	NNE2	NE2	UO	NW1	E1	SE2	ESE2	ESE3	SSE2	SSE3	SE3	SE4	SE4	SE4	SE4	SE4	SE4	SE4	SE4	SE3	ESE2	SE4	SE2	SSE1	SE2.6	SE4	
16-Nov	SSE1	S2	SSW2	SSW3	SSE3	S4	SSE6	SSE6	SSE7	SSE8	SSE8	SSE9	SSE9	SE8	SSE9	SSE9	SSE9	SSE10	SSE10	SSE10	SSE11	SSE9	SE7	SE8	SSE6.8	SSE11	
17-Nov	SE8	SE7	SE7	SE7	SE6	SE5	SE6	SE7	SE7	SSE6	S6	SSW5	SSE5	SE4	SE3	SW5	SSW4	SW6	WSW11	W12	W16	WNW13	WNW13	W10	SSW3.5	W16	
18-Nov	WNW10	WNW8	WNW9	WNW9	WNW8	WNW7	WNW7	NW5	NW5	NW6	NW5	NW5	NNW6	NNW5	N4	N5	NE4	NNE4	NNE3	NE3	N3	NNE3	ENE3	NE3	NW4.2	WNW10	
19-Nov	NE4	NE4	ENE5	E7	N2	NNW2	N2	N2	NW4	NNW6	N8	N9	N10	NNW10	NNW10	NNW10	NNW10	NNW11	NNW8	NNW9	NNW9	NNW11	NNW10	NNW10	N6.4	NNW11	
20-Nov	NNW10	NNW9	NNW9	NNW9	NNW8	NNW8	NNW9	NNW9	NNW9	NNW9	NNW9	NNW8	NNW7	NNW8	NNW8	NNW8	NNW7	NNW7	NNW9	NNW7	NW6	NW7	NNW7	NNW6	NNW8.0	NNW10	
21-Nov	NNW6	NNW6	NW7	NNW7	NNW7	NNW8	NNW7	NNW5	NNW6	NNW6	NNW7	NNW7	N7	NW5	N6	NNW6	NW4	NW4	NW4	NW4	NW4	NW4	WNW4	WNW4	NNW5.4	NNW8	
22-Nov	WNW4	NW4	NNW5	NW5	NW4	NW5	NW4	NW3	WNW3	WNW5	NW6	NW5	NNW6	N6	NNW7	NW5	NW4	NNW4	NNW4	NNW5	NNW5	NNW4	NW3	N3	NW4.3	NNW7	
23-Nov	NNE3	NNE4	NNE4	NE5	NE3	ENE4	E4	ENE4	E4	ENE3	NNE3	NE4	NNE5	NNE5	NNE5	NNE5	NNE4	NNE4	NNE4	N4	N5	N5	N4	NNE5	NNE3.8	N5	
24-Nov	NNE4	NNE5	NNE4	NNE4	NNE3	N3	N3	N3	NW2	NW3	NNW3	N5	NNE4	NNW6	NNW5	NNW4	NNW4	NW3	WNW1	WSW2	WSW2	SW2	WSW2	SW2	NNW2.6	NNW6	
25-Nov	WSW2	WSW2	SW1	WSW2	SW2	SW2	SSW1	SSW2	S2	SSE2	SE2	SE4	SE5	SE7	SE6	SE7	SSE5	SE6	SE5	SE3	SE5	SE7	SE7	ESE7	SE3.3	SE7	
26-Nov	ESE7	ESE7	SE8	SE7	ESE7	SE7	SE5	SE6	SE5	SSE6	SSE6	SSE6	S7	S7	SSE5	SW4	SW4	SSW2	SW3	W6	WNW9	WNW11	WNW12	WNW12	S2.7	WNW12	
27-Nov	WNW11	WNW11	WNW11	WNW11	W12	W11	WNW11	W11	W12	W13	W12	WNW13	WNW12	WNW13	NW11	WNW11	WNW11	NW9	NW9	NNW9	NNW9	NNW8	NNW7	NNW8	WNW10.0	WNW13	
28-Nov	NNW8	NNW7	NNW7	NNW5	WNW6	NW6	NNW8	NNW9	NNW6	NNW5	NNW8	NNW8	NNW9	NNW9	NNW6	NW7	NNW7	NW4	N6	NNW5	NNW6	N4	NNW6	NNW5	NNW6.4	NNW9	
29-Nov	NNW5	NNW4	N5	NNW6	NNW5	NW4	NW3	NNW4	NNW4	NNW4	NNW6	NNE5	NNE3	ENE4	NE3	WNW2	WSW1	WSW2	WSW1	WSW1	S0	SW0	SSE0	E0	NNW2.5	NNW6	
30-Nov	ESE1	SE1	ESE2	ESE3	SE3	SE3	SE3	SE3	ESE3	ESE4	ESE5	SE3	ESE5	ESE6	ESE6	ESE3	SE2	NNE3	NNE4	NNE3	N4	NNW5	NNW3	NW3	E2.0	ESE6	

NNW0.9	WNW1.1	WNW1.2	NW1.1	NW1.1	WNW1.3	WNW1.2	WNW1.4	WNW1.4	WNW1.7	WNW1.8	WNW1.7	WNW1.5	WNW1.4	NW1.2	WNW1.1	WNW0.7	WNW0.2	WNW0.4	WNW0.9	WNW1.2	NW1.1	WNW1.4	WNW1.3	Diurnal Average	
W12	W14	WNW15	NW14	W12	WNW11	WNW11	W11	W12	W13	W12	W15	WSW14	WSW17	WSW16	WSW14	WNW11	NNW11	WSW11	W12	W16	WNW13	WSW13	W14	Diurnal Maximum	

UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Surmont 2 - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	402	56.22	56.22
6 - 11	286	40.00	96.22
12 - 19	27	3.78	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 715

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Surmont 2 - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 5	18	28	16	20	13	43	42	24	10	16	31	39	14	23	35	30	402
6 - 11	7	0	0	0	16	26	37	23	3	2	2	15	34	38	11	72	286
12 - 19	0	0	0	0	0	0	0	0	0	0	0	5	11	10	1	0	27
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	25	28	16	20	29	69	79	47	13	18	33	59	59	71	47	102	715

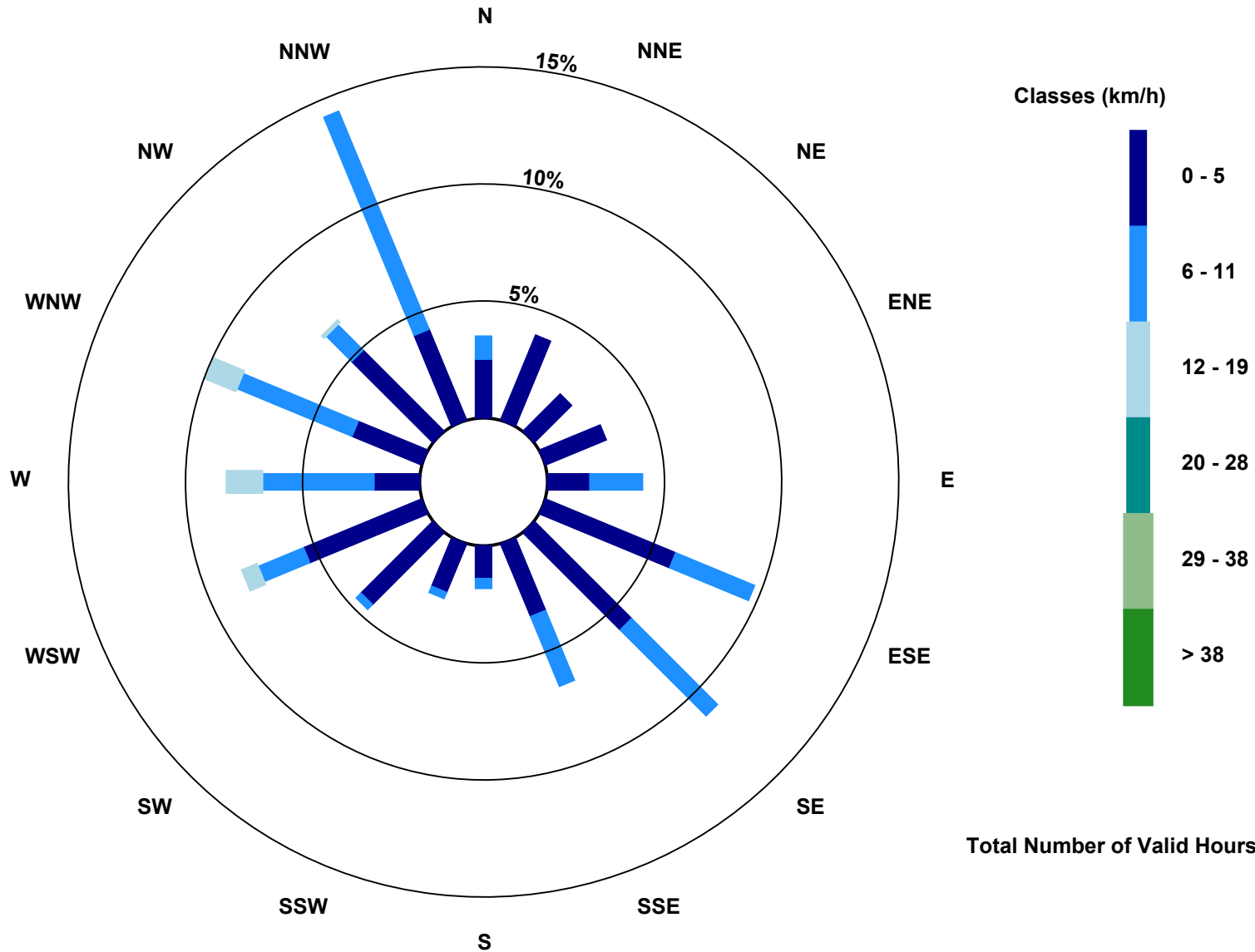
Total Number of Valid Hours: 715

Total Number of Hours: 720



Wood Buffalo Environmental Association  
 Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
 Surmont 2





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Surmont 2 - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 6 km/h on Nov 7 04:00	Hours of Data: 715
Minimum Value: 0 km/h on Nov 29 21:00	Hours of Missing Data: 5
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 5	Hours of Calibration: 0
	Percent Operational Time: 99.3

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2-Nov	1	1	1	2	1	1	1	1	1	1	2	3	3	3	2	2	3	3	2	2	1	1	1	1	1	3
3-Nov	1	1	1	UO	UO	1	1	1	1	2	2	1	1	2	2	2	1	2	2	2	2	2	1	1	2	2
4-Nov	1	2	2	1	1	1	2	2	2	3	2	2	3	2	1	1	2	1	2	1	1	1	1	1	UO	3
5-Nov	1	1	1	UO	1	1	1	1	1	2	2	2	1	2	2	2	2	2	2	2	2	1	2	2	1	2
6-Nov	2	2	2	1	1	2	2	2	3	4	4	4	6	5	5	5	4	1	1	1	2	2	6	5	6	
7-Nov	4	5	6	6	4	5	4	4	3	3	3	4	3	3	2	2	1	1	1	1	2	2	2	2	6	
8-Nov	3	2	2	3	3	4	2	3	2	3	3	3	2	2	2	1	1	1	1	2	3	3	3	3	4	
9-Nov	2	2	2	2	3	2	2	2	2	2	3	3	3	3	2	1	1	1	1	2	2	2	1	1	3	
10-Nov	2	2	2	2	1	1	2	3	3	3	2	2	2	2	2	1	1	1	1	1	1	2	1	1	3	
11-Nov	2	3	3	4	3	3	2	3	3	3	3	3	2	2	2	3	2	2	3	2	2	2	2	1	4	
12-Nov	1	1	1	1	2	2	3	4	4	4	6	6	5	5	4	2	2	1	1	1	2	1	2	3	6	
13-Nov	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	2	2	3	3	
14-Nov	2	2	2	3	3	2	2	2	2	2	2	2	3	2	2	1	1	1	1	1	1	1	1	1	3	
15-Nov	1	1	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
16-Nov	1	1	1	2	1	2	2	3	3	3	3	4	4	4	4	4	4	4	5	4	4	3	3	3	5	
17-Nov	3	3	3	2	2	2	2	2	2	2	3	3	2	2	1	3	2	3	5	4	6	5	4	4	6	
18-Nov	4	3	3	3	3	3	2	2	2	2	2	2	2	2	1	2	2	2	1	1	2	2	2	1	4	
19-Nov	1	2	2	2	2	1	1	1	1	2	3	4	4	4	4	4	4	4	3	4	4	4	4	4	4	
20-Nov	4	4	4	3	4	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	4	
21-Nov	2	2	3	3	3	3	3	2	3	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	3	
22-Nov	1	2	2	1	1	2	2	1	1	2	2	2	2	2	3	2	1	2	2	2	2	2	1	1	3	
23-Nov	1	2	2	2	1	1	1	1	1	1	1	2	2	2	2	2	2	1	2	2	2	2	2	2	2	
24-Nov	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	1	2	1	1	1	1	1	1	1	2	
25-Nov	1	1	1	1	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	2	2	2	2	2	
26-Nov	2	2	3	3	2	2	2	2	2	2	2	3	3	3	2	2	2	1	1	3	4	4	4	4	4	
27-Nov	5	4	4	4	4	4	4	4	4	4	5	5	4	5	5	4	4	4	4	4	4	3	3	3	5	
28-Nov	3	3	3	2	3	2	3	4	3	2	3	3	4	4	2	3	3	2	3	2	3	2	3	2	4	
29-Nov	2	1	2	2	2	2	1	2	2	2	2	2	2	2	1	1	1	2	1	1	0	0	1	1	2	
30-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	2	1	1	2	
	5	5	6	6	4	5	4	4	4	4	6	6	6	5	5	5	4	4	5	4	6	5	6	5		
Diurnal Maximum																										

UO - Unstable Operation



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Surmont 2 - November 2024**

Direction of Maximum Speed: 251 deg on Nov 6 14:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 296.5 deg on Nov 27	Hours of Data: 715
Direction of Minimum Speed: 181 deg on Nov 29 21:00	Hours of Missing Data: 5
Direction of Minimum Daily Speed Average: 0.6 deg on Nov 13	Percent Operational Time: 99.3
Monthly Average Direction: 295.4 deg	

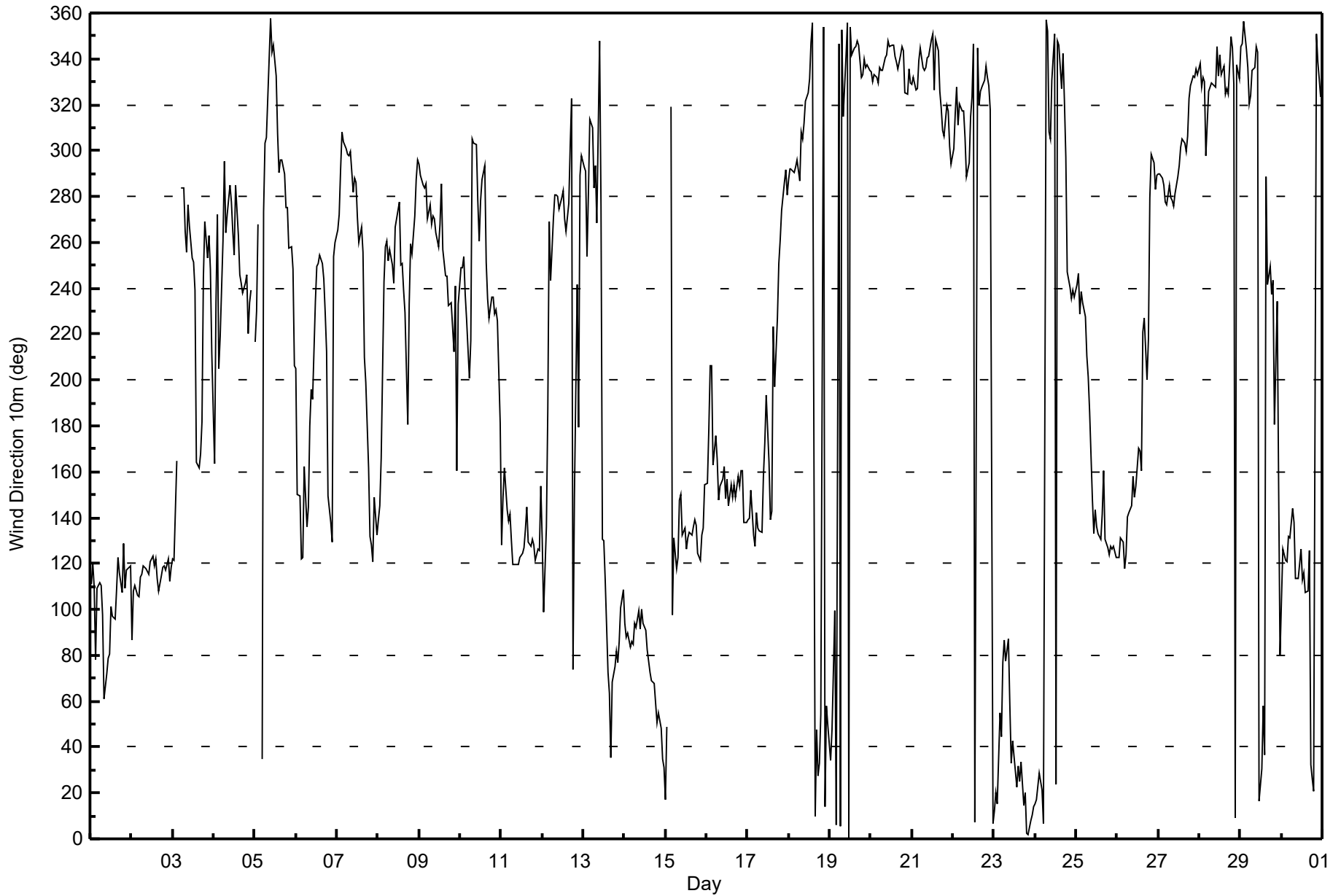
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	111	120	110	78	109	111	111	98	61	72	79	80	102	97	96	109	123	116	108	129	109	117	118	119	104.5
2-Nov	87	108	110	106	105	114	115	119	118	117	115	121	123	119	122	113	108	115	118	119	117	122	112	119	116.3
3-Nov	122	122	165	UO	UO	284	284	265	256	276	267	253	251	239	164	162	168	182	245	269	253	263	248	212	239.4
4-Nov	163	234	272	205	219	260	296	264	272	285	278	265	255	285	263	246	242	238	242	246	220	234	239	UO	262.7
5-Nov	217	230	268	UO	35	273	303	306	340	358	343	346	333	308	291	296	296	290	275	275	258	258	248	206	296.6
6-Nov	205	150	149	122	123	163	136	145	180	196	191	234	250	251	254	251	244	229	212	150	138	129	254	260	218.1
7-Nov	266	272	292	308	304	301	299	298	300	282	288	286	271	260	267	255	210	199	162	132	128	121	149	132	278.6
8-Nov	139	145	166	243	258	260	252	257	250	242	267	270	278	250	251	239	230	180	233	259	255	272	287	296	252.7
9-Nov	294	289	285	284	285	271	276	268	272	270	264	258	268	286	257	245	245	232	233	234	212	241	160	233	267.3
10-Nov	249	249	254	237	227	201	217	305	303	302	278	261	278	287	293	252	236	227	236	236	229	231	226	181	262.8
11-Nov	128	149	162	143	139	141	130	120	120	120	120	123	125	127	135	145	129	128	131	128	122	126	126	154	130.7
12-Nov	131	99	136	187	269	243	270	281	281	280	275	280	282	270	265	277	302	323	74	149	242	179	289	298	274.7
13-Nov	293	291	254	281	314	310	284	294	268	348	276	131	130	113	72	64	35	68	75	82	77	86	101	108	43.2
14-Nov	94	88	90	83	86	85	94	92	99	92	100	94	91	82	77	73	69	68	59	51	55	48	35	31	84.0
15-Nov	17	49	UO	319	98	131	118	122	148	150	132	136	126	131	134	132	136	139	137	124	122	132	135	154	129.2
16-Nov	155	178	206	206	163	176	165	148	154	157	162	148	157	145	154	149	154	149	158	154	160	161	138	138	155.8
17-Nov	139	140	152	132	128	142	136	134	133	158	173	193	164	139	143	223	197	227	251	261	274	286	292	281	204.6
18-Nov	287	292	291	290	293	296	287	308	305	312	321	326	331	347	356	10	48	27	33	55	354	14	58	49	321.8
19-Nov	34	48	73	99	6	347	6	353	315	341	356	0	354	342	344	345	348	346	332	333	340	336	338	335	350.3
20-Nov	335	330	333	332	329	336	335	335	341	342	348	345	346	346	341	339	335	342	346	344	325	324	336	329	337.4
21-Nov	329	332	326	327	339	345	336	335	336	340	341	348	351	326	349	343	326	319	309	306	320	317	302	294	332.0
22-Nov	301	316	328	311	320	317	317	306	288	295	315	323	346	7	345	320	326	327	331	337	332	328	318	7	325.5
23-Nov	12	20	15	55	45	77	87	78	88	59	33	43	29	22	32	25	33	15	20	2	2	8	11	14	32.8
24-Nov	15	17	29	25	22	7	357	352	308	305	331	351	24	348	346	327	342	322	297	247	240	236	239	236	345.8
25-Nov	241	247	229	238	234	228	210	202	186	148	133	143	136	133	130	142	160	131	127	124	127	126	128	123	142.9
26-Nov	122	123	131	129	118	124	140	142	145	158	149	154	170	169	161	221	227	200	218	280	299	294	283	289	177.8
27-Nov	290	290	288	285	277	277	285	279	278	276	281	288	293	301	305	303	300	306	323	328	333	332	336	333	296.5
28-Nov	338	328	332	330	298	326	327	330	329	328	345	332	342	333	337	324	327	324	350	345	329	9	337	332	332.7
29-Nov	345	346	356	344	336	320	324	335	336	346	343	16	30	58	36	289	242	250	237	244	181	234	153	80	343.8
30-Nov	104	126	121	121	132	131	144	138	114	113	114	126	113	116	107	108	126	33	26	20	351	339	331	324	96.7

303.9 300.2 301.5 311.1 306.6 287.2 292.6 286.9 285.8 281.5 293.0 294.5 294.2 298.4 305.9 287.3 291.8 326.6 286.9 294.2 291.8 305.2 299.0 298.8

Diurnal Average

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods







**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Surmont 2 - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 100 deg on Nov 10 08:00	Hours of Data: 715
Minimum Value: 10 deg on Nov 24 23:00	Hours of Missing Data: 5
Percentiles: P <sub>1</sub> = 16 P <sub>10</sub> = 25 Q <sub>1</sub> = 31 Median = 38 Q <sub>3</sub> = 45 P <sub>90</sub> = 56 P <sub>99</sub> = 84	Hours of Calibration: 0
	Percent Operational Time: 99.3

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	30	43	43	31	19	18	29	47	30	33	46	39	31	44	28	22	23	17	24	29	15	19	26	28	47
2-Nov	57	58	19	28	26	39	21	29	17	20	19	26	32	24	26	23	21	19	19	22	19	32	17	22	58
3-Nov	20	31	51	UO	UO	33	34	26	24	34	39	71	43	60	55	42	58	70	34	33	20	23	44	36	71
4-Nov	55	58	52	66	54	83	80	27	35	32	33	32	58	53	85	16	20	34	44	20	63	45	62	UO	85
5-Nov	65	55	69	UO	92	77	31	41	43	39	46	43	51	47	31	40	34	32	25	27	22	24	38	65	92
6-Nov	50	53	39	35	31	49	39	43	65	62	54	48	32	23	23	22	28	40	45	33	31	41	35	32	65
7-Nov	26	27	35	39	39	39	37	36	41	29	31	32	30	31	27	22	31	61	46	38	35	34	53	37	61
8-Nov	49	58	84	57	33	35	53	26	23	19	32	26	31	24	27	34	39	72	46	30	28	26	33	41	84
9-Nov	41	33	34	30	37	28	29	25	26	28	24	25	28	31	24	23	25	56	52	60	69	61	69	61	69
10-Nov	18	23	75	38	82	66	74	100	50	60	28	28	29	31	30	27	19	26	19	35	51	25	46	48	100
11-Nov	33	50	62	41	36	38	32	19	22	23	22	29	29	38	45	48	35	31	37	39	25	32	39	45	62
12-Nov	52	59	57	47	52	40	30	32	30	29	34	30	35	32	30	32	34	59	41	49	28	94	72	39	94
13-Nov	33	28	20	46	52	45	38	65	47	80	91	81	74	28	33	32	67	63	55	37	28	30	22	21	91
14-Nov	27	26	30	29	26	25	26	26	22	24	24	25	31	30	26	33	35	29	30	33	41	20	33	32	41
15-Nov	33	32	UO	33	61	42	21	27	42	34	29	26	26	31	28	30	34	41	25	24	45	28	31	69	69
16-Nov	58	43	37	44	53	49	51	52	54	49	46	51	56	55	48	53	53	48	52	42	45	50	41	40	58
17-Nov	40	54	53	37	40	47	39	41	42	51	59	62	53	40	55	66	60	54	35	27	35	30	31	66	
18-Nov	32	30	31	31	30	37	30	40	36	45	50	42	43	40	43	40	31	51	64	43	40	50	46	44	64
19-Nov	48	48	32	22	38	46	39	47	37	35	42	44	38	37	32	34	36	36	42	37	40	38	38	37	48
20-Nov	40	43	45	42	42	45	37	38	37	42	34	37	39	40	41	37	44	35	36	39	43	41	45	49	49
21-Nov	49	40	40	41	40	38	38	47	41	43	38	33	31	42	34	35	41	38	36	37	38	39	34	32	49
22-Nov	37	45	47	37	37	38	38	36	42	30	40	48	38	39	40	40	32	44	40	40	41	51	50	46	51
23-Nov	39	39	43	38	34	28	30	30	26	35	44	36	39	33	36	36	32	42	41	39	38	34	38	40	44
24-Nov	43	40	39	36	47	41	42	37	28	29	44	30	55	35	32	36	37	34	50	16	16	11	10	41	55
25-Nov	14	22	48	43	51	51	50	40	49	32	52	35	40	36	35	45	47	36	40	41	47	35	38	33	52
26-Nov	44	35	42	44	34	34	45	48	54	55	49	51	60	52	56	45	55	94	51	40	34	36	29	34	94
27-Nov	34	30	30	30	26	29	31	31	33	30	31	31	32	32	38	37	32	40	44	44	43	40	35	39	44
28-Nov	39	47	41	43	33	40	38	40	44	46	39	45	42	42	37	39	43	38	46	40	42	52	41	47	52
29-Nov	44	45	48	42	41	36	43	39	39	37	40	44	61	54	43	46	36	35	58	62	91	77	84	67	91
30-Nov	59	66	23	35	28	27	37	39	27	16	18	34	19	25	16	21	64	50	30	34	35	35	33	33	66

65	66	84	66	92	83	80	100	65	80	91	81	74	60	85	66	67	94	64	62	91	94	84	69	
Diurnal Maximum																								

UO - Unstable Operation



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS30 ELLS RIVER NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)  
NOVEMBER 2024

MONTHLY SUMMARY for  
AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	684	34	36	99.72	11.3	0	2.8	0
TRS (ppb) Average	683	35	37	99.72	3	0	0.7	0
THC (ppm) Average	684	34	36	99.72	4.1	-	2.7	-
NMHC (ppm) Average	684	34	36	99.72	0.758	-	0.166	-
CH4 (ppm) Average	684	34	36	99.72	3.6	-	2.5	-
NO2 (ppb) Average	684	35	36	99.86	31.7	0	20.8	-
NO (ppb) Average	684	35	36	99.86	93.2	-	18.7	-
NOX (ppb) Average	684	35	36	99.86	107.8	-	35.8	-
PM2.5 (ug/m3) Average	717	2	3	99.86	12.9	0	6.7	0
Temperature 2 m (C) Average	719	0	1	99.86	13.2	-	5.8	-
Relative Humidity (%) Average	719	0	1	99.86	96.1	-	92.1	-
Wind Speed 10 m (km/h) Average	699	0	21	97.08	25	-	18	-
Wind Direction 10 m (deg) Average	699	0	21	97.08	-	-	-	-
Global Solar Radiation (W/m2) Average	719	0	1	99.86	316.7	-	47.9	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)  
NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	684	0.31	1	-	0	0	0	0.1	0.2	0.4	11.3
TRS (ppb) Average	683	0.45	0.2	-	0.3	0.3	0.4	0.4	0.5	0.6	3
THC (ppm) Average	684	2.23	0.3	-	2	2	2	2.1	2.3	2.7	4.1
NMHC(ppm) Average	684	0.057	0.112	-	0	0	0	0	0.1	0.2	0.758
CH4(ppm) Average	684	2.18	0.2	-	2	2	2	2.1	2.2	2.4	3.6
NO2 (ppb) Average	684	7.94	7.5	-	0.1	0.4	1.2	5.7	12.6	19.6	31.7
NO (ppb) Average	684	4.86	10.8	-	0	0	0	0.2	3.5	18	93.2
NOX (ppb) Average	684	12.8	16.1	-	0.1	0.4	1.3	6.5	17	34.7	107.8
PM2.5 (ug/m3) Average	717	3.59	2.1	-	0.3	1.3	2	3.1	4.7	6.4	12.9
Temperature 2 m (C) Average	719	-8.21	8.6	-	-33	-18.9	-14.7	-6.6	-1.9	1.3	13.2
Relative Humidity (%) Average	719	79.99	9.5	-	39.5	68.3	75.5	80.3	86.6	92.2	96.1
Wind Speed 10 m (km/h) Average	699	8.7	5	-	0	3	5	8	12	16	25
Wind Direction 10 m (deg) Average	699	265.6	-	-	-	-	-	-	-	-	-
Global Solar Radiation (W/m2) Average	719	21.93	45.7	-	0	0	0	0	21.9	80.5	316.7

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)  
NOVEMBER 2024

OPERATIONAL NOTES

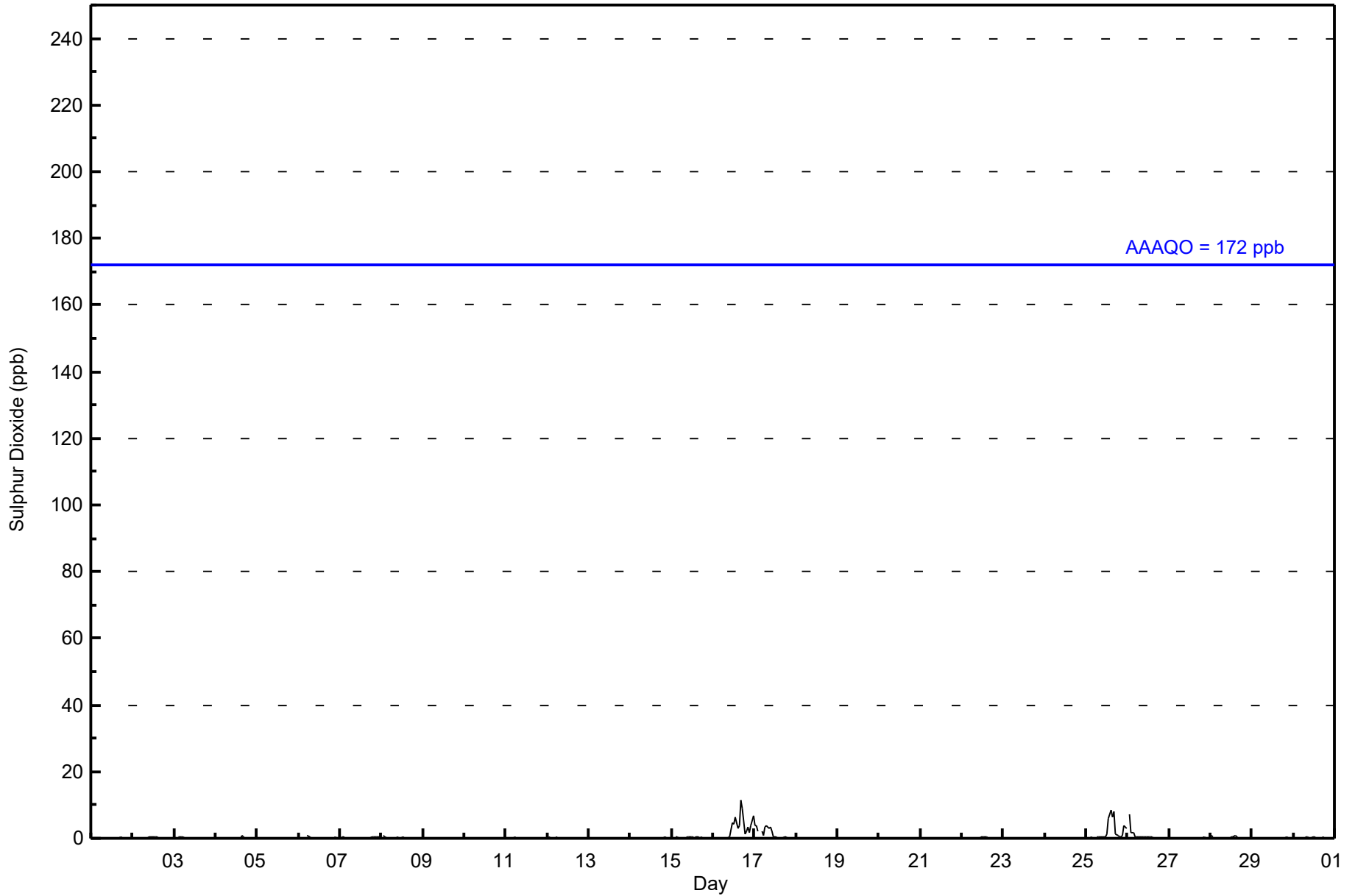
Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL GASEOUS ANALYZERS	12 Nov 2024 12:00	12 Nov 2024 12:00	1	Maintenance - sample manifold cleaned
ALL PARAMETERS	20 Nov 2024 13:00	20 Nov 2024 13:00	1	Maintenance - station logger/modem reset
Wind Speed, Wind Direction	04 Nov 2024 19:00	04 Nov 2024 19:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	06 Nov 2024 21:00	06 Nov 2024 21:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	06 Nov 2024 23:00	06 Nov 2024 23:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	18 Nov 2024 14:00	18 Nov 2024 15:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	18 Nov 2024 17:00	18 Nov 2024 18:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	18 Nov 2024 23:00	18 Nov 2024 23:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	21 Nov 2024 19:00	21 Nov 2024 19:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	22 Nov 2024 08:00	22 Nov 2024 09:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	22 Nov 2024 12:00	22 Nov 2024 13:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	24 Nov 2024 20:00	24 Nov 2024 22:00	3	Flat line in sensor output signal
Wind Speed, Wind Direction	28 Nov 2024 17:00	28 Nov 2024 17:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	28 Nov 2024 19:00	28 Nov 2024 19:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	29 Nov 2024 05:00	29 Nov 2024 05:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	29 Nov 2024 12:00	29 Nov 2024 12:00	1	Flat line in sensor output signal





Wood Buffalo Environmental Association  
Hourly Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Ells River - November 2024





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Ells River - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	683	99.85	99.85
11 - 20	1	0.15	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Ells River - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	104	71	15	4	5	6	19	75	83	69	52	25	43	29	27	36	663
11 - 20	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	104	71	15	4	5	6	19	76	83	69	52	25	43	29	27	36	664

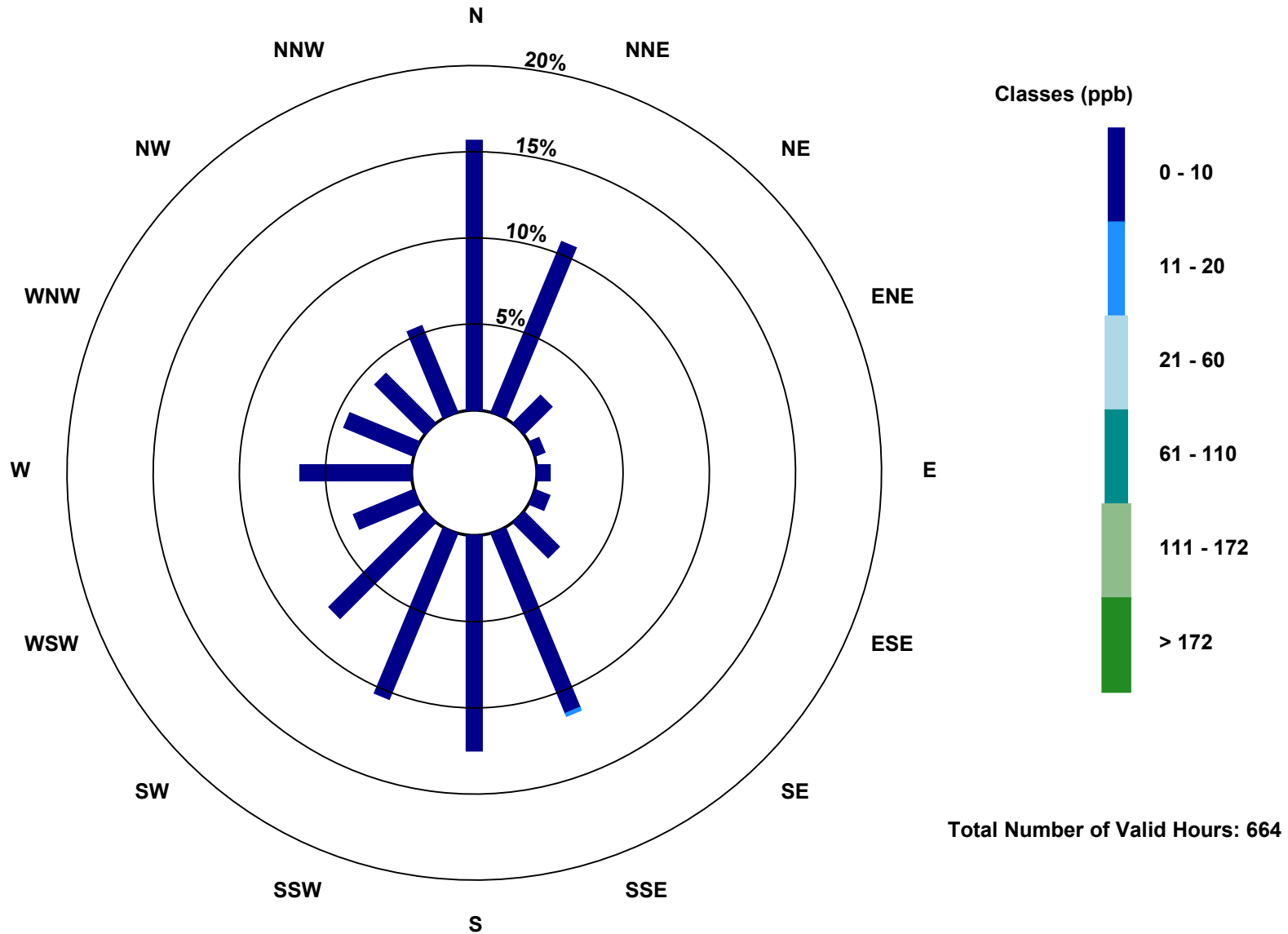
Total Number of Valid Hours: 664

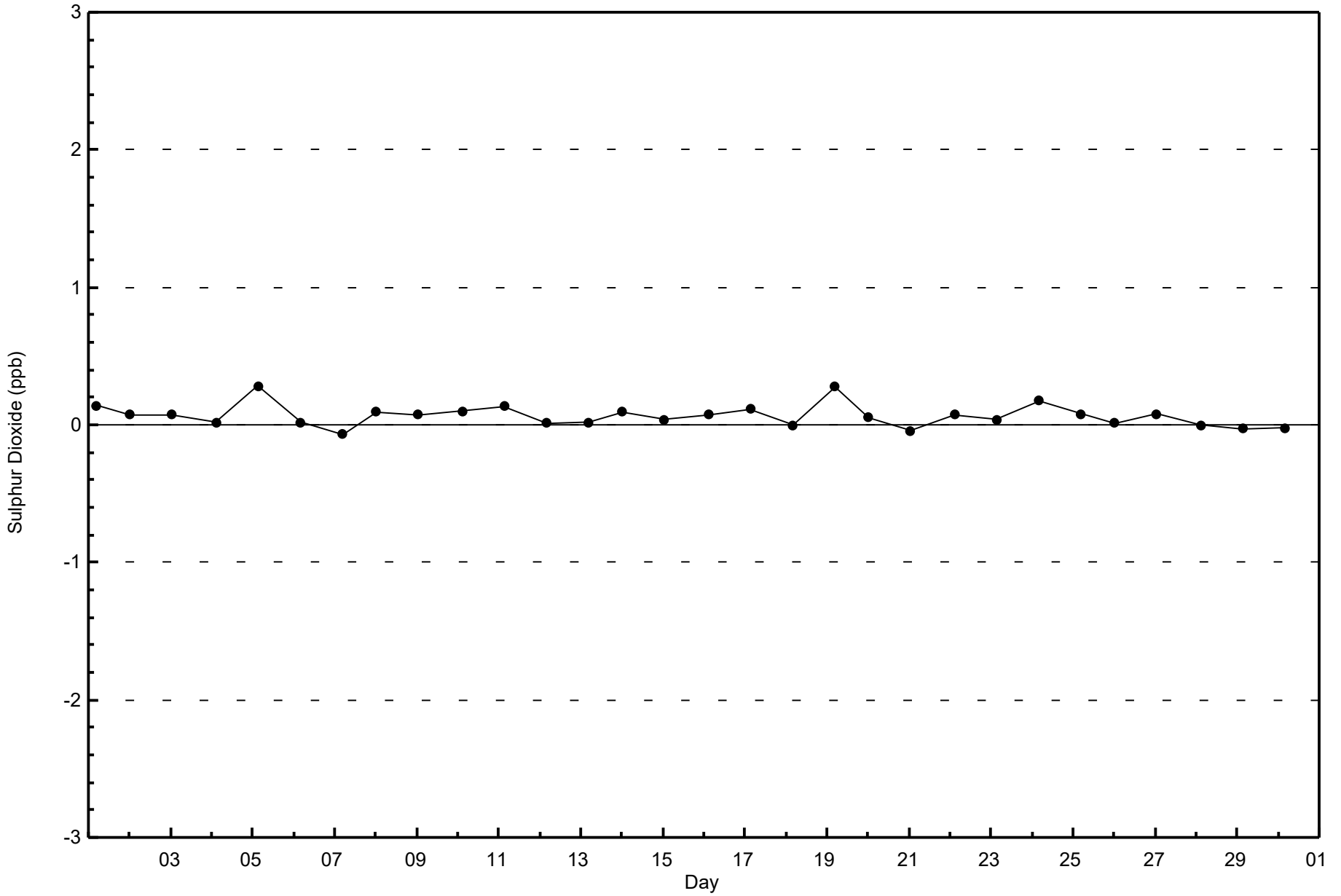
Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Ells River

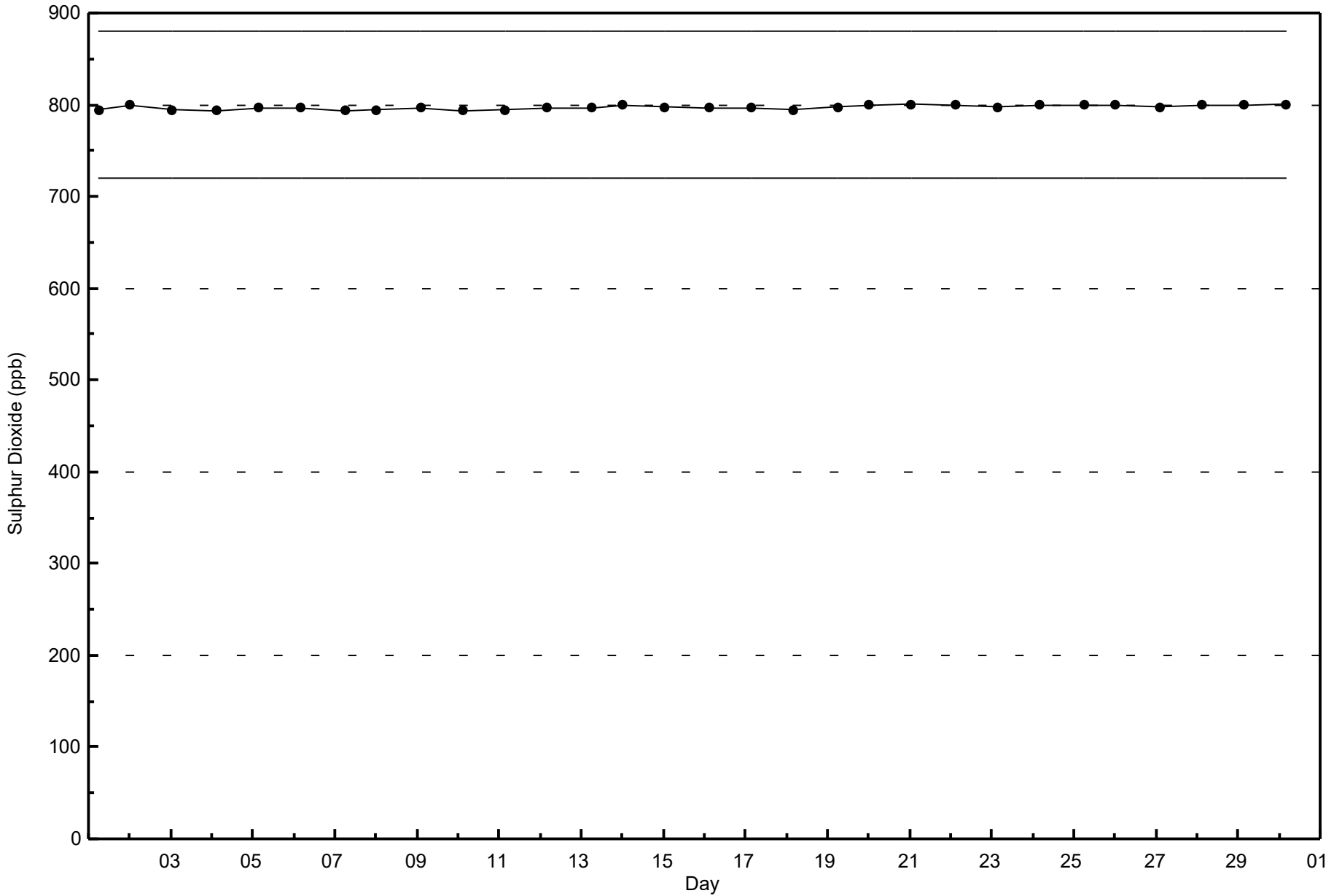






**Wood Buffalo Environmental Association**  
**Span Responses**

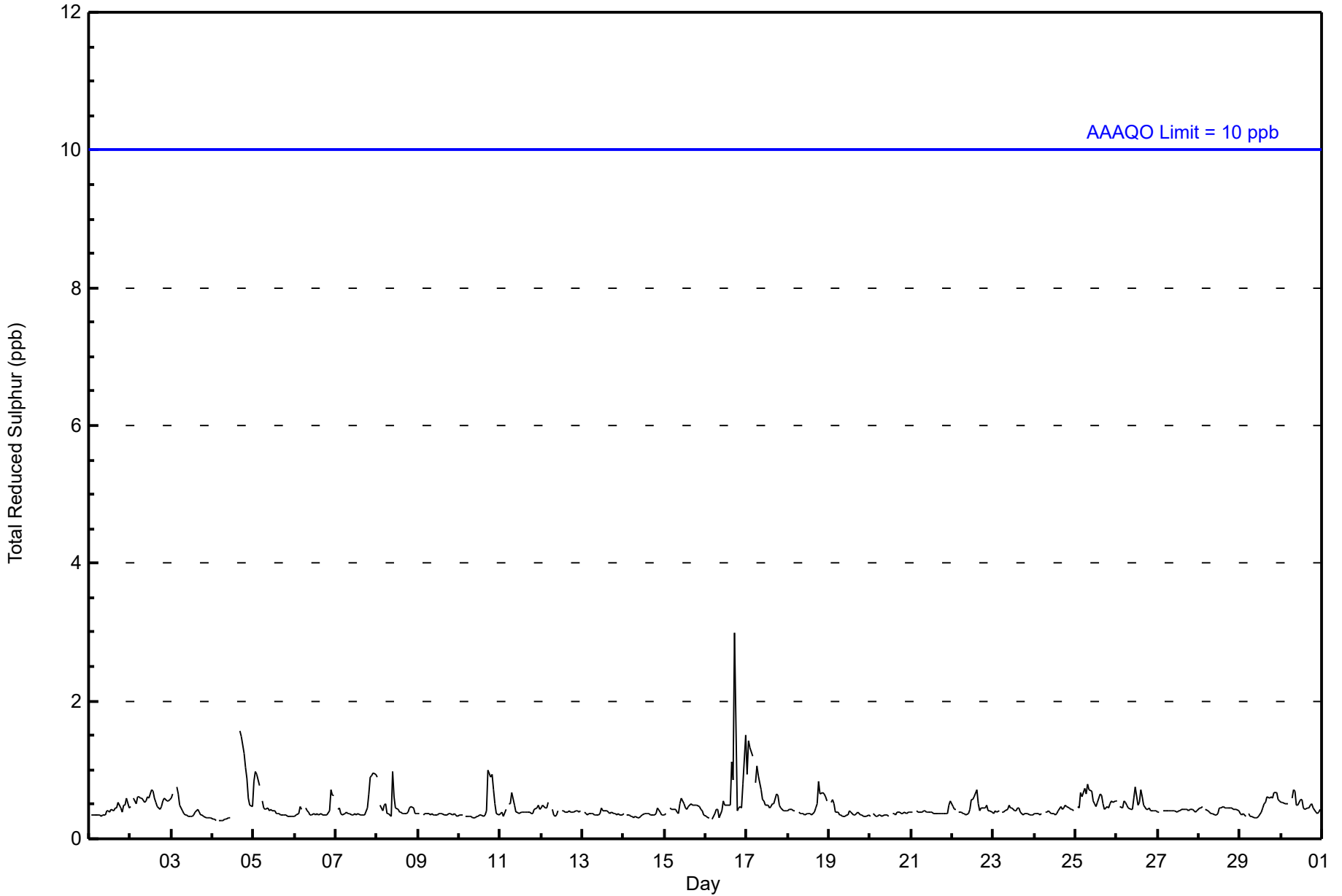
**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Ells River - November 2024**





Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Daily Average		Daily Maximum				
Maximum Value: 3.0 ppb on Nov 16 18:00		Maximum Daily Average: 0.7 ppb on Nov 17																	Hours of Data: 683		Hours of Missing Data: 37						
Minimum Value: 0.3 ppb on Nov 4 06:00		Minimum Daily Average: 0.3 ppb on Nov 14																	Hours of Calibration: 35		Percent Operational Time: 99.7						
Maximum Diurnal Average: 0.6 ppb at hour 18		Minimum Diurnal Average: 0.4 ppb at hour 9																									
Monthly Average: 0.45 ppb		Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 0.3 Q <sub>1</sub> = 0.4 Median = 0.4 Q <sub>3</sub> = 0.5 P <sub>90</sub> = 0.6 P <sub>99</sub> = 1.2																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.4	0.4	0.5	0.5	0.6	0.5	0.4	0.6	
2-Nov	0.5	Z	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.7	0.7	0.6	0.5	0.5	0.4	0.5	0.5	0.6	0.5	0.5	0.6	0.6	0.7	
3-Nov	0.6	0.6	Z	0.8	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.8	
4-Nov	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	C	C	C	C	C	1.6	1.5	1.2	1.0	0.9	0.6	0.5	0.5	1.6		
5-Nov	0.8	1.0	0.9	0.8	Z	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	1.0		
6-Nov	0.3	0.3	0.4	0.5	0.4	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.7	0.6	0.6	0.7		
7-Nov	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.6	0.9	0.9	0.9	0.9	0.9		
8-Nov	0.9	Z	0.5	0.4	0.5	0.5	0.4	0.4	0.3	1.0	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	1.0		
9-Nov	0.4	0.4	Z	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.4		
10-Nov	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	1.0	0.9	0.9	0.7	0.5	0.4	0.3	1.0		
11-Nov	0.4	0.4	0.3	0.4	Z	0.5	0.5	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.7		
12-Nov	0.5	0.5	0.5	0.5	0.5	Z	0.4	0.3	0.3	0.3	0.4	M	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5		
13-Nov	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4		
14-Nov	0.4	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.5	0.4	0.3	0.4	0.5		
15-Nov	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.6		
16-Nov	0.3	0.3	0.3	Z	0.3	0.4	0.4	0.4	0.3	0.4	0.6	0.5	0.5	0.5	0.5	1.1	0.9	3.0	0.4	0.4	0.5	0.4	0.8	1.5	3.0		
17-Nov	0.9	1.4	1.3	1.2	Z	0.8	1.1	0.9	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.6	0.5	0.4	0.4	0.4	0.4	1.4		
18-Nov	0.4	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.8	0.7	0.7	0.7	0.6	0.6	0.8		
19-Nov	Z	0.5	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.6		
20-Nov	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	M	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4		
21-Nov	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5		
22-Nov	0.5	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.6	0.7	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.7		
23-Nov	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.5		
24-Nov	0.4	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5		
25-Nov	Z	0.5	0.5	0.7	0.6	0.7	0.7	0.8	0.7	0.7	0.6	0.5	0.5	0.5	0.6	0.6	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.8		
26-Nov	0.5	Z	0.5	0.4	0.6	0.5	0.5	0.4	0.4	0.4	0.6	0.8	0.5	0.5	0.7	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.8		
27-Nov	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4		
28-Nov	0.5	0.5	0.5	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5		
29-Nov	0.4	0.3	0.4	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.7		
30-Nov	0.5	0.5	0.5	0.5	0.5	Z	0.6	0.7	0.7	0.5	0.5	0.6	0.6	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.7		
																								Diurnal Average		Diurnal Maximum	
																								0.5		0.9	
																								1.4		1.3	
																								1.2		1.2	
																								0.6		0.8	
																								1.1		0.9	
																								0.7		1.0	
																								0.6		0.8	
																								0.8		0.7	
																								1.1		1.6	
																								3.0		1.2	
																								1.0		0.9	
																								0.9		0.9	
																								0.9		1.5	

Z - zerospan      C - Calibration      M - Maintenance  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb    24-hr 3 ppb





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Ells River - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	682	99.85	99.85
3 - 4	1	0.15	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 683

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb**  
**Ells River - November 2024**

<b>Concentration</b> <b>Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	102	77	15	4	5	6	18	75	81	67	53	26	41	28	29	36	663
3 - 4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	102	77	15	4	5	6	18	76	81	67	53	26	41	28	29	36	664

Total Number of Valid Hours: 664

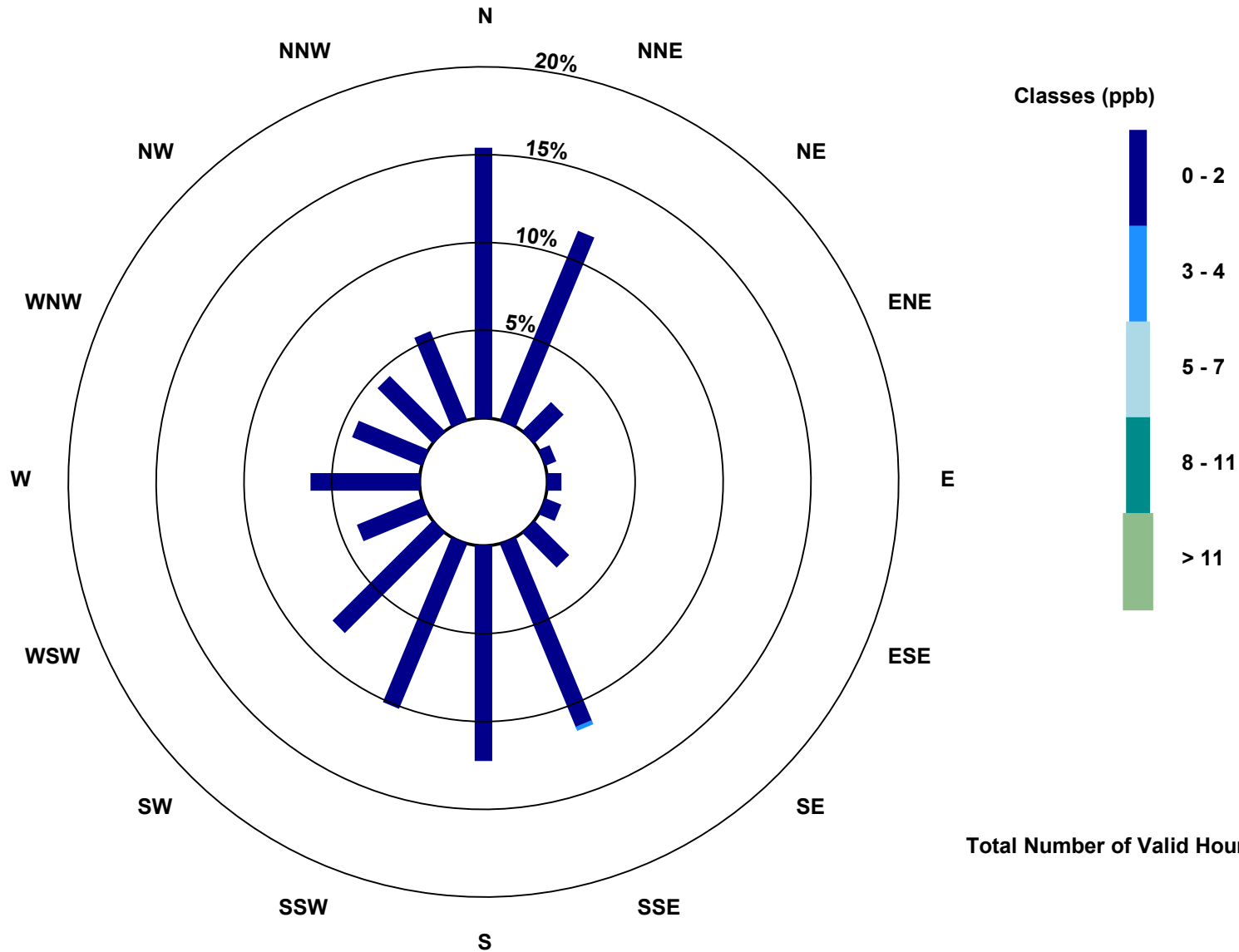
Total Number of Hours: 720



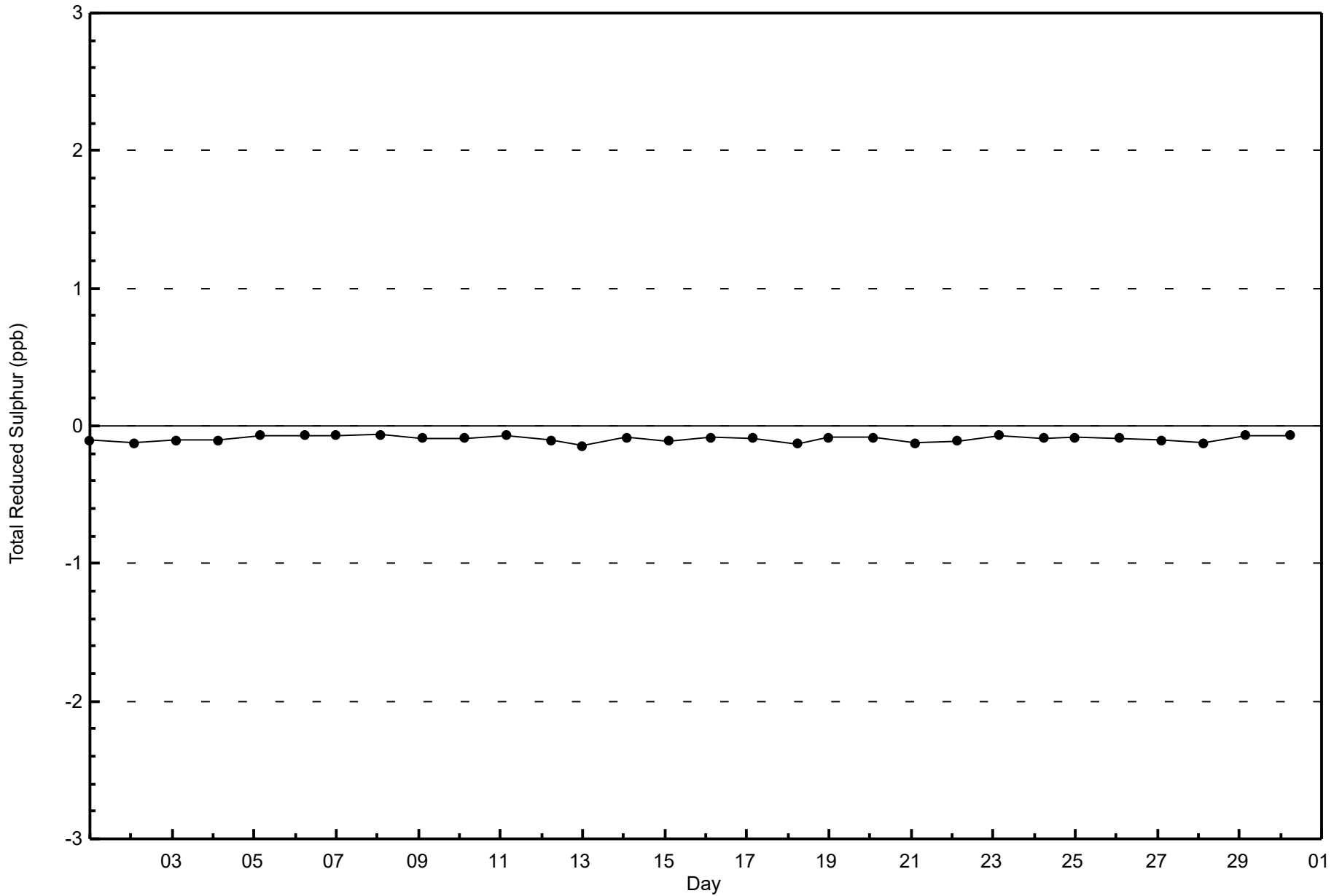


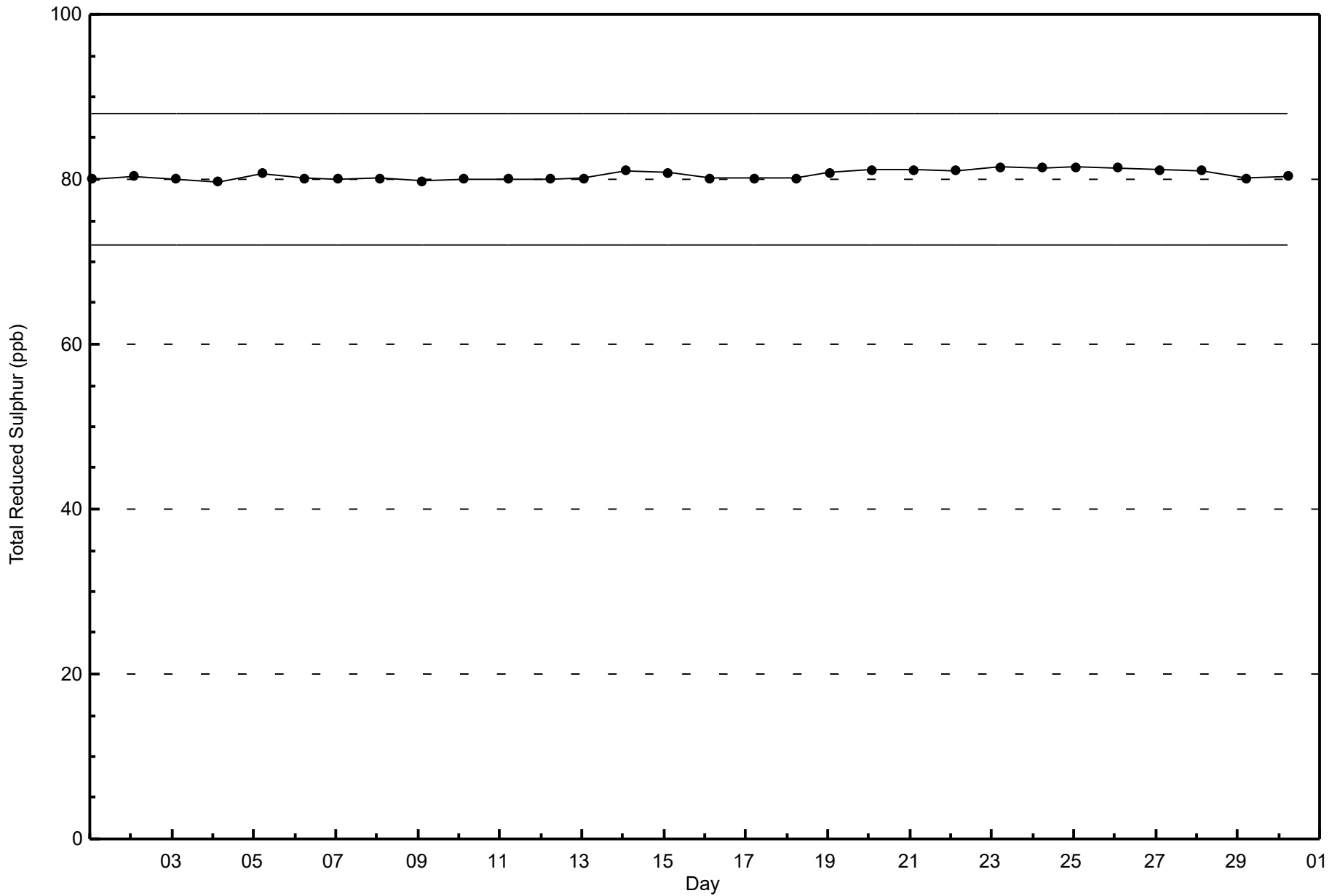
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Reduced Sulphur (TRS) - ppb  
Ells River



Total Number of Valid Hours: 664



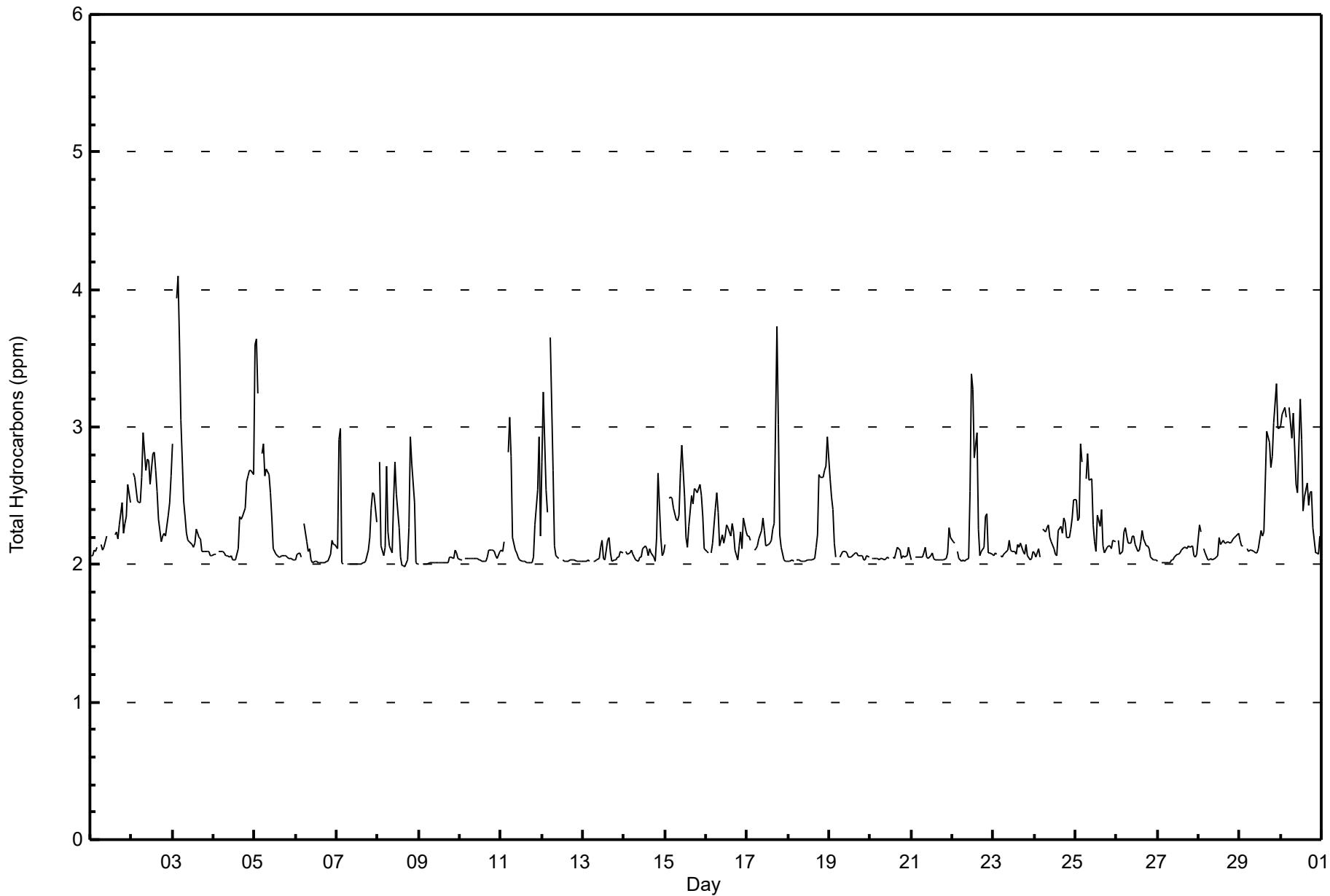




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Total Hydrocarbons (THC) - ppm**  
**Ells River - November 2024**

Maximum Value: 4.1 ppm on Nov 3 04:00		Maximum Daily Average: 2.7 ppm on Nov 30		Hours in Service: 720																																												
Minimum Value: 2.0 ppm on Nov 8 17:00		Minimum Daily Average: 2.0 ppm on Nov 9		Hours of Data: 684																																												
Maximum Diurnal Average: 2.4 ppm at hour 6		Minimum Diurnal Average: 2.1 ppm at hour 14		Hours of Missing Data: 36																																												
Monthly Average: 2.23 ppm		Percentiles: P <sub>1</sub> = 2.0 P <sub>10</sub> = 2.0 Q <sub>1</sub> = 2.0 Median = 2.1 Q <sub>3</sub> = 2.3 P <sub>90</sub> = 2.7 P <sub>99</sub> = 3.4		Hours of Calibration: 34																																												
				Percent Operational Time: 99.7																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.2	C	C	C	C	2.2	2.2	2.2	2.3	2.4	2.2	2.3	2.4	2.6	2.5	2.2	2.6																						
2-Nov	Z	2.7	2.6	2.5	2.5	2.4	2.6	3.0	2.7	2.8	2.8	2.6	2.8	2.8	2.7	2.5	2.3	2.2	2.2	2.2	2.2	2.4	2.4	2.6	2.5	3.0																						
3-Nov	2.9	Z	3.9	4.1	3.6	3.1	2.5	2.3	2.2	2.2	2.2	2.1	2.1	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.5	4.1																						
4-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.4	2.3	2.4	2.4	2.6	2.6	2.7	2.7	2.7	2.2	2.7																						
5-Nov	3.6	3.6	3.2	Z	2.8	2.9	2.6	2.7	2.7	2.5	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.4	3.6																						
6-Nov	2.0	2.1	2.1	2.1	Z	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.3																						
7-Nov	2.1	2.9	3.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.4	2.5	2.5	2.3	2.2	3.0																						
8-Nov	Z	2.7	2.1	2.1	2.1	2.7	2.2	2.1	2.1	2.5	2.7	2.5	2.3	2.1	2.0	2.0	2.0	2.0	2.3	2.9	2.7	2.5	2.0	2.0	2.3	2.9																						
9-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.1																						
10-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1																						
11-Nov	2.1	2.1	2.2	Z	2.8	3.1	2.8	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.5	2.9	2.2	2.2	2.2	3.1																						
12-Nov	2.7	3.3	2.5	2.4	Z	3.6	2.7	2.1	2.1	2.1	2.0	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	3.6																						
13-Nov	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.2	2.0	2.0	2.2	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2																						
14-Nov	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.2	2.7	2.2	2.1	2.1	2.7																						
15-Nov	2.1	Z	2.5	2.5	2.5	2.4	2.3	2.3	2.4	2.7	2.9	2.5	2.2	2.1	2.3	2.5	2.4	2.6	2.5	2.5	2.6	2.5	2.3	2.1	2.4	2.9																						
16-Nov	2.1	2.1	Z	2.1	2.2	2.4	2.5	2.4	2.1	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.2	2.1	2.0	2.1	2.2	2.1	2.3	2.2	2.2	2.5																						
17-Nov	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.1	2.1	2.2	2.2	2.3	2.3	3.7	3.0	2.2	2.1	2.0	2.0	2.0	2.3	3.7																						
18-Nov	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.7	2.6	2.6	2.7	2.7	2.9	2.2	2.9																						
19-Nov	2.6	2.5	2.4	2.2	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.6																						
20-Nov	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	M	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1																						
21-Nov	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.2	2.1	2.1	2.3																						
22-Nov	2.2	2.2	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.5	3.4	3.3	2.8	3.0	2.3	2.1	2.1	2.1	2.3	2.4	2.1	2.1	2.1	2.3	3.4																						
23-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.2																						
24-Nov	2.1	2.1	2.1	2.1	Z	2.3	2.2	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.3	2.3	2.5	2.2	2.5																						
25-Nov	2.5	2.3	2.3	2.9	2.7	Z	2.6	2.8	2.6	2.6	2.3	2.2	2.1	2.4	2.3	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.4	2.9																						
26-Nov	Z	2.2	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.3																						
27-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																						
28-Nov	2.3	2.2	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.3																						
29-Nov	2.2	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.6	3.0	2.9	2.7	2.8	3.0	3.3	3.0	3.0	2.4	3.3																						
30-Nov	3.0	3.1	3.1	3.1	Z	3.1	2.9	3.1	2.8	2.6	2.5	3.2	2.9	2.4	2.5	2.6	2.4	2.5	2.5	2.3	2.1	2.1	2.1	2.2	2.7	3.2																						
																								2.3	2.4	2.4	2.3	2.3	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.2	Diumal Average
																								3.6	3.6	3.9	4.1	3.6	3.6	2.9	3.1	2.8	2.8	2.9	3.4	3.3	2.8	3.0	2.6	3.0	3.7	3.0	2.9	3.0	3.3	3.0	3.0	Diumal Maximum
Z - zerspan																								C - Calibration				M - Maintenance																				





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Ells River - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	184	26.90	26.90
2.1 - 3.0	480	70.18	97.08
3.1 - 10.0	20	2.92	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Ells River - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	18	8	0	0	1	1	8	6	10	29	31	16	33	13	5	0	179
2.1 - 3.0	84	63	15	4	4	5	11	69	73	39	19	9	9	15	19	29	467
3.1 - 10.0	2	0	0	0	0	0	0	1	0	1	2	0	1	1	3	7	18
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	104	71	15	4	5	6	19	76	83	69	52	25	43	29	27	36	664

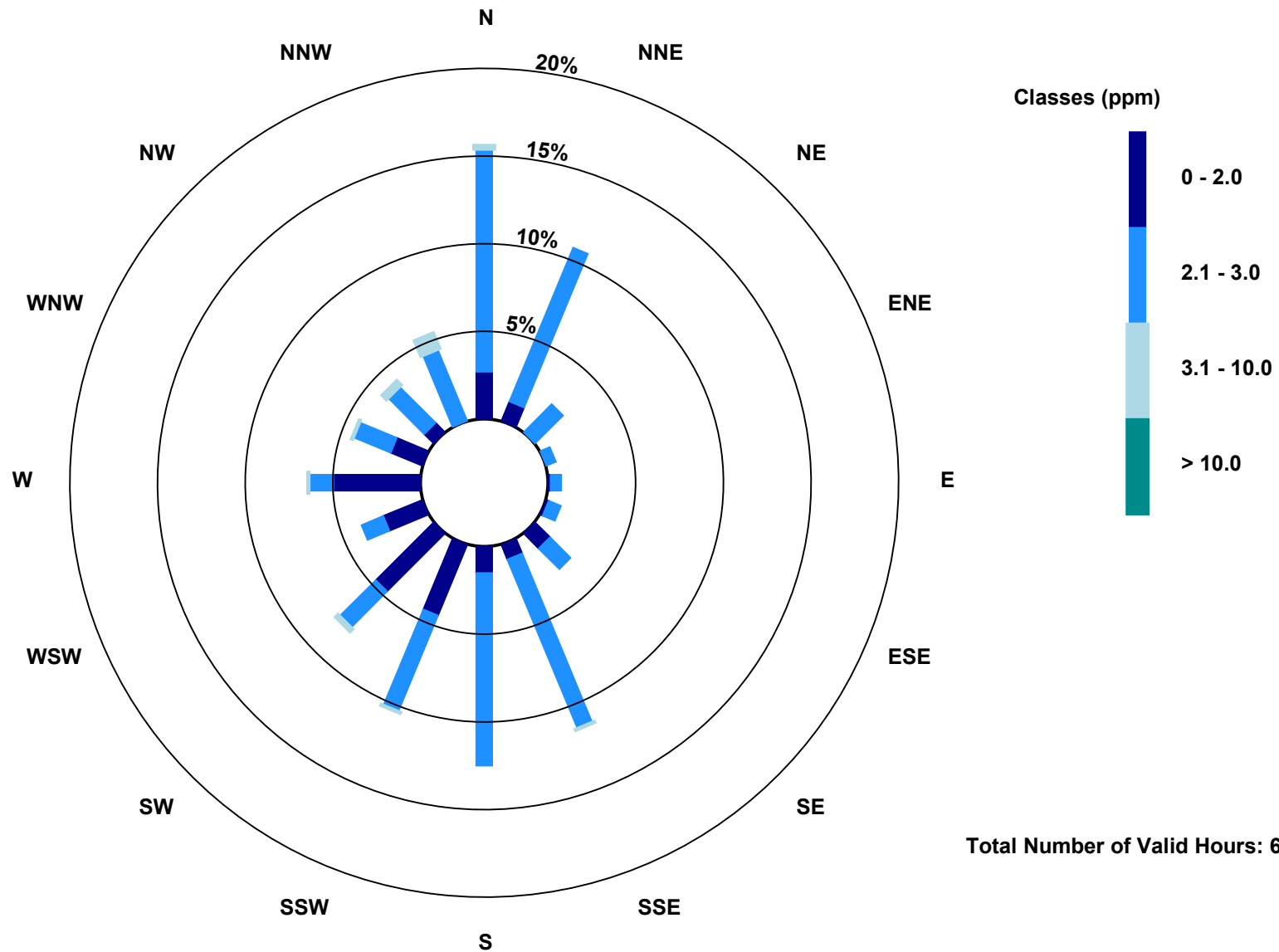
Total Number of Valid Hours: 664

Total Number of Hours: 720

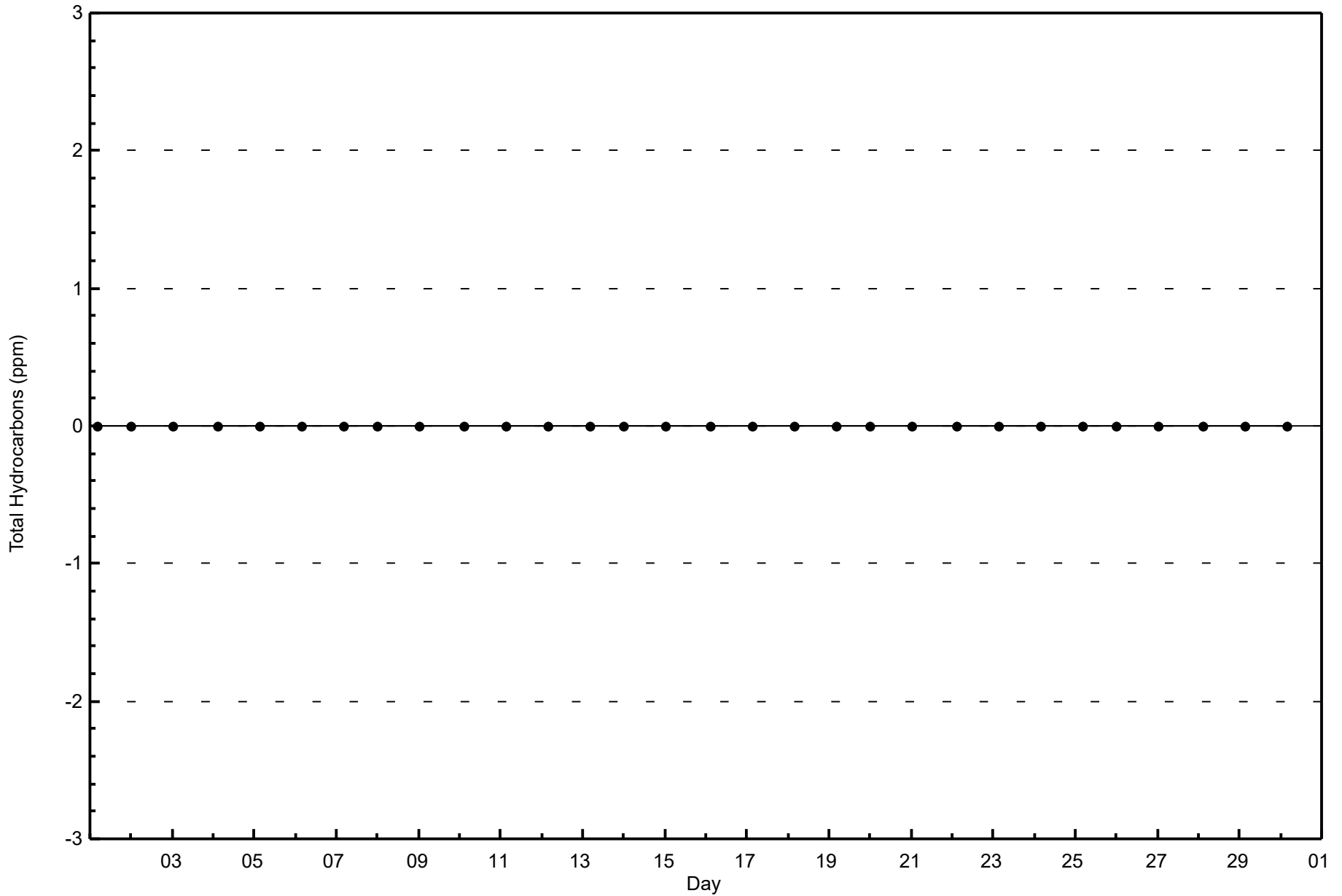


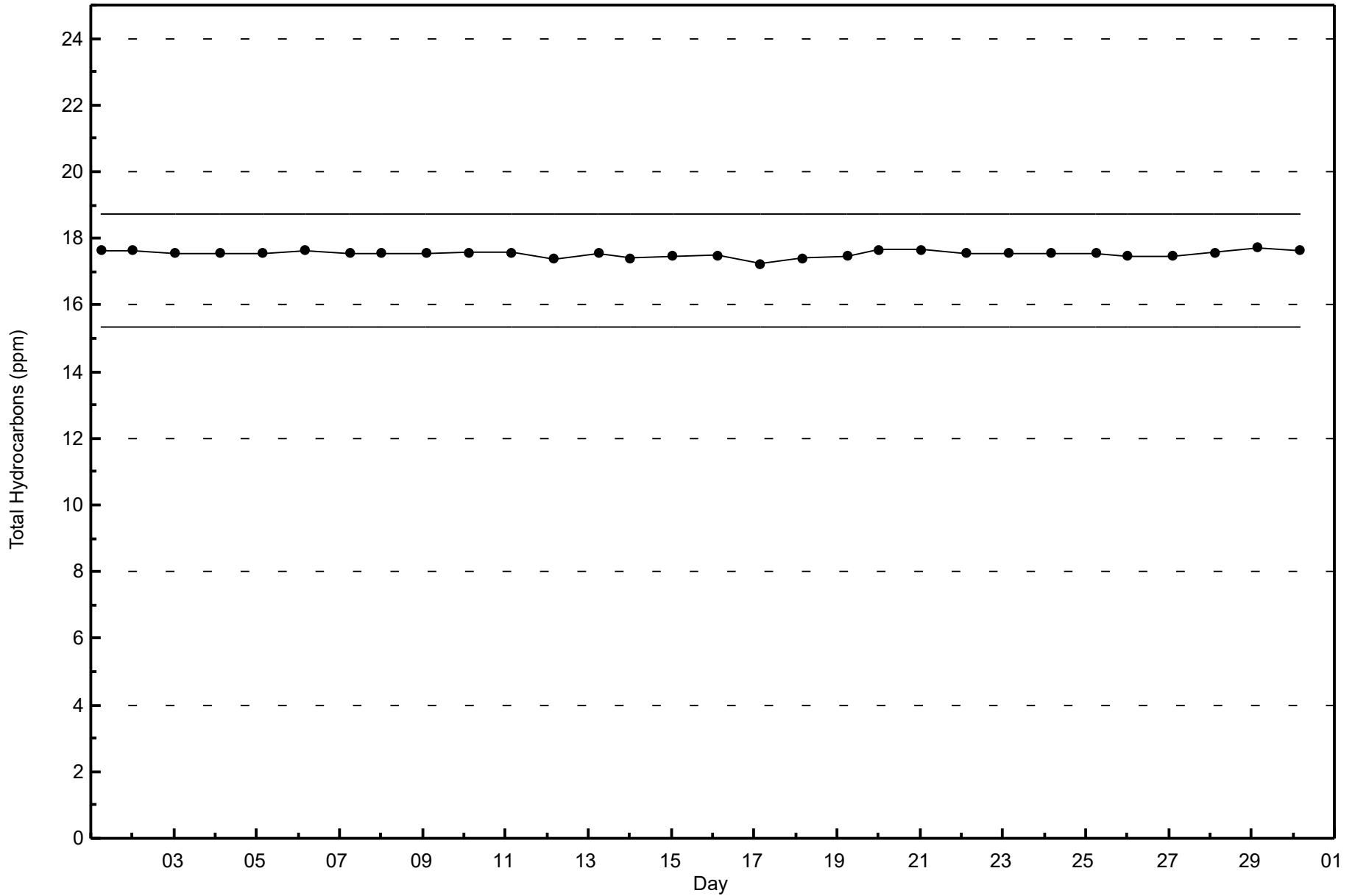
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Hydrocarbons (THC) - ppm  
Ells River







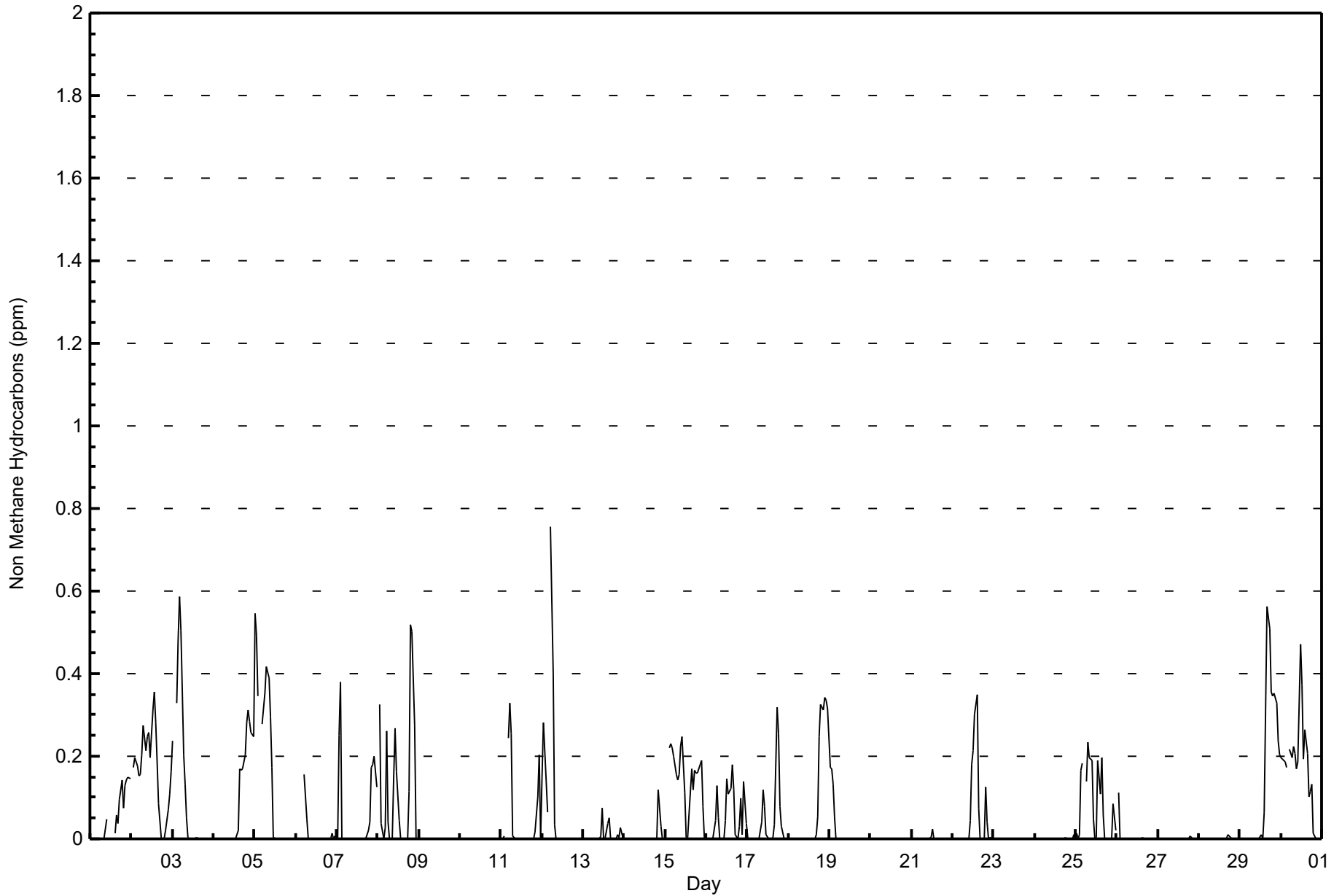




Summary of Hour Averages

Ells River - November 2024

Maximum Value: 0.758 ppm on Nov 12 06:00		Maximum Daily Average: 0.166 ppm on Nov 30		Hours in Service:	720																					
Minimum Value: 0.000 ppm on Nov 1 01:00		Minimum Daily Average: 0.000 ppm on Nov 9		Hours of Data:	684																					
Maximum Diurnal Average: 0.118 ppm at hour 6		Minimum Diurnal Average: 0.040 ppm at hour 14		Hours of Missing Data:	36																					
Monthly Average: 0.057 ppm		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.1 P <sub>90</sub> = 0.2 P <sub>99</sub> = 0.5		Hours of Calibration:	34																					
				Percent Operational Time:	99.7																					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.048	C	C	C	C	0.013	0.058	0.036	0.097	0.142	0.073	0.130	0.141	0.150	0.145	0.054	0.150
2-Nov	Z	0.174	0.196	0.176	0.152	0.154	0.203	0.275	0.213	0.246	0.258	0.195	0.312	0.357	0.282	0.187	0.084	0.000	0.000	0.001	0.020	0.070	0.109	0.162	0.166	0.357
3-Nov	0.237	Z	0.327	0.483	0.587	0.506	0.202	0.134	0.049	0.002	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.110	0.587
4-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.021	0.170	0.167	0.171	0.202	0.283	0.313	0.284	0.257	0.247	0.092	0.313
5-Nov	0.545	0.491	0.346	Z	0.279	0.317	0.352	0.416	0.391	0.295	0.174	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.157	0.545
6-Nov	0.000	0.000	0.000	0.000	Z	0.154	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.000	0.006	0.010	0.154
7-Nov	0.000	0.252	0.381	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.041	0.174	0.179	0.201	0.124	0.060	0.381
8-Nov	Z	0.326	0.037	0.000	0.029	0.260	0.039	0.000	0.000	0.146	0.268	0.164	0.043	0.000	0.000	0.000	0.000	0.000	0.114	0.519	0.503	0.273	0.000	0.000	0.118	0.519
9-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.002
11-Nov	0.000	0.000	0.008	Z	0.245	0.330	0.253	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.101	0.204	0.005	0.051	0.330
12-Nov	0.149	0.282	0.140	0.066	Z	0.758	0.400	0.034	0.000	0.000	0.000	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.758
13-Nov	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.007	0.075	0.001	0.000	0.036	0.050	0.000	0.000	0.000	0.000	0.009	0.005	0.028	0.000	0.009	0.075
14-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.117	0.031	0.000	0.000	0.006	0.117
15-Nov	0.000	Z	0.221	0.229	0.221	0.200	0.157	0.143	0.157	0.224	0.246	0.111	0.004	0.000	0.059	0.169	0.120	0.165	0.158	0.159	0.179	0.190	0.077	0.000	0.139	0.246
16-Nov	0.000	0.000	Z	0.000	0.000	0.043	0.127	0.049	0.000	0.000	0.000	0.043	0.145	0.109	0.122	0.179	0.118	0.009	0.000	0.031	0.097	0.012	0.140	0.036	0.055	0.179
17-Nov	0.003	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.041	0.118	0.079	0.011	0.000	0.000	0.000	0.002	0.034	0.318	0.256	0.076	0.030	0.000	0.000	0.000	0.042	0.318
18-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.054	0.249	0.325	0.311	0.342	0.337	0.315	0.084	0.342
19-Nov	0.172	0.170	0.131	0.055	0.002	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.172
20-Nov	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
21-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.022
22-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.043	0.179	0.213	0.303	0.349	0.074	0.000	0.000	0.000	0.127	0.041	0.000	0.003	0.001	0.058	0.349
23-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
24-Nov	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.002	0.002	0.000	0.000	0.000	0.000	0.011	0.001	0.011
25-Nov	0.015	0.000	0.011	0.167	0.184	Z	0.138	0.234	0.198	0.191	0.048	0.001	0.005	0.189	0.110	0.196	0.058	0.000	0.000	0.000	0.000	0.085	0.020	0.080	0.234	
26-Nov	Z	0.111	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.111
27-Nov	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.006
28-Nov	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.003	0.000	0.000	0.000	0.000	0.000	0.001	0.010
29-Nov	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.065	0.314	0.562	0.510	0.355	0.345	0.352	0.327	0.238	0.203	0.143	0.562
30-Nov	0.198	0.193	0.187	0.175	Z	0.218	0.195	0.224	0.207	0.171	0.188	0.472	0.374	0.194	0.264	0.207	0.103	0.114	0.131	0.014	0.000	0.000	0.000	0.000	0.166	0.472
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan      C - Calibration      M - Maintenance																										





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Ells River - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	465	67.98	67.98
0.006 - 0.05	50	7.31	75.29
0.06 - 0.1	47	6.87	82.16
> 0.1	122	17.84	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Ells River - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	78	49	6	2	4	6	15	38	53	53	46	23	38	19	9	12	451
0.006 - 0.05	4	6	4	1	0	0	2	14	5	3	1	0	2	1	3	2	48
0.06 - 0.1	5	9	2	0	0	0	0	11	7	4	0	0	0	1	4	4	47
> 0.1	17	7	3	1	1	0	2	13	18	9	5	2	3	8	11	18	118
<b>Totals</b>	104	71	15	4	5	6	19	76	83	69	52	25	43	29	27	36	664

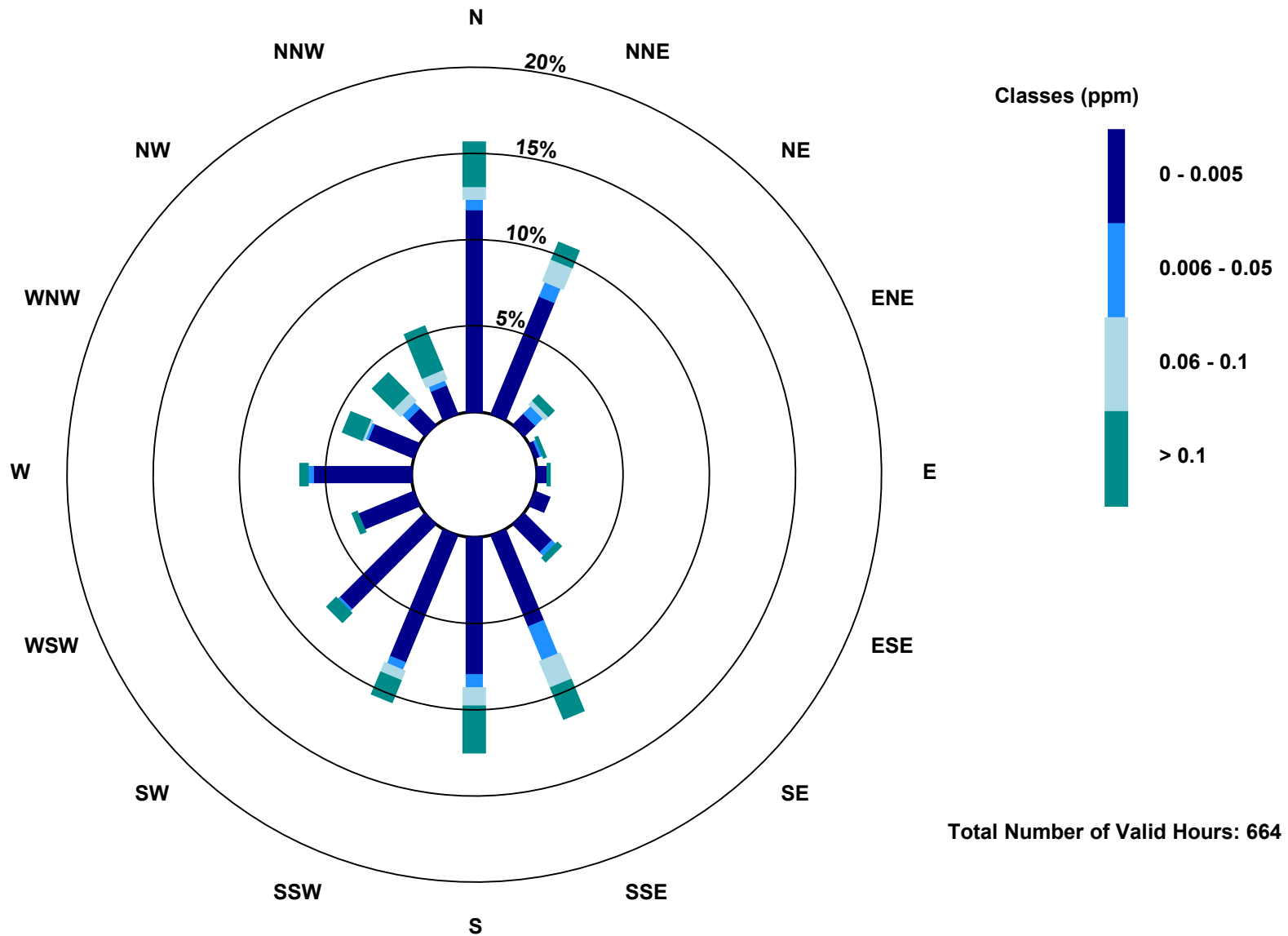
Total Number of Valid Hours: 664

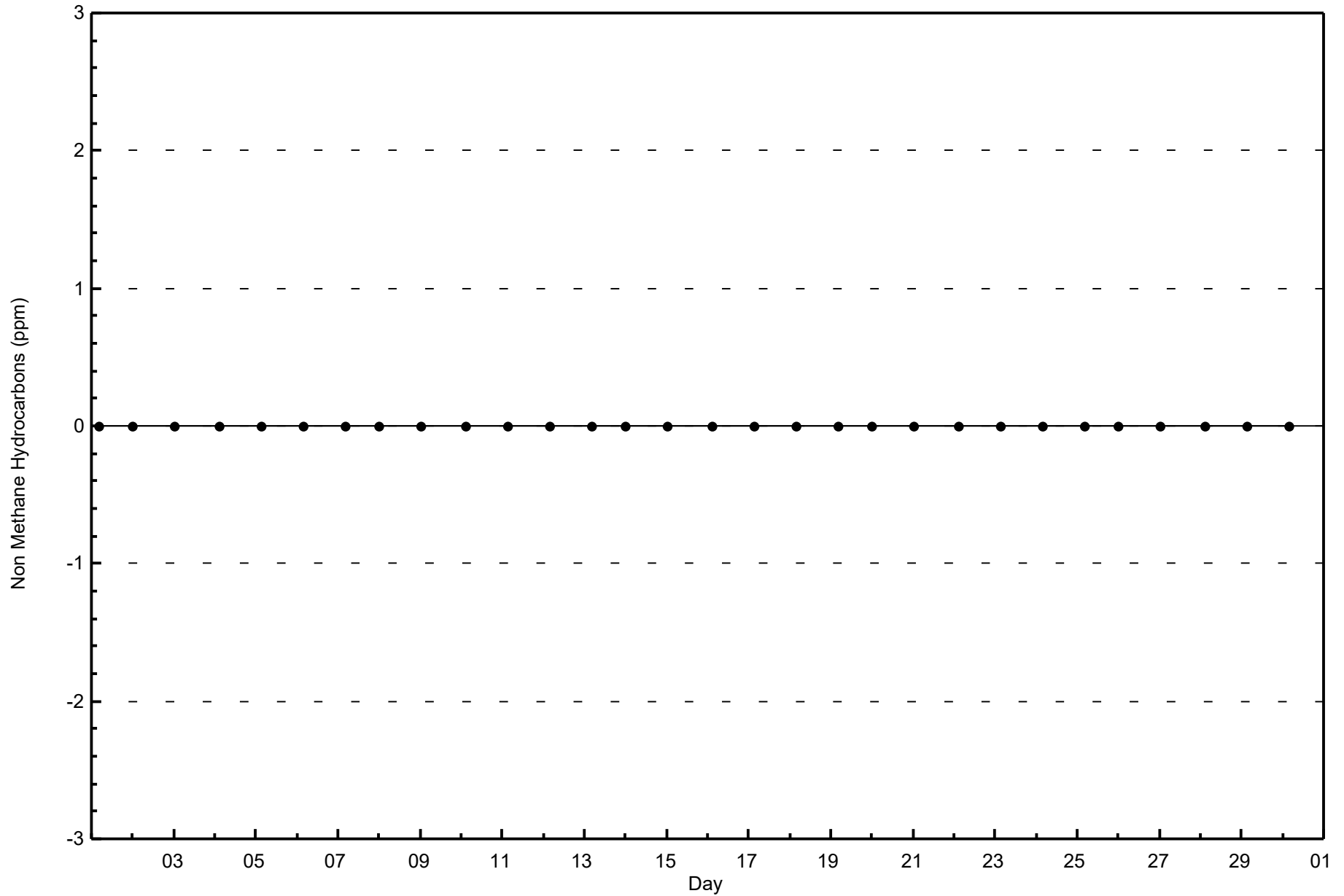
Total Number of Hours: 720



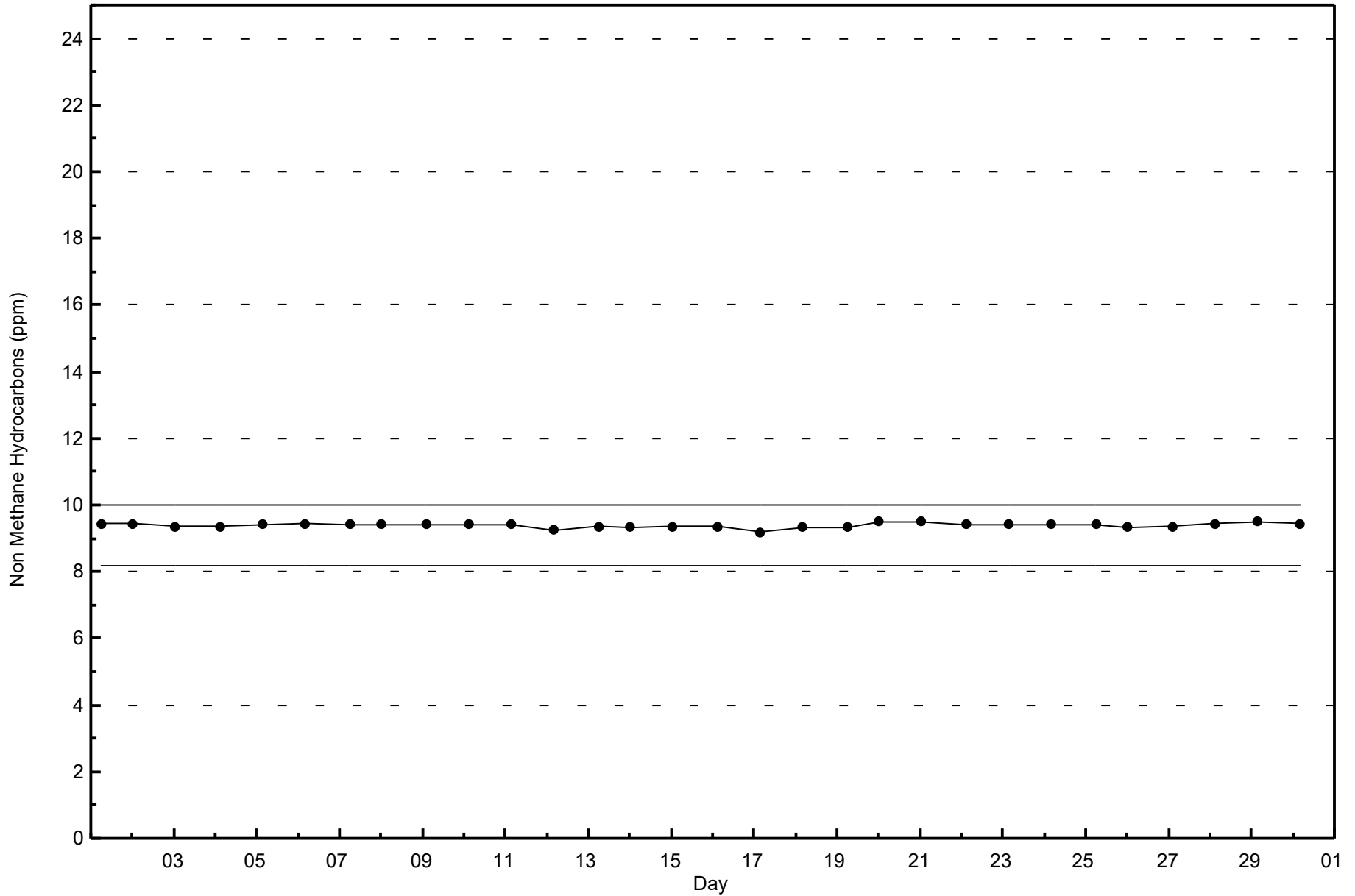
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Non Methane Hydrocarbons (NMHC) - ppm  
Ells River











Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH<sub>4</sub>) - ppm

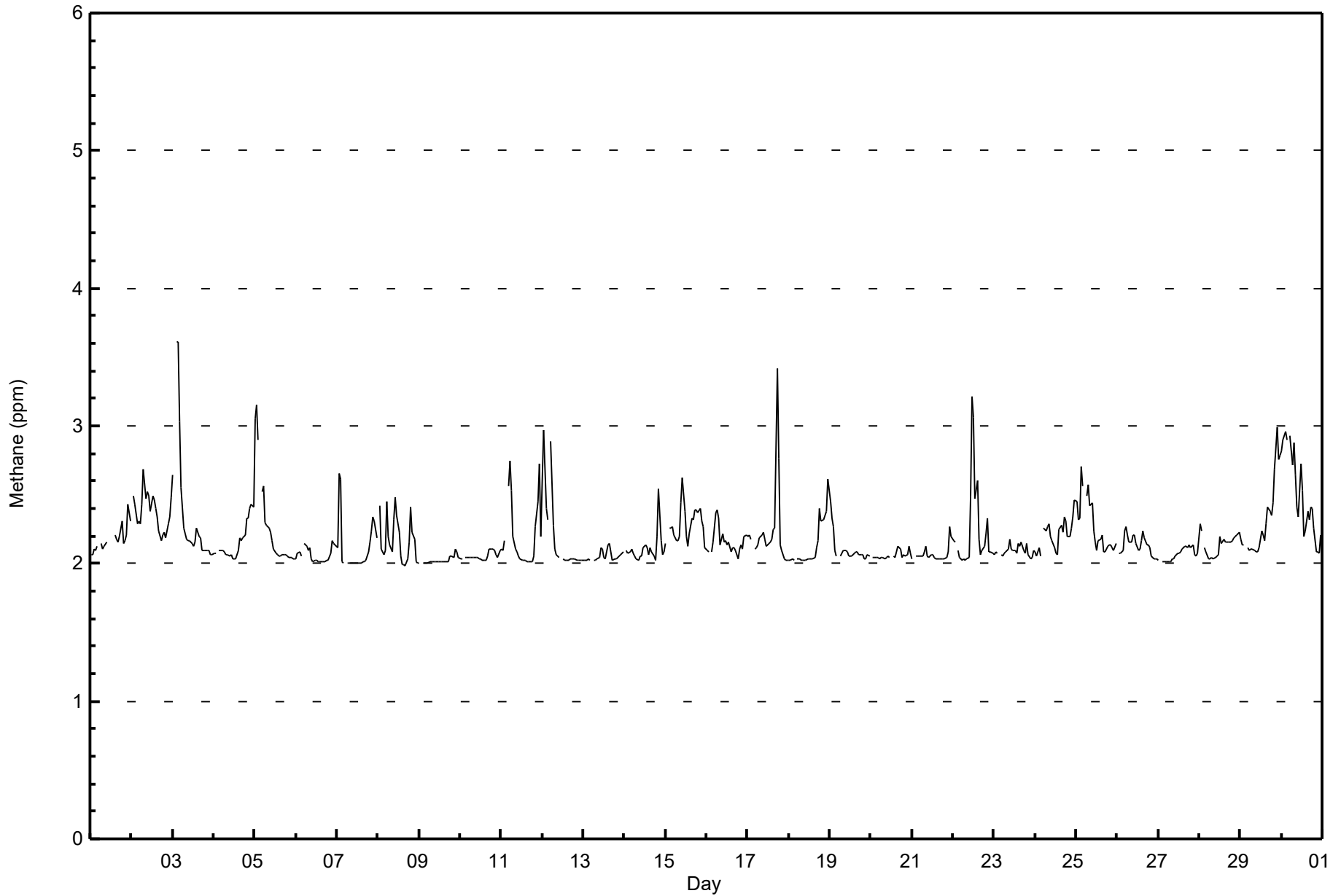
Ells River - November 2024

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 720																																											
Maximum Value: 3.6 ppm on Nov 3 03:00		Maximum Daily Average: 2.5 ppm on Nov 30		Hours of Data: 684																																													
Minimum Value: 2.0 ppm on Nov 8 17:00		Minimum Daily Average: 2.0 ppm on Nov 9		Hours of Missing Data: 36																																													
Maximum Diurnal Average: 2.3 ppm at hour 3		Minimum Diurnal Average: 2.1 ppm at hour 14		Hours of Calibration: 34																																													
Monthly Average: 2.18 ppm		Percentiles: P <sub>1</sub> = 2.0 P <sub>10</sub> = 2.0 Q <sub>1</sub> = 2.0 Median = 2.1 Q <sub>3</sub> = 2.2 P <sub>90</sub> = 2.4 P <sub>99</sub> = 3.0		Percent Operational Time: 99.7																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.2	C	C	C	C	2.2	2.2	2.2	2.2	2.3	2.1	2.2	2.2	2.4	2.3	2.2	2.4																							
2-Nov	Z	2.5	2.4	2.3	2.3	2.3	2.4	2.7	2.5	2.5	2.5	2.4	2.5	2.5	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.5	2.4	2.7																							
3-Nov	2.6	Z	3.6	3.6	3.0	2.6	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	3.6																							
4-Nov	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.2	2.4																							
5-Nov	3.1	3.2	2.9	Z	2.5	2.6	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.3	3.2																							
6-Nov	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.2																							
7-Nov	2.1	2.7	2.6	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.3	2.3	2.2	2.1	2.7																							
8-Nov	Z	2.4	2.1	2.1	2.1	2.5	2.2	2.1	2.1	2.3	2.5	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.2	2.4	2.2	2.2	2.0	2.0	2.2	2.5																							
9-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.1																							
10-Nov	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1																							
11-Nov	2.1	2.1	2.2	Z	2.6	2.7	2.5	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.4	2.7	2.2	2.2	2.7																							
12-Nov	2.6	3.0	2.4	2.3	Z	2.9	2.3	2.1	2.1	2.1	2.0	M	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	3.0																							
13-Nov	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1																							
14-Nov	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.2	2.5	2.2	2.1	2.1	2.5																							
15-Nov	2.1	Z	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.4	2.6	2.4	2.2	2.1	2.2	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.1	2.6																							
16-Nov	2.1	2.1	Z	2.1	2.2	2.4	2.4	2.3	2.1	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.4																							
17-Nov	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.3	2.3	3.4	2.8	2.1	2.1	2.0	2.0	2.0	2.2	3.4																							
18-Nov	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.4	2.3	2.3	2.3	2.4	2.6	2.1	2.6																							
19-Nov	2.5	2.3	2.3	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.5																							
20-Nov	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	M	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1																							
21-Nov	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.2	2.1	2.3																							
22-Nov	2.2	2.2	Z	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.5	3.2	3.1	2.5	2.6	2.2	2.1	2.1	2.1	2.2	2.3	2.1	2.1	2.1	2.2	3.2																							
23-Nov	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.2																							
24-Nov	2.1	2.1	2.1	2.1	Z	2.3	2.2	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.3	2.3	2.5	2.2	2.5																							
25-Nov	2.5	2.3	2.3	2.7	2.6	Z	2.5	2.6	2.4	2.4	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.7																							
26-Nov	Z	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.3																							
27-Nov	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																							
28-Nov	2.3	2.2	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.3																							
29-Nov	2.2	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.4	2.4	2.4	2.4	2.4	2.7	3.0	2.8	2.8	3.0																							
30-Nov	2.8	2.9	3.0	2.9	Z	2.9	2.7	2.9	2.6	2.4	2.3	2.7	2.5	2.2	2.2	2.4	2.3	2.4	2.4	2.3	2.1	2.1	2.1	2.2	2.5	3.0																							
																								2.2	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	Diumal Average
																								3.1	3.2	3.6	3.6	3.0	2.9	2.7	2.9	2.6	2.5	2.6	3.2	3.1	2.5	2.6	2.4	2.4	3.4	2.8	2.4	2.7	3.0	2.8	2.8	2.8	Diumal Maximum
Z - zerspan																								C - Calibration				M - Maintenance																					



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Methane (CH<sub>4</sub>) - ppm**  
**Ells River - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Ells River - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	186	27.19	27.19
2.1 - 3.0	491	71.78	98.98
3.1 - 10.0	7	1.02	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Ells River - November 2024**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	18	10	0	0	1	1	8	6	10	29	31	16	33	13	5	0	181
2.1 - 3.0	86	61	15	4	4	5	11	70	73	40	21	9	9	15	21	34	478
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	5
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	104	71	15	4	5	6	19	76	83	69	52	25	43	29	27	36	664

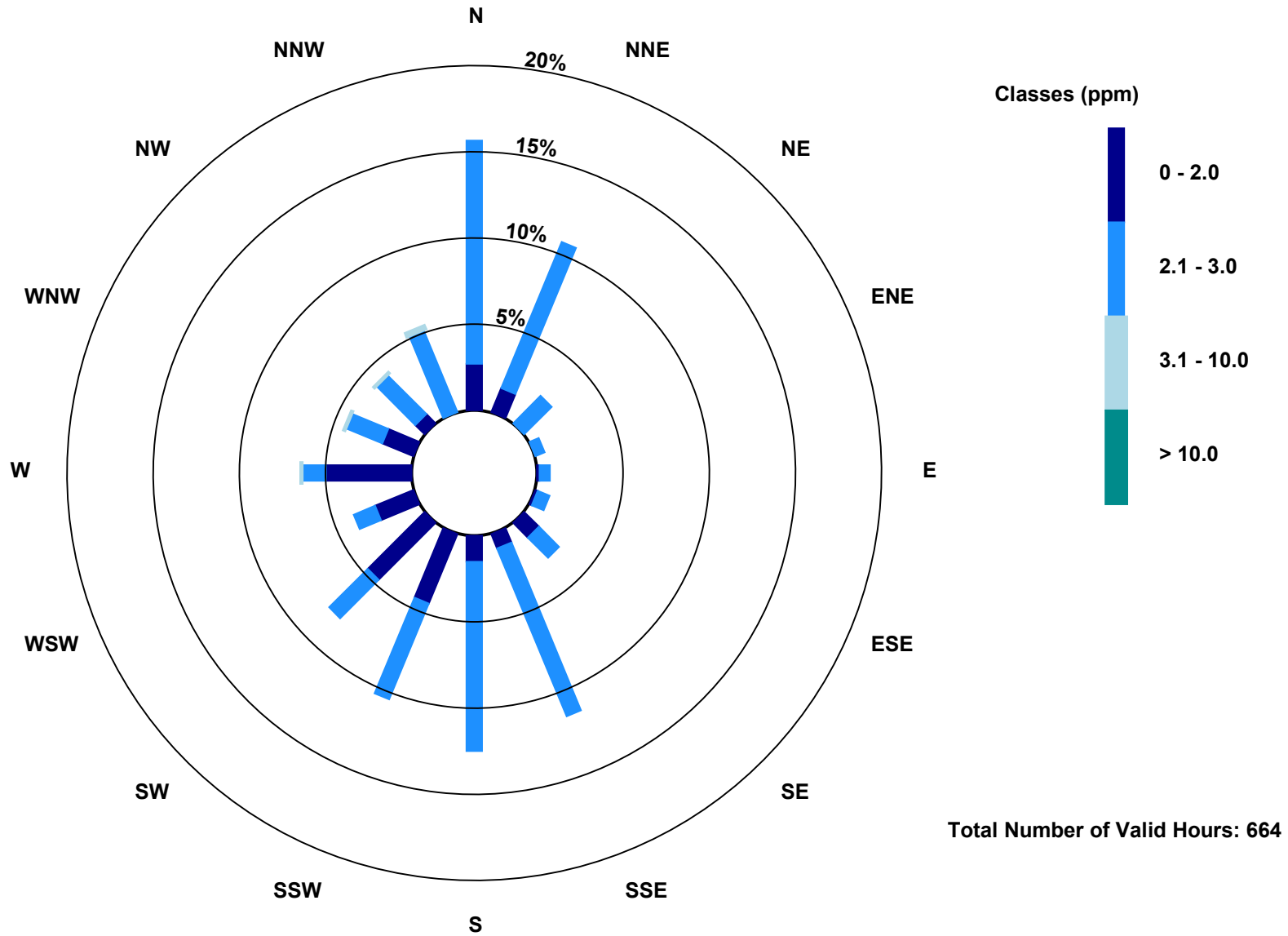
Total Number of Valid Hours: 664

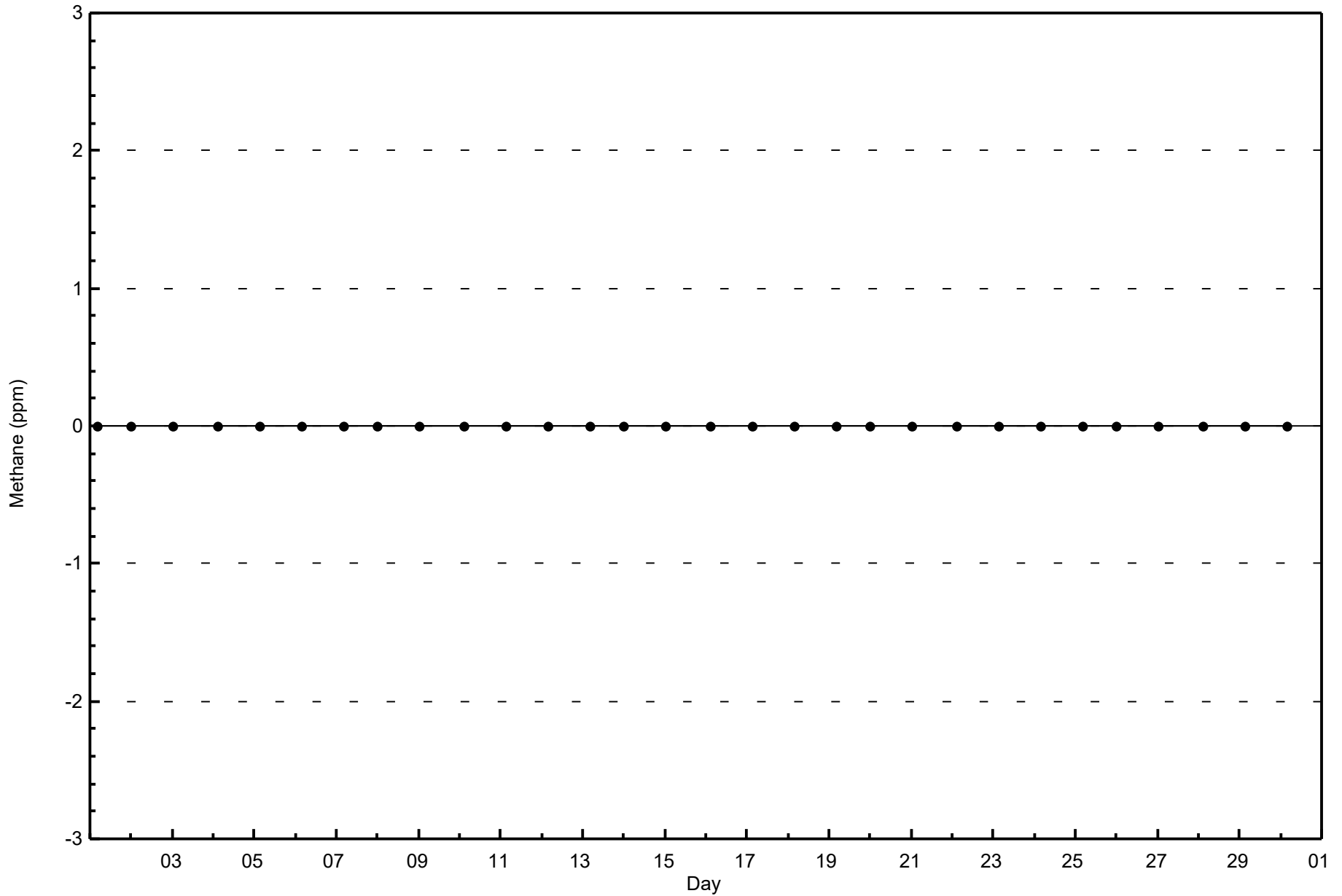
Total Number of Hours: 720

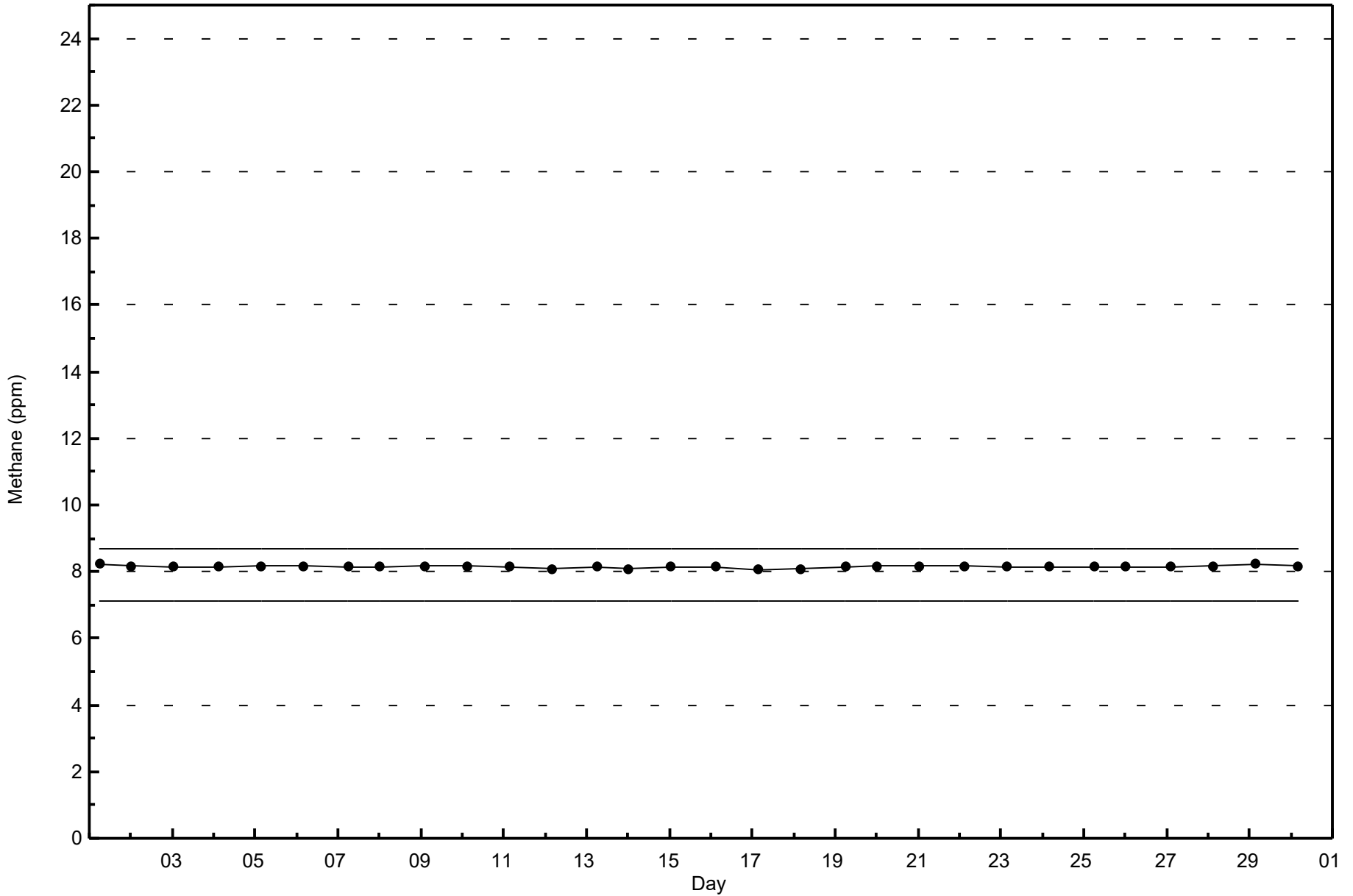


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Methane (CH<sub>4</sub>) - ppm  
Ells River









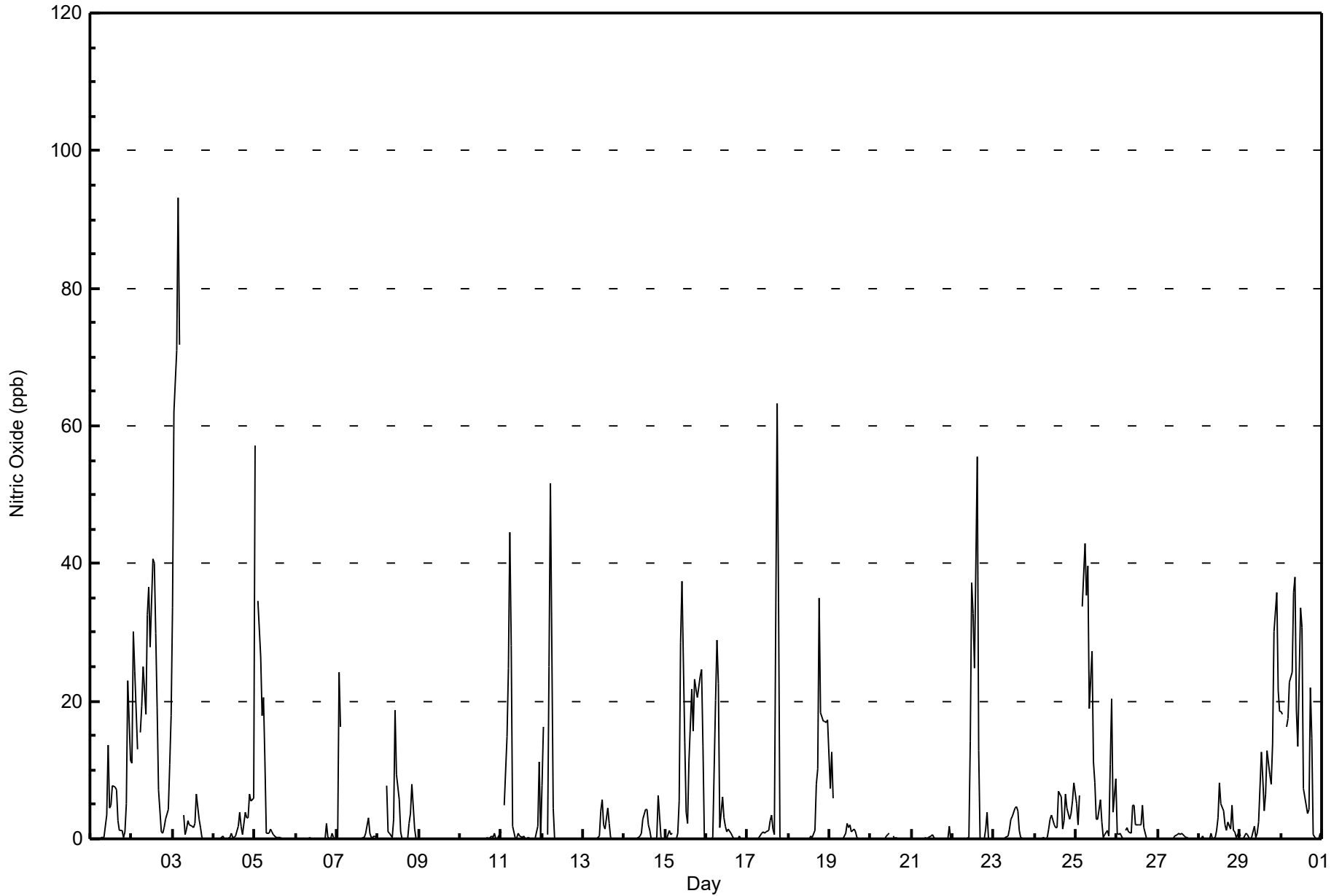


Maximum Value: 93.2 ppb on Nov 3 04:00		Maximum Daily Average: 18.7 ppb on Nov 2		Hours in Service: 720																																												
Minimum Value: 0.0 ppb on Nov 3 19:00		Minimum Daily Average: 0.0 ppb on Nov 9		Hours of Data: 684																																												
Maximum Diurnal Average: 9.1 ppb at hour 6		Minimum Diurnal Average: 2.0 ppb at hour 17		Hours of Missing Data: 36																																												
Monthly Average: 4.86 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.2 Q <sub>3</sub> = 3.5 P <sub>90</sub> = 18.0 P <sub>99</sub> = 52.3		Hours of Calibration: 35																																												
				Percent Operational Time: 99.9																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	0.0	0.0	0.0	Z	0.1	0.0	0.1	0.2	0.2	3.4	13.7	4.4	4.8	7.7	7.5	7.0	2.6	1.2	1.3	0.3	1.0	5.1	23.0	11.4	4.1	23.0																						
2-Nov	11.0	30.1	24.5	12.9	Z	15.5	19.4	24.9	18.2	32.5	36.5	27.8	40.7	40.0	29.9	19.2	7.2	1.1	0.7	1.5	2.8	4.3	10.7	17.8	18.7	40.7																						
3-Nov	33.5	62.0	71.1	93.2	71.9	Z	3.6	0.6	1.4	2.7	2.0	1.8	1.7	2.3	6.6	2.9	1.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	15.6	93.2																						
4-Nov	Z	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.2	0.9	0.1	0.2	0.3	1.8	3.9	1.8	0.6	3.8	3.1	3.0	6.6	5.6	6.0	1.7	6.6																						
5-Nov	57.2	Z	34.7	26.5	17.8	20.6	11.3	0.8	0.9	1.4	1.0	0.5	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	7.6	57.2																						
6-Nov	0.1	0.1	Z	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.3	0.1	0.9	0.2	0.0	0.2	2.3																						
7-Nov	0.0	24.1	16.2	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.8	3.2	0.8	0.2	0.1	0.4	0.1	2.0	24.1																						
8-Nov	0.1	0.1	0.1	0.0	Z	7.7	1.0	0.9	0.2	2.9	18.7	9.3	5.7	1.0	0.1	0.1	0.0	0.1	2.3	3.6	7.9	1.5	0.0	0.1	2.8	18.7																						
9-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1																					
10-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.0	0.5	0.3	0.8	0.0	0.0	0.8	0.1	0.8																						
11-Nov	1.1	Z	4.9	14.9	24.7	44.6	28.0	1.9	0.1	0.1	0.9	0.5	0.2	0.4	0.0	0.0	0.2	0.0	0.0	0.0	0.0	1.9	11.1	0.1	5.9	44.6																						
12-Nov	7.7	16.3	Z	0.5	25.0	51.6	4.6	0.0	0.0	0.1	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	51.6																						
13-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.3	4.1	5.8	2.0	1.4	4.4	2.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	5.8																						
14-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.5	0.8	2.8	4.2	4.2	2.0	1.2	0.1	0.0	0.0	0.2	6.3	0.3	0.0	0.0	1.0	6.3																						
15-Nov	0.1	0.1	1.3	0.5	0.8	Z	0.1	0.8	5.4	28.4	37.4	14.0	4.0	2.2	11.4	21.8	15.8	23.2	21.8	20.5	23.5	24.6	13.4	0.0	11.8	37.4																						
16-Nov	Z	0.0	0.0	0.0	0.2	20.0	22.6	1.6	6.0	3.1	1.9	1.1	1.4	0.7	0.3	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	3.8	29.0																						
17-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.9	1.1	0.9	1.0	1.2	2.7	3.5	1.4	0.6	63.2	34.3	0.2	0.0	0.0	0.0	0.0	4.8	63.2																						
18-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	1.2	7.9	10.2	35.0	18.3	17.0	17.2	16.9	17.3	6.2	35.0																						
19-Nov	7.4	12.6	5.8	Z	0.0	0.0	0.0	0.0	0.1	0.9	2.3	1.6	2.0	1.1	1.4	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	12.6																						
20-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.3	0.6	0.7	M	0.3	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7																						
21-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.2	0.1	0.1	0.4	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.7	0.0	0.2	1.7																						
22-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	14.2	37.1	32.7	24.8	55.6	12.8	0.0	0.0	0.1	1.4	3.9	0.0	0.0	0.0	7.9	55.6																						
23-Nov	0.1	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.5	1.5	2.8	3.3	4.4	4.7	4.0	1.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	1.0	4.7																						
24-Nov	0.0	0.0	Z	0.0	0.1	0.2	0.1	0.2	1.3	2.8	3.4	2.0	1.6	1.6	6.9	6.2	1.4	2.7	6.6	4.5	2.9	3.7	5.5	8.1	2.7	8.1																						
25-Nov	5.0	2.1	6.3	Z	33.8	42.9	35.4	39.7	18.9	27.3	11.3	8.2	2.8	2.9	5.8	2.4	0.3	0.6	1.2	0.3	10.8	20.3	3.8	8.7	12.6	42.9																						
26-Nov	0.8	0.5	0.8	0.1	Z	1.3	1.6	1.0	0.9	4.9	4.8	2.1	1.9	2.0	2.0	4.9	1.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	1.4	4.9																						
27-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.3	0.6	0.7	0.7	0.9	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.9																						
28-Nov	Z	0.1	0.4	0.0	0.0	0.0	0.0	0.8	0.0	0.2	1.2	3.0	8.2	5.1	4.0	2.0	1.2	2.5	1.5	4.9	1.2	1.0	0.2	1.0	1.7	8.2																						
29-Nov	0.4	Z	0.0	0.9	0.7	0.3	0.1	0.3	1.8	0.2	0.8	2.5	12.6	8.8	4.0	6.5	12.8	9.4	8.0	13.8	30.1	35.7	21.6	18.5	8.2	35.7																						
30-Nov	18.4	18.1	Z	16.2	17.5	22.8	24.1	35.8	38.0	18.8	13.5	33.5	30.7	7.3	6.0	3.6	4.3	22.0	14.7	0.6	0.0	0.0	0.0	0.7	15.1	38.0																						
																								5.7	6.7	6.6	6.6	7.7	9.1	5.3	4.4	3.0	4.6	6.0	5.7	5.9	4.3	5.5	3.4	2.0	4.6	4.6	2.5	3.7	4.1	3.8	3.0	Diurnal Average
																								57.2	62.0	71.1	93.2	71.9	51.6	35.4	39.7	38.0	32.5	37.4	37.1	40.7	40.0	55.6	21.8	15.8	63.2	35.0	20.5	30.1	35.7	23.0	18.5	Diurnal Maximum
Z - zerospan		C - Calibration				M - Maintenance																																										



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Ells River - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Ells River - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	628	91.81	91.81
21 - 40	45	6.58	98.39
41 - 80	10	1.46	99.85
81 - 159	1	0.15	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Ells River - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	93	72	13	3	4	6	20	68	79	63	49	24	39	29	23	25	610
21 - 40	9	5	0	1	1	0	0	4	5	5	1	0	1	0	4	7	43
11 - 80	1	0	1	0	0	0	0	1	1	0	2	0	0	1	2	1	10
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	103	77	14	4	5	6	20	73	85	68	52	24	41	30	29	33	664

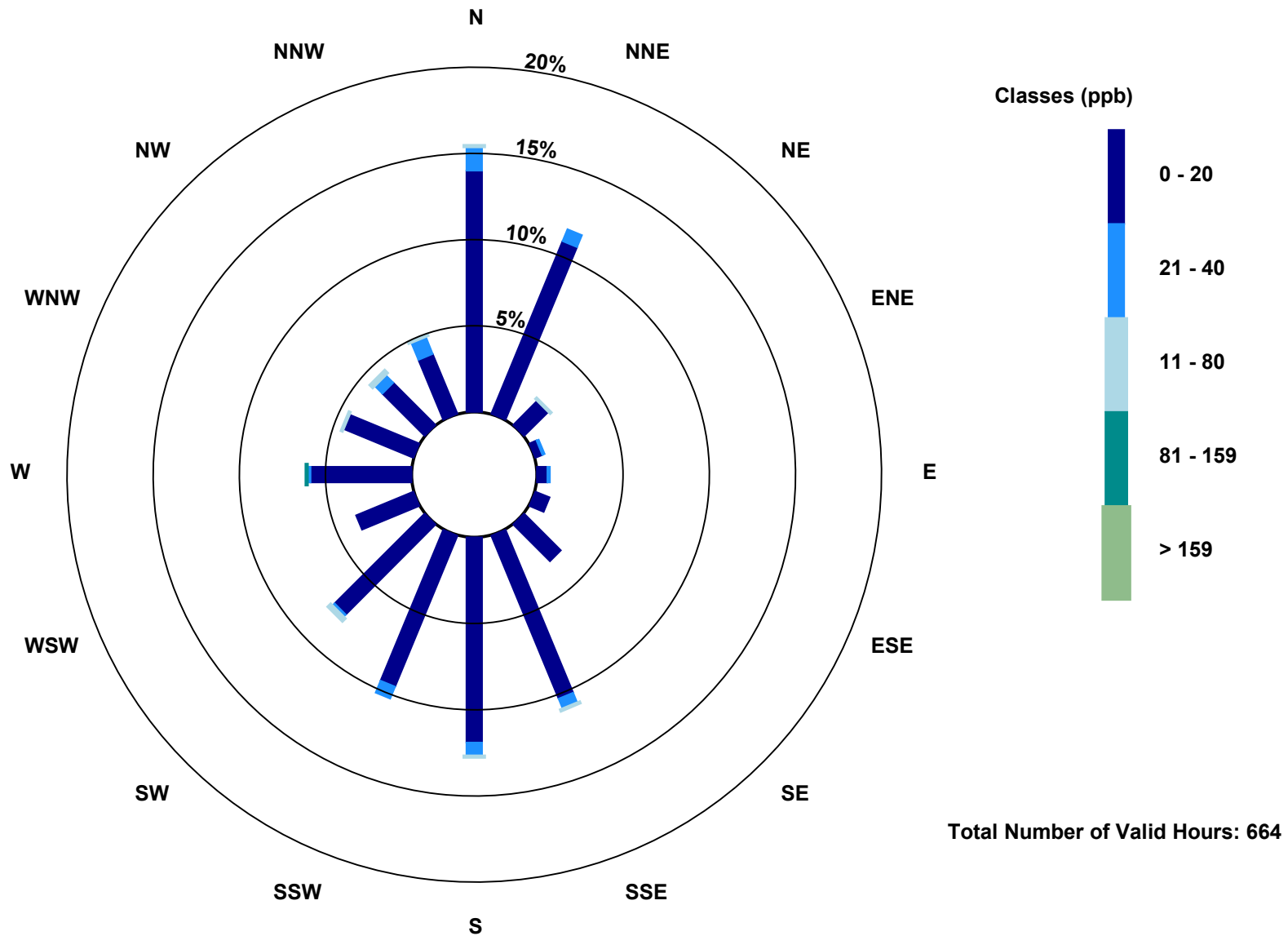
Total Number of Valid Hours: 664

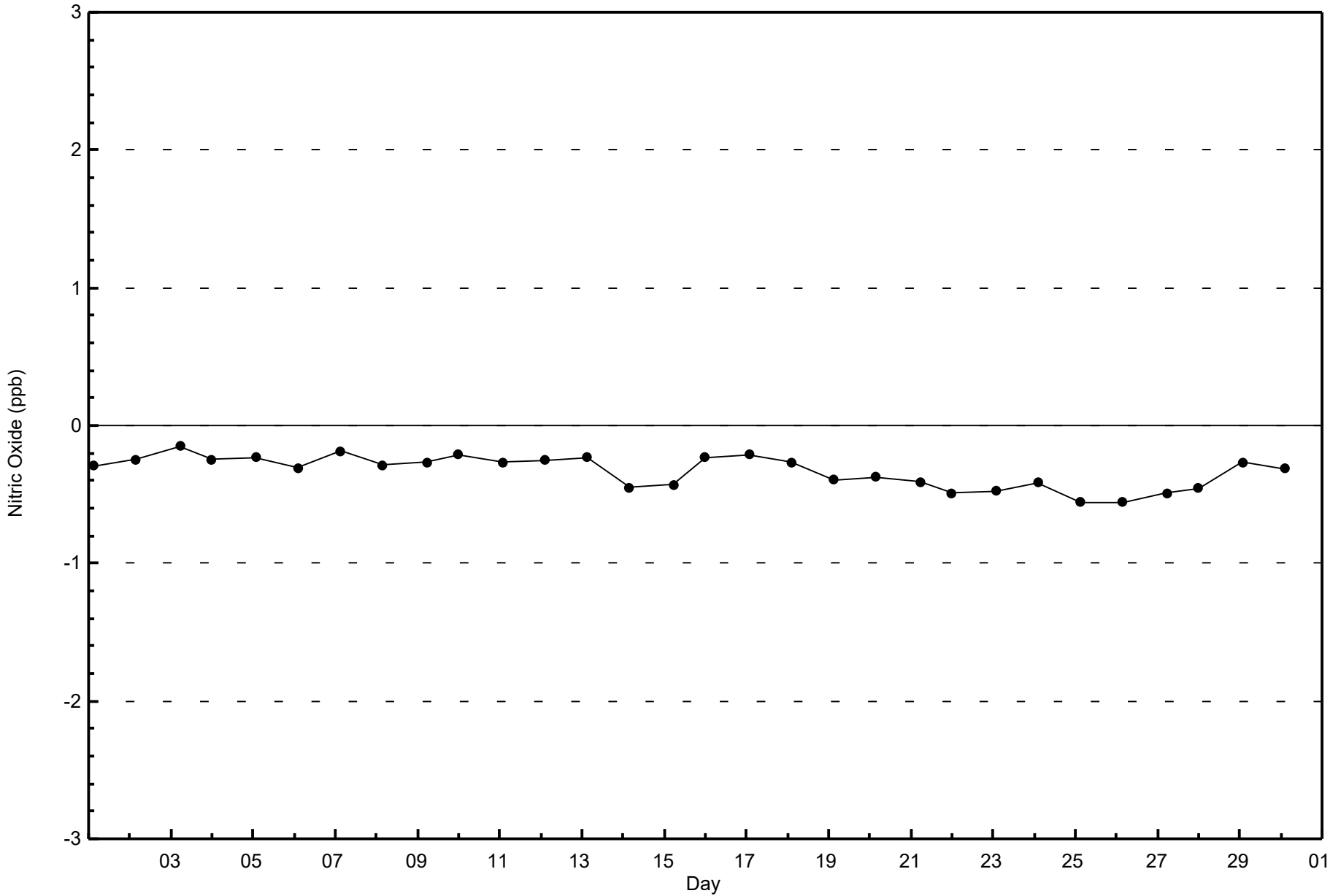
Total Number of Hours: 720

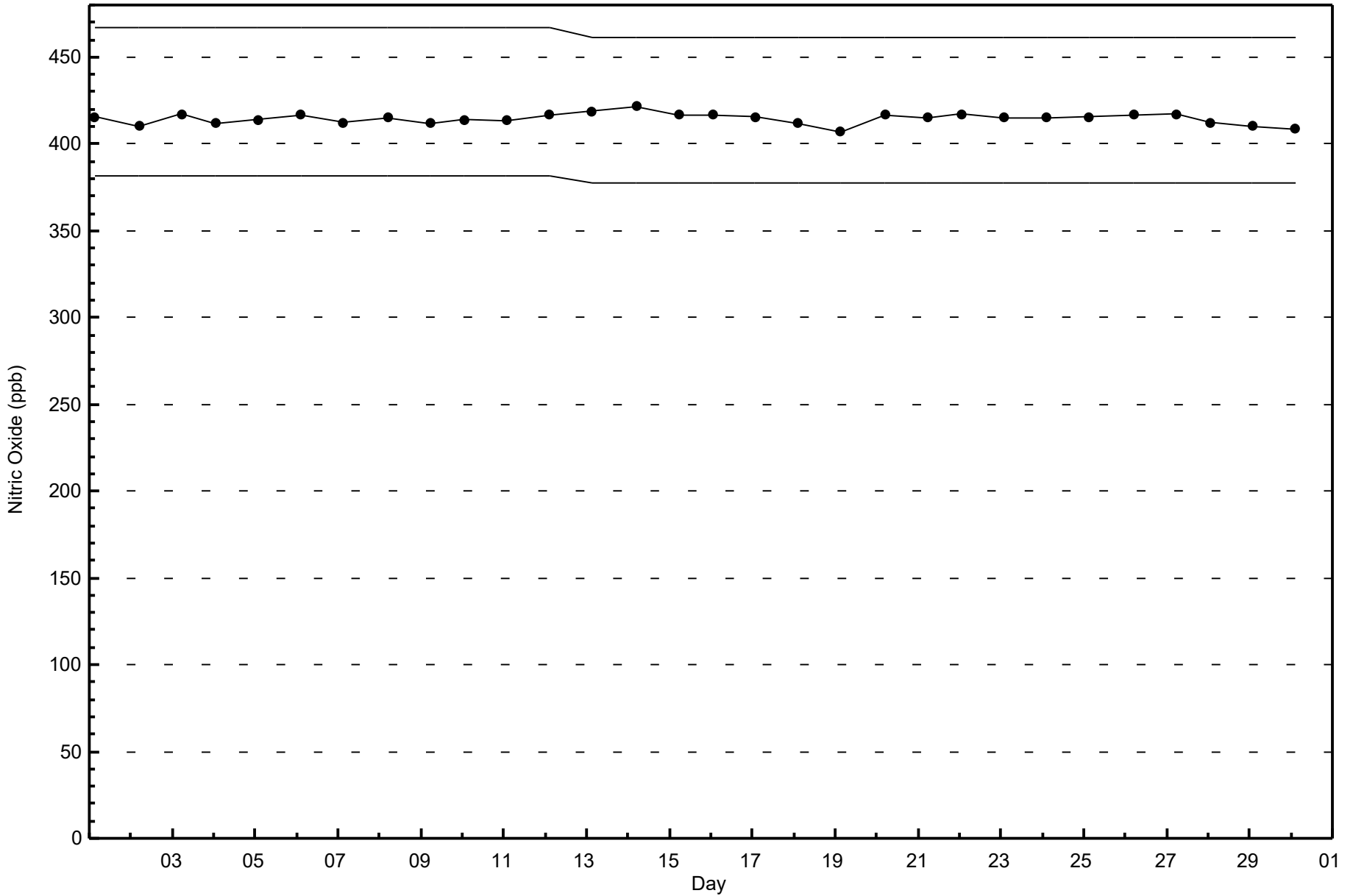


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitric Oxide (NO) - ppb  
Ells River









# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Nitrogen Dioxide (NO<sub>2</sub>) - ppb

## Ells River - November 2024

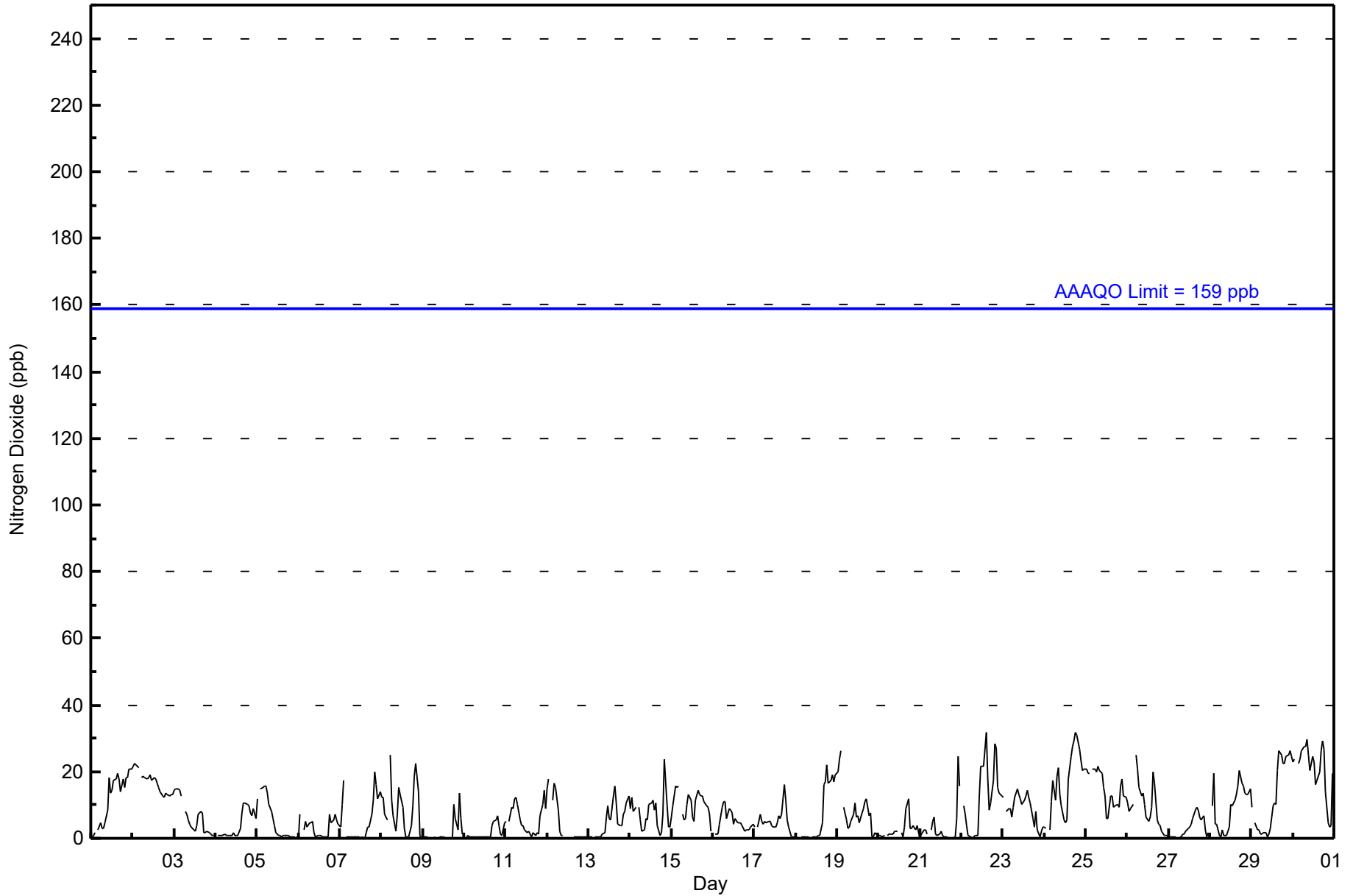
Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														720																													
Maximum Value: 31.7 ppb on Nov 22 15:00				Maximum Daily Average: 20.8 ppb on Nov 30		Hours of Data:														684																													
Minimum Value: 0.1 ppb on Nov 21 17:00				Minimum Daily Average: 1.7 ppb on Nov 10		Hours of Missing Data:														36																													
Maximum Diurnal Average: 9.8 ppb at hour 21				Minimum Diurnal Average: 6.1 ppb at hour 10		Hours of Calibration:														35																													
Monthly Average: 7.94 ppb				Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 1.2 Median = 5.7 Q <sub>3</sub> = 12.6 P <sub>90</sub> = 19.6 P <sub>99</sub> = 27.5		Percent Operational Time:														99.9																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	0.6	0.7	1.5	Z	2.4	4.7	3.0	3.0	4.5	8.4	18.1	13.5	14.3	17.2	17.8	19.4	17.6	14.0	17.6	15.4	18.2	18.2	20.9	20.7	11.8	20.9																							
2-Nov	21.4	22.4	21.9	21.0	Z	18.1	18.8	18.4	17.8	18.1	18.9	17.4	18.4	17.8	16.6	15.1	14.0	12.6	12.4	13.4	13.0	12.8	13.3	13.3	16.8	22.4																							
3-Nov	14.3	14.9	14.9	14.6	12.5	Z	8.1	7.2	5.4	4.3	3.4	2.7	2.3	3.7	7.4	7.9	7.6	1.9	1.9	2.0	1.6	1.2	0.9	1.0	6.2	14.9																							
4-Nov	Z	0.9	0.9	1.0	0.9	1.2	0.7	0.7	0.7	1.0	1.9	0.9	0.8	1.0	2.9	7.7	10.8	10.6	10.1	9.9	7.5	6.8	8.8	6.1	4.1	10.8																							
5-Nov	11.8	Z	14.8	15.1	15.7	15.7	13.5	10.0	7.9	6.0	3.7	1.8	0.8	0.7	0.6	0.7	0.7	0.8	0.7	0.6	0.5	0.3	0.2	0.3	5.3	15.7																							
6-Nov	0.2	7.1	Z	2.4	5.0	3.4	4.8	4.7	4.9	1.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	7.1	4.5	5.4	7.3	5.4	4.2	3.2	7.3																							
7-Nov	3.6	10.2	17.4	Z	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	1.8	3.4	3.2	7.0	11.3	19.9	16.3	11.9	14.0	5.4	19.9																							
8-Nov	12.2	12.4	7.4	5.4	Z	24.9	11.4	6.7	2.2	7.4	15.2	13.3	9.3	3.1	0.6	0.5	0.6	3.8	9.6	18.6	22.5	13.9	0.7	0.2	8.8	24.9																							
9-Nov	0.3	0.3	0.3	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	10.0	5.8	2.7	13.6	5.8	1.4	1.9	13.6																						
10-Nov	Z	0.6	0.7	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.4	3.7	5.0	5.5	6.6	3.8	1.3	0.8	4.8	1.7	6.6																							
11-Nov	5.0	Z	5.1	9.3	8.8	11.7	12.3	10.0	5.4	3.7	4.0	2.5	1.9	2.3	1.1	0.6	1.6	0.9	1.6	1.3	6.9	10.1	14.5	8.7	5.6	14.5																							
12-Nov	14.8	17.6	Z	11.5	16.4	15.1	8.6	2.1	0.9	0.7	Z	Z	Z	Z	Z	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	5.1	17.6																							
13-Nov	0.3	0.3	0.3	Z	0.4	0.3	0.4	0.4	1.3	1.6	6.5	9.7	6.1	5.5	12.6	15.6	10.7	4.1	3.8	3.9	7.2	7.9	10.6	12.5	5.3	15.6																							
14-Nov	8.8	12.4	8.2	9.3	Z	9.3	5.7	2.2	2.6	5.9	5.7	10.0	10.8	11.3	8.5	10.5	4.0	0.8	1.7	7.4	23.9	9.7	3.5	3.5	7.6	23.9																							
15-Nov	6.3	9.9	15.8	15.2	15.5	Z	7.1	5.7	5.9	10.1	13.2	11.5	6.2	5.2	11.6	14.2	13.1	12.9	12.5	11.2	9.6	9.4	7.3	2.1	10.1	15.8																							
16-Nov	Z	1.4	1.2	1.2	4.3	9.5	11.2	11.2	5.9	8.7	8.3	7.7	4.2	6.1	4.5	4.7	4.7	3.8	2.1	2.6	2.5	2.5	3.3	4.3	5.0	11.2																							
17-Nov	3.5	Z	3.3	7.1	5.0	4.4	5.0	4.7	5.2	5.1	3.8	3.5	3.4	4.6	6.6	5.9	7.3	16.0	11.3	5.4	3.2	0.5	0.4	0.4	5.0	16.0																							
18-Nov	0.4	0.4	Z	0.5	0.4	0.5	0.5	0.3	0.2	0.2	0.3	0.3	0.3	0.9	0.8	4.6	16.2	16.9	22.2	16.6	17.2	19.1	16.9	19.2	6.7	22.2																							
19-Nov	20.1	23.8	26.3	Z	9.3	5.3	3.0	3.4	5.1	7.3	10.6	6.2	6.9	4.7	7.6	9.0	11.2	11.7	6.8	7.6	0.4	0.4	1.6	0.9	8.2	26.3																							
20-Nov	0.7	0.8	0.4	0.7	Z	0.7	1.3	1.3	1.3	2.3	2.3	2.1	M	1.5	0.6	3.5	9.1	11.8	3.1	2.8	3.7	2.7	3.7	1.7	2.6	11.8																							
21-Nov	0.3	1.3	2.4	2.4	1.3	Z	2.6	4.9	6.3	1.2	0.8	1.2	2.0	0.9	0.6	0.5	0.1	0.1	0.1	0.2	0.3	5.8	24.6	15.5	3.3	24.6																							
22-Nov	Z	9.6	7.4	3.9	0.9	0.3	0.2	0.3	0.9	0.9	12.9	21.5	21.7	21.5	31.7	17.9	8.6	10.8	17.3	28.2	27.1	15.1	13.5	12.5	12.4	31.7																							
23-Nov	12.4	Z	8.2	8.7	8.9	6.5	9.2	12.1	14.7	13.2	12.0	10.0	11.5	12.6	14.4	12.2	10.7	6.1	3.6	8.1	2.6	0.6	2.0	3.2	8.8	14.7																							
24-Nov	3.3	2.9	Z	2.5	10.9	17.3	11.4	18.7	21.3	13.1	9.9	5.6	4.7	5.3	17.8	24.5	27.4	29.2	31.7	30.8	26.5	23.1	20.5	20.8	16.5	31.7																							
25-Nov	20.6	19.7	19.6	Z	20.6	20.7	20.1	21.5	20.4	19.4	15.2	12.7	5.9	5.9	12.7	12.9	9.5	9.9	10.1	9.4	15.6	17.9	12.6	12.4	15.0	21.5																							
26-Nov	10.6	8.0	8.7	10.0	Z	25.0	20.9	15.1	12.6	13.7	10.1	6.3	5.1	6.2	9.2	20.0	16.7	5.6	4.4	3.9	2.0	1.0	0.9	0.8	9.4	25.0																							
27-Nov	0.6	0.4	0.4	0.3	0.3	Z	0.5	0.5	1.2	1.2	2.1	2.9	3.6	4.1	6.1	8.5	9.3	8.4	6.5	5.6	6.7	2.7	0.4	1.5	3.2	9.3																							
28-Nov	Z	9.9	19.5	4.3	4.2	0.8	0.4	2.7	1.0	0.8	2.1	3.5	10.0	9.8	11.3	13.3	15.7	20.4	16.6	15.6	13.4	13.1	13.0	14.8	9.4	20.4																							
29-Nov	9.2	Z	4.5	2.5	2.7	1.3	1.3	1.5	1.8	0.6	1.1	2.8	9.9	10.7	10.2	20.2	26.4	25.0	22.5	22.4	24.7	25.1	26.3	24.6	12.1	26.4																							
30-Nov	23.0	23.7	Z	22.5	23.7	26.3	27.4	27.4	29.8	25.1	20.2	24.7	23.0	16.0	17.5	19.9	26.1	29.1	26.7	14.1	4.6	3.3	3.8	19.6	20.8	29.8																							
																								8.2	8.5	8.4	6.9	6.9	9.0	7.0	6.6	6.3	6.1	7.0	6.8	6.6	6.2	8.0	9.1	9.6	9.2	9.6	9.5	9.8	8.7	8.3	8.2	Diurnal Average	
																								23.0	23.8	26.3	22.5	23.7	26.3	27.4	27.4	29.8	25.1	20.2	24.7	23.0	21.5	31.7	24.5	27.4	29.2	31.7	30.8	27.1	25.1	26.3	24.6	Diurnal Maximum	
Z - zerspan      C - Calibration      M - Maintenance																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																	





Wood Buffalo Environmental Association  
Hourly Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Ells River - November 2024





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Ells River - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	627	91.67	91.67
21 - 40	57	8.33	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Ells River - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	89	70	11	2	4	6	20	71	82	65	52	23	41	27	25	24	612
21 - 40	14	7	3	2	1	0	0	2	3	3	0	1	0	3	4	9	52
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	103	77	14	4	5	6	20	73	85	68	52	24	41	30	29	33	664

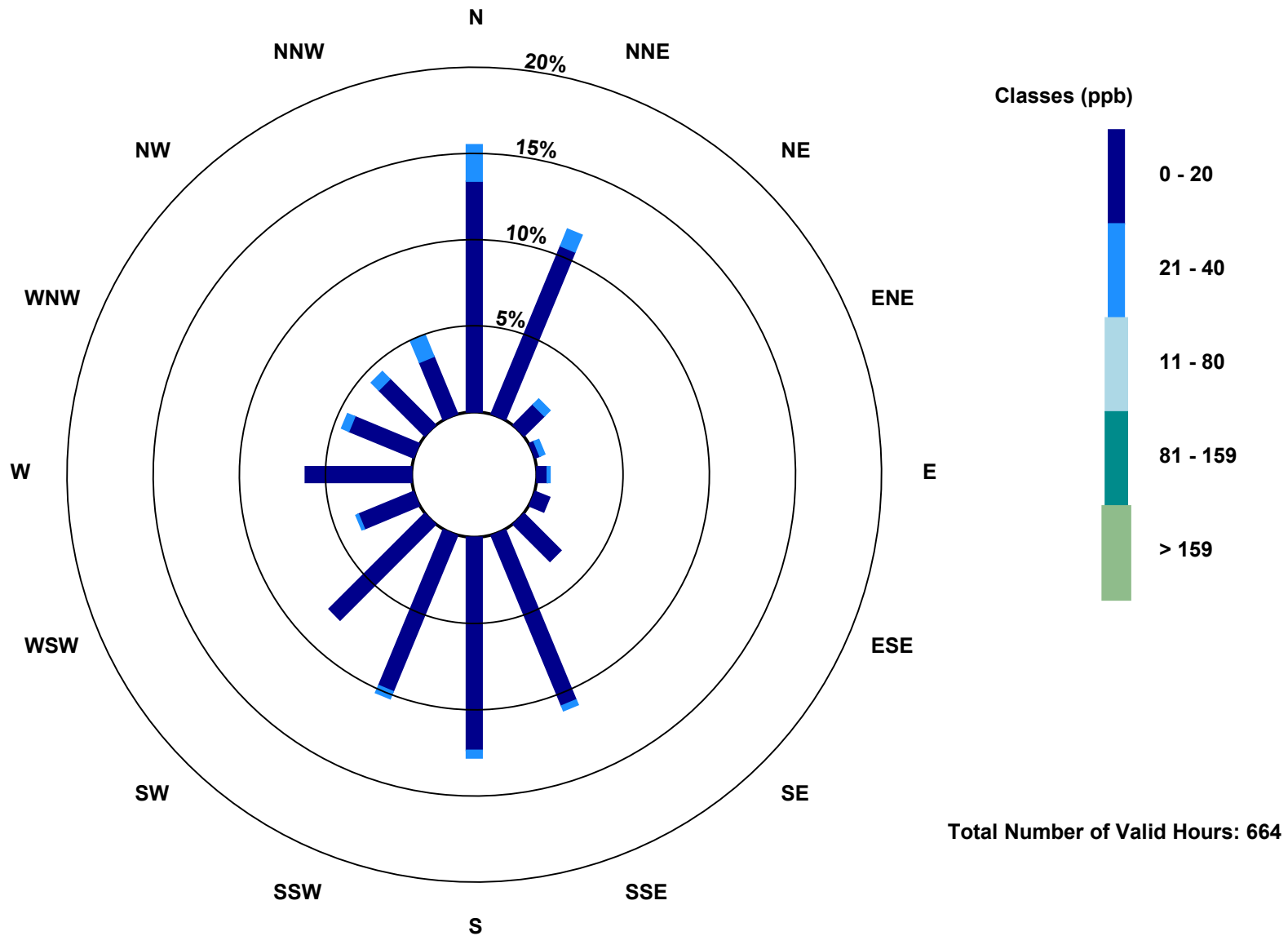
Total Number of Valid Hours: 664

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

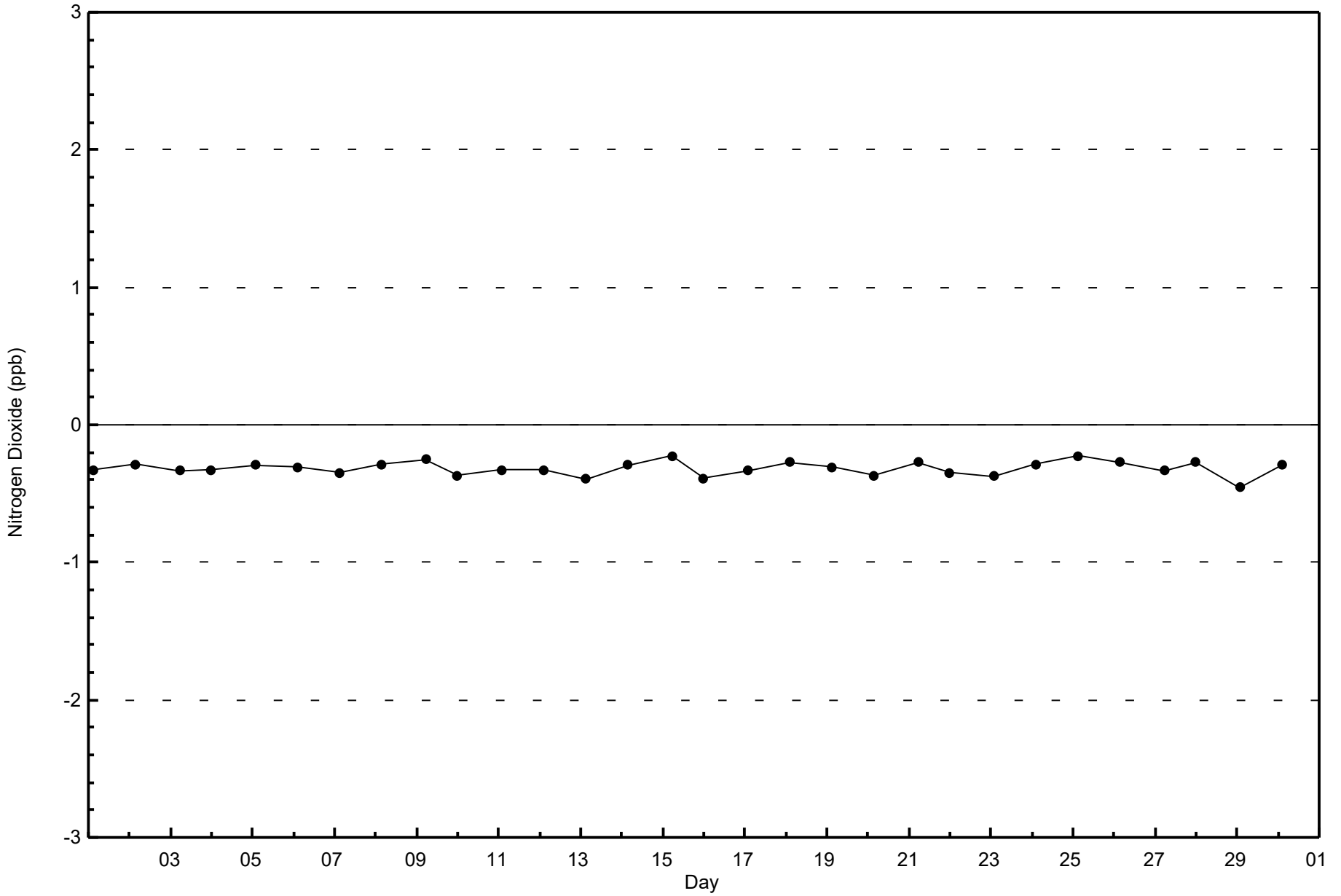
Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Ells River

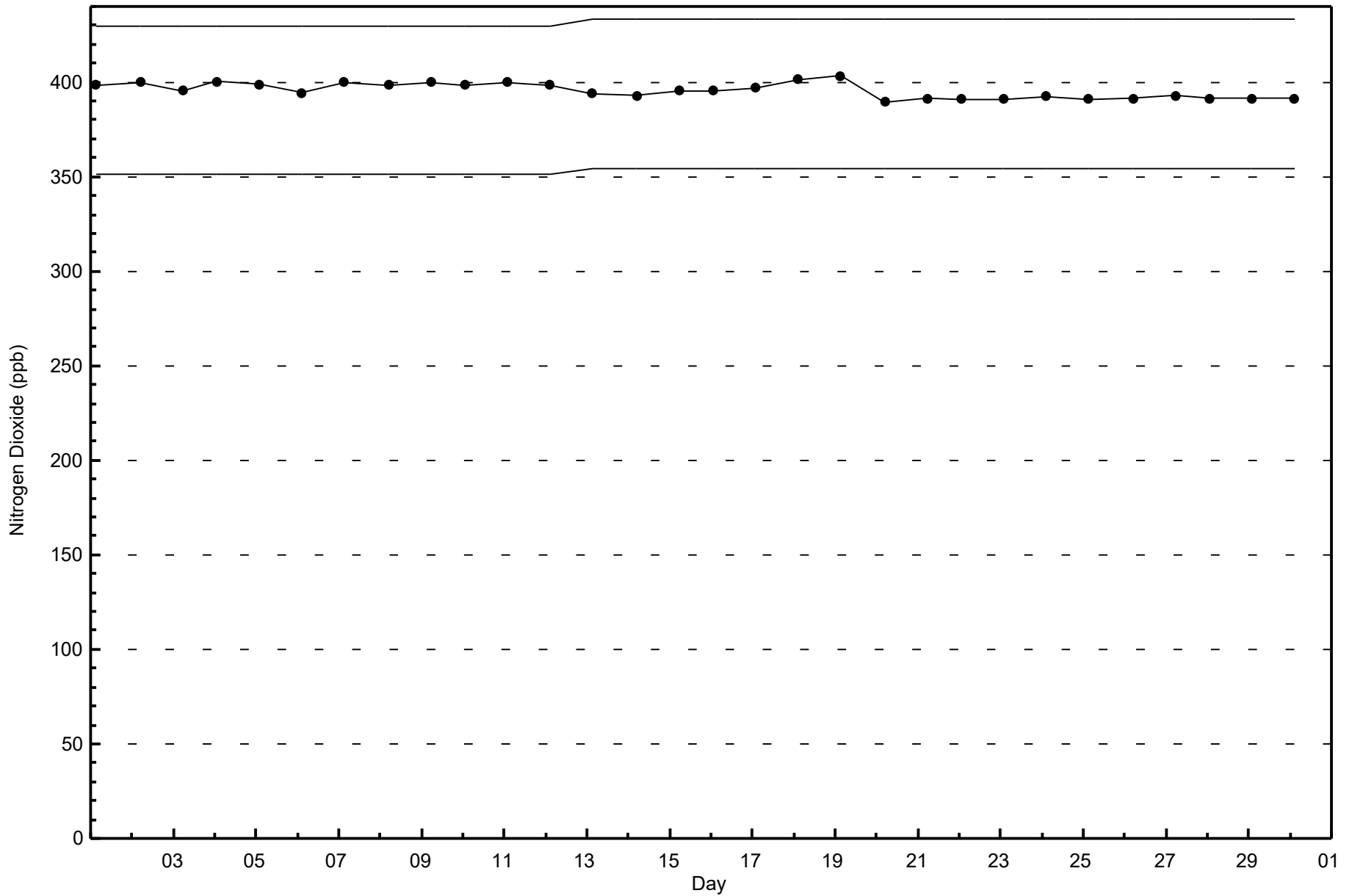




**Wood Buffalo Environmental Association**  
**Zero Responses**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Ells River - November 2024**







**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

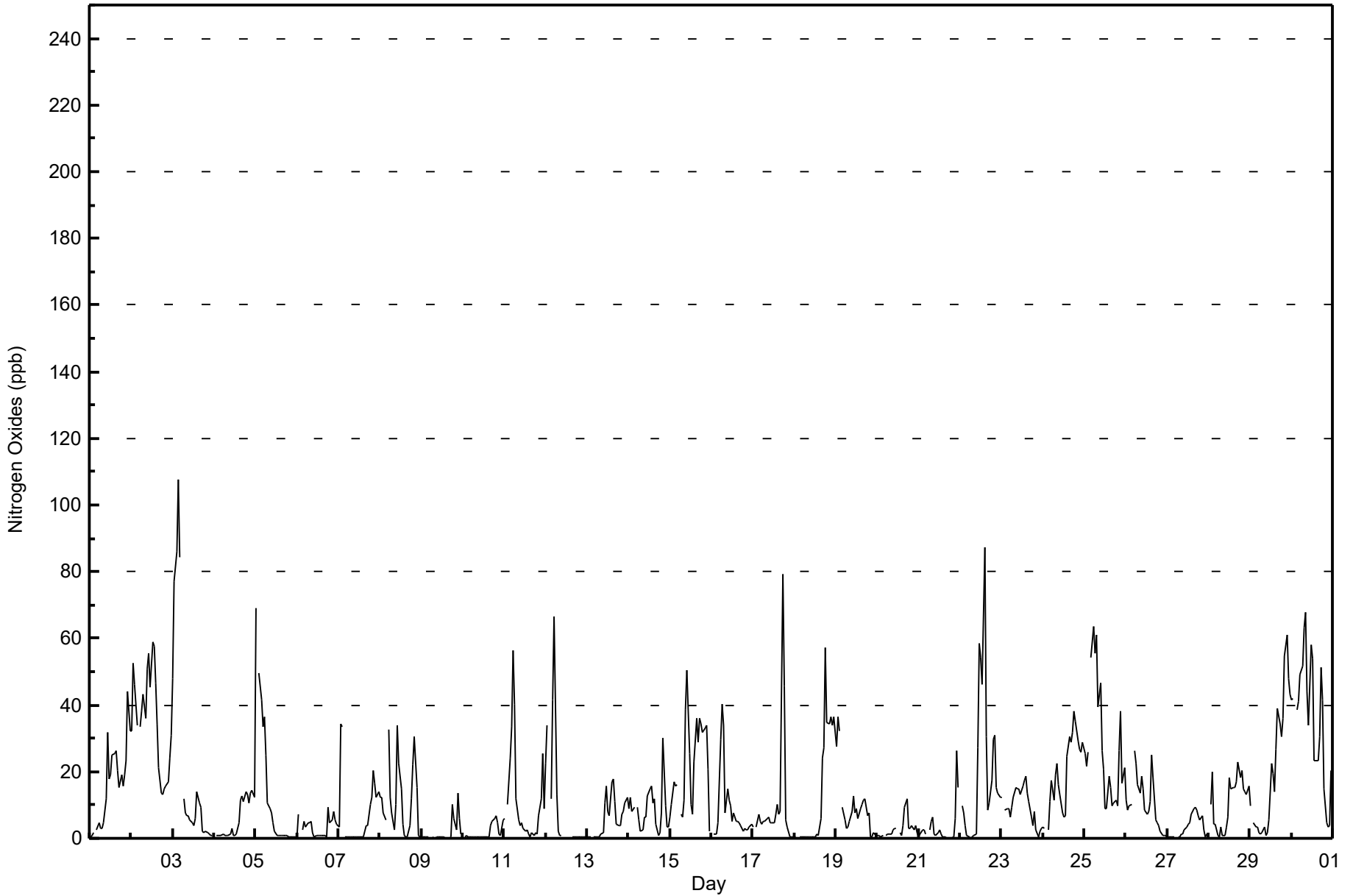
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Ells River - November 2024**

Maximum Value: 107.8 ppb on Nov 3 04:00      Maximum Daily Average: 35.8 ppb on Nov 30																					Hours in Service: 720 Hours of Data: 684					
Minimum Value: 0.1 ppb on Nov 21 18:00      Minimum Daily Average: 1.8 ppb on Nov 10 Maximum Diurnal Average: 18.1 ppb at hour 6      Minimum Diurnal Average: 9.3 ppb at hour 9 Monthly Average: 12.80 ppb      Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 1.3 Median = 6.5 Q <sub>3</sub> = 17.0 P <sub>90</sub> = 34.7 P <sub>99</sub> = 68.0																					Hours of Missing Data: 36 Hours of Calibration: 35 Percent Operational Time: 99.9					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.6	0.7	1.5	Z	2.5	4.7	3.1	3.2	4.7	11.8	31.8	17.9	19.1	24.9	25.3	26.4	20.2	15.2	18.9	15.7	19.2	23.3	43.9	32.1	15.9	43.9
2-Nov	32.4	52.5	46.4	33.9	Z	33.6	38.2	43.3	36.0	50.6	55.4	45.2	59.1	57.8	46.5	34.3	21.2	13.7	13.1	14.9	15.8	17.1	24.0	31.1	35.5	59.1
3-Nov	47.8	76.9	86.0	107.8	84.4	Z	11.7	7.8	6.8	7.0	5.4	4.5	4.0	6.0	14.0	10.8	9.2	2.0	1.9	2.0	1.6	1.2	0.9	1.0	21.8	107.8
4-Nov	Z	0.9	0.9	1.0	0.9	1.5	0.7	0.7	0.7	1.2	2.8	1.0	1.0	1.3	4.7	11.6	12.6	11.2	13.9	13.0	10.5	13.4	14.4	12.1	5.7	14.4
5-Nov	69.0	Z	49.5	41.6	33.5	36.3	24.8	10.8	8.8	7.4	4.7	2.3	0.9	0.8	0.8	0.8	0.8	0.9	0.8	0.6	0.5	0.4	0.3	0.3	12.9	69.0
6-Nov	0.3	7.2	Z	2.4	5.1	3.5	4.8	4.8	5.0	1.7	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	9.4	4.8	5.5	8.2	5.6	4.2	3.4	9.4
7-Nov	3.6	34.3	33.6	Z	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	2.1	3.6	4.0	10.2	12.1	20.1	16.4	12.3	14.1	7.4	34.3
8-Nov	12.3	12.5	7.5	5.4	Z	32.6	12.4	7.6	2.4	10.3	33.9	22.6	15.0	4.1	0.7	0.6	0.6	3.9	11.9	22.2	30.4	15.4	0.7	0.3	11.5	33.9
9-Nov	0.3	0.3	0.3	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	10.1	5.8	2.7	13.6	5.8	1.4	1.9	13.6
10-Nov	Z	0.6	0.7	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	3.9	5.0	6.0	6.9	4.6	1.3	0.8	5.6	1.8	6.9
11-Nov	6.1	Z	10.0	24.2	33.5	56.3	40.3	11.9	5.5	3.8	4.9	3.0	2.1	2.7	1.1	0.6	1.8	0.9	1.6	1.3	6.9	12.0	25.6	8.8	11.5	56.3
12-Nov	22.5	33.9	Z	12.0	41.4	66.7	13.2	2.1	0.9	0.8	C	C	C	C	C	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	10.9	66.7
13-Nov	0.3	0.3	0.3	Z	0.4	0.3	0.4	0.4	1.4	1.9	10.6	15.5	8.1	6.9	17.0	17.9	11.0	4.1	3.8	3.9	7.2	7.9	10.6	12.5	6.2	17.9
14-Nov	8.8	12.4	8.2	9.3	Z	9.3	5.7	2.2	2.7	6.4	6.5	12.8	15.0	15.5	10.5	11.7	4.1	0.8	1.7	7.6	30.2	10.0	3.5	3.5	8.6	30.2
15-Nov	6.4	10.0	17.1	15.7	16.3	Z	7.2	6.5	11.3	38.5	50.6	25.5	10.2	7.4	23.0	36.0	28.9	36.1	34.3	31.7	33.1	34.0	20.7	2.1	21.9	50.6
16-Nov	Z	1.4	1.2	1.2	4.5	29.5	40.2	33.8	7.5	14.7	11.4	9.6	5.3	7.5	5.2	5.0	4.7	3.8	2.1	3.0	2.5	2.5	3.3	4.3	8.9	40.2
17-Nov	3.5	Z	3.3	7.1	5.0	4.4	5.0	4.9	6.1	6.2	4.7	4.5	4.6	7.3	10.1	7.3	7.9	79.2	45.6	5.6	3.2	0.5	0.4	0.4	9.9	79.2
18-Nov	0.4	0.4	Z	0.5	0.4	0.5	0.5	0.3	0.2	0.2	0.3	0.3	0.4	1.2	1.0	5.8	24.1	27.1	57.2	34.9	34.2	36.3	33.8	36.5	12.9	57.2
19-Nov	27.5	36.4	32.1	Z	9.3	5.3	3.0	3.4	5.2	8.2	12.9	7.8	8.9	5.8	9.0	10.0	11.3	11.7	6.8	7.6	0.4	0.4	1.6	0.9	9.8	36.4
20-Nov	0.7	0.8	0.4	0.7	Z	0.7	1.3	1.3	1.4	2.6	2.9	2.8	M	1.8	0.7	3.7	9.2	11.8	3.1	2.8	3.7	2.7	3.7	1.7	2.8	11.8
21-Nov	0.3	1.3	2.4	2.4	1.3	Z	2.6	5.0	6.5	1.3	0.9	1.6	2.7	1.1	0.6	0.5	0.1	0.1	0.1	0.2	0.3	5.9	26.3	15.5	3.4	26.3
22-Nov	Z	9.6	7.4	3.9	0.9	0.3	0.2	0.3	0.9	1.1	27.1	58.6	54.4	46.3	87.3	30.7	8.6	10.8	17.4	29.6	31.0	15.1	13.5	12.5	20.3	87.3
23-Nov	12.5	Z	8.3	8.8	9.0	6.5	9.3	12.2	15.2	14.7	14.8	13.3	15.9	17.3	18.4	13.5	11.0	6.2	3.7	8.2	2.6	0.6	2.0	3.2	9.9	18.4
24-Nov	3.3	2.9	Z	2.5	11.0	17.5	11.5	18.9	22.6	15.9	13.3	7.6	6.3	6.9	24.7	30.7	28.8	31.9	38.3	35.3	29.4	26.8	26.0	28.9	19.2	38.3
25-Nov	25.6	21.8	25.9	Z	54.4	63.6	55.5	61.2	39.3	46.7	26.5	20.9	8.7	8.8	18.5	15.3	9.8	10.5	11.3	9.7	26.4	38.2	16.4	21.1	27.6	63.6
26-Nov	11.4	8.5	9.5	10.1	Z	26.3	22.5	16.1	13.5	18.6	14.9	8.4	7.0	8.2	11.2	24.9	18.3	5.6	4.5	3.9	2.0	1.0	0.9	0.8	10.8	26.3
27-Nov	0.6	0.4	0.4	0.3	0.3	Z	0.5	0.5	1.2	1.3	2.4	3.5	4.3	4.8	7.0	9.0	9.5	8.5	6.6	5.7	6.8	2.7	0.4	1.5	3.4	9.5
28-Nov	Z	10.0	19.9	4.3	4.2	0.8	0.4	3.5	1.0	1.0	3.3	6.5	18.2	14.9	15.3	15.3	16.9	22.9	18.1	20.5	14.6	14.1	13.2	15.8	11.1	22.9
29-Nov	9.6	Z	4.5	3.4	3.4	1.6	1.4	1.8	3.6	0.8	1.9	5.3	22.5	19.5	14.2	26.7	39.2	34.4	30.5	36.2	54.8	60.8	47.9	43.1	20.3	60.8
30-Nov	41.4	41.8	Z	38.7	41.2	49.1	51.5	63.2	67.8	43.9	33.7	58.2	53.7	23.3	23.5	23.5	30.4	51.1	41.4	14.7	4.6	3.3	3.8	20.3	35.8	67.8
13.9 15.1 15.1 13.5 14.6 18.1 12.3 11.0 9.3 10.7 13.1 12.4 12.5 10.5 13.5 12.5 11.6 13.8 14.2 12.0 13.5 12.9 12.1 11.2																								Diurnal Average		
69.0 76.9 86.0 107.8 84.4 66.7 55.5 63.2 67.8 50.6 55.4 58.6 59.1 57.8 87.3 36.0 39.2 79.2 57.2 36.2 54.8 60.8 47.9 43.1																								Diurnal Maximum		
Z - zerspan		C - Calibration				M - Maintenance																				



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Ells River - November 2024**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Ells River - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	537	78.51	78.51
21 - 40	97	14.18	92.69
41 - 80	46	6.73	99.42
81 - 159	4	0.58	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Ells River - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	76	60	9	2	4	6	20	63	70	56	48	23	38	20	16	14	525
21 - 40	15	12	4	1	0	0	0	6	13	11	1	1	2	9	8	8	91
11 - 80	12	5	0	1	1	0	0	4	2	1	2	0	0	0	5	11	44
81 - 159	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	4
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	103	77	14	4	5	6	20	73	85	68	52	24	41	30	29	33	664

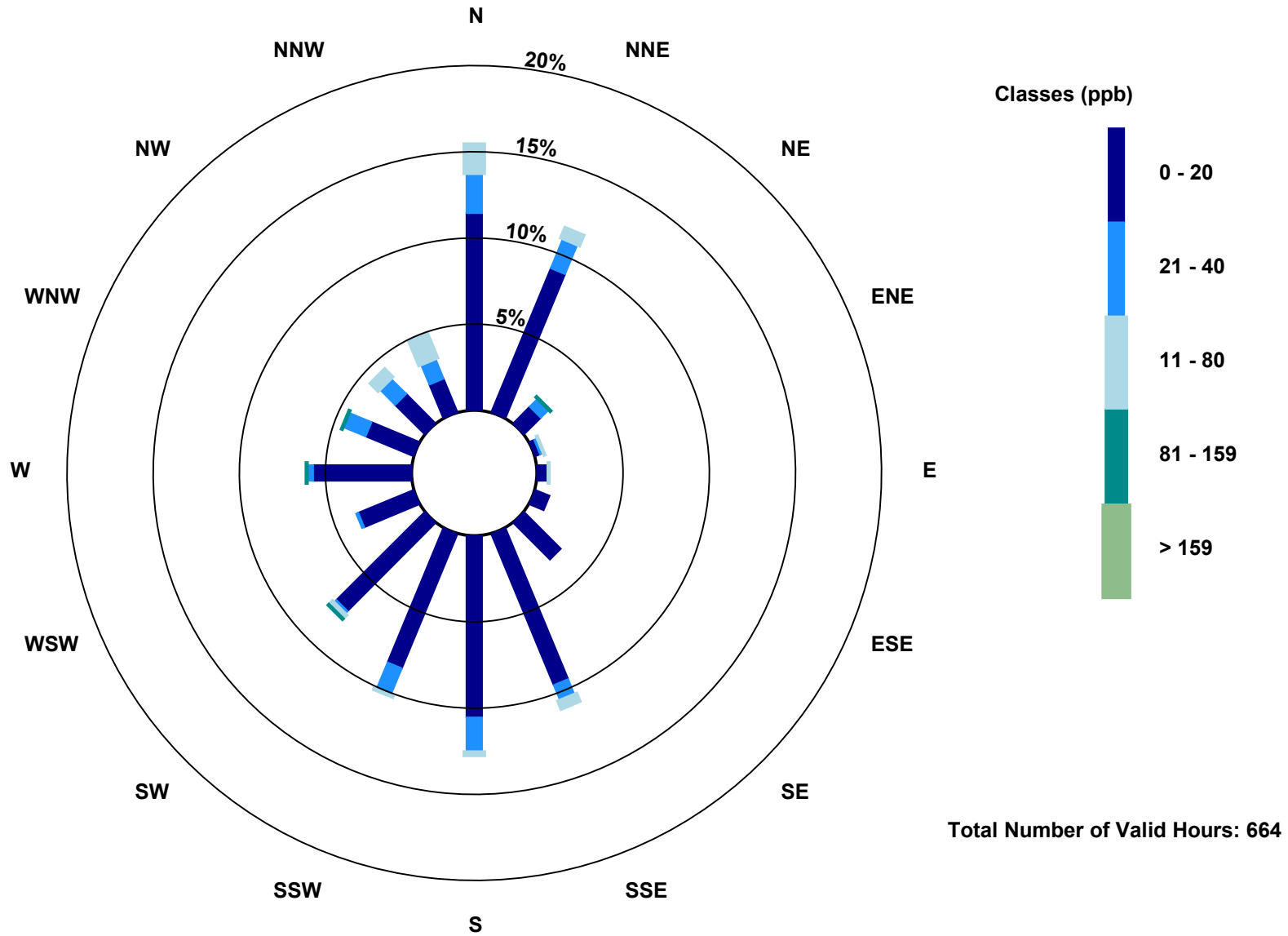
Total Number of Valid Hours: 664

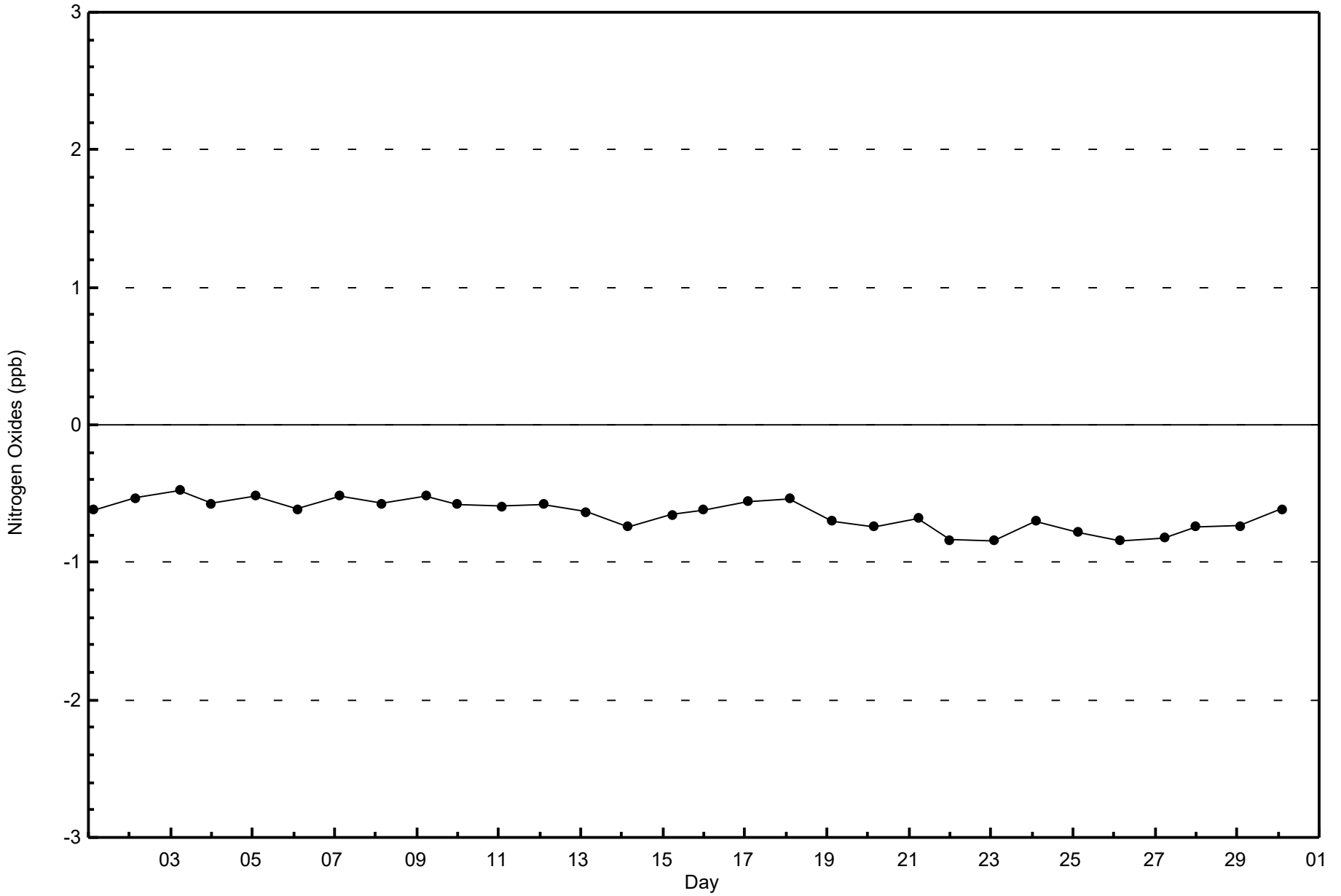
Total Number of Hours: 720

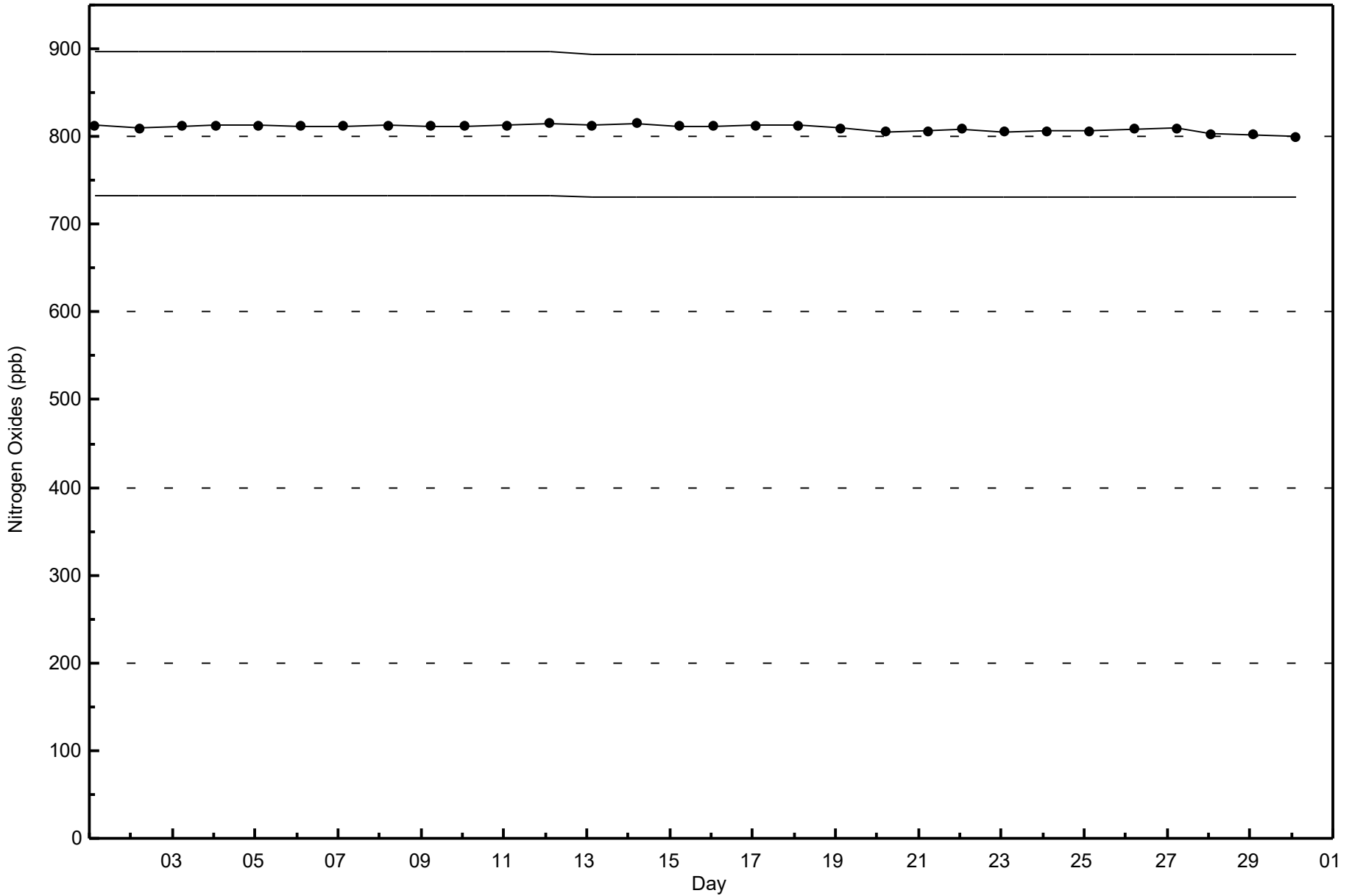


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Ells River









# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

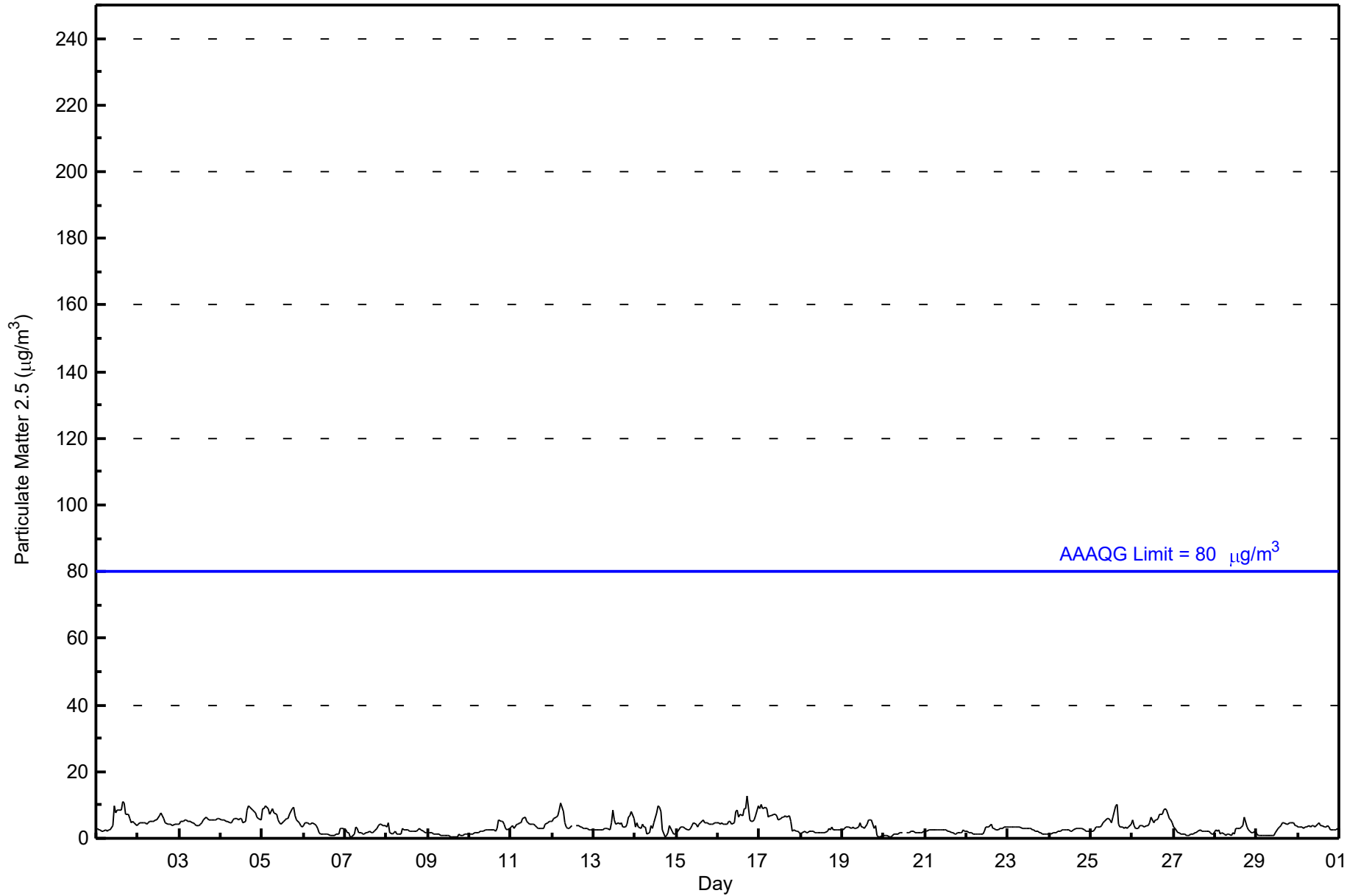
## Ells River - November 2024

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 720																	Daily Average		Daily Maximum																										
Maximum Value: 12.9 µg/m <sup>3</sup> on Nov 16 18:00		Maximum Daily Average: 6.7 µg/m <sup>3</sup> on Nov 5		Hours of Data: 717																	Hours of Missing Data: 3		Hours of Calibration: 2																										
Minimum Value: 0.3 µg/m <sup>3</sup> on Nov 7 04:00		Minimum Daily Average: 1.0 µg/m <sup>3</sup> on Nov 9		Hours of Calibration: 2																	Percent Operational Time: 99.9																												
Maximum Diurnal Average: 4.5 µg/m <sup>3</sup> at hour 16		Minimum Diurnal Average: 3.1 µg/m <sup>3</sup> at hour 9		Percentiles: P <sub>1</sub> = 0.5 P <sub>10</sub> = 1.3 Q <sub>1</sub> = 2.0 Median = 3.1 Q <sub>3</sub> = 4.7 P <sub>90</sub> = 6.4 P <sub>99</sub> = 9.8																																													
Monthly Average: 3.59 µg/m <sup>3</sup>																																																	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	2.8	2.5	2.5	2.0	2.1	2.3	2.2	2.5	2.7	4.0	9.7	7.6	8.3	8.5	8.5	10.9	10.4	7.1	7.3	5.8	4.8	5.0	4.4	4.0	5.3	10.9																							
2-Nov	4.2	4.5	4.7	4.6	4.5	4.4	4.8	5.1	5.0	5.1	5.7	5.6	6.7	7.5	6.6	6.0	4.6	4.1	4.2	4.2	3.9	4.1	4.2	4.1	4.9	7.5																							
3-Nov	4.3	4.9	5.2	5.7	5.4	5.0	4.9	4.8	4.7	4.3	4.0	4.0	4.2	4.5	5.4	6.3	6.0	5.6	5.4	5.4	5.4	5.4	5.7	6.0	5.1	6.3																							
4-Nov	5.6	5.5	5.4	5.0	4.9	4.6	4.9	5.5	5.8	5.8	5.5	5.9	5.7	4.7	5.0	8.7	9.8	9.4	8.6	8.2	7.6	6.4	5.8	5.5	6.2	9.8																							
5-Nov	8.9	9.1	9.7	8.8	7.2	8.2	8.8	7.8	7.1	5.6	4.5	4.4	5.0	5.5	5.7	5.9	7.2	9.0	9.2	6.9	5.4	4.5	3.7	3.4	6.7	9.7																							
6-Nov	4.0	4.6	4.8	4.3	4.2	4.5	4.1	3.7	2.9	1.8	1.3	1.2	1.1	1.2	1.1	1.1	0.9	0.9	1.0	1.1	1.3	3.1	3.0	2.9	2.5	4.8																							
7-Nov	2.5	1.6	1.7	0.3	0.3	1.2	3.3	2.8	1.8	1.5	1.3	1.3	1.5	1.6	1.9	1.6	1.7	1.9	2.9	3.7	4.2	4.1	3.9	3.6	2.2	4.2																							
8-Nov	3.5	4.7	1.7	1.3	1.5	2.0	1.4	1.5	1.5	3.0	2.8	2.6	2.4	2.1	1.9	1.9	2.0	2.1	2.5	3.0	2.7	2.2	1.6	1.7	2.2	4.7																							
9-Nov	1.8	1.6	1.6	1.5	1.3	1.2	1.1	1.0	1.0	1.0	1.0	1.0	0.8	0.6	0.4	0.3	0.3	0.4	1.3	1.0	0.8	1.3	1.2	1.2	1.0	1.8																							
10-Nov	1.3	1.3	1.4	1.5	1.6	1.8	1.9	2.2	2.2	2.4	2.7	2.6	2.7	2.5	2.5	2.3	3.1	5.4	5.1	5.1	4.3	3.0	2.6	3.1	2.7	5.4																							
11-Nov	3.5	3.7	3.0	4.0	4.1	4.9	4.8	6.1	6.2	5.1	4.8	4.3	4.1	4.0	3.6	3.2	3.0	2.9	2.9	2.9	4.3	4.6	5.1	5.1	4.2	6.2																							
12-Nov	5.2	5.8	6.2	6.8	8.5	10.6	8.0	4.6	3.5	2.9	3.1	3.9	C	C	4.0	3.6	3.5	3.5	3.1	2.9	2.8	2.7	2.6	2.6	4.6	10.6																							
13-Nov	2.6	2.4	2.5	2.4	2.4	2.6	2.8	2.8	2.8	2.7	4.6	8.3	5.4	4.1	4.5	4.2	4.5	3.5	3.6	4.3	6.3	6.8	8.0	6.0	4.2	8.3																							
14-Nov	3.4	4.5	3.4	3.1	4.1	3.6	3.2	1.3	1.5	3.6	2.9	4.5	7.7	9.6	9.2	8.1	2.6	0.5	1.0	1.8	3.8	2.1	1.4	1.2	3.7	9.6																							
15-Nov	1.7	2.3	3.5	3.2	3.2	2.8	2.6	2.6	2.8	3.8	4.7	4.1	3.6	4.1	4.5	5.5	4.6	4.8	4.5	4.4	4.4	4.3	4.6	4.8	3.8	5.5																							
16-Nov	4.7	4.4	4.5	4.4	4.3	4.4	5.0	4.9	4.2	4.5	7.9	8.5	6.3	7.2	6.7	8.9	8.8	12.9	5.3	4.9	4.9	5.4	6.7	9.8	6.2	12.9																							
17-Nov	8.7	10.2	9.1	9.1	8.9	6.4	6.6	6.7	7.1	7.1	6.7	5.5	6.1	6.4	6.4	6.8	6.5	6.6	4.9	2.2	2.4	2.3	2.1	1.6	6.1	10.2																							
18-Nov	1.2	1.6	2.0	1.8	1.8	2.1	2.2	1.9	1.8	1.9	1.7	1.7	1.7	1.8	1.7	2.3	3.1	2.7	3.2	2.6	2.5	2.7	2.6	2.7	2.1	3.2																							
19-Nov	2.7	3.1	3.4	3.5	3.4	3.2	3.3	3.1	3.0	3.4	4.9	3.3	3.4	3.0	4.1	5.7	5.5	5.7	3.0	4.0	1.0	0.5	0.6	0.8	3.2	5.7																							
20-Nov	0.9	1.0	0.6	0.6	0.6	0.8	1.3	1.5	1.4	1.5	1.8	1.8	M	1.5	1.5	1.8	2.1	2.3	1.8	1.8	1.8	1.8	1.9	2.1	1.5	2.3																							
21-Nov	2.0	2.2	2.4	2.5	2.5	2.5	2.6	2.7	2.7	2.7	2.7	2.6	2.7	2.3	2.0	1.7	1.5	1.4	1.5	1.6	1.7	1.7	2.4	2.2	2.2	2.7																							
22-Nov	2.0	1.9	1.8	1.7	1.5	1.4	1.3	1.3	1.2	1.3	2.2	3.4	3.6	3.3	4.1	3.0	2.8	2.7	2.7	3.1	3.1	3.0	3.2	3.4	2.5	4.1																							
23-Nov	3.2	3.3	3.3	3.5	3.3	3.3	3.5	3.4	3.0	2.8	2.8	2.9	2.9	2.9	2.7	2.6	2.1	2.0	1.7	1.6	1.4	1.2	1.2	1.1	2.6	3.5																							
24-Nov	1.3	1.4	1.6	1.7	1.9	2.3	2.3	2.5	2.7	2.6	2.5	2.4	2.2	2.1	2.7	2.9	2.9	2.8	2.9	2.9	2.6	2.2	2.0	2.1	2.3	2.9																							
25-Nov	2.2	2.0	2.4	3.4	3.2	3.4	3.8	4.8	4.9	5.8	5.7	5.7	4.8	6.4	9.6	10.0	4.3	3.2	3.3	3.0	3.2	3.0	3.2	4.3	4.4	10.0																							
26-Nov	5.6	3.7	3.0	3.1	3.6	3.8	3.7	3.5	3.7	3.9	4.7	6.4	4.8	5.3	5.6	5.8	7.2	7.4	8.5	9.0	8.5	5.9	5.5	4.7	5.3	9.0																							
27-Nov	3.6	2.8	1.8	1.6	1.5	1.3	1.2	1.0	1.0	1.0	1.3	1.4	1.6	1.9	2.1	2.6	2.1	2.1	2.1	2.2	2.3	1.8	1.3	1.4	1.8	3.6																							
28-Nov	2.3	2.2	2.6	1.4	1.6	1.2	1.0	1.3	1.1	0.8	1.6	1.5	3.0	3.0	3.0	3.4	3.6	6.3	3.4	2.6	2.1	1.8	1.7	1.9	2.3	6.3																							
29-Nov	1.4	1.1	0.9	0.9	0.7	0.8	0.7	0.6	0.8	0.7	0.9	1.5	2.9	3.5	3.6	4.5	4.7	4.2	4.1	4.5	4.8	4.5	3.9	3.7	2.5	4.8																							
30-Nov	3.4	3.5	3.2	3.1	3.4	3.6	3.6	3.6	3.9	3.7	3.4	4.4	4.7	3.7	3.7	3.6	3.4	3.7	3.5	2.7	2.5	2.6	2.5	2.9	3.4	4.7																							
																								3.4	3.5	3.3	3.2	3.3	3.3	3.4	3.2	3.1	3.2	3.6	3.8	3.9	4.0	4.2	4.5	4.2	4.2	3.8	3.6	3.6	3.3	3.3	3.3	Diurnal Average	
																								8.9	10.2	9.7	9.1	8.9	10.6	8.8	7.8	7.1	7.1	9.7	8.5	8.3	9.6	9.6	10.9	10.4	12.9	9.2	9.0	8.5	6.8	8.0	9.8	Diurnal Maximum	
C - Calibration M - Maintenance																																																	
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m <sup>3</sup> 24-hr 29 µg/m <sup>3</sup>																																																	



Wood Buffalo Environmental Association  
Hourly Averages

Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Ells River - November 2024





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Ells River - November 2024**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	598	83.40	83.40
6 - 15	119	16.60	100.00
16 - 25	0	0.00	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>**  
**Ells River - November 2024**

Concentration Ranges (μg/m <sup>3</sup> )	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	92	66	15	3	4	5	16	49	76	63	42	22	41	28	25	32	579
6 - 15	14	14	0	1	1	1	4	29	13	8	13	4	3	3	4	6	118
16 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	106	80	15	4	5	6	20	78	89	71	55	26	44	31	29	38	697

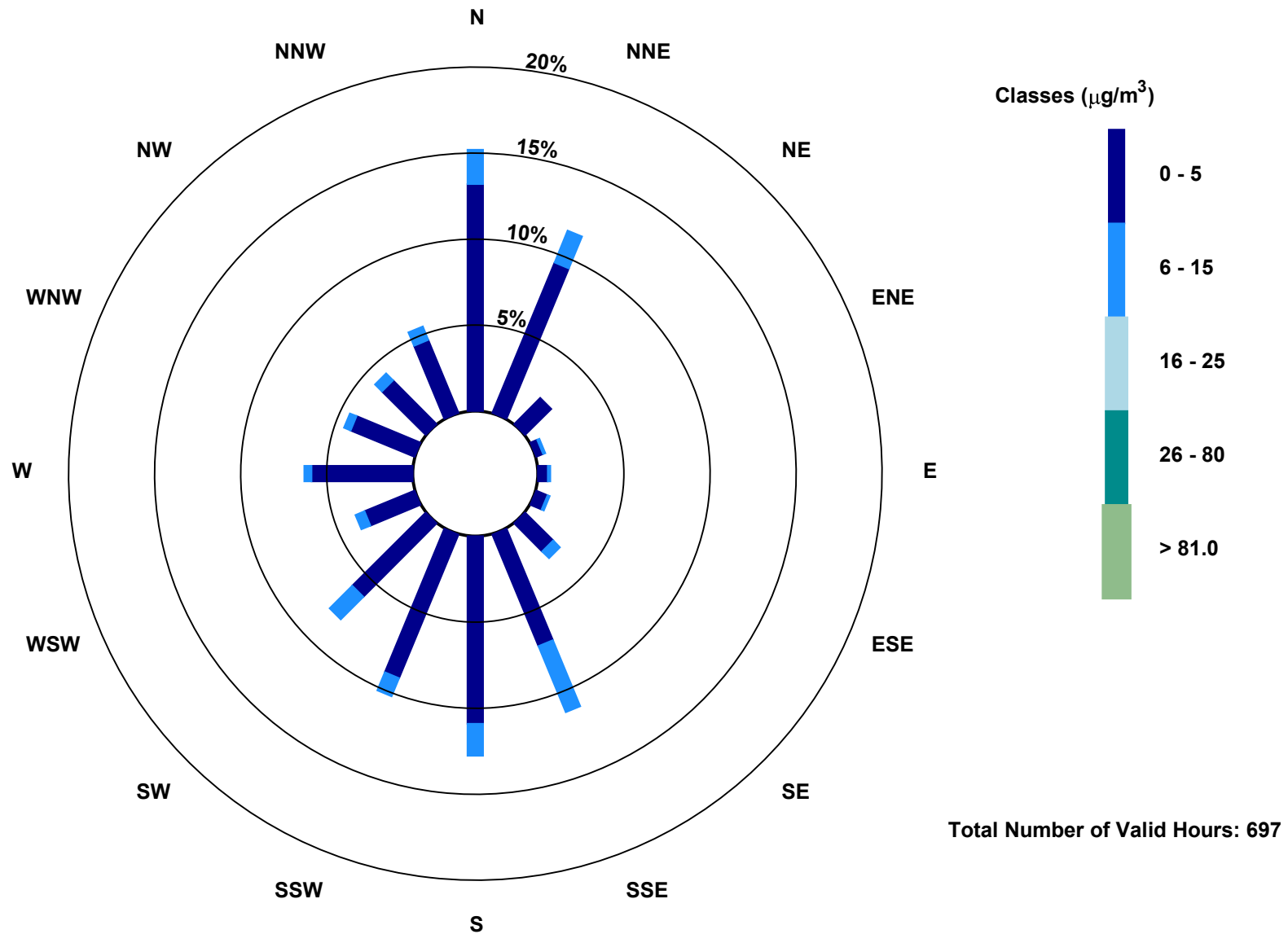
Total Number of Valid Hours: 697

Total Number of Hours: 720



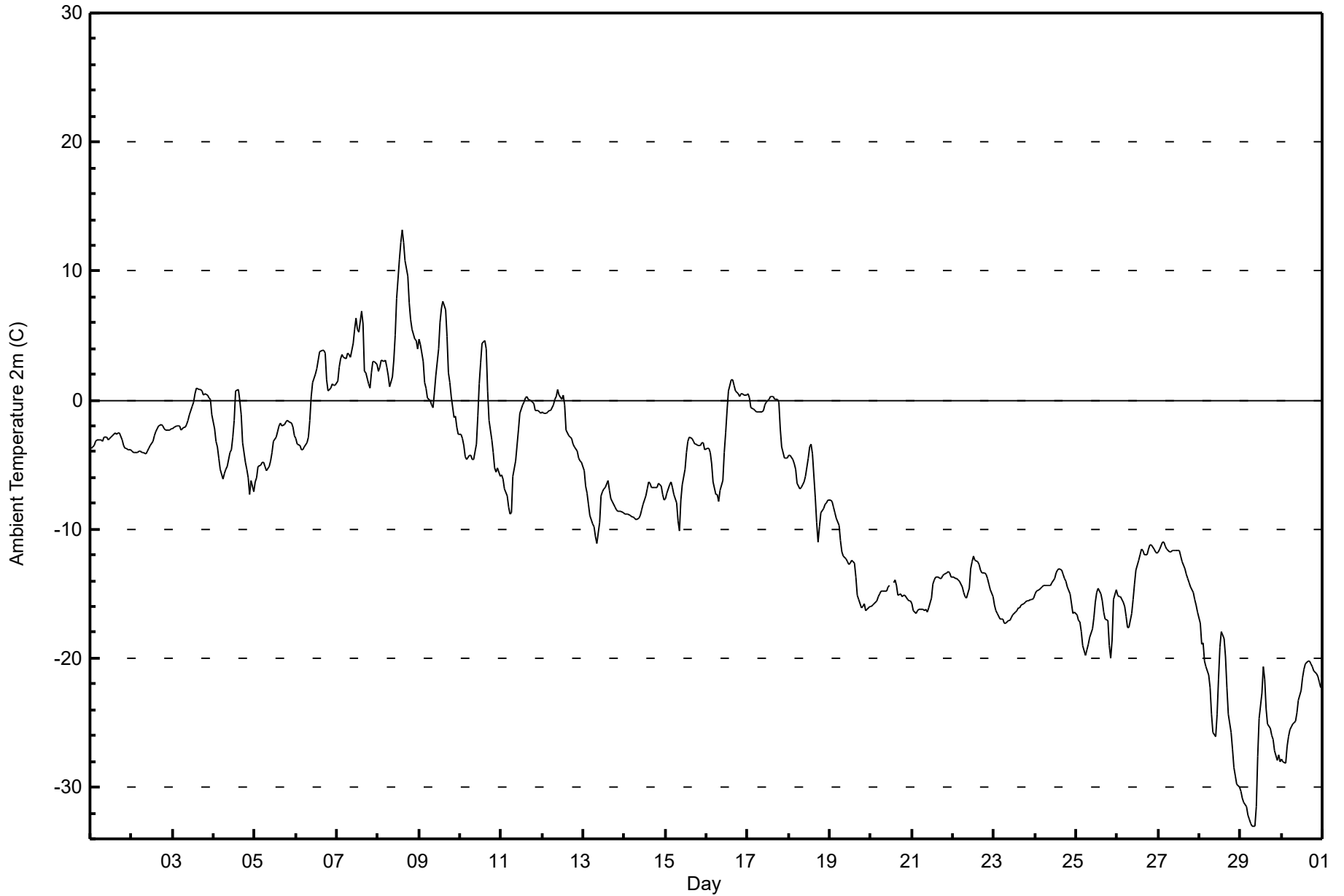
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>  
Ells River





Maximum Value: 13.2 C on Nov 8 15:00		Maximum Daily Average: 5.8 C on Nov 8		Hours in Service: 720																																												
Minimum Value: -33.0 C on Nov 29 08:00		Minimum Daily Average: -28.1 C on Nov 29		Hours of Data: 719																																												
Maximum Diurnal Average: -5.7 C at hour 15		Minimum Diurnal Average: -9.8 C at hour 8		Hours of Missing Data: 1																																												
Monthly Average: -8.21 C		Percentiles: P <sub>1</sub> = -31.1 P <sub>10</sub> = -18.9 Q <sub>1</sub> = -14.7 Median = -6.6 Q <sub>3</sub> = -1.9 P <sub>90</sub> = 1.3 P <sub>99</sub> = 7.7		Hours of Calibration: 0																																												
				Percent Operational Time: 99.9																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-3.7	-3.6	-3.5	-3.2	-3.1	-3.1	-3.0	-3.2	-2.9	-2.9	-3.1	-3.0	-2.9	-2.8	-2.5	-2.6	-2.6	-2.6	-3.1	-3.5	-3.7	-3.8	-3.8	-3.9	-3.2	-2.5																						
2-Nov	-4.0	-4.0	-4.0	-4.1	-4.0	-3.9	-4.0	-4.1	-4.1	-4.0	-3.8	-3.5	-3.2	-2.8	-2.4	-2.2	-2.0	-1.9	-2.0	-2.2	-2.3	-2.3	-2.3	-2.3	-3.1	-1.9																						
3-Nov	-2.2	-2.1	-2.0	-2.0	-2.0	-2.3	-2.2	-2.1	-1.9	-1.6	-1.2	-0.5	-0.1	0.5	0.9	0.8	0.8	0.7	0.4	0.5	0.3	0.2	0.1	-1.1	-0.8	0.9																						
4-Nov	-2.2	-3.2	-3.7	-4.5	-5.3	-6.2	-5.6	-5.4	-5.1	-4.1	-3.8	-2.9	-1.6	0.7	0.8	0.0	-1.1	-3.3	-4.8	-5.4	-6.1	-7.3	-6.2	-7.1	-3.9	0.8																						
5-Nov	-6.3	-6.0	-5.2	-5.0	-4.8	-4.8	-5.2	-5.5	-5.1	-4.7	-4.1	-3.2	-2.9	-2.4	-2.0	-1.8	-2.0	-1.9	-1.6	-1.6	-1.6	-1.8	-2.1	-2.7	-3.5	-1.6																						
6-Nov	-3.0	-3.4	-3.5	-3.8	-3.8	-3.6	-3.3	-2.9	-1.5	0.2	1.3	2.0	2.5	3.1	3.8	3.8	3.8	3.6	1.5	0.7	1.0	1.3	1.1	1.1	0.1	3.8																						
7-Nov	1.5	2.5	3.2	3.5	3.3	3.2	3.6	3.5	3.3	4.4	5.4	6.4	5.5	5.3	6.9	6.0	2.3	2.1	1.3	1.0	2.1	3.0	2.9	2.8	3.5	6.9																						
8-Nov	2.3	2.6	3.1	3.0	3.1	2.6	2.0	1.1	1.8	3.1	5.0	7.8	10.9	12.2	13.2	12.2	10.8	9.6	7.5	6.2	5.5	4.8	4.6	4.0	5.8	13.2																						
9-Nov	4.7	4.3	2.9	1.3	0.9	0.2	-0.1	-0.4	-0.6	0.6	1.9	4.0	6.1	7.1	7.7	7.0	4.9	2.1	1.4	0.3	-1.3	-1.3	-2.2	-2.7	2.0	7.7																						
10-Nov	-2.7	-2.9	-3.5	-4.4	-4.6	-4.2	-4.3	-4.6	-4.6	-3.4	-1.3	1.3	2.9	4.4	4.6	4.0	0.7	-1.6	-3.1	-4.0	-5.3	-5.6	-5.2	-5.9	-2.2	4.6																						
11-Nov	-5.8	-6.1	-6.9	-7.5	-8.3	-8.8	-8.7	-5.9	-4.7	-3.6	-2.4	-1.0	-0.3	-0.1	0.2	0.3	0.0	-0.1	-0.2	-0.2	-0.8	-0.8	-0.9	-1.1	-3.1	0.3																						
12-Nov	-1.0	-1.0	-1.0	-0.9	-0.9	-0.8	-0.4	0.0	0.3	0.8	0.4	0.1	0.4	-0.4	-2.3	-2.7	-2.9	-3.0	-3.4	-3.7	-4.0	-4.5	-4.7	-4.8	-1.7	0.8																						
13-Nov	-5.4	-6.6	-7.2	-8.0	-9.0	-9.6	-9.8	-10.6	-11.1	-9.5	-7.4	-7.1	-6.9	-6.7	-6.2	-7.0	-7.6	-7.8	-8.3	-8.5	-8.6	-8.6	-8.7	-8.7	-8.1	-5.4																						
14-Nov	-8.8	-8.8	-8.8	-8.9	-9.0	-9.0	-9.1	-9.3	-9.2	-9.0	-8.5	-8.0	-7.5	-6.9	-6.3	-6.4	-6.7	-6.8	-6.8	-6.7	-6.5	-6.6	-7.3	-7.8	-7.9	-6.3																						
15-Nov	-7.7	-7.2	-6.6	-6.4	-6.8	-7.3	-7.9	-9.4	-10.1	-7.7	-6.6	-5.3	-4.0	-3.2	-2.8	-2.9	-3.2	-3.4	-3.5	-3.5	-3.6	-3.3	-3.3	-3.9	-5.4	-2.8																						
16-Nov	-3.8	-3.7	-4.0	-5.0	-6.4	-7.3	-7.4	-7.8	-7.0	-6.3	-4.0	-2.5	-0.8	0.8	1.6	1.5	1.1	0.7	0.5	0.3	0.5	0.5	0.4	0.3	-2.4	1.6																						
17-Nov	0.5	0.2	-0.6	-0.7	-0.8	-0.9	-0.9	-0.9	-0.9	-0.8	-0.4	-0.1	0.0	0.2	0.3	0.3	0.1	0.1	-0.2	-2.2	-3.6	-4.5	-4.5	-4.5	-1.0	0.5																						
18-Nov	-4.3	-4.3	-4.6	-5.0	-5.4	-6.4	-6.9	-6.8	-6.6	-6.4	-5.9	-4.5	-3.6	-3.5	-4.2	-7.6	-9.4	-11.0	-9.8	-8.8	-8.4	-8.1	-8.0	-7.7	-6.5	-3.5																						
19-Nov	-7.8	-7.9	-8.3	-8.7	-9.2	-9.7	-10.9	-11.7	-12.1	-12.3	-12.5	-12.8	-12.6	-12.5	-12.6	-13.8	-15.1	-15.5	-16.1	-16.0	-15.8	-16.3	-16.2	-15.9	-12.6	-7.8																						
20-Nov	-16.0	-15.9	-15.8	-15.5	-15.2	-15.0	-14.8	-14.8	-14.8	-14.8	-14.4	-14.4	M	-14.2	-13.9	-14.4	-15.1	-15.0	-15.2	-15.2	-15.2	-15.4	-15.6	-15.6	-15.1	-13.9																						
21-Nov	-15.8	-16.3	-16.5	-16.3	-16.2	-16.2	-16.2	-16.3	-16.2	-16.4	-16.1	-15.3	-14.3	-13.9	-13.8	-13.7	-13.8	-13.8	-13.6	-13.5	-13.4	-13.3	-13.4	-13.7	-14.9	-13.3																						
22-Nov	-13.8	-13.8	-13.8	-13.9	-14.1	-14.5	-15.0	-15.2	-15.3	-14.6	-13.1	-12.5	-12.1	-12.4	-12.5	-12.7	-13.1	-13.4	-13.4	-13.5	-13.9	-14.3	-14.7	-15.3	-13.8	-12.1																						
23-Nov	-15.8	-16.3	-16.6	-16.9	-16.9	-17.0	-17.2	-17.3	-17.1	-17.0	-16.9	-16.7	-16.4	-16.3	-16.1	-16.1	-15.9	-15.8	-15.7	-15.6	-15.5	-15.5	-15.4	-15.3	-16.3	-15.3																						
24-Nov	-15.0	-14.9	-14.7	-14.6	-14.4	-14.4	-14.4	-14.4	-14.4	-14.3	-14.1	-13.8	-13.4	-13.2	-13.0	-13.2	-13.5	-13.8	-14.1	-14.5	-15.1	-15.8	-16.5	-16.4	-14.4	-13.0																						
25-Nov	-16.6	-17.0	-17.2	-17.9	-19.1	-19.8	-19.3	-18.9	-18.3	-17.7	-16.9	-15.6	-14.9	-14.6	-15.0	-15.6	-16.5	-16.9	-17.1	-19.0	-20.0	-18.6	-15.4	-14.6	-17.2	-14.6																						
26-Nov	-15.2	-15.2	-15.2	-15.7	-16.0	-16.7	-17.7	-17.6	-16.5	-15.4	-14.2	-13.2	-12.5	-11.9	-11.6	-11.7	-12.0	-12.0	-11.6	-11.2	-11.2	-11.6	-11.8	-11.9	-13.7	-11.2																						
27-Nov	-11.8	-11.6	-11.0	-11.0	-11.4	-11.6	-11.8	-11.7	-11.6	-11.7	-11.6	-11.6	-11.7	-12.1	-12.6	-13.0	-13.4	-13.8	-14.1	-14.5	-14.9	-15.5	-15.9	-16.5	-12.8	-11.0																						
28-Nov	-17.3	-18.9	-18.8	-20.2	-20.6	-21.3	-22.3	-24.3	-25.8	-26.1	-24.3	-21.6	-19.1	-17.9	-18.4	-19.9	-22.3	-24.4	-25.8	-27.0	-28.4	-29.1	-29.7	-30.0	-23.1	-17.3																						
29-Nov	-30.3	-30.9	-31.1	-31.5	-32.1	-32.4	-32.8	-33.0	-33.0	-31.5	-27.6	-24.7	-22.7	-20.7	-21.6	-23.9	-25.1	-25.4	-25.9	-26.3	-27.2	-27.9	-27.5	-28.0	-28.1	-20.7																						
30-Nov	-27.8	-28.1	-28.1	-26.8	-26.1	-25.6	-25.1	-25.0	-24.8	-24.3	-23.3	-22.5	-21.6	-20.9	-20.4	-20.2	-20.2	-20.4	-20.6	-21.0	-21.2	-21.4	-21.9	-22.2	-23.3	-20.2																						
																								-8.5	-8.7	-8.8	-9.0	-9.3	-9.5	-9.7	-9.8	-9.7	-9.0	-8.1	-7.2	-6.1	-5.8	-5.7	-6.2	-7.0	-7.5	-7.9	-8.3	-8.6	-8.8	-8.8	-9.0	Diurnal Average
																								4.7	4.3	3.2	3.5	3.3	3.2	3.6	3.5	3.3	4.4	5.4	7.8	10.9	12.2	13.2	12.2	10.8	9.6	7.5	6.2	5.5	4.8	4.6	4.0	Diurnal Maximum
M - Maintenance																																																





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C**  
**Ells River - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	66	9.18	9.18
-20 - 0	527	73.30	82.48
0 - 10	121	16.83	99.30
10 - 20	5	0.70	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

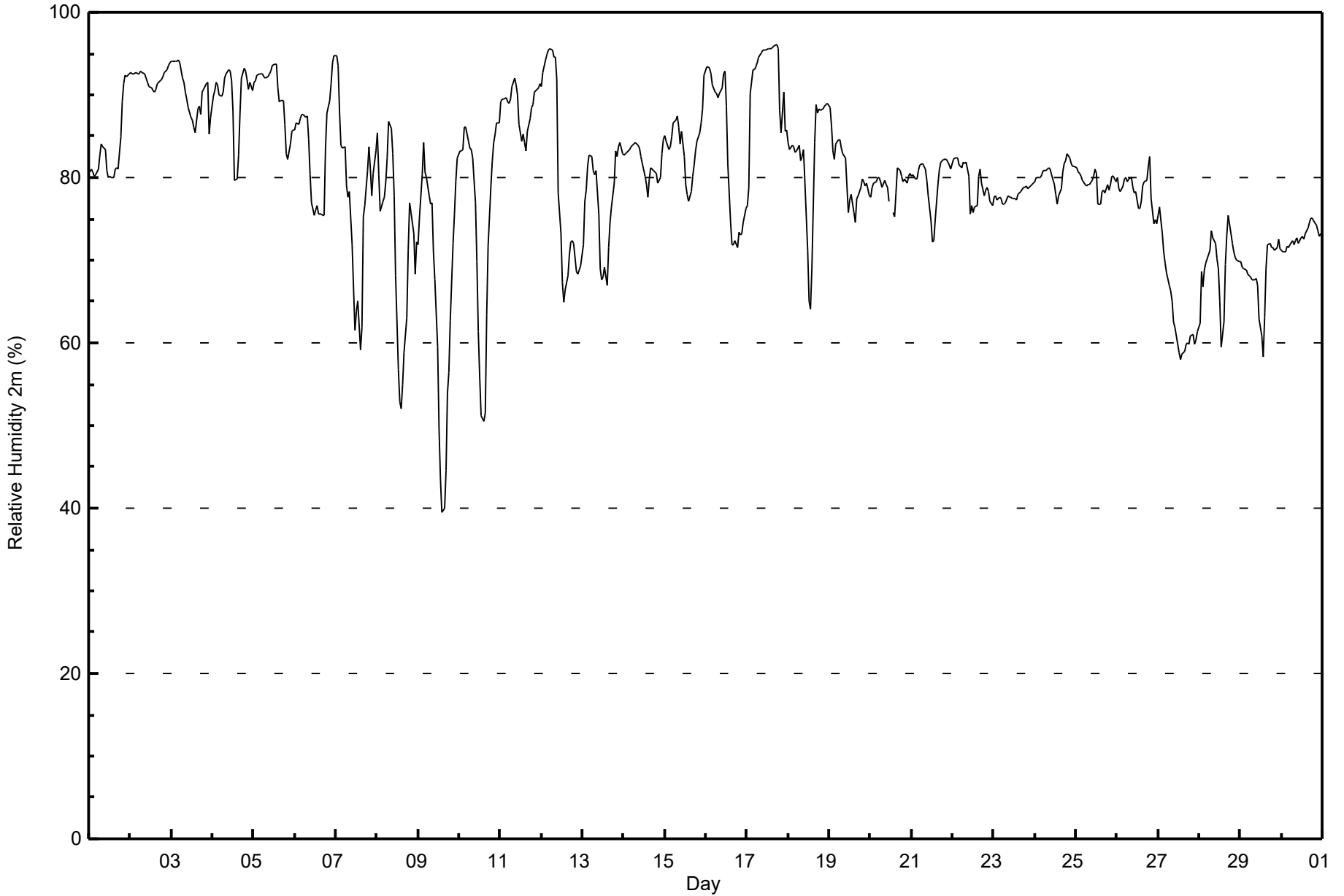
**Relative Humidity 2m (RH2) - %**  
**Ells River - November 2024**

Maximum Value: 96.1 % on Nov 17 18:00      Maximum Daily Average: 92.1 % on Nov 2																						Hours in Service: 720 Hours of Data: 719																										
Minimum Value: 39.5 % on Nov 9 15:00      Minimum Daily Average: 63.9 % on Nov 27 Maximum Diurnal Average: 83.1 % at hour 4      Minimum Diurnal Average: 72.8 % at hour 15 Monthly Average: 79.99 %      Percentiles: P <sub>1</sub> = 51.6 P <sub>10</sub> = 68.3 Q <sub>1</sub> = 75.5 Median = 80.3 Q <sub>3</sub> = 86.6 P <sub>90</sub> = 92.2 P <sub>99</sub> = 95.5																						Hours of Missing Data: 1 Hours of Calibration: 0 Percent Operational Time: 99.9																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	80.7	81.0	80.7	80.2	80.4	81.1	82.6	84.1	83.7	83.4	80.9	80.0	80.2	80.1	80.1	81.0	81.2	81.1	85.0	89.1	91.3	92.3	92.1	92.5	83.5	92.5																						
2-Nov	92.7	92.6	92.5	92.7	92.5	92.5	92.8	92.8	92.5	92.1	91.5	91.0	90.9	90.5	90.3	90.7	91.3	91.6	91.8	92.3	92.8	93.1	93.6	93.9	92.1	93.9																						
3-Nov	94.0	94.1	94.1	94.1	94.2	93.9	92.1	91.5	90.4	89.6	88.4	87.2	86.9	86.1	85.5	88.4	88.7	87.6	90.3	90.6	91.4	91.5	85.2	87.2	90.1	94.2																						
4-Nov	89.9	90.4	91.5	91.1	90.1	89.9	90.3	92.1	92.5	93.0	92.8	91.7	88.0	79.6	79.8	82.7	87.8	92.0	93.2	92.8	91.9	90.6	91.5	90.6	89.8	93.2																						
5-Nov	91.5	91.8	92.4	92.5	92.6	92.6	92.2	92.0	92.2	92.5	92.9	93.5	93.8	93.7	90.9	89.2	89.4	89.3	86.4	82.9	82.2	84.1	85.5	85.7	90.1	93.8																						
6-Nov	85.7	86.6	86.5	87.2	87.7	87.7	87.3	87.5	84.6	80.4	77.0	75.5	76.1	76.6	75.6	75.6	75.4	75.5	83.6	87.8	89.4	91.3	93.9	94.7	83.7	94.7																						
7-Nov	94.8	93.5	88.0	84.0	83.6	83.7	79.0	77.7	78.3	71.9	66.7	61.4	63.7	65.1	59.2	61.8	75.3	76.6	80.9	83.8	81.0	77.8	80.4	83.2	77.1	94.8																						
8-Nov	85.5	80.4	75.9	77.2	77.7	79.5	82.3	86.9	85.9	82.8	77.8	68.2	56.8	52.9	52.0	54.9	58.8	63.1	71.1	76.9	75.8	73.2	68.3	72.2	72.3	86.9																						
9-Nov	71.8	75.0	80.4	84.3	80.7	80.1	77.9	76.8	77.0	71.1	67.6	59.5	49.7	43.6	39.5	40.0	44.5	54.0	56.5	62.7	72.0	75.5	79.7	82.4	66.8	84.3																						
10-Nov	83.2	83.2	83.5	86.1	86.0	84.5	83.6	83.5	82.3	76.9	69.8	61.3	55.9	51.1	50.4	51.6	63.4	71.7	79.0	82.1	84.3	85.2	86.6	86.6	75.5	86.6																						
11-Nov	89.1	89.6	89.4	89.7	89.2	89.0	89.5	91.1	92.1	91.3	90.0	86.5	84.4	85.3	84.2	83.3	85.6	87.1	88.5	88.9	90.4	90.7	90.9	91.4	88.6	92.1																						
12-Nov	91.1	92.7	94.3	95.0	95.4	95.6	95.5	94.6	94.5	91.9	78.1	73.2	67.4	64.9	66.4	68.1	70.6	72.2	72.3	72.0	68.6	68.3	68.9	69.3	80.0	95.6																						
13-Nov	71.9	77.0	78.6	81.4	82.7	82.5	80.9	80.3	80.9	75.6	69.0	67.7	68.0	69.2	66.9	71.5	74.5	76.4	79.3	83.3	82.6	83.7	84.2	82.8	77.1	84.2																						
14-Nov	82.7	82.8	83.0	83.4	83.8	83.9	84.1	84.2	83.9	83.6	82.6	81.6	80.2	79.1	77.6	79.7	81.2	80.8	80.7	80.5	79.4	80.0	82.9	84.6	81.9	84.6																						
15-Nov	85.0	84.5	83.3	83.7	85.0	86.6	87.0	87.5	86.1	84.1	85.6	82.5	79.1	77.9	77.1	78.4	80.2	81.6	83.2	84.4	85.5	86.7	88.3	92.4	84.0	92.4																						
16-Nov	93.4	93.4	93.3	92.6	91.2	90.3	90.2	89.7	90.2	90.8	92.6	92.8	88.6	81.8	74.6	71.8	71.9	72.4	71.5	73.3	73.0	73.2	74.7	76.2	83.5	93.4																						
17-Nov	76.6	78.9	90.2	93.1	93.1	93.3	93.9	94.5	95.1	95.4	95.5	95.5	95.6	95.7	95.7	95.8	95.9	96.1	95.5	88.1	85.5	90.4	85.6	85.8	91.7	96.1																						
18-Nov	84.3	83.5	84.0	83.7	83.0	83.2	83.9	82.0	82.6	83.3	79.6	71.2	65.1	64.1	68.9	84.2	88.8	87.8	88.3	88.1	88.4	88.6	88.8	89.0	82.3	89.0																						
19-Nov	88.4	86.2	83.3	82.2	84.1	84.7	84.6	83.5	82.9	82.4	79.0	75.7	77.3	78.0	75.8	74.6	77.5	77.8	78.8	79.8	79.5	78.9	79.4	77.9	80.5	88.4																						
20-Nov	77.6	78.8	79.3	79.6	79.9	80.0	79.5	78.9	79.7	79.1	78.7	77.2	M	75.7	75.3	78.2	81.1	80.9	80.1	79.6	79.9	79.2	80.1	80.6	79.1	81.1																						
21-Nov	80.1	80.3	79.8	79.8	80.9	81.5	81.6	81.3	81.0	79.7	77.8	74.7	72.2	72.3	74.9	79.3	81.1	81.8	82.0	82.1	82.2	81.9	81.4	81.1	79.6	82.2																						
22-Nov	82.2	82.4	82.4	82.4	81.6	81.2	81.9	81.6	81.8	80.1	75.6	76.6	75.8	76.5	76.5	80.2	81.0	79.4	77.7	78.5	78.8	78.4	77.1	76.6	79.4	82.4																						
23-Nov	77.6	77.7	77.3	77.5	77.5	76.7	76.7	77.0	77.7	77.6	77.5	77.5	77.4	78.0	78.1	78.3	78.7	78.8	79.0	78.7	78.9	79.2	79.3	79.3	77.9	79.3																						
24-Nov	79.6	80.1	80.1	80.0	80.4	80.8	80.8	81.1	81.3	81.1	80.4	79.1	77.9	76.8	77.8	78.6	80.7	81.6	82.0	82.8	82.4	81.7	81.3	81.3	80.4	82.8																						
25-Nov	81.2	80.7	80.6	80.2	79.7	79.1	79.1	79.2	79.7	80.1	81.0	80.5	76.8	76.8	78.4	78.4	78.1	82.1	79.1	78.5	79.2	80.1	80.2	79.6	79.4	81.2																						
26-Nov	80.0	78.6	78.2	79.0	79.9	79.9	79.5	79.8	79.9	78.9	78.2	78.3	76.3	76.2	77.1	78.9	79.6	79.7	81.4	82.6	77.4	74.4	74.9	74.3	78.5	82.6																						
27-Nov	75.4	76.5	73.2	71.1	69.7	68.5	66.9	66.2	65.1	62.5	61.8	59.8	58.9	57.9	58.6	58.9	59.8	60.1	59.9	60.8	61.0	59.9	60.4	61.4	63.9	76.5																						
28-Nov	62.4	68.6	66.8	68.7	69.7	70.7	71.2	73.5	72.7	72.0	70.2	69.0	65.0	59.6	62.5	69.5	73.0	75.3	73.2	72.0	71.1	70.4	69.9	69.9	69.5	75.3																						
29-Nov	69.8	69.2	68.9	68.9	68.3	68.2	67.9	67.7	67.6	67.8	67.0	62.9	60.8	58.3	63.0	69.0	71.8	72.1	71.5	71.5	71.2	71.5	72.5	71.4	68.3	72.5																						
30-Nov	71.3	71.1	71.0	71.7	71.5	71.9	72.3	71.9	72.4	72.8	72.1	72.7	72.8	72.6	73.2	73.9	74.6	75.2	75.1	74.8	74.3	73.6	72.9	73.2	72.9	75.2																						
																								82.3	82.7	82.7	83.1	83.1	83.1	82.9	83.0	82.9	81.4	79.2	76.8	74.7	73.2	72.8	74.9	77.4	78.6	79.9	80.7	80.7	80.8	81.0	81.6	Diurnal Average
																								94.8	94.1	94.3	95.0	95.4	95.6	95.5	94.6	95.1	95.4	95.5	95.5	95.6	95.7	95.7	95.8	95.9	96.1	95.5	92.8	92.8	93.1	93.9	94.7	Diurnal Maximum
M - Maintenance																																																



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 2m (RH2) - %**  
**Ells River - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 2m (RH2) - %**  
**Ells River - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	1	0.14	0.14
40 - 60	27	3.76	3.89
60 - 80	310	43.12	47.01
80 - 100	381	52.99	100.00

Total Number of Valid Hours: 719

Total Number of Hours: 720





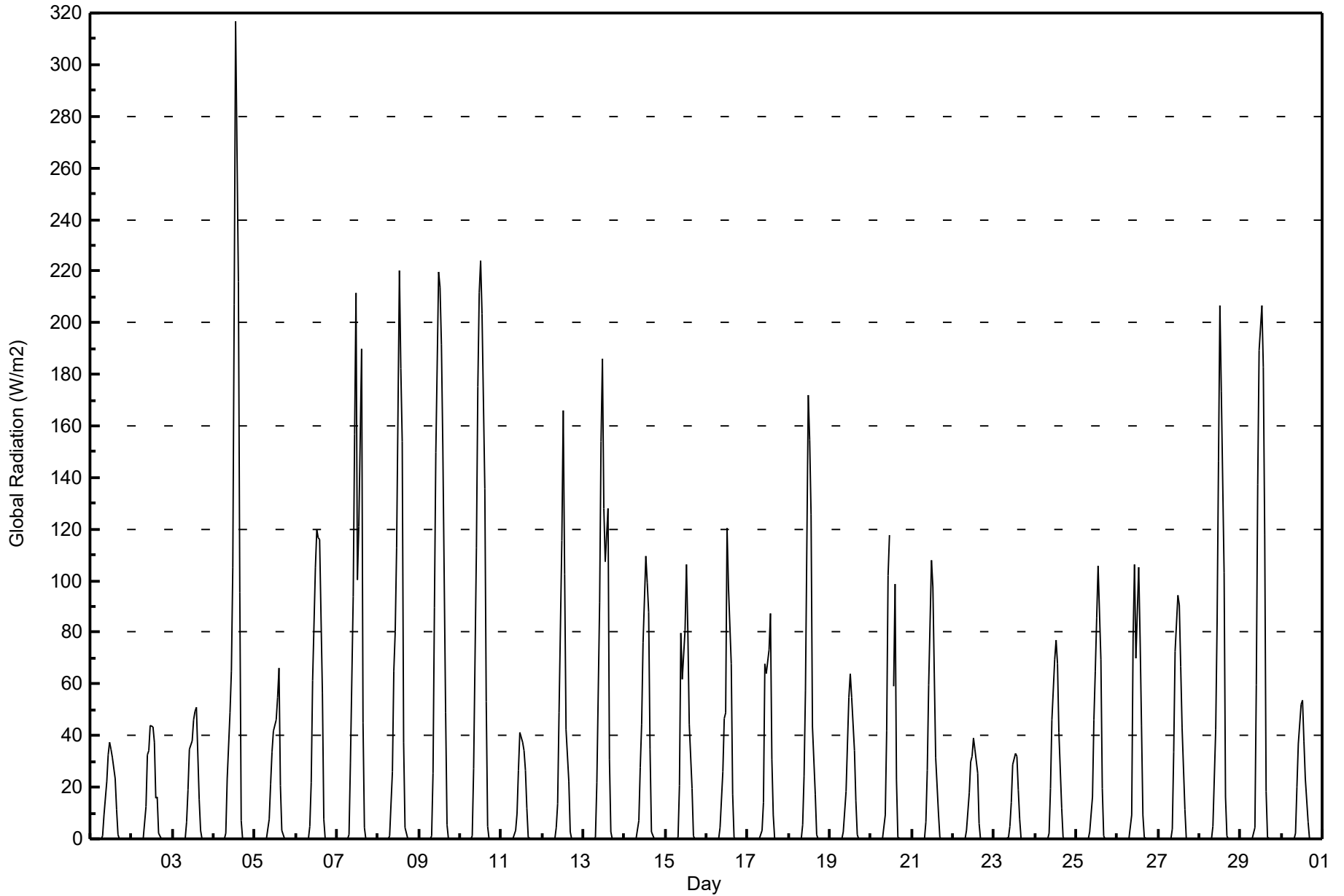
Wood Buffalo Environmental Association

Summary of Hour Averages

Global Radiation (GR) - W/m2

Ells River - November 2024

Maximum Value: 316.7 W/m2 on Nov 4 14:00		Maximum Daily Average: 47.9 W/m2 on Nov 10		Hours in Service: 720																							
Minimum Value: 0.0 W/m2 on Nov 1 01:00		Minimum Daily Average: 5.8 W/m2 on Nov 23		Hours of Data: 719																							
Maximum Diurnal Average: 110.7 W/m2 at hour 13		Minimum Diurnal Average: 0.0 W/m2 at hour 23		Hours of Missing Data: 1																							
Monthly Average: 21.93 W/m2		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 21.9 P <sub>90</sub> = 80.5 P <sub>99</sub> = 210.6		Hours of Calibration: 0																							
				Percent Operational Time: 99.9																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	9.0	22.3	32.3	37.5	35.0	31.4	23.2	11.3	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5	37.5
2-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	12.3	32.5	34.1	43.9	43.1	37.5	15.7	16.5	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.9	43.9
3-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	6.3	19.2	34.6	38.0	46.3	49.1	50.9	14.9	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.9	50.9
4-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	23.1	48.7	65.1	105.3	207.3	316.7	216.1	95.4	7.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.3	316.7
5-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	7.4	21.2	33.5	41.7	46.2	54.9	66.3	20.4	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.3	66.3
6-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	5.0	21.9	61.5	105.1	119.9	116.8	116.0	56.3	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.4	119.9
7-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	29.5	94.1	156.9	211.6	100.4	120.9	190.0	44.9	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.8	211.6
8-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	25.8	64.8	80.4	112.7	220.0	182.3	154.0	37.4	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	220.0
9-Nov	0.0	0.0	0.2	0.1	0.1	0.2	0.1	1.1	25.2	89.5	149.6	219.5	213.7	191.4	151.8	48.9	5.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	45.7	219.5
10-Nov	0.2	0.1	0.1	0.1	0.1	0.1	0.0	1.0	27.0	112.8	175.3	211.3	224.0	203.4	135.6	53.0	4.8	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	47.9	224.0
11-Nov	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	3.0	10.0	26.8	41.1	37.2	34.3	26.8	12.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	41.1
12-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	13.6	48.9	115.7	166.0	102.6	42.3	22.1	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.6	166.0
13-Nov	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.6	21.8	91.6	154.1	186.1	127.9	107.5	128.2	30.7	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.5	186.1
14-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9	27.7	44.6	76.1	109.8	99.4	88.1	34.8	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.4	109.8
15-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	20.5	79.8	61.8	80.7	106.1	80.4	44.5	19.3	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.6	106.1
16-Nov	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	4.6	26.0	46.9	49.0	120.2	97.7	67.7	17.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.9	120.2
17-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	14.0	68.0	64.1	73.4	87.1	30.8	9.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.6	87.1
18-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	24.4	57.4	171.8	154.4	125.6	43.4	17.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.1	171.8
19-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	18.6	36.7	54.7	63.7	54.8	34.1	14.5	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.7	63.7
20-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	42.0	102.1	117.8	M	59.0	98.5	22.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.6	117.8
21-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	26.7	59.4	108.0	97.6	63.9	31.3	9.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.8	108.0
22-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	17.9	29.6	32.0	39.1	34.8	25.2	6.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.8	39.1
23-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	5.1	14.0	28.5	33.3	31.8	19.1	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	33.3
24-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	19.5	46.4	69.6	77.1	67.9	41.0	11.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0	77.1
25-Nov	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	2.6	16.2	46.1	65.0	85.5	105.6	69.2	19.7	0.8	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	17.1	105.6
26-Nov	0.1	0.0	0.1	0.1	0.2	0.1	0.0	0.0	9.3	77.7	106.2	70.2	105.0	77.5	43.9	9.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.8	106.2
27-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	33.7	72.4	94.2	90.5	66.8	42.9	11.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.4	94.2
28-Nov	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	4.9	42.5	84.0	146.5	206.8	173.4	103.1	16.3	0.9	0.0	0.2	0.2	0.2	0.2	0.2	0.1	0.1	32.5	206.8
29-Nov	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	4.3	59.5	137.0	189.2	206.8	182.9	117.9	18.2	0.3	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	38.2	206.8
30-Nov	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	20.0	36.8	52.1	53.9	38.0	23.2	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.7	53.9
																								Diurnal Average			
																								Diurnal Maximum			
M - Maintenance																											



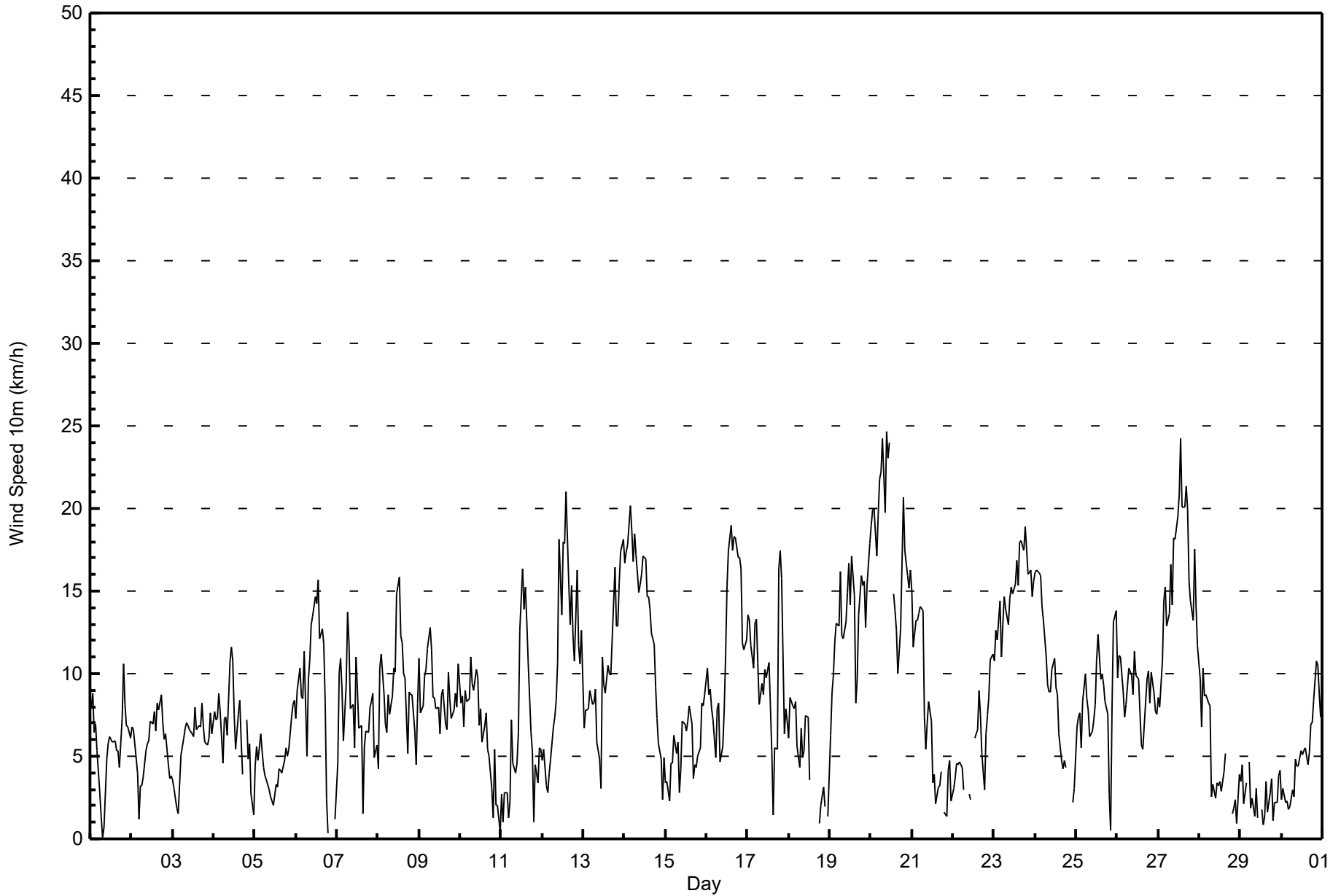


Maximum Speed: 25 km/h on Nov 20 10:00	Maximum Daily Speed Average: 18.2 km/h on Nov 20	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 1 08:00	Minimum Daily Speed Average: 0.5 km/h on Nov 29	Hours of Data: 699
Maximum Diurnal Speed Average: 3.0 km/h at hour 21	Minimum Diurnal Speed Average: 0.1 km/h at hour 16	Hours of Missing Data: 21
Monthly Average Velocity: 1.1 km/h 307.9 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 3 Q <sub>1</sub> = 5 Median = 8 Q <sub>3</sub> = 12 P <sub>90</sub> = 16 P <sub>99</sub> = 21	Percent Operational Time: 97.1

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	S8	SSE9	SSE6	SSE7	SSE5	S3	WNW1	SSE0	NNE1	N5	NNE6	N6	NNE6	NNE6	NNE6	N5	ENE5	NNE4	N7	NNE11	NNE8	NNE7	NNE7	NNE6	NE2.7	NNE11	
2-Nov	NNE7	NNE7	NNE6	NNE4	NE1	WNW3	NNW3	NNE4	N5	NNE6	N6	N7	N7	N8	N7	NNE8	NNE8	NNE9	N7	N6	N6	NNW4	NNW4	NNW4	N5.4	NNE9	
3-Nov	NNW4	NW3	WNW2	W2	SW3	SSW5	SSW6	SSW7	SW7	SSW7	SSW7	SSW6	S6	SSE8	SSE7	SE7	S7	S8	S7	SSW6	S6	SSW6	WSW8	SW6	SSW4.7	S8	
4-Nov	SW8	SSW7	SW7	SW9	SW8	SSW5	SW7	SSW7	S6	S11	S12	SSW11	SSW8	S5	SE8	SE8	S6	SSW4	UO	S7	S5	S6	SSW3	NNW1	SSW6.2	S12	
5-Nov	NW4	NNW6	NW5	NNW6	NNW5	NW4	WNW4	WSW4	SW3	SW3	WSW2	SW2	SW3	SW3	SW4	SSW4	S4	SW5	SW5	SSW5	SSW7	SSW8	SSW8	WSW3.0	SSW8		
6-Nov	S7	SSE9	SSE10	SSE9	SSE8	SSE11	S5	SSE10	SSE11	S13	SSW13	SW15	SW14	WSW16	SW12	SW13	SW12	SSW8	SE2	E0	UO	SSE3	UO	W1	SSW7.9	WSW16	
7-Nov	W5	NW10	NW11	W9	WSW6	W9	W14	W12	W8	W8	NW6	W11	W9	WSW7	W7	SSW2	ESE6	SSE7	SSE6	SE8	SSE8	SSE9	SE5	SSE6	WSW4.3	W14	
8-Nov	SSW4	S10	SSE11	SSE9	SSE7	S6	SSE9	SE8	S9	S10	SSE10	S15	S16	S12	SSW12	SSW10	SSW10	W5	WNW9	NW9	WNW9	W7	WSW4	SSW8	S6.6	S16	
9-Nov	SW11	SW8	SSW8	S10	S10	SSW11	SSW13	SSW11	SSW9	SW9	SW8	SW8	SW6	SW9	SW9	SSW7	SSW7	S10	SSW8	SSW7	S8	S9	S8	S11	SSW8.6	SSW13	
10-Nov	SSW8	SSW9	S7	S9	SSW8	SSW8	SW11	SW9	SW9	SW10	SW10	SW7	SW8	SW6	SSW7	SSW8	SE5	SSE5	SSE3	SSW1	SSE5	WNW2	WNW2	SSE0	SSW5.9	SW11	
11-Nov	N3	NNW1	NW3	WNW3	W1	SSE2	SSE7	SE5	E4	E5	ESE6	SE13	SE16	SE14	SE15	SSE13	SE11	SSE6	SE5	ESE1	NNE4	NW3	N5	N5	SE4.0	SE16	
12-Nov	NW5	N5	NNW3	NW3	SW4	SW5	SW7	SSW7	SW8	SW11	W18	WSW14	WSW18	WSW18	WSW21	WSW15	WSW13	SW15	WSW12	W11	WNW16	W12	W11	W13	WSW9.9	WSW21	
13-Nov	WSW7	SSW8	SW8	SW8	SW9	WSW8	WSW8	W9	W6	W5	NW3	NNE11	NNE9	NNE9	NE11	NE10	NE10	NNE12	NNE16	NNE13	NNE13	NNE16	N17	N18	N4.9	N18	
14-Nov	NNE17	NNE17	N18	N20	NNE19	NNE17	N18	N17	N15	N15	NNE16	N17	NNE17	NNE15	N15	N14	N12	N12	N9	NNW7	NNW6	NE5	NNW2	W5	N13.1	N20	
15-Nov	S3	SSW3	S2	S5	S5	S6	S5	S6	S3	S4	SSW7	S7	S7	S7	S8	S7	SSW4	SSW5	SSW4	SSW5	SSW5	S8	SSW8	S9	S5.5	S9	
16-Nov	S10	S9	S9	S8	S7	SSW5	SSW8	S8	SSW5	SE6	SSE8	SSE11	SSE15	SSE17	SSE19	SSE17	SSE18	SSE18	SSE17	SSE17	SSE16	SSE12	SSE11	SSE12	SSE11.5	SSE19	
17-Nov	SSE14	SSE13	SSE12	SE10	SSE13	SSE13	SSE11	SSE8	SSE9	SSE9	SSE10	SSE10	SSE11	SSE8	SSE5	ESE1	NNW6	NNW5	NNW16	NW17	NW16	WNW6	W8	W7	SSE3.7	NW17	
18-Nov	SW6	WSW9	W8	W8	WNW8	WNW6	W4	W7	WSW5	W5	W7	WNW7	NW4	UO	UO	N3	UO	UO	E1	S2	WNW3	NW2	UO	N1	W4.3	WSW9	
19-Nov	N6	N9	NNE10	NNE12	NNE13	NNE13	N16	N12	N12	N13	NNE15	NNE17	NNE14	NNE17	NNE15	N8	NNE10	NNE14	NNE16	N15	N16	N13	N15	N18	N13.1	N18	
20-Nov	N19	N20	N20	N17	N20	N22	N22	N24	N20	NNE25	NNE23	NNE24	M	N15	N14	N13	N10	NNE13	NNE17	NNE21	NNE17	N16	NNW15	N16	N18.2	NNE25	
21-Nov	N15	NNE12	N13	N13	N14	N14	N14	NNW7	NW5	W7	W8	WSW7	WNW3	WNW4	WNW2	WSW3	SW3	SSW4	UO	SSE2	SE1	NE4	ENE5	SSE2	NNW4.4	N15	
22-Nov	SW3	SSW4	S5	SSW5	SW5	SW4	S3	UO	UO	W3	W2	UO	UO	ENE6	NE7	NE9	NE8	ENE5	NE3	NE6	NE7	NE9	NNE11	NNE11	NE2.6	NNE11	
23-Nov	NE11	NNE13	NNE12	NNE14	NNE11	NNE13	NNE15	NNE14	N13	NNE15	NNE15	NNE15	NNE15	NNE17	NNE15	N18	N18	N17	N19	N18	N16	N16	N15	N16	NNE14.8	N19	
24-Nov	N16	NNE16	N16	NNE16	N14	N13	NNE11	N9	N9	N9	N10	N11	N9	N9	N6	N5	N4	N5	N4	UO	UO	UO	UO	WSW2	SSW3	N9.0	NNE16
25-Nov	S7	S7	S8	SSE5	SSE8	S10	S8	SSE8	SSE6	SSE6	SSE7	S8	S11	SSE12	SSE10	S10	S9	S8	S8	SSW3	WNW1	SSE8	SSE13	SSE14	S8.1	SSE14	
26-Nov	S10	S11	S11	S9	S7	SSW8	SSW9	SSW10	SSW10	SSW9	S11	S10	S10	S8	SSW6	SW5	SSW7	WSW10	WSW10	W8	WNW10	WNW9	W8	W8	SSW7.0	S11	
27-Nov	WSW9	WSW8	W11	WNW14	WNW15	WNW13	WNW14	WNW17	NW14	NW18	NW18	NW19	NW21	NW24	NNW20	NNW20	NNW21	NNW20	NNW16	NNW14	NNW13	N18	N14	N12	NW14.4	NW24	
28-Nov	NNW10	W7	NW10	WNW9	WNW9	W8	W8	SW3	W3	SW2	SSE3	SSE3	SE3	ESE3	SE4	ESE5	UO	NNE3	UO	WSW2	WSW2	S2	SSW1	S4	W2.0	NW10	
29-Nov	S4	S4	S2	S3	UO	S5	S2	SSW2	S1	S3	SSE1	UO	NNE2	E1	NNE1	NE3	WNW2	WNW3	NW4	NNW1	NW2	NNW2	N4	NNW4	SW0.5	S5	
30-Nov	NW2	NNW3	NNW2	NW2	NNW2	NNW2	NNW3	NNW3	N5	N4	NW4	N5	N5	N5	NNW6	NNW4	N5	N7	N7	N8	N11	N11	N9	N7	N5.0	N11	

WNW1.0	NNW0.7	NW0.9	NNW1.0	NNW1.1	W1.3	W2.0	W1.6	W1.3	W1.6	NNW1.5	NNW1.2	SW1.0	NNW0.5	WSW0.3	ENE0.1	NNE0.2	NNW0.7	N2.6	NNW2.7	NNW3.0	NNW2.0	NNW2.3	NNW1.5	Diurnal Average	
N19	N20	N20	N20	N20	N22	N22	N24	N20	NNE25	NNE23	NNE24	NW21	NW24	WSW21	NNW20	NNW21	NNW20	N19	NNE21	NNE17	N18	N17	N18	Diurnal Maximum	

M - Maintenance      UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Ells River - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	208	29.76	29.76
6 - 11	314	44.92	74.68
12 - 19	158	22.60	97.28
20 - 28	19	2.72	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 699

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Ells River - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	20	8	5	3	5	4	8	15	25	24	19	8	12	14	17	21	208
6 - 11	30	25	10	1	0	2	8	43	59	44	30	12	27	11	4	8	314
12 - 19	48	43	0	0	0	0	4	20	5	3	6	7	5	6	6	5	158
20 - 28	8	4	0	0	0	0	0	0	0	0	0	1	0	0	2	4	19
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	106	80	15	4	5	6	20	78	89	71	55	28	44	31	29	38	699

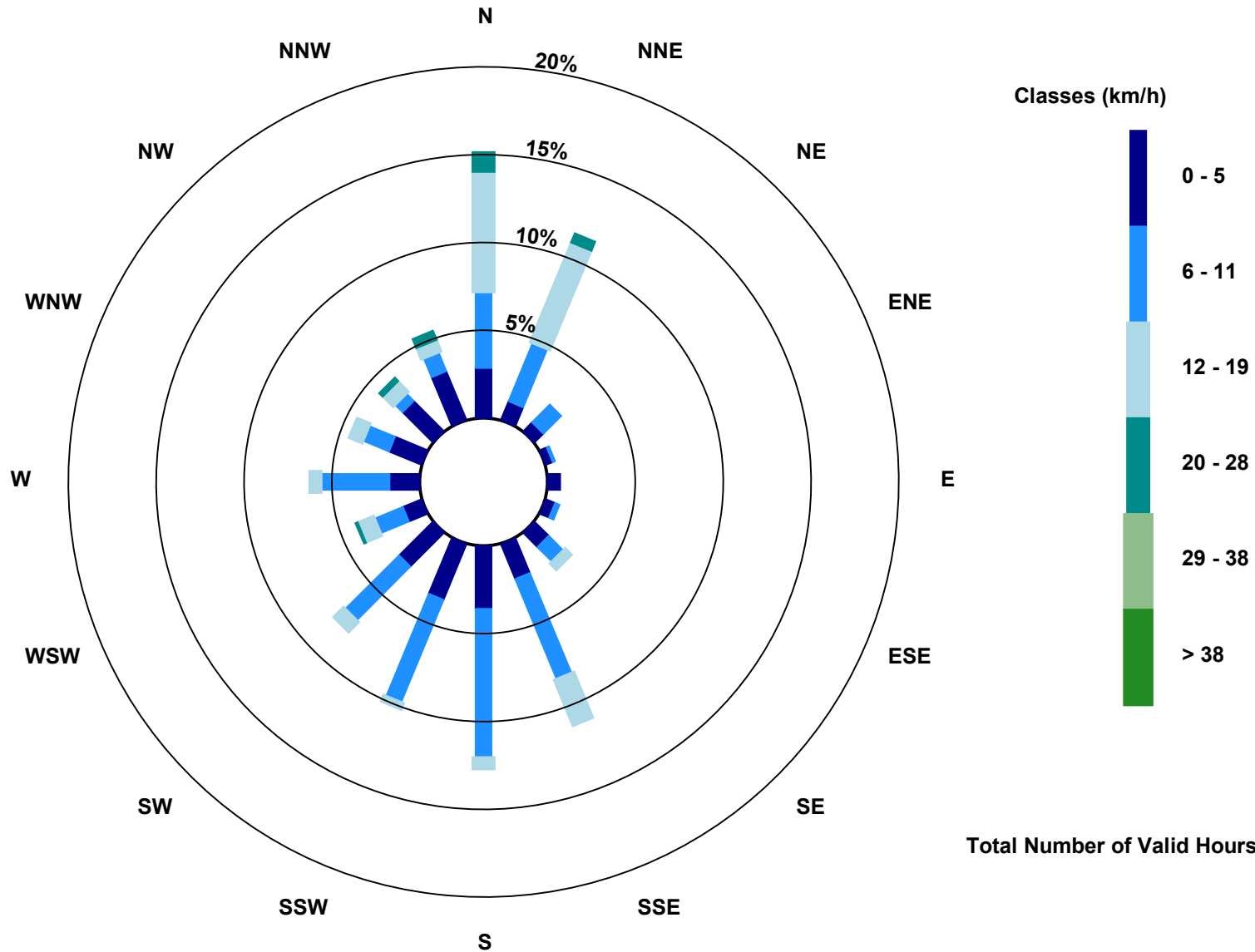
Total Number of Valid Hours: 699

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Ells River





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Ells River - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 6 km/h on Nov 27 16:00 Minimum Value: 0 km/h on Nov 22 03:00 Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 2 P <sub>90</sub> = 3 P <sub>99</sub> = 5																		Hours in Service: 720 Hours of Data: 699 Hours of Missing Data: 21 Hours of Calibration: 0 Percent Operational Time: 97.1							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	3	1	1	1	1	2	2	2	2	4	1	1	1	1	1	1	1	2	2	1	2	1	1	1	4
2-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	3
3-Nov	0	1	1	1	1	1	1	2	2	1	1	2	1	1	2	2	1	1	1	1	1	1	2	3	3
4-Nov	2	1	1	2	2	2	2	2	2	2	3	3	3	2	2	1	1	2	UO	1	2	2	2	2	3
5-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2
6-Nov	2	2	2	2	2	2	3	4	2	3	3	4	5	4	3	3	3	2	1	2	UO	2	UO	2	5
7-Nov	2	2	2	4	2	2	3	4	3	3	3	4	5	2	3	2	2	1	1	1	1	1	1	1	5
8-Nov	1	1	2	1	1	1	1	2	3	2	3	2	3	3	3	2	2	2	2	2	2	1	1	2	3
9-Nov	3	2	1	1	1	2	2	3	1	2	2	2	2	2	2	1	1	2	2	1	1	1	1	1	3
10-Nov	2	2	2	1	2	2	3	2	2	2	2	2	2	2	2	1	1	1	2	2	2	2	2	1	3
11-Nov	2	1	2	2	2	2	1	2	1	1	2	3	3	2	3	3	2	1	1	2	1	1	2	1	3
12-Nov	1	1	1	1	1	1	2	2	2	4	6	4	5	5	6	5	4	4	3	3	5	3	3	3	6
13-Nov	5	1	1	1	2	2	3	2	3	1	1	3	2	2	2	1	2	3	3	2	2	2	2	3	5
14-Nov	3	2	2	2	3	3	3	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2	3
15-Nov	1	1	2	1	1	1	1	1	2	2	1	1	1	1	2	2	1	1	1	1	1	1	2	2	2
16-Nov	2	2	2	2	1	1	2	2	1	5	3	2	3	3	4	3	3	3	3	4	3	3	2	2	5
17-Nov	2	2	2	2	2	2	3	1	2	1	2	2	2	2	1	1	2	2	6	4	3	3	2	2	6
18-Nov	2	2	2	2	2	2	2	2	1	2	2	2	2	UO	UO	1	UO	UO	1	1	2	1	UO	1	2
19-Nov	2	1	1	2	3	2	2	2	2	2	3	2	2	3	3	4	4	2	2	2	3	2	2	3	4
20-Nov	3	4	3	3	4	4	4	4	5	4	4	4	M	2	2	3	2	2	3	3	4	3	3	2	5
21-Nov	2	2	3	3	2	2	3	1	1	1	2	2	2	1	1	1	1	1	UO	1	1	1	1	1	3
22-Nov	1	0	0	1	1	2	0	UO	UO	1	1	UO	UO	1	1	3	2	2	1	1	2	2	2	2	3
23-Nov	2	2	2	2	3	3	2	2	3	2	2	2	2	3	2	2	2	2	3	3	3	2	2	2	3
24-Nov	2	2	2	2	2	2	2	1	1	1	1	1	1	2	1	1	0	1	1	UO	UO	UO	1	2	2
25-Nov	1	1	1	1	2	1	2	2	1	1	1	1	1	2	2	2	1	1	2	1	1	5	2	2	5
26-Nov	1	2	2	1	1	1	1	1	1	1	2	2	2	2	1	1	1	3	3	2	3	2	2	2	3
27-Nov	2	2	3	4	3	3	4	4	4	4	4	4	4	5	4	6	5	4	3	3	3	3	3	2	6
28-Nov	2	2	2	2	1	2	2	1	1	2	2	2	1	1	1	1	UO	1	UO	2	1	2	2	1	2
29-Nov	2	1	3	2	UO	1	2	2	2	2	1	UO	1	1	2	2	2	1	1	2	1	1	1	1	3
30-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	1	2
																		5 4 3 4 4 4 4 4 4 5 5 6 4 5 5 6 6 5 4 6 4 5 5 3 3							
Diurnal Maximum																									
M - Maintenance UO - Unstable Operation																									





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Ells River - November 2024**

Direction of Maximum Speed: 14 deg on Nov 20 10:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 7.5 deg on Nov 20	Hours of Data: 699
Direction of Minimum Speed: 155 deg on Nov 1 08:00	Hours of Missing Data: 21
Direction of Minimum Daily Speed Average: 0.5 deg on Nov 29	Percent Operational Time: 97.1
Monthly Average Direction: 307.9 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	190	160	164	153	162	176	298	155	15	7	12	7	12	21	25	11	58	25	0	27	24	18	21	27	36.5
2-Nov	17	28	24	18	52	299	334	18	10	13	2	10	3	3	357	12	21	16	3	358	358	345	348	346	6.5
3-Nov	337	320	290	263	232	204	209	213	222	213	212	208	172	164	155	145	188	185	173	197	191	213	251	219	201.5
4-Nov	216	206	223	217	226	196	214	205	173	180	182	204	204	185	141	139	181	200	UO	180	191	176	212	339	193.5
5-Nov	319	328	320	338	329	309	292	258	234	220	240	219	225	236	225	205	181	225	234	236	193	212	199	193	242.7
6-Nov	183	163	160	166	160	158	175	152	167	183	206	215	225	238	231	222	226	199	146	91	UO	148	UO	280	194.2
7-Nov	261	318	304	272	239	262	274	269	269	276	310	279	260	242	262	196	116	168	153	142	156	159	130	160	249.0
8-Nov	193	173	164	161	168	180	164	132	169	177	168	169	175	177	202	201	201	260	298	311	295	278	242	196	189.6
9-Nov	229	218	199	189	189	196	203	208	199	223	232	225	222	225	216	201	194	181	196	203	183	182	179	182	202.6
10-Nov	193	204	187	179	192	207	226	222	214	231	225	226	220	223	207	200	142	150	153	196	167	289	286	164	205.5
11-Nov	0	340	308	285	279	167	160	128	81	99	120	136	139	136	142	152	137	147	142	107	15	312	4	358	131.4
12-Nov	324	350	334	317	235	231	230	210	217	235	267	256	256	253	255	245	239	235	244	270	293	280	266	271	257.1
13-Nov	253	204	217	226	225	241	251	276	265	261	319	19	20	24	46	46	34	32	29	21	19	16	10	8	0.5
14-Nov	13	12	11	10	13	17	9	1	5	7	13	11	15	13	10	359	354	0	2	329	345	49	329	265	6.9
15-Nov	170	193	178	175	180	181	184	173	175	190	200	175	175	189	172	176	201	199	200	197	192	177	207	181	184.8
16-Nov	181	184	180	178	182	194	199	187	206	139	160	160	157	157	168	157	154	160	163	158	162	164	147	149	164.8
17-Nov	152	153	150	144	149	148	150	150	148	151	159	163	162	163	153	112	347	339	348	318	315	283	269	267	166.1
18-Nov	228	256	278	280	295	293	263	279	243	270	276	294	320	UO	UO	9	UO	UO	90	186	286	310	UO	353	277.3
19-Nov	1	2	14	23	14	14	357	354	355	8	20	14	23	26	17	7	13	22	20	4	360	4	354	0	9.7
20-Nov	1	360	360	4	8	6	10	10	9	14	16	15	M	356	4	10	3	16	17	16	19	1	346	354	7.5
21-Nov	6	14	11	1	3	10	357	342	315	278	267	258	286	295	283	241	215	195	UO	160	126	47	64	155	346.8
22-Nov	218	200	174	201	222	217	187	UO	UO	273	276	UO	UO	63	56	42	54	71	54	48	38	43	24	24	49.5
23-Nov	42	29	33	31	29	18	22	22	11	14	18	19	14	14	13	7	5	6	8	11	7	10	8	7	15.5
24-Nov	11	12	9	12	11	9	12	7	3	356	360	3	11	3	3	354	356	355	358	UO	UO	UO	239	211	5.7
25-Nov	174	176	181	168	164	175	174	167	166	158	165	174	172	168	158	177	172	173	173	210	282	161	165	163	169.9
26-Nov	169	172	172	180	191	200	199	196	195	201	174	169	172	182	196	219	200	239	255	274	282	282	259	261	206.1
27-Nov	248	250	269	284	286	291	292	296	305	312	320	324	325	324	327	327	327	332	330	329	338	359	359	0	317.8
28-Nov	343	280	309	291	294	275	268	219	269	235	157	166	141	112	124	118	UO	33	UO	252	243	191	203	173	270.1
29-Nov	182	185	188	184	UO	188	187	198	181	184	154	UO	21	92	31	51	286	294	317	333	313	339	360	332	234.1
30-Nov	306	331	330	317	334	335	343	337	4	353	323	0	7	0	346	348	9	356	352	351	3	3	4	355	352.9

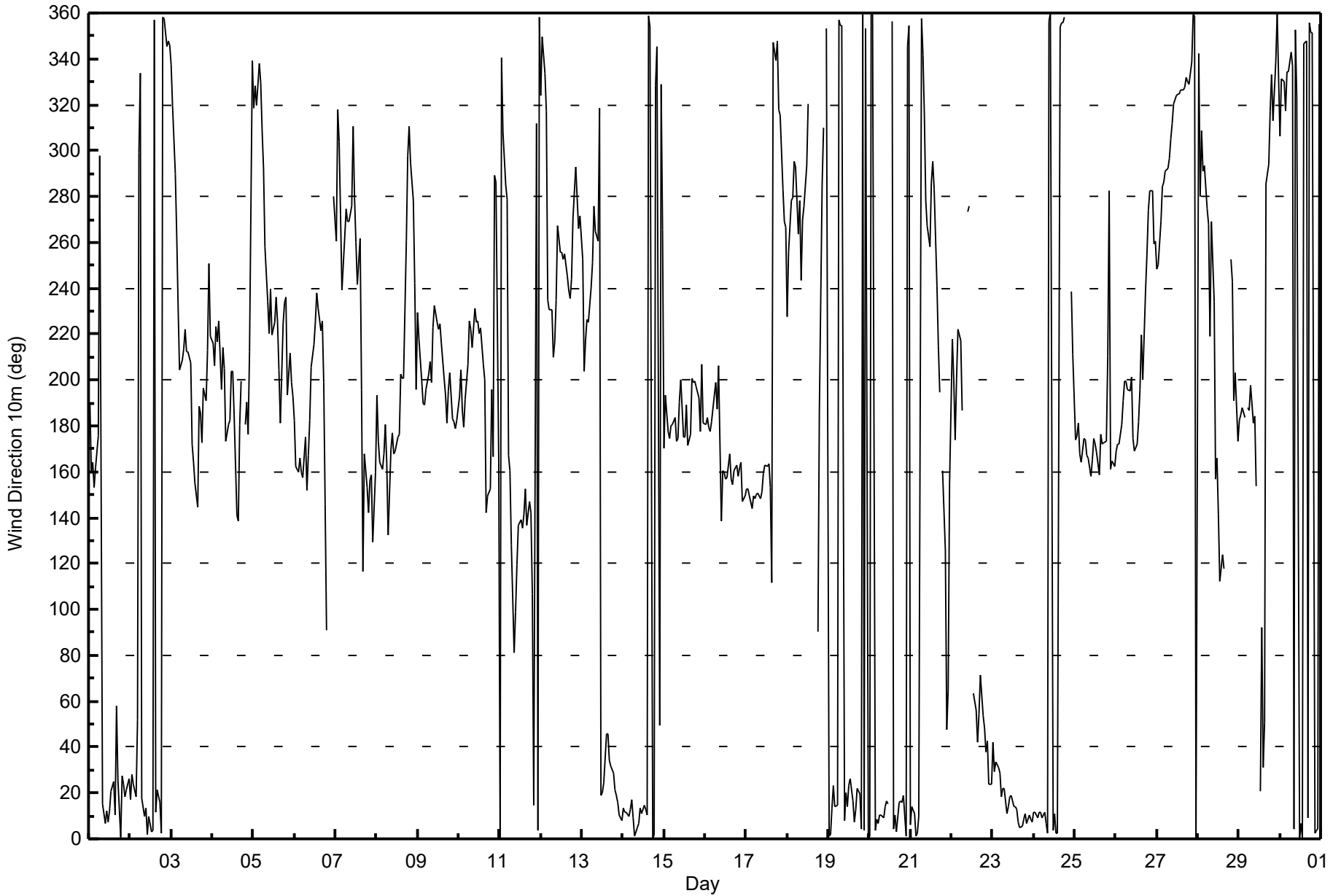
293.7 283.4 305.7 299.9 282.4 265.4 275.6 271.9 273.2 279.3 282.9 296.8 222.3 285.7 254.2 78.7 17.8 334.0 350.7 340.3 339.4 346.3 336.0 327.9

Diurnal Average

M - Maintenance

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Ells River - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 88 deg on Nov 1 08:00	Hours of Data: 699
Minimum Value: 5 deg on Nov 9 18:00	Hours of Missing Data: 21
Percentiles: P <sub>1</sub> = 7 P <sub>10</sub> = 9 Q <sub>1</sub> = 11 Median = 14 Q <sub>3</sub> = 21 P <sub>90</sub> = 35 P <sub>99</sub> = 79	Hours of Calibration: 0
	Percent Operational Time: 97.1

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	23	10	13	9	25	62	42	88	85	48	15	13	14	12	16	15	27	49	18	11	21	16	11	11	88
2-Nov	14	10	16	20	87	23	24	20	13	12	11	9	10	10	10	7	7	7	32	15	18	24	23	23	87
3-Nov	18	12	23	31	25	13	12	17	17	17	18	18	21	11	14	16	16	13	9	10	10	15	18	34	34
4-Nov	12	14	14	17	17	30	17	21	21	17	19	18	23	36	11	8	12	60	UO	7	12	14	79	78	79
5-Nov	15	12	14	12	13	16	13	21	21	22	26	16	23	31	19	16	11	20	17	19	15	17	15	14	31
6-Nov	14	8	12	10	9	9	55	15	20	13	16	21	24	19	21	19	20	25	72	76	UO	63	UO	70	76
7-Nov	37	24	13	20	22	16	16	19	23	44	51	30	30	24	28	69	21	15	14	10	15	8	15	25	69
8-Nov	14	9	8	9	5	11	10	16	9	12	11	9	13	16	18	14	13	53	19	17	11	24	37	18	53
9-Nov	17	21	10	9	10	9	10	14	15	22	22	23	29	21	18	14	7	5	7	13	14	10	7	9	29
10-Nov	16	20	32	8	17	24	17	16	17	17	16	23	20	28	21	15	18	27	37	60	19	58	30	81	81
11-Nov	22	46	46	46	88	54	12	24	23	15	11	13	9	8	9	12	10	13	14	73	16	30	14	15	88
12-Nov	15	16	40	47	30	26	20	17	17	23	19	22	20	19	18	20	19	17	20	27	14	16	19	19	47
13-Nov	56	14	18	15	14	17	20	13	22	21	48	15	14	18	14	10	7	9	13	8	8	7	7	9	56
14-Nov	10	8	8	9	9	8	10	11	10	10	8	11	10	10	12	10	12	11	11	10	22	14	51	14	51
15-Nov	46	33	59	19	15	9	25	13	50	34	21	24	17	25	15	19	29	12	11	14	13	8	24	17	59
16-Nov	13	16	14	16	13	27	16	17	26	27	21	11	10	11	13	10	11	12	11	11	11	13	9	8	27
17-Nov	9	9	9	8	10	9	11	9	9	9	12	11	11	11	10	69	14	15	20	14	11	34	23	24	69
18-Nov	28	20	16	28	13	23	28	19	22	23	16	16	58	UO	UO	11	UO	UO	79	70	34	33	UO	45	79
19-Nov	17	10	9	8	7	11	12	13	11	11	9	8	9	10	11	14	14	10	7	11	12	13	11	12	17
20-Nov	12	14	11	12	12	14	11	9	11	8	10	10	M	12	13	11	10	10	7	8	11	13	11	14	14
21-Nov	9	7	8	15	11	9	12	13	19	13	16	21	33	24	51	23	20	14	UO	47	54	12	30	37	54
22-Nov	16	12	7	16	13	18	20	UO	UO	22	23	UO	UO	19	13	13	12	19	21	11	10	11	9	11	23
23-Nov	16	10	10	9	10	9	9	10	14	9	8	7	7	8	9	10	10	10	9	9	11	10	9	9	16
24-Nov	7	8	10	7	7	7	9	10	11	10	10	11	8	10	15	9	14	11	11	UO	UO	UO	38	38	38
25-Nov	14	10	8	7	5	12	12	9	11	10	13	13	11	12	14	9	9	9	9	48	70	9	8	9	70
26-Nov	7	8	9	9	8	9	7	8	10	15	14	12	12	17	18	31	14	19	20	18	16	16	18	17	31
27-Nov	17	17	19	16	14	14	16	13	15	12	11	11	11	10	12	12	10	11	12	11	16	13	11	12	19
28-Nov	14	22	20	11	16	14	14	56	45	38	34	23	24	23	23	26	UO	21	UO	58	56	83	69	15	83
29-Nov	23	11	76	23	UO	12	64	22	70	22	20	UO	35	65	27	32	45	24	16	22	25	37	27	9	76
30-Nov	38	27	19	27	31	52	41	33	18	27	19	15	12	14	12	15	28	10	11	11	10	10	11	13	52

56	46	76	47	88	62	64	88	85	48	51	30	58	65	51	69	45	60	79	76	70	83	79	81	
Diurnal Maximum																								

M - Maintenance      UO - Unstable Operation



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS33 MONDAY CREEK NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MONDAY CREEK (AMS33)  
 NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	535	26	26	100	6.7	0	1.9	0
H2S (ppb) Average	537	27	27	100	0.5	0	0.2	0
NO2 (ppb) Average	535	29	29	100	13.2	0	4.7	-
NO (ppb) Average	535	29	29	100	4.2	-	0.8	-
NOX (ppb) Average	535	29	29	100	14.5	-	5	-
Temperature 2 m (C) Average	565	0	0	100	11.7	-	7	-
Relative Humidity (%) Average	564	0	0	100	96.5	-	89.5	-
Wind Speed 10 m (km/h) Average	559	4	5	99.82	25	-	18	-
Wind Direction 10 m (deg) Average	559	4	5	99.82	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MONDAY CREEK (AMS33)  
 NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile							
					Min	P10	Q1	Median	Q3	P90	Max	
SO2 (ppb) Average	535	0.54	0.9	-	0	0	0.1	0.2	0.6	1.5	6.7	
H2S (ppb) Average	537	0.1	0.1	-	0	0.1	0.1	0.1	0.1	0.2	0.5	
NO2 (ppb) Average	535	2.08	1.9	-	0.1	0.5	0.8	1.6	2.7	4.4	13.2	
NO (ppb) Average	535	0.2	0.4	-	0	0	0	0	0.2	0.6	4.2	
NOX (ppb) Average	535	2.27	2.1	-	0.1	0.5	0.8	1.8	2.8	4.9	14.5	
Temperature 2 m (C) Average	565	-8.27	8.9	-	-25.7	-19.5	-16	-8.9	-1.2	4	11.7	
Relative Humidity (%) Average	564	78.54	9.6	-	44	65.8	74.9	80.7	83.8	88.7	96.5	
Wind Speed 10 m (km/h) Average	559	9.3	4	-	0	4	6	9	12	15	25	
Wind Direction 10 m (deg) Average	559	-	-	-	-	-	-	-	-	-	-	

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MONDAY CREEK (AMS33)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction	24 Nov 2024 22:00	24 Nov 2024 22:00	1	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Monday Creek - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	561
Maximum Value: 6.7 ppb on Nov 21 21:00	Maximum Daily Average: 1.9 ppb on Nov 12		Hours of Data:	535
Minimum Value: 0.0 ppb on Nov 9 12:00	Minimum Daily Average: 0.1 ppb on Nov 20		Hours of Missing Data:	26
Maximum Diurnal Average: 0.9 ppb at hour 21	Minimum Diurnal Average: 0.3 ppb at hour 6		Hours of Calibration:	26
Monthly Average: 0.54 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.1 Median = 0.2 Q <sub>3</sub> = 0.6 P <sub>90</sub> = 1.5 P <sub>99</sub> = 4.3		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
2-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
3-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
4-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
5-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	C	C	C	0.2	0.3	0.3	0.6	1.0	1.0	--	1.0
8-Nov	Z	0.9	0.7	1.5	1.8	1.6	1.1	0.8	1.5	1.7	1.8	2.6	2.9	3.4	2.9	1.1	0.8	0.7	0.4	0.6	0.6	0.2	0.2	2.5	1.4	3.4
9-Nov	3.6	Z	0.3	0.1	0.0	0.2	0.2	0.1	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.3	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	3.6
10-Nov	0.0	0.0	Z	0.2	0.0	0.2	0.5	0.6	0.7	0.7	0.6	0.8	2.1	1.0	0.8	0.9	0.8	0.3	0.2	0.1	0.2	0.1	0.0	0.1	0.5	2.1
11-Nov	0.1	0.1	0.4	Z	0.3	0.1	0.2	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.4
12-Nov	0.0	0.3	1.0	3.3	Z	1.9	6.6	4.7	3.6	3.2	1.6	2.8	0.9	0.2	0.4	0.4	2.7	3.9	2.0	0.8	2.1	0.7	0.0	0.0	1.9	6.6
13-Nov	0.1	0.0	0.0	0.2	0.2	Z	0.2	0.3	0.9	0.6	0.3	0.2	0.5	0.2	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.4	0.2	0.9
14-Nov	Z	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.5
15-Nov	0.1	Z	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.4	0.4	0.6	0.7	0.4	0.6	0.4	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.7
16-Nov	1.4	2.7	Z	1.0	0.8	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.4	2.7
17-Nov	0.3	0.3	0.4	Z	0.2	0.1	0.1	0.1	0.4	0.4	0.5	0.3	0.5	0.8	1.5	1.0	1.0	1.0	1.5	0.4	0.7	0.0	0.1	0.0	0.5	1.5
18-Nov	0.0	0.0	0.0	0.1	Z	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.0	0.2	0.5	0.7	0.8	0.8	0.2	0.8
19-Nov	0.7	1.1	1.6	0.8	0.8	Z	0.2	0.1	0.1	0.1	0.8	0.8	0.4	0.3	0.4	0.9	0.4	0.3	0.2	0.2	0.2	0.0	0.0	0.1	0.5	1.6
20-Nov	Z	0.1	0.2	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.4	0.1	0.1	0.4
21-Nov	0.2	Z	0.3	0.3	0.2	0.3	0.2	0.3	0.4	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	3.1	6.7	5.3	4.3	2.2	1.1	6.7
22-Nov	1.1	1.1	Z	0.5	0.3	0.1	0.4	0.3	0.6	0.2	0.4	0.3	0.6	0.6	0.5	0.5	0.3	0.3	3.5	3.1	2.2	1.6	1.2	0.7	0.9	3.5
23-Nov	0.2	0.1	0.1	Z	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.1	0.3	0.3	0.2	0.3	0.1	0.1	0.1	0.3	0.1	0.3
24-Nov	0.4	0.2	0.2	0.2	Z	0.3	0.4	0.2	0.1	0.2	0.3	0.5	0.5	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.5
25-Nov	0.0	0.0	0.0	0.0	1.0	Z	4.4	0.9	0.2	0.1	0.5	0.4	0.3	0.3	0.3	0.2	0.3	0.5	1.0	1.0	0.7	0.7	0.8	0.7	0.6	4.4
26-Nov	Z	0.7	0.7	0.6	0.5	0.4	0.2	0.2	0.2	0.2	0.3	0.2	0.8	0.2	0.6	0.6	0.3	0.6	0.7	0.8	4.2	1.0	0.4	0.0	0.6	4.2
27-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.1	0.3	0.1	0.2	0.2	0.3	0.1	0.3
28-Nov	0.3	0.2	Z	0.3	0.3	0.2	0.3	0.7	1.0	1.2	2.4	2.0	2.1	2.2	2.4	2.3	1.9	3.0	1.5	1.4	2.6	2.5	2.3	2.5	1.6	3.0
29-Nov	2.4	1.7	0.8	Z	0.1	0.0	0.0	0.1	0.1	0.1	0.7	1.7	1.5	1.5	0.6	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.5	2.4
30-Nov	0.1	0.1	0.0	0.0	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.3	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.3

0.6	0.5	0.4	0.5	0.4	0.3	0.7	0.4	0.5	0.4	0.5	0.6	0.6	0.5	0.5	0.4	0.5	0.6	0.5	0.6	0.9	0.6	0.5	0.5	Diurnal Average	
3.6	2.7	1.6	3.3	1.8	1.9	6.6	4.7	3.6	3.2	2.4	2.8	2.9	3.4	2.9	2.3	2.7	3.9	3.5	3.1	6.7	5.3	4.3	2.5	Diurnal Maximum	

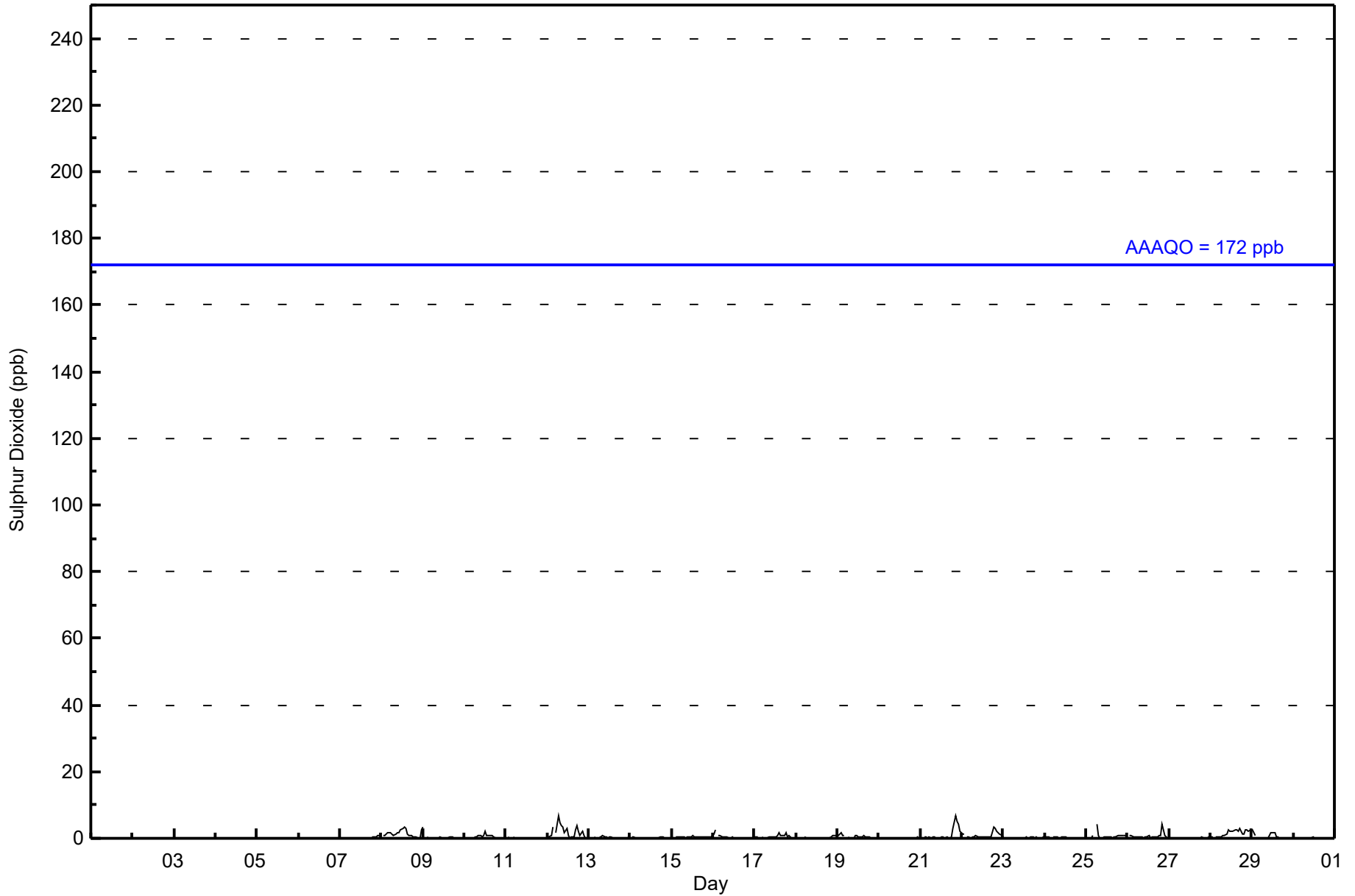
Z - zerospan      C - Calibration      NS - Not in Service  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb    24-hr 48 ppb





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Monday Creek - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Monday Creek - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	535	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 535

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Monday Creek - November 2024**

<b>Concentration</b> <b>Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	23	44	45	48	18	11	21	35	46	37	25	20	38	60	30	33	534
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	23	44	45	48	18	11	21	35	46	37	25	20	38	60	30	33	534

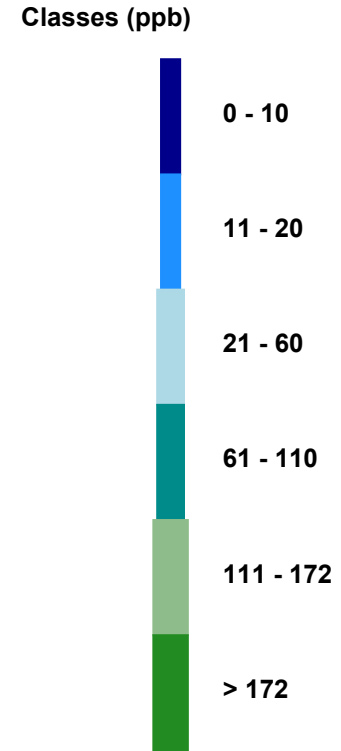
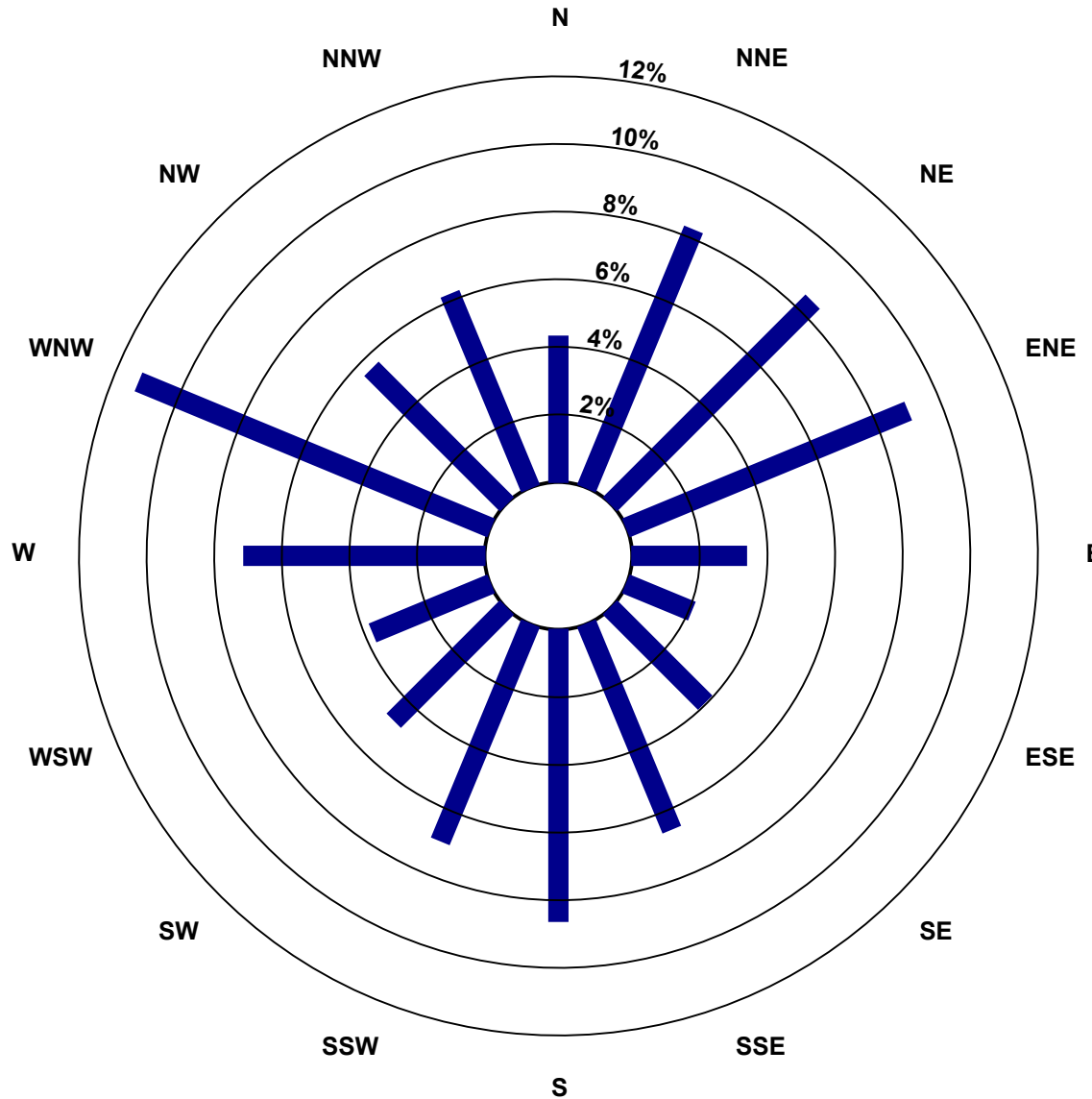
Total Number of Valid Hours: 534

Total Number of Hours: 720

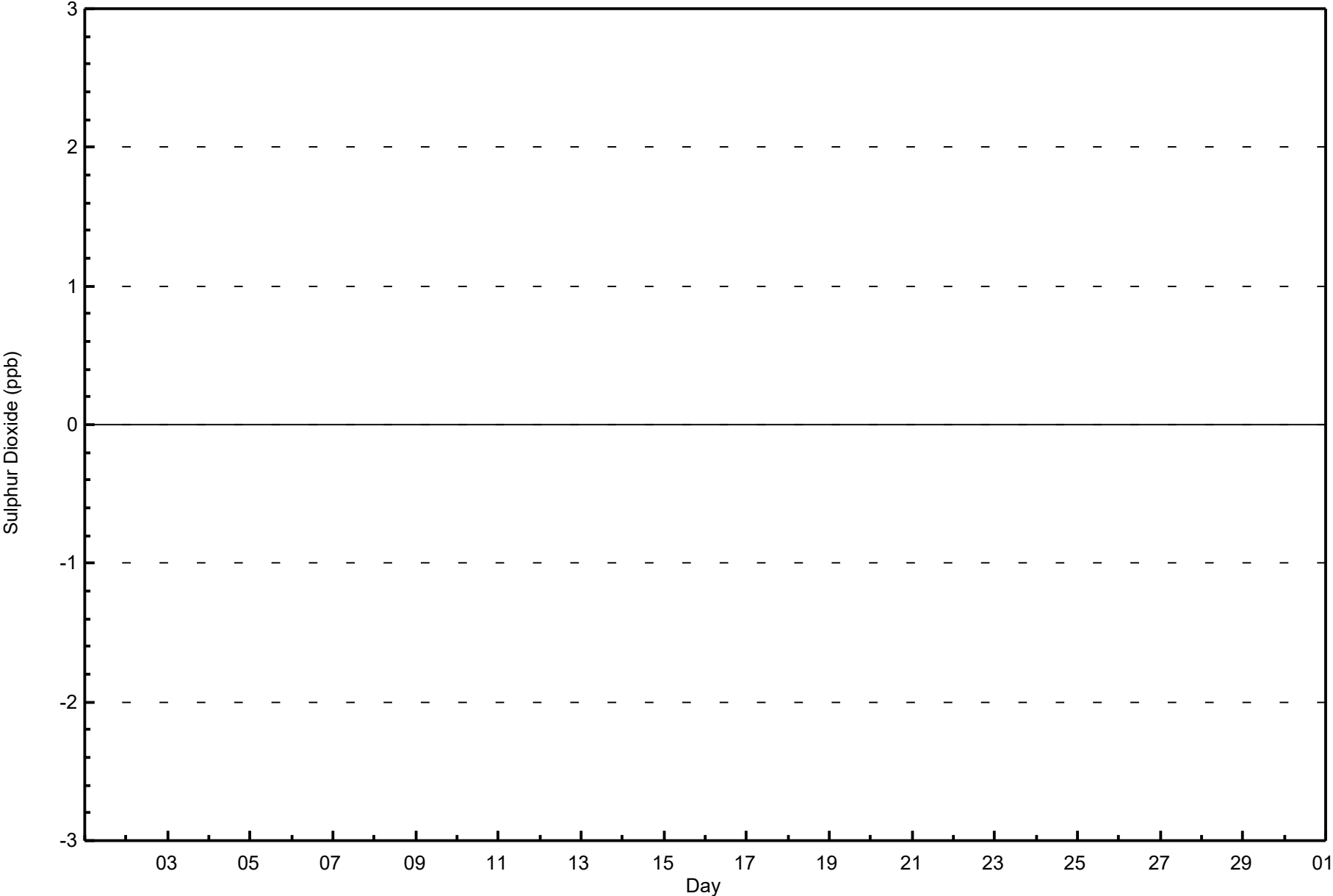


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Monday Creek



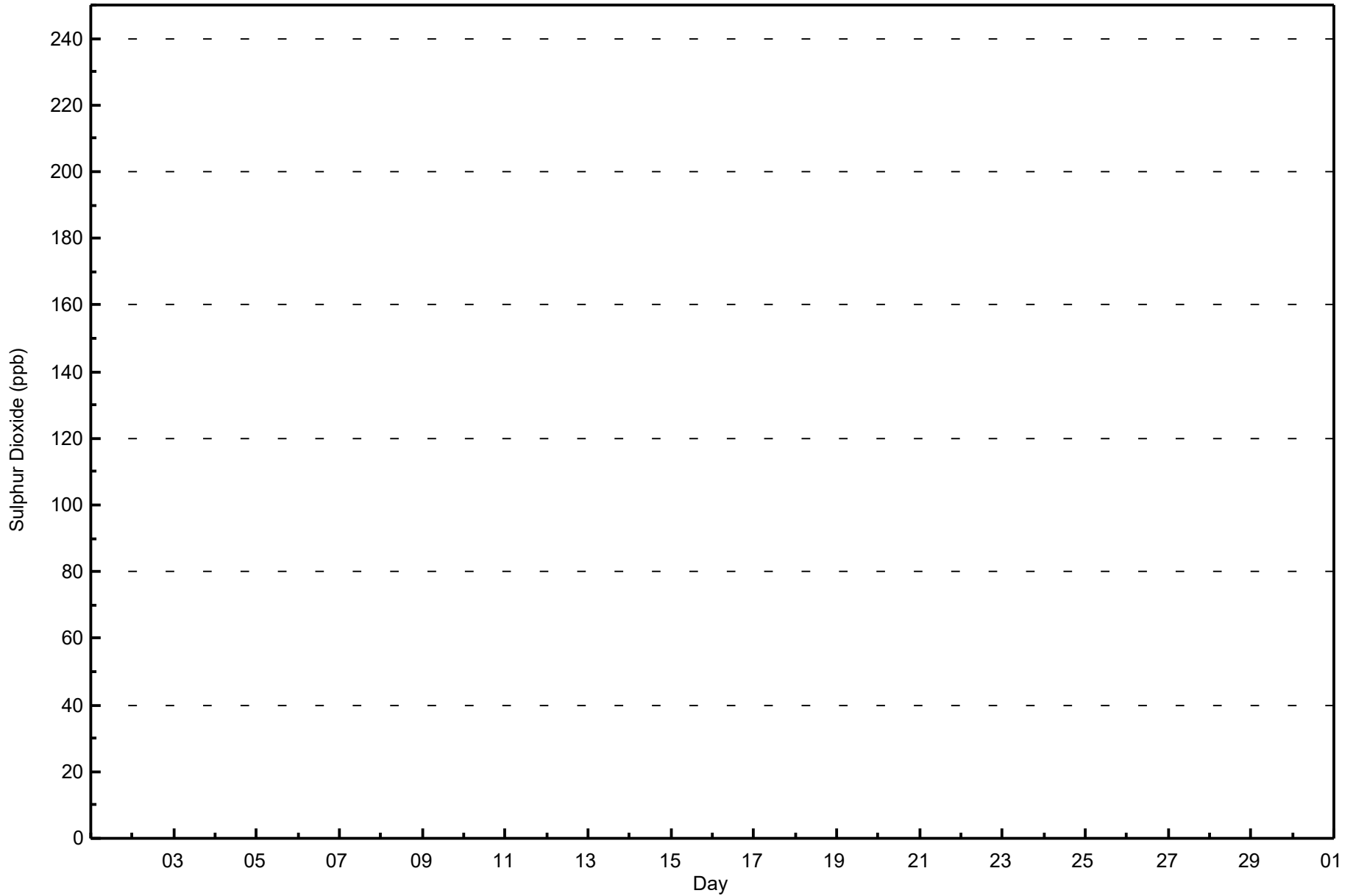
Total Number of Valid Hours: 534





**Wood Buffalo Environmental Association**  
**Span Responses**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Monday Creek - November 2024**





Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H<sub>2</sub>S) - ppb

Monday Creek - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	564
Maximum Value: 0.5 ppb on Nov 25 06:00	Maximum Daily Average: 0.2 ppb on Nov 10		Hours of Data:	537
Minimum Value: 0.0 ppb on Nov 7 18:00	Minimum Daily Average: 0.0 ppb on Nov 24		Hours of Missing Data:	27
Maximum Diurnal Average: 0.1 ppb at hour 6	Minimum Diurnal Average: 0.1 ppb at hour 16		Hours of Calibration:	27
Monthly Average: 0.10 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.1 Median = 0.1 Q <sub>3</sub> = 0.1 P <sub>90</sub> = 0.2 P <sub>99</sub> = 0.3		Percent Operational Time:	100.0

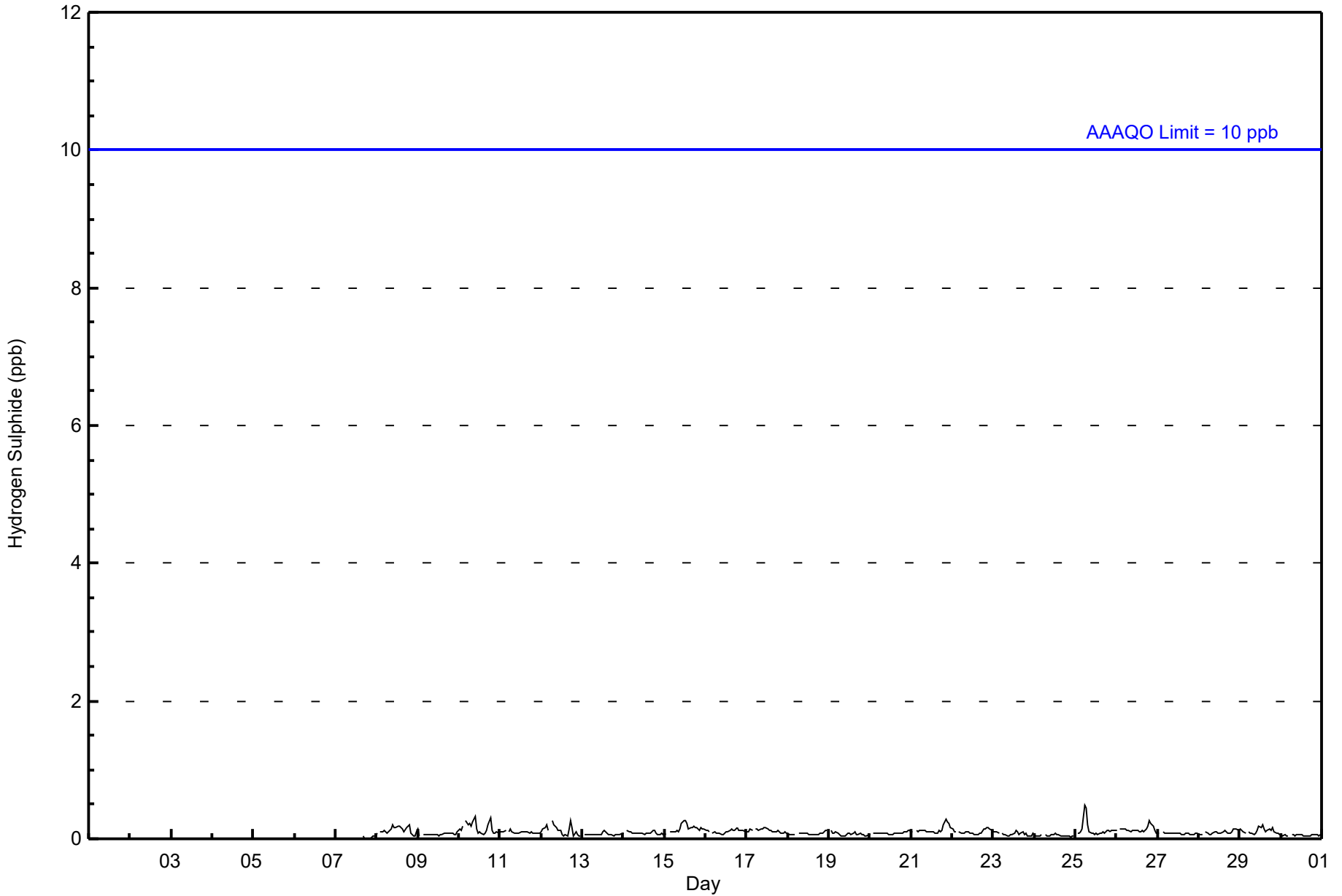
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
2-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
3-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
4-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
5-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--																						
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0																						
8-Nov	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.2																						
9-Nov	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
10-Nov	0.1	0.1	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.3																						
11-Nov	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
12-Nov	0.1	0.1	0.2	0.2	0.1	Z	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.3	0.2	0.0	0.1	0.1	0.0	0.0	0.1	0.3																						
13-Nov	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
14-Nov	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
15-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.3																						
16-Nov	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
17-Nov	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
18-Nov	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
19-Nov	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1																						
20-Nov	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
21-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.1	0.3																						
22-Nov	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2																						
23-Nov	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1																						
24-Nov	0.1	0.0	0.0	0.0	0.1	Z	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																						
25-Nov	Z	0.1	0.1	0.1	0.1	0.5	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5																						
26-Nov	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.3																							
27-Nov	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
28-Nov	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
29-Nov	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2																						
30-Nov	0.1	0.0	0.1	0.0	0.0	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1																						
																								0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Diurnal Average
																								0.1	0.1	0.2	0.2	0.3	0.5	0.5	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	Diurnal Maximum

Z - zerospan      C - Calibration      NS - Not in Service  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb    24-hr 3 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Monday Creek - November 2024**







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Monday Creek - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	537	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 537

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Monday Creek - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 2	23	44	44	50	17	11	20	38	45	38	25	19	39	59	30	34	536
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	23	44	44	50	17	11	20	38	45	38	25	19	39	59	30	34	536

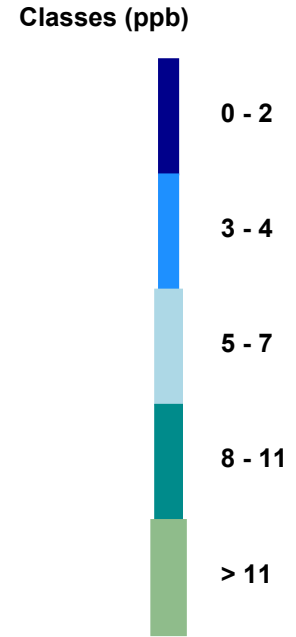
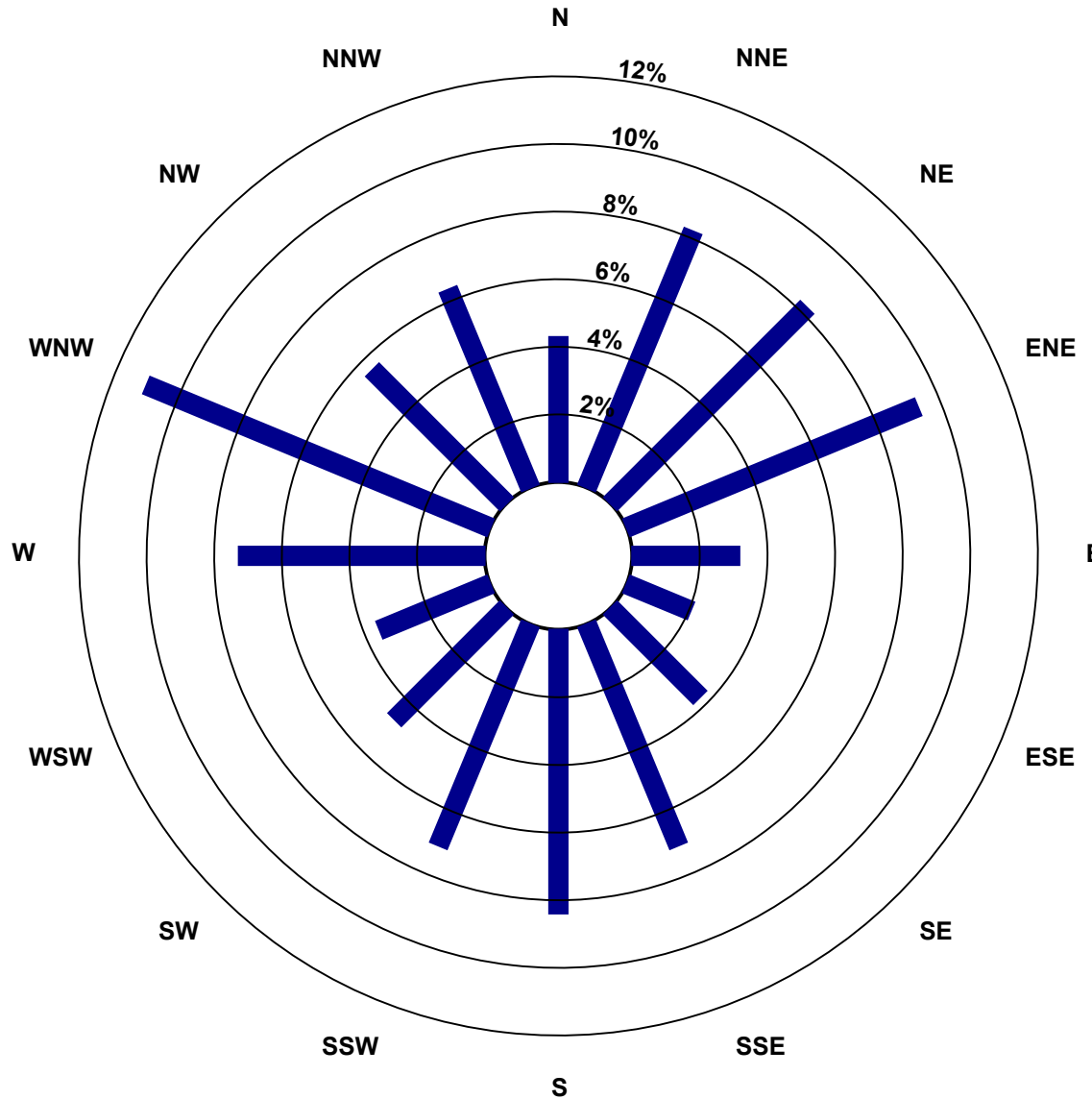
Total Number of Valid Hours: 536

Total Number of Hours: 720

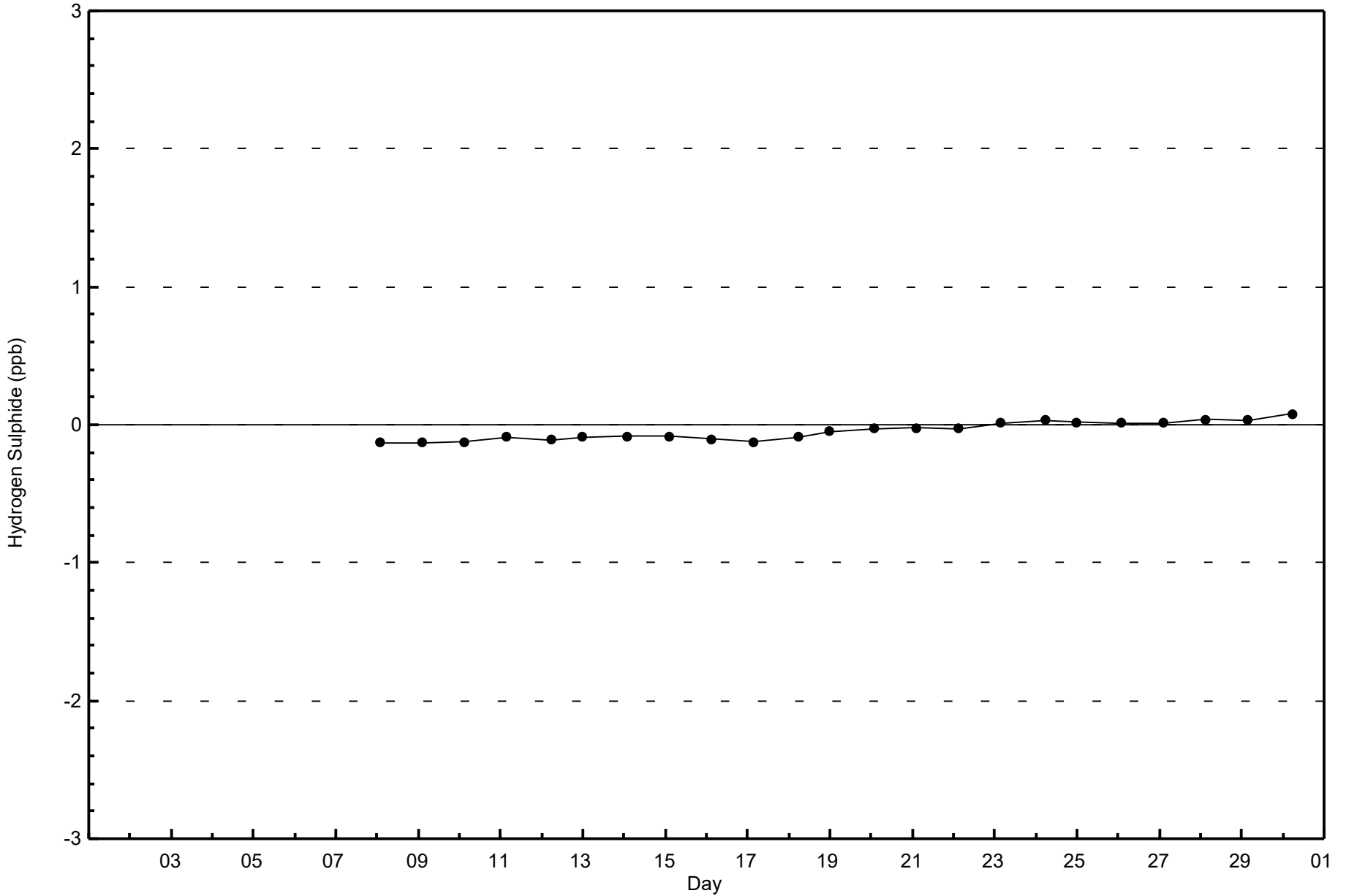


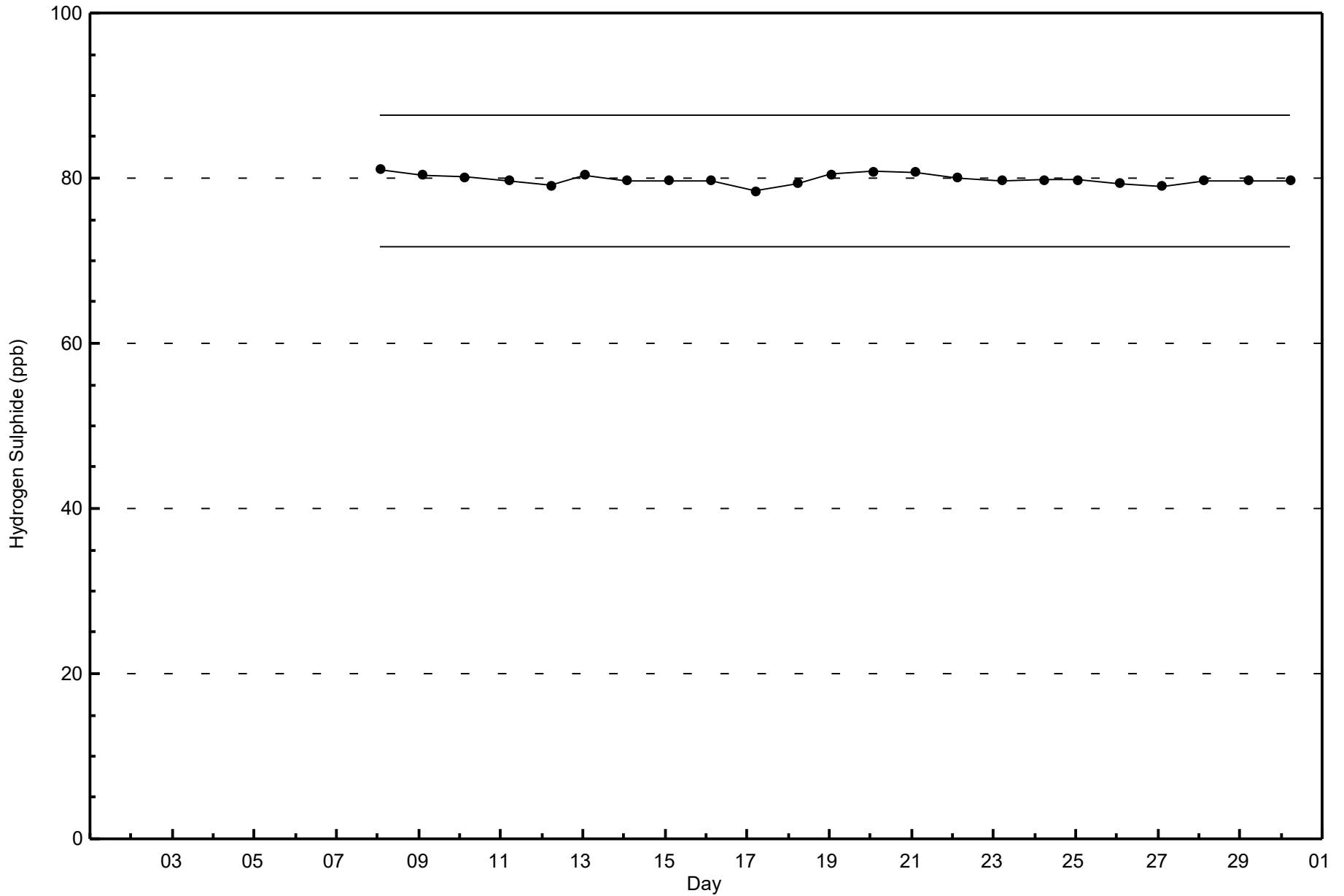
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Monday Creek



Total Number of Valid Hours: 536





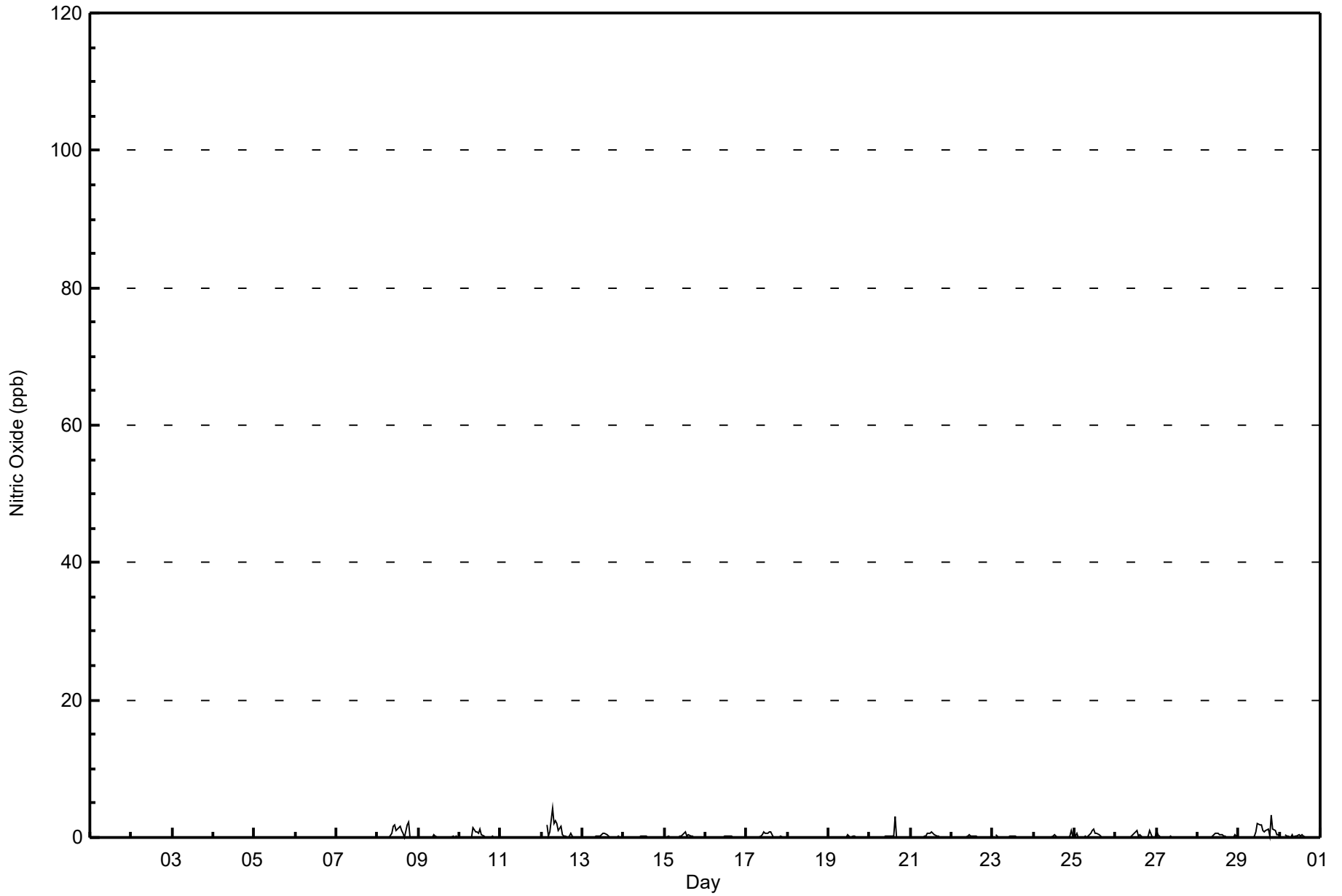


Maximum Value: 4.2 ppb on Nov 12 07:00		Maximum Daily Average: 0.8 ppb on Nov 12		Hours in Service: 564																							
Minimum Value: 0.0 ppb on Nov 14 20:00		Minimum Daily Average: 0.0 ppb on Nov 18		Hours of Data: 535																							
Maximum Diurnal Average: 0.5 ppb at hour 12		Minimum Diurnal Average: 0.0 ppb at hour 5		Hours of Missing Data: 29																							
Monthly Average: 0.20 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 0.6 P <sub>99</sub> = 2.0		Hours of Calibration: 29																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
2-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
3-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
4-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
5-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0	
8-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.6	1.6	1.9	1.1	1.4	1.7	1.1	0.6	0.1	1.8	2.1	0.0	0.0	0.0	0.0	0.0	0.6	2.1	
9-Nov	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.5	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.1	0.5	
10-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	1.4	0.9	0.7	0.5	1.2	0.4	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	1.4	
11-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	
12-Nov	0.0	0.0	Z	1.9	0.2	0.9	4.2	2.1	2.4	2.0	1.0	1.7	0.5	0.2	0.2	0.1	0.2	0.6	0.2	0.0	0.1	0.1	0.0	0.0	0.8	4.2	
13-Nov	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.4	0.6	0.5	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.6	
14-Nov	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
15-Nov	0.0	0.0	0.1	0.0	0.1	Z	0.0	0.0	0.0	0.2	0.3	0.5	0.7	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	
16-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	
17-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.7	0.7	0.7	0.8	0.9	0.3	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.9	
18-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
19-Nov	0.0	0.1	0.0	Z	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
20-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.3	0.2	0.2	0.3	0.3	3.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	3.0	
21-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.3	0.5	0.7	0.8	0.6	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	
22-Nov	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
23-Nov	0.1	Z	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
24-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	0.3	0.1	1.0	
25-Nov	0.2	0.6	0.0	Z	0.0	0.0	0.1	0.0	0.2	0.6	0.9	1.1	0.6	0.6	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.1	
26-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.4	0.7	0.9	0.3	0.4	0.2	0.0	0.0	0.0	0.2	1.0	0.1	0.0	0.0	0.2	1.0	
27-Nov	1.0	0.3	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	
28-Nov	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.4	0.7	0.5	0.5	0.5	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.4	0.0	0.2	0.7	
29-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	2.0	1.8	1.8	1.0	0.7	1.1	1.3	0.2	3.3	1.3	1.0	0.3	0.5	0.7	3.3	
30-Nov	0.2	0.0	Z	0.5	0.2	0.2	0.0	0.5	0.0	0.3	0.2	0.3	0.2	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	
																								Diurnal Average			
																								Diurnal Maximum			
0.1 0.1 0.0 0.1 0.0 0.1 0.2 0.1 0.2 0.4 0.4 0.5 0.5 0.4 0.3 0.3 0.1 0.2 0.1 0.2 0.1 0.1 0.1 0.0																								Diurnal Average			
																								1.0 0.6 0.4 1.9 0.2 0.9 4.2 2.1 2.4 2.0 1.9 2.0 1.8 1.8 1.1 3.0 1.1 1.8 2.1 3.3 1.3 1.0 1.0 0.5		Diurnal Maximum	
Z - zerspan C - Calibration NS - Not in Service																											



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Monday Creek - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Monday Creek - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	535	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 535

Total Number of Hours: 720





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Monday Creek - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 20	24	43	46	48	19	11	20	34	46	38	25	20	39	59	30	32	534
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	24	43	46	48	19	11	20	34	46	38	25	20	39	59	30	32	534

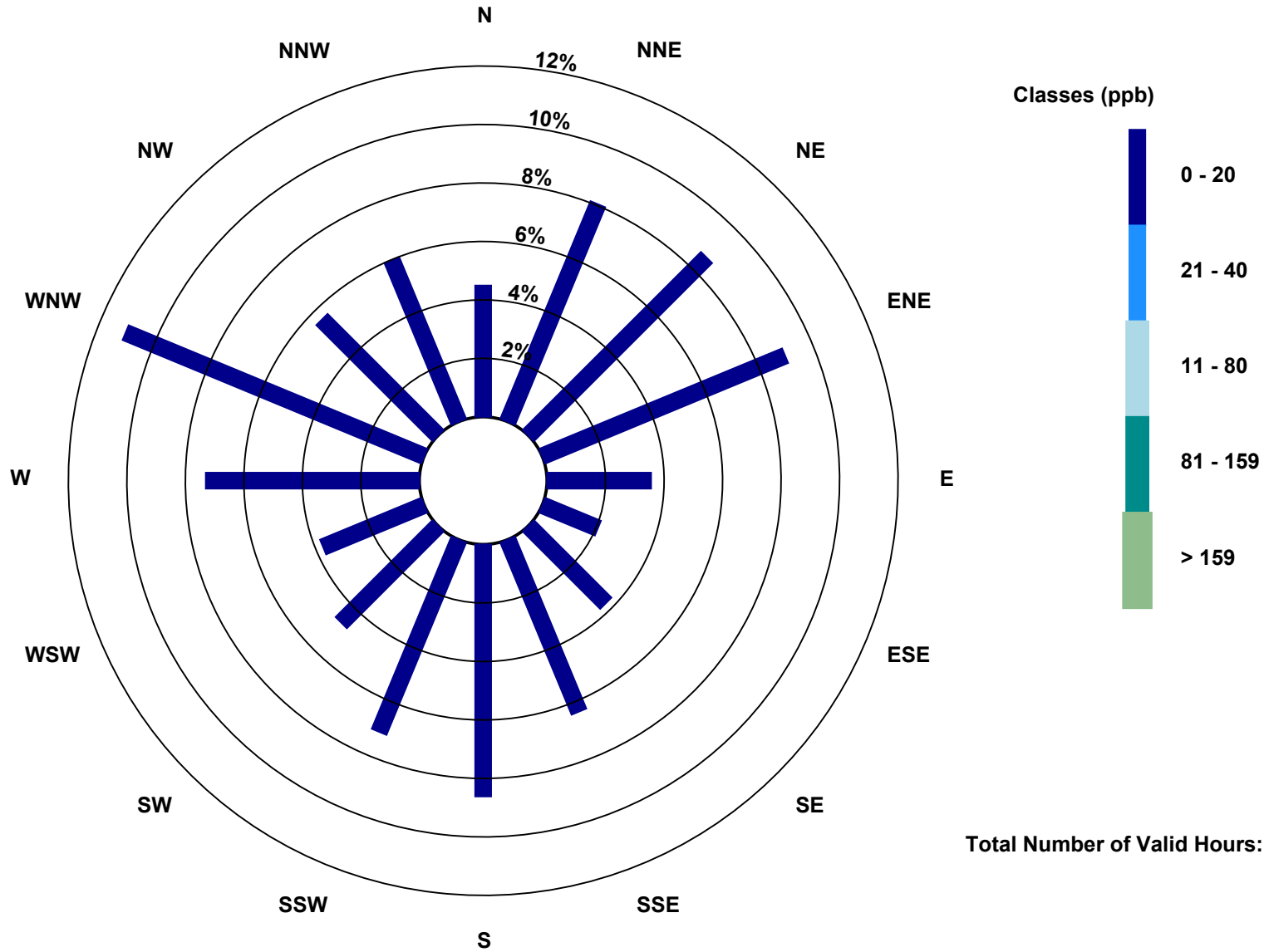
Total Number of Valid Hours: 534

Total Number of Hours: 720

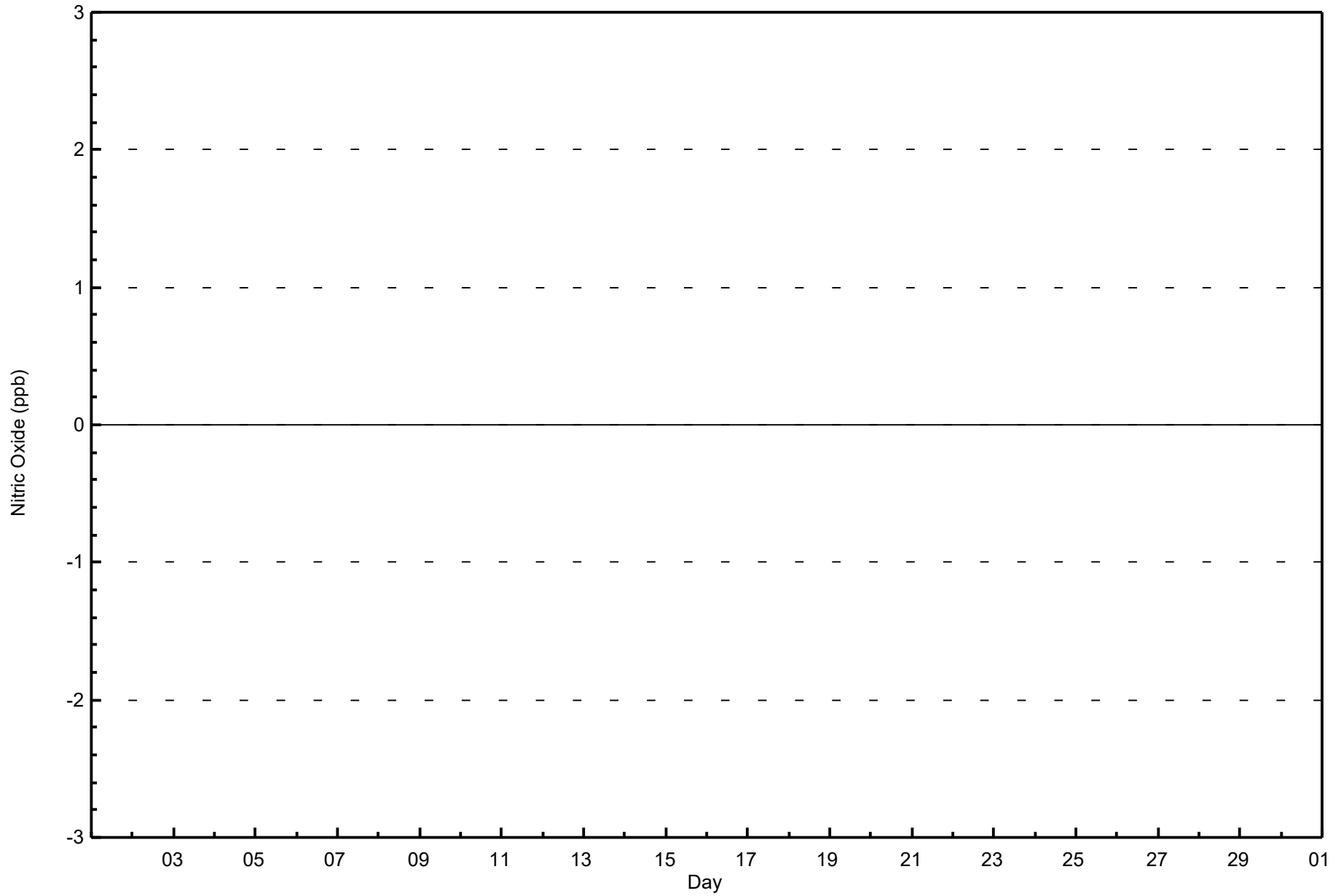


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitric Oxide (NO) - ppb  
Monday Creek



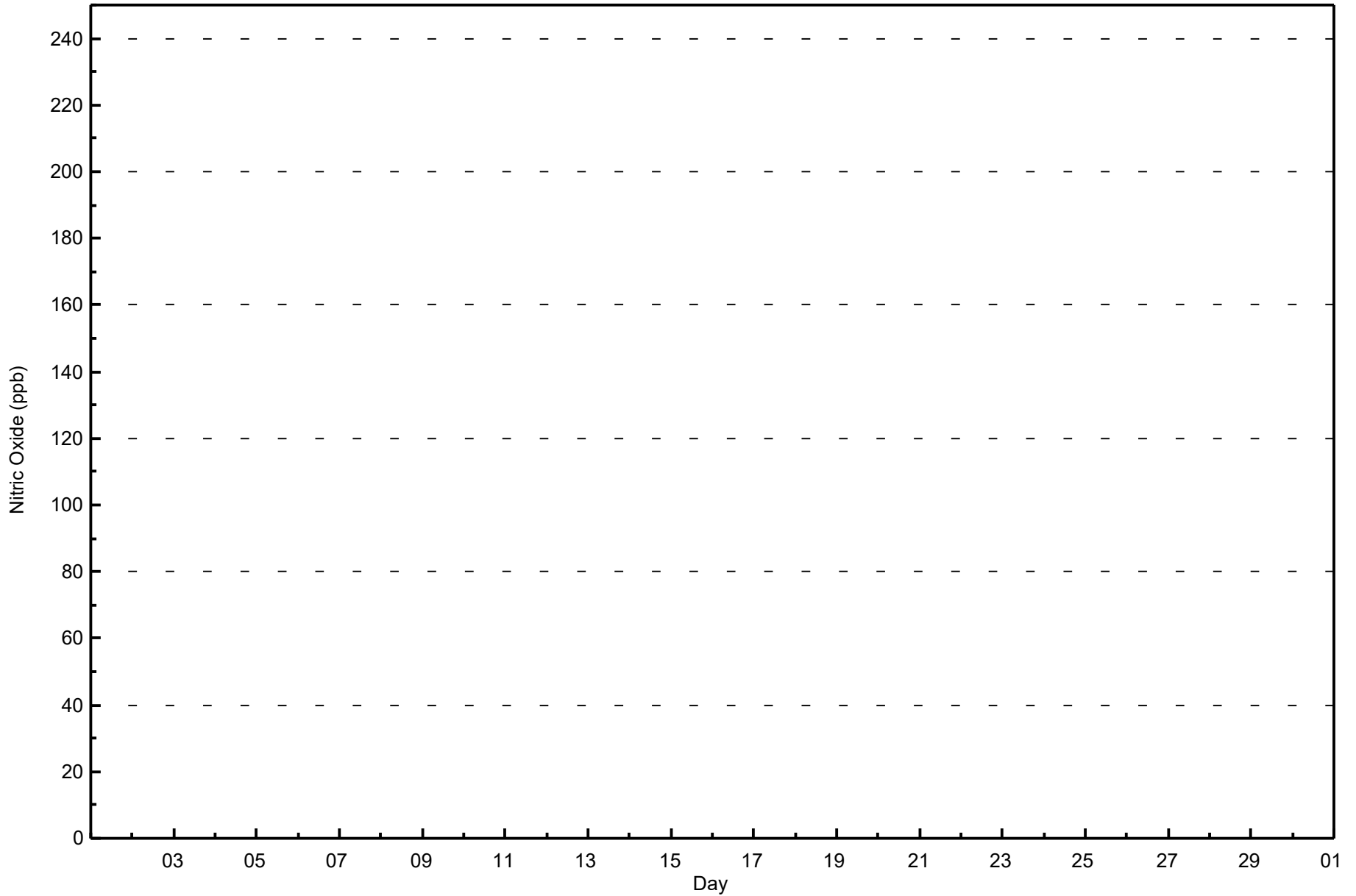
Total Number of Valid Hours: 534





**Wood Buffalo Environmental Association**  
**Span Responses**

**Nitric Oxide (NO) - ppb**  
**Monday Creek - November 2024**





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb

Monday Creek - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	564
Maximum Value: 13.2 ppb on Nov 29 18:00	Maximum Daily Average: 4.7 ppb on Nov 25		Hours of Data:	535
Minimum Value: 0.1 ppb on Nov 24 15:00	Minimum Daily Average: 0.6 ppb on Nov 27		Hours of Missing Data:	29
Maximum Diurnal Average: 3.1 ppb at hour 18	Minimum Diurnal Average: 1.4 ppb at hour 14		Hours of Calibration:	29
Monthly Average: 2.08 ppb	Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.8 Median = 1.6 Q <sub>3</sub> = 2.7 P <sub>90</sub> = 4.4 P <sub>99</sub> = 9.3		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
2-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
3-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
4-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
5-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	C	C	C	C	C	C	1.5	0.5	0.4	0.7	2.2	2.1	--	2.2
8-Nov	2.5	2.3	2.2	3.6	Z	4.4	3.3	2.8	4.7	5.3	4.6	5.8	4.9	4.7	4.5	6.0	5.8	6.1	8.9	5.4	2.6	0.6	0.4	3.5	4.1	8.9
9-Nov	4.6	0.6	0.5	0.5	0.6	Z	1.0	0.8	0.6	1.8	0.9	0.3	0.3	0.4	0.9	2.0	2.7	1.9	4.0	1.9	1.7	1.0	2.6	2.5	1.5	4.6
10-Nov	Z	1.5	1.8	2.0	1.3	1.9	4.9	3.9	7.5	3.0	2.0	1.5	2.8	1.2	0.9	1.6	3.4	5.4	2.3	3.0	2.0	1.8	2.4	3.2	2.7	7.5
11-Nov	3.0	Z	2.8	2.8	1.4	0.7	0.9	0.6	0.5	0.5	0.6	1.0	1.0	0.9	1.0	1.0	1.1	1.1	1.3	0.8	0.8	1.1	0.9	0.9	1.2	3.0
12-Nov	1.3	2.2	Z	5.1	3.0	3.7	8.3	6.9	6.5	4.8	2.5	3.1	1.5	1.0	0.9	1.0	4.4	8.8	3.3	1.4	3.5	1.8	0.7	0.8	3.3	8.8
13-Nov	1.3	0.7	0.9	Z	0.7	0.6	0.6	0.6	1.0	0.7	0.6	1.4	1.8	2.0	1.5	1.1	0.8	0.6	0.9	1.1	1.2	1.2	0.5	0.8	1.0	2.0
14-Nov	0.7	0.8	1.3	1.3	Z	0.7	0.8	0.8	0.9	0.6	0.9	0.7	0.6	0.8	0.7	0.6	1.1	0.9	0.7	0.4	0.3	0.3	0.5	0.4	0.7	1.3
15-Nov	0.2	0.5	1.2	0.6	0.9	Z	0.8	0.9	1.4	1.7	1.5	2.3	2.9	1.4	2.3	3.0	3.0	2.4	1.8	1.7	1.5	1.7	1.9	2.2	1.6	3.0
16-Nov	Z	2.7	2.1	1.4	1.2	1.1	1.4	1.0	0.9	0.6	0.8	1.3	1.5	1.7	2.1	2.5	2.4	2.5	2.6	2.7	2.5	2.4	1.9	1.7	1.8	2.7
17-Nov	2.1	Z	2.1	1.6	1.4	1.7	2.4	2.3	3.4	3.8	3.7	3.7	2.8	2.7	3.8	3.5	2.3	2.7	2.5	1.9	1.7	0.7	0.5	0.5	2.3	3.8
18-Nov	0.4	0.4	Z	0.5	0.4	0.5	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.5	0.6	0.5	0.3	0.4	0.8	2.1	2.5	2.2	0.7	2.5
19-Nov	2.1	2.5	1.7	Z	2.6	1.8	0.7	0.4	0.3	0.4	0.9	2.1	1.5	0.5	1.1	2.2	1.9	1.8	1.3	1.8	2.5	2.8	1.9	2.2	1.6	2.8
20-Nov	2.4	2.1	2.0	2.2	Z	2.2	2.1	2.0	1.9	1.8	1.1	0.6	0.7	1.0	1.2	2.0	1.5	1.9	3.4	4.3	4.3	3.7	3.3	2.9	2.2	4.3
21-Nov	2.5	1.8	2.2	2.5	2.6	Z	2.8	3.3	3.1	1.5	1.5	1.5	1.7	1.6	1.7	2.1	3.4	2.9	3.1	5.0	7.7	7.4	7.8	5.7	3.3	7.8
22-Nov	Z	2.3	1.2	0.7	0.5	0.5	0.7	0.9	1.6	0.8	0.8	0.5	0.6	0.7	0.7	1.2	3.7	4.1	4.0	6.1	6.5	5.4	5.0	2.1	6.5	
23-Nov	3.8	Z	4.4	3.1	2.8	2.4	1.7	0.7	0.9	1.1	1.1	1.1	1.0	1.5	1.1	1.1	1.3	1.1	0.9	1.3	0.2	0.2	0.3	1.4	1.5	4.4
24-Nov	1.0	0.3	Z	0.3	0.8	0.4	0.8	0.4	0.3	0.3	0.5	1.0	1.2	0.5	0.1	0.3	0.3	0.3	0.4	0.4	0.7	2.0	2.0	3.1	0.8	3.1
25-Nov	4.5	7.2	5.6	Z	6.2	10.1	11.0	4.0	2.8	3.1	2.3	2.1	1.5	1.6	1.8	2.4	3.1	5.1	7.7	7.2	5.4	5.3	4.8	4.3	4.7	11.0
26-Nov	3.9	3.4	3.0	3.1	Z	2.3	2.0	1.9	1.8	1.5	1.5	1.4	2.5	1.5	2.7	3.5	3.0	3.7	4.6	6.1	9.5	5.4	3.2	0.9	3.1	9.5
27-Nov	1.8	0.8	0.6	0.5	0.5	Z	0.6	0.6	1.0	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.5	0.8	0.6	0.7	0.6	0.6	0.6	0.6	1.8
28-Nov	Z	0.7	1.1	0.9	1.0	2.1	1.4	1.6	1.9	1.7	1.8	1.2	1.2	1.3	1.8	2.4	2.8	3.0	1.9	1.8	2.7	2.8	2.8	2.5	1.8	3.0
29-Nov	2.7	Z	1.7	1.0	0.7	0.5	0.5	0.7	0.6	1.0	2.5	3.9	3.6	3.8	3.2	6.2	8.2	13.2	13.1	11.2	5.9	4.2	2.3	2.3	4.0	13.2
30-Nov	1.6	0.6	Z	1.9	1.9	1.8	1.7	2.4	0.9	2.1	1.2	1.2	0.9	1.1	1.2	1.0	1.7	1.6	0.8	0.4	0.6	0.9	0.6	0.4	1.2	2.4

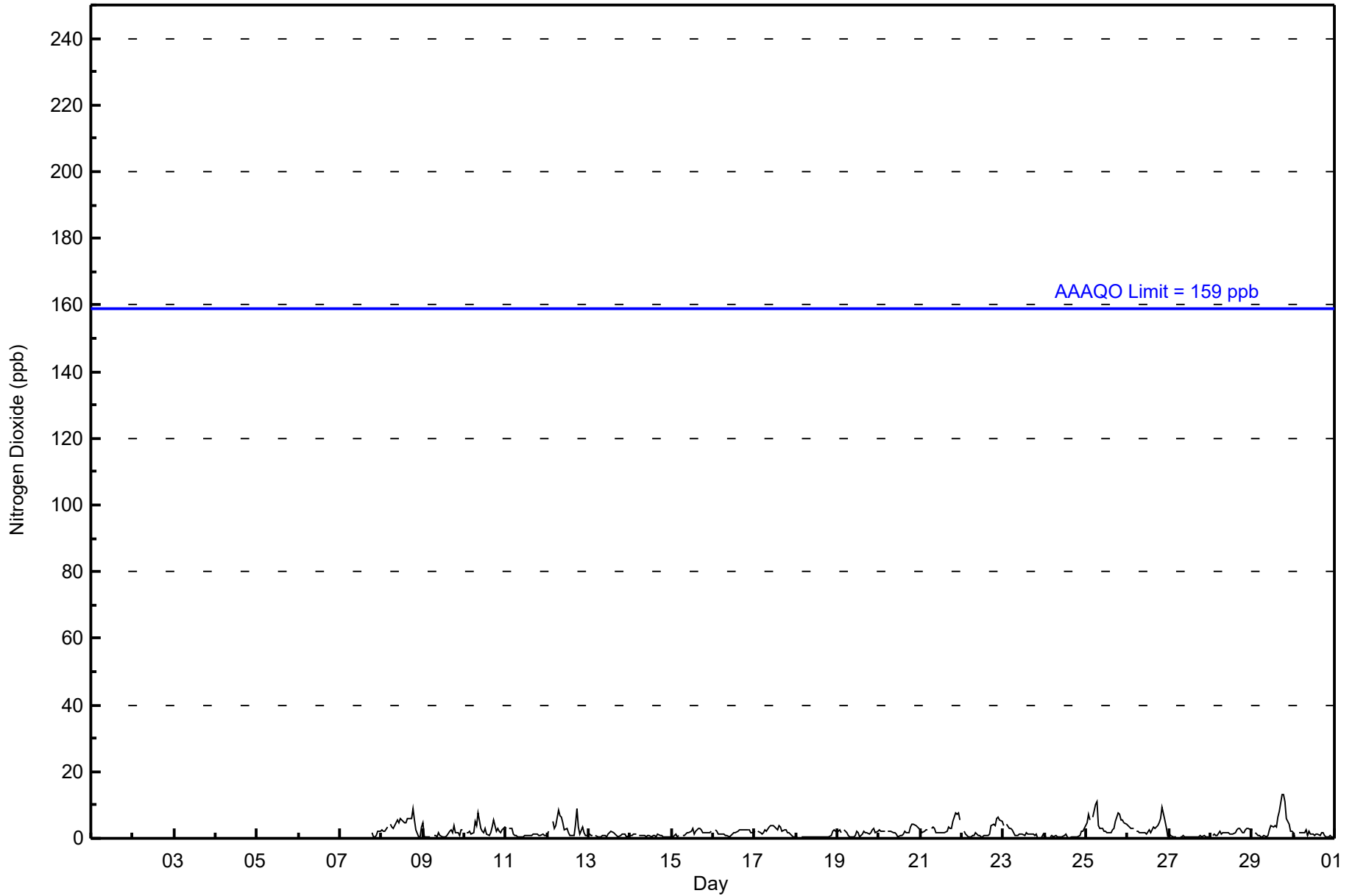
2.2	1.8	2.0	1.8	1.6	2.1	2.2	1.7	2.0	1.7	1.5	1.7	1.6	1.4	1.6	2.0	2.5	3.1	3.0	2.7	2.7	2.4	2.2	2.2	Diurnal Average	
4.6	7.2	5.6	5.1	6.2	10.1	11.0	6.9	7.5	5.3	4.6	5.8	4.9	4.7	4.5	6.2	8.2	13.2	13.1	11.2	9.5	7.4	7.8	5.7	Diurnal Maximum	

Z - zerospan      C - Calibration      NS - Not in Service  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association  
Hourly Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Monday Creek - November 2024





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Monday Creek - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	535	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 535  
Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Monday Creek - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	24	43	46	48	19	11	20	34	46	38	25	20	39	59	30	32	534
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	24	43	46	48	19	11	20	34	46	38	25	20	39	59	30	32	534

Total Number of Valid Hours: 534

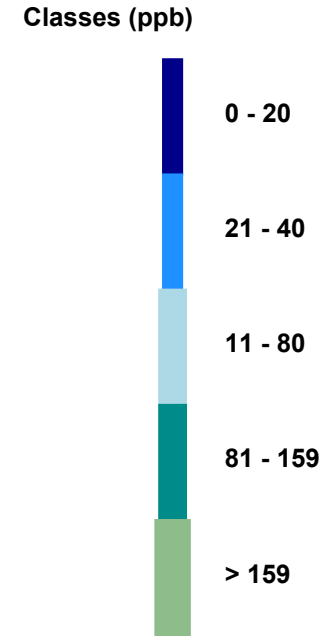
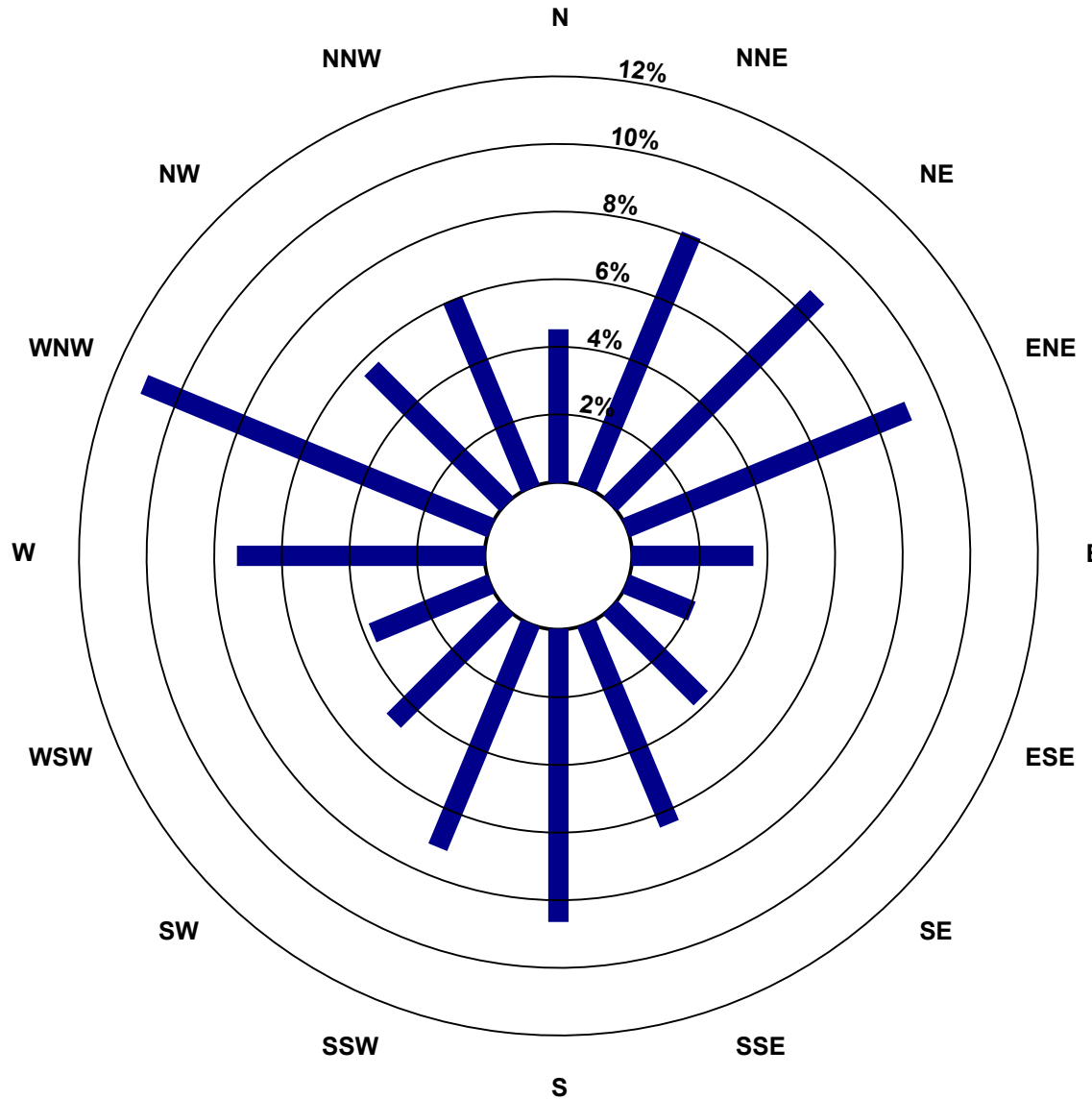
Total Number of Hours: 720



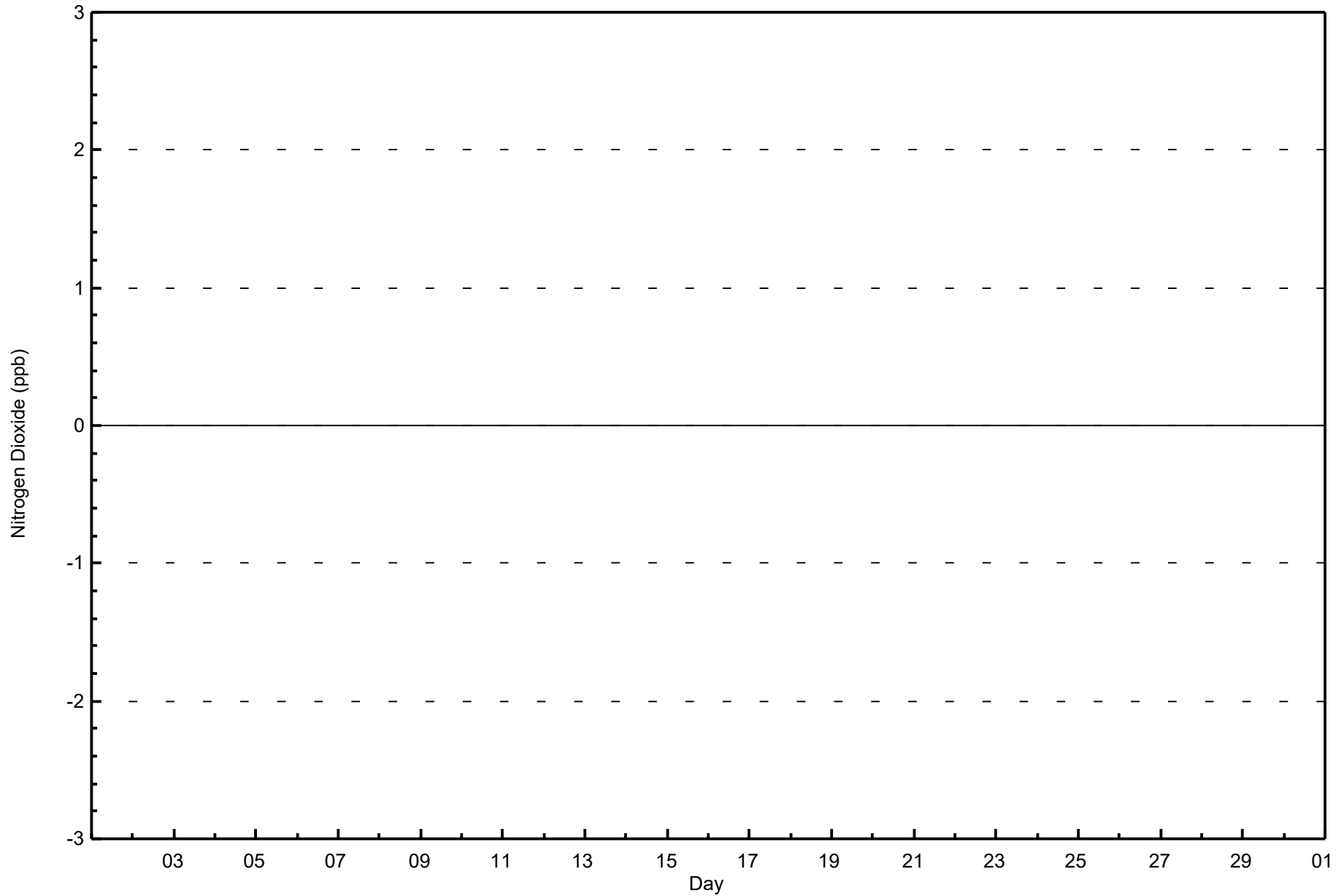


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Monday Creek



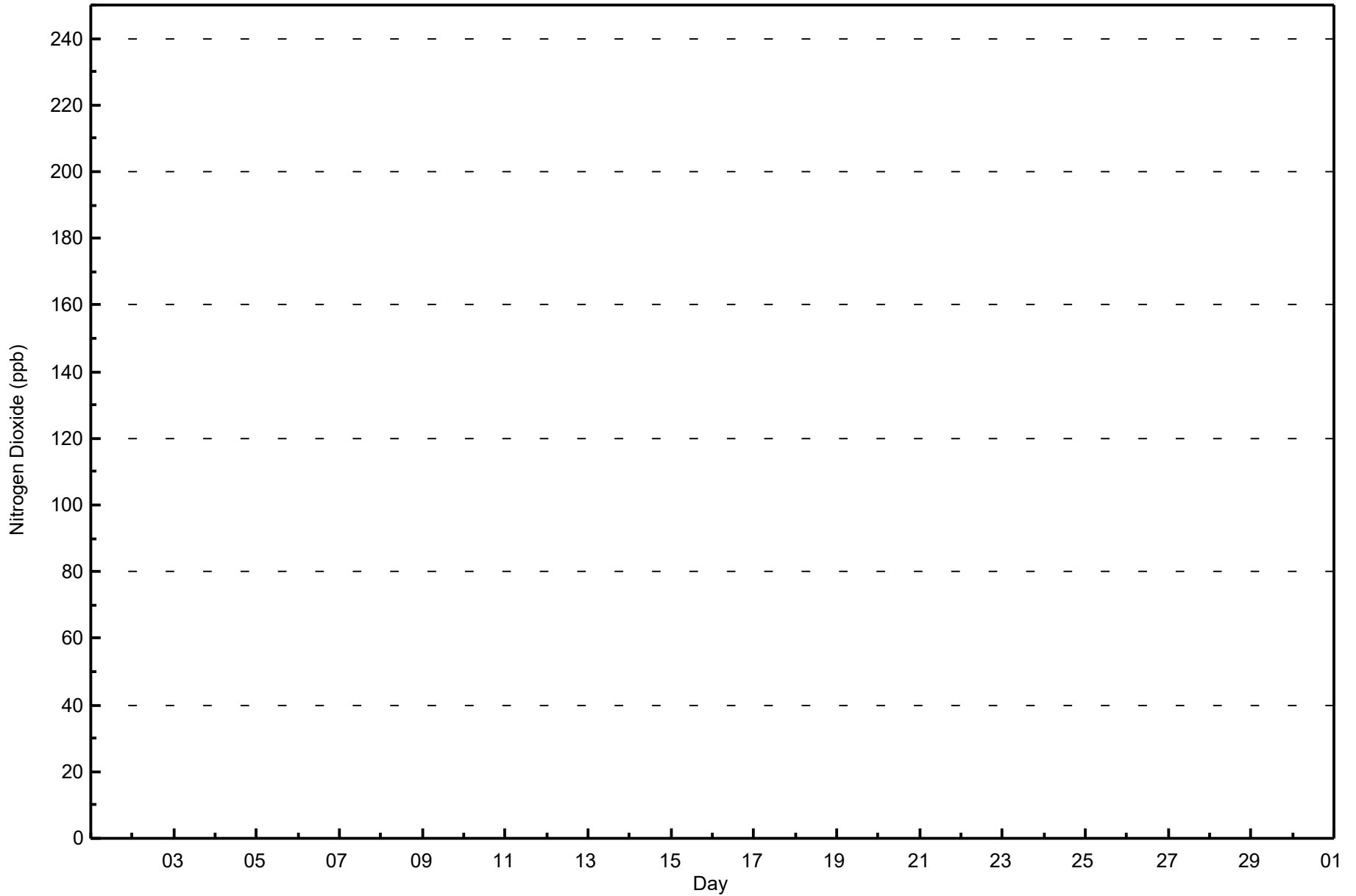
Total Number of Valid Hours: 534





**Wood Buffalo Environmental Association**  
**Span Responses**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Monday Creek - November 2024**





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Monday Creek - November 2024**

Maximum Value: 14.5 ppb on Nov 29 18:00	Maximum Daily Average: 5.0 ppb on Nov 25	Hours in Service: 564
Minimum Value: 0.1 ppb on Nov 24 15:00	Minimum Daily Average: 0.7 ppb on Nov 27	Hours of Data: 535
Maximum Diurnal Average: 3.3 ppb at hour 18	Minimum Diurnal Average: 1.6 ppb at hour 5	Hours of Missing Data: 29
Monthly Average: 2.27 ppb	Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.8 Median = 1.8 Q <sub>3</sub> = 2.8 P <sub>90</sub> = 4.9 P <sub>99</sub> = 10.8	Hours of Calibration: 29
		Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
2-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
3-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
4-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
5-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	C	C	C	C	C	C	1.5	0.5	0.4	0.7	2.2	2.1	--	2.2
8-Nov	2.5	2.3	2.2	3.6	Z	4.4	3.3	2.8	5.3	6.9	6.5	6.9	6.3	6.4	5.6	6.6	5.9	7.9	11.0	5.4	2.6	0.6	0.4	3.5	4.7	11.0
9-Nov	4.7	0.6	0.5	0.5	0.6	Z	1.0	0.8	0.7	2.3	1.1	0.4	0.3	0.4	1.0	2.1	2.7	1.9	4.0	1.9	1.8	1.0	2.9	2.5	1.6	4.7
10-Nov	Z	1.5	1.8	2.0	1.3	1.9	5.0	4.0	8.9	3.9	2.7	2.0	4.0	1.6	1.1	1.7	3.5	5.4	2.3	3.1	2.0	1.8	2.4	3.2	2.9	8.9
11-Nov	3.0	Z	2.8	2.8	1.4	0.7	0.9	0.6	0.5	0.5	0.6	1.1	1.1	1.0	1.0	1.1	1.1	1.3	0.8	0.8	1.2	0.9	0.9	1.2	3.0	
12-Nov	1.3	2.2	Z	7.0	3.2	4.6	12.5	9.0	8.9	6.8	3.5	4.8	2.0	1.2	1.1	1.1	4.6	9.4	3.5	1.4	3.6	1.9	0.7	0.8	4.1	12.5
13-Nov	1.4	0.7	0.9	Z	0.7	0.6	0.6	0.6	1.1	0.9	0.7	1.8	2.4	2.5	1.8	1.3	0.8	0.6	0.9	1.1	1.2	1.4	0.5	0.8	1.1	2.5
14-Nov	0.8	0.8	1.3	1.3	Z	0.7	0.8	0.8	1.0	0.7	1.1	1.0	0.7	1.0	0.8	0.7	1.2	0.9	0.7	0.4	0.3	0.3	0.5	0.4	0.8	1.3
15-Nov	0.2	0.5	1.3	0.6	1.0	Z	0.8	0.9	1.4	1.9	1.8	2.8	3.6	1.7	2.6	3.3	3.2	2.5	1.8	1.7	1.5	1.7	1.9	2.2	1.8	3.6
16-Nov	Z	2.7	2.1	1.4	1.2	1.1	1.4	1.0	0.9	0.6	0.9	1.5	1.7	1.9	2.3	2.6	2.4	2.5	2.6	2.7	2.5	2.4	1.9	1.7	1.8	2.7
17-Nov	2.1	Z	2.1	1.6	1.4	1.7	2.4	2.3	3.5	4.1	4.4	4.4	3.5	3.5	4.7	3.8	2.4	2.7	2.5	1.9	1.8	0.7	0.5	0.5	2.5	4.7
18-Nov	0.4	0.4	Z	0.5	0.4	0.5	0.3	0.3	0.4	0.5	0.5	0.4	0.3	0.4	0.4	0.5	0.6	0.5	0.3	0.4	0.8	2.1	2.5	2.2	0.7	2.5
19-Nov	2.1	2.6	1.7	Z	2.6	1.9	0.7	0.4	0.3	0.4	1.0	2.4	1.7	0.6	1.2	2.3	1.9	1.8	1.3	1.8	2.5	2.8	1.9	2.2	1.7	2.8
20-Nov	2.4	2.1	2.0	2.2	Z	2.2	2.1	2.0	2.0	2.0	1.4	0.8	0.9	1.3	1.5	5.0	1.6	1.9	3.4	4.3	4.3	3.7	3.3	2.9	2.4	5.0
21-Nov	2.5	1.8	2.2	2.5	2.6	Z	2.8	3.3	3.2	1.8	2.0	2.2	2.5	2.2	2.1	2.3	3.5	2.9	3.1	5.0	7.7	7.4	7.8	5.7	3.4	7.8
22-Nov	Z	2.3	1.2	0.7	0.5	0.5	0.7	0.9	1.7	1.0	1.1	0.7	0.9	0.9	0.8	0.7	1.2	3.7	4.1	4.0	6.1	6.5	5.4	5.0	2.2	6.5
23-Nov	3.9	Z	4.8	3.2	2.8	2.4	1.7	0.7	0.9	1.2	1.2	1.2	1.1	1.7	1.2	1.1	1.3	1.1	0.9	1.3	0.2	0.2	0.3	1.4	1.6	4.8
24-Nov	1.0	0.3	Z	0.3	0.8	0.4	0.8	0.4	0.3	0.3	0.6	1.2	1.5	0.6	0.1	0.3	0.3	0.3	0.4	0.4	0.7	2.2	3.0	3.4	0.9	3.4
25-Nov	4.7	7.8	5.6	Z	6.2	10.1	11.1	4.0	3.0	3.7	3.2	3.2	2.1	2.2	2.3	2.7	3.1	5.1	7.7	7.2	5.4	5.3	4.8	4.3	5.0	11.1
26-Nov	3.9	3.4	3.0	3.1	Z	2.3	2.0	1.9	1.9	1.7	1.9	2.1	3.4	1.8	3.1	3.7	3.0	3.7	4.6	6.3	10.5	5.5	3.2	0.9	3.3	10.5
27-Nov	2.8	1.1	0.6	0.5	0.5	Z	0.6	0.6	1.1	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.5	0.8	0.6	0.7	0.6	0.6	0.6	0.7	2.8
28-Nov	Z	0.7	1.1	0.9	1.0	2.2	1.4	1.6	2.0	2.1	2.5	1.7	1.7	1.8	2.2	2.6	2.9	3.1	1.9	1.8	2.7	2.8	3.2	2.5	2.0	3.2
29-Nov	2.7	Z	1.7	1.0	0.7	0.5	0.5	0.7	0.6	1.1	3.3	5.9	5.4	5.6	4.2	6.9	9.3	14.5	13.3	14.5	7.2	5.2	2.6	2.8	4.8	14.5
30-Nov	1.8	0.6	Z	2.4	2.1	2.0	1.7	2.9	0.9	2.4	1.4	1.5	1.1	1.4	1.4	1.1	1.8	1.6	0.8	0.4	0.6	0.9	0.6	0.4	1.4	2.9

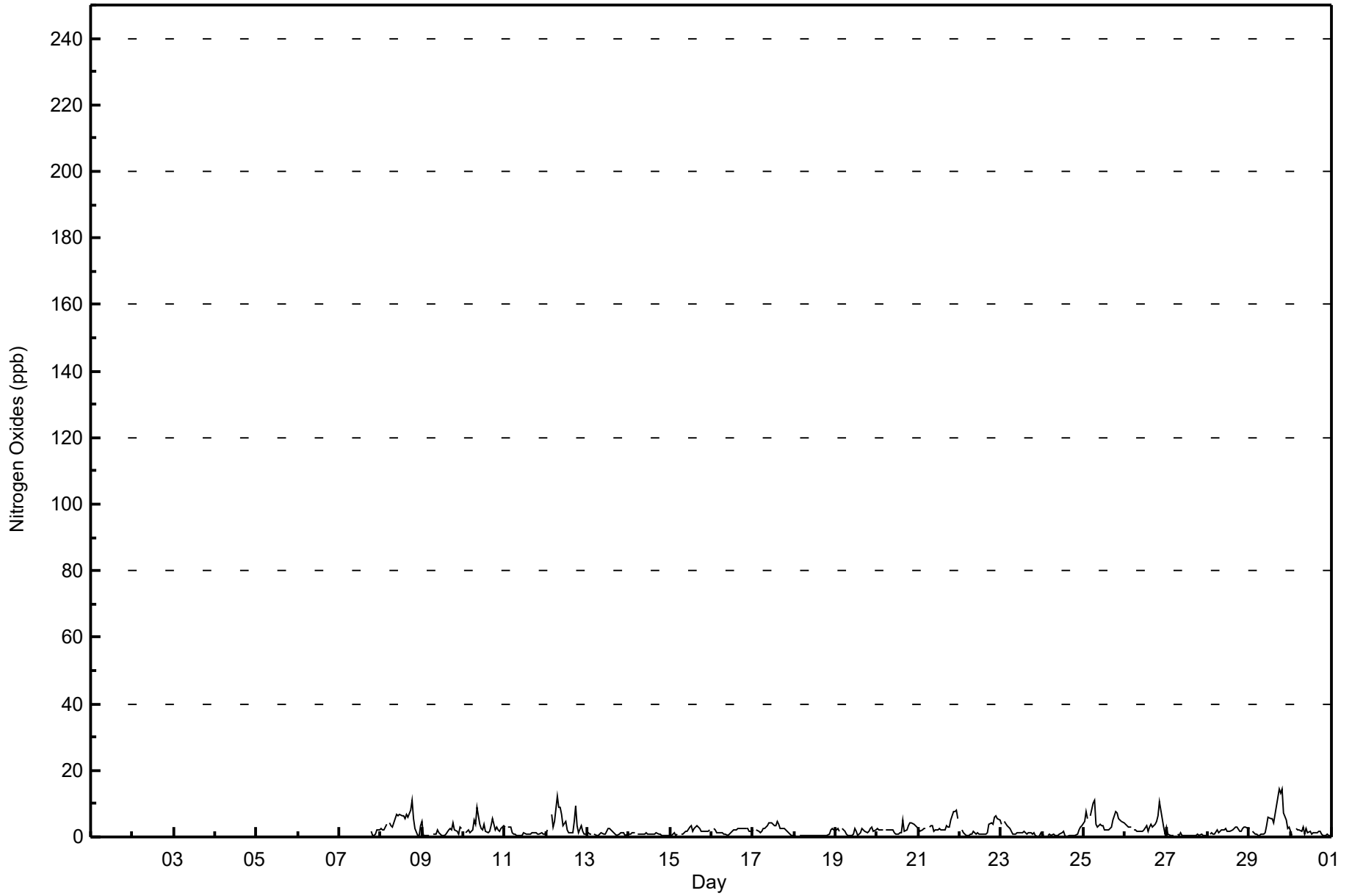
2.3	1.8	2.0	1.9	1.6	2.2	2.4	1.8	2.2	2.1	1.9	2.2	2.1	1.8	1.9	2.3	2.6	3.3	3.1	2.9	2.8	2.5	2.2	2.2	Diurnal Average	
4.7	7.8	5.6	7.0	6.2	10.1	12.5	9.0	8.9	6.9	6.5	6.9	6.3	6.4	5.6	6.9	9.3	14.5	13.3	14.5	10.5	7.4	7.8	5.7	Diurnal Maximum	

Z - zerspan      C - Calibration      NS - Not in Service



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Monday Creek - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Monday Creek - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	535	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 535

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Monday Creek - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	24	43	46	48	19	11	20	34	46	38	25	20	39	59	30	32	534
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	24	43	46	48	19	11	20	34	46	38	25	20	39	59	30	32	534

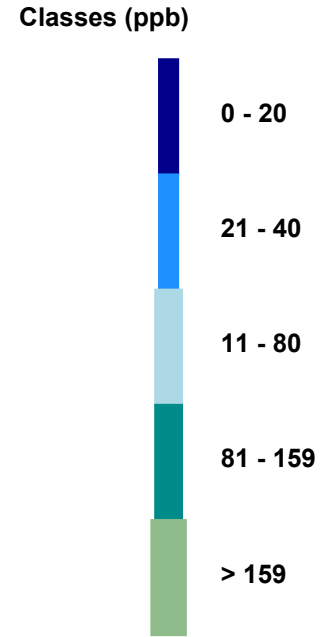
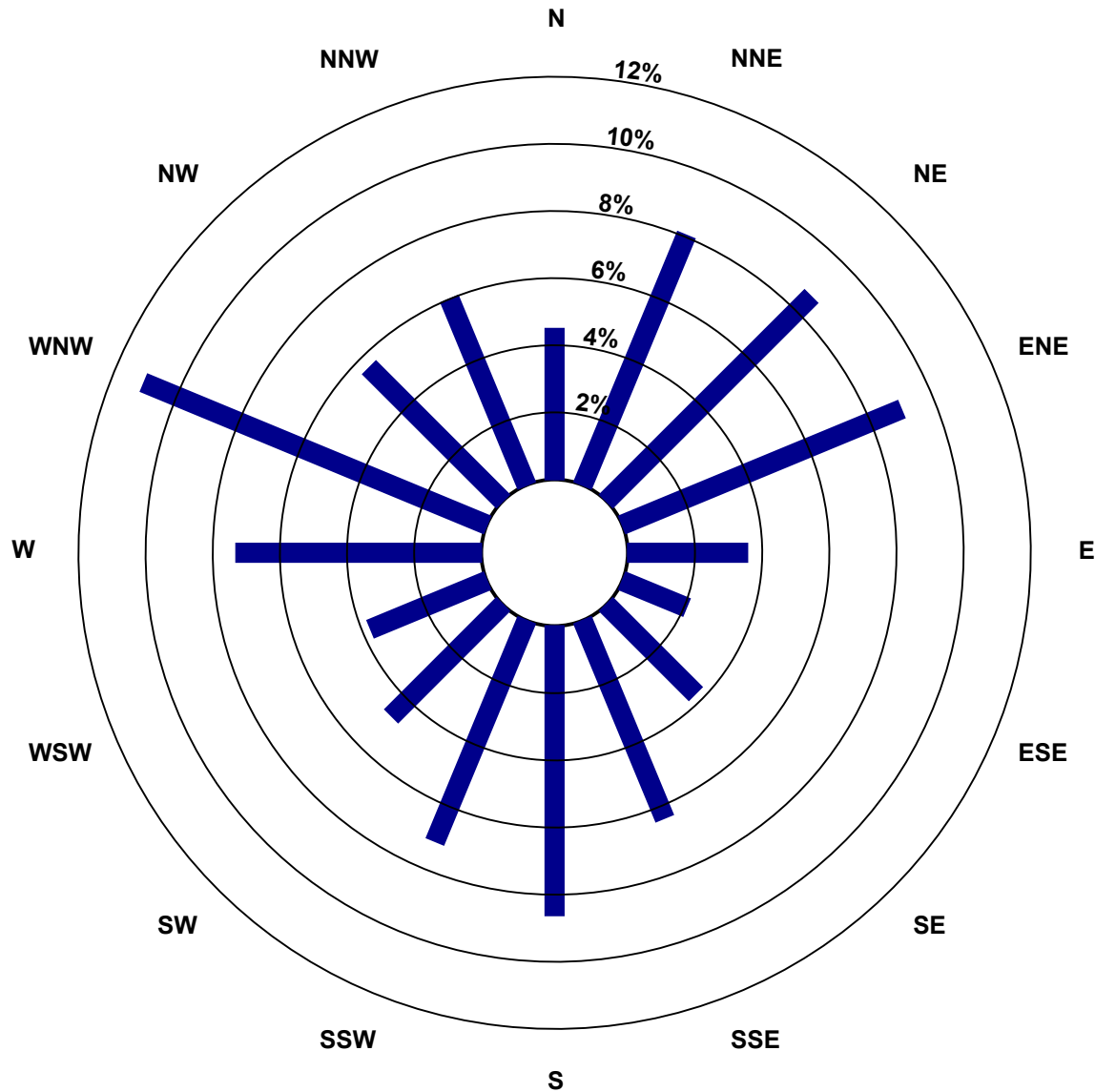
Total Number of Valid Hours: 534

Total Number of Hours: 720



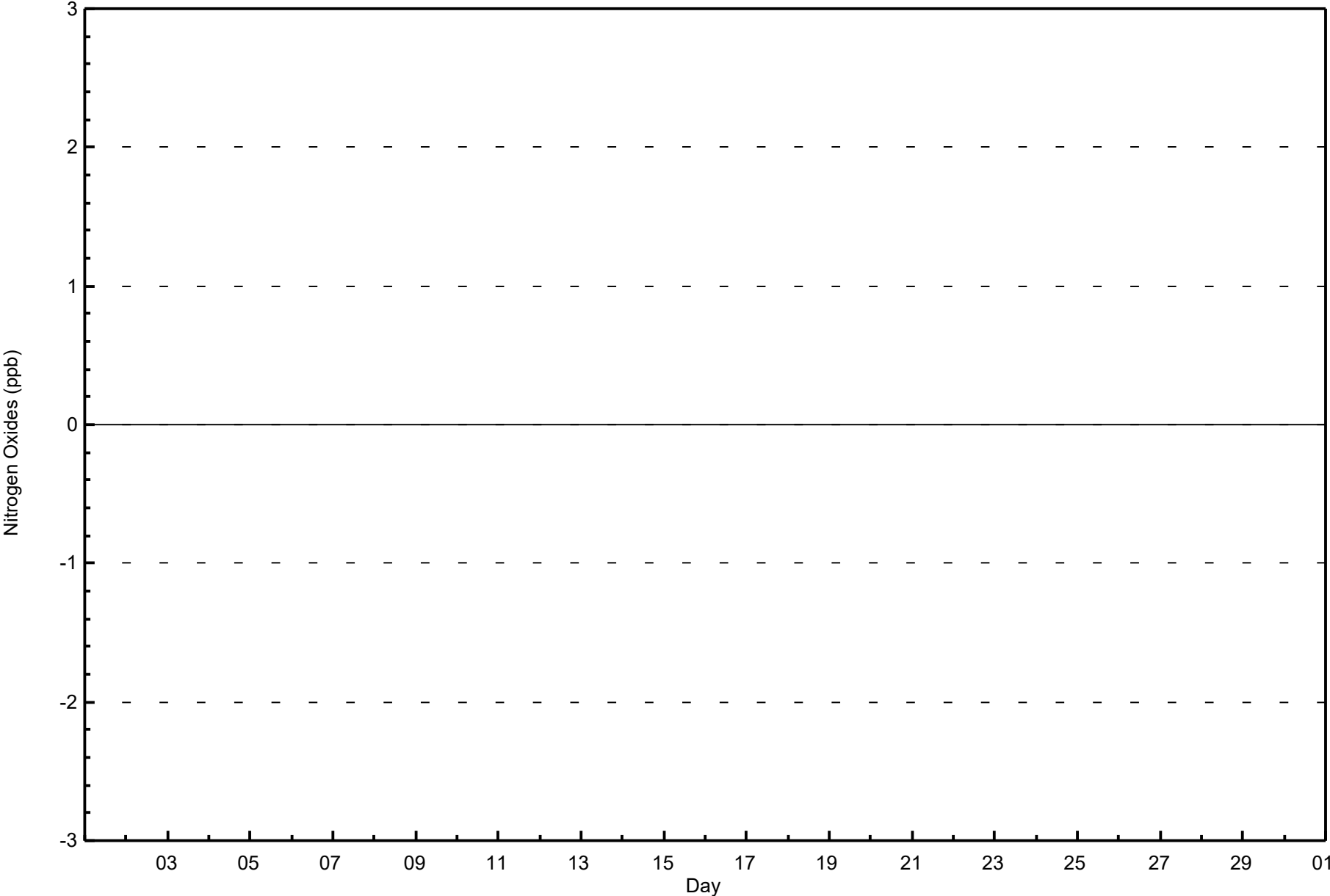
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Monday Creek



Total Number of Valid Hours: 534

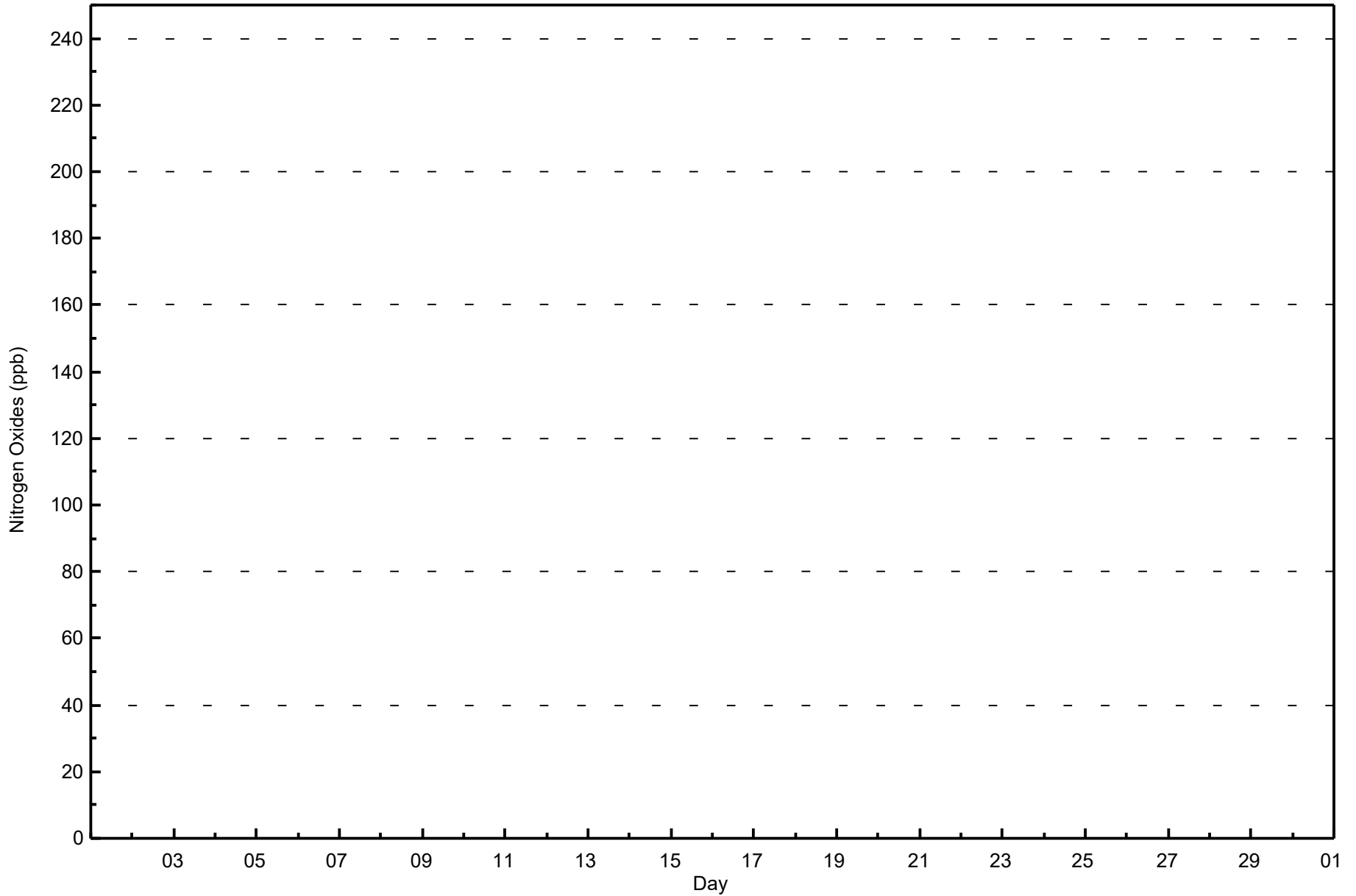






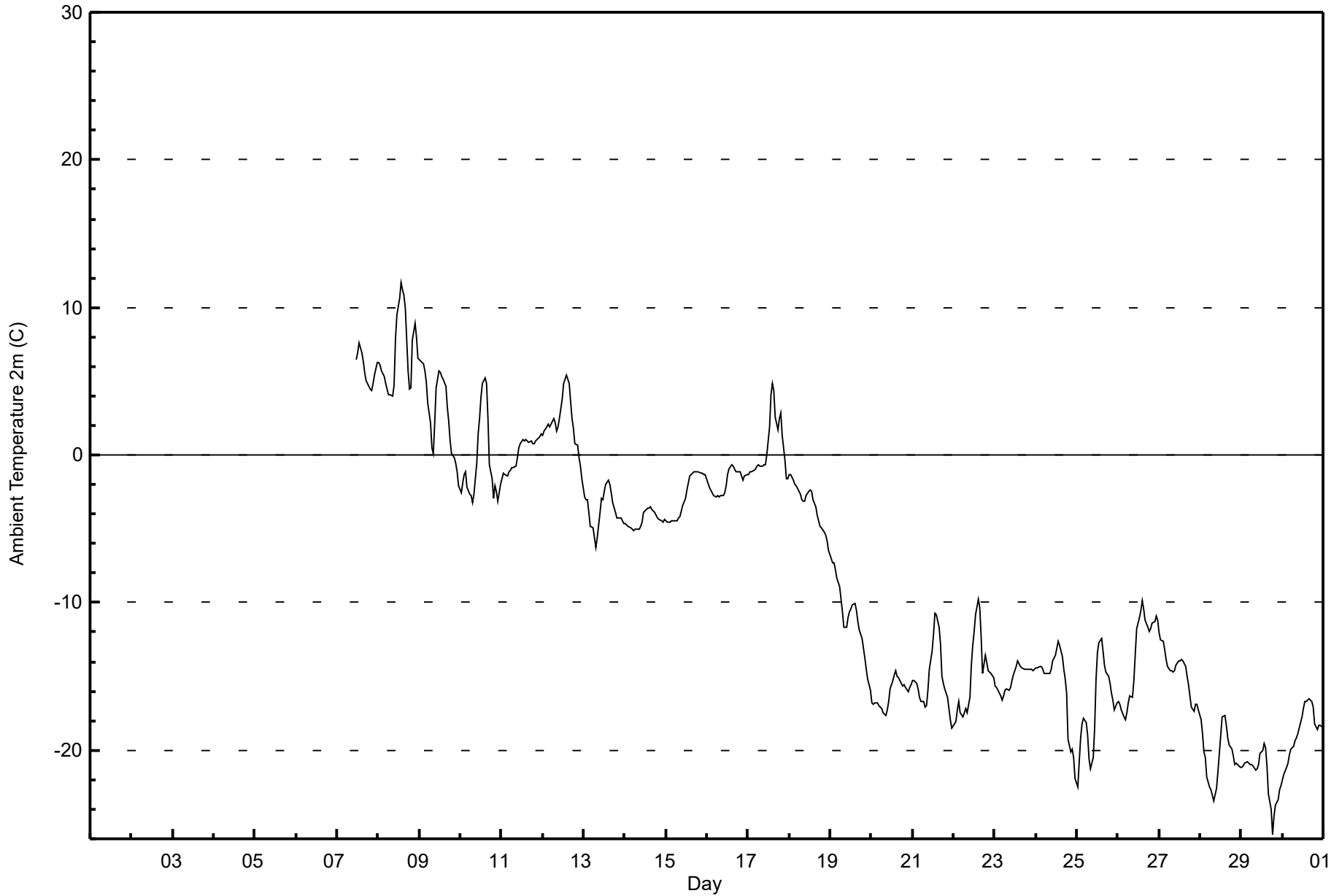
**Wood Buffalo Environmental Association**  
**Span Responses**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Monday Creek - November 2024**





Maximum Value: 11.7 C on Nov 8 14:00																				Maximum Daily Average: 7.0 C on Nov 8					Hours in Service: 565			
Minimum Value: -25.7 C on Nov 29 19:00																				Minimum Daily Average: -21.7 C on Nov 29					Hours of Data: 565			
Maximum Diurnal Average: -5.6 C at hour 15																				Minimum Diurnal Average: -10.0 C at hour 9					Hours of Missing Data: 0			
Monthly Average: -8.27 C																				Percentiles: P <sub>1</sub> = -23.2 P <sub>10</sub> = -19.5 Q <sub>1</sub> = -16.0 Median = -8.9 Q <sub>3</sub> = -1.2 P <sub>90</sub> = 4.0 P <sub>99</sub> = 9.1					Hours of Calibration: 0			
																									Percent Operational Time: 100.0			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
2-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
3-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
4-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
5-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	6.4	6.9	7.6	6.9	6.4	5.6	5.0	4.7	4.5	4.3	4.8	5.5	6.3	--	7.6		
8-Nov	6.3	6.1	5.7	5.3	4.8	4.5	4.1	4.1	4.0	4.8	7.9	9.5	10.7	11.7	11.2	10.9	9.9	5.7	4.4	4.5	7.8	8.9	8.0	6.5	7.0	11.7		
9-Nov	6.5	6.4	6.2	5.7	4.9	3.5	2.2	0.5	0.1	2.2	4.6	5.7	5.6	5.4	5.2	4.7	3.2	2.3	1.0	0.1	-0.1	-0.6	-1.1	-2.1	3.0	6.5		
10-Nov	-2.5	-1.9	-1.3	-1.2	-2.1	-2.7	-2.8	-3.2	-2.7	-0.5	1.4	2.5	3.9	4.8	5.2	4.8	2.5	-0.6	-1.6	-2.9	-2.1	-2.5	-3.1	-2.0	-0.4	5.2		
11-Nov	-1.6	-1.3	-1.3	-1.4	-1.2	-1.0	-0.8	-0.8	-0.8	-0.2	0.5	0.8	1.1	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.9	1.1	1.2	1.4	0.1	1.4		
12-Nov	1.3	1.6	1.9	2.1	1.9	2.1	2.5	2.2	1.7	1.9	2.4	3.8	4.8	5.1	5.4	4.9	3.6	2.4	1.9	0.8	0.7	-0.2	-0.8	-1.6	2.2	5.4		
13-Nov	-2.9	-3.0	-3.0	-3.9	-4.8	-4.9	-5.6	-6.2	-5.6	-3.9	-2.9	-3.1	-2.5	-2.0	-1.7	-2.0	-2.6	-3.2	-3.9	-4.3	-4.3	-4.2	-4.3	-4.6	-3.7	-1.7		
14-Nov	-4.7	-4.7	-4.9	-4.9	-5.0	-5.1	-5.1	-5.0	-5.0	-4.9	-4.5	-3.9	-3.7	-3.6	-3.6	-3.5	-3.6	-3.9	-4.1	-4.3	-4.4	-4.5	-4.6	-4.4	-4.4	-3.5		
15-Nov	-4.4	-4.6	-4.6	-4.4	-4.5	-4.5	-4.4	-4.3	-4.2	-3.8	-3.4	-2.9	-2.3	-1.9	-1.5	-1.2	-1.1	-1.1	-1.1	-1.2	-1.2	-1.3	-1.4	-1.4	-2.8	-1.1		
16-Nov	-1.9	-2.2	-2.4	-2.5	-2.8	-2.9	-2.8	-2.8	-2.8	-2.7	-2.6	-2.0	-1.3	-0.9	-0.7	-0.7	-1.0	-1.1	-1.2	-1.1	-1.5	-1.7	-1.4	-1.3	-1.8	-0.7		
17-Nov	-1.3	-1.1	-1.1	-1.0	-0.9	-0.8	-0.7	-0.8	-0.8	-0.7	-0.6	0.0	1.9	4.1	4.8	4.4	2.6	1.7	2.5	2.9	1.3	-0.4	-1.6	-1.6	0.5	4.8		
18-Nov	-1.4	-1.3	-1.7	-2.0	-2.0	-2.3	-2.7	-3.0	-3.1	-3.1	-2.7	-2.5	-2.4	-2.4	-3.0	-3.5	-4.1	-4.5	-4.8	-4.9	-5.2	-5.4	-5.8	-6.4	-3.3	-1.3		
19-Nov	-7.0	-7.3	-7.3	-7.8	-8.4	-8.9	-9.8	-10.6	-11.7	-11.7	-11.0	-10.7	-10.4	-10.2	-10.1	-10.5	-11.3	-11.9	-12.4	-13.1	-13.7	-14.6	-15.2	-16.0	-10.9	-7.0		
20-Nov	-16.8	-16.9	-16.8	-16.8	-17.0	-17.1	-17.2	-17.4	-17.6	-17.2	-16.7	-15.9	-15.3	-14.9	-14.6	-15.0	-15.1	-15.5	-15.6	-15.6	-15.8	-16.0	-15.8	-15.6	-16.2	-14.6		
21-Nov	-15.2	-15.2	-15.5	-15.8	-16.4	-16.7	-16.7	-17.1	-17.0	-16.0	-14.5	-13.2	-12.2	-10.7	-10.8	-11.7	-12.8	-15.0	-15.5	-15.8	-16.4	-17.2	-17.9	-18.5	-15.2	-10.7		
22-Nov	-18.2	-18.0	-17.3	-16.7	-17.4	-17.7	-17.5	-17.2	-17.4	-16.4	-14.2	-12.9	-12.0	-10.8	-9.8	-10.3	-12.4	-14.8	-13.6	-14.1	-14.6	-14.7	-14.8	-15.1	-14.9	-9.8		
23-Nov	-15.6	-15.8	-15.9	-16.3	-16.6	-16.3	-16.0	-15.8	-15.9	-15.7	-15.3	-14.9	-14.3	-14.0	-14.1	-14.3	-14.4	-14.5	-14.5	-14.5	-14.5	-14.5	-14.5	-14.6	-15.1	-14.0		
24-Nov	-14.4	-14.5	-14.3	-14.4	-14.5	-14.8	-14.8	-14.8	-14.8	-14.5	-14.0	-13.5	-13.1	-12.6	-12.9	-13.7	-14.5	-15.1	-16.1	-19.3	-20.1	-19.9	-20.5	-22.0	-15.5	-12.6		
25-Nov	-22.5	-20.8	-19.1	-18.2	-17.8	-18.2	-19.0	-20.5	-21.3	-20.5	-18.5	-15.2	-13.4	-12.7	-12.4	-13.2	-14.2	-14.7	-15.0	-15.5	-16.1	-16.6	-17.3	-16.8	-17.1	-12.4		
26-Nov	-16.7	-16.9	-17.3	-17.8	-17.9	-17.4	-16.8	-16.3	-16.4	-15.3	-13.4	-11.8	-11.0	-10.5	-9.9	-10.4	-11.2	-11.7	-12.0	-11.8	-11.4	-11.3	-10.9	-11.2	-13.6	-9.9		
27-Nov	-12.0	-12.5	-12.6	-13.2	-13.8	-14.3	-14.6	-14.6	-14.7	-14.6	-14.2	-14.0	-13.9	-13.8	-14.0	-14.3	-15.0	-15.5	-16.3	-17.1	-17.3	-16.9	-16.9	-17.3	-14.7	-12.0		
28-Nov	-17.9	-18.8	-20.1	-20.5	-21.8	-22.5	-22.7	-23.1	-23.5	-22.6	-21.4	-20.2	-19.0	-17.8	-17.7	-18.4	-19.2	-19.7	-19.9	-20.4	-21.0	-20.9	-21.0	-21.1	-20.5	-17.7		
29-Nov	-21.2	-21.0	-20.8	-20.8	-20.9	-21.0	-21.0	-21.1	-21.3	-21.2	-20.9	-20.2	-20.0	-19.5	-19.8	-21.1	-23.0	-24.0	-25.7	-24.5	-23.8	-23.3	-22.7	-22.4	-21.7	-19.5		
30-Nov	-22.0	-21.6	-21.2	-20.9	-20.3	-19.9	-19.8	-19.4	-19.1	-18.9	-18.5	-17.8	-17.2	-16.7	-16.7	-16.5	-16.6	-16.7	-17.1	-18.3	-18.6	-18.3	-18.3	-18.4	-18.7	-16.5		
																								Diurnal Average				
																								Diurnal Maximum				
NS - Not in Service																												





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Monday Creek - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	50	8.85	8.85
-20 - 0	407	72.04	80.89
0 - 10	104	18.41	99.29
10 - 20	4	0.71	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 565

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Relative Humidity 2m (RH2) - %**  
**Monday Creek - November 2024**

Maximum Value: 96.5 % on Nov 11 21:00	Maximum Daily Average: 89.5 % on Nov 15	Hours in Service: 564
Minimum Value: 44.0 % on Nov 9 12:00	Minimum Daily Average: 65.4 % on Nov 8	Hours of Data: 564
Maximum Diurnal Average: 83.2 % at hour 8	Minimum Diurnal Average: 69.0 % at hour 15	Hours of Missing Data: 0
Monthly Average: 78.54 %	Percentiles: P <sub>1</sub> = 45.9 P <sub>10</sub> = 65.8 Q <sub>1</sub> = 74.9 Median = 80.7 Q <sub>3</sub> = 83.8 P <sub>90</sub> = 88.7 P <sub>99</sub> = 96.0	Hours of Calibration: 0
		Percent Operational Time: 100.0

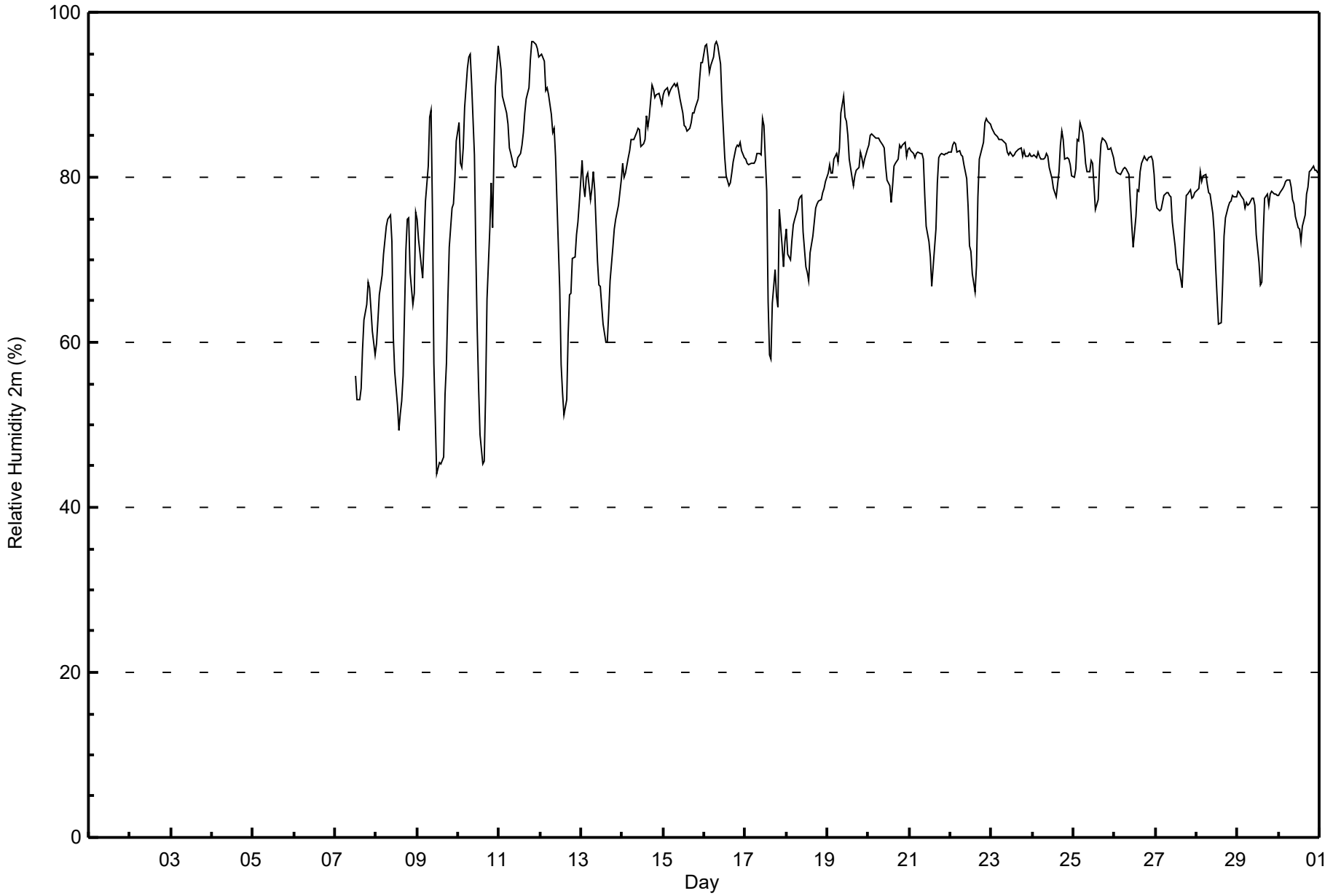
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
2-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
3-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
4-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
5-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	56.0	53.1	53.0	54.3	59.1	62.7	64.5	67.3	66.6	64.1	61.4	58.4	--	67.3
8-Nov	59.8	62.7	65.8	68.1	70.7	72.4	74.1	74.9	75.4	72.2	60.6	56.4	52.3	49.4	51.3	52.8	56.0	71.2	74.9	75.0	68.4	64.5	66.0	75.8	65.4	75.8
9-Nov	74.8	72.6	69.3	67.8	72.5	77.1	81.4	87.2	88.1	75.8	57.4	44.0	44.7	45.5	45.2	46.1	53.7	57.4	65.0	71.6	76.3	76.7	79.7	84.4	67.3	88.1
10-Nov	86.6	81.7	81.3	83.6	88.4	93.2	94.6	95.0	91.4	82.6	71.0	61.6	54.4	48.7	45.2	45.6	53.8	65.2	73.7	79.3	73.9	83.3	91.1	95.9	75.9	95.9
11-Nov	94.5	93.0	89.9	88.5	87.9	86.4	83.6	82.9	81.3	81.2	81.3	82.4	82.8	83.9	85.4	87.9	89.5	90.8	94.2	96.4	96.5	96.1	95.6	94.5	88.6	96.5
12-Nov	94.8	94.8	94.1	90.6	90.8	90.0	87.6	85.4	85.9	82.6	77.1	66.4	57.3	54.0	51.2	53.0	60.9	65.7	65.9	70.1	70.3	73.1	74.6	76.9	75.5	94.8
13-Nov	82.0	79.1	77.7	80.0	80.4	77.2	78.7	80.7	78.4	69.9	67.0	66.9	64.3	62.2	60.0	60.1	63.5	67.5	71.5	73.7	74.9	75.8	76.6	79.7	72.8	82.0
14-Nov	81.8	80.0	80.5	82.3	83.3	84.5	84.6	84.6	85.4	86.0	85.8	83.8	84.1	84.7	87.5	86.0	87.3	91.3	90.7	89.7	90.1	90.2	89.6	88.8	85.9	91.3
15-Nov	90.0	90.6	90.8	90.0	90.5	90.8	91.4	91.0	91.3	90.5	89.6	87.9	86.3	86.2	85.7	85.9	86.6	87.8	87.9	88.4	89.5	91.9	94.0	93.9	89.5	94.0
16-Nov	95.9	96.1	94.6	92.7	93.5	94.5	96.2	96.4	95.9	93.7	89.2	85.8	82.4	80.1	78.9	79.4	80.6	81.9	83.6	83.9	83.7	84.2	83.3	82.3	87.9	96.4
17-Nov	82.2	81.7	81.6	81.6	81.7	81.8	82.0	82.8	82.9	82.7	87.1	86.3	78.4	64.9	58.5	58.0	64.8	68.9	65.6	64.3	76.2	71.6	69.2	72.2	75.3	87.1
18-Nov	73.8	70.7	70.0	72.4	74.3	75.0	76.1	77.4	77.6	77.9	73.3	69.1	68.4	67.5	70.9	72.8	74.6	76.2	76.8	77.1	77.3	78.1	78.6	79.5	74.4	79.5
19-Nov	80.4	81.5	80.4	80.6	82.3	82.9	81.8	83.6	87.7	89.8	87.3	86.8	85.0	82.2	80.0	79.0	80.2	80.9	81.2	83.0	82.4	81.4	82.2	83.3	82.8	89.8
20-Nov	84.0	85.1	85.2	84.9	84.8	84.8	84.7	84.4	84.0	83.5	81.3	79.7	78.9	76.9	79.0	81.3	81.7	82.3	83.9	83.5	83.9	84.3	82.5	83.3	82.8	85.2
21-Nov	83.6	83.2	82.9	82.3	82.8	83.0	82.9	82.9	82.2	77.7	74.1	72.3	70.3	66.7	69.1	73.7	79.3	82.4	82.8	82.9	82.7	82.9	82.9	83.0	79.5	83.6
22-Nov	83.1	83.9	84.2	84.1	83.1	83.2	82.8	82.5	81.6	79.8	76.4	71.7	71.0	68.4	66.2	69.4	77.7	82.2	83.6	84.3	86.7	87.1	86.7	86.4	80.2	87.1
23-Nov	85.9	85.5	85.3	84.9	84.6	84.5	84.5	84.4	84.0	83.0	82.8	83.0	82.5	82.8	83.1	83.2	83.4	83.5	82.6	83.2	82.5	82.5	82.8	82.6	83.6	85.9
24-Nov	82.6	82.8	82.4	83.0	82.5	82.2	82.4	82.9	82.5	81.2	79.7	78.6	78.2	77.6	80.7	84.0	85.6	84.6	82.3	82.4	82.2	81.5	80.1	81.8	81.8	85.6
25-Nov	80.1	81.0	84.7	84.3	86.7	85.5	84.0	81.7	80.7	80.7	82.1	81.6	78.9	76.2	77.4	81.3	84.1	84.7	84.4	84.0	83.5	83.5	83.5	82.4	82.4	86.7
26-Nov	81.4	80.7	80.4	80.4	80.6	81.1	81.2	81.0	80.3	77.2	74.3	71.5	75.3	78.5	78.3	80.7	81.7	82.5	82.1	82.0	82.3	82.5	82.1	80.4	79.9	82.5
27-Nov	77.2	76.2	75.9	76.2	77.0	77.9	78.2	78.1	77.8	77.6	74.7	71.7	69.7	68.8	68.7	66.7	70.3	74.4	77.8	78.0	78.5	77.5	77.7	78.2	75.2	78.5
28-Nov	78.4	78.6	80.8	79.5	80.2	80.3	79.1	78.1	77.9	75.6	73.2	69.1	65.6	62.2	62.4	67.2	72.9	75.2	76.5	77.0	77.1	77.9	77.6	77.6	75.0	80.8
29-Nov	78.3	78.1	77.8	77.3	76.3	76.9	76.7	76.8	77.5	77.4	76.6	73.1	69.6	66.9	67.3	73.0	77.5	78.0	76.5	77.9	78.2	78.0	77.9	77.8	75.9	78.3
30-Nov	77.8	78.2	78.6	79.1	79.5	79.6	79.6	78.7	77.3	76.8	75.3	73.9	73.8	72.2	74.0	75.5	78.0	78.8	80.7	80.9	81.3	80.8	80.9	80.6	78.0	81.3
	82.1	81.6	81.5	81.5	82.4	82.8	82.9	83.2	82.9	80.7	77.3	74.1	71.3	69.2	69.0	70.6	74.2	77.4	78.8	79.8	80.2	80.4	80.7	81.6		Diurnal Average
	95.9	96.1	94.6	92.7	93.5	94.5	96.2	96.4	95.9	93.7	89.6	87.9	86.3	86.2	87.5	87.9	89.5	91.3	94.2	96.4	96.5	96.1	95.6	95.9		Diurnal Maximum

NS - Not in Service



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 2m (RH2) - %**  
**Monday Creek - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 2m (RH2) - %**  
**Monday Creek - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	33	5.85	5.85
60 - 80	229	40.60	46.45
80 - 100	302	53.55	100.00

Total Number of Valid Hours: 564

Total Number of Hours: 720





Maximum Speed: 25 km/h on Nov 17 22:00	Maximum Daily Speed Average: 18.2 km/h on Nov 27	Hours in Service: 564
Minimum Speed Value: 0 km/h on Nov 24 23:00	Minimum Daily Speed Average: 2.2 km/h on Nov 15	Hours of Data: 559
Maximum Diurnal Speed Average: 2.7 km/h at hour 13	Minimum Diurnal Speed Average: 0.5 km/h at hour 17	Hours of Missing Data: 5
Monthly Average Velocity: 1.5 km/h 303.7 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 4 Q <sub>1</sub> = 6 Median = 9 Q <sub>3</sub> = 12 P <sub>90</sub> = 15 P <sub>99</sub> = 23	Percent Operational Time: 99.8

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---
2-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---
3-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---
4-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---
5-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	---	---
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	C	C	C	C	SSW4	SSE5	SSE4	SE6	SE8	SE7	SSE8	S9	---	S9	
8-Nov	S9	S11	S10	SSW7	S6	S8	SSW8	SSW11	SSW8	S6	SSW8	SW6	WSW7	SSW6	SSW6	SSW7	SW4	WNW1	SSE2	W4WNW14WNW19WNW17	W10	SW5.8	WNW19				
9-Nov	W12	W11WNW12WNW13WNW11	WNW7	WNW5	W4	WNW6	WNW9	WNW5	WNW5	WNW4	S2	S4	SSW4	S5	SSE3	S3	SE3	SSE4	NW1	S2	W4.4	WNW13					
10-Nov	SSE3	S7	SSW8	SSW7	SSW6	SW8	SW7	SW7	SSW7	SW7WSW10	W10WSW11	W11WNW12	W8	WSW6	SSW5	S4	SSE4	S5	SSW9	SSW12	SSE7	SW6.0	SSW12				
11-Nov	SE8	SSE11	SSE13	SE13	SE11	SSE12	SSE14	SSE15	SE14	SE16	SSE16	SSE12	S12	S15	S13	S11	SSE11	SSE9	SE9	SE8	SE8	ESE6	SE6	SSE3	SSE10.7	SSE16	
12-Nov	SW2	W8	W15	W15	W13WSW16	W18	W18WSW17	W23	W23	W24	W24	W24	W21	W19	W16WSW12	W12	W10WSW10	W9	W8	W8	W15.0	W24					
13-Nov	W4	W6	NW6	NNW8	NW7	NNW6	NW5	NNW4	NNW3	WNW2	NNW2	ENE5	E4	ENE9	ENE9	ENE11	ENE10	ENE11	ENE11	ENE11	ENE12	E12	ENE11	ENE13	NE5.0	ENE13	
14-Nov	ENE14	ENE14	ENE15	ENE14	ENE14	ENE14	ENE14	ENE15	ENE15	ENE13	ENE13	E13	ENE12	ENE12	ENE9	ENE10	ENE11	NE7	NE7	ENE8	ENE9	ENE9	NE6	NNE3	ENE11.2	ENE15	
15-Nov	NE5	ENE4	E3	NE2	E3	SE2	S1	SSW1	SSW2	S2	SSE3	SW2	WSW3	S4	SW4	SSW4	SW3	SW3	SW8	SW6	SW6	SW6	SW6	WSW8	SSW2.2	WSW8	
16-Nov	SW11	SW10	SW10	SW10	SSW9	S9	SSW11	S10	SSW12	S14	S13	SSW13	SSW15	S15	S13	S16	S15	S13	S15	S16	S13	S11	S11	SSW11.8	S16		
17-Nov	S11	S11	SSE11	SSE11	S9	SSW9	SSW10	S8	SSW11	SSW12	SSW11	SSW10	SW10WSW15WSW17WSW16	SW13	SW12WSW18WSW22	W24WNW25WNW22WNW14	SW10.8	WNW25									
18-Nov	WNW14	NW15	NW11WNW12	NW10	NW10	NW8	NNW8	NW6	WNW7	W12	NW10	NW8	NNW9	N10	N9	N10	NNE8	NNE6	NNE6	NE8	NE9	NE10	NE9	NNW7.3	NW15		
19-Nov	NE9	ENE10	ENE12	ENE12	ENE12	ENE9	NE9	NNE10	NNE10	NE10	NNE10	NNE14	NNE13	NNE15	NNE14	N13	N12	NNE16	N14	N12	NNW11	NNW10	N12	N14	NNE10.2	NNE16	
20-Nov	N15	N11	N13	N12	N11	NNE10	N10	NNE11	NNE13	NNE12	NNE11	NNE10	NNW10	NNW8	N8	NNE8	NNE10	NNE15	NNE9	NNW7	N9	NW7	NNW8	NNW8	N9.8	N15	
21-Nov	N7	NNE11	N9	NNE7	NNE6	NNE6	N6	N7	NW7	NNW9	NNW7	NW4	NNW6	NNW7	N8	N5	NNE5	NNE4	NNW5	WNW6	WNW7	WNW7	W6	W6	NNW5.5	NNE11	
22-Nov	WNW6	W7	WNW9	WNW9	W6	WSW7	WSW7	W7	W9	W11WNW11	NW10	NW9	NW7	NW8	WNW5	NNE4	ENE4	NE9	NE10	NNE8	NE7	NE5	ENE7	NW4.2	WNW11		
23-Nov	E7	ENE6	E6	ENE6	ENE7	ENE6	ENE9	ENE8	ENE10	NE8	NE9	NE10	NE11	NE10	NE11	NE11	NE12	NE11	NE13	NE11	NNE12	NNE12	NE11	NE12	NE9.3	NE13	
24-Nov	NE10	NE9	NNE11	NE11	NE10	NE10	NE9	NE9	NE10	NE10	NE9	NE9	NNE8	NNE9	NNE8	NNE7	NE7	NE5	NNW1	NW2	UO	W0	ESE1	NE7.5	NNE11		
25-Nov	SE1	E2	SE3	SE3	SSE5	SSE4	SSE5	SSE4	SE3	SSE2	SE3	SSE3	S5	SSE8	SSE9	SSE6	SE8	SSE6	SSE8	S5	SSE6	SE5	SSE6	SSE10	SSE4.9	SSE10	
26-Nov	S10	S10	S9	SSE9	SSE8	S10	S9	S10	SSW10	S11	SSW13	SSW13	SSW10	SSW12	SSW11	SSW9	SW11	SW11WSW13WSW13	W11	W10WNW14	NW17	SSW8.6	NW17				
27-Nov	NW18WNW19WNW20WNW20WNW19WNW21WNW19WNW19WNW19WNW20WNW22WNW23WNW20WNW19	NW17	NW17WNW14WNW16WNW16WNW16WNW14WNW16WNW16WNW18	WNW18.2	WNW23																						
28-Nov	WNW17WNW14WNW11WNW10	WNW9	WNW8	WNW8WNW11WNW10	WNW6WNW11	NW12	NW10	NW10	NNW8	NNW8	NNW8	NNW9	NNW9	NNW8	NNW6	N7	NW6	NW7	NW8.7	WNW17							
29-Nov	NW6	NNW5	NNW6	N5	NNE9	NNE8	NE9	NNE9	NNE8	NNE6	NNE6	NNE6	NE6	NE5	ENE6	ENE5	ENE6	ENE5	E4	E6	E7	E7	E7	E8	NE5.1	NNE9	
30-Nov	E6	ENE6	ENE6	E7	E6	E5	ENE4	ESE6	SE6	ESE8	SE7	ESE6	ESE6	ESE7	ESE6	ESE7	ESE4	E3	NNE8	N7	NNW5	NNW5	NNW5	NNW6	E3.9	NNE8	

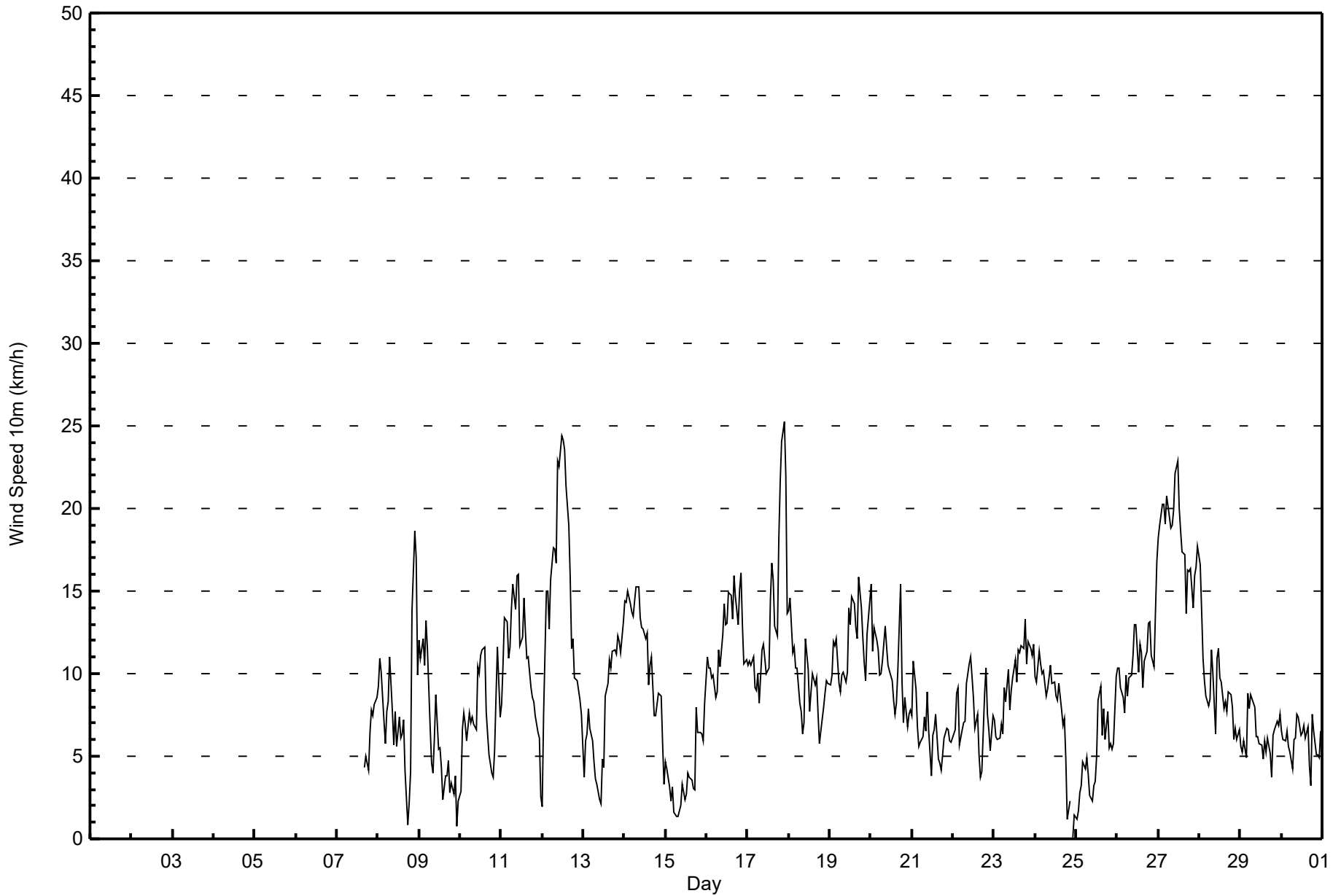
NW1.5	NW1.5	NW1.8	NW1.5	NW1.3	NW1.3	NW1.1	W1.1	W1.0	W1.6	W2.6	NNW2.2	NNW2.7	NNW2.4	NW1.8	NW1.2	NNW0.5	NNE0.9	N1.1	NW1.1	NW1.9	NW2.2	NW2.6	NW1.8	Diurnal Average
NW18	WNW19	WNW20	WNW20	WNW19	WNW21	WNW19	WNW19	WNW19	WNW20	WNW22	WNW23	WNW20	WNW19	NW17	NW17	WNW14	WNW16	WNW16	WNW14	WNW16	WNW16	WNW16	WNW18	Diurnal Maximum

C - Calibration      UO - Unstable Operation      NS - Not in Service  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 10m (WS10) - km/h**  
**Monday Creek - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Monday Creek - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	98	17.53	17.53
6 - 11	319	57.07	74.60
12 - 19	125	22.36	96.96
20 - 28	17	3.04	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 559

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Monday Creek - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 5	2	4	5	6	7	2	8	15	12	6	6	1	4	6	5	9	98
6 - 11	14	31	38	28	10	9	11	17	23	25	18	8	20	22	20	25	319
12 - 19	9	10	3	18	2	0	3	6	13	8	2	10	9	26	6	0	125
20 - 28	0	0	0	0	0	0	0	0	0	0	0	1	7	9	0	0	17
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	25	45	46	52	19	11	22	38	48	39	26	20	40	63	31	34	559

Total Number of Valid Hours: 559

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Monday Creek - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 564
Maximum Value: 7 km/h on Nov 26 23:00	Hours of Data: 559
Minimum Value: 1 km/h on Nov 15 04:00	Hours of Missing Data: 5
Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 2 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 5	Hours of Calibration: 4
	Percent Operational Time: 99.8

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
2-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
3-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
4-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
5-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	C	C	C	C	2	1	1	1	2	2	2	3	3
8-Nov	3	3	3	2	1	2	3	3	2	1	2	2	2	3	2	2	1	1	2	2	5	5	4	3	5
9-Nov	2	2	3	2	2	2	2	1	1	2	2	2	1	1	2	1	1	1	1	1	1	3	1	2	3
10-Nov	2	2	2	1	1	2	1	2	2	2	2	2	3	3	2	2	2	1	1	1	1	3	3	2	3
11-Nov	2	3	4	3	3	3	4	4	3	4	5	4	4	5	4	4	3	2	2	2	1	1	2	2	5
12-Nov	1	3	4	4	3	4	4	5	4	6	6	5	6	5	5	5	4	3	3	2	2	1	1	2	6
13-Nov	1	1	1	2	2	1	1	2	2	1	1	1	1	2	2	2	2	2	2	2	3	2	3	2	3
14-Nov	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	3	2	2	1	2	2	2	1	1	3
15-Nov	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	2	2	1	3	2	3	3
16-Nov	2	2	3	3	3	3	2	3	3	4	4	4	4	5	4	4	5	5	4	5	5	4	4	3	5
17-Nov	3	3	3	3	3	3	3	2	3	4	3	2	3	4	4	4	3	2	4	5	5	5	6	3	6
18-Nov	3	4	4	3	2	3	2	2	2	2	3	2	2	3	2	2	2	2	2	1	2	3	2	2	4
19-Nov	2	2	2	2	2	3	2	2	3	2	3	3	3	3	3	3	3	4	3	3	2	2	3	4	4
20-Nov	4	4	3	3	3	3	3	3	3	3	3	2	2	2	2	2	3	3	3	2	2	2	2	2	4
21-Nov	2	3	3	2	1	2	2	2	1	2	2	2	2	2	2	1	1	1	1	2	1	1	1	1	3
22-Nov	2	1	2	2	1	1	1	1	1	2	2	2	2	2	2	1	2	1	2	2	2	1	2	2	2
23-Nov	1	1	1	1	1	2	3	2	2	2	3	3	2	2	2	2	2	3	3	2	2	3	2	2	3
24-Nov	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	1	1	1	UO	1	1	2
25-Nov	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	2	2
26-Nov	2	3	2	2	2	3	3	3	3	3	4	3	3	3	3	3	3	2	3	3	3	3	2	7	7
27-Nov	5	4	4	4	3	4	4	4	4	4	4	5	5	5	4	5	3	4	3	3	2	4	3	3	5
28-Nov	3	3	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	3
29-Nov	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	2	1	1	1	2	1	1	1	1	2
30-Nov	1	1	1	1	2	1	1	1	1	2	1	2	2	2	1	2	1	1	1	2	1	1	1	1	2

5	4	4	4	3	4	4	5	4	6	6	5	6	5	5	5	5	5	5	4	5	5	5	7	5	
Diurnal Maximum																									

C - Calibration      UO - Unstable Operation      NS - Not in Service



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Monday Creek - November 2024**

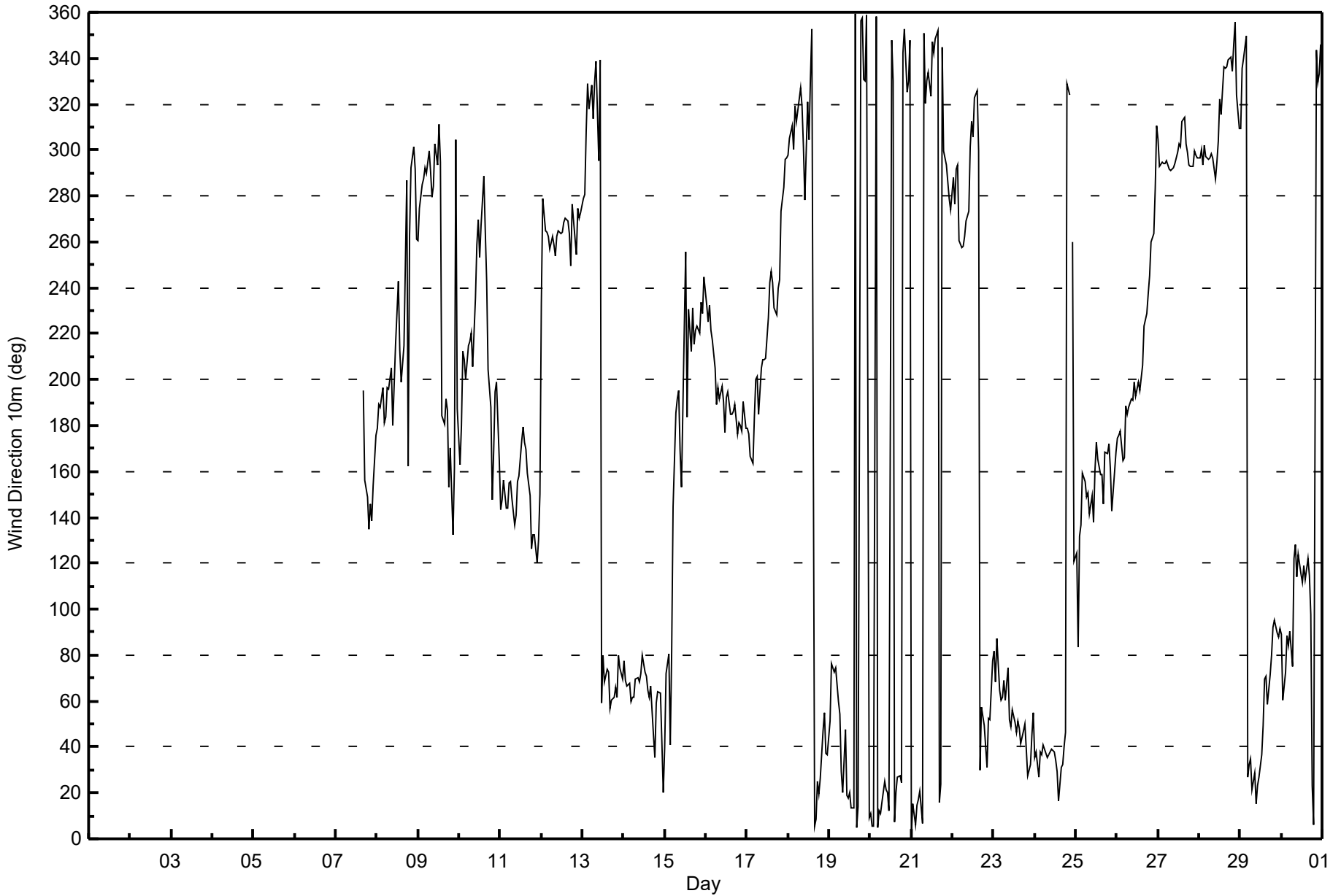
Direction of Maximum Speed: 284 deg on Nov 17 22:00		Hours in Service: 564
Direction of Maximum Daily Speed Average: 297.4 deg on Nov 27		Hours of Data: 559
Direction of Minimum Speed: 260 deg on Nov 24 23:00		Hours of Missing Data: 5
Direction of Minimum Daily Speed Average: 2.2 deg on Nov 15		Percent Operational Time: 99.8
Monthly Average Direction: 303.7 deg		

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
2-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
3-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
4-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
5-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	C	C	C	C	196	156	149	135	146	139	154	175	--
8-Nov	178	189	188	196	181	184	196	196	205	180	198	215	243	213	199	207	215	287	162	263	292	301	292	261	223.6
9-Nov	261	274	285	288	293	290	299	291	279	284	303	293	311	295	184	180	192	186	153	170	132	161	304	188	273.1
10-Nov	163	180	213	209	200	215	217	220	206	235	258	270	253	267	289	265	243	204	188	147	169	194	199	165	224.0
11-Nov	144	148	156	144	144	155	156	148	136	141	156	158	174	180	173	169	159	150	126	132	132	120	130	150	151.3
12-Nov	233	279	265	264	262	257	262	259	254	263	265	263	264	269	270	269	264	249	276	269	254	275	270	273	264.3
13-Nov	279	280	308	329	318	328	314	329	339	295	339	59	80	68	74	72	57	61	61	66	61	80	74	69	45.2
14-Nov	78	69	66	68	60	62	62	70	70	68	72	80	73	71	65	62	67	45	36	59	64	63	42	20	65.2
15-Nov	39	72	81	41	82	144	185	192	195	169	153	223	256	183	231	212	232	216	221	223	220	234	229	245	211.0
16-Nov	232	225	233	222	217	205	189	197	191	197	190	177	192	194	185	185	186	189	176	181	180	177	190	179	193.4
17-Nov	179	176	166	163	183	200	201	185	205	209	209	210	227	242	247	243	231	228	240	244	273	284	296	297	233.1
18-Nov	298	305	311	300	319	312	322	327	319	301	278	321	304	331	353	6	9	25	19	26	47	55	37	37	335.6
19-Nov	51	76	74	72	75	60	54	30	20	47	19	18	20	13	13	359	5	14	357	357	331	330	359	9	23.0
20-Nov	11	5	5	358	5	12	11	16	25	21	20	12	348	330	7	20	27	28	25	342	353	325	330	348	7.1
21-Nov	1	15	6	15	17	20	7	351	320	330	334	323	347	342	349	352	16	24	345	300	293	286	279	274	343.1
22-Nov	288	277	292	293	261	258	258	262	269	273	302	312	306	323	326	300	30	57	50	40	31	52	52	77	314.6
23-Nov	82	68	87	65	60	62	69	60	74	52	49	56	51	46	52	48	41	47	50	39	28	32	45	55	52.6
24-Nov	36	38	27	38	36	41	37	35	37	38	39	38	34	29	17	31	32	40	46	329	324	UO	260	121	34.3
25-Nov	124	84	132	137	160	156	149	150	142	149	138	161	173	165	158	159	146	168	168	172	161	142	151	168	156.2
26-Nov	174	176	178	165	166	189	185	188	192	191	199	193	199	195	200	206	224	229	237	245	260	264	283	311	211.8
27-Nov	304	293	294	294	294	295	292	291	292	293	294	299	303	302	312	314	303	299	294	293	293	300	298	296	297.4
28-Nov	297	300	294	302	297	296	297	298	297	287	295	304	322	315	336	336	336	339	341	334	346	356	324	309	312.1
29-Nov	309	335	340	349	27	33	35	21	29	15	23	27	36	49	69	71	59	71	80	92	95	90	88	91	43.2
30-Nov	89	60	72	88	84	90	75	122	128	114	124	115	112	119	113	122	115	98	23	6	343	329	333	346	84.4

316.5 306.8 302.4 313.5 329.9 291.3 289.5 279.4 277.8 270.8 274.7 296.6 292.6 285.8 310.0 310.1 342.0 27.3 352.1 304.9 307.4 310.8 310.7 322.7

Diurnal Average

C - Calibration      UO - Unstable Operation      NS - Not in Service  
 All monthly, daily, and diurnal averages have been calculated using vector methods







**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Monday Creek - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 564
Maximum Value: 89 deg on Nov 24 23:00	Hours of Data: 559
Minimum Value: 5 deg on Nov 29 17:00	Hours of Missing Data: 5
Percentiles: P <sub>1</sub> = 9 P <sub>10</sub> = 12 Q <sub>1</sub> = 13 Median = 17 Q <sub>3</sub> = 21 P <sub>90</sub> = 27 P <sub>99</sub> = 59	Hours of Calibration: 4
	Percent Operational Time: 99.8

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
2-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
3-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
4-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
5-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
6-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--
7-Nov	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	C	C	C	C	21	14	17	14	17	16	19	23	23
8-Nov	21	18	20	25	25	15	17	16	20	23	20	35	16	43	18	16	20	81	72	25	20	16	15	13	81
9-Nov	11	12	12	13	9	9	21	28	23	26	19	27	22	32	39	15	15	14	30	18	21	25	56	54	56
10-Nov	55	15	13	12	11	10	11	13	21	28	20	16	21	16	12	16	19	16	17	24	20	17	17	26	55
11-Nov	15	17	16	17	17	20	18	16	14	15	18	19	22	21	21	22	19	20	13	13	13	15	16	40	40
12-Nov	61	16	12	12	13	15	13	15	14	12	12	12	13	14	14	12	13	14	10	11	14	14	12	13	61
13-Nov	29	22	23	20	24	20	28	56	53	53	66	29	32	19	15	13	11	11	12	12	12	14	13	11	66
14-Nov	11	13	13	11	13	12	12	13	12	13	14	14	12	13	13	13	16	15	13	12	12	17	17	32	32
15-Nov	21	17	26	30	27	47	23	62	26	30	25	32	29	27	24	25	31	44	15	19	15	20	23	20	62
16-Nov	16	14	20	19	22	20	19	19	18	21	19	23	21	21	20	21	20	20	20	20	20	22	21	21	23
17-Nov	21	20	20	21	22	19	18	20	16	17	17	17	20	16	16	17	14	13	14	13	16	12	15	13	22
18-Nov	15	18	20	18	17	19	18	16	20	26	19	23	28	22	19	17	20	31	30	25	17	17	21	16	31
19-Nov	18	15	14	14	11	20	19	11	19	16	23	18	18	19	19	19	18	15	19	19	18	16	19	16	23
20-Nov	18	21	20	21	19	19	19	23	18	18	24	21	25	21	26	17	14	12	20	23	19	32	20	20	32
21-Nov	19	17	17	20	13	24	15	18	23	20	27	57	36	32	23	15	11	11	30	23	11	12	11	14	57
22-Nov	18	15	19	13	12	11	11	12	10	12	18	19	24	36	21	25	51	17	11	11	16	14	17	27	51
23-Nov	13	13	11	13	12	15	14	18	12	18	17	13	13	14	11	14	11	12	13	13	12	13	11	14	18
24-Nov	12	13	13	12	14	11	12	12	13	13	15	14	16	17	15	10	10	11	35	36	27	UO	89	50	89
25-Nov	54	23	27	20	20	20	15	18	26	32	20	24	25	20	17	22	13	22	16	20	18	16	17	17	54
26-Nov	18	18	18	16	17	18	21	20	19	18	18	19	20	18	19	19	16	14	13	15	12	12	17	19	21
27-Nov	16	12	12	12	12	11	10	11	11	11	12	13	15	15	19	16	15	14	11	10	11	14	12	11	19
28-Nov	12	14	12	16	10	14	15	12	11	16	11	17	25	21	18	14	17	18	18	20	20	16	20	21	25
29-Nov	25	15	17	23	16	17	17	19	13	19	27	26	30	31	20	11	5	12	12	9	7	8	10	8	31
30-Nov	12	12	13	8	21	18	28	21	15	15	20	24	22	23	27	18	22	40	11	14	17	16	16	13	40

61	23	27	30	27	47	28	62	53	53	66	57	36	43	39	25	51	81	72	36	27	32	89	54	
Diurnal Maximum																								

C - Calibration      UO - Unstable Operation      NS - Not in Service



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS506 JACKFISH 1 NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 1 (AMS506)  
 NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	682	34	38	99.44	15.1	0	4.9	0
H2S (ppb) Average	684	36	36	100	1.1	0	0.3	0
NO2 (ppb) Average	681	35	39	99.44	23.8	0	8.2	-
NO (ppb) Average	681	35	39	99.44	15.5	-	3.7	-
NOX (ppb) Average	681	35	39	99.44	35.5	-	12	-
Temperature 2 m (C) Average	720	0	0	100	10	-	5.9	-
Relative Humidity (%) Average	720	0	0	100	96.9	-	95.2	-
Wind Speed 10 m (km/h) Average	717	0	3	99.58	15	-	8	-
Wind Direction 10 m (deg) Average	717	0	3	99.58	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 1 (AMS506)  
NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	682	0.65	1.5	-	0	0	0.1	0.2	0.5	1.7	15.1
H2S (ppb) Average	684	0.12	0.1	-	0	0	0.1	0.1	0.1	0.2	1.1
NO2 (ppb) Average	681	2.4	2.7	-	0	0.4	0.8	1.6	3	5	23.8
NO (ppb) Average	681	0.62	1.4	-	0	0	0	0.1	0.7	1.7	15.5
NOX (ppb) Average	681	3.02	3.8	-	0	0.4	0.9	1.8	3.7	6.6	35.5
Temperature 2 m (C) Average	720	-7.25	8.5	-	-24.4	-18.9	-15.5	-4.1	-1.3	3.2	10
Relative Humidity (%) Average	720	82.48	9.5	-	46.7	68.2	79.2	83.8	88.4	94.2	96.9
Wind Speed 10 m (km/h) Average	717	5.2	3	-	0	2	3	5	7	9	15
Wind Direction 10 m (deg) Average	717	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 1 (AMS506)  
NOVEMBER 2024

OPERATIONAL NOTES

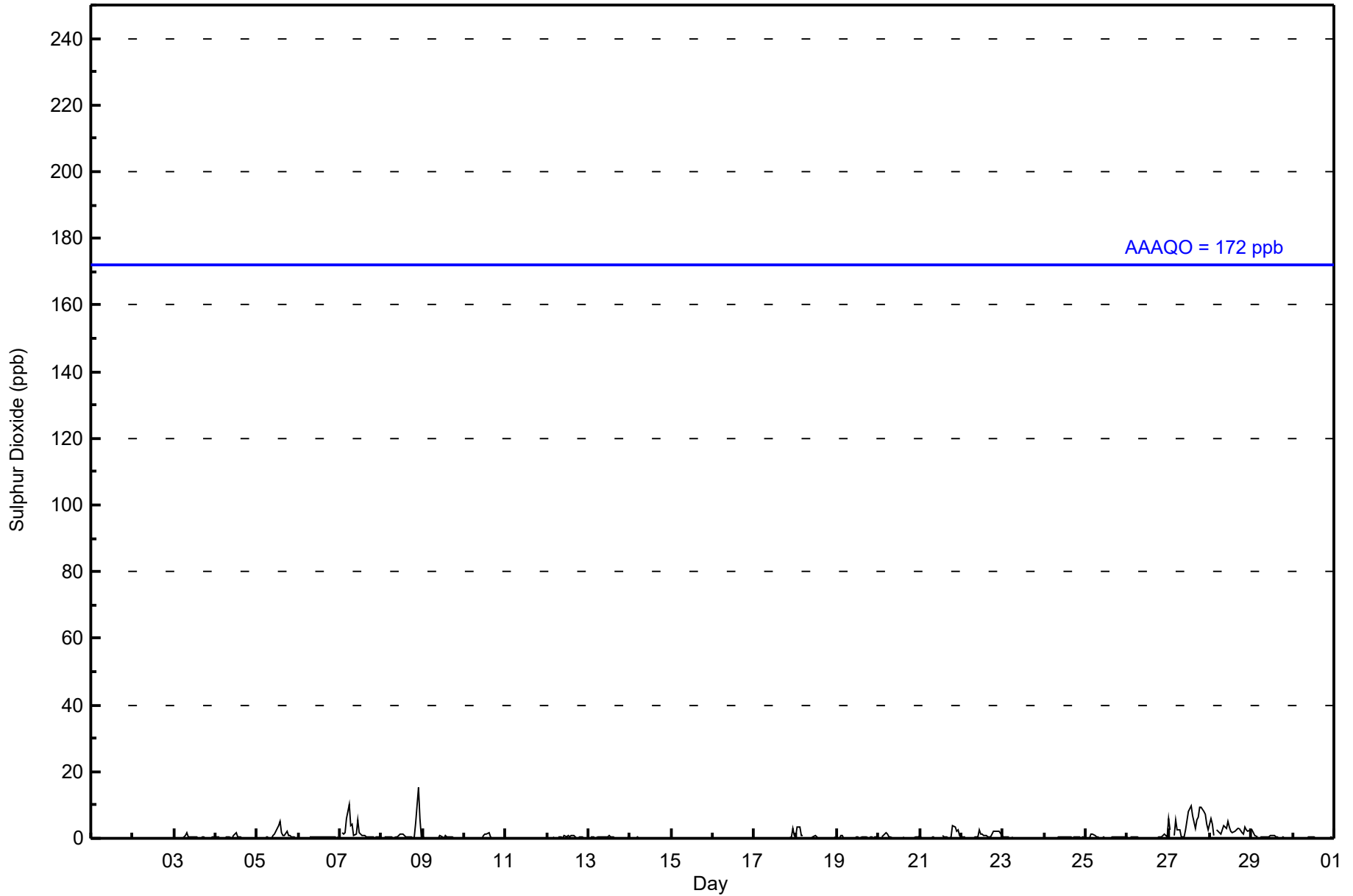
Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2, SO2	20 Nov 2024 11:00	20 Nov 2024 14:00	4	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	01 Nov 2024 02:00	01 Nov 2024 03:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	02 Nov 2024 22:00	02 Nov 2024 22:00	1	Flat line in sensor output signal - Sensor frozen





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Jackfish 1 - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Jackfish 1 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	681	99.85	99.85
11 - 20	1	0.15	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 720





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Jackfish 1 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	<b>N</b>	<b>NNE</b>	<b>NE</b>	<b>ENE</b>	<b>E</b>	<b>ESE</b>	<b>SE</b>	<b>SSE</b>	<b>S</b>	<b>SSW</b>	<b>SW</b>	<b>WSW</b>	<b>W</b>	<b>WNW</b>	<b>NW</b>	<b>NNW</b>	
0 - 10	40	43	36	19	15	17	21	70	95	66	19	10	27	98	50	52	678
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	<b>40</b>	<b>43</b>	<b>36</b>	<b>19</b>	<b>15</b>	<b>17</b>	<b>21</b>	<b>70</b>	<b>95</b>	<b>66</b>	<b>19</b>	<b>10</b>	<b>27</b>	<b>99</b>	<b>50</b>	<b>52</b>	<b>679</b>

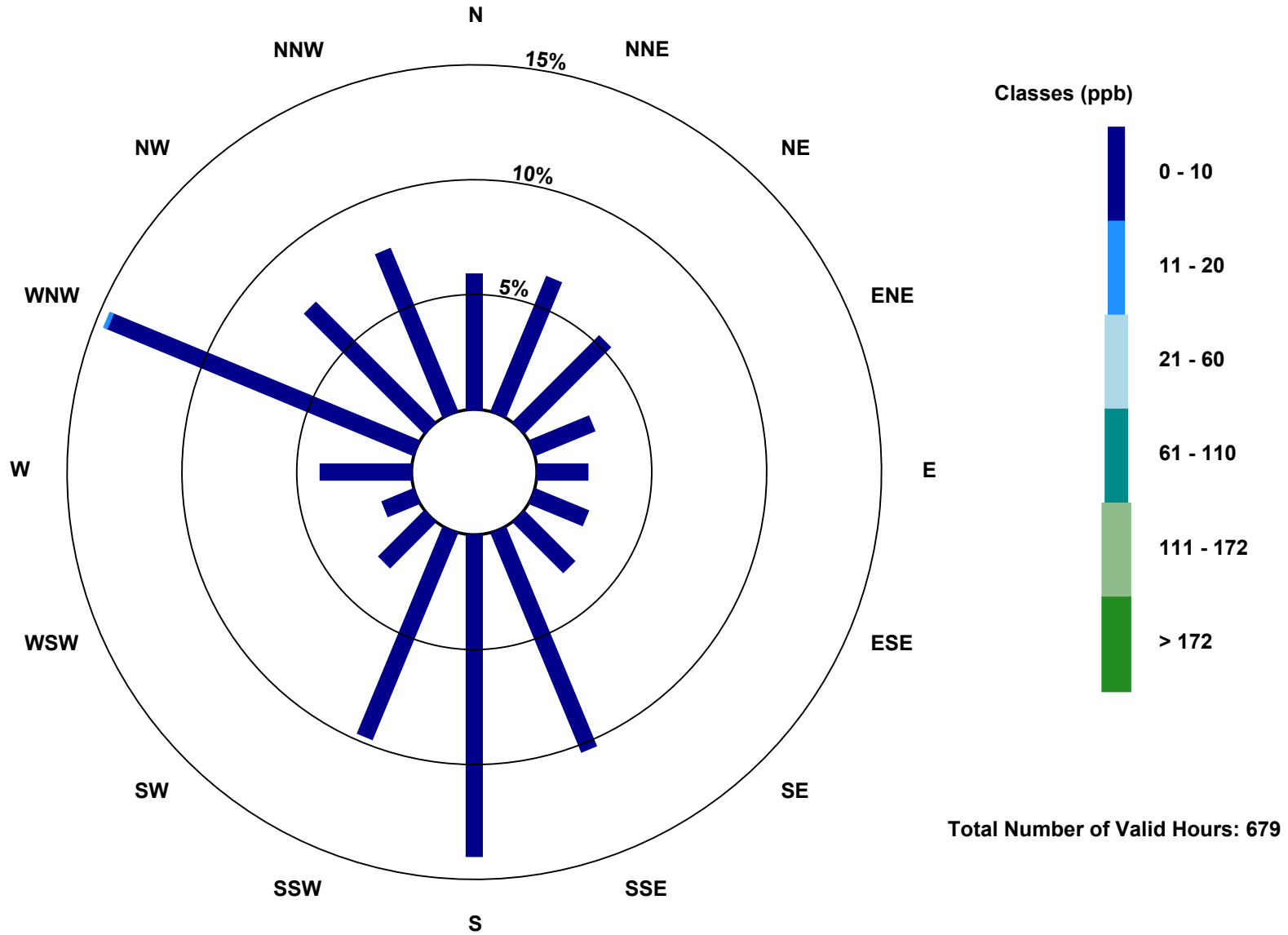
Total Number of Valid Hours: 679

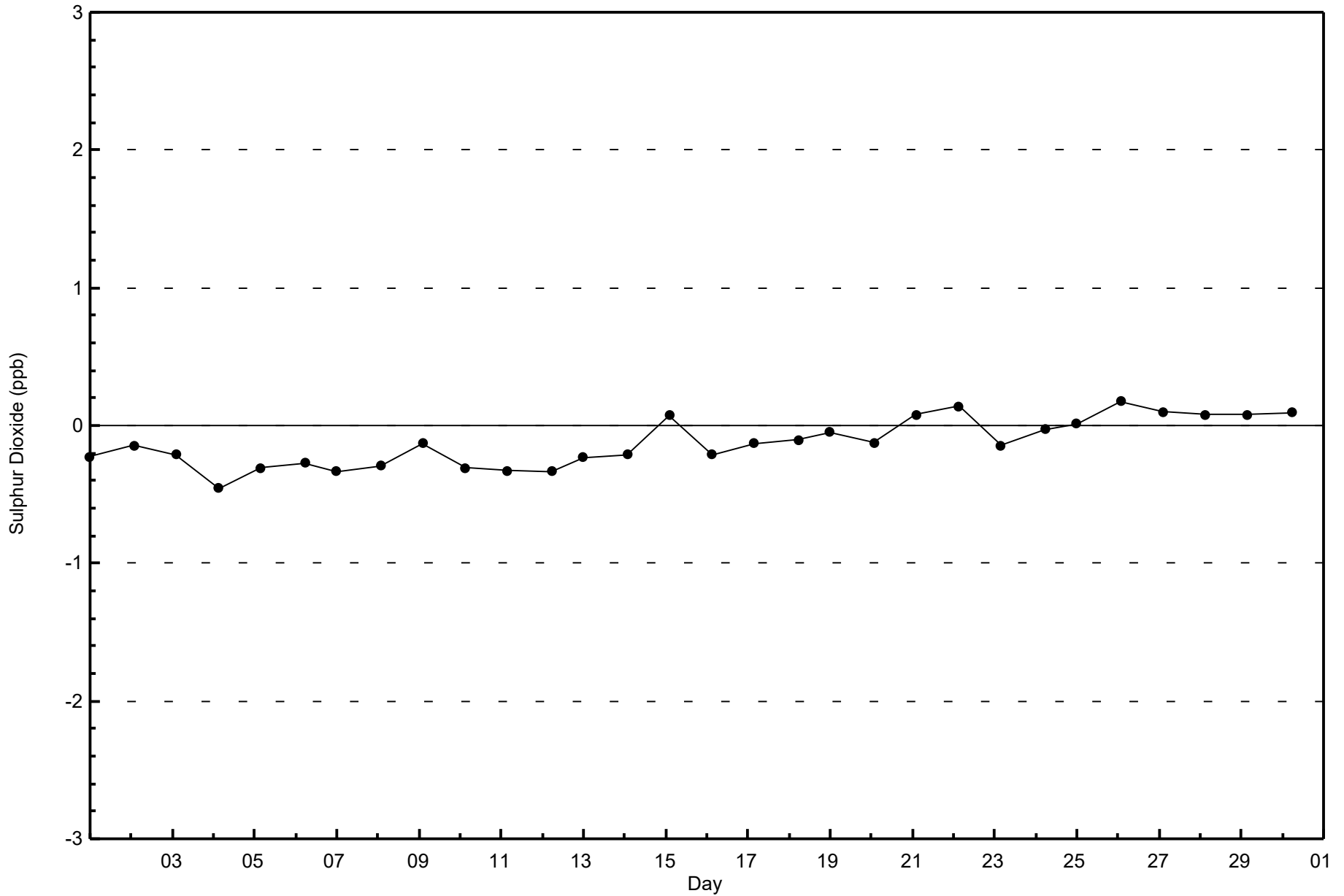
Total Number of Hours: 720

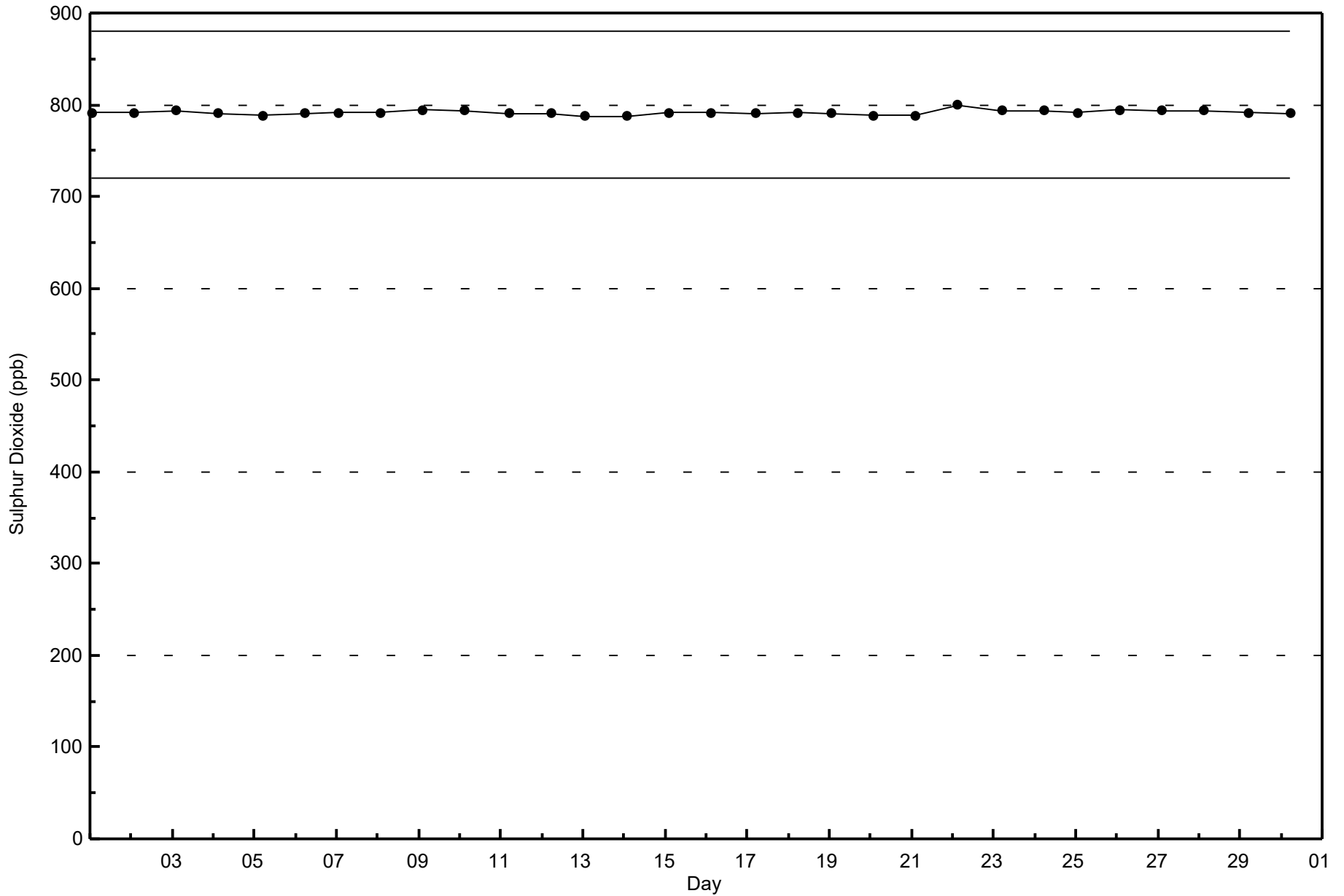


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

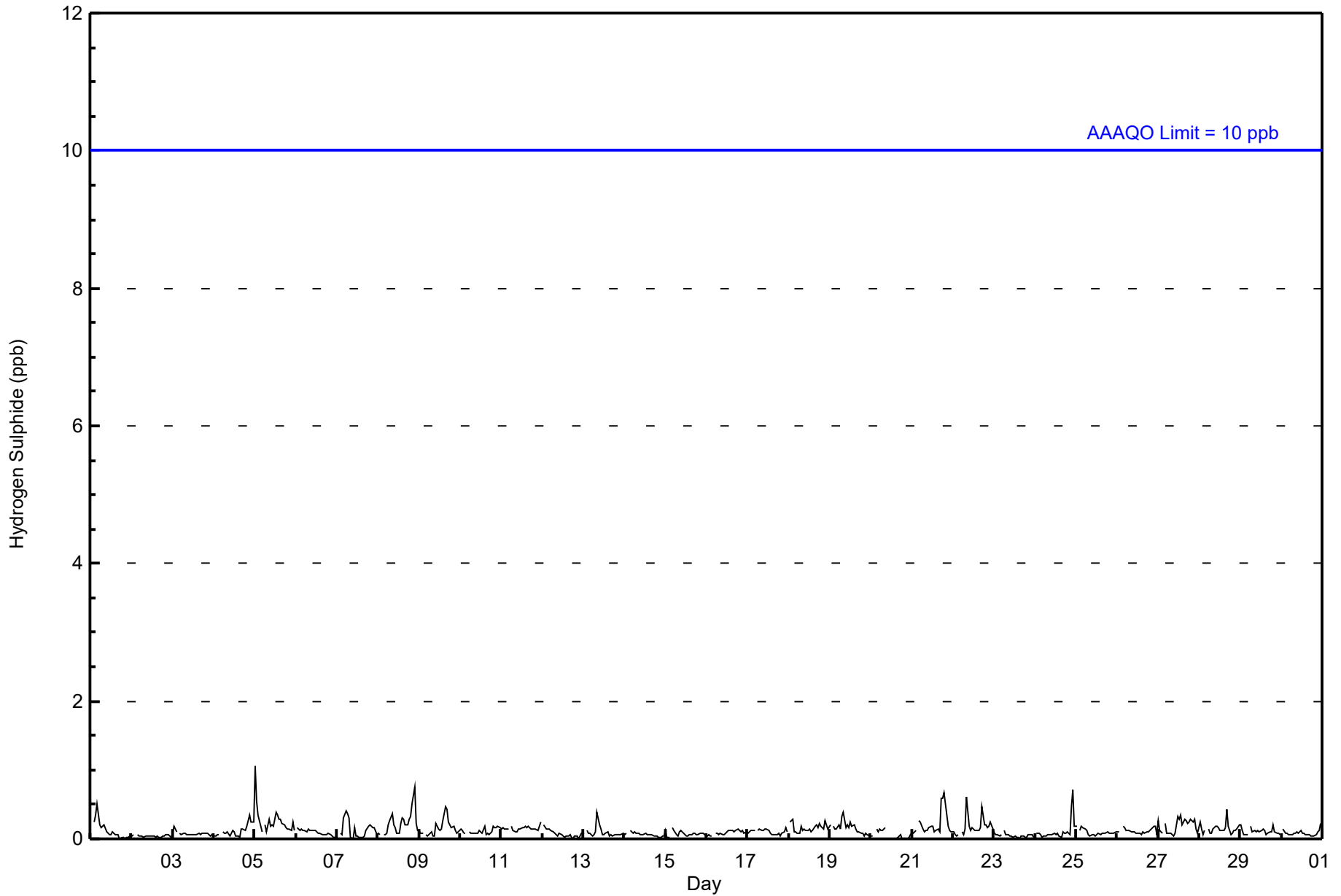
Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Jackfish 1













**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Jackfish 1 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	684	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Jackfish 1 - November 2024**

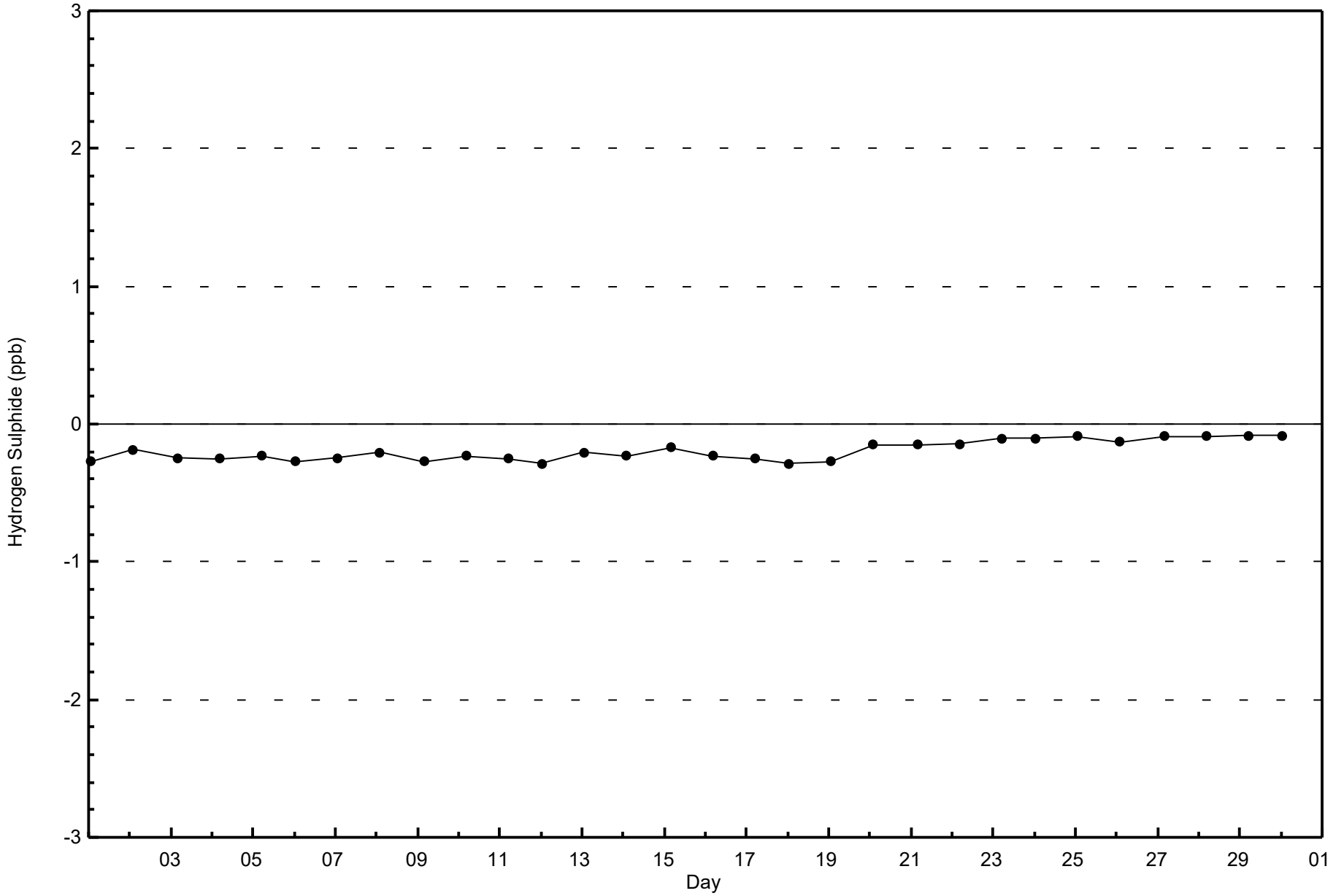
<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	39	43	34	21	14	18	21	70	93	67	19	11	29	98	53	52	682
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	39	43	34	21	14	18	21	70	93	67	19	11	29	98	53	52	682

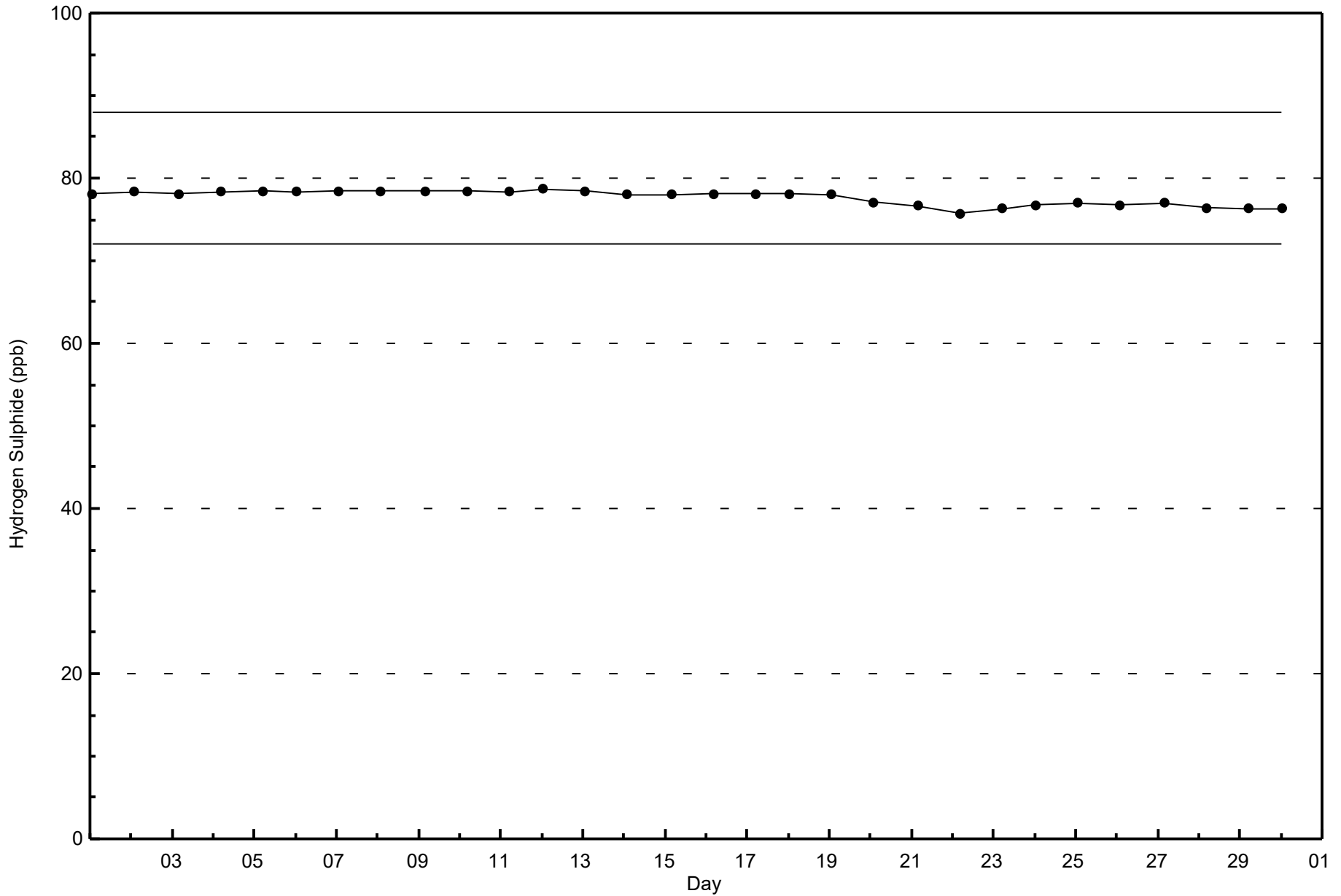
Total Number of Valid Hours: 682

Total Number of Hours: 720







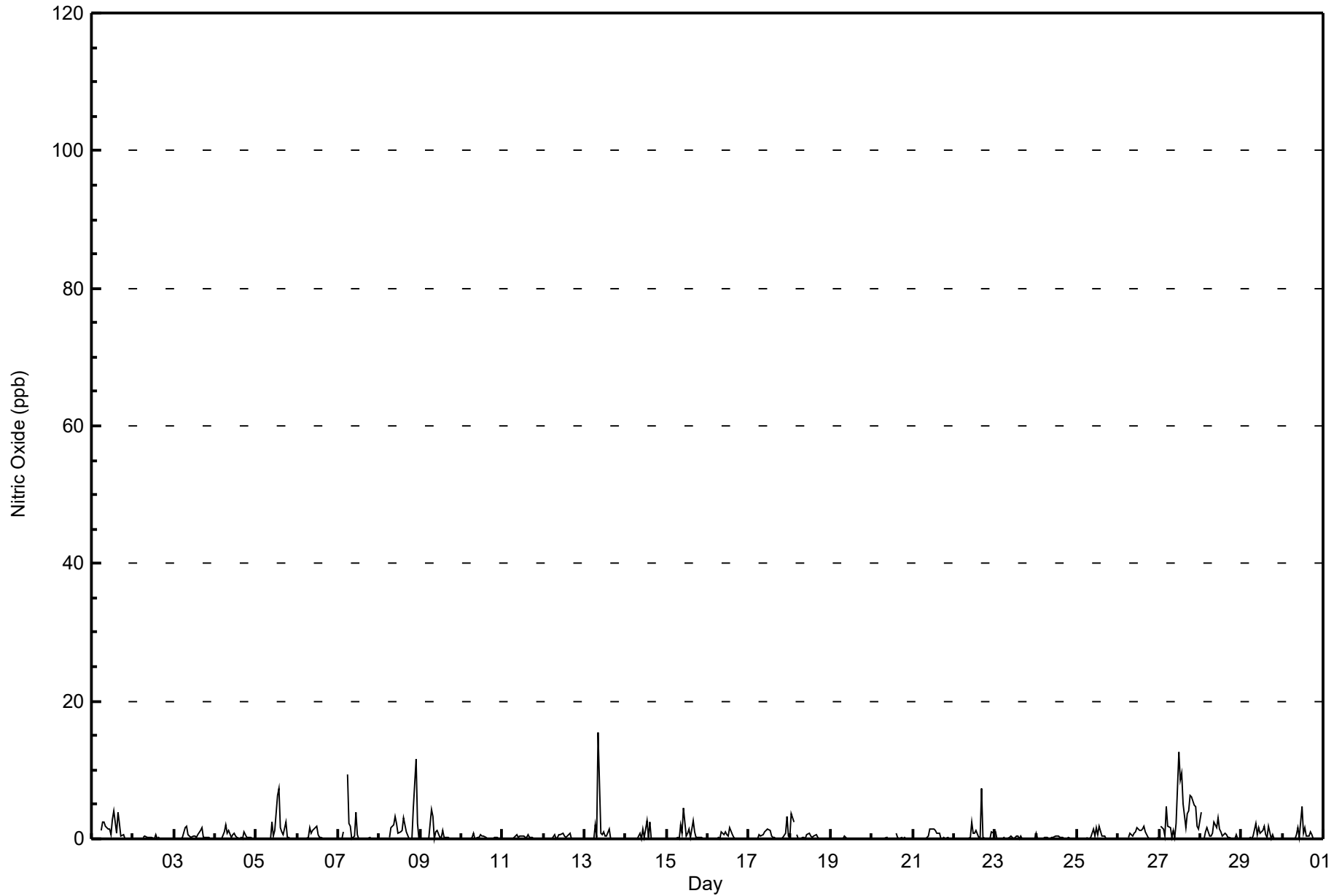






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Jackfish 1 - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Jackfish 1 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	681	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Jackfish 1 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	39	42	34	21	15	16	21	69	97	66	19	11	29	98	52	49	678
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	39	42	34	21	15	16	21	69	97	66	19	11	29	98	52	49	678

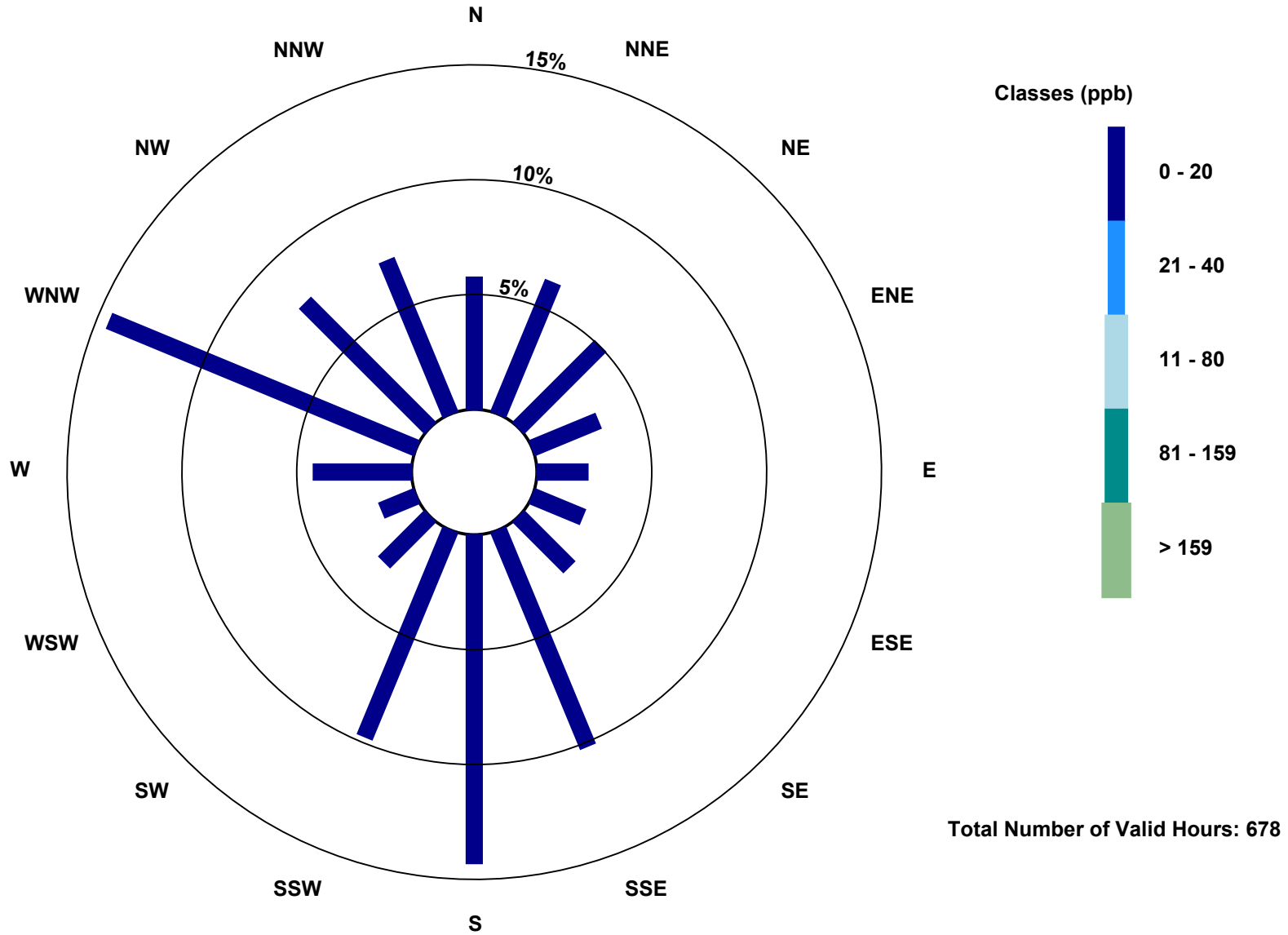
Total Number of Valid Hours: 678

Total Number of Hours: 720

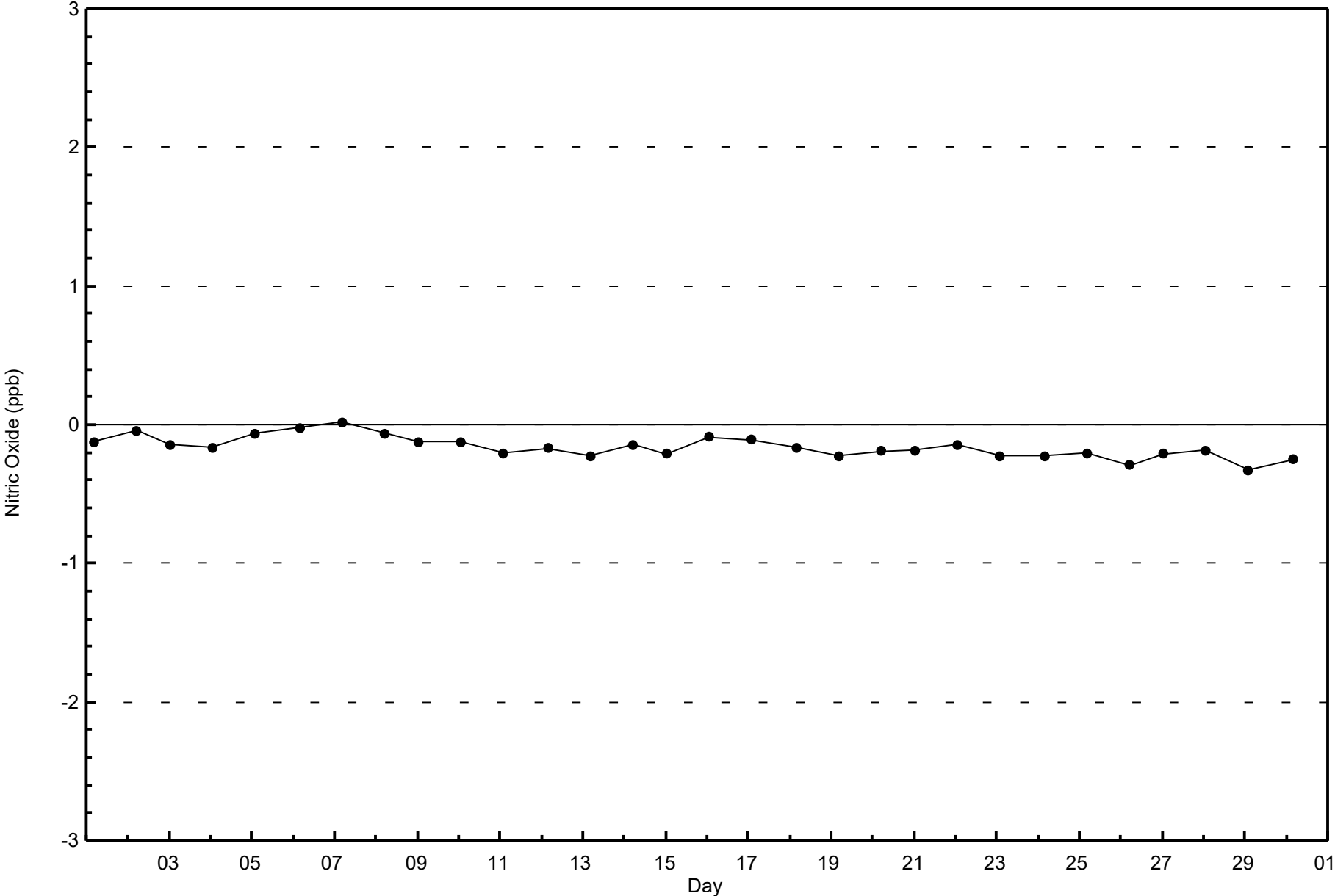


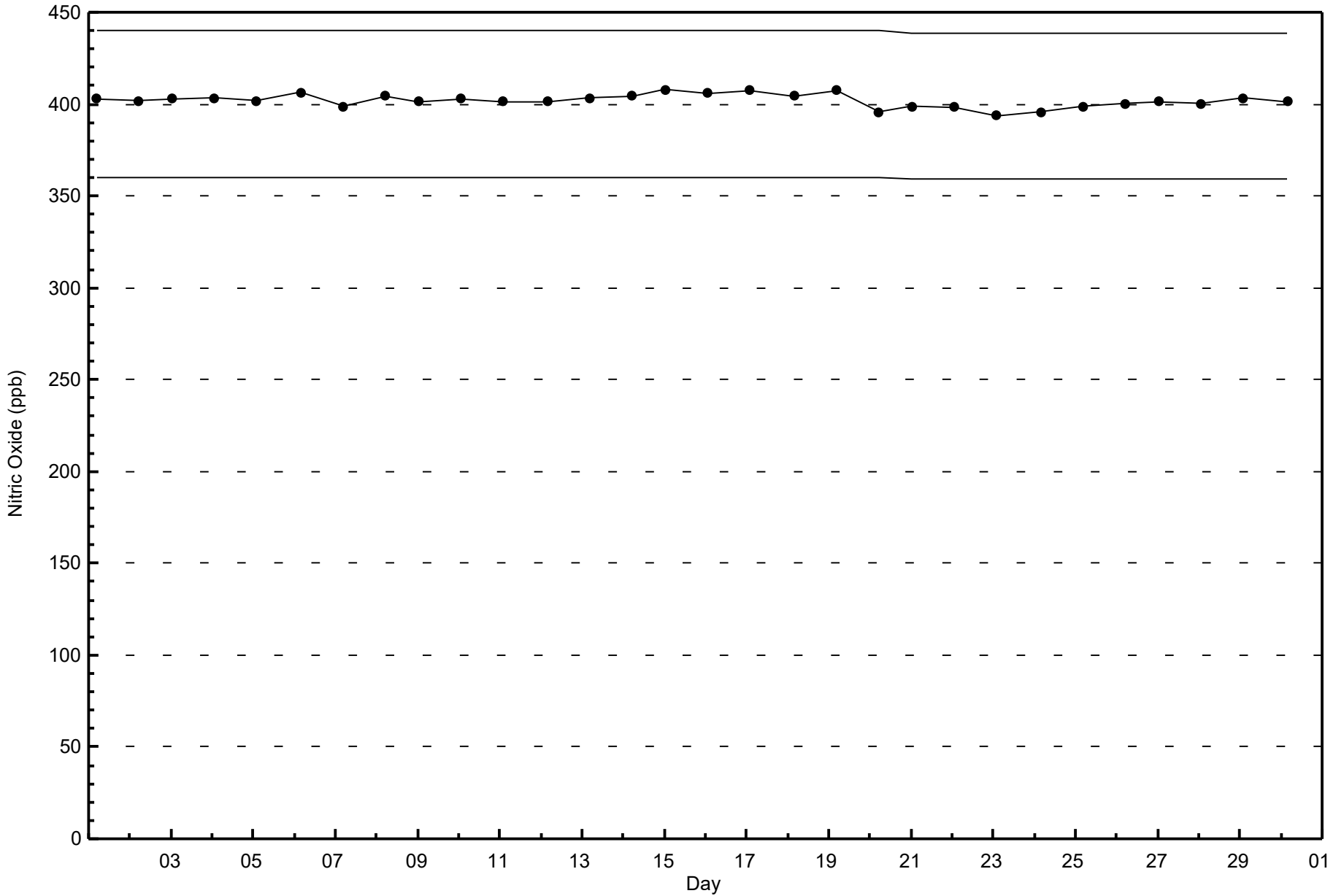
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitric Oxide (NO) - ppb  
Jackfish 1











Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb

Jackfish 1 - November 2024

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	720
Maximum Value: 23.8 ppb on Nov 8 22:00	Maximum Daily Average: 8.2 ppb on Nov 27		Hours of Data:	681
Minimum Value: 0.0 ppb on Nov 7 00:00	Minimum Daily Average: 0.5 ppb on Nov 14		Hours of Missing Data:	39
Maximum Diurnal Average: 3.0 ppb at hour 22	Minimum Diurnal Average: 1.5 ppb at hour 3		Hours of Calibration:	35
Monthly Average: 2.40 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 0.8 Median = 1.6 Q <sub>3</sub> = 3.0 P <sub>90</sub> = 5.0 P <sub>99</sub> = 14.2		Percent Operational Time:	99.4

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	0.2	1.2	0.9	1.6	Z	2.3	3.3	4.1	5.2	3.4	2.6	1.4	2.3	3.7	2.1	3.8	4.1	2.4	2.5	1.2	0.6	0.8	1.2	0.9	2.3	5.2	
2-Nov	0.7	0.6	0.8	1.3	0.9	Z	1.2	1.5	2.0	1.4	0.9	1.0	0.9	1.3	1.0	0.8	0.9	0.7	0.7	0.7	0.6	0.5	0.5	0.6	0.9	2.0	
3-Nov	Z	1.5	1.5	1.1	1.3	1.3	3.0	4.1	2.3	1.8	1.5	1.3	1.5	1.2	2.1	3.7	4.5	2.9	1.7	1.4	1.5	1.6	1.7	1.6	2.0	4.5	
4-Nov	1.3	Z	1.3	0.9	0.8	0.8	5.1	3.3	3.1	0.8	1.5	2.4	2.1	1.1	0.7	1.5	0.9	1.8	3.1	1.6	0.7	0.8	0.5	1.8	1.6	5.1	
5-Nov	2.0	1.8	Z	1.2	1.1	2.9	3.7	1.4	1.5	4.2	2.5	3.8	9.4	10.7	5.0	3.3	2.8	6.6	3.4	3.1	1.8	0.7	0.6	0.4	3.2	10.7	
6-Nov	0.4	0.5	0.3	Z	0.4	0.2	1.2	3.8	4.0	3.9	3.9	4.6	2.5	1.9	1.7	1.3	0.4	0.4	0.6	1.0	1.0	0.7	0.3	0.0	1.5	4.6	
7-Nov	0.0	1.5	0.4	1.8	Z	17.7	7.4	12.4	1.0	1.9	9.0	3.8	1.0	0.3	0.2	0.7	1.3	0.3	0.0	0.0	0.0	0.2	1.3	1.8	2.8	17.7	
8-Nov	2.3	2.0	1.9	1.9	2.4	Z	3.2	5.8	5.1	8.3	5.7	5.1	4.9	4.7	7.7	9.1	7.7	3.9	4.7	3.1	8.8	23.8	14.9	2.7	6.1	23.8	
9-Nov	Z	1.0	1.0	0.3	0.4	1.4	2.3	5.3	1.6	3.1	4.1	2.2	2.0	4.1	2.0	2.3	4.1	3.5	4.6	1.5	0.5	0.6	0.9	1.9	2.2	5.3	
10-Nov	1.3	Z	1.6	1.2	1.1	1.4	1.9	4.5	1.7	1.2	1.2	2.4	2.2	2.0	2.0	0.8	1.6	0.9	0.7	1.4	1.3	1.6	2.3	2.5	1.7	4.5	
11-Nov	2.2	1.3	Z	2.1	1.6	0.6	0.7	0.7	0.8	0.4	0.8	0.8	0.8	0.7	0.6	0.7	0.7	0.6	0.7	0.6	0.5	0.6	0.8	0.7	0.9	2.2	2.2
12-Nov	0.7	0.7	1.8	Z	2.8	2.0	1.6	1.3	1.1	1.1	2.3	2.1	1.7	1.3	1.9	2.5	1.9	1.4	1.0	1.5	1.3	0.6	1.3	1.0	1.5	2.8	
13-Nov	0.8	0.7	0.7	0.7	Z	0.8	2.5	3.5	8.8	3.4	2.3	2.1	1.7	1.8	2.5	0.8	0.7	0.6	0.5	0.3	0.2	0.2	0.2	0.3	1.6	8.8	
14-Nov	0.4	0.5	0.6	0.6	0.5	Z	0.8	0.7	0.9	0.6	0.5	0.4	1.1	0.4	0.1	0.4	0.6	0.7	0.5	0.5	0.4	0.3	0.2	0.3	0.5	1.1	
15-Nov	Z	0.7	0.5	0.4	0.5	0.4	1.4	1.4	2.9	3.2	5.1	1.8	2.1	2.7	1.7	4.1	3.0	1.7	1.4	0.9	1.0	1.1	1.3	1.2	1.8	5.1	
16-Nov	0.9	Z	0.8	0.5	0.4	0.9	1.6	1.3	2.6	1.5	2.1	1.8	1.7	2.9	3.1	2.2	2.0	1.9	2.0	2.1	1.9	1.7	1.4	1.0	1.7	3.1	
17-Nov	1.2	1.5	Z	1.8	1.2	1.4	3.0	3.0	3.1	4.0	3.9	4.1	2.9	1.7	1.4	1.2	1.4	1.5	1.1	0.6	1.1	1.3	6.3	2.1	2.2	6.3	
18-Nov	0.2	6.7	6.1	Z	2.2	0.0	0.2	1.7	2.0	0.2	1.3	2.5	1.8	0.6	1.0	0.9	0.5	0.3	0.2	0.2	0.2	0.9	1.3	1.8	1.4	6.7	
19-Nov	0.9	0.6	1.9	1.9	Z	0.9	2.8	1.6	1.9	0.4	C	C	C	C	C	1.6	1.2	1.3	0.2	0.8	2.1	1.6	3.1	1.5	1.5	3.1	
20-Nov	1.3	1.1	2.7	6.0	6.3	Z	3.3	2.2	1.3	1.1	M	M	M	M	3.5	1.1	0.4	0.9	1.5	4.0	4.9	5.7	4.6	4.8	3.0	6.3	
21-Nov	Z	2.1	0.9	1.2	1.4	2.0	2.5	3.0	3.9	1.8	4.2	3.7	4.1	4.4	3.7	2.8	2.7	4.0	6.6	7.8	8.9	8.2	7.6	4.6	4.0	8.9	
22-Nov	2.9	Z	0.8	0.8	0.6	0.3	1.0	0.4	2.1	1.3	5.8	2.4	2.4	2.9	1.5	3.3	8.1	4.4	8.4	5.9	4.5	9.5	11.0	6.7	3.8	11.0	
23-Nov	4.6	3.6	Z	2.3	2.4	2.0	1.6	1.3	1.5	1.0	0.8	1.1	0.8	0.8	0.4	0.4	0.6	0.4	0.1	0.1	0.4	0.5	0.8	0.1	1.2	4.6	
24-Nov	1.0	0.5	1.1	Z	2.4	1.0	1.1	0.9	0.9	1.2	1.2	1.3	1.4	1.3	1.0	0.9	0.1	0.3	0.9	2.8	1.1	0.0	0.7	0.1	0.9	2.8	
25-Nov	3.7	4.2	2.5	6.0	Z	3.8	2.9	1.1	0.4	2.6	1.1	2.6	1.2	3.7	1.6	4.0	4.1	6.6	9.3	6.3	3.4	4.5	4.7	3.7	3.7	9.3	
26-Nov	3.3	2.8	2.4	2.5	2.3	Z	2.3	2.3	2.3	2.2	2.2	2.8	2.8	2.9	3.8	6.6	6.1	4.3	3.1	3.3	4.8	6.4	4.3	2.0	3.4	6.6	
27-Nov	Z	7.3	4.9	2.2	11.6	5.7	5.5	0.8	0.1	0.2	4.4	17.0	14.2	16.6	11.3	4.4	10.0	11.8	15.2	14.3	12.1	11.3	6.2	2.5	8.2	17.0	
28-Nov	8.8	Z	0.0	1.8	3.2	1.4	2.0	4.9	6.9	7.2	6.7	3.1	1.6	0.6	1.6	3.7	3.6	2.4	1.8	1.2	3.2	3.5	2.9	4.8	3.3	8.8	
29-Nov	4.9	3.6	Z	0.4	0.1	1.2	2.6	2.5	4.7	2.7	3.2	2.5	3.3	5.0	2.9	1.4	5.0	1.2	3.5	2.9	0.8	0.4	0.0	0.0	2.4	5.0	
30-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	1.7	1.9	0.9	2.5	1.7	1.4	0.0	0.0	1.0	0.1	0.0	0.0	0.1	1.7	1.8	0.7	0.7	2.5	

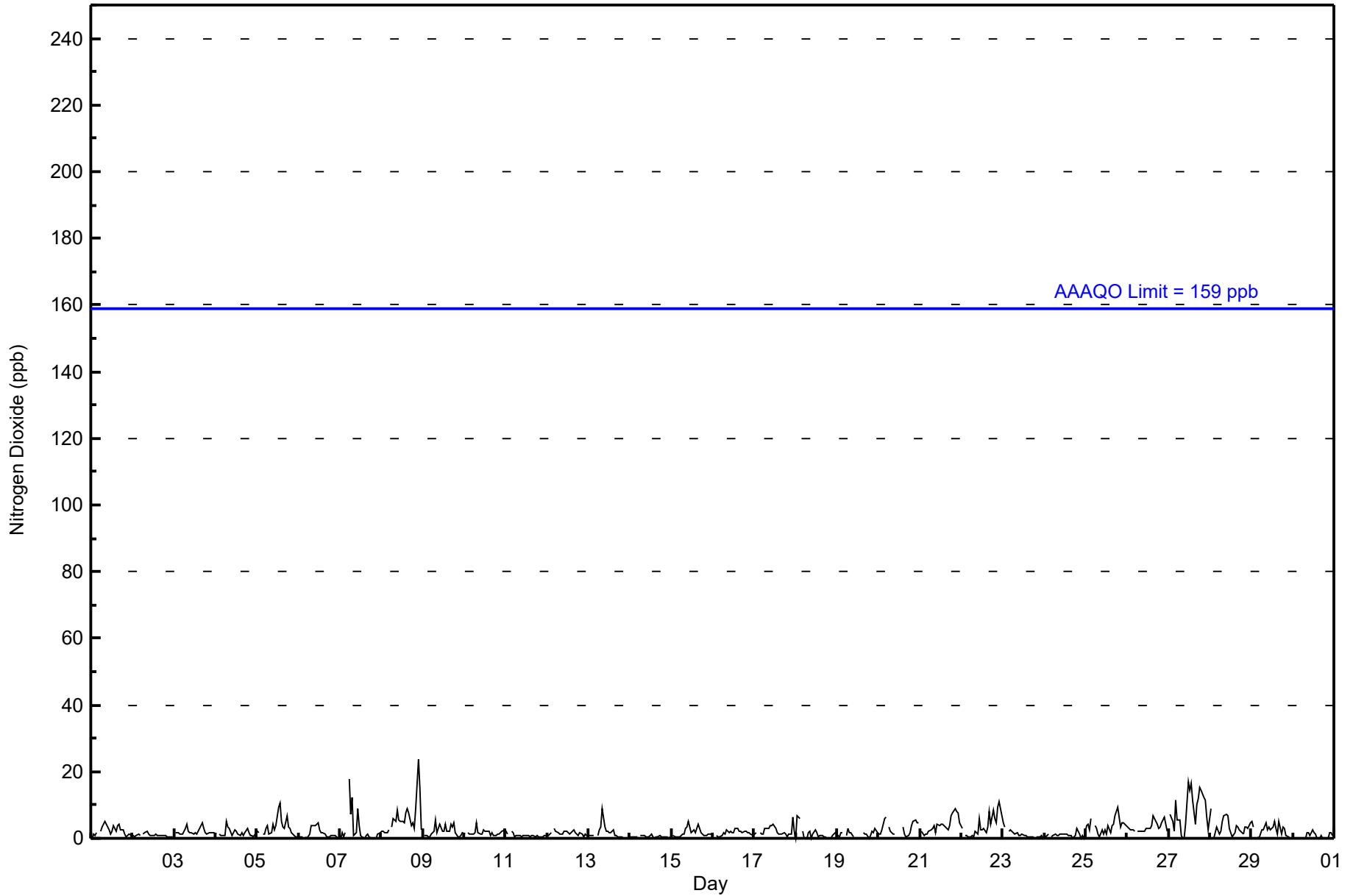
1.8	1.9	1.5	1.7	1.8	2.1	2.4	2.7	2.6	2.3	2.9	3.0	2.7	3.0	2.3	2.3	2.7	2.3	2.7	2.4	2.3	3.0	2.8	1.8	Diurnal Average	
8.8	7.3	6.1	6.0	11.6	17.7	7.4	12.4	8.8	8.3	9.0	17.0	14.2	16.6	11.3	9.1	10.0	11.8	15.2	14.3	12.1	23.8	14.9	6.7	Diurnal Maximum	

Z - zerospan      C - Calibration      M - Maintenance  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Jackfish 1 - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Jackfish 1 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	680	99.85	99.85
21 - 40	1	0.15	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Jackfish 1 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	39	42	34	21	15	16	21	69	97	66	19	11	29	97	52	49	677
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	39	42	34	21	15	16	21	69	97	66	19	11	29	98	52	49	678

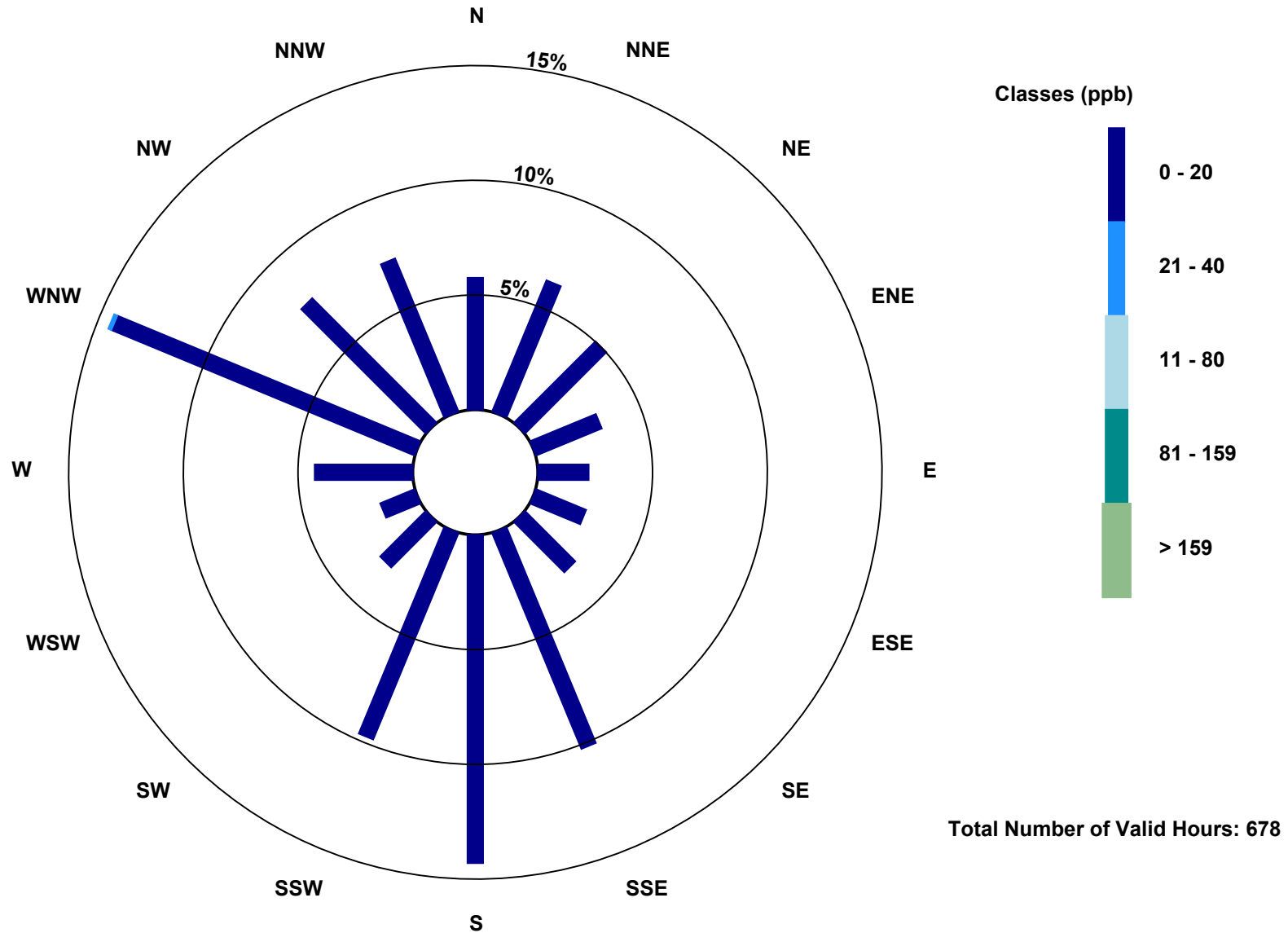
Total Number of Valid Hours: 678

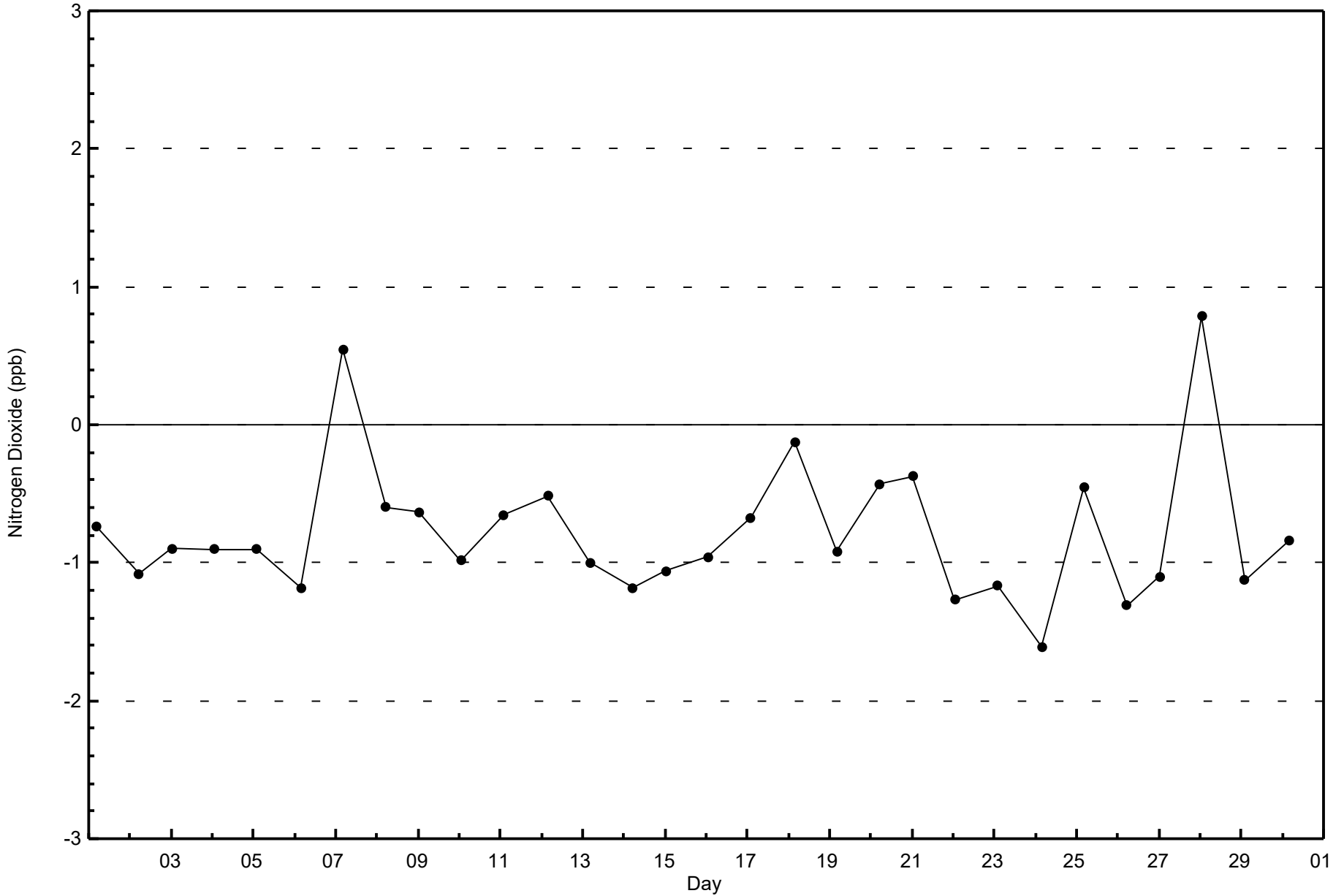
Total Number of Hours: 720



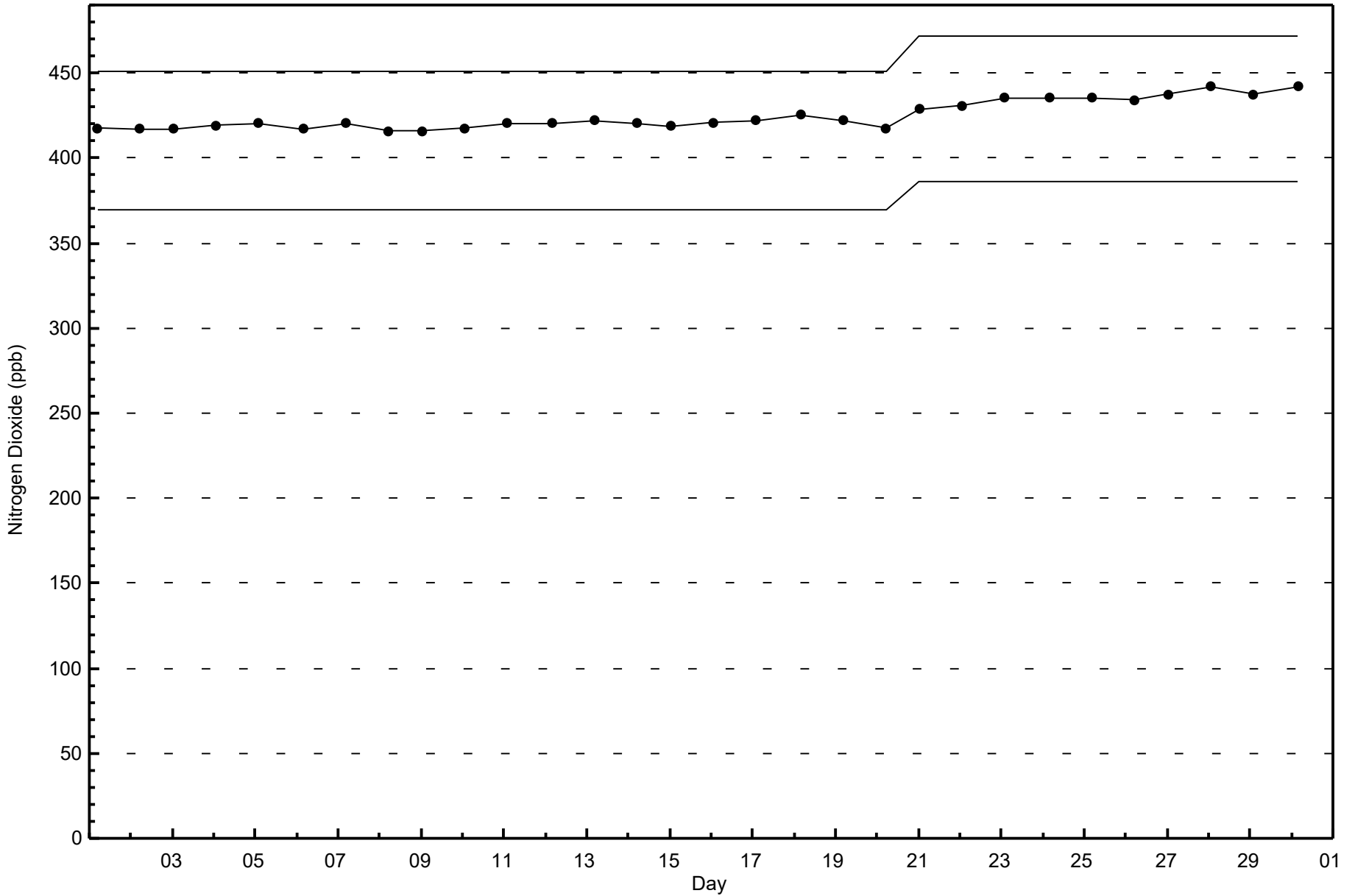
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Jackfish 1











**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

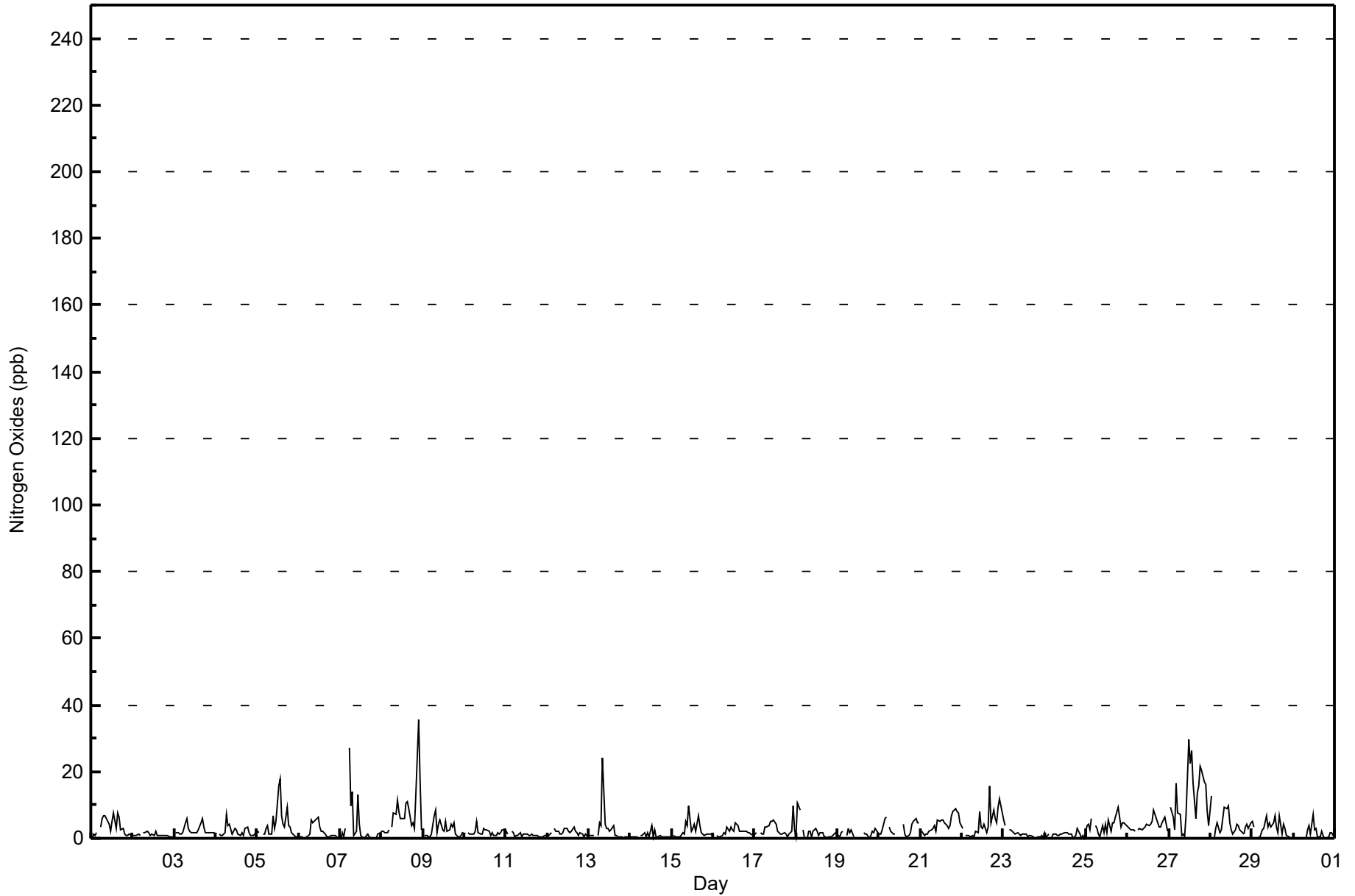
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Jackfish 1 - November 2024**

Maximum Value: 35.5 ppb on Nov 8 22:00		Maximum Daily Average: 12.0 ppb on Nov 27		Hours in Service: 720																						
Minimum Value: 0.0 ppb on Nov 7 00:00		Minimum Daily Average: 0.9 ppb on Nov 14		Hours of Data: 681																						
Maximum Diurnal Average: 4.4 ppb at hour 14		Minimum Diurnal Average: 1.7 ppb at hour 3		Hours of Missing Data: 39																						
Monthly Average: 3.02 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 0.9 Median = 1.8 Q <sub>3</sub> = 3.7 P <sub>90</sub> = 6.6 P <sub>99</sub> = 20.6		Hours of Calibration: 35																						
				Percent Operational Time: 99.4																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.2	1.2	0.9	1.6	Z	3.5	5.8	6.6	7.0	4.9	4.0	2.0	5.2	7.7	3.0	7.6	6.3	2.7	3.2	1.2	0.6	0.8	1.2	0.9	3.4	7.7
2-Nov	0.7	0.7	0.9	1.3	0.9	Z	1.5	1.8	2.2	1.6	1.0	1.2	0.9	2.0	1.0	0.9	1.0	0.7	0.7	0.7	0.6	0.6	0.5	0.6	1.0	2.2
3-Nov	Z	1.6	1.6	1.2	1.4	1.5	4.7	5.9	2.8	2.2	1.7	1.7	1.8	1.5	2.7	4.8	6.1	3.2	1.9	1.6	1.6	1.7	1.8	1.7	2.5	6.1
4-Nov	1.4	Z	1.3	0.9	0.8	1.8	7.2	4.0	4.3	1.1	2.1	3.2	2.6	1.2	0.8	1.6	0.9	2.8	3.2	1.7	0.9	1.0	0.6	1.8	2.1	7.2
5-Nov	2.0	1.8	Z	1.2	1.1	2.9	3.7	1.4	1.5	6.6	2.8	5.0	15.8	18.0	6.7	4.4	3.4	9.1	3.7	3.4	1.9	0.7	0.6	0.4	4.3	18.0
6-Nov	0.4	0.5	0.3	Z	0.4	0.2	1.4	5.4	4.7	5.1	5.3	6.4	3.2	2.1	1.9	1.3	0.4	0.4	0.6	1.0	1.0	0.7	0.3	0.0	1.9	6.4
7-Nov	0.0	1.5	0.4	2.8	Z	27.1	9.7	14.1	1.0	2.3	13.0	4.4	1.0	0.3	0.2	0.7	1.3	0.4	0.1	0.1	0.0	0.2	1.3	1.8	3.6	27.1
8-Nov	2.3	2.0	1.9	1.9	2.4	Z	3.4	7.5	7.2	11.6	7.9	5.8	5.9	5.9	10.7	11.1	8.7	3.9	4.8	3.2	13.2	35.5	17.2	2.7	7.7	35.5
9-Nov	Z	1.0	1.0	0.3	0.4	1.4	6.6	8.6	1.7	4.2	5.3	2.5	2.2	5.2	2.2	2.6	4.3	3.6	4.7	1.5	0.6	0.6	0.9	1.9	2.8	8.6
10-Nov	1.3	Z	1.6	1.2	1.1	1.4	2.1	5.3	1.8	1.4	1.5	3.1	2.5	2.5	2.2	0.8	1.6	0.9	0.8	1.5	1.4	1.7	2.4	2.6	1.8	5.3
11-Nov	2.2	1.3	Z	2.1	1.6	0.6	0.7	0.9	1.5	0.6	1.1	1.1	1.2	0.9	0.8	1.3	0.8	0.8	0.7	0.6	0.5	0.6	0.8	0.7	1.0	2.2
12-Nov	0.7	0.8	1.9	Z	2.9	2.1	2.3	1.3	1.3	1.8	2.9	3.0	2.1	1.6	2.3	3.4	2.0	1.5	1.0	1.5	1.3	0.6	1.3	1.0	1.8	3.4
13-Nov	0.8	0.7	0.7	0.8	Z	0.8	4.6	3.7	24.3	4.2	3.0	3.1	2.1	2.3	3.9	0.8	0.7	0.6	0.5	0.3	0.2	0.2	0.2	0.3	2.6	24.3
14-Nov	0.4	0.5	0.6	0.6	0.5	Z	0.8	0.8	1.6	0.6	1.9	0.5	3.7	0.5	2.6	0.4	0.6	0.8	0.5	0.5	0.4	0.3	0.2	0.3	0.9	3.7
15-Nov	Z	0.7	0.5	0.4	0.5	0.4	1.6	1.4	5.0	3.9	9.7	2.3	3.0	4.1	2.0	6.8	4.0	1.9	1.5	1.0	1.1	1.2	1.3	1.2	2.4	9.7
16-Nov	0.9	Z	0.8	0.5	0.4	0.9	1.8	1.4	3.6	2.2	3.2	2.4	2.1	4.6	3.8	2.3	2.1	1.9	2.0	2.1	1.9	1.7	1.4	1.0	2.0	4.6
17-Nov	1.2	1.5	Z	1.8	1.2	1.4	3.5	3.5	3.8	5.0	5.1	5.6	4.0	2.1	1.6	1.3	1.4	1.5	1.1	0.6	1.3	2.1	9.6	2.6	2.7	9.6
18-Nov	0.3	10.4	8.5	Z	2.7	0.0	0.2	2.0	2.2	0.3	1.9	3.2	2.2	0.8	1.5	1.6	0.6	0.3	0.2	0.2	0.2	0.9	1.3	1.8	1.9	10.4
19-Nov	0.9	0.6	1.9	1.9	Z	0.9	2.9	1.6	2.4	0.4	C	C	C	C	C	1.6	1.2	1.3	0.2	0.8	2.1	1.6	3.1	1.5	1.5	3.1
20-Nov	1.3	1.1	2.7	6.0	6.3	Z	3.3	2.2	1.4	1.3	M	M	M	M	4.2	1.3	0.4	1.0	1.5	4.1	4.9	5.7	4.6	4.8	3.1	6.3
21-Nov	Z	2.1	0.9	1.2	1.4	2.0	2.5	3.1	4.0	2.2	5.6	5.1	5.6	5.7	4.6	3.6	2.8	4.0	6.9	7.8	9.0	8.2	7.6	4.6	4.4	9.0
22-Nov	2.9	Z	0.8	0.8	0.6	0.3	1.0	0.4	2.2	1.6	8.2	3.2	3.1	4.1	1.7	3.5	15.5	4.7	8.4	5.9	4.5	9.5	12.0	7.5	4.5	15.5
23-Nov	5.6	3.6	Z	2.3	2.4	2.1	1.6	1.4	1.8	1.4	0.9	1.2	1.2	1.2	0.5	0.8	0.7	0.4	0.1	0.1	0.4	0.5	0.9	0.1	1.4	5.6
24-Nov	1.7	0.5	1.1	Z	0.4	1.3	1.3	0.9	0.9	1.4	1.3	1.7	1.8	1.8	1.3	1.1	0.1	0.3	0.9	2.9	1.1	0.0	0.7	0.1	1.1	2.9
25-Nov	3.7	4.2	2.5	6.0	Z	4.0	3.0	1.1	0.5	4.0	1.5	4.3	1.8	5.5	2.0	4.5	4.5	6.6	9.3	6.3	3.4	4.5	4.7	3.7	4.0	9.3
26-Nov	3.3	2.8	2.4	2.5	2.3	Z	2.5	3.1	2.7	2.9	3.2	4.4	4.0	4.1	5.2	8.4	7.1	4.5	3.2	3.3	4.8	6.4	4.3	2.2	3.9	8.4
27-Nov	Z	9.1	6.4	2.7	16.3	7.5	7.1	0.9	1.3	0.5	6.7	29.6	22.7	26.2	16.4	6.1	13.6	15.9	21.6	20.3	16.9	15.9	8.1	3.9	12.0	29.6
28-Nov	12.6	Z	0.0	2.9	4.7	1.8	2.3	5.7	9.3	8.8	9.7	4.5	2.6	1.1	2.4	4.4	3.9	2.6	1.8	1.2	3.2	4.2	2.9	4.8	4.2	12.6
29-Nov	4.9	3.6	Z	0.4	0.1	1.3	2.6	2.8	6.9	3.4	4.8	3.3	4.5	6.7	3.5	1.6	6.8	1.2	4.2	3.0	0.8	0.4	0.0	0.0	2.9	6.9
30-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	2.4	3.6	1.2	7.2	2.5	2.9	0.4	0.4	2.0	0.7	0.0	0.0	0.2	1.7	1.8	0.7	1.2	7.2
																								Diurnal Average		
																								Diurnal Maximum		
																								2.1 2.2 1.7 1.8 2.1 2.7 3.1 3.3 3.8 3.0 4.2 4.3 4.0 4.4 3.2 3.0 3.5 2.7 3.0 2.6 2.7 3.7 3.1 1.9		
																								12.6 10.4 8.5 6.0 16.3 27.1 9.7 14.1 24.3 11.6 13.0 29.6 22.7 26.2 16.4 11.1 15.5 15.9 21.6 20.3 16.9 35.5 17.2 7.5		
																								Z - zerospan C - Calibration M - Maintenance		



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Jackfish 1 - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Jackfish 1 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	674	98.97	98.97
21 - 40	7	1.03	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Jackfish 1 - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	39	42	34	21	15	16	21	69	97	66	19	11	29	92	52	48	671
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	7
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	39	42	34	21	15	16	21	69	97	66	19	11	29	98	52	49	678

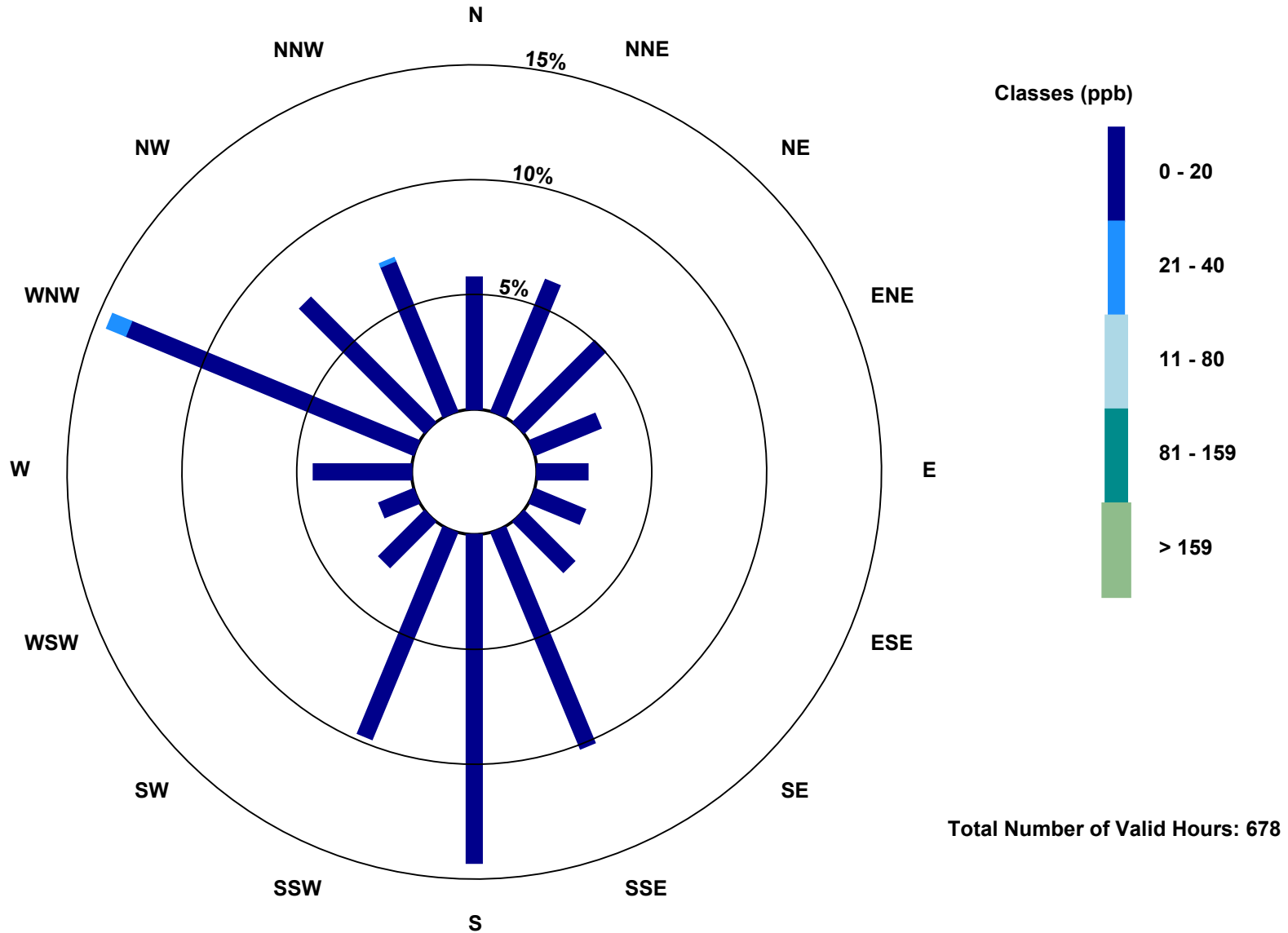
Total Number of Valid Hours: 678

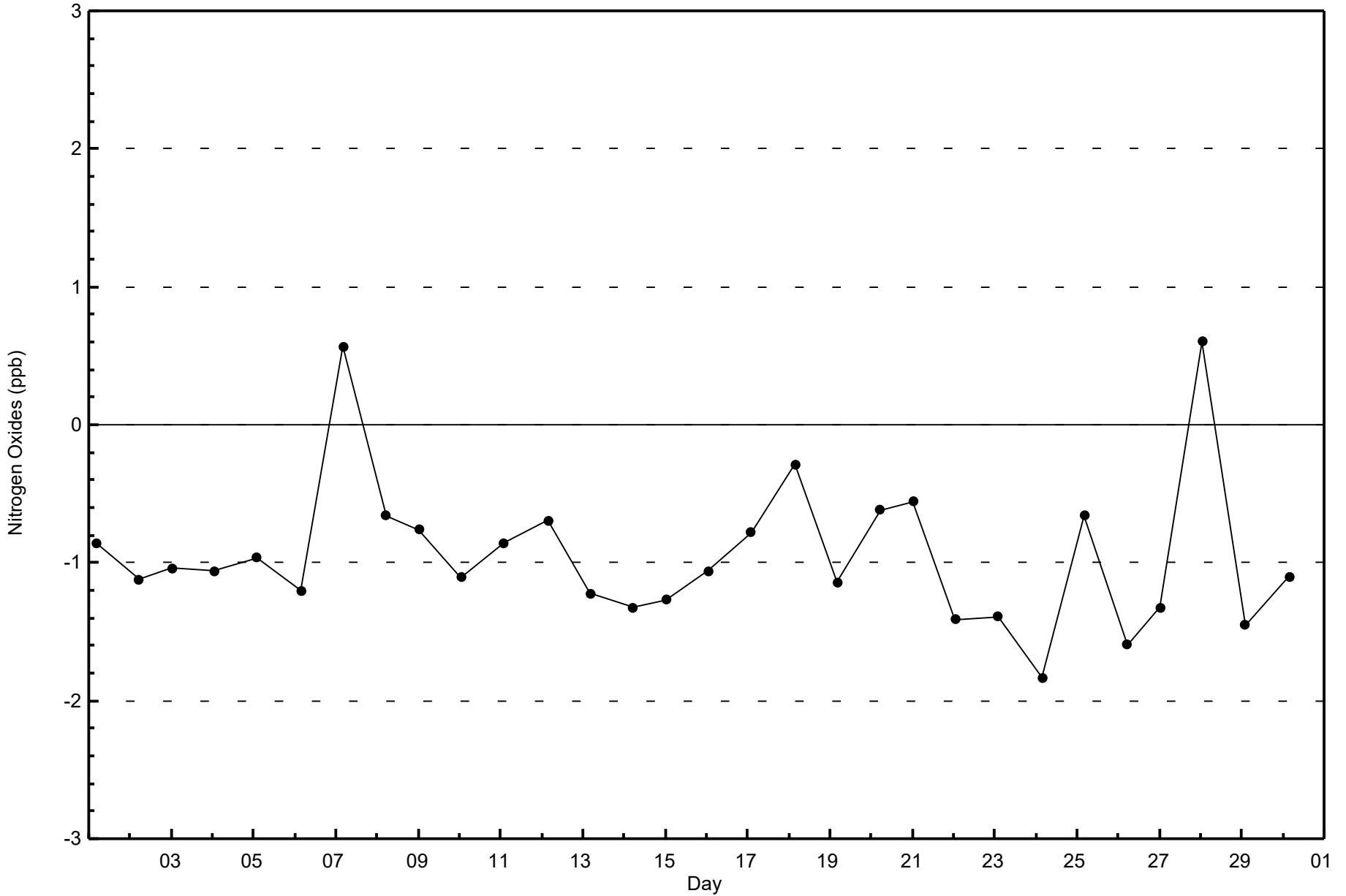
Total Number of Hours: 720

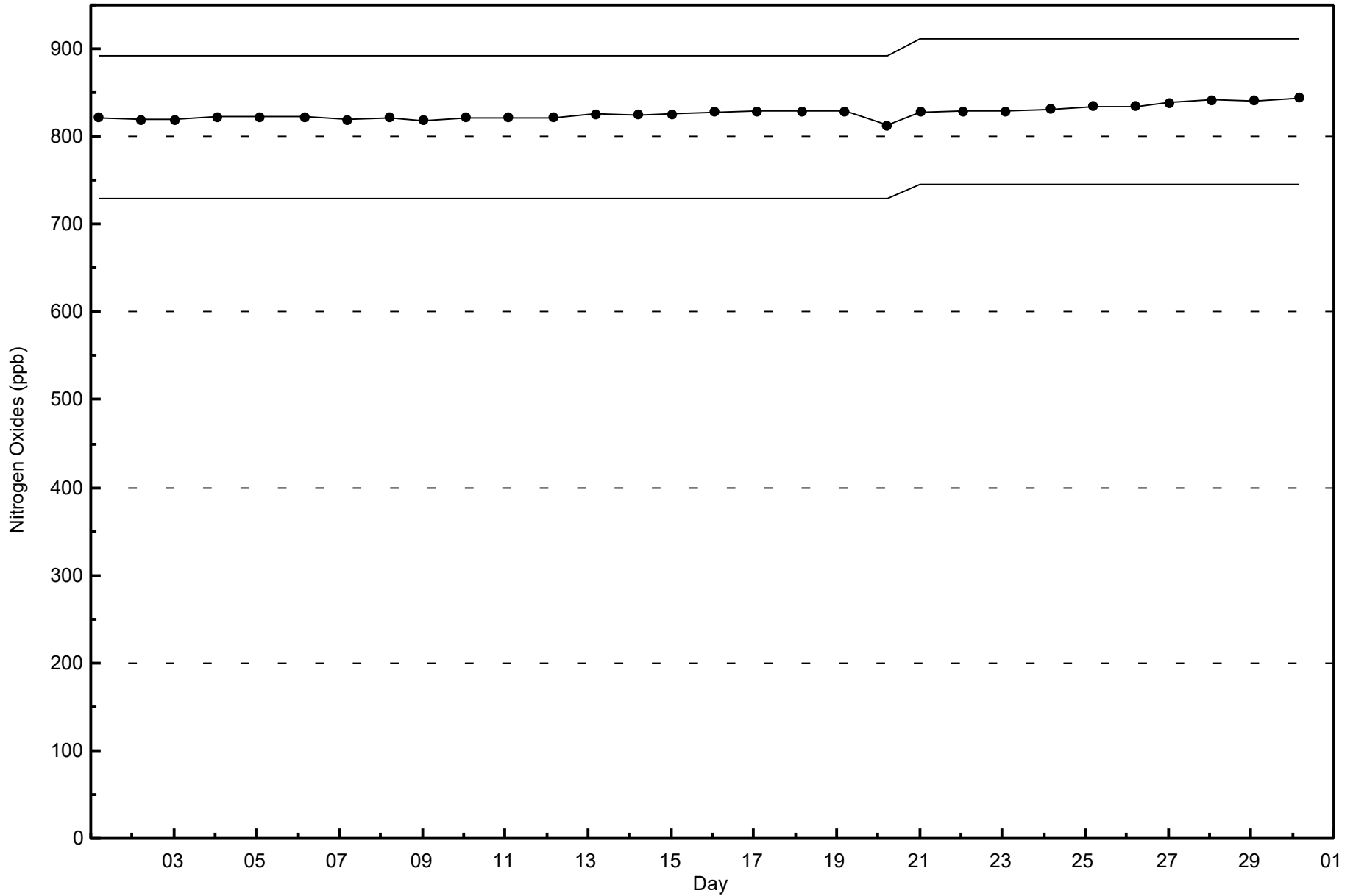


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Jackfish 1











**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

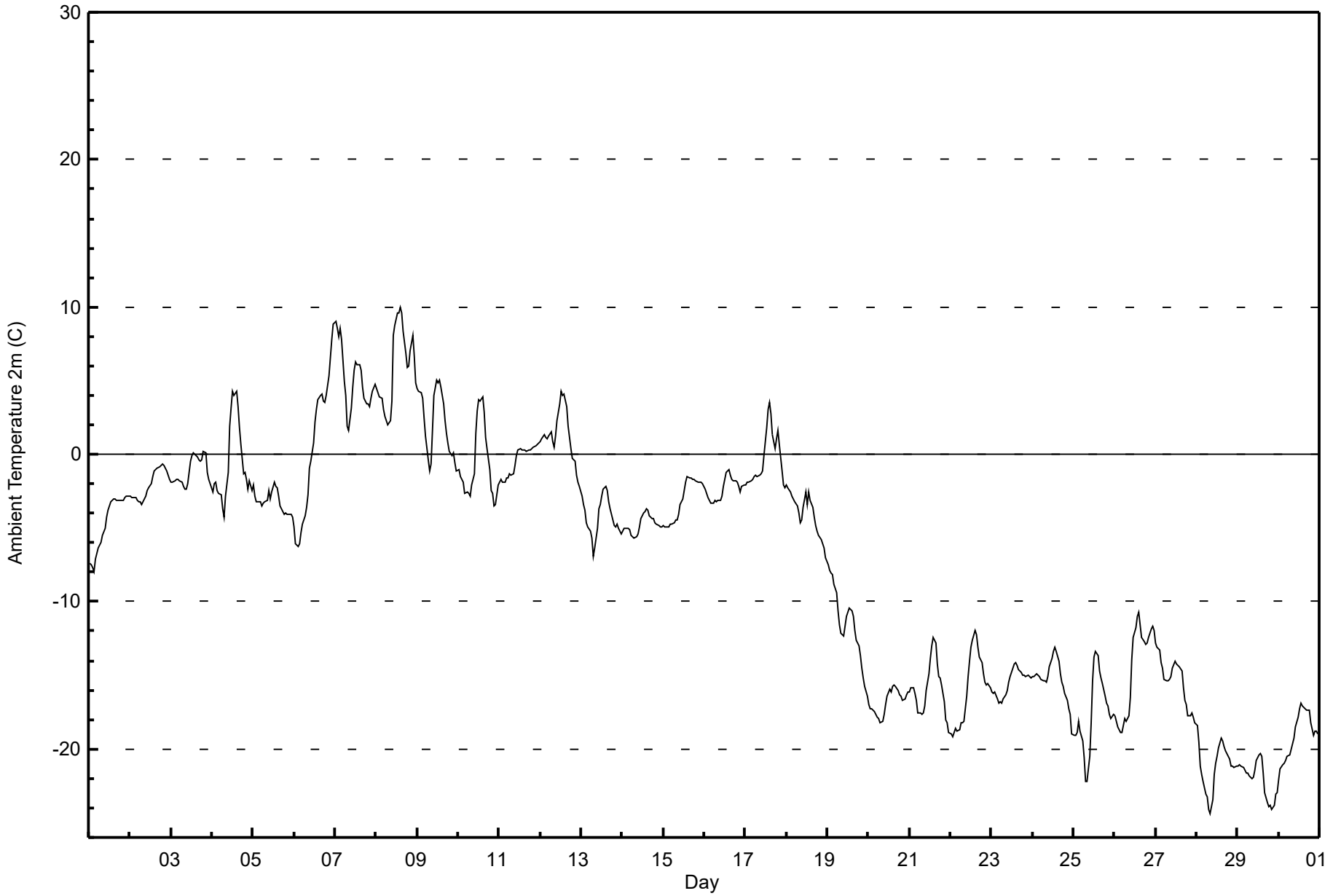
**Ambient Temperature 2m (AT2) - C**  
**Jackfish 1 - November 2024**

Maximum Value: 10.0 C on Nov 8 15:00      Maximum Daily Average: 5.9 C on Nov 8																						Hours in Service: 720 Hours of Data: 720																										
Minimum Value: -24.4 C on Nov 28 09:00      Minimum Daily Average: -22.0 C on Nov 29 Maximum Diurnal Average: -5.0 C at hour 15      Minimum Diurnal Average: -8.9 C at hour 8 Monthly Average: -7.25 C      Percentiles: P <sub>1</sub> = -23.4 P <sub>10</sub> = -18.9 Q <sub>1</sub> = -15.5 Median = -4.1 Q <sub>3</sub> = -1.3 P <sub>90</sub> = 3.2 P <sub>99</sub> = 8.6																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-7.4	-7.5	-7.7	-8.0	-7.1	-6.3	-6.2	-5.9	-5.5	-5.1	-4.3	-3.8	-3.5	-3.2	-3.0	-3.0	-3.1	-3.2	-3.1	-3.1	-3.1	-2.9	-2.8	-2.9	-4.7	-2.8																						
2-Nov	-2.9	-2.9	-2.9	-3.0	-3.1	-3.2	-3.2	-3.4	-3.0	-2.8	-2.5	-2.2	-2.0	-1.5	-1.1	-1.1	-0.9	-0.8	-0.7	-0.7	-0.7	-1.1	-1.5	-1.7	-2.0	-0.7																						
3-Nov	-1.8	-1.9	-1.8	-1.7	-1.7	-1.8	-1.9	-2.1	-2.4	-2.4	-2.0	-0.5	-0.1	0.1	0.0	-0.2	-0.4	-0.4	-0.4	0.2	0.1	-1.2	-1.7	-2.0	-1.2	0.2																						
4-Nov	-2.5	-1.9	-1.9	-2.4	-2.7	-2.7	-3.7	-4.2	-2.8	-1.2	1.9	3.1	4.3	4.0	4.3	3.2	1.8	0.6	-1.3	-1.3	-1.7	-2.4	-1.8	-2.5	-0.6	4.3																						
5-Nov	-2.1	-2.8	-3.2	-3.3	-3.3	-3.5	-3.3	-3.2	-3.1	-2.4	-3.0	-2.5	-1.9	-2.1	-2.3	-2.8	-3.5	-3.9	-4.1	-4.0	-4.1	-4.1	-4.1	-4.3	-3.2	-1.9																						
6-Nov	-4.9	-6.1	-6.2	-6.0	-5.4	-4.7	-4.1	-3.6	-2.7	-1.0	-0.4	0.8	2.2	3.1	3.7	4.0	4.0	3.6	3.5	4.0	5.3	6.6	7.8	8.8	0.5	8.8																						
7-Nov	9.1	8.6	8.0	8.5	7.8	4.9	4.0	1.9	1.6	3.2	4.6	5.7	6.3	6.1	6.1	5.7	4.6	3.8	3.4	3.5	3.2	3.8	4.3	4.8	5.1	9.1																						
8-Nov	4.5	4.2	3.9	3.8	3.1	2.6	2.3	2.0	2.3	3.7	8.1	8.7	9.6	9.6	10.0	9.6	8.4	6.8	5.8	6.0	7.0	8.1	6.6	4.9	5.9	10.0																						
9-Nov	4.4	4.3	4.2	3.8	2.5	1.3	-0.4	-1.1	-0.6	1.6	4.0	5.1	4.9	5.1	4.6	3.4	2.2	1.4	0.8	0.2	-0.1	0.1	-0.5	-1.2	2.1	5.1																						
10-Nov	-1.0	-1.6	-1.7	-1.9	-2.7	-2.5	-2.6	-2.8	-2.1	-1.3	1.4	2.9	3.7	3.6	3.9	2.8	1.1	0.4	-1.0	-2.5	-2.6	-3.5	-3.4	-2.1	-0.6	3.9																						
11-Nov	-1.9	-1.7	-1.9	-1.9	-1.6	-1.6	-1.3	-1.4	-1.3	-0.7	-0.1	0.3	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.6	0.7	0.8	-0.4	0.8																						
12-Nov	0.9	1.0	1.4	1.2	1.0	1.3	1.6	0.9	0.5	1.2	2.3	3.4	4.3	4.0	4.1	3.3	2.0	1.1	0.3	-0.3	-0.4	-1.4	-1.9	-2.2	1.2	4.3																						
13-Nov	-2.8	-3.4	-3.8	-4.7	-4.9	-5.2	-5.7	-7.0	-6.3	-5.0	-3.7	-3.4	-2.8	-2.4	-2.2	-2.5	-3.2	-3.7	-4.4	-4.8	-4.9	-4.7	-5.1	-5.4	-4.3	-2.2																						
14-Nov	-5.2	-5.0	-5.0	-5.0	-5.1	-5.5	-5.6	-5.7	-5.6	-5.4	-4.9	-4.3	-4.0	-3.9	-3.7	-3.8	-4.2	-4.4	-4.4	-4.6	-4.8	-4.8	-4.9	-4.9	-4.8	-3.7																						
15-Nov	-4.9	-4.9	-4.9	-4.9	-4.8	-4.7	-4.6	-4.5	-4.4	-4.1	-3.5	-3.0	-2.5	-1.9	-1.5	-1.6	-1.7	-1.7	-1.7	-1.8	-1.9	-1.9	-1.9	-2.0	-3.1	-1.5																						
16-Nov	-2.4	-2.7	-2.9	-3.1	-3.3	-3.3	-3.1	-3.2	-3.2	-3.1	-2.9	-2.2	-1.7	-1.2	-1.0	-1.4	-1.7	-1.8	-1.8	-1.9	-2.2	-2.5	-2.2	-2.1	-2.4	-1.0																						
17-Nov	-2.1	-1.9	-1.9	-1.8	-1.7	-1.5	-1.4	-1.5	-1.5	-1.3	-1.2	-0.1	1.8	3.0	3.5	2.8	1.3	0.4	1.0	1.6	0.7	-1.1	-2.1	-2.2	-0.3	3.5																						
18-Nov	-2.1	-2.3	-2.6	-2.8	-3.0	-3.3	-3.5	-4.0	-4.6	-4.4	-3.6	-2.5	-3.4	-2.6	-3.2	-3.6	-4.2	-4.9	-5.2	-5.5	-5.8	-6.1	-6.3	-7.1	-4.0	-2.1																						
19-Nov	-7.5	-7.9	-8.1	-8.1	-8.8	-9.4	-10.6	-11.5	-12.1	-12.3	-11.7	-11.0	-10.8	-10.4	-10.6	-11.0	-12.0	-12.6	-13.0	-13.7	-14.5	-15.2	-15.8	-16.4	-11.5	-7.5																						
20-Nov	-16.9	-17.3	-17.3	-17.4	-17.6	-17.8	-17.9	-18.2	-18.1	-17.7	-17.0	-16.4	-15.9	-16.1	-15.8	-15.6	-15.7	-16.0	-16.4	-16.4	-16.7	-16.6	-16.3	-16.1	-16.8	-15.6																						
21-Nov	-16.1	-15.9	-15.9	-16.2	-16.7	-17.6	-17.5	-17.6	-17.5	-17.1	-16.0	-14.9	-13.8	-13.0	-12.4	-12.9	-14.2	-15.1	-15.2	-15.6	-16.8	-18.0	-18.2	-18.9	-16.0	-12.4																						
22-Nov	-19.0	-19.2	-18.8	-18.6	-18.8	-18.7	-18.2	-18.2	-18.1	-16.4	-15.1	-14.0	-13.1	-12.6	-12.0	-12.3	-13.1	-13.8	-14.1	-14.9	-15.5	-15.6	-15.6	-15.8	-15.9	-12.0																						
23-Nov	-16.1	-16.2	-16.1	-16.6	-16.9	-16.8	-16.9	-16.6	-16.3	-16.0	-15.5	-15.1	-14.5	-14.2	-14.2	-14.4	-14.6	-14.8	-14.9	-15.0	-15.0	-15.0	-15.1	-15.2	-15.5	-14.2																						
24-Nov	-15.1	-15.1	-14.9	-14.9	-15.1	-15.3	-15.4	-15.4	-15.4	-15.1	-14.4	-13.8	-13.4	-13.1	-13.4	-14.0	-14.9	-15.4	-15.7	-16.2	-16.7	-17.2	-17.6	-19.0	-15.3	-13.1																						
25-Nov	-19.0	-19.1	-18.9	-18.1	-18.8	-19.4	-20.6	-22.2	-20.5	-18.2	-15.4	-13.8	-13.3	-13.6	-14.7	-15.2	-15.6	-16.4	-16.8	-17.1	-17.6	-17.9	-17.6	-17.6	-17.6	-13.3																						
26-Nov	-17.8	-18.1	-18.5	-18.9	-18.9	-18.4	-18.0	-18.1	-17.7	-16.5	-13.9	-12.4	-11.8	-11.0	-10.7	-11.6	-12.4	-12.7	-12.9	-12.8	-12.4	-11.9	-11.7	-11.9	-14.6	-10.7																						
27-Nov	-12.8	-13.1	-13.3	-14.1	-14.5	-15.3	-15.4	-15.3	-15.0	-14.6	-14.0	-14.2	-14.4	-14.4	-14.7	-15.8	-16.7	-17.0	-17.7	-17.8	-17.6	-17.8	-18.2	-18.2	-15.4	-12.8																						
28-Nov	-18.4	-19.6	-21.2	-21.8	-22.2	-23.1	-23.2	-24.1	-24.4	-23.5	-21.7	-21.0	-20.5	-19.9	-19.3	-19.4	-19.8	-20.2	-20.5	-20.6	-21.1	-21.2	-21.3	-21.2	-21.2	-18.4																						
29-Nov	-21.2	-21.0	-21.1	-21.3	-21.5	-21.7	-21.6	-21.8	-22.0	-21.9	-21.5	-20.8	-20.4	-20.3	-20.5	-21.6	-22.9	-23.6	-23.9	-23.9	-24.1	-23.8	-23.1	-23.0	-22.0	-20.3																						
30-Nov	-22.1	-21.4	-21.1	-21.0	-20.7	-20.5	-20.4	-20.0	-19.6	-19.3	-18.5	-17.8	-17.3	-16.8	-17.1	-17.3	-17.4	-17.4	-17.4	-18.2	-19.1	-18.8	-18.8	-19.0	-19.0	-16.8																						
																								-7.6	-7.7	-7.9	-8.0	-8.2	-8.5	-8.6	-8.9	-8.8	-8.1	-6.9	-6.0	-5.5	-5.2	-5.0	-5.5	-6.2	-6.7	-7.0	-7.2	-7.4	-7.6	-7.7	-7.8	Diurnal Average
																								9.1	8.6	8.0	8.5	7.8	4.9	4.0	2.0	2.3	3.7	8.1	8.7	9.6	9.6	10.0	9.6	8.4	6.8	5.8	6.0	7.0	8.1	7.8	8.8	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 2m (AT2) - C**  
**Jackfish 1 - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C**  
**Jackfish 1 - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	53	7.36	7.36
-20 - 0	527	73.19	80.56
0 - 10	140	19.44	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

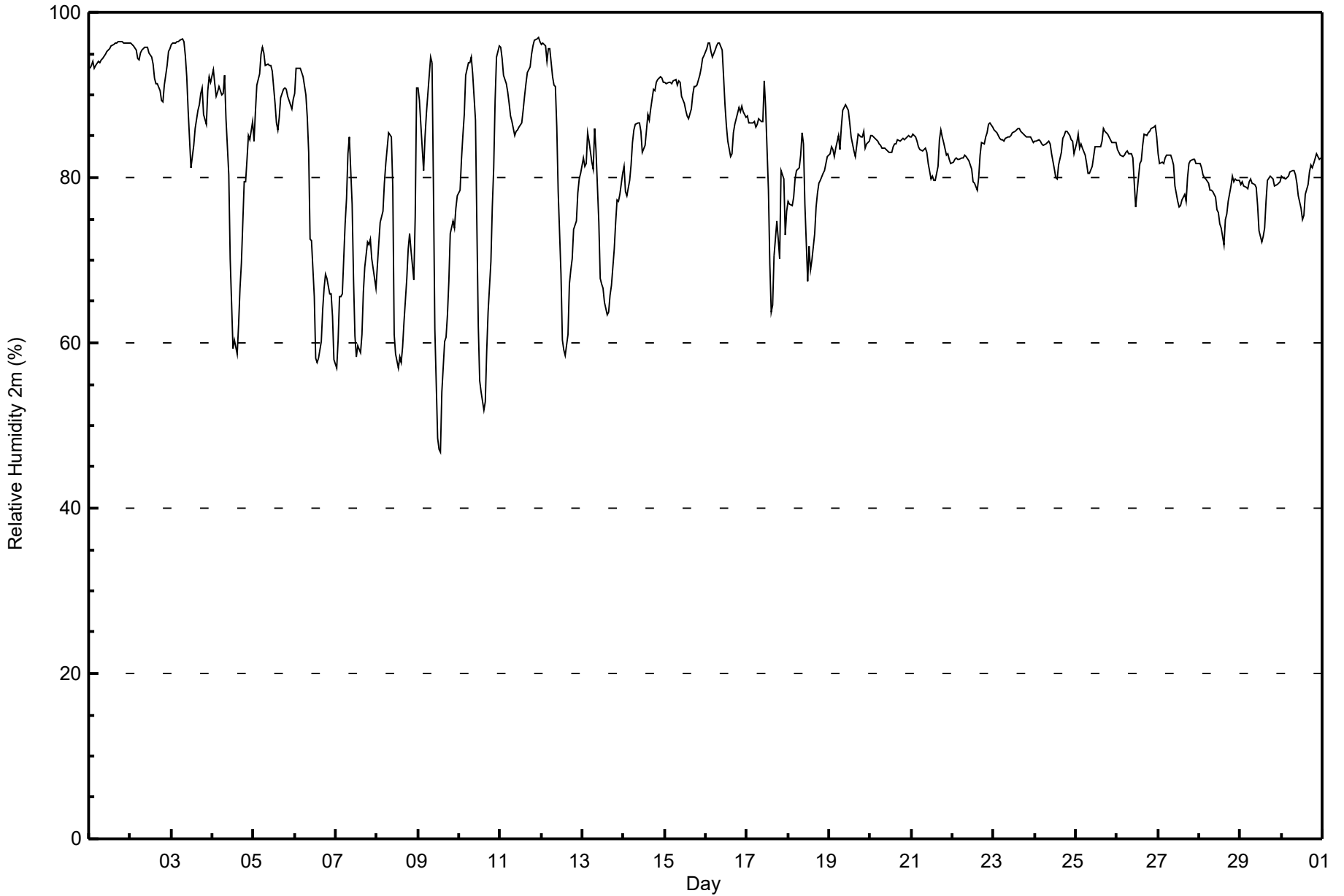
**Relative Humidity 2m (RH2) - %**  
**Jackfish 1 - November 2024**

<b>Maximum Value: 96.9 % on Nov 11 23:00</b> <b>Maximum Daily Average: 95.2 % on Nov 1</b>																						<b>Hours in Service: 720</b>				
<b>Minimum Value: 46.7 % on Nov 9 14:00</b> <b>Minimum Daily Average: 68.1 % on Nov 7</b>																						<b>Hours of Data: 720</b>				
<b>Maximum Diurnal Average: 87.1 % at hour 8</b> <b>Minimum Diurnal Average: 75.4 % at hour 15</b>																						<b>Hours of Missing Data: 0</b>				
<b>Monthly Average: 82.48 %</b> <b>Percentiles: P<sub>1</sub> = 55.7 P<sub>10</sub> = 68.2 Q<sub>1</sub> = 79.2 Median = 83.8 Q<sub>3</sub> = 88.4 P<sub>90</sub> = 94.2 P<sub>99</sub> = 96.5</b>																						<b>Hours of Calibration: 0</b>				
																						<b>Percent Operational Time: 100.0</b>				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	93.2	93.6	94.1	93.2	93.6	94.0	93.9	94.3	94.4	94.9	95.2	95.4	95.7	95.9	96.1	96.2	96.3	96.4	96.5	96.4	96.3	96.3	96.4	96.2	95.2	96.5
2-Nov	96.2	96.0	95.9	95.5	94.5	94.2	95.0	95.4	95.7	95.7	95.7	95.1	94.6	93.8	92.0	91.3	91.3	90.5	89.4	89.1	91.1	93.6	95.3	95.6	93.9	96.2
3-Nov	96.1	96.2	96.3	96.4	96.5	96.7	96.8	96.4	94.8	92.1	88.2	81.2	82.5	84.0	86.0	88.2	88.8	90.2	90.9	87.7	86.4	90.4	92.1	91.5	91.1	96.8
4-Nov	93.0	91.4	89.8	90.4	91.0	90.0	90.1	92.4	87.1	80.4	70.2	64.8	59.3	60.4	58.7	62.3	66.7	69.6	79.4	79.5	82.1	85.1	84.5	86.9	79.4	93.0
5-Nov	84.5	88.0	91.2	92.6	95.0	95.8	95.1	93.6	93.8	93.6	93.6	92.9	89.1	86.6	85.7	87.3	89.6	90.6	90.9	90.7	89.8	88.9	88.4	89.5	90.7	95.8
6-Nov	90.2	93.3	93.2	93.2	92.8	92.1	90.0	87.2	83.1	72.6	72.3	65.6	58.2	57.6	58.2	60.1	64.1	66.6	68.3	67.8	66.0	65.9	63.3	57.9	74.2	93.3
7-Nov	57.0	60.3	65.6	65.5	65.9	74.4	77.5	82.9	84.8	76.8	67.6	60.9	58.4	59.7	58.7	61.0	66.2	69.2	72.2	71.9	72.6	70.2	69.0	66.6	68.1	84.8
8-Nov	69.3	72.1	74.6	75.9	79.3	81.7	83.5	85.3	84.9	78.8	61.0	58.7	57.0	58.2	57.7	59.5	62.6	67.9	71.4	73.2	71.1	67.7	75.2	90.8	71.6	90.8
9-Nov	90.9	89.3	83.6	80.9	84.9	87.9	92.3	94.5	93.9	78.9	61.7	48.4	47.1	46.7	54.0	60.1	60.7	63.3	67.5	73.2	74.7	73.9	76.3	77.8	73.4	94.5
10-Nov	78.5	82.2	85.1	87.6	92.3	93.8	93.9	94.6	92.5	87.0	74.0	62.0	55.4	54.0	51.9	52.9	59.0	63.7	69.8	76.5	81.2	89.3	94.5	95.9	77.8	95.9
11-Nov	95.8	94.5	92.4	91.3	90.4	89.0	87.4	86.8	85.2	85.6	85.8	86.2	86.7	88.2	89.9	91.4	92.8	93.4	94.8	96.0	96.6	96.9	96.9	96.5	91.3	96.9
12-Nov	96.1	96.3	95.9	94.1	95.5	95.6	92.3	91.2	91.1	86.1	78.4	68.3	60.3	59.2	58.5	61.0	67.1	68.9	70.2	73.8	74.8	78.1	79.9	80.5	79.7	96.3
13-Nov	82.4	81.4	81.7	85.4	84.4	81.8	81.0	86.0	83.2	74.6	67.8	67.1	66.5	65.0	63.5	63.7	65.8	66.9	71.3	74.5	77.3	77.1	77.9	80.5	75.3	86.0
14-Nov	81.4	78.3	77.8	79.7	81.6	84.2	85.8	86.4	86.7	86.7	85.7	83.1	83.9	85.8	87.6	87.0	88.4	90.6	90.5	91.6	91.8	92.2	92.1	91.5	86.3	92.2
15-Nov	91.6	91.3	91.5	91.5	91.4	91.6	91.8	91.2	91.8	91.5	89.9	88.2	88.2	87.5	87.2	88.2	90.1	91.0	91.0	91.2	92.4	93.1	94.4	94.7	91.0	94.7
16-Nov	95.6	96.2	96.3	95.2	94.7	95.4	96.0	96.2	96.3	95.5	92.2	88.8	86.2	84.4	82.5	83.0	85.4	86.5	87.8	88.5	88.0	88.6	88.0	87.3	90.6	96.3
17-Nov	87.4	86.5	86.6	86.5	86.7	86.2	86.4	87.2	86.7	86.7	91.7	88.4	78.4	69.5	63.7	64.6	70.5	74.7	72.5	70.1	80.8	79.8	73.1	75.9	80.0	91.7
18-Nov	77.2	76.7	76.5	77.6	79.8	80.8	81.2	82.7	85.5	84.0	76.8	67.5	71.7	68.8	70.0	73.2	76.4	78.1	79.4	79.6	80.5	80.9	81.7	82.6	77.9	85.5
19-Nov	82.8	83.7	83.4	82.5	83.6	85.1	83.5	86.1	88.2	88.8	88.4	88.2	86.7	85.0	83.2	82.5	83.9	85.2	84.8	85.0	85.6	83.6	84.1	84.4	84.9	88.8
20-Nov	85.1	85.0	84.9	84.6	84.3	84.0	83.9	83.6	83.6	83.5	83.2	83.1	83.1	83.7	84.1	84.1	84.7	84.4	84.6	84.7	84.6	85.0	85.1	84.9	84.2	85.1
21-Nov	85.0	85.3	84.9	84.3	83.7	83.4	83.3	83.4	83.6	83.0	81.7	79.8	80.2	79.7	79.7	81.4	84.6	85.8	84.9	84.2	82.7	82.8	82.2	81.6	83.0	85.8
22-Nov	81.8	82.1	82.4	82.2	82.2	82.4	82.4	82.7	82.6	82.0	81.5	81.0	79.5	79.3	78.4	80.0	82.8	84.2	84.2	85.0	85.5	86.5	86.5	86.1	82.6	86.5
23-Nov	85.8	85.5	85.5	84.7	84.6	84.5	84.5	84.7	84.8	84.9	85.1	85.4	85.7	85.8	85.9	85.9	85.6	85.2	85.0	84.9	84.9	84.9	84.7	84.3	85.1	85.9
24-Nov	84.4	84.5	84.6	84.5	84.0	84.0	84.1	84.2	84.5	84.1	83.0	81.1	80.0	79.8	81.5	83.1	84.7	85.1	85.6	85.7	85.1	84.6	84.5	83.0	83.7	85.7
25-Nov	84.2	85.2	83.5	84.2	83.5	82.6	81.7	80.4	80.5	81.4	82.5	83.8	83.7	83.7	83.8	84.5	86.0	85.7	85.3	84.8	84.5	84.3	84.2	84.2	83.7	86.0
26-Nov	83.4	83.0	82.7	82.6	82.7	83.1	83.2	82.9	82.9	82.4	79.3	76.5	80.0	81.7	82.0	84.0	85.3	85.1	85.5	85.5	85.9	86.1	86.3	84.9	83.2	86.3
27-Nov	82.8	81.8	81.8	81.7	82.4	82.7	82.8	82.7	82.2	81.5	79.0	77.1	76.4	76.6	77.2	77.9	77.0	79.9	81.7	82.1	82.2	82.2	81.6	81.7	80.6	82.8
28-Nov	81.8	81.2	80.3	80.0	79.8	79.2	78.5	78.4	78.4	77.7	76.0	75.7	74.4	73.9	71.9	75.0	75.6	77.0	79.0	80.2	79.4	79.8	79.7	79.6	78.0	81.8
29-Nov	79.2	79.5	78.9	78.9	78.7	79.4	79.8	79.3	79.2	78.9	76.5	73.6	72.2	72.8	73.9	77.1	79.6	80.1	80.0	79.8	79.0	79.1	79.3	79.5	78.1	80.1
30-Nov	80.1	79.9	79.8	80.0	80.2	80.6	80.9	80.8	80.3	79.3	77.8	76.3	74.9	75.4	77.9	79.2	80.7	81.4	81.2	81.7	82.8	82.6	82.2	82.3	79.9	82.8
																						Diurnal Average				
																						Diurnal Maximum				



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Relative Humidity 2m (RH2) - %**  
**Jackfish 1 - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 2m (RH2) - %**  
**Jackfish 1 - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	26	3.61	3.61
60 - 80	192	26.67	30.28
80 - 100	502	69.72	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Speed: 15 km/h on Nov 7 05:00	Maximum Daily Speed Average: 8.1 km/h on Nov 11	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 9 14:00	Minimum Daily Speed Average: 0.9 km/h on Nov 1	Hours of Data: 717
Maximum Diurnal Speed Average: 1.1 km/h at hour 14	Minimum Diurnal Speed Average: 0.3 km/h at hour 18	Hours of Missing Data: 3
Monthly Average Velocity: 0.7 km/h 266.0 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 2 Q <sub>1</sub> = 3 Median = 5 Q <sub>3</sub> = 7 P <sub>90</sub> = 9 P <sub>99</sub> = 11	Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	NW3	UO	UO	W1	NNE1	NNE1	ENE1	ENE1	ESE1	ENE1	N1	NE3	ENE2	NE2	NE1	NE2	NE2	E2	ESE2	ENE1	ESE0	SSW0	SSW1	S1	NE0.9	NE3	
2-Nov	S1	S2	S2	S2	SSE2	ESE2	SE5	ESE7	SE8	SE9	SE7	SE8	SE9	SE8	E8	E9	E7	ESE7	ESE7	E4	S2	UO	E3	NE2	ESE4.8	SE9	
3-Nov	NW1	W2	WNW1	NW1	WNW3	WNW3	WNW4	WNW4	WNW3	WNW4	W3	SW3	SW4	SSW5	S5	S4	S5	S5	S6	SSW6	SSW4	SSW4	SSW5	SSW5	SW2.8	S6	
4-Nov	SSW4	SSW5	SSW5	SSW5	SSW5	SSW5	S5	S4	SSW5	SW5	WSW3	W4	SW3	SW4	SW4	SSW3	S1	SSW2	SSE3	SSE3	SE0	SSW2	WSW2	WNW3	SSW3.2	SSW5	
5-Nov	NW4	NW3	WNW2	W3	WNW2	WNW1	W2	SW1	W2	WNW7	NW12	NW8	WNW9	WNW8	NW9	NW10	NW7	WNW6	WNW4	WNW4	W2	WNW2	NW0	SSW2	WNW4.4	NW12	
6-Nov	S3	S6	S7	S7	S8	S9	S8	S7	S8	S8	S9	S9	SSW8	SSW8	SSW7	SSW5	SSW7	SSW8	S8	SSW8	SSW9	SSW10	SSW12	SSW11	S7.8	SSW12	
7-Nov	WSW9	WNW7	WNW6	WNW9	WNW15	WNW10	WNW13	WNW6	W3	WNW4	WNW7	WNW5	WNW4	WNW4	SW3	SSW3	S4	SSE3	SSE4	SSE5	SSE6	SSE8	SSE7	S10	W3.3	WNW15	
8-Nov	S11	S11	S10	S10	S9	S8	SSE8	SSE6	S6	S6	SSW7	SSW6	SSW4	S3	S3	S3	S3	S1	S3	SW2	WNW6	WNW11	WNW7	SSW3	S4.7	S11	
9-Nov	WSW3	W3	W3	W3	W3	W2	WSW1	WNW1	W2	NW1	NW5	NNW4	NW2	NW0	S3	S3	S4	S5	S5	S5	S5	S4	SSW4	S3	SW1.6	NW5	
10-Nov	S3	S4	S5	S4	S4	SSW5	SSW5	SSW6	SSW7	SSW7	SW5	WNW3	SW4	W3	W4	SW3	SSW5	SSW5	S5	SSE5	S6	S8	S8	SSE7	SSW4.4	S8	
11-Nov	SSE7	SSE9	SSE9	SSE10	SSE10	SSE10	SSE10	SE11	SE11	SE11	SSE10	SSE9	SSE9	SSE10	SSE8	SSE7	SSE7	SSE7	SE7	SE7	SE6	SE5	SE4	S2	SSE8.1	SE11	
12-Nov	SSE1	WSW2	W4	W4	WSW2	W4	WSW6	SW5	SSW6	WSW7	W7	W7	WNW7	WNW6	W6	WNW5	SW4	SW4	SSW4	SSW1	SSW4	SW3	SW2	SW2	WSW3.8	WNW7	
13-Nov	WSW2	WSW2	W1	WNW3	NW6	NNW5	NNW4	NNW1	NNW1	ESE3	ESE3	E3	ENE4	NNE6	NE5	NE5	NNE6	NE6	NE6	NE6	NE6	ENE7	ENE7	ENE8	NE3.1	ENE8	
14-Nov	ENE9	ENE9	NE7	ENE8	NE8	NE8	NNE7	NE9	NE8	NE8	ENE8	ENE9	NE7	NE6	NNE6	NNE6	NE6	NNE5	NNE5	NNE4	NE5	NNE4	N4	NNW2	NE6.2	ENE9	
15-Nov	NNE2	NE2	ENE2	NNE1	ENE0	ENE0	W1	NNW1	ESE2	SSE2	S2	SSW4	S2	S2	SSW2	S2	S3	SSW4	S3	S2	SSW3	SSW4	SW4	SW4	S1.5	SSW4	
16-Nov	SSW5	SSW4	SSW5	SSW4	S5	S4	S6	S7	S6	S7	S9	SSE8	SSE8	SSE8	S9	S9	SSE8	SSE8	SSE8	SSE9	SSE10	SSE9	SSE7	SSE8	S7.0	SSE10	
17-Nov	SSE7	SSE7	SSE7	SSE9	SSE6	S6	S5	S5	S6	S6	S4	S5	SSW5	SW5	SW6	SSW7	SSW7	SSW7	SSW8	SSW8	SW6	W7	WNW9	WNW8	WNW5	SSW4.7	WNW9
18-Nov	WNW5	WNW7	WNW7	WNW4	WNW4	W3	WNW2	WNW3	WNW1	W3	WNW4	NW6	NW4	WNW4	NNW6	N7	NNW7	NNW7	NNE6	N5	NNE6	N5	NNE6	NNE7	NNW3.8	WNW7	
19-Nov	NNE6	NE6	NE6	NNE6	NNE6	NNE7	NE6	N5	N7	NNE8	N9	NNW10	N9	NNW10	NNW10	NNW11	NNW8	NNW9	NNW9	NNW11	NW11	NW11	NW10	NNW11	N7.6	NW11	
20-Nov	NNW9	NNW10	NNW10	NNW11	NNW10	NNW8	NW8	NNW8	N8	N8	NNW7	NNW7	NNW8	NNW8	NW6	NNW6	N7	N10	NNW7	NW6	NW7	NW7	NW7	NW6	NNW7.7	NNW11	
21-Nov	NW6	NNW7	NNW5	NNW4	NNW6	N4	NNW5	NW8	NNW7	NW8	NW5	NW4	NW5	NNW5	NNW4	NNW2	NNW3	NNW3	NW6	NW8	WNW3	WNW2	WNW4	WNW3	NW4.6	NW8	
22-Nov	WNW4	WNW2	WNW3	WNW2	WNW3	WNW3	WNW3	WNW2	W2	WNW3	NW5	NW8	NW6	NW6	NW5	NNW1	W2	N2	NNE5	N5	N3	NNE4	NNE4	ENE4	NW2.8	NW8	
23-Nov	NE4	NNE5	NE4	NE3	NNE4	NNE4	NE5	NNE4	NE4	NNE3	NNE4	NNE4	N4	NNE4	NNE5	NNE5	NNE6	NNE7	NNE7	N8	N9	N8	N8	NNE7	NNE5.1	N9	
24-Nov	N7	N7	N7	N8	N7	N7	N6	N6	N6	N6	N6	N6	N6	N6	N6	NNW5	NNW4	N5	N4	NE3	NW3	NNW2	WNW2	S1	N5.1	N8	
25-Nov	S3	SSE3	SSE2	SSE1	SSE2	SSE1	SSE2	SSE2	S3	S2	SSE2	SSE3	S3	SSE4	SSE4	S3	SSE5	SSE5	SSE5	SSE4	SSE4	SSE3	SSE4	SSE5	SSE3.3	SSE5	
26-Nov	S6	SSE6	S6	SSE5	S5	SSE5	SSE6	SSE6	S6	S6	S6	S7	S7	S7	S6	S6	SSW5	SSW5	SSW6	SSW5	WSW2	W3	WNW4	WNW6	S4.7	S7	
27-Nov	WNW8	WNW7	WNW7	WNW7	WNW7	WNW7	WNW6	WNW6	WNW6	WNW7	WNW8	WNW9	WNW8	WNW9	WNW7	NW11	WNW8	WNW7	WNW7	WNW7	WNW7	WNW7	WNW6	WNW6	WNW7.3	NW11	
28-Nov	WNW7	WNW5	WNW4	WNW6	WNW6	WNW5	WNW5	WNW5	WNW5	WNW4	WNW4	NW7	NW10	NW8	NW8	WNW5	NW8	NW10	NNW7	NNW6	NNW8	NNW6	NNW5	NW5	NNW5.9	NW10	
29-Nov	NNW4	NNW5	NNW5	N6	N6	N6	N6	NNE4	N4	NE4	NNW4	NNE4	NNW4	NNE3	NE4	NE3	ENE2	ESE1	ENE1	E2	E2	E2	NE2	ENE3	NNE3.0	N6	
30-Nov	E3	ESE4	ESE4	ESE5	ESE5	ESE4	E3	ESE5	SE5	SE5	SE5	SE6	SE5	E3	ENE5	E4	E3	E2	NNE2	NW3	NW5	NW4	NW4	NW6	E2.3	NW6	

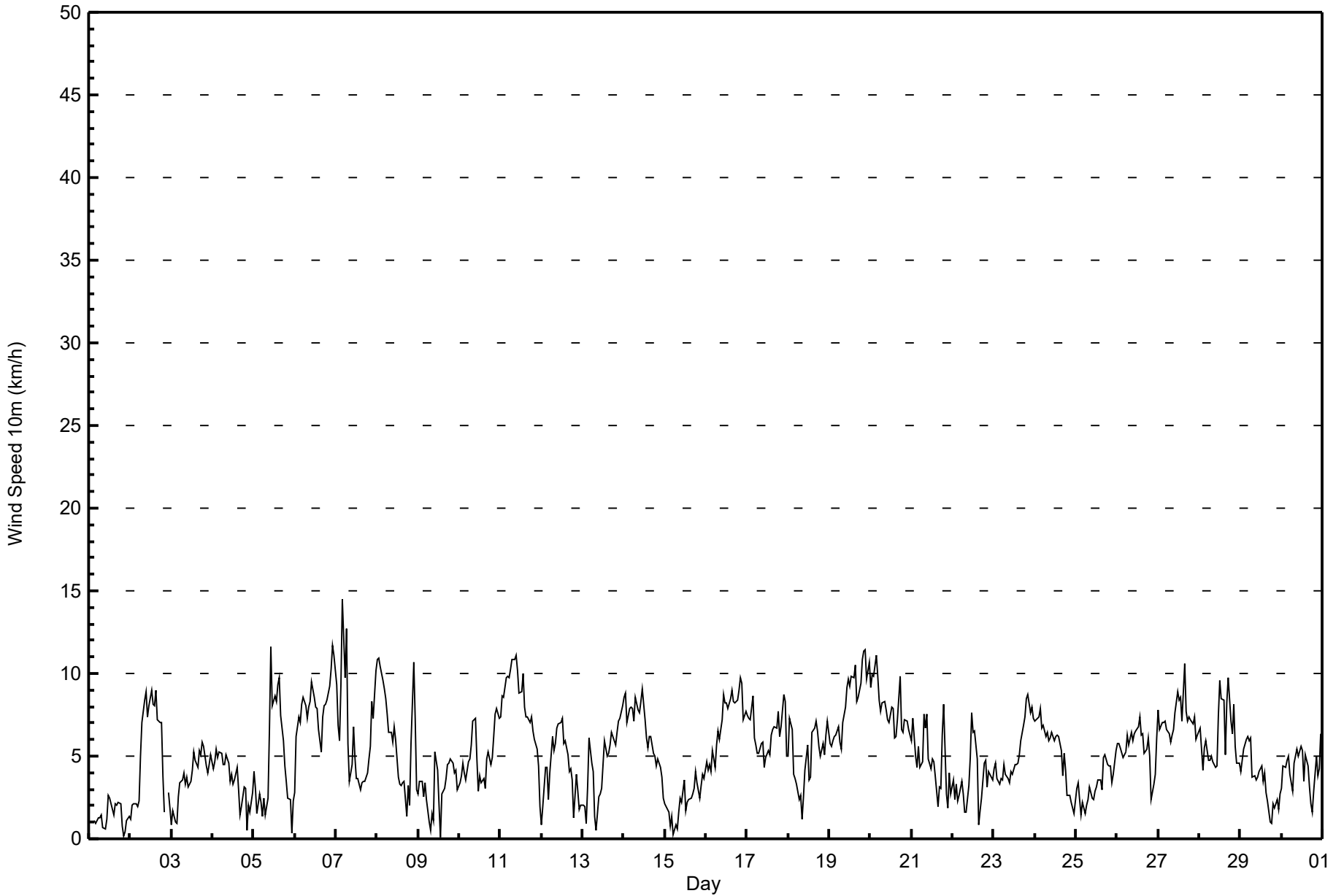
W0.9WSW0.7WSW0.7	W0.8WNW0.9	W0.8WSW0.6	SW0.5SSW0.8	SW0.8	W1.1NNW1.1	NNW1.1	NNW1.1	NNW1.1	NNW1.0	NNW0.6	WSW0.4	SW0.3	S0.4WSW0.3	NNW0.9	W1.1	W1.0	WSW0.8						Diurnal Average		
S11	S11	S10	NNW11	WNW15	WNW10	WNW13	SE11	SE11	SE11	NW12	NNW10	NW10	SSE10	NNW10	NW11	NNW8	N10	NNW9	NNW11	NW11	NW11	SSW12	SSW11	Diurnal Maximum	

UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 10m (WS10) - km/h**  
**Jackfish 1 - November 2024**







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h**  
**Jackfish 1 - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	396	55.23	55.23
6 - 11	317	44.21	99.44
12 - 19	4	0.56	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 717

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Jackfish 1 - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	13	26	20	13	13	14	8	32	56	45	18	9	26	56	22	25	396
6 - 11	29	19	16	8	2	4	13	41	44	22	1	3	4	46	32	33	317
12 - 19	0	0	0	0	0	0	0	0	0	1	0	0	0	2	1	0	4
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	42	45	36	21	15	18	21	73	100	68	19	12	30	104	55	58	717

Total Number of Valid Hours: 717

Total Number of Hours: 720





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Jackfish 1 - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 5 km/h on Nov 7 00:00 Minimum Value: 1 km/h on Nov 9 17:00 Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 2 P <sub>90</sub> = 3 P <sub>99</sub> = 4														Hours in Service: 720 Hours of Data: 717 Hours of Missing Data: 3 Hours of Calibration: 0 Percent Operational Time: 99.6													
Day	Hourly Period Ending At (MST)																								Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	1	UO	UO	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	1	1	1	1	1	2		
2-Nov	1	1	1	1	2	2	2	2	2	3	2	2	3	2	2	3	2	2	2	2	1	UO	1	1	1	3	
3-Nov	1	1	2	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	2	2	2	1	1	2	2	
4-Nov	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	1	2	2	2	1	1	1	1	2	
5-Nov	1	1	2	1	1	1	1	1	1	2	3	3	3	2	2	3	3	2	1	1	1	1	1	1	1	3	
6-Nov	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	2	3	3	3	3	4	4	5	5	5	5	
7-Nov	5	4	3	3	4	2	3	3	1	1	2	2	2	2	2	1	1	1	1	1	1	2	2	3	5		
8-Nov	3	3	3	3	2	2	1	2	2	2	2	3	2	1	1	1	1	1	1	1	4	3	2	1	4		
9-Nov	1	1	2	1	1	1	1	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2		
10-Nov	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2	3	2	3		
11-Nov	3	3	3	3	3	3	3	4	4	3	4	3	3	4	3	3	3	2	2	2	2	2	3	1	4		
12-Nov	1	2	2	2	2	2	3	3	3	3	4	3	4	3	3	3	2	2	2	1	1	1	1	1	4		
13-Nov	1	1	1	2	2	1	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	3	2	3	3		
14-Nov	3	3	3	3	3	3	2	3	3	3	3	2	2	2	2	2	2	2	2	1	1	1	1	1	3		
15-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2		
16-Nov	2	2	2	2	2	1	2	3	2	3	3	3	3	3	3	4	3	3	3	3	3	3	2	2	4		
17-Nov	2	2	3	3	2	2	2	2	2	2	2	2	2	3	3	2	2	2	3	3	3	3	2	2	3		
18-Nov	2	2	2	1	2	1	1	2	1	1	1	3	3	2	2	2	2	2	2	2	2	2	2	2	3		
19-Nov	2	2	2	2	2	2	2	1	3	3	3	3	3	3	3	3	2	2	3	3	2	2	2	3	3		
20-Nov	2	3	2	2	2	2	2	2	3	3	2	2	2	2	2	2	3	3	2	2	1	1	1	1	3		
21-Nov	1	2	2	1	1	1	1	2	2	2	2	1	2	1	2	2	1	2	1	2	2	1	1	1	2		
22-Nov	1	1	1	1	1	1	2	1	1	1	2	2	2	2	2	1	1	1	1	2	1	2	2	2	2		
23-Nov	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	2	2	3	3	2	2	3	2	3	3		
24-Nov	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2	1	1	1	1	2	3		
25-Nov	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2		
26-Nov	2	2	2	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
27-Nov	3	2	2	2	2	2	2	1	2	2	2	3	2	3	2	3	2	2	1	1	1	1	1	1	3		
28-Nov	1	1	1	2	1	1	1	1	1	1	1	2	2	2	2	1	3	2	1	2	2	2	1	1	3		
29-Nov	1	1	2	2	2	2	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2		
30-Nov	1	1	1	1	2	1	1	1	1	2	2	2	1	2	2	1	1	1	1	1	1	1	2	1	2		
														Diurnal Maximum													
UO - Unstable Operation																											



**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**  
**Jackfish 1 - November 2024**

Direction of Maximum Speed: 303 deg on Nov 7 05:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 150.1 deg on Nov 11	Hours of Data: 717
Direction of Minimum Speed: 313 deg on Nov 9 14:00	Hours of Missing Data: 3
Direction of Minimum Daily Speed Average: 0.9 deg on Nov 1	Percent Operational Time: 99.6
Monthly Average Direction: 266.0 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	318	UO	UO	279	12	25	74	71	122	66	5	46	57	55	52	39	53	97	106	68	109	192	207	182	55.8
2-Nov	182	176	176	181	167	106	133	120	127	131	143	131	124	128	88	101	101	105	113	91	181	UO	85	45	120.7
3-Nov	304	271	291	307	283	283	284	286	284	288	263	229	214	200	186	179	180	183	178	192	200	201	207	205	219.4
4-Nov	201	198	196	207	203	201	186	188	196	219	247	275	235	227	217	210	186	206	151	152	146	198	256	283	207.8
5-Nov	312	307	295	260	292	284	273	235	273	300	324	322	303	303	308	307	309	295	292	293	277	287	320	196	301.4
6-Nov	183	176	173	176	175	174	173	174	176	186	177	186	200	209	208	197	197	199	191	192	200	196	201	203	189.0
7-Nov	245	300	291	292	303	297	302	294	274	284	294	287	286	292	229	195	174	163	165	153	149	152	157	170	259.6
8-Nov	172	172	172	175	174	172	167	167	173	179	192	207	202	186	176	184	188	170	171	217	293	299	289	213	189.3
9-Nov	249	281	280	272	279	259	250	288	281	318	314	331	325	313	172	170	172	176	173	173	174	184	193	183	223.3
10-Nov	177	182	177	176	185	211	193	204	209	209	214	284	233	267	259	228	202	195	182	168	169	171	172	159	194.7
11-Nov	158	154	153	148	147	153	147	142	139	143	151	155	163	165	164	162	157	147	135	139	140	132	143	181	150.1
12-Nov	163	239	275	279	257	262	243	227	209	256	276	263	283	282	269	288	233	214	208	208	199	226	223	229	251.2
13-Nov	245	238	261	303	325	329	346	344	328	120	113	83	62	33	40	43	26	44	40	56	40	75	69	66	39.8
14-Nov	72	71	51	59	41	36	24	48	49	48	61	68	56	25	22	36	29	30	22	34	29	355	345	44.6	
15-Nov	14	46	62	24	12	70	266	345	118	159	184	205	189	184	196	185	184	190	195	186	186	200	205	217	187.7
16-Nov	197	201	201	193	191	175	171	174	172	169	171	165	168	168	169	170	167	168	162	161	159	163	166	160	170.6
17-Nov	164	166	159	158	167	174	178	174	181	185	182	185	196	226	229	201	198	196	199	214	280	292	292	286	199.6
18-Nov	286	294	298	285	285	271	287	302	301	270	286	314	306	283	339	349	344	345	14	10	28	5	27	33	329.5
19-Nov	15	47	45	26	31	18	39	352	354	17	356	340	353	346	345	332	333	338	334	329	322	319	324	329	348.9
20-Nov	334	329	328	327	328	328	322	331	358	351	348	342	328	327	326	344	359	355	342	323	325	323	326	326	334.4
21-Nov	320	334	340	337	344	360	337	326	327	322	323	324	319	340	330	332	337	331	323	318	287	289	290	286	326.1
22-Nov	288	284	290	293	287	282	285	283	265	290	305	322	323	326	324	333	266	359	24	5	350	14	16	58	324.0
23-Nov	37	30	53	41	28	19	36	33	37	23	18	19	9	13	21	23	14	20	15	11	358	356	7	17	18.4
24-Nov	1	4	351	5	10	10	10	355	352	360	353	359	10	355	351	340	347	356	356	39	322	330	296	176	357.6
25-Nov	175	165	165	154	162	159	152	166	173	170	160	162	169	164	168	169	158	163	161	166	165	159	164	167	164.4
26-Nov	170	168	169	166	169	168	162	168	170	169	174	174	178	171	178	182	196	197	211	212	255	270	287	293	184.7
27-Nov	296	291	290	292	293	291	287	290	291	293	293	299	297	299	295	306	298	294	296	298	298	300	295	292	295.1
28-Nov	300	294	293	294	295	287	293	288	291	295	300	318	325	325	325	301	315	325	327	333	331	332	343	326	313.4
29-Nov	336	331	339	356	4	356	359	22	355	37	348	14	333	17	56	41	59	116	65	79	97	84	56	72	12.3
30-Nov	98	113	108	113	112	116	100	116	124	125	127	127	127	83	69	90	79	84	16	323	320	316	321	323	95.3

260.3 253.6 248.4 264.6 288.2 273.3 256.6 214.5 193.5 218.8 270.8 291.8 286.3 291.3 296.4 284.1 244.3 234.7 183.0 256.2 283.0 276.9 276.0 251.6

Diurnal Average

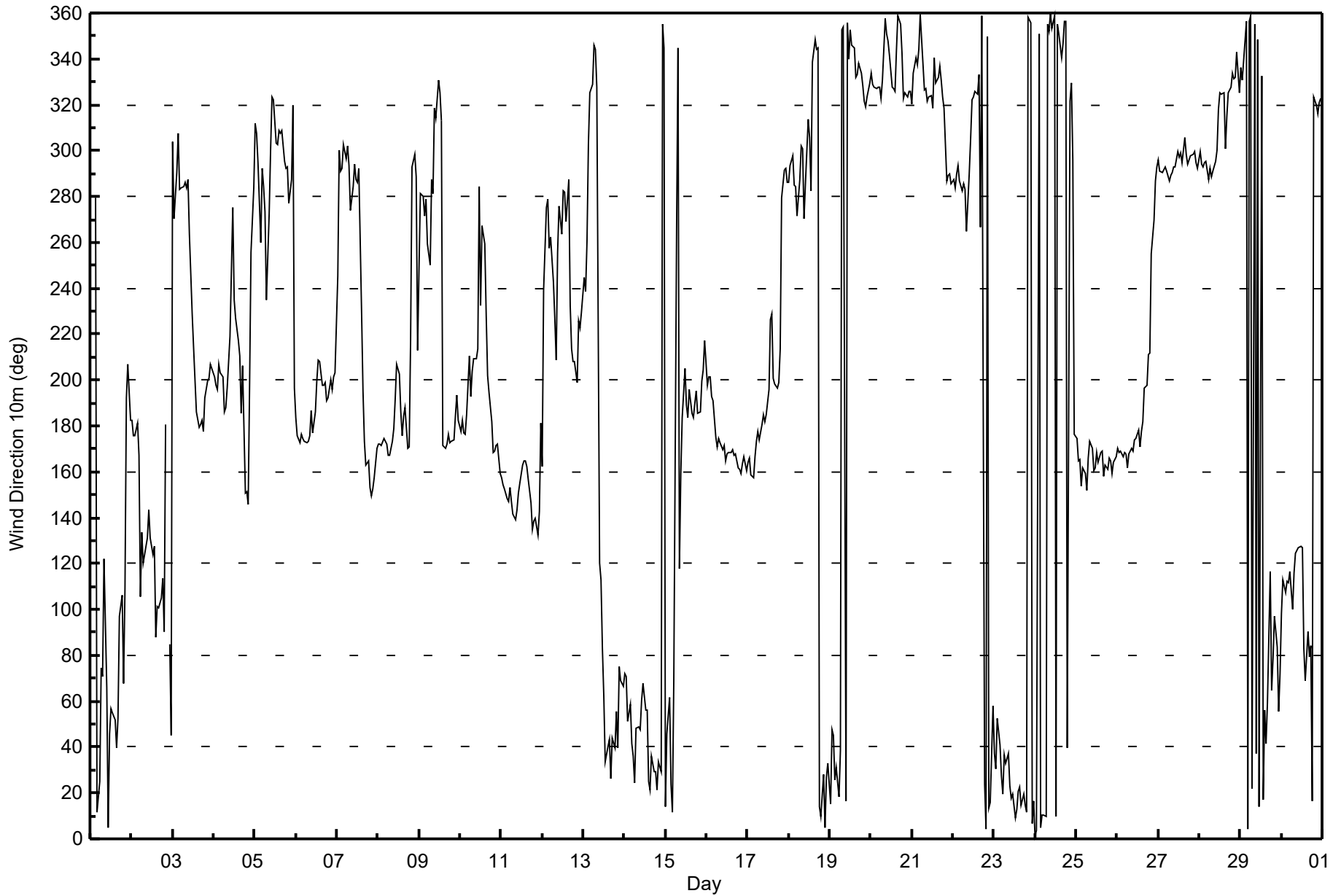
UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Direction 10m (WD10) - deg**  
**Jackfish 1 - November 2024**





**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**  
**Jackfish 1 - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 720
Maximum Value: 96 deg on Nov 12 20:00	Hours of Data: 717
Minimum Value: 8 deg on Nov 9 17:00	Hours of Missing Data: 3
Percentiles: P <sub>1</sub> = 10 P <sub>10</sub> = 15 Q <sub>1</sub> = 19 Median = 26 Q <sub>3</sub> = 34 P <sub>90</sub> = 53 P <sub>99</sub> = 85	Hours of Calibration: 0
	Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	21	UO	UO	18	92	77	52	53	92	77	51	36	43	45	62	36	38	48	70	81	84	49	27	40	92
2-Nov	51	15	19	34	39	42	23	18	18	18	19	21	18	19	27	23	28	23	19	31	30	UO	21	23	51
3-Nov	53	10	15	29	17	26	26	24	43	37	66	60	60	37	32	42	29	29	20	26	38	42	32	23	66
4-Nov	34	34	28	34	21	22	28	24	24	33	59	60	64	63	47	51	34	37	18	15	45	18	10	17	64
5-Nov	9	19	33	13	36	63	21	46	47	15	14	20	17	15	14	16	19	19	29	31	52	51	87	31	87
6-Nov	29	15	16	18	16	17	17	18	21	27	21	29	36	43	46	40	32	25	28	31	35	30	38	43	46
7-Nov	70	77	62	26	16	15	13	43	35	30	21	46	65	53	50	25	10	11	9	12	14	11	16	18	77
8-Nov	16	16	15	18	16	15	12	13	21	19	27	40	54	53	22	19	18	74	29	66	33	16	27	39	74
9-Nov	54	52	40	32	31	33	73	65	43	50	15	33	53	92	20	10	8	10	9	12	11	16	24	44	92
10-Nov	20	15	12	12	24	26	22	19	21	20	41	61	62	71	51	38	16	16	15	12	13	15	18	15	71
11-Nov	16	17	17	19	19	19	19	18	18	20	19	20	22	23	23	25	22	21	17	18	18	19	31	32	32
12-Nov	86	88	61	61	80	72	56	61	49	64	65	67	64	70	68	79	73	60	45	96	36	42	29	29	96
13-Nov	25	41	47	37	20	26	18	56	85	51	37	46	32	29	33	27	26	22	23	25	25	28	27	25	85
14-Nov	26	28	32	28	28	27	27	29	31	29	28	28	31	31	29	31	30	30	27	27	26	32	32	40	40
15-Nov	26	31	32	46	36	74	56	55	38	28	47	27	43	38	40	35	20	22	22	25	23	24	26	43	74
16-Nov	34	37	35	34	27	29	24	24	24	26	22	22	27	26	24	25	23	26	20	18	20	20	24	18	37
17-Nov	22	21	19	19	27	29	29	26	27	31	33	35	38	55	58	36	24	27	30	59	65	24	19	27	65
18-Nov	25	20	19	30	35	36	36	46	70	38	33	38	57	41	32	26	22	23	26	26	27	34	30	32	70
19-Nov	31	33	31	29	33	28	29	24	23	29	28	26	25	25	24	19	18	21	20	15	12	12	14	19	33
20-Nov	20	18	17	15	16	16	14	18	28	27	28	28	19	17	16	23	24	23	27	15	12	12	16	15	28
21-Nov	13	18	22	21	21	26	17	12	13	14	30	31	23	27	29	41	12	21	9	13	51	22	14	21	51
22-Nov	16	21	18	15	22	17	17	34	27	24	19	15	14	16	17	84	63	46	23	26	29	37	32	37	84
23-Nov	34	33	36	36	35	39	39	38	35	34	34	31	30	29	33	30	28	27	27	26	23	24	23	26	39
24-Nov	24	26	24	27	24	26	26	23	24	25	27	27	25	23	19	16	20	25	24	22	15	26	26	78	78
25-Nov	13	12	15	54	26	31	19	18	25	33	29	29	31	29	20	13	15	14	13	18	19	16	16	18	54
26-Nov	20	18	19	17	17	23	19	20	25	23	25	25	24	25	27	25	31	30	32	44	61	66	45	31	66
27-Nov	21	25	25	27	22	27	28	24	26	28	21	17	19	17	19	14	14	16	13	14	14	14	16	18	28
28-Nov	13	16	19	16	12	19	12	16	18	18	19	14	13	14	13	13	17	12	14	22	17	20	25	15	25
29-Nov	22	16	21	24	25	30	28	31	25	31	30	32	26	52	30	24	20	61	25	28	40	23	39	22	61
30-Nov	22	18	19	17	17	17	23	18	15	16	27	21	22	53	31	25	25	36	42	14	15	16	21	11	53

86	88	62	61	92	77	73	65	92	77	66	67	65	92	68	84	73	74	70	96	84	66	87	78	
Diurnal Maximum																								

UO - Unstable Operation



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS508 KIRBY NORTH NOVEMBER 2024**

Operations, Data Collection,  
QA/QC, Data Validation and Reporting by:  
Wood Buffalo Environmental Association  
Fort McMurray, Alberta

December 23, 2024



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY NORTH (AMS 508)  
 NOVEMBER 2024

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	684	36	36	100	5.7	0	2.2	0
H2S (ppb) Average	680	40	40	100	1.8	0	0.3	0
THC (ppm) Average	684	36	36	100	2.6	-	2.4	-
NO2 (ppb) Average	685	35	35	100	9.3	0	3.3	-
NO (ppb) Average	685	35	35	100	3.6	-	0.5	-
NOX (ppb) Average	685	35	35	100	10.9	-	3.6	-
Temperature 2 m (C) Average	720	0	0	100	9.5	-	5.7	-
Relative Humidity (%) Average	720	0	0	100	98.8	-	95.6	-
Wind Speed 10 m (km/h) Average	720	0	0	100	25	-	16	-
Wind Direction 10 m (deg) Average	720	0	0	100	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY NORTH (AMS508)  
NOVEMBER 2024

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	684	0.49	0.8	-	0	0	0	0.2	0.4	1.6	5.7
H2S (ppb) Average	680	0.1	0.2	-	0	0	0	0.1	0.1	0.1	1.8
THC (ppm) Average	684	2.34	0.1	-	2.2	2.3	2.3	2.3	2.4	2.4	2.6
NO2 (ppb) Average	685	1.69	1.2	-	0.2	0.6	0.9	1.4	2.2	3.1	9.3
NO (ppb) Average	685	0.2	0.3	-	0	0	0	0	0.2	0.6	3.6
NOX (ppb) Average	685	1.88	1.4	-	0.2	0.6	1	1.5	2.4	3.6	10.9
Temperature 2 m (C) Average	720	-7.53	8.5	-	-25.2	-19.2	-15.9	-4.6	-1.7	3.1	9.5
Relative Humidity (%) Average	720	82.91	9.8	-	47.8	68.6	78.6	83.9	89.4	95.1	98.8
Wind Speed 10 m (km/h) Average	720	9.9	5	-	0	4	6	10	13	16	25
Wind Direction 10 m (deg) Average	720	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY NORTH (AMS508)  
NOVEMBER 2024

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
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No operational issues to report



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb

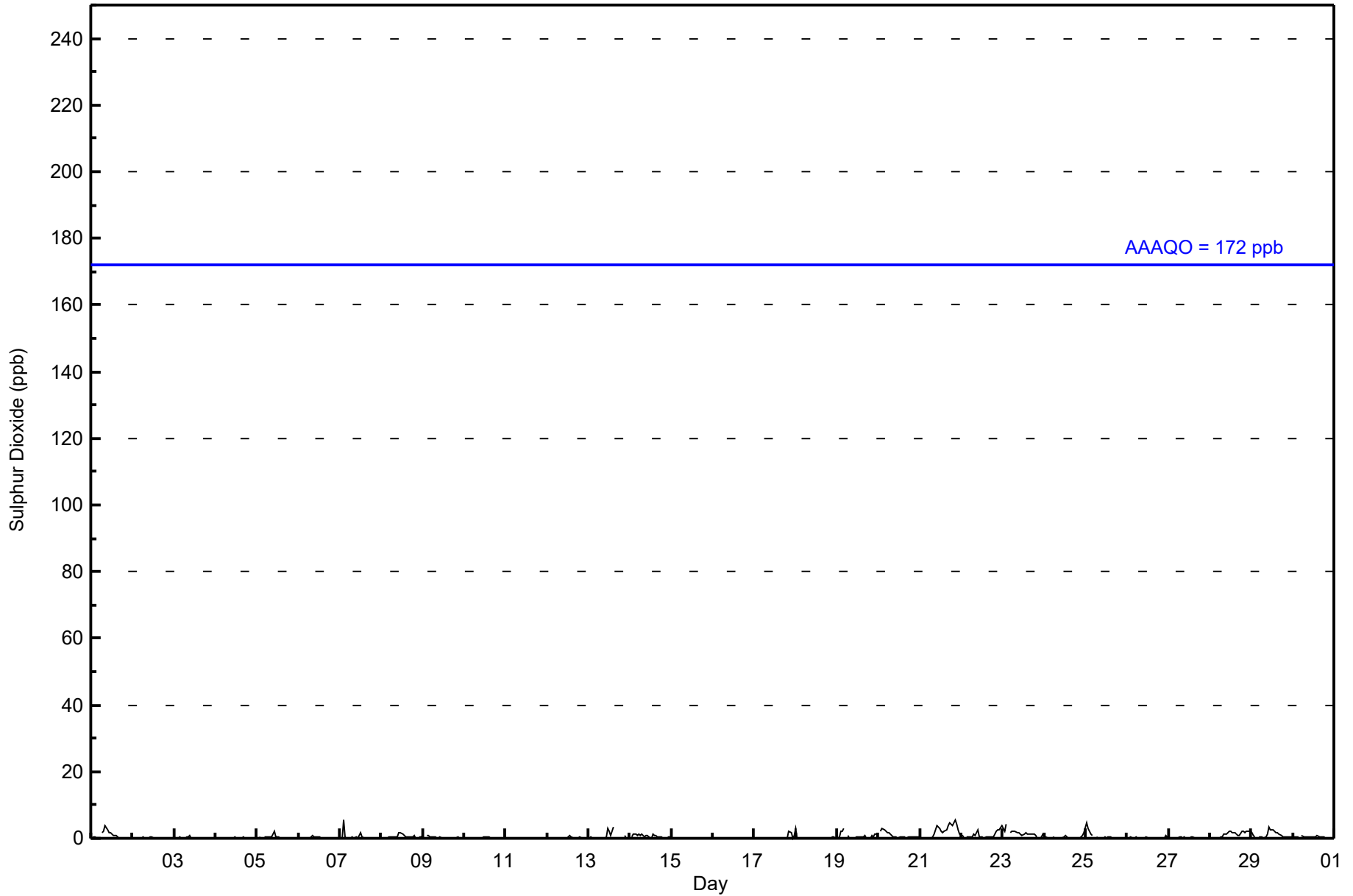
Kirby North - November 2024

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														720						
Maximum Value: 5.7 ppb on Nov 7 03:00		Maximum Daily Average: 2.2 ppb on Nov 21														Hours of Data:		684								
Minimum Value: 0.0 ppb on Nov 1 23:00		Minimum Daily Average: 0.0 ppb on Nov 11														Hours of Missing Data:		36								
Maximum Diurnal Average: 0.9 ppb at hour 3		Minimum Diurnal Average: 0.3 ppb at hour 6														Hours of Calibration:		36								
Monthly Average: 0.49 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.2 Q <sub>3</sub> = 0.4 P <sub>90</sub> = 1.6 P <sub>99</sub> = 4.0														Percent Operational Time:		100.0								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.0	0.2	0.3	0.1	0.2	Z	1.8	2.2	3.8	2.5	1.5	1.6	1.2	0.8	0.6	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.8	3.8
2-Nov	Z	0.1	0.0	0.0	0.0	0.0	0.3	0.0	0.2	0.1	0.4	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.4
3-Nov	0.1	Z	0.0	0.3	0.0	0.0	0.0	0.2	0.4	0.8	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8
4-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.2	0.1	0.1	0.2	0.3	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.3
5-Nov	0.2	0.2	0.3	Z	0.3	0.3	0.3	0.2	0.2	1.2	1.9	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.1	0.1	0.0	0.3	1.9
6-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.3	0.7	0.4	0.2	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7
7-Nov	0.0	0.0	5.7	0.5	0.0	Z	0.0	0.3	0.1	0.4	0.0	0.9	1.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	5.7
8-Nov	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.5	1.8	1.7	1.2	0.8	0.6	0.5	0.3	0.4	0.4	1.0	0.2	0.2	0.4	0.3	0.5	1.8
9-Nov	0.7	Z	1.0	0.7	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.0	0.1	0.2	0.1	0.1	0.1	0.3	1.0
10-Nov	0.1	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
11-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.9	0.4	0.2	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.1	0.1	0.9
13-Nov	0.0	0.4	0.2	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.4	3.0	2.0	1.0	3.4	C	C	C	C	C	C	0.7	0.0	0.1	--	3.4
14-Nov	Z	0.2	1.2	1.3	1.1	1.2	0.9	1.1	0.6	1.0	0.9	0.3	0.1	1.1	1.0	0.9	0.5	0.5	0.3	0.1	0.2	0.2	0.2	0.3	0.7	1.3
15-Nov	0.2	Z	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2
16-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.1
17-Nov	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	2.0	1.5	0.0	0.9	0.2	2.0
18-Nov	3.0	0.0	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.2	0.3	0.1	0.2	3.0
19-Nov	0.2	0.4	2.0	2.2	2.8	Z	0.6	0.2	0.0	0.0	0.0	0.2	0.3	0.4	0.5	0.3	0.8	0.2	0.1	0.1	0.8	0.6	1.1	1.1	0.7	2.8
20-Nov	Z	2.2	3.1	2.7	2.1	1.9	1.7	1.1	0.5	0.4	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.4	0.9	3.1
21-Nov	0.4	Z	0.1	0.1	0.1	0.1	0.1	0.4	1.3	2.7	3.9	3.1	2.1	1.5	2.3	2.5	3.9	4.8	4.3	4.0	5.5	4.3	2.5	1.2	2.2	5.5
22-Nov	0.7	0.4	Z	0.6	0.6	0.2	0.2	1.2	1.0	2.7	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.4	1.3	2.2	2.4	2.3	4.0	1.0	4.0
23-Nov	3.2	2.0	4.2	Z	1.9	2.0	2.0	2.3	1.7	1.5	1.2	0.9	1.2	1.7	1.5	1.1	1.2	1.2	1.1	0.8	0.2	0.1	0.4	1.2	1.5	4.2
24-Nov	0.3	0.2	0.2	Z	0.4	0.2	0.1	0.1	0.1	0.2	0.4	1.0	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.3	0.8	1.7	0.3	1.7
25-Nov	4.6	3.1	2.1	1.2	0.9	Z	0.3	0.1	0.0	0.1	0.2	0.3	0.2	0.3	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.6	4.6
26-Nov	Z	0.1	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.8	0.3	0.2	0.8
27-Nov	0.2	Z	0.0	0.1	0.0	0.0	0.3	0.3	0.2	0.4	0.2	0.0	0.1	0.4	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.4
28-Nov	0.0	0.0	Z	0.1	0.0	0.2	0.3	0.4	1.1	1.4	1.8	2.3	2.2	1.6	1.6	1.4	0.9	1.0	1.9	2.2	1.8	2.1	2.1	2.2	1.2	2.3
29-Nov	1.5	0.8	0.4	Z	0.4	0.3	0.2	0.2	0.2	1.4	3.2	2.7	2.5	2.0	1.9	1.8	1.2	0.7	0.3	0.2	0.3	0.3	0.2	0.5	1.0	3.2
30-Nov	0.3	0.3	0.3	0.3	Z	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.6	0.6	0.5	0.3	0.3	0.2	0.2	0.0	0.0	0.0	0.1	0.4	0.7
																								Diurnal Average		
																								Diurnal Maximum		
																								0.6 0.4 0.9 0.4 0.5 0.3 0.4 0.4 0.4 0.6 0.7 0.7 0.6 0.5 0.6 0.4 0.4 0.4 0.3 0.4 0.5 0.5 0.4 0.5		
																								4.6 3.1 5.7 2.7 2.8 2.0 2.0 2.3 3.8 2.7 3.9 3.1 2.5 2.0 3.4 2.5 3.9 4.8 4.3 4.0 5.5 4.3 2.5 4.0		
Z - zerospan C - Calibration																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																										



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Kirby North - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Kirby North - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	684	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Kirby North - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	44	67	73	28	21	15	9	28	97	75	58	27	8	50	55	29	684
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	44	67	73	28	21	15	9	28	97	75	58	27	8	50	55	29	684

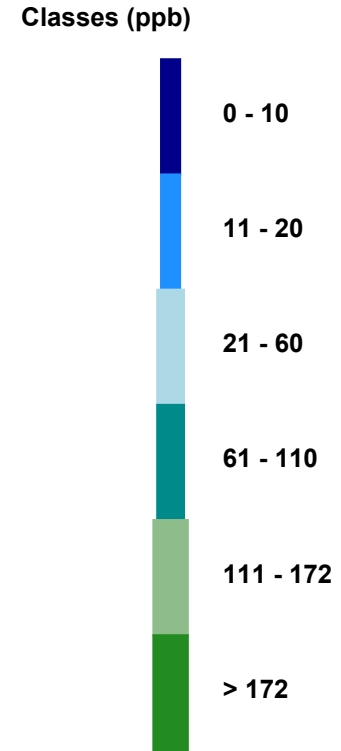
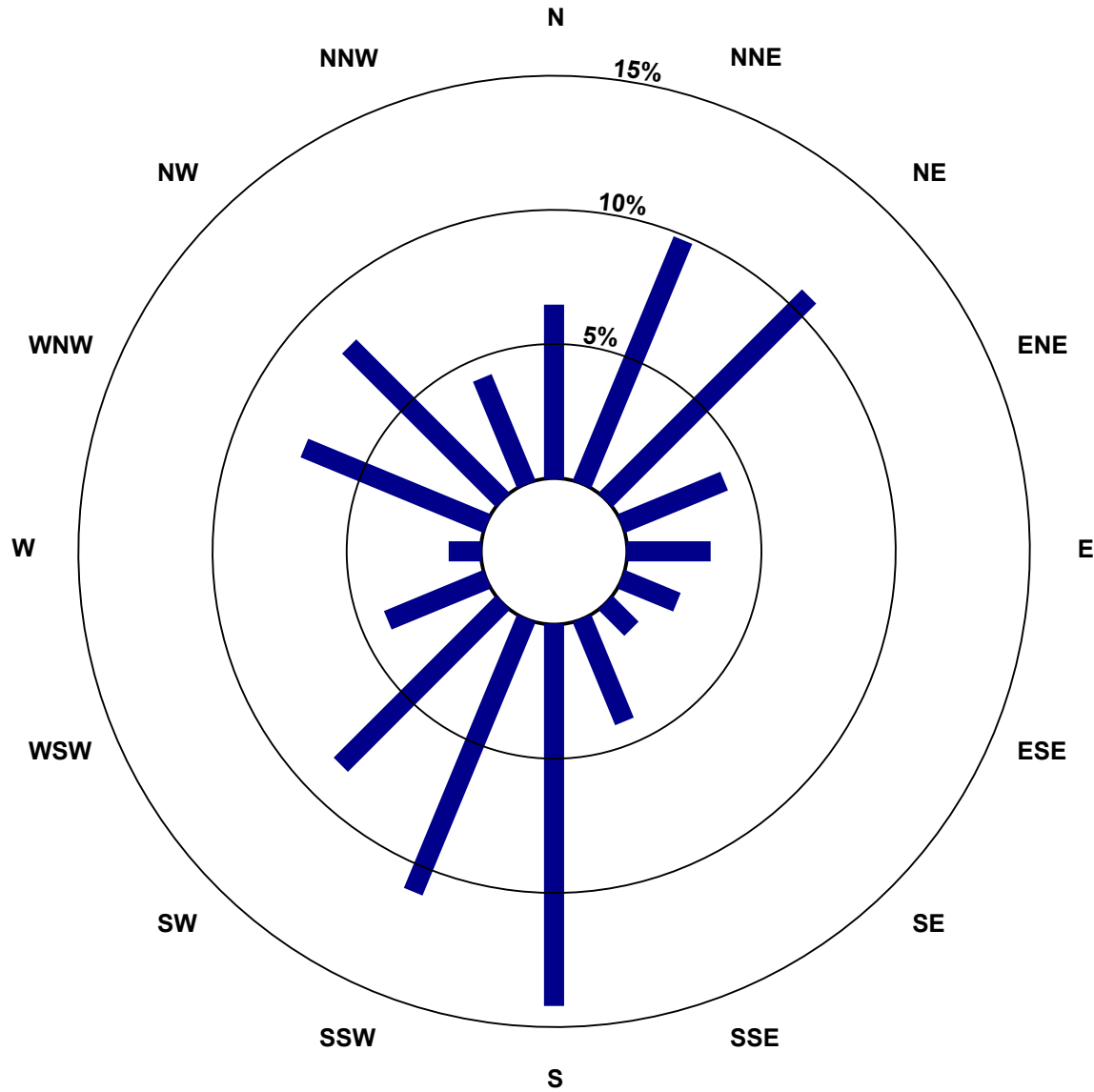
Total Number of Valid Hours: 684

Total Number of Hours: 720



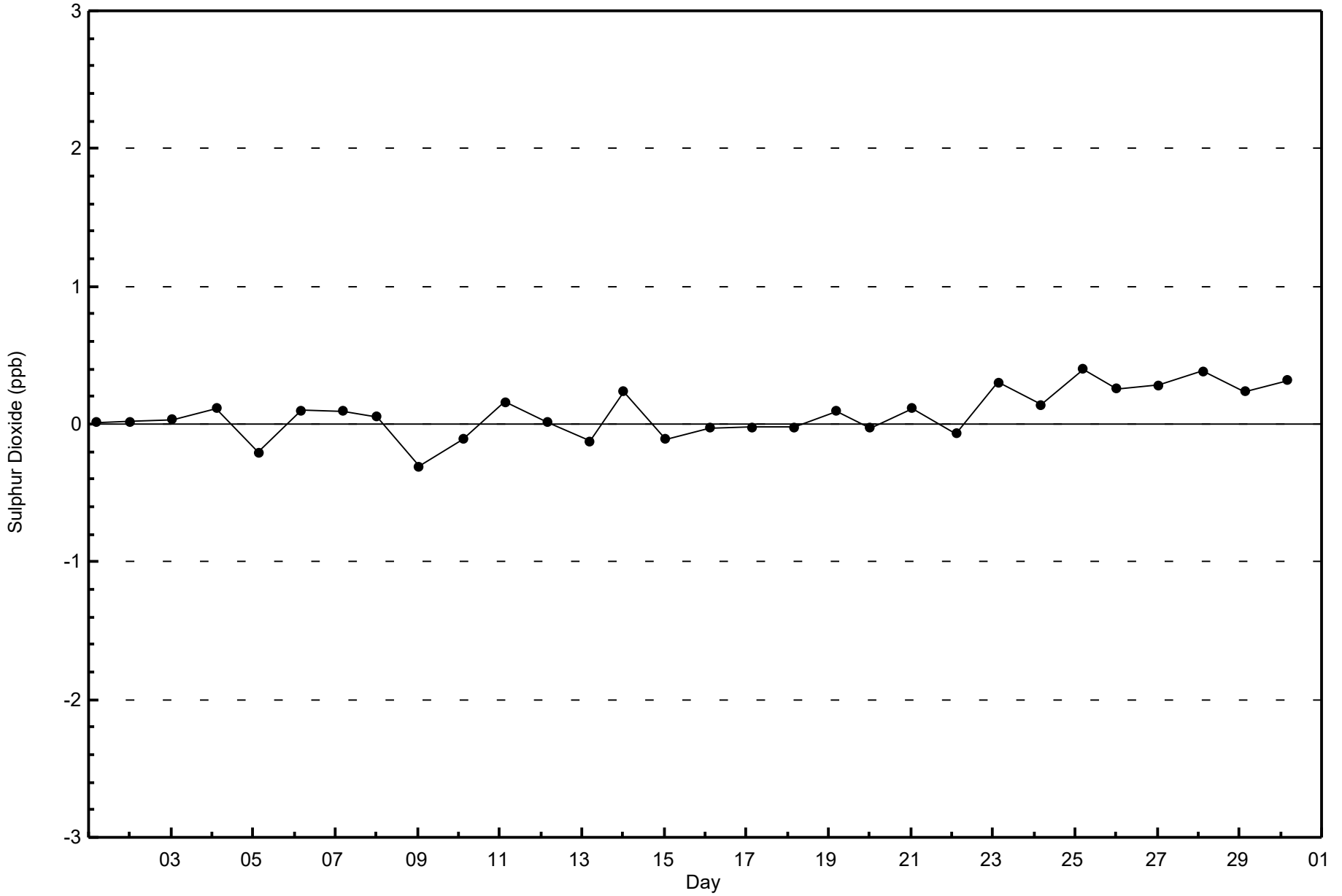
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

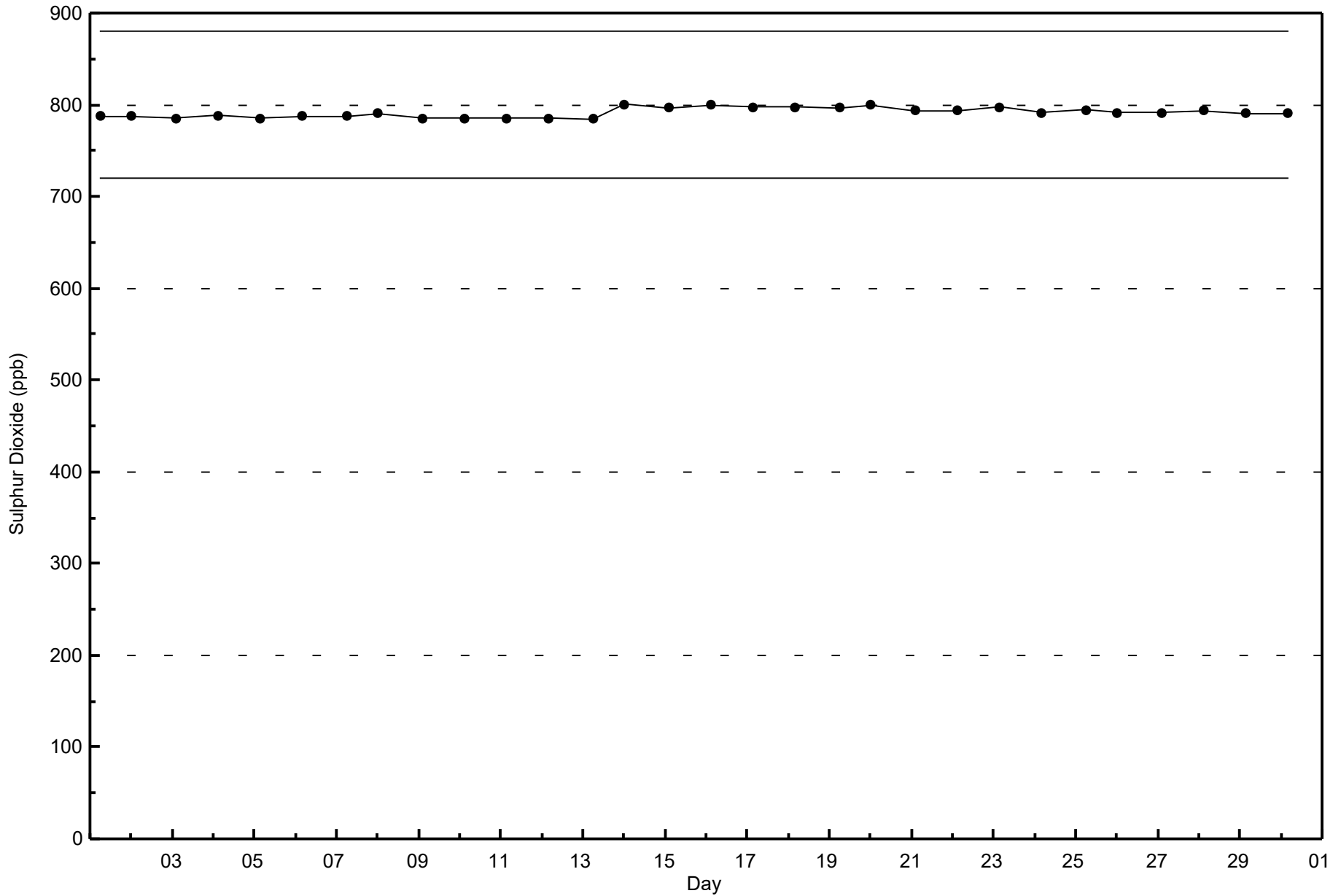
Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Kirby North



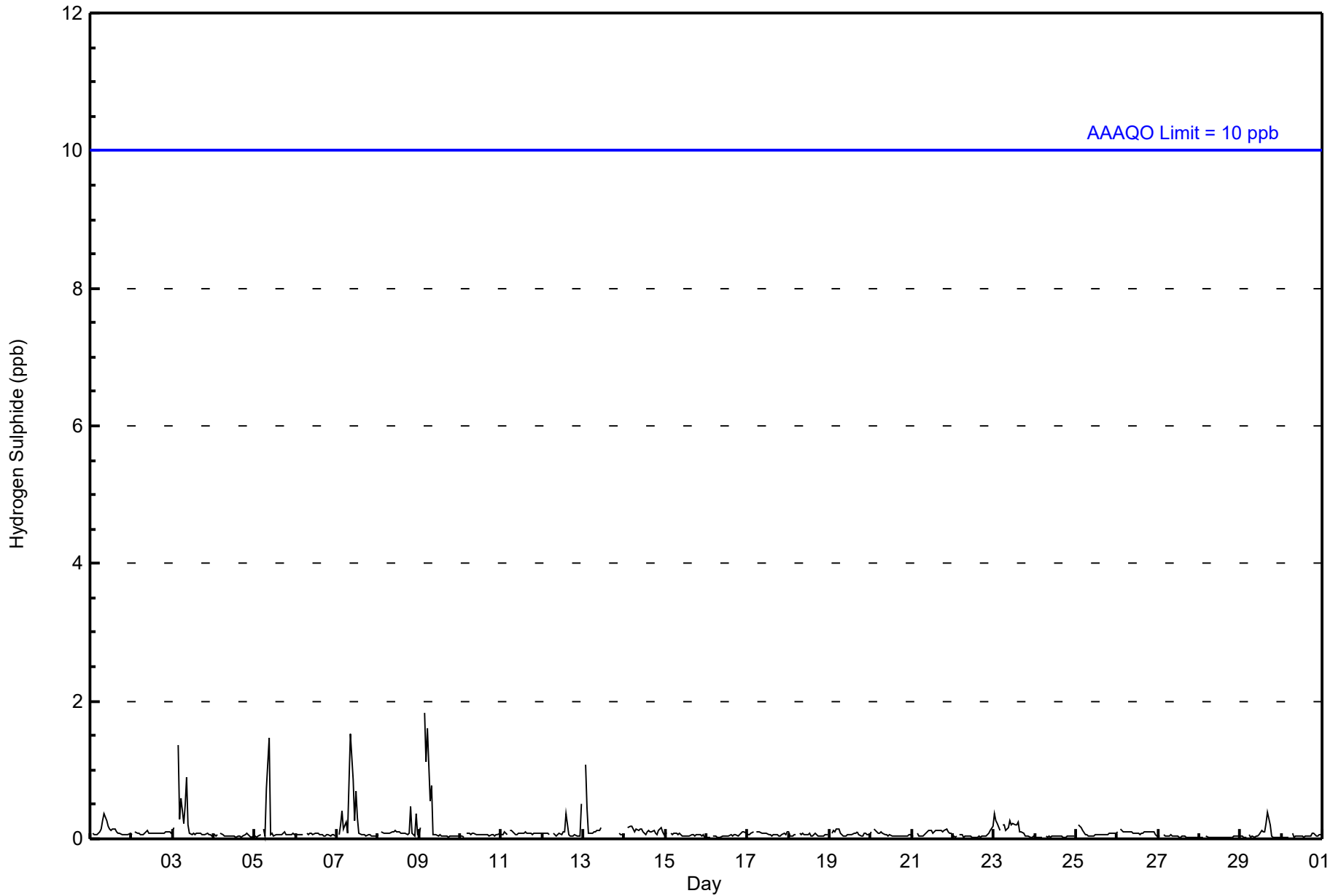
Total Number of Valid Hours: 684













**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Kirby North - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	680	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Kirby North - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	46	67	71	26	20	15	9	28	99	74	57	27	9	46	57	29	680
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	46	67	71	26	20	15	9	28	99	74	57	27	9	46	57	29	680

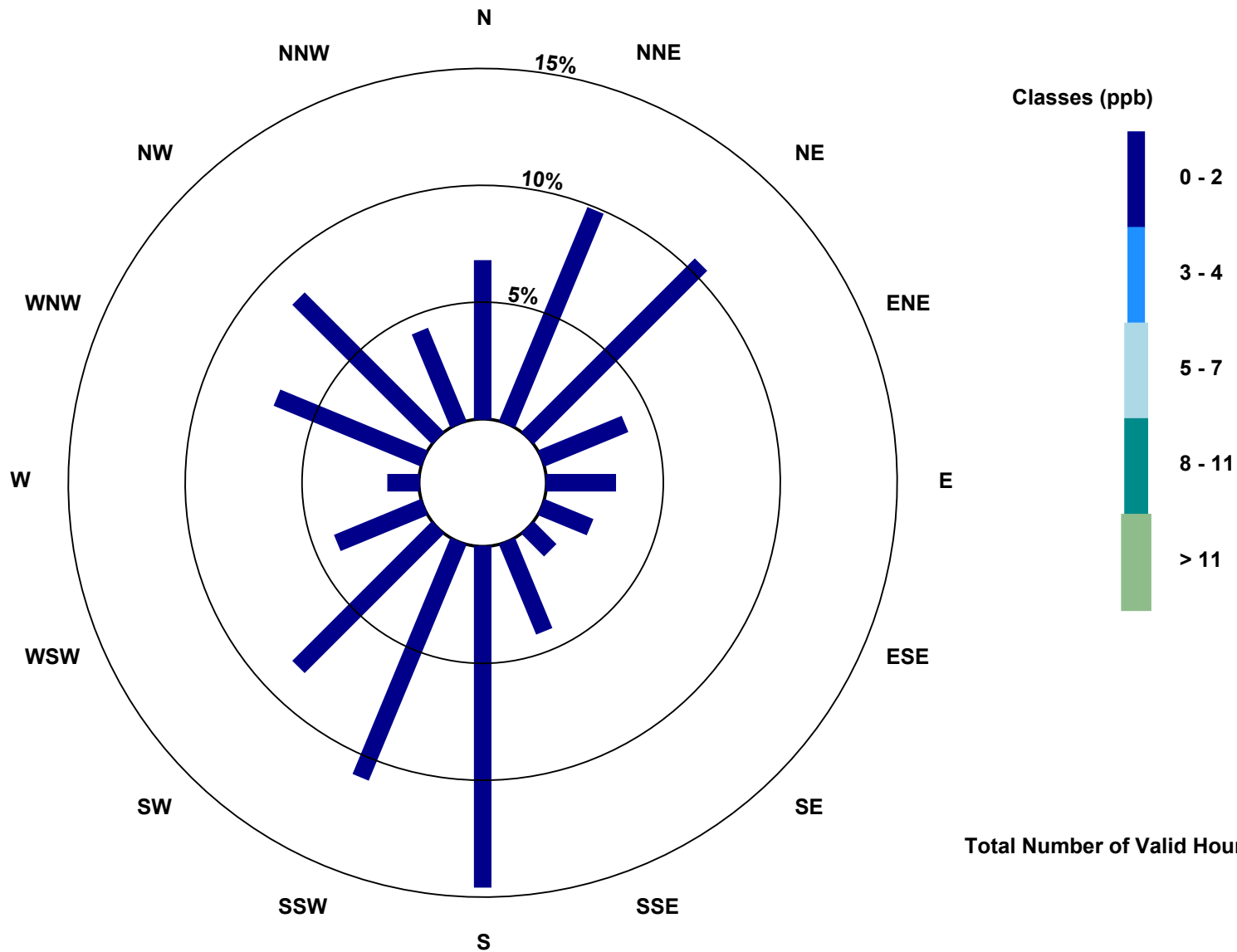
Total Number of Valid Hours: 680

Total Number of Hours: 720

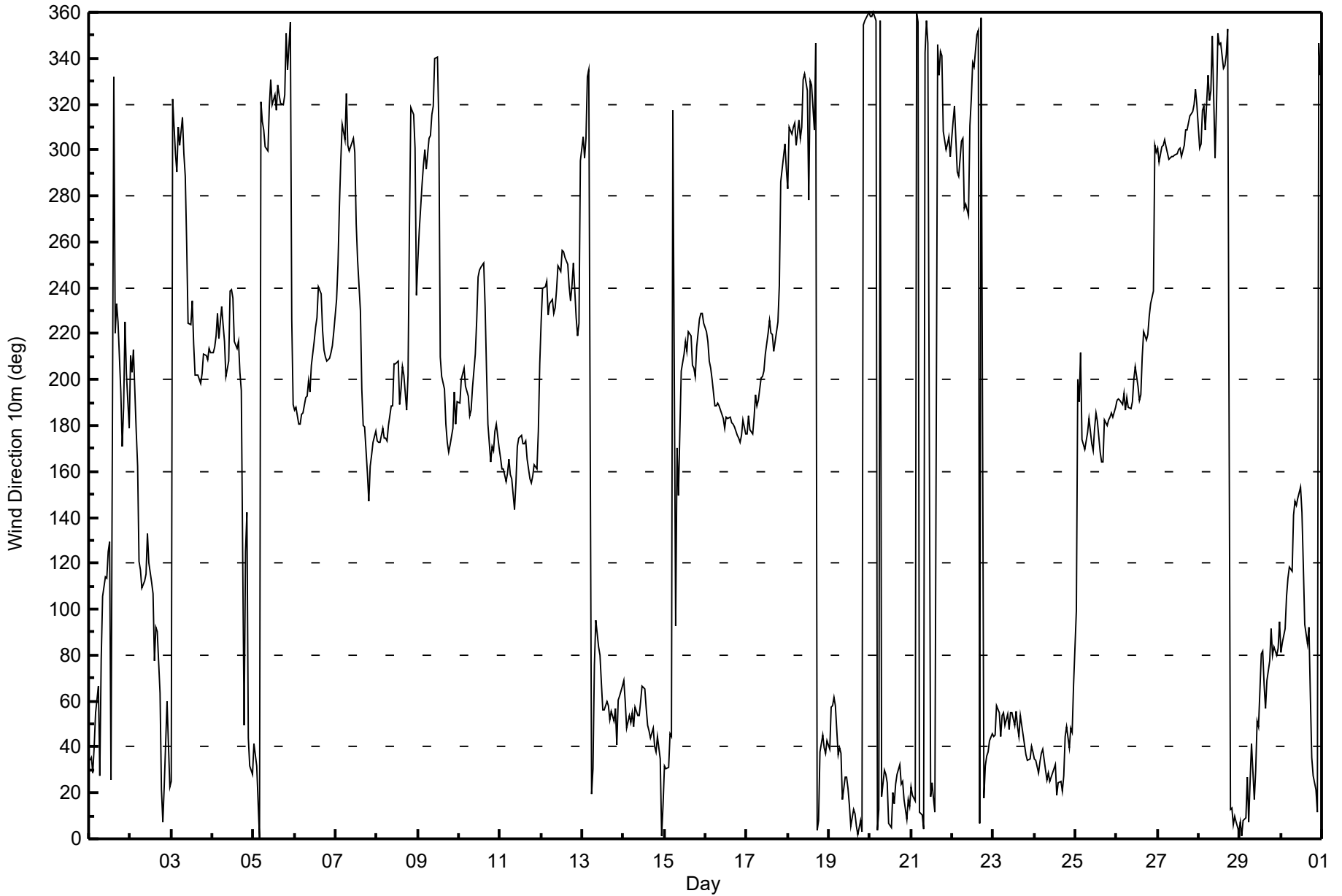


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

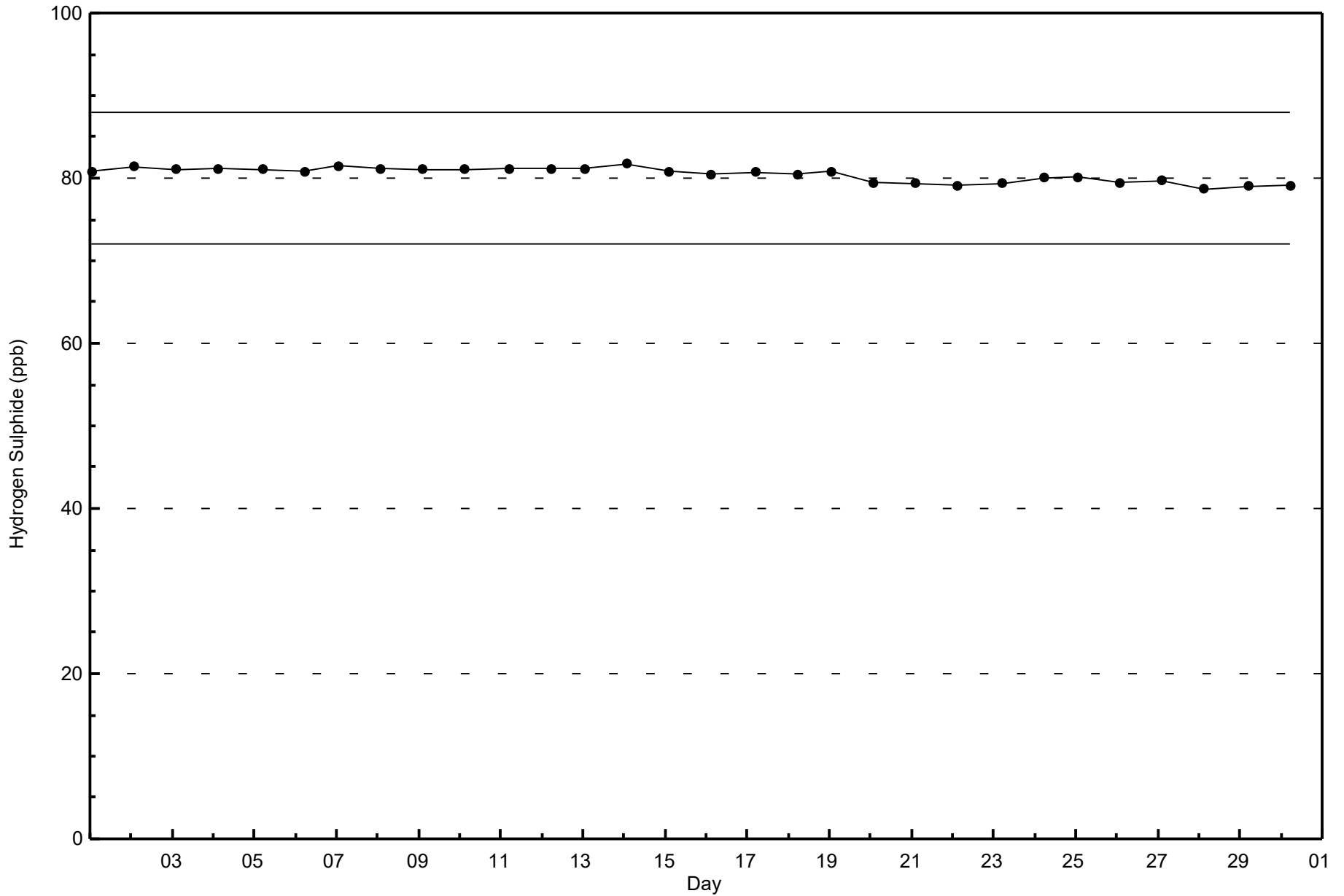
Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Kirby North



Total Number of Valid Hours: 680





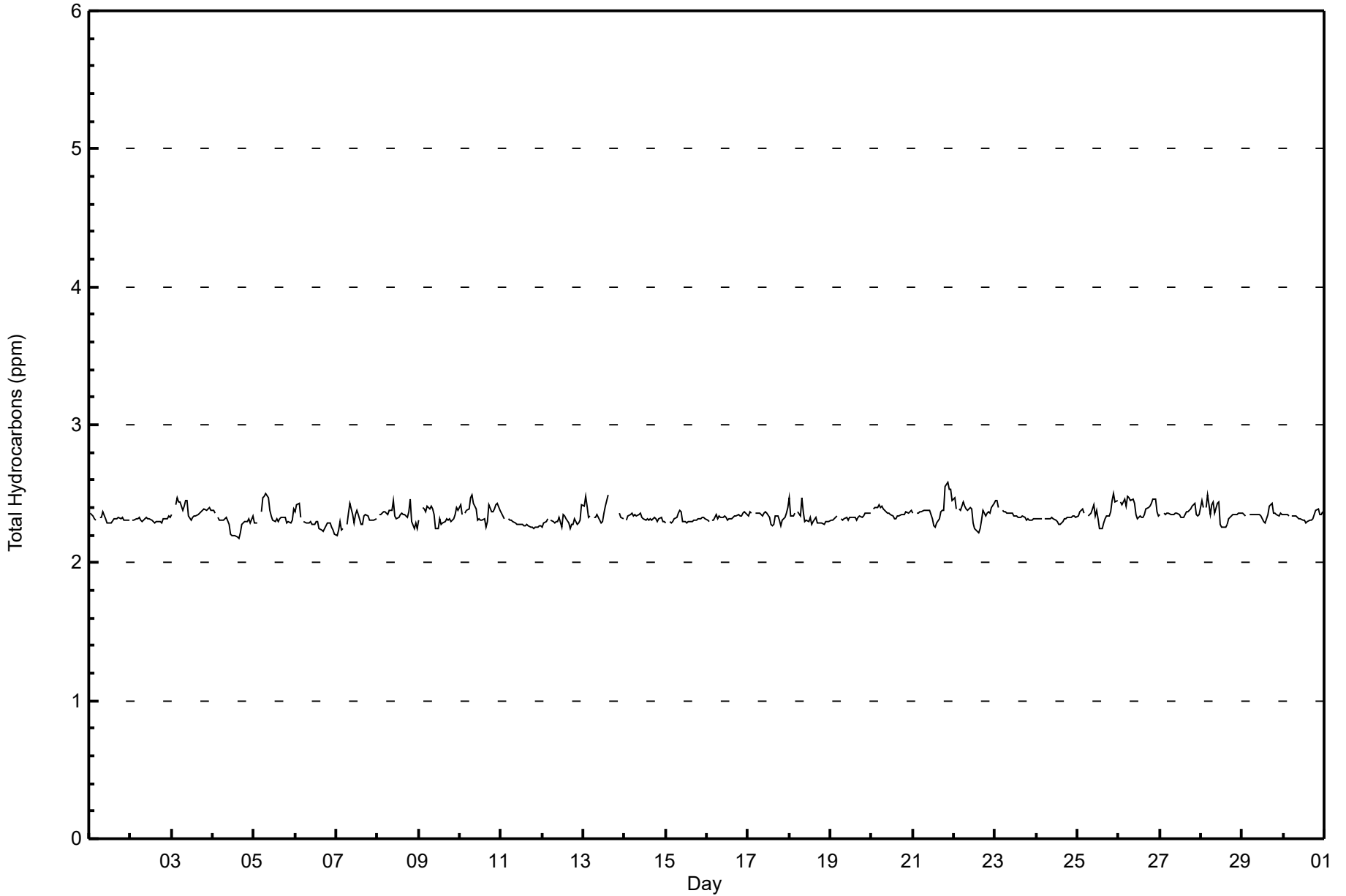






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Kirby North - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Kirby North - November 2024**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	0	0.00	0.00
2.1 - 3.0	684	100.00	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 720



**Wood Buffalo Environmental Association**  
**Frequency Distribution**

**Total Hydrocarbons (THC) - ppm**  
**Kirby North - November 2024**

<b>Concentration</b> <b>Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	44	67	73	28	21	15	9	28	97	75	58	27	8	50	55	29	684
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	44	67	73	28	21	15	9	28	97	75	58	27	8	50	55	29	684

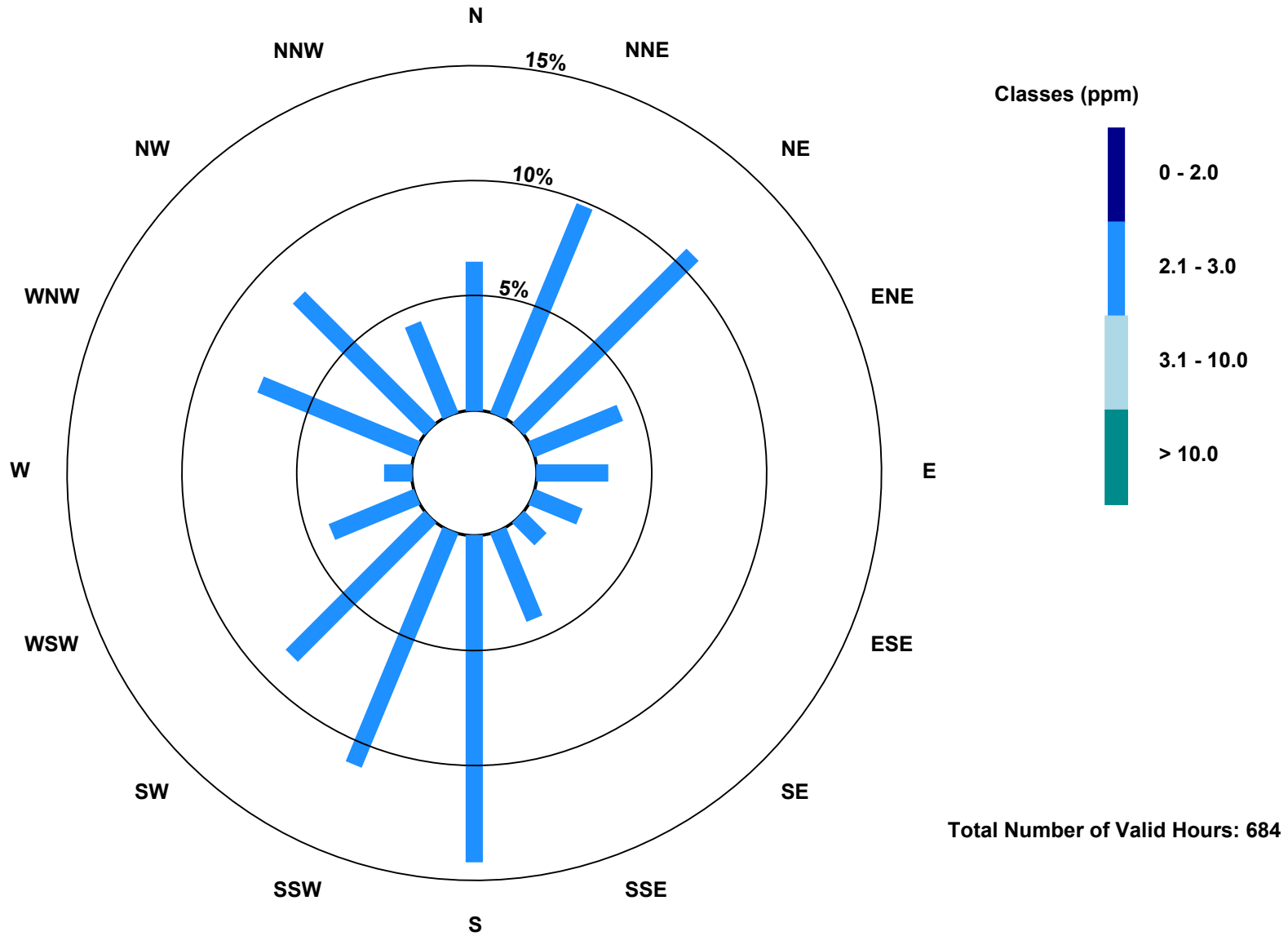
Total Number of Valid Hours: 684

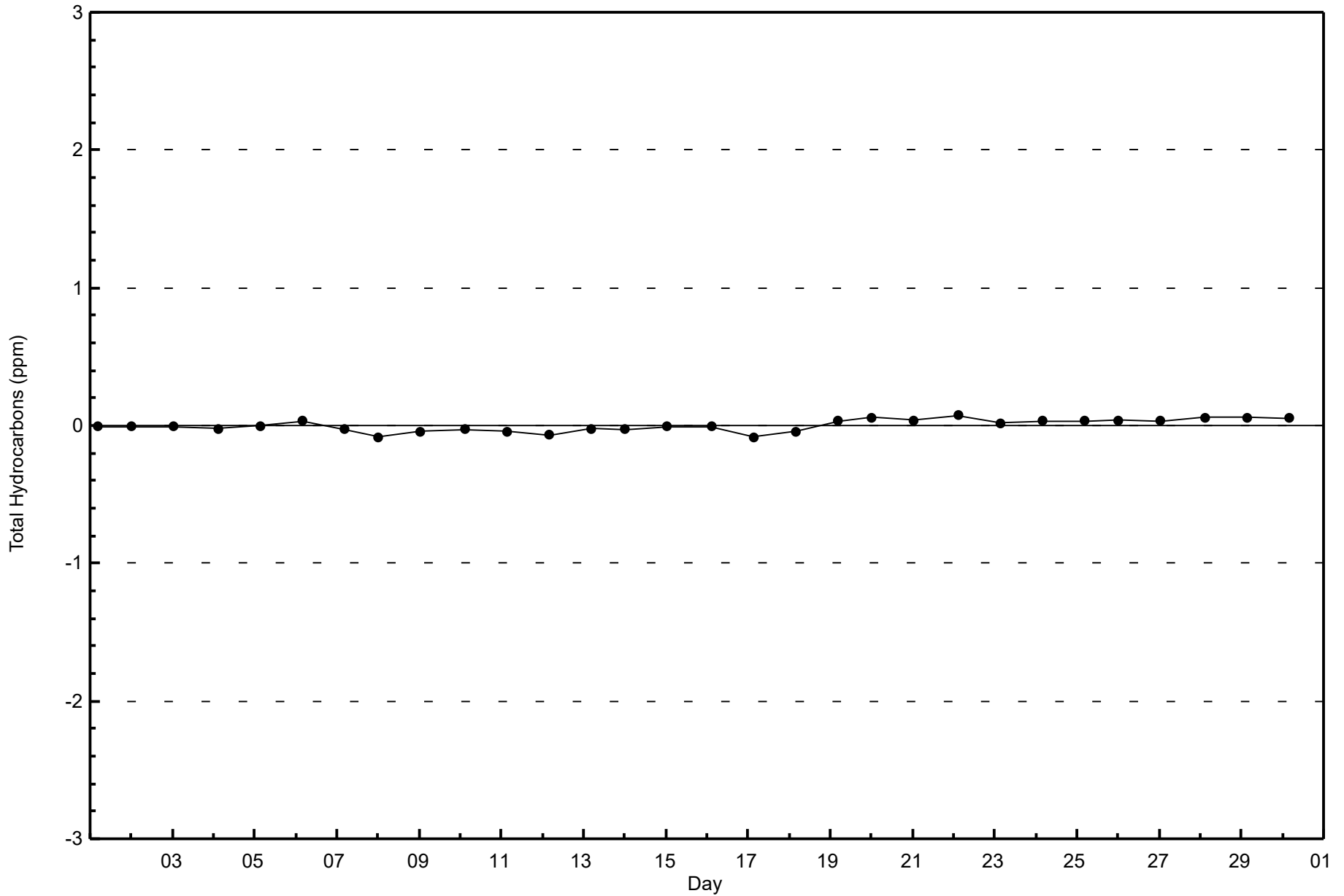
Total Number of Hours: 720

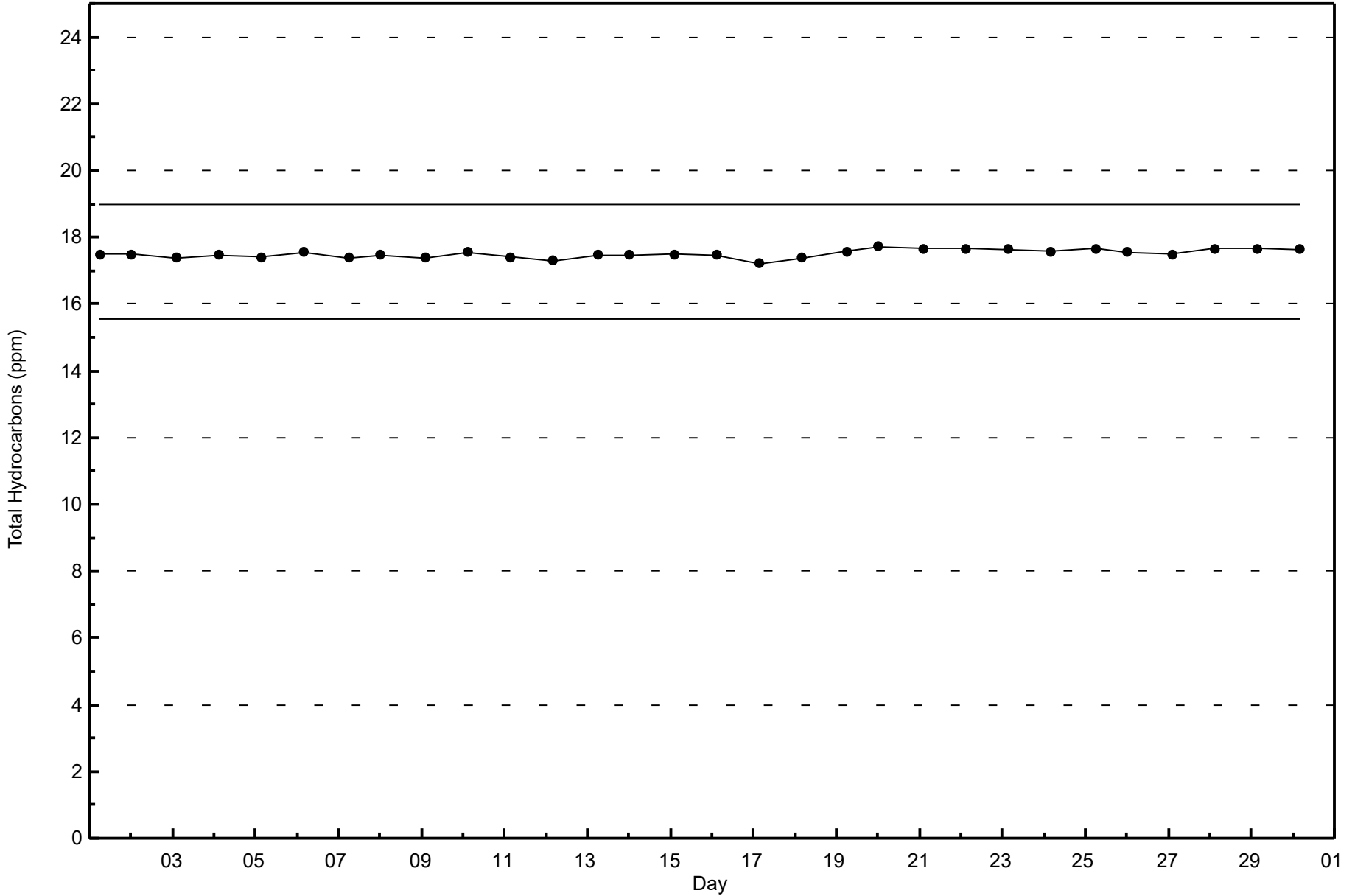


Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Total Hydrocarbons (THC) - ppm  
Kirby North









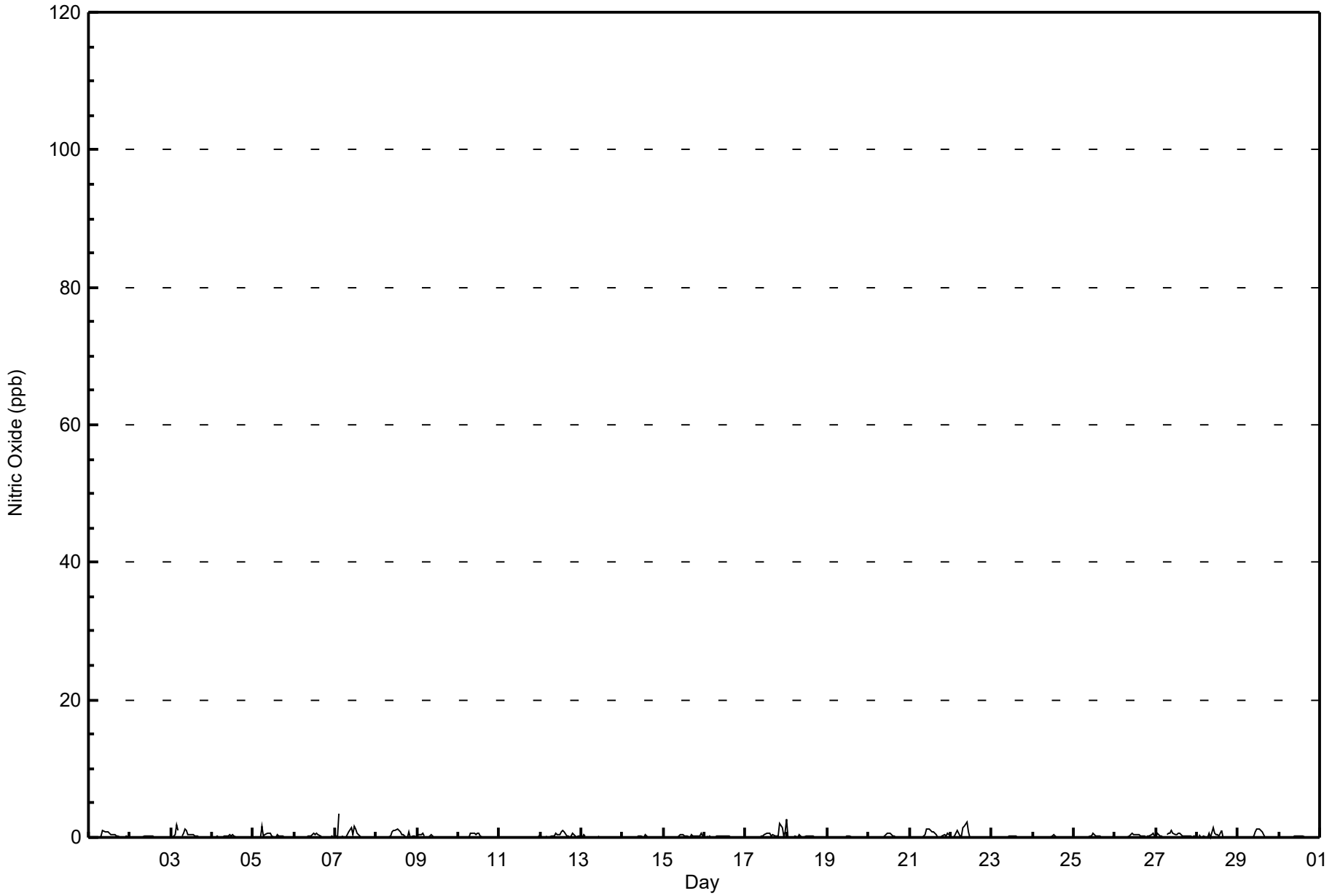


Maximum Value: 3.6 ppb on Nov 7 03:00																				Maximum Daily Average: 0.5 ppb on Nov 7					Hours in Service:	720
Minimum Value: 0.0 ppb on Nov 3 23:00																				Minimum Daily Average: 0.0 ppb on Nov 11					Hours of Data:	685
Maximum Diurnal Average: 0.5 ppb at hour 10																				Minimum Diurnal Average: 0.0 ppb at hour 19					Hours of Missing Data:	35
Monthly Average: 0.20 ppb																				Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.0 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 0.6 P <sub>99</sub> = 1.6					Hours of Calibration:	35
																									Percent Operational Time:	100.0
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	1.0	0.9	0.7	0.8	0.7	0.4	0.3	0.3	0.2	0.2	0.0	0.0	0.1	0.0	0.1	0.0	0.3	1.0
2-Nov	0.0	0.0	0.1	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
3-Nov	0.0	0.1	0.3	1.8	1.1	Z	0.2	0.7	1.2	1.1	0.4	0.4	0.4	0.3	0.2	0.3	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.4	1.8
4-Nov	Z	0.1	0.0	0.3	0.0	0.0	0.2	0.2	0.1	0.4	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
5-Nov	0.0	Z	0.0	0.0	0.0	1.6	0.2	0.4	0.6	0.6	0.5	0.2	0.0	0.0	0.5	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.6
6-Nov	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.6	0.5	0.6	0.5	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.2	0.6
7-Nov	0.1	0.1	3.6	Z	0.1	0.0	0.0	0.3	0.8	1.3	0.4	1.7	1.1	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.6
8-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.9	1.1	1.1	1.3	1.1	0.7	0.3	0.4	0.0	0.1	0.9	0.0	0.1	0.2	0.0	0.4	1.3
9-Nov	0.4	0.5	0.4	0.5	0.2	Z	0.0	0.2	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
10-Nov	Z	0.0	0.0	0.0	0.1	0.1	0.0	0.6	0.7	0.6	0.5	0.5	0.6	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
11-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
12-Nov	0.0	0.2	Z	0.2	0.1	0.1	0.1	0.3	0.2	0.5	0.5	0.5	0.8	1.1	0.8	0.3	0.2	0.1	0.2	0.6	0.2	0.0	0.2	0.1	0.3	1.1
13-Nov	0.1	0.5	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
14-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
15-Nov	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.3	0.4	0.4	0.3	0.2	0.2	0.1	0.3	0.2	0.1	0.3	0.2	0.2	0.6	0.3	0.2	0.6
16-Nov	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
17-Nov	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.3	0.4	0.6	0.6	0.5	0.2	0.3	0.1	0.3	0.3	2.0	1.3	0.1	0.8	0.4	2.0
18-Nov	2.5	0.0	Z	0.1	0.0	0.2	0.0	0.3	0.3	0.0	0.0	0.1	0.2	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.5
19-Nov	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
20-Nov	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.3	0.5	0.5	0.5	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
21-Nov	0.0	0.0	0.0	0.0	0.1	Z	0.1	0.1	0.1	0.5	1.3	1.3	1.0	0.9	0.8	0.4	0.1	0.0	0.1	0.2	0.4	0.3	0.5	0.4	0.4	1.3
22-Nov	Z	0.1	0.2	0.7	0.9	0.3	0.2	1.4	1.6	2.2	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.2
23-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
24-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
25-Nov	0.0	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.7	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.7
26-Nov	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.4	0.6	0.5	0.4	0.5	0.4	0.3	0.2	0.1	0.1	0.2	0.2	0.5	0.6	0.2	0.2	0.6
27-Nov	0.2	0.5	0.1	0.1	0.1	Z	0.5	0.5	0.6	1.0	0.5	0.5	0.4	0.6	0.6	0.2	0.1	0.2	0.1	0.2	0.2	0.0	0.1	0.1	0.3	1.0
28-Nov	Z	0.3	0.0	0.0	0.1	0.0	0.1	0.7	0.1	1.3	0.6	0.4	0.4	0.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3
29-Nov	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	1.1	1.3	1.0	0.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.3
30-Nov	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
																								Diurnal Average		
																								Diurnal Maximum		
0.2 0.1 0.2 0.2 0.1 0.1 0.1 0.2 0.3 0.5 0.4 0.5 0.4 0.4 0.3 0.1 0.1 0.0 0.0 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1																										
2.5 0.5 3.6 1.8 1.1 1.6 0.5 1.4 1.6 2.2 1.3 1.7 1.3 1.1 0.9 0.4 0.4 0.2 0.3 0.9 2.0 1.3 0.6 0.8																										
Z - zerospan C - Calibration																										



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Kirby North - November 2024**





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb**  
**Kirby North - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	685	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Kirby North - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	45	68	75	27	20	16	9	27	98	75	59	26	9	46	57	28	685
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	45	68	75	27	20	16	9	27	98	75	59	26	9	46	57	28	685

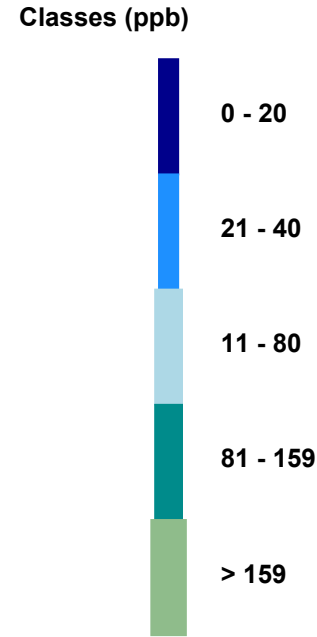
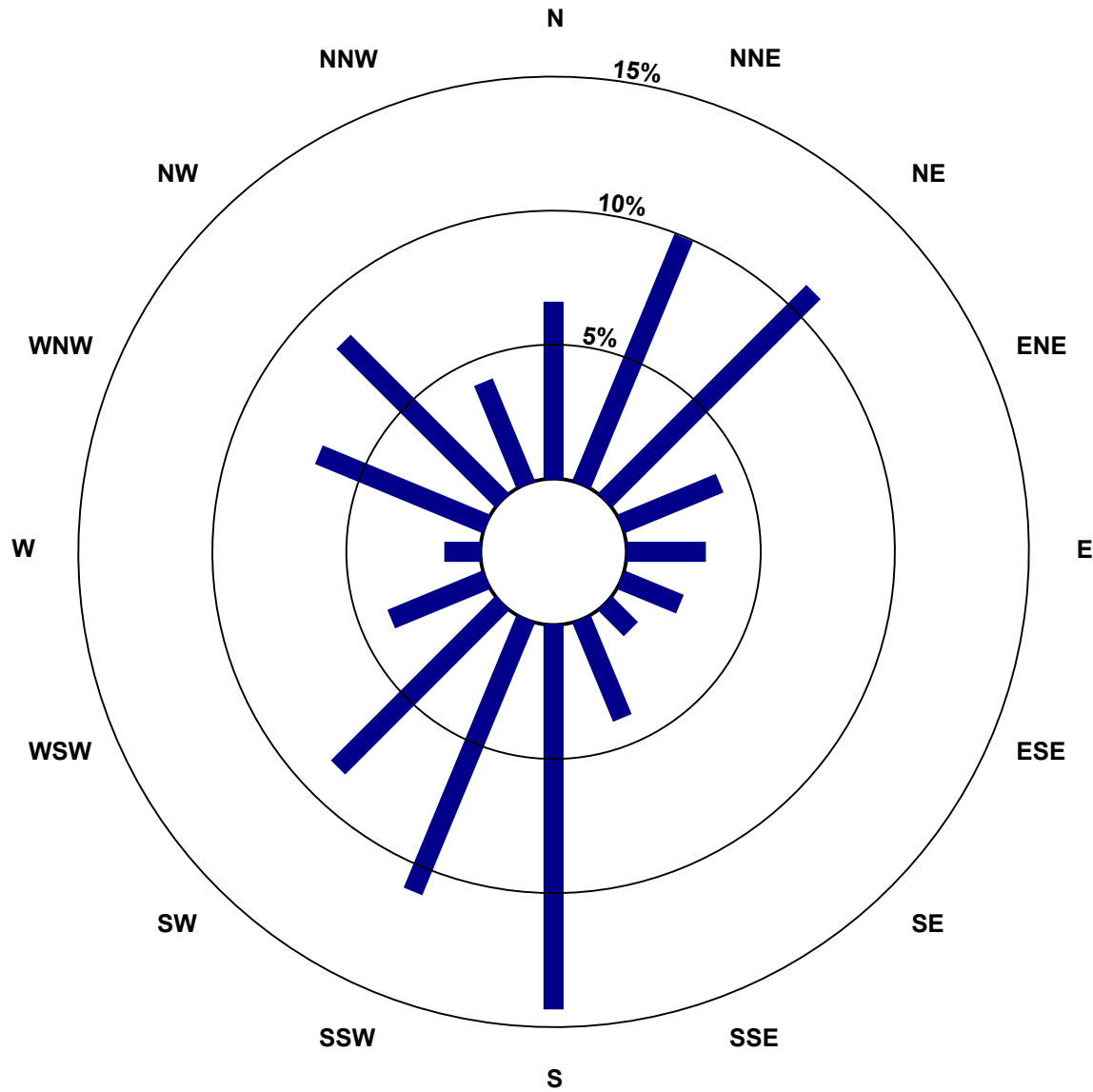
Total Number of Valid Hours: 685

Total Number of Hours: 720

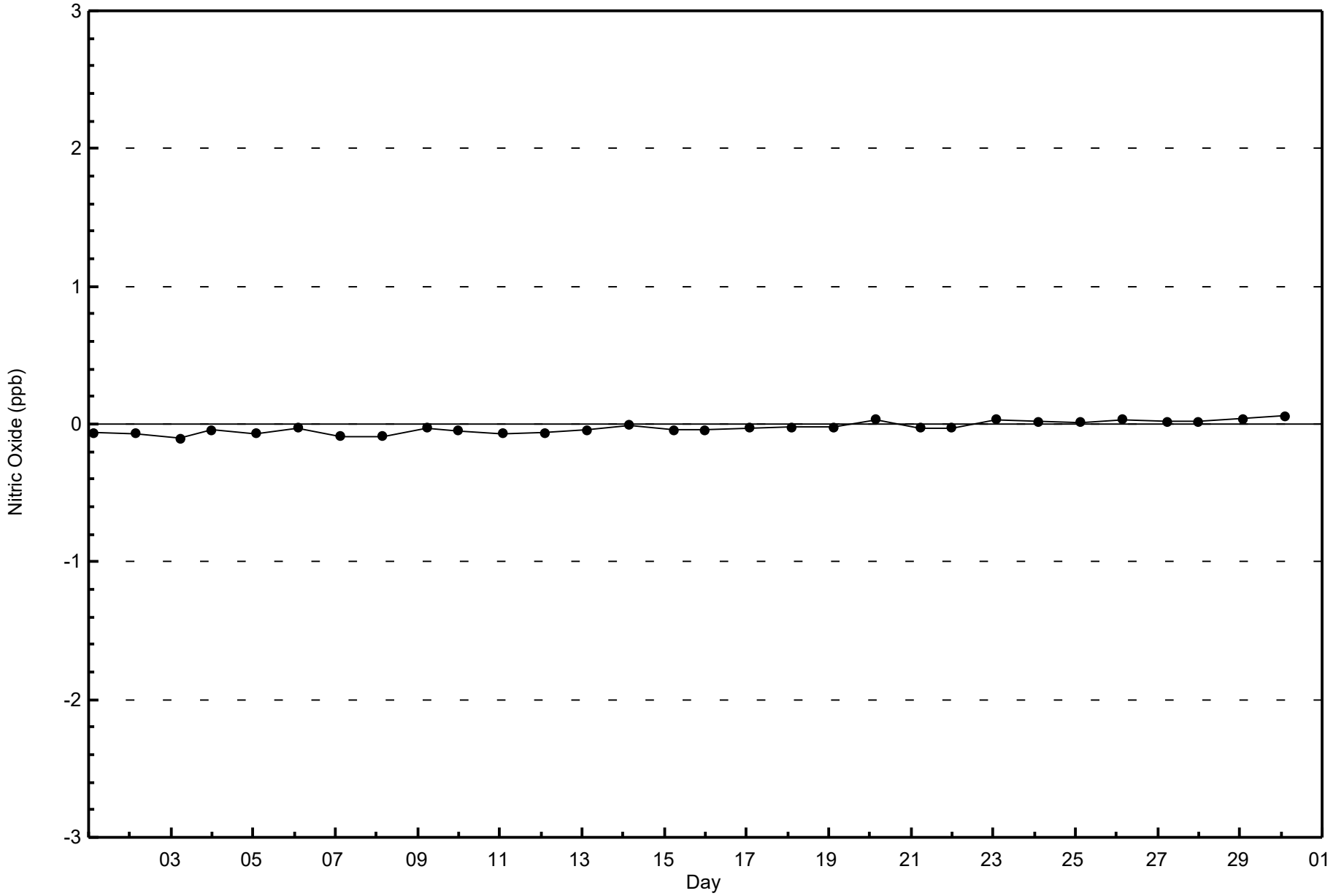


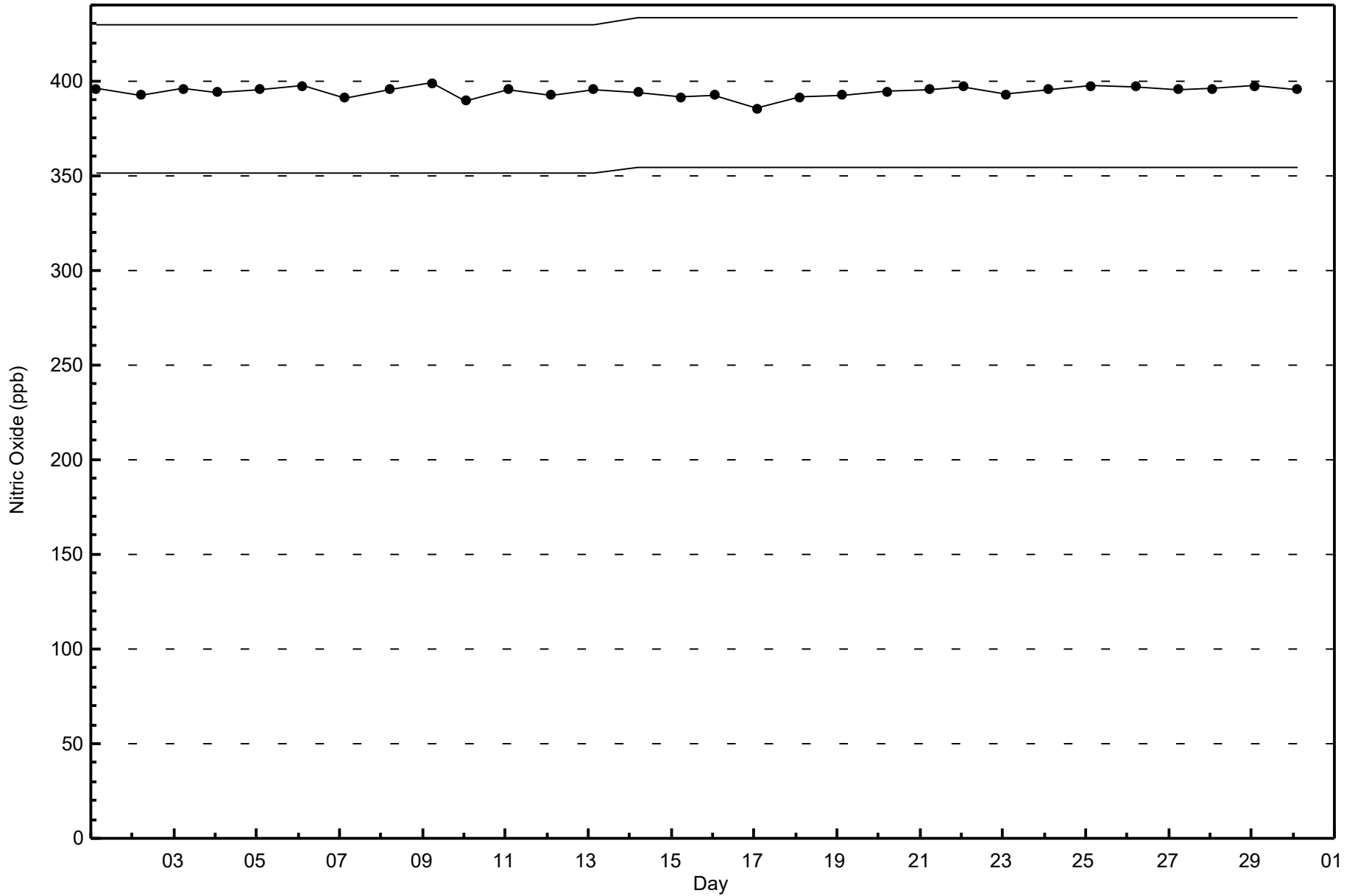
Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitric Oxide (NO) - ppb  
Kirby North



Total Number of Valid Hours: 685







# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Nitrogen Dioxide (NO<sub>2</sub>) - ppb

## Kirby North - November 2024

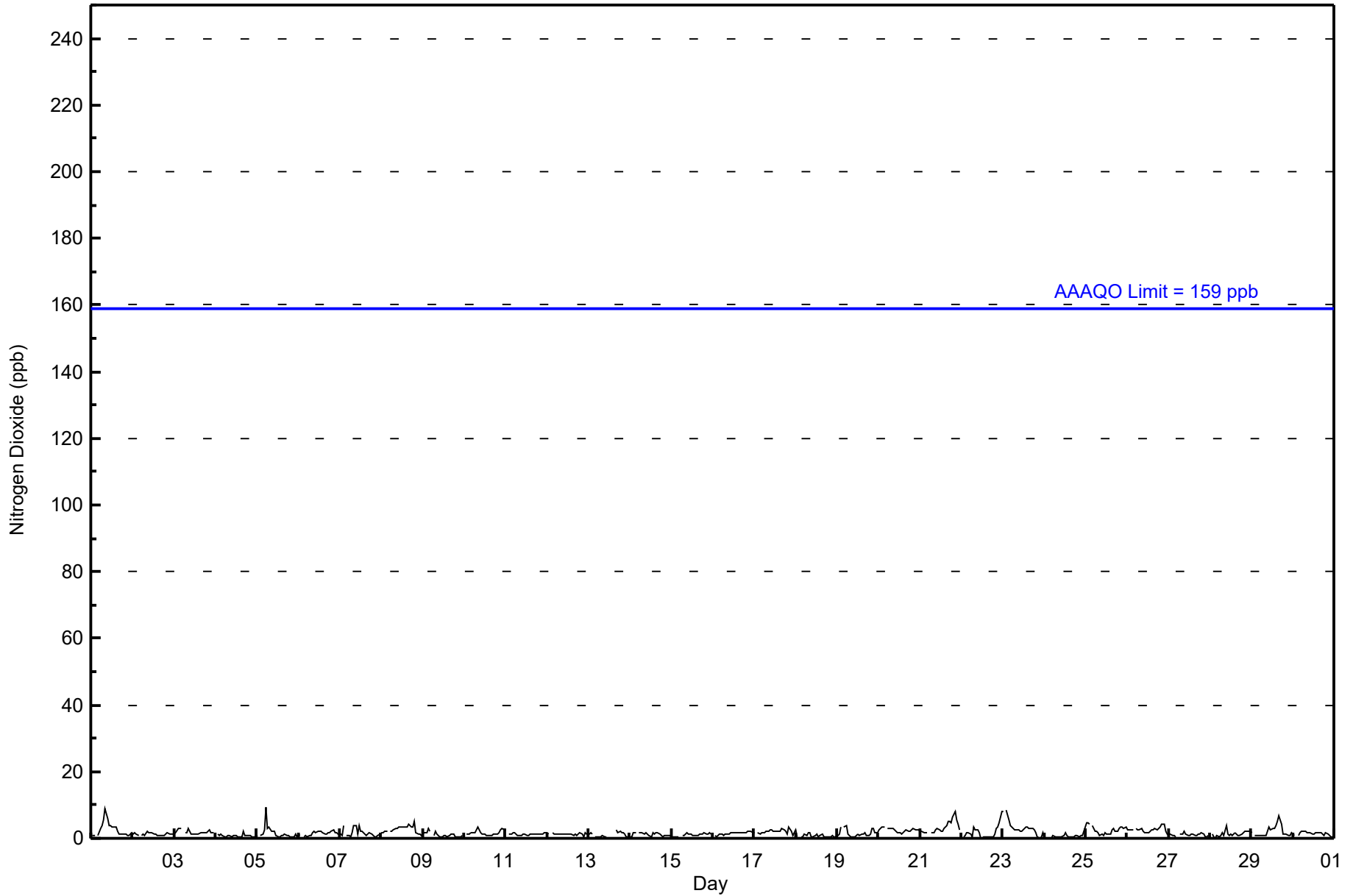
Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		720																																									
Maximum Value: 9.3 ppb on Nov 5 06:00		Maximum Daily Average: 3.3 ppb on Nov 21		Minimum Value: 0.2 ppb on Nov 22 12:00		Minimum Daily Average: 0.6 ppb on Nov 24		Hours of Data: 685																																									
Maximum Diurnal Average: 2.0 ppb at hour 9		Minimum Diurnal Average: 1.3 ppb at hour 2		Hours of Missing Data: 35		Hours of Calibration: 35		Percent Operational Time: 100.0																																									
Monthly Average: 1.69 ppb		Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.6 Q <sub>1</sub> = 0.9 Median = 1.4 Q <sub>3</sub> = 2.2 P <sub>90</sub> = 3.1 P <sub>99</sub> = 6.5																																															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	0.8	0.7	1.0	Z	0.9	2.9	3.9	5.6	8.7	6.0	4.0	3.9	3.5	3.3	3.2	2.1	1.2	1.3	1.3	1.1	1.1	1.0	1.0	1.5	2.6	8.7																							
2-Nov	1.3	1.5	1.3	1.0	Z	0.8	1.4	0.9	2.2	1.6	1.8	1.5	1.3	1.1	0.9	0.9	0.9	0.9	1.0	1.2	1.6	1.4	1.2	1.2	1.3	2.2																							
3-Nov	1.4	1.5	2.8	3.0	2.9	Z	1.8	1.9	2.9	2.2	1.2	1.1	1.3	1.2	1.3	1.7	1.7	1.6	1.5	1.6	2.5	1.8	1.5	1.5	1.8	3.0																							
4-Nov	Z	1.2	1.0	1.1	0.7	0.6	0.6	0.8	0.8	0.6	0.7	0.7	0.8	0.6	0.5	0.6	2.3	0.9	0.7	0.8	0.7	0.6	0.6	0.6	0.8	2.3																							
5-Nov	0.7	Z	0.8	1.2	2.5	9.3	3.1	3.5	2.2	2.1	2.1	0.8	0.5	0.6	0.7	0.8	1.1	0.9	0.8	0.4	0.4	0.6	1.1	0.5	1.6	9.3																							
6-Nov	1.3	0.7	Z	0.6	0.9	0.6	0.7	1.0	1.9	2.1	1.7	2.0	2.2	2.1	1.6	1.2	1.1	1.6	1.7	2.1	2.4	1.9	1.6	1.1	1.5	2.4																							
7-Nov	1.1	0.7	3.9	Z	0.8	0.7	0.4	1.7	4.0	3.8	1.4	3.7	2.3	2.1	1.4	0.7	1.4	1.5	1.1	0.7	0.4	0.5	1.0	1.3	1.6	4.0																							
8-Nov	1.6	1.8	2.0	2.1	Z	2.1	2.2	2.4	2.8	3.0	3.2	3.5	3.3	3.2	3.2	3.3	4.4	3.6	3.6	5.2	1.6	1.3	1.4	0.8	2.7	5.2																							
9-Nov	1.1	1.5	1.8	3.0	2.1	Z	0.9	2.1	1.4	0.8	0.6	0.3	0.8	0.7	0.6	0.8	1.1	1.4	1.2	0.6	0.6	0.6	0.6	0.8	1.1	3.0																							
10-Nov	Z	1.1	1.1	1.1	1.6	1.7	1.9	2.6	3.2	1.9	1.4	1.3	1.4	0.9	0.7	0.7	0.7	1.1	1.3	1.3	1.8	2.5	2.8	2.7	1.6	3.2																							
11-Nov	2.5	Z	1.4	1.3	1.6	1.6	1.1	1.0	0.8	0.9	1.1	1.1	1.0	1.0	1.1	1.3	1.3	1.3	1.4	1.4	1.3	1.4	1.5	1.7	1.3	2.5																							
12-Nov	1.6	1.4	Z	1.7	1.3	1.3	1.3	1.4	1.3	1.4	1.2	1.1	1.2	1.4	1.2	1.0	1.1	0.8	1.1	1.5	1.3	0.5	1.9	1.2	1.3	1.9																							
13-Nov	1.1	1.6	1.2	Z	0.6	0.5	0.4	0.4	0.7	0.4	0.6	C	C	C	C	C	2.5	1.5	2.0	1.5	1.7	1.3	0.4	0.5	1.1	2.5																							
14-Nov	0.4	0.4	1.7	1.7	Z	1.7	1.6	1.8	1.3	1.5	1.3	0.9	0.5	1.8	1.4	1.8	1.7	1.1	0.8	0.5	0.9	0.9	1.0	0.7	1.2	1.8																							
15-Nov	0.6	0.4	0.5	0.5	0.5	Z	1.0	1.0	1.1	1.7	1.2	1.1	0.7	0.8	0.8	0.9	1.2	1.1	1.1	1.6	1.2	1.4	1.6	1.1	1.0	1.7																							
16-Nov	Z	0.8	0.6	0.9	1.1	1.4	1.0	1.1	1.1	1.3	1.6	1.6	1.5	1.8	1.9	1.8	1.9	1.8	1.8	1.9	2.3	2.2	2.0	1.8	1.5	2.3																							
17-Nov	1.6	Z	1.5	1.4	1.5	1.7	1.9	2.0	2.2	2.7	2.6	2.3	2.2	2.2	2.2	2.3	2.9	2.4	2.0	1.2	3.4	2.1	0.9	1.7	2.0	3.4																							
18-Nov	2.7	0.6	Z	0.6	0.5	1.1	0.7	1.6	1.5	0.3	0.3	0.7	1.1	0.5	1.0	1.4	0.6	0.4	0.3	0.5	0.4	0.7	0.4	0.5	0.8	2.7																							
19-Nov	0.7	1.2	3.4	Z	3.6	3.8	1.4	0.7	0.6	0.6	0.4	1.0	1.1	1.0	1.1	1.2	1.6	1.0	0.8	1.1	2.9	2.8	1.8	1.6	1.5	3.8																							
20-Nov	2.4	2.9	3.5	3.6	Z	2.9	3.1	3.0	2.9	2.4	2.1	1.9	1.6	1.3	1.7	2.1	2.7	2.2	2.2	2.5	3.0	2.5	2.5	2.6	2.5	3.6																							
21-Nov	2.3	2.0	1.9	1.9	1.8	Z	1.6	1.5	1.7	2.4	2.8	2.4	2.1	2.2	2.9	4.0	5.1	5.0	4.6	6.4	7.9	5.4	4.4	2.7	3.3	7.9																							
22-Nov	Z	0.6	0.7	1.6	1.9	1.1	0.6	3.6	2.5	2.5	1.5	0.2	0.2	0.3	0.4	0.3	0.3	0.3	0.6	1.2	2.8	3.5	4.5	7.9	1.7	7.9																							
23-Nov	7.9	Z	8.4	5.6	3.8	3.6	3.0	2.7	2.5	2.4	2.2	2.3	2.8	3.2	3.3	2.8	3.0	3.0	2.5	1.5	0.4	0.2	0.4	1.5	3.0	8.4																							
24-Nov	0.2	0.2	Z	0.2	0.2	0.8	0.3	0.3	0.4	0.3	0.4	0.9	1.5	0.7	0.5	0.4	0.3	0.4	0.7	0.8	0.6	0.7	1.0	2.1	0.6	2.1																							
25-Nov	4.7	4.8	4.3	Z	3.7	2.2	2.1	1.9	1.0	1.2	0.9	1.7	1.2	1.1	1.3	2.5	2.9	2.3	2.3	2.8	3.5	3.3	3.0	3.2	2.5	4.8																							
26-Nov	2.6	2.5	2.7	2.6	Z	2.9	2.7	2.5	3.0	2.3	1.7	1.6	1.8	2.1	2.5	2.4	3.1	2.7	2.8	3.5	4.3	4.4	2.3	1.2	2.6	4.4																							
27-Nov	0.8	1.2	0.7	0.9	0.5	Z	1.4	1.3	1.3	2.1	1.2	1.0	0.8	1.3	1.3	1.0	0.8	1.4	1.1	1.7	1.1	0.3	0.4	0.9	1.1	2.1																							
28-Nov	Z	1.3	0.3	0.2	0.7	0.3	0.7	1.5	0.9	3.7	1.3	1.0	1.1	1.0	1.5	1.3	1.0	1.0	1.4	1.7	2.3	2.2	2.1	2.0	1.3	3.7																							
29-Nov	1.6	Z	0.8	0.8	0.8	0.9	0.9	1.0	1.0	2.2	3.6	2.7	2.9	3.1	4.0	5.2	6.8	4.3	1.2	1.3	1.3	1.0	0.9	1.5	2.2	6.8																							
30-Nov	1.1	1.0	Z	1.0	1.6	2.1	2.1	2.2	1.7	1.8	1.7	1.4	1.2	1.7	1.9	1.7	1.8	1.3	0.7	1.5	1.4	0.8	0.5	0.5	1.4	2.2																							
																								1.8	1.3	2.0	1.6	1.5	1.9	1.5	1.8	2.0	1.9	1.6	1.6	1.5	1.5	1.6	1.7	2.0	1.7	1.5	1.7	1.9	1.7	1.5	1.6	Diurnal Average	
																								7.9	4.8	8.4	5.6	3.8	9.3	3.9	5.6	8.7	6.0	4.0	3.9	3.5	3.3	4.0	5.2	6.8	5.0	4.6	6.4	7.9	5.4	4.5	7.9	Diurnal Maximum	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																	





**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Kirby North - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Kirby North - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	685	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Kirby North - November 2024**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	45	68	75	27	20	16	9	27	98	75	59	26	9	46	57	28	685
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	45	68	75	27	20	16	9	27	98	75	59	26	9	46	57	28	685

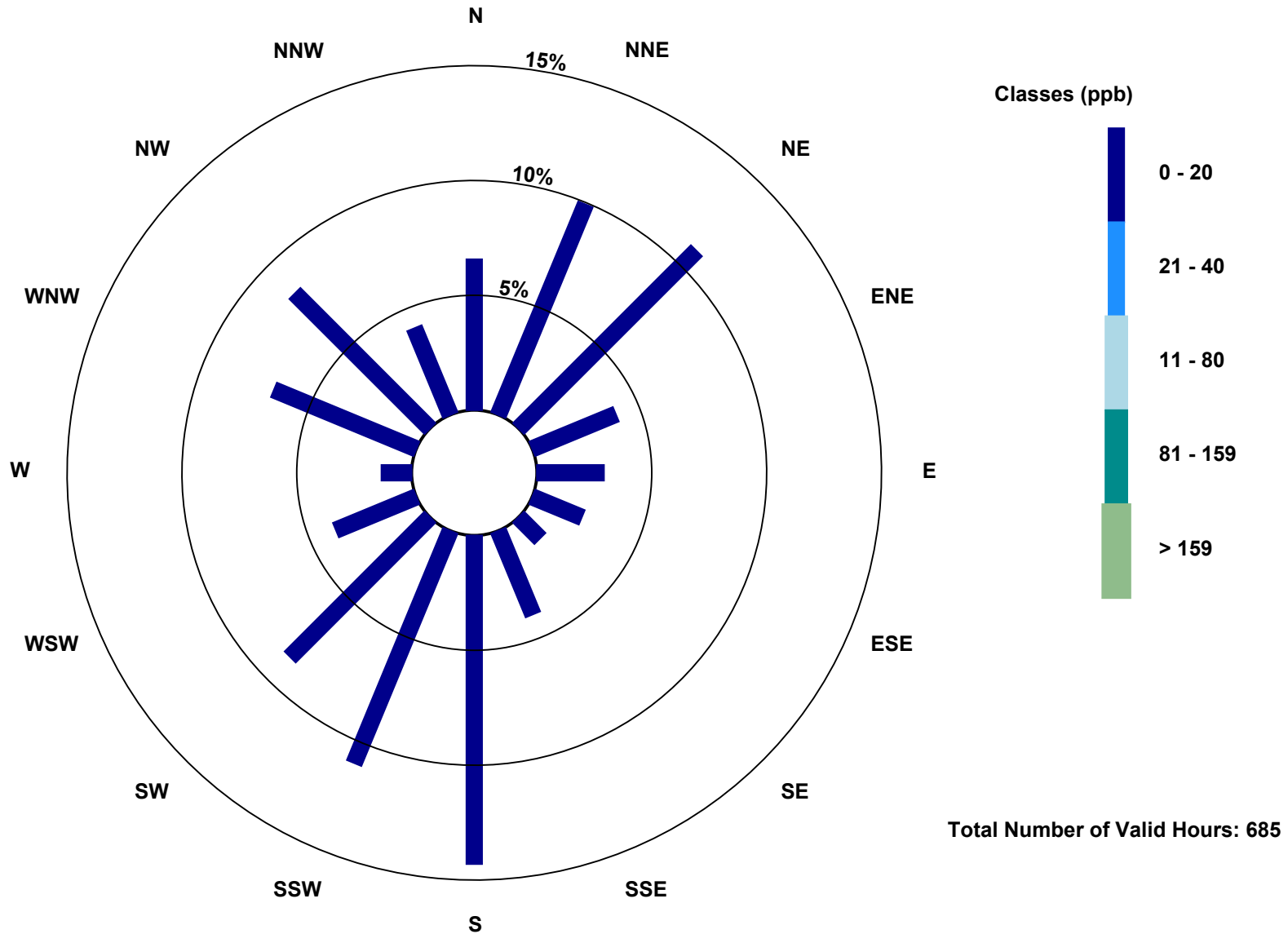
Total Number of Valid Hours: 685

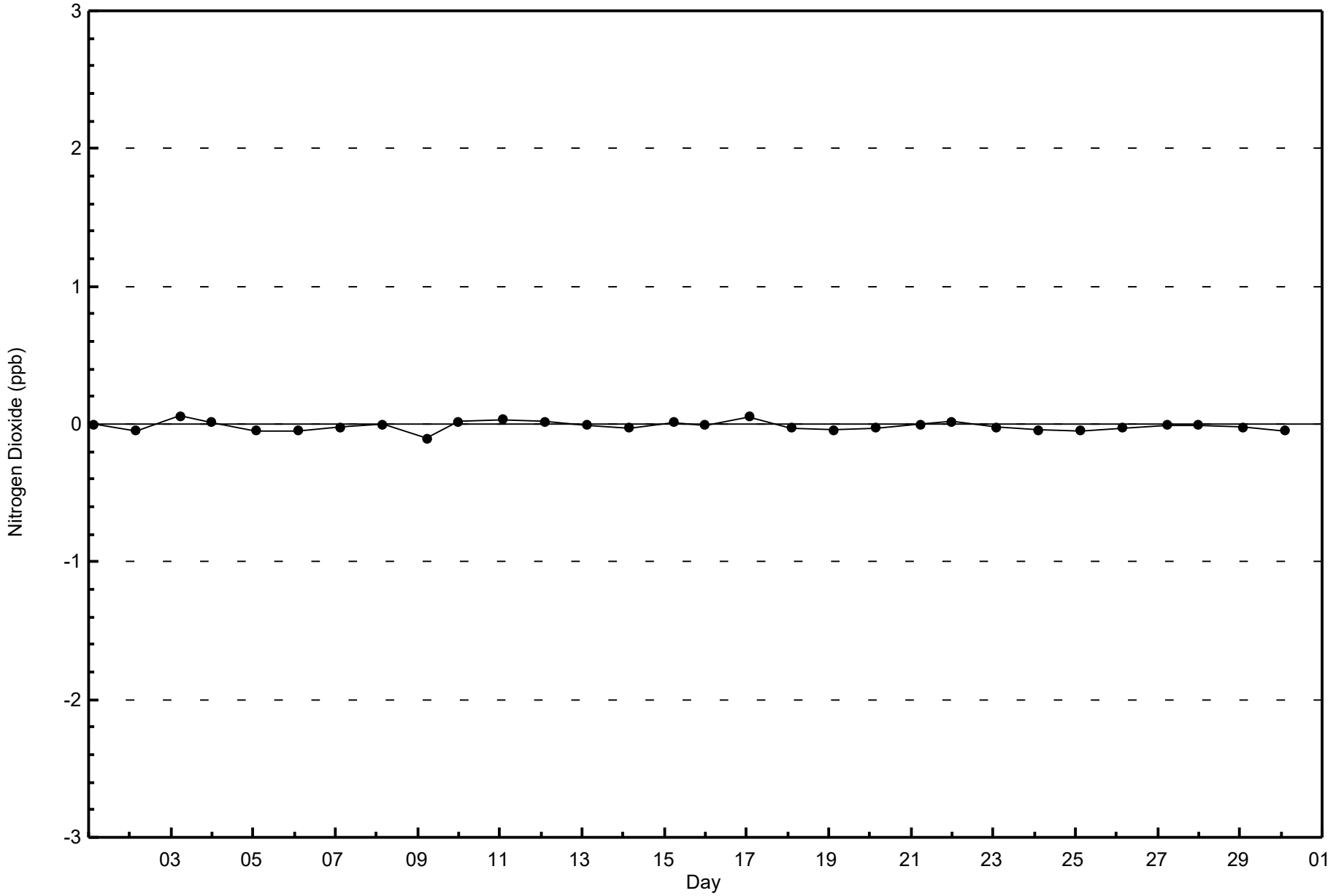
Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Kirby North

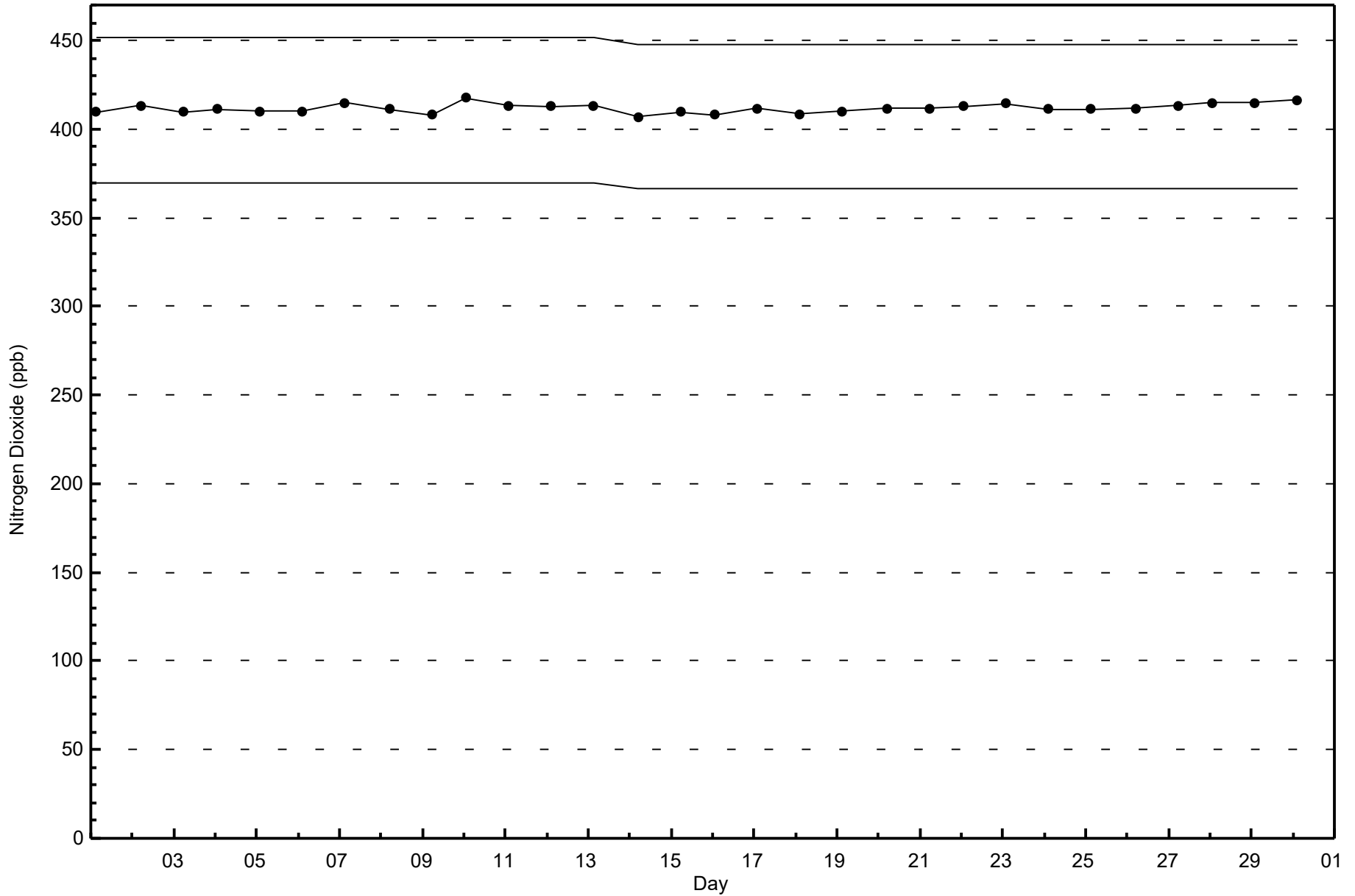






Wood Buffalo Environmental Association  
Span Responses

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Kirby North - November 2024





**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

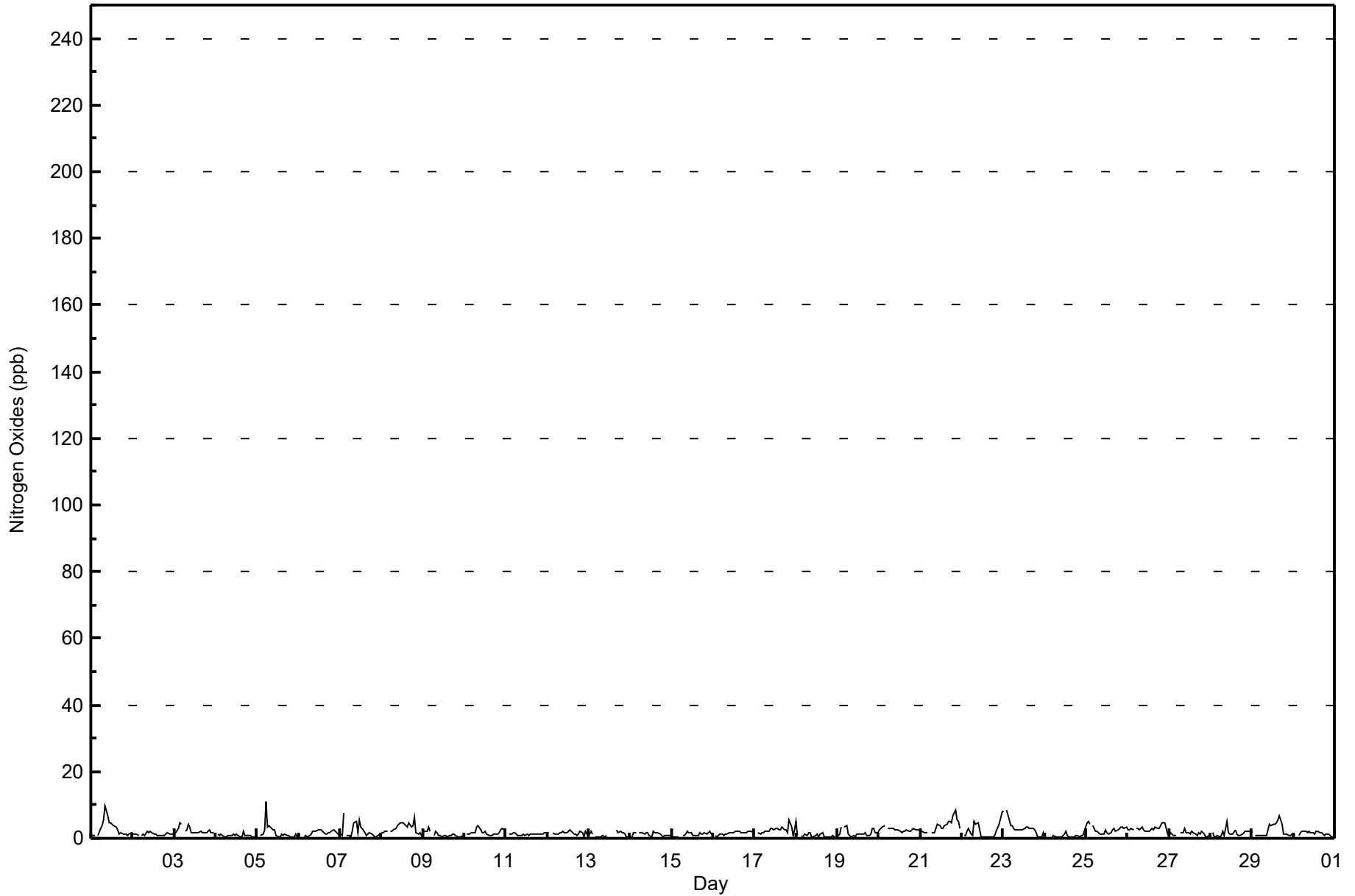
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Kirby North - November 2024**

Maximum Value: 10.9 ppb on Nov 5 06:00		Maximum Daily Average: 3.6 ppb on Nov 21		Hours in Service: 720																																													
Minimum Value: 0.2 ppb on Nov 24 05:00		Minimum Daily Average: 0.6 ppb on Nov 24		Hours of Data: 685																																													
Maximum Diurnal Average: 2.4 ppb at hour 10		Minimum Diurnal Average: 1.4 ppb at hour 2		Hours of Missing Data: 35																																													
Monthly Average: 1.88 ppb		Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 0.6 Q <sub>1</sub> = 1.0 Median = 1.5 Q <sub>3</sub> = 2.4 P <sub>90</sub> = 3.6 P <sub>99</sub> = 7.0		Hours of Calibration: 35																																													
				Percent Operational Time: 100.0																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Nov	0.8	0.7	1.0	Z	0.9	2.9	3.9	5.7	9.7	6.9	4.7	4.7	4.2	3.7	3.5	2.4	1.4	1.5	1.3	1.1	1.2	1.0	1.1	1.5	2.9	9.7																							
2-Nov	1.3	1.5	1.4	1.0	Z	0.8	1.4	0.9	2.3	1.8	2.1	1.8	1.4	1.3	1.0	0.9	0.9	0.9	1.0	1.2	1.6	1.4	1.2	1.2	1.3	2.3																							
3-Nov	1.4	1.6	3.1	4.8	4.0	Z	2.0	2.6	4.1	3.3	1.6	1.5	1.7	1.5	1.5	2.0	1.8	1.6	1.5	1.7	2.6	1.8	1.5	1.5	2.2	4.8																							
4-Nov	Z	1.3	1.0	1.4	0.7	0.6	0.6	1.0	1.0	0.7	1.1	1.0	1.1	0.7	0.5	0.6	2.3	0.9	0.7	0.8	0.7	0.6	0.6	0.6	0.9	2.3																							
5-Nov	0.7	Z	0.8	1.2	2.5	10.9	3.3	3.9	2.8	2.7	2.6	1.0	0.5	0.6	1.2	1.0	1.3	1.0	0.8	0.4	0.4	0.6	1.1	0.5	1.8	10.9																							
6-Nov	1.4	0.7	Z	0.6	0.9	0.6	0.7	1.1	2.1	2.3	1.9	2.6	2.7	2.7	2.1	1.3	1.1	1.7	1.7	2.2	2.5	2.0	1.7	1.1	1.6	2.7																							
7-Nov	1.2	0.8	7.5	Z	0.9	0.7	0.4	2.0	4.8	5.1	1.8	5.4	3.4	2.8	1.6	0.7	1.4	1.5	1.1	0.7	0.4	0.5	1.0	1.3	2.1	7.5																							
8-Nov	1.6	1.8	2.0	2.1	Z	2.1	2.2	2.4	3.0	3.9	4.3	4.6	4.6	4.3	3.9	3.6	4.8	3.6	3.7	6.1	1.6	1.4	1.6	0.8	3.0	6.1																							
9-Nov	1.5	2.0	2.2	3.5	2.3	Z	0.9	2.3	1.8	1.0	0.7	0.3	0.8	0.7	0.6	0.8	1.1	1.4	1.2	0.6	0.6	0.6	0.6	0.8	1.2	3.5																							
10-Nov	Z	1.1	1.1	1.1	1.7	1.8	1.9	3.2	3.9	2.5	1.9	1.8	2.0	1.1	0.8	0.8	0.7	1.1	1.3	1.3	1.8	2.5	2.8	2.7	1.8	3.9																							
11-Nov	2.5	Z	1.4	1.3	1.6	1.6	1.1	1.0	0.8	0.9	1.1	1.1	1.1	1.0	1.2	1.3	1.3	1.3	1.4	1.4	1.3	1.4	1.5	1.8	1.3	2.5																							
12-Nov	1.6	1.6	Z	1.9	1.4	1.4	1.4	1.7	1.5	1.9	1.7	1.6	2.0	2.5	2.0	1.3	1.3	0.9	1.3	2.1	1.5	0.5	2.1	1.3	1.6	2.5																							
13-Nov	1.2	2.1	1.3	Z	0.6	0.5	0.4	0.4	0.7	0.5	0.7	C	C	C	C	C	2.5	1.5	2.0	1.5	1.7	1.3	0.4	0.5	1.1	2.5																							
14-Nov	0.4	0.4	1.7	1.7	Z	1.7	1.6	1.8	1.3	1.6	1.5	1.0	0.5	2.2	1.6	1.9	1.7	1.1	0.8	0.5	0.9	0.9	1.0	0.7	1.2	2.2																							
15-Nov	0.6	0.4	0.5	0.5	0.5	Z	1.0	1.0	1.2	2.0	1.6	1.5	1.0	1.0	1.0	1.0	1.5	1.3	1.2	1.9	1.4	1.6	2.2	1.4	1.2	2.2																							
16-Nov	Z	0.9	0.6	1.0	1.1	1.4	1.0	1.2	1.2	1.5	1.8	1.8	1.7	2.0	2.0	1.9	1.9	1.8	1.8	1.9	2.3	2.2	2.0	1.8	1.6	2.3																							
17-Nov	1.6	Z	1.5	1.4	1.5	1.8	1.9	2.0	2.2	2.9	2.9	2.7	2.8	2.8	2.7	2.5	3.2	2.5	2.3	1.5	5.4	3.4	1.0	2.5	2.4	5.4																							
18-Nov	5.2	0.6	Z	0.7	0.5	1.3	0.7	1.9	1.8	0.3	0.3	0.8	1.3	0.6	1.2	1.6	0.6	0.4	0.3	0.5	0.4	0.7	0.4	0.5	1.0	5.2																							
19-Nov	0.7	1.2	3.4	Z	3.6	3.8	1.4	0.7	0.6	0.7	0.4	1.1	1.3	1.1	1.2	1.2	1.6	1.0	0.8	1.1	2.9	2.8	1.8	1.6	1.6	3.8																							
20-Nov	2.4	2.9	3.5	3.6	Z	2.9	3.1	3.0	3.0	2.7	2.6	2.4	2.1	1.7	2.0	2.2	2.7	2.2	2.2	2.5	3.0	2.5	2.5	2.6	2.6	3.6																							
21-Nov	2.3	2.0	1.9	1.9	1.9	Z	1.7	1.6	1.8	2.9	4.1	3.7	3.1	3.1	3.7	4.4	5.2	5.0	4.7	6.6	8.3	5.7	4.9	3.1	3.6	8.3																							
22-Nov	Z	0.7	0.9	2.3	2.8	1.4	0.8	5.0	4.1	4.7	2.4	0.3	0.2	0.3	0.4	0.3	0.3	0.3	0.6	1.2	2.8	3.5	4.5	7.9	2.1	7.9																							
23-Nov	7.9	Z	8.4	5.6	3.8	3.6	3.0	2.7	2.5	2.5	2.4	2.5	3.0	3.4	3.5	2.9	3.0	3.0	2.5	1.5	0.4	0.2	0.4	1.5	3.0	8.4																							
24-Nov	0.2	0.2	Z	0.2	0.2	0.8	0.3	0.3	0.4	0.3	0.4	1.1	2.0	0.9	0.6	0.4	0.3	0.4	0.7	0.8	0.6	0.7	1.0	2.1	0.6	2.1																							
25-Nov	4.7	4.9	4.4	Z	3.8	2.2	2.1	1.9	1.1	1.4	1.2	2.4	1.6	1.4	1.5	2.6	2.9	2.3	2.3	2.8	3.5	3.3	3.0	3.3	2.6	4.9																							
26-Nov	2.7	2.6	2.8	2.7	Z	3.0	2.8	2.6	3.2	2.7	2.3	2.1	2.2	2.6	2.9	2.7	3.3	2.8	2.9	3.7	4.5	4.9	2.9	1.4	2.9	4.9																							
27-Nov	1.0	1.7	0.8	1.0	0.6	Z	1.9	1.8	1.9	3.1	1.7	1.5	1.2	1.9	1.9	1.2	0.9	1.6	1.2	1.9	1.3	0.3	0.5	1.0	1.4	3.1																							
28-Nov	Z	1.6	0.3	0.2	0.8	0.3	0.8	2.2	1.0	5.0	1.9	1.4	1.5	1.3	2.4	1.3	1.0	1.0	1.4	1.7	2.3	2.2	2.1	2.0	1.5	5.0																							
29-Nov	1.6	Z	0.8	0.8	0.8	0.9	0.9	1.0	1.0	2.5	4.4	3.8	4.2	4.1	4.9	5.6	6.8	4.3	1.2	1.3	1.3	1.0	0.9	1.5	2.4	6.8																							
30-Nov	1.1	1.0	Z	1.0	1.6	2.1	2.1	2.2	1.7	1.9	1.9	1.6	1.4	2.0	2.1	1.7	1.8	1.3	0.7	1.5	1.4	0.8	0.5	0.5	1.5	2.2																							
																								1.9	1.4	2.2	1.7	1.6	2.0	1.6	2.0	2.3	2.4	2.0	2.0	1.9	1.9	1.8	2.0	1.7	1.5	1.8	2.0	1.7	1.6	1.7	Diurnal Average		
																								7.9	4.9	8.4	5.6	4.0	10.9	3.9	5.7	9.7	6.9	4.7	5.4	4.6	4.3	4.9	5.6	6.8	5.0	4.7	6.6	8.3	5.7	4.9	7.9	Diurnal Maximum	
Z - zerospan      C - Calibration																																																	



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Kirby North - November 2024**







**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Kirby North - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	685	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Kirby North - November 2024**

<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	45	68	75	27	20	16	9	27	98	75	59	26	9	46	57	28	685
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	45	68	75	27	20	16	9	27	98	75	59	26	9	46	57	28	685

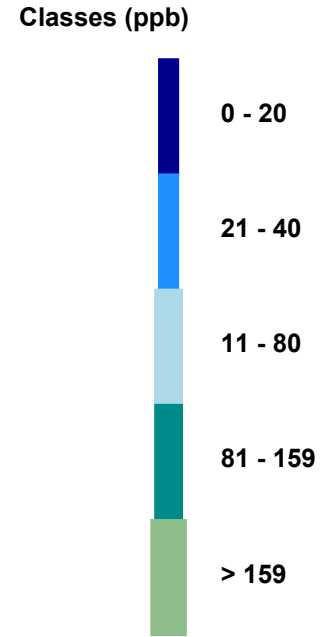
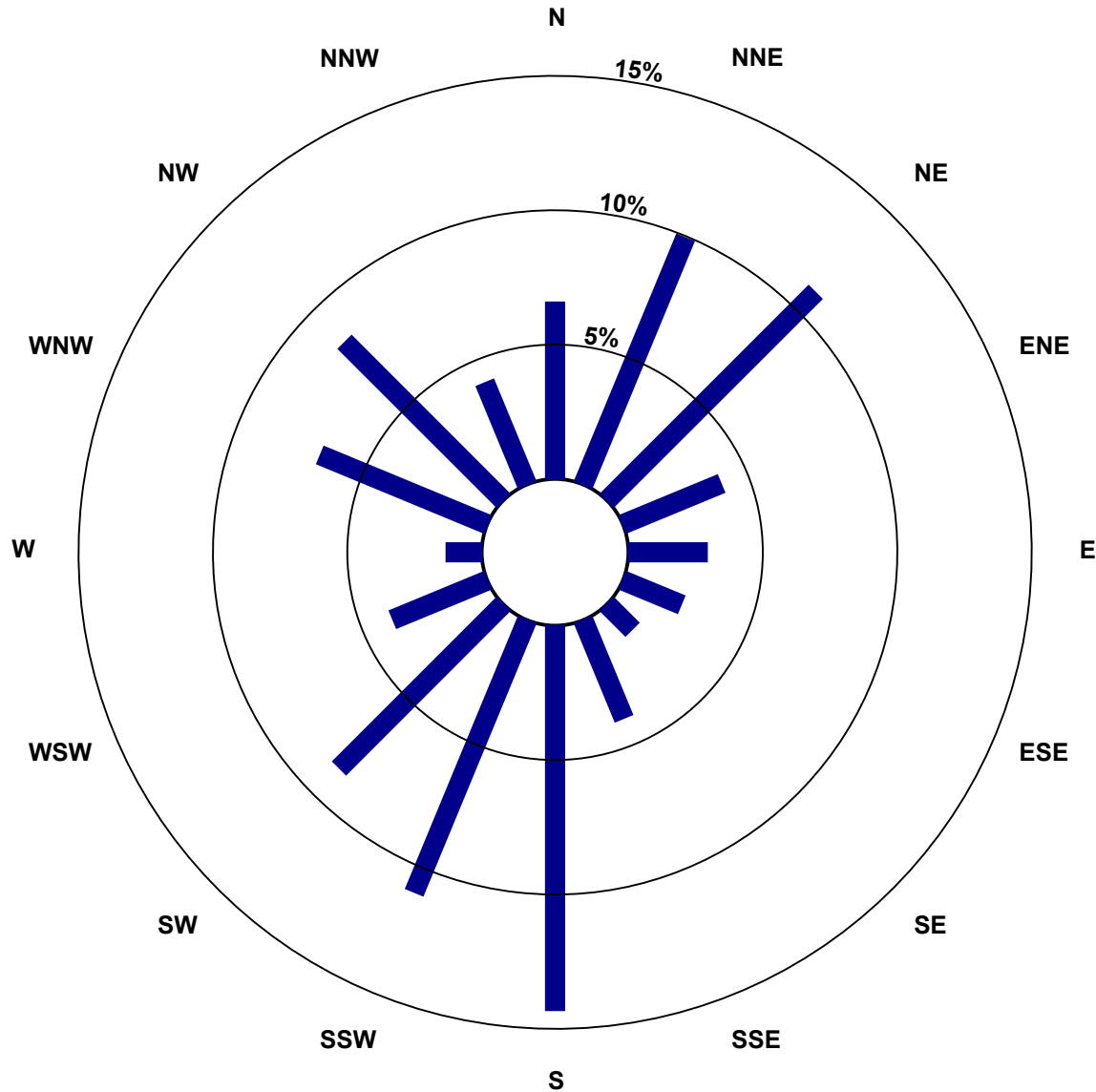
Total Number of Valid Hours: 685

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Kirby North

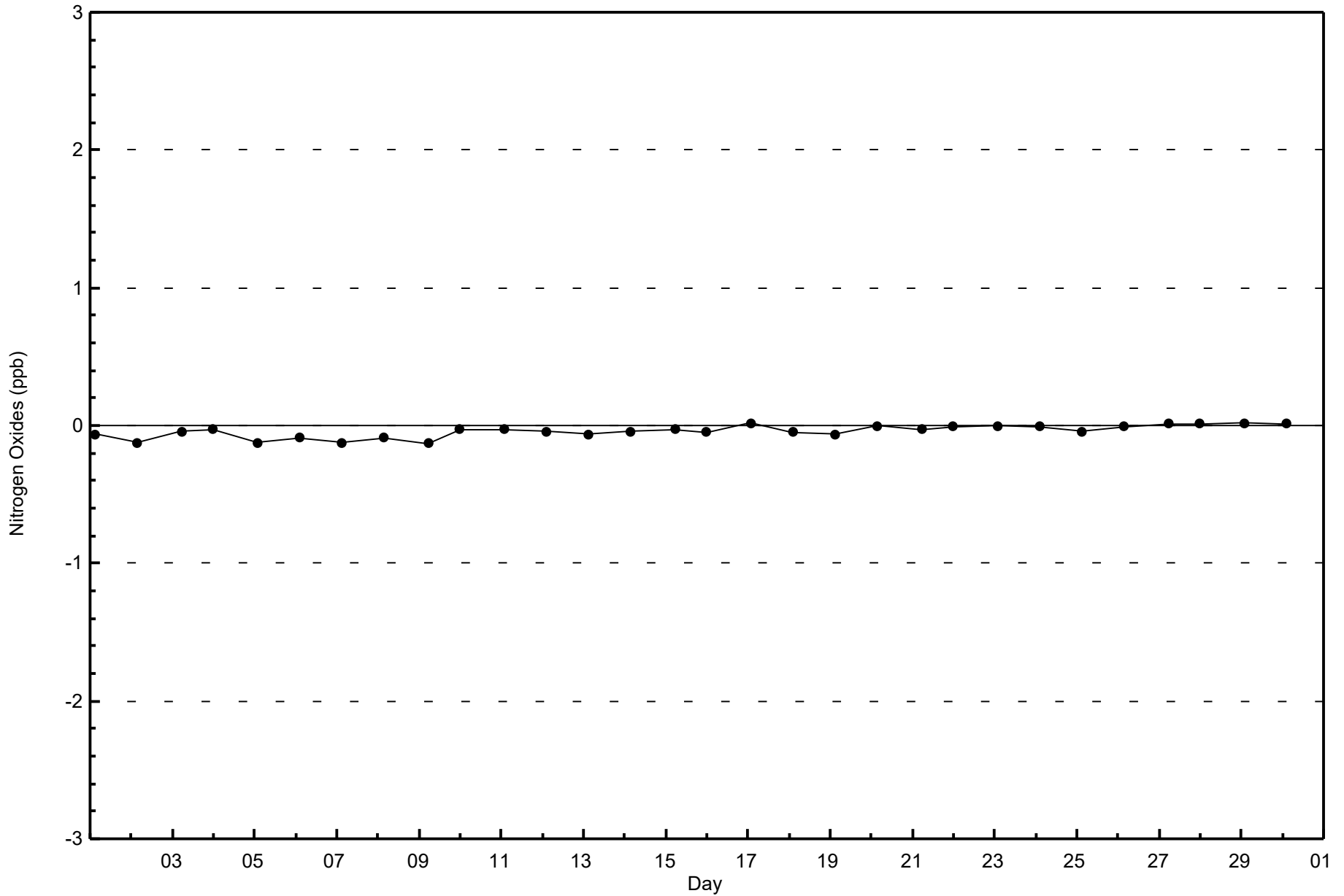


Total Number of Valid Hours: 685



Wood Buffalo Environmental Association  
Zero Responses

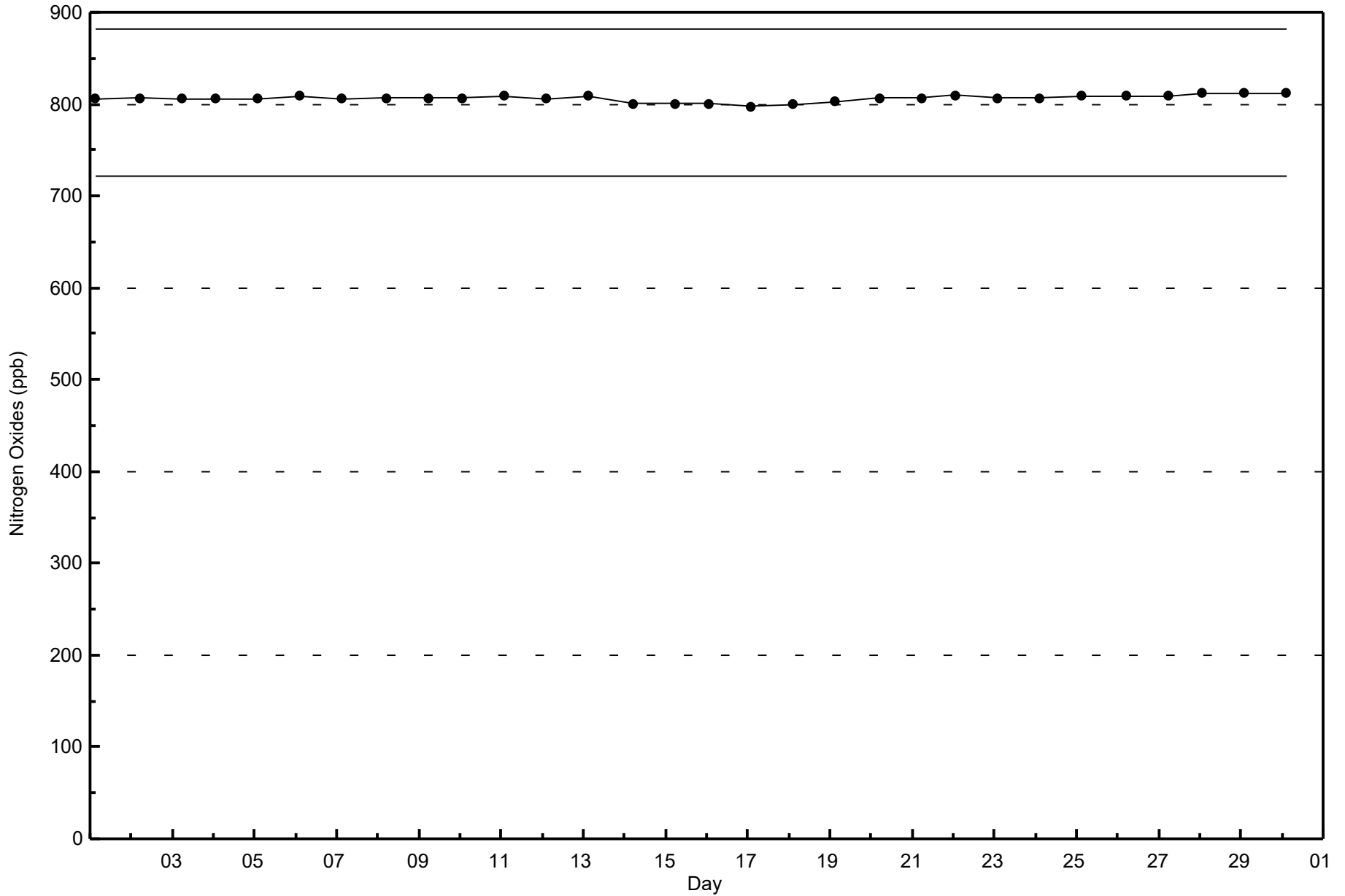
Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Kirby North - November 2024





Wood Buffalo Environmental Association  
Span Responses

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Kirby North - November 2024



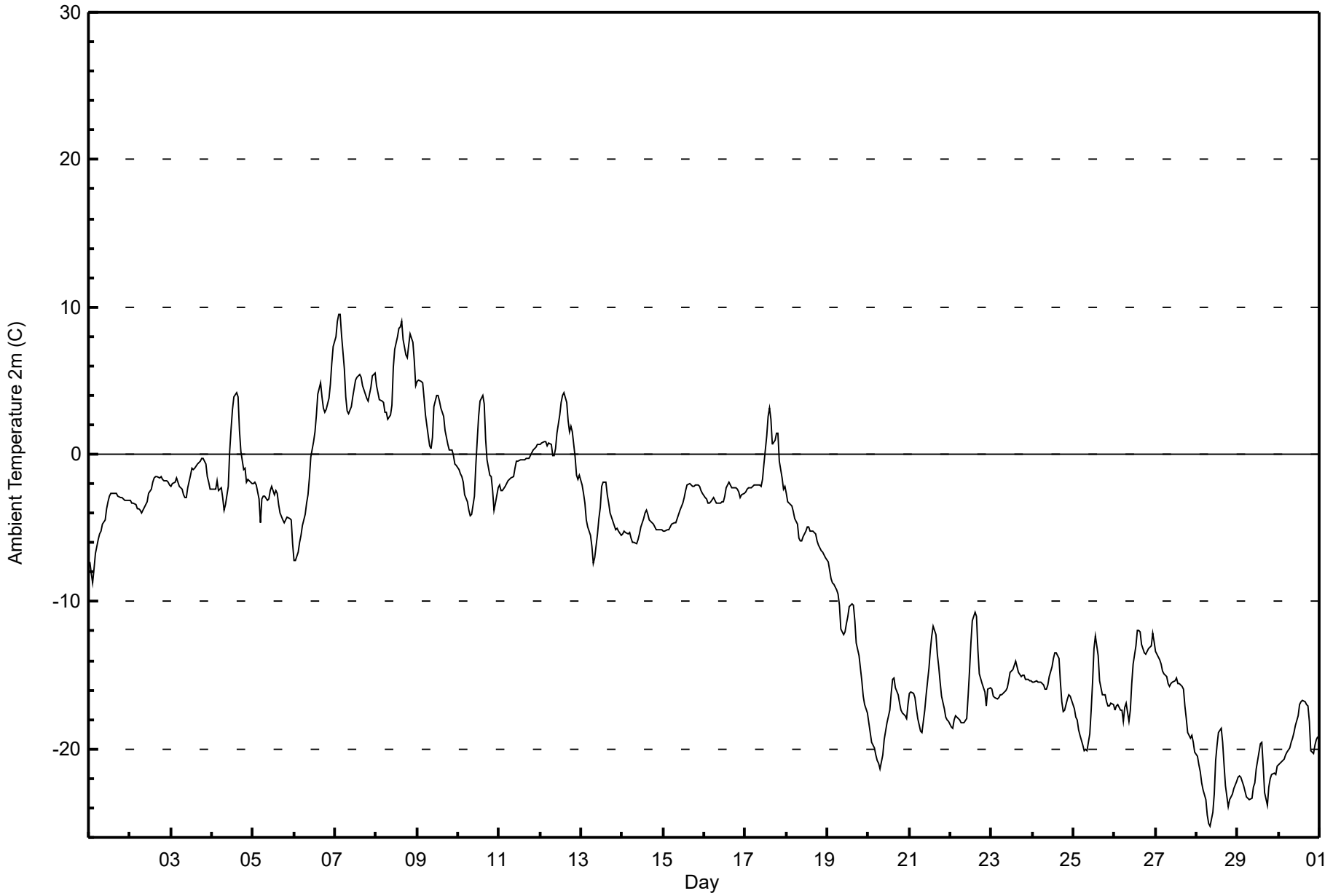


Maximum Value: 9.5 C on Nov 7 03:00		Maximum Daily Average: 5.7 C on Nov 8		Hours in Service: 720																																												
Minimum Value: -25.2 C on Nov 28 09:00		Minimum Daily Average: -22.2 C on Nov 28		Hours of Data: 720																																												
Maximum Diurnal Average: -5.3 C at hour 15		Minimum Diurnal Average: -9.1 C at hour 8		Hours of Missing Data: 0																																												
Monthly Average: -7.53 C		Percentiles: P <sub>1</sub> = -23.4 P <sub>10</sub> = -19.2 Q <sub>1</sub> = -15.9 Median = -4.6 Q <sub>3</sub> = -1.7 P <sub>90</sub> = 3.1 P <sub>99</sub> = 8.1		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Nov	-7.3	-8.0	-8.7	-7.7	-6.7	-5.8	-5.4	-5.2	-4.8	-4.4	-3.7	-3.2	-2.8	-2.7	-2.6	-2.6	-2.7	-2.9	-2.9	-3.0	-3.1	-3.1	-3.1	-3.1	-4.4	-2.6																						
2-Nov	-3.1	-3.3	-3.3	-3.4	-3.7	-3.7	-3.8	-4.0	-3.6	-3.4	-3.2	-2.7	-2.4	-1.9	-1.6	-1.5	-1.5	-1.6	-1.6	-1.7	-1.7	-1.8	-1.9	-2.1	-2.6	-1.5																						
3-Nov	-2.2	-2.0	-1.9	-1.7	-1.9	-2.1	-2.4	-2.8	-3.0	-2.9	-2.3	-1.4	-1.0	-1.0	-0.9	-0.7	-0.5	-0.5	-0.3	-0.3	-0.7	-1.5	-1.9	-2.4	-1.6	-0.3																						
4-Nov	-2.4	-2.4	-2.3	-1.8	-2.5	-2.3	-2.9	-3.8	-3.4	-2.2	0.2	1.7	3.1	3.9	4.2	3.9	1.6	0.2	-1.0	-1.0	-1.9	-1.7	-1.8	-2.0	-0.7	4.2																						
5-Nov	-1.9	-1.8	-2.1	-3.0	-4.6	-3.0	-2.9	-2.8	-3.1	-3.0	-2.5	-2.2	-2.7	-2.5	-2.7	-3.4	-4.0	-4.5	-4.6	-4.4	-4.3	-4.3	-4.5	-6.1	-3.4	-1.8																						
6-Nov	-7.2	-7.2	-6.7	-6.0	-5.5	-4.8	-4.1	-3.4	-2.8	-1.6	-0.2	0.8	1.5	2.7	4.1	4.8	3.9	3.1	2.9	3.1	3.8	4.8	6.2	7.3	0.0	7.3																						
7-Nov	8.0	9.0	9.5	9.5	8.1	5.8	3.9	2.9	2.7	3.2	3.9	4.5	5.1	5.2	5.4	5.3	4.7	4.4	3.8	3.6	4.0	4.5	5.3	5.5	5.3	9.5																						
8-Nov	4.7	4.2	3.7	3.7	3.6	2.9	2.9	2.4	2.7	3.3	5.9	7.1	8.0	8.6	8.6	9.0	7.8	6.7	6.6	7.4	8.2	7.6	6.4	4.7	5.7	9.0																						
9-Nov	4.9	5.0	4.9	4.9	3.8	2.6	1.3	0.6	0.3	1.1	3.2	4.0	4.0	3.6	3.1	2.6	1.7	1.1	0.7	0.3	0.3	-0.1	-0.7	-0.8	2.2	5.0																						
10-Nov	-1.0	-1.3	-1.5	-1.9	-2.8	-3.3	-3.8	-4.2	-4.1	-2.8	-0.7	0.9	2.6	3.7	4.0	3.4	1.1	-0.4	-1.4	-1.5	-2.5	-3.8	-3.3	-2.3	-1.1	4.0																						
11-Nov	-2.1	-2.5	-2.4	-2.2	-2.0	-1.8	-1.7	-1.6	-1.5	-0.9	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.3	-0.3	-0.1	0.1	0.3	0.5	0.7	0.7	-0.8	0.7																						
12-Nov	0.6	0.8	0.8	0.8	0.5	0.8	0.7	0.0	-0.1	0.4	1.4	2.6	3.5	4.0	4.1	3.5	2.3	1.6	1.9	1.6	-0.1	-1.4	-1.7	-1.4	1.1	4.1																						
13-Nov	-2.1	-2.6	-3.3	-4.5	-5.0	-5.5	-6.3	-7.4	-7.0	-5.4	-4.4	-3.6	-2.1	-1.9	-1.9	-2.7	-3.3	-4.0	-4.6	-4.9	-5.1	-5.0	-5.2	-5.5	-4.3	-1.9																						
14-Nov	-5.4	-5.2	-5.3	-5.4	-5.4	-5.7	-6.0	-6.0	-6.0	-5.8	-5.4	-4.9	-4.3	-4.0	-3.7	-4.0	-4.4	-4.6	-4.7	-5.0	-5.1	-5.1	-5.1	-5.1	-5.1	-3.7																						
15-Nov	-5.2	-5.2	-5.2	-5.1	-4.9	-4.8	-4.6	-4.6	-4.4	-4.1	-3.8	-3.3	-2.9	-2.5	-2.1	-2.0	-2.1	-2.2	-2.2	-2.1	-2.1	-2.2	-2.4	-2.7	-3.4	-2.0																						
16-Nov	-2.9	-3.0	-3.3	-3.4	-3.2	-2.9	-3.1	-3.3	-3.3	-3.3	-3.2	-3.2	-2.8	-2.2	-1.9	-2.1	-2.2	-2.3	-2.3	-2.4	-2.6	-2.9	-2.8	-2.6	-2.8	-1.9																						
17-Nov	-2.5	-2.4	-2.3	-2.2	-2.2	-2.1	-2.1	-2.1	-2.1	-2.2	-1.7	-0.7	1.3	2.6	3.2	2.4	0.6	1.0	1.5	1.5	-0.5	-1.6	-2.4	-2.2	-0.7	3.2																						
18-Nov	-2.6	-3.2	-3.4	-3.5	-3.9	-4.3	-4.7	-5.6	-5.9	-5.9	-5.6	-5.2	-4.9	-4.9	-5.2	-5.2	-5.3	-5.4	-5.8	-6.1	-6.6	-6.7	-6.8	-7.0	-5.2	-2.6																						
19-Nov	-7.3	-7.9	-8.5	-8.7	-8.8	-9.2	-9.5	-10.2	-11.9	-12.3	-12.0	-11.5	-11.0	-10.4	-10.2	-10.2	-11.3	-12.8	-13.7	-14.5	-15.4	-16.4	-16.9	-17.5	-11.6	-7.3																						
20-Nov	-18.2	-18.9	-19.5	-19.9	-20.4	-20.8	-21.0	-21.3	-20.4	-19.4	-18.8	-18.2	-17.3	-16.2	-15.2	-15.1	-15.8	-16.4	-16.9	-17.4	-17.6	-17.7	-17.9	-16.9	-18.2	-15.1																						
21-Nov	-16.2	-16.1	-16.2	-16.5	-17.3	-18.0	-18.8	-18.9	-18.1	-17.4	-16.4	-14.5	-13.3	-12.3	-11.6	-12.3	-13.5	-14.4	-15.5	-16.4	-17.3	-17.9	-18.1	-18.1	-16.0	-11.6																						
22-Nov	-18.5	-18.6	-18.0	-17.8	-17.9	-18.1	-18.2	-18.2	-18.3	-18.0	-16.4	-14.7	-12.8	-11.3	-10.7	-11.0	-13.3	-14.9	-15.6	-15.9	-16.1	-17.1	-16.0	-15.8	-16.0	-10.7																						
23-Nov	-15.9	-16.4	-16.5	-16.6	-16.5	-16.4	-16.3	-16.3	-16.1	-15.8	-15.4	-14.8	-14.6	-14.3	-14.1	-14.4	-14.8	-15.0	-15.0	-15.0	-15.3	-15.3	-15.4	-15.3	-15.5	-14.1																						
24-Nov	-15.5	-15.5	-15.4	-15.5	-15.5	-15.5	-15.7	-16.0	-16.0	-15.7	-15.1	-14.4	-13.9	-13.4	-13.5	-13.8	-15.5	-16.8	-17.4	-17.4	-16.6	-16.3	-16.4	-16.7	-15.6	-13.4																						
25-Nov	-17.3	-17.9	-18.0	-18.7	-19.1	-19.8	-20.1	-20.0	-20.1	-19.0	-17.3	-15.5	-13.2	-12.3	-13.6	-15.3	-15.9	-16.3	-16.3	-16.8	-17.1	-17.0	-16.9	-17.0	-17.1	-12.3																						
26-Nov	-17.4	-17.1	-16.9	-17.3	-17.3	-18.2	-17.2	-16.9	-18.2	-17.4	-15.5	-14.2	-13.0	-12.0	-11.9	-12.0	-12.9	-13.5	-13.5	-13.4	-13.2	-13.0	-12.1	-12.7	-14.9	-11.9																						
27-Nov	-13.3	-13.5	-13.9	-14.2	-14.7	-14.9	-15.1	-15.6	-15.7	-15.5	-15.5	-15.4	-15.2	-15.5	-15.5	-15.7	-15.9	-17.1	-18.0	-18.9	-19.2	-19.1	-19.5	-20.2	-16.1	-13.3																						
28-Nov	-20.5	-21.1	-21.5	-22.3	-22.7	-23.4	-24.5	-25.0	-25.2	-24.3	-23.1	-20.8	-19.7	-18.9	-18.6	-19.5	-21.1	-22.5	-23.9	-23.4	-23.2	-23.0	-22.7	-22.2	-22.2	-18.6																						
29-Nov	-21.9	-21.9	-21.9	-22.5	-22.9	-23.2	-23.4	-23.5	-23.3	-22.6	-22.3	-21.4	-20.2	-19.7	-19.6	-21.2	-23.0	-23.9	-22.6	-22.1	-21.8	-21.6	-21.7	-21.1	-22.0	-19.6																						
30-Nov	-21.1	-21.0	-20.8	-20.7	-20.4	-20.2	-19.9	-19.6	-19.2	-18.9	-18.4	-17.7	-17.0	-16.8	-16.7	-16.8	-16.9	-17.1	-18.1	-20.1	-20.3	-19.7	-19.4	-19.1	-19.0	-16.7																						
																								-7.8	-7.9	-8.0	-8.1	-8.4	-8.6	-8.8	-9.1	-9.1	-8.5	-7.6	-6.7	-6.0	-5.4	-5.3	-5.6	-6.4	-7.0	-7.4	-7.5	-7.8	-7.9	-7.9	-8.0	Diurnal Average
																								8.0	9.0	9.5	9.5	8.1	5.8	3.9	2.9	2.7	3.3	5.9	7.1	8.0	8.6	8.6	9.0	7.8	6.7	6.6	7.4	8.2	7.6	6.4	7.3	Diurnal Maximum



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Ambient Temperature 2m (AT2) - C**  
**Kirby North - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT2) - C  
Kirby North - November 2024**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	59	8.19	8.19
-20 - 0	534	74.17	82.36
0 - 10	127	17.64	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720

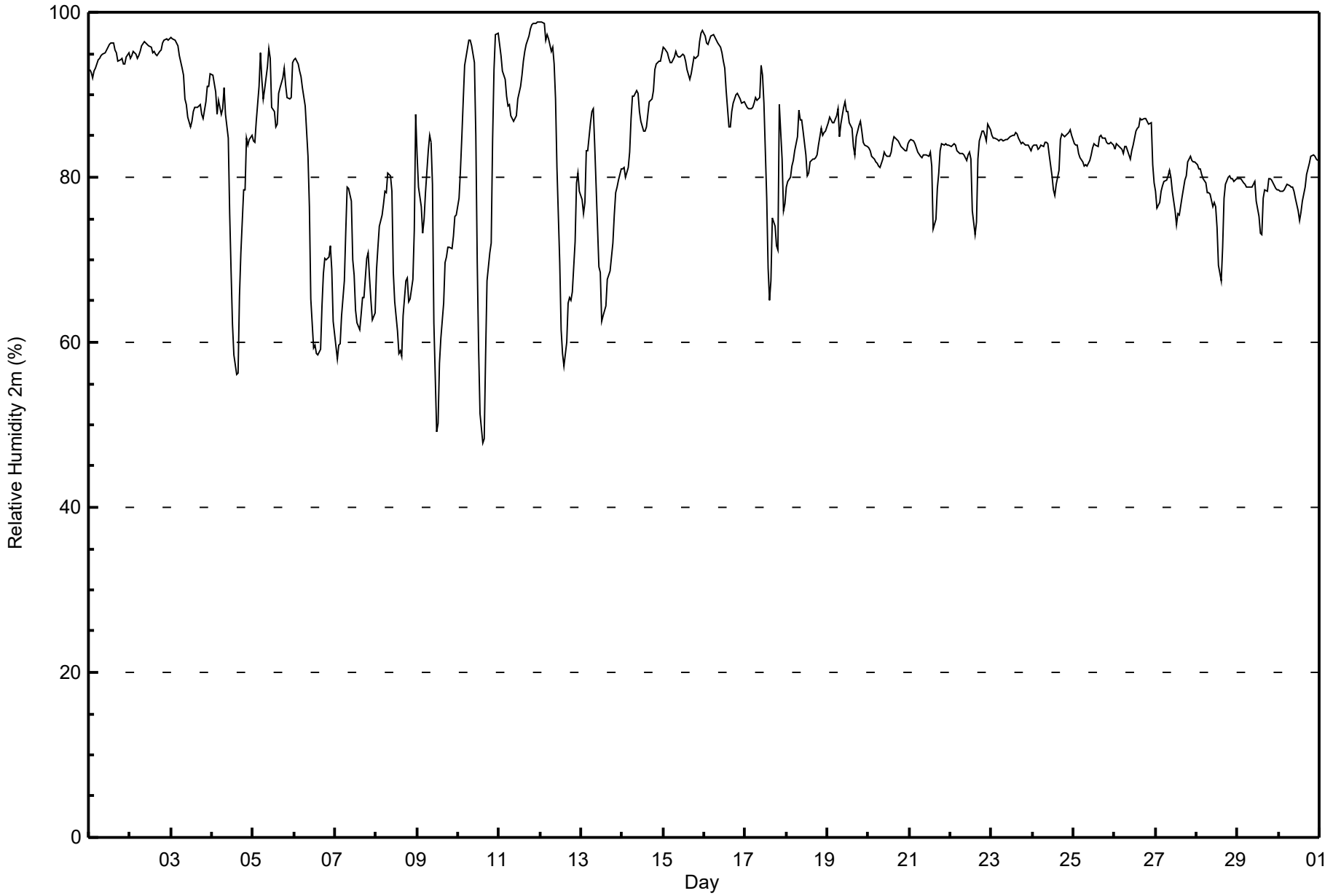




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Relative Humidity 2m (RH2) - %**  
**Kirby North - November 2024**

<b>Maximum Value: 98.8 % on Nov 12 00:00</b> <b>Maximum Daily Average: 95.6 % on Nov 2</b>																						<b>Hours in Service: 720</b>				
<b>Minimum Value: 47.8 % on Nov 10 15:00</b> <b>Minimum Daily Average: 66.5 % on Nov 7</b>																						<b>Hours of Data: 720</b>				
<b>Maximum Diurnal Average: 86.8 % at hour 8</b> <b>Minimum Diurnal Average: 76.1 % at hour 15</b>																						<b>Hours of Missing Data: 0</b>				
<b>Monthly Average: 82.91 %</b> <b>Percentiles: P<sub>1</sub> = 57.2 P<sub>10</sub> = 68.6 Q<sub>1</sub> = 78.6 Median = 83.9 Q<sub>3</sub> = 89.4 P<sub>90</sub> = 95.1 P<sub>99</sub> = 98.4</b>																						<b>Hours of Calibration: 0</b>				
																						<b>Percent Operational Time: 100.0</b>				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Nov	93.1	92.7	92.1	92.8	93.2	94.2	94.4	94.7	94.9	95.1	95.5	95.8	96.1	96.3	96.3	95.3	95.0	94.1	94.3	94.4	93.7	93.8	94.5	95.1	94.5	96.3
2-Nov	94.4	94.8	95.3	95.0	94.4	94.8	95.3	96.0	96.4	96.3	96.1	95.9	95.7	95.2	95.3	95.0	94.7	95.2	95.5	96.2	96.6	96.8	96.7	96.8	95.6	96.8
3-Nov	97.0	96.9	96.6	96.3	95.9	94.7	93.3	92.5	89.5	88.8	87.2	86.1	86.7	88.0	88.4	88.4	88.7	88.8	87.6	87.1	89.2	91.1	91.0	92.5	90.9	97.0
4-Nov	92.3	91.4	90.4	87.7	89.4	87.6	88.3	90.8	87.6	84.7	75.5	68.6	62.2	58.5	56.1	56.4	65.6	70.9	78.5	78.4	84.7	83.9	84.6	85.0	79.1	92.3
5-Nov	84.4	84.3	86.8	91.0	95.1	91.8	89.6	90.7	93.5	95.6	94.4	88.5	88.0	86.2	86.5	90.2	90.8	92.1	93.2	91.2	89.6	89.4	89.6	94.0	90.3	95.6
6-Nov	94.3	94.5	93.7	92.9	92.3	90.8	88.7	85.5	82.6	76.4	65.2	59.4	59.7	58.6	58.5	59.2	64.4	68.2	70.1	69.9	70.3	71.7	68.8	62.5	74.9	94.5
7-Nov	59.4	57.9	59.7	59.8	63.2	67.4	73.4	78.9	78.7	77.1	69.9	68.1	63.9	62.4	61.5	63.3	65.4	65.4	70.2	70.8	67.7	65.2	62.8	63.5	66.5	78.9
8-Nov	68.9	71.5	74.1	75.4	76.7	78.2	78.2	80.5	80.2	78.2	68.5	64.8	61.4	58.7	59.0	58.3	63.2	67.5	67.8	65.0	65.3	67.6	73.6	87.7	70.4	87.7
9-Nov	82.7	78.8	76.4	73.2	74.9	78.1	83.2	85.2	84.3	79.2	62.4	49.2	50.1	57.5	60.5	64.7	69.6	70.3	71.6	71.6	71.3	72.9	75.2	75.5	71.6	85.2
10-Nov	77.4	80.9	85.0	89.3	93.6	95.5	96.6	96.6	95.9	93.9	85.1	69.8	59.1	51.4	47.8	48.2	58.5	67.5	70.8	72.0	84.5	93.1	97.3	97.4	79.5	97.4
11-Nov	96.1	94.8	92.8	91.8	89.9	88.6	88.8	87.5	86.8	87.2	87.4	89.5	91.1	92.4	94.0	95.2	96.2	97.2	98.0	98.4	98.6	98.7	98.8	98.8	93.3	98.8
12-Nov	98.8	98.8	98.6	96.6	97.2	96.8	95.3	95.8	93.8	89.5	81.2	69.7	61.6	58.7	57.1	60.0	64.7	65.5	65.0	66.1	72.3	79.3	80.5	78.3	80.0	98.8
13-Nov	77.2	75.7	76.9	83.3	83.2	86.6	88.0	88.3	83.9	74.1	69.1	68.5	62.5	63.2	64.5	67.7	68.1	68.7	72.0	75.3	78.2	78.8	79.6	80.9	75.6	88.3
14-Nov	81.0	81.2	80.0	81.2	83.0	87.1	89.9	89.9	90.5	90.3	88.0	86.9	85.6	85.6	86.1	87.6	89.1	89.5	90.5	93.0	93.7	94.0	94.0	95.0	88.0	95.0
15-Nov	95.7	95.5	95.1	94.5	94.0	93.9	94.6	95.3	94.8	94.6	94.6	94.9	94.7	94.1	93.0	91.9	92.6	93.5	94.6	94.5	94.7	96.5	97.5	97.8	94.7	97.8
16-Nov	97.1	96.3	96.0	96.6	97.0	97.3	97.0	96.6	96.3	95.8	95.1	94.1	93.2	90.5	86.1	86.1	88.0	88.9	90.0	90.1	89.8	89.5	89.0	89.1	92.7	97.3
17-Nov	88.8	88.4	88.4	88.3	88.5	89.1	89.7	89.3	89.7	93.6	92.4	89.1	77.5	69.0	65.1	67.4	75.1	74.0	71.7	71.2	88.8	82.2	76.0	76.8	82.1	93.6
18-Nov	78.8	79.6	80.0	81.4	82.0	83.3	84.9	88.2	86.9	87.0	85.6	82.8	80.1	80.5	81.8	82.2	82.2	82.4	82.8	83.8	85.9	85.0	85.4	85.6	83.2	88.2
19-Nov	86.6	87.2	87.0	86.6	86.5	87.4	88.2	85.0	86.4	88.5	89.1	88.0	87.9	86.6	86.0	83.7	82.8	84.9	86.3	86.8	85.6	84.3	83.8	83.7	86.2	89.1
20-Nov	83.6	83.1	82.5	82.2	81.8	81.7	81.4	81.1	82.2	83.0	82.6	82.5	82.5	83.1	84.3	85.0	84.7	84.5	84.0	83.7	83.6	83.3	83.2	84.0	83.1	85.0
21-Nov	84.5	84.5	84.4	84.1	83.6	83.0	82.5	82.5	82.7	82.7	82.6	82.6	83.1	81.3	73.7	74.8	78.6	80.5	83.2	84.0	83.9	84.0	83.9	83.9	82.3	84.5
22-Nov	83.8	83.9	84.1	83.9	83.3	82.9	82.9	82.9	82.8	82.1	82.6	83.0	82.2	75.9	73.0	74.6	82.1	84.4	85.6	85.6	85.0	84.5	86.4	85.8	82.6	86.4
23-Nov	85.1	84.7	84.8	84.6	84.5	84.6	84.5	84.4	84.6	84.6	84.8	85.0	85.0	85.2	85.5	85.2	84.8	84.0	84.3	84.1	84.0	83.9	83.6	83.3	84.5	85.5
24-Nov	83.7	83.9	83.9	83.4	83.6	83.9	83.8	84.2	84.3	84.0	82.8	80.2	78.5	77.7	79.2	80.8	84.6	85.3	85.1	85.0	85.2	85.4	85.8	85.2	83.3	85.8
25-Nov	84.0	83.9	83.9	82.9	82.3	81.9	81.3	81.5	81.4	82.1	82.8	83.5	84.1	84.0	83.7	85.0	85.0	84.8	84.7	84.3	84.1	84.1	84.2	83.8	83.5	85.0
26-Nov	83.4	84.0	83.9	83.6	83.5	82.9	83.8	83.7	82.7	82.2	83.3	83.9	85.7	86.0	86.1	87.2	87.0	87.2	87.1	86.8	86.4	86.6	81.5	79.3	84.5	87.2
27-Nov	78.3	76.2	76.9	78.3	79.0	79.6	79.7	80.2	80.9	80.0	78.4	75.9	74.2	75.6	75.5	77.6	78.6	79.7	80.2	81.9	82.5	82.1	81.9	81.8	79.0	82.5
28-Nov	81.5	81.0	81.0	80.3	79.8	79.4	78.2	78.1	78.0	76.5	77.0	76.4	74.0	69.3	67.5	71.5	77.5	79.2	79.9	80.2	79.8	79.8	79.5	79.8	77.7	81.5
29-Nov	79.9	79.9	79.9	79.4	79.1	78.8	78.8	78.8	78.8	79.2	79.4	77.1	75.2	73.2	73.1	77.5	78.5	78.3	79.8	79.8	79.6	79.0	78.6	78.5	78.3	79.9
30-Nov	78.5	78.3	78.4	78.4	78.7	79.1	79.0	78.9	78.7	78.4	77.4	75.9	74.7	75.8	77.2	78.9	80.4	81.0	81.7	82.5	82.7	82.5	82.3	82.1	79.2	82.7
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Relative Humidity 2m (RH2) - %**  
**Kirby North - November 2024**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	25	3.47	3.47
60 - 80	202	28.06	31.53
80 - 100	493	68.47	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



Maximum Speed: 25 km/h on Nov 12 13:00	Maximum Daily Speed Average: 16.1 km/h on Nov 27	Hours in Service: 720
Minimum Speed Value: 0 km/h on Nov 3 02:00	Minimum Daily Speed Average: 0.8 km/h on Nov 1	Hours of Data: 720
Maximum Diurnal Speed Average: 2.8 km/h at hour 13	Minimum Diurnal Speed Average: 0.4 km/h at hour 20	Hours of Missing Data: 0
Monthly Average Velocity: 1.3 km/h 253.7 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 4 Q <sub>1</sub> = 6 Median = 10 Q <sub>3</sub> = 13 P <sub>90</sub> = 16 P <sub>99</sub> = 22	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Nov	NE5	NE4	NNE4	NE4	NE4	ENE3	NNE3	ENE2	ESE2	ESE3	ESE2	SE2	SE1	NNE3	NNW1	SW4	SW4	SW4	SSW3	S2	S3	SW4	SSW2	S2	ESE0.8	NE5	
2-Nov	SSW4	SSW3	SSW4	S3	SSE3	ESE3	ESE6	ESE6	ESE7	ESE7	SE7	ESE6	ESE6	ESE6	ENE12	E7	E5	ENE6	NNE3	N3	NNE2	ENE3	NE2	NNE2	ESE3.5	ENE12	
3-Nov	NNE2	NW0	NNW1	NNW5	NW6	NNW8	NW9	NNW9	NNW9	W9	SW8	SW10	SW12	SW13	SSW12	SSW12	SSW10	SSW9	SSW10	SSW11	SSW9	SSW10	SSW10	SSW11	SW6.5	SW13	
4-Nov	SSW10	SW11	SW12	SW13	SW11	SW13	SW12	SW11	SSW10	SSW11	WSW11	WSW11	WSW11	WSW11	WSW11	WSW11	WSW11	WSW11	WSW11	WSW11	WSW11	WSW11	WSW11	WSW11	SW6.9	SW13	
5-Nov	NE6	NE5	NNE5	N5	NW5	NW8	NW9	NNW10	NNW12	NNW11	NNW12	NW16	NW15	NW13	NNW13	NW12	NW13	NW12	NW17	N6	NNW6	N4	SW2	S7	NW7.6	NW16	
6-Nov	S8	S10	S10	S9	S9	S10	SSW12	SSW12	SSW14	SSW13	SSW18	SW21	SW20	SW18	WSW19	WSW19	SW16	SSW16	SSW16	SSW16	SSW17	SSW18	SW19	SW23	SSW14.4	SW23	
7-Nov	SW21	WSW22	W21	NNW25	NW22	NW15	NW15	NNW11	NNW12	NNW13	NW14	NNW13	W12	WSW10	SW6	SSW5	S6	S7	SSE6	SSE9	SSE11	SSE14	S15	S13	W7.7	NNW25	
8-Nov	S12	S13	S13	S12	S12	S13	S13	S12	S11	S11	SSW14	SSW13	SSW9	S8	SSW8	SSW8	SSW8	S5	SSW4	W9	NNW13	NNW18	NNW15	WSW9	SSW7.6	NW18	
9-Nov	WSW12	W10	NNW10	NNW15	NNW12	NNW11	NW8	NW7	NW9	NW7	NNW6	NNW2	NW0	SSW6	SSW6	SSW6	S5	S6	S6	S7	S7	SSW7	S6	S7	WSW4.2	NNW15	
10-Nov	S8	SSW8	SSW8	SSW9	SSW9	SSW9	S9	S9	SSW8	SSW10	SW10	WSW12	WSW12	WSW12	WSW12	WSW12	WSW12	WSW12	WSW12	WSW12	WSW12	WSW12	WSW12	WSW12	SSW8.5	WSW12	
11-Nov	SSE13	SSE17	SSE17	SSE18	SSE19	SSE16	SSE16	SSE16	SE17	SSE16	S18	S17	S16	S16	S16	S14	SSE12	SSE11	SSE11	SSE10	SSE10	SSE7	S7	SSW9	SSE13.8	SSE19	
12-Nov	SW11	WSW14	WSW15	WSW13	SW12	SW15	SW17	SW16	SW18	WSW20	WSW21	WSW25	WSW25	WSW23	WSW20	WSW17	WSW15	SW13	WSW14	WSW14	SW12	SW10	SW7	NNW7	WSW15.2	WSW25	
13-Nov	NNW8	NNW11	NW8	NNW5	NNW5	NNE5	NNE8	ENE4	E5	E5	E7	ENE7	NE9	NE10	ENE12	ENE12	NE12	NE14	NE14	ENE16	NE14	ENE12	ENE19	ENE21	NE8.2	ENE21	
14-Nov	ENE23	ENE18	NE15	NE15	NE14	NE15	NE17	ENE19	NE17	NE17	ENE18	ENE15	ENE13	ENE11	NE11	NE10	NE11	NE10	NE10	NE8	NE8	NE7	N4	NNE3	NE12.6	ENE23	
15-Nov	NNE4	NNE4	NNE5	NE3	NE0	NW0	E0	S2	SSE3	S5	SSW7	SSW6	SW7	SSW9	SW9	SW8	SSW7	SSW7	SSW6	SW8	SW9	SW10	NNW1	SW11	SW4.3	SW11	
16-Nov	SW11	SW11	SSW12	SSW12	SSW12	S10	S12	S12	S11	S13	S13	S16	S15	S16	S17	S17	S17	S15	S15	S18	S17	S17	S14	S13	S13.6	S18	
17-Nov	S15	S13	S14	S14	S14	SSW11	S11	S12	SSW12	SSW12	SSW12	SSW15	SW17	SW16	SW15	SW13	SSW11	SW12	SW13	WSW19	NNW19	NNW19	NNW14	NNW13	SW11.0	WSW19	
18-Nov	NNW14	NW12	NW11	NW12	NNW12	NNW10	NW7	NW7	NW8	NNW8	NNW7	NW6	W6	NNW6	NNW4	NW5	NNW5	N6	N6	NE8	NE11	NE9	NE11	NE11	NNW6.4	NNW14	
19-Nov	NE11	ENE12	ENE12	ENE12	ENE10	NE10	NE12	NE12	NNE10	NNE14	NNE14	NNE13	NNE13	N14	NNE15	N14	N14	N12	N13	N12	N12	N12	N11	N11	NNE11.6	NNE15	
20-Nov	N11	N10	N10	N9	N9	NNE10	N9	NNE12	NNE14	NNE16	NNE12	N8	N9	NNE9	NNE7	NNE8	NNE9	NNE12	NNE9	NNE10	NNE8	N7	NNE8	NNE6	NNE9.4	NNE16	
21-Nov	NNE8	NNE9	NNE6	N5	N4	N5	N6	N6	NNW5	N7	NNW3	NNE4	NNE6	NNE5	NNE5	NNW5	NNW5	NNW7	NNW6	NW6	NNW7	NNW8	NW8	NNW8	NNW5.2	NNE9	
22-Nov	NW8	NW7	NW7	NNW8	NNW8	NW6	NW6	W8	W9	W6	NW6	NW6	NNW6	NNW7	N8	N6	N5	N6	NNE7	NNE6	NE5	NE6	NE7	NE6	NNW5.0	W9	
23-Nov	NE6	NE7	ENE7	NE8	NE8	NE9	NE9	NE8	NE7	NE11	NE13	NE12	NE13	NE15	NE14	NE15	NE17	NE17	NE15	NE16	NE18	NE16	NE16	NE17	NE12.1	NE18	
24-Nov	NE16	NE14	NNE16	NE17	NE16	NE15	NNE14	NNE13	NNE12	NNE12	NNE13	NNE12	NNE11	NNE11	NNE11	NNE9	NNE7	NNE7	NE9	NE10	NE9	NE7	NE7	ENE4	NNE11.1	NNE17	
25-Nov	E1	SSW2	S2	SSW2	S1	S3	S2	S3	S4	S3	S4	S3	S4	S5	S8	S10	SSW10	SSE10	S7	S10	S8	S9	S9	S10	S11	S5.6	S11
26-Nov	S12	S12	S11	S12	SSW11	S12	SSW11	S13	S12	S11	SSW11	SSW12	SSW13	S14	SSW12	SSW14	SW16	SW14	SW14	SW12	SW12	WSW12	NNW19	NNW20	SSW10.9	NNW20	
27-Nov	NNW16	NNW20	NNW20	NNW18	NW18	NNW18	NNW19	NNW19	NNW19	NNW19	NNW18	NNW19	NNW20	NNW20	NNW17	NNW17	NNW15	NW14	NW12	NW12	NW10	NNW11	NNW13	NNW11	NNW16.1	NNW20	
28-Nov	NNW9	NNW9	NW8	NW8	NW8	NNW8	NW5	NW7	N6	NNW5	NW6	N10	NNW9	NNW9	NNW8	NNW7	NNW8	N8	NNE7	NNE6	N8	N7	N6	N5	NNW6.8	N10	
29-Nov	N5	N6	N7	N6	NNE7	N5	NNE6	NE6	NNE4	NNE6	NE7	NE6	E7	E6	ENE7	ENE8	ENE7	ENE7	E9	E8	E6	E6	E5	E6	NE5.5	E9	
30-Nov	E5	E5	E6	ESE5	ESE6	ESE5	ESE5	SE5	SSE6	SE7	SSE7	SSE8	SE7	ESE5	E6	E6	E6	ENE5	NE5	NNE7	NNE5	N6	NNW5	NNW6	E3.8	SSE8	

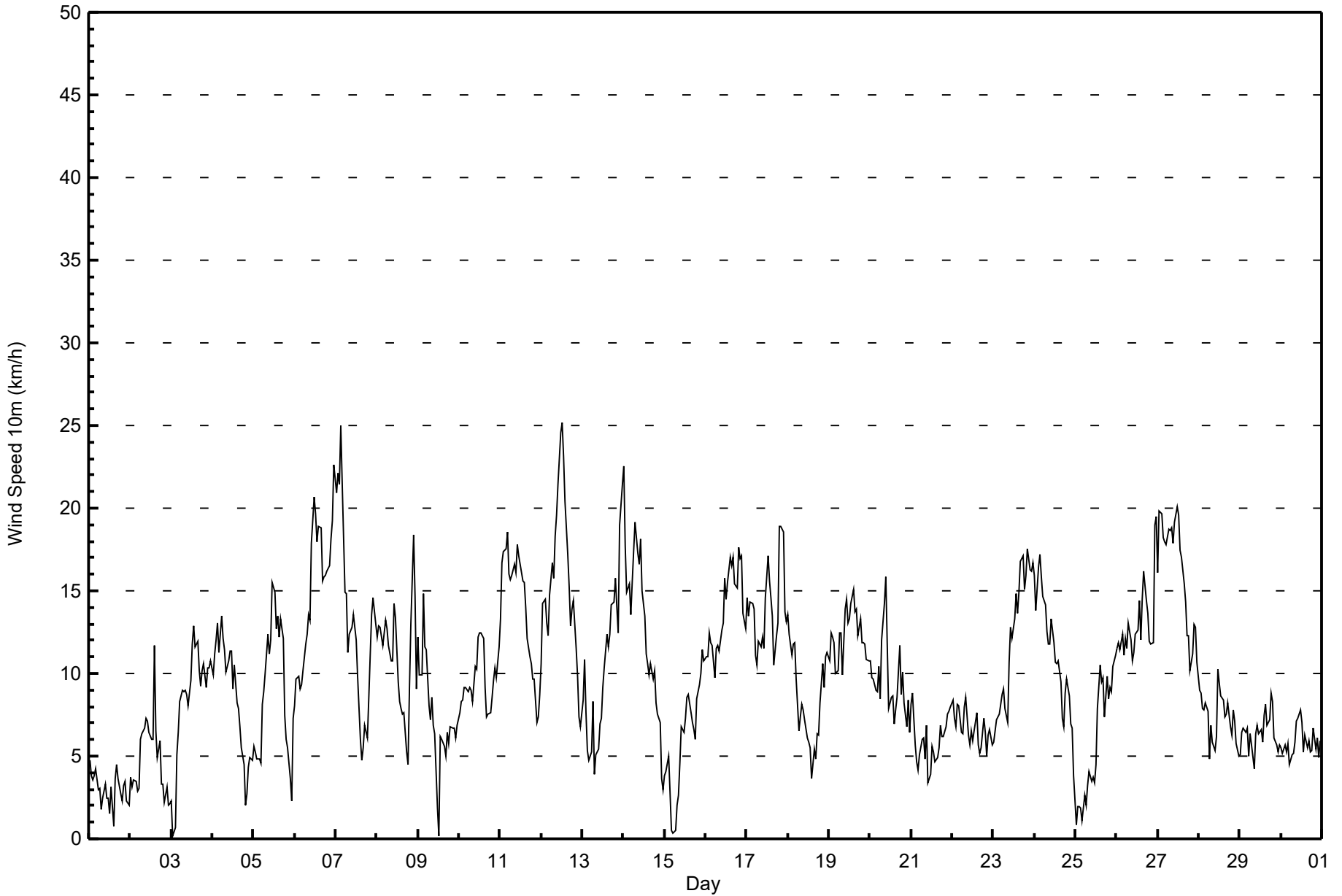
WSW1.3	W1.8	W1.7	W1.9	W1.5	W1.5	NNW1.0	WSW1.1	WSW1.4	WSW1.2	WSW1.7	WSW2.6	WSW2.8	WSW2.5	WSW1.7	WSW1.9	SW1.3	SSW0.6	SE0.4	SSW0.4	NNW0.8	NNW1.0	NNW1.2	WSW1.2	Diurnal Average
ENE23	WSW22	W21	NNW25	NW22	NNW18	NNW19	ENE19	NNW19	WSW20	WSW21	WSW25	WSW25	WSW23	WSW20	WSW19	S17	NE17	SSW16	WSW19	NNW19	NNW19	SW19	SW23	Diurnal Maximum

All monthly, daily, and diurnal averages have been calculated using vector methods



**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Wind Speed 10m (WS10) - km/h**  
**Kirby North - November 2024**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Kirby North - November 2024**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	124	17.22	17.22
6 - 11	330	45.83	63.06
12 - 19	245	34.03	97.08
20 - 28	21	2.92	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 720

Total Number of Hours: 720



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 10m (WS10) - km/h  
Kirby North - November 2024**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	10	21	12	6	8	8	5	2	18	9	5	0	0	3	6	11	124
6 - 11	29	31	37	10	13	8	3	16	39	42	24	4	7	18	33	16	330
12 - 19	8	18	31	14	0	0	1	11	45	27	27	16	1	24	20	2	245
20 - 28	0	0	0	2	0	0	0	0	0	0	4	7	1	6	1	0	21
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	47	70	80	32	21	16	9	29	102	78	60	27	9	51	60	29	720

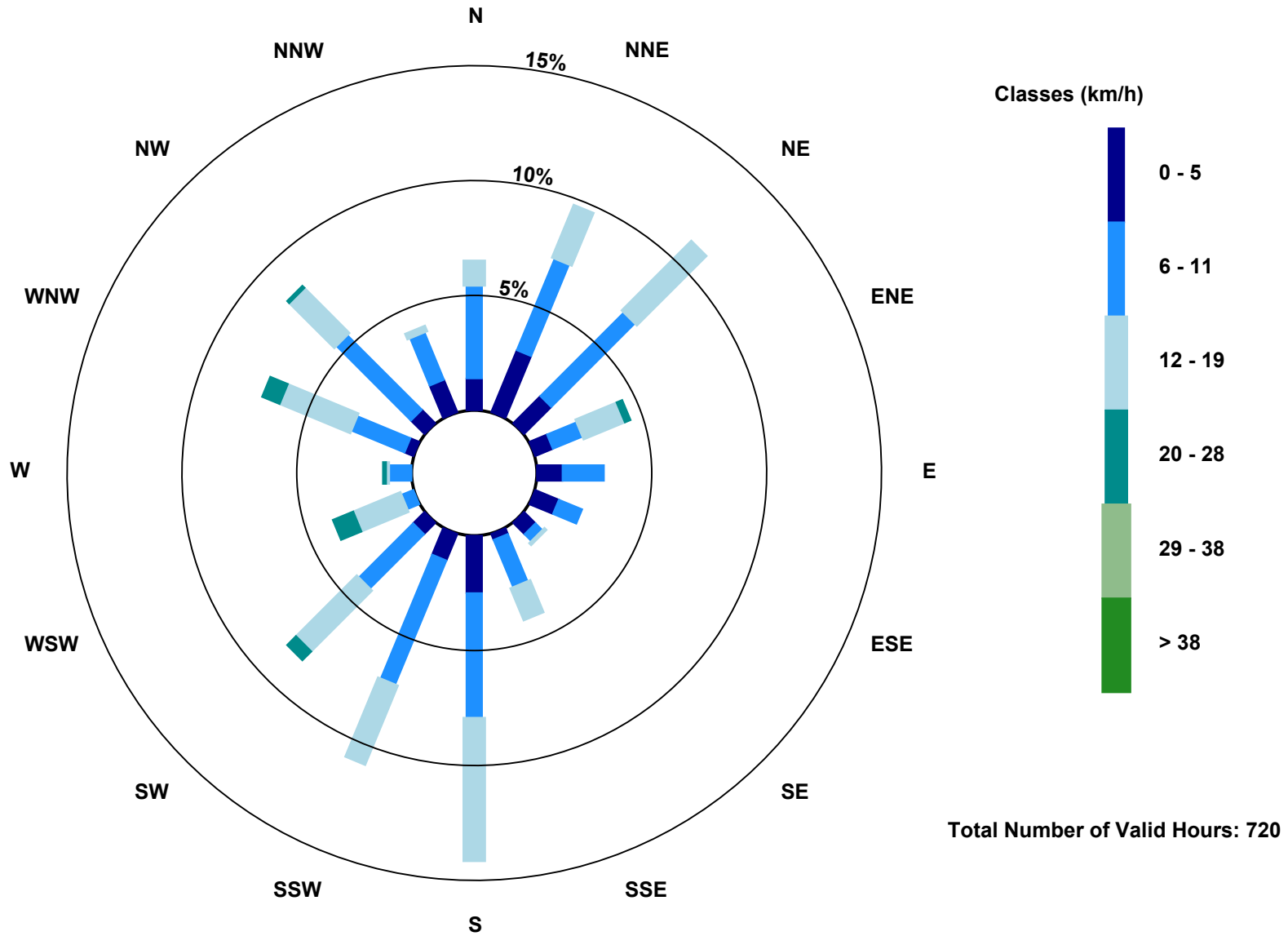
Total Number of Valid Hours: 720

Total Number of Hours: 720



Wood Buffalo Environmental Association  
Wind Rose Nov 2024

Wind Speed 10m (WS10) - km/h  
Kirby North







**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed 10m (WS10) - km/h**  
**Kirby North - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Nov 7 04:00 Minimum Value: 0 km/h on Nov 2 23:00 Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 2 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 6																	Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
2-Nov	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	2	1	1	1	2	2	1	0	1	3
3-Nov	1	1	1	3	2	2	2	2	3	2	2	3	3	3	3	2	2	2	2	2	2	2	2	3	
4-Nov	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	1	1	0	1	0	3
5-Nov	1	1	1	1	2	1	2	3	3	3	3	4	3	3	3	3	3	4	3	2	2	1	2	1	4
6-Nov	2	2	2	2	2	3	3	3	4	4	5	5	5	4	5	4	3	3	4	3	5	4	4	5	5
7-Nov	5	5	7	7	6	4	4	3	3	3	3	4	3	3	2	1	1	1	1	2	3	3	4	3	7
8-Nov	3	3	3	2	2	2	2	2	2	2	4	3	3	3	2	2	2	3	3	3	5	6	6	3	6
9-Nov	3	4	4	3	3	3	2	2	2	2	1	2	1	2	2	1	1	1	1	2	1	1	2	1	4
10-Nov	1	2	2	2	1	1	1	1	1	2	2	2	3	3	3	2	1	1	1	2	2	3	2	3	3
11-Nov	4	4	5	5	5	4	5	5	4	5	6	5	5	5	5	5	3	3	3	3	3	2	2	2	6
12-Nov	3	4	3	3	3	3	4	3	4	4	5	6	6	5	5	4	3	3	3	3	3	3	2	3	6
13-Nov	2	3	2	2	2	2	2	1	1	2	1	1	2	2	3	3	3	3	3	3	3	3	5	5	5
14-Nov	5	4	3	4	3	3	4	4	4	4	3	3	3	3	2	2	2	2	2	2	2	2	1	1	5
15-Nov	1	1	1	2	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	2	2	2	3	3	3
16-Nov	3	3	3	3	3	3	3	4	4	4	4	4	5	5	5	4	5	4	4	5	5	5	4	4	5
17-Nov	4	4	4	4	4	3	3	3	3	3	3	4	4	3	3	3	2	3	3	4	5	5	3	4	5
18-Nov	5	3	3	3	3	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	3	2	3	2	5
19-Nov	2	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	3
20-Nov	2	2	1	1	2	2	2	2	3	3	3	2	2	2	1	2	3	3	2	2	3	2	1	2	3
21-Nov	2	2	2	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2
22-Nov	2	2	2	2	2	2	2	3	3	2	1	2	1	2	2	1	1	1	1	2	1	1	1	1	3
23-Nov	1	2	2	2	2	2	2	2	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3
24-Nov	3	3	3	3	3	3	3	2	2	2	3	2	2	2	2	2	1	1	1	1	1	2	2	2	3
25-Nov	1	1	1	1	1	0	1	1	1	1	1	1	1	3	3	2	2	2	3	2	2	2	3	3	3
26-Nov	3	3	3	3	3	3	3	4	3	3	3	3	4	4	3	5	4	3	3	3	2	2	6	5	6
27-Nov	4	5	5	5	5	5	5	4	4	4	5	5	4	5	4	4	4	3	3	3	3	3	3	3	5
28-Nov	2	3	2	1	2	2	2	2	2	1	2	2	3	2	2	2	1	1	1	2	1	2	1	1	3
29-Nov	1	2	1	1	1	1	2	1	1	2	1	2	2	2	2	1	1	1	2	2	2	2	1	1	2
30-Nov	1	1	1	1	2	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	2	2
																	Diurnal Maximum								



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Wind Direction 10m (WD10) - deg**

**Kirby North - November 2024**

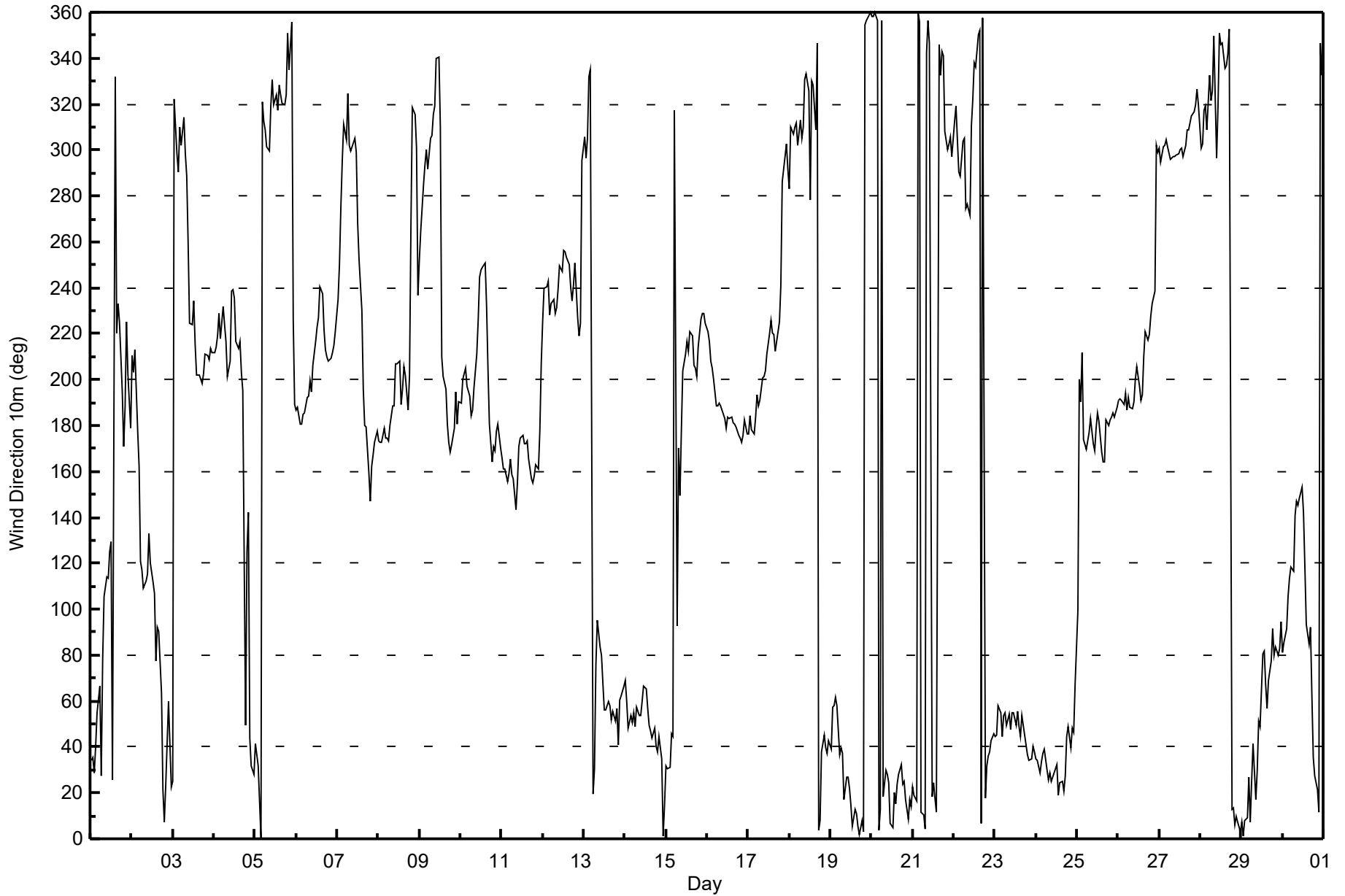
Direction of Maximum Speed: 256 deg on Nov 12 13:00	Hours in Service: 720
Direction of Maximum Daily Speed Average: 303.3 deg on Nov 27	Hours of Data: 720
Direction of Minimum Speed: 322 deg on Nov 3 02:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 0.8 deg on Nov 1	Percent Operational Time: 100.0
Monthly Average Direction: 253.7 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	34	35	29	41	55	67	28	78	106	114	113	125	130	26	332	220	233	225	195	171	188	225	202	179	105.2
2-Nov	210	203	213	177	162	121	117	109	112	116	133	120	112	107	78	92	90	64	21	7	23	60	41	22	104.6
3-Nov	25	322	299	290	310	302	314	299	289	260	225	224	234	215	202	202	200	198	203	211	211	209	213	212	231.1
4-Nov	212	214	219	229	218	232	224	216	201	208	239	239	236	217	213	217	203	195	49	125	142	44	32	28	218.5
5-Nov	42	36	32	0	321	312	309	302	300	319	330	320	324	318	328	324	321	320	324	351	335	356	227	189	324.0
6-Nov	187	188	181	181	185	186	192	193	200	195	206	216	223	227	240	237	222	213	210	208	209	212	215	221	210.1
7-Nov	235	250	275	295	311	304	325	302	299	303	305	299	268	252	230	196	180	179	159	147	162	167	173	178	261.5
8-Nov	173	172	173	179	175	175	173	180	188	188	207	207	208	189	196	206	202	187	202	267	319	315	301	237	203.8
9-Nov	252	265	285	293	300	292	305	306	315	319	340	340	310	210	201	196	181	173	169	171	179	195	181	190	256.1
10-Nov	190	200	202	205	197	193	184	187	196	211	226	245	248	249	251	232	204	180	164	171	169	177	181	170	203.5
11-Nov	166	161	161	156	159	165	159	157	143	155	171	174	175	172	172	173	165	157	155	158	163	161	177	207	164.2
12-Nov	225	240	241	243	228	233	235	229	231	239	249	247	256	256	253	250	241	235	241	251	227	219	225	296	242.0
13-Nov	306	297	305	332	335	19	31	75	95	84	80	68	56	56	60	58	52	56	51	57	41	61	62	67	48.0
14-Nov	69	60	48	54	51	55	49	58	54	54	60	66	65	57	49	47	44	48	40	38	45	34	1	15	53.1
15-Nov	32	31	31	46	44	317	93	170	149	177	204	211	217	213	221	219	206	205	202	214	226	229	229	224	213.9
16-Nov	221	217	208	205	200	189	189	189	189	185	183	179	184	183	184	181	180	179	175	175	172	176	182	176	185.9
17-Nov	177	184	178	176	184	194	189	191	201	201	204	211	220	225	220	220	212	221	225	241	286	297	303	291	218.9
18-Nov	283	310	307	310	312	302	313	305	310	331	333	326	278	330	328	308	346	4	8	38	45	40	37	43	334.1
19-Nov	39	57	58	62	58	37	40	37	17	27	27	22	14	5	13	11	6	2	8	3	354	356	358	360	21.4
20-Nov	358	358	360	356	4	13	356	18	30	28	25	7	5	20	15	24	28	33	24	25	17	9	17	14	15.3
21-Nov	23	19	16	360	356	11	10	4	342	357	346	18	25	18	12	346	333	343	341	308	300	303	306	297	348.4
22-Nov	312	319	304	291	288	304	305	275	276	272	310	322	338	336	350	352	7	358	17	32	36	38	43	46	330.3
23-Nov	45	45	58	55	45	54	55	49	54	48	55	55	49	56	49	44	54	45	41	37	34	35	40	38	46.2
24-Nov	35	34	29	34	37	39	30	26	29	25	27	31	32	19	24	25	21	27	44	49	40	48	46	67	32.7
25-Nov	99	200	190	212	174	170	174	177	183	172	169	179	185	182	169	164	164	182	180	182	184	185	184	188	178.6
26-Nov	191	191	191	189	194	187	192	188	187	191	200	205	197	191	193	210	221	217	220	228	233	239	302	299	211.2
27-Nov	301	295	302	302	305	302	296	297	297	297	298	298	300	301	297	302	309	309	312	315	317	320	326	320	303.3
28-Nov	301	303	317	319	309	333	322	326	350	297	319	351	346	347	335	337	342	353	13	14	6	9	7	3	337.6
29-Nov	7	1	8	9	27	7	25	42	17	30	51	49	81	82	67	57	69	78	91	80	84	80	83	94	53.1
30-Nov	81	85	91	106	113	118	117	141	147	145	148	153	142	119	93	85	92	62	36	27	21	11	346	333	95.9

251.9 259.1 268.9 279.0 276.2 275.2 291.8 241.8 245.8 243.8 246.9 247.6 250.9 242.2 241.1 236.4 215.7 191.6 136.4 194.6 284.9 286.8 297.3 253.4

Diurnal Average

All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association**

**Summary of Hour Standard Deviations**

**Wind Direction 10m (WD10) - deg**

**Kirby North - November 2024**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 90 deg on Nov 9 13:00 Minimum Value: 6 deg on Nov 5 00:00 Percentiles: P <sub>1</sub> = 7 P <sub>10</sub> = 12 Q <sub>1</sub> = 14 Median = 16 Q <sub>3</sub> = 19 P <sub>90</sub> = 24 P <sub>99</sub> = 60																		Hours in Service: 720 Hours of Data: 720 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Nov	7	15	11	14	26	27	26	37	25	18	22	26	35	18	81	28	20	26	25	48	24	20	28	31	81
2-Nov	20	26	20	30	31	34	22	19	17	21	19	22	20	27	19	28	22	15	15	19	30	16	13	24	34
3-Nov	15	46	37	22	16	16	18	24	22	21	20	17	15	17	18	18	17	16	17	15	13	12	13	11	46
4-Nov	13	12	13	10	11	11	12	10	14	16	17	14	22	17	18	15	14	46	28	44	31	9	9	6	46
5-Nov	7	10	15	13	24	9	12	15	15	15	16	16	15	16	15	15	17	20	19	26	24	21	60	13	60
6-Nov	14	15	15	15	18	18	20	19	19	21	19	15	15	14	12	13	16	15	16	15	17	15	15	15	21
7-Nov	14	13	19	16	18	17	17	18	14	16	16	18	23	17	23	17	14	14	19	15	17	16	18	19	23
8-Nov	17	14	15	14	12	12	13	14	15	17	16	16	20	21	19	18	15	62	72	24	19	16	20	27	72
9-Nov	16	21	21	13	16	14	17	16	13	16	19	45	90	20	17	15	11	12	14	14	14	14	10	11	90
10-Nov	13	15	14	13	13	11	10	11	13	14	17	13	14	14	13	15	12	11	12	11	14	18	17	17	18
11-Nov	16	16	18	17	18	19	18	18	17	20	20	20	21	20	20	21	19	18	18	17	19	23	19	17	23
12-Nov	16	14	12	13	15	14	13	13	13	13	14	13	14	13	13	13	11	12	12	13	15	16	28	44	44
13-Nov	16	15	21	19	26	27	10	32	14	15	18	15	18	16	15	13	12	12	12	14	14	16	12	12	32
14-Nov	12	15	13	14	14	13	13	13	13	14	14	16	14	16	16	13	13	13	15	12	16	22	27	27	27
15-Nov	18	15	12	35	80	81	39	23	34	27	16	17	17	16	14	13	15	15	18	16	13	13	14	17	81
16-Nov	16	16	18	17	19	19	21	21	21	20	20	20	21	20	20	19	19	19	20	18	20	20	21	20	21
17-Nov	19	21	18	19	21	21	20	20	20	19	17	16	14	15	15	16	15	16	15	13	17	17	15	18	21
18-Nov	22	18	16	15	16	15	16	12	17	18	25	44	32	40	60	31	39	22	30	18	17	17	15	14	60
19-Nov	18	17	16	16	19	17	16	14	11	12	16	17	16	15	16	13	17	13	12	13	14	14	15	13	19
20-Nov	13	14	13	14	13	11	16	12	9	11	12	19	20	14	13	11	11	10	11	10	20	13	10	15	20
21-Nov	14	13	14	14	18	13	9	18	19	17	36	29	21	22	18	13	9	15	16	14	15	14	17	15	36
22-Nov	13	14	19	15	15	18	21	18	20	30	19	15	18	19	18	14	7	11	15	9	10	6	12	14	30
23-Nov	14	15	16	14	13	17	15	15	15	12	13	13	12	14	13	10	11	11	12	12	11	10	12	11	17
24-Nov	14	15	11	10	11	12	10	11	11	12	11	14	14	13	12	12	7	7	8	8	10	14	20	33	33
25-Nov	51	21	28	58	67	14	14	18	19	23	18	22	21	22	18	16	16	18	19	20	19	20	21	20	67
26-Nov	21	20	19	19	20	19	21	19	19	20	21	17	20	20	20	17	14	15	15	18	13	16	17	15	21
27-Nov	16	14	15	16	16	15	14	14	13	14	15	15	16	16	14	17	16	16	15	16	14	13	13	15	17
28-Nov	18	22	17	13	16	12	24	20	24	27	21	17	17	18	18	14	14	16	6	12	11	9	12	14	27
29-Nov	15	17	14	12	11	14	12	13	14	19	21	22	30	31	18	10	10	8	15	14	19	18	17	20	31
30-Nov	17	17	17	19	21	20	19	17	19	18	22	21	23	33	20	18	14	21	26	6	10	17	16	15	33
																		51 46 37 58 80 81 39 37 34 30 36 45 90 40 81 31 39 62 72 48 31 23 60 44							
Diurnal Maximum																									

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**ELECTRONIC TRANSFER SYSTEM  
AIRDATA  
SUBMISSION REPORT**

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December 23, 2024  
10:23:31 AM  
Request # 4753081

**Submitted by:** EN6138\_DENNY  
**Submission Date:** Dec 23, 2024 10:23:21 AM

File Type

Calibration Report

File Name

CAL-WBEA-202411.pdf

**Total Number of Files: 1**

\*\*\* End of Report \*\*\*

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**ELECTRONIC TRANSFER SYSTEM  
AIRDATA  
SUBMISSION REPORT**

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December 23, 2024  
10:25:50 AM  
Request # 4753082

**Submitted by:** EN6138\_DENNY  
**Submission Date:** Dec 23, 2024 10:24:01 AM

File Type  
Airshed Monitoring Report

File Name  
WBEA-202411.pdf

**Total Number of Files: 1**

\*\*\* End of Report \*\*\*

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**ELECTRONIC TRANSFER SYSTEM  
AIRDATA  
SUBMISSION REPORT**

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December 23, 2024  
11:01:22 AM  
Request # 4753099

**Submitted by:** EN6138  
**Submission Date:** Dec 23, 2024 11:00:53 AM

File Type  
Ambient Data

File Name  
AMB-WBEA-202411-V00.xml

**Total Number of Files: 1**

\*\*\* End of Report \*\*\*

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**ELECTRONIC TRANSFER SYSTEM  
AIRDATA  
SUBMISSION REPORT**

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December 23, 2024  
11:59:38 AM  
Request # 4753138

**Submitted by:** EN6138  
**Submission Date:** Dec 23, 2024 11:59:32 AM

File Type  
Ambient Data

File Name  
AMB-WBEA-202411-V00-33.xml

**Total Number of Files: 1**

\*\*\* End of Report \*\*\*





End of Report