

**WOOD BUFFALO ENVIRONMENTAL ASSOCIATION  
MONTHLY AMBIENT AIR QUALITY MONITORING REPORT  
FEBRUARY 2023  
REPORT HISTORY**

Original report release date: March 31, 2023

Revised report release date: April 28, 2023

**Revision 1 – Resubmission of Air Monitoring Station Monthly Summary Report.**

The monthly Air Monitoring Stations (AMS) summary reports for February were inaccurately created for Bertha Ganter AMS, Lower Camp AMS, and Patricia McInnes AMS.

The Air Monitoring Station summary reports have been updated from the original version, and they were re-submitted to the Electronic Transfer System (ETS) on April 28, 2023.



**WOOD BUFFALO  
ENVIRONMENTAL ASSOCIATION**

Unit 3 - 805 Memorial Drive  
Fort McMurray, AB T9K 0K4  
P: 780.799.4420 E: info@wbea.org  
[wbea.org](http://wbea.org)

Wood Buffalo Environmental Association

# FEBRUARY 2023 MONTHLY REPORT

CONTINUOUS MONITORING

March 31, 2023

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





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## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

Unit 3 - 805 Memorial Drive  
Fort McMurray, AB T9K 0K4  
P: 780.799.4420 E: info@wbea.org  
[wbea.org](http://wbea.org)

March 31, 2023

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 February 2023  
Wood Buffalo Environmental Association**

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Enclosed is the February 2023 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 continuous ambient air quality monitoring network stations are:

AMS01 - Bertha Ganter - Fort McKay	AMS18 - Stony Mountain
AMS02 - Mildred Lake	AMS19 - Firebag
AMS03 - Lower Camp (Meteorology)	AMS20 - MacKay River
AMS04 - Buffalo Viewpoint	AMS21 - Conklin
AMS05 - Mannix	AMS22 - Janvier
AMS06 - Patricia McInnes	AMS23 - Fort Hills
AMS07 - Athabasca Valley	AMS25 - Waskōw ohci Pimâtisiwin
AMS08 - Fort Chipewyan	AMS26 - Christina Lake
AMS09 - Barge Landing	AMS27 - Jackfish 2/3
AMS11 - Lower Camp (Air Quality)	AMS29 - Surmont 2
AMS13 - Fort McKay South	AMS30 - Ells River
AMS14 - Anzac	AMS506 - Jackfish 1
AMS17 - Wapasu	AMS508 - Kirby North

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):



**Industry Operators**

Athabasca Oil Corporation  
Canadian Natural

**EPEA Approval No.**

289664-00-00; 241311-00-00  
149968-01-00; 153125-01-00;  
20809-02-00; 224816-01-00; 228044-00-00;  
237382-00-00

Cenovus Energy Inc.

48522-01-00

ChemTrade Logistics

404827-00-00

CNOOC International

137467-01-00; 236394-00-00

Connacher Oil and Gas Ltd.

240008-00-00

ConocoPhillips

48263-01-00

Fort Hills Energy Corporation

151469-01-00

Hammerstone Corporation

189942-00-00

Harvest Operations Corp.

246984-01-00

H.J. Baker Sulphur Canada ULC

426549-00-00

Husky Oil Operations Ltd.

206355-01-00

Imperial Oil Ltd.

00046586-00-00

Inter Pipeline Ltd.

73203-02-00

Keyera Energy Ltd.

187-03-00

MEG Energy Corp.

00216466-01-00

Parsons Creek Aggregates

231302-00

PetroChina Canada Ltd.

254465-00-00

Suncor Energy Inc.

094-02-00; 80105-01-00

Sunshine Oilsands Ltd.

305529-00-00

Surmont Energy

318401-00-00

Syncrude Canada Ltd.

026-02-00

Teck Resources Ltd.

00247548-00-00

Titan Tire Reclamation Corporation

364232-00-00

**Government and Non-Government Organizations**

Alberta Energy Regulator

Health Canada

Alberta Environment and Protected Areas

Keyano College

Alberta Health

Parks Canada

Alberta Health Services

Pembina Institute

Environment and Climate Change Canada

Regional Municipality of Wood Buffalo

**Indigenous Communities**

Athabasca Chipewyan First Nation

Fort McKay First Nation

Chard Métis Nation

Fort McMurray 468 First Nation

Chipewyan Prairie Dene First Nation

Fort McKay Métis

Christina River Dene Nation Council

Lakeland Métis Local 1909

Conklin Resource Development Advisory  
Council

McMurray Métis

Mikisew Cree First Nation



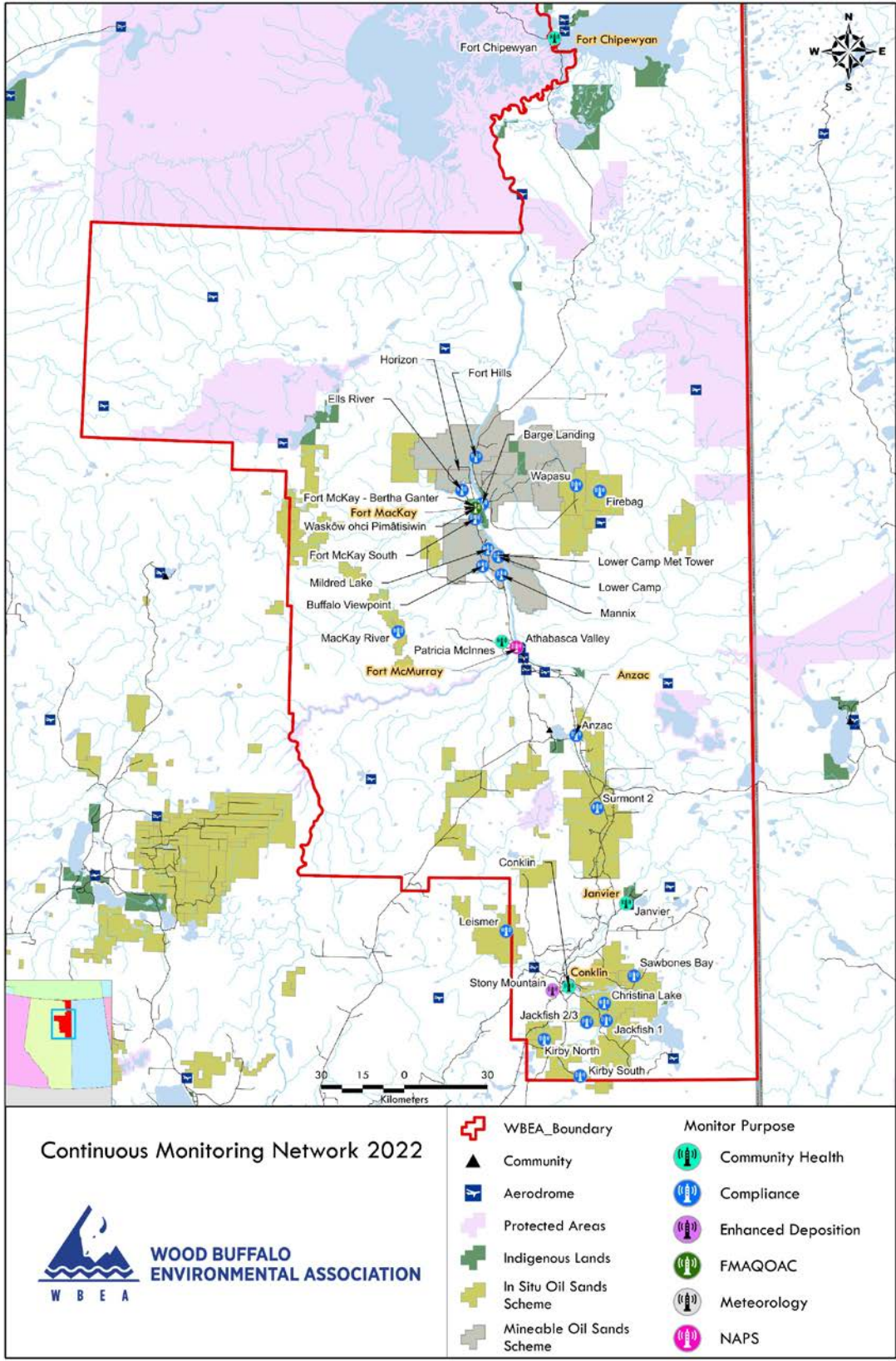


Figure 1: Map of WBEA Continuous Monitoring Network

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 5-F for CO, H<sub>2</sub>S, NH<sub>3</sub>, NO<sub>2</sub>, O<sub>3</sub>, SO<sub>2</sub>, and TRS.

There was one ground-level concentration in excess of the 1-hour H<sub>2</sub>S objective reported to AEPA; following data validation and processing this exceedance was not confirmed.

There were two ambient ground level concentrations in excess of the 1-hour PM<sub>2.5</sub> guideline reported to AEPA; following data validation and processing these exceedances were confirmed.

Site	Parameter	Date / Time	Reference	Period	Reported	Final	Status*
Anzac	PM <sub>2.5</sub>	19Feb23, 01:00	409784	1-hr	214	214.3	exc
Anzac	PM <sub>2.5</sub>	19Feb23, 02:00	409784	1-hr	207	207.4	exc
Lower Camp	H <sub>2</sub> S	25Feb23, 20:00	409943	1-hr	10	9.4	nae

\*status legend:

- late    exceedance, raw values were not found to be in exceedance in real time, and/or were not reported, but final values were found to be an exceedance after data processing.
- exc    exceedance, raw values reported in real time were confirmed to be in exceedance after data processing.
- nae    not an exceedance, raw values reported in real time were found not in exceedance after data processing.
- ret    retracted, reported exceedance was found to be not an exceedance after investigation of measurement system status and/or validation of raw data in conjunction with all associated measurement parameters.

## 2.0 Data Processing and Validation

Concentrations reported in near real-time were raw values. The final values were determined after processing data for reporting. For all parameters, except PM<sub>2.5</sub>, the final 5-minute data values were 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 were then rounded to one decimal place greater than the reporting precision indicated in the Air Monitoring Directive (AMD). The final 1-hour data values were calculated from final 5-minute data values and then rounded to reporting precision. The final 24-hour data values were calculated from final 1-hour values.

After data processing and validation, NO<sub>2</sub> concentrations were re-calculated from baseline-corrected NO<sub>x</sub> and NO concentrations. Specifically, the NO concentration was 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 at the Electronic Transfer System with this monthly report.

## 3.0 Operational Status

### 3.1 Continuous Monitoring

In January 2023, there were three instances that resulted in monitoring instruments operating less than 90% of the time.

1. The THC, NMHC, and CH<sub>4</sub> analyzer at the Ells River AMS operated for less than 90% of February 2023, 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 (AEPA) on February 27, 2023 (reference number 409974).

This instrument is a semi-continuous gas chromatograph that requires the CH<sub>4</sub> and NMHC peaks to remain within the data capture windows. In early February, these peaks shifted outside of the optimal data capture windows, and as a result, the baseline shifted outside of the normal range. The WBEA performed maintenance to rectify the issue, including a column bakeout to remove impurities, however, the analyzer did not return to normal operation. The analyzer was replaced, and normal operation resumed on February 12, 2023. Data for the incident period was invalidated for a total of 90 hours of downtime.

2. The precipitation collector at the Bertha Ganter – Fort McKay air monitoring station (AMS) operated for less than 90% of February 2023, 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 (AEPA) on March 27, 2023 (reference number 411026).

On February 23, a WBEA Field Technician identified that the data transfer program had stopped writing files to the data logger on February 20. The data logger was reset, and data transfer resumed on February 23 at 10:00 MST. Data for the incident period of February 20 through 23 was invalidated, resulting in a total of 82 hours of downtime.

### 3.2 Intermittent Monitoring

The results for time-integrated sampling of precipitation, PAH, VOC, ECOC, PM<sub>2.5</sub>, and PM<sub>10</sub> will be submitted in the 2023 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 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, 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 28 hours this month.

Station power failure on February 10 affected the normal operations of all analyzers for 2 hours.

Stabilization of the CO analyzer post power failure on February 10 and 11 resulted in 7 hours of invalid data.

Cleaning of the sample manifold on February 16 interrupted the normal operations of all gaseous analyzers, except for the NH<sub>3</sub> analyzer, for 1 hour.

Unstable operations due to excessive baseline noise in the output signal of the NH<sub>3</sub> analyzer on February 15 and 24 resulted in 2 hours of invalid data.

Stabilization post replacement of the NH<sub>3</sub> analyzer on February 16 and 17 resulted in 14 hours of invalid data.

Unstable operations due to flatline in the output signal of the SO<sub>2</sub> analyzer on February 22 and 23 resulted in 21 hours of invalid data. Subsequent maintenance to reset the SO<sub>2</sub> analyzer on February 23 resulted in an additional 1 hour of downtime.

Maintenance to verify the daily QA check on February 23 interrupted the normal operations of the O<sub>3</sub> analyzer for 1 hour.

Maintenance to empty the precipitation collector bucket on February 8 resulted in 1 hour of invalid data.

Failure to record data of the precipitation collector on February 10 and 20 to 23 resulted in 83 hours of invalid data.

The surface leaf wetness sensor operated out-of-range on February 11 resulting in 2 hours of invalid data.

A flatline in the output signal of the temperature sensor at the 10-meter elevation on February 13 resulted in 1 hour of invalid data.

A flatline in the output signal of the wind sensor on February 15 resulted in 2 hours of invalid data.

The daily span check of all gaseous analyzers was outside the 10% AMD criteria on February 23 due to an interruption in the station calibrator configuration.

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

Maintenance to bring the tower down on February 8 interrupted the normal operations of the wind sensor for 2 hours.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 4 hours of invalid data.

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

Failure to record data of all parameters throughout the month resulted in 45 hours of invalid data.

A flatline in the output signal of the wind sensor at 45-meter elevation on February 13 resulted in 2 hours of invalid data.

A flatline in the output signal of the wind sensor at 100-meter elevation on February 13 resulted in 3 hours of invalid data.

Intermittent flatlines in the output signal of the wind sensor at 163-meter throughout the month resulted in 16 hours of invalid data.

A flatline in the output signal of the temperature sensor at 20-meter elevation on February 21 and 25 resulted in 7 hours of invalid data.

A flatline in the output signal of the relative humidity and temperature sensor at 20-meter elevation on February 27 resulted in 5 hours of invalid data.

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

Analyzer failure due to non-responsive output signal of the SO<sub>2</sub> analyzer from February 15 to 16 resulted in 22 hours of invalid data.

Maintenance to reboot the SO<sub>2</sub> analyzer on February 16 resulted in one hour of down time.

Maintenance to replace the support gas cylinder of the THC/NMHC/CH<sub>4</sub> analyzer on February 16 resulted in 2 hours of downtime.

Maintenance to clean the reaction cell on February 13, and the stabilization period before routine calibration on February 14 affected the normal operation of the NO<sub>2</sub> analyzer for 17 hours.

A flatline in the output signal of the wind sensor on February 13 and 14 resulted in 17 hours of down time.

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

A flatline in the output signal of the wind sensor at 45-meter throughout the month resulted in 4 hours of invalid data.

A flatline in the output signal of the wind sensor at 75-meter throughout the month resulted in 6 hours of invalid data.

A flatline in the output signal of the wind sensor at 90-meter throughout the month resulted in 3 hours of invalid data.

Relative humidity and temperatures can affect the performance of the SO<sub>x</sub> scrubbers in the H<sub>2</sub>S analyzer. During these events, the sulfur concentrations take a longer period to stabilize during the daily span checks. Therefore, the H<sub>2</sub>S span was outside of the 10% AMD criteria on February 2 and 22.

### ***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 to 2 hours following each daily span has been reported as invalid for a total of 41 hours this month.

Cleaning of the sample manifold on February 2 interrupted the normal operations of the O<sub>3</sub>, SO<sub>2</sub>, THC/NMHC/CH<sub>4</sub>, and TRS analyzers for 2 hours.

Unstable operations due to excessive baseline drift in the output signal of the analyzer THC/NMHC/CH<sub>4</sub> on February 23 to 25 resulted in 61 hours of invalid data.

Maintenance to replace the sample pump on February 25 interrupted the normal operations of the THC/NMHC/CH<sub>4</sub> analyzer for 6 hours.

A flatline in the output signal of the wind sensor on February 13 to 15 resulted in 52 hours of invalid data.

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

Cleaning of the sample manifold on February 8 interrupted the normal operations of the NO<sub>2</sub>, SO<sub>2</sub>, THC/NMHC/CH<sub>4</sub>, and TRS analyzers for 1 hour.

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

Maintenance to verify the daily QA check on February 3 interrupted the normal operations of the CO and CO<sub>2</sub> analyzers for 3 hours.

Analyzer failure due to a non-responsive SO<sub>2</sub> instrument on February 8 resulted in 9 hours of invalid data.

An internal audit on February 28 interrupted the normal operations of NO<sub>2</sub>, SO<sub>2</sub>, and TRS analyzers for 2 to 3 hours.

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

Station power failure on February 10 affected the normal operations of all analyzers for 4 to 5 hours.

A flatline in the output signal of the wind sensor on February 22 resulted in 1 hour of invalid data.

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

Cleaning of the sample manifold on February 8 interrupted the normal operations of the SO<sub>2</sub> and THC/NMHC/CH<sub>4</sub> analyzers for 2 hours.

A flatline in the output signal of the wind sensor on February 23 and 28 resulted in 3 hours of invalid data.

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

Station power failure on February 10 affected the normal operations of all analyzers for 1 to 2 hours.

Maintenance to replace the support gas cylinder of the THC/NMHC/CH<sub>4</sub> analyzer on February 16 resulted in 2 hours of downtime.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 4 hours of invalid data.

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

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

Unstable operations due to excessive baseline drift in the output signal of the O<sub>3</sub> analyzer on February 10 and 20 resulted in 3 hours of invalid data.

A flatline in the output signal of the wind sensor on February 3, 4, and 11 resulted in 8 hours of invalid data.

The surface leaf wetness sensor operated out-of-range on February 13 resulting in 1 hour of invalid data.

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

Cleaning of the sample manifold on February 23 interrupted the normal operations of the H<sub>2</sub>S, O<sub>3</sub>, SO<sub>2</sub>, and THC analyzers for 1 hour.

A flatline in the output signal of the wind on February 1 and 28 resulted in 2 hours of invalid data.

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

Station operator activities on February 3 affected the normal operations of the SO<sub>2</sub> analyzer for 2 hours.

Maintenance to replace the support gas cylinder of the THC/NMHC/CH<sub>4</sub> analyzer on February 3 resulted in 2 hours of downtime.

Station operator activities on February 8 affected the normal operations of the TRS analyzer for 1 hour.

Cleaning of the sample manifold on February 22 interrupted the normal operations of the CO, CO<sub>2</sub>, O<sub>3</sub>, SO<sub>2</sub>, THC/NMHC/CH<sub>4</sub>, and TRS analyzers for 1 hour.

A flatline in the output signal of the wind on February 14 resulted in 1 hour of invalid data.

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

Unstable Operations of the SO<sub>2</sub> and THC analyzer on Feb 7 and 8 due to the sample line being disconnected to the manifold resulting on a total of 19 hours of downtime.

Station operator activities on February 8 affected the normal operations of the wind sensor for 2 hours.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 6 hours of invalid data.

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

Cleaning of the sample manifold on February 2 interrupted the normal operations of the H<sub>2</sub>S, SO<sub>2</sub>, THC and analyzers for 1 hour.

Maintenance to reset the logger and the modem on February 2 interrupted the normal operation of the H<sub>2</sub>S, SO<sub>2</sub>, THC and analyzers for 2 hours.

Maintenance to reset the logger and the modem on February 2 interrupted the normal operation of all meteorological sensors for 2 hours.

Maintenance to bring the tower down on February 14 interrupted the normal operations of the wind sensor for 1 hour.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 30 hours of invalid data.

Relative humidity and temperatures can affect the performance of the SO<sub>x</sub> scrubbers in the analyzer. During these events, the sulfur concentrations take a longer period to stabilize during the daily span checks. Therefore, the H<sub>2</sub>S span was outside of the 10% AMD criteria on February 2, 22, and 23.

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

Cleaning of the sample manifold on February 3 interrupted the normal operations of the NO<sub>2</sub>, SO<sub>2</sub>, THC/NMHC/CH<sub>4</sub>, and TRS analyzers for 2 hours.

Station operator activities on February 8 affected the normal operations of the wind sensor for 1 hour.



A flatline in the output signal of the wind sensor on February 14 resulted in 1 hour of invalid data.

Relative humidity and temperatures can affect the performance of the SO<sub>x</sub> scrubbers in the TRS analyzer. During these events, the sulfur concentrations take a longer period to stabilize during the daily span checks. Therefore, the TRS span was outside of the 10% AMD criteria for multiple days throughout the month of February.

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

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

Cleaning of the sample manifold on February 24 interrupted the normal operations of the NO<sub>2</sub>, O<sub>3</sub>, SO<sub>2</sub>, and THC/NMHC/CH<sub>4</sub> analyzers for 1 hour.

A flatline in the output signal of the wind sensor on February 11 and 23 resulted in 2 hours of invalid data.

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

Maintenance to replace the sample pump on February 14 interrupted the normal operations of the TRS analyzer for 6 hours.

Maintenance to reinitiate the daily QA check on February 24 interrupted the normal operations of the SO<sub>2</sub>, THC/NMHC/CH<sub>4</sub>, and TRS analyzer for 1 to 2 hours.

Unstable operations due to daily spans outside criteria on February 22 and 23 affected the normal operation of the NO<sub>2</sub> analyzer for 30 hours.

Maintenance to replace the NO<sub>2</sub> analyzer, and verification of the daily QA check on February 24 affected the normal operation of the instrument for 21 hours.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 6 hours of invalid data.

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

Station power cut-off since January 27 affected the normal operations of all analyzers and sensors on February for 672 hours.

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

Cleaning of the sample manifold on February 15 interrupted the normal operations of the NO<sub>2</sub> and SO<sub>2</sub> analyzers for 2 hours.

Maintenance to reinitiate the daily QA check on February 16 interrupted the normal operations of the H<sub>2</sub>S analyzer for 2 hours.

Failure to record data of the NO<sub>2</sub> analyzer on February 27 resulted in 1 hour of invalid data.  
Station operator activities on February 15 affected the normal operations of the wind sensor for 2 hours.

The daily span check for the H<sub>2</sub>S analyzer was outside the 10% AMD criteria on February 16 due to an interruption in the station calibrator configuration.

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

Failure to record data of all parameters on February 5 and 13 resulted in 2 hours of invalid data.

Cleaning of the sample manifold on February 14 interrupted the normal operations of the H<sub>2</sub>S and NO<sub>2</sub> analyzers for 1 hour.

Station operator activities on February 14 affected the normal operations of the wind sensor for 1 hour.

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

Maintenance to replace the station calibrator and verify the QA check interrupted the normal operations of the NO<sub>2</sub> analyzer for 3 hours.

Station operator activities on February 17 affected the normal operations of the wind sensor for 2 hours.

A flatline in the output signal of the wind sensor on February 23 and 28 resulted in 6 hours of invalid data.

The daily span check for the NO<sub>2</sub> analyzer was outside the 10% AMD criteria on February 18 due to an interruption in the station calibrator configuration.

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

Station power failure on February 10 affected the normal operations of all analyzers, and PM<sub>2.5</sub>, for 1 to 2 hours.

Unstable operations due to excessive baseline drift in the output signal of the THC/NMHC/CH<sub>4</sub> analyzer on February 8 through 11 resulted in 64 hours of invalid data.

Maintenance to condition the column and replace the analyzer on February 12 interrupted the normal operations of the THC/NMHC/CH<sub>4</sub> analyzer for 26 hours.

An internal audit on February 14 interrupted the normal operations of all air quality analyzers for 1 to 4 hours.

Cleaning of the sample manifold on February 15 interrupted the normal operations of the NO<sub>2</sub>, THC/NMHC/CH<sub>4</sub>, and TRS analyzers for 2 hours.

Maintenance to bring the tower down on February 15 interrupted the normal operations of the wind sensor for 2 hours.

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

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

An internal audit on February 8 interrupted the normal operations of all air quality analyzers for 3 to 4 hours.

Maintenance to re-fill the SO<sub>2</sub> scrubber hydrator, and a subsequent multi-point verification check on February 13 interrupted the normal operations of the H<sub>2</sub>S analyzer for 5 hours.

Maintenance to verify the daily QA check on February 21 interrupted the normal operations of the H<sub>2</sub>S analyzer for 2 hours.

Maintenance to re-fill the SO<sub>2</sub> scrubber hydrator on February 22 interrupted the normal operations of the H<sub>2</sub>S analyzer for 3 hours.

Analyzer failure due to a non-responsive H<sub>2</sub>S analyzer from February 22 to 24 resulted in 45 hours of invalid data.

Maintenance to replace the H<sub>2</sub>S analyzer on February 24 resulted in 1 hour of invalid data.

A flatline in the output signal of the wind sensor on February 6 resulted in 10 hours of invalid data.

Relative humidity and temperatures can affect the performance of the SO<sub>x</sub> scrubbers in the analyzer. During these events, the sulfur concentrations take a longer period to stabilize during the daily span checks. Therefore, the H<sub>2</sub>S span was outside of the 10% AMD criteria for multiple days throughout February.

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

Maintenance to complete a multi-point verification check of the THC analyzer on February 2 resulted in 7 hours of invalid data.

Unstable operations due to the inconsistent response of the H<sub>2</sub>S analyzer on February 13 and 14 resulted in 32 hours of invalid data.

Maintenance to re-fill the SO<sub>2</sub> scrubber hydrator, and a subsequent multi-point verification check on February 14 and 15 interrupted the normal operations of the H<sub>2</sub>S analyzer for 23 hours.

Station operator activities on February 2 affected the normal operations of the wind sensor for 6 hours.

A flatline in the output signal of the wind sensor on February 14 resulted in 3 hours of invalid data.

If additional information is required, please contact either Sanjay Prasad at (780) 799-8216 or the Wood Buffalo Environmental Association at (780) 799-4420.

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 Karina Fenwick of WBEA. The WBEA has retained the services of Whiteley Enterprises to conduct Level three (L3) review on its behalf. Contact information for WBEA staff is included below.

Asad Hidayat, Data Technician  
Wood Buffalo Environmental Association  
T: (780) 215-6000  
E: [ahidayat@wbea.org](mailto:ahidayat@wbea.org)

Karina Fenwick, Data Technician  
Wood Buffalo Environmental Association  
T: (780) 215-7499  
E: [kfenwick@wbea.org](mailto:kfenwick@wbea.org)

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.



Emilie Briggs  
Operations Manager

Wood Buffalo Environmental Association  
Unit 3 - 805 Memorial Drive  
Fort McMurray AB T9K 0K4  
[www.wbea.org](http://www.wbea.org)  
T: (780) 799-8216 | E: [ebriggs@wbea.org](mailto:ebriggs@wbea.org)

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WOOD BUFFALO ENVIRONMENTAL ASSOCIATION  
MONTHLY AIR MONITORING SUMMARY

February 2023

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APPROVAL NUMBERS	REPORT DATE						
	MONTH	YEAR					
289664-00-00	02	2023					
241311-00-00	CONTINUOUS AMBIENT MONITORING						
20809-02-00							
149968-01-00							
237382-00-00				ONE-HOUR AVERAGE		24-HOUR AVERAGE	
48522-01-00	PARAMETER	STN. NO.	% TIME OPERATIONAL	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
240008-00-00	SO2(ppb)	1	96	78	0	6.8	0
48263-01-00	SO2(ppb)	2	100	53.8	0	9.5	0
224816-00-00	SO2(ppb)	4	97	59.7	0	12.9	0
151469-01-00	SO2(ppb)	5	100	62.5	0	13.3	0
189942-00-00	SO2(ppb)	6	100	28.1	0	6.5	0
206355-00-00	SO2(ppb)	7	100	24.4	0	6.7	0
46586-00-00	SO2(ppb)	8	98	4.0	0	1.9	0
73203-02-00	SO2(ppb)	9	99	19.7	0	5.8	0
216466-01-00	SO2(ppb)	11	100	77.5	0	8.8	0
137467-01-00	SO2(ppb)	13	100	30.0	0	4.4	0
236394-00-00	SO2(ppb)	14	100	31.4	0	8.0	0
254465-00-00	SO2(ppb)	17	100	28.0	0	6.9	0
094-03-00	SO2(ppb)	18	100	9.9	0	3.3	0
80105-01-00	SO2(ppb)	19	97	23.8	0	4.6	0
305529-00-00	SO2(ppb)	20	100	18.3	0	4.9	0
318401-00-00	SO2(ppb)	21	100	8.0	0	2.4	0
026-03-00	SO2(ppb)	22	100	7.9	0	3.1	0
364232-00-00	SO2(ppb)	23	100	33.7	0	4.7	0
228044-00-00	SO2(ppb)	25	0	--	0	--	0
247548-00-00	SO2(ppb)	26	100	26.4	0	4.6	0
231302-00-00	SO2(ppb)	27	100	8.5	0	2.2	0
153125-01-00	SO2(ppb)	29	100	21.5	0	7.1	0
	SO2(ppb)	30	100	14.8	0	2.9	0
	SO2(ppb)	506	100	34.7	0	6.4	0
	SO2(ppb)	508	100	12.8	0	3.1	0
	H2S(ppb)	1	100	3.1	0	1.2	0
	H2S(ppb)	2	100	9.4	0	2.8	0
	H2S(ppb)	4	100	7.4	0	1.7	0
	H2S(ppb)	5	100	5.0	0	1.9	0
	H2S(ppb)	11	100	9.4	0	1.8	0
	H2S(ppb)	17	100	1.9	0	0.5	0
	H2S(ppb)	19	100	3.4	0	0.7	0
	H2S(ppb)	20	100	2.2	0	0.9	0
	H2S(ppb)	25	0	--	0	--	0
	H2S(ppb)	26	100	1.0	0	0.3	0
	H2S(ppb)	27	100	1.5	0	0.3	0
	H2S(ppb)	29	100	1.1	0	0.5	0
	H2S(ppb)	506	91	0.7	0	0.2	0
	H2S(ppb)	508	92	0.8	0	0.3	0
	TRS(ppb)	1	100	3.6	0	1.7	0
	TRS(ppb)	6	100	1.8	0	0.7	0
	TRS(ppb)	7	100	2.4	0	1.0	0
	TRS(ppb)	8	100	0.6	0	0.3	0
	TRS(ppb)	9	99	3.7	0	1.5	0
	TRS(ppb)	13	100	2.6	0	1.4	0
	TRS(ppb)	14	100	1.5	0	0.6	0
	TRS(ppb)	18	100	0.6	0	0.3	0
	TRS(ppb)	21	100	0.6	0	0.5	0
	TRS(ppb)	22	100	0.5	0	0.2	0
	TRS(ppb)	23	99	2.6	0	1.0	0
	TRS(ppb)	30	99	2.2	0	1.0	0
	THC(ppm)	1	100	4.1	-	3.2	-
	THC(ppm)	2	100	4.3	-	3.1	-
	THC(ppm)	4	100	3.9	-	2.7	-
	THC(ppm)	5	100	5.1	-	3.1	-
	THC(ppm)	6	91	2.6	-	2.4	-
	THC(ppm)	7	100	2.8	-	2.5	-
	THC(ppm)	9	99	4.3	-	3.0	-
	THC(ppm)	11	100	3.8	-	3.0	-
	THC(ppm)	13	99	4.5	-	3.0	-
	THC(ppm)	14	100	2.9	-	2.2	-
	THC(ppm)	17	100	2.9	-	2.4	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION  
MONTHLY AIR MONITORING SUMMARY

February 2023

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REPORT DATE								
MONTH	YEAR							
02	2023	CONTINUOUS AMBIENT MONITORING						
APPROVAL NUMBERS	PARAMETER	STN. NO.	% TIME OPERATIONAL	ONE-HOUR AVERAGE		24-HOUR AVERAGE		
				MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	
289664-00-00	THC(ppm)	18	100	2.2	-	2.2	-	
241311-00-00	THC(ppm)	19	97	2.7	-	2.4	-	
20809-02-00	THC(ppm)	20	100	3.8	-	2.7	-	
149968-01-00	THC(ppm)	21	100	2.3	-	2.2	-	
237382-00-00	THC(ppm)	22	100	2.2	-	2.1	-	
48522-01-00	THC(ppm)	23	100	6.0	-	3.1	-	
240008-00-00	THC(ppm)	29	100	3.4	-	2.4	-	
48263-01-00	THC(ppm)	30	86	5.7	-	3.2	-	
224816-00-00	THC(ppm)	508	99	3.2	-	2.6	-	
151469-01-00	O3(ppb)	1	99	38.8	0	28.7	-	
189942-00-00	O3(ppb)	4	100	36.9	0	31.4	-	
206355-00-00	O3(ppb)	6	100	44.9	0	39.8	-	
46586-00-00	O3(ppb)	7	100	45.5	0	34.6	-	
73203-02-00	O3(ppb)	8	100	44.7	0	40.9	-	
216466-01-00	O3(ppb)	13	100	40.5	0	30.2	-	
137467-01-00	O3(ppb)	14	100	45.5	0	39.5	-	
236394-00-00	O3(ppb)	17	100	47.7	0	42.6	-	
254465-00-00	O3(ppb)	18	100	43.7	0	41.2	-	
094-03-00	O3(ppb)	21	100	45.3	0	41.0	-	
80105-01-00	O3(ppb)	22	100	46.5	0	43.9	-	
305529-00-00	NO2(ppb)	1	100	37.8	0	28.8	-	
318401-00-00	NO2(ppb)	4	97	45.6	0	27.6	-	
026-03-00	NO2(ppb)	6	100	46.4	0	25.7	-	
364232-00-00	NO2(ppb)	7	100	40.5	0	24.7	-	
228044-00-00	NO2(ppb)	8	100	33.6	0	7.8	-	
247548-00-00	NO2(ppb)	9	99	52.9	0	37.8	-	
231302-00-00	NO2(ppb)	13	100	37.6	0	27.2	-	
153125-01-00	NO2(ppb)	14	100	36.5	0	11.8	-	
	NO2(ppb)	17	100	30.0	0	11.3	-	
	NO2(ppb)	18	100	13.5	0	4.7	-	
	NO2(ppb)	19	100	63.3	0	18.0	-	
	NO2(ppb)	20	100	34.3	0	22.9	-	
	NO2(ppb)	21	100	21.0	0	5.1	-	
	NO2(ppb)	22	100	13.0	0	5.3	-	
	NO2(ppb)	23	92	55.5	0	31.0	-	
	NO2(ppb)	26	100	28.1	0	10.9	-	
	NO2(ppb)	27	100	12.6	0	5.2	-	
	NO2(ppb)	29	100	28.4	0	11.1	-	
	NO2(ppb)	30	99	41.0	0	23.6	-	
	NO2(ppb)	506	99	15.0	0	5.8	-	
	NO2(ppb)	508	100	18.4	0	6.2	-	
	CO(ppm)	1	99	0.4	0	0.3	-	
	CO(ppm)	7	100	1.0	0	0.3	-	
	CO(ppm)	8	100	0.1	0	0.1	-	
	CO(ppm)	18	100	0.2	0	0.2	-	
	CO2(ppm)	1	100	465.4	-	448.1	-	
	CO2(ppm)	8	100	450.5	-	445.0	-	
	CO2(ppm)	18	100	452.4	-	449.9	-	
	NH3(ppb)	1	93	0.0	0	0.0	-	
	NH3(ppb)	6	94	0.0	0	0.0	-	
	PM2.5(ug/m3)	1	100	52.0	0	12.8	0	
	PM2.5(ug/m3)	4	100	49.9	0	15.0	0	
	PM2.5(ug/m3)	6	100	23.0	0	12.0	0	
	PM2.5(ug/m3)	7	100	64.5	0	12.1	0	
	PM2.5(ug/m3)	8	100	18.5	0	5.4	0	
	PM2.5(ug/m3)	9	99	41.6	0	17.3	0	
	PM2.5(ug/m3)	13	100	23.8	0	11.8	0	
	PM2.5(ug/m3)	14	100	214.3	2	23.9	0	
	PM2.5(ug/m3)	17	100	10.5	0	6.3	0	
	PM2.5(ug/m3)	18	100	24.2	0	6.8	0	
	PM2.5(ug/m3)	21	100	21.6	0	8.1	0	
	PM2.5(ug/m3)	22	100	32.9	0	8.0	0	
	PM2.5(ug/m3)	23	100	46.7	0	16.2	0	
	PM2.5(ug/m3)	29	100	13.9	0	8.8	0	

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION  
MONTHLY AIR MONITORING SUMMARY

February 2023

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REPORT DATE


MONTH YEAR

02 2023

CONTINUOUS AMBIENT MONITORING

ONE-HOUR AVERAGE

24-HOUR AVERAGE

APPROVAL NUMBERS	PARAMETER	STN. NO.	% TIME OPERATIONAL	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
289664-00-00	PM2.5(ug/m3)	30	100	14.5	0	9.5	0
241311-00-00	WS(km/h)	1	100	-	-	-	-
20809-02-00	WS(km/h)	2	99	-	-	-	-
149968-01-00	WS(km/h)	4	97	-	-	-	-
237382-00-00	WS(km/h)	5	100	-	-	-	-
48522-01-00	WS(km/h)	6	92	-	-	-	-
240008-00-00	WS(km/h)	7	100	-	-	-	-
48263-01-00	WS(km/h)	8	100	-	-	-	-
224816-00-00	WS(km/h)	9	100	-	-	-	-
151469-01-00	WS(km/h)	11	100	-	-	-	-
189942-00-00	WS(km/h)	13	99	-	-	-	-
206355-00-00	WS(km/h)	14	99	-	-	-	-
46586-00-00	WS(km/h)	17	100	-	-	-	-
73203-02-00	WS(km/h)	18	100	-	-	-	-
216466-01-00	WS(km/h)	19	99	-	-	-	-
137467-01-00	WS(km/h)	20	95	-	-	-	-
236394-00-00	WS(km/h)	21	100	-	-	-	-
254465-00-00	WS(km/h)	22	100	-	-	-	-
094-03-00	WS(km/h)	23	99	-	-	-	-
80105-01-00	WS(km/h)	25	0	-	-	-	-
318401-00-00	WS(km/h)	26	100	-	-	-	-
026-03-00	WS(km/h)	27	100	-	-	-	-
364232-00-00	WS(km/h)	29	99	-	-	-	-
228044-00-00	WS(km/h)	30	99	-	-	-	-
247548-00-00	WS(km/h)	506	99	-	-	-	-
231302-00-00	WS(km/h)	508	99	-	-	-	-
153125-01-00							
							
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 FEBRUARY 2023**

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

March 31, 2023



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY - BERTHA GANTER (AMS01)  
FEBRUARY 2023

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	616	31	56	96.28	77.5	0	6.8	0
H2S(ppb) Average	634	35	38	99.55	3.1	0	1.2	0
TRS(ppb) Average	635	34	37	99.55	3.6	0	1.7	0
THC(ppm) Average	634	35	38	99.55	4.1	-	3.2	-
NMHC(ppm) Average	634	35	38	99.55	0.375	-	0.192	-
CH4(ppm) Average	634	35	38	99.55	3.8	-	3	-
O3 (ppb) Average	637	31	35	99.4	38.8	0	28.7	-
NO2 (ppb) Average	636	33	36	99.55	37.8	0	28.8	-
NO (ppb) Average	636	33	36	99.55	101.4	-	44.8	-
NOX (ppb) Average	636	33	36	99.55	139.2	-	73.7	-
NH3 (ppb) Average	580	46	92	93.15	0	0	0	-
PM2.5 (ug/m3) Average	669	1	3	99.7	52	0	12.8	0
CO(ppm) Average	629	33	43	98.51	0.4	0	0.3	0
CO2(ppm) Average	637	32	35	99.55	465.4	0	448.1	0
Temperature 2 m (C) Average	672	0	0	100	3.5	-	-1.8	-
Temperature 10 m (C) Average	671	0	1	99.85	3.6	-	-1.6	-
Relative Humidity (%) Average	672	0	0	100	95.1	-	89.1	-
Wind Speed 10 m (km/h) Average	670	0	2	99.7	30	-	14	-
Wind Direction 10 m (deg) Average	670	0	2	99.7	-	-	-	-
Precipitation (mm) Total	588	0	84	87.5	1.3	-	7.9	-
Leaf Wetness (% of range) Average	670	0	2	99.7	88.6	-	14.1	-
Global Solar Radiation (W/m2) Average	672	0	0	100	461.2	-	118.3	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER FORT MCKAY (AMS01)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	616	1.25	4.3	-	0	0	0.1	0.2	0.8	2.8	77.5
H2S (ppb) Average	634	0.39	0.4	-	0	0.1	0.1	0.2	0.5	1	3.1
TRS (ppb) Average	635	0.7	0.4	-	0.3	0.4	0.5	0.5	0.7	1.3	3.6
THC (ppm) Average	634	2.3	0.3	-	2	2	2.1	2.2	2.4	2.7	4.1
NMHC(ppm) Average	634	0.057	0.067	-	0	0	0	0	0.1	0.2	0.375
CH4(ppm) Average	634	2.25	0.3	-	2	2	2.1	2.2	2.3	2.5	3.8
O3 (ppb) Average	637	15.62	10.9	-	0.3	0.9	4.7	15.9	24.6	29.4	38.8
NO2 (ppb) Average	636	16.2	9.6	-	0	3.7	8.3	15.5	24.2	30.1	37.8
NO (ppb) Average	636	8.71	15.7	-	0	0	0	2.1	10.8	25.1	101.4
NOX (ppb) Average	636	24.9	22.5	-	0	4.1	10.2	18.1	32.9	54.2	139.2
NH3 (ppb) Average	580	0	0	-	0	0	0	0	0	0	0
PM2.5 (ug/m3) Average	669	6.67	4.9	-	0.5	2.3	3.6	5.5	8.1	11.8	52
CO(ppm) Average	629	0.2	0	-	0.1	0.2	0.2	0.2	0.2	0.3	0.4
CO2(ppm) Average	637	435.68	8.8	-	414.8	425.3	430.2	434.2	440.2	448.6	465.4
Temperature 2 m (C) Average	672	-16.44	9.2	-	-38.2	-30.3	-23.2	-16.1	-9.4	-5.8	3.5
Temperature 10 m (C) Average	671	-16.14	8.9	-	-36.6	-29.1	-22.3	-15.7	-9.5	-5.6	3.6
Relative Humidity (%) Average	672	72.98	10.3	-	43.5	59.3	67	73.2	80.7	85.6	95.1
Wind Speed 10 m (km/h) Average	670	5.9	4	-	0	2	3	5	8	12	30
Wind Direction 10 m (deg) Average	670	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	588	-	-	20.29	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	670	2.97	6.2	-	0	0	0	1	4.8	6.6	88.6
Global Solar Radiation (W/m2) Average	672	63.22	109.9	-	0	0	0	0	85.4	251.6	461.2

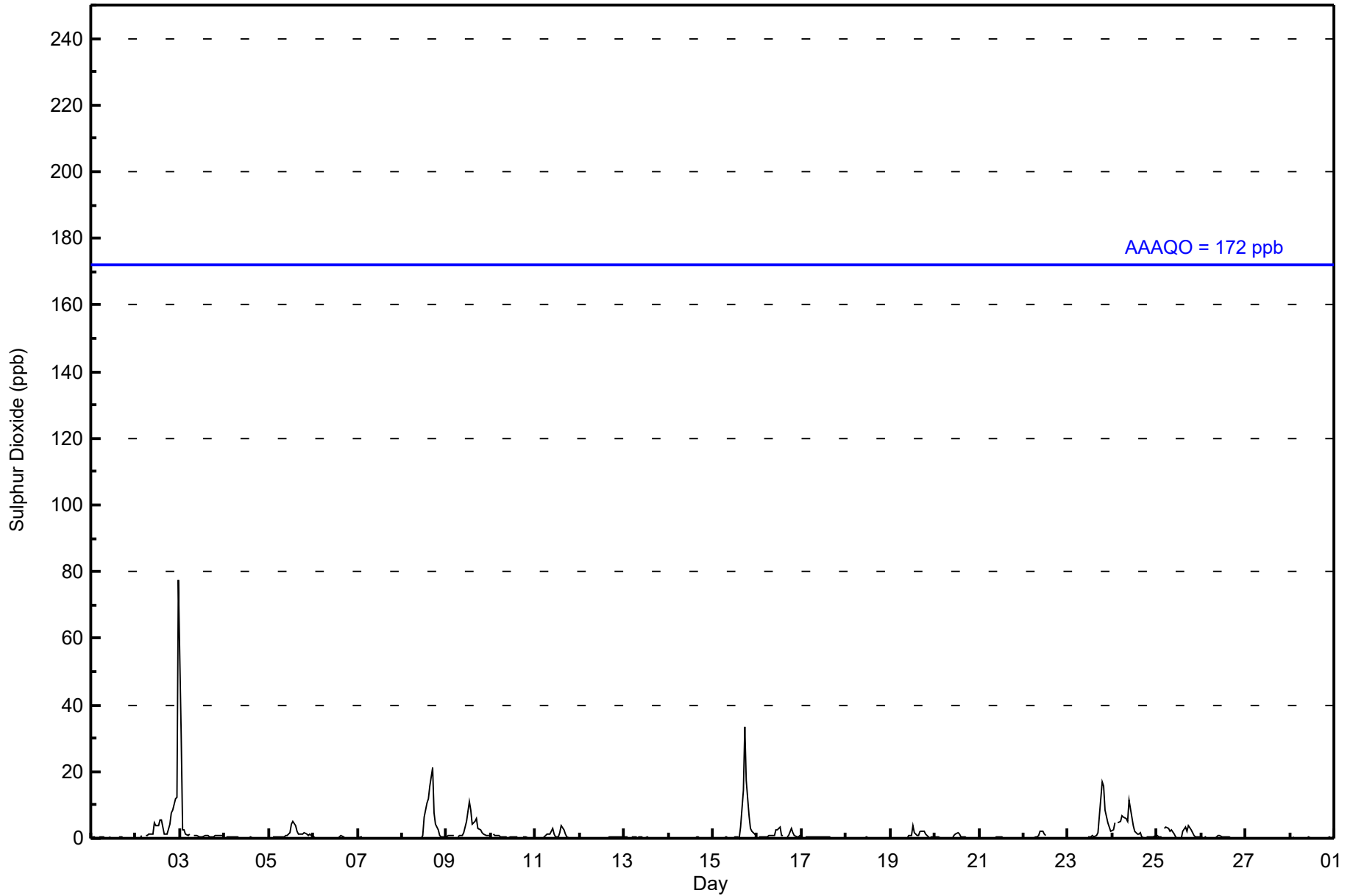
WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER FORT MCKAY (AMS01)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	10 Feb 2023 16:00	10 Feb 2023 17:00	2	Station power failure
ALL GASEOUS ANALYZERS (except NH3)	16 Feb 2023 16:00	16 Feb 2023 16:00	1	Maintenance - sample manifold cleaned
SO2	22 Feb 2023 14:00	23 Feb 2023 10:00	21	Unstable Operation - flatline in analyzer output signal
SO2	23 Feb 2023 11:00	23 Feb 2023 11:00	1	Maintenance - analyzer rebooted
O3	23 Feb 2023 11:00	23 Feb 2023 11:00	1	Maintenance - reinitiated daily QA check
NH3	01 Feb 2023 02:00	28 Feb 2023 05:00	28	Stabilization after daily QA check
NH3	15 Feb 2023 13:00	15 Feb 2023 13:00	1	Unstable Operation - excessive baseline noise
NH3	16 Feb 2023 23:00	17 Feb 2023 12:00	14	Maintenance - stabilization post analyzer replacement
NH3	24 Feb 2023 05:00	24 Feb 2023 05:00	1	Unstable Operation - excessive baseline noise
CO	10 Feb 2023 18:00	11 Feb 2023 00:00	7	Stabilization after station power outage
Temperature 10 m	13 Feb 2023 06:00	13 Feb 2023 06:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	15 Feb 2023 20:00	15 Feb 2023 21:00	2	Flat line in sensor output signal - Sensor frozen
Precipitation Collector	08 Feb 2023 15:00	08 Feb 2023 15:00	1	Maintenance - bucket emptied
Precipitation Collector	10 Feb 2023 16:00	10 Feb 2023 16:00	1	DAS Failure - data not recorded
Precipitation Collector	20 Feb 2023 01:00	23 Feb 2023 10:00	82	DAS Failure - data not recorded
Surface Leaf Wetness	11 Feb 2023 13:00	11 Feb 2023 14:00	2	Sensor operated out of range



Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														672							
Maximum Value: 77.5 ppb on Feb 3 00:00		Maximum Daily Average: 6.8 ppb on Feb 2		Hours of Data:														616									
Minimum Value: 0.0 ppb on Feb 1 20:00		Minimum Daily Average: 0.0 ppb on Feb 18		Hours of Missing Data:														56									
Maximum Diurnal Average: 3.2 ppb at hour 24		Minimum Diurnal Average: 0.4 ppb at hour 3		Hours of Calibration:														31									
Monthly Average: 1.25 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> = 0.8 P <sub>90</sub> = 2.8 P <sub>99</sub> = 15.8		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-Feb	0.3	0.4	0.3	Z	0.3	0.2	0.3	0.2	0.1	0.1	0.2	C	C	C	C	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	
2-Feb	0.0	0.0	0.0	0.6	Z	0.8	1.0	1.5	1.4	1.1	4.6	3.8	3.6	5.4	5.7	1.4	1.3	1.4	4.3	7.7	8.5	11.7	12.3	77.5	6.8	77.5	
3-Feb	30.8	2.6	2.7	1.4	1.0	1.2	Z	0.9	1.0	0.9	0.6	0.5	0.6	0.9	0.9	0.8	0.5	0.6	0.6	0.8	0.9	0.8	0.7	0.7	2.3	30.8	
4-Feb	Z	0.5	0.6	0.5	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.6	
5-Feb	0.4	Z	0.3	0.5	0.4	0.3	0.4	0.5	0.6	0.8	0.7	1.7	4.2	5.0	3.8	2.1	1.4	1.4	1.3	1.7	1.3	0.8	1.5	1.0	1.4	5.0	
6-Feb	0.3	0.2	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.5	0.7	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7	
7-Feb	0.2	0.3	0.4	Z	0.1	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	0.0	0.0	0.1	0.4	
8-Feb	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.7	6.5	10.6	11.9	15.7	21.1	7.8	4.2	2.6	0.9	0.5	0.5	0.4	3.6	21.1	
9-Feb	0.6	0.9	0.8	0.7	0.8	Z	0.6	0.8	1.0	1.9	3.5	5.1	11.1	8.3	4.3	5.0	5.8	3.0	2.4	1.6	1.2	1.0	1.0	1.0	2.7	11.1	
10-Feb	Z	1.2	0.9	0.8	0.7	0.5	0.3	0.2	0.3	0.2	0.3	0.3	0.2	0.3	0.3	PF	PF	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.4	1.2	
11-Feb	0.2	Z	0.2	0.2	0.2	0.3	1.1	1.2	1.4	3.0	1.2	0.6	0.6	1.7	3.6	2.5	1.1	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.9	3.6	
12-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.4	0.3	0.4	0.5	0.5	0.4	0.3	0.2	0.5	
13-Feb	0.3	0.5	0.4	Z	0.4	0.3	0.2	0.2	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	0.2	0.5	
14-Feb	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.2	
15-Feb	0.0	0.0	0.0	0.0	0.1	Z	0.4	0.2	0.1	0.0	0.0	0.1	0.4	0.3	0.2	3.3	14.2	33.6	17.6	6.9	2.8	2.1	1.6	0.7	3.7	33.6	
16-Feb	Z	0.6	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7	2.7	2.4	3.3	1.0	0.8	M	0.5	0.8	2.9	1.8	0.7	0.5	0.6	0.7	1.1	3.3	
17-Feb	0.6	Z	0.5	0.5	0.5	0.5	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.3	0.4	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.6	
18-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.3	
19-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	1.1	1.0	3.7	1.6	0.9	1.0	2.1	2.1	2.2	1.5	0.4	0.2	0.5	0.5	0.8	3.7	
20-Feb	0.3	0.2	0.3	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.7	1.4	1.8	1.1	0.4	0.3	0.3	0.2	0.0	0.1	0.0	0.0	0.1	0.1	0.3	1.8	
21-Feb	0.1	0.2	0.1	0.2	0.1	Z	0.2	0.2	0.1	0.3	0.3	0.3	0.5	0.2	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.5	
22-Feb	Z	0.1	0.1	0.1	0.2	0.1	0.3	0.5	1.0	2.3	1.9	1.1	0.7	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	2.3	
23-Feb	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	0.3	0.3	0.8	0.6	0.9	1.8	6.8	17.0	15.8	8.3	4.7	3.5	2.0	--	17.0	
24-Feb	2.6	4.6	Z	4.8	5.1	6.6	6.5	5.8	5.0	11.4	6.4	3.9	2.1	1.2	1.2	1.8	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.7	3.1	11.4	
25-Feb	0.7	0.6	0.5	Z	2.8	3.3	3.0	2.0	2.4	1.3	0.3	0.2	0.2	0.2	2.0	3.2	2.0	3.9	2.7	1.6	0.9	0.6	0.6	0.4	1.5	3.9	
26-Feb	0.5	0.2	0.2	0.2	Z	0.1	0.1	0.2	0.5	0.8	0.6	0.5	0.4	0.3	0.4	0.2	0.2	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.3	0.8	
27-Feb	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	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2
28-Feb	Z	0.3	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	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.5	0.2	0.3	0.1	0.5
		1.7	0.6	0.4	0.5	0.6	0.7	0.6	0.6	0.6	1.0	1.0	0.9	1.5	1.5	1.5	1.6	2.1	2.4	2.1	1.6	1.0	0.9	0.9	3.2	Diurnal Average	
		30.8	4.6	2.7	4.8	5.1	6.6	6.5	5.8	5.0	11.4	6.4	5.1	11.1	10.6	11.9	15.7	21.1	33.6	17.6	15.8	8.5	11.7	12.3	77.5	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance				UO - Unstable Operation				PF - Power 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**  
**Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	601	97.56	97.56
11 - 20	11	1.79	99.35
21 - 60	3	0.49	99.84
61 - 110	1	0.16	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 616

Total Number of Hours: 672



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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Fort McKay - Bertha Ganter - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	124	66	32	29	11	6	11	44	81	36	11	21	30	25	36	36	599
11 - 20	0	0	0	0	0	0	0	5	4	1	0	0	0	0	1	0	11
21 - 60	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	3
61 - 110	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
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>	124	66	32	29	11	6	11	51	87	37	11	21	30	25	37	36	614

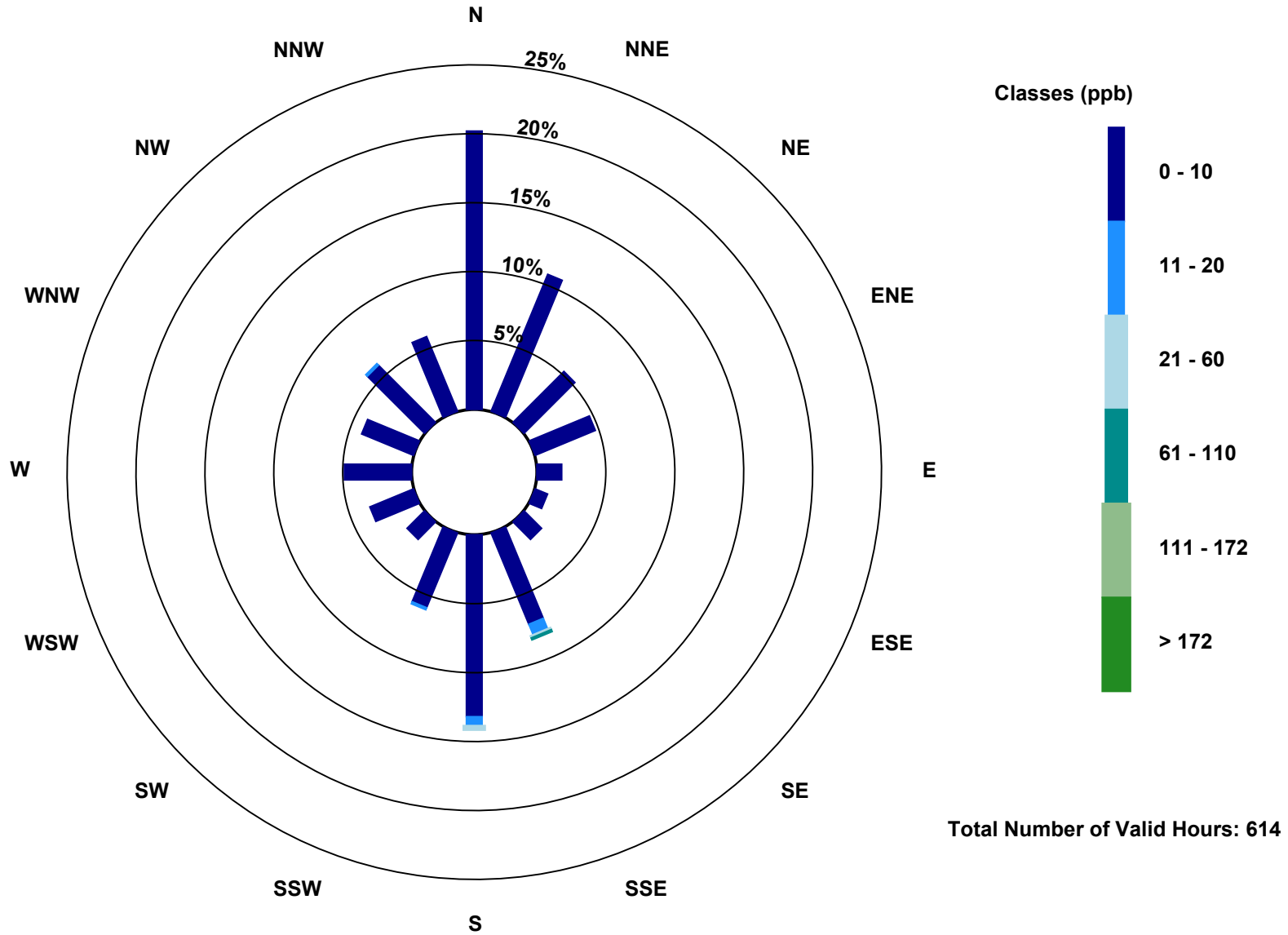
Total Number of Valid Hours: 614

Total Number of Hours: 672

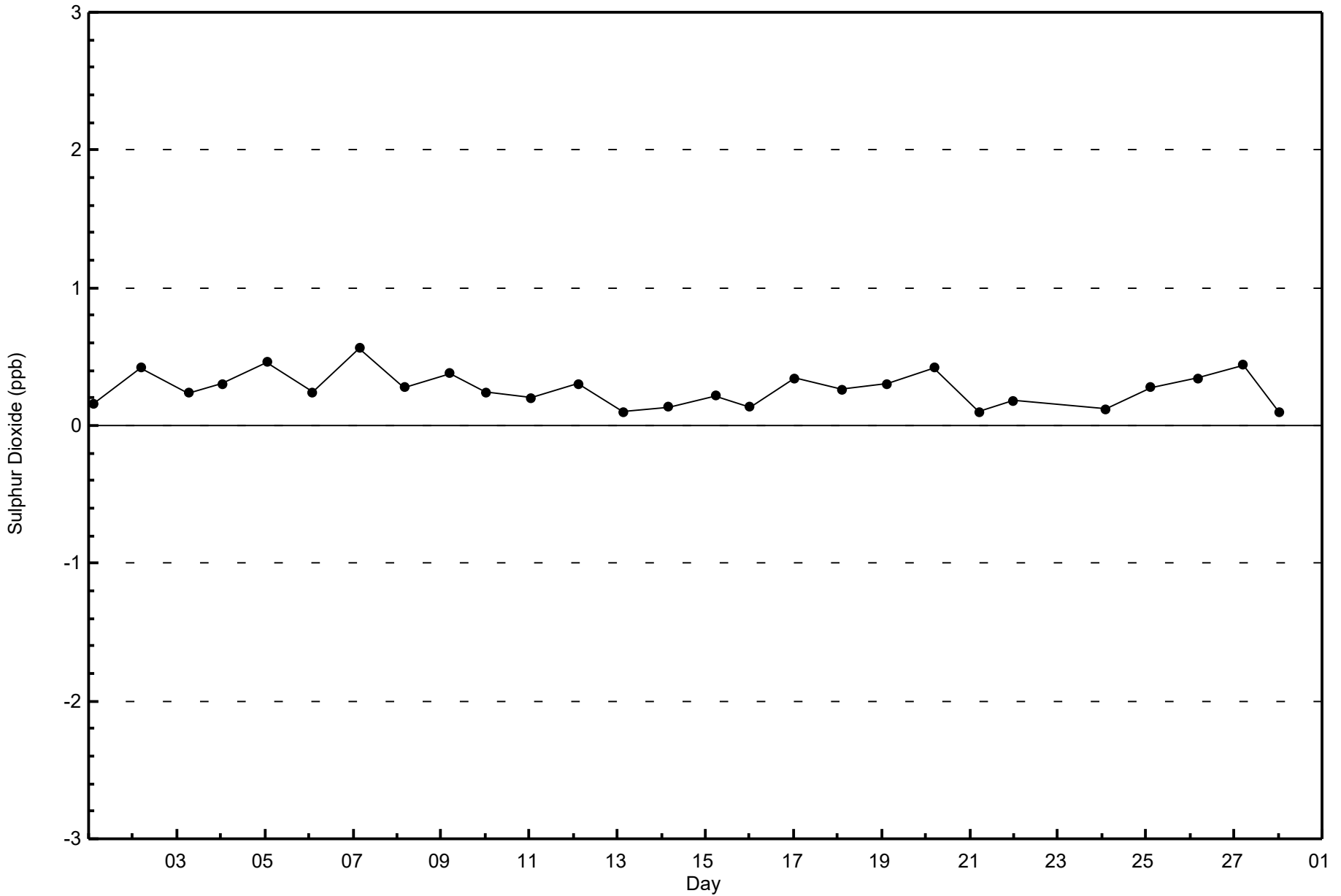


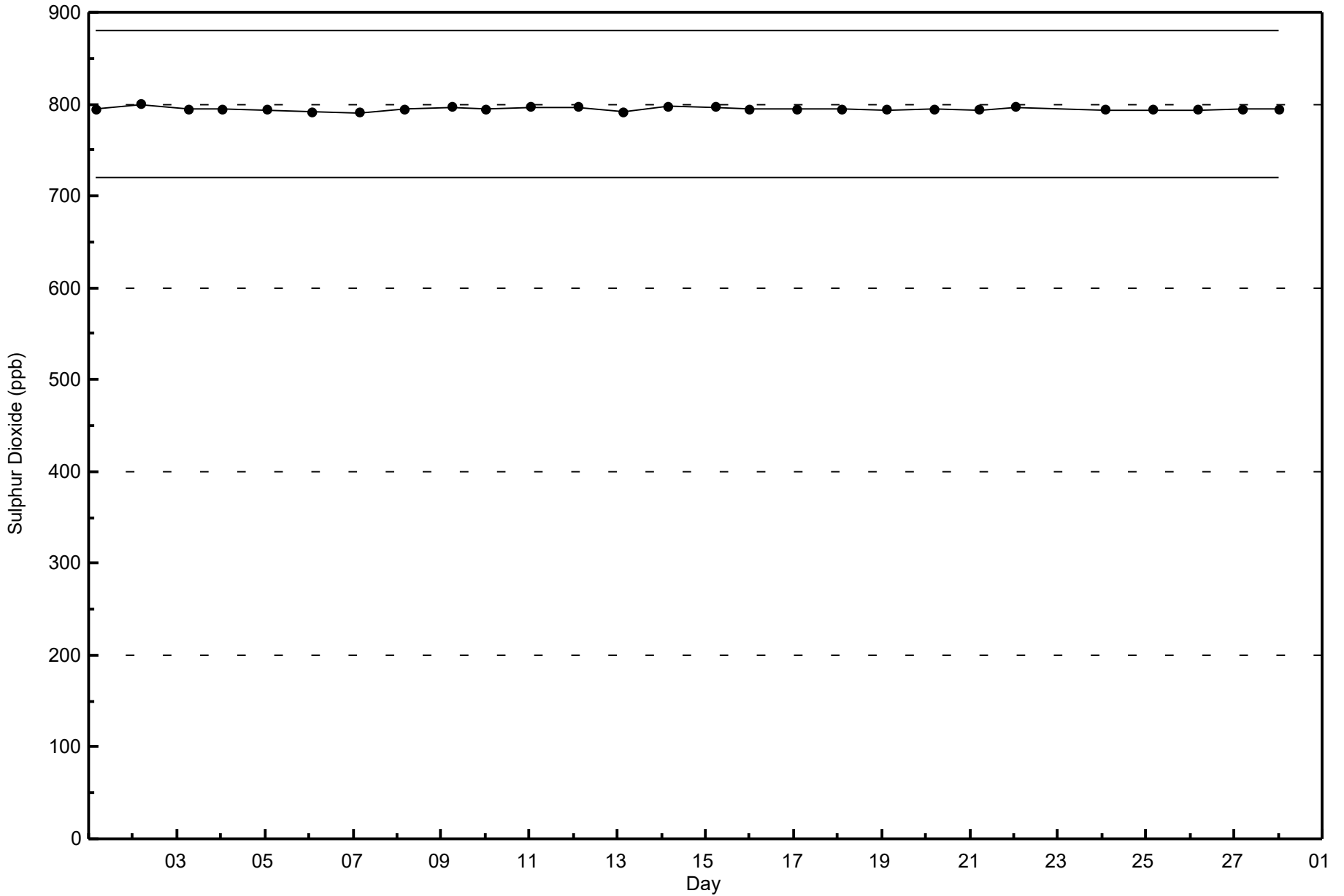
**Wood Buffalo Environmental Association**  
**Wind Rose Feb 2023**

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









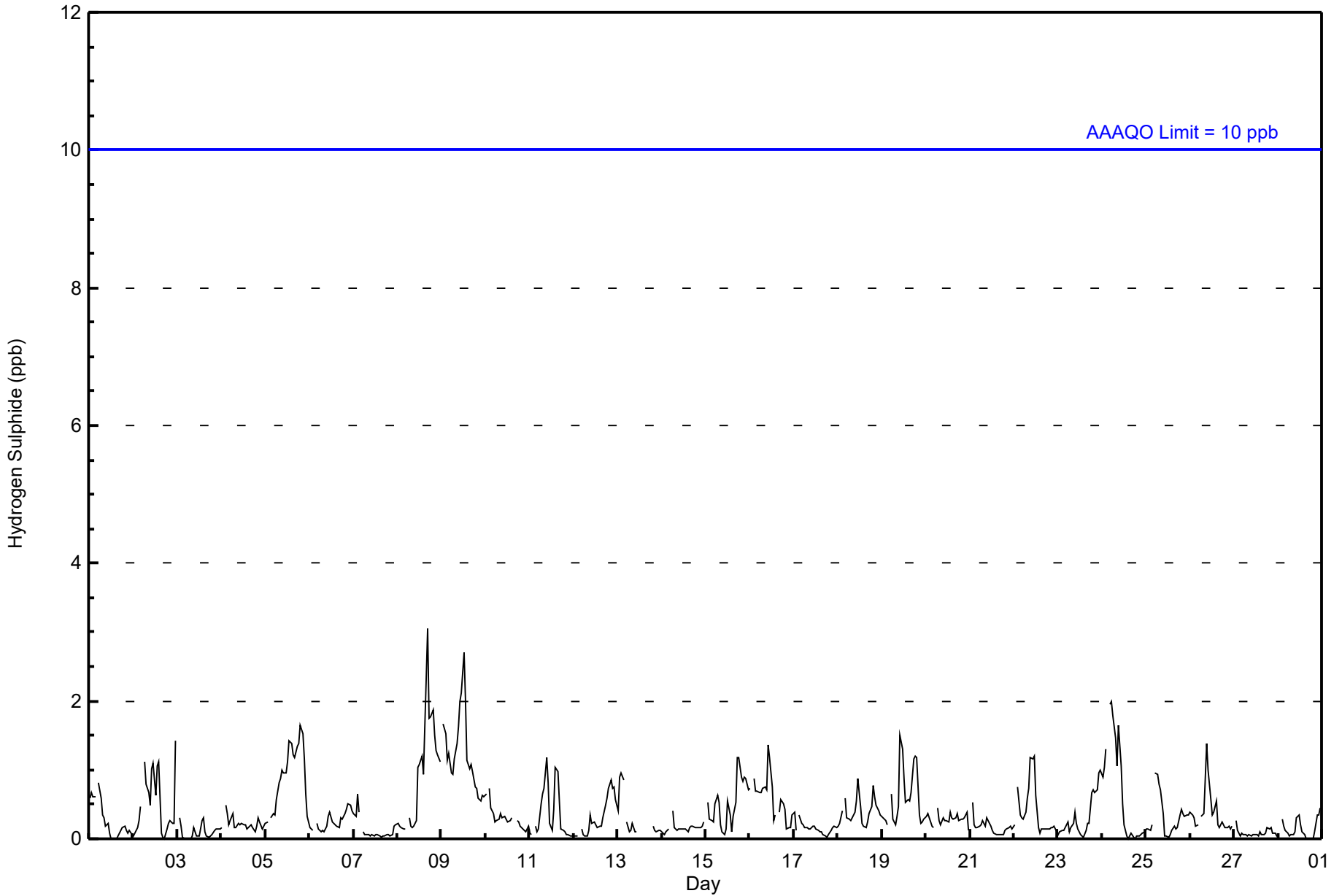


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	672					
Maximum Value: 3.1 ppb on Feb 8 17:00		Maximum Daily Average: 1.2 ppb on Feb 9																	Hours of Data:	634							
Minimum Value: 0.0 ppb on Feb 1 13:00		Minimum Daily Average: 0.1 ppb on Feb 27																	Hours of Missing Data:	38							
Maximum Diurnal Average: 0.5 ppb at hour 11		Minimum Diurnal Average: 0.3 ppb at hour 1																	Hours of Calibration:	35							
Monthly Average: 0.39 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> = 1.0 P <sub>99</sub> = 1.9																	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-Feb	0.6	0.7	0.6	0.6	Z	0.8	0.6	0.3	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.8		
2-Feb	0.0	0.1	0.2	0.3	0.5	Z	1.1	0.8	0.7	0.5	1.0	1.1	0.6	1.1	1.1	0.1	0.0	0.1	0.2	0.3	0.2	0.2	1.4	0.5	1.4		
3-Feb	Z	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.3	0.3	0.1	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.1	0.3		
4-Feb	0.2	Z	0.5	0.4	0.2	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.3	0.2	0.1	0.2	0.2	0.5		
5-Feb	0.2	0.2	Z	0.3	0.4	0.3	0.6	0.8	0.9	1.0	1.0	1.1	1.4	1.4	1.2	1.2	1.3	1.4	1.6	1.5	1.2	0.6	0.3	0.9	1.6		
6-Feb	0.2	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.4	0.3	0.5		
7-Feb	0.4	0.3	0.7	0.4	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.2	0.1	0.7	
8-Feb	0.2	0.2	0.2	0.1	0.1	Z	0.3	0.2	0.2	0.2	0.3	1.0	1.1	1.2	0.9	1.6	3.1	1.7	1.8	1.9	1.5	1.3	1.2	1.1	0.9	3.1	
9-Feb	Z	1.7	1.5	1.1	1.2	1.0	0.9	1.2	1.4	1.6	2.0	2.1	2.7	2.0	1.1	1.0	1.1	1.0	0.8	0.7	0.6	0.5	0.6	0.6	1.2	2.7	
10-Feb	0.7	Z	0.7	0.4	0.4	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	PF	PF	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.7	
11-Feb	0.1	0.1	Z	0.2	0.1	0.1	0.5	0.7	0.7	1.2	0.8	0.2	0.1	0.4	1.0	1.0	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.4	1.2	
12-Feb	0.0	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.6	0.7	0.9	0.7	0.7	0.6	0.3	0.9	
13-Feb	0.4	0.9	1.0	0.9	Z	0.2	0.1	0.1	0.2	0.1	0.1	C	C	C	C	C	C	C	C	0.2	0.1	0.1	0.1	0.1	--	1.0	
14-Feb	0.1	0.1	0.1	0.1	0.1	Z	0.4	0.2	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	0.4	0.4
15-Feb	Z	0.5	0.3	0.3	0.2	0.5	0.6	0.5	0.2	0.1	0.1	0.1	0.6	0.3	0.1	0.3	0.5	1.2	1.2	0.9	0.8	0.9	0.9	0.7	0.5	1.2	
16-Feb	0.7	Z	0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	1.4	1.2	0.7	0.3	0.3	M	0.4	0.6	0.5	0.4	0.1	0.2	0.2	0.3	0.6	1.4	
17-Feb	0.4	0.1	Z	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.4
18-Feb	0.2	0.2	0.4	Z	0.6	0.3	0.3	0.3	0.3	0.4	0.5	0.9	0.5	0.2	0.2	0.2	0.2	0.4	0.5	0.8	0.6	0.5	0.4	0.4	0.4	0.9	
19-Feb	0.3	0.3	0.3	0.2	Z	0.6	0.3	0.2	0.3	0.5	1.5	1.3	0.9	0.5	0.6	0.5	0.7	1.2	1.2	1.2	0.3	0.2	0.3	0.3	0.6	1.5	
20-Feb	0.3	0.4	0.3	0.2	0.2	Z	0.5	0.3	0.2	0.3	0.3	0.3	0.2	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.1	0.3	0.5	
21-Feb	Z	0.5	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.5	
22-Feb	0.2	Z	0.7	0.3	0.3	0.3	0.4	0.6	0.7	1.2	1.2	1.2	0.6	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.4	1.2	
23-Feb	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.4	0.2	0.1	0.1	0.0	0.1	0.2	0.2	0.7	0.7	0.7	0.7	0.9	1.0	0.3	1.0		
24-Feb	0.9	1.0	1.3	Z	1.9	2.0	1.8	1.5	1.1	1.6	1.1	0.5	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.7	2.0	
25-Feb	0.1	0.1	0.1	0.2	Z	1.0	0.9	0.8	0.7	0.4	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.2	0.4	0.4	0.4	0.3	0.3	0.4	0.3	1.0	
26-Feb	0.4	0.4	0.3	0.2	0.2	Z	0.3	0.4	0.9	1.4	1.0	0.6	0.3	0.4	0.6	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.4	1.4	
27-Feb	Z	0.3	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	0.2	0.1	0.2	0.1	0.1	0.0	0.1	0.3	
28-Feb	0.0	Z	0.3	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.1	0.4	
																								Diurnal Average			
																								Diurnal Maximum			
0.3 0.4 0.4 0.3 0.4 0.4 0.4 0.4 0.4 0.5 0.5 0.5 0.4 0.4 0.4 0.3 0.4 0.4 0.4 0.4 0.4 0.4 0.3 0.3 0.4 0.4																											
0.9 1.7 1.5 1.1 1.9 2.0 1.8 1.5 1.4 1.6 2.0 2.1 2.7 2.0 1.4 1.6 3.1 1.7 1.8 1.9 1.5 1.3 1.2 1.4																											
Z - zerospan 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**  
**Hourly Averages**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Fort McKay - Bertha Ganter - February 2023**





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

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	632	99.68	99.68
3 - 4	2	0.32	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: 634

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Fort McKay - Bertha Ganter - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	116	67	37	30	12	5	13	51	83	39	14	23	34	30	37	39	630
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>	116	67	37	30	12	5	13	51	85	39	14	23	34	30	37	39	632

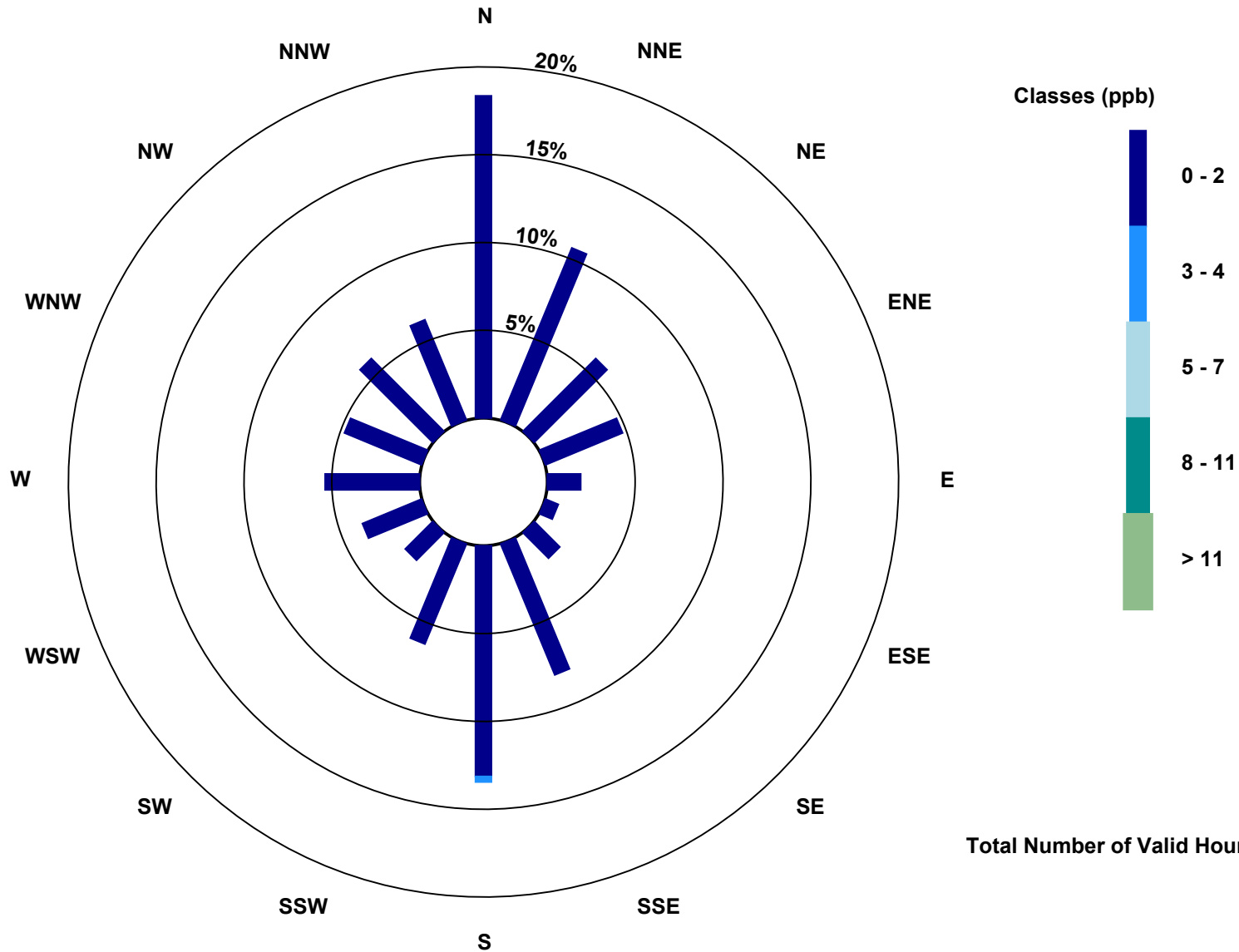
Total Number of Valid Hours: 632

Total Number of Hours: 672

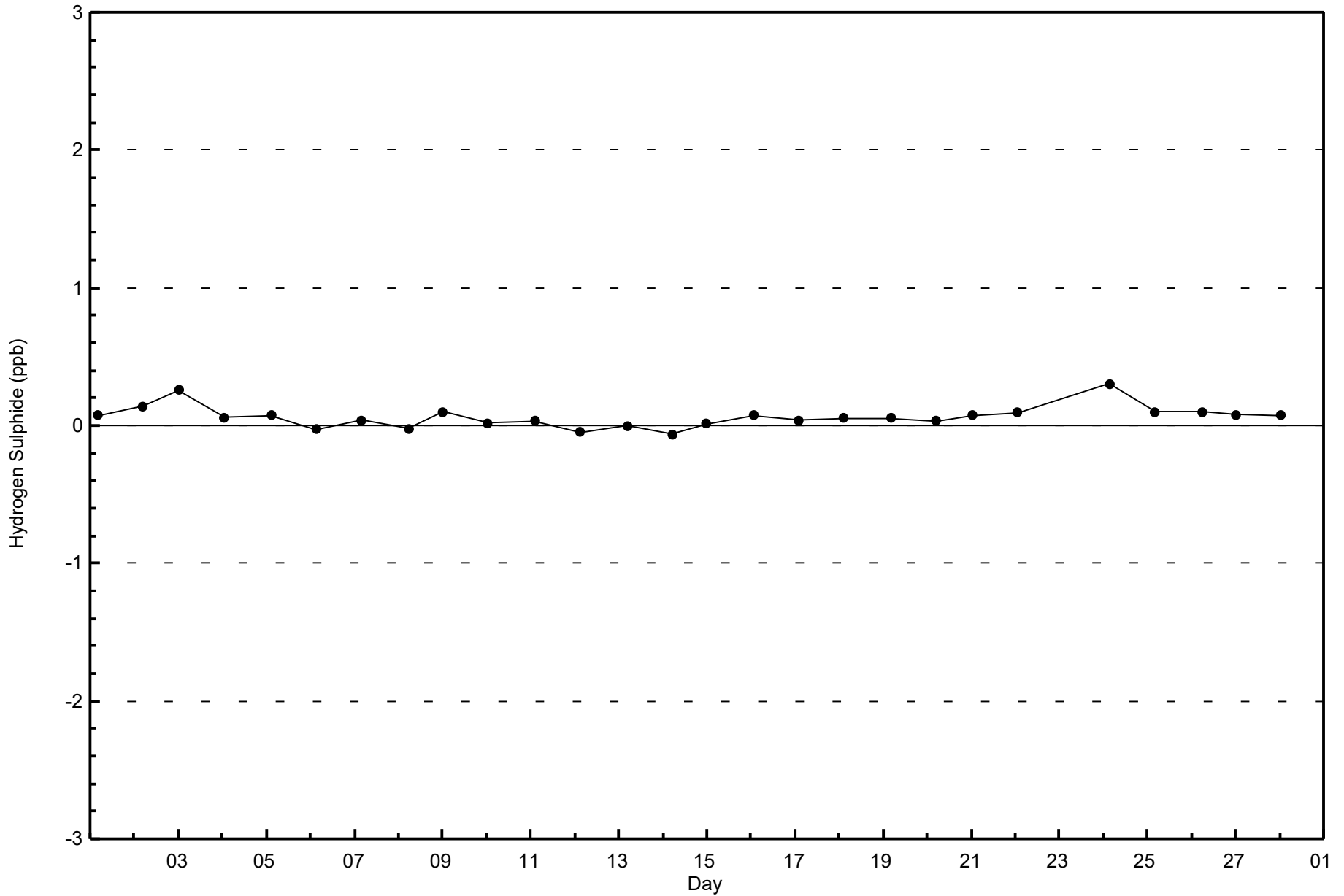


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

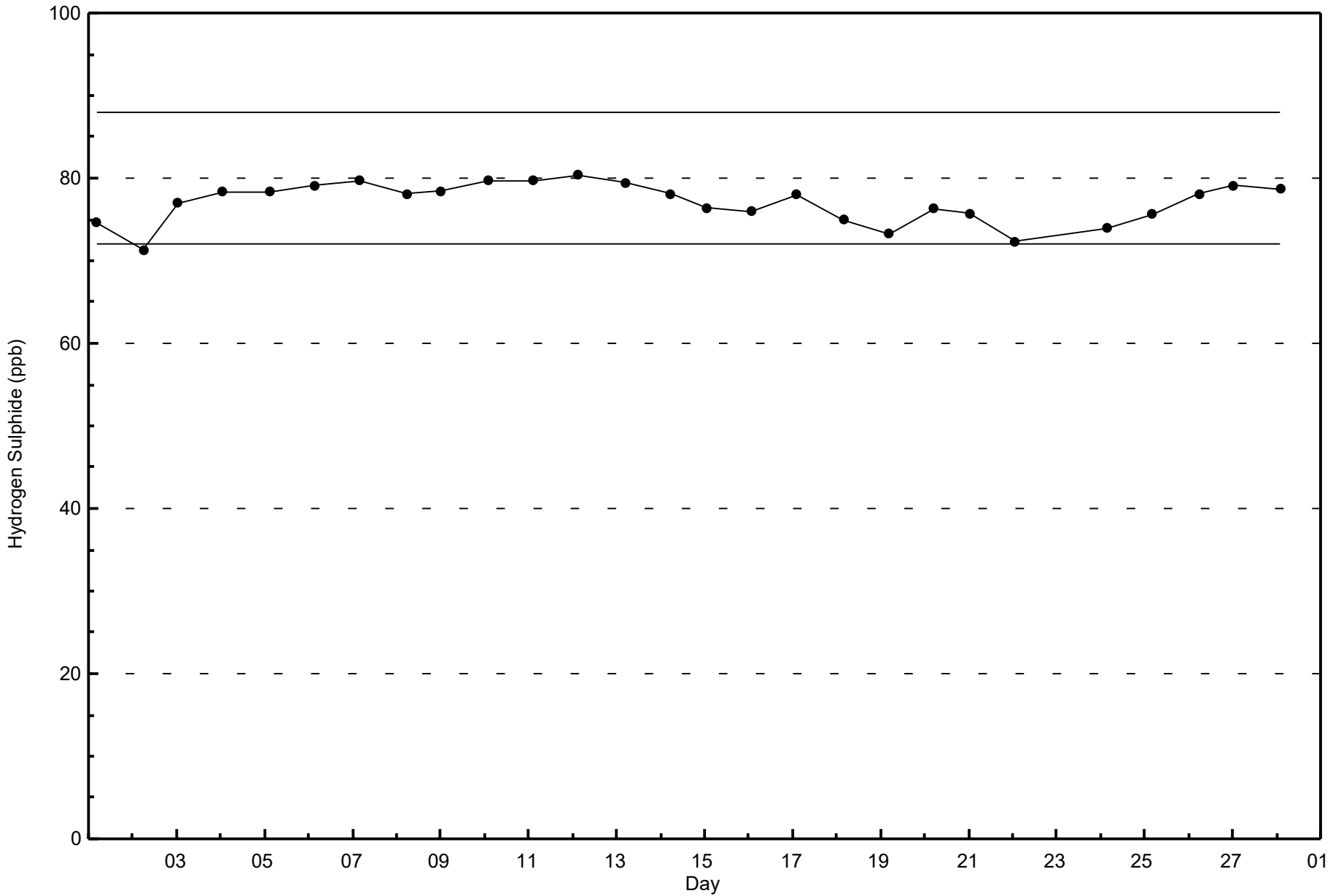
Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Fort McKay - Bertha Ganter



Total Number of Valid Hours: 632







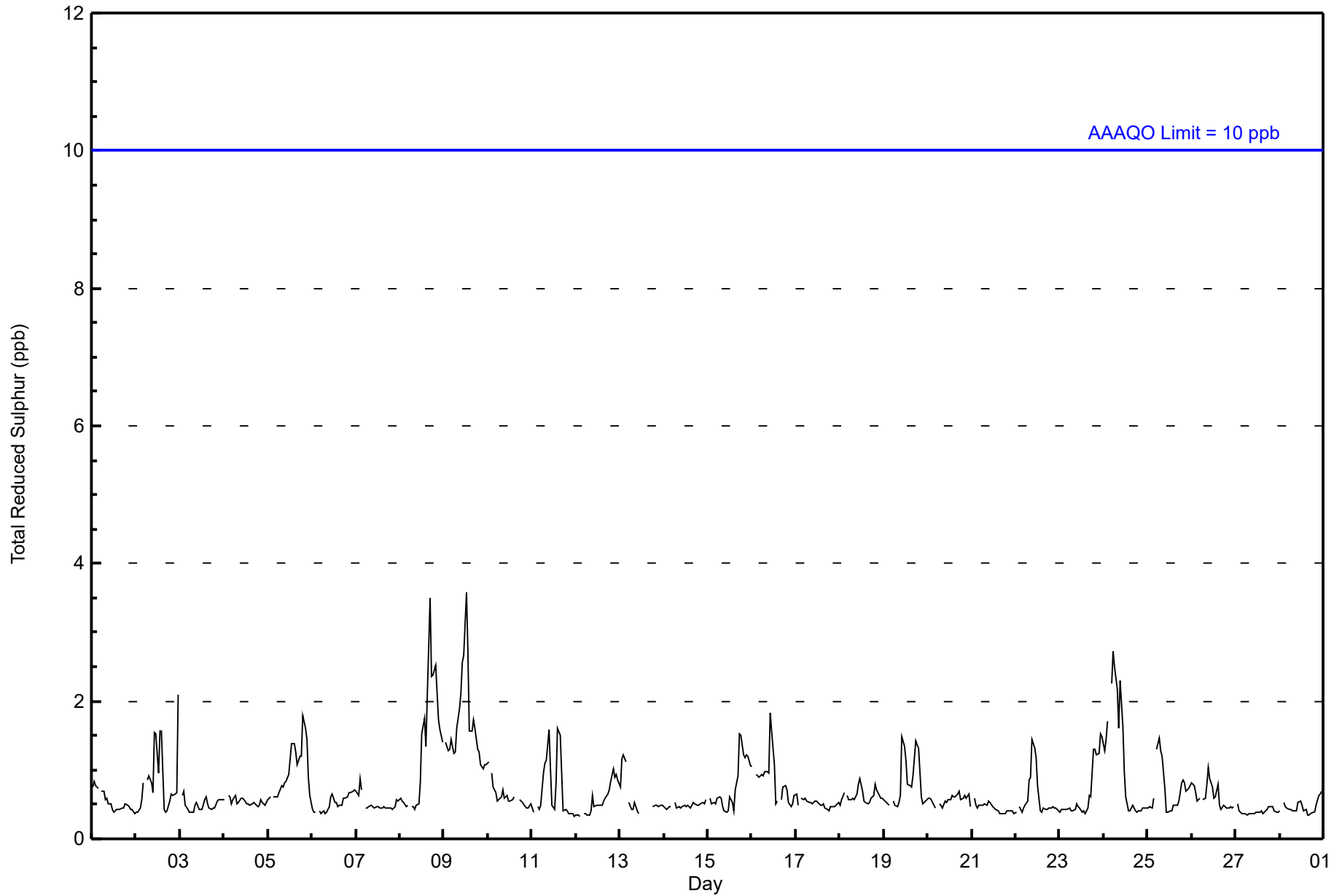


Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														672									
Maximum Value: 3.6 ppb on Feb 9 13:00		Maximum Daily Average: 1.7 ppb on Feb 9														Hours of Data:		635											
Minimum Value: 0.3 ppb on Feb 12 03:00		Minimum Daily Average: 0.4 ppb on Feb 27														Hours of Missing Data:		37											
Maximum Diurnal Average: 0.8 ppb at hour 11		Minimum Diurnal Average: 0.6 ppb at hour 4														Hours of Calibration:		34											
Monthly Average: 0.70 ppb		Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 0.5 Median = 0.5 Q <sub>3</sub> = 0.7 P <sub>90</sub> = 1.3 P <sub>99</sub> = 2.5														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-Feb	0.7	0.8	0.8	0.7	Z	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.8			
2-Feb	0.4	0.4	0.4	0.6	0.8	Z	0.9	0.9	0.8	0.7	1.5	1.5	1.0	1.6	1.6	0.4	0.4	0.4	0.5	0.6	0.6	0.7	0.7	2.1	0.8	2.1			
3-Feb	Z	0.6	0.7	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.5	0.7			
4-Feb	0.6	Z	0.6	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6			
5-Feb	0.6	0.6	Z	0.6	0.6	0.6	0.7	0.8	0.8	0.8	0.8	0.9	1.2	1.4	1.4	1.3	1.1	1.2	1.2	1.8	1.6	1.4	0.9	0.6	1.0	1.8			
6-Feb	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.5	0.7			
7-Feb	0.7	0.6	0.9	0.7	Z	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.6	0.6	0.5	0.9			
8-Feb	0.6	0.5	0.5	0.5	0.5	Z	0.5	0.5	0.4	0.5	0.5	0.8	1.5	1.8	1.3	2.1	3.5	2.4	2.4	2.5	2.1	1.7	1.6	1.4	1.3	3.5			
9-Feb	Z	1.4	1.3	1.3	1.4	1.2	1.3	1.6	1.9	2.1	2.6	2.7	3.6	2.7	1.6	1.6	1.7	1.6	1.3	1.3	1.1	1.0	1.1	1.1	1.7	3.6			
10-Feb	1.1	Z	0.9	0.8	0.7	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	PF	PF	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	1.1			
11-Feb	0.4	0.4	Z	0.5	0.4	0.5	1.0	1.1	1.1	1.6	1.0	0.5	0.4	0.8	1.6	1.5	1.0	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.7	1.6			
12-Feb	0.4	0.3	0.3	Z	0.4	0.4	0.3	0.4	0.4	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.8	1.0	0.9	0.9	0.8	0.6	1.0			
13-Feb	0.8	1.2	1.2	1.1	Z	0.5	0.4	0.4	0.5	0.4	0.4	C	C	C	C	C	C	C	0.5	0.5	0.5	0.5	0.5	0.5	--	1.2			
14-Feb	0.5	0.4	0.4	0.5	0.5	Z	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.6			
15-Feb	Z	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.6	0.5	0.4	0.7	0.9	1.5	1.5	1.2	1.2	1.2	1.2	1.0	0.8	1.5			
16-Feb	1.1	Z	0.9	0.9	0.9	0.9	0.9	1.0	1.0	0.9	1.8	1.6	1.1	0.5	0.5	M	0.6	0.7	0.8	0.7	0.5	0.5	0.5	0.6	0.9	1.8			
17-Feb	0.6	0.5	Z	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6			
18-Feb	0.5	0.6	0.7	Z	0.6	0.6	0.6	0.6	0.6	0.7	0.8	0.9	0.7	0.6	0.5	0.5	0.5	0.6	0.6	0.8	0.7	0.7	0.6	0.6	0.6	0.9			
19-Feb	0.6	0.5	0.5	0.5	Z	0.6	0.5	0.5	0.5	0.6	1.5	1.3	1.1	0.8	0.8	0.8	0.9	1.4	1.4	1.3	0.6	0.5	0.5	0.5	0.8	1.5			
20-Feb	0.6	0.6	0.6	0.5	0.4	Z	0.5	0.5	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.5	0.6	0.7			
21-Feb	Z	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6			
22-Feb	0.4	Z	0.5	0.4	0.4	0.5	0.5	0.8	0.9	1.4	1.3	1.2	0.8	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.4	0.6	1.4			
23-Feb	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.6	0.6	1.3	1.3	1.2	1.2	1.5	1.5	0.7	1.5			
24-Feb	1.3	1.4	1.7	Z	2.3	2.7	2.5	2.2	1.6	2.3	1.6	1.0	0.6	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1.1	2.7			
25-Feb	0.5	0.5	0.4	0.6	Z	1.3	1.5	1.3	1.2	0.7	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.8	0.9	0.8	0.7	0.7	0.8	0.7	1.5			
26-Feb	0.8	0.8	0.7	0.5	0.6	Z	0.6	0.6	0.8	1.0	0.9	0.7	0.6	0.6	0.8	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.6	1.0			
27-Feb	Z	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	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5			
28-Feb	0.4	Z	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.5	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.6	0.7	0.5	0.7			
																								Diurnal Average		0.6			
																								Diurnal Maximum		1.3			
Z - zerospan																								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**  
**Hourly Averages**

**Total Reduced Sulphur (TRS) - ppb**  
**Fort McKay - Bertha Ganter - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	627	98.74	98.74
3 - 4	8	1.26	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: 635

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Fort McKay - Bertha Ganter - February 2023**

<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	117	67	37	30	12	5	13	51	78	39	14	23	33	30	37	39	625
3 - 4	0	0	0	0	0	0	0	0	7	0	0	0	1	0	0	0	8
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>	117	67	37	30	12	5	13	51	85	39	14	23	34	30	37	39	633

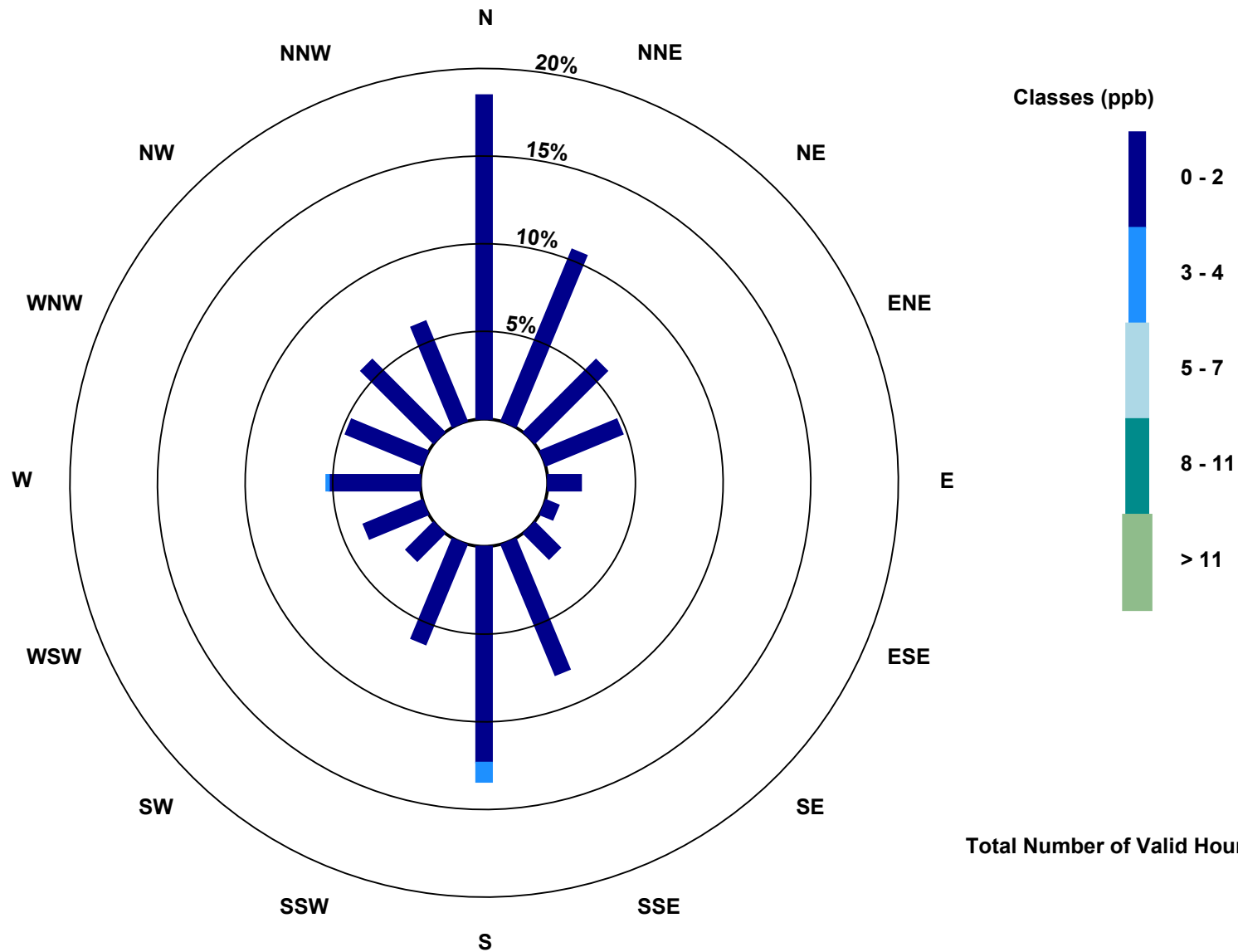
Total Number of Valid Hours: 633

Total Number of Hours: 672

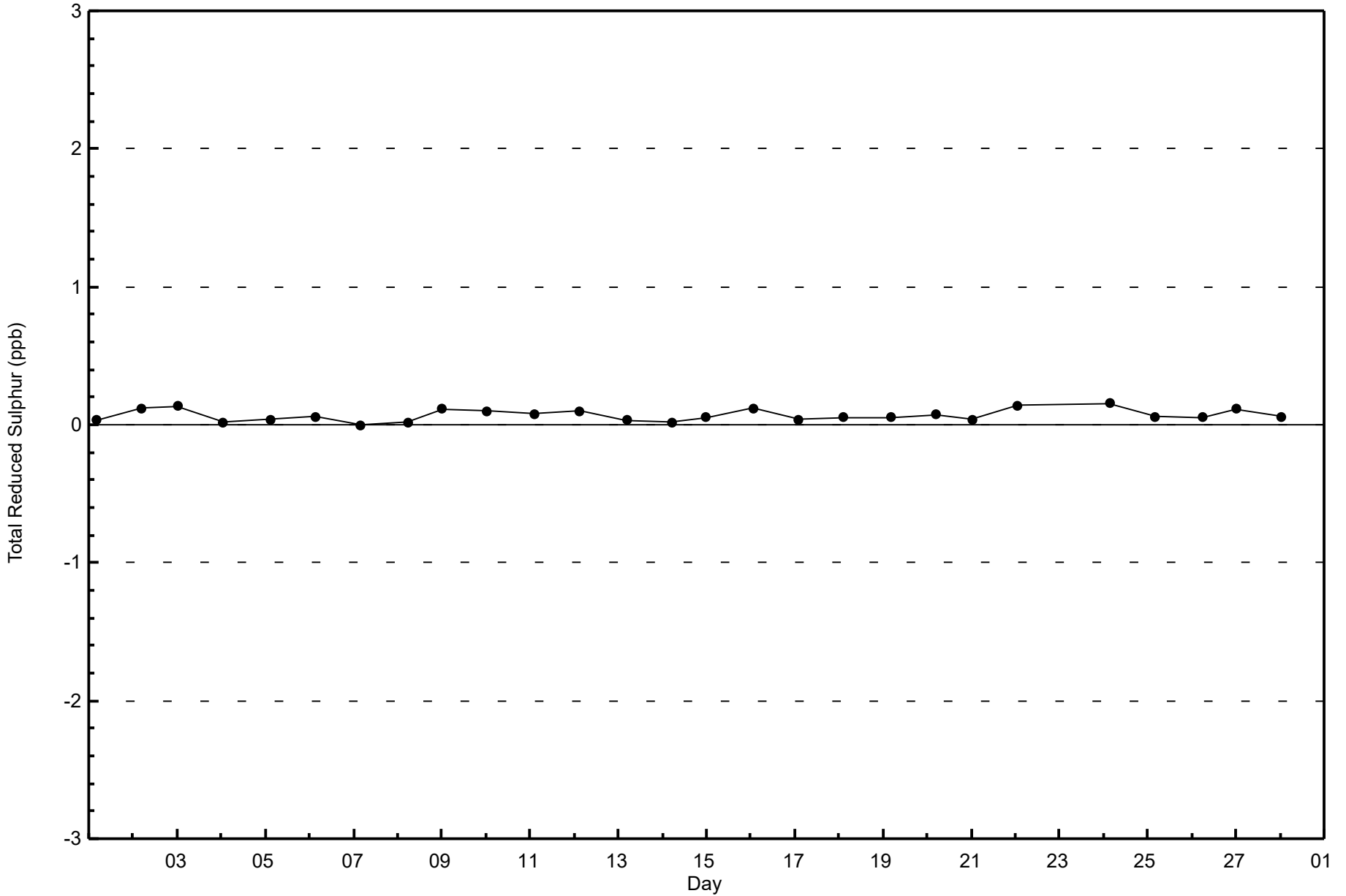


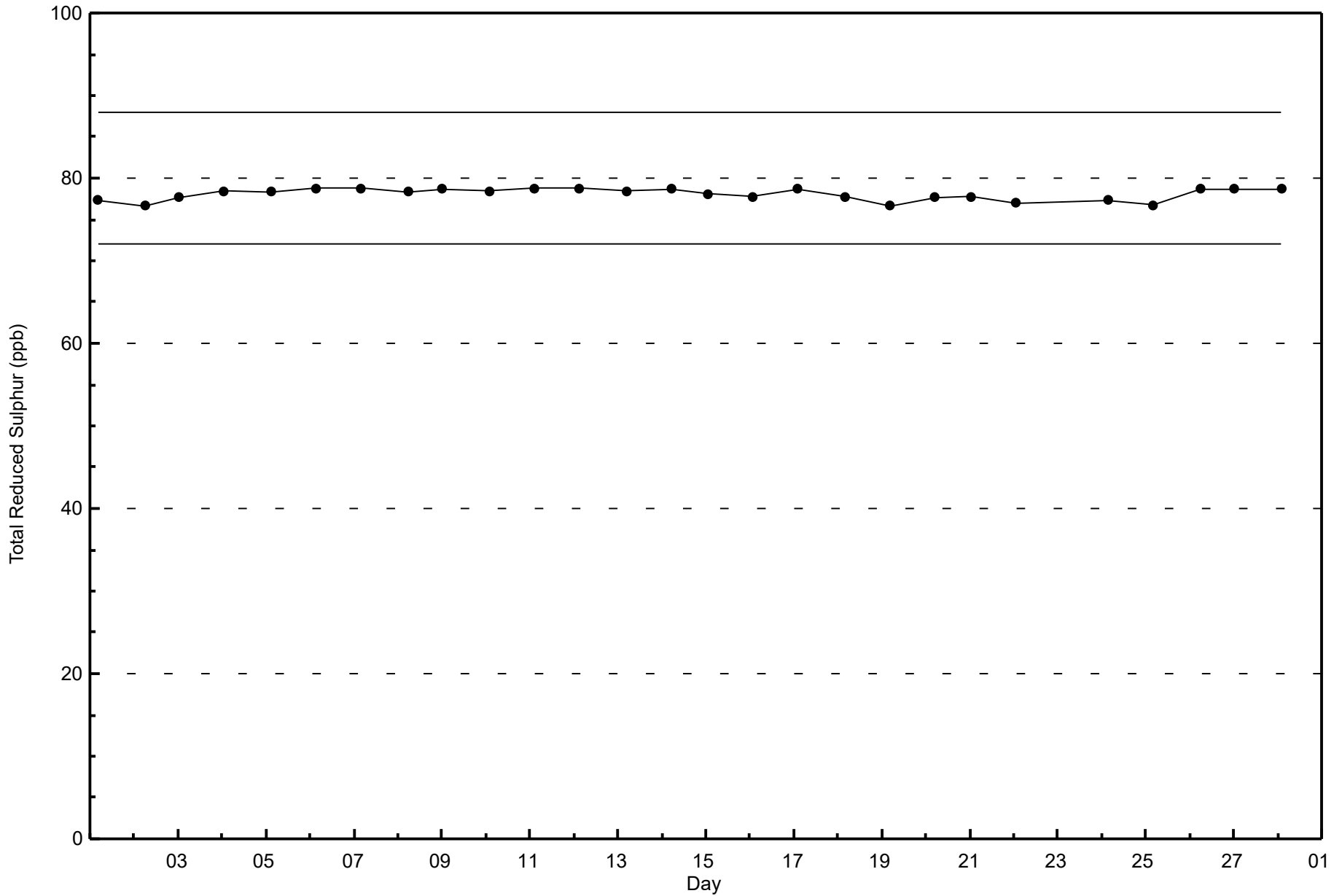
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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



Total Number of Valid Hours: 633







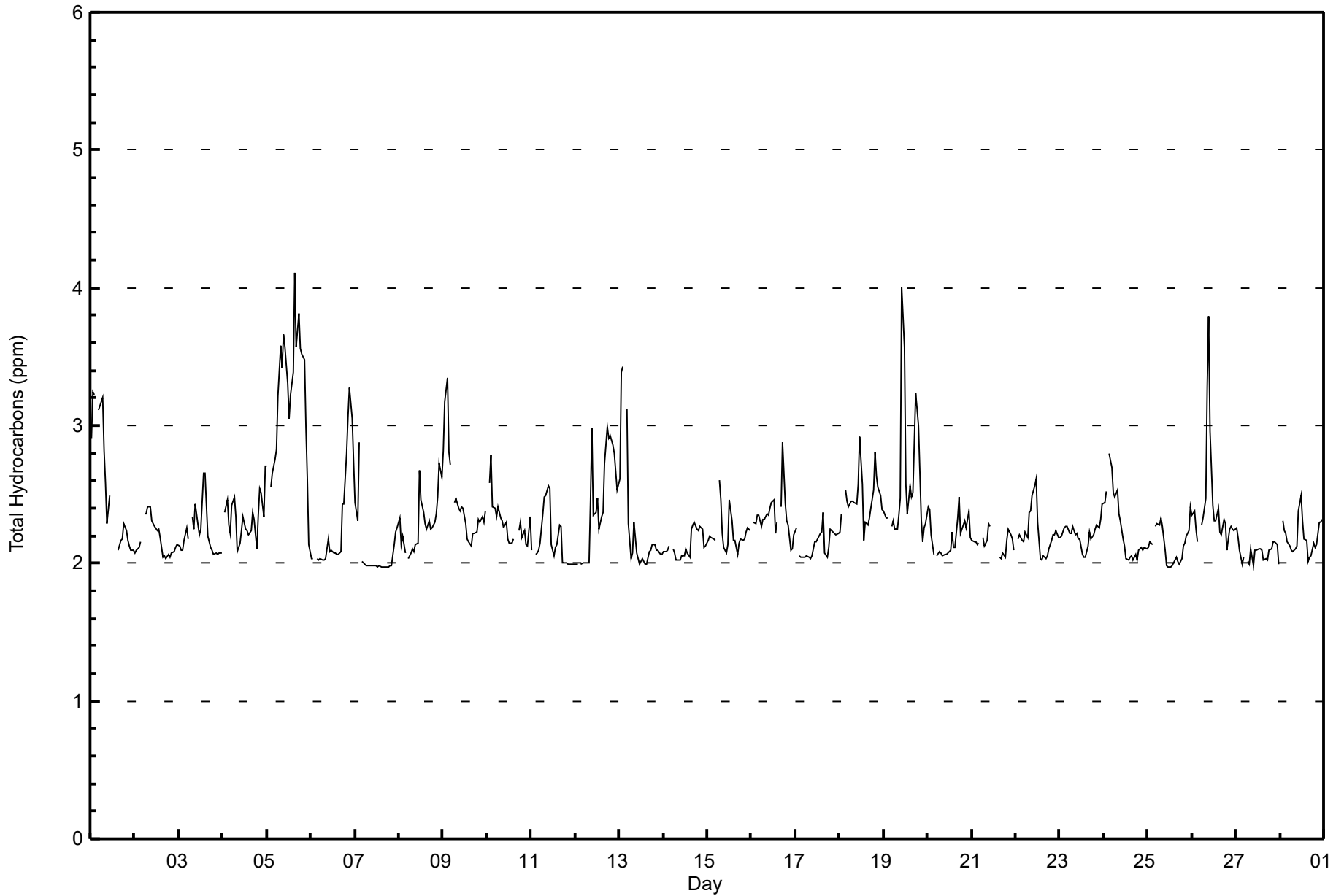


Maximum Value: 4.1 ppm on Feb 5 16:00		Maximum Daily Average: 3.2 ppm on Feb 5		Hours in Service: 672																																												
Minimum Value: 2.0 ppm on Feb 25 13:00		Minimum Daily Average: 2.1 ppm on Feb 27		Hours of Data: 634																																												
Maximum Diurnal Average: 2.4 ppm at hour 3		Minimum Diurnal Average: 2.2 ppm at hour 14		Hours of Missing Data: 38																																												
Monthly Average: 2.30 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> = 2.4 P <sub>90</sub> = 2.7 P <sub>99</sub> = 3.6		Hours of Calibration: 35																																												
				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-Feb	2.9	3.2	3.2	Z	3.1	3.1	3.2	2.8	2.6	2.3	2.5	C	C	C	C	2.1	2.2	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.5	3.2																						
2-Feb	2.1	2.1	2.1	2.2	Z	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.0	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.4																						
3-Feb	2.1	2.1	2.1	2.2	2.3	2.2	Z	2.3	2.3	2.4	2.3	2.2	2.2	2.7	2.7	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.7																						
4-Feb	Z	2.4	2.5	2.3	2.2	2.4	2.5	2.3	2.1	2.1	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.1	2.4	2.5	2.5	2.3	2.7	2.3	2.7																						
5-Feb	2.7	Z	2.6	2.7	2.8	2.8	3.2	3.6	3.4	3.7	3.6	3.3	3.1	3.2	3.4	4.1	3.6	3.8	3.6	3.5	3.5	3.0	2.6	2.1	3.2	4.1																						
6-Feb	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.4	2.8	3.1	3.3	3.0	2.7	2.3	3.3																						
7-Feb	2.4	2.3	2.9	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	2.0	2.0	2.1	2.2	2.3	2.1	2.9																						
8-Feb	2.3	2.1	2.2	2.1	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.7	2.5	2.4	2.3	2.2	2.3	2.2	2.3	2.3	2.4	2.5	2.7	2.6	2.3	2.7																						
9-Feb	2.8	3.2	3.4	2.8	2.7	Z	2.4	2.5	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.5	3.4																						
10-Feb	Z	2.6	2.8	2.4	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.2	2.1	2.1	2.2	PF	PF	2.2	2.3	2.2	2.2	2.1	2.1	2.3	2.3	2.8																						
11-Feb	2.1	Z	2.1	2.1	2.1	2.2	2.4	2.5	2.5	2.6	2.5	2.1	2.1	2.1	2.1	2.3	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.6																						
12-Feb	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.5	3.0	2.3	2.4	2.5	2.2	2.3	2.4	2.7	3.0	2.9	2.9	2.9	2.8	2.7	2.5	2.4	3.0																						
13-Feb	2.6	3.4	3.4	Z	3.1	2.3	2.0	2.1	2.3	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	2.3	3.4																						
14-Feb	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.2	2.3	2.3	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.3																						
15-Feb	2.2	2.2	2.2	2.2	2.2	Z	2.6	2.5	2.2	2.1	2.1	2.1	2.5	2.3	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.3	2.2	2.2	2.6																						
16-Feb	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.4	2.4	2.5	2.2	2.3	M	2.4	2.9	2.4	2.3	2.3	2.1	2.1	2.2	2.3	2.9																						
17-Feb	2.3	Z	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.4	2.1	2.0	2.1	2.3	2.2	2.2	2.2	2.2	2.1	2.4																						
18-Feb	2.2	2.4	Z	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.6	2.9	2.6	2.2	2.3	2.3	2.3	2.4	2.5	2.8	2.6	2.6	2.5	2.4	2.5	2.9																						
19-Feb	2.4	2.3	2.3	Z	2.3	2.3	2.2	2.2	2.3	2.5	4.0	3.6	2.6	2.4	2.6	2.5	2.5	3.2	3.1	3.0	2.3	2.2	2.3	2.3	2.6	4.0																						
20-Feb	2.4	2.4	2.2	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	2.3	2.5	2.2	2.3	2.3	2.3	2.4	2.2	2.2	2.5																						
21-Feb	2.2	2.2	2.2	2.1	2.1	Z	2.2	2.1	2.2	2.3	2.3	C	C	C	C	2.0	2.0	2.1	2.0	2.2	2.2	2.2	2.2	2.1	2.2	2.3																						
22-Feb	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.4	2.5	2.6	2.6	2.3	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.6																						
23-Feb	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.2	2.4																						
24-Feb	2.4	2.5	Z	2.8	2.7	2.5	2.5	2.5	2.4	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.8																						
25-Feb	2.1	2.2	2.1	Z	2.3	2.3	2.3	2.3	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.4	2.1	2.4																						
26-Feb	2.3	2.4	2.3	2.2	Z	2.3	2.3	2.5	3.3	3.8	3.0	2.4	2.3	2.3	2.4	2.2	2.2	2.3	2.3	2.1	2.2	2.3	2.3	2.2	2.4	3.8																						
27-Feb	2.3	2.2	2.1	2.0	2.0	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	2.1	2.1	2.2	2.2	2.1	2.0	2.1	2.3																						
28-Feb	Z	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.4	2.5	2.3	2.2	2.2	2.0	2.0	2.1	2.1	2.1	2.1	2.3	2.3	2.3	2.2	2.5																						
																								2.3	2.4	2.4	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.4	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	Diurnal Average
																								2.9	3.4	3.4	2.8	3.1	3.1	3.2	3.6	3.4	3.8	4.0	3.6	3.1	3.2	3.4	4.1	3.6	3.8	3.6	3.5	3.5	3.3	3.0	2.7	Diurnal Maximum
Z - zerospan																								C - Calibration				M - Maintenance				PF - Power Failure																



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

**Total Hydrocarbons (THC) - ppm**  
**Fort McKay - Bertha Ganter - February 2023**





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

**Total Hydrocarbons (THC) - ppm**  
**Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	96	15.14	15.14
2.1 - 3.0	505	79.65	94.80
3.1 - 10.0	33	5.21	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 634

Total Number of Hours: 672



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

**Total Hydrocarbons (THC) - ppm**  
**Fort McKay - Bertha Ganter - February 2023**

<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	15	6	5	7	3	0	0	9	7	1	4	11	17	7	2	2	96
2.1 - 3.0	107	56	29	19	8	6	12	38	74	33	9	11	16	23	31	31	503
3.1 - 10.0	2	3	0	2	0	0	1	4	6	4	1	1	0	0	4	5	33
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	124	65	34	28	11	6	13	51	87	38	14	23	33	30	37	38	632

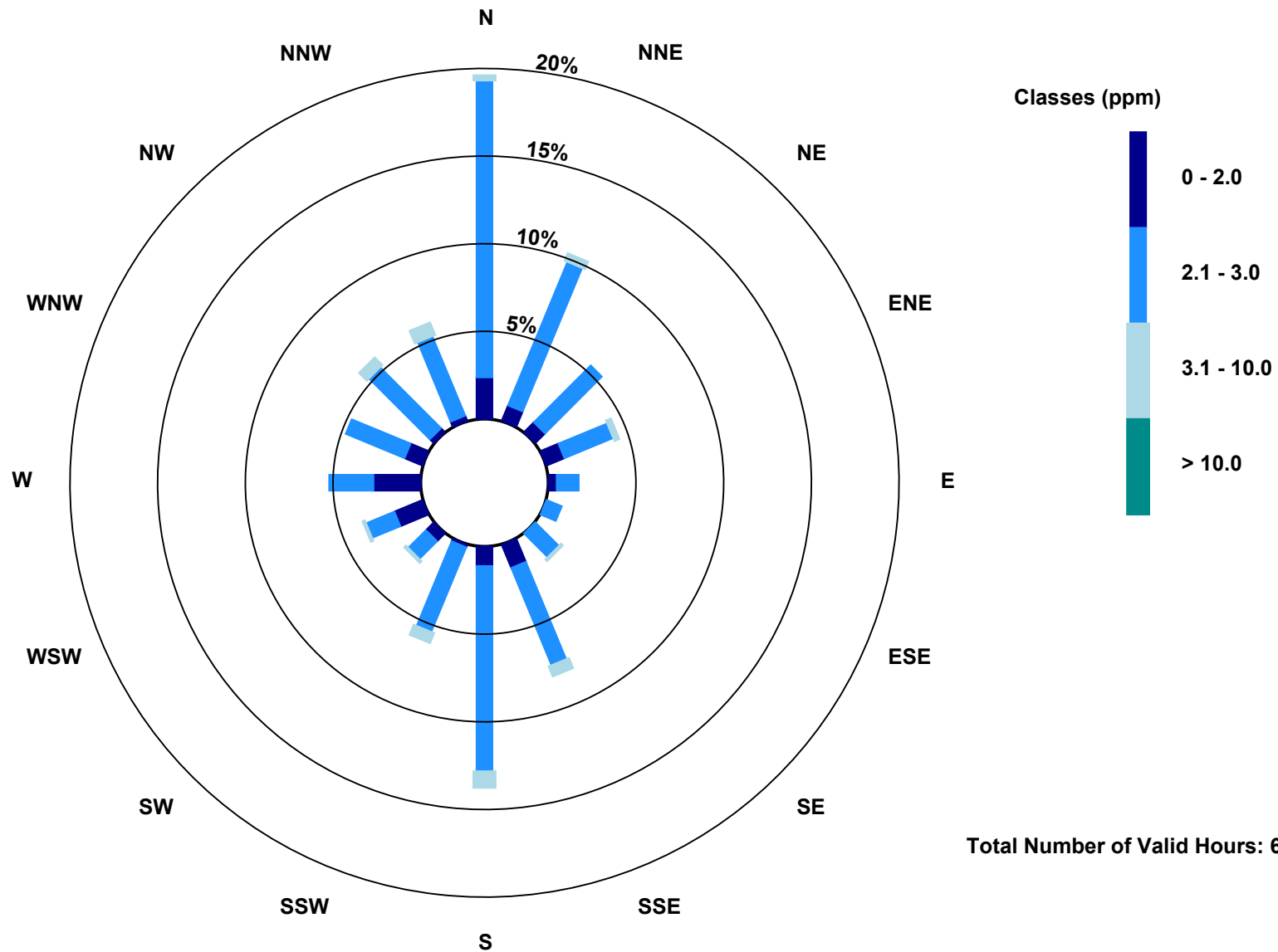
Total Number of Valid Hours: 632

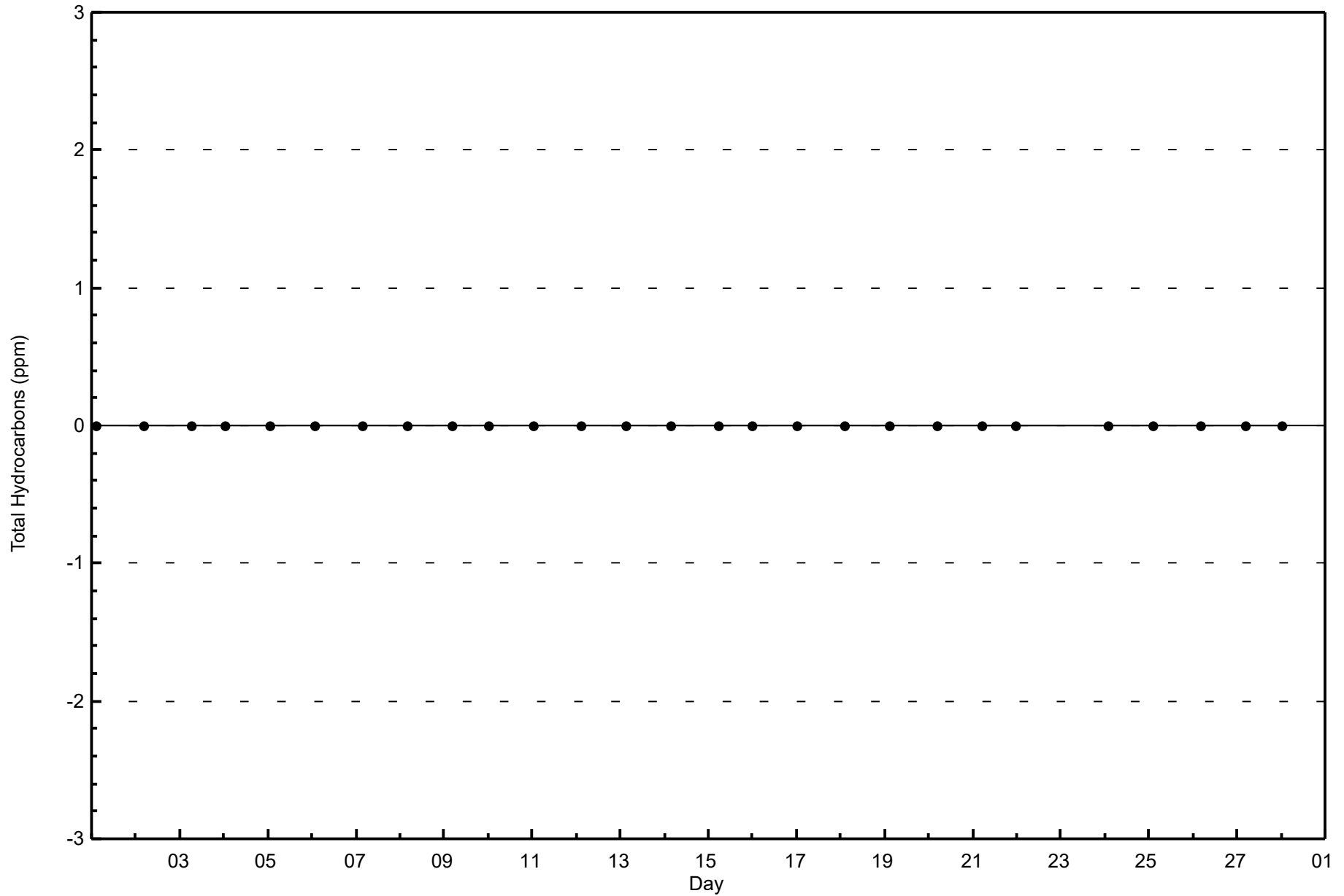
Total Number of Hours: 672

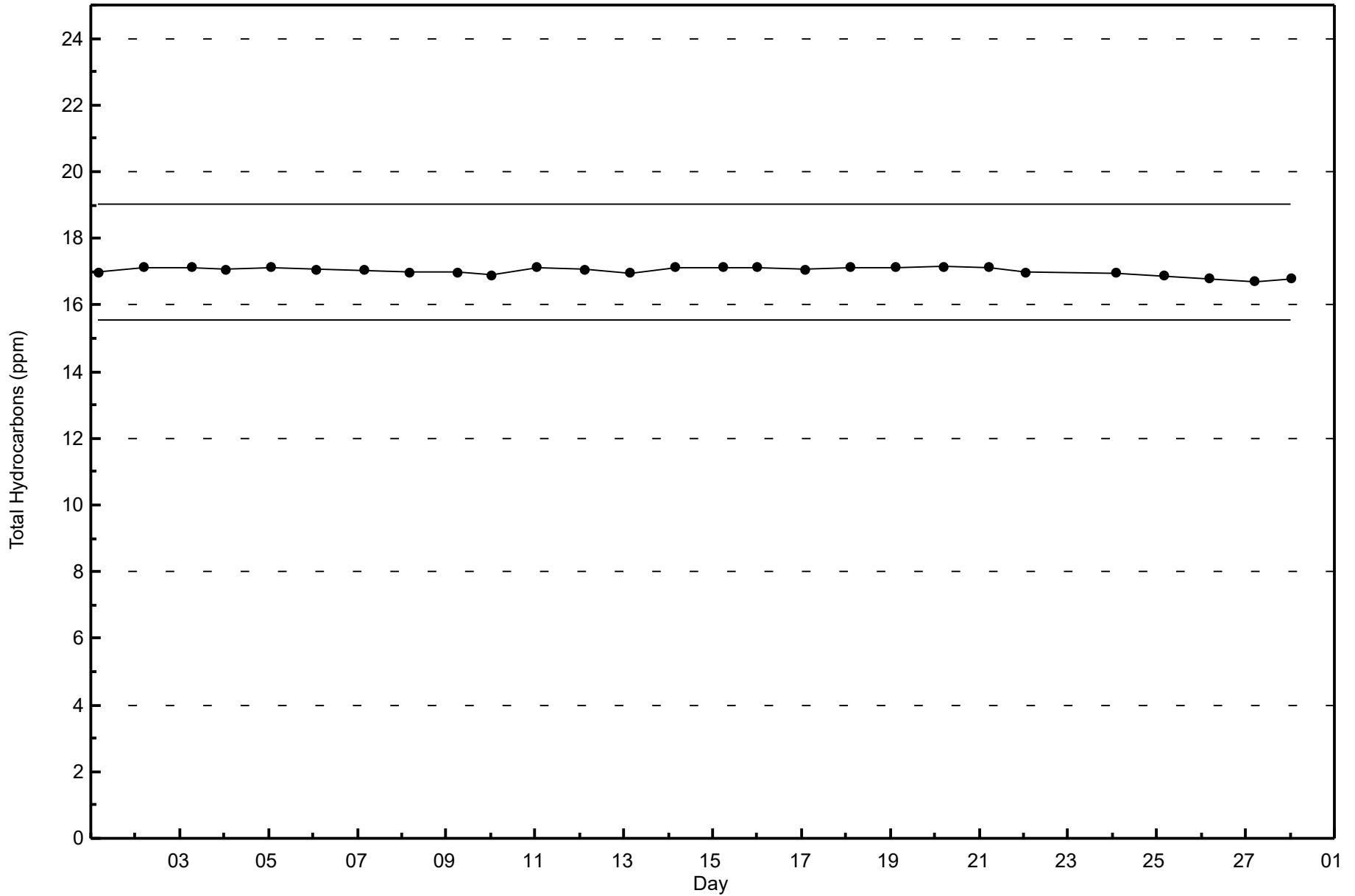


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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







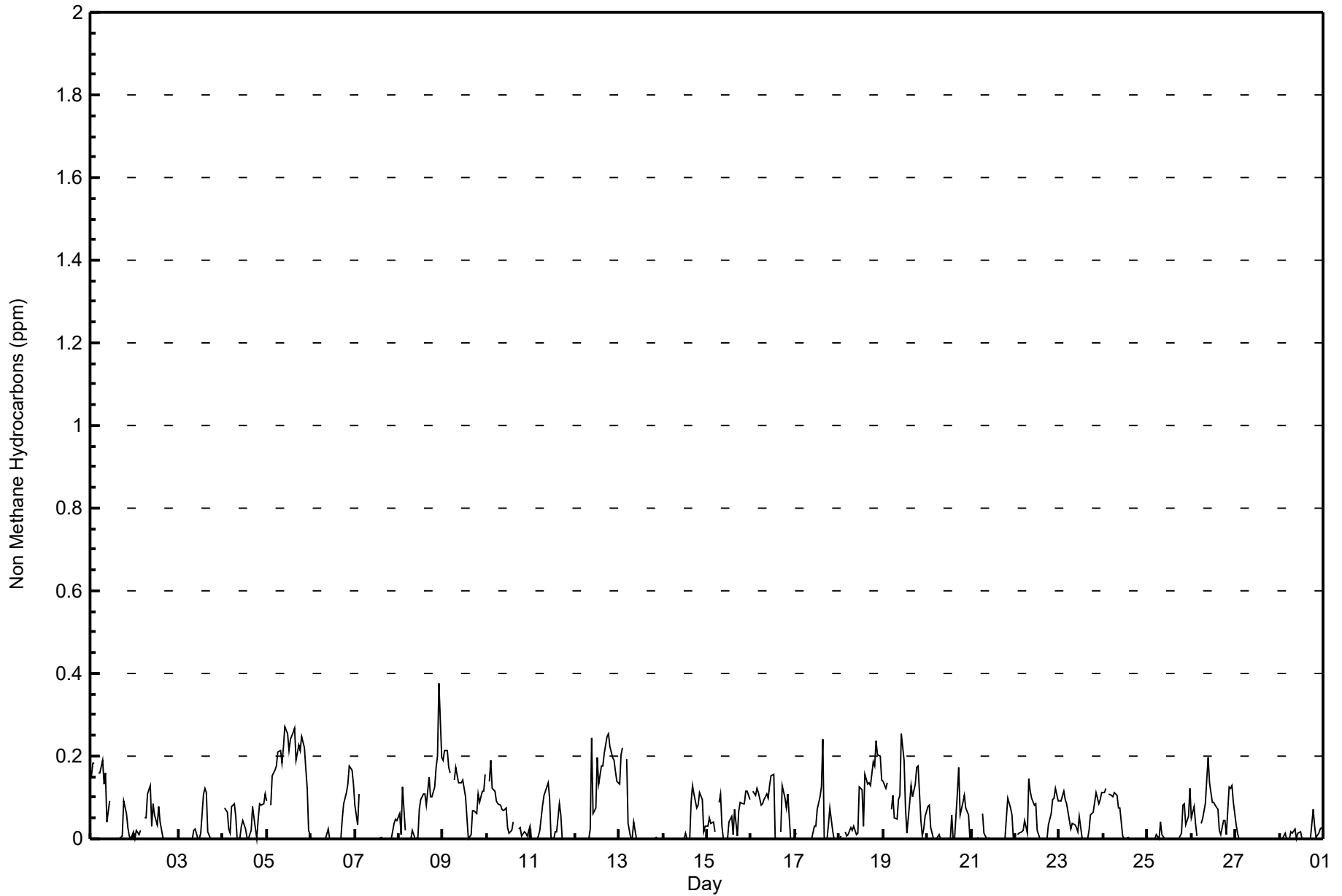






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Fort McKay - Bertha Ganter - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	236	37.22	37.22
0.006 - 0.05	140	22.08	59.31
0.06 - 0.1	189	29.81	89.12
> 0.1	69	10.88	100.00

Total Number of Valid Hours: 634

Total Number of Hours: 672



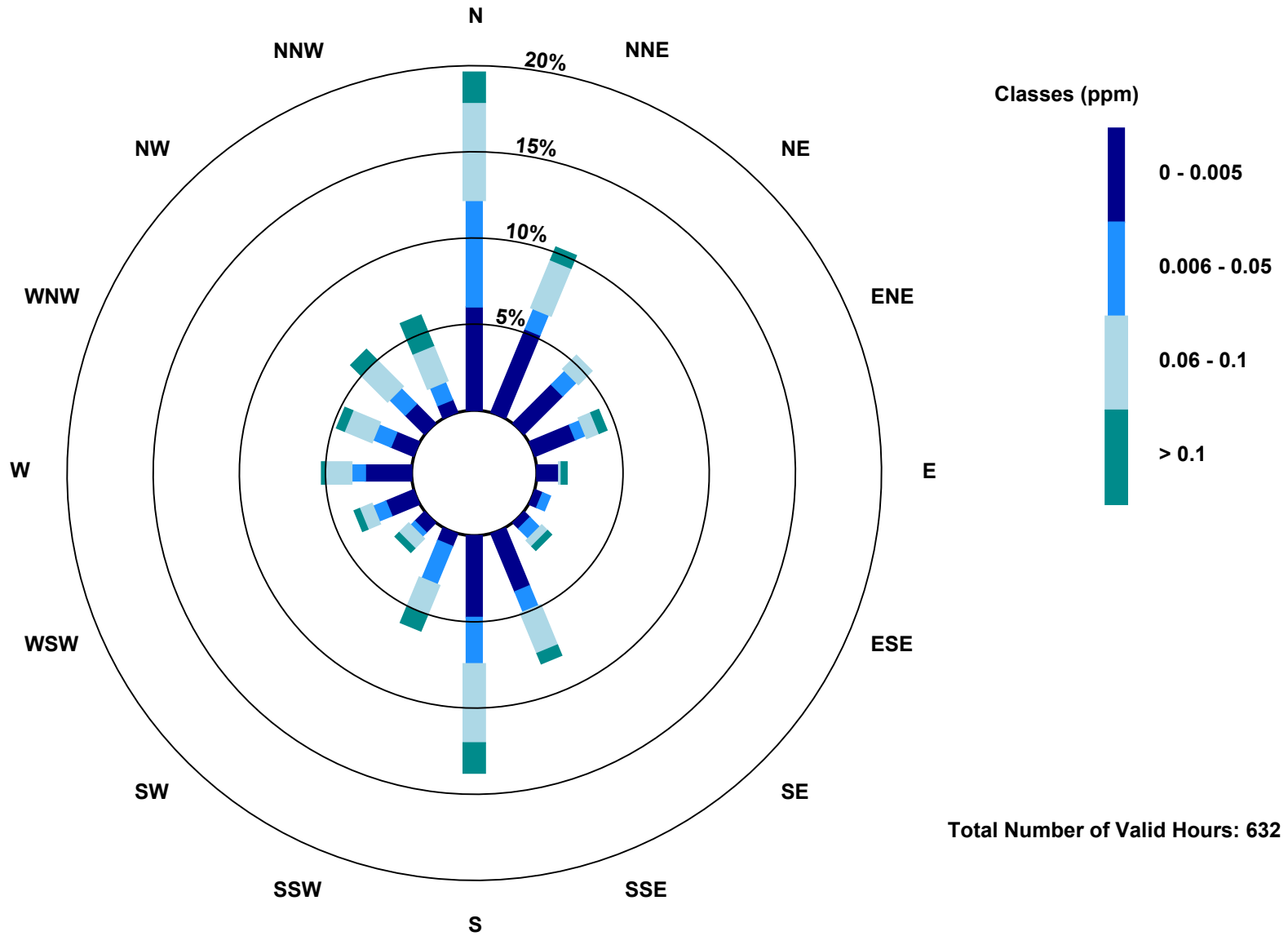
**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Fort McKay - Bertha Ganter - February 2023**

<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	38	33	20	16	8	3	3	23	30	5	5	11	17	9	10	5	236
0.006 - 0.05	39	8	7	4	0	3	5	8	17	15	2	5	5	7	8	7	140
0.06 - 0.1	36	19	7	5	1	0	3	16	29	12	5	5	10	11	14	14	187
> 0.1	11	5	0	3	2	0	2	4	11	6	2	2	1	3	5	12	69
<b>Totals</b>	124	65	34	28	11	6	13	51	87	38	14	23	33	30	37	38	632

Total Number of Valid Hours: 632

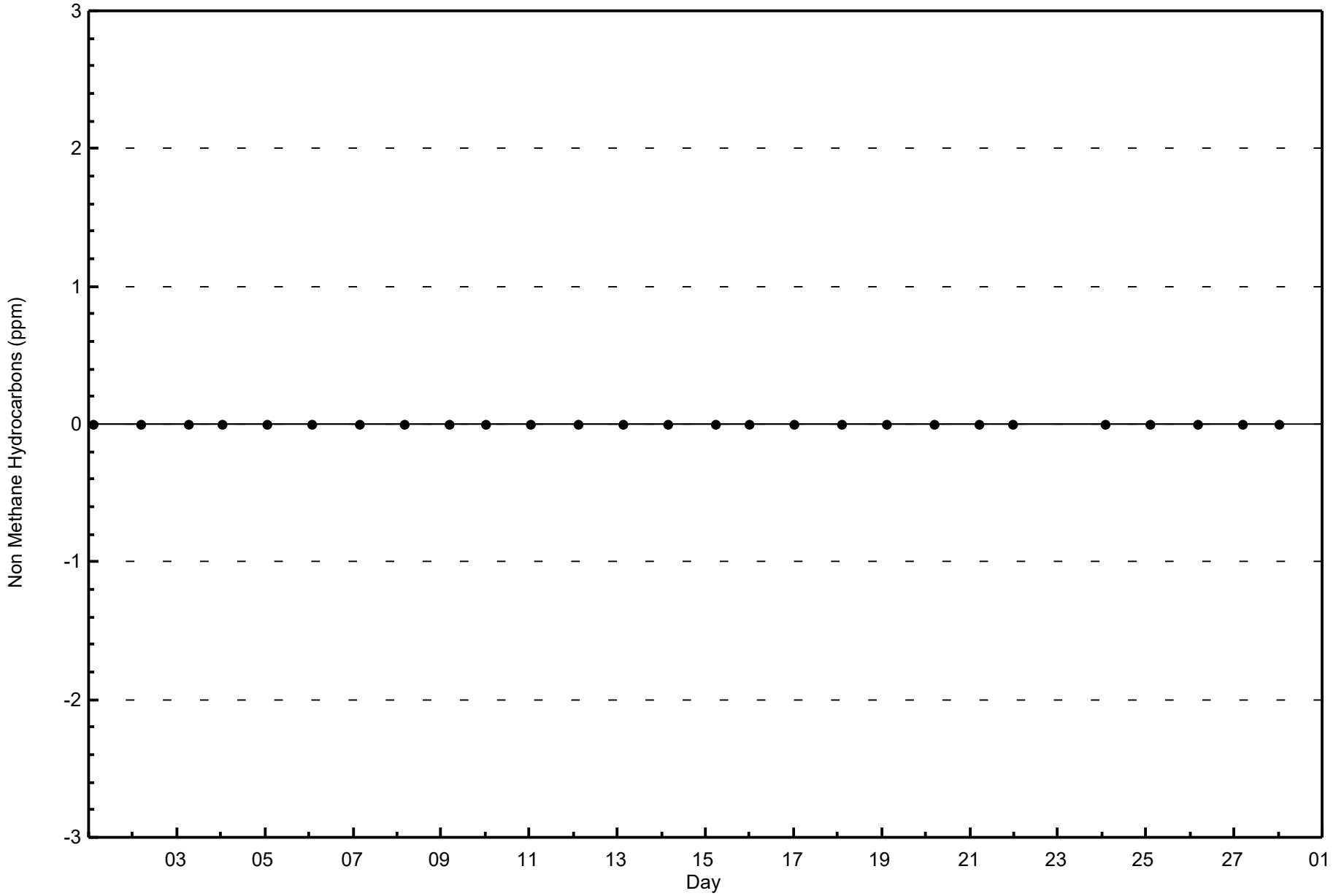
Total Number of Hours: 672

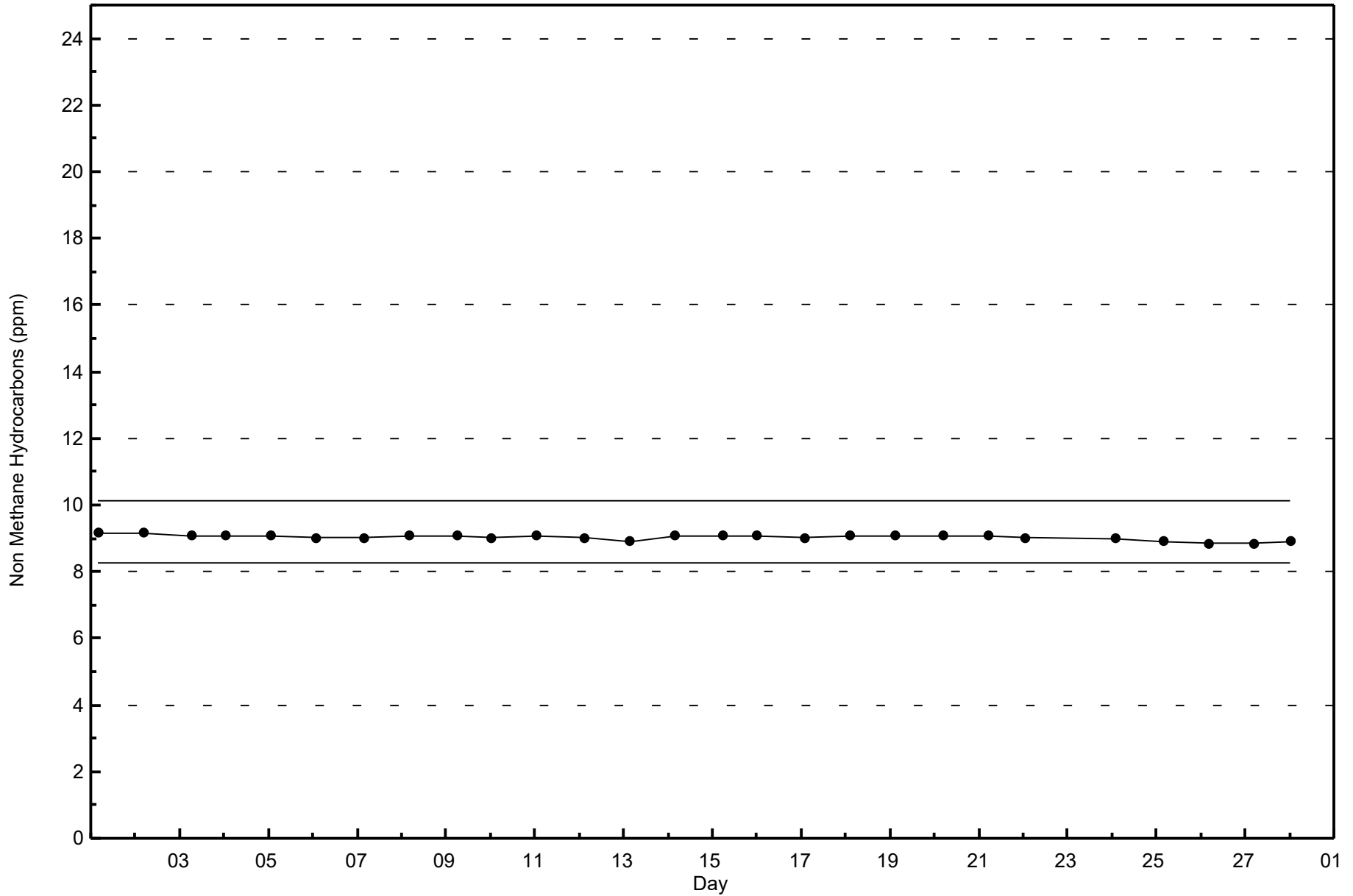




Wood Buffalo Environmental Association  
Zero Responses

Non Methane Hydrocarbons (NMHC) - ppm  
Fort McKay - Bertha Ganter - February 2023





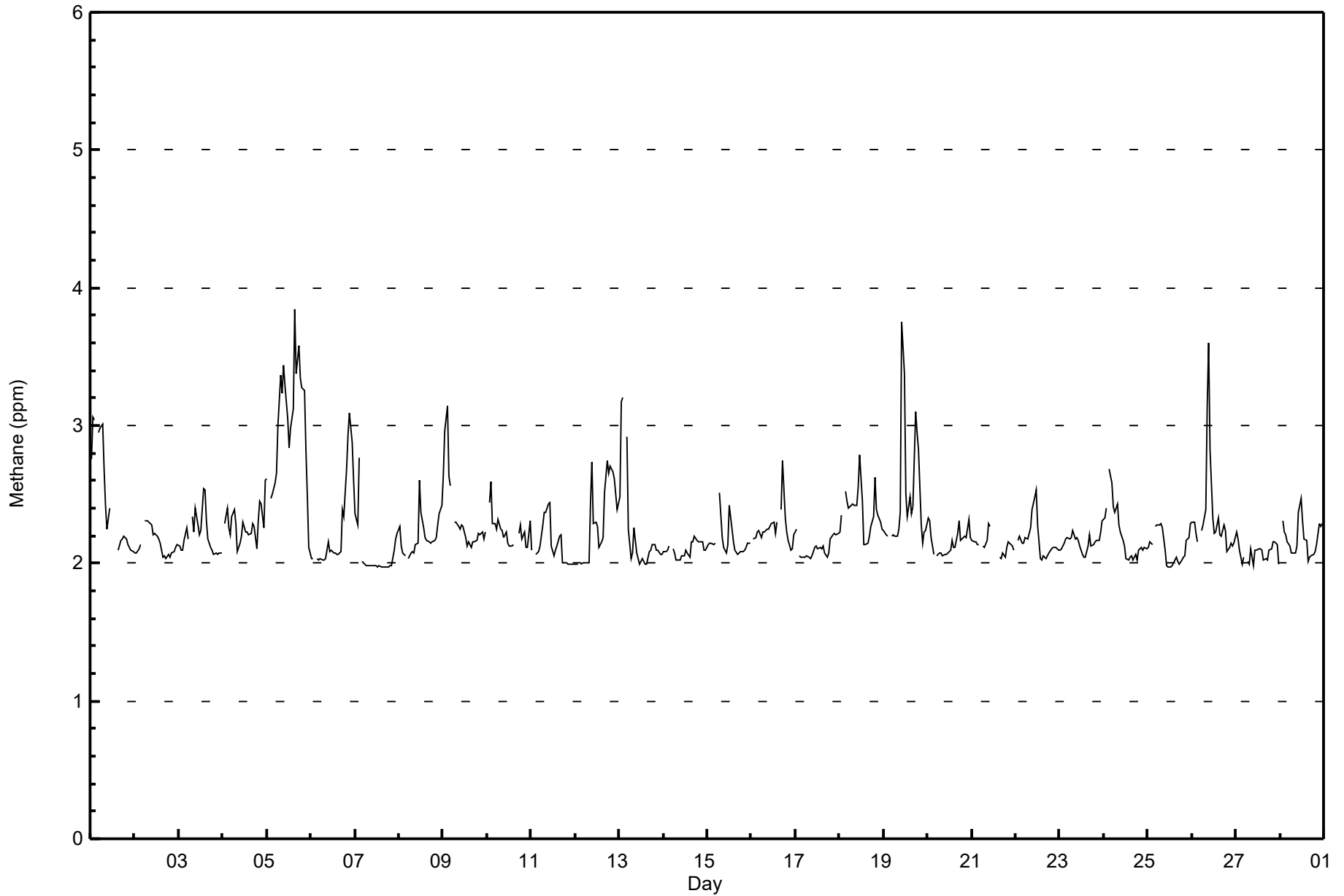


**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

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

**Fort McKay - Bertha Ganter - February 2023**

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																											
Maximum Value: 3.8 ppm on Feb 5 16:00		Maximum Daily Average: 3.0 ppm on Feb 5		Minimum Value: 2.0 ppm on Feb 25 13:00		Minimum Daily Average: 2.1 ppm on Feb 7		Hours of Data: 634																											
Maximum Diurnal Average: 2.3 ppm at hour 3		Minimum Diurnal Average: 2.2 ppm at hour 14		Monthly Average: 2.25 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> = 3.4		Hours of Missing Data: 38																											
								Hours of Calibration: 35																											
								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-Feb	2.8	3.1	3.0	Z	3.0	3.0	3.0	2.7	2.4	2.2	2.4	C	C	C	C	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.5	3.1									
2-Feb	2.1	2.1	2.1	2.1	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.0	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.3									
3-Feb	2.1	2.1	2.1	2.2	2.3	2.2	Z	2.3	2.2	2.4	2.3	2.2	2.2	2.5	2.5	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.5									
4-Feb	Z	2.3	2.4	2.3	2.2	2.3	2.4	2.3	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.1	2.3	2.5	2.4	2.3	2.6	2.3	2.6									
5-Feb	2.6	Z	2.5	2.5	2.6	2.7	3.0	3.4	3.2	3.4	3.3	3.0	2.8	3.0	3.1	3.8	3.4	3.6	3.3	3.3	3.3	2.8	2.5	2.1	3.0	3.8									
6-Feb	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.3	2.7	2.9	3.1	2.9	2.6	2.3	3.1									
7-Feb	2.4	2.3	2.8	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	2.2	2.2	2.2	2.1	2.8									
8-Feb	2.3	2.1	2.1	2.1	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.6	2.4	2.3	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.3	2.4	2.4	2.2	2.6								
9-Feb	2.6	3.0	3.1	2.6	2.6	Z	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	3.1									
10-Feb	Z	2.4	2.6	2.3	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	PF	PF	2.2	2.3	2.2	2.2	2.1	2.1	2.3	2.2	2.6									
11-Feb	2.1	Z	2.1	2.1	2.1	2.1	2.3	2.4	2.4	2.4	2.4	2.1	2.1	2.1	2.1	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4									
12-Feb	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.4	2.7	2.3	2.3	2.3	2.1	2.2	2.2	2.5	2.7	2.7	2.7	2.7	2.6	2.5	2.4	2.3	2.7									
13-Feb	2.5	3.2	3.2	Z	2.9	2.3	2.0	2.1	2.3	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	2.2	3.2									
14-Feb	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2									
15-Feb	2.1	2.1	2.1	2.1	2.1	Z	2.5	2.3	2.2	2.1	2.1	2.1	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.5									
16-Feb	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.3	M	2.4	2.7	2.3	2.2	2.2	2.1	2.1	2.2	2.3	2.7									
17-Feb	2.2	Z	2.1	2.0	2.0	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	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.2									
18-Feb	2.2	2.3	Z	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.6	2.8	2.5	2.1	2.1	2.1	2.2	2.3	2.3	2.6	2.4	2.4	2.3	2.2	2.4	2.8									
19-Feb	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.4	3.8	3.4	2.5	2.3	2.5	2.4	2.4	3.1	2.9	2.8	2.3	2.1	2.2	2.2	2.5	3.8									
20-Feb	2.3	2.3	2.2	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	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.3									
21-Feb	2.2	2.2	2.2	2.1	2.1	Z	2.1	2.1	2.2	2.3	2.3	C	C	C	C	2.0	2.0	2.1	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.3									
22-Feb	Z	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.3	2.4	2.5	2.5	2.3	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.5									
23-Feb	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.2	2.3									
24-Feb	2.3	2.4	Z	2.7	2.6	2.4	2.4	2.4	2.3	2.2	2.2	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.7									
25-Feb	2.1	2.2	2.1	Z	2.3	2.3	2.3	2.3	2.3	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	2.3	2.1	2.3									
26-Feb	2.3	2.3	2.2	2.2	Z	2.2	2.3	2.4	3.1	3.6	2.8	2.3	2.2	2.2	2.3	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.4	3.6									
27-Feb	2.2	2.2	2.1	2.0	2.0	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	2.1	2.1	2.2	2.2	2.1	2.0	2.1	2.2									
28-Feb	Z	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.4	2.5	2.3	2.2	2.2	2.0	2.0	2.1	2.1	2.1	2.1	2.3	2.3	2.3	2.2	2.5									
																								Diurnal Average											
																								Diurnal Maximum											
2.3 2.3 2.3 2.2 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 2.3 2.2 2.3 2.2 2.2 2.2 2.2 2.2 2.2																								2.8 3.2 3.2 2.7 3.0 3.0 3.0 3.4 3.2 3.6 3.8 3.4 2.8 3.0 3.1 3.8 3.4 3.6 3.3 3.3 3.3 3.1 2.9 2.6											
Z - zerospan			C - Calibration			M - Maintenance			PF - Power Failure																										







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

**Methane (CH<sub>4</sub>) - ppm**  
**Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	97	15.30	15.30
2.1 - 3.0	516	81.39	96.69
3.1 - 10.0	21	3.31	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 634

Total Number of Hours: 672



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

**Methane (CH<sub>4</sub>) - ppm**  
**Fort McKay - Bertha Ganter - February 2023**

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	15	6	5	7	3	0	0	9	8	1	4	11	17	7	2	2	97
2.1 - 3.0	109	56	29	19	8	6	13	39	74	34	10	11	16	23	33	34	514
3.1 - 10.0	0	3	0	2	0	0	0	3	5	3	0	1	0	0	2	2	21
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	124	65	34	28	11	6	13	51	87	38	14	23	33	30	37	38	632

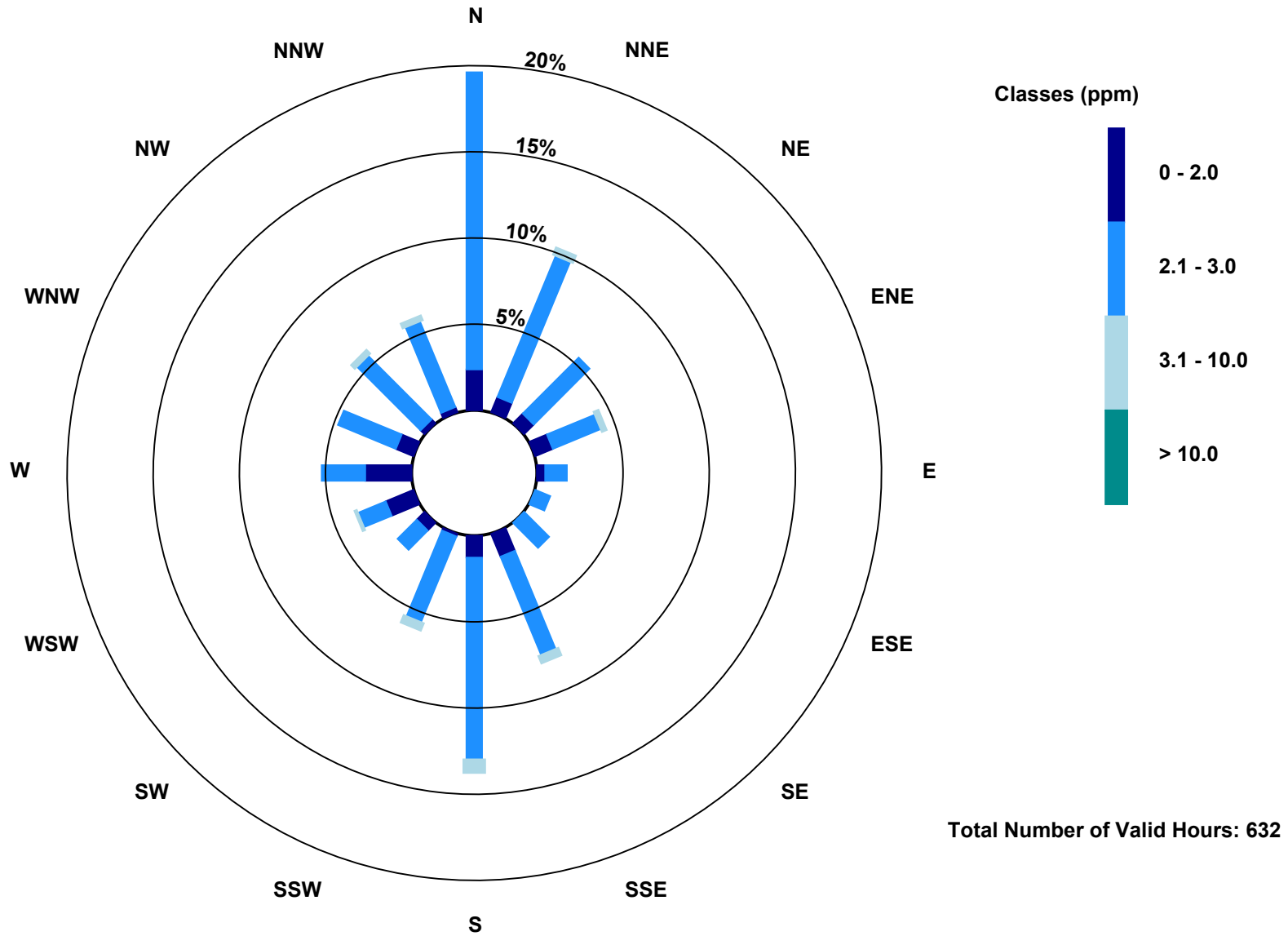
Total Number of Valid Hours: 632

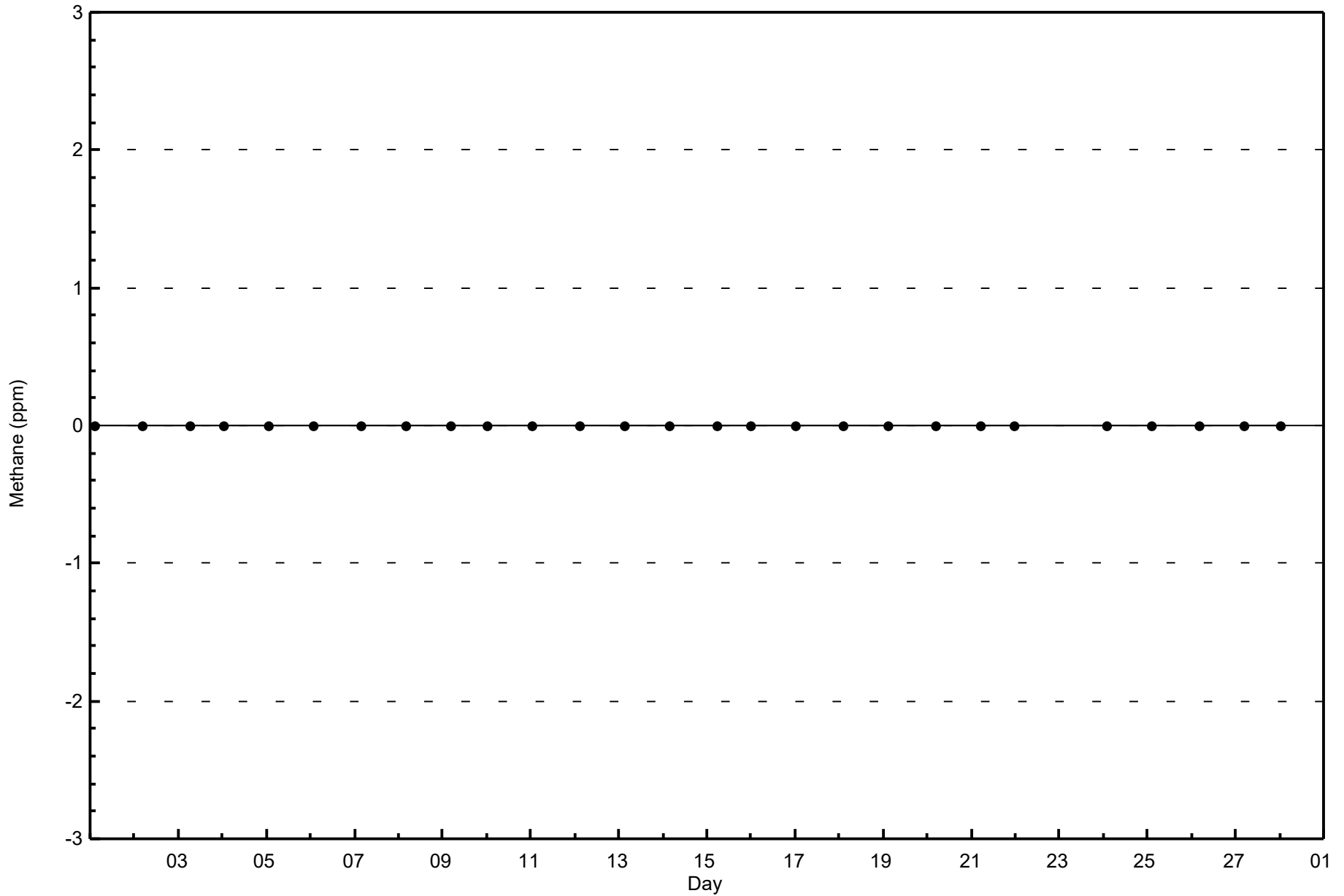
Total Number of Hours: 672

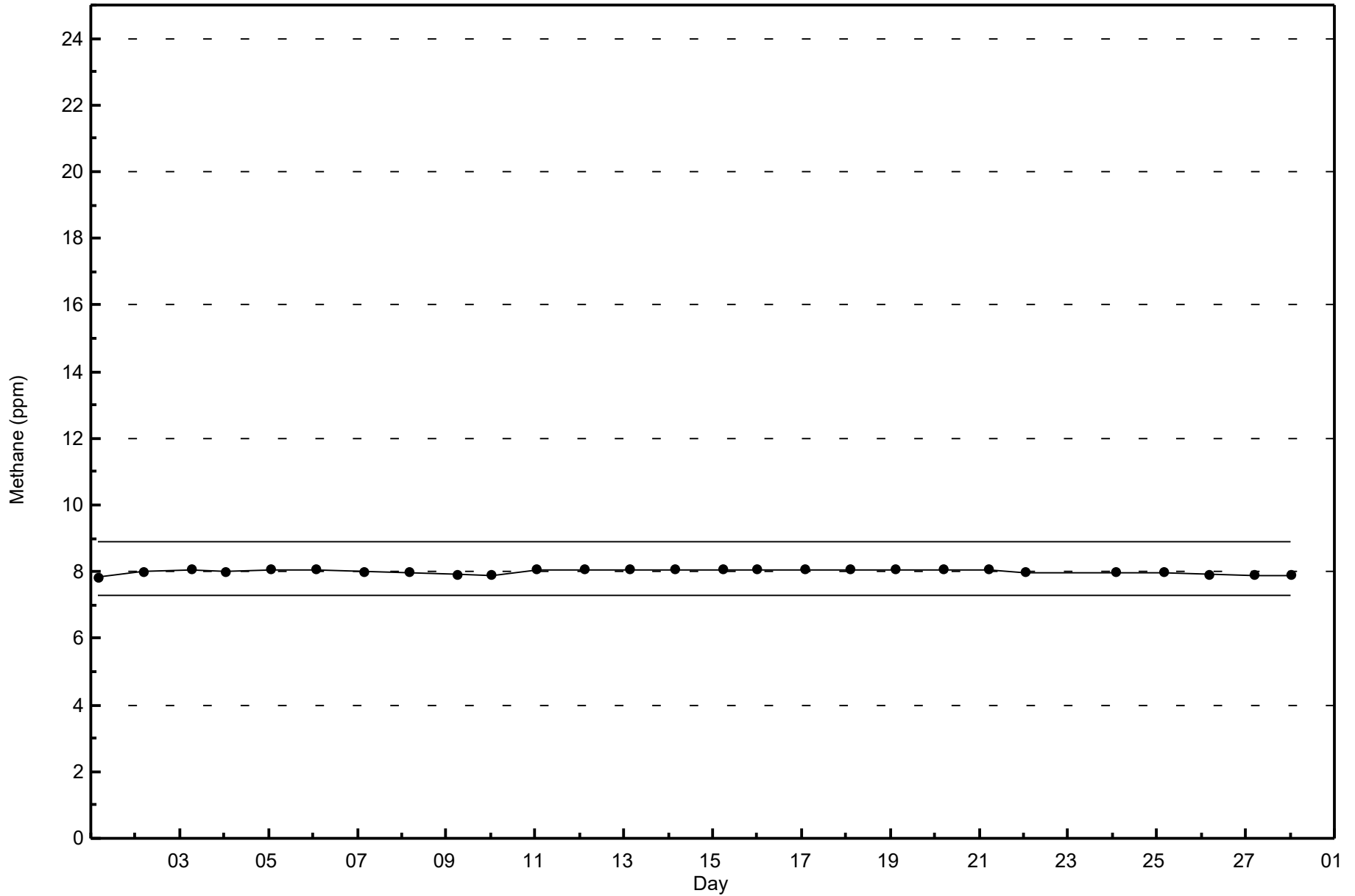


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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





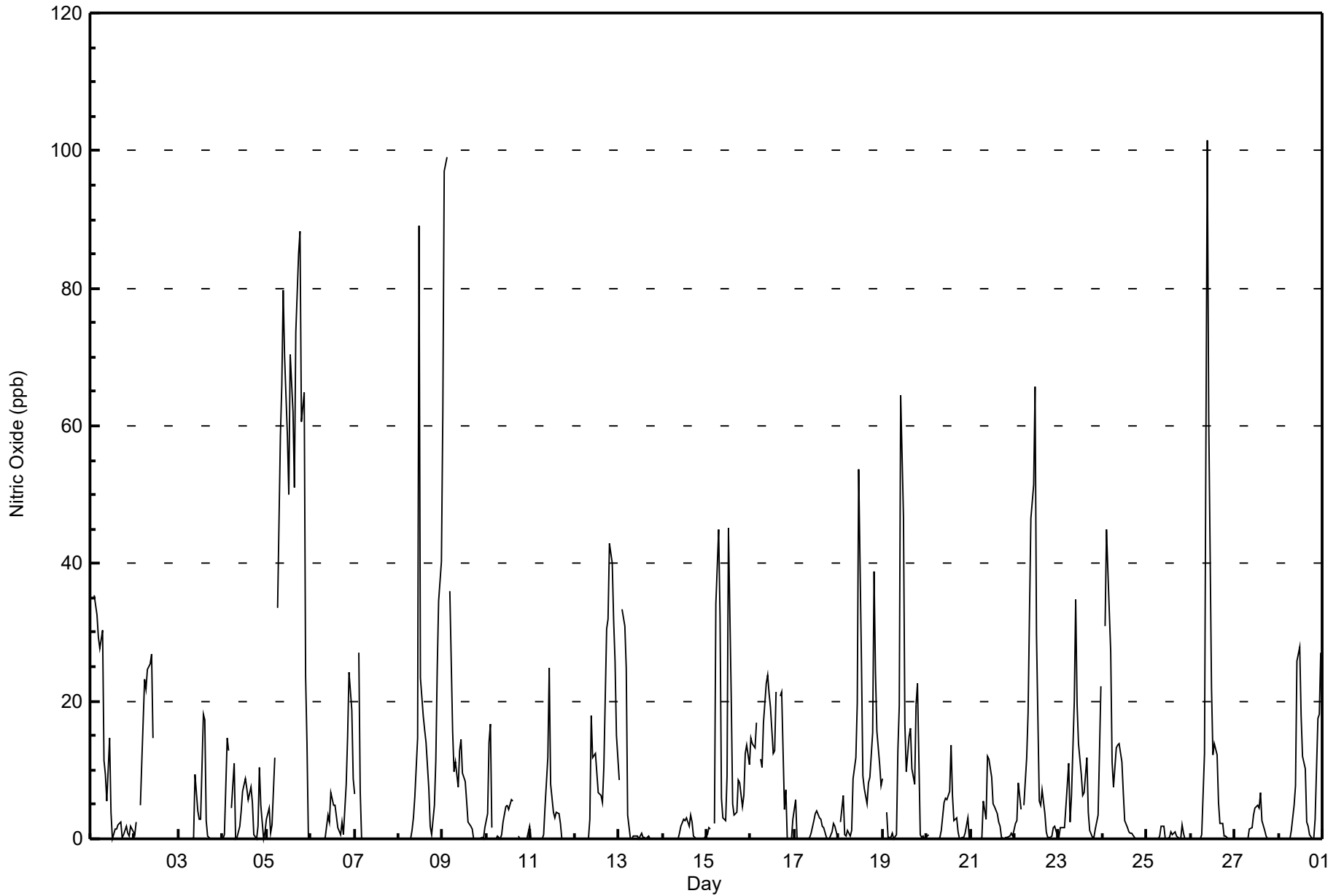




Summary of Hour Averages

Fort McKay - Bertha Ganter - February 2023

Maximum Value: 101.4 ppb on Feb 26 10:00		Maximum Daily Average: 44.8 ppb on Feb 5		Hours in Service: 672																							
Minimum Value: 0.0 ppb on Feb 1 13:00		Minimum Daily Average: 0.5 ppb on Feb 25		Hours of Data: 636																							
Maximum Diurnal Average: 18.3 ppb at hour 12		Minimum Diurnal Average: 5.1 ppb at hour 24		Hours of Missing Data: 36																							
Monthly Average: 8.71 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 2.1 Q <sub>3</sub> = 10.8 P <sub>90</sub> = 25.1 P <sub>99</sub> = 77.6		Hours of Calibration: 33																							
				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-Feb	28.5	Z	35.3	32.6	29.3	27.6	30.3	11.4	9.4	5.4	14.6	4.0	0.0	1.5	1.4	2.0	2.5	0.1	0.6	1.9	0.7	0.5	1.9	1.0	10.5	35.3	
2-Feb	0.6	2.4	Z	4.8	11.2	23.1	21.7	24.6	25.4	26.8	14.6	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.1	--	26.8	
3-Feb	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	9.3	4.1	2.8	2.9	18.2	17.4	2.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	18.2	
4-Feb	0.0	0.6	14.7	12.9	Z	4.4	11.0	0.1	0.1	1.9	4.1	6.9	8.7	7.2	5.7	5.3	0.5	0.0	1.9	10.3	4.9	0.0	1.1	4.8	14.7	4.8	
5-Feb	2.8	4.5	0.8	2.1	11.8	Z	33.7	58.7	65.8	79.8	69.9	58.5	50.0	70.3	62.1	51.1	73.6	85.0	88.2	60.7	64.8	23.7	13.6	0.1	44.8	88.2	
6-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	3.4	2.4	6.7	5.0	4.8	3.4	1.7	0.6	2.5	0.5	7.9	14.9	24.2	18.7	8.8	4.6	24.2	
7-Feb	6.6	Z	27.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.8	27.0		
8-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	1.1	3.1	6.1	14.7	89.0	23.3	17.8	15.9	14.1	7.4	1.8	0.7	4.9	11.5	24.7	34.5	40.4	13.5	89.0	
9-Feb	61.8	96.9	99.0	Z	36.1	15.7	9.8	11.2	7.6	12.7	14.4	9.6	8.3	5.5	2.4	1.9	1.5	0.0	0.0	0.0	0.0	0.3	0.0	1.6	17.2	99.0	
10-Feb	3.7	14.1	16.6	1.7	Z	0.0	0.3	0.0	0.6	2.4	4.6	4.9	4.2	5.6	5.4	PF	PF	0.3	0.0	0.0	0.0	0.0	0.0	1.7	3.2	16.6	
11-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.6	4.8	11.9	24.7	7.9	3.9	3.1	3.8	3.6	2.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	2.9	24.7	
12-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.0	2.9	17.8	11.7	12.5	9.6	6.6	6.4	5.2	10.4	30.4	32.0	42.9	40.0	31.7	25.8	15.0	13.1	42.9		
13-Feb	8.4	Z	33.4	30.9	24.8	3.5	0.0	0.0	0.5	0.4	0.4	0.0	0.8	0.2	0.2	0.0	0.5	0.0	0.1	0.0	0.0	0.0	0.0	0.0	4.5	33.4	
14-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.9	1.9	2.8	2.6	3.0	1.9	3.4	2.4	0.4	0.0	0.0	0.0	0.0	0.0	0.2	0.9	3.4	0.9	
15-Feb	0.7	1.6	1.4	Z	2.3	34.1	44.9	32.2	6.0	3.0	2.7	9.2	45.1	20.4	5.0	3.5	4.0	8.5	8.1	4.8	6.2	12.3	13.6	10.8	12.2	45.1	
16-Feb	14.6	13.8	13.2	16.9	Z	11.6	10.4	16.9	22.6	23.8	21.1	19.2	12.4	12.7	21.3	M	20.7	21.3	4.2	7.1	0.0	0.0	0.1	2.9	13.0	23.8	
17-Feb	5.8	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.2	0.8	2.6	3.6	4.1	3.0	2.8	1.8	1.7	0.3	0.0	0.0	1.0	2.3	1.9	0.1	1.4	5.8	
18-Feb	Z	2.5	6.3	0.5	0.4	1.2	0.3	1.2	8.7	11.8	19.8	53.7	25.6	9.3	7.3	5.2	8.1	8.8	15.4	38.8	24.2	15.6	10.8	7.8	12.3	53.7	
19-Feb	8.7	Z	3.9	0.2	0.1	0.9	0.0	0.6	12.8	19.3	64.4	46.8	16.6	9.7	14.8	16.1	10.1	7.9	19.6	22.6	0.6	0.2	0.3	0.0	12.0	64.4	
20-Feb	0.5	0.6	Z	0.0	0.0	0.0	0.0	0.1	1.2	5.2	5.9	5.7	6.8	13.7	6.2	2.6	3.0	1.0	0.0	0.2	0.1	0.8	3.0	0.0	2.5	13.7	
21-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.2	5.4	2.9	12.0	11.5	8.9	5.0	4.6	3.6	2.4	1.8	0.3	0.0	0.1	0.2	0.3	0.9	0.5	2.6	12.0	
22-Feb	2.3	2.6	8.0	4.3	Z	4.8	11.8	18.3	32.8	46.5	51.4	65.7	29.6	5.5	4.9	7.1	3.7	1.1	0.1	0.2	0.3	1.6	1.9	0.4	13.3	65.7	
23-Feb	0.1	1.7	1.7	1.6	4.8	11.0	2.4	6.2	19.9	34.9	19.6	13.8	9.3	6.3	6.7	11.8	3.9	1.2	0.3	0.1	1.3	3.5	12.7	22.2	8.2	34.9	
24-Feb	Z	30.8	45.0	38.8	27.3	11.2	7.5	13.2	13.7	13.8	11.3	6.7	2.5	1.6	0.9	0.7	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	9.8	45.0	
25-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.3	1.7	1.8	0.1	0.1	0.1	0.9	0.7	1.1	0.5	0.1	0.0	2.0	0.9	0.1	0.0	0.1	0.5	2.0	
26-Feb	0.2	0.1	Z	0.0	0.0	0.1	0.6	12.5	57.2	101.4	61.5	22.0	12.1	13.8	12.1	5.3	2.2	2.3	0.5	0.4	0.0	0.0	0.0	0.0	13.2	101.4	
27-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	1.5	1.6	3.4	4.5	5.0	4.4	6.7	2.7	1.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.4	6.7	
28-Feb	0.0	0.0	0.0	0.0	Z	0.0	0.0	1.1	4.9	7.8	25.8	27.9	17.9	11.9	10.1	2.4	1.9	0.6	0.0	0.0	2.8	17.5	18.1	27.0	7.7	27.9	
		6.0	7.5	13.3	6.4	6.7	6.0	6.6	7.7	11.0	16.5	17.3	18.3	11.5	9.7	8.5	6.2	6.5	6.3	6.1	7.0	6.4	5.9	5.6	5.1	Diurnal Average	
		61.8	96.9	99.0	38.8	36.1	34.1	44.9	58.7	65.8	101.4	69.9	89.0	50.0	70.3	62.1	51.1	73.6	85.0	88.2	60.7	64.8	31.7	34.5	40.4	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance				PF - Power Failure																	





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

**Nitric Oxide (NO) - ppb**  
**Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	553	86.95	86.95
21 - 40	52	8.18	95.13
41 - 80	25	3.93	99.06
81 - 159	6	0.94	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 636

Total Number of Hours: 672





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

**Nitric Oxide (NO) - ppb**  
**Fort McKay - Bertha Ganter - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	114	63	34	26	10	6	7	36	69	26	11	24	30	29	36	30	551
21 - 40	6	1	3	0	2	0	2	7	7	10	0	0	2	2	4	6	52
11 - 80	2	2	0	3	0	0	3	4	5	2	2	0	0	0	1	1	25
81 - 159	0	1	0	0	0	0	0	1	2	1	1	0	0	0	0	0	6
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	122	67	37	29	12	6	12	48	83	39	14	24	32	31	41	37	634

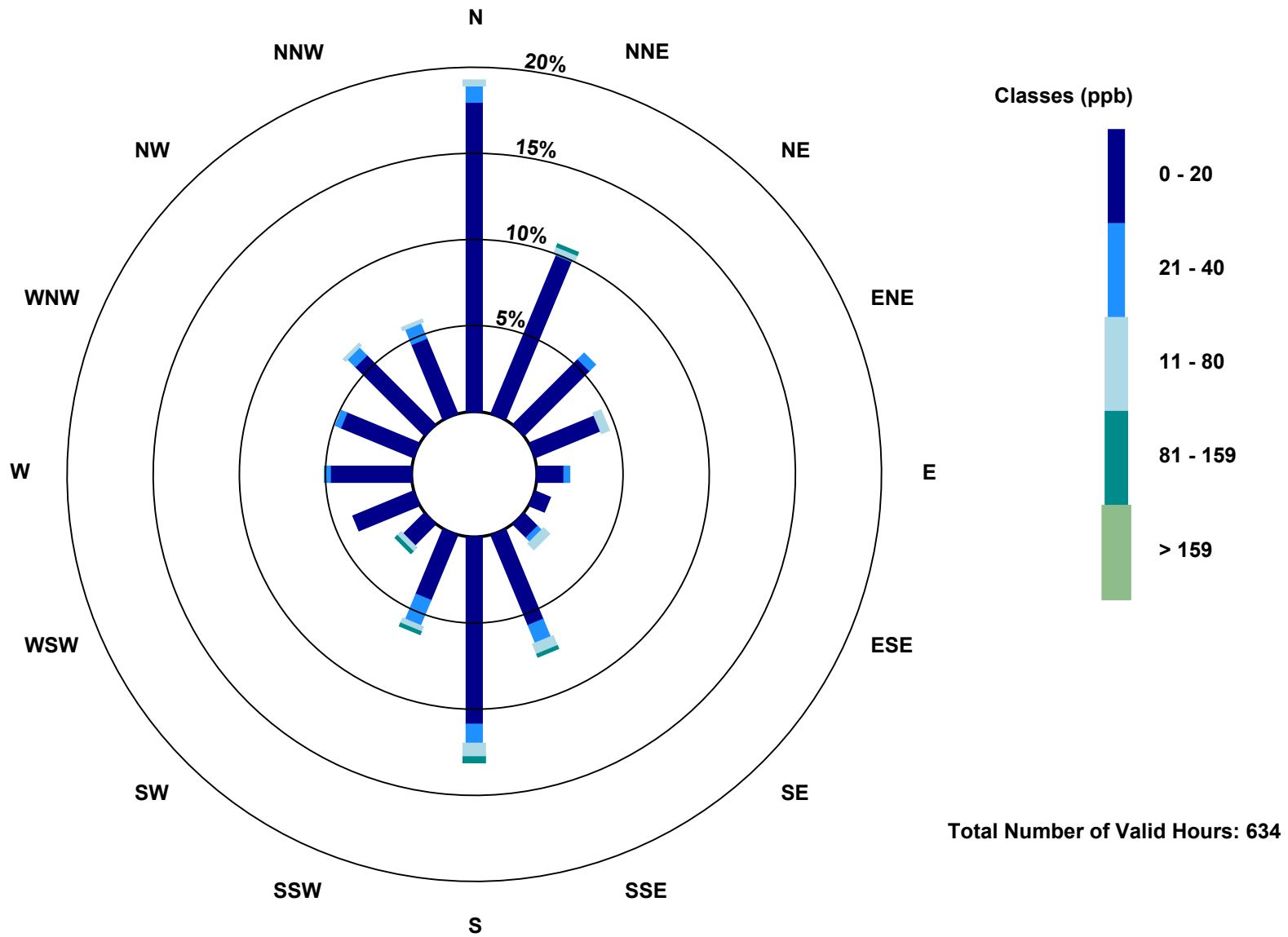
Total Number of Valid Hours: 634

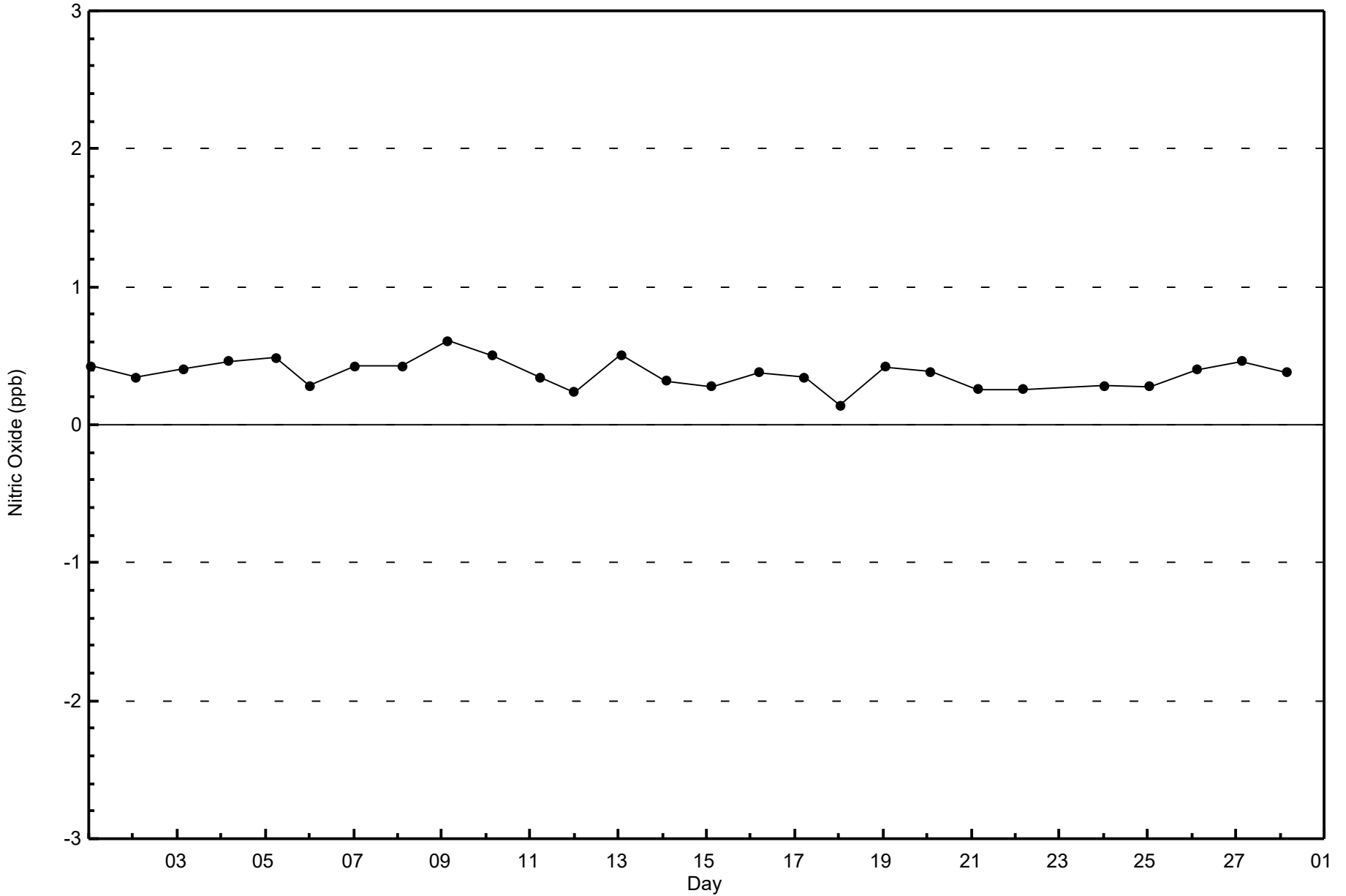
Total Number of Hours: 672

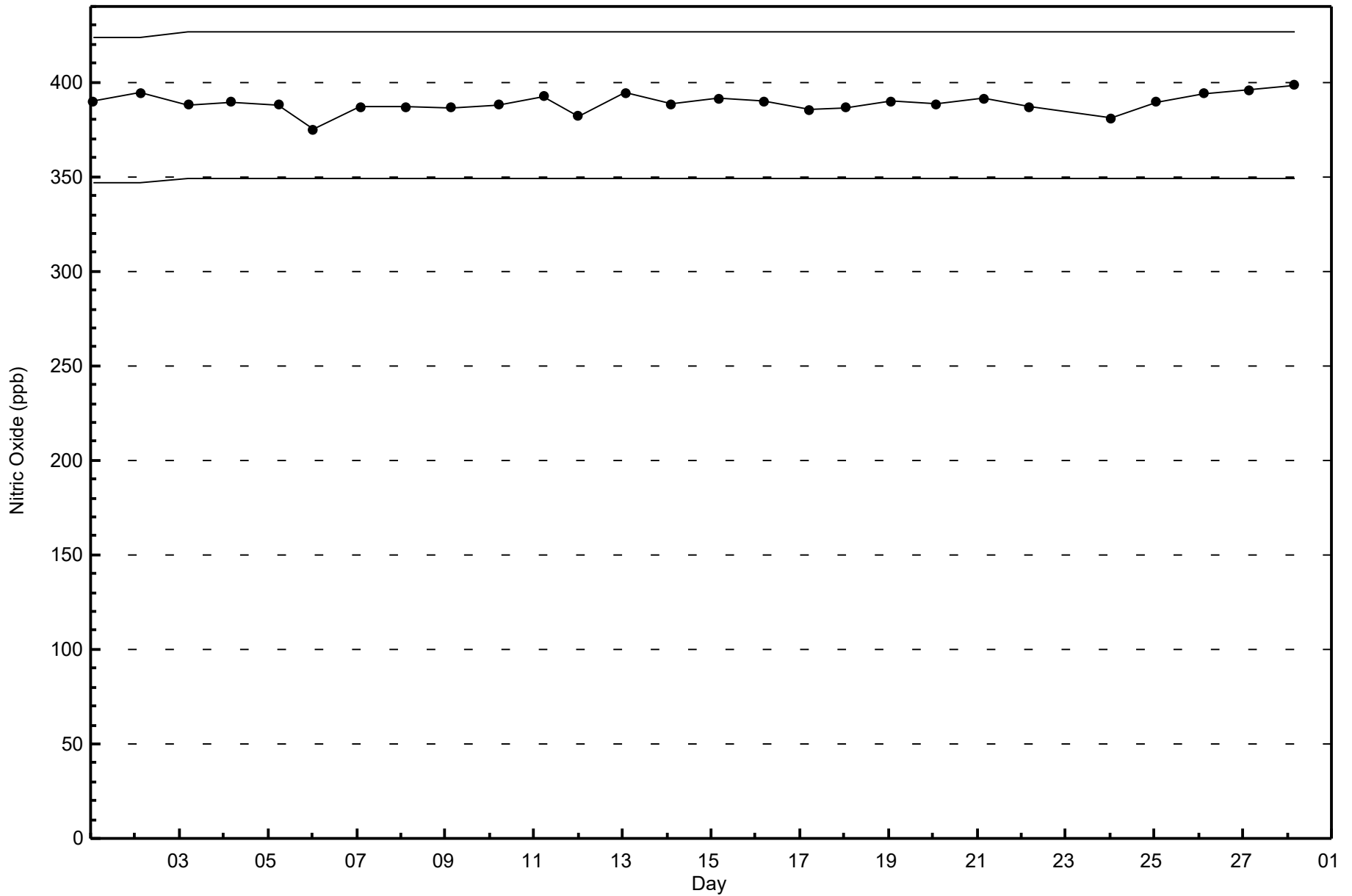


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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 - February 2023**

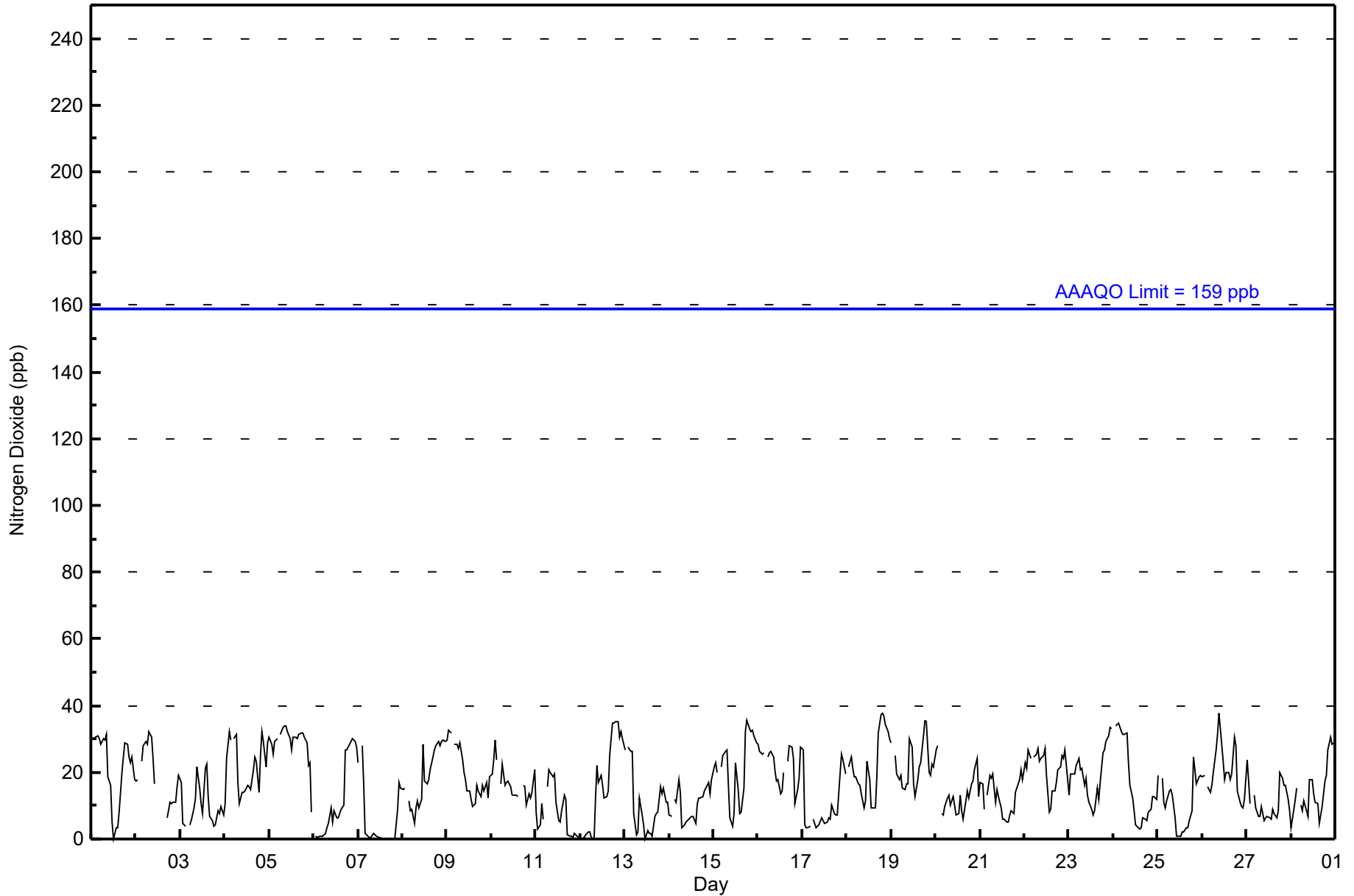
Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																			
Maximum Value: 37.8 ppb on Feb 26 10:00		Maximum Daily Average: 28.8 ppb on Feb 5		Minimum Value: 0.0 ppb on Feb 1 13:00		Minimum Daily Average: 5.1 ppb on Feb 7		Hours of Data:		636																	
Maximum Diurnal Average: 20.4 ppb at hour 1		Minimum Diurnal Average: 10.3 ppb at hour 14		Monthly Average: 16.20 ppb		Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 3.7 Q <sub>1</sub> = 8.3 Median = 15.5 Q <sub>3</sub> = 24.2 P <sub>90</sub> = 30.1 P <sub>99</sub> = 35.2		Hours of Missing Data:		36																	
								Hours of Calibration:		33																	
								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-Feb	34.8	Z	30.6	31.0	29.9	28.6	30.0	29.8	31.2	18.8	15.9	5.2	0.0	3.3	3.5	7.9	19.9	24.7	28.9	28.5	24.7	22.9	24.5	17.6	21.4	34.8	
2-Feb	17.3	17.9	Z	23.3	28.0	29.3	28.4	32.0	30.7	24.0	16.6	C	C	C	C	C	C	6.2	11.0	10.7	10.9	11.0	15.6	18.9	--	32.0	
3-Feb	16.9	4.5	4.4	3.7	Z	4.3	5.5	9.4	12.1	21.6	15.2	10.8	7.6	21.2	22.5	12.9	6.9	5.6	3.8	4.1	8.6	7.5	9.9	7.1	9.8	22.5	
4-Feb	10.4	24.0	32.2	29.6	Z	30.1	31.5	17.0	10.6	14.1	14.1	14.3	16.0	15.5	15.0	20.7	24.6	23.5	14.1	24.9	32.1	29.1	21.7	29.0	21.5	32.2	
5-Feb	30.4	28.2	25.4	29.1	30.1	Z	31.3	33.6	33.8	34.1	32.1	29.9	26.6	30.6	30.5	29.9	31.3	31.9	31.6	30.5	29.0	22.2	22.7	8.0	28.8	34.1	
6-Feb	Z	0.7	0.6	0.8	0.7	1.0	1.7	3.6	4.6	9.2	5.0	8.6	6.5	6.5	7.5	8.8	10.1	26.9	26.6	28.5	29.2	30.1	29.2	27.6	11.9	30.1	
7-Feb	22.7	Z	27.9	16.5	1.8	0.7	0.5	0.6	1.8	1.1	0.7	0.4	0.3	0.2	0.1	0.0	0.0	0.2	0.1	0.0	8.9	16.9	15.1	5.1	27.9		
8-Feb	15.0	15.3	Z	11.3	8.6	9.0	4.8	9.5	11.5	9.3	11.7	28.3	17.2	16.5	17.6	20.8	24.5	26.6	27.9	29.3	27.9	29.4	29.7	29.2	18.7	29.7	
9-Feb	29.5	32.8	31.8	Z	28.4	28.2	27.3	28.7	23.7	19.8	18.0	14.5	14.2	11.8	9.6	10.5	16.1	14.2	12.8	16.2	14.4	16.9	12.4	18.7	19.6	32.8	
10-Feb	19.6	23.9	29.6	23.6	Z	16.5	22.5	16.1	17.1	17.2	15.6	13.2	13.1	13.0	12.6	PF	PF	16.2	15.7	10.3	13.4	12.2	13.9	20.9	17.0	29.6	
11-Feb	7.9	2.9	4.3	10.4	5.9	Z	15.8	20.7	19.9	18.7	19.6	11.2	5.6	5.1	8.3	13.1	11.7	1.2	0.9	0.8	0.5	1.8	1.0	0.6	8.2	20.7	
12-Feb	Z	0.5	0.5	1.3	2.3	2.2	0.6	0.2	12.3	22.2	17.0	18.9	16.0	12.2	12.9	14.2	24.9	34.8	34.6	35.3	35.0	30.7	32.4	30.0	17.0	35.3	
13-Feb	26.8	Z	27.4	26.2	26.3	7.8	1.3	2.1	12.3	7.3	4.1	0.2	2.7	1.7	1.5	0.9	6.6	7.8	8.1	15.5	13.7	15.1	11.1	11.0	10.3	27.4	
14-Feb	7.4	6.9	Z	12.0	11.2	17.7	14.0	3.3	4.1	5.0	5.5	6.3	6.9	6.8	4.8	10.7	12.4	12.3	12.7	14.3	15.4	17.0	13.4	17.9	10.3	17.9	
15-Feb	21.6	22.7	19.9	Z	21.4	24.9	26.1	26.6	16.3	6.5	3.7	7.7	22.8	14.4	7.6	7.9	15.3	32.1	35.4	33.2	32.4	32.8	30.9	28.7	21.3	35.4	
16-Feb	28.5	26.3	25.4	25.8	Z	24.6	25.7	26.3	24.5	20.4	17.5	17.7	13.5	14.2	19.8	M	23.5	27.9	27.4	24.2	10.6	15.0	18.3	27.6	22.0	28.5	
17-Feb	26.6	4.4	3.4	3.4	4.0	Z	5.8	3.6	3.9	4.1	6.2	5.6	4.5	5.0	6.2	6.1	10.0	7.7	7.0	7.4	19.7	25.3	23.7	19.5	9.3	26.6	
18-Feb	Z	21.8	24.4	21.0	18.6	18.8	16.6	16.2	13.4	9.5	11.5	23.2	17.7	9.4	9.2	9.3	18.8	31.8	37.4	37.7	36.8	34.3	32.1	30.1	21.7	37.7	
19-Feb	29.0	Z	24.8	19.4	17.7	19.2	15.2	14.7	16.7	16.5	30.1	27.7	16.4	12.9	17.9	21.4	22.8	30.9	35.5	35.1	19.8	19.0	22.4	21.4	22.0	35.5	
20-Feb	26.6	28.0	Z	7.5	7.2	9.7	12.4	13.0	10.1	12.5	10.3	7.0	7.5	13.3	8.4	5.8	11.4	14.6	12.3	16.4	17.2	20.8	24.3	12.9	13.4	28.0	
21-Feb	16.8	16.7	9.1	Z	13.1	19.0	18.1	19.4	10.9	14.8	12.7	9.4	5.9	5.8	5.2	5.2	7.2	8.4	7.8	13.9	15.1	17.7	20.7	17.7	12.6	20.7	
22-Feb	22.7	21.2	26.6	24.0	Z	24.6	25.5	27.1	23.5	24.3	24.8	27.1	19.1	8.1	8.8	14.4	14.3	17.1	20.9	21.7	25.1	24.3	26.7	17.6	21.3	27.1	
23-Feb	13.1	19.5	19.6	19.5	22.2	24.0	20.8	21.2	16.2	18.2	13.3	10.9	8.8	7.4	8.4	15.4	11.9	16.8	25.9	26.5	29.4	31.1	33.3	33.1	19.4	33.3	
24-Feb	Z	33.8	34.2	34.9	32.2	31.4	31.2	31.6	22.7	16.0	12.1	8.3	4.1	3.4	2.9	3.6	6.5	6.0	5.7	8.1	9.1	12.9	12.6	11.8	16.3	34.9	
25-Feb	19.1	Z	18.3	11.2	9.3	11.3	14.4	14.7	13.1	6.3	0.9	0.7	0.9	2.2	2.0	3.4	3.2	5.4	8.5	24.7	20.9	16.5	18.8	19.1	10.6	24.7	
26-Feb	18.8	19.0	Z	15.5	14.1	16.0	19.9	26.6	31.4	37.8	33.1	23.5	18.0	19.8	19.8	17.9	19.4	30.6	28.1	14.5	11.0	9.7	9.4	11.9	20.3	37.8	
27-Feb	23.6	17.4	10.7	Z	13.1	9.4	6.7	6.9	9.7	5.6	6.2	6.7	6.5	5.8	8.9	7.5	6.4	8.3	19.9	18.2	16.2	16.1	11.8	8.5	10.9	23.6	
28-Feb	3.5	8.8	11.9	15.3	Z	10.3	8.6	11.6	8.6	6.9	17.6	17.8	13.5	10.9	10.6	4.6	7.1	9.6	17.5	19.1	26.6	30.4	28.3	28.7	14.3	30.4	
		20.4	17.3	19.3	17.3	15.7	16.7	16.5	16.6	16.0	15.1	14.0	13.2	10.8	10.3	10.4	10.9	14.1	17.1	18.5	19.6	19.5	20.0	20.3	19.3	Diurnal Average	
		34.8	33.8	34.2	34.9	32.2	31.4	31.5	33.6	33.8	37.8	33.1	29.9	26.6	30.6	30.5	29.9	31.3	34.8	37.4	37.7	36.8	34.3	33.3	33.1	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**  
**Fort McKay - Bertha Ganter - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	426	66.98	66.98
21 - 40	210	33.02	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: 636

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort McKay - Bertha Ganter - February 2023**

<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	81	57	35	24	11	6	8	34	56	8	8	17	24	18	23	16	426
21 - 40	41	10	2	5	1	0	4	14	27	31	6	7	8	13	18	21	208
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>	122	67	37	29	12	6	12	48	83	39	14	24	32	31	41	37	634

Total Number of Valid Hours: 634

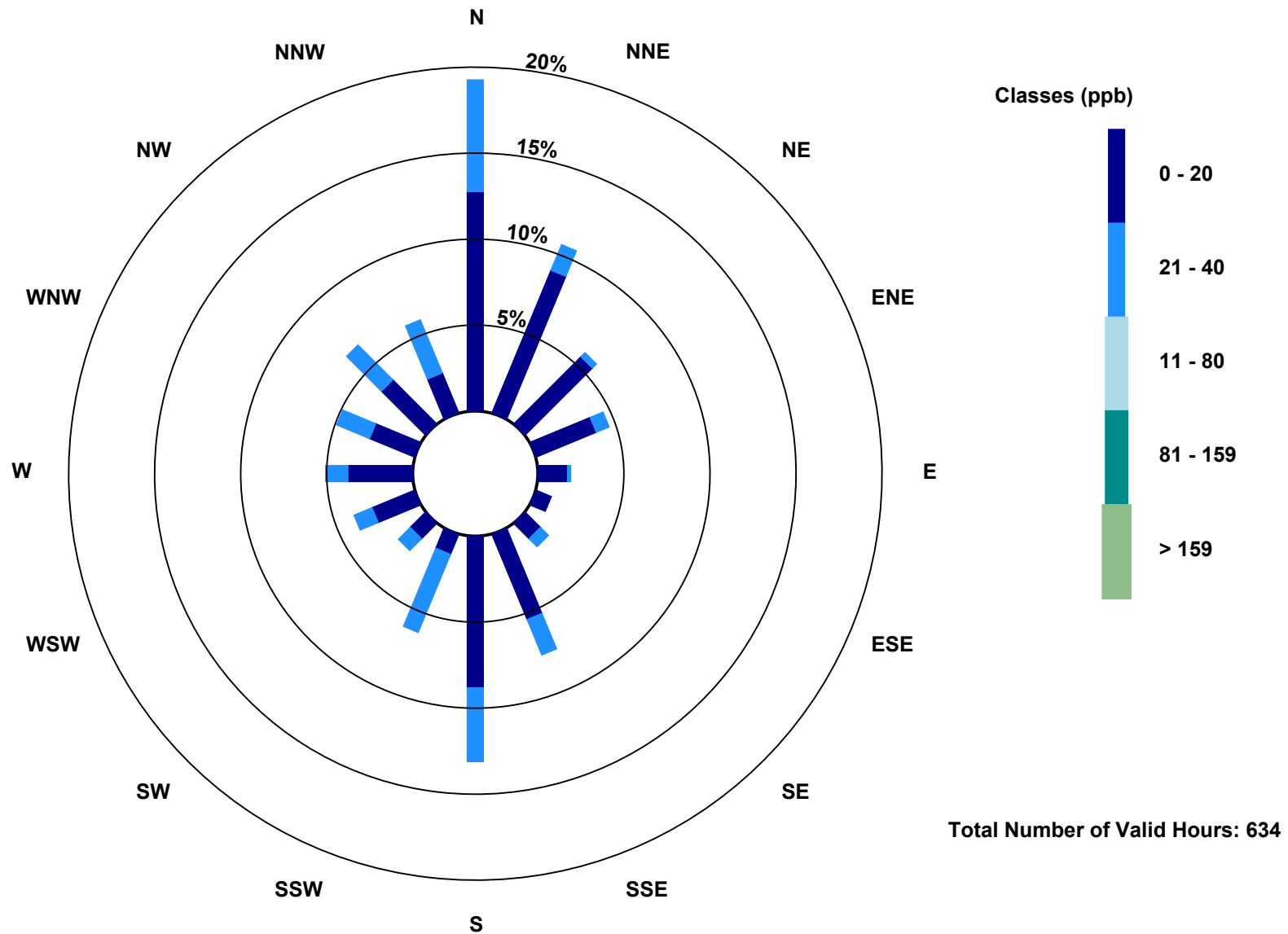
Total Number of Hours: 672

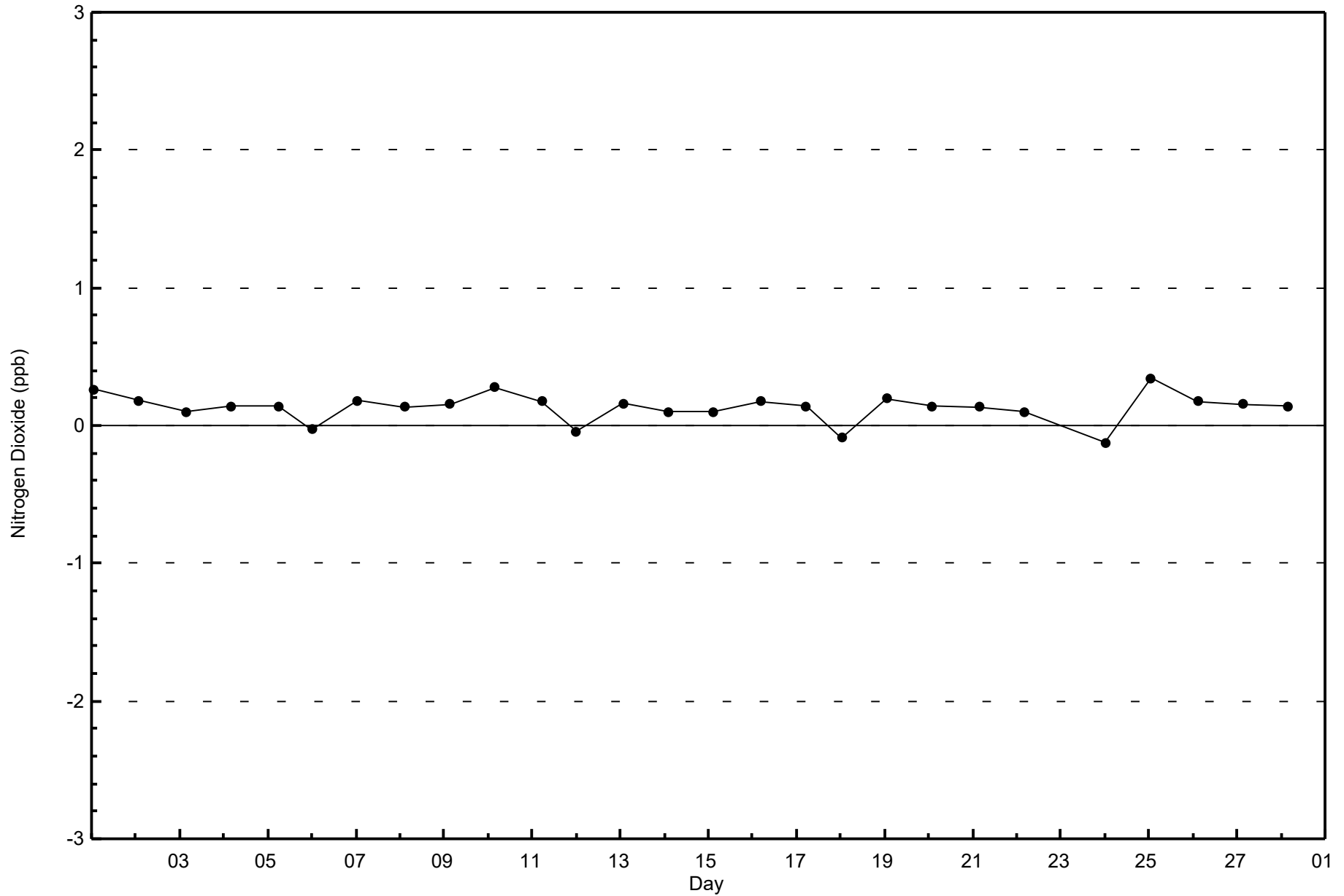


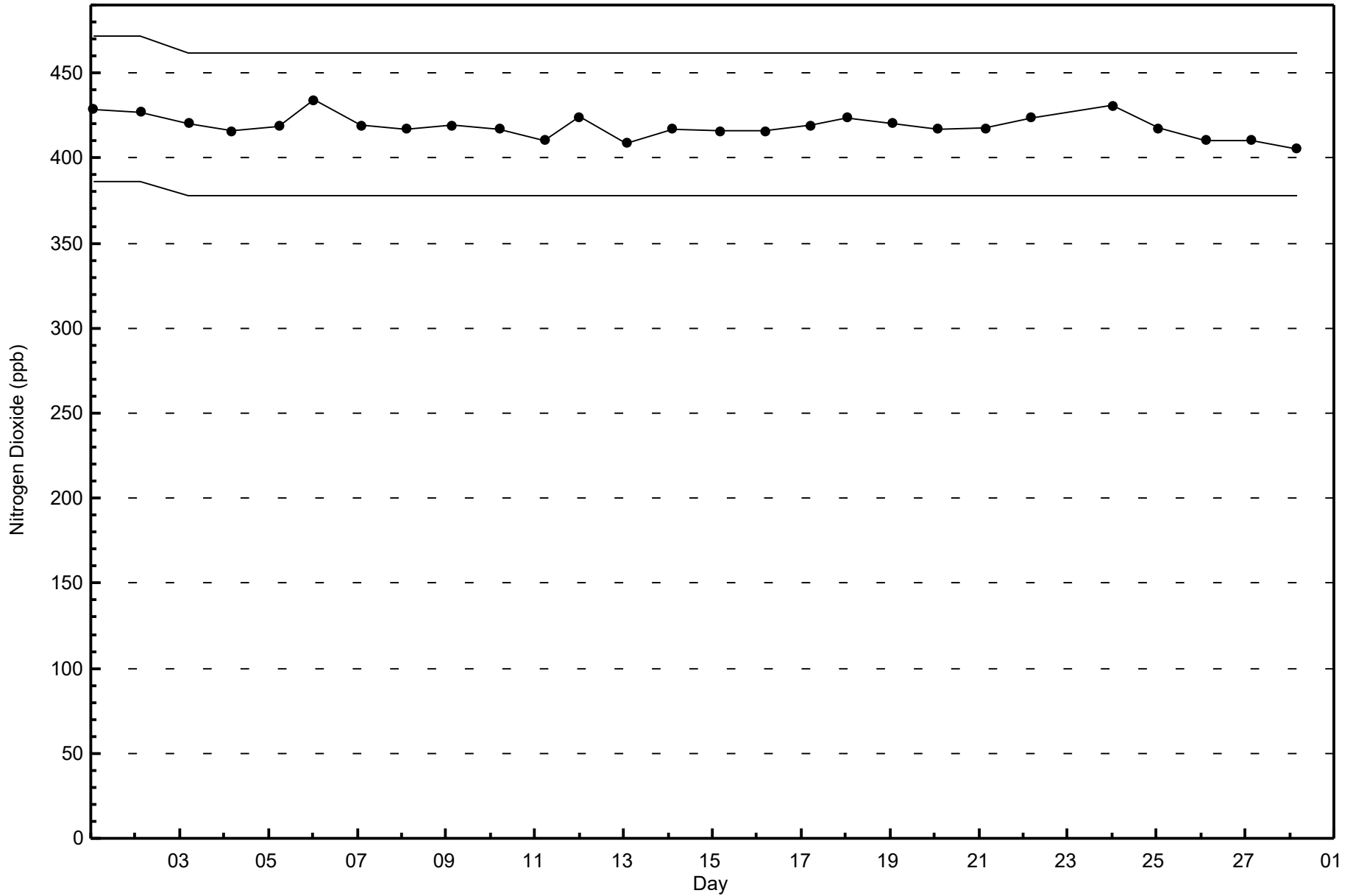


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









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

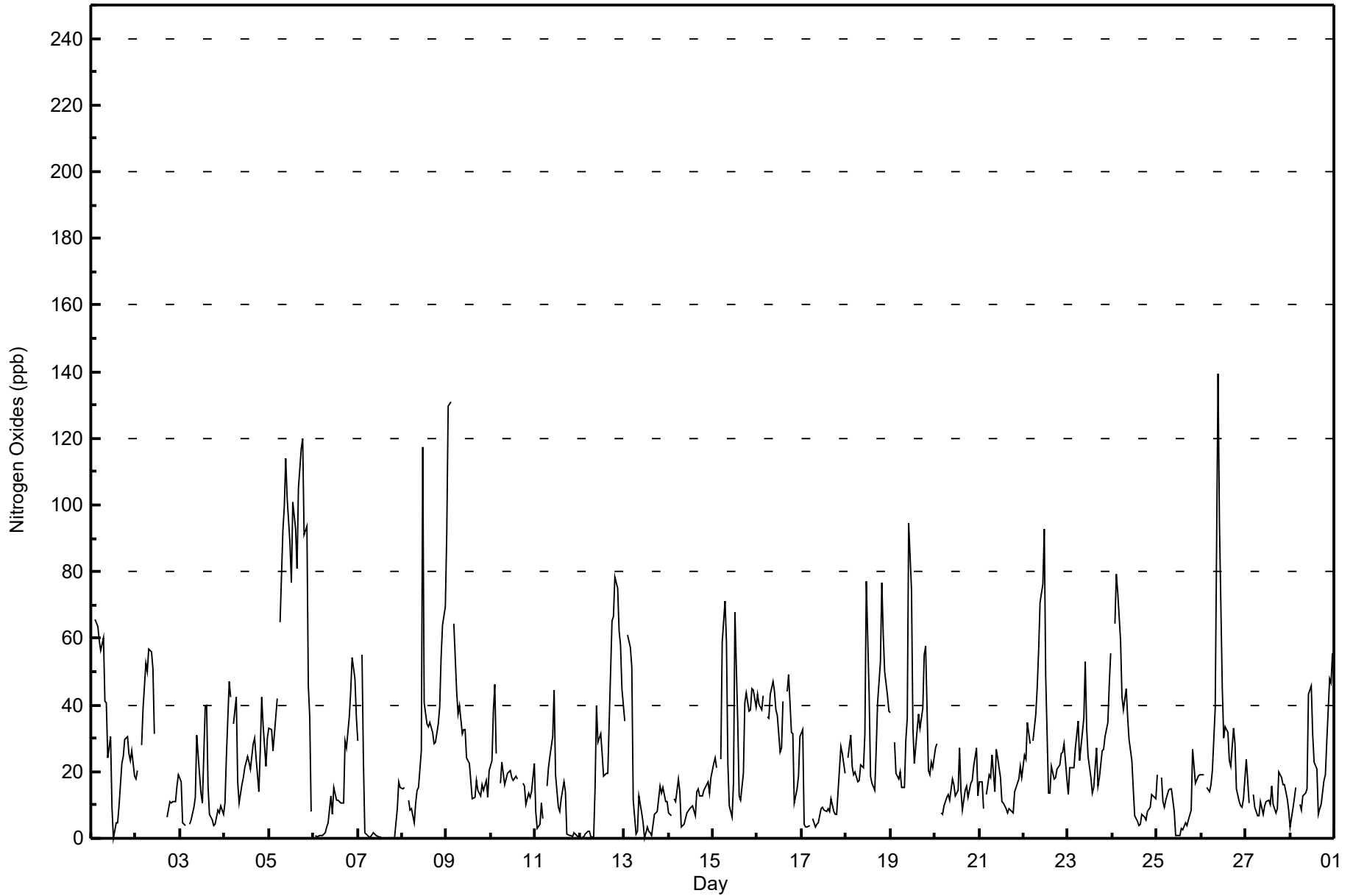
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Fort McKay - Bertha Ganter - February 2023**

Maximum Value: 139.2 ppb on Feb 26 10:00																						Maximum Daily Average: 73.7 ppb on Feb 5																						Hours in Service: 672	
Minimum Value: 0.0 ppb on Feb 1 13:00																						Minimum Daily Average: 6.8 ppb on Feb 7																						Hours of Data: 636	
Maximum Diurnal Average: 32.6 ppb at hour 3																						Minimum Diurnal Average: 17.1 ppb at hour 16																						Hours of Missing Data: 36	
Monthly Average: 24.90 ppb																						Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 4.1 Q <sub>1</sub> = 10.2 Median = 18.1 Q <sub>3</sub> = 32.9 P <sub>90</sub> = 54.2 P <sub>99</sub> = 110.8																						Hours of Calibration: 33	
																						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-Feb	63.3	Z	65.9	63.6	59.2	56.2	60.3	41.2	40.6	24.2	30.5	9.2	0.0	4.8	4.9	9.9	22.4	24.8	29.5	30.4	25.4	23.4	26.4	18.6	31.9	65.9																			
2-Feb	17.9	20.3	Z	28.1	39.2	52.4	50.1	56.6	56.1	50.8	31.2	C	C	C	C	C	C	6.2	11.0	10.7	10.9	11.0	15.6	19.0	--	56.6																			
3-Feb	16.9	4.5	4.4	3.7	Z	4.3	5.5	9.4	12.3	30.9	19.3	13.6	10.5	39.4	39.9	15.5	7.4	5.6	3.8	4.1	8.6	7.5	9.9	7.1	12.4	39.9																			
4-Feb	10.4	24.6	46.9	42.5	Z	34.5	42.5	17.1	10.7	16.0	18.2	21.2	24.7	22.7	20.7	28.2	29.9	24.0	14.1	26.8	42.4	34.0	21.7	30.1	26.3	46.9																			
5-Feb	33.2	32.7	26.2	31.2	41.9	Z	65.0	92.3	99.6	113.9	102.0	88.4	76.6	100.9	92.6	81.0	104.9	116.9	119.8	91.2	93.8	45.9	36.3	8.1	73.7	119.8																			
6-Feb	Z	0.7	0.6	0.8	0.7	1.0	1.7	3.6	4.8	12.6	7.4	15.3	11.5	11.3	10.9	10.5	10.7	29.4	27.1	36.4	44.1	54.3	47.9	36.4	16.5	54.3																			
7-Feb	29.3	Z	54.9	23.4	1.8	0.7	0.5	0.6	1.8	1.1	0.7	0.4	0.3	0.2	0.1	0.0	0.0	0.1	0.2	0.1	0.0	8.9	17.0	15.1	6.8	54.9																			
8-Feb	15.0	15.3	Z	11.3	8.6	9.0	4.8	10.6	14.6	15.4	26.4	117.3	40.5	34.3	33.5	34.9	31.9	28.4	28.6	34.2	39.4	54.1	64.2	69.6	32.3	117.3																			
9-Feb	91.3	129.7	130.8	Z	64.5	43.9	37.1	39.9	31.3	32.5	32.4	24.1	22.5	17.3	12.0	12.4	17.6	14.2	12.8	16.2	14.4	17.2	12.4	20.3	36.8	130.8																			
10-Feb	23.3	38.0	46.2	25.3	Z	16.5	22.8	16.1	17.7	19.6	20.2	18.1	17.3	18.6	18.0	PF	PF	16.5	15.7	10.3	13.4	12.2	13.9	22.6	20.1	46.2																			
11-Feb	7.9	2.9	4.3	10.4	5.9	Z	15.9	21.3	24.7	30.6	44.3	19.1	9.5	8.2	12.1	16.7	13.9	1.3	1.0	0.8	0.5	1.8	1.0	0.6	11.1	44.3																			
12-Feb	Z	0.5	0.5	1.3	2.3	2.2	0.6	0.2	15.2	40.0	28.7	31.4	25.6	18.8	19.3	19.4	35.3	65.2	66.6	78.2	75.0	62.4	58.2	45.0	30.1	78.2																			
13-Feb	35.2	Z	60.8	57.1	51.1	11.3	1.3	2.1	12.8	7.7	4.5	0.2	3.5	1.9	1.7	0.9	7.1	7.8	8.2	15.5	13.7	15.1	11.1	11.0	14.9	60.8																			
14-Feb	7.4	6.9	Z	12.0	11.2	17.7	14.0	3.3	4.2	5.9	7.4	9.1	9.5	9.8	6.7	14.1	14.8	12.7	12.7	14.3	15.4	17.0	13.4	18.1	11.2	18.1																			
15-Feb	22.3	24.3	21.3	Z	23.7	59.0	71.0	58.8	22.3	9.5	6.4	16.9	67.9	34.8	12.6	11.4	19.3	40.6	43.5	38.0	38.6	45.1	44.5	39.5	33.5	71.0																			
16-Feb	43.1	40.1	38.6	42.7	Z	36.2	36.1	43.2	47.1	44.2	38.6	36.9	25.9	26.9	41.1	M	44.2	49.2	31.6	31.3	10.6	15.0	18.4	30.5	35.1	49.2																			
17-Feb	32.4	4.4	3.4	3.4	4.0	Z	5.8	3.6	4.1	4.9	8.8	9.2	8.6	8.0	9.0	7.9	11.7	8.0	7.0	7.4	20.7	27.6	25.6	19.6	10.7	32.4																			
18-Feb	Z	24.3	30.7	21.5	19.0	20.0	16.9	17.4	22.1	21.3	31.3	76.9	43.3	18.7	16.5	14.5	26.9	40.6	52.8	76.5	61.0	49.9	42.9	37.9	34.0	76.9																			
19-Feb	37.7	Z	28.7	19.6	17.8	20.1	15.2	15.3	29.5	35.8	94.5	74.5	33.0	22.6	32.7	37.5	32.9	38.8	55.1	57.7	20.4	19.2	22.7	21.4	34.0	94.5																			
20-Feb	27.1	28.6	Z	7.5	7.2	9.7	12.4	13.1	11.3	17.7	16.2	12.7	14.3	27.0	14.6	8.4	14.4	15.6	12.3	16.6	17.3	21.6	27.3	12.9	15.9	28.6																			
21-Feb	16.8	16.7	9.1	Z	13.1	19.0	18.3	24.8	13.8	26.8	24.2	18.3	10.9	10.4	8.8	7.6	9.0	8.7	7.8	14.0	15.3	18.0	21.6	18.2	15.3	26.8																			
22-Feb	25.0	23.8	34.6	28.3	Z	29.4	37.3	45.4	56.3	70.8	76.2	92.8	48.7	13.6	13.7	21.5	18.0	18.2	21.0	21.9	25.4	25.9	28.6	18.0	34.5	92.8																			
23-Feb	13.2	21.2	21.3	21.1	27.0	35.0	23.2	27.4	36.1	53.1	32.9	24.7	18.1	13.7	15.1	27.2	15.8	18.0	26.2	26.6	30.7	34.6	46.0	55.3	27.6	55.3																			
24-Feb	Z	64.6	79.2	73.7	59.5	42.6	38.7	44.8	36.4	29.8	23.4	15.0	6.6	5.0	3.8	4.3	7.4	6.3	5.7	8.1	9.1	12.9	12.6	11.8	26.1	79.2																			
25-Feb	19.1	Z	18.3	11.2	9.3	11.3	14.4	15.0	14.8	8.1	1.0	0.8	1.0	3.1	2.7	4.5	3.7	5.5	8.5	26.7	21.8	16.6	18.8	19.2	11.1	26.7																			
26-Feb	19.0	19.1	Z	15.5	14.1	16.1	20.5	39.1	88.6	139.2	94.6	45.5	30.1	33.6	31.9	23.2	21.6	32.9	28.6	14.9	11.0	9.7	9.4	11.9	33.5	139.2																			
27-Feb	23.6	17.4	10.7	Z	13.1	9.4	6.7	6.9	11.2	7.2	9.6	11.2	11.5	10.2	15.6	10.2	7.6	8.7	19.9	18.2	16.2	16.1	11.8	8.5	12.2	23.6																			
28-Feb	3.5	8.8	11.9	15.3	Z	10.3	8.6	12.7	13.5	14.7	43.4	45.7	31.4	22.8	20.7	7.0	9.0	10.2	17.5	19.1	29.4	47.9	46.4	55.7	22.0	55.7																			
26.4 24.8 32.6 23.8 22.5 22.7 23.1 24.3 26.9 31.6 31.2 31.4 22.4 20.0 18.9 17.1 20.7 23.4 24.6 26.6 25.9 25.9 25.9 24.4																								Diurnal Average																					
91.3 129.7 130.8 73.7 64.5 59.0 71.0 92.3 99.6 139.2 102.0 117.3 76.6 100.9 92.6 81.0 104.9 116.9 119.8 91.2 93.8 62.4 64.2 69.6																								Diurnal Maximum																					
Z - zerospan C - Calibration M - Maintenance PF - Power Failure																																													



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

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Fort McKay - Bertha Ganter - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	356	55.97	55.97
21 - 40	169	26.57	82.55
41 - 80	89	13.99	96.54
81 - 159	21	3.30	99.84
> 159	0	0.00	99.84

Total Number of Valid Hours: 636

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Fort McKay - Bertha Ganter - February 2023**

<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	50	30	18	8	4	2	25	43	8	6	16	20	18	22	15	356
21 - 40	34	13	4	8	2	2	4	12	23	12	5	7	9	9	12	11	167
41 - 80	16	1	3	2	2	0	4	8	11	17	1	1	3	4	6	10	89
81 - 159	1	3	0	1	0	0	2	3	6	1	2	0	0	0	1	1	21
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	122	67	37	29	12	6	12	48	83	38	14	24	32	31	41	37	633

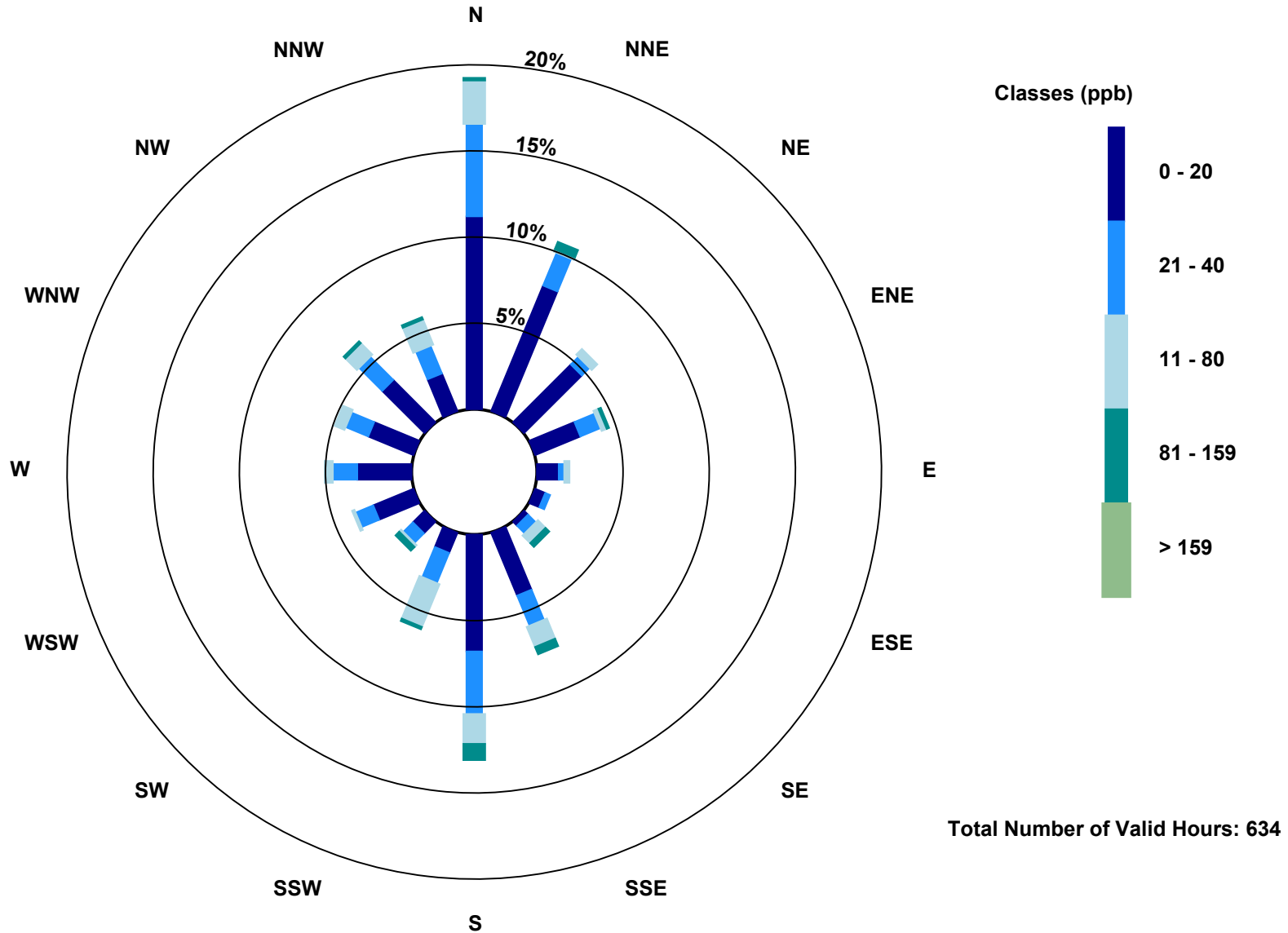
Total Number of Valid Hours: 634

Total Number of Hours: 672

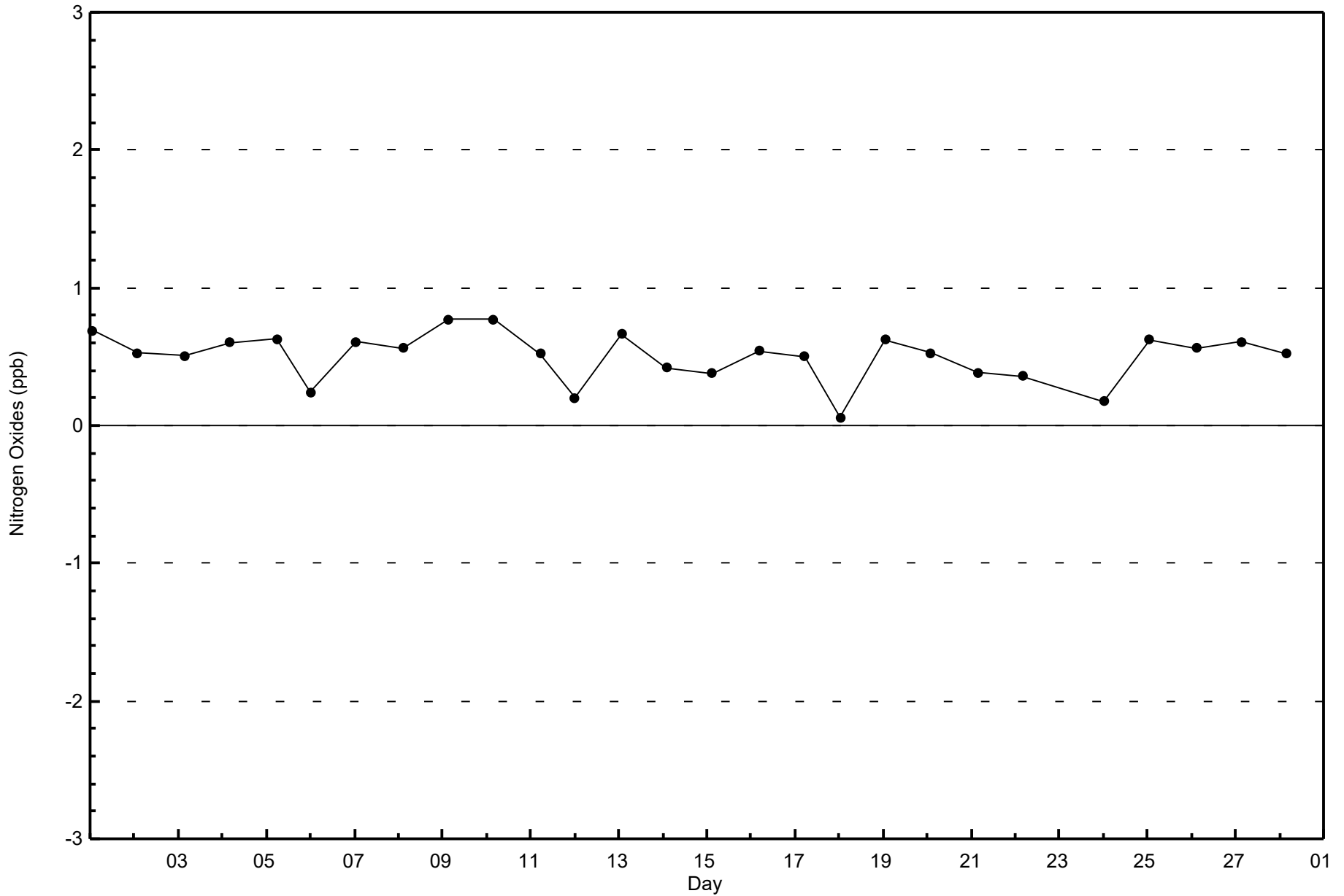


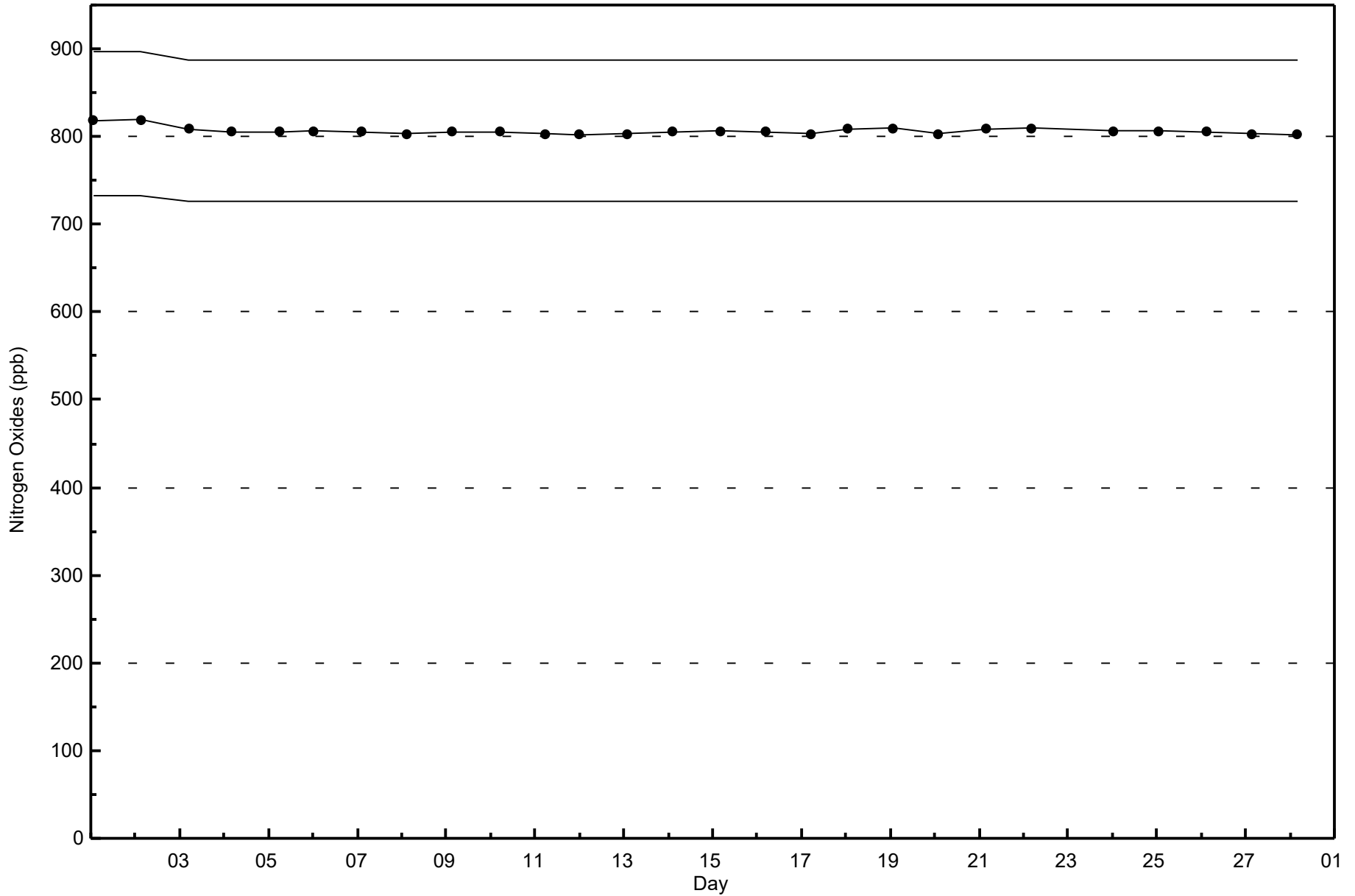
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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











**Summary of Hour Averages**

**Fort McKay - Bertha Ganter - February 2023**

<b>Number of Exceedences (AAAQO):</b> 1-hr: 0    24-hr: 0	<b>Hours in Service:</b> 672
<b>Maximum Value:</b> 38.8 ppb on Feb 7 16:00 <b>Maximum Daily Average:</b> 28.7 ppb on Feb 7	<b>Hours of Data:</b> 637
<b>Minimum Value:</b> 0.3 ppb on Feb 1 04:00 <b>Minimum Daily Average:</b> 2.4 ppb on Feb 5	<b>Hours of Missing Data:</b> 35
<b>Maximum Diurnal Average:</b> 24.3 ppb at hour 16 <b>Minimum Diurnal Average:</b> 10.6 ppb at hour 1	<b>Hours of Calibration:</b> 31
<b>Monthly Average:</b> 15.62 ppb <b>Percentiles:</b> P <sub>1</sub> = 0.4    P <sub>10</sub> = 0.9    Q <sub>1</sub> = 4.7    Median = 15.9    Q <sub>3</sub> = 24.6    P <sub>90</sub> = 29.4    P <sub>99</sub> = 38.1	<b>Percent Operational Time:</b> 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-Feb	0.8	1.4	0.5	0.3	0.4	Z	0.7	2.6	5.5	17.4	17.5	30.3	36.4	33.5	33.5	28.9	17.3	12.3	9.6	7.6	9.2	8.9	6.6	9.3	12.6	36.4
2-Feb	Z	7.8	5.4	4.7	1.3	1.1	0.9	0.9	2.0	6.0	14.0	14.8	16.5	16.1	15.5	27.8	26.3	29.2	24.9	25.2	25.1	25.0	20.5	17.6	14.3	29.2
3-Feb	18.9	30.1	Z	30.1	29.6	28.6	27.6	23.5	20.4	10.7	15.7	19.0	21.8	12.7	12.2	20.7	25.4	26.3	28.3	27.7	22.8	23.5	21.2	23.3	22.6	30.1
4-Feb	19.4	6.8	Z	2.0	6.0	0.9	0.5	13.6	20.0	17.2	17.5	17.7	16.7	16.8	17.4	12.2	8.3	8.2	15.8	6.5	0.4	2.2	8.1	2.5	10.3	20.0
5-Feb	1.1	2.3	4.1	Z	0.7	0.5	0.7	0.7	0.9	1.4	2.7	3.6	5.5	3.0	2.5	1.9	1.0	0.7	0.6	0.7	0.7	1.5	1.8	17.6	2.4	17.6
6-Feb	26.3	26.4	26.1	25.9	Z	25.8	25.4	23.7	20.6	18.4	24.2	21.1	22.5	22.4	21.6	20.1	18.4	3.4	3.2	1.1	0.5	0.5	0.8	1.4	16.5	26.4
7-Feb	4.9	9.0	0.9	12.2	27.8	Z	34.2	35.9	33.7	34.6	35.0	36.3	37.3	38.0	38.6	38.8	38.7	38.4	38.0	37.7	36.1	25.4	13.9	14.6	28.7	38.8
8-Feb	Z	14.5	14.9	14.7	15.4	14.7	18.0	12.7	7.9	11.7	10.9	C	C	C	C	11.6	8.9	4.6	2.4	1.5	0.9	1.3	0.9	0.9	8.9	18.0
9-Feb	1.3	Z	0.8	0.9	0.9	1.1	1.4	1.5	5.6	10.3	13.8	19.4	20.6	22.5	24.5	23.8	18.4	16.0	16.4	11.3	10.5	6.0	8.9	3.2	10.4	24.5
10-Feb	1.1	1.3	Z	4.3	4.7	13.0	7.9	13.0	13.2	13.7	15.4	17.8	17.8	17.7	18.3	PF	PF	14.6	14.8	19.7	16.9	17.4	15.3	9.8	12.7	19.7
11-Feb	20.9	25.6	23.7	Z	19.6	16.9	9.6	4.2	4.8	6.7	7.0	15.7	20.9	21.4	17.8	14.0	17.2	30.7	28.6	28.1	33.5	32.2	29.2	30.0	19.9	33.5
12-Feb	31.7	31.8	30.5	29.6	Z	25.6	28.2	28.7	14.9	10.4	16.1	15.7	19.1	21.6	20.2	18.8	9.3	1.4	0.7	0.7	0.7	0.7	0.7	0.8	15.6	31.8
13-Feb	0.9	0.8	0.8	0.8	1.0	Z	27.6	24.7	18.3	28.4	33.7	38.7	37.3	38.6	37.9	38.2	32.8	30.7	29.1	20.7	22.7	21.2	24.7	24.8	23.2	38.7
14-Feb	Z	27.9	24.9	21.4	21.1	15.3	18.4	28.6	27.6	26.9	26.3	26.5	26.4	28.8	23.2	21.3	20.4	18.9	16.2	11.3	12.7	18.1	13.4	13.4	21.8	28.8
15-Feb	6.1	Z	3.8	2.4	1.4	0.6	0.6	0.8	10.1	19.5	24.6	21.9	12.9	20.6	27.1	26.9	19.8	4.2	1.2	1.1	0.8	1.0	0.6	0.4	9.1	27.1
16-Feb	1.1	0.5	Z	0.6	0.6	0.4	0.5	0.6	2.7	5.6	11.1	11.3	16.0	14.3	8.7	M	4.7	1.6	1.8	8.4	19.0	14.7	11.3	2.7	6.3	19.0
17-Feb	3.3	23.5	24.6	Z	23.7	20.9	21.0	24.1	25.3	25.4	23.4	23.7	24.2	23.6	22.3	22.1	18.4	20.2	20.8	20.2	8.2	2.8	3.1	6.6	18.8	25.4
18-Feb	4.8	4.1	1.9	2.1	Z	3.0	3.3	3.3	6.0	10.5	13.3	10.5	17.2	24.2	25.1	25.1	16.5	4.7	0.6	0.5	0.9	0.4	0.6	0.8	7.8	25.1
19-Feb	1.0	0.8	1.7	3.8	3.9	Z	4.8	4.0	4.9	7.0	5.7	9.8	17.6	20.8	16.9	14.2	12.2	4.3	0.4	0.6	14.3	15.6	12.0	12.0	8.2	20.8
20-Feb	Z	4.0	13.0	25.8	26.3	23.7	19.5	17.9	21.7	19.4	22.4	24.6	24.9	21.3	25.8	27.9	22.8	19.2	20.6	15.8	12.9	7.9	5.4	20.9	19.3	27.9
21-Feb	18.1	Z	24.6	23.8	19.5	14.2	12.0	11.2	16.3	14.9	21.4	25.1	28.9	29.8	30.7	31.4	29.3	28.1	28.2	22.3	19.0	14.5	11.9	12.3	21.2	31.4
22-Feb	7.2	6.9	Z	1.8	1.9	1.7	0.4	0.6	3.7	7.7	10.5	9.6	19.4	33.0	33.1	27.5	26.6	23.0	19.1	16.3	11.3	11.5	9.1	13.7	12.8	33.1
23-Feb	14.9	9.8	8.2	6.7	2.7	1.5	4.4	4.4	8.7	9.1	M	20.7	24.6	26.9	26.6	20.8	23.8	19.7	11.0	9.0	5.2	2.6	1.3	1.6	11.5	26.9
24-Feb	0.9	0.6	0.7	0.7	Z	1.3	1.7	2.3	10.2	16.9	22.9	27.9	34.0	35.3	36.4	36.3	34.0	33.7	32.8	29.8	28.8	25.0	24.7	24.6	20.1	36.4
25-Feb	16.8	15.4	16.6	23.3	24.3	Z	18.6	17.9	19.9	28.8	36.7	37.5	38.0	36.8	37.6	36.6	36.8	34.1	30.0	15.6	14.6	15.4	13.1	9.4	24.9	38.0
26-Feb	Z	7.1	8.1	13.0	9.8	5.6	3.5	1.2	1.9	2.1	4.4	11.2	17.4	18.0	20.1	22.9	21.3	11.1	13.0	25.7	28.6	29.7	29.6	26.6	14.4	29.7
27-Feb	14.7	Z	26.8	29.0	24.1	27.0	29.2	28.8	26.0	29.2	29.1	28.3	28.6	29.5	27.3	27.7	28.5	26.7	15.8	16.4	18.1	18.3	21.7	23.9	25.0	29.5
28-Feb	27.7	21.6	Z	13.2	13.8	14.3	14.1	11.5	13.0	15.9	15.9	17.0	21.0	23.5	25.0	31.2	28.7	25.4	17.9	14.0	4.6	0.9	0.8	0.8	16.2	31.2

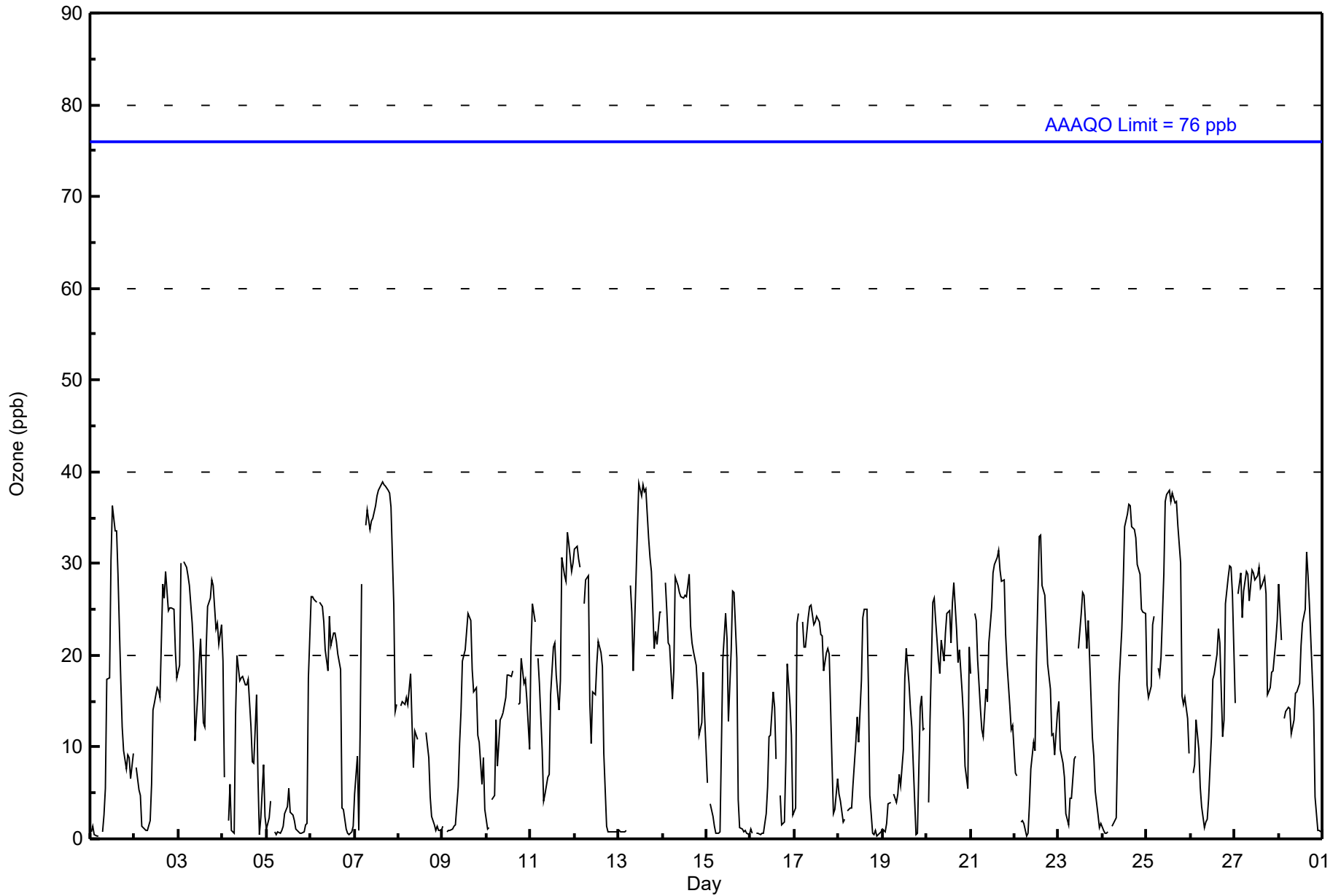
10.6	11.7	11.9	11.7	11.7	11.2	11.9	12.2	13.1	15.2	18.2	20.6	23.1	24.0	24.1	24.3	21.0	17.6	15.9	14.3	13.5	12.1	11.3	11.6	Diurnal Average	
31.7	31.8	30.5	30.1	29.6	28.6	34.2	35.9	33.7	34.6	36.7	38.7	38.0	38.6	38.6	38.8	38.7	38.4	38.0	37.7	36.1	32.2	29.6	30.0	Diurnal Maximum	

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



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

**Ozone (O<sub>3</sub>) - ppb**  
**Fort McKay - Bertha Ganter - February 2023**





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

**Ozone (O<sub>3</sub>) - ppb**  
**Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	405	63.58	63.58
21 - 50	232	36.42	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 637

Total Number of Hours: 672



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

**Ozone (O<sub>3</sub>) - ppb**  
**Fort McKay - Bertha Ganter - February 2023**

<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	86	32	11	12	2	3	9	26	57	38	10	13	14	25	33	32	403
21 - 50	36	34	26	19	9	3	3	22	28	2	4	11	17	7	6	5	232
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>	122	66	37	31	11	6	12	48	85	40	14	24	31	32	39	37	635

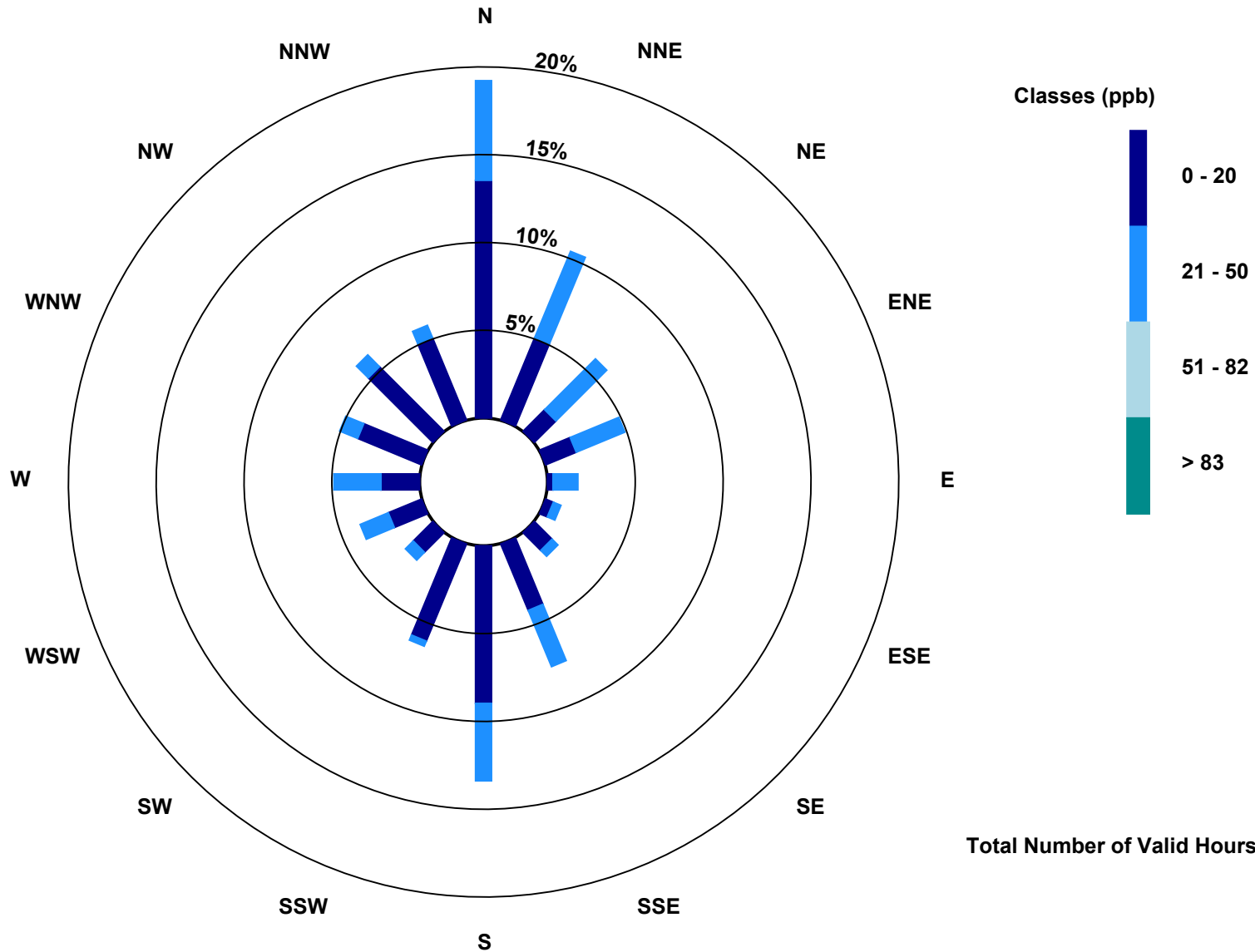
Total Number of Valid Hours: 635

Total Number of Hours: 672

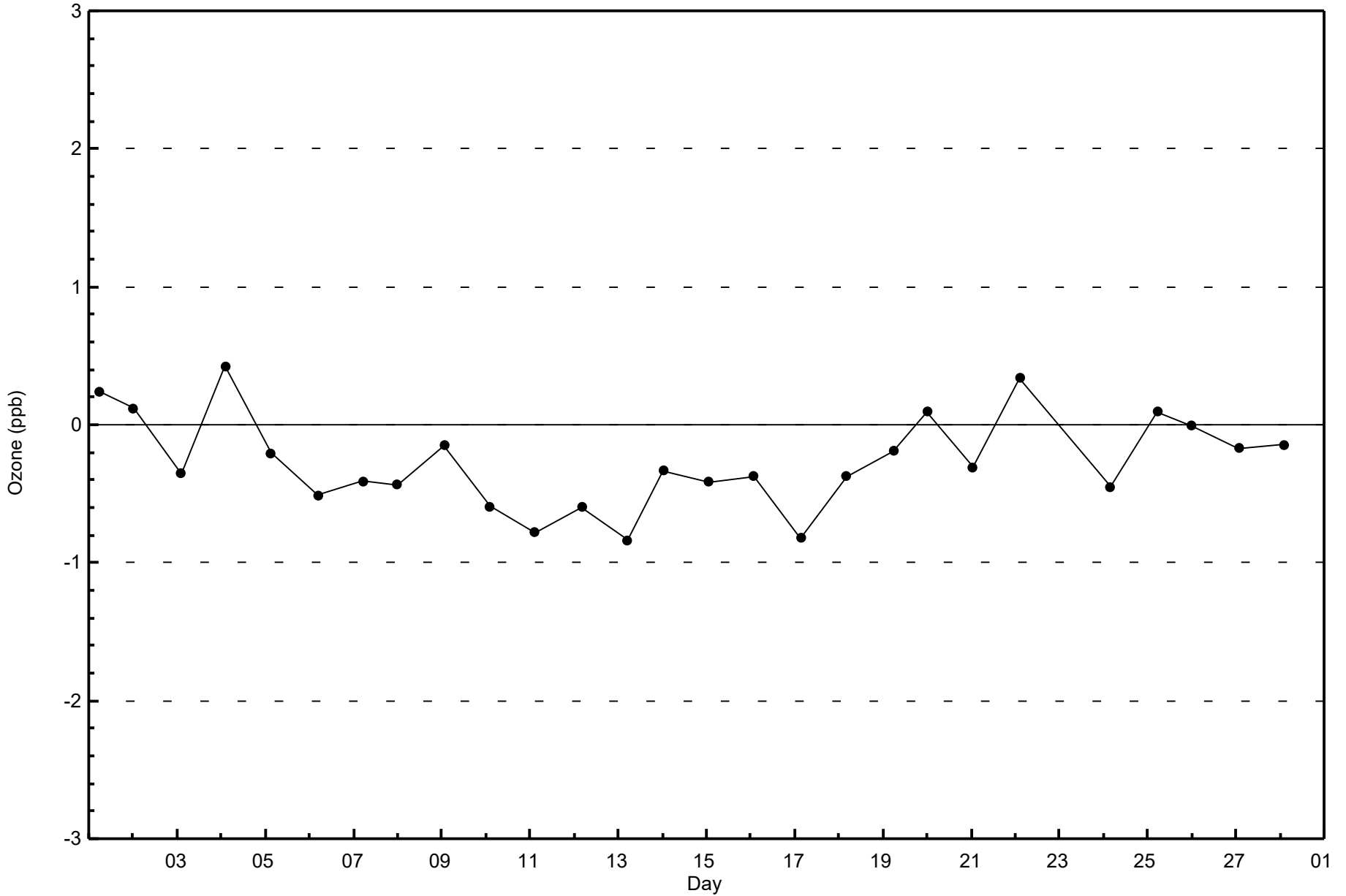


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

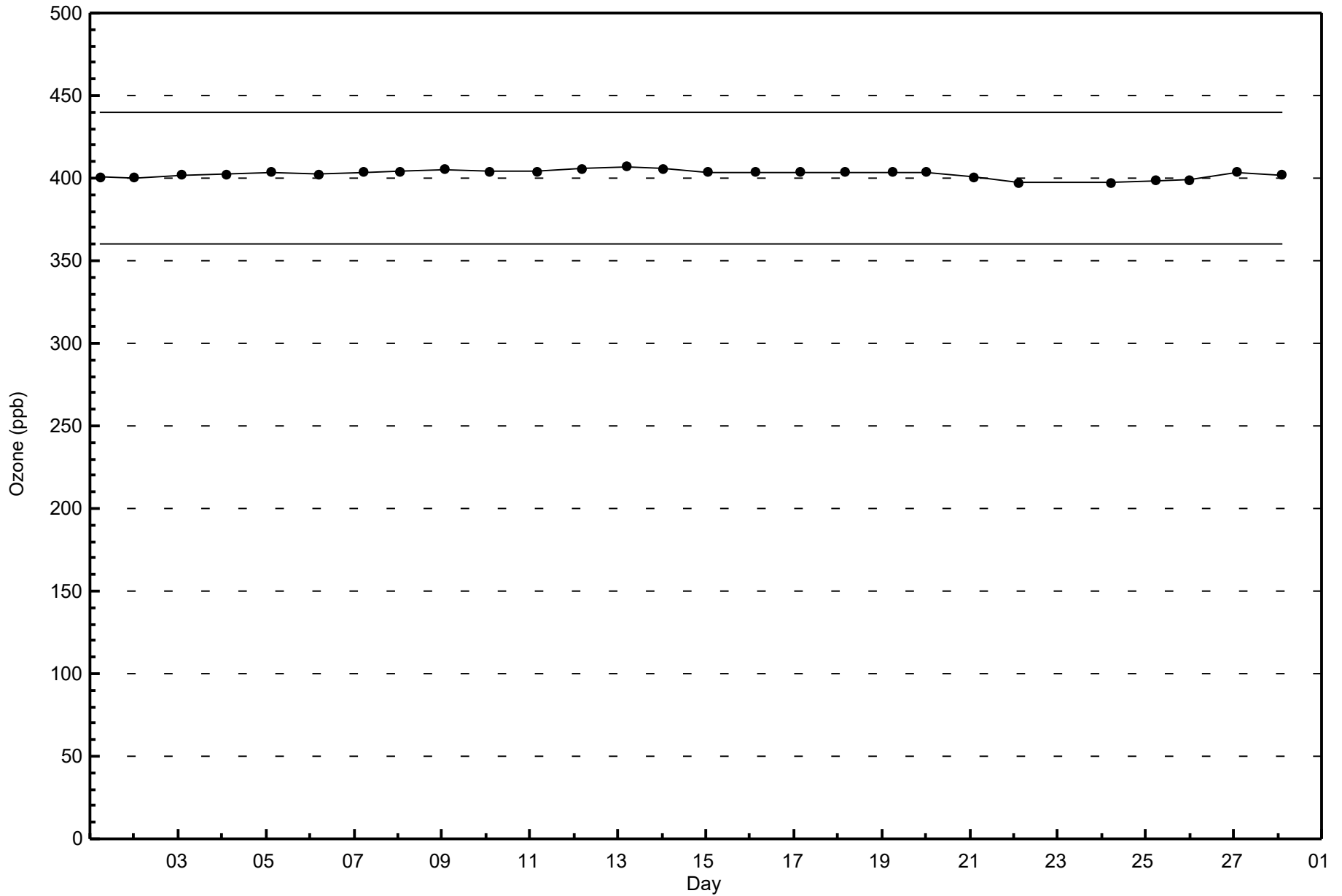
Ozone (O<sub>3</sub>) - ppb  
Fort McKay - Bertha Ganter



Total Number of Valid Hours: 635









Wood Buffalo Environmental Association

Summary of Hour Averages

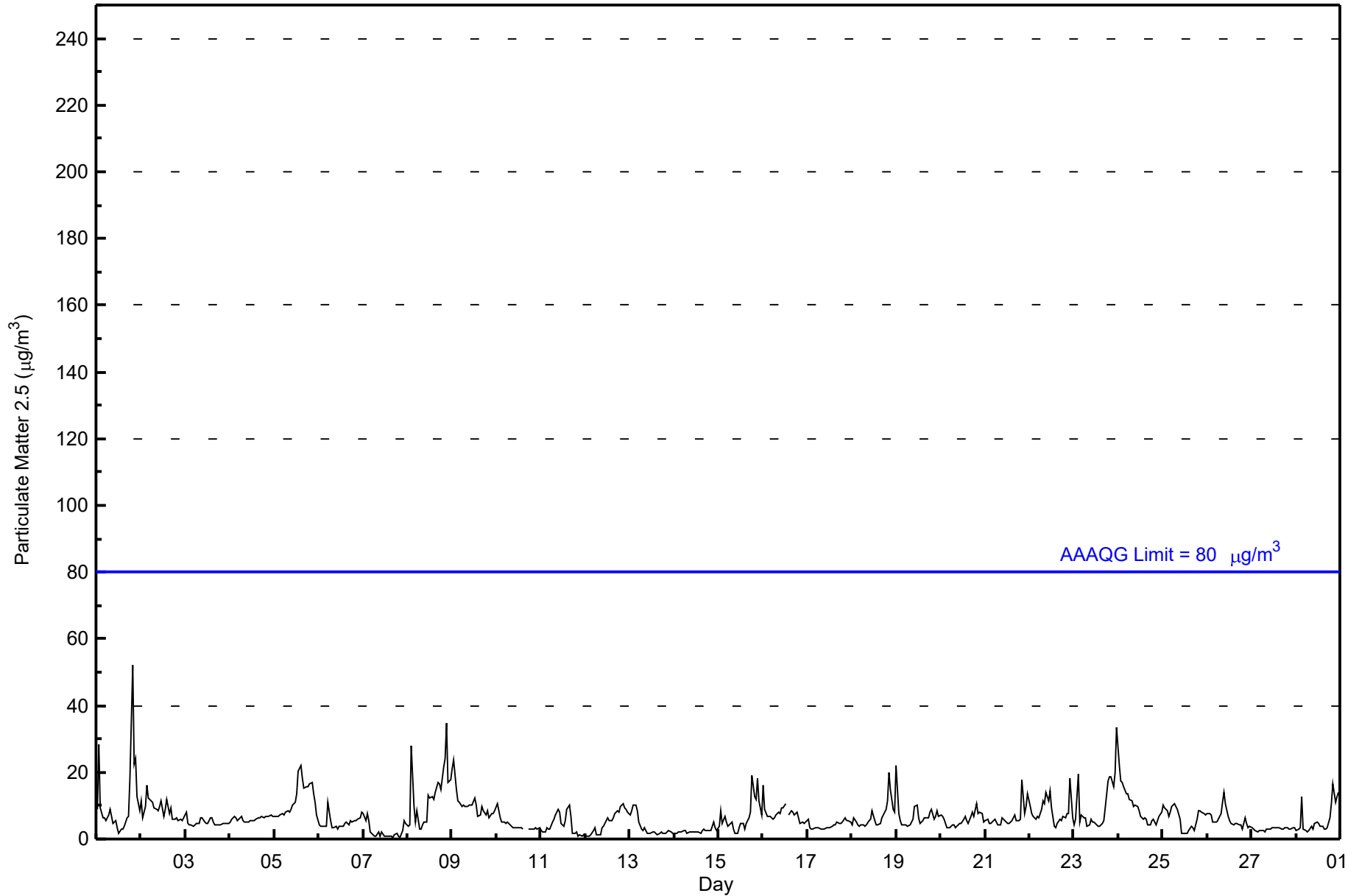
Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>

Fort McKay - Bertha Ganter - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 52.0 µg/m <sup>3</sup> on Feb 1 20:00	Maximum Daily Average: 12.8 µg/m <sup>3</sup> on Feb 8		Hours of Data:	669
Minimum Value: 0.5 µg/m <sup>3</sup> on Feb 7 21:00	Minimum Daily Average: 2.4 µg/m <sup>3</sup> on Feb 14		Hours of Missing Data:	3
Maximum Diurnal Average: 9.2 µg/m <sup>3</sup> at hour 20	Minimum Diurnal Average: 5.4 µg/m <sup>3</sup> at hour 8		Hours of Calibration:	1
Monthly Average: 6.67 µg/m <sup>3</sup>	Percentiles: P <sub>1</sub> = 0.9 P <sub>10</sub> = 2.3 Q <sub>1</sub> = 3.6 Median = 5.5 Q <sub>3</sub> = 8.1 P <sub>90</sub> = 11.8 P <sub>99</sub> = 23.9		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-Feb	8.7	28.6	9.5	6.5	6.3	5.3	7.3	9.1	6.7	4.7	5.6	3.6	1.6	2.8	3.0	3.6	6.5	6.6	18.2	52.0	22.7	24.3	12.7	8.3	11.0	52.0																						
2-Feb	11.3	6.5	9.9	16.3	12.3	11.5	11.0	9.1	8.8	8.4	9.9	11.4	6.9	8.9	11.7	7.4	9.5	6.1	6.0	6.4	5.6	5.8	5.6	6.3	8.9	16.3																						
3-Feb	7.9	4.9	4.3	4.1	3.7	4.2	4.5	4.7	6.1	6.4	5.1	4.9	4.5	6.4	6.5	5.0	4.4	4.2	4.2	4.3	4.7	4.7	4.8	4.5	5.0	7.9																						
4-Feb	4.9	5.7	6.7	6.5	5.7	6.0	6.7	5.5	5.1	5.1	5.1	5.5	5.4	5.6	5.7	6.4	6.5	6.7	6.2	6.6	7.0	6.8	7.2	6.8	6.1	7.2																						
5-Feb	6.8	6.7	7.0	7.2	7.6	7.2	7.9	8.4	8.2	8.9	10.0	10.9	13.6	20.3	21.8	18.1	15.4	15.8	15.7	16.4	17.0	13.8	10.9	7.1	11.8	21.8																						
6-Feb	4.2	3.9	3.9	3.7	3.9	10.9	5.4	3.2	3.3	3.6	3.1	3.8	3.7	3.7	4.5	5.1	4.1	5.4	5.1	5.4	5.3	6.0	6.2	7.9	4.8	10.9																						
7-Feb	7.8	5.4	7.4	5.6	2.1	1.4	0.9	0.9	2.3	1.0	2.2	1.0	0.9	0.7	0.8	0.7	0.6	1.5	1.5	0.8	0.5	2.5	5.5	4.5	2.4	7.8																						
8-Feb	4.0	4.4	28.1	9.7	4.9	8.5	2.9	3.1	4.3	5.1	5.2	12.9	12.2	12.9	11.7	14.0	17.2	16.5	14.9	21.7	24.3	34.7	17.0	17.8	12.8	34.7																						
9-Feb	21.2	23.6	14.9	11.6	10.8	9.7	10.1	9.9	10.0	10.0	10.3	10.4	12.3	10.0	6.9	7.1	9.7	8.5	7.1	8.6	6.4	7.5	7.8	8.3	10.5	23.6																						
10-Feb	10.5	8.3	6.4	5.0	5.0	4.6	5.0	4.3	3.6	3.3	3.3	3.2	3.3	3.2	PF	PF	2.9	3.1	2.8	3.0	3.2	3.1	3.2	4.3	10.5	10.5																						
11-Feb	2.6	2.1	2.3	3.3	2.8	3.0	5.0	5.9	7.1	8.9	8.2	4.5	4.0	5.5	8.7	10.0	6.8	1.8	1.5	2.1	0.9	1.3	0.9	1.4	4.2	10.0																						
12-Feb	1.0	1.0	1.0	1.2	2.4	3.3	1.2	1.1	1.3	3.4	3.9	5.5	6.2	5.5	5.7	6.4	7.7	8.5	8.0	9.8	10.5	9.4	9.1	8.0	5.1	10.5																						
13-Feb	7.2	8.6	10.2	10.0	8.6	5.0	3.2	2.7	3.3	1.6	1.8	1.5	2.1	2.0	1.7	1.4	1.7	2.2	1.5	1.8	1.9	2.5	2.1	1.9	3.6	10.2																						
14-Feb	1.6	1.8	2.0	2.2	2.3	2.7	2.6	1.9	2.1	2.0	2.2	2.2	2.3	2.1	1.6	2.5	3.0	2.6	2.4	2.7	2.4	4.9	3.3	2.6	2.4	4.9																						
15-Feb	3.7	8.4	4.8	6.6	4.9	3.9	4.5	5.0	2.9	1.6	1.7	3.6	4.5	4.9	3.1	4.8	6.3	7.9	19.0	12.7	11.8	18.3	11.3	7.2	6.8	19.0																						
16-Feb	16.0	8.9	6.9	6.6	6.6	6.1	6.3	7.3	8.0	7.7	9.2	9.2	10.7	C	7.4	8.4	8.0	7.2	8.1	6.3	4.6	5.2	4.8	5.0	7.6	16.0																						
17-Feb	5.8	3.4	2.9	2.8	3.2	3.3	3.4	3.1	3.1	3.2	3.5	3.4	3.3	3.8	4.1	4.4	4.9	4.7	4.6	5.3	6.2	5.6	5.4	5.1	4.1	6.2																						
18-Feb	4.3	6.4	5.1	4.3	3.9	4.2	4.1	3.9	4.1	5.6	6.1	8.5	5.5	4.1	4.4	4.5	6.2	7.3	8.7	11.5	19.8	15.0	8.9	8.1	6.9	19.8																						
19-Feb	22.1	7.8	5.6	4.4	4.2	4.4	4.0	4.2	5.1	6.0	9.9	10.0	6.3	4.6	5.6	6.6	6.2	6.2	8.1	8.9	6.1	6.9	8.3	6.8	7.0	22.1																						
20-Feb	7.4	6.8	5.8	3.5	3.5	3.6	4.4	4.3	3.5	4.1	4.5	4.7	5.8	6.9	5.7	4.8	6.7	8.1	6.8	10.5	7.7	8.1	7.6	5.1	5.8	10.5																						
21-Feb	5.6	5.8	4.8	4.7	5.0	5.8	5.0	4.2	4.3	6.4	5.8	5.1	4.5	4.7	5.5	6.5	7.0	5.4	5.4	6.0	17.6	7.8	9.9	13.5	6.5	17.6																						
22-Feb	9.8	7.6	6.9	5.8	6.7	6.4	8.8	11.3	10.5	14.2	11.2	14.6	9.5	3.7	3.5	4.6	6.0	5.6	6.8	6.5	7.8	7.5	18.0	6.4	8.3	18.0																						
23-Feb	4.4	6.0	19.5	5.3	7.2	6.3	6.5	4.0	4.4	5.9	5.1	5.3	4.2	3.7	3.9	4.5	5.5	9.5	17.2	18.5	18.4	15.7	19.9	33.6	9.8	33.6																						
24-Feb	21.9	17.4	16.9	15.6	13.6	13.4	11.8	11.4	10.0	10.3	9.8	8.3	6.6	5.9	6.2	5.7	4.1	4.2	5.5	5.7	4.2	5.3	6.6	7.9	9.5	21.9																						
25-Feb	10.3	9.2	8.5	6.6	8.0	9.6	10.6	9.6	9.1	5.8	1.8	1.8	1.7	1.7	2.7	3.8	3.3	2.7	5.8	8.4	8.7	8.0	7.7	7.1	6.4	10.6																						
26-Feb	7.6	7.5	7.2	5.3	5.1	5.0	6.1	7.7	10.9	13.9	10.7	6.7	5.4	4.7	4.4	4.6	4.5	4.3	4.1	2.8	6.4	4.6	3.4	3.9	6.1	13.9																						
27-Feb	3.4	2.9	2.7	2.0	2.7	2.5	2.4	2.3	2.8	2.9	3.0	3.3	3.3	3.3	3.4	3.3	3.1	3.0	3.4	3.2	3.1	2.9	3.3	3.4	3.0	3.4																						
28-Feb	2.8	3.1	3.3	12.6	3.0	2.5	2.1	2.6	3.7	3.0	4.6	5.0	4.6	3.9	3.8	2.8	3.1	3.4	6.4	10.6	16.4	11.2	12.6	14.2	5.9	16.4																						
																								8.0	7.6	7.7	6.4	5.6	5.7	5.5	5.4	5.5	5.8	5.8	6.1	5.5	5.4	5.6	5.8	6.2	6.0	7.3	9.2	9.0	8.9	8.0	7.7	Diurnal Average
																								22.1	28.6	28.1	16.3	13.6	13.4	11.8	11.4	10.9	14.2	11.2	14.6	13.6	20.3	21.8	18.1	17.2	16.5	19.0	52.0	24.3	34.7	19.9	33.6	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>) -  $\mu\text{g}/\text{m}^3$**   
**Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	334	49.93	49.93
6 - 15	293	43.80	93.72
16 - 25	37	5.53	99.25
26 - 80	5	0.75	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 669

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Fort McKay - Bertha Ganter - February 2023**

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	77	48	30	20	10	4	6	18	23	2	6	17	23	14	21	15	334
6 - 15	52	20	7	11	2	2	7	33	57	29	6	4	6	15	17	23	291
16 - 25	0	0	0	0	0	0	0	3	8	10	3	3	5	1	3	1	37
26 - 80	0	0	0	0	0	0	0	0	0	1	0	1	1	2	0	0	5
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	129	68	37	31	12	6	13	54	88	42	15	25	35	32	41	39	667

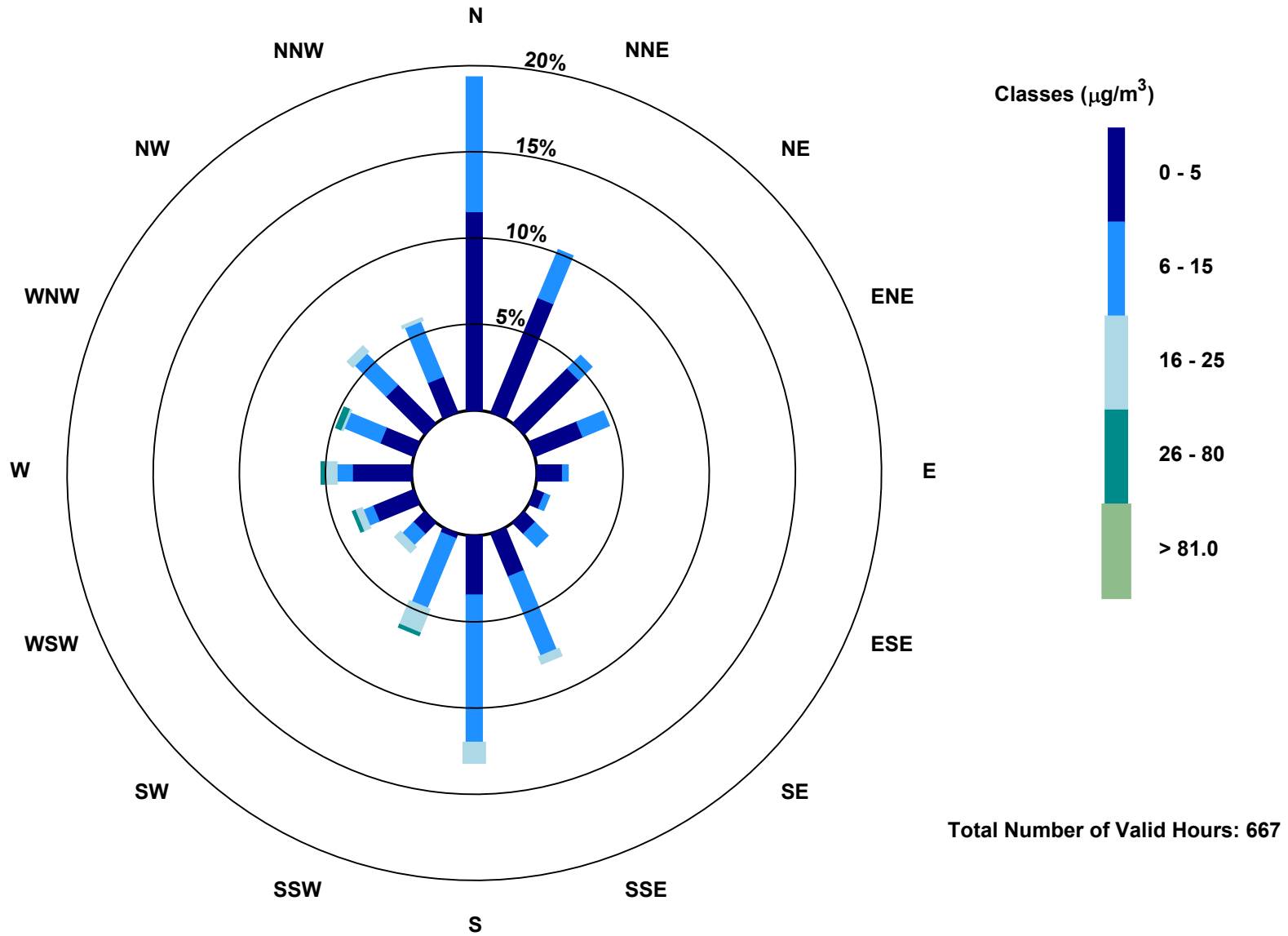
Total Number of Valid Hours: 667

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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

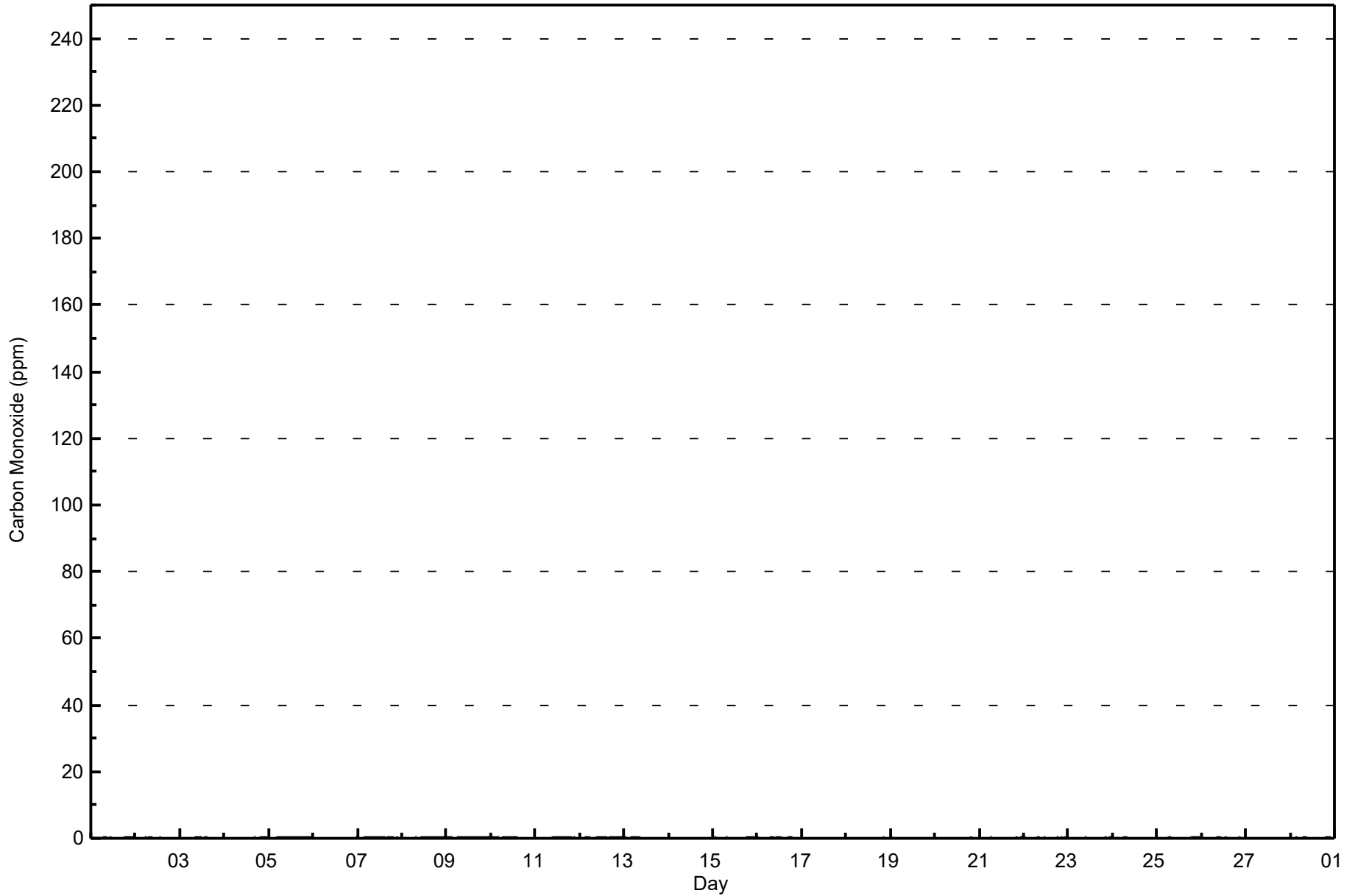
Fort McKay - Bertha Ganter - February 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0		Hours in Service: 672																									
Maximum Value: 0.4 ppm on Feb 2 09:00		Maximum Daily Average: 0.3 ppm on Feb 9																									
Minimum Value: 0.1 ppm on Feb 15 11:00		Minimum Daily Average: 0.1 ppm on Feb 14																									
Maximum Diurnal Average: 0.2 ppm at hour 21		Minimum Diurnal Average: 0.2 ppm at hour 5																									
Monthly Average: 0.20 ppm		Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 0.2 Median = 0.2 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 0.3 P <sub>99</sub> = 0.3																									
		Hours of Data: 629																									
		Hours of Missing Data: 43																									
		Hours of Calibration: 33																									
		Percent Operational Time: 98.5																									
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-Feb	0.2	0.3	Z	0.2	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	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3
2-Feb	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4
3-Feb	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
4-Feb	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3
5-Feb	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	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3
6-Feb	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	0.2	0.2
7-Feb	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	0.2
8-Feb	0.2	0.2	0.3	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	0.3	0.3	0.3	0.4	0.3	0.3	0.2	0.4
9-Feb	0.3	0.3	0.2	0.2	Z	0.2	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	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10-Feb	0.3	0.3	0.3	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	PF	PF	RE	RE	RE	RE	RE	RE	RE	RE	--	0.3
11-Feb	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	0.2	0.2	0.3
12-Feb	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	0.3	0.2	0.2	0.2	0.2	0.2	0.3
13-Feb	0.2	0.3	Z	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3
14-Feb	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	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2
15-Feb	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.2	0.1	0.1	C	C	C	C	C	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.4
16-Feb	0.2	0.2	0.1	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	M	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
17-Feb	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
18-Feb	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3
19-Feb	0.2	0.2	Z	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
20-Feb	0.2	0.2	0.2	Z	0.1	0.1	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2
21-Feb	0.2	0.2	0.1	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	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.3
22-Feb	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.4	0.4	0.2	0.2	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	0.4
23-Feb	Z	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	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
24-Feb	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	0.2	0.2
25-Feb	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	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3
26-Feb	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
27-Feb	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2
28-Feb	0.1	0.1	0.2	0.3	0.2	Z	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan      C - Calibration      M - Maintenance      PF - Power Failure      RE - Recovery Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 13 ppm																											



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

**Carbon Monoxide (CO) - ppm**  
**Fort McKay - Bertha Ganter - February 2023**







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

**Carbon Monoxide (CO) - ppm**  
**Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	624	99.21	99.21
0.4 - 0.5	5	0.79	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: 629

Total Number of Hours: 672



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

**Carbon Monoxide (CO) - ppm**  
**Fort McKay - Bertha Ganter - February 2023**

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	120	65	35	30	12	4	12	50	84	35	14	24	32	31	38	36	622
0.4 - 0.5	0	0	0	0	0	0	0	0	1	3	0	0	0	1	0	0	5
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>	120	65	35	30	12	4	12	50	85	38	14	24	32	32	38	36	627

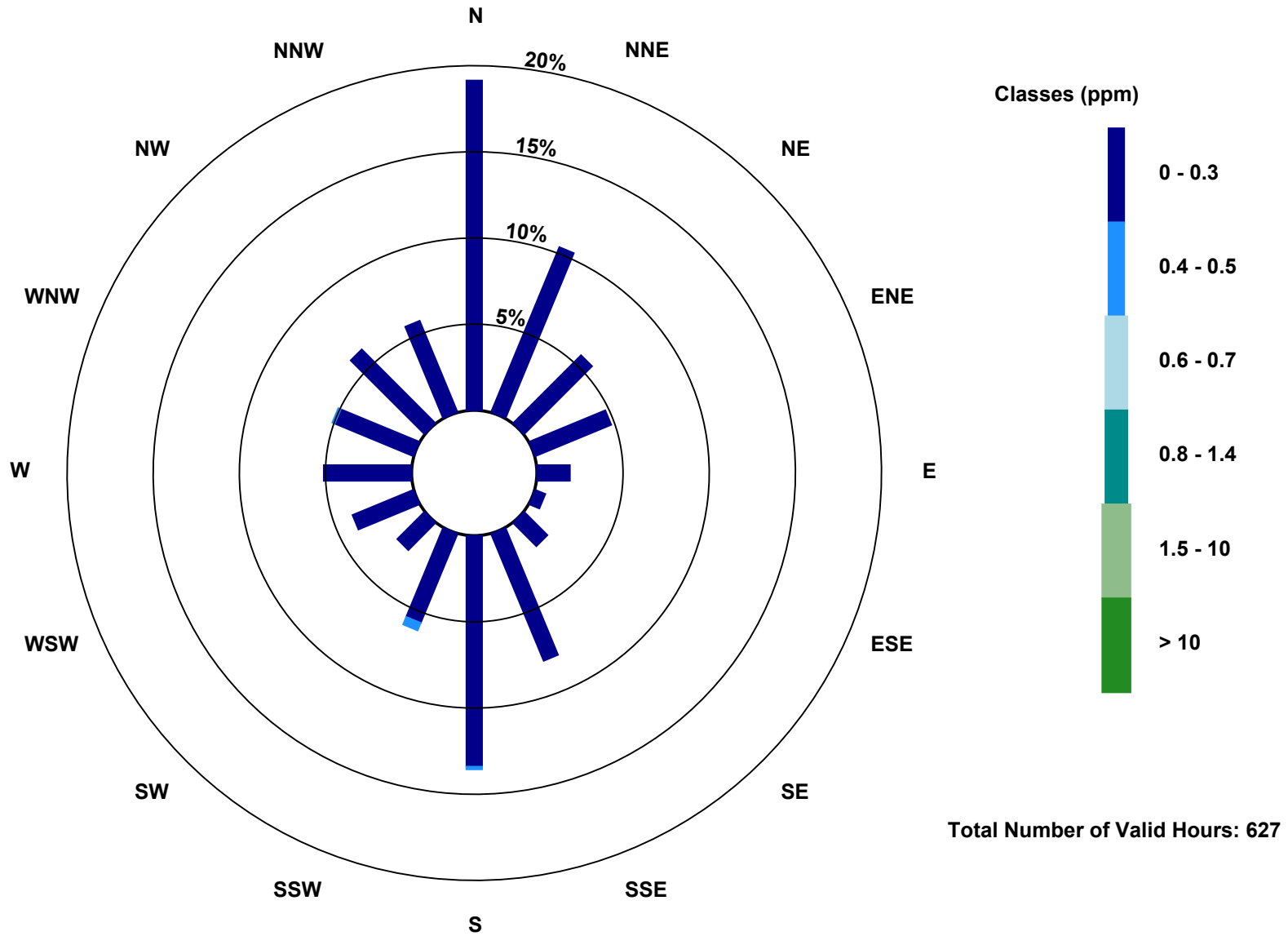
Total Number of Valid Hours: 627

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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

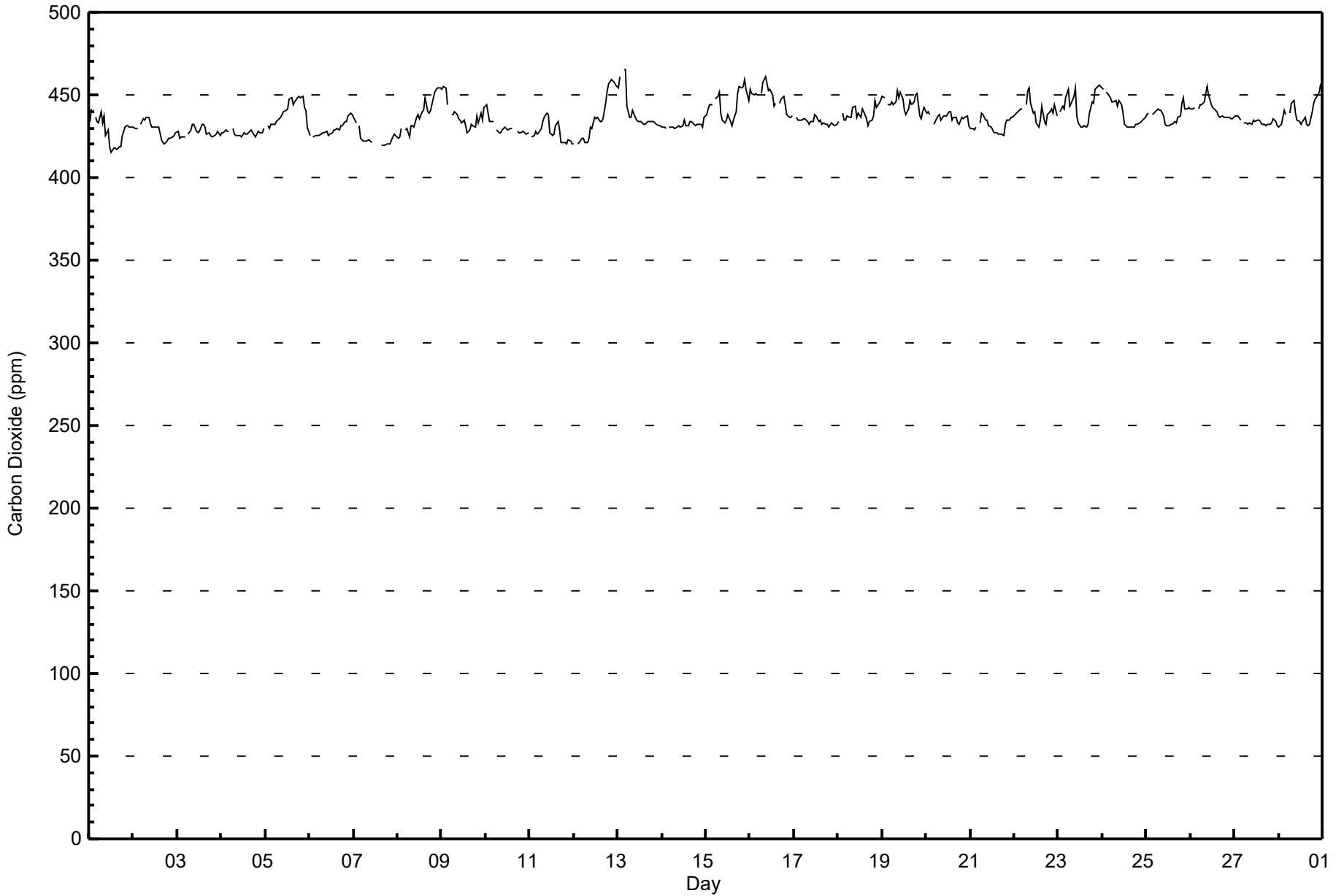






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Carbon Dioxide (CO<sub>2</sub>) - ppm**  
**Fort McKay - Bertha Ganter - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Carbon Dioxide (CO<sub>2</sub>) - ppm  
Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
400 - 420	16	2.51	2.51
420 - 440	463	72.68	75.20
440 - 460	154	24.18	99.37
460 - 480	4	0.63	100.00
480 - 500	0	0.00	100.00
> 500	0	0.00	100.00

Total Number of Valid Hours: 637

Total Number of Hours: 672



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

**Carbon Dioxide (CO<sub>2</sub>) - ppm**  
**Fort McKay - Bertha Ganter - February 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
400 - 420	2	0	1	1	1	0	0	1	0	0	0	2	4	1	3	0	16
420 - 440	106	56	31	25	10	3	7	41	60	17	7	15	14	24	22	25	463
440 - 460	18	9	2	5	1	2	6	9	26	20	6	6	12	7	13	10	152
460 - 480	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	1	4
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>	126	65	35	31	12	5	13	52	86	38	13	23	30	32	38	36	635

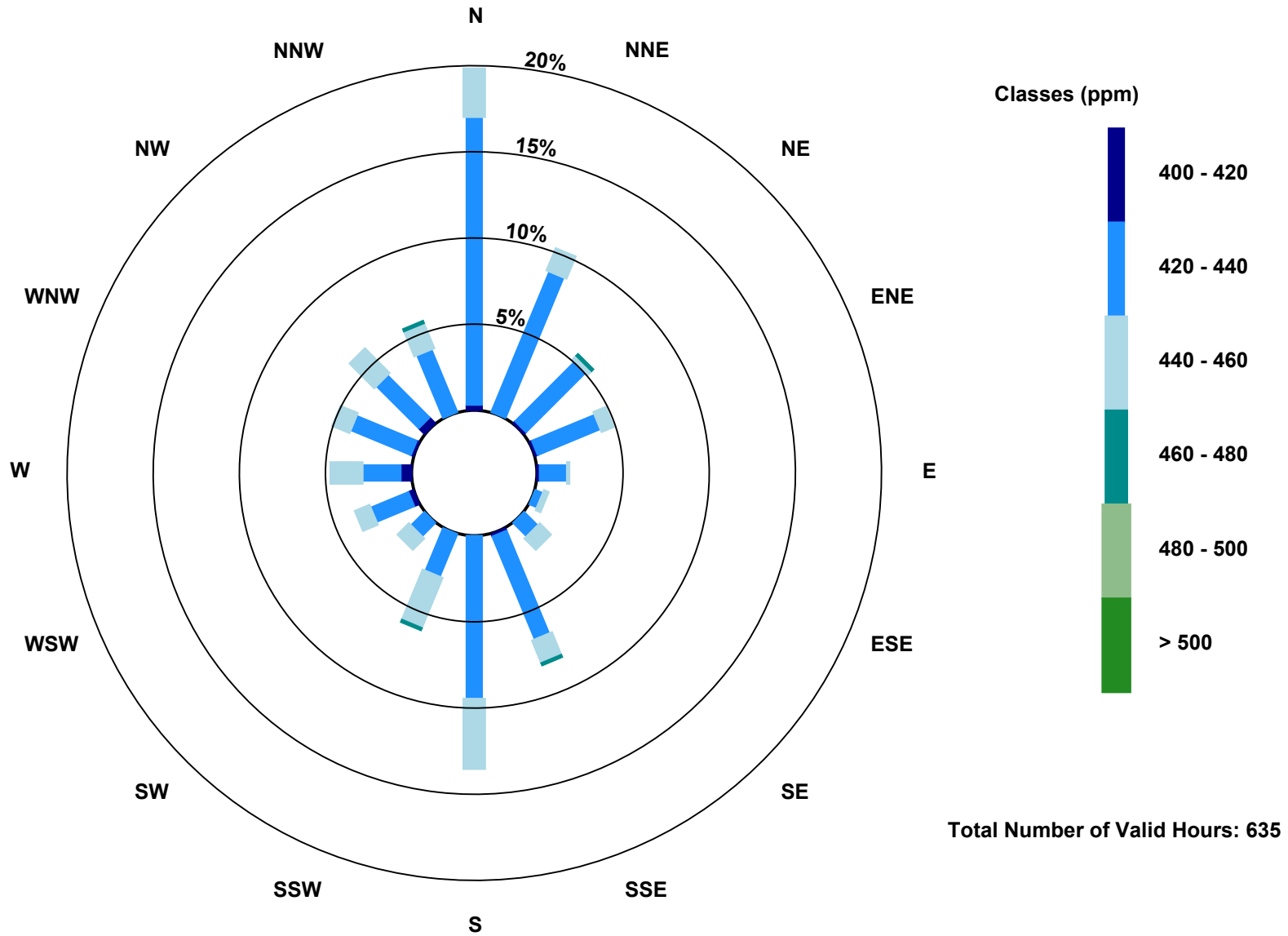
Total Number of Valid Hours: 635

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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





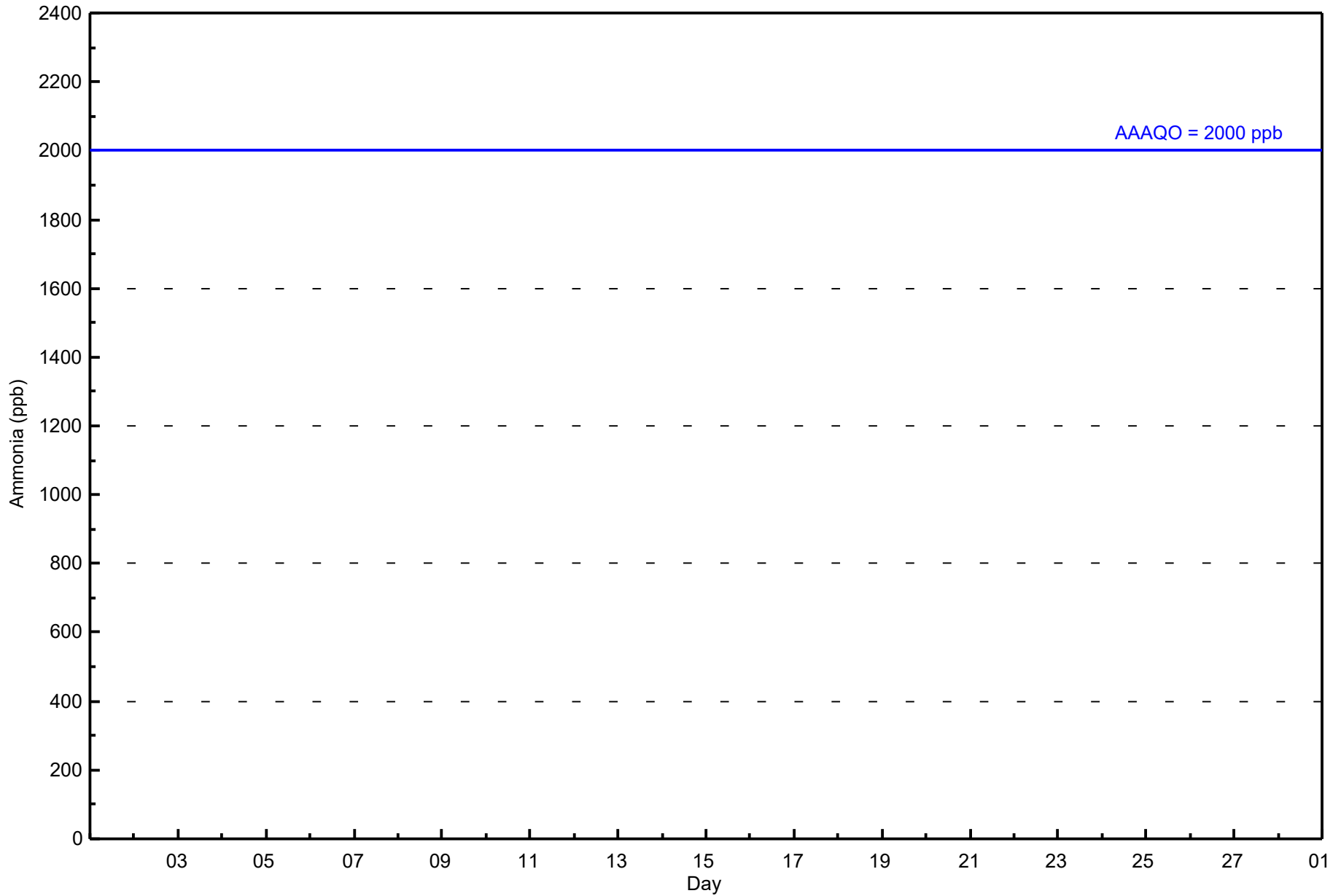


Number of Exceedences (AAAQO): 1-hr: 0		Hours in Service: 672																									
Maximum Value: 0.0 ppb on Feb 1 03:00		Maximum Daily Average: 0.0 ppb on Feb 1																									
Minimum Value: 0.0 ppb on Feb 1 03:00		Hours of Data: 580																									
Maximum Diurnal Average: 0.0 ppb at hour 1		Hours of Missing Data: 92																									
Monthly Average: 0.00 ppb		Hours of Calibration: 46																									
Minimum Daily Average: 0.0 ppb on Feb 1		Percent Operational Time: 93.2																									
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-Feb	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
2-Feb	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
3-Feb	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
4-Feb	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
5-Feb	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
6-Feb	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
7-Feb	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
8-Feb	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
9-Feb	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
10-Feb	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	PF	PF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-Feb	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
12-Feb	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
13-Feb	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	0.0
14-Feb	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
15-Feb	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	UO	0.0	0.0	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-Feb	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	C	C	C	C	C	C	C	C	M	M	--
17-Feb	M	M	M	M	M	M	M	M	M	M	M	M	C	C	C	C	C	C	C	C	C	C	C	0.0	0.0	0.0	--
18-Feb	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
19-Feb	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
20-Feb	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
21-Feb	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
22-Feb	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
23-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	UO	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-Feb	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
26-Feb	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
27-Feb	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
28-Feb	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
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation PF - Power Failure 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 - February 2023**





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

**Ammonia (NH<sub>3</sub>) - ppb**  
**Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	580	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: 580

Total Number of Hours: 672



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

**Ammonia (NH<sub>3</sub>) - ppb**  
**Fort McKay - Bertha Ganter - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	114	52	30	26	9	6	10	52	74	36	14	23	31	30	38	33	578
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>	114	52	30	26	9	6	10	52	74	36	14	23	31	30	38	33	578

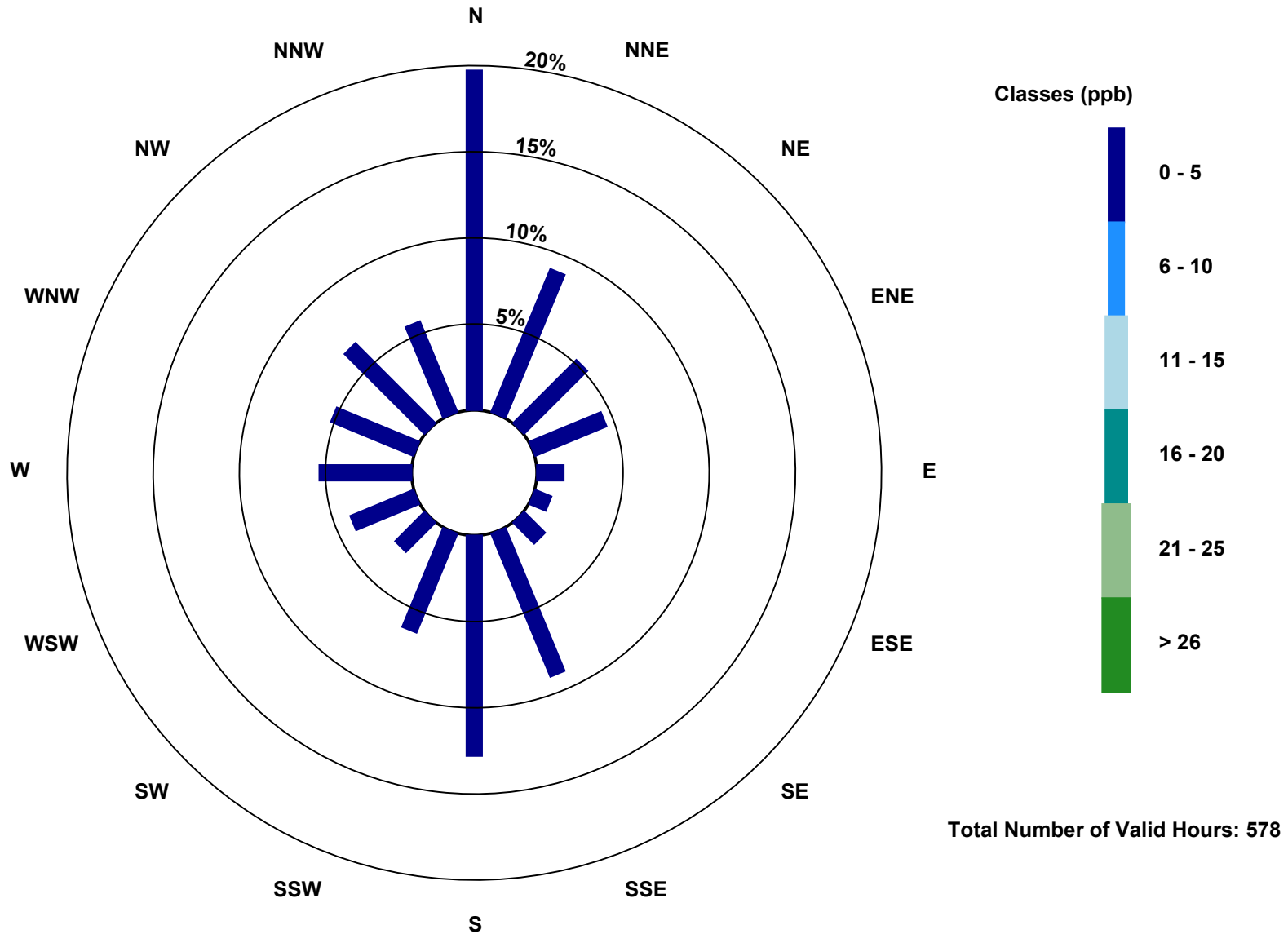
Total Number of Valid Hours: 578

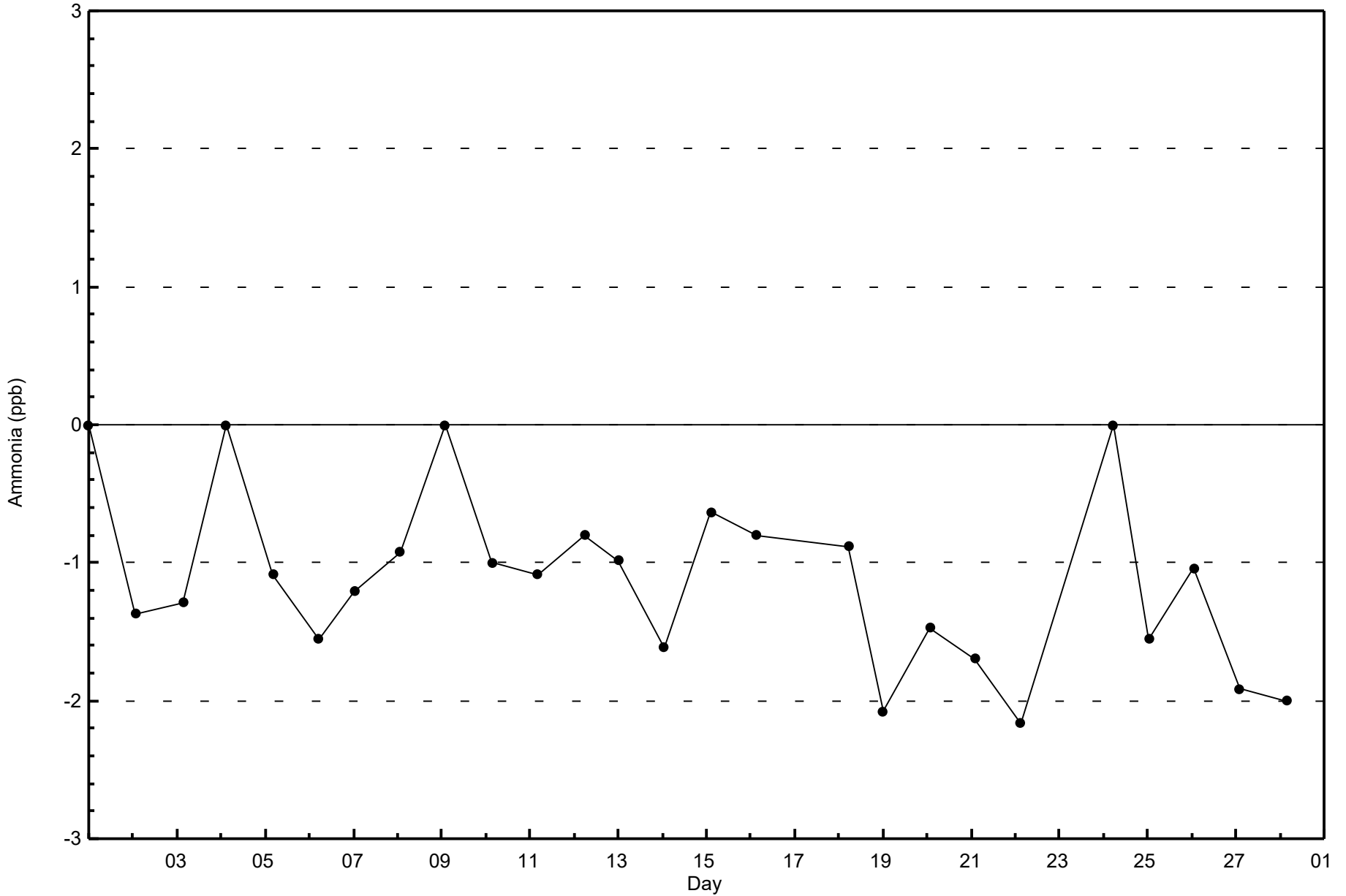
Total Number of Hours: 672

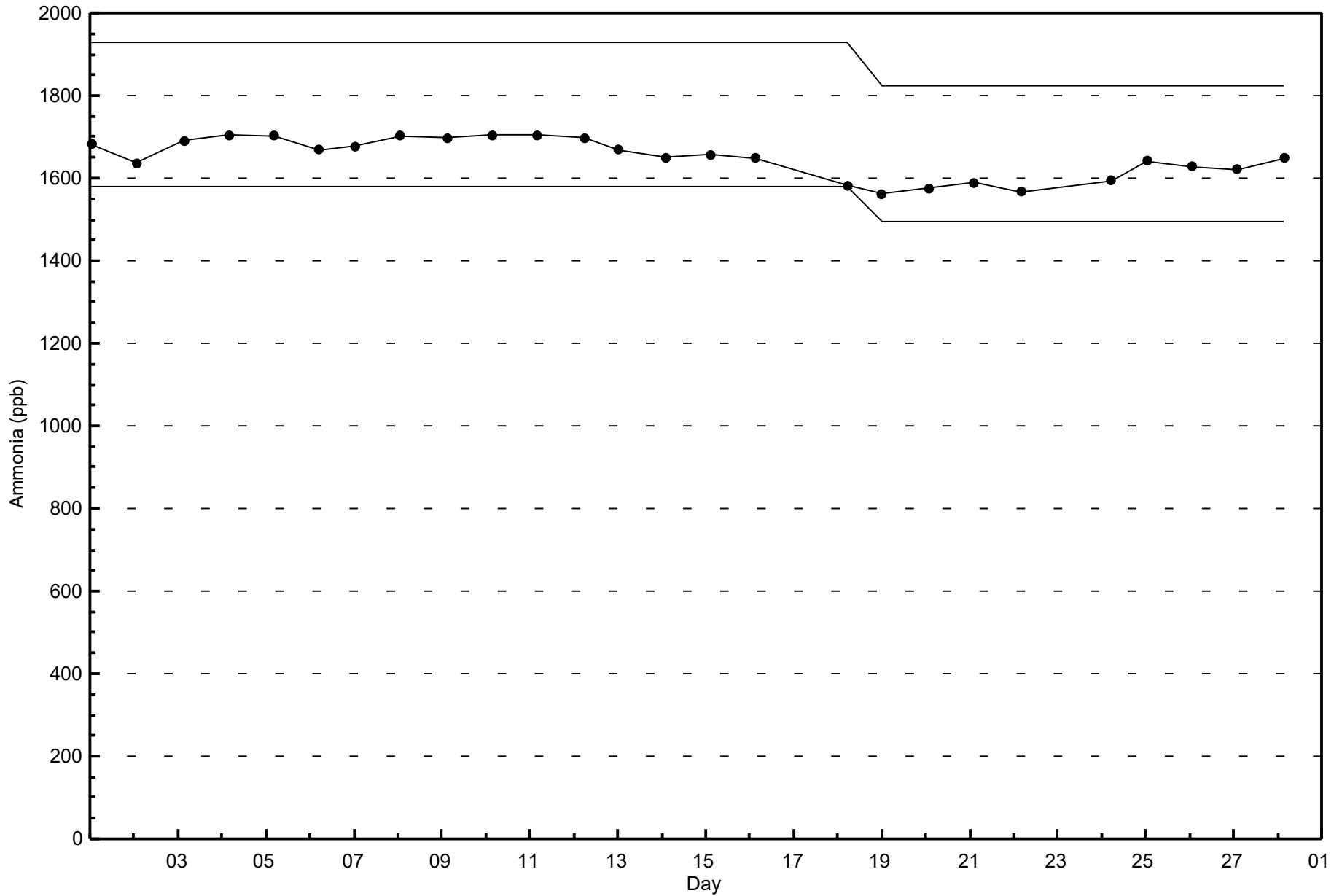


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 10 m (AT 10m) - C

Fort McKay - Bertha Ganter - February 2023

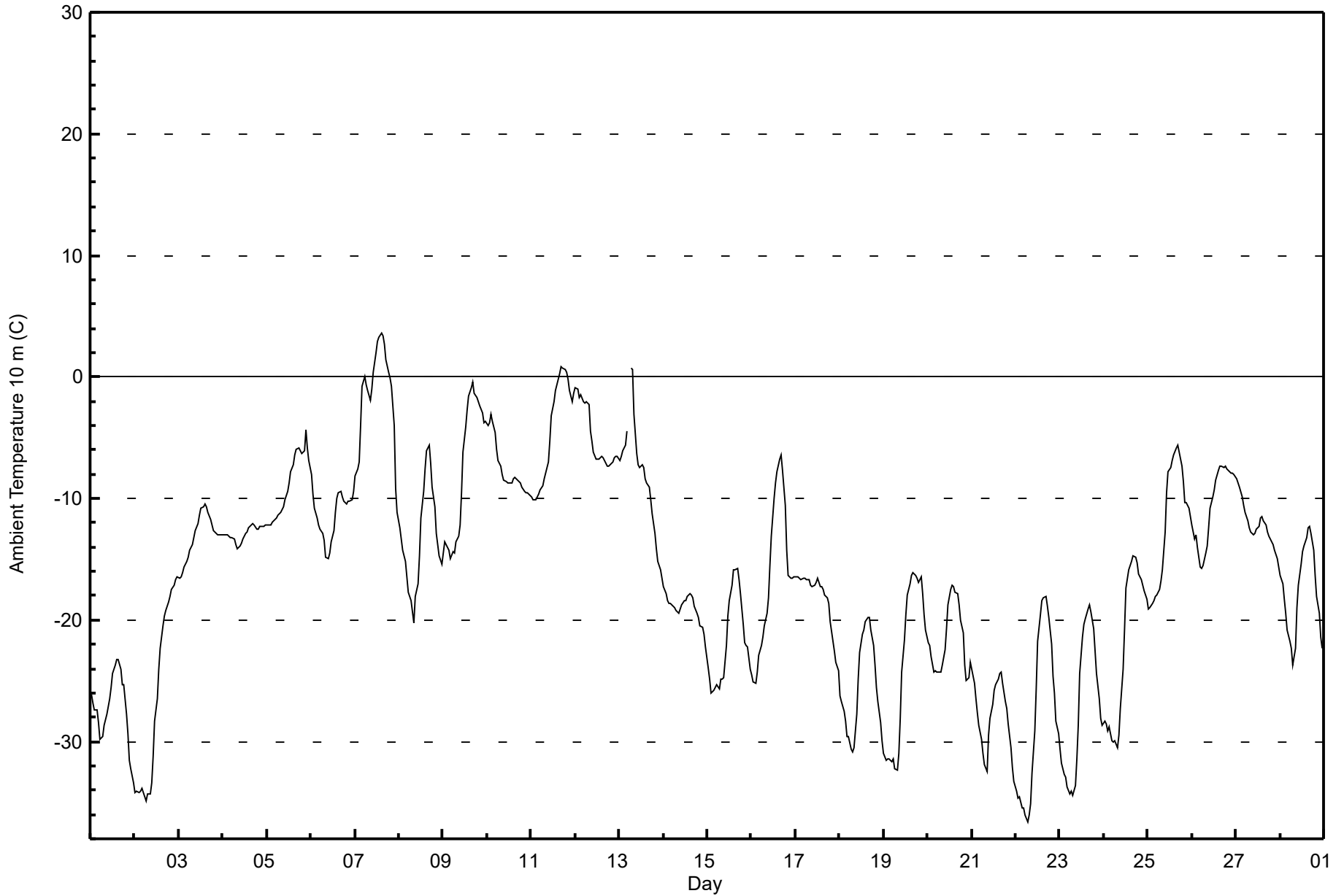
Maximum Value: 3.6 C on Feb 7 15:00		Maximum Daily Average: -1.6 C on Feb 7		Hours in Service: 672																							
Minimum Value: -36.6 C on Feb 22 07:00		Minimum Daily Average: -27.9 C on Feb 22		Hours of Data: 671																							
Maximum Diurnal Average: -12.0 C at hour 17		Minimum Diurnal Average: -19.7 C at hour 6		Hours of Missing Data: 1																							
Monthly Average: -16.14 C		Percentiles: P <sub>1</sub> = -34.7 P <sub>10</sub> = -29.1 Q <sub>1</sub> = -22.3 Median = -15.7 Q <sub>3</sub> = -9.5 P <sub>90</sub> = -5.6 P <sub>99</sub> = 1.0		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-Feb	-26.2	-26.8	-27.4	-27.4	-28.5	-29.8	-29.6	-28.7	-28.2	-27.7	-26.5	-25.5	-24.4	-23.7	-23.2	-23.3	-24.1	-25.3	-25.3	-27.7	-29.4	-31.5	-32.3	-33.4	-27.3	-23.2	
2-Feb	-34.2	-34.1	-34.2	-34.1	-33.9	-34.6	-34.8	-34.3	-34.3	-33.4	-31.2	-28.3	-26.5	-24.1	-22.4	-20.5	-19.6	-19.2	-18.6	-18.0	-17.5	-17.2	-16.7	-16.5	-26.6	-16.5	
3-Feb	-16.6	-16.4	-16.1	-15.7	-15.2	-14.8	-14.3	-13.8	-13.2	-12.6	-12.0	-11.4	-10.8	-10.7	-10.5	-10.7	-11.2	-11.7	-12.2	-12.6	-12.9	-13.0	-13.0	-13.0	-13.1	-10.5	
4-Feb	-13.0	-13.0	-13.0	-13.1	-13.2	-13.2	-13.3	-13.8	-14.1	-14.0	-13.6	-13.3	-12.8	-12.8	-12.4	-12.2	-12.1	-12.2	-12.5	-12.5	-12.3	-12.3	-12.3	-12.2	-12.9	-12.1	
5-Feb	-12.2	-12.2	-12.2	-12.0	-11.7	-11.6	-11.4	-11.1	-11.0	-10.7	-10.1	-9.4	-8.8	-7.9	-7.3	-6.4	-6.0	-5.9	-6.1	-6.4	-6.0	-4.3	-5.8	-6.8	-8.9	-4.3	
6-Feb	-8.0	-9.7	-10.8	-11.6	-12.2	-12.6	-12.9	-13.5	-14.8	-15.0	-14.5	-13.5	-12.6	-11.1	-10.0	-9.5	-9.5	-9.9	-10.2	-10.5	-10.2	-10.2	-10.1	-9.4	-11.3	-8.0	
7-Feb	-8.1	-7.5	-7.0	-4.0	-0.8	0.0	-0.7	-1.1	-1.9	-1.0	0.4	2.0	2.9	3.3	3.6	3.4	2.7	1.4	0.4	-0.1	-0.8	-4.0	-9.2	-11.1	-1.6	3.6	
8-Feb	-12.4	-13.3	-14.2	-15.2	-16.5	-17.7	-18.4	-19.4	-20.2	-18.1	-17.0	-14.7	-11.6	-9.5	-7.6	-6.0	-5.6	-7.1	-9.1	-10.7	-12.9	-13.8	-14.8	-15.4	-13.4	-5.6	
9-Feb	-14.4	-13.6	-14.0	-14.2	-14.9	-14.4	-14.5	-13.6	-13.2	-12.2	-9.6	-6.2	-4.1	-2.8	-1.6	-0.9	-0.4	-1.4	-1.7	-2.0	-2.4	-3.0	-3.7	-3.6	-7.6	-0.4	
10-Feb	-4.0	-3.7	-3.0	-3.6	-4.6	-5.9	-6.9	-7.4	-8.0	-8.4	-8.6	-8.7	-8.8	-8.8	-8.4	-8.3	-8.4	-8.6	-8.8	-9.1	-9.4	-9.6	-9.6	-9.7	-7.5	-3.0	
11-Feb	-9.9	-10.1	-10.1	-9.9	-9.7	-9.4	-8.9	-8.4	-8.0	-7.0	-5.3	-3.2	-2.0	-1.1	-0.7	0.3	0.8	0.7	0.6	0.3	-0.2	-1.1	-2.0	-1.4	-4.4	0.8	
12-Feb	-0.9	-1.0	-1.7	-1.5	-2.0	-2.2	-2.1	-2.3	-4.4	-5.3	-6.1	-6.8	-6.8	-6.5	-6.7	-6.9	-7.4	-7.4	-7.2	-7.0	-6.7	-6.5	-6.5	-6.5	-4.9	-0.9	
13-Feb	-6.8	-6.5	-6.1	-5.6	-4.5	UO	0.8	0.6	-3.0	-6.3	-7.2	-7.5	-7.2	-7.4	-8.3	-8.7	-9.0	-10.1	-11.3	-12.9	-14.1	-15.2	-15.9	-16.5	-8.2	0.8	
14-Feb	-17.3	-17.8	-18.4	-18.6	-18.7	-18.8	-18.9	-19.2	-19.4	-19.1	-18.8	-18.4	-18.4	-18.1	-17.8	-17.9	-18.2	-18.9	-19.5	-19.8	-20.5	-20.6	-21.1	-22.2	-19.0	-17.3	
15-Feb	-23.9	-24.9	-26.1	-25.8	-25.5	-25.3	-25.7	-24.9	-24.9	-24.7	-22.1	-19.7	-18.4	-17.1	-15.9	-15.8	-15.7	-17.8	-20.4	-21.8	-22.0	-22.2	-24.1	-21.7	-15.7		
16-Feb	-24.5	-25.1	-25.2	-24.3	-22.9	-22.1	-21.4	-20.5	-19.5	-18.1	-15.5	-13.1	-10.0	-8.7	-7.8	-6.8	-6.4	-7.7	-10.5	-14.2	-16.4	-16.6	-16.5	-16.5	-16.3	-6.4	
17-Feb	-16.4	-16.5	-16.6	-16.6	-16.6	-16.6	-16.7	-16.7	-17.1	-17.3	-17.2	-17.0	-16.6	-17.2	-17.3	-17.5	-18.0	-18.2	-18.6	-20.2	-21.7	-22.6	-23.5	-24.2	-18.2	-16.4	
18-Feb	-26.2	-26.7	-27.5	-28.3	-29.6	-29.6	-30.7	-30.8	-30.5	-27.7	-24.9	-22.7	-21.2	-20.8	-20.2	-19.8	-19.8	-20.8	-22.1	-23.7	-25.5	-26.7	-28.4	-29.9	-25.6	-19.8	
19-Feb	-31.0	-31.5	-31.5	-31.4	-31.7	-31.5	-32.2	-32.3	-31.0	-28.0	-24.3	-21.6	-19.5	-18.0	-17.0	-16.4	-16.1	-16.3	-16.6	-16.9	-16.5	-17.8	-19.6	-20.9	-23.7	-16.1	
20-Feb	-21.8	-22.2	-23.1	-24.2	-24.2	-24.2	-24.3	-24.2	-23.7	-22.5	-20.7	-18.7	-17.5	-17.1	-17.2	-17.7	-17.8	-18.8	-20.0	-21.0	-23.8	-25.0	-24.8	-23.4	-21.6	-17.1	
21-Feb	-24.0	-25.2	-26.5	-27.6	-28.7	-29.8	-30.9	-31.9	-32.5	-29.5	-28.1	-27.0	-25.8	-25.3	-24.9	-24.4	-24.3	-25.2	-26.7	-27.3	-28.5	-30.5	-32.2	-33.3	-27.9	-24.0	
22-Feb	-34.0	-34.7	-34.6	-35.4	-35.5	-36.0	-36.6	-36.1	-35.1	-32.6	-29.1	-25.7	-21.8	-19.5	-18.4	-18.2	-18.1	-18.9	-19.8	-22.0	-24.6	-26.0	-28.3	-29.3	-27.9	-18.1	
23-Feb	-30.6	-31.8	-32.7	-32.9	-33.7	-34.3	-34.1	-34.4	-33.6	-31.4	-28.7	-24.4	-21.3	-20.4	-19.9	-19.2	-18.8	-19.3	-20.7	-22.6	-24.4	-26.4	-28.0	-28.7	-27.2	-18.8	
24-Feb	-28.3	-28.5	-29.1	-28.8	-29.9	-30.1	-29.9	-30.5	-29.4	-27.2	-24.0	-20.9	-17.4	-15.9	-15.5	-15.1	-14.7	-14.9	-15.3	-16.2	-16.7	-17.1	-17.6	-18.3	-22.1	-14.7	
25-Feb	-19.1	-19.0	-18.7	-18.4	-18.1	-17.9	-17.5	-16.8	-15.9	-12.7	-9.5	-7.8	-7.4	-6.9	-6.4	-5.9	-5.6	-6.1	-7.4	-8.6	-10.3	-10.3	-10.8	-11.5	-12.0	-5.6	
26-Feb	-12.2	-13.3	-13.0	-14.0	-15.7	-15.8	-15.5	-14.5	-13.9	-12.4	-10.8	-9.9	-9.3	-8.5	-7.7	-7.3	-7.4	-7.4	-7.4	-7.6	-7.8	-7.9	-7.9	-8.1	-10.6	-7.3	
27-Feb	-8.4	-8.7	-9.1	-9.9	-10.5	-11.2	-11.9	-12.4	-12.7	-12.9	-12.8	-12.5	-12.3	-11.6	-11.5	-11.8	-12.2	-12.8	-13.1	-13.5	-13.8	-14.3	-15.0	-15.6	-12.1	-8.4	
28-Feb	-16.3	-17.0	-18.3	-19.4	-20.8	-21.7	-22.3	-23.7	-22.3	-18.9	-17.2	-15.4	-14.4	-13.9	-13.2	-12.4	-12.3	-12.9	-14.3	-16.4	-18.0	-19.5	-21.4	-22.3	-17.7	-12.3	
	-17.9	-18.2	-18.6	-18.7	-18.9	-19.7	-19.1	-19.1	-19.1	-18.1	-16.6	-15.0	-13.7	-12.9	-12.4	-12.0	-12.0	-12.6	-13.3	-14.3	-15.2	-15.9	-16.8	-17.3		Diurnal Average	
	-0.9	-1.0	-1.7	-1.5	-0.8	0.0	0.8	0.6	-1.9	-1.0	0.4	2.0	2.9	3.3	3.6	3.4	2.7	1.4	0.6	0.3	-0.2	-1.1	-2.0	-1.4		Diurnal Maximum	
UO - Unstable Operation																											





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

**Ambient Temperature 10 m (AT 10m) - C**  
**Fort McKay - Bertha Ganter - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 10 m (AT 10m) - C  
Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	207	30.85	30.85
-20 - 0	447	66.62	97.47
0 - 10	17	2.53	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 671

Total Number of Hours: 672



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Ambient Temperature 2m (AT 2m) - C**

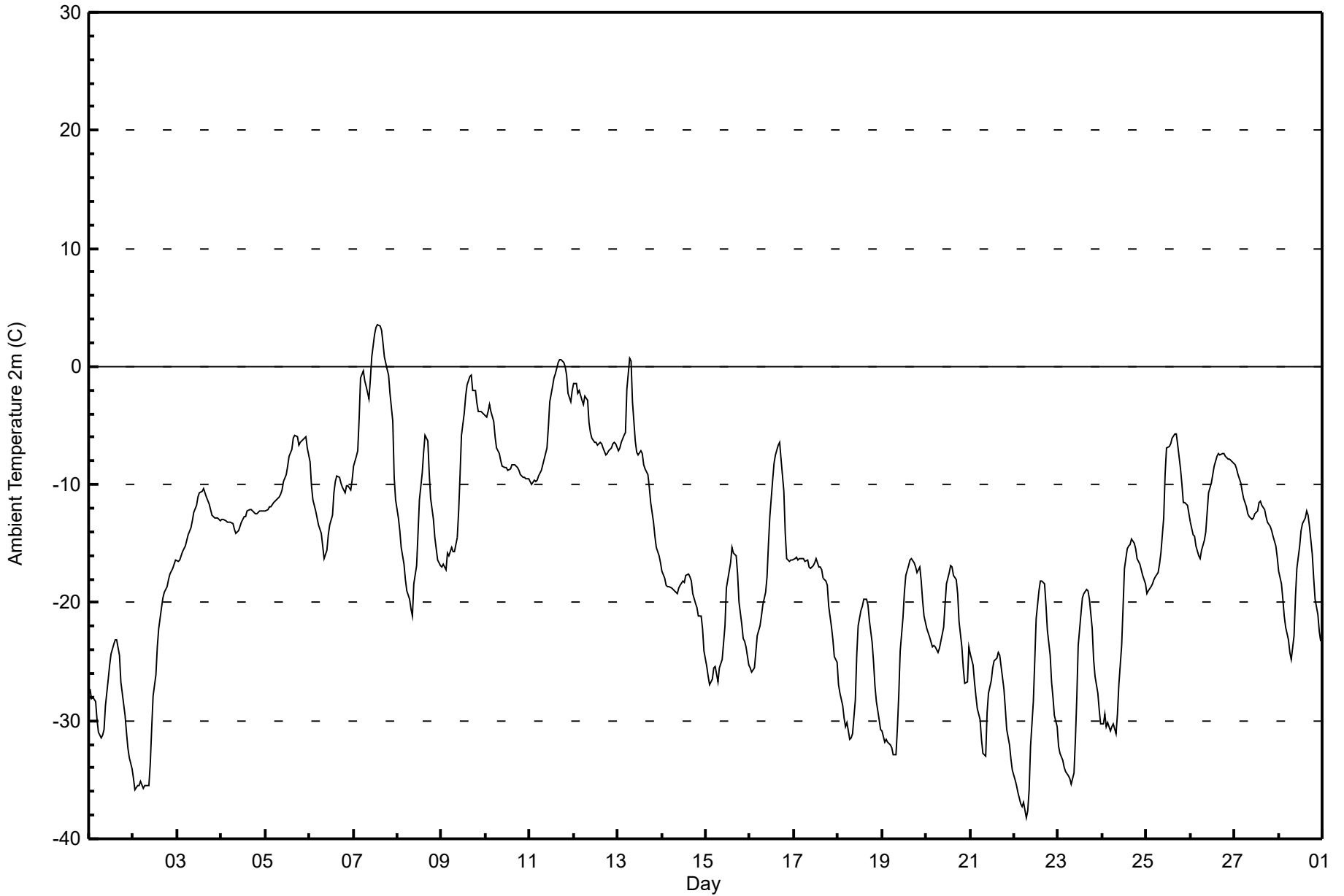
**Fort McKay - Bertha Ganter - February 2023**

Maximum Value: 3.5 C on Feb 7 14:00		Maximum Daily Average: -1.8 C on Feb 7		Hours in Service: 672																							
Minimum Value: -38.2 C on Feb 22 07:00		Minimum Daily Average: -28.8 C on Feb 22		Hours of Data: 672																							
Maximum Diurnal Average: -11.9 C at hour 16		Minimum Diurnal Average: -19.7 C at hour 8		Hours of Missing Data: 0																							
Monthly Average: -16.44 C		Percentiles: P <sub>1</sub> = -35.8 P <sub>10</sub> = -30.3 Q <sub>1</sub> = -23.2 Median = -16.1 Q <sub>3</sub> = -9.4 P <sub>90</sub> = -5.8 P <sub>99</sub> = 0.8		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-Feb	-27.3	-28.1	-28.1	-28.4	-29.9	-31.0	-31.4	-31.2	-30.7	-28.8	-26.4	-25.3	-24.3	-23.6	-23.1	-23.2	-24.4	-26.7	-27.7	-29.5	-31.0	-32.3	-33.1	-34.1	-28.3	-23.1	
2-Feb	-34.9	-35.8	-35.4	-35.6	-35.1	-35.7	-35.5	-35.5	-35.5	-33.6	-30.6	-27.9	-26.2	-23.7	-22.2	-20.4	-19.6	-19.2	-18.6	-18.0	-17.5	-17.1	-16.7	-16.4	-27.0	-16.4	
3-Feb	-16.5	-16.4	-16.0	-15.6	-15.1	-14.8	-14.2	-13.7	-13.0	-12.4	-11.8	-11.1	-10.7	-10.6	-10.4	-10.6	-11.1	-11.7	-12.1	-12.6	-12.8	-12.9	-12.9	-13.0	-13.0	-10.4	
4-Feb	-13.0	-13.0	-13.0	-13.1	-13.2	-13.2	-13.4	-13.8	-14.1	-13.9	-13.6	-13.2	-12.7	-12.7	-12.2	-12.1	-12.1	-12.2	-12.5	-12.3	-12.3	-12.3	-12.2	-12.2	-12.9	-12.1	
5-Feb	-12.2	-12.2	-11.9	-11.9	-11.6	-11.4	-11.3	-11.1	-10.8	-10.4	-9.8	-9.1	-8.4	-7.6	-7.0	-6.1	-5.9	-6.0	-6.6	-6.4	-6.2	-6.0	-5.9	-6.9	-8.9	-5.9	
6-Feb	-8.1	-10.1	-11.3	-12.2	-12.9	-13.5	-14.2	-15.2	-16.2	-15.5	-14.3	-13.4	-12.6	-10.6	-9.7	-9.3	-9.4	-9.9	-10.2	-10.7	-10.1	-10.1	-10.4	-9.6	-11.6	-8.1	
7-Feb	-8.4	-7.6	-7.1	-4.4	-0.9	-0.3	-1.2	-1.6	-2.8	-1.0	0.9	2.7	3.3	3.5	3.4	3.0	2.0	0.8	-0.2	-0.7	-2.3	-4.7	-9.3	-11.3	-1.8	3.5	
8-Feb	-12.8	-13.9	-15.3	-16.8	-18.0	-18.9	-19.7	-20.5	-21.1	-18.5	-16.9	-14.2	-11.3	-9.0	-7.3	-5.9	-6.3	-9.1	-11.2	-13.0	-14.5	-15.4	-16.4	-16.9	-14.3	-5.9	
9-Feb	-16.9	-16.8	-17.2	-15.8	-16.0	-15.4	-15.6	-15.6	-14.5	-12.2	-9.2	-5.9	-3.9	-2.6	-1.6	-0.9	-0.7	-2.0	-2.0	-3.1	-3.9	-3.8	-4.0	-4.1	-8.5	-0.7	
10-Feb	-4.3	-3.8	-3.2	-3.8	-4.6	-5.9	-6.9	-7.3	-8.0	-8.4	-8.6	-8.6	-8.7	-8.7	-8.4	-8.3	-8.4	-8.6	-8.8	-9.1	-9.4	-9.4	-9.5	-9.6	-7.5	-3.2	
11-Feb	-9.8	-9.9	-9.6	-9.8	-9.6	-9.2	-8.8	-8.3	-7.8	-6.8	-5.1	-3.0	-1.7	-0.9	-0.6	0.3	0.6	0.6	0.3	0.0	-0.7	-2.3	-2.9	-2.0	-4.5	0.6	
12-Feb	-1.5	-1.5	-2.2	-2.0	-2.9	-3.2	-2.5	-2.9	-4.7	-5.6	-6.1	-6.5	-6.4	-6.6	-6.4	-6.6	-6.9	-7.4	-7.3	-7.1	-6.9	-6.5	-6.4	-6.6	-5.1	-1.5	
13-Feb	-7.1	-6.9	-6.4	-5.8	-5.6	-1.9	0.7	0.5	-3.0	-6.3	-7.2	-7.5	-7.2	-7.4	-8.3	-8.7	-9.1	-10.2	-11.5	-13.2	-14.4	-15.3	-16.0	-16.6	-8.1	0.7	
14-Feb	-17.3	-17.9	-18.5	-18.7	-18.7	-18.8	-18.8	-19.0	-19.2	-18.8	-18.5	-18.1	-18.2	-17.7	-17.6	-17.8	-18.1	-19.2	-20.0	-20.5	-21.1	-21.1	-22.2	-24.1	-19.2	-17.3	
15-Feb	-25.4	-26.3	-26.9	-26.4	-25.5	-25.5	-26.8	-25.6	-25.2	-24.8	-22.0	-18.8	-18.0	-16.6	-15.3	-15.7	-16.0	-17.5	-19.9	-21.8	-23.0	-23.2	-23.8	-25.3	-22.3	-15.3	
16-Feb	-25.5	-25.8	-25.5	-24.2	-22.8	-22.0	-21.2	-20.1	-19.1	-17.9	-15.0	-12.7	-9.6	-8.3	-7.5	-6.6	-6.4	-7.8	-10.6	-14.1	-16.3	-16.5	-16.4	-16.3	-16.2	-6.4	
17-Feb	-16.3	-16.1	-16.3	-16.3	-16.3	-16.3	-16.5	-16.4	-17.0	-17.1	-16.9	-16.6	-16.3	-17.0	-17.0	-17.2	-17.9	-18.2	-18.5	-20.3	-22.1	-23.1	-24.6	-25.1	-18.1	-16.1	
18-Feb	-26.9	-27.7	-28.7	-29.7	-30.5	-30.2	-31.6	-31.5	-31.2	-28.2	-24.5	-22.0	-20.7	-20.3	-19.8	-19.7	-20.2	-21.5	-23.4	-25.0	-27.1	-28.4	-30.0	-30.7	-26.2	-19.7	
19-Feb	-30.8	-31.9	-31.6	-31.8	-32.0	-32.2	-32.9	-32.8	-30.6	-27.8	-24.1	-21.2	-19.1	-17.7	-16.9	-16.4	-16.2	-16.7	-17.0	-17.4	-16.9	-18.1	-19.8	-21.1	-23.9	-16.2	
20-Feb	-22.2	-22.6	-22.9	-23.7	-23.7	-23.8	-24.3	-23.9	-23.3	-22.1	-20.2	-18.4	-17.4	-16.9	-17.0	-17.6	-18.1	-19.3	-21.6	-23.8	-25.5	-26.8	-26.7	-23.8	-21.9	-16.9	
21-Feb	-24.3	-25.3	-26.7	-27.9	-28.9	-30.0	-31.6	-32.8	-33.0	-29.4	-27.7	-26.6	-25.6	-25.0	-24.7	-24.3	-24.5	-25.4	-27.3	-28.9	-30.7	-32.1	-33.2	-34.2	-28.3	-24.3	
22-Feb	-35.0	-35.5	-36.1	-37.1	-37.3	-36.9	-38.2	-37.6	-35.9	-32.2	-28.3	-24.9	-21.4	-19.0	-18.2	-18.1	-18.4	-20.2	-22.3	-24.4	-26.7	-28.0	-29.6	-30.5	-28.8	-18.1	
23-Feb	-32.1	-32.7	-33.4	-34.0	-34.3	-34.7	-34.8	-35.4	-34.5	-31.6	-28.0	-23.7	-20.9	-19.6	-19.3	-18.9	-19.0	-19.7	-22.2	-24.8	-26.3	-27.7	-29.1	-30.3	-27.8	-18.9	
24-Feb	-30.3	-29.5	-30.5	-30.1	-30.8	-30.6	-30.3	-31.1	-29.4	-27.0	-23.6	-20.5	-17.1	-15.4	-15.3	-15.1	-14.7	-14.9	-15.4	-16.3	-16.7	-17.2	-17.7	-18.3	-22.4	-14.7	
25-Feb	-19.2	-19.0	-18.7	-18.4	-18.1	-17.8	-17.5	-16.8	-15.8	-12.8	-9.1	-6.9	-6.7	-6.5	-6.1	-5.8	-5.8	-6.7	-8.7	-10.0	-11.5	-11.5	-11.8	-12.5	-12.2	-5.8	
26-Feb	-13.1	-14.2	-14.4	-15.1	-16.1	-16.2	-15.5	-14.7	-14.0	-12.3	-10.7	-9.8	-9.2	-8.4	-7.7	-7.3	-7.4	-7.4	-7.4	-7.6	-7.8	-7.9	-7.9	-8.1	-10.8	-7.3	
27-Feb	-8.4	-8.7	-9.1	-9.9	-10.5	-11.2	-11.9	-12.5	-12.8	-12.9	-12.8	-12.4	-12.2	-11.5	-11.4	-11.7	-12.1	-12.7	-13.2	-13.6	-13.8	-14.4	-15.3	-16.1	-12.1	-8.4	
28-Feb	-17.3	-18.4	-19.7	-21.1	-22.1	-23.1	-24.2	-24.8	-22.8	-19.4	-17.1	-15.2	-13.9	-13.3	-12.8	-12.2	-12.6	-13.6	-15.9	-17.9	-19.7	-21.0	-22.4	-23.3	-18.5	-12.2	
		-18.5	-18.8	-19.1	-19.3	-19.4	-19.4	-19.6	-19.7	-19.5	-18.1	-16.3	-14.7	-13.5	-12.6	-12.2	-11.9	-12.1	-12.9	-14.0	-15.1	-16.0	-16.6	-17.4	-17.8	Diurnal Average	
		-1.5	-1.5	-2.2	-2.0	-0.9	-0.3	0.7	0.5	-2.8	-1.0	0.9	2.7	3.3	3.5	3.4	3.0	2.0	0.8	0.3	0.0	-0.7	-2.3	-2.9	-2.0	Diurnal Maximum	



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

**Ambient Temperature 2m (AT 2m) - C**  
**Fort McKay - Bertha Ganter - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C  
Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	213	31.70	31.70
-20 - 0	445	66.22	97.92
0 - 10	14	2.08	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Relative Humidity (RH) - %**

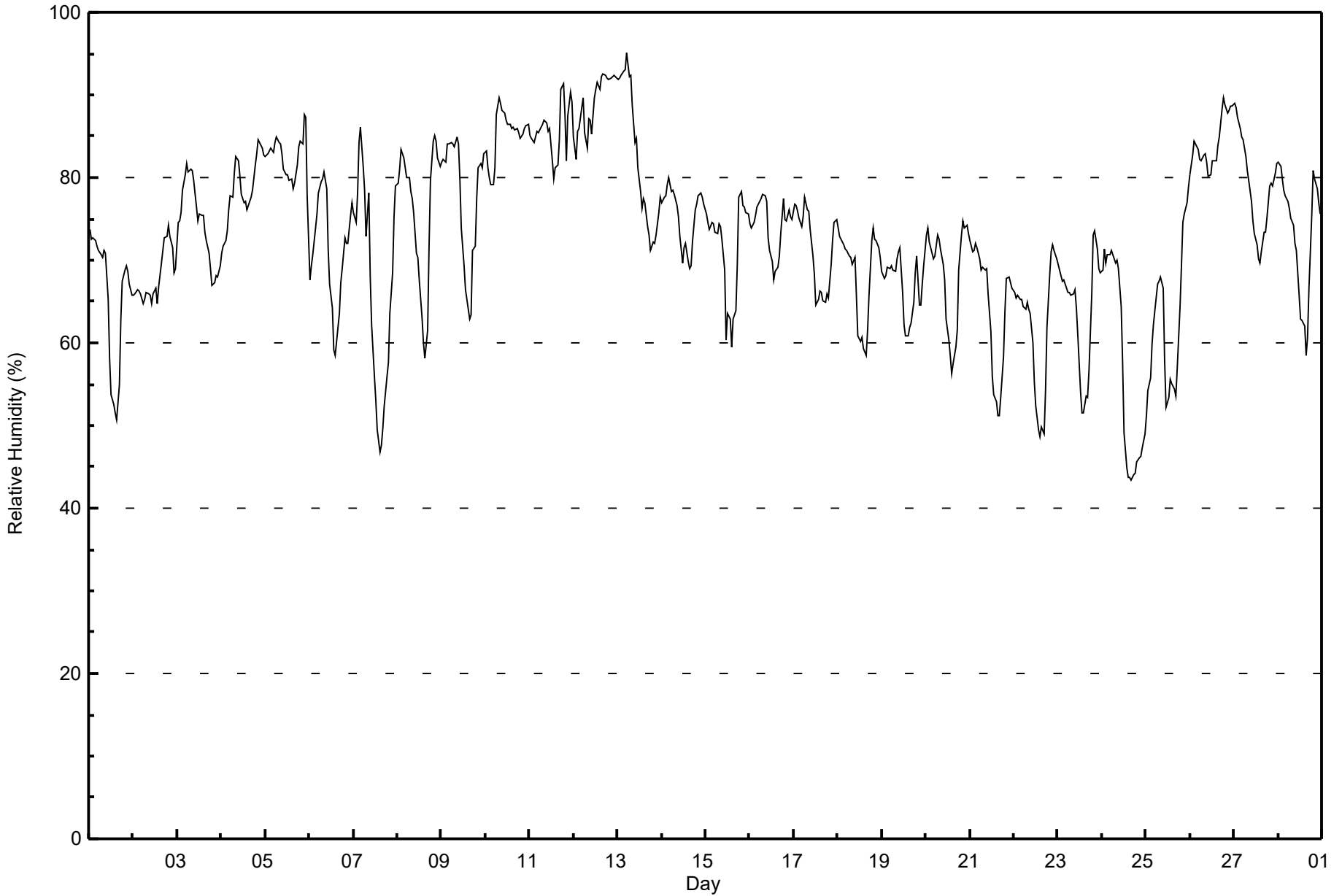
**Fort McKay - Bertha Ganter - February 2023**

Maximum Value: 95.1 % on Feb 13 06:00      Maximum Daily Average: 89.1 % on Feb 12																						Hours in Service: 672 Hours of Data: 672				
Minimum Value: 43.5 % on Feb 24 17:00      Minimum Daily Average: 57.1 % on Feb 24 Maximum Diurnal Average: 76.8 % at hour 7      Minimum Diurnal Average: 65.1 % at hour 15 Monthly Average: 72.98 %      Percentiles: P <sub>1</sub> = 45.9 P <sub>10</sub> = 59.3 Q <sub>1</sub> = 67.0 Median = 73.2 Q <sub>3</sub> = 80.7 P <sub>90</sub> = 85.6 P <sub>99</sub> = 92.3																						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-Feb	73.7	72.5	72.7	72.3	71.7	71.2	70.7	70.4	71.2	70.8	65.2	58.2	53.7	52.5	51.5	50.7	55.0	62.7	67.4	68.8	69.3	68.6	67.2	65.7	65.6	73.7
2-Feb	65.7	66.0	66.5	66.3	66.0	64.7	65.3	66.1	65.9	65.8	64.7	65.9	66.6	64.8	66.8	69.7	71.2	72.7	72.9	74.3	72.9	71.5	68.5	69.1	67.9	74.3
3-Feb	74.7	74.7	75.7	78.4	80.4	81.6	80.7	81.0	80.9	79.6	76.5	74.8	75.6	75.5	75.4	73.4	72.4	70.9	69.0	67.0	67.3	68.1	67.9	69.4	74.6	81.6
4-Feb	70.9	71.7	72.4	73.6	76.0	77.8	77.7	80.4	82.5	82.1	80.1	78.0	77.0	77.2	76.1	77.1	77.7	78.5	81.4	82.8	84.6	84.2	83.5	82.7	78.6	84.6
5-Feb	82.5	82.9	83.2	83.6	83.1	84.3	84.9	84.3	84.1	82.9	81.1	80.3	80.3	79.7	79.8	78.7	79.4	81.5	83.8	84.4	84.1	87.6	87.3	77.8	82.6	87.6
6-Feb	67.6	69.3	70.7	73.9	75.5	78.1	79.4	79.9	80.7	78.7	71.3	67.2	64.2	59.2	58.4	60.1	63.5	67.2	69.0	72.7	72.1	72.1	75.5	76.9	71.0	80.7
7-Feb	75.7	74.6	78.2	84.2	86.1	81.4	78.4	72.8	78.1	68.1	62.1	55.9	53.0	49.5	46.8	47.6	49.7	52.3	56.0	57.7	63.6	68.5	75.3	79.0	66.4	86.1
8-Feb	79.4	81.0	83.4	82.3	81.1	79.9	80.0	78.4	77.5	75.8	70.8	70.3	67.6	63.1	60.1	58.1	61.5	71.7	79.6	84.4	85.0	84.5	82.4	81.4	75.8	85.0
9-Feb	81.9	82.2	81.9	84.1	84.0	84.3	84.1	83.8	84.9	84.2	79.8	74.0	69.4	66.4	65.3	62.9	63.3	71.2	71.7	77.5	81.2	81.7	81.1	82.9	77.7	84.9
10-Feb	83.3	81.3	80.0	79.1	79.2	81.2	87.7	89.6	89.0	88.1	87.8	86.9	86.5	86.5	85.9	86.0	85.8	85.9	85.4	84.8	85.2	85.9	86.3	86.5	85.2	89.6
11-Feb	85.2	84.8	84.2	84.9	85.5	85.5	86.0	86.5	86.9	86.6	85.6	85.9	82.1	79.8	81.1	81.5	84.5	90.6	91.3	87.6	82.1	87.4	90.4	89.1	85.6	91.3
12-Feb	84.9	82.1	85.5	86.0	88.4	89.7	85.5	83.5	87.2	87.0	85.3	89.7	90.7	91.5	90.7	92.2	92.6	92.3	92.0	91.9	92.0	92.2	92.4	92.3	89.1	92.6
13-Feb	91.9	92.0	92.4	92.9	93.1	95.1	92.2	92.4	88.8	84.2	84.7	81.1	78.3	76.3	77.5	76.9	74.1	73.1	71.2	72.3	72.0	73.0	75.8	77.6	82.4	95.1
14-Feb	77.0	77.6	77.8	79.2	79.9	78.2	78.5	78.0	76.6	75.2	72.8	69.7	71.5	72.0	69.8	69.0	69.4	72.3	76.1	76.8	77.8	78.2	77.7	76.8	75.3	79.9
15-Feb	75.6	74.5	73.8	74.5	74.3	73.4	73.3	74.5	74.1	72.6	68.8	60.4	63.6	62.8	59.5	62.9	64.0	69.4	77.6	78.3	76.7	76.5	75.8	75.5	71.3	78.3
16-Feb	74.5	73.9	74.7	75.4	76.4	77.1	77.5	78.0	77.8	77.1	72.7	71.2	69.9	67.7	68.6	69.2	70.4	73.2	77.4	75.0	74.7	76.1	75.2	74.9	74.1	78.0
17-Feb	76.8	76.6	75.9	75.0	74.0	75.3	77.6	76.1	76.0	73.7	70.5	68.3	64.6	65.3	66.2	66.2	65.1	64.9	65.9	65.5	69.5	72.4	74.5	74.9	71.3	77.6
18-Feb	73.9	72.8	72.2	71.8	71.4	71.2	70.4	70.4	69.5	70.3	65.7	60.9	60.1	60.6	59.3	58.5	61.5	65.7	72.4	74.0	72.6	72.3	71.5	70.4	68.3	74.0
19-Feb	68.7	67.7	68.2	69.1	68.9	69.3	68.9	68.7	70.2	71.1	71.4	66.2	62.2	60.8	60.8	61.9	62.4	65.0	68.4	70.5	64.5	64.5	67.0	69.3	66.9	71.4
20-Feb	73.1	73.8	72.2	70.8	70.1	70.5	73.1	72.5	71.3	69.5	67.6	62.8	60.3	58.4	56.3	57.5	59.5	61.6	68.8	73.1	74.8	74.0	74.2	73.2	68.3	74.8
21-Feb	72.4	70.9	71.1	72.1	71.5	70.1	68.8	69.2	68.8	69.0	65.9	61.4	55.9	53.7	52.9	51.1	51.3	53.4	58.2	63.7	67.8	68.1	67.3	66.6	64.2	72.4
22-Feb	66.1	65.4	65.8	65.2	65.3	64.4	64.1	64.8	64.0	63.6	60.0	55.3	52.3	49.6	48.7	49.8	49.0	54.2	61.8	68.4	70.9	71.9	71.2	70.1	61.7	71.9
23-Feb	69.4	68.9	67.4	67.6	67.0	66.2	66.1	65.8	65.9	66.4	64.3	61.1	54.0	51.5	51.6	53.6	53.3	56.7	66.0	73.1	73.5	71.3	69.1	68.4	64.1	73.5
24-Feb	68.8	71.3	69.6	70.7	70.6	71.2	70.6	69.7	70.0	68.9	64.4	57.6	49.1	44.9	43.8	43.7	43.5	44.1	44.2	45.6	46.0	46.3	47.3	49.0	57.1	71.3
25-Feb	51.2	54.2	55.8	59.9	62.2	63.8	67.1	67.5	67.9	66.7	57.8	52.2	53.3	55.5	55.1	54.4	53.5	57.0	64.4	69.3	74.6	75.7	77.0	78.9	62.3	78.9
26-Feb	80.3	82.7	84.3	84.0	83.4	82.1	82.1	82.7	82.9	81.9	80.1	80.3	82.0	82.1	82.0	83.9	85.0	88.3	89.7	88.8	87.9	88.2	88.6	88.6	84.2	89.7
27-Feb	88.9	88.5	87.3	85.9	84.9	84.6	82.6	80.9	79.6	77.0	74.8	73.2	71.9	70.2	69.6	71.0	73.4	73.4	75.1	79.0	79.4	79.0	80.5	81.7	78.8	88.9
28-Feb	81.9	81.4	79.8	78.4	77.7	77.1	76.4	75.1	74.2	72.0	71.1	65.7	62.9	62.6	62.1	58.4	60.7	66.6	75.4	80.9	79.9	78.7	77.0	75.6	73.0	81.9
75.6 75.5 75.8 76.5 76.7 76.8 76.8 76.5 76.7 75.3 72.2 69.1 67.1 65.7 65.1 65.2 66.2 69.2 72.6 74.6 75.1 75.7 76.0 75.9																								Diurnal Average		
91.9 92.0 92.4 92.9 93.1 95.1 92.2 92.4 89.0 88.1 87.8 89.7 90.7 91.5 90.7 92.2 92.6 92.3 92.0 91.9 92.0 92.2 92.4 92.3																								Diurnal Maximum		



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

**Relative Humidity (RH) - %**  
**Fort McKay - Bertha Ganter - February 2023**





**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Precipitation (PC) - mm**

**Fort McKay - Bertha Ganter - February 2023**

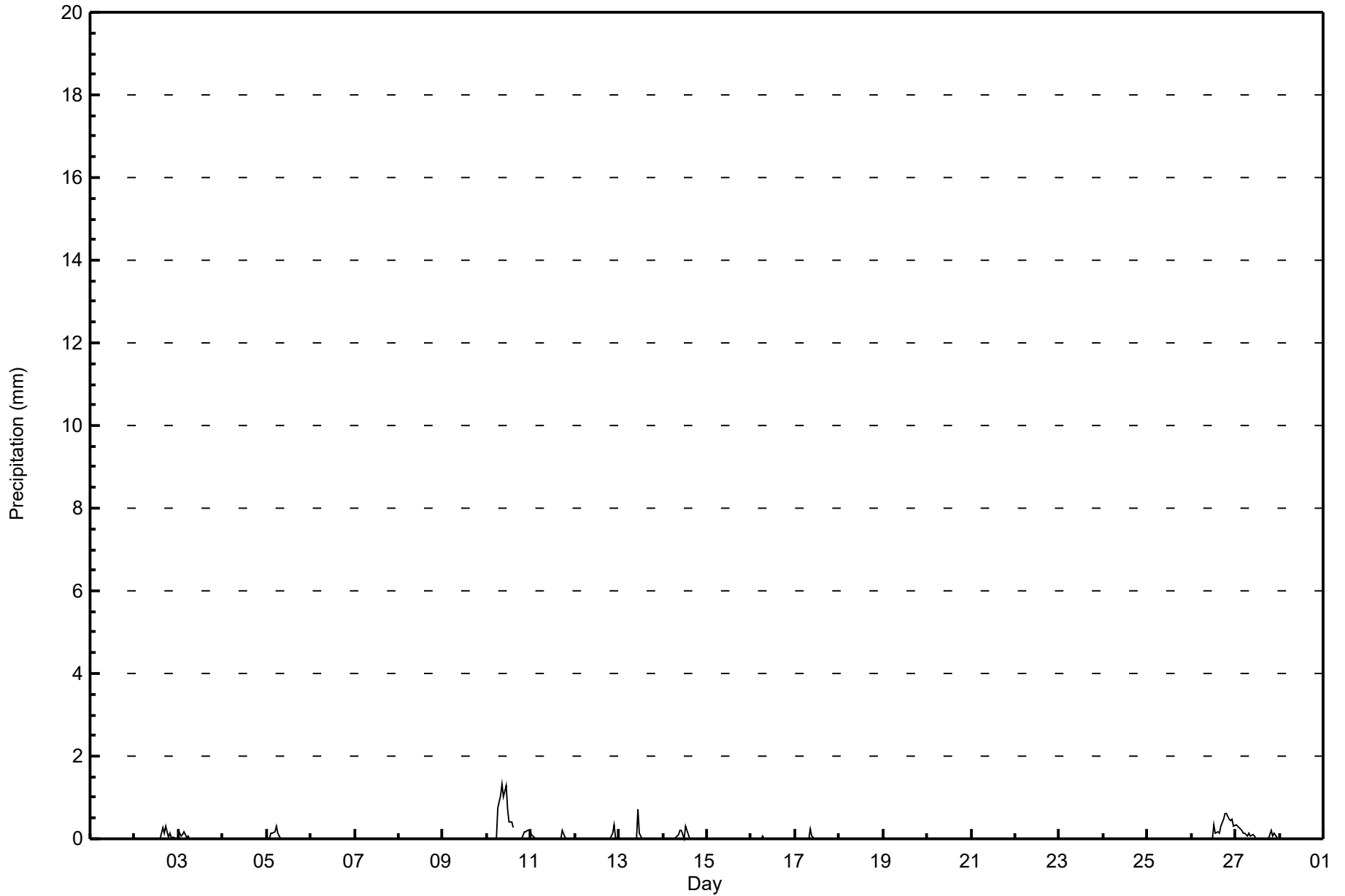
Maximum Value: 1.3 mm on Feb 10 09:00      Maximum Daily Total: 7.9 mm on Feb 10																								Hours in Service: 672									
Minimum Value: 0.0 mm on Feb 1 01:00      Minimum Daily Total: 0.0 mm on Feb 1																								Hours of Data: 588									
Maximum Diurnal Total: 2.3 mm at hour 11      Minimum Diurnal Total: 0.4 mm at hour 5																								Hours of Missing Data: 84									
Monthly Total: 20.29 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> = 0.7																								Hours of Calibration: 0									
																								Percent Operational Time: 87.5									
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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	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	0.3	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.3
3-Feb	0.1	0.1	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	0.0	0.0	0.0	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	
4-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	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	0.0	0.0	0.0	0.9	0.3		
6-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	
9-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.0	1.3	1.0	1.3	0.7	0.4	0.4	0.3	DF	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	7.9	1.3		
11-Feb	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	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.0		
12-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.0		
13-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	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	0.9	0.7	0.0		
14-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.0	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	1.1	0.3	0.0	0.0		
15-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	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	0.0	0.0	0.0	0.1	0.1	0.0	0.0		
17-Feb	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	0.0	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		
18-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	--	--	--	--	
21-Feb	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	--	--	--	--	
22-Feb	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	--	--	--	--	--	
23-Feb	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0	--	0.0		
24-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.2	0.1	0.3	0.5	0.6	0.6	0.5	0.4	0.5	0.3	0.0	0.0	4.5	0.6	0.0	0.0	0.0		
27-Feb	0.3	0.3	0.3	0.2	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	0.2	0.1	0.1	0.1	0.0	0.0	2.3	0.3	0.0	0.0	0.0	0.0		
28-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
0.6   0.4   0.5   0.5   0.4   0.5   1.0   1.2   1.7   1.4   2.3   0.9   1.1   0.7   0.5   0.4   0.4   1.0   0.7   0.9   0.9   1.1   0.8   0.5																								Diurnal Average									
0.3   0.3   0.3   0.2   0.2   0.3   0.7   1.0   1.3   1.0   1.3   0.7   0.4   0.4   0.3   0.3   0.3   0.5   0.6   0.6   0.5   0.4   0.5   0.3																								Diurnal Maximum									
M - Maintenance			DF - DAS Failure																														





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

**Precipitation (PC) - mm**  
**Fort McKay - Bertha Ganter - February 2023**





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

**Precipitation (PC) - mm**  
**Fort McKay - Bertha Ganter - February 2023**

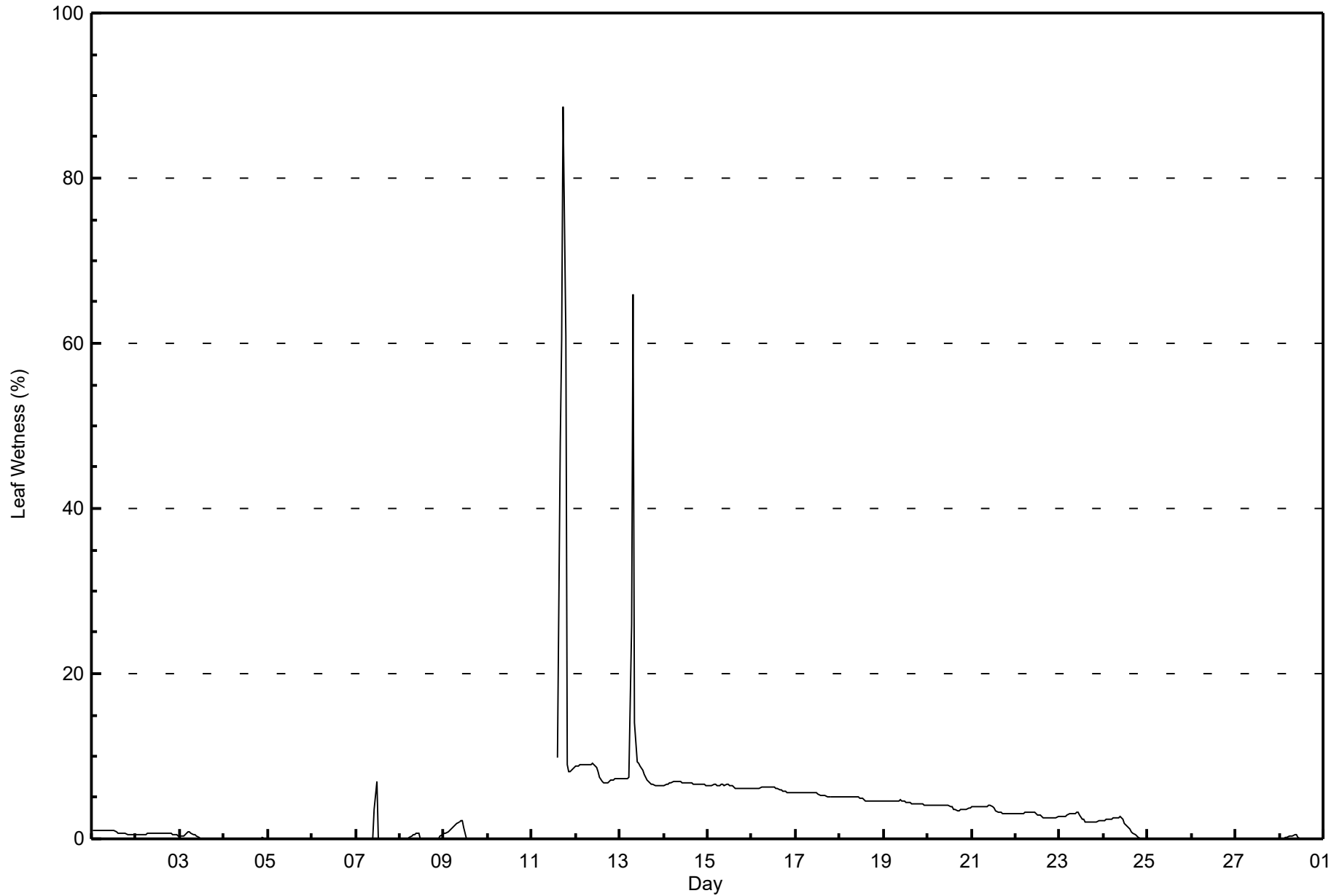
<b>Concentration Ranges (mm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	573	97.45	97.45
0.4 - 0.5	6	1.02	98.47
0.6 - 0.7	5	0.85	99.32
0.8 - 1.4	4	0.68	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 588

Total Number of Hours: 672



Maximum Value: 88.6 % on Feb 11 18:00		Maximum Daily Average: 14.1 % on Feb 11		Hours in Service: 672																						
Minimum Value: 0.0 % on Feb 3 13:00		Minimum Daily Average: 0.0 % on Feb 6		Hours of Data: 670																						
Maximum Diurnal Average: 5.3 % at hour 18		Minimum Diurnal Average: 2.4 % at hour 21		Hours of Missing Data: 2																						
Monthly Average: 2.97 %		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 1.0 Q <sub>3</sub> = 4.8 P <sub>90</sub> = 6.6 P <sub>99</sub> = 11.1		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-Feb	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.0	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.8	1.1
2-Feb	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.4	0.4	0.6	0.7
3-Feb	0.4	0.3	0.3	0.5	0.8	0.8	0.7	0.6	0.5	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
4-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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
5-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	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	0.4	7.0
8-Feb	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.4	0.5	0.7	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.2	0.7
9-Feb	0.6	0.7	0.9	1.1	1.2	1.5	1.6	1.8	2.0	2.2	2.2	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.2
10-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	OR	OR	9.8	48.0	60.6	88.6	60.9	9.1	8.1	8.2	8.4	8.7	14.1	88.6
12-Feb	8.9	8.9	8.9	8.9	8.9	9.0	9.0	8.9	9.0	9.1	8.9	8.6	8.1	7.5	7.0	6.8	6.7	6.9	7.0	7.1	7.2	7.3	7.4	7.3	8.1	9.1
13-Feb	7.3	7.3	7.3	7.3	7.3	7.5	25.9	65.9	14.1	9.4	9.1	8.8	8.4	7.9	7.5	7.1	6.9	6.7	6.5	6.5	6.5	6.4	6.4	6.5	10.8	65.9
14-Feb	6.5	6.6	6.6	6.7	6.8	6.9	6.9	6.9	6.9	6.9	6.8	6.8	6.8	6.8	6.7	6.7	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.5	6.7	6.9
15-Feb	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.5	6.4	6.2	6.1	6.2	6.1	6.1	6.1	6.1	6.1	6.1	6.0	6.3	6.6
16-Feb	6.0	6.1	6.1	6.1	6.2	6.2	6.2	6.2	6.3	6.3	6.2	6.2	6.2	6.1	6.0	5.9	5.9	5.8	5.7	5.6	5.6	5.6	5.6	5.6	6.0	6.3
17-Feb	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.5	5.5	5.4	5.3	5.2	5.2	5.2	5.2	5.1	5.1	5.0	5.0	5.0	5.1	5.4	5.6
18-Feb	5.1	5.1	5.1	5.0	5.1	5.1	5.0	5.1	5.0	5.1	5.1	4.9	4.8	4.8	4.7	4.5	4.5	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.8	5.1
19-Feb	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.7	4.7	4.6	4.5	4.5	4.4	4.3	4.3	4.3	4.2	4.3	4.3	4.2	4.2	4.1	4.1	4.4	4.7
20-Feb	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	3.9	3.8	3.6	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.7	3.9	4.1
21-Feb	3.8	3.9	3.8	3.8	3.9	3.9	3.9	3.9	4.0	4.0	4.0	3.9	3.7	3.5	3.3	3.2	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.6	4.0
22-Feb	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.2	3.2	3.3	3.2	3.0	2.9	2.8	2.7	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.6	2.9	3.3
23-Feb	2.6	2.7	2.7	2.7	2.9	3.0	3.0	3.1	3.1	3.1	3.2	2.9	2.4	2.3	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.5	3.2
24-Feb	2.2	2.3	2.3	2.3	2.4	2.5	2.5	2.5	2.6	2.7	2.5	1.9	1.7	1.4	1.1	0.9	0.7	0.5	0.3	0.1	0.0	0.0	0.0	0.0	1.5	2.7
25-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.5	0.5	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	0.5
																								Diurnal Average		
																								Diurnal Maximum		
OR - Out of Range																										





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

**Leaf Wetness (LW) - %**  
**Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	276	41.19	41.19
0.4 - 0.5	21	3.13	44.33
0.6 - 0.7	31	4.63	48.96
0.8 - 1.4	23	3.43	52.39
1.5 - 10	311	46.42	98.81
> 10	7	1.04	99.85

Total Number of Valid Hours: 670

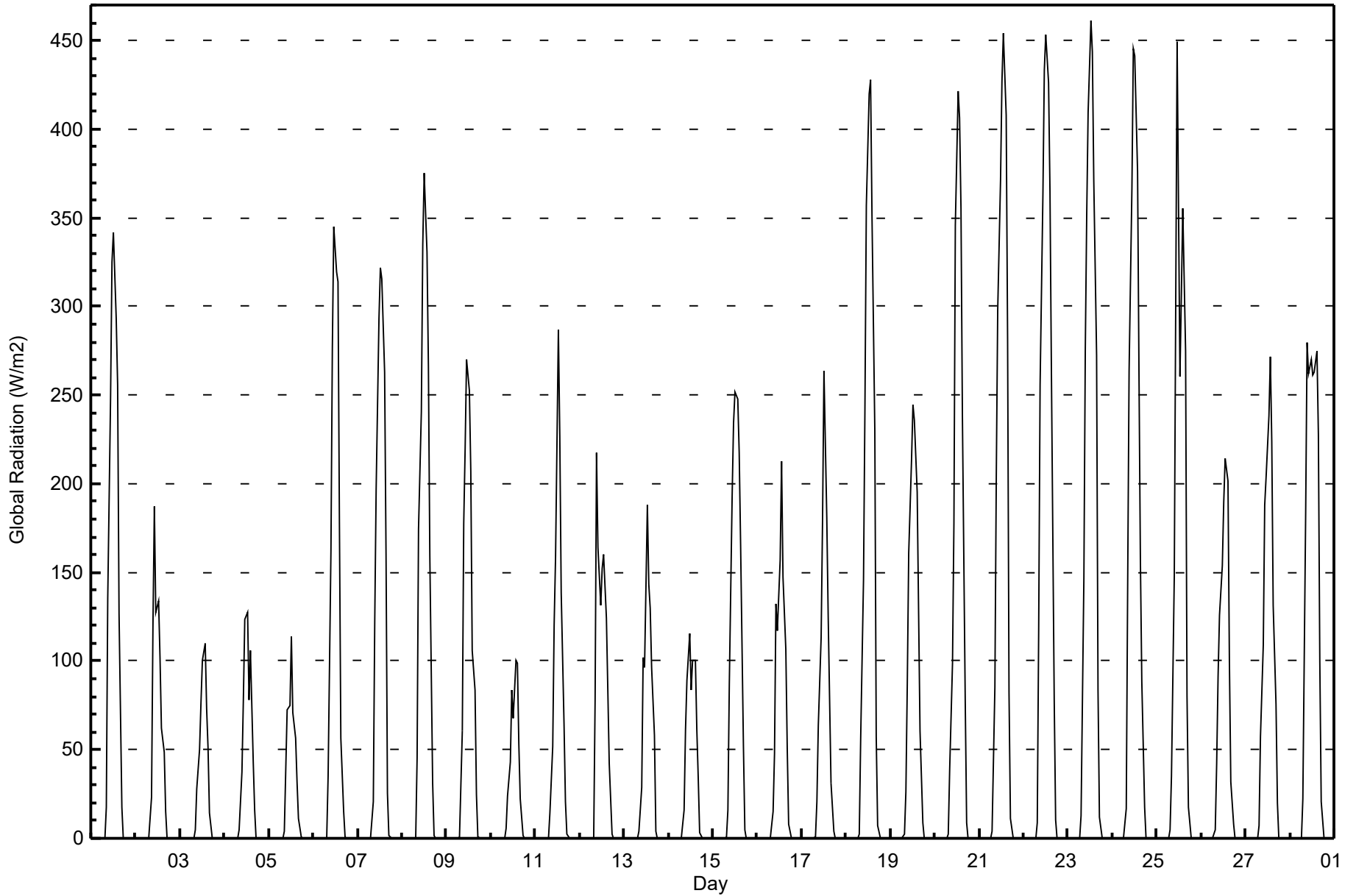
Total Number of Hours: 672



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

**Global Radiation (GR) - W/m2**  
**Fort McKay - Bertha Ganter - February 2023**

Maximum Value: 461.2 W/m2 on Feb 23 13:00      Maximum Daily Average: 118.3 W/m2 on Feb 23																							Hours in Service:	672		
Minimum Value: 0.0 W/m2 on Feb 1 01:00      Minimum Daily Average: 19.8 W/m2 on Feb 5																							Hours of Data:	672		
Maximum Diurnal Average: 262.7 W/m2 at hour 13      Minimum Diurnal Average: 0.0 W/m2 at hour 1																							Hours of Missing Data:	0		
Monthly Average: 63.22 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> = 85.4 P <sub>90</sub> = 251.6 P <sub>99</sub> = 435.7																							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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.6	135.1	248.6	325.4	341.5	293.4	256.1	126.8	17.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	73.4	341.5
2-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.2	119.7	186.9	127.7	134.2	101.6	62.5	48.4	15.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	34.2	186.9
3-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	27.6	49.9	76.6	100.1	109.8	73.3	51.0	14.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	21.2	109.8
4-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	37.5	77.9	123.6	127.5	78.3	105.8	43.0	16.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	25.6	127.5
5-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	38.2	72.2	75.2	113.7	71.0	56.9	32.2	11.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	19.8	113.7
6-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.8	161.5	276.2	344.6	319.6	314.2	178.5	56.6	15.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	70.9	344.6
7-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.7	121.6	196.6	292.9	322.2	315.2	263.0	160.0	25.4	1.7	0.0	0.0	0.0	0.0	0.0	0.0	71.6	322.2
8-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	45.6	174.1	240.2	334.3	375.1	330.5	266.3	159.3	30.9	1.7	0.0	0.0	0.0	0.0	0.0	0.0	81.6	375.1
9-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	60.7	177.3	219.7	270.3	252.3	207.2	105.6	83.9	24.8	1.1	0.0	0.0	0.0	0.0	0.0	0.0	58.5	270.3
10-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	23.8	42.9	83.5	67.5	100.6	98.6	53.7	22.4	1.9	0.0	0.0	0.0	0.0	0.0	0.0	20.8	100.6
11-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	14.4	52.0	120.5	158.6	286.6	226.8	138.4	64.4	20.9	2.7	0.0	0.0	0.0	0.0	0.0	0.0	45.2	286.6
12-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	77.9	217.4	164.1	131.5	152.3	160.0	124.5	83.7	42.1	2.4	0.0	0.0	0.0	0.0	0.0	0.0	48.2	217.4
13-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	28.5	102.0	96.7	188.3	143.3	129.8	96.6	57.9	4.1	0.0	0.0	0.0	0.0	0.0	0.0	35.5	188.3
14-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	15.6	61.1	89.5	115.6	83.6	100.3	100.6	61.7	33.9	3.5	0.0	0.0	0.0	0.0	0.0	0.0	27.7	115.6
15-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	16.3	86.8	192.8	233.9	251.9	247.4	217.8	165.9	51.8	4.4	0.0	0.0	0.0	0.0	0.0	0.0	61.2	251.9
16-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	15.2	48.1	131.9	117.2	156.7	212.6	147.5	106.4	51.0	7.8	0.0	0.0	0.0	0.0	0.0	0.0	41.4	212.6
17-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	21.1	63.6	112.9	179.6	264.0	180.9	125.2	78.2	31.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	44.2	264.0
18-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	56.3	145.5	241.9	356.5	419.4	428.0	350.9	230.3	57.7	7.1	0.0	0.0	0.0	0.0	0.0	0.0	95.7	428.0
19-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	26.5	87.5	160.8	213.3	244.9	235.7	195.4	127.7	60.2	8.8	0.0	0.0	0.0	0.0	0.0	0.0	56.8	244.9
20-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	38.7	98.7	177.6	345.8	421.2	406.4	355.0	239.1	78.4	9.1	0.0	0.0	0.0	0.0	0.0	0.0	90.5	421.2
21-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	85.0	204.6	298.2	371.4	426.8	453.9	408.2	281.4	82.0	10.9	0.0	0.0	0.0	0.0	0.0	0.0	109.4	453.9
22-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.7	117.0	255.5	363.4	433.4	453.0	426.6	364.8	264.6	77.7	10.7	0.0	0.0	0.0	0.0	0.0	0.0	115.6	453.0
23-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.1	146.8	275.3	351.6	409.6	461.2	443.4	371.6	272.1	83.3	12.1	0.0	0.0	0.0	0.0	0.0	0.0	118.3	461.2
24-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.5	143.4	263.8	366.5	445.0	441.5	376.2	263.2	157.2	88.6	17.7	0.1	0.0	0.0	0.0	0.0	0.0	107.5	445.0
25-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	35.3	147.9	299.2	449.0	260.6	307.0	355.2	274.7	80.2	17.3	0.1	0.0	0.0	0.0	0.0	0.0	93.0	449.0
26-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	42.2	91.2	126.1	154.0	189.2	214.7	201.2	100.3	31.8	8.0	0.0	0.0	0.0	0.0	0.0	0.0	48.5	214.7
27-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.2	57.2	109.0	187.7	204.3	238.5	271.5	223.8	131.8	75.7	19.6	0.1	0.0	0.0	0.0	0.0	0.0	63.6	271.5
28-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.7	183.1	279.4	262.2	270.2	261.1	263.1	275.1	228.2	100.0	21.0	0.0	0.0	0.0	0.0	0.0	0.0	90.3	279.4
																							Diurnal Average			
																							Diurnal Maximum			





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

**Global Radiation (GR) - W/m2**  
**Fort McKay - Bertha Ganter - February 2023**

<b>Concentration Ranges (W/m2)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	434	64.58	64.58
21 - 100	83	12.35	76.93
101 - 300	116	17.26	94.20
301 - 600	39	5.80	100.00
601 - 900	0	0.00	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672

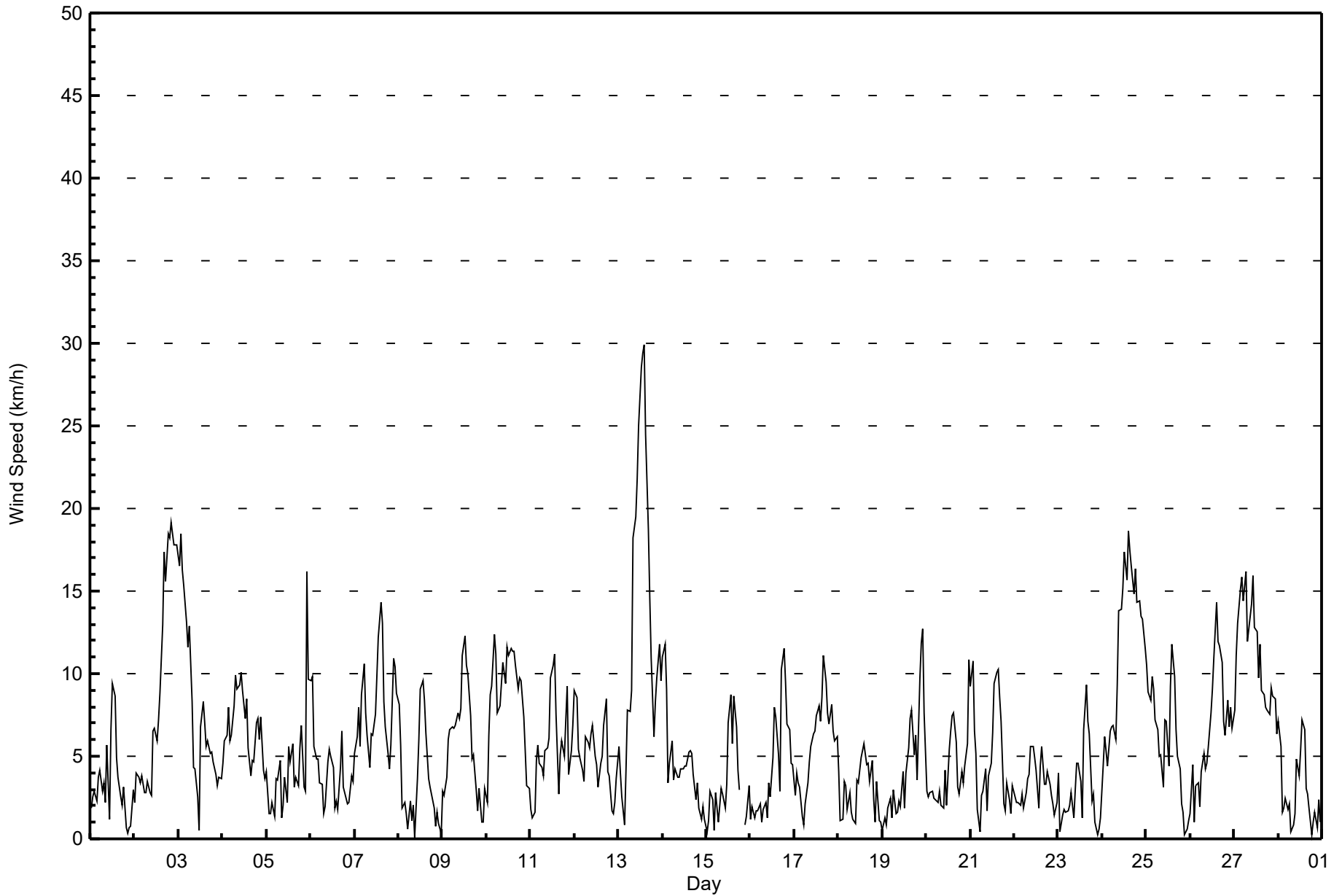




Maximum Speed: 30 km/h on Feb 13 15:00	Maximum Daily Speed Average: 12.2 km/h on Feb 13	Hours in Service: 672
Minimum Speed Value: 0 km/h on Feb 8 10:00	Minimum Daily Speed Average: 0.4 km/h on Feb 5	Hours of Data: 670
Maximum Diurnal Speed Average: 2.4 km/h at hour 18	Minimum Diurnal Speed Average: 0.4 km/h at hour 3	Hours of Missing Data: 2
Monthly Average Velocity: 1.0 km/h 3.9 deg	Percentiles: P <sub>1</sub> = 0 P <sub>10</sub> = 2 Q <sub>1</sub> = 3 Median = 5 Q <sub>3</sub> = 8 P <sub>90</sub> = 12 P <sub>99</sub> = 19	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-Feb	NW2	WSW3	NNW3	WNW2	NW4	NNW4	NW3	N3	NNW2	NNW6	ENE1	NW7	NW9	N9	NE5	E4	ENE3	N2	WSW3	WNW1	WNW0	SSE1	SW1	SSW3	NNW2.1	NW9
2-Feb	SSW2	SSW4	SSW4	SSW3	SSW4	SSW3	S3	SSW3	SSW3	S3	S7	S7	SSE6	S7	SSE9	SSE13	SSE17	SSE16	SSE18	SSE18	SSE19	SSE18	SSE18	SSE18	S9.0	SSE19
3-Feb	S17	S19	S16	S15	S13	S12	S13	S8	S4	SSW4	SSE3	NNE1	N7	N8	NNE7	NNE6	NE6	NE5	ENE5	ENE5	NE4	ENE3	E4	N4	SSE3.6	S19
4-Feb	N5	N6	N6	N8	N6	N6	N8	N10	N9	N9	N10	N9	NNE7	N8	N5	N4	NNW5	N5	N7	N7	N6	NNW7	NNW4	NNW4	N6.7	N10
5-Feb	NW4	N2	SE2	N2	NNW1	N4	N4	NNW5	ENE1	NW2	SE4	SE2	SSE6	S5	SSE6	SSW3	S4	S3	S5	S7	S3	NNW3	NNW16	NW10	W0.4	NNW16
6-Feb	WNW10	W10	WSW6	WSW5	WSW5	W3	W3	W2	N2	NE5	NE5	NE5	NE4	NNE2	NNE2	NE2	NNE4	N6	N3	WNW2	N2	SSE2	S4	SSE3	NW1.5	W10
7-Feb	S5	S6	SSE8	SW6	W9	W11	W8	WSW6	WSW4	SW6	SW6	SW8	WSW10	W12	W14	W13	W8	W7	WSW5	W4	NW6	N11	N10	N9	W5.4	W14
8-Feb	N8	NNW6	W2	SW2	WSW2	WNW1	NW2	NW1	NNW2	NW0	SE4	SSE6	SSE9	SSE10	SSE8	S6	S4	NW3	NW3	W2	WSW1	WNW2	SSW1	NW0	SSW1.0	SSE10
9-Feb	SW3	SW3	SSW4	S6	S7	S7	S7	S7	S8	S7	S8	S11	S12	S11	S10	S7	S5	N5	NNW3	WNW2	WNW3	WNW1	N1	SSW3	S4.6	S12
10-Feb	NNE2	N6	N9	N9	N12	NNE11	N8	N8	N9	N11	N9	N12	N11	N12	N11	N11	N10	N9	N10	N10	N7	N5	N3	ENE3	N8.6	N12
11-Feb	NE2	ENE1	ESE2	SSE5	S6	SSE5	S4	S4	S5	S5	SSE6	S10	S11	S11	S8	SSW3	WSW5	W6	WNW5	WNW7	WNW9	SW4	WSW5	WSW7	SSW3.7	S11
12-Feb	W9	W9	W5	SSE5	S4	WSW4	WNW6	NW6	NNE6	N6	NNE7	NE5	ENE4	N3	N5	NNE5	N7	NNW8	N4	N4	NNW2	E2	N2	N4	NNW2.7	W9
13-Feb	NNW6	NNW4	SSW3	NE1	SSW4	W8	W8	NNW9	N18	N19	N22	N25	N29	N29	N30	N25	N19	N15	N11	NNE6	NNE8	NNE10	NNE12	NNE10	N12.2	N30
14-Feb	NNE11	NNE12	NNE9	N3	N5	N6	NE4	ENE4	ENE4	ENE4	ENE4	ENE4	ENE4	NE5	NE5	NNE5	N4	NW2	WNW3	NNW2	NE1	NW2	NW1	NNE3.9	NNE12	
15-Feb	WSW0	W1	S3	SW2	WSW0	SSW3	SW1	W2	W3	WNW3	NNW2	ESE3	SE7	SSE9	S6	SSE9	S7	SSE4	SSW3	UO	UO	SSW1	NW1	NNW3	S2.1	SSE9
16-Feb	W1	NW2	NW1	NW2	N2	NNE2	ENE1	SE2	SSE2	SE1	SSE3	SE3	S5	S8	S7	SSE5	NE3	N10	NNE11	NNE10	NE7	NNE7	NNE5	NNE4	NE1.5	NNE11
17-Feb	NNE3	E4	ENE3	E3	ENE1	ENE1	E2	ENE3	NE5	NE6	NE6	NE6	NE7	NNE8	NNE7	NNE9	NNE11	NNE10	NNE8	NNE7	N8	N6	NW6	NW6	NNE5.0	NNE11
18-Feb	N4	NW1	WNW1	WNW3	N3	NW2	NNW3	NNW2	ESE1	ENE1	ESE4	ENE3	E5	ENE5	E6	ENE5	NNE5	N3	N5	N2	W1	WNW3	WNW1	WSW1	NNE1.6	E6
19-Feb	S1	W1	W1	NW2	NW2	W1	NW3	WNW1	S2	NNE2	NNE2	ENE4	ENE2	NE4	N6	NNW7	NW8	NW5	NNW6	NNW4	N10	N12	N13	N8	NNW3.6	N13
20-Feb	N3	N3	ENE3	ESE3	SSE2	S2	SSE2	SSE3	SE2	SSE2	SSE4	NE2	NE5	NE7	NE7	NE8	NE6	NNE3	NNW3	WNW4	NW3	NW4	NNW6	N11	NNE2.2	N11
21-Feb	NNE9	NNE11	N7	N5	NE2	ENE0	SW3	W3	WNW4	NW2	NNE4	ENE5	NE6	NNE9	NNE10	NNE10	N9	NNE7	N2	WNW2	WSW3	W2	SSW2	SSW3	N3.5	NNE11
22-Feb	SSW3	SSW2	SSW2	SSW2	SSW3	SSW2	SSW3	SSW4	S4	S6	SSE6	SE5	SSE4	NNE2	NE4	NE6	NE3	NNW3	WNW4	WNW3	NW3	WNW2	SW1	WNW2	SSW0.9	S6
23-Feb	NNW4	SW0	W1	W2	SW2	SSW2	W2	WSW3	WSW1	SE3	SE5	SE3	E1	SSE7	SSE9	SSE7	S6	SSE2	NW3	NNW1	W0	SSW1	SSW1	S1.7	SSE9	
24-Feb	SSW5	SSW6	SSW5	S4	S7	S7	S7	SSW6	S9	S14	SSE14	SSE15	S17	S16	S19	S18	S17	S15	SSW16	S14	S14	S13	S13	S12	S11.7	S19
25-Feb	S10	S9	S8	SSE10	S9	S7	SSE7	S5	S5	SSW3	W7	WSW7	WSW4	S9	SSE12	SSE10	SSE7	SSE5	S4	S2	SSE2	NNE0	ESE1	N1	S5.1	SSE12
26-Feb	N2	N5	SE1	NNW3	NNW3	N2	N4	NNE5	NNE4	NNE5	N5	N8	N9	N11	N14	N12	N12	N11	N7	NNE6	NNE8	NNE7	NNE8	NNE7	N6.4	N14
27-Feb	N8	N11	N13	N15	N16	N14	N16	N12	N13	N14	NNE16	NNE13	N13	NNE10	NNE12	NNE9	NNE9	NNE8	NNE8	NNE9	N9	N8	NNW6	N11.0	N16	
28-Feb	NW7	NW6	NW2	WNW2	NNW2	NW2	NW2	WNW0	NW1	NE2	NNE5	NE4	ENE5	E7	E7	ENE3	N3	ENE2	WSW0	S1	SSW2	WSW1	SSW2	SSW1	NNE1.1	E7
NW1.4 NW1.2WSW0.4WSW0.5WSW0.7 W1.0WNW1.1 NW1.0 N0.9NNE1.2 NE1.5 NE1.6 NE1.5 NE1.8 NE2.1 NE2.0 NNE1.9 N2.4 N1.6NNW1.2 N1.5 N1.6 N1.8NNW1.4																								Diurnal Average		
S17 S19 S16 S15 N16 N14 N16 N12 N18 N19 N22 N25 N29 N29 N30 N25 N19 SSE16 SSE18 SSE18 SSE19 SSE18 SSE18 SSE18																								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 (WS) - km/h  
Fort McKay - Bertha Ganter - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	377	56.27	56.27
6 - 11	224	33.43	89.70
12 - 19	63	9.40	99.10
20 - 28	3	0.45	99.55
29 - 38	3	0.45	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 670

Total Number of Hours: 672



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

**Wind Speed (WS) - km/h**  
**Fort McKay - Bertha Ganter - February 2023**

<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	44	23	25	31	9	6	12	22	29	39	11	20	21	27	31	27	377
6 - 11	60	40	12	0	3	0	1	20	40	2	4	5	12	4	10	11	224
12 - 19	21	5	0	0	0	0	0	12	20	1	0	0	2	1	0	1	63
20 - 28	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
29 - 38	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	<b>131</b>	<b>68</b>	<b>37</b>	<b>31</b>	<b>12</b>	<b>6</b>	<b>13</b>	<b>54</b>	<b>89</b>	<b>42</b>	<b>15</b>	<b>25</b>	<b>35</b>	<b>32</b>	<b>41</b>	<b>39</b>	<b>670</b>

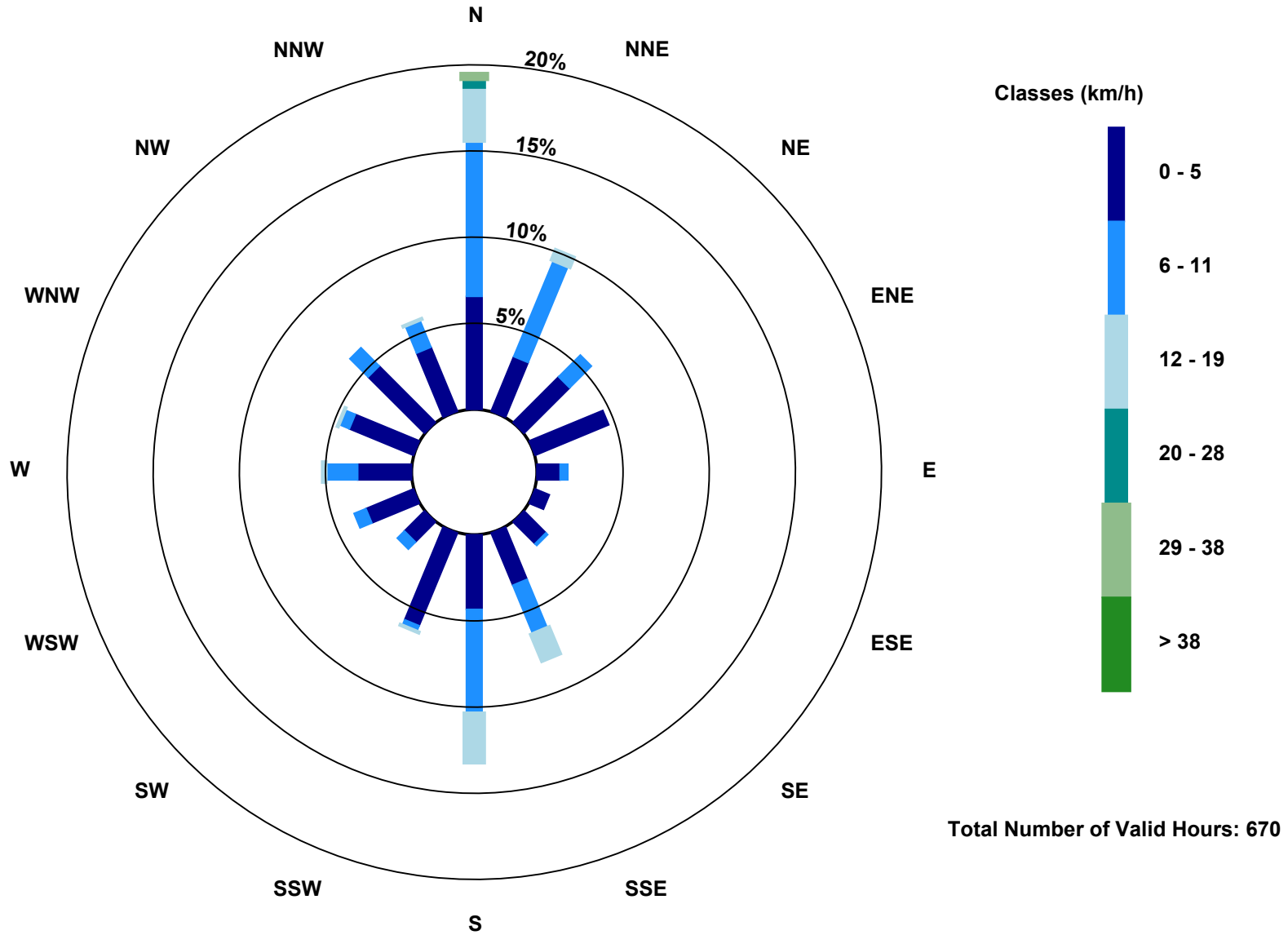
Total Number of Valid Hours: 670

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Fort McKay - Bertha Ganter





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

**Wind Speed (WS) - km/h**  
**Fort McKay - Bertha Ganter - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Feb 13 14:00 Minimum Value: 0 km/h on Feb 8 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> = 6														Hours in Service: 672 Hours of Data: 670 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-Feb	1	2	2	2	1	1	2	2	1	2	1	4	3	4	2	1	1	1	1	1	1	1	1	1	4		
2-Feb	1	2	1	1	1	1	1	1	2	2	2	2	1	2	3	4	4	4	4	4	4	4	4	4	4		
3-Feb	4	4	4	3	3	2	3	3	1	2	1	1	2	2	2	2	2	2	2	1	1	1	1	1	4		
4-Feb	1	1	1	2	1	1	2	2	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2		
5-Feb	1	1	1	1	1	1	1	1	1	2	2	2	1	2	2	2	1	1	1	1	2	2	5	4	5		
6-Feb	4	4	3	2	2	1	1	1	2	2	2	1	1	1	1	1	2	2	1	2	1	1	1	1	4		
7-Feb	1	2	2	3	4	5	3	3	1	2	2	3	4	5	6	5	4	3	2	2	1	6	3	2	6		
8-Feb	2	2	0	1	1	1	1	1	1	1	1	2	2	1	1	1	2	1	1	1	1	1	1	1	2		
9-Feb	2	1	1	1	1	2	2	1	1	1	2	3	3	3	3	1	3	1	1	1	1	1	1	1	3		
10-Feb	2	2	1	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	3		
11-Feb	1	1	1	1	1	1	1	1	1	2	1	2	3	2	2	2	4	2	2	3	4	1	2	3	4		
12-Feb	4	4	2	1	1	2	2	2	2	2	2	2	1	1	1	2	1	2	1	1	2	1	2	2	4		
13-Feb	1	2	1	1	1	4	3	5	6	4	6	6	7	8	6	6	5	4	3	4	3	3	4	3	8		
14-Feb	3	3	3	1	1	1	1	1	1	1	2	1	1	1	2	2	1	1	1	1	1	1	1	1	3		
15-Feb	1	2	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	1	UO	UO	1	1	1	2		
16-Feb	1	2	1	1	1	1	1	1	1	1	1	1	2	2	2	1	2	3	3	3	2	2	1	1	3		
17-Feb	1	1	1	1	1	1	2	2	2	2	2	2	3	2	3	3	3	3	2	2	1	1	1	1	3		
18-Feb	1	2	1	1	1	2	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	2	1	2		
19-Feb	1	1	1	1	1	1	2	1	2	2	1	1	1	2	2	1	2	1	1	3	2	3	2	3	3		
20-Feb	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	2	1	2	3	3	3		
21-Feb	2	3	2	2	1	1	1	1	2	1	2	2	2	3	3	4	3	3	1	1	1	1	2	1	4		
22-Feb	1	1	1	1	2	1	2	1	1	1	1	1	1	1	2	2	1	1	1	1	2	1	1	2	2		
23-Feb	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	2	1	1	1	1	1	2		
24-Feb	2	2	2	2	2	1	2	2	3	3	3	5	5	5	5	5	4	5	4	3	3	3	3	3	5		
25-Feb	2	2	2	2	2	1	3	1	1	2	3	3	2	3	2	2	1	1	1	1	2	1	1	1	3		
26-Feb	1	1	1	1	1	1	1	1	2	1	2	2	2	2	3	3	2	2	2	2	3	2	2	2	3		
27-Feb	2	2	2	3	3	3	3	3	3	4	4	4	4	3	3	3	3	2	2	2	3	2	2	1	4		
28-Feb	1	2	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	2		
														Diurnal Maximum													
UO - Unstable Operation																											



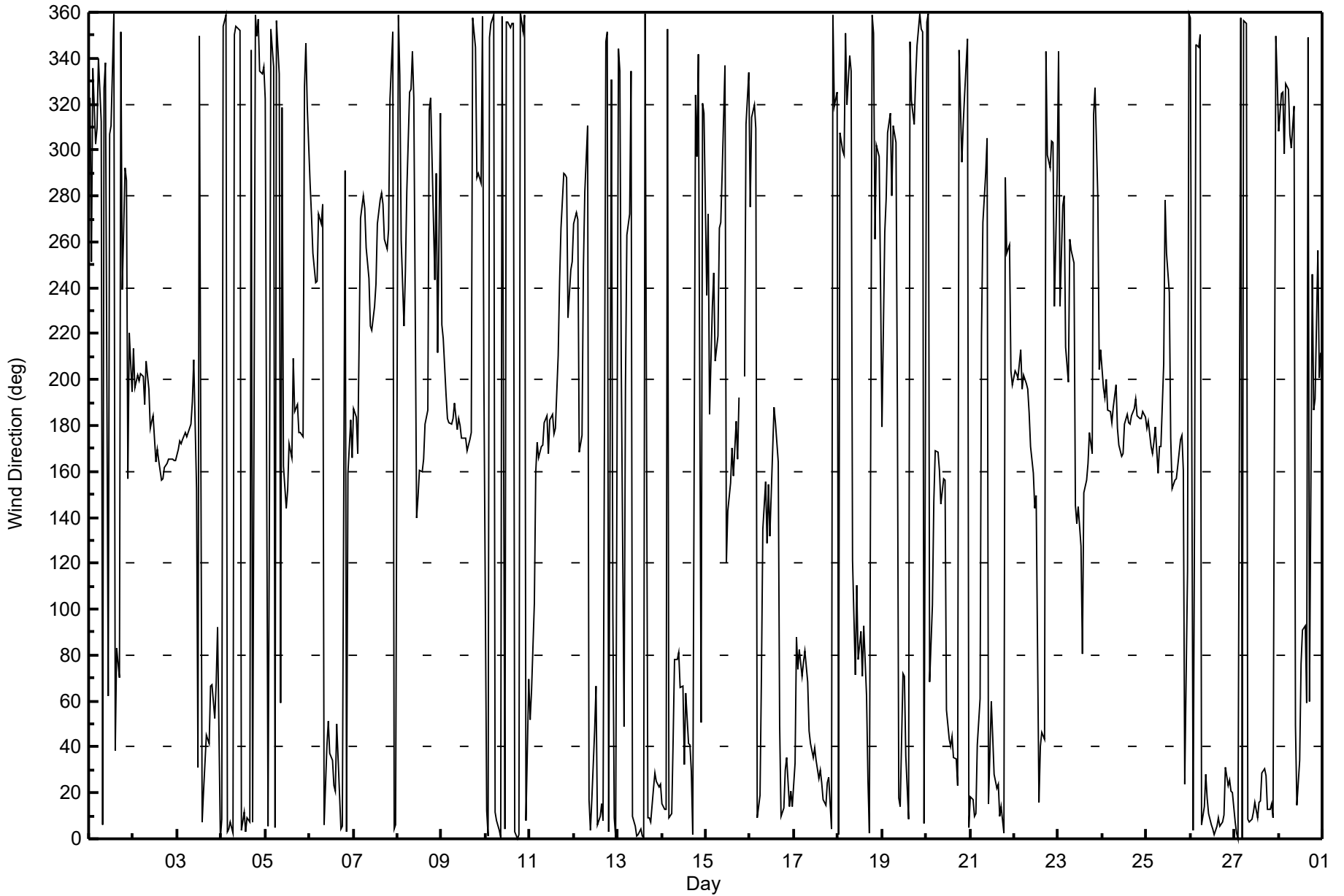
**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction (WD) - deg**  
**Fort McKay - Bertha Ganter - February 2023**

Direction of Maximum Speed: 1 deg on Feb 13 15:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 1.9 deg on Feb 13	Hours of Data: 670
Direction of Minimum Speed: 322 deg on Feb 8 10:00	Hours of Missing Data: 2
Direction of Minimum Daily Speed Average: 0.4 deg on Feb 5	Percent Operational Time: 99.7
Monthly Average Direction: 3.9 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-Feb	323	251	336	302	309	340	312	6	327	338	62	307	311	360	38	83	70	351	239	292	287	157	220	194	332.2
2-Feb	213	196	202	199	203	202	189	208	196	179	182	184	164	169	165	156	157	162	163	165	165	166	165	165	169.2
3-Feb	170	173	172	174	177	175	177	180	190	208	153	31	350	7	21	33	45	42	67	67	52	68	92	0	151.1
4-Feb	8	354	359	3	4	7	3	350	354	353	352	4	12	3	9	7	344	7	359	350	357	334	333	336	357.0
5-Feb	322	5	146	353	336	5	356	333	59	318	162	144	152	172	166	209	186	189	177	177	175	328	347	319	272.2
6-Feb	285	272	255	242	243	272	268	276	6	40	52	37	34	23	21	50	19	4	6	291	3	159	182	166	317.4
7-Feb	187	184	168	217	270	280	274	258	244	223	221	232	241	268	278	281	277	261	257	265	322	352	4	6	267.4
8-Feb	359	333	260	223	247	282	325	326	343	322	140	149	161	160	166	180	187	317	323	270	243	290	212	316	193.5
9-Feb	224	218	193	183	181	181	183	190	178	183	180	175	175	174	169	174	177	358	345	288	290	285	358	199	184.1
10-Feb	12	1	349	355	359	12	8	4	1	358	5	356	356	353	355	355	3	0	2	360	351	359	8	69	0.1
11-Feb	52	65	103	160	173	166	171	172	181	185	168	182	185	176	179	211	243	266	290	289	288	227	248	251	204.4
12-Feb	268	272	270	168	176	249	282	311	17	4	17	47	66	6	10	15	8	347	352	3	331	99	9	1	340.5
13-Feb	344	334	208	49	197	263	272	334	10	6	1	2	4	1	1	360	9	9	7	22	29	25	22	24	1.9
14-Feb	15	13	13	353	9	11	43	78	78	81	66	67	32	63	41	41	29	2	324	297	341	51	320	316	25.9
15-Feb	237	272	185	232	246	208	219	266	269	290	337	120	143	155	170	158	182	166	192	UO	UO	201	311	334	182.2
16-Feb	275	314	320	309	9	19	71	135	155	129	154	132	169	188	181	164	50	10	13	30	35	14	21	14	43.5
17-Feb	33	88	74	82	71	77	81	68	47	42	36	40	34	26	30	25	17	15	24	27	4	359	319	325	26.6
18-Feb	2	307	300	298	351	320	341	334	122	71	111	78	90	71	93	62	26	2	359	351	261	302	297	241	24.8
19-Feb	179	264	279	307	316	280	310	303	188	18	14	72	71	36	9	347	322	311	331	345	359	353	351	7	348.7
20-Feb	356	359	68	102	147	169	168	161	146	157	156	56	43	40	44	35	34	23	344	295	312	325	348	5	29.7
21-Feb	19	17	10	11	41	61	219	269	290	305	15	60	45	28	22	24	10	14	3	288	255	259	204	198	11.2
22-Feb	204	203	201	213	196	202	198	196	185	171	160	144	149	16	40	46	43	343	298	292	304	303	232	289	193.2
23-Feb	343	232	276	280	214	199	261	256	251	145	137	145	127	81	150	156	164	177	168	316	327	279	204	213	172.3
24-Feb	196	192	200	187	186	181	188	198	179	172	166	168	180	185	181	181	185	187	192	184	183	183	186	184	182.7
25-Feb	179	182	171	168	173	179	159	171	207	278	255	238	174	152	156	157	162	174	175	160	24	117	359		177.3
26-Feb	358	4	143	346	345	350	6	14	28	18	11	6	4	2	5	9	5	7	10	31	23	25	21	20	10.5
27-Feb	7	2	0	358	0	356	355	9	7	9	12	16	9	16	17	29	30	27	13	13	15	9	350	330	7.4
28-Feb	308	325	325	298	329	326	307	301	319	50	15	34	76	91	93	59	349	60	246	187	192	256	201	212	17.4
322.3 310.4 244.8 244.8 255.8 280.4 283.1 309.4 8.2 13.2 46.6 53.5 55.6 42.8 51.9 49.0 27.2 3.6 351.6 341.9 351.0 354.9 350.7 340.9																									
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 (WD) - deg**  
**Fort McKay - Bertha Ganter - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 99 deg on Feb 3 12:00 Minimum Value: 8 deg on Feb 19 19:00 Percentiles: P <sub>1</sub> = 11 P <sub>10</sub> = 13 Q <sub>1</sub> = 16 Median = 24 Q <sub>3</sub> = 41 P <sub>90</sub> = 66 P <sub>99</sub> = 89																			Hours in Service: 672 Hours of Data: 670 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-Feb	53	33	52	52	22	22	67	43	25	22	68	69	19	31	44	40	22	35	33	86	87	73	82	20	87
2-Feb	32	22	21	18	14	25	22	20	60	40	17	22	18	19	16	15	13	15	13	12	12	13	12	12	60
3-Feb	13	14	13	13	14	13	13	18	21	36	58	99	28	18	23	23	28	28	32	36	32	28	30	32	99
4-Feb	13	11	13	12	12	11	13	12	13	12	14	17	26	14	30	30	17	18	12	13	19	13	28	19	30
5-Feb	13	42	53	34	51	33	20	36	55	68	55	81	22	70	52	66	45	41	15	14	54	65	13	31	81
6-Feb	32	28	40	39	38	34	36	80	83	31	31	23	23	74	52	54	24	16	18	38	37	43	16	26	83
7-Feb	24	28	16	50	39	27	28	36	40	33	51	47	39	36	31	29	35	48	51	68	32	44	15	12	68
8-Feb	12	23	59	49	62	76	25	38	32	94	11	10	15	12	15	16	33	29	33	57	81	40	77	69	94
9-Feb	35	38	18	15	11	14	14	16	10	11	13	12	13	14	13	12	67	16	19	78	33	74	69	48	78
10-Feb	70	17	13	14	14	15	14	13	14	13	14	12	14	13	14	13	14	15	15	15	14	16	25	30	70
11-Feb	21	52	81	12	14	17	16	32	15	41	21	15	16	14	16	62	57	43	25	22	24	22	32	47	81
12-Feb	38	41	47	29	48	36	30	28	27	17	17	31	40	41	21	26	16	10	19	16	49	84	40	65	84
13-Feb	21	38	36	87	27	46	35	40	18	17	16	18	17	19	18	16	18	17	15	30	21	18	19	20	87
14-Feb	16	17	17	28	16	12	33	24	26	27	31	34	26	32	30	27	19	19	36	19	30	36	48	24	48
15-Feb	94	79	42	31	85	18	81	31	35	43	81	23	11	18	32	14	15	23	24	UO	UO	70	72	24	94
16-Feb	35	39	52	45	43	35	75	63	53	57	31	43	38	24	18	20	64	15	16	22	31	19	21	14	75
17-Feb	47	19	24	29	70	59	45	30	30	28	25	24	26	25	23	22	16	15	20	20	12	14	11	13	70
18-Feb	15	70	67	15	17	74	30	71	19	47	22	45	36	33	27	34	18	14	15	55	65	22	80	82	82
19-Feb	71	39	51	41	28	33	39	80	60	59	58	28	68	35	27	15	13	15	8	20	13	12	12	13	80
20-Feb	26	30	40	13	22	41	45	24	55	71	22	66	30	27	30	22	20	20	23	15	25	22	25	13	71
21-Feb	15	15	15	23	33	75	41	21	17	57	62	47	35	23	23	22	23	22	31	48	15	54	78	17	78
22-Feb	29	30	59	66	56	57	56	29	22	12	17	15	24	70	35	28	28	15	11	24	41	62	69	58	70
23-Feb	30	93	50	52	54	63	41	30	80	31	11	12	44	83	17	11	13	12	62	20	52	92	83	81	93
24-Feb	37	15	13	28	16	14	17	15	13	11	12	12	19	20	16	16	16	16	19	16	15	15	14	14	37
25-Feb	14	18	15	10	12	15	30	34	15	68	43	46	56	29	13	12	11	10	18	50	73	80	62	60	80
26-Feb	21	14	61	36	25	70	16	16	41	19	21	15	15	16	15	15	14	13	16	27	18	18	17	14	70
27-Feb	12	12	12	14	14	14	13	16	16	16	17	17	17	23	20	22	23	20	17	15	16	14	15	10	23
28-Feb	11	21	26	15	31	23	20	91	74	36	28	51	33	19	19	52	23	19	91	75	56	80	43	55	91
94 93 81 87 85 76 81 91 83 94 81 99 68 83 52 66 67 48 91 86 87 92 83 82																								Diurnal Maximum	
UO - Unstable Operation																									



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS02 MILDRED LAKE FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS02)  
FEBRUARY 2023

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	641	31	31	100	53.8	0	9.5	0
H2S (ppb) Average	639	33	33	100	9.4	0	2.8	0
THC (ppm) Average	641	31	31	100	4.3	-	3.1	-
NMHC(ppm) Average	641	31	31	100	0.303	-	0.151	-
CH4(ppm) Average	641	31	31	100	4	-	2.9	-
Temperature (C) Average	672	0	0	100	3.9	-	-0.6	-
Relative Humidity (%) Average	672	0	0	100	94.9	-	86.8	-
Wind Speed 10 m (km/h) Average	666	0	6	99.11	24	-	16	-
Wind Direction 10 m (deg) Average	666	0	6	99.11	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS02)  
FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	641	2.56	5.8	-	0	0.1	0.2	0.6	1.9	6.7	53.8
H2S (ppb) Average	639	0.59	0.9	-	0	0.1	0.2	0.3	0.6	1.5	9.4
THC (ppm) Average	641	2.26	0.3	-	2	2	2	2.1	2.4	2.6	4.3
NMHC(ppm) Average	641	0.045	0.058	-	0	0	0	0	0.1	0.1	0.303
CH4(ppm) Average	641	2.21	0.3	-	2	2	2	2.1	2.3	2.5	4
Temperature 2 m (C) Average	672	-15.58	9	-	-34.9	-28.2	-22.3	-15.7	-9.1	-3.3	3.9
Relative Humidity (%) Average	672	76.02	9.4	-	46	64.2	71.6	77	81.9	88.1	94.9
Wind Speed 10 m (km/h) Average	666	7.6	5	-	0	3	4	7	10	14	24
Wind Direction 10 m (deg) Average	666	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS02)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction	01 Feb 2023 03:00	01 Feb 2023 03:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	08 Feb 2023 13:00	08 Feb 2023 13:00	1	Maintenance - tower brought down
Wind Speed, Wind Direction	09 Feb 2023 20:00	09 Feb 2023 21:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	15 Feb 2023 00:00	15 Feb 2023 00:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	23 Feb 2023 09:00	23 Feb 2023 09:00	1	Flat line in sensor output signal



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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Mildred Lake - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0		Hours in Service: 672	
Maximum Value: 53.8 ppb on Feb 23 17:00		Maximum Daily Average: 9.5 ppb on Feb 23	
Minimum Value: 0.0 ppb on Feb 1 13:00		Hours of Data: 641	
Maximum Diurnal Average: 6.9 ppb at hour 17		Hours of Missing Data: 31	
Monthly Average: 2.56 ppb		Hours of Calibration: 31	
Minimum Daily Average: 0.0 ppb on Feb 14		Percent Operational Time: 100.0	
Minimum Diurnal Average: 1.1 ppb at hour 8		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.2 Median = 0.6 Q <sub>3</sub> = 1.9 P <sub>90</sub> = 6.7 P <sub>99</sub> = 25.5	

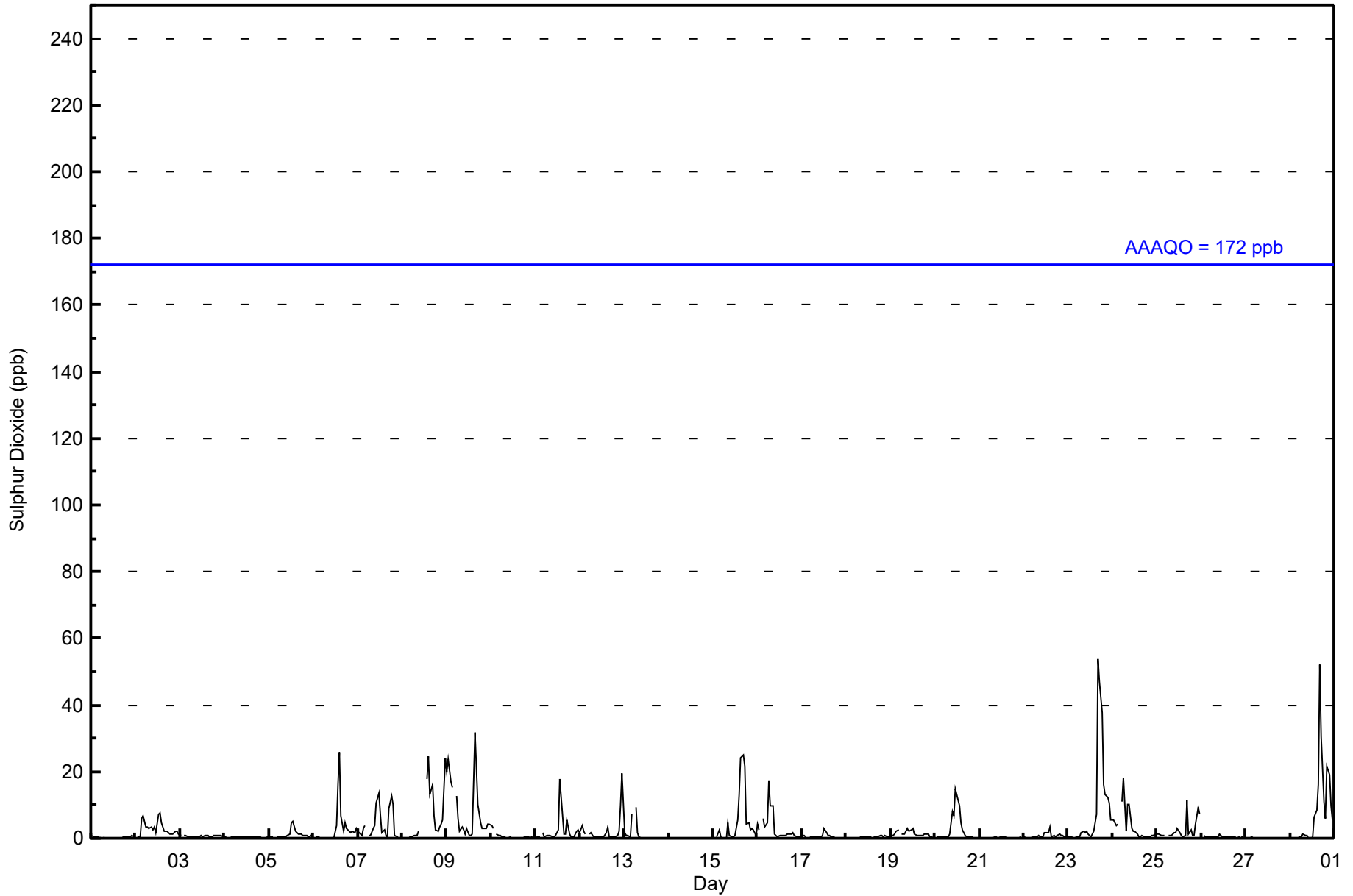
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Feb	0.8	0.4	0.3	0.3	0.2	Z	0.3	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.1	0.2	0.5	0.6	0.3	0.4	0.4	0.7	0.3	0.3	0.8	
2-Feb	Z	0.4	0.2	6.0	6.6	3.5	3.4	2.8	3.2	2.6	3.2	1.8	7.3	7.6	4.8	2.0	2.0	1.9	1.1	1.2	1.2	1.9	2.3	1.3	3.0	7.6
3-Feb	1.0	Z	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.5	0.5	1.0	0.6	0.8	0.9	0.7	0.6	0.4	0.7	0.7	0.7	0.7	0.6	0.6	1.0	
4-Feb	0.5	0.5	Z	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.5	
5-Feb	0.3	0.2	0.3	Z	0.4	0.3	0.4	0.3	0.4	0.6	0.7	1.4	4.7	5.3	2.2	1.6	1.3	1.2	0.8	0.7	0.8	0.5	0.6	0.7	1.1	5.3
6-Feb	0.1	0.0	0.3	0.4	Z	0.1	0.1	0.0	0.0	0.0	0.1	0.0	3.9	16.2	25.7	6.9	2.1	4.8	2.9	2.1	1.8	1.9	1.7	3.0	3.2	25.7
7-Feb	2.2	1.2	0.8	2.9	3.9	Z	0.7	0.9	3.0	3.9	10.5	13.4	7.3	1.7	2.4	0.8	0.5	9.0	12.6	10.1	0.7	0.3	0.1	0.0	3.9	13.4
8-Feb	Z	0.0	0.1	0.1	0.2	0.4	0.7	0.9	0.9	2.1	C	C	C	17.7	24.6	13.0	16.0	6.7	2.7	2.2	3.4	4.2	5.6	24.2	6.3	24.6
9-Feb	19.8	23.8	16.9	15.1	Z	12.8	5.8	1.9	3.3	2.5	1.3	3.2	1.0	0.7	1.4	31.6	21.2	10.2	4.8	2.9	2.8	3.1	4.2	4.2	8.5	31.6
10-Feb	3.7	2.9	Z	1.4	0.9	0.8	0.6	0.3	0.2	0.1	0.2	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	0.6	3.7
11-Feb	0.2	0.2	0.2	Z	1.7	0.5	0.8	0.8	1.0	0.6	0.5	0.7	2.4	17.8	12.2	1.4	1.1	5.3	1.1	0.5	0.3	0.3	1.9	2.7	2.4	17.8
12-Feb	1.8	3.9	2.2	1.1	Z	1.1	1.8	0.5	0.2	0.2	0.3	0.2	0.3	0.6	1.8	3.4	0.4	0.2	0.3	0.6	0.7	2.2	9.7	19.6	2.3	19.6
13-Feb	1.7	1.0	0.8	0.6	7.1	Z	9.3	1.8	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	1.0	9.3
14-Feb	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	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
15-Feb	0.1	Z	0.3	2.4	0.3	0.2	0.2	0.2	4.5	0.9	0.5	0.5	0.7	5.7	13.2	24.3	25.2	21.5	4.2	4.6	2.3	3.0	2.5	0.9	5.1	25.2
16-Feb	4.2	2.5	Z	6.0	3.2	4.5	17.5	9.6	9.9	1.1	1.0	0.6	0.9	0.9	1.0	0.8	1.1	1.4	1.1	1.9	0.7	0.5	0.5	0.6	3.1	17.5
17-Feb	0.7	0.7	0.6	Z	0.5	0.4	0.5	0.4	0.4	0.4	0.4	1.0	3.0	1.7	0.7	0.7	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.6	3.0
18-Feb	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.1	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.6	0.6	0.4	0.9	0.9	0.6	0.8	0.6	0.4	0.4	0.9
19-Feb	0.9	1.0	1.3	2.3	2.6	Z	1.1	1.5	2.3	3.1	2.3	2.6	3.0	1.1	0.9	0.9	0.7	0.8	1.1	1.1	1.1	0.5	0.4	0.4	1.4	3.1
20-Feb	Z	0.4	0.4	0.3	0.3	0.4	0.3	0.3	1.1	8.1	6.6	14.7	11.6	9.9	4.6	2.5	0.7	0.6	0.3	0.3	0.3	0.2	0.2	0.1	2.8	14.7
21-Feb	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.3	0.3	0.2	0.3	0.5	0.4	0.2	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.3	0.2	0.2	0.5
22-Feb	0.4	0.2	Z	0.1	0.2	0.5	0.4	0.5	0.7	0.4	0.5	1.9	1.8	1.6	3.4	0.4	0.9	0.4	0.6	1.2	1.0	0.8	0.6	0.3	0.8	3.4
23-Feb	0.3	0.5	0.6	Z	0.5	0.5	0.4	1.5	2.0	1.9	2.1	1.4	0.6	1.1	2.1	7.3	53.8	47.0	37.9	16.0	12.9	12.1	10.7	5.3	9.5	53.8
24-Feb	5.3	4.7	3.8	4.2	Z	11.0	18.0	2.1	10.3	10.3	2.8	2.0	1.9	1.1	0.6	0.5	0.8	0.6	0.5	0.5	0.6	0.9	1.0	1.2	3.7	18.0
25-Feb	1.2	1.1	0.9	0.8	0.7	Z	0.8	1.0	1.0	1.8	1.6	3.2	1.8	0.8	0.4	0.7	11.5	1.5	2.7	0.9	0.8	4.2	9.1	7.3	2.4	11.5
26-Feb	Z	0.7	0.4	0.4	0.3	0.5	0.3	0.2	0.3	0.4	1.2	0.6	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.4	1.2
27-Feb	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	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	0.1	0.2
28-Feb	0.0	0.0	Z	0.1	0.2	0.2	0.6	1.1	0.7	0.7	0.2	0.2	0.4	6.2	8.5	16.3	52.1	30.5	10.9	6.1	21.5	18.9	9.8	5.5	8.3	52.1
2.0 1.9 1.4 1.9 1.4 1.7 2.3 1.1 1.7 1.6 1.4 1.9 2.1 3.6 4.0 4.2 6.9 5.2 3.2 2.0 2.0 2.1 2.3 2.8																								Diurnal Average		
19.8 23.8 16.9 15.1 7.1 12.8 18.0 9.6 10.3 10.3 10.5 14.7 11.6 17.8 25.7 31.6 53.8 47.0 37.9 16.0 21.5 18.9 10.7 24.2																								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**  
**Mildred Lake - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Mildred Lake - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	599	93.45	93.45
11 - 20	27	4.21	97.66
21 - 60	15	2.34	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: 641

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Mildred Lake - February 2023**

<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	137	61	16	8	6	16	41	57	59	30	7	18	26	19	27	66	594
11 - 20	0	0	0	0	0	2	9	5	3	6	0	1	1	0	0	0	27
21 - 60	0	0	0	0	0	3	9	0	0	1	0	1	0	0	1	0	15
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>137</b>	<b>61</b>	<b>16</b>	<b>8</b>	<b>6</b>	<b>21</b>	<b>59</b>	<b>62</b>	<b>62</b>	<b>37</b>	<b>7</b>	<b>20</b>	<b>27</b>	<b>19</b>	<b>28</b>	<b>66</b>	<b>636</b>

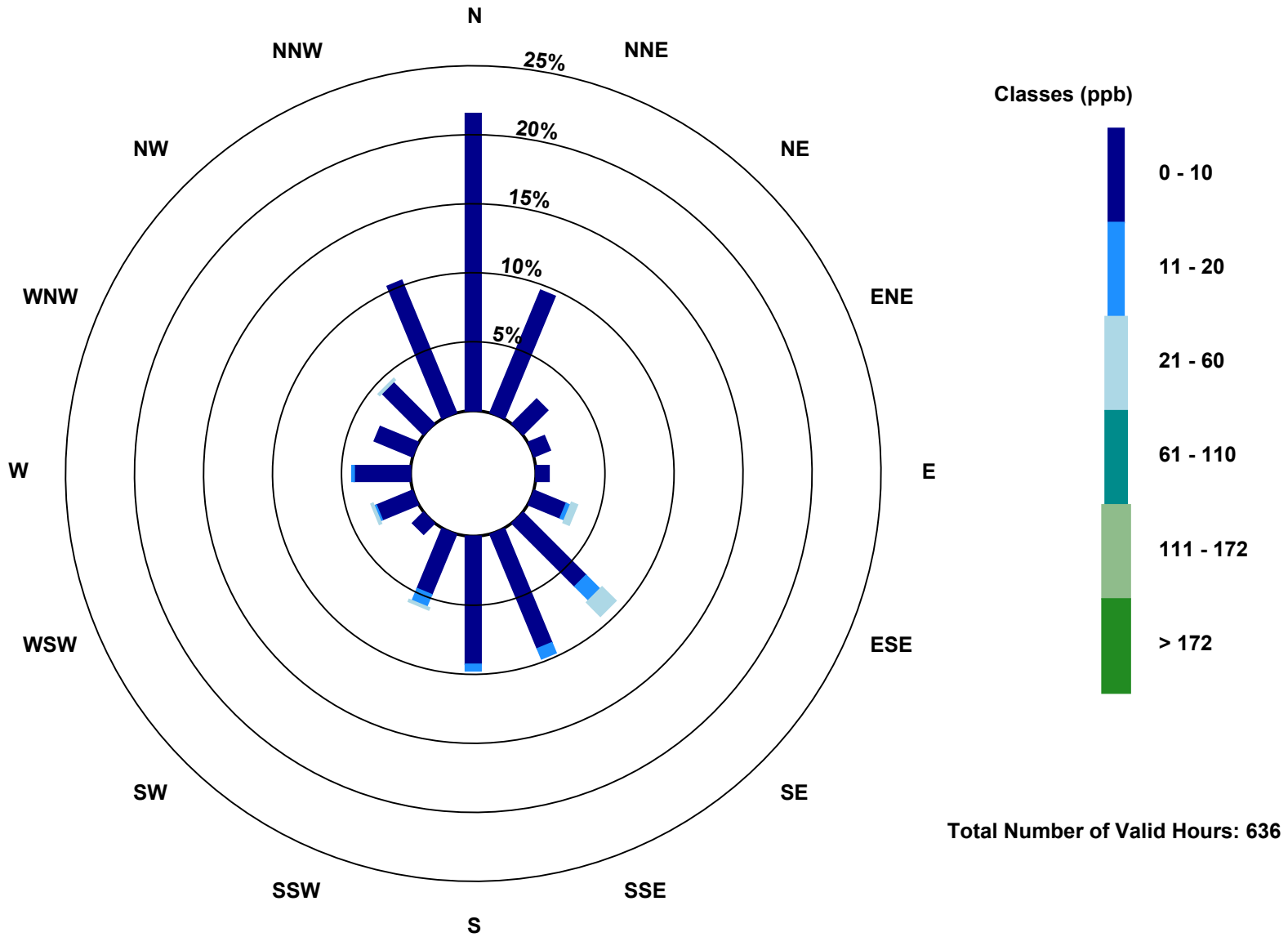
Total Number of Valid Hours: 636

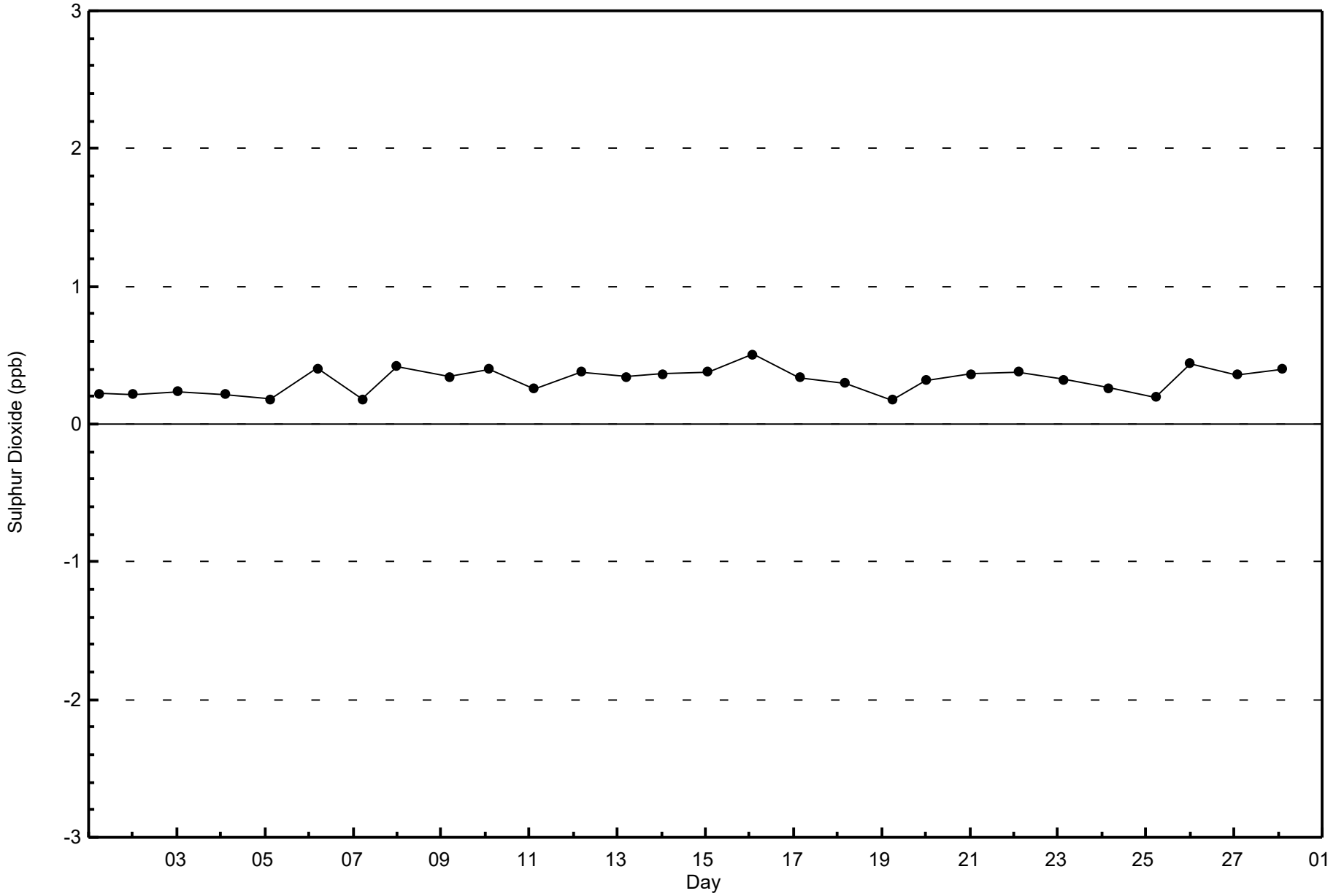
Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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

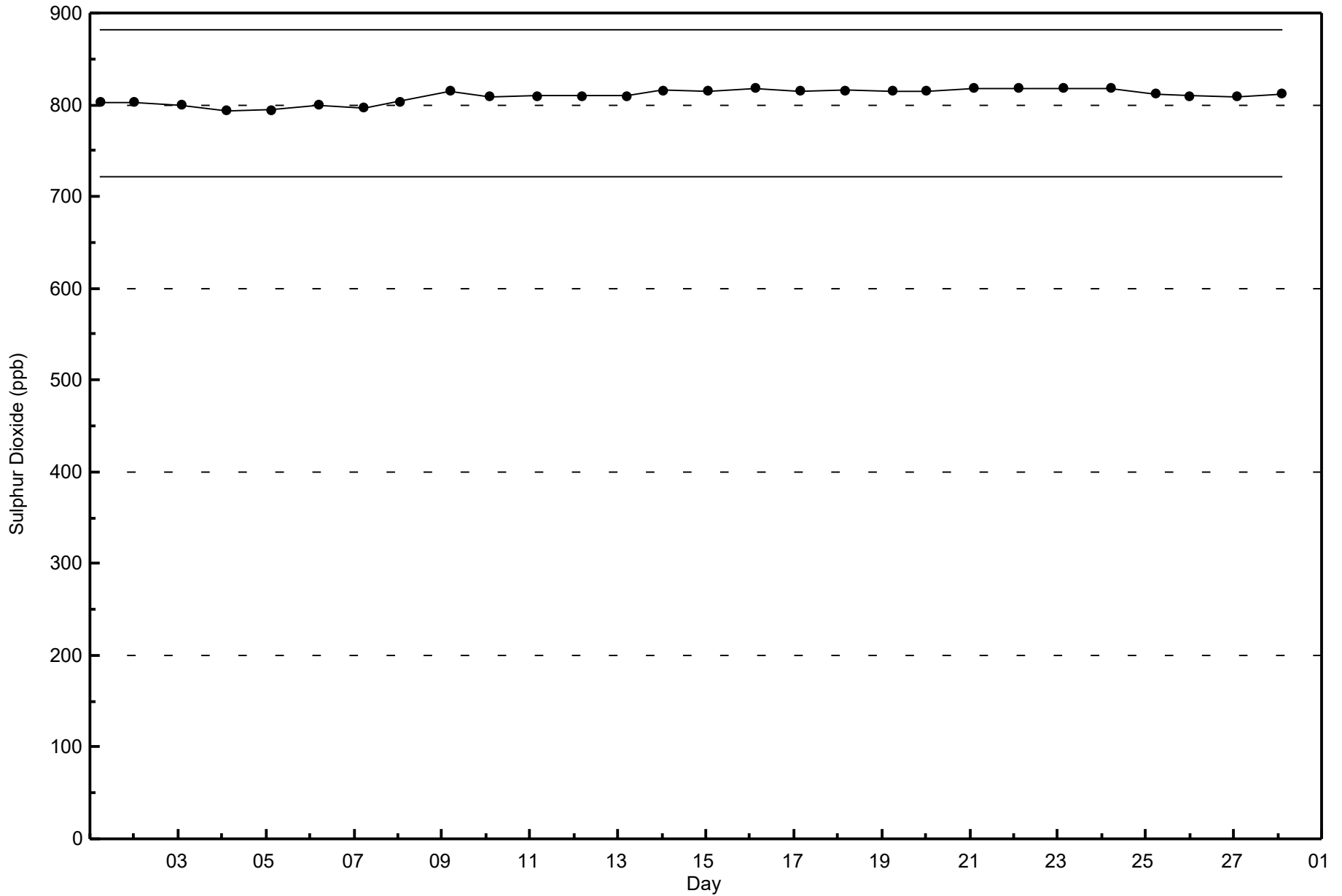






**Wood Buffalo Environmental Association**  
**Span Responses**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Mildred Lake - February 2023**





# Wood Buffalo Environmental Association

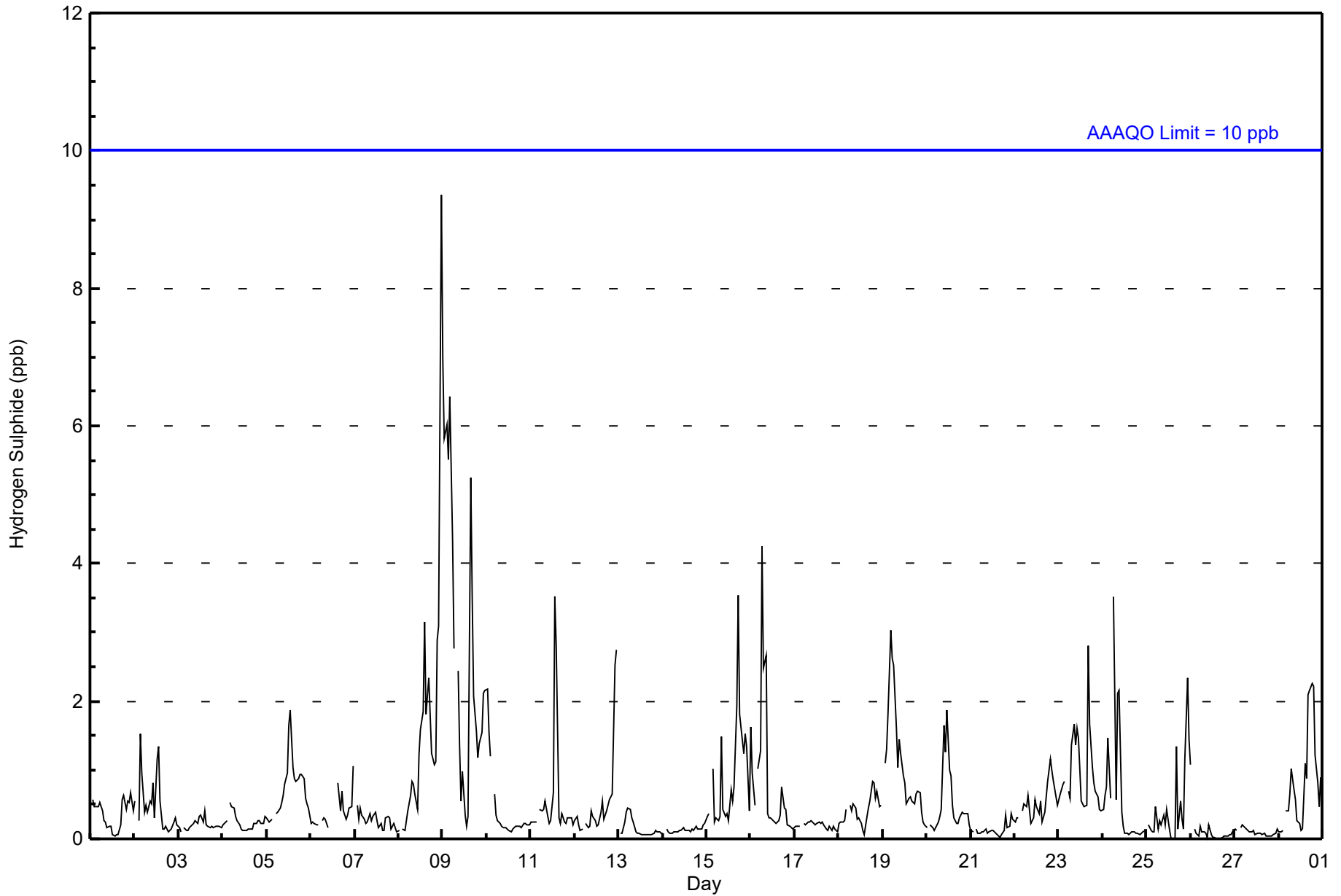
## Summary of Hour Averages

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

## Mildred Lake - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																			
Maximum Value: 9.4 ppb on Feb 9 00:00		Maximum Daily Average: 2.8 ppb on Feb 9		Minimum Daily Average: 0.1 ppb on Feb 27		Hours of Data:		639																			
Minimum Value: 0.0 ppb on Feb 25 15:00		Minimum Diurnal Average: 0.8 ppb at hour 24		Minimum Diurnal Average: 0.4 ppb at hour 13		Hours of Missing Data:		33																			
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 = 0.3 Q <sub>3</sub> = 0.6 P <sub>90</sub> = 1.5 P <sub>99</sub> = 4.9		Hours of Calibration:		Percent Operational Time:		33																			
								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-Feb	Z	0.6	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.0	0.1	0.1	0.2	0.6	0.6	0.4	0.6	0.5	0.7	0.4	0.4	0.7	
2-Feb	0.5	Z	0.3	1.5	1.0	0.4	0.5	0.4	0.6	0.5	0.8	0.3	1.2	1.3	0.5	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.3	0.2	0.5	1.5	
3-Feb	0.2	0.1	Z	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.3	0.4	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	
4-Feb	0.2	0.2	0.3	Z	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.5	
5-Feb	0.3	0.2	0.3	0.3	Z	0.4	0.4	0.4	0.4	0.5	0.6	0.8	0.9	1.7	1.9	1.0	0.9	0.8	0.9	0.9	0.9	0.9	0.6	0.5	0.4	0.7	
6-Feb	0.2	0.2	0.2	0.2	0.2	Z	0.3	0.3	0.3	0.2	C	C	C	C	C	0.8	0.4	0.7	0.4	0.3	0.3	0.4	0.5	1.0	0.4	1.0	
7-Feb	Z	0.5	0.3	0.4	0.4	0.3	0.2	0.2	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.1	0.1	0.3	0.3	0.3	0.1	0.2	0.2	0.1	0.3	0.5	
8-Feb	0.1	Z	0.1	0.1	0.3	0.4	0.6	0.8	0.8	0.6	0.4	1.2	1.6	1.8	3.2	1.8	2.3	1.8	1.2	1.1	1.1	2.9	3.1	9.4	1.6	9.4	
9-Feb	7.0	5.8	6.0	5.5	6.4	4.3	2.8	Z	2.4	1.3	0.5	1.0	0.3	0.2	0.3	5.2	3.5	2.1	1.6	1.2	1.4	1.5	2.1	2.2	2.8	7.0	
10-Feb	2.2	1.5	1.2	Z	0.6	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	2.2	
11-Feb	0.2	0.2	0.2	0.2	Z	0.4	0.4	0.4	0.6	0.3	0.2	0.3	0.7	3.5	2.8	0.3	0.2	0.4	0.2	0.2	0.3	0.3	0.3	0.2	0.6	3.5	
12-Feb	0.3	0.3	0.2	0.1	0.1	Z	0.2	0.2	0.2	0.4	0.3	0.3	0.2	0.2	0.4	0.5	0.3	0.4	0.5	0.6	0.7	1.6	2.5	2.7	0.6	2.7	
13-Feb	Z	0.1	0.1	0.2	0.4	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	0.1	0.1	0.1	0.1	0.1	0.4	
14-Feb	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	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2
15-Feb	0.3	0.4	Z	1.0	0.2	0.3	0.3	0.3	1.5	0.4	0.3	0.4	0.3	0.7	0.5	0.7	1.9	3.5	1.8	1.4	1.2	1.5	1.3	0.4	0.9	3.5	
16-Feb	1.6	1.0	0.5	Z	1.0	1.3	4.2	2.5	2.7	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.8	0.5	0.4	0.2	0.2	0.2	0.1	0.8	4.2	
17-Feb	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.3	
18-Feb	0.2	0.2	0.3	0.3	0.4	Z	0.5	0.4	0.5	0.5	0.3	0.3	0.2	0.1	0.1	0.3	0.5	0.5	0.8	0.8	0.6	0.7	0.5	0.5	0.4	0.8	
19-Feb	Z	1.1	1.3	1.8	3.0	2.6	2.5	1.6	1.0	1.5	1.2	0.9	0.8	0.5	0.6	0.6	0.5	0.5	0.6	0.7	0.7	0.4	0.2	0.2	1.1	3.0	
20-Feb	0.2	Z	0.2	0.2	0.1	0.2	0.2	0.3	0.4	1.7	1.3	1.9	1.0	0.9	0.5	0.3	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.2	0.5	1.9	
21-Feb	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	0.0	0.0	0.1	0.1	0.4	0.2	0.2	0.4	0.3	0.1	0.4	
22-Feb	0.2	0.3	0.3	Z	0.4	0.5	0.5	0.6	0.4	0.2	0.3	0.6	0.5	0.4	0.5	0.2	0.4	0.6	0.8	1.2	1.0	0.9	0.7	0.5	0.5	1.2	
23-Feb	0.6	0.7	0.8	0.8	Z	0.7	0.6	1.4	1.7	1.4	1.6	1.5	0.5	0.5	0.5	2.8	1.7	1.0	0.8	0.7	0.6	0.4	0.4	1.0	2.8		
24-Feb	0.4	0.6	0.8	1.5	0.6	Z	3.5	0.6	2.1	2.2	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	0.6	3.5	
25-Feb	Z	0.2	0.1	0.1	0.1	0.5	0.1	0.3	0.2	0.3	0.2	0.4	0.1	0.0	0.0	0.0	1.3	0.1	0.5	0.3	0.1	1.2	2.3	1.4	0.4	2.3	
26-Feb	1.1	Z	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.0	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	0.1	1.1	
27-Feb	0.1	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	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	
28-Feb	0.1	0.1	0.1	Z	0.4	0.4	0.7	1.0	0.7	0.6	0.3	0.2	0.1	0.1	1.1	0.9	2.1	2.2	2.3	2.2	1.2	0.8	0.5	0.9	0.8	2.3	
		0.7	0.6	0.6	0.7	0.7	0.6	0.7	0.5	0.7	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.7	0.7	0.6	0.5	0.5	0.6	0.7	0.8	Diurnal Average	
		7.0	5.8	6.0	5.5	6.4	4.3	4.2	2.5	2.7	2.2	1.6	1.9	1.7	3.5	3.2	5.2	3.5	3.5	2.3	2.2	1.4	2.9	3.1	9.4	Diurnal Maximum	

Z - zerospan      C - Calibration  
 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  
Mildred Lake - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	614	96.09	96.09
3 - 4	18	2.82	98.90
5 - 7	6	0.94	99.84
8 - 11	1	0.16	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Mildred Lake - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	137	61	15	8	5	18	44	57	57	37	7	21	29	19	27	66	608
3 - 4	0	1	1	0	0	2	9	2	3	0	0	0	0	0	0	0	18
5 - 7	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	6
8 - 11	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	137	62	16	8	5	20	57	62	60	37	7	21	29	19	27	66	633

Total Number of Valid Hours: 633

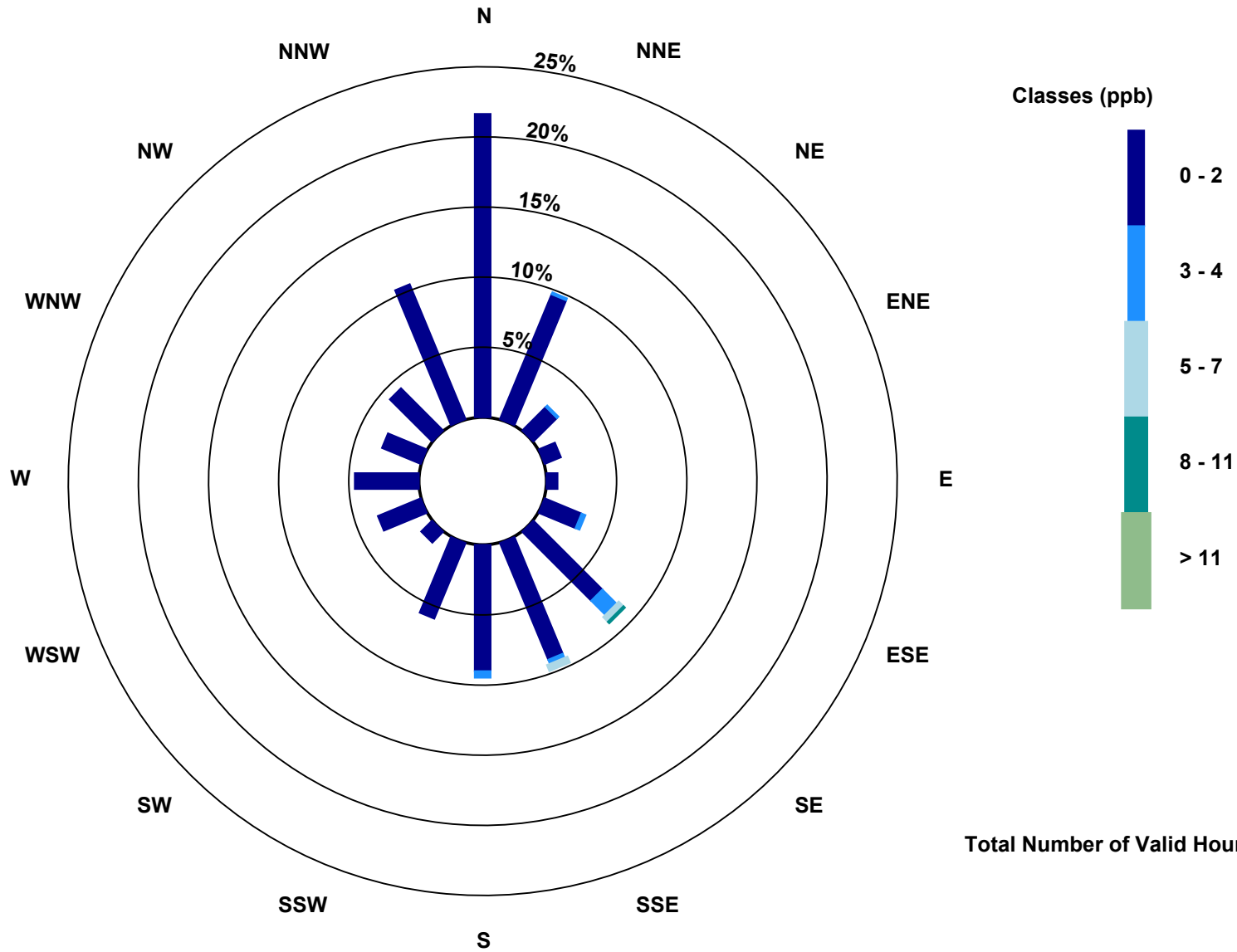
Total Number of Hours: 672



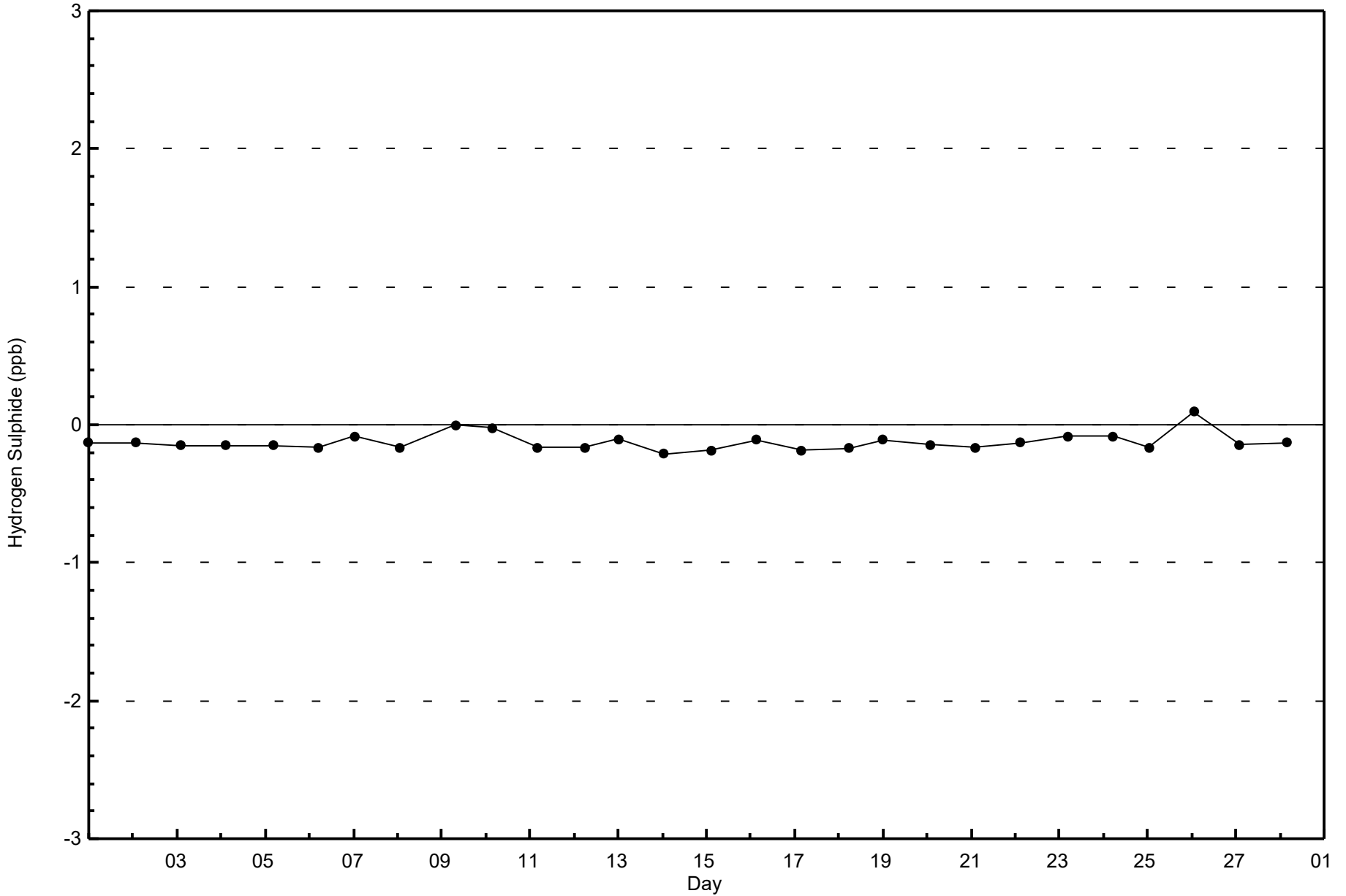


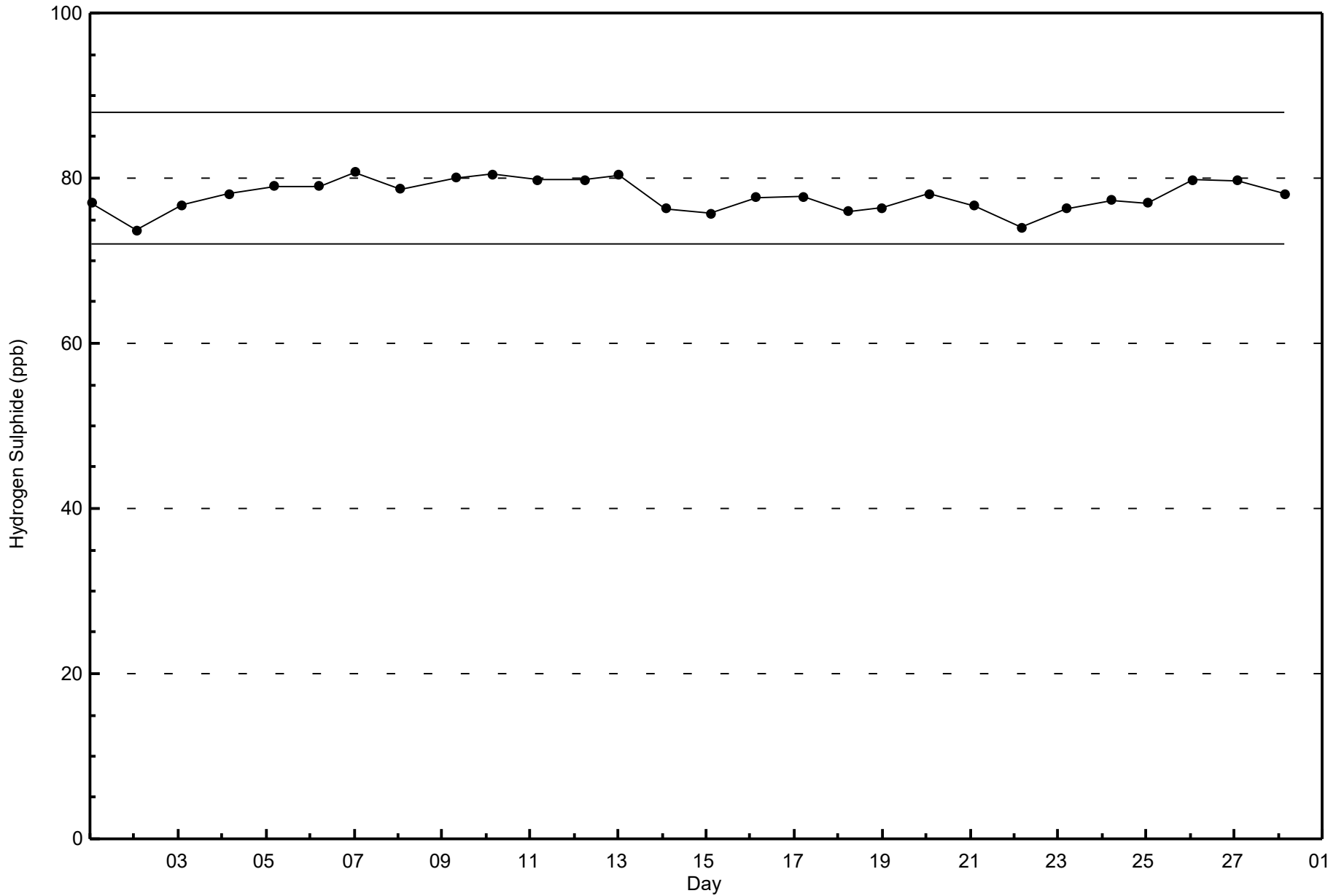
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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



Total Number of Valid Hours: 633







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

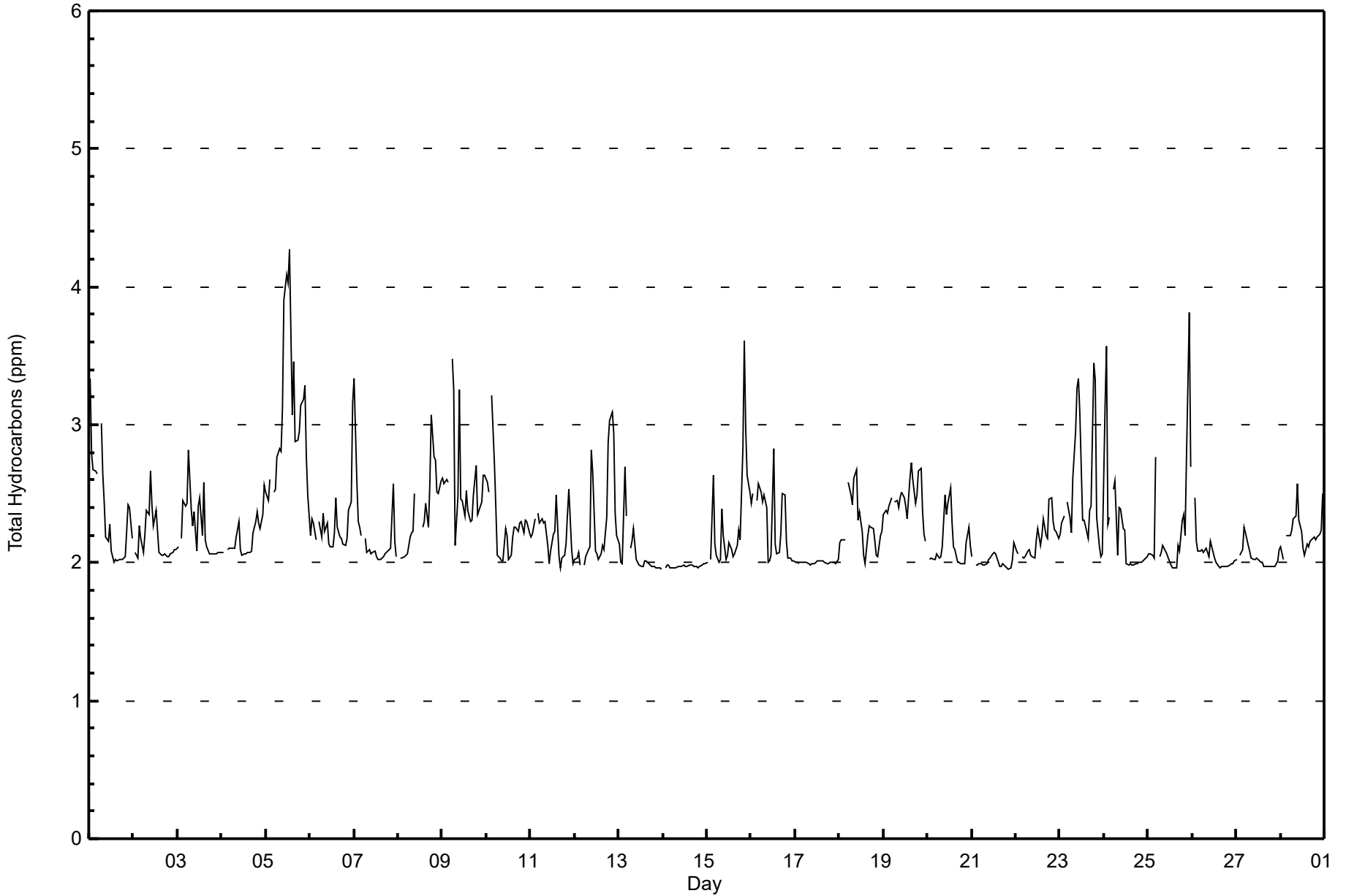
**Total Hydrocarbons (THC) - ppm**  
**Mildred Lake - February 2023**

Maximum Value: 4.3 ppm on Feb 5 14:00		Maximum Daily Average: 3.1 ppm on Feb 5		Hours in Service: 672																																												
Minimum Value: 2.0 ppm on Feb 14 00:00		Minimum Daily Average: 2.0 ppm on Feb 14		Hours of Data: 641																																												
Maximum Diurnal Average: 2.4 ppm at hour 10		Minimum Diurnal Average: 2.2 ppm at hour 17		Hours of Missing Data: 31																																												
Monthly Average: 2.26 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> = 2.4 P <sub>90</sub> = 2.6 P <sub>99</sub> = 3.5		Hours of Calibration: 31																																												
				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-Feb	3.3	2.8	2.7	2.7	2.6	Z	3.0	2.6	2.4	2.2	2.2	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.4	2.4	2.2	2.4	3.3																							
2-Feb	Z	2.1	2.0	2.3	2.2	2.1	2.2	2.4	2.3	2.7	2.4	2.3	2.4	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.7																							
3-Feb	2.1	Z	2.2	2.5	2.4	2.4	2.8	2.4	2.3	2.4	2.1	2.4	2.5	2.2	2.6	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.8																							
4-Feb	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.4	2.3	2.2	2.3	2.6																								
5-Feb	2.5	2.4	2.6	Z	2.5	2.5	2.8	2.8	2.8	3.1	3.9	4.1	4.0	4.3	3.1	3.5	2.9	2.9	3.0	3.1	3.2	3.3	2.8	2.5	4.3																							
6-Feb	2.2	2.3	2.3	2.2	Z	2.3	2.2	2.4	2.2	2.3	2.1	2.1	2.1	2.2	2.5	2.3	2.2	2.2	2.1	2.1	2.2	2.4	2.4	3.2	3.2																							
7-Feb	3.3	2.6	2.3	2.3	2.2	Z	2.2	2.1	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	2.6	2.2	2.0	3.3																							
8-Feb	Z	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.5	C	C	C	2.3	2.3	2.4	2.3	2.6	3.1	2.8	2.7	2.5	2.5	2.6	3.1																							
9-Feb	2.6	2.6	2.6	2.6	Z	3.5	3.2	2.1	2.5	3.3	2.5	2.5	2.3	2.5	2.4	2.3	2.3	2.5	2.7	2.3	2.4	2.4	2.6	2.6	3.5																							
10-Feb	2.6	2.5	Z	3.2	2.7	2.4	2.1	2.0	2.0	2.0	2.2	2.2	2.0	2.1	2.2	2.3	2.3	2.2	2.3	2.3	2.2	2.3	2.3	2.2	3.2																							
11-Feb	2.2	2.2	2.3	Z	2.4	2.3	2.3	2.3	2.3	2.1	2.0	2.1	2.2	2.2	2.5	2.0	2.0	2.0	2.1	2.1	2.3	2.5	2.1	2.0	2.5																							
12-Feb	2.0	2.0	2.1	2.0	Z	2.0	2.0	2.1	2.1	2.8	2.7	2.1	2.1	2.0	2.1	2.1	2.1	2.3	2.9	3.0	3.1	2.9	2.4	2.2	3.1																							
13-Feb	2.1	2.0	2.0	2.7	2.3	Z	2.1	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.7																							
14-Feb	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-Feb	2.0	Z	2.0	2.6	2.1	2.1	2.0	2.0	2.4	2.2	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.2	2.2	2.8	3.6	3.0	2.6	2.5	3.6																							
16-Feb	2.4	2.5	Z	2.5	2.6	2.5	2.4	2.5	2.4	2.0	2.0	2.1	2.8	2.1	2.1	2.1	2.2	2.5	2.5	2.2	2.0	2.0	2.0	2.0	2.8																							
17-Feb	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																							
18-Feb	2.1	2.2	2.2	2.2	Z	2.6	2.5	2.4	2.6	2.7	2.3	2.4	2.2	2.1	2.0	2.2	2.3	2.3	2.2	2.2	2.1	2.0	2.2	2.2	2.7																							
19-Feb	2.3	2.4	2.4	2.4	2.5	Z	2.4	2.4	2.4	2.5	2.5	2.5	2.4	2.3	2.6	2.7	2.6	2.4	2.5	2.7	2.7	2.4	2.2	2.2	2.7																							
20-Feb	Z	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.5	2.3	2.4	2.5	2.3	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.1	2.5																							
21-Feb	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1																							
22-Feb	2.1	2.1	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.2	2.3	2.1	2.2	2.3	2.2	2.2	2.5	2.5	2.3	2.2	2.2	2.2	2.5																							
23-Feb	2.2	2.3	2.3	Z	2.4	2.3	2.2	2.6	2.9	3.3	3.3	3.1	2.3	2.3	2.3	2.2	2.4	2.4	3.5	3.3	2.3	2.1	2.0	2.1	3.5																							
24-Feb	3.1	3.6	2.3	Z	2.5	2.6	2.1	2.4	2.4	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.6																							
25-Feb	2.1	2.1	2.1	2.0	2.8	Z	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.4	2.2	2.8	3.8	2.7	3.8																							
26-Feb	Z	2.5	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5																							
27-Feb	2.0	Z	2.1	2.1	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	2.0	2.0	2.0	2.0	2.1	2.3																							
28-Feb	2.1	2.0	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.6	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	2.6																							
																								2.3	2.3	2.2	2.3	2.3	2.3	2.2	2.3	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	Diurnal Average	
																								3.3	3.6	2.7	3.2	2.8	3.5	3.2	2.8	2.9	3.3	3.9	4.1	4.0	4.3	3.1	3.5	2.9	2.9	3.5	3.3	3.6	3.3	3.8	3.2	Diurnal Maximum
Z - zerospan      C - Calibration																																																



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

**Total Hydrocarbons (THC) - ppm**  
**Mildred Lake - February 2023**





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

**Total Hydrocarbons (THC) - ppm**  
**Mildred Lake - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	196	30.58	30.58
2.1 - 3.0	417	65.05	95.63
3.1 - 10.0	28	4.37	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 641

Total Number of Hours: 672



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

**Total Hydrocarbons (THC) - ppm**  
**Mildred Lake - February 2023**

<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	60	43	9	5	1	1	5	6	23	5	1	7	8	1	5	15	195
2.1 - 3.0	75	18	6	3	5	20	51	48	34	31	3	12	19	16	21	51	413
3.1 - 10.0	2	0	1	0	0	0	3	8	5	1	3	1	0	2	2	0	28
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	137	61	16	8	6	21	59	62	62	37	7	20	27	19	28	66	636

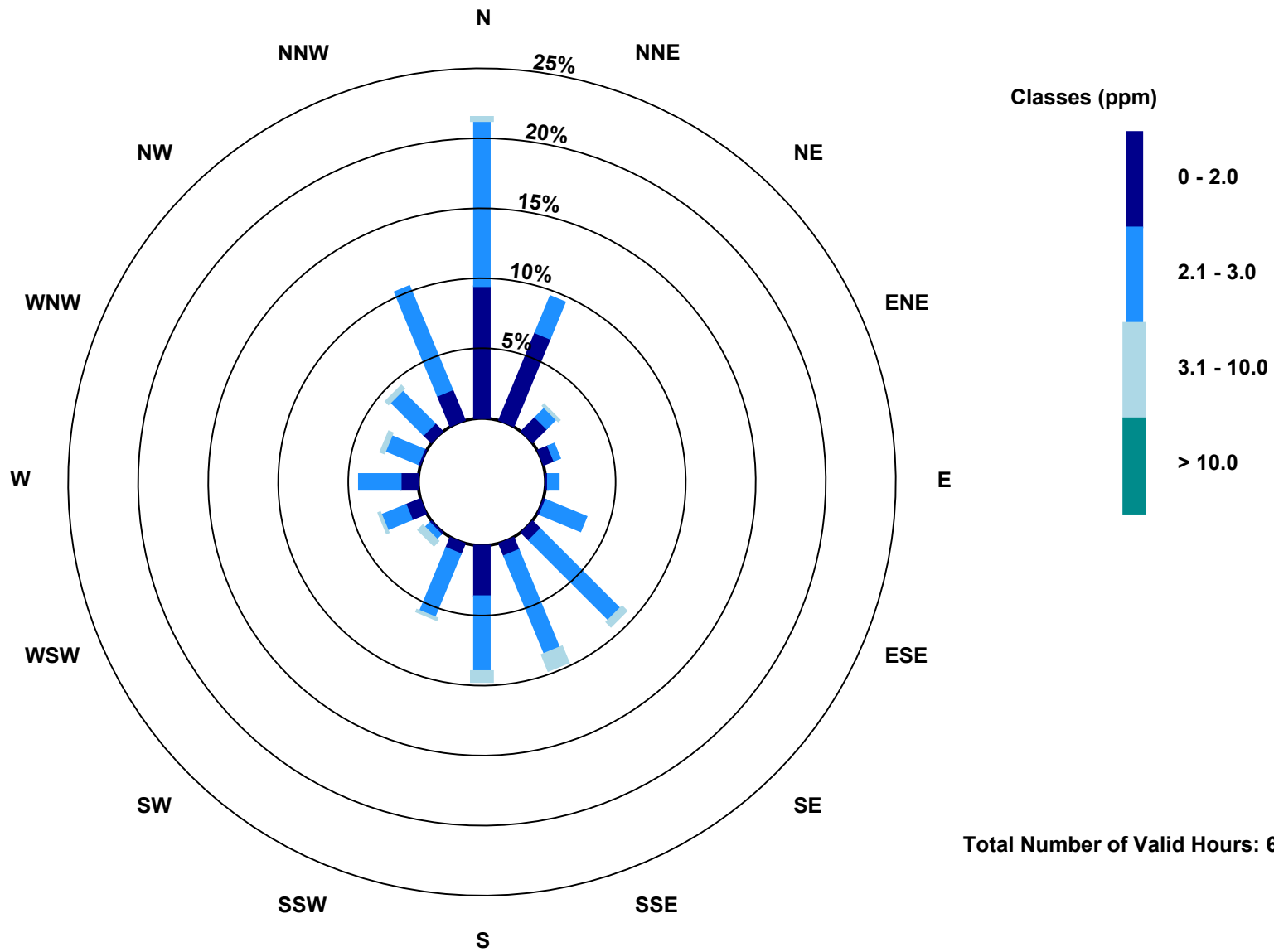
Total Number of Valid Hours: 636

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Hydrocarbons (THC) - ppm  
Mildred Lake

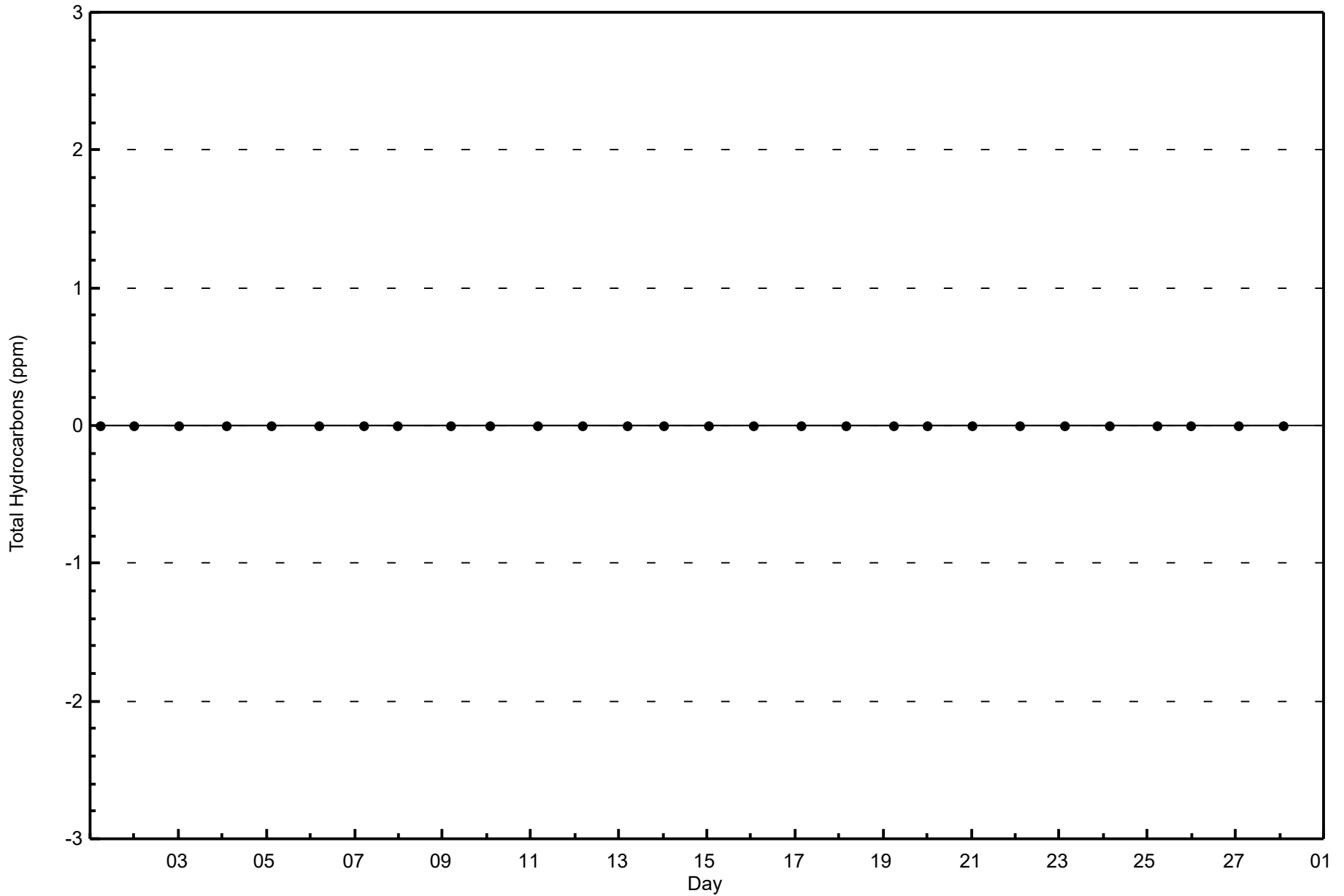


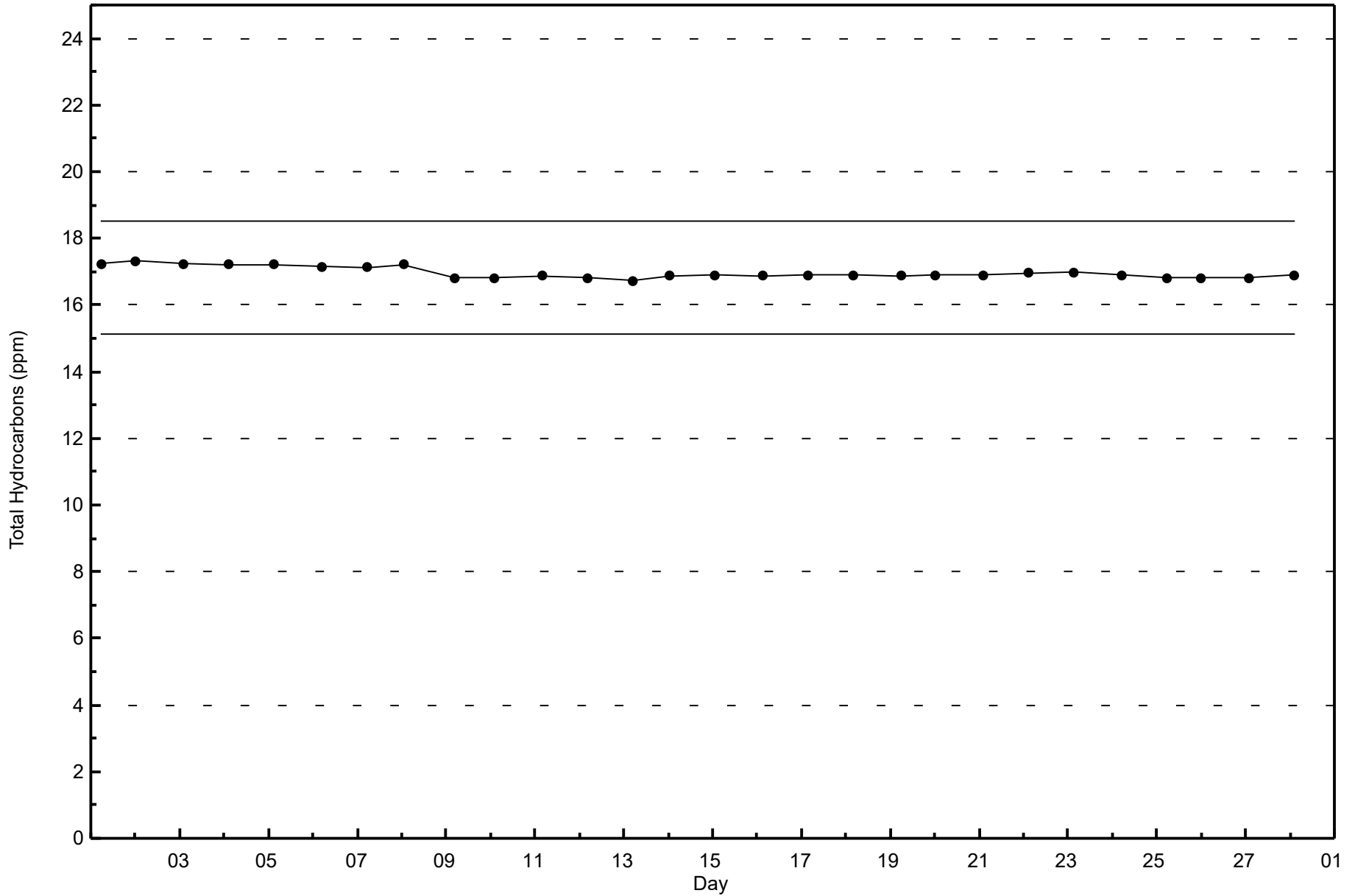




Wood Buffalo Environmental Association  
Zero Responses

Total Hydrocarbons (THC) - ppm  
Mildred Lake - February 2023







**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Non Methane Hydrocarbons (NMHC) - ppm**

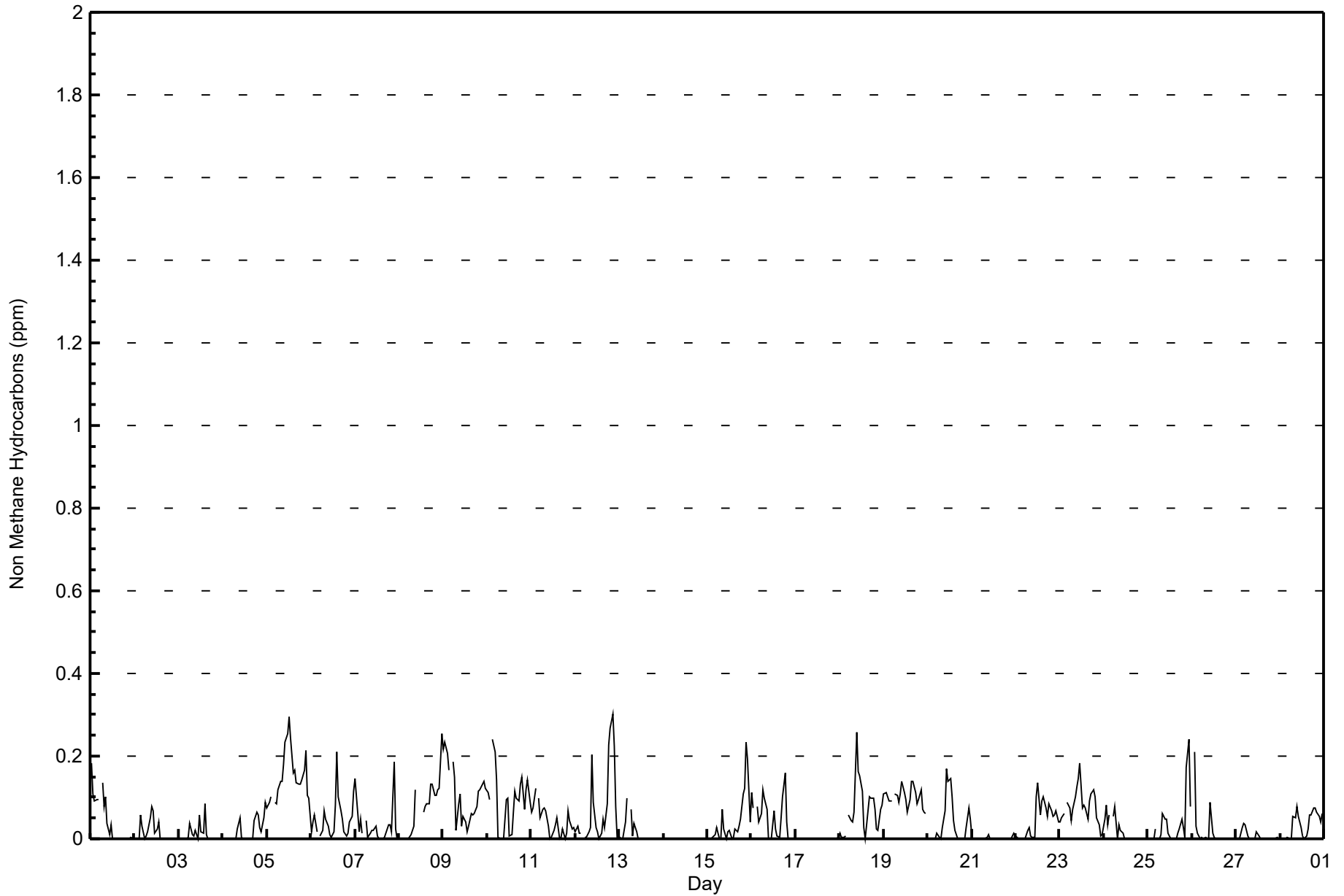
**Mildred Lake - February 2023**

Maximum Value: 0.303 ppm on Feb 12 21:00		Maximum Daily Average: 0.151 ppm on Feb 5		Hours in Service: 672																							
Minimum Value: 0.000 ppm on Feb 1 13:00		Minimum Daily Average: 0.000 ppm on Feb 14		Hours of Data: 641																							
Maximum Diurnal Average: 0.063 ppm at hour 22		Minimum Diurnal Average: 0.031 ppm at hour 14		Hours of Missing Data: 31																							
Monthly Average: 0.045 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		Hours of Calibration: 31																							
				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-Feb	0.185	0.109	0.091	0.096	0.095	Z	0.134	0.078	0.102	0.036	0.011	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.042	0.185	
2-Feb	Z	0.000	0.000	0.057	0.030	0.001	0.008	0.018	0.052	0.078	0.067	0.015	0.024	0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.078	
3-Feb	0.000	Z	0.001	0.001	0.000	0.004	0.037	0.012	0.008	0.019	0.000	0.058	0.016	0.013	0.085	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.085	
4-Feb	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.023	0.052	0.005	0.000	0.000	0.000	0.000	0.001	0.043	0.064	0.058	0.026	0.018	0.052	0.087	0.019	0.087		
5-Feb	0.075	0.088	0.102	Z	0.087	0.086	0.119	0.138	0.139	0.178	0.233	0.253	0.294	0.243	0.158	0.167	0.137	0.134	0.133	0.141	0.166	0.213	0.105	0.097	0.151	0.294	
6-Feb	0.017	0.041	0.057	0.017	Z	0.007	0.022	0.066	0.047	0.032	0.012	0.002	0.018	0.081	0.212	0.103	0.069	0.048	0.018	0.007	0.013	0.041	0.054	0.116	0.048	0.212	
7-Feb	0.147	0.060	0.017	0.046	0.014	Z	0.044	0.004	0.013	0.020	0.021	0.032	0.008	0.000	0.000	0.001	0.002	0.012	0.032	0.033	0.017	0.185	0.025	0.000	0.032	0.185	
8-Feb	Z	0.000	0.000	0.000	0.000	0.000	0.012	0.019	0.029	0.118	C	C	C	0.064	0.079	0.084	0.084	0.133	0.132	0.103	0.104	0.118	0.122	0.253	0.073	0.253	
9-Feb	0.216	0.235	0.206	0.165	Z	0.186	0.149	0.021	0.086	0.107	0.029	0.054	0.042	0.017	0.031	0.060	0.057	0.062	0.077	0.114	0.120	0.133	0.138	0.122	0.106	0.235	
10-Feb	0.112	0.096	Z	0.240	0.211	0.141	0.003	0.000	0.000	0.000	0.094	0.097	0.005	0.011	0.063	0.116	0.100	0.090	0.133	0.149	0.071	0.119	0.141	0.089	0.090	0.240	
11-Feb	0.065	0.076	0.121	Z	0.097	0.052	0.071	0.076	0.069	0.030	0.000	0.002	0.019	0.033	0.049	0.000	0.005	0.025	0.000	0.014	0.069	0.044	0.024	0.028	0.042	0.121	
12-Feb	0.016	0.030	0.014	0.013	Z	0.002	0.005	0.016	0.029	0.204	0.090	0.028	0.019	0.000	0.013	0.047	0.029	0.084	0.227	0.267	0.303	0.224	0.079	0.002	0.076	0.303	
13-Feb	0.002	0.000	0.000	0.039	0.097	Z	0.072	0.006	0.037	0.016	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.097	
14-Feb	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-Feb	0.000	Z	0.000	0.006	0.011	0.027	0.000	0.001	0.072	0.022	0.001	0.018	0.019	0.001	0.005	0.025	0.017	0.031	0.047	0.108	0.123	0.234	0.192	0.042	0.044	0.234	
16-Feb	0.111	0.074	Z	0.079	0.042	0.060	0.120	0.099	0.072	0.000	0.000	0.002	0.067	0.024	0.007	0.003	0.051	0.102	0.159	0.041	0.000	0.000	0.000	0.000	0.048	0.159	
17-Feb	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	0.004	0.000	0.004		
18-Feb	0.014	0.004	0.002	0.005	Z	0.057	0.046	0.042	0.063	0.258	0.164	0.153	0.114	0.029	0.000	0.069	0.101	0.098	0.100	0.070	0.023	0.019	0.072	0.081	0.069	0.258	
19-Feb	0.108	0.110	0.103	0.092	0.092	Z	0.110	0.106	0.089	0.109	0.138	0.112	0.096	0.065	0.097	0.138	0.139	0.111	0.083	0.094	0.119	0.071	0.063	0.061	0.100	0.139	
20-Feb	Z	0.000	0.000	0.000	0.000	0.015	0.002	0.001	0.026	0.067	0.169	0.139	0.147	0.101	0.042	0.019	0.000	0.000	0.000	0.000	0.000	0.027	0.074	0.046	0.038	0.169	
21-Feb	0.011	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.009	0.001	0.001	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.012	0.002	0.012	
22-Feb	0.005	0.002	Z	0.000	0.001	0.000	0.019	0.029	0.006	0.004	0.002	0.102	0.136	0.056	0.092	0.101	0.076	0.055	0.085	0.068	0.053	0.058	0.069	0.039	0.046	0.136	
23-Feb	0.042	0.050	0.061	Z	0.088	0.074	0.045	0.072	0.103	0.126	0.147	0.182	0.073	0.082	0.074	0.049	0.091	0.108	0.118	0.103	0.050	0.035	0.008	0.010	0.078	0.182	
24-Feb	0.049	0.081	0.032	0.057	Z	0.054	0.079	0.001	0.032	0.020	0.013	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	0.018	0.081	
25-Feb	0.000	0.000	0.001	0.000	0.025	Z	0.000	0.012	0.063	0.046	0.048	0.013	0.000	0.000	0.000	0.000	0.014	0.023	0.046	0.028	0.002	0.172	0.241	0.078	0.035	0.241	
26-Feb	Z	0.211	0.031	0.012	0.000	0.002	0.000	0.005	0.001	0.000	0.087	0.014	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.211	
27-Feb	0.000	Z	0.000	0.027	0.037	0.033	0.007	0.001	0.000	0.000	0.000	0.017	0.006	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.006	0.037	
28-Feb	0.001	0.000	Z	0.000	0.004	0.001	0.002	0.053	0.051	0.078	0.056	0.028	0.008	0.000	0.006	0.022	0.057	0.058	0.074	0.074	0.066	0.054	0.042	0.062	0.035	0.078	
		0.051	0.053	0.036	0.040	0.040	0.035	0.039	0.031	0.043	0.058	0.051	0.050	0.041	0.031	0.036	0.036	0.037	0.043	0.055	0.053	0.047	0.063	0.054	0.044	Diurnal Average	
		0.216	0.235	0.206	0.240	0.211	0.186	0.149	0.138	0.139	0.258	0.233	0.253	0.294	0.243	0.212	0.167	0.139	0.134	0.227	0.267	0.303	0.234	0.241	0.253	Diurnal Maximum	
Z - zerspan		C - Calibration																									



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

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Mildred Lake - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Mildred Lake - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	264	41.19	41.19
0.006 - 0.05	165	25.74	66.93
0.06 - 0.1	176	27.46	94.38
> 0.1	36	5.62	100.00

Total Number of Valid Hours: 641

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Mildred Lake - February 2023**

<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	73	53	9	7	2	2	16	14	31	7	1	3	8	1	11	25	263
0.006 - 0.05	25	2	2	1	1	5	16	22	16	15	2	11	15	9	6	17	165
0.06 - 0.1	33	6	4	0	3	10	22	20	13	14	2	5	4	5	9	22	172
> 0.1	6	0	1	0	0	4	5	6	2	1	2	1	0	4	2	2	36
<b>Totals</b>	<b>137</b>	<b>61</b>	<b>16</b>	<b>8</b>	<b>6</b>	<b>21</b>	<b>59</b>	<b>62</b>	<b>62</b>	<b>37</b>	<b>7</b>	<b>20</b>	<b>27</b>	<b>19</b>	<b>28</b>	<b>66</b>	<b>636</b>

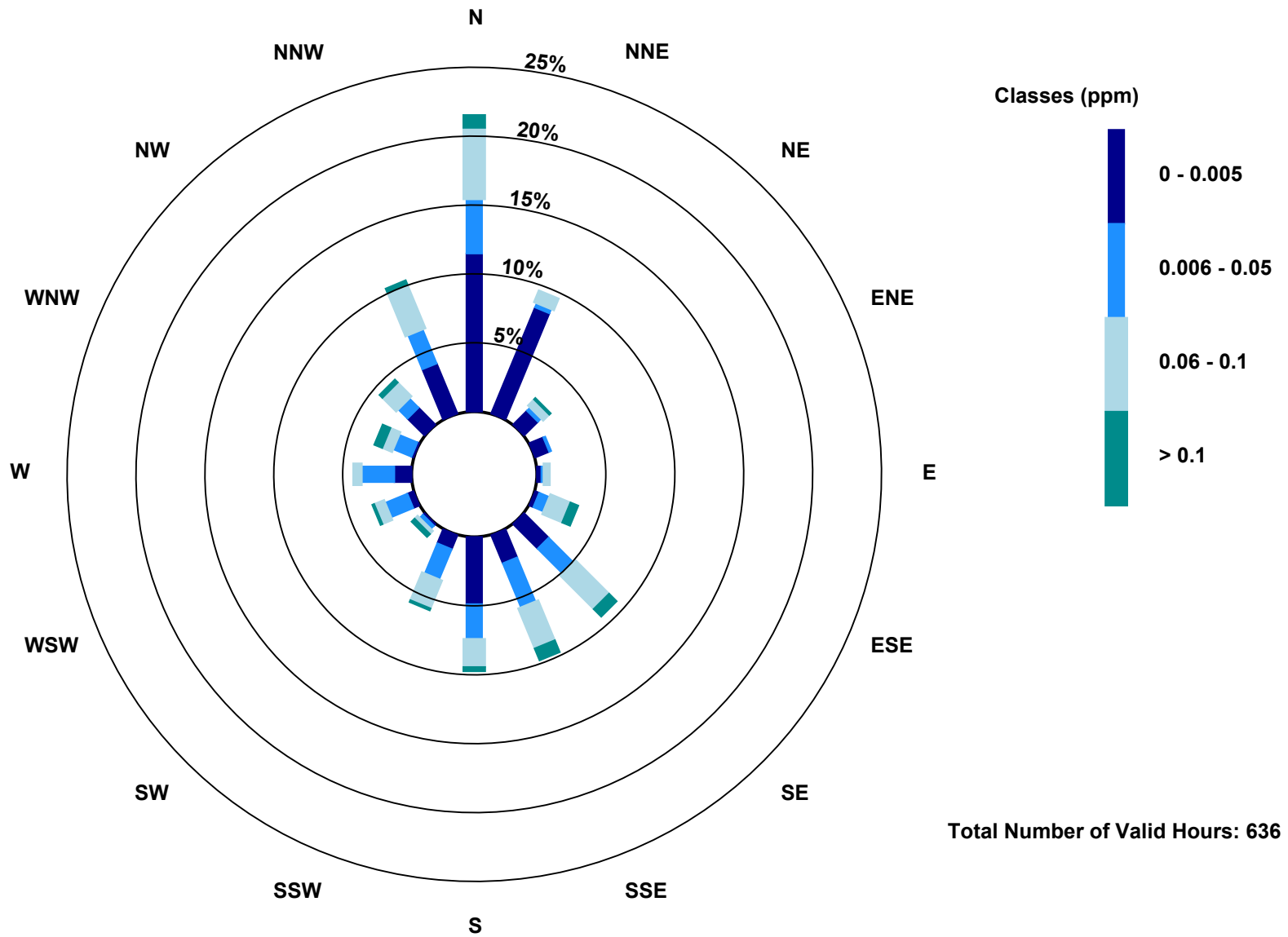
Total Number of Valid Hours: 636

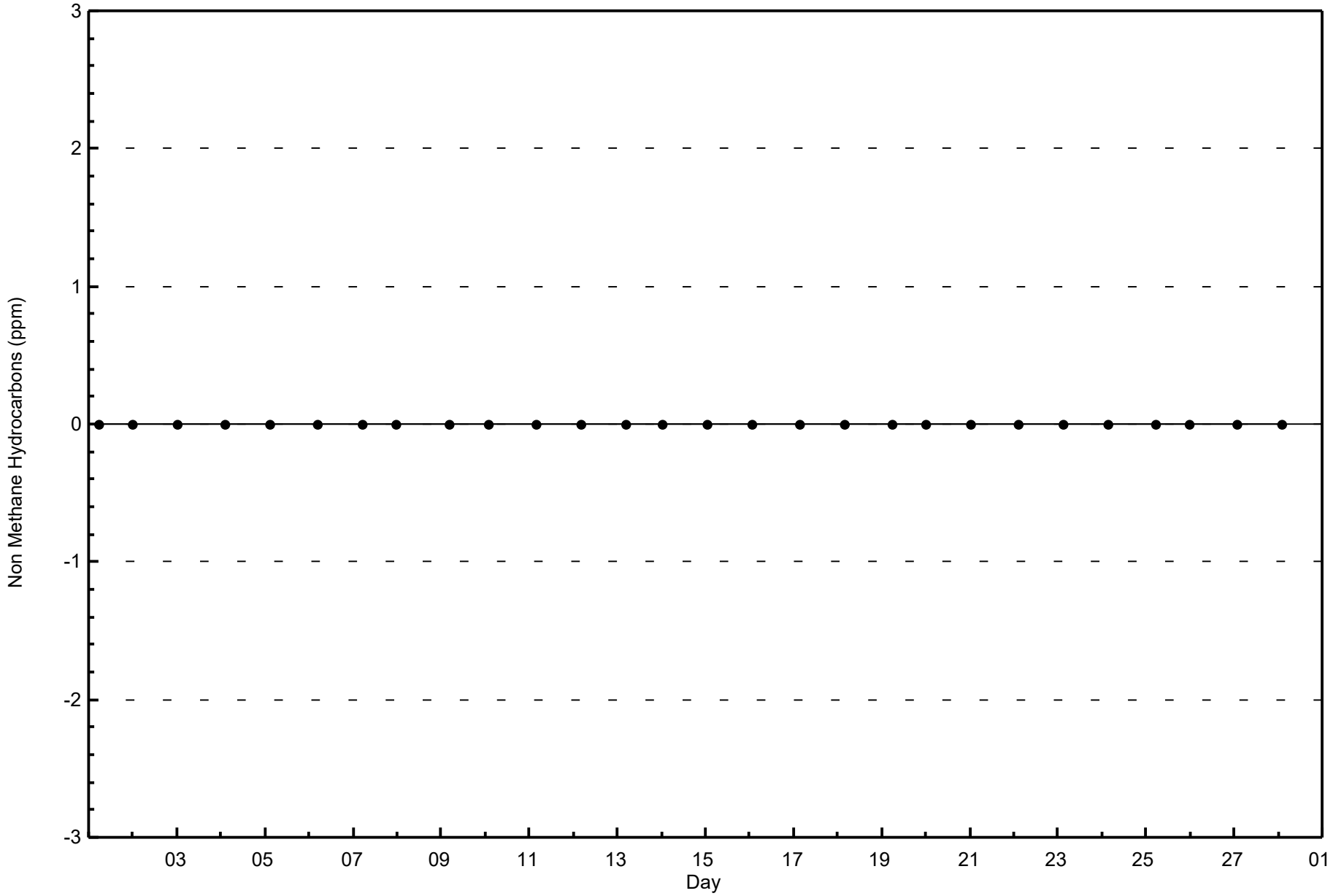
Total Number of Hours: 672



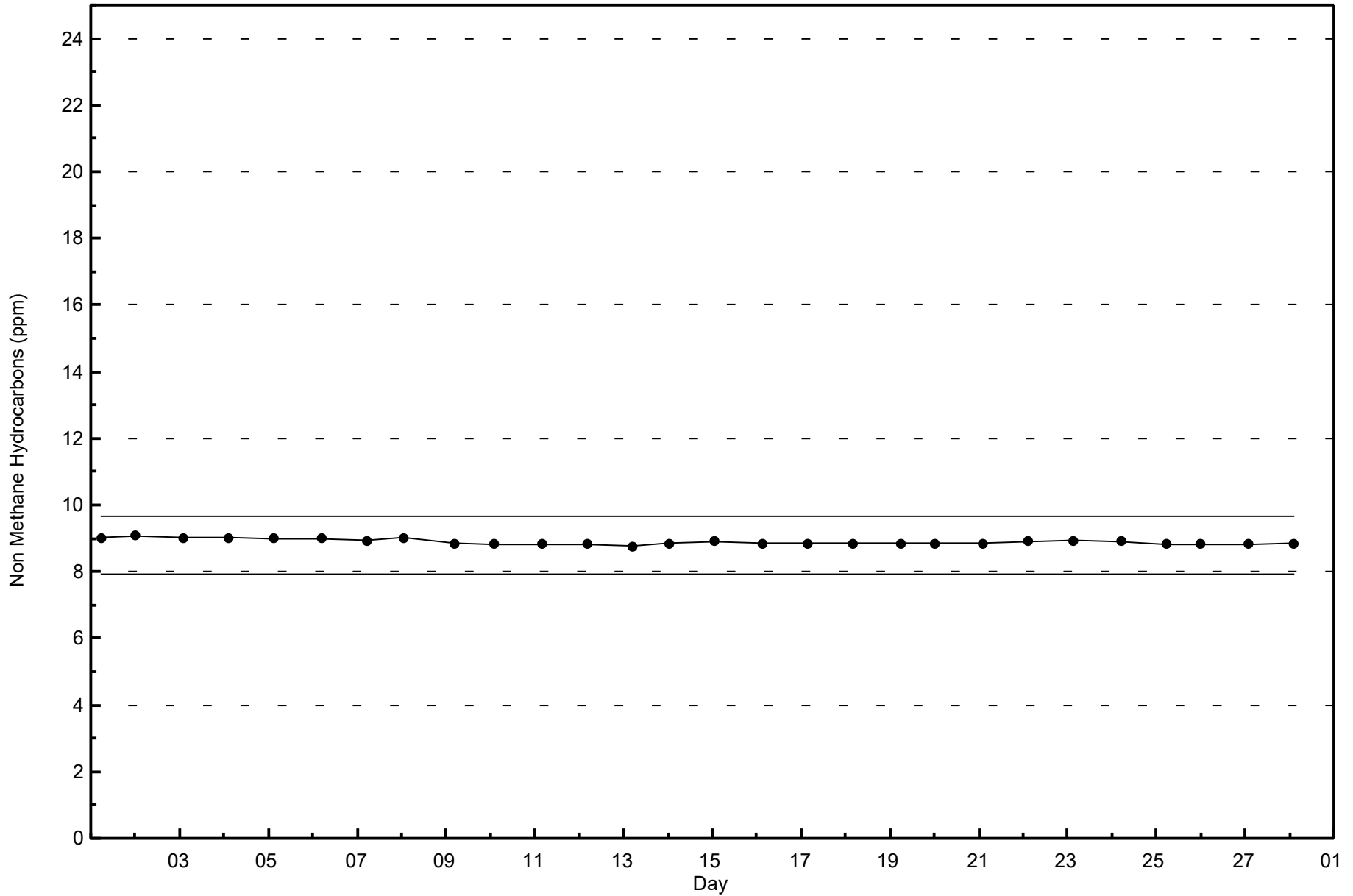
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Non Methane Hydrocarbons (NMHC) - ppm  
Mildred Lake









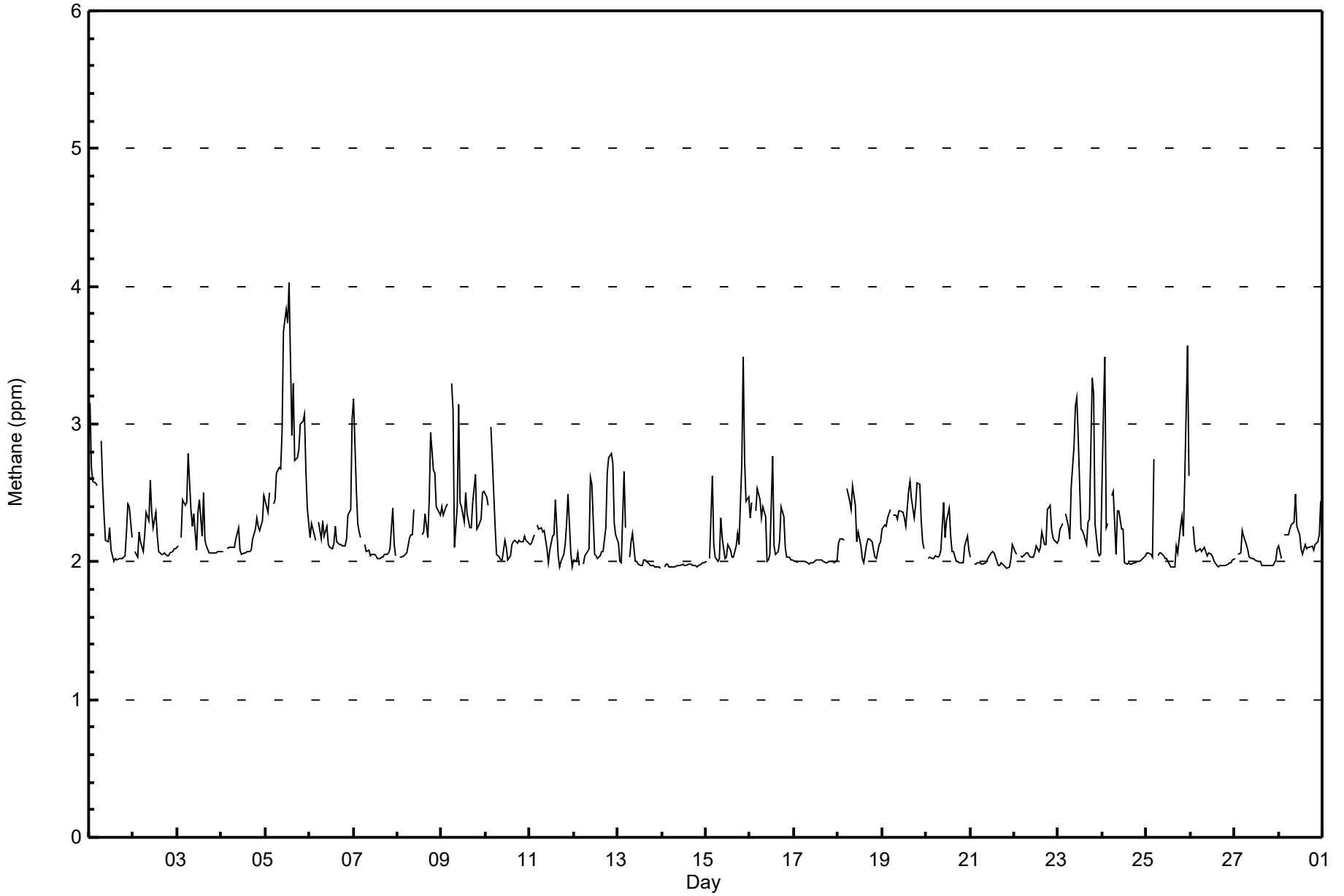


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	672				
Maximum Value: 4.0 ppm on Feb 5 14:00		Maximum Daily Average: 2.9 ppm on Feb 5																			Hours of Data:	641				
Minimum Value: 2.0 ppm on Feb 14 00:00		Minimum Daily Average: 2.0 ppm on Feb 14																			Hours of Missing Data:	31				
Maximum Diurnal Average: 2.3 ppm at hour 10		Minimum Diurnal Average: 2.1 ppm at hour 17																			Hours of Calibration:	31				
Monthly Average: 2.21 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> = 2.5 P <sub>99</sub> = 3.4																			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-Feb	3.1	2.7	2.6	2.6	2.5	Z	2.9	2.6	2.3	2.2	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.4	2.4	2.2	2.3	3.1
2-Feb	Z	2.1	2.0	2.2	2.1	2.1	2.2	2.4	2.3	2.6	2.4	2.2	2.4	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.6
3-Feb	2.1	Z	2.2	2.5	2.4	2.4	2.8	2.4	2.3	2.3	2.1	2.4	2.5	2.2	2.5	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.8
4-Feb	2.1	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	2.1	2.2	2.2	2.3	2.3	2.2	2.3	2.5	2.2	2.5
5-Feb	2.4	2.4	2.5	Z	2.4	2.4	2.6	2.7	2.7	2.9	3.7	3.8	3.7	4.0	2.9	3.3	2.7	2.8	2.8	3.0	3.0	3.1	2.7	2.4	2.9	4.0
6-Feb	2.2	2.3	2.2	2.2	Z	2.3	2.2	2.3	2.2	2.3	2.1	2.1	2.1	2.1	2.3	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.4	3.0	2.2	3.0
7-Feb	3.2	2.5	2.3	2.2	2.2	Z	2.1	2.1	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	2.4	2.1	2.0	2.2	3.2
8-Feb	Z	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.4	C	C	C	2.2	2.2	2.4	2.2	2.4	2.9	2.7	2.6	2.4	2.4	2.3	2.3	2.9
9-Feb	2.4	2.3	2.4	2.4	Z	3.3	3.1	2.1	2.4	3.1	2.4	2.4	2.3	2.5	2.4	2.2	2.3	2.4	2.6	2.2	2.3	2.3	2.5	2.5	2.5	3.3
10-Feb	2.5	2.4	Z	3.0	2.5	2.3	2.1	2.0	2.0	2.0	2.2	2.1	2.0	2.0	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.2	2.2	2.1	2.2	3.0
11-Feb	2.1	2.1	2.2	Z	2.3	2.2	2.2	2.2	2.2	2.1	2.0	2.1	2.2	2.2	2.4	2.0	2.0	2.0	2.1	2.1	2.3	2.5	2.1	2.0	2.2	2.5
12-Feb	2.0	2.0	2.1	2.0	Z	2.0	2.0	2.1	2.1	2.6	2.6	2.1	2.0	2.0	2.0	2.1	2.1	2.2	2.6	2.8	2.8	2.7	2.3	2.2	2.2	2.8
13-Feb	2.1	2.0	2.0	2.7	2.2	Z	2.0	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.7
14-Feb	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-Feb	2.0	Z	2.0	2.6	2.1	2.0	2.0	2.0	2.3	2.2	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.2	2.1	2.7	3.5	2.7	2.4	2.5	2.3	3.5
16-Feb	2.3	2.4	Z	2.4	2.5	2.4	2.3	2.4	2.3	2.0	2.0	2.1	2.8	2.1	2.1	2.1	2.2	2.4	2.3	2.1	2.0	2.0	2.0	2.0	2.2	2.8
17-Feb	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
18-Feb	2.1	2.2	2.2	2.2	Z	2.5	2.4	2.4	2.5	2.4	2.1	2.2	2.1	2.0	2.0	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.1	2.1	2.2	2.5
19-Feb	2.2	2.3	2.3	2.3	2.4	Z	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.5	2.6	2.5	2.3	2.4	2.6	2.6	2.3	2.1	2.1	2.4	2.6
20-Feb	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	2.2	2.3	2.4	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.4
21-Feb	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1
22-Feb	2.1	2.1	Z	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.4	2.4	2.2	2.2	2.2	2.1	2.1	2.4
23-Feb	2.2	2.2	2.3	Z	2.4	2.3	2.2	2.5	2.8	3.1	3.2	2.9	2.2	2.2	2.2	2.1	2.3	2.3	3.3	3.2	2.3	2.1	2.0	2.1	2.5	3.3
24-Feb	3.1	3.5	2.2	Z	2.5	2.5	2.1	2.4	2.4	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	3.5
25-Feb	2.1	2.1	2.1	2.0	2.7	Z	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.3	2.2	2.6	3.6	2.6	2.2	3.6
26-Feb	Z	2.3	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	2.0	2.0	2.0	2.0	2.0	2.0	2.3
27-Feb	2.0	Z	2.1	2.1	2.2	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	2.0	2.0	2.1	2.0	2.2
28-Feb	2.1	2.0	Z	2.2	2.2	2.2	2.2	2.3	2.3	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	2.4	2.2	2.5
																								2.3	3.2	
																								2.2	3.5	
																								2.2	2.6	
																								2.2	3.0	
																								2.2	2.7	
																								2.2	3.3	
																								2.2	3.1	
																								2.2	2.7	
																								2.2	2.8	
																								2.3	3.1	
																								2.2	3.7	
																								2.2	3.8	
																								2.2	3.7	
																								2.2	4.0	
																								2.1	2.9	
																								2.1	3.3	
																								2.1	2.7	
																								2.1	2.8	
																								2.1	3.3	
																								2.2	3.2	
																								2.2	3.5	
																								2.2	3.1	
																								2.2	3.6	
																								2.2	3.0	
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan      C - Calibration																										



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

**Methane (CH<sub>4</sub>) - ppm**  
**Mildred Lake - February 2023**





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

**Methane (CH<sub>4</sub>) - ppm**  
**Mildred Lake - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	210	32.76	32.76
2.1 - 3.0	412	64.27	97.04
3.1 - 10.0	19	2.96	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 641

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Mildred Lake - February 2023**

<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	62	43	10	5	1	2	5	6	25	7	1	10	9	1	5	17	209
2.1 - 3.0	74	18	6	3	5	19	51	50	33	30	5	9	18	16	22	49	408
3.1 - 10.0	1	0	0	0	0	0	3	6	4	0	1	1	0	2	1	0	19
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	137	61	16	8	6	21	59	62	62	37	7	20	27	19	28	66	636

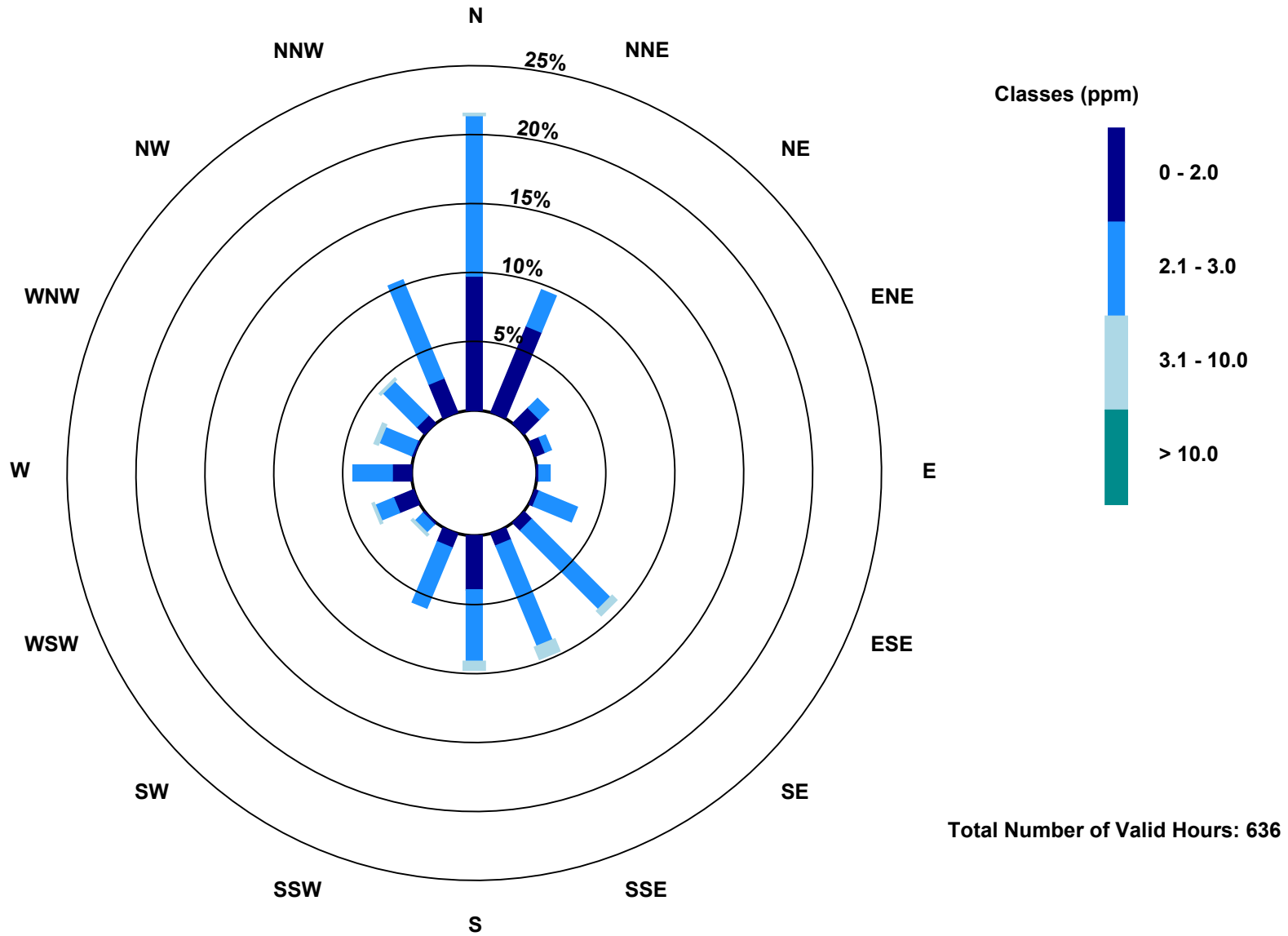
Total Number of Valid Hours: 636

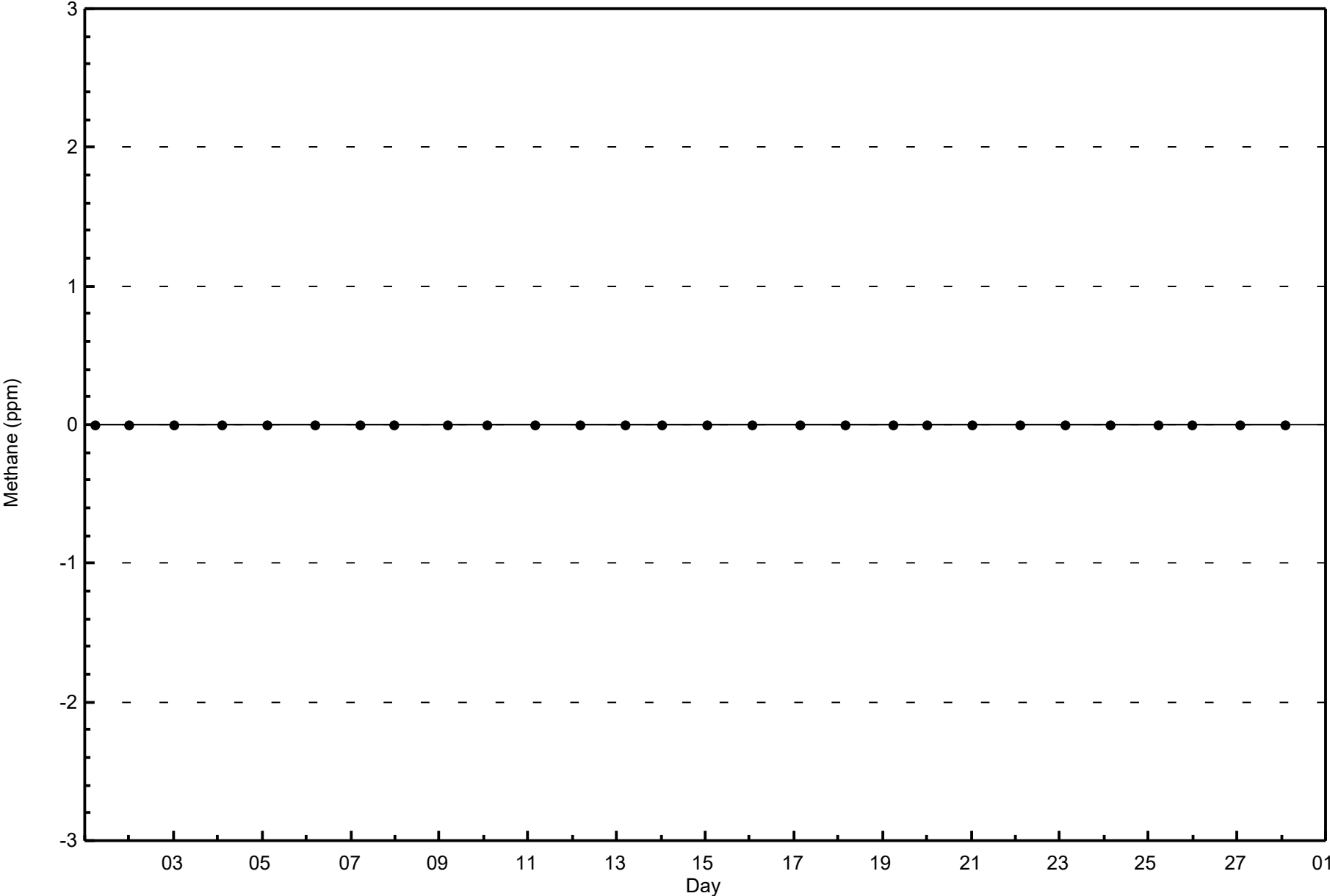
Total Number of Hours: 672

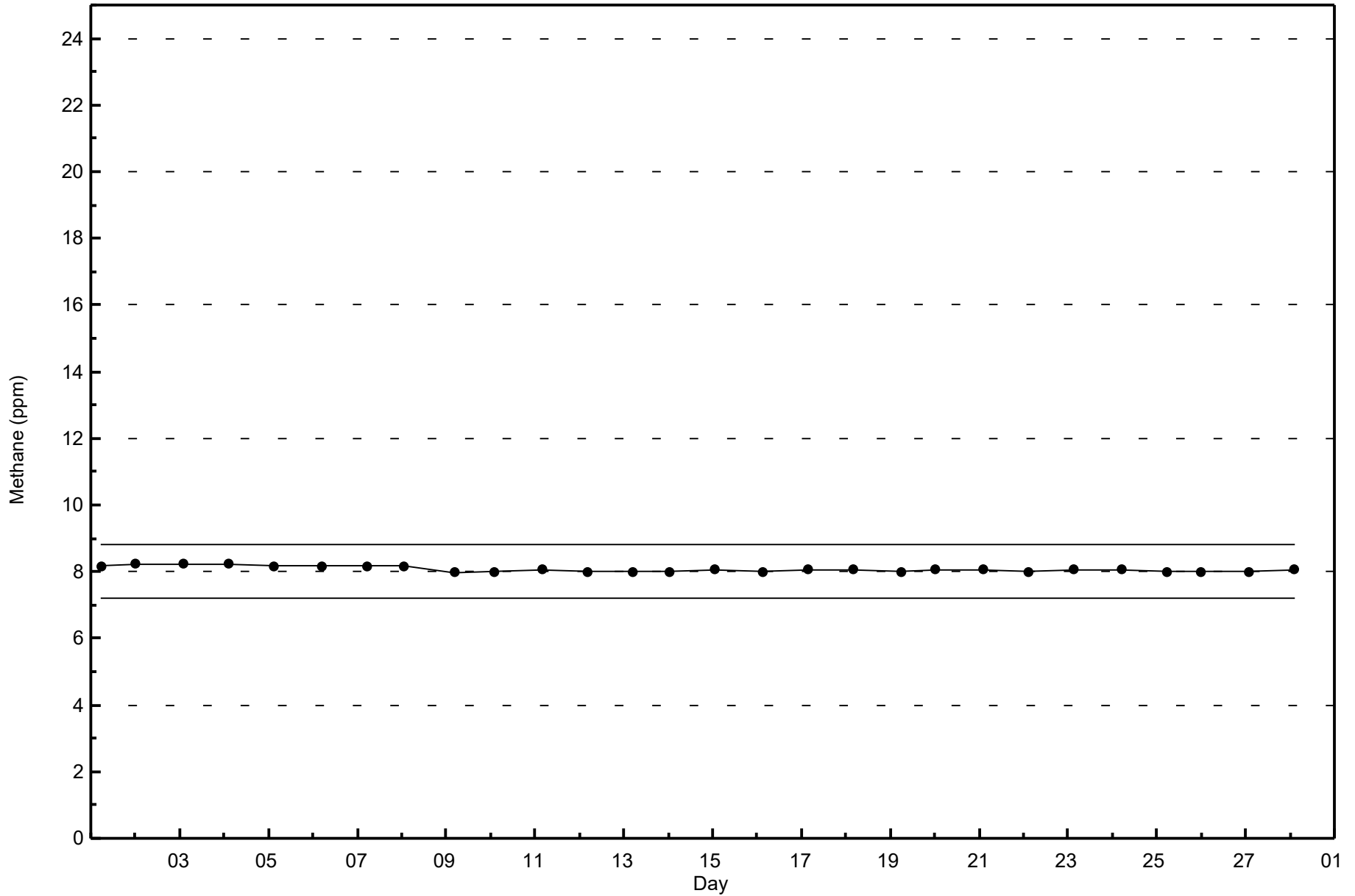


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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











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

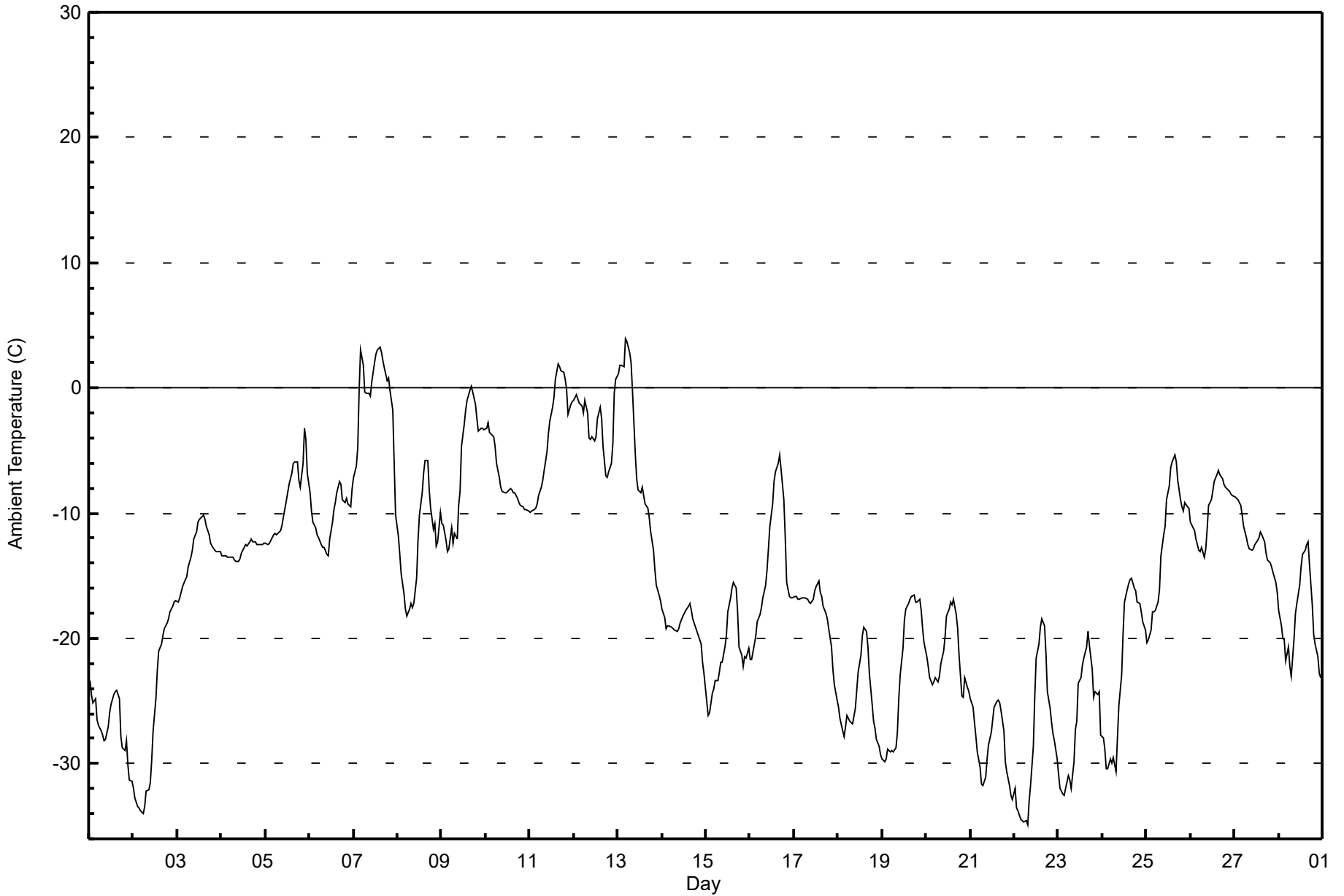
**Ambient Temperature (AT) - C**  
**Mildred Lake - February 2023**

Maximum Value: 3.9 C on Feb 13 05:00      Maximum Daily Average: -0.6 C on Feb 7																						Hours in Service:	672			
Minimum Value: -34.9 C on Feb 22 08:00      Minimum Daily Average: -28.4 C on Feb 21																						Hours of Data:	672			
Maximum Diurnal Average: -11.7 C at hour 16      Minimum Diurnal Average: -18.0 C at hour 8																						Hours of Missing Data:	0			
Monthly Average: -15.58 C      Percentiles: P <sub>1</sub> = -33.7 P <sub>10</sub> = -28.2 Q <sub>1</sub> = -22.3 Median = -15.7 Q <sub>3</sub> = -9.1 P <sub>90</sub> = -3.3 P <sub>99</sub> = 2.8																						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-Feb	-23.3	-24.4	-25.1	-24.9	-26.5	-27.0	-27.4	-27.7	-28.2	-28.1	-27.1	-26.0	-25.3	-24.5	-24.2	-24.2	-24.8	-27.9	-28.8	-28.9	-28.2	-30.1	-31.3	-31.4	-26.9	-23.3
2-Feb	-32.0	-32.8	-33.4	-33.5	-33.7	-34.0	-33.5	-32.2	-32.1	-31.5	-29.8	-27.4	-24.8	-22.5	-21.0	-20.4	-19.8	-19.2	-18.8	-18.4	-17.9	-17.5	-17.1	-17.0	-25.8	-17.0
3-Feb	-17.0	-16.8	-16.3	-15.8	-15.4	-15.1	-14.3	-13.5	-13.0	-12.0	-11.5	-10.7	-10.4	-10.3	-10.1	-10.5	-11.1	-11.7	-12.4	-12.7	-12.9	-13.1	-13.1	-13.1	-13.0	-10.1
4-Feb	-13.4	-13.4	-13.4	-13.5	-13.5	-13.5	-13.5	-13.8	-13.9	-13.8	-13.6	-13.2	-12.5	-12.6	-12.3	-12.1	-12.3	-12.3	-12.5	-12.5	-12.5	-12.5	-12.5	-12.4	-13.0	-12.1
5-Feb	-12.4	-12.5	-12.4	-12.2	-11.7	-11.6	-11.7	-11.5	-11.4	-11.0	-10.3	-9.1	-8.4	-7.7	-6.8	-6.0	-5.9	-5.9	-7.4	-7.9	-6.1	-3.2	-4.2	-6.8	-8.9	-3.2
6-Feb	-8.3	-9.9	-10.7	-11.1	-11.8	-11.9	-12.5	-12.7	-12.8	-13.3	-13.4	-12.1	-10.7	-9.7	-9.1	-8.4	-7.5	-7.7	-9.0	-9.2	-8.8	-9.3	-9.5	-8.1	-10.3	-7.5
7-Feb	-7.2	-6.3	-4.8	-0.2	3.0	1.8	-0.3	-0.4	-0.4	-0.7	0.5	2.0	2.8	3.1	3.3	2.8	2.2	1.6	0.6	0.8	-0.2	-1.7	-6.1	-10.2	-0.6	3.3
8-Feb	-11.9	-13.2	-14.8	-16.5	-17.6	-18.3	-17.6	-17.2	-17.6	-17.2	-15.2	-12.2	-10.2	-8.3	-6.8	-5.8	-5.8	-8.1	-9.6	-11.3	-10.9	-12.6	-12.3	-9.9	-12.5	-5.8
9-Feb	-10.8	-11.0	-12.1	-13.1	-12.9	-11.2	-12.4	-11.6	-12.1	-9.4	-8.2	-4.6	-2.9	-1.8	-1.0	-0.2	0.1	-0.3	-1.3	-2.4	-3.4	-3.2	-3.2	-3.3	-6.3	0.1
10-Feb	-3.3	-2.8	-3.5	-3.7	-3.9	-4.7	-6.1	-7.1	-8.0	-8.3	-8.4	-8.4	-8.3	-8.0	-8.1	-8.3	-8.4	-8.8	-9.2	-9.4	-9.5	-9.7	-9.7	-9.9	-7.3	-2.8
11-Feb	-9.9	-9.8	-9.7	-9.6	-9.3	-8.6	-8.0	-7.3	-6.5	-5.1	-3.6	-2.7	-1.6	-0.7	0.7	1.9	1.7	1.4	1.2	0.7	-0.1	-2.1	-1.3	-1.1	-3.7	1.9
12-Feb	-1.0	-0.5	-0.9	-1.2	-1.5	-2.0	-1.0	-2.0	-4.0	-4.1	-3.9	-4.3	-3.9	-2.5	-1.6	-2.5	-4.7	-7.0	-7.1	-6.7	-6.1	-4.5	-0.5	0.7	-3.0	0.7
13-Feb	1.1	1.8	1.8	1.7	3.9	3.7	2.8	2.1	-0.2	-5.2	-7.2	-8.1	-8.3	-7.9	-8.6	-9.2	-9.6	-10.4	-11.6	-13.0	-14.6	-15.7	-16.5	-17.0	-6.0	3.9
14-Feb	-17.7	-18.3	-19.2	-19.0	-19.0	-19.1	-19.2	-19.3	-19.4	-19.2	-18.7	-18.2	-18.0	-17.8	-17.5	-17.2	-17.8	-18.4	-19.1	-19.5	-19.8	-20.5	-21.9	-22.8	-19.0	-17.2
15-Feb	-25.0	-26.2	-26.0	-24.4	-24.0	-23.3	-23.4	-22.7	-21.9	-21.9	-20.7	-19.8	-17.9	-16.8	-16.0	-15.6	-16.0	-17.9	-20.7	-21.4	-22.3	-21.5	-21.5	-20.8	-21.2	-15.6
16-Feb	-21.7	-21.7	-20.4	-19.8	-18.7	-18.1	-17.6	-16.8	-15.7	-14.5	-12.9	-11.0	-9.3	-7.5	-6.7	-6.0	-5.3	-6.5	-8.9	-12.0	-15.6	-16.6	-16.8	-16.8	-14.0	-5.3
17-Feb	-16.6	-16.7	-16.8	-16.9	-16.8	-16.8	-16.8	-16.9	-17.1	-17.2	-16.9	-16.2	-15.9	-15.5	-16.3	-16.6	-17.4	-18.0	-18.4	-19.2	-20.7	-22.5	-23.7	-24.9	-17.9	-15.5
18-Feb	-25.5	-26.3	-27.4	-27.8	-27.0	-26.2	-26.6	-26.7	-26.8	-25.6	-24.1	-22.7	-21.4	-19.8	-19.1	-19.5	-20.6	-22.8	-25.2	-26.6	-27.1	-28.1	-28.6	-29.2	-25.0	-19.1
19-Feb	-29.6	-29.8	-29.6	-28.9	-29.1	-29.0	-29.1	-28.7	-27.5	-24.8	-22.9	-20.7	-18.5	-17.7	-17.3	-16.9	-16.7	-16.6	-17.1	-17.1	-16.9	-17.8	-19.2	-20.3	-22.6	-16.6
20-Feb	-21.5	-22.3	-23.2	-23.7	-23.5	-23.1	-23.5	-23.1	-22.0	-21.0	-19.9	-18.2	-17.6	-17.1	-17.3	-16.9	-18.1	-19.2	-21.4	-24.5	-24.7	-23.1	-23.9	-24.3	-21.4	-16.9
21-Feb	-24.8	-25.5	-26.7	-27.9	-29.1	-30.3	-31.6	-31.7	-31.1	-29.6	-28.5	-27.5	-26.4	-25.4	-25.0	-24.9	-25.2	-25.8	-27.4	-29.9	-30.7	-31.8	-32.6	-32.9	-28.4	-24.8
22-Feb	-32.0	-33.6	-33.8	-34.4	-34.6	-34.7	-34.5	-34.9	-33.0	-31.7	-28.7	-24.7	-21.6	-20.5	-19.1	-18.4	-19.0	-21.2	-24.2	-25.6	-26.8	-27.7	-28.2	-29.6	-28.0	-18.4
23-Feb	-30.9	-32.0	-32.4	-32.6	-32.0	-30.9	-31.3	-32.0	-29.8	-27.2	-26.6	-23.6	-23.2	-22.2	-21.6	-20.7	-19.4	-20.6	-22.5	-24.7	-24.2	-24.5	-24.2	-27.7	-26.5	-19.4
24-Feb	-28.0	-28.8	-30.4	-30.4	-29.7	-29.9	-29.5	-30.7	-27.9	-25.3	-23.0	-19.6	-17.1	-16.0	-15.7	-15.3	-15.2	-16.0	-16.2	-17.1	-17.3	-17.9	-18.6	-19.4	-22.3	-15.2
25-Feb	-20.4	-20.1	-19.4	-17.9	-17.8	-17.8	-17.1	-16.1	-13.4	-11.8	-11.0	-8.9	-7.8	-6.4	-5.9	-5.3	-6.0	-7.4	-8.9	-9.5	-9.8	-9.2	-9.5	-9.6	-12.0	-5.3
26-Feb	-10.7	-11.1	-11.4	-12.0	-12.9	-13.1	-12.7	-13.5	-12.9	-11.3	-9.4	-9.0	-8.2	-7.4	-6.9	-6.6	-6.9	-7.3	-7.7	-7.9	-8.2	-8.3	-8.5	-8.6	-9.7	-6.6
27-Feb	-8.7	-8.8	-9.0	-9.3	-10.2	-11.1	-12.0	-12.6	-12.9	-13.0	-12.9	-12.5	-12.1	-12.0	-11.5	-11.7	-12.2	-13.2	-13.7	-14.0	-14.3	-14.8	-15.6	-16.3	-12.3	-8.7
28-Feb	-17.7	-19.0	-20.0	-20.1	-21.8	-20.7	-22.3	-23.0	-20.0	-17.9	-17.2	-15.7	-14.3	-13.3	-13.0	-12.5	-12.2	-14.1	-17.3	-19.6	-20.5	-21.5	-22.8	-23.1	-18.3	-12.2
																								Diurnal Average	-15.58	
																								Diurnal Maximum	3.9	



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

**Ambient Temperature (AT) - C**  
**Mildred Lake - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Mildred Lake - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	208	30.95	30.95
-20 - 0	436	64.88	95.83
0 - 10	28	4.17	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Relative Humidity (RH) - %**

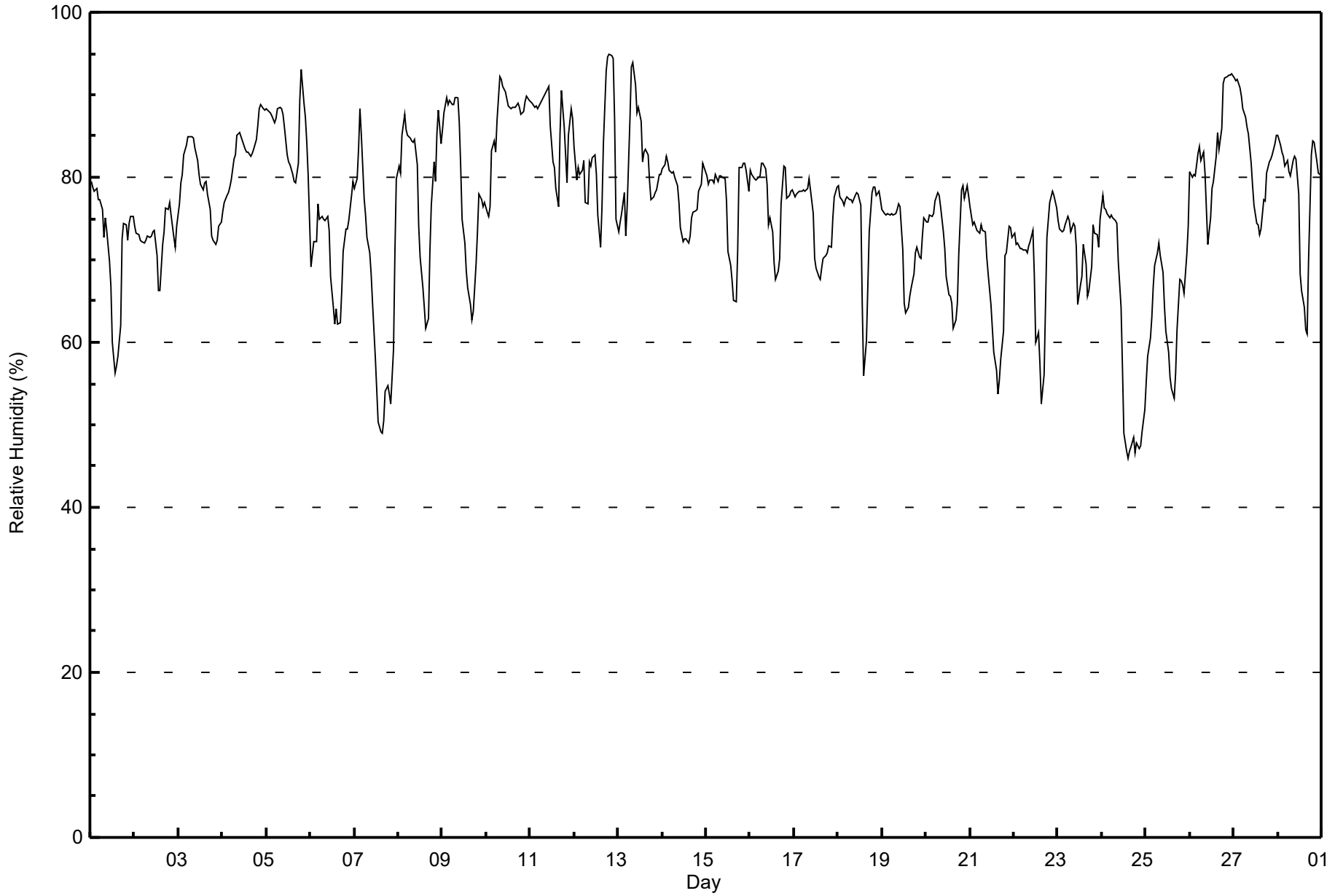
**Mildred Lake - February 2023**

<b>Maximum Value: 94.9 % on Feb 12 20:00</b> <b>Maximum Daily Average: 86.8 % on Feb 10</b>																						<b>Hours in Service: 672</b>				
<b>Minimum Value: 46.0 % on Feb 24 15:00</b> <b>Minimum Daily Average: 60.2 % on Feb 24</b>																						<b>Hours of Data: 672</b>				
<b>Maximum Diurnal Average: 80.2 % at hour 9</b> <b>Minimum Diurnal Average: 67.6 % at hour 16</b>																						<b>Hours of Missing Data: 0</b>				
<b>Monthly Average: 76.02 %</b> <b>Percentiles: P<sub>1</sub> = 47.7 P<sub>10</sub> = 64.2 Q<sub>1</sub> = 71.6 Median = 77.0 Q<sub>3</sub> = 81.9 P<sub>90</sub> = 88.1 P<sub>99</sub> = 93.0</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-Feb	79.5	78.8	78.2	78.6	77.2	77.4	76.1	72.7	75.1	73.5	69.9	66.8	60.0	56.3	57.1	58.3	62.0	72.5	74.5	74.2	72.4	74.4	75.2	75.2	71.5	79.5
2-Feb	74.2	73.3	73.0	72.4	72.1	72.0	72.4	72.9	72.7	72.9	73.4	73.6	70.6	66.2	66.3	71.9	73.4	76.3	76.1	77.0	75.4	72.7	71.5	74.1	72.8	77.0
3-Feb	76.8	79.4	80.3	82.6	83.9	85.0	84.9	84.9	84.8	83.6	82.1	80.4	79.1	78.4	79.4	79.4	78.0	76.0	72.9	72.4	71.8	72.4	74.1	74.6	79.1	85.0
4-Feb	76.0	76.9	77.8	78.2	78.8	79.7	82.2	82.7	85.1	85.5	85.0	84.3	83.3	83.0	83.1	82.6	82.9	83.3	84.5	86.3	88.3	88.8	88.4	88.2	83.1	88.8
5-Feb	88.2	88.0	87.8	87.5	86.6	87.1	88.3	88.5	88.4	87.6	86.1	82.6	81.8	81.5	80.4	79.5	79.4	81.7	89.4	93.1	88.9	87.4	84.2	80.2	85.6	93.1
6-Feb	69.2	70.7	72.3	72.2	76.7	74.9	75.3	75.0	74.7	75.2	73.6	68.0	64.2	62.1	64.0	62.3	66.3	71.1	73.7	73.8	74.8	77.8	79.5	71.2	79.5	
7-Feb	78.7	79.8	83.4	88.3	85.0	77.4	75.3	72.7	70.9	68.2	64.8	58.1	54.3	50.3	49.1	49.0	50.4	54.0	54.7	53.8	52.6	59.2	71.1	79.9	65.9	88.3
8-Feb	81.4	80.5	85.1	87.6	85.7	85.1	84.8	84.4	84.3	84.6	81.6	74.1	70.3	66.6	64.3	61.8	62.9	71.0	76.6	81.9	79.6	85.3	88.1	84.0	78.8	88.1
9-Feb	85.7	87.8	89.7	88.8	89.4	88.9	88.8	89.7	89.6	86.6	81.3	74.9	72.1	68.7	66.6	64.6	62.7	63.8	69.5	73.4	78.0	77.3	76.5	77.0	78.8	89.7
10-Feb	75.8	75.2	76.4	83.2	84.4	83.1	86.9	92.2	91.9	91.1	90.4	89.5	88.7	88.2	88.4	88.4	88.5	88.9	88.4	87.6	87.9	89.2	89.8	89.3	86.8	92.2
11-Feb	89.1	89.1	88.4	88.7	88.3	88.6	89.3	89.7	90.1	90.7	91.0	86.2	81.8	81.2	78.6	76.5	85.3	90.5	86.1	82.6	79.3	85.0	88.4	87.1	86.3	91.0
12-Feb	83.7	79.6	81.1	80.3	80.9	82.0	77.0	76.7	81.9	81.3	82.4	82.6	80.3	75.5	71.5	76.5	84.0	93.0	94.6	94.9	94.8	94.5	87.2	75.0	83.0	94.9
13-Feb	73.4	74.5	75.6	78.1	72.9	76.4	87.1	93.3	93.9	91.2	87.8	88.5	86.7	81.8	83.1	83.4	82.7	79.5	77.3	77.7	78.1	78.5	80.4	80.4	81.8	93.9
14-Feb	80.9	81.5	82.5	81.9	80.9	80.5	80.7	79.9	79.0	77.0	73.8	72.3	72.5	72.6	72.1	73.0	75.1	75.7	75.9	76.1	78.3	79.2	81.7	81.2	77.7	82.5
15-Feb	80.2	79.1	79.6	79.6	79.3	80.3	79.6	80.1	80.2	79.9	77.2	70.9	69.3	67.5	65.1	64.9	71.2	81.2	81.2	81.7	81.7	80.8	78.2	77.0	81.7	81.7
16-Feb	80.9	80.4	79.8	79.7	79.8	80.2	81.8	81.7	80.9	79.2	74.2	75.0	73.5	69.7	67.6	68.7	70.2	76.8	81.4	81.2	77.5	77.7	78.3	78.6	77.3	81.8
17-Feb	77.6	77.9	78.1	78.4	78.3	78.5	78.4	78.7	79.9	78.5	75.6	70.2	68.9	68.0	67.6	69.0	70.2	70.5	70.9	71.6	71.5	75.1	77.6	78.8	74.6	79.9
18-Feb	79.0	77.7	77.1	76.7	77.3	77.6	77.3	77.4	76.9	77.7	78.1	78.0	76.6	64.8	55.9	60.2	66.7	73.5	78.2	78.8	78.8	77.9	78.3	77.3	74.9	79.0
19-Feb	76.1	75.7	75.5	75.6	75.4	75.5	75.4	75.5	76.1	76.7	76.5	71.3	64.7	63.5	64.2	65.6	66.5	68.3	70.9	71.4	70.4	70.2	73.0	75.1	72.0	76.7
20-Feb	74.5	74.6	75.4	75.3	75.6	77.0	78.1	77.7	76.5	73.4	71.3	68.0	65.8	65.5	64.7	61.7	62.7	64.7	70.7	78.6	79.0	77.4	78.9	77.8	72.7	79.0
21-Feb	76.4	74.3	74.6	74.0	73.5	73.3	74.3	73.5	73.4	70.4	68.3	64.6	61.7	58.9	56.6	53.8	55.4	58.0	61.4	70.5	70.8	74.0	73.9	72.7	68.3	76.4
22-Feb	73.1	71.9	72.1	71.4	71.3	71.3	71.3	70.8	71.7	72.2	73.5	68.1	60.0	61.3	57.5	52.5	56.2	64.5	72.7	77.0	77.5	78.3	77.8	76.3	69.6	78.3
23-Feb	74.7	73.7	73.4	73.5	74.3	75.3	74.8	73.5	74.3	74.0	71.6	64.6	67.0	68.0	71.9	69.5	65.5	66.3	69.1	74.3	73.2	73.1	71.5	74.9	71.8	75.3
24-Feb	77.8	76.3	76.1	75.6	75.0	75.4	75.1	74.8	74.4	69.9	64.2	56.9	49.0	46.8	46.0	46.8	47.3	48.4	46.6	47.7	47.2	47.5	49.2	51.8	60.2	77.8
25-Feb	55.2	58.2	60.5	63.0	66.7	69.3	70.8	72.0	70.6	68.5	64.3	61.4	58.8	55.7	54.4	53.2	56.2	61.5	67.7	67.5	66.9	65.9	70.6	74.0	63.9	74.0
26-Feb	80.6	80.0	80.4	80.2	82.9	83.7	82.1	83.0	80.5	76.1	71.9	75.1	78.7	79.4	82.6	85.4	83.3	86.0	91.4	92.1	92.2	92.4	92.5	92.5	83.5	92.5
27-Feb	92.0	91.7	91.9	90.9	89.8	88.3	87.3	86.2	85.3	81.6	78.9	76.6	74.4	74.2	73.0	73.7	77.3	77.1	80.4	81.8	82.2	82.7	84.1	85.2	82.8	92.0
28-Feb	85.1	83.9	83.0	82.5	81.3	82.0	80.7	80.2	82.0	82.6	82.2	78.0	68.3	66.3	64.2	61.6	61.0	69.9	82.7	84.3	84.2	81.9	80.6	80.3	77.9	85.1
																								Diurnal Average		
																								Diurnal Maximum		



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

**Relative Humidity (RH) - %**  
**Mildred Lake - February 2023**





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

**Wind Speed (WS) - km/h**  
**Mildred Lake - February 2023**

Maximum Speed: 24 km/h on Feb 13 15:00	Maximum Daily Speed Average: 12.7 km/h on Feb 7	Hours in Service: 672
Minimum Speed Value: 0 km/h on Feb 16 17:00	Minimum Daily Speed Average: 1.4 km/h on Feb 16	Hours of Data: 666
Maximum Diurnal Speed Average: 2.4 km/h at hour 18	Minimum Diurnal Speed Average: 0.5 km/h at hour 2	Hours of Missing Data: 6
Monthly Average Velocity: 1.3 km/h 346.3 deg	Percentiles: P <sub>1</sub> = 0 P <sub>10</sub> = 3 Q <sub>1</sub> = 4 Median = 7 Q <sub>3</sub> = 10 P <sub>90</sub> = 14 P <sub>99</sub> = 22	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-Feb	N9	N4	UO	N5	N4	N7	NNW10	N9	N6	NNW6	NNW8	NW8	NW11	NW9	NW6	N4	N3	NNW4	NNW4	NW6	NW6	NNW4	SSE3	S4	NNW5.3	NW11			
2-Feb	SSE4	S5	S5	SE5	S6	SSW5	SSE5	SSE7	SSE8	SSE8	SSE7	SSE9	SE9	SSE10	SE18	SE21	SE20	SE20	SE22	SE22	SE21	SE20	SE18	SE19	SSE11.9	SE22			
3-Feb	SE20	SSE19	SSE16	SSE15	SSE12	SSE14	SSE12	SSE9	SSE8	S6	S4	N6	NW7	N9	N9	NNE9	NNE9	NNE8	NNE8	NNE7	NNE6	NNE5	NNE4	N6	ESE3.5	SE20			
4-Feb	N8	NNE5	N7	N9	N8	N8	N9	N11	N11	N10	N10	N9	N9	N9	N7	NNE4	NNW4	N5	N6	N8	N6	NNW7	N6	NNW6	N7.5	N11			
5-Feb	NNW5	N5	N2	N2	SE0	NNE4	N4	NNW5	N4	NW3	WVW1	WSW1	SSE5	S4	SSE6	SW1	SSW3	SSW3	E0	S3	SW3	WVW9	NW16	NNW14	WVW2.0	NW16			
6-Feb	WVW18	W17	W13	W11	W10	WVW12	W10	W10	W10	N9	NE7	E4	SSE6	ESE6	ESE7	E5	SE3	NNW5	N7	NNW1	N3	N4	SW2	SW4	WVW3.9	WVW18			
7-Feb	SE1	S4	SE3	WSW11	W17	WVW22	WVW16	W17	W14	WSW11	WSW12	W16	W16	W21	W22	W22	W18	W16	WSW15	W19	WVW12	WVW10	NNW19	N12	W12.7	W22			
8-Feb	N14	N8	N3	NNW5	NW2	SSW2	SSE1	E2	S2	SSW4	S5	SE7	M	SE9	SE8	SE7	SE4	SSE4	SSE6	SE5	SSE7	SE4	SSE5	SE7	SE2.5	N14			
9-Feb	SE6	SE7	SSE6	SSE6	SSE7	SSE8	S7	S7	SSE6	SSE10	S6	SE8	SSE11	SSE13	SE10	SE8	SE7	SE3	N4	UO	UO	NNE1	SE1	E2	SSE5.9	SSE13			
10-Feb	NE2	NNE4	N11	N10	NNW10	N11	N11	N13	N11	N11	N10	N11	N12	N11	NNW12	NNW13	N11	NNW9	NNW10	N10	NNW8	N5	N4	NE3	N9.1	N13			
11-Feb	N2	N1	NE2	ESE3	SSE5	SSE7	SSE6	SSE5	ESE1	SSW7	SSW9	SSE8	SE9	SE8	SE7	SW11	WSW14	W13	WVW13	WVW13	WVW14	WVW3	W13	WSW14	SW4.1	WSW14			
12-Feb	WSW13	WSW16	W13	WSW8	WSW6	WSW6	W13	WVW10	W4	WVW6	NW8	NNW8	NNW7	NNW5	S1	NNE5	N7	N10	N6	N4	NE0	SE5	SE13	SE16	WVW3.3	SE16			
13-Feb	SSE13	S8	S6	SW6	WSW15	WSW17	W21	W15	N17	N21	N23	N23	N24	N24	N24	N18	N16	N13	N11	NNE13	NNE14	NNE12	NNE13	NNW10.5	N24				
14-Feb	N11	N8	N7	NNW8	N7	N7	NNE6	NNE5	NE6	NNE6	NE6	NE6	NE4	NNE6	NNE6	NNE8	NNE8	NNE7	NNE4	N3	N4	N4	N0	UO	NNE5.7	N11			
15-Feb	ENE1	ESE3	SE4	SSW6	SSW4	SSW4	S3	SSE5	SSE3	S4	S3	S4	SSE5	SE7	ESE8	ESE8	SE7	ESE4	SE3	SSE5	SE4	ESE4	S4	SSE6	SSE3.9	ESE8			
16-Feb	SSE5	SSE4	SSE6	SE6	SSE7	SSE6	SE3	SSE4	S6	S8	SSW7	S9	SSE8	S5	S3	SSE2	W0	N10	N13	N13	NNE11	N10	N8	N6	ESE1.4	N13			
17-Feb	NNE6	NNE6	NNE7	NNE6	N5	NNE4	ENE5	NE6	NNE7	NNE8	NNE8	NNE8	N8	NNE8	NNE11	N11	N11	N10	N10	NNE9	NNE10	N8	N6	NNW4	NNE7.3	N11			
18-Feb	N7	NNW6	NNW5	NNW6	NNW7	NNW8	N8	N8	N6	N5	NNW7	NW8	NW9	NNW6	NE4	S3	WSW3	W1	NNE4	NE4	NE2	SSE0	SSW4	S3	NNW3.8	NW9			
19-Feb	ESE4	ESE3	ESE3	ESE2	ESE2	NE3	NNE2	N5	NNE3	NNW6	NNW5	NNW4	WVW3	NW7	NW9	NNW10	NNW9	NNW7	NNW4	NNW7	N10	N11	N12	N11	N4.7	N12			
20-Feb	N9	N6	NNE5	N3	NW5	N2	S2	SE2	SSE4	ESE4	SE6	S5	SSW5	SSW5	SSW1	N5	NNE9	NNE8	N6	NNW2	N7	N9	N8	NNW11	N2.6	NNW11			
21-Feb	N9	NNE13	NNE11	NNE10	NNE10	N7	NNW6	NNW6	NNW5	NNW7	NW8	NW10	NW9	NNW10	N11	NNE13	N11	N7	NNE5	N4	NNW4	W2	SW4	SSW5	N6.6	NNE13			
22-Feb	SSW6	SSW2	S5	S4	SSE4	S3	S5	S4	SSW5	S5	S4	S1	SSW5	SSW8	WSW7	WVW7	SW5	W4	NW3	WVW2	NW1	SSW2	SSW3	SSW2	SSW3.1	SSW8			
23-Feb	S3	N2	N3	W1	NNW4	NNW6	NW6	NW2	UO	NW0	S5	SSW5	SSW4	SW4	S3	SE4	SE7	SE6	SE6	SSE5	S7	SSW4	S6	SSE6	S1.9	SE7			
24-Feb	SSE6	S7	S5	SSE7	SSE6	SSE5	S6	S5	SE8	SE14	SE12	SSE14	S19	S19	S18	S15	SSE16	S16	S18	S16	S14	S14	S11	S9	S11.3	S19			
25-Feb	S8	S9	S8	S10	SE5	SE3	SSE4	SE3	WSW8	WSW7	WSW7	WVW8	WSW7	SSW9	SSE9	SE8	SE7	ESE6	SSE4	S4	ENE2	ESE6	SSE6	ESE6	S4.4	S10			
26-Feb	ESE6	ESE6	ESE7	ESE6	ESE2	ENE3	NNE4	N7	N6	N4	ESE3	ENE6	ENE7	NE8	NE8	ENE7	E8	ENE7	NE6	NNE7	N7	N7	N7	NNE6	NE4.7	NE8			
27-Feb	NNE7	N6	N8	N10	NNW10	NNW12	NNW12	N12	N13	N14	N13	N14	N14	NNW15	N12	NNE12	NNE13	NNE12	NNE10	NNE9	NNE7	NNW7	N7	N7	N10.6	NNW15			
28-Feb	NNW5	NNW4	NNW4	NW5	NNW5	NNW4	NNW4	NNW4	NNW4	NNW4	NNW4	NNW4	NNW4	NNW6	NW6	NW7	W6	SSW7	SSW6	WSW4	NW1	SSW1	S0	SSW4	SSW4	SSW5	SE4	WVW2.2	NW7

NNE1.0 NNE0.5 NNE0.6 NW0.6 WVW1.5 NW1.7 NW2.3 NW2.2 WVW1.9 NNW1.6 NNW1.6 NNW1.7 NW1.7 NNW1.1 NNE0.9 NNE1.7 NNE1.4 N2.4 N2.3 N1.9 N2.2 N1.8 NNW1.0 NE0.6	Diurnal Average
SE20 SSE19 SSE16 SSE15 W17 WVW22 W21 W17 N17 N21 N23 N23 N24 N24 N24 N24 N24 N24 SE20 SE22 SE22 SE21 SE20 NNW19 SE19	Diurnal Maximum

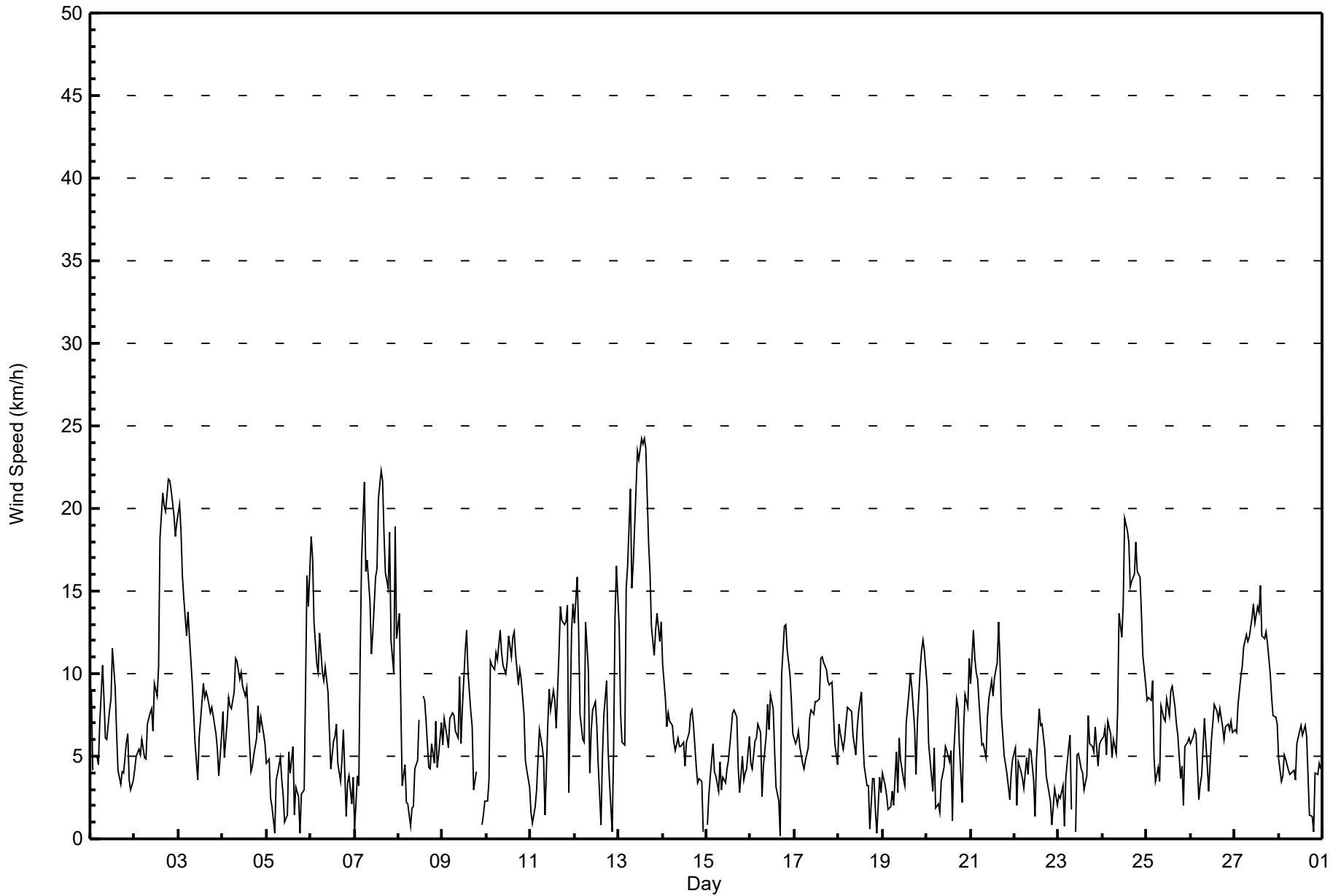
M - Maintenance UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



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

**Wind Speed (WS) - km/h**  
**Mildred Lake - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Feb 7 04:00 Minimum Value: 0 km/h on Feb 15 02:00 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> = 4 P <sub>99</sub> = 6																	Hours in Service: 672 Hours of Data: 666 Hours of Missing Data: 6 Hours of Calibration: 0 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-Feb	2	3	UO	1	1	2	2	3	2	1	2	2	2	3	2	1	1	1	1	2	1	2	1	1	3	5
2-Feb	2	1	2	1	1	1	1	2	2	2	2	3	2	2	5	5	5	4	4	4	4	4	4	4	4	5
3-Feb	4	3	3	3	2	3	2	2	2	2	2	4	2	2	2	2	2	2	2	2	2	1	1	3	4	
4-Feb	2	1	1	2	1	1	2	2	2	2	2	2	2	2	2	1	1	1	2	1	2	1	2	1	2	
5-Feb	1	1	1	1	1	2	1	1	1	2	2	2	1	1	2	2	1	2	1	1	3	2	5	3	5	
6-Feb	5	4	4	5	3	3	2	2	3	2	2	2	2	2	2	1	2	2	2	2	2	2	2	1	5	
7-Feb	1	2	1	8	6	6	4	5	5	4	4	6	5	6	7	6	5	5	7	6	4	3	4	4	8	
8-Feb	3	3	1	1	2	2	1	1	1	1	1	2	M	2	2	1	2	2	1	1	2	1	1	1	3	
9-Feb	2	1	1	2	1	1	1	2	2	1	2	2	2	3	2	2	1	1	2	UO	UO	1	1	1	3	
10-Feb	1	2	2	2	2	3	2	2	2	2	2	3	3	3	2	3	3	2	2	3	2	1	1	2	3	
11-Feb	1	1	2	1	2	1	1	1	1	3	2	1	2	2	1	5	5	4	4	4	4	2	8	4	8	
12-Feb	5	6	4	2	2	3	4	4	2	2	1	2	1	1	2	1	2	2	2	1	2	3	4	4	6	
13-Feb	3	3	2	3	6	6	6	5	5	5	6	6	6	7	6	6	5	5	3	3	4	4	4	4	7	
14-Feb	3	3	2	2	2	2	2	1	2	1	1	2	2	1	2	2	2	2	2	1	1	1	1	UO	3	
15-Feb	1	0	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	2	1	1	1	2	2	
16-Feb	1	2	1	1	2	3	1	1	2	2	2	2	2	1	2	2	2	5	2	4	4	2	2	2	5	
17-Feb	2	2	1	2	1	1	1	2	2	2	2	2	2	2	3	3	3	3	2	2	2	2	1	2	3	
18-Feb	1	1	1	1	1	2	1	1	2	1	1	2	2	3	2	2	2	1	1	1	1	1	1	1	3	
19-Feb	1	1	1	1	1	1	1	1	1	3	2	2	2	2	2	2	2	2	1	1	2	2	2	3	3	
20-Feb	2	2	1	1	1	2	2	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	2	2	2	
21-Feb	2	3	3	2	2	2	1	1	1	2	2	2	3	3	3	4	3	2	1	1	1	1	3	1	4	
22-Feb	1	1	2	1	1	2	2	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	2	2	
23-Feb	2	2	1	2	1	1	1	2	UO	2	1	1	1	1	2	2	2	1	2	1	1	1	2	2	2	
24-Feb	3	1	2	2	1	2	1	1	3	3	3	3	4	4	4	4	4	3	5	4	4	3	2	2	5	
25-Feb	2	2	2	2	2	1	2	2	3	2	2	3	2	3	1	1	1	1	1	2	2	1	2	2	3	
26-Feb	1	2	1	1	2	1	1	1	1	1	2	1	2	2	2	2	1	2	2	2	1	1	1	1	2	
27-Feb	1	1	2	2	2	2	2	2	3	3	3	4	4	4	4	3	3	3	3	3	3	3	2	2	4	
28-Feb	1	1	1	0	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	2	1	1	2	
																	Diurnal Maximum									
M - Maintenance UO - Unstable Operation																										







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Mildred Lake - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	245	36.79	36.79
6 - 11	309	46.40	83.18
12 - 19	92	13.81	97.00
20 - 28	20	3.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 666

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Mildred Lake - February 2023**

<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	33	17	9	4	5	13	21	24	36	27	5	3	6	4	9	29	245
6 - 11	87	37	8	4	1	11	25	33	19	10	2	10	5	7	18	32	309
12 - 19	18	9	0	0	0	0	7	10	9	0	0	9	14	8	1	7	92
20 - 28	7	0	0	0	0	0	8	0	0	0	0	0	4	1	0	0	20
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>	145	63	17	8	6	24	61	67	64	37	7	22	29	20	28	68	666

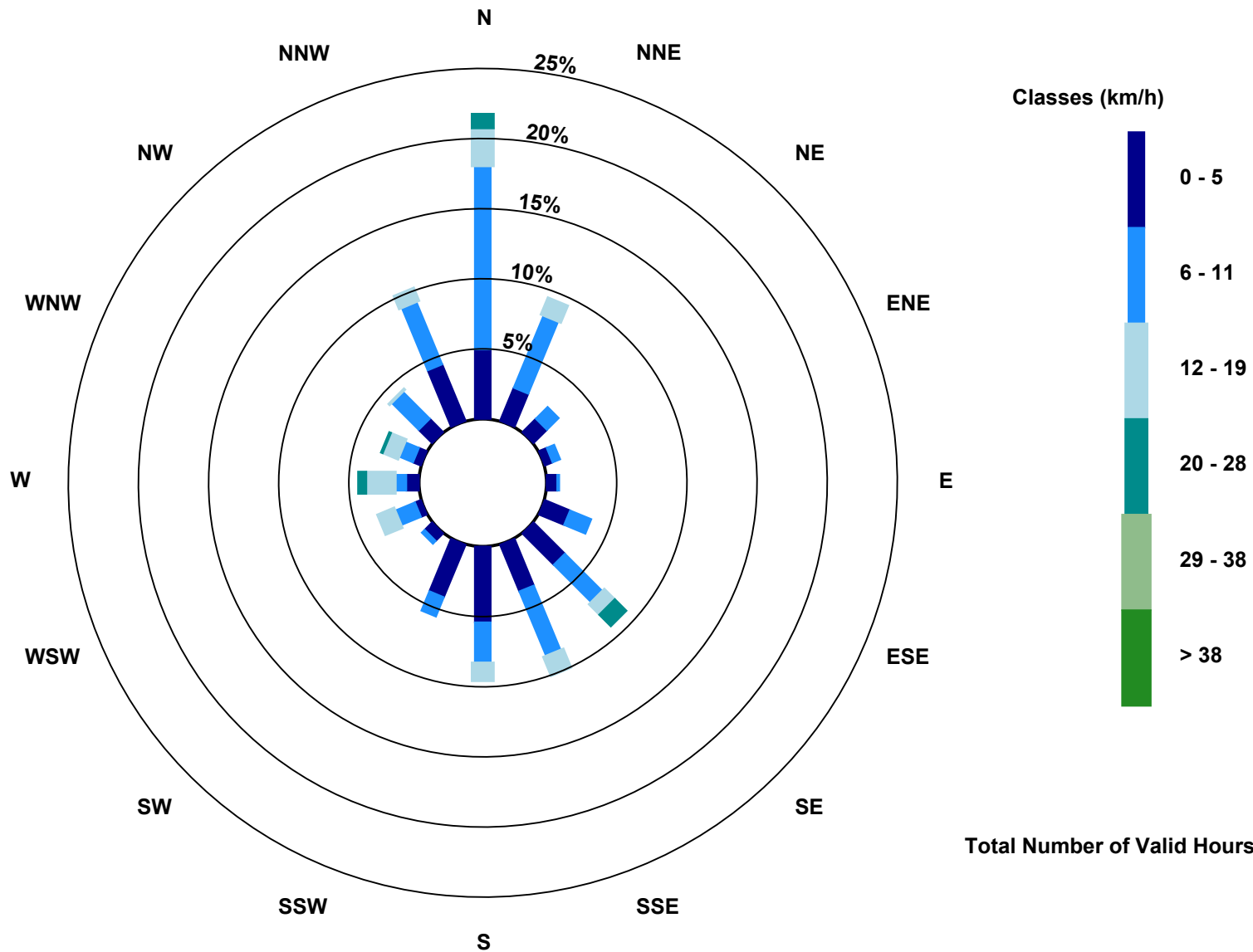
Total Number of Valid Hours: 666

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Mildred Lake



Total Number of Valid Hours: 666



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

**Wind Direction (WD) - deg**  
**Mildred Lake - February 2023**

Direction of Maximum Speed: 350 deg on Feb 13 15:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 275.8 deg on Feb 7	Hours of Data: 666
Direction of Minimum Speed: 280 deg on Feb 16 17:00	Hours of Missing Data: 6
Direction of Minimum Daily Speed Average: 1.4 deg on Feb 16	Percent Operational Time: 99.1
Monthly Average Direction: 346.3 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-Feb	353	0	UO	355	351	353	338	354	358	341	332	304	317	310	315	352	358	343	334	323	318	329	161	182	334.6
2-Feb	152	177	187	132	191	193	147	147	158	165	156	164	141	149	139	140	140	141	143	142	143	143	142	143	147.2
3-Feb	145	149	148	153	156	150	150	166	155	186	191	355	323	354	10	20	33	30	33	28	14	18	28	359	112.2
4-Feb	5	12	358	358	359	360	349	356	1	5	2	3	4	355	352	16	328	349	5	354	357	341	352	342	357.2
5-Feb	344	1	350	6	134	15	356	333	9	315	300	251	152	190	160	233	195	202	97	171	236	282	306	299	300.0
6-Feb	283	278	281	275	280	284	281	273	281	351	40	81	151	120	121	93	135	342	357	341	357	356	215	224	291.3
7-Feb	143	174	134	253	269	282	285	277	270	246	256	260	274	271	269	277	278	268	251	268	291	298	348	1	275.8
8-Feb	0	7	4	331	326	205	148	89	179	205	174	141	M	141	145	139	138	161	150	142	155	144	149	134	135.9
9-Feb	142	132	166	148	150	150	169	170	167	154	174	142	148	148	144	131	128	140	1	UO	UO	19	128	85	147.4
10-Feb	54	20	351	355	347	0	6	358	358	357	359	1	359	358	348	347	351	343	341	354	346	356	356	49	355.6
11-Feb	3	357	45	112	152	161	162	155	107	201	195	157	144	138	145	217	240	263	282	287	302	300	259	241	224.7
12-Feb	252	254	276	252	244	252	278	282	267	288	325	336	338	347	184	24	355	353	6	355	53	137	128	138	286.1
13-Feb	151	175	173	225	247	256	262	276	351	4	358	356	354	1	350	351	0	10	5	10	17	18	15	13	347.0
14-Feb	9	3	352	345	358	10	21	28	36	17	39	36	44	31	28	13	31	31	25	355	354	9	351	UO	16.5
15-Feb	69	117	131	192	202	192	184	147	149	189	177	177	152	130	122	123	135	119	135	154	139	111	182	168	150.4
16-Feb	153	163	155	145	154	153	128	148	170	185	193	171	162	177	179	155	280	2	357	5	22	3	359	11	112.0
17-Feb	15	33	25	26	3	15	58	39	29	29	27	16	11	12	16	11	5	9	8	15	20	8	352	343	16.2
18-Feb	350	344	346	343	345	339	351	359	6	359	327	319	323	343	35	186	238	275	17	40	55	168	199	175	344.5
19-Feb	118	108	112	116	106	53	28	354	14	334	341	331	295	317	324	327	335	339	344	346	357	356	357	4	350.4
20-Feb	10	3	22	353	313	10	179	140	154	111	146	190	210	194	203	9	23	20	10	338	360	356	355	343	6.3
21-Feb	1	12	14	12	19	7	341	338	327	343	322	318	325	347	5	15	1	5	29	7	339	281	214	205	354.1
22-Feb	212	202	182	178	168	179	188	173	199	186	179	178	212	211	247	289	232	265	325	284	321	198	204	194	212.0
23-Feb	171	4	7	278	339	335	322	309	UO	314	188	201	211	214	183	124	129	139	141	157	171	199	191	164	176.9
24-Feb	154	177	174	165	167	148	174	188	143	141	134	147	182	179	180	169	168	170	187	184	182	180	178	174	170.5
25-Feb	178	176	177	179	134	140	151	146	246	250	246	282	243	201	151	145	131	111	167	172	78	112	147	120	174.8
26-Feb	102	105	104	106	118	67	14	356	353	1	112	75	74	43	45	65	95	61	36	19	8	7	6	13	49.4
27-Feb	16	8	356	353	341	345	340	348	354	351	3	9	349	350	348	4	33	17	13	17	16	13	342	349	359.1
28-Feb	333	339	337	326	332	332	334	337	337	343	329	316	316	272	203	201	244	306	207	175	204	195	193	142	295.4
20.8	23.4	16.2	310.2	289.3	308.6	303.8	319.6	336.8	337.4	338.5	340.8	319.1	330.4	20.3	20.5	30.1	9.6	3.9	354.5	1.3	6.4	343.9	56.1		
Diurnal Average																									

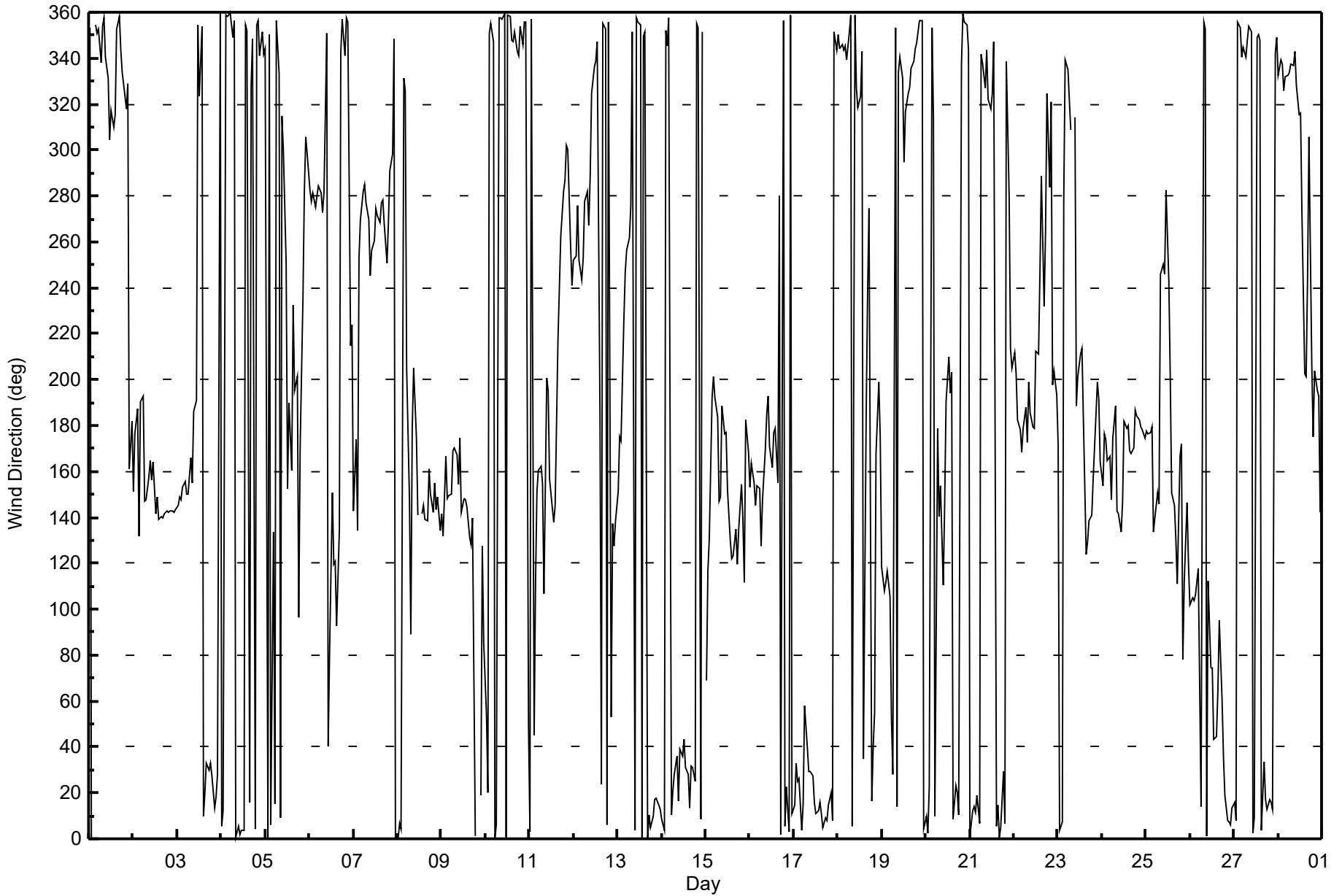
M - Maintenance      UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



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

**Wind Direction (WD) - deg**  
**Mildred Lake - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 95 deg on Feb 28 20:00 Minimum Value: 5 deg on Feb 23 07:00 Percentiles: P <sub>1</sub> = 8 P <sub>10</sub> = 12 Q <sub>1</sub> = 15 Median = 19 Q <sub>3</sub> = 26 P <sub>90</sub> = 43 P <sub>99</sub> = 88																		Hours in Service: 672 Hours of Data: 666 Hours of Missing Data: 6 Hours of Calibration: 0 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-Feb	11	16	UO	15	14	11	11	14	13	15	14	19	12	16	26	17	15	14	17	20	10	42	23	12	42
2-Feb	34	27	19	31	9	15	29	15	19	16	22	16	16	13	15	14	15	13	13	13	13	13	14	12	34
3-Feb	12	11	12	12	13	12	12	14	17	24	25	23	23	20	20	18	18	20	19	27	17	17	19	40	40
4-Feb	18	20	11	13	13	13	12	13	14	14	16	19	16	17	18	32	17	26	15	13	18	14	22	17	32
5-Feb	19	20	33	39	88	29	26	20	43	61	91	72	26	46	43	80	28	71	93	53	80	17	27	22	93
6-Feb	17	17	18	24	21	16	15	17	17	28	28	29	30	34	23	19	43	23	14	81	32	33	86	28	86
7-Feb	80	37	38	47	19	19	17	19	20	25	23	24	23	19	19	17	17	20	24	21	32	19	17	19	80
8-Feb	16	18	21	15	36	62	61	34	28	15	20	18	M	17	17	17	21	32	12	20	19	18	23	13	62
9-Feb	17	12	13	17	12	11	14	17	18	9	26	14	12	12	13	17	15	26	59	UO	UO	72	70	37	72
10-Feb	24	32	11	12	13	17	16	14	14	15	16	16	16	19	15	14	15	15	15	17	17	24	24	63	63
11-Feb	30	75	37	25	26	14	20	22	72	30	20	13	15	16	21	25	24	23	18	17	16	82	38	20	82
12-Feb	26	22	20	25	30	30	19	32	41	16	14	14	23	43	84	30	11	12	19	42	86	52	17	15	86
13-Feb	12	27	37	30	23	22	19	21	28	17	18	16	17	19	16	17	18	20	17	17	19	18	20	21	37
14-Feb	19	18	22	14	15	17	19	21	22	27	25	32	36	21	19	23	19	19	29	20	20	20	81	UO	81
15-Feb	62	24	19	16	19	15	25	36	42	35	28	25	19	20	26	27	16	14	22	14	24	11	26	14	62
16-Feb	25	38	17	12	17	20	51	30	21	15	21	16	16	29	38	69	93	20	15	19	21	15	14	20	93
17-Feb	19	17	17	18	24	27	29	19	21	19	20	27	25	27	20	19	17	17	18	18	18	15	18	21	29
18-Feb	10	12	10	8	10	13	9	13	14	21	13	14	17	39	60	81	44	89	20	10	37	87	11	19	89
19-Feb	17	15	28	46	35	17	21	13	48	35	27	34	42	12	11	12	11	15	13	12	14	13	16	15	48
20-Feb	15	17	21	41	13	33	70	31	29	27	27	19	20	22	75	51	16	14	9	58	10	8	11	11	75
21-Feb	15	16	16	14	16	21	20	16	16	19	16	16	24	28	25	21	18	14	14	11	11	48	30	16	48
22-Feb	12	84	34	20	24	26	15	16	19	14	17	87	53	22	26	23	28	21	37	52	87	43	22	53	87
23-Feb	50	50	13	76	15	15	5	74	UO	90	13	17	23	38	23	27	18	15	14	8	10	20	24	11	90
24-Feb	21	9	14	11	12	14	19	11	21	14	16	18	14	14	13	14	15	13	16	14	14	14	14	15	21
25-Feb	14	14	13	15	33	44	44	52	27	29	24	28	32	28	14	14	15	15	39	55	52	16	16	15	55
26-Feb	12	16	15	11	56	18	20	9	10	18	74	21	19	21	21	24	13	19	24	17	15	14	14	15	74
27-Feb	15	15	13	14	13	13	12	13	13	16	18	20	20	18	15	19	17	18	17	18	18	18	14	13	20
28-Feb	8	24	29	8	7	8	9	15	16	56	18	17	21	37	22	17	39	70	48	95	11	11	14	26	95
80 84 38 76 88 62 70 74 72 90 91 87 53 46 84 81 93 89 93 95 87 87 86 63																									
Diurnal Maximum																									
M - Maintenance UO - Unstable Operation																									





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS03 LOWER CAMP METEOROLOGY FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)  
FEBRUARY 2023

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	622	0	50	92.56	4.3	-	-0.6	-
Temperature 45 m (C) Average	627	0	45	93.3	4.2	-	-0.5	-
Temperature 100 m (C) Average	627	0	45	93.3	4.9	-	-0.2	-
Temperature 163 m (C) Average	627	0	45	93.3	4.6	-	-0.2	-
Relative Humidity 20 m (%) Average	615	0	57	91.52	93.4	-	84.3	-
Relative Humidity 45 m (%) Average	627	0	45	93.3	92.4	-	85.0	-
Relative Humidity 100 m (%) Average	627	0	45	93.3	89.7	-	82.4	-
Relative Humidity 163 m (%) Average	627	0	45	93.3	93.7	-	84.7	-
Wind Speed 20 m (km/h) Average	627	0	45	93.3	28	-	17.0	-
Wind Speed 45 m (km/h) Average	625	0	47	93.01	43	-	24.0	-
Wind Speed 100 m (km/h) Average	624	0	48	92.86	49	-	30.0	-
Wind Speed 163 m (km/h) Average	611	0	61	90.92	48	-	34.0	-
Wind Direction 20 m (deg) Average	627	0	45	93.3	-	-	-	-
Wind Direction 45 m (deg) Average	625	0	47	93.01	-	-	-	-
Wind Direction 100 m (deg) Average	624	0	48	92.86	-	-	-	-
Wind Direction 163 m (deg) Average	611	0	61	90.92	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	627	0	45	93.3	0.3	-	0.0	-
Vertical Wind Speed 45 m (km/h) Average	625	0	47	93.01	1.3	-	0.6	-
Vertical Wind Speed 100 m (km/h) Average	624	0	48	92.86	1.8	-	0.4	-
Vertical Wind Speed 163 m (km/h) Average	611	0	61	90.92	2.8	-	0.9	-

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



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)  
 FEBRUARY 2023

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	622	-15.56	9.4	-	-36.2	-29.3	-22.6	-15.6	-9	-3.3	4.3
Temperature 45 m (C) Average	627	-15.32	9	-	-34	-28	-21.7	-15.6	-9.3	-3	4.2
Temperature 100 m (C) Average	627	-14.76	8.6	-	-31.2	-26	-21.2	-15.6	-8.3	-2	4.9
Temperature 163 m (C) Average	627	-14.49	8.5	-	-30.9	-25.2	-20.9	-15.4	-8.6	-1.4	4.6
Relative Humidity 20 m (%) Average	615	72.49	9.7	-	42.1	59.6	68.7	73.4	79	84	93.4
Relative Humidity 45 m (%) Average	627	73.51	9.9	-	42.6	59.4	69	74.6	80.3	85.6	92.4
Relative Humidity 100 m (%) Average	627	71.05	9.9	-	40.5	56.8	65.8	72.7	77.6	82.4	89.7
Relative Humidity 163 m (%) Average	627	71.73	10.9	-	40.9	55.3	65.2	73.2	79.3	85	93.7
Wind Speed 20 m (km/h) Average	627	7.5	6	-	0	2	3	6	10	17	28
Wind Speed 45 m (km/h) Average	625	10.6	8	-	0	2	5	8	14	21	43
Wind Speed 100 m (km/h) Average	624	13.4	9	-	1	3	7	11	17	27	49
Wind Speed 163 m (km/h) Average	611	16.2	10	-	0	5	9	14	21	31	48
Wind Direction 20 m (deg) Average	627	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	625	-	-	-	-	-	-	-	-	-	-
Wind Direction 100 m (deg) Average	624	-	-	-	-	-	-	-	-	-	-
Wind Direction 163 m (deg) Average	611	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	627	-0.23	0.4	-	-1.9	-0.8	-0.3	-0.1	0	0	0.3
Vertical Wind Speed 45 m (km/h) Average	625	0.02	0.4	-	-2.8	-0.3	-0.1	0	0.2	0.4	1.3
Vertical Wind Speed 100 m (km/h) Average	624	0.03	0.4	-	-1.8	-0.4	-0.1	0.1	0.2	0.4	1.8
Vertical Wind Speed 163 m (km/h) Average	611	0.3	0.4	-	-0.8	-0.1	0	0.2	0.4	0.8	2.8

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	10 Feb 2023 17:00	28 Feb 2023 16:00	45	DAS Failure - data not recorded
Relative Humidity, Temperature at 20m	27 Feb 2023 13:00	27 Feb 2023 17:00	5	Flat line in sensor output signal
Relative Humidity at 20m	21 Feb 2023 11:00	21 Feb 2023 11:00	1	Flat line in sensor output signal
Relative Humidity at 20m	25 Feb 2023 19:00	26 Feb 2023 00:00	6	Flat line in sensor output signal
Wind Speed, Wind Direction, Vertical Wind Speed at 45m	13 Feb 2023 10:00	13 Feb 2023 11:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 100m	13 Feb 2023 10:00	13 Feb 2023 12:00	3	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 163m	13 Feb 2023 09:00	13 Feb 2023 14:00	6	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 163m	18 Feb 2023 09:00	18 Feb 2023 12:00	4	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 163m	18 Feb 2023 14:00	18 Feb 2023 14:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 163m	28 Feb 2023 08:00	28 Feb 2023 12:00	5	Flat line in sensor output signal - Sensor frozen



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

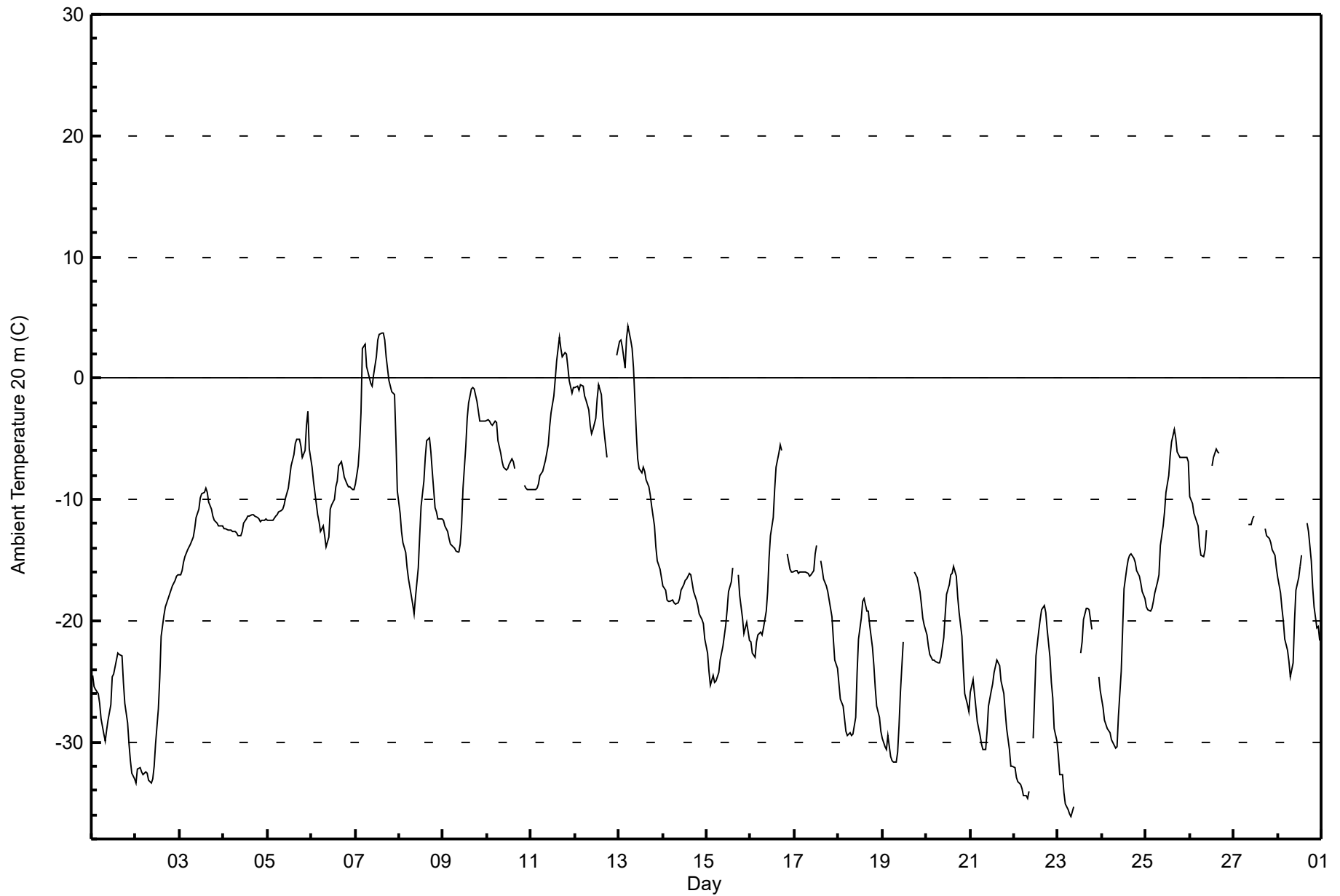
**Ambient Temperature 20 m (AT20m) - C**  
**Lower Camp Met Tower - February 2023**

Maximum Value: 4.3 C on Feb 13 06:00		Maximum Daily Average: -0.6 C on Feb 7		Hours in Service: 672																						
Minimum Value: -36.2 C on Feb 23 08:00		Minimum Daily Average: -27.9 C on Feb 23		Hours of Data: 622																						
Maximum Diurnal Average: -10.6 C at hour 16		Minimum Diurnal Average: -18.9 C at hour 8		Hours of Missing Data: 50																						
Monthly Average: -15.56 C		Percentiles: P <sub>1</sub> = -34.4 P <sub>10</sub> = -29.3 Q <sub>1</sub> = -22.6 Median = -15.6 Q <sub>3</sub> = -9.0 P <sub>90</sub> = -3.3 P <sub>99</sub> = 3.2		Hours of Calibration: 0																						
				Percent Operational Time: 92.6																						
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-Feb	-24.5	-25.5	-25.7	-26.0	-26.8	-28.1	-29.4	-29.9	-29.0	-28.2	-26.9	-24.6	-24.4	-23.3	-22.6	-22.8	-23.0	-25.0	-26.9	-28.4	-30.2	-31.6	-32.5	-33.1	-27.0	-22.6
2-Feb	-33.4	-32.3	-32.1	-32.4	-32.7	-32.5	-32.5	-33.1	-33.4	-33.0	-32.0	-30.2	-27.2	-24.8	-21.3	-19.6	-18.8	-18.5	-17.9	-17.5	-17.1	-16.6	-16.3	-16.3	-25.9	-16.3
3-Feb	-16.2	-15.8	-15.2	-14.7	-14.2	-13.9	-13.7	-13.1	-12.4	-11.5	-10.8	-9.9	-9.5	-9.4	-9.1	-9.5	-10.3	-10.8	-11.4	-11.8	-12.0	-12.2	-12.2	-12.2	-12.2	-9.1
4-Feb	-12.4	-12.4	-12.5	-12.5	-12.5	-12.6	-12.8	-13.0	-13.0	-12.6	-12.0	-11.7	-11.3	-11.4	-11.3	-11.3	-11.3	-11.5	-11.6	-11.8	-11.7	-11.7	-11.6	-11.6	-12.0	-11.3
5-Feb	-11.7	-11.7	-11.7	-11.7	-11.4	-11.3	-11.1	-10.9	-10.8	-10.5	-9.9	-9.0	-8.1	-7.2	-6.3	-5.4	-5.0	-5.0	-5.6	-6.6	-5.9	-3.8	-2.7	-5.8	-8.3	-2.7
6-Feb	-7.3	-8.5	-9.4	-11.3	-11.8	-12.6	-12.2	-13.0	-13.9	-13.2	-10.8	-10.5	-10.0	-9.0	-8.5	-7.3	-6.9	-7.5	-8.2	-8.7	-8.9	-9.0	-9.2	-9.1	-9.9	-6.9
7-Feb	-8.7	-7.2	-5.5	-2.8	2.5	2.8	1.0	0.5	-0.5	-0.7	0.3	1.8	3.2	3.6	3.7	3.1	1.8	-0.2	-0.7	-1.1	-1.3	-5.0	-9.3	-0.6	3.7	
8-Feb	-11.1	-12.6	-13.5	-14.4	-15.7	-16.6	-18.0	-18.7	-19.4	-18.0	-15.6	-13.0	-10.6	-8.5	-6.6	-5.2	-5.0	-6.1	-7.7	-10.7	-11.0	-11.6	-11.6	-12.2	-5.0	
9-Feb	-11.7	-12.2	-12.7	-13.2	-13.7	-13.9	-14.0	-14.3	-14.4	-13.7	-12.1	-9.1	-5.6	-3.3	-2.0	-0.9	-0.7	-0.9	-2.0	-2.7	-3.6	-3.5	-3.5	-3.6	-7.8	-0.7
10-Feb	-3.4	-3.5	-3.8	-3.8	-3.5	-3.7	-5.2	-6.2	-6.9	-7.4	-7.6	-7.5	-7.1	-6.7	-6.9	-7.5	DF	DF	DF	DF	-8.9	-9.1	-9.2	-9.2	-6.3	-3.4
11-Feb	-9.2	-9.2	-9.2	-9.1	-8.7	-8.1	-7.6	-7.2	-6.8	-5.4	-3.9	-2.8	-1.5	-0.1	1.4	3.4	2.5	1.8	2.1	2.0	1.0	-0.2	-1.2	-0.7	-3.2	3.4
12-Feb	-0.7	-0.7	-1.0	-0.6	-0.6	-1.4	-1.8	-2.6	-3.9	-4.6	-4.2	-3.3	-1.7	-0.5	-1.4	-3.2	-4.5	-6.5	DF	DF	DF	DF	DF	1.9	-2.2	1.9
13-Feb	3.1	3.2	2.6	0.9	3.2	4.3	3.2	2.5	0.9	-4.5	-6.7	-7.5	-7.8	-7.3	-7.7	-8.4	-8.9	-9.6	-10.6	-12.2	-13.9	-15.0	-15.8	-16.4	-5.4	4.3
14-Feb	-17.1	-17.5	-18.2	-18.4	-18.4	-18.3	-18.5	-18.6	-18.6	-18.2	-17.5	-17.0	-16.6	-16.6	-16.1	-16.2	-16.9	-17.6	-18.3	-18.8	-19.4	-19.9	-20.2	-21.5	-18.1	-16.1
15-Feb	-22.6	-24.1	-25.4	-24.5	-25.1	-24.9	-24.3	-23.2	-22.7	-22.1	-20.4	-19.1	-17.6	-16.8	-15.6	DF	DF	-16.3	-17.9	-19.8	-21.1	-20.6	-20.1	-21.7	-21.2	-15.6
16-Feb	-21.7	-22.7	-23.0	-21.8	-21.2	-20.9	-21.1	-20.6	-19.2	-17.5	-14.8	-13.0	-11.5	-9.1	-7.3	-6.2	-5.5	-6.0	DF	DF	-14.5	-15.7	-16.0	-16.0	-15.7	-5.5
17-Feb	-15.9	-15.9	-16.0	-16.0	-16.0	-16.0	-16.0	-16.1	-16.3	-16.2	-15.8	-14.5	-13.8	DF	-15.1	-15.8	-16.6	-17.2	-17.6	-18.3	-19.7	-21.6	-23.3	-24.0	-17.1	-13.8
18-Feb	-25.2	-26.5	-27.0	-28.1	-29.1	-29.4	-29.3	-29.5	-29.4	-28.0	-24.2	-21.5	-19.8	-18.4	-18.2	-19.2	-19.2	-20.4	-22.2	-23.7	-25.5	-27.1	-28.0	-29.2	-24.9	-18.2
19-Feb	-29.7	-30.4	-30.6	-29.5	-31.2	-31.6	-31.7	-31.6	-30.8	-28.7	-25.8	-21.7	DF	DF	DF	DF	DF	-16.0	-16.2	-16.5	-17.6	-18.6	-19.7	-20.4	-25.2	-16.0
20-Feb	-21.2	-22.1	-22.8	-23.2	-23.2	-23.4	-23.5	-23.5	-23.0	-21.4	-19.6	-17.8	-17.1	-16.3	-16.1	-15.6	-16.4	-18.0	-19.3	-21.3	-24.0	-26.0	-27.0	-27.5	-21.2	-15.6
21-Feb	-25.9	-24.9	-26.0	-27.2	-28.3	-29.5	-30.2	-30.7	-30.6	-29.2	-27.1	-25.8	-25.2	-24.2	-23.2	-23.5	-23.7	-25.0	-26.0	-27.5	-28.9	-30.6	-32.0	-32.0	-27.4	-23.2
22-Feb	-32.1	-32.9	-33.3	-33.5	-33.8	-34.4	-34.4	-34.6	-34.1	DF	-29.7	-26.4	-22.9	-20.8	-19.9	-19.1	-18.7	-19.4	-20.8	-23.0	-25.1	-26.3	-28.8	-29.9	-27.6	-18.7
23-Feb	-31.1	-32.7	-32.7	-34.2	-35.1	-35.6	-35.9	-36.2	-35.3	DF	DF	DF	-22.7	-21.7	-20.0	-18.9	-19.0	-19.1	-20.7	DF	DF	DF	-24.7	-25.8	-27.9	-18.9
24-Feb	-27.2	-28.2	-28.6	-28.9	-29.3	-29.8	-30.0	-30.5	-30.4	-27.8	-24.2	-20.7	-17.3	-15.6	-15.0	-14.6	-14.5	-14.9	-15.1	-15.9	-16.3	-16.9	-17.6	-18.1	-22.0	-14.5
25-Feb	-18.8	-19.1	-19.2	-19.0	-18.5	-17.7	-16.8	-16.2	-13.8	-12.1	-11.1	-9.4	-8.0	-6.4	-5.3	-4.3	-5.0	-6.0	-6.5	-6.5	-6.5	-6.5	-6.5	-6.9	-11.1	-4.3
26-Feb	-9.8	-10.4	-11.1	-11.5	-12.2	-13.8	-14.6	-14.7	-14.1	-12.5	DF	DF	-7.2	-6.5	-5.9	-6.0	-6.2	DF	DF	DF	DF	DF	DF	DF	--	-5.9
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	-12.1	-12.1	-11.7	-11.4	UO	UO	UO	UO	UO	-12.5	-13.0	-13.3	-13.6	-14.1	-14.6	-15.6	--	-11.4
28-Feb	-16.4	-17.7	-19.0	-20.0	-21.5	-22.4	-23.4	-24.6	-23.5	-20.0	-17.5	-16.4	-15.6	-14.6	DF	DF	-11.9	-12.7	-15.1	-17.3	-18.9	-20.6	-20.5	-21.6	-18.7	-11.9
																								Diurnal Average		
																								Diurnal Maximum		
-17.1 -17.5 -17.9 -18.1 -18.1 -18.3 -18.7 -18.9 -18.5 -16.5 -15.9 -14.3 -13.0 -11.8 -11.1 -10.6 -10.9 -12.3 -13.7 -14.4 -15.0 -15.6 -16.5 -16.6																								3.1 3.2 2.6 0.9 3.2 4.3 3.2 2.5 0.9 -0.7 0.3 1.8 3.2 3.6 3.7 3.7 3.1 1.8 2.1 2.0 1.0 -0.2 -1.2 1.9		
DF - DAS Failure																								UO - Unstable Operation		



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

**Ambient Temperature 20 m (AT20m) - C**  
**Lower Camp Met Tower - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 20 m (AT20m) - C  
Lower Camp Met Tower - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	192	30.87	30.87
-20 - 0	401	64.47	95.34
0 - 10	29	4.66	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 622

Total Number of Hours: 672



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

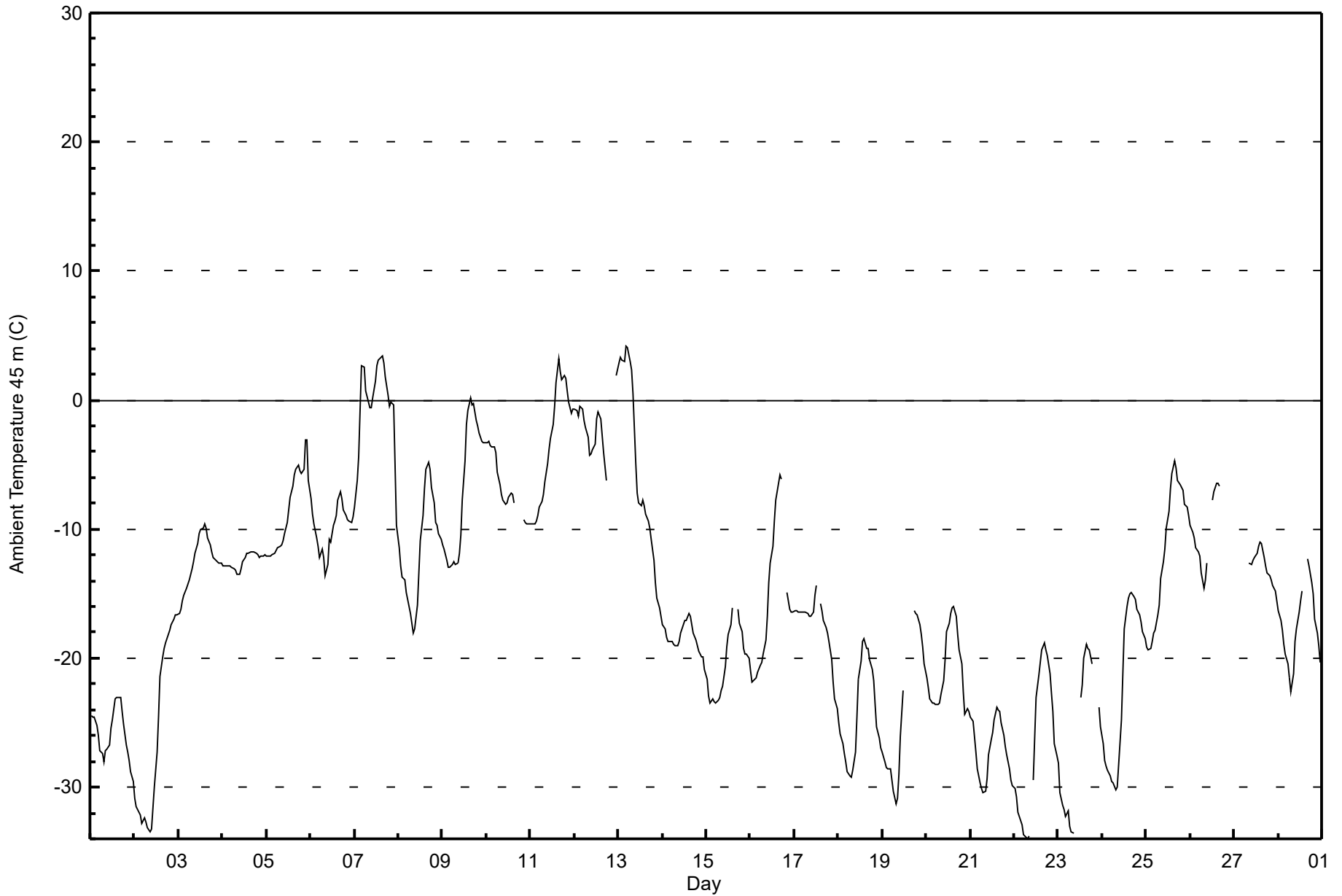
**Ambient Temperature 45 m (AT45m) - C**  
**Lower Camp Met Tower - February 2023**

Maximum Value: 4.2 C on Feb 13 05:00		Maximum Daily Average: -0.5 C on Feb 7		Hours in Service: 672																						
Minimum Value: -34.0 C on Feb 22 08:00		Minimum Daily Average: -27.1 C on Feb 21		Hours of Data: 627																						
Maximum Diurnal Average: -10.8 C at hour 16		Minimum Diurnal Average: -18.5 C at hour 8		Hours of Missing Data: 45																						
Monthly Average: -15.32 C		Percentiles: P <sub>1</sub> = -33.4 P <sub>10</sub> = -28.0 Q <sub>1</sub> = -21.7 Median = -15.6 Q <sub>3</sub> = -9.3 P <sub>90</sub> = -3.0 P <sub>99</sub> = 3.1		Hours of Calibration: 0																						
				Percent Operational Time: 93.3																						
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-Feb	-24.5	-24.5	-24.5	-25.2	-25.9	-27.2	-27.4	-28.0	-27.2	-27.1	-26.8	-25.5	-24.8	-23.2	-23.1	-23.1	-23.0	-24.1	-25.1	-26.7	-27.2	-27.9	-28.8	-29.6	-25.9	-23.0
2-Feb	-30.8	-31.5	-31.9	-32.2	-32.8	-32.4	-32.7	-33.1	-33.5	-33.2	-31.6	-29.9	-27.3	-24.6	-21.4	-19.9	-19.2	-18.8	-18.2	-17.9	-17.5	-17.0	-16.7	-16.6	-25.9	-16.6
3-Feb	-16.6	-16.2	-15.6	-15.1	-14.6	-14.3	-13.9	-13.0	-12.5	-11.9	-11.1	-10.3	-10.0	-9.9	-9.6	-10.0	-10.7	-11.2	-11.8	-12.2	-12.4	-12.5	-12.6	-12.6	-12.5	-9.6
4-Feb	-12.8	-12.8	-12.9	-12.9	-12.9	-13.0	-13.0	-13.2	-13.5	-13.5	-13.1	-12.5	-11.8	-11.9	-11.7	-11.7	-11.7	-11.9	-12.0	-12.2	-12.2	-12.1	-12.1	-12.0	-12.5	-11.7
5-Feb	-12.1	-12.1	-12.1	-12.0	-11.8	-11.7	-11.5	-11.3	-11.2	-10.9	-10.3	-9.5	-8.5	-7.6	-6.7	-5.8	-5.3	-5.0	-5.5	-5.7	-5.3	-3.0	-3.0	-6.3	-8.5	-3.0
6-Feb	-7.7	-8.8	-9.6	-10.7	-11.3	-12.2	-11.6	-12.2	-13.6	-12.7	-10.8	-11.0	-9.7	-9.4	-9.0	-7.8	-7.1	-7.6	-8.5	-9.0	-9.3	-9.4	-9.5	-9.0	-9.9	-7.1
7-Feb	-8.3	-6.2	-4.4	-0.8	2.7	2.6	0.7	0.3	-0.6	-0.6	0.1	1.4	2.7	3.2	3.3	3.4	2.9	1.8	0.4	-0.4	-0.1	-0.4	-5.0	-9.7	-0.5	3.4
8-Feb	-11.4	-12.9	-13.7	-14.0	-14.9	-15.4	-16.6	-17.3	-18.0	-17.7	-15.9	-13.4	-10.9	-8.9	-6.9	-5.4	-4.9	-5.4	-6.8	-8.0	-9.4	-9.8	-10.4	-10.7	-11.6	-4.9
9-Feb	-11.2	-11.5	-12.4	-13.0	-13.0	-12.8	-12.5	-12.7	-12.7	-11.9	-10.5	-7.8	-4.7	-1.9	-0.8	0.2	-0.4	-0.2	-1.5	-2.0	-2.5	-3.2	-3.3	-3.3	-6.9	0.2
10-Feb	-3.3	-3.2	-3.5	-3.6	-3.6	-4.1	-5.6	-6.6	-7.3	-7.8	-8.0	-8.0	-7.5	-7.2	-7.3	-7.9	DF	DF	DF	DF	-9.3	-9.5	-9.6	-9.5	-6.6	-3.2
11-Feb	-9.6	-9.5	-9.6	-9.4	-8.9	-8.3	-7.9	-7.3	-6.4	-4.9	-3.8	-3.0	-1.8	-0.5	1.4	3.2	2.2	1.5	1.9	1.7	0.7	-0.2	-1.0	-0.6	-3.3	3.2
12-Feb	-0.7	-0.8	-1.2	-0.5	-0.6	-1.6	-2.1	-2.9	-4.2	-4.2	-3.9	-3.4	-1.4	-1.0	-1.4	-2.8	-4.1	-6.2	DF	DF	DF	DF	DF	1.9	-2.2	1.9
13-Feb	2.9	3.3	3.1	2.9	4.2	4.1	3.0	2.3	0.5	-5.0	-7.2	-7.9	-8.2	-7.8	-8.2	-8.8	-9.4	-10.0	-10.8	-12.5	-14.2	-15.3	-16.1	-16.8	-5.5	4.2
14-Feb	-17.4	-17.8	-18.4	-18.7	-18.7	-18.7	-18.9	-19.0	-19.0	-18.7	-18.0	-17.4	-17.1	-17.1	-16.6	-16.8	-17.4	-18.0	-18.6	-19.0	-19.5	-19.9	-19.9	-20.8	-18.4	-16.6
15-Feb	-21.7	-22.9	-23.5	-23.2	-23.4	-23.4	-23.3	-23.0	-22.5	-22.2	-20.7	-19.1	-18.2	-17.4	-16.1	DF	DF	-16.2	-17.3	-17.9	-19.2	-19.7	-19.7	-20.0	-20.5	-16.1
16-Feb	-21.0	-21.8	-21.6	-21.5	-21.1	-20.6	-20.3	-19.7	-18.6	-16.8	-14.1	-12.6	-11.3	-9.4	-7.7	-6.5	-5.8	-6.1	DF	DF	-15.0	-16.2	-16.4	-16.4	-15.5	-5.8
17-Feb	-16.3	-16.4	-16.5	-16.5	-16.4	-16.4	-16.4	-16.6	-16.7	-16.7	-16.4	-15.1	-14.3	DF	-15.7	-16.3	-17.1	-17.6	-18.0	-18.7	-20.1	-21.8	-23.1	-23.9	-17.5	-14.3
18-Feb	-25.0	-25.9	-26.7	-27.3	-28.1	-28.8	-29.1	-29.3	-28.7	-27.3	-24.6	-21.6	-20.2	-18.7	-18.5	-19.3	-19.3	-20.1	-20.9	-21.7	-23.5	-25.3	-26.2	-26.9	-24.3	-18.5
19-Feb	-27.3	-28.0	-28.5	-28.6	-28.6	-29.4	-30.3	-31.3	-30.8	-29.0	-26.1	-22.5	DF	DF	DF	DF	DF	-16.3	-16.5	-16.7	-17.4	-18.2	-19.1	-20.5	-24.5	-16.3
20-Feb	-21.5	-22.3	-23.1	-23.5	-23.4	-23.6	-23.6	-23.5	-22.9	-21.8	-20.1	-17.9	-17.3	-16.5	-16.1	-16.0	-16.7	-18.2	-19.4	-20.4	-22.7	-24.3	-23.9	-24.1	-20.9	-16.0
21-Feb	-24.6	-24.9	-26.1	-27.2	-28.6	-29.7	-30.1	-30.4	-30.3	-29.3	-27.5	-26.3	-25.8	-24.8	-23.8	-24.1	-24.1	-25.0	-26.0	-26.8	-27.5	-28.6	-29.5	-29.9	-27.1	-23.8
22-Feb	-30.1	-30.7	-32.0	-32.6	-32.9	-33.7	-33.8	-34.0	-33.8	DF	-29.4	-26.2	-23.0	-21.3	-20.3	-19.3	-18.8	-19.3	-19.8	-21.2	-22.7	-24.2	-26.6	-27.6	-26.7	-18.8
23-Feb	-28.2	-30.5	-31.4	-31.7	-32.3	-31.8	-33.0	-33.5	-33.6	DF	DF	DF	-23.0	-22.0	-20.0	-18.9	-19.3	-19.3	-20.4	DF	DF	DF	-23.9	-25.3	-26.6	-18.9
24-Feb	-26.7	-27.9	-28.3	-28.7	-29.1	-29.5	-29.6	-30.2	-30.0	-28.2	-24.8	-21.2	-17.7	-16.0	-15.4	-15.0	-14.9	-15.2	-15.5	-16.2	-16.7	-17.2	-17.9	-18.5	-22.1	-14.9
25-Feb	-19.2	-19.4	-19.3	-18.7	-18.0	-17.9	-16.6	-15.9	-13.8	-12.6	-11.6	-10.0	-8.6	-6.9	-5.7	-4.7	-5.3	-6.3	-6.6	-6.7	-7.0	-8.0	-8.3	-9.0	-11.5	-4.7
26-Feb	-9.8	-10.3	-10.7	-11.4	-11.8	-12.1	-13.4	-14.5	-14.0	-12.7	DF	DF	-7.7	-7.1	-6.4	-6.5	-6.6	DF	DF	DF	DF	DF	DF	DF	--	-6.4
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	-12.6	-12.7	-12.4	-12.2	-11.9	-11.3	-11.0	-11.2	-12.2	-12.9	-13.4	-13.6	-13.9	-14.4	-14.8	-15.6	--	-11.0
28-Feb	-16.4	-17.0	-17.8	-18.9	-19.7	-20.4	-21.5	-22.6	-21.2	-18.8	-17.7	-16.4	-15.6	-14.8	DF	DF	-12.3	-12.9	-14.2	-15.1	-17.0	-18.0	-19.0	-20.3	-17.6	-12.3
																								Diurnal Average		
																								Diurnal Maximum		
-16.7 -17.1 -17.5 -17.6 -17.6 -17.9 -18.2 -18.5 -18.2 -16.5 -16.0 -14.6 -13.2 -12.1 -11.3 -10.8 -11.2 -12.3 -13.5 -13.9 -14.4 -15.0 -16.0 -16.1																								2.9 3.3 3.1 2.9 4.2 4.1 3.0 2.3 0.5 -0.6 0.1 1.4 2.7 3.2 3.3 3.4 2.9 1.8 1.9 1.7 0.7 -0.2 -1.0 1.9		
DF - DAS Failure																										



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

**Ambient Temperature 45 m (AT45m) - C**  
**Lower Camp Met Tower - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 45 m (AT45m) - C  
Lower Camp Met Tower - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	187	29.82	29.82
-20 - 0	409	65.23	95.06
0 - 10	31	4.94	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 627

Total Number of Hours: 672





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

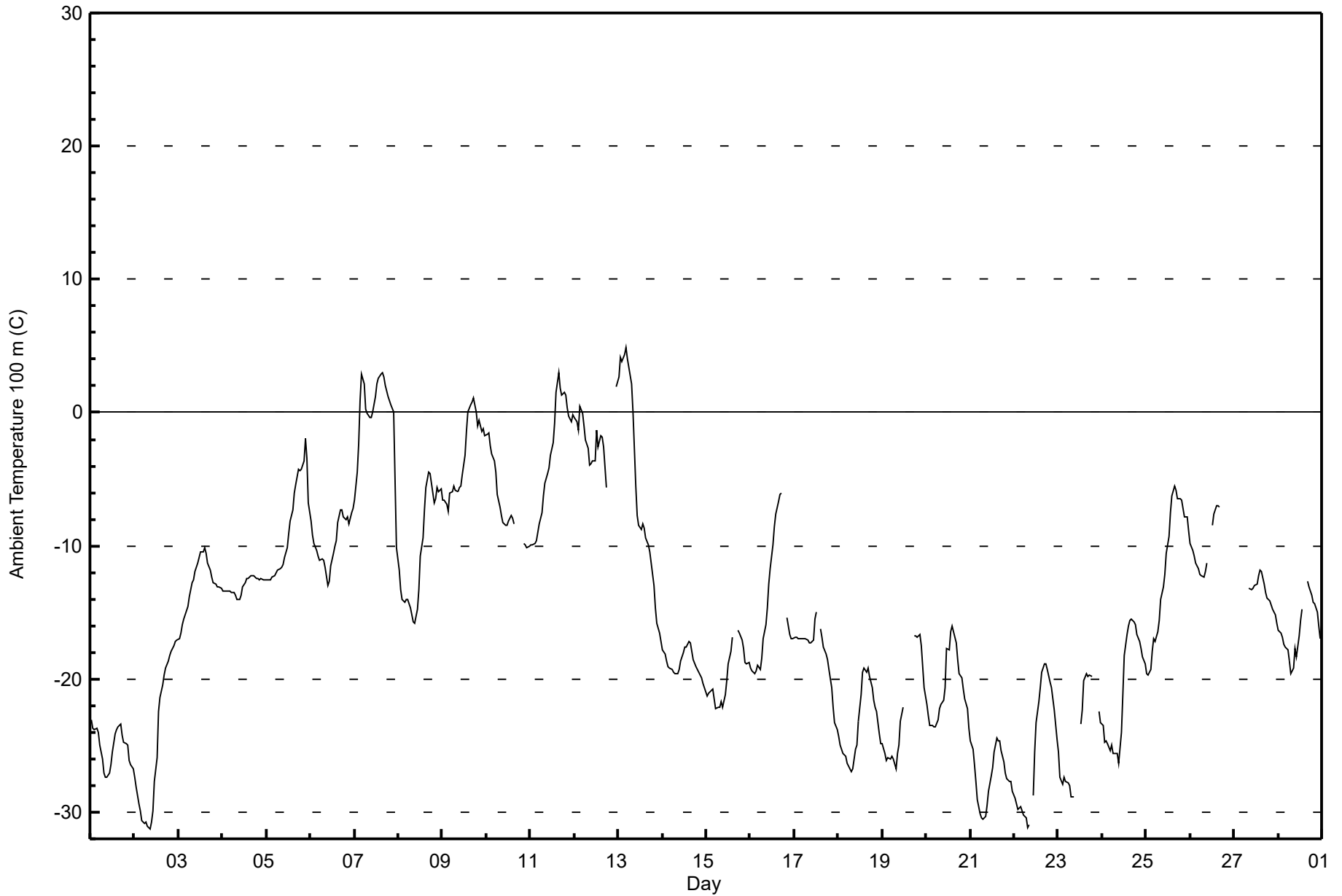
**Ambient Temperature 100 m (AT100m) - C**  
**Lower Camp Met Tower - February 2023**

Maximum Value: 4.9 C on Feb 13 05:00      Maximum Daily Average: -0.2 C on Feb 7																						Hours in Service:	672																							
Minimum Value: -31.2 C on Feb 2 09:00      Minimum Daily Average: -27.3 C on Feb 21																						Hours of Data:	627																							
Maximum Diurnal Average: -11.2 C at hour 16      Minimum Diurnal Average: -17.0 C at hour 8																						Hours of Missing Data:	45																							
Monthly Average: -14.76 C      Percentiles: P <sub>1</sub> = -30.7 P <sub>10</sub> = -26.0 Q <sub>1</sub> = -21.2 Median = -15.6 Q <sub>3</sub> = -8.3 P <sub>90</sub> = -2.0 P <sub>99</sub> = 3.0																						Hours of Calibration:	0																							
																						Percent Operational Time:	93.3																							
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-Feb	-23.1	-23.7	-23.8	-23.7	-24.0	-24.9	-26.1	-27.0	-27.4	-27.4	-27.1	-26.4	-25.5	-24.1	-23.8	-23.6	-23.4	-24.2	-24.7	-24.8	-25.0	-26.1	-26.4	-26.7	-25.1	-23.1																				
2-Feb	-27.4	-28.1	-29.4	-29.9	-30.6	-30.8	-30.7	-31.0	-31.2	-30.7	-29.9	-27.7	-25.9	-22.4	-21.3	-20.4	-19.7	-19.2	-18.6	-18.3	-17.9	-17.5	-17.2	-17.1	-24.7	-17.1																				
3-Feb	-17.0	-16.6	-16.0	-15.5	-14.9	-14.6	-13.8	-12.8	-12.6	-11.9	-11.2	-10.8	-10.5	-10.5	-10.2	-10.5	-11.3	-11.8	-12.4	-12.7	-12.9	-13.1	-13.1	-13.2	-12.9	-10.2																				
4-Feb	-13.4	-13.4	-13.4	-13.4	-13.4	-13.5	-13.5	-13.7	-14.0	-14.0	-13.7	-13.1	-12.7	-12.4	-12.5	-12.2	-12.3	-12.4	-12.4	-12.4	-12.6	-12.4	-12.6	-12.5	-13.0	-12.2																				
5-Feb	-12.6	-12.6	-12.5	-12.3	-12.2	-12.0	-11.8	-11.7	-11.6	-11.4	-10.9	-10.1	-9.1	-8.1	-7.3	-6.1	-5.4	-4.3	-4.3	-4.3	-3.6	-1.9	-3.5	-6.8	-8.6	-1.9																				
6-Feb	-8.2	-9.2	-9.8	-10.3	-10.8	-11.1	-11.0	-11.1	-11.6	-12.9	-12.6	-11.5	-10.5	-10.1	-9.6	-8.3	-7.3	-7.3	-7.9	-8.1	-7.8	-8.4	-7.5	-7.2	-9.6	-7.2																				
7-Feb	-6.6	-4.5	-2.4	0.9	2.9	2.2	0.3	-0.1	-0.4	-0.4	0.1	1.2	2.2	2.6	2.9	3.0	2.6	2.1	1.2	0.9	0.6	0.0	-5.1	-10.1	-0.2	3.0																				
8-Feb	-11.9	-13.3	-14.1	-14.2	-14.1	-14.0	-14.6	-15.2	-15.7	-15.8	-14.8	-13.2	-10.8	-9.4	-7.3	-5.6	-4.5	-4.6	-5.3	-6.8	-6.4	-5.6	-5.9	-5.7	-10.4	-4.5																				
9-Feb	-6.5	-6.6	-6.9	-7.4	-6.0	-6.0	-5.5	-5.8	-5.9	-5.6	-5.6	-4.7	-3.2	-1.4	0.0	0.6	0.8	1.1	0.0	-1.0	-0.5	-1.4	-1.2	-1.8	-3.4	1.1																				
10-Feb	-1.6	-1.5	-2.5	-3.1	-3.6	-4.5	-6.1	-7.1	-7.7	-8.2	-8.5	-8.5	-8.1	-7.8	-7.9	-8.3	DF	DF	DF	DF	-9.8	-9.9	-10.1	-10.0	-6.7	-1.5																				
11-Feb	-9.9	-10.0	-9.9	-9.6	-9.0	-8.4	-7.5	-6.2	-5.3	-4.5	-4.1	-3.2	-2.2	-0.7	1.5	3.0	1.9	1.3	1.5	1.3	0.4	-0.3	-0.7	-0.1	-3.4	3.0																				
12-Feb	-0.3	-0.7	-1.3	0.5	0.0	-1.0	-2.0	-2.7	-4.0	-3.9	-3.6	-3.6	-1.3	-2.6	-1.7	-1.9	-2.6	-5.6	DF	DF	DF	DF	DF	2.0	-1.9	2.0																				
13-Feb	2.7	4.1	3.8	4.4	4.9	4.1	2.8	2.1	0.0	-5.5	-7.7	-8.5	-8.7	-8.3	-8.7	-9.4	-9.9	-10.4	-11.2	-12.9	-14.6	-15.8	-16.5	-17.2	-5.7	4.9																				
14-Feb	-17.8	-18.2	-18.6	-19.1	-19.1	-19.3	-19.5	-19.5	-19.6	-19.3	-18.6	-18.1	-17.6	-17.6	-17.2	-17.3	-17.9	-18.6	-19.1	-19.3	-19.5	-19.9	-20.3	-20.7	-18.8	-17.2																				
15-Feb	-21.3	-21.0	-20.9	-20.8	-21.5	-22.2	-22.1	-21.7	-22.1	-21.2	-20.1	-18.8	-17.9	-16.9	DF	DF	-16.4	-16.6	-17.1	-17.7	-18.7	-18.9	-18.8	-19.8	-19.8	-16.4																				
16-Feb	-19.2	-19.4	-19.6	-19.4	-18.9	-19.3	-18.4	-17.0	-15.9	-14.7	-12.9	-11.7	-9.9	-8.6	-7.7	-6.7	-6.1	-6.1	DF	DF	-15.4	-16.7	-17.0	-17.0	-14.4	-6.1																				
17-Feb	-16.9	-16.9	-17.0	-17.0	-17.0	-16.9	-17.0	-17.1	-17.3	-17.3	-17.0	-15.6	-15.0	DF	-16.2	-16.9	-17.6	-18.2	-18.6	-19.3	-20.6	-22.1	-23.3	-23.8	-18.0	-15.0																				
18-Feb	-24.4	-25.0	-25.6	-25.7	-25.8	-26.4	-26.7	-26.9	-26.8	-25.3	-25.0	-23.2	-21.2	-19.5	-19.1	-19.5	-19.2	-19.8	-20.7	-21.6	-22.1	-22.5	-24.1	-24.9	-23.4	-19.1																				
19-Feb	-24.9	-25.5	-26.1	-25.9	-26.0	-25.8	-26.0	-26.8	-25.6	-24.9	-23.2	-22.1	DF	DF	DF	DF	DF	-16.7	-16.8	-16.9	-16.7	-17.5	-19.1	-20.6	-22.5	-16.7																				
20-Feb	-21.9	-22.8	-23.5	-23.5	-23.6	-23.6	-23.1	-22.3	-21.9	-21.6	-20.6	-17.7	-17.8	-16.4	-16.0	-16.5	-17.3	-18.6	-19.6	-19.9	-20.7	-21.4	-22.2	-23.7	-20.7	-16.0																				
21-Feb	-24.6	-25.3	-26.5	-27.7	-29.0	-30.1	-30.4	-30.6	-30.4	-29.4	-28.4	-27.3	-26.7	-25.5	-24.4	-24.7	-24.6	-25.4	-26.2	-27.1	-27.5	-27.7	-27.7	-28.5	-27.3	-24.4																				
22-Feb	-28.9	-29.4	-29.8	-29.5	-29.9	-30.2	-30.5	-31.1	-30.9	DF	-28.7	-25.5	-23.3	-21.7	-20.6	-19.4	-18.8	-18.9	-19.3	-20.2	-20.7	-21.5	-22.3	-24.5	-25.0	-18.8																				
23-Feb	-25.5	-27.4	-27.9	-27.4	-27.7	-27.8	-28.0	-28.9	-28.9	DF	DF	DF	-23.3	-22.3	-20.1	-19.6	-19.8	-19.7	-19.8	DF	DF	DF	-22.4	-23.2	-24.4	-19.6																				
24-Feb	-23.5	-24.7	-24.7	-24.8	-25.4	-24.9	-25.6	-25.6	-25.6	-26.4	-24.0	-21.2	-18.3	-16.7	-16.0	-15.6	-15.5	-15.7	-15.9	-16.6	-17.2	-17.7	-18.3	-18.9	-20.8	-15.5																				
25-Feb	-19.6	-19.7	-19.3	-17.9	-17.0	-17.1	-16.5	-15.6	-14.1	-13.1	-12.1	-10.6	-9.3	-7.5	-6.3	-5.5	-5.8	-6.5	-6.4	-6.5	-7.2	-7.8	-7.8	-8.8	-11.6	-5.5																				
26-Feb	-9.9	-10.4	-10.8	-11.3	-11.7	-12.1	-12.3	-12.4	-11.9	-11.3	DF	DF	-8.5	-7.6	-7.0	-7.0	-7.1	DF	DF	DF	DF	DF	DF	DF	--	-7.0																				
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	-13.1	-13.3	-13.2	-13.0	-12.8	-12.3	-11.8	-11.9	-12.9	-13.5	-14.0	-14.2	-14.4	-14.8	-15.2	-15.8	--	-11.8																				
28-Feb	-16.3	-16.6	-16.9	-17.4	-17.6	-17.8	-18.7	-19.6	-19.2	-17.7	-18.3	-16.7	-15.6	-14.7	DF	DF	-12.7	-13.1	-13.7	-14.3	-14.3	-14.9	-16.0	-16.9	-16.3	-12.7																				
																						-15.9	-16.2	-16.5	-16.3	-16.3	-16.6	-16.8	-17.0	-16.8	-15.7	-15.9	-14.7	-13.5	-12.4	-11.7	-11.2	-11.5	-12.4	-13.4	-13.6	-13.8	-14.2	-15.2	-15.3	Diurnal Average
																						2.7	4.1	3.8	4.4	4.9	4.1	2.8	2.1	0.0	-0.4	0.1	1.2	2.2	2.6	2.9	3.0	2.6	2.1	1.5	1.3	0.6	0.0	-0.7	2.0	Diurnal Maximum
DF - DAS Failure																																														



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

**Ambient Temperature 100 m (AT100m) - C**  
**Lower Camp Met Tower - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 100 m (AT100m) - C  
Lower Camp Met Tower - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	174	27.75	27.75
-20 - 0	414	66.03	93.78
0 - 10	39	6.22	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 627

Total Number of Hours: 672

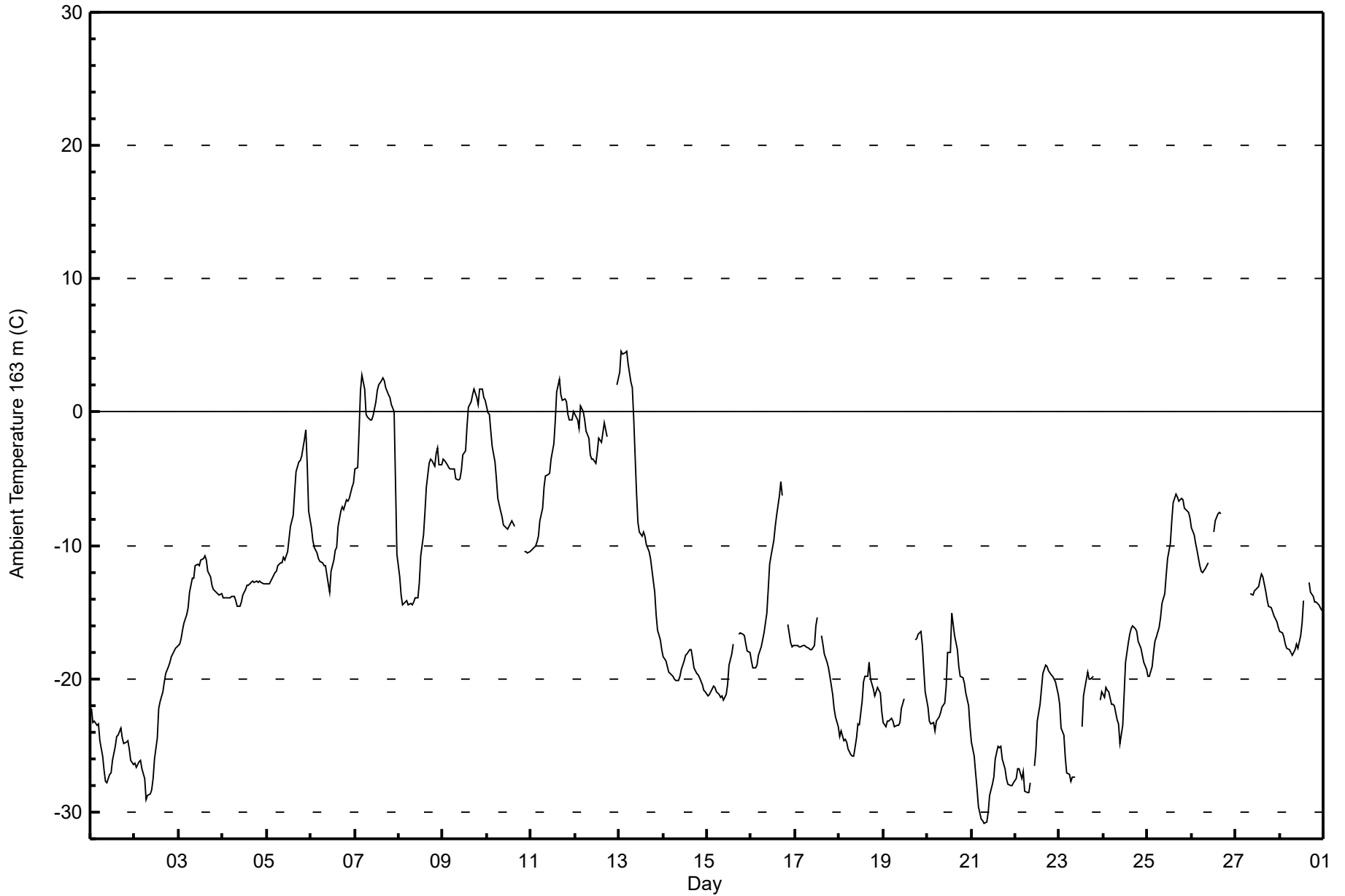


Maximum Value: 4.6 C on Feb 13 05:00																						Maximum Daily Average: -0.2 C on Feb 7																						Hours in Service: 672	
Minimum Value: -30.9 C on Feb 21 08:00																						Minimum Daily Average: -27.7 C on Feb 21																						Hours of Data: 627	
Maximum Diurnal Average: -11.5 C at hour 16																						Minimum Diurnal Average: -16.3 C at hour 8																						Hours of Missing Data: 45	
Monthly Average: -14.49 C																						Percentiles: P <sub>1</sub> = -29.0 P <sub>10</sub> = -25.2 Q <sub>1</sub> = -20.9 Median = -15.4 Q <sub>3</sub> = -8.6 P <sub>90</sub> = -1.4 P <sub>99</sub> = 2.7																						Hours of Calibration: 0	
																																												Percent Operational Time: 93.3	
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-Feb	-22.3	-23.3	-23.2	-23.5	-23.4	-24.6	-25.8	-26.9	-27.7	-27.8	-27.2	-27.1	-26.1	-25.0	-24.3	-24.2	-23.7	-24.4	-24.8	-24.7	-24.6	-25.3	-26.1	-26.4	-25.1	-22.3																			
2-Feb	-26.3	-26.6	-26.3	-26.1	-26.7	-27.5	-29.0	-28.8	-28.7	-28.3	-27.5	-26.0	-24.4	-22.2	-21.7	-20.9	-20.2	-19.6	-19.1	-18.7	-18.4	-18.0	-17.7	-17.6	-23.6	-17.6																			
3-Feb	-17.4	-17.0	-16.4	-15.8	-15.1	-14.6	-13.5	-12.4	-12.5	-11.5	-11.4	-11.5	-11.1	-11.0	-10.8	-11.1	-11.9	-12.4	-13.0	-13.3	-13.5	-13.7	-13.7	-13.7	-13.3	-10.8																			
4-Feb	-13.9	-14.0	-13.9	-13.9	-13.9	-13.9	-13.8	-14.2	-14.5	-14.5	-14.2	-13.7	-13.3	-13.0	-13.0	-12.8	-12.7	-12.8	-12.7	-12.7	-12.8	-12.8	-12.9	-12.9	-13.4	-12.7																			
5-Feb	-12.8	-12.8	-12.7	-12.5	-12.0	-12.0	-11.5	-11.3	-11.3	-10.9	-11.1	-10.4	-9.5	-8.6	-7.7	-6.0	-4.5	-3.7	-3.6	-3.3	-2.1	-1.3	-3.9	-7.4	-8.5	-1.3																			
6-Feb	-8.7	-9.6	-10.2	-10.6	-11.0	-11.2	-11.3	-11.5	-11.5	-12.8	-13.5	-11.9	-11.1	-10.3	-10.1	-8.6	-7.4	-7.1	-7.3	-6.6	-6.7	-6.5	-5.6	-5.3	-9.4	-5.3																			
7-Feb	-4.3	-4.2	-1.5	1.7	2.8	1.7	-0.2	-0.4	-0.6	-0.6	-0.3	0.8	1.6	2.1	2.4	2.5	2.3	1.8	1.3	1.1	0.6	0.0	-5.3	-10.7	-0.2	2.8																			
8-Feb	-12.3	-13.8	-14.4	-14.3	-14.1	-14.4	-14.3	-14.5	-14.3	-13.9	-14.0	-12.8	-10.8	-9.2	-7.6	-5.6	-3.9	-3.5	-3.6	-4.1	-3.1	-2.7	-4.0	-3.9	-9.5	-2.7																			
9-Feb	-3.5	-3.6	-3.9	-4.1	-4.3	-4.2	-4.3	-5.0	-5.1	-5.0	-4.3	-3.2	-2.9	-1.1	0.4	0.8	1.3	1.8	1.1	0.6	1.7	1.7	1.1	0.9	-1.8	1.8																			
10-Feb	-0.1	-0.2	-1.4	-2.6	-3.7	-5.0	-6.5	-7.4	-7.8	-8.5	-8.7	-8.8	-8.5	-8.2	-8.4	-8.6	DF	DF	DF	DF	-10.4	-10.4	-10.5	-10.4	-6.8	-0.1																			
11-Feb	-10.3	-10.2	-10.0	-9.7	-9.3	-8.1	-7.2	-5.6	-4.8	-4.7	-4.6	-3.6	-2.3	-0.7	1.5	2.5	1.3	0.8	1.0	0.8	-0.1	-0.6	-0.6	0.0	-3.5	2.5																			
12-Feb	-0.1	-0.5	-1.2	0.5	0.0	-0.5	-1.4	-2.0	-3.2	-3.5	-3.5	-3.8	-3.0	-2.0	-2.3	-1.5	-0.8	-1.9	DF	DF	DF	DF	DF	2.0	-1.5	2.0																			
13-Feb	3.0	4.5	4.3	4.5	4.6	3.6	2.2	1.8	-0.5	-6.1	-8.3	-9.0	-9.3	-8.9	-9.3	-10.0	-10.5	-11.0	-11.8	-13.5	-15.2	-16.3	-17.1	-17.8	-6.1	4.6																			
14-Feb	-18.3	-18.7	-19.1	-19.5	-19.6	-19.8	-20.0	-20.1	-20.1	-19.9	-19.3	-18.6	-18.2	-18.1	-17.8	-17.9	-18.5	-19.1	-19.6	-19.7	-19.9	-20.4	-20.9	-21.0	-19.3	-17.8																			
15-Feb	-21.3	-21.2	-21.0	-20.6	-20.7	-20.9	-21.2	-21.4	-21.3	-21.6	-21.2	-20.4	-19.0	-18.2	-17.4	DF	DF	-16.7	-16.6	-16.6	-16.8	-17.4	-17.9	-18.1	-19.4	-16.6																			
16-Feb	-18.7	-19.2	-19.2	-19.0	-18.2	-17.6	-17.1	-16.5	-15.1	-13.3	-11.4	-10.7	-9.7	-8.6	-7.7	-6.2	-5.2	-6.3	DF	DF	-15.9	-17.3	-17.6	-17.5	-14.0	-5.2																			
17-Feb	-17.5	-17.5	-17.6	-17.6	-17.5	-17.5	-17.6	-17.7	-17.8	-17.9	-17.6	-16.1	-15.4	DF	-16.7	-17.4	-18.2	-18.7	-19.2	-19.8	-21.1	-22.2	-22.9	-23.6	-18.5	-15.4																			
18-Feb	-24.3	-24.0	-24.6	-24.6	-24.8	-25.3	-25.7	-25.8	-25.8	-24.4	-23.4	-23.5	-21.7	-20.2	-19.8	-19.8	-18.8	-20.1	-20.7	-21.2	-21.0	-20.7	-21.1	-22.4	-22.7	-18.8																			
19-Feb	-23.2	-23.6	-23.2	-23.2	-23.0	-23.2	-23.6	-23.5	-23.5	-23.2	-22.2	-21.5	DF	DF	DF	DF	DF	-17.1	-17.0	-16.7	-16.4	-17.5	-19.3	-21.0	-21.2	-16.4																			
20-Feb	-22.1	-23.1	-23.4	-23.2	-23.9	-23.2	-22.9	-22.5	-22.2	-21.9	-20.6	-18.1	-18.1	-15.1	-15.9	-16.8	-17.8	-19.1	-19.8	-20.0	-20.4	-21.1	-22.1	-23.6	-20.7	-15.1																			
21-Feb	-24.8	-25.8	-27.0	-28.2	-29.6	-30.5	-30.7	-30.9	-30.8	-30.0	-28.7	-27.9	-27.4	-26.1	-25.0	-25.1	-25.1	-26.0	-26.8	-27.5	-27.9	-28.0	-28.0	-27.8	-27.7	-24.8																			
22-Feb	-27.5	-26.7	-26.8	-27.5	-26.9	-28.4	-28.6	-28.5	-27.8	DF	-26.6	-25.4	-23.1	-21.9	-20.8	-19.7	-18.9	-19.1	-19.4	-19.7	-19.9	-20.1	-20.2	-21.2	-23.7	-18.9																			
23-Feb	-22.0	-23.7	-24.2	-25.9	-27.1	-27.2	-27.7	-27.4	-27.4	DF	DF	DF	-23.6	-21.3	-20.6	-19.5	-20.0	-20.0	-19.8	DF	DF	DF	-21.6	-21.0	-23.3	-19.5																			
24-Feb	-21.4	-20.6	-20.8	-21.0	-21.9	-21.9	-22.0	-23.1	-23.3	-24.9	-23.5	-21.2	-18.8	-17.3	-16.6	-16.2	-16.1	-16.3	-16.5	-17.1	-17.7	-18.2	-18.8	-19.2	-19.8	-16.1																			
25-Feb	-19.8	-19.8	-19.1	-18.1	-17.2	-16.9	-16.1	-15.4	-14.3	-13.6	-12.3	-11.0	-9.8	-8.1	-6.8	-6.1	-6.3	-6.7	-6.5	-6.6	-7.2	-7.3	-7.5	-8.0	-11.7	-6.1																			
26-Feb	-8.7	-9.2	-9.9	-10.4	-11.5	-11.9	-12.0	-11.7	-11.5	-11.3	DF	DF	-9.0	-8.2	-7.6	-7.5	-7.7	DF	DF	DF	DF	DF	DF	DF	--	-7.5																			
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	-13.6	-13.7	-13.4	-13.3	-13.1	-12.6	-12.1	-12.3	-13.4	-14.0	-14.5	-14.7	-14.9	-15.3	-15.7	-16.2	--	-12.1																			
28-Feb	-16.5	-16.5	-16.9	-17.4	-17.7	-17.9	-18.0	-18.3	-17.8	-17.4	-17.7	-16.7	-15.8	-14.2	DF	DF	-12.8	-13.5	-13.9	-14.3	-14.2	-14.5	-14.7	-14.9	-16.0	-12.8																			
																						Diurnal Average																							
																						Diurnal Maximum																							
-15.4 -15.6 -15.7 -15.6 -15.8 -16.0 -16.3 -16.3 -16.2 -15.4 -15.6 -14.8 -13.8 -12.6 -12.1 -11.5 -11.6 -12.5 -13.4 -13.4 -13.5 -13.8 -14.8 -14.8																																													
3.0 4.5 4.3 4.5 4.6 3.6 2.2 1.8 -0.5 -0.6 -0.3 0.8 1.6 2.1 2.4 2.5 2.3 1.8 1.3 1.1 1.7 1.7 1.1 2.0																																													
DF - DAS Failure																																													



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

**Ambient Temperature 163 m (AT163m) - C**  
**Lower Camp Met Tower - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 163 m (AT163m) - C  
Lower Camp Met Tower - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	180	28.71	28.71
-20 - 0	405	64.59	93.30
0 - 10	42	6.70	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 627

Total Number of Hours: 672



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

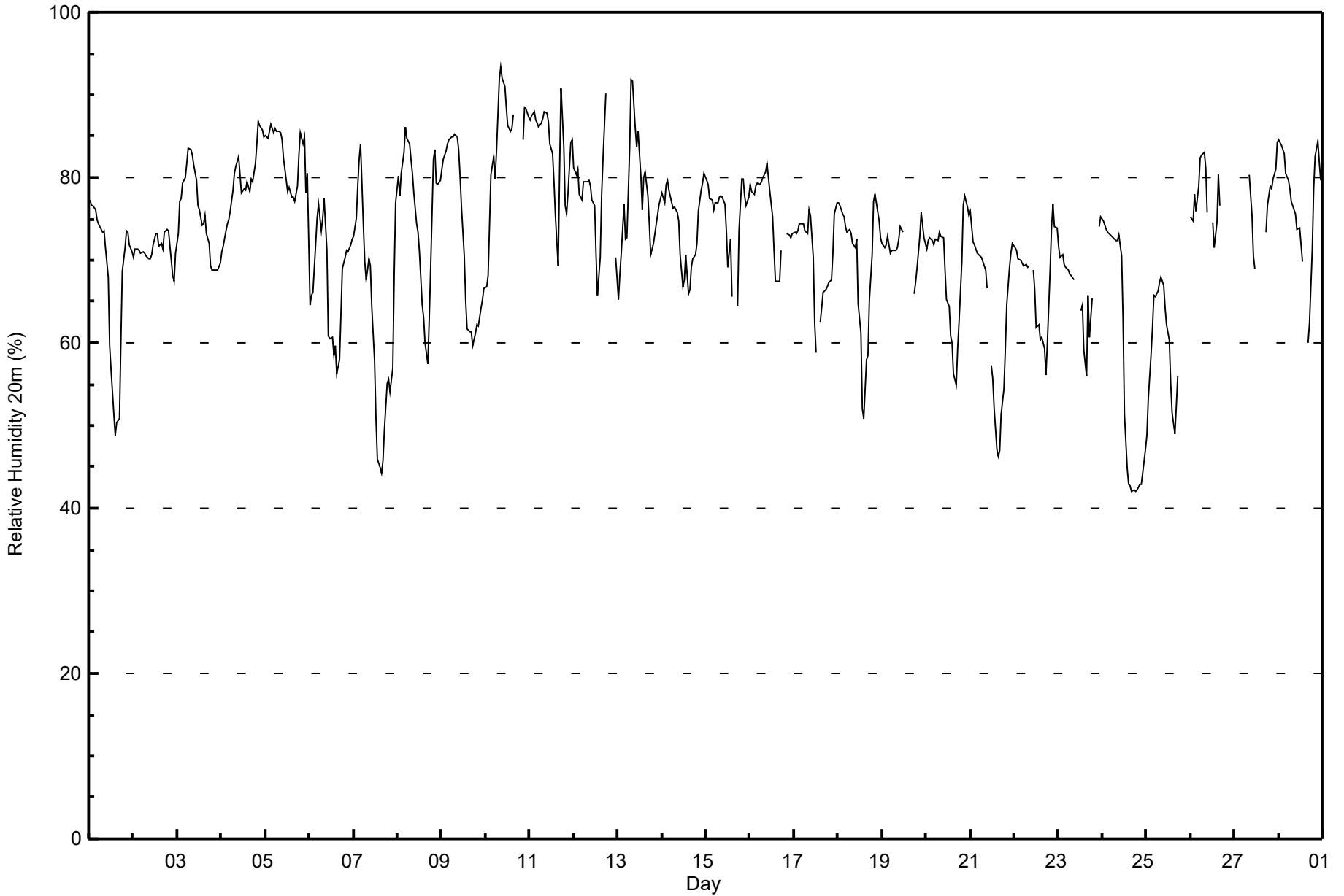
**Relative Humidity 20m (RH20m) - %**  
**Lower Camp Met Tower - February 2023**

Maximum Value: 93.4 % on Feb 10 09:00      Maximum Daily Average: 84.3 % on Feb 10																						Hours in Service: 672 Hours of Data: 615				
Minimum Value: 42.1 % on Feb 24 17:00      Minimum Daily Average: 58.1 % on Feb 24 Maximum Diurnal Average: 77.5 % at hour 9      Minimum Diurnal Average: 64.0 % at hour 17 Monthly Average: 72.49 %      Percentiles: P <sub>1</sub> = 42.9 P <sub>10</sub> = 59.6 Q <sub>1</sub> = 68.7 Median = 73.4 Q <sub>3</sub> = 79.0 P <sub>90</sub> = 84.0 P <sub>99</sub> = 90.7																						Hours of Missing Data: 57 Hours of Calibration: 0 Percent Operational Time: 91.5				
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-Feb	77.2	76.6	76.5	76.1	75.0	74.5	73.7	73.5	73.5	71.6	67.9	59.7	56.8	51.4	48.8	50.4	50.9	60.0	68.7	71.5	73.5	73.4	71.9	71.0	67.7	77.2
2-Feb	70.4	71.3	71.4	71.1	70.8	71.0	70.9	70.4	70.2	70.2	70.7	71.9	73.3	73.2	71.6	72.1	71.3	73.4	73.8	73.6	71.7	68.2	67.4	70.8	71.3	73.8
3-Feb	73.2	77.1	77.5	79.3	80.1	81.7	83.6	83.4	82.6	81.5	79.6	76.6	76.2	74.2	74.5	75.4	73.3	72.0	69.3	68.8	68.8	68.8	68.9	69.7	75.7	83.6
4-Feb	70.9	71.7	73.6	74.4	75.0	76.0	78.5	80.5	81.4	82.6	80.3	78.1	78.7	78.4	79.6	78.2	79.7	79.4	81.6	84.0	86.8	86.2	85.7	84.9	79.4	86.8
5-Feb	85.1	84.8	85.5	86.4	85.5	85.9	85.6	85.7	85.5	84.6	82.4	79.6	78.4	78.9	77.6	77.6	77.2	79.0	82.7	85.5	84.1	85.0	78.2	80.6	82.6	86.4
6-Feb	64.6	65.8	66.1	72.0	75.1	76.9	73.5	75.0	77.4	71.2	60.8	60.6	60.7	58.5	59.6	56.3	58.0	63.3	69.0	70.3	71.2	71.0	71.8	72.6	67.6	77.4
7-Feb	72.9	75.1	78.9	82.2	84.0	74.2	69.8	67.7	70.2	69.4	64.4	57.8	50.8	46.0	44.9	44.3	45.8	49.6	55.0	55.6	54.1	56.9	68.4	76.9	63.1	84.0
8-Feb	80.2	77.9	80.5	83.1	86.1	84.7	84.2	82.2	80.6	78.1	74.5	73.4	71.0	64.5	63.1	60.1	57.5	62.9	69.0	82.2	83.4	79.4	79.1	79.6	75.7	86.1
9-Feb	80.9	82.2	83.2	84.0	84.5	85.0	85.0	85.2	85.0	83.3	80.1	76.4	70.6	65.1	61.7	61.3	61.4	59.7	61.2	62.2	62.0	64.2	65.3	66.7	73.2	85.2
10-Feb	66.8	68.2	74.3	80.3	82.5	79.8	83.2	91.9	93.4	92.0	91.1	88.5	86.2	85.6	86.0	87.6	DF	DF	DF	DF	84.6	88.5	88.2	87.3	84.3	93.4
11-Feb	87.0	87.5	88.0	86.9	86.5	86.1	86.6	87.2	87.9	87.8	86.8	84.1	82.9	79.6	75.5	69.4	80.8	90.8	83.7	76.6	75.5	78.1	84.2	84.7	83.5	90.8
12-Feb	81.2	80.3	81.1	77.9	77.3	79.6	79.4	79.6	79.7	78.9	77.3	76.6	70.7	65.8	70.3	78.0	82.5	90.2	DF	DF	DF	DF	DF	70.3	77.7	90.2
13-Feb	65.2	68.4	70.9	76.8	72.5	72.7	83.6	91.8	91.7	85.9	83.7	85.6	80.2	76.1	80.0	80.6	77.8	74.5	70.7	72.1	73.2	74.4	76.7	77.4	77.6	91.8
14-Feb	78.1	77.0	79.1	79.6	78.5	76.9	76.2	76.4	75.8	74.7	70.6	66.8	67.7	70.6	65.9	66.4	69.2	70.2	70.7	72.0	75.9	78.4	79.4	80.6	74.0	80.6
15-Feb	79.6	79.2	77.5	77.3	76.1	76.9	76.9	77.7	77.8	77.6	76.8	73.6	69.2	72.5	65.6	DF	DF	64.5	73.5	79.9	79.9	77.8	76.7	77.6	75.6	79.9
16-Feb	79.2	78.4	78.0	78.9	79.3	79.2	79.4	79.9	80.6	81.6	80.0	78.4	75.3	71.1	67.4	67.5	71.1	DF	DF	73.2	73.0	72.7	73.2	75.7	81.6	
17-Feb	73.3	73.3	73.5	74.4	74.4	74.4	73.6	73.2	76.1	75.4	70.4	62.3	58.8	DF	62.5	64.2	66.1	66.4	66.8	67.3	67.6	70.8	75.6	76.9	70.3	76.9
18-Feb	76.9	76.6	75.7	75.2	74.1	73.4	73.8	73.2	72.1	71.6	72.5	64.7	61.3	52.0	50.8	58.0	58.5	65.1	70.6	77.1	77.9	77.0	74.8	72.7	69.8	77.9
19-Feb	72.1	71.6	71.9	72.9	70.9	71.2	71.2	71.1	71.6	72.5	74.1	73.4	DF	DF	DF	DF	DF	65.9	67.3	69.0	72.8	75.8	74.3	72.7	71.7	75.8
20-Feb	71.3	72.3	72.7	72.3	71.9	72.5	72.3	73.4	72.8	72.7	68.8	65.3	64.4	60.8	60.0	56.3	54.9	59.3	62.6	69.9	76.6	77.8	76.4	75.4	68.9	77.8
21-Feb	76.0	72.3	71.9	71.3	70.9	70.5	70.3	69.8	68.8	66.6	UO	57.2	55.8	52.1	47.1	46.4	46.9	51.4	54.4	59.2	64.6	69.2	70.9	72.0	63.3	76.0
22-Feb	71.6	71.2	70.2	70.0	69.7	69.4	69.4	69.2	69.3	DF	68.8	66.4	61.8	62.2	60.3	60.7	59.4	56.0	59.9	68.9	74.1	76.8	74.1	73.8	67.5	76.8
23-Feb	71.8	70.4	70.7	69.4	69.1	68.7	68.4	68.1	67.6	DF	DF	DF	63.8	64.5	59.2	55.9	65.7	60.6	65.5	DF	DF	DF	74.1	75.3	67.2	75.3
24-Feb	74.7	74.2	73.7	73.4	73.0	72.9	72.7	72.4	72.4	73.0	70.5	62.9	51.3	44.7	42.9	42.8	42.1	42.3	42.1	42.2	42.8	42.9	44.2	47.1	58.1	74.7
25-Feb	48.9	53.1	58.7	61.9	65.7	65.6	66.2	67.3	68.0	67.0	64.3	62.3	60.4	55.0	51.6	48.9	52.4	56.0	UO	UO	UO	UO	UO	UO	59.6	68.0
26-Feb	75.3	74.7	77.9	76.0	79.0	82.3	82.7	83.0	81.2	75.8	DF	DF	74.6	71.5	74.6	80.4	76.7	DF	DF	DF	DF	DF	DF	DF	--	83.0
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	80.3	75.3	70.5	69.0	UO	UO	UO	UO	UO	73.4	76.7	79.0	78.7	79.8	81.0	84.2	--	84.2
28-Feb	84.6	83.9	83.5	82.9	80.6	79.6	78.6	77.1	76.1	75.6	73.7	73.8	71.8	69.8	DF	DF	60.0	62.3	71.4	78.7	82.6	84.5	81.9	79.6	76.9	84.6
74.4 74.6 75.6 76.5 76.6 76.4 76.6 77.2 77.5 76.8 74.4 71.0 68.2 65.8 64.0 64.1 64.0 66.1 68.1 71.2 73.2 74.1 74.5 75.1																								Diurnal Average		
87.0 87.5 88.0 86.9 86.5 86.1 86.6 91.9 93.4 92.0 91.1 88.5 86.2 85.6 86.0 87.6 82.5 90.8 83.7 85.5 86.8 88.5 88.2 87.3																								Diurnal Maximum		
DF - DAS Failure      UO - Unstable Operation																										



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

**Relative Humidity 20m (RH20m) - %**  
**Lower Camp Met Tower - February 2023**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Relative Humidity 20m (RH20m) - %  
Lower Camp Met Tower - February 2023**

<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	67	10.89	10.89
60 - 80	427	69.43	80.33
80 - 100	121	19.67	100.00

Total Number of Valid Hours: 615

Total Number of Hours: 672



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

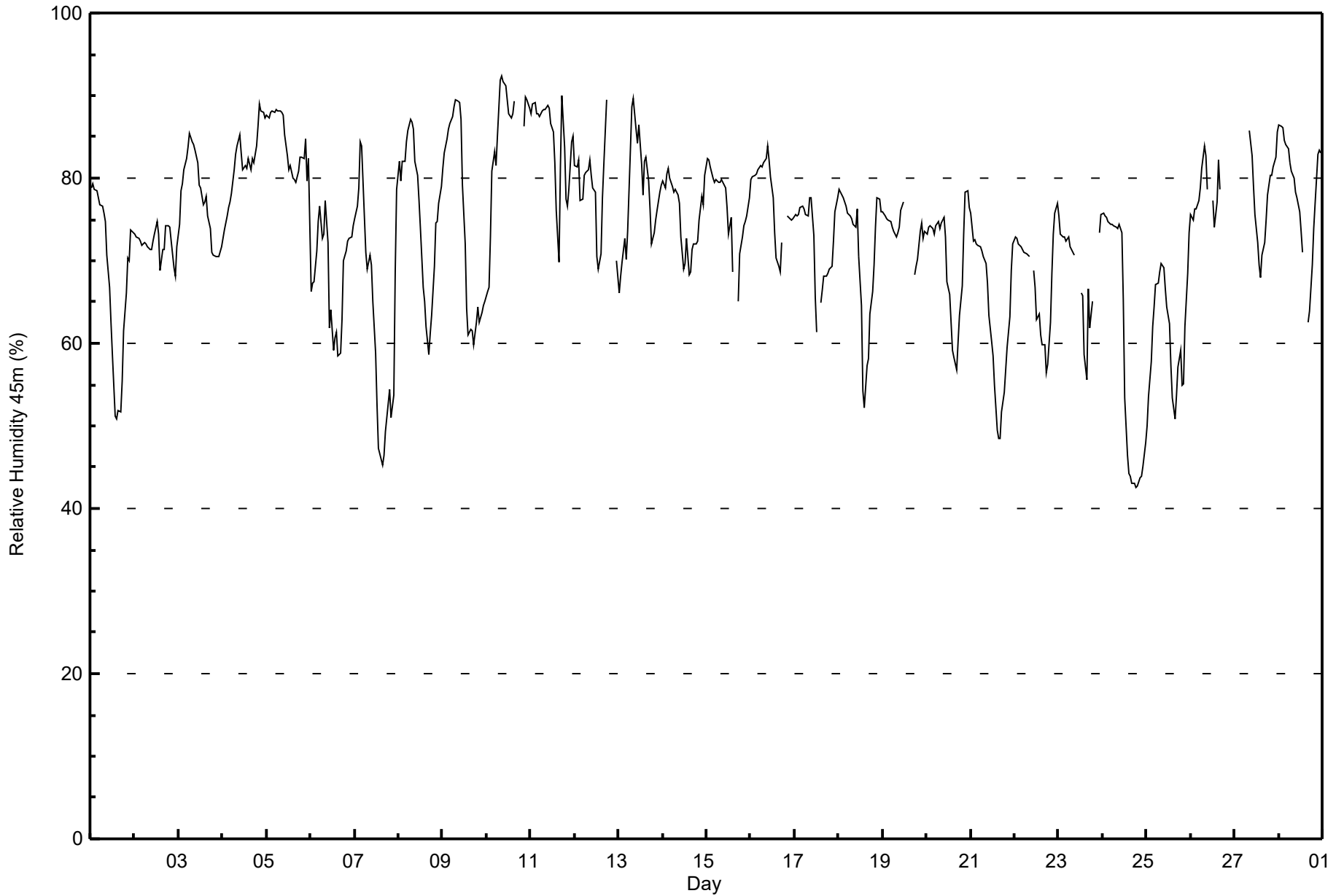
**Relative Humidity 45m (RH45m) - %**  
**Lower Camp Met Tower - February 2023**

Maximum Value: 92.4 % on Feb 10 09:00      Maximum Daily Average: 85.0 % on Feb 10																						Hours in Service: 672 Hours of Data: 627																									
Minimum Value: 42.6 % on Feb 24 19:00      Minimum Daily Average: 59.4 % on Feb 24 Maximum Diurnal Average: 79.3 % at hour 9      Minimum Diurnal Average: 65.5 % at hour 17 Monthly Average: 73.51 %      Percentiles: P <sub>1</sub> = 43.9 P <sub>10</sub> = 59.4 Q <sub>1</sub> = 69.0 Median = 74.6 Q <sub>3</sub> = 80.3 P <sub>90</sub> = 85.6 P <sub>99</sub> = 89.6																						Hours of Missing Data: 45 Hours of Calibration: 0 Percent Operational Time: 93.3																									
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-Feb	78.8	79.2	78.6	78.4	77.6	76.7	76.6	75.8	74.8	70.6	66.8	62.5	58.6	51.2	50.9	51.8	51.7	55.4	61.4	66.2	70.3	70.0	73.8	73.4	68.0	79.2																					
2-Feb	73.3	72.9	72.6	72.4	71.9	72.3	72.0	71.6	71.4	71.4	72.3	73.3	74.8	73.2	68.8	71.3	71.4	74.2	74.3	74.1	72.4	69.1	68.2	71.8	72.1	74.8																					
3-Feb	74.5	78.5	79.2	81.1	82.3	83.7	85.4	84.5	84.0	83.5	81.9	79.2	78.8	76.8	77.2	77.8	75.5	74.0	71.1	70.7	70.6	70.5	70.5	71.6	77.6	85.4																					
4-Feb	72.7	73.7	75.4	76.4	77.1	78.2	81.0	82.9	84.0	85.2	83.1	81.1	81.6	81.2	82.4	80.9	82.4	81.9	83.9	86.2	88.9	88.2	88.0	87.3	81.8	88.9																					
5-Feb	87.6	87.4	87.9	88.1	88.0	88.2	88.2	88.2	88.0	87.6	85.3	82.8	81.1	81.6	80.1	79.8	79.6	80.9	82.5	82.6	82.4	84.7	79.6	82.4	84.3	88.2																					
6-Feb	66.3	67.3	67.5	71.1	74.7	76.6	72.7	73.3	77.3	72.2	61.9	64.1	59.2	60.7	61.3	58.5	58.8	62.8	69.9	71.2	72.3	72.7	72.9	74.3	68.3	77.3																					
7-Feb	75.1	76.7	78.8	84.4	84.0	75.3	71.0	68.9	70.8	69.4	65.1	58.8	52.5	47.3	45.9	45.3	46.4	49.3	52.7	54.4	51.1	53.7	68.6	78.7	63.5	84.4																					
8-Feb	82.1	79.7	82.0	82.1	84.3	85.8	87.0	86.8	85.9	82.0	80.3	77.3	73.9	66.7	65.1	62.1	58.7	61.1	63.4	69.3	74.6	74.7	77.0	78.9	75.9	87.0																					
9-Feb	81.3	83.1	84.8	85.9	86.6	87.5	88.6	89.6	89.3	89.2	87.2	79.2	72.0	64.3	60.9	61.7	61.5	59.8	62.5	64.5	62.5	63.6	64.6	65.1	74.8	89.6																					
10-Feb	66.2	66.7	72.9	80.8	83.3	81.6	85.1	91.9	92.4	91.6	91.2	89.4	87.8	87.3	87.8	89.3	DF	DF	DF	DF	86.3	89.9	89.5	88.5	85.0	92.4																					
11-Feb	87.9	88.9	89.1	87.8	87.8	87.4	88.1	88.3	88.3	88.9	88.5	86.6	85.7	81.8	76.0	69.8	81.6	90.0	83.7	77.4	76.6	78.7	84.5	85.1	84.5	90.0																					
12-Feb	81.6	81.4	82.3	77.4	77.5	80.4	80.6	81.0	82.1	80.3	78.8	78.3	70.6	69.0	70.9	77.5	81.7	89.4	DF	DF	DF	DF	DF	70.0	78.5	89.4																					
13-Feb	66.1	68.1	69.9	72.7	70.1	73.5	83.5	88.6	89.7	86.0	84.3	86.4	81.7	78.0	82.0	82.6	79.7	76.2	72.0	73.4	74.8	76.1	78.4	79.2	78.0	89.7																					
14-Feb	79.7	78.8	80.5	81.2	80.1	79.0	78.2	78.6	78.0	76.9	73.0	69.0	69.6	72.7	68.2	68.7	71.3	72.0	72.0	72.4	74.9	77.7	76.8	80.3	75.4	81.2																					
15-Feb	82.3	82.2	81.4	80.0	79.5	79.8	79.5	79.5	79.9	79.6	78.8	76.5	73.2	75.3	68.7	DF	DF	65.0	70.8	72.8	74.3	74.7	75.3	77.6	76.7	82.3																					
16-Feb	79.8	80.2	80.4	80.5	81.1	81.5	81.4	81.9	82.4	83.9	82.2	80.1	77.6	73.3	70.3	69.3	68.7	72.3	DF	DF	75.4	75.1	74.9	75.2	77.6	83.9																					
17-Feb	75.6	75.4	75.6	76.5	76.6	76.3	75.7	75.4	77.7	77.7	73.1	65.6	61.3	DF	64.9	66.4	68.1	68.1	68.4	69.0	69.3	72.4	75.9	77.7	72.3	77.7																					
18-Feb	78.6	78.3	77.6	77.1	76.6	75.8	75.4	75.1	74.3	74.0	76.3	70.5	64.6	54.2	52.3	57.2	58.1	63.5	66.2	69.5	74.1	77.6	77.5	75.9	70.8	78.6																					
19-Feb	75.9	75.4	75.0	74.9	74.7	74.0	73.6	72.9	73.3	74.1	76.1	77.2	DF	DF	DF	DF	DF	68.3	69.3	70.2	73.6	74.6	72.6	73.6	73.6	77.2																					
20-Feb	73.2	74.0	74.3	73.9	73.1	74.2	74.7	74.0	74.6	75.3	72.9	67.5	65.9	62.5	59.1	58.3	56.7	60.1	63.3	67.0	73.2	78.3	78.6	76.5	70.1	78.6																					
21-Feb	75.8	72.3	72.6	72.0	71.9	71.7	71.3	70.5	69.7	67.3	63.4	60.2	58.4	54.9	49.4	48.4	48.4	51.7	54.0	56.8	59.6	63.2	68.9	72.0	63.5	75.8																					
22-Feb	72.9	72.7	72.0	71.6	71.4	71.0	70.9	70.7	70.5	DF	68.8	66.8	63.0	63.5	61.1	59.9	59.8	56.4	57.4	62.6	68.5	73.1	75.8	76.9	67.7	76.9																					
23-Feb	75.5	73.2	72.9	72.9	72.4	72.9	71.7	71.4	70.7	DF	DF	DF	66.1	65.8	58.7	55.5	66.6	61.8	65.2	DF	DF	DF	73.4	75.5	69.0	75.5																					
24-Feb	75.8	75.4	75.2	74.7	74.4	74.5	74.3	74.0	73.9	74.4	73.5	65.3	53.4	46.5	44.2	43.9	43.1	43.1	42.6	42.7	43.8	43.8	45.1	48.0	59.4	75.8																					
25-Feb	50.1	53.6	57.8	62.0	64.3	67.2	67.2	68.6	69.6	69.1	66.7	64.3	62.4	57.4	53.3	50.9	53.7	57.1	59.2	54.9	55.0	62.1	68.5	73.3	61.2	73.3																					
26-Feb	75.6	74.9	76.3	76.3	77.4	78.9	81.2	84.0	82.8	78.6	DF	DF	77.3	74.0	77.1	82.3	78.6	DF	DF	DF	DF	DF	DF	DF	--	84.0																					
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	85.8	82.6	79.0	75.6	72.2	69.5	68.0	70.7	72.2	74.9	78.0	80.4	80.3	81.3	82.6	85.6	--	85.8																					
28-Feb	86.4	86.3	86.0	84.6	84.1	83.6	81.8	80.8	79.9	78.3	77.6	76.0	73.6	70.9	DF	DF	62.6	63.9	69.5	74.0	76.9	82.8	83.5	83.0	78.5	86.4																					
																						75.9	76.2	77.0	77.7	77.9	78.1	78.4	78.8	79.3	78.8	76.5	73.6	70.2	67.7	65.6	65.6	66.7	67.2	68.8	71.3	73.2	74.8	76.2	Diurnal Average		
																						87.9	88.9	89.1	88.1	88.0	88.2	88.6	91.9	92.4	91.6	91.2	89.4	87.8	87.3	87.8	89.3	82.4	90.0	83.9	86.2	88.9	89.9	89.5	88.5	Diurnal Maximum	
DF - DAS Failure																																															



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

**Relative Humidity 45m (RH45m) - %**  
**Lower Camp Met Tower - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Relative Humidity 45m (RH45m) - %  
Lower Camp Met Tower - February 2023**

<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	67	10.69	10.69
60 - 80	394	62.84	73.52
80 - 100	166	26.48	100.00

Total Number of Valid Hours: 627

Total Number of Hours: 672



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

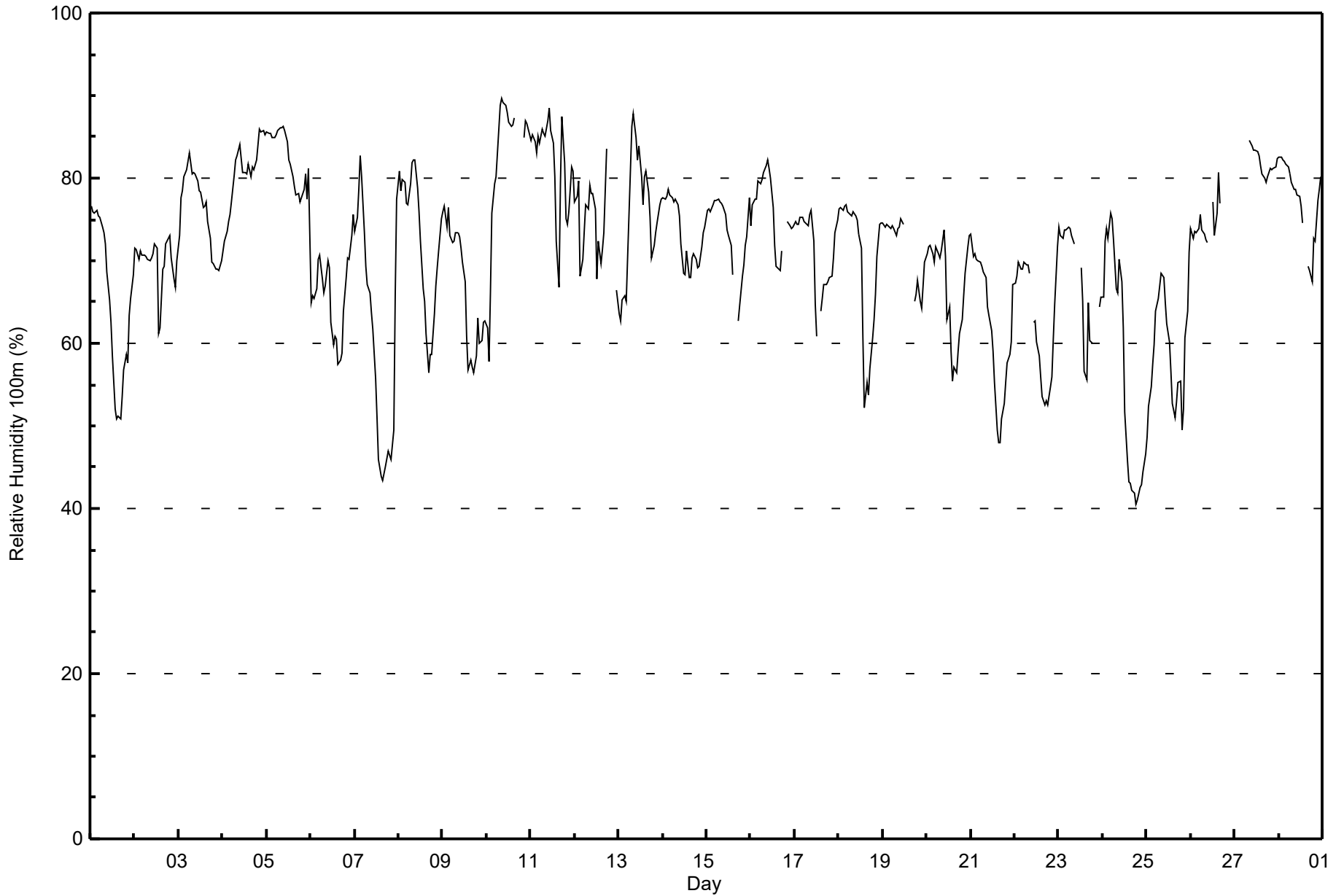
**Relative Humidity 100m (RH100m) - %**  
**Lower Camp Met Tower - February 2023**

Maximum Value: 89.7 % on Feb 10 09:00      Maximum Daily Average: 82.4 % on Feb 5																						Hours in Service: 672 Hours of Data: 627				
Minimum Value: 40.5 % on Feb 24 19:00      Minimum Daily Average: 56.9 % on Feb 24 Maximum Diurnal Average: 76.5 % at hour 10      Minimum Diurnal Average: 64.1 % at hour 19 Monthly Average: 71.05 %      Percentiles: P <sub>1</sub> = 43.1 P <sub>10</sub> = 56.8 Q <sub>1</sub> = 65.8 Median = 72.7 Q <sub>3</sub> = 77.6 P <sub>90</sub> = 82.4 P <sub>99</sub> = 87.7																						Hours of Missing Data: 45 Hours of Calibration: 0 Percent Operational Time: 93.3				
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-Feb	76.6	76.0	75.8	76.0	75.5	75.3	74.1	73.3	72.0	68.7	65.3	62.6	58.5	52.1	50.9	51.1	50.8	53.5	56.8	58.6	57.6	63.4	65.4	68.4	64.9	76.6
2-Feb	71.5	71.4	70.2	71.2	70.7	70.7	70.5	70.2	70.1	70.4	70.8	72.0	71.6	61.3	61.9	69.1	69.4	72.0	72.7	73.0	70.4	67.8	66.7	70.0	69.8	73.0
3-Feb	73.0	77.6	78.5	80.2	81.1	82.0	83.1	80.5	80.6	80.4	79.7	78.4	78.3	76.5	76.6	77.1	74.8	72.8	69.9	69.7	68.9	69.0	68.8	70.0	76.1	83.1
4-Feb	71.1	72.4	73.6	74.8	75.5	77.1	80.3	82.2	82.8	84.1	82.5	80.7	80.6	80.5	81.7	80.2	81.4	81.0	82.2	84.0	86.0	85.6	85.7	85.3	80.5	86.0
5-Feb	85.6	85.5	85.4	85.0	85.0	85.2	85.7	86.2	86.2	86.2	85.7	84.4	82.2	81.8	80.1	78.9	78.0	78.1	77.2	77.6	78.6	80.4	77.5	81.2	82.4	86.2
6-Feb	64.9	65.7	65.5	66.7	70.2	70.6	67.8	66.0	66.9	69.9	69.2	62.5	59.9	60.8	60.5	57.5	57.9	58.9	64.0	67.9	70.3	70.1	73.0	75.6	65.9	75.6
7-Feb	73.5	75.2	78.7	82.7	80.2	73.4	69.4	67.0	66.0	63.7	61.8	55.8	51.0	45.9	44.0	43.5	44.3	45.0	47.0	46.5	45.9	49.4	65.7	77.4	60.6	82.7
8-Feb	80.8	78.4	79.8	79.5	76.9	76.8	79.3	81.8	82.3	82.3	78.8	75.9	72.3	66.7	65.1	61.2	56.5	58.7	58.7	63.5	66.9	69.1	71.1	75.0	72.4	82.3
9-Feb	75.9	76.5	74.1	76.4	73.0	72.2	72.4	73.4	73.5	72.9	71.6	69.9	67.5	60.8	56.7	58.0	57.2	56.4	58.5	63.1	60.0	60.4	62.5	62.6	66.9	76.5
10-Feb	61.9	57.8	66.1	75.8	79.3	80.2	83.1	88.8	89.7	89.2	88.8	87.9	86.8	86.3	86.5	87.3	DF	DF	DF	DF	85.0	86.9	86.5	85.2	82.0	89.7
11-Feb	84.5	85.2	84.4	83.1	85.1	84.2	86.0	85.5	85.1	87.0	88.6	85.8	84.2	80.1	72.4	66.8	79.3	87.4	81.9	75.1	74.4	76.0	81.3	80.8	81.8	88.6
12-Feb	77.2	77.8	79.7	68.2	70.2	73.6	76.7	76.2	79.2	78.1	78.1	76.2	67.9	72.4	69.7	71.3	73.4	83.6	DF	DF	DF	DF	DF	66.4	74.5	83.6
13-Feb	63.6	62.7	65.3	65.8	65.0	70.6	81.1	86.3	87.8	84.9	82.3	83.9	80.2	76.7	80.2	80.9	78.3	75.3	70.4	71.9	73.3	74.7	76.7	77.4	75.6	87.8
14-Feb	77.6	77.4	77.8	78.7	78.0	77.6	77.1	77.4	76.8	75.5	72.0	68.5	68.3	71.3	68.0	67.9	70.4	70.9	70.1	69.2	69.3	71.7	73.5	74.1	73.3	78.7
15-Feb	76.1	76.3	76.0	76.8	77.3	77.3	77.4	77.1	76.9	76.5	75.6	73.7	73.0	71.8	68.3	DF	DF	62.7	64.5	68.2	69.5	71.9	72.9	77.6	73.5	77.6
16-Feb	74.2	76.7	77.5	77.4	79.7	79.4	79.8	80.6	81.6	82.2	81.3	80.1	76.5	71.9	69.4	69.0	68.8	71.2	DF	DF	74.7	74.2	73.9	74.1	76.1	82.2
17-Feb	74.7	74.5	74.4	75.2	75.3	74.7	74.6	74.3	75.6	76.1	72.4	64.7	60.9	DF	63.9	65.4	67.1	67.1	67.4	67.9	68.1	70.3	73.4	75.0	71.0	76.1
18-Feb	76.3	76.5	76.2	76.6	76.7	75.9	75.6	75.4	76.0	75.5	74.9	73.2	71.5	60.9	52.2	55.2	53.7	56.9	60.7	62.8	66.0	70.4	74.4	74.6	69.5	76.7
19-Feb	74.6	74.1	74.4	74.3	73.9	74.2	73.8	73.0	73.9	74.1	75.1	74.3	DF	DF	DF	DF	DF	65.1	66.0	67.6	65.2	64.2	67.0	69.8	71.3	75.1
20-Feb	70.8	71.7	71.9	70.9	69.9	71.7	70.9	70.3	71.3	73.7	70.6	63.0	64.3	58.9	55.5	57.1	56.4	58.9	61.3	62.8	65.8	68.5	71.7	73.0	66.7	73.7
21-Feb	73.2	70.4	70.8	70.2	70.0	69.7	69.3	68.7	68.0	64.3	63.4	61.4	59.0	55.2	49.4	47.9	47.9	50.8	52.7	55.2	57.6	58.7	60.1	67.1	61.7	73.2
22-Feb	67.3	68.2	69.8	68.9	68.9	69.8	69.5	69.5	68.5	DF	62.6	62.7	60.2	58.4	55.9	53.5	52.5	53.0	52.6	54.7	55.9	60.6	64.7	71.7	62.6	71.7
23-Feb	74.0	73.1	72.7	73.7	73.7	74.0	73.8	73.0	72.1	DF	DF	DF	69.2	65.0	56.5	55.7	64.9	60.4	59.9	DF	DF	DF	64.4	65.6	67.9	74.0
24-Feb	65.5	72.4	74.0	72.7	75.7	75.1	72.5	66.6	66.1	70.2	67.5	61.9	51.7	45.7	43.3	43.1	42.2	41.8	40.5	41.0	42.6	42.8	44.4	46.7	56.9	75.7
25-Feb	48.7	52.3	54.8	57.4	59.8	63.9	65.4	66.9	68.4	68.0	65.0	62.4	60.2	56.6	52.8	51.0	52.9	55.3	55.4	49.5	52.1	60.7	64.0	71.1	58.9	71.1
26-Feb	73.9	72.7	73.5	73.4	73.9	75.6	73.7	73.2	72.6	72.2	DF	DF	77.1	73.1	75.8	80.7	76.9	DF	DF	DF	DF	DF	DF	DF	--	80.7
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	84.5	84.0	83.4	83.4	83.3	82.7	81.6	80.5	80.0	79.4	80.2	81.2	81.0	81.2	81.4	82.3	--	84.5
28-Feb	82.5	82.5	82.3	82.0	81.6	81.4	80.5	79.5	78.7	78.7	78.0	77.8	76.6	74.6	DF	DF	69.3	68.8	67.5	72.7	72.4	77.3	78.7	80.2	77.4	82.5
																								Diurnal Average		
																								Diurnal Maximum		
73.0 73.4 74.2 74.6 74.9 75.3 75.7 75.7 76.2 76.5 74.8 72.4 70.1 67.2 64.6 64.4 64.2 64.8 64.1 65.4 67.1 69.0 71.0 73.3 85.6 85.5 85.4 85.0 85.1 85.2 86.0 88.8 89.7 89.2 88.8 87.9 86.8 86.3 86.5 87.3 81.4 87.4 82.2 84.0 86.0 86.9 86.5 85.3																										
DF - DAS Failure																										



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

**Relative Humidity 100m (RH100m) - %**  
**Lower Camp Met Tower - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Relative Humidity 100m (RH100m) - %  
Lower Camp Met Tower - February 2023**

<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	88	14.04	14.04
60 - 80	420	66.99	81.02
80 - 100	119	18.98	100.00

Total Number of Valid Hours: 627

Total Number of Hours: 672



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

**Relative Humidity 163 m (RH163m) - %**  
**Lower Camp Met Tower - February 2023**

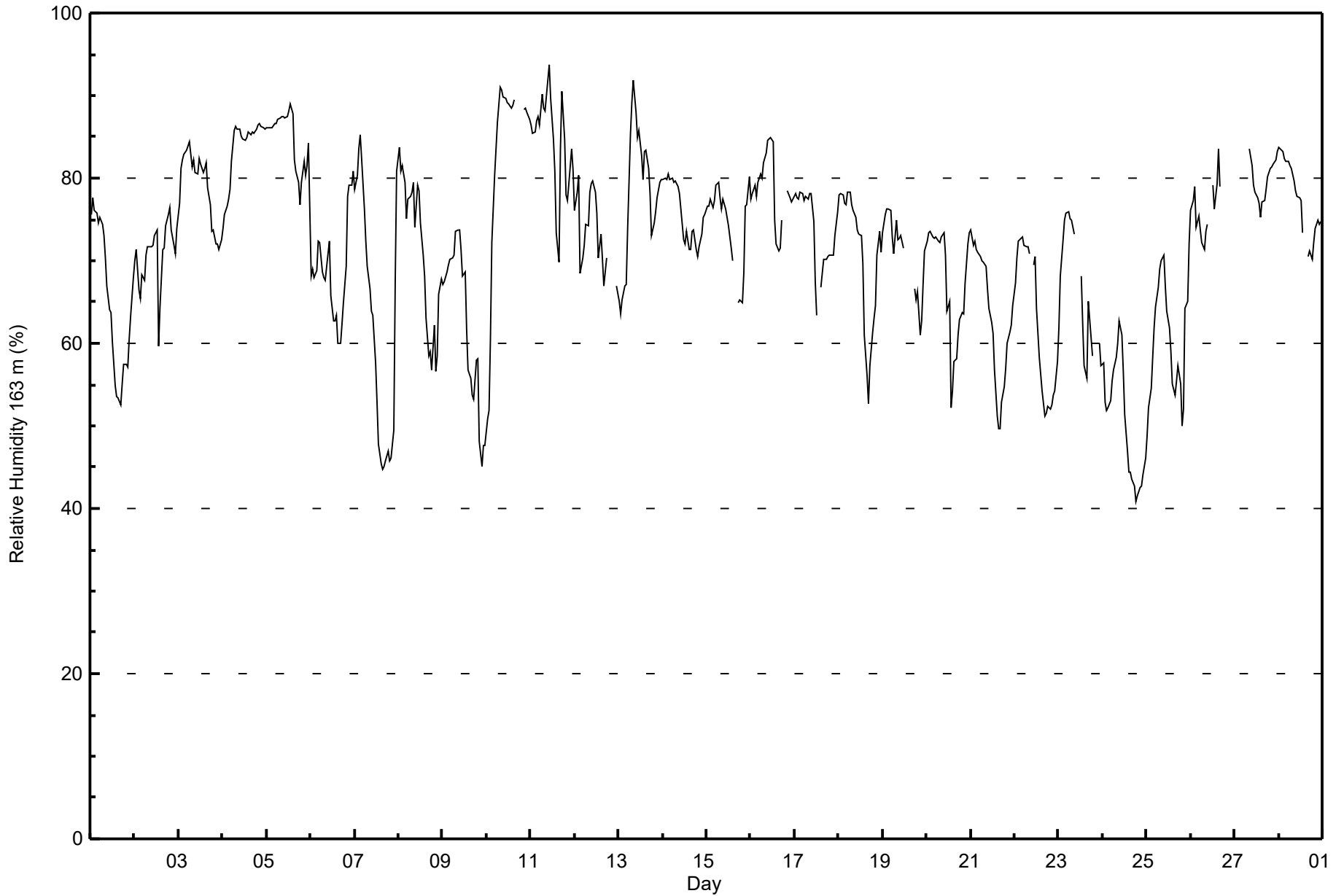
Maximum Value: 93.7 % on Feb 11 11:00		Maximum Daily Average: 84.7 % on Feb 5		Hours in Service: 672																						
Minimum Value: 40.9 % on Feb 24 19:00		Minimum Daily Average: 50.4 % on Feb 24		Hours of Data: 627																						
Maximum Diurnal Average: 76.9 % at hour 9		Minimum Diurnal Average: 65.1 % at hour 19		Hours of Missing Data: 45																						
Monthly Average: 71.73 %		Percentiles: P <sub>1</sub> = 44.2 P <sub>10</sub> = 55.3 Q <sub>1</sub> = 65.2 Median = 73.2 Q <sub>3</sub> = 79.3 P <sub>90</sub> = 85.0 P <sub>99</sub> = 90.1		Hours of Calibration: 0																						
				Percent Operational Time: 93.3																						
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-Feb	75.6	77.6	76.2	75.8	74.6	75.3	74.4	73.1	70.3	67.0	64.1	63.7	60.2	55.0	53.5	53.4	52.5	55.1	57.5	57.5	57.0	60.5	63.2	68.0	65.0	77.6
2-Feb	70.0	71.4	66.4	65.5	68.4	67.7	70.8	71.7	71.6	71.6	71.9	73.1	73.7	59.6	64.4	71.3	71.5	74.2	75.5	76.4	73.8	71.9	70.8	74.0	70.7	76.4
3-Feb	77.0	81.2	82.2	82.8	83.4	84.0	84.5	81.3	82.3	80.6	80.6	82.4	81.7	80.6	81.2	81.8	78.8	76.8	73.6	73.7	72.1	72.1	71.4	72.6	79.1	84.5
4-Feb	74.0	75.6	76.6	77.4	78.7	82.1	85.8	86.2	86.0	86.0	85.0	84.8	84.6	84.9	85.6	85.3	85.5	85.4	86.0	86.5	86.6	86.2	86.2	86.0	83.6	86.6
5-Feb	86.0	86.0	86.1	86.2	86.5	86.5	87.1	87.3	87.4	87.5	87.3	87.5	88.2	89.0	87.8	82.2	80.8	79.4	76.8	79.4	82.0	80.3	81.5	84.3	84.7	89.0
6-Feb	68.2	68.9	68.0	68.8	72.4	72.2	68.6	67.9	67.7	70.9	72.4	65.7	62.7	62.8	63.5	60.0	60.1	62.4	64.9	69.3	77.8	79.2	79.2	80.8	68.9	80.8
7-Feb	78.6	80.3	83.5	85.3	82.4	76.4	72.4	69.2	66.7	63.8	63.4	57.6	52.8	47.8	45.4	44.7	45.1	45.8	46.9	45.7	46.0	49.4	67.4	80.9	62.4	85.3
8-Feb	83.8	80.9	81.6	79.5	75.0	77.4	77.8	78.3	79.4	74.1	79.1	78.5	74.5	70.7	68.2	63.0	58.5	58.9	56.8	62.1	56.5	58.5	65.9	67.8	71.1	83.8
9-Feb	67.2	67.5	68.6	69.5	70.1	70.4	70.6	73.5	73.8	73.7	71.4	68.2	68.6	61.6	56.8	55.7	53.7	53.2	58.0	58.1	48.1	45.0	47.6	47.6	62.4	73.8
10-Feb	50.9	51.8	60.6	72.1	80.4	83.6	86.9	91.1	90.7	89.9	89.6	89.2	89.0	88.5	88.9	89.4	DF	DF	DF	DF	88.4	88.5	88.0	87.2	82.2	91.1
11-Feb	86.4	85.5	85.6	86.9	87.4	86.5	90.2	88.4	88.2	91.9	93.7	89.6	84.8	80.8	73.3	69.8	83.6	90.4	84.8	78.0	77.3	79.4	83.5	81.0	84.5	93.7
12-Feb	76.1	78.3	80.3	68.4	70.4	71.8	74.4	74.2	78.4	79.3	79.6	78.3	75.7	70.3	73.2	70.1	66.9	70.3	DF	DF	DF	DF	DF	67.0	73.8	80.3
13-Feb	65.2	63.5	65.3	67.0	67.1	73.9	85.2	89.2	91.9	87.9	84.9	85.8	82.7	79.9	83.2	83.3	81.1	78.2	73.0	74.5	75.9	77.6	79.4	79.9	78.1	91.9
14-Feb	79.8	79.9	79.9	80.6	79.8	80.0	79.6	79.7	79.0	78.2	76.2	72.5	72.0	73.5	71.4	71.3	73.6	73.8	71.4	70.4	71.7	73.2	75.3	75.5	75.8	80.6
15-Feb	76.6	76.6	77.4	76.5	77.3	79.2	79.4	77.7	76.3	77.5	76.3	75.2	74.3	71.5	70.0	DF	DF	64.9	65.2	64.8	68.6	76.6	76.8	80.2	74.5	80.2
16-Feb	77.4	78.2	79.1	77.8	79.5	80.5	80.0	81.9	83.0	84.6	84.8	85.0	84.4	74.9	72.0	71.2	71.5	75.0	DF	DF	78.4	77.6	77.2	77.4	78.7	85.0
17-Feb	78.1	77.6	77.5	78.3	78.2	77.3	77.8	77.5	78.1	78.2	74.7	67.4	63.4	DF	66.8	68.4	70.2	70.1	70.4	70.7	70.7	73.0	75.9	73.5	78.3	
18-Feb	77.9	78.2	78.0	76.9	76.8	78.3	78.2	76.8	76.2	75.2	73.8	73.2	73.0	69.7	61.1	56.1	52.7	57.3	61.4	63.1	64.5	70.7	73.6	71.0	70.6	78.3
19-Feb	73.4	75.5	76.3	76.2	76.2	72.9	70.9	75.0	72.6	72.6	73.1	71.5	DF	DF	DF	DF	DF	66.6	65.3	66.3	61.1	62.7	67.2	71.2	70.9	76.3
20-Feb	72.4	73.5	73.5	72.9	72.7	72.9	72.4	72.2	72.8	73.3	70.7	63.8	65.0	52.2	54.3	57.8	58.1	61.0	62.8	63.7	63.6	67.3	72.0	73.4	67.3	73.5
21-Feb	73.7	71.9	72.4	71.4	70.9	70.5	70.0	69.8	69.3	66.6	64.3	62.5	61.3	56.7	51.2	49.7	49.6	52.9	54.8	56.9	60.0	61.3	62.1	64.6	63.1	73.7
22-Feb	67.2	70.3	72.4	72.6	72.9	71.8	71.8	71.6	70.9	DF	69.5	70.6	64.2	58.3	56.3	54.3	51.2	51.5	52.4	52.0	52.6	53.7	54.2	57.9	62.6	72.9
23-Feb	61.9	68.1	72.6	75.0	75.8	75.9	75.1	74.9	73.2	DF	DF	DF	68.1	62.4	57.3	55.7	65.1	62.8	58.5	DF	DF	DF	60.0	57.3	66.7	75.9
24-Feb	57.6	52.9	51.9	52.2	53.0	55.5	56.7	58.2	60.0	62.7	61.0	56.6	51.4	47.0	44.4	44.4	43.6	42.8	40.9	41.6	42.5	42.7	44.1	46.1	50.4	62.7
25-Feb	48.7	52.2	54.6	58.4	61.8	64.5	66.7	68.9	70.0	70.6	67.0	64.0	61.9	58.9	55.1	53.7	55.5	57.3	55.1	50.0	52.0	64.2	65.1	72.0	60.3	72.0
26-Feb	76.1	77.3	78.9	74.1	75.4	73.8	72.2	71.3	73.6	74.4	DF	DF	79.2	76.3	79.3	83.6	79.0	DF	DF	DF	DF	DF	DF	DF	--	83.6
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	83.6	81.5	79.1	78.4	77.6	76.9	75.3	77.1	77.3	78.6	80.1	81.2	81.3	81.7	82.2	83.3	--	83.6
28-Feb	83.7	83.4	83.2	82.4	82.0	82.0	81.5	81.1	79.7	78.4	77.7	77.6	77.2	73.4	DF	DF	70.5	71.1	70.2	72.2	73.9	74.9	74.4	74.7	77.5	83.7
																								Diurnal Average		
																								Diurnal Maximum		
72.7 73.5 74.4 74.5 75.2 75.7 76.3 76.6 76.9 76.8 75.8 74.0 72.3 68.6 66.9 66.1 65.4 66.0 65.1 65.8 67.3 69.0 70.8 72.5																										
86.4 86.0 86.1 86.9 87.4 86.5 90.2 91.1 91.9 91.9 93.7 89.6 89.0 89.0 88.9 89.4 85.5 90.4 86.0 86.5 88.4 88.5 88.0 87.2																										
DF - DAS Failure																										





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

**Relative Humidity 163 m (RH163m) - %**  
**Lower Camp Met Tower - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Relative Humidity 163 m (RH163m) - %  
Lower Camp Met Tower - February 2023**

<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	100	15.95	15.95
60 - 80	389	62.04	77.99
80 - 100	138	22.01	100.00

Total Number of Valid Hours: 627

Total Number of Hours: 672



Maximum Speed: 28 km/h on Feb 2 20:00	Maximum Daily Speed Average: 16.1 km/h on Feb 24	Hours in Service: 672
Minimum Speed Value: 0 km/h on Feb 5 17:00	Minimum Daily Speed Average: 0.8 km/h on Feb 15	Hours of Data: 627
Maximum Diurnal Speed Average: 1.8 km/h at hour 18	Minimum Diurnal Speed Average: 0.4 km/h at hour 15	Hours of Missing Data: 45
Monthly Average Velocity: 0.4 km/h 301.4 deg	Percentiles: P <sub>1</sub> = 0 P <sub>10</sub> = 2 Q <sub>1</sub> = 3 Median = 6 Q <sub>3</sub> = 10 P <sub>90</sub> = 17 P <sub>99</sub> = 25	Percent Operational Time: 93.3

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-Feb	NW3	N2	NNW3	WNW3	NNW4	NW4	NNW5	NNW3	NNW4	NNW3	NNW5	NW6	NW9	NNW9	NW6	NW4	SW3	NW1	WNW3	NW2	NW1	WSW0	SE1	SE2	NW3.1	NNW9	
2-Feb	SE4	SE7	SE9	SE8	SSE7	SE10	SE9	SE9	SE8	SE8	SE8	SE9	SE6	SSE7	SE15	SE25	SE26	SE22	SE28	SE28	SE25	SE23	SE21	SE21	SE14.2	SE28	
3-Feb	SE20	SE23	SE20	SE20	SSE18	SSE18	SE17	SE15	SE6	SE5	SE4	NNW5	NNW4	NNW7	N8	N9	NNE8	N8	NNE6	N6	NNW5	N5	N3	NNW5	ESE4.6	SE23	
4-Feb	N7	N3	NNW4	NNW6	NNW5	NNW5	NNW5	NNW6	NNW8	NNW8	NNW8	NNW8	N9	NNW8	N6	NNW3	NW4	NNW4	NNW4	NNW5	NNW5	NW6	NW5	NNW5	NNW5.6	N9	
5-Feb	NW4	NNW4	NW3	NNW3	NNW2	N5	NNW4	NW4	NNW3	NW3	WSW2	WSW1	S2	WSW2	SSE3	ENE1	ESE0	W1	NW1	SSE0	N1	WNW6	WNW19	NW13	NW2.9	WNW19	
6-Feb	WNW21	WNW17	W16	WSW10	WSW8	W6	W11	W8	WNW6	NNW3	NW1	SW2	S3	SE7	SE6	ESE1	N0	NNW6	NNW6	NNW4	NNW6	NNW4	NW2	NNW3	WNW4.4	WNW21	
7-Feb	NNW3	SE5	SE9	SSE7	WSW13	WNW22	WNW17	W13	W14	WSW18	WSW11	WSW15	W17	W23	W24	W23	W19	W14	WSW12	W10	W9	WNW6	NNW14	NNW12	W11.1	W24	
8-Feb	NNW8	NNW7	NW3	NW4	NNW2	NNW2	NW1	NNW2	NNW2	WSW1	SE2	SE5	SE9	SE9	SSE8	SSE6	SE5	S2	SSW1	NNW2	SSE1	SE8	SE10	SE15	SE1.9	SE15	
9-Feb	SE13	SE18	SE17	SE15	SE18	SE16	SE18	SE20	SE18	SE18	SE17	SE16	SE13	SE18	SE18	SE13	SE7	SE6	SE3	SE7	SE9	SE7	SE6	S2	SE12.9	SE20	
10-Feb	SE1	NW2	NNW6	NNW5	NNW5	NNW9	NNW9	NNW6	NNW6	NNW6	NNW7	NNW7	NNW9	NNW9	NNW8	NW10	DF	DF	DF	DF	NNW6	NNW5	NNW5	NNW3	NNW6.0	NW10	
11-Feb	NW3	NNW2	N2	E1	SE3	SE7	SE9	SE10	SE8	SE8	SE7	SE9	SE11	SE7	SE8	SSW13	WSW20	WSW10	W11	WNW17	NW14	W3	WSW10	W18	SSW3.5	WSW20	
12-Feb	WSW18	W17	W8	WSW16	WSW14	WSW10	W10	W7	NW5	WSW13	WSW9	WSW4	N6	N5	N4	N11	N9	N6	DF	DF	DF	DF	DF	SE17	W6.2	WSW18	
13-Feb	SSE24	SSE13	ESE5	NNW3	W12	WSW18	W19	W15	NNW16	N26	N25	N24	N28	N25	NNW19	NNW21	N20	N18	N14	N12	N14	N13	N11	N12	NNW10.9	N28	
14-Feb	NNW9	N12	NNW6	NW4	NNW4	N6	N7	N5	N4	NNW4	N4	NNW6	NNW5	N6	NNW5	N8	NNE8	NNE7	N5	NNW4	N4	NW2	WNW1	NW3	N5.2	N12	
15-Feb	NNW2	NW2	W1	SW1	NW2	WSW1	WNW0	ESE0	SE1	W2	SE0	SE1	SE3	ESE7	ESE7	DF	DF	SE3	SW2	SSE1	E1	SE1	WSW1	SE3	SE0.8	ESE7	
16-Feb	SSE3	SE4	SSE3	SSE5	SSE3	W1	NNW3	NW2	NW1	SE3	SE4	SE5	SE10	SE3	SE2	ESE1	NNW1	NNW7	DF	DF	NNW12	N11	NNW11	N8	NE1.1	NNW12	
17-Feb	NNE3	NNE4	N6	N4	NW3	NNW4	NNE5	NE5	NNE7	NNE5	N7	N8	NNW9	DF	N12	N13	N12	N10	N11	N11	N10	NNW6	NNW2	NNW5	N6.8	N13	
18-Feb	NW4	NNW3	NNW5	WNW4	NW4	NW3	WNW3	WNW3	NW2	WNW3	WNW2	W1	NW5	NNW8	WNW5	WSW10	W5	WNW3	NW1	WNW2	NW4	NW2	NW1	WNW1	WNW3.0	WSW10	
19-Feb	NNW1	NW2	NW1	S2	NW3	NNW3	NNW4	NW3	NNW1	NNW4	W2	NNW2	DF	DF	DF	DF	DF	DF	NW5	WNW3	WNW2	NNW4	NNW6	NNW5	NNW6	NNW2.8	NNW6
20-Feb	NNW6	N5	NNW4	NW5	N4	N3	ENE0	SE2	ESE3	WNW1	SSE3	SSW3	SW6	SW6	SW5	N6	N10	NNW7	NNW4	NW3	NW4	NW4	NNW5	NNW5	NNW2.4	N10	
21-Feb	NW5	NNW9	N11	N10	N7	NNW4	NW4	NNW4	NW4	NW4	NNW5	NNW7	NW8	NNW10	N10	N14	NNW11	N7	N6	NNW4	NW3	NNW2	NW1	SSE1	NNW6.0	N14	
22-Feb	SSW3	SSW4	SE5	SE6	SSE4	SE7	SSE7	SE6	SE8	DF	SE7	SE5	SW6	WSW12	WSW11	WSW11	WSW10	WNW2	W3	NW2	NNW1	SSE1	NNW2	S0	SSW3.3	WSW12	
23-Feb	W0	NNW3	NW1	NNW3	NW3	NNW4	W1	ESE1	NNW1	DF	DF	DF	WSW7	SW7	SW4	SSE4	SE7	SE6	ESE3	DF	DF	DF	SSE3	SE10	S1.2	SE10	
24-Feb	SE13	SE12	SE11	SE16	SE14	SE13	SE10	SE16	SE19	ESE7	ESE9	SE16	SSE19	S24	S25	SSE22	SSE25	SSE22	S26	S23	S21	S19	SSE15	SSE10	SSE16.1	S26	
25-Feb	SE9	SE15	SE14	SE16	SE13	ESE7	ESE8	ESE8	SSE5	SSW8	WSW12	WSW16	WSW12	SW10	S4	SSE3	ESE6	ESE4	SE3	SSE4	ESE5	ESE3	ESE5	ESE7	SSE5.5	WSW16	
26-Feb	ESE7	ESE5	ESE5	ESE6	WNW2	NW3	NNW3	NNW3	NW2	NNW2	DF	DF	E4	E6	ENE5	ESE6	ESE7	DF	DF	DF	DF	DF	DF	DF	---	ESE7	
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	NNW12	NNW15	N14	N14	NNW14	N14	N13	N11	NNE15	N13	N11	N10	N7	NNW6	NW5	NNW3	---	NNE15	
28-Feb	NW2	NW2	NW3	WNW3	NW3	NW2	WNW2	NNW2	NW1	W1	WSW3	WSW10	WSW11	WSW11	DF	DF	W5	WNW3	WSW1	SSW1	SSW1	SSW3	S3	SSE4	WSW2.6	WSW11	

S0.6 SSE0.9 SE1.1 SSE1.4 SW1.3WSW1.1WSW0.9 S0.8NNE0.6NNW1.4 NW0.7WNW0.9WNW1.6 W1.5WNW0.4 NW1.3NNW0.9 N1.8 NW0.8 NW0.9NNW1.6 N0.7 NW1.1 ENE0.4	Diurnal Average
SSE24 SE23 SE20 SE20 SE18WNW22 W19 SE20 SE19 N26 N25 N24 N28 N25 S25 SE25 SE26 SE22 SE28 SE28 SE25 SE23 SE21 SE21	Diurnal Maximum

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 Speed 20 m (WS20m) - km/h**  
**Lower Camp Met Tower - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 672
Maximum Value: 9 km/h on Feb 13 13:00	Hours of Data: 627
Minimum Value: 0 km/h on Feb 19 01:00	Hours of Missing Data: 45
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> = 5 P <sub>99</sub> = 8	Hours of Calibration: 0
	Percent Operational Time: 93.3

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-Feb	1	1	2	1	1	1	2	2	1	1	2	3	3	3	3	2	2	1	1	1	1	1	1	1	3
2-Feb	1	2	1	2	2	2	2	2	1	3	2	2	2	3	6	8	8	7	7	8	7	7	6	6	8
3-Feb	5	6	5	5	4	4	3	4	3	2	2	3	2	3	3	3	3	3	2	2	2	1	1	3	6
4-Feb	2	1	1	2	2	2	2	2	4	2	3	3	3	3	2	2	2	2	2	2	2	2	2	2	4
5-Feb	1	2	1	1	1	2	2	2	2	1	2	1	1	1	2	3	1	1	2	2	2	4	7	6	7
6-Feb	7	6	7	3	2	3	3	4	4	2	1	1	1	2	2	1	2	3	3	2	2	2	1	1	7
7-Feb	1	2	3	6	5	8	6	5	4	4	3	4	6	7	7	6	4	3	3	3	2	6	4	8	
8-Feb	3	3	1	2	1	1	1	1	1	1	2	2	3	2	1	1	1	1	1	1	1	2	3	4	4
9-Feb	5	2	2	2	2	4	4	2	2	1	2	2	3	4	3	3	2	2	2	3	2	2	2	1	5
10-Feb	1	1	3	2	3	4	3	2	2	2	2	2	3	3	3	3	DF	DF	DF	DF	2	2	1	1	4
11-Feb	1	1	1	1	2	2	3	2	3	2	2	2	2	3	3	4	5	3	4	6	5	2	6	5	6
12-Feb	5	6	5	4	4	4	4	4	3	3	4	2	3	2	3	2	4	3	DF	DF	DF	DF	DF	6	6
13-Feb	6	5	4	2	6	6	6	5	6	8	8	8	9	8	7	7	7	6	5	4	5	5	4	5	9
14-Feb	5	5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	2	1	2	1	1	1	5
15-Feb	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	DF	DF	2	1	1	1	2	1	2	2
16-Feb	2	2	1	1	1	1	2	1	1	2	1	2	2	2	2	1	1	4	DF	DF	5	4	4	3	5
17-Feb	1	2	2	2	1	2	2	2	2	2	2	3	3	DF	3	3	3	3	3	3	3	3	1	2	3
18-Feb	1	2	1	1	1	1	1	1	1	1	1	2	3	3	3	3	2	1	1	1	1	1	1	0	3
19-Feb	0	1	1	1	1	1	1	1	1	2	1	1	DF	DF	DF	DF	DF	2	1	1	1	2	2	3	3
20-Feb	2	1	1	2	2	2	1	1	1	1	1	1	2	1	1	4	2	2	1	1	2	1	2	2	4
21-Feb	2	3	3	2	2	2	2	2	1	2	2	3	3	4	4	5	4	2	1	1	1	1	1	1	5
22-Feb	1	1	2	2	2	2	1	2	2	DF	1	3	3	2	2	2	3	2	2	1	1	1	1	1	3
23-Feb	0	2	1	1	1	1	1	1	1	DF	DF	DF	2	1	3	3	2	1	2	DF	DF	DF	1	3	3
24-Feb	2	2	4	3	4	3	3	4	5	4	4	4	5	4	4	4	4	3	5	4	3	3	3	3	5
25-Feb	3	3	3	2	2	2	2	3	2	2	4	5	3	3	2	2	3	2	2	3	2	1	2	2	5
26-Feb	2	2	2	2	1	1	2	2	1	1	DF	DF	3	3	3	3	3	DF	DF	DF	DF	DF	DF	DF	3
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	4	5	5	4	5	4	4	4	5	5	3	3	2	2	2	2	5
28-Feb	1	1	1	1	1	1	1	1	1	1	2	2	2	2	DF	DF	2	1	1	1	1	1	1	2	2
	7	6	7	6	6	8	6	5	6	8	8	8	9	8	7	8	8	7	7	8	7	7	7	6	

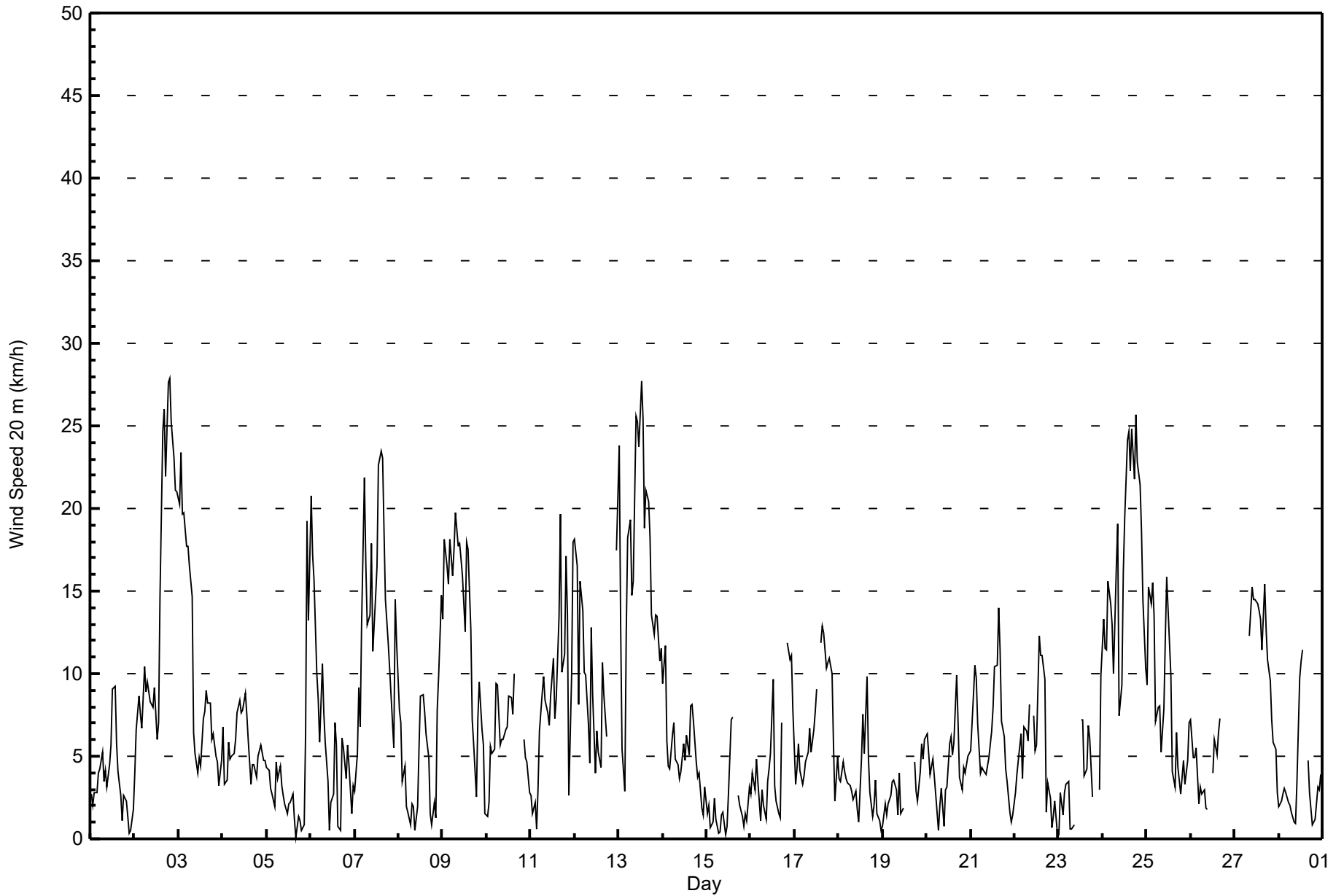
Diurnal Maximum

DF - DAS Failure



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

**Wind Speed 20 m (WS20m) - km/h**  
**Lower Camp Met Tower - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h  
Lower Camp Met Tower - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	305	48.64	48.64
6 - 11	192	30.62	79.27
12 - 19	94	14.99	94.26
20 - 28	36	5.74	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

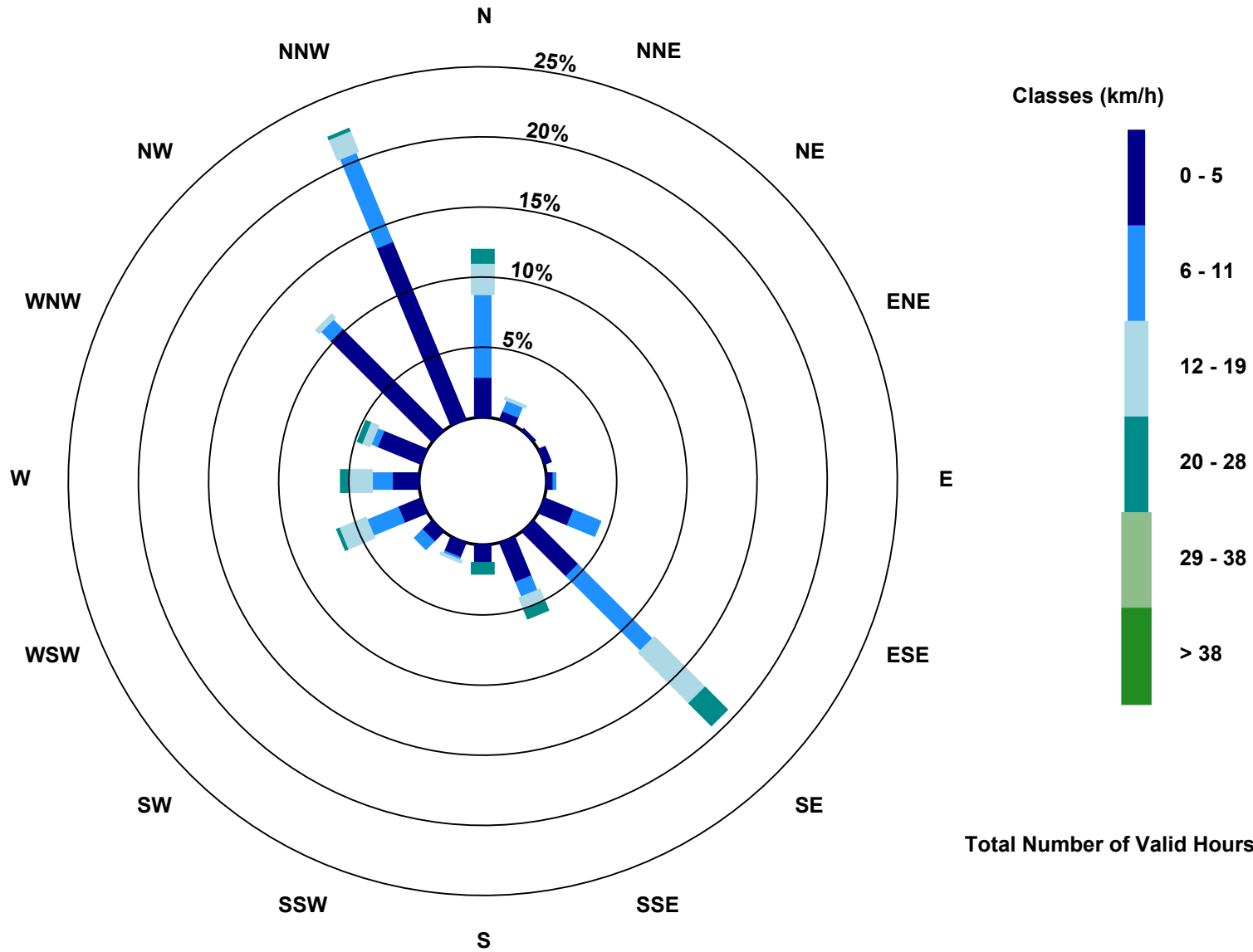
Total Number of Valid Hours: 627

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed 20 m (WS20m) - km/h  
Lower Camp Met Tower





Maximum Speed: 43 km/h on Feb 2 20:00	Maximum Daily Speed Average: 20.7 km/h on Feb 2	Hours in Service: 672
Minimum Speed Value: 0 km/h on Feb 16 07:00	Minimum Daily Speed Average: 2.3 km/h on Feb 16	Hours of Data: 625
Maximum Diurnal Speed Average: 2.9 km/h at hour 18	Minimum Diurnal Speed Average: 0.6 km/h at hour 8	Hours of Missing Data: 47
Monthly Average Velocity: 0.8 km/h 334.4 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 2 Q <sub>1</sub> = 5 Median = 8 Q <sub>3</sub> = 14 P <sub>90</sub> = 21 P <sub>99</sub> = 38	Percent Operational Time: 93.0

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-Feb	NNW6	NW4	NNW4	NNW6	NNW4	NNW8	NNW13	NNW12	NNW12	NNW10	NNW10	NW8	NW12	NNW12	NW8	NNW7	SW3	N1	NNW4	NW2	W1	SSW1	SSE5	SE7	NW5.4	NNW13
2-Feb	SE11	SE11	SE10	SE10	SE8	SE12	SE11	SE10	SE10	SE10	ESE8	ESE9	SE6	SE12	SE25	SE39	SE39	SE35	SE42	SE43	SE39	SE36	SE33	SE31	SE20.7	SE43
3-Feb	SE29	SE33	SE28	SE27	SSE21	SSE21	SE20	SE17	SE8	SE8	SE4	NNW6	NNW6	NNW10	N11	N14	NNE12	N12	NNE9	N9	N8	N7	N5	NNW7	ESE6.2	SE33
4-Feb	N10	N5	NNW6	NNW9	NNW8	NNW9	NNW8	NNW10	NNW12	N12	NNW11	N10	N11	N10	N8	NNW4	NW5	NNW6	NNW6	NNW8	NNW8	NNW9	NW7	NW7	NNW8.1	N12
5-Feb	NNW6	NNW6	NW4	NNW4	NNW2	NNW6	NNW5	NW6	NNW4	NW3	WSW3	WSW2	SSE3	WSW2	SE4	ESE1	SSW1	SSW2	WSW1	SW3	SE3	W15	WNW28	NW18	WNW3.9	WNW28
6-Feb	WNW29	W24	W22	WSW17	WSW16	W12	W19	W17	W13	NNW8	NNW2	W2	SSE2	SE8	SE7	E2	ESE2	NNW7	NNW8	NNW4	NNW8	NNW6	NNW4	NW4	WNW7.2	WNW29
7-Feb	NW3	SE7	SE13	SSW9	WSW22	WNW31	WNW24	W18	WSW21	WSW26	WSW17	WSW20	W23	W32	W34	W33	W26	W22	WSW21	WSW18	W13	WNW9	NNW21	NNW17	W16.8	W34
8-Feb	NNW14	NNW12	NNW7	NW10	WNW3	W2	N1	NW2	WNW2	SSW1	ESE6	SE8	SE10	SE10	SE9	SE8	SE8	SSE5	SE5	SSE1	SE8	SE14	ESE13	SE18	ESE3.2	SE18
9-Feb	SE19	SE19	SE19	SE18	SE21	SE18	SE19	SE20	SE18	SE18	SE18	SE18	SE16	SE22	SE21	SE17	SE10	SE6	ESE1	SSE3	SE9	SE8	SE7	SE5	SE14.4	SE22
10-Feb	SE4	NNW1	NNW10	NNW9	NNW11	NNW14	NNW14	NNW9	NNW10	NNW10	NNW10	NNW11	NNW12	NNW12	NNW11	NW14	DF	DF	DF	DF	NNW9	NNW7	NNW7	N4	NNW9.0	NNW14
11-Feb	NNW4	NNW2	N3	E0	SE6	SE10	SE12	SE13	SE10	SSE7	S7	SE11	SE14	SE11	SSE12	SW18	WSW25	WSW16	W17	WNW25	NW19	WNW4	WSW17	WSW28	SW5.4	WSW28
12-Feb	WSW27	W25	W12	WSW25	WSW21	WSW17	WSW16	WSW13	W8	WSW16	W9	W4	NNW5	NNW5	NW4	NNW10	NNW7	NNW6	DF	DF	DF	DF	DF	SE27	W9.6	WSW27
13-Feb	SSE30	SSE20	SE8	WSW4	WSW22	WSW26	WSW29	W22	N23	UO	UO	N38	N41	N39	NNW28	NNW30	N31	N29	N22	N18	N20	N21	N18	N18	NNW14.3	N41
14-Feb	N15	N18	NNW12	NNW9	NNW8	N10	N11	N7	N6	N5	N5	N7	NNW6	N7	N6	N11	NNE12	NNE10	N7	NNW6	NNW7	NNW5	WNW2	NNW4	N7.9	N18
15-Feb	WNW2	NW2	S1	SE5	WSW2	SW2	SSE2	ESE2	SE6	SSW2	SE1	SE1	ESE4	ESE10	ESE9	DF	DF	ESE5	ESE3	SE5	ESE6	SE4	SE7	SE7	SE3.3	ESE10
16-Feb	SE6	SE7	SE8	SE7	SE6	SSE3	WNW0	N0	SSE1	SE7	SE5	SE6	SE10	ESE5	ESE3	E1	NNW2	NNW11	DF	DF	N18	N16	N16	N12	ENE2.3	N18
17-Feb	NNE4	NNE7	N8	N6	NNW4	NNW6	NNE7	NE8	NNE10	NNE7	N9	N10	NNW11	DF	N16	N18	N18	N17	N16	N17	N15	NNW10	NNW6	NNW10	N10.1	N18
18-Feb	NNW8	NNW7	NNW4	NNW6	NNW7	NNW7	NNW4	N3	NNW4	NW5	WNW3	NW2	NW6	NNW10	NW6	WSW10	W7	W4	NNW3	NW3	NNW3	NW2	WSW1	SSE2	NW4.1	WSW10
19-Feb	SSE5	SE7	SSE7	SSE7	SSE4	NW3	NNW6	NNW7	NNW3	NNW6	NW4	NW3	DF	DF	DF	DF	DF	NNW8	NW5	NW3	NNW9	NNW10	NNW10	NNW12	NNW3.1	NNW12
20-Feb	NNW10	N8	N6	NW7	NNW7	N4	NW1	E2	SE6	ENE1	SE4	SSW3	SW5	SW6	WSW3	N9	N15	N11	NNW6	NW5	NNW7	N10	NNW12	NNW16	NNW4.8	NNW16
21-Feb	NNW12	NNW15	N16	N14	N10	NNW8	NW8	NNW8	NW9	NW7	NNW7	NNW8	NW10	NNW14	N14	N21	NNW17	N11	N10	N9	NNW8	W3	WSW3	S4	NNW9.4	N21
22-Feb	SE7	SE6	SE11	SE10	SE8	SE11	SE10	SE10	SE10	DF	SE5	SE4	WSW6	WSW13	WSW12	WSW12	WSW13	W5	WNW5	W4	W1	S1	W1	S1	S4.0	WSW13
23-Feb	SW2	NNW4	NNW3	NW3	NW4	SE2	SE9	SE8	DF	DF	DF	WSW6	WSW6	SW3	SE4	SE9	SE8	SE7	DF	DF	DF	SE6	SE13	SSE2.6	SE13	
24-Feb	SE15	SE12	SE15	SE18	SE20	SE15	SE20	SE22	ESE12	SE17	SE22	SSE21	S25	S27	SSE24	SSE27	SSE25	S29	S26	S23	S21	SSE17	S12	SSE18.7	S29	
25-Feb	SSE10	SE17	SE16	SE15	SE15	SE10	SE9	SE8	SSW6	SW9	WSW15	WSW19	WSW14	SW11	S4	SE4	ESE9	ESE8	SSE6	S7	SE8	SE8	SE9	ESE11	SSE7.1	WSW19
26-Feb	ESE12	ESE10	ESE10	ESE10	SE2	N1	NNW6	NNW6	NW6	NW5	DF	DF	E5	E9	ENE7	ESE9	ESE11	DF	DF	DF	DF	DF	DF	DF	---	ESE12
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	NNW18	N22	N21	N21	N20	N18	N20	N18	NNE22	N22	N18	N15	N12	N10	NNW10	NNW7	---	NNE22
28-Feb	NNW5	NNW5	NW4	NW3	NNW5	WNW3	NNW2	NW2	WNW1	NW2	W3	WSW8	WSW10	WSW11	DF	DF	W5	WNW4	NW2	WSW1	WSW2	SSW3	SSE6	SE9	W2.4	WSW11
SE0.7 SE1.2 ESE1.7 SSE1.3 SW2.2WSW1.5 W1.4WSW0.6 N1.3 NW1.8 NW0.7NNW2.0 NW2.3 NW1.8 N0.9NNW2.1 N1.5 N2.9 N1.4 NW1.7 N2.7NNE1.8NNW1.7 NE1.0																								Diurnal Average		
SSE30 SE33 SE28 SE27 WSW22WNW31WSW29 W22 N23 WSW26 N21 N38 N41 N39 W34 SE39 SE39 SE35 SE42 SE43 SE39 SE36 SE33 SE31																								Diurnal Maximum		

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**

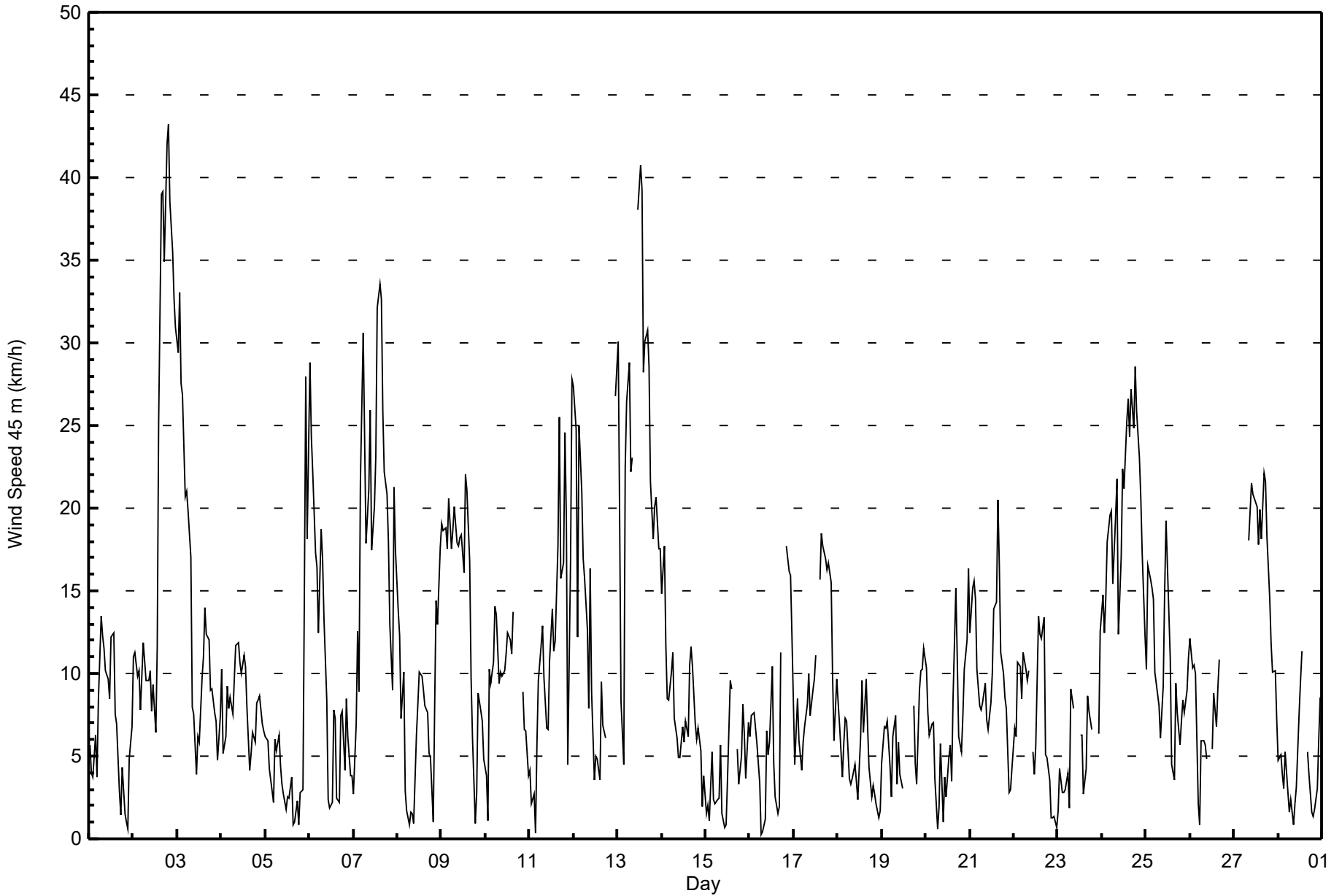
**Wind Speed 45 m (WS45m) - km/h**  
**Lower Camp Met Tower - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Feb 13 14:00														Hours in Service: 672 Hours of Data: 625 Hours of Missing Data: 47 Hours of Calibration: 0 Percent Operational Time: 93.0											
Minimum Value: 0 km/h on Feb 18 20:00																									
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> = 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-Feb	2	1	3	2	1	2	1	2	1	1	2	4	3	3	3	2	2	1	1	1	1	1	1	1	4
2-Feb	2	2	2	3	1	2	3	1	2	2	2	2	1	4	6	7	7	5	5	6	6	5	5	5	7
3-Feb	4	4	5	5	4	3	2	3	3	3	2	3	3	2	3	2	2	3	3	2	3	1	1	5	5
4-Feb	3	1	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	1	3
5-Feb	1	2	1	1	1	2	1	2	2	2	2	1	1	2	3	3	1	2	1	2	2	6	7	7	7
6-Feb	8	6	8	4	2	3	3	5	6	2	1	1	2	2	3	1	1	4	4	3	2	3	1	1	8
7-Feb	2	4	1	7	6	8	6	5	3	3	3	3	7	7	7	7	6	4	2	3	3	2	6	4	8
8-Feb	4	4	1	2	2	1	1	1	1	1	2	2	3	2	1	1	2	2	2	1	3	2	2	2	4
9-Feb	2	2	2	2	1	3	2	2	2	1	1	2	2	4	2	2	4	2	2	1	2	1	2	1	4
10-Feb	1	1	3	1	2	4	3	3	2	3	2	2	3	2	3	3	DF	DF	DF	DF	2	2	2	2	4
11-Feb	1	1	1	1	2	2	2	1	3	2	2	2	2	2	2	4	5	3	5	6	5	4	8	4	8
12-Feb	4	6	7	3	3	4	4	5	4	3	5	2	1	2	2	1	4	2	DF	DF	DF	DF	DF	5	7
13-Feb	4	4	4	4	6	6	7	5	6	UO	UO	7	8	9	6	7	6	6	5	3	4	5	4	4	9
14-Feb	5	5	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	3	2	1	1	2	1	1	5
15-Feb	1	1	1	3	1	1	1	2	1	1	1	2	1	2	1	2	DF	DF	2	1	2	1	1	2	3
16-Feb	1	3	2	1	1	1	1	1	1	2	2	2	2	2	2	1	2	6	DF	DF	5	5	4	3	6
17-Feb	2	1	2	2	1	1	2	2	2	3	2	3	3	DF	3	3	3	3	3	3	3	3	3	1	3
18-Feb	2	2	3	1	1	1	1	2	1	1	2	2	2	2	3	1	2	2	1	0	1	1	1	1	3
19-Feb	2	1	1	1	2	2	1	1	2	3	2	1	DF	DF	DF	DF	DF	2	1	1	2	3	3	3	3
20-Feb	2	1	2	2	3	1	1	1	1	1	1	1	2	2	1	5	2	3	1	1	2	1	3	2	5
21-Feb	3	3	3	2	2	2	2	2	2	2	2	3	3	4	4	5	3	3	2	1	2	2	2	1	5
22-Feb	1	2	1	1	1	1	2	2	3	DF	1	2	2	2	1	1	2	3	1	1	1	1	1	1	3
23-Feb	1	2	1	1	1	1	1	2	2	DF	DF	DF	2	1	2	3	1	1	2	DF	DF	DF	1	3	3
24-Feb	2	2	2	2	2	1	2	3	2	4	3	3	5	4	4	4	5	4	6	5	3	3	4	3	6
25-Feb	3	2	2	2	1	2	2	4	3	3	3	5	3	3	2	2	5	3	3	4	2	1	1	1	5
26-Feb	1	1	1	3	2	1	2	2	3	2	DF	DF	4	3	3	4	4	DF	DF	DF	DF	DF	DF	DF	4
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	4	4	4	4	4	4	3	3	3	4	3	2	2	1	2	2	4
28-Feb	1	1	1	1	2	2	1	1	1	1	2	2	2	1	DF	DF	1	2	1	1	1	1	2	2	2
Diurnal Maximum																									
DF - DAS Failure      UO - Unstable Operation																									



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

**Wind Speed 45 m (WS45m) - km/h**  
**Lower Camp Met Tower - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 45 m (WS45m) - km/h  
Lower Camp Met Tower - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	173	27.68	27.68
6 - 11	245	39.20	66.88
12 - 19	120	19.20	86.08
20 - 28	62	9.92	96.00
29 - 38	18	2.88	98.88
> 38	7	1.12	100.00

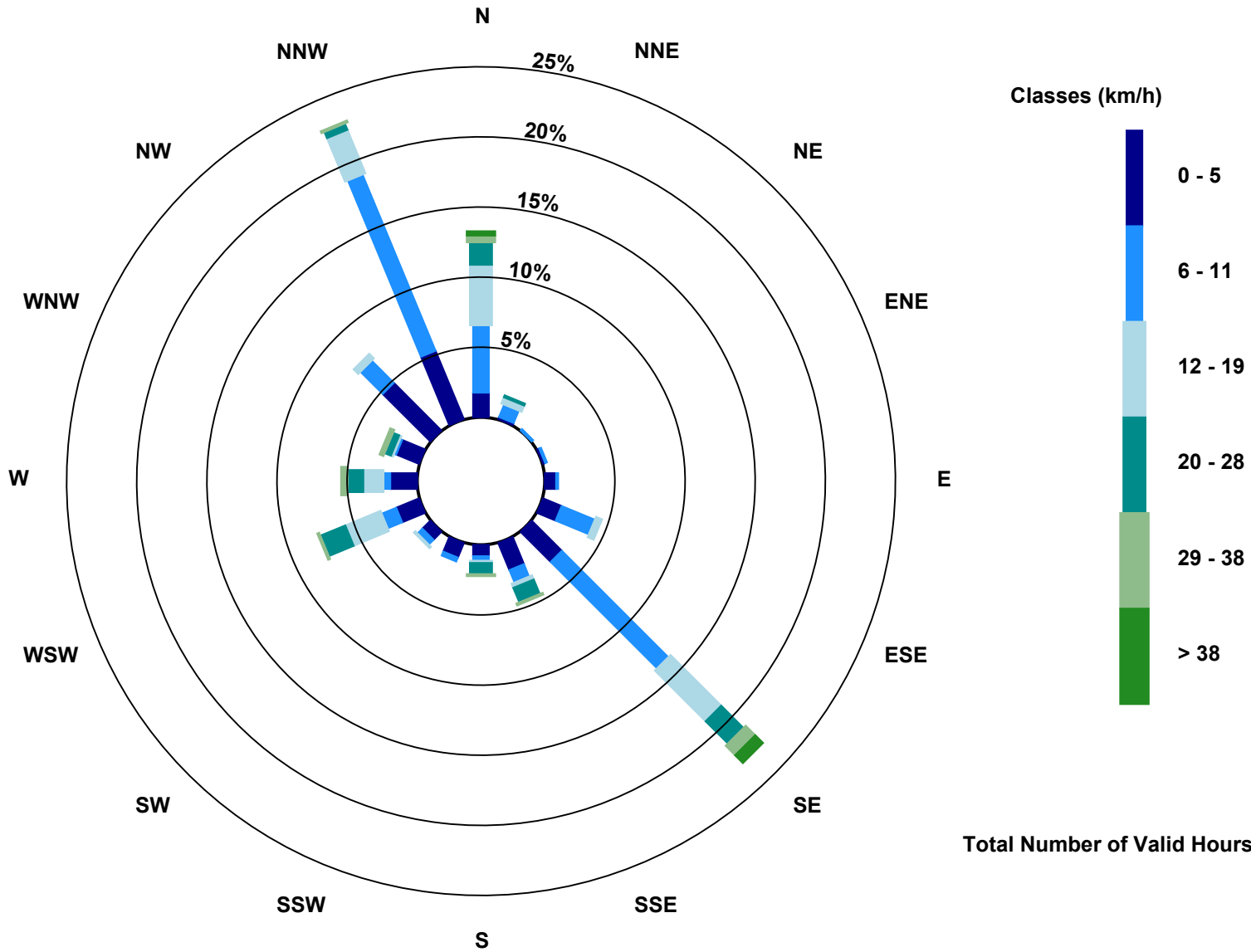
Total Number of Valid Hours: 625

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed 45 m (WS45m) - km/h  
Lower Camp Met Tower





Maximum Speed: 49 km/h on Feb 13 13:00	Maximum Daily Speed Average: 25.4 km/h on Feb 2	Hours in Service: 672
Minimum Speed Value: 1 km/h on Feb 10 00:00	Minimum Daily Speed Average: 1.0 km/h on Feb 23	Hours of Data: 624
Maximum Diurnal Speed Average: 4.2 km/h at hour 7	Minimum Diurnal Speed Average: 0.3 km/h at hour 24	Hours of Missing Data: 48
Monthly Average Velocity: 1.5 km/h 301.1 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 3 Q <sub>1</sub> = 7 Median = 11 Q <sub>3</sub> = 17 P <sub>90</sub> = 27 P <sub>99</sub> = 44	Percent Operational Time: 92.9

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-Feb	NNW15	N10	N5	NNW10	NNW11	N17	NNW17	N18	N15	NNW11	NNW12	NW12	NW14	NNW14	NNW10	NNW10	WNW2	N3	NE4	NW6	NW12	NNW2	SW3	SW3	NNW9.1	N18	
2-Feb	SSE6	S9	S10	SE15	SSE13	SSE16	SSE12	SSE10	SSE8	SE15	SE15	SSE15	SE14	SE29	SE36	SE44	SE45	SE42	SE47	SE48	SE46	SE43	SE39	SE37	SE25.4	SE48	
3-Feb	SE35	SE36	SE32	SE29	SSE25	SSE24	SSE23	SSE23	SSE11	SSE10	SSW4	NNW6	NNW6	NNW11	N11	N14	NNE13	NNE13	NNE10	NNE9	N9	NNE7	NNE6	N9	ESE7.0	SE36	
4-Feb	N12	NNE6	N9	N12	N10	N11	N11	NNW13	N15	N13	N13	N11	N11	N11	N8	NNW4	NW6	NNW7	N8	NNW11	N10	NNW11	NNW9	NNW8	N9.9	N15	
5-Feb	NNW7	NNW7	NNW4	NNW3	WNW2	NNW5	NNW7	NW7	NNW5	WNW4	W3	W2	SE4	SSW4	SE6	SSW6	SSE6	SSE11	SSE8	SSW5	WSW9	WNW26	WNW35	NW23	WNW4.3	WNW35	
6-Feb	WNW35	W31	W29	W24	W25	W22	W24	W23	W25	N12	NNE4	NW2	ESE3	ESE8	ESE9	E5	ESE7	NNW4	NNW6	W2	NE1	NNW6	SSW2	SW9	W9.3	WNW35	
7-Feb	WSW9	SSW9	SSW10	WSW24	W31	WNW39	WNW32	W26	W30	WSW32	WSW25	WSW27	W29	W40	W41	W43	W36	W34	WSW31	W32	W20	WNW18	NNW26	N21	W25.2	W43	
8-Feb	N19	N17	N11	NNW12	NNW11	NW5	N4	NE6	NE4	SSE3	S5	SE10	SSE10	SE11	SE11	SE11	SE14	SE10	SSE10	SE11	SE16	SE21	SE21	SE21	ESE4.9	SSE21	
9-Feb	SE21	SE19	SSE15	SSE14	SSE14	SSE14	SSW11	S11	S12	SSE14	SSE16	SSE18	SSE20	SSE27	SSE23	SE17	SE13	SE8	E2	NNW3	S6	S3	SSW3	ESE1	SSE12.0	SSE27	
10-Feb	N2	E2	NNW14	NNW13	NNW15	N17	N16	NNW15	N14	NNW14	NNW14	NNW15	N17	N15	NNW15	NNW17	DF	DF	DF	DF	NNW11	NNW8	NNW9	N5	NNW12.2	NNW17	
11-Feb	N3	NW2	W1	SE3	SSE8	SSE12	S11	SSW8	SSW7	SW11	SSW10	SSE11	SE13	SE13	S16	SW24	WSW31	WSW23	W22	WNW31	WNW25	WNW9	WSW28	WSW39	SW9.8	WSW39	
12-Feb	WSW39	WSW37	W19	W29	W24	WSW25	WSW26	WSW24	WSW19	W14	WNW6	WNW3	NNW3	WNW4	ESE2	ENE3	N4	NNW11	DF	DF	DF	DF	DF	SE33	WSW12.8	WSW39	
13-Feb	SSE37	S29	SSW15	SW18	WSW35	WSW36	WSW36	W30	N26	UO	UO	UO	N49	N45	NNW35	NNW37	N36	N34	N27	N21	N25	NNE26	N21	N21	NNW15.1	N49	
14-Feb	N19	N23	N17	NNW14	NNW13	N12	N12	N8	N6	N6	N6	N7	N6	N7	N6	N11	NNE12	NNE12	NNE10	N9	N11	N9	NW1	N3	N9.8	N23	
15-Feb	NNW1	E2	SE7	SSE9	SSE5	SSE6	S5	SE6	SSE7	S3	E1	SSW1	SE6	ESE10	ESE10	DF	DF	SE8	SE9	SE11	SE13	SE13	SE11	SE14	SE6.8	SE14	
16-Feb	SE14	SE13	SE11	SE16	SE13	SE10	SSE6	SSE3	SSE7	S11	S7	SSE10	SSE10	S6	S3	SSW2	N1	N16	DF	DF	N18	N18	N18	N13	ESE3.3	N18	
17-Feb	NNE5	NNE7	N9	N7	NNW5	N8	NNE8	NE10	NNE11	NNE8	NNE10	N9	N11	DF	N15	N18	N19	N18	N18	N17	N14	N11	N14	N14	N11.4	N19	
18-Feb	N14	N11	NNW9	NNW10	NNW14	NNW15	NNW14	NNW12	NNW10	N8	NW6	NW5	NW7	NNW10	NW7	W7	WNW4	NNW4	NNE6	NE3	NE2	SE3	SE7	SE10	NNW6.1	NNW15	
19-Feb	SE10	SE11	SE14	SE13	SSE8	SSE7	SSE1	N3	N5	NW5	NNW8	NNW7	DF	DF	DF	DF	DF	NNW14	NNW10	NNW11	NNW18	N19	NNW19	N18	N4.1	NNW19	
20-Feb	N11	N9	N10	N13	NNW11	NW3	W3	WSW3	S5	SE5	SE5	WSW1	W4	SW3	WNW2	N9	NNE15	NNE13	NNE9	NNE8	N12	N13	N19	N21	N6.6	N21	
21-Feb	N17	N19	N19	N16	N13	N11	N11	NNW13	NNW14	NNW12	NNW9	NW9	NW12	NNW15	N16	N23	NNW20	N15	NNE14	N11	N11	NNW7	W4	SW8	N12.5	N23	
22-Feb	SW7	WSW8	SSW4	SSW5	SSW4	SSW5	SSW6	SSW6	SW7	DF	S4	SSW3	W6	WSW12	WSW11	W10	WSW11	W10	NW7	NNW7	NNW6	ESE2	SE2	SE4	WSW4.5	WSW12	
23-Feb	SE5	SE2	NNW2	N8	NNW11	NNW11	NW6	W3	W3	DF	DF	DF	WSW4	WNW5	WSW2	SE4	SE9	SE11	SSE13	DF	DF	DF	SSW8	S11	S1.0	SSE13	
24-Feb	SSE13	SSE12	SSE16	SSE18	SSE18	SSE23	SSE23	SSE25	SSE26	SE21	SE23	SSE24	S23	S27	S30	SSE27	SSE31	S31	S36	S32	S27	S25	S21	S19	SSE23.3	S36	
25-Feb	S16	S17	S14	SSW13	SSW14	S12	SSW8	SSW9	WSW13	SW12	WSW19	WSW22	WSW17	SW17	SW12	S5	SE4	ESE10	ESE13	S11	SSW16	SSE8	SE14	SE14	SE15	S9.7	WSW22
26-Feb	SE15	ESE15	ESE16	ESE16	ESE8	ESE4	ENE2	NNE5	NE4	NNW1	DF	DF	E6	ENE8	ENE7	ESE10	ESE13	DF	DF	DF	DF	DF	DF	DF	---	ESE16	
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	DF	N23	N25	N23	N22	N23	NNW20	N21	N18	NNE24	N24	N20	N17	N16	N14	NNW17	NNW15	---	N25
28-Feb	NNW13	NNW13	NNW13	N11	NNW11	NNW10	NNW9	NNW8	NW3	NNW7	WNW5	WNW6	W6	W6	DF	DF	W4	W4	W2	NE1	SE3	SE6	S7	SE10	NNW4.2	NNW13	

SW0.8	SSW1.3	SSW0.5	WSW1.5	W3.6	W3.3	W4.2	W3.8	NNW3.0	NNW2.2	WNW1.9	W2.0	NNW2.7	NNW1.6	NNW0.5	NNW1.9	NE1.3	N2.6	N0.9	NW1.9	N3.4	NNE2.7	NNW2.2	ESE0.3	Diurnal Average
WSW39	WSW37	SE32	SE29	WSW35	WNW39	WSW36	W30	W30	WSW32	WSW25	WSW27	N49	N45	W41	SE44	SE45	SE42	SE47	SE48	SE46	SE43	SE39	WSW39	Diurnal Maximum

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 Speed 100 m (WS100m) - km/h**  
**Lower Camp Met Tower - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 672
Maximum Value: 10 km/h on Feb 11 23:00	Hours of Data: 624
Minimum Value: 0 km/h on Feb 28 20:00	Hours of Missing Data: 48
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 of Calibration: 0
	Percent Operational Time: 92.9

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-Feb	2	4	2	2	2	4	2	2	2	1	1	3	4	3	3	2	1	1	2	4	3	2	1	1	4
2-Feb	3	2	2	3	1	2	3	2	3	3	2	1	2	4	3	5	6	4	4	4	4	5	4	4	6
3-Feb	4	3	5	4	4	4	3	4	3	3	1	3	2	2	2	2	2	3	2	2	3	2	2	5	5
4-Feb	3	1	1	2	1	1	1	2	2	2	2	2	2	2	2	2	1	2	2	1	1	1	2	1	3
5-Feb	1	1	1	1	1	2	1	1	2	2	3	1	2	2	3	3	2	4	2	2	4	5	6	7	7
6-Feb	7	6	8	4	2	2	4	2	3	4	2	1	3	2	2	2	2	4	3	1	2	3	3	2	8
7-Feb	3	2	2	9	5	7	6	5	3	2	3	3	7	6	6	6	6	3	2	3	5	4	4	3	9
8-Feb	3	4	2	2	2	1	1	2	2	1	1	4	3	2	2	2	2	1	2	2	2	1	2	2	4
9-Feb	1	2	1	1	1	2	2	2	1	1	1	2	3	6	3	2	3	1	2	1	2	1	1	1	6
10-Feb	1	1	3	1	2	2	1	2	2	2	2	2	2	2	2	2	DF	DF	DF	DF	2	2	2	2	3
11-Feb	0	1	1	2	2	1	2	2	3	2	2	2	2	2	4	4	4	2	5	7	5	5	10	2	10
12-Feb	2	6	9	2	3	3	4	4	4	3	3	2	1	2	1	1	3	2	DF	DF	DF	DF	DF	4	9
13-Feb	4	4	4	7	4	4	5	4	5	UO	UO	UO	6	8	6	7	6	6	5	4	4	6	4	4	8
14-Feb	5	5	2	2	1	2	3	1	2	2	2	2	1	1	1	2	3	2	2	1	3	1	1	1	5
15-Feb	1	1	2	2	1	1	2	1	1	3	1	1	3	1	2	DF	DF	1	1	1	2	1	2	2	3
16-Feb	3	5	5	2	1	3	3	2	1	3	2	2	3	2	2	1	2	7	DF	DF	4	4	3	3	7
17-Feb	2	1	2	2	1	1	2	2	2	2	2	3	3	DF	2	3	2	3	2	2	2	2	1	1	3
18-Feb	1	2	1	0	1	1	0	1	1	1	2	2	3	2	3	2	1	1	1	2	1	2	1	2	3
19-Feb	2	3	2	2	2	2	1	1	2	4	3	2	DF	DF	DF	DF	DF	2	1	2	1	1	2	2	4
20-Feb	2	1	2	2	3	1	1	1	2	1	2	1	2	2	2	4	2	3	2	2	2	3	4	2	4
21-Feb	5	4	3	2	2	2	3	2	2	3	3	3	3	3	4	4	3	3	2	2	1	3	1	3	5
22-Feb	2	2	2	1	1	1	1	2	3	DF	1	2	2	2	1	1	2	1	2	2	3	1	1	1	3
23-Feb	1	1	2	2	2	2	1	1	1	DF	DF	DF	2	1	1	2	1	2	1	DF	DF	DF	3	4	4
24-Feb	2	1	4	2	2	2	2	2	2	2	2	3	5	4	4	5	5	3	5	5	4	4	4	4	5
25-Feb	4	3	2	2	2	2	2	3	3	3	2	4	3	3	3	2	5	3	4	4	3	1	2	1	5
26-Feb	2	2	1	2	2	2	1	2	3	1	DF	DF	3	3	2	4	5	DF	DF	DF	DF	DF	DF	DF	5
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	3	3	3	2	3	4	3	2	3	3	3	2	3	2	2	2	4
28-Feb	1	1	1	2	1	2	0	1	1	2	2	2	1	2	DF	DF	1	1	1	0	1	1	1	3	3
	7	6	9	9	5	7	6	5	5	4	3	4	7	8	6	7	6	7	5	7	5	6	10	7	

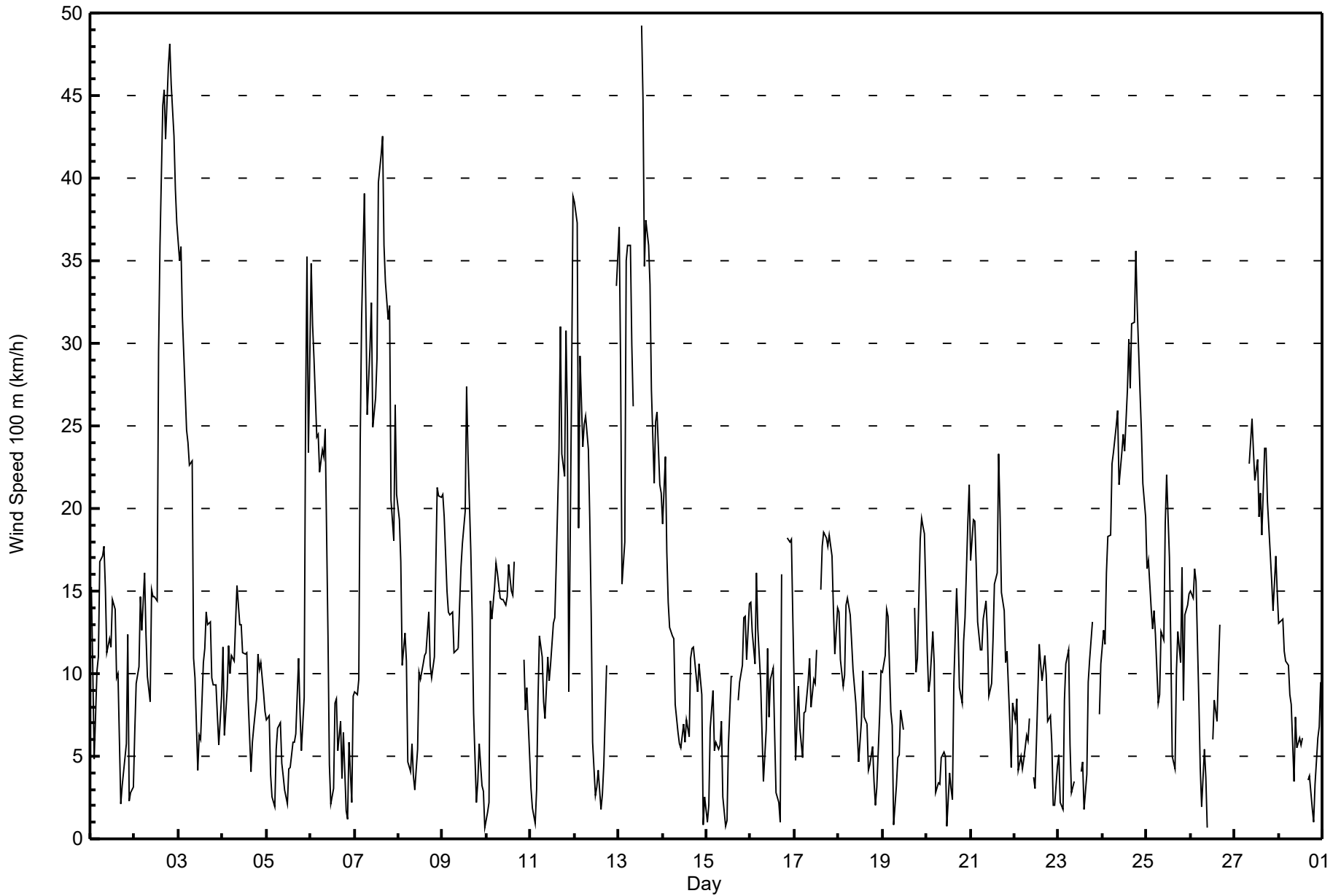
Diurnal Maximum

DF - DAS Failure UO - Unstable Operation



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

**Wind Speed 100 m (WS100m) - km/h**  
**Lower Camp Met Tower - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 100 m (WS100m) - km/h  
Lower Camp Met Tower - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	119	19.07	19.07
6 - 11	213	34.13	53.21
12 - 19	166	26.60	79.81
20 - 28	70	11.22	91.03
29 - 38	40	6.41	97.44
> 38	16	2.56	100.00

Total Number of Valid Hours: 624

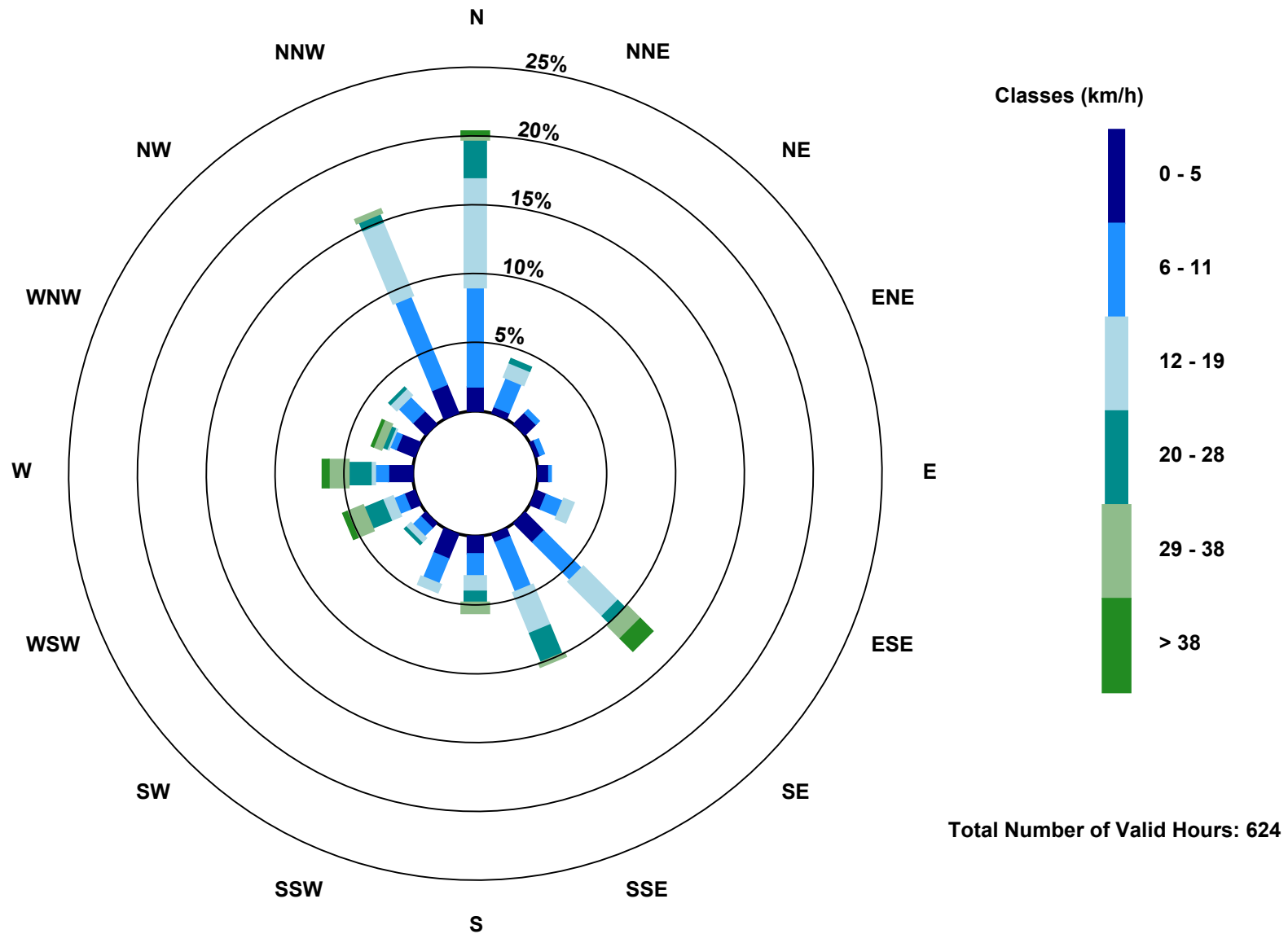
Total Number of Hours: 672





Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed 100 m (WS100m) - km/h  
Lower Camp Met Tower





Maximum Speed: 48 km/h on Feb 2 17:00	Maximum Daily Speed Average: 31.2 km/h on Feb 7	Hours in Service: 672
Minimum Speed Value: 0 km/h on Feb 12 14:00	Minimum Daily Speed Average: 3.4 km/h on Feb 23	Hours of Data: 611
Maximum Diurnal Speed Average: 4.6 km/h at hour 8	Minimum Diurnal Speed Average: 0.3 km/h at hour 15	Hours of Missing Data: 61
Monthly Average Velocity: 1.1 km/h 282.2 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 5 Q <sub>1</sub> = 9 Median = 14 Q <sub>3</sub> = 21 P <sub>90</sub> = 31 P <sub>99</sub> = 46	Percent Operational Time: 90.9

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-Feb	NNE20	NE17	ENE7	NNE12	N19	N24	N21	N25	N22	N13	N13	NW14	NW15	NNW14	NNW11	NNW11	N5	NNW7	N6	NW13	NW20	NW15	NW8	SW2	N12.3	N25	
2-Feb	SSE3	S10	S17	SSE17	SSE22	S28	SSE20	SSE21	SSE22	SSE21	SE22	SE21	SE26	SE35	SE39	SE46	SE48	SE45	SE47	SE47	SE48	SE44	SE41	SE39	SSE29.7	SE48	
3-Feb	SE35	SSE32	SSE31	SSE27	SSE26	SSE27	S27	S19	S13	SSW8	WSW9	NNW6	NW7	NNW10	NNE11	NNE13	NNE13	NNE14	NE11	NE10	NNE11	NE9	NE7	NNE8	SE6.8	SE35	
4-Feb	NNE13	NE9	NNE9	NNE12	NNE11	NNE12	NNE10	N12	N15	N13	N12	N11	N10	N11	N8	N4	N6	NNW6	NNE8	NNE11	NNE10	N9	N9	N6	N9.7	N15	
5-Feb	N6	NNE6	NE4	ENE3	ESE2	NE4	NNE4	N5	NNE3	NE3	W3	SW2	SE7	SSW7	SSE9	S12	S16	S23	S12	WSW9	W22WNW35	NW38	NW25	W3.6	NW38		
6-Feb	WNW37	W36	W34	W28	W28	W26WNW29	WNW25	WNW27	NNW14	NE7	NE3	SE5	ESE6	ESE9	ESE11	SE13	SSE5	ESE5	SSE13	SSE12	SSE8	SSE15	S15	W8.2	WNW37		
7-Feb	S12WSW20	WSW21	W36	W38WNW46	WNW39	W34	W35	W37	W30	W31	W33	W44	W46	W48	W43	W41	W40	W42	W28WNW28	NNW25	N21			W31.2	W48		
8-Feb	N23	N20	NNE15	NNE16	NNE11	N5	N6	NNE8	NE5	SSE3	S9	SSE12	S11	SE11	SE14	SE15	SE17	SSE14	SSE17	SSE18	SSE23	S17	SSE22	SSE25	SE6.3	SSE25	
9-Feb	S25	SSW21	SW18	SW17	SW14	SW12WSW20	SW19	SW16	SW13	SSW17	S16	SSE21	SSE28	S25	SSE19	SSE20	SSE13	SE6	SSE8	S19	SSW16	SSW12	S11	S14.9	SSE28		
10-Feb	S12	SSE7	NNE11	NNE16	N14	N16	N14	N14	NNE14	N16	N14	N16	N17	N15	N16	N18	DF	DF	DF	DF	NNW11	NNW9	NNW11	NNE6	N11.4	N18	
11-Feb	NNW4	N2	W2	S5	S8	S15	SSW12	WSW11	WSW14	SW15	SSW13	S11	SSE13	SSE15	SSW22	SW28WSW35	W29	W26WNW36	WNW32	W14	W35	W47		WSW14.0	W47		
12-Feb	W45	W46	W28	W29WNW21	W23	W28	W26WNW19	NW12	NNW6	NW3	NNW2	WNW0	ESE9	SE13	SE16	SE13	DF	DF	DF	DF	DF	SSE38		W11.6	W46		
13-Feb	S42	SSW34	SW25	SW27WSW42	WSW41	W40	W35	UO	UO	UO	UO	UO	UO	UO	N38	N41	N38	N38	N31	N26	NNE31	NNE32	NNE25	N23	NW13.7	WSW42	
14-Feb	N22	N27	N19	N17	N14	NNE13	NNE13	NNE8	NNE6	NNE6	NNE6	NNE7	N5	N7	NNE6	N10	NNE11	NNE12	NE14	NNE10	NNE12	NNE12	ENE2	E1	NNE10.6	N27	
15-Feb	ENE1	ESE4	SSE6	S11	S12	S14	S13	S13	S13	S8	S1	S3	SSE7	SE9	SE11	DF	DF	SE10	SSE12	SSE15	SSE17	SE17	SSE17	SSE19	SSE10.1	SSE19	
16-Feb	SE16	SE14	SE14	SE20	SE17	SE18	SE16	SSE10	SSE15	SSE17	SE17	SSE14	SSE16	S11	SW6WSW12	W10	N18	DF	DF	NNE17	N18	N18	N14	SE6.3	SE20		
17-Feb	NNE5	NNE8	NNE9	NNE7	N5	N9	NE8	NE10	NNE11	NE8	NNE9	N9	N11	DF	N14	N16	N17	NNE18	NNE18	NNE18	NNE19	NNE20	NNE16	N17	NNE12.2	NNE20	
18-Feb	NNE19	NE18	NE11	NE9	NNE11	N15	N14	N12	UO	UO	UO	UO	NNW7	UO	NNW8	NW7	NNW4	N6	NE8	ENE9	E6	SE8	SSE7	SSE12	NNE6.6	NNE19	
19-Feb	SSE10	SE14	SE18	SE19	SE18	SE14	SE8	ESE8	ESE12	SE8	W1	WNW4	DF	DF	DF	DF	DF	NNW17	N14	N19	N26	N24	N21	N21	ENE5.3	NNE26	
20-Feb	NNE18	N12	N17	N17	NNW9	N4	SSW2	SSE2	SSE6	ESE7	ESE4	NE1	NW4	NW1	NNW4	N10	NNE15	NNE16	NE14	NE12	NNE12	NNE14	NNE29	N31	NNE9.2	N31	
21-Feb	NNE26	N23	NNE23	NNE19	NNE17	NNE16	NNE19	N17	N19	N19	N9	NNW9	NNW12	NNW15	N16	N23	N19	N15	NNE16	NNE15	N14	N9	N3	SW6	N15.1	NNE26	
22-Feb	WSW9	WNW7	WNW7	W10	WNW9	W8	WSW9	W7WSW11	DF	W6	W6	NW8	W8	WNW7	WNW6	WNW6	WNW9	N6	NNE6	NNE7	NE5	NE7	NNE6	WNW5.4	WSW11		
23-Feb	N5	N9	NNE17	NNE22	NNE19	NNE19	N9	N7	NNW10	DF	DF	DF	WNW3	NNW5	WSW3	SSE2	SE9	SSE13	SSE16	DF	DF	DF	S19	SSW13	NE3.4	NNE22	
24-Feb	S10	SSW14	SSW18	SSW18	S22	SSW22	SSW24	SSW24	S26	SSE26	SSE24	SSE26	S25	S28	S32	SSE30	SSE34	S36	S40	S37	S33	S31	S29	SSW28	S26.1	S40	
25-Feb	SSW24	SSW22	SW16	SW14	SW15	SW16	SW16	WSW16	WSW13	WSW17	WSW22	WSW19	SW17	SSW5	SSE5	SE10	SE15	SSW14	SW21	SSW11	SSE8	S15	SE17	SW12.3	SSW24		
26-Feb	SSE16	SSE15	SE18	SE20	SE14	ESE12	ESE12	ESE13	ESE13	ESE7	DF	DF	E7	ENE9	ENE7	ESE10	E14	DF	DF	DF	DF	DF	DF	DF	---	SE20	
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	DF	N24	N26	N23	N21	N22	N19	N21	N18	NNE25	NNE25	NNE23	NNE21	NNE20	N19	N21	N20	---	N26
28-Feb	N18	N19	N19	NNE15	NNE12	N12	N9	UO	UO	UO	UO	UO	NW6	NW4	DF	DF	NW3	WNW4	W3	NE2	SE3	SSE5	S8	S11	---	N19	

SW1.0WSW1.9	W1.1	W1.4	W3.1	W3.1	W4.4	W4.6	W3.3WNW1.2	WSW1.8	WSW1.8	WSW1.4	SSW1.6	WNW0.3	NNW1.0	ESE1.5	NE1.5	ENE1.1	NNW1.3	NNE2.7	N2.8	N1.5	SSE1.4	Diurnal Average					
W45	W46	W34	W36	WSW42	WNW46	W40	W35	W35	W37	W30	W31	W33	W44	W46	W48	SE48	SE45	SE47	SE47	SE48	SE44	SE41	W47	Diurnal Maximum			

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**

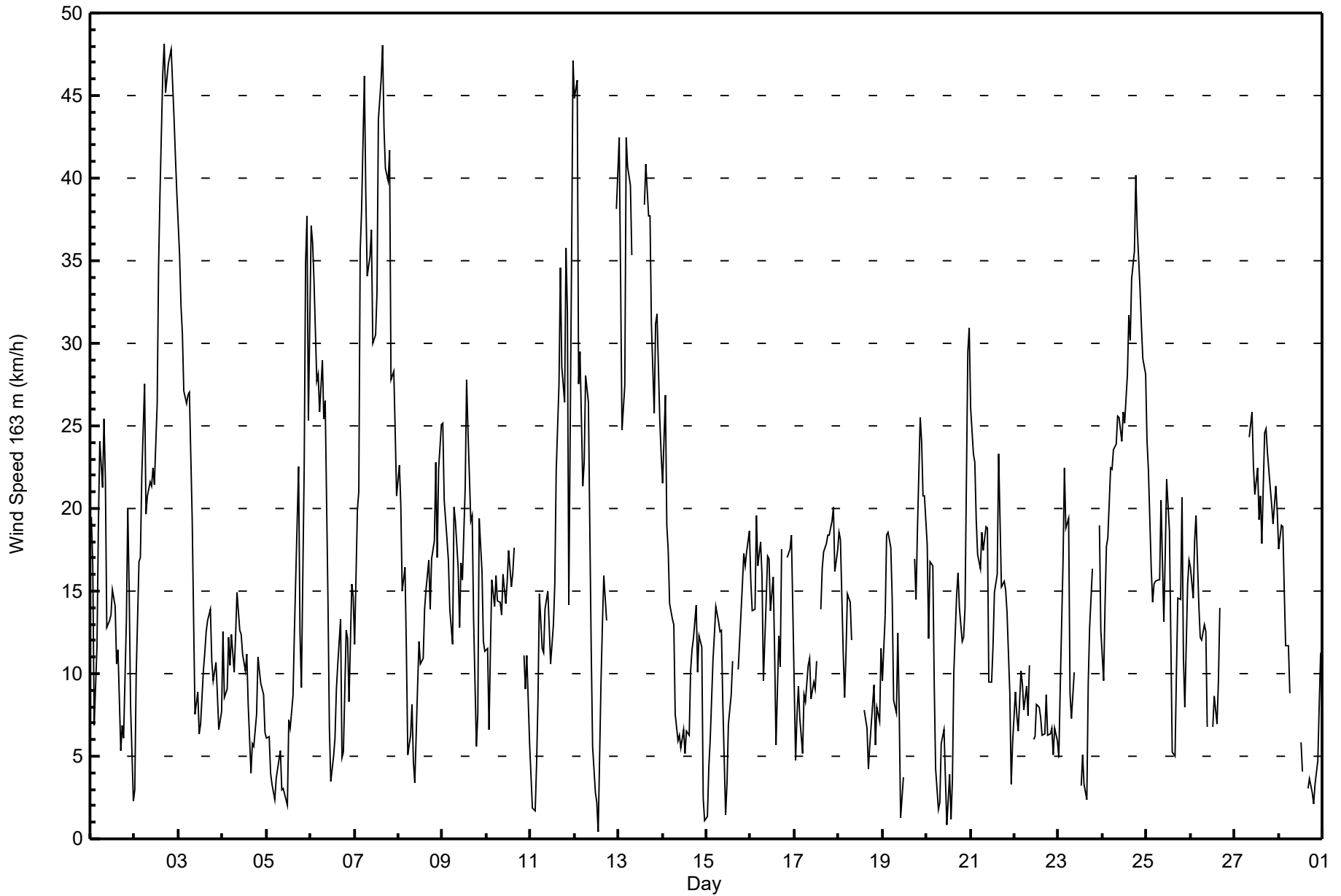
**Wind Speed 163 m (WS163m) - km/h**  
**Lower Camp Met Tower - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 672
Maximum Value: 10 km/h on Feb 11 23:00	Hours of Data: 611
Minimum Value: 0 km/h on Feb 18 18:00	Hours of Missing Data: 61
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 of Calibration: 0
	Percent Operational Time: 90.9

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-Feb	1	4	2	3	2	6	2	3	3	2	2	3	3	3	2	2	1	2	5	2	2	3	1	6	
2-Feb	2	2	1	2	2	2	5	3	2	4	3	2	3	2	3	5	6	4	5	5	4	4	4	6	
3-Feb	4	4	4	3	3	3	2	2	3	2	3	1	2	2	2	2	3	3	2	3	2	2	5	5	
4-Feb	2	1	1	1	1	1	1	2	1	2	2	2	2	2	2	2	1	1	2	1	1	2	1	2	
5-Feb	1	1	2	1	1	2	1	2	1	2	3	1	2	2	3	3	3	3	4	2	6	3	6	7	
6-Feb	6	5	8	4	3	2	5	3	3	4	2	2	3	3	2	5	2	3	3	4	4	1	4	8	
7-Feb	4	4	4	6	5	6	5	5	2	2	3	3	7	5	5	4	4	2	3	4	7	6	3	7	
8-Feb	3	3	2	2	2	1	1	1	1	2	1	1	2	3	1	3	3	2	3	3	2	2	2	3	
9-Feb	2	2	2	3	1	1	5	3	3	2	2	1	2	4	3	2	2	4	3	4	2	2	2	5	
10-Feb	2	3	5	2	2	2	1	1	1	1	1	1	1	2	2	1	DF	DF	DF	DF	1	2	1	5	
11-Feb	1	1	1	2	2	2	1	2	3	3	3	1	1	2	3	4	2	2	5	6	5	6	10	10	
12-Feb	2	3	9	4	3	4	2	2	2	3	1	2	1	2	1	3	2	4	DF	DF	DF	DF	DF	9	
13-Feb	4	5	3	6	3	4	4	4	UO	UO	UO	UO	UO	UO	5	6	6	7	6	4	5	7	5	7	
14-Feb	5	5	2	1	1	2	3	2	2	1	2	2	2	1	2	1	2	2	1	1	2	2	2	5	
15-Feb	1	1	1	1	1	1	2	2	2	2	2	1	2	1	2	1	DF	DF	1	1	3	2	1	3	
16-Feb	3	5	4	1	2	2	4	3	3	3	3	2	2	3	2	3	2	6	DF	DF	3	4	3	6	
17-Feb	2	2	2	2	2	1	2	2	2	2	2	3	2	DF	2	3	2	3	3	3	2	2	2	3	
18-Feb	1	1	2	1	1	1	1	2	UO	UO	UO	UO	3	UO	3	2	1	0	2	1	2	2	2	3	
19-Feb	3	2	3	2	2	2	2	1	4	7	1	2	DF	DF	DF	DF	DF	2	2	2	1	1	3	7	
20-Feb	3	2	2	3	2	2	1	1	2	1	2	1	2	1	2	3	2	2	2	1	1	4	6	6	
21-Feb	5	4	3	3	3	3	4	3	3	3	4	3	4	3	3	3	3	3	2	2	1	2	2	5	
22-Feb	1	2	1	2	2	1	1	2	3	DF	2	2	1	1	2	2	1	2	2	1	1	1	1	3	
23-Feb	1	4	2	3	2	4	1	1	1	DF	DF	DF	2	1	2	1	2	1	1	DF	DF	DF	2	4	
24-Feb	3	1	2	2	2	1	1	1	2	2	2	3	5	4	4	5	3	4	4	4	4	4	3	5	
25-Feb	2	2	2	2	1	2	2	3	2	2	2	3	2	3	3	2	4	2	4	2	3	2	3	4	
26-Feb	2	1	1	1	4	2	2	4	5	3	DF	DF	3	3	2	6	5	DF	DF	DF	DF	DF	DF	6	
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	2	3	3	3	3	4	3	2	3	3	4	3	3	2	2	4	
28-Feb	1	1	1	2	1	1	1	UO	UO	UO	UO	UO	1	1	DF	DF	1	1	1	1	1	0	2	2	
	6	5	9	6	5	6	5	5	5	7	4	3	7	5	5	6	6	7	6	6	7	7	10	7	

Diurnal Maximum

DF - DAS Failure UO - Unstable Operation





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 163 m (WS163m) - km/h  
Lower Camp Met Tower - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	64	10.47	10.47
6 - 11	162	26.51	36.99
12 - 19	213	34.86	71.85
20 - 28	101	16.53	88.38
29 - 38	43	7.04	95.42
> 38	28	4.58	100.00

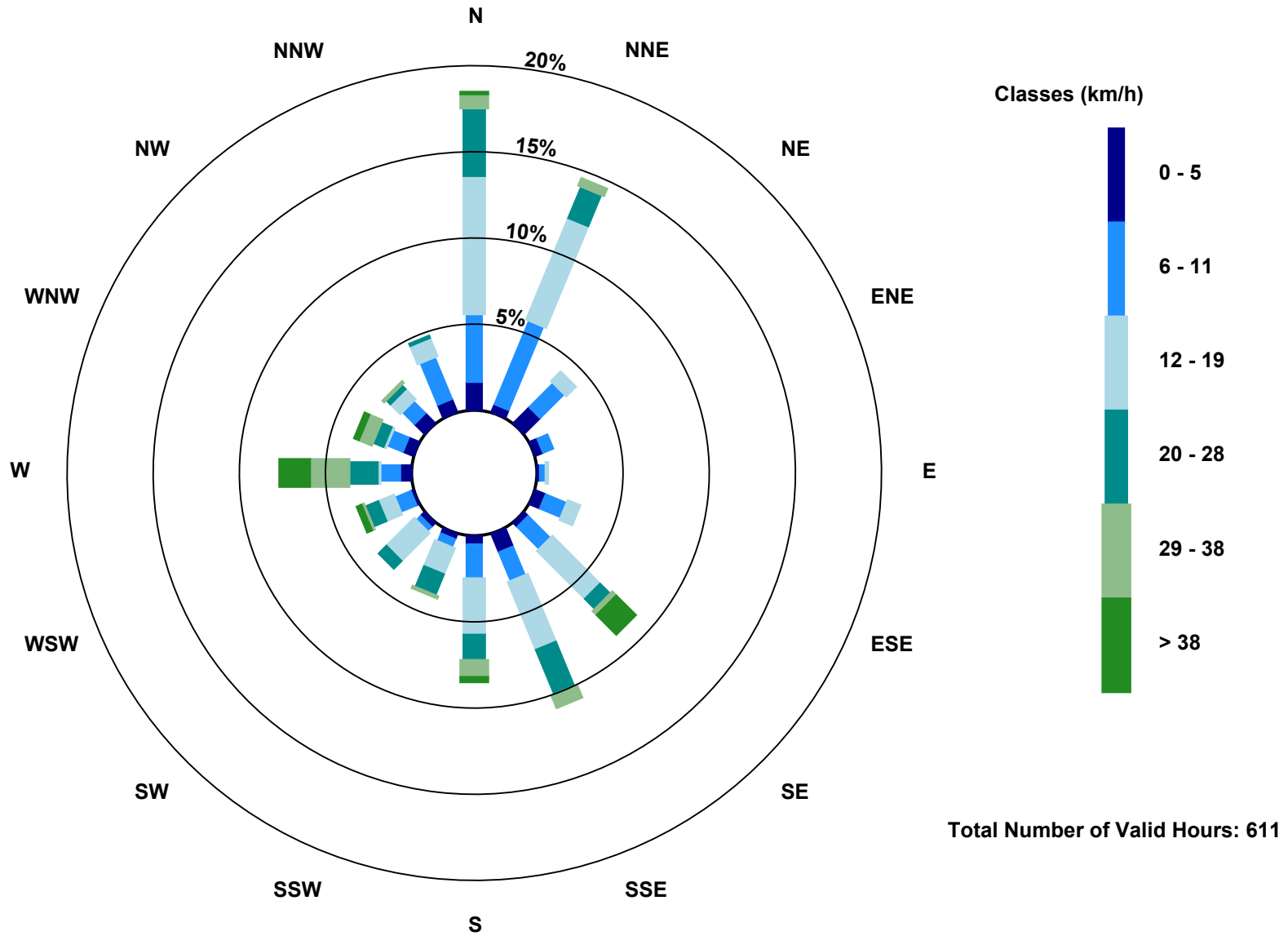
Total Number of Valid Hours: 611

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed 163 m (WS163m) - km/h  
Lower Camp Met Tower





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

**Wind Direction 20 m (WD20m) - deg**  
**Lower Camp Met Tower - February 2023**

Direction of Maximum Speed: 134 deg on Feb 2 20:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 156.4 deg on Feb 24	Hours of Data: 627
Direction of Minimum Speed: 102 deg on Feb 5 17:00	Hours of Missing Data: 45
Direction of Minimum Daily Speed Average: 0.8 deg on Feb 15	Percent Operational Time: 93.3
Monthly Average Direction: 301.4 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-Feb	308	358	334	302	340	323	341	332	329	330	327	321	306	340	308	326	229	316	302	308	324	256	140	133	322.2
2-Feb	135	142	143	142	147	141	138	139	136	140	143	131	145	149	129	135	135	132	136	134	135	133	134	135	136.1
3-Feb	137	140	139	143	158	153	141	140	131	125	130	346	331	338	354	1	19	11	19	3	345	357	1	347	118.2
4-Feb	353	353	334	341	342	337	326	333	343	348	346	348	351	347	351	331	309	340	337	331	333	325	323	327	339.4
5-Feb	326	336	323	345	341	349	329	324	348	320	244	249	181	247	152	63	102	271	311	159	7	283	298	315	311.0
6-Feb	290	283	273	254	255	269	265	270	286	327	321	226	176	143	131	102	349	342	345	348	343	342	319	346	284.3
7-Feb	342	133	131	151	257	285	297	279	260	251	251	251	267	267	264	273	273	263	254	260	265	282	341	345	269.9
8-Feb	338	339	325	323	339	331	324	338	337	245	137	137	136	141	152	149	145	190	194	340	147	131	131	133	130.2
9-Feb	135	138	141	141	138	138	137	134	134	133	135	132	127	138	137	138	131	143	136	139	138	146	142	173	136.6
10-Feb	135	324	344	348	329	345	343	336	331	330	331	338	340	341	331	322	DF	DF	DF	DF	339	343	333	337	336.6
11-Feb	326	332	355	83	146	134	134	129	130	135	142	137	139	136	144	210	246	256	275	291	307	262	241	262	211.6
12-Feb	256	266	278	255	250	249	259	265	307	254	251	254	351	352	349	352	352	351	DF	DF	DF	DF	DF	137	272.1
13-Feb	148	155	120	340	265	257	259	266	348	2	354	351	351	355	342	342	352	0	354	357	360	8	357	349	343.4
14-Feb	345	350	334	326	333	349	3	2	5	346	359	347	343	354	348	352	14	12	0	339	349	310	298	316	349.9
15-Feb	329	315	263	217	321	254	299	121	146	271	146	130	139	106	108	DF	DF	127	218	162	101	133	256	149	135.5
16-Feb	161	136	154	159	161	275	335	325	311	145	138	127	135	134	138	107	328	335	DF	DF	347	356	347	359	40.7
17-Feb	13	25	3	353	320	334	24	37	13	20	7	352	346	DF	354	353	355	3	358	357	355	344	332	340	358.0
18-Feb	321	336	344	302	323	313	293	286	305	285	291	279	315	331	298	250	261	293	311	297	323	322	309	303	302.3
19-Feb	343	323	310	187	314	329	335	318	330	335	278	338	DF	DF	DF	DF	DF	325	303	293	339	340	341	345	327.2
20-Feb	348	357	341	306	351	5	68	137	120	284	159	200	224	220	235	353	3	347	330	324	323	318	327	337	327.3
21-Feb	319	336	356	355	349	331	312	328	323	314	332	328	315	343	350	352	344	0	355	338	324	331	324	163	340.2
22-Feb	204	205	145	146	156	145	154	143	143	DF	141	139	233	243	240	240	241	288	259	324	328	165	334	170	196.8
23-Feb	270	331	313	333	326	335	264	114	333	DF	DF	DF	237	235	226	147	134	134	110	DF	DF	DF	156	138	181.6
24-Feb	135	139	141	139	138	133	135	137	135	112	121	137	164	175	172	161	161	166	182	178	171	169	164	166	156.4
25-Feb	144	142	138	133	125	116	115	121	162	213	242	243	244	234	174	150	123	118	142	163	121	122	112	113	156.3
26-Feb	113	114	114	122	290	325	336	332	326	347	DF	DF	82	80	66	116	109	DF	DF	DF	DF	DF	DF	DF	--
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	343	348	349	354	348	350	8	359	18	10	5	1	359	346	326	336	--
28-Feb	325	310	314	302	316	323	302	339	310	270	245	240	243	237	DF	DF	263	282	255	210	204	198	185	155	254.0
172.8	150.0	126.8	162.9	219.4	253.6	254.1	172.7	30.3	326.9	321.4	303.3	290.0	277.4	288.4	316.2	340.7	355.4	309.0	313.5	348.1	10.6	325.0	72.2		
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 20 m (WD20m) - deg**  
**Lower Camp Met Tower - February 2023**

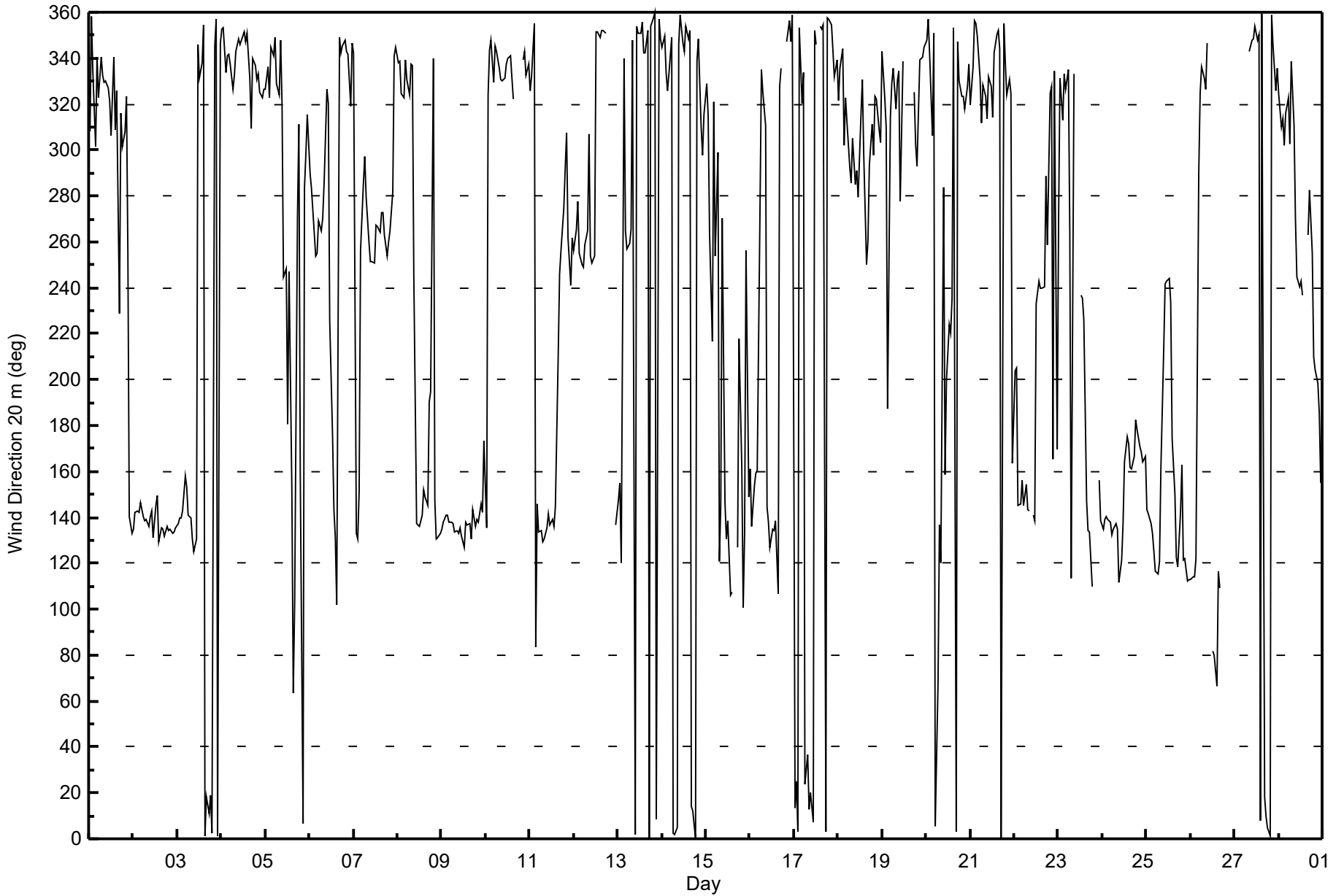
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 104 deg on Feb 15 07:00 Minimum Value: 3 deg on Feb 9 10:00 Percentiles: P <sub>1</sub> = 5 P <sub>10</sub> = 11 Q <sub>1</sub> = 14 Median = 19 Q <sub>3</sub> = 32 P <sub>90</sub> = 60 P <sub>99</sub> = 94																		Hours in Service: 672 Hours of Data: 627 Hours of Missing Data: 45 Hours of Calibration: 0 Percent Operational Time: 93.3									
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-Feb	33	68	33	34	13	20	18	30	21	16	16	31	22	20	34	35	30	69	39	32	49	86	81	29	86		
2-Feb	16	9	6	12	12	9	14	9	14	17	16	12	15	18	20	15	14	16	14	14	13	15	14	13	20		
3-Feb	14	12	13	11	14	12	7	8	23	26	24	38	31	21	18	15	22	19	21	24	21	17	26	43	43		
4-Feb	14	21	18	18	16	19	17	17	17	14	15	16	14	20	16	33	19	17	18	16	23	16	25	19	33		
5-Feb	19	20	28	30	32	24	27	17	44	38	64	65	36	69	68	78	101	65	89	83	94	47	24	19	101		
6-Feb	18	20	18	17	19	30	13	52	53	29	91	71	34	16	24	100	99	23	24	22	16	26	33	25	100		
7-Feb	42	49	13	63	14	22	19	20	14	10	13	13	20	16	16	17	17	15	12	15	27	22	20	14	63		
8-Feb	19	15	14	20	36	40	75	19	29	75	61	13	13	13	11	11	12	60	82	29	85	10	7	6	85		
9-Feb	17	6	6	7	4	5	6	5	4	3	5	7	13	9	6	7	12	12	59	16	10	11	21	41	59		
10-Feb	63	56	26	12	15	17	15	19	17	18	18	17	18	16	19	13	DF	DF	DF	DF	17	20	21	36	63		
11-Feb	25	44	40	85	25	14	10	10	11	12	20	12	10	18	20	28	12	16	18	19	18	74	26	14	85		
12-Feb	13	20	37	12	13	28	21	39	47	15	13	55	33	22	38	6	11	16	DF	DF	DF	DF	DF	17	55		
13-Feb	12	28	66	74	27	16	14	15	30	16	14	14	15	17	17	14	15	17	15	13	18	20	19	16	74		
14-Feb	19	14	16	18	16	17	16	21	26	24	26	20	19	13	18	16	18	19	19	16	17	59	60	27	60		
15-Feb	50	36	83	81	19	59	104	90	60	42	89	62	40	14	17	DF	DF	91	22	33	71	75	64	27	104		
16-Feb	62	31	32	12	15	70	50	50	39	36	15	14	11	58	49	58	72	22	DF	DF	16	20	14	16	72		
17-Feb	27	24	20	22	23	22	23	23	19	26	21	17	15	DF	13	13	13	17	15	15	14	20	64	17	64		
18-Feb	16	38	17	15	18	20	20	40	32	21	69	102	49	21	44	11	20	22	41	22	20	44	59	56	102		
19-Feb	33	26	69	34	20	20	14	12	48	29	67	65	DF	DF	DF	DF	DF	15	25	24	14	14	21	26	69		
20-Feb	13	12	18	21	21	45	84	27	36	73	42	19	14	11	17	39	15	14	18	30	21	19	24	14	84		
21-Feb	34	16	12	11	15	21	21	27	23	26	34	32	30	24	19	16	15	16	11	25	19	34	84	52	84		
22-Feb	28	17	22	13	19	8	7	11	10	DF	8	17	32	10	10	7	14	76	36	30	86	52	31	95	95		
23-Feb	94	40	34	29	21	23	83	75	92	DF	DF	DF	11	11	50	26	13	16	60	DF	DF	DF	23	6	94		
24-Feb	4	9	11	7	13	12	14	7	8	35	29	14	20	13	8	9	9	7	9	10	7	8	9	13	35		
25-Feb	15	8	8	6	8	14	13	25	43	19	14	14	15	19	50	47	24	31	48	50	27	25	17	11	50		
26-Feb	11	16	17	27	53	31	46	26	48	46	DF	DF	40	26	28	21	19	DF	DF	DF	DF	DF	DF	DF	53		
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	15	14	14	15	14	13	18	18	14	17	14	14	16	15	15	32	32		
28-Feb	32	33	34	10	10	30	23	48	68	63	62	9	7	6	DF	DF	20	20	63	75	49	24	20	33	75		
Diurnal Maximum																								95			
DF - DAS Failure																											





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

**Wind Direction 20 m (WD20m) - deg**  
**Lower Camp Met Tower - February 2023**





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

**Wind Direction 45 m (WD45m) - deg**  
**Lower Camp Met Tower - February 2023**

Direction of Maximum Speed: 132 deg on Feb 2 20:00																						Hours in Service: 672			
Direction of Maximum Daily Speed Average: 130.8 deg on Feb 2																						Hours of Data: 625			
Direction of Minimum Speed: 289 deg on Feb 16 07:00											Direction of Minimum Daily Speed Average: 2.3 deg on Feb 16											Hours of Missing Data: 47			
Monthly Average Direction: 334.4 deg																						Percent Operational Time: 93.0			
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-Feb	332	321	340	330	333	330	333	331	330	329	328	313	304	337	313	332	235	2	327	314	271	194	153	141	325.2
2-Feb	136	134	130	131	135	128	128	128	126	126	117	113	128	132	126	133	133	130	133	132	133	131	132	132	130.8
3-Feb	133	137	136	137	151	149	140	145	135	131	138	347	338	339	357	2	18	11	18	5	349	6	4	347	109.7
4-Feb	356	0	339	345	345	343	333	337	345	350	348	349	353	350	351	329	312	339	338	333	335	327	325	325	341.8
5-Feb	327	336	319	336	332	348	331	324	343	307	257	257	161	240	144	120	166	197	245	228	129	274	297	313	303.0
6-Feb	289	280	272	255	250	259	268	260	270	346	335	262	147	130	124	98	109	337	342	340	342	339	331	319	281.3
7-Feb	321	141	136	213	252	283	294	275	258	250	252	251	266	265	264	272	270	262	249	257	268	303	340	347	268.2
8-Feb	340	342	334	325	300	279	11	321	289	194	122	128	130	130	140	137	127	152	138	161	130	126	123	127	117.7
9-Feb	128	128	131	131	132	131	132	132	129	129	129	129	135	146	137	134	127	141	113	157	127	135	129	138	132.3
10-Feb	136	332	335	332	329	346	344	339	334	335	334	339	343	342	333	324	DF	DF	DF	DF	340	345	334	349	337.8
11-Feb	327	328	354	80	142	138	136	131	134	167	174	137	135	130	149	214	244	253	275	290	305	289	245	256	220.8
12-Feb	253	260	276	251	246	244	255	257	274	253	265	268	341	332	322	345	335	332	DF	DF	DF	DF	DF	132	259.7
13-Feb	148	162	145	240	255	254	257	264	349	UO	UO	349	353	358	343	342	354	1	357	359	3	11	1	352	339.4
14-Feb	350	354	339	330	337	351	4	4	5	349	2	353	346	355	353	14	13	5	345	345	334	301	346	352.8	
15-Feb	303	324	179	144	248	219	156	118	136	208	137	125	120	108	109	DF	DF	118	121	133	119	119	138	125	127.6
16-Feb	135	138	132	138	143	156	289	8	150	132	139	126	130	111	117	87	347	342	DF	DF	351	358	351	360	60.4
17-Feb	16	25	4	357	327	341	26	36	14	20	11	354	347	DF	357	356	357	3	360	0	358	346	329	338	359.7
18-Feb	338	329	332	338	334	348	339	352	346	326	297	320	322	334	309	251	266	281	340	325	338	308	249	166	319.3
19-Feb	147	140	148	149	155	323	331	340	329	335	325	308	DF	DF	DF	DF	DF	332	324	311	341	340	334	343	337.0
20-Feb	348	350	352	323	343	356	312	101	126	74	146	200	232	220	245	356	8	355	344	322	340	349	336	330	342.0
21-Feb	332	342	357	356	351	337	325	330	325	325	327	328	318	342	352	353	345	4	3	352	334	260	237	174	341.6
22-Feb	144	144	136	131	138	133	135	135	130	DF	128	126	249	244	239	244	238	274	282	274	274	176	281	178	180.2
23-Feb	214	327	331	311	321	309	124	139	143	DF	DF	DF	237	242	233	133	127	132	126	DF	DF	DF	133	128	149.9
24-Feb	126	129	130	130	129	126	126	128	128	121	127	136	164	175	172	161	161	167	183	180	175	172	168	173	152.9
25-Feb	153	146	141	140	141	129	134	135	207	221	241	242	245	235	174	142	115	111	181	182	124	125	127	120	162.0
26-Feb	115	118	116	117	137	9	334	339	319	316	DF	DF	82	80	70	113	108	DF	DF	DF	DF	DF	DF	DF	--
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	344	350	350	355	349	349	6	0	16	8	4	1	0	351	335	337	--
28-Feb	331	330	319	315	332	296	329	316	294	316	264	251	254	241	DF	DF	260	284	315	251	242	195	150	137	269.0
130.7	130.8	111.9	165.4	220.1	256.7	280.4	237.2	350.0	312.6	309.7	333.1	317.1	309.7	354.9	337.6	5.5	359.7	348.9	315.3	2.6	13.0	336.3	56.2		
Diurnal Average																									
DF - DAS Failure                      UO - Unstable Operation																									
All monthly, daily, and diurnal averages have been calculated using vector methods																									



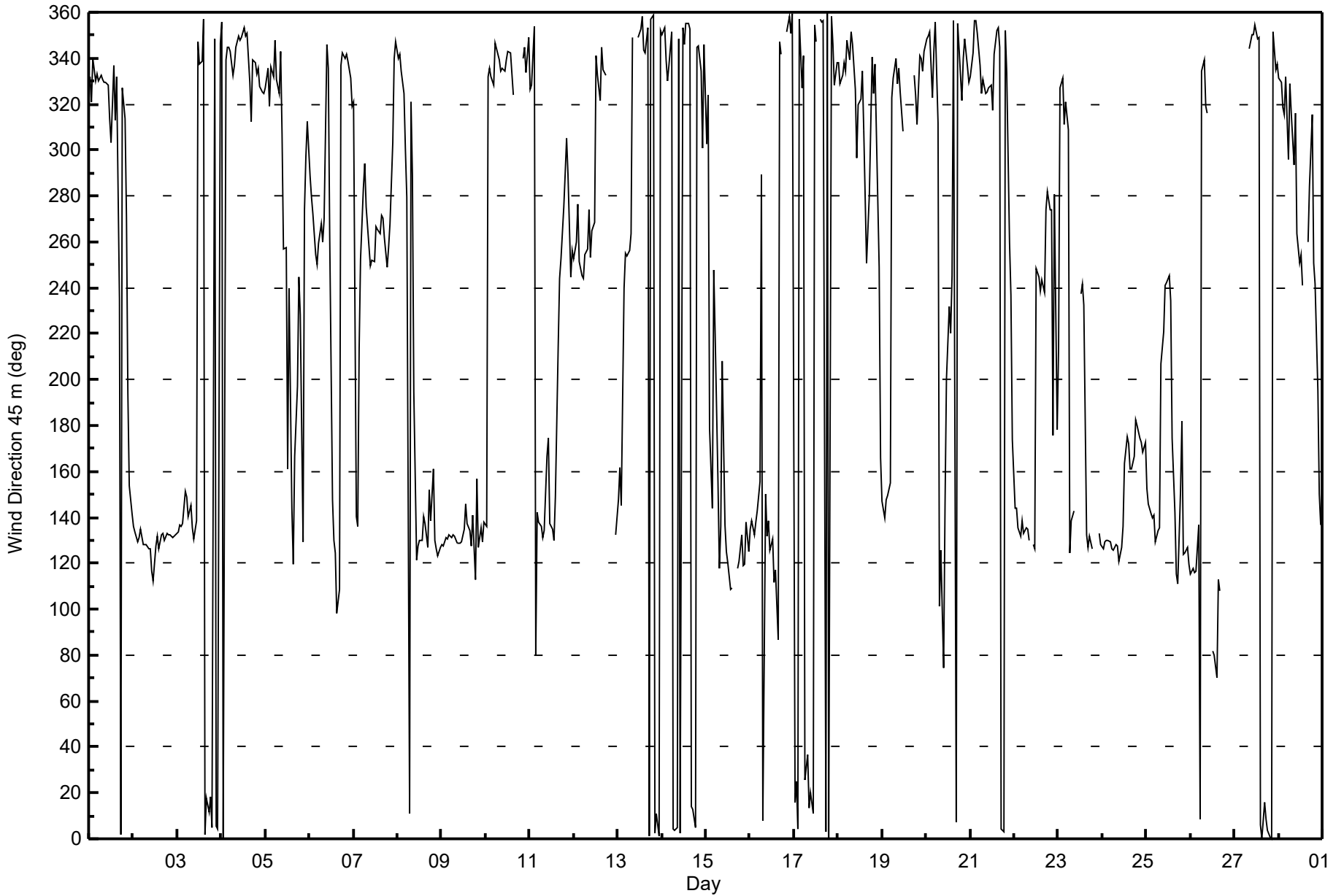
**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 45 m (WD45m) - deg**  
**Lower Camp Met Tower - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 672
Maximum Value: 102 deg on Feb 9 19:00	Hours of Data: 625
Minimum Value: 2 deg on Feb 9 05:00	Hours of Missing Data: 47
Percentiles: P <sub>1</sub> = 3 P <sub>10</sub> = 6 Q <sub>1</sub> = 9 Median = 12 Q <sub>3</sub> = 22 P <sub>90</sub> = 41 P <sub>99</sub> = 89	Hours of Calibration: 0
	Percent Operational Time: 93.0

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-Feb	11	19	39	13	17	7	6	7	7	6	8	24	17	15	30	21	24	51	32	36	74	98	9	10	98
2-Feb	6	6	4	6	10	6	10	8	10	12	15	7	14	9	8	6	6	7	6	6	6	7	7	6	15
3-Feb	7	6	8	7	12	10	4	8	20	14	28	32	24	16	13	7	15	13	16	20	14	13	19	32	32
4-Feb	8	15	10	9	9	11	11	10	11	7	11	9	12	11	12	27	16	11	10	11	16	10	17	15	27
5-Feb	13	13	18	23	28	18	21	11	37	31	60	59	35	65	49	102	91	51	81	57	78	22	20	18	102
6-Feb	12	15	13	12	6	10	7	15	24	17	42	63	49	14	18	67	48	24	16	32	13	15	13	18	67
7-Feb	52	43	7	44	8	19	13	16	9	5	7	9	13	11	10	11	12	10	6	10	27	22	19	9	52
8-Feb	10	9	8	5	38	55	62	16	27	68	11	7	9	9	10	6	8	27	54	81	14	4	4	3	81
9-Feb	5	4	3	3	2	4	4	5	3	3	4	3	11	8	7	4	9	10	102	28	7	9	12	11	102
10-Feb	14	85	7	6	9	13	9	12	10	12	11	10	11	10	12	10	DF	DF	DF	DF	11	13	15	30	85
11-Feb	15	33	33	86	12	11	6	6	8	26	24	9	6	8	21	23	8	10	14	12	13	70	17	8	86
12-Feb	6	13	33	6	7	13	12	19	38	9	16	56	27	22	28	7	24	12	DF	DF	DF	DF	DF	12	56
13-Feb	8	21	42	68	15	10	7	10	29	UO	UO	8	9	10	12	10	10	11	10	8	13	14	12	9	68
14-Feb	10	10	10	11	9	11	10	15	22	16	20	13	13	8	12	11	11	15	15	14	12	35	42	14	42
15-Feb	32	33	77	11	27	43	17	40	13	65	79	45	29	8	10	DF	DF	12	16	11	7	8	23	7	79
16-Feb	19	19	9	11	11	31	98	101	64	15	17	19	8	30	42	41	55	12	DF	DF	11	14	8	8	101
17-Feb	23	18	14	14	19	16	17	15	14	17	13	13	9	DF	8	6	8	9	8	9	9	11	17	5	23
18-Feb	8	12	31	11	15	11	21	26	21	24	33	69	37	15	38	10	11	22	27	20	27	43	49	84	84
19-Feb	14	12	9	9	19	71	9	6	39	22	25	35	DF	DF	DF	DF	DF	10	9	18	7	12	10	11	71
20-Feb	7	8	12	18	14	11	77	21	16	90	30	21	20	12	21	34	9	9	12	35	12	5	8	5	90
21-Feb	11	11	9	8	12	11	13	16	8	17	25	27	27	18	14	11	10	13	6	13	6	26	32	38	38
22-Feb	11	11	6	5	5	4	5	3	8	DF	10	25	31	8	7	5	9	27	18	20	80	38	55	77	80
23-Feb	23	35	15	32	18	28	62	6	5	DF	DF	DF	15	14	65	40	9	12	9	DF	DF	DF	8	6	65
24-Feb	4	5	3	3	3	3	4	3	3	16	9	9	19	11	8	9	8	7	8	9	8	8	9	14	19
25-Feb	18	8	6	9	11	11	15	33	40	16	10	9	12	17	45	38	21	14	34	41	16	7	9	5	45
26-Feb	5	4	6	11	57	82	18	13	26	13	DF	DF	30	17	20	14	13	DF	DF	DF	DF	DF	DF	DF	82
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	10	8	7	8	9	9	11	12	8	7	7	9	9	8	10	11	12
28-Feb	9	10	15	20	11	21	39	34	63	41	49	12	5	6	DF	DF	16	20	36	33	41	22	20	6	63
Diurnal Maximum																									
52 85 77 86 57 82 98 101 64 90 79 69 49 65 65 102 91 51 102 81 80 98 55 84																									

DF - DAS Failure UO - Unstable Operation





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

**Wind Direction 100 m (WD100m) - deg**  
**Lower Camp Met Tower - February 2023**

Direction of Maximum Speed: 355 deg on Feb 13 13:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 139.6 deg on Feb 2	Hours of Data: 624
Direction of Minimum Speed: 122 deg on Feb 10 00:00	Hours of Missing Data: 48
Direction of Minimum Daily Speed Average: 1.0 deg on Feb 23	Percent Operational Time: 92.9
Monthly Average Direction: 301.1 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-Feb	345	357	352	346	347	349	347	349	353	341	333	309	305	331	321	337	301	0	35	324	326	330	232	216	337.5	
2-Feb	154	172	169	140	152	149	153	159	153	140	138	161	137	134	132	137	137	135	138	137	136	136	136	137	139.6	
3-Feb	138	142	141	143	150	149	156	160	159	167	206	347	334	339	1	4	22	16	25	14	4	22	17	354	122.6	
4-Feb	1	16	353	355	357	358	349	348	350	355	351	352	355	350	353	343	325	339	349	348	352	341	339	333	350.5	
5-Feb	336	344	335	333	295	343	344	326	345	299	262	268	135	204	142	195	163	167	164	196	237	282	301	314	288.6	
6-Feb	289	277	273	266	264	267	281	274	273	352	25	324	123	115	120	100	119	337	347	259	47	339	200	236	278.0	
7-Feb	242	213	199	245	259	283	292	272	262	256	256	255	266	267	263	272	270	263	255	263	272	301	342	353	269.3	
8-Feb	349	352	352	344	347	326	349	34	54	168	170	140	156	126	131	136	133	132	162	141	146	146	143	144	121.8	
9-Feb	144	145	167	160	163	167	197	190	178	165	163	155	155	156	157	140	137	132	93	341	172	187	210	122	158.5	
10-Feb	6	80	346	344	340	352	351	348	349	347	345	348	351	350	342	338	DF	DF	DF	DF	341	345	340	10	347.1	
11-Feb	349	326	262	132	151	160	169	194	208	216	203	154	140	136	174	221	246	254	276	289	302	288	253	252	235.2	
12-Feb	254	257	273	264	260	255	258	257	256	273	298	294	337	301	116	77	8	348	DF	DF	DF	DF	DF	142	258.2	
13-Feb	160	186	196	222	250	254	257	265	349	UO	UO	UO	355	358	346	346	355	2	1	2	9	16	8	359	330.6	
14-Feb	358	359	349	346	347	360	8	5	7	353	10	3	349	359	0	354	15	16	19	5	5	10	323	352	0.5	
15-Feb	333	98	128	160	159	149	174	146	155	170	100	200	128	117	117	DF	DF	131	141	139	142	132	141	145	140.0	
16-Feb	135	141	139	132	142	133	152	153	162	169	171	165	161	172	179	212	355	352	DF	DF	360	1	356	2	118.4	
17-Feb	20	23	7	6	344	354	33	36	15	26	15	357	349	DF	0	0	360	5	4	4	8	3	349	349	4.9	
18-Feb	351	359	344	344	344	337	339	346	344	353	316	310	324	339	321	271	300	330	24	40	53	127	130	138	343.8	
19-Feb	140	144	141	143	149	149	156	0	5	325	340	328	DF	DF	DF	DF	DF	DF	337	336	333	347	349	348	352	359.9
20-Feb	360	352	7	355	334	312	274	241	169	124	129	253	266	234	290	358	14	12	14	21	358	0	360	350	357.4	
21-Feb	359	357	3	5	1	357	353	346	340	347	331	326	321	340	350	354	348	7	16	8	349	335	267	230	350.0	
22-Feb	216	237	208	211	206	200	206	206	215	DF	180	208	273	255	257	268	255	268	317	337	341	111	124	144	243.1	
23-Feb	145	138	344	352	338	344	320	260	261	DF	DF	DF	252	288	255	137	126	142	153	DF	DF	DF	192	169	182.0	
24-Feb	163	160	154	154	157	149	156	159	156	139	144	148	170	177	174	164	164	169	185	184	181	181	181	184	166.0	
25-Feb	179	172	175	194	196	177	195	205	239	233	243	246	246	232	180	142	118	116	182	205	148	134	153	133	190.6	
26-Feb	129	122	120	115	117	112	62	30	51	343	DF	DF	84	72	72	109	104	DF	DF	DF	DF	DF	DF	DF	DF	--
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	349	351	350	355	349	347	3	3	15	9	5	4	5	0	345	347	--	
28-Feb	340	344	347	350	338	331	331	330	326	343	303	293	276	261	DF	DF	261	275	276	35	143	146	178	144	324.9	
Diurnal Average																										
215.1	207.9	194.7	239.5	259.4	267.4	276.4	275.0	300.6	300.7	284.5	271.6	313.6	311.5	342.1	336.2	37.2	6.8	8.7	320.8	358.1	13.9	329.0	120.3			

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**

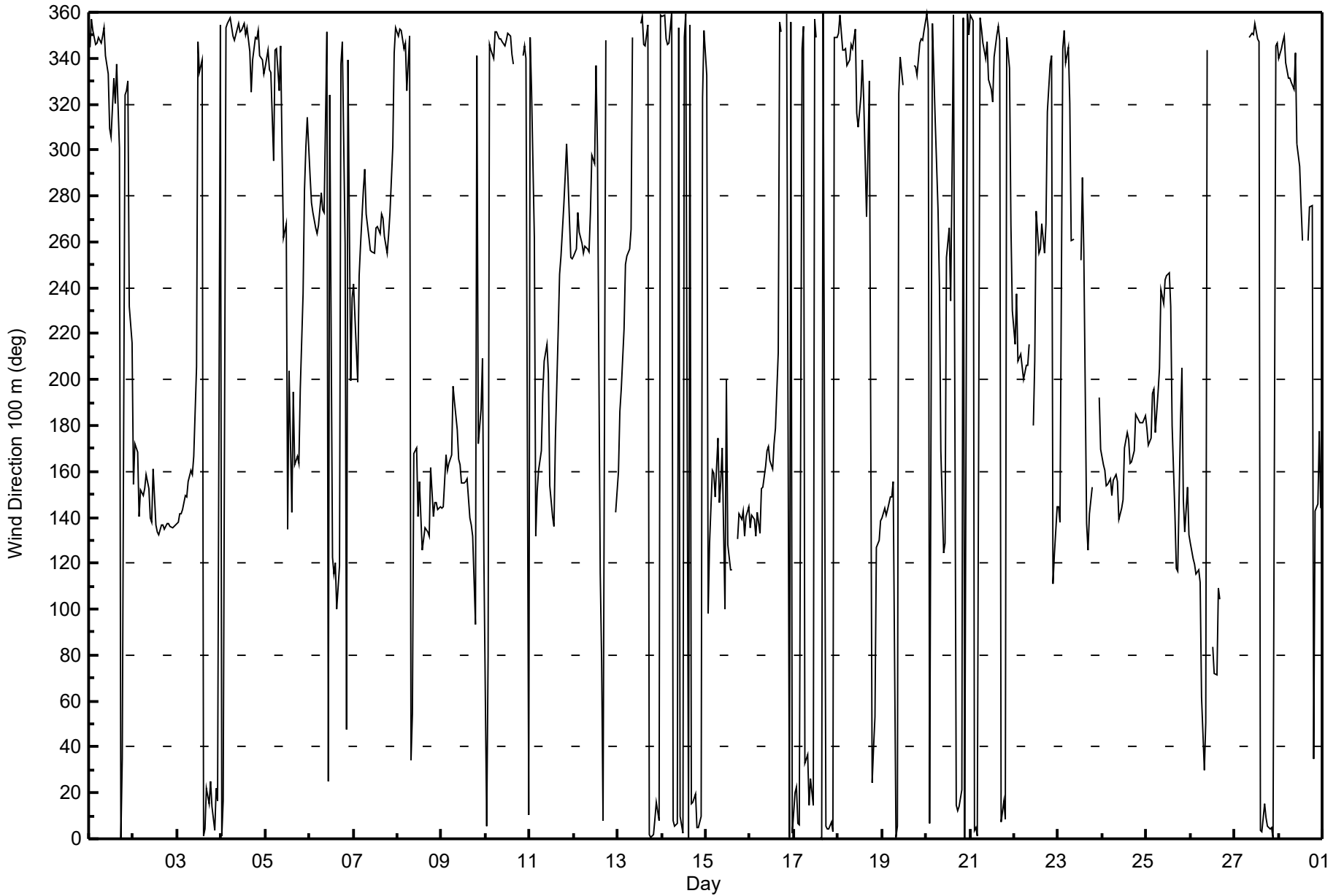
**Wind Direction 100 m (WD100m) - deg**  
**Lower Camp Met Tower - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 672
Maximum Value: 101 deg on Feb 26 10:00	Hours of Data: 624
Minimum Value: 2 deg on Feb 28 02:00	Hours of Missing Data: 48
Percentiles: P <sub>1</sub> = 3 P <sub>10</sub> = 5 Q <sub>1</sub> = 6 Median = 10 Q <sub>3</sub> = 17 P <sub>90</sub> = 31 P <sub>99</sub> = 82	Hours of Calibration: 0
	Percent Operational Time: 92.9

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-Feb	9	9	13	10	9	4	6	7	7	9	5	17	14	11	19	10	44	28	21	19	5	39	30	23	44
2-Feb	25	7	11	6	7	9	10	10	24	11	10	6	11	3	3	5	4	5	4	4	4	5	5	4	25
3-Feb	6	5	6	6	8	6	5	4	10	10	32	18	20	11	11	6	11	11	14	20	11	13	14	31	32
4-Feb	8	14	5	5	5	6	6	6	5	6	6	8	7	8	10	25	10	11	5	6	10	7	10	11	25
5-Feb	9	9	15	29	33	21	10	15	30	31	68	59	29	38	38	38	9	13	7	30	27	10	19	17	68
6-Feb	8	10	10	8	5	8	7	7	6	30	25	51	69	16	13	27	16	76	19	63	78	20	92	20	92
7-Feb	15	20	19	8	3	17	9	12	5	4	4	5	10	7	6	7	8	5	4	5	27	11	13	7	27
8-Feb	7	6	7	6	4	14	15	11	19	36	24	9	13	7	8	10	6	8	14	8	7	3	4	5	36
9-Feb	3	5	6	7	4	4	23	15	14	6	4	4	4	5	4	6	10	11	63	39	13	29	31	86	86
10-Feb	49	38	8	6	4	8	5	5	5	6	6	6	6	8	8	6	DF	DF	DF	DF	7	11	11	24	49
11-Feb	13	50	76	40	22	8	8	11	17	19	19	14	8	9	20	17	5	6	11	10	9	39	8	2	76
12-Feb	3	6	25	4	8	7	5	6	11	9	21	48	32	19	61	23	56	8	DF	DF	DF	DF	DF	8	61
13-Feb	6	20	23	14	8	6	4	7	28	UO	UO	UO	6	7	8	7	7	9	7	7	11	11	10	7	28
14-Feb	8	7	6	6	5	10	7	14	17	11	15	14	15	10	14	9	8	11	9	10	7	14	78	29	78
15-Feb	61	28	5	14	14	23	16	10	11	82	66	64	23	6	8	DF	DF	6	6	10	8	4	13	5	82
16-Feb	8	8	11	5	7	12	19	32	12	5	10	10	11	22	48	74	91	10	DF	DF	9	9	6	5	91
17-Feb	21	11	11	11	18	13	16	11	11	14	12	11	9	DF	8	6	6	7	8	7	7	9	6	6	21
18-Feb	3	7	5	4	3	7	3	7	5	5	12	34	28	12	29	16	21	10	15	31	25	23	8	5	34
19-Feb	10	11	9	8	17	14	89	22	44	84	11	20	DF	DF	DF	DF	DF	5	3	4	7	3	4	5	89
20-Feb	7	7	10	12	10	23	31	15	22	8	17	81	27	36	44	27	7	10	12	17	5	4	7	6	81
21-Feb	12	9	8	8	10	9	12	12	7	13	18	20	16	15	11	8	8	9	4	11	5	14	30	15	30
22-Feb	14	17	25	9	15	13	11	10	12	DF	23	27	18	15	9	10	8	9	17	5	11	55	52	14	55
23-Feb	16	43	60	13	7	10	12	29	13	DF	DF	DF	25	26	36	39	8	9	5	DF	DF	DF	21	9	60
24-Feb	4	5	4	3	3	2	4	3	4	8	6	7	17	9	7	8	7	6	6	7	7	7	8	10	17
25-Feb	13	13	11	11	12	14	16	31	15	11	7	6	7	15	39	30	19	8	34	11	28	4	9	5	39
26-Feb	4	4	4	4	9	26	60	28	51	101	DF	DF	18	16	19	11	12	DF	DF	DF	DF	DF	DF	DF	101
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	6	5	5	6	7	7	9	9	6	6	5	8	7	7	6	5	9
28-Feb	2	2	3	5	3	5	3	7	20	8	17	20	9	12	DF	DF	18	16	36	37	13	17	14	14	37
	61	50	76	40	33	26	89	32	51	101	68	81	69	38	61	74	91	76	63	63	78	55	92	86	

Diurnal Maximum

DF - DAS Failure UO - Unstable Operation





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

**Wind Direction 163 m (WD163m) - deg**  
**Lower Camp Met Tower - February 2023**

Direction of Maximum Speed: 140 deg on Feb 2 17:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 272.5 deg on Feb 7	Hours of Data: 611
Direction of Minimum Speed: 293 deg on Feb 12 14:00	Hours of Missing Data: 61
Direction of Minimum Daily Speed Average: 3.4 deg on Feb 23	Percent Operational Time: 90.9
Monthly Average Direction: 282.2 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-Feb	13	38	62	23	9	4	357	7	10	4	349	310	311	331	328	340	351	343	349	320	317	318	313	235	350.6
2-Feb	156	185	188	168	168	173	154	161	155	149	144	146	138	136	137	140	140	140	142	142	141	141	141	142	146.5
3-Feb	145	149	149	152	152	155	170	180	173	200	252	338	320	346	13	13	30	25	37	34	22	40	41	12	132.1
4-Feb	15	40	16	12	18	26	16	3	2	10	4	2	9	358	4	10	351	346	22	15	26	356	4	352	9.7
5-Feb	8	16	47	64	120	44	21	352	27	40	281	230	131	192	164	180	175	171	179	240	268	292	308	317	268.6
6-Feb	289	279	277	275	276	281	290	287	288	343	50	41	132	103	122	117	131	154	110	159	152	154	168	170	266.9
7-Feb	190	244	240	259	266	285	292	277	269	264	261	260	268	269	266	275	274	268	264	270	279	296	348	5	272.5
8-Feb	6	11	19	20	17	355	358	17	45	149	178	155	173	138	135	141	143	155	156	153	161	174	157	166	130.7
9-Feb	180	192	220	220	228	228	239	232	229	216	198	172	156	163	186	164	161	157	126	161	174	198	196	182	191.2
10-Feb	170	159	14	27	3	5	10	10	14	9	8	9	5	4	357	356	DF	DF	DF	DF	345	347	339	21	6.4
11-Feb	347	352	268	191	173	180	209	244	238	234	213	176	163	163	194	230	251	259	279	291	303	279	262	259	246.4
12-Feb	263	262	275	280	285	275	275	277	283	310	334	319	344	293	113	126	134	131	DF	DF	DF	DF	DF	152	260.9
13-Feb	179	209	215	231	253	257	261	270	UO	UO	UO	UO	UO	UO	352	351	1	8	8	10	18	23	17	8	316.5
14-Feb	7	8	3	4	3	12	20	16	16	12	26	17	6	9	13	1	20	21	38	20	19	32	62	87	14.2
15-Feb	78	116	148	173	178	179	185	173	176	187	178	178	154	133	126	DF	DF	140	150	161	155	146	149	147	158.2
16-Feb	142	143	141	131	138	129	130	152	161	148	145	151	158	185	231	251	264	353	DF	DF	15	9	7	10	133.2
17-Feb	31	27	21	23	6	11	43	41	22	35	23	8	0	DF	10	11	9	14	16	13	22	31	22	11	18.5
18-Feb	15	37	41	34	13	7	2	0	UO	UO	UO	UO	337	UO	336	319	343	9	48	65	84	139	153	168	24.9
19-Feb	157	141	139	142	137	130	126	122	122	129	280	291	DF	DF	DF	DF	DF	337	349	354	11	10	6	6	60.2
20-Feb	17	10	7	11	335	10	196	164	148	116	113	48	304	322	335	7	26	29	36	36	30	17	13	9	18.4
21-Feb	16	10	14	17	14	15	13	6	1	5	351	334	328	344	354	0	356	11	21	21	10	4	352	227	5.0
22-Feb	243	282	289	280	299	270	257	262	254	DF	259	270	311	277	289	303	290	307	353	16	23	34	37	29	294.8
23-Feb	7	354	19	30	22	19	9	357	340	DF	DF	DF	290	347	245	158	135	148	161	DF	DF	DF	177	192	37.8
24-Feb	190	203	196	200	190	192	192	192	188	165	168	164	178	181	177	168	167	174	188	188	187	188	189	194	182.9
25-Feb	200	203	216	225	221	215	232	237	255	250	258	256	248	231	198	148	130	133	197	222	193	168	170	146	214.1
26-Feb	153	148	138	136	133	119	114	107	107	104	DF	DF	83	70	70	105	101	DF	DF	DF	DF	DF	DF	DF	--
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	356	356	356	0	353	351	6	11	19	14	12	12	13	10	356	359	--
28-Feb	357	360	9	18	12	354	349	UO	UO	UO	UO	UO	318	318	DF	DF	318	302	264	45	135	162	173	173	--
	232.8	255.2	264.1	272.0	264.2	273.0	274.5	275.4	276.7	291.2	253.2	249.4	251.5	208.4	281.4	343.9	107.0	51.7	77.0	331.1	13.0	7.7	1.4	148.8	
	Diurnal Average																								

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**

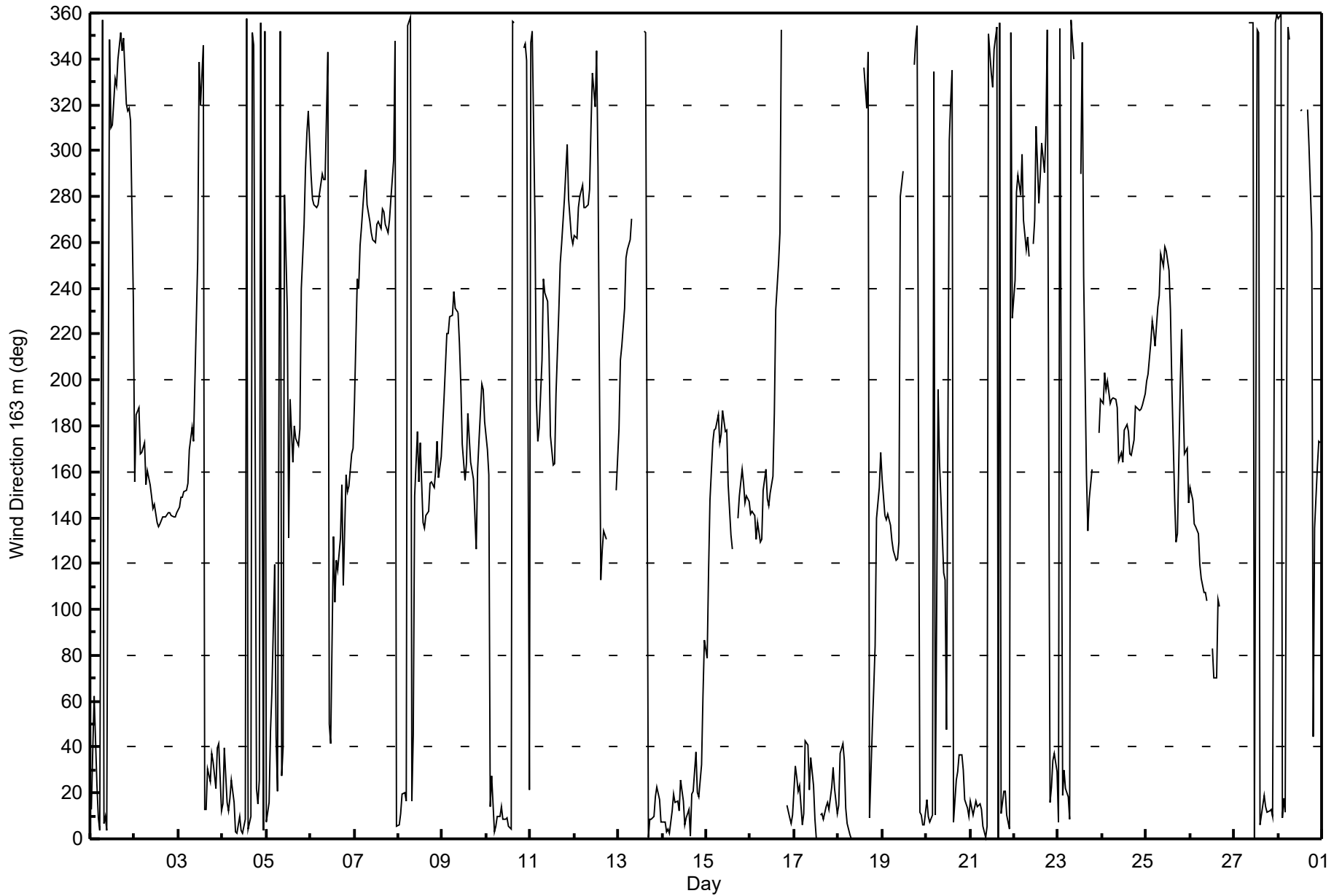
**Wind Direction 163 m (WD163m) - deg**  
**Lower Camp Met Tower - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0										Hours in Service: 672															
Maximum Value: 98 deg on Feb 12 14:00										Hours of Data: 611															
Minimum Value: 2 deg on Feb 12 00:00										Hours of Missing Data: 61															
Percentiles: P <sub>1</sub> = 3 P <sub>10</sub> = 4 Q <sub>1</sub> = 6 Median = 8 Q <sub>3</sub> = 13 P <sub>90</sub> = 22 P <sub>99</sub> = 70										Hours of Calibration: 0															
										Percent Operational Time: 90.9															
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-Feb	7	9	15	9	4	4	6	5	5	10	6	12	11	10	15	7	11	7	21	7	5	4	20	27	
2-Feb	70	6	2	8	5	4	13	8	8	7	3	5	3	2	4	5	4	5	5	4	5	5	5	70	
3-Feb	7	6	6	6	6	6	7	5	8	15	20	36	24	12	9	8	10	10	14	17	11	13	13	41	
4-Feb	8	9	6	5	5	5	11	5	5	6	7	8	12	7	12	24	6	18	7	4	8	8	10	9	
5-Feb	11	16	10	16	28	34	19	27	32	46	85	65	11	27	18	19	5	5	14	12	12	7	20	19	
6-Feb	6	6	7	10	7	7	6	7	5	29	13	34	48	18	10	15	13	38	55	10	11	12	10	7	
7-Feb	26	7	10	3	4	14	7	8	5	4	4	6	8	6	5	4	5	3	3	4	22	7	19	8	
8-Feb	5	6	7	5	4	19	14	5	24	43	11	10	13	13	6	6	4	7	5	5	6	8	6	10	
9-Feb	8	10	10	7	8	11	7	4	6	10	6	12	3	9	4	8	6	10	27	28	12	5	7	8	
10-Feb	4	32	17	6	10	7	6	4	4	4	6	5	4	7	6	4	DF	DF	DF	DF	7	9	7	27	
11-Feb	13	60	65	19	13	6	12	15	10	8	14	15	10	18	7	14	5	6	9	8	7	27	7	2	
12-Feb	4	3	11	5	9	5	6	6	11	10	15	33	55	98	5	8	7	8	DF	DF	DF	DF	DF	7	
13-Feb	8	13	13	9	6	5	3	7	UO	UO	UO	UO	UO	UO	7	6	7	9	7	7	8	9	9	7	
14-Feb	9	6	5	4	5	9	7	13	15	14	16	16	23	11	18	10	7	8	8	7	5	13	55	55	
15-Feb	32	10	9	9	4	4	4	5	5	7	70	18	9	8	7	DF	DF	5	7	7	6	9	8	7	
16-Feb	8	13	11	3	6	5	13	16	8	6	4	7	9	11	34	5	19	17	DF	DF	8	8	7	6	
17-Feb	22	10	10	11	14	14	14	9	10	16	10	12	10	DF	10	6	6	7	8	7	8	7	4	5	
18-Feb	5	3	6	7	6	5	6	13	UO	UO	UO	UO	21	UO	22	16	15	12	11	4	12	19	15	6	
19-Feb	10	8	3	4	3	5	5	8	6	83	74	34	DF	DF	DF	DF	DF	5	4	4	5	4	4	5	
20-Feb	6	7	4	6	12	22	72	30	24	9	27	77	31	56	49	22	7	9	7	4	2	5	4	4	
21-Feb	9	7	7	7	9	8	8	11	7	8	16	17	13	13	10	7	8	7	3	7	6	9	56	8	
22-Feb	10	20	14	10	8	13	8	9	9	DF	9	14	17	15	15	14	19	10	19	5	9	9	9	13	
23-Feb	8	5	10	4	4	5	7	6	10	DF	DF	DF	28	20	31	30	10	10	6	DF	DF	DF	4	8	
24-Feb	15	9	4	7	5	5	3	4	6	5	6	7	14	8	6	5	6	5	5	5	5	6	5	15	
25-Feb	6	7	9	7	6	7	9	15	8	11	8	4	6	11	32	20	18	7	32	4	25	11	7	7	
26-Feb	6	8	4	4	7	9	9	11	10	20	DF	DF	13	12	17	14	13	DF	DF	DF	DF	DF	DF	20	
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	6	4	5	6	7	8	7	10	5	5	5	7	6	5	6	4	
28-Feb	4	3	2	4	6	4	5	UO	UO	UO	UO	UO	13	19	DF	DF	21	27	8	44	12	15	8	12	
										Diurnal Maximum															
DF - DAS Failure UO - Unstable Operation																									



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

**Wind Direction 163 m (WD163m) - deg**  
**Lower Camp Met Tower - February 2023**





# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Vertical Wind Speed 20 m (VW20m) - km/h

## Lower Camp Met Tower - February 2023

Maximum Value: 0.3 km/h on Feb 17 11:00																								Hours in Service: 672											
Maximum Daily Average: 0.0 km/h on Feb 10																								Hours of Data: 627											
Minimum Value: -1.9 km/h on Feb 24 15:00																								Hours of Missing Data: 45											
Minimum Daily Average: -0.9 km/h on Feb 24																								Hours of Calibration: 0											
Maximum Diurnal Average: -0.1 km/h at hour 23																								Percent Operational Time: 93.3											
Minimum Diurnal Average: -0.4 km/h at hour 14																																			
Monthly Average: -0.23 km/h																																			
Percentiles: P <sub>1</sub> = -1.4 P <sub>10</sub> = -0.8 Q <sub>1</sub> = -0.3 Median = -0.1 Q <sub>3</sub> = 0.0 P <sub>90</sub> = 0.0 P <sub>99</sub> = 0.2																																			
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-Feb	-0.1	0.0	0.0	-0.1	0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
2-Feb	0.0	0.0	-0.1	-0.1	-0.2	-0.4	-0.4	-0.5	-0.3	-0.5	-0.7	-0.5	-0.4	-0.2	-0.6	-1.3	-1.3	-0.8	-1.4	-1.2	-1.1	-1.0	-0.8	-1.1	-0.6	-0.6	0.0	-0.6	0.0	-0.4	0.2	0.0	0.0		
3-Feb	-0.8	-1.3	-1.0	-1.1	-1.0	-1.0	-1.1	-1.0	-0.3	-0.2	0.0	-0.1	-0.1	-0.1	0.0	-0.1	0.1	0.0	0.2	0.0	0.0	0.1	0.0	0.0	-0.4	0.2	0.0	-0.4	0.2	0.0	0.0	0.0	0.0	0.0	
4-Feb	-0.1	0.0	0.1	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.2	-0.2	0.0	-0.1	-0.1	-0.2	0.0	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	0.2	
5-Feb	0.0	0.0	-0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.2	-0.2	-0.2	-0.3	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.0	-0.2	-0.6	-0.3	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	
6-Feb	-0.8	-0.7	-0.8	-0.5	-0.3	-0.3	-0.3	-0.1	0.0	0.0	0.0	-0.2	-0.3	-0.6	-0.1	-0.1	-0.1	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7-Feb	0.0	0.0	0.0	-0.1	-0.5	-1.1	-0.5	-0.8	-0.7	-1.1	-0.7	-1.0	-0.8	-1.0	-1.3	-1.2	-1.0	-0.7	-0.5	-0.6	-0.4	-0.2	-0.2	-0.2	-0.6	0.0	-0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8-Feb	0.2	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	-0.5	-0.6	-0.5	-0.5	-0.2	0.0	0.0	0.0	0.0	0.1	0.2	-0.4	-0.1	0.2	-0.4	-0.1	0.2	0.0	0.0	0.0	0.0	0.2	
9-Feb	-1.0	-0.8	-0.9	-0.8	-0.8	-0.4	-0.4	-0.4	-0.4	-0.4	-0.9	-0.7	-0.8	-0.9	-0.8	-0.8	-0.6	-0.1	0.1	-0.1	0.1	0.0	0.0	0.0	-0.5	0.1	-0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.1	
10-Feb	0.0	0.0	0.0	0.1	0.0	-0.1	-0.2	0.2	0.2	0.1	0.1	0.1	0.0	-0.2	-0.1	-0.2	DF	DF	DF	DF	0.0	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2		
11-Feb	0.0	0.0	-0.1	0.0	0.0	-0.4	-0.4	-0.3	-0.1	-0.1	-0.2	-0.5	-0.6	-0.4	-0.2	-0.7	-1.0	-0.6	-0.3	-0.5	-0.6	-0.2	-0.4	-1.1	-0.4	-0.4	0.0	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	
12-Feb	-1.1	-0.7	-0.3	-0.7	-0.6	-0.2	-0.5	-0.3	-0.2	-0.9	-0.6	-0.3	-0.2	0.1	0.0	-0.1	0.0	0.1	DF	DF	DF	DF	DF	-0.8	-0.4	0.1	-0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.1	
13-Feb	-1.1	-0.4	-0.2	0.0	-0.5	-0.9	-1.1	-0.6	-0.1	0.1	-0.6	-0.7	-0.7	-0.3	0.0	-0.3	-0.2	0.0	0.0	-0.2	-0.1	0.1	0.2	-0.3	0.2	-0.3	0.2	-0.3	0.2	0.0	0.0	0.0	0.0	0.2	
14-Feb	-0.2	-0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	-0.1	0.1	-0.1	-0.2	0.0	-0.3	-0.1	-0.2	0.0	-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	0.0	0.1	
15-Feb	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	-0.4	-0.5	-0.3	DF	DF	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	
16-Feb	0.0	0.0	0.0	-0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	-0.1	-0.4	-0.1	-0.2	-0.1	0.1	-0.1	DF	DF	0.0	0.0	-0.3	0.0	-0.1	0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
17-Feb	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.3	-0.2	-0.3	DF	-0.3	-0.2	-0.3	0.2	-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	0.3	
18-Feb	-0.1	-0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.2	0.0	-0.2	0.1	0.0	-0.7	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
19-Feb	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	-0.1	0.0	0.0	-0.1	0.1	DF	DF	DF	DF	DF	DF	-0.1	-0.1	0.0	-0.1	-0.3	-0.1	-0.1	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.1	
20-Feb	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.3	-0.5	-0.7	-0.6	-0.3	0.0	0.1	-0.1	-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	0.1	
21-Feb	-0.2	-0.2	0.1	0.0	0.0	-0.1	-0.1	0.0	-0.1	-0.1	0.3	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	0.0	0.0	0.0	0.0	0.0	0.0	0.3	
22-Feb	-0.1	-0.1	0.0	-0.1	-0.1	0.0	-0.1	-0.1	-0.2	DF	-0.5	-0.4	-0.5	-0.9	-0.7	-0.7	-0.5	0.0	-0.1	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	
23-Feb	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	DF	DF	DF	-0.8	-0.7	-0.5	-0.3	-0.4	-0.2	0.0	DF	DF	DF	0.0	-0.2	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
24-Feb	-0.2	-0.4	-0.6	-0.6	-0.8	-0.1	0.0	-0.2	-1.0	-0.5	-0.2	-0.9	-1.2	-1.7	-1.9	-1.3	-1.4	-1.6	-1.8	-1.7	-1.3	-1.1	-0.7	-0.3	-0.9	0.0	-0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
25-Feb	-0.4	-1.0	-0.8	-0.5	-0.4	-0.2	0.0	-0.1	-0.1	-0.6	-0.9	-0.9	-0.8	-0.8	-0.2	-0.4	-0.2	-0.2	-0.1	0.2	0.2	0.0	0.0	-0.3	-0.4	0.0	-0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.2	
26-Feb	-0.2	-0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	DF	DF	0.0	-0.1	0.0	-0.2	-0.2	DF	DF	DF	DF	DF	DF	DF	--	--	--	--	--	--	--	--	--	0.1	
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	-0.1	-0.4	-0.3	-0.4	-0.2	-0.6	0.0	0.0	0.1	0.2	0.1	0.0	0.1	-0.1	0.0	0.0	--	--	--	--	--	--	--	--	--	0.2	
28-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	-0.9	-1.0	-0.9	DF	DF	-0.3	-0.1	0.0	0.0	0.0	-0.1	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Diurnal Average																								Diurnal Average											
0.2																								0.2											
Diurnal Maximum																								Diurnal Maximum											
0.0																								0.0											
DF - DAS Failure																																			



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

**Vertical Wind Speed 20 m (VW20m) - km/h**  
**Lower Camp Met Tower - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.9 km/h on Feb 2 20:00 Minimum Value: 0.1 km/h on Feb 23 01:00 Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 0.4 Median = 0.9 Q <sub>3</sub> = 1.5 P <sub>90</sub> = 2.3 P <sub>99</sub> = 4.2		Hours in Service: 672 Hours of Data: 627 Hours of Missing Data: 45 Hours of Calibration: 0 Percent Operational Time: 93.3																							
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-Feb	0.4	0.2	0.2	0.3	0.3	0.3	0.6	0.5	0.6	0.4	0.7	1.4	1.9	1.8	1.4	0.7	0.4	0.1	0.3	0.2	0.2	0.2	0.2	0.1	1.9
2-Feb	0.2	0.4	0.5	0.8	0.6	1.2	0.9	0.8	0.7	1.2	0.8	1.4	0.8	1.1	3.0	4.4	4.2	4.2	4.6	4.9	4.2	4.1	3.6	3.4	4.9
3-Feb	3.3	3.3	2.9	2.7	1.9	1.8	1.4	1.4	0.9	0.9	0.7	1.0	1.0	1.5	1.4	1.5	1.5	1.5	1.2	1.1	1.0	0.8	0.7	1.0	3.3
4-Feb	1.0	0.6	0.7	1.0	0.9	1.0	1.0	1.1	1.4	1.3	1.3	1.3	1.4	1.5	1.1	0.8	0.8	0.9	0.8	1.0	1.0	1.0	1.0	0.8	1.5
5-Feb	0.8	0.8	0.5	0.5	0.4	0.8	0.8	0.7	0.7	0.6	0.8	0.7	0.6	0.7	0.8	0.8	0.3	0.3	0.2	0.3	0.3	1.3	3.6	2.5	3.6
6-Feb	3.7	3.3	2.8	1.3	1.2	1.0	1.6	1.6	1.7	0.6	0.5	0.7	0.6	1.0	1.2	0.6	0.4	0.9	0.9	0.5	0.9	0.8	0.2	0.4	3.7
7-Feb	0.4	0.4	0.9	1.4	2.1	4.0	3.4	2.6	2.2	2.0	1.6	2.0	3.0	4.0	4.3	4.0	3.3	2.6	1.6	1.7	0.9	0.5	2.2	1.8	4.3
8-Feb	1.6	1.4	0.5	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.3	0.9	1.3	1.1	0.9	0.6	0.5	0.3	0.2	0.4	0.5	0.7	0.8	1.2	1.6
9-Feb	1.7	1.4	1.3	1.2	1.0	1.0	1.0	1.0	0.9	0.9	1.1	1.4	1.7	1.7	1.3	1.0	0.9	0.3	0.5	0.5	0.6	0.6	0.5	0.1	1.7
10-Feb	0.2	0.3	0.8	0.7	1.0	1.6	1.6	1.3	1.3	1.3	1.4	1.5	1.7	1.7	1.6	1.7	DF	DF	DF	DF	1.2	0.8	0.9	0.6	1.7
11-Feb	0.5	0.3	0.4	0.2	0.3	1.0	1.1	0.8	0.6	0.7	0.7	1.0	1.4	1.2	1.1	1.6	2.3	1.7	2.1	3.2	2.4	0.7	1.6	2.8	3.2
12-Feb	2.6	3.1	2.0	2.2	1.8	1.7	2.1	1.8	1.6	1.5	1.0	0.9	0.9	0.9	0.6	0.8	1.0	0.8	DF	DF	DF	DF	DF	2.7	3.1
13-Feb	2.7	1.9	1.1	0.7	2.2	2.9	3.1	2.5	3.1	4.4	4.1	3.5	4.2	4.4	3.5	3.7	3.5	3.4	2.4	1.8	2.3	2.7	2.2	1.9	4.4
14-Feb	1.6	1.9	1.0	0.8	0.8	1.1	1.2	1.0	0.9	0.9	1.0	1.2	1.1	1.0	1.2	1.3	1.4	1.2	0.8	0.5	0.4	0.3	0.2	0.2	1.9
15-Feb	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.3	0.3	0.3	0.3	0.7	1.4	1.7	DF	DF	0.3	0.2	0.2	0.3	0.2	0.3	0.3	1.7
16-Feb	0.3	0.4	0.3	0.5	0.4	0.3	0.5	0.3	0.1	0.5	0.4	0.8	1.3	0.6	0.5	0.5	0.3	1.1	DF	DF	2.1	2.0	1.8	1.4	2.1
17-Feb	0.8	0.9	1.1	0.9	0.6	0.8	0.8	1.1	1.2	1.2	1.4	1.5	1.6	DF	1.8	1.9	1.9	1.9	1.8	1.8	1.6	1.0	0.4	0.5	1.9
18-Feb	0.3	0.4	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.7	0.8	0.9	1.6	1.6	1.5	1.1	0.8	0.3	0.1	0.2	0.2	0.1	0.1	0.1	1.6
19-Feb	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.8	0.5	0.6	DF	DF	DF	DF	DF	0.8	0.3	0.3	0.5	0.8	0.6	1.1	1.1
20-Feb	0.9	0.6	0.6	0.6	0.5	0.3	0.1	0.1	0.4	0.4	0.6	0.5	0.8	0.7	0.5	1.2	1.6	1.0	0.5	0.3	0.4	0.3	0.6	0.5	1.6
21-Feb	0.7	1.4	1.3	1.1	1.1	0.7	0.7	0.8	0.4	1.1	1.4	1.9	1.9	2.0	2.0	2.4	1.9	1.0	0.5	0.4	0.3	0.2	0.1	0.3	2.4
22-Feb	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	DF	0.9	0.9	1.1	1.4	1.2	1.0	0.9	0.7	0.3	0.1	0.1	0.1	0.1	0.1	1.4
23-Feb	0.1	0.2	0.1	0.3	0.2	0.3	0.2	0.1	0.1	DF	DF	DF	1.0	0.8	0.4	0.7	0.9	0.5	0.3	DF	DF	DF	0.2	0.4	1.0
24-Feb	0.8	0.9	1.3	1.3	1.6	1.7	1.5	1.5	1.8	1.9	2.1	2.4	2.3	2.2	2.2	2.2	2.3	2.1	2.4	2.2	1.8	1.8	1.6	1.4	2.4
25-Feb	1.2	1.5	1.4	1.3	1.0	1.0	0.9	1.0	1.3	1.4	1.9	2.2	1.8	1.6	1.3	0.9	1.2	0.9	0.8	0.8	0.7	0.3	0.4	0.8	2.2
26-Feb	0.9	0.6	0.5	0.8	0.3	0.3	0.5	0.6	0.4	0.4	DF	DF	1.2	1.5	1.3	1.4	1.5	DF	DF	DF	DF	DF	DF	DF	1.5
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	2.3	2.4	2.3	2.4	2.4	2.1	2.4	2.0	2.5	2.4	1.9	1.5	1.3	0.9	0.9	0.6	2.5
28-Feb	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.7	0.8	1.0	0.8	DF	DF	1.0	0.5	0.2	0.2	0.2	0.2	0.2	0.2	1.0
Diurnal Maximum																									
DF - DAS Failure																									



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

**Vertical Wind Speed 45 m (VW45m) - km/h**  
**Lower Camp Met Tower - February 2023**

Maximum Value: 1.3 km/h on Feb 24 07:00		Maximum Daily Average: 0.6 km/h on Feb 2		Hours in Service: 672																									
Minimum Value: -2.8 km/h on Feb 13 12:00		Minimum Daily Average: -0.4 km/h on Feb 7		Hours of Data: 625																									
Maximum Diurnal Average: 0.1 km/h at hour 4		Minimum Diurnal Average: -0.1 km/h at hour 14		Hours of Missing Data: 47																									
Monthly Average: 0.02 km/h		Percentiles: $P_1 = -1.0$ $P_{10} = -0.3$ $Q_1 = -0.1$ Median = 0.0 $Q_3 = 0.2$ $P_{90} = 0.4$ $P_{99} = 1.0$		Hours of Calibration: 0																									
				Percent Operational Time: 93.0																									
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-Feb	-0.1	-0.1	0.1	-0.1	0.0	-0.2	-0.2	-0.2	-0.2	-0.3	-0.2	0.1	-0.3	-0.6	-0.2	-0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.3	-0.1	0.3			
2-Feb	0.7	0.6	0.5	0.7	0.4	0.2	0.2	0.1	0.2	0.0	-0.2	0.0	0.2	0.5	0.8	1.0	0.9	0.6	1.2	0.9	1.0	0.9	1.0	0.8	0.6	1.2			
3-Feb	1.0	1.1	0.9	1.2	0.6	0.6	0.4	0.5	0.0	0.0	0.3	-0.1	-0.2	-0.2	0.1	-0.1	0.1	0.0	0.2	0.1	0.1	0.0	0.0	-0.1	0.3	1.2			
4-Feb	0.0	0.0	0.1	-0.1	0.0	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.3	-0.3	-0.2	-0.1	-0.1	-0.2	-0.1	0.0	-0.1	-0.1	-0.2	-0.1	-0.2	0.1	0.1		
5-Feb	-0.1	-0.1	-0.1	0.0	0.0	-0.1	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	-0.2	0.1	-0.1	0.0	0.1	0.0	0.1	0.3	0.1	-1.0	-0.5	-0.1	0.3	0.3		
6-Feb	-1.2	-0.5	-0.6	-0.1	-0.1	0.1	-0.1	0.1	0.3	-0.1	0.1	0.1	0.0	0.0	0.4	-0.1	0.0	-0.3	-0.2	0.0	-0.2	0.0	0.0	-0.1	-0.1	0.4	0.4		
7-Feb	0.0	0.4	1.0	0.2	-0.2	-1.1	-0.8	-0.8	-0.4	-0.6	-0.4	-0.5	-0.7	-0.8	-1.2	-1.2	-1.1	-0.6	-0.2	-0.4	-0.2	-0.2	-0.5	-0.3	-0.4	1.0	1.0		
8-Feb	-0.1	-0.1	-0.2	-0.3	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.0	0.2	0.3	0.1	0.3	0.6	0.7	0.2	0.1	0.7	0.7		
9-Feb	-0.1	0.2	0.2	0.2	0.2	0.6	0.9	0.8	0.6	0.6	0.2	0.4	0.2	0.5	0.3	0.1	-0.1	0.3	0.1	0.2	0.7	0.5	0.4	0.2	0.3	0.9	0.9		
10-Feb	0.1	0.0	-0.1	0.0	-0.1	0.0	-0.1	0.0	-0.1	0.0	0.0	-0.2	-0.2	-0.3	-0.2	-0.5	DF	DF	DF	DF	-0.1	-0.1	-0.2	0.0	-0.1	0.1	0.1		
11-Feb	0.0	0.0	-0.1	0.1	0.3	0.0	0.1	0.3	0.4	0.2	0.1	0.2	0.3	0.3	0.5	0.1	-0.1	-0.3	-0.4	-1.1	-1.0	-0.1	0.0	-0.8	0.0	0.5	0.5		
12-Feb	-0.9	-0.8	-0.5	-0.2	0.2	0.6	-0.3	0.4	-0.5	-0.5	-0.1	0.0	-0.1	0.1	0.0	-0.3	-0.2	0.0	DF	DF	DF	DF	DF	DF	0.9	-0.1	0.9	0.9	
13-Feb	0.8	0.9	0.2	0.1	-0.2	-0.3	-0.7	-0.6	-0.3	UO	UO	-2.8	-0.7	-0.3	-0.5	-0.9	-0.3	0.1	0.0	-0.1	0.0	0.3	0.3	0.0	-0.2	0.9	0.9		
14-Feb	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.1	0.0	0.0	-0.1	-0.2	-0.1	-0.3	-0.2	-0.2	0.1	0.1	0.0	0.0	-0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	
15-Feb	0.0	0.0	0.0	0.3	0.1	0.1	0.1	0.1	0.1	0.3	0.0	0.0	0.0	-0.2	0.0	DF	DF	0.2	0.1	0.2	0.3	0.2	0.0	0.2	0.1	0.3	0.3	0.3	
16-Feb	0.2	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.8	0.6	0.2	0.3	0.1	0.0	0.0	-0.1	DF	DF	-0.2	0.0	-0.2	-0.1	0.1	0.8	0.8		
17-Feb	0.0	0.2	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.2	0.2	-0.2	-0.5	DF	-0.2	-0.3	-0.2	0.1	0.0	0.2	0.0	-0.1	-0.1	-0.2	0.0	0.2	0.2		
18-Feb	-0.1	-0.1	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.0	0.2	0.0	-0.1	-0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.3	0.3	
19-Feb	0.2	0.3	0.2	0.3	0.1	0.1	0.0	-0.1	-0.1	-0.1	-0.1	0.0	DF	DF	DF	DF	DF	-0.2	0.0	0.0	-0.1	-0.2	-0.1	0.0	0.0	0.3	0.3	0.3	
20-Feb	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.1	0.4	-0.1	-0.1	-0.4	-0.5	-0.2	-0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	-0.2	-0.4	-0.1	0.4	0.4	0.4	
21-Feb	-0.4	-0.3	-0.1	-0.2	-0.1	-0.1	-0.2	0.0	-0.3	0.0	0.6	0.3	0.2	-0.4	-0.2	-0.2	-0.4	0.3	0.0	-0.1	-0.1	0.0	0.0	0.1	-0.1	0.6	0.6	0.6	
22-Feb	0.2	0.3	0.6	0.5	0.6	0.6	0.6	0.6	0.5	DF	0.2	-0.1	-0.1	-0.2	-0.2	-0.1	0.2	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.6	
23-Feb	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.4	DF	DF	DF	-0.4	-0.3	-0.2	0.0	0.2	0.1	0.3	DF	DF	DF	0.3	0.6	0.1	0.6	0.6		
24-Feb	0.5	0.4	0.2	0.3	-0.1	1.1	1.3	0.9	-0.3	0.2	0.7	0.7	0.6	-0.4	-0.7	-0.1	-0.3	-0.8	-0.2	-0.5	-0.2	-0.1	-0.2	0.2	0.1	1.3	1.3	1.3	
25-Feb	0.0	0.0	0.2	0.1	0.2	0.3	0.4	0.3	0.1	-0.1	-0.2	0.1	-0.3	0.0	0.3	-0.2	0.3	0.2	0.0	0.6	0.4	0.4	0.4	0.1	0.2	0.6	0.6	0.6	
26-Feb	0.2	0.2	0.5	0.3	0.1	0.1	0.0	0.0	-0.1	-0.2	DF	DF	0.1	0.1	0.1	0.1	0.2	DF	DF	DF	DF	DF	DF	DF	DF	--	0.5	0.5	
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	-0.2	-0.4	-0.4	-0.5	-0.5	-0.6	-0.1	0.1	-0.1	0.2	0.1	-0.2	0.0	0.0	-0.1	0.0	--	0.2	0.2	0.2	
28-Feb	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.3	-0.3	-0.5	-0.3	DF	DF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.0	0.5	0.5	
		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	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.9	0.9	0.9
		1.0	1.1	1.0	1.2	0.6	1.1	1.3	0.9	0.6	0.8	0.7	0.7	0.6	0.5	0.8	1.0	0.9	0.6	1.2	0.9	1.0	0.9	1.0	0.9	1.0	0.9	0.9	0.9
DF - DAS Failure		UO - Unstable Operation																								Diurnal Average			
																										Diurnal Maximum			



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

**Vertical Wind Speed 45 m (VW45m) - km/h**  
**Lower Camp Met Tower - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.4 km/h on Feb 7 16:00 Minimum Value: 0.1 km/h on Feb 8 08:00 Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 0.4 Median = 0.8 Q <sub>3</sub> = 1.3 P <sub>90</sub> = 2.1 P <sub>99</sub> = 3.6																								Hours in Service: 672 Hours of Data: 625 Hours of Missing Data: 47 Hours of Calibration: 0 Percent Operational Time: 93.0	
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-Feb	0.4	0.4	0.2	0.4	0.4	0.3	0.4	0.6	0.8	0.5	0.8	1.5	2.1	1.8	1.6	0.8	0.5	0.2	0.5	0.2	0.3	0.3	0.4	0.2	2.1
2-Feb	0.4	0.3	0.4	0.6	0.5	0.8	0.8	0.6	0.8	0.8	0.7	0.8	0.8	1.4	2.3	2.9	2.7	3.0	2.9	3.1	2.8	2.8	2.6	2.5	3.1
3-Feb	2.4	2.1	2.1	2.1	2.0	1.7	1.0	1.2	0.6	0.9	0.5	0.8	0.9	1.3	1.2	1.0	1.3	1.3	1.2	1.0	0.9	0.7	0.6	0.9	2.4
4-Feb	0.8	0.6	0.7	0.9	0.9	0.8	1.0	1.1	1.3	1.0	1.2	1.2	1.1	1.3	1.1	0.9	0.8	0.7	0.7	1.0	0.9	1.0	0.9	0.7	1.3
5-Feb	0.7	0.7	0.4	0.4	0.4	0.6	0.6	0.6	0.6	0.6	0.8	0.8	0.7	0.7	0.7	0.9	0.3	0.4	0.2	0.4	0.5	1.4	3.3	2.7	3.3
6-Feb	3.5	3.6	2.5	1.1	0.8	1.2	1.4	1.5	2.0	0.8	0.7	1.0	0.7	1.0	1.1	0.7	0.5	0.7	0.7	0.3	0.6	0.7	0.3	0.3	3.6
7-Feb	0.5	0.8	0.8	1.5	1.9	4.0	3.6	3.2	2.1	1.4	1.3	1.8	3.1	4.0	3.7	4.4	3.6	2.5	1.2	1.7	0.9	0.8	1.8	1.5	4.4
8-Feb	1.5	1.4	0.6	0.6	0.3	0.2	0.1	0.1	0.1	0.2	0.3	0.6	0.9	0.9	0.8	0.6	0.5	0.5	0.4	0.5	0.5	0.7	0.6	0.8	1.5
9-Feb	1.2	0.9	0.8	0.8	0.8	0.6	0.6	0.7	0.5	0.5	0.5	0.8	1.2	1.2	0.8	0.7	0.7	0.4	0.4	0.3	0.5	0.5	0.4	0.2	1.2
10-Feb	0.2	0.3	0.6	0.6	1.1	1.4	1.3	1.4	1.2	1.3	1.3	1.4	1.6	1.5	1.7	1.8	DF	DF	DF	DF	1.1	0.6	0.8	0.4	1.8
11-Feb	0.4	0.3	0.3	0.2	0.5	0.9	0.8	0.7	0.5	0.8	0.8	0.8	1.0	0.8	1.0	1.6	1.9	1.6	2.2	2.9	2.5	0.9	1.5	2.2	2.9
12-Feb	2.1	3.1	2.5	1.5	1.4	1.5	2.1	1.9	2.0	1.1	0.7	0.9	0.8	0.8	0.5	0.3	0.5	0.6	DF	DF	DF	DF	DF	DF	3.1
13-Feb	2.4	2.1	1.3	1.2	2.3	2.6	2.4	2.4	2.5	UO	UO	3.2	3.5	3.7	3.4	3.5	2.9	2.9	2.1	1.7	2.3	2.8	2.1	1.6	3.7
14-Feb	1.4	1.6	1.1	1.0	0.9	0.9	0.9	1.0	0.9	0.8	0.9	1.1	1.0	0.9	1.0	1.1	1.2	1.1	0.7	0.5	0.2	0.2	0.2	0.2	1.6
15-Feb	0.2	0.1	0.1	0.3	0.2	0.1	0.2	0.3	0.3	0.3	0.3	0.4	0.8	0.9	1.5	DF	DF	0.4	0.3	0.2	0.4	0.4	0.5	0.5	1.5
16-Feb	0.5	0.5	0.4	0.4	0.5	0.4	0.2	0.2	0.2	0.5	0.6	0.5	0.8	0.4	0.5	0.4	0.2	1.0	DF	DF	1.7	1.5	1.4	1.0	1.7
17-Feb	0.7	0.9	0.9	0.7	0.6	0.8	0.7	1.0	0.9	1.0	1.3	1.3	1.4	DF	1.3	1.2	1.3	1.6	1.4	1.6	1.4	0.9	0.6	0.3	1.6
18-Feb	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.7	0.9	1.2	1.8	1.9	1.7	1.0	0.6	0.3	0.2	0.2	0.2	0.2	0.2	0.2	1.9
19-Feb	0.3	0.3	0.3	0.4	0.2	0.2	0.2	0.4	0.4	0.7	0.6	0.7	DF	DF	DF	DF	DF	0.9	0.3	0.4	0.3	0.8	0.9	1.2	1.2
20-Feb	0.8	0.5	0.6	0.5	0.5	0.3	0.1	0.2	0.5	0.4	0.7	0.4	0.9	0.8	0.3	1.2	1.1	0.9	0.8	0.4	0.2	0.3	1.0	0.7	1.2
21-Feb	1.0	1.4	1.3	1.1	1.3	0.9	0.8	1.1	0.7	1.4	1.7	2.2	2.3	2.0	1.8	1.9	1.8	0.9	0.4	0.4	0.3	0.3	0.2	0.4	2.3
22-Feb	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.5	DF	0.4	0.5	1.1	1.0	0.8	0.5	0.7	0.8	0.3	0.2	0.1	0.1	0.1	0.1	1.1
23-Feb	0.1	0.1	0.2	0.5	0.3	0.5	0.3	0.2	0.3	DF	DF	DF	1.1	0.9	0.4	0.5	0.7	0.5	0.4	DF	DF	DF	0.4	0.3	1.1
24-Feb	0.6	0.7	0.7	0.8	1.1	0.9	0.8	0.8	1.0	1.9	1.8	1.6	2.5	2.8	2.5	2.7	2.9	2.3	2.8	2.4	2.2	1.9	1.8	1.9	2.9
25-Feb	1.6	1.6	1.0	1.1	0.9	0.8	1.2	1.1	1.5	1.4	1.7	1.9	1.7	1.9	1.7	1.1	0.8	1.0	1.0	1.2	0.9	0.4	0.5	0.5	1.9
26-Feb	0.6	0.5	0.5	0.9	0.5	0.4	0.7	0.7	0.6	0.5	DF	DF	1.2	1.4	1.4	1.1	1.5	DF	DF	DF	DF	DF	DF	DF	1.5
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	2.1	2.0	1.7	1.5	2.0	1.9	1.9	1.4	1.8	1.8	1.5	1.2	1.3	0.7	1.2	0.8	2.1
28-Feb	0.4	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.7	0.9	0.5	0.4	DF	DF	0.9	0.5	0.2	0.1	0.1	0.2	0.3	0.3	0.9
Diurnal Maximum																									
DF - DAS Failure                      UO - Unstable Operation																									



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

**Vertical Wind Speed 100 m (VW100m) - km/h**  
**Lower Camp Met Tower - February 2023**

Maximum Value: 1.8 km/h on Feb 24 06:00		Maximum Daily Average: 0.4 km/h on Feb 3		Hours in Service: 672																							
Minimum Value: -1.8 km/h on Feb 12 00:00		Minimum Daily Average: -0.9 km/h on Feb 7		Hours of Data: 624																							
Maximum Diurnal Average: 0.2 km/h at hour 22		Minimum Diurnal Average: -0.1 km/h at hour 14		Hours of Missing Data: 48																							
Monthly Average: 0.03 km/h		Percentiles: P <sub>1</sub> = -1.4 P <sub>10</sub> = -0.4 Q <sub>1</sub> = -0.1 Median = 0.1 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 0.4 P <sub>99</sub> = 1.2		Hours of Calibration: 0																							
				Percent Operational Time: 92.9																							
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-Feb	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.2	0.0	-0.2	-0.1	-0.2	-0.5	0.2	0.0	0.1	0.2	0.3	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
2-Feb	0.0	-0.2	-0.4	0.8	0.1	0.1	-0.2	-0.6	-0.3	-0.3	-0.3	-0.3	0.4	0.8	0.6	0.2	0.0	0.0	0.5	0.0	0.3	0.3	0.3	0.5	0.1	0.1	0.8
3-Feb	1.0	1.0	1.2	1.4	1.2	0.9	0.4	0.6	0.1	-0.3	-0.1	0.0	0.0	-0.1	0.4	0.2	0.7	0.5	0.4	0.3	0.2	0.3	0.2	0.1	0.4	1.4	
4-Feb	0.4	0.2	0.3	0.2	0.3	0.4	0.2	0.2	0.1	0.1	0.2	0.2	0.0	-0.1	0.2	0.1	-0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.4	
5-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.1	-0.2	-0.2	-0.3	0.1	0.0	0.0	-0.1	-0.1	-0.2	-0.3	0.1	-1.0	-0.5	-0.1	0.1	
6-Feb	-1.4	-0.4	-0.7	-0.5	-0.2	0.2	-0.3	-0.1	0.7	0.3	0.6	-0.1	-0.1	0.2	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.1	0.7	
7-Feb	-0.2	-0.3	-0.3	-0.9	-0.3	-1.5	-1.2	-0.9	-0.8	-1.2	-1.0	-1.0	-1.2	-1.6	-1.6	-1.8	-1.5	-1.1	-0.8	-0.7	-0.4	-0.4	0.0	0.1	-0.9	0.1	
8-Feb	0.3	0.1	0.0	0.0	0.2	0.0	0.1	0.2	0.1	0.0	-0.1	0.1	-0.3	-0.1	0.1	-0.1	-0.1	0.3	0.1	0.4	0.4	0.4	0.5	0.0	0.1	0.5	
9-Feb	0.1	0.2	-0.5	-0.1	-0.4	-0.3	-0.4	-0.5	-0.1	-0.2	-0.4	0.4	1.0	0.5	-0.3	-0.1	-0.4	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	1.0	
10-Feb	0.1	0.1	0.2	0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.1	DF	DF	DF	DF	0.1	0.0	-0.1	0.2	0.2	0.3	
11-Feb	0.1	0.0	0.0	0.1	0.2	-0.2	-0.6	-0.5	-0.3	-0.3	-0.2	-0.1	-0.2	0.3	0.2	-0.4	-1.0	-0.8	-0.6	-1.1	-1.3	-0.3	-0.6	-1.8	-0.4	0.3	
12-Feb	-1.8	-1.4	-0.7	-0.5	-0.2	0.7	0.0	1.1	-1.2	-0.6	-0.1	0.3	-0.2	-0.1	0.0	0.2	0.1	0.2	DF	DF	DF	DF	DF	1.2	-0.1	1.2	
13-Feb	0.2	1.0	-0.3	-0.4	-0.8	-1.2	-1.0	-1.0	0.3	UO	UO	UO	0.4	0.7	0.4	0.0	0.6	1.0	0.8	0.3	0.8	1.3	0.9	0.6	0.2	1.3	
14-Feb	0.4	0.4	0.3	0.1	0.1	0.4	0.3	0.5	0.2	0.1	0.1	-0.1	0.0	-0.2	-0.1	0.0	0.5	0.5	0.3	0.1	0.3	0.3	0.1	0.1	0.2	0.5	
15-Feb	0.1	0.1	0.1	-0.1	0.0	0.1	-0.1	0.1	0.1	0.2	0.0	-0.1	0.1	0.0	0.0	DF	DF	0.2	0.3	0.1	0.2	-0.1	0.0	0.0	0.0	0.3	
16-Feb	0.0	0.2	-0.1	-0.1	0.0	-0.2	-0.1	0.1	0.0	-0.3	0.1	-0.5	0.1	0.0	0.1	0.0	0.0	0.3	DF	DF	0.4	0.3	0.2	0.1	0.0	0.4	
17-Feb	0.1	0.4	0.2	0.3	0.0	0.2	0.3	0.1	0.2	0.8	0.4	-0.1	-0.5	DF	0.2	0.1	0.4	0.7	0.3	0.6	0.5	0.4	0.1	0.0	0.2	0.8	
18-Feb	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.0	0.7	0.5	0.0	0.7	-0.1	-0.1	0.0	0.2	0.1	0.1	0.1	0.3	0.3	0.2	0.7	
19-Feb	0.2	0.1	0.3	0.3	0.0	0.1	0.1	0.1	0.2	-0.2	-0.1	0.0	DF	DF	DF	DF	DF	-0.1	0.1	0.0	0.1	0.2	0.3	0.5	0.1	0.5	
20-Feb	0.3	0.1	0.2	0.2	-0.1	0.0	0.0	0.0	0.0	0.2	-0.1	-0.4	-0.6	-0.3	-0.3	0.3	0.6	0.4	0.4	0.4	0.3	0.4	0.2	0.1	0.1	0.6	
21-Feb	0.1	-0.1	0.2	0.0	0.2	0.2	0.1	0.2	0.0	0.2	0.9	1.1	0.5	-0.3	0.1	0.2	0.1	1.0	0.7	0.2	0.1	0.1	0.0	-0.2	0.2	1.1	
22-Feb	-0.2	-0.2	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	DF	0.0	0.0	-0.2	-0.3	-0.4	-0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	-0.1	0.1	
23-Feb	0.1	0.1	0.1	0.1	0.1	0.2	-0.1	0.0	0.0	DF	DF	DF	-0.3	-0.5	-0.2	-0.1	0.1	0.1	0.5	DF	DF	DF	-0.1	-0.4	0.0	0.5	
24-Feb	-0.1	-0.2	0.2	0.1	0.3	1.8	1.6	0.2	-0.3	0.4	0.6	0.3	0.5	-0.7	-1.2	-0.4	-1.0	-1.3	-0.9	-1.3	-0.5	-0.4	-0.1	0.0	-0.1	1.8	
25-Feb	-0.7	-0.9	-0.8	-0.8	-0.6	-0.1	-0.2	-0.5	-0.2	-0.2	-0.1	-0.2	-0.6	0.0	0.3	-0.3	0.4	0.4	0.1	0.5	0.0	0.4	0.2	-0.1	-0.2	0.5	
26-Feb	-0.1	0.1	0.5	0.4	0.4	0.0	0.1	0.5	0.3	0.0	DF	DF	0.3	0.3	0.3	0.2	0.4	DF	DF	DF	DF	DF	DF	DF	--	0.5	
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	0.2	0.1	-0.1	0.1	-0.1	-0.2	0.0	0.8	0.3	1.0	0.5	0.3	0.4	0.2	0.1	0.2	--	1.0	
28-Feb	0.1	0.1	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.1	-0.2	-0.4	-0.3	DF	DF	0.1	0.0	0.0	0.1	0.1	0.1	-0.1	0.2	0.0	0.3	
	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	0.0	-0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.1	0.0		Diurnal Average	
	1.0	1.0	1.2	1.4	1.2	1.8	1.6	1.1	0.7	0.8	0.9	1.1	1.0	0.8	0.7	0.8	0.7	1.0	0.8	0.6	0.8	1.3	0.9	1.2		Diurnal Maximum	
DF - DAS Failure		UO - Unstable Operation																									



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

**Vertical Wind Speed 100 m (VW100m) - km/h**  
**Lower Camp Met Tower - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 3.9 km/h on Feb 13 13:00 Minimum Value: 0.1 km/h on Feb 28 20:00 Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.3 Q <sub>1</sub> = 0.5 Median = 0.8 Q <sub>3</sub> = 1.3 P <sub>90</sub> = 2.1 P <sub>99</sub> = 3.4																								Hours in Service: 672 Hours of Data: 624 Hours of Missing Data: 48 Hours of Calibration: 0 Percent Operational Time: 92.9	
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-Feb	0.4	0.6	0.2	0.8	0.6	0.4	0.5	0.8	1.2	0.9	0.6	1.8	2.2	2.2	1.8	0.9	0.7	0.4	0.8	0.3	0.4	0.4	0.4	0.2	2.2
2-Feb	0.4	0.4	0.4	0.7	0.6	0.8	0.8	0.7	0.7	0.9	0.9	0.9	0.9	1.5	1.8	2.7	2.5	2.6	3.2	3.1	2.5	2.6	2.5	2.4	3.2
3-Feb	2.3	2.5	2.5	2.4	2.2	1.9	1.4	1.1	1.0	0.9	0.5	0.7	0.9	1.3	1.2	0.9	1.5	1.5	1.4	1.0	0.9	0.9	0.7	0.6	2.5
4-Feb	0.7	0.7	0.5	0.6	0.6	0.6	0.5	0.7	1.0	0.8	1.0	1.2	0.9	1.3	1.0	0.8	0.5	0.5	0.6	0.5	0.6	0.7	0.4	1.3	
5-Feb	0.4	0.4	0.2	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.8	0.6	0.7	0.8	0.8	1.1	0.5	0.9	0.5	0.5	0.8	1.8	2.7	2.5	2.7
6-Feb	3.0	3.6	2.3	1.2	0.8	1.3	1.6	1.5	1.3	1.0	0.7	1.1	0.6	0.8	1.0	0.9	0.8	0.7	0.8	0.5	0.7	0.5	0.5	0.6	3.6
7-Feb	0.7	1.1	1.0	1.1	1.1	3.8	3.5	3.4	1.5	0.8	1.2	1.7	2.8	3.2	3.2	3.4	3.2	1.9	0.7	1.2	1.1	1.4	1.4	1.4	3.8
8-Feb	1.4	1.1	0.6	0.9	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.7	0.7	0.6	0.6	0.7	0.6	0.6	0.7	0.6	0.6	0.6	0.7	0.7	1.4
9-Feb	1.1	0.9	0.7	0.8	0.5	0.5	0.9	0.8	0.6	0.6	0.4	0.6	1.0	1.4	1.0	1.0	1.0	0.8	0.5	0.3	0.5	0.5	0.3	0.2	1.4
10-Feb	0.3	0.4	0.3	0.3	0.6	1.0	0.9	1.1	0.8	1.0	0.9	1.2	1.2	1.3	1.6	1.3	DF	DF	DF	DF	0.9	0.4	0.6	0.3	1.6
11-Feb	0.2	0.1	0.2	0.2	0.5	0.8	0.6	0.7	0.6	0.8	0.9	0.9	1.2	1.1	1.0	1.7	1.5	1.1	2.3	3.1	2.4	0.9	0.7	0.9	3.1
12-Feb	1.0	2.2	2.5	0.9	1.3	1.2	1.8	1.3	1.9	0.9	0.7	0.9	0.7	0.8	0.4	0.4	0.7	0.9	DF	DF	DF	DF	DF	2.5	2.5
13-Feb	2.1	2.3	1.7	1.7	1.8	1.7	1.4	1.9	2.5	UO	UO	UO	3.9	3.6	3.0	3.3	3.1	3.1	2.5	2.0	2.6	3.4	2.3	1.8	3.9
14-Feb	1.6	1.8	0.7	0.7	0.6	1.0	1.1	1.0	0.9	0.7	1.0	1.2	1.0	0.8	1.0	1.2	1.3	1.2	1.0	0.5	0.4	0.5	0.4	0.2	1.8
15-Feb	0.2	0.1	0.2	0.4	0.4	0.3	0.4	0.5	0.4	0.5	0.3	0.5	0.6	0.7	1.4	DF	DF	0.5	0.5	0.5	0.6	0.6	0.7	0.8	1.4
16-Feb	0.6	0.7	0.6	0.5	0.6	0.5	0.4	0.4	0.5	0.4	0.6	0.7	0.7	0.5	0.5	0.3	0.3	0.8	DF	DF	1.4	1.5	1.3	0.9	1.5
17-Feb	0.9	1.0	1.0	0.8	0.6	0.7	0.8	1.0	0.9	1.2	1.2	1.2	1.4	DF	1.2	1.1	1.4	1.8	1.5	1.6	1.5	0.9	0.6	0.3	1.8
18-Feb	0.3	0.4	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.8	1.3	2.0	2.1	2.1	1.0	0.4	0.2	0.4	0.5	0.3	0.3	0.2	0.3	2.1
19-Feb	0.4	0.5	0.7	0.7	0.4	0.4	0.2	0.2	0.3	0.8	0.4	0.5	DF	DF	DF	DF	DF	0.6	0.2	0.5	0.4	0.6	0.7	0.9	0.9
20-Feb	1.0	0.6	0.8	0.8	0.3	0.2	0.2	0.2	0.5	0.2	0.6	0.6	1.0	0.8	0.4	1.2	1.4	1.2	1.2	0.3	0.3	0.3	1.4	1.0	1.4
21-Feb	1.5	2.0	1.8	1.5	1.7	1.2	1.4	1.6	0.9	1.6	2.2	2.5	2.5	2.3	2.1	2.0	1.6	0.8	0.5	0.7	0.5	0.2	0.3	0.6	2.5
22-Feb	0.7	0.7	0.7	0.5	0.5	0.3	0.3	0.4	0.7	DF	0.3	0.3	0.8	0.8	0.6	0.8	0.6	0.7	0.3	0.2	0.1	0.1	0.1	0.2	0.8
23-Feb	0.2	0.3	0.3	0.9	0.5	0.6	0.3	0.3	0.2	DF	DF	DF	0.9	1.0	0.5	0.5	0.6	0.8	0.9	DF	DF	DF	0.6	0.5	1.0
24-Feb	0.6	0.5	0.6	0.9	0.9	0.7	0.9	0.8	0.9	1.6	1.5	1.8	3.0	3.1	2.7	3.0	2.7	2.0	2.6	2.3	2.5	2.2	2.0	2.5	3.1
25-Feb	2.0	1.7	1.1	1.1	1.0	1.1	1.3	1.4	2.0	1.2	1.2	1.5	1.4	2.2	2.0	1.3	0.8	1.0	1.5	1.1	1.2	0.6	1.1	0.7	2.2
26-Feb	0.6	0.6	0.6	0.9	0.9	0.6	0.8	1.1	0.9	0.8	DF	DF	1.4	1.6	1.6	1.0	1.4	DF	DF	DF	DF	DF	DF	DF	1.6
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	1.7	1.6	1.5	1.5	1.8	2.0	1.9	1.7	1.9	1.7	1.5	1.5	1.6	1.0	1.0	0.7	2.0
28-Feb	0.3	0.2	0.3	0.3	0.1	0.1	0.1	0.2	0.3	0.3	0.8	1.0	0.6	0.4	DF	DF	0.6	0.5	0.2	0.1	0.1	0.2	0.3	0.4	1.0
Diurnal Maximum																									
DF - DAS Failure                      UO - Unstable Operation																									





Maximum Value: 2.8 km/h on Feb 12 08:00		Maximum Daily Average: 0.9 km/h on Feb 13		Hours in Service: 672																						
Minimum Value: -0.8 km/h on Feb 24 18:00		Minimum Daily Average: 0.0 km/h on Feb 24		Hours of Data: 611																						
Maximum Diurnal Average: 0.5 km/h at hour 5		Minimum Diurnal Average: 0.1 km/h at hour 14		Hours of Missing Data: 61																						
Monthly Average: 0.30 km/h		Percentiles: $P_1 = -0.6$ $P_{10} = -0.1$ $Q_1 = 0.0$ Median = 0.2 $Q_3 = 0.4$ $P_{90} = 0.8$ $P_{99} = 1.8$		Hours of Calibration: 0																						
				Percent Operational Time: 90.9																						
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-Feb	0.4	0.1	0.0	0.5	0.3	0.3	0.4	0.4	0.2	0.1	0.1	0.4	0.5	-0.1	0.7	0.1	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.7
2-Feb	0.1	-0.2	-0.5	0.3	0.0	-0.3	0.0	-0.7	-0.2	0.2	0.7	0.7	1.4	1.4	1.0	0.3	0.2	-0.2	0.7	-0.1	0.7	0.8	0.8	1.1	0.3	1.4
3-Feb	1.7	1.8	1.7	2.0	1.6	0.8	0.6	0.6	0.0	0.1	0.1	0.0	0.1	0.2	0.3	0.0	0.5	0.3	0.3	0.2	0.3	0.2	0.0	0.2	0.6	2.0
4-Feb	0.4	0.1	0.3	0.2	0.4	0.6	0.4	0.2	0.2	0.1	0.3	0.2	0.1	0.0	0.4	0.2	0.2	0.1	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.6
5-Feb	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.2	0.0	-0.1	0.2	-0.1	-0.5	-0.1	-0.1	0.0	0.6	1.5	0.3	0.5	0.2	1.5
6-Feb	0.7	1.7	1.0	1.1	1.4	1.5	0.7	0.9	1.5	0.6	0.3	-0.1	-0.1	-0.1	0.0	0.0	0.1	0.2	0.3	0.3	0.2	0.0	0.1	0.0	0.5	1.7
7-Feb	-0.1	0.1	0.2	1.2	1.8	0.7	0.5	1.0	0.8	0.4	0.3	0.7	0.4	0.6	0.6	0.2	0.6	1.0	1.1	1.3	1.0	0.5	0.3	0.1	0.6	1.8
8-Feb	0.1	0.2	0.4	0.6	0.5	0.1	0.1	0.4	0.1	0.1	-0.1	0.0	-0.2	-0.1	0.3	0.3	0.3	0.6	0.6	0.7	0.1	-0.3	-0.1	-0.4	0.2	0.7
9-Feb	-0.2	-0.5	0.1	0.3	0.2	0.3	0.3	0.3	0.5	0.2	-0.1	0.1	1.5	1.1	-0.5	0.3	-0.1	0.3	0.2	0.0	0.1	0.0	-0.1	-0.1	0.2	1.5
10-Feb	-0.1	0.0	0.6	0.7	0.4	0.3	0.4	0.5	0.4	0.4	0.2	0.2	0.1	0.3	0.4	0.5	DF	DF	DF	DF	0.3	0.3	0.2	0.0	0.3	0.7
11-Feb	0.1	0.1	0.1	0.0	0.1	-0.2	-0.1	0.1	0.1	0.4	0.4	-0.1	-0.3	0.1	0.5	0.8	0.8	0.6	0.9	0.4	-0.5	0.3	1.5	0.7	0.3	1.5
12-Feb	0.5	0.9	1.1	0.8	0.7	2.0	1.6	2.8	0.2	0.1	0.0	0.3	-0.1	-0.2	0.1	0.2	0.1	0.1	DF	DF	DF	DF	DF	1.8	0.7	2.8
13-Feb	1.0	2.4	0.8	0.8	1.6	1.1	0.8	0.5	UO	UO	UO	UO	UO	UO	1.0	0.6	0.8	1.0	0.8	0.1	0.8	1.2	0.7	0.4	0.9	2.4
14-Feb	0.3	0.2	0.3	0.1	0.1	0.4	0.3	0.5	0.2	0.3	-0.1	0.0	0.1	-0.1	-0.1	-0.1	0.6	0.5	0.1	0.2	0.4	0.3	0.0	0.1	0.2	0.6
15-Feb	0.0	0.1	0.1	-0.2	-0.2	-0.2	-0.3	0.0	-0.2	-0.1	0.0	-0.2	0.0	-0.2	-0.3	DF	DF	0.3	0.3	0.2	0.4	0.3	0.6	0.6	0.0	0.6
16-Feb	0.0	0.1	0.1	0.0	0.5	0.1	0.2	0.0	0.0	0.0	0.1	-0.2	0.4	0.0	0.2	0.5	0.4	0.3	DF	DF	0.4	0.1	0.0	0.0	0.1	0.5
17-Feb	0.1	0.3	0.1	0.2	0.1	0.1	0.1	-0.2	0.3	0.4	0.2	-0.1	-0.5	DF	0.3	0.1	0.2	0.7	0.4	0.4	0.6	0.6	0.6	0.2	0.2	0.7
18-Feb	0.4	0.2	0.1	0.3	0.4	0.4	0.3	0.7	UO	UO	UO	UO	0.8	UO	1.1	0.0	0.0	0.1	0.0	-0.3	0.0	0.0	0.1	0.0	0.2	1.1
19-Feb	0.1	0.3	0.4	0.3	0.6	0.4	0.3	0.1	0.2	0.2	0.1	0.1	DF	DF	DF	DF	DF	0.4	0.5	0.4	0.4	0.6	0.4	0.5	0.3	0.6
20-Feb	0.3	0.3	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.0	-0.2	-0.6	-0.3	-0.5	0.4	0.5	0.5	0.3	0.3	0.6	0.6	0.4	0.2	0.2	0.6
21-Feb	0.3	-0.3	-0.3	-0.1	-0.1	0.2	0.4	0.4	0.2	0.2	1.1	1.9	1.2	0.0	0.1	0.3	0.4	0.8	0.5	0.3	0.3	0.2	0.2	0.2	0.3	1.9
22-Feb	0.4	0.3	0.1	0.3	0.1	0.3	0.3	0.3	0.4	DF	0.3	0.4	0.1	0.3	0.1	0.2	0.5	0.3	0.2	0.3	0.3	0.1	0.1	0.2	0.3	0.5
23-Feb	0.1	0.2	0.4	0.7	0.7	0.9	0.3	0.3	0.4	DF	DF	DF	0.3	-0.7	-0.3	0.0	0.0	0.3	0.7	DF	DF	DF	-0.2	-0.1	0.2	0.9
24-Feb	0.0	-0.2	-0.2	-0.2	-0.4	0.5	0.7	-0.1	-0.7	0.8	0.7	0.1	0.9	-0.1	-0.6	-0.5	-0.8	-0.8	-0.4	-0.7	-0.1	0.2	0.5	1.0	0.0	1.0
25-Feb	0.3	-0.3	-0.2	-0.2	0.2	0.5	0.5	0.3	1.1	0.5	1.5	1.6	0.7	0.9	-0.1	-0.5	0.2	0.2	0.6	1.6	-0.1	0.2	0.1	0.3	0.4	1.6
26-Feb	0.3	0.2	0.3	0.1	0.5	-0.3	0.1	0.4	0.2	-0.2	DF	DF	-0.1	0.2	0.3	-0.1	0.0	DF	DF	DF	DF	DF	DF	DF	--	0.5
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	0.3	0.2	0.1	0.0	-0.1	0.2	-0.4	1.0	-0.1	0.9	0.2	0.0	0.4	0.2	0.4	0.4	--	1.0
28-Feb	0.5	0.4	0.3	0.8	0.5	0.5	0.4	UO	UO	UO	UO	UO	0.0	-0.1	DF	DF	0.0	0.1	0.2	0.1	0.1	0.0	-0.1	0.0	--	0.8
																								Diurnal Average		
																								Diurnal Maximum		
0.3 0.3 0.3 0.4 0.5 0.4 0.3 0.4 0.2 0.2 0.3 0.3 0.3 0.1 0.2 0.2 0.2 0.3 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3																										
1.7 2.4 1.7 2.0 1.8 2.0 1.6 2.8 1.5 0.8 1.5 1.9 1.5 1.4 1.1 1.0 0.8 1.0 1.1 1.6 1.0 1.5 1.5 1.8																										
DF - DAS Failure UO - Unstable Operation																										



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

**Vertical Wind Speed 163 m (VW163m) - km/h**  
**Lower Camp Met Tower - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																				Hours in Service: 672					
Maximum Value: 4.7 km/h on Feb 2 19:00																				Hours of Data: 611					
Minimum Value: 0.1 km/h on Feb 28 21:00																				Hours of Missing Data: 61					
Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.3 Q <sub>1</sub> = 0.5 Median = 0.8 Q <sub>3</sub> = 1.3 P <sub>90</sub> = 2.1 P <sub>99</sub> = 3.3																				Hours of Calibration: 0					
																				Percent Operational Time: 90.9					
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-Feb	0.6	0.7	0.4	1.1	0.6	0.6	0.7	1.0	1.4	1.1	0.6	1.8	2.6	2.4	2.2	0.8	0.7	0.5	1.0	0.4	0.5	0.5	0.3	0.1	2.6
2-Feb	0.2	0.2	0.3	0.6	0.7	0.8	0.9	0.8	0.9	0.9	0.8	1.1	0.8	1.2	2.1	3.3	3.3	3.5	4.7	4.3	3.3	3.3	3.2	3.0	4.7
3-Feb	3.0	3.0	2.8	2.8	2.3	1.8	1.2	0.8	1.1	0.8	0.8	0.7	0.8	1.3	1.3	0.9	1.5	1.5	1.5	1.1	1.1	1.1	0.6	0.4	3.0
4-Feb	0.5	0.6	0.4	0.5	0.6	0.6	0.4	0.5	0.7	0.8	0.9	1.1	1.1	1.1	1.2	0.8	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.2	1.2
5-Feb	0.3	0.2	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.3	0.8	0.5	0.4	0.8	0.9	1.3	0.8	1.1	0.5	0.6	1.0	2.0	2.1	2.2	2.2
6-Feb	2.5	3.0	2.3	1.4	1.4	1.6	2.1	1.9	1.2	1.2	0.7	0.8	0.7	0.7	0.7	1.0	1.1	1.1	1.3	0.9	0.8	0.9	0.6	0.7	3.0
7-Feb	1.3	1.2	1.2	1.2	1.2	3.2	3.2	2.8	1.5	1.2	1.5	2.1	2.7	2.9	2.5	2.6	2.2	1.4	1.0	1.5	1.3	1.5	1.2	1.2	3.2
8-Feb	1.3	1.1	0.8	1.1	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.5	0.7	0.6	0.7	0.8	0.8	0.8	0.8	0.7	1.0	1.0	1.1	1.1	1.3
9-Feb	1.2	1.1	1.3	0.7	0.7	0.8	1.3	0.7	0.9	1.0	0.6	0.6	1.3	1.0	0.5	1.0	1.3	1.0	0.8	0.7	0.8	0.6	0.4	0.3	1.3
10-Feb	0.4	0.5	0.4	0.3	0.4	1.0	0.8	0.5	0.5	0.5	0.6	0.7	0.8	0.9	1.1	0.8	DF	DF	DF	DF	0.7	0.4	0.4	0.3	1.1
11-Feb	0.3	0.2	0.2	0.2	0.5	0.8	0.6	0.8	0.6	0.7	0.8	0.8	1.0	1.0	1.0	2.1	1.4	1.1	2.2	3.2	2.4	1.0	1.0	0.9	3.2
12-Feb	1.2	1.1	1.8	1.4	1.7	1.4	1.4	1.4	1.1	0.7	0.6	0.9	0.7	0.6	0.4	0.8	0.9	1.2	DF	DF	DF	DF	DF	3.2	3.2
13-Feb	1.9	2.4	1.8	2.0	1.9	1.8	1.7	1.5	UO	UO	UO	UO	UO	UO	2.8	2.9	3.3	3.5	2.6	2.3	2.9	3.4	2.6	1.8	3.5
14-Feb	1.9	1.8	0.6	0.6	0.4	1.1	1.1	1.1	0.7	0.8	1.0	1.1	0.9	0.9	1.1	1.1	1.4	1.1	0.7	0.3	0.5	0.6	0.6	0.4	1.9
15-Feb	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.6	0.4	0.6	0.3	0.5	0.6	0.5	1.2	DF	DF	0.7	0.7	0.8	0.8	0.7	1.0	1.0	1.2
16-Feb	0.6	0.6	0.9	0.7	0.8	0.5	0.5	0.6	0.6	0.8	0.8	1.1	1.0	0.5	0.6	0.6	0.5	0.8	DF	DF	1.5	1.7	1.4	0.9	1.7
17-Feb	0.9	1.0	1.0	1.0	0.6	0.9	0.9	0.9	0.9	1.3	1.2	1.6	1.3	DF	1.4	1.1	1.5	1.9	1.5	1.8	1.6	0.8	0.6	0.4	1.9
18-Feb	0.3	0.4	0.3	0.3	0.3	0.4	0.2	1.5	UO	UO	UO	UO	2.4	UO	2.4	1.0	0.5	0.3	0.4	0.7	0.4	0.3	0.4	0.6	2.4
19-Feb	0.6	0.5	0.7	0.7	0.6	0.6	0.4	0.4	0.4	0.8	0.4	0.5	DF	DF	DF	DF	DF	0.3	0.3	0.3	0.5	0.5	0.7	0.9	0.9
20-Feb	1.4	0.9	0.6	0.7	0.4	0.2	0.3	0.4	0.6	0.2	0.5	0.7	1.2	0.8	0.6	1.2	1.2	1.2	1.2	0.3	0.2	0.3	1.4	1.1	1.4
21-Feb	1.8	2.2	2.2	1.9	1.9	1.6	1.8	2.2	1.3	1.7	2.4	2.8	2.8	2.6	2.1	2.1	1.5	1.0	0.5	0.7	0.6	0.4	0.3	0.4	2.8
22-Feb	0.5	0.5	0.6	0.5	0.4	0.4	0.3	0.3	0.8	DF	0.4	0.5	0.8	0.9	0.9	0.8	0.9	0.7	0.2	0.2	0.2	0.2	0.2	0.2	0.9
23-Feb	0.2	0.2	0.5	1.2	0.8	0.6	0.3	0.2	0.2	DF	DF	DF	1.3	0.9	0.7	0.3	0.7	0.9	0.9	DF	DF	DF	0.8	0.6	1.3
24-Feb	0.8	0.6	0.6	0.9	0.8	0.9	0.6	0.6	0.9	1.7	1.7	2.1	3.2	3.2	2.5	2.6	2.5	1.8	2.1	2.2	2.3	2.1	1.9	1.8	3.2
25-Feb	1.2	1.5	0.9	0.8	0.8	1.1	1.2	1.4	1.5	1.2	0.8	1.0	1.0	2.2	2.2	1.3	0.9	0.8	1.9	0.6	1.2	0.7	1.1	0.9	2.2
26-Feb	0.7	0.8	0.7	1.0	0.8	0.7	1.1	1.2	0.8	1.4	DF	DF	1.5	2.0	1.6	1.0	1.1	DF	DF	DF	DF	DF	DF	DF	2.0
27-Feb	DF	DF	DF	DF	DF	DF	DF	DF	1.5	1.5	1.5	1.6	1.7	2.0	1.9	2.0	1.6	1.8	1.6	1.7	1.8	1.2	1.0	0.7	2.0
28-Feb	0.4	0.2	0.3	0.3	0.2	0.3	0.3	UO	UO	UO	UO	UO	0.4	0.3	DF	DF	0.4	0.5	0.3	0.2	0.1	0.2	0.3	0.3	0.5
Diurnal Maximum																									
DF - DAS Failure      UO - Unstable Operation																									



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS04 BUFFALO VIEWPOINT FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS04)  
 FEBRUARY 2023

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	618	31	54	96.58	59.7	0	12.9	0
H2S (ppb) Average	639	33	33	100	7.4	0	1.7	0
THC (ppm) Average	638	32	34	99.7	3.9	-	2.7	-
NMHC(ppm) Average	638	32	34	99.7	0.186	-	0.016	-
CH4(ppm) Average	638	32	34	99.7	3.9	-	2.7	-
O3(ppb) Average	641	31	31	100	36.9	0	31.4	-
NO2(ppb) Average	617	38	55	97.47	45.6	0	27.6	-
NO(ppb) Average	617	38	55	97.47	116.1	-	24.8	-
NOX(ppb) Average	617	38	55	97.47	161.7	-	50.1	-
PM2.5(ug/m3) Average	671	1	1	100	49.9	0	15	0
Temperature (C) Average	672	0	0	100	4.8	-	-0.6	-
Relative Humidity (%) Average	672	0	0	100	92.1	-	85.8	-
Wind Speed 10 m (km/h) Average	655	0	17	97.47	32	-	21	-
Wind Direction 10 m (deg) Average	655	0	17	97.47	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS04)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	618	1.73	5.7	-	0	0	0.1	0.4	0.8	3.1	59.7
H2S (ppb) Average	639	0.43	0.5	-	0	0.1	0.2	0.3	0.5	0.9	7.4
THC (ppm) Average	638	2.12	0.3	-	1.9	2	2	2	2.1	2.4	3.9
NMHC(ppm) Average	638	0.002	0.016	-	0	0	0	0	0	0	0.186
CH4(ppm) Average	638	2.11	0.2	-	1.9	2	2	2	2.1	2.4	3.9
O3(ppb) Average	641	18.32	10.2	-	0.8	2.8	9.2	20.2	26.5	31.5	36.9
NO2(ppb) Average	617	13.99	11.2	-	0	0.9	4.3	11.8	23.1	30	45.6
NO(ppb) Average	617	6.66	12.7	-	0	0	0.5	1.3	6.9	19.3	116.1
NOX(ppb) Average	617	20.64	21.5	-	0	1.4	5.1	14.7	27.7	50.7	161.7
PM2.5(ug/m3) Average	671	7.08	5.3	-	0.5	2.4	3.7	5.8	9.1	12.8	49.9
Temperature 2 m (C) Average	672	-15.41	9	-	-35.9	-27.7	-22	-15.5	-8.9	-3.2	4.8
Relative Humidity (%) Average	672	75.09	9.9	-	42.2	62	70.1	76.5	81.7	87.4	92.1
Wind Speed 10 m (km/h) Average	655	8.1	5	-	0	3	5	7	10	14	32
Wind Direction 10 m (deg) Average	655	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS04)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	15 Feb 2023 15:00	16 Feb 2023 12:00	22	Analyzer Failure - inconsistent response
SO2	16 Feb 2023 13:00	16 Feb 2023 13:00	1	Maintenance - analyzer rebooted
THC/NMHC/CH4	16 Feb 2023 12:00	16 Feb 2023 13:00	2	Maintenance - replaced support gas cylinder
NO2	13 Feb 2023 15:00	14 Feb 2023 07:00	17	Maintenance - to clean reaction cell
Wind Speed, Wind Direction	13 Feb 2023 19:00	14 Feb 2023 11:00	17	Flat line in sensor output signal - Sensor frozen



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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Buffalo Viewpoint - February 2023**

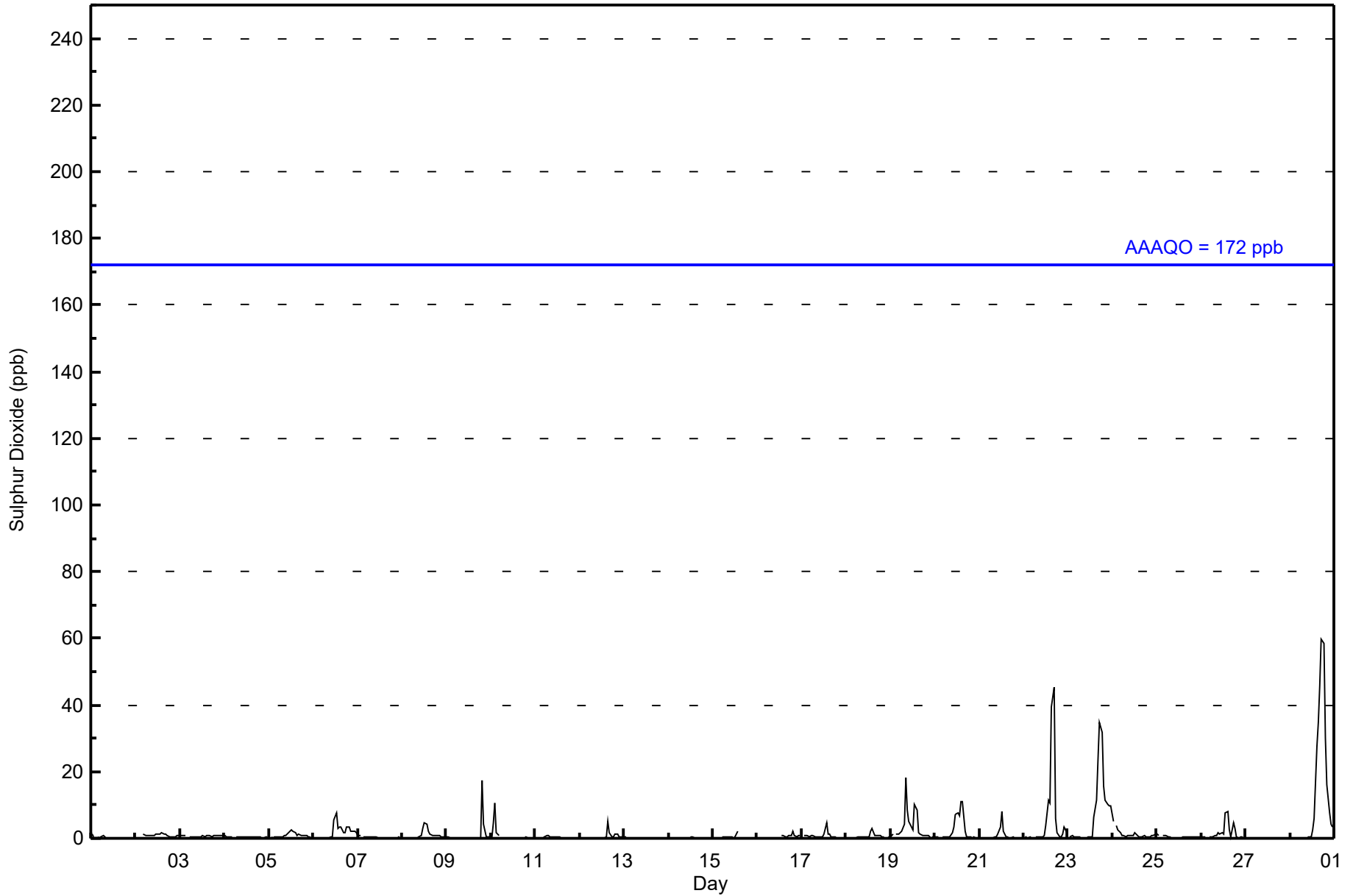
Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 672																	Daily Average		Daily Maximum				
Maximum Value: 59.7 ppb on Feb 28 18:00		Maximum Daily Average: 12.9 ppb on Feb 28																	Hours of Data: 618		Hours of Missing Data: 54						
Minimum Value: 0.0 ppb on Feb 1 10:00		Minimum Daily Average: 0.0 ppb on Feb 14																	Hours of Calibration: 31		Percent Operational Time: 96.6						
Maximum Diurnal Average: 4.8 ppb at hour 17		Minimum Diurnal Average: 0.4 ppb at hour 6																									
Monthly Average: 1.73 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> = 0.8 P <sub>90</sub> = 3.1 P <sub>99</sub> = 34.3																									
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-Feb	1.1	0.5	Z	0.4	0.2	0.3	0.9	0.3	0.0	0.0	0.0	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	0.2	1.1	
2-Feb	0.0	0.0	0.0	Z	1.1	0.8	0.8	0.7	0.7	0.9	1.0	1.1	1.3	1.4	1.5	1.4	1.1	0.8	0.6	0.6	0.6	0.6	0.7	0.8	0.8	1.5	
3-Feb	0.7	0.8	0.7	0.7	Z	0.6	0.5	0.5	0.5	0.5	0.5	0.5	1.0	0.6	1.0	0.8	0.8	0.5	0.9	0.8	0.8	0.8	0.8	0.9	0.7	1.0	
4-Feb	0.7	0.6	0.6	0.6	0.6	Z	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.4	0.3	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.4	0.7	
5-Feb	Z	0.2	0.2	0.2	0.3	0.5	0.6	0.4	0.9	1.0	1.3	2.3	2.7	2.3	1.6	1.0	1.1	0.9	0.8	0.7	0.6	0.5	0.2	0.1	0.9	2.7	
6-Feb	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	5.3	7.6	3.1	3.5	3.5	1.8	1.6	3.2	3.5	2.2	2.0	2.1	1.6	1.8	7.6	
7-Feb	1.0	1.0	Z	0.5	0.4	0.4	0.4	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.3	1.0	
8-Feb	0.1	0.1	0.0	Z	0.0	0.1	0.2	0.1	0.2	0.2	0.9	3.1	4.5	4.2	2.3	1.3	1.0	0.8	0.9	0.9	0.8	0.5	0.3	0.4	1.0	4.5	
9-Feb	0.3	0.2	0.1	0.0	Z	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.2	17.4	4.1	0.6	0.4	0.4	1.1	17.4	
10-Feb	0.3	4.8	10.8	1.6	1.0	Z	0.6	C	C	C	C	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	1.1	10.8	
11-Feb	Z	0.1	0.1	0.2	0.1	0.3	0.7	0.7	0.6	0.4	0.5	0.4	0.2	0.3	0.2	0.2	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.2	0.7	
12-Feb	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	0.1	0.3	5.2	1.7	0.5	0.3	1.2	1.1	0.5	0.2	0.3	0.5	5.2	
13-Feb	0.4	0.3	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	
14-Feb	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	0.3	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	
15-Feb	0.0	0.1	0.1	0.1	Z	0.3	0.2	0.3	0.2	0.4	0.2	0.2	0.3	2.1	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	2.1	
16-Feb	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	0.9	0.8	0.6	0.5	0.7	0.8	2.0	0.9	0.6	0.7	0.9	--	2.0	
17-Feb	Z	0.9	0.8	0.7	0.6	0.6	0.7	0.6	0.5	0.5	0.5	1.5	4.5	1.1	1.1	0.3	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.7	4.5		
18-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.4	0.3	0.3	0.4	0.6	0.5	2.1	2.8	0.9	0.8	1.1	0.8	0.5	0.4	0.1	0.1	0.4	0.6	2.8	
19-Feb	0.3	1.1	Z	1.2	1.2	1.7	1.9	4.4	18.3	8.4	5.3	3.3	2.5	10.3	8.4	1.8	1.1	1.0	0.7	0.8	0.7	0.4	0.2	0.4	3.3	18.3	
20-Feb	0.3	0.5	0.5	Z	0.4	0.5	0.3	0.4	0.5	1.7	3.2	7.2	7.7	6.6	11.0	10.8	2.1	0.6	0.4	0.3	0.2	0.2	0.2	0.1	2.4	11.0	
21-Feb	0.1	0.2	0.1	0.2	Z	0.2	0.2	0.2	0.3	0.2	1.2	3.3	7.9	2.1	0.5	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.0	0.8	7.9	
22-Feb	0.1	0.3	0.1	0.2	0.1	Z	0.2	0.2	0.3	0.3	0.3	0.9	3.7	11.4	10.4	39.3	45.5	5.9	1.6	0.6	0.6	1.5	3.4	1.8	5.6	45.5	
23-Feb	Z	0.5	0.7	0.6	0.4	0.3	0.3	0.1	0.1	0.1	0.2	0.3	0.4	0.5	6.4	11.4	23.3	34.9	31.7	15.7	11.6	10.4	9.9	9.6	7.4	34.9	
24-Feb	4.9	Z	3.7	2.4	1.5	0.9	0.7	0.6	0.7	0.8	1.0	1.0	1.7	0.7	0.4	0.5	0.5	0.6	0.5	0.6	0.6	0.8	1.0	1.1	1.2	4.9	
25-Feb	1.3	0.8	Z	0.7	0.7	0.6	0.6	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.6	0.3	0.4	0.4	0.4	0.4	0.3	0.2	0.4	1.3	
26-Feb	0.4	0.5	0.4	Z	0.4	0.3	0.4	0.8	0.8	1.9	1.4	1.5	1.2	7.8	7.9	2.6	0.5	4.7	2.8	0.2	0.1	0.3	0.5	0.1	1.6	7.9	
27-Feb	0.1	0.1	0.0	0.0	Z	0.2	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	0.0	0.0	0.0	0.2	
28-Feb	0.0	0.0	0.0	0.1	0.2	Z	0.2	0.0	0.0	0.2	0.2	0.6	2.5	5.8	27.6	34.8	45.8	59.7	58.4	30.0	16.2	7.5	4.4	3.4	12.9	59.7	
																								Diurnal Average		Diurnal Maximum	
																								0.5		4.9	
																								0.6		4.8	
																								0.9		10.8	
																								0.5		2.4	
																								0.4		1.5	
																								0.4		1.7	
																								0.4		1.9	
																								0.5		4.4	
																								1.0		18.3	
																								0.7		8.4	
																								0.8		5.3	
																								1.3		7.2	
																								1.8		7.9	
																								2.4		11.4	
																								3.3		27.6	
																								4.4		39.3	
																								4.8		45.8	
																								4.3		59.7	
																								3.9		58.4	
																								2.9		30.0	
																								1.6		16.2	
																								1.1		10.4	
																								1.0		9.9	
																								0.9		9.6	

Z - zerospan      C - Calibration      M - Maintenance      AF - Analyzer 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**  
**Buffalo Viewpoint - February 2023**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Buffalo Viewpoint - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	597	96.60	96.60
11 - 20	10	1.62	98.22
21 - 60	11	1.78	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: 618

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Buffalo Viewpoint - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	141	62	17	6	8	9	50	88	27	10	8	24	36	27	33	35	581
11 - 20	1	2	2	0	1	0	0	2	1	0	0	0	0	1	0	0	10
21 - 60	0	0	0	0	0	0	3	0	1	0	0	0	2	2	2	1	11
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>	142	64	19	6	9	9	53	90	29	10	8	24	38	30	35	36	602

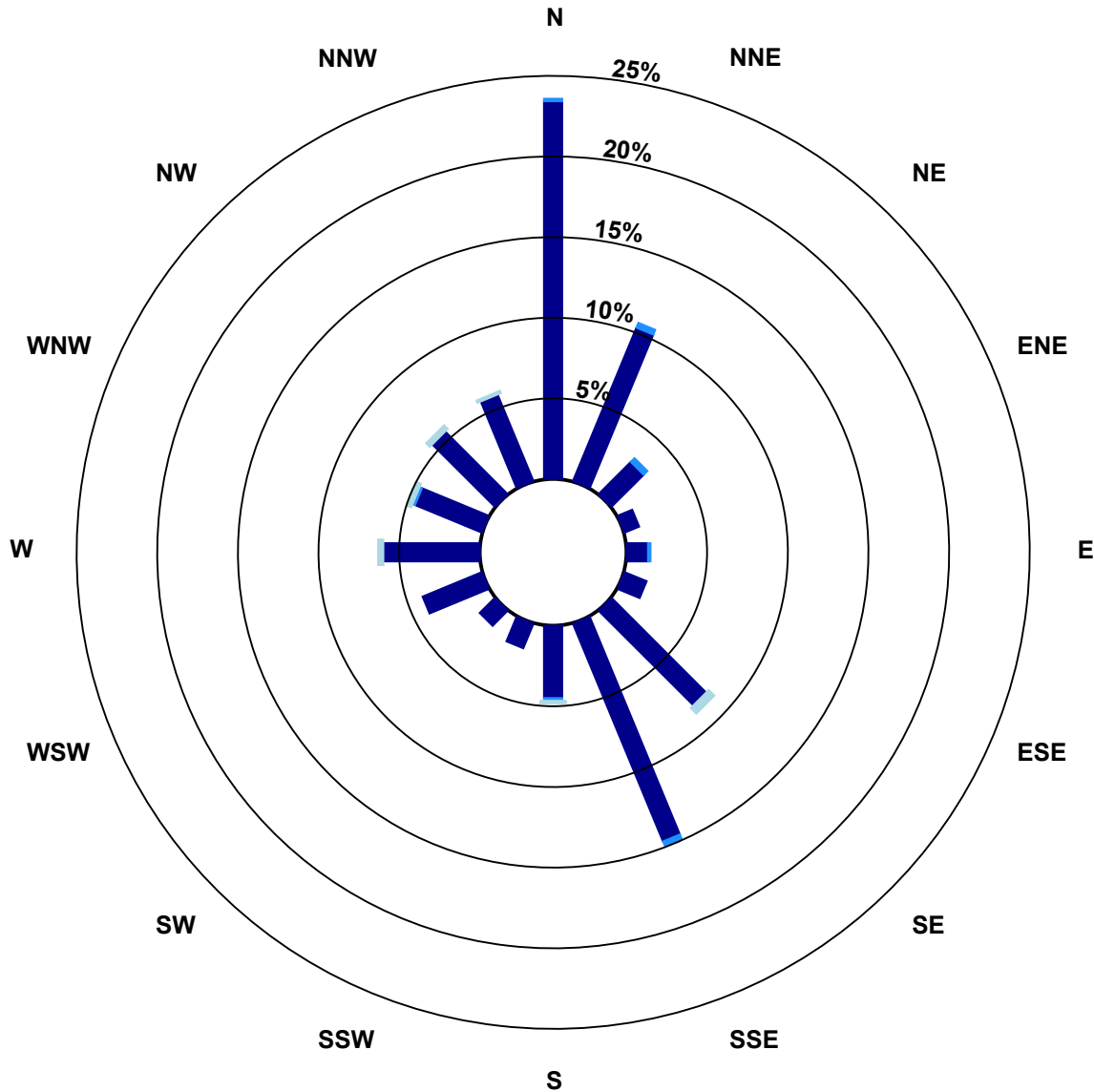
Total Number of Valid Hours: 602

Total Number of Hours: 672

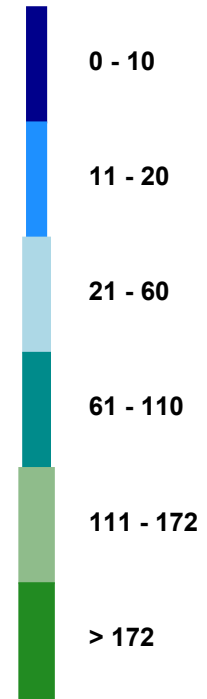


**Wood Buffalo Environmental Association**  
**Wind Rose Feb 2023**

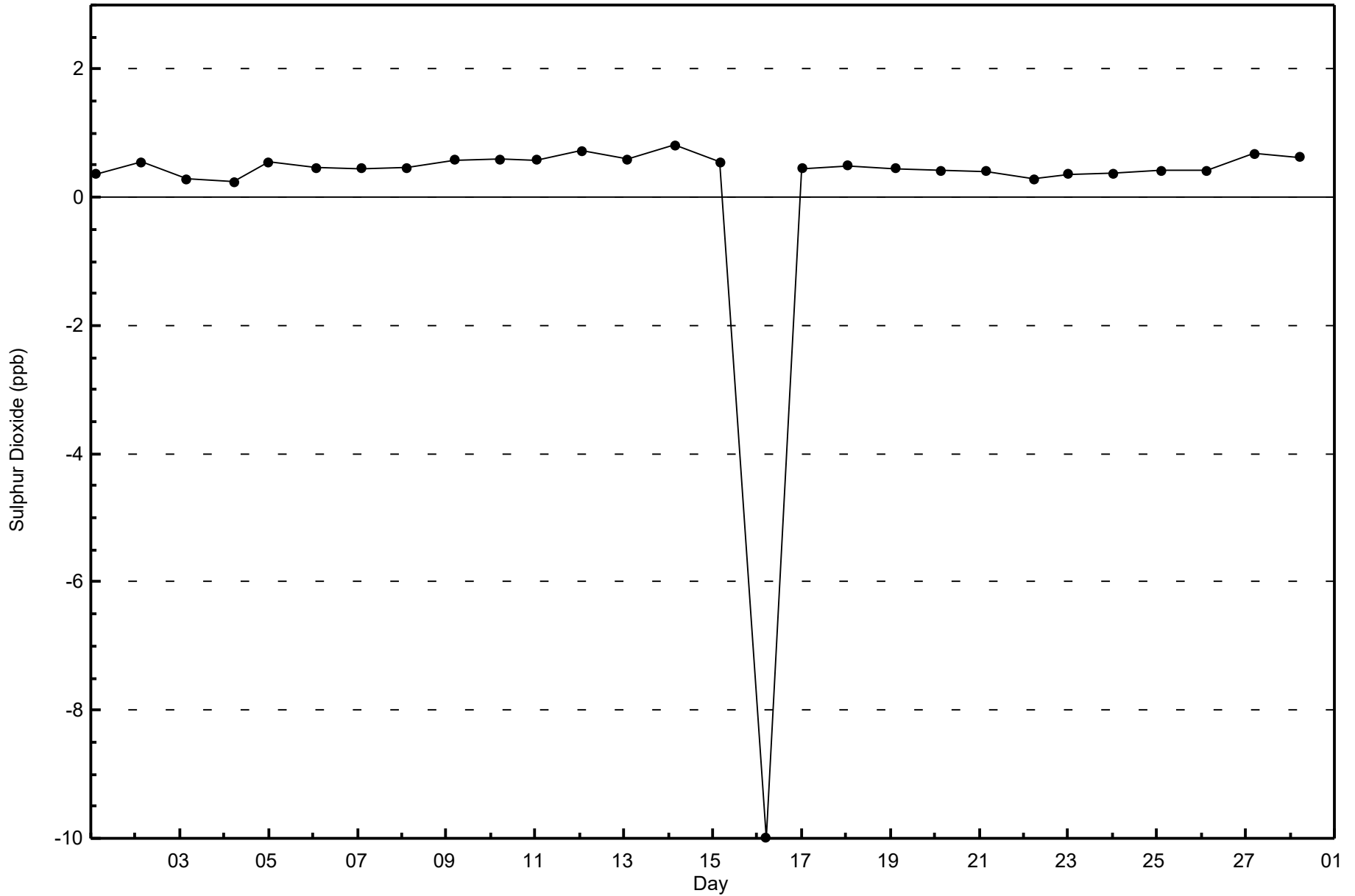
**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Buffalo Viewpoint**

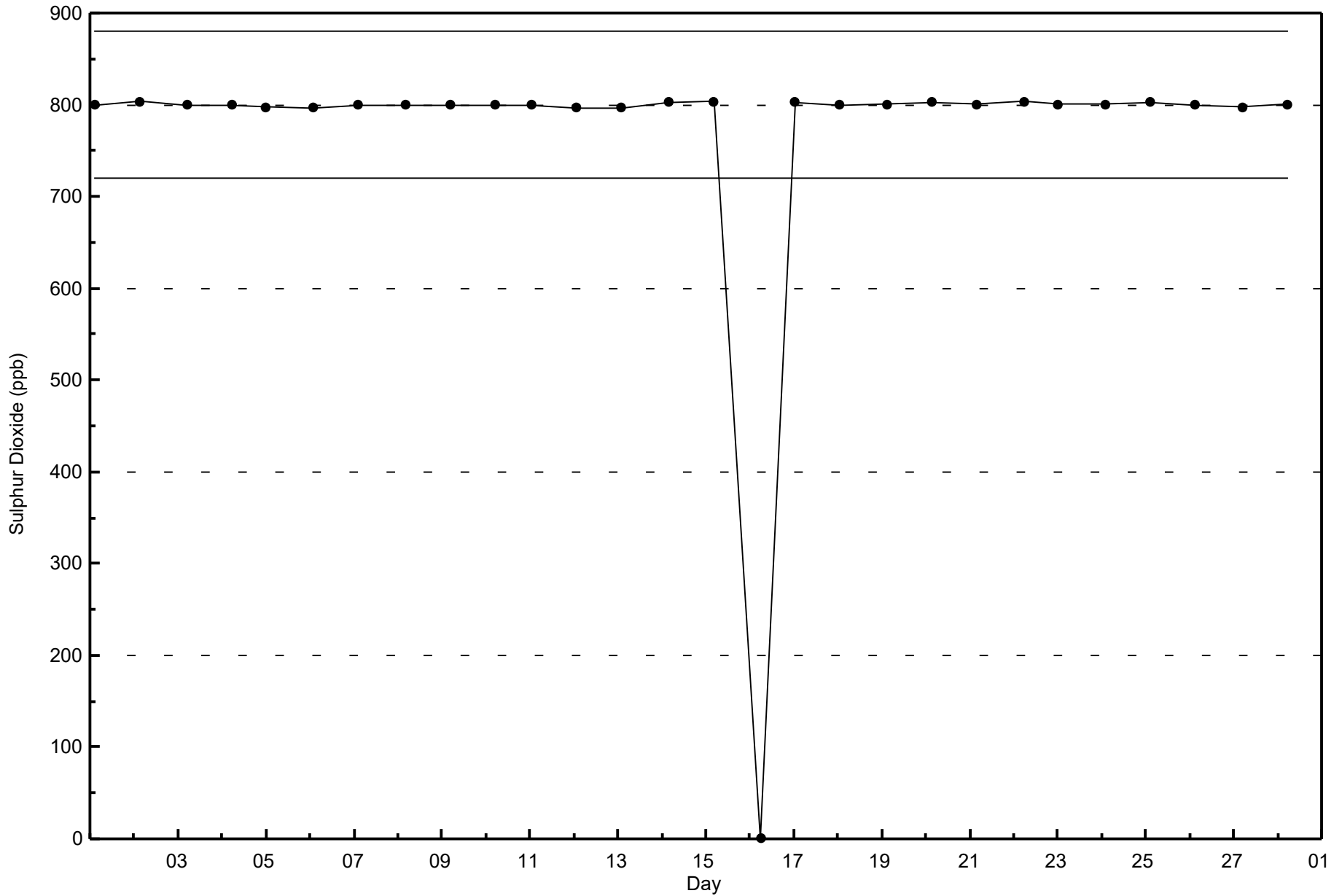


Classes (ppb)



Total Number of Valid Hours: 602





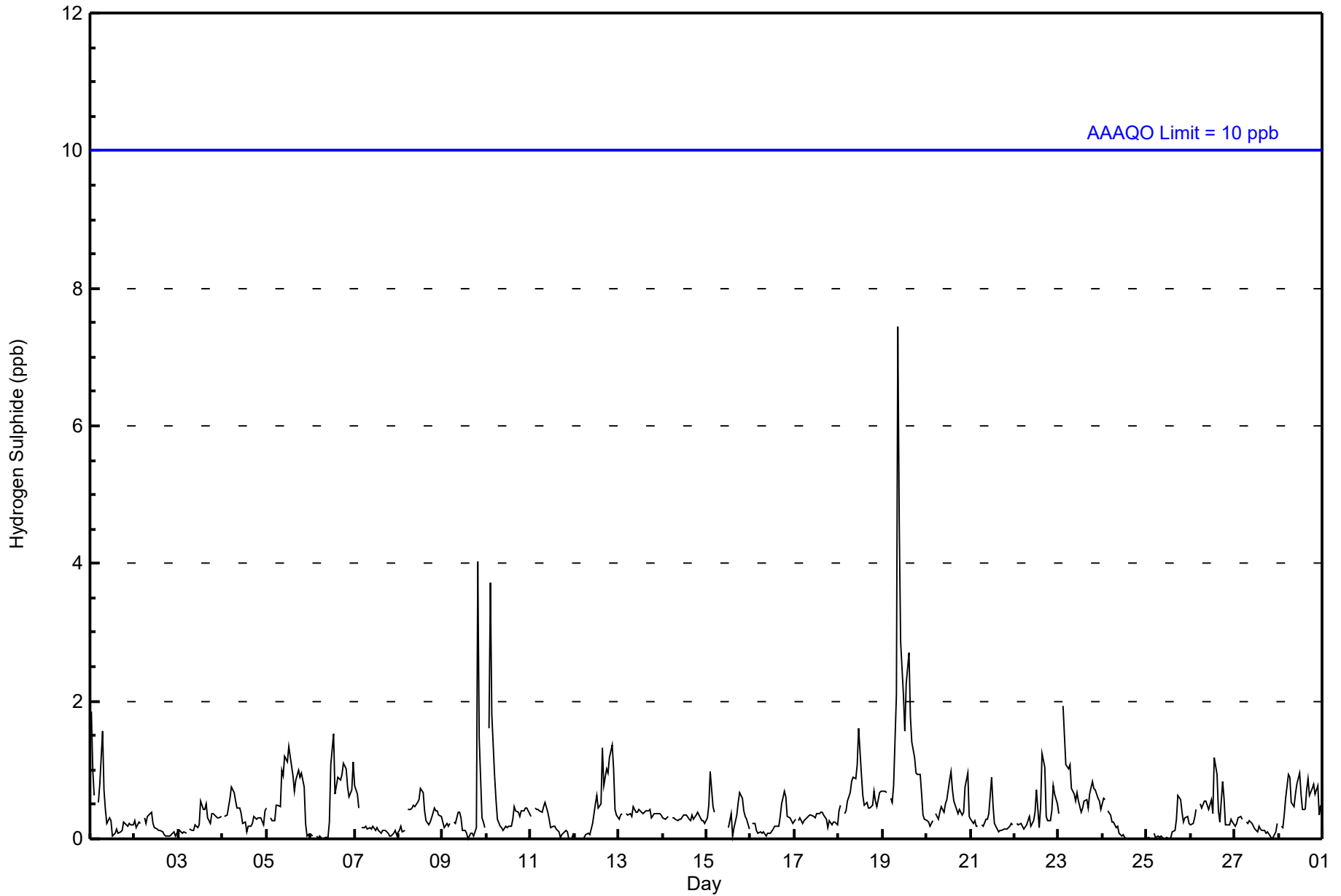


# Wood Buffalo Environmental Association

## Summary of Hour Averages

## Hydrogen Sulphide (H<sub>2</sub>S) - ppb Buffalo Viewpoint - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																		
Maximum Value: 7.4 ppb on Feb 19 09:00		Maximum Daily Average: 1.7 ppb on Feb 19				Hours of Data:		639																		
Minimum Value: 0.0 ppb on Feb 6 05:00		Minimum Daily Average: 0.1 ppb on Feb 24				Hours of Missing Data:		33																		
Maximum Diurnal Average: 0.6 ppb at hour 9		Minimum Diurnal Average: 0.3 ppb at hour 24				Hours of Calibration:		33																		
Monthly Average: 0.43 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.2 Median = 0.3 Q <sub>3</sub> = 0.5 P <sub>90</sub> = 0.9 P <sub>99</sub> = 2.2				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-Feb	1.9	1.0	0.6	Z	0.5	0.8	1.6	0.7	0.4	0.2	0.3	0.3	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.4	1.9
2-Feb	0.3	0.2	0.2	0.2	Z	0.3	0.2	0.3	0.4	0.4	0.2	0.2	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	0.4
3-Feb	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.5	0.4	0.4	0.5	0.3	0.2	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.5
4-Feb	Z	0.3	0.3	0.5	0.6	0.7	0.7	0.6	0.4	0.4	0.4	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.4	0.7	
5-Feb	0.5	Z	0.3	0.3	0.3	0.5	0.5	0.5	1.0	0.9	1.2	1.1	1.3	1.2	0.9	0.7	0.8	1.0	0.9	1.0	0.8	0.2	0.0	0.1	0.7	1.3
6-Feb	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.1	1.5	0.6	0.8	0.9	0.9	0.9	1.1	1.0	0.7	0.6	0.7	1.1	0.5	1.5
7-Feb	0.8	0.7	0.5	Z	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.8
8-Feb	0.1	0.2	0.1	0.1	Z	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.7	0.7	0.4	0.3	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.7
9-Feb	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.4	0.4	0.3	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.2	4.0	1.5	0.3	0.3	0.2	0.4	4.0
10-Feb	Z	1.6	3.7	1.8	0.9	0.6	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.5	0.4	0.4	0.3	0.4	0.4	0.5	0.4	0.4	0.6	3.7
11-Feb	0.3	Z	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.5
12-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.5	0.6	0.5	0.5	1.3	0.8	1.0	1.0	1.2	1.4	1.0	0.4	0.4	0.5	1.4
13-Feb	0.3	0.3	0.4	Z	0.4	0.3	0.4	0.3	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5
14-Feb	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	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.3	0.4
15-Feb	0.3	0.5	1.0	0.5	0.4	Z	0.3	C	C	C	C	C	0.2	0.4	0.0	0.2	0.3	0.5	0.7	0.6	0.4	0.3	0.3	0.1	0.4	1.0
16-Feb	Z	0.2	0.2	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	0.3	0.5	0.7	0.6	0.3	0.3	0.3	0.2	0.2	0.7
17-Feb	0.3	Z	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.3	0.4
18-Feb	0.4	0.5	Z	0.4	0.4	0.5	0.7	0.8	0.9	0.9	1.1	1.6	0.9	0.6	0.5	0.5	0.4	0.4	0.5	0.7	0.6	0.5	0.7	0.7	0.7	1.6
19-Feb	0.7	0.7	0.7	Z	0.6	0.5	0.8	2.1	7.4	4.6	2.9	2.1	1.6	2.3	2.7	1.8	1.4	1.2	1.0	0.9	0.9	0.6	0.3	0.3	1.7	7.4
20-Feb	0.3	0.2	0.2	0.3	Z	0.4	0.3	0.4	0.5	0.4	0.5	0.6	0.9	1.0	0.7	0.5	0.4	0.4	0.4	0.3	0.4	0.8	1.0	0.3	0.5	1.0
21-Feb	0.3	0.2	0.3	0.2	0.2	Z	0.2	0.2	0.3	0.3	0.4	0.9	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.9
22-Feb	Z	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.3	0.2	0.3	0.4	0.7	0.2	0.5	1.2	1.0	0.3	0.3	0.3	0.4	0.8	0.6	0.5	0.4	1.2
23-Feb	0.4	Z	1.9	1.5	1.1	1.0	1.1	0.7	0.7	0.5	0.7	0.5	0.4	0.4	0.6	0.6	0.5	0.6	0.8	0.7	0.7	0.6	0.6	0.4	0.7	1.9
24-Feb	0.6	0.6	Z	0.4	0.3	0.2	0.2	0.2	0.2	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	0.1	0.6
25-Feb	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	0.1	0.1	0.3	0.6	0.6	0.4	0.3	0.3	0.3	0.2	0.2	0.6
26-Feb	0.2	0.2	0.3	0.4	Z	0.5	0.4	0.6	0.5	0.5	0.4	0.6	0.4	1.2	0.9	0.4	0.2	0.8	0.6	0.2	0.2	0.2	0.3	0.2	0.5	1.2
27-Feb	0.2	0.2	0.3	0.3	0.3	Z	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.3
28-Feb	Z	0.2	0.2	0.3	0.6	0.9	0.9	0.5	0.5	0.6	0.8	1.0	0.7	0.4	0.4	0.7	0.9	0.6	0.7	0.8	0.7	0.8	0.3	0.5	0.6	1.0
																								Diurnal Average		
																								Diurnal Maximum		
																								1.9 1.6 3.7 1.8 1.1 1.0 1.6 2.1 7.4 4.6 2.9 2.1 1.6 2.3 2.7 1.8 1.4 1.2 1.1 4.0 1.5 1.0 1.0 1.1		
Z - zerospan C - Calibration																										
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  
Buffalo Viewpoint - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	633	99.06	99.06
3 - 4	4	0.63	99.69
5 - 7	2	0.31	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 639

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Buffalo Viewpoint - February 2023**

<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	143	62	19	6	9	12	54	104	31	9	8	23	37	31	34	35	617
3 - 4	0	2	1	0	0	0	0	0	0	0	0	0	0	0	1	0	4
5 - 7	0	0	1	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>	143	64	21	6	9	12	54	104	31	9	8	23	37	31	36	35	623

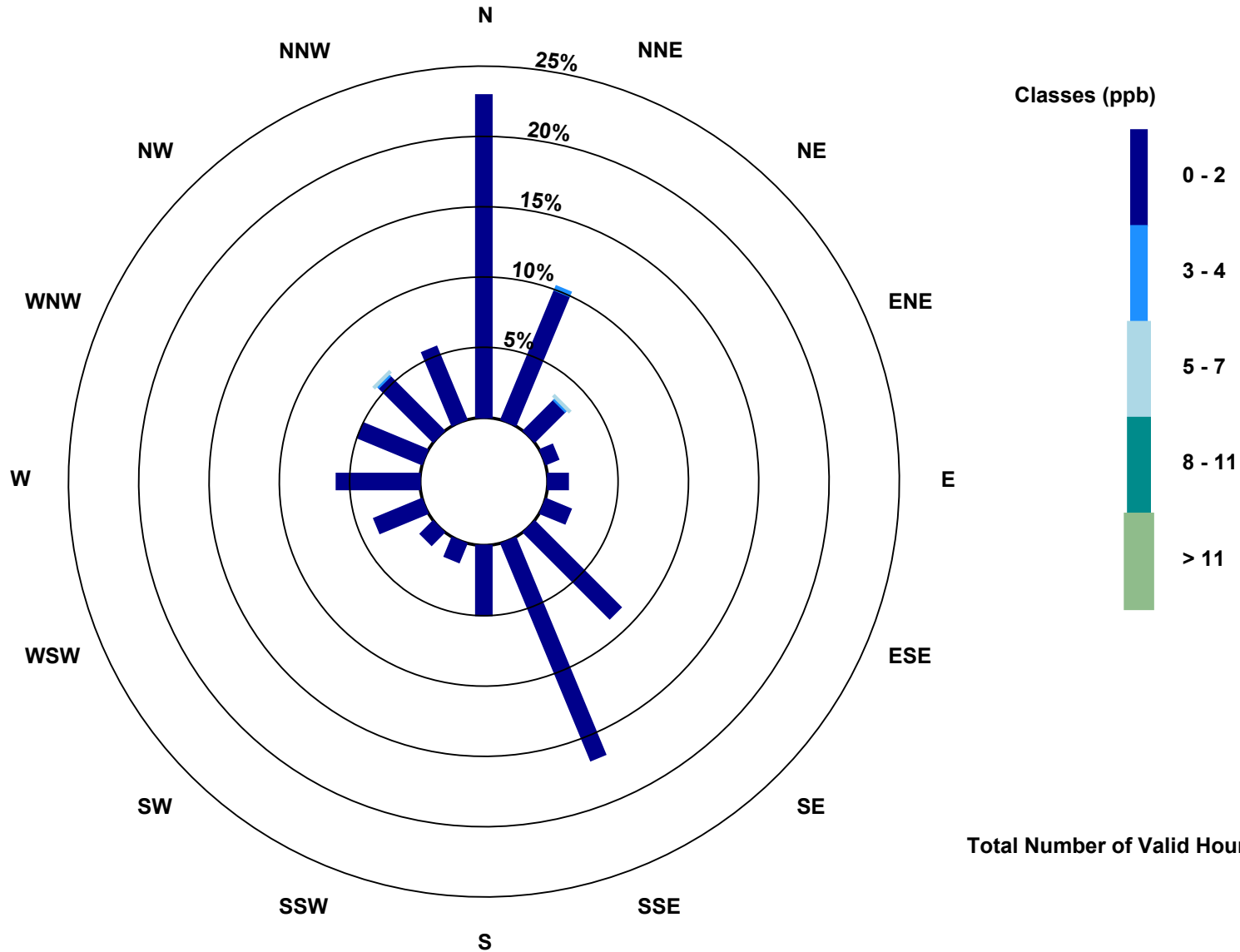
Total Number of Valid Hours: 623

Total Number of Hours: 672

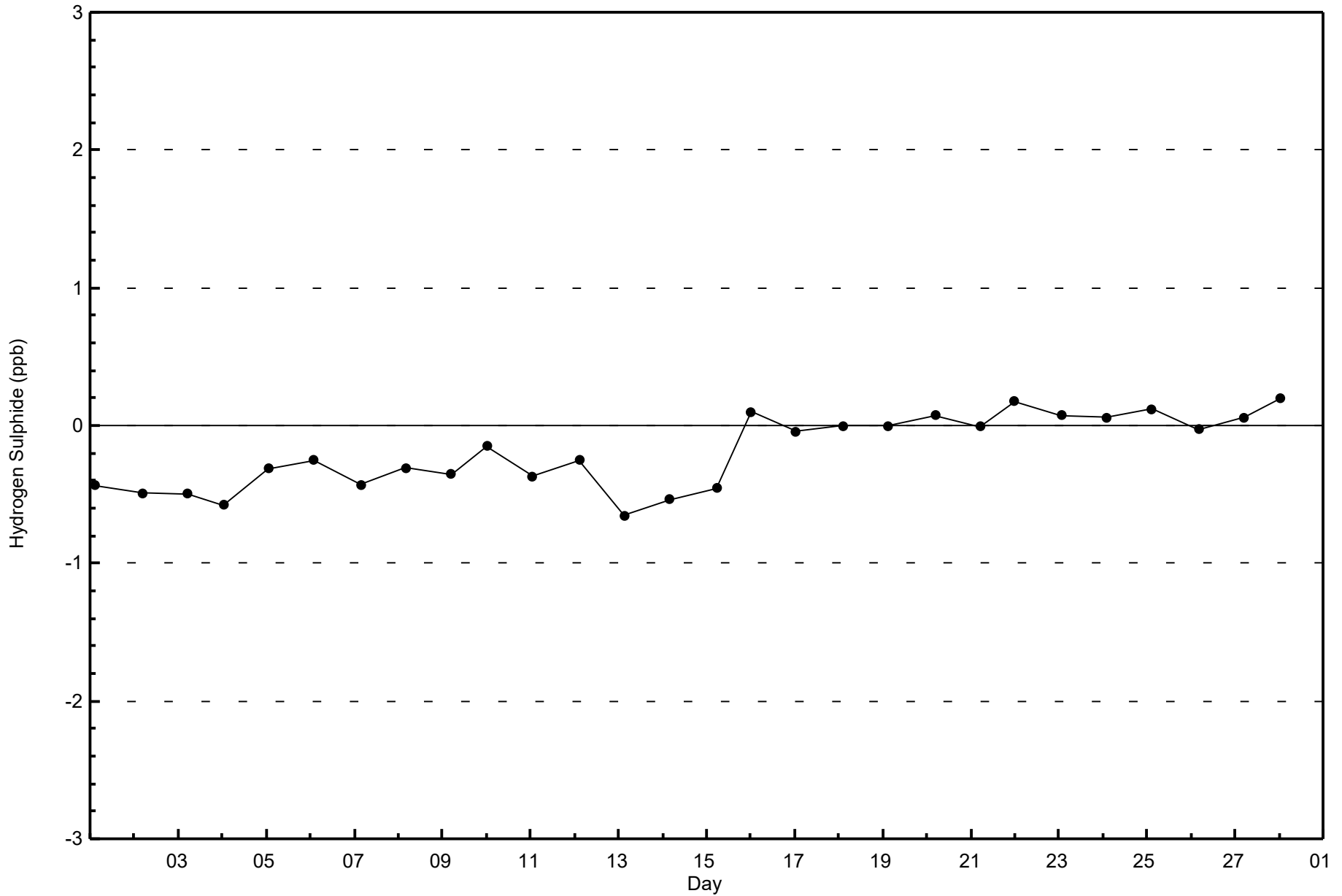


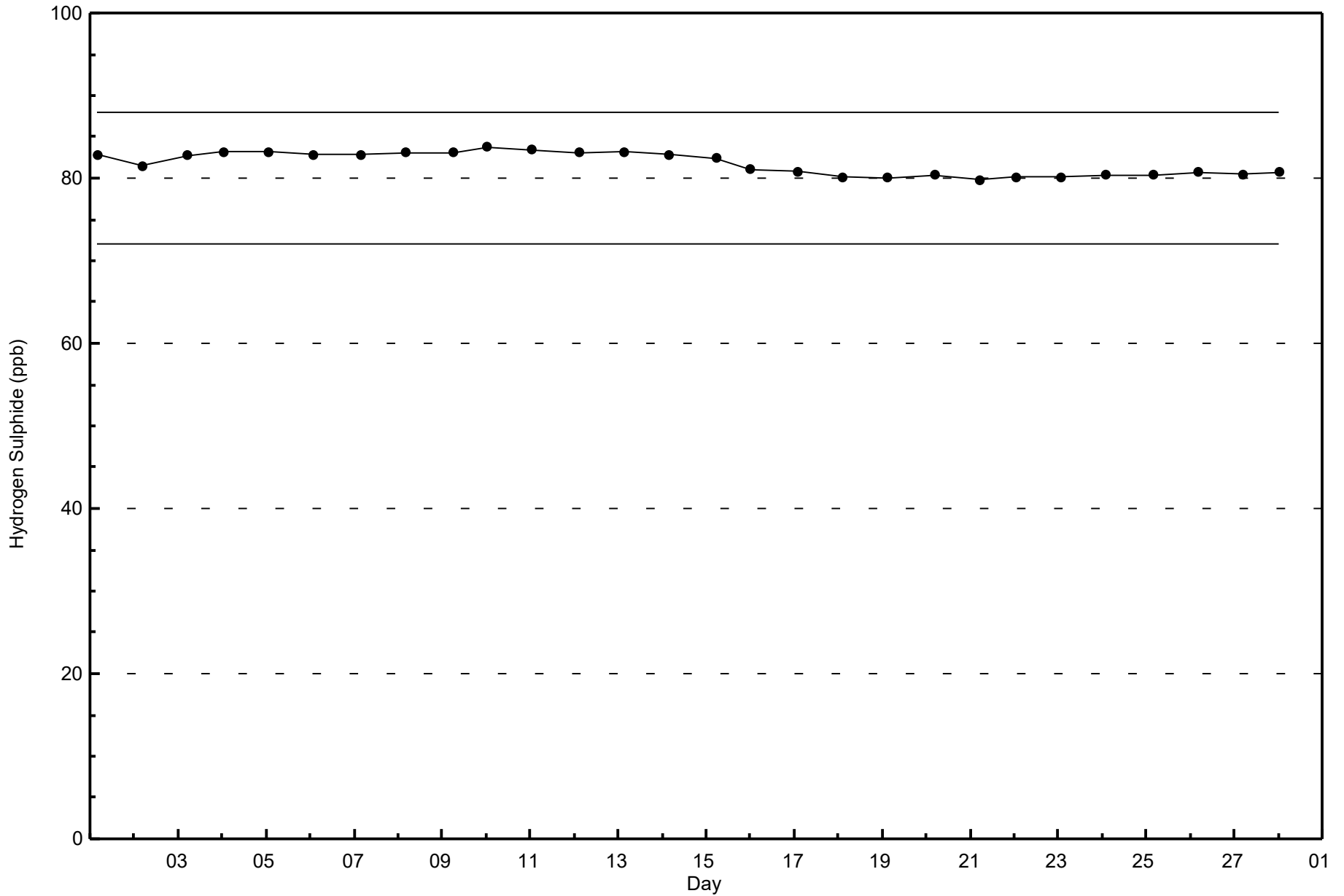
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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



Total Number of Valid Hours: 623







# Wood Buffalo Environmental Association

## Summary of Hour Averages

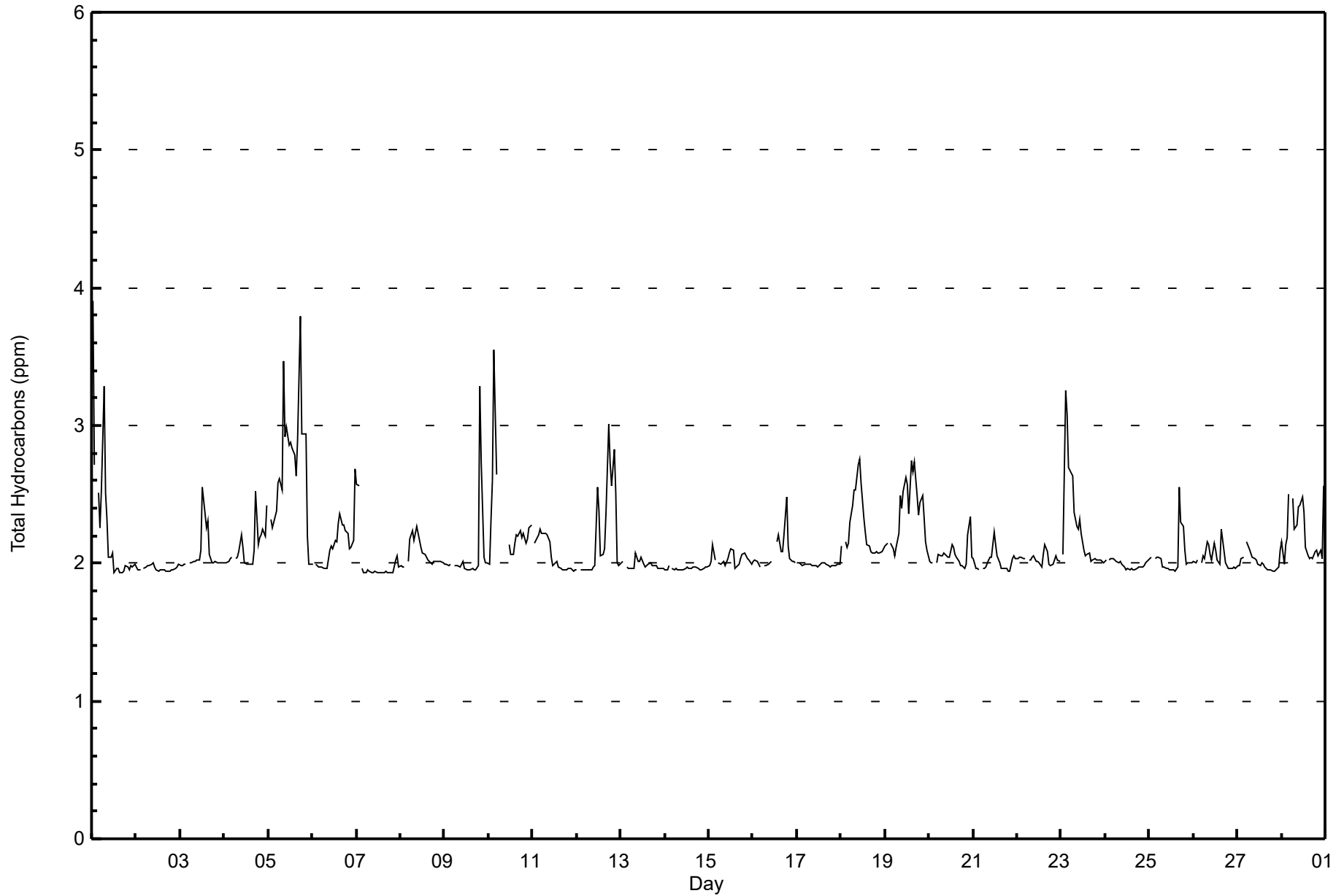
## Total Hydrocarbons (THC) - ppm Buffalo Viewpoint - February 2023

Maximum Value: 3.9 ppm on Feb 1 01:00		Maximum Daily Average: 2.7 ppm on Feb 5		Hours in Service: 672																						
Minimum Value: 1.9 ppm on Feb 7 13:00		Minimum Daily Average: 2.0 ppm on Feb 14		Hours of Data: 638																						
Maximum Diurnal Average: 2.2 ppm at hour 4		Minimum Diurnal Average: 2.0 ppm at hour 23		Hours of Missing Data: 34																						
Monthly Average: 2.12 ppm		Percentiles: P <sub>1</sub> = 1.9 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> = 2.4 P <sub>99</sub> = 3.2		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-Feb	3.9	2.7	Z	2.5	2.3	2.5	3.3	2.5	2.3	2.0	2.0	2.1	1.9	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.2	3.9
2-Feb	2.0	2.0	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	1.9	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0
3-Feb	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.6	2.4	2.3	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.6
4-Feb	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.5	2.1	2.2	2.2	2.2	2.2	2.4	2.1	2.5	2.5
5-Feb	Z	2.3	2.3	2.3	2.4	2.6	2.6	2.5	3.5	2.9	3.0	2.9	2.9	2.8	2.8	2.6	2.9	3.8	2.9	2.9	2.9	2.2	2.0	2.0	2.7	3.8
6-Feb	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.3	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.2	2.7	2.1	2.7
7-Feb	2.6	2.6	Z	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	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.0	2.6
8-Feb	2.0	2.0	2.0	Z	2.0	2.2	2.2	2.2	2.2	2.3	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	2.3
9-Feb	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	2.0	2.0	2.0	2.0	2.0	2.0	3.3	2.7	2.0	2.0	2.0	2.1	3.3
10-Feb	2.0	2.3	2.6	3.5	2.6	Z	2.1	C	C	C	C	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.3	2.3	2.3	3.5
11-Feb	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	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	2.1	2.2
12-Feb	1.9	Z	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.4	2.1	2.1	2.1	2.4	3.0	2.7	2.6	2.8	2.5	2.0	2.0	3.0
13-Feb	2.0	2.0	Z	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	2.0	2.0	2.0	2.1
14-Feb	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
15-Feb	2.0	2.0	2.1	2.0	Z	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	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1
16-Feb	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	2.2	2.2	2.1	2.1	2.2	2.5	2.1	2.0	2.0	2.0	2.1	2.5
17-Feb	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
18-Feb	2.1	Z	2.2	2.1	2.2	2.3	2.4	2.5	2.5	2.7	2.8	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	2.3
19-Feb	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.5	2.4	2.5	2.6	2.6	2.4	2.7	2.7	2.7	2.5	2.3	2.4	2.5	2.3	2.2	2.1	2.4	2.7
20-Feb	2.0	2.0	2.0	Z	2.0	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.3	2.0	2.1	2.3
21-Feb	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.2
22-Feb	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	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
23-Feb	Z	2.1	3.3	3.1	2.7	2.7	2.6	2.4	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	3.3
24-Feb	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
25-Feb	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	1.9	2.0	2.6	2.3	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.6
26-Feb	2.0	2.0	2.0	Z	2.0	2.1	2.0	2.2	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
27-Feb	2.0	2.0	2.0	2.0	Z	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	1.9	1.9	1.9	1.9	2.0	2.1	2.2
28-Feb	2.2	2.0	2.1	2.2	2.5	Z	2.5	2.2	2.3	2.4	2.4	2.5	2.4	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.6	2.2	2.6
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan      C - Calibration      M - Maintenance																										



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

**Total Hydrocarbons (THC) - ppm**  
**Buffalo Viewpoint - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Buffalo Viewpoint - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	400	62.70	62.70
2.1 - 3.0	230	36.05	98.75
3.1 - 10.0	8	1.25	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Buffalo Viewpoint - February 2023**

<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	80	37	9	3	1	7	41	81	24	10	5	23	31	16	11	5	384
2.1 - 3.0	61	27	9	3	8	5	15	21	7	0	3	1	7	14	22	27	230
3.1 - 10.0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	4	8
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	142	64	19	6	9	12	56	102	31	10	8	24	38	30	35	36	622

Total Number of Valid Hours: 622

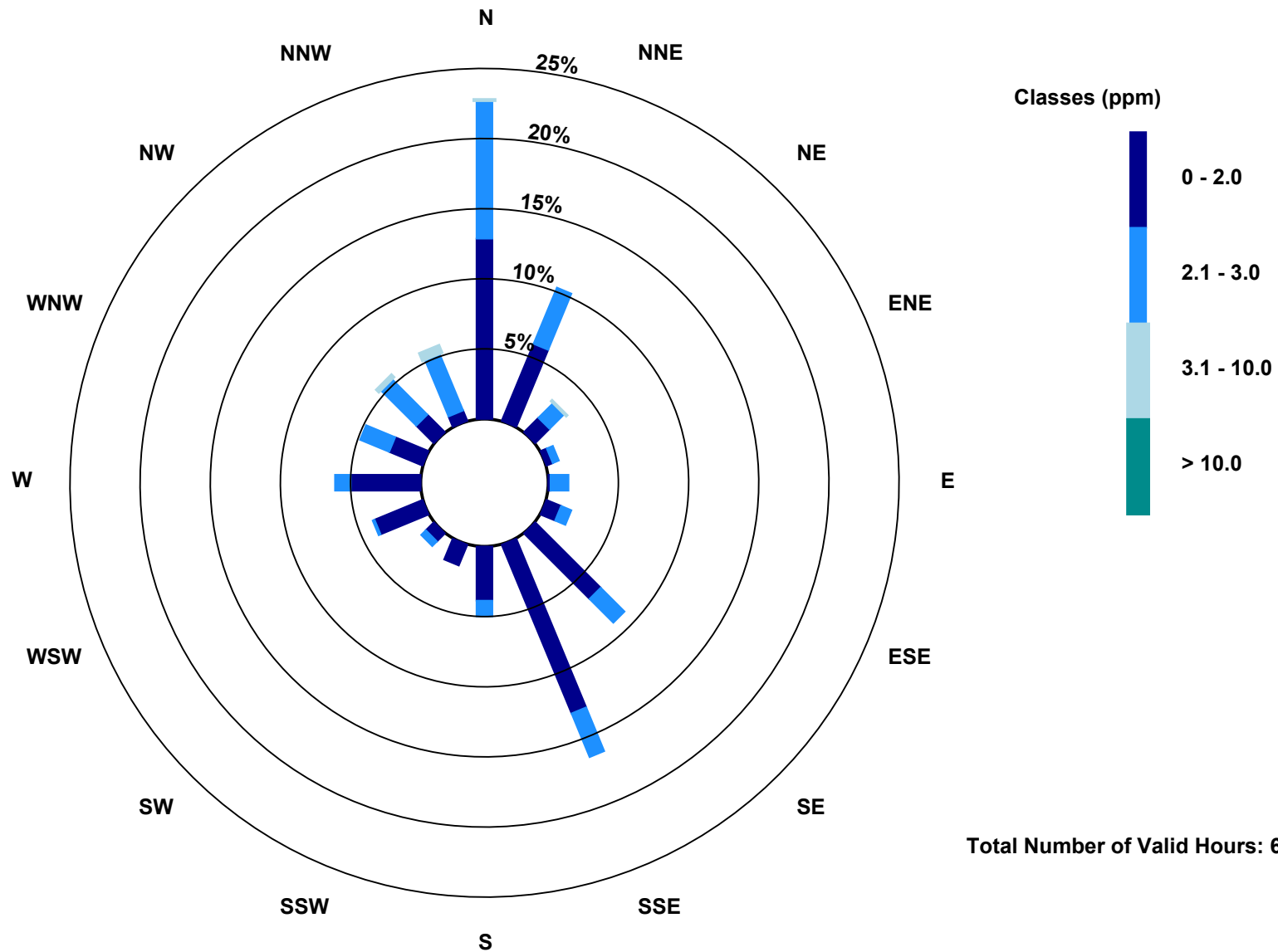
Total Number of Hours: 672

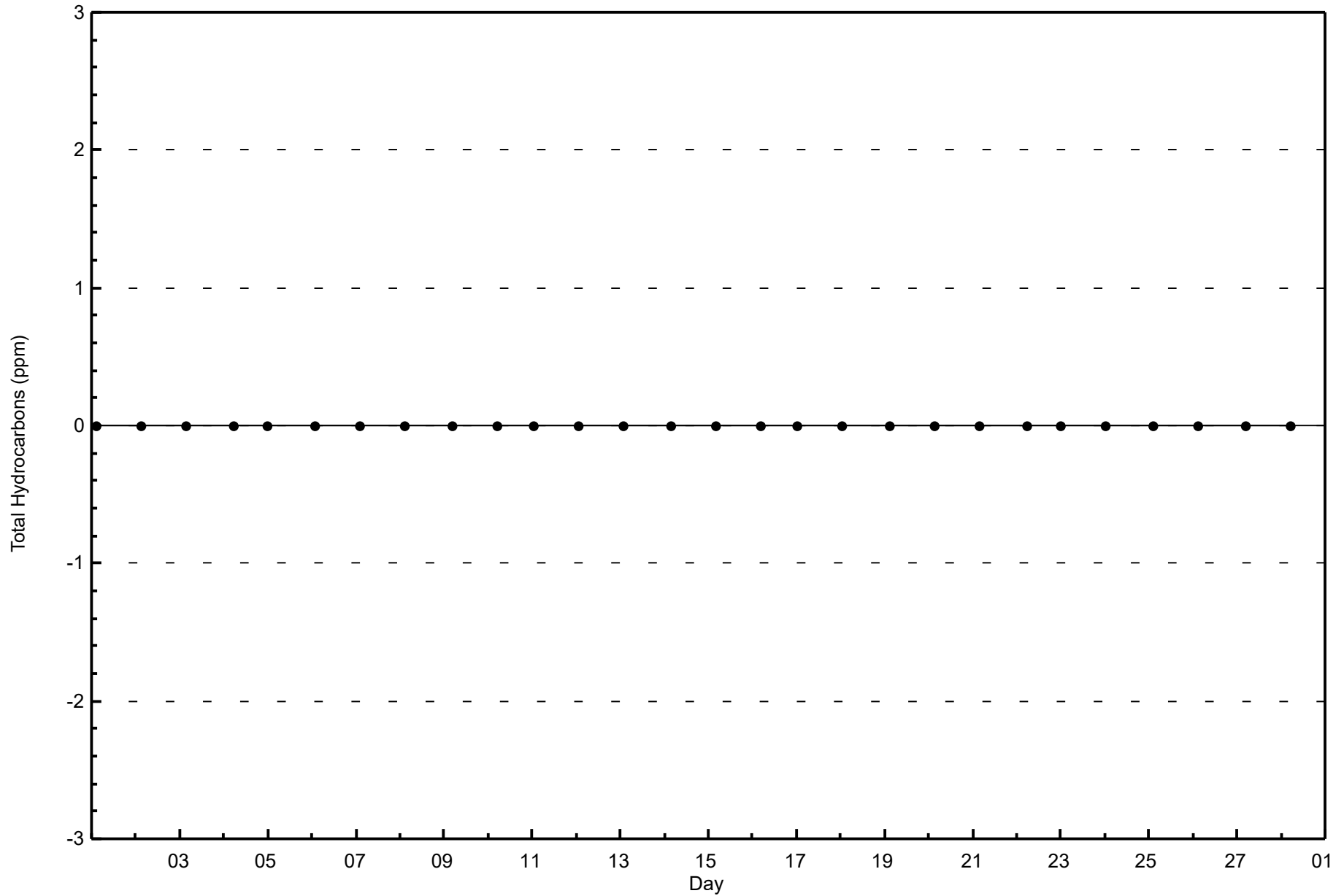


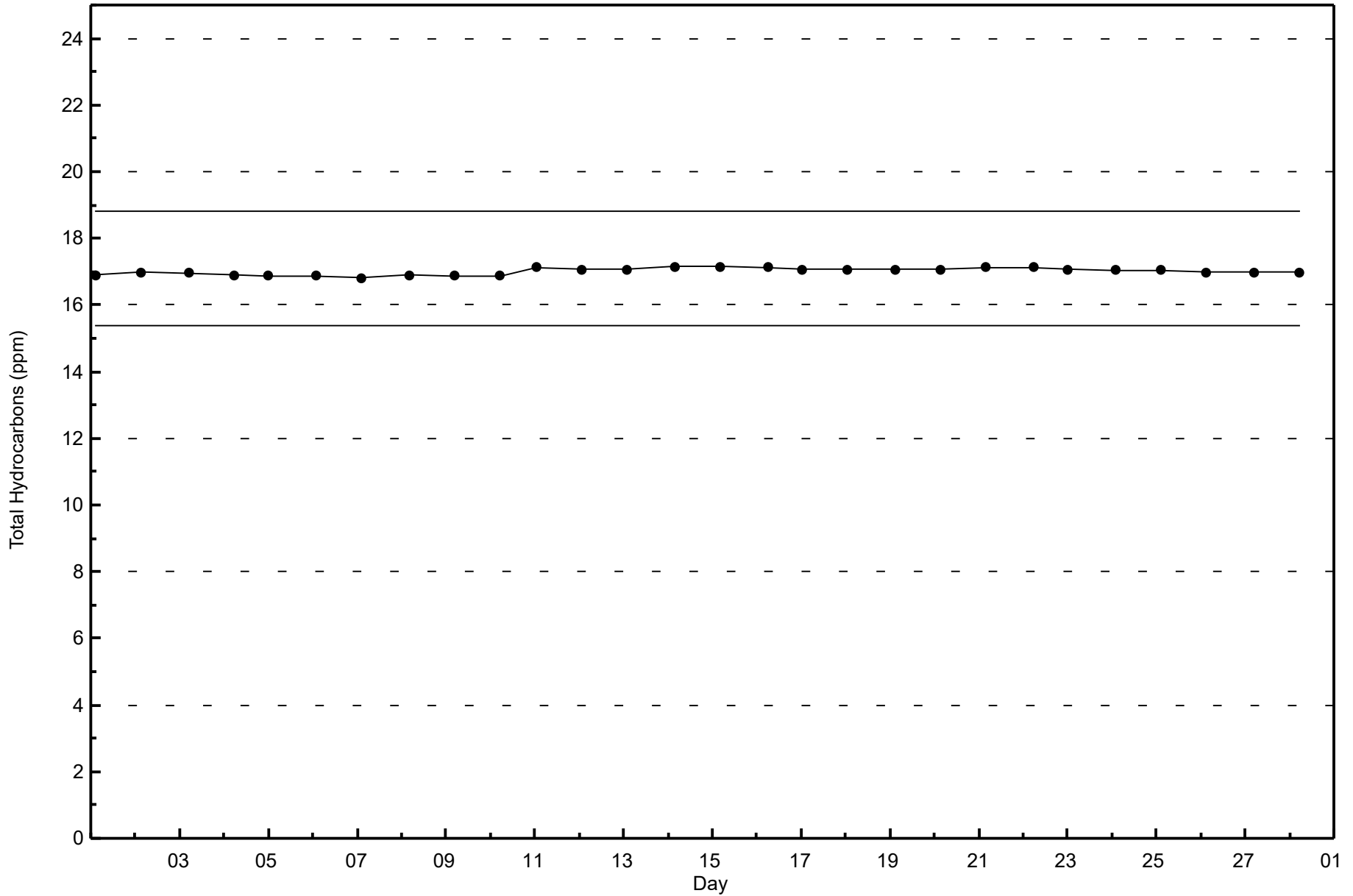


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Hydrocarbons (THC) - ppm  
Buffalo Viewpoint









# Wood Buffalo Environmental Association

## Summary of Hour Averages

## Non Methane Hydrocarbons (NMHC) - ppm

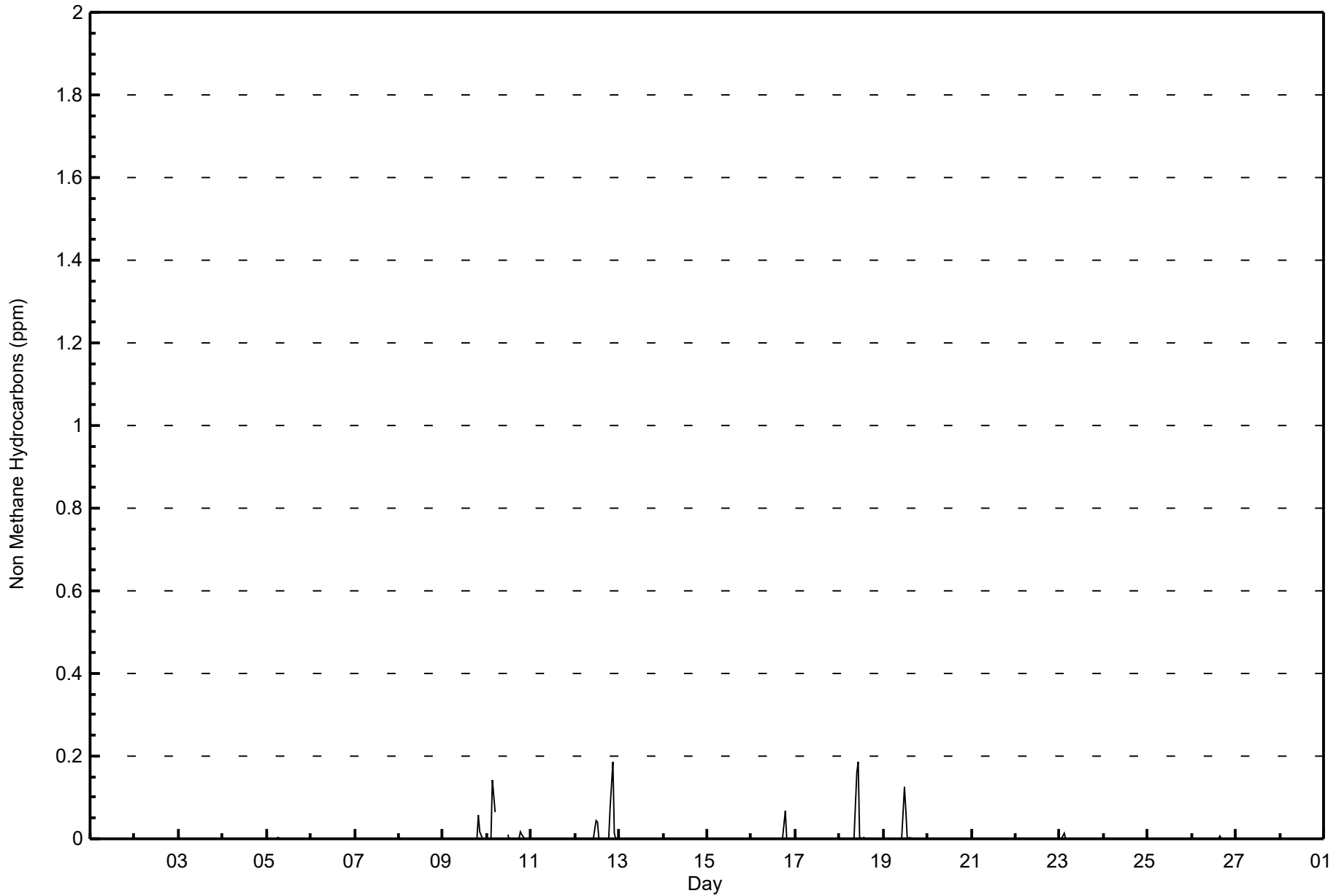
### Buffalo Viewpoint - February 2023

Maximum Value: 0.186 ppm on Feb 18 11:00																							Maximum Daily Average: 0.016 ppm on Feb 12					Hours in Service: 672					
Minimum Value: 0.000 ppm on Feb 1 01:00																							Minimum Daily Average: 0.000 ppm on Feb 1					Hours of Data: 638					
Maximum Diurnal Average: 0.007 ppm at hour 21																							Minimum Diurnal Average: 0.000 ppm at hour 1					Hours of Missing Data: 34					
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> = 0.1					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-Feb	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		
2-Feb	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		
3-Feb	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		
4-Feb	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		
5-Feb	Z	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	0.000	0.000	0.000	0.004	0.004		
6-Feb	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		
7-Feb	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		
8-Feb	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		
9-Feb	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	0.059	0.016	0.000	0.000	0.003	0.059
10-Feb	0.000	0.000	0.000	0.143	0.066	Z	0.011	C	C	C	C	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.143	
11-Feb	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	
12-Feb	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.044	0.042	0.000	0.000	0.000	0.000	0.000	0.000	0.076	0.186	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.186	0.016	0.186	
13-Feb	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	
14-Feb	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	
15-Feb	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	
16-Feb	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	M	M	0.000	0.000	0.000	0.000	0.000	0.068	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.068	0.003	0.068		
17-Feb	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	
18-Feb	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.161	0.186	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	0.000	0.000	0.015	0.186	
19-Feb	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.126	0.068	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	0.009	0.126	
20-Feb	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	
21-Feb	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	
22-Feb	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	
23-Feb	Z	0.000	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.013	0.001	
24-Feb	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	
25-Feb	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	
26-Feb	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	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.008
27-Feb	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	
28-Feb	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	0.002
																										Diurnal Average							
																										Diurnal Maximum							
																										Diurnal Maximum							
Z - zerospan                      C - Calibration                      M - Maintenance																																	



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

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Buffalo Viewpoint - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Buffalo Viewpoint - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	618	96.87	96.87
0.006 - 0.05	10	1.57	98.43
0.06 - 0.1	7	1.10	99.53
> 0.1	3	0.47	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



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

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Buffalo Viewpoint - February 2023**

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	134	59	18	6	8	12	55	101	31	10	8	24	38	30	34	34	602
0.006 - 0.05	4	1	0	0	1	0	1	1	0	0	0	0	0	0	1	1	10
0.06 - 0.1	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	7
> 0.1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
<b>Totals</b>	142	64	19	6	9	12	56	102	31	10	8	24	38	30	35	36	622

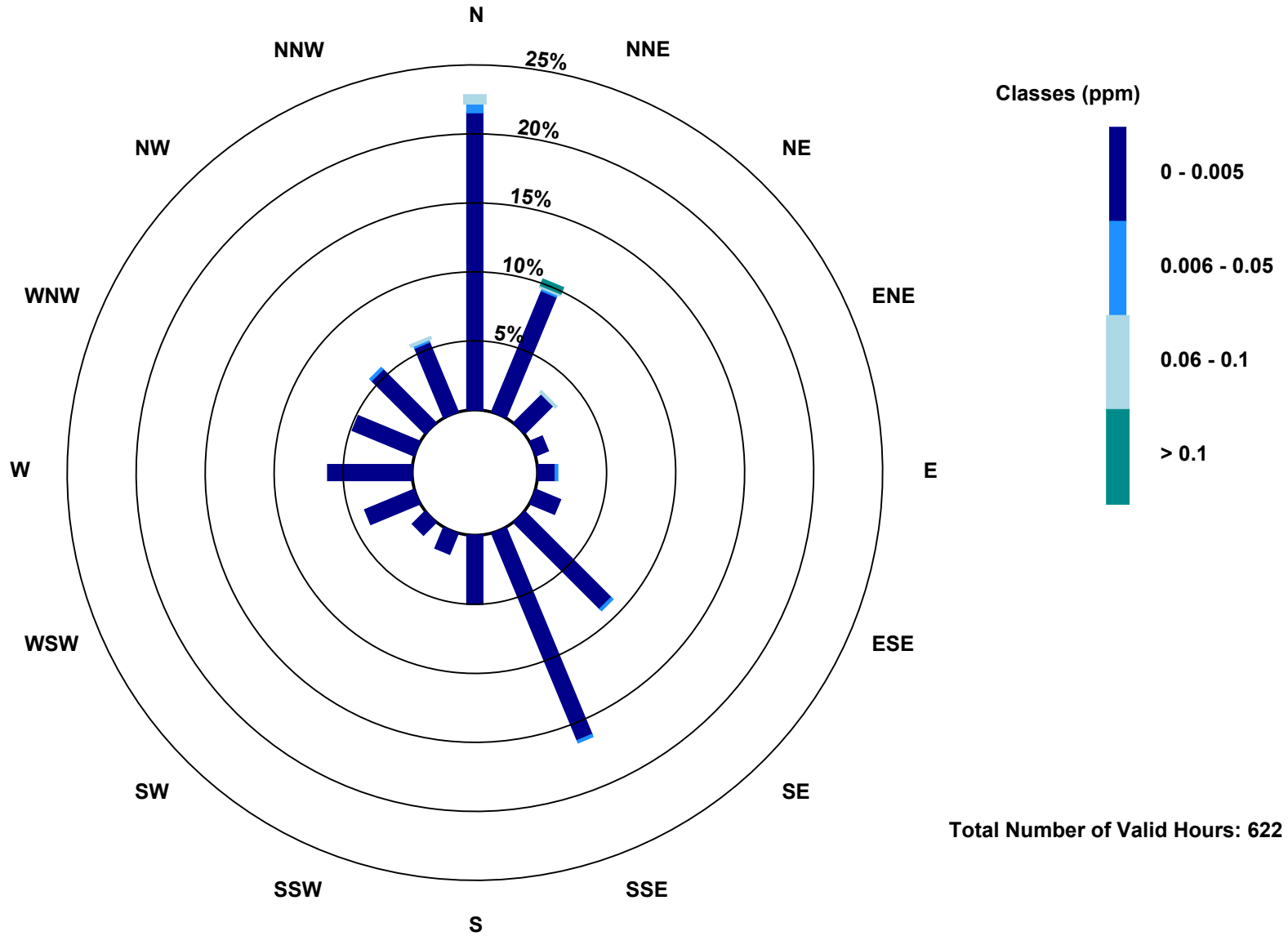
Total Number of Valid Hours: 622

Total Number of Hours: 672

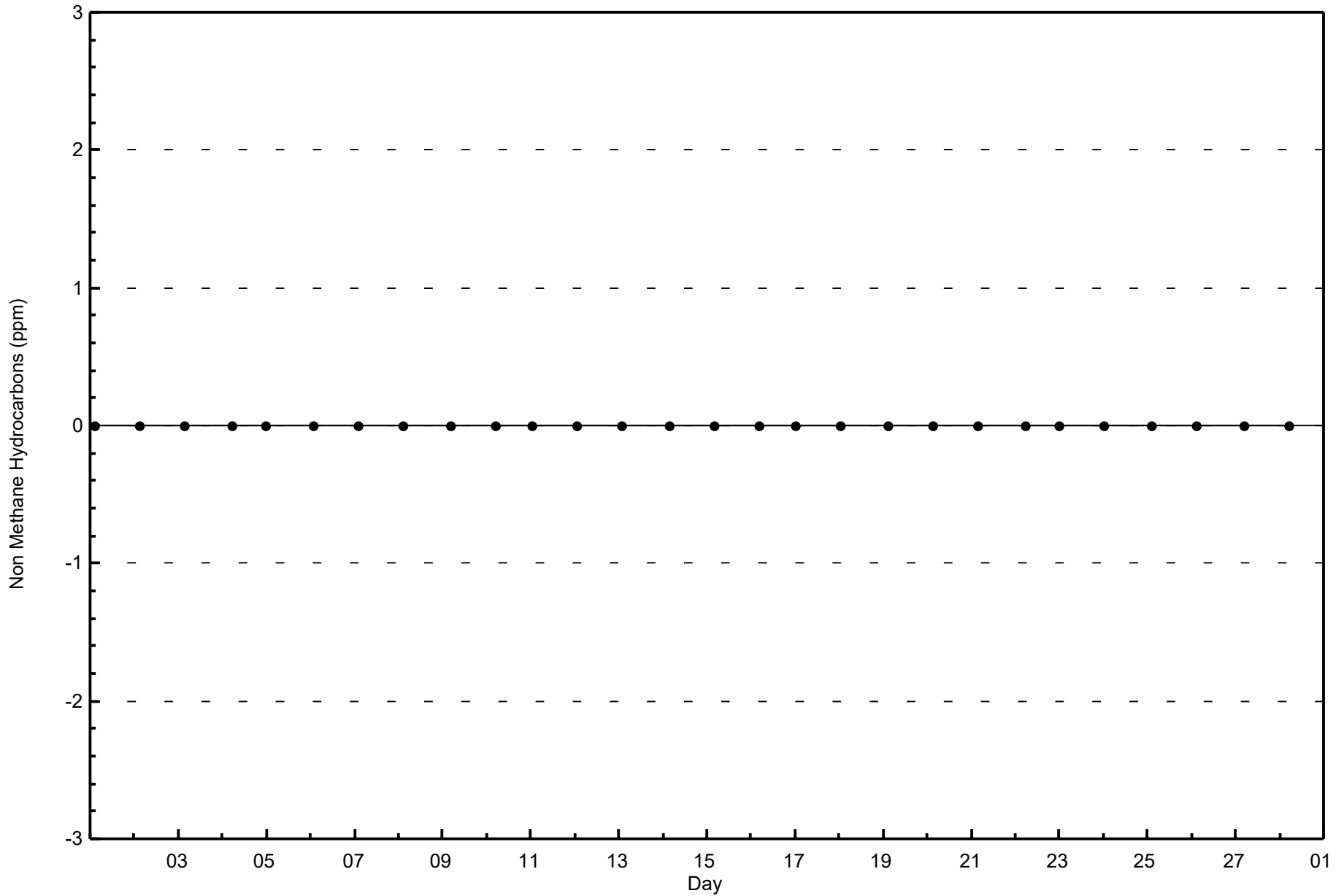


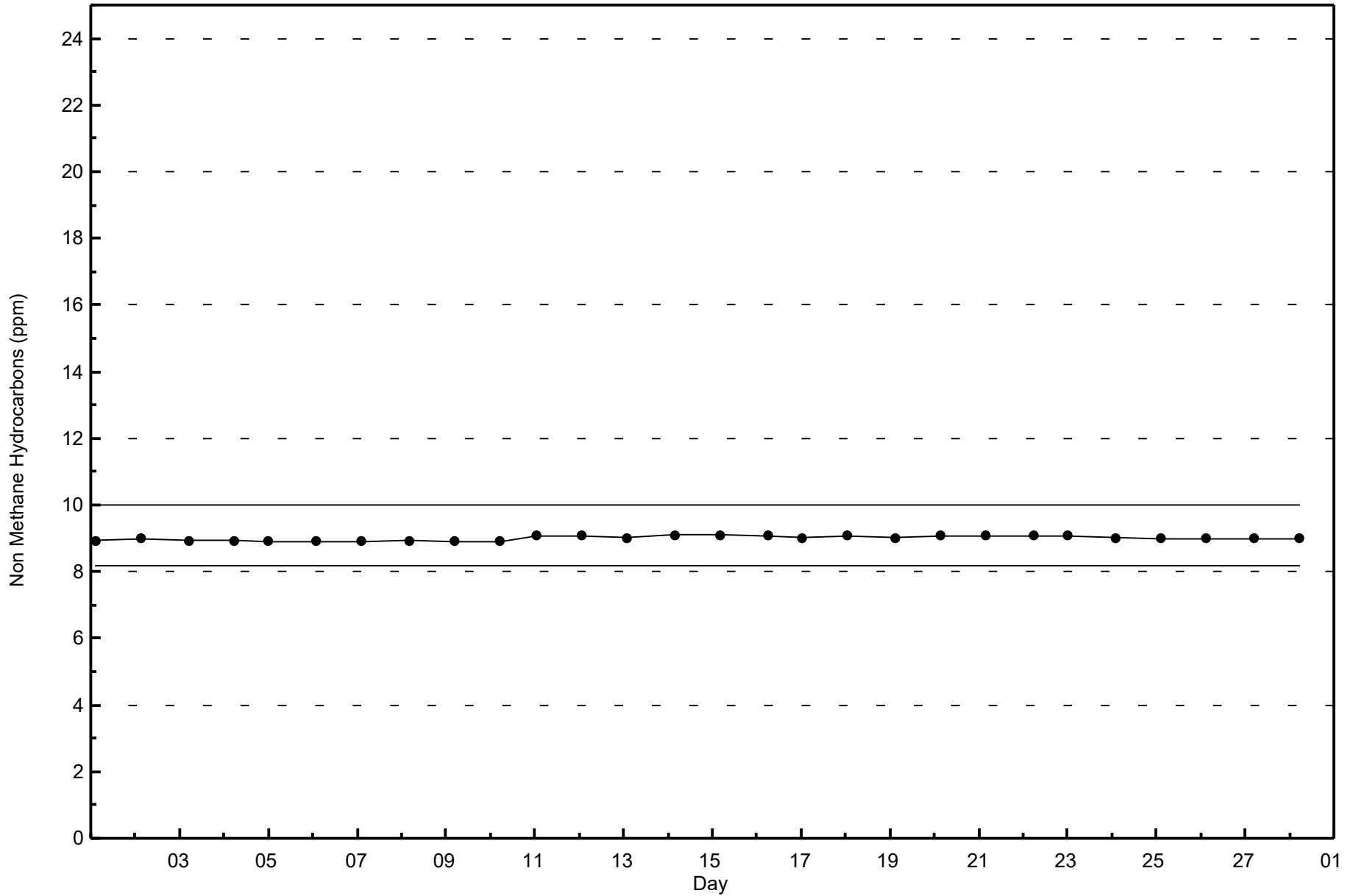
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Non Methane Hydrocarbons (NMHC) - ppm  
Buffalo Viewpoint











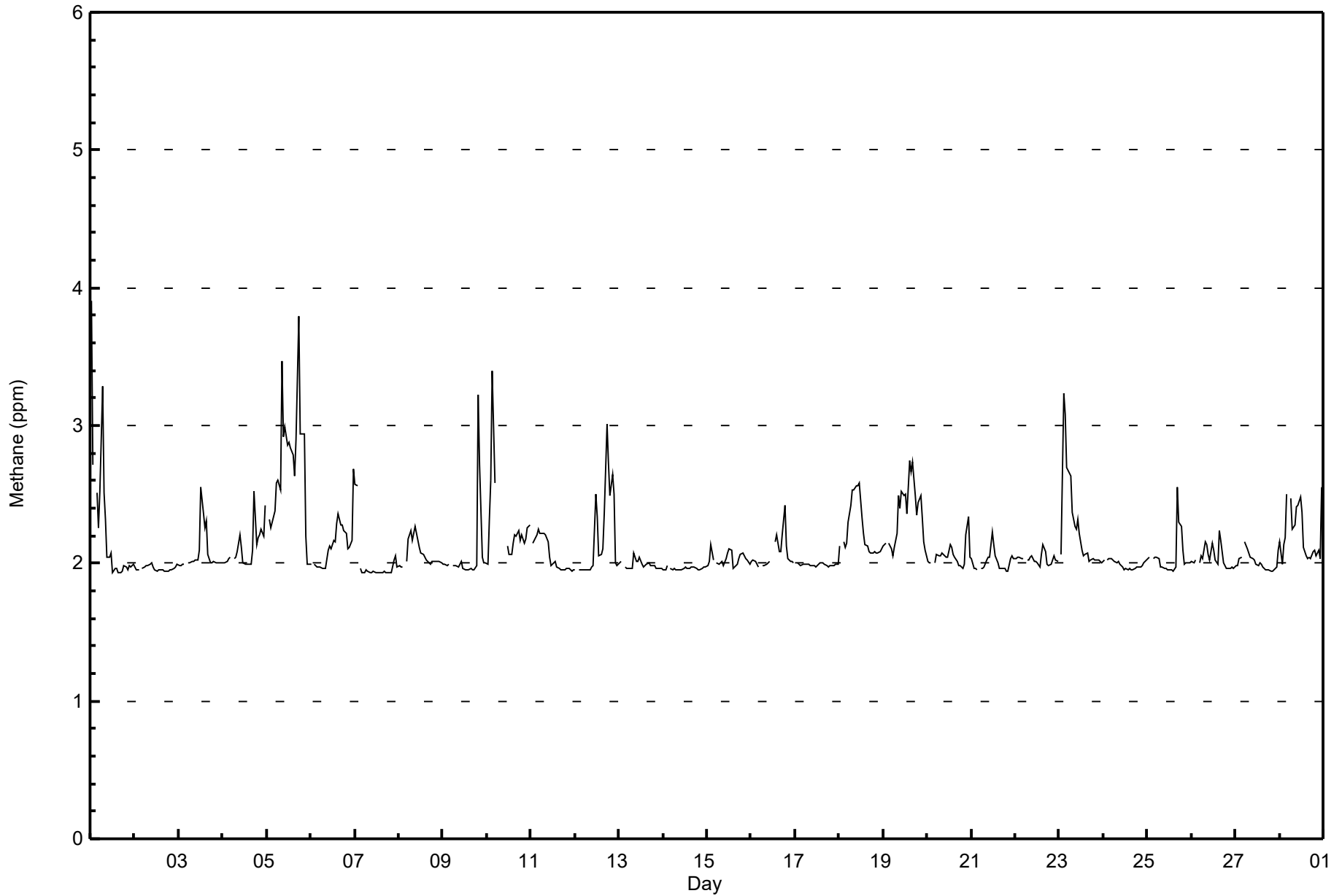
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Buffalo Viewpoint - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 672														672																												
Maximum Value: 3.9 ppm on Feb 1 01:00		Maximum Daily Average: 2.7 ppm on Feb 5		Hours of Data: 638														638																														
Minimum Value: 1.9 ppm on Feb 7 13:00		Minimum Daily Average: 2.0 ppm on Feb 14		Hours of Missing Data: 34														34																														
Maximum Diurnal Average: 2.2 ppm at hour 4		Minimum Diurnal Average: 2.0 ppm at hour 23		Hours of Calibration: 32														32																														
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 = 2.0 Q <sub>3</sub> = 2.1 P <sub>90</sub> = 2.4 P <sub>99</sub> = 3.2		Percent Operational Time: 99.7														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-Feb	3.9	2.7	Z	2.5	2.3	2.5	3.3	2.5	2.3	2.0	2.0	2.1	1.9	2.0	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.2	3.9																						
2-Feb	2.0	2.0	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	1.9	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0																						
3-Feb	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.6	2.4	2.3	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.6																						
4-Feb	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.5	2.1	2.2	2.2	2.2	2.2	2.4	2.1	2.5																						
5-Feb	Z	2.3	2.3	2.3	2.4	2.6	2.6	2.5	3.5	2.9	3.0	2.9	2.9	2.8	2.8	2.6	2.9	3.8	2.9	2.9	2.9	2.2	2.0	2.0	2.7	3.8																						
6-Feb	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.3	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.2	2.7	2.1	2.7																						
7-Feb	2.6	2.6	Z	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	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.0	2.6																						
8-Feb	2.0	2.0	2.0	Z	2.0	2.2	2.2	2.2	2.2	2.3	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	2.3																						
9-Feb	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	2.0	2.0	2.0	2.0	2.0	2.0	3.2	2.7	2.0	2.0	2.0	2.1	3.2																						
10-Feb	2.0	2.3	2.6	3.4	2.6	Z	2.1	C	C	C	C	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.3	2.3	2.3	3.4																						
11-Feb	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	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	2.1	2.2																						
12-Feb	1.9	Z	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.3	2.1	2.1	2.1	2.4	3.0	2.7	2.5	2.6	2.5	2.0	2.0	2.2	3.0																						
13-Feb	2.0	2.0	Z	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	2.0	2.0	2.0	2.1	2.1																					
14-Feb	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																					
15-Feb	2.0	2.0	2.1	2.0	Z	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	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1																					
16-Feb	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	M	M	2.2	2.2	2.1	2.1	2.2	2.4	2.1	2.0	2.0	2.0	2.0	2.1	2.4																						
17-Feb	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																					
18-Feb	2.1	Z	2.2	2.1	2.2	2.3	2.4	2.5	2.5	2.6	2.6	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	2.2	2.6																					
19-Feb	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.5	2.4	2.5	2.5	2.5	2.4	2.7	2.7	2.7	2.5	2.3	2.4	2.5	2.3	2.2	2.1	2.4	2.7																						
20-Feb	2.0	2.0	2.0	Z	2.0	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.3	2.0	2.1	2.3																						
21-Feb	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.2																						
22-Feb	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	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																						
23-Feb	Z	2.1	3.2	3.1	2.7	2.7	2.6	2.4	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	3.2																						
24-Feb	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																					
25-Feb	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	1.9	2.0	2.6	2.3	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.6																						
26-Feb	2.0	2.0	2.0	Z	2.0	2.1	2.0	2.2	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2																						
27-Feb	2.0	2.0	2.0	2.0	Z	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	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.2																						
28-Feb	2.2	2.0	2.1	2.2	2.5	Z	2.5	2.2	2.3	2.4	2.4	2.5	2.4	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.6	2.2	2.6																						
																								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	2.1	2.1	2.1	2.1	2.0	2.1	Diurnal Average
																								3.9	2.7	3.2	3.4	2.7	2.7	3.3	2.5	3.5	2.9	3.0	2.9	2.9	2.8	2.8	2.7	2.9	3.8	2.9	3.2	2.9	2.5	2.3	2.7	Diurnal Maximum
Z - zerospan																								C - Calibration				M - Maintenance																				





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Buffalo Viewpoint - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	400	62.70	62.70
2.1 - 3.0	230	36.05	98.75
3.1 - 10.0	8	1.25	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



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

**Methane (CH<sub>4</sub>) - ppm**  
**Buffalo Viewpoint - February 2023**

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	80	37	9	3	1	7	41	81	24	10	5	23	31	16	11	5	384
2.1 - 3.0	61	27	9	3	8	5	15	21	7	0	3	1	7	14	22	27	230
3.1 - 10.0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	4	8
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	142	64	19	6	9	12	56	102	31	10	8	24	38	30	35	36	622

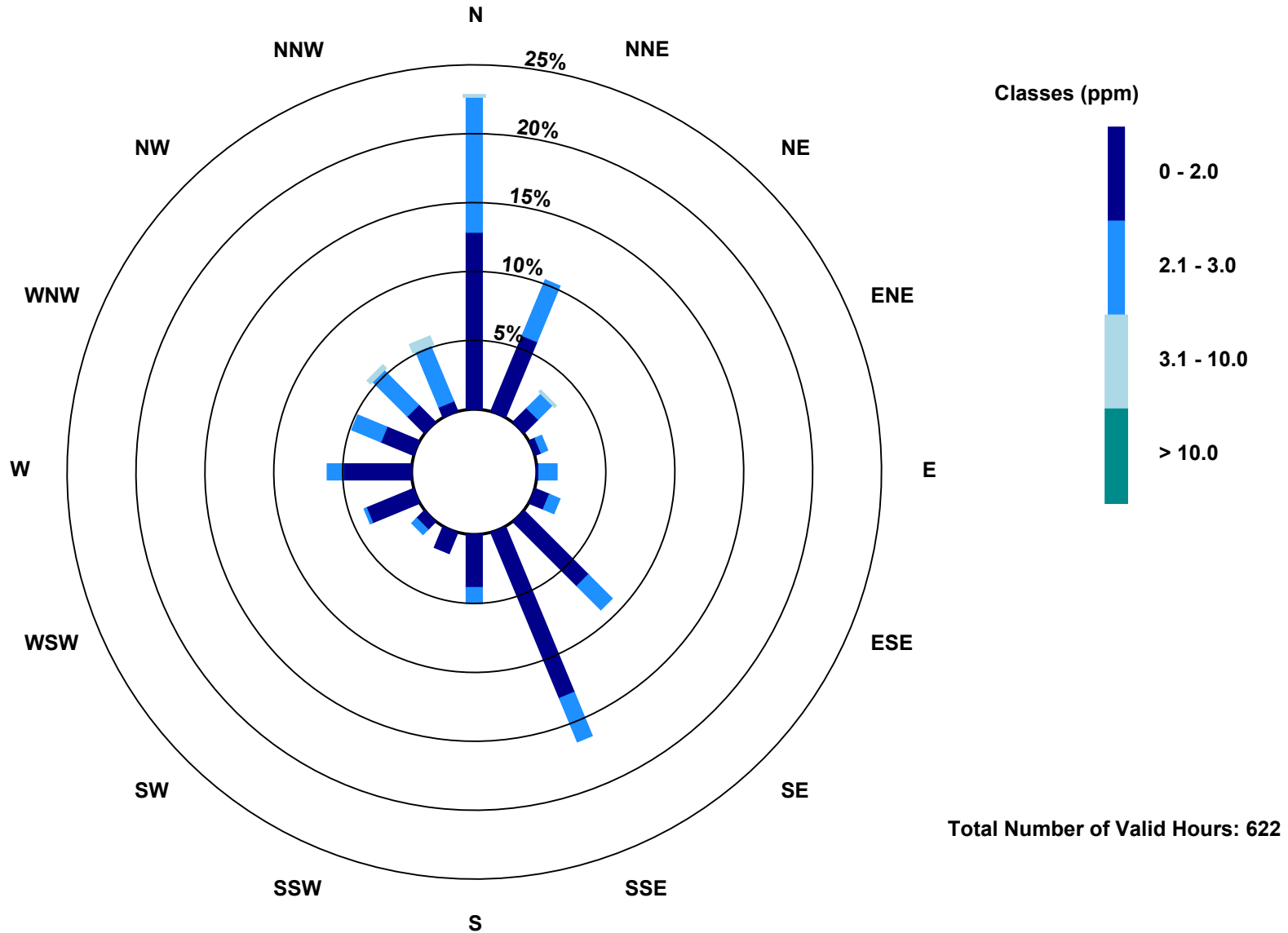
Total Number of Valid Hours: 622

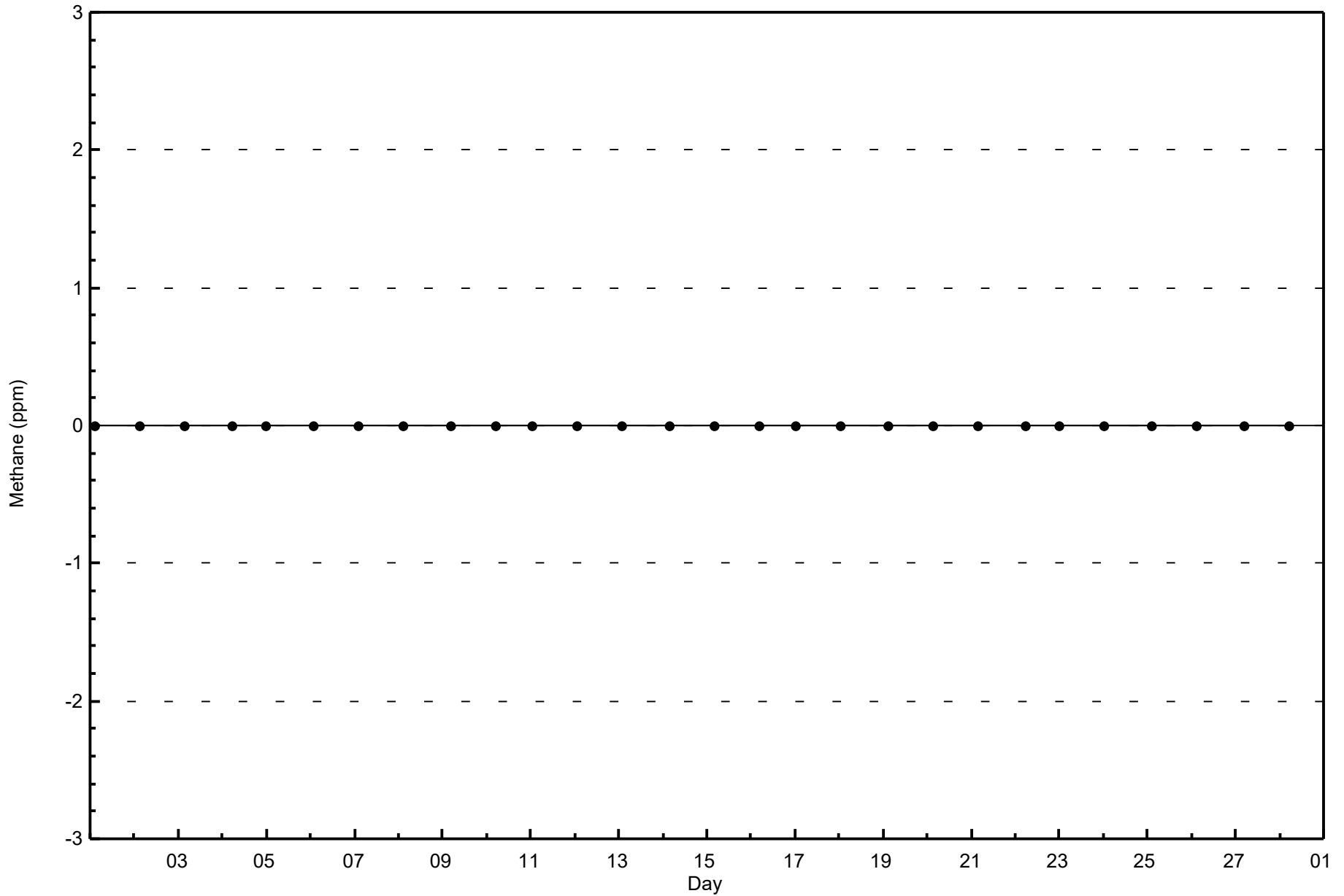
Total Number of Hours: 672



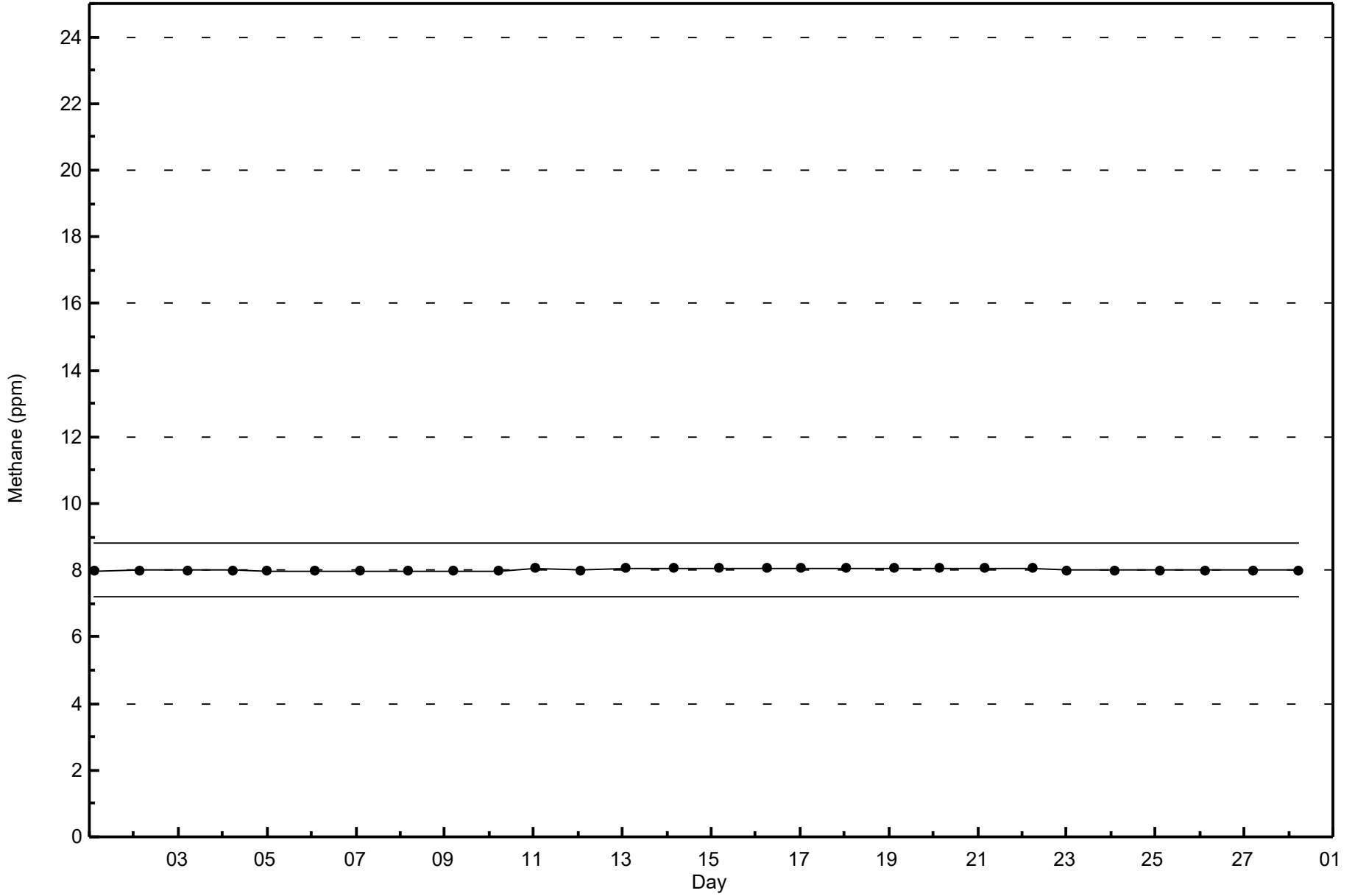
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









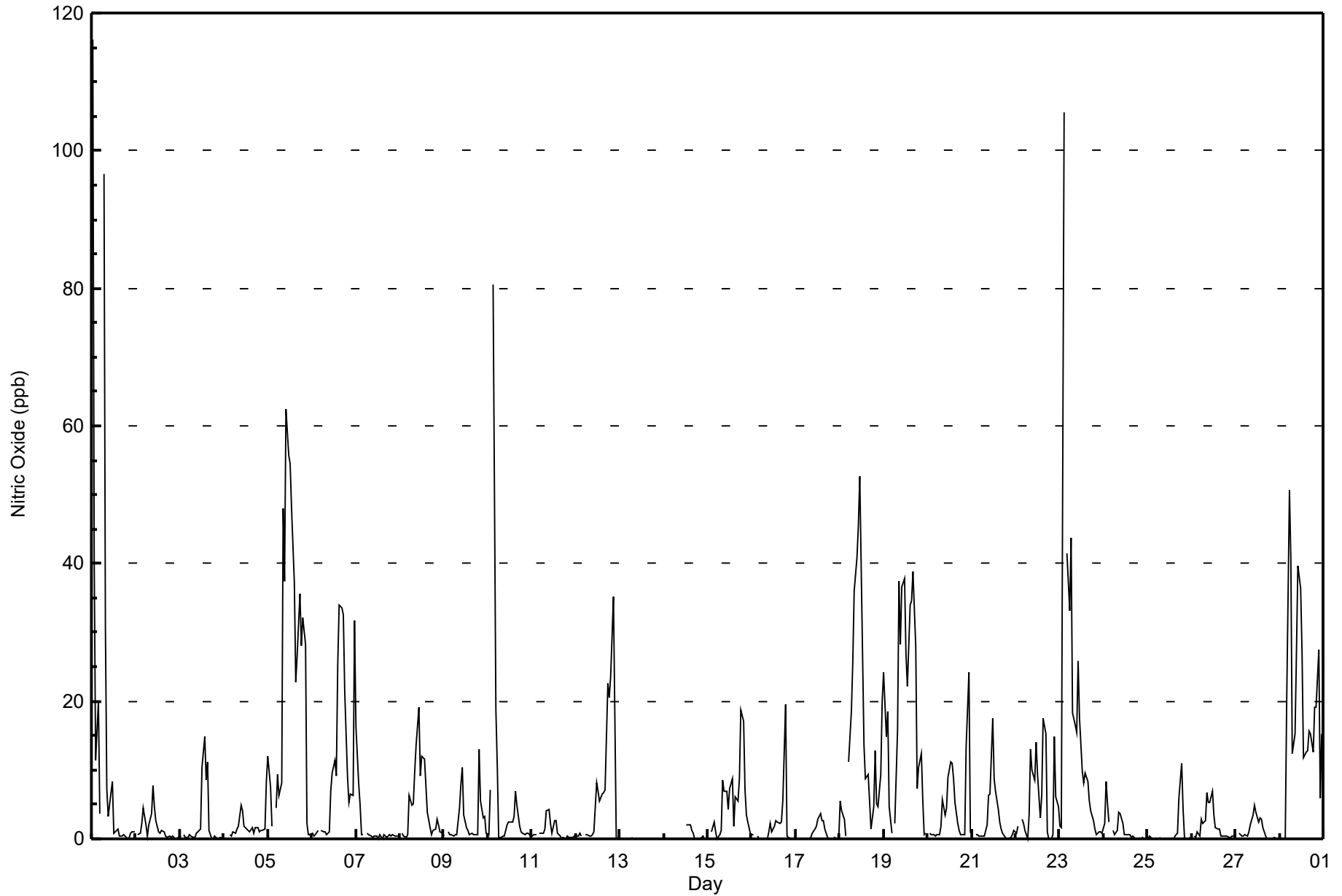


Maximum Value: 116.1 ppb on Feb 1 01:00      Maximum Daily Average: 24.8 ppb on Feb 5																						Hours in Service: 672 Hours of Data: 617				
Minimum Value: 0.0 ppb on Feb 3 18:00      Minimum Daily Average: 0.8 ppb on Feb 17 Maximum Diurnal Average: 12.0 ppb at hour 11      Minimum Diurnal Average: 2.5 ppb at hour 23 Monthly Average: 6.66 ppb      Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.5 Median = 1.3 Q <sub>3</sub> = 6.9 P <sub>90</sub> = 19.3 P <sub>99</sub> = 54.2																						Hours of Missing Data: 55 Hours of Calibration: 38 Percent Operational Time: 97.5				
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-Feb	116.1	40.4	11.4	20.0	3.7	Z	96.7	30.8	7.2	3.3	6.7	8.2	0.8	1.1	1.5	0.4	0.5	0.7	0.4	0.1	0.2	0.9	0.9	1.0	15.3	116.1
2-Feb	Z	0.6	0.9	2.1	4.4	2.0	0.5	2.1	3.7	7.8	4.6	2.7	1.0	0.8	1.2	0.9	0.5	0.3	0.3	0.2	0.5	0.0	0.0	0.3	1.6	7.8
3-Feb	0.5	Z	0.7	0.1	0.3	0.6	0.4	0.1	0.3	0.8	1.3	1.5	10.4	14.8	8.6	11.1	1.2	0.0	0.0	0.3	0.0	0.0	0.2	0.0	2.3	14.8
4-Feb	0.0	0.0	Z	0.6	0.4	0.9	0.9	1.5	1.7	4.8	4.0	1.8	1.4	1.3	1.0	1.6	0.9	1.7	1.6	1.0	1.3	1.2	1.4	8.2	1.7	8.2
5-Feb	12.0	7.5	1.8	Z	4.5	9.3	6.3	8.2	48.0	37.5	62.4	55.6	54.5	48.0	37.1	22.9	26.7	35.7	28.1	32.1	28.2	2.2	0.6	0.6	24.8	62.4
6-Feb	0.8	0.4	0.5	1.1	Z	1.1	0.9	0.9	0.5	0.9	6.8	9.5	11.4	9.1	25.3	33.9	33.5	32.5	21.3	9.0	5.4	6.4	6.4	31.8	10.9	33.9
7-Feb	16.2	7.9	5.0	0.6	0.6	Z	0.8	0.7	0.5	0.1	0.4	0.4	0.1	0.5	0.1	0.6	0.4	0.2	0.6	0.5	0.5	0.4	0.4	0.3	1.6	16.2
8-Feb	Z	0.8	0.5	0.2	0.7	6.3	4.9	5.1	9.7	13.7	19.2	9.2	11.9	11.6	7.7	3.9	1.7	0.7	1.2	1.4	2.8	2.1	1.0	0.8	5.1	19.2
9-Feb	0.5	Z	1.1	0.7	0.6	0.3	0.7	0.7	4.5	8.0	10.3	3.4	1.6	1.2	0.5	0.8	0.6	0.6	0.6	13.0	5.4	3.0	3.2	0.9	2.7	13.0
10-Feb	0.7	7.0	Z	80.5	18.7	10.6	0.2	0.2	0.5	0.5	2.1	2.5	2.4	2.5	3.3	6.9	4.9	1.9	0.9	0.8	0.7	0.8	0.7	0.4	6.5	80.5
11-Feb	0.4	0.7	0.5	Z	0.9	0.7	0.9	1.4	4.0	4.2	2.3	0.9	2.7	2.6	0.9	0.4	0.0	0.2	0.0	0.5	0.2	0.1	0.3	0.3	1.1	4.2
12-Feb	0.3	0.4	0.8	0.5	Z	0.6	0.6	0.4	0.4	0.6	0.9	8.2	7.0	5.6	6.4	6.6	7.1	22.7	20.5	23.5	35.2	17.6	0.3	0.0	7.2	35.2
13-Feb	0.0	0.0	0.0	0.1	0.0	Z	0.2	0.0	C	C	C	C	C	C	M	M	M	M	M	M	M	M	M	M	--	0.2
14-Feb	M	M	M	M	M	M	M	C	C	C	C	C	1.9	2.0	2.0	1.2	0.9	0.0	0.0	0.1	0.0	0.3	0.0	0.0	--	2.0
15-Feb	0.0	Z	1.0	2.5	0.9	0.1	0.6	1.2	8.6	6.9	6.9	4.3	7.4	8.7	1.9	6.0	5.4	8.7	18.7	17.1	7.2	3.5	2.4	0.6	5.2	18.7
16-Feb	0.6	0.7	Z	0.5	0.1	0.0	0.0	0.0	0.0	1.0	2.1	1.0	1.8	2.7	2.5	2.3	2.5	5.4	19.6	0.5	0.1	0.0	0.0	0.0	1.9	19.6
17-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.9	1.4	1.8	2.8	3.6	2.7	2.6	1.3	0.1	0.0	0.0	0.0	0.2	0.0	0.1	0.8	3.6
18-Feb	5.5	4.1	2.8	0.4	Z	11.2	18.5	25.7	35.9	40.9	45.6	52.7	26.6	13.6	8.8	9.3	5.4	1.5	4.8	12.8	5.0	4.6	9.4	20.0	15.9	52.7
19-Feb	24.1	14.9	18.5	4.7	0.9	Z	2.1	15.8	37.4	28.3	36.5	37.8	26.8	22.1	33.9	34.5	38.8	27.8	7.4	10.4	12.5	5.7	0.6	0.7	19.2	38.8
20-Feb	Z	0.8	0.5	0.5	0.4	0.6	0.6	1.9	5.6	3.4	4.5	8.8	11.3	11.0	8.6	5.4	2.3	1.2	0.5	0.7	0.6	13.5	24.1	0.9	4.7	24.1
21-Feb	0.6	Z	0.6	0.7	0.3	0.3	0.5	0.4	2.1	6.3	6.6	17.5	8.7	6.9	4.3	2.5	1.5	0.8	0.3	0.1	0.1	0.2	0.5	1.2	2.7	17.5
22-Feb	0.7	1.8	Z	2.8	2.3	1.3	0.1	3.4	12.9	9.9	8.5	14.0	9.3	3.1	6.2	17.5	15.2	0.9	0.1	0.1	0.7	14.9	6.2	4.6	5.9	17.5
23-Feb	1.8	1.6	105.5	Z	41.5	33.1	43.7	18.3	16.5	15.4	25.8	17.5	9.7	8.2	9.6	8.3	5.4	4.1	2.5	1.4	0.7	1.0	1.1	0.8	16.2	105.5
24-Feb	2.3	8.4	5.1	2.5	Z	1.3	0.5	1.3	3.9	3.7	2.3	0.6	0.7	0.6	0.6	0.2	0.3	0.0	0.1	0.0	0.0	0.3	0.1	0.0	1.5	8.4
25-Feb	0.0	0.3	0.0	0.0	0.0	Z	0.2	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.6	0.8	5.9	11.0	4.3	0.2	0.0	0.0	0.2	1.0	11.0
26-Feb	Z	0.5	0.2	1.0	0.4	2.9	2.2	2.7	6.8	5.3	5.2	6.9	3.5	1.6	1.4	1.4	0.4	0.5	0.5	0.3	0.2	0.2	0.5	0.3	2.0	6.9
27-Feb	0.6	Z	0.8	0.4	0.5	0.5	1.0	2.0	3.5	5.0	3.9	2.4	3.1	2.8	1.6	0.4	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	1.3	5.0
28-Feb	0.0	0.0	Z	0.0	19.6	50.6	40.8	12.4	15.2	27.0	39.7	36.5	27.0	11.9	12.5	12.8	15.7	15.3	12.7	19.1	19.1	27.4	6.0	15.3	19.0	50.6
8.0 4.5 7.2 5.3 4.4 6.1 8.3 5.0 8.8 9.0 12.0 11.8 9.1 7.3 7.1 7.3 6.4 6.3 5.7 5.5 4.7 4.0 2.5 3.3																								Diurnal Average		
116.1 40.4 105.5 80.5 41.5 50.6 96.7 30.8 48.0 40.9 62.4 55.6 54.5 48.0 37.1 34.5 38.8 35.7 28.1 32.1 35.2 27.4 24.1 31.8																								Diurnal Maximum		
Z - zerospan      C - Calibration      M - Maintenance																										



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

**Nitric Oxide (NO) - ppb**  
**Buffalo Viewpoint - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Buffalo Viewpoint - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	559	90.60	90.60
21 - 40	42	6.81	97.41
41 - 80	12	1.94	99.35
81 - 159	3	0.49	99.84
> 159	0	0.00	99.84

Total Number of Valid Hours: 617

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Buffalo Viewpoint - February 2023**

<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	126	55	18	5	9	9	56	99	32	10	7	24	35	25	22	27	559
21 - 40	8	5	3	1	0	2	0	4	0	0	1	0	1	4	10	3	42
41 - 80	0	2	0	0	0	1	0	0	1	0	0	0	1	1	3	3	12
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	134	62	21	6	9	12	56	103	33	10	8	24	37	30	36	35	616

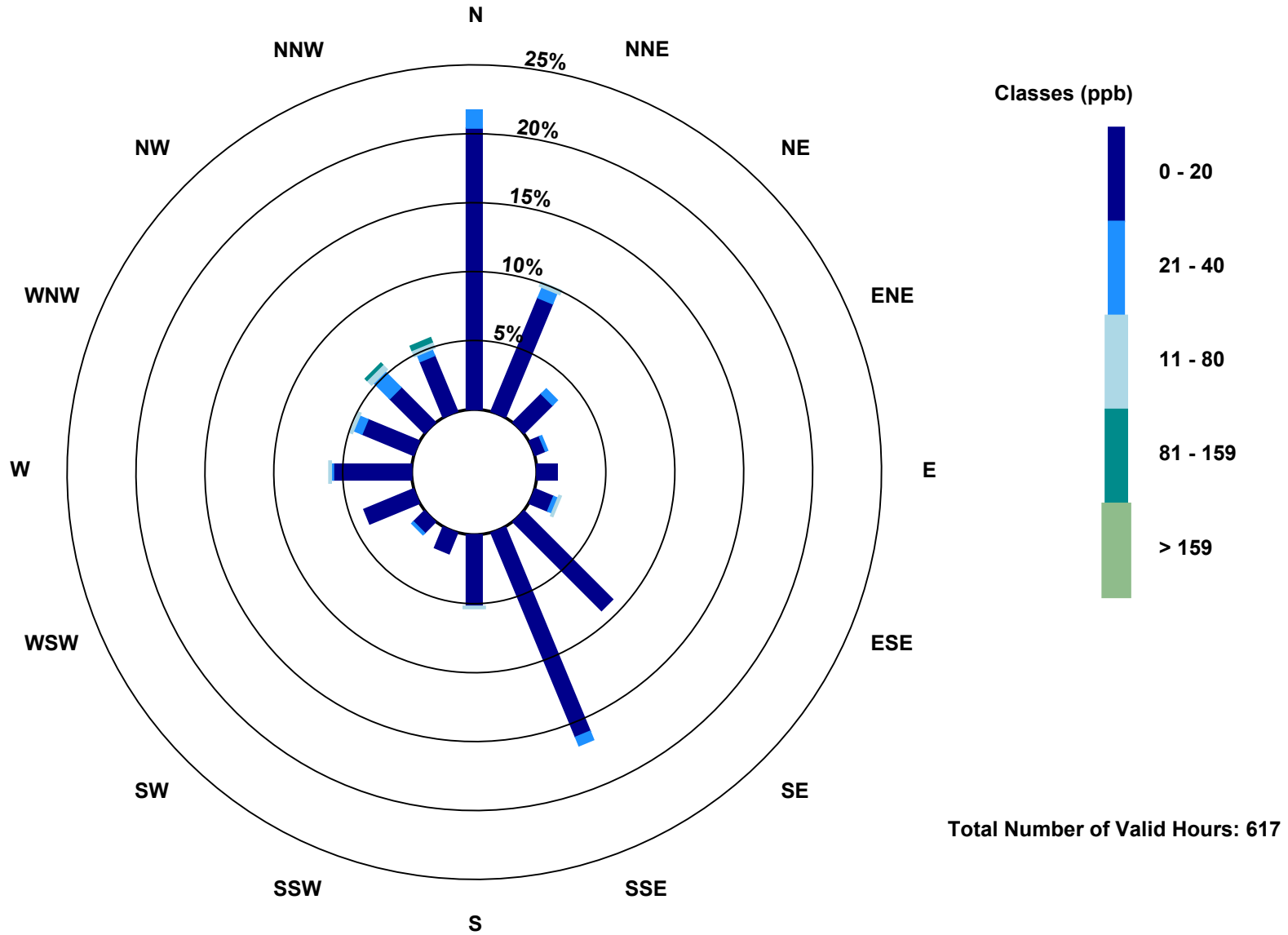
Total Number of Valid Hours: 617

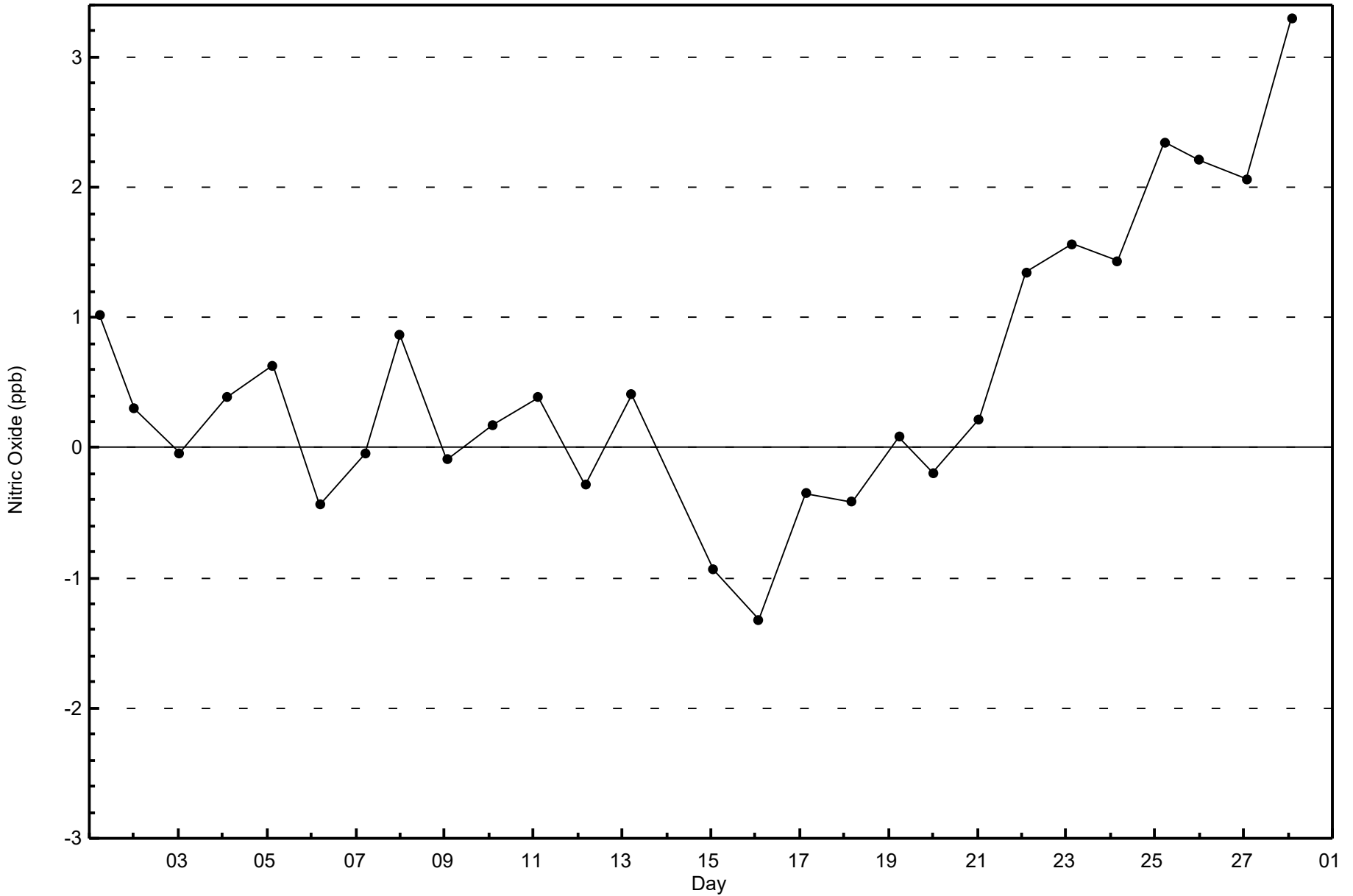
Total Number of Hours: 672

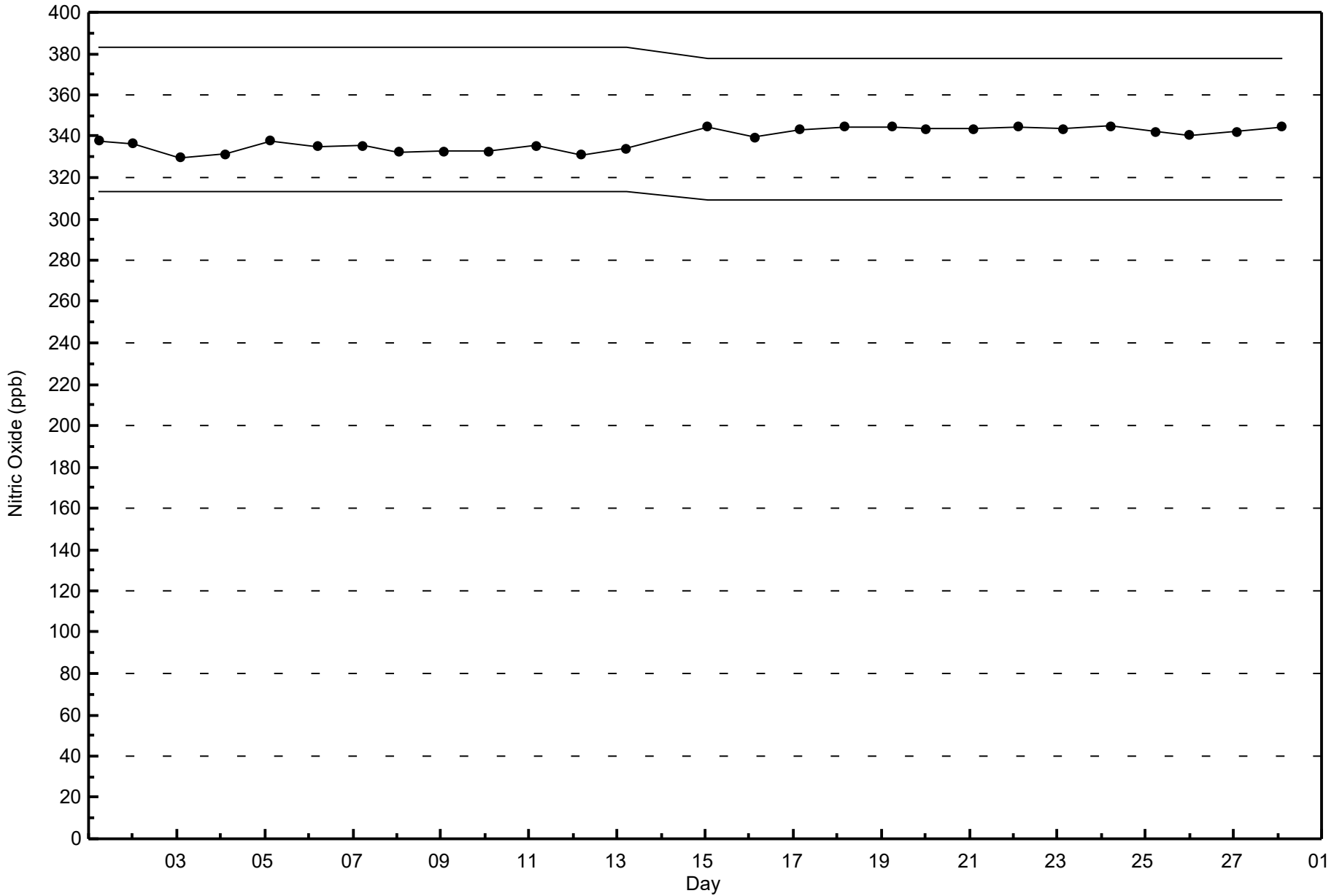


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitric Oxide (NO) - ppb  
Buffalo Viewpoint











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

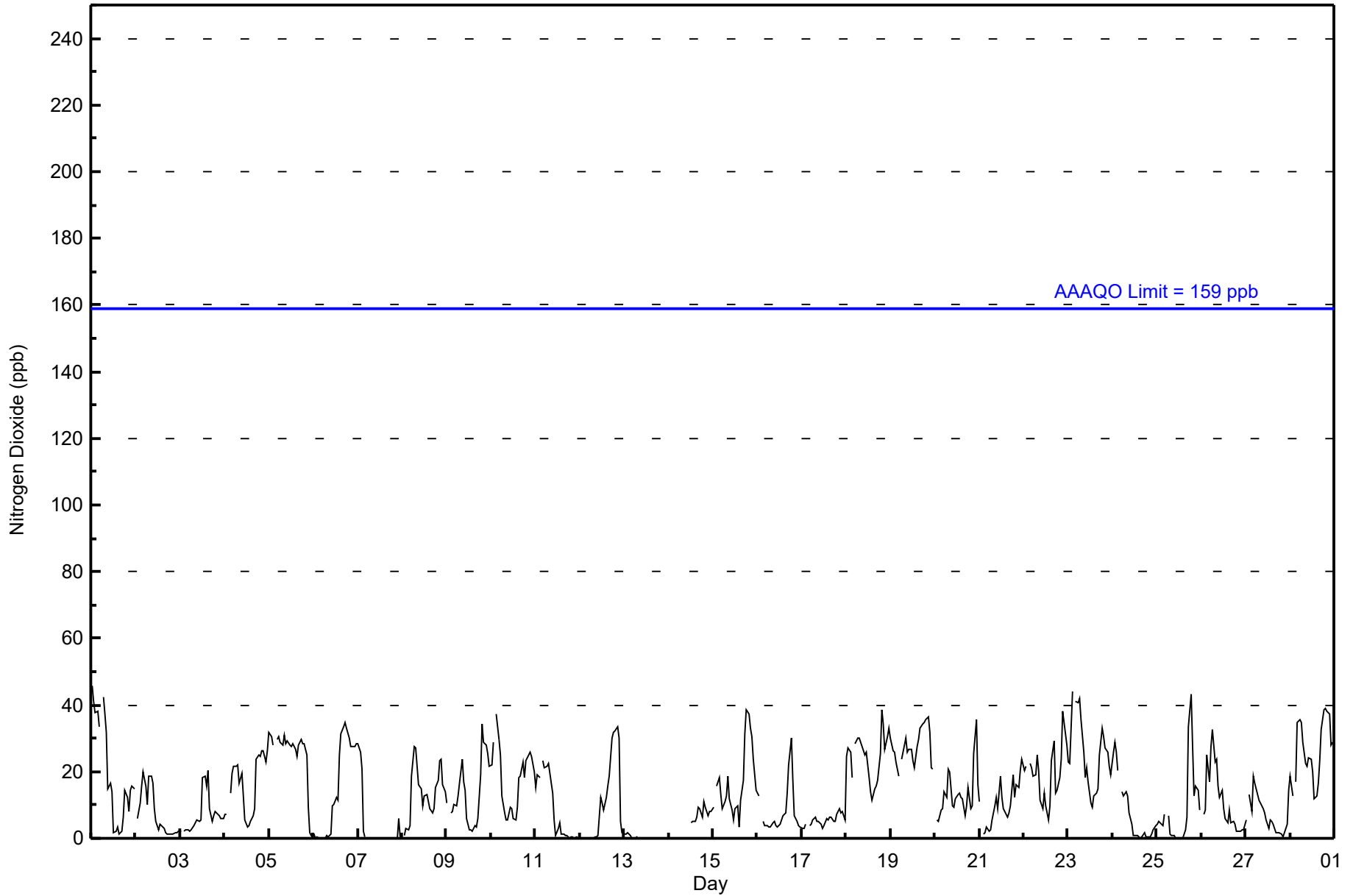
**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Buffalo Viewpoint - February 2023**

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	672									
Maximum Value: 45.6 ppb on Feb 1 01:00		Maximum Daily Average: 27.6 ppb on Feb 19																	Hours of Data:	617											
Minimum Value: 0.0 ppb on Feb 6 04:00		Minimum Daily Average: 3.7 ppb on Feb 7																	Hours of Missing Data:	55											
Maximum Diurnal Average: 18.6 ppb at hour 19		Minimum Diurnal Average: 8.4 ppb at hour 14																	Hours of Calibration:	38											
Monthly Average: 13.99 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.9 Q <sub>1</sub> = 4.3 Median = 11.8 Q <sub>3</sub> = 23.1 P <sub>90</sub> = 30.0 P <sub>99</sub> = 40.8																	Percent Operational Time:	97.5											
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-Feb	45.6	41.2	37.9	38.0	33.4	Z	42.5	37.3	31.6	15.0	16.4	14.1	1.6	2.2	3.6	1.3	2.2	6.4	14.3	12.1	8.1	14.5	15.5	14.9	19.6	45.6					
2-Feb	Z	6.1	10.4	15.7	19.8	15.7	10.2	18.6	18.5	16.4	9.1	5.2	2.6	4.1	4.0	2.9	1.5	1.1	1.1	1.2	1.3	1.6	1.9	2.1	7.4	19.8					
3-Feb	2.3	Z	2.1	2.4	2.4	2.3	2.4	4.0	4.6	5.6	5.0	5.7	18.3	18.7	15.5	20.5	8.9	5.1	6.8	7.9	7.2	6.6	6.1	6.1	7.2	20.5					
4-Feb	7.3	7.4	Z	13.6	19.5	21.5	21.7	21.9	16.7	19.5	12.7	5.4	3.4	3.7	5.0	6.9	9.0	23.9	24.8	24.4	26.3	26.3	23.0	26.4	16.1	26.4					
5-Feb	31.8	30.6	28.0	Z	29.5	30.3	28.7	28.1	30.8	28.2	29.2	28.1	27.7	28.2	26.8	24.5	27.9	29.7	28.5	28.5	24.8	9.2	1.9	0.9	25.3	31.8					
6-Feb	1.4	0.1	0.3	0.0	Z	0.0	0.0	0.9	0.4	1.3	9.9	10.2	12.2	11.5	24.9	31.3	33.5	34.6	33.2	29.9	27.6	27.6	27.4	28.6	15.1	34.6					
7-Feb	28.2	25.9	20.6	2.2	0.4	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	0.2	6.0	0.5	3.7	28.2					
8-Feb	Z	1.0	2.9	2.5	3.8	18.6	27.5	27.0	21.7	16.3	14.9	9.9	12.9	13.1	11.1	8.9	7.5	9.1	15.3	17.2	23.2	23.8	15.9	14.0	13.8	27.5					
9-Feb	10.5	Z	7.6	8.2	10.1	9.9	12.6	16.5	23.6	17.1	14.3	5.8	2.7	2.6	2.3	3.7	3.3	6.0	19.0	34.4	28.8	28.0	25.4	21.8	13.7	34.4					
10-Feb	22.2	28.8	Z	37.3	29.6	25.0	12.5	7.6	5.7	5.5	9.2	8.9	5.9	5.6	9.4	18.2	18.6	22.8	18.3	23.4	24.8	25.7	24.7	20.1	17.8	37.3					
11-Feb	15.3	19.1	18.4	Z	23.5	21.3	21.8	22.5	19.7	13.5	5.7	0.9	3.0	4.6	1.3	1.1	0.7	0.7	0.1	0.3	0.4	0.2	0.3	0.2	8.5	23.5					
12-Feb	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.5	0.6	0.8	12.3	10.7	8.5	12.1	15.7	18.6	30.2	31.8	32.2	33.6	30.1	4.9	1.5	10.6	33.6					
13-Feb	1.1	1.4	1.7	0.7	0.2	Z	0.6	0.3	C	C	C	C	C	C	M	M	M	M	M	M	M	M	M	M	--	1.7					
14-Feb	M	M	M	M	M	M	M	C	C	C	C	C	4.8	5.1	4.9	6.2	9.3	8.9	6.2	11.0	9.4	6.8	8.1	7.9	--	11.0					
15-Feb	9.4	Z	15.5	18.1	13.0	8.8	11.2	12.8	18.5	11.9	8.3	5.7	8.9	9.6	3.6	11.6	17.5	31.5	38.4	37.4	33.0	30.7	23.9	14.3	17.1	38.4					
16-Feb	13.4	12.9	Z	5.1	3.7	3.8	3.3	3.5	4.8	5.0	4.0	3.5	4.1	5.7	6.8	7.6	13.4	22.2	29.9	17.3	6.9	5.0	4.0	3.2	8.2	29.9					
17-Feb	2.9	2.9	4.1	Z	4.0	4.3	5.6	6.2	4.9	4.9	4.4	3.1	4.0	6.0	5.4	6.4	6.4	5.0	5.0	7.4	8.7	7.7	8.0	5.6	5.3	8.7					
18-Feb	24.7	27.1	25.8	18.2	Z	28.5	30.1	30.2	28.8	26.4	25.1	25.7	18.4	13.8	11.6	15.0	15.5	17.3	25.6	38.7	34.5	26.9	30.4	32.9	24.8	38.7					
19-Feb	29.9	26.3	25.7	23.0	18.6	Z	23.6	27.9	30.1	25.7	26.6	26.7	23.1	21.1	27.7	29.8	33.1	34.5	34.6	35.5	36.4	31.8	21.3	20.8	27.6	36.4					
20-Feb	Z	5.3	5.2	8.3	9.1	13.8	12.1	20.9	20.0	9.9	9.3	11.8	13.3	13.6	12.2	12.0	6.9	9.8	15.2	9.1	9.9	25.3	35.8	16.0	13.3	35.8					
21-Feb	10.9	Z	1.4	1.7	3.3	2.3	2.7	5.5	9.6	12.1	8.9	18.8	12.2	9.0	7.2	6.2	7.6	9.8	19.0	12.2	15.9	15.1	20.4	23.6	10.2	23.6					
22-Feb	20.3	21.5	Z	22.5	21.1	18.8	19.2	25.1	20.4	11.3	8.7	13.7	9.8	5.5	9.9	23.5	29.1	13.7	14.2	18.4	23.7	38.1	34.9	27.8	19.6	38.1					
23-Feb	22.9	22.5	44.2	Z	40.9	40.5	42.1	35.6	25.7	18.4	21.2	17.1	10.5	9.4	12.8	13.7	14.8	25.1	33.2	30.3	27.2	25.8	21.8	19.2	25.0	44.2					
24-Feb	25.7	28.8	25.9	20.2	Z	14.0	12.7	14.1	12.7	7.6	4.3	0.9	1.0	0.8	0.6	0.1	0.5	1.8	0.5	0.3	0.3	1.3	2.7	3.9	7.9	28.8					
25-Feb	4.3	4.9	4.2	3.8	7.3	Z	6.8	1.4	0.8	0.7	0.2	0.2	0.0	0.2	2.4	6.2	33.4	43.4	27.7	12.8	15.8	14.4	8.4	8.7	43.4						
26-Feb	Z	7.3	8.3	25.0	16.9	27.6	32.6	22.7	23.7	15.5	12.2	14.4	8.9	5.9	4.8	8.5	4.5	5.0	4.2	2.3	2.3	2.0	2.5	2.7	11.3	32.6					
27-Feb	5.7	Z	13.1	8.2	18.8	16.5	13.1	11.5	10.8	8.7	7.7	5.7	3.1	5.7	5.0	4.4	1.8	1.9	1.5	1.1	0.6	1.6	4.3	14.6	7.2	18.8					
28-Feb	18.8	12.8	Z	17.1	34.7	35.7	34.7	28.8	22.5	21.8	24.1	23.8	19.9	11.8	12.7	16.7	23.5	32.6	38.7	39.0	38.1	37.5	27.9	28.8	26.2	39.0					
		15.4	15.2	13.8	12.7	15.8	16.3	15.9	16.0	15.7	12.3	11.2	10.7	9.0	8.4	8.9	11.1	11.9	15.6	18.6	18.5	17.3	17.2	15.3	13.6	Diurnal Average					
		45.6	41.2	44.2	38.0	40.9	40.5	42.5	37.3	31.6	28.2	29.2	28.1	27.7	28.2	27.7	31.3	33.5	34.6	43.4	39.0	38.1	38.1	35.8	32.9	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 - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Buffalo Viewpoint - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	433	70.18	70.18
21 - 40	177	28.69	98.87
41 - 80	7	1.13	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 617

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Buffalo Viewpoint - February 2023**

<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	95	50	14	3	7	8	40	70	25	8	5	23	32	20	17	16	433
21 - 40	39	12	7	3	2	4	16	32	8	2	3	1	5	10	17	16	177
11 - 80	1	0	0	0	0	0	0	1	0	0	0	0	0	0	2	3	7
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>	135	62	21	6	9	12	56	103	33	10	8	24	37	30	36	35	617

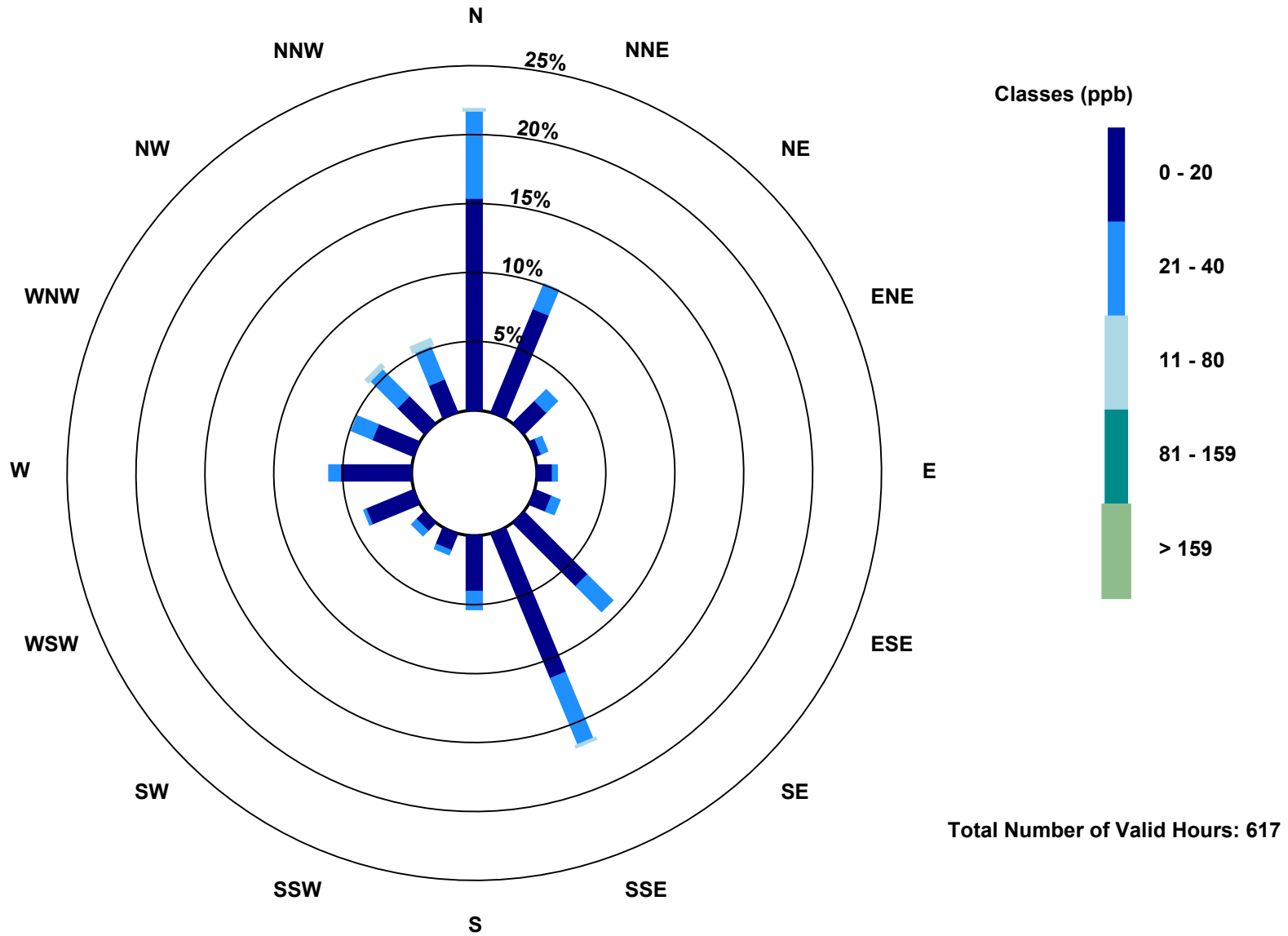
Total Number of Valid Hours: 617

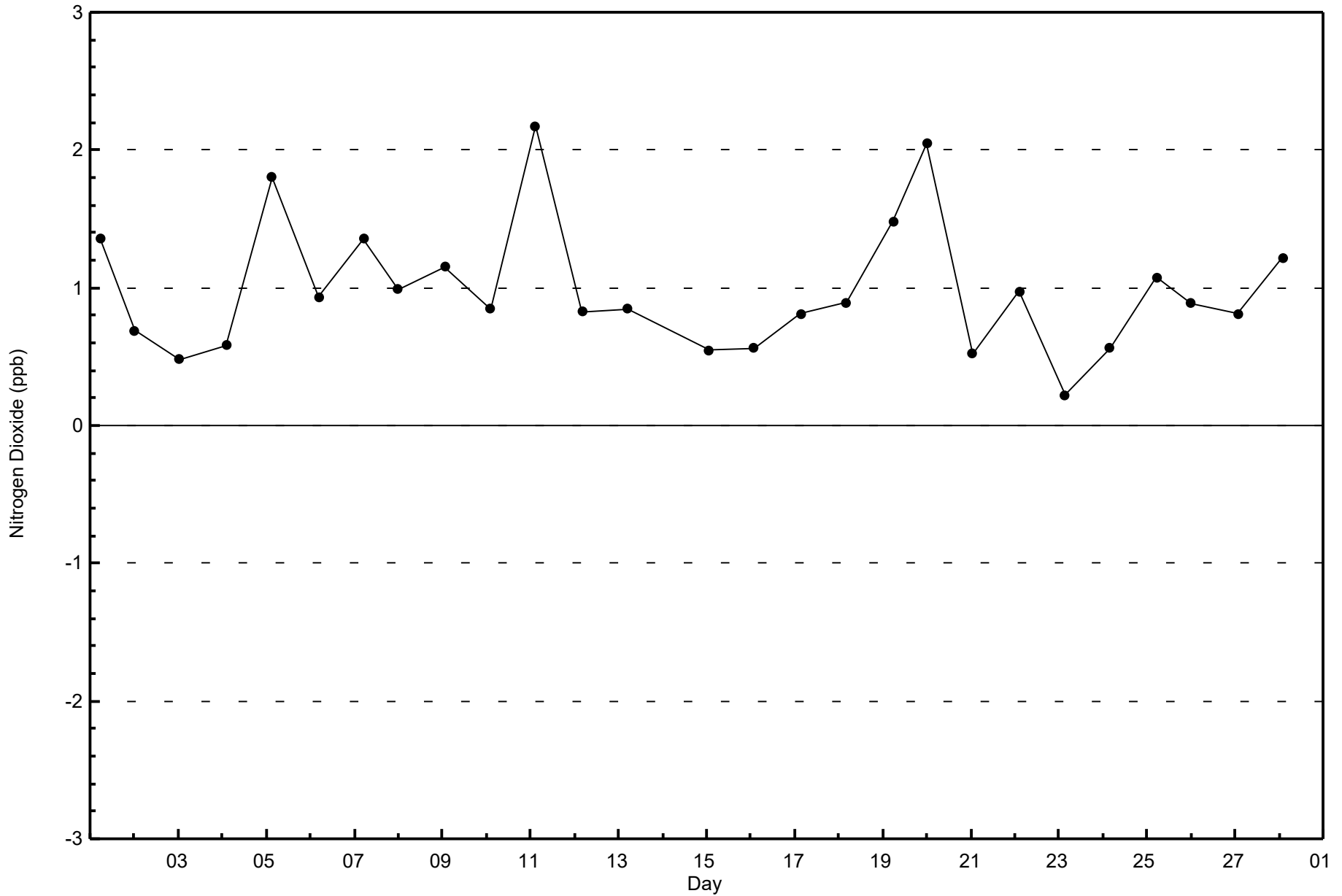
Total Number of Hours: 672

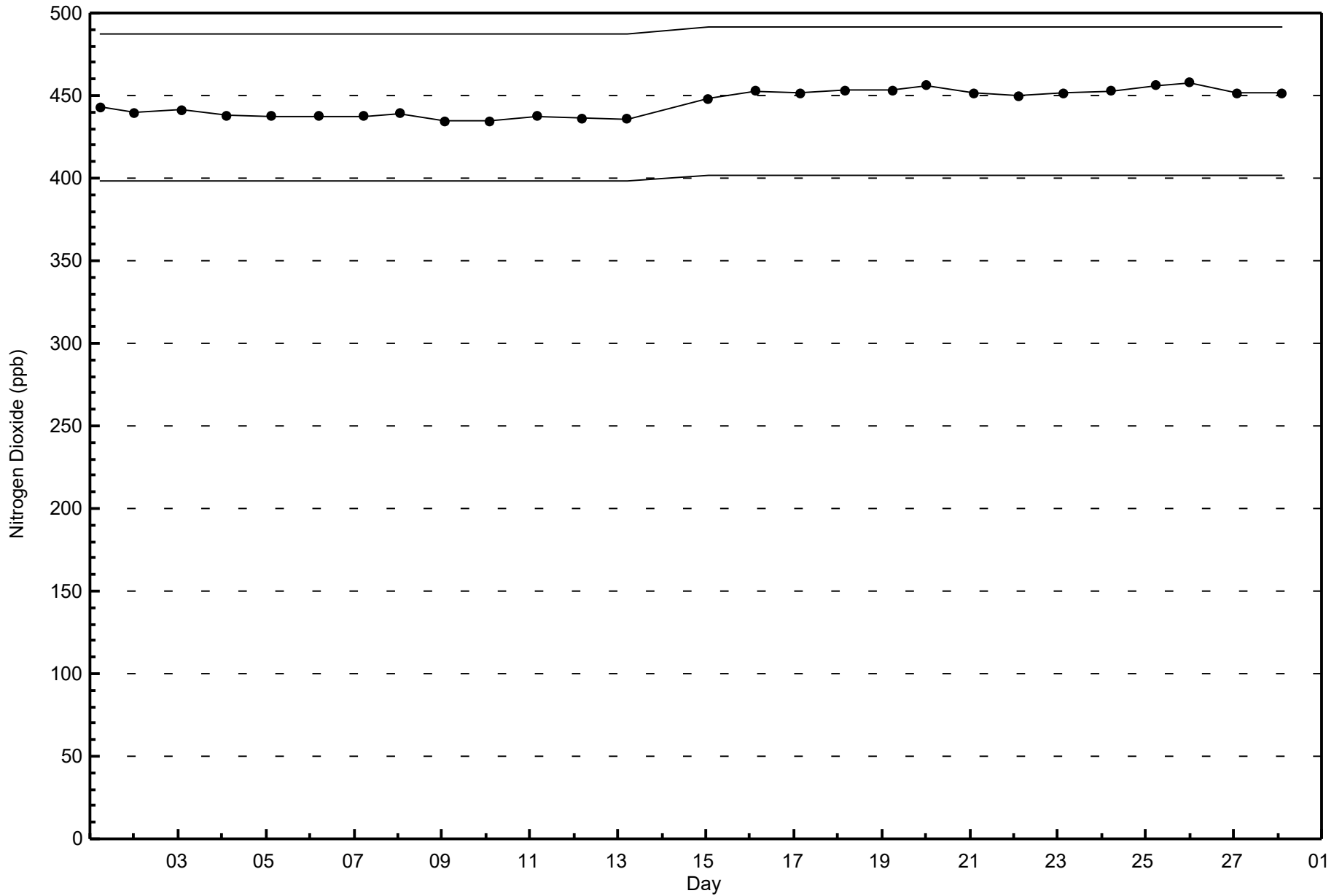


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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 - February 2023

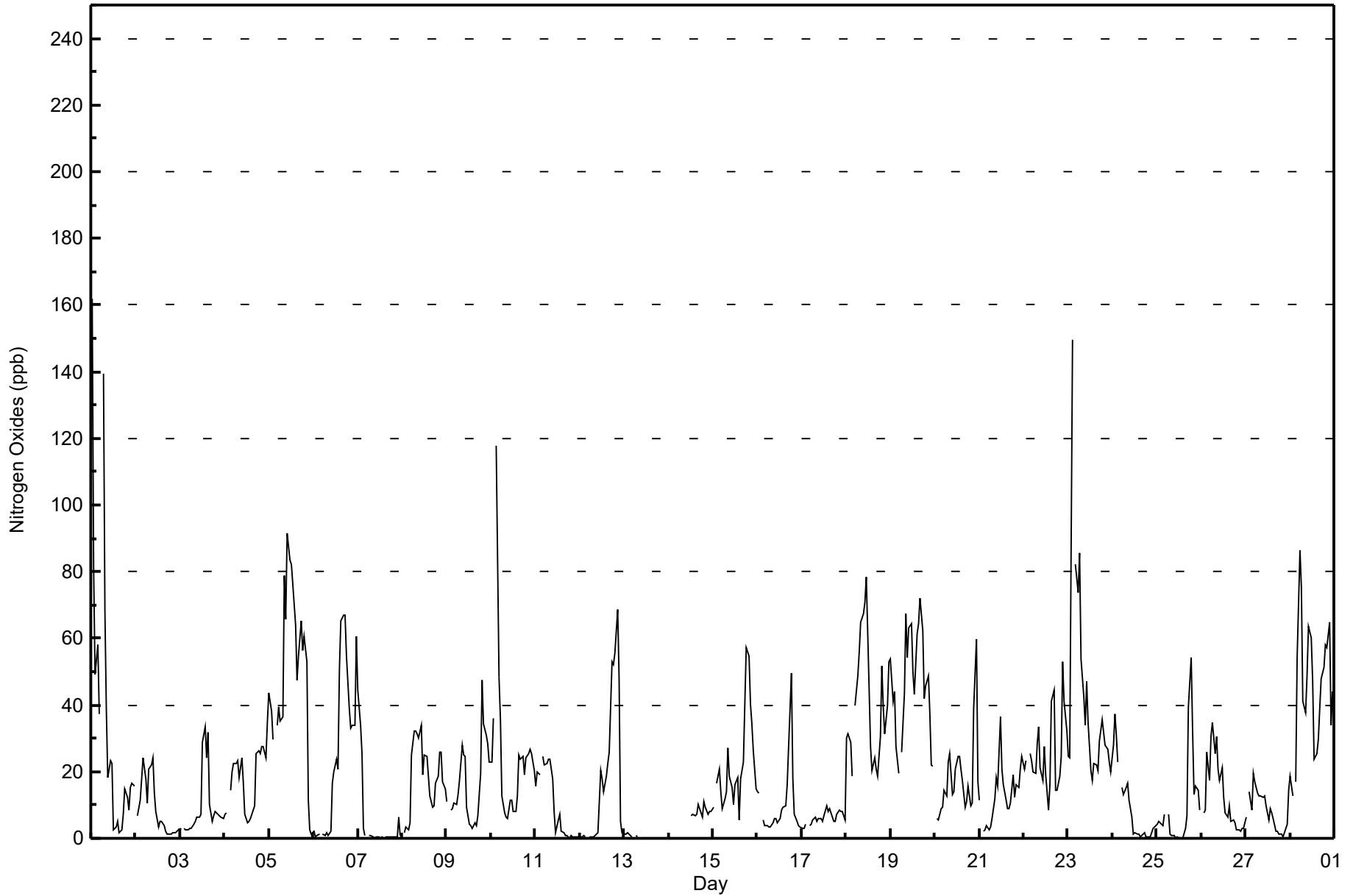
Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	672					
Maximum Value: 161.7 ppb on Feb 1 01:00		Maximum Daily Average: 50.1 ppb on Feb 5																	Hours of Data:	617							
Minimum Value: 0.0 ppb on Feb 25 13:00		Minimum Daily Average: 5.3 ppb on Feb 7																	Hours of Missing Data:	55							
Maximum Diurnal Average: 24.4 ppb at hour 9		Minimum Diurnal Average: 15.7 ppb at hour 14																	Hours of Calibration:	38							
Monthly Average: 20.64 ppb		Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 1.4 Q <sub>1</sub> = 5.1 Median = 14.7 Q <sub>3</sub> = 27.7 P <sub>90</sub> = 50.7 P <sub>99</sub> = 85.4																	Percent Operational Time:	97.5							
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-Feb	161.7	81.6	49.3	58.0	37.1	Z	139.2	68.1	38.8	18.3	23.1	22.3	2.4	3.3	5.1	1.7	2.7	7.1	14.7	12.2	8.3	15.4	16.4	15.9	34.9	161.7	
2-Feb	Z	6.7	11.3	17.8	24.2	17.7	10.7	20.7	22.2	24.2	13.7	7.9	3.6	4.9	5.2	3.8	2.0	1.4	1.4	1.4	1.8	1.6	1.9	2.4	9.1	24.2	
3-Feb	2.8	Z	2.8	2.5	2.7	2.9	2.8	4.1	4.9	6.4	6.3	7.2	28.7	33.5	24.1	31.6	10.1	5.1	6.8	8.2	7.2	6.6	6.3	6.1	9.6	33.5	
4-Feb	7.3	7.4	Z	14.2	19.9	22.4	22.6	23.4	18.4	24.3	16.7	7.2	4.8	5.0	6.0	8.5	9.9	25.6	26.4	25.4	27.6	27.5	24.4	34.6	17.8	34.6	
5-Feb	43.8	38.1	29.8	Z	34.0	39.6	35.0	36.3	78.8	65.7	91.6	83.7	82.2	76.2	63.9	47.4	54.6	65.4	56.6	60.6	53.0	11.4	2.5	1.5	50.1	91.6	
6-Feb	2.2	0.5	0.8	1.1	Z	1.1	0.9	1.8	0.9	2.2	16.7	19.7	23.6	20.6	50.2	65.2	67.0	67.1	54.5	38.9	33.0	34.0	33.8	60.4	25.9	67.1	
7-Feb	44.4	33.8	25.6	2.8	1.0	Z	1.0	0.7	0.5	0.1	0.4	0.4	0.1	0.5	0.1	0.6	0.4	0.2	0.6	0.5	0.5	0.6	6.4	0.8	5.3	44.4	
8-Feb	Z	1.8	3.4	2.7	4.5	24.9	32.4	32.1	31.4	30.0	34.1	19.1	24.8	24.7	18.8	12.8	9.2	9.8	16.5	18.6	26.0	25.9	16.9	14.8	18.9	34.1	
9-Feb	11.0	Z	8.7	8.9	10.7	10.2	13.3	17.2	28.1	25.1	24.6	9.2	4.3	3.8	2.8	4.5	3.9	6.6	19.6	47.4	34.2	31.0	28.6	22.7	16.4	47.4	
10-Feb	22.9	35.8	Z	117.8	48.3	35.6	12.7	7.8	6.2	6.0	11.3	11.4	8.3	8.1	12.7	25.1	23.5	24.7	19.2	24.2	25.5	26.5	25.4	20.5	24.3	117.8	
11-Feb	15.7	19.8	18.9	Z	24.4	22.0	22.7	23.9	23.7	17.7	8.0	1.8	5.7	7.2	2.2	1.5	0.7	0.9	0.1	0.8	0.6	0.3	0.6	0.5	9.6	24.4	
12-Feb	0.3	0.4	0.8	0.5	Z	0.6	0.6	0.4	0.9	1.2	1.7	20.5	17.7	14.1	18.5	22.3	25.7	52.9	52.3	55.7	68.8	47.7	5.2	1.5	17.8	68.8	
13-Feb	1.1	1.4	1.7	0.8	0.2	Z	0.8	0.3	C	C	C	C	C	C	M	M	M	M	M	M	M	M	M	M	--	1.7	
14-Feb	M	M	M	M	M	M	M	C	C	C	C	C	C	6.7	7.1	6.9	7.4	10.2	8.9	6.2	11.1	9.4	7.1	8.1	7.9	--	11.1
15-Feb	9.4	Z	16.5	20.6	13.9	8.9	11.8	14.0	27.1	18.8	15.2	10.0	16.3	18.3	5.5	17.6	22.9	40.2	57.1	54.5	40.2	34.2	26.3	14.9	22.4	57.1	
16-Feb	14.0	13.6	Z	5.6	3.8	3.8	3.3	3.5	4.8	6.0	6.1	4.5	5.9	8.4	9.3	9.9	15.9	27.6	49.5	17.8	7.0	5.0	4.0	3.2	10.1	49.5	
17-Feb	2.9	2.9	4.1	Z	4.0	4.3	5.6	6.2	5.0	5.8	5.8	4.9	6.8	9.6	8.1	9.0	7.7	5.1	5.0	7.4	8.7	7.9	8.0	5.7	6.1	9.6	
18-Feb	30.2	31.2	28.6	18.6	Z	39.7	48.6	55.9	64.7	67.3	70.7	78.4	45.0	27.4	20.4	24.3	20.9	18.8	30.4	51.5	39.5	31.5	39.8	52.9	40.7	78.4	
19-Feb	54.0	41.2	44.2	27.7	19.5	Z	25.7	43.7	67.5	54.0	63.1	64.5	49.9	43.2	61.6	64.3	71.9	62.3	42.0	45.9	48.9	37.5	21.9	21.5	46.8	71.9	
20-Feb	Z	6.1	5.7	8.8	9.5	14.4	12.7	22.8	25.6	13.3	13.8	20.6	24.6	24.6	20.8	17.4	9.2	11.0	15.7	9.8	10.5	38.8	59.9	16.9	17.9	59.9	
21-Feb	11.5	Z	2.0	2.4	3.6	2.6	3.2	5.9	11.7	18.4	15.5	36.3	20.9	15.9	11.5	8.7	9.1	10.6	19.3	12.3	16.0	15.3	20.9	24.8	13.0	36.3	
22-Feb	21.0	23.3	Z	25.3	23.4	20.1	19.3	28.5	33.3	21.2	17.2	27.7	19.1	8.6	16.1	41.0	44.3	14.6	14.3	18.5	24.4	53.0	41.1	32.4	25.6	53.0	
23-Feb	24.7	24.1	149.7	Z	82.4	73.6	85.8	53.9	42.2	33.8	47.0	34.6	20.2	17.6	22.4	22.0	20.2	29.2	35.7	31.7	27.9	26.8	22.9	20.0	41.2	149.7	
24-Feb	28.0	37.2	31.0	22.7	Z	15.3	13.2	15.4	16.6	11.3	6.6	1.5	1.7	1.4	1.2	0.3	0.8	1.8	0.6	0.3	0.3	1.6	2.8	3.9	9.4	37.2	
25-Feb	4.3	5.2	4.2	3.8	7.3	Z	7.0	1.4	0.9	0.7	0.2	0.3	0.0	0.0	0.2	3.0	7.0	39.3	54.4	32.0	13.0	15.8	14.4	8.6	9.7	54.4	
26-Feb	Z	7.8	8.5	26.0	17.3	30.5	34.8	25.4	30.5	20.8	17.4	21.3	12.4	7.5	6.2	9.9	4.9	5.5	4.7	2.6	2.5	2.2	3.0	3.0	13.3	34.8	
27-Feb	6.3	Z	13.9	8.6	19.3	17.0	13.6	12.5	12.8	12.2	12.7	9.6	5.5	8.8	7.8	6.0	2.2	2.0	1.5	1.1	0.6	1.8	4.3	14.6	8.5	19.3	
28-Feb	18.8	12.8	Z	17.1	54.3	86.3	75.5	41.2	37.7	48.8	63.8	60.3	46.9	23.7	25.2	29.5	39.2	47.9	51.4	58.1	57.2	64.9	33.9	44.1	45.2	86.3	
		23.4	19.7	21.0	18.0	20.2	22.4	24.3	21.0	24.4	21.3	23.2	22.5	18.1	15.7	16.0	18.3	18.4	21.9	24.3	24.0	21.9	21.2	17.8	16.9	Diurnal Average	
		161.7	81.6	149.7	117.8	82.4	86.3	139.2	68.1	78.8	67.3	91.6	83.7	82.2	76.2	63.9	65.2	71.9	67.1	57.1	60.6	68.8	64.9	59.9	60.4	Diurnal Maximum	
Z - zerspan		C - Calibration				M - Maintenance																					





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

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Buffalo Viewpoint - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Buffalo Viewpoint - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	379	61.43	61.43
21 - 40	147	23.82	85.25
41 - 80	80	12.97	98.22
81 - 159	10	1.62	99.84
> 159	1	0.16	100.00

Total Number of Valid Hours: 617

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Buffalo Viewpoint - February 2023**

<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	88	43	13	3	5	6	35	60	22	8	2	23	31	16	13	11	379
21 - 40	31	11	3	2	4	3	17	34	8	1	5	1	2	6	6	13	147
11 - 80	14	8	5	1	0	2	4	9	3	1	1	0	3	7	14	8	80
81 - 159	2	0	0	0	0	1	0	0	0	0	0	0	1	1	3	2	10
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
<b>Totals</b>	135	62	21	6	9	12	56	103	33	10	8	24	37	30	36	35	617

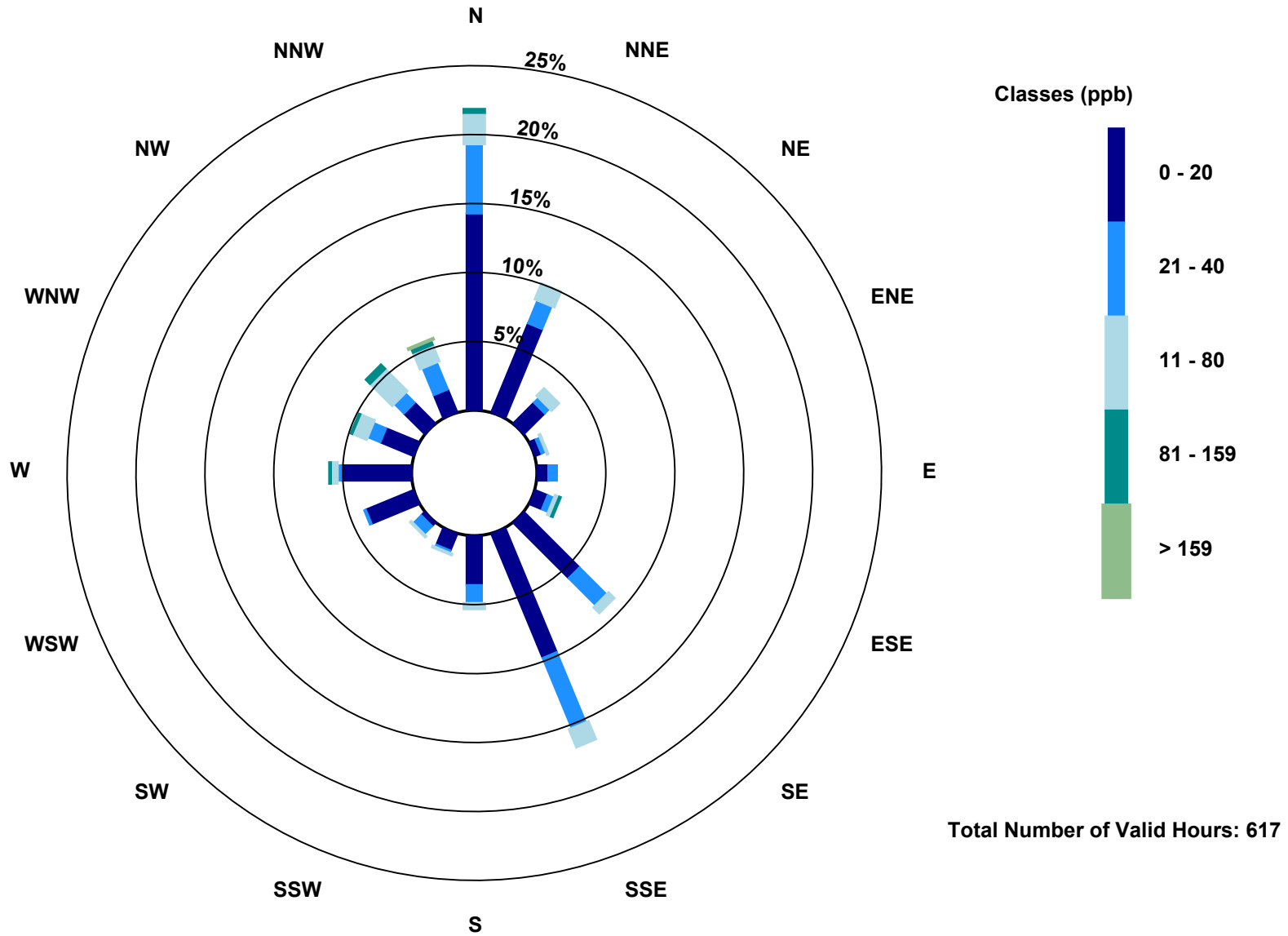
Total Number of Valid Hours: 617

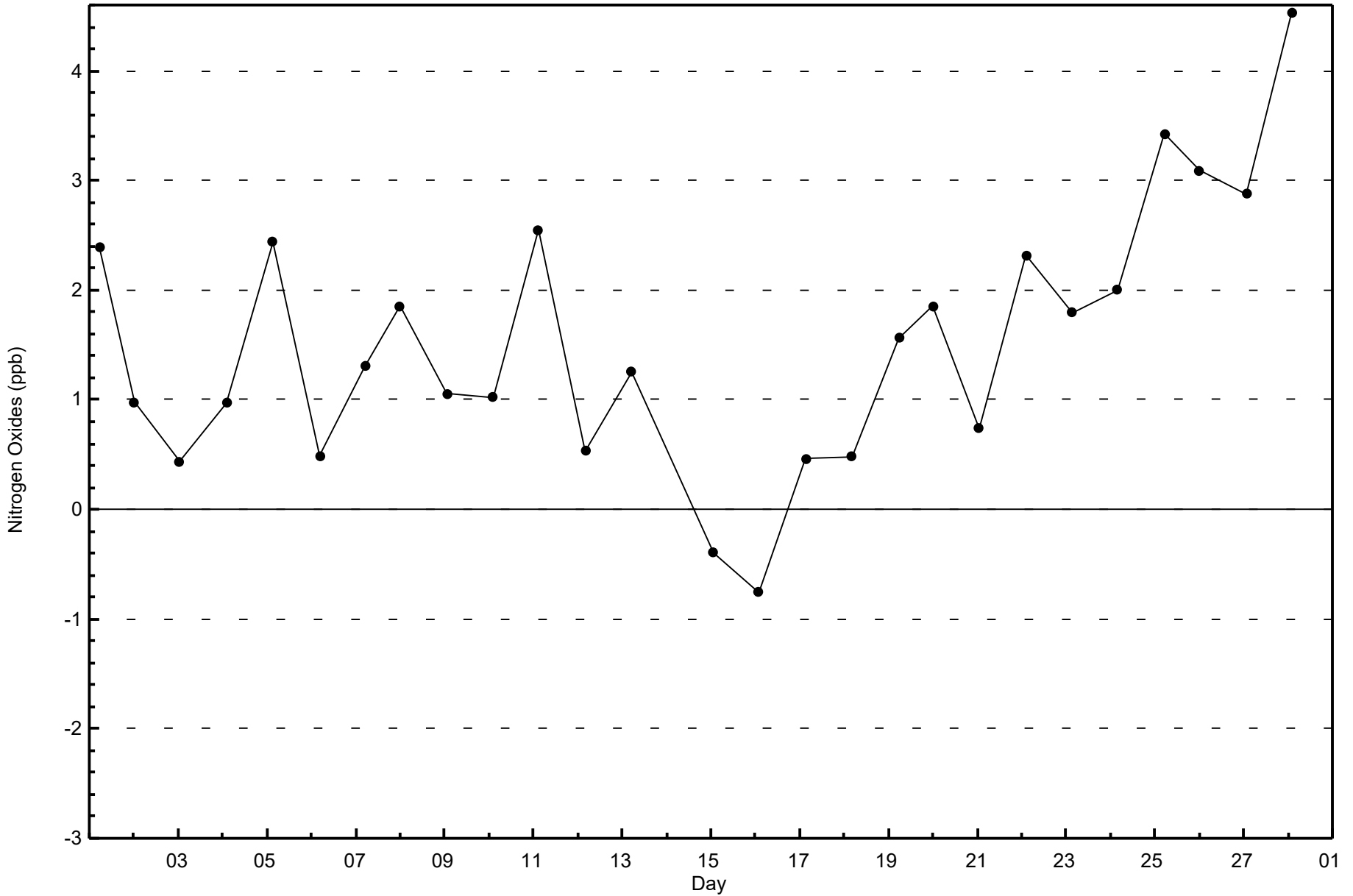
Total Number of Hours: 672

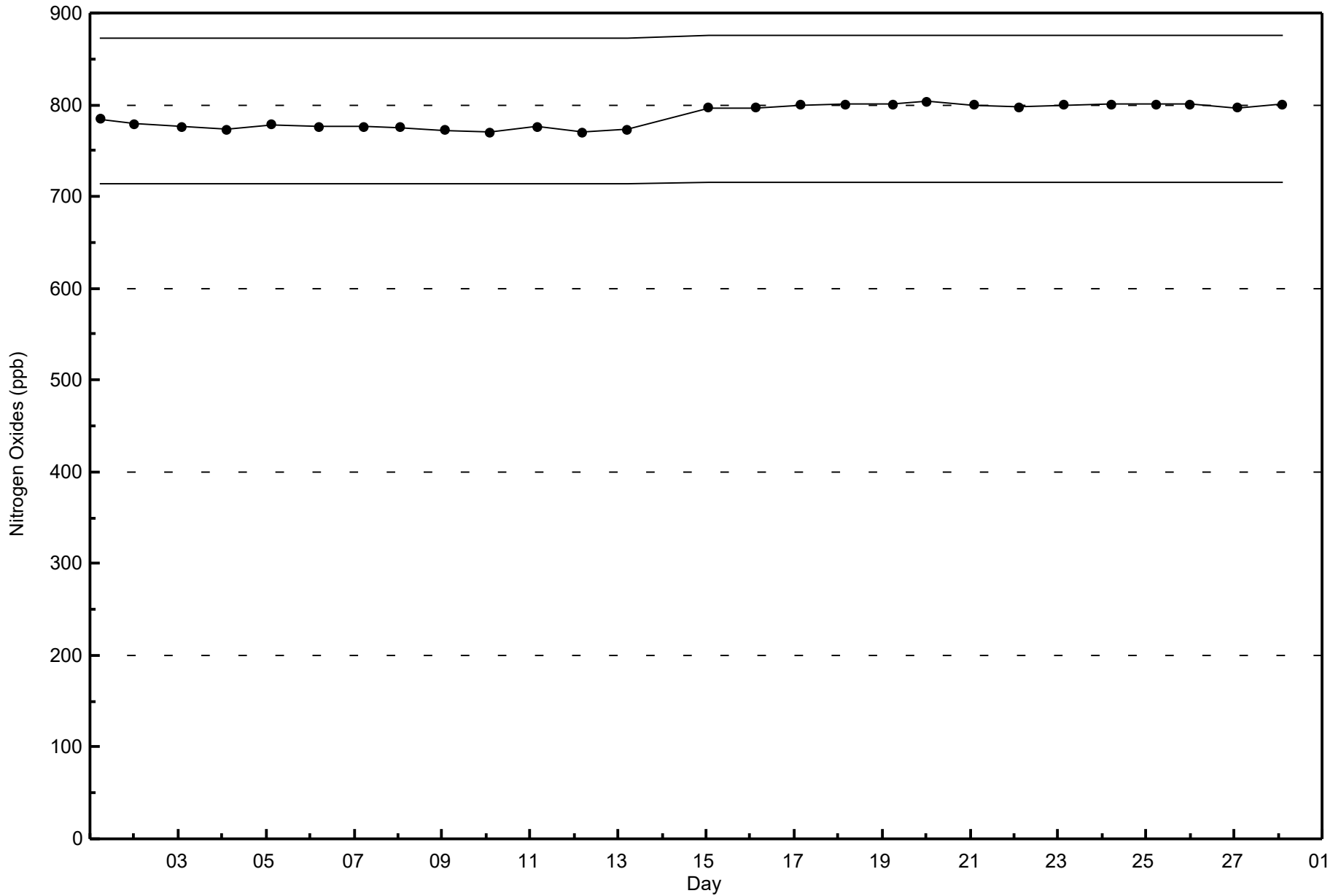


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









Wood Buffalo Environmental Association

Summary of Hour Averages

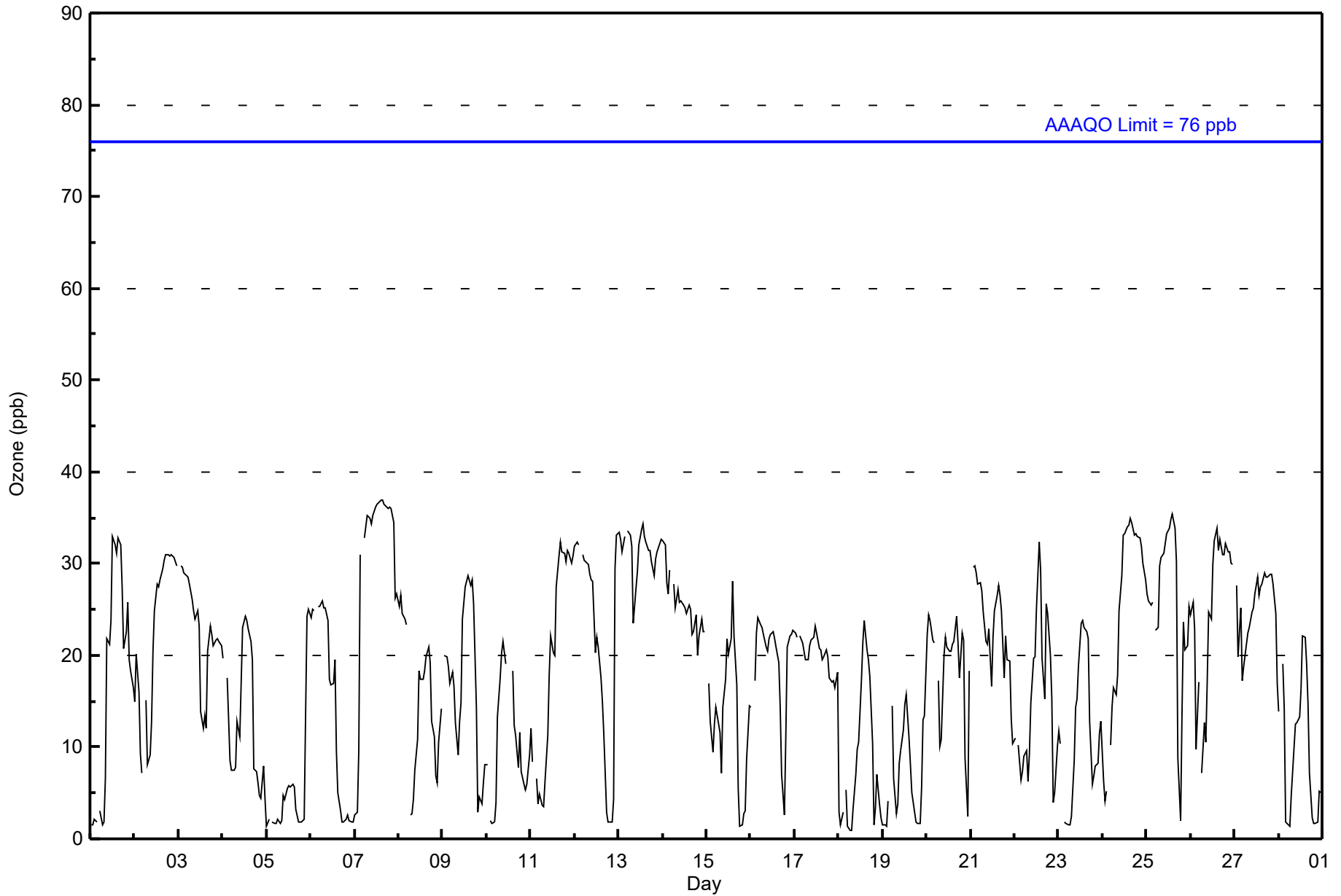
Ozone (O<sub>3</sub>) - ppb

Buffalo Viewpoint - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 36.9 ppb on Feb 7 15:00	Maximum Daily Average: 31.4 ppb on Feb 13		Hours of Data:	641
Minimum Value: 0.8 ppb on Feb 18 08:00	Minimum Daily Average: 5.5 ppb on Feb 5		Hours of Missing Data:	31
Maximum Diurnal Average: 24.3 ppb at hour 14	Minimum Diurnal Average: 14.8 ppb at hour 8		Hours of Calibration:	31
Monthly Average: 18.32 ppb	Percentiles: P <sub>1</sub> = 1.4 P <sub>10</sub> = 2.8 Q <sub>1</sub> = 9.2 Median = 20.2 Q <sub>3</sub> = 26.5 P <sub>90</sub> = 31.5 P <sub>99</sub> = 36.1		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-Feb	1.5	1.5	2.1	1.9	Z	3.1	1.5	1.8	6.5	21.9	21.3	23.7	33.0	32.1	31.1	32.9	32.1	27.4	20.7	22.5	25.8	19.5	18.4	16.5	17.3	33.0
2-Feb	14.9	20.2	16.0	9.3	7.2	Z	15.1	8.1	9.1	12.8	20.4	24.8	27.7	27.4	28.2	29.4	30.3	30.9	30.9	30.9	30.9	30.7	30.3	29.7	22.4	30.9
3-Feb	Z	29.8	29.5	29.0	28.6	28.5	27.8	26.1	24.9	23.9	24.9	23.2	13.9	12.0	13.5	12.1	20.4	23.2	22.3	21.1	21.6	21.8	21.5	21.1	22.6	29.8
4-Feb	19.7	Z	17.5	13.1	8.6	7.5	7.5	7.8	12.9	11.2	17.1	23.0	24.2	23.8	22.9	21.5	19.5	7.7	7.3	6.2	4.8	4.5	7.9	4.4	13.1	24.2
5-Feb	1.4	2.2	Z	1.8	1.7	1.7	2.2	1.7	2.0	4.8	4.3	5.4	5.8	5.7	5.9	5.6	3.2	1.9	1.8	1.9	2.2	13.5	24.3	25.0	5.5	25.0
6-Feb	24.1	25.0	24.9	Z	25.3	25.4	26.0	25.2	25.2	23.7	17.3	16.7	17.0	19.5	9.6	5.1	3.1	1.8	1.8	2.1	2.6	1.9	1.9	1.9	14.2	26.0
7-Feb	2.5	2.9	9.7	30.9	Z	32.8	34.0	35.3	35.0	34.3	35.2	36.1	36.5	36.6	36.9	36.9	36.5	36.3	35.9	36.1	36.0	34.5	26.3	26.6	30.6	36.9
8-Feb	25.3	26.6	24.6	24.0	23.4	Z	2.5	2.7	4.3	7.4	10.8	18.3	17.4	17.4	18.3	19.8	21.0	19.2	12.9	11.2	6.8	6.0	10.5	14.1	15.0	26.6
9-Feb	Z	20.0	19.8	18.8	16.9	18.1	16.6	12.6	9.2	12.9	14.8	23.9	27.4	28.0	28.7	27.6	28.2	25.6	14.3	2.9	4.6	3.9	6.1	8.2	16.9	28.7
10-Feb	8.1	Z	1.9	1.7	1.9	4.0	13.3	17.6	20.3	21.5	19.1	C	C	C	18.3	12.3	11.3	7.7	11.7	7.3	5.9	5.3	5.9	9.2	10.2	21.5
11-Feb	12.0	8.3	Z	6.5	3.8	4.9	3.7	3.5	6.2	11.3	17.8	22.1	20.2	20.0	27.4	30.9	32.4	31.3	31.1	30.2	31.4	31.1	30.1	30.7	19.4	32.4
12-Feb	31.9	32.3	32.0	Z	30.9	30.3	30.3	29.9	28.9	28.2	28.1	20.2	21.9	20.9	17.5	15.0	11.5	3.0	1.8	1.8	1.8	4.3	29.4	33.1	21.1	33.1
13-Feb	33.4	32.6	31.2	32.9	Z	33.6	33.0	31.9	23.6	27.3	29.1	32.0	33.8	34.4	33.0	32.3	31.4	31.5	30.2	28.7	30.5	31.2	32.1	32.7	31.4	34.4
14-Feb	32.5	32.0	28.0	26.7	29.3	Z	27.8	25.1	27.2	25.8	25.9	25.5	25.1	24.5	25.4	25.0	22.3	22.5	24.4	20.0	22.1	23.9	22.6	22.6	25.5	32.5
15-Feb	Z	17.0	12.9	9.4	12.5	14.3	12.5	11.6	7.1	14.3	17.4	21.8	20.2	21.8	28.1	22.1	16.8	5.4	1.4	1.5	2.8	3.1	8.7	14.4	12.9	28.1
16-Feb	14.3	Z	17.3	22.5	24.0	23.3	23.0	22.2	20.9	20.5	21.7	22.3	22.5	21.8	20.9	19.2	14.4	7.0	2.5	11.2	20.9	22.1	22.3	22.8	19.1	24.0
17-Feb	22.5	22.0	Z	22.1	21.3	20.4	19.6	19.5	21.0	21.7	22.0	23.2	22.4	20.7	20.6	19.6	19.8	20.5	19.8	17.6	17.0	17.3	16.4	18.1	20.2	23.2
18-Feb	2.9	1.6	2.9	Z	5.3	1.3	0.9	0.8	3.3	7.0	9.8	10.6	17.2	21.4	23.8	20.6	19.6	17.6	10.4	1.6	3.4	7.0	3.6	2.2	8.5	23.8
19-Feb	1.6	1.5	1.3	4.1	Z	14.6	6.6	2.8	3.9	8.3	9.6	11.9	14.7	15.8	11.0	8.1	5.1	2.9	1.9	1.6	1.7	5.6	13.0	13.4	7.0	15.8
20-Feb	22.2	24.4	23.7	21.7	21.4	Z	17.3	10.0	10.9	20.0	21.9	21.0	20.5	20.4	21.2	21.5	24.2	21.4	17.6	22.5	21.6	8.8	2.5	18.3	18.9	24.4
21-Feb	Z	29.6	29.8	29.0	27.8	27.9	26.9	24.6	21.6	21.2	22.8	16.6	22.0	24.8	26.5	27.6	26.6	24.8	17.6	22.2	19.6	19.4	13.2	10.4	23.1	29.8
22-Feb	10.9	Z	10.3	6.4	7.4	9.1	9.6	6.3	9.3	14.7	19.6	19.8	25.0	32.4	29.3	19.6	15.2	25.6	24.6	19.9	15.3	3.9	5.0	10.0	15.2	32.4
23-Feb	11.7	10.4	Z	1.8	1.6	1.6	1.5	2.4	8.5	14.3	15.2	18.8	23.6	23.8	23.0	22.6	21.8	12.8	6.0	6.9	7.9	8.3	11.4	12.9	11.7	23.8
24-Feb	6.2	4.1	5.2	Z	10.2	14.4	16.5	15.8	17.9	24.9	28.7	33.1	33.2	34.0	34.2	34.9	34.5	33.1	33.2	33.0	32.8	31.9	30.0	28.1	24.8	34.9
25-Feb	26.8	26.0	25.5	25.8	Z	22.7	23.1	29.7	30.7	31.1	32.2	33.1	33.9	34.7	35.3	33.9	30.2	8.9	1.9	13.9	23.7	20.6	21.1	25.3	25.7	35.3
26-Feb	24.4	25.8	22.9	9.7	17.1	Z	7.2	12.6	10.5	17.2	24.7	23.9	29.9	32.4	33.9	31.5	32.7	31.0	30.9	32.2	31.2	31.2	30.0	29.9	24.9	33.9
27-Feb	Z	27.7	19.8	25.2	17.2	18.8	21.3	22.4	23.0	24.7	25.1	26.8	28.5	26.6	27.4	27.8	29.0	28.5	28.6	28.8	28.8	27.7	24.6	16.9	25.0	29.0
28-Feb	13.9	Z	19.1	14.1	1.9	1.5	1.4	4.7	9.9	12.6	12.6	13.2	16.3	22.2	22.0	19.1	14.6	7.2	2.3	1.6	1.7	1.8	5.2	5.0	9.7	22.2
15.9 18.4 17.8 16.2 15.0 15.6 15.3 14.8 15.5 18.6 20.3 21.9 23.5 24.3 24.1 22.7 21.7 18.4 15.9 15.6 16.3 15.7 16.9 18.0																								Diurnal Average		
33.4 32.6 32.0 32.9 30.9 33.6 34.0 35.3 35.0 34.3 35.2 36.1 36.5 36.6 36.9 36.9 36.5 36.3 35.9 36.1 36.0 34.5 32.1 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**  
**Buffalo Viewpoint - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	331	51.64	51.64
21 - 50	310	48.36	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 641

Total Number of Hours: 672



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

**Ozone (O<sub>3</sub>) - ppb**  
**Buffalo Viewpoint - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	75	24	13	4	3	8	37	68	16	4	4	1	8	11	26	29	331
21 - 50	69	38	8	2	6	4	18	37	17	5	3	23	28	20	10	6	294
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>	144	62	21	6	9	12	55	105	33	9	7	24	36	31	36	35	625

Total Number of Valid Hours: 625

Total Number of Hours: 672

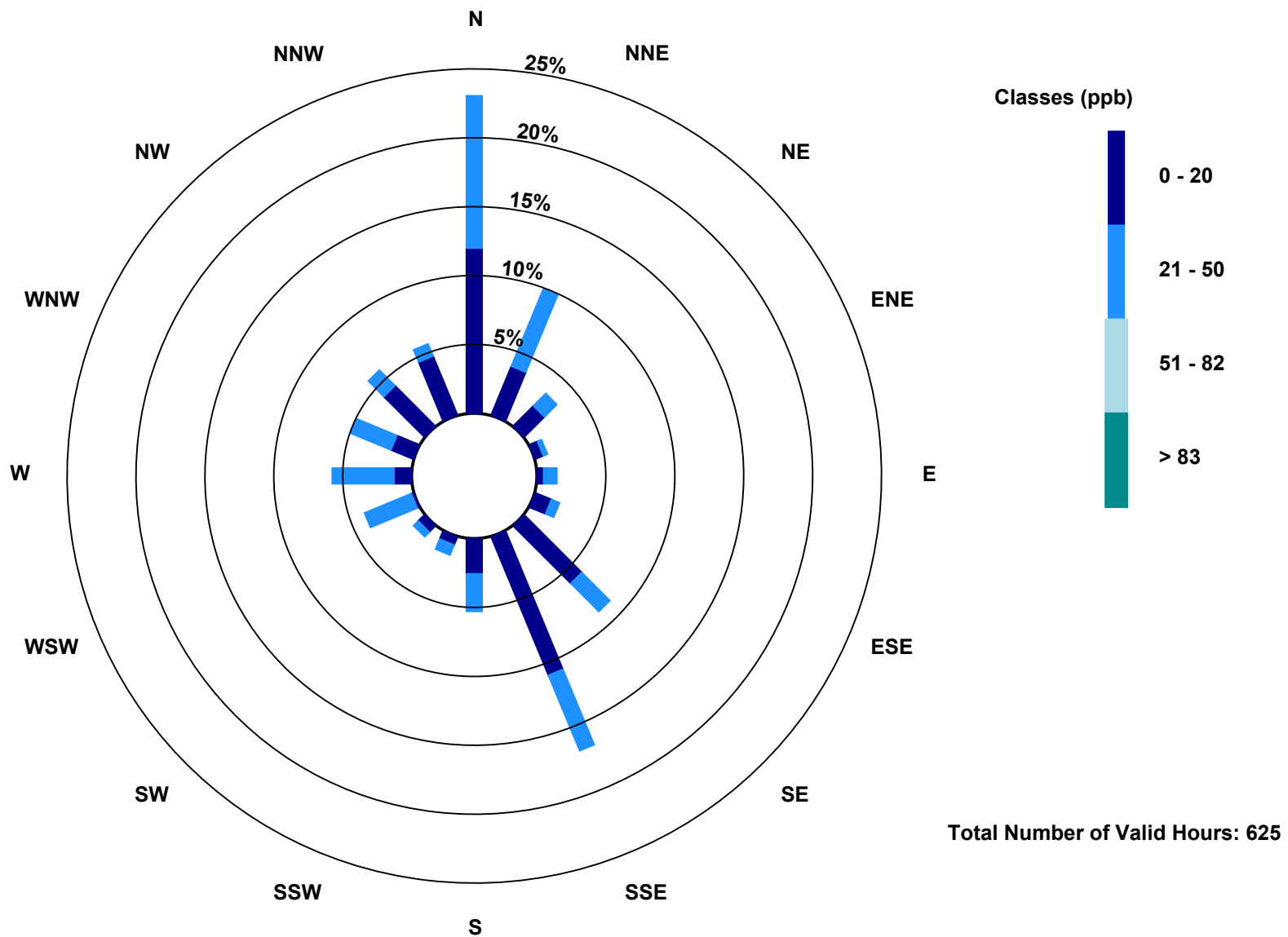


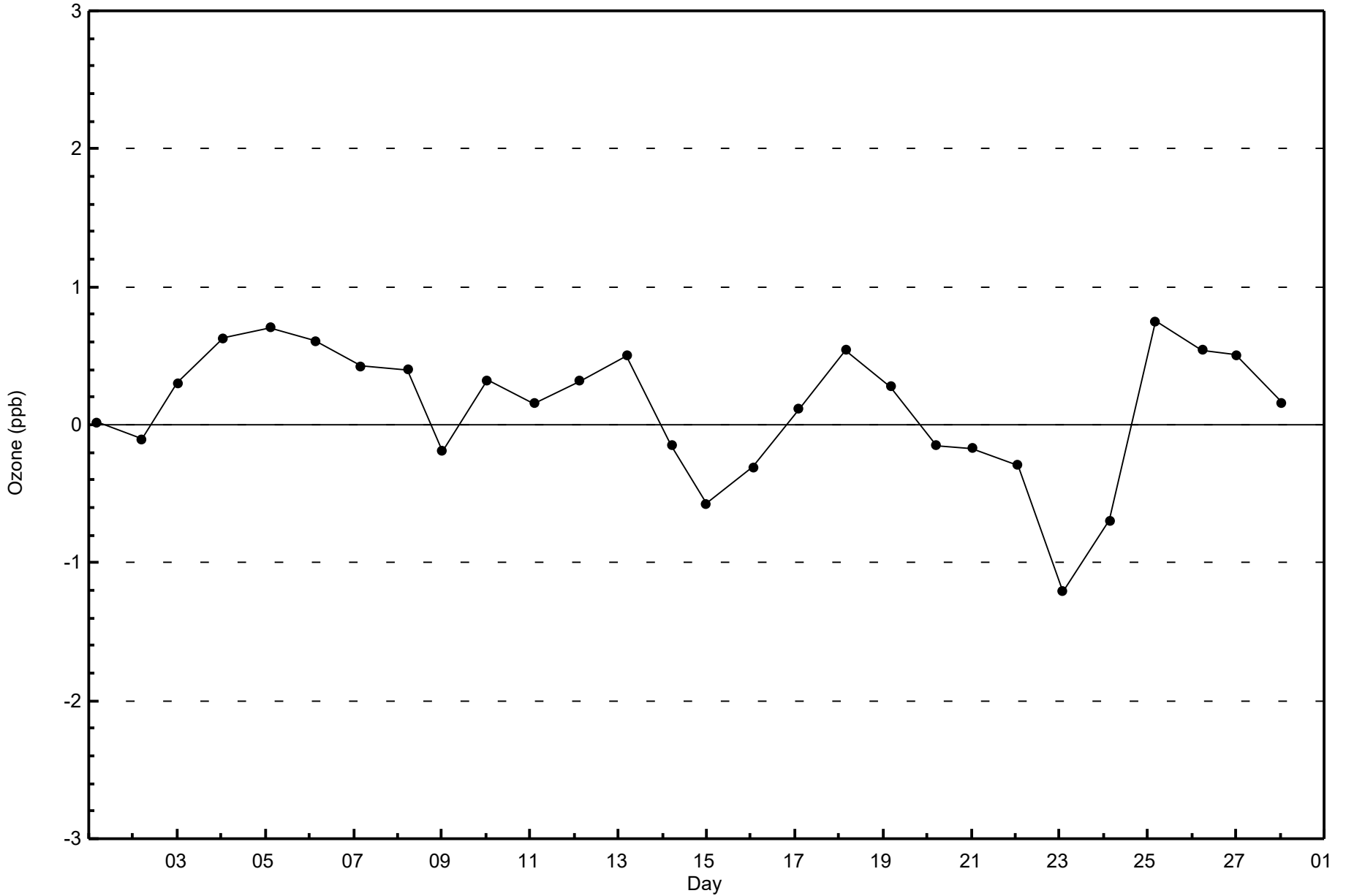
Wood Buffalo Environmental Association

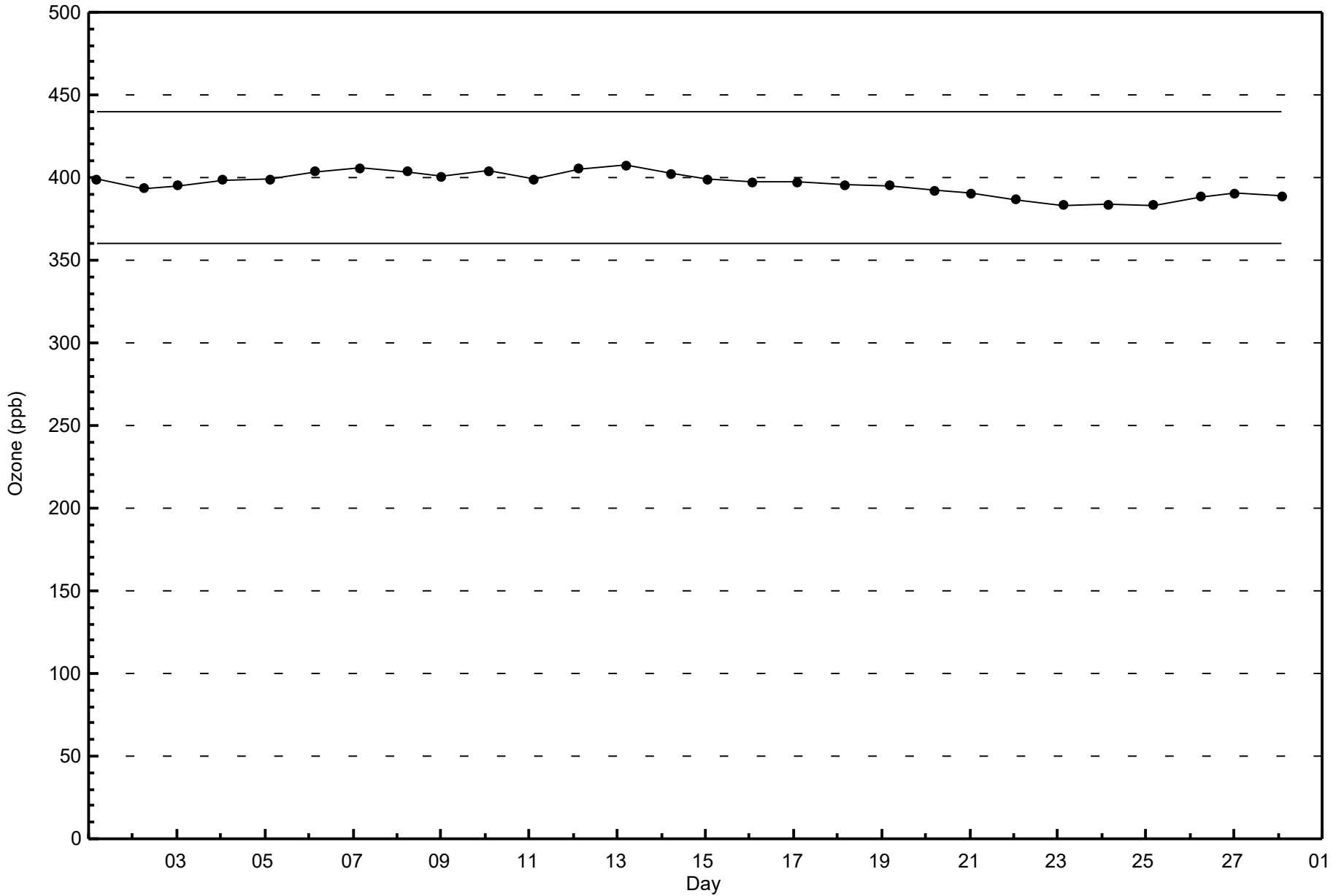
Wind Rose Feb 2023

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

Buffalo Viewpoint









Summary of Hour Averages

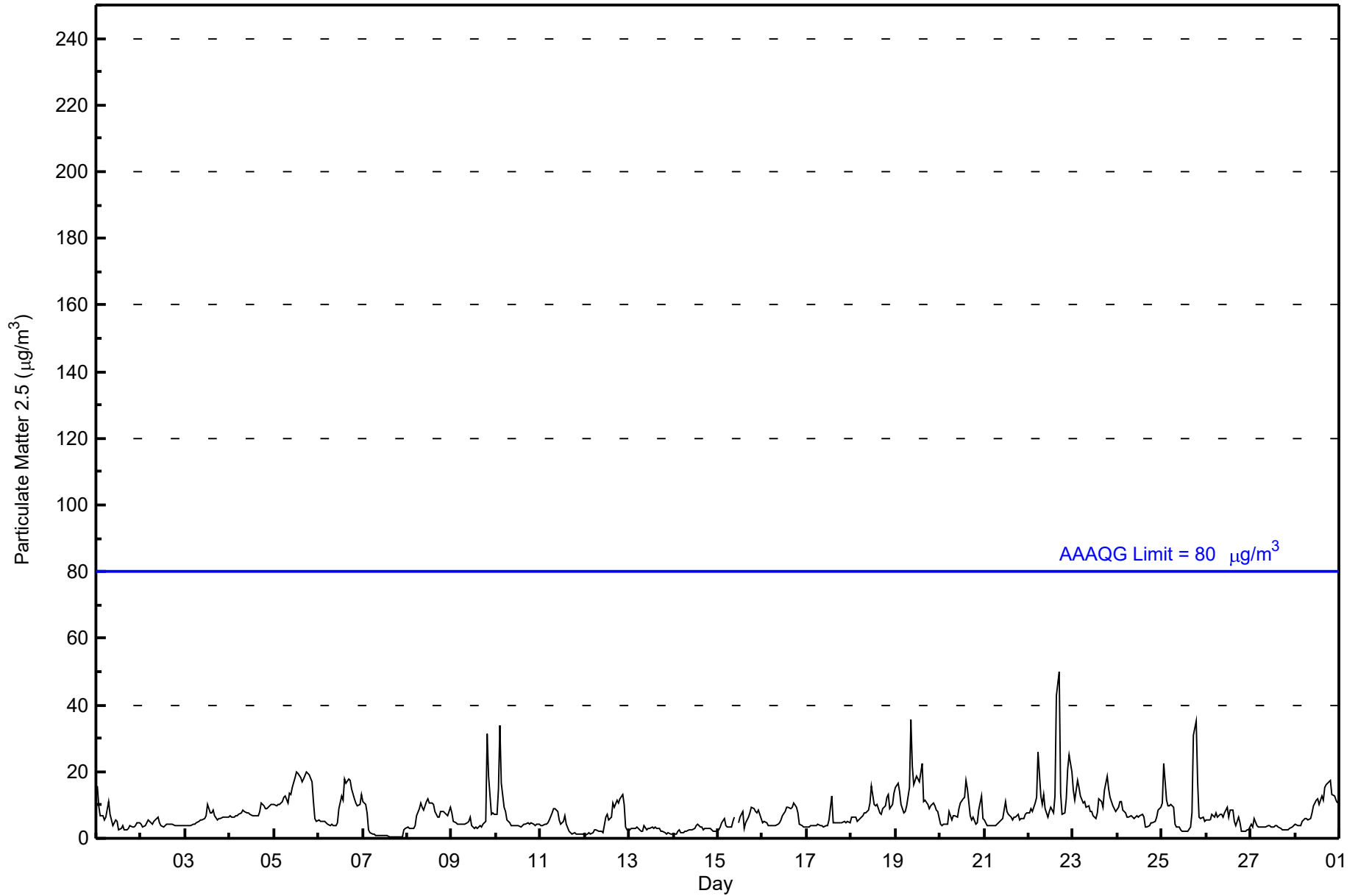
Buffalo Viewpoint - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:															672						
Maximum Value: 49.9 µg/m <sup>3</sup> on Feb 22 17:00		Maximum Daily Average: 15.0 µg/m <sup>3</sup> on Feb 22															Hours of Data:		671								
Minimum Value: 0.5 µg/m <sup>3</sup> on Feb 7 21:00		Minimum Daily Average: 2.1 µg/m <sup>3</sup> on Feb 7															Hours of Missing Data:		1								
Maximum Diurnal Average: 8.5 µg/m <sup>3</sup> at hour 19		Minimum Diurnal Average: 5.6 µg/m <sup>3</sup> at hour 5															Hours of Calibration:		1								
Monthly Average: 7.08 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 0.6 P <sub>10</sub> = 2.4 Q <sub>1</sub> = 3.7 Median = 5.8 Q <sub>3</sub> = 9.1 P <sub>90</sub> = 12.8 P <sub>99</sub> = 27.5															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-Feb	15.8	9.9	7.0	6.8	5.5	6.5	10.9	7.1	5.6	3.9	5.4	5.3	2.5	3.1	3.9	2.7	2.6	3.0	3.8	3.6	3.2	3.7	4.5	4.5	5.5	15.8	
2-Feb	4.1	3.4	3.9	4.9	5.5	4.7	4.3	5.0	5.8	6.5	4.7	3.9	3.4	3.8	4.0	4.4	4.2	4.1	4.0	3.9	3.7	3.7	3.8	3.8	4.3	6.5	
3-Feb	3.9	3.8	3.8	3.9	4.1	4.3	4.5	5.0	5.4	5.7	5.9	6.6	10.0	7.7	7.8	8.5	6.8	5.6	5.7	6.1	6.3	6.3	6.2	6.4	5.8	10.0	
4-Feb	6.7	6.4	6.4	6.8	7.0	7.2	7.8	8.4	8.1	7.8	7.5	7.1	6.9	6.7	6.7	6.8	8.2	10.6	9.5	8.9	9.4	10.1	10.0	7.9	10.6		
5-Feb	10.0	9.9	10.1	10.4	11.1	12.4	12.7	10.5	13.5	13.0	15.2	18.3	19.7	19.6	18.4	17.1	17.8	20.0	19.5	19.1	17.0	10.8	6.1	5.3	14.1	20.0	
6-Feb	5.4	5.1	5.0	4.9	4.5	4.3	4.0	4.2	3.9	3.7	4.9	8.7	12.9	11.6	17.7	16.5	17.6	17.5	14.7	11.7	10.5	9.7	10.2	13.0	9.3	17.7	
7-Feb	11.1	10.0	7.5	2.4	1.7	1.4	1.1	0.7	0.8	0.9	1.1	0.8	0.8	0.6	0.6	0.5	0.5	0.6	0.6	0.5	0.5	0.6	2.5	3.1	2.1	11.1	
8-Feb	3.2	2.9	3.0	3.1	3.8	6.9	8.7	10.5	9.5	8.3	11.2	11.9	10.5	10.4	10.2	8.0	6.3	6.2	8.2	8.0	7.7	7.2	7.0	9.4	7.6	11.9	
9-Feb	7.6	4.9	4.7	4.2	4.2	4.1	4.3	4.4	4.6	5.0	6.2	3.7	2.9	3.3	3.1	3.7	3.5	4.3	5.1	31.2	18.5	7.1	7.5	7.4	6.5	31.2	
10-Feb	7.1	14.8	34.0	16.7	9.4	7.9	5.5	4.5	3.8	3.7	3.9	3.8	3.6	3.6	3.8	4.4	4.2	4.5	4.4	4.5	4.4	4.0	4.1	4.1	6.9	34.0	
11-Feb	4.0	4.0	4.4	4.3	4.7	5.3	7.8	8.7	9.0	8.2	5.5	4.1	5.1	6.9	4.2	2.1	1.9	1.5	1.6	1.4	1.1	1.1	1.4	1.2	4.1	9.0	
12-Feb	1.0	1.3	1.5	1.5	1.8	2.4	2.4	2.3	2.1	1.9	1.8	6.2	7.3	5.6	6.4	10.6	9.5	11.2	10.8	12.1	13.1	10.1	3.3	2.5	5.4	13.1	
13-Feb	2.6	3.0	3.0	3.0	3.2	3.0	2.2	2.0	3.7	2.7	2.9	3.1	3.4	3.0	3.3	3.0	3.0	2.3	2.0	1.8	1.4	1.5	1.4	1.3	2.6	3.7	
14-Feb	1.4	1.4	2.1	2.5	1.8	1.6	2.1	2.2	2.4	2.6	2.7	2.9	3.7	4.3	3.6	3.3	3.0	2.6	2.8	3.0	2.9	3.2	2.0	2.3	2.3	2.6	4.3
15-Feb	2.4	3.2	4.8	6.0	3.6	3.3	3.3	3.5	4.9	6.4	C	4.6	6.5	8.2	3.0	4.6	6.3	7.5	9.1	8.9	8.0	7.8	8.6	6.1	5.7	9.1	
16-Feb	4.7	4.9	4.6	3.9	3.7	3.7	3.7	4.0	4.3	4.7	5.5	6.7	8.2	9.2	9.1	9.0	9.4	10.7	9.4	7.5	4.2	3.6	3.4	3.5	5.9	10.7	
17-Feb	3.4	3.5	3.7	3.7	3.7	3.7	4.0	3.9	3.7	3.6	3.8	3.6	5.5	12.7	4.8	4.7	4.6	4.8	4.5	4.8	5.2	4.9	5.0	4.6	4.6	12.7	
18-Feb	6.5	6.4	6.2	5.2	5.6	6.1	6.6	7.6	7.8	8.7	10.6	15.8	10.1	9.7	10.0	7.5	7.1	9.0	9.7	12.2	13.2	9.0	10.0	13.7	8.9	15.8	
19-Feb	15.3	16.4	14.0	10.1	7.6	8.0	9.6	15.1	35.6	21.5	16.3	18.6	17.7	16.9	22.4	11.0	11.4	10.1	8.8	9.6	10.5	9.8	8.6	8.1	13.9	35.6	
20-Feb	4.3	3.8	4.1	4.3	4.4	7.9	5.5	6.8	6.9	6.6	8.8	10.7	11.8	12.4	17.3	14.9	6.7	5.5	6.2	4.4	4.5	8.4	12.9	6.1	7.7	17.3	
21-Feb	5.7	3.7	3.7	3.7	3.8	3.8	3.9	4.3	4.9	5.5	6.0	11.2	8.2	7.0	6.5	5.4	6.3	6.4	7.1	5.6	5.8	6.1	7.3	7.6	5.8	11.2	
22-Feb	7.7	8.9	7.9	10.5	12.2	26.0	12.6	10.2	13.1	8.9	6.3	7.9	9.4	7.5	12.7	42.8	49.9	13.6	7.1	7.6	11.8	20.9	24.8	20.1	15.0	49.9	
23-Feb	14.4	11.4	17.5	15.0	12.7	10.7	10.9	9.4	9.5	8.1	8.0	6.6	5.8	7.4	11.9	11.1	9.3	14.6	18.5	15.0	12.2	9.9	9.0	8.2	11.1	18.5	
24-Feb	9.3	11.0	10.9	8.4	7.5	6.3	6.2	6.9	6.5	5.9	6.8	6.2	6.8	7.2	6.5	3.6	3.3	3.7	4.5	4.5	5.0	6.4	8.3	9.4	6.7	11.0	
25-Feb	10.6	22.5	11.4	9.9	9.6	10.1	9.2	4.1	3.5	3.3	2.7	2.3	2.1	2.0	2.1	3.2	7.4	31.0	35.3	16.8	6.6	6.0	6.6	4.9	9.3	35.3	
26-Feb	5.7	5.4	5.5	7.2	6.5	7.6	6.5	7.4	7.1	6.4	7.7	9.3	6.2	8.4	8.6	5.1	3.7	6.2	4.5	2.1	2.2	2.2	2.4	2.7	5.7	9.3	
27-Feb	4.4	3.5	5.8	4.0	3.6	3.5	3.4	3.4	3.6	3.7	3.7	3.5	3.5	3.7	3.6	3.5	3.0	2.7	2.4	2.4	2.4	2.8	3.3	3.8	3.5	5.8	
28-Feb	4.1	3.9	3.6	3.9	5.0	5.9	5.8	5.4	5.8	7.8	9.6	11.4	11.9	10.3	12.8	11.2	15.2	16.1	16.9	17.3	13.2	12.6	11.5	10.4	9.7	17.3	
		6.5	6.8	7.1	6.1	5.6	6.4	6.0	6.0	7.0	6.2	6.5	7.3	7.4	7.6	8.0	8.2	8.3	8.4	8.5	8.4	7.3	6.7	6.9	6.6	Diurnal Average	
		15.8	22.5	34.0	16.7	12.7	26.0	12.7	15.1	35.6	21.5	16.3	18.6	19.7	19.6	22.4	42.8	49.9	31.0	35.3	31.2	18.5	20.9	24.8	20.1	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**  
**Hourly Averages**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Buffalo Viewpoint - February 2023**





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

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Buffalo Viewpoint - February 2023**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	318	47.39	47.39
6 - 15	309	46.05	93.44
16 - 25	36	5.37	98.81
26 - 80	8	1.19	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 671

Total Number of Hours: 672





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

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>**  
**Buffalo Viewpoint - February 2023**

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	82	27	12	1	3	2	25	49	11	3	2	24	29	14	8	9	301
6 - 15	64	36	7	4	6	7	31	54	20	6	4	2	6	13	25	24	309
16 - 25	5	2	0	1	0	3	3	5	2	1	2	0	1	4	4	3	36
26 - 80	0	1	2	0	0	0	0	3	0	0	0	0	2	0	0	0	8
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	151	66	21	6	9	12	59	111	33	10	8	26	38	31	37	36	654

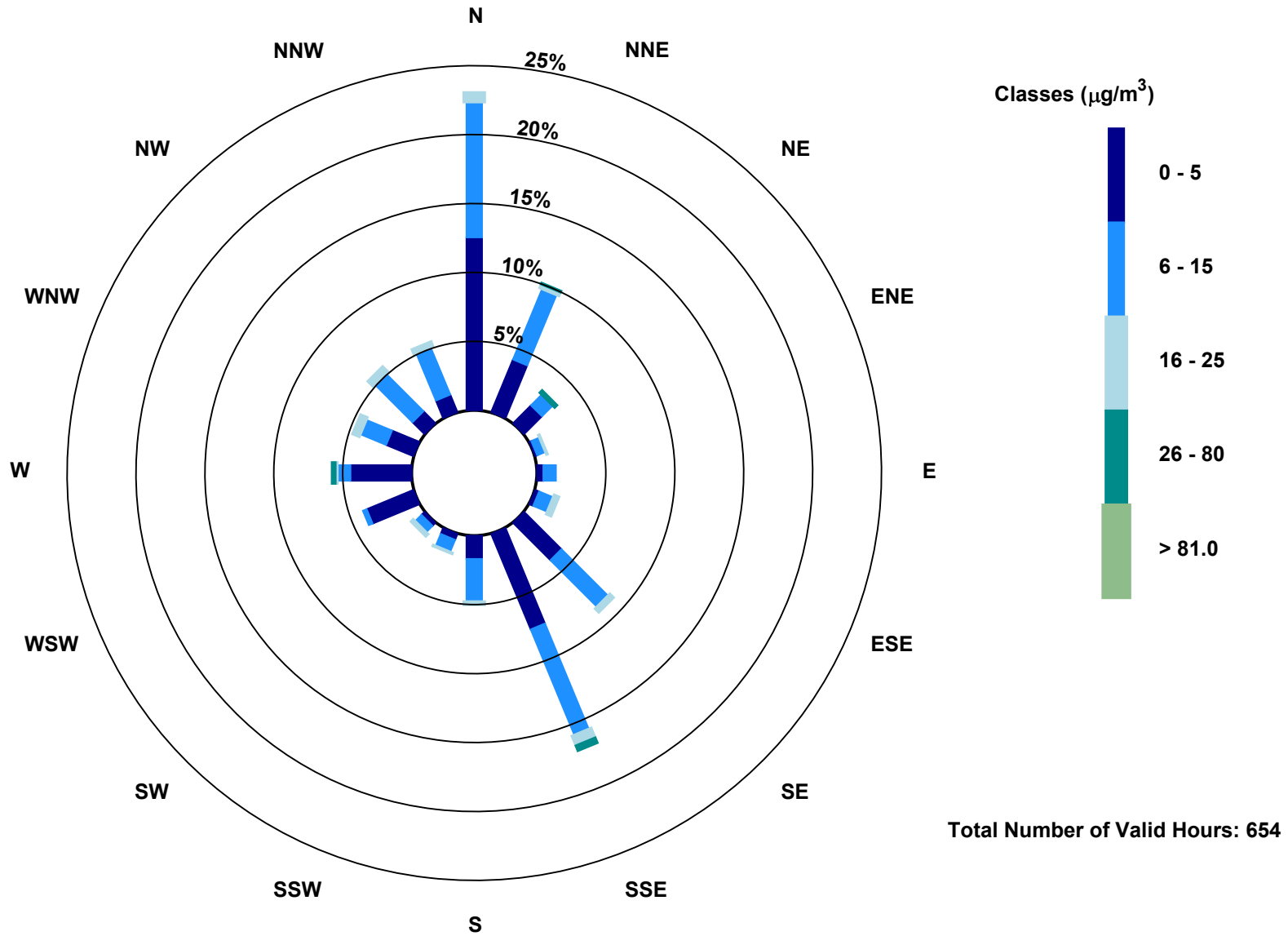
Total Number of Valid Hours: 654

Total Number of Hours: 672



**Wood Buffalo Environmental Association**  
**Wind Rose Feb 2023**

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

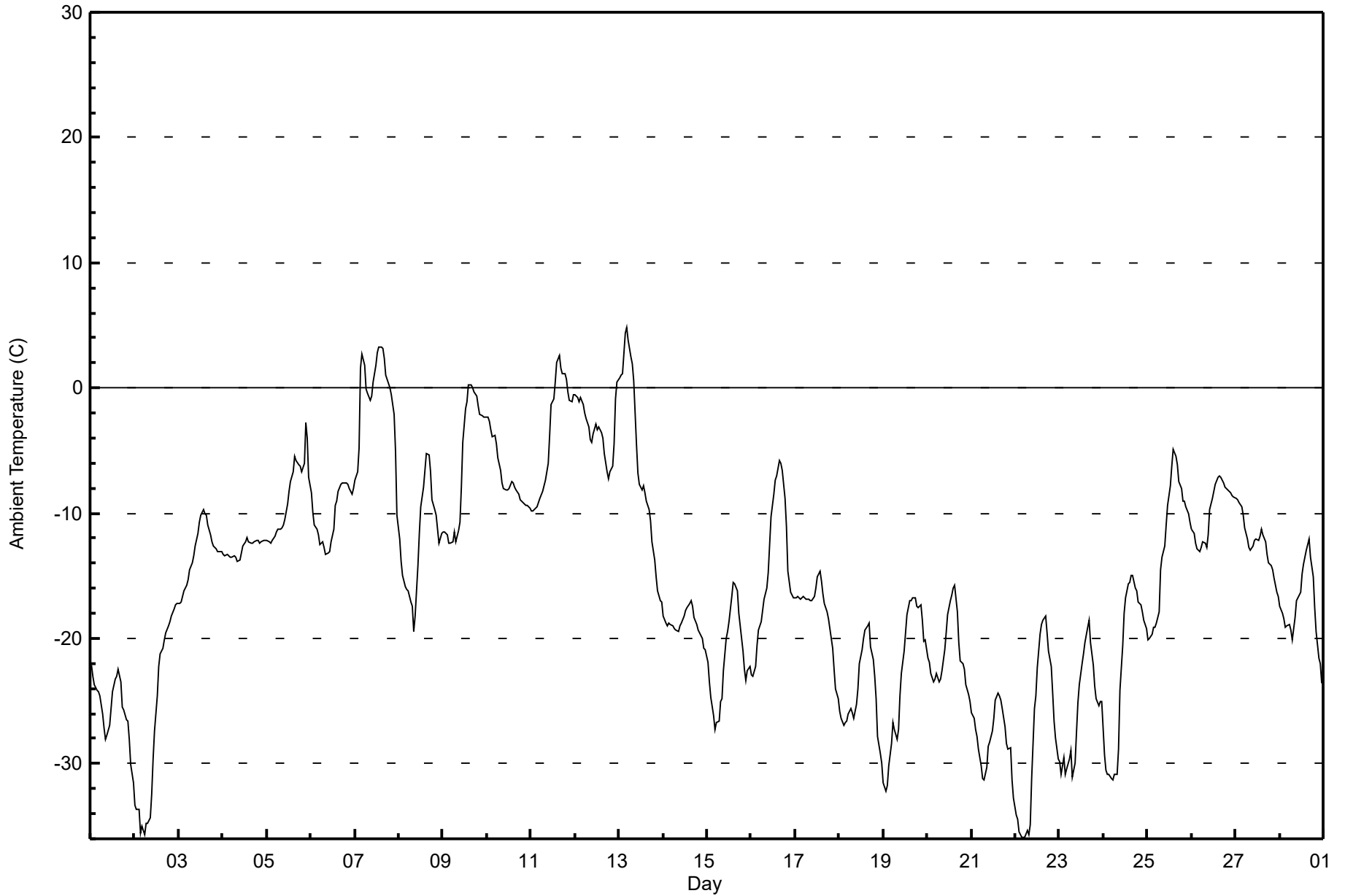




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Ambient Temperature (AT) - C**  
**Buffalo Viewpoint - February 2023**

Maximum Value: 4.8 C on Feb 13 05:00		Maximum Daily Average: -0.6 C on Feb 7		Hours in Service: 672																							
Minimum Value: -35.9 C on Feb 22 04:00		Minimum Daily Average: -28.0 C on Feb 21		Hours of Data: 672																							
Maximum Diurnal Average: -11.4 C at hour 16		Minimum Diurnal Average: -18.0 C at hour 8		Hours of Missing Data: 0																							
Monthly Average: -15.41 C		Percentiles: P <sub>1</sub> = -35.4 P <sub>10</sub> = -27.7 Q <sub>1</sub> = -22.0 Median = -15.5 Q <sub>3</sub> = -8.9 P <sub>90</sub> = -3.2 P <sub>99</sub> = 2.7		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-Feb	-22.2	-23.0	-23.7	-24.1	-24.2	-24.6	-26.1	-27.1	-28.0	-27.7	-26.9	-25.6	-24.2	-23.3	-23.0	-22.4	-23.5	-25.5	-25.8	-26.5	-26.6	-28.0	-30.1	-31.6	-25.6	-22.2	
2-Feb	-33.4	-33.7	-33.6	-35.5	-35.0	-35.7	-34.8	-34.8	-34.3	-32.4	-29.7	-27.4	-24.6	-22.3	-21.2	-20.7	-20.1	-19.5	-19.0	-18.7	-18.2	-17.7	-17.3	-17.2	-26.5	-17.2	
3-Feb	-17.2	-17.1	-16.7	-16.2	-15.7	-15.3	-14.6	-13.9	-13.4	-12.6	-11.6	-10.7	-10.1	-9.7	-10.1	-10.1	-11.0	-11.8	-12.3	-12.6	-12.9	-13.0	-13.1	-13.1	-13.1	-9.7	
4-Feb	-13.3	-13.4	-13.3	-13.4	-13.5	-13.5	-13.4	-13.6	-13.8	-13.7	-13.2	-12.6	-12.3	-11.9	-12.2	-12.4	-12.4	-12.3	-12.2	-12.2	-12.4	-12.2	-12.2	-12.2	-12.2	-12.8	-11.9
5-Feb	-12.2	-12.3	-12.3	-12.1	-11.8	-11.5	-11.3	-11.3	-11.1	-10.9	-10.5	-9.2	-8.2	-7.5	-6.6	-5.5	-5.8	-6.2	-6.3	-6.7	-6.1	-2.8	-4.0	-7.1	-8.7	-2.8	
6-Feb	-8.4	-9.9	-11.0	-11.3	-11.7	-12.5	-12.2	-12.7	-13.3	-13.2	-13.0	-12.3	-11.3	-9.4	-9.0	-8.2	-7.7	-7.6	-7.6	-7.5	-7.7	-8.1	-8.4	-8.0	-10.1	-7.5	
7-Feb	-7.3	-6.7	-4.8	1.6	2.7	1.8	-0.1	-0.5	-0.9	-0.6	0.5	1.8	2.8	3.2	3.3	3.1	2.3	1.1	0.3	0.0	-0.5	-2.1	-5.0	-10.2	-0.6	3.3	
8-Feb	-12.0	-13.9	-15.0	-15.8	-16.1	-16.2	-17.1	-17.5	-19.4	-18.2	-14.2	-11.6	-9.5	-7.9	-6.5	-5.3	-5.3	-6.7	-8.9	-9.7	-10.2	-11.3	-12.4	-11.6	-12.2	-5.3	
9-Feb	-11.5	-11.5	-11.7	-12.4	-12.4	-12.3	-11.5	-12.3	-11.3	-10.8	-8.0	-4.4	-1.6	-1.1	0.2	0.3	0.1	-0.3	-0.7	-1.4	-2.2	-2.3	-2.3	-2.3	-6.0	0.3	
10-Feb	-2.3	-2.6	-3.3	-3.9	-3.7	-4.5	-5.6	-6.6	-7.6	-8.1	-8.2	-8.2	-8.0	-7.5	-7.6	-7.9	-8.1	-8.4	-8.9	-9.0	-9.3	-9.4	-9.4	-9.6	-7.0	-2.3	
11-Feb	-9.8	-9.8	-9.6	-9.5	-9.2	-8.8	-8.3	-7.9	-7.3	-6.0	-3.8	-1.4	-0.8	0.5	2.0	2.6	1.6	1.2	1.2	0.7	-0.3	-1.0	-1.1	-0.5	-3.6	2.6	
12-Feb	-0.6	-0.7	-1.1	-0.7	-1.3	-2.0	-2.4	-3.1	-4.2	-4.3	-3.7	-2.8	-3.4	-3.2	-3.6	-4.0	-5.2	-6.7	-7.3	-6.6	-6.2	-4.5	-0.8	0.5	-3.2	0.5	
13-Feb	0.8	1.1	1.1	4.3	4.8	3.8	2.5	1.9	0.6	-4.5	-6.8	-7.7	-8.2	-7.9	-8.4	-9.0	-9.7	-10.6	-12.3	-13.7	-15.1	-16.2	-17.0	-17.1	-6.0	4.8	
14-Feb	-18.2	-18.7	-19.0	-18.8	-18.9	-19.0	-19.3	-19.3	-19.4	-19.0	-18.7	-18.2	-17.8	-17.6	-17.2	-17.0	-17.4	-18.3	-18.9	-19.4	-19.6	-20.1	-20.8	-21.0	-18.8	-17.0	
15-Feb	-21.9	-23.5	-24.7	-26.2	-27.3	-26.8	-26.6	-25.1	-24.8	-22.5	-20.0	-19.4	-18.7	-16.7	-15.5	-15.7	-16.2	-18.0	-18.9	-21.0	-22.5	-23.3	-22.5	-22.3	-21.7	-15.5	
16-Feb	-22.9	-23.0	-22.2	-20.5	-19.4	-18.7	-17.8	-16.9	-16.0	-14.7	-12.5	-10.3	-8.4	-7.4	-7.0	-5.8	-6.0	-6.6	-8.8	-11.1	-14.7	-16.3	-16.6	-16.7	-14.2	-5.8	
17-Feb	-16.7	-16.6	-16.8	-16.9	-16.7	-16.8	-16.9	-16.9	-17.0	-17.0	-16.7	-16.0	-15.1	-14.7	-15.4	-16.4	-17.3	-17.9	-18.5	-19.2	-20.8	-22.4	-24.1	-24.9	-17.8	-14.7	
18-Feb	-25.8	-26.4	-27.0	-26.8	-26.6	-26.1	-25.6	-25.9	-26.4	-25.2	-24.0	-22.0	-20.9	-20.0	-19.3	-19.0	-18.8	-20.7	-21.7	-23.0	-24.8	-27.8	-29.1	-30.0	-24.3	-18.8	
19-Feb	-31.5	-32.2	-31.7	-30.2	-28.4	-26.8	-27.3	-28.1	-27.3	-24.6	-22.8	-21.0	-19.5	-18.1	-17.0	-16.9	-16.7	-16.8	-17.5	-17.5	-17.4	-18.6	-20.2	-20.2	-22.8	-16.7	
20-Feb	-21.5	-21.9	-22.8	-23.5	-23.3	-22.8	-23.5	-23.2	-22.6	-20.9	-19.5	-18.1	-16.9	-16.5	-16.0	-15.7	-17.8	-20.4	-21.8	-22.0	-22.4	-23.7	-24.5	-25.0	-21.1	-15.7	
21-Feb	-25.9	-26.4	-27.3	-27.8	-28.9	-30.2	-31.2	-31.3	-30.3	-28.6	-28.3	-27.4	-26.4	-25.0	-24.3	-24.6	-24.9	-25.6	-27.0	-28.4	-28.9	-28.7	-31.3	-32.7	-28.0	-24.3	
22-Feb	-34.1	-34.4	-35.5	-35.9	-35.9	-35.8	-35.4	-35.6	-34.8	-31.2	-25.6	-24.6	-22.4	-19.6	-18.9	-18.5	-18.2	-19.6	-21.0	-22.2	-24.4	-26.6	-28.0	-29.6	-27.8	-18.2	
23-Feb	-29.9	-30.8	-29.5	-30.9	-30.4	-29.6	-29.0	-31.1	-29.9	-27.4	-25.1	-23.7	-22.0	-21.2	-20.3	-19.1	-18.6	-20.4	-22.2	-23.9	-24.8	-25.4	-25.1	-25.0	-25.6	-18.6	
24-Feb	-29.3	-30.5	-30.9	-30.9	-31.2	-31.2	-30.9	-30.9	-28.8	-24.1	-20.6	-18.0	-16.7	-15.7	-15.5	-15.0	-15.0	-15.9	-16.2	-17.1	-17.4	-17.9	-18.6	-19.3	-22.4	-15.0	
25-Feb	-20.2	-20.0	-19.7	-19.2	-19.2	-18.7	-17.8	-14.6	-13.5	-12.1	-11.0	-9.3	-7.8	-6.3	-4.9	-5.5	-6.1	-7.5	-8.1	-9.0	-9.0	-9.5	-10.1	-10.7	-12.1	-4.9	
26-Feb	-11.3	-11.6	-12.4	-12.8	-13.1	-12.7	-12.3	-12.4	-12.7	-11.8	-9.7	-8.8	-8.2	-7.7	-7.1	-7.0	-7.2	-7.6	-7.9	-8.0	-8.2	-8.4	-8.5	-8.7	-9.8	-7.0	
27-Feb	-8.8	-8.9	-9.1	-9.4	-10.2	-11.1	-12.0	-12.7	-12.9	-12.6	-12.2	-12.1	-12.1	-11.8	-11.2	-11.7	-12.2	-13.3	-13.9	-14.2	-14.6	-15.2	-16.3	-16.6	-12.3	-8.8	
28-Feb	-17.4	-18.0	-18.4	-19.1	-19.1	-18.8	-19.4	-20.1	-18.3	-16.9	-16.8	-16.3	-14.9	-14.1	-13.0	-12.5	-12.0	-13.5	-15.1	-17.5	-19.5	-21.6	-22.1	-23.5	-17.4	-12.0	
		-17.3	-17.7	-17.9	-17.8	-17.7	-17.9	-18.0	-17.8	-16.9	-15.4	-14.2	-13.1	-12.1	-11.6	-11.4	-11.8	-12.7	-13.5	-14.2	-14.9	-15.5	-16.1	-16.7	Diurnal Average		
		0.8	1.1	1.1	4.3	4.8	3.8	2.5	1.9	0.6	-0.6	0.5	1.8	2.8	3.2	3.3	3.1	2.3	1.2	1.2	0.7	-0.3	-1.0	-0.8	0.5	Diurnal Maximum	





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Buffalo Viewpoint - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	199	29.61	29.61
-20 - 0	441	65.63	95.24
0 - 10	32	4.76	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672

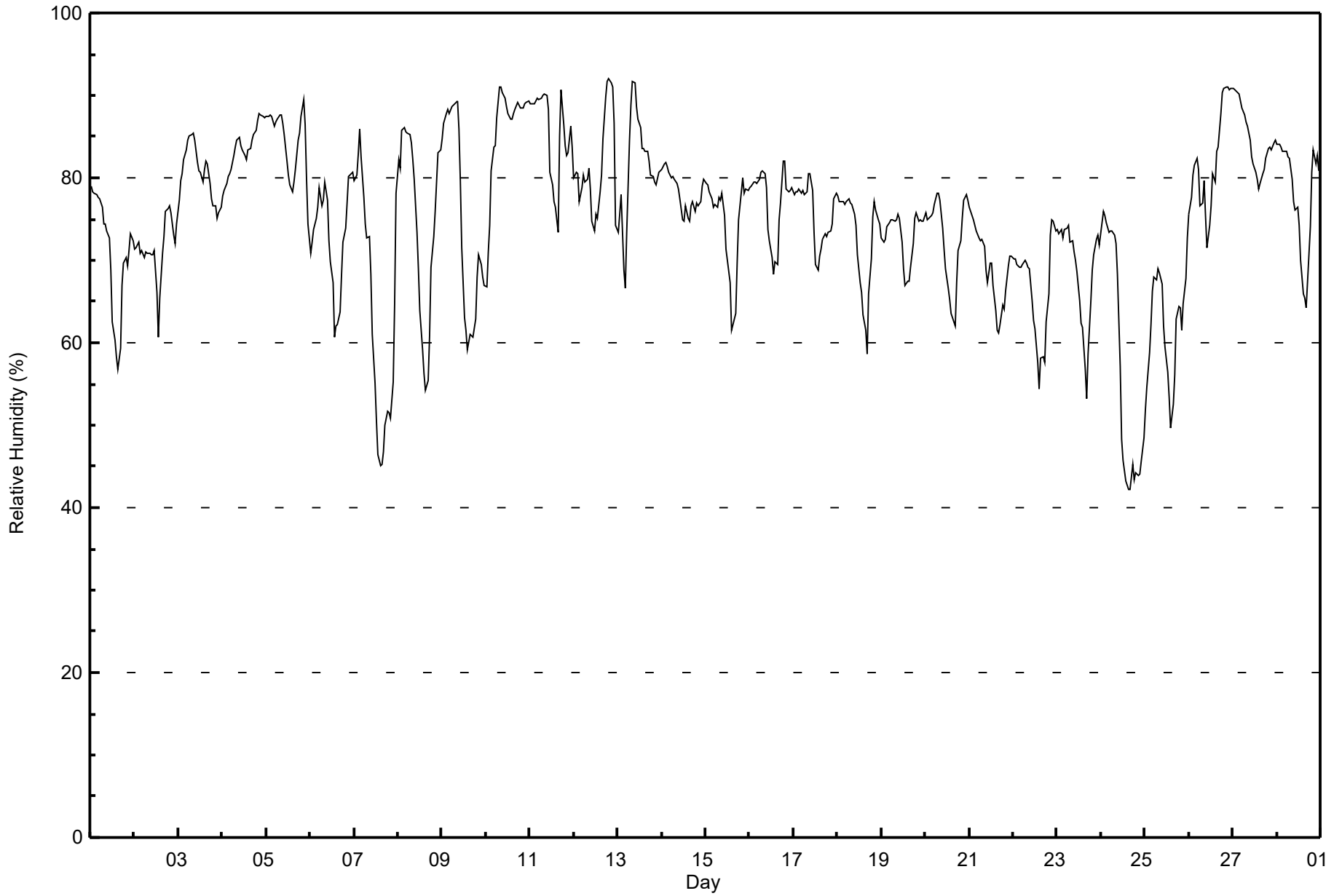


Maximum Value: 92.1 % on Feb 12 20:00																						Maximum Daily Average: 85.8 % on Feb 10				Hours in Service: 672																					
Minimum Value: 42.2 % on Feb 24 17:00																						Minimum Daily Average: 57.1 % on Feb 24				Hours of Data: 672																					
Maximum Diurnal Average: 79.5 % at hour 9																						Minimum Diurnal Average: 67.3 % at hour 15				Hours of Missing Data: 0																					
Monthly Average: 75.09 %																						Percentiles: P <sub>1</sub> = 44.2 P <sub>10</sub> = 62.0 Q <sub>1</sub> = 70.1 Median = 76.5 Q <sub>3</sub> = 81.7 P <sub>90</sub> = 87.4 P <sub>99</sub> = 91.0				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-Feb	78.9	78.3	78.2	77.9	77.6	77.5	76.5	74.5	74.3	73.5	72.8	68.8	62.6	60.3	58.4	56.7	59.4	66.9	69.6	70.3	69.3	71.2	73.2	72.3	70.8	78.9																					
2-Feb	71.4	71.6	72.1	70.9	71.3	70.4	71.1	70.9	70.9	70.6	70.7	71.1	66.1	60.6	65.5	70.9	72.9	75.9	76.3	76.6	75.7	73.0	72.0	74.4	71.4	76.6																					
3-Feb	77.4	79.7	80.5	82.2	83.3	84.5	85.1	85.3	85.4	84.5	81.9	80.8	80.7	79.4	81.0	82.0	81.7	79.3	77.5	76.7	76.5	75.1	75.7	76.5	80.5	85.4																					
4-Feb	77.9	78.5	79.4	80.2	80.5	81.0	82.7	83.8	84.5	85.0	83.9	83.4	82.7	82.3	83.4	83.6	84.7	85.3	85.7	86.9	87.8	87.6	87.5	87.3	83.6	87.8																					
5-Feb	87.4	87.5	87.7	87.4	86.3	86.8	87.2	87.6	87.7	86.7	85.3	82.0	80.3	79.2	78.3	79.5	81.0	84.6	85.4	87.5	89.5	86.4	79.9	74.4	84.4	89.5																					
6-Feb	70.9	72.2	73.7	75.1	76.5	78.8	76.5	77.3	79.4	77.3	72.5	69.8	67.3	60.7	62.1	62.1	63.8	68.2	72.2	73.9	77.0	80.1	80.5	80.7	72.9	80.7																					
7-Feb	79.6	80.4	82.8	85.9	82.6	77.6	74.5	72.7	72.9	68.3	61.1	55.1	50.6	46.4	45.2	45.3	46.9	49.9	51.7	51.5	50.9	55.3	64.7	78.1	63.7	85.9																					
8-Feb	82.2	81.1	85.8	86.0	85.6	85.4	85.2	84.3	82.2	79.9	73.4	68.9	63.8	59.2	56.3	54.2	55.5	60.8	69.1	72.9	76.0	79.4	83.1	83.4	74.7	86.0																					
9-Feb	84.8	86.6	87.9	88.4	87.8	88.7	88.7	89.0	89.3	86.0	79.6	71.5	63.0	61.6	59.2	61.0	60.9	60.7	62.8	67.9	70.8	69.5	67.9	66.9	75.0	89.3																					
10-Feb	66.8	71.1	74.3	80.9	83.7	83.9	87.4	91.0	90.9	90.3	89.7	88.7	87.7	87.2	87.2	87.9	88.3	89.1	88.8	88.6	88.5	89.0	89.2	89.4	85.8	91.0																					
11-Feb	89.0	89.1	89.0	89.3	89.6	89.4	89.7	89.9	90.2	90.0	88.3	80.7	79.2	77.1	76.4	73.3	85.0	90.7	86.4	83.9	82.7	83.1	86.3	83.8	85.5	90.7																					
12-Feb	80.1	80.6	80.5	77.2	78.9	80.3	79.5	79.9	81.2	78.6	74.8	73.6	75.7	75.1	78.4	80.4	84.8	89.8	91.8	92.1	91.6	91.0	86.6	74.3	81.5	92.1																					
13-Feb	73.4	75.6	77.9	68.8	66.7	73.4	84.6	88.8	91.7	91.6	88.7	87.1	86.1	83.5	83.6	83.2	83.2	80.4	80.2	79.5	79.2	80.6	80.9	81.3	91.7																						
14-Feb	81.0	81.7	81.9	81.4	80.7	80.0	80.2	79.8	79.3	78.7	77.5	75.0	74.7	76.7	75.0	74.8	76.7	77.2	76.0	76.9	76.7	77.0	79.0	79.8	78.2	81.9																					
15-Feb	79.4	79.1	78.3	77.5	76.4	76.8	76.4	77.7	77.3	78.2	75.5	71.3	70.0	67.4	61.6	62.3	63.5	69.6	74.8	78.3	80.0	78.2	78.6	78.4	74.4	80.0																					
16-Feb	78.8	79.0	79.5	79.4	79.3	79.9	80.6	80.8	80.6	78.8	73.8	72.4	70.3	68.4	69.9	69.4	74.9	77.0	82.0	82.1	78.7	78.3	78.5	78.8	77.1	82.1																					
17-Feb	78.0	78.4	78.4	78.6	78.2	78.5	77.9	78.3	80.5	80.5	78.5	73.4	69.5	68.8	70.5	71.4	72.5	73.2	72.9	73.5	73.5	74.4	77.4	78.1	75.6	80.5																					
18-Feb	77.7	77.1	77.1	77.2	76.7	77.1	77.4	77.0	76.7	75.6	74.3	70.7	67.3	66.0	63.4	61.6	58.6	65.9	70.1	75.2	77.1	76.1	75.0	74.5	72.7	77.7																					
19-Feb	72.8	72.2	72.6	74.1	74.6	74.9	74.9	74.7	75.0	75.7	75.2	72.2	69.0	67.0	67.5	67.5	69.1	72.0	75.1	75.8	74.8	74.8	74.8	74.8	73.0	75.8																					
20-Feb	75.7	74.9	75.1	75.4	75.8	76.9	78.1	78.2	77.4	73.8	71.3	68.9	66.7	65.3	63.5	63.0	62.1	67.3	71.1	72.4	75.0	77.2	77.9	77.4	72.5	78.2																					
21-Feb	76.5	75.4	74.9	74.2	73.6	72.8	72.4	72.6	71.7	68.7	67.2	69.6	69.6	67.0	63.9	61.5	61.2	62.3	64.6	64.0	66.3	69.3	70.6	70.5	69.2	76.5																					
22-Feb	70.1	70.1	69.5	69.2	69.2	69.5	69.9	69.6	69.2	69.1	65.0	62.6	61.8	57.6	54.4	58.2	58.3	57.5	62.6	66.0	73.0	75.0	74.7	73.6	66.5	75.0																					
23-Feb	73.6	73.2	73.7	72.7	73.7	74.0	74.2	72.1	72.3	71.1	70.0	68.7	65.2	62.4	61.8	56.7	53.3	58.7	65.0	68.8	70.7	72.6	73.0	71.9	68.7	74.2																					
24-Feb	74.5	75.9	75.4	74.5	73.4	73.6	73.6	73.1	72.0	68.3	57.1	48.3	45.8	43.3	42.7	42.3	42.2	45.3	43.4	44.2	44.0	44.1	45.6	48.4	57.1	75.9																					
25-Feb	51.9	54.6	58.8	62.2	66.3	67.9	67.5	69.1	68.5	67.2	62.0	59.5	56.4	53.3	49.7	52.6	56.1	62.9	64.4	64.3	61.6	64.7	67.8	72.7	61.7	72.7																					
26-Feb	75.7	77.6	80.4	81.5	82.4	81.0	76.6	76.9	79.6	75.4	71.5	74.3	76.5	80.6	79.4	83.2	83.7	87.9	90.3	90.9	91.0	91.0	90.8	90.8	82.0	91.0																					
27-Feb	90.8	90.7	90.6	90.2	89.4	88.5	87.6	86.8	86.3	84.5	82.6	81.7	80.6	79.9	78.7	79.3	80.5	81.1	82.4	83.6	83.7	83.4	84.2	84.5	84.7	90.8																					
28-Feb	84.0	84.1	83.8	83.3	83.3	83.3	82.5	82.4	79.8	77.1	76.0	76.4	74.3	70.0	66.0	65.4	64.3	67.5	74.1	80.6	83.4	81.7	82.8	80.8	77.8	84.1																					
																						77.2	77.7	78.5	78.6	78.7	79.0	79.2	79.4	79.5	78.0	75.0	72.4	70.1	68.1	67.3	67.5	68.7	71.7	73.8	75.2	75.9	76.4	77.1	77.0	Diurnal Average	
																						90.8	90.7	90.6	90.2	89.6	89.4	89.7	91.0	91.7	91.6	89.7	88.7	87.7	87.2	87.2	87.9	88.3	90.7	91.8	92.1	91.6	91.0	90.8	90.8	Diurnal Maximum	



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

**Relative Humidity (RH) - %**  
**Buffalo Viewpoint - February 2023**





# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Wind Speed (WS) - km/h

## Buffalo Viewpoint - February 2023

Maximum Speed: 32 km/h on Feb 13 13:00	Maximum Daily Speed Average: 15.7 km/h on Feb 7	Hours in Service: 672
Minimum Speed Value: 0 km/h on Feb 8 08:00	Minimum Daily Speed Average: 0.4 km/h on Feb 23	Hours of Data: 655
Maximum Diurnal Speed Average: 3.3 km/h at hour 14	Minimum Diurnal Speed Average: 0.2 km/h at hour 22	Hours of Missing Data: 17
Monthly Average Velocity: 1.4 km/h 332.1 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 3 Q <sub>1</sub> = 5 Median = 7 Q <sub>3</sub> = 10 P <sub>90</sub> = 14 P <sub>99</sub> = 26	Percent Operational Time: 97.5

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-Feb	NNW5	N6	NW2	N5	N4	NNW5	NNW8	N8	N7	N7	N6	WNW7	NW9	NW11	NW9	WNW7	WNW9	NW9	NW10	NW7	WNW6	W3	SSW4	SSE5	NW5.4	NW11	
2-Feb	SSE8	SSE7	SE9	SSE9	SSE8	SSE7	SSE7	SE8	SSE7	SSE7	SSE7	SSE8	SSE9	SSE9	SE13	SE16	SE17	SSE16	SSE17	SSE16	SSE15	SSE14	SSE13	SSE13	SSE10.7	SSE17	
3-Feb	SSE13	SSE12	SSE10	SSE10	SSE8	SSE8	SSE6	SSE6	SSE6	S5	SSW3	N5	NNW4	NNW8	N9	N9	NNE9	NNE10	NNE10	NNE8	NNE7	NNE6	NNE4	N4	ENE2.1	SSE13	
4-Feb	N7	NNE6	N6	N8	N9	NNE9	N6	N8	N11	N8	N8	N7	N7	N6	N4	NW4	NW3	N5	N7	N7	NNW6	NNW5	NNW5	N6.5	N11		
5-Feb	N4	N4	N3	N2	SW1	N3	N3	NNW4	NNW3	NW2	W3	WNW2	ESE3	S4	SSE5	WNW1	N3	NNW3	WNW3	SW2	W5	W14WNW22	NW23	NW3.5	NW23		
6-Feb	NW18WNW14	W12WSW13	W14	W10	W11	W8	W14	WNW9	NE5	NNE5	NE5	ESE7	ESE7	ESE4	SSE3	ENE2	NE5	SSE2	ENE3	NNE5	NW3	NW4	WNW3.7	NW18			
7-Feb	N5	E3	S5WSW19	W22WNW25WNW19	W19	W20WSW16WSW21WSW22	W25	W24	W26	W23	W22	W18WSW18WSW21	W14	W10	NNW11	N14								W15.7	W26		
8-Feb	N13	N10	N4	NNW6	N3	SW3	NW1	NW0	S4	S4	SSE4	SE6	SE7	SE8	SE8	SE7	SE7	SSE7	SE9	SE9	SE9	SSE8	SSE8	SSE9	SE3.3	N13	
9-Feb	SSE10	SSE10	SE10	SE13	SE12	SE12	SE8	SE10	SE9	SE8	SSE6	SE7	SE7	SE8	SSE6	SE7	SE5	SSE4	ENE4	NE5	SSE4	SE5	SSE4	S3	SE7.0	SE13	
10-Feb	SE2	NNE6	NNE8	N7	NNW11	N15	N11	N10	N12	N14	N13	N13	N14	N11	N14	N13	N13	NNW10	N10	N11	N8	N6	N4	NE3	N9.6	N15	
11-Feb	NE3	SSE0	SE1	SSE4	SSE5	SSE6	SSE7	SE8	SSE6	SSE5	S4	SSW4	E4	ESE5	S7	SW12WSW14WSW14	W18	W16	WNW17	W9	W17WSW19			SW5.2	WSW19		
12-Feb	WSW24WSW24	W23	W13WSW12	W15	W14	W13	W11	WNW9	WNW7	NNW4	NNE8	NNE7	NNE6	NNE6	NNE7	N7	NNE8	NNE5	NNE2	SE6	SSE10	SSE12		W5.5	WSW24		
13-Feb	SSE12	SE9	SE3WSW14WSW22WSW20WSW21WSW21	NNW17	N26	N26	N29	N32	N30	N28	N27	N24	N20	UO	UO	UO	UO	UO	UO	UO	UO	UO		NNW12.7	N32		
14-Feb	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	NNE5	NNE4	NNE6	NNE6	N6	NNE8	NNE9	NNE6	NNE3	NE3	NE4	SSW1	WSW1	---	NNE9	
15-Feb	SSE2	SE4	SSE5	S6	S7	SSE6	SSE5	SE7	S3	SSW2	NNW2	N4	NNE6	NNE4	ESE8	ESE7	SE6	SSE5	SSE7	SSE6	SSE7	SE7		SE4.1	ESE9		
16-Feb	SSE6	SSE7	SE7	SSE7	SSE8	SSE7	SSE6	SSE5	S5	SSE5	S7	SSE7	SSE6	WSW3	NW3	S1	NNE3	N9	N12	N16	N15	N13	N8	NNE8	E1.1	N16	
17-Feb	NNE5	NNE5	NNE5	NNE5	N3	N4	NE5	NE6	NNE6	NNE7	NNE7	N7	N7	N8	N10	N11	N12	N12	N11	N11	N11	N8	NNW6	N7	NNE7.3	N12	
18-Feb	N8	N7	N5	NNW4	N5	N5	N6	NNE5	NE5	NNE5	NNE4	NNW5	NW6	WNW6	WNW7	WNW5	W4	NNW3	NNE4	NE4	NE2	S3	SSE5	SE6	N2.8	N8	
19-Feb	SSE6	SSE6	SSE6	SE7	SE6	SE4	E2	NNE4	NE5	NW2	NNE6	N4	N6	N6	NW6	NW7	NW6	NNW6	N6	NNW6	N9	NNW7	N10	N13	N3.0	N13	
20-Feb	N9	N9	NNE6	NE5	NW3	NNW0	SSW3	SE5	SE4	ESE4	ESE5	SW4	N5	NNE6	NNE7	N7	NNE10	NNE11	N8	N7	N5	NNW5	N7	N12	NNE4.3	N12	
21-Feb	N11	N12	N9	N9	N7	N7	NNW5	N6	N7	N9	NNW6	NW5	N6	N9	N10	N9	N10	N10	N8	NNE7	NW4	WNW4	SW4	SSE5	N6.5	N12	
22-Feb	SSE6	SSW5	SSE8	SSE7	SSE7	SSE9	SSE7	SSE8	SSE8	SSE5	NW1	NNE4	N4	WNW5	W5	W5	W5	WNW6	W4	NW5	W3	SE3	SSW2	SW2	SSW2.3	SSE9	
23-Feb	WSW3	NNW4	NW5	NW5	NNW7	NNW7	NW6	WNW5	NW5	NNW4	NW4	NNW4	N4	NNE7	NNE6	E5	SE6	SE7	SE8	SSE7	SSE8	SE10	S4	S6	N0.4	SE10	
24-Feb	SSE8	SSE8	SSE10	SSE10	SSE8	SSE9	SSE8	SSE7	SSE8	SSE10	SSE11	S16	SSW17	SSW17	S16	S15	S14	S11	S15	S14	S14	S13	S10	S10	S10	S11.2	SSW17
25-Feb	S8	SSE8	SE6	SE7	SE9	SSE7	S7	W8	W10	WSW8	W15WSW17WSW12	SW9	W1	NE7	E7	SSE5	SSE5	SE7	SE8	SE6	SE6	SE6			SSW4.0	WSW17	
26-Feb	SSE6	SSE5	SSE4	SSE3	S2	SE3	ESE5	ENE4	NE5	NNE4	E6	E6	E9	ENE9	ENE9	E8	E7	ENE7	NE7	NE7	NNE6	NE7	NNE7	NNE8	ENE4.5	ENE9	
27-Feb	NNE7	NNE6	N8	N11	N12	N12	N13	NNW13	N12	N15	N13	N14	N16	N15	N13	N10	NNE11	NNE10	N9	N10	NNE10	NNE10	N9	N10	N11.1	N16	
28-Feb	N10	N9	N8	N6	NNW4	NW3	NW4	WNW4	NW4	NW3	WNW6	WNW6	NW6	WNW6	NW3	NNW3	WNW4	WNW4	NW3	S2	S5	SSE7	SSE8	SE8	NW2.4	N10	

NNW0.4	ENE0.4	SSE0.6	SW0.9	WSW1.7	W1.4	W1.6	W1.5	NW1.8	NNW2.0	NNW2.3	NNW2.7	NNW3.1	NNW3.3	N2.7	N2.5	N2.3	N2.8	N2.1	N1.8	N1.2	NNW0.2	W0.8	NNW0.3		Diurnal Average
WSW24	WSW24	WSW23	WSW19	W22	WNW25	WSW21	WSW21	W20	N26	N26	N29	N32	N30	N28	N27	N24	N20	W18	WSW21	WNW17	SSE14	WNW22	NW23		Diurnal Maximum

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

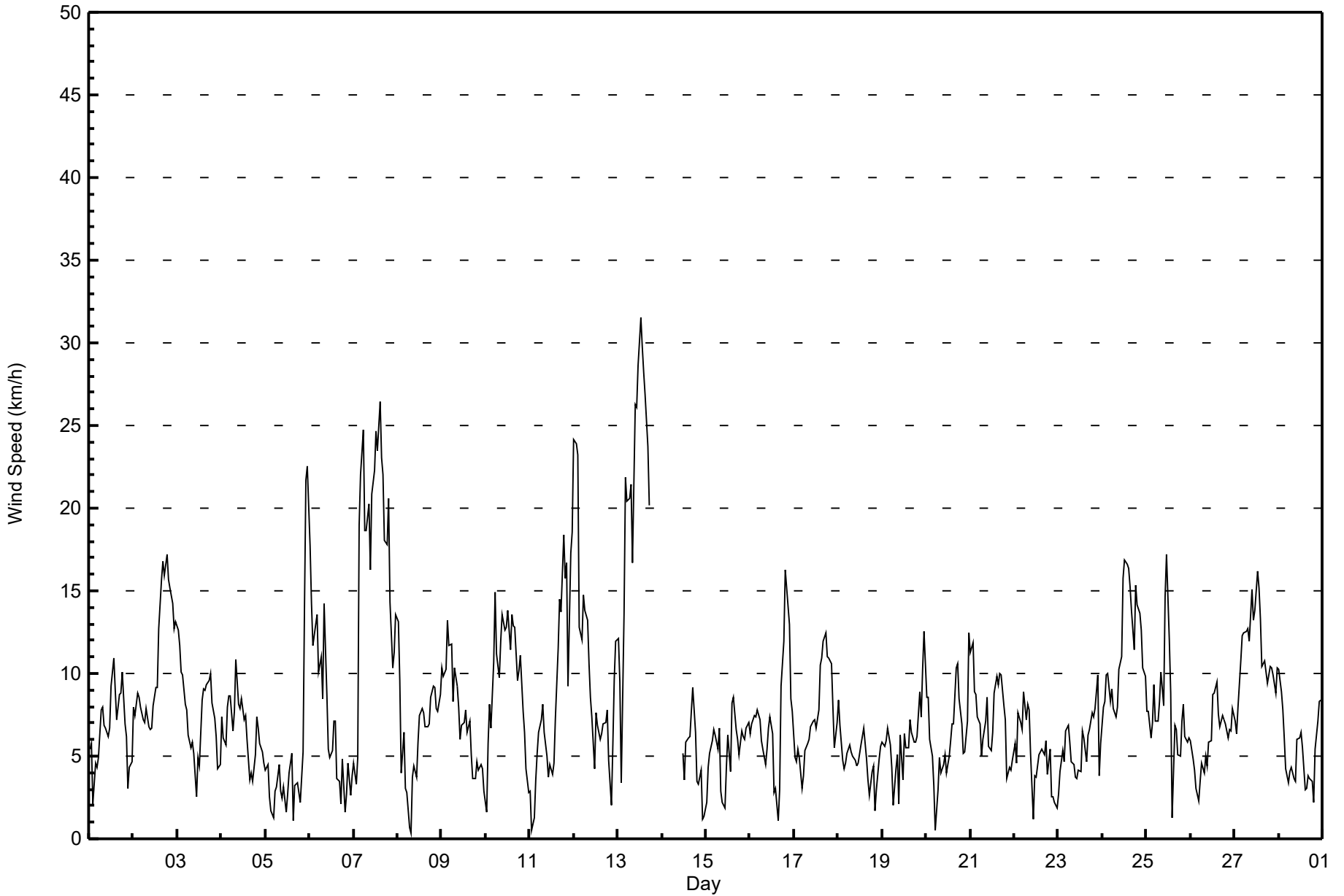




**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Speed (WS) - km/h**  
**Buffalo Viewpoint - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Feb 11 23:00 Minimum Value: 0 km/h on Feb 28 23:00 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> = 7																	Hours in Service: 672 Hours of Data: 655 Hours of Missing Data: 17 Hours of Calibration: 0 Percent Operational Time: 97.5									
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-Feb	1	2	1	1	1	1	2	2	2	2	2	3	2	3	2	2	2	1	2	1	3	1	1	1	3	
2-Feb	1	1	1	1	1	1	1	2	1	2	2	3	3	3	4	5	6	5	6	5	5	5	4	4	6	
3-Feb	4	4	3	3	2	3	2	2	2	2	1	3	1	3	2	3	2	2	2	3	2	2	2	2	4	
4-Feb	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	1	1	1	2	2	2	1	2	1	2	
5-Feb	1	1	1	1	1	2	1	1	1	2	2	1	1	1	2	2	2	1	1	1	3	4	6	6	6	
6-Feb	5	4	3	4	3	2	3	1	3	4	1	1	2	2	2	1	1	1	1	1	1	1	1	1	5	
7-Feb	2	2	3	7	5	7	5	4	4	4	5	5	7	6	6	6	5	4	5	4	3	3	4	3	7	
8-Feb	3	3	1	1	2	1	1	1	1	1	1	2	2	2	2	2	1	1	2	2	2	2	1	1	3	
9-Feb	2	1	2	1	2	2	3	1	1	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	3	
10-Feb	1	1	2	1	3	3	3	2	2	2	3	3	3	3	2	3	3	3	3	3	2	1	1	2	3	
11-Feb	1	1	1	1	1	2	2	1	2	1	1	1	1	2	2	4	4	4	4	4	6	2	8	5	8	
12-Feb	6	6	5	4	3	2	3	4	4	2	2	2	1	1	1	1	1	1	1	2	1	3	3	3	6	
13-Feb	3	4	3	5	6	5	5	4	6	6	6	7	7	7	7	7	6	5	UO	UO	UO	UO	UO	UO	7	
14-Feb	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	1	1	1	1	2	2	2	2	3	2	1	1	3	
15-Feb	1	1	0	1	1	1	1	2	2	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	2	
16-Feb	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	5	3	4	4	4	2	2	5	
17-Feb	2	1	1	2	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	2	1	1	3	
18-Feb	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	2	
19-Feb	0	1	1	1	1	2	1	1	2	2	2	1	2	1	1	2	2	1	1	2	2	1	2	3	3	
20-Feb	3	2	2	1	1	1	1	1	1	1	2	1	1	1	1	2	2	2	2	2	1	2	1	2	3	
21-Feb	3	4	2	2	2	2	1	1	2	2	2	2	2	3	2	2	3	2	2	2	1	1	1	2	4	
22-Feb	1	1	2	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	
23-Feb	1	3	1	2	1	1	1	2	1	1	1	1	1	1	2	2	1	1	1	1	1	2	2	1	3	
24-Feb	1	1	1	2	2	1	1	1	2	3	4	5	5	5	5	4	5	4	5	4	4	4	3	3	5	
25-Feb	2	2	1	1	1	1	2	3	3	3	4	4	3	4	2	2	2	1	1	1	2	1	1	1	4	
26-Feb	1	1	1	1	1	1	1	1	1	1	2	3	2	2	2	2	2	2	2	2	1	1	2	2	3	
27-Feb	2	1	2	2	3	3	3	3	3	4	3	3	4	3	3	3	3	3	3	3	3	2	3	2	4	
28-Feb	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	2	1	1	0	1	2	
																	Diurnal Maximum									
UO - Unstable Operation																										





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Buffalo Viewpoint - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	213	32.52	32.52
6 - 11	323	49.31	81.83
12 - 19	90	13.74	95.57
20 - 28	26	3.97	99.54
29 - 38	3	0.46	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 655

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Buffalo Viewpoint - February 2023**

<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	28	21	15	4	4	6	10	27	15	8	6	3	10	11	24	21	213
6 - 11	84	45	6	2	5	6	43	73	10	0	1	2	7	14	11	14	323
12 - 19	30	0	0	0	0	0	6	11	8	2	1	11	14	4	1	2	90
20 - 28	6	0	0	0	0	0	0	0	0	0	0	10	7	2	1	0	26
29 - 38	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	151	66	21	6	9	12	59	111	33	10	8	26	38	31	37	37	655

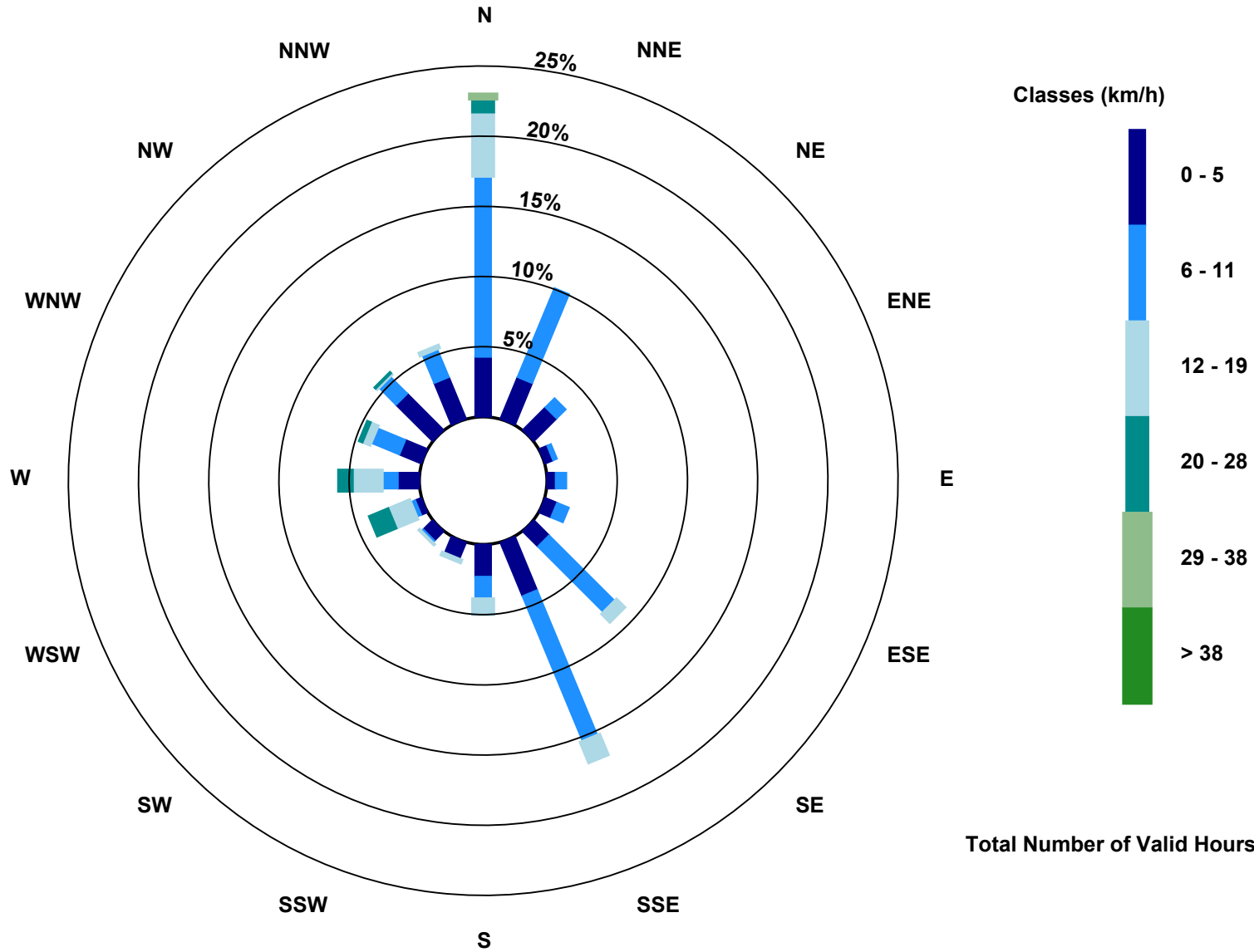
Total Number of Valid Hours: 655

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Buffalo Viewpoint



Total Number of Valid Hours: 655



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

**Wind Direction (WD) - deg**  
**Buffalo Viewpoint - February 2023**

Direction of Maximum Speed: 354 deg on Feb 13 13:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 268.7 deg on Feb 7	Hours of Data: 655
Direction of Minimum Speed: 313 deg on Feb 8 08:00	Hours of Missing Data: 17
Direction of Minimum Daily Speed Average: 0.4 deg on Feb 23	Percent Operational Time: 97.5
Monthly Average Direction: 332.1 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-Feb	327	356	322	2	358	342	341	353	356	6	351	303	307	316	311	299	297	314	311	304	285	266	212	160	321.2
2-Feb	161	159	145	148	166	158	147	144	148	147	147	163	157	155	145	146	144	148	151	147	148	147	147	147	149.7
3-Feb	154	154	158	158	162	155	158	168	148	170	204	359	337	346	2	3	24	18	28	23	12	26	33	9	77.2
4-Feb	11	17	356	5	8	16	4	351	3	354	349	1	357	357	356	358	311	318	360	353	357	331	343	331	356.5
5-Feb	350	5	2	350	224	4	355	331	328	319	269	291	106	170	160	291	359	333	292	220	265	275	301	307	305.0
6-Feb	306	286	268	257	265	281	271	259	265	299	37	33	45	117	113	122	162	67	47	148	58	20	310	314	287.7
7-Feb	356	94	187	253	261	284	288	271	261	257	257	256	262	270	264	274	270	260	252	257	259	279	343	2	268.7
8-Feb	350	357	356	344	9	221	324	313	178	179	153	127	143	125	124	132	142	160	142	142	139	149	160	152	134.1
9-Feb	147	148	141	128	133	128	134	137	136	145	161	135	138	144	147	131	140	148	62	56	166	146	150	180	137.9
10-Feb	135	33	16	354	348	354	357	355	354	354	353	350	351	350	354	351	354	347	349	0	352	359	355	36	355.3
11-Feb	41	157	145	148	163	162	156	139	155	168	174	195	90	118	186	230	248	254	269	281	298	260	259	245	234.0
12-Feb	253	253	259	261	255	263	267	268	275	288	287	334	24	22	26	33	25	1	20	13	12	142	151	158	274.6
13-Feb	151	136	130	240	251	253	258	257	328	4	359	355	354	359	349	351	355	7	UO	UO	UO	UO	UO	UO	333.7
14-Feb	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	24	27	20	29	9	21	21	25	19	47	41	202	258	-
15-Feb	153	140	152	174	177	158	159	142	175	210	344	8	29	33	118	118	121	127	153	151	154	163	166	145	141.5
16-Feb	155	151	142	158	160	163	167	167	169	166	177	164	164	245	312	172	29	7	357	359	5	2	357	14	80.7
17-Feb	24	23	29	21	350	8	48	43	26	26	22	11	7	358	8	11	9	6	4	8	8	2	345	7	12.1
18-Feb	7	9	359	335	0	353	4	29	34	26	17	340	305	293	283	288	271	327	18	51	35	184	157	143	352.7
19-Feb	165	164	153	146	143	127	93	14	43	312	22	353	11	360	319	316	325	342	354	338	353	346	357	355	2.3
20-Feb	353	4	15	46	325	333	207	133	145	115	121	214	1	13	18	1	13	14	8	11	359	333	354	360	11.7
21-Feb	3	4	5	8	7	11	343	354	357	3	343	326	10	6	9	5	0	359	10	20	313	289	214	167	359.6
22-Feb	160	199	150	158	158	152	149	148	159	164	321	12	357	287	279	261	269	286	269	305	260	141	213	218	192.8
23-Feb	251	328	316	326	339	327	309	292	305	327	307	346	2	17	19	92	141	141	143	152	154	141	189	177	348.9
24-Feb	151	158	156	155	156	150	157	162	154	149	158	184	193	195	190	185	177	178	190	188	186	189	184	187	175.9
25-Feb	180	164	144	137	132	153	189	263	267	248	262	258	246	226	268	44	86	150	161	140	130	146	135	144	191.3
26-Feb	157	152	165	147	169	132	119	69	34	30	101	90	90	49	69	83	97	58	52	39	27	37	32	22	72.9
27-Feb	26	17	7	1	349	350	349	347	353	352	352	357	353	359	353	356	30	12	4	11	14	15	355	349	359.7
28-Feb	358	358	358	353	337	308	309	299	304	306	293	290	307	289	323	345	296	301	307	182	173	155	149	143	315.8
337.8	56.4	147.0	219.0	246.0	267.0	272.3	276.8	309.5	339.0	328.8	326.6	345.8	346.1	351.3	352.8	357.6	355.1	351.9	357.5	349.8	342.5	276.3	337.4		
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**

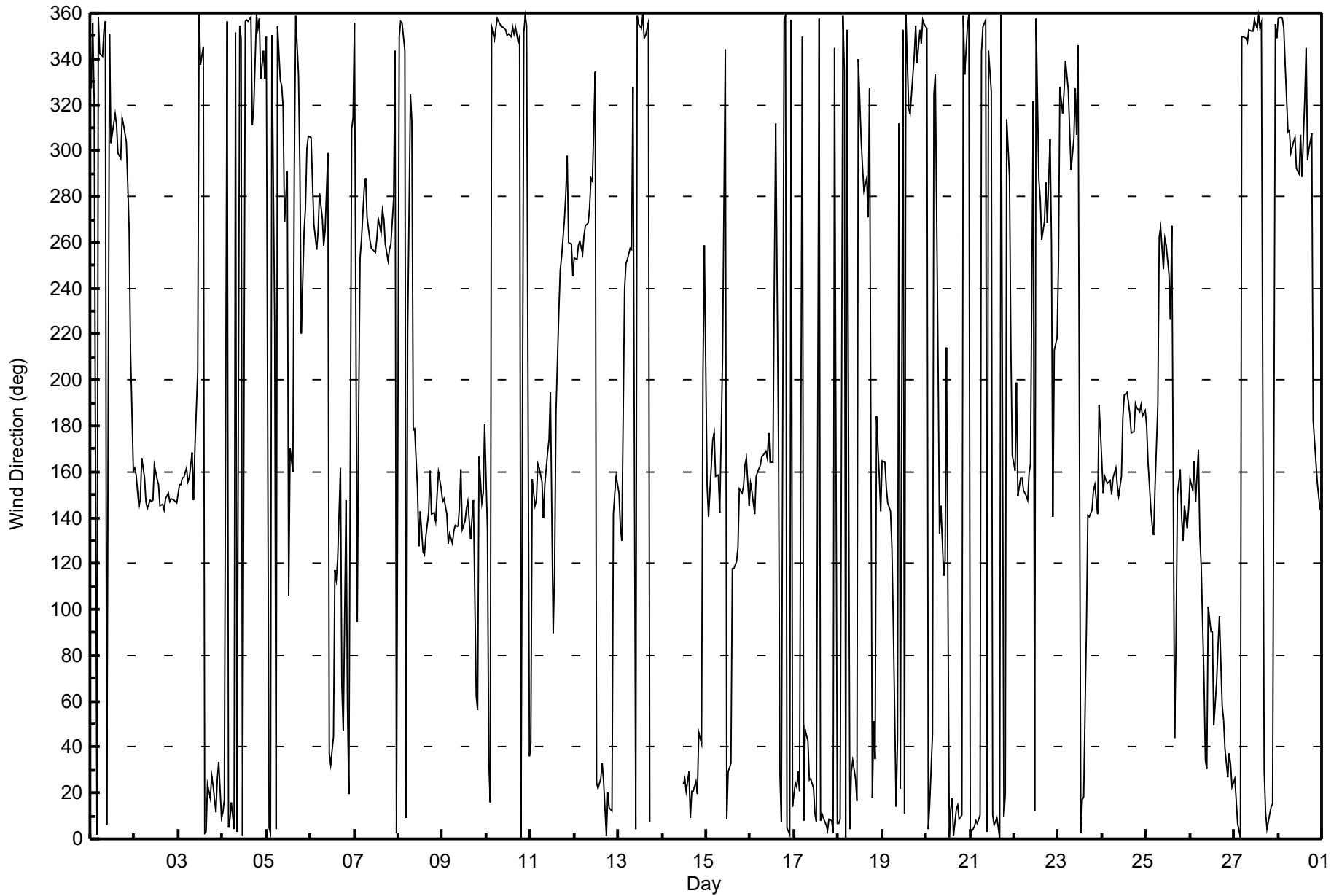
**Wind Direction (WD) - deg**  
**Buffalo Viewpoint - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 92 deg on Feb 8 08:00 Minimum Value: 5 deg on Feb 9 04:00 Percentiles: P <sub>1</sub> = 8 P <sub>10</sub> = 12 Q <sub>1</sub> = 15 Median = 20 Q <sub>3</sub> = 27 P <sub>90</sub> = 42 P <sub>99</sub> = 78																	Hours in Service: 672 Hours of Data: 655 Hours of Missing Data: 17 Hours of Calibration: 0 Percent Operational Time: 97.5								
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-Feb	17	14	48	13	10	18	20	18	20	18	22	27	20	19	20	21	17	9	14	12	31	44	21	25	48
2-Feb	16	12	14	12	9	11	17	16	19	19	26	26	29	30	29	28	29	29	27	30	28	27	27	27	30
3-Feb	29	27	29	28	29	33	30	26	25	23	33	62	37	29	18	20	21	19	18	25	21	21	30	48	62
4-Feb	17	18	15	16	15	16	19	18	15	16	20	17	20	17	17	30	23	28	28	17	18	19	23	18	30
5-Feb	21	20	33	51	68	43	31	25	42	66	64	76	67	43	51	77	45	37	42	63	46	15	24	21	77
6-Feb	20	19	22	14	12	16	17	12	10	43	24	18	29	26	22	35	38	54	20	63	56	8	54	26	63
7-Feb	43	54	48	15	12	22	20	15	12	14	14	14	15	16	13	16	15	12	13	11	15	30	35	20	54
8-Feb	19	16	20	9	47	61	88	92	23	14	24	25	27	21	22	20	18	15	13	12	12	13	10	11	92
9-Feb	11	14	12	5	7	7	18	9	11	20	24	21	28	28	23	18	22	32	41	23	17	17	24	51	51
10-Feb	76	14	12	13	17	19	18	18	16	16	17	17	17	18	17	18	18	18	20	19	17	19	24	58	76
11-Feb	19	75	58	20	19	17	19	11	20	35	35	40	51	29	25	21	16	14	14	19	19	12	16	16	75
12-Feb	14	13	10	15	15	12	13	15	18	17	21	37	13	11	12	9	9	20	10	28	86	47	26	28	86
13-Feb	24	22	78	20	15	14	12	12	42	22	23	21	21	20	21	20	20	20	20	20	20	20	20	20	78
14-Feb	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	28	49	19	22	20	21	20	23	31	26	35	81	81
15-Feb	54	26	12	13	10	13	20	17	42	37	63	27	13	50	21	18	16	12	10	8	9	9	15	15	63
16-Feb	18	22	20	25	25	25	33	29	32	27	28	28	29	77	55	79	56	20	19	18	24	22	21	21	79
17-Feb	22	22	22	21	19	26	26	23	26	20	19	18	18	20	20	18	21	20	19	19	18	15	17	12	26
18-Feb	13	12	15	23	15	19	20	16	15	13	19	35	29	23	24	30	27	34	9	13	57	25	10	10	57
19-Feb	9	15	14	14	15	25	36	15	38	78	28	42	18	28	28	19	18	14	8	18	13	13	15	20	78
20-Feb	17	18	21	19	37	73	29	19	28	21	28	38	31	15	16	15	17	15	15	9	20	17	12	15	73
21-Feb	17	17	17	16	19	19	11	14	17	16	39	33	21	19	19	18	17	16	15	14	29	15	37	37	39
22-Feb	14	27	9	15	15	7	10	8	11	20	76	27	45	29	29	27	21	11	32	22	46	70	43	59	76
23-Feb	38	16	8	12	12	14	13	18	18	26	27	28	24	12	16	49	23	19	14	14	13	10	40	15	49
24-Feb	11	12	12	13	15	11	11	12	19	24	27	25	23	23	24	24	29	27	22	24	24	21	25	21	29
25-Feb	19	19	17	15	9	20	24	34	20	23	13	12	21	28	83	17	24	33	23	14	14	23	20	18	83
26-Feb	18	17	19	32	51	24	19	39	16	20	32	41	29	18	19	21	24	17	19	19	17	20	22	19	51
27-Feb	18	20	18	20	19	21	20	19	19	20	20	20	21	18	20	18	22	20	20	20	18	18	14	16	22
28-Feb	14	13	13	14	11	19	18	17	20	35	21	20	23	25	51	27	18	13	22	65	16	13	7	13	65
76 75 78 51 68 73 88 92 42 78 76 76 67 77 83 79 56 54 42 65 86 70 81 59																									
Diurnal Maximum																									
UO - Unstable Operation																									



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

**Wind Direction (WD) - deg**  
**Buffalo Viewpoint - February 2023**







## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

**AMS05  
MANNIX  
FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)  
FEBRUARY 2023

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	641	31	31	100	62.5	0	13.3	0
H2S (ppb) Average	639	33	33	100	5	0	1.9	0
THC (ppm) Average	641	31	31	100	5.1	-	3.1	-
NMHC(ppm) Average	641	31	31	100	0.721	-	0.172	-
CH4(ppm) Average	641	31	31	100	4.8	-	3	-
Temperature 2 m (C) Average	672	0	0	100	4.3	-	-0.7	-
Temperature 20 m (C) Average	672	0	0	100	5	-	-0.2	-
Temperature 45 m (C) Average	672	0	0	100	5	-	0	-
Temperature 75 m (C) Average	672	0	0	100	4.8	-	0	-
Temperature 90 m (C) Average	672	0	0	100	4.7	-	0	-
Relative Humidity 2 m (%) Average	672	0	0	100	92	-	84	-
Relative Humidity 20 m (%) Average	672	0	0	100	96	-	88	-
Relative Humidity 45 m (%) Average	672	0	0	100	93	-	85	-
Relative Humidity 75 m (%) Average	672	0	0	100	94	-	87	-
Relative Humidity 90 m (%) Average	672	0	0	100	99	-	89	-
Wind Speed 20 m (km/h) Average	672	0	0	100	34	-	22	-
Wind Speed 45 m (km/h) Average	668	0	4	99.4	39	-	28	-
Wind Speed 75 m (km/h) Average	666	0	6	99.11	42	-	31	-
Wind Speed 90 m (km/h) Average	669	0	3	99.55	43	-	33	-
Wind Direction 20 m (deg) Average	672	0	0	100	-	-	-	-
Wind Direction 45 m (deg) Average	668	0	4	99.4	-	-	-	-
Wind Direction 75 m (deg) Average	666	0	6	99.11	-	-	-	-
Wind Direction 90 m (deg) Average	669	0	3	99.55	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	672	0	0	100	1.3	-	0.7	-
Vertical Wind Speed 45 m (km/h) Average	668	0	4	99.4	1.5	-	0.5	-
Vertical Wind Speed 75 m (km/h) Average	666	0	6	99.11	1.4	-	0.4	-
Vertical Wind Speed 90 m (km/h) Average	669	0	3	99.55	8.9	-	0.6	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)  
FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	641	3.94	6.8	-	0	0.3	0.5	1	4.6	10.8	62.5
H2S (ppb) Average	639	0.68	0.7	-	0	0.1	0.2	0.4	0.8	1.4	5
THC (ppm) Average	641	2.32	0.4	-	2	2	2.1	2.2	2.4	2.8	5.1
NMHC(ppm) Average	641	0.059	0.093	-	0	0	0	0	0.1	0.2	0.721
CH4(ppm) Average	641	2.26	0.4	-	2	2	2.1	2.1	2.3	2.7	4.8
Temperature 2 m (C) Average	672	-14.92	8.8	-	-34.1	-27.1	-21.3	-15.3	-8.8	-2.5	4.3
Temperature 20 m (C) Average	672	-14.67	8.6	-	-32.8	-26.1	-20.8	-15.3	-8.7	-1.7	5
Temperature 45 m (C) Average	672	-14.5	8.5	-	-30.8	-25.7	-20.6	-15.2	-8.5	-1.4	5
Temperature 75 m (C) Average	672	-14.4	8.5	-	-30.6	-25.5	-20.6	-14.9	-8.7	-1.5	4.8
Temperature 90 m (C) Average	672	-14.38	8.4	-	-30.7	-25.5	-20.7	-15	-8.7	-1.4	4.7
Relative Humidity 2 m (%) Average	672	73.8	9	-	44	62	69	75	79	85	92
Relative Humidity 20 m (%) Average	672	74	11	-	43	59	68	75	81	88	96
Relative Humidity 45 m (%) Average	672	73.5	11	-	42	58	67	75	81	87	93
Relative Humidity 75 m (%) Average	672	74	11	-	43	58	68	76	82	88	94
Relative Humidity 90 m (%) Average	672	74.6	12	-	43	58	68	76	82	89	99
Wind Speed 20 m (km/h) Average	672	9.8	6	-	0	3	6	8	12	19	34
Wind Speed 45 m (km/h) Average	668	13.2	8	-	0	4	7	12	18	25	39
Wind Speed 75 m (km/h) Average	666	15	9	-	1	5	8	14	20	29	42
Wind Speed 90 m (km/h) Average	669	15.8	9	-	0	5	9	14	21	29	43
Wind Direction 20 m (deg) Average	672	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	668	-	-	-	-	-	-	-	-	-	-
Wind Direction 75 m (deg) Average	666	-	-	-	-	-	-	-	-	-	-
Wind Direction 90 m (deg) Average	669	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	672	0.07	0.4	-	-1.5	-0.4	-0.2	0	0.3	0.6	1.3
Vertical Wind Speed 45 m (km/h) Average	668	-0.02	0.4	-	-1.4	-0.5	-0.3	-0.1	0.3	0.6	1.5
Vertical Wind Speed 75 m (km/h) Average	666	0.14	0.3	-	-0.9	-0.2	0	0.1	0.3	0.5	1.4
Vertical Wind Speed 90 m (km/h) Average	669	0.11	0.5	-	-1.2	-0.4	-0.1	0.1	0.3	0.6	8.9

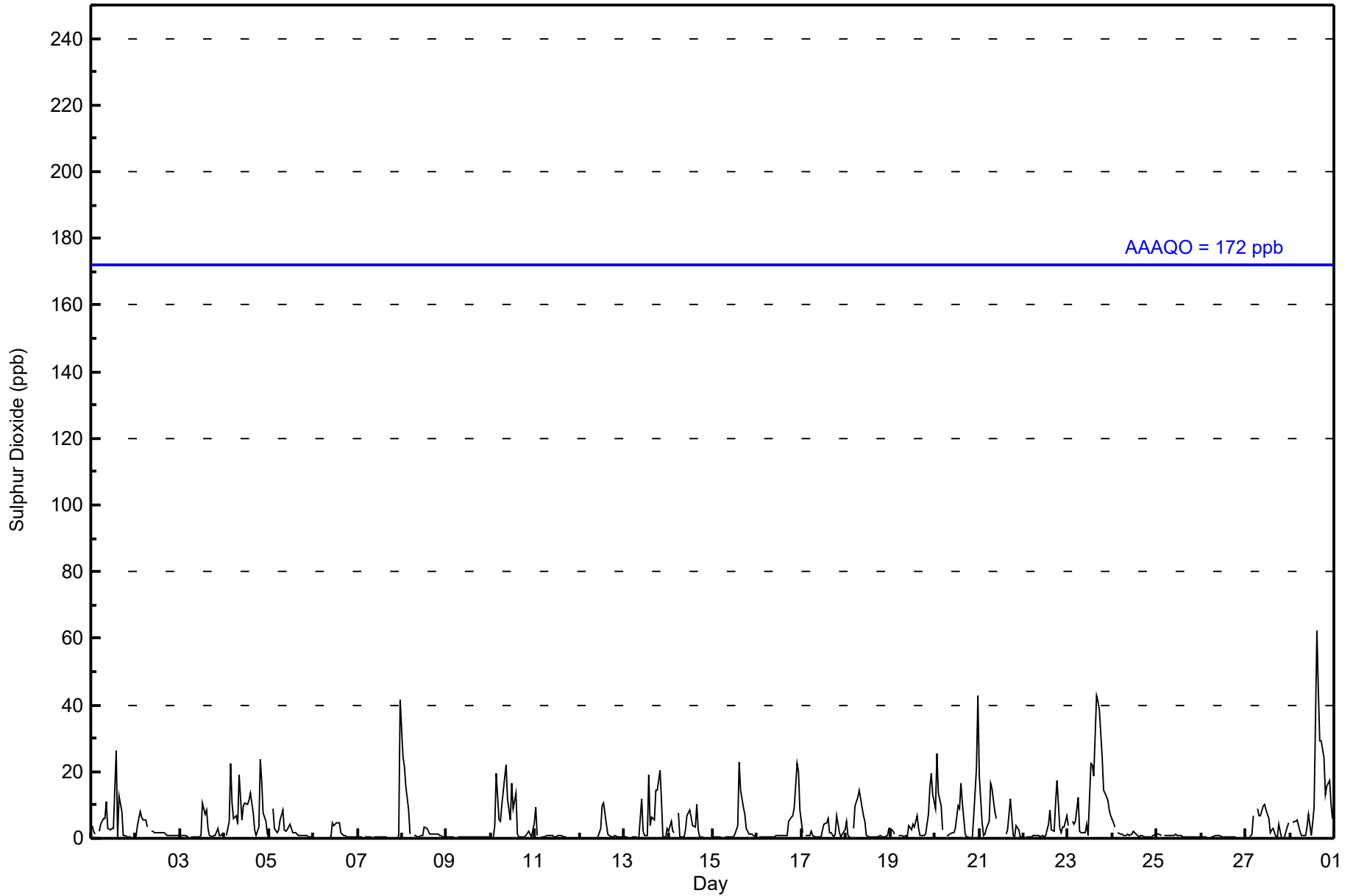
WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction, Vertical Wind Speed at 45m	13 Feb 2023 10:00	13 Feb 2023 13:00	4	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 75m	13 Feb 2023 10:00	13 Feb 2023 15:00	6	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 90m	13 Feb 2023 10:00	13 Feb 2023 12:00	3	Flat line in sensor output signal - Sensor frozen



Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 672																	672																												
Maximum Value: 62.5 ppb on Feb 28 15:00		Maximum Daily Average: 13.3 ppb on Feb 23																	641																														
Minimum Value: 0.0 ppb on Feb 6 06:00		Minimum Daily Average: 0.4 ppb on Feb 9																	31																														
Maximum Diurnal Average: 7.0 ppb at hour 15		Minimum Diurnal Average: 2.3 ppb at hour 5																	31																														
Monthly Average: 3.94 ppb		Percentiles: P <sub>1</sub> = 0.1 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> = 10.8 P <sub>99</sub> = 34.8																	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-Feb	3.9	2.1	1.3	Z	1.9	4.4	6.1	5.9	11.2	3.1	2.6	3.0	2.9	26.1	0.5	12.8	8.2	0.8	0.8	0.4	0.4	0.2	0.2	0.2	4.3	26.1																							
2-Feb	0.3	3.8	8.2	6.4	5.4	5.4	3.3	Z	2.3	2.0	1.7	1.9	1.7	1.7	1.9	1.7	1.3	1.0	0.8	0.7	0.7	0.8	0.8	0.8	2.4	8.2																							
3-Feb	0.7	0.7	0.7	0.7	0.6	Z	0.5	0.5	0.5	0.5	0.5	0.6	10.4	7.2	8.6	3.0	1.0	0.6	0.7	0.8	3.1	0.9	0.8	1.7	2.0	10.4																							
4-Feb	Z	0.8	4.9	22.5	10.4	5.8	6.7	4.4	18.9	5.6	9.6	10.6	10.2	11.3	13.7	7.5	2.4	0.8	3.4	23.8	17.1	7.8	5.0	1.3	8.9	23.8																							
5-Feb	0.8	Z	9.1	3.0	1.8	2.4	5.3	8.3	2.6	1.9	2.4	4.3	3.1	1.8	1.5	1.2	1.0	0.8	0.8	0.7	0.8	0.5	0.4	0.4	2.4	9.1																							
6-Feb	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.6	4.7	4.0	4.8	4.5	4.8	1.6	0.9	0.8	0.5	0.4	0.4	0.4	0.4	0.4	1.3	4.8																							
7-Feb	0.4	0.4	0.5	Z	0.5	0.4	0.3	0.2	0.2	0.3	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.7	41.6	2.1	41.6																							
8-Feb	24.7	21.4	15.5	8.4	1.3	Z	0.7	0.9	0.6	0.6	1.0	0.9	3.3	2.9	2.1	1.5	1.2	1.1	1.3	1.3	0.9	0.7	0.5	0.4	4.1	24.7																							
9-Feb	0.4	0.3	0.3	0.3	0.3	Z	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.3	0.4	0.3	0.5	0.4	0.4	0.6																							
10-Feb	Z	0.6	3.7	19.3	5.5	5.1	10.4	18.0	22.1	11.7	5.5	16.6	9.0	13.5	1.1	0.6	0.4	0.3	0.2	0.7	2.0	1.3	0.4	4.7	6.6	22.1																							
11-Feb	9.1	0.7	Z	0.4	0.5	0.6	1.0	1.0	0.8	1.0	0.6	0.6	0.7	0.7	0.7	0.5	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.9	9.1																							
12-Feb	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	3.1	9.7	10.5	4.2	1.3	0.8	0.6	0.5	0.7	0.5	0.4	0.4	0.5	1.5	10.5																							
13-Feb	0.5	0.4	0.4	Z	0.4	0.3	0.2	0.1	0.5	11.8	2.3	0.7	1.0	19.3	3.7	6.5	5.3	14.5	14.6	20.2	11.4	0.6	0.4	3.0	5.1	20.2																							
14-Feb	2.0	5.2	2.2	1.5	Z	7.8	0.3	0.3	0.3	2.5	6.6	8.3	6.2	3.8	3.6	10.1	2.5	0.4	0.6	0.2	0.1	0.1	0.1	0.1	2.8	10.1																							
15-Feb	0.2	0.3	0.3	0.3	0.3	Z	0.3	0.4	0.4	0.3	0.3	0.4	1.3	3.8	23.0	14.2	9.4	7.4	3.1	1.3	1.1	1.1	0.8	0.6	3.1	23.0																							
16-Feb	Z	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.8	0.8	0.9	1.0	1.0	0.9	0.8	5.3	6.2	6.8	9.3	22.3	20.0	8.4	3.9	22.3																								
17-Feb	1.5	Z	0.9	0.8	0.8	2.1	0.9	0.6	0.5	0.5	0.5	2.7	4.2	4.8	6.0	1.7	1.8	0.5	1.2	6.9	1.5	0.2	1.3	2.5	1.9	6.9																							
18-Feb	5.1	0.9	0.2	Z	3.0	9.8	12.2	14.3	12.0	7.0	4.9	0.8	0.5	0.3	0.4	0.3	0.5	0.3	1.0	0.6	0.4	0.5	1.0	3.0	3.4	14.3																							
19-Feb	2.8	1.9	1.2	Z	1.0	0.9	0.8	0.5	0.7	0.5	3.8	2.6	4.2	3.5	6.6	2.8	0.9	0.7	0.9	1.1	7.2	15.2	19.4	13.2	4.0	19.4																							
20-Feb	8.9	25.5	13.5	9.8	2.6	Z	0.9	0.8	1.2	1.8	1.7	3.1	9.7	8.7	16.6	10.8	1.2	0.6	0.3	0.2	0.2	6.5	21.1	42.6	8.2	42.6																							
21-Feb	18.5	4.6	0.8	1.4	2.9	5.1	16.6	15.0	7.9	6.0	Z	C	C	C	1.4	2.7	7.1	11.9	0.6	0.4	3.7	2.8	0.5	0.4	5.5	18.5																							
22-Feb	Z	0.4	0.4	0.5	0.6	0.6	0.9	0.8	0.8	0.6	0.7	0.6	1.0	4.2	8.5	2.7	2.0	10.8	17.4	2.9	1.6	3.6	3.5	6.9	3.1	17.4																							
23-Feb	3.7	Z	5.2	4.1	5.0	12.2	2.3	1.8	1.6	1.7	4.2	0.7	22.6	21.8	18.4	42.6	41.3	38.5	24.3	14.6	13.4	11.3	8.5	6.7	13.3	42.6																							
24-Feb	4.8	3.5	Z	1.6	1.2	1.1	1.0	1.0	1.1	1.0	1.4	2.0	1.7	0.7	0.5	0.7	0.8	0.6	0.5	0.4	0.4	0.5	0.7	1.2	1.2	4.8																							
25-Feb	1.2	1.1	0.9	Z	0.8	0.8	0.8	0.7	0.8	0.9	1.2	1.0	0.7	0.7	0.6	0.6	0.5	0.6	0.6	0.5	0.5	0.4	0.4	0.6	0.7	1.2																							
26-Feb	0.6	0.6	0.5	0.3	Z	0.4	0.5	0.7	0.7	0.7	0.8	0.6	0.6	0.6	0.6	0.4	0.4	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.4	0.8																							
27-Feb	0.2	0.2	0.2	1.1	6.7	Z	8.8	6.9	6.6	9.9	10.4	8.6	5.8	1.9	2.6	2.9	0.3	0.4	4.1	0.1	0.1	0.6	3.4	4.6	3.7	10.4																							
28-Feb	Z	4.7	4.9	5.0	5.4	2.2	1.0	0.8	0.7	3.2	7.4	1.0	4.8	9.2	62.5	44.6	29.0	29.3	24.0	13.2	15.9	17.6	10.2	6.0	13.1	62.5																							
																								3.9	3.2	3.2	4.0	2.3	3.1	3.0	3.1	3.4	2.7	2.8	3.0	4.5	6.1	7.0	6.3	4.3	4.6	3.9	3.6	3.3	3.5	3.6	5.4	Diurnal Average	
																								24.7	25.5	15.5	22.5	10.4	12.2	16.6	18.0	22.1	11.8	10.4	16.6	22.6	26.1	62.5	44.6	41.3	38.5	24.3	23.8	17.1	22.3	21.1	42.6	Diurnal Maximum	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																																																	





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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Mannix - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	573	89.39	89.39
11 - 20	45	7.02	96.41
21 - 60	22	3.43	99.84
61 - 110	1	0.16	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 641

Total Number of Hours: 672



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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Mannix - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	53	52	13	10	7	9	63	119	36	7	6	17	50	30	49	52	573
11 - 20	14	5	1	0	1	0	1	1	3	0	2	0	0	2	2	13	45
21 - 60	7	0	0	0	0	0	2	3	0	0	0	0	4	1	2	3	22
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
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>	74	57	14	10	8	9	66	123	39	7	8	17	55	33	53	68	641

Total Number of Valid Hours: 641

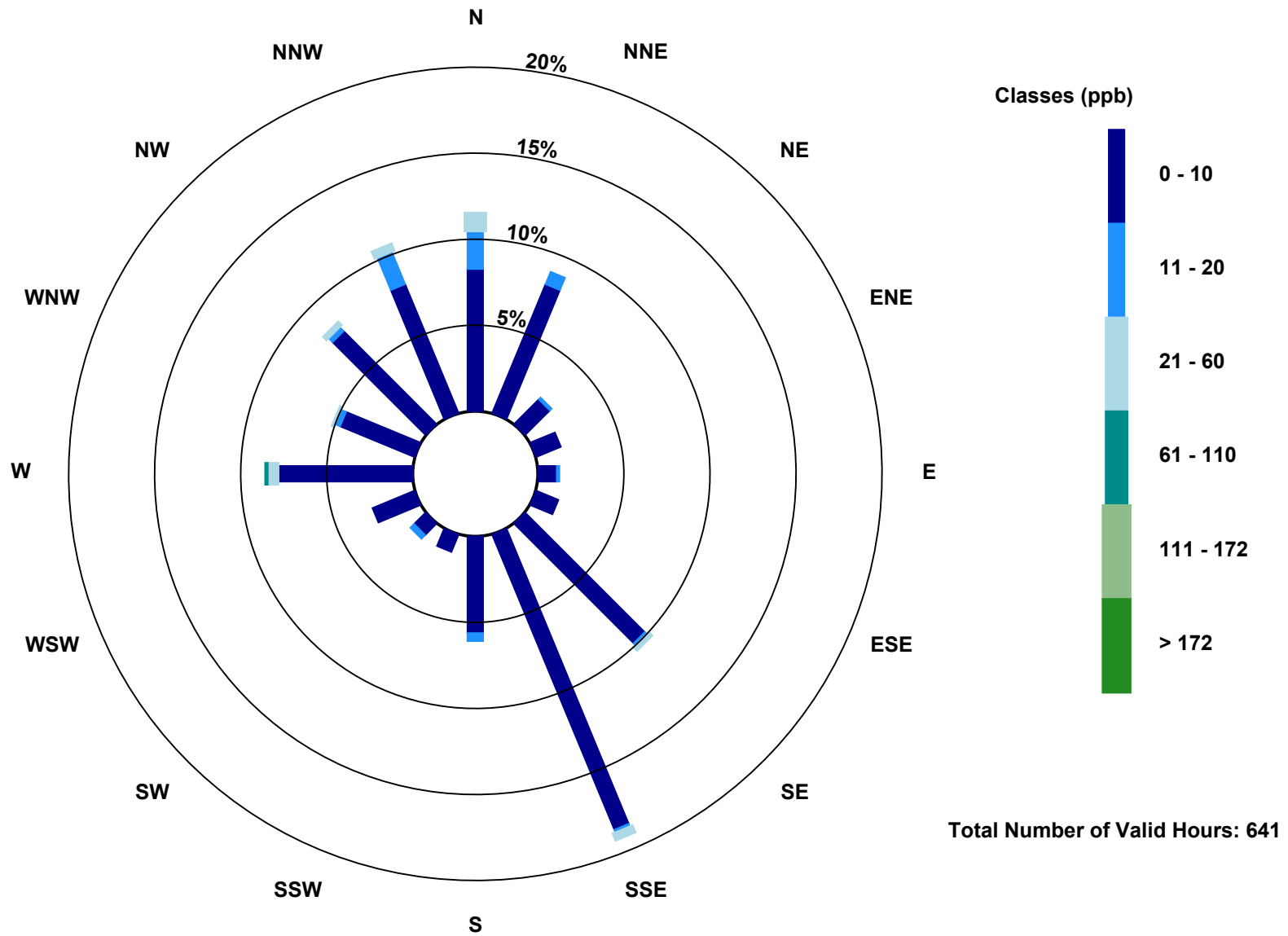
Total Number of Hours: 672

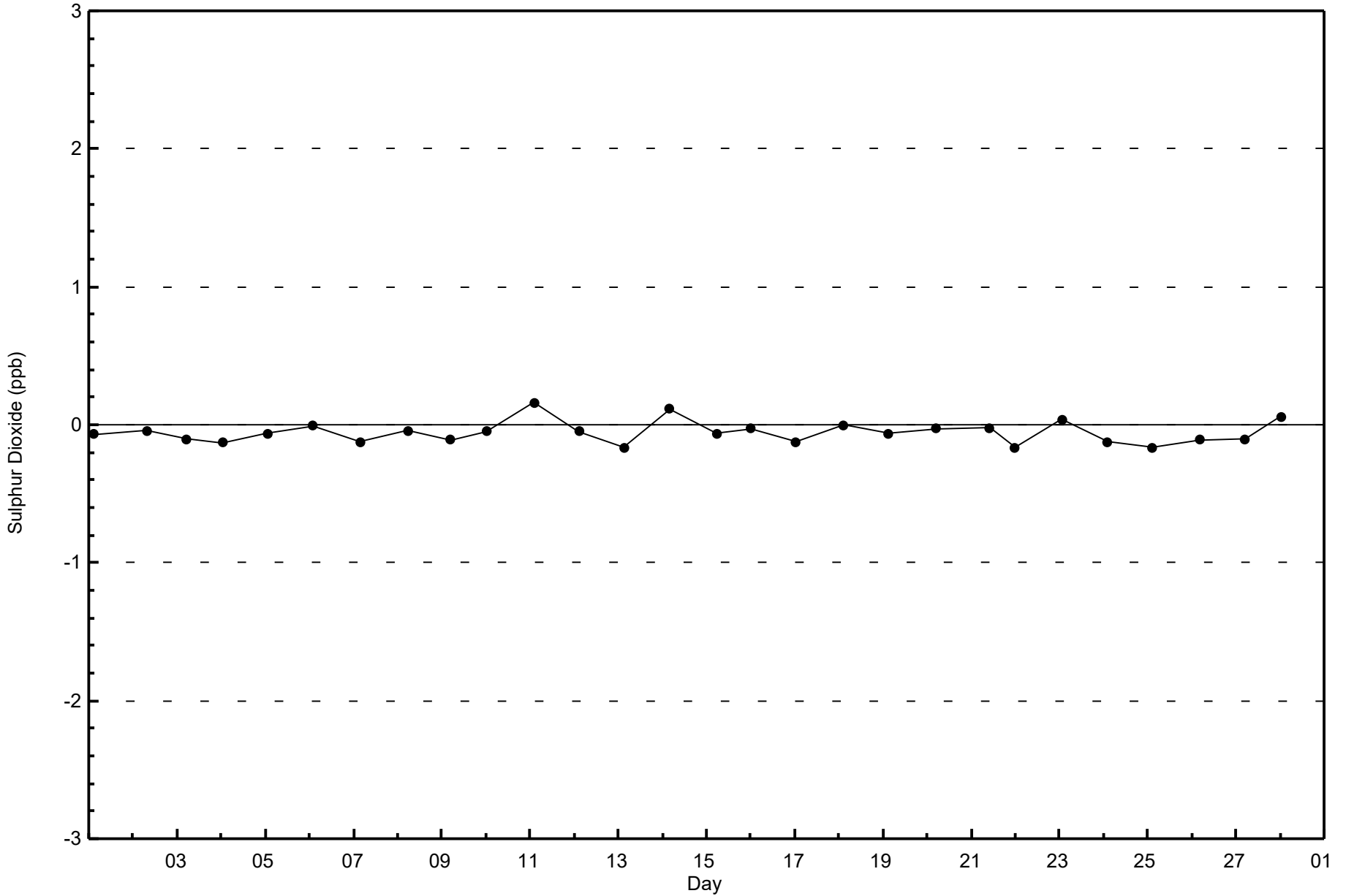


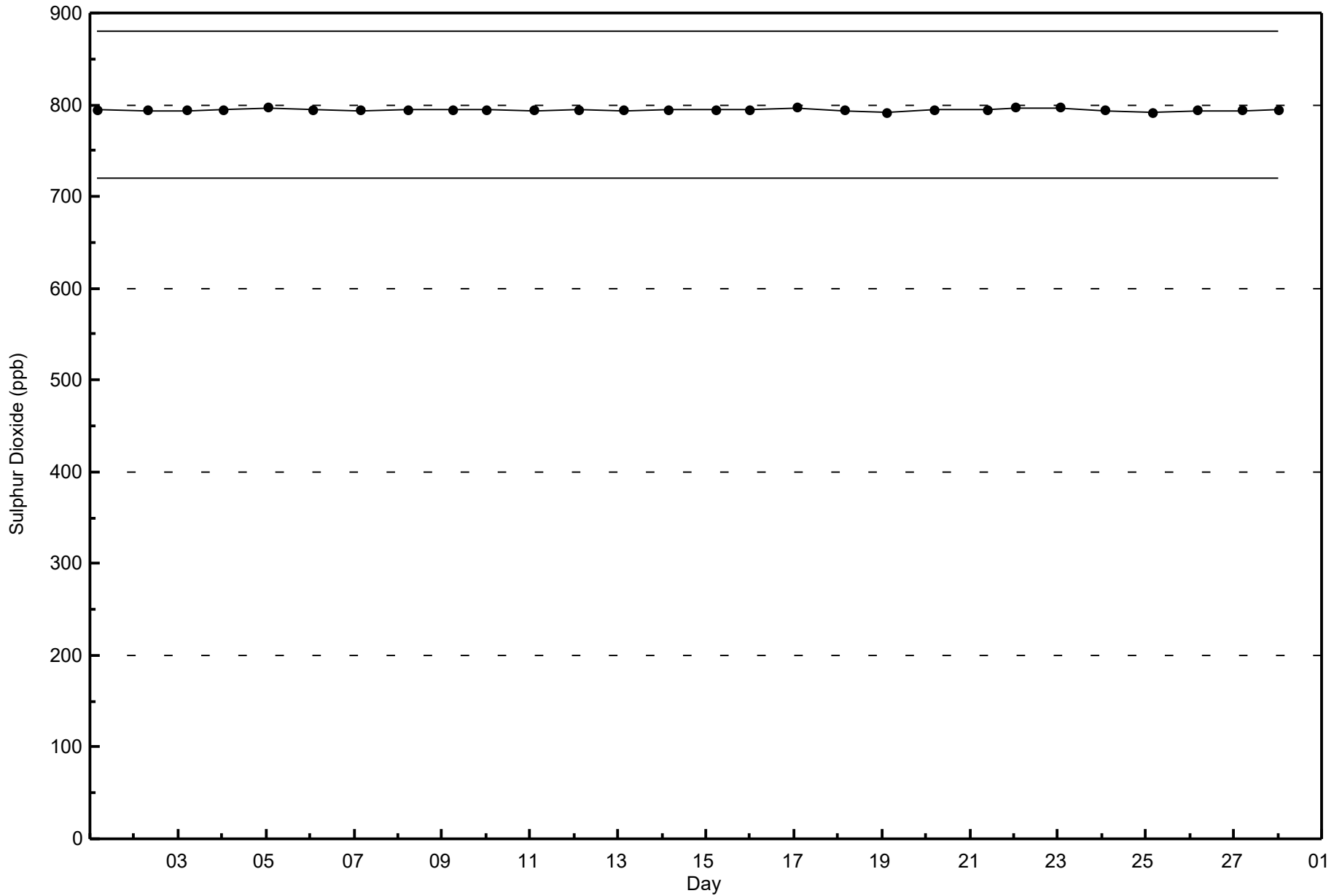


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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

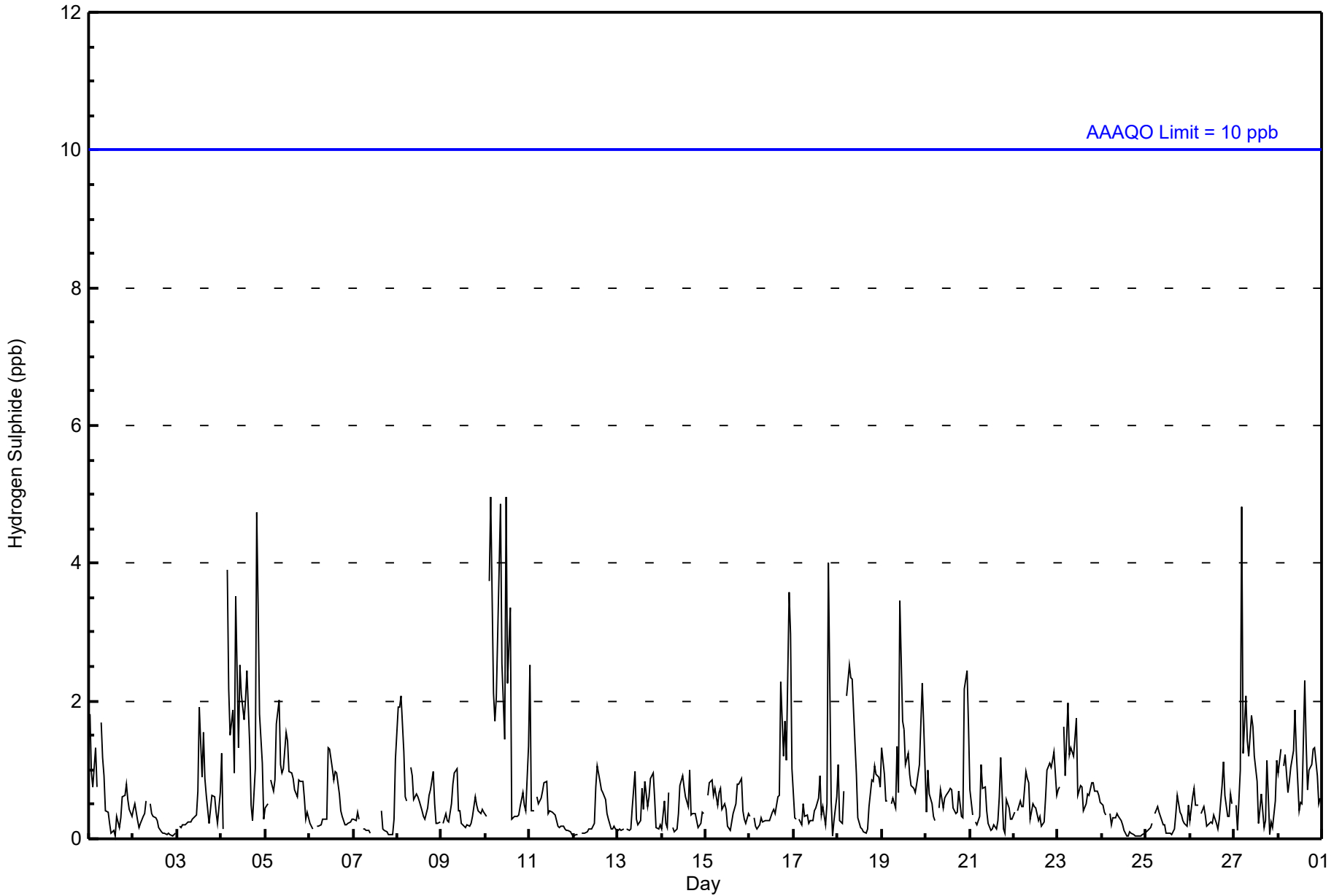








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																			
Maximum Value: 5.0 ppb on Feb 10 04:00		Maximum Daily Average: 1.9 ppb on Feb 10				Hours of Data:		639																			
Minimum Value: 0.0 ppb on Feb 24 14:00		Minimum Daily Average: 0.2 ppb on Feb 24				Hours of Missing Data:		33																			
Maximum Diurnal Average: 1.0 ppb at hour 9		Minimum Diurnal Average: 0.4 ppb at hour 17				Hours of Calibration:		33																			
Monthly Average: 0.68 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> = 0.8 P <sub>90</sub> = 1.4 P <sub>99</sub> = 3.9				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-Feb	1.8	1.0	0.8	1.3	0.7	Z	1.7	1.2	0.9	0.4	0.4	0.2	0.1	0.1	0.1	0.3	0.2	0.3	0.6	0.6	0.8	0.6	0.4	0.3	0.6	1.8	
2-Feb	0.4	0.5	0.3	0.2	0.2	0.3	0.4	0.6	Z	0.5	0.4	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6
3-Feb	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.7	1.9	0.9	1.5	0.9	0.6	0.2	0.4	0.6	0.6	0.4	0.2	0.7	0.5	1.9	
4-Feb	1.3	0.1	Z	3.9	2.2	1.5	1.9	1.0	3.5	1.3	2.5	2.1	1.7	2.0	2.4	1.4	0.5	0.3	1.0	4.7	3.4	1.8	1.1	0.3	1.8	4.7	
5-Feb	0.5	0.5	Z	0.9	0.7	0.9	1.7	2.0	1.1	0.9	1.0	1.6	1.4	1.0	1.0	0.9	0.7	0.6	0.9	0.8	0.8	0.6	0.3	0.4	0.9	2.0	
6-Feb	0.2	0.2	0.1	Z	0.2	0.2	0.2	0.3	0.3	0.3	1.3	1.3	1.0	0.9	1.0	0.9	0.6	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.5	1.3	
7-Feb	0.3	0.3	0.4	0.3	Z	0.1	0.1	0.1	0.1	0.1	C	C	C	C	C	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.2	0.2	1.2	
8-Feb	1.9	1.9	2.1	1.3	0.6	0.6	Z	1.0	0.9	0.6	0.6	0.6	0.5	0.4	0.3	0.3	0.4	0.6	0.7	1.0	0.5	0.2	0.2	0.2	0.8	2.1	
9-Feb	Z	0.2	0.4	0.3	0.3	0.5	0.8	1.0	1.0	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.6	0.5	0.4	0.4	0.4	0.4	0.4	1.0	
10-Feb	0.3	Z	3.7	5.0	2.1	1.7	2.1	3.9	4.9	2.6	1.4	5.0	2.2	3.4	0.3	0.3	0.3	0.3	0.3	0.5	0.7	0.5	0.4	1.4	1.9	5.0	
11-Feb	2.5	0.4	0.4	Z	0.6	0.5	0.6	0.7	0.8	0.8	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.5	2.5	
12-Feb	0.0	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.8	1.1	0.8	0.7	0.7	0.6	0.4	0.3	0.1	0.1	0.2	0.1	0.3	1.1	
13-Feb	0.1	0.1	0.1	0.2	Z	0.1	0.1	0.1	0.5	1.0	0.3	0.2	0.3	0.7	0.4	0.8	0.5	0.6	0.9	1.0	0.6	0.2	0.1	0.2	0.4	1.0	
14-Feb	0.1	0.6	0.2	0.2	0.7	Z	0.2	0.1	0.1	0.4	0.8	0.9	0.8	0.6	0.5	1.0	0.3	0.4	0.4	0.3	0.2	0.2	0.4	0.4	0.4	1.0	
15-Feb	Z	0.6	0.8	0.9	0.6	0.7	0.5	0.7	0.7	0.4	0.5	0.4	0.2	0.1	0.2	0.4	0.5	0.8	0.8	0.9	0.4	0.3	0.2	0.4	0.5	0.9	
16-Feb	0.3	Z	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.6	0.6	2.3	1.2	1.7	1.1	3.6	3.0	1.0	0.8	3.6	
17-Feb	0.3	0.3	Z	0.3	0.2	0.5	0.3	0.3	0.2	0.3	0.3	0.4	0.4	0.6	0.9	0.3	0.5	0.2	0.5	4.0	0.5	0.0	0.3	0.6	0.5	4.0	
18-Feb	1.1	0.3	0.2	0.7	Z	2.1	2.5	2.3	2.3	1.4	0.9	0.3	0.2	0.1	0.1	0.1	0.1	0.5	0.8	0.8	1.1	0.9	0.9	0.8	0.9	2.5	
19-Feb	1.3	0.9	0.6	0.5	Z	0.5	0.6	0.5	1.4	0.7	3.5	1.7	1.6	1.1	1.2	0.9	0.8	0.7	0.7	0.8	1.1	1.7	2.3	1.7	1.2	3.5	
20-Feb	0.4	1.0	0.7	0.5	0.3	0.3	Z	0.4	0.7	0.4	0.6	0.6	0.7	0.7	0.7	0.5	0.4	0.4	0.7	0.3	0.3	2.2	2.4	1.7	0.7	2.4	
21-Feb	0.7	0.3	Z	0.2	0.2	0.3	1.1	0.7	0.8	0.4	0.2	0.1	0.1	0.2	0.1	0.3	0.6	1.2	0.1	0.1	0.6	0.4	0.3	0.3	0.4	1.2	
22-Feb	0.4	Z	0.4	0.5	0.5	0.5	1.0	0.9	0.8	0.3	0.5	0.5	0.5	0.3	0.3	0.2	0.2	0.6	1.0	1.1	1.0	1.1	1.3	0.6	0.6	1.3	
23-Feb	0.7	0.8	Z	1.6	0.9	2.0	1.2	1.3	1.2	1.5	1.8	0.6	0.8	0.8	0.4	0.5	0.6	0.6	0.8	0.8	0.7	0.7	0.6	0.5	0.9	2.0	
24-Feb	0.5	0.4	0.3	Z	0.4	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.5	
25-Feb	0.1	0.1	0.2	0.2	Z	0.4	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.4	0.6	0.4	0.3	0.3	0.2	0.2	0.5	0.3	0.6	
26-Feb	0.3	0.6	0.7	0.5	0.5	Z	0.4	0.5	0.3	0.2	0.2	0.3	0.2	0.3	0.2	0.1	0.3	0.8	1.1	0.6	0.3	0.3	0.7	0.5	0.4	1.1	
27-Feb	Z	0.5	0.1	1.0	4.8	1.2	2.1	1.4	1.2	1.8	1.6	1.2	0.8	0.2	0.4	0.6	0.2	0.3	1.1	0.1	0.3	0.2	0.5	1.1	1.0	4.8	
28-Feb	1.0	1.3	Z	1.1	1.2	0.7	0.8	1.0	1.3	1.9	1.3	0.4	0.5	0.5	2.3	1.4	0.7	1.0	1.1	1.3	1.3	0.9	0.5	0.6	1.0	2.3	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.7 0.5 0.6 0.9 0.8 0.7 0.8 0.8 1.0 0.7 0.8 0.8 0.7 0.6 0.6 0.5 0.4 0.4 0.5 0.6 0.8 0.6 0.6 0.6 0.6 0.6 0.6			
																								2.5 1.9 3.7 5.0 4.8 2.1 2.5 3.9 4.9 2.6 3.5 5.0 2.2 3.4 2.4 1.4 0.8 2.3 1.2 4.7 3.4 3.6 3.0 1.7			
Z - zerospan C - Calibration																											
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 - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	620	97.03	97.03
3 - 4	14	2.19	99.22
5 - 7	5	0.78	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Mannix - February 2023**

<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	66	54	15	8	8	9	64	126	39	7	8	19	47	35	55	60	620
3 - 4	6	0	0	1	0	0	0	0	0	0	0	0	0	1	1	5	14
5 - 7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5
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>	74	54	15	9	8	9	64	126	39	7	8	19	47	36	56	68	639

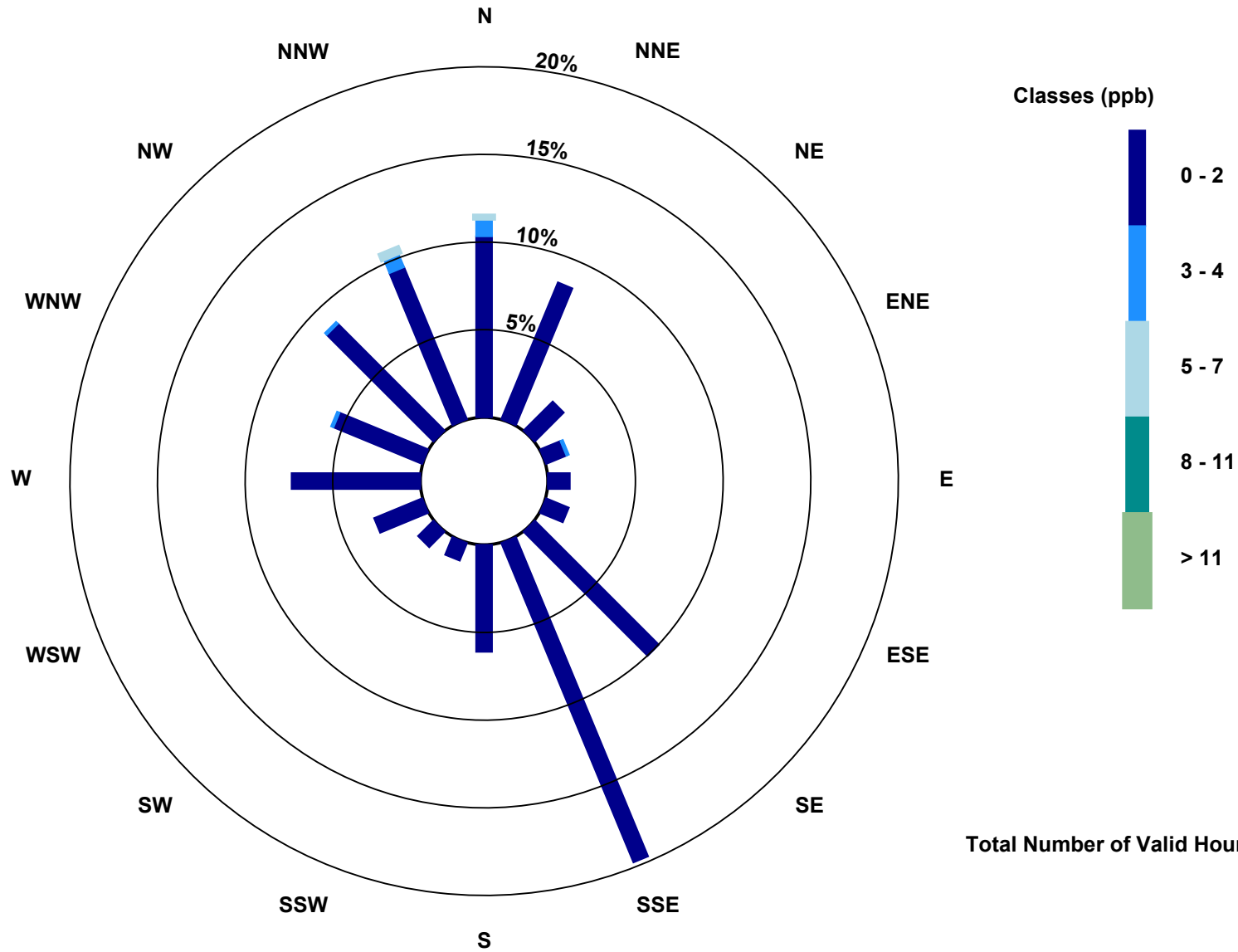
Total Number of Valid Hours: 639

Total Number of Hours: 672



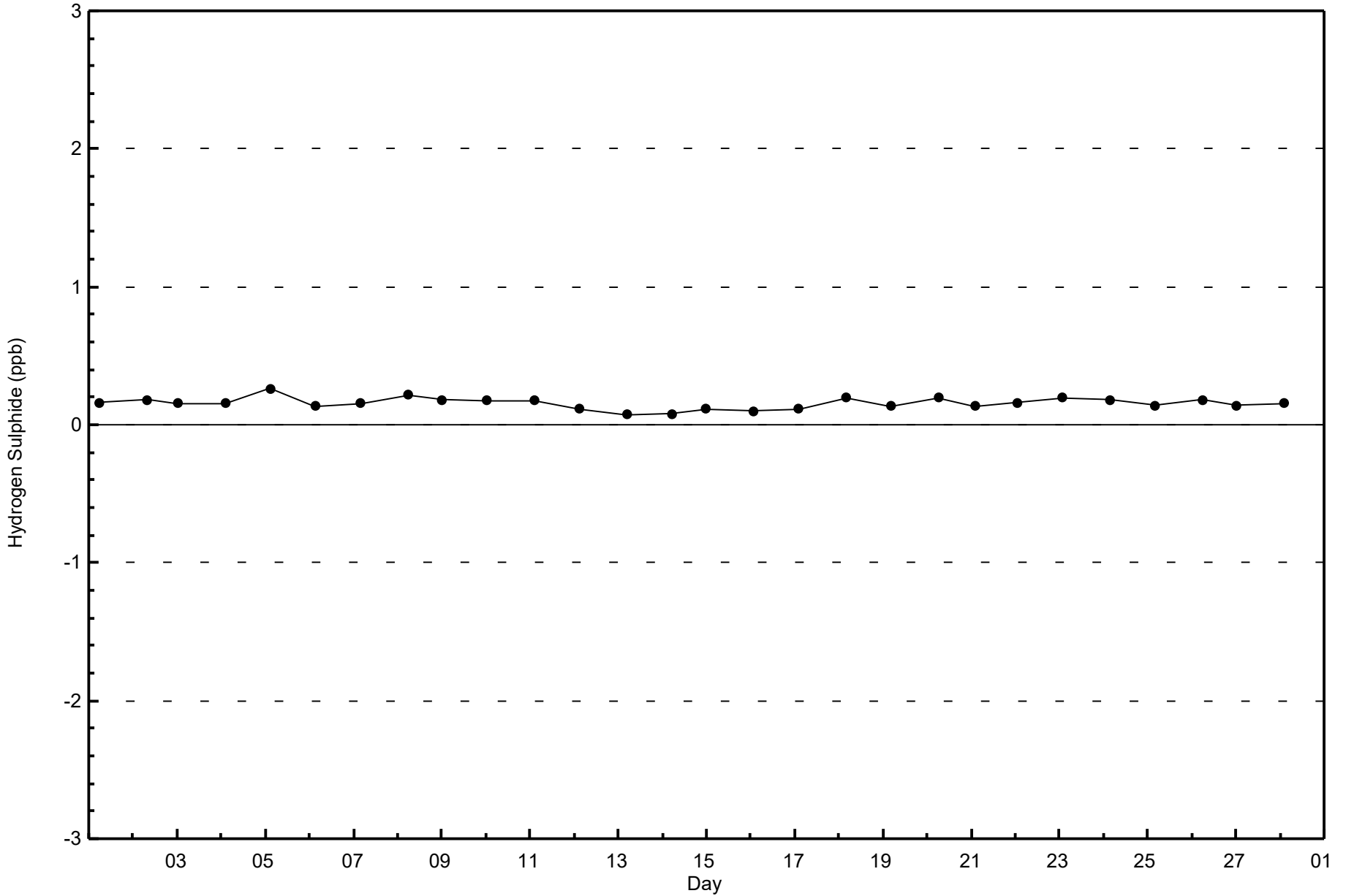
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

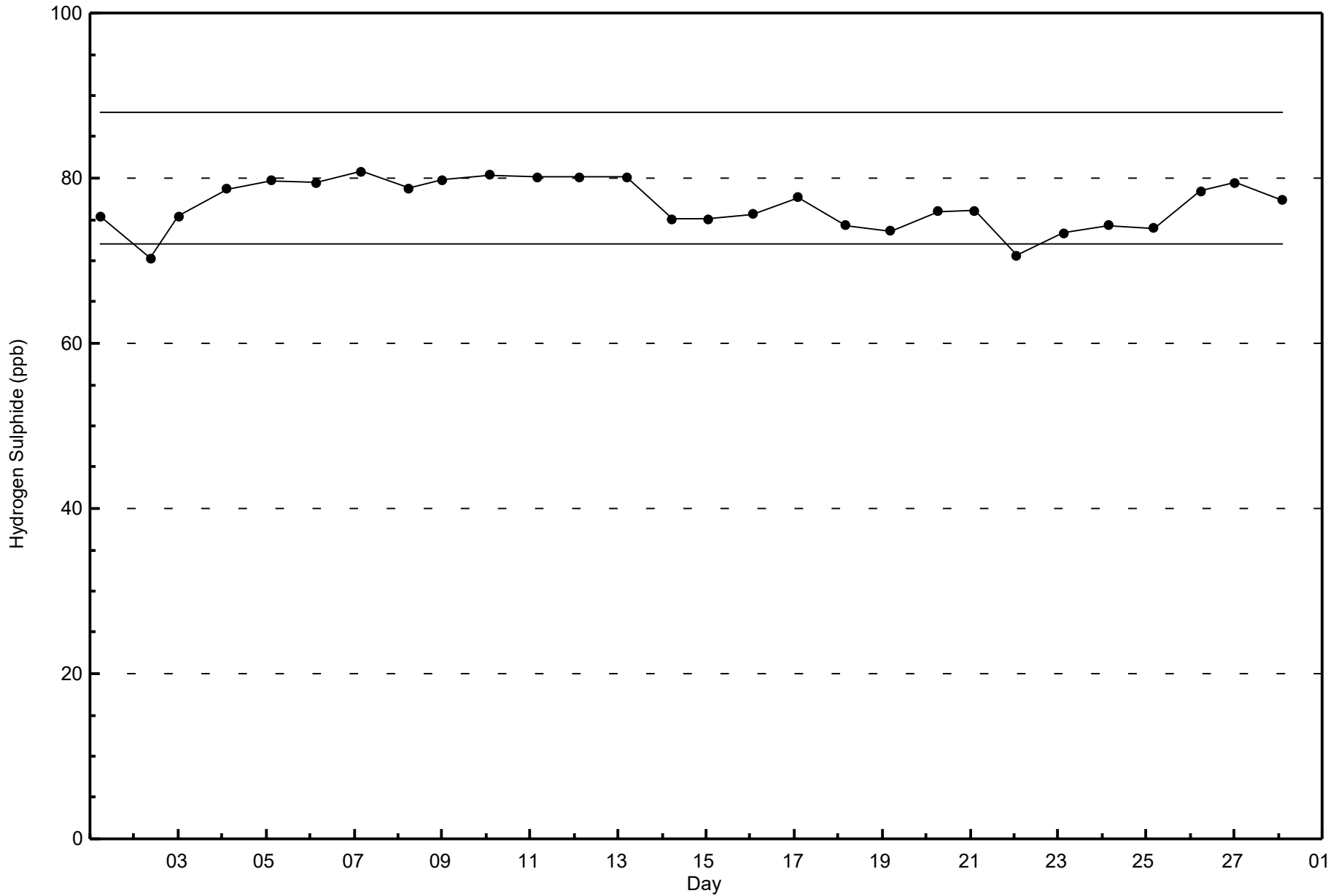
Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Mannix



Total Number of Valid Hours: 639









Wood Buffalo Environmental Association

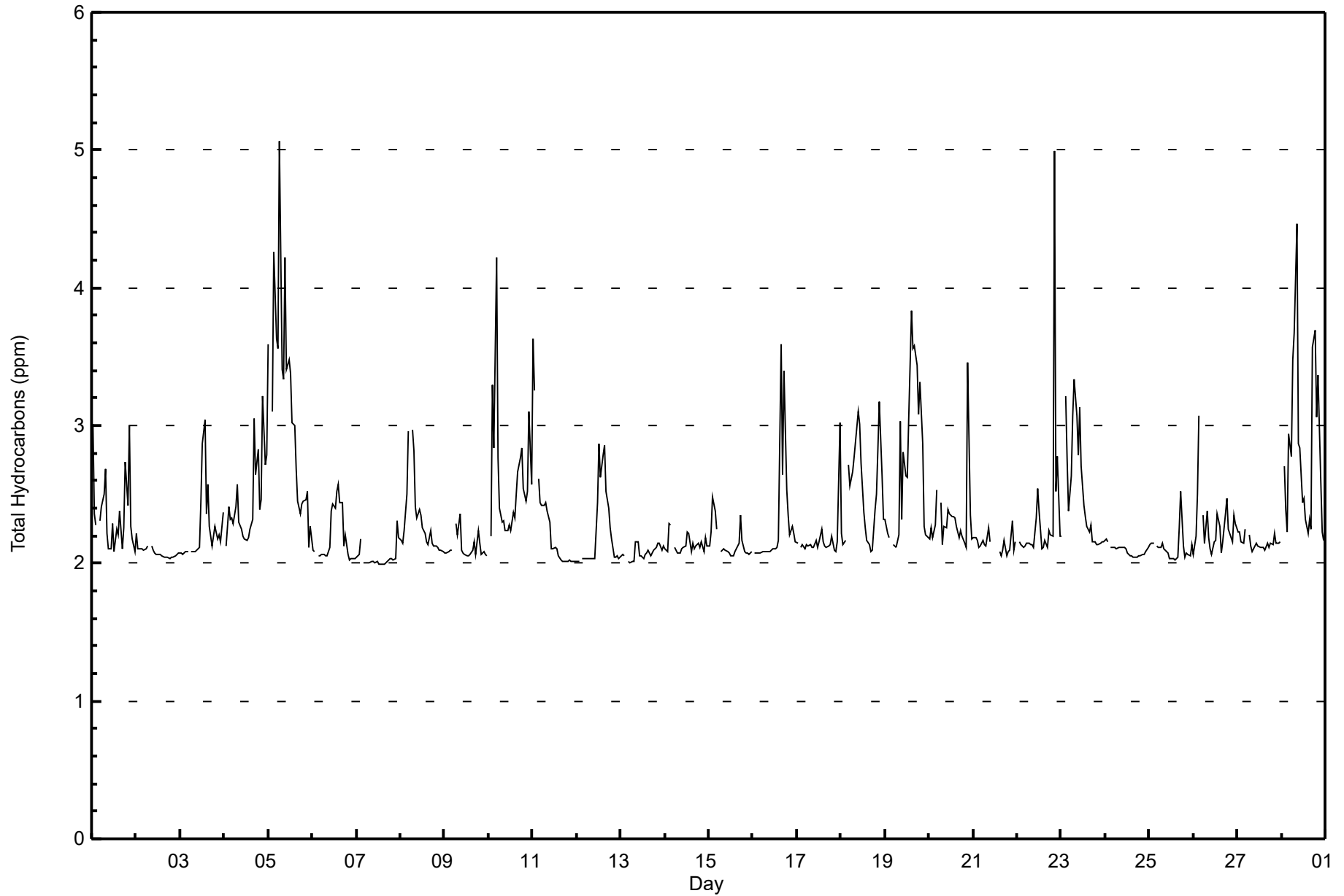
Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Mannix - February 2023

Maximum Value: 5.1 ppm on Feb 5 07:00		Maximum Daily Average: 3.1 ppm on Feb 5		Hours in Service: 672																							
Minimum Value: 2.0 ppm on Feb 7 16:00		Minimum Daily Average: 2.0 ppm on Feb 7		Hours of Data: 641																							
Maximum Diurnal Average: 2.4 ppm at hour 7		Minimum Diurnal Average: 2.2 ppm at hour 2		Hours of Missing Data: 31																							
Monthly Average: 2.32 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> = 2.4 P <sub>90</sub> = 2.8 P <sub>99</sub> = 3.8		Hours of Calibration: 31																							
				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-Feb	3.0	2.4	2.3	Z	2.3	2.4	2.5	2.7	2.2	2.1	2.1	2.3	2.1	2.2	2.2	2.4	2.1	2.3	2.7	2.4	3.0	2.3	2.2	2.1	2.4	3.0	
2-Feb	2.2	2.1	2.1	2.1	2.1	2.1	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	2.1	2.1	2.1	2.1	2.2	2.2
3-Feb	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.4	2.9	3.0	2.4	2.6	2.3	2.1	2.2	2.3	2.2	2.2	2.2	2.4	2.3	3.0	
4-Feb	Z	2.1	2.4	2.3	2.3	2.3	2.4	2.6	2.3	2.2	2.2	2.2	2.2	2.2	2.3	3.0	3.0	2.6	2.8	2.4	2.5	3.2	2.7	2.8	2.5	3.2	
5-Feb	3.6	Z	3.1	4.3	3.6	3.6	5.1	3.4	3.3	4.2	3.4	3.5	3.4	3.0	3.0	2.7	2.4	2.4	2.4	2.5	2.5	2.5	2.1	2.3	3.1	5.1	
6-Feb	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.4	2.4	2.5	2.6	2.4	2.4	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.2	2.6	
7-Feb	2.0	2.1	2.2	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	2.3	2.2	2.0	2.3	
8-Feb	2.2	2.1	2.2	2.5	3.0	Z	3.0	2.8	2.4	2.3	2.4	2.3	2.3	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	3.0
9-Feb	2.1	2.1	2.1	2.1	2.1	Z	2.3	2.2	2.4	2.1	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	2.1	2.4
10-Feb	Z	2.2	3.3	2.8	4.2	2.8	2.4	2.3	2.3	2.2	2.2	2.3	2.2	2.4	2.3	2.5	2.7	2.8	2.8	2.5	2.5	2.5	3.1	2.6	2.6	4.2	
11-Feb	3.6	3.3	Z	2.6	2.4	2.4	2.4	2.4	2.4	2.3	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	2.3	3.6	
12-Feb	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	2.9	2.6	2.8	2.9	2.5	2.4	2.3	2.2	2.0	2.0	2.1	2.0	2.2	2.9	
13-Feb	2.1	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.2	2.2	2.1	2.1	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	
14-Feb	2.1	2.1	2.3	2.3	Z	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	2.2	2.1	2.2	2.1	2.1	2.3	
15-Feb	2.1	2.2	2.5	2.4	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	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.5	
16-Feb	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	3.6	2.6	3.4	2.5	2.4	2.2	2.3	2.2	2.2	2.3	3.6	
17-Feb	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	3.0	2.2	3.0	
18-Feb	2.2	2.1	2.2	Z	2.7	2.6	2.7	2.8	2.9	3.1	3.0	2.7	2.4	2.3	2.2	2.1	2.1	2.1	2.4	2.5	2.8	3.2	2.6	2.3	2.5	3.2	
19-Feb	2.3	2.2	2.2	Z	2.1	2.1	2.1	2.2	3.0	2.3	2.8	2.6	2.6	3.1	3.8	3.6	3.6	3.4	3.1	3.3	2.9	2.3	2.2	2.2	2.7	3.8	
20-Feb	2.2	2.3	2.2	2.3	2.5	Z	2.4	2.1	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	3.5	2.3	2.2	2.3	3.5	
21-Feb	2.2	2.2	2.2	2.1	2.1	2.2	2.1	2.1	2.3	2.2	Z	C	C	C	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.3	2.1	2.2	2.1	2.3	
22-Feb	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.5	2.4	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	5.0	2.5	2.8	2.2	5.0	
23-Feb	2.2	Z	3.2	2.8	2.4	2.6	3.1	3.3	3.1	2.8	3.1	2.7	2.4	2.3	2.3	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.5	3.3	
24-Feb	2.2	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	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	
25-Feb	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.3	2.5	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.5	
26-Feb	2.1	2.2	2.5	3.1	Z	2.3	2.1	2.4	2.2	2.1	2.1	2.2	2.2	2.4	2.3	2.1	2.2	2.4	2.5	2.2	2.2	2.2	2.4	2.3	2.3	3.1	
27-Feb	2.2	2.2	2.2	2.1	2.3	Z	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	2.2	2.1	2.1	2.2	2.2	2.3	
28-Feb	Z	2.7	2.4	2.2	2.9	2.8	3.5	3.7	4.5	2.9	2.8	2.4	2.5	2.3	2.2	2.3	2.2	3.6	3.7	3.1	3.4	2.6	2.2	2.2	2.8	4.5	
																								Diurnal Average			
																								Diurnal Maximum			
																								2.3 3.6			
																								2.2 3.3			
																								2.3 4.3			
																								2.4 4.2			
																								2.4 3.6			
																								2.3 5.1			
																								2.4 3.7			
																								2.4 4.5			
																								2.3 4.2			
																								2.3 3.4			
																								2.3 3.5			
																								2.3 3.4			
																								2.3 3.1			
																								2.3 3.8			
																								2.3 3.6			
																								2.3 3.6			
																								2.4 3.6			
																								2.3 3.7			
																								2.3 3.3			
																								2.4 5.0			
																								2.3 3.5			
																								2.2 3.1			
																								2.2 3.0			

Z - zerospan      C - Calibration





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

**Total Hydrocarbons (THC) - ppm**  
**Mannix - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	65	10.14	10.14
2.1 - 3.0	532	83.00	93.14
3.1 - 10.0	44	6.86	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 641

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Mannix - February 2023**

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	11	7	2	0	1	13	27	3	0	1	65
2.1 - 3.0	72	56	12	9	7	8	55	114	36	7	6	3	24	24	37	62	532
3.1 - 10.0	2	1	2	1	1	1	0	2	1	0	1	1	4	6	16	5	44
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	74	57	14	10	8	9	66	123	39	7	8	17	55	33	53	68	641

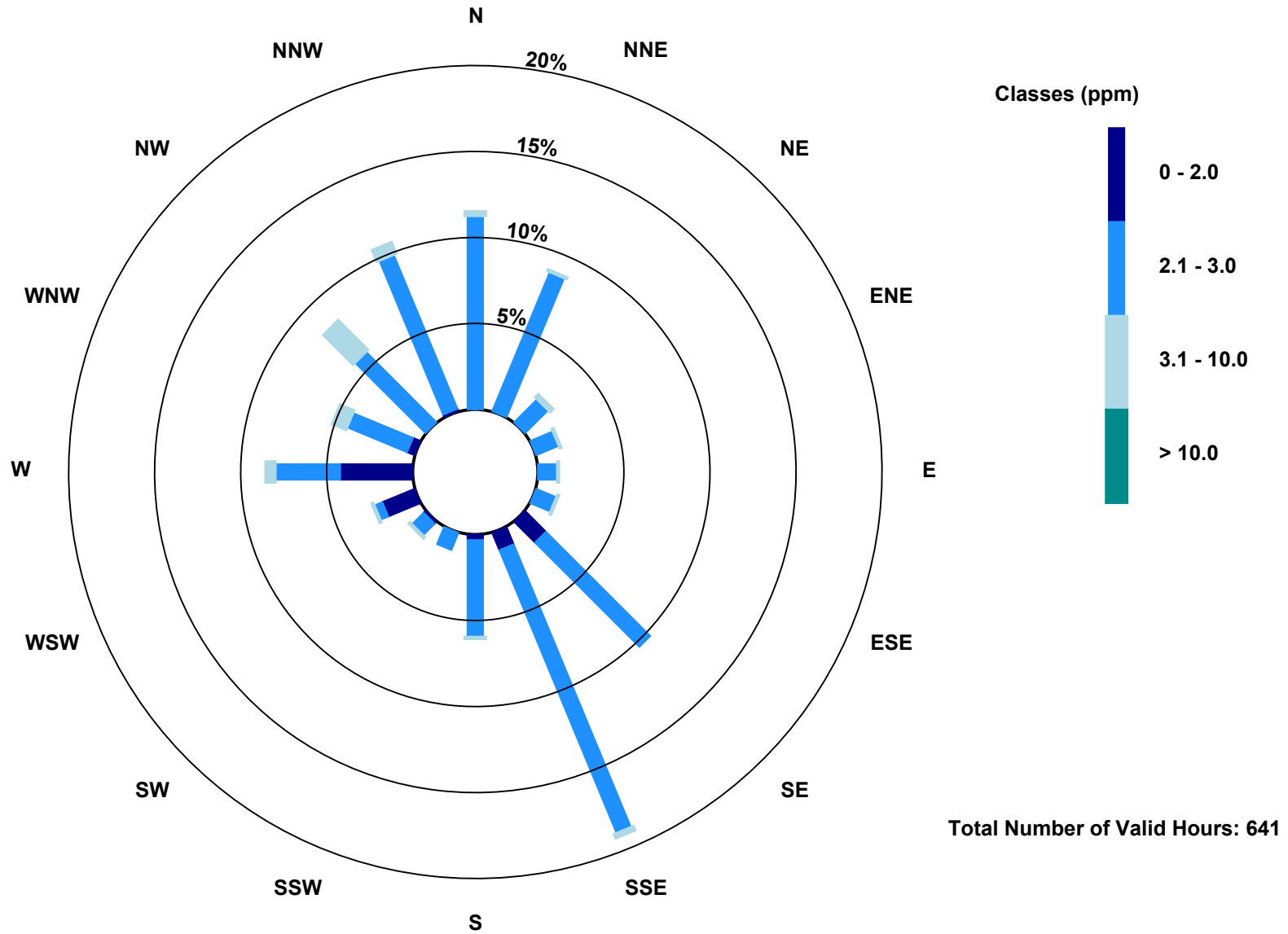
Total Number of Valid Hours: 641

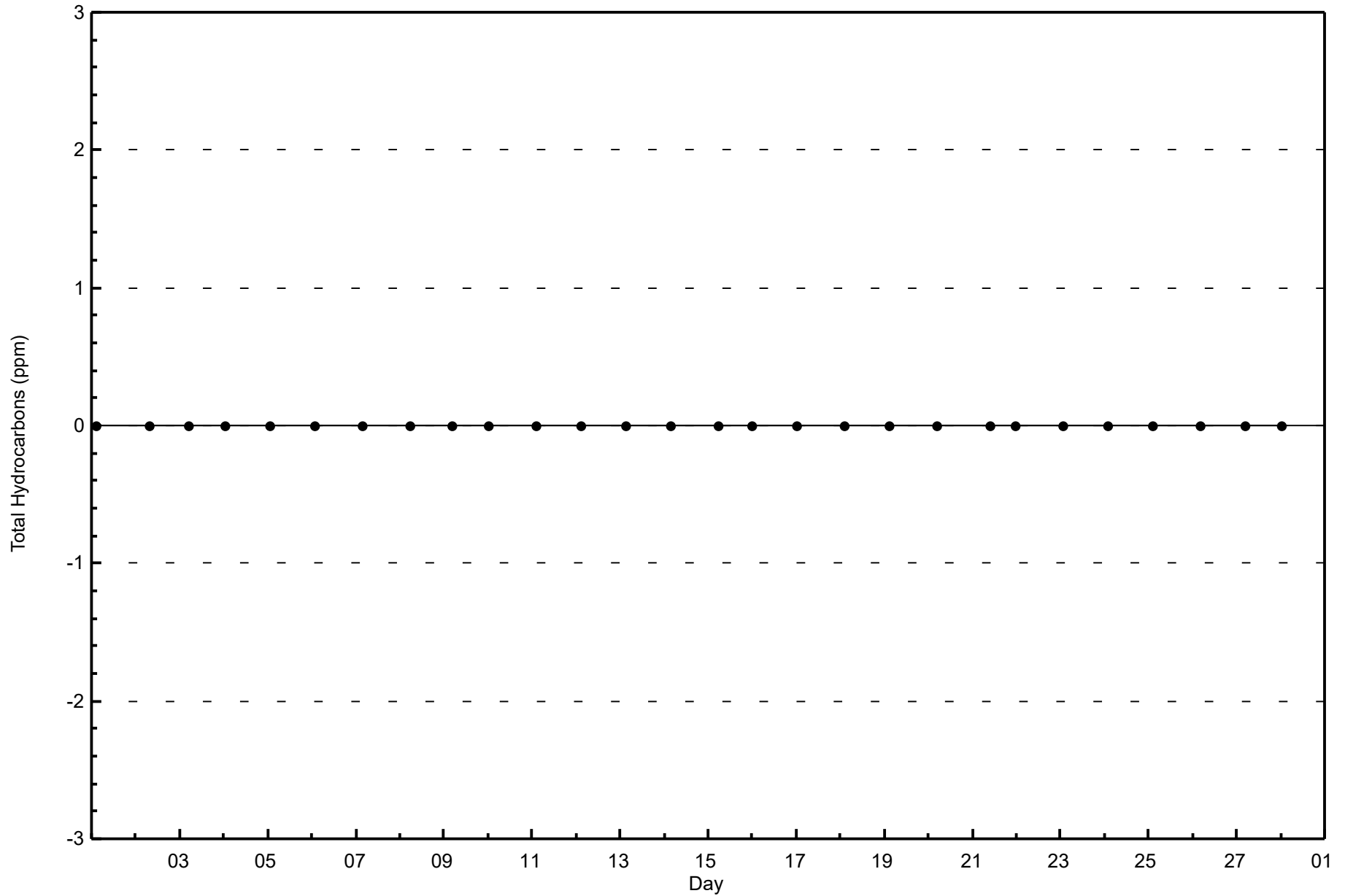
Total Number of Hours: 672



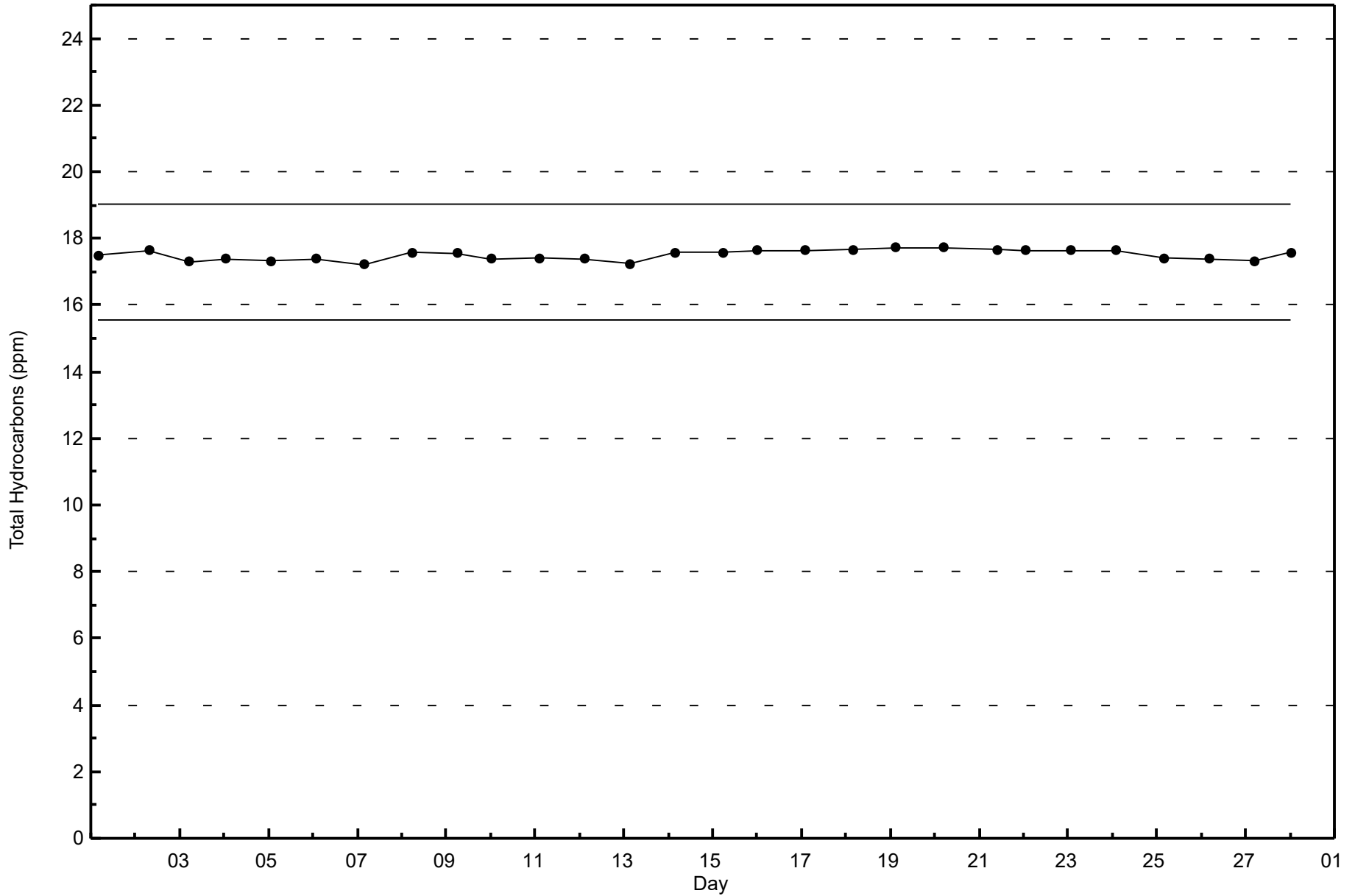
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Hydrocarbons (THC) - ppm  
Mannix







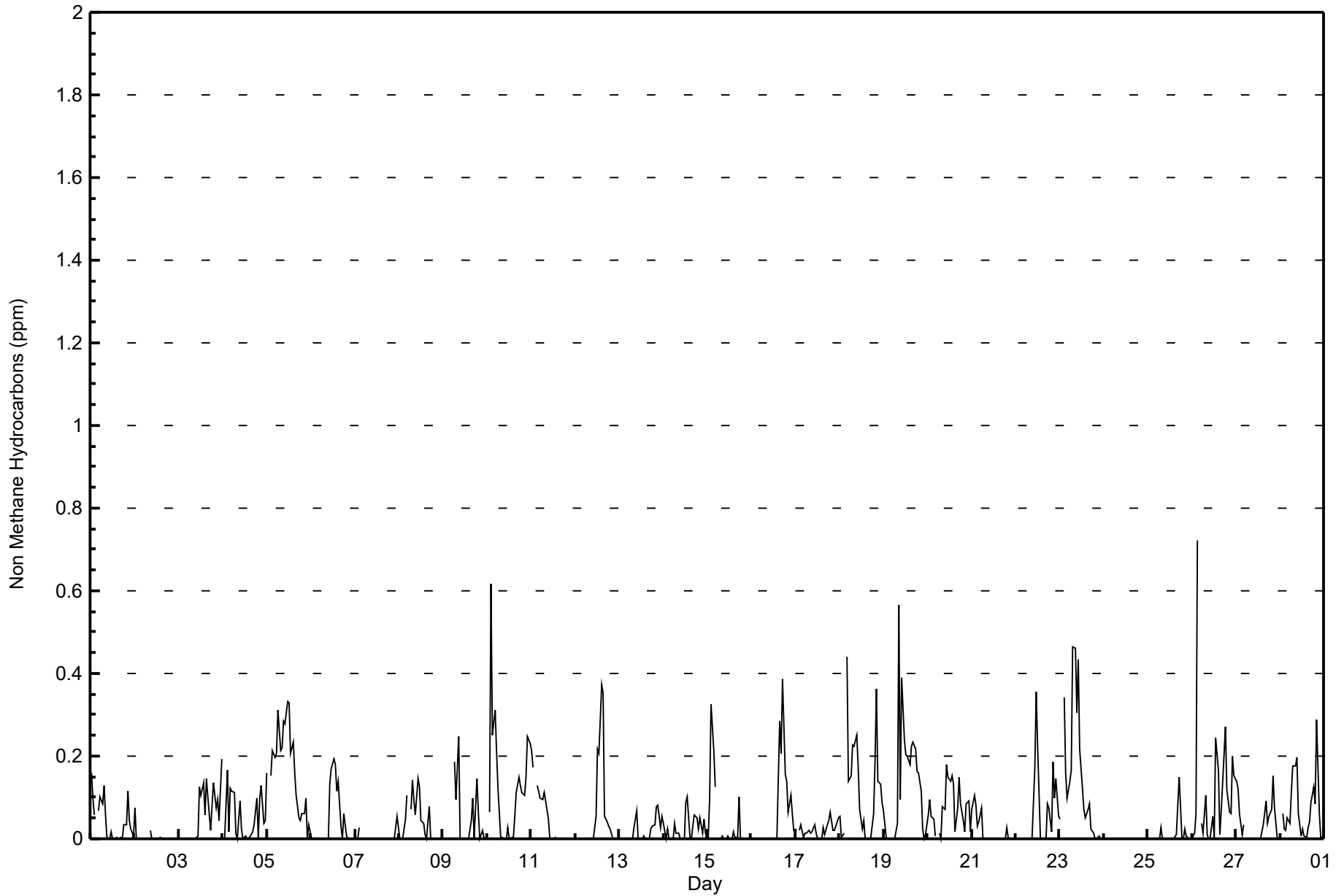




Summary of Hour Averages

Mannix - February 2023

Maximum Value: 0.721 ppm on Feb 26 04:00		Maximum Daily Average: 0.172 ppm on Feb 5		Hours in Service:	672																						
Minimum Value: 0.000 ppm on Feb 1 11:00		Minimum Daily Average: 0.000 ppm on Feb 24		Hours of Data:	641																						
Maximum Diurnal Average: 0.086 ppm at hour 4		Minimum Diurnal Average: 0.034 ppm at hour 2		Hours of Missing Data:	31																						
Monthly Average: 0.059 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> = 0.4		Hours of Calibration:	31																						
				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-Feb	0.158	0.099	0.059	Z	0.068	0.102	0.085	0.128	0.056	0.005	0.000	0.018	0.000	0.000	0.003	0.001	0.003	0.000	0.034	0.033	0.115	0.044	0.024	0.006	0.045	0.158	
2-Feb	0.076	0.000	0.000	0.000	0.000	0.000	0.001	Z	0.019	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	0.004	0.076	
3-Feb	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.008	0.126	0.104	0.137	0.058	0.147	0.101	0.019	0.078	0.136	0.073	0.097	0.044	0.194	0.057	0.194	
4-Feb	Z	0.000	0.165	0.018	0.123	0.116	0.112	0.013	0.000	0.091	0.023	0.000	0.007	0.000	0.000	0.009	0.018	0.034	0.100	0.002	0.096	0.128	0.036	0.044	0.049	0.165	
5-Feb	0.159	Z	0.153	0.213	0.196	0.207	0.312	0.214	0.220	0.285	0.279	0.332	0.330	0.206	0.236	0.160	0.104	0.051	0.045	0.059	0.062	0.098	0.000	0.032	0.172	0.332	
6-Feb	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.134	0.169	0.192	0.181	0.115	0.141	0.031	0.000	0.063	0.006	0.000	0.000	0.000	0.000	0.045	0.192	
7-Feb	0.000	0.001	0.028	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	0.028	0.055	0.005	0.055		
8-Feb	0.000	0.000	0.000	0.046	0.104	Z	0.070	0.144	0.096	0.059	0.147	0.127	0.045	0.036	0.011	0.001	0.079	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.042	0.147	
9-Feb	0.000	0.000	0.000	0.000	0.000	Z	0.185	0.096	0.248	0.000	0.000	0.000	0.000	0.000	0.002	0.044	0.099	0.005	0.146	0.065	0.000	0.021	0.004	0.000	0.040	0.248	
10-Feb	Z	0.065	0.617	0.252	0.310	0.209	0.121	0.002	0.003	0.000	0.000	0.026	0.000	0.002	0.002	0.054	0.111	0.151	0.129	0.112	0.105	0.149	0.248	0.231	0.126	0.617	
11-Feb	0.212	0.173	Z	0.130	0.117	0.097	0.096	0.111	0.091	0.047	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	0.047	0.212	
12-Feb	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.054	0.216	0.207	0.373	0.354	0.053	0.041	0.032	0.024	0.000	0.000	0.001	0.000	0.059	0.373	
13-Feb	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.028	0.068	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.023	0.030	0.034	0.079	0.082	0.027	0.055	0.019	0.082	
14-Feb	0.038	0.000	0.023	0.000	Z	0.001	0.036	0.012	0.013	0.001	0.000	0.001	0.087	0.100	0.003	0.000	0.029	0.056	0.050	0.024	0.051	0.014	0.048	0.013	0.026	0.100	
15-Feb	0.003	0.096	0.327	0.213	0.125	Z	0.000	0.000	0.007	0.000	0.000	0.005	0.000	0.000	0.016	0.005	0.003	0.103	0.001	0.000	0.000	0.000	0.000	0.003	0.039	0.327	
16-Feb	Z	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.003	0.283	0.206	0.386	0.156	0.138	0.065	0.106	0.060	0.019	0.062	0.386	
17-Feb	0.024	Z	0.021	0.033	0.002	0.013	0.013	0.021	0.015	0.016	0.035	0.013	0.001	0.000	0.000	0.027	0.011	0.034	0.045	0.065	0.019	0.019	0.030	0.051	0.022	0.065	
18-Feb	0.055	0.005	0.013	Z	0.442	0.139	0.154	0.228	0.223	0.251	0.173	0.071	0.025	0.045	0.000	0.000	0.000	0.003	0.061	0.188	0.363	0.138	0.131	0.087	0.121	0.442	
19-Feb	0.069	0.004	0.001	Z	0.000	0.000	0.000	0.039	0.567	0.094	0.389	0.236	0.204	0.201	0.179	0.223	0.234	0.217	0.161	0.158	0.114	0.024	0.000	0.012	0.136	0.567	
20-Feb	0.058	0.095	0.054	0.048	0.005	Z	0.013	0.000	0.079	0.072	0.179	0.148	0.138	0.151	0.132	0.016	0.074	0.150	0.084	0.043	0.017	0.083	0.090	0.016	0.076	0.179	
21-Feb	0.071	0.105	0.082	0.031	0.041	0.075	0.001	0.001	0.000	0.000	Z	C	C	C	0.000	0.000	0.000	0.000	0.000	0.028	0.002	0.000	0.000	0.000	0.022	0.105	
22-Feb	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.169	0.357	0.225	0.000	0.000	0.000	0.001	0.086	0.075	0.017	0.185	0.097	0.147	0.055	0.061	0.357	
23-Feb	0.049	Z	0.341	0.161	0.099	0.138	0.165	0.463	0.460	0.304	0.433	0.218	0.123	0.072	0.051	0.073	0.084	0.022	0.012	0.000	0.000	0.007	0.000	0.000	0.142	0.463	
24-Feb	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	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001
25-Feb	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.082	0.149	0.000	0.000	0.023	0.005	0.000	0.000	0.013	0.149	
26-Feb	0.000	0.015	0.061	0.721	Z	0.036	0.015	0.104	0.009	0.000	0.000	0.053	0.004	0.243	0.165	0.011	0.067	0.203	0.271	0.119	0.066	0.060	0.200	0.153	0.112	0.721	
27-Feb	0.138	0.122	0.062	0.009	0.034	Z	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.033	0.091	0.036	0.053	0.071	0.151	0.073	0.001	0.000	0.039	0.151	
28-Feb	Z	0.063	0.025	0.022	0.051	0.037	0.112	0.175	0.175	0.196	0.062	0.006	0.025	0.008	0.003	0.028	0.041	0.087	0.127	0.083	0.288	0.062	0.005	0.002	0.073	0.288	
																								Diurnal Average			
																								Diurnal Maximum			
0.048 0.034 0.085 0.086 0.066 0.053 0.053 0.066 0.082 0.053 0.075 0.073 0.064 0.059 0.049 0.058 0.054 0.066 0.063 0.050 0.067 0.047 0.040 0.037																											
0.212 0.173 0.617 0.721 0.442 0.209 0.312 0.463 0.567 0.304 0.433 0.357 0.330 0.243 0.373 0.354 0.234 0.386 0.271 0.188 0.363 0.149 0.248 0.231																											
Z - zerospan C - Calibration																											





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

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Mannix - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	297	46.33	46.33
0.006 - 0.05	128	19.97	66.30
0.06 - 0.1	128	19.97	86.27
> 0.1	88	13.73	100.00

Total Number of Valid Hours: 641

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Mannix - February 2023**

<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	13	1	0	0	1	0	39	87	30	6	1	15	42	12	9	41	297
0.006 - 0.05	25	28	1	1	0	2	16	12	3	0	2	1	4	9	17	7	128
0.06 - 0.1	25	23	5	2	2	4	8	18	5	0	4	0	3	6	11	12	128
> 0.1	11	5	8	7	5	3	3	6	1	1	1	1	6	6	16	8	88
<b>Totals</b>	74	57	14	10	8	9	66	123	39	7	8	17	55	33	53	68	641

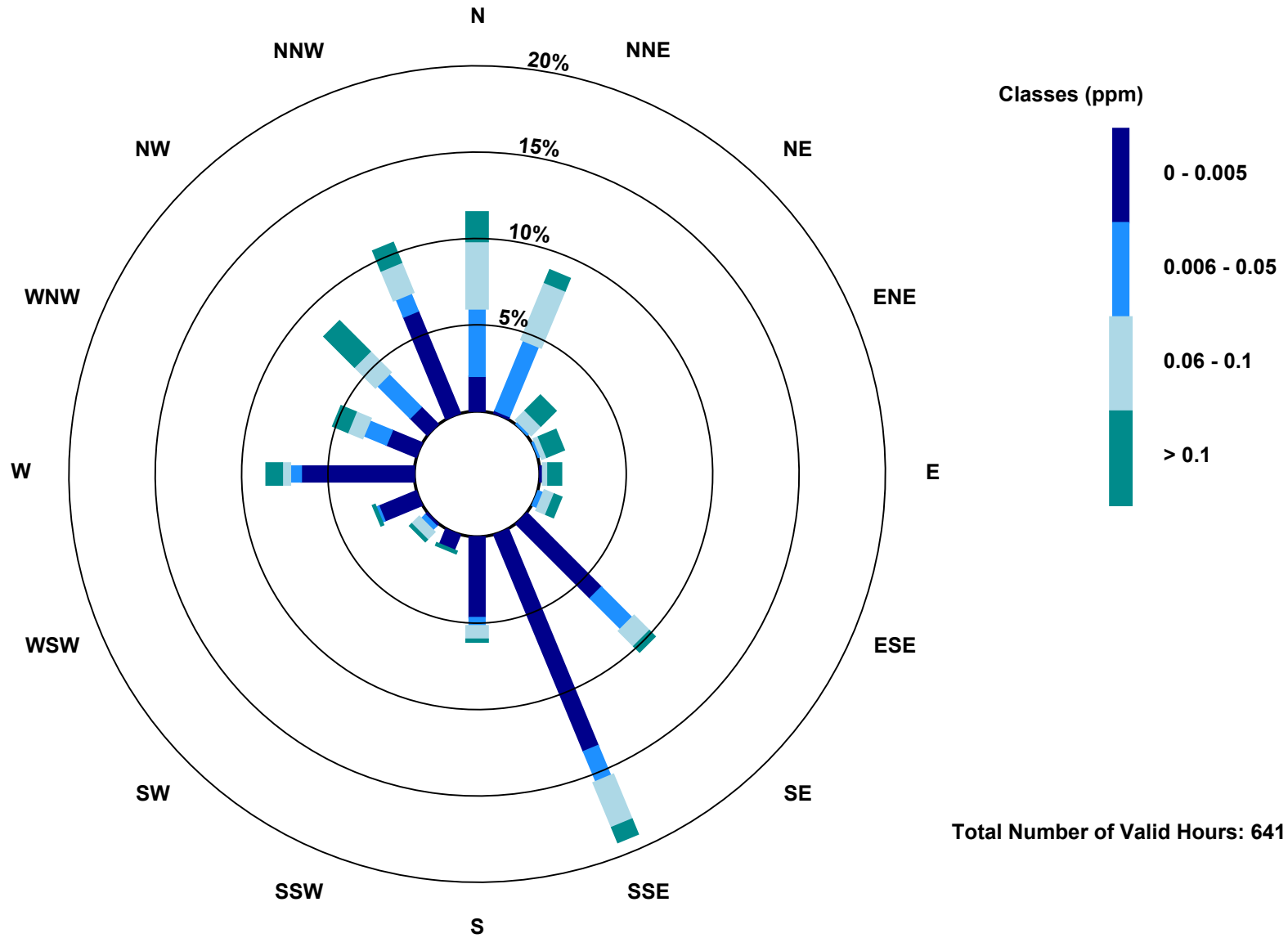
Total Number of Valid Hours: 641

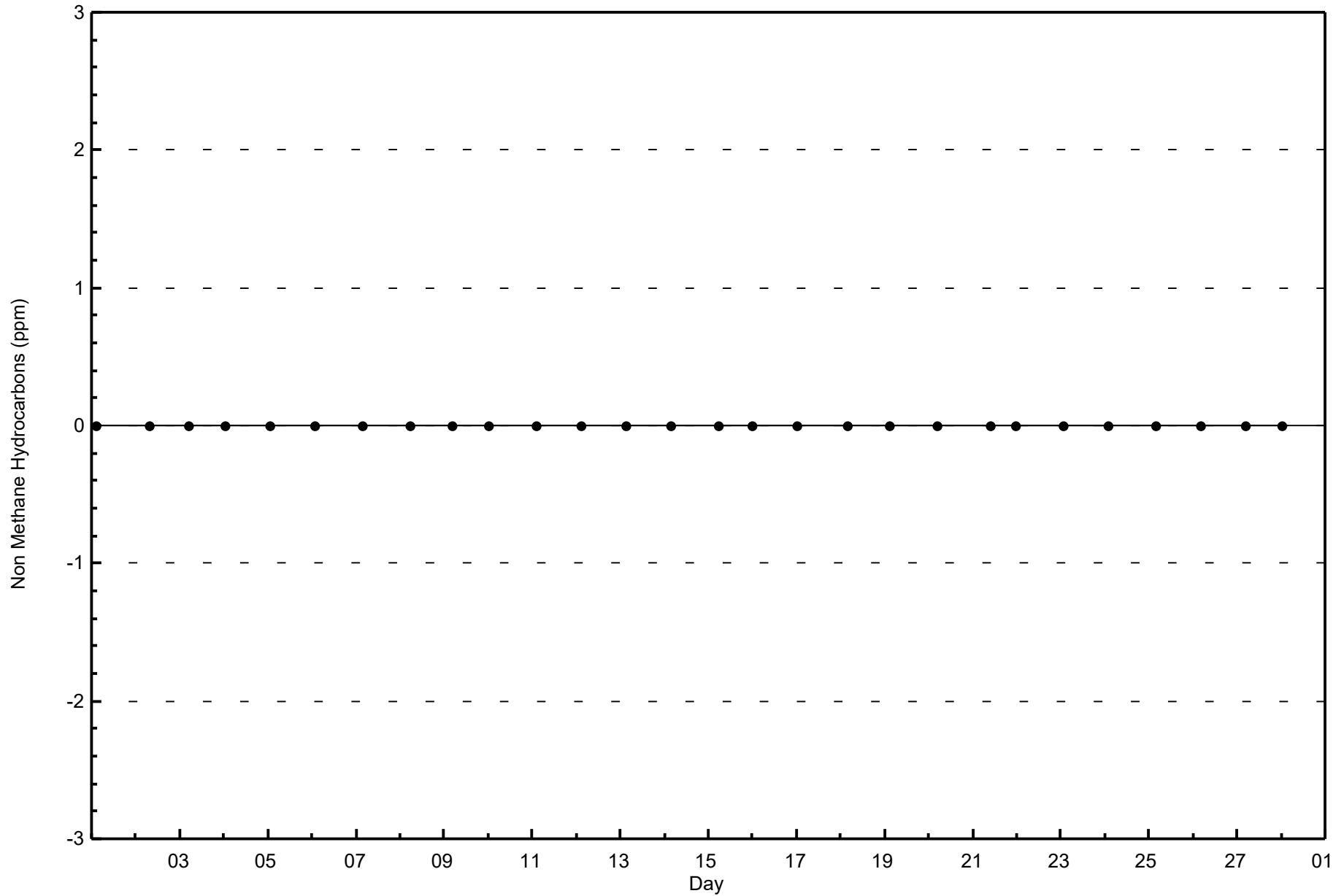
Total Number of Hours: 672

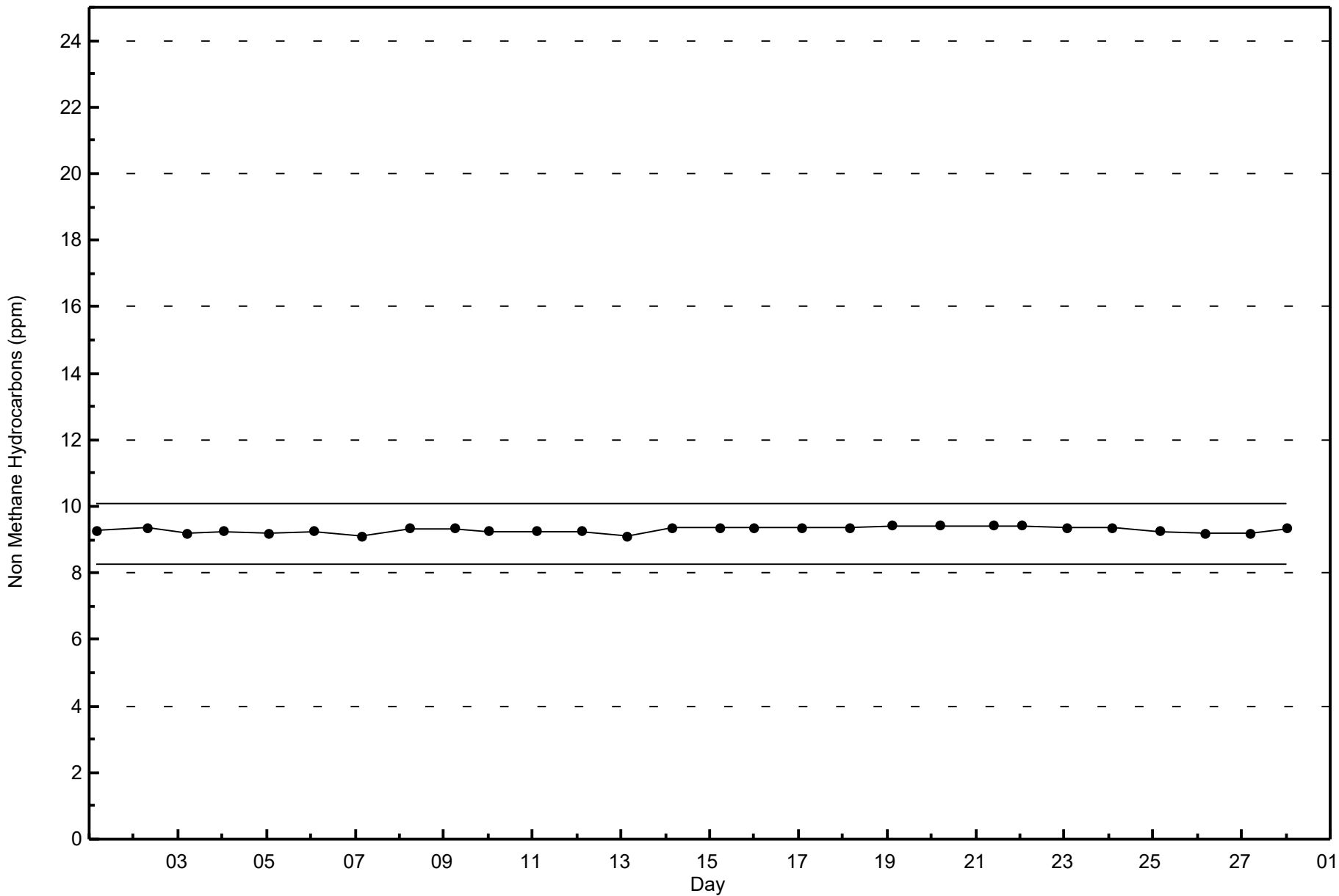


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Non Methane Hydrocarbons (NMHC) - ppm  
Mannix











**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

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

**Mannix - February 2023**

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 4.8 ppm on Feb 22 21:00	Maximum Daily Average: 3.0 ppm on Feb 5		Hours of Data:	641
Minimum Value: 2.0 ppm on Feb 7 16:00	Minimum Daily Average: 2.0 ppm on Feb 7		Hours of Missing Data:	31
Maximum Diurnal Average: 2.4 ppm at hour 7	Minimum Diurnal Average: 2.2 ppm at hour 2		Hours of Calibration:	31
Monthly Average: 2.26 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> = 2.7 P <sub>99</sub> = 3.6		Percent Operational Time:	100.0

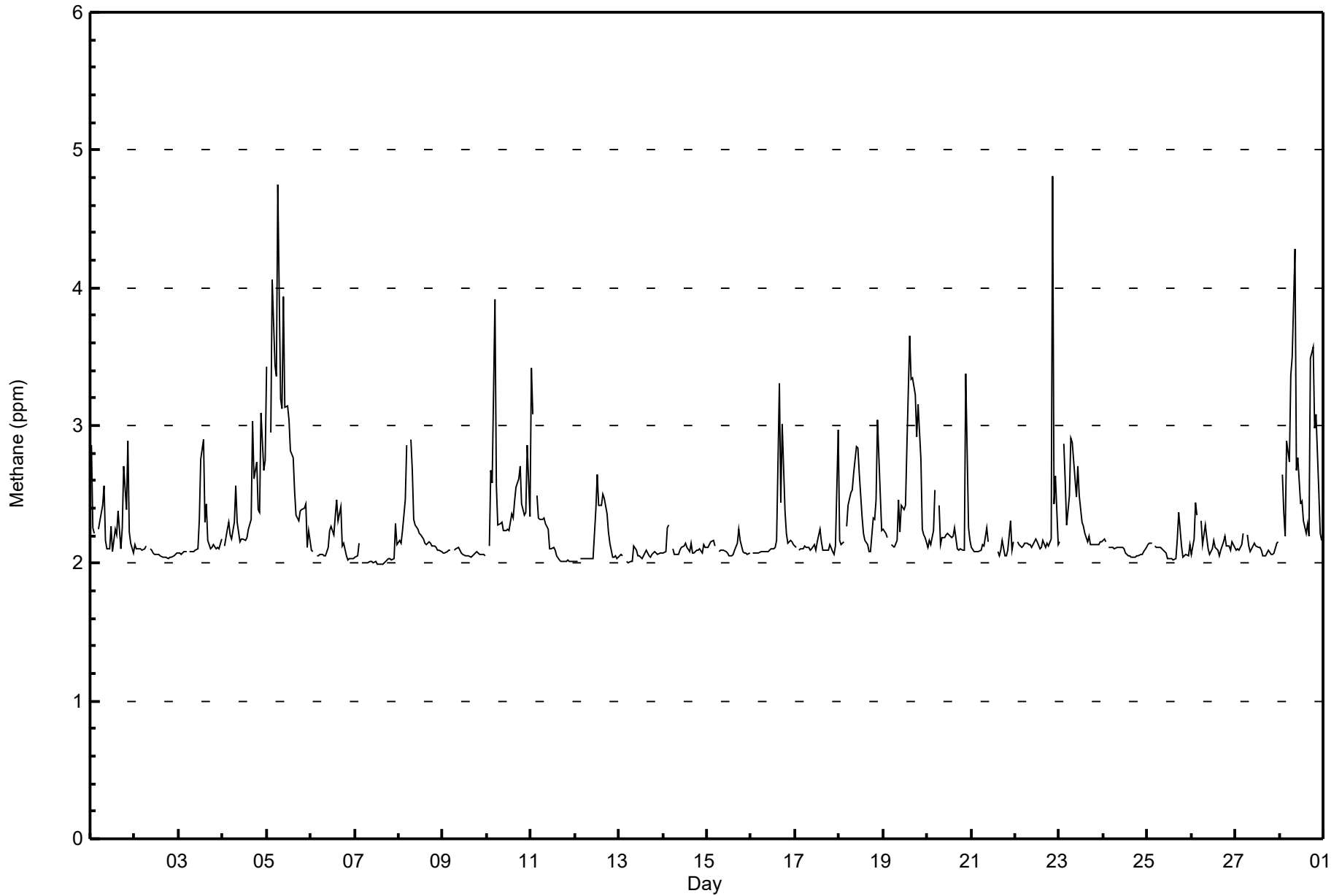
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Feb	2.9	2.3	2.2	Z	2.2	2.3	2.4	2.6	2.2	2.1	2.1	2.3	2.1	2.2	2.2	2.4	2.1	2.3	2.7	2.4	2.9	2.2	2.1	2.1	2.3	2.9																						
2-Feb	2.1	2.1	2.1	2.1	2.1	2.1	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	2.1	2.1	2.1	2.1	2.1																						
3-Feb	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.3	2.8	2.9	2.3	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.9																						
4-Feb	Z	2.1	2.2	2.3	2.2	2.2	2.3	2.6	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	3.0	2.6	2.7	2.4	2.4	3.1	2.7	2.7	2.4	3.1																						
5-Feb	3.4	Z	2.9	4.1	3.4	3.4	4.8	3.2	3.1	3.9	3.1	3.1	3.0	2.8	2.8	2.5	2.3	2.3	2.4	2.4	2.4	2.4	2.1	2.2	3.0	4.8																						
6-Feb	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.3	2.5	2.3	2.4	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.5																						
7-Feb	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	2.3	2.1	2.0	2.3																						
8-Feb	2.2	2.1	2.2	2.5	2.9	Z	2.9	2.7	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																						
9-Feb	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																						
10-Feb	Z	2.1	2.7	2.6	3.9	2.6	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.4	2.3	2.4	2.6	2.6	2.7	2.4	2.3	2.4	2.9	2.3	2.5	3.9																						
11-Feb	3.4	3.1	Z	2.5	2.3	2.3	2.3	2.3	2.3	2.2	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	2.2																						
12-Feb	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	2.6	2.4	2.4	2.5	2.5	2.4	2.2	2.1	2.0	2.0	2.1	2.0	2.2	2.6																						
13-Feb	2.1	2.1	2.1	Z	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	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1																						
14-Feb	2.1	2.1	2.3	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	2.3																						
15-Feb	2.1	2.1	2.2	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	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2																						
16-Feb	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	3.3	2.4	3.0	2.4	2.2	2.1	2.2	2.2	2.1	2.2	3.3																						
17-Feb	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	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	3.0	2.2	3.0																						
18-Feb	2.2	2.1	2.2	Z	2.3	2.4	2.5	2.5	2.7	2.8	2.8	2.7	2.3	2.2	2.2	2.1	2.1	2.1	2.3	2.3	2.5	3.0	2.5	2.2	2.4	3.0																						
19-Feb	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.2	2.5	2.2	2.4	2.4	2.4	2.9	3.7	3.3	3.3	3.2	2.9	3.2	2.8	2.2	2.2	2.2	2.6	3.7																						
20-Feb	2.1	2.2	2.1	2.2	2.5	Z	2.4	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.1	2.1	2.1	2.1	2.1	3.4	2.3	2.2	2.2	3.4																						
21-Feb	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.2	Z	C	C	C	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.3	2.1	2.2	2.1	2.3																						
22-Feb	Z	2.2	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	2.2	2.1	2.1	2.1	2.2	4.8	2.4	2.6	2.1	2.3	4.8																						
23-Feb	2.2	Z	2.9	2.6	2.3	2.5	2.9	2.9	2.6	2.5	2.7	2.5	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.4	2.9																						
24-Feb	2.2	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	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2																						
25-Feb	2.1	2.1	2.1	Z	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	2.2	2.4	2.1	2.0	2.1	2.1	2.1	2.1	2.4																						
26-Feb	2.1	2.2	2.4	2.4	Z	2.3	2.1	2.3	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.2	2.4																						
27-Feb	2.1	2.1	2.1	2.1	2.2	Z	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	2.2	2.1																						
28-Feb	Z	2.6	2.4	2.2	2.9	2.7	3.4	3.5	4.3	2.7	2.8	2.4	2.4	2.3	2.2	2.3	2.2	3.5	3.6	3.0	3.1	2.5	2.2	2.2	2.8	4.3																						
																								2.3	2.2	2.2	2.3	2.3	2.3	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.2	Diurnal Average
																								3.4	3.1	2.9	4.1	3.9	3.4	4.8	3.5	4.3	3.9	3.1	3.1	3.0	2.9	3.7	3.3	3.3	3.5	3.6	3.2	4.8	3.4	2.9	3.0	Diurnal Maximum

Z - zerospan      C - Calibration



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

**Methane (CH<sub>4</sub>) - ppm**  
**Mannix - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Mannix - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	67	10.45	10.45
2.1 - 3.0	546	85.18	95.63
3.1 - 10.0	28	4.37	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 641

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Mannix - February 2023**

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	1	0	0	0	0	0	11	8	2	0	1	13	27	3	0	1	67
2.1 - 3.0	73	57	14	9	8	9	55	115	36	7	7	3	24	25	40	64	546
3.1 - 10.0	0	0	0	1	0	0	0	0	1	0	0	1	4	5	13	3	28
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	74	57	14	10	8	9	66	123	39	7	8	17	55	33	53	68	641

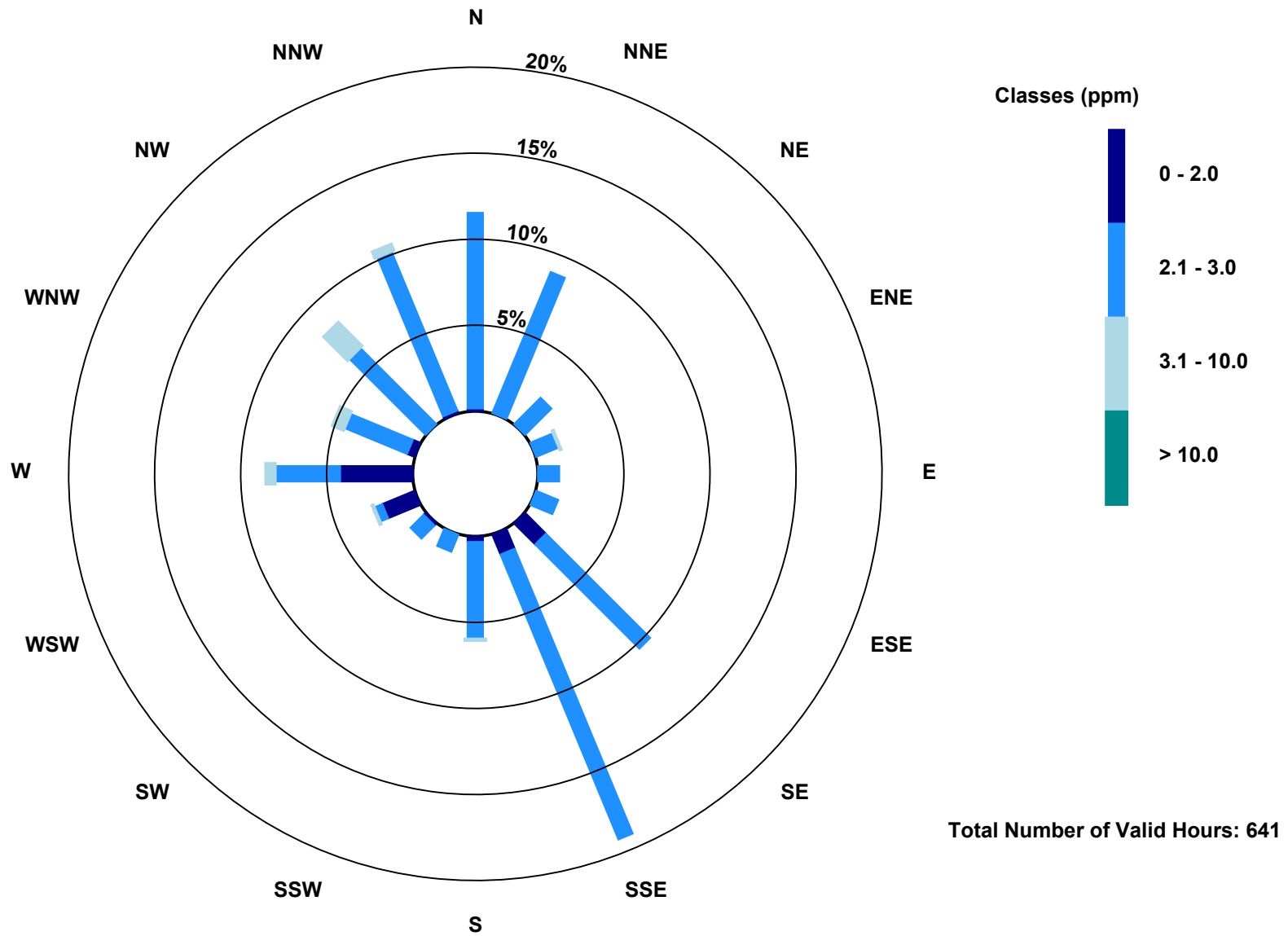
Total Number of Valid Hours: 641

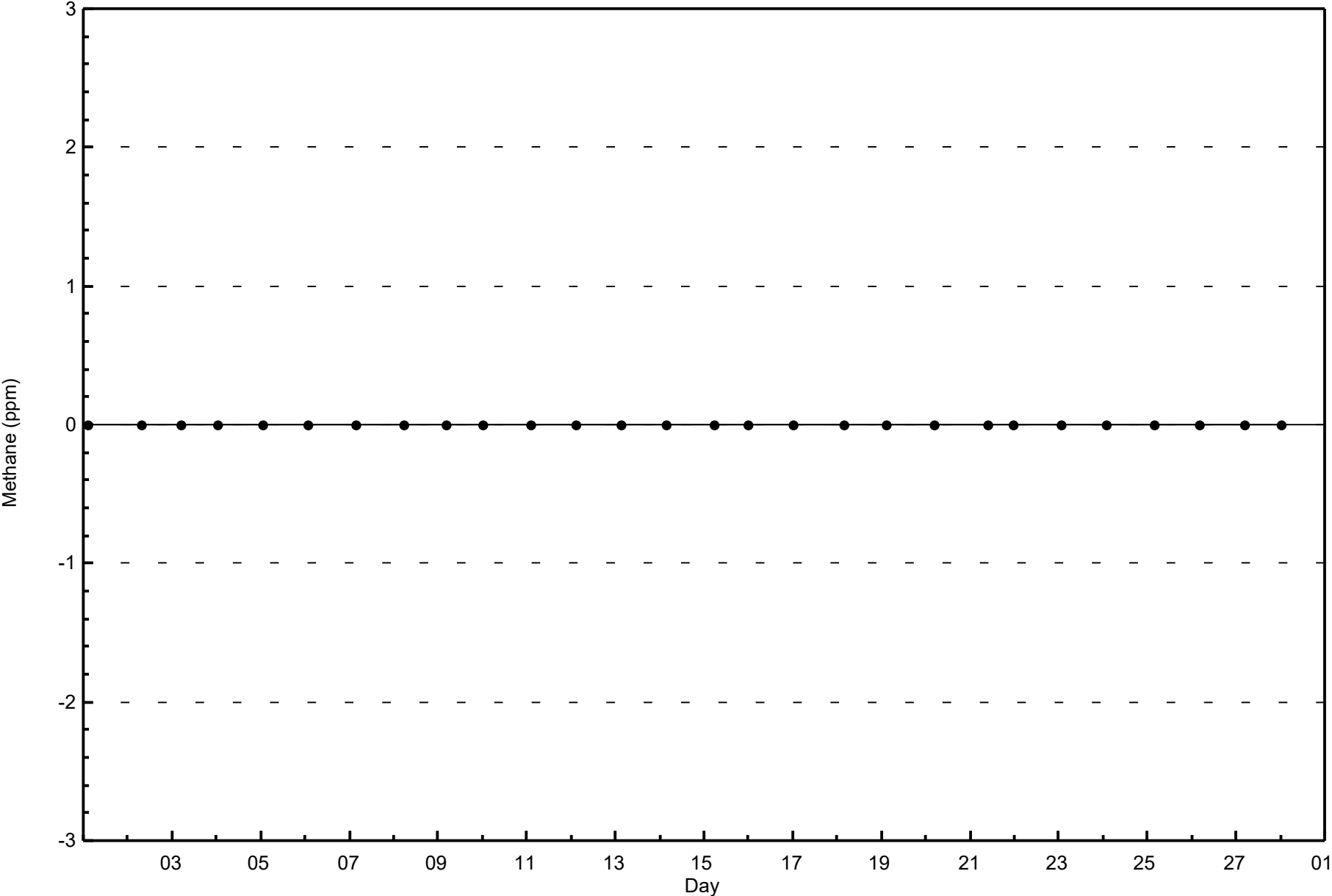
Total Number of Hours: 672

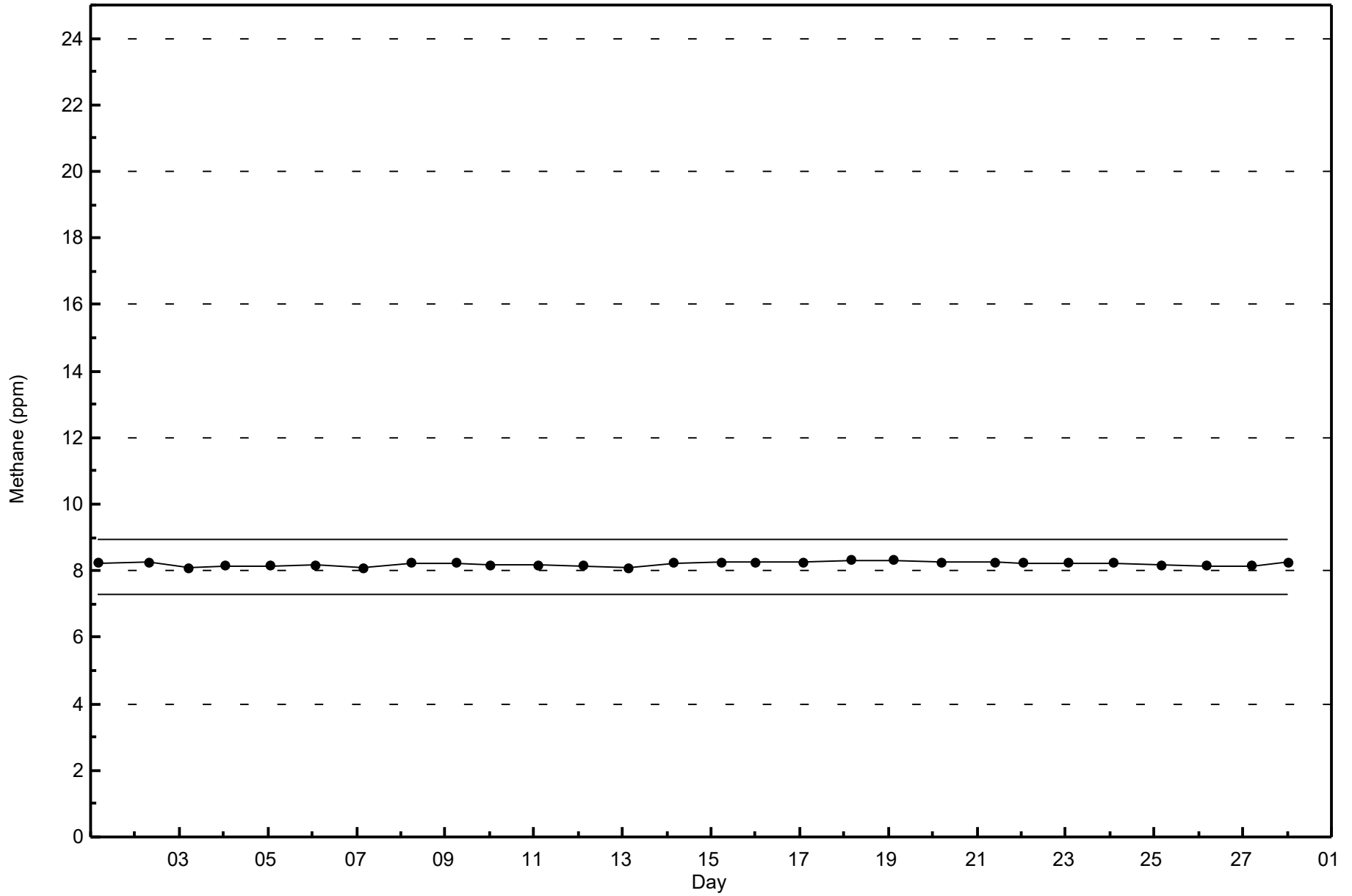


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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



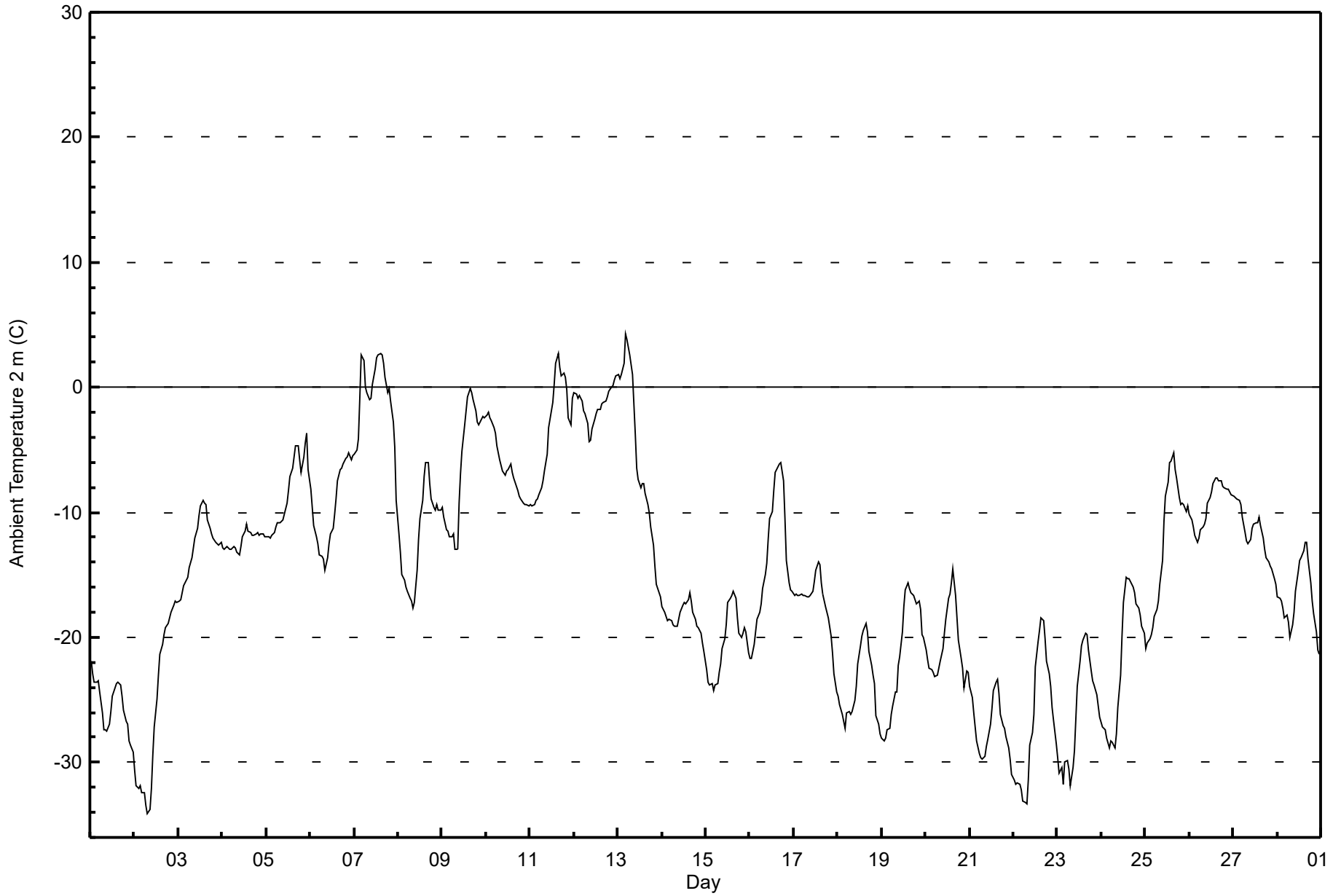






Maximum Value: 4.3 C on Feb 13 05:00      Maximum Daily Average: -0.7 C on Feb 7																						Hours in Service:	672																								
Minimum Value: -34.1 C on Feb 2 08:00      Minimum Daily Average: -27.1 C on Feb 21																						Hours of Data:	672																								
Maximum Diurnal Average: -11.2 C at hour 16      Minimum Diurnal Average: -17.5 C at hour 8																						Hours of Missing Data:	0																								
Monthly Average: -14.92 C      Percentiles: P <sub>1</sub> = -32.4 P <sub>10</sub> = -27.1 Q <sub>1</sub> = -21.3 Median = -15.3 Q <sub>3</sub> = -8.8 P <sub>90</sub> = -2.5 P <sub>99</sub> = 2.6																						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-Feb	-22.0	-22.9	-23.6	-23.6	-23.5	-24.4	-26.1	-27.4	-27.4	-27.5	-27.0	-25.9	-24.7	-24.0	-23.7	-23.6	-23.8	-24.7	-25.8	-26.7	-27.0	-28.2	-28.6	-29.2	-25.5	-22.0																					
2-Feb	-30.6	-31.9	-32.1	-31.9	-32.4	-32.4	-33.5	-34.1	-33.8	-32.1	-29.4	-27.1	-24.9	-23.1	-21.3	-20.5	-19.8	-19.3	-18.9	-18.5	-18.0	-17.5	-17.1	-17.2	-25.7	-17.1																					
3-Feb	-17.1	-17.0	-16.4	-15.9	-15.4	-15.2	-14.4	-13.6	-12.9	-12.1	-11.3	-10.3	-9.4	-9.1	-9.2	-9.4	-10.6	-11.3	-11.8	-12.1	-12.3	-12.5	-12.6	-12.4	-12.7	-9.1																					
4-Feb	-12.8	-12.9	-12.8	-12.8	-12.9	-12.9	-12.7	-12.8	-13.2	-13.4	-12.7	-11.9	-11.5	-11.0	-11.5	-11.6	-11.8	-11.9	-11.7	-11.6	-11.8	-11.8	-11.8	-11.9	-12.2	-11.0																					
5-Feb	-12.0	-12.0	-12.0	-11.8	-11.6	-11.2	-10.8	-10.8	-10.8	-10.6	-10.2	-9.2	-8.3	-7.1	-6.4	-5.6	-4.7	-4.7	-5.8	-6.8	-5.6	-4.5	-3.7	-6.5	-8.4	-3.7																					
6-Feb	-8.1	-9.6	-11.0	-11.9	-12.5	-13.4	-13.5	-13.8	-14.6	-13.6	-12.5	-11.7	-11.3	-10.2	-9.0	-7.5	-6.6	-6.5	-6.1	-5.7	-5.5	-5.3	-5.8	-5.4	-9.6	-5.3																					
7-Feb	-5.3	-5.1	-4.1	-0.9	2.6	2.1	0.0	-0.5	-1.0	-0.9	0.3	1.5	2.3	2.6	2.7	2.6	1.9	0.8	-0.5	-0.1	-1.1	-2.7	-4.8	-9.0	-0.7	2.7																					
8-Feb	-11.7	-13.2	-14.9	-15.4	-16.0	-16.3	-16.9	-17.1	-17.6	-17.2	-14.7	-12.2	-10.5	-9.1	-7.2	-6.0	-6.0	-7.7	-8.9	-9.6	-9.8	-9.4	-9.8	-9.9	-12.0	-6.0																					
9-Feb	-9.6	-10.3	-11.4	-11.5	-12.0	-11.9	-11.8	-13.0	-13.0	-9.3	-6.9	-5.2	-3.0	-1.9	-0.8	-0.1	-0.4	-1.0	-1.8	-2.8	-3.0	-2.5	-2.4	-2.4	-6.2	-0.1																					
10-Feb	-2.2	-2.0	-2.4	-2.6	-3.2	-3.7	-4.7	-5.8	-6.3	-6.7	-7.0	-6.7	-6.6	-6.1	-6.8	-7.2	-7.6	-8.2	-8.8	-8.9	-9.2	-9.3	-9.3	-9.5	-6.3	-2.0																					
11-Feb	-9.4	-9.5	-9.4	-9.1	-8.9	-8.5	-8.0	-7.5	-6.7	-5.3	-3.3	-2.6	-1.2	0.3	1.9	2.7	1.6	1.0	1.1	0.8	-0.2	-2.5	-3.0	-0.9	-3.6	2.7																					
12-Feb	-0.5	-0.5	-0.9	-0.6	-1.1	-1.9	-2.1	-2.9	-4.3	-4.2	-3.3	-2.6	-2.1	-1.8	-1.8	-1.3	-1.2	-1.1	-0.8	-0.3	0.0	0.1	0.6	1.0	-1.4	1.0																					
13-Feb	1.1	0.7	1.1	2.0	4.3	3.8	2.6	1.8	1.0	-3.8	-6.5	-7.3	-8.0	-7.7	-7.7	-8.5	-9.4	-10.0	-11.2	-12.6	-14.3	-15.7	-16.5	-16.8	-5.7	4.3																					
14-Feb	-17.5	-18.0	-18.4	-18.7	-18.6	-18.7	-19.0	-19.1	-19.1	-18.5	-18.0	-17.4	-17.2	-17.3	-17.0	-16.4	-17.1	-18.0	-18.5	-19.2	-19.3	-19.7	-20.5	-21.1	-18.4	-16.4																					
15-Feb	-22.6	-23.5	-23.8	-23.7	-24.3	-23.9	-23.7	-22.8	-22.1	-20.9	-20.1	-19.0	-17.2	-16.8	-16.6	-16.3	-16.9	-18.4	-19.7	-20.0	-19.7	-19.3	-19.6	-21.2	-20.5	-16.3																					
16-Feb	-21.7	-21.6	-20.5	-19.6	-18.6	-18.0	-17.4	-16.0	-15.0	-14.1	-12.2	-10.5	-10.0	-8.3	-6.8	-6.3	-6.2	-6.0	-7.5	-10.5	-13.8	-15.6	-16.2	-16.3	-13.7	-6.0																					
17-Feb	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.7	-16.8	-16.8	-16.7	-16.3	-15.5	-14.7	-13.9	-14.2	-15.6	-16.5	-17.5	-18.0	-18.5	-19.8	-21.3	-22.9	-24.4	-17.3	-13.9																					
18-Feb	-24.7	-25.3	-26.1	-26.7	-27.2	-26.1	-25.9	-26.2	-26.0	-25.0	-23.9	-22.1	-20.6	-19.9	-19.5	-18.9	-19.5	-21.2	-22.2	-23.0	-23.7	-26.3	-26.9	-27.8	-23.9	-18.9																					
19-Feb	-28.0	-28.3	-28.1	-27.4	-27.3	-26.1	-25.5	-24.3	-24.4	-22.3	-21.5	-19.5	-17.6	-16.2	-15.6	-16.0	-16.4	-16.7	-17.0	-17.4	-17.1	-17.8	-19.8	-20.0	-21.3	-15.6																					
20-Feb	-21.0	-21.8	-22.4	-22.6	-22.8	-23.1	-23.0	-22.5	-21.9	-20.8	-19.7	-18.5	-16.9	-16.5	-15.7	-14.6	-16.7	-18.5	-20.2	-21.7	-22.5	-24.1	-22.7	-22.8	-20.5	-14.6																					
21-Feb	-23.9	-24.8	-26.0	-27.1	-28.3	-29.2	-29.6	-29.8	-29.5	-28.7	-28.1	-27.0	-25.7	-24.2	-23.6	-23.4	-24.5	-26.1	-27.1	-27.3	-28.0	-28.8	-29.8	-31.0	-27.1	-23.4																					
22-Feb	-31.5	-31.7	-31.7	-31.7	-32.2	-33.0	-33.2	-33.3	-31.5	-28.7	-27.6	-26.1	-22.3	-20.3	-19.5	-18.5	-18.6	-20.1	-21.9	-22.9	-23.9	-25.6	-26.6	-28.5	-26.7	-18.5																					
23-Feb	-29.7	-30.8	-30.4	-31.7	-30.0	-29.8	-30.5	-31.9	-30.4	-29.1	-26.5	-23.9	-21.9	-20.7	-20.2	-19.6	-19.8	-21.0	-22.7	-23.4	-23.8	-24.6	-25.5	-26.3	-26.0	-19.6																					
24-Feb	-27.2	-27.3	-27.4	-28.0	-28.8	-28.3	-28.3	-28.8	-27.8	-25.6	-23.1	-19.9	-17.2	-15.2	-15.3	-15.4	-15.5	-16.0	-16.4	-17.3	-17.7	-18.2	-19.1	-19.7	-21.8	-15.2																					
25-Feb	-20.9	-20.5	-20.2	-19.8	-19.3	-18.4	-17.7	-17.1	-15.7	-13.8	-10.7	-8.7	-7.6	-6.1	-6.0	-5.2	-6.6	-7.3	-8.8	-9.4	-9.2	-9.4	-10.0	-9.5	-12.4	-5.2																					
26-Feb	-10.2	-10.6	-11.2	-11.8	-12.4	-12.0	-11.3	-11.1	-11.0	-10.5	-9.3	-8.9	-8.4	-7.7	-7.3	-7.2	-7.5	-7.5	-8.0	-8.0	-8.1	-8.2	-8.4	-8.6	-9.4	-7.2																					
27-Feb	-8.7	-8.8	-9.0	-9.0	-9.4	-10.4	-11.6	-12.3	-12.5	-12.2	-11.3	-11.0	-10.8	-10.8	-10.3	-11.0	-12.0	-12.9	-13.7	-14.0	-14.3	-14.6	-15.3	-15.7	-11.7	-8.7																					
28-Feb	-16.7	-16.9	-17.1	-17.6	-18.4	-18.3	-18.8	-20.0	-19.0	-18.0	-16.3	-14.7	-13.8	-13.6	-13.1	-12.3	-12.4	-13.8	-15.6	-17.1	-18.1	-19.6	-21.0	-21.3	-16.8	-12.3																					
																						-16.5	-16.9	-17.1	-17.1	-17.0	-17.1	-17.3	-17.5	-17.3	-16.5	-15.3	-14.1	-12.9	-12.0	-11.5	-11.2	-11.6	-12.3	-13.1	-13.7	-14.2	-14.8	-15.3	-15.9	Diurnal Average	
																						1.1	0.7	1.1	2.0	4.3	3.8	2.6	1.8	1.0	-0.9	0.3	1.5	2.3	2.6	2.7	2.7	1.9	1.0	1.1	0.8	0.0	0.1	0.6	1.0	Diurnal Maximum	







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2 m (AT2m) - C  
Mannix - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	192	28.57	28.57
-20 - 0	449	66.82	95.39
0 - 10	31	4.61	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



Summary of Hour Averages

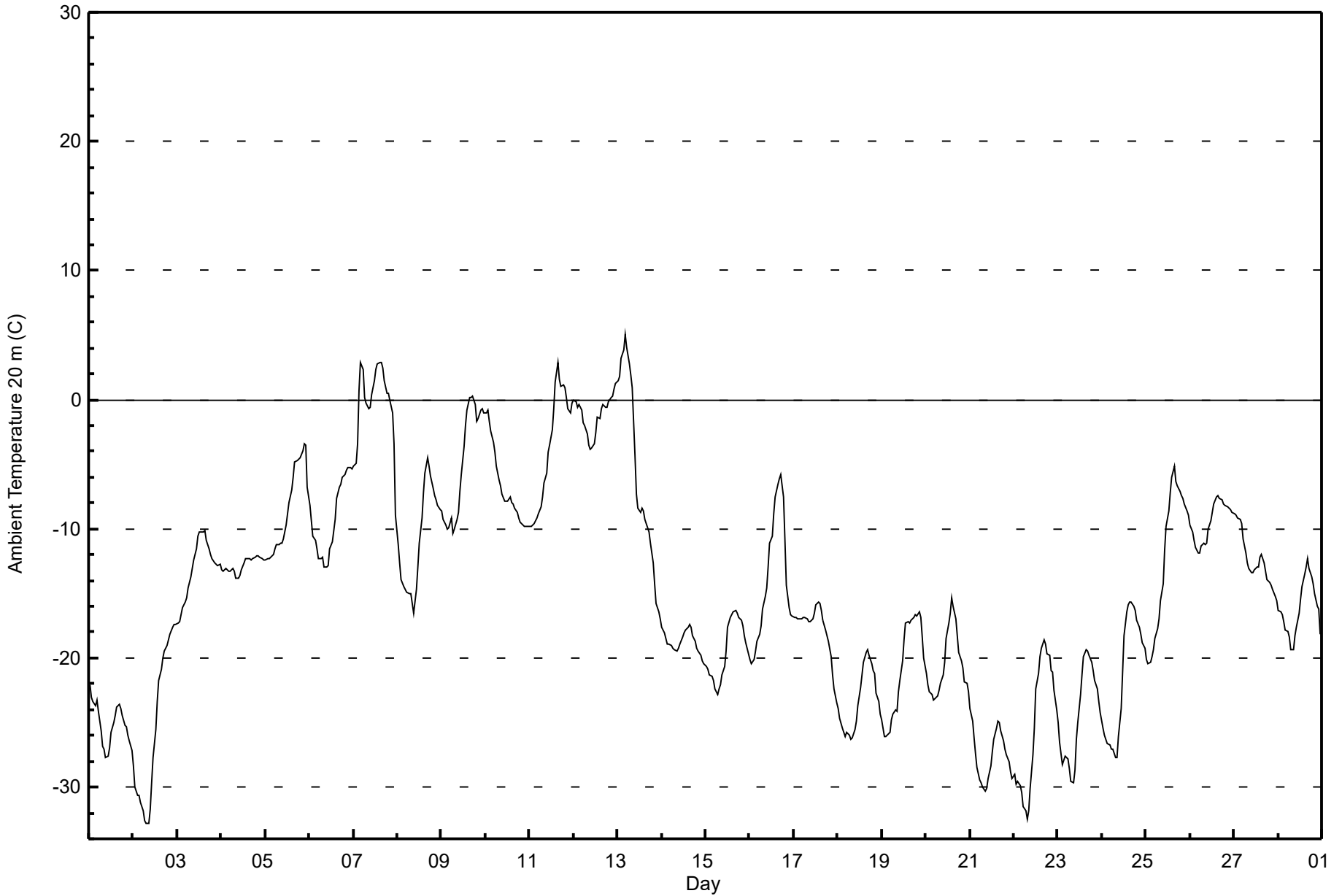
Mannix - February 2023

Maximum Value: 5.0 C on Feb 13 05:00      Maximum Daily Average: -0.2 C on Feb 7																								Hours in Service:	672	
Minimum Value: -32.8 C on Feb 2 08:00      Minimum Daily Average: -27.5 C on Feb 21																								Hours of Data:	672	
Maximum Diurnal Average: -11.6 C at hour 16      Minimum Diurnal Average: -17.1 C at hour 9																								Hours of Missing Data:	0	
Monthly Average: -14.67 C      Percentiles: P <sub>1</sub> = -31.8 P <sub>10</sub> = -26.1 Q <sub>1</sub> = -20.8 Median = -15.3 Q <sub>3</sub> = -8.7 P <sub>90</sub> = -1.7 P <sub>99</sub> = 2.9																								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-Feb	-22.0	-23.0	-23.3	-23.7	-23.3	-24.1	-25.6	-26.8	-27.1	-27.8	-27.7	-26.9	-25.7	-25.0	-24.4	-23.9	-23.6	-23.9	-24.5	-25.3	-25.3	-25.9	-26.4	-27.1	-25.1	-22.0
2-Feb	-28.4	-30.0	-30.7	-30.6	-31.2	-31.8	-32.6	-32.8	-32.8	-31.8	-29.7	-27.7	-25.6	-23.4	-21.7	-20.9	-20.0	-19.4	-19.0	-18.6	-18.2	-17.7	-17.4	-17.4	-25.4	-17.4
3-Feb	-17.3	-17.2	-16.6	-16.1	-15.6	-15.4	-14.6	-13.8	-13.1	-12.5	-11.6	-10.6	-10.3	-10.2	-10.2	-10.1	-10.9	-11.6	-12.0	-12.3	-12.6	-12.7	-12.9	-12.7	-13.0	-10.1
4-Feb	-13.2	-13.2	-13.1	-13.2	-13.3	-13.2	-13.1	-13.3	-13.8	-13.8	-13.6	-13.1	-12.6	-12.3	-12.4	-12.3	-12.5	-12.4	-12.2	-12.1	-12.1	-12.2	-12.3	-12.4	-12.8	-12.1
5-Feb	-12.4	-12.3	-12.3	-12.2	-12.0	-11.5	-11.2	-11.2	-11.1	-11.1	-10.8	-9.7	-8.8	-7.9	-7.0	-6.0	-4.8	-4.7	-4.6	-4.5	-3.9	-3.4	-3.5	-6.7	-8.5	-3.4
6-Feb	-8.2	-9.4	-10.5	-10.9	-11.5	-12.3	-12.3	-12.2	-13.0	-12.9	-12.8	-11.6	-11.0	-10.1	-9.2	-7.7	-6.7	-6.6	-6.1	-5.7	-5.5	-5.2	-5.3	-5.4	-9.3	-5.2
7-Feb	-5.1	-4.9	-3.4	0.7	2.9	2.3	0.2	-0.2	-0.7	-0.6	0.4	1.5	2.3	2.7	2.9	2.9	2.5	1.5	0.5	0.5	-0.1	-1.0	-3.4	-8.9	-0.2	2.9
8-Feb	-11.2	-12.6	-13.9	-14.5	-14.7	-14.9	-15.1	-15.1	-15.7	-16.6	-14.6	-13.0	-11.1	-9.1	-7.2	-5.7	-4.5	-5.1	-5.9	-6.9	-7.4	-7.7	-8.1	-8.5	-10.8	-4.5
9-Feb	-8.6	-9.3	-9.7	-10.0	-9.9	-9.2	-10.3	-10.1	-9.3	-8.7	-7.1	-5.8	-3.6	-2.0	-0.9	0.1	0.1	0.3	-0.4	-1.7	-1.5	-0.8	-0.7	-1.0	-5.0	0.3
10-Feb	-1.0	-0.8	-1.7	-2.5	-3.3	-4.0	-5.2	-6.3	-6.7	-7.4	-7.9	-7.8	-7.9	-7.5	-8.0	-8.1	-8.4	-8.7	-9.2	-9.5	-9.7	-9.8	-9.8	-9.8	-6.7	-0.8
11-Feb	-9.8	-9.8	-9.6	-9.4	-9.2	-8.8	-8.3	-7.6	-6.4	-5.7	-4.1	-3.5	-2.3	-0.7	1.4	2.8	1.6	1.0	1.2	0.9	0.1	-0.7	-1.0	-0.3	-3.7	2.8
12-Feb	0.0	-0.2	-0.5	-0.3	-0.9	-1.8	-2.0	-2.6	-3.5	-3.8	-3.7	-3.4	-2.6	-1.3	-1.4	-0.7	-0.4	-0.6	-0.6	-0.1	0.2	0.3	0.8	1.3	-1.2	1.3
13-Feb	1.4	1.8	3.2	3.9	5.0	4.1	2.7	1.9	0.9	-4.4	-7.4	-8.4	-8.7	-8.3	-8.6	-9.2	-9.9	-10.3	-11.2	-12.6	-14.3	-15.7	-16.5	-16.9	-5.7	5.0
14-Feb	-17.6	-18.1	-18.5	-19.0	-18.9	-19.0	-19.3	-19.4	-19.5	-19.2	-18.9	-18.4	-18.1	-17.9	-17.6	-17.4	-17.6	-18.2	-18.7	-19.2	-19.4	-19.8	-20.2	-20.5	-18.8	-17.4
15-Feb	-20.7	-20.9	-21.3	-21.4	-21.8	-22.4	-22.8	-22.3	-22.1	-21.3	-20.7	-19.4	-17.6	-16.9	-16.7	-16.4	-16.3	-16.5	-16.8	-17.1	-17.5	-18.3	-18.9	-19.7	-19.4	-16.3
16-Feb	-20.1	-20.5	-20.1	-19.5	-18.7	-18.2	-17.5	-16.2	-15.3	-14.6	-13.0	-11.2	-10.6	-8.9	-7.5	-6.6	-6.1	-5.8	-7.6	-10.8	-14.3	-16.1	-16.7	-16.8	-13.9	-5.8
17-Feb	-16.9	-16.9	-16.9	-16.9	-16.9	-16.9	-16.9	-17.0	-17.2	-17.2	-17.0	-16.5	-15.9	-15.7	-15.7	-16.3	-17.1	-17.8	-18.3	-18.7	-19.9	-21.3	-22.4	-23.5	-17.7	-15.7
18-Feb	-23.9	-24.7	-25.4	-25.7	-26.1	-25.8	-26.0	-26.3	-26.2	-25.5	-24.9	-23.7	-22.3	-21.3	-20.3	-19.5	-19.4	-19.8	-20.4	-21.0	-21.2	-22.7	-23.4	-24.3	-23.3	-19.4
19-Feb	-24.8	-26.1	-26.1	-25.9	-25.7	-24.8	-24.4	-24.0	-24.2	-22.7	-21.7	-20.2	-18.6	-17.3	-17.2	-17.3	-17.0	-16.8	-16.7	-16.7	-16.4	-16.9	-18.4	-20.0	-20.8	-16.4
20-Feb	-21.2	-22.1	-22.7	-22.9	-23.2	-23.2	-22.9	-22.5	-22.0	-21.3	-20.3	-18.5	-17.3	-16.5	-15.3	-16.0	-16.9	-18.3	-19.6	-20.2	-20.8	-21.8	-21.9	-22.6	-20.4	-15.3
21-Feb	-23.9	-24.9	-26.2	-27.4	-28.5	-29.4	-29.7	-30.0	-30.3	-30.0	-29.3	-28.4	-27.3	-26.3	-25.4	-24.9	-25.0	-25.6	-26.4	-27.1	-27.5	-28.1	-28.8	-29.3	-27.5	-23.9
22-Feb	-29.1	-29.8	-29.5	-29.8	-30.4	-31.5	-31.8	-32.4	-31.9	-30.1	-27.4	-25.4	-22.4	-21.2	-19.9	-19.2	-18.6	-19.0	-19.7	-19.8	-20.9	-21.1	-22.5	-24.0	-25.3	-18.6
23-Feb	-25.0	-26.6	-28.3	-27.9	-27.6	-27.8	-28.5	-29.5	-29.7	-28.7	-26.3	-24.9	-22.9	-21.3	-19.9	-19.4	-19.5	-19.8	-20.4	-21.0	-21.7	-22.4	-23.4	-24.3	-24.4	-19.4
24-Feb	-25.4	-25.9	-26.3	-26.6	-26.7	-27.0	-27.0	-27.7	-27.7	-26.1	-23.9	-21.1	-18.3	-16.4	-15.9	-15.6	-15.7	-16.0	-16.3	-17.0	-17.6	-18.1	-18.9	-19.3	-21.5	-15.6
25-Feb	-20.2	-20.4	-20.3	-19.9	-19.4	-18.5	-17.7	-17.0	-15.6	-14.2	-11.7	-9.8	-8.6	-7.3	-6.0	-5.1	-6.4	-6.6	-7.1	-7.5	-7.7	-8.1	-8.6	-8.9	-12.2	-5.1
26-Feb	-9.7	-10.2	-10.9	-11.4	-11.9	-11.9	-11.3	-11.1	-11.2	-11.1	-10.0	-9.3	-8.7	-8.0	-7.5	-7.5	-7.7	-7.7	-8.1	-8.2	-8.3	-8.4	-8.6	-8.8	-9.5	-7.5
27-Feb	-8.8	-8.9	-9.2	-9.2	-9.6	-10.7	-11.9	-12.6	-13.1	-13.4	-13.4	-13.2	-13.0	-12.9	-12.2	-11.9	-12.6	-13.3	-13.9	-14.2	-14.4	-14.7	-15.2	-15.6	-12.4	-8.8
28-Feb	-16.3	-16.5	-16.7	-17.2	-17.8	-18.0	-18.4	-19.3	-19.3	-18.2	-17.7	-16.5	-15.4	-14.5	-13.5	-13.0	-12.4	-13.1	-13.7	-14.3	-15.0	-15.9	-16.2	-18.1	-16.1	-12.4
																								Diurnal Average		
																								Diurnal Maximum		



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

**Ambient Temperature 20 m (AT20m) - C**  
**Mannix - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 20 m (AT20m) - C  
Mannix - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	186	27.68	27.68
-20 - 0	449	66.82	94.49
0 - 10	37	5.51	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

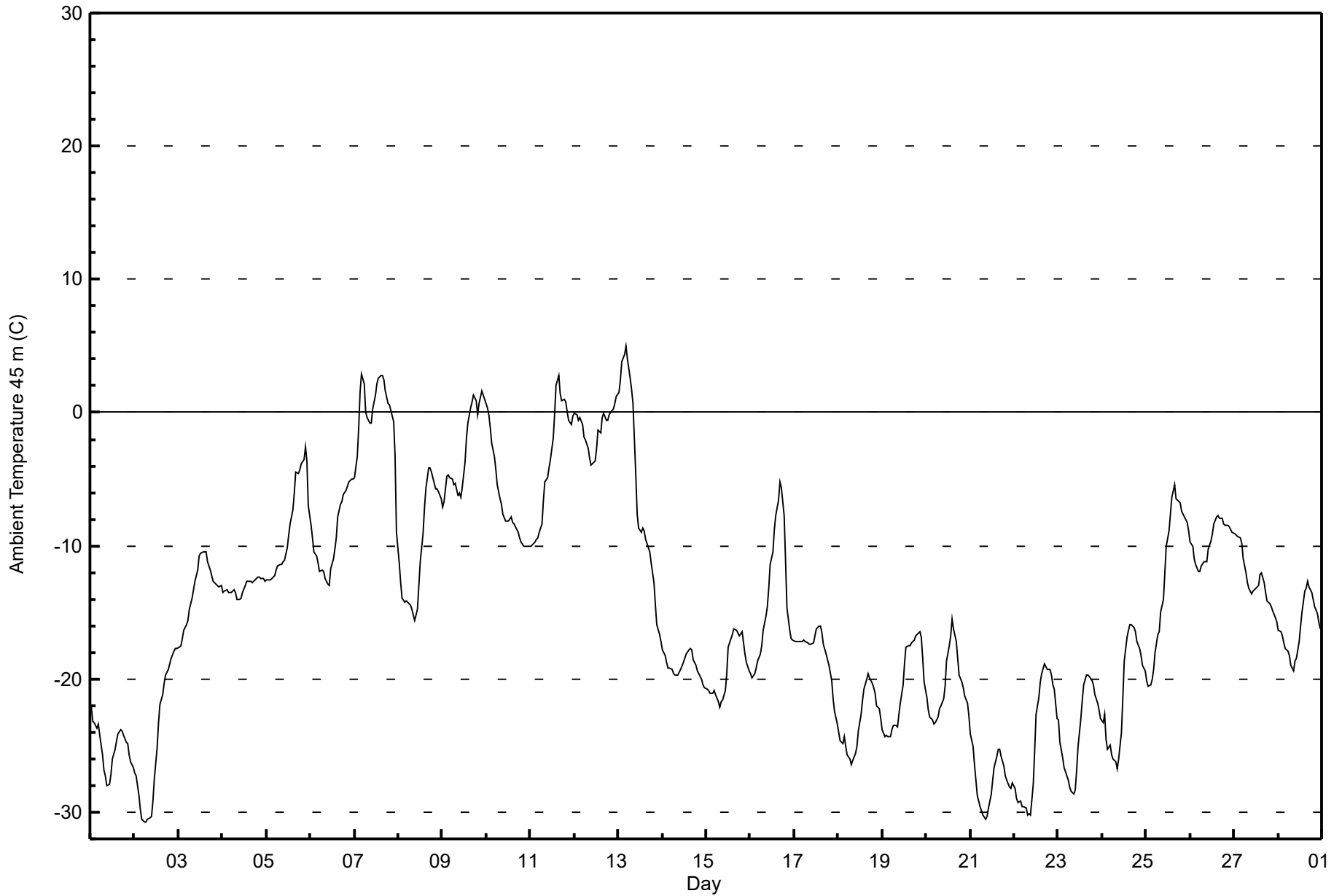
Total Number of Hours: 672



Summary of Hour Averages

Mannix - February 2023

Maximum Value: 5.0 C on Feb 13 05:00      Maximum Daily Average: 0.0 C on Feb 7																						Hours in Service:	672			
Minimum Value: -30.8 C on Feb 2 06:00      Minimum Daily Average: -27.6 C on Feb 21																						Hours of Data:	672			
Maximum Diurnal Average: -11.7 C at hour 17      Minimum Diurnal Average: -16.7 C at hour 10																						Hours of Missing Data:	0			
Monthly Average: -14.50 C      Percentiles: P <sub>1</sub> = -30.3 P <sub>10</sub> = -25.7 Q <sub>1</sub> = -20.6 Median = -15.2 Q <sub>3</sub> = -8.5 P <sub>90</sub> = -1.4 P <sub>99</sub> = 2.8																						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-Feb	-22.1	-23.2	-23.3	-23.7	-23.4	-24.2	-25.7	-26.8	-27.2	-28.0	-27.9	-27.2	-26.0	-25.3	-24.7	-24.1	-23.8	-23.9	-24.2	-24.7	-24.9	-25.7	-26.2	-26.6	-25.1	-22.1
2-Feb	-27.1	-27.3	-28.8	-29.8	-30.5	-30.8	-30.7	-30.5	-30.4	-30.3	-29.2	-27.5	-25.2	-23.3	-21.9	-21.1	-20.3	-19.7	-19.3	-18.9	-18.4	-17.9	-17.7	-17.7	-24.8	-17.7
3-Feb	-17.6	-17.5	-16.9	-16.4	-15.9	-15.6	-14.8	-13.9	-13.3	-12.6	-11.8	-10.8	-10.5	-10.5	-10.4	-11.2	-11.8	-12.2	-12.6	-12.9	-13.0	-13.1	-12.9	-13.3	-10.4	
4-Feb	-13.5	-13.4	-13.3	-13.5	-13.5	-13.5	-13.3	-13.5	-14.0	-14.0	-13.9	-13.5	-13.0	-12.7	-12.7	-12.7	-12.6	-12.4	-12.4	-12.3	-12.5	-12.5	-12.6	-13.1	-12.3	
5-Feb	-12.6	-12.6	-12.6	-12.4	-12.2	-11.8	-11.5	-11.5	-11.4	-11.2	-11.0	-11.1	-9.2	-8.4	-7.3	-6.0	-4.5	-4.6	-4.2	-3.8	-3.5	-2.6	-3.6	-7.0	-8.6	-2.6
6-Feb	-8.5	-9.5	-10.5	-10.7	-11.3	-11.9	-11.9	-11.9	-12.4	-12.8	-13.0	-11.7	-11.0	-10.3	-9.4	-7.9	-6.9	-6.7	-6.1	-5.9	-5.5	-5.2	-5.0	-5.0	-9.2	-5.0
7-Feb	-4.9	-3.3	-1.2	1.5	2.9	2.2	0.0	-0.3	-0.8	-0.7	0.3	1.3	2.2	2.6	2.8	2.8	2.4	1.6	0.7	0.6	0.1	-0.7	-3.2	-9.0	0.0	2.9
8-Feb	-11.3	-12.8	-13.9	-14.3	-14.1	-14.2	-14.4	-14.7	-15.2	-15.6	-14.7	-13.0	-11.2	-9.0	-7.2	-5.7	-4.2	-4.1	-4.5	-5.3	-5.7	-5.7	-5.9	-6.5	-10.1	-4.1
9-Feb	-7.1	-6.7	-4.8	-4.6	-4.9	-5.0	-5.4	-5.3	-6.2	-6.1	-6.4	-5.6	-3.7	-2.0	-0.8	0.4	0.8	1.4	0.9	-0.1	0.7	1.6	1.3	1.0	-2.8	1.6
10-Feb	0.4	-0.1	-1.1	-2.2	-3.3	-4.3	-5.4	-6.5	-6.9	-7.6	-8.1	-8.1	-8.1	-7.8	-8.2	-8.4	-8.6	-8.9	-9.4	-9.7	-10.0	-10.0	-10.0	-10.0	-6.8	0.4
11-Feb	-10.1	-9.9	-9.7	-9.6	-9.4	-9.0	-8.4	-6.6	-5.2	-4.9	-4.2	-3.5	-1.9	-0.1	2.0	2.8	1.4	0.9	1.0	0.8	0.1	-0.6	-0.8	-0.3	-3.5	2.8
12-Feb	0.0	-0.2	-0.6	-0.3	-0.9	-1.8	-2.1	-2.7	-3.4	-3.9	-3.9	-3.6	-2.7	-1.4	-1.5	-0.3	-0.1	-0.6	-0.6	-0.2	0.1	0.3	0.6	1.2	-1.2	1.2
13-Feb	1.5	2.5	3.8	4.4	5.0	4.0	2.6	1.8	0.7	-4.7	-7.6	-8.7	-9.0	-8.6	-8.9	-9.5	-10.1	-10.5	-11.3	-12.8	-14.5	-16.0	-16.7	-17.1	-5.8	5.0
14-Feb	-17.8	-18.3	-18.8	-19.2	-19.2	-19.3	-19.6	-19.7	-19.7	-19.5	-19.3	-18.7	-18.4	-18.2	-17.9	-17.7	-17.8	-18.5	-19.0	-19.4	-19.6	-20.1	-20.4	-20.6	-19.0	-17.7
15-Feb	-20.7	-20.9	-21.1	-21.0	-20.8	-21.1	-21.7	-22.1	-21.7	-21.6	-20.9	-19.6	-17.6	-17.0	-16.6	-16.3	-16.3	-16.6	-16.7	-16.4	-17.3	-18.2	-18.8	-19.4	-19.2	-16.3
16-Feb	-19.6	-19.9	-19.6	-19.2	-18.6	-18.1	-17.5	-16.3	-15.3	-14.6	-13.2	-11.4	-10.4	-8.8	-7.7	-6.6	-5.2	-5.6	-7.7	-11.1	-14.6	-16.4	-16.9	-17.1	-13.8	-5.2
17-Feb	-17.1	-17.1	-17.2	-17.2	-17.2	-17.1	-17.2	-17.2	-17.4	-17.4	-17.3	-16.8	-16.2	-16.0	-16.1	-16.6	-17.4	-18.1	-18.5	-19.0	-20.1	-21.5	-22.4	-23.4	-18.0	-16.0
18-Feb	-24.0	-24.7	-24.8	-24.4	-25.1	-25.7	-26.0	-26.4	-26.1	-25.6	-25.1	-23.9	-22.6	-21.6	-20.8	-20.0	-19.6	-19.9	-20.3	-20.7	-21.0	-22.0	-22.2	-23.0	-23.1	-19.6
19-Feb	-23.8	-24.4	-24.2	-24.3	-24.3	-23.9	-23.5	-23.5	-23.6	-22.6	-21.8	-20.4	-18.9	-17.6	-17.5	-17.5	-17.3	-17.1	-16.8	-16.7	-16.4	-16.8	-18.5	-20.2	-20.5	-16.4
20-Feb	-21.4	-22.3	-22.9	-23.0	-23.4	-23.3	-22.9	-22.2	-22.0	-21.5	-20.5	-18.7	-17.5	-16.8	-15.5	-16.3	-17.2	-18.5	-19.7	-20.2	-20.6	-21.3	-21.8	-22.8	-20.5	-15.5
21-Feb	-24.1	-25.1	-26.4	-27.6	-28.7	-29.6	-29.9	-30.2	-30.5	-30.3	-29.7	-28.7	-27.6	-26.6	-25.8	-25.3	-25.3	-25.8	-26.6	-27.3	-27.6	-28.1	-28.2	-27.8	-27.6	-24.1
22-Feb	-28.2	-28.9	-29.2	-29.2	-29.6	-29.6	-29.7	-30.2	-30.1	-30.3	-27.9	-25.4	-22.7	-21.4	-20.2	-19.6	-18.9	-19.0	-19.3	-19.3	-19.7	-20.4	-20.8	-23.0	-24.7	-18.9
23-Feb	-23.1	-24.8	-25.9	-26.6	-27.0	-27.6	-28.1	-28.4	-28.6	-28.3	-26.8	-25.1	-22.9	-21.6	-20.4	-19.7	-19.7	-19.9	-20.1	-20.4	-21.2	-21.8	-22.4	-22.9	-23.9	-19.7
24-Feb	-23.2	-22.7	-24.6	-25.3	-25.0	-25.7	-26.0	-26.2	-26.7	-26.0	-24.1	-21.4	-18.6	-16.9	-16.3	-15.9	-15.9	-16.1	-16.4	-17.2	-17.7	-18.3	-18.9	-19.4	-21.0	-15.9
25-Feb	-20.1	-20.6	-20.4	-20.0	-19.3	-18.0	-16.7	-16.4	-14.9	-14.1	-12.0	-10.1	-8.9	-7.6	-6.4	-5.4	-6.5	-6.6	-6.8	-7.4	-7.6	-7.8	-8.2	-8.9	-12.1	-5.4
26-Feb	-9.7	-10.1	-11.0	-11.4	-11.9	-12.0	-11.5	-11.2	-11.2	-11.2	-10.2	-9.6	-9.1	-8.3	-7.8	-7.7	-7.9	-8.0	-8.3	-8.4	-8.5	-8.5	-8.8	-9.0	-9.6	-7.7
27-Feb	-9.1	-9.1	-9.3	-9.4	-9.8	-10.9	-12.0	-12.8	-13.2	-13.6	-13.5	-13.3	-13.0	-12.9	-12.2	-12.0	-12.8	-13.5	-14.1	-14.4	-14.6	-14.9	-15.4	-15.8	-12.6	-9.1
28-Feb	-16.3	-16.4	-16.7	-17.2	-17.7	-17.9	-18.3	-19.0	-19.3	-18.7	-18.5	-17.2	-16.0	-15.0	-13.4	-13.2	-12.6	-13.1	-13.5	-14.0	-14.5	-15.1	-15.7	-16.3	-16.1	-12.6
																						Diurnal Average				
																						Diurnal Maximum				





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 45 m (AT45m) - C  
Mannix - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	188	27.98	27.98
-20 - 0	440	65.48	93.45
0 - 10	44	6.55	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672





Summary of Hour Averages

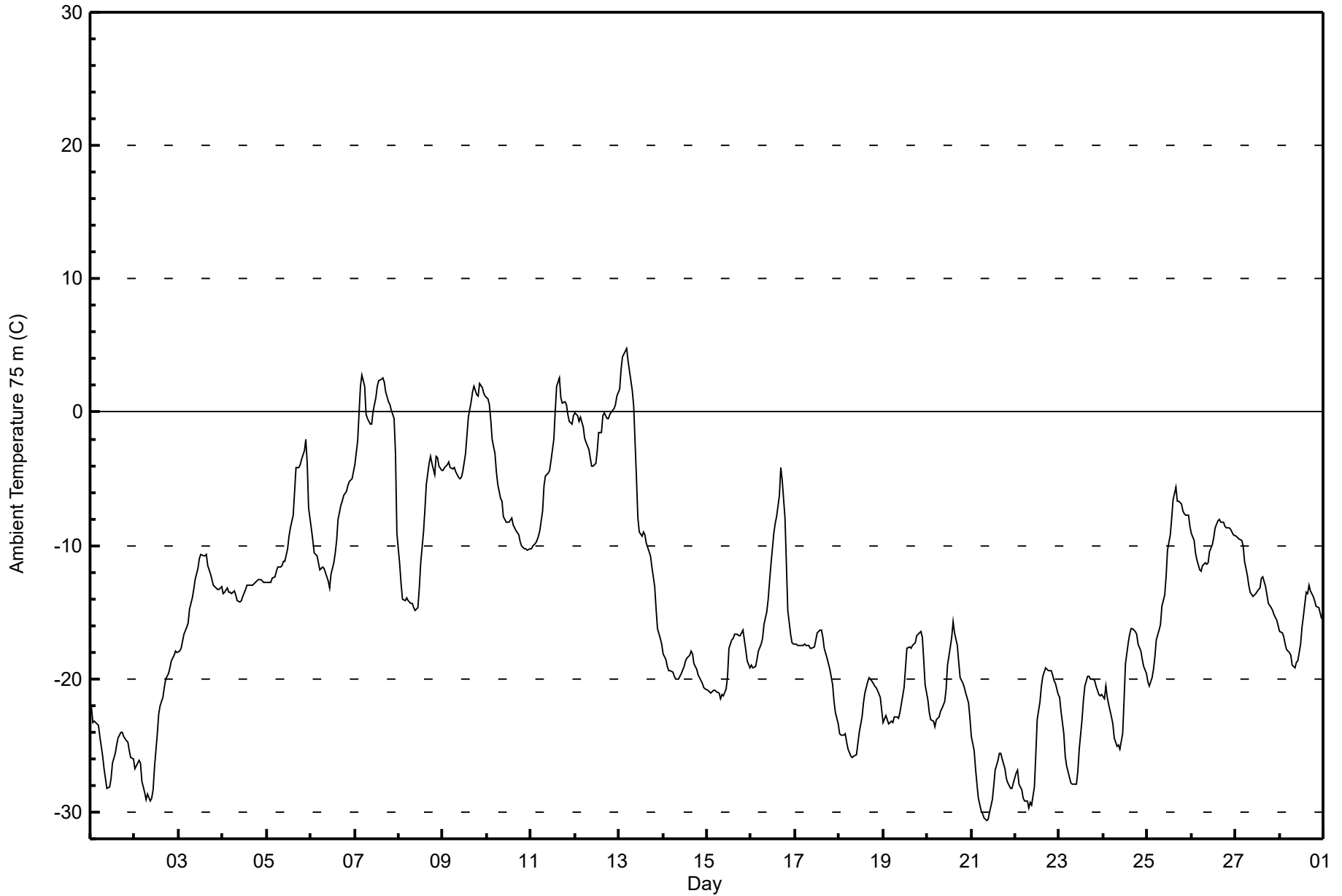
Mannix - February 2023

Maximum Value: 4.8 C on Feb 13 05:00      Maximum Daily Average: 0.0 C on Feb 7																						Hours in Service:	672																							
Minimum Value: -30.6 C on Feb 21 09:00      Minimum Daily Average: -27.8 C on Feb 21																						Hours of Data:	672																							
Maximum Diurnal Average: -11.9 C at hour 17      Minimum Diurnal Average: -16.6 C at hour 10																						Hours of Missing Data:	0																							
Monthly Average: -14.40 C      Percentiles: P <sub>1</sub> = -29.5 P <sub>10</sub> = -25.5 Q <sub>1</sub> = -20.6 Median = -14.9 Q <sub>3</sub> = -8.7 P <sub>90</sub> = -1.5 P <sub>99</sub> = 2.6																						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-Feb	-22.1	-23.3	-23.2	-23.4	-23.5	-24.4	-25.8	-26.8	-27.4	-28.2	-28.1	-27.5	-26.3	-25.6	-25.0	-24.4	-24.0	-24.1	-24.3	-24.7	-24.7	-25.4	-25.9	-26.0	-25.2	-22.1																				
2-Feb	-26.8	-26.6	-26.1	-26.3	-27.7	-28.6	-29.1	-28.6	-29.1	-29.0	-28.3	-26.6	-24.2	-22.7	-22.1	-21.4	-20.6	-20.0	-19.6	-19.2	-18.7	-18.2	-18.0	-18.0	-24.0	-18.0																				
3-Feb	-17.9	-17.7	-17.2	-16.6	-16.1	-15.8	-14.7	-13.9	-13.2	-12.6	-11.8	-10.9	-10.7	-10.7	-10.8	-10.7	-11.5	-12.1	-12.6	-12.9	-13.2	-13.3	-13.3	-13.1	-13.5	-10.7																				
4-Feb	-13.6	-13.5	-13.2	-13.6	-13.5	-13.6	-13.4	-13.7	-14.2	-14.2	-14.1	-13.8	-13.3	-13.0	-13.0	-13.0	-13.0	-12.8	-12.7	-12.6	-12.5	-12.6	-12.7	-12.8	-13.3	-12.5																				
5-Feb	-12.8	-12.8	-12.8	-12.5	-12.4	-11.9	-11.6	-11.6	-11.5	-11.2	-11.2	-10.8	-9.3	-8.7	-7.7	-6.0	-4.1	-4.2	-4.0	-3.6	-2.9	-2.0	-3.8	-7.2	-8.6	-2.0																				
6-Feb	-8.7	-9.7	-10.5	-10.8	-11.3	-11.8	-11.6	-11.8	-12.0	-12.6	-13.2	-12.1	-11.3	-10.5	-9.6	-8.0	-7.0	-6.7	-6.2	-5.9	-5.6	-5.2	-5.0	-4.5	-9.2	-4.5																				
7-Feb	-3.9	-2.1	-0.1	2.0	2.7	2.0	-0.2	-0.5	-0.9	-0.9	0.0	1.1	1.9	2.3	2.5	2.6	2.2	1.5	0.8	0.5	0.1	-0.5	-3.1	-9.1	0.0	2.7																				
8-Feb	-11.4	-12.9	-14.0	-14.1	-14.0	-14.1	-14.4	-14.4	-14.7	-14.8	-14.6	-13.2	-11.3	-9.0	-7.3	-5.4	-3.8	-3.3	-3.8	-4.7	-3.3	-3.4	-4.0	-4.4	-9.6	-3.3																				
9-Feb	-4.3	-4.2	-3.9	-3.7	-4.2	-4.3	-4.1	-4.5	-4.9	-5.0	-4.9	-4.4	-3.1	-1.7	-0.4	0.8	1.5	1.9	1.3	1.3	2.1	1.8	1.4	1.2	-1.8	2.1																				
10-Feb	1.0	0.6	-0.6	-2.0	-3.2	-4.4	-5.4	-6.5	-6.7	-7.8	-8.3	-8.3	-8.3	-8.0	-8.5	-8.6	-8.8	-9.2	-9.7	-10.0	-10.2	-10.3	-10.3	-10.3	-6.8	1.0																				
11-Feb	-10.3	-10.1	-9.8	-9.6	-9.3	-8.9	-7.4	-5.5	-4.8	-4.6	-4.4	-3.6	-2.1	0.1	1.9	2.6	1.1	0.7	0.8	0.6	-0.1	-0.6	-0.9	-0.3	-3.5	2.6																				
12-Feb	-0.1	-0.3	-0.6	-0.4	-1.1	-2.0	-2.2	-2.8	-3.5	-4.1	-4.0	-3.8	-2.9	-1.6	-1.5	-0.3	0.0	-0.5	-0.5	-0.2	0.2	0.3	0.6	1.2	-1.2	1.2																				
13-Feb	1.7	3.2	4.2	4.5	4.8	3.8	2.4	1.6	0.4	-5.0	-7.9	-9.0	-9.3	-8.9	-9.2	-9.8	-10.4	-10.8	-11.6	-13.0	-14.7	-16.2	-17.0	-17.4	-6.0	4.8																				
14-Feb	-18.1	-18.5	-19.0	-19.4	-19.4	-19.5	-19.9	-20.0	-20.0	-19.8	-19.6	-19.1	-18.6	-18.4	-18.2	-18.0	-18.2	-18.8	-19.3	-19.7	-19.9	-20.4	-20.7	-20.8	-19.3	-18.0																				
15-Feb	-20.9	-21.0	-21.1	-20.9	-20.9	-21.1	-21.5	-21.2	-21.3	-20.7	-19.8	-17.7	-17.1	-16.9	-16.6	-16.6	-16.8	-16.8	-16.8	-16.4	-17.0	-17.8	-18.7	-19.2	-19.1	-16.4																				
16-Feb	-19.0	-19.2	-19.1	-18.5	-18.0	-17.4	-16.9	-15.9	-14.9	-14.0	-12.7	-11.4	-9.1	-8.3	-7.9	-6.2	-4.2	-5.1	-7.9	-11.4	-14.9	-16.7	-17.2	-17.4	-13.5	-4.2																				
17-Feb	-17.4	-17.5	-17.5	-17.5	-17.5	-17.4	-17.5	-17.5	-17.7	-17.7	-17.6	-17.1	-16.5	-16.3	-16.4	-16.9	-17.7	-18.4	-18.8	-19.3	-20.4	-21.7	-22.5	-23.4	-18.3	-16.3																				
18-Feb	-24.1	-24.3	-24.3	-24.1	-24.7	-25.3	-25.8	-26.0	-25.8	-25.7	-24.8	-24.0	-22.8	-21.8	-21.1	-20.2	-19.9	-20.0	-20.4	-20.5	-20.6	-20.9	-21.4	-22.3	-22.9	-19.9																				
19-Feb	-23.3	-22.7	-23.0	-23.3	-23.2	-23.3	-22.9	-22.8	-22.9	-22.6	-21.9	-20.6	-19.2	-17.8	-17.6	-17.7	-17.5	-17.2	-16.8	-16.7	-16.5	-16.9	-18.6	-20.5	-20.2	-16.5																				
20-Feb	-21.6	-22.5	-23.0	-23.2	-23.6	-23.1	-22.8	-22.5	-22.2	-21.7	-20.7	-19.0	-17.6	-16.9	-15.7	-16.5	-17.5	-18.7	-19.9	-20.3	-20.6	-21.1	-21.8	-22.9	-20.6	-15.7																				
21-Feb	-24.3	-25.4	-26.7	-27.9	-29.0	-29.9	-30.1	-30.4	-30.6	-30.5	-30.0	-29.0	-28.0	-26.9	-26.1	-25.6	-25.6	-26.0	-26.8	-27.5	-27.8	-28.2	-28.2	-27.8	-27.8	-24.3																				
22-Feb	-27.0	-26.9	-27.9	-28.4	-29.0	-29.2	-29.1	-29.7	-29.3	-29.5	-28.2	-25.7	-23.1	-21.7	-20.5	-19.8	-19.2	-19.3	-19.4	-19.4	-19.7	-20.1	-20.3	-21.2	-24.3	-19.2																				
23-Feb	-21.4	-22.4	-24.2	-25.8	-26.5	-27.3	-27.8	-27.9	-27.9	-27.9	-27.0	-25.3	-23.1	-21.6	-20.5	-19.8	-19.8	-20.0	-20.1	-20.2	-20.5	-21.2	-21.3	-21.2	-23.3	-19.8																				
24-Feb	-21.5	-20.6	-21.4	-21.9	-22.8	-23.4	-24.4	-25.0	-25.0	-25.3	-24.1	-21.6	-18.9	-17.3	-16.6	-16.2	-16.2	-16.4	-16.7	-17.4	-18.0	-18.5	-19.1	-19.6	-20.3	-16.2																				
25-Feb	-20.3	-20.5	-19.9	-19.3	-18.4	-17.1	-16.3	-15.9	-14.6	-13.7	-12.3	-10.4	-9.2	-7.9	-6.6	-5.6	-6.7	-6.7	-6.8	-7.4	-7.6	-7.7	-7.7	-8.6	-12.0	-5.6																				
26-Feb	-9.1	-9.6	-10.6	-11.1	-11.8	-11.9	-11.5	-11.3	-11.4	-11.3	-10.5	-9.9	-9.4	-8.7	-8.1	-8.0	-8.2	-8.2	-8.6	-8.7	-8.7	-8.8	-9.0	-9.2	-9.7	-8.0																				
27-Feb	-9.3	-9.4	-9.6	-9.6	-10.0	-11.2	-12.3	-13.0	-13.5	-13.9	-13.8	-13.6	-13.3	-13.2	-12.5	-12.3	-13.1	-13.8	-14.4	-14.7	-14.9	-15.1	-15.6	-16.0	-12.8	-9.3																				
28-Feb	-16.4	-16.6	-16.9	-17.4	-17.8	-18.0	-18.3	-18.9	-19.2	-18.7	-18.6	-17.4	-16.2	-15.2	-13.5	-13.6	-13.0	-13.4	-13.8	-14.1	-14.5	-14.7	-15.1	-15.5	-16.1	-13.0																				
																						-15.1	-15.2	-15.4	-15.5	-15.8	-16.0	-16.2	-16.3	-16.4	-16.6	-16.2	-15.2	-14.0	-13.1	-12.5	-12.0	-11.9	-12.1	-12.4	-12.8	-13.0	-13.4	-13.9	-14.5	Diurnal Average
																						1.7	3.2	4.2	4.5	4.8	3.8	2.4	1.6	0.4	-0.9	0.0	1.1	1.9	2.3	2.5	2.6	2.2	1.9	1.3	1.3	2.1	1.8	1.4	1.2	Diurnal Maximum



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

**Ambient Temperature 75 m (AT75m) - C**  
**Mannix - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 75 m (AT75m) - C  
Mannix - February 2023**

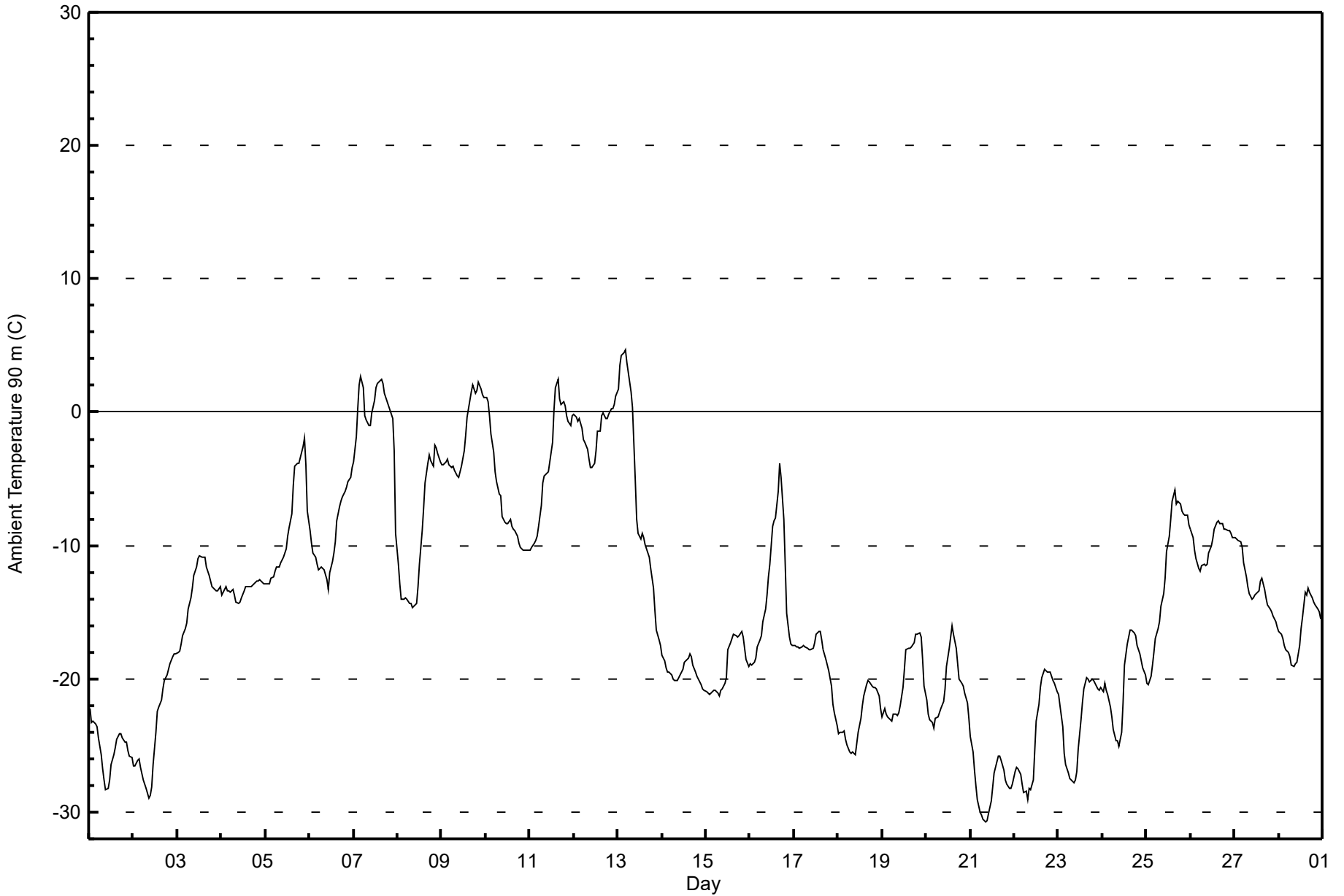
<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	190	28.27	28.27
-20 - 0	437	65.03	93.30
0 - 10	45	6.70	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



Maximum Value: 4.7 C on Feb 13 05:00																						Maximum Daily Average: 0.0 C on Feb 7				Hours in Service: 672			
Minimum Value: -30.7 C on Feb 21 09:00																						Minimum Daily Average: -28.0 C on Feb 21				Hours of Data: 672			
Maximum Diurnal Average: -11.9 C at hour 17																						Minimum Diurnal Average: -16.5 C at hour 10				Hours of Missing Data: 0			
Monthly Average: -14.38 C																						Percentiles: P <sub>1</sub> = -29.1 P <sub>10</sub> = -25.5 Q <sub>1</sub> = -20.7 Median = -15.0 Q <sub>3</sub> = -8.7 P <sub>90</sub> = -1.4 P <sub>99</sub> = 2.5				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-Feb	-22.2	-23.2	-23.2	-23.4	-23.6	-24.4	-25.7	-26.8	-27.6	-28.4	-27.6	-26.5	-25.7	-25.1	-24.5	-24.1	-24.2	-24.4	-24.7	-24.8	-25.4	-25.8	-25.9	-25.2	-22.2				
2-Feb	-26.6	-26.6	-26.1	-26.0	-26.6	-27.6	-27.9	-28.2	-28.9	-28.7	-28.2	-26.4	-24.0	-22.5	-22.1	-21.6	-20.8	-20.1	-19.7	-19.3	-18.8	-18.4	-18.1	-23.8	-18.1				
3-Feb	-18.0	-17.9	-17.3	-16.7	-16.2	-15.9	-14.7	-13.9	-13.2	-12.2	-11.6	-11.0	-10.7	-10.9	-10.9	-10.9	-11.6	-12.3	-12.7	-13.1	-13.3	-13.4	-13.4	-13.1	-10.7				
4-Feb	-13.7	-13.5	-13.1	-13.4	-13.4	-13.5	-13.3	-13.7	-14.2	-14.4	-14.2	-13.9	-13.4	-13.1	-13.1	-13.1	-12.9	-12.8	-12.6	-12.6	-12.5	-12.8	-12.9	-13.3	-12.5				
5-Feb	-12.9	-12.9	-12.9	-12.5	-12.3	-11.9	-11.6	-11.6	-11.3	-11.1	-10.9	-10.9	-9.3	-8.7	-7.7	-5.5	-4.0	-3.8	-3.8	-3.4	-2.6	-1.9	-3.9	-7.4	-1.9				
6-Feb	-8.9	-9.8	-10.6	-10.9	-11.4	-11.8	-11.6	-11.8	-11.9	-12.5	-13.3	-12.1	-11.2	-10.6	-9.7	-8.1	-7.1	-6.6	-6.3	-5.9	-5.6	-5.2	-4.9	-4.2	-4.2				
7-Feb	-3.7	-1.8	0.2	2.1	2.7	1.8	-0.3	-0.6	-1.0	-1.0	0.9	1.8	2.2	2.4	2.5	2.1	1.4	0.8	0.5	0.1	-0.4	-2.9	-9.1	0.0					
8-Feb	-11.4	-12.9	-14.0	-14.0	-13.9	-14.1	-14.4	-14.4	-14.6	-14.5	-14.4	-13.1	-11.4	-8.9	-7.2	-5.3	-3.8	-3.2	-3.7	-4.1	-2.5	-2.6	-3.1	-3.7	-2.5				
9-Feb	-4.0	-3.9	-3.7	-3.5	-4.0	-4.1	-4.1	-4.3	-4.8	-4.9	-4.5	-4.1	-2.9	-1.7	-0.3	0.9	1.5	2.0	1.4	1.6	2.2	1.7	1.3	1.2	2.2				
10-Feb	1.1	0.8	-0.3	-1.7	-3.0	-4.5	-5.2	-6.2	-6.2	-7.8	-8.3	-8.4	-8.4	-8.1	-8.5	-8.7	-8.9	-9.3	-9.8	-10.1	-10.3	-10.4	-10.4	-10.3	1.1				
11-Feb	-10.3	-10.1	-9.8	-9.6	-9.3	-8.6	-6.9	-5.4	-4.8	-4.6	-4.5	-3.8	-2.3	0.2	1.8	2.5	1.0	0.6	0.7	0.5	-0.2	-0.7	-0.9	-0.3	2.5				
12-Feb	-0.1	-0.3	-0.7	-0.4	-1.2	-2.0	-2.3	-2.8	-3.5	-4.1	-4.1	-3.9	-2.9	-1.4	-1.4	-0.3	0.0	-0.5	-0.4	-0.1	0.2	0.3	0.6	1.3	1.3				
13-Feb	1.8	3.5	4.3	4.5	4.7	3.7	2.2	1.5	0.3	-5.1	-8.1	-9.1	-9.5	-9.1	-9.4	-10.0	-10.6	-10.9	-11.7	-13.2	-14.9	-16.4	-17.1	-17.5	4.7				
14-Feb	-18.3	-18.6	-19.1	-19.5	-19.5	-19.7	-20.0	-20.1	-20.1	-19.9	-19.7	-19.3	-18.8	-18.6	-18.4	-18.1	-18.3	-19.0	-19.4	-19.8	-20.0	-20.5	-20.8	-20.9	-18.1				
15-Feb	-21.0	-21.1	-21.1	-20.9	-20.8	-20.9	-21.0	-21.3	-20.8	-20.7	-20.3	-19.9	-17.9	-17.3	-17.0	-16.7	-16.7	-16.8	-16.8	-16.5	-16.9	-17.7	-18.6	-19.1	-16.5				
16-Feb	-18.8	-19.0	-18.8	-18.4	-17.6	-17.1	-16.8	-15.7	-14.8	-13.7	-12.3	-11.4	-8.5	-8.2	-7.9	-5.9	-3.8	-4.8	-8.0	-11.5	-15.0	-16.8	-17.4	-17.5	-3.8				
17-Feb	-17.5	-17.6	-17.7	-17.7	-17.6	-17.5	-17.6	-17.7	-17.9	-17.9	-17.7	-17.2	-16.7	-16.4	-16.5	-17.0	-17.8	-18.6	-19.0	-19.4	-20.5	-21.9	-22.6	-23.5	-18.4				
18-Feb	-24.1	-24.0	-24.0	-23.9	-24.6	-25.0	-25.5	-25.6	-25.5	-25.7	-24.8	-24.1	-22.9	-22.0	-21.2	-20.4	-20.1	-20.2	-20.6	-20.6	-20.6	-20.7	-21.3	-22.2	-20.1				
19-Feb	-22.9	-22.2	-22.7	-22.8	-23.0	-23.1	-22.7	-22.7	-22.7	-22.6	-22.0	-20.7	-19.3	-17.8	-17.7	-17.7	-17.6	-17.3	-16.7	-16.7	-16.5	-16.9	-18.6	-20.6	-16.5				
20-Feb	-21.6	-22.6	-23.1	-23.3	-23.7	-22.9	-22.9	-22.6	-22.3	-21.7	-20.8	-19.1	-17.7	-16.9	-16.0	-16.7	-17.7	-18.9	-20.1	-20.4	-20.6	-21.1	-21.9	-23.0	-16.0				
21-Feb	-24.4	-25.5	-26.8	-28.0	-29.1	-30.0	-30.2	-30.5	-30.7	-30.6	-30.1	-29.2	-28.1	-27.0	-26.2	-25.8	-25.8	-26.2	-26.9	-27.6	-27.9	-28.3	-28.2	-27.9	-24.4				
22-Feb	-27.0	-26.7	-26.8	-27.1	-27.9	-28.6	-28.4	-29.1	-28.2	-28.4	-27.5	-25.3	-23.1	-21.9	-20.6	-20.0	-19.3	-19.4	-19.5	-19.5	-19.8	-20.1	-20.4	-21.0	-19.3				
23-Feb	-21.2	-22.0	-23.6	-25.6	-26.4	-27.1	-27.4	-27.6	-27.8	-27.6	-27.0	-25.3	-23.1	-21.8	-20.7	-19.9	-20.1	-20.2	-20.0	-20.1	-20.3	-20.8	-20.8	-20.7	-19.9				
24-Feb	-21.0	-20.3	-20.9	-21.2	-22.1	-22.8	-23.8	-24.7	-24.6	-25.1	-24.0	-21.8	-19.0	-17.4	-16.8	-16.4	-16.4	-16.5	-16.8	-17.5	-18.1	-18.6	-19.2	-19.7	-16.4				
25-Feb	-20.4	-20.5	-19.8	-18.9	-18.1	-16.9	-16.3	-15.7	-14.5	-13.6	-12.4	-10.5	-9.3	-8.1	-6.7	-5.8	-6.9	-6.7	-6.9	-7.4	-7.7	-7.7	-7.8	-8.4	-5.8				
26-Feb	-8.8	-9.4	-10.3	-10.9	-11.7	-11.9	-11.5	-11.4	-11.5	-11.4	-10.6	-10.1	-9.5	-8.8	-8.3	-8.1	-8.3	-8.4	-8.7	-8.8	-8.9	-8.9	-9.1	-9.4	-8.1				
27-Feb	-9.4	-9.5	-9.7	-9.7	-10.2	-11.3	-12.4	-13.1	-13.6	-14.0	-13.9	-13.7	-13.5	-13.4	-12.6	-12.5	-13.3	-13.9	-14.5	-14.8	-15.0	-15.3	-15.7	-16.1	-9.4				
28-Feb	-16.5	-16.6	-17.0	-17.5	-17.8	-18.1	-18.3	-18.9	-19.1	-18.9	-18.7	-17.5	-16.3	-15.4	-13.5	-13.7	-13.2	-13.5	-13.9	-14.3	-14.5	-14.8	-15.0	-15.5	-13.2				
																						-15.1				Diurnal Average			
																						1.8				Diurnal Maximum			





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 90 m (AT90m) - C  
Mannix - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	195	29.02	29.02
-20 - 0	432	64.29	93.30
0 - 10	45	6.70	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Relative Humidity (RH) - %**

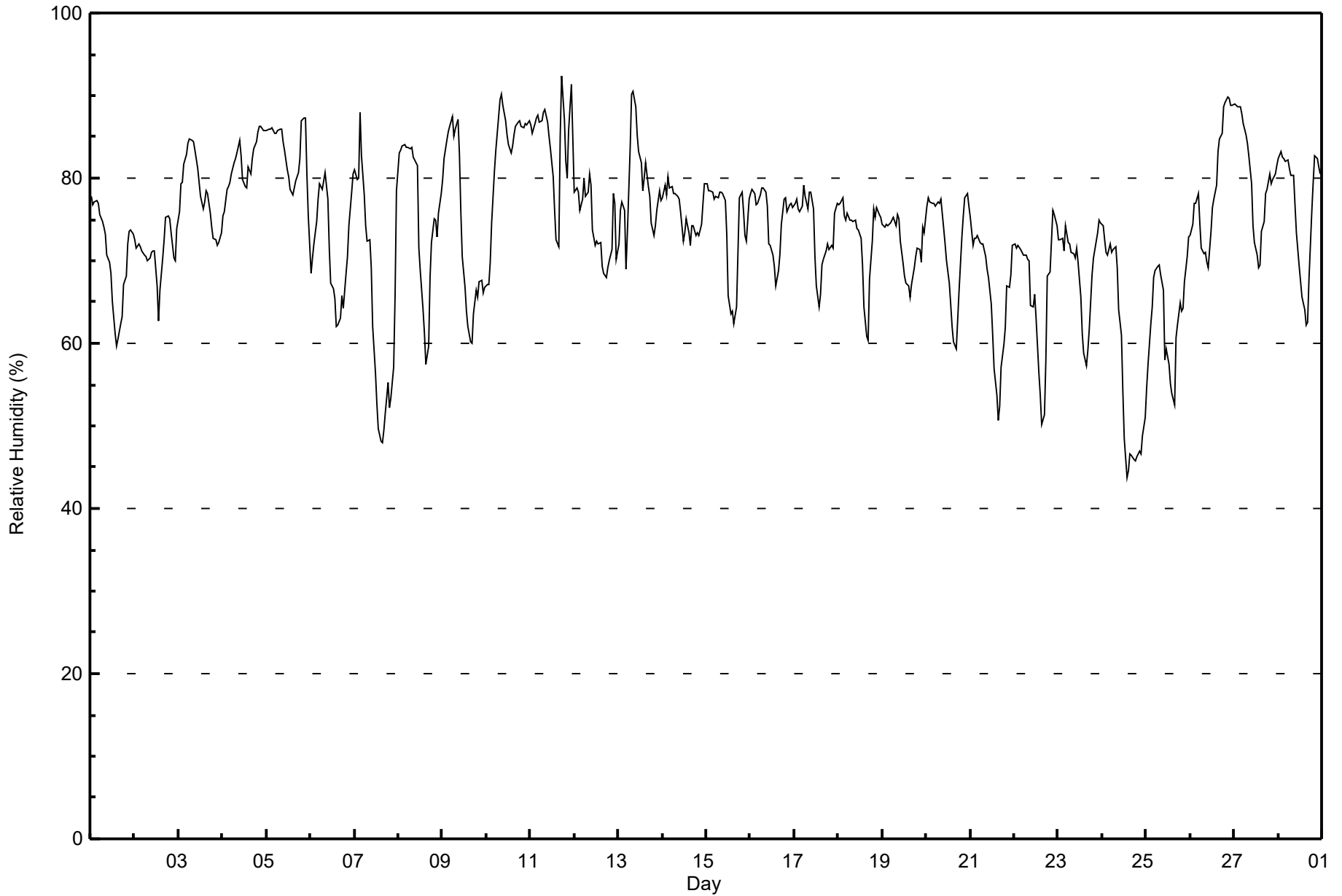
**Mannix - February 2023**

Maximum Value: 92 % on Feb 11 18:00														Maximum Daily Average: 84.5 % on Feb 11														Hours in Service: 672	
Minimum Value: 44 % on Feb 24 14:00														Minimum Daily Average: 57.7 % on Feb 24														Hours of Data: 672	
Maximum Diurnal Average: 78.3 % at hour 9														Minimum Diurnal Average: 65.7 % at hour 16														Hours of Missing Data: 0	
Monthly Average: 73.8 %														Percentiles: P <sub>1</sub> = 47 P <sub>10</sub> = 62 Q <sub>1</sub> = 69 Median = 75 Q <sub>3</sub> = 79 P <sub>90</sub> = 85 P <sub>99</sub> = 90														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-Feb	78	77	77	77	77	76	75	74	73	71	70	68	65	61	60	60	62	63	67	68	72	73	74	73	70.5	78			
2-Feb	73	72	72	72	71	71	70	70	70	71	71	71	67	63	66	70	73	75	75	75	73	70	70	74	71.1	75			
3-Feb	76	79	79	82	83	84	85	85	84	83	81	80	78	76	77	78	78	76	74	73	73	72	72	73	78.4	85			
4-Feb	75	76	79	79	80	80	82	82	83	85	83	80	79	79	81	80	82	84	84	86	86	86	86	86	81.8	86			
5-Feb	86	86	86	86	85	85	86	86	86	84	83	81	80	79	78	79	80	81	82	87	87	87	80	75	83.2	87			
6-Feb	69	70	72	75	78	79	79	80	81	77	72	67	67	65	62	62	63	66	64	69	71	74	78	81	71.6	81			
7-Feb	81	80	80	88	83	78	74	72	73	69	62	56	53	50	48	48	49	51	55	52	53	57	66	78	64.9	88			
8-Feb	83	83	84	84	84	84	84	84	83	82	81	71	69	64	61	57	60	68	72	75	75	73	76	78	75.6	84			
9-Feb	80	82	85	86	86	88	85	86	87	83	76	70	67	64	62	60	60	64	66	66	67	68	66	67	73.8	88			
10-Feb	67	67	70	75	81	83	86	89	90	89	87	85	84	83	84	85	86	87	87	86	86	87	86	87	83.2	90			
11-Feb	86	85	87	87	88	87	87	88	88	87	85	84	80	76	73	72	85	92	87	82	80	86	91	85	84.5	92			
12-Feb	78	79	78	76	78	80	78	78	80	79	74	72	72	72	72	69	68	68	69	70	71	78	77	70	74.5	80			
13-Feb	72	76	77	76	69	73	84	90	90	89	85	83	82	78	80	82	79	78	75	73	74	76	78	77	79.1	90			
14-Feb	78	79	78	80	79	79	78	78	78	77	76	72	73	75	73	72	74	74	73	73	73	74	77	79	76.0	80			
15-Feb	79	78	78	78	77	78	78	78	78	78	77	73	66	64	64	62	64	71	78	78	76	73	72	77	74.1	79			
16-Feb	78	79	78	77	77	78	79	79	78	77	72	72	71	69	67	69	71	74	78	78	76	77	77	76	75.2	79			
17-Feb	77	78	76	76	77	79	78	76	78	78	76	71	67	64	66	69	70	71	72	71	72	71	76	77	73.6	79			
18-Feb	77	77	78	75	75	76	75	75	75	75	74	74	73	69	64	61	60	68	72	76	75	77	76	75	73.0	78			
19-Feb	74	74	74	74	75	75	75	74	76	75	72	70	68	67	67	66	67	69	71	72	71	70	74	73	71.8	76			
20-Feb	77	78	77	77	77	77	77	77	77	74	72	70	67	65	62	60	59	63	66	73	75	78	78	77	72.2	78			
21-Feb	75	72	73	73	73	72	72	72	71	69	68	65	61	57	54	51	52	57	60	62	67	67	68	72	65.9	75			
22-Feb	72	72	72	71	71	71	71	70	70	65	64	66	63	57	54	50	51	58	68	69	72	76	76	74	66.8	76			
23-Feb	73	73	73	71	74	72	72	71	71	70	72	70	66	61	59	57	59	62	68	70	71	73	75	75	69.1	75			
24-Feb	74	73	71	71	72	71	71	72	69	64	61	54	48	44	44	47	46	46	46	46	47	47	49	51	57.7	74			
25-Feb	55	58	62	64	68	69	69	69	68	66	58	59	57	55	54	52	61	62	65	64	64	67	70	73	63.0	73			
26-Feb	73	74	77	77	78	75	72	71	71	70	69	74	76	77	79	83	85	85	89	89	90	90	89	89	79.2	90			
27-Feb	89	89	89	89	88	87	85	84	83	79	74	72	71	69	69	74	75	78	79	80	79	80	81	82	80.1	89			
28-Feb	82	83	83	82	82	82	81	80	80	77	73	69	68	66	64	62	63	68	76	79	83	82	81	81	76.2	83			
76.3														76.7														Diurnal Average	
89														89														Diurnal Maximum	



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

**Relative Humidity (RH) - %**  
**Mannix - February 2023**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %  
Mannix - February 2023**

<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	50	7.44	7.44
60 - 80	469	69.79	77.23
80 - 100	153	22.77	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672

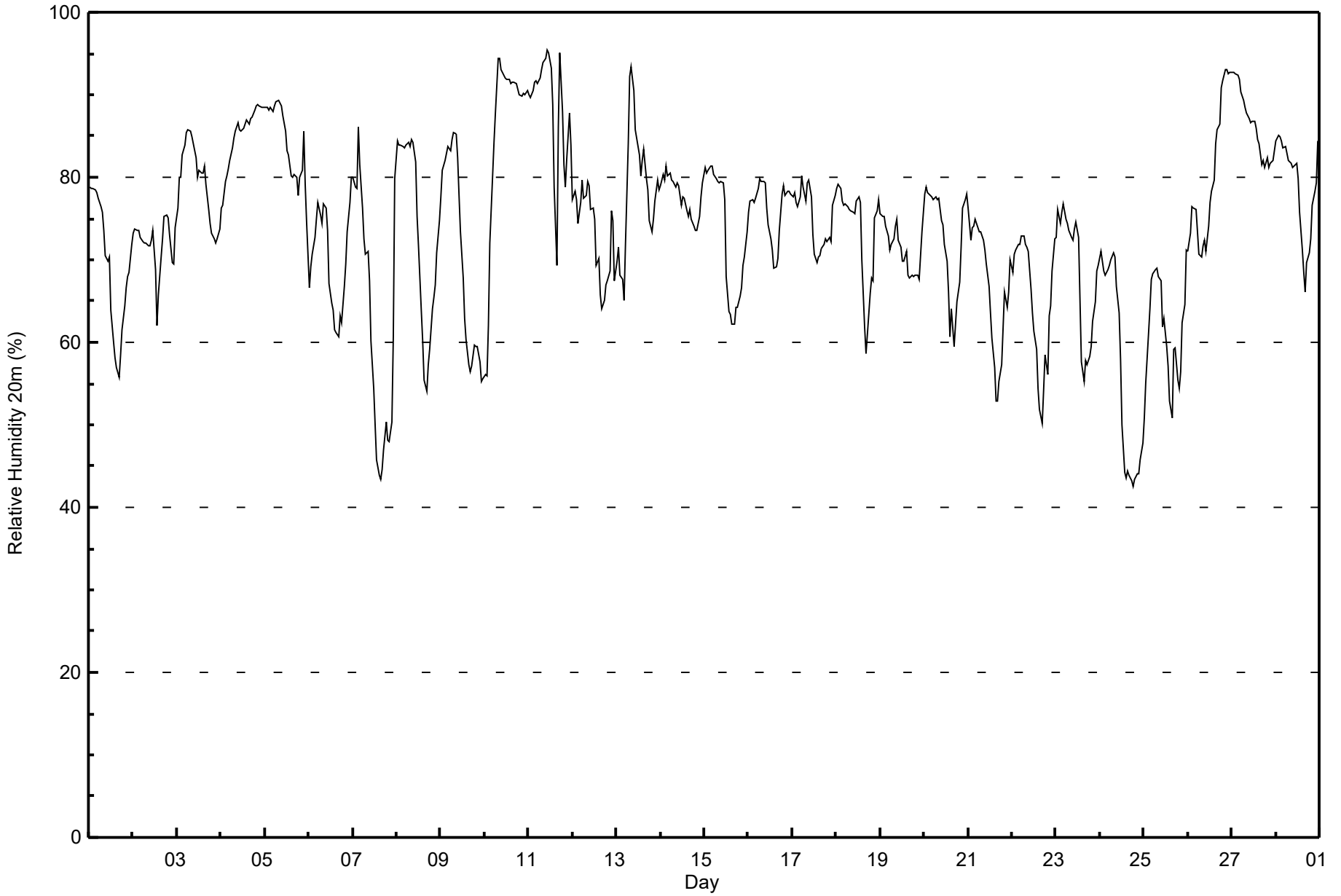


Maximum Value: 96 % on Feb 11 11:00														Maximum Daily Average: 88.4 % on Feb 11														Hours in Service: 672	
Minimum Value: 43 % on Feb 24 19:00														Minimum Daily Average: 56.3 % on Feb 24														Hours of Data: 672	
Maximum Diurnal Average: 79.4 % at hour 9														Minimum Diurnal Average: 66.6 % at hour 16														Hours of Missing Data: 0	
Monthly Average: 74.0 %														Percentiles: P <sub>1</sub> = 44 P <sub>10</sub> = 59 Q <sub>1</sub> = 68 Median = 75 Q <sub>3</sub> = 81 P <sub>90</sub> = 88 P <sub>99</sub> = 94														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-Feb	79	79	79	78	78	77	76	76	74	70	70	70	64	60	58	57	56	58	61	64	67	68	68	72	69.2	79			
2-Feb	73	74	74	74	73	72	72	72	72	72	72	74	69	62	66	70	73	75	75	75	73	70	69	74	71.8	75			
3-Feb	76	80	80	83	84	85	86	86	85	84	82	80	81	80	80	81	79	76	74	73	73	72	73	74	79.5	86			
4-Feb	76	77	79	80	81	82	83	85	86	87	86	86	86	86	87	86	87	88	89	89	89	88	88	88	85.0	89			
5-Feb	88	88	88	88	88	89	89	89	89	89	88	86	83	83	80	80	80	80	78	80	81	86	79	74	84.3	89			
6-Feb	67	69	71	73	75	77	75	74	77	76	73	67	65	64	62	61	61	63	62	67	70	73	77	80	70.0	80			
7-Feb	80	79	79	86	82	76	73	71	71	67	60	54	50	46	44	43	45	47	50	48	48	50	61	80	62.1	86			
8-Feb	84	84	84	84	84	84	84	84	85	84	82	75	72	64	60	55	54	57	59	64	65	67	71	75	73.4	85			
9-Feb	78	81	82	83	84	83	85	85	85	82	78	73	68	63	60	57	56	57	60	59	59	58	55	56	70.3	85			
10-Feb	56	56	62	72	80	84	88	94	94	93	92	92	92	92	91	91	92	91	91	90	90	90	91	91	85.6	94			
11-Feb	90	90	91	91	92	91	92	93	94	94	96	95	93	89	79	69	86	95	88	82	79	82	88	84	88.4	96			
12-Feb	77	78	77	74	77	80	77	78	80	79	76	76	75	69	70	66	64	65	67	67	69	76	75	68	73.4	80			
13-Feb	70	71	68	68	65	72	84	92	93	90	86	85	83	80	82	83	80	78	75	73	75	77	80	78	78.7	93			
14-Feb	79	80	80	81	80	80	80	80	79	79	79	77	78	77	76	75	76	75	74	73	74	75	78	79	77.7	81			
15-Feb	81	81	81	81	81	80	80	79	79	80	79	77	68	64	63	62	62	64	64	66	67	69	70	73	73.1	81			
16-Feb	76	77	77	77	77	79	80	80	79	79	76	74	73	71	69	69	70	74	78	79	78	78	78	78	76.1	80			
17-Feb	78	78	77	76	78	80	79	77	79	80	78	73	71	70	70	71	72	73	72	73	72	77	78	78	75.0	80			
18-Feb	79	79	79	77	77	77	76	76	76	76	76	77	78	77	70	62	59	61	66	68	68	75	76	77	73.3	79			
19-Feb	76	75	75	74	73	71	72	73	74	75	72	72	70	70	71	68	68	68	68	68	68	68	71	73	71.3	76			
20-Feb	78	79	78	78	78	77	78	77	77	75	74	72	70	66	61	64	59	62	65	67	72	76	77	78	72.4	79			
21-Feb	76	72	74	74	75	74	73	73	72	71	69	67	64	61	57	53	53	55	57	62	66	64	66	70	66.7	76			
22-Feb	68	71	71	72	72	73	73	72	72	71	66	63	61	59	54	52	50	54	58	56	63	64	69	72	64.9	73			
23-Feb	73	76	74	76	77	75	74	74	73	72	74	75	73	65	58	55	58	57	58	59	62	65	69	69	68.4	77			
24-Feb	71	70	69	68	69	69	70	71	70	67	64	58	50	44	44	44	43	43	43	43	44	44	46	48	56.3	71			
25-Feb	51	55	61	64	68	68	69	69	68	67	62	63	60	57	53	51	59	59	55	54	57	62	65	71	61.2	71			
26-Feb	71	73	76	76	76	73	71	70	72	72	71	74	77	78	80	84	86	86	91	92	93	93	92	93	80.1	93			
27-Feb	93	93	93	92	92	90	89	88	88	87	87	87	87	86	85	84	81	82	81	82	81	82	82	83	86.5	93			
28-Feb	84	85	85	84	84	84	83	82	82	81	81	82	80	76	71	69	66	70	71	72	77	78	79	84	78.7	85			
																												Diurnal Average	
76.0														76.8														93	
77.2														78.1														92	
78.4														78.7														91	
79.0														79.3														92	
79.4														79.4														94	
78.6														78.6														94	
76.8														75.1														96	
72.7														72.7														93	
70.0														70.0														92	
67.9														67.9														91	
66.6														66.6														91	
67.0														67.0														92	
68.4														68.4														95	
69.0														69.0														91	
69.6														69.6														92	
70.6														70.6														93	
72.3														72.3														93	
73.9														73.9														92	
75.7														75.7														93	
																												Diurnal Maximum	



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

**Relative Humidity 20m (RH20m) - %**  
**Mannix - February 2023**





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

**Relative Humidity 20m (RH20m) - %**  
**Mannix - February 2023**

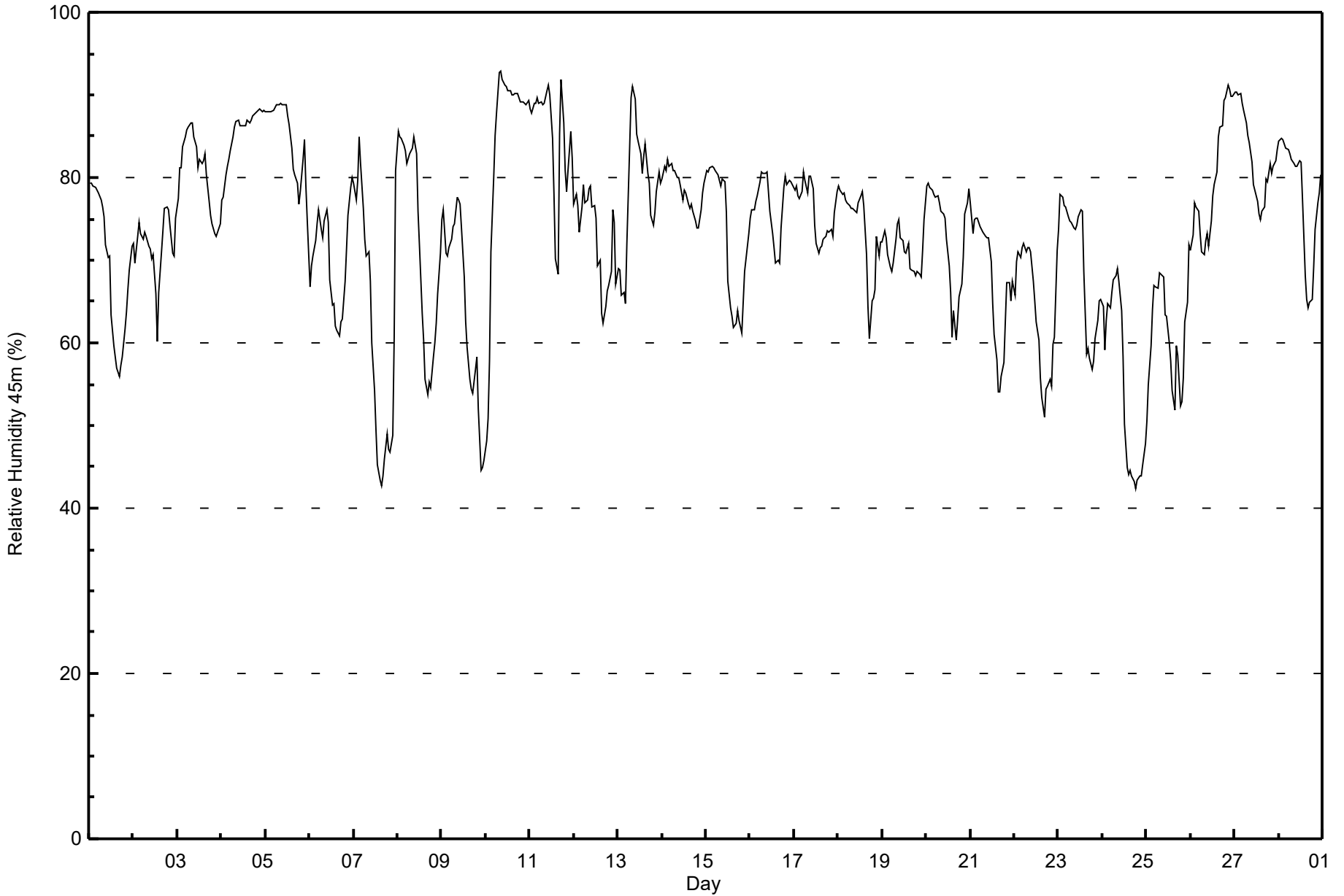
<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	75	11.16	11.16
60 - 80	415	61.76	72.92
80 - 100	182	27.08	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



Maximum Value: 93 % on Feb 10 09:00														Maximum Daily Average: 85.4 % on Feb 4														Hours in Service: 672	
Minimum Value: 42 % on Feb 24 19:00														Minimum Daily Average: 54.7 % on Feb 24														Hours of Data: 672	
Maximum Diurnal Average: 78.8 % at hour 9														Minimum Diurnal Average: 66.8 % at hour 16														Hours of Missing Data: 0	
Monthly Average: 73.5 %														Percentiles: P <sub>1</sub> = 44 P <sub>10</sub> = 58 Q <sub>1</sub> = 67 Median = 75 Q <sub>3</sub> = 81 P <sub>90</sub> = 87 P <sub>99</sub> = 91														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-Feb	79	79	79	79	79	78	77	76	75	72	70	71	63	60	58	57	56	57	58	62	64	66	69	72	69.0	79			
2-Feb	72	70	73	75	73	73	73	73	72	71	70	71	66	60	66	71	74	76	76	76	74	71	71	75	71.7	76			
3-Feb	77	81	81	84	85	86	86	87	87	85	84	81	82	82	82	83	80	77	75	74	73	73	74	80.6	87				
4-Feb	77	78	80	81	82	83	85	86	87	87	86	86	86	86	87	87	87	88	88	88	88	88	88	88	85.4	88			
5-Feb	88	88	88	88	88	89	89	89	89	89	89	89	88	87	84	81	80	79	77	78	82	85	79	75	84.8	89			
6-Feb	67	69	70	72	74	76	74	73	75	76	75	68	65	65	62	61	61	63	63	67	71	75	79	80	70.1	80			
7-Feb	79	77	80	85	82	76	73	71	71	68	60	54	50	45	43	43	44	46	49	47	47	49	61	81	61.6	85			
8-Feb	86	85	85	84	83	82	83	83	84	85	83	76	72	64	60	56	54	55	55	58	60	62	66	71	72.1	86			
9-Feb	75	76	71	70	71	73	74	74	78	77	77	74	68	63	59	56	54	54	57	58	52	45	45	46	64.4	78			
10-Feb	48	51	58	71	80	85	88	93	93	92	91	91	91	90	90	90	90	90	90	89	89	89	89	89	84.0	93			
11-Feb	88	88	89	89	90	89	89	89	89	90	91	90	85	78	70	68	85	92	87	81	78	81	86	82	85.2	92			
12-Feb	77	78	77	73	76	79	77	77	79	79	76	77	75	69	70	64	62	64	66	67	69	76	75	67	72.9	79			
13-Feb	69	69	66	66	65	72	84	90	91	89	85	84	83	80	83	84	80	79	75	74	76	78	81	79	78.5	91			
14-Feb	80	81	81	82	81	82	81	81	80	80	79	77	79	78	77	76	77	76	75	74	74	76	78	79	78.5	82			
15-Feb	81	81	81	81	81	81	80	80	79	80	79	76	67	64	63	62	62	64	63	61	65	69	70	73	72.7	81			
16-Feb	75	76	76	77	78	79	81	80	80	81	78	76	73	72	70	70	70	74	79	80	79	80	79	79	76.8	81			
17-Feb	79	79	78	77	78	81	80	78	80	80	79	74	72	71	71	72	73	73	74	73	74	73	76	78	75.9	81			
18-Feb	79	78	78	78	77	77	77	76	76	76	76	77	78	78	77	71	64	61	65	66	67	73	71	72	73.6	79			
19-Feb	72	74	73	71	69	69	70	73	74	75	73	72	71	71	72	69	69	69	68	69	68	68	71	75	71.0	75			
20-Feb	79	79	79	79	78	78	78	77	76	76	75	73	69	66	61	64	60	63	66	67	70	76	77	79	72.6	79			
21-Feb	77	73	75	75	75	74	74	73	73	73	73	70	65	61	58	54	54	56	58	63	67	67	65	67	67.5	77			
22-Feb	66	70	71	70	72	72	71	72	72	71	67	65	63	60	56	53	51	54	55	56	55	60	61	71	63.9	72			
23-Feb	74	78	78	77	76	75	75	75	74	74	74	75	76	76	69	59	59	58	57	58	61	63	65	65	69.5	78			
24-Feb	64	59	63	65	64	66	68	68	69	67	64	58	50	45	44	45	44	43	42	43	44	44	45	48	54.7	69			
25-Feb	51	55	60	64	67	67	67	68	68	68	63	63	60	58	54	52	60	58	52	53	56	62	65	72	61.0	72			
26-Feb	71	73	77	76	76	73	71	71	72	73	72	75	78	79	81	85	86	86	89	90	91	91	90	90	79.8	91			
27-Feb	90	90	90	90	89	88	87	85	84	82	79	79	77	76	75	76	76	80	79	82	81	81	82	83	82.6	90			
28-Feb	84	85	85	84	83	83	83	82	82	81	81	82	82	77	68	65	64	65	65	69	74	77	78	80	77.6	85			
75.2														75.7														Diurnal Average	
90														90														Diurnal Maximum	





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

**Relative Humidity 45m (RH45m) - %**  
**Mannix - February 2023**

<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	80	11.90	11.90
60 - 80	408	60.71	72.62
80 - 100	184	27.38	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



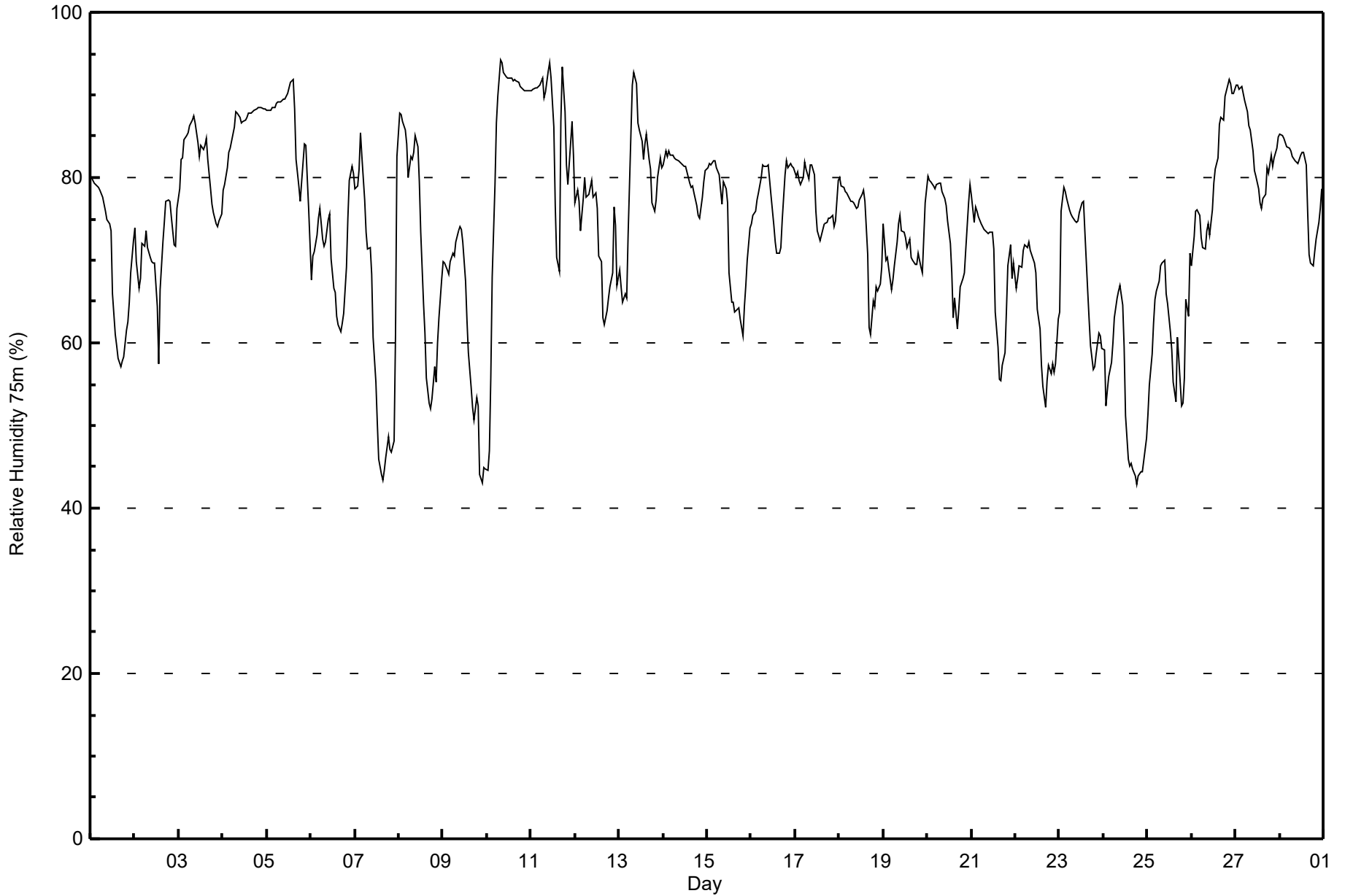
Maximum Value: 94 % on Feb 10 08:00														Maximum Daily Average: 86.6 % on Feb 11														Hours in Service: 672	
Minimum Value: 43 % on Feb 24 19:00														Minimum Daily Average: 53.0 % on Feb 24														Hours of Data: 672	
Maximum Diurnal Average: 79.1 % at hour 10														Minimum Diurnal Average: 68.3 % at hour 17														Hours of Missing Data: 0	
Monthly Average: 74.0 %														Percentiles: P <sub>1</sub> = 44 P <sub>10</sub> = 58 Q <sub>1</sub> = 68 Median = 76 Q <sub>3</sub> = 82 P <sub>90</sub> = 88 P <sub>99</sub> = 92														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-Feb	80	80	79	79	79	78	78	77	76	75	74	74	66	61	60	58	57	58	58	61	63	65	68	72	69.8	80			
2-Feb	74	70	67	68	72	72	74	72	70	70	70	70	64	58	66	72	75	77	77	77	75	72	72	76	71.2	77			
3-Feb	79	82	82	85	85	85	86	87	87	87	84	83	84	83	84	85	82	79	77	76	74	74	75	76	81.7	87			
4-Feb	79	79	81	83	83	84	86	88	88	87	87	87	87	87	88	88	88	88	88	88	88	88	88	88	86.2	88			
5-Feb	88	88	88	89	88	89	89	89	89	90	89	90	91	92	92	88	82	79	77	79	84	84	80	76	86.3	92			
6-Feb	68	71	71	73	75	76	73	72	72	75	76	70	67	66	63	62	61	62	64	69	75	80	81	81	70.9	81			
7-Feb	79	79	81	85	83	77	73	71	72	68	61	55	50	46	44	43	44	46	49	47	47	48	61	83	62.2	85			
8-Feb	88	88	87	86	84	80	82	82	83	85	84	80	73	65	61	56	53	52	53	57	55	60	63	68	71.9	88			
9-Feb	70	70	69	68	70	71	70	72	74	74	74	72	68	63	59	55	52	51	53	52	44	43	45	45	61.8	74			
10-Feb	45	47	56	68	79	87	90	94	94	93	92	92	92	92	92	92	92	92	91	91	91	91	90	91	84.6	94			
11-Feb	91	91	91	91	91	91	92	90	90	93	94	92	86	77	70	69	87	93	88	82	79	82	87	83	86.6	94			
12-Feb	77	78	77	74	77	80	78	78	79	80	78	78	76	70	70	63	62	64	65	67	69	76	74	67	73.2	80			
13-Feb	69	67	65	66	65	73	85	91	93	91	87	86	84	82	84	85	82	81	77	76	77	80	82	81	79.6	93			
14-Feb	81	83	83	83	83	83	82	82	82	82	82	81	81	81	79	79	78	77	75	75	78	79	81	81	80.4	83			
15-Feb	81	82	82	82	82	81	80	79	77	79	79	77	69	65	65	64	64	64	63	61	64	67	70	74	72.9	82			
16-Feb	74	75	76	77	78	80	81	81	81	82	80	78	74	72	71	71	71	75	80	82	81	82	81	81	77.8	82			
17-Feb	80	81	80	79	80	82	81	80	82	82	80	76	74	72	73	74	74	75	75	75	75	74	75	80	77.4	82			
18-Feb	80	79	79	78	78	78	77	77	77	76	76	77	78	78	77	71	62	61	65	64	67	66	67	69	73.3	80			
19-Feb	74	70	70	69	66	68	69	72	74	75	74	73	73	72	73	70	70	69	70	71	69	69	73	77	71.3	77			
20-Feb	80	80	79	79	79	79	79	79	78	77	77	75	72	69	63	65	62	64	67	68	68	71	77	79	73.6	80			
21-Feb	78	75	76	76	75	74	74	74	73	73	73	73	71	64	59	56	55	57	59	64	69	72	68	70	69.1	78			
22-Feb	67	68	69	69	71	72	72	72	71	71	70	68	64	62	57	55	52	55	57	56	57	56	57	63	63.9	72			
23-Feb	64	76	79	78	77	76	76	75	75	75	76	77	77	73	66	63	60	57	57	57	59	61	61	59	69.6	79			
24-Feb	59	52	54	56	58	60	63	65	66	67	65	60	51	46	45	45	44	43	44	44	44	44	46	48	53.0	67			
25-Feb	51	55	59	62	65	66	68	69	70	70	66	65	61	59	55	53	61	58	52	53	56	65	63	71	61.4	71			
26-Feb	69	73	76	76	75	73	71	71	74	74	73	76	79	81	82	86	87	87	90	90	92	91	90	90	80.4	92			
27-Feb	91	91	91	91	90	89	88	86	86	83	81	80	79	77	76	78	78	81	80	83	81	82	83	85	83.8	91			
28-Feb	85	85	85	84	84	84	83	83	82	82	82	83	83	83	81	76	71	70	69	71	73	75	76	79	79.5	85			
	75.0	75.5	76.1	77.0	77.7	78.2	78.6	78.9	79.1	79.1	77.8	76.6	74.1	71.4	70.2	68.7	68.3	68.6	68.7	69.2	69.8	71.3	72.7	74.7	Diurnal Average				
	91	91	91	91	91	91	92	94	94	93	94	92	92	92	92	92	92	93	91	91	92	91	90	91	Diurnal Maximum				





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

**Relative Humidity 75m (RH75m) - %**  
**Mannix - February 2023**





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

**Relative Humidity 75m (RH75m) - %**  
**Mannix - February 2023**

<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	83	12.35	12.35
60 - 80	375	55.80	68.15
80 - 100	214	31.85	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672

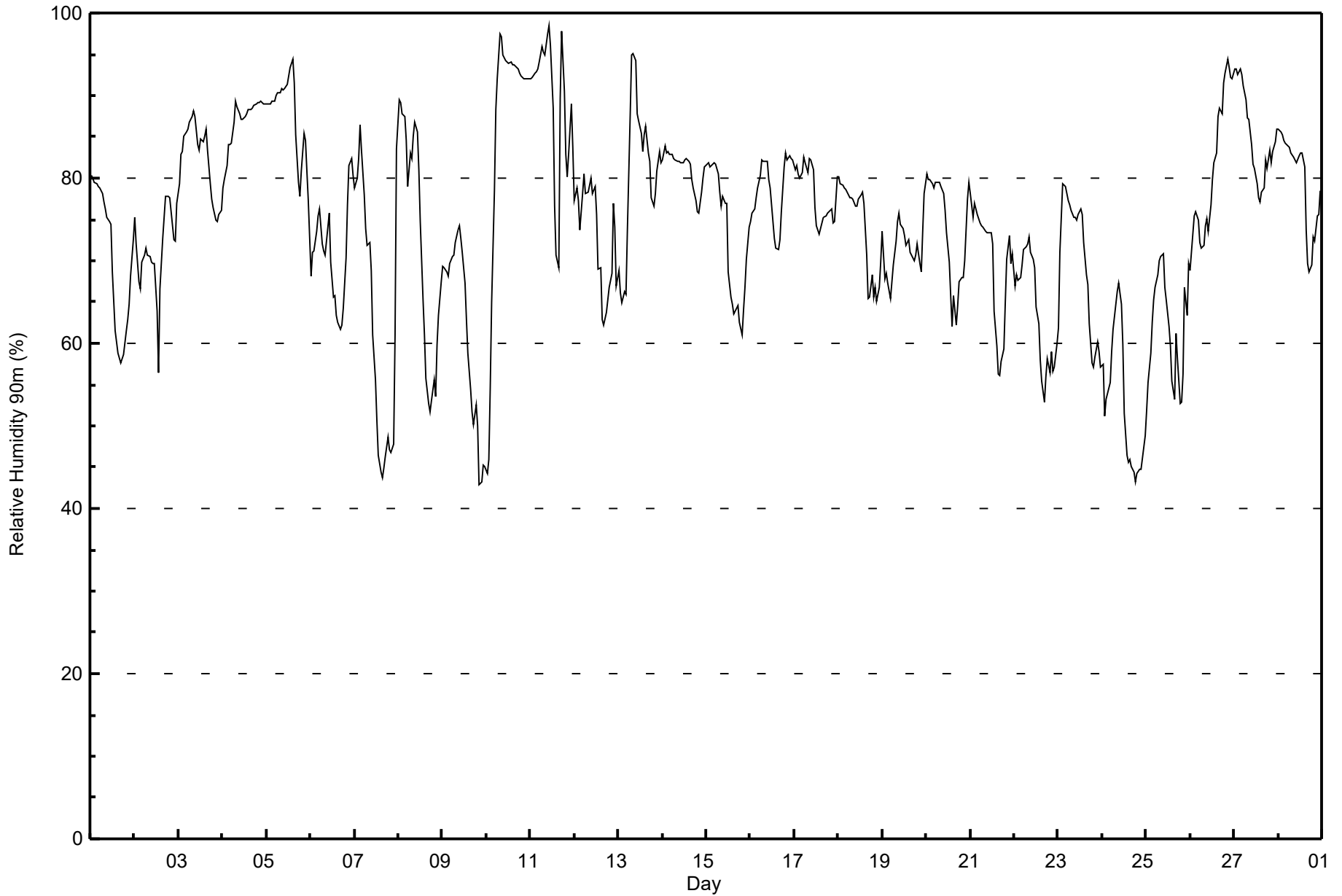


Maximum Value: 99 % on Feb 11 11:00														Maximum Daily Average: 89.0 % on Feb 11														Hours in Service: 672	
Minimum Value: 43 % on Feb 9 21:00														Minimum Daily Average: 52.7 % on Feb 24														Hours of Data: 672	
Maximum Diurnal Average: 79.9 % at hour 9														Minimum Diurnal Average: 69.3 % at hour 17														Hours of Missing Data: 0	
Monthly Average: 74.6 %														Percentiles: P <sub>1</sub> = 44 P <sub>10</sub> = 58 Q <sub>1</sub> = 68 Median = 76 Q <sub>3</sub> = 82 P <sub>90</sub> = 89 P <sub>99</sub> = 95														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-Feb	80	80	79	79	79	79	78	77	76	75	75	74	69	62	60	59	58	58	59	62	63	65	68	73	70.2	80			
2-Feb	75	72	67	67	70	71	72	71	71	70	70	70	64	56	67	73	75	78	78	78	76	73	72	77	71.2	78			
3-Feb	79	83	83	85	86	86	87	87	88	87	84	83	85	84	85	86	83	79	78	77	75	75	76	76	82.4	88			
4-Feb	79	80	82	84	84	84	87	89	89	88	87	87	88	88	88	88	89	89	89	89	89	89	89	89	86.8	89			
5-Feb	89	89	89	89	89	90	90	90	91	91	91	91	92	93	94	92	85	80	78	81	85	85	81	77	87.6	94			
6-Feb	68	71	71	74	75	76	72	71	71	74	76	70	66	66	63	63	62	62	64	70	77	82	82	80	71.1	82			
7-Feb	79	80	82	86	83	78	74	72	72	69	61	56	51	46	44	44	45	46	49	47	47	48	61	84	62.7	86			
8-Feb	89	89	88	87	85	79	83	82	85	87	86	81	75	65	61	56	53	52	53	56	54	60	63	67	72.3	89			
9-Feb	69	69	69	68	70	70	71	72	74	74	73	71	67	63	59	54	52	50	53	50	43	43	45	45	61.4	74			
10-Feb	44	46	55	65	78	88	92	97	97	95	94	94	94	94	94	94	94	93	93	92	92	92	92	92	85.9	97			
11-Feb	92	92	93	93	93	94	96	95	95	98	99	96	88	77	71	69	90	98	90	83	80	83	89	84	89.0	99			
12-Feb	77	79	77	74	78	81	78	78	79	80	78	79	76	69	69	63	62	64	65	67	68	77	74	67	73.3	81			
13-Feb	69	66	65	66	66	74	88	95	95	94	88	87	85	83	85	86	83	82	78	77	78	81	83	82	80.7	95			
14-Feb	82	84	83	83	83	83	82	82	82	82	82	82	82	82	82	82	80	79	77	76	76	78	80	81	81.1	84			
15-Feb	82	82	81	82	82	82	81	78	77	78	77	77	69	66	65	64	64	65	63	61	64	67	70	74	72.8	82			
16-Feb	75	76	76	78	79	80	82	82	82	82	80	79	75	73	72	71	73	76	81	83	82	83	82	82	78.5	83			
17-Feb	81	81	80	80	81	83	82	81	82	82	81	77	74	73	74	75	75	75	76	76	76	75	75	80	78.1	83			
18-Feb	80	79	79	79	79	78	78	78	77	77	77	77	78	78	77	71	65	66	68	66	67	65	67	70	74.0	80			
19-Feb	74	68	69	67	65	67	70	72	75	76	74	74	73	72	73	71	71	70	71	72	70	69	74	78	71.4	78			
20-Feb	81	80	80	79	79	80	79	80	79	78	76	73	70	66	62	66	62	65	67	68	68	70	77	80	73.5	81			
21-Feb	78	75	77	76	76	75	74	74	74	73	73	73	72	64	60	56	56	58	59	65	70	73	70	71	69.7	78			
22-Feb	67	68	68	68	69	71	72	72	73	71	70	69	64	62	58	55	53	56	58	56	59	57	57	60	63.9	73			
23-Feb	62	71	79	79	79	77	77	76	75	75	76	76	76	72	68	67	62	58	57	58	60	59	57	69.7	79				
24-Feb	57	51	53	54	55	59	62	65	66	67	65	60	51	46	46	45	44	43	44	45	45	46	49	52.7	67				
25-Feb	52	55	59	62	65	67	68	70	71	71	67	65	62	60	55	53	61	58	53	53	56	67	63	70	61.8	71			
26-Feb	69	73	75	76	75	72	72	72	74	75	74	77	80	82	83	87	89	88	92	93	94	93	92	92	81.2	94			
27-Feb	93	93	93	93	92	91	90	87	87	84	82	81	79	78	77	78	79	82	81	83	82	83	84	86	85.0	93			
28-Feb	86	86	85	85	84	84	84	83	83	82	82	83	83	83	81	74	70	69	69	73	72	75	76	79	79.6	86			
	75.3	75.7	76.3	77.1	77.8	78.5	79.2	79.7	79.9	79.8	78.4	77.2	74.6	71.7	70.6	69.4	69.3	69.4	69.4	69.8	70.3	71.8	73.2	75.0	Diurnal Average				
	93	93	93	93	93	94	96	97	97	98	99	96	94	94	94	94	94	94	94	93	93	94	93	92	92	Diurnal Maximum			



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

**Relative Humidity 90m (RH90m) - %**  
**Mannix - February 2023**





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

**Relative Humidity 90m (RH90m) - %**  
**Mannix - February 2023**

<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	85	12.65	12.65
60 - 80	359	53.42	66.07
80 - 100	228	33.93	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



Maximum Speed: 34 km/h on Feb 7 16:00      Maximum Daily Speed Average: 18.4 km/h on Feb 7		Hours in Service: 672 Hours of Data: 672 Hours of Missing Data: 0 Percent Operational Time: 100.0																								
Minimum Speed Value: 0 km/h on Feb 20 14:00 Maximum Diurnal Speed Average: 2.3 km/h at hour 14 Monthly Average Velocity: 0.7 km/h 285.5 deg		Minimum Daily Speed Average: 0.5 km/h on Feb 19 Minimum Diurnal Speed Average: 0.2 km/h at hour 1 Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 3 Q <sub>1</sub> = 6 Median = 8 Q <sub>3</sub> = 12 P <sub>90</sub> = 19 P <sub>99</sub> = 28																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Feb	NNW6	N9	NW3	N5	N10	N9	N10	N9	N14	N12	NNW11	WNW11	NW12	NW11	NW9	NNW6	NNW5	WNW5	WNW7	WNW11	WNW8	WNW3	WSW3	SE1	NNW6.9	NNE14
2-Feb	SSE6	SSE10	SSE9	SE10	SSE12	SSE12	SSE11	SSE11	SSE10	SSE11	SSE11	SSE10	SSE12	SE15	SE22	SE28	SE25	SE24	SE25	SE26	SE27	SE26	SE23	SE25	SE16.5	SE28
3-Feb	SE22	SE20	SE18	SE15	SE13	SSE12	SE11	SSE11	SSE9	S8	S2	N3	NW6	NW10	N9	NNW7	NNE10	NNE10	NNE10	NNE10	N8	NNE7	NNE6	N4	ESE3.7	SE22
4-Feb	N8	N7	NNW5	N6	N7	N8	NNW5	NW5	NNW7	N7	NNW7	NNW7	NNW6	NNW7	NNW6	NW4	NW6	NW5	NNW5	NNW6	NNW6	NW7	NW6	NW6	NNW5.9	N8
5-Feb	NW5	NW4	NW3	WNW3	WSW3	NNW2	WNW4	NW5	NNW2	W4	W5	W0	SE4	SSW5	SE5	SSE6	SSE6	SSE9	SSE8	SW4	SW2	W16	WNW26	WNW27	W3.7	WNW27
6-Feb	WNW25	W26	W19	W13	W14	W10	W12	W11	W12	WNW9	NNE5	ENE3	E5	ESE6	ESE6	E6	SE10	S3	SE6	SSE10	SE8	SSE9	SSE11	SSE8	WSW4.2	W26
7-Feb	SSE6	SSE8	SE5	WSW14	W24	W31	WNW25	W22	W21	W21	W20	W24	W27	W31	W32	W34	W28	W21	WSW17	W24	W17	W15	NW11	N13	W18.4	W34
8-Feb	NNW13	NNW10	NNW7	NNW9	NNW7	WNW4	N3	NE4	WNW1	SW6	SSE4	SSE8	SSE9	SE6	SE8	SSE8	SE6	SSE9	S8	SSE8	SE12	SSE13	SE12	SE13	SSE3.0	SE13
9-Feb	SSE13	SSE12	SSE12	SSE12	SSE13	SSE14	SSE13	SSE10	SSE12	SSE13	SSE14	SSE15	SSE15	SSE17	SSE12	SSE11	SE8	SE7	ESE3	SSE4	S6	S8	SSE9	SSE10	SSE10.8	SSE17
10-Feb	SSE9	ENE2	N5	N8	NW7	NNW10	N10	NNW6	N7	NNW6	NNW7	NNW7	NNW9	NW9	NW13	NW13	NW10	NW11	NW12	NNW10	NW9	NNW6	NW6	N4	NNW7.1	NW13
11-Feb	WNW4	W2	WSW1	S4	SSE7	SSE10	SSE9	SSE6	S6	S6	S5	SSE10	SE9	SSE8	S9	SW16	WSW20	WSW15	W20	W23	WNW18	W8	WSW10	WSW20	SW6.8	W23
12-Feb	WSW22	WSW24	W24	W20	W17	WSW15	W17	W15	W12	W8	WNW8	WNW5	NE4	E4	E6	SE7	SE12	SE14	SE12	SE16	SE16	SE14	SE21	SE19	SW5.7	WSW24
13-Feb	SSE17	SSE15	S14	SSW10	WSW23	WSW24	WSW24	W22	NW18	N26	NNW27	NNW30	NNW31	N27	NNW26	NNW26	NNW29	N25	N22	N18	NNE25	NNE23	NNE20	NNE18	NNW13.2	NNW31
14-Feb	NNE17	N13	N10	NNW8	N8	N9	NNE12	NNE10	NNE7	N5	NNW4	NNW4	WNW2	NNE4	NNE5	NNW6	NNE9	NNE9	NNE8	N6	NNE6	NNE5	ENE1	SW1	N6.6	NNE17
15-Feb	W1	SSE2	ESE3	SSE6	S7	S6	SSW5	SSE3	SSE7	SSE7	SSE6	SE4	SE5	SE6	SE6	SE8	SE6	SE6	SE8	SE8	SE10	SE10	SSE10	SSE11	SSE6.1	SSE11
16-Feb	SSE11	SSE10	SSE10	SSE12	SSE14	SSE12	SSE12	SSE11	S6	S6	SSE8	SSE11	SSE7	W1	ENE1	WNW0	N9	N15	N20	N15	N13	N9	N8	SE3.0	N20	
17-Feb	NNE6	NNE7	NNE8	NNE8	N5	NNE3	NE5	NNE7	N8	NNE7	N6	N6	NNW6	NW10	NNW10	N12	N12	NNE15	N13	N14	N14	NNE13	N8	NW7	N8.2	NNE15
18-Feb	N10	N9	N8	N8	N5	NNW6	N6	N6	NNE5	WNW2	NW6	NW8	NW9	NW8	WNW7	WNW5	W5	WNW3	N4	NE5	NE3	SSE3	SSE4	SSE7	NNW3.9	N10
19-Feb	SSE10	SSE9	SSE11	SSE12	SSE10	SSE10	SSE9	SE6	ENE1	SSE5	ENE2	NW2	N3	NNW3	NW6	NW10	NW11	NW9	NNW5	NW6	NNW8	N12	NNW11	N10	NW0.5	N12
20-Feb	N12	N7	N9	NW6	NW6	NW4	W4	W2	S2	SSE3	SSE3	SE2	S1	NE0	NNE2	NW8	NNE12	NNE10	NE3	NNE4	NNE8	NNW5	N13	N16	N4.4	N16
21-Feb	NNE19	NNE22	NNE16	N12	NNE13	NNE10	N6	N8	NNW10	NNW10	NW8	WNW11	WNW13	NW15	NW14	NNW14	NNW9	NNW7	N9	NNE11	N5	WNW6	WSW7	WSW7	NNW9.1	NNE22
22-Feb	WSW5	SSW4	S5	SSW5	S6	S8	S8	S8	S5	SSW2	SE2	E2	W2	W6	W5	WNW5	W5	WNW6	WNW7	NW8	WNW4	NE2	ENE1	W4	SW2.7	S8
23-Feb	SE1	NE2	NNE4	NNW4	N11	NNW5	NW4	E1	NE1	NE2	SW1	W4	W3	W3	SW2	SE4	SSE8	SSE9	SSE9	S9	S8	SSE7	SSE9	SSE12	SSE1.8	SSE12
24-Feb	SSE11	SSE12	SSE11	SSE11	SSE14	SSE15	SSE16	SSE15	SSE17	SSE18	SSE19	SSE13	SSE16	S19	S20	SSE22	SSE24	S20	S20	S16	S15	S15	S13	S13	SSE15.6	SSE24
25-Feb	S12	S12	SSE10	SSE8	SSE10	SSE10	SSE9	SSE8	SSE5	SSE6	SSW3	W13	WSW11	WSW13	S2	SE4	ESE6	SE6	S9	SSE7	SE7	SE6	SSE11	SE12	S6.3	W13
26-Feb	SE10	SE7	SE6	ESE5	SSE7	SE5	SE10	ESE6	SSE6	SSE5	SE7	ESE9	E10	ENE11	ENE9	ESE9	E11	ENE12	NE11	NE8	NNE7	NNE9	NE9	NNE9	E6.2	ENE12
27-Feb	NNE8	NNE8	NNE11	N8	NNW12	NNW14	NNW15	NNW15	N12	NNW15	NNW13	NNW12	NNW14	NW15	NNW11	NNE11	NNE13	N13	NNE16	NNE15	NNE16	N14	NNW10	N10	N11.9	NNE16
28-Feb	NNW7	NNW8	NNW7	N7	NW4	NW5	NW3	NW3	NW3	N1	NW7	WNW5	WNW4	WNW4	W3	W5	W3	NW3	WNW4	NE1	S1	SW4	S5	SE8	NW2.7	NNW8
ESE0.2 SE0.4 ESE0.3 SW0.8WSW2.1WSW2.1WSW1.9WSW1.6 W1.0 W0.7WNW1.4WNW1.9WNW2.0WNW2.3WNW1.5WNW1.3 NO.6NNE1.0 N1.2 N1.4NNE1.8 NE0.8 SSE0.5 SE0.6 WNW25 W26 W24 W20 W24 W31WNW25 W22 W21 N26 NNW27 NNW30 NNW31 W31 W32 W34 NNW29 N25 SE25 SE26 SE27 SE26WNW26WNW27																								Diurnal Average Diurnal Maximum		
All monthly, daily, and diurnal averages have been calculated using vector methods																										

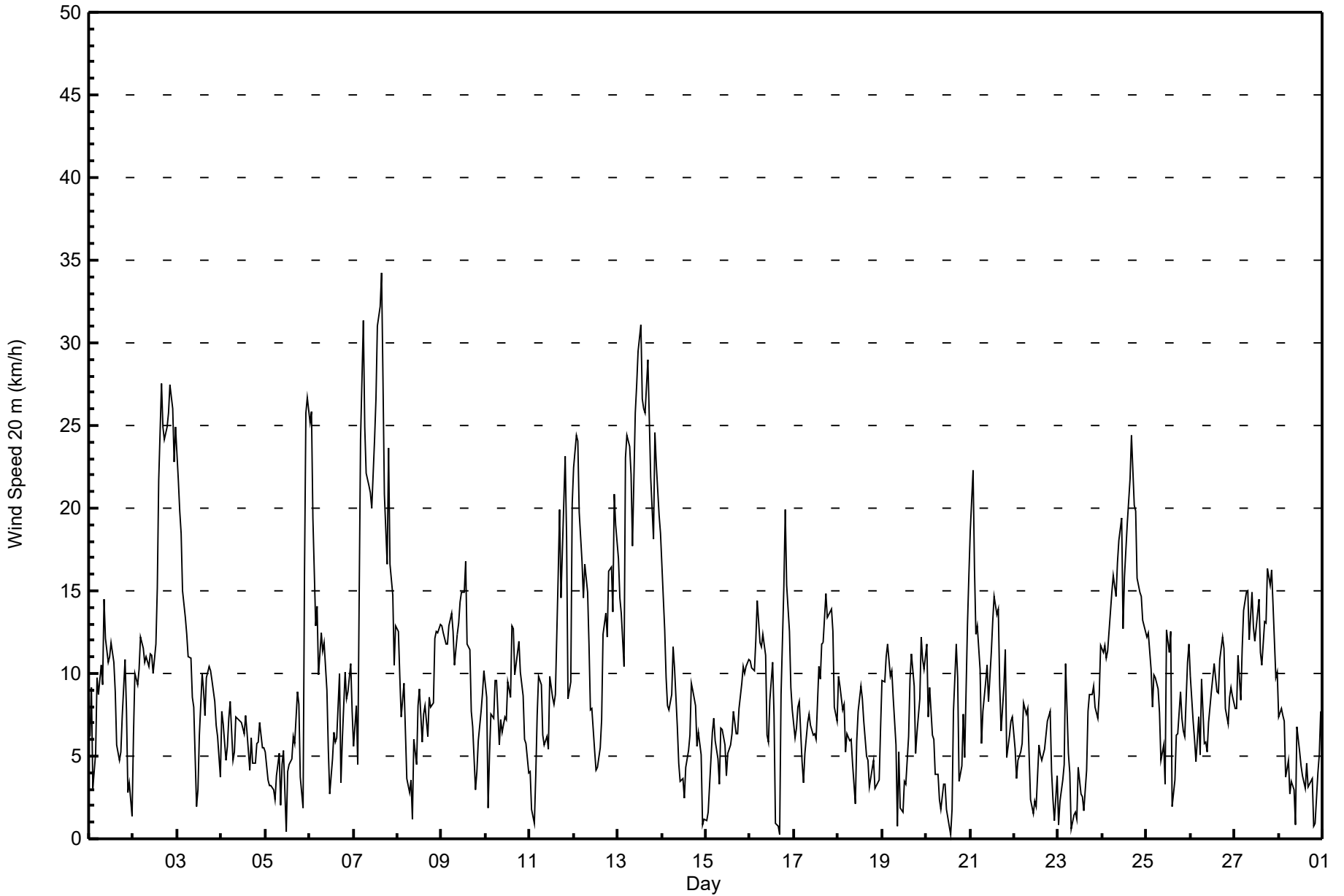


Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Feb 13 12:00 Minimum Value: 1 km/h on Feb 15 20:00 Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 2 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 5 P <sub>99</sub> = 8														Hours in Service: 672 Hours of Data: 672 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-Feb	3	2	2	2	4	3	3	2	4	4	3	3	3	3	3	2	2	2	2	1	2	2	2	1	4
2-Feb	2	1	2	2	2	2	2	2	3	2	2	2	2	4	6	7	7	7	6	6	6	6	6	6	7
3-Feb	5	5	5	4	3	3	2	3	2	3	1	3	2	2	3	2	3	3	3	2	3	2	2	3	5
4-Feb	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	1	2
5-Feb	2	2	1	1	1	2	2	3	2	2	5	1	2	2	3	5	3	2	1	1	2	2	5	6	6
6-Feb	8	6	6	4	3	4	2	1	3	3	2	1	2	2	2	2	2	2	2	2	2	2	2	2	8
7-Feb	2	4	2	8	4	7	5	4	4	4	5	6	7	6	7	6	6	5	4	4	2	2	3	4	8
8-Feb	4	4	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	1	1	2	3	2	2	2	4
9-Feb	3	2	1	2	1	1	3	3	2	2	3	3	3	3	2	2	2	2	1	1	1	1	3	1	3
10-Feb	2	2	2	2	3	3	3	2	2	2	2	2	3	3	3	3	3	3	3	3	3	2	2	1	3
11-Feb	1	1	1	2	2	3	2	2	1	2	2	2	2	2	2	5	6	3	4	4	4	2	3	5	6
12-Feb	5	5	4	4	3	3	3	2	2	2	2	2	2	2	2	3	3	4	4	5	4	4	5	5	5
13-Feb	5	2	4	4	6	6	6	4	6	7	8	9	9	8	8	7	8	8	6	5	6	6	6	6	9
14-Feb	6	4	6	2	3	3	3	2	2	1	1	1	1	2	2	2	2	2	3	2	2	2	2	1	6
15-Feb	1	1	1	3	1	1	1	2	3	2	1	1	2	2	2	2	2	2	1	1	2	2	3	1	3
16-Feb	2	3	2	2	3	3	2	3	3	2	2	3	2	2	2	1	1	5	4	5	5	4	3	3	5
17-Feb	2	2	3	3	2	2	2	2	2	2	2	2	3	3	3	3	3	3	4	3	3	3	3	2	4
18-Feb	2	4	2	1	2	2	2	3	3	1	2	2	2	2	2	2	1	1	1	1	1	1	1	2	4
19-Feb	1	1	2	1	1	2	1	4	1	2	2	1	2	2	2	2	2	2	2	2	4	3	3	3	4
20-Feb	2	3	3	2	2	1	1	1	1	1	1	1	1	1	2	2	3	3	3	2	1	2	4	5	5
21-Feb	5	6	5	4	4	4	2	3	3	3	3	2	3	3	4	4	3	2	2	2	4	1	2	1	6
22-Feb	1	1	1	2	2	1	1	1	2	1	1	1	2	2	1	2	1	1	1	1	2	1	1	2	2
23-Feb	1	2	2	2	3	2	2	1	1	1	1	1	1	1	1	1	2	2	1	2	2	1	2	3	3
24-Feb	2	2	2	2	2	2	2	2	3	3	5	3	5	7	7	5	6	5	7	5	4	4	4	4	7
25-Feb	3	3	3	2	2	2	2	3	1	1	2	4	3	3	2	2	2	3	2	1	2	3	2	3	4
26-Feb	3	3	2	2	3	2	4	2	2	1	3	3	3	2	2	3	3	2	3	2	2	2	2	2	4
27-Feb	2	2	2	2	3	4	4	4	4	4	4	3	4	4	4	3	4	3	4	4	5	4	3	4	5
28-Feb	2	2	2	3	1	1	1	2	1	1	1	1	2	1	1	1	1	1	1	1	1	2	1	4	4
														Diurnal Maximum											



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

**Wind Speed 20 m (WS20m) - km/h**  
**Mannix - February 2023**







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

**Wind Speed 20 m (WS20m) - km/h**  
**Mannix - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	166	24.70	24.70
6 - 11	306	45.54	70.24
12 - 19	136	20.24	90.48
20 - 28	57	8.48	98.96
29 - 38	7	1.04	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h  
Mannix - February 2023**

<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	13	9	12	7	4	3	11	12	10	7	6	4	19	19	17	13	166
6 - 11	42	30	3	2	4	6	29	78	18	1	1	4	5	11	32	40	306
12 - 19	18	15	0	1	0	0	13	40	9	0	1	5	13	2	8	11	136
20 - 28	5	4	0	0	0	0	13	2	3	0	0	7	16	4	0	3	57
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	3	7
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	78	58	15	10	8	9	66	132	40	8	8	20	57	36	57	70	672

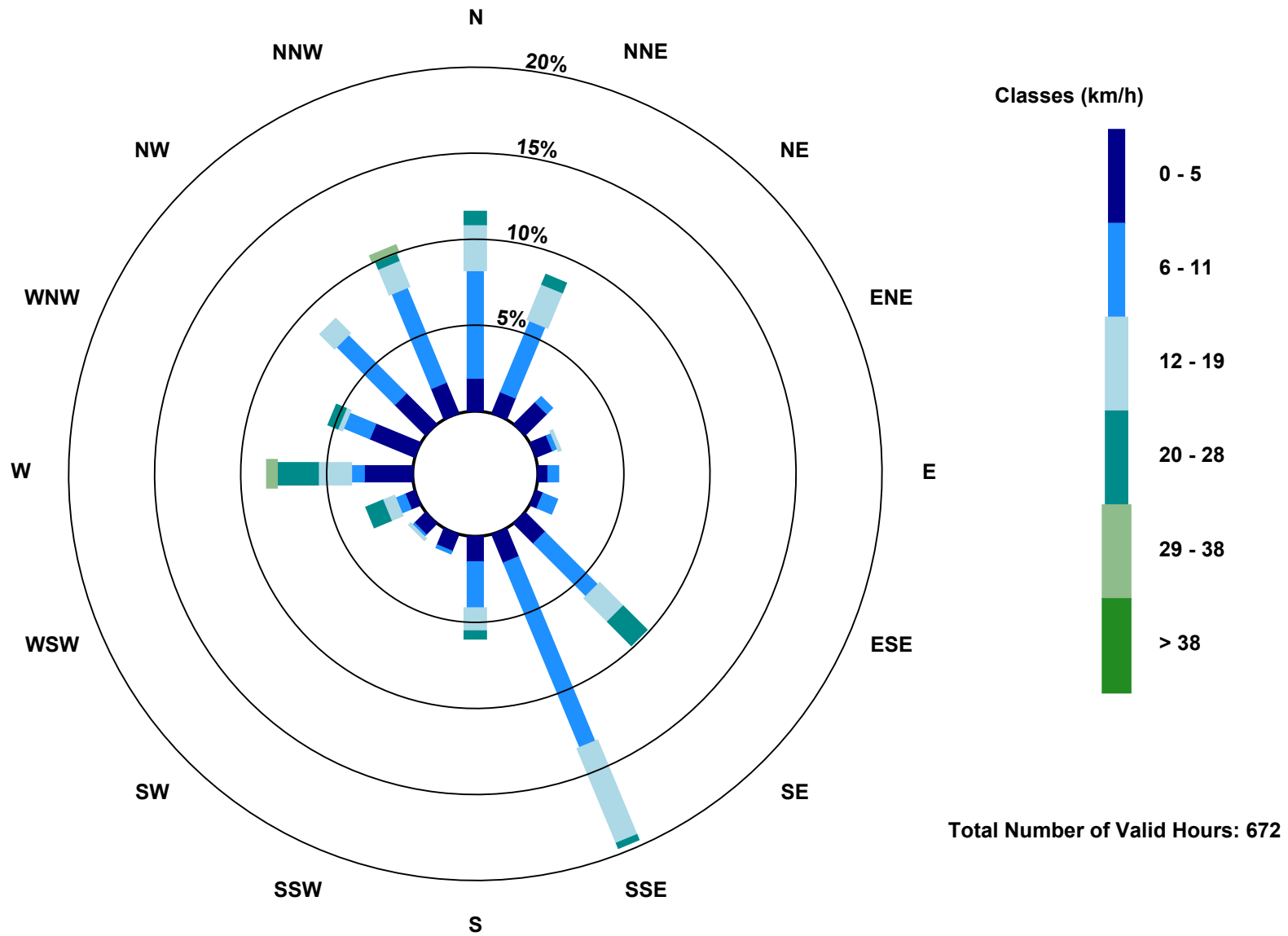
Total Number of Valid Hours: 672

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed 20 m (WS20m) - km/h  
Mannix





Maximum Speed: 39 km/h on Feb 7 16:00	Maximum Daily Speed Average: 23.9 km/h on Feb 24	Hours in Service: 672
Minimum Speed Value: 0 km/h on Feb 20 14:00	Minimum Daily Speed Average: 1.8 km/h on Feb 23	Hours of Data: 668
Maximum Diurnal Speed Average: 2.6 km/h at hour 7	Minimum Diurnal Speed Average: 0.5 km/h at hour 4	Hours of Missing Data: 4
Monthly Average Velocity: 0.5 km/h 238.6 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 4 Q <sub>1</sub> = 7 Median = 12 Q <sub>3</sub> = 18 P <sub>90</sub> = 25 P <sub>99</sub> = 34	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-Feb	NNW10	N12	N4	N8	N14	N13	NNW16	N14	N19	N16	NNW14	WNW13	WNW15	NW13	NW11	NW8	NNW7	NW8	NW12	NW15	NW13	NW7	WNW5	W2	NNW10.0	N19
2-Feb	SSE7	SSE14	SSE17	SE18	SSE22	SSE22	SSE20	SSE23	SE20	SE20	SE17	SSE14	SSE18	SE23	SE28	SE34	SE30	SE30	SE31	SE32	SE34	SE32	SE28	SE30	SE23.1	SE34
3-Feb	SE27	SE25	SE23	SE19	SE17	SE16	SE15	SE15	SSE12	SSE11	S2	NNW4	NW7	NW12	N11	NNW10	NNE13	NNE13	NNE12	NNE12	N10	NNE9	NNE7	N5	ESE5.1	SE27
4-Feb	N11	NNE8	N7	N9	N11	N12	NNW7	NW7	NNW11	N10	NNW9	NNW8	NNW7	NNW9	NNW8	NW5	WNW7	WNW5	NNW6	NNW7	N8	NW8	NW7	NW7	NNW7.5	N12
5-Feb	NW6	NW5	NW4	NW3	W3	NNW3	NW4	WNW6	NNW3	W4	W6	WSW0	SE4	SSW6	SE6	SSE11	SSE11	SSE15	SSE9	SW6	W7	W25	W32	WNW34	W4.9	WNW34
6-Feb	WNW31	W30	W25	WSW19	W20	W17	W20	W17	W19	WNW13	NNE6	ENE3	E5	ESE7	ESE7	E8	SE14	SSE6	ESE8	SE14	SE12	SE14	SSE16	SSE13	WSW5.8	WNW31
7-Feb	SSE10	SE12	S8	WSW24	W29	W38	W31	W27	W26	WSW25	WSW24	WSW29	WSW31	W36	WSW38	W39	W33	WSW28	WSW24	W29	W22	W21	WNW15	N18	W22.8	W39
8-Feb	NNW18	N15	N12	NNW14	NNW10	NNW5	N5	NNE6	NNE4	S6	SSE6	SE10	SSE10	SE7	SE9	SE10	SE11	SSE14	SSE16	SSE17	SE20	SE20	SE23	SE24	SE5.2	SE24
9-Feb	SSE25	SSE25	SSE18	SSE16	SSE15	S16	S17	S18	S18	SSE19	SSE22	SSE22	SSE20	SSE24	SSE17	SSE18	SE14	SE13	SE10	SE11	SSE15	S15	SSE11	SSE17	SSE16.9	SSE25
10-Feb	SSE18	SE6	N6	N12	NNW10	NNW14	N14	N9	N10	NNW10	NNW10	NNW9	NNW12	NNW11	NW16	NW16	NW13	NW14	NW15	NW13	NW11	NNW8	NW7	N5	NNW8.8	SSE18
11-Feb	WNW5	W2	WSW2	S4	SSE9	SSE13	SSE13	SSW7	S10	SSW10	S8	SE12	SE10	SSE11	S15	SW22	WSW25	WSW20	W24	W28	WNW24	W13	WSW14	WSW28	SW9.7	W28
12-Feb	WSW29	WSW32	W29	W25	WSW22	WSW20	WSW22	W19	W16	W10	WNW10	WNW6	NNE4	E4	ESE6	SE12	SE16	SE19	SE16	SE21	SE23	SE18	SE27	SE26	SSW7.4	WSW32
13-Feb	SSE24	SSE23	S22	SSW17	WSW30	WSW31	WSW30	WSW28	NW22	UO	UO	UO	UO	N35	NNW35	NNW34	NNW38	N33	N29	N24	N32	NNE29	N25	N24	NNW13.1	NNW38
14-Feb	N22	NNW18	N14	NNW10	N10	N11	NNE14	N12	NNE8	N5	NNW4	NNW4	WNW2	NNE5	NNE6	NNW8	N11	NNE11	NNE10	N7	NNE8	NNE7	NE2	SW1	N8.3	N22
15-Feb	WSW1	SE2	ESE4	SE9	SSE12	SSE14	SSE11	SSE7	SSE12	S9	SSE7	SSE4	SE5	SE6	SE7	SE8	SE7	SE8	SE11	SSE16	SE16	SE16	SE15	SE14	SE8.8	SE16
16-Feb	SE17	SE18	SE18	SE19	SE21	SE18	SE16	SE18	SE17	SSE11	SSE10	SSE11	SSE16	SSE10	W1	WNW2	W6	NNW12	N22	N26	N20	N16	NNW13	N10	ESE5.1	N26
17-Feb	NNE7	NNE8	NNE10	NNE10	N6	NNE4	NE6	NNE8	N9	NNE8	N7	N7	NNW7	NW12	NNW12	N14	N16	N19	N17	N18	N18	NNE16	N12	NNW8	N10.4	N19
18-Feb	N14	N13	N13	N14	NNW9	NNW10	N9	N8	NNW6	NW2	NW6	NW9	NW11	NW10	WNW9	W6	WSW5	WNW3	N6	NE8	ENE4	SE4	SE8	SSE12	NNW5.2	N14
19-Feb	SSE14	SE17	SE19	SE19	SE19	SE17	SE14	SE10	ESE3	SSE8	ESE3	NNW2	N4	NNW3	NW7	NW11	NW13	NW13	NNW8	NNW9	N14	N18	N16	N13	ENE1.8	SE19
20-Feb	N15	N11	N13	NNW8	NW7	NW5	W5	W3	SSE3	SE3	SE3	SE2	S1	E0	NNE2	NW9	NNE14	NNE13	NNE6	NNE7	N11	N10	N19	N22	N6.5	N22
21-Feb	N25	NNE29	N21	N17	N17	NNE14	N9	N11	NNW13	NNW14	NW11	WNW13	WNW15	NW17	NW17	NNW18	NNW12	N9	N12	N15	N7	WNW6	WSW8	W9	NNW12.1	NNE29
22-Feb	WSW11	W8	SW5	SW4	SSW3	SW6	SW8	SW6	SW6	SSW5	SSW3	SSW1	W3	W6	W6	WNW5	WSW6	W8	W10	NW10	NNW6	NNE5	NE5	SW0	WSW4.0	WSW11
23-Feb	N1	N5	N8	N14	N19	NNW10	NNW8	NW5	NW5	NNW5	WSW3	W4	W2	W2	SSW2	SE4	SE8	SE10	SSE13	SSE17	SSE16	SSE14	SSE18	SSE20	SE1.8	SSE20
24-Feb	SSE21	SSE20	SSE21	SSE21	SSE25	SSE26	SSE27	SSE27	SSE27	SSE24	SSE24	SSE16	SSE21	S29	S28	SSE27	SSE30	SSE27	S30	S24	S23	S22	S22	S20	SSE23.9	SSE30
25-Feb	S19	S18	SSE14	SSE11	SSE14	SSE13	SSW11	SSW7	SSW3	SSW5	SSW5	W15	WSW13	WSW14	S3	SSE4	E8	SE8	S16	S11	SE10	SE11	SSE17	SE16	S8.7	S19
26-Feb	SE14	ESE9	ESE7	ESE7	SE10	SE7	ESE11	ESE7	SE7	SE5	SE8	ESE10	E11	ENE12	ENE10	E11	ENE13	NE15	NE14	NE11	NNE9	NNE11	NE12	NNE11	E8.0	NE15
27-Feb	NNE11	NNE10	NNE14	N12	NNW15	NNW18	NNW20	NNW21	NNW17	NNW19	NNW16	NNW16	NNW17	NW19	NNW14	NNE13	NNE16	N17	N20	NNE20	NNE21	N19	NNW14	N14	N15.6	NNE21
28-Feb	NNW11	N13	N12	N11	N6	NNW6	NNW5	NW5	NNW5	NNW2	NW8	WNW6	WNW5	WNW4	WSW3	WSW5	WSW3	WNW3	WNW3	NW1	ESE2	SSE3	SSE7	SE11	NNW3.1	N13
SE1.1 SE1.3 SE0.8 SW0.5 SW1.9 SW2.0WSW2.0WSW2.0WSW1.6SSW1.7 SW1.0WSW2.0WSW1.9 W2.4NNW1.7 W1.4NNE0.6 NNE1.2 NNE1.2 NNE1.5 NE2.3 ENE1.5 SE1.4 SE1.7																								Diurnal Average		
WNW31 WSW32 W29 W25 WSW30 W38 W31 WSW28 SSE27 WSW25 WSW24 WSW29 WSW31 W36 WSW38 W39 NNW38 N33 SE31 SE32 SE34 SE32 W32 WNW34																								Diurnal Maximum		

UO - Unstable Operation

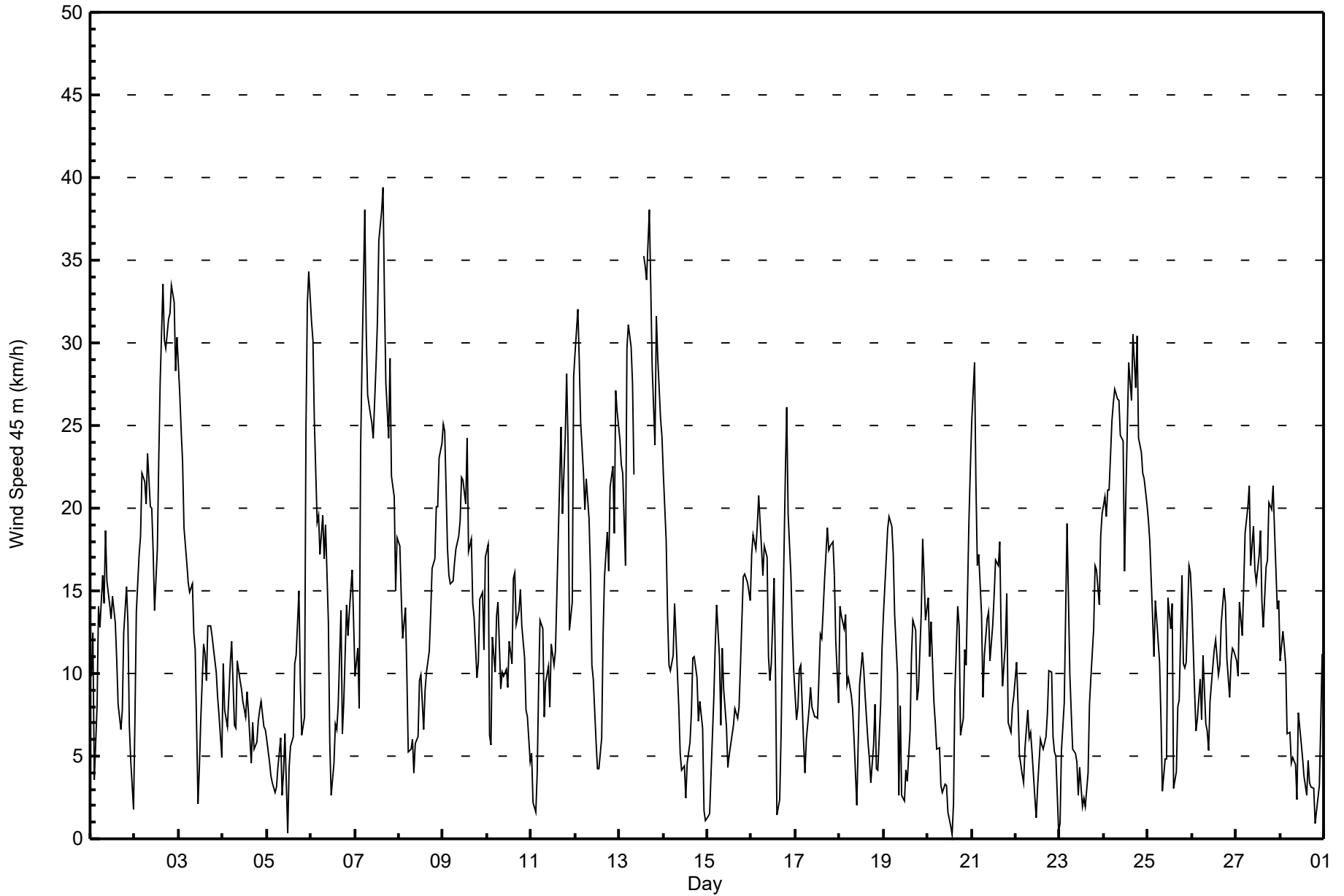
All monthly, daily, and diurnal averages have been calculated using vector methods



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

**Wind Speed 45 m (WS45m) - km/h**  
**Mannix - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Feb 13 15:00 Minimum Value: 0 km/h on Feb 18 18:00 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> = 7																	Hours in Service: 672 Hours of Data: 668 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.4								
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-Feb	4	2	2	2	4	3	3	3	4	5	3	3	3	3	2	2	1	2	3	2	1	3	1	1	5
2-Feb	3	3	2	3	2	2	1	1	4	3	3	3	2	5	5	6	6	7	6	6	6	6	6	5	7
3-Feb	5	5	5	3	3	4	2	3	2	4	2	3	2	2	3	2	3	3	2	2	3	2	1	3	5
4-Feb	2	2	2	2	2	2	2	1	2	2	2	2	2	2	1	1	2	1	2	1	2	2	1	1	2
5-Feb	1	2	1	1	1	2	2	3	2	2	5	1	2	2	3	6	2	2	2	1	3	2	5	5	6
6-Feb	8	6	6	4	3	3	2	1	3	3	2	1	2	2	3	2	3	3	3	2	2	2	1	2	8
7-Feb	2	3	2	7	4	7	5	4	4	4	5	6	7	6	7	6	5	4	4	4	3	2	3	3	7
8-Feb	3	4	2	2	3	3	1	1	1	3	2	3	2	2	2	2	3	1	1	2	2	1	2	2	4
9-Feb	2	2	2	1	2	2	2	2	2	2	3	3	3	3	2	1	2	3	2	2	2	2	2	1	3
10-Feb	2	4	3	2	3	2	3	2	2	2	2	2	2	3	3	3	2	2	2	2	2	2	2	1	4
11-Feb	1	1	1	1	1	3	2	3	1	1	2	2	2	2	2	5	6	3	4	4	4	2	3	5	6
12-Feb	5	5	4	3	3	3	3	3	2	2	2	2	2	2	2	4	2	4	4	5	4	3	5	4	5
13-Feb	5	2	4	6	6	6	6	5	6	UO	UO	UO	UO	8	9	7	8	8	6	5	7	6	6	6	9
14-Feb	7	4	7	2	3	3	3	2	2	1	1	1	1	2	2	2	2	2	3	2	2	2	2	1	7
15-Feb	1	1	1	2	1	1	2	2	4	2	1	1	2	2	2	2	1	2	2	1	2	3	3	2	4
16-Feb	2	3	2	2	3	3	2	3	4	2	3	3	2	2	2	2	2	6	4	5	5	3	3	3	6
17-Feb	3	2	3	3	2	2	2	2	2	2	1	2	3	2	2	2	3	3	4	2	3	2	4	2	4
18-Feb	3	4	3	1	2	1	2	3	2	1	2	1	2	2	2	2	1	0	2	1	1	2	1	1	4
19-Feb	2	1	2	1	2	3	2	3	2	3	2	1	2	2	1	2	2	2	2	2	4	4	3	3	4
20-Feb	2	3	3	3	2	2	1	1	1	1	1	1	1	1	2	2	2	3	4	2	2	3	5	5	5
21-Feb	5	6	5	4	4	4	2	3	3	3	3	2	3	3	3	4	3	2	2	2	5	1	2	1	6
22-Feb	2	3	1	1	1	1	1	1	2	2	1	1	2	2	1	2	1	1	0	1	1	2	1	1	3
23-Feb	1	4	3	4	2	4	1	2	2	2	1	1	1	1	1	2	2	1	2	1	1	2	2	2	4
24-Feb	2	1	2	2	2	2	1	2	2	2	5	3	6	5	6	5	5	4	6	4	4	3	3	3	6
25-Feb	2	2	2	1	2	1	2	3	1	2	2	4	3	4	2	3	2	4	2	2	4	2	3	3	4
26-Feb	3	3	2	2	3	3	4	2	3	1	3	4	3	2	2	3	3	3	3	2	2	1	2	2	4
27-Feb	2	2	2	2	2	3	4	4	4	4	3	3	3	4	4	3	3	3	4	4	5	4	3	4	5
28-Feb	2	2	2	3	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	0	1	1	3	3
8 6 7 7 6 7 6 5 6 5 5 6 7 8 9 7 8 8 8 6 6 7 6 6 6 6																								Diurnal Maximum	
UO - Unstable Operation																									





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

**Wind Speed 45 m (WS45m) - km/h**  
**Mannix - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	107	16.02	16.02
6 - 11	221	33.08	49.10
12 - 19	208	31.14	80.24
20 - 28	92	13.77	94.01
29 - 38	39	5.84	99.85
> 38	1	0.15	100.00

Total Number of Valid Hours: 668

Total Number of Hours: 672



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

**Wind Speed 45 m (WS45m) - km/h**  
**Mannix - February 2023**

<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	8	6	2	2	3	4	9	4	4	8	4	8	10	12	11	12	107
6 - 11	34	24	3	1	4	10	29	23	6	4	5	4	10	7	22	35	221
12 - 19	45	12	3	2	0	0	39	40	9	1	0	4	7	6	17	23	208
20 - 28	10	3	0	0	0	0	17	27	7	0	1	13	10	1	1	2	92
29 - 38	4	2	0	0	0	0	8	1	2	0	0	8	9	2	0	3	39
> 38	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
<b>Totals</b>	<b>101</b>	<b>47</b>	<b>8</b>	<b>5</b>	<b>7</b>	<b>14</b>	<b>102</b>	<b>95</b>	<b>28</b>	<b>13</b>	<b>10</b>	<b>37</b>	<b>47</b>	<b>28</b>	<b>51</b>	<b>75</b>	<b>668</b>

Total Number of Valid Hours: 668

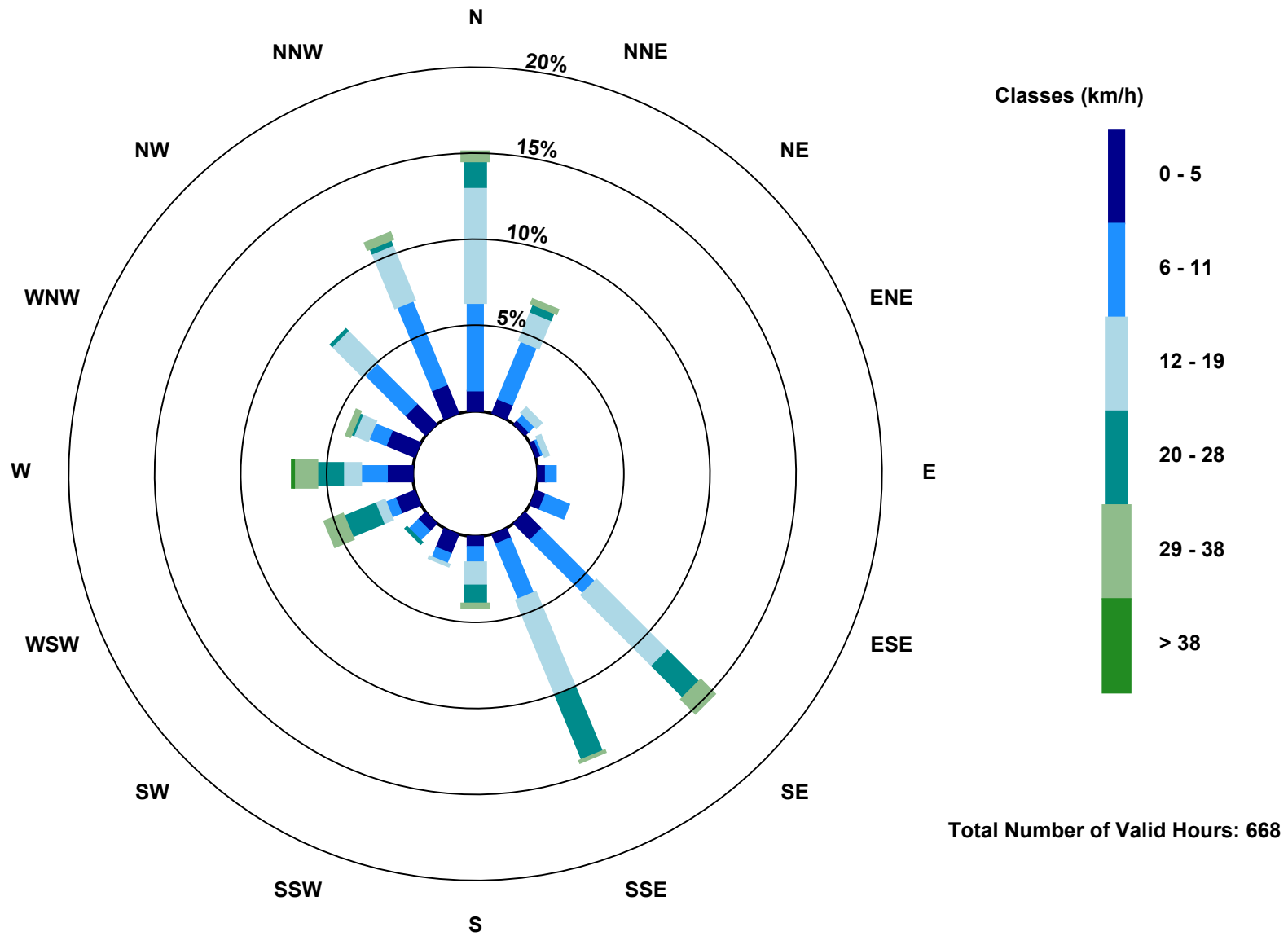
Total Number of Hours: 672





Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed 45 m (WS45m) - km/h  
Mannix





Maximum Speed: 42 km/h on Feb 13 17:00	Maximum Daily Speed Average: 26.5 km/h on Feb 7	Hours in Service: 672
Minimum Speed Value: 1 km/h on Feb 5 12:00	Minimum Daily Speed Average: 1.4 km/h on Feb 23	Hours of Data: 666
Maximum Diurnal Speed Average: 3.2 km/h at hour 8	Minimum Diurnal Speed Average: 0.4 km/h at hour 17	Hours of Missing Data: 6
Monthly Average Velocity: 0.7 km/h 252.5 deg	Percentiles: P <sub>1</sub> = 2 P <sub>10</sub> = 5 Q <sub>1</sub> = 8 Median = 14 Q <sub>3</sub> = 20 P <sub>90</sub> = 29 P <sub>99</sub> = 37	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-Feb	N14	NNE15	NE6	N10	N17	N15	N21	N18	N21	N17	NNW16	WNW14	WNW15	NW14	NW11	NW9	NW8	NW10	NW14	NW18	NW17	NW11	WNW9	NW6	NNW12.0	N21
2-Feb	SSE4	S10	S18	SSE18	SSE23	SSE28	SE24	SSE23	SE21	SE26	SE25	SE20	SE23	SE30	SE30	SE35	SE32	SE32	SE35	SE34	SE36	SE34	SE30	SE31	SE25.4	SE36
3-Feb	SE29	SE28	SE26	SE22	SE20	SSE19	SE20	SSE20	SSE18	SSE15	SW3	NW6	NW8	NNW12	N12	N10	NNE14	NNE14	NNE14	NNE13	NNE11	NNE10	NNE8	NNE5	ESE6.3	SE29
4-Feb	N12	NNE8	NNE8	N11	N13	N14	N8	NNW8	N13	N11	NNW10	NNW8	NNW7	NNW9	NNW8	NNW4	NW7	NW5	N7	N8	N9	NNW8	NNW7	NW6	N8.2	N19
5-Feb	NW6	NNW5	NNW3	N3	W2	N3	NW4	NW6	NNW3	NW2	W6	SE1	SE5	S7	SSE8	NNE17	S17	SSE23	S11	WSW8	W15	W31	WNW35	WNW37	WSW5.3	WNW37
6-Feb	WNW34	W33	W30	W23	W24	W23	W26	W22	W26	WNW18	N7	ENE2	ESE3	ESE6	ESE6	ESE7	SE15	SSE10	SE9	SE18	SE16	SE18	SE19	SSE18	WSW7.3	WNW34
7-Feb	SSE11	S6	SW11	WSW31	W33	W41	W34	W30	W29	W28	WSW27	WSW31	WSW34	W39	WSW41	W42	W36	WSW32	WSW31	W34	W26	W26	NW18	N22	W26.5	W42
8-Feb	N22	N17	N16	N14	N9	N7	N7	NNE9	NNE6	SSE2	SSE8	SSE12	SSE11	SE8	SE9	SE14	SE13	SSE17	SE18	SSE21	SSE21	SSE18	SSE29	SSE29	SE6.2	SSE29
9-Feb	SSE25	SSE20	SSW15	SSW13	SSW14	SSW15	SSW16	SSW17	SSW14	S12	SSE17	SSE21	SSE25	SSE30	SSE20	SSE21	SSE21	SE17	SE13	SE18	S21	SSW13	S10	SSE14	S16.5	SSE30
10-Feb	SSE18	SSE12	N6	NNE15	N12	N16	N17	N13	N13	N13	N13	N11	NNW13	NNW11	NNW17	NW18	NNW15	NW15	NW16	NNW14	NW11	NNW9	NW8	N5	NNW9.9	SSE18
11-Feb	WNW5	WSW4	W3	SSW3	S12	SSE17	S15	WSW11	SW10	SW12	SSW10	SSE13	SE12	S14	SSW18	SW25	WSW28	WSW24	W27	W30	WNW27	W16	WSW19	WSW35	SW12.4	WSW35
12-Feb	WSW36	WSW38	W33	W29	WSW25	W24	W25	W23	W19	W13	W11	WNW6	NE4	E3	SE7	SE16	SE14	SE17	SE14	SE22	SE25	SE22	SE30	SE32	SW9.3	WSW38
13-Feb	SSE29	S28	SSW27	SW22	WSW34	WSW36	WSW34	WSW31	NW24	UO	UO	UO	UO	UO	UO	NNW39	N42	N37	N32	N27	NNE36	NNE33	N29	N27	NW12.3	N42
14-Feb	N26	N22	N16	NNW12	N12	N12	NNE16	NNE13	NNE8	N5	NNW4	NNW4	NW2	NNE4	NNE6	NNW8	NNE12	NNE12	NNE11	NNE8	NNE10	NNE8	NE3	SW1	N9.4	N26
15-Feb	SW2	SSE2	SE4	SSE9	SSE11	SSE14	S16	SSE13	S16	S14	S9	S6	SSE5	SSE6	SE5	SE6	SE6	SE9	SE12	SSE18	SE19	SE20	SE20	SE18	SSE10.4	SE20
16-Feb	SE21	SE23	SE21	SE21	SE23	SE24	SE18	SE22	SE22	SE17	SE14	SSE13	SSE21	SSE13	WSW3	W8	W15	NNW16	N24	N29	N22	N17	N14	N12	ESE7.0	N29
17-Feb	NNE8	NNE8	NNE11	NNE11	N6	NNE4	NE6	NNE8	NNE10	NNE8	NNE7	N8	NNW8	NW12	NNW13	N14	N17	NNE21	N19	N19	NNE20	NNE18	NNE14	N8	N11.2	NNE21
18-Feb	N17	NNE18	NNE17	NNE14	N12	N12	N12	N12	NNW8	N3	NNW4	NNW9	NNW11	NW10	NW9	WNW6	WSW5	WNW2	NNE5	ENE8	E3	SE7	SE11	SSE13	N5.7	NNE18
19-Feb	SE13	SE17	SE17	SE22	SE22	SE15	SE16	SE8	ESE4	SE11	SE4	NNE3	NNE4	N3	NW5	NW10	NW14	NNW15	NNW11	NNW10	N17	N22	N20	N16	ENE3.5	SE22
20-Feb	N16	N13	N16	NNW10	NW7	N6	W3	WNW2	SE3	SE3	ESE3	SE2	SW1	E1	NNE2	NNW9	NNE16	NNE16	NNE9	NNE11	NNE14	NNE14	N23	N27	N8.1	N27
21-Feb	NNE30	NNE33	NNE25	N19	NNE20	NNE16	N11	N13	NNW15	N16	NNW12	WNW13	NW15	NNW18	NW17	NNW20	NNW14	N10	NNE14	NNE18	N8	NNW6	W8	WSW9	N13.9	NNE33
22-Feb	W11	WNW13	W8	W10	W6	WSW9	WSW9	W9	WSW12	WSW9	WSW4	W5	W4	W6	W6	WNW6	WSW6	W7	W10	NW9	N5	NNE7	NE8	NNE5	W6.0	WNW13
23-Feb	NNE5	N7	N14	NNE22	NNE25	N14	N9	NNW8	NNW10	NNW9	WNW4	W5	WNW2	WNW2	SSW2	SSE3	SE8	SE10	SSE14	SSE20	S23	SSE22	SSE26	S16	ESE1.4	SSE26
24-Feb	SSE14	S14	S19	S22	S24	S26	S29	S30	S31	SSE31	SSE25	SSE19	S24	S32	S30	SSE29	SSE33	S31	S35	S29	S28	S26	S27	S25	S26.1	S35
25-Feb	S23	S21	S15	S12	S12	SSW10	SW13	SW7	WSW8	WSW9	SW7	W15	WSW14	WSW15	S3	S4	ESE6	SSE9	SSW19	S13	SSE11	SSE11	SE18	SE16	SSW9.7	S23
26-Feb	SE19	SE10	ESE6	ESE7	SE10	SE8	ESE9	ESE6	ESE5	SE4	SE8	ESE9	E11	ENE13	ENE10	E9	ENE14	ENE17	ENE17	NE13	NE9	NE11	NE13	NE13	E8.5	SE19
27-Feb	NNE14	NNE12	NNE16	N14	N17	NNW22	NNW24	NNW25	N19	NNW21	NNW18	NNW16	NNW18	NNW20	N16	NNE14	NNE19	NNE18	NNE22	NNE23	NNE26	N22	NNW17	N17	N17.9	NNE26
28-Feb	N13	N15	N14	N13	N9	N8	N7	NNW6	N8	N4	NW7	WNW5	NW5	WNW3	WSW2	WSW5	SW3	W3	W3	W1	S1	SE3	SSE9	SSE12	NNW3.5	N15

E0.6	S0.4	NNW0.6	W1.1	WSW2.0	WSW3.0	WSW3.1	W3.2	W2.6	SW1.9	SW1.6	WSW2.0	SW1.8	SW2.5	SW1.4	W1.5	N0.4	NE1.1	NE1.4	NE1.6	NE1.9	ENE1.5	SE1.6	SE1.5	Diurnal Average
WSW36	WSW38	W33	WSW31	WSW34	W41	WSW34	WSW31	S31	SSE31	WSW27	WSW31	WSW34	W39	WSW41	W42	N42	N37	S35	SE34	SE36	SE34	WNW35	WNW37	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**

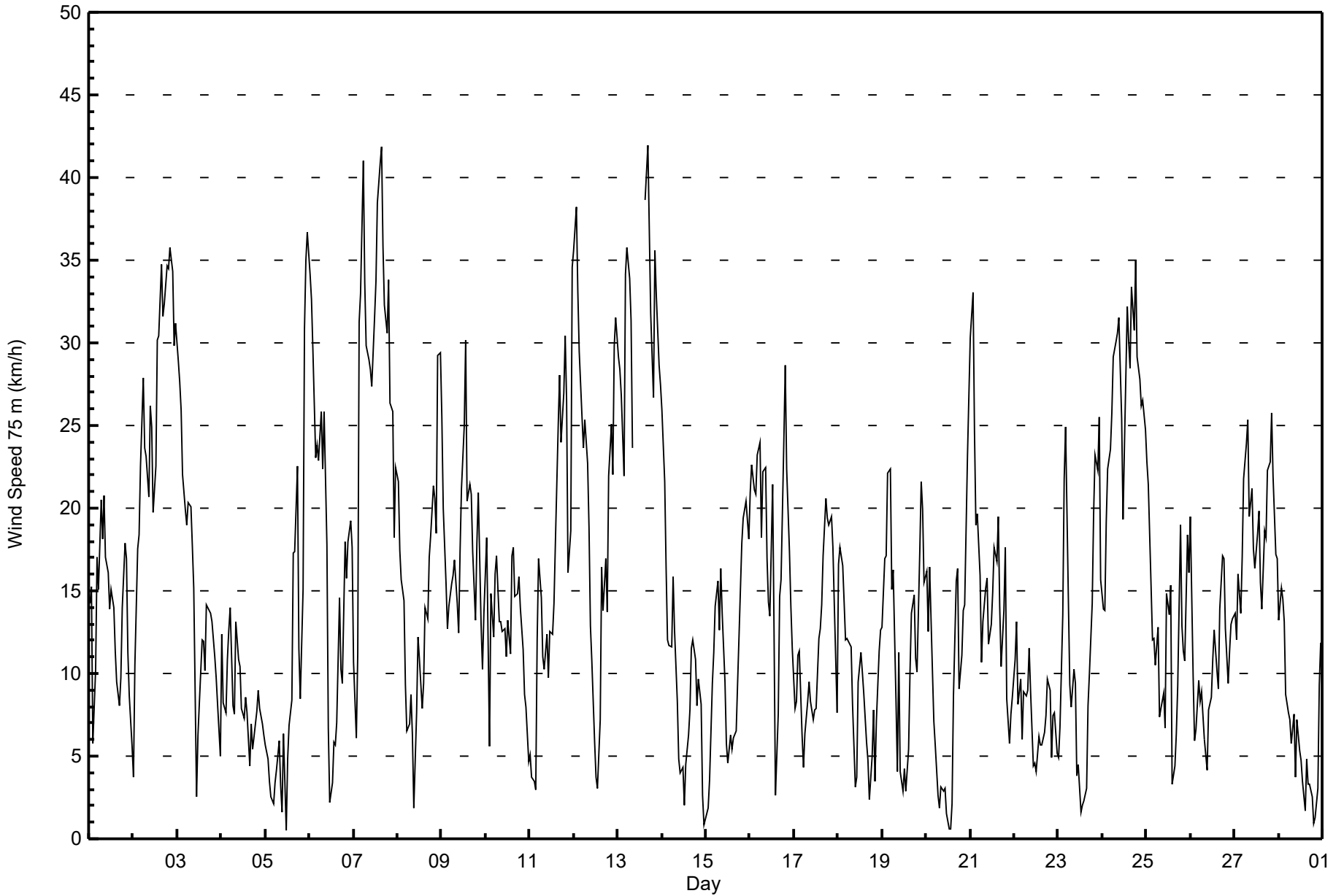
**Wind Speed 75 m (WS75m) - km/h**  
**Mannix - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Feb 13 18:00 Minimum Value: 0 km/h on Feb 18 18:00 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> = 7																	Hours in Service: 672 Hours of Data: 666 Hours of Missing Data: 6 Hours of Calibration: 0 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-Feb	4	3	3	2	3	4	4	5	4	5	4	2	3	3	3	2	2	2	2	2	1	4	2	1	5																
2-Feb	2	2	1	2	2	2	2	2	3	3	2	3	3	5	6	8	8	8	7	7	7	6	7	7	8																
3-Feb	6	5	5	4	3	3	2	3	2	4	2	2	2	2	3	2	3	3	2	2	3	3	2	3	6																
4-Feb	1	1	1	1	1	2	1	1	2	2	2	1	2	2	1	1	2	1	2	1	2	2	1	1	2																
5-Feb	1	1	1	1	1	2	1	3	3	1	5	1	3	3	4	6	2	2	3	2	4	2	5	5	6																
6-Feb	8	6	6	5	3	3	2	1	2	5	3	2	2	2	3	3	4	3	5	2	4	3	2	2	8																
7-Feb	5	2	4	6	4	6	5	4	4	4	5	7	6	6	7	7	5	4	4	4	3	2	4	3	7																
8-Feb	3	3	2	1	2	3	1	1	1	2	1	4	2	2	3	3	3	1	2	2	3	4	2	1	4																
9-Feb	3	2	2	3	2	2	1	2	3	2	2	3	2	2	3	1	1	3	2	2	2	4	2	2	4																
10-Feb	2	5	5	2	3	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2	1	5																
11-Feb	1	1	2	1	2	2	2	4	3	3	3	2	2	2	3	6	5	3	4	4	4	2	4	5	6																
12-Feb	5	5	4	3	3	3	3	3	2	2	2	1	1	2	4	3	4	6	6	7	6	5	8	4	8																
13-Feb	6	3	4	6	6	6	5	5	5	UO	UO	UO	UO	UO	UO	7	7	8	6	5	6	6	5	6	8																
14-Feb	7	4	7	2	3	3	3	2	2	1	1	1	1	2	2	1	2	2	3	3	2	2	3	1	7																
15-Feb	1	1	2	2	1	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	1	2	2	3	3																
16-Feb	2	3	2	4	2	4	5	2	4	3	4	2	2	4	2	3	3	6	3	4	5	3	3	3	6																
17-Feb	3	2	3	3	2	2	2	2	2	2	1	2	2	2	2	2	3	3	3	2	3	2	3	3	3																
18-Feb	2	4	3	1	2	1	2	4	3	2	2	1	2	2	1	2	1	0	1	1	2	2	2	1	4																
19-Feb	2	3	3	3	4	6	4	3	2	3	3	1	2	2	1	3	2	2	2	3	4	4	2	3	6																
20-Feb	3	2	3	3	2	2	2	1	1	1	2	1	1	1	2	2	2	3	5	3	2	2	5	4	5																
21-Feb	5	6	5	4	4	4	3	3	4	3	3	2	3	3	3	4	3	2	3	2	5	1	2	1	6																
22-Feb	3	2	2	2	2	2	1	1	2	2	2	1	2	2	1	2	1	1	1	1	2	1	1	1	3																
23-Feb	1	3	5	2	2	4	1	1	2	2	1	1	1	1	2	2	2	2	1	3	1	1	2	5	5																
24-Feb	4	1	3	2	1	2	1	1	2	2	3	3	6	5	5	5	5	4	6	4	4	3	2	3	6																
25-Feb	2	2	2	1	2	2	2	3	3	2	2	3	3	4	2	3	2	6	2	3	2	5	1	4	6																
26-Feb	2	5	3	2	4	4	4	2	3	2	3	3	3	2	3	3	2	2	2	2	2	2	2	1	5																
27-Feb	2	2	2	2	2	3	3	4	4	4	4	3	4	4	4	2	3	3	3	4	5	4	4	5	5																
28-Feb	2	2	2	3	2	2	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	2	1	3	3																
																	8	6	7	6	6	6	5	5	5	5	5	7	6	6	7	8	8	8	7	7	7	6	8	7	
Diurnal Maximum																																									
UO - Unstable Operation																																									



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

**Wind Speed 75 m (WS75m) - km/h**  
**Mannix - February 2023**





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

**Wind Speed 75 m (WS75m) - km/h**  
**Mannix - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	88	13.21	13.21
6 - 11	181	27.18	40.39
12 - 19	217	32.58	72.97
20 - 28	110	16.52	89.49
29 - 38	64	9.61	99.10
> 38	6	0.90	100.00

Total Number of Valid Hours: 666

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 75 m (WS75m) - km/h  
Mannix - February 2023**

<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	7	10	2	1	3	4	10	5	3	2	5	6	9	8	6	7	88
6 - 11	27	24	5	2	2	9	17	12	7	2	4	9	13	4	19	25	181
12 - 19	54	28	3	4	0	0	28	29	12	12	2	4	6	5	12	18	217
20 - 28	15	9	0	0	0	0	26	20	12	1	2	4	13	1	1	6	110
29 - 38	4	4	0	0	0	0	14	8	7	0	0	12	12	3	0	0	64
> 38	1	0	0	0	0	0	0	0	0	0	0	1	3	0	0	1	6
<b>Totals</b>	<b>108</b>	<b>75</b>	<b>10</b>	<b>7</b>	<b>5</b>	<b>13</b>	<b>95</b>	<b>74</b>	<b>41</b>	<b>17</b>	<b>13</b>	<b>36</b>	<b>56</b>	<b>21</b>	<b>38</b>	<b>57</b>	<b>666</b>

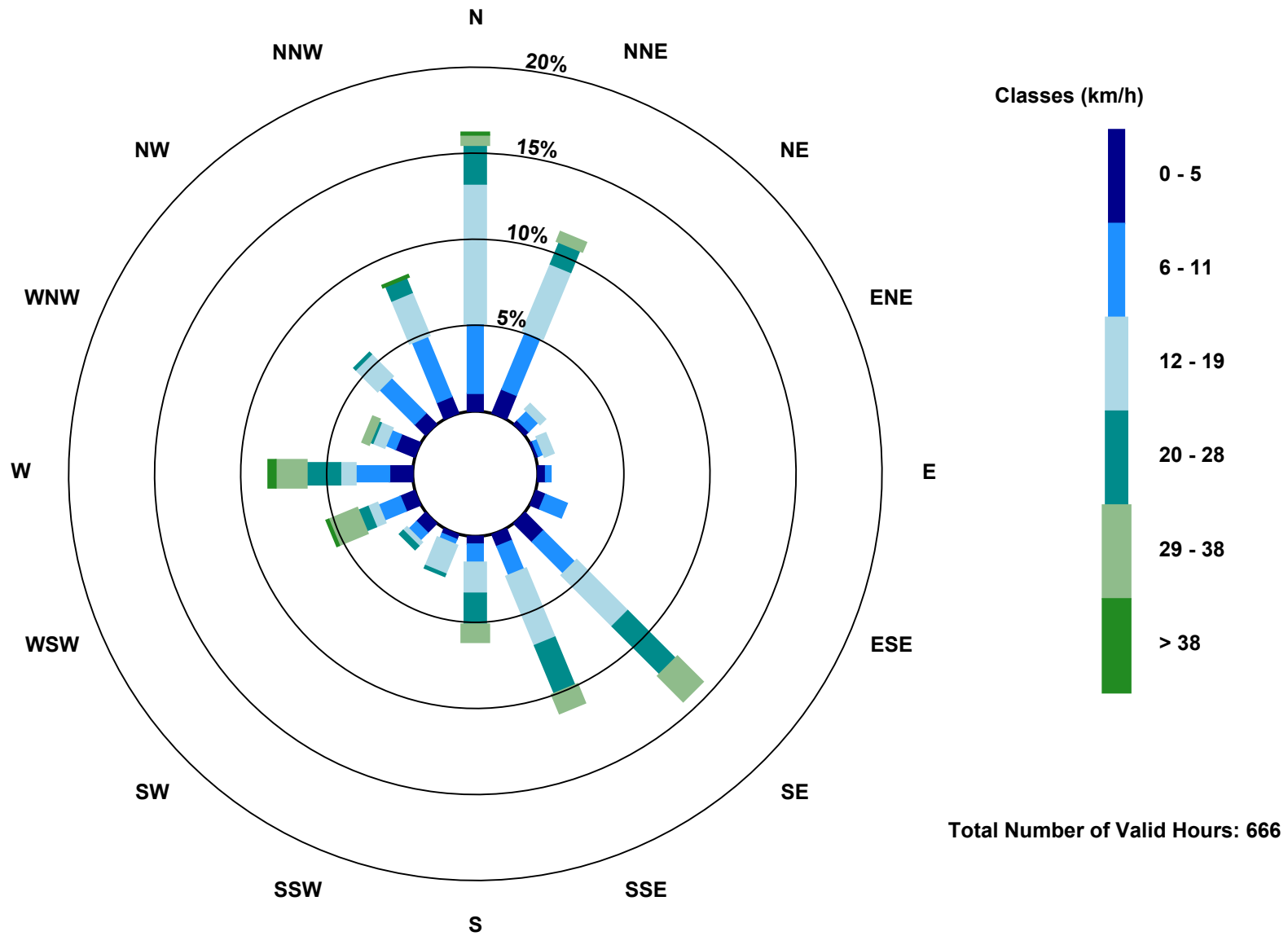
Total Number of Valid Hours: 666

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed 75 m (WS75m) - km/h  
Mannix





Maximum Speed: 43 km/h on Feb 13 17:00		Maximum Daily Speed Average: 28.1 km/h on Feb 7		Hours in Service: 672																						
Minimum Speed Value: 0 km/h on Feb 15 00:00		Minimum Daily Speed Average: 1.3 km/h on Feb 23		Hours of Data: 669																						
Maximum Diurnal Speed Average: 3.8 km/h at hour 8		Minimum Diurnal Speed Average: 0.4 km/h at hour 17		Hours of Missing Data: 3																						
Monthly Average Velocity: 1.1 km/h 287.5 deg		Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 5 Q <sub>1</sub> = 9 Median = 14 Q <sub>3</sub> = 21 P <sub>90</sub> = 29 P <sub>99</sub> = 40		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-Feb	N16	NNE17	NE7	N11	N19	N16	N23	N20	N22	N18	NNW17	WNW14	WNW15	NW14	NW12	NW10	NW9	NW11	NW15	NW19	NW18	NW13	NW10	NW5	NNW13.0	N23
2-Feb	SE3	S9	S17	SSE19	SSE21	SSE27	SE25	SSE23	SE22	SE28	SE27	SE21	SE24	SE33	SE32	SE36	SE33	SE34	SE35	SE36	SE37	SE35	SE31	SE32	SE26.2	SE37
3-Feb	SE30	SE28	SE27	SE23	SE21	SSE20	SSE22	SSE22	SSE18	S13	WSW4	NW8	NW10	NNW13	N13	N10	NNE14	NNE14	NNE14	NNE14	NNE11	NNE10	NE8	NE5	ESE6.2	SE30
4-Feb	N13	NE9	NNE8	N10	N12	NNE15	NNE8	N9	N14	N12	NNW11	NNW8	NNW7	NNW9	NNW8	NNW4	NW7	NW6	N7	N8	N10	NNW8	NNW7	NW6	N8.4	NNE15
5-Feb	NW6	NNW5	NNW3	NNE3	NW1	NNE4	NNW4	NW6	N4	N1	W6	SE1	SE6	S8	SSE10	SSE20	S19	SSE26	S12	WSW10	W19	W33	WNW36	WNW38	WSW5.4	WNW38
6-Feb	WNW36	W34	W31	W24	W26	W25	W28	W24	W28	WNW20	N8	NE2	ESE4	ESE6	ESE7	ESE9	SE16	SSE12	SE11	SE18	SE17	SE19	SE20	SSE18	WSW7.5	WNW36
7-Feb	S10	SW7	WSW14	WSW34	W35	W42	W35	W31	W30	W29	WSW28	WSW32	WSW34	W39	WSW41	W42	W37	W34	WSW33	W36	W29	W28	NW20	N24	W28.1	W42
8-Feb	N23	N19	N17	N15	N10	N7	N8	NNE9	NNE6	SE2	SSE8	SSE14	SSE11	SE9	SE11	SE15	SE14	SSE17	SE19	SSE23	S20	S15	SSE26	SSE27	SE5.7	SSE27
9-Feb	S22	S17	SSW16	SW14	SW16	SW17	SW17	SW16	SW14	SSW12	S14	SSE17	SSE24	SSE30	S20	SSE20	SSE21	SSE18	SE14	SSE20	S21	SSW12	SSW10	S11	S15.4	SSE30
10-Feb	SSE15	S10	N4	NNE15	N13	N17	N18	N15	N13	N14	N14	N12	N14	NNW12	NNW18	NW19	NNW16	NW16	NW16	NNW15	NW12	NNW9	NW9	N5	NNW10.6	NW19
11-Feb	WNW5	WSW5	W4	SW3	S11	S18	SSW13	WSW13	SW11	SW13	SSW10	SSE12	SSE13	S15	SSW19	SW26	WSW29	WSW25	W28	W32	WNW28	W18	WSW20	WSW37	WSW13.6	WSW37
12-Feb	WSW38	WSW40	W35	W31	W27	W25	W27	W24	W20	W14	W11	WNW6	NE3	E3	SE9	SE18	SE16	SE19	ESE17	SE24	SE28	SE24	SE31	SE33	SW9.6	WSW40
13-Feb	SSE30	S29	SSW28	SW24	WSW35	WSW37	WSW35	WSW33	NW25	UO	UO	UO	N37	N40	NNW40	NNW40	NNW43	N38	N33	N27	N36	NNE34	N29	N28	NNW16.4	NNW43
14-Feb	N27	N23	N17	NNW13	N12	N12	NNE16	N13	NNE8	N5	NNW4	NNW4	NNW2	N5	NNE6	NNW8	N12	NNE12	NNE11	N9	NNE10	NNE9	NE3	SSW0	N9.9	N27
15-Feb	SSW1	SSE2	SE4	SSE9	S11	S13	S16	S14	S15	S15	S10	S7	SSE4	SSE6	SE6	SE7	SE10	SE13	SSE18	SE10	SE22	SE21	SE19	SSE10.6	SE22	
16-Feb	SE22	SE23	SE22	SE20	SE24	SE25	SE18	SE23	SE24	SE19	SE16	SSE14	SSE22	SSE13	WSW3	W11	W18	NW18	N24	N29	N24	N18	N15	N12	ESE7.1	N29
17-Feb	NNE8	NNE8	NNE11	NNE12	N6	N4	NE6	NNE8	NNE10	NNE8	NNE7	N8	NNW8	NW12	NNW13	N14	N17	N21	N20	N19	NNE20	NNE18	NNE15	N8	N11.5	NNE21
18-Feb	N18	NNE19	NNE18	NNE15	N13	N13	N12	N13	NNW10	N4	N4	NNW9	NNW12	NW10	NW9	WNW6	W5	WNW2	NNE4	ENE7	ESE3	SSE7	SE11	SSE13	N6.1	NNE19
19-Feb	SE15	SE21	SE21	SE26	SE25	SE13	SE16	ESE9	ESE6	SE12	SE5	NNE3	NNE4	N3	NW5	NW10	NW14	NNW16	N12	N11	N19	N23	N21	N17	ENE4.6	SE26
20-Feb	N17	N13	N18	N11	NNW8	N7	WNW1	NNW1	SE3	SE4	E4	SE1	WNW0	E1	N2	NNW9	NNE16	NNE18	NNE10	NNE13	NNE14	NNE15	N24	N29	N8.9	N29
21-Feb	N32	NNE34	N26	N20	N20	NNE17	N12	N14	NNW16	N17	NNW13	WNW13	NW15	NNW18	NW17	NNW20	NNW15	N11	N15	N19	N9	NNW6	NNW7	WSW8	N14.9	NNE34
22-Feb	W9	WNW12	WNW10	WNW12	WNW10	W12	W11	W14	W13	W12	W6	W7	WNW5	W6	W6	WNW6	WSW6	W7	W10	NW9	N5	NNE7	NE7	NNE7	WNW7.1	W14
23-Feb	NNE7	N7	N16	NNE24	NNE27	N17	N11	N7	NNW11	NNW12	WNW5	W4	WNW1	NW2	SSW2	SE3	SE8	SE10	SSE14	SSE20	SSE24	SSE25	SSE26	SSW13	E1.3	NNE27
24-Feb	S10	SSW14	S17	S19	S19	S22	S27	S29	S32	SSE26	SSE20	S24	S32	S30	SSE28	SSE33	S31	S36	S30	S29	S27	S27	S25	S25.2	S36	
25-Feb	S23	SSW21	SSW16	SSW12	SSW10	SW11	SW14	WSW9	W11	WSW12	SW8	W15	WSW14	WSW16	S3	S5	ESE8	SSE10	SSW20	SSW14	SSE10	SSE9	SSE17	SE19	SSW9.9	S23
26-Feb	SE20	SE14	ESE10	ESE10	ESE10	SE11	ESE13	ESE8	ESE6	ESE5	SE9	ESE11	E12	ENE13	ENE10	E12	ENE15	ENE18	NE18	NE13	NE10	NE11	NE13	NE14	E9.8	SE20
27-Feb	NNE15	NNE13	NNE17	N14	N18	NNW23	NNW26	NNW27	N21	NNW23	NNW18	NNW17	NNW19	NNW21	N16	NNE14	NNE19	N18	N23	NNE24	NNE28	N23	NNW19	N18	N18.9	NNE28
28-Feb	N15	N17	N16	N14	N10	N8	N9	N7	N9	N5	NNW7	NW5	NW5	WNW3	W1	WSW5	WSW3	W3	W2	WSW0	S2	SE3	S9	SSE12	NNW4.0	N17
NNE0.6WNW0.5 NW1.3WNW1.7 W2.3 W3.3 W3.5 W3.8WNW3.3WSW2.2WSW1.6WSW2.0 W1.4 W2.1WNW1.6 W1.6 N0.4 NE1.0NNE1.4NNE1.7 NE1.7 NE1.5 ESE1.0 SE0.9																								Diurnal Average		
WSW38WSW40 W35WSW34WSW35 W42 W35WSW33 W30 S32WSW28WSW32 N37 N40WSW41 W42NNW43 N38 S36 W36 SE37 SE35WNW36WNW38																								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**

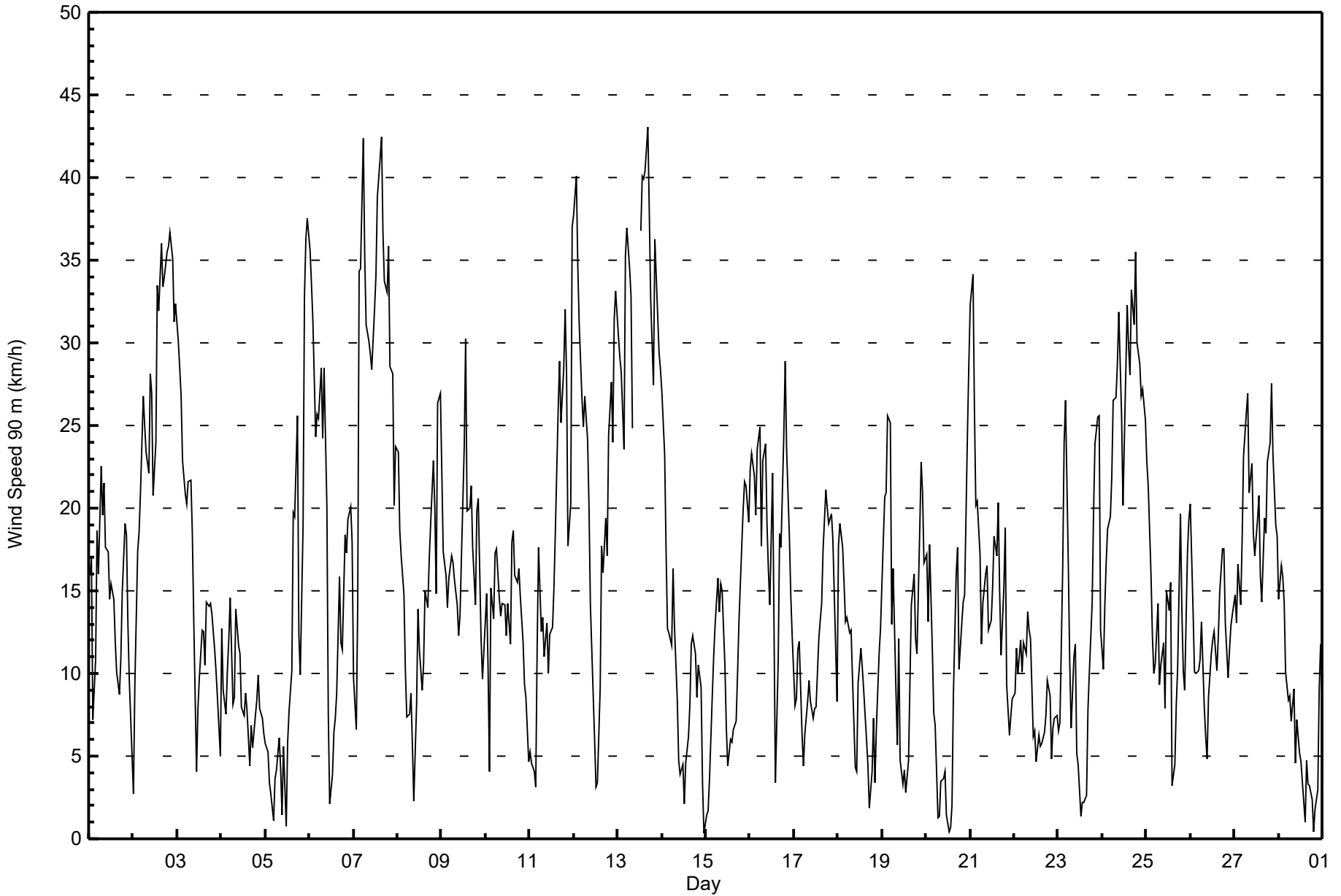
**Wind Speed 90 m (WS90m) - km/h**  
**Mannix - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Feb 13 18:00 Minimum Value: 1 km/h on Feb 18 20:00 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> = 7																	Hours in Service: 672 Hours of Data: 669 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-Feb	3	3	3	3	3	4	3	5	4	5	4	2	3	3	3	2	2	2	2	2	1	4	1	2	5	
2-Feb	2	2	1	2	1	3	3	2	2	2	1	2	3	4	5	6	6	6	6	5	5	5	5	5	6	
3-Feb	4	4	5	3	2	3	2	3	2	4	3	2	2	3	2	3	3	2	2	3	3	1	2	5		
4-Feb	1	1	1	1	1	2	1	2	1	2	3	2	1	2	2	1	1	2	1	2	2	2	1	1	3	
5-Feb	1	1	1	2	1	2	1	3	3	2	5	1	3	3	5	6	2	2	2	2	5	2	5	5	6	
6-Feb	8	6	6	5	3	2	3	1	2	6	4	2	2	2	3	2	4	2	4	2	3	3	3	2	8	
7-Feb	4	3	6	5	4	6	5	4	4	5	5	7	6	6	6	7	5	4	4	4	3	2	4	3	7	
8-Feb	3	3	2	2	1	2	1	1	1	2	2	3	2	2	3	2	3	1	1	3	4	3	2	2	4	
9-Feb	3	2	3	3	2	3	2	2	3	2	2	2	2	2	3	2	1	2	2	2	3	3	2	2	3	
10-Feb	2	5	5	1	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	1	5	
11-Feb	1	1	2	1	3	2	2	3	3	3	3	2	2	3	3	6	5	3	4	4	5	2	4	5	6	
12-Feb	5	5	4	3	3	3	3	3	2	2	2	1	1	2	4	2	3	5	4	6	4	4	6	4	6	
13-Feb	6	3	4	6	6	6	5	5	5	UO	UO	UO	6	6	7	6	6	8	6	6	6	5	5	5	8	
14-Feb	7	4	7	2	3	3	3	2	3	1	1	2	1	2	2	2	2	3	3	3	2	2	4	1	7	
15-Feb	1	1	2	1	1	1	1	1	2	2	1	2	2	2	2	2	2	1	1	2	1	2	3	3	3	
16-Feb	2	4	1	4	3	5	6	2	4	3	4	2	3	6	2	4	2	5	3	3	5	3	3	3	6	
17-Feb	4	2	3	3	2	2	2	2	2	2	1	2	2	2	2	2	3	2	3	2	2	2	3	2	4	
18-Feb	2	3	2	1	1	1	2	4	3	2	2	1	2	2	1	2	1	1	1	1	2	1	1	1	4	
19-Feb	1	2	3	3	3	4	4	2	1	3	3	1	2	2	1	3	2	2	2	3	4	3	2	3	4	
20-Feb	3	2	3	4	1	2	1	1	1	1	2	1	1	1	2	2	2	2	5	2	1	2	5	4	5	
21-Feb	5	6	5	4	4	4	3	3	4	3	3	2	3	3	3	4	3	2	3	2	5	2	1	1	6	
22-Feb	2	2	2	2	3	1	2	2	2	1	2	1	2	2	1	2	1	1	1	1	2	1	1	1	3	
23-Feb	2	4	5	2	2	4	2	2	1	1	1	1	1	1	2	2	2	2	1	3	1	1	2	4	5	
24-Feb	3	1	2	1	2	3	1	2	2	2	3	3	6	4	5	4	4	6	4	4	4	3	2	3	6	
25-Feb	2	2	2	1	2	3	2	4	3	2	2	3	3	4	2	3	2	6	2	3	2	5	1	3	6	
26-Feb	2	4	3	2	3	4	4	2	2	2	3	4	3	2	2	4	2	2	2	2	1	2	2	1	4	
27-Feb	2	2	2	2	2	3	3	4	4	3	4	3	3	4	4	3	3	3	3	4	4	4	4	5	5	
28-Feb	2	2	2	3	2	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	2	1	3	3	
																	Diurnal Maximum									
UO - Unstable Operation																										



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

**Wind Speed 90 m (WS90m) - km/h**  
**Mannix - February 2023**





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

**Wind Speed 90 m (WS90m) - km/h**  
**Mannix - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	81	12.11	12.11
6 - 11	167	24.96	37.07
12 - 19	224	33.48	70.55
20 - 28	123	18.39	88.94
29 - 38	65	9.72	98.65
> 38	9	1.35	100.00

Total Number of Valid Hours: 669

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 90 m (WS90m) - km/h  
Mannix - February 2023**

<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	11	6	4	0	3	3	10	2	3	3	1	6	6	9	5	9	81
6 - 11	27	23	6	2	0	13	13	9	11	3	4	4	10	8	16	18	167
12 - 19	58	27	4	3	2	2	22	18	17	10	8	5	9	5	15	19	224
20 - 28	21	6	0	0	0	0	30	24	11	3	2	3	13	2	2	6	123
29 - 38	8	2	0	0	0	0	14	3	9	0	0	11	15	3	0	0	65
> 38	1	0	0	0	0	0	0	0	0	0	0	2	3	0	0	3	9
<b>Totals</b>	<b>126</b>	<b>64</b>	<b>14</b>	<b>5</b>	<b>5</b>	<b>18</b>	<b>89</b>	<b>56</b>	<b>51</b>	<b>19</b>	<b>15</b>	<b>31</b>	<b>56</b>	<b>27</b>	<b>38</b>	<b>55</b>	<b>669</b>

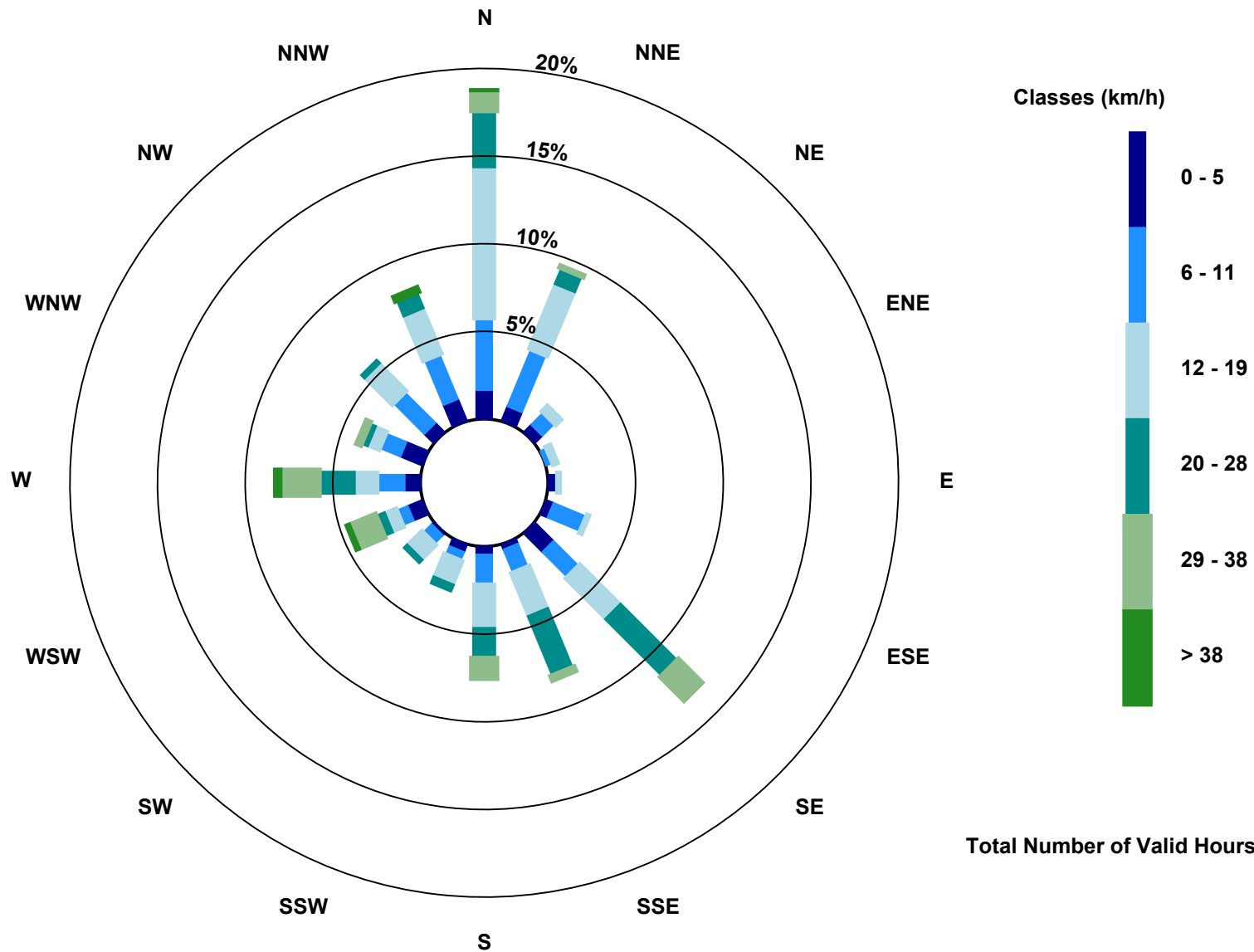
Total Number of Valid Hours: 669

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed 90 m (WS90m) - km/h  
Mannix





Direction of Maximum Speed: 271 deg on Feb 7 16:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 266.9 deg on Feb 7	Hours of Data: 672
Direction of Minimum Speed: 40 deg on Feb 20 14:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 0.5 deg on Feb 19	Percent Operational Time: 100.0
Monthly Average Direction: 285.5 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-Feb	331	5	326	350	3	354	352	355	11	6	346	303	304	318	318	330	342	295	298	295	302	291	255	131	332.9
2-Feb	157	157	152	144	156	156	148	157	156	154	153	162	158	146	137	137	137	139	139	139	136	136	137	137	143.5
3-Feb	139	140	141	142	146	149	146	153	155	169	177	358	306	323	352	345	30	13	24	32	9	23	16	6	106.1
4-Feb	359	7	346	352	359	1	341	325	342	3	338	328	339	335	331	316	307	304	341	330	347	311	324	307	338.1
5-Feb	313	323	307	297	254	334	302	304	341	271	277	266	146	193	140	165	151	161	166	229	226	273	283	297	266.8
6-Feb	289	269	273	261	267	280	280	264	263	300	24	78	101	107	110	96	143	179	124	152	146	153	162	158	244.3
7-Feb	157	147	130	254	266	278	283	269	264	263	262	259	263	265	262	271	267	260	253	265	270	279	304	2	266.9
8-Feb	344	347	341	328	331	295	10	43	282	222	158	148	157	138	139	153	141	163	172	152	146	147	145	145	146.6
9-Feb	148	148	153	148	149	157	156	155	158	158	160	155	154	154	153	153	141	146	122	158	185	175	156	161	154.4
10-Feb	164	69	8	352	322	340	354	348	354	345	339	339	335	323	320	317	320	315	313	328	326	342	322	354	332.3
11-Feb	303	279	242	180	167	159	165	165	170	174	177	148	146	149	183	228	243	248	270	279	289	266	249	253	228.5
12-Feb	258	257	273	266	259	257	260	263	263	262	287	291	40	89	98	125	132	135	132	134	134	140	136	144	215.5
13-Feb	154	160	183	203	247	252	255	261	315	8	346	348	346	356	343	339	347	1	7	10	16	18	12	12	340.1
14-Feb	13	349	3	336	351	2	17	13	22	354	345	343	283	23	24	336	13	27	24	9	15	17	58	223	5.7
15-Feb	261	147	108	148	174	181	194	164	158	168	159	139	139	144	133	134	135	140	146	158	144	143	153	149	150.9
16-Feb	157	160	155	154	157	155	153	155	160	180	187	162	153	157	263	69	287	353	6	11	3	1	350	2	128.2
17-Feb	26	22	19	16	359	20	55	31	11	20	7	5	343	314	341	7	3	12	8	6	11	13	4	323	6.4
18-Feb	357	357	5	1	354	347	7	11	13	288	304	317	316	306	300	282	263	294	1	34	47	157	157	151	339.6
19-Feb	158	157	154	162	162	150	157	141	76	163	77	313	2	334	317	312	313	319	328	317	347	355	348	349	322.7
20-Feb	9	357	357	322	309	311	262	261	171	154	148	129	174	40	30	320	16	24	46	14	12	342	3	2	358.0
21-Feb	15	17	16	10	13	21	350	352	332	338	318	295	301	319	320	337	340	345	359	17	354	288	252	257	344.5
22-Feb	240	213	191	192	171	175	172	171	182	199	133	100	273	273	274	284	259	282	285	305	303	36	76	264	230.2
23-Feb	125	40	20	341	2	341	318	96	36	55	230	266	272	278	214	141	149	148	157	170	171	153	157	159	156.3
24-Feb	151	150	148	150	155	155	158	156	156	153	160	149	167	189	174	161	161	171	187	181	180	179	179	183	165.7
25-Feb	177	171	161	150	155	162	164	152	151	163	194	273	255	245	184	145	107	129	188	167	146	145	152	136	170.4
26-Feb	136	132	127	115	153	135	126	111	149	166	138	116	90	74	78	103	80	59	55	42	23	28	42	32	91.1
27-Feb	29	26	13	2	347	342	338	345	349	345	339	340	328	326	348	17	18	11	12	15	23	11	345	354	356.8
28-Feb	337	346	347	354	323	315	324	304	317	10	316	301	302	288	267	265	268	305	303	55	181	224	190	145	309.4
122.4 138.4 109.3 233.6 236.8 242.9 239.7 241.3 266.1 267.6 291.3 290.7 286.9 287.7 303.5 287.8 9.5 15.3 5.8 357.5 30.4 39.7 148.6 139.3																									
Diurnal Average																									

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



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

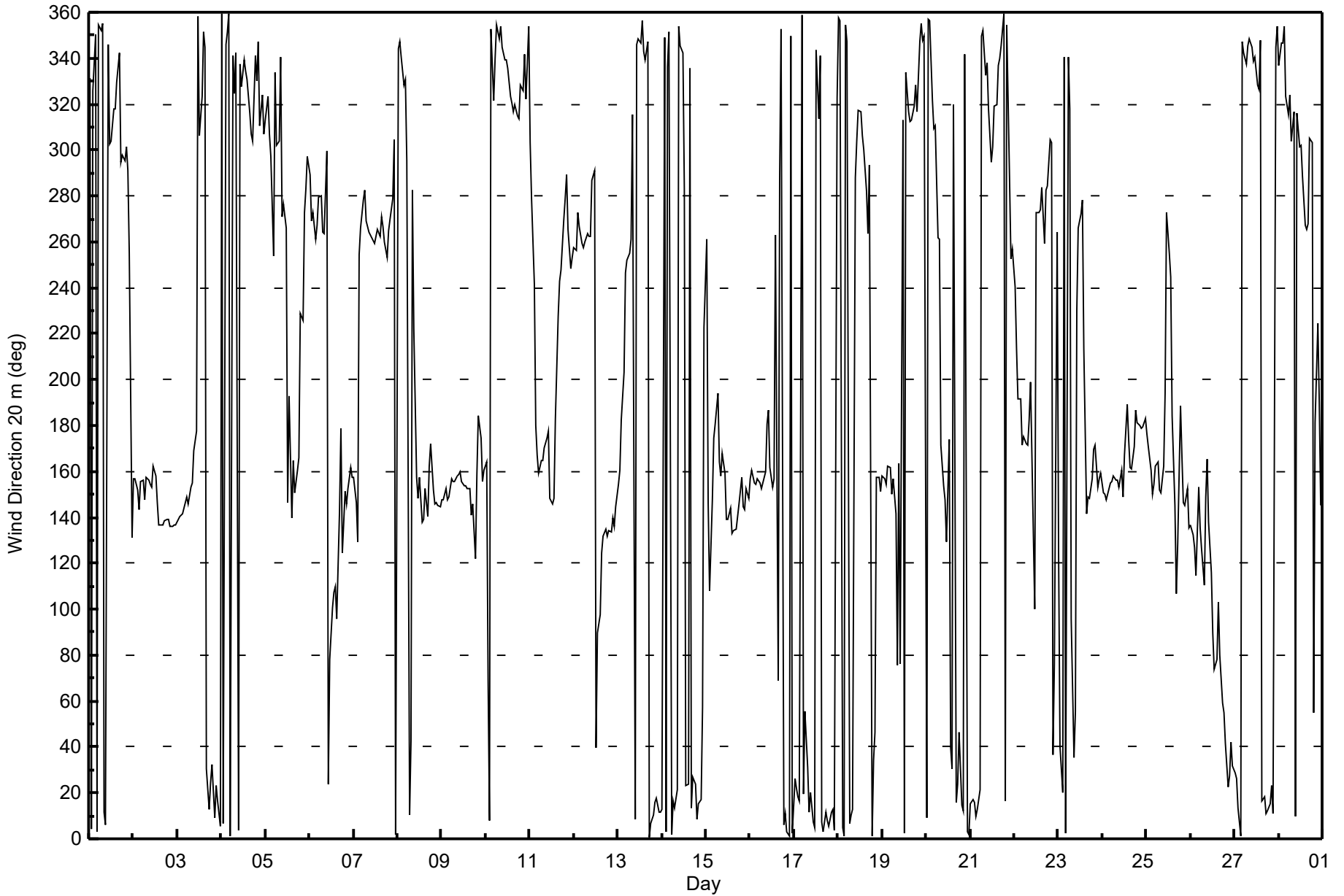
**Wind Direction 20 m (WD20m) - deg**  
**Mannix - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 106 deg on Feb 5 12:00 Minimum Value: 5 deg on Feb 15 20:00 Percentiles: P <sub>1</sub> = 6 P <sub>10</sub> = 8 Q <sub>1</sub> = 10 Median = 14 Q <sub>3</sub> = 20 P <sub>90</sub> = 35 P <sub>99</sub> = 84														Hours in Service: 672 Hours of Data: 672 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-Feb	32	10	39	25	16	14	13	13	10	15	15	12	16	14	13	20	24	13	12	14	10	71	32	40	71
2-Feb	29	6	10	9	7	7	7	13	17	15	12	10	8	9	8	8	8	9	9	8	8	8	8	8	29
3-Feb	9	9	9	9	10	10	8	9	9	11	40	67	30	20	13	17	15	9	13	19	13	14	12	47	67
4-Feb	14	8	15	14	10	10	25	15	12	17	16	17	21	14	15	22	11	21	19	13	24	12	20	13	25
5-Feb	15	24	34	34	35	45	40	33	59	28	83	106	31	37	41	58	19	11	10	30	55	11	13	11	106
6-Feb	11	7	10	9	9	15	7	7	6	30	26	37	18	25	25	25	10	45	20	8	12	9	11	15	45
7-Feb	21	21	26	28	9	14	9	9	8	8	11	11	11	11	10	8	9	9	10	7	8	8	32	17	32
8-Feb	11	12	12	9	9	35	39	12	74	13	20	14	9	18	15	10	17	10	12	10	7	6	6	7	74
9-Feb	8	7	6	7	5	6	11	10	5	7	7	7	8	8	7	7	8	15	43	24	13	14	16	5	43
10-Feb	11	68	22	10	12	14	14	16	14	17	16	14	12	17	10	10	12	10	9	14	14	22	19	28	68
11-Feb	14	31	89	23	9	8	9	15	20	12	27	8	10	14	15	15	9	10	10	8	10	16	18	10	89
12-Feb	10	10	8	9	9	9	9	7	7	10	12	17	34	20	14	13	7	9	11	10	8	14	8	11	34
13-Feb	10	10	15	32	12	10	10	9	40	14	12	12	14	14	11	13	16	13	12	11	12	12	13	40	40
14-Feb	18	16	27	14	18	18	11	10	18	18	26	31	40	32	25	25	12	14	18	22	15	17	83	56	83
15-Feb	49	41	22	16	9	16	19	26	23	17	14	27	24	21	12	9	11	10	6	5	9	9	9	6	49
16-Feb	16	19	9	9	7	10	9	10	17	17	21	17	9	11	77	88	101	18	12	12	14	15	16	23	101
17-Feb	17	15	15	14	16	39	25	18	19	20	15	21	33	11	20	15	13	10	12	10	9	9	23	19	39
18-Feb	9	11	10	9	13	15	18	12	17	60	21	12	13	16	14	27	15	12	26	9	25	15	30	13	60
19-Feb	9	10	8	7	7	9	8	34	80	28	59	80	37	46	13	9	9	16	16	13	17	11	12	15	80
20-Feb	10	16	12	31	16	34	16	25	66	21	28	37	84	95	71	16	17	13	68	21	7	29	10	12	95
21-Feb	12	11	12	15	13	15	20	21	16	14	20	15	12	16	14	14	16	17	14	10	43	9	22	8	43
22-Feb	11	24	17	16	21	6	7	6	20	35	65	30	84	26	19	35	17	9	10	16	33	14	65	27	84
23-Feb	73	64	32	41	9	23	32	69	53	43	68	15	33	39	67	23	16	8	9	7	8	8	10	6	73
24-Feb	7	6	8	6	5	6	5	6	6	6	8	11	20	16	16	9	9	11	14	14	13	11	12	12	20
25-Feb	12	10	7	9	8	8	12	23	15	9	45	12	15	14	71	57	16	28	13	11	16	16	7	8	71
26-Feb	9	11	10	12	16	19	15	16	16	11	18	17	19	12	15	12	20	13	11	12	14	17	12	11	20
27-Feb	11	11	8	11	11	11	11	13	14	12	14	14	14	13	25	16	14	11	10	11	12	12	17	16	25
28-Feb	12	12	14	20	26	15	42	38	23	93	11	21	27	31	25	20	23	15	8	69	60	18	23	12	93
														73 68 89 41 35 45 42 69 80 93 83 106 84 95 77 88 101 45 68 69 60 71 83 56											
														Diurnal Maximum											



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

**Wind Direction 20 m (WD20m) - deg**  
**Mannix - February 2023**







Direction of Maximum Speed: 265 deg on Feb 7 16:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 163.7 deg on Feb 24	Hours of Data: 668
Direction of Minimum Speed: 89 deg on Feb 20 14:00	Hours of Missing Data: 4
Direction of Minimum Daily Speed Average: 1.8 deg on Feb 23	Percent Operational Time: 99.4
Monthly Average Direction: 238.6 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-Feb	345	3	6	353	4	352	348	352	6	2	342	297	298	315	316	320	328	304	304	306	306	304	284	263	331.9
2-Feb	158	164	158	141	153	160	156	161	146	137	137	154	148	137	132	133	133	135	136	135	132	132	131	131	140.7
3-Feb	134	136	136	137	141	145	139	146	148	162	182	337	308	322	349	344	26	12	21	27	8	22	20	11	102.1
4-Feb	358	14	352	353	358	360	347	326	344	1	337	327	338	333	328	316	303	302	345	335	350	311	324	304	339.5
5-Feb	312	325	311	305	260	341	307	303	335	277	273	242	132	192	143	165	158	158	167	234	262	274	279	292	261.0
6-Feb	285	266	269	258	264	273	275	264	263	291	17	71	98	104	104	100	133	158	121	145	136	142	150	150	238.7
7-Feb	147	143	170	252	260	273	278	264	259	258	256	253	256	259	256	265	262	256	249	260	265	275	301	358	261.2
8-Feb	346	349	351	337	345	330	350	21	32	189	166	145	152	134	133	141	129	148	156	153	141	136	138	140	127.5
9-Feb	149	151	167	161	166	170	174	178	169	163	159	152	150	150	150	150	141	134	126	135	157	178	167	155	156.9
10-Feb	159	143	8	358	329	340	353	350	351	344	342	343	337	327	320	316	320	314	312	325	321	336	316	352	332.7
11-Feb	299	268	245	180	162	157	161	196	190	195	185	144	139	156	187	223	239	245	265	273	284	264	247	248	226.2
12-Feb	253	252	266	260	256	256	257	260	262	259	282	295	32	85	106	128	125	126	125	128	129	135	131	140	209.1
13-Feb	152	165	187	210	243	248	251	256	312	UO	UO	UO	UO	354	339	336	344	357	4	5	10	13	7	8	327.8
14-Feb	8	346	357	337	350	360	14	11	18	349	340	335	292	14	19	333	9	21	20	8	13	17	52	216	2.2
15-Feb	251	141	107	141	157	163	168	162	163	169	166	153	138	144	125	127	129	134	140	147	137	134	141	137	146.2
16-Feb	140	145	144	140	146	143	142	146	146	152	164	159	154	159	259	295	259	339	3	6	0	358	347	359	122.3
17-Feb	23	20	17	15	3	12	48	26	9	18	4	2	340	313	340	3	1	9	6	2	9	12	5	334	4.4
18-Feb	355	1	10	1	348	341	358	359	347	320	312	317	316	305	298	280	256	289	8	45	61	127	142	147	345.9
19-Feb	153	142	134	139	137	132	136	133	113	149	119	338	5	338	311	310	311	318	330	328	349	358	351	350	77.4
20-Feb	6	354	356	332	312	318	269	264	163	141	130	126	178	89	22	320	14	20	29	21	8	3	0	358	358.1
21-Feb	9	12	11	7	9	15	352	351	334	341	318	290	299	318	318	334	336	349	4	11	354	301	258	259	344.2
22-Feb	252	266	224	229	196	219	227	225	220	208	202	204	260	267	273	282	249	273	281	308	341	25	51	226	258.1
23-Feb	351	1	8	8	5	347	339	325	325	337	252	263	274	281	208	139	142	138	149	164	168	160	157	158	140.3
24-Feb	151	157	153	155	156	155	156	156	155	158	149	167	182	170	158	157	166	182	177	176	175	176	180	180	163.7
25-Feb	178	170	164	150	153	167	193	164	194	204	266	249	240	182	155	100	134	191	173	145	143	148	128	128	172.5
26-Feb	130	121	118	106	136	126	118	110	125	143	131	108	82	66	72	97	72	54	51	37	25	30	39	28	83.8
27-Feb	23	25	12	358	346	338	334	342	346	340	335	336	327	325	345	12	14	8	10	12	17	8	342	350	353.2
28-Feb	347	351	351	354	354	334	343	326	342	345	316	298	303	284	255	250	243	282	286	306	107	154	165	139	327.9
133.9	143.5	130.7	225.6	220.6	236.2	239.9	239.7	255.8	211.3	232.1	247.0	240.3	277.9	293.4	275.3	27.3	32.8	22.3	18.8	42.5	58.1	124.0	129.5		
Diurnal Average																									

UO - Unstable Operation

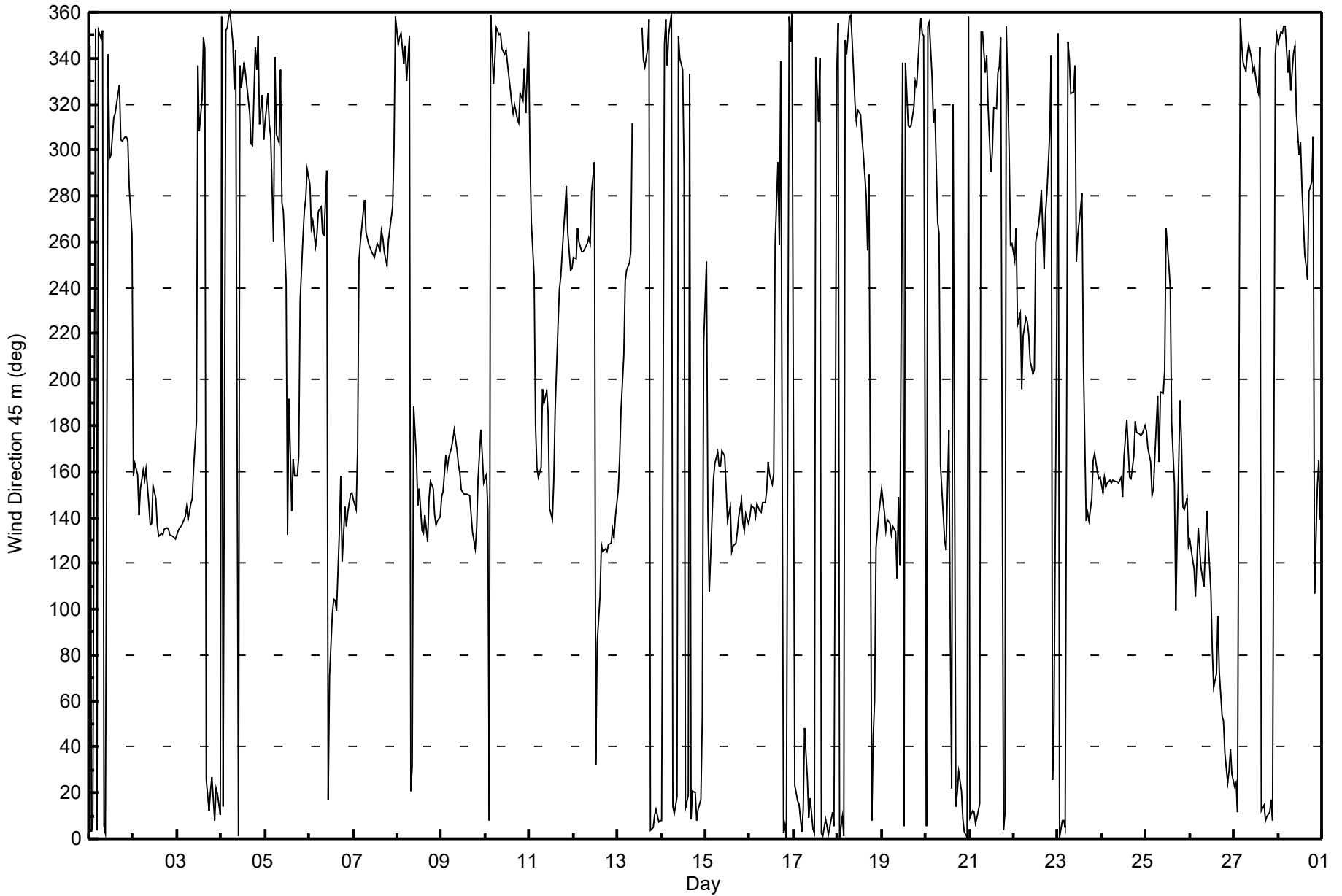
All monthly, daily, and diurnal averages have been calculated using vector methods



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

**Wind Direction 45 m (WD45m) - deg**  
**Mannix - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 100 deg on Feb 20 13:00 Minimum Value: 2 deg on Feb 24 05:00 Percentiles: P <sub>1</sub> = 3 P <sub>10</sub> = 6 Q <sub>1</sub> = 7 Median = 10 Q <sub>3</sub> = 15 P <sub>90</sub> = 30 P <sub>99</sub> = 76																	Hours in Service: 672 Hours of Data: 668 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.4										
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-Feb	23	8	47	19	9	10	9	10	7	10	12	11	13	11	10	16	20	18	8	7	4	34	17	68	68		
2-Feb	29	6	7	6	5	6	6	9	12	9	8	11	8	6	6	7	7	8	7	7	7	6	7	6	29		
3-Feb	8	7	7	7	8	8	6	8	7	10	65	34	29	18	12	14	10	7	9	15	11	10	10	44	65		
4-Feb	11	7	10	8	5	5	21	11	9	12	12	12	16	10	11	21	7	16	11	9	20	10	18	14	21		
5-Feb	15	19	34	36	31	41	33	37	56	48	73	95	36	28	32	31	12	6	13	11	14	8	11	9	95		
6-Feb	9	6	9	6	7	7	6	4	3	31	28	40	26	23	21	19	8	29	18	6	9	7	7	7	40		
7-Feb	13	11	39	9	7	13	8	8	8	6	9	10	10	9	8	7	7	6	7	6	6	6	31	12	39		
8-Feb	8	7	8	6	5	30	28	7	15	40	20	12	10	13	13	8	7	14	10	4	5	4	3	4	40		
9-Feb	3	3	7	7	7	12	8	5	9	4	4	4	7	6	4	4	6	6	4	5	9	5	11	4	12		
10-Feb	4	41	33	6	10	11	8	10	9	12	11	11	9	15	8	8	10	8	6	12	10	19	17	29	41		
11-Feb	12	26	80	28	6	6	5	25	23	14	23	7	8	16	10	13	8	7	8	6	8	14	14	7	80		
12-Feb	8	7	7	7	6	6	6	6	4	6	9	12	29	25	18	7	4	6	8	9	5	11	6	10	29		
13-Feb	6	8	13	22	10	9	8	7	40	UO	UO	UO	UO	12	11	9	10	13	10	10	8	9	8	10	40		
14-Feb	16	13	26	10	14	15	8	13	16	21	22	36	29	19	22	10	11	14	17	11	15	80	53	80			
15-Feb	42	42	20	10	5	6	9	11	12	13	14	27	25	21	11	8	9	8	5	3	5	7	6	5	42		
16-Feb	10	12	6	5	4	8	10	7	10	10	17	13	6	12	70	51	11	20	8	9	11	11	11	20	70		
17-Feb	12	11	11	10	15	30	22	13	15	15	12	13	27	8	18	13	10	7	8	6	6	6	13	16	30		
18-Feb	6	8	9	6	9	9	14	18	16	47	24	10	9	12	11	24	12	12	22	6	12	13	12	6	47		
19-Feb	6	6	5	6	5	5	6	7	40	28	66	57	29	48	13	7	8	13	11	9	14	6	9	13	66		
20-Feb	7	9	8	28	18	18	11	18	67	16	30	51	100	89	77	14	14	9	39	13	5	6	6	9	100		
21-Feb	9	8	8	10	10	12	14	16	12	11	17	12	10	15	11	11	13	14	10	7	35	14	24	9	35		
22-Feb	10	10	22	16	21	14	9	10	8	19	45	68	43	23	14	32	11	7	9	13	15	14	11	75	75		
23-Feb	56	53	10	8	6	9	6	8	12	14	33	13	45	47	60	21	14	7	6	2	3	4	3	3	60		
24-Feb	5	3	4	3	2	2	3	2	3	4	5	9	17	9	11	7	7	7	7	8	8	6	6	7	17		
25-Feb	6	5	7	8	6	15	15	26	45	27	31	9	12	11	63	55	13	28	9	12	11	9	6	5	63		
26-Feb	6	7	8	10	13	13	12	12	12	16	13	14	18	10	13	10	18	10	8	8	10	14	10	9	18		
27-Feb	8	9	6	7	8	8	8	8	10	9	10	10	11	10	22	12	10	8	8	8	9	9	14	13	22		
28-Feb	9	7	9	9	15	14	15	23	21	54	9	14	18	25	35	16	17	13	13	96	25	26	8	6	96		
																	56 53 80 36 31 41 33 37 67 54 73 95 100 89 77 55 20 29 39 96 35 34 80 75 Diurnal Maximum										
UO - Unstable Operation																											





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 75 m (WD75m) - deg

Mannix - February 2023

Direction of Maximum Speed: 349 deg on Feb 13 17:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 263.8 deg on Feb 7	Hours of Data: 666
Direction of Minimum Speed: 143 deg on Feb 5 12:00	Hours of Missing Data: 6
Direction of Minimum Daily Speed Average: 1.4 deg on Feb 23	Percent Operational Time: 99.1
Monthly Average Direction: 252.5 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-Feb	357	13	44	8	10	356	353	358	7	6	346	300	299	319	321	318	317	314	313	313	309	308	299	310	337.6
2-Feb	156	171	178	161	164	166	145	149	138	136	136	145	137	136	135	136	137	138	140	138	137	137	136	135	142.5
3-Feb	138	139	139	141	143	148	145	149	154	168	233	321	312	328	356	351	29	19	27	31	14	30	32	30	111.4
4-Feb	5	32	21	3	8	10	8	348	354	6	346	340	347	339	333	329	309	314	0	352	3	327	334	312	352.7
5-Feb	321	340	327	2	276	11	322	313	346	316	280	143	132	189	156	168	169	164	175	247	267	278	282	295	255.7
6-Feb	288	269	272	261	266	273	278	270	268	291	9	62	110	112	107	107	134	150	129	143	136	139	146	154	242.9
7-Feb	163	182	224	255	261	275	280	266	261	259	257	254	257	261	258	266	264	258	253	262	267	277	308	4	263.8
8-Feb	356	359	0	353	2	359	359	19	28	166	168	149	157	141	137	140	134	147	146	150	158	156	156	156	129.5
9-Feb	164	168	197	198	201	202	208	207	203	191	166	156	153	154	162	157	150	144	140	143	170	197	185	165	170.8
10-Feb	167	161	9	14	351	350	3	1	2	350	352	353	348	340	329	324	328	321	318	330	325	338	317	356	342.4
11-Feb	291	246	264	199	170	167	184	241	217	216	196	150	145	178	193	225	241	247	267	276	287	268	251	250	232.5
12-Feb	254	254	266	261	258	260	261	263	266	263	281	300	38	93	126	137	131	130	128	134	134	142	136	145	216.4
13-Feb	161	179	198	220	245	248	252	257	315	UO	UO	UO	UO	UO	UO	342	349	360	5	7	12	15	11	11	319.3
14-Feb	10	351	0	345	357	7	17	14	20	352	346	344	319	16	23	342	12	21	25	13	17	23	54	221	6.9
15-Feb	222	153	128	154	164	168	169	167	169	177	176	173	155	148	128	130	134	139	142	149	139	135	138	136	151.8
16-Feb	136	139	138	134	138	136	137	141	140	137	145	155	153	165	245	268	265	330	6	9	4	2	353	3	120.1
17-Feb	28	26	23	20	10	14	48	27	17	23	13	10	346	322	348	6	6	13	10	7	15	19	16	353	10.8
18-Feb	0	18	26	24	5	353	360	358	344	357	335	331	327	311	304	288	258	282	19	60	93	142	144	151	2.0
19-Feb	137	133	133	135	134	132	133	130	118	142	137	15	21	357	317	316	319	328	346	348	358	3	359	356	66.0
20-Feb	6	358	0	347	324	355	275	294	142	135	109	131	216	85	24	327	19	24	29	28	22	14	5	3	8.1
21-Feb	12	14	13	9	12	16	358	358	345	351	328	296	305	327	325	338	341	359	12	13	2	331	278	258	351.7
22-Feb	264	289	278	267	268	256	257	262	258	249	243	267	271	268	276	284	250	274	279	316	3	25	37	22	278.4
23-Feb	14	355	3	15	12	1	357	345	335	338	288	270	288	300	197	147	146	142	153	164	169	167	164	179	112.9
24-Feb	168	187	175	175	174	171	172	171	172	166	164	158	172	184	172	160	160	169	184	180	180	179	181	185	173.1
25-Feb	185	183	191	182	176	204	225	219	253	247	224	265	249	241	188	171	106	152	199	191	159	153	155	132	193.4
26-Feb	140	131	121	108	130	128	119	115	122	127	133	110	83	69	75	96	74	59	57	44	34	44	48	35	85.5
27-Feb	28	32	18	3	352	344	340	346	351	343	338	340	333	331	351	16	17	12	13	15	18	11	346	355	358.0
28-Feb	359	359	358	1	4	349	352	347	358	353	326	303	307	283	257	239	235	270	274	273	170	142	168	153	342.1
96.6 179.7 296.5 280.7 249.9 253.6 258.3 263.7 280.3 233.4 234.1 241.1 225.1 233.2 231.4 261.5 357.9 51.0 35.8 41.8 50.4 57.4 128.0 133.4																									
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**

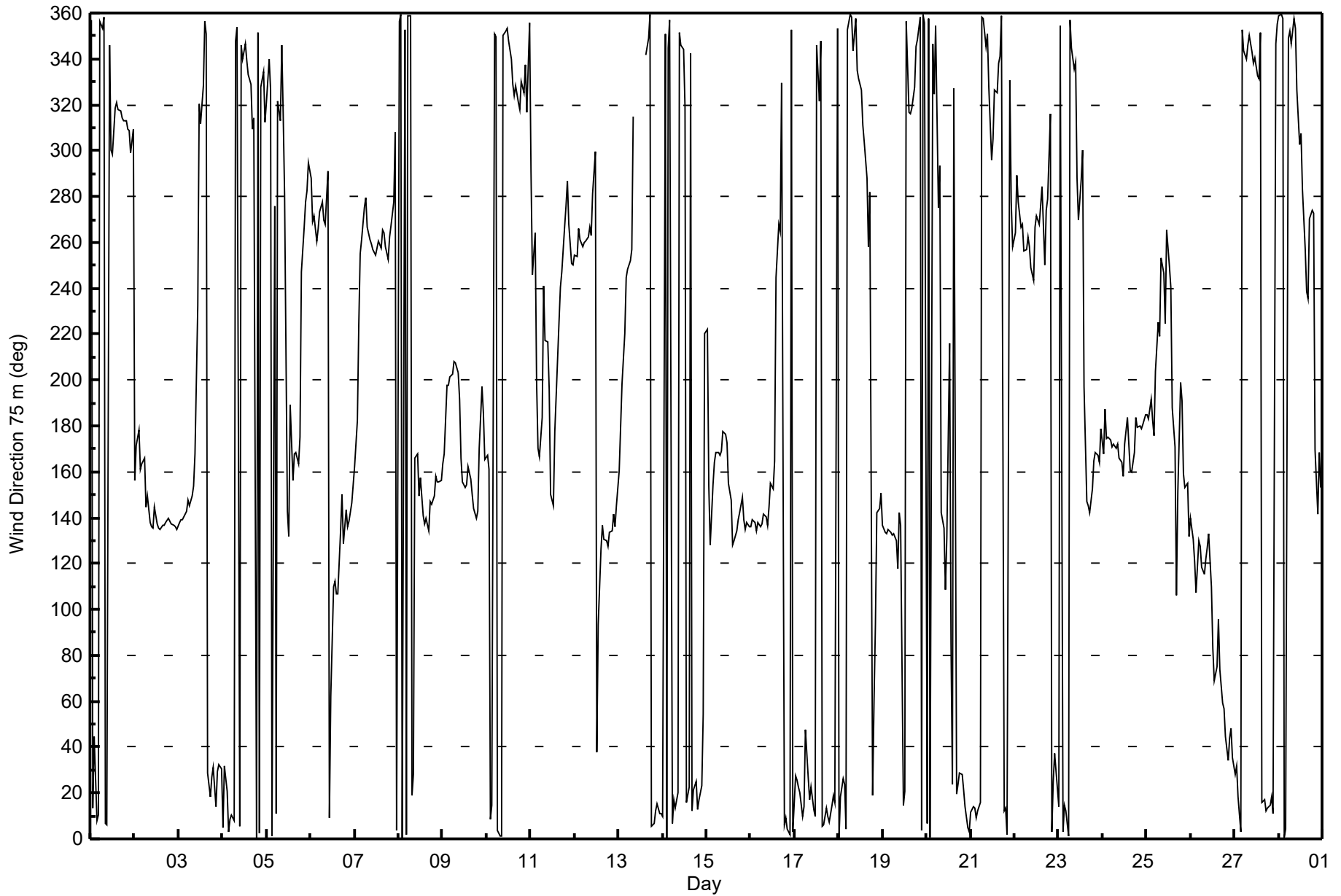
**Wind Direction 75 m (WD75m) - deg**  
**Mannix - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 672
Maximum Value: 108 deg on Feb 20 13:00	Hours of Data: 666
Minimum Value: 1 deg on Feb 23 21:00	Hours of Missing Data: 6
Percentiles: P <sub>1</sub> = 3 P <sub>10</sub> = 5 Q <sub>1</sub> = 6 Median = 9 Q <sub>3</sub> = 14 P <sub>90</sub> = 27 P <sub>99</sub> = 69	Hours of Calibration: 0
	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-Feb	10	9	23	7	7	9	6	8	7	7	12	13	12	11	11	13	16	15	6	5	5	12	7	13	23
2-Feb	61	7	6	4	6	4	7	7	4	4	3	8	5	3	4	6	7	7	6	6	5	5	5	5	61
3-Feb	6	5	5	6	7	6	4	6	5	8	60	22	27	16	11	14	8	6	7	12	11	9	9	44	60
4-Feb	9	10	9	5	5	5	18	9	6	11	9	11	14	10	10	23	7	20	7	7	17	12	18	19	23
5-Feb	15	21	40	54	35	35	32	41	55	70	82	96	36	23	25	17	6	4	7	23	8	8	12	10	96
6-Feb	8	5	9	7	6	5	5	3	2	31	29	56	29	24	19	17	8	11	16	4	6	5	6	6	56
7-Feb	27	33	38	6	7	13	8	8	7	6	8	9	10	9	8	7	7	6	6	6	6	6	32	8	38
8-Feb	7	5	5	4	5	21	12	6	9	67	12	11	11	10	12	6	6	5	8	3	11	6	3	3	67
9-Feb	4	7	10	11	10	12	7	7	10	13	6	5	4	6	6	3	4	6	4	5	11	7	12	6	13
10-Feb	5	13	67	6	8	10	4	7	9	9	8	8	8	14	7	6	9	8	6	10	9	17	14	31	67
11-Feb	16	12	35	32	3	6	13	18	22	15	19	10	7	14	8	12	7	6	8	6	8	13	11	6	35
12-Feb	7	6	7	6	5	5	6	5	4	5	10	8	38	29	19	4	7	8	10	8	4	11	6	8	38
13-Feb	6	10	13	15	9	7	7	7	41	UO	UO	UO	UO	UO	UO	7	8	11	9	9	6	7	6	8	41
14-Feb	13	11	23	10	11	12	6	8	12	18	20	23	48	23	14	16	10	9	11	14	11	12	72	69	72
15-Feb	55	33	20	8	5	7	6	7	9	7	12	18	26	16	14	10	11	6	3	3	4	3	4	3	55
16-Feb	4	8	4	3	3	4	7	4	6	5	13	10	6	7	62	27	6	27	5	8	8	9	9	16	62
17-Feb	9	9	9	8	16	24	21	9	14	12	11	12	23	9	16	10	9	5	7	5	7	5	8	9	24
18-Feb	5	6	9	6	9	7	9	11	16	39	33	9	10	13	10	21	11	27	20	7	31	8	8	5	39
19-Feb	5	3	4	3	3	5	5	6	20	17	35	38	28	55	20	9	9	13	9	9	10	4	7	10	55
20-Feb	6	5	6	22	23	24	50	43	43	22	26	49	108	83	92	13	13	7	24	9	4	5	5	7	108
21-Feb	8	6	7	9	8	11	11	12	10	9	16	12	11	15	11	9	12	12	9	6	25	16	26	8	26
22-Feb	12	5	17	9	16	7	12	5	5	8	24	21	39	22	14	29	10	7	12	16	14	7	6	11	39
23-Feb	9	13	6	4	4	6	6	7	6	5	24	12	56	60	56	30	11	6	3	3	1	2	2	9	60
24-Feb	9	7	7	5	4	2	2	2	3	3	4	8	14	7	10	7	6	7	6	7	6	5	4	5	14
25-Feb	4	3	14	12	10	17	10	30	22	15	20	9	11	10	56	51	14	28	7	11	8	7	7	6	56
26-Feb	5	12	14	13	10	13	14	14	16	17	14	15	17	8	12	12	15	8	7	8	8	13	9	9	17
27-Feb	6	7	5	6	6	7	6	6	8	7	8	9	9	9	19	11	8	7	7	7	7	9	12	11	19
28-Feb	7	5	6	6	7	7	7	14	13	52	11	12	18	25	59	13	16	13	21	54	38	17	10	5	59
	61	33	67	54	35	35	50	43	55	70	82	96	108	83	92	51	16	28	24	54	38	17	72	69	

Diurnal Maximum

UO - Unstable Operation





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

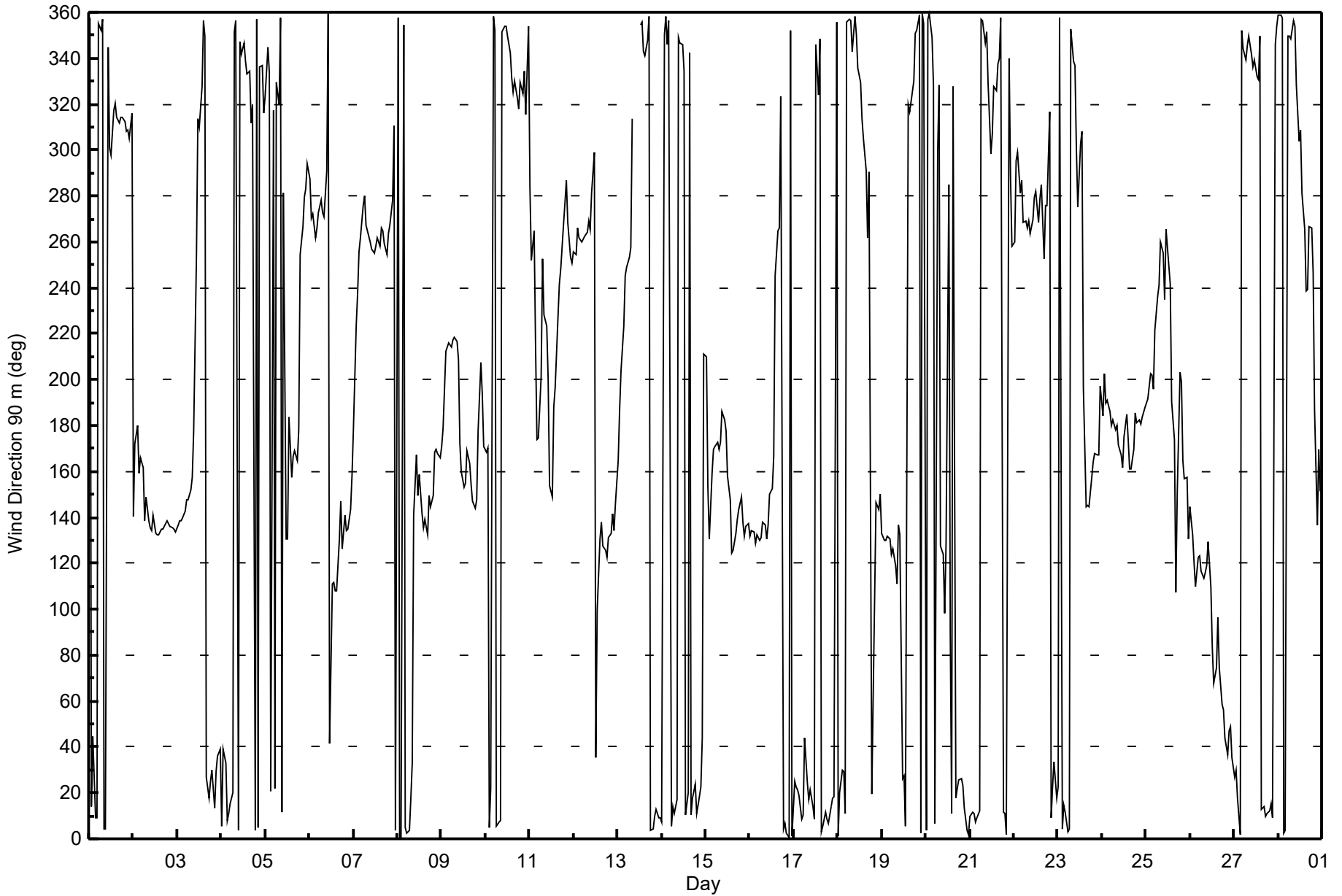
**Wind Direction 90 m (WD90m) - deg**  
**Mannix - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 672
Maximum Value: 93 deg on Feb 20 13:00	Hours of Data: 669
Minimum Value: 2 deg on Feb 19 05:00	Hours of Missing Data: 3
Percentiles: P <sub>1</sub> = 2 P <sub>10</sub> = 4 Q <sub>1</sub> = 6 Median = 8 Q <sub>3</sub> = 13 P <sub>90</sub> = 24 P <sub>99</sub> = 81	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-Feb	7	8	14	5	6	8	5	7	6	6	11	13	11	10	9	11	13	13	6	4	5	7	5	16	16
2-Feb	68	5	5	4	7	10	7	6	5	4	3	5	4	2	4	6	6	6	6	6	5	5	5	5	68
3-Feb	6	5	5	5	6	5	3	5	5	11	43	19	23	15	10	13	7	6	7	11	10	9	11	45	45
4-Feb	9	11	10	6	6	7	16	9	5	9	9	10	14	10	11	25	7	17	6	7	14	13	17	21	25
5-Feb	16	21	41	46	60	34	30	41	36	74	82	92	33	22	24	15	6	4	6	25	8	8	11	9	92
6-Feb	7	5	9	7	6	5	4	3	3	29	22	78	28	23	14	12	7	8	13	3	5	5	6	7	78
7-Feb	36	35	29	5	7	13	7	7	7	6	8	8	9	9	7	7	6	6	6	6	6	5	31	7	36
8-Feb	6	4	5	5	5	18	9	7	16	55	7	9	11	9	10	5	7	4	6	3	11	9	2	3	55
9-Feb	5	10	9	9	9	8	5	8	8	12	11	5	3	7	6	4	5	6	3	7	10	8	12	7	12
10-Feb	6	9	81	10	8	8	3	7	11	6	6	7	7	13	7	6	8	8	5	9	8	16	13	31	81
11-Feb	17	8	23	22	4	8	15	15	20	15	18	10	8	12	8	12	6	6	8	6	7	12	11	5	23
12-Feb	6	6	6	6	5	5	6	5	4	4	10	11	46	27	16	4	5	5	6	8	4	12	6	8	46
13-Feb	7	11	12	14	9	7	7	6	41	UO	UO	UO	10	10	8	6	8	10	8	8	6	7	6	7	41
14-Feb	12	10	21	10	10	11	6	8	12	18	19	21	47	19	13	14	9	8	10	11	9	12	69	88	88
15-Feb	68	29	10	10	5	10	5	6	6	5	12	15	27	16	14	10	11	5	3	3	4	3	4	3	68
16-Feb	3	7	4	4	3	4	8	4	5	4	11	10	7	8	59	21	4	28	5	7	7	9	9	15	59
17-Feb	9	9	8	7	16	21	22	9	14	12	10	12	20	10	14	10	8	5	6	5	7	5	7	8	22
18-Feb	5	4	6	4	10	7	9	6	10	30	29	9	10	12	10	18	12	35	21	9	33	11	6	7	35
19-Feb	3	2	3	3	2	5	5	5	11	15	30	36	30	55	21	10	10	13	7	8	8	4	6	9	55
20-Feb	5	5	5	19	22	22	69	60	38	20	18	56	93	76	86	12	12	6	20	7	3	5	5	7	93
21-Feb	7	5	6	8	8	9	10	10	10	9	14	12	11	14	10	8	11	11	8	4	17	14	27	6	27
22-Feb	11	10	11	8	12	4	9	4	6	8	19	14	37	21	15	26	10	7	11	19	13	8	5	9	37
23-Feb	8	17	5	3	4	4	4	10	4	4	24	16	59	52	51	36	11	7	2	3	2	2	6	11	59
24-Feb	14	7	8	6	5	4	2	3	4	3	4	7	13	7	10	7	6	7	6	6	6	5	4	5	14
25-Feb	4	4	13	11	14	13	9	22	9	9	16	9	11	9	55	48	9	28	6	11	9	10	6	4	55
26-Feb	7	11	7	7	7	9	9	10	13	13	14	12	18	9	11	11	15	7	7	8	8	13	10	8	18
27-Feb	6	7	5	6	6	6	5	6	8	6	8	8	9	8	18	10	6	6	6	6	6	8	11	10	18
28-Feb	6	5	5	6	6	6	6	10	11	29	10	12	15	24	83	13	16	11	31	91	34	15	8	5	91
	68	35	81	46	60	34	69	60	41	74	82	92	93	76	86	48	16	35	31	91	34	16	69	88	

Diurnal Maximum

UO - Unstable Operation







Maximum Value: 1.3 km/h on Feb 24 17:00      Maximum Daily Average: 0.7 km/h on Feb 2																						Hours in Service: 672 Hours of Data: 672				
Minimum Value: -1.5 km/h on Feb 13 12:00      Minimum Daily Average: -0.6 km/h on Feb 13 Maximum Diurnal Average: 0.1 km/h at hour 8      Minimum Diurnal Average: 0.0 km/h at hour 19 Monthly Average: 0.07 km/h      Percentiles: $P_1 = -1.0$ $P_{10} = -0.4$ $Q_1 = -0.2$ Median = 0.0 $Q_3 = 0.3$ $P_{90} = 0.6$ $P_{99} = 1.0$																						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-Feb	-0.2	-0.4	-0.1	-0.2	-0.5	-0.3	-0.4	-0.3	-0.7	-0.5	-0.4	-0.2	0.0	-0.4	-0.2	-0.1	-0.1	0.1	-0.1	-0.2	-0.2	0.0	0.0	0.1	-0.2	0.1
2-Feb	0.3	0.5	0.4	0.5	0.7	0.7	0.6	0.6	0.5	0.6	0.4	0.4	0.4	0.6	0.7	0.8	0.8	1.0	1.0	1.0	0.7	0.9	1.0	0.9	0.7	1.0
3-Feb	0.9	0.8	0.8	0.7	0.7	0.6	0.7	0.6	0.5	0.3	0.3	0.1	0.0	-0.3	-0.4	-0.2	0.2	-0.3	-0.1	-0.2	-0.3	0.2	0.0	0.0	0.2	0.9
4-Feb	-0.2	-0.3	-0.2	-0.1	-0.3	-0.3	-0.1	-0.1	-0.1	-0.3	-0.2	-0.1	-0.2	-0.1	-0.2	0.0	-0.1	0.0	-0.1	-0.2	-0.2	0.0	0.0	0.0	-0.1	0.0
5-Feb	-0.1	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	0.6	0.4	0.4	0.5	0.3	0.0	0.1	-0.2	-0.1	-0.5	0.1	0.6
6-Feb	-0.4	-0.1	0.0	0.0	0.0	0.0	-0.2	-0.1	-0.1	-0.1	-0.1	0.1	0.0	0.3	0.3	0.3	0.4	0.1	0.3	0.4	0.4	0.4	0.4	0.4	0.1	0.4
7-Feb	0.2	0.5	0.3	0.0	-0.2	-0.4	-0.4	-0.1	-0.2	-0.1	0.0	0.0	-0.2	-0.4	-0.3	-0.2	-0.1	-0.2	-0.2	-0.2	-0.1	-0.1	-0.3	-0.5	-0.1	0.5
8-Feb	-0.3	-0.3	-0.2	-0.4	-0.3	-0.1	0.0	0.0	0.0	-0.2	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.1	0.4	0.5	0.5	0.5	0.5	0.2	0.5
9-Feb	0.6	0.4	0.2	0.3	0.3	0.3	0.2	0.4	0.5	0.4	0.7	0.8	0.9	1.0	0.8	0.7	0.5	0.3	0.3	0.2	0.1	0.2	0.3	0.5	0.5	1.0
10-Feb	0.5	0.1	-0.1	-0.3	-0.2	-0.2	-0.3	0.0	-0.3	-0.2	-0.1	-0.2	-0.4	0.0	-0.4	-0.4	-0.2	-0.3	-0.3	-0.3	-0.2	-0.2	-0.1	-0.1	-0.2	0.5
11-Feb	0.0	0.1	0.1	0.1	0.4	0.7	0.6	0.1	0.0	0.1	0.2	0.6	0.8	0.8	0.2	0.0	-0.2	-0.2	-0.1	-0.1	-0.3	0.0	0.0	-0.3	0.2	0.8
12-Feb	-0.2	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	0.0	0.0	-0.1	0.0	0.0	0.1	0.3	0.6	0.6	0.8	0.6	0.9	0.9	0.7	0.9	0.9	0.3	0.9
13-Feb	1.0	0.8	0.4	0.2	-0.2	-0.3	-0.2	0.0	-0.6	-0.9	-1.2	-1.5	-1.4	-0.9	-1.1	-1.1	-1.3	-1.1	-0.9	-0.7	-1.0	-0.8	-0.9	-0.6	-0.6	1.0
14-Feb	-0.3	-0.3	-0.1	-0.2	-0.3	-0.2	-0.3	-0.3	-0.1	0.0	0.1	0.3	0.3	0.1	0.1	0.0	-0.3	0.1	-0.1	-0.1	-0.1	-0.1	0.1	0.0	-0.1	0.3
15-Feb	0.0	0.1	0.2	0.4	0.3	0.1	0.0	0.1	0.4	0.3	0.3	0.3	0.5	0.4	0.5	0.3	0.4	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.4	0.6
16-Feb	0.5	0.4	0.5	0.4	0.6	0.7	0.5	0.7	0.6	0.1	0.2	0.3	0.5	0.2	0.2	0.2	0.1	-0.3	-0.6	-0.7	-0.7	-0.4	-0.1	-0.1	0.2	0.7
17-Feb	-0.1	0.1	0.0	-0.1	-0.1	0.1	0.4	0.1	-0.1	0.0	-0.1	-0.1	0.0	-0.1	0.0	-0.5	-0.3	-0.5	-0.3	-0.6	-0.5	-0.5	-0.3	-0.2	-0.1	0.4
18-Feb	-0.5	-0.5	-0.3	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	0.1	-0.1	-0.2	-0.3	-0.2	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.2	0.2	0.5	-0.1	0.5
19-Feb	0.6	0.6	0.6	0.5	0.4	0.4	0.5	0.5	0.2	0.3	0.1	0.0	0.2	0.2	-0.1	-0.2	-0.3	-0.2	-0.1	-0.2	-0.3	-0.5	-0.4	-0.5	0.1	0.6
20-Feb	-0.4	-0.3	-0.4	-0.1	-0.2	0.0	-0.1	-0.1	0.1	0.2	0.2	0.2	0.6	0.0	0.3	0.0	-0.3	-0.2	0.1	-0.1	-0.2	-0.2	-0.6	-0.6	-0.1	0.6
21-Feb	-0.6	-0.8	-0.4	-0.1	-0.3	-0.1	0.0	-0.1	-0.3	-0.4	0.0	-0.2	-0.4	-0.8	-0.3	-0.3	-0.1	-0.3	-0.5	-0.4	-0.2	-0.1	0.1	0.1	-0.3	0.1
22-Feb	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.6	0.3	0.1	0.0	0.0	-0.2	-0.1	0.0	0.0	-0.1	-0.2	-0.1	0.0	0.1	0.0	0.0	0.6
23-Feb	0.1	0.0	-0.1	-0.2	-0.6	-0.2	-0.1	0.1	0.0	0.0	0.2	-0.5	-0.1	0.3	0.4	0.2	0.4	0.6	0.5	0.3	0.2	0.3	0.4	0.6	0.1	0.6
24-Feb	0.4	0.3	0.3	0.6	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.6	0.3	0.7	1.1	1.3	0.6	0.2	0.2	0.4	0.3	0.4	0.2	0.6	1.3
25-Feb	0.3	0.4	0.6	0.2	0.5	0.4	0.2	0.2	0.2	0.1	0.5	0.0	0.0	0.0	0.3	0.2	0.3	0.2	0.1	0.2	0.4	0.4	0.7	0.6	0.3	0.7
26-Feb	0.8	0.6	0.5	0.4	0.4	0.5	0.9	0.5	0.5	0.1	0.5	0.9	0.3	0.2	0.3	0.3	0.5	0.0	0.2	0.0	-0.1	-0.1	0.0	0.0	0.3	0.9
27-Feb	0.0	0.0	-0.3	-0.2	-0.6	-0.6	-0.6	-0.5	-0.4	-0.8	-0.2	-0.2	-0.3	-0.3	-0.3	0.0	-0.2	-0.4	-0.8	-0.4	-0.4	-0.6	-0.3	-0.4	-0.4	0.0
28-Feb	-0.1	-0.2	-0.2	-0.3	-0.2	-0.2	0.0	0.0	0.1	0.2	-0.2	0.0	0.0	0.2	-0.1	-0.1	0.0	-0.1	-0.1	0.0	0.1	0.0	0.1	0.4	0.0	0.4
																								Diurnal Average		
																								Diurnal Maximum		



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.3 km/h on Feb 13 13:00 Minimum Value: 0.1 km/h on Feb 15 01:00 Percentiles: $P_1 = 0.2$ $P_{10} = 0.4$ $Q_1 = 0.7$ Median = 1.0 $Q_3 = 1.4$ $P_{90} = 2.1$ $P_{99} = 3.4$																								Hours in Service: 672 Hours of Data: 672 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-Feb	1.2	1.1	0.4	0.6	1.3	1.2	1.5	1.2	1.6	1.5	1.5	1.2	1.5	1.3	1.2	1.0	0.6	0.5	0.7	0.5	0.4	0.3	0.1	0.2	1.6
2-Feb	0.4	0.4	0.7	0.9	0.9	0.9	0.8	0.8	0.9	1.2	1.0	0.9	1.0	1.8	2.4	3.0	2.7	2.9	2.9	2.8	2.8	2.7	2.6	2.5	3.0
3-Feb	2.3	2.2	2.3	1.7	1.5	1.2	1.2	1.1	0.8	0.9	0.7	0.8	0.8	1.1	1.4	1.1	1.5	1.2	1.3	1.2	1.0	1.0	0.8	0.7	2.3
4-Feb	1.0	0.7	0.6	0.8	0.9	1.1	0.7	0.7	1.0	1.1	1.1	1.0	0.9	1.0	0.9	0.6	0.6	0.7	0.7	0.8	0.7	0.7	0.5	1.1	
5-Feb	0.5	0.5	0.4	0.4	0.5	0.5	0.6	0.7	0.6	0.4	0.8	0.8	0.6	0.8	0.9	0.9	0.7	0.8	0.5	0.2	0.3	1.0	2.2	2.6	
6-Feb	2.5	1.7	1.5	1.1	1.0	1.0	0.9	0.6	0.6	0.9	0.9	0.8	0.7	1.0	0.9	1.1	1.1	0.6	0.9	0.9	0.8	0.8	0.7	0.7	2.5
7-Feb	0.7	0.8	0.6	2.0	2.0	2.8	2.2	1.9	1.9	1.8	2.2	2.6	2.6	2.8	3.0	2.6	2.2	1.9	1.9	1.9	1.1	0.7	1.3	1.7	3.0
8-Feb	1.6	1.3	0.8	0.9	0.5	0.4	0.2	0.2	0.2	0.4	0.7	1.0	0.9	0.8	0.9	0.7	0.7	0.4	0.4	0.5	0.8	0.9	1.0	1.1	1.6
9-Feb	1.4	1.1	0.6	0.9	0.7	0.5	0.8	0.6	0.5	0.7	1.1	1.2	1.4	1.6	1.0	0.9	0.8	0.6	0.4	0.4	0.4	0.4	0.5	0.4	1.6
10-Feb	0.5	0.5	0.6	0.7	0.7	1.4	1.6	1.0	1.2	1.2	1.2	1.1	1.3	1.1	1.5	1.4	1.3	1.2	1.2	1.3	1.0	0.8	0.7	0.4	1.6
11-Feb	0.4	0.3	0.2	0.4	0.7	0.9	0.9	0.5	0.5	0.6	0.8	1.0	1.1	0.9	1.2	1.9	2.2	1.7	1.7	1.8	1.6	0.5	1.2	2.5	2.5
12-Feb	2.6	2.9	2.0	1.5	1.6	1.6	1.6	1.1	0.8	0.4	0.6	0.8	0.9	0.7	0.6	0.8	1.1	1.6	1.6	1.8	1.8	1.4	2.2	2.0	2.9
13-Feb	1.6	1.1	1.4	1.5	2.8	2.8	2.7	2.3	2.5	3.5	4.0	4.0	4.3	3.8	3.7	3.2	3.7	3.4	2.9	2.4	2.9	2.9	2.4	2.4	4.3
14-Feb	2.4	2.1	1.7	1.0	1.1	1.2	1.5	1.2	1.1	0.8	0.9	1.1	0.9	1.0	1.1	1.0	1.1	1.2	1.2	0.8	1.0	0.9	0.6	0.1	2.4
15-Feb	0.1	0.1	0.3	0.4	0.3	0.3	0.4	0.4	0.7	0.8	0.8	0.9	1.2	1.2	1.1	1.0	0.8	0.7	0.4	0.3	1.0	1.1	0.9	0.6	1.2
16-Feb	0.9	1.0	0.9	1.2	1.2	1.1	1.1	1.2	1.4	1.0	1.1	1.0	1.0	0.8	0.7	0.5	0.2	1.1	2.0	2.4	2.1	1.7	1.4	1.3	2.4
17-Feb	0.9	1.0	1.1	1.3	0.7	0.7	1.0	1.1	1.0	1.1	1.1	1.3	1.3	1.2	1.4	1.3	1.7	1.8	1.7	1.6	1.6	1.4	0.8	0.4	1.8
18-Feb	1.1	0.9	0.7	0.5	0.4	0.7	0.7	0.6	0.5	0.7	0.8	1.0	1.2	1.2	1.1	0.9	0.5	0.2	0.2	0.3	0.2	0.2	0.3	0.4	1.2
19-Feb	0.4	0.6	0.7	0.6	0.5	0.9	0.6	0.7	0.3	0.9	0.8	0.9	1.1	1.1	0.8	0.9	0.9	1.0	0.7	0.6	1.2	1.4	1.3	1.3	1.4
20-Feb	1.3	1.1	1.4	1.0	0.6	0.5	0.5	0.3	0.4	0.5	0.7	0.8	1.0	0.9	1.2	1.0	1.4	1.3	1.0	0.6	0.4	0.4	1.7	2.4	2.4
21-Feb	2.5	2.7	2.2	1.9	1.8	1.7	1.0	1.3	1.5	1.5	1.4	1.4	1.5	1.8	1.8	2.1	1.6	0.9	1.0	1.2	0.7	0.3	0.3	0.2	2.7
22-Feb	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.7	0.9	0.7	0.6	1.1	1.2	1.1	0.9	0.5	0.3	0.3	0.2	0.2	0.1	0.2	0.2	1.2
23-Feb	0.2	0.2	0.3	0.5	1.1	0.6	0.4	0.2	0.1	0.3	0.8	0.8	1.0	1.0	1.2	0.9	0.7	0.7	0.4	0.6	0.6	0.4	0.6	0.5	1.2
24-Feb	0.7	0.8	1.1	0.8	0.8	1.1	1.0	1.0	1.2	1.4	1.6	1.6	2.3	3.1	2.5	1.9	2.2	2.1	3.0	2.3	2.2	1.9	1.8	1.7	3.1
25-Feb	1.3	1.2	0.8	0.8	0.9	0.8	0.6	0.6	0.4	0.5	1.0	1.1	1.4	1.7	1.2	1.1	1.0	0.8	0.9	0.4	0.6	0.6	0.7	1.3	1.7
26-Feb	1.1	1.0	0.8	0.7	0.8	0.8	1.6	1.0	0.9	0.6	1.2	1.6	1.4	1.4	1.1	1.2	1.4	1.4	1.5	1.1	0.8	1.0	1.1	1.1	1.6
27-Feb	1.0	0.9	1.1	1.1	1.4	1.8	2.0	2.3	1.8	2.1	1.9	1.8	1.9	2.0	2.0	1.7	1.9	1.6	1.9	2.0	2.3	2.0	1.5	1.6	2.3
28-Feb	0.8	1.0	1.0	1.0	0.4	0.4	0.5	0.4	0.5	0.6	0.9	1.0	1.2	1.2	1.1	0.9	0.7	0.3	0.2	0.1	0.2	0.2	0.2	0.5	1.2
Diurnal Maximum																									



Maximum Value: 1.5 km/h on Feb 26 12:00		Maximum Daily Average: 0.5 km/h on Feb 2		Hours in Service: 672																						
Minimum Value: -1.4 km/h on Feb 13 16:00		Minimum Daily Average: -0.6 km/h on Feb 7		Hours of Data: 668																						
Maximum Diurnal Average: 0.1 km/h at hour 1		Minimum Diurnal Average: -0.1 km/h at hour 10		Hours of Missing Data: 4																						
Monthly Average: -0.02 km/h		Percentiles: P <sub>1</sub> = -1.0 P <sub>10</sub> = -0.5 Q <sub>1</sub> = -0.3 Median = -0.1 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: 99.4																						
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-Feb	-0.2	-0.4	0.0	-0.3	-0.4	-0.2	-0.3	-0.4	-0.4	-0.6	-0.5	-0.2	0.1	-0.5	-0.3	-0.3	-0.3	-0.1	-0.3	-0.5	-0.5	-0.3	-0.2	-0.1	-0.3	0.1
2-Feb	0.2	0.3	0.3	0.6	0.8	0.6	0.6	0.5	0.7	0.8	0.4	0.2	0.2	0.7	0.4	0.4	0.6	0.9	0.7	0.7	0.4	0.5	0.6	0.4	0.5	0.9
3-Feb	0.9	0.8	0.7	0.5	0.5	0.4	0.5	0.5	0.4	0.3	0.1	0.0	-0.1	-0.4	-0.5	-0.2	0.5	0.0	0.2	0.0	-0.2	0.2	0.1	0.0	0.2	0.9
4-Feb	-0.2	-0.2	-0.1	-0.1	-0.3	-0.3	-0.2	-0.3	-0.3	-0.2	-0.2	0.0	-0.1	0.3	-0.3	-0.2	-0.2	-0.1	-0.1	-0.2	-0.3	-0.1	-0.1	-0.2	-0.2	0.3
5-Feb	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	0.0	-0.1	0.0	-0.2	0.1	0.1	0.0	-0.2	0.4	0.1	0.2	0.3	0.0	-0.3	-0.3	-0.8	-0.5	-0.7	-0.1	0.4
6-Feb	-0.8	-0.7	-0.6	-0.5	-0.4	-0.3	-0.6	-0.6	-0.6	-0.5	0.0	0.1	-0.2	0.3	0.5	0.5	0.4	0.0	0.0	0.3	0.2	0.3	0.4	0.4	-0.1	0.5
7-Feb	0.1	0.5	0.0	-0.9	-0.7	-1.0	-0.8	-0.6	-0.7	-0.7	-0.6	-0.6	-0.6	-1.1	-1.0	-0.6	-0.8	-0.9	-1.0	-0.8	-0.7	-0.6	-0.5	-0.4	-0.6	0.5
8-Feb	-0.3	-0.4	-0.2	-0.4	-0.2	-0.1	-0.2	-0.1	0.0	-0.2	-0.1	0.2	0.1	0.3	0.3	0.2	0.5	0.3	0.2	0.5	0.5	0.5	0.7	0.9	0.1	0.9
9-Feb	0.8	0.4	-0.3	0.2	0.0	-0.2	-0.2	0.1	0.1	0.2	0.5	0.7	0.6	0.9	0.7	0.7	0.5	0.5	0.3	0.3	0.3	0.1	0.1	0.4	0.3	0.9
10-Feb	0.5	0.2	-0.1	-0.4	-0.4	-0.4	-0.1	-0.2	-0.3	-0.3	-0.2	-0.1	-0.4	0.0	-0.3	-0.4	-0.2	-0.5	-0.4	-0.5	-0.1	-0.3	-0.2	-0.2	-0.2	0.5
11-Feb	-0.1	-0.1	-0.1	0.0	0.1	0.5	0.5	-0.1	-0.2	-0.2	0.1	0.4	0.7	0.6	0.1	-0.6	-1.1	-0.8	-0.6	-0.6	-0.7	-0.4	-0.4	-0.9	-0.2	0.7
12-Feb	-0.9	-0.9	-0.7	-0.7	-0.6	-0.7	-0.7	-0.5	-0.3	-0.3	-0.3	-0.3	-0.1	0.0	0.3	0.8	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.8	0.0	0.8
13-Feb	1.0	0.4	-0.2	-0.5	-1.0	-1.0	-0.9	-0.7	-0.8	UO	UO	UO	UO	-0.2	-1.1	-1.4	-1.2	-0.7	-0.2	-0.1	-0.4	-0.3	-0.6	-0.2	-0.5	1.0
14-Feb	0.0	-0.1	-0.1	-0.6	-0.2	-0.1	-0.1	-0.2	-0.1	-0.1	0.0	0.4	0.4	0.4	0.1	-0.2	0.5	0.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.5
15-Feb	-0.1	0.0	0.1	0.3	0.3	0.2	0.0	-0.1	0.2	0.2	0.2	-0.1	0.3	0.1	0.1	0.3	0.6	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.2	0.6
16-Feb	0.4	0.5	0.5	0.3	0.4	0.6	0.4	0.5	0.5	0.1	0.0	0.0	0.3	0.1	0.0	-0.1	-0.2	-0.4	-0.4	-0.2	-0.2	-0.3	-0.2	-0.1	0.1	0.6
17-Feb	0.1	0.3	0.2	0.0	-0.1	0.1	0.6	0.6	0.1	0.1	-0.2	-0.1	0.0	-0.2	0.0	-0.4	-0.2	-0.2	-0.2	-0.5	-0.3	-0.2	-0.3	-0.2	0.0	0.6
18-Feb	-0.4	-0.4	-0.1	-0.3	-0.2	-0.3	-0.4	-0.3	-0.2	0.2	-0.2	-0.2	-0.3	-0.4	-0.2	-0.2	-0.2	-0.2	-0.1	0.1	0.1	0.1	0.3	0.5	-0.1	0.5
19-Feb	0.5	0.9	0.9	0.6	0.6	0.5	0.7	0.7	0.2	0.2	0.1	-0.2	0.0	0.2	-0.3	-0.3	-0.5	-0.3	-0.3	-0.4	-0.4	-0.4	-0.5	-0.6	0.1	0.9
20-Feb	-0.3	-0.2	-0.3	-0.3	-0.3	-0.2	-0.3	-0.2	0.0	0.0	0.1	0.1	0.8	0.0	0.7	0.0	0.0	0.1	-0.1	-0.1	-0.1	-0.1	-0.5	-0.5	-0.1	0.8
21-Feb	-0.4	-0.5	0.0	0.1	0.1	0.3	0.0	-0.1	-0.5	-0.8	-0.1	-0.2	-0.7	-1.0	-0.4	-0.4	-0.2	-0.5	-0.6	-0.4	-0.3	-0.3	-0.1	-0.1	-0.3	0.3
22-Feb	-0.2	-0.3	-0.2	-0.1	0.0	-0.2	-0.2	-0.2	-0.2	0.0	0.3	-0.1	0.0	-0.2	-0.4	-0.2	-0.2	-0.1	-0.2	-0.3	-0.1	-0.1	0.0	0.0	-0.1	0.3
23-Feb	0.0	-0.1	-0.2	-0.3	-0.5	-0.4	-0.3	-0.2	-0.3	-0.2	0.1	-0.6	-0.2	0.2	0.7	0.0	0.1	0.6	0.4	0.1	0.0	0.2	0.3	0.3	0.0	0.7
24-Feb	0.4	0.0	0.2	0.6	0.8	0.9	0.8	0.8	0.8	0.8	0.7	0.9	0.5	0.3	0.8	1.1	1.0	0.4	-0.1	0.3	0.2	0.2	0.3	0.1	0.5	1.1
25-Feb	0.1	0.1	0.2	0.1	0.3	0.0	-0.3	-0.1	-0.1	-0.2	0.2	-0.3	0.0	-0.3	0.2	0.3	0.7	0.2	-0.2	0.1	0.5	0.5	0.6	0.6	0.1	0.7
26-Feb	0.8	0.6	0.5	0.5	0.4	0.4	0.8	0.7	0.6	0.2	0.4	1.5	0.4	0.6	0.5	0.0	0.6	0.4	0.5	-0.1	0.0	0.1	0.2	0.1	0.4	1.5
27-Feb	0.1	0.3	-0.1	-0.3	-0.7	-0.6	-0.8	-0.8	-0.5	-1.1	-0.2	-0.1	-0.1	-0.5	0.1	0.4	0.1	-0.2	-0.5	-0.2	0.1	-0.2	-0.3	-0.5	-0.3	0.4
28-Feb	0.0	-0.3	-0.3	-0.3	-0.3	-0.4	-0.1	-0.1	-0.1	0.1	-0.4	-0.1	-0.2	0.3	-0.3	-0.3	-0.1	-0.1	-0.1	0.0	0.0	0.1	0.1	0.4	-0.1	0.4
																								Diurnal Average		
																								Diurnal Maximum		
UO - Unstable Operation																										



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

**Vertical Wind Speed 45 m (VW45m) - km/h**  
**Mannix - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.1 km/h on Feb 13 15:00		Hours in Service: 672 Hours of Data: 668 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.4																								
Minimum Value: 0.1 km/h on Feb 15 01:00  Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.3 Q <sub>1</sub> = 0.6 Median = 1.0 Q <sub>3</sub> = 1.5 P <sub>90</sub> = 2.3 P <sub>99</sub> = 3.4																										
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-Feb	1.5	1.0	0.4	0.6	1.4	1.2	1.5	1.2	1.7	1.3	1.6	1.4	1.8	1.6	1.5	1.2	0.8	0.6	0.6	0.4	0.4	0.4	0.3	0.2	1.8	
2-Feb	0.3	0.4	0.5	0.9	0.7	0.8	0.4	0.6	1.0	1.1	1.2	1.0	1.0	2.0	2.6	3.5	3.3	3.4	3.3	3.3	3.0	2.9	2.8	2.8	3.5	
3-Feb	2.8	2.6	2.5	2.1	1.7	1.4	1.3	1.1	0.8	0.8	0.6	0.7	0.8	1.4	1.3	1.1	1.5	1.1	1.5	1.2	1.0	1.3	0.9	0.8	2.8	
4-Feb	0.8	0.5	0.5	0.7	0.7	0.7	0.6	0.6	1.0	1.1	1.2	1.2	1.1	1.3	0.9	0.6	0.6	0.6	0.7	0.6	0.7	0.6	0.7	0.5	1.3	
5-Feb	0.5	0.4	0.3	0.3	0.4	0.5	0.6	0.6	0.6	0.6	0.3	0.7	0.8	0.7	1.0	0.9	0.5	0.9	0.4	0.4	0.6	0.6	2.4	2.6	2.6	
6-Feb	2.7	1.8	1.5	1.2	1.3	1.1	0.9	0.6	0.6	0.9	1.1	0.9	0.7	1.2	1.1	1.2	1.3	0.7	1.2	0.9	0.9	1.0	0.6	0.7	2.7	
7-Feb	0.7	1.1	1.0	2.3	2.4	3.2	2.5	2.5	2.4	2.2	2.7	3.1	3.3	3.3	3.5	3.2	2.7	2.1	1.9	2.1	1.5	0.8	1.4	1.7	3.5	
8-Feb	1.6	1.2	1.0	0.7	0.3	0.3	0.2	0.3	0.2	0.2	0.7	1.2	1.0	1.0	1.1	0.7	0.9	0.3	0.3	0.4	0.5	0.6	0.7	0.8	1.6	
9-Feb	1.0	0.8	0.9	0.9	0.8	0.8	0.6	0.4	0.4	0.7	0.9	1.0	1.3	1.5	0.9	0.7	0.7	0.6	0.5	0.4	0.4	0.4	0.7	0.5	1.5	
10-Feb	0.4	0.5	0.5	0.5	0.7	1.4	1.3	1.1	1.0	1.3	1.2	1.2	1.4	1.3	1.7	1.7	1.5	1.3	1.3	1.4	1.2	0.8	0.7	0.4	1.7	
11-Feb	0.3	0.2	0.1	0.2	0.6	0.8	0.8	0.6	0.7	0.4	1.0	1.1	1.4	1.1	1.4	2.2	2.3	1.8	2.1	2.0	1.9	0.7	1.7	2.7	2.7	
12-Feb	2.9	3.1	2.4	1.6	1.6	1.5	1.6	1.3	0.6	0.4	0.6	0.6	0.9	0.7	1.0	1.0	0.7	1.4	1.5	1.8	1.6	1.6	2.2	2.1	3.1	
13-Feb	1.6	1.2	1.6	2.0	3.2	3.3	2.9	2.6	2.4	UO	UO	UO	UO	4.1	4.1	3.7	3.9	3.6	3.0	2.6	3.0	3.1	2.5	2.3	4.1	
14-Feb	2.9	2.3	1.8	1.2	1.4	1.3	1.7	1.2	1.3	0.8	0.9	1.3	1.1	1.3	1.5	1.2	1.2	1.5	1.4	0.9	1.2	1.3	0.8	0.2	2.9	
15-Feb	0.1	0.2	0.3	0.4	0.2	0.2	0.4	0.5	0.7	1.0	0.7	0.8	1.5	1.5	1.4	1.2	1.2	1.0	0.5	0.2	1.0	1.2	1.1	0.5	1.5	
16-Feb	0.9	1.0	0.8	1.0	1.0	1.3	1.0	1.3	1.6	1.0	0.9	0.9	0.9	0.8	0.7	0.5	0.4	1.2	1.5	1.9	2.1	1.8	1.5	1.5	2.1	
17-Feb	1.2	1.3	1.3	1.4	1.0	0.9	1.3	1.4	1.2	1.3	1.2	1.4	1.6	1.4	1.6	1.3	1.6	1.6	1.6	1.4	1.2	1.2	0.7	0.5	1.6	
18-Feb	0.9	0.8	0.6	0.3	0.3	0.6	0.7	0.7	0.5	0.7	0.7	1.0	1.3	1.4	1.2	1.0	0.5	0.2	0.3	0.3	0.2	0.2	0.3	0.4	1.4	
19-Feb	0.3	0.5	0.6	0.4	0.6	0.9	0.8	1.0	0.5	1.1	1.0	0.8	1.2	1.3	0.7	0.8	1.0	1.1	0.8	0.7	1.2	1.3	1.4	1.5	1.5	
20-Feb	1.4	0.9	1.3	1.1	0.7	0.4	0.3	0.3	0.3	0.5	0.9	1.0	1.2	1.2	1.4	1.2	1.6	1.6	1.2	0.9	0.4	0.5	1.7	2.6	2.6	
21-Feb	2.4	2.8	2.4	2.1	1.9	1.8	1.3	1.6	1.7	1.7	1.7	1.8	1.8	2.0	2.1	2.3	1.9	1.1	1.3	1.3	0.8	0.4	0.3	0.2	2.8	
22-Feb	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.9	1.1	0.6	1.5	1.4	1.2	1.2	0.7	0.2	0.1	0.2	0.3	0.2	0.2	0.1	1.5	
23-Feb	0.1	0.2	0.5	0.8	0.9	0.7	0.3	0.2	0.2	0.3	0.8	0.7	0.9	1.1	1.5	1.0	1.1	1.2	0.3	0.4	0.4	0.4	0.5	0.7	1.5	
24-Feb	0.4	0.5	0.6	0.6	0.6	0.7	0.8	0.7	1.0	1.4	1.5	1.9	2.6	2.8	2.4	2.3	2.5	2.1	2.8	2.3	2.3	1.7	1.6	1.7	2.8	
25-Feb	1.1	0.9	0.6	0.7	0.8	0.7	0.8	0.7	0.6	0.6	1.3	1.3	1.9	2.3	1.8	1.6	1.1	1.0	0.5	0.4	0.7	0.7	0.6	1.1	2.3	
26-Feb	1.2	1.0	0.9	0.9	1.1	1.2	1.8	1.2	1.2	0.8	1.6	2.1	1.6	1.6	1.3	1.2	1.5	1.4	1.4	1.1	0.8	0.9	1.0	1.1	2.1	
27-Feb	1.3	1.2	1.0	0.9	1.6	1.9	2.1	2.4	2.1	2.2	2.4	2.3	2.2	2.3	2.4	2.0	2.0	1.4	1.7	2.1	2.7	2.3	1.6	1.7	2.7	
28-Feb	1.1	1.1	1.2	1.1	0.5	0.4	0.4	0.3	0.4	0.6	0.8	1.1	1.2	1.4	1.1	0.9	0.7	0.3	0.1	0.1	0.1	0.1	0.1	0.4	1.4	
		2.9	3.1	2.5	2.3	3.2	3.3	2.9	2.6	2.4	2.2	2.7	3.1	3.3	4.1	4.1	3.7	3.9	3.6	3.3	3.3	3.0	3.1	2.8	2.8	
		Diurnal Maximum																								
UO - Unstable Operation																										



Maximum Value: 1.4 km/h on Feb 26 12:00		Maximum Daily Average: 0.4 km/h on Feb 24		Hours in Service: 672																						
Minimum Value: -0.9 km/h on Feb 13 16:00		Minimum Daily Average: -0.1 km/h on Feb 13		Hours of Data: 666																						
Maximum Diurnal Average: 0.3 km/h at hour 12		Minimum Diurnal Average: 0.1 km/h at hour 5		Hours of Missing Data: 6																						
Monthly Average: 0.14 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> = 0.5 P <sub>99</sub> = 1.0		Hours of Calibration: 0																						
				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-Feb	0.1	-0.1	0.2	0.0	-0.2	0.0	0.4	0.1	-0.2	-0.4	0.0	0.3	1.0	0.1	0.1	-0.1	0.0	0.3	0.1	0.0	0.0	0.1	0.2	0.1	0.1	1.0
2-Feb	0.2	0.4	0.4	0.7	0.6	0.7	0.3	0.4	0.1	0.0	-0.2	0.0	-0.2	-0.4	-0.5	-0.8	-0.3	-0.4	-0.4	-0.5	-0.8	-0.6	-0.5	-0.6	-0.1	0.7
3-Feb	-0.2	-0.3	-0.2	-0.2	-0.1	0.0	0.0	0.3	0.4	0.5	0.2	0.3	0.2	0.0	-0.2	0.2	0.6	0.2	0.4	0.1	0.0	0.3	0.2	0.1	0.1	0.6
4-Feb	0.1	-0.1	0.4	0.3	0.2	-0.1	0.2	0.1	0.1	0.1	0.2	0.4	0.4	0.6	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.6
5-Feb	0.2	0.1	0.1	0.2	0.1	0.0	0.2	0.3	0.1	0.2	0.4	0.2	0.2	-0.1	0.4	0.2	0.3	0.4	0.2	0.0	0.1	0.1	0.5	0.6	0.2	0.6
6-Feb	0.3	0.2	0.3	0.2	0.5	0.5	0.1	0.0	0.0	0.0	0.1	0.2	-0.1	0.2	0.6	0.6	-0.2	0.2	-0.1	0.0	-0.2	-0.2	0.1	0.5	0.2	0.6
7-Feb	0.3	0.3	0.1	0.0	0.1	0.5	0.4	0.3	0.1	0.1	0.1	0.4	0.4	0.2	0.3	0.5	0.1	0.0	-0.1	0.2	0.1	0.1	0.1	0.0	0.2	0.5
8-Feb	0.3	0.0	0.0	0.1	0.0	0.2	0.1	0.1	0.2	0.2	0.3	0.1	0.2	0.2	0.1	-0.1	0.1	0.2	0.1	0.5	0.3	0.5	0.7	1.1	0.2	1.1
9-Feb	0.8	0.3	-0.2	0.1	-0.1	-0.3	-0.2	-0.1	-0.1	0.0	0.4	0.7	0.5	0.7	0.7	1.0	0.4	0.1	-0.1	0.0	0.4	0.0	0.2	0.4	0.2	1.0
10-Feb	0.6	0.4	0.2	0.0	0.0	0.1	0.5	0.0	0.0	0.0	0.2	0.1	0.1	0.3	0.0	0.0	0.1	-0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.6
11-Feb	0.2	0.1	0.1	0.1	0.1	0.4	0.4	0.0	0.0	-0.1	0.3	0.2	0.4	0.5	0.1	-0.2	-0.4	-0.3	0.3	0.5	0.2	0.0	0.0	0.0	0.1	0.5
12-Feb	0.1	0.2	0.2	0.0	0.0	-0.1	-0.1	0.1	0.1	0.0	0.2	0.1	0.0	0.0	0.2	0.2	0.0	0.0	0.0	-0.1	-0.1	0.1	-0.4	0.2	0.0	0.2
13-Feb	0.7	0.3	-0.2	-0.2	-0.1	0.0	-0.1	0.3	0.2	UO	UO	UO	UO	UO	UO	-0.9	-0.7	-0.2	0.3	0.5	-0.3	-0.4	-0.7	0.0	-0.1	0.7
14-Feb	0.2	0.7	0.1	-0.3	0.1	0.2	0.0	-0.1	0.1	0.2	0.1	0.8	0.5	0.5	0.4	0.3	0.1	0.6	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.8
15-Feb	0.1	0.2	0.2	0.4	0.4	0.4	0.4	0.3	0.5	0.5	0.4	0.1	0.4	0.1	-0.2	-0.3	0.1	0.2	0.1	0.2	0.1	-0.1	-0.1	-0.1	0.2	0.5
16-Feb	-0.3	0.0	-0.1	-0.4	-0.3	-0.1	-0.1	-0.1	-0.1	-0.3	-0.1	0.1	0.5	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.1	0.3	0.2	0.0	0.5
17-Feb	0.3	0.4	0.3	0.1	0.1	0.3	0.7	0.7	0.4	0.3	0.0	-0.2	0.0	0.0	0.2	0.0	0.1	0.3	0.1	-0.3	-0.1	0.1	0.0	0.1	0.2	0.7
18-Feb	-0.2	0.1	0.3	0.1	0.2	0.0	-0.2	-0.2	0.0	0.3	0.1	0.1	0.2	-0.1	0.0	0.1	0.0	0.1	0.2	0.2	0.1	0.1	0.2	0.4	0.1	0.4
19-Feb	0.0	0.0	-0.1	-0.2	-0.1	-0.2	0.1	0.1	0.0	0.2	0.3	0.0	0.2	0.4	0.0	0.2	-0.1	0.2	0.1	0.0	0.1	-0.2	-0.1	-0.4	0.0	0.4
20-Feb	-0.1	0.2	0.1	-0.1	-0.1	0.2	0.1	0.1	0.2	0.1	0.3	0.2	1.1	0.2	1.3	0.3	0.0	0.3	-0.1	0.1	0.2	0.2	-0.2	-0.3	0.2	1.3
21-Feb	-0.2	-0.2	0.1	0.4	0.6	0.5	0.3	0.2	-0.2	-0.4	0.3	0.3	-0.2	-0.7	0.0	0.0	0.3	-0.1	-0.3	-0.3	0.0	0.0	0.2	0.1	0.0	0.6
22-Feb	0.4	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	-0.3	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.4
23-Feb	0.1	0.1	-0.1	0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	0.4	-0.2	-0.2	0.1	0.7	0.0	0.1	0.3	0.4	0.4	0.2	0.3	0.5	0.1	0.1	0.7
24-Feb	0.4	0.0	0.1	0.3	0.4	0.3	0.4	0.5	0.4	0.5	0.7	0.8	0.3	0.2	0.8	1.0	0.6	0.5	0.1	0.5	0.3	0.3	0.3	0.2	0.4	1.0
25-Feb	0.1	0.1	0.0	0.0	0.1	0.0	-0.1	0.0	0.1	0.1	0.3	0.2	0.4	0.1	0.3	0.6	1.2	0.2	-0.1	0.0	0.5	0.5	0.6	0.1	0.2	1.2
26-Feb	0.3	0.3	0.4	0.9	0.0	0.5	0.4	1.1	0.7	0.4	0.4	1.4	0.1	0.8	0.6	-0.4	0.4	0.3	0.5	0.0	0.1	0.3	0.2	0.2	0.4	1.4
27-Feb	0.2	0.4	0.2	-0.2	-0.4	-0.2	-0.3	-0.3	-0.2	-0.4	0.1	0.2	0.3	-0.1	0.8	0.5	0.3	0.1	0.0	-0.1	0.2	0.2	0.1	0.0	0.1	0.8
28-Feb	0.2	0.0	0.0	0.0	-0.1	-0.1	0.2	0.2	0.1	0.2	0.0	0.1	0.0	0.2	-0.3	-0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.3	0.4	0.1	0.4
																								Diurnal Average		
																								Diurnal Maximum		
UO - Unstable Operation																										



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																				Hours in Service: 672					
Maximum Value: 3.8 km/h on Feb 13 17:00																				Hours of Data: 666					
Minimum Value: 0.1 km/h on Feb 28 19:00																				Hours of Missing Data: 6					
Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.3 Q <sub>1</sub> = 0.6 Median = 1.0 Q <sub>3</sub> = 1.5 P <sub>90</sub> = 2.3 P <sub>99</sub> = 3.4																				Hours of Calibration: 0					
																				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-Feb	1.3	0.9	0.5	0.5	1.6	1.3	1.3	1.0	1.6	1.3	1.5	1.4	2.1	1.7	1.7	1.2	0.9	0.8	0.8	0.3	0.4	0.5	0.4	0.2	2.1
2-Feb	0.3	0.2	0.3	0.3	0.4	0.4	0.6	0.4	0.7	0.8	0.8	0.7	0.9	1.7	2.1	3.2	3.2	3.3	3.2	3.2	2.9	2.8	2.7	2.5	3.3
3-Feb	2.7	2.3	2.1	1.8	1.4	1.1	0.8	0.8	0.6	0.7	0.6	0.8	0.9	1.4	1.3	1.1	1.3	0.9	1.4	1.0	1.1	1.2	0.7	0.8	2.7
4-Feb	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.9	1.0	1.1	1.3	1.2	1.4	0.9	0.7	0.4	0.6	0.5	0.5	0.6	0.5	0.5	0.4	1.4	
5-Feb	0.4	0.4	0.3	0.3	0.3	0.3	0.5	0.5	0.4	0.3	0.5	0.7	0.7	0.8	1.1	0.9	0.5	0.7	0.3	0.5	0.9	0.6	2.5	2.5	
6-Feb	2.4	1.8	1.4	1.3	1.5	1.2	0.9	0.5	0.5	1.0	1.0	0.9	0.9	1.3	1.3	1.5	1.2	0.7	1.4	0.6	0.8	0.9	0.7	0.8	2.4
7-Feb	0.9	1.4	1.4	2.5	2.6	3.5	2.6	2.6	2.6	2.5	2.9	3.4	3.5	3.7	3.8	3.4	3.0	2.2	1.9	2.5	1.6	0.9	1.2	1.4	3.8
8-Feb	1.6	1.1	1.0	0.6	0.3	0.3	0.2	0.2	0.2	0.2	0.3	1.1	0.9	0.9	0.9	0.6	0.9	0.3	0.4	0.4	0.7	0.7	0.6	0.7	1.6
9-Feb	0.8	0.9	1.2	1.1	1.1	0.9	0.6	0.6	0.6	1.1	0.8	0.5	0.9	0.9	0.6	0.4	0.4	0.3	0.4	0.4	0.4	0.6	0.9	0.6	1.2
10-Feb	0.4	0.5	0.5	0.5	0.6	1.2	0.9	1.0	0.9	1.2	1.2	1.3	1.3	1.3	1.5	1.5	1.4	1.2	1.1	1.2	1.0	0.7	0.6	0.3	1.5
11-Feb	0.2	0.1	0.1	0.1	0.4	0.6	0.9	0.7	0.8	0.5	0.9	0.8	1.1	1.2	1.4	2.3	2.3	1.7	2.2	2.1	2.1	0.7	2.0	2.6	2.6
12-Feb	3.0	3.1	2.7	1.6	1.5	1.5	1.7	1.3	0.7	0.4	0.6	0.5	0.8	1.0	1.0	0.8	1.1	1.5	1.7	1.5	1.5	1.6	1.8	1.7	3.1
13-Feb	1.5	1.2	1.7	2.1	3.1	3.1	2.9	2.6	2.5	UO	UO	UO	UO	UO	UO	3.3	3.8	3.7	3.0	2.8	2.9	3.0	2.3	2.3	3.8
14-Feb	2.6	2.4	1.8	1.2	1.4	1.4	1.6	1.2	1.4	0.8	0.9	1.4	1.0	1.3	1.4	1.2	1.1	1.6	1.3	1.1	1.3	1.4	0.7	0.2	2.6
15-Feb	0.1	0.2	0.4	0.3	0.3	0.2	0.5	0.7	0.6	1.0	0.7	0.8	1.5	1.8	1.6	1.4	1.3	0.8	0.2	0.2	0.5	0.9	0.7	0.5	1.8
16-Feb	0.7	0.8	0.6	0.9	0.6	1.2	0.9	0.7	1.5	1.1	0.9	0.8	0.7	0.8	0.6	0.6	0.4	1.0	1.2	1.5	1.9	1.9	1.5	1.5	1.9
17-Feb	1.2	1.4	1.3	1.3	1.1	1.0	1.3	1.4	1.3	1.3	1.2	1.4	1.6	1.4	1.6	1.3	1.5	1.4	1.5	1.2	1.1	1.2	0.6	0.5	1.6
18-Feb	0.9	0.7	0.6	0.2	0.4	0.5	0.5	0.6	0.6	0.9	0.5	1.0	1.4	1.6	1.3	1.1	0.5	0.1	0.2	0.2	0.4	0.2	0.4	0.2	1.6
19-Feb	0.5	0.8	1.0	0.8	0.9	1.0	1.2	1.0	0.7	1.0	1.1	0.7	1.1	1.1	0.7	0.7	1.0	1.1	0.9	0.9	1.2	1.2	1.2	1.4	1.4
20-Feb	1.3	0.7	1.0	1.0	0.6	0.4	0.3	0.5	0.6	0.6	0.8	0.8	1.3	1.3	1.5	1.3	1.3	1.3	1.4	1.0	0.5	0.5	1.7	2.5	2.5
21-Feb	2.3	2.6	2.3	2.3	1.9	1.7	1.4	1.7	1.9	1.7	1.9	2.0	2.0	2.0	2.2	2.3	1.8	1.3	1.5	1.2	0.8	0.4	0.4	0.2	2.6
22-Feb	0.4	0.3	0.4	0.5	0.5	0.3	0.3	0.3	0.4	0.5	1.0	0.7	1.3	1.5	1.2	1.3	0.7	0.2	0.2	0.2	0.2	0.2	0.2	0.1	1.5
23-Feb	0.1	0.2	0.5	0.6	0.7	0.5	0.3	0.2	0.2	0.3	0.6	0.5	0.7	0.9	1.5	1.0	1.0	1.0	0.2	0.3	0.2	0.3	0.4	0.6	1.5
24-Feb	0.5	0.7	0.7	0.8	0.5	0.5	0.5	0.5	0.7	1.0	1.2	1.7	2.7	2.8	2.5	2.3	2.3	2.1	2.8	2.2	2.3	1.7	1.5	1.6	2.8
25-Feb	1.0	0.7	0.6	0.6	0.9	0.8	0.9	0.9	0.9	0.6	1.2	1.5	2.0	2.2	1.8	1.6	1.5	1.2	0.5	0.5	0.5	0.5	0.3	1.0	2.2
26-Feb	0.7	1.1	1.3	1.7	1.3	1.4	2.2	1.7	1.4	1.0	1.8	2.6	2.0	1.6	1.5	1.8	1.7	1.1	1.2	1.0	0.8	1.0	0.9	0.8	2.6
27-Feb	1.0	1.1	0.9	0.8	1.4	1.8	1.9	2.1	2.0	2.1	2.4	2.3	2.3	2.2	2.7	2.1	1.8	1.3	1.7	2.1	2.4	2.3	1.8	1.8	2.7
28-Feb	1.2	1.1	1.3	1.0	0.5	0.4	0.5	0.3	0.3	0.5	0.6	1.0	1.2	1.3	0.8	0.9	0.7	0.3	0.1	0.2	0.2	0.3	0.2	0.3	1.3
3.0 3.1 2.7 2.5 3.1 3.5 2.9 2.6 2.6 2.5 2.9 3.4 3.5 3.7 3.8 3.4 3.8 3.7 3.2 3.2 2.9 3.0 2.7 2.6																									
Diurnal Maximum																									
UO - Unstable Operation																									



Summary of Hour Averages

Mannix - February 2023

Maximum Value: 8.9 km/h on Feb 13 13:00		Maximum Daily Average: 0.6 km/h on Feb 13		Hours in Service: 672																						
Minimum Value: -1.2 km/h on Feb 11 17:00		Minimum Daily Average: -0.4 km/h on Feb 7		Hours of Data: 669																						
Maximum Diurnal Average: 0.4 km/h at hour 13		Minimum Diurnal Average: 0.0 km/h at hour 10		Hours of Missing Data: 3																						
Monthly Average: 0.11 km/h		Percentiles: P <sub>1</sub> = -0.9 P <sub>10</sub> = -0.4 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> = 1.3		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-Feb	0.5	0.4	0.3	0.3	0.4	0.4	1.0	0.5	0.3	-0.1	0.2	0.0	0.8	0.0	0.0	-0.4	-0.1	0.2	0.0	-0.2	-0.1	0.0	0.1	0.0	0.2	1.0
2-Feb	0.1	0.0	0.0	0.2	0.1	0.1	0.4	0.5	0.6	0.7	0.6	0.4	0.2	0.3	0.0	-0.2	0.3	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.7
3-Feb	0.3	0.2	0.3	0.1	0.1	0.0	0.2	0.2	0.2	-0.1	-0.1	0.1	0.0	0.0	-0.1	0.4	1.0	0.6	0.7	0.4	0.2	0.5	0.3	0.2	0.2	1.0
4-Feb	0.3	0.0	0.5	0.5	0.4	0.3	0.4	0.2	0.4	0.3	0.2	0.4	0.4	0.5	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.2	0.5
5-Feb	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	-0.4	0.2	-0.1	-0.2	-0.2	-0.2	-0.2	-0.4	-0.5	-0.1	0.2	0.0	0.2
6-Feb	-0.3	-0.5	-0.3	-0.3	-0.2	0.0	-0.4	-0.5	-0.6	-0.2	0.0	0.2	-0.2	0.2	0.6	0.5	-0.1	0.2	0.0	0.4	0.1	0.2	0.2	0.2	0.0	0.6
7-Feb	-0.2	-0.1	-0.3	-0.8	-0.7	-0.3	-0.2	-0.3	-0.6	-0.6	-0.6	-0.4	-0.5	-0.7	-0.7	-0.5	-0.6	-0.8	-0.8	-0.5	-0.5	-0.4	0.0	0.7	-0.4	0.7
8-Feb	0.9	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.0	0.1	0.0	-0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	-0.1	0.0	0.0	0.3	0.2	0.9
9-Feb	0.0	-0.2	-0.7	-0.3	-0.5	-0.8	-0.6	-0.5	-0.5	-0.4	-0.1	0.1	0.2	0.3	0.1	0.2	0.2	0.3	0.1	0.2	-0.3	-0.4	-0.2	0.0	-0.2	0.3
10-Feb	0.0	0.1	0.3	0.4	0.2	0.4	1.0	0.3	0.5	0.2	0.4	0.1	0.3	0.3	0.1	0.1	0.2	-0.2	0.0	0.1	0.0	0.0	-0.1	0.0	0.2	1.0
11-Feb	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.4	-0.5	-0.2	0.1	0.4	0.0	-0.4	-1.0	-1.2	-0.9	-0.4	-0.3	-0.3	-0.4	-0.5	-1.1	-0.3	0.4
12-Feb	-0.8	-0.9	-0.6	-0.8	-0.7	-0.7	-0.7	-0.5	-0.3	-0.4	0.0	-0.1	0.0	0.0	0.4	0.7	-0.2	-0.4	-0.2	0.0	0.4	0.1	0.4	0.6	-0.2	0.7
13-Feb	0.0	-0.5	-1.0	-1.0	-1.1	-1.0	-0.9	-0.5	0.2	UO	UO	UO	8.9	2.0	0.4	-0.3	0.2	1.3	1.5	1.5	0.9	0.8	0.2	1.0	0.6	8.9
14-Feb	1.2	1.3	0.7	-0.2	0.3	0.5	0.5	0.2	0.2	0.2	0.1	0.8	0.4	0.4	0.5	0.3	0.4	0.9	0.6	0.3	0.5	0.2	0.1	0.0	0.4	1.3
15-Feb	-0.1	0.1	0.0	0.0	0.0	0.1	-0.1	-0.1	0.0	0.0	0.1	-0.1	0.2	-0.1	-0.4	-0.5	0.0	0.3	0.2	0.2	0.6	0.2	0.5	0.6	0.1	0.6
16-Feb	0.1	0.2	0.3	-0.4	0.1	0.2	0.0	0.4	0.3	-0.1	0.0	0.0	0.3	-0.2	-0.1	-0.2	-0.3	0.3	0.9	1.1	1.0	0.5	0.5	0.5	0.2	1.1
17-Feb	0.4	0.6	0.5	0.4	0.2	0.4	0.7	0.8	0.6	0.5	0.2	-0.2	-0.2	-0.1	0.3	0.3	0.6	0.8	0.5	0.1	0.4	0.6	0.4	0.2	0.4	0.8
18-Feb	0.3	0.7	0.8	0.4	0.4	0.2	0.0	0.1	0.0	0.2	0.0	0.1	0.3	-0.2	-0.2	-0.2	-0.2	-0.1	0.2	0.3	0.0	0.0	0.3	0.2	0.2	0.8
19-Feb	0.3	0.2	0.2	0.3	0.2	-0.6	-0.1	0.0	-0.1	0.2	0.1	0.1	0.3	0.5	0.0	0.1	-0.2	0.2	0.3	0.1	0.5	0.3	0.3	-0.1	0.1	0.5
20-Feb	0.2	0.5	0.5	0.0	-0.2	0.3	0.0	-0.1	0.1	0.1	0.2	0.0	0.9	0.1	1.3	0.2	0.4	0.8	0.1	0.5	0.5	0.6	0.4	0.4	0.3	1.3
21-Feb	0.7	0.9	0.8	1.0	1.2	1.0	0.5	0.4	0.0	-0.2	0.3	0.0	-0.5	-0.9	0.1	0.2	0.6	0.0	0.0	0.3	0.2	-0.1	0.1	-0.2	0.3	1.2
22-Feb	0.0	0.1	0.1	0.0	0.0	0.0	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.7	-0.2	-0.1	0.0	-0.1	0.0	0.2	0.2	0.2	0.2	-0.1	0.2
23-Feb	0.2	0.1	0.2	0.8	0.7	0.3	0.1	0.0	0.0	0.0	0.3	-0.3	-0.5	-0.2	0.5	-0.2	0.0	0.3	0.1	-0.1	-0.2	-0.2	-0.2	-0.4	0.1	0.8
24-Feb	-0.1	-0.5	-0.4	-0.5	-0.3	-0.2	-0.3	-0.1	-0.3	-0.4	-0.1	0.4	-0.3	-0.7	0.1	0.5	0.0	-0.2	-0.8	-0.2	-0.5	-0.3	-0.4	-0.5	-0.3	0.5
25-Feb	-0.5	-0.6	-0.5	-0.4	-0.3	-0.4	-0.6	-0.3	-0.1	-0.2	0.0	-0.2	0.0	-0.5	0.0	0.5	1.2	0.0	-0.7	-0.5	0.1	0.2	0.1	0.2	-0.1	1.2
26-Feb	0.6	0.4	0.3	0.4	-0.2	0.4	0.3	0.9	0.6	0.3	0.4	1.7	0.5	1.1	0.7	-0.1	0.8	0.8	0.9	0.4	0.3	0.5	0.5	0.5	0.5	1.7
27-Feb	0.5	0.6	0.6	0.1	-0.2	0.2	-0.1	0.1	0.2	0.0	0.2	0.3	0.4	0.0	1.2	0.8	0.8	0.7	0.6	0.4	0.8	1.0	0.5	0.4	0.4	1.2
28-Feb	0.4	0.3	0.3	0.2	0.0	-0.1	0.2	0.1	0.2	0.2	-0.1	0.0	-0.2	-0.2	-0.5	-0.5	-0.1	0.0	-0.1	0.1	0.0	0.1	0.0	0.2	0.0	0.4
																								Diurnal Average		
																								Diurnal Maximum		
UO - Unstable Operation																										



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																				Hours in Service: 672					
Maximum Value: 6.9 km/h on Feb 13 13:00																				Hours of Data: 669					
Minimum Value: 0.1 km/h on Feb 18 22:00																				Hours of Missing Data: 3					
Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.3 Q <sub>1</sub> = 0.5 Median = 1.0 Q <sub>3</sub> = 1.5 P <sub>90</sub> = 2.3 P <sub>99</sub> = 3.7																				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-Feb	1.2	0.9	0.5	0.5	1.6	1.4	1.3	1.2	1.7	1.4	1.4	1.4	2.2	1.7	1.6	1.2	0.9	0.8	0.9	0.4	0.3	0.6	0.3	0.2	2.2
2-Feb	0.3	0.2	0.2	0.2	0.3	0.4	0.5	0.4	0.6	0.5	0.6	0.6	0.7	1.2	1.9	3.1	3.1	3.3	3.2	3.2	2.8	2.7	2.4	2.4	3.3
3-Feb	2.5	2.2	1.9	1.8	1.2	1.0	0.7	0.7	0.6	0.7	0.6	0.8	1.0	1.3	1.3	1.1	1.3	0.9	1.4	1.0	1.1	1.1	0.7	0.8	2.5
4-Feb	0.7	0.6	0.5	0.4	0.5	0.5	0.6	0.5	0.8	0.9	1.0	1.3	1.2	1.4	0.9	0.7	0.4	0.5	0.5	0.4	0.5	0.4	0.5	0.4	1.4
5-Feb	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.5	0.6	0.8	0.8	1.0	0.8	0.5	0.6	0.2	0.6	1.0	0.6	2.4	2.6
6-Feb	2.4	1.8	1.3	1.3	1.6	1.2	0.9	0.5	0.5	1.1	1.1	0.9	0.8	1.1	1.2	1.5	1.2	0.6	1.4	0.6	0.7	0.7	0.8	1.0	2.4
7-Feb	1.1	1.8	1.6	2.4	2.5	3.3	2.6	2.6	2.6	2.5	3.0	3.5	3.7	3.7	3.8	3.6	3.1	2.1	1.9	2.6	1.7	0.9	1.2	1.2	3.8
8-Feb	1.7	1.1	1.0	0.7	0.4	0.3	0.2	0.2	0.2	0.2	0.3	1.0	0.9	0.9	0.8	0.5	0.7	0.2	0.4	0.4	0.7	0.7	0.6	0.7	1.7
9-Feb	0.8	1.0	1.3	1.3	1.3	1.0	0.6	0.7	0.7	1.1	0.9	0.4	0.6	0.7	0.6	0.5	0.3	0.4	0.4	0.4	0.5	0.6	0.9	0.6	1.3
10-Feb	0.3	0.4	0.6	0.6	0.5	1.1	0.9	1.0	0.8	1.1	1.0	1.2	1.2	1.3	1.3	1.4	1.3	1.1	0.9	1.2	0.9	0.6	0.5	0.3	1.4
11-Feb	0.2	0.1	0.1	0.1	0.2	0.6	1.0	0.7	0.9	0.5	0.9	0.6	1.0	1.3	1.4	2.4	2.5	1.8	2.3	2.1	2.1	0.8	2.1	2.6	2.6
12-Feb	2.9	3.1	2.7	1.5	1.4	1.4	1.7	1.3	0.7	0.5	0.6	0.4	0.8	0.9	1.0	0.6	0.9	1.1	1.5	1.5	1.3	1.5	1.7	1.6	3.1
13-Feb	1.6	1.3	1.9	2.2	3.3	3.2	2.9	2.8	2.5	UO	UO	UO	6.9	4.5	3.8	3.0	3.8	3.9	3.2	2.9	3.1	2.9	2.2	2.4	6.9
14-Feb	2.5	2.4	1.9	1.2	1.5	1.4	1.6	1.2	1.4	0.8	1.1	1.6	1.0	1.3	1.4	1.2	1.1	1.7	1.3	1.1	1.3	1.5	0.7	0.3	2.5
15-Feb	0.1	0.1	0.3	0.2	0.2	0.2	0.4	0.7	0.5	0.9	0.6	0.8	1.7	2.1	1.7	1.4	1.2	0.8	0.2	0.1	0.5	0.6	0.6	0.5	2.1
16-Feb	0.5	0.6	0.4	0.7	0.6	0.9	0.9	0.7	1.4	0.8	0.8	0.7	0.7	0.8	0.5	0.8	0.4	0.9	1.3	1.5	2.0	1.9	1.5	1.4	2.0
17-Feb	1.1	1.4	1.3	1.3	1.1	1.1	1.3	1.4	1.4	1.4	1.2	1.5	1.8	1.4	1.5	1.4	1.4	1.3	1.5	1.2	1.0	1.2	0.6	0.5	1.8
18-Feb	0.9	0.6	0.5	0.2	0.4	0.5	0.5	0.6	0.6	0.9	0.5	0.9	1.3	1.6	1.4	1.1	0.5	0.2	0.2	0.3	0.2	0.1	0.3	0.2	1.6
19-Feb	0.3	0.5	0.7	0.5	0.5	0.8	1.1	0.9	0.6	1.1	1.2	0.7	1.2	1.2	0.6	0.6	0.9	1.1	0.9	1.0	1.3	1.2	1.1	1.4	1.4
20-Feb	1.3	0.7	0.9	1.0	0.7	0.5	0.4	0.5	0.6	0.6	0.7	0.7	1.4	1.4	1.6	1.3	1.2	1.1	1.5	1.0	0.5	0.5	1.8	2.9	2.9
21-Feb	2.3	2.5	2.3	2.2	1.9	1.7	1.6	1.9	2.0	1.8	1.9	2.1	2.0	1.9	2.2	2.3	1.8	1.4	1.6	1.1	1.0	0.6	0.4	0.2	2.5
22-Feb	0.3	0.3	0.4	0.6	0.6	0.3	0.4	0.4	0.4	0.5	0.9	0.6	1.4	1.6	1.1	1.3	0.8	0.2	0.2	0.3	0.3	0.2	0.2	0.2	1.6
23-Feb	0.2	0.3	0.5	0.6	0.7	0.5	0.2	0.2	0.1	0.3	0.7	0.5	0.8	0.9	1.7	1.1	1.0	1.0	0.2	0.1	0.1	0.2	0.3	0.5	1.7
24-Feb	0.5	0.7	0.9	0.8	0.5	0.4	0.3	0.4	0.5	0.7	1.1	1.7	2.8	2.7	2.6	2.3	2.3	2.2	2.8	2.2	2.3	1.7	1.5	1.6	2.8
25-Feb	1.0	0.7	0.6	0.6	1.0	0.8	1.0	1.0	0.9	0.7	1.2	1.6	2.1	2.2	1.9	1.7	1.3	1.1	0.5	0.5	0.5	0.5	0.3	0.7	2.2
26-Feb	0.4	0.9	1.3	1.2	1.4	1.6	2.0	1.6	1.4	1.0	1.9	2.5	1.7	1.7	1.5	1.0	1.5	1.1	1.1	1.0	0.7	1.1	1.0	0.8	2.5
27-Feb	0.9	1.0	0.8	0.8	1.4	1.7	1.6	1.9	2.0	2.1	2.4	2.3	2.2	2.2	2.8	2.1	1.7	1.3	1.8	2.2	2.4	2.4	1.8	1.8	2.8
28-Feb	1.3	1.2	1.3	0.9	0.5	0.4	0.4	0.3	0.4	0.5	0.6	1.0	1.2	1.4	0.8	0.9	0.8	0.2	0.1	0.1	0.1	0.2	0.1	0.2	1.4
	Diurnal Maximum																								
UO - Unstable Operation																									





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

**AMS06**  
**PATRICIA MCINNES**  
**FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS06)  
 FEBRUARY 2023

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	638	32	34	99.7	28.1	0	6.5	0
TRS (ppb) Average	637	33	35	99.7	1.8	0	0.7	0
THC (ppm) Average	577	32	95	90.63	2.6	-	2.4	-
NMHC(ppm) Average	577	32	95	90.63	0.153	-	0.021	-
CH4(ppm) Average	577	32	95	90.63	2.6	-	2.3	-
O3 (ppb) Average	638	32	34	99.7	44.9	0	39.8	-
NO2 (ppb) Average	637	35	35	100	46.4	0	25.7	-
NO (ppb) Average	637	35	35	100	90	-	16.2	-
NOX (ppb) Average	637	35	35	100	136.4	-	41.8	-
NH3 (ppb) Average	593	36	79	93.6	0	0	0	-
PM2.5 (ug/m3) Average	671	1	1	100	23	0	12	0
Temperature 2 m (C) Average	672	0	0	100	4.6	-	0.3	-
Relative Humidity (%) Average	672	0	0	100	94.6	-	85.7	-
Wind Speed 10 m (km/h) Average	620	0	52	92.26	31	-	17	-
Wind Direction 10 m (deg) Average	620	0	52	92.26	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS06)  
FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	638	2.38	3.9	-	0	0.1	0.3	0.7	2.6	6.8	28.1
TRS (ppb) Average	637	0.29	0.3	-	0	0.1	0.1	0.2	0.4	0.6	1.8
THC (ppm) Average	577	2.08	0.1	-	1.9	2	2	2	2.1	2.2	2.6
NMHC(ppm) Average	577	0.002	0.012	-	0	0	0	0	0	0	0.153
CH4(ppm) Average	577	2.07	0.1	-	1.9	2	2	2	2.1	2.2	2.6
O3 (ppb) Average	638	23.43	11.7	-	0.9	5.7	14.2	24.2	32.5	38.4	44.9
NO2 (ppb) Average	637	12.41	9.8	-	0.1	1.5	5.2	9.6	17.5	27.9	46.4
NO (ppb) Average	637	5.04	8.9	-	0	0.1	0.5	1.6	5.8	13.2	90
NOX (ppb) Average	637	17.44	17	-	0.1	1.8	6.2	12.5	23.1	38.9	136.4
NH3 (ppb) Average	593	0	0	-	0	0	0	0	0	0	0
PM2.5 (ug/m3) Average	671	5.15	3.1	-	0.4	1.8	3.1	4.5	6.6	9.1	23
Temperature 2 m (C) Average	672	-14.77	9.5	-	-36.6	-27.6	-21.1	-14.7	-8.1	-1.3	4.6
Relative Humidity (%) Average	672	73.4	10.7	-	39.7	56	68.9	75.6	80.1	85.6	94.6
Wind Speed 10 m (km/h) Average	620	8.9	5	-	0	3	5	8	11	16	31
Wind Direction 10 m (deg) Average	620	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS06)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2, TRS, THC, O3, NH3	02 Feb 2023 15:00	02 Feb 2023 16:00	2	Maintenance - sample manifold cleaned
THC/NMHC/CH4	23 Feb 2023 03:00	24 Feb 2023 02:00	24	Unstable Operation - excessive baseline drift
THC/NMHC/CH4	24 Feb 2023 04:00	25 Feb 2023 03:00	24	Unstable Operation - excessive baseline drift
THC/NMHC/CH4	25 Feb 2023 05:00	25 Feb 2023 11:00	7	Unstable Operation - excessive baseline drift
THC/NMHC/CH4	25 Feb 2023 12:00	25 Feb 2023 17:00	6	Maintenance - replaced sample pump
NH3	01 Feb 2023 02:00	28 Feb 2023 05:00	41	Unstable Operation - excessive baseline drift
Wind Speed, Wind Direction	13 Feb 2023 10:00	15 Feb 2023 13:00	52	Flat line in sensor output signal - Sensor frozen



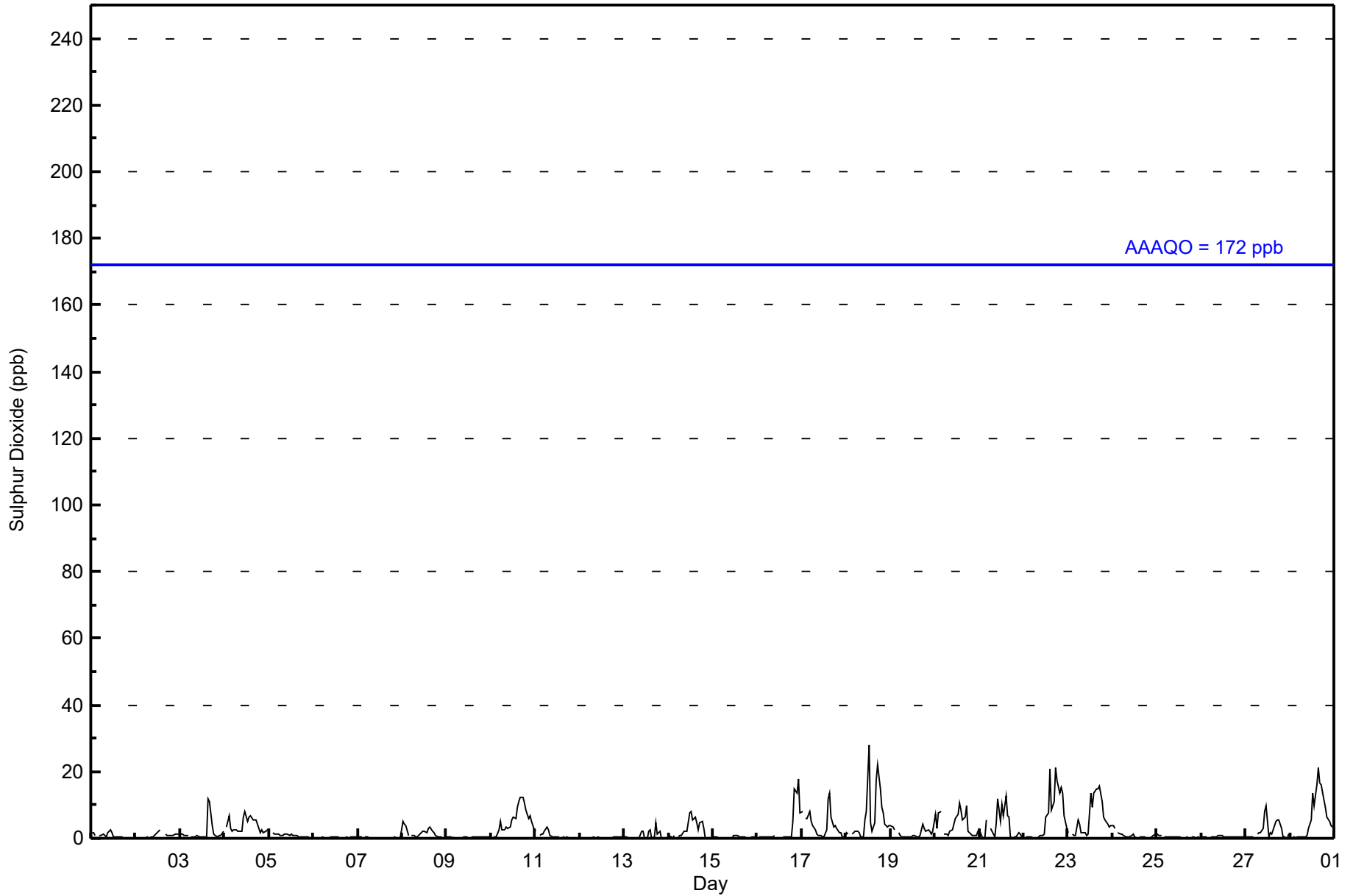
# Wood Buffalo Environmental Association

## Summary of Hour Averages

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

## Patricia McInnes - February 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 672																	672																											
Maximum Value: 28.1 ppb on Feb 18 13:00		Maximum Daily Average: 6.5 ppb on Feb 22																	Hours of Data: 638																													
Minimum Value: 0.0 ppb on Feb 2 01:00		Minimum Daily Average: 0.1 ppb on Feb 7																	Hours of Missing Data: 34																													
Maximum Diurnal Average: 4.8 ppb at hour 18		Minimum Diurnal Average: 0.8 ppb at hour 9																	Hours of Calibration: 32																													
Monthly Average: 2.38 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.3 Median = 0.7 Q <sub>3</sub> = 2.6 P <sub>90</sub> = 6.8 P <sub>99</sub> = 17.5																	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-Feb	1.8	1.5	0.9	Z	0.8	0.8	1.3	1.0	0.6	1.7	2.7	1.6	0.3	0.3	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.7	2.7																						
2-Feb	0.0	0.0	0.0	0.1	Z	0.1	0.3	0.2	0.3	0.6	0.9	1.2	2.0	2.6	M	M	1.5	1.0	1.0	0.9	1.0	1.1	1.1	1.2	0.8	2.6																						
3-Feb	1.2	1.1	1.0	0.7	0.7	Z	0.6	0.6	0.6	0.7	0.5	0.5	0.5	0.5	0.6	11.9	10.9	3.8	1.1	0.7	0.6	0.9	0.8	2.0	1.8	11.9																						
4-Feb	Z	3.4	6.7	3.0	2.3	2.6	2.4	2.3	2.3	2.2	6.2	8.1	5.1	6.5	6.8	5.4	5.3	5.4	2.9	1.9	2.4	1.8	2.1	2.5	3.9	8.1																						
5-Feb	2.4	Z	1.9	1.4	1.4	1.2	1.0	1.0	1.1	1.1	1.2	1.0	1.1	1.0	0.8	0.7	0.6	0.4	0.5	0.3	0.5	0.5	0.2	0.1	0.9	2.4																						
6-Feb	0.0	0.0	Z	0.0	0.1	0.3	0.1	0.1	0.0	0.2	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3																						
7-Feb	0.3	0.3	0.3	Z	0.3	0.2	0.1	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.4	0.0	0.1	0.1	0.1	0.4																						
8-Feb	4.9	4.3	3.8	1.0	Z	0.8	0.8	0.4	0.3	1.0	1.8	2.2	2.0	1.7	3.2	3.3	2.3	1.5	1.0	0.6	0.5	0.5	0.1	0.2	1.7	4.9																						
9-Feb	0.4	0.3	0.2	0.1	0.2	Z	0.1	0.2	0.1	0.4	0.4	0.3	0.1	0.1	0.2	0.4	0.3	0.4	0.5	0.4	0.4	0.4	0.5	0.6	0.3	0.6																						
10-Feb	Z	0.6	0.5	0.5	2.4	5.1	2.6	2.5	3.5	2.9	3.3	5.6	6.2	6.0	9.4	11.0	12.4	12.4	10.5	8.3	5.7	6.7	5.1	2.6	5.5	12.4																						
11-Feb	1.9	Z	1.0	1.1	1.4	1.9	3.3	2.6	1.0	0.5	0.3	0.4	0.2	0.2	0.1	0.3	0.2	0.2	0.2	0.2	0.0	0.1	0.0	0.0	0.8	3.3																						
12-Feb	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.3	0.1	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.4	0.2	0.3	0.3	0.3	0.2	0.5																						
13-Feb	0.4	0.4	0.3	Z	0.2	0.1	0.0	0.0	0.0	2.3	2.0	0.0	0.0	2.2	2.6	0.0	0.4	4.8	1.1	2.3	0.0	0.0	0.0	0.0	0.8	4.8																						
14-Feb	0.8	0.5	0.1	0.7	Z	0.5	0.8	1.1	2.0	2.1	1.9	7.6	8.0	5.7	6.3	4.7	2.4	4.6	5.3	2.9	0.2	0.1	0.1	0.1	2.5	8.0																						
15-Feb	0.3	0.4	0.3	0.2	0.2	Z	0.1	0.1	0.0	0.0	0.2	0.7	1.0	0.8	0.5	0.5	0.4	0.3	0.0	0.0	0.0	0.3	0.6	0.6	0.3	1.0																						
16-Feb	Z	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.8	C	C	C	C	0.6	0.5	0.4	0.3	0.5	5.1	14.8	13.6	17.7	7.8	3.5	17.7																						
17-Feb	8.0	Z	6.0	5.7	7.9	5.3	4.0	2.6	1.3	0.8	0.7	0.5	0.6	2.7	12.0	13.5	6.3	3.5	3.7	2.8	1.8	1.5	0.3	0.5	4.0	13.5																						
18-Feb	1.5	1.3	Z	1.1	1.7	2.2	2.2	1.8	0.4	0.5	5.5	8.1	28.1	4.7	2.3	4.8	17.4	22.1	14.7	9.1	7.7	4.3	3.3	3.7	6.5	28.1																						
19-Feb	3.7	3.4	2.4	Z	1.7	0.9	0.5	0.3	0.2	0.3	0.3	0.4	0.7	0.8	0.6	0.6	0.7	4.4	2.8	2.0	2.4	2.2	1.4	2.2	1.5	4.4																						
20-Feb	7.0	3.0	7.8	7.9	Z	1.2	1.2	1.0	2.0	2.6	4.3	5.9	7.1	10.7	8.4	5.5	6.3	9.7	2.2	1.3	0.8	0.9	0.9	1.9	4.3	10.7																						
21-Feb	2.4	0.6	0.0	0.3	5.5	Z	2.9	2.1	0.4	4.7	11.7	5.0	10.0	6.8	12.6	6.8	6.4	0.5	0.2	0.3	0.4	1.6	1.1	0.6	3.6	12.6																						
22-Feb	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.4	0.7	0.7	1.2	6.5	7.6	20.7	8.4	11.1	21.3	17.5	13.7	15.1	13.5	7.0	3.0	6.5	21.3																						
23-Feb	1.7	Z	1.5	0.9	0.7	5.5	4.3	1.7	1.6	1.6	0.9	1.4	13.7	9.4	13.6	15.0	14.6	15.9	11.0	6.5	5.6	4.1	3.4	3.9	6.0	15.9																						
24-Feb	3.8	3.1	Z	1.5	1.2	1.1	0.9	0.5	0.3	0.4	0.9	1.3	0.3	0.1	0.2	0.5	0.2	0.3	0.1	0.1	0.2	0.4	0.8	1.4	0.8	3.8																						
25-Feb	1.3	1.0	0.7	Z	0.3	0.3	0.3	0.2	0.3	0.4	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.2	0.3	1.3																						
26-Feb	0.3	0.3	0.3	0.3	Z	0.4	0.6	0.6	0.6	0.8	0.8	0.7	0.6	0.5	0.4	0.5	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.4	0.8																						
27-Feb	0.3	0.4	0.3	0.3	0.3	Z	1.4	1.9	1.6	2.9	7.9	9.7	0.5	1.8	1.3	2.3	5.1	5.5	5.6	2.8	0.3	0.2	0.2	1.4	2.4	9.7																						
28-Feb	Z	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.5	0.7	3.2	5.7	13.6	9.9	16.2	21.4	16.4	16.0	11.6	9.4	6.5	5.1	3.9	3.2	6.3	21.4																						
																								1.9	1.1	1.5	1.2	1.3	1.4	1.2	0.9	0.8	1.2	2.2	2.6	4.0	3.1	4.5	4.4	4.4	4.8	3.4	2.6	2.4	2.2	1.9	1.5	Diurnal Average
																								8.0	4.3	7.8	7.9	7.9	5.5	4.3	2.6	3.5	4.7	11.7	9.7	28.1	10.7	20.7	21.4	17.4	22.1	17.5	13.7	15.1	13.6	17.7	7.8	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**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Patricia McInnes - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	602	94.36	94.36
11 - 20	31	4.86	99.22
21 - 60	5	0.78	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: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Patricia McInnes - February 2023**

<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	70	25	15	8	6	29	63	36	35	35	30	32	33	21	14	100	552
11 - 20	9	2	5	2	1	1	0	0	0	2	0	1	1	3	0	4	31
21 - 60	1	1	2	0	0	0	0	0	0	0	0	0	1	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>	<b>80</b>	<b>28</b>	<b>22</b>	<b>10</b>	<b>7</b>	<b>30</b>	<b>63</b>	<b>36</b>	<b>35</b>	<b>37</b>	<b>30</b>	<b>33</b>	<b>35</b>	<b>24</b>	<b>14</b>	<b>104</b>	<b>588</b>

Total Number of Valid Hours: 588

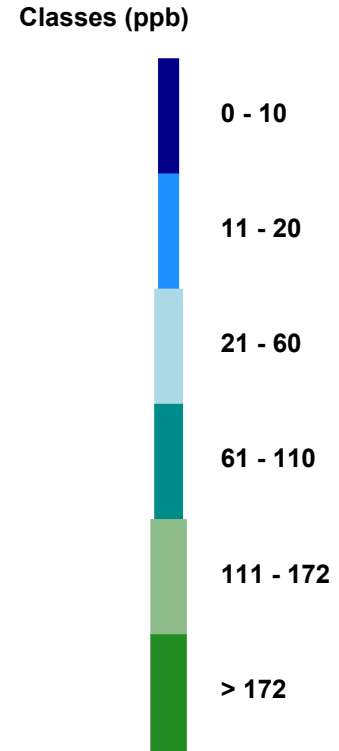
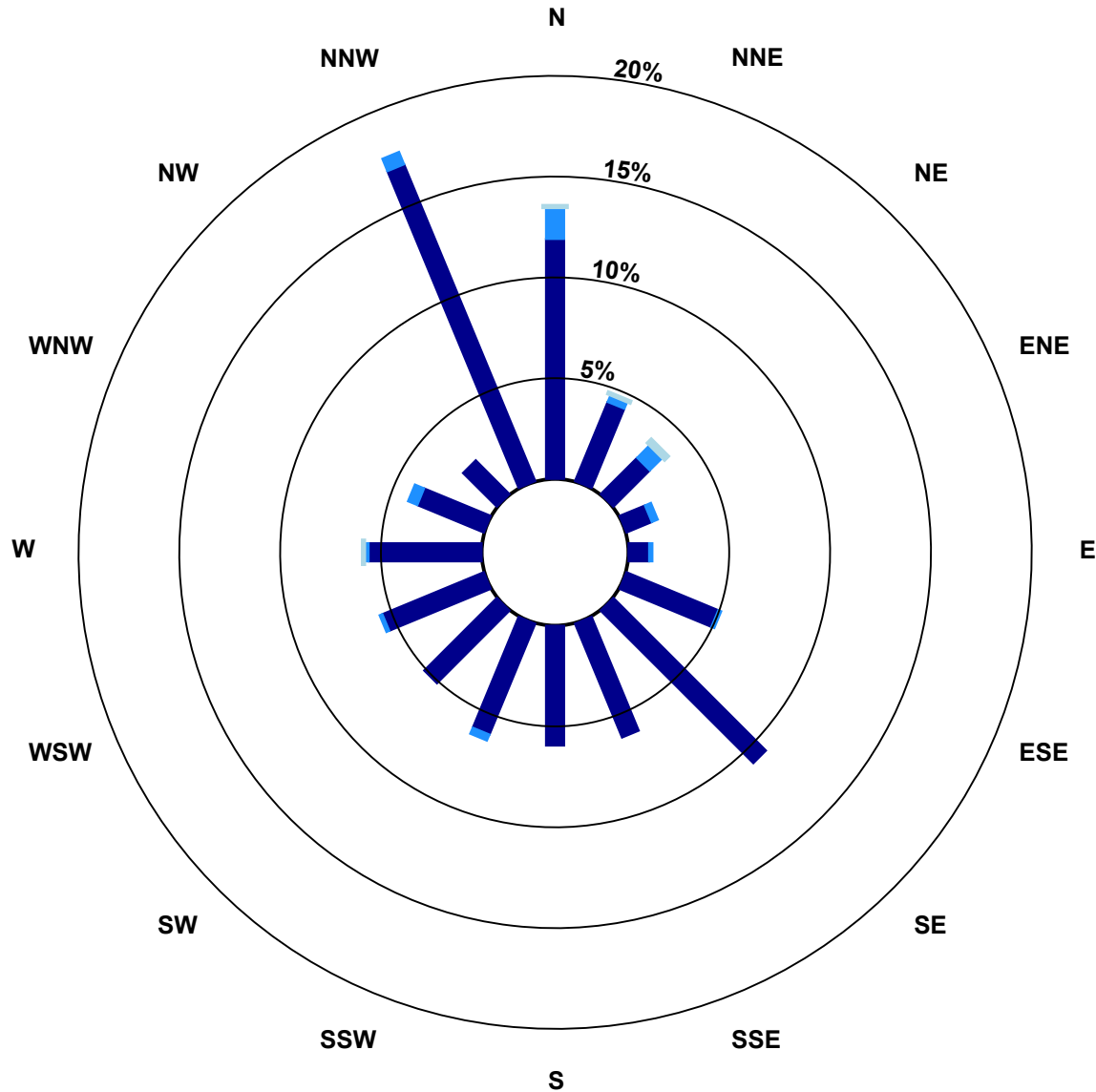
Total Number of Hours: 672



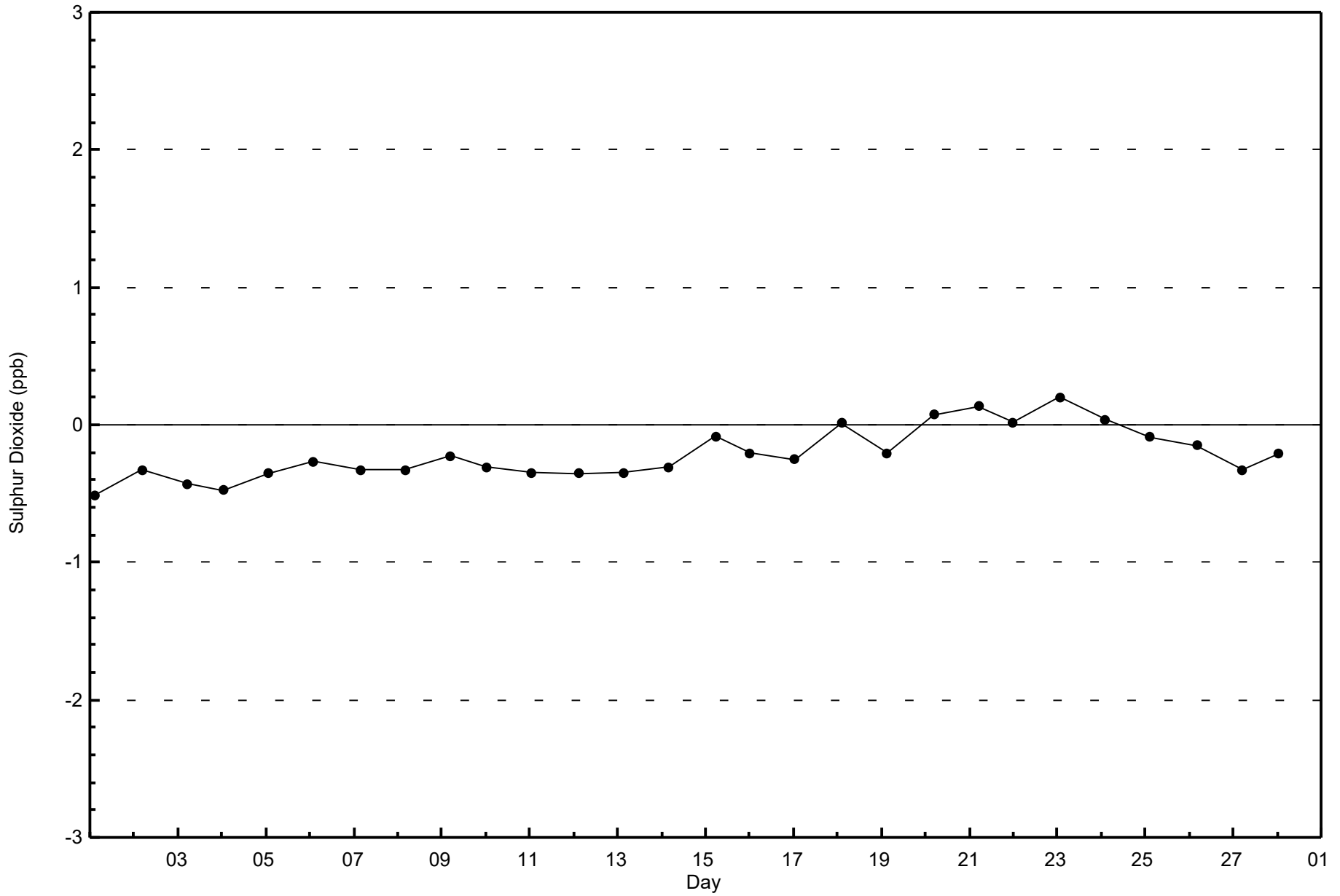


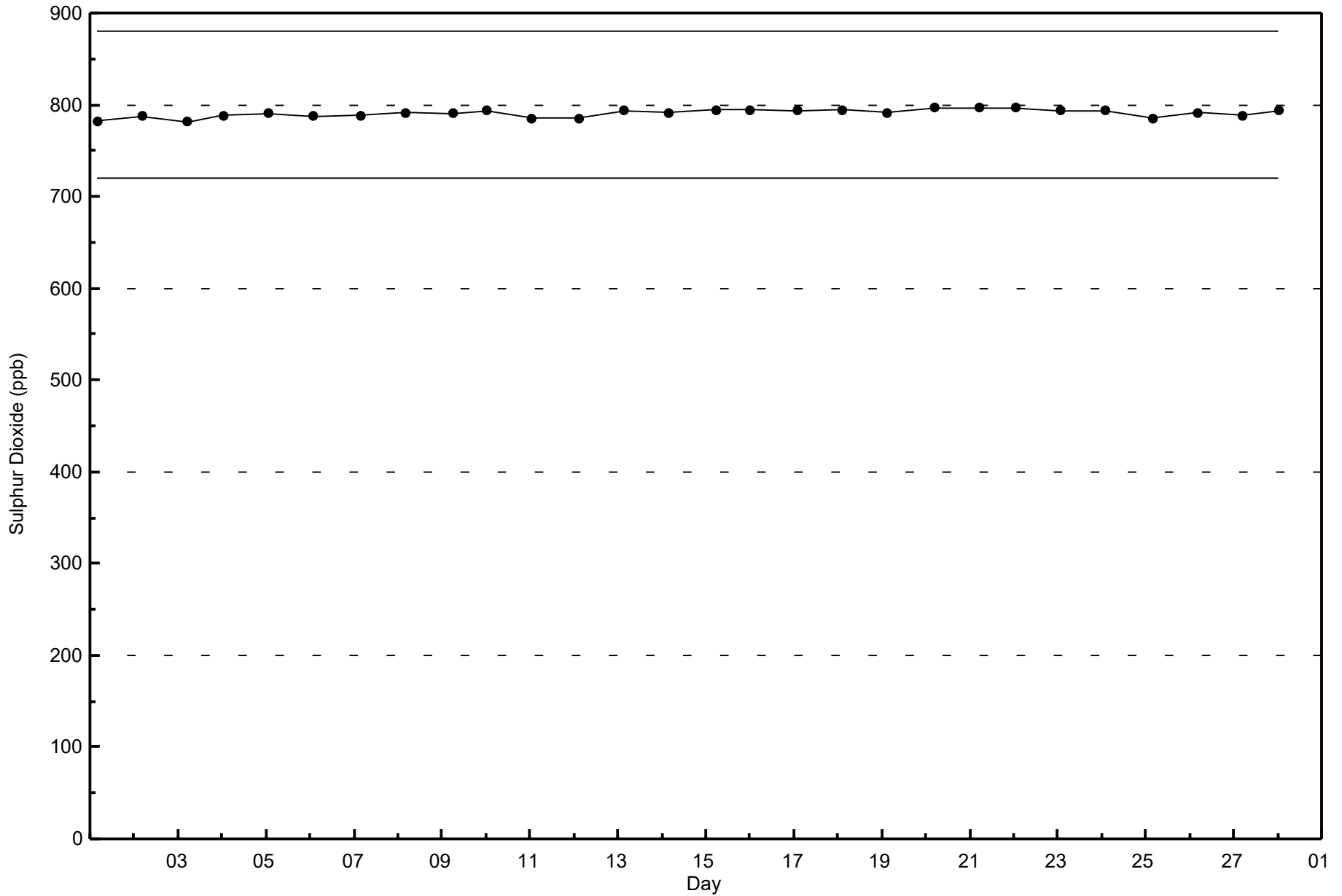
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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



Total Number of Valid Hours: 588







# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Total Reduced Sulphur (TRS) - ppb

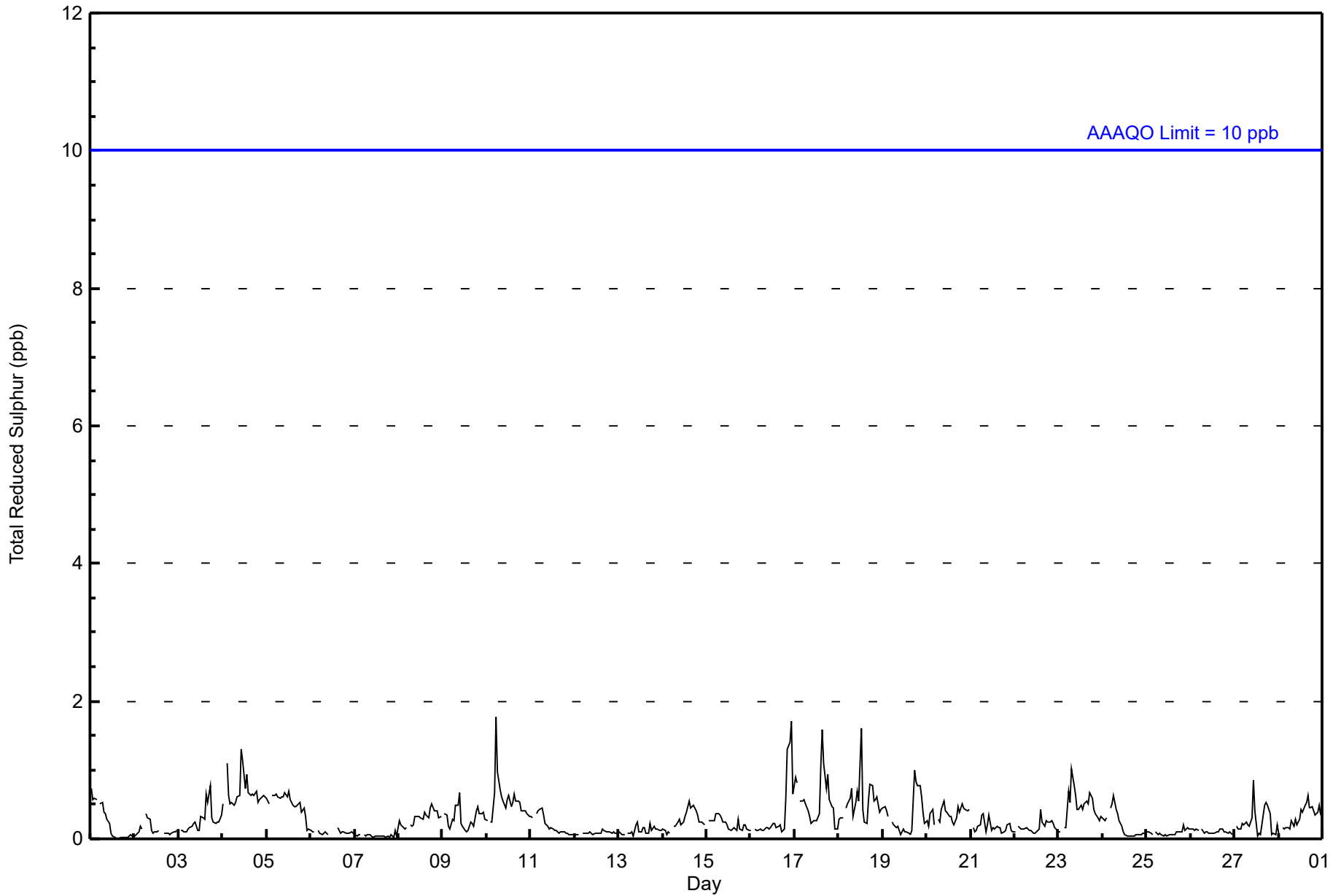
## Patricia McInnes - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																																									
Maximum Value: 1.8 ppb on Feb 10 06:00		Maximum Daily Average: 0.7 ppb on Feb 4		Minimum Daily Average: 0.0 ppb on Feb 7		Hours of Data:		637																																									
Minimum Value: 0.0 ppb on Feb 1 15:00		Minimum Diurnal Average: 0.4 ppb at hour 6		Minimum Diurnal Average: 0.2 ppb at hour 24		Hours of Missing Data:		35																																									
Monthly Average: 0.29 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> = 0.4 P <sub>90</sub> = 0.6 P <sub>99</sub> = 1.2				Hours of Calibration:		33																																									
						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-Feb	0.7	0.6	0.6	0.6	Z	0.5	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	0.0	0.1	0.0	0.2	0.7																								
2-Feb	0.0	0.1	0.1	0.2	0.2	Z	0.4	0.3	0.3	0.1	0.1	0.1	0.1	M	M	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4																							
3-Feb	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.3	0.3	0.6	0.5	0.8	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.8																							
4-Feb	0.5	Z	1.1	0.6	0.5	0.5	0.5	0.5	0.6	0.6	1.3	1.1	0.7	0.9	0.7	0.6	0.7	0.6	0.7	0.5	0.6	0.6	0.6	0.6	0.6	1.3																							
5-Feb	0.6	0.5	Z	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.7	0.6	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.1	0.1	0.5	0.7																							
6-Feb	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	C	C	C	C	C	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																							
7-Feb	0.1	0.0	0.1	0.1	Z	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	0.1	0.0	0.1	0.0	0.0	0.1																							
8-Feb	0.3	0.2	0.2	0.1	0.2	Z	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.5																							
9-Feb	Z	0.4	0.3	0.2	0.1	0.3	0.3	0.5	0.5	0.7	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.5	0.4	0.4	0.4	0.3	0.3	0.7																							
10-Feb	0.3	Z	0.3	0.2	0.7	1.8	1.0	0.7	0.6	0.6	0.4	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.3	0.6	1.8																							
11-Feb	0.3	0.3	Z	0.4	0.4	0.4	0.4	0.3	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	0.1	0.1	0.1	0.4																							
12-Feb	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																							
13-Feb	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.3																							
14-Feb	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.5	0.5	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.5																							
15-Feb	Z	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.3	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.4																							
16-Feb	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.6	1.3	1.4	1.7	0.7	0.4	1.7																							
17-Feb	0.9	0.8	Z	0.5	0.6	0.6	0.5	0.4	0.3	0.2	0.3	0.3	0.3	0.4	1.1	1.6	1.1	0.7	0.9	0.6	0.5	0.4	0.1	0.1	0.6	1.6																							
18-Feb	0.3	0.3	0.3	Z	0.4	0.5	0.6	0.7	0.3	0.5	0.7	0.5	1.6	0.4	0.2	0.2	0.5	0.8	0.8	0.6	0.6	0.6	0.4	0.4	0.5	1.6																							
19-Feb	0.5	0.5	0.4	0.3	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0	0.8	0.8	0.8	0.6	0.4	0.2	0.3	1.0																							
20-Feb	0.3	0.2	0.4	0.4	0.2	Z	0.3	0.2	0.4	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.3	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5																							
21-Feb	Z	0.2	0.1	0.1	0.2	0.2	0.3	0.4	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	0.2	0.1	0.1	0.1	0.4																							
22-Feb	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	0.4	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.4																							
23-Feb	0.1	0.1	Z	0.2	0.2	0.7	0.5	1.0	0.8	0.6	0.4	0.4	0.5	0.4	0.5	0.6	0.5	0.7	0.6	0.4	0.4	0.3	0.3	0.3	0.5	1.0																							
24-Feb	0.3	0.3	0.3	Z	0.5	0.5	0.6	0.4	0.4	0.3	0.2	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	0.2	0.6																							
25-Feb	0.1	0.1	0.1	0.1	Z	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	0.2	0.1	0.2	0.1	0.1	0.2																							
26-Feb	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																							
27-Feb	Z	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.8	0.4	0.0	0.1	0.1	0.2	0.5	0.5	0.5	0.4	0.1	0.1	0.1	0.2	0.2	0.8																							
28-Feb	0.1	Z	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.6																							
																								0.3	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	Diurnal Average		
																								0.9	0.8	1.1	0.6	0.7	1.8	1.0	1.0	0.8	0.7	1.3	1.1	1.6	0.9	1.1	1.6	1.1	1.0	0.9	0.8	1.3	1.4	1.7	0.7	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**  
**Patricia McInnes - February 2023**





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

**Total Reduced Sulphur (TRS) - ppb**  
**Patricia McInnes - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	637	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: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Patricia McInnes - February 2023**

<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	78	28	21	10	5	30	63	37	36	36	30	33	36	24	15	105	587
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>	78	28	21	10	5	30	63	37	36	36	30	33	36	24	15	105	587

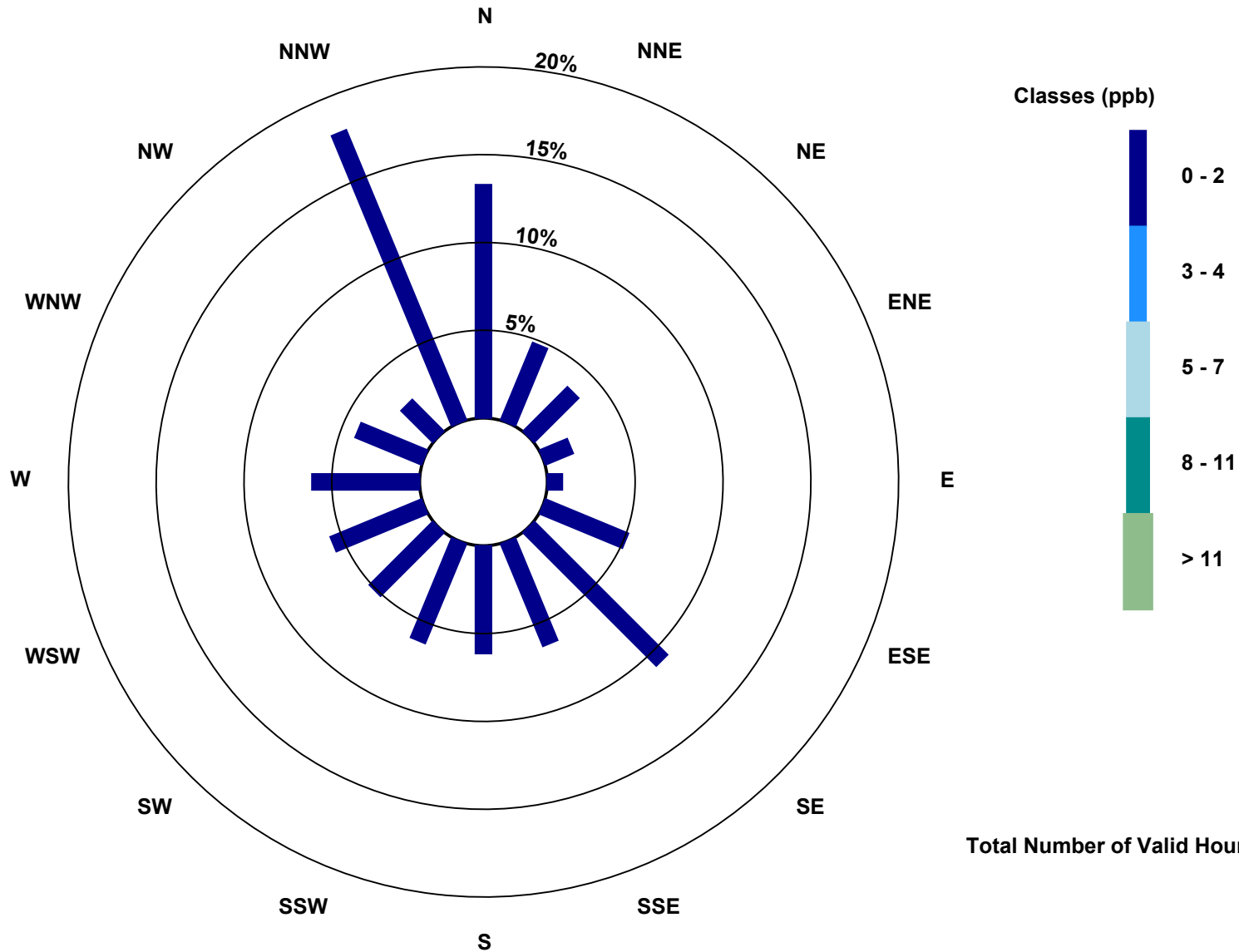
Total Number of Valid Hours: 587

Total Number of Hours: 672



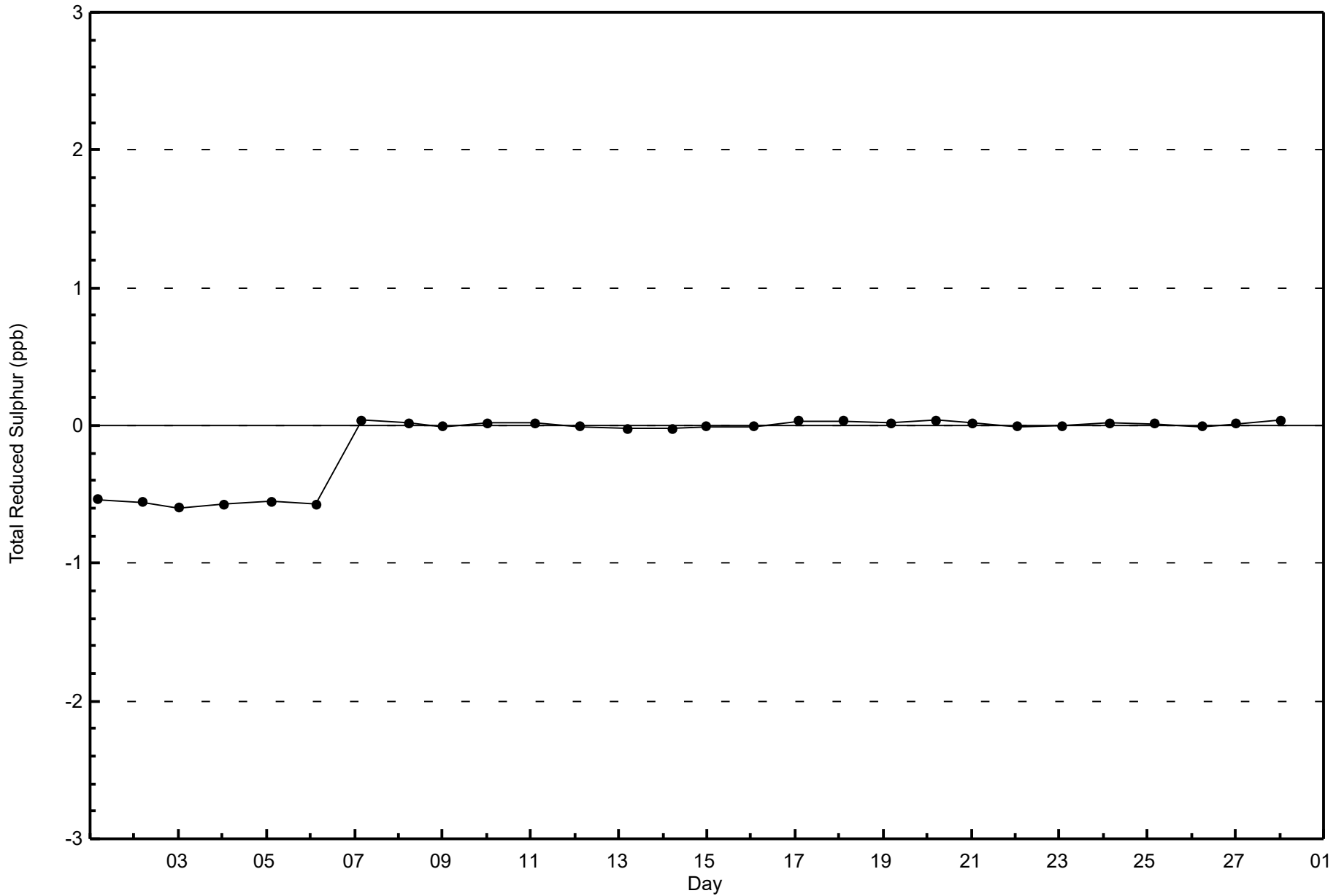
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

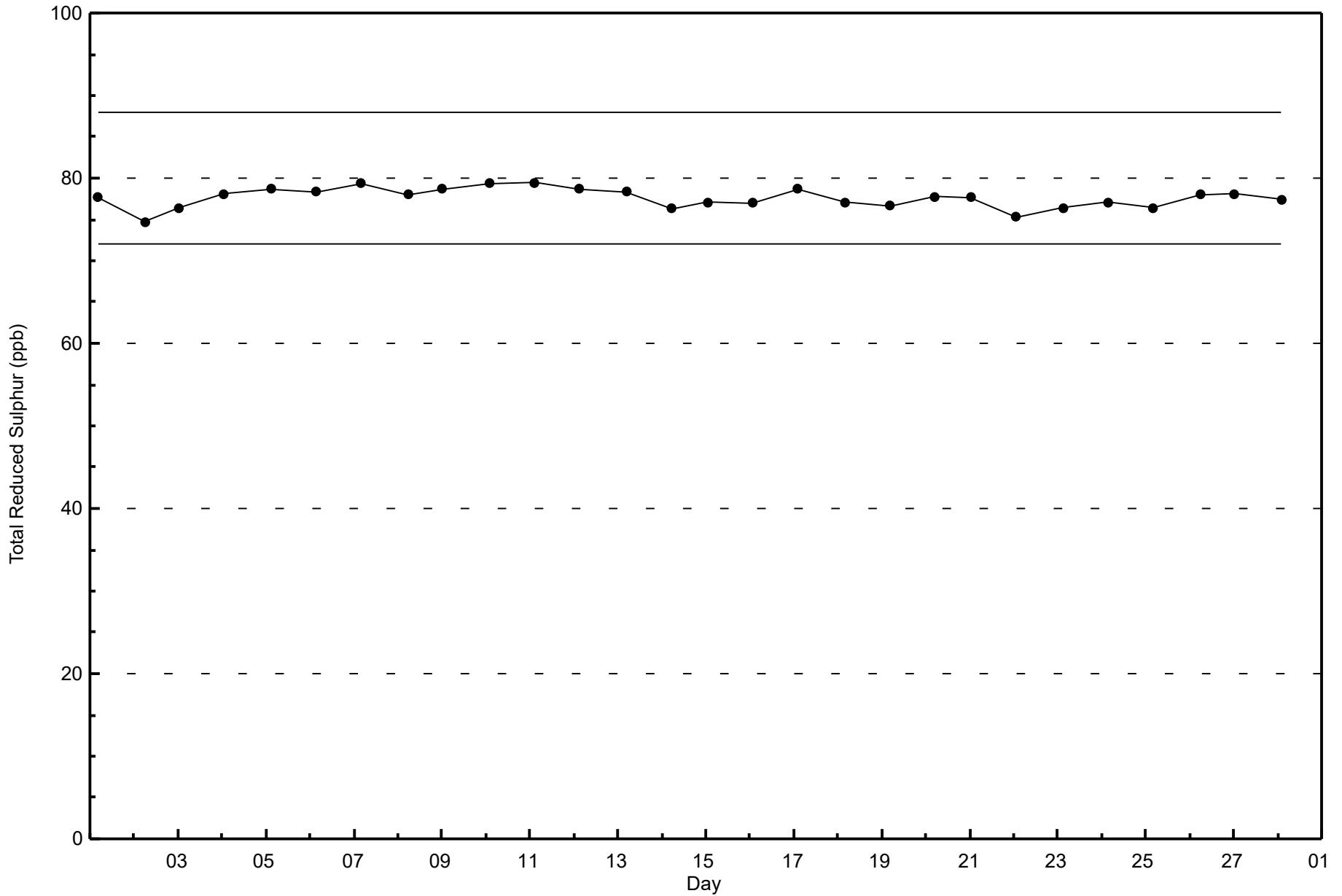
Total Reduced Sulphur (TRS) - ppb  
Patricia McInnes



Total Number of Valid Hours: 587









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

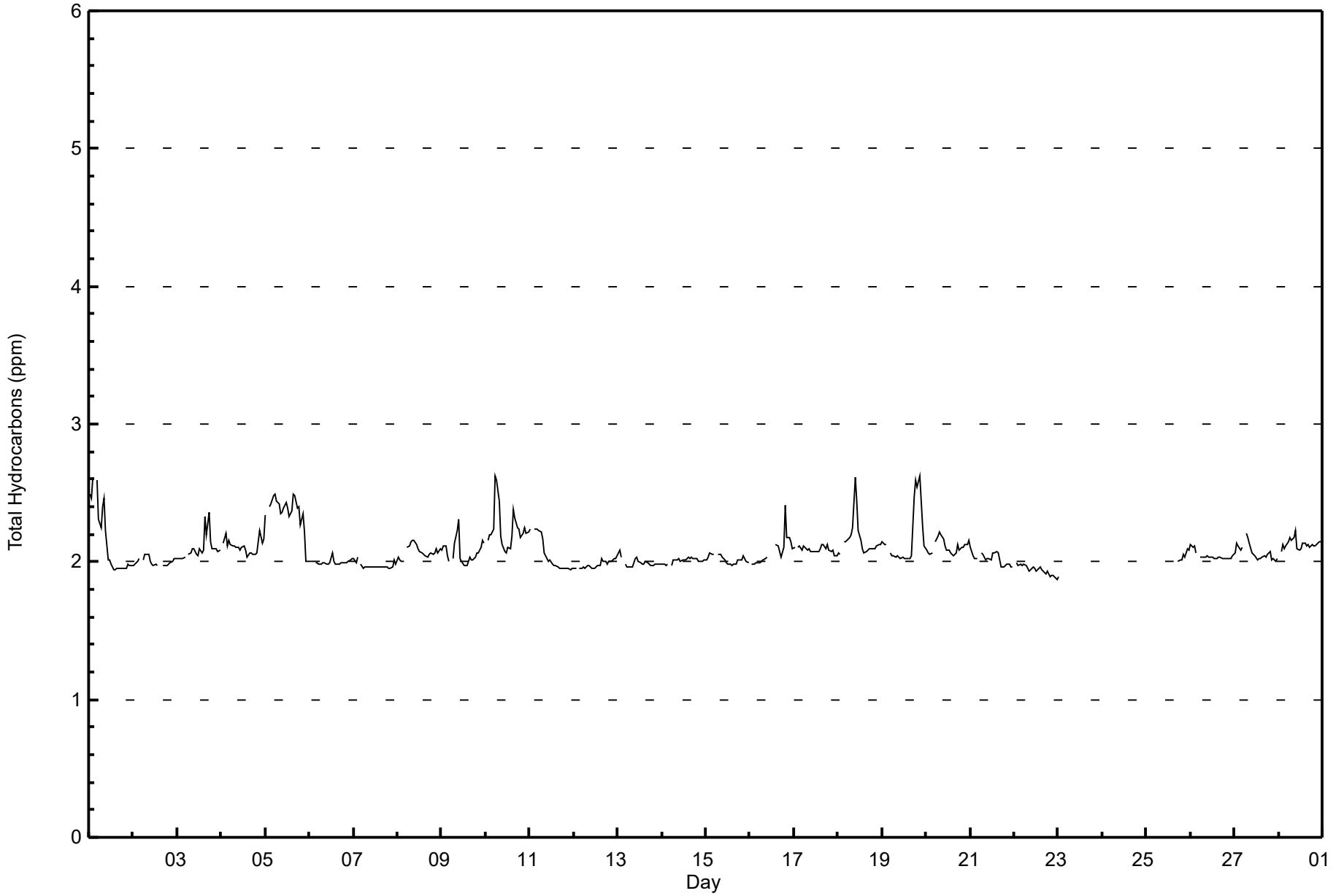
**Total Hydrocarbons (THC) - ppm**  
**Patricia McInnes - February 2023**

Maximum Value: 2.6 ppm on Feb 19 21:00		Maximum Daily Average: 2.4 ppm on Feb 5		Hours in Service: 672																						
Minimum Value: 1.9 ppm on Feb 23 00:00		Minimum Daily Average: 1.9 ppm on Feb 22		Hours of Data: 577																						
Maximum Diurnal Average: 2.1 ppm at hour 6		Minimum Diurnal Average: 2.0 ppm at hour 14		Hours of Missing Data: 95																						
Monthly Average: 2.08 ppm		Percentiles: P <sub>1</sub> = 1.9 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> = 2.2 P <sub>99</sub> = 2.6		Hours of Calibration: 32																						
				Percent Operational Time: 90.6																						
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-Feb	2.5	2.5	2.6	Z	2.6	2.3	2.2	2.4	2.5	2.2	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	2.1	2.6
2-Feb	2.0	2.0	2.0	2.0	Z	2.0	2.1	2.1	2.1	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	2.1
3-Feb	2.0	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.3	2.2	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4
4-Feb	Z	2.1	2.2	2.1	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	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2
5-Feb	2.3	Z	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.5	2.5	2.4	2.4	2.3	2.4	2.2	2.0	2.0	2.5	2.5
6-Feb	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
7-Feb	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
8-Feb	2.0	2.0	2.0	2.0	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
9-Feb	2.1	2.1	2.1	2.0	2.0	Z	2.0	2.1	2.2	2.3	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	2.3	2.3
10-Feb	Z	2.2	2.2	2.2	2.2	2.6	2.6	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.6
11-Feb	2.2	Z	2.2	2.2	2.2	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	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2
12-Feb	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
13-Feb	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
14-Feb	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
15-Feb	2.0	2.0	2.1	2.1	2.1	Z	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
16-Feb	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	C	C	C	C	2.1	2.1	2.1	2.0	2.1	2.4	2.2	2.2	2.1	2.1	2.4	
17-Feb	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	2.0	2.0	2.1	2.1
18-Feb	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.2	2.6	2.4	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	2.6
19-Feb	2.1	2.1	2.1	Z	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	2.5	2.6	2.5	2.6	2.4	2.3	2.1	2.6	
20-Feb	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.1	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	2.2	2.2
21-Feb	2.1	2.0	2.0	2.0	2.0	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.1
22-Feb	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	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
23-Feb	1.9	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	1.9
24-Feb	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
25-Feb	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	M	2.0	2.0	2.1	2.0	2.1	2.1	--
26-Feb	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
27-Feb	2.1	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.2
28-Feb	Z	2.1	2.1	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	2.1	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**  
**Patricia McInnes - February 2023**





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

**Total Hydrocarbons (THC) - ppm**  
**Patricia McInnes - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	302	52.34	52.34
2.1 - 3.0	275	47.66	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 577

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Patricia McInnes - February 2023**

<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	13	7	8	7	2	23	45	9	10	17	16	25	29	15	5	27	258
2.1 - 3.0	65	20	10	1	4	6	17	19	13	10	2	5	5	9	8	75	269
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>	78	27	18	8	6	29	62	28	23	27	18	30	34	24	13	102	527

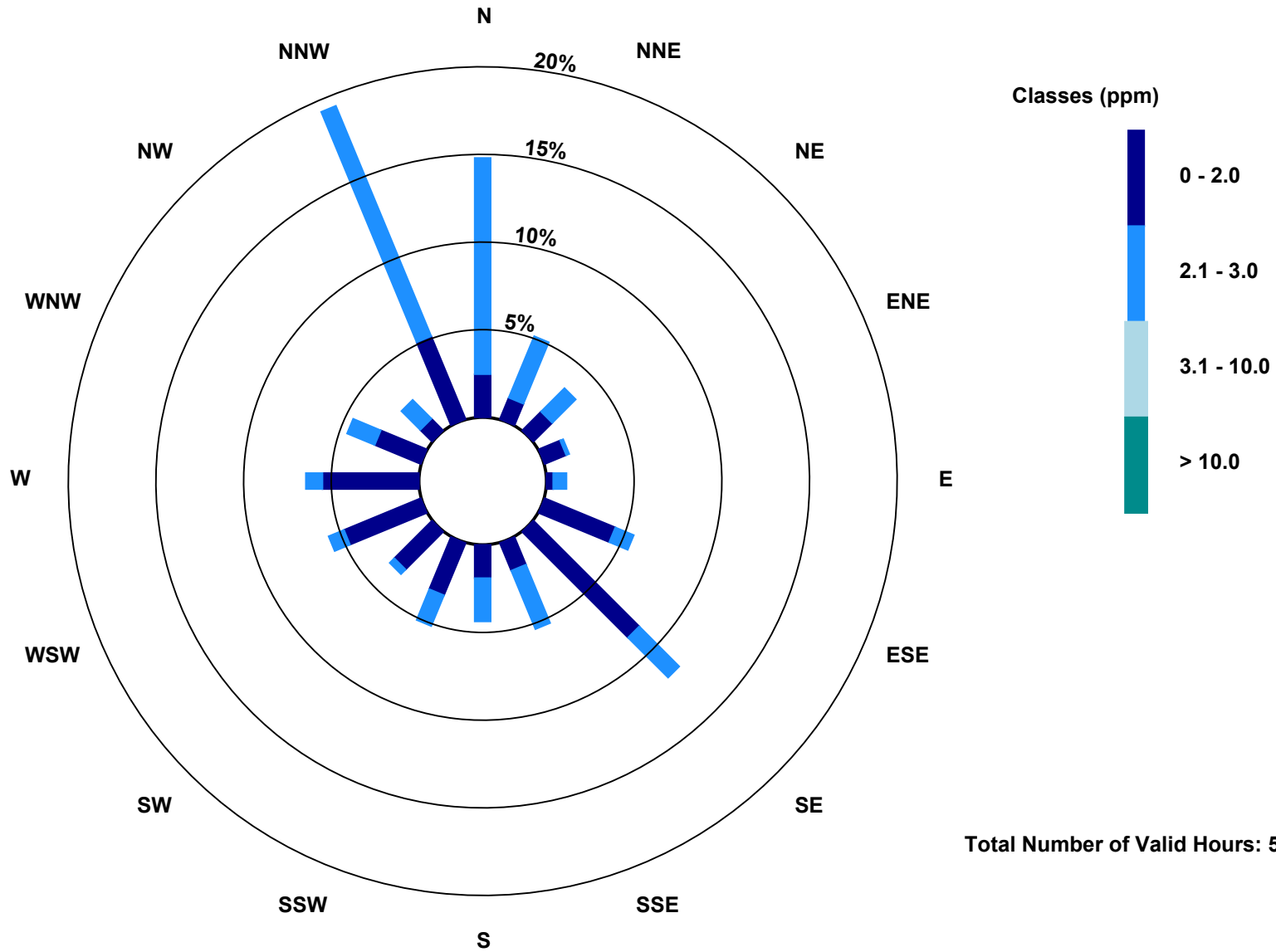
Total Number of Valid Hours: 527

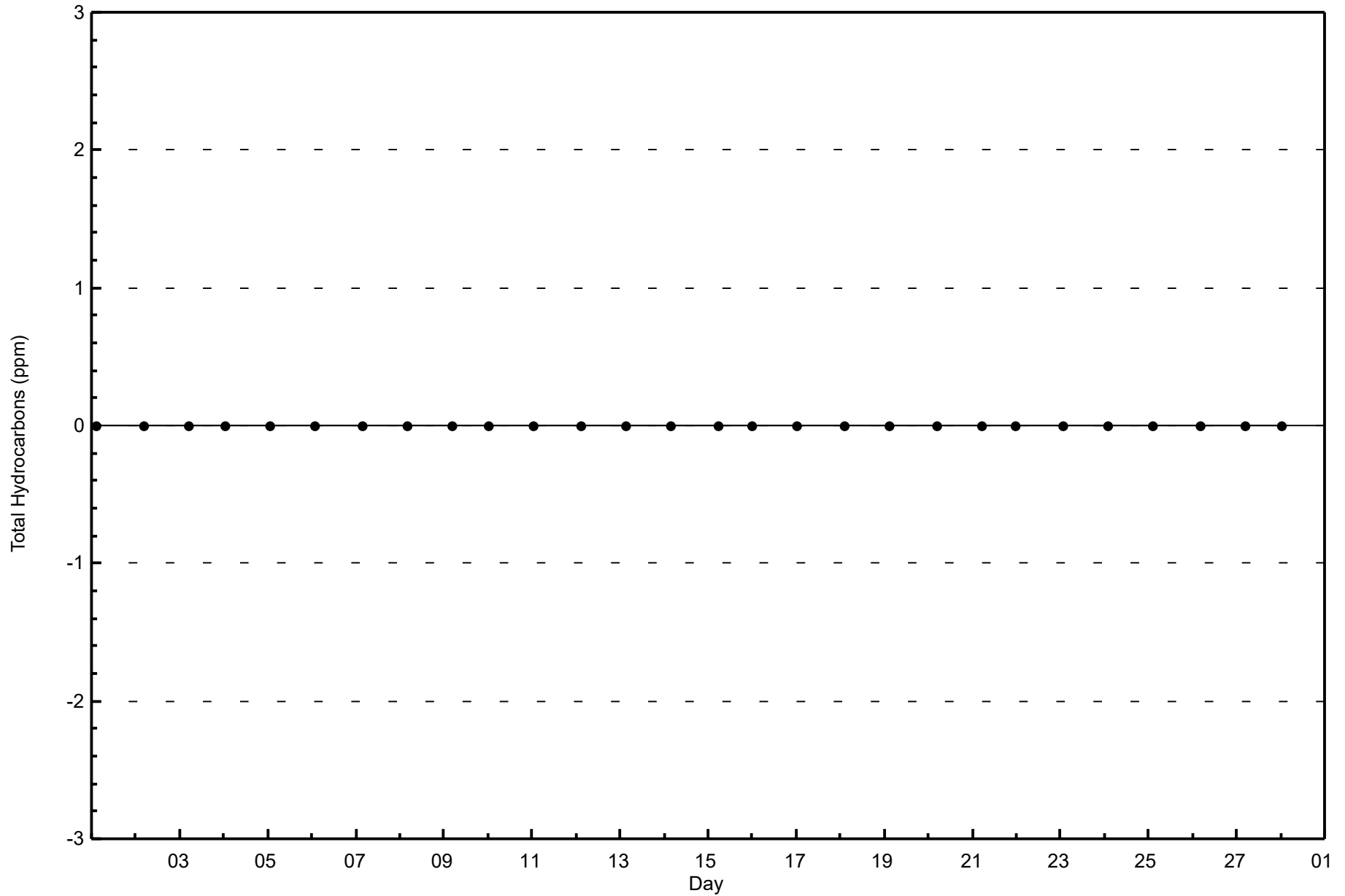
Total Number of Hours: 672



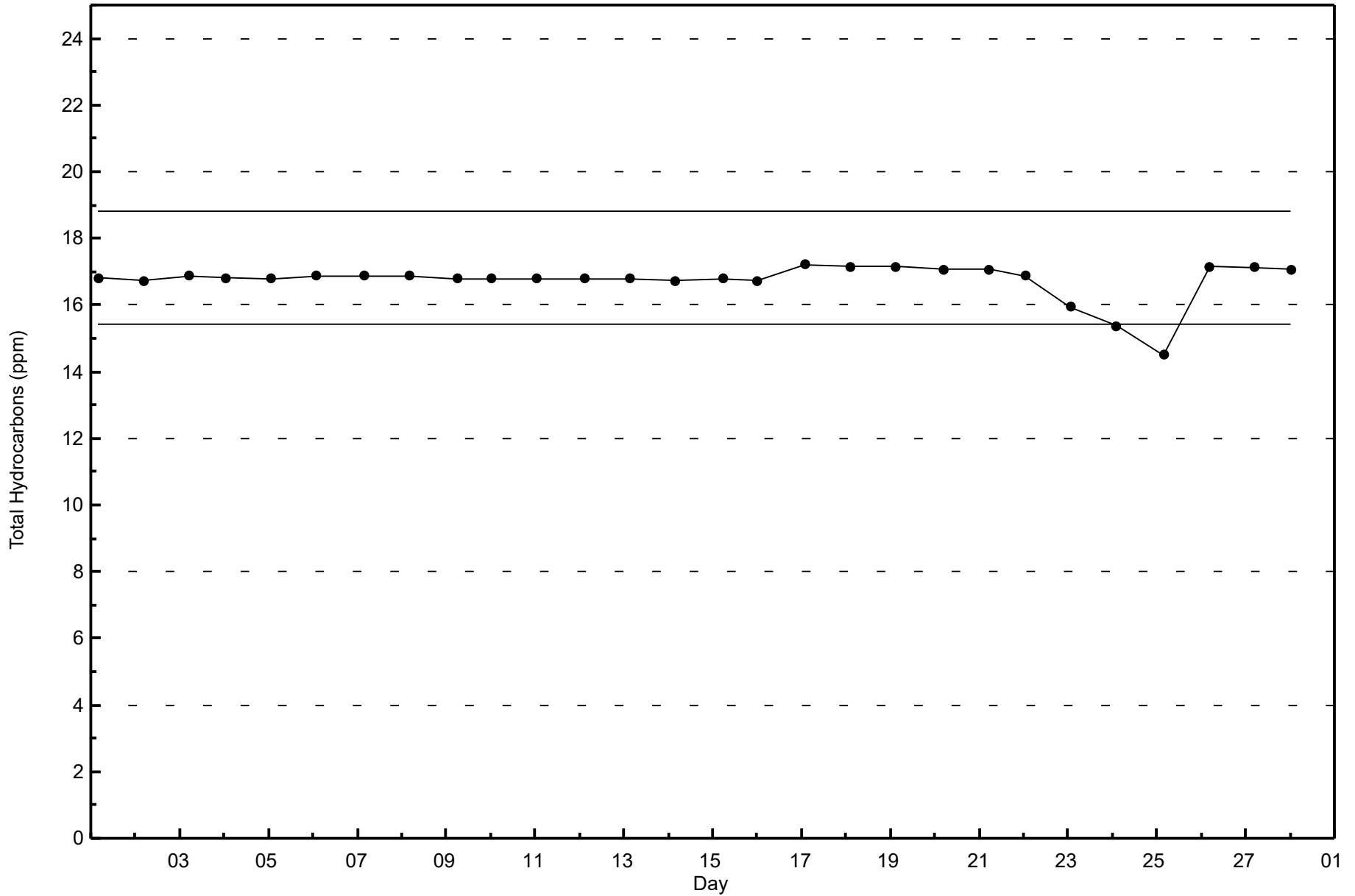
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Hydrocarbons (THC) - ppm  
Patricia McInnes



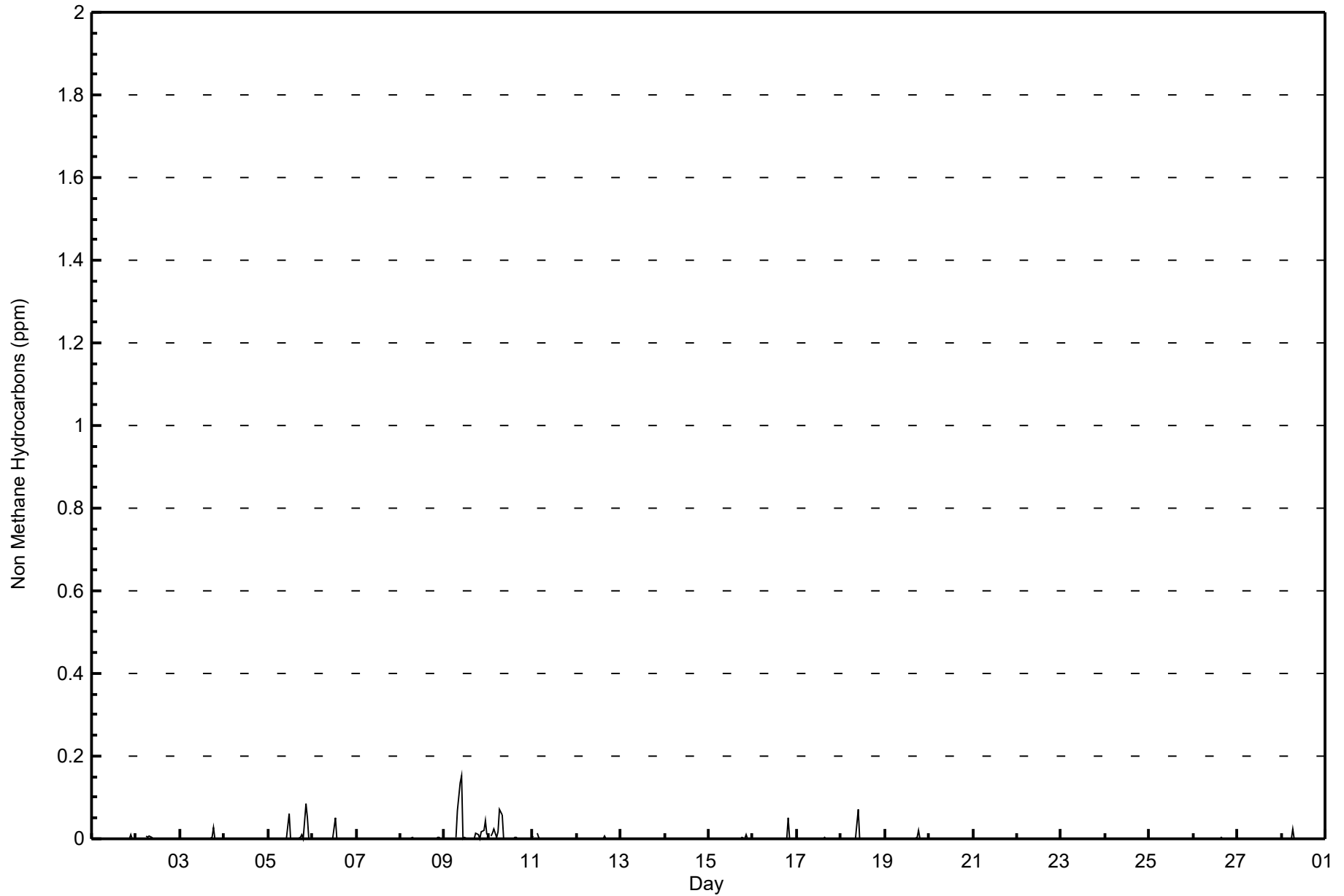








Maximum Value: 0.153 ppm on Feb 9 10:00																				Maximum Daily Average: 0.021 ppm on Feb 9					Hours in Service: 672			
Minimum Value: 0.000 ppm on Feb 1 01:00																				Minimum Daily Average: 0.000 ppm on Feb 4					Hours of Data: 577			
Maximum Diurnal Average: 0.009 ppm at hour 10																				Minimum Diurnal Average: 0.000 ppm at hour 11					Hours of Missing Data: 95			
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> = 0.1					Hours of Calibration: 32			
																									Percent Operational Time: 90.6			
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-Feb	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	0.009	0.000	0.000	0.000	0.000	0.001	0.008
2-Feb	0.000	0.000	0.000	0.000	Z	0.008	0.003	0.007	0.003	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	0.001	0.008
3-Feb	0.000	0.000	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	0.004	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.028	
4-Feb	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
5-Feb	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.061	0.000	0.000	0.000	0.000	0.000	0.002	0.011	0.000	0.086	0.052	0.000	0.000	0.000	0.009	0.086	
6-Feb	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.051	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.051	
7-Feb	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
8-Feb	0.000	0.000	0.000	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	0.002	0.002	0.000	0.001	0.000	0.000	0.002	
9-Feb	0.000	0.000	0.002	0.000	0.002	Z	0.004	0.068	0.136	0.153	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.012	0.011	0.000	0.017	0.021	0.042	0.010	0.021	0.153		
10-Feb	Z	0.007	0.012	0.023	0.004	0.019	0.070	0.059	0.002	0.000	0.000	0.000	0.000	0.000	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.009	0.070	
11-Feb	0.005	Z	0.013	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	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.013	
12-Feb	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	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007
13-Feb	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
14-Feb	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
15-Feb	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	0.002	0.000	0.010	0.000	0.000	0.000	0.000	0.001	0.010	0.010	
16-Feb	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.052	0.000	0.000	0.000	0.000	0.003	0.052		
17-Feb	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	
18-Feb	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.001	0.073	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.073	
19-Feb	0.000	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	0.000	0.002	0.021	0.000	0.000	0.000	0.000	0.000	0.001	0.021		
20-Feb	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	
21-Feb	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	
22-Feb	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	
23-Feb	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	0.000
24-Feb	UO	UO	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	--
25-Feb	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	--	0.000	
26-Feb	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	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	
27-Feb	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	
28-Feb	Z	0.000	0.000	0.000	0.000	0.000	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	0.001	0.023	
																				0.000 0.000 0.001 0.001 0.000 0.001 0.004 0.005 0.006 0.009 0.000 0.003 0.002 0.000 0.000 0.001 0.000 0.001 0.003 0.002 0.004 0.003 0.002 0.000					Diurnal Average			
																				0.005 0.007 0.013 0.023 0.004 0.019 0.070 0.068 0.136 0.153 0.000 0.061 0.051 0.000 0.005 0.007 0.000 0.012 0.028 0.052 0.086 0.052 0.042 0.010					Diurnal Maximum			
Z - zerospan			C - Calibration				M - Maintenance				UO - Unstable Operation																	





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

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Patricia McInnes - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	546	94.63	94.63
0.006 - 0.05	23	3.99	98.61
0.06 - 0.1	7	1.21	99.83
> 0.1	1	0.17	100.00

Total Number of Valid Hours: 577

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Patricia McInnes - February 2023**

<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	73	27	17	8	5	27	56	21	21	27	18	30	34	22	12	98	496
0.006 - 0.05	3	0	1	0	1	1	5	5	2	0	0	0	0	2	1	2	23
0.06 - 0.1	2	0	0	0	0	0	1	2	0	0	0	0	0	0	0	2	7
> 0.1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
<b>Totals</b>	<b>78</b>	<b>27</b>	<b>18</b>	<b>8</b>	<b>6</b>	<b>29</b>	<b>62</b>	<b>28</b>	<b>23</b>	<b>27</b>	<b>18</b>	<b>30</b>	<b>34</b>	<b>24</b>	<b>13</b>	<b>102</b>	<b>527</b>

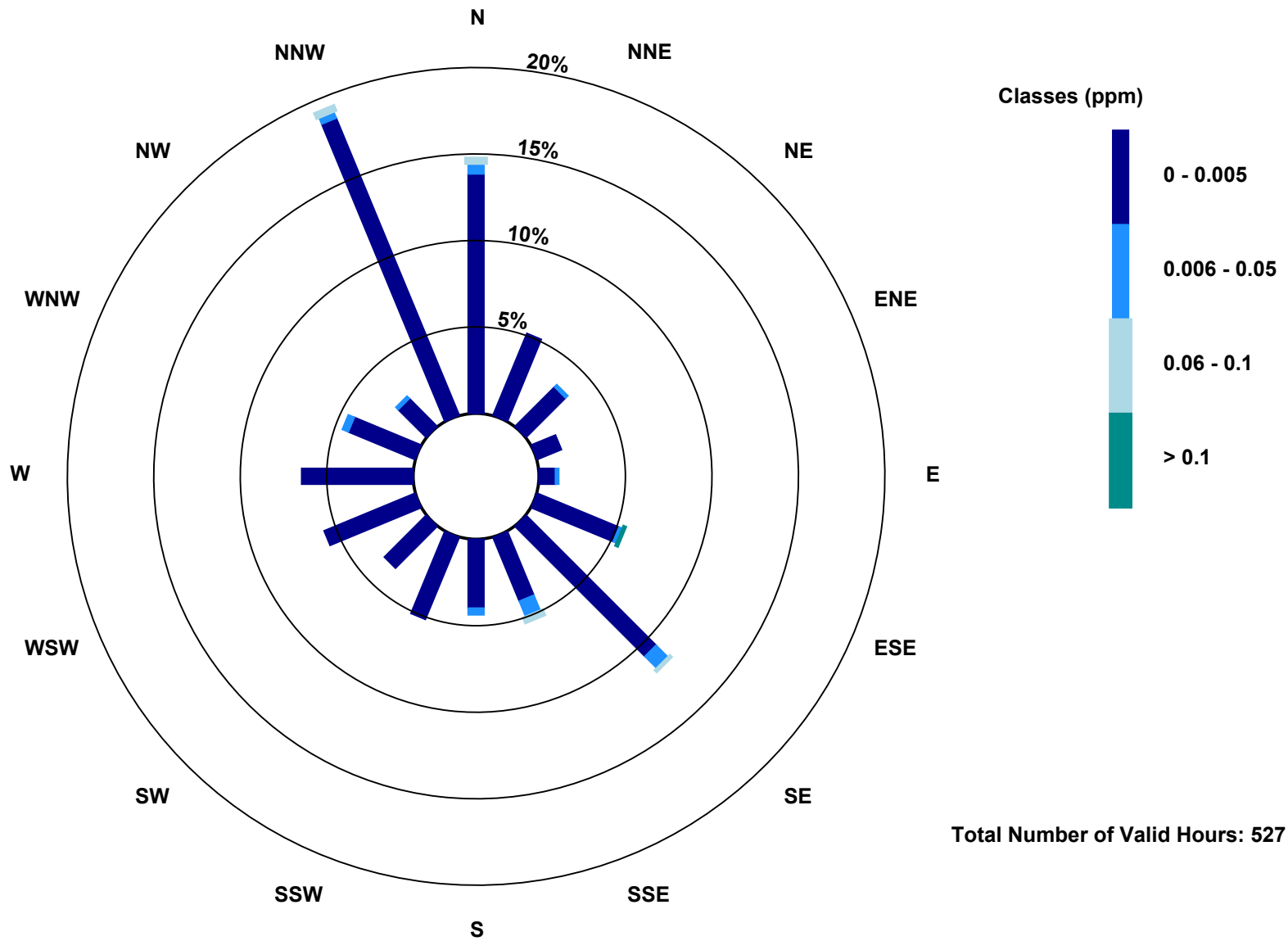
Total Number of Valid Hours: 527

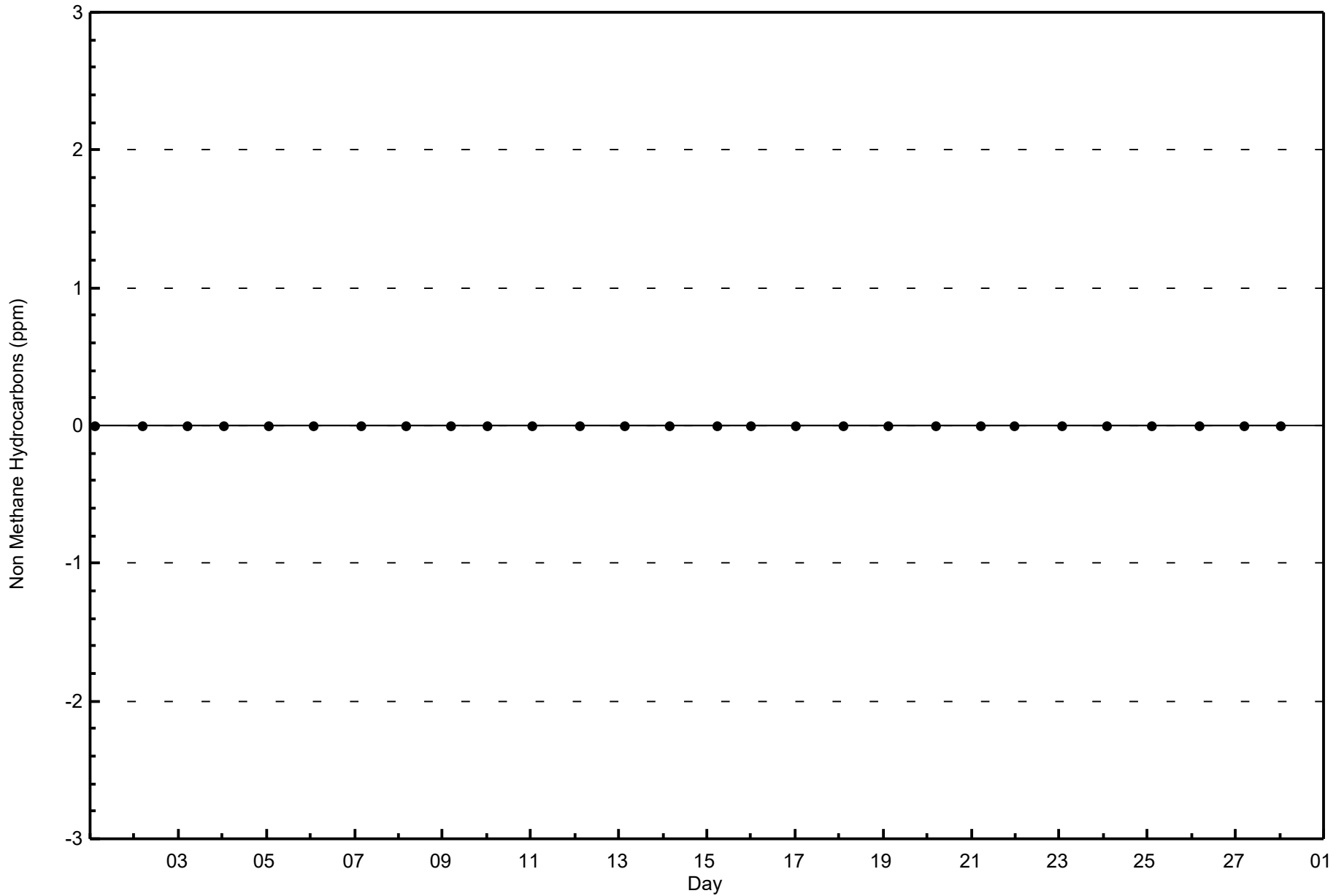
Total Number of Hours: 672

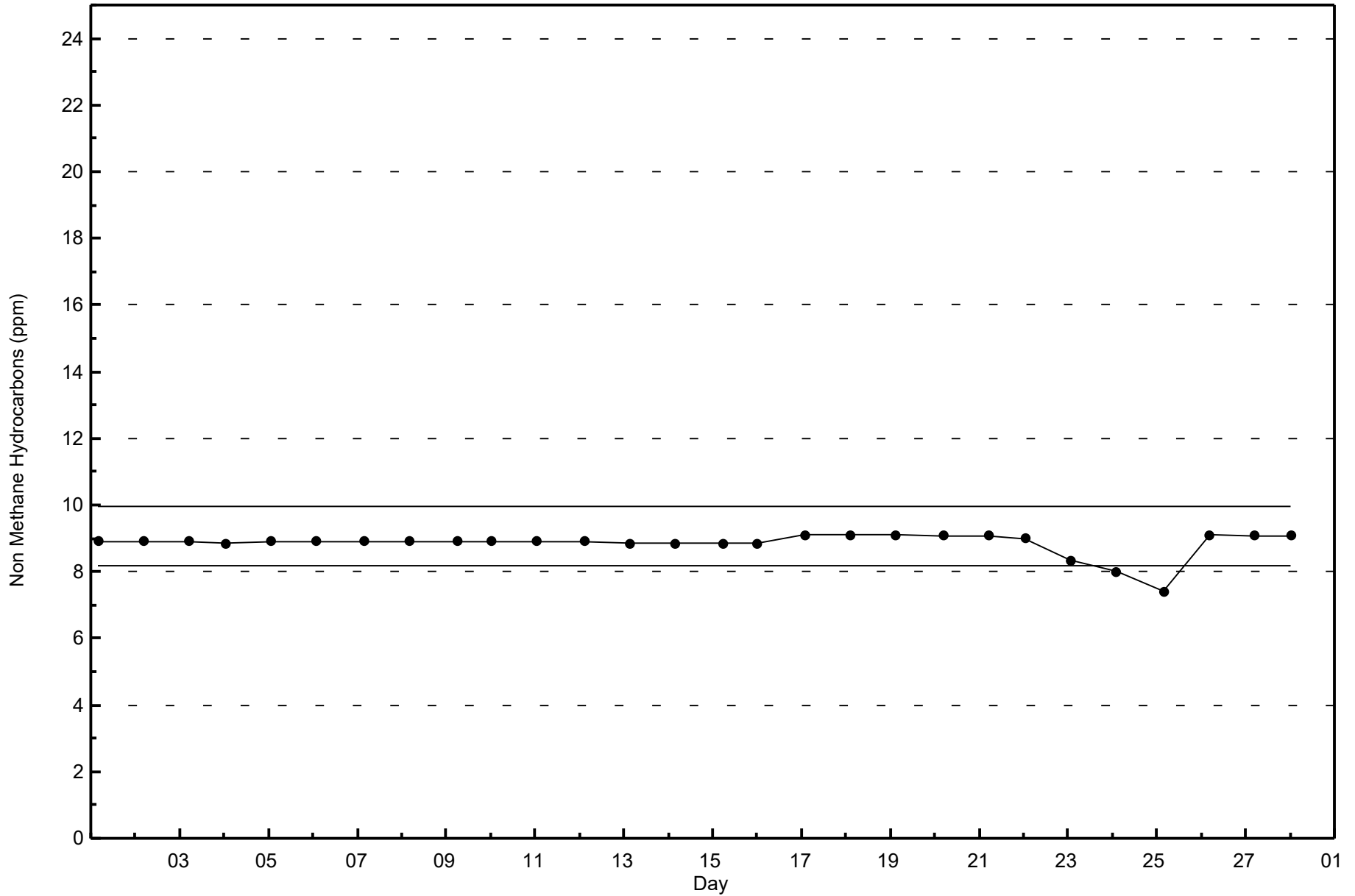


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Non Methane Hydrocarbons (NMHC) - ppm  
Patricia McInnes







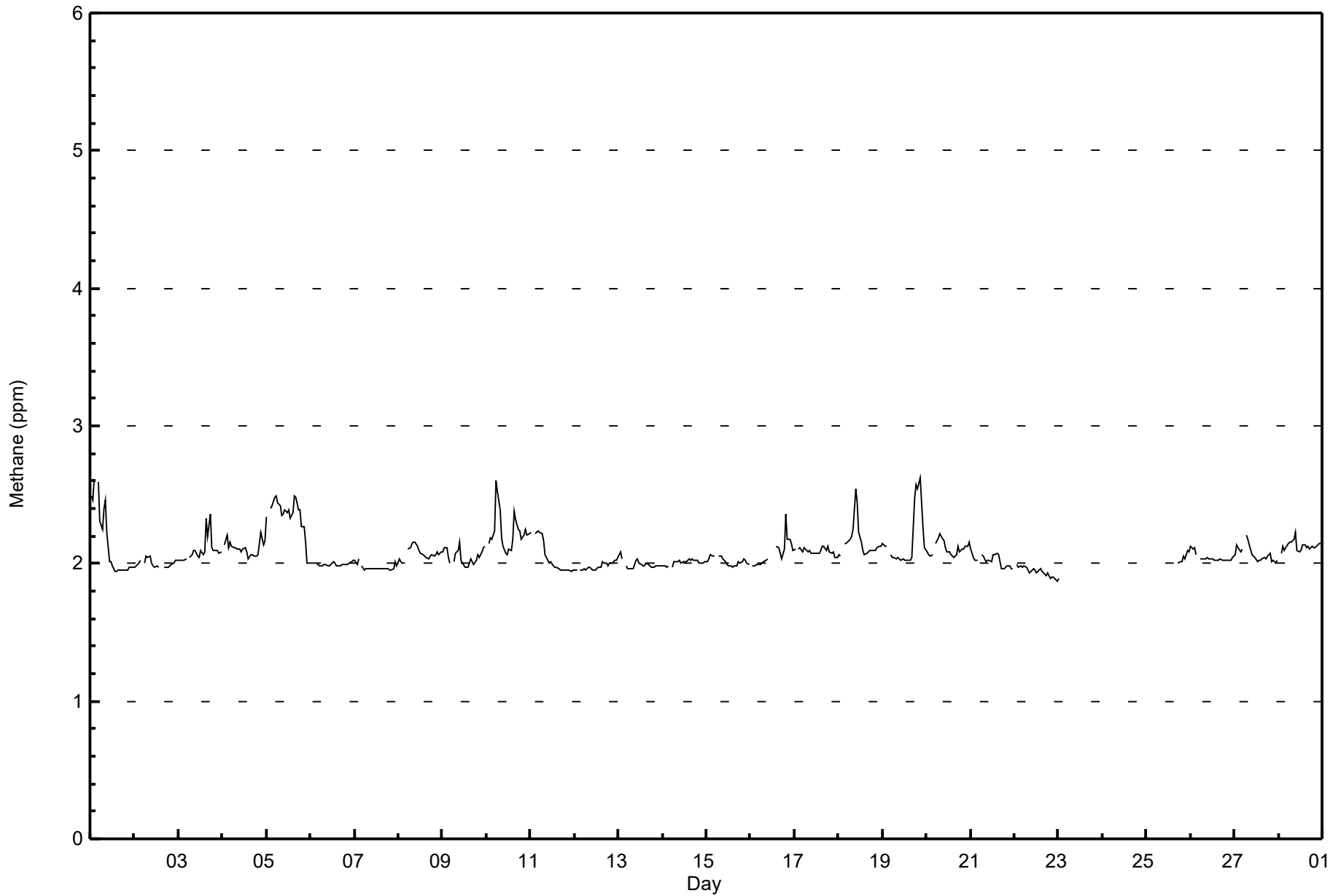




Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 2.6 ppm on Feb 19 21:00	Maximum Daily Average: 2.3 ppm on Feb 5		Hours of Data:	577
Minimum Value: 1.9 ppm on Feb 23 00:00	Minimum Daily Average: 1.9 ppm on Feb 22		Hours of Missing Data:	95
Maximum Diurnal Average: 2.1 ppm at hour 6	Minimum Diurnal Average: 2.0 ppm at hour 14		Hours of Calibration:	32
Monthly Average: 2.07 ppm	Percentiles: P <sub>1</sub> = 1.9 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> = 2.2 P <sub>99</sub> = 2.5		Percent Operational Time:	90.6

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-Feb	2.5	2.5	2.6	Z	2.6	2.3	2.2	2.4	2.5	2.2	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	2.1	2.6																							
2-Feb	2.0	2.0	2.0	2.0	Z	2.0	2.1	2.0	2.1	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	2.1																							
3-Feb	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.3	2.2	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4																							
4-Feb	Z	2.1	2.2	2.1	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	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2																							
5-Feb	2.3	Z	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.5	2.5	2.4	2.4	2.3	2.3	2.2	2.0	2.0	2.5	2.5																							
6-Feb	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																							
7-Feb	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																							
8-Feb	2.0	2.0	2.0	2.0	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																							
9-Feb	2.1	2.1	2.1	2.0	2.0	Z	2.0	2.1	2.1	2.2	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	2.2																								
10-Feb	Z	2.1	2.2	2.2	2.2	2.6	2.5	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.6																								
11-Feb	2.2	Z	2.2	2.2	2.2	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	1.9	1.9	1.9	1.9	1.9	1.9	2.2																								
12-Feb	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-Feb	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	2.1																								
14-Feb	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																								
15-Feb	2.0	2.0	2.1	2.1	2.1	Z	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																								
16-Feb	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	C	C	C	C	2.1	2.1	2.1	2.0	2.1	2.4	2.2	2.2	2.1	2.1	2.4																								
17-Feb	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	2.0	2.0	2.1																								
18-Feb	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.2	2.5	2.4	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	2.5																								
19-Feb	2.1	2.1	2.1	Z	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	2.5	2.6	2.5	2.6	2.4	2.3	2.1	2.6																								
20-Feb	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2																								
21-Feb	2.1	2.0	2.0	2.0	2.0	Z	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	2.0	2.0	2.0	2.0	2.0	2.1																								
22-Feb	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	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	2.0																								
23-Feb	1.9	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	1.9																								
24-Feb	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--																								
25-Feb	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	M	2.0	2.0	2.1	2.0	2.1	--																								
26-Feb	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	2.1																								
27-Feb	2.1	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.2																								
28-Feb	Z	2.1	2.1	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	2.1	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	2.0	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	
																								2.5	2.5	2.6	2.4	2.6	2.6	2.5	2.4	2.5	2.5	2.4	2.4	2.4	2.3	2.4	2.5	2.5	2.5	2.6	2.5	2.6	2.4	2.3	2.2	2.1	Diurnal Maximum

Z - zerospan                      C - Calibration                      M - Maintenance                      UO - Unstable Operation





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

**Methane (CH<sub>4</sub>) - ppm**  
**Patricia McInnes - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	306	53.03	53.03
2.1 - 3.0	271	46.97	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 577

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Patricia McInnes - February 2023**

<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	13	7	8	7	3	23	47	10	10	17	16	25	29	15	5	27	262
2.1 - 3.0	65	20	10	1	3	6	15	18	13	10	2	5	5	9	8	75	265
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>	78	27	18	8	6	29	62	28	23	27	18	30	34	24	13	102	527

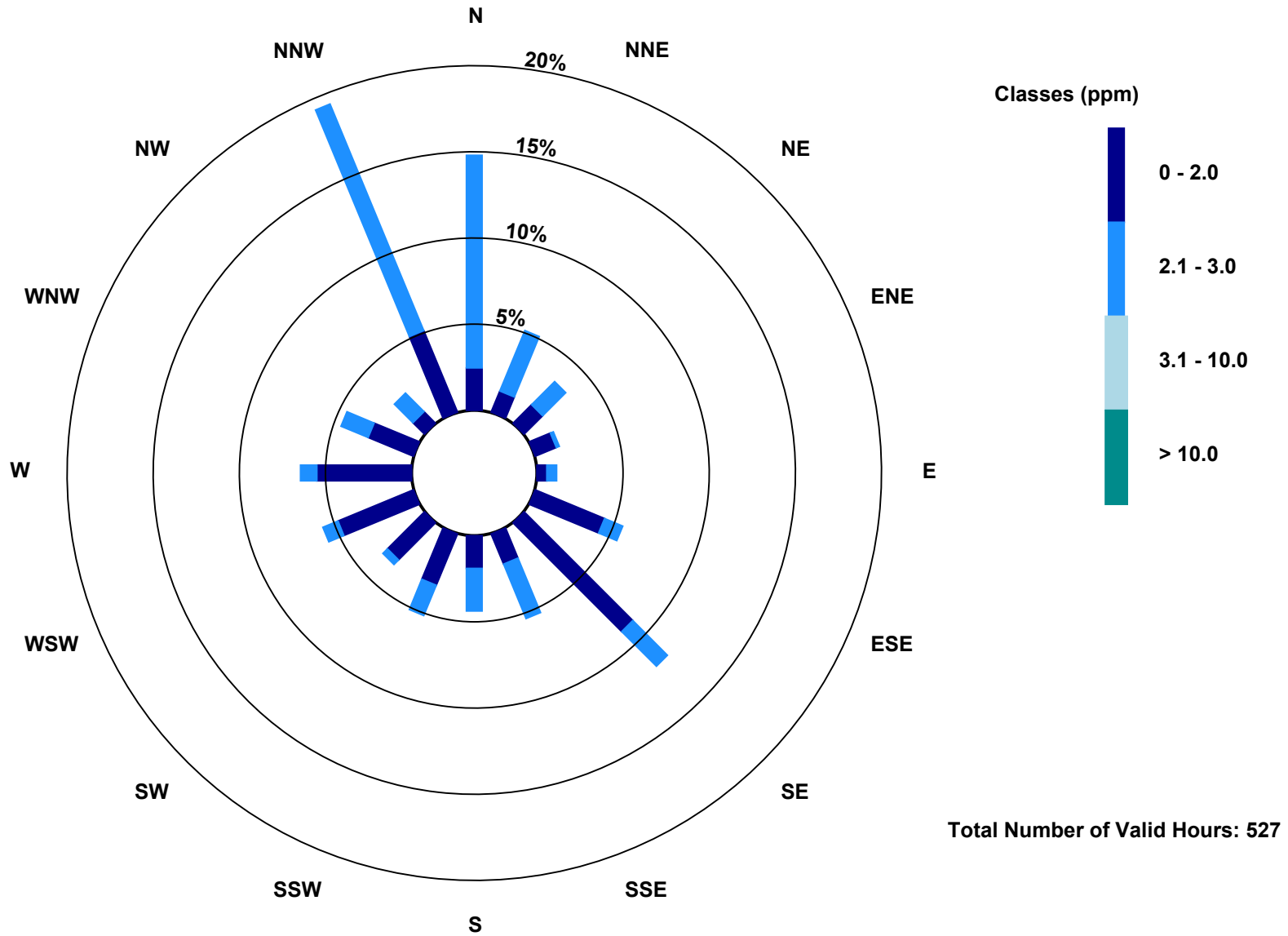
Total Number of Valid Hours: 527

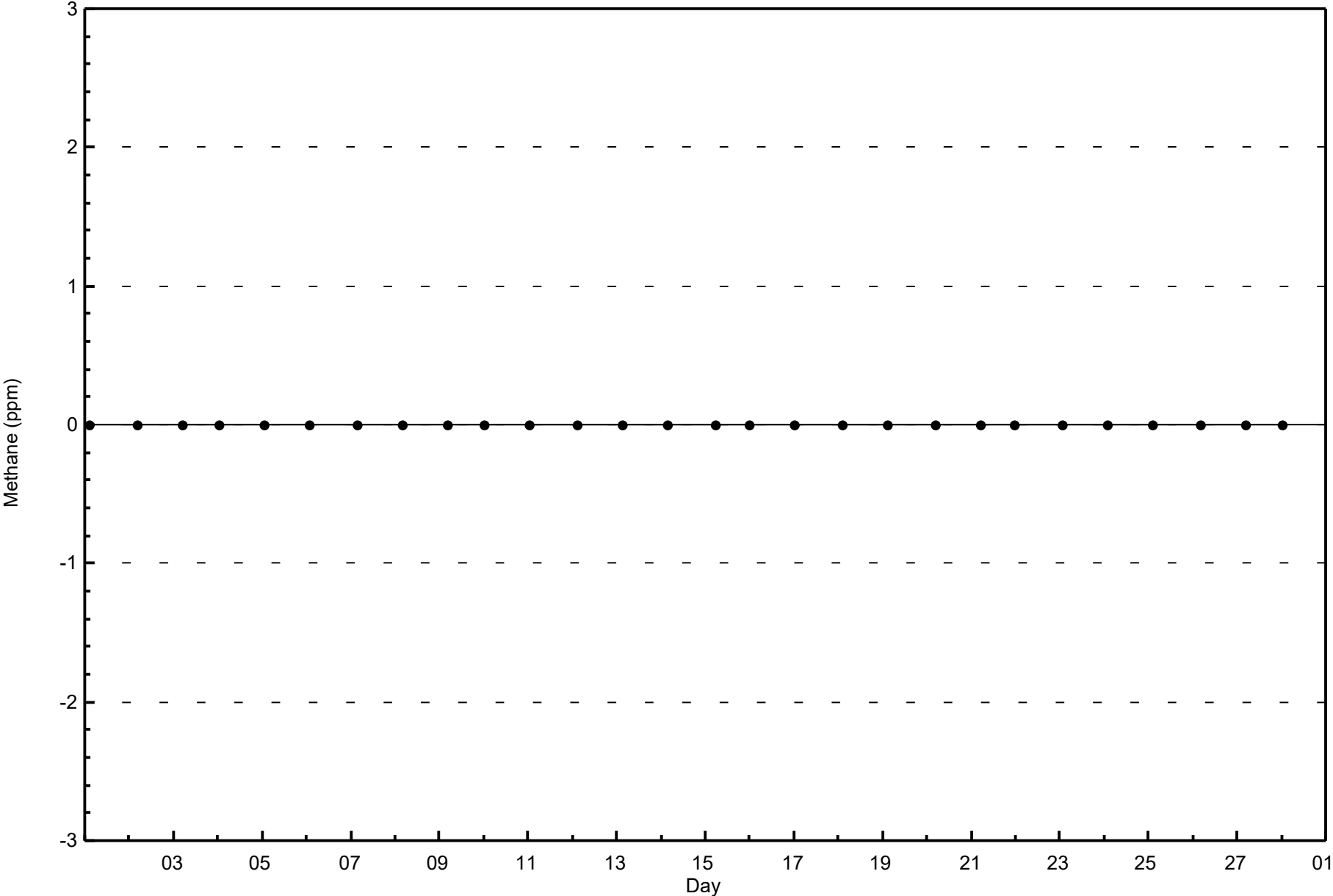
Total Number of Hours: 672

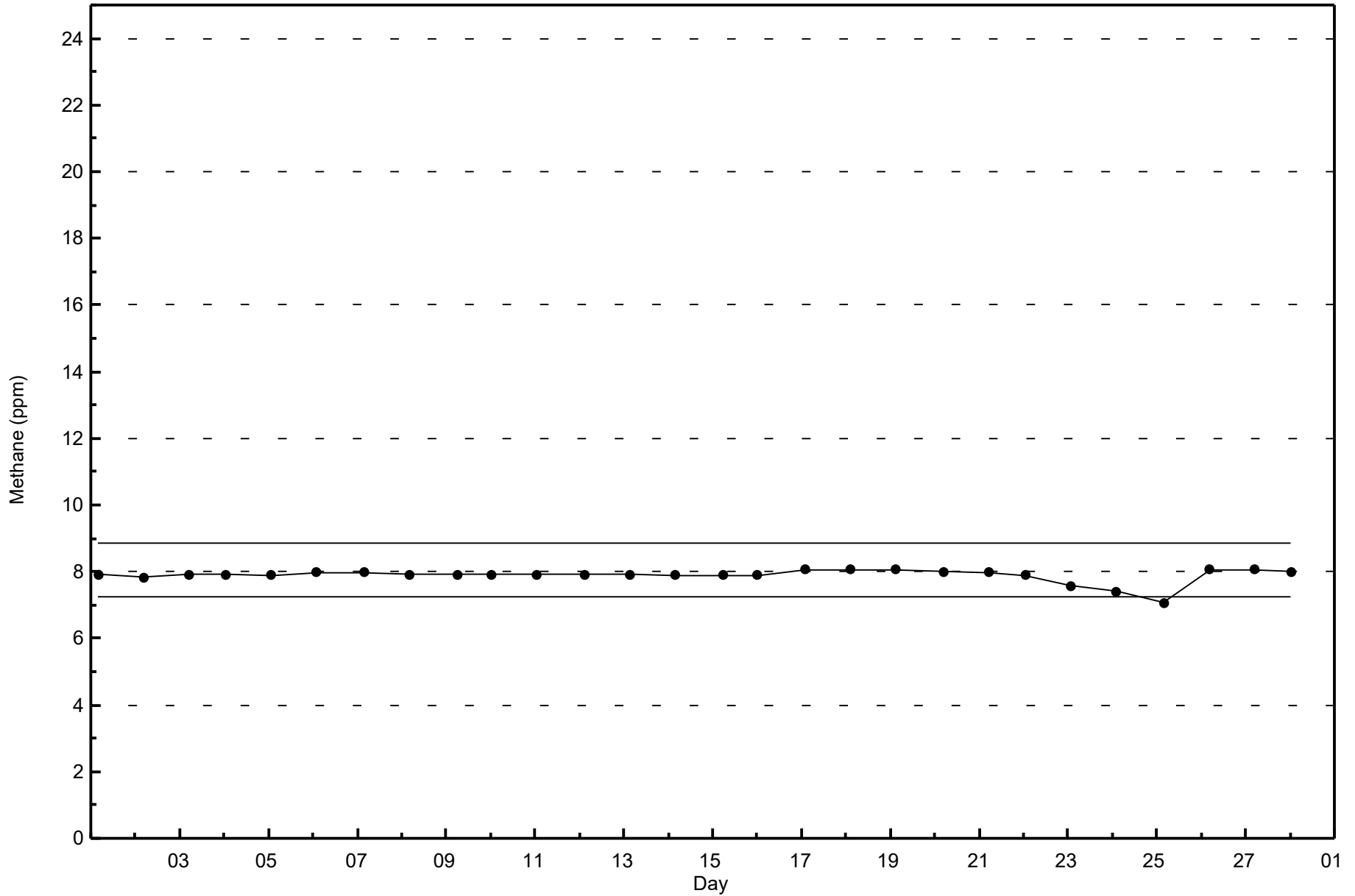


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Methane (CH<sub>4</sub>) - ppm  
Patricia McInnes









Wood Buffalo Environmental Association

Summary of Hour Averages

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

Patricia McInnes - February 2023

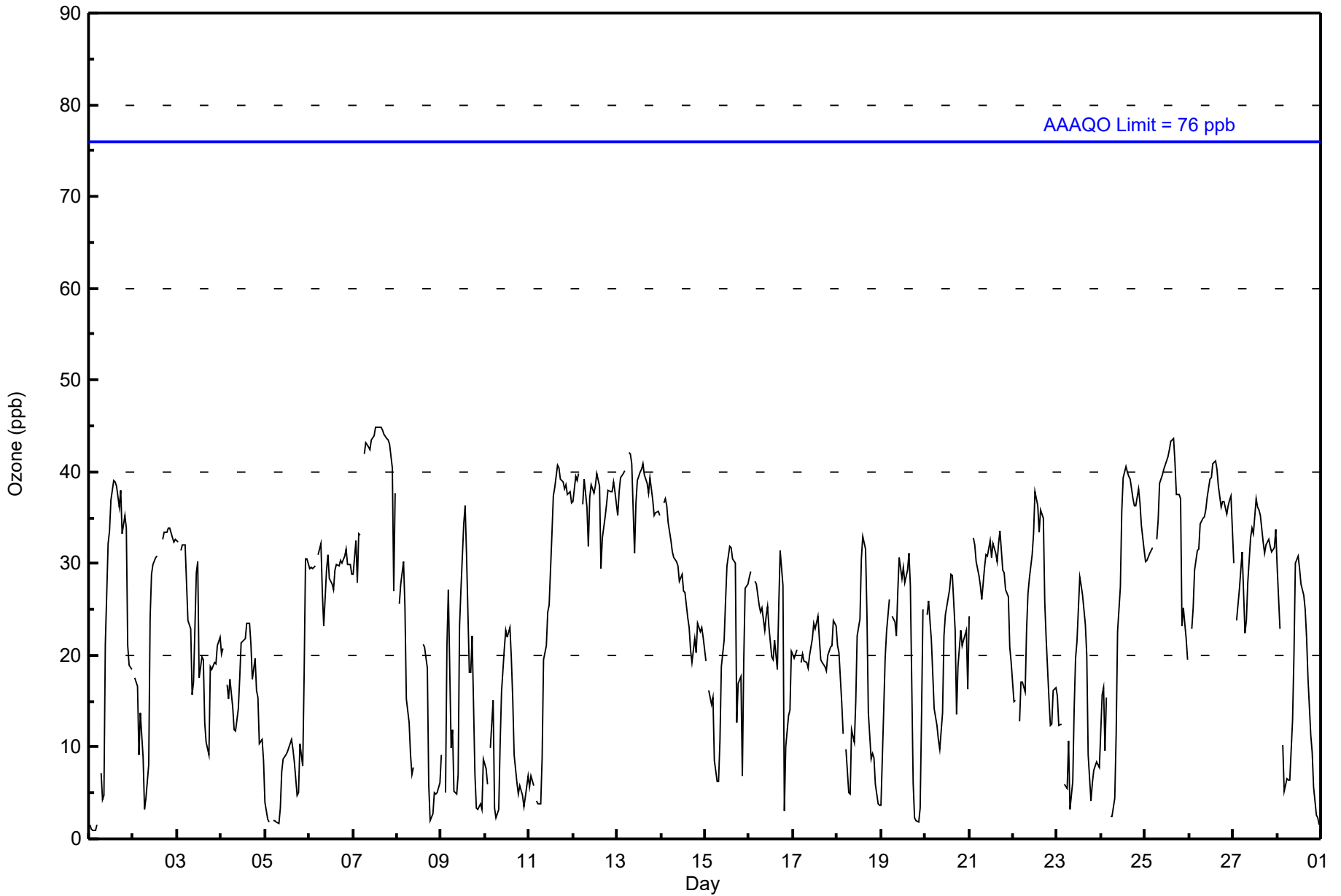
Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																			
Maximum Value: 44.9 ppb on Feb 7 15:00		Maximum Daily Average: 39.8 ppb on Feb 7				Hours of Data:		638																			
Minimum Value: 0.9 ppb on Feb 1 04:00		Minimum Daily Average: 8.7 ppb on Feb 5				Hours of Missing Data:		34																			
Maximum Diurnal Average: 31.2 ppb at hour 14		Minimum Diurnal Average: 16.9 ppb at hour 6				Hours of Calibration:		32																			
Monthly Average: 23.43 ppb		Percentiles: P <sub>1</sub> = 1.7 P <sub>10</sub> = 5.7 Q <sub>1</sub> = 14.2 Median = 24.2 Q <sub>3</sub> = 32.5 P <sub>90</sub> = 38.4 P <sub>99</sub> = 43.8				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-Feb	1.5	1.1	1.0	0.9	1.6	Z	7.1	4.3	4.8	21.2	32.1	33.6	37.0	39.0	39.0	38.4	36.1	38.1	33.3	35.2	33.9	21.1	18.9	18.5	21.6	39.0	
2-Feb	Z	17.6	16.7	9.2	13.8	8.9	3.3	4.4	8.2	24.2	28.8	29.8	30.7	30.8	M	M	32.7	33.4	33.4	33.8	33.8	32.8	32.4	32.6	23.4	33.8	
3-Feb	32.4	Z	31.4	32.0	32.1	27.9	23.8	22.9	15.7	17.1	29.0	30.2	17.6	19.8	19.5	12.7	10.5	9.1	18.8	18.4	19.2	19.1	21.0	22.0	21.8	32.4	
4-Feb	20.2	20.8	Z	16.8	15.3	17.3	14.3	11.9	11.8	14.2	17.5	21.3	21.7	21.9	23.5	23.5	21.2	17.5	19.7	16.1	15.4	10.4	10.8	8.5	17.0	23.5	
5-Feb	3.9	2.1	1.9	Z	2.0	1.9	1.8	1.6	3.3	7.3	8.7	9.2	9.4	10.0	10.8	9.7	8.4	4.7	5.0	10.4	7.9	17.9	30.5	30.5	8.7	30.5	
6-Feb	29.4	29.6	29.5	29.8	Z	31.0	32.2	26.8	23.2	29.3	30.9	28.3	27.7	27.2	29.3	29.9	29.8	30.3	30.1	30.9	31.5	29.9	30.0	28.8	29.4	32.2	
7-Feb	28.9	32.5	27.8	33.2	33.1	Z	42.0	43.2	42.7	42.5	43.4	43.9	44.8	44.8	44.9	44.9	44.5	44.1	43.6	43.5	42.9	40.5	26.9	37.7	39.8	44.9	
8-Feb	Z	25.6	27.8	30.2	25.3	15.2	12.6	9.2	7.0	7.7	C	C	C	C	21.2	20.9	18.6	5.9	2.0	2.7	5.0	4.8	5.0	6.0	13.3	30.2	
9-Feb	9.1	Z	5.1	21.0	27.1	10.0	11.8	5.3	4.9	7.0	23.2	27.1	34.4	36.3	30.9	18.1	18.2	22.1	7.1	3.4	3.3	3.7	3.3	8.6	14.8	36.3	
10-Feb	7.7	5.9	Z	9.9	15.1	3.3	2.3	3.2	10.4	16.0	20.8	22.8	21.9	23.0	19.7	15.3	9.1	6.1	4.9	5.7	4.7	3.5	4.5	6.9	10.6	23.0	
11-Feb	5.7	6.9	5.7	Z	4.1	3.8	3.8	8.8	19.5	21.1	24.7	25.4	33.2	37.4	38.2	40.7	40.4	39.2	38.9	38.1	38.5	37.6	37.8	36.7	25.5	40.7	
12-Feb	36.8	39.5	39.0	39.8	Z	36.5	39.2	36.2	31.8	37.2	38.6	37.7	38.4	39.9	38.5	29.4	32.8	35.1	36.5	37.9	37.9	37.9	38.8	37.8	37.1	39.9	
13-Feb	35.2	37.9	39.3	39.8	40.1	Z	42.1	41.9	40.9	31.2	36.7	39.1	40.0	40.3	40.9	39.6	38.7	37.7	39.4	36.9	35.2	35.5	35.7	35.3	38.2	42.1	
14-Feb	Z	36.5	37.0	36.2	34.5	32.4	31.3	30.7	30.2	29.7	28.1	28.9	27.1	26.9	24.1	23.0	20.6	19.2	21.8	20.4	23.4	22.5	23.0	22.0	27.4	37.0	
15-Feb	19.4	Z	16.1	14.7	15.5	8.5	6.2	6.3	10.6	18.8	21.7	25.9	29.7	31.9	31.7	30.5	30.0	12.6	17.0	17.7	6.9	19.4	27.3	27.7	19.4	31.9	
16-Feb	28.6	29.1	Z	28.1	27.8	25.5	24.7	25.2	22.7	24.3	25.4	23.1	19.9	19.6	21.7	18.4	25.3	31.4	27.6	3.1	10.0	13.5	14.1	20.4	22.1	31.4	
17-Feb	19.6	20.1	20.6	Z	19.2	20.2	19.4	19.2	18.6	20.0	21.8	23.4	22.8	24.2	21.9	19.6	19.2	18.7	18.3	20.0	20.9	21.1	23.8	23.2	20.7	24.2	
18-Feb	21.0	20.4	14.8	11.5	Z	9.7	5.0	4.8	11.9	10.5	14.9	22.1	24.0	30.5	33.0	31.5	24.4	13.8	8.6	9.4	8.8	5.9	3.8	3.7	15.0	33.0	
19-Feb	3.6	14.2	19.7	22.6	26.1	Z	24.2	23.7	22.2	26.8	30.7	28.3	29.5	27.9	29.3	31.1	27.7	6.1	2.4	2.0	1.8	3.3	13.6	25.0	19.2	31.1	
20-Feb	Z	24.4	25.9	21.6	17.9	14.2	12.4	10.8	9.8	13.7	22.2	24.4	26.2	27.2	28.8	28.7	22.8	13.6	18.8	22.7	21.1	21.6	22.7	16.3	20.3	28.8	
21-Feb	24.3	Z	32.8	32.0	30.2	28.6	27.6	26.0	29.5	31.0	30.9	32.4	30.7	32.2	31.1	30.3	32.1	33.6	29.3	28.9	27.2	26.4	21.0	19.2	29.0	33.6	
22-Feb	14.9	15.1	Z	12.9	17.1	17.0	16.0	22.7	26.7	28.3	30.9	33.3	37.8	36.3	33.3	35.9	35.0	25.8	21.9	15.3	12.4	12.5	16.2	16.5	23.2	37.8	
23-Feb	15.6	12.4	12.4	Z	6.0	5.5	10.7	3.2	6.2	14.3	19.7	21.5	28.5	27.7	26.6	23.4	20.0	9.1	4.2	6.0	7.5	8.4	8.1	7.7	13.2	28.5	
24-Feb	15.7	16.4	9.7	15.4	Z	2.4	2.4	4.4	11.4	22.6	27.4	35.8	39.4	40.5	39.9	39.5	39.3	37.1	36.3	36.3	38.1	36.7	34.2	31.4	26.6	40.5	
25-Feb	30.2	30.3	31.1	31.4	31.7	Z	32.7	34.7	38.8	39.7	40.3	40.7	41.6	42.4	43.3	43.6	41.0	37.5	37.5	37.0	23.2	25.2	21.8	19.6	34.6	43.6	
26-Feb	Z	22.8	25.1	29.3	31.4	31.6	34.3	35.0	35.0	35.9	37.2	39.2	39.4	40.8	41.1	40.3	38.5	36.1	36.7	36.8	35.3	36.2	37.0	37.3	35.3	41.1	
27-Feb	30.1	Z	23.7	27.2	29.4	31.3	22.4	23.7	27.8	32.8	33.9	33.2	37.1	36.1	35.8	35.3	32.4	31.1	32.1	32.6	31.8	31.3	31.8	33.6	31.2	37.1	
28-Feb	29.6	22.9	Z	10.2	5.2	6.6	6.3	6.5	12.9	20.2	30.1	30.9	29.5	27.7	26.6	25.0	22.0	17.6	11.2	9.4	5.6	2.7	2.2	1.5	15.8	30.9	
		20.2	21.1	21.5	23.2	20.9	16.9	18.3	17.7	19.2	23.0	27.8	29.3	30.4	31.2	30.5	28.9	27.5	23.8	22.7	21.8	20.8	20.8	21.3	22.0	Diurnal Average	
		36.8	39.5	39.3	39.8	40.1	36.5	42.1	43.2	42.7	42.5	43.4	43.9	44.8	44.8	44.9	44.9	44.5	44.1	43.6	43.5	42.9	40.5	38.8	37.8	Diurnal Maximum	
Z - zerspan										C - Calibration					M - Maintenance												
Alberta Ambient Air Quality Objectives (AAAQO):										1-hr 76 ppb																	





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

**Ozone (O<sub>3</sub>) - ppb**  
**Patricia McInnes - February 2023**





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

**Ozone (O<sub>3</sub>) - ppb**  
**Patricia McInnes - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	246	38.56	38.56
21 - 50	392	61.44	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



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

**Ozone (O<sub>3</sub>) - ppb**  
**Patricia McInnes - February 2023**

<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	46	12	4	0	2	9	12	24	16	20	10	9	8	10	8	45	235
21 - 50	35	15	18	10	5	21	52	11	19	15	22	25	28	13	8	56	353
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>	81	27	22	10	7	30	64	35	35	35	32	34	36	23	16	101	588

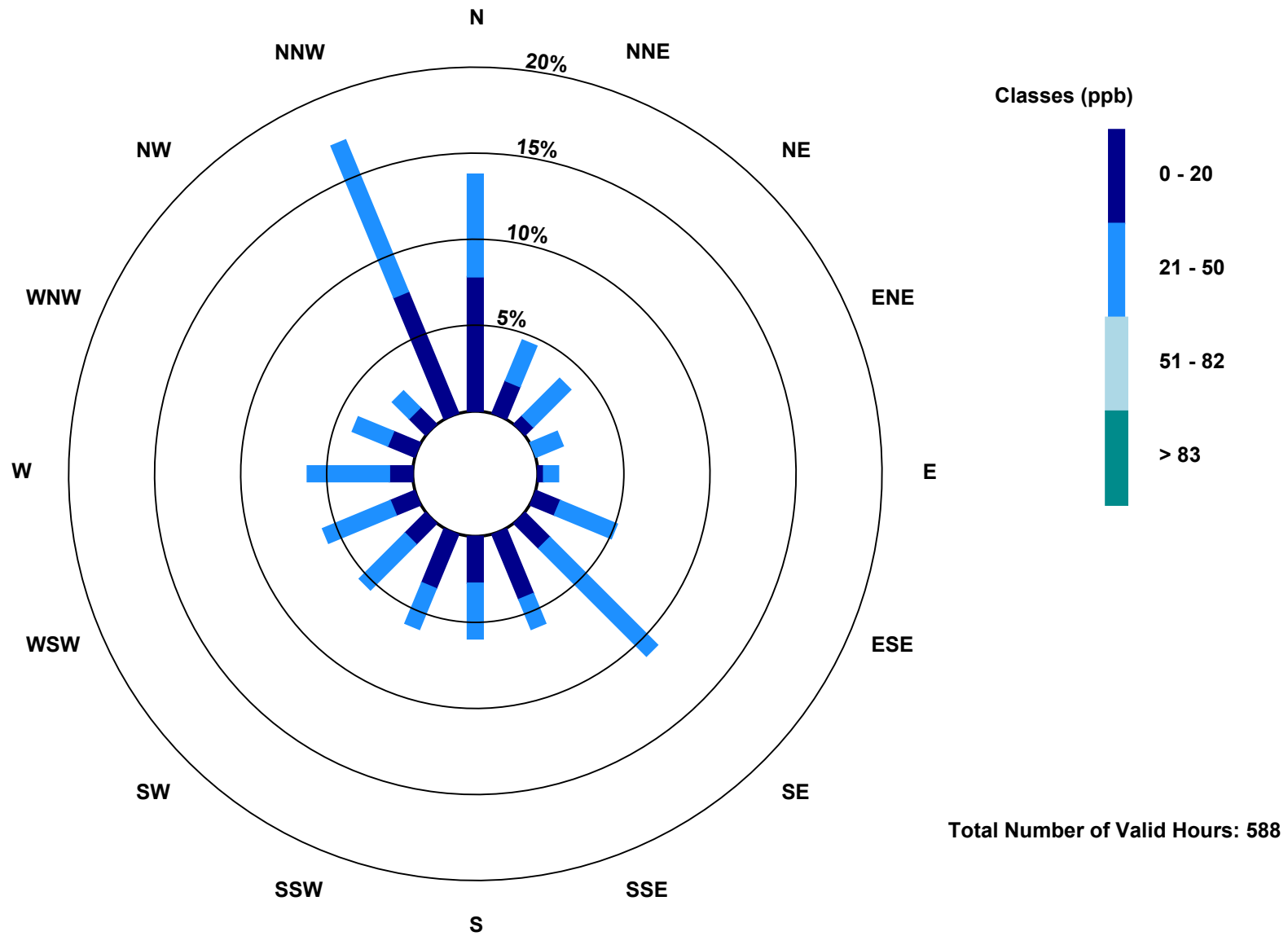
Total Number of Valid Hours: 588

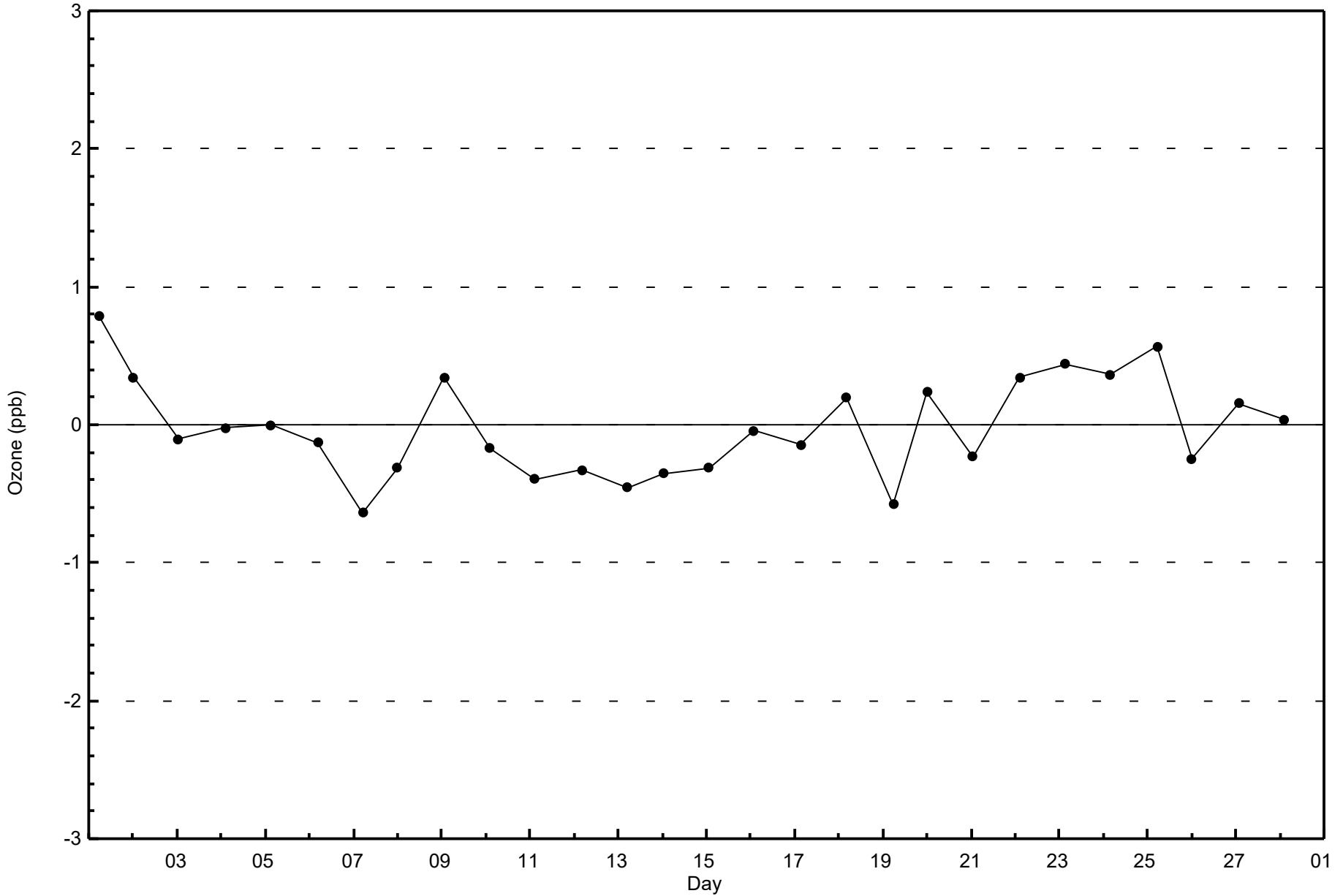
Total Number of Hours: 672

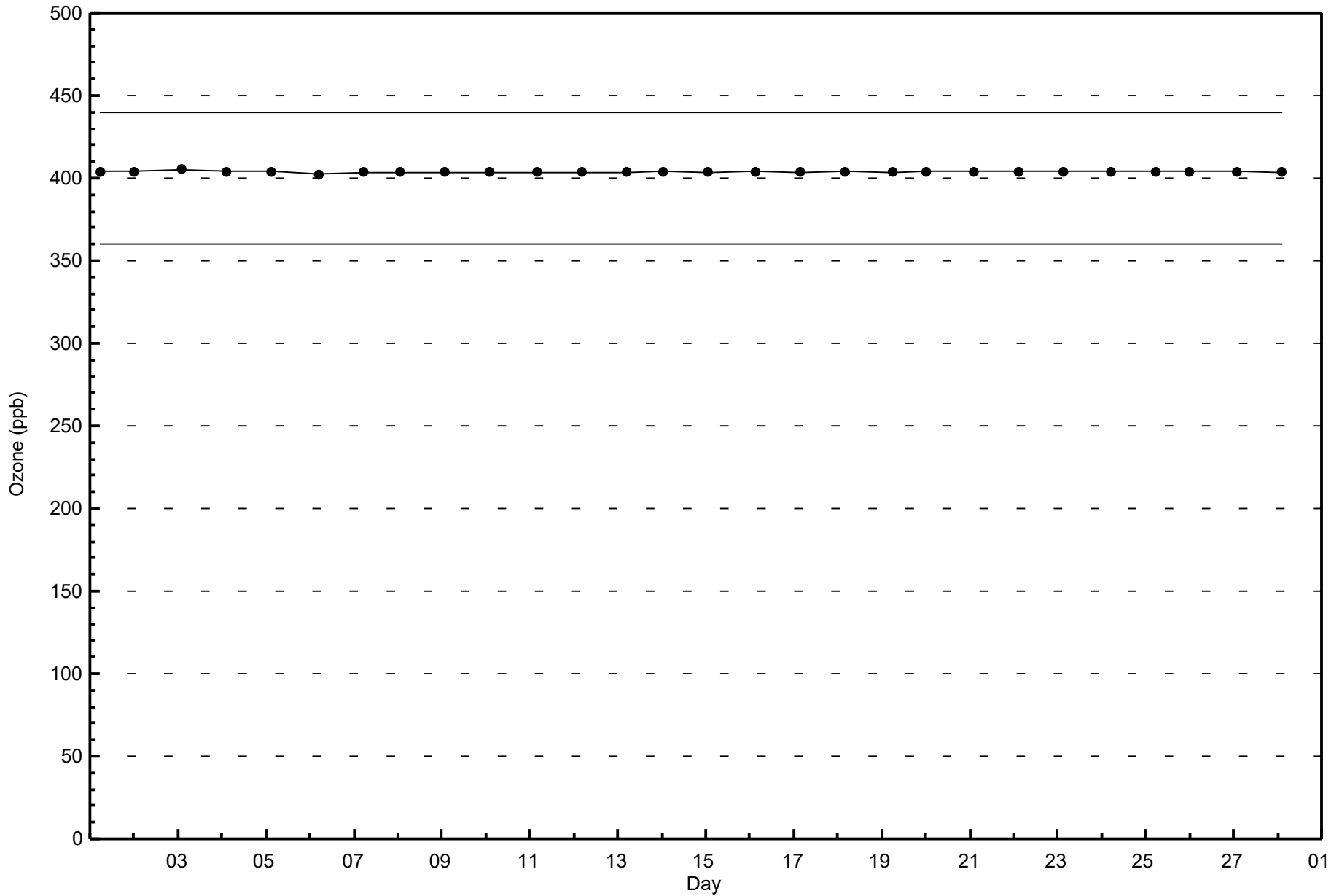


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Ozone (O<sub>3</sub>) - ppb  
Patricia McInnes







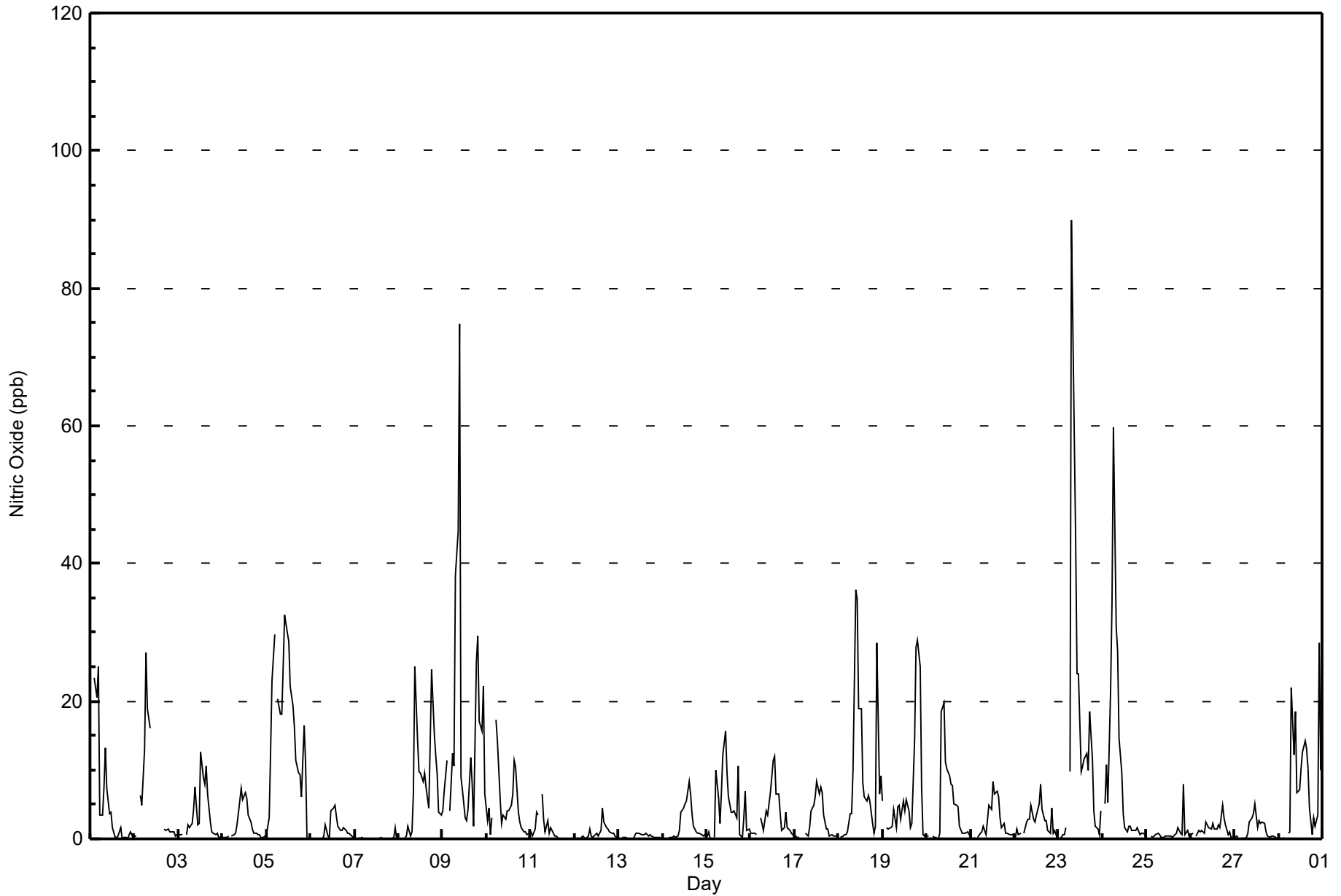


Maximum Value: 90.0 ppb on Feb 23 08:00																				Maximum Daily Average: 16.2 ppb on Feb 9					Hours in Service: 672	
Minimum Value: 0.0 ppb on Feb 1 18:00																				Minimum Daily Average: 0.1 ppb on Feb 7					Hours of Data: 637	
Maximum Diurnal Average: 12.0 ppb at hour 10																				Minimum Diurnal Average: 1.1 ppb at hour 2					Hours of Missing Data: 35	
Monthly Average: 5.04 ppb																				Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.5 Median = 1.6 Q <sub>3</sub> = 5.8 P <sub>90</sub> = 13.2 P <sub>99</sub> = 37.6					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-Feb	26.0	Z	23.3	20.5	25.0	3.5	3.4	7.6	13.3	7.4	3.7	3.9	1.6	0.2	0.3	0.4	1.7	0.0	0.1	0.2	0.1	0.7	1.1	0.1	6.3	26.0
2-Feb	0.5	0.5	Z	6.3	4.8	12.9	27.1	18.9	16.0	C	C	C	C	C	C	C	1.3	1.3	1.4	1.0	1.0	1.1	0.5	0.6	--	27.1
3-Feb	0.6	0.6	0.6	Z	0.6	2.1	1.7	2.3	4.2	7.5	2.0	2.2	12.7	8.9	8.0	10.7	6.5	2.4	1.0	0.9	0.6	0.9	0.3	0.3	3.4	12.7
4-Feb	0.2	0.1	0.2	0.3	Z	0.5	0.7	0.9	2.1	5.5	7.3	5.7	6.7	5.8	3.4	2.4	1.3	0.9	0.8	0.7	0.6	0.3	0.3	0.3	2.0	7.3
5-Feb	0.5	3.1	12.6	23.1	29.7	Z	20.3	18.2	18.0	25.1	32.6	29.8	28.7	22.2	19.3	16.3	11.5	9.6	9.4	6.1	16.4	11.0	0.0	0.0	15.8	32.6
6-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.3	2.0	0.5	0.3	4.0	4.4	4.9	3.2	1.8	1.3	1.1	1.7	1.3	0.8	0.9	0.4	0.3	1.3	4.9
7-Feb	0.4	Z	0.2	0.0	0.2	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	0.2	1.7	0.0	0.1	1.7
8-Feb	0.0	0.0	Z	0.2	0.5	1.8	0.5	1.0	6.4	25.0	14.3	9.7	9.6	8.4	9.6	7.5	4.5	13.9	24.7	15.1	12.0	9.4	3.9	3.5	7.9	25.0
9-Feb	4.0	6.9	11.4	Z	4.0	12.4	10.5	38.3	44.8	74.8	8.9	7.2	3.1	2.6	4.2	11.8	8.0	1.9	25.8	29.4	17.1	15.6	22.2	6.6	16.2	74.8
10-Feb	2.7	4.4	0.6	3.0	Z	17.4	14.2	5.6	2.2	3.4	2.9	4.1	4.0	4.9	6.6	11.3	10.4	3.8	2.4	1.7	1.1	1.0	0.7	0.8	4.7	17.4
11-Feb	1.1	0.3	1.4	3.9	3.5	Z	6.5	2.9	1.1	2.7	0.8	1.6	0.7	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.2	6.5
12-Feb	Z	0.2	0.1	0.0	0.4	0.2	0.0	0.4	1.4	0.4	0.3	0.6	0.9	0.5	1.2	4.5	2.4	1.7	1.4	0.9	0.9	0.8	0.4	0.2	0.9	4.5
13-Feb	0.3	Z	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.5	0.5	0.4	0.3	0.3	0.3	0.1	0.0	0.4	0.8
14-Feb	0.0	0.0	Z	0.0	0.1	0.2	0.4	0.1	0.3	1.3	3.9	4.5	5.1	5.5	8.3	6.6	3.7	1.8	1.0	0.8	0.8	0.6	0.4	0.5	2.0	8.3
15-Feb	0.4	0.9	0.0	Z	0.2	10.0	6.0	2.3	6.7	12.3	15.7	9.7	6.1	3.8	3.8	4.0	3.0	10.7	0.5	0.3	3.0	6.9	1.3	1.4	4.7	15.7
16-Feb	0.9	0.7	0.7	0.7	Z	3.0	2.3	1.2	4.2	3.4	5.0	6.7	11.4	11.9	6.4	6.6	3.7	1.3	1.6	3.9	1.6	1.2	0.8	0.5	3.5	11.9
17-Feb	0.3	0.2	0.2	0.1	0.0	Z	0.8	0.3	1.7	4.0	4.8	6.1	8.3	6.6	7.6	6.6	3.4	1.4	1.5	0.5	0.6	0.4	0.4	0.4	2.4	8.3
18-Feb	Z	0.2	0.5	0.7	0.6	1.1	3.6	3.6	10.0	36.3	34.7	19.0	18.9	8.2	6.1	5.5	6.3	5.4	2.3	0.9	1.8	28.5	6.5	9.1	9.1	36.3
19-Feb	5.4	Z	1.7	1.4	1.6	1.7	4.3	1.6	4.6	4.9	2.8	5.5	4.0	5.8	4.0	1.7	2.3	14.5	27.8	28.9	25.0	7.6	0.6	0.3	6.9	28.9
20-Feb	0.4	0.3	Z	0.4	0.1	0.2	0.1	0.8	18.5	19.7	11.2	10.2	9.1	8.0	7.7	5.1	4.8	4.7	1.7	0.7	0.8	0.8	1.0	0.5	4.6	19.7
21-Feb	0.2	0.1	0.2	Z	0.2	0.9	1.0	1.9	0.7	2.7	5.0	4.3	8.4	6.6	7.0	6.2	3.0	1.7	2.2	0.8	0.9	0.6	0.5	0.6	2.4	8.4
22-Feb	0.2	1.4	0.7	0.9	Z	0.8	2.4	2.8	2.8	4.8	2.8	2.5	3.4	5.2	7.9	4.2	2.6	2.7	1.2	0.9	4.4	0.8	1.2	0.1	2.5	7.9
23-Feb	0.0	0.0	0.7	0.5	1.5	Z	9.7	90.0	59.2	43.6	24.1	24.0	9.8	10.5	11.5	12.4	10.0	18.6	11.6	4.0	1.9	1.4	0.6	4.1	15.2	90.0
24-Feb	Z	5.0	10.7	5.2	21.7	34.6	59.7	30.7	27.3	14.7	9.6	3.6	1.7	1.0	1.8	1.7	1.3	1.2	1.2	1.6	0.7	0.7	0.8	0.6	10.3	59.7
25-Feb	0.5	Z	0.3	0.2	0.4	0.6	0.7	0.5	0.2	0.2	0.3	0.4	0.3	0.5	0.3	0.5	0.8	1.5	0.7	0.6	7.9	0.7	1.1	0.4	0.9	7.9
26-Feb	0.6	0.8	Z	0.3	1.2	1.1	1.2	0.9	2.5	2.1	1.6	1.5	2.2	1.5	1.3	1.9	1.6	4.9	3.1	2.1	0.6	0.9	0.2	0.1	1.5	4.9
27-Feb	0.3	0.4	0.3	Z	0.2	0.1	0.3	0.7	2.4	3.0	3.7	5.1	1.7	2.7	2.2	2.4	2.2	1.1	0.3	0.3	0.5	0.5	0.2	0.0	1.3	5.1
28-Feb	0.1	0.0	0.1	0.3	Z	0.8	1.0	21.9	12.1	18.4	6.8	7.1	10.1	12.5	14.3	13.1	10.3	4.5	0.7	3.1	1.9	3.5	28.4	10.0	7.9	28.4
																								Diurnal Average		
																								Diurnal Maximum		
1.9 1.1 2.9 3.0 4.2 4.4 6.4 9.1 9.4 12.0 7.6 6.7 6.4 5.5 5.5 5.4 3.9 4.0 4.5 3.8 3.7 3.5 2.7 1.5																										
26.0 6.9 23.3 23.1 29.7 34.6 59.7 90.0 59.2 74.8 34.7 29.8 28.7 22.2 19.3 16.3 11.5 18.6 27.8 29.4 25.0 28.5 28.4 10.0																										
Z - zerospan C - Calibration																										



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

**Nitric Oxide (NO) - ppb**  
**Patricia McInnes - February 2023**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Patricia McInnes - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	600	94.19	94.19
21 - 40	31	4.87	99.06
41 - 80	5	0.78	99.84
81 - 159	1	0.16	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Patricia McInnes - February 2023**

<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	77	24	20	10	5	27	59	28	32	35	28	34	37	21	16	97	550
21 - 40	1	3	2	0	1	1	3	7	2	1	1	1	0	1	1	6	31
11 - 80	0	1	0	0	0	1	0	3	0	0	0	0	0	0	0	0	5
81 - 159	0	0	0	0	0	0	0	1	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>	<b>78</b>	<b>28</b>	<b>22</b>	<b>10</b>	<b>6</b>	<b>29</b>	<b>62</b>	<b>39</b>	<b>34</b>	<b>36</b>	<b>29</b>	<b>35</b>	<b>37</b>	<b>22</b>	<b>17</b>	<b>103</b>	<b>587</b>

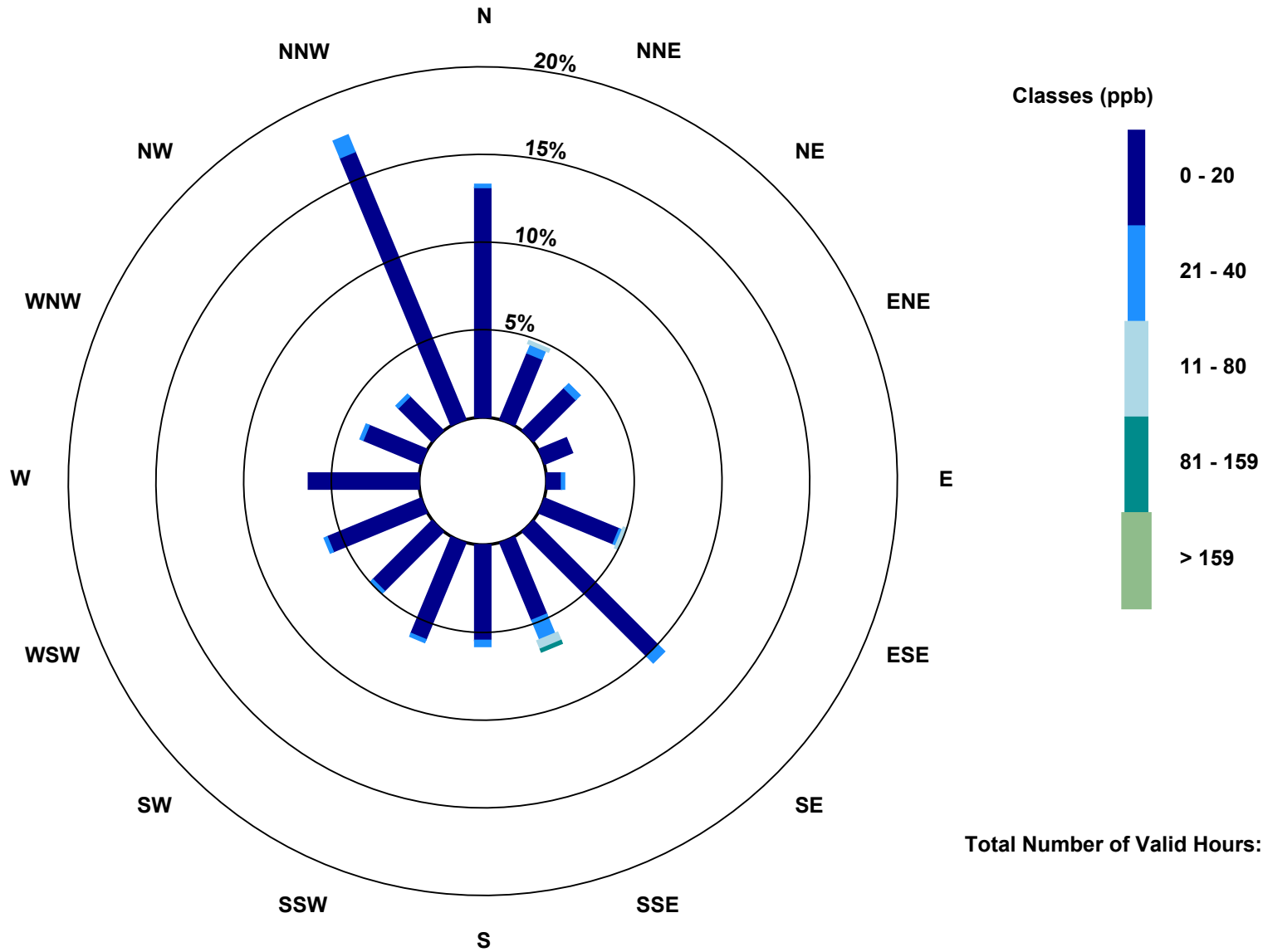
Total Number of Valid Hours: 587

Total Number of Hours: 672

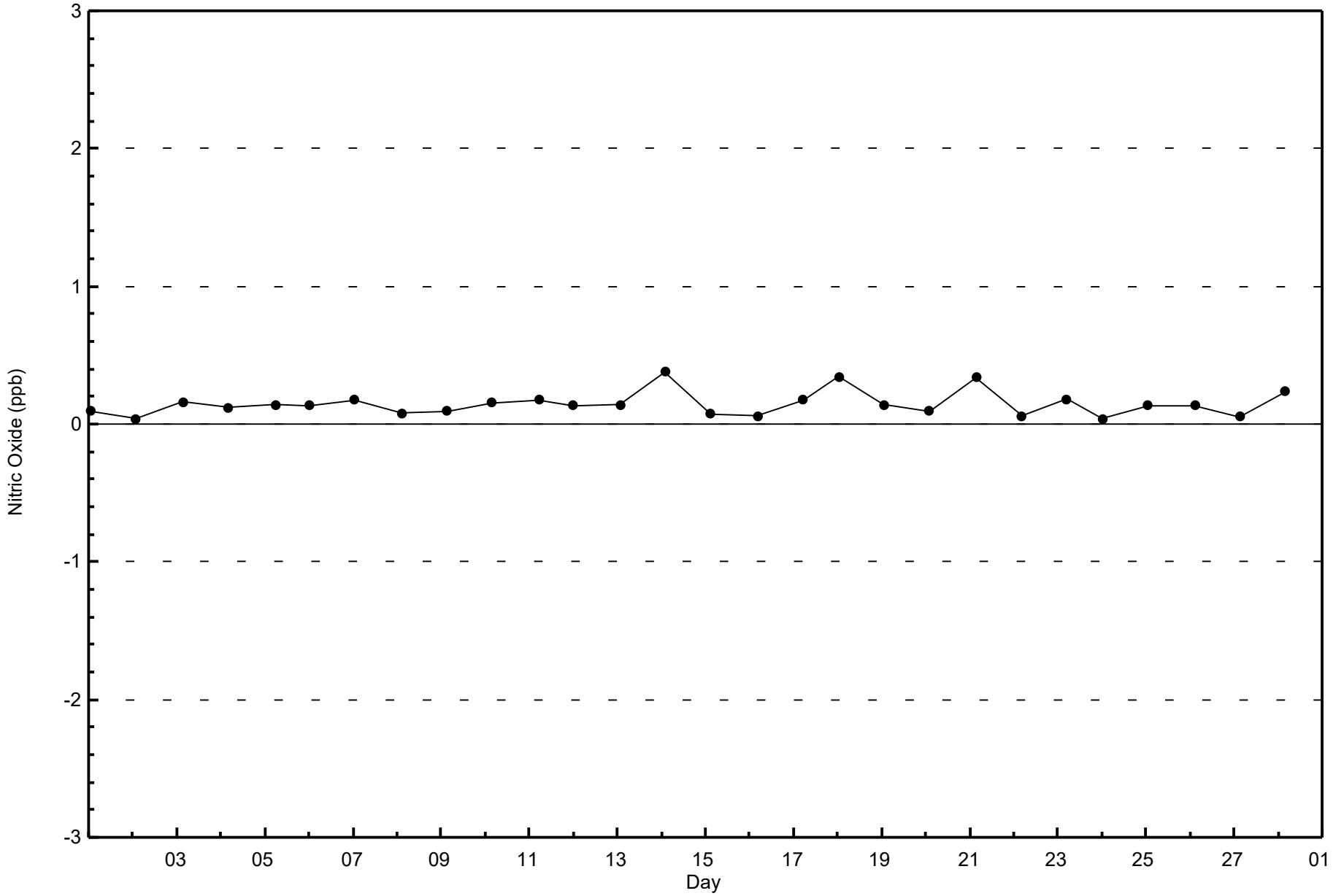


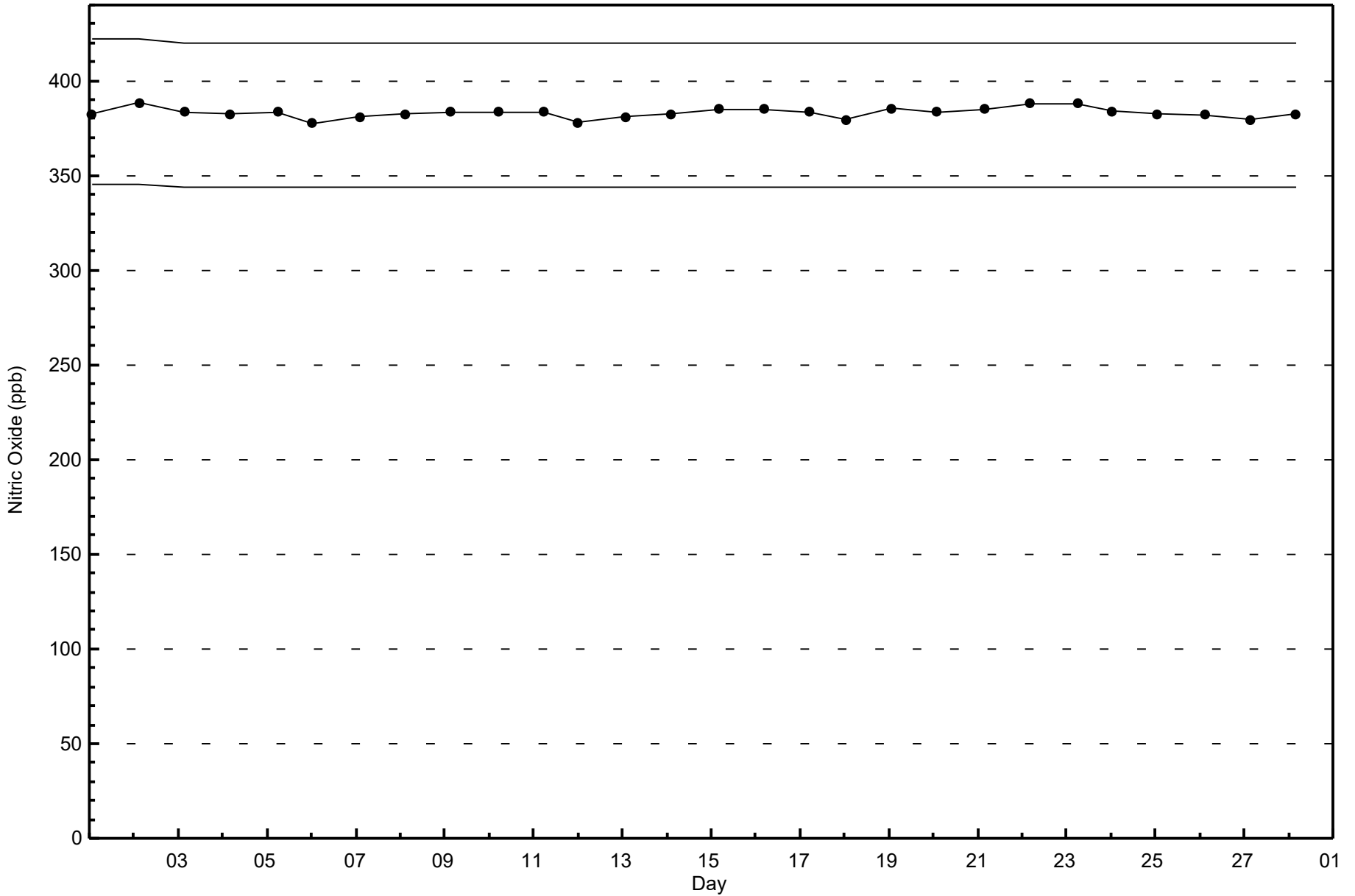
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitric Oxide (NO) - ppb  
Patricia McInnes



Total Number of Valid Hours: 587







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

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Patricia McInnes - February 2023**

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	672						
Maximum Value: 46.4 ppb on Feb 23 08:00		Maximum Daily Average: 25.7 ppb on Feb 9																	Hours of Data:	637							
Minimum Value: 0.1 ppb on Feb 7 20:00		Minimum Daily Average: 2.4 ppb on Feb 7																	Hours of Missing Data:	35							
Maximum Diurnal Average: 17.0 ppb at hour 8		Minimum Diurnal Average: 7.0 ppb at hour 14																	Hours of Calibration:	35							
Monthly Average: 12.41 ppb		Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 1.5 Q <sub>1</sub> = 5.2 Median = 9.6 Q <sub>3</sub> = 17.5 P <sub>90</sub> = 27.9 P <sub>99</sub> = 39.7																	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-Feb	36.8	Z	38.4	35.9	39.6	33.1	31.4	35.2	35.9	17.9	7.0	5.8	2.4	0.3	0.3	0.8	3.8	0.6	3.7	1.3	1.1	3.3	7.3	0.7	14.9	39.6	
2-Feb	3.7	5.2	Z	23.7	18.9	23.9	29.3	28.2	26.2	C	C	C	C	C	C	C	5.9	5.5	5.7	5.2	5.2	6.2	6.0	5.6	--	29.3	
3-Feb	5.6	6.0	6.3	Z	5.2	10.1	14.0	15.0	22.5	21.4	6.9	4.7	20.7	16.8	16.2	22.6	22.8	24.8	15.3	14.9	13.8	13.8	11.4	10.5	14.0	24.8	
4-Feb	11.3	10.5	12.3	14.2	Z	12.2	15.1	17.1	18.0	17.1	15.0	11.2	11.4	11.6	9.9	9.5	11.6	15.4	12.5	15.3	15.7	21.0	20.0	22.4	14.4	22.4	
5-Feb	28.8	31.6	32.3	32.8	33.8	Z	31.1	30.9	28.9	26.1	24.7	24.5	24.6	22.6	20.8	20.7	21.5	25.4	24.8	16.5	23.1	12.3	1.6	0.6	23.5	33.8	
6-Feb	Z	0.6	0.3	0.3	0.3	0.5	0.5	5.0	6.0	1.3	0.6	4.8	6.6	7.3	5.4	5.4	6.0	5.9	5.4	5.2	4.0	5.6	5.8	5.8	3.9	7.3	
7-Feb	4.0	Z	9.5	5.3	8.2	1.6	0.5	0.3	0.3	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.4	0.2	0.3	0.1	0.6	2.3	16.2	2.4	2.4	16.2	
8-Feb	9.8	6.8	Z	3.6	8.0	16.5	11.7	13.0	14.3	16.0	15.4	11.1	10.1	9.8	12.6	13.5	17.2	32.2	33.8	27.3	24.2	24.1	16.6	18.6	15.9	33.8	
9-Feb	20.9	25.0	27.5	Z	12.1	33.3	28.3	42.5	38.3	39.7	13.9	10.2	4.5	3.5	9.7	20.7	22.4	17.7	37.0	41.1	35.9	36.4	38.5	31.6	25.7	42.5	
10-Feb	31.7	34.4	25.9	25.0	Z	31.7	31.0	26.5	17.1	12.7	9.4	8.7	9.9	9.2	13.4	19.7	25.8	27.9	28.9	27.5	28.2	30.0	28.0	25.1	22.9	34.4	
11-Feb	26.3	22.5	24.0	28.6	26.6	Z	24.5	18.8	8.1	7.2	1.9	2.2	1.5	1.4	1.7	1.0	1.2	1.5	0.5	0.5	0.6	0.7	0.5	0.9	8.8	28.6	
12-Feb	Z	0.8	0.3	0.5	1.9	2.0	0.5	4.2	6.9	1.3	0.6	1.0	1.7	1.2	3.4	13.2	10.0	7.0	5.8	4.0	4.0	4.2	3.1	5.0	3.6	13.2	
13-Feb	8.3	Z	2.3	1.4	1.3	0.3	0.3	0.2	0.2	3.7	3.3	2.9	2.9	2.4	2.7	3.7	4.1	5.7	3.6	4.2	4.1	3.0	2.7	3.0	2.9	8.3	
14-Feb	2.5	1.3	Z	1.5	2.5	4.3	5.4	5.3	5.1	5.6	7.5	7.2	9.4	9.5	12.5	13.7	16.9	17.8	14.1	14.8	12.4	13.0	11.5	9.5	8.8	17.8	
15-Feb	6.1	7.8	5.6	Z	4.7	17.9	18.0	16.4	13.9	16.4	16.2	9.9	6.9	4.6	5.4	8.0	8.6	29.2	14.7	9.0	18.4	16.0	7.3	6.2	11.6	29.2	
16-Feb	5.6	4.6	3.9	4.7	Z	6.6	6.3	5.8	8.8	6.9	7.5	9.4	14.4	13.0	8.4	12.3	10.3	6.1	7.7	28.0	21.3	17.7	17.4	11.0	10.3	28.0	
17-Feb	11.2	9.9	9.4	8.5	10.7	Z	10.4	10.4	11.1	10.5	9.4	8.1	9.3	8.6	11.2	13.2	12.4	11.9	12.2	9.5	8.7	8.6	6.1	6.0	9.9	13.2	
18-Feb	Z	7.7	13.5	17.2	15.7	19.2	24.9	25.6	18.9	22.6	19.3	13.1	12.9	7.8	7.6	9.6	17.5	29.0	28.6	22.1	22.8	32.9	19.8	20.5	18.6	32.9	
19-Feb	19.3	Z	15.5	12.1	9.0	9.2	12.0	11.2	12.9	7.7	4.1	6.9	5.1	7.4	6.3	4.2	7.9	32.4	38.1	37.2	36.2	34.0	23.5	12.8	15.9	38.1	
20-Feb	14.9	12.1	Z	14.5	17.0	20.8	23.0	22.1	28.6	25.7	16.1	13.6	11.3	10.2	9.6	8.9	15.0	25.6	18.0	13.2	14.6	12.7	11.4	19.5	16.5	28.6	
21-Feb	12.1	5.1	4.3	Z	5.8	7.3	6.9	7.3	3.0	4.4	5.6	4.2	7.1	6.2	7.6	8.9	7.5	5.7	10.0	9.4	11.4	8.4	9.2	7.2	7.2	12.1	
22-Feb	8.2	15.5	12.9	11.1	Z	8.1	11.0	11.6	7.4	6.6	3.1	2.9	4.3	5.9	10.3	7.7	9.3	18.3	17.1	16.3	18.8	15.9	11.2	7.8	10.5	18.8	
23-Feb	7.4	7.6	10.0	11.0	14.3	Z	29.6	46.4	34.9	28.8	19.1	17.5	9.2	10.1	12.2	16.1	19.7	34.8	33.8	23.9	19.8	14.7	14.2	19.7	19.8	46.4	
24-Feb	Z	19.7	27.9	23.1	39.7	43.9	41.0	35.1	28.7	17.5	10.9	4.2	2.5	1.7	3.0	3.3	3.1	4.9	4.8	5.7	3.1	4.3	5.5	7.7	14.8	43.9	
25-Feb	8.0	Z	6.3	5.8	5.4	5.7	5.2	3.9	1.2	0.9	0.8	0.7	0.7	0.8	0.8	1.5	4.7	8.6	7.6	7.8	23.7	12.9	17.4	10.7	6.1	23.7	
26-Feb	13.7	12.6	Z	9.6	9.1	10.0	6.4	5.5	5.3	5.0	3.8	3.4	4.4	3.5	3.9	5.1	5.9	9.9	8.4	9.4	8.8	8.0	6.8	5.1	7.1	13.7	
27-Feb	11.2	20.3	16.8	Z	8.4	6.8	16.4	14.9	11.5	6.9	5.6	6.7	2.3	3.5	3.6	4.5	6.9	7.8	5.9	4.8	5.4	5.7	4.8	2.4	8.0	20.3	
28-Feb	6.3	12.6	16.2	15.4	Z	15.7	16.4	18.6	12.9	16.9	7.2	6.7	8.8	10.9	13.3	15.4	18.3	22.4	26.1	25.4	25.6	26.5	27.9	24.0	16.9	27.9	
		13.1	12.2	14.0	13.3	13.0	14.2	16.1	17.0	15.2	12.9	8.7	7.5	7.6	7.0	7.9	9.8	11.3	15.5	15.2	14.3	14.7	14.1	12.6	10.8	Diurnal Average	
		36.8	34.4	38.4	35.9	39.7	43.9	41.0	46.4	38.3	39.7	24.7	24.5	24.6	22.6	20.8	22.6	25.8	34.8	38.1	41.1	36.2	36.4	38.5	31.6	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**  
**Patricia McInnes - February 2023**





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

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Patricia McInnes - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	509	79.91	79.91
21 - 40	123	19.31	99.22
41 - 80	5	0.78	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 637

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Patricia McInnes - February 2023**

<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	59	19	19	10	5	21	54	17	22	28	25	34	35	17	13	81	459
21 - 40	19	9	3	0	1	7	8	18	12	8	4	1	2	5	4	22	123
11 - 80	0	0	0	0	0	1	0	4	0	0	0	0	0	0	0	0	5
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>	78	28	22	10	6	29	62	39	34	36	29	35	37	22	17	103	587

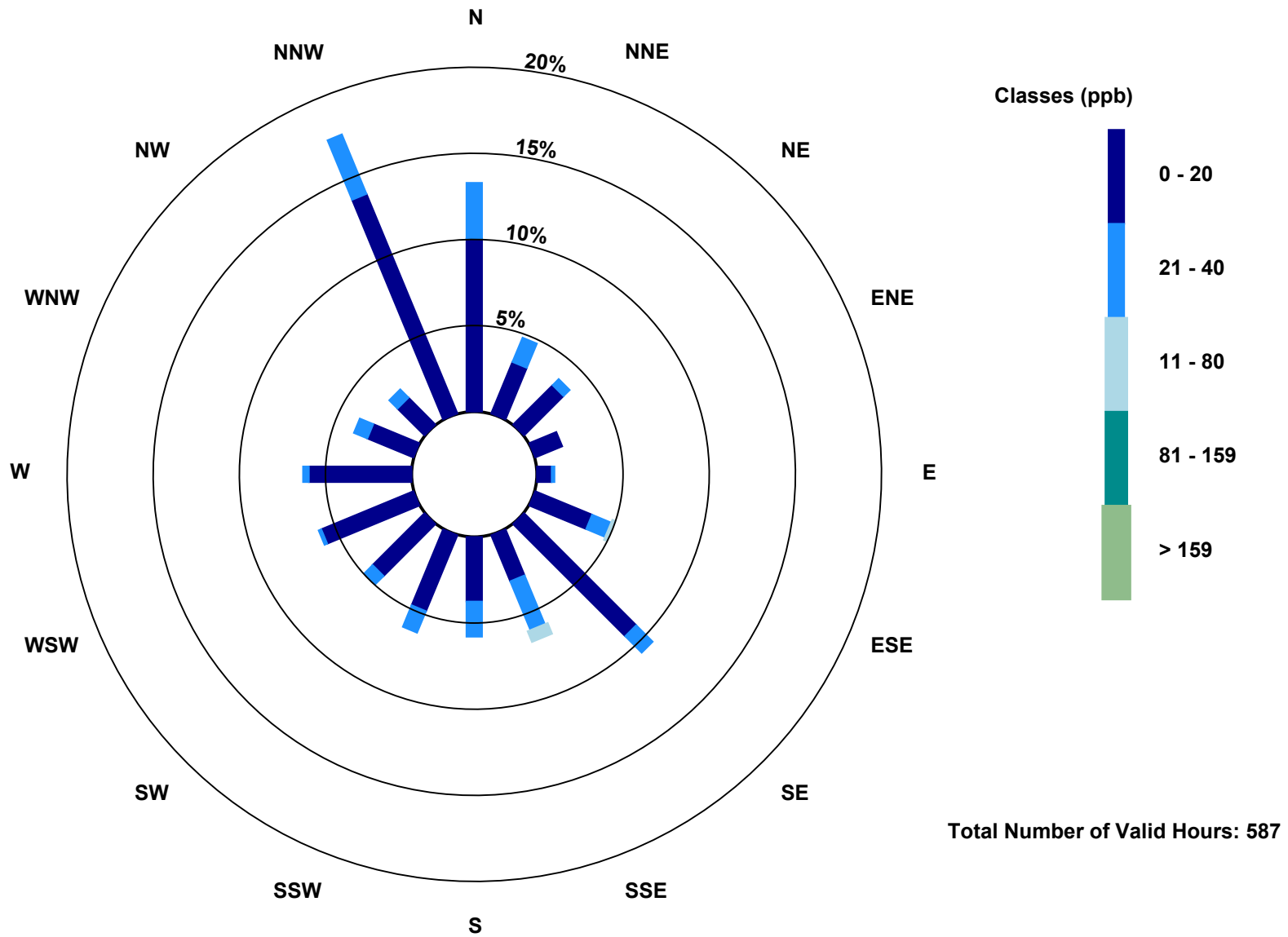
Total Number of Valid Hours: 587

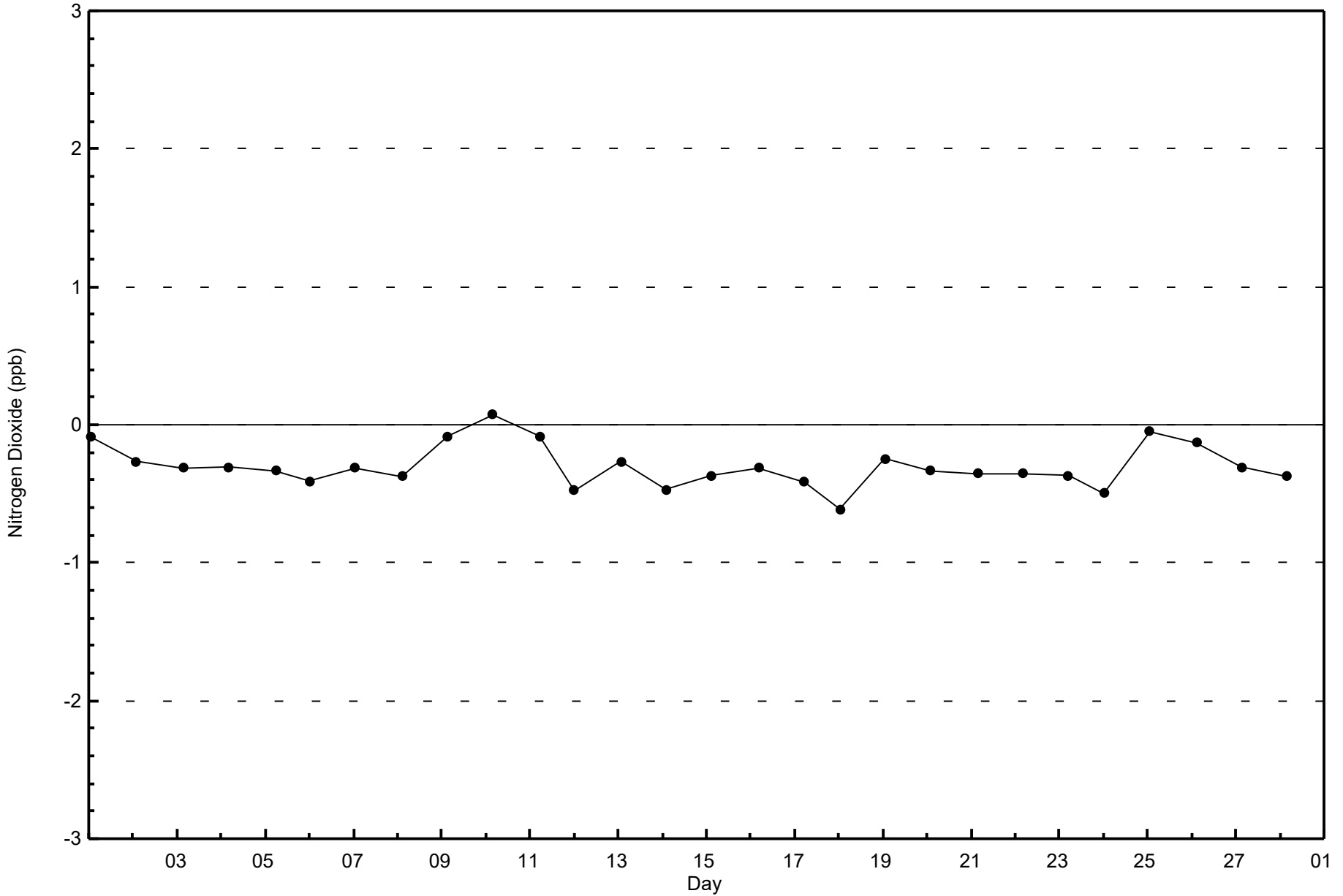
Total Number of Hours: 672

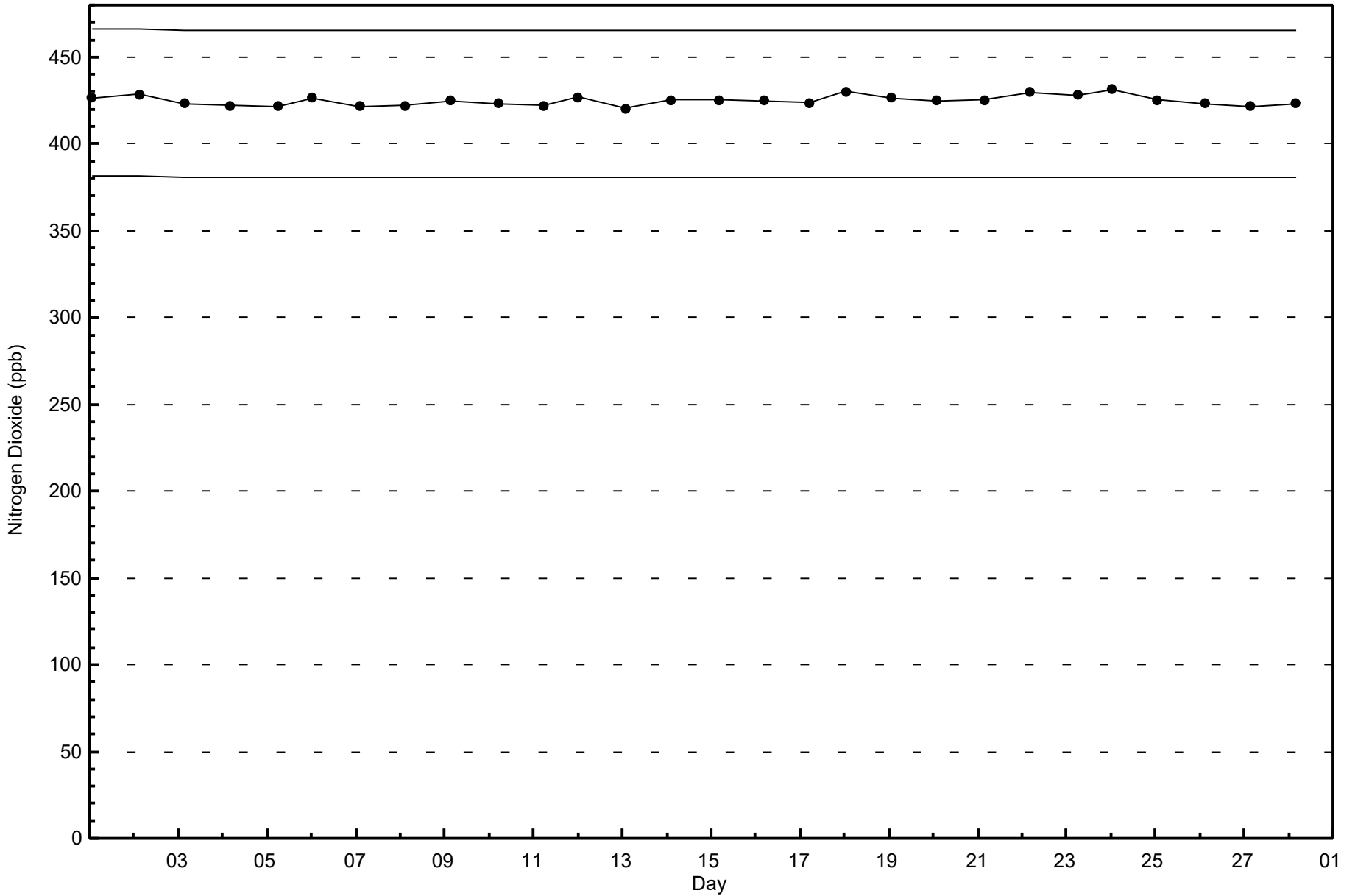


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









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

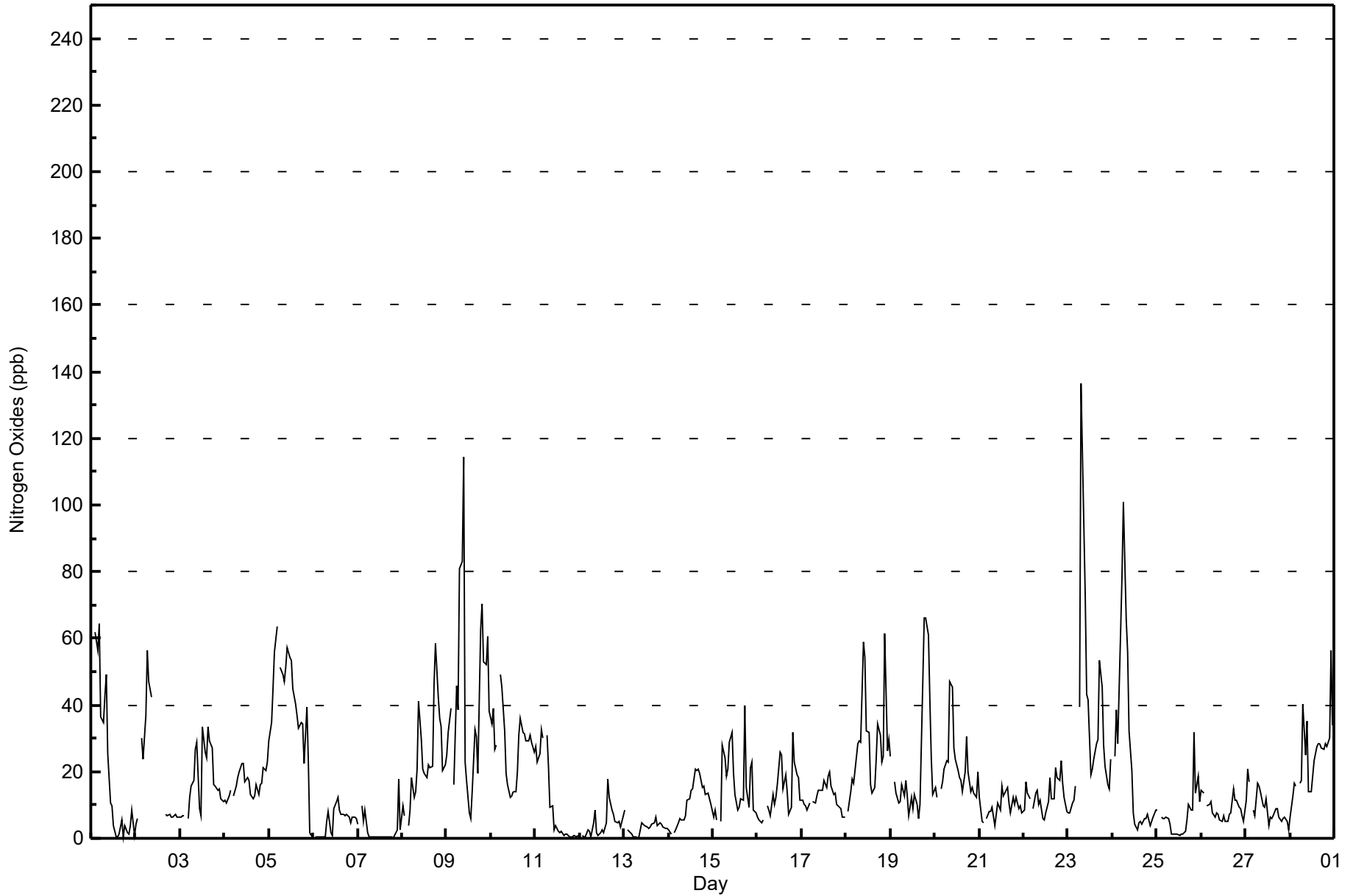
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Patricia McInnes - February 2023**

Maximum Value: 136.4 ppb on Feb 23 08:00																								Hours in Service: 672		
Maximum Daily Average: 41.8 ppb on Feb 9																								Hours of Data: 637		
Minimum Value: 0.1 ppb on Feb 7 20:00																								Hours of Missing Data: 35		
Minimum Daily Average: 2.5 ppb on Feb 7																								Hours of Calibration: 35		
Maximum Diurnal Average: 26.2 ppb at hour 8																								Percent Operational Time: 100.0		
Minimum Diurnal Average: 12.3 ppb at hour 24																										
Monthly Average: 17.44 ppb																										
Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 1.8 Q <sub>1</sub> = 6.2 Median = 12.5 Q <sub>3</sub> = 23.1 P <sub>90</sub> = 38.9 P <sub>99</sub> = 76.3																										
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-Feb	62.8	Z	61.7	56.4	64.6	36.6	34.8	42.8	49.2	25.3	10.7	9.7	4.0	0.5	0.6	1.2	5.5	0.6	3.8	1.5	1.2	4.0	8.4	0.8	21.2	64.6
2-Feb	4.2	5.7	Z	30.0	23.7	36.8	56.4	47.1	42.2	C	C	C	C	C	C	C	7.2	6.8	7.1	6.2	6.2	7.3	6.5	6.2	--	56.4
3-Feb	6.2	6.6	6.9	Z	5.8	12.2	15.7	17.3	26.7	28.9	8.9	6.9	33.4	25.7	24.2	33.3	29.3	27.2	16.3	15.8	14.4	14.7	11.7	10.8	17.3	33.4
4-Feb	11.5	10.6	12.5	14.5	Z	12.7	15.8	18.0	20.1	22.6	22.3	16.9	18.1	17.4	13.3	11.9	12.9	16.3	13.3	16.0	16.3	21.3	20.3	22.7	16.4	22.7
5-Feb	29.3	34.7	44.9	55.9	Z	63.5	51.4	49.1	46.9	51.2	57.3	54.3	53.3	44.8	40.1	37.0	33.0	35.0	34.2	22.6	39.5	23.3	1.6	0.6	39.3	63.5
6-Feb	Z	0.6	0.3	0.3	0.3	0.5	0.6	5.3	8.0	1.8	0.9	8.8	11.0	12.2	8.6	7.2	7.3	7.0	7.1	6.5	4.8	6.5	6.2	6.1	5.1	12.2
7-Feb	4.4	Z	9.7	5.3	8.4	1.6	0.5	0.3	0.3	0.4	0.3	0.3	0.2	0.4	0.4	0.3	0.5	0.3	0.3	0.1	0.6	2.5	17.9	2.4	2.5	17.9
8-Feb	9.8	6.8	Z	3.8	8.5	18.3	12.2	14.0	20.7	41.0	29.7	20.8	19.7	18.2	22.2	21.0	21.7	46.1	58.6	42.4	36.2	33.5	20.5	22.1	23.8	58.6
9-Feb	24.9	31.9	38.9	Z	16.1	45.7	38.8	80.8	83.1	114.5	22.8	17.4	7.6	6.1	13.9	32.5	30.4	19.6	62.8	70.5	53.0	52.0	60.7	38.2	41.8	114.5
10-Feb	34.4	38.8	26.5	28.0	Z	49.1	45.2	32.1	19.3	16.1	12.3	12.8	13.9	14.1	20.0	31.0	36.2	31.7	31.3	29.2	29.3	31.0	28.7	25.9	27.7	49.1
11-Feb	27.4	22.8	25.4	32.5	30.1	Z	31.0	21.7	9.2	9.9	2.7	3.8	2.2	1.8	2.1	1.0	1.2	1.5	0.5	0.5	0.6	0.8	0.5	0.9	10.0	32.5
12-Feb	Z	1.0	0.4	0.5	2.3	2.2	0.5	4.6	8.3	1.7	0.9	1.6	2.6	1.7	4.6	17.7	12.4	8.7	7.2	4.9	4.9	5.0	3.5	5.2	4.5	17.7
13-Feb	8.6	Z	2.5	1.5	1.4	0.3	0.3	0.2	0.2	4.5	4.1	3.7	3.6	3.1	3.4	4.4	4.6	6.2	4.0	4.5	4.4	3.3	2.8	3.0	3.3	8.6
14-Feb	2.5	1.3	Z	1.5	2.6	4.5	5.8	5.4	5.4	6.9	11.4	11.7	14.5	15.0	20.8	20.3	20.6	19.6	15.1	15.6	13.2	13.6	11.9	10.0	10.8	20.8
15-Feb	6.5	8.7	5.6	Z	4.9	27.9	24.0	18.7	20.6	28.7	31.9	19.6	13.0	8.4	9.2	12.0	11.6	39.9	15.2	9.3	21.4	22.9	8.6	7.6	16.4	39.9
16-Feb	6.5	5.3	4.6	5.4	Z	9.6	8.6	7.0	13.0	10.3	12.5	16.1	25.8	24.9	14.8	18.9	14.0	7.4	9.3	31.9	22.9	18.9	18.2	11.5	13.8	31.9
17-Feb	11.5	10.1	9.6	8.6	10.7	Z	11.2	10.7	12.8	14.5	14.2	14.2	17.6	15.2	18.8	19.8	15.8	13.3	13.7	10.0	9.3	9.0	6.5	6.4	12.3	19.8
18-Feb	Z	7.9	14.0	17.9	16.3	20.3	28.5	29.2	28.9	58.9	54.0	32.1	31.8	16.0	13.7	15.1	23.8	34.4	30.9	23.0	24.6	61.4	26.3	29.6	27.8	61.4
19-Feb	24.7	Z	17.2	13.5	10.6	10.9	16.3	12.8	17.5	12.6	6.9	12.4	9.1	13.2	10.3	5.9	10.2	46.9	65.9	66.1	61.2	41.6	24.1	13.1	22.7	66.1
20-Feb	15.3	12.4	Z	14.9	17.1	21.0	23.1	22.9	47.1	45.4	27.3	23.8	20.4	18.2	17.3	14.0	19.8	30.3	19.7	13.9	15.4	13.5	12.4	20.0	21.1	47.1
21-Feb	12.3	5.2	4.5	Z	6.0	8.2	7.9	9.2	3.7	7.1	10.6	8.5	15.5	12.8	14.6	15.1	10.5	7.4	12.2	10.2	12.3	9.0	9.7	7.8	9.6	15.5
22-Feb	8.4	16.9	13.6	12.0	Z	8.9	13.4	14.4	10.2	11.4	5.9	5.4	7.7	11.1	18.2	11.9	11.9	21.0	18.3	17.2	23.2	16.7	12.4	7.9	13.0	23.2
23-Feb	7.4	7.6	10.7	11.5	15.8	Z	39.3	136.4	94.1	72.4	43.2	41.5	19.0	20.6	23.7	28.5	29.7	53.4	45.4	27.9	21.7	16.1	14.9	23.8	35.0	136.4
24-Feb	Z	24.7	38.6	28.3	61.4	78.5	100.7	65.8	56.0	32.2	20.5	7.8	4.2	2.7	4.8	5.0	4.4	6.1	6.0	7.3	3.8	5.0	6.3	8.3	25.2	100.7
25-Feb	8.5	Z	6.6	6.0	5.8	6.3	5.9	4.4	1.4	1.1	1.1	1.1	1.0	1.3	1.1	2.0	5.5	10.1	8.3	8.4	31.6	13.6	18.5	11.1	7.0	31.6
26-Feb	14.3	13.4	Z	9.9	10.3	11.1	7.6	6.4	7.8	7.1	5.4	4.9	6.6	5.0	5.2	7.0	7.5	14.8	11.5	11.5	9.4	8.9	7.0	5.2	8.6	14.8
27-Feb	11.5	20.7	17.1	Z	8.6	6.9	16.7	15.6	13.9	9.9	9.3	11.8	4.0	6.2	5.8	6.9	9.1	8.9	6.2	5.1	5.9	6.2	5.0	2.4	9.3	20.7
28-Feb	6.4	12.6	16.3	15.7	Z	16.5	17.4	40.5	25.0	35.3	14.0	13.8	18.9	23.4	27.6	28.5	28.6	26.9	26.8	28.5	27.5	30.0	56.3	34.0	24.8	56.3
15.0 13.3 16.9 16.3 17.2 18.6 22.5 26.2 24.7 24.9 16.3 14.1 14.0 12.6 13.3 15.2 15.2 19.5 19.7 18.1 18.4 17.6 15.3 12.3																								Diurnal Average		
62.8 38.8 61.7 56.4 64.6 78.5 100.7 136.4 94.1 114.5 57.3 54.3 53.3 44.8 40.1 37.0 36.2 53.4 65.9 70.5 61.2 61.4 60.7 38.2																								Diurnal Maximum		
Z - zerospan C - Calibration																										



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

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Patricia McInnes - February 2023**





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

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Patricia McInnes - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	448	70.33	70.33
21 - 40	131	20.57	90.89
41 - 80	52	8.16	99.06
81 - 159	5	0.78	99.84
> 159	0	0.00	99.84

Total Number of Valid Hours: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Patricia McInnes - February 2023**

<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	50	15	12	7	3	20	49	10	18	24	23	34	33	15	12	80	405
21 - 40	21	8	8	3	2	4	8	16	12	10	4	0	4	7	3	14	124
11 - 80	7	5	2	0	1	4	5	8	4	2	2	1	0	0	2	9	52
81 - 159	0	0	0	0	0	1	0	4	0	0	0	0	0	0	0	0	5
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	<b>78</b>	<b>28</b>	<b>22</b>	<b>10</b>	<b>6</b>	<b>29</b>	<b>62</b>	<b>38</b>	<b>34</b>	<b>36</b>	<b>29</b>	<b>35</b>	<b>37</b>	<b>22</b>	<b>17</b>	<b>103</b>	<b>586</b>

Total Number of Valid Hours: 587

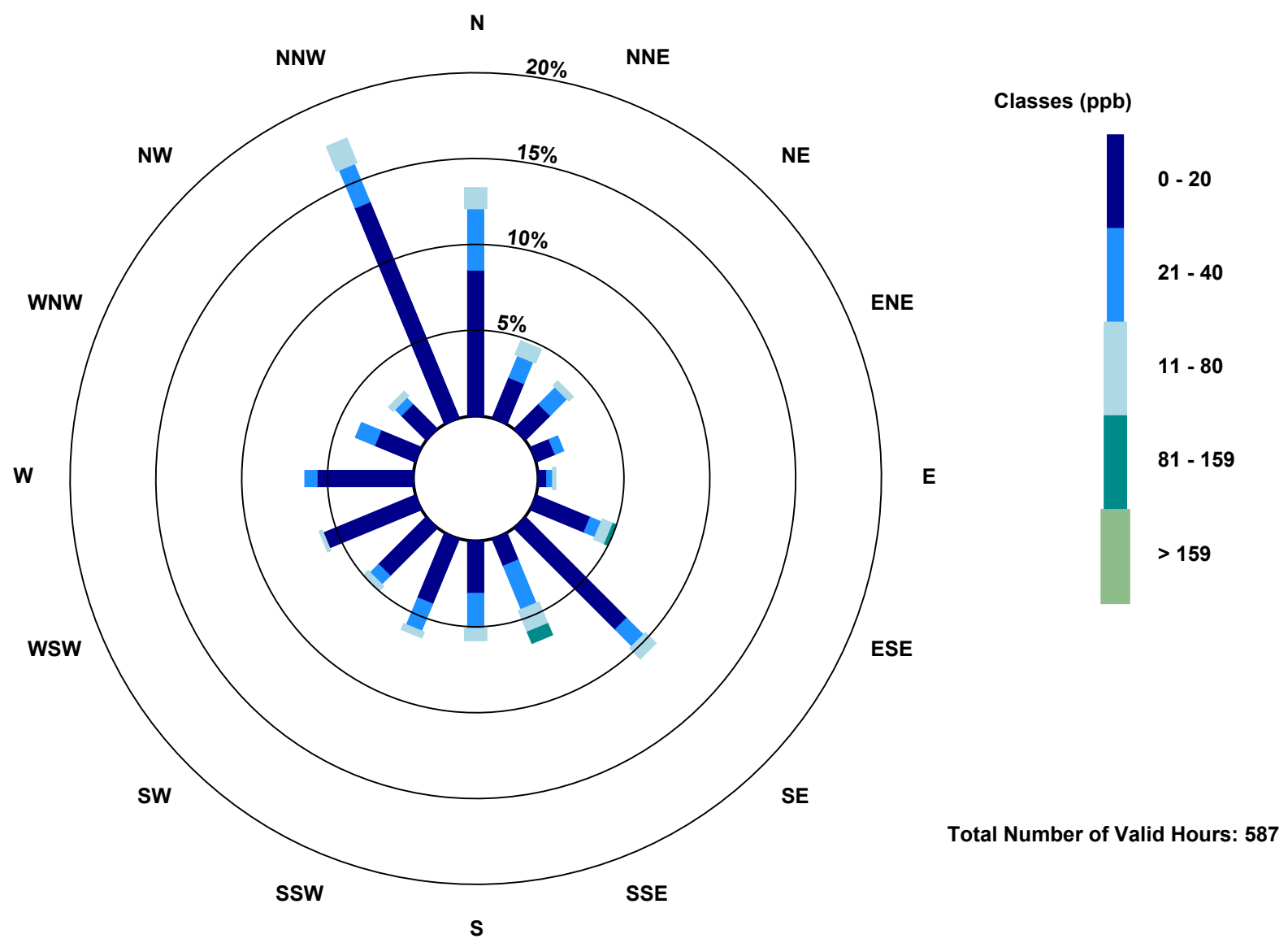
Total Number of Hours: 672

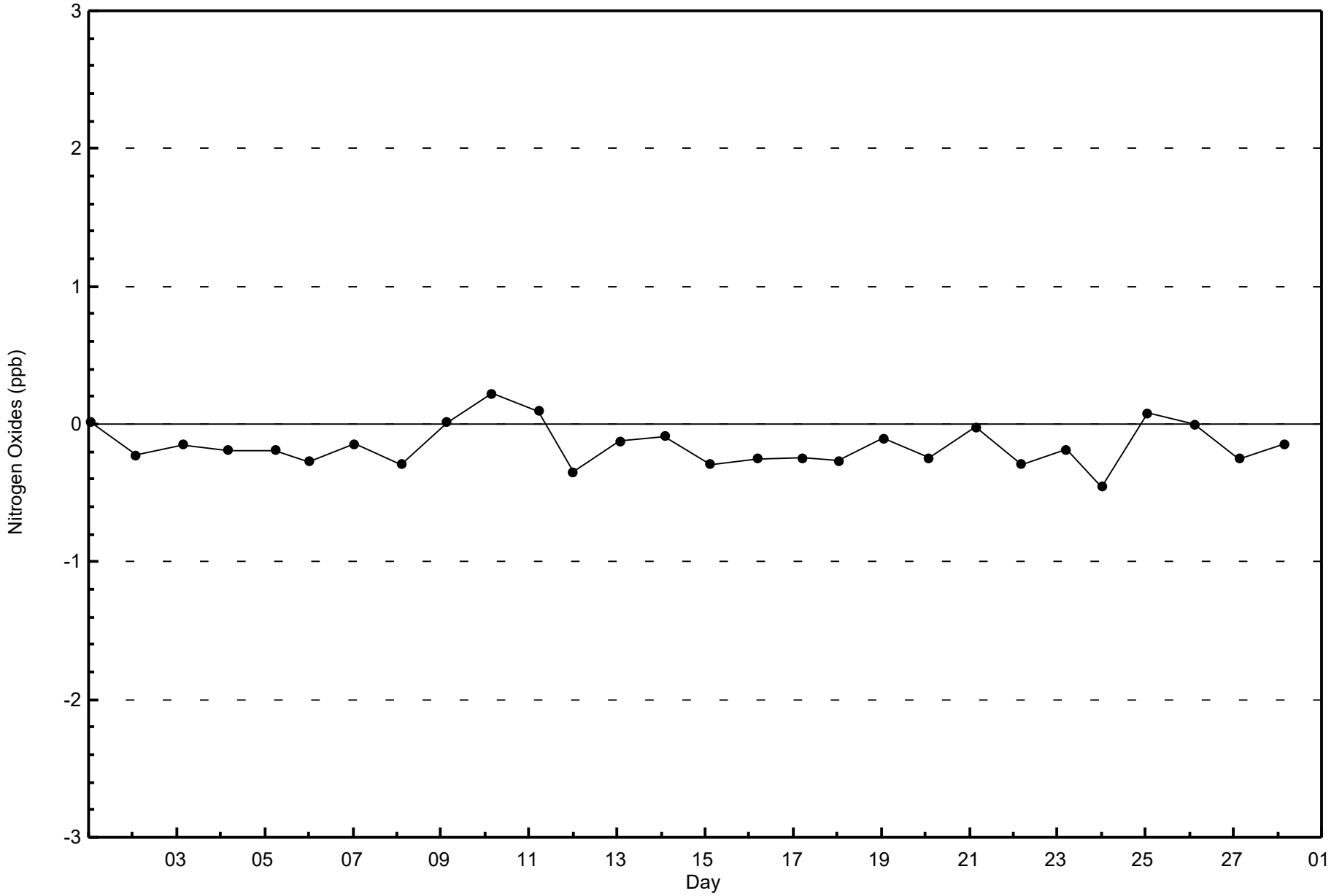


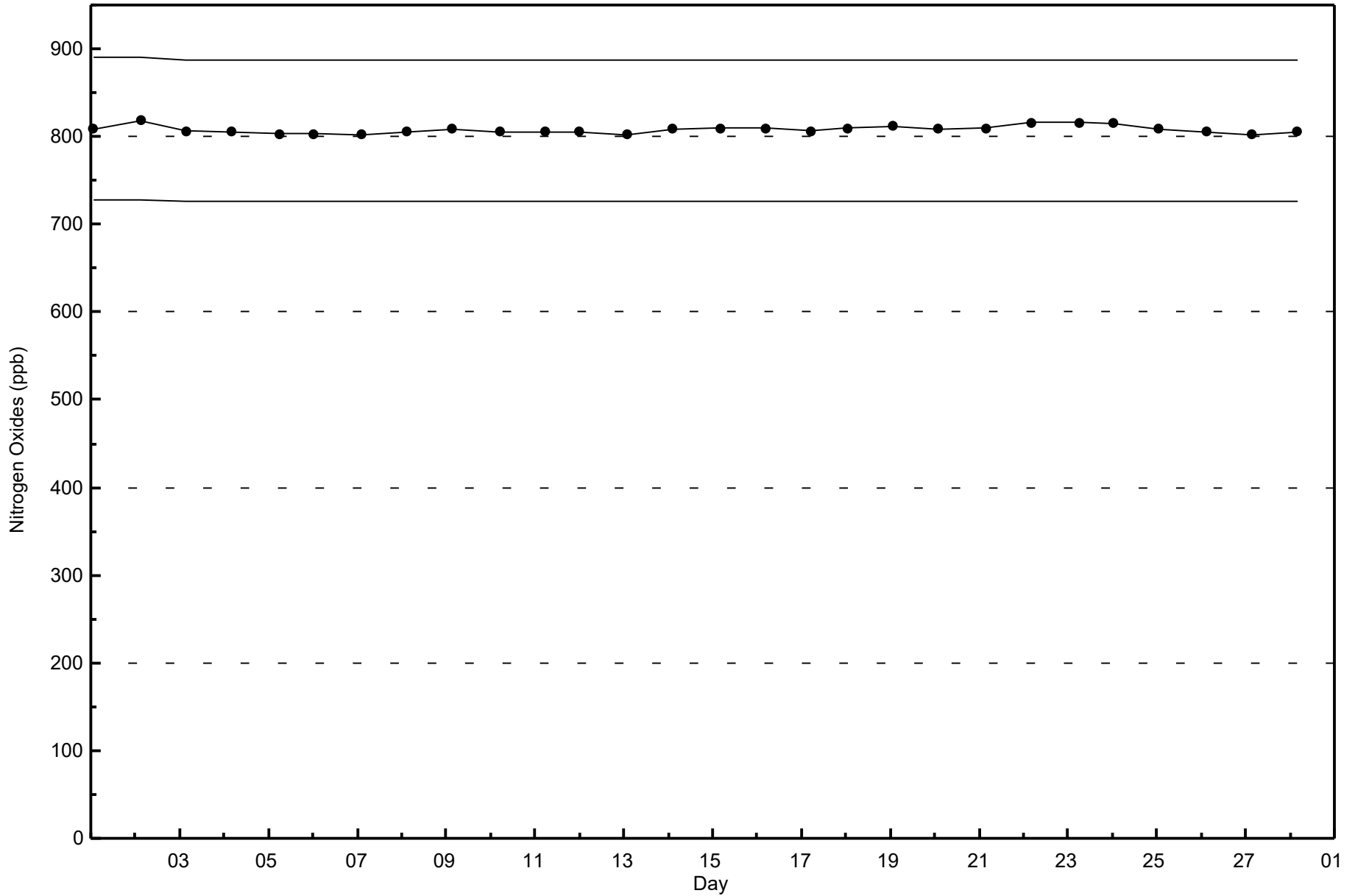


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









Wood Buffalo Environmental Association

Summary of Hour Averages

Ammonia (NH<sub>3</sub>) - ppb

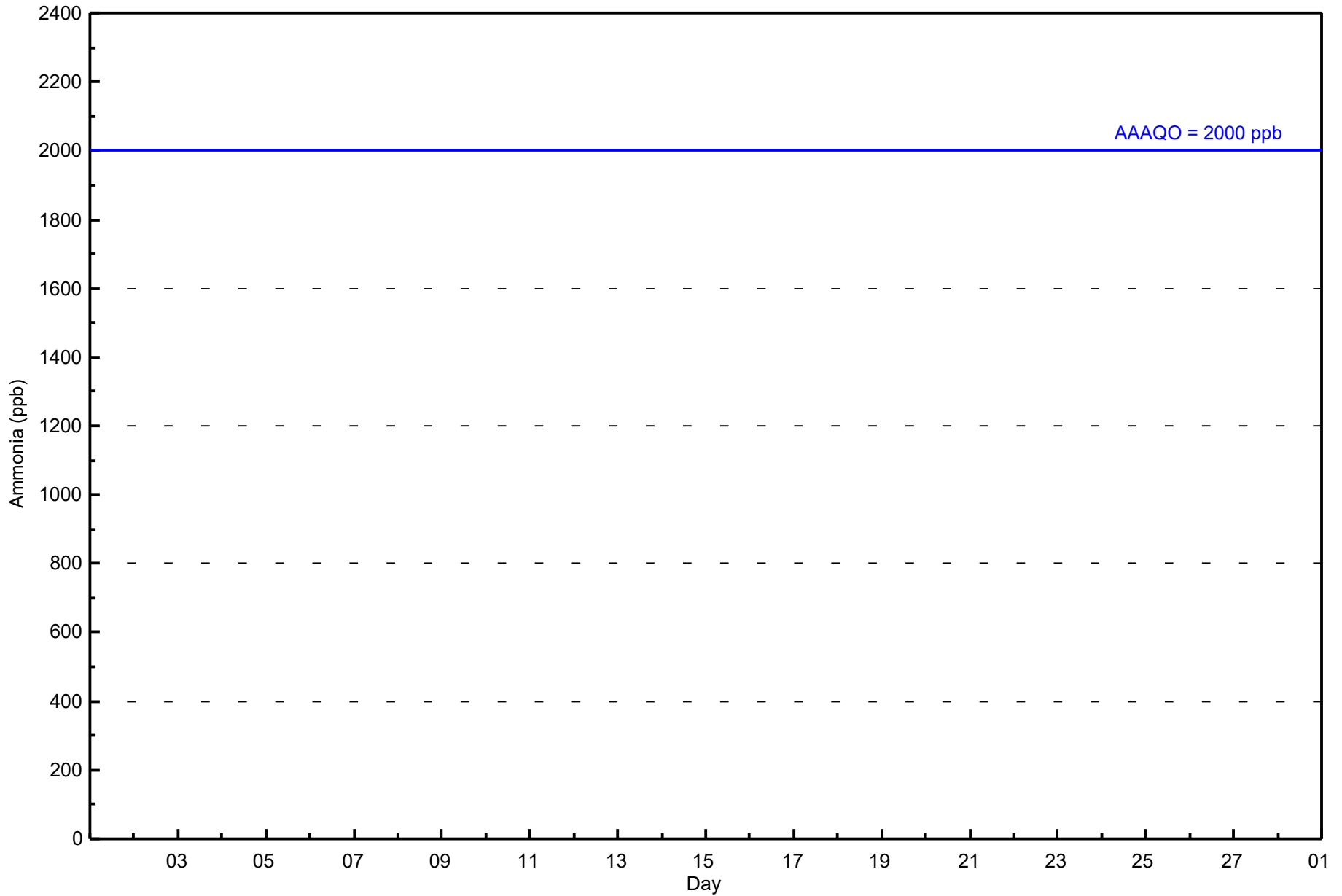
Patricia McInnes - February 2023

Number of Exceedences (AAAQO): 1-hr: 0		Hours in Service: 672																									
Maximum Value: 0.0 ppb on Feb 1 03:00		Maximum Daily Average: 0.0 ppb on Feb 1																									
Minimum Value: 0.0 ppb on Feb 1 03:00		Hours of Data: 593																									
Maximum Diurnal Average: 0.0 ppb at hour 1		Hours of Missing Data: 79																									
Monthly Average: 0.00 ppb		Hours of Calibration: 36																									
Minimum Daily Average: 0.0 ppb on Feb 1		Percent Operational Time: 93.6																									
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-Feb	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
2-Feb	0.0	Z	RE	RE	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
3-Feb	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
4-Feb	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	0.0
5-Feb	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
6-Feb	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
7-Feb	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	C	C	C	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8-Feb	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
9-Feb	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
10-Feb	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	0.0
11-Feb	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
12-Feb	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
13-Feb	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	0.0
14-Feb	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
15-Feb	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
16-Feb	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
17-Feb	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
18-Feb	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
19-Feb	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	0.0
20-Feb	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
21-Feb	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
22-Feb	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
23-Feb	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
24-Feb	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
25-Feb	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	0.0
26-Feb	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
27-Feb	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
28-Feb	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
0.0																								Diurnal Average			
0.0																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance RE - Recovery																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 2000 ppb																											



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

**Ammonia (NH<sub>3</sub>) - ppb**  
**Patricia McInnes - February 2023**





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

**Ammonia (NH<sub>3</sub>) - ppb**  
**Patricia McInnes - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	593	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: 593

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Ammonia (NH<sub>3</sub>) - ppb  
Patricia McInnes - February 2023**

<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 - 5	70	27	21	10	6	31	61	33	34	32	25	33	28	22	16	96	545
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>	70	27	21	10	6	31	61	33	34	32	25	33	28	22	16	96	545

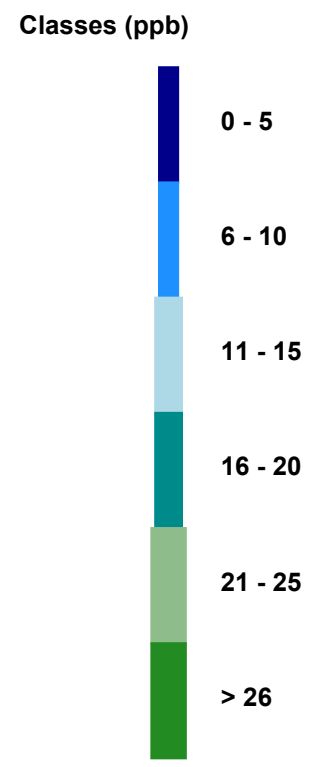
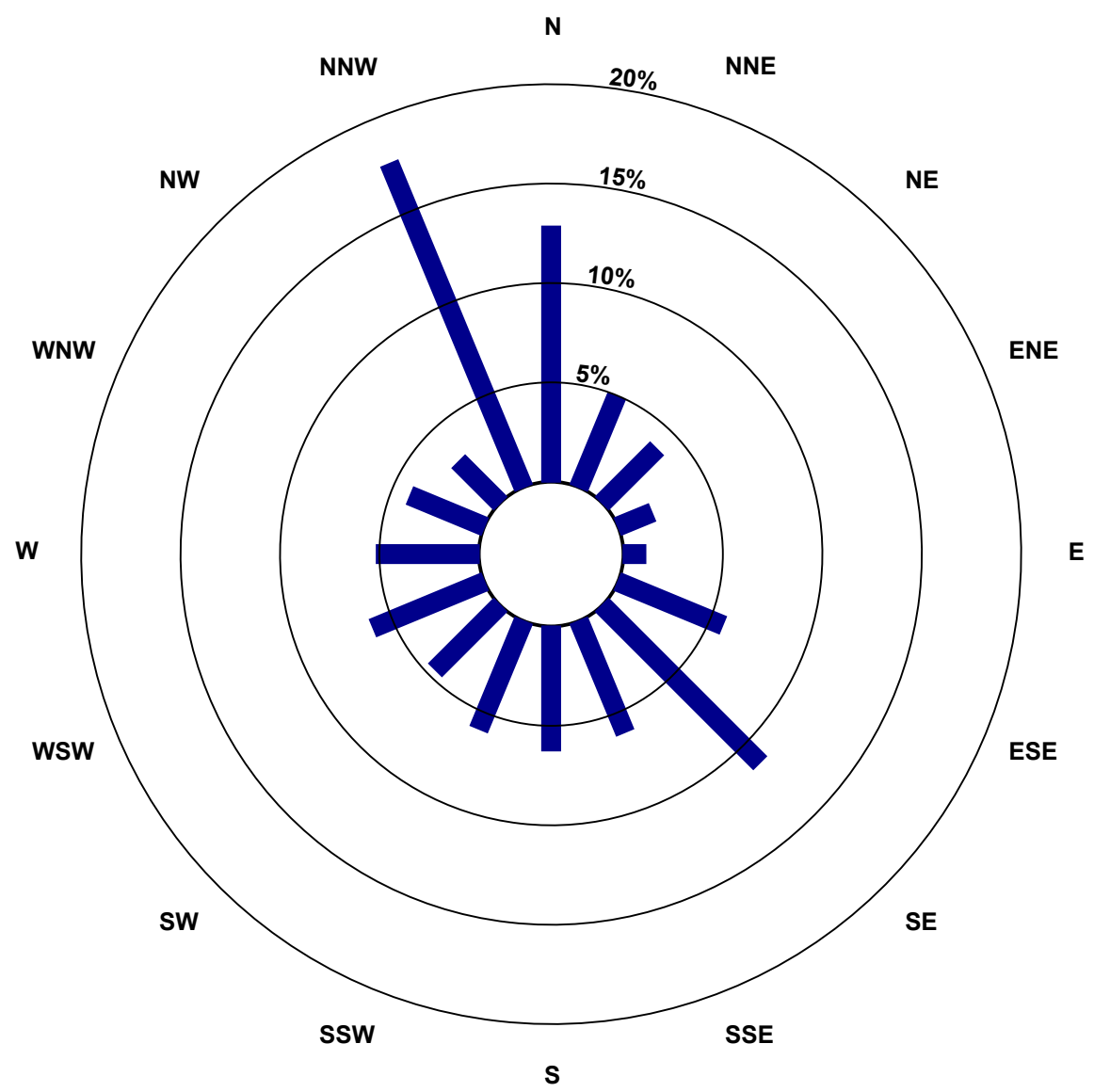
Total Number of Valid Hours: 545

Total Number of Hours: 672



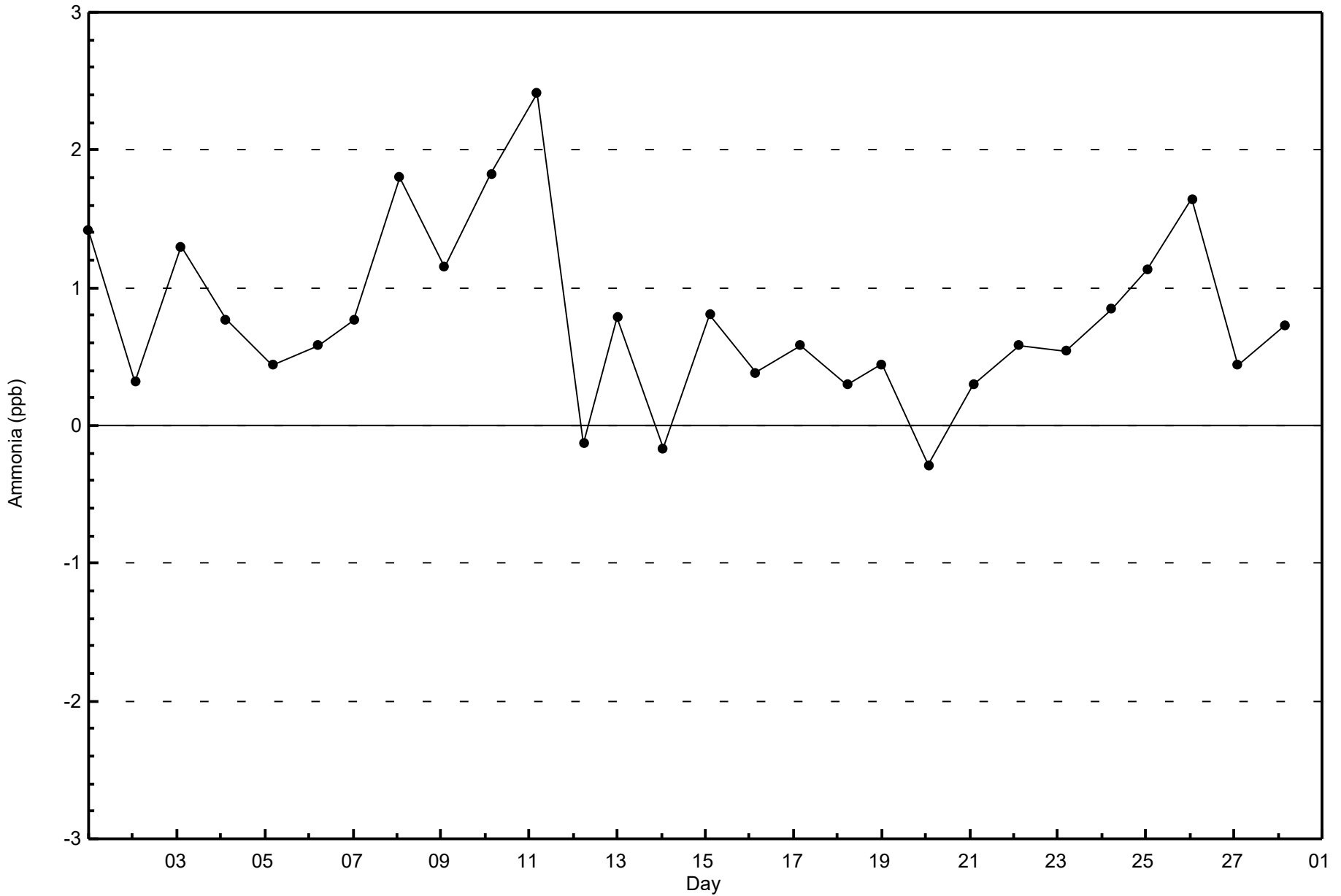
**Wood Buffalo Environmental Association**  
**Wind Rose Feb 2023**

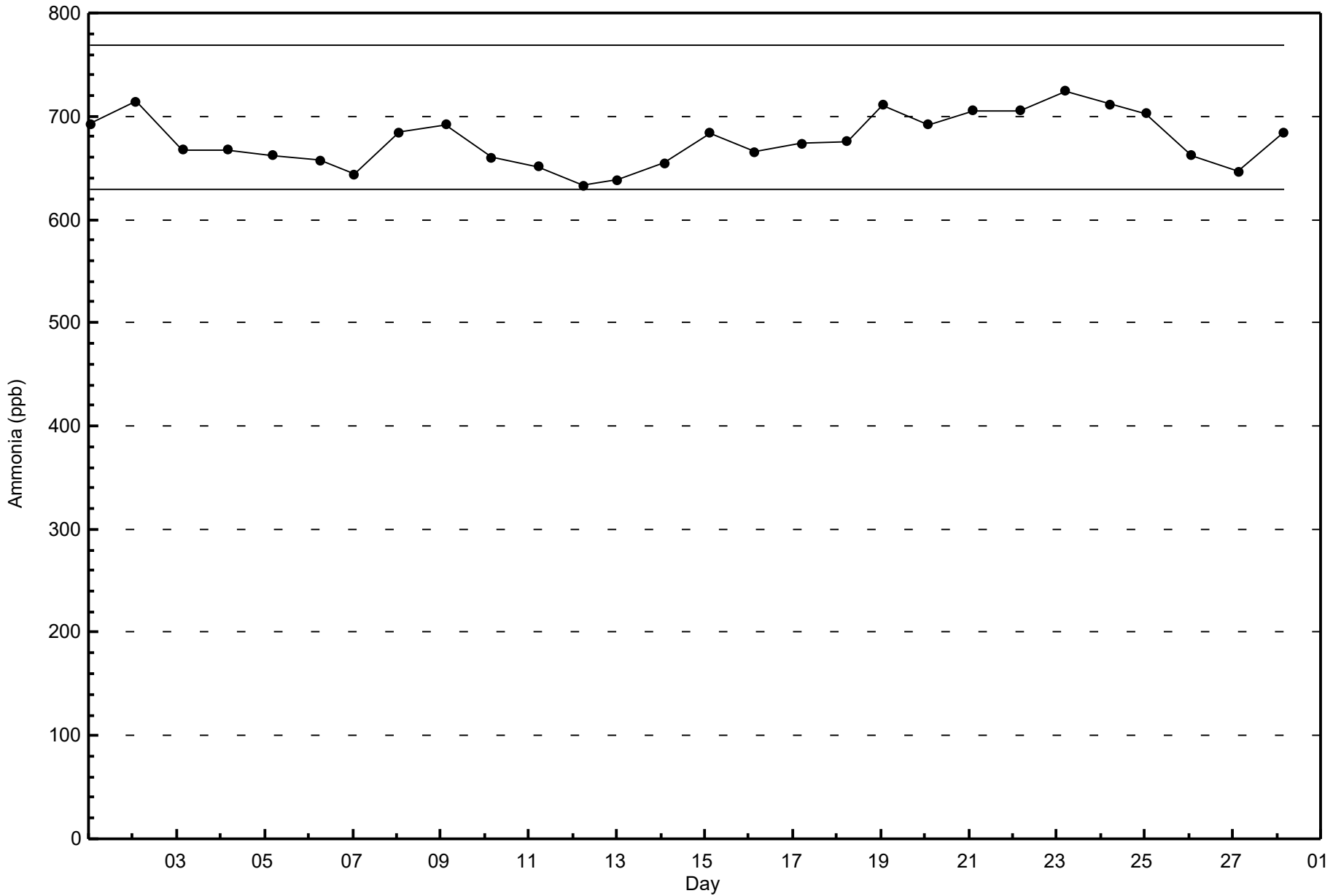
**Ammonia (NH<sub>3</sub>) - ppb**  
**Patricia McInnes**



**Total Number of Valid Hours: 545**









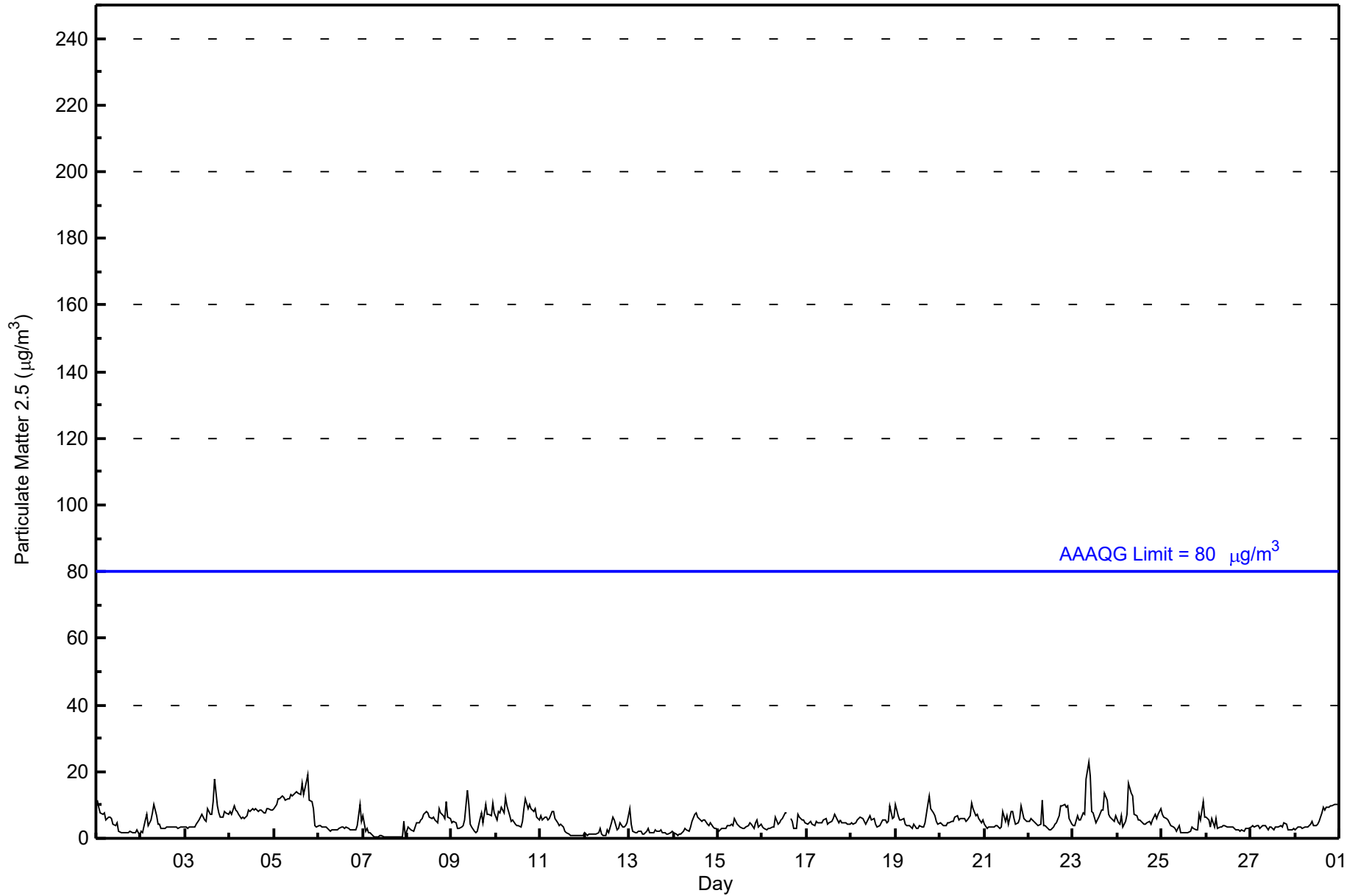
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Patricia McInnes - February 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 672																	672							
Maximum Value: 23.0 µg/m <sup>3</sup> on Feb 23 09:00		Maximum Daily Average: 12.0 µg/m <sup>3</sup> on Feb 5																	Hours of Data: 671									
Minimum Value: 0.4 µg/m <sup>3</sup> on Feb 7 21:00		Minimum Daily Average: 1.3 µg/m <sup>3</sup> on Feb 7																	Hours of Missing Data: 1									
Maximum Diurnal Average: 6.1 µg/m <sup>3</sup> at hour 19		Minimum Diurnal Average: 4.3 µg/m <sup>3</sup> at hour 14																	Hours of Calibration: 1									
Monthly Average: 5.15 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 1.8 Q <sub>1</sub> = 3.1 Median = 4.5 Q <sub>3</sub> = 6.6 P <sub>90</sub> = 9.1 P <sub>99</sub> = 16.4																	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-Feb	11.4	9.2	7.6	7.2	7.7	5.3	6.2	6.4	5.7	4.4	3.8	4.5	2.3	1.7	1.7	1.7	1.7	2.1	1.6	1.5	1.5	2.4	1.0	4.2	11.4			
2-Feb	2.2	1.8	5.6	7.1	3.6	5.6	7.6	10.2	6.8	4.1	4.3	3.0	2.8	3.0	3.3	3.3	3.4	3.3	3.4	3.2	3.2	3.3	3.4	3.5	4.2	10.2		
3-Feb	3.3	3.1	3.2	3.3	3.2	3.6	4.0	5.5	6.5	7.3	5.6	5.2	9.0	7.3	7.4	10.9	17.6	9.6	7.5	6.5	6.3	7.9	7.4	7.0	6.6	17.6		
4-Feb	8.0	7.3	9.8	8.6	8.1	7.3	6.1	6.2	6.1	6.8	8.6	8.0	8.8	8.6	8.1	8.3	8.4	7.6	7.7	8.8	8.9	8.5	8.3	8.0	9.8	8.0	9.8	
5-Feb	8.7	10.1	11.8	11.7	12.6	12.1	11.6	12.0	12.0	13.3	12.9	13.4	14.0	13.4	13.1	16.4	13.3	16.9	19.1	11.4	11.2	9.1	3.9	3.4	12.0	19.1		
6-Feb	3.7	3.6	3.6	3.4	3.3	3.0	2.3	2.5	2.6	2.5	2.4	3.2	3.6	3.5	3.1	3.2	3.1	2.4	2.7	2.4	2.7	3.7	10.2	4.9	3.4	10.2		
7-Feb	6.8	2.3	2.9	1.8	1.6	0.9	0.6	0.4	0.6	0.7	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.6	5.1	1.0	1.3	6.8	1.3	6.8	
8-Feb	3.5	3.0	2.7	2.3	3.4	4.5	4.8	5.3	5.9	7.2	8.1	7.4	6.4	6.0	6.4	5.6	4.7	8.9	7.7	6.7	6.0	10.8	6.3	5.8	5.8	10.8	5.8	10.8
9-Feb	4.9	5.1	4.5	2.9	3.0	3.5	3.7	5.4	14.5	10.1	4.1	3.5	1.9	1.7	2.1	6.1	7.7	4.5	10.3	7.1	7.4	6.8	10.7	7.6	5.8	14.5	5.8	14.5
10-Feb	5.4	8.1	7.4	9.3	7.8	12.1	9.8	6.6	5.2	5.4	4.4	3.7	3.7	3.4	5.3	8.9	11.7	9.0	10.1	8.8	8.1	8.9	6.5	5.7	7.3	12.1	7.3	12.1
11-Feb	7.0	5.4	6.2	6.5	5.5	5.9	8.1	8.1	5.8	4.5	3.8	4.2	3.4	2.1	1.6	1.1	0.8	1.0	1.0	0.8	0.7	0.9	0.8	0.9	3.6	8.1	3.6	8.1
12-Feb	1.7	1.0	1.2	1.2	1.3	1.3	1.3	1.8	3.0	1.1	1.0	1.0	2.8	1.7	4.5	6.2	5.3	2.6	3.1	4.5	3.5	3.3	3.7	4.8	2.6	6.2	2.6	6.2
13-Feb	8.8	4.2	2.1	1.8	1.9	2.0	2.0	1.2	1.2	2.2	3.0	1.8	1.8	1.8	2.7	2.2	2.2	2.5	1.7	1.5	1.2	1.2	1.7	2.0	2.3	8.8	2.3	8.8
14-Feb	1.6	1.2	1.0	1.4	1.3	1.9	2.8	2.7	2.3	3.3	5.0	7.3	7.7	6.4	5.4	5.0	5.5	5.7	4.4	3.8	4.5	3.4	2.9	2.8	3.7	7.7	3.7	7.7
15-Feb	2.2	2.7	3.0	2.8	2.9	3.9	3.7	4.0	3.9	5.8	4.3	3.6	3.3	2.9	2.9	3.6	3.8	4.8	4.2	3.0	4.8	5.5	3.3	4.2	3.7	5.8	3.7	5.8
16-Feb	3.4	3.0	2.6	2.8	2.9	3.2	3.2	6.2	4.2	4.8	5.7	5.9	7.4	7.6	C	6.0	5.0	2.8	3.1	7.1	6.1	5.6	5.7	4.6	4.7	7.6	4.7	7.6
17-Feb	4.3	4.7	4.9	4.3	4.0	5.2	4.6	4.7	4.6	5.5	6.0	4.0	4.5	5.0	6.0	7.1	6.2	4.7	5.5	4.7	4.8	4.8	4.3	4.4	4.9	7.1	4.9	7.1
18-Feb	4.5	4.3	4.7	5.7	5.7	6.4	5.8	4.9	4.4	6.1	6.6	5.4	6.0	4.2	3.6	3.7	4.5	5.3	5.7	4.8	5.1	9.6	6.1	6.4	5.4	9.6	5.4	9.6
19-Feb	10.1	6.9	5.5	5.6	5.9	4.2	3.8	3.6	3.2	3.0	4.3	2.9	2.9	3.7	3.4	3.4	4.7	10.0	12.8	8.9	7.8	6.9	5.2	4.2	5.5	12.8	5.5	12.8
20-Feb	4.5	4.1	3.6	3.9	4.6	4.8	5.0	5.1	6.2	6.8	5.6	6.1	5.9	6.1	5.3	5.6	6.9	10.8	8.9	6.7	7.2	5.9	4.9	5.4	5.8	10.8	5.8	10.8
21-Feb	4.2	3.1	3.4	3.5	3.5	3.6	3.9	4.0	3.1	3.5	7.9	5.2	6.9	4.4	7.9	8.0	5.8	4.1	4.5	5.9	9.7	5.7	5.6	5.1	5.1	9.7	5.1	9.7
22-Feb	5.3	6.0	5.6	4.9	4.1	4.0	4.1	11.4	3.7	3.6	2.9	2.7	2.5	3.3	4.1	4.5	6.6	9.5	9.7	10.1	9.3	9.5	5.9	4.2	5.7	11.4	5.7	11.4
23-Feb	4.0	3.9	6.9	5.5	5.5	7.5	7.0	17.8	23.0	18.6	8.2	7.6	4.8	5.3	6.5	8.6	8.5	13.5	11.6	7.1	6.6	5.4	5.3	6.8	8.6	23.0	8.6	23.0
24-Feb	4.8	4.4	6.8	3.5	5.1	7.3	16.4	13.4	12.8	7.4	6.7	5.6	5.4	4.5	4.1	4.4	4.8	5.3	4.0	5.7	7.0	6.0	7.2	9.1	6.7	16.4	6.7	16.4
25-Feb	7.2	6.5	6.0	5.3	4.6	4.0	3.5	2.8	2.3	3.8	1.8	1.6	1.6	1.6	1.5	2.0	3.4	2.9	2.6	2.7	7.3	5.3	11.1	6.3	4.1	11.1	4.1	11.1
26-Feb	6.2	5.3	3.3	5.9	3.2	5.7	2.8	3.4	3.6	3.9	3.6	3.4	3.4	3.3	3.3	2.9	2.3	2.4	2.3	2.3	2.1	2.9	3.1	3.0	3.5	6.2	3.5	6.2
27-Feb	3.5	3.6	3.2	3.7	3.8	3.1	3.9	4.0	3.9	2.7	3.2	3.4	2.6	3.5	3.6	3.5	3.8	3.4	4.5	4.1	2.7	2.6	2.8	3.1	3.4	4.5	3.4	4.5
28-Feb	2.6	3.5	3.3	3.2	3.2	3.2	3.4	3.3	4.3	5.3	3.9	3.6	4.3	5.1	7.8	9.3	8.6	9.4	9.5	9.6	9.8	10.2	10.2	10.2	6.1	10.2	6.1	10.2
5.1 4.5 4.7 4.6 4.4 4.8 5.1 5.8 5.8 5.5 4.9 4.6 4.7 4.3 4.7 5.4 5.7 5.9 6.1 5.3 5.6 5.6 5.5 4.9																								Diurnal Average				
11.4 10.1 11.8 11.7 12.6 12.1 16.4 17.8 23.0 18.6 12.9 13.4 14.0 13.4 13.1 16.4 17.6 16.9 19.1 11.4 11.2 10.8 11.1 10.2																								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>) -  $\mu\text{g}/\text{m}^3$**   
**Patricia McInnes - February 2023**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	417	62.15	62.15
6 - 15	246	36.66	98.81
16 - 25	8	1.19	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 671

Total Number of Hours: 672



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

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>**  
**Patricia McInnes - February 2023**

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	36	16	12	7	4	21	48	8	19	22	25	30	30	20	13	59	370
6 - 15	45	12	10	3	3	11	21	28	15	14	8	6	7	4	4	50	241
16 - 25	1	1	0	0	0	0	0	3	3	0	0	0	0	0	0	0	8
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>	82	29	22	10	7	32	69	39	37	36	33	36	37	24	17	109	619

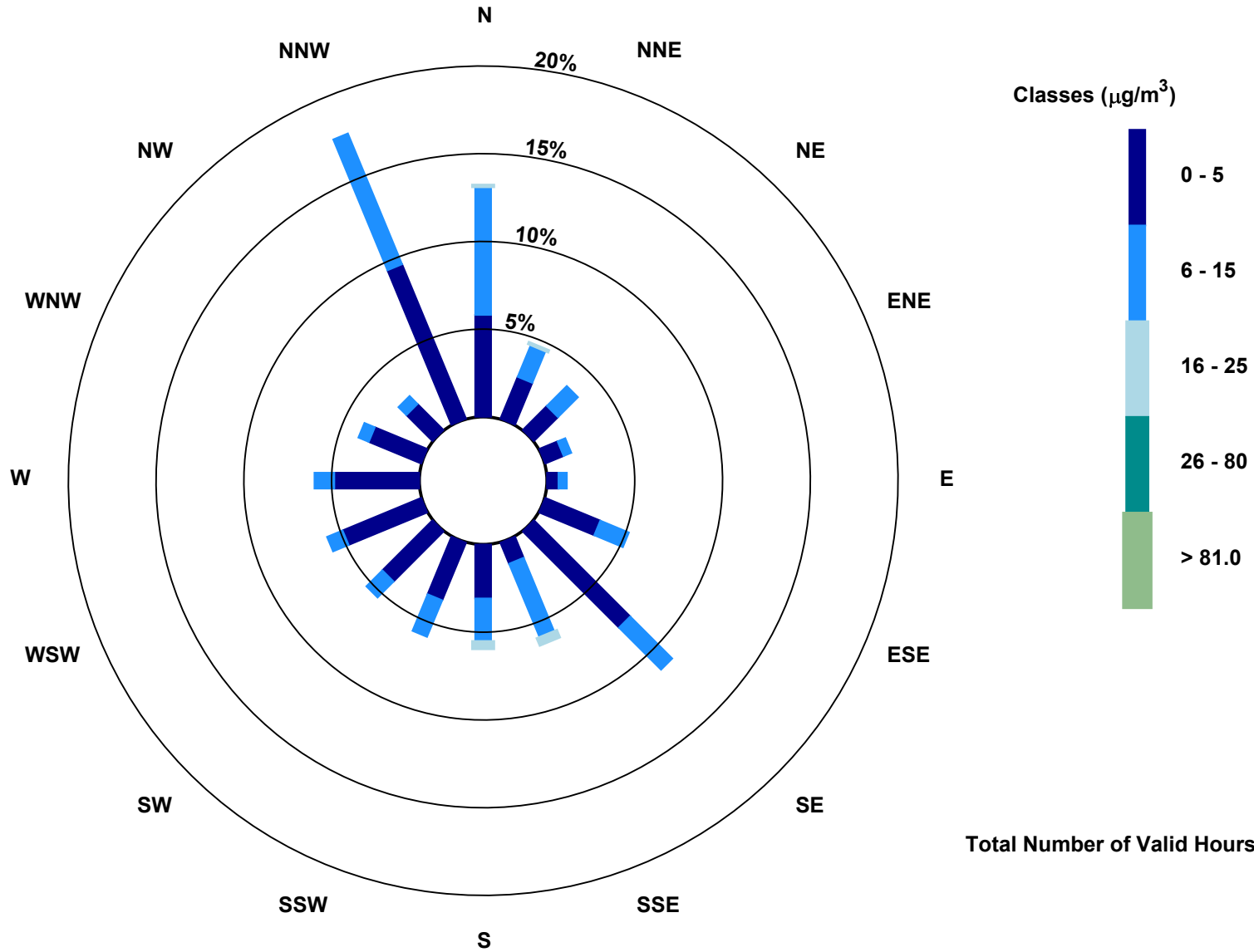
Total Number of Valid Hours: 619

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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 (AT) - C**  
**Patricia McInnes - February 2023**

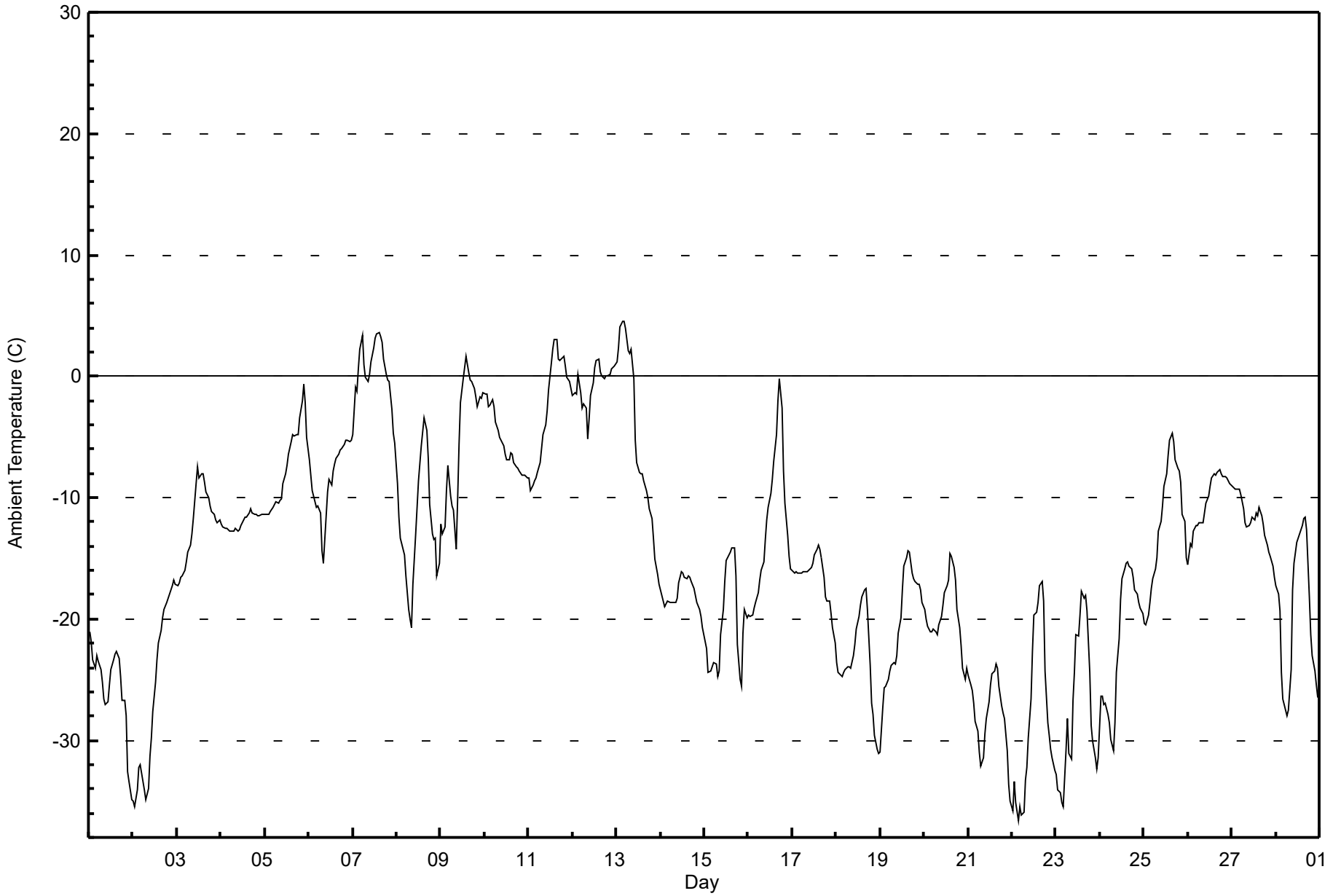
Maximum Value: 4.6 C on Feb 13 04:00		Maximum Daily Average: 0.3 C on Feb 7		Hours in Service: 672																							
Minimum Value: -36.6 C on Feb 22 04:00		Minimum Daily Average: -28.4 C on Feb 22		Hours of Data: 672																							
Maximum Diurnal Average: -10.5 C at hour 16		Minimum Diurnal Average: -17.6 C at hour 8		Hours of Missing Data: 0																							
Monthly Average: -14.77 C		Percentiles: P <sub>1</sub> = -35.2 P <sub>10</sub> = -27.6 Q <sub>1</sub> = -21.1 Median = -14.7 Q <sub>3</sub> = -8.1 P <sub>90</sub> = -1.3 P <sub>99</sub> = 3.3		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-Feb	-21.0	-21.9	-23.4	-24.0	-23.0	-23.5	-24.2	-25.2	-26.6	-27.0	-26.8	-25.5	-24.2	-23.4	-22.9	-22.7	-23.3	-24.7	-26.7	-26.7	-28.0	-32.6	-33.3	-34.8	-25.6	-21.0	
2-Feb	-35.1	-35.5	-34.0	-32.3	-32.0	-33.4	-34.0	-34.9	-34.0	-31.3	-29.8	-27.6	-25.2	-23.3	-22.0	-20.9	-19.9	-19.2	-18.6	-18.3	-17.9	-17.3	-16.8	-17.2	-26.3	-16.8	
3-Feb	-17.2	-17.0	-16.6	-16.4	-16.0	-15.3	-14.5	-13.9	-12.9	-11.7	-8.8	-7.4	-8.3	-8.1	-8.1	-8.7	-9.5	-10.0	-10.7	-11.2	-11.3	-11.8	-12.1	-11.9	-12.1	-7.4	
4-Feb	-12.1	-12.4	-12.6	-12.5	-12.6	-12.8	-12.8	-12.8	-12.6	-12.7	-12.6	-12.3	-11.8	-11.6	-11.6	-11.2	-11.0	-11.3	-11.3	-11.3	-11.5	-11.5	-11.3	-11.3	-12.0	-11.0	
5-Feb	-11.4	-11.4	-11.4	-11.2	-10.8	-10.5	-10.4	-10.5	-10.3	-10.1	-8.9	-8.0	-7.4	-6.4	-5.4	-4.8	-4.9	-4.9	-4.8	-3.4	-2.0	-0.7	-2.2	-5.0	-7.4	-0.7	
6-Feb	-6.9	-8.2	-9.4	-10.3	-10.8	-10.7	-11.2	-14.4	-15.4	-11.5	-9.5	-8.5	-9.0	-7.8	-7.2	-6.7	-6.4	-6.1	-6.0	-5.6	-5.3	-5.3	-5.4	-5.3	-8.5	-5.3	
7-Feb	-4.8	-0.9	-1.2	0.6	2.2	3.4	1.0	-0.1	-0.4	0.1	1.2	2.4	3.1	3.5	3.6	3.3	2.8	1.5	0.1	-0.4	-0.5	-2.7	-4.7	-5.6	0.3	3.6	
8-Feb	-8.9	-11.6	-13.3	-14.3	-14.7	-16.4	-19.2	-20.1	-20.7	-17.1	-13.0	-10.8	-8.6	-5.8	-4.5	-3.5	-4.4	-6.8	-10.6	-13.0	-13.4	-13.3	-16.4	-15.4	-12.3	-3.5	
9-Feb	-12.2	-12.9	-12.5	-9.5	-7.3	-9.9	-10.7	-11.1	-14.3	-10.1	-5.6	-2.1	-0.2	0.7	1.7	0.3	-0.3	-0.4	-1.0	-1.7	-2.5	-1.7	-1.9	-1.4	-5.3	1.7	
10-Feb	-1.5	-1.5	-2.5	-2.4	-2.0	-2.5	-3.7	-4.5	-5.0	-5.3	-5.7	-6.4	-6.8	-6.9	-6.3	-6.4	-7.1	-7.4	-7.6	-7.8	-8.2	-8.1	-8.2	-8.4	-5.5	-1.5	
11-Feb	-8.3	-9.4	-9.0	-8.6	-8.4	-7.9	-7.1	-6.0	-4.8	-4.0	-2.9	-1.1	1.1	2.2	3.0	3.1	1.5	1.3	1.6	1.6	0.8	-0.1	-0.4	-1.0	-2.6	3.1	
12-Feb	-1.5	-1.3	-1.4	0.2	-1.3	-2.6	-2.2	-2.6	-5.1	-3.5	-1.5	-0.6	0.7	1.2	1.4	0.4	0.1	-0.2	0.0	0.0	0.1	0.6	0.7	0.8	-0.7	1.4	
13-Feb	1.2	2.4	4.1	4.6	4.6	3.9	2.1	1.9	2.2	-0.2	-5.2	-7.2	-7.9	-8.0	-8.0	-8.6	-9.4	-10.0	-10.9	-11.7	-13.4	-15.1	-16.3	-17.1	-5.1	4.6	
14-Feb	-17.6	-18.6	-19.0	-18.8	-18.6	-18.6	-18.6	-18.6	-18.7	-18.3	-17.0	-16.2	-16.2	-16.5	-16.7	-16.4	-16.5	-17.0	-17.5	-18.0	-18.6	-19.2	-19.7	-20.7	-18.0	-16.2	
15-Feb	-21.8	-22.5	-24.4	-24.3	-23.9	-23.6	-23.7	-24.7	-24.3	-21.3	-19.2	-16.9	-15.1	-14.7	-14.4	-14.1	-14.2	-16.4	-22.2	-25.0	-25.6	-21.2	-19.3	-19.9	-20.5	-14.1	
16-Feb	-19.6	-19.7	-19.7	-19.1	-18.6	-17.9	-16.8	-16.0	-15.3	-13.5	-11.9	-10.8	-9.6	-8.5	-7.0	-4.8	-2.1	-0.2	-2.6	-7.8	-10.5	-13.1	-14.9	-15.9	-12.3	-0.2	
17-Feb	-16.1	-16.2	-16.1	-16.2	-16.2	-16.2	-16.2	-16.1	-16.1	-16.0	-15.8	-15.4	-14.7	-14.2	-13.9	-14.3	-15.0	-16.6	-18.1	-18.5	-18.5	-19.6	-20.8	-22.0	-16.6	-13.9	
18-Feb	-23.6	-24.4	-24.6	-24.8	-24.4	-24.1	-24.0	-24.0	-24.0	-23.0	-22.1	-20.8	-19.8	-18.9	-18.2	-17.6	-17.5	-19.2	-23.8	-27.0	-27.8	-29.6	-30.7	-31.1	-23.5	-17.5	
19-Feb	-30.9	-27.3	-25.7	-25.5	-24.9	-24.2	-23.8	-23.6	-23.7	-23.0	-21.1	-19.9	-17.6	-15.7	-14.9	-14.4	-14.4	-16.2	-16.6	-16.9	-17.2	-17.1	-17.5	-18.6	-20.5	-14.4	
20-Feb	-19.2	-20.0	-20.6	-21.0	-21.1	-20.9	-21.1	-21.3	-20.5	-19.8	-18.9	-17.9	-17.3	-16.7	-14.6	-14.9	-15.8	-16.8	-19.2	-20.7	-22.2	-24.1	-25.0	-24.0	-19.7	-14.6	
21-Feb	-24.6	-25.5	-25.8	-26.9	-28.4	-29.2	-31.0	-32.2	-31.4	-29.4	-28.3	-26.8	-25.4	-24.6	-24.3	-23.7	-24.0	-25.6	-27.2	-27.8	-28.2	-30.9	-33.7	-35.0	-27.9	-23.7	
22-Feb	-35.8	-33.4	-35.2	-36.6	-35.5	-36.1	-35.9	-33.2	-32.2	-29.8	-26.6	-22.7	-19.6	-19.4	-18.6	-17.3	-16.9	-18.5	-24.3	-28.6	-29.6	-30.7	-31.4	-32.5	-28.4	-16.9	
23-Feb	-32.8	-34.0	-34.3	-35.1	-35.5	-30.9	-28.3	-31.1	-31.5	-26.7	-24.3	-21.3	-21.4	-19.6	-17.7	-18.3	-18.1	-19.3	-24.4	-28.8	-30.0	-31.4	-32.4	-31.5	-27.4	-17.7	
24-Feb	-26.3	-26.4	-27.1	-27.0	-27.9	-28.6	-30.0	-30.8	-28.5	-24.5	-21.7	-18.4	-16.7	-15.9	-15.4	-15.3	-15.7	-15.9	-16.6	-17.6	-17.9	-18.6	-19.1	-19.5	-21.7	-15.3	
25-Feb	-20.4	-20.5	-19.6	-18.7	-17.5	-16.7	-15.8	-14.9	-12.8	-12.0	-10.6	-9.0	-8.0	-6.6	-5.2	-4.7	-5.4	-6.8	-7.6	-7.8	-8.7	-11.4	-12.0	-14.9	-12.0	-4.7	
26-Feb	-15.6	-13.8	-14.1	-12.7	-12.2	-12.3	-12.1	-12.1	-11.2	-10.5	-9.9	-9.0	-8.4	-8.0	-8.1	-7.9	-7.7	-8.1	-8.3	-8.3	-8.4	-8.6	-8.8	-10.3	-7.7		
27-Feb	-9.0	-9.1	-9.3	-9.3	-9.2	-9.7	-10.9	-12.0	-12.4	-12.3	-12.0	-11.6	-11.8	-11.3	-11.5	-10.8	-11.5	-12.2	-13.1	-13.9	-14.5	-14.8	-15.7	-16.6	-11.9	-9.0	
28-Feb	-17.3	-17.9	-19.3	-24.4	-26.6	-27.5	-28.0	-27.5	-24.2	-17.6	-15.4	-13.7	-13.3	-13.0	-12.3	-11.7	-11.6	-12.6	-18.2	-21.3	-23.0	-24.2	-25.5	-26.4	-19.7	-11.6	
		-16.8	-16.8	-17.1	-17.0	-16.9	-17.0	-17.3	-17.6	-17.4	-15.8	-14.5	-13.1	-12.2	-11.3	-10.7	-10.5	-10.7	-11.4	-13.1	-14.2	-14.8	-15.5	-16.2	-16.8	Diurnal Average	
		1.2	2.4	4.1	4.6	4.6	3.9	2.1	1.9	2.2	0.1	1.2	2.4	3.1	3.5	3.6	3.3	2.8	1.5	1.6	1.6	0.8	0.6	0.7	0.8	Diurnal Maximum	





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

**Ambient Temperature (AT) - C**  
**Patricia McInnes - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Patricia McInnes - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	185	27.53	27.53
-20 - 0	440	65.48	93.01
0 - 10	47	6.99	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



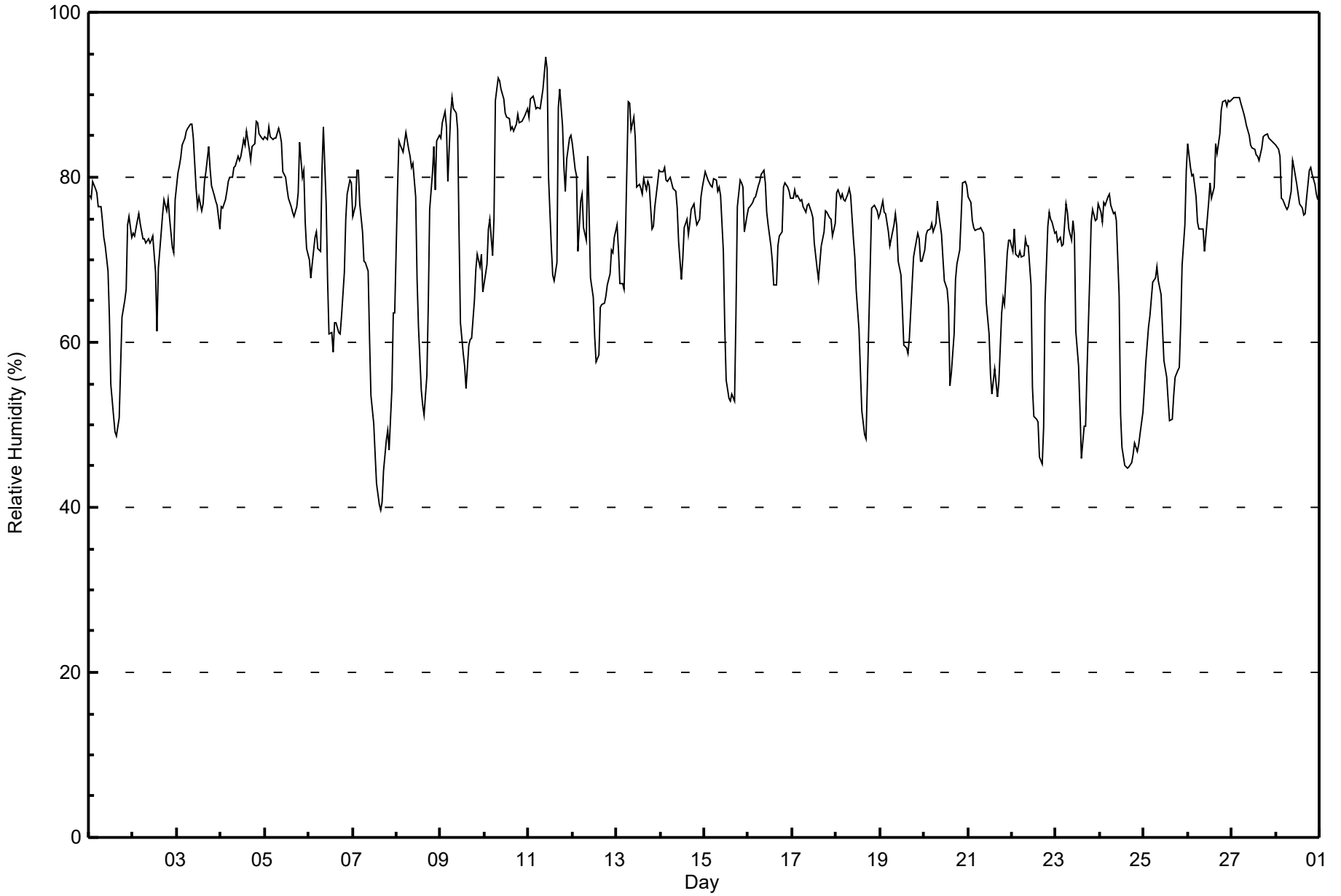
**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Relative Humidity (RH) - %**

**Patricia McInnes - February 2023**

<b>Maximum Value: 94.6 % on Feb 11 10:00</b> <b>Maximum Daily Average: 85.7 % on Feb 27</b>																						<b>Hours in Service: 672</b>				
<b>Minimum Value: 39.7 % on Feb 7 16:00</b> <b>Minimum Daily Average: 59.0 % on Feb 7</b>																						<b>Hours of Data: 672</b>				
<b>Maximum Diurnal Average: 79.1 % at hour 9</b> <b>Minimum Diurnal Average: 63.2 % at hour 15</b>																						<b>Hours of Missing Data: 0</b>				
<b>Monthly Average: 73.40 %</b> <b>Percentiles: P<sub>1</sub> = 44.9 P<sub>10</sub> = 56.0 Q<sub>1</sub> = 68.9 Median = 75.6 Q<sub>3</sub> = 80.1 P<sub>90</sub> = 85.6 P<sub>99</sub> = 90.1</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-Feb	77.7	77.4	79.5	78.6	78.2	76.5	76.4	74.8	72.7	71.7	68.7	63.0	55.0	51.0	49.2	48.6	50.8	56.9	63.1	65.0	66.4	74.2	75.2	72.8	67.6	79.5
2-Feb	73.2	72.9	74.7	75.7	74.5	72.5	72.5	72.0	72.6	72.1	72.4	72.9	68.5	61.4	69.0	73.2	75.4	77.4	75.9	77.3	75.0	71.5	70.9	77.3	72.9	77.4
3-Feb	80.5	81.3	82.4	83.9	84.8	85.6	86.0	86.4	86.4	84.7	78.7	76.4	77.7	75.9	76.8	79.4	80.7	83.7	81.0	79.0	77.7	77.1	76.6	73.7	80.7	86.4
4-Feb	76.4	76.3	77.4	78.2	79.5	80.0	80.0	81.1	81.4	82.5	82.0	82.5	84.5	83.9	85.6	83.3	82.0	83.8	84.1	86.7	86.6	85.3	84.7	84.6	82.2	86.7
5-Feb	85.0	84.7	86.1	85.0	84.6	84.7	84.8	86.0	85.3	84.3	80.7	80.0	78.6	77.5	76.5	75.8	75.2	76.5	78.2	84.3	79.9	80.8	74.6	71.3	80.8	86.1
6-Feb	69.9	67.8	69.5	72.7	73.5	71.4	71.0	80.8	86.1	76.7	67.6	61.0	61.2	58.9	62.3	62.3	61.2	61.1	63.3	68.4	74.9	78.0	79.6	79.4	69.9	86.1
7-Feb	75.2	76.6	80.9	80.8	76.9	73.4	69.9	69.6	68.7	60.6	53.6	50.2	46.5	42.8	40.4	39.7	40.6	44.4	48.2	49.3	47.0	54.4	63.6	63.5	59.0	80.9
8-Feb	78.5	84.3	83.9	83.0	84.3	85.5	83.4	82.5	81.2	81.8	77.7	67.7	61.9	54.2	52.3	51.2	56.0	64.4	76.0	80.5	83.7	78.5	84.5	85.1	75.1	85.5
9-Feb	84.7	86.5	87.9	86.1	79.5	87.6	89.6	88.2	87.9	85.8	73.4	62.4	58.6	57.1	54.3	59.6	60.3	60.5	65.1	68.9	70.7	69.1	70.7	66.1	73.4	89.6
10-Feb	68.3	69.5	73.7	74.9	70.5	75.0	89.4	92.1	91.7	90.7	89.5	87.8	87.4	87.2	85.7	86.0	85.6	86.5	87.6	86.6	86.9	87.1	87.4	88.3	84.0	92.1
11-Feb	87.3	89.6	89.9	89.1	88.4	88.4	88.3	89.5	90.7	94.6	93.1	80.0	71.6	68.2	67.4	69.6	88.4	90.8	86.2	81.1	78.4	82.2	84.7	85.1	84.3	94.6
12-Feb	84.1	81.1	80.2	71.0	77.1	78.0	74.0	72.4	82.6	75.6	67.8	65.5	60.7	57.6	58.5	64.2	64.5	64.8	65.5	66.9	68.3	71.1	70.8	72.7	70.6	84.1
13-Feb	74.2	71.1	67.1	67.1	66.4	72.8	89.1	89.0	85.8	87.3	84.8	78.8	79.2	78.6	78.0	79.9	78.4	79.5	79.0	73.8	74.0	76.4	79.4	80.9	77.9	89.1
14-Feb	80.6	80.7	81.1	79.7	79.5	79.9	79.3	78.7	78.4	76.2	72.1	67.6	70.3	73.9	74.9	73.1	74.3	76.2	76.8	75.3	74.3	75.0	77.6	78.9	76.4	81.1
15-Feb	80.7	80.2	79.7	79.1	78.7	79.9	79.6	78.4	78.9	77.8	71.0	61.9	55.5	53.3	52.9	53.8	52.9	63.4	76.5	79.7	79.3	78.9	73.5	75.5	71.7	80.7
16-Feb	76.2	76.5	77.0	77.5	77.7	78.9	79.6	80.4	80.9	79.2	75.8	74.2	71.7	69.8	67.0	67.0	71.8	72.9	73.4	78.9	79.3	78.8	78.3	77.5	75.8	80.9
17-Feb	77.4	78.5	77.6	77.8	77.0	77.3	76.4	75.8	76.7	76.8	75.7	75.0	72.1	69.0	67.7	69.7	71.8	73.5	75.9	75.8	75.0	74.9	72.9	74.4	74.8	78.5
18-Feb	78.2	78.4	77.4	78.0	77.3	77.2	77.9	78.6	77.9	72.6	70.4	66.2	61.5	56.5	51.7	48.9	48.3	55.2	69.1	76.2	76.5	76.5	75.9	75.2	70.1	78.6
19-Feb	75.6	77.2	75.7	75.5	73.3	71.7	72.5	74.3	75.5	74.1	69.8	68.1	64.0	59.7	59.3	58.7	60.5	67.2	70.3	71.3	73.2	72.5	69.9	69.8	70.0	77.2
20-Feb	71.2	73.1	73.5	73.7	74.4	73.4	74.4	77.2	75.6	73.1	70.2	67.4	66.4	64.3	54.8	56.3	61.0	67.6	69.5	71.1	75.2	79.3	79.5	79.0	70.9	79.5
21-Feb	77.6	76.9	74.7	73.8	73.5	73.7	73.7	74.0	73.2	69.7	64.7	61.1	56.0	53.8	56.7	55.0	53.4	55.2	63.5	65.4	64.5	70.8	72.3	72.4	66.9	77.6
22-Feb	71.1	73.7	70.7	70.4	71.1	70.3	70.6	72.5	71.7	71.7	67.0	54.6	51.1	50.7	50.4	46.1	45.3	49.7	64.7	74.1	75.8	74.9	74.5	73.2	65.2	75.8
23-Feb	73.4	72.2	72.8	71.7	71.9	76.8	75.8	73.8	72.4	74.8	73.0	61.3	57.2	51.7	46.0	49.8	49.8	56.4	68.0	74.6	76.1	74.7	75.0	76.8	67.8	76.8
24-Feb	75.8	74.6	76.9	76.7	77.6	77.9	76.6	75.7	75.7	74.8	65.6	51.4	47.3	45.1	44.8	44.8	45.0	45.4	46.5	47.8	46.8	47.5	49.1	51.5	60.0	77.9
25-Feb	54.2	57.4	61.9	63.2	65.2	67.3	67.8	69.1	67.4	65.8	61.7	57.8	55.8	53.0	50.5	50.6	53.5	55.7	56.6	56.9	62.2	69.3	74.2	80.8	61.6	80.8
26-Feb	84.0	81.2	80.2	80.3	77.5	74.6	73.8	73.7	73.7	71.0	72.8	77.0	79.3	77.5	78.8	84.1	82.9	85.2	88.1	89.2	89.3	88.6	89.3	89.2	80.9	89.3
27-Feb	89.5	89.6	89.6	89.6	89.6	89.0	87.8	87.1	86.4	85.2	83.9	83.5	83.5	82.7	82.6	82.0	83.6	84.9	85.2	85.2	84.8	84.5	84.2	84.0	85.7	89.6
28-Feb	83.9	83.3	82.5	77.4	77.2	76.4	76.2	76.5	78.3	82.0	81.1	79.1	77.9	76.8	76.2	75.5	75.6	77.5	80.9	81.2	80.3	79.1	77.9	77.3	78.8	83.9
																								Diurnal Average		
																								Diurnal Maximum		





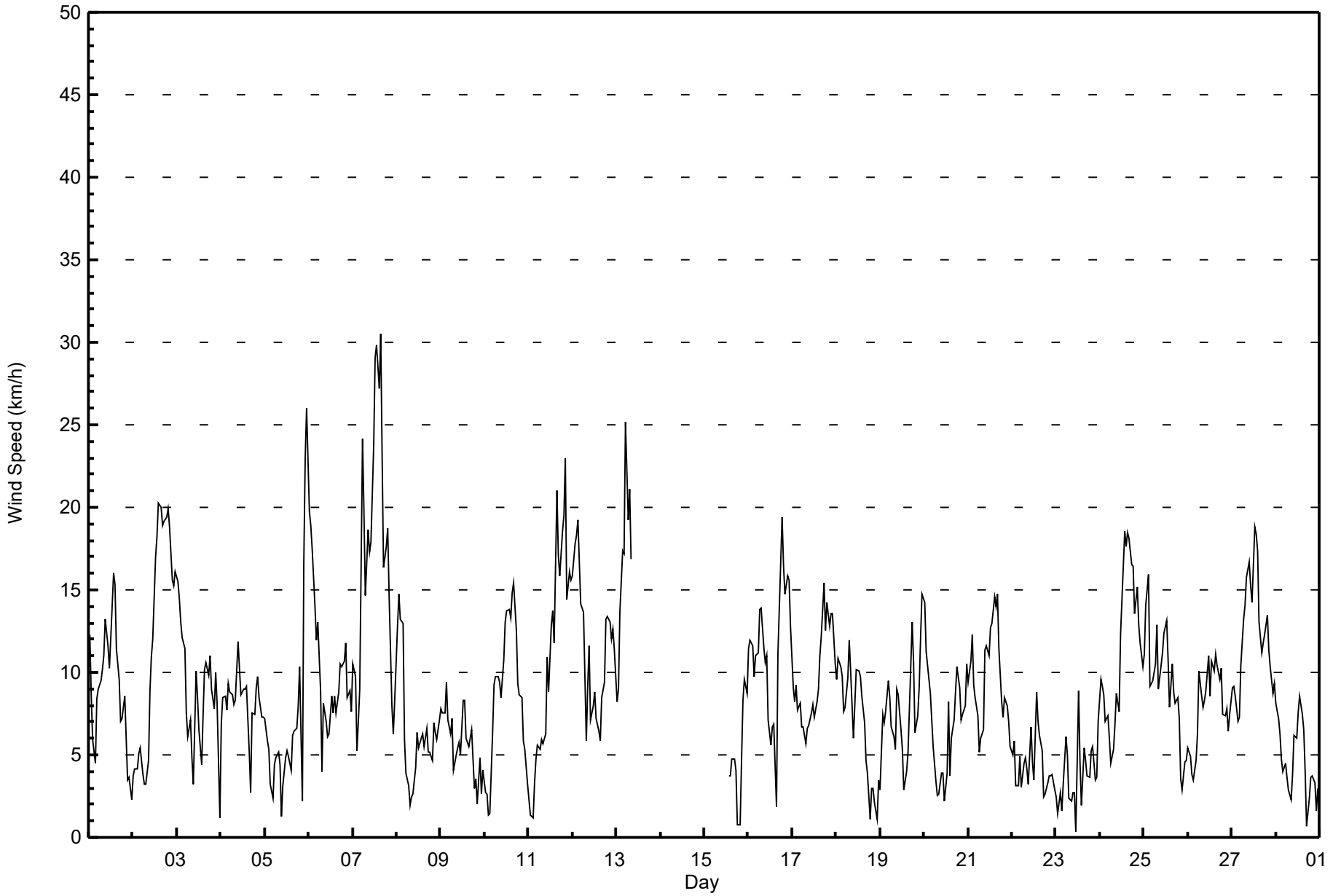
Maximum Speed: 31 km/h on Feb 7 16:00		Maximum Daily Speed Average: 15.9 km/h on Feb 7		Hours in Service: 672																							
Minimum Speed Value: 0 km/h on Feb 23 12:00		Minimum Daily Speed Average: 0.3 km/h on Feb 23		Hours of Data: 620																							
Maximum Diurnal Speed Average: 3.3 km/h at hour 6		Minimum Diurnal Speed Average: 0.9 km/h at hour 12		Hours of Missing Data: 52																							
Monthly Average Velocity: 1.7 km/h 305.1 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> = 16 P <sub>99</sub> = 24		Percent Operational Time: 92.3																							
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-Feb	NNW12	NNW9	NW6	NW4	N8	NNW9	N9	N10	N11	N13	N12	NNW10	NNW12	NNW16	NNW15	NNW11	NW10	WNW7	WNW7	WNW9	WNW6	WNW4	SSW4	SW2	NNW8.1	NNW16	
2-Feb	SSW4	SSW4	S4	SSE5	S5	SSE4	SSE3	SE3	SE5	SE9	SE11	SE12	ESE17	ESE18	ESE20	SE20	SE19	SE19	SE19	SE20	SE19	SE16	SE15	SE16	SE11.5	ESE20	
3-Feb	SE15	SE15	SE13	SE12	SE11	SE8	SE6	SE7	SSE5	SSE3	WSW10	WSW9	NNE7	N4	NNE7	N10	N11	N10	N11	N9	NNW8	N10	NNW8	NNW1	ENE2.3	SE15	
4-Feb	NNW7	N8	NNW9	N8	N9	NNW9	NNW9	NNW8	N8	N12	N10	NNW9	N9	NNW9	NNW9	N5	NNW3	NNE8	N7	NNW9	N10	NNW8	NNW7	NNW7	N8.1	N12	
5-Feb	NNW7	N6	N5	NNE3	NNE2	NNE4	N5	NNW5	NNE4	SW1	NNW3	SE5	SE5	SSE5	S4	S5	SSW6	S7	S8	SW10	NNW2	NW17	NNW23	NW26	WNW2.9	NW26	
6-Feb	WNW20	W19	W17	WSW14	W12	W13	WNW9	W4	WSW8	W7	NW6	NE6	E9	E8	ESE9	ESE8	SE9	SE10	ESE10	SE11	SE12	SSE8	SSE9	S8	SW2.4	WNW20	
7-Feb	SSW11	SW10	SW5	WSW7	SW9	NNW24	WNW20	W15	W19	W17	WSW18	WSW24	W29	W30	W27	W31	W23	W16	WSW18	W19	W15	WSW8	S6	W8	W15.9	W31	
8-Feb	NNW13	NNW15	NNW13	NNW13	NW6	WSW4	W3	W2	W2	SSW3	SSE4	SSE6	SSE5	SE6	SE6	ESE6	SE7	SSE5	SSE5	S5	SSW7	S6	S6	S7	SSW1.1	NNW15	
9-Feb	S8	S8	SSW8	SW9	SW7	SW6	SW7	SSE4	SSE5	ESE5	SE6	SE5	S8	SSW8	S6	ESE6	ESE6	SSE7	SSE3	ESE4	SSE2	S5	SE3	SE4	S4.6	SW9	
10-Feb	SE3	SSE3	N1	NE1	N6	N9	N10	N10	N9	N8	N11	N13	NNW14	NNW14	NNW13	NNW15	NNW15	NNW13	NNW9	NNW9	NNW8	NNW6	N5	NE3	N8.2	NNW15	
11-Feb	NNE2	NNE1	SE1	SSE3	SSE5	S6	SSW5	SSW6	WSW6	SSW6	SW11	SSW9	SW13	SW14	SW12	WSW21	WSW17	WSW16	W19	WNW20	WNW23	W14	WSW16	WSW16	WSW9.1	WNW23	
12-Feb	WSW16	WSW18	W18	W19	WSW14	WSW14	W14	W6	SSW9	WSW12	WSW7	SW8	S9	S7	SSE6	ESE6	ESE8	SE9	ESE13	SE13	ESE13	ESE12	SE13	SE11	SSW6.0	W19	
13-Feb	SSE8	S9	SW14	SW17	WSW17	WSW25	WSW19	W21	W17	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	WSW25	
14-Feb	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-Feb	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	SE4	ESE4	ENE5	E5	ESE4	WSW1	SW1	SE5	SE8	SE10	SE9	---	SE10
16-Feb	SE11	SE12	SE12	SE10	SE11	SE11	SE14	SE14	SE11	SE11	SE11	SSE7	SSE6	SSE7	SSW7	WSW2	WNW11	NW14	NNW19	NNW16	N15	N16	N16	N13	E2.4	NNW19	
17-Feb	N9	NNW8	NNW9	NNW8	NNW8	NNW7	N7	N6	N7	N7	N8	NNE8	NNE7	N8	N9	N11	N12	NNW15	NNW13	NNW14	N13	N14	N14	N11	N9.4	NNW15	
18-Feb	NNW10	NNW11	NNW10	NNW10	NNW8	NNW8	N10	N12	N10	NNW6	NNE8	N10	N10	NNW10	N9	NNE7	NNE5	NE4	SSW1	WNW3	WNW3	WSW2	SSW1	SSW3	N6.2	N12	
19-Feb	SSE3	SE7	SE7	SE8	SE9	SE9	SE7	ESE6	SE5	ESE9	ESE9	NE7	NNE5	NE3	NNE4	N5	N8	NNW13	NNW11	NNW6	NNW7	NNW9	NNW12	NNW15	NE2.6	NNW15	
20-Feb	NNW14	NNW11	NNW10	NNW9	NW7	NW6	WNW3	NW3	ESE3	ESE4	ENE4	E2	NE4	NE8	NNE4	NE6	NNE7	NNE9	NNW10	NNW9	NNW7	NNW7	NNW8	NNW10	N5.7	NNW14	
21-Feb	NNW9	NNW11	N12	N9	NNW8	N7	NW5	NW6	NW7	NNW11	NNW12	NNW11	NNW13	N13	N15	N14	NNW15	NNW11	NNW8	N7	N8	W8	WSW7	WSW6	NNW8.7	NNW15	
22-Feb	WSW5	SW6	SSW3	S3	SW5	SSW3	SSW5	SSW5	SSW4	S3	S7	S5	NNW4	NNE9	NNE7	NNE6	N5	W2	WNW3	WSW3	WNW4	W4	W4	W3	WSW1.7	NNE9	
23-Feb	WNW2	WSW1	N3	NW2	NNW3	NNW6	N5	SSE2	SSE2	NNE3	NE3	NE0	NE9	NE5	ENE2	ENE5	E5	ESE4	SSW4	SW5	SW6	SSW3	SSW4	SSW7	ENE0.3	NE9	
24-Feb	SSW10	S9	S9	SSW7	S7	SSE6	SSE5	S5	SSE7	SSE9	SE8	S12	SSW14	S19	S18	SSE18	SSE18	S17	S16	S14	S15	S13	S12	SSW10	S11.1	S19	
25-Feb	SW11	SW14	SW16	SW9	SW9	SW9	SW11	SW13	W9	WSW10	WSW11	WSW12	WSW13	SW11	SW8	SSW10	SSW9	SSW8	SSW9	SSW9	SSW7	SSE4	SSE3	SE5	ESE5	SW8.4	SW16
26-Feb	ESE5	SE5	E4	SE3	ESE5	SE6	SE10	ESE9	ESE8	ESE8	ESE9	ESE11	E9	ENE11	ENE10	ENE11	ENE10	ENE10	NE10	NE7	NE7	NE8	NNE6	NNE7	E6.7	ENE11	
27-Feb	NNE9	NNE9	N9	N7	NNW7	NNW10	NNW13	NNW14	NNW16	NNW17	N15	NNW14	NNW19	NNW18	NNW17	N13	N11	N12	NNW12	N13	N11	NNW10	NNW9	NNW9	NNW12.1	NNW19	
28-Feb	NNW8	NNW7	NNW6	NW5	WNW4	NW4	WNW4	WNW3	N2	N4	NNW6	NNE6	NE8	NE9	NE7	NE7	NE4	NNE1	WNW2	W4	W4	W3	E2	SSE3	N3.1	NE9	
WNW2.1 W2.2 W2.4 W2.6 W2.1																								Diurnal Average			
NNW3.3 NNW2.7 NNW2.1 NNW2.1 NNW1.3 NNW1.1 NNW0.9 NNW1.7 NNW1.9 N1.6 NNE1.8 N1.5 NNW1.3 NNW1.9 NNW2.5 NNW2.0 NNW1.7 NNW1.3 NNW1.7																								Diurnal Maximum			
WNW20 W19 W18 W19 WSW17 WSW25 WNW20 W21 W19 W17 WSW18 WSW24 W29 W30 W27 W31 W23 SE19 NNW19 SE20 WNW23 NW17 WNW23 NW26																											
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 (WS) - km/h**  
**Patricia McInnes - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Feb 5 22:00														Hours in Service: 672 Hours of Data: 620 Hours of Missing Data: 52 Hours of Calibration: 0 Percent Operational Time: 92.3											
Minimum Value: 0 km/h on Feb 28 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> = 3 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-Feb	2	2	2	1	2	1	2	3	2	2	3	2	3	3	3	2	1	1	1	2	1	1	1	3	3
2-Feb	1	1	1	1	1	1	1	1	2	2	2	3	4	4	5	5	5	5	5	5	4	3	4	5	
3-Feb	3	4	3	3	3	2	2	2	1	2	3	2	2	2	2	2	2	2	3	2	2	2	1	4	
4-Feb	2	2	1	1	2	1	1	2	2	2	2	2	2	2	1	3	1	1	1	2	2	1	2	1	3
5-Feb	1	1	1	1	1	1	1	2	2	2	2	1	1	3	2	2	2	2	1	4	3	10	5	5	10
6-Feb	4	4	3	3	2	2	3	2	2	2	2	2	1	2	2	2	2	3	2	3	3	2	2	2	4
7-Feb	3	3	2	3	3	9	5	4	5	4	4	6	5	7	7	7	5	3	3	3	3	3	2	2	9
8-Feb	2	2	2	2	4	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	4
9-Feb	1	1	1	1	3	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	1	2	3
10-Feb	1	1	1	1	2	2	2	2	2	2	2	3	3	2	2	3	3	2	2	2	2	1	1	1	3
11-Feb	1	1	1	1	1	1	1	1	1	3	3	2	3	4	3	7	4	3	3	4	5	3	3	3	7
12-Feb	2	3	3	3	2	2	3	3	2	2	3	2	2	1	2	1	2	2	3	3	3	4	3	2	4
13-Feb	2	3	4	3	4	6	4	3	3	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	6	
14-Feb	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
15-Feb	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	1	2	2	1	1	1	1	3	2	2	3
16-Feb	3	3	3	3	2	3	3	4	3	3	3	2	1	2	2	2	7	3	4	3	3	3	3	3	7
17-Feb	2	1	2	1	1	1	1	1	2	2	1	1	1	2	2	2	2	2	2	2	2	2	3	2	3
18-Feb	1	1	2	1	1	2	2	2	2	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2
19-Feb	1	3	2	2	2	2	2	2	1	3	3	2	2	2	2	2	2	2	3	1	1	2	1	2	3
20-Feb	3	2	2	2	2	1	1	1	2	1	2	1	3	2	2	2	2	2	1	1	2	1	1	2	3
21-Feb	1	3	2	3	3	2	1	1	1	3	3	2	3	3	3	3	2	3	1	1	2	1	1	1	3
22-Feb	1	2	1	1	2	2	1	2	2	2	2	2	2	3	2	2	1	1	1	1	1	1	1	1	3
23-Feb	1	1	1	1	1	1	2	1	0	2	2	1	2	2	2	1	1	1	1	1	1	1	1	2	2
24-Feb	1	1	1	1	1	1	1	1	1	2	2	4	3	4	4	4	4	4	4	3	4	3	2	2	4
25-Feb	2	3	3	3	2	2	2	2	2	2	2	2	2	3	2	3	2	2	2	2	1	1	1	1	3
26-Feb	1	1	1	1	1	3	2	3	2	2	3	3	2	2	2	2	2	2	3	1	1	2	1	1	3
27-Feb	1	1	1	1	1	2	2	2	3	3	3	3	3	3	3	3	2	2	2	2	2	2	1	1	3
28-Feb	1	1	1	0	1	0	1	0	0	1	1	2	2	1	2	1	2	1	1	1	1	0	1	1	2
														Diurnal Maximum											
UO - Unstable Operation																									





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Patricia McInnes - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	164	26.45	26.45
6 - 11	303	48.87	75.32
12 - 19	134	21.61	96.94
20 - 28	16	2.58	99.52
29 - 38	3	0.48	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 620

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Patricia McInnes - February 2023**

<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	12	9	4	5	10	15	24	8	17	6	7	10	12	6	7	164
6 - 11	49	17	13	6	2	16	33	13	20	19	18	11	5	6	8	67	303
12 - 19	21	0	0	0	0	5	19	2	9	1	9	15	16	0	2	35	134
20 - 28	0	0	0	0	0	1	2	0	0	0	0	3	3	6	1	0	16
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	82	29	22	10	7	32	69	39	37	37	33	36	37	24	17	109	620

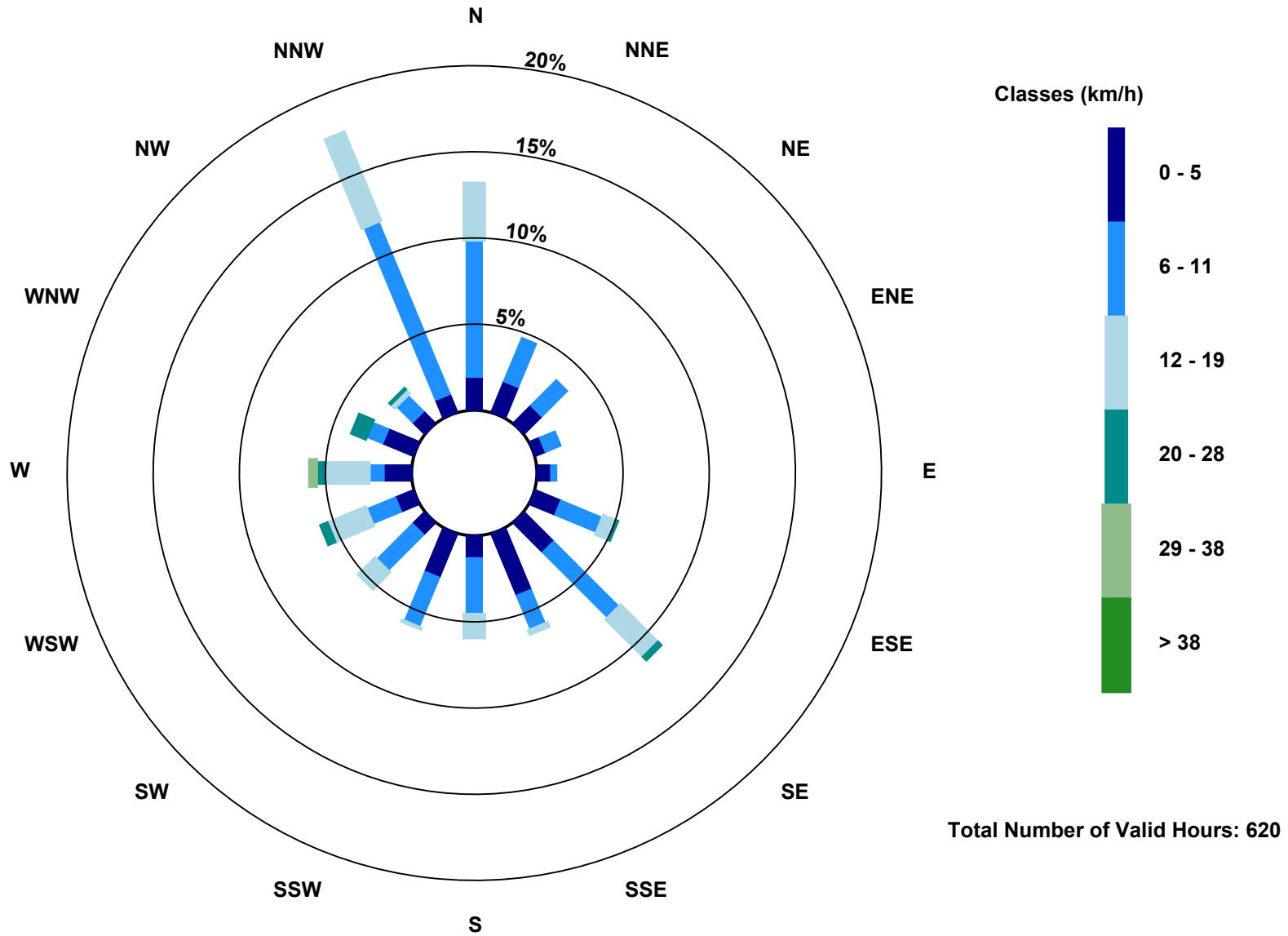
Total Number of Valid Hours: 620

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Patricia McInnes





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

**Wind Direction (WD) - deg**  
**Patricia McInnes - February 2023**

Direction of Maximum Speed: 270 deg on Feb 7 16:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 265.4 deg on Feb 7	Hours of Data: 620
Direction of Minimum Speed: 42 deg on Feb 23 12:00	Hours of Missing Data: 52
Direction of Minimum Daily Speed Average: 0.3 deg on Feb 23	Percent Operational Time: 92.3
Monthly Average Direction: 305.1 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-Feb	333	330	314	306	358	345	355	354	353	352	357	340	332	335	337	335	320	296	289	298	300	296	203	226	332.2	
2-Feb	210	193	177	162	176	157	151	136	144	131	134	127	120	120	120	124	128	136	138	139	137	137	136	131	134.9	
3-Feb	132	139	139	125	130	137	139	134	148	164	245	256	29	2	26	2	2	355	1	1	345	358	346	337	68.8	
4-Feb	343	355	348	356	3	344	346	343	350	352	349	347	360	345	347	5	341	21	9	347	0	338	348	346	351.7	
5-Feb	344	349	357	19	15	15	352	347	13	221	347	144	134	157	177	181	201	186	187	234	337	310	301	307	300.2	
6-Feb	303	281	267	258	264	278	296	271	258	264	310	56	82	88	121	117	127	131	122	127	138	147	163	183	223.7	
7-Feb	200	229	222	247	233	287	296	273	272	268	252	258	267	279	277	270	274	270	251	263	267	253	186	273	265.4	
8-Feb	335	333	333	333	324	251	266	266	264	209	163	149	156	129	125	123	146	154	164	190	199	172	182	183	213.4	
9-Feb	176	182	206	223	227	224	218	157	164	115	130	129	186	202	189	115	117	155	150	109	166	182	137	134	174.3	
10-Feb	133	149	352	50	359	1	355	352	353	350	355	358	347	348	346	347	345	340	339	338	334	340	352	39	350.2	
11-Feb	30	17	136	165	168	188	198	213	237	211	223	205	222	224	218	243	243	245	271	292	292	267	253	245	244.4	
12-Feb	246	245	260	271	240	241	264	260	203	249	248	226	182	186	156	103	122	128	120	127	123	122	127	145	203.1	
13-Feb	160	188	219	232	240	257	255	261	278	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
14-Feb	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-Feb	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	137	116	74	95	108	239	219	126	129	130	130	--
16-Feb	132	134	132	133	128	127	129	135	143	138	142	150	160	167	194	239	292	311	329	346	4	360	350	353	98.9	
17-Feb	356	344	344	331	336	327	4	352	351	357	6	18	21	8	359	2	353	346	339	346	350	353	353	349	352.0	
18-Feb	340	339	346	347	346	348	354	355	2	340	12	4	354	345	357	12	27	38	212	283	284	237	205	193	350.7	
19-Feb	154	140	141	140	136	132	129	118	127	119	113	39	26	41	17	7	1	347	347	338	336	334	333	336	42.8	
20-Feb	339	345	341	336	326	325	289	304	105	109	76	85	36	38	28	35	33	13	346	347	347	339	339	333	354.4	
21-Feb	336	342	354	349	339	350	325	310	309	336	343	345	342	352	6	2	347	340	334	349	351	259	246	247	339.0	
22-Feb	241	230	213	191	217	208	207	202	209	185	181	187	348	12	32	12	9	279	287	251	287	268	265	265	247.7	
23-Feb	286	258	357	316	343	341	351	153	152	31	43	42	44	53	76	78	86	121	204	224	215	206	204	206	65.9	
24-Feb	209	188	187	203	182	163	165	175	168	150	131	190	199	189	178	164	165	182	183	183	189	186	189	200	181.1	
25-Feb	215	219	224	226	223	220	221	233	278	255	249	239	233	228	229	213	211	207	206	201	151	157	137	103	222.8	
26-Feb	105	129	98	130	113	129	125	111	110	115	113	105	79	62	73	73	68	62	52	39	39	52	30	20	82.1	
27-Feb	22	15	11	351	343	332	330	332	333	343	358	344	342	344	345	352	6	2	347	352	356	348	346	331	348.0	
28-Feb	337	337	330	304	292	315	303	290	7	6	347	22	37	41	44	42	45	29	284	275	276	281	101	164	350.9	
298.6 275.3 281.1 271.3 262.8 282.1 290.7 284.6 291.5 314.8 327.3 314.7 341.6 345.4 8.0 12.1 2.4 336.0 307.3 308.1 324.2 312.1 297.2 284.1																										
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**

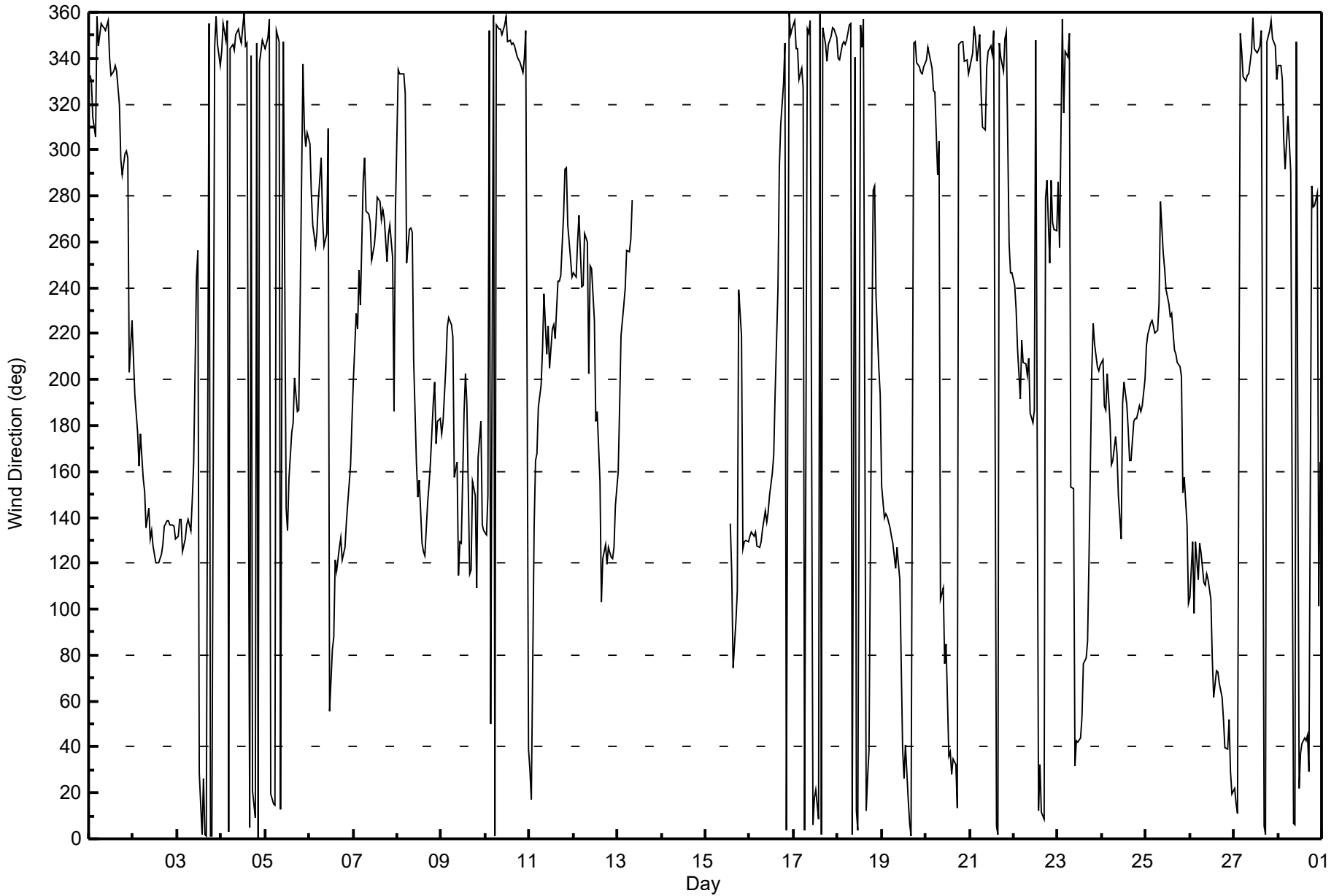
**Wind Direction (WD) - deg**  
**Patricia McInnes - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 101 deg on Feb 23 12:00 Minimum Value: 5 deg on Feb 8 23:00 Percentiles: P <sub>1</sub> = 6 P <sub>10</sub> = 10 Q <sub>1</sub> = 12 Median = 15 Q <sub>3</sub> = 20 P <sub>90</sub> = 32 P <sub>99</sub> = 72														Hours in Service: 672 Hours of Data: 620 Hours of Missing Data: 52 Hours of Calibration: 0 Percent Operational Time: 92.3												
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-Feb	8	8	20	31	25	11	14	15	15	14	17	15	16	13	13	11	14	8	10	7	12	30	24	34	34	
2-Feb	15	12	24	15	12	22	28	21	26	14	13	15	12	12	13	13	14	14	14	13	13	13	12	13	28	
3-Feb	13	13	13	12	15	14	26	24	28	62	20	36	10	29	19	17	14	14	13	16	13	13	16	81	81	
4-Feb	52	15	10	13	12	10	8	8	12	12	13	13	18	14	15	31	47	14	12	15	17	10	15	13	52	
5-Feb	11	15	19	32	48	15	25	39	25	65	60	32	19	29	48	21	19	15	13	20	68	56	11	10	68	
6-Feb	13	11	12	10	11	9	9	24	9	14	24	38	9	17	19	17	15	15	13	14	17	14	20	16	38	
7-Feb	24	15	24	20	15	19	12	16	18	13	13	15	13	13	13	11	11	10	9	12	15	45	45	40	45	
8-Feb	9	8	7	6	56	24	19	34	25	27	20	18	26	20	15	16	11	22	23	23	21	11	5	6	56	
9-Feb	11	7	20	7	31	10	11	33	11	17	14	20	17	14	16	15	12	12	37	17	40	9	41	55	55	
10-Feb	45	20	61	73	20	14	14	12	14	12	14	13	12	11	12	13	10	11	11	12	13	16	23	14	73	
11-Feb	19	39	61	28	18	12	17	13	22	29	14	15	17	13	13	15	10	11	12	11	10	13	10	9	61	
12-Feb	9	11	14	11	9	9	16	62	27	13	18	20	12	15	25	8	9	11	12	12	12	12	12	13	62	
13-Feb	14	22	15	12	13	10	10	11	16	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	22	
14-Feb	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-Feb	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	45	52	25	18	18	54	69	12	12	12	12	69
16-Feb	12	13	13	14	13	14	13	14	14	14	17	16	16	13	16	78	31	24	16	14	13	16	14	15	78	
17-Feb	20	15	14	10	11	14	18	20	20	20	16	14	22	18	17	14	15	11	8	10	12	13	13	11	22	
18-Feb	8	8	12	11	12	16	15	15	14	14	17	19	21	20	21	21	24	18	61	31	24	26	35	15	61	
19-Feb	18	16	16	14	15	14	16	18	23	18	20	29	19	50	39	21	17	11	12	10	7	9	8	9	50	
20-Feb	10	11	11	13	9	17	22	29	71	22	27	71	74	17	56	15	13	16	10	10	10	8	10	9	74	
21-Feb	8	12	13	17	12	15	11	9	9	11	15	18	17	21	16	16	13	9	8	12	19	11	6	5	21	
22-Feb	11	16	21	23	17	29	13	19	33	66	15	63	63	37	23	21	20	33	33	11	20	15	29	24	66	
23-Feb	20	43	55	59	19	7	30	26	18	54	59	101	20	39	89	20	22	25	18	7	10	9	7	10	101	
24-Feb	10	8	6	14	10	6	10	14	13	14	20	30	17	15	15	12	12	17	13	12	13	11	13	12	30	
25-Feb	12	11	11	16	13	14	10	13	22	14	19	15	16	23	23	20	18	21	14	12	31	27	15	11	31	
26-Feb	9	12	11	27	19	18	14	16	16	16	14	14	16	16	14	17	14	14	13	13	12	15	16	15	27	
27-Feb	11	10	11	14	12	8	8	8	9	12	16	16	13	14	13	16	19	14	12	15	16	13	10	10	19	
28-Feb	13	11	7	12	19	13	22	14	29	14	17	31	19	14	20	23	30	65	15	6	16	8	73	39	73	
Diurnal Maximum																										
UO - Unstable Operation																										



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

**Wind Direction (WD) - deg**  
**Patricia McInnes - February 2023**





## **WOOD BUFFALO ENVIRONMENTAL ASSOCIATION**

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS07 ATHABASCA VALLEY FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS07)  
FEBRUARY 2023

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	639	32	33	99.85	24.4	0	6.7	0
TRS (ppb) Average	636	35	36	99.85	2.4	0	1	0
THC (ppm) Average	639	32	33	99.85	2.8	-	2.5	-
NMHC (ppm) Average	639	32	33	99.85	0.471	-	0.087	-
CH4(ppm) Average	639	32	33	99.85	2.7	-	2.5	-
O3 (ppb) Average	639	33	33	100	45.5	0	34.6	-
NO2 (ppb) Average	638	33	34	99.85	40.5	0	24.7	-
NO (ppb) Average	638	33	34	99.85	93.5	-	17.6	-
NOX (ppb) Average	638	33	34	99.85	126.3	-	42.4	-
PM2.5 (ug/m3) Average	670	2	2	100	64.5	0	12.1	0
CO(ppm) Average	641	31	31	100	1	0	0.3	-
Temperature 2 m (C) Average	672	0	0	100	5.3	-	0	-
Relative Humidity (%) Average	672	0	0	100	92.6	-	83.9	-
Barometric Pressure (inHg) Average	672	0	0	100	29.9	-	29.8	-
Wind Speed 10 m (km/h) Average	672	0	0	100	34	-	18	-
Wind Direction 10 m (deg) Average	672	0	0	100	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS07)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	639	1.81	3.1	-	0	0.1	0.3	0.6	1.8	4.7	24.4
TRS (ppb) Average	636	0.39	0.3	-	0.1	0.1	0.2	0.3	0.5	0.8	2.4
THC (ppm) Average	639	2.15	0.1	-	2	2	2.1	2.1	2.2	2.4	2.8
NMHC (ppm) Average	639	0.01	0.047	-	0	0	0	0	0	0	0.471
CH4(ppm) Average	639	2.14	0.1	-	2	2	2.1	2.1	2.2	2.3	2.7
O3 (ppb) Average	639	19.58	10.2	-	0.9	5.2	11.1	19.7	27.5	33.8	45.5
NO2 (ppb) Average	638	14.02	8.8	-	0.7	3.1	7.7	11.8	19.4	27	40.5
NO (ppb) Average	638	5.7	8.4	-	0	0.1	0.7	2.6	7	15.3	93.5
NOX (ppb) Average	638	19.72	15.2	-	0.8	4	9.4	16	26.2	40.4	126.3
PM2.5 (ug/m3) Average	670	5.83	4.5	-	0.8	2.3	3.4	4.8	7.2	10	64.5
CO(ppm) Average	641	0.18	0.1	-	0.1	0.1	0.1	0.2	0.2	0.2	1
Temperature 2 m (C) Average	672	-14.91	9.5	-	-36.2	-28.5	-21.6	-14.6	-7.9	-3.6	5.3
Relative Humidity (%) Average	672	69.17	10.4	-	37.8	54	65.3	70.6	75.4	81.2	92.6
Barometric Pressure (inHg) Average	672	28.96	0.4	-	28.1	28.5	28.7	28.9	29.2	29.5	29.9
Wind Speed 10 m (km/h) Average	672	8.1	6	-	0	2	4	7	11	15	34
Wind Direction 10 m (deg) Average	672	-	-	-	-	-	-	-	-	-	-



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS07)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2, SO2, THC/NMHC/CH4/TRS	08 Feb 2023 12:00	08 Feb 2023 12:00	1	Maintenance - sample manifold cleaned



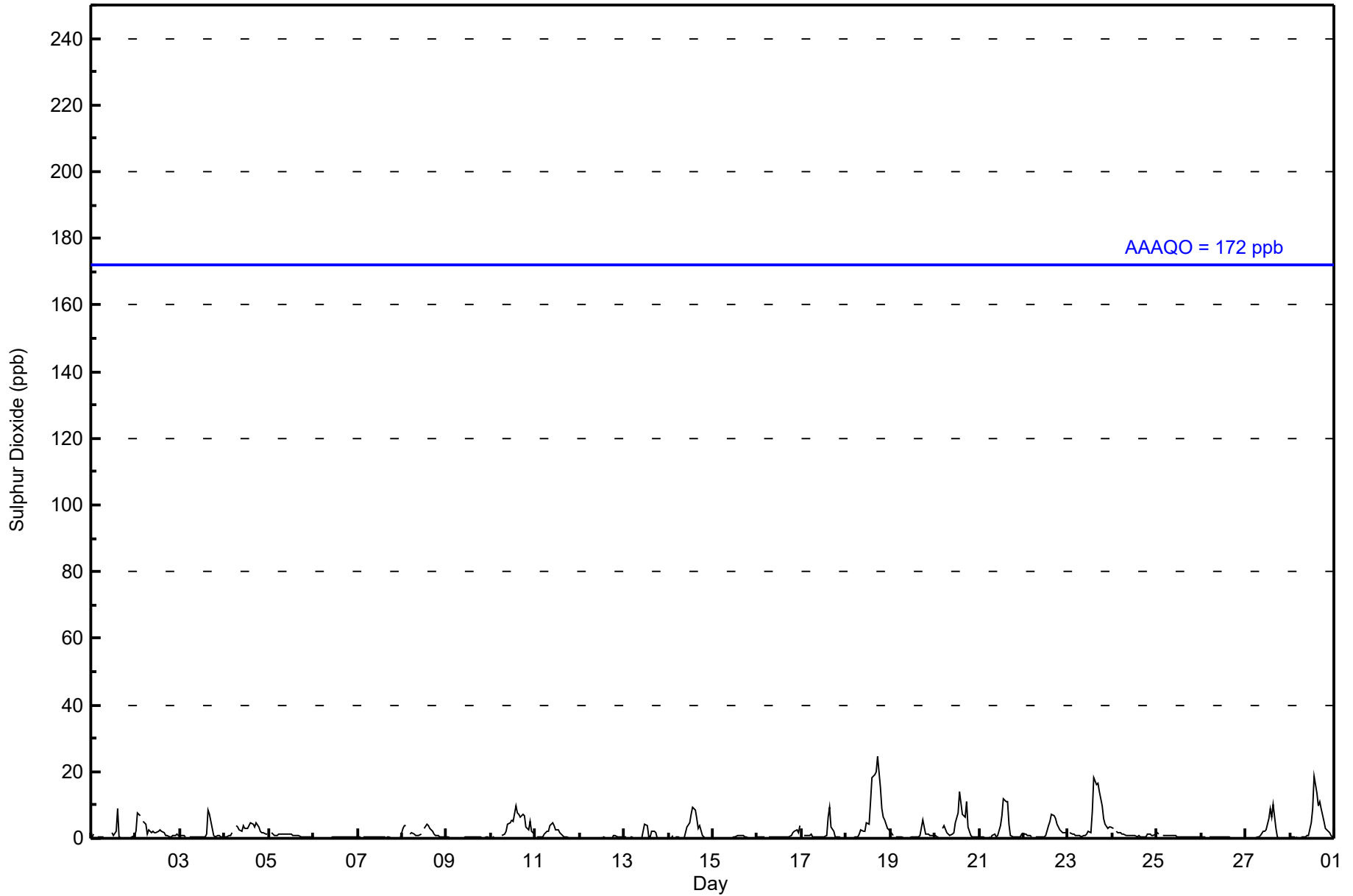
# Wood Buffalo Environmental Association

## Summary of Hour Averages

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

## Athabasca Valley - February 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 672																	672						
Maximum Value: 24.4 ppb on Feb 18 18:00		Maximum Daily Average: 6.7 ppb on Feb 18																	Hours of Data: 639								
Minimum Value: 0.0 ppb on Feb 1 19:00		Minimum Daily Average: 0.2 ppb on Feb 12																	Hours of Missing Data: 33								
Maximum Diurnal Average: 4.8 ppb at hour 15		Minimum Diurnal Average: 0.5 ppb at hour 4																	Hours of Calibration: 32								
Monthly Average: 1.81 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.3 Median = 0.6 Q <sub>3</sub> = 1.8 P <sub>90</sub> = 4.7 P <sub>99</sub> = 16.3																	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-Feb	0.4	1.3	Z	0.6	0.5	0.5	0.2	C	C	C	C	1.6	1.0	1.9	9.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.9	1.0	9.1	
2-Feb	2.0	7.5	6.8	Z	5.1	4.3	1.1	2.6	1.8	2.1	1.7	1.7	2.2	2.7	2.3	1.6	1.0	0.7	0.6	0.6	0.7	0.9	1.2	1.0	2.3	7.5	
3-Feb	0.8	0.7	0.7	0.6	Z	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	1.3	8.5	7.3	2.9	0.8	0.6	0.6	0.7	0.6	0.6	1.3	8.5	
4-Feb	0.6	0.5	0.9	1.0	1.6	Z	3.7	3.5	2.6	2.2	3.8	3.1	2.8	3.7	4.6	4.3	3.5	4.5	3.4	2.2	1.5	1.9	1.3	1.3	2.5	4.6	
5-Feb	Z	1.5	1.3	1.0	1.0	1.2	1.2	1.1	1.1	1.1	1.2	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.6	0.5	0.4	0.3	0.9	1.5	1.5	
6-Feb	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.5	0.5	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.5	0.3	0.5	
7-Feb	0.5	0.5	Z	0.5	0.5	0.5	0.6	0.4	0.4	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.6	
8-Feb	3.1	4.0	3.6	Z	1.4	1.5	1.4	1.0	0.9	1.0	1.3	M	3.2	4.1	3.8	2.9	2.1	1.5	1.0	0.8	0.6	0.5	0.4	0.3	1.8	4.1	
9-Feb	0.3	0.2	0.2	0.2	Z	0.2	0.2	0.1	0.1	0.2	0.2	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	0.3	
10-Feb	0.2	0.2	0.2	0.2	0.2	Z	1.0	1.3	2.1	4.3	4.5	5.3	4.9	9.6	7.6	7.2	6.5	7.2	6.6	3.6	2.7	5.1	2.0	1.1	3.6	9.6	
11-Feb	Z	0.6	0.5	0.5	0.6	1.2	1.9	2.2	3.9	4.7	3.8	2.7	2.7	1.9	1.4	0.5	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	1.3	4.7	
12-Feb	0.1	Z	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	0.8	0.7	0.4	0.3	0.3	0.4	0.2	0.8
13-Feb	0.5	0.4	Z	0.3	0.2	0.2	0.1	0.1	0.1	0.2	2.2	4.2	3.9	0.6	0.3	2.3	2.2	1.7	0.1	0.1	0.0	0.0	0.0	0.0	0.9	4.2	
14-Feb	0.0	0.2	0.8	Z	0.6	0.2	0.1	0.0	0.1	1.7	3.5	4.8	7.3	9.2	8.5	5.8	2.9	4.0	0.9	0.5	0.2	0.1	0.1	0.1	2.2	9.2	
15-Feb	0.1	0.1	0.0	0.0	Z	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.6	0.8	0.6	0.7	0.7	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.8	
16-Feb	0.3	0.3	0.4	0.4	0.4	Z	0.4	0.3	0.4	0.4	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	1.0	1.6	2.0	2.7	1.8	3.8	0.9	3.8	
17-Feb	Z	1.1	0.8	0.7	0.7	1.2	0.6	0.6	0.5	0.4	0.4	0.4	0.5	0.8	6.2	9.2	3.2	2.1	0.5	0.5	0.3	0.2	0.1	0.1	1.4	9.2	
18-Feb	0.4	Z	0.2	0.1	0.1	0.3	0.6	1.5	2.7	2.3	2.0	4.5	4.2	11.2	18.4	19.1	19.9	24.4	15.4	8.9	6.2	5.6	3.2	2.6	6.7	24.4	
19-Feb	2.0	0.9	Z	0.6	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.4	0.6	0.5	0.5	0.7	5.4	3.3	1.3	1.1	0.9	0.9	0.9	1.0	5.4	
20-Feb	0.8	0.4	0.4	Z	3.0	4.0	1.9	1.4	1.0	1.3	1.9	4.6	7.7	13.8	10.6	7.2	6.3	10.9	3.4	0.8	0.4	0.3	0.3	0.2	3.6	13.8	
21-Feb	0.3	0.2	0.2	0.1	Z	0.2	0.2	0.7	1.2	0.6	0.8	3.9	7.0	12.0	11.0	10.9	4.3	1.0	0.4	0.3	0.3	0.3	0.5	1.3	2.5	12.0	
22-Feb	1.4	1.2	0.9	0.7	0.5	Z	0.3	0.3	0.4	0.5	0.4	0.5	0.9	3.9	5.2	7.2	6.7	5.8	4.2	2.3	2.3	1.8	1.9	1.5	2.2	7.2	
23-Feb	Z	1.5	1.4	1.2	1.0	0.9	0.7	0.6	0.7	0.9	1.3	2.0	1.9	8.2	18.2	15.9	16.5	14.0	9.7	5.7	4.2	3.1	3.4	3.2	5.1	18.2	
24-Feb	2.9	Z	2.1	1.8	1.6	1.4	1.3	1.0	0.9	0.9	0.9	1.0	0.7	0.6	0.9	0.6	0.4	0.4	0.6	1.1	1.2	0.8	0.7	1.4	1.1	2.9	
25-Feb	1.7	1.3	Z	0.9	0.8	0.8	0.7	0.7	0.7	0.8	0.7	0.5	0.5	0.4	0.4	0.3	0.4	0.3	0.4	0.5	0.5	0.4	0.4	0.2	0.6	1.7	
26-Feb	0.2	0.2	0.2	Z	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.6	0.6	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.6	
27-Feb	0.1	0.1	0.1	0.1	Z	0.2	0.4	0.4	0.7	2.1	2.1	2.4	6.1	8.7	6.4	10.0	3.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1	1.9	10.0	
28-Feb	0.3	0.3	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.7	0.6	4.6	9.0	18.5	13.4	9.9	11.1	8.9	5.0	3.1	2.6	1.6	1.0	0.6	4.0	18.5	
0.8 1.1 1.0 0.5 0.9 0.9 0.7 0.8 0.9 1.1 1.3 1.9 2.6 4.2 4.8 4.6 3.6 3.5 2.1 1.3 1.1 1.0 0.8 0.8																								Diurnal Average			
3.1 7.5 6.8 1.8 5.1 4.3 3.7 3.5 3.9 4.7 4.5 5.3 9.0 18.5 18.4 19.1 19.9 24.4 15.4 8.9 6.2 5.6 3.4 3.8																								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**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Athabasca Valley - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	620	97.03	97.03
11 - 20	18	2.82	99.84
21 - 60	1	0.16	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: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Athabasca Valley - February 2023**

<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	92	13	7	9	13	12	116	50	17	23	24	38	28	22	26	130	620
11 - 20	2	0	0	0	0	0	0	0	0	0	0	0	3	1	6	6	18
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
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>	94	13	7	9	13	12	116	50	17	23	24	38	31	23	32	137	639

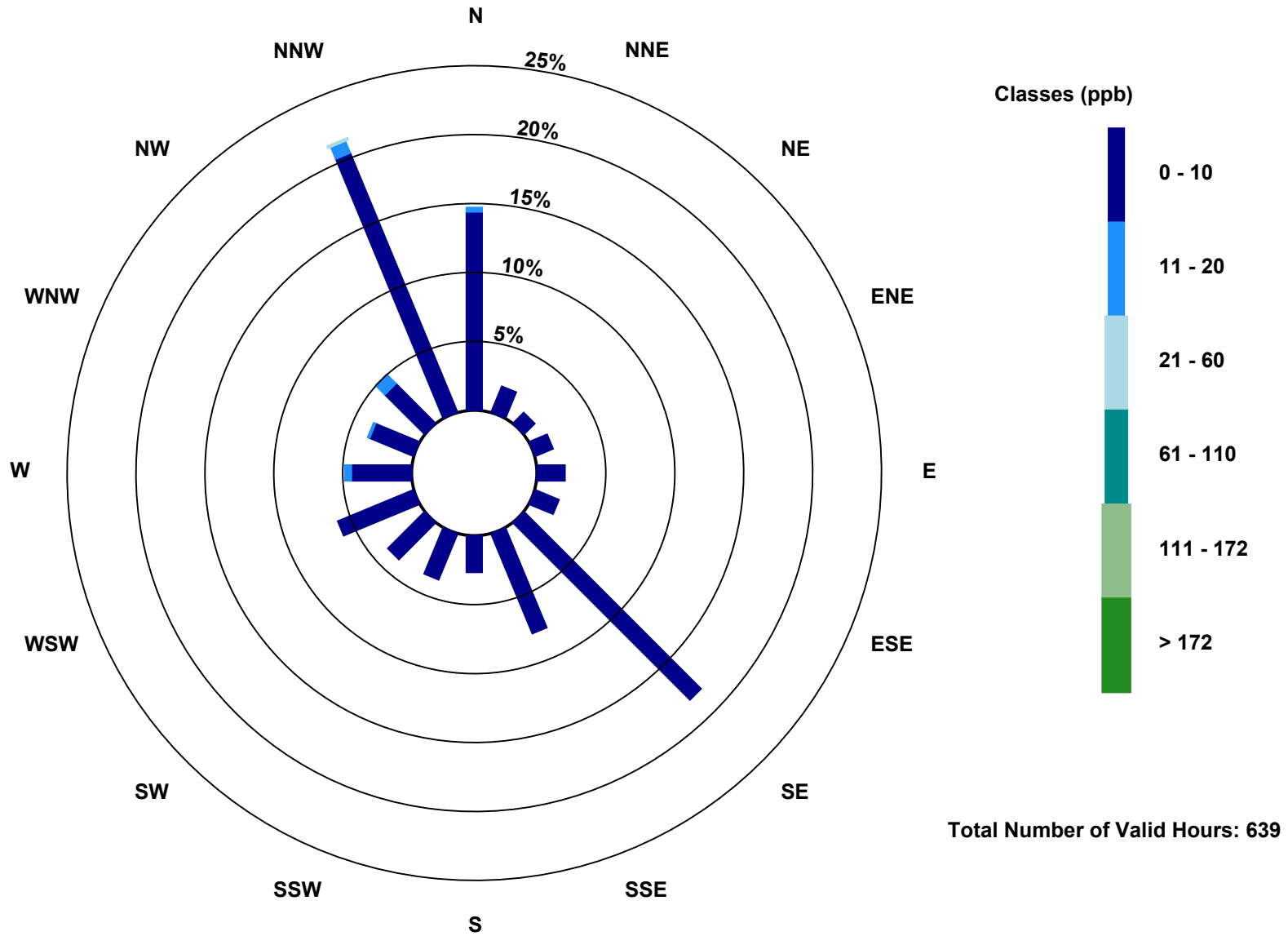
Total Number of Valid Hours: 639

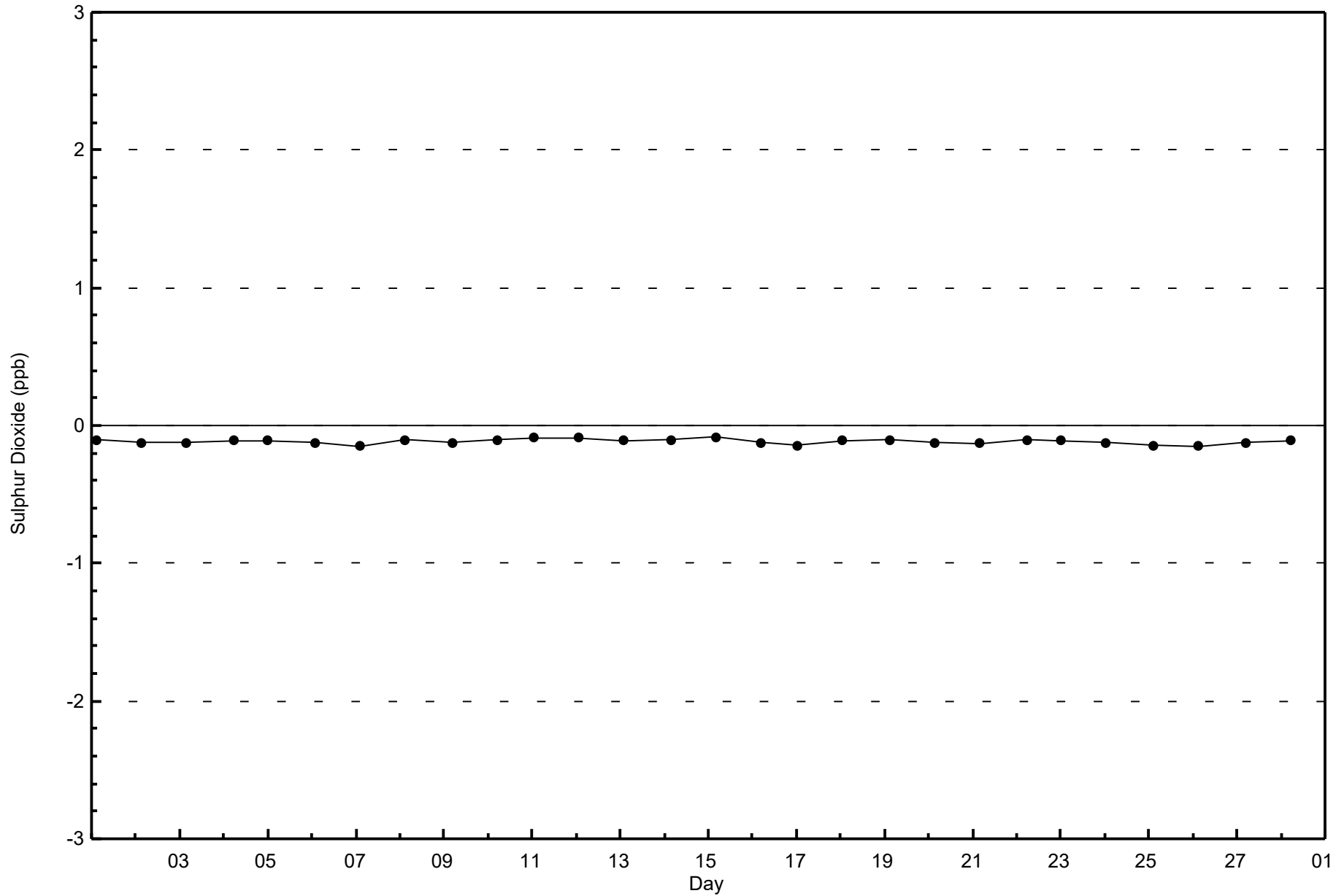
Total Number of Hours: 672

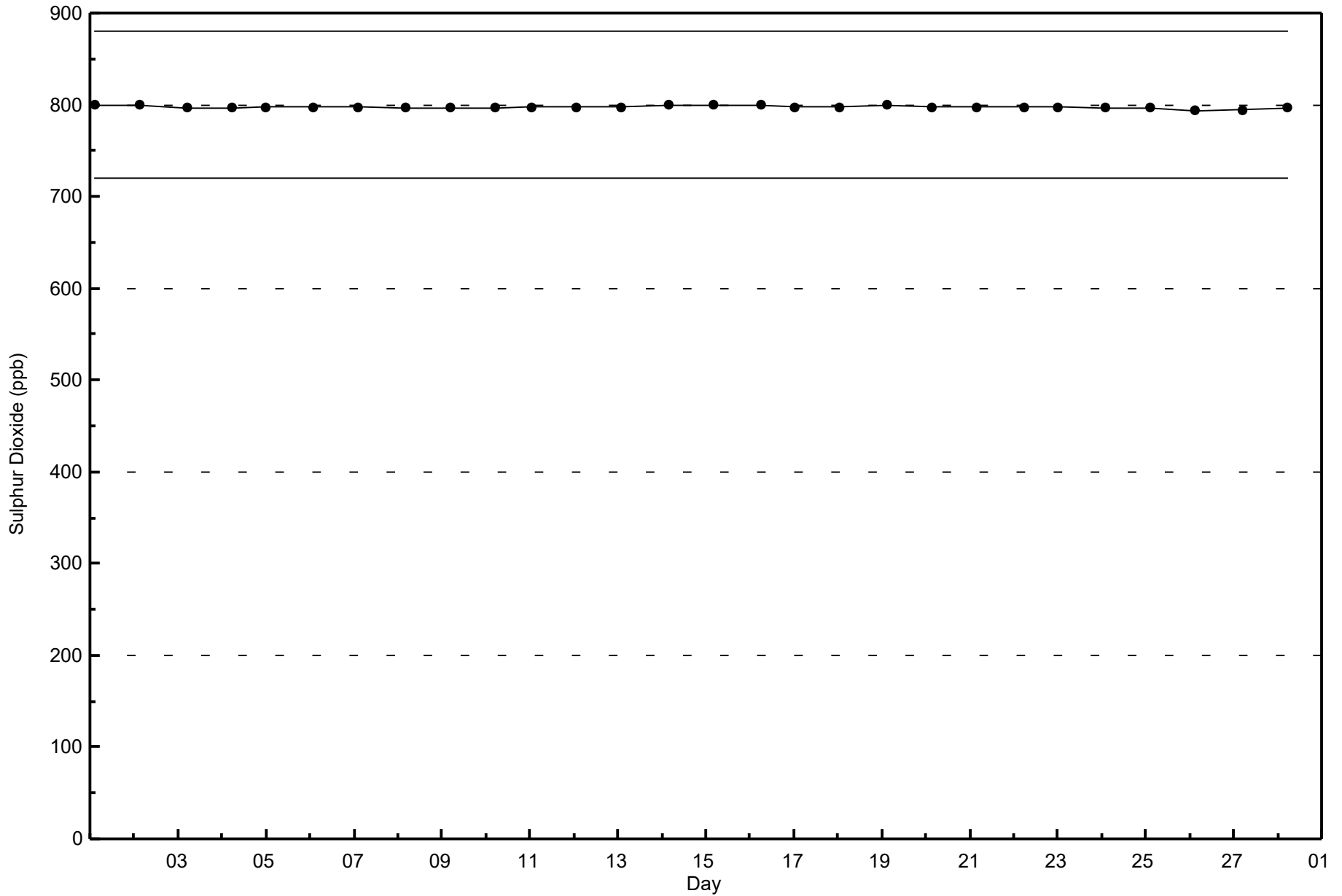


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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











# Wood Buffalo Environmental Association

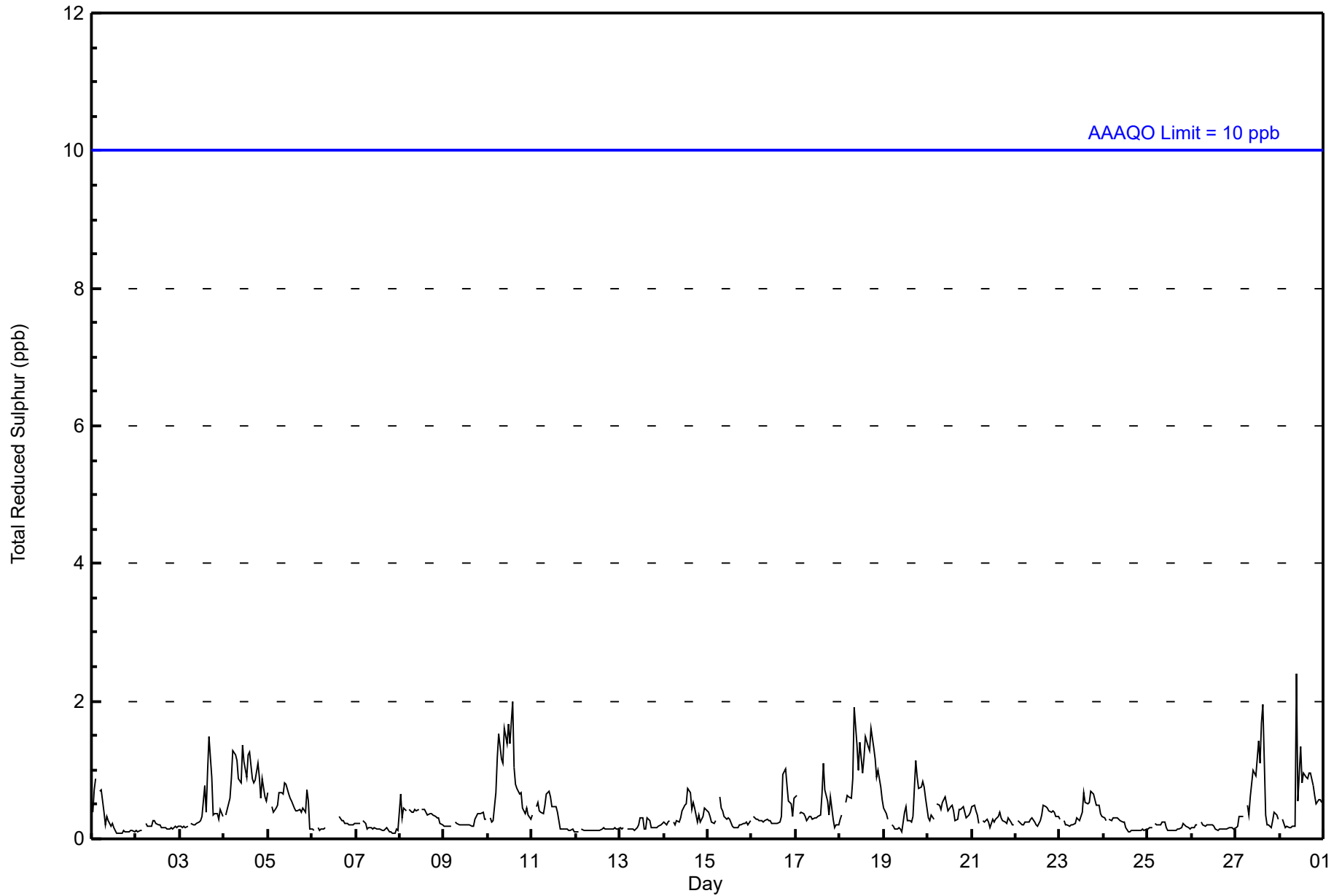
## Summary of Hour Averages

# Total Reduced Sulphur (TRS) - ppb

## Athabasca Valley - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																			
Maximum Value: 2.4 ppb on Feb 28 10:00		Maximum Daily Average: 1.0 ppb on Feb 18		Hours of Data:		636		Hours of Missing Data:		36																	
Minimum Value: 0.1 ppb on Feb 1 16:00		Minimum Daily Average: 0.1 ppb on Feb 12		Hours of Calibration:		35		Percent Operational Time:		99.9																	
Maximum Diurnal Average: 0.5 ppb at hour 10		Minimum Diurnal Average: 0.3 ppb at hour 2		Monthly Average: 0.39 ppb		Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.2 Median = 0.3 Q <sub>3</sub> = 0.5 P <sub>90</sub> = 0.8 P <sub>99</sub> = 1.6																					
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-Feb	0.4	0.7	0.9	Z	0.7	0.7	0.4	0.2	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	0.1	0.1	0.3	0.9	
2-Feb	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.3	0.3	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	0.2	0.2	0.3
3-Feb	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.8	0.4	1.0	1.5	0.9	0.4	0.4	0.4	0.3	0.4	0.3	0.4	1.5	
4-Feb	Z	0.4	0.5	0.6	0.9	1.3	1.2	1.1	0.9	0.8	1.4	1.1	0.9	1.2	1.3	0.9	0.8	0.8	1.1	0.9	0.6	0.9	0.6	0.6	0.9	1.4	
5-Feb	0.7	Z	0.5	0.4	0.4	0.5	0.7	0.7	0.6	0.8	0.8	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.7	0.5	0.1	0.5	0.8	
6-Feb	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.2	C	C	C	C	C	C	C	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	--	0.3	
7-Feb	0.2	0.2	0.2	Z	0.3	0.2	0.1	0.2	0.2	0.1	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	0.1	0.2	0.3	
8-Feb	0.6	0.3	0.5	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	M	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.4	0.6	
9-Feb	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	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.4	
10-Feb	Z	0.3	0.2	0.3	0.7	1.2	1.5	1.2	1.1	1.6	1.4	1.7	1.4	2.0	1.0	0.8	0.7	0.7	0.7	0.4	0.4	0.4	0.3	0.3	0.9	2.0	
11-Feb	0.3	Z	0.5	0.5	0.4	0.4	0.4	0.5	0.7	0.7	0.6	0.5	0.5	0.5	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.7	
12-Feb	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	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	
13-Feb	0.2	0.1	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	
14-Feb	0.2	0.2	0.2	0.3	Z	0.2	0.2	0.3	0.2	0.3	0.4	0.5	0.5	0.7	0.7	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.7	
15-Feb	0.4	0.3	0.2	0.2	0.3	Z	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.6	
16-Feb	Z	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.9	1.0	0.8	0.5	0.5	0.3	0.6	0.4	1.0	
17-Feb	0.6	Z	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.6	1.1	0.7	0.5	0.3	0.6	0.3	0.2	0.2	0.2	0.4	1.1	
18-Feb	0.3	0.4	Z	0.5	0.6	0.6	0.6	0.9	1.9	1.4	1.0	1.4	1.0	1.2	1.5	1.3	1.3	1.6	1.3	1.2	0.9	1.0	0.8	0.6	1.0	1.9	
19-Feb	0.5	0.4	0.3	Z	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.4	0.5	0.3	0.3	0.3	0.3	1.1	0.9	0.7	0.7	0.8	0.8	0.6	0.4	1.1	
20-Feb	0.3	0.3	0.3	0.3	Z	0.5	0.5	0.4	0.5	0.6	0.5	0.4	0.5	0.5	0.4	0.3	0.3	0.4	0.4	0.5	0.4	0.3	0.3	0.4	0.4	0.6	
21-Feb	0.5	0.5	0.4	0.3	0.2	Z	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.5	
22-Feb	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.5	
23-Feb	0.3	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.7	0.5	0.5	0.5	0.7	0.6	0.6	0.5	0.5	0.4	0.3	0.4	0.7	
24-Feb	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	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	0.1	0.1	0.2	0.3	
25-Feb	0.1	0.2	0.2	Z	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
26-Feb	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	
27-Feb	0.2	0.2	0.3	0.3	0.3	Z	0.5	0.3	0.6	1.0	0.9	0.9	1.4	1.1	1.7	2.0	0.4	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.6	2.0	
28-Feb	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.4	0.5	1.4	0.8	1.0	0.9	0.9	1.0	1.0	0.8	0.6	0.5	0.6	0.6	0.5	0.6	2.4	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.3 0.3 0.3 0.3 0.3 0.4 0.4 0.4 0.4 0.5 0.4 0.5 0.4 0.5 0.5 0.5 0.4 0.5 0.4 0.4 0.3 0.4 0.3 0.3			
																								0.7 0.7 0.9 0.6 0.9 1.3 1.5 1.2 1.9 2.4 1.4 1.7 1.4 2.0 1.7 2.0 1.5 1.6 1.3 1.2 0.9 1.0 0.8 0.6			

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  
Athabasca Valley - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	636	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: 636

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Athabasca Valley - February 2023**

<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	95	12	7	9	15	11	116	50	16	22	24	35	29	23	31	141	636
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>	95	12	7	9	15	11	116	50	16	22	24	35	29	23	31	141	636

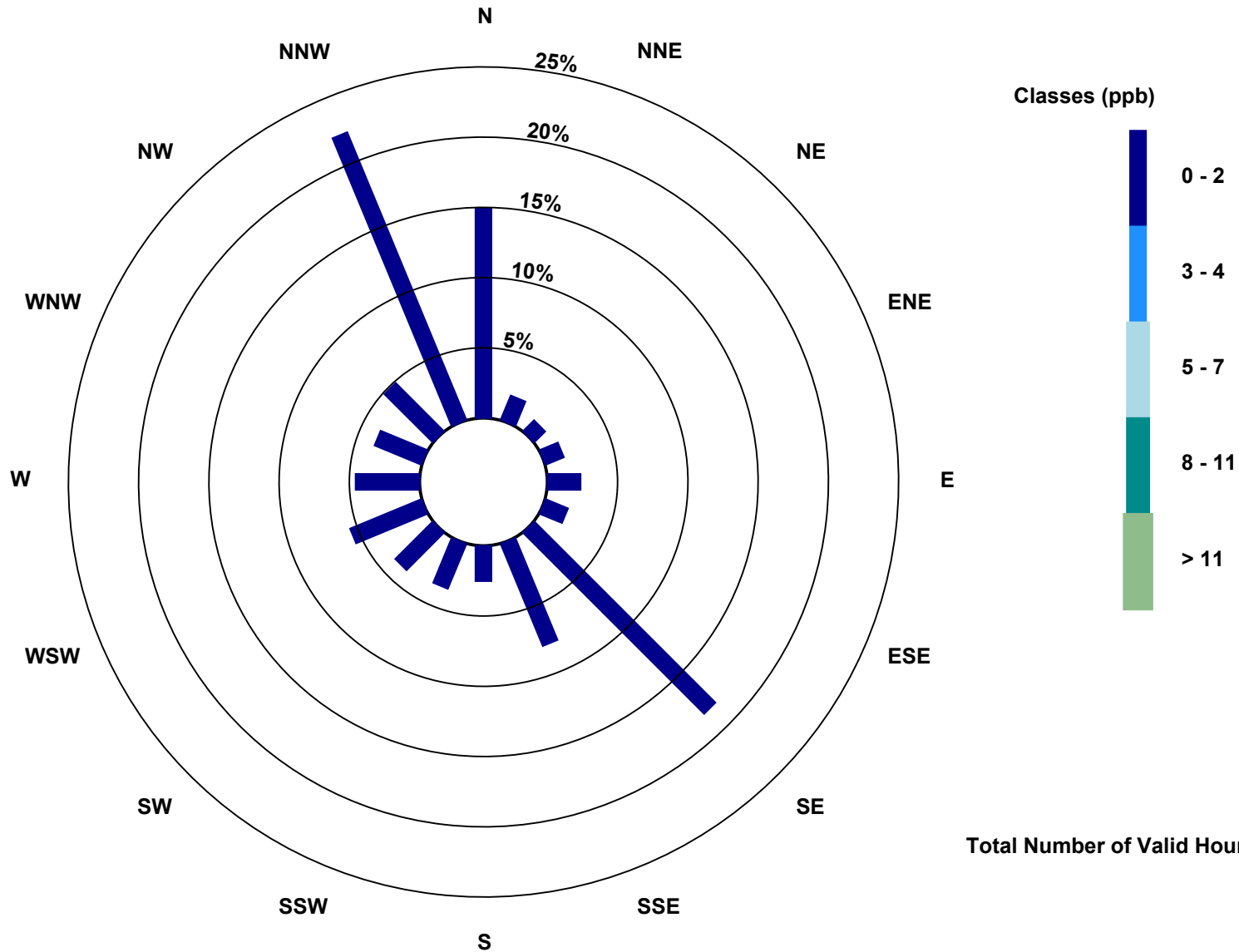
Total Number of Valid Hours: 636

Total Number of Hours: 672

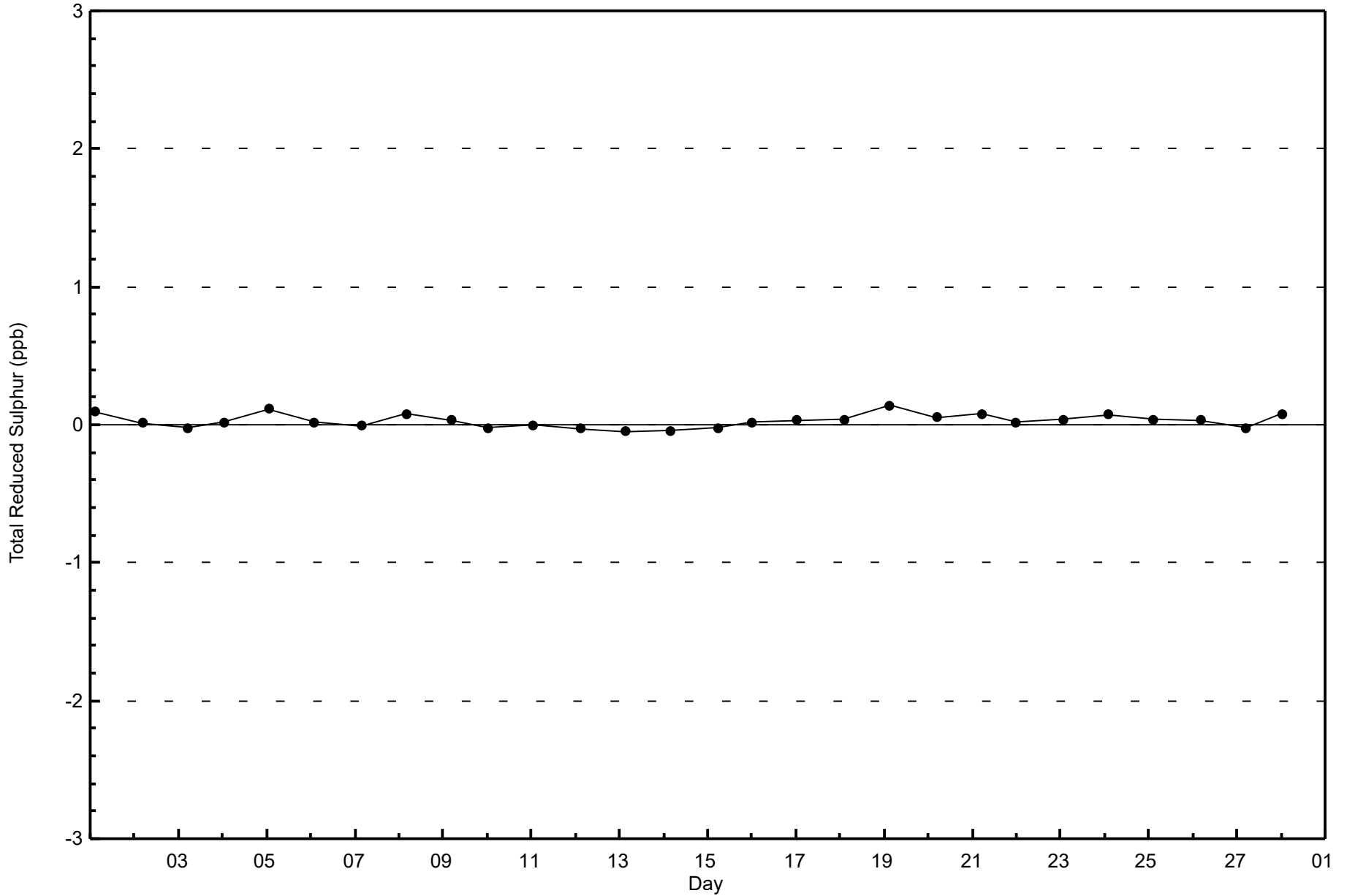


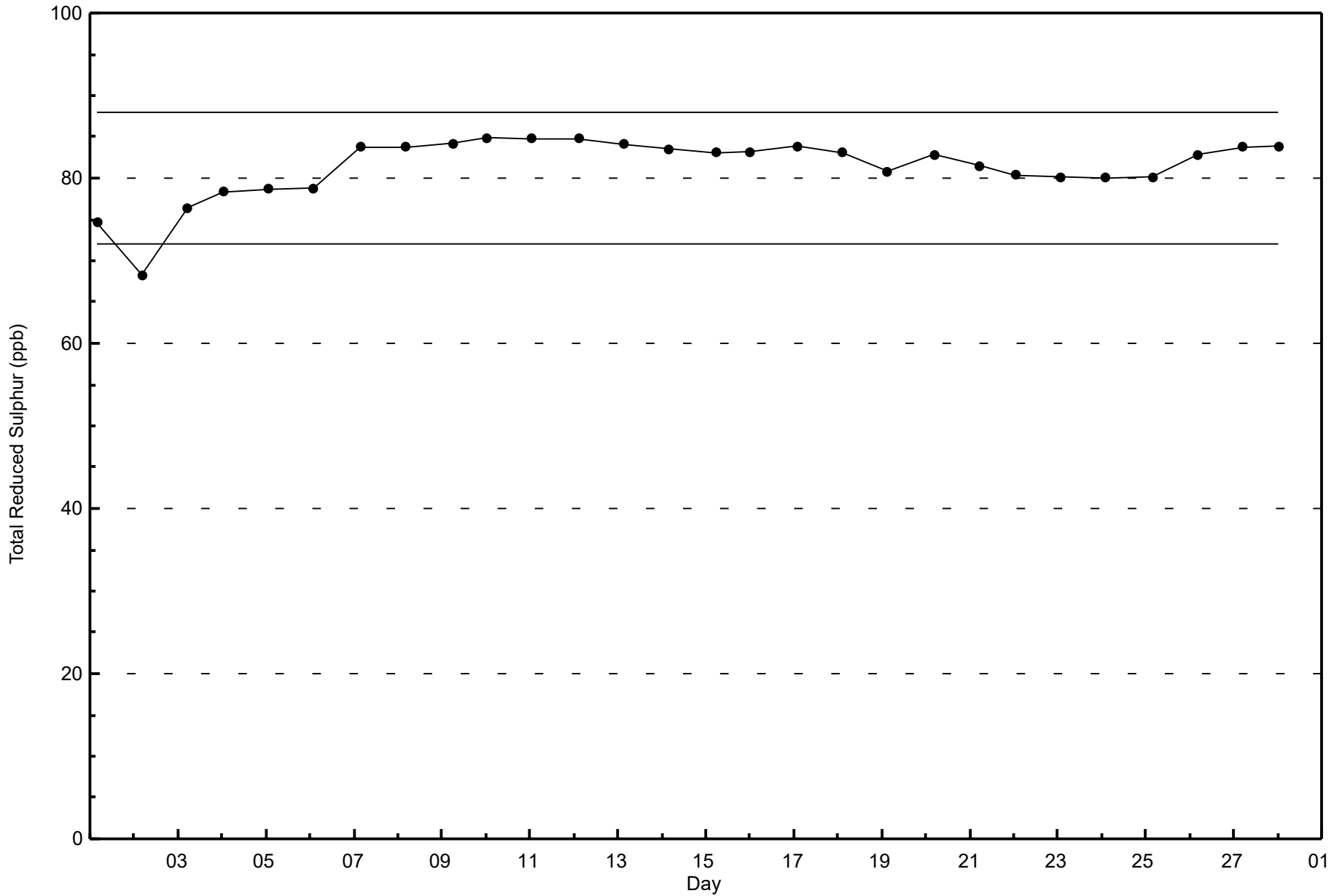
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Reduced Sulphur (TRS) - ppb  
Athabasca Valley



Total Number of Valid Hours: 636







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

**Total Hydrocarbons (THC) - ppm**  
**Athabasca Valley - February 2023**

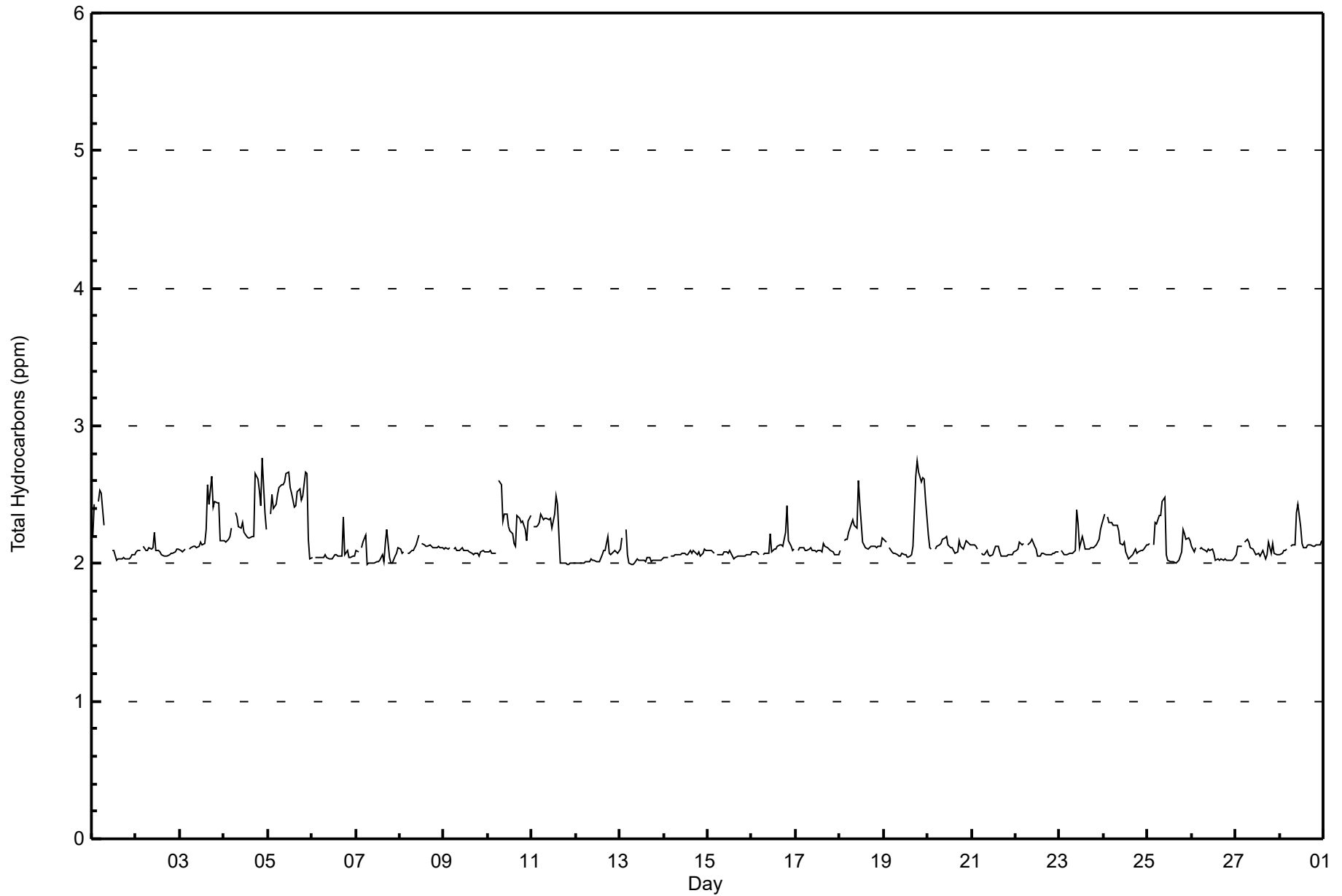
Maximum Value: 2.8 ppm on Feb 4 22:00		Maximum Daily Average: 2.5 ppm on Feb 5		Hours in Service: 672																						
Minimum Value: 2.0 ppm on Feb 13 07:00		Minimum Daily Average: 2.0 ppm on Feb 13		Hours of Data: 639																						
Maximum Diurnal Average: 2.2 ppm at hour 11		Minimum Diurnal Average: 2.1 ppm at hour 16		Hours of Missing Data: 33																						
Monthly Average: 2.15 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> = 2.4 P <sub>99</sub> = 2.7		Hours of Calibration: 32																						
				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-Feb	2.2	2.4	Z	2.4	2.5	2.5	2.3	C	C	C	C	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.5	
2-Feb	2.1	2.1	2.1	Z	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	
3-Feb	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	2.1	2.2	2.6	2.4	2.6	2.4	2.5	2.4	2.4	2.2	2.2	2.6	
4-Feb	2.2	2.2	2.2	2.2	2.3	Z	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.6	2.5	2.4	2.8	2.4	2.2	2.8	
5-Feb	Z	2.4	2.5	2.4	2.4	2.5	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.5	2.4	2.4	2.5	2.5	2.5	2.5	2.7	2.7	2.2	2.0	2.7	
6-Feb	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.3	2.1	2.1	2.0	2.0	2.1	2.1	2.3	
7-Feb	2.1	2.1	Z	2.1	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.2	2.0	2.0	2.0	2.0	2.1	2.1	2.2	
8-Feb	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	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	2.2	
9-Feb	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	
10-Feb	2.1	2.1	2.1	2.1	2.1	Z	2.6	2.6	2.3	2.4	2.4	2.3	2.2	2.2	2.1	2.1	2.4	2.3	2.3	2.3	2.2	2.2	2.3	2.4	2.6	
11-Feb	Z	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.4	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	
12-Feb	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	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	
13-Feb	2.1	2.2	Z	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	
14-Feb	2.0	2.0	2.0	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	
15-Feb	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	2.1	2.1	2.1	2.1	2.1	2.1	
16-Feb	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	2.2	2.4	2.2	2.1	2.1	2.1	2.4	
17-Feb	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	
18-Feb	2.1	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.6	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.6	
19-Feb	2.2	2.2	Z	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	2.6	2.7	2.7	2.6	2.6	2.6	2.5	2.7	
20-Feb	2.2	2.1	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	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.2	
21-Feb	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	
22-Feb	2.1	2.1	2.2	2.1	2.1	Z	2.1	2.1	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	2.2	
23-Feb	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.3	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.4	
24-Feb	2.4	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.1	2.1	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	
25-Feb	2.1	2.1	Z	2.1	2.3	2.3	2.4	2.4	2.5	2.5	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.2	2.2	2.2	2.2	2.5	
26-Feb	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
27-Feb	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	
28-Feb	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.4	2.4	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	
																								Diurnal Average		
																								Diurnal Maximum		
																								2.1 2.1 2.1 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.2 2.2 2.2 2.2 2.1 2.1 2.1 2.1		
																								2.4 2.4 2.5 2.4 2.5 2.5 2.6 2.6 2.6 2.6 2.7 2.7 2.6 2.5 2.4 2.6 2.5 2.6 2.7 2.7 2.7 2.7 2.8 2.6 2.5 2.5		
																								Z - zerospan C - Calibration M - Maintenance		





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

**Total Hydrocarbons (THC) - ppm**  
**Athabasca Valley - February 2023**





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

**Total Hydrocarbons (THC) - ppm**  
**Athabasca Valley - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	104	16.28	16.28
2.1 - 3.0	535	83.72	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Athabasca Valley - February 2023**

<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	13	1	2	2	3	0	3	1	2	9	9	24	10	5	5	15	104
2.1 - 3.0	81	12	5	7	10	12	113	49	15	14	15	14	21	18	27	122	535
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>	94	13	7	9	13	12	116	50	17	23	24	38	31	23	32	137	639

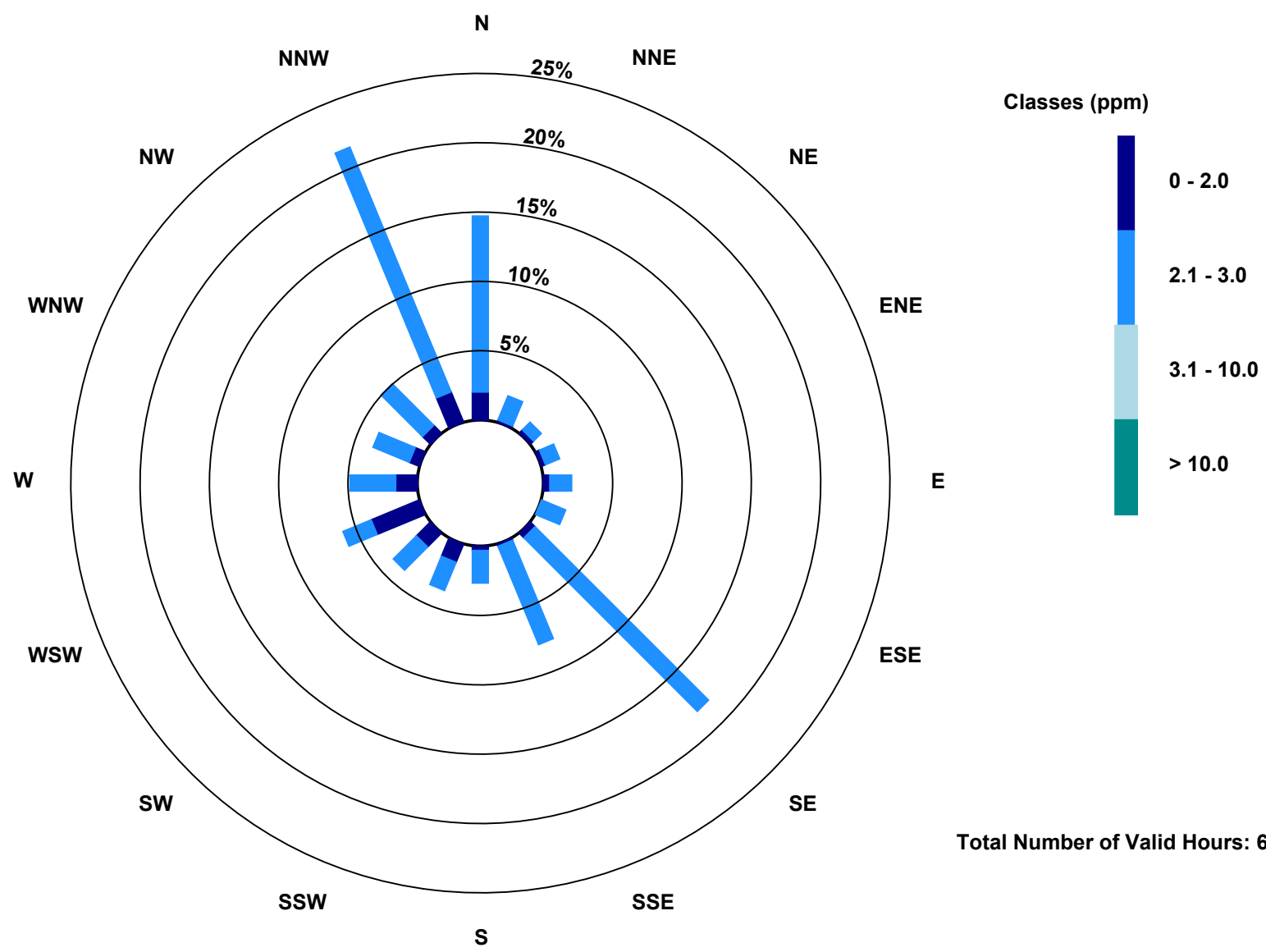
Total Number of Valid Hours: 639

Total Number of Hours: 672

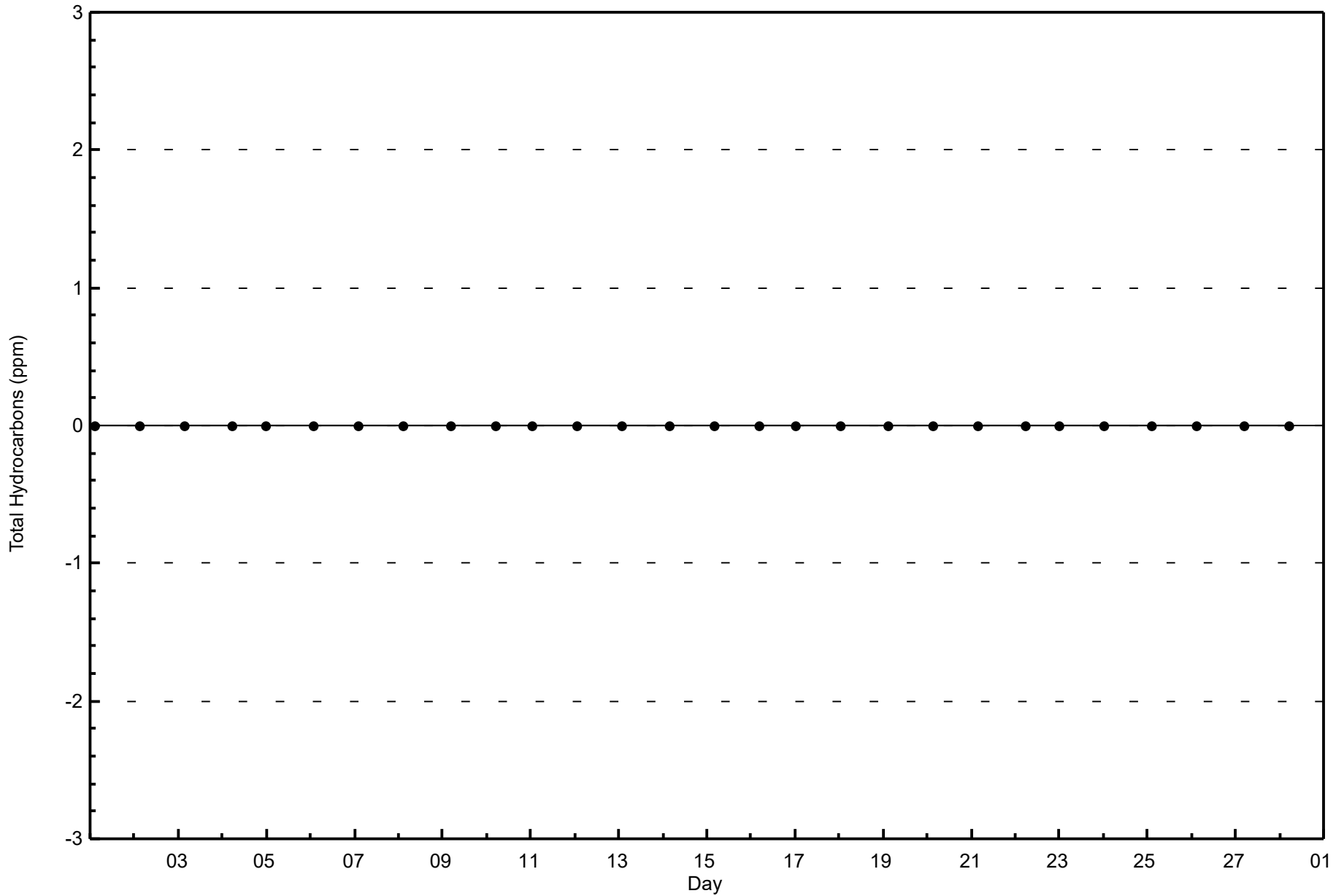


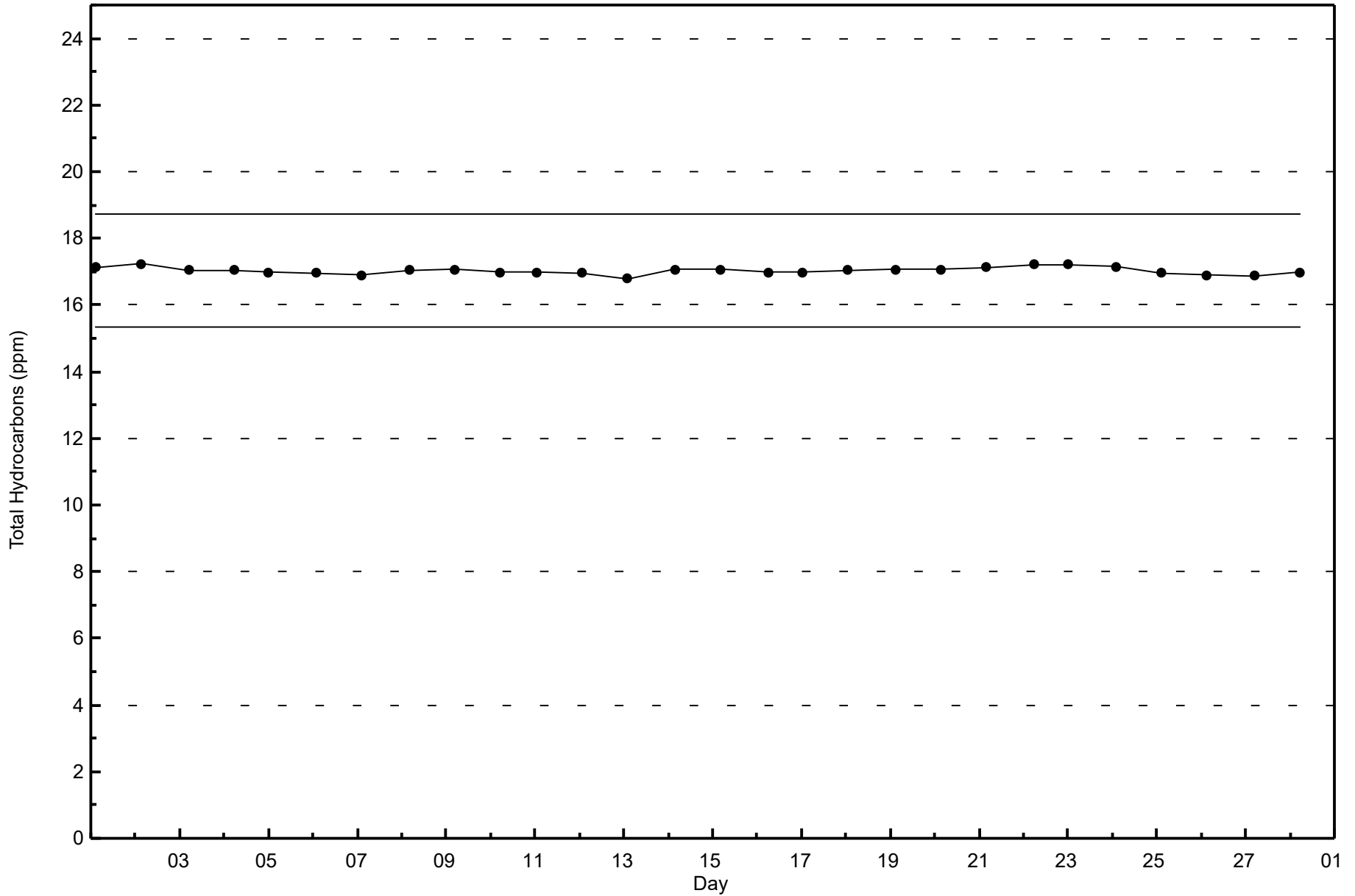
**Wood Buffalo Environmental Association**  
**Wind Rose Feb 2023**

**Total Hydrocarbons (THC) - ppm**  
**Athabasca Valley**

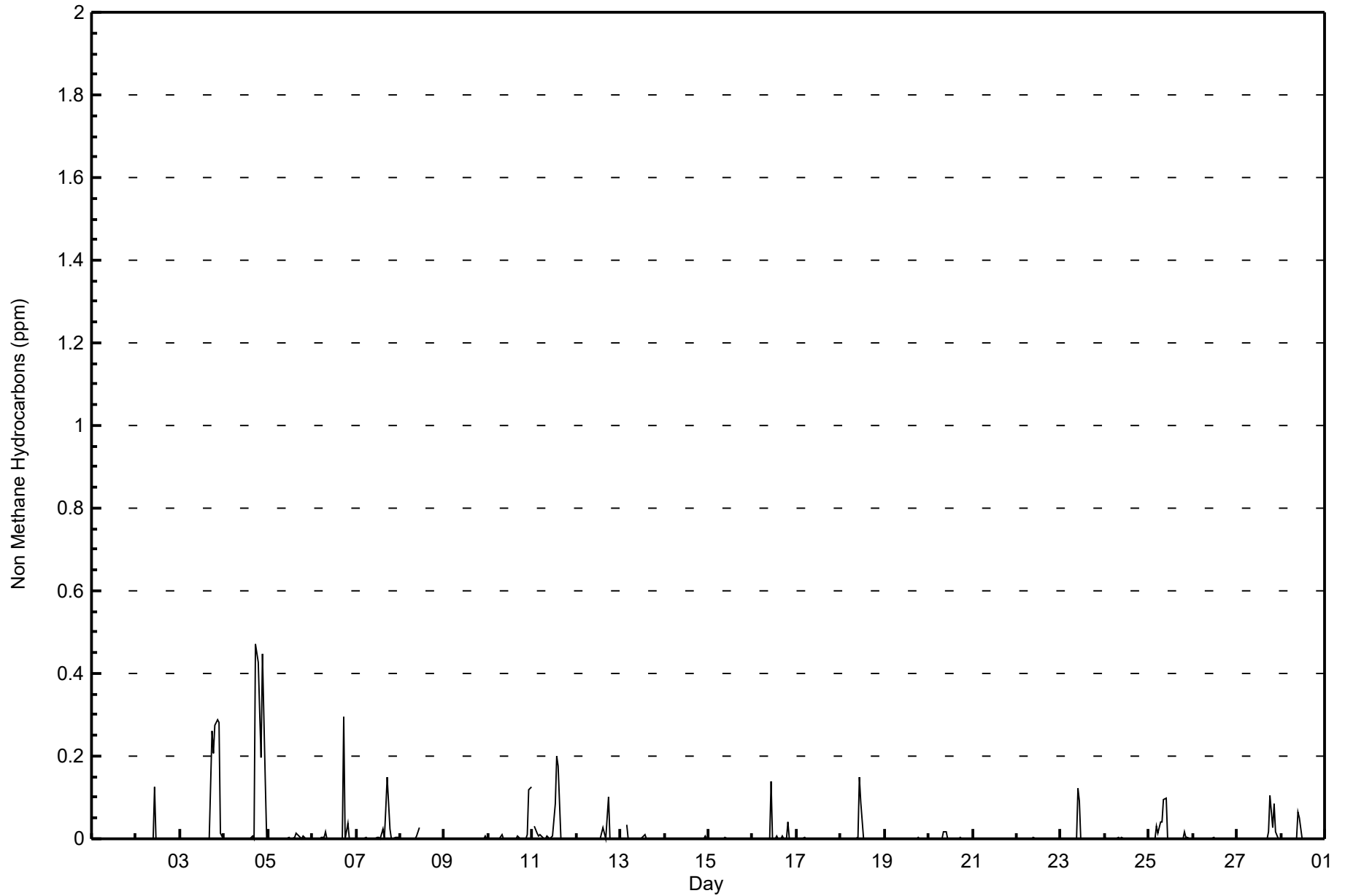


Total Number of Valid Hours: 639













**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Athabasca Valley - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	568	88.89	88.89
0.006 - 0.05	40	6.26	95.15
0.06 - 0.1	18	2.82	97.97
> 0.1	13	2.03	100.00

Total Number of Valid Hours: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Athabasca Valley - February 2023**

<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	85	13	6	7	12	9	100	45	16	21	23	37	29	22	28	115	568
0.006 - 0.05	5	0	0	1	1	2	8	5	1	2	1	1	0	1	3	9	40
0.06 - 0.1	3	0	1	1	0	1	5	0	0	0	0	0	2	0	1	4	18
> 0.1	1	0	0	0	0	0	3	0	0	0	0	0	0	0	0	9	13
<b>Totals</b>	<b>94</b>	<b>13</b>	<b>7</b>	<b>9</b>	<b>13</b>	<b>12</b>	<b>116</b>	<b>50</b>	<b>17</b>	<b>23</b>	<b>24</b>	<b>38</b>	<b>31</b>	<b>23</b>	<b>32</b>	<b>137</b>	<b>639</b>

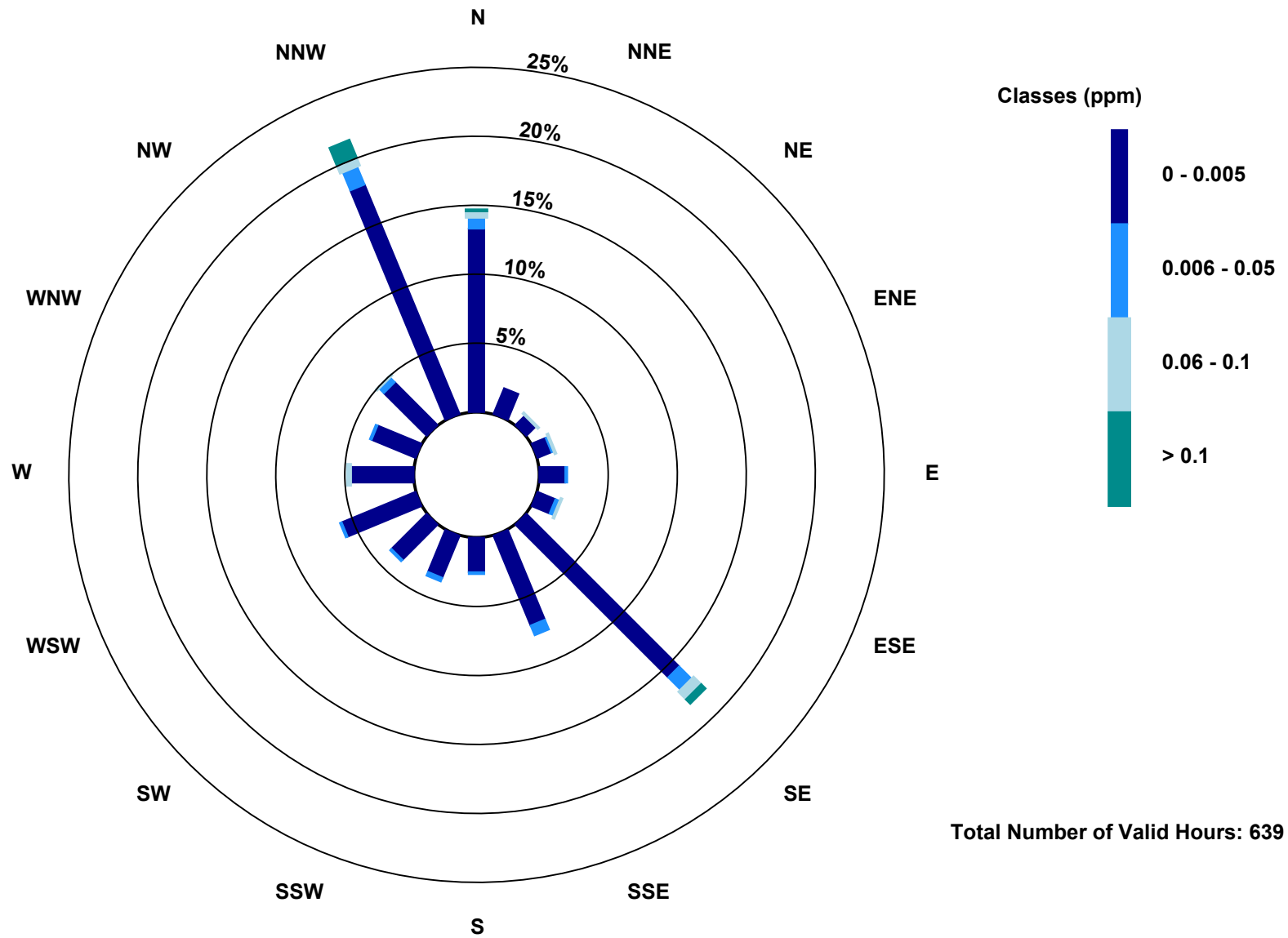
Total Number of Valid Hours: 639

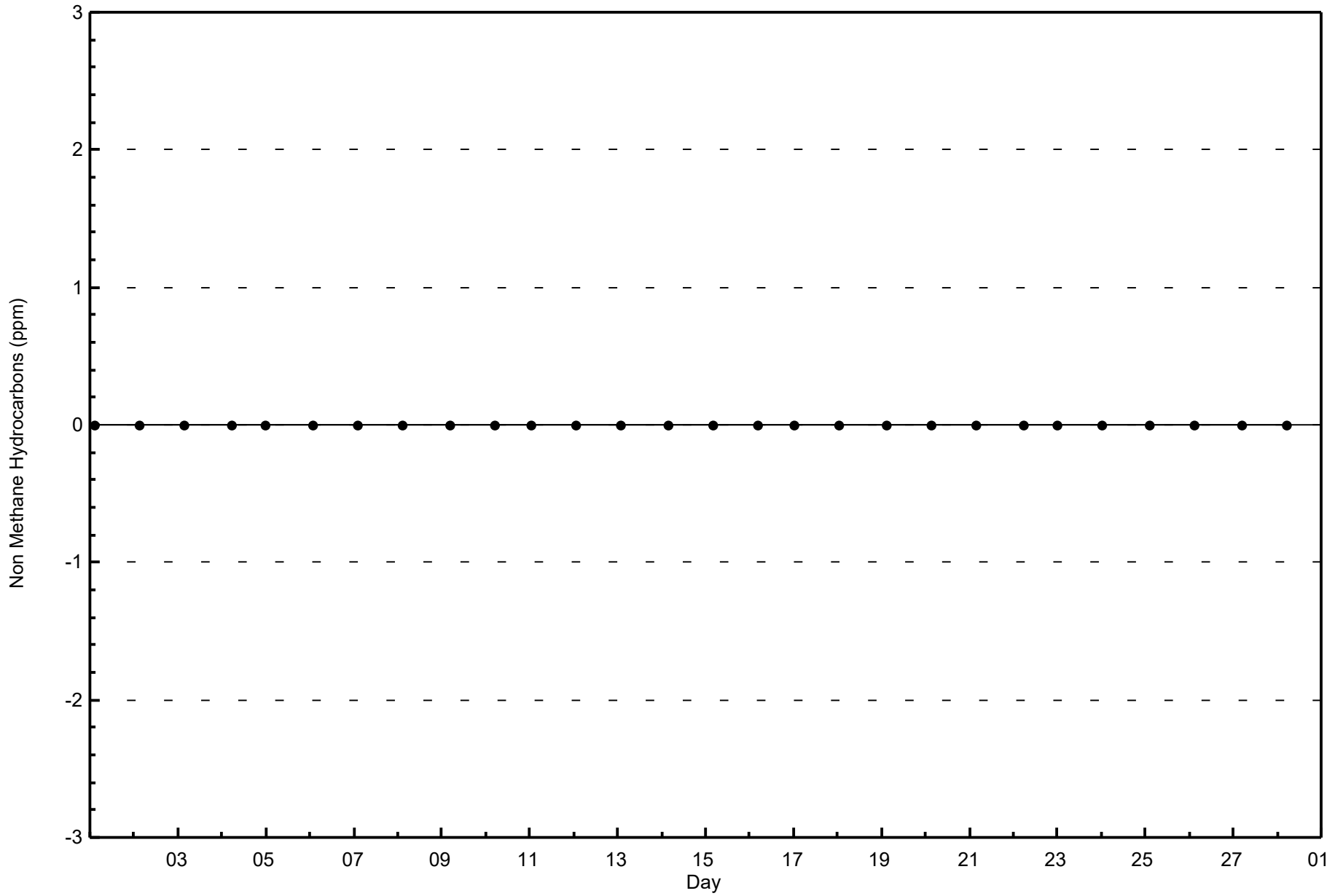
Total Number of Hours: 672

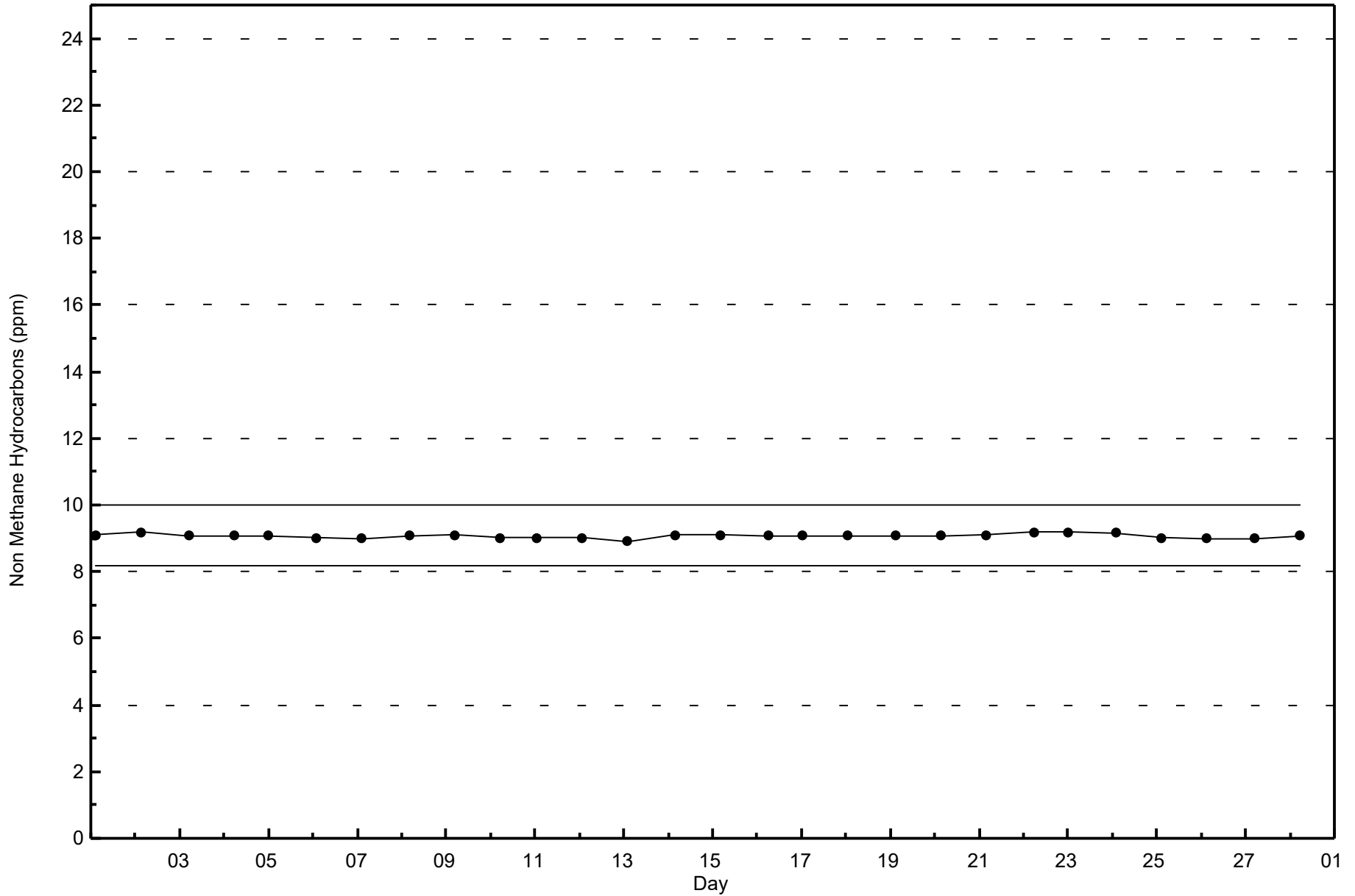


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

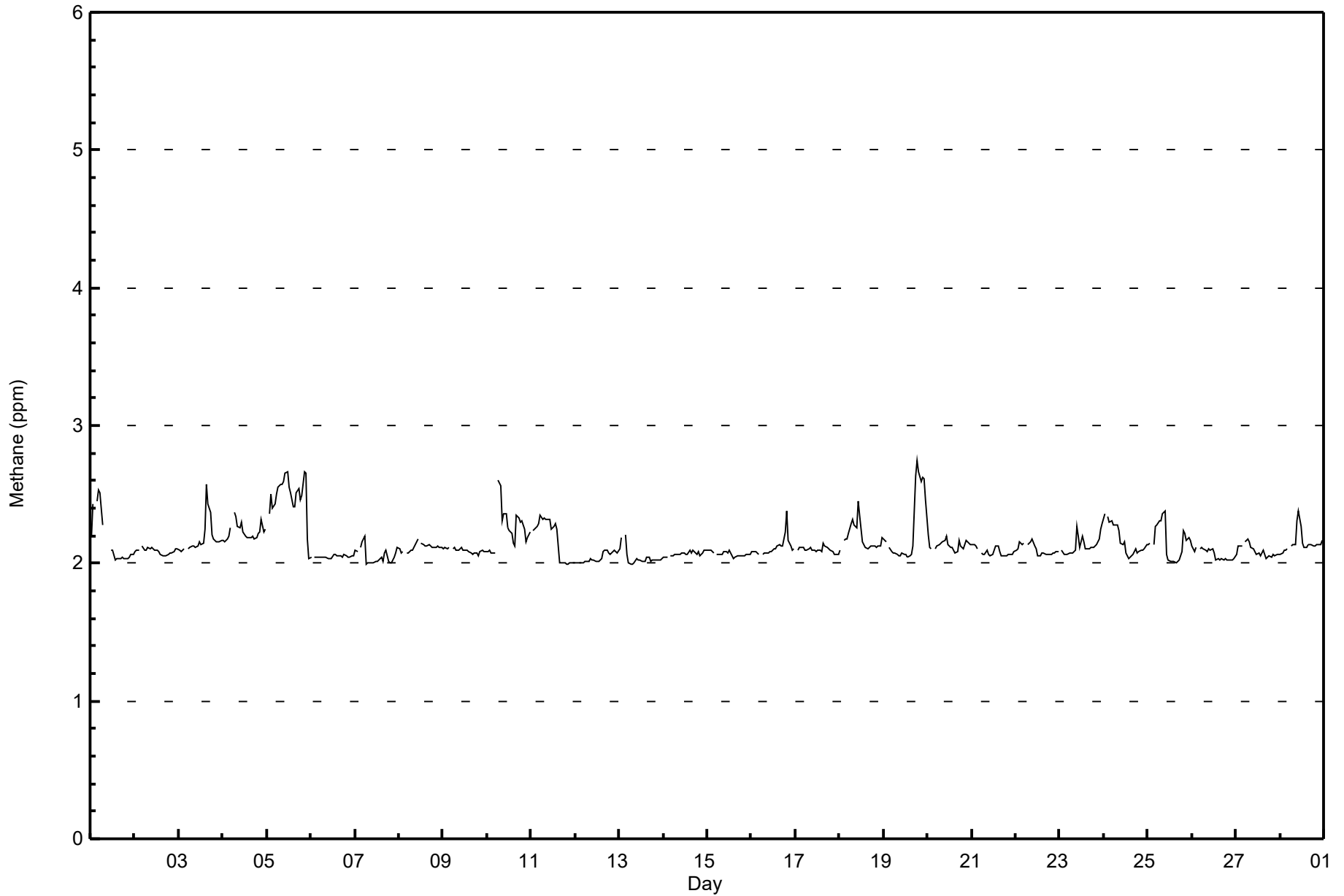
Non Methane Hydrocarbons (NMHC) - ppm  
Athabasca Valley













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

**Methane (CH<sub>4</sub>) - ppm**  
**Athabasca Valley - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	110	17.21	17.21
2.1 - 3.0	529	82.79	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 639

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Athabasca Valley - February 2023**

<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	14	1	2	2	3	1	4	1	2	9	9	24	10	6	6	16	110
2.1 - 3.0	80	12	5	7	10	11	112	49	15	14	15	14	21	17	26	121	529
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>	94	13	7	9	13	12	116	50	17	23	24	38	31	23	32	137	639

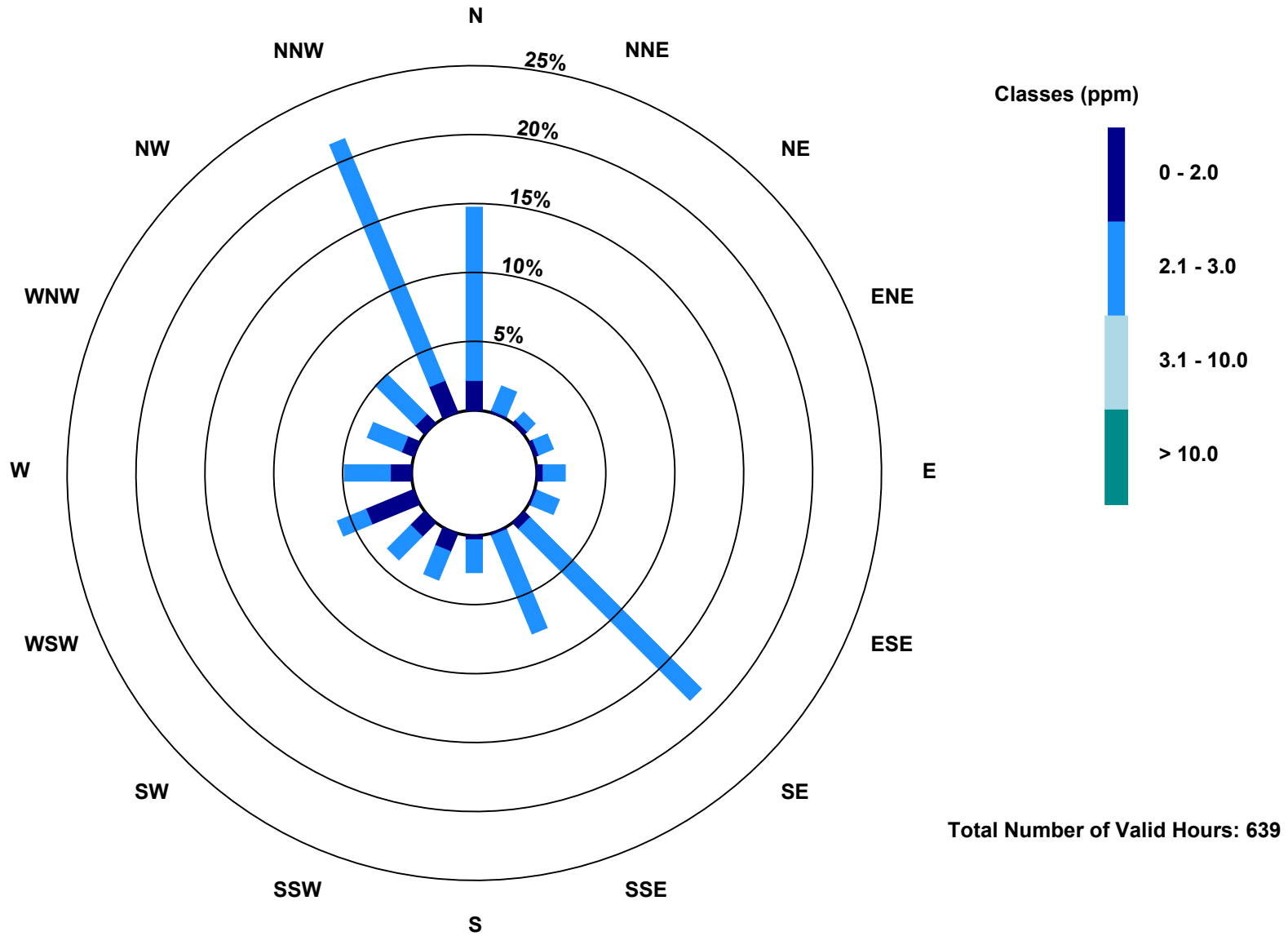
Total Number of Valid Hours: 639

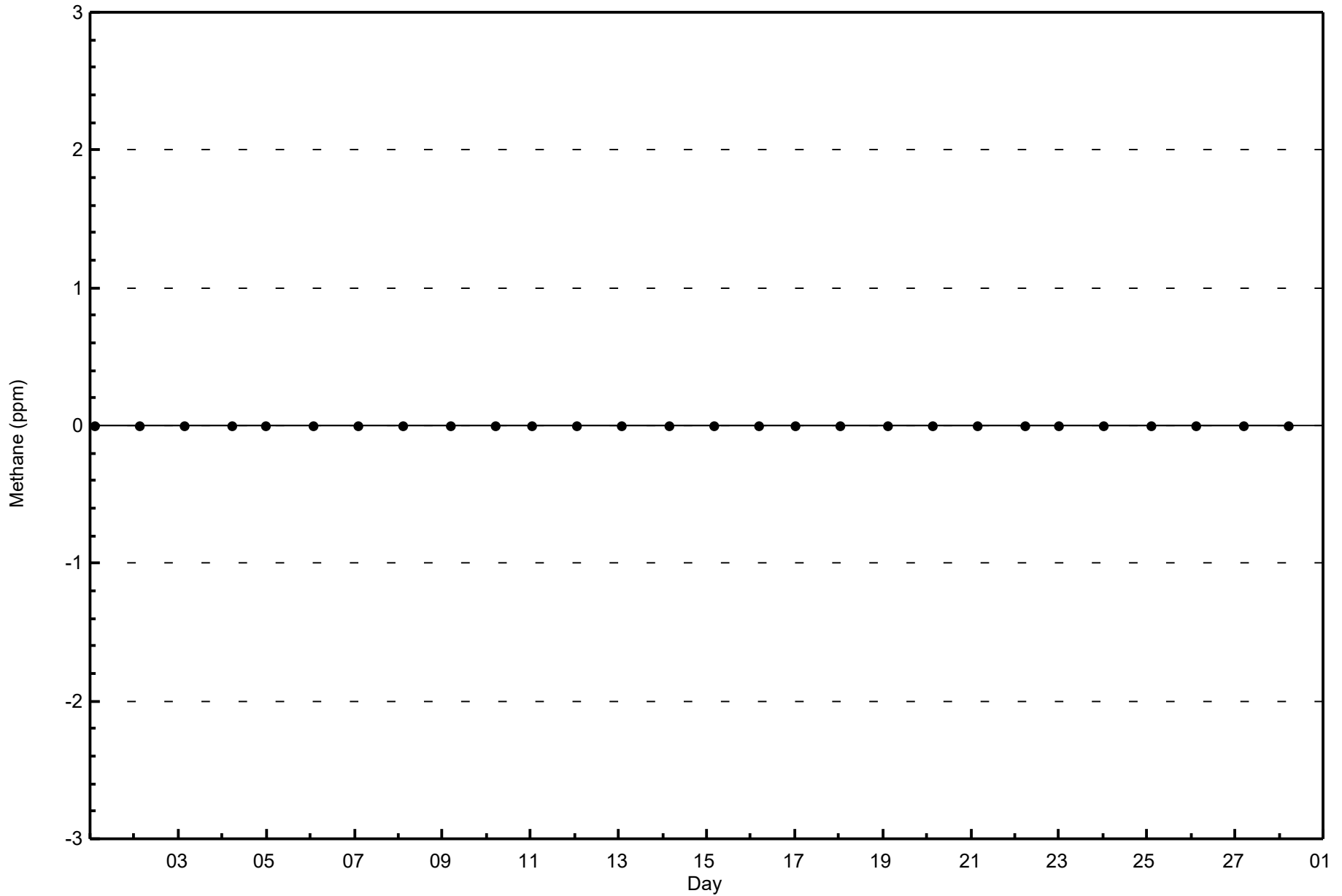
Total Number of Hours: 672

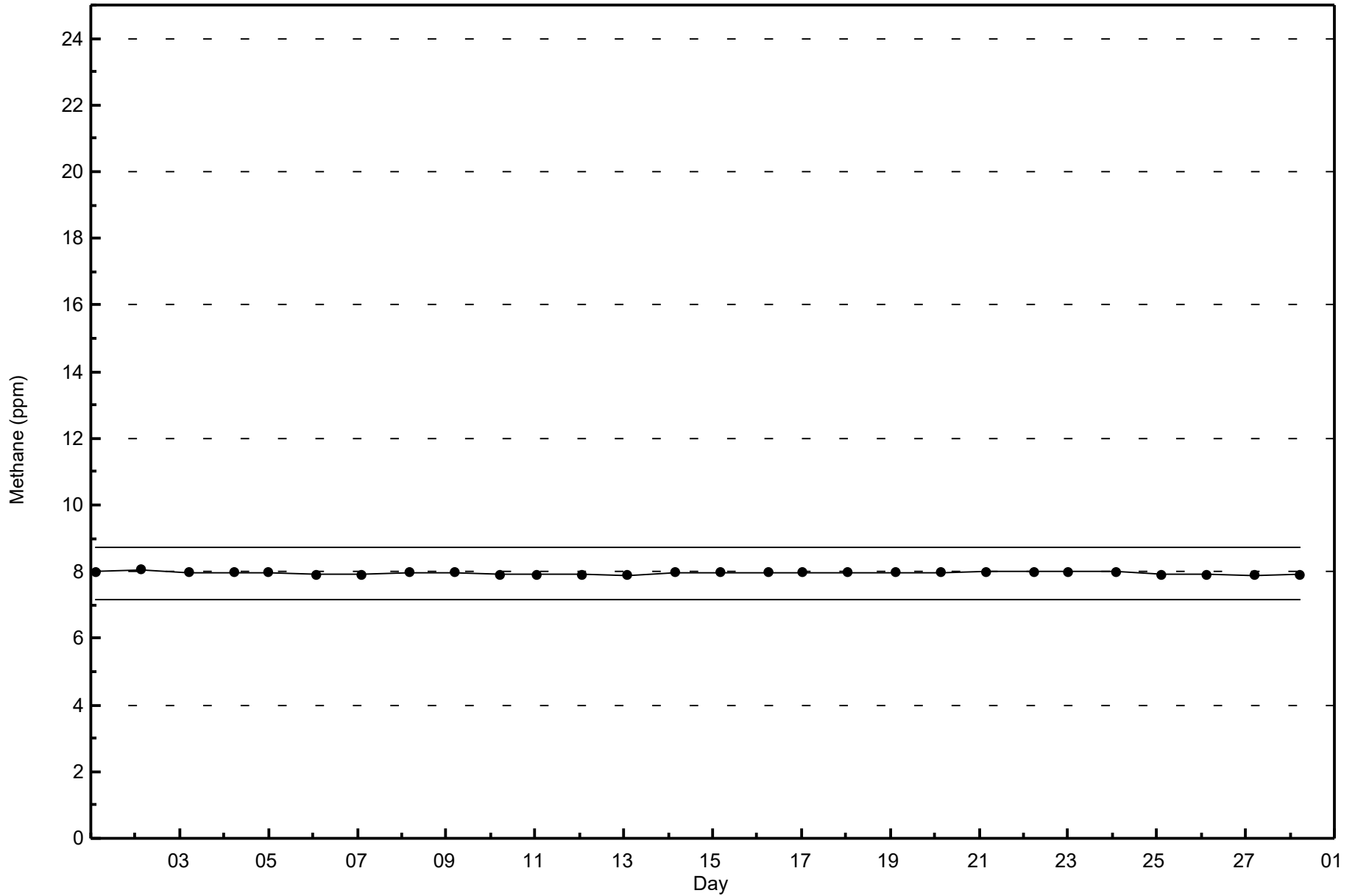


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Methane (CH<sub>4</sub>) - ppm  
Athabasca Valley









Wood Buffalo Environmental Association

Summary of Hour Averages

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

Athabasca Valley - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 45.5 ppb on Feb 7 18:00	Maximum Daily Average: 34.6 ppb on Feb 13		Hours of Data:	639
Minimum Value: 0.9 ppb on Feb 1 04:00	Minimum Daily Average: 5.5 ppb on Feb 5		Hours of Missing Data:	33
Maximum Diurnal Average: 26.5 ppb at hour 15	Minimum Diurnal Average: 15.2 ppb at hour 6		Hours of Calibration:	33
Monthly Average: 19.58 ppb	Percentiles: P <sub>1</sub> = 1.1 P <sub>10</sub> = 5.2 Q <sub>1</sub> = 11.1 Median = 19.7 Q <sub>3</sub> = 27.5 P <sub>90</sub> = 33.8 P <sub>99</sub> = 38.9		Percent Operational Time:	100.0

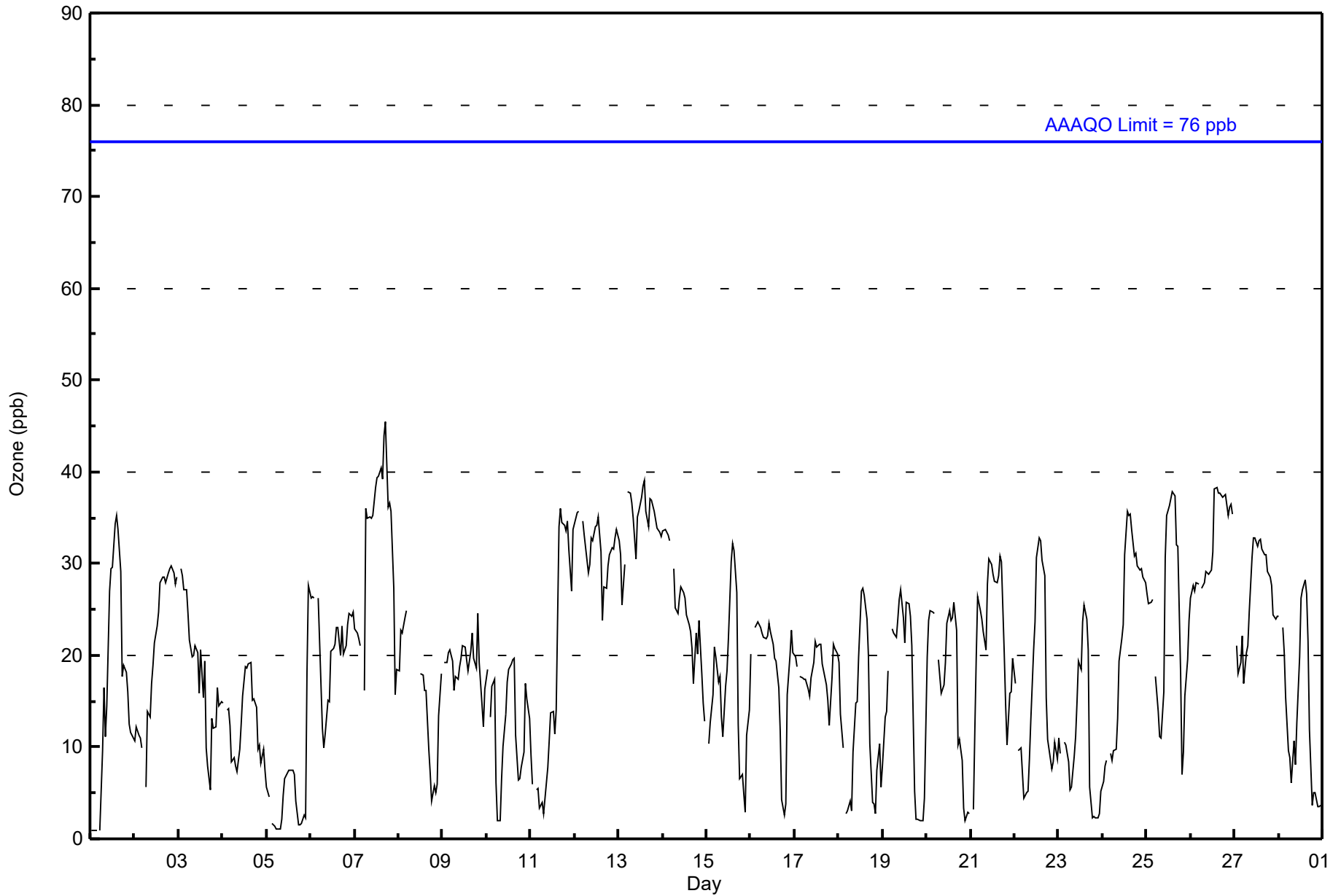
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Feb	1.0	0.9	0.9	0.9	Z	1.0	9.6	16.5	11.2	14.5	27.1	29.5	34.4	35.2	33.7	29.2	17.7	18.9	18.2	16.0	12.4	11.6	11.0	16.6	35.2																							
2-Feb	10.7	12.3	11.3	11.0	9.8	Z	5.6	13.9	13.3	16.9	18.9	21.4	23.1	24.7	27.9	28.5	28.5	28.0	28.9	29.4	29.8	29.0	27.8	28.5	20.8	29.8																						
3-Feb	Z	29.5	28.7	27.2	27.1	24.6	21.7	19.8	20.0	21.0	20.3	15.8	20.6	15.5	19.3	9.9	8.0	5.3	13.1	12.1	12.3	16.4	14.6	14.9	18.2	29.5																						
4-Feb	14.8	Z	14.0	14.3	12.3	8.4	8.8	7.9	7.4	9.8	12.5	15.6	18.7	18.7	19.1	19.2	15.0	15.2	14.3	9.8	10.3	8.2	9.7	7.5	12.7	19.2																						
5-Feb	5.7	4.6	Z	1.7	1.4	1.1	1.1	1.1	2.2	4.8	6.6	7.1	7.5	7.5	7.4	7.0	4.2	1.6	1.5	1.6	2.6	2.2	18.1	27.6	5.5	27.6																						
6-Feb	26.2	26.4	26.3	Z	26.2	21.5	12.0	9.9	11.4	15.1	14.9	20.4	20.7	21.3	23.1	23.0	19.9	23.2	20.1	21.1	23.3	24.6	24.3	24.7	20.9	26.4																						
7-Feb	22.8	22.4	21.9	21.0	Z	16.2	35.9	35.0	35.1	34.9	35.2	38.3	39.4	39.5	40.3	39.2	43.9	45.5	36.2	36.6	35.7	27.3	15.7	18.4	32.0	45.5																						
8-Feb	18.3	22.8	22.4	24.2	24.8	Z	5.2	C	C	C	C	C	18.0	17.8	16.1	16.1	9.8	7.1	4.1	5.9	5.0	6.0	13.4	18.0	14.2	24.8																						
9-Feb	Z	19.2	19.2	20.3	20.6	19.4	16.2	17.6	17.5	18.7	19.7	21.1	20.9	19.6	18.3	20.4	22.5	19.7	18.6	24.6	19.2	14.7	12.2	16.4	19.0	24.6																						
10-Feb	18.4	Z	13.3	16.6	17.4	6.2	2.0	2.0	6.5	10.0	13.6	17.1	18.4	19.1	19.5	19.6	11.4	6.4	6.5	7.8	9.5	17.0	15.3	13.1	12.5	19.6																						
11-Feb	9.2	5.9	Z	5.3	5.6	3.3	4.0	2.7	4.5	7.8	10.7	13.7	13.9	11.5	14.0	34.0	36.0	34.4	34.1	33.6	34.6	31.5	27.0	33.8	17.9	36.0																						
12-Feb	34.4	35.6	35.7	Z	34.6	33.1	31.8	29.0	29.9	32.8	32.4	34.0	34.1	35.1	31.3	23.9	27.5	27.3	29.8	31.0	31.7	31.6	32.7	33.7	31.9	35.7																						
13-Feb	32.6	31.0	25.5	29.8	Z	37.8	37.6	36.6	35.0	30.5	35.2	35.7	37.2	38.5	39.1	35.7	34.0	37.0	36.9	35.6	34.7	33.8	33.5	32.9	34.6	39.1																						
14-Feb	33.6	33.7	33.3	33.1	32.6	Z	29.5	25.2	24.5	26.3	27.5	26.9	26.2	24.4	23.3	22.5	20.7	17.0	22.5	20.1	23.8	18.0	14.8	12.9	24.9	33.7																						
15-Feb	Z	10.4	12.6	15.8	20.9	19.9	17.1	17.7	13.3	11.1	16.6	18.3	21.8	30.3	32.2	31.4	26.8	12.5	6.5	7.0	4.9	2.9	11.4	14.1	16.3	32.2																						
16-Feb	20.1	Z	23.0	23.3	23.7	23.0	22.4	21.9	21.8	22.2	23.5	22.5	21.2	19.7	19.4	16.5	11.7	4.3	2.5	3.8	15.7	19.9	22.7	20.3	18.5	23.7																						
17-Feb	19.8	18.8	Z	17.7	17.5	17.3	17.3	16.3	15.6	17.6	19.2	21.5	20.9	21.2	21.2	19.1	18.4	16.7	15.2	12.4	17.6	21.2	20.8	20.1	18.4	21.5																						
18-Feb	19.2	13.6	9.9	Z	2.7	3.0	4.2	3.1	9.4	14.8	15.0	19.8	27.0	27.2	26.6	23.9	20.0	10.4	4.0	3.7	2.7	7.5	10.3	5.7	12.3	27.2																						
19-Feb	8.0	13.2	13.9	18.3	Z	22.9	22.4	21.9	24.0	26.1	27.2	24.0	21.3	25.7	25.6	24.2	21.0	5.1	2.1	2.1	2.0	2.0	2.0	4.5	15.6	27.2																						
20-Feb	19.9	23.8	24.9	24.7	24.5	Z	19.6	17.8	15.8	16.7	19.3	23.5	24.8	23.8	24.1	25.8	22.7	10.2	10.9	8.6	3.4	2.0	2.8	2.7	17.1	25.8																						
21-Feb	Z	3.2	11.7	19.6	26.4	24.9	24.0	22.5	20.6	27.8	30.5	30.0	28.8	28.1	27.9	28.6	30.9	30.3	20.3	14.7	10.2	15.9	16.0	19.7	22.3	30.9																						
22-Feb	16.9	Z	9.6	9.9	7.2	4.3	5.0	5.2	8.7	13.0	20.7	23.7	30.6	32.8	32.5	30.4	28.7	15.4	10.9	8.8	7.6	8.4	10.6	8.8	15.2	32.8																						
23-Feb	11.0	9.3	Z	10.6	10.3	8.4	5.3	5.7	9.1	11.1	15.0	19.3	18.4	23.6	25.4	24.0	20.6	5.6	2.2	2.5	2.3	2.4	2.8	5.3	10.9	25.4																						
24-Feb	6.2	7.9	8.5	Z	9.3	8.5	9.6	9.8	13.1	19.4	21.8	23.3	30.9	35.7	35.2	35.4	33.7	30.8	31.1	29.8	29.3	29.5	28.5	27.9	22.4	35.7																						
25-Feb	26.6	25.7	25.8	26.1	Z	17.6	13.9	11.1	11.0	16.0	30.6	35.3	36.3	37.1	37.9	37.4	32.0	31.9	17.9	7.0	9.5	15.6	19.6	23.8	23.7	37.9																						
26-Feb	26.2	27.6	27.0	27.9	27.7	Z	27.3	27.9	29.2	28.9	28.8	29.2	31.2	38.2	38.2	37.6	37.7	37.3	37.3	37.5	35.3	36.2	36.4	35.4	32.4	38.2																						
27-Feb	Z	21.0	18.0	19.2	22.1	16.9	20.3	21.0	24.7	30.7	32.7	32.9	31.9	32.4	32.7	31.5	31.0	30.9	29.1	28.6	27.6	24.4	24.0	24.2	26.4	32.9																						
28-Feb	24.3	Z	23.0	20.2	15.4	9.6	8.8	6.2	10.7	8.1	12.7	19.9	26.3	27.1	28.3	26.7	21.6	12.0	3.6	5.0	5.1	3.6	3.4	3.6	14.1	28.3																						
18.5																								18.2	19.2	18.3	18.3	15.2	15.6	15.8	16.5	18.8	21.8	23.7	25.0	26.1	26.5	25.9	23.8	19.2	17.1	16.4	16.5	16.6	17.2	18.2	Diurnal Average	
34.4																								35.6	35.7	33.1	34.6	37.8	37.6	36.6	35.1	34.9	35.2	38.3	39.4	39.5	40.3	39.2	43.9	45.5	37.3	37.5	35.7	36.2	36.4	35.4	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**  
**Athabasca Valley - February 2023**





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

**Ozone (O<sub>3</sub>) - ppb**  
**Athabasca Valley - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	342	53.52	53.52
21 - 50	297	46.48	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb  
Athabasca Valley - February 2023**

<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	56	8	5	7	9	6	48	30	11	14	14	14	13	12	14	81	342
21 - 50	37	4	2	2	6	6	67	20	5	9	10	21	14	12	16	66	297
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>	93	12	7	9	15	12	115	50	16	23	24	35	27	24	30	147	639

Total Number of Valid Hours: 639

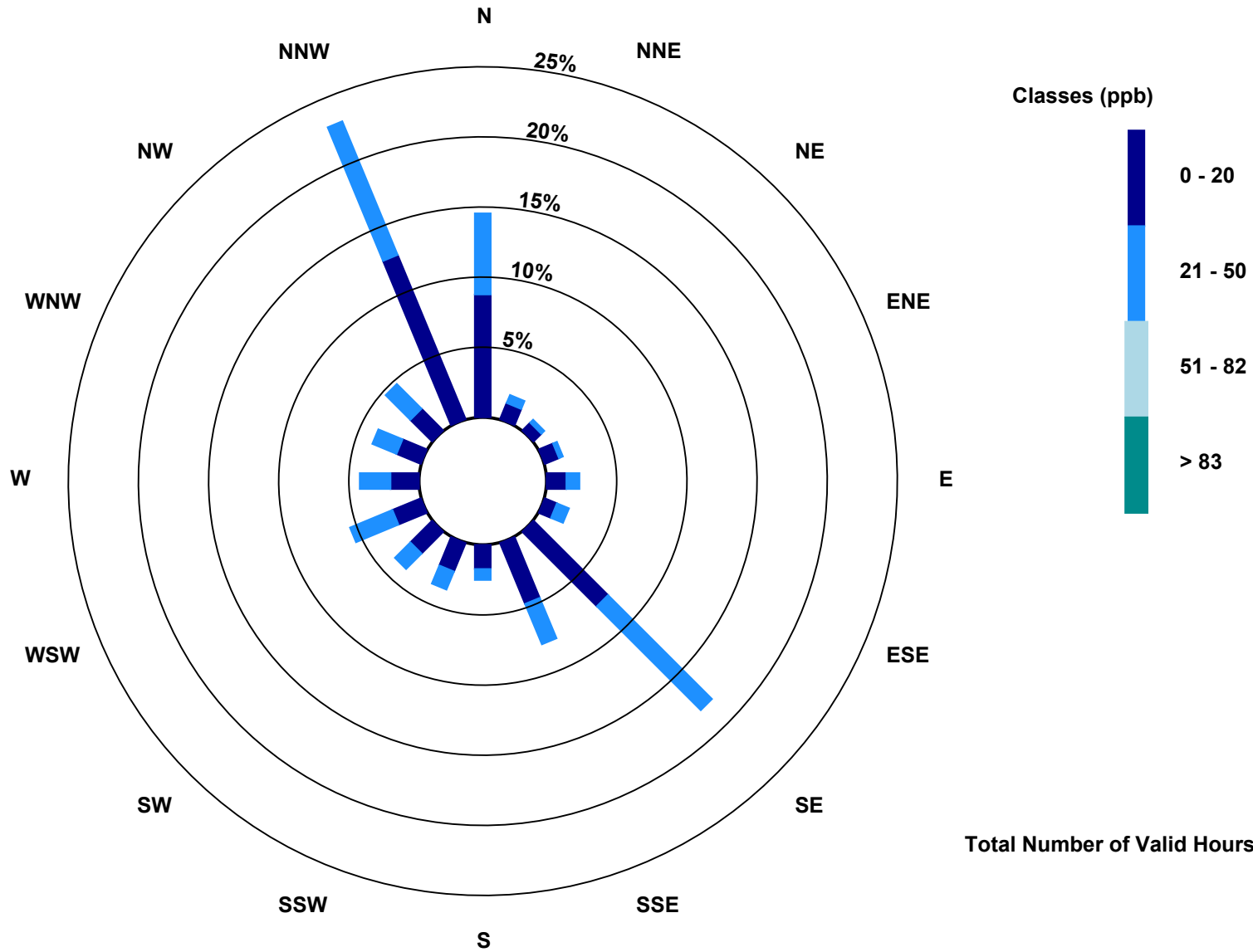
Total Number of Hours: 672



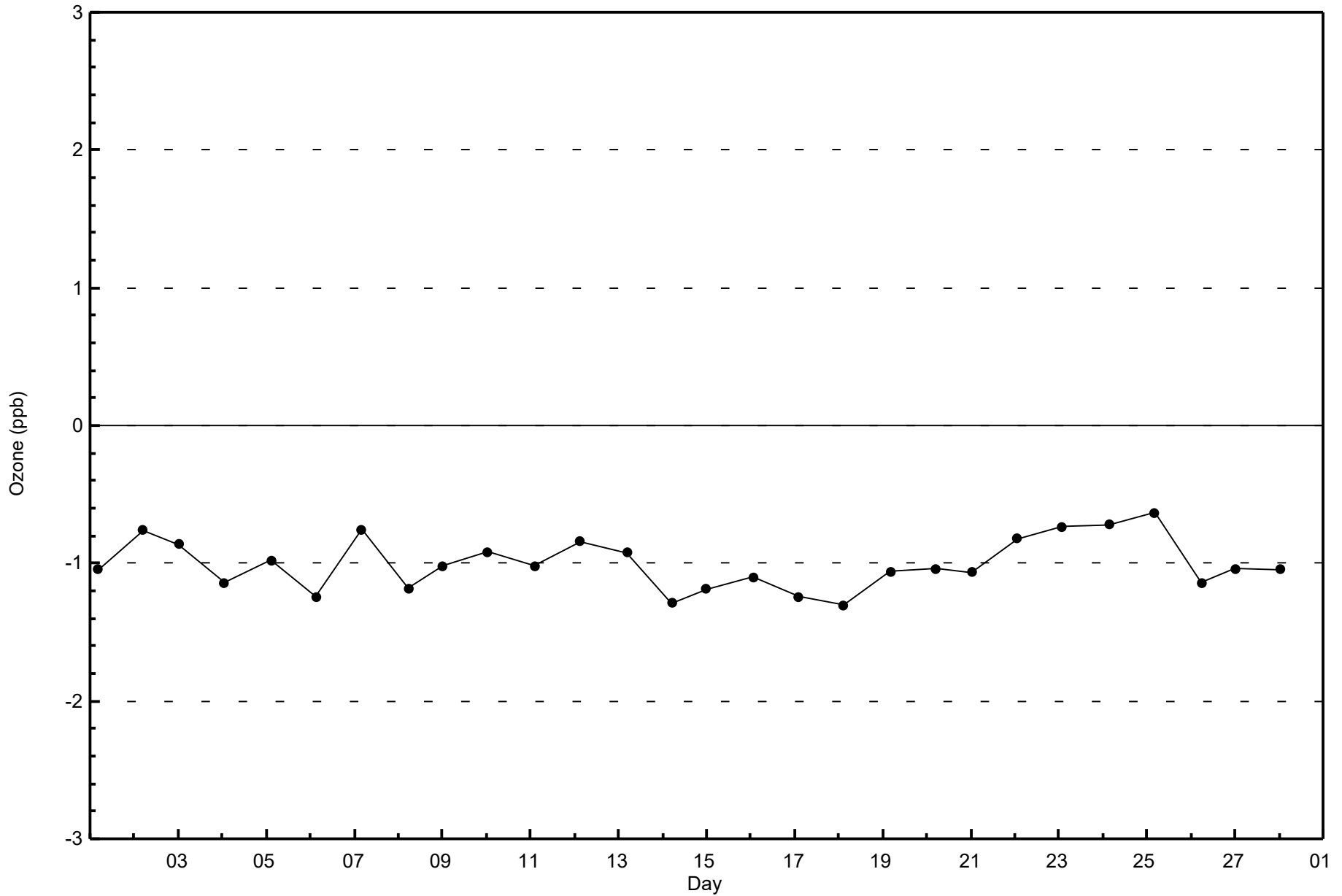


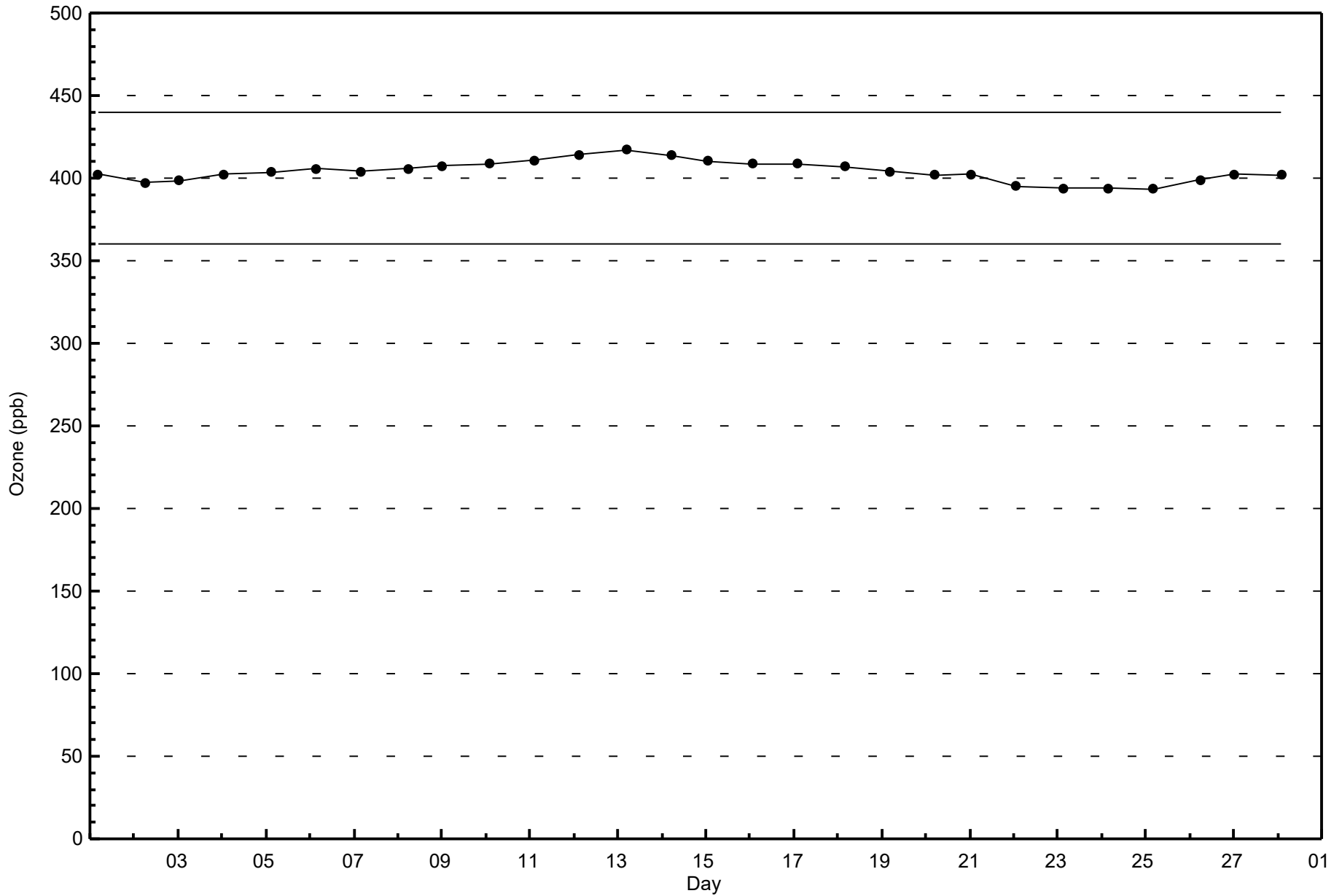
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Ozone (O<sub>3</sub>) - ppb  
Athabasca Valley



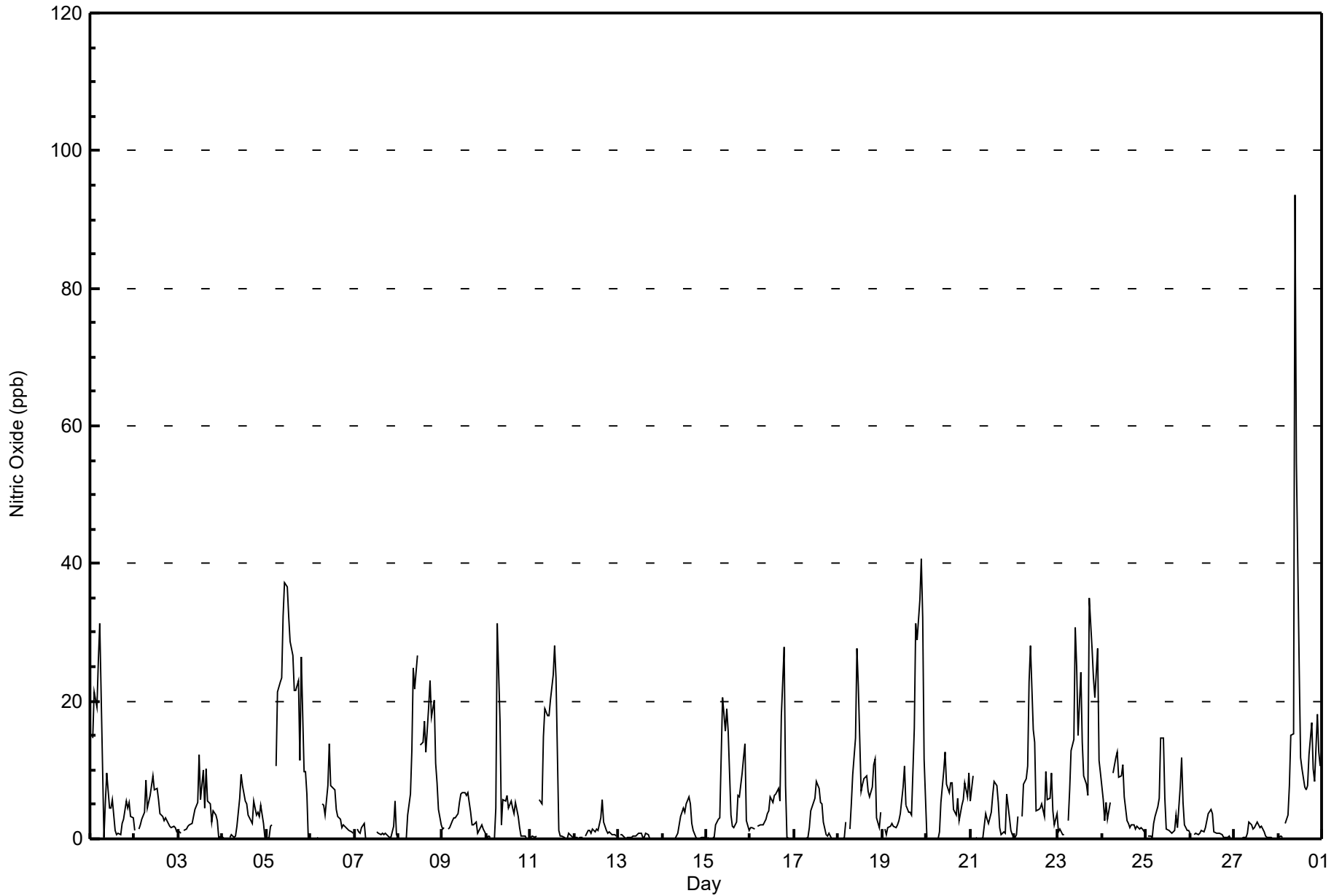
Total Number of Valid Hours: 639







Maximum Value: 93.5 ppb on Feb 28 10:00																				Maximum Daily Average: 17.6 ppb on Feb 5					Hours in Service: 672	
Minimum Value: 0.0 ppb on Feb 18 01:00																				Minimum Daily Average: 0.3 ppb on Feb 13					Hours of Data: 638	
Maximum Diurnal Average: 13.3 ppb at hour 10																				Minimum Diurnal Average: 0.9 ppb at hour 1					Hours of Missing Data: 34	
Monthly Average: 5.70 ppb																				Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.7 Median = 2.6 Q <sub>3</sub> = 7.0 P <sub>90</sub> = 15.3 P <sub>99</sub> = 33.8					Hours of Calibration: 33	
																									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-Feb	Z	14.7	21.3	19.1	25.9	31.3	10.6	0.2	5.2	9.5	4.5	4.5	5.7	1.3	0.7	0.8	0.7	2.2	2.9	5.6	4.4	5.4	3.3	3.1	8.0	31.3
2-Feb	1.2	Z	1.5	2.1	2.8	3.9	8.5	4.4	6.2	7.7	9.1	7.2	7.4	5.6	3.6	3.2	2.6	3.1	2.3	1.9	1.6	1.8	1.7	1.1	3.9	9.1
3-Feb	1.0	0.9	Z	1.2	1.3	1.8	2.1	2.3	3.2	4.2	5.2	12.3	5.6	10.0	4.5	10.2	5.5	5.1	2.4	4.0	3.4	2.7	0.2	0.5	3.9	12.3
4-Feb	0.3	0.1	0.1	Z	0.1	0.5	0.3	0.3	1.7	5.8	9.3	7.7	5.4	5.1	3.5	2.7	2.3	5.5	3.5	3.8	3.3	4.8	2.2	0.1	3.0	9.3
5-Feb	0.1	0.2	1.9	2.0	Z	10.5	21.3	22.7	23.5	32.3	37.2	36.5	32.4	28.8	26.7	21.5	21.6	22.9	11.3	26.4	9.8	9.8	6.5	0.0	17.6	37.2
6-Feb	0.0	0.0	0.1	0.1	0.2	Z	5.2	4.9	3.6	7.8	13.9	7.8	7.4	7.1	4.3	3.3	2.9	1.6	2.1	1.6	1.4	1.1	0.9	0.8	3.4	13.9
7-Feb	Z	1.3	0.9	0.9	1.6	2.2	0.0	C	C	C	C	C	1.0	0.8	0.6	0.7	0.5	0.8	0.3	0.3	0.3	1.8	5.6	0.6	1.1	5.6
8-Feb	0.1	Z	0.0	0.0	0.0	3.4	6.5	12.7	24.9	21.9	26.6	M	13.6	14.0	17.2	12.5	19.1	23.0	17.8	20.0	10.9	8.2	4.3	2.0	11.8	26.6
9-Feb	1.5	1.7	Z	1.4	1.5	2.6	3.1	3.0	3.7	5.3	6.4	6.8	6.7	6.2	6.7	3.8	2.0	2.0	2.4	0.7	1.1	2.0	1.5	1.0	3.2	6.8
10-Feb	0.2	0.3	0.1	Z	0.1	4.4	31.4	17.0	2.1	5.6	5.4	6.4	4.5	5.5	4.5	3.6	5.4	3.2	1.5	0.4	0.3	0.3	0.0	0.0	4.4	31.4
11-Feb	0.2	0.3	0.2	0.4	Z	5.7	5.1	14.9	18.9	17.8	17.9	20.0	23.9	28.0	23.4	1.1	0.4	0.4	0.2	0.1	0.0	0.8	0.4	0.1	7.8	28.0
12-Feb	0.1	0.1	0.1	0.1	0.2	Z	0.4	1.2	1.2	0.9	1.4	1.0	1.5	1.3	3.0	5.6	2.5	1.2	0.9	0.9	0.7	0.6	0.6	0.5	1.1	5.6
13-Feb	Z	0.5	0.6	0.1	0.1	0.1	0.2	0.2	0.5	0.5	0.6	0.8	0.9	0.3	0.2	0.9	0.6	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.3	0.9
14-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.8	1.9	3.2	4.4	3.9	5.0	6.1	5.1	2.3	1.1	0.2	0.1	0.1	0.1	0.2	0.2	1.5	6.1
15-Feb	0.1	0.1	Z	0.1	0.2	2.0	2.9	3.1	11.7	20.5	15.8	18.9	15.6	3.5	1.7	1.6	2.4	6.2	6.1	9.6	11.8	13.8	2.7	1.3	6.6	20.5
16-Feb	1.6	1.6	1.5	Z	1.8	2.0	2.0	2.1	2.8	3.7	4.0	6.2	5.3	6.2	6.5	7.2	5.6	18.0	27.9	7.7	0.2	0.1	0.0	0.1	5.0	27.9
17-Feb	0.0	0.0	0.1	0.0	Z	0.1	0.1	0.2	1.6	4.0	5.2	5.9	8.4	7.4	5.3	5.1	2.4	0.7	0.3	0.8	0.1	0.0	0.0	0.0	2.1	8.4
18-Feb	0.0	0.0	0.0	0.3	2.4	Z	1.4	5.1	9.3	14.7	27.6	22.1	6.9	8.0	8.8	9.1	6.8	6.1	7.5	10.7	11.7	3.0	1.6	3.8	7.3	27.6
19-Feb	Z	1.4	0.6	1.7	1.9	2.3	1.9	1.5	2.1	2.6	3.7	7.6	10.6	4.9	3.8	3.8	3.4	16.1	31.2	28.9	34.7	40.7	32.1	11.7	10.8	40.7
20-Feb	0.1	Z	0.0	0.0	0.0	0.0	0.1	1.1	5.2	9.7	12.7	7.8	6.8	8.2	8.2	4.2	3.5	5.9	2.6	4.8	5.7	8.1	6.0	9.5	4.8	12.7
21-Feb	5.5	9.2	Z	0.1	0.0	0.0	0.1	0.3	3.7	2.8	2.3	3.8	6.3	8.3	7.8	5.3	1.7	0.7	1.0	0.9	6.5	3.1	1.2	0.6	3.1	9.2
22-Feb	0.3	0.7	3.3	Z	3.3	7.8	8.7	10.5	22.9	28.0	15.9	14.1	4.2	4.3	4.4	5.0	3.3	9.7	5.6	5.9	9.6	4.0	2.0	3.7	7.7	28.0
23-Feb	1.1	1.5	0.5	0.7	Z	2.6	7.2	12.9	14.4	30.7	25.1	15.0	24.2	14.0	9.1	7.9	6.4	34.9	27.6	23.4	20.6	27.6	11.4	9.5	14.3	34.9
24-Feb	5.7	2.7	5.3	2.9	5.3	Z	9.6	11.9	12.6	8.9	9.1	10.9	6.1	2.6	2.2	1.6	2.1	2.0	1.4	1.8	1.5	1.6	1.5	0.8	4.8	12.6
25-Feb	Z	0.5	0.3	0.3	2.3	3.2	4.6	6.0	14.6	14.6	6.0	1.4	1.1	1.0	0.8	1.1	3.4	1.6	7.5	11.8	5.4	2.1	1.3	1.3	4.0	14.6
26-Feb	0.9	Z	0.6	0.8	0.6	0.9	1.2	1.1	1.7	2.6	3.7	4.3	3.7	0.9	0.7	0.8	0.7	0.6	0.2	0.2	0.3	0.4	0.1	0.0	1.2	4.3
27-Feb	0.0	0.0	Z	0.1	0.1	0.2	0.2	0.7	2.5	1.9	1.5	1.5	2.3	2.1	1.6	1.9	0.9	0.3	0.3	0.2	0.3	0.1	0.0	0.0	0.8	2.5
28-Feb	0.2	0.5	0.2	Z	2.2	3.5	7.8	15.1	15.2	93.5	54.8	25.0	11.9	10.3	7.6	7.2	7.8	12.3	16.9	10.1	8.4	18.1	12.7	10.6	15.3	93.5
0.9 1.7 1.7 1.5 2.2 3.8 5.1 5.8 8.0 13.3 12.1 10.0 8.3 7.2 6.2 4.9 4.2 6.7 6.6 6.5 5.5 5.8 3.6 2.2																								Diurnal Average		
5.7 14.7 21.3 19.1 25.9 31.3 31.4 22.7 24.9 93.5 54.8 36.5 32.4 28.8 26.7 21.5 21.6 34.9 31.2 28.9 34.7 40.7 32.1 11.7																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Athabasca Valley - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	592	92.79	92.79
21 - 40	43	6.74	99.53
41 - 80	2	0.31	99.84
81 - 159	1	0.16	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



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

**Nitric Oxide (NO) - ppb**  
**Athabasca Valley - February 2023**

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	12	5	4	13	11	113	46	15	20	24	31	26	20	28	131	592
21 - 40	5	0	0	4	1	0	6	1	2	2	1	3	2	3	1	12	43
11 - 80	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	2
81 - 159	0	0	1	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>	98	12	6	9	14	11	119	47	17	22	25	34	28	23	30	143	638

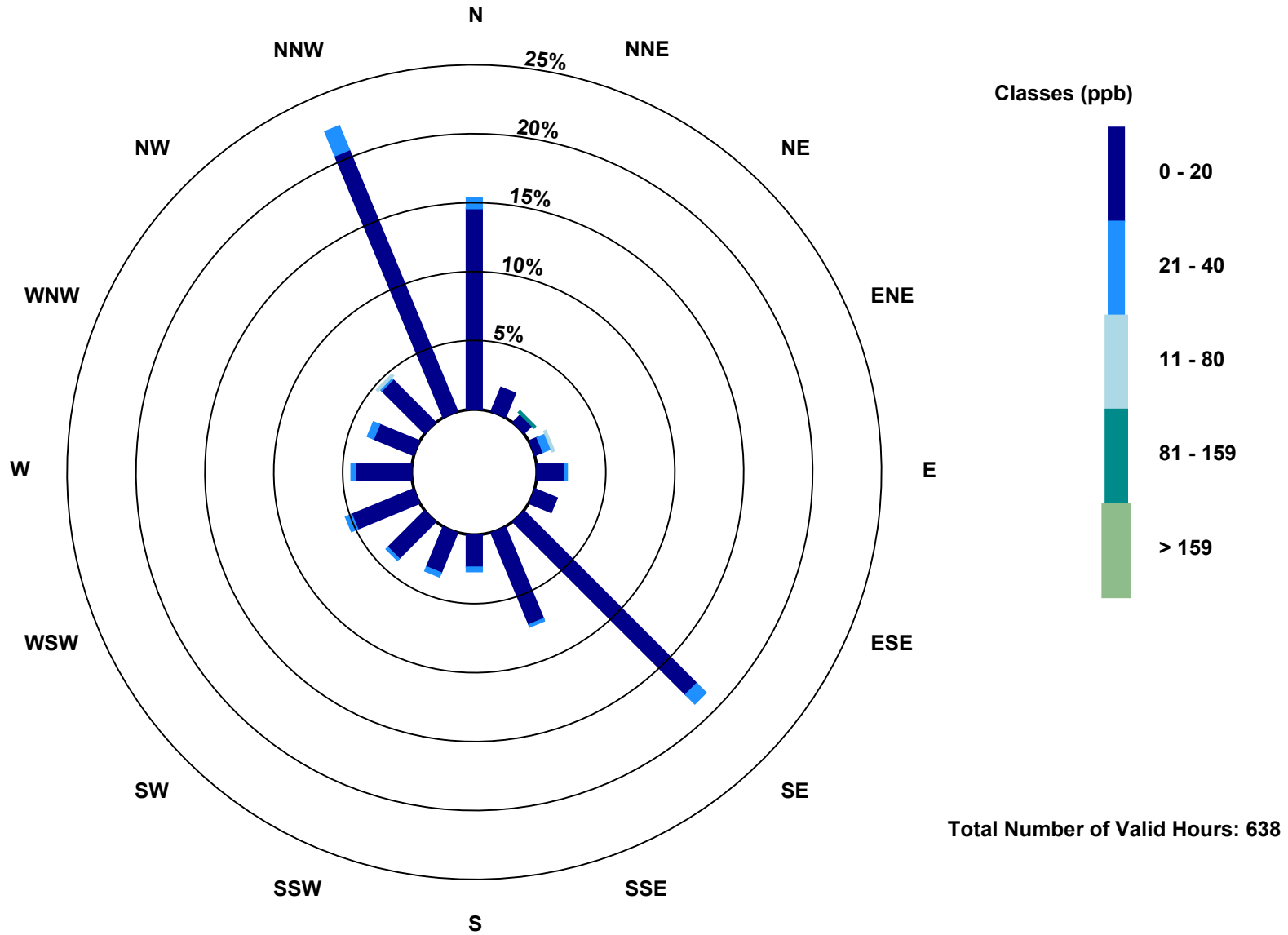
Total Number of Valid Hours: 638

Total Number of Hours: 672

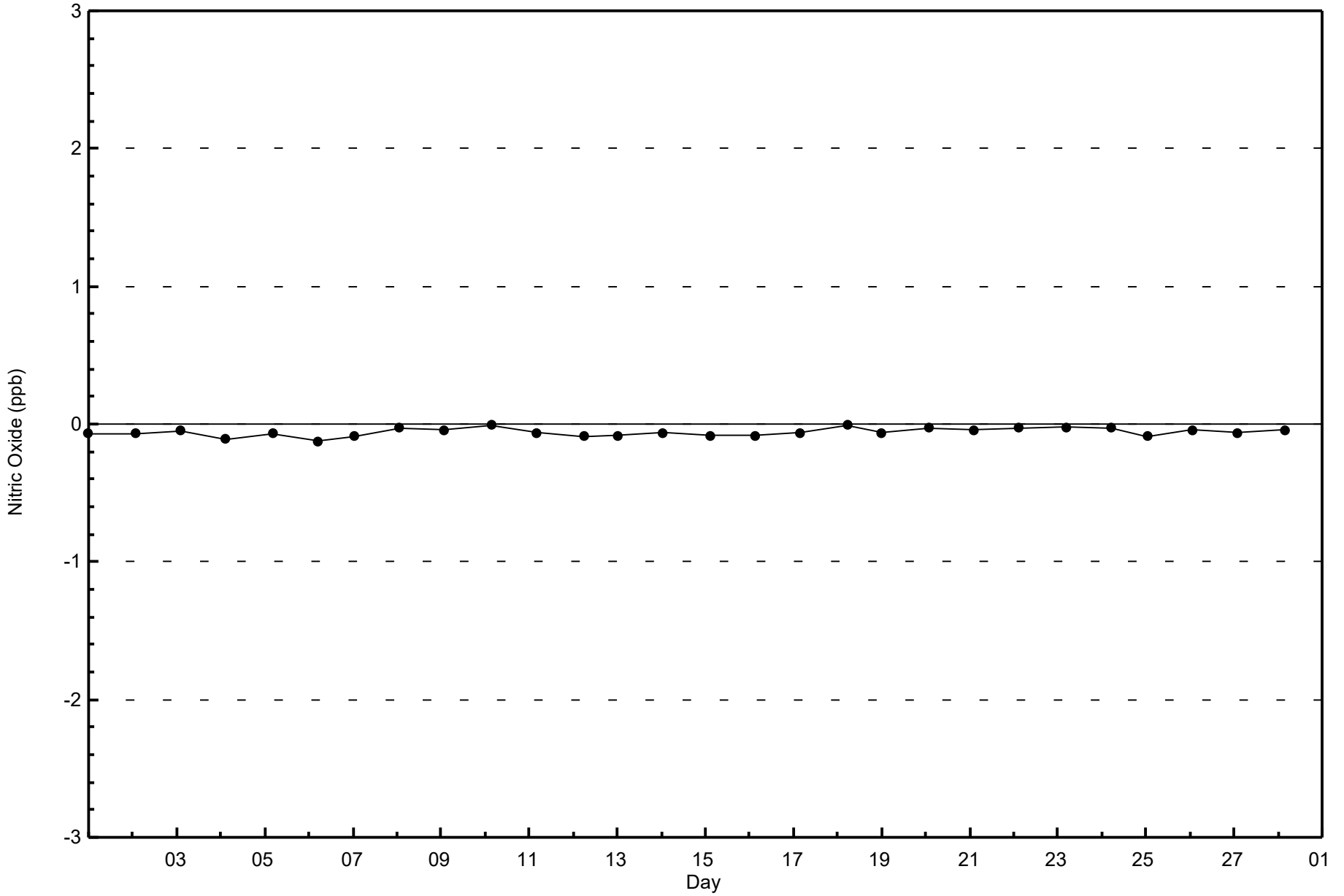


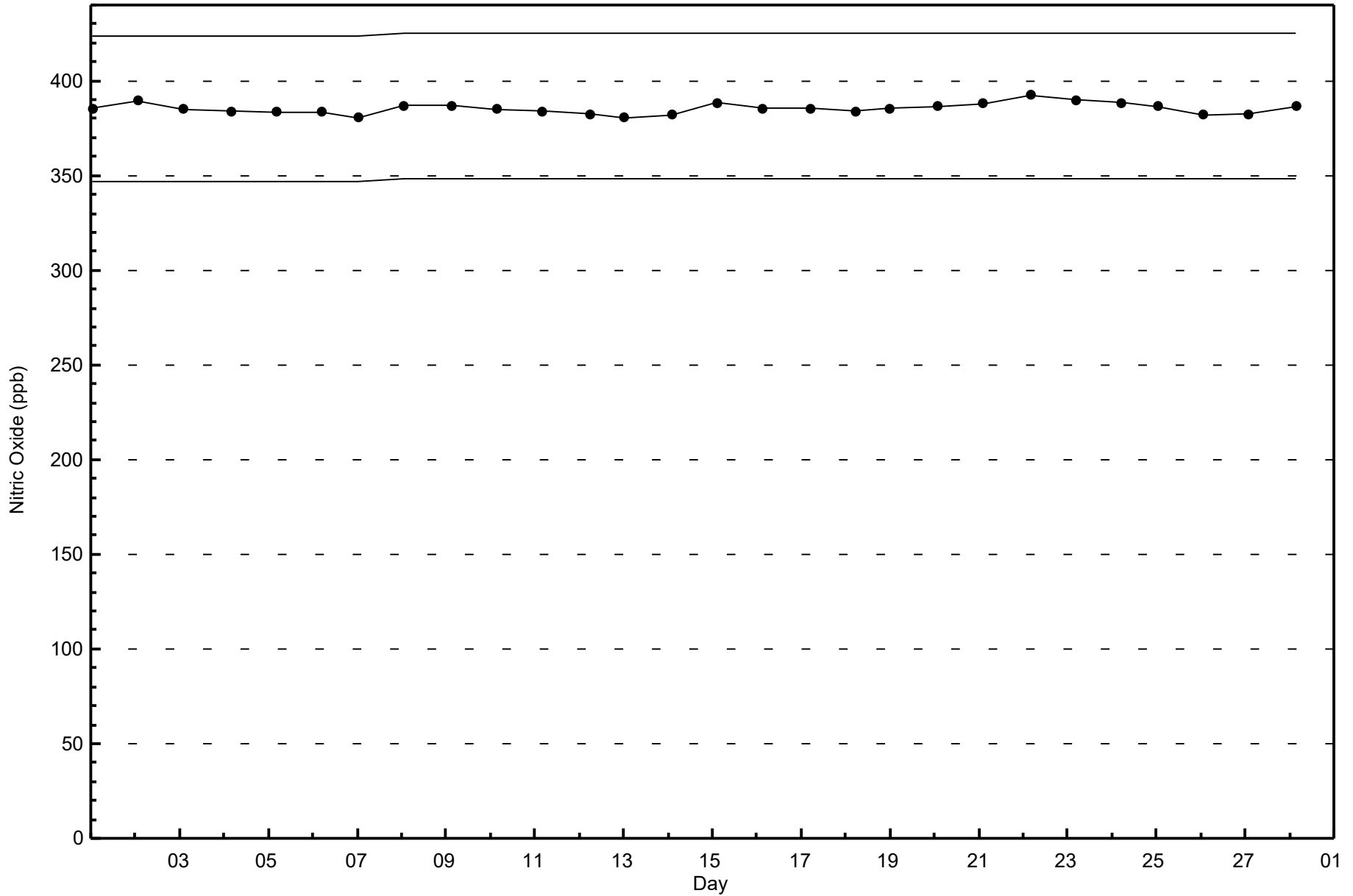
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitric Oxide (NO) - ppb  
Athabasca Valley











Wood Buffalo Environmental Association

Summary of Hour Averages

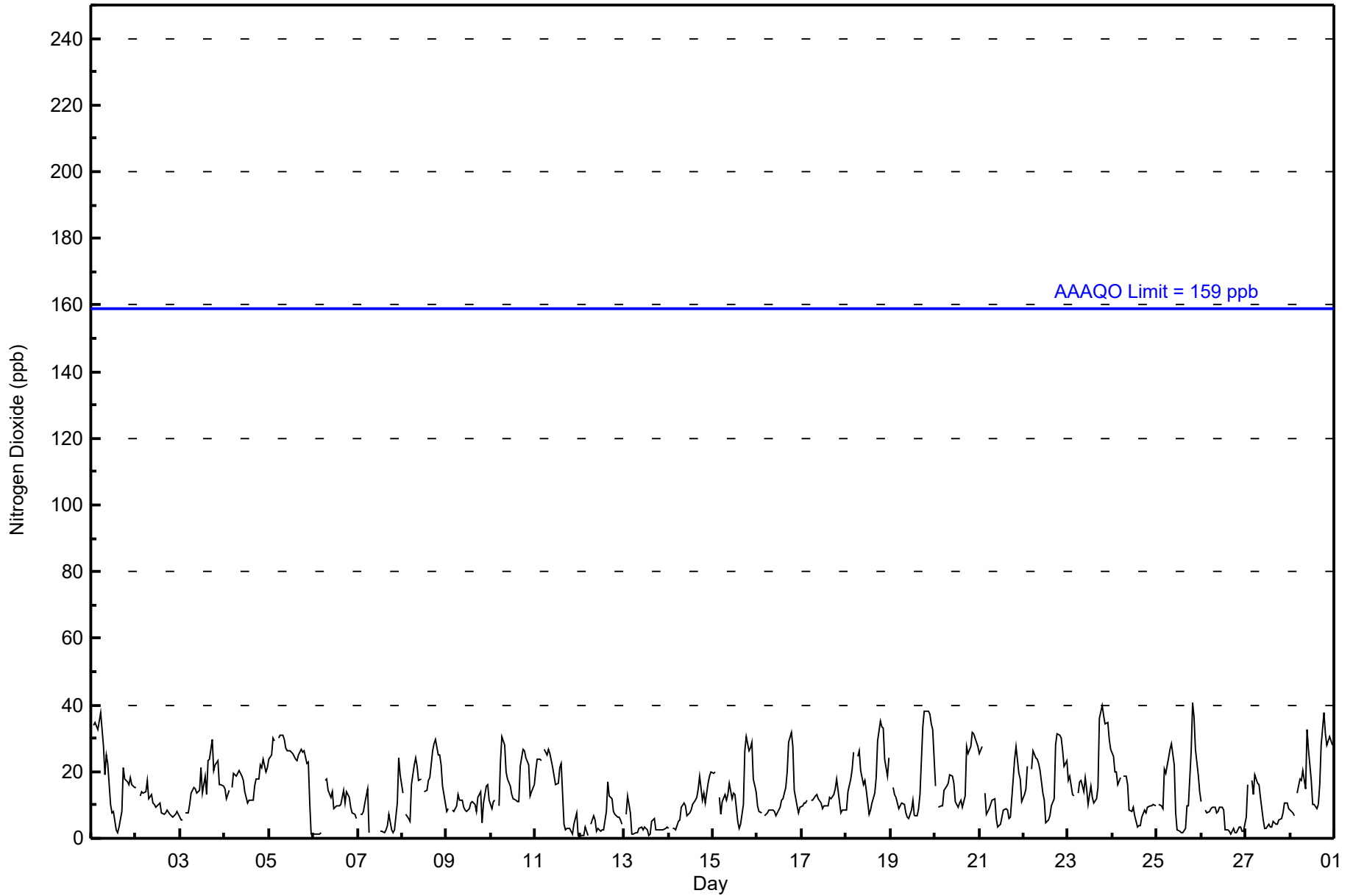
Nitrogen Dioxide (NO<sub>2</sub>) - ppb

Athabasca Valley - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 40.5 ppb on Feb 25 20:00	Maximum Daily Average: 24.7 ppb on Feb 5		Hours of Data:	638
Minimum Value: 0.7 ppb on Feb 12 03:00	Minimum Daily Average: 3.5 ppb on Feb 13		Hours of Missing Data:	34
Maximum Diurnal Average: 19.4 ppb at hour 19	Minimum Diurnal Average: 9.0 ppb at hour 15		Hours of Calibration:	33
Monthly Average: 14.02 ppb	Percentiles: P <sub>1</sub> = 1.2 P <sub>10</sub> = 3.1 Q <sub>1</sub> = 7.7 Median = 11.8 Q <sub>3</sub> = 19.4 P <sub>90</sub> = 27.0 P <sub>99</sub> = 37.5		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-Feb	Z	33.8	34.8	32.5	35.0	37.6	27.6	18.9	25.2	22.5	10.1	7.8	8.2	2.4	1.8	3.3	8.1	21.2	17.9	16.9	16.2	18.2	16.3	15.4	18.8	37.6																							
2-Feb	15.2	Z	12.8	13.8	13.7	14.1	17.5	11.7	13.2	10.7	10.1	9.3	10.2	10.7	7.7	7.1	7.6	8.5	7.2	6.8	6.5	7.3	7.9	7.0	10.3	17.5																							
3-Feb	5.5	5.6	Z	7.6	7.5	10.2	13.4	15.3	14.8	13.6	14.3	21.0	13.6	18.8	13.2	23.1	23.6	29.5	20.3	21.9	23.4	16.0	16.0	15.5	15.8	29.5																							
4-Feb	14.7	11.9	14.3	Z	15.1	19.5	18.6	19.4	20.2	18.6	17.4	14.1	10.8	11.4	11.5	11.4	15.5	18.0	17.6	22.0	21.3	23.7	19.8	21.1	16.9	23.7																							
5-Feb	23.6	25.2	30.2	29.4	Z	30.0	30.9	30.8	29.5	27.1	26.4	26.2	25.9	25.5	23.6	23.1	24.9	26.9	26.0	22.0	26.4	22.6	22.8	10.8	1.3	24.7	30.9																						
6-Feb	1.4	1.3	1.3	1.3	1.7	Z	17.3	18.0	14.5	12.3	13.8	9.0	9.9	9.6	10.2	14.2	10.4	13.8	12.3	9.2	7.5	7.1	5.9	9.2	18.0																								
7-Feb	Z	7.2	7.3	7.9	10.7	14.8	1.8	C	C	C	C	C	2.2	2.1	1.5	2.5	3.7	7.4	2.7	1.9	2.5	10.4	24.0	19.0	7.2	24.0																							
8-Feb	13.7	Z	7.0	6.1	5.0	16.0	22.0	24.3	21.6	17.2	17.9	M	13.9	14.6	17.5	18.2	26.1	28.6	29.6	25.1	25.1	22.0	15.5	10.7	18.1	29.6																							
9-Feb	7.9	9.1	Z	8.6	8.2	9.6	13.2	11.5	11.6	9.5	8.3	8.1	8.9	10.7	11.1	10.1	8.0	12.4	14.0	4.5	10.4	15.8	15.9	11.3	10.4	15.9																							
10-Feb	9.0	11.2	11.3	Z	9.8	22.7	30.4	27.8	20.0	17.8	15.5	13.0	11.7	11.3	10.9	11.0	21.6	26.7	26.3	24.2	22.0	12.7	14.0	16.0	17.3	30.4																							
11-Feb	20.3	23.7	23.8	23.5	Z	26.8	25.2	26.7	25.4	21.3	18.7	16.2	16.4	21.3	22.4	4.4	2.4	3.0	3.0	2.2	1.4	4.4	7.7	0.9	14.8	26.8																							
12-Feb	1.0	0.8	0.7	3.4	1.0	Z	4.3	6.7	5.6	2.2	3.1	2.0	2.6	2.7	7.9	17.1	12.9	11.9	8.0	7.2	6.2	6.3	5.4	4.3	5.4	17.1																							
13-Feb	Z	7.2	12.6	7.5	1.3	1.4	1.6	1.7	3.0	3.5	2.6	3.3	2.4	1.0	1.2	4.9	5.9	2.5	2.5	2.7	2.4	2.6	3.1	3.6	3.5	12.6																							
14-Feb	2.9	Z	2.8	2.8	2.6	4.9	5.3	9.5	10.4	9.6	6.9	7.6	8.3	10.3	11.4	12.3	14.8	18.7	11.6	13.4	10.8	16.4	18.8	19.8	10.1	19.8																							
15-Feb	19.5	19.9	Z	12.2	7.2	11.1	13.3	11.3	13.3	16.5	12.0	13.5	13.2	4.9	3.1	4.3	10.0	26.2	30.3	26.4	27.3	28.7	17.6	13.9	15.5	30.3																							
16-Feb	9.8	7.9	7.7	Z	6.9	7.6	8.4	8.4	8.5	8.1	6.6	7.8	9.5	11.4	11.7	15.3	19.8	29.0	31.6	27.7	14.4	9.9	7.5	9.5	12.4	31.6																							
17-Feb	9.9	10.8	10.7	11.6	Z	11.5	11.3	12.5	13.3	11.8	10.8	8.7	9.7	9.9	9.8	12.1	11.9	13.0	14.9	17.6	11.2	7.6	8.5	8.4	11.2	17.6																							
18-Feb	8.5	13.9	17.8	20.9	25.9	Z	24.4	26.3	20.5	16.1	17.5	14.2	7.1	8.5	10.4	13.7	18.3	29.2	35.0	33.6	33.2	23.8	18.7	24.2	20.1	35.0																							
19-Feb	Z	15.3	13.2	12.1	9.0	9.7	10.4	10.2	7.8	6.2	6.1	8.5	11.4	6.8	6.8	9.0	13.1	33.3	38.2	38.1	38.1	37.3	34.5	32.6	17.7	38.2																							
20-Feb	15.5	Z	9.3	9.6	9.7	14.2	15.5	16.6	19.0	18.6	16.6	11.1	9.2	10.7	11.3	9.4	12.6	27.4	25.5	27.7	31.8	31.4	28.8	27.5	17.8	31.8																							
21-Feb	25.4	27.4	Z	13.5	7.1	9.0	10.2	11.3	11.7	5.8	3.3	4.4	6.4	8.5	9.0	8.5	5.8	6.4	17.7	23.6	27.7	19.6	17.9	11.0	12.7	27.7																							
22-Feb	13.3	14.8	21.7	Z	20.7	26.2	24.3	23.7	22.5	20.3	13.6	11.5	4.7	5.6	6.8	9.8	11.9	27.9	31.2	31.1	29.9	26.3	21.8	23.1	19.2	31.2																							
23-Feb	17.5	18.8	13.2	12.9	Z	13.5	16.9	17.2	14.1	18.1	14.7	10.1	15.7	12.3	10.6	11.7	15.4	36.2	40.0	36.7	34.3	34.6	29.7	26.6	20.5	40.0																							
24-Feb	24.4	20.1	19.8	16.0	18.1	Z	18.5	18.8	16.0	8.6	7.9	9.5	6.6	3.6	3.9	4.0	6.3	8.5	7.5	9.2	9.9	9.7	10.3	9.7	11.6	24.4																							
25-Feb	Z	10.2	9.6	8.9	20.7	19.3	24.0	26.9	28.3	22.0	7.5	2.4	2.0	1.9	1.7	3.1	9.9	9.6	26.3	40.5	36.4	26.8	19.1	13.9	16.1	40.5																							
26-Feb	11.0	Z	8.6	7.6	8.0	8.7	9.4	9.3	7.7	8.1	9.2	9.5	8.4	2.5	2.5	2.1	1.4	2.9	1.9	1.7	3.6	3.2	2.0	2.1	5.7	11.0																							
27-Feb	6.5	16.0	Z	17.4	13.1	19.0	16.7	16.0	12.2	5.7	3.0	2.8	4.1	3.5	3.4	4.9	4.4	4.4	5.7	6.1	7.5	10.6	10.5	9.0	8.8	19.0																							
28-Feb	8.6	7.7	6.8	Z	13.7	18.0	17.5	20.2	14.7	32.8	26.5	17.3	10.3	10.0	8.8	10.3	16.3	27.9	37.6	31.5	28.0	30.6	29.4	27.8	19.7	37.6																							
																								12.4	13.9	12.9	12.5	11.3	15.6	16.1	16.7	15.7	14.2	11.9	10.3	9.4	9.0	9.0	9.9	12.4	18.1	19.4	19.3	18.3	17.4	15.7	14.0	Diurnal Average	
																								25.4	33.8	34.8	32.5	35.0	37.6	30.9	30.8	29.5	32.8	26.5	26.2	25.9	25.5	23.6	23.1	26.1	36.2	40.0	40.5	38.1	37.3	34.5	32.6	Diurnal Maximum	

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  
Athabasca Valley - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	494	77.43	77.43
21 - 40	143	22.41	99.84
41 - 80	1	0.16	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Athabasca Valley - February 2023**

<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	76	10	5	6	9	8	106	36	13	13	17	28	16	19	23	109	494
21 - 40	22	2	1	3	5	3	12	11	4	9	8	6	12	4	7	34	143
11 - 80	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
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>	<b>98</b>	<b>12</b>	<b>6</b>	<b>9</b>	<b>14</b>	<b>11</b>	<b>119</b>	<b>47</b>	<b>17</b>	<b>22</b>	<b>25</b>	<b>34</b>	<b>28</b>	<b>23</b>	<b>30</b>	<b>143</b>	<b>638</b>

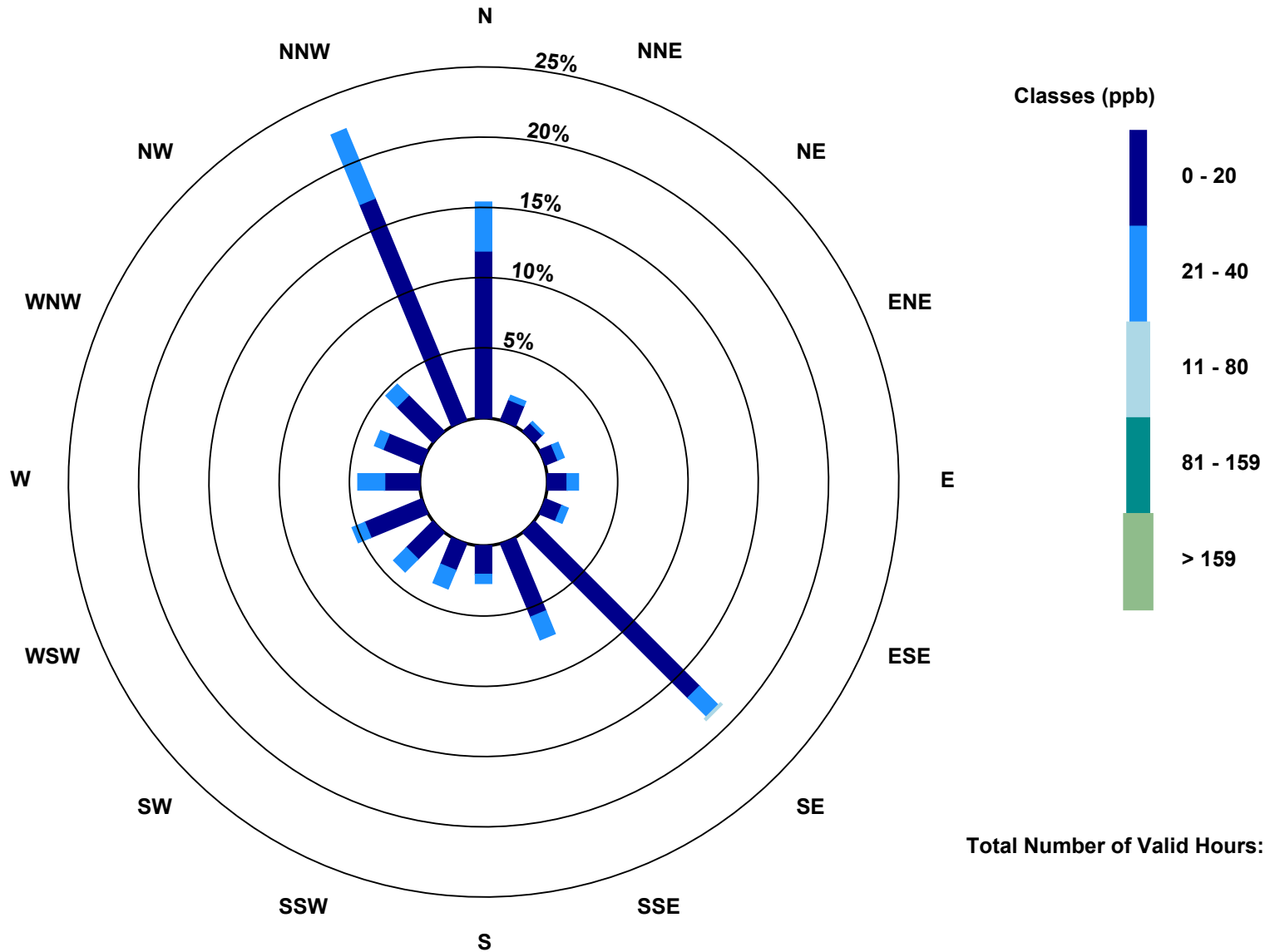
Total Number of Valid Hours: 638

Total Number of Hours: 672

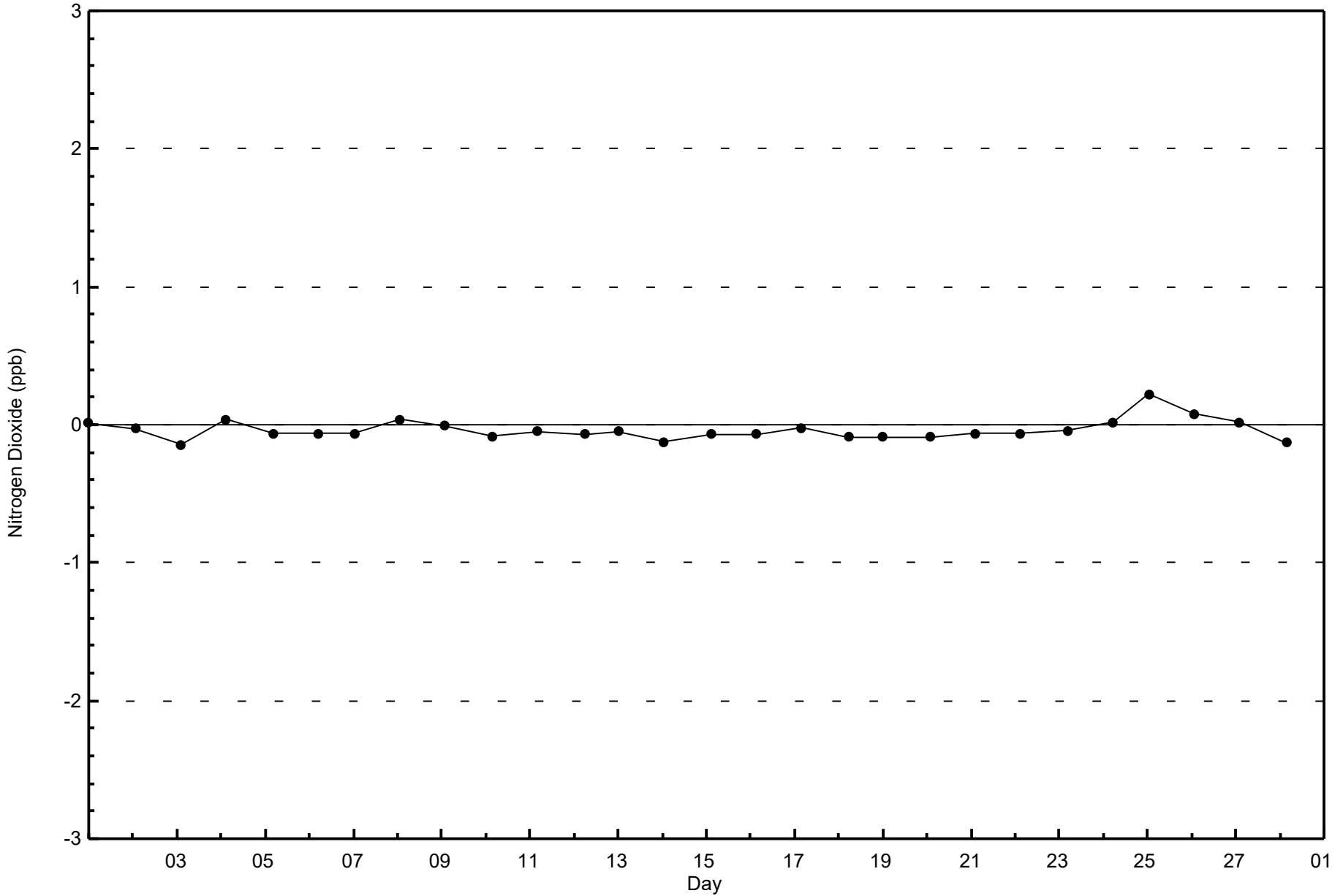


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

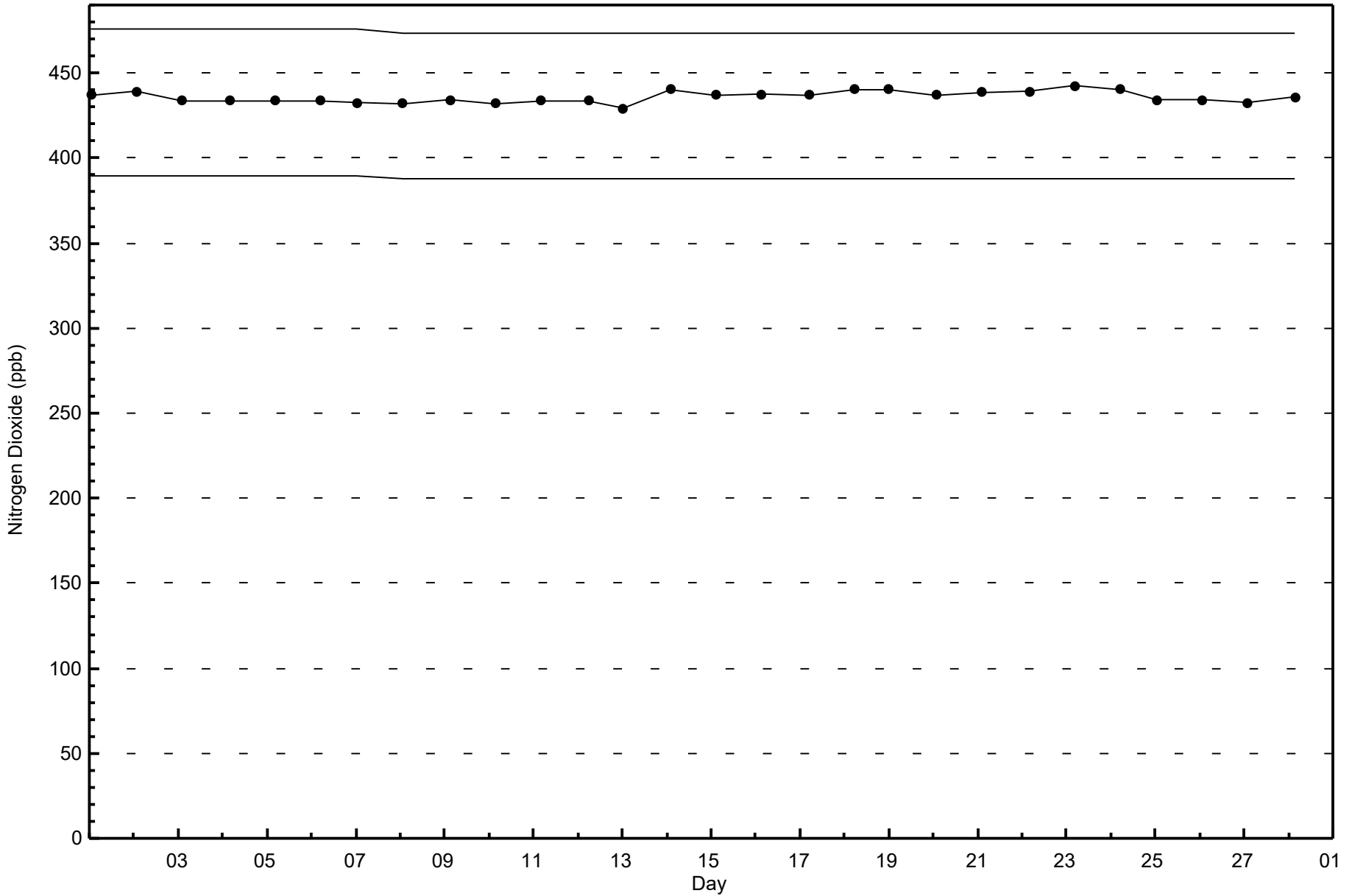
Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Athabasca Valley



Total Number of Valid Hours: 638





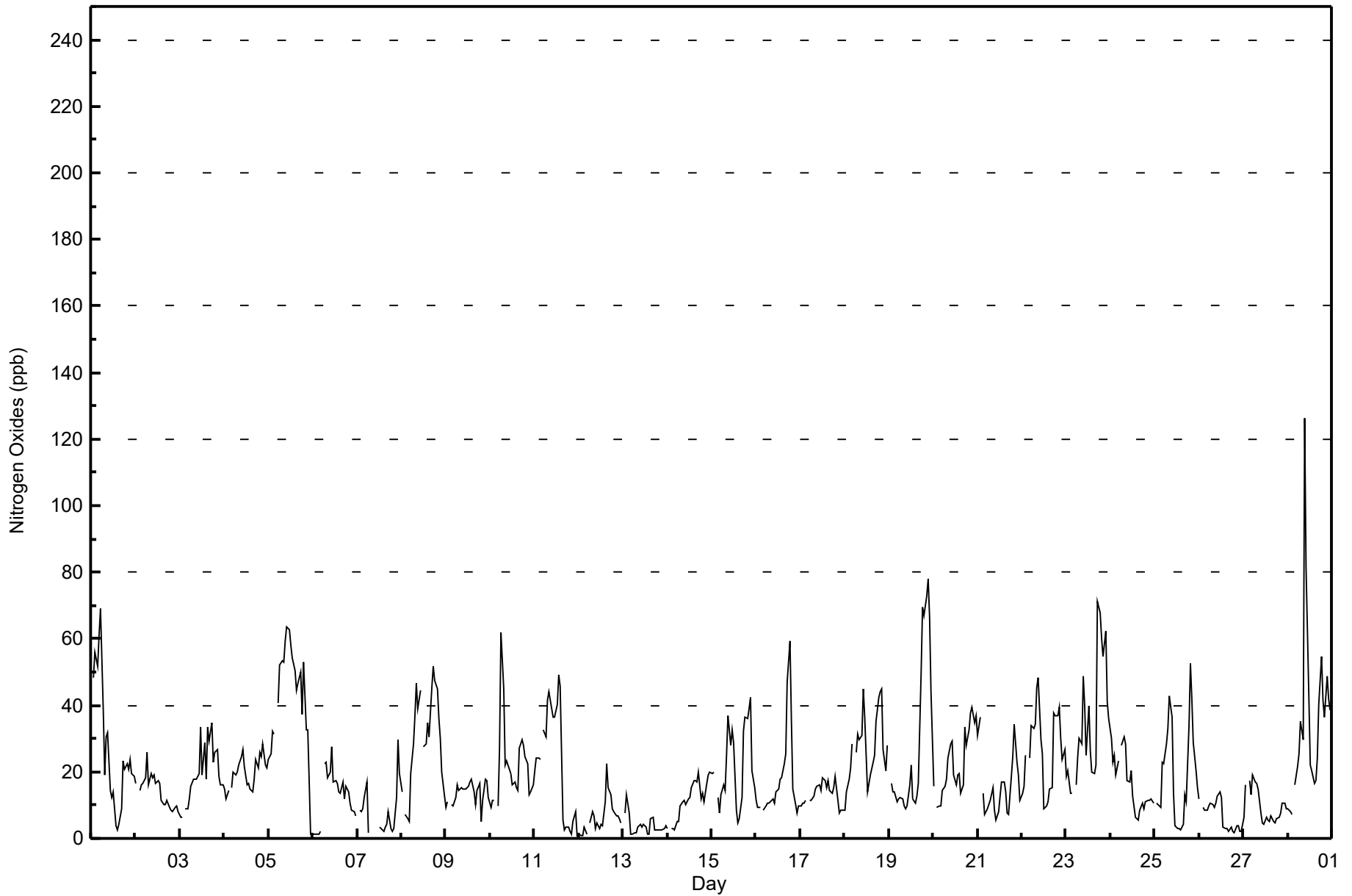




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Athabasca Valley - February 2023**

Maximum Value: 126.3 ppb on Feb 28 10:00      Maximum Daily Average: 42.4 ppb on Feb 5																						Hours in Service:	672																								
Minimum Value: 0.8 ppb on Feb 12 03:00      Minimum Daily Average: 3.8 ppb on Feb 13																						Hours of Data:	638																								
Maximum Diurnal Average: 27.5 ppb at hour 10      Minimum Diurnal Average: 13.3 ppb at hour 1																						Hours of Missing Data:	34																								
Monthly Average: 19.72 ppb      Percentiles: P <sub>1</sub> = 1.3 P <sub>10</sub> = 4.0 Q <sub>1</sub> = 9.4 Median = 16.0 Q <sub>3</sub> = 26.2 P <sub>90</sub> = 40.4 P <sub>99</sub> = 68.4																						Hours of Calibration:	33																								
																						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-Feb	Z	48.5	56.1	51.6	60.9	68.9	38.2	19.1	30.4	32.0	14.6	12.3	13.9	3.7	2.5	4.1	8.8	23.4	20.8	22.5	20.6	23.6	19.6	18.5	26.7	68.9																					
2-Feb	16.4	Z	14.3	15.9	16.5	18.0	26.0	16.1	19.4	18.4	19.2	16.5	17.6	16.3	11.3	10.3	10.2	11.6	9.5	8.7	8.1	9.1	9.6	8.1	14.2	26.0																					
3-Feb	6.5	6.5	Z	8.8	8.8	12.0	15.5	17.6	18.0	17.8	19.5	33.3	19.2	28.8	17.7	33.3	29.1	34.6	22.7	25.9	26.8	18.7	16.2	16.0	19.7	34.6																					
4-Feb	15.0	12.0	14.4	Z	15.2	20.0	18.9	19.7	21.9	24.4	26.7	21.8	16.2	16.5	15.0	14.1	17.8	23.5	21.1	25.8	24.6	28.5	22.0	21.2	19.8	28.5																					
5-Feb	23.7	25.4	32.1	31.4	Z	40.5	52.2	53.5	53.0	59.4	63.6	62.7	58.3	54.3	50.3	44.6	46.5	49.8	37.3	52.8	32.4	32.6	17.3	1.3	42.4	63.6																					
6-Feb	1.4	1.3	1.4	1.4	1.9	Z	22.5	22.9	18.1	20.1	27.7	16.8	17.3	16.7	14.0	13.5	17.1	12.0	15.9	13.9	10.6	8.6	8.0	6.7	12.6	27.7																					
7-Feb	Z	8.5	8.2	8.8	12.3	17.0	1.8	C	C	C	C	C	3.2	2.9	2.1	3.2	4.2	8.2	3.0	2.2	2.8	12.2	29.6	19.6	8.3	29.6																					
8-Feb	13.8	Z	7.0	6.1	5.0	19.4	28.5	37.0	46.5	39.1	44.5	M	27.5	28.6	34.7	30.7	45.2	51.6	47.4	45.1	36.0	30.2	19.8	12.7	29.8	51.6																					
9-Feb	9.4	10.8	Z	10.0	9.7	12.2	16.3	14.5	15.3	14.8	14.7	14.9	15.6	16.9	17.8	13.9	10.0	14.4	16.4	5.2	11.5	17.8	17.4	12.3	13.6	17.8																					
10-Feb	9.2	11.5	11.4	Z	9.9	27.1	61.8	44.8	22.1	23.4	20.9	19.4	16.2	16.8	15.4	14.6	27.0	29.9	27.8	24.6	22.3	13.0	14.0	16.0	21.7	61.8																					
11-Feb	20.5	24.0	24.0	23.9	Z	32.5	30.3	41.6	44.3	39.1	36.6	36.2	40.3	49.3	45.8	5.5	2.8	3.4	3.2	2.3	1.4	5.2	8.1	1.0	22.7	49.3																					
12-Feb	1.1	0.9	0.8	3.5	1.2	Z	4.7	7.9	6.8	3.1	4.5	3.0	4.1	4.0	10.9	22.7	15.4	13.1	8.9	8.1	6.9	6.9	6.0	4.8	6.5	22.7																					
13-Feb	Z	7.7	13.2	7.6	1.4	1.5	1.8	1.9	3.5	4.0	3.2	4.1	3.3	1.3	1.4	5.8	6.5	2.6	2.5	2.7	2.5	2.7	3.1	3.6	3.8	13.2																					
14-Feb	2.9	Z	2.8	2.8	2.6	4.9	5.3	9.6	11.2	11.5	10.1	12.0	12.2	15.3	17.5	17.4	17.1	19.8	11.8	13.5	10.9	16.5	19.0	20.0	11.6	20.0																					
15-Feb	19.6	20.0	Z	12.3	7.4	13.1	16.2	14.4	25.0	37.0	27.8	32.4	28.8	8.4	4.8	5.9	12.4	32.4	36.4	36.0	39.1	42.5	20.3	15.2	22.1	42.5																					
16-Feb	11.4	9.5	9.2	Z	8.7	9.6	10.4	10.5	11.3	11.8	10.6	14.0	14.8	17.6	18.2	22.5	25.4	47.0	59.5	35.4	14.6	10.0	7.5	9.6	17.4	59.5																					
17-Feb	9.9	10.8	10.8	11.6	Z	11.6	11.4	12.7	14.9	15.8	16.0	14.6	18.1	17.3	15.1	17.2	14.3	13.7	15.2	18.4	11.3	7.6	8.5	8.4	13.3	18.4																					
18-Feb	8.5	13.9	17.8	21.2	28.3	Z	25.8	31.4	29.8	30.8	45.1	36.3	14.0	16.5	19.2	22.8	25.1	35.3	42.5	44.3	44.9	26.8	20.3	28.0	27.3	45.1																					
19-Feb	Z	16.7	13.8	13.8	10.9	12.0	12.3	11.7	9.9	8.8	9.8	16.1	22.0	11.7	10.6	12.8	16.5	49.4	69.4	67.0	72.8	78.0	66.6	44.3	28.6	78.0																					
20-Feb	15.6	Z	9.3	9.6	9.7	14.2	15.6	17.7	24.2	28.3	29.3	18.9	16.0	18.9	19.5	13.6	16.1	33.3	28.1	32.5	37.5	39.5	34.8	37.0	22.6	39.5																					
21-Feb	30.9	36.6	Z	13.6	7.1	9.0	10.3	11.6	15.4	8.6	5.6	8.2	12.7	16.8	16.8	13.8	7.5	7.1	18.7	24.5	34.2	22.7	19.1	11.6	15.8	36.6																					
22-Feb	13.6	15.5	25.0	Z	24.0	34.0	33.0	34.2	45.4	48.3	29.5	25.6	8.9	9.9	11.2	14.8	15.2	37.6	36.8	37.0	39.5	30.3	23.8	26.8	26.9	48.3																					
23-Feb	18.6	20.3	13.7	13.6	Z	16.1	24.1	30.1	28.5	48.8	39.8	25.1	39.9	26.3	19.7	19.6	21.8	71.1	67.6	60.1	54.9	62.2	41.1	36.1	34.7	71.1																					
24-Feb	30.1	22.8	25.1	18.9	23.4	Z	28.1	30.7	28.6	17.5	17.0	20.4	12.7	6.2	6.1	5.6	8.4	10.5	8.9	11.0	11.4	11.3	11.8	10.5	16.4	30.7																					
25-Feb	Z	10.7	9.9	9.2	23.0	22.5	28.6	32.9	42.9	36.6	13.5	3.8	3.1	2.9	2.5	4.2	13.3	11.2	33.8	52.3	41.8	28.9	20.4	15.2	20.1	52.3																					
26-Feb	11.9	Z	9.2	8.4	8.6	9.6	10.6	10.4	9.4	10.7	12.9	13.8	12.1	3.4	3.2	2.9	2.1	3.5	2.1	1.9	3.9	3.6	2.1	2.1	6.9	13.8																					
27-Feb	6.5	16.0	Z	17.5	13.2	19.2	16.9	16.7	14.7	7.6	4.5	4.3	6.4	5.6	5.0	6.8	5.3	4.7	6.0	6.3	7.8	10.7	10.5	9.0	9.6	19.2																					
28-Feb	8.8	8.2	7.0	Z	15.9	21.5	25.3	35.3	29.9	126.3	81.3	42.3	22.2	20.3	16.4	17.5	24.1	40.2	54.5	41.6	36.4	48.7	42.1	38.4	35.0	126.3																					
																						13.3	15.6	14.6	14.0	13.6	19.4	21.2	22.5	23.7	27.5	24.0	20.3	17.7	16.2	15.2	14.8	16.6	24.8	26.0	25.8	23.8	23.2	19.2	16.2	Diurnal Average	
																						30.9	48.5	56.1	51.6	60.9	61.8	53.5	53.0	126.3	81.3	62.7	58.3	54.3	50.3	44.6	46.5	71.1	69.4	67.0	72.8	78.0	66.6	44.3	Diurnal Maximum		
Z - zerspan      C - Calibration      M - Maintenance																																															





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Athabasca Valley - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	420	65.83	65.83
21 - 40	155	24.29	90.13
41 - 80	61	9.56	99.69
81 - 159	1	0.16	99.84
> 159	0	0.00	99.84

Total Number of Valid Hours: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Athabasca Valley - February 2023**

<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	68	9	4	4	8	7	96	30	10	12	12	23	14	14	15	94	420
21 - 40	23	3	1	0	3	4	15	12	5	8	10	8	9	6	13	35	155
11 - 80	7	0	0	4	3	0	8	5	2	2	3	3	5	3	2	14	61
81 - 159	0	0	1	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>	98	12	6	8	14	11	119	47	17	22	25	34	28	23	30	143	637

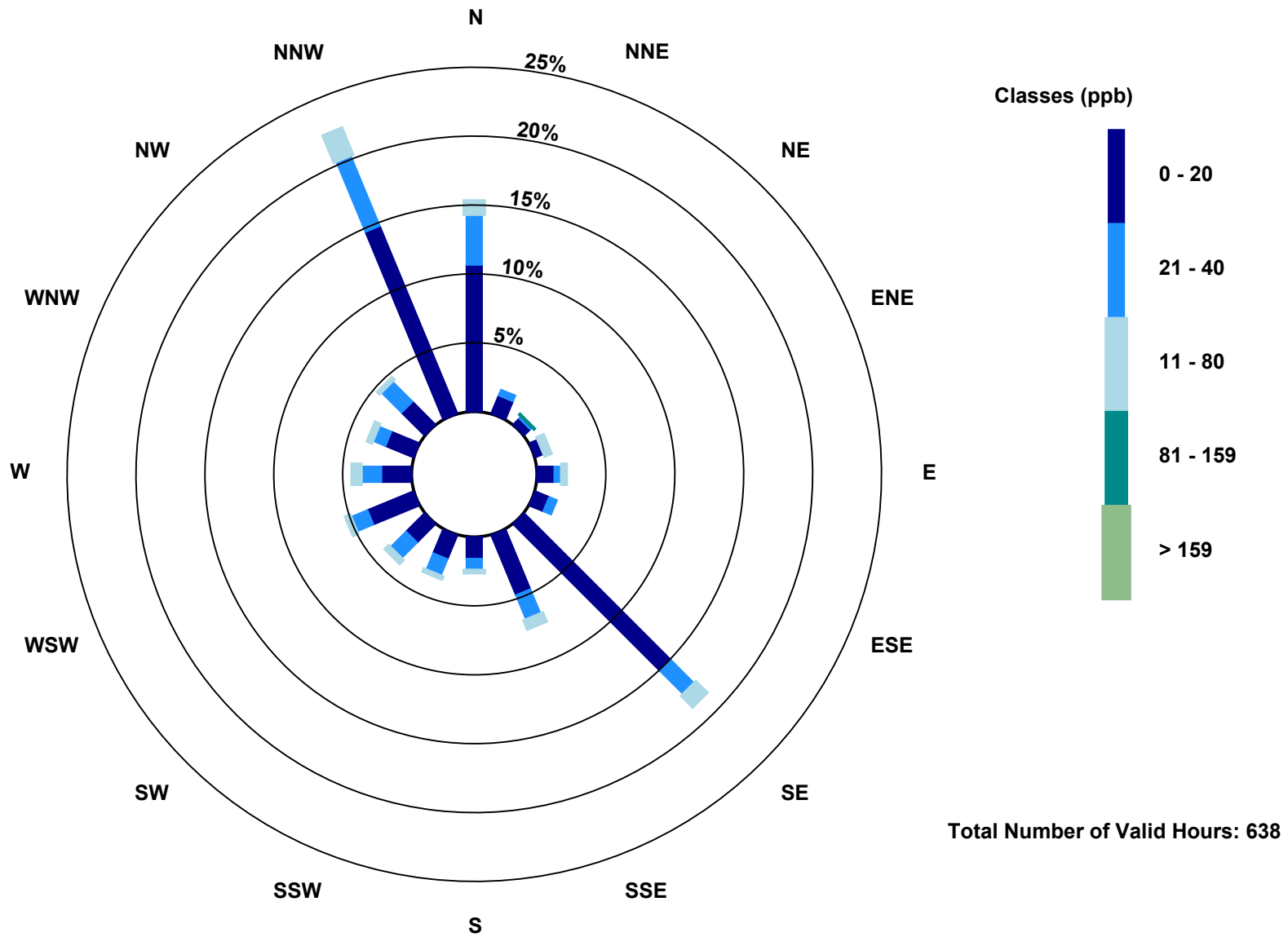
Total Number of Valid Hours: 638

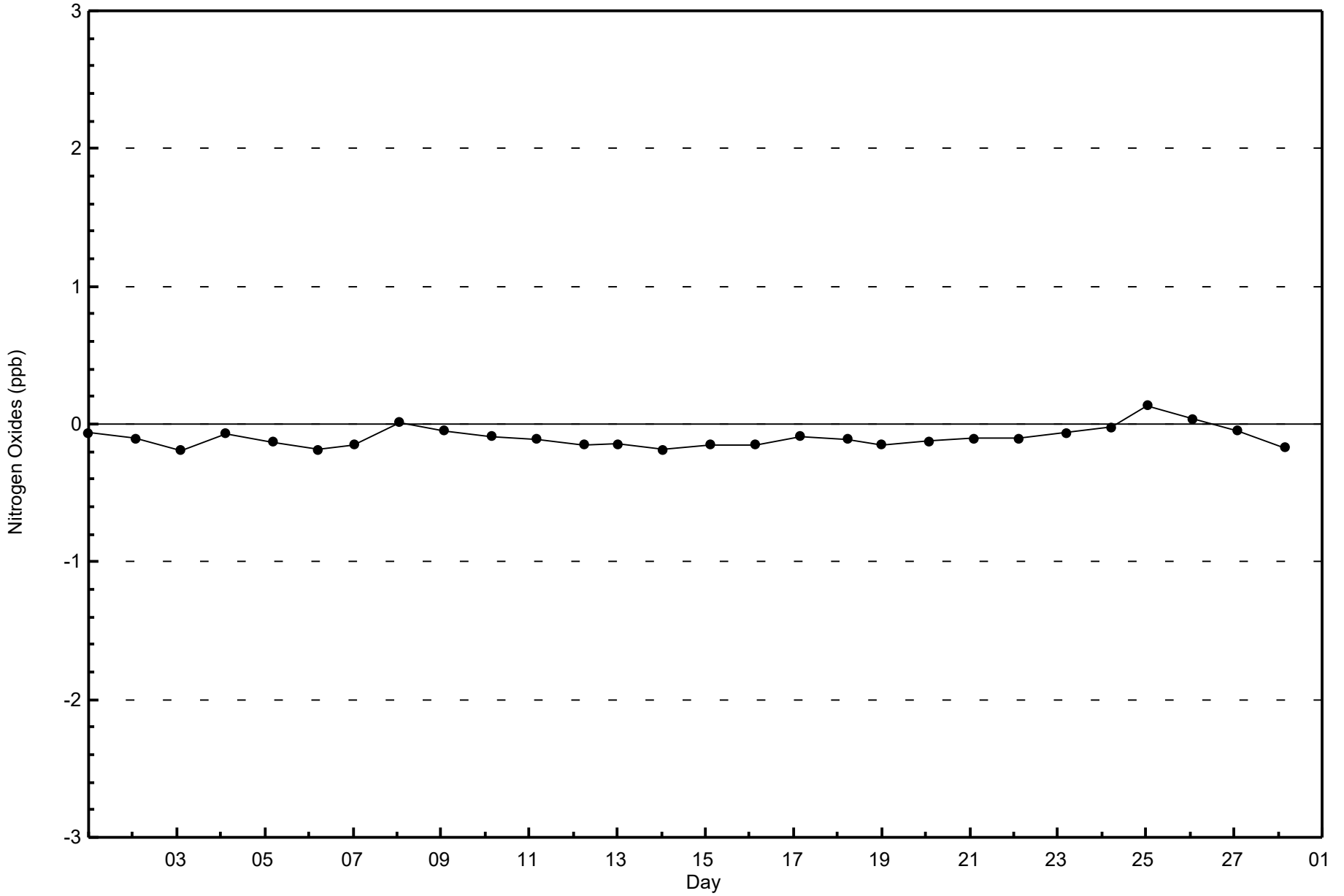
Total Number of Hours: 672

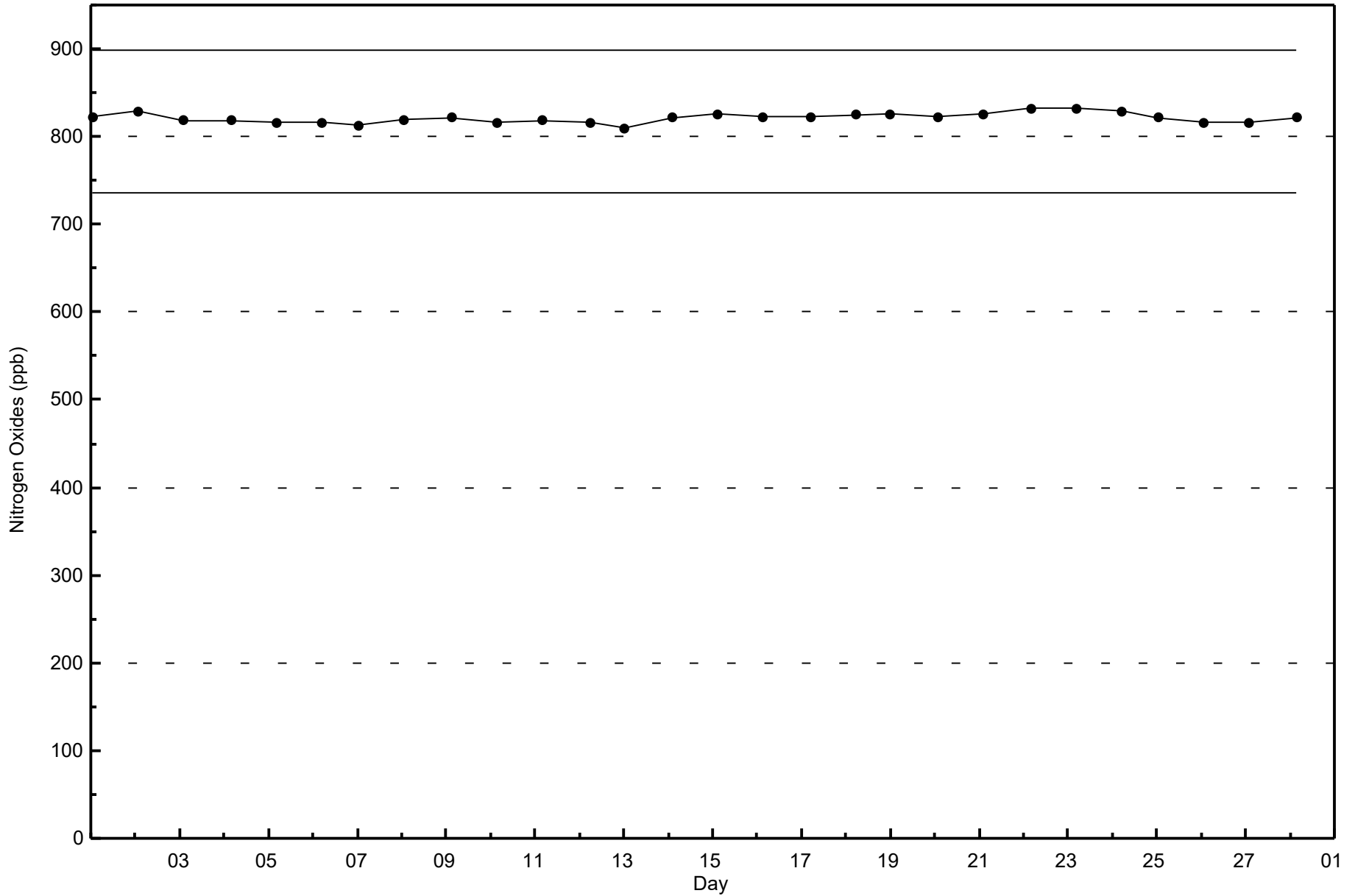


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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











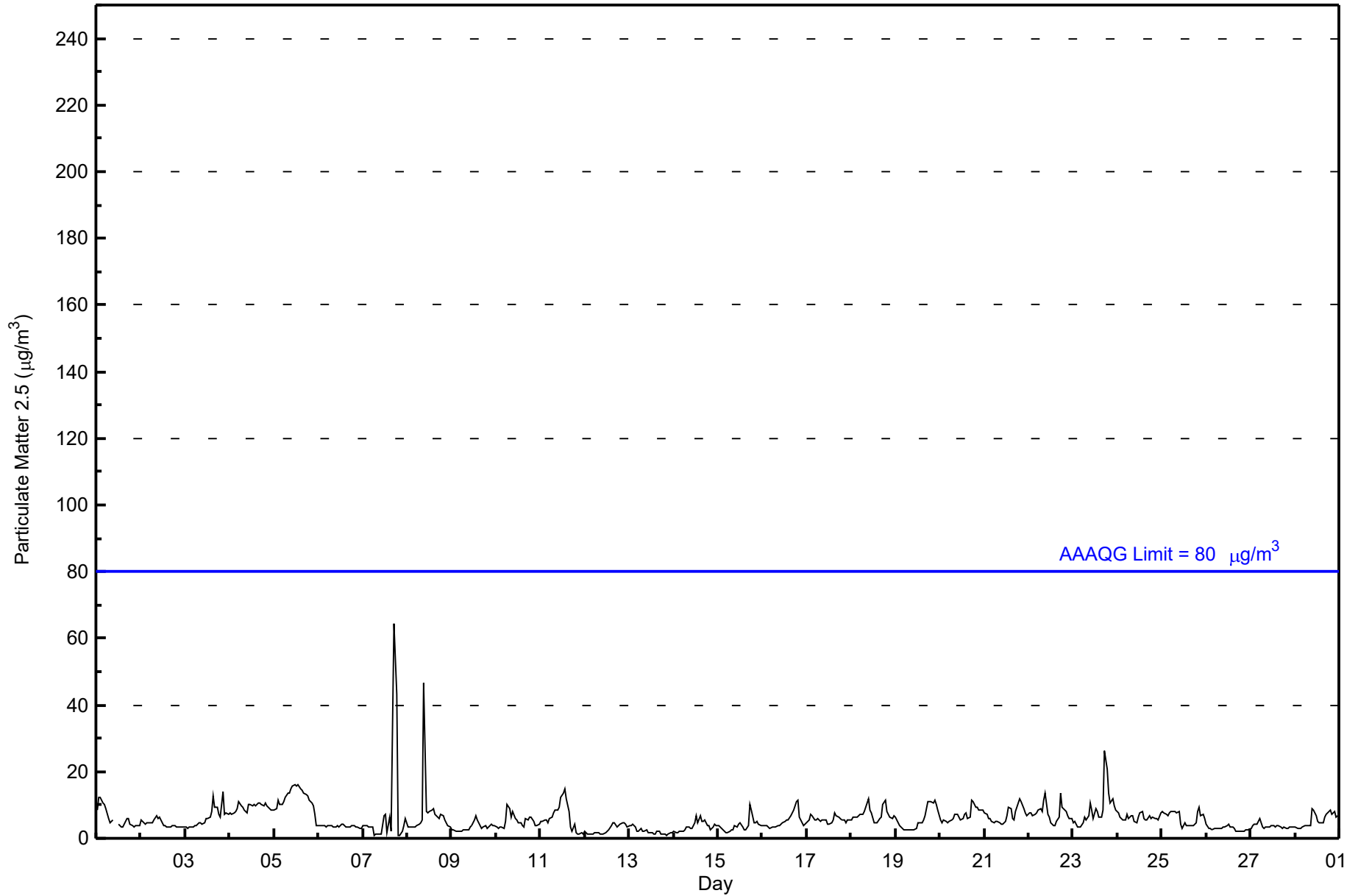
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Athabasca Valley - February 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 64.5 µg/m <sup>3</sup> on Feb 7 18:00 Minimum Value: 0.8 µg/m <sup>3</sup> on Feb 7 07:00 Maximum Diurnal Average: 9.5 µg/m <sup>3</sup> at hour 18 Monthly Average: 5.83 µg/m <sup>3</sup>		Maximum Daily Average: 12.1 µg/m <sup>3</sup> on Feb 5 Minimum Daily Average: 2.1 µg/m <sup>3</sup> on Feb 13 Minimum Diurnal Average: 4.6 µg/m <sup>3</sup> at hour 5 Percentiles: P <sub>1</sub> = 1.1 P <sub>10</sub> = 2.3 Q <sub>1</sub> = 3.4 Median = 4.8 Q <sub>3</sub> = 7.2 P <sub>90</sub> = 10.0 P <sub>99</sub> = 16.0		Hours in Service: 672 Hours of Data: 670 Hours of Missing Data: 2 Hours of Calibration: 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-Feb	8.6	12.3	12.4	10.7	10.1	8.9	6.0	4.6	5.0	5.7	C	C	4.1	3.2	3.3	4.4	5.8	5.8	4.3	3.9	3.6	3.8	4.0	4.0	6.1	12.4	
2-Feb	5.4	5.1	4.4	4.8	4.6	4.7	4.8	5.5	6.9	5.9	6.2	5.5	3.8	3.6	3.5	3.5	3.6	3.7	3.8	3.6	3.4	3.4	3.4	3.4	3.3	4.4	6.9
3-Feb	3.2	3.2	3.2	3.3	3.4	3.6	4.0	4.5	4.5	4.4	4.7	6.1	5.9	6.3	8.1	12.8	9.4	9.4	7.1	6.3	13.9	7.2	7.8	7.4	6.2	13.9	
4-Feb	7.6	7.1	7.6	8.2	8.9	10.9	9.8	9.4	8.5	7.8	10.2	10.0	9.6	10.2	9.8	10.6	10.7	10.0	9.6	10.6	9.6	9.5	8.7	8.4	9.3	10.9	
5-Feb	8.6	9.0	11.6	10.2	10.1	11.1	12.4	13.5	13.6	14.7	15.6	16.0	15.9	16.0	14.8	14.4	13.7	13.2	12.7	11.5	10.5	9.9	7.2	3.7	12.1	16.0	
6-Feb	3.9	3.9	3.7	3.7	3.5	3.6	3.8	3.9	3.5	3.4	3.6	3.6	4.1	4.2	3.6	3.3	3.4	3.4	3.6	4.0	3.5	3.5	3.2	3.1	3.6	4.2	
7-Feb	3.6	3.8	3.9	3.5	3.5	3.4	0.8	1.1	1.1	1.1	1.4	6.6	7.3	1.7	6.5	2.0	33.7	64.5	43.2	0.8	1.0	2.2	4.0	5.9	8.6	64.5	
8-Feb	3.4	3.4	3.5	3.5	3.3	3.9	4.3	4.8	5.5	46.8	8.1	7.5	8.0	8.3	9.1	7.3	6.4	5.8	7.3	6.8	5.6	4.8	3.9	3.2	7.3	46.8	
9-Feb	2.6	2.5	2.3	2.1	2.0	2.0	2.4	2.6	2.6	2.7	3.4	3.6	5.5	6.6	5.5	3.8	2.9	3.5	3.7	2.9	3.4	4.0	3.9	3.8	3.3	6.6	
10-Feb	3.5	3.1	3.5	3.2	3.1	5.2	10.3	8.9	6.5	7.9	6.0	5.3	4.6	4.7	4.0	3.5	6.1	5.5	6.4	6.5	5.3	3.7	3.8	4.3	5.2	10.3	
11-Feb	4.9	5.0	5.4	5.7	4.9	6.0	6.3	7.6	8.5	8.6	9.5	12.2	13.7	14.7	11.9	8.2	3.3	2.1	4.1	1.7	1.2	1.4	1.8	1.4	6.3	14.7	
12-Feb	2.1	1.2	1.1	1.4	1.4	1.6	1.6	1.8	1.4	1.2	1.4	1.6	2.1	2.4	3.7	4.7	4.5	3.4	4.0	4.4	4.7	4.8	4.0	3.6	2.7	4.8	
13-Feb	3.6	3.8	4.4	3.3	2.0	2.2	3.0	2.0	2.1	2.3	1.8	1.6	1.6	1.4	1.5	2.0	2.2	1.3	1.3	1.0	1.2	1.6	1.9	2.1	4.4		
14-Feb	2.1	1.7	1.7	2.0	2.0	1.9	2.5	3.3	3.4	3.0	3.1	4.5	6.7	4.7	6.6	5.1	5.3	5.4	3.6	3.6	2.6	3.3	4.2	4.0	3.6	6.7	
15-Feb	3.9	3.5	3.0	2.3	1.9	1.8	2.2	2.4	2.8	3.9	3.5	4.1	4.8	3.2	2.4	2.6	3.7	10.0	8.5	4.6	4.8	5.2	4.4	4.0	3.9	10.0	
16-Feb	4.0	3.7	3.6	3.3	3.1	3.3	3.3	3.4	3.8	3.8	4.1	4.5	5.0	5.7	5.4	6.6	7.5	8.4	11.1	11.6	6.3	4.8	3.9	4.1	5.2	11.6	
17-Feb	4.9	5.7	7.2	6.9	5.6	5.3	5.8	5.2	5.6	5.4	5.3	4.2	4.2	4.7	5.7	7.5	6.8	6.3	5.9	5.4	5.5	4.7	5.4	5.5	5.6	7.5	
18-Feb	5.6	6.2	6.3	6.3	6.9	7.1	7.1	7.9	9.3	12.1	8.4	7.7	4.7	4.5	4.9	5.7	6.5	10.1	11.4	8.1	7.3	6.3	5.8	6.7	7.2	12.1	
19-Feb	6.3	4.8	4.0	3.2	2.5	2.4	2.7	2.4	2.4	2.4	2.6	2.9	4.5	4.7	4.5	5.6	6.8	11.2	11.0	10.9	10.6	11.4	10.0	8.4	5.8	11.4	
20-Feb	5.4	4.8	5.4	5.0	4.6	5.1	5.6	6.1	7.4	7.1	6.5	5.5	5.8	7.3	7.8	5.9	6.2	11.5	11.0	9.4	9.4	8.3	8.5	8.4	7.0	11.5	
21-Feb	7.5	7.0	5.7	6.1	5.1	4.8	5.2	5.0	4.8	4.3	4.2	5.1	6.8	9.4	9.0	6.1	5.4	7.9	10.8	11.8	11.1	9.0	7.6	6.6	6.9	11.8	
22-Feb	7.4	7.4	6.8	7.1	7.6	8.3	8.8	8.1	11.3	13.4	7.2	6.5	4.7	3.7	3.9	5.3	6.3	13.5	9.4	8.5	7.9	6.8	6.0	6.1	7.6	13.5	
23-Feb	4.7	5.0	3.6	3.3	3.4	4.8	6.5	5.5	6.9	10.6	8.3	6.0	9.1	7.9	6.4	6.4	8.3	26.4	20.9	13.4	10.8	11.9	9.6	8.5	8.7	26.4	
24-Feb	7.5	6.5	5.9	5.5	5.7	7.1	5.8	7.0	6.9	5.0	4.8	6.4	7.7	7.9	6.0	5.4	5.6	6.6	5.8	6.4	6.1	5.9	5.6	7.5	6.3	7.9	
25-Feb	8.2	7.8	7.1	6.7	7.5	8.0	8.1	8.2	7.5	8.1	4.3	3.2	4.5	4.0	3.7	3.9	3.9	3.7	4.8	8.3	9.2	6.9	7.2	5.8	6.3	9.2	
26-Feb	4.0	3.1	3.0	2.4	2.8	3.0	3.1	3.0	3.1	3.3	3.5	3.8	4.1	3.3	3.2	2.9	2.3	2.2	2.3	2.0	2.3	2.4	2.5	2.3	2.9	4.1	
27-Feb	3.0	3.8	4.2	4.4	4.9	5.8	3.5	3.1	3.2	3.3	3.4	3.6	3.7	3.4	3.6	3.9	3.5	3.1	3.3	2.8	3.0	3.2	3.2	3.5	3.6	5.8	
28-Feb	3.4	3.2	3.1	3.1	3.3	3.6	3.6	3.8	3.8	9.0	8.3	6.9	5.1	4.8	4.5	4.8	6.4	7.2	8.2	8.3	7.2	8.0	6.2	6.7	5.5	9.0	
5.0 4.9 4.9 4.7 4.6 5.0 5.1 5.2 5.4 7.4 5.5 5.7 6.0 5.8 5.8 5.7 6.8 9.5 8.5 6.4 6.1 5.6 5.3 5.1																								Diurnal Average			
8.6 12.3 12.4 10.7 10.1 11.1 12.4 13.5 13.6 46.8 15.6 16.0 15.9 16.0 14.8 14.4 33.7 64.5 43.2 13.4 13.9 11.9 10.0 8.5																								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>) -  $\mu\text{g}/\text{m}^3$**   
**Athabasca Valley - February 2023**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	383	57.16	57.16
6 - 15	277	41.34	98.51
16 - 25	5	0.75	99.25
26 - 80	5	0.75	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 670

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>  
Athabasca Valley - February 2023**

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	50	7	6	4	9	8	92	22	6	14	15	30	14	14	15	77	383
6 - 15	48	6	1	5	6	4	31	29	12	9	10	8	13	10	17	68	277
16 - 25	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	2	5
26 - 80	0	0	0	0	0	0	1	0	0	0	0	1	3	0	0	0	5
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	99	13	7	9	15	12	124	52	18	23	25	39	31	24	32	147	670

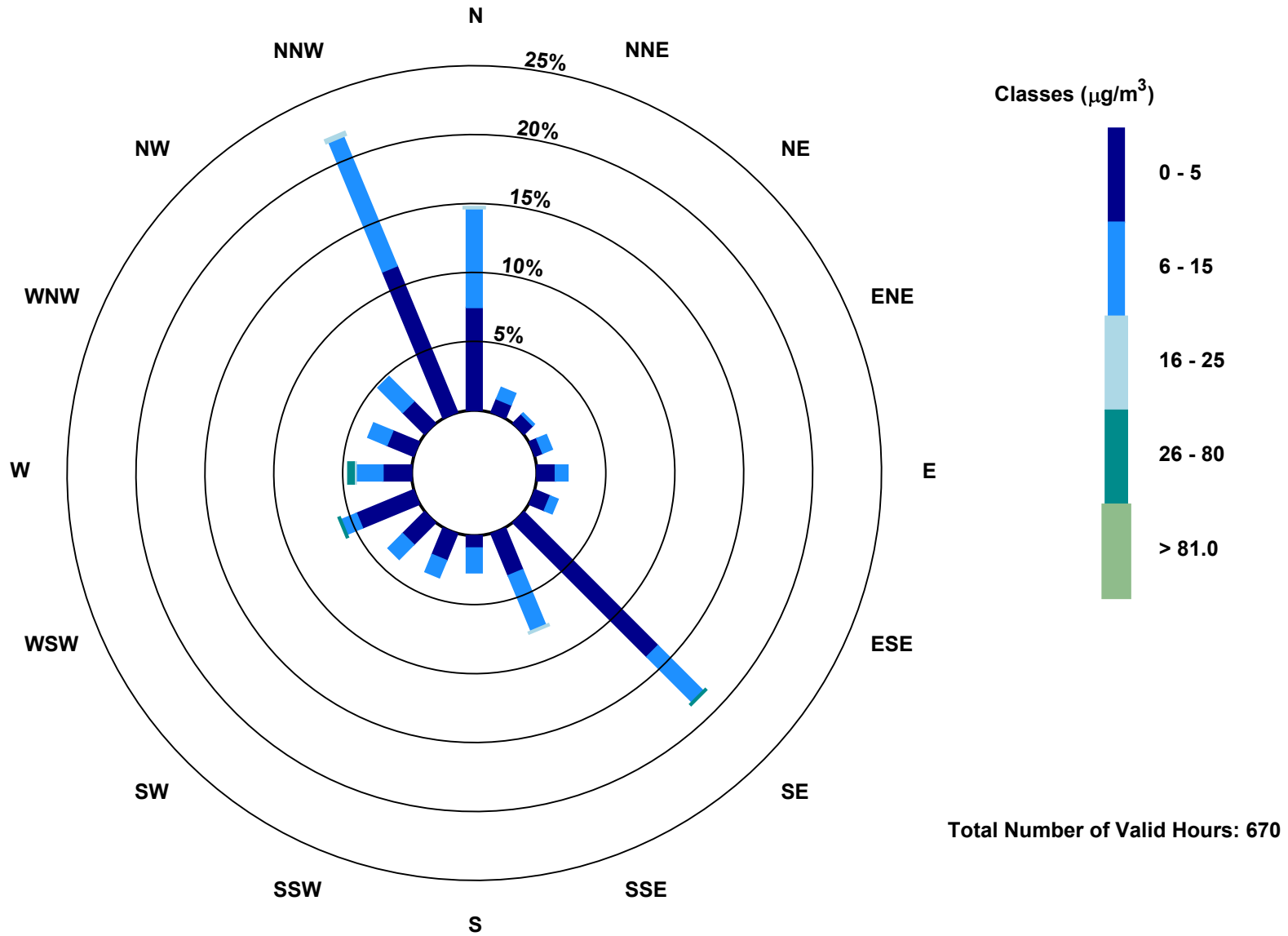
Total Number of Valid Hours: 670

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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





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

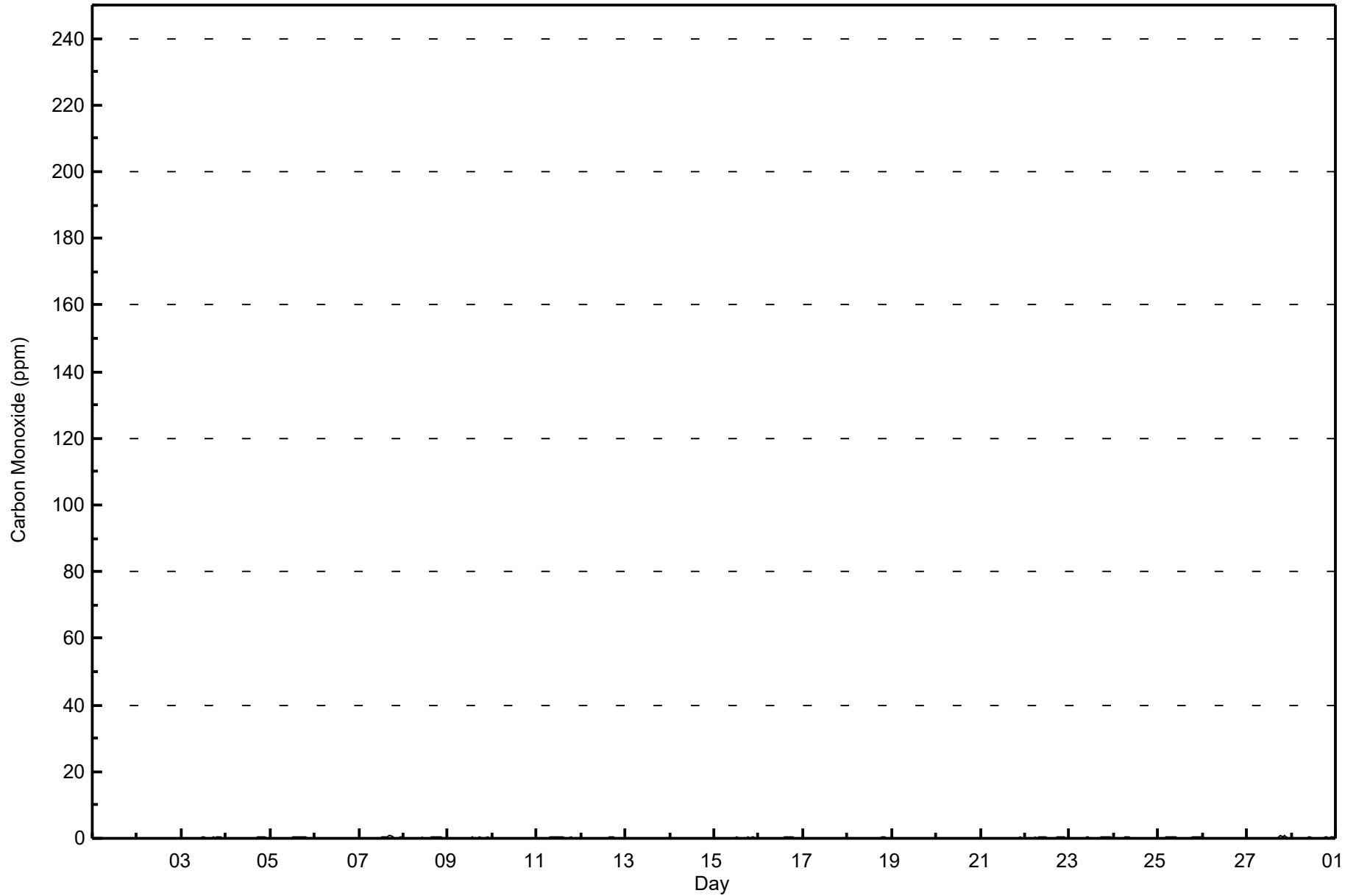
**Carbon Monoxide (CO) - ppm**  
**Athabasca Valley - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 1.0 ppm on Feb 7 18:00 Maximum Daily Average: 0.3 ppm on Feb 7		Hours in Service: 672 Hours of Data: 641 Hours of Missing Data: 31 Hours of Calibration: 31 Percent Operational Time: 100.0																								
Minimum Value: 0.1 ppm on Feb 8 05:00 Maximum Diurnal Average: 0.2 ppm at hour 18 Monthly Average: 0.18 ppm		Minimum Daily Average: 0.1 ppm on Feb 14 Minimum Diurnal Average: 0.1 ppm at hour 2 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> = 0.2 P <sub>90</sub> = 0.2 P <sub>99</sub> = 0.4																								
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-Feb	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2
2-Feb	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	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2
3-Feb	0.1	0.1	0.1	Z	0.1	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	0.3	0.2	0.1	0.1	0.2	0.3
4-Feb	0.1	0.1	0.1	0.1	Z	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	0.3	0.2	0.3	0.2	0.1	0.2	0.3
5-Feb	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.1	0.1	0.2	0.3
6-Feb	Z	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2
7-Feb	0.2	Z	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.5	0.3	0.8	1.0	0.3	0.2	0.1	0.2	0.2	0.2	0.3
8-Feb	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	C	C	C	0.2	0.2	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.4
9-Feb	0.1	0.1	0.1	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
10-Feb	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
11-Feb	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.4
12-Feb	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	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
13-Feb	0.2	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	0.1	0.2
14-Feb	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
15-Feb	0.1	0.1	0.1	Z	0.1	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	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.3
16-Feb	0.1	0.1	0.1	0.1	Z	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	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.3
17-Feb	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
18-Feb	Z	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	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
19-Feb	0.2	Z	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	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
20-Feb	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2
21-Feb	0.2	0.2	0.1	Z	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	0.2	0.2	0.2	0.2	0.1	0.2	0.2
22-Feb	0.1	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.3	0.2	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	0.2	0.3
23-Feb	0.2	0.2	0.2	0.1	0.1	Z	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3
24-Feb	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
25-Feb	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.4
26-Feb	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2
27-Feb	0.1	0.1	0.1	Z	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	0.4	0.7	0.6	0.9	0.3	0.1	0.1	0.2	0.9
28-Feb	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.4	0.4	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.4
																								Diurnal Average		
																								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**  
**Athabasca Valley - February 2023**





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

**Carbon Monoxide (CO) - ppm**  
**Athabasca Valley - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	628	97.97	97.97
0.4 - 0.5	8	1.25	99.22
0.6 - 0.7	2	0.31	99.53
0.8 - 1.4	3	0.47	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 641

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Carbon Monoxide (CO) - ppm  
Athabasca Valley - February 2023**

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	96	13	5	8	15	12	111	49	16	20	25	38	29	23	31	137	628
0.4 - 0.5	1	0	1	1	0	0	4	0	0	0	0	0	0	1	0	0	8
0.6 - 0.7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
0.8 - 1.4	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	3
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>	98	13	6	9	15	12	115	49	16	20	25	38	31	24	31	139	641

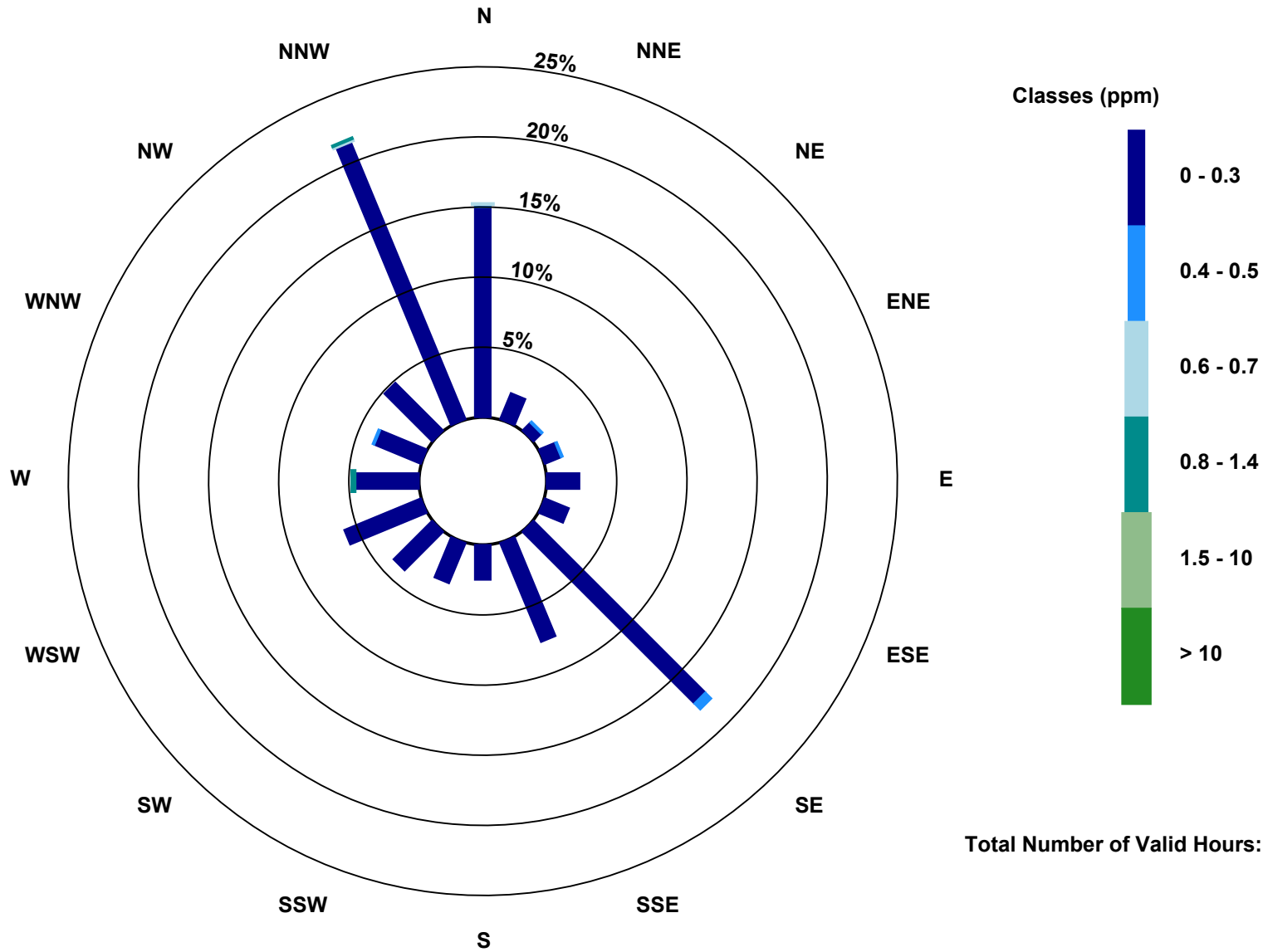
Total Number of Valid Hours: 641

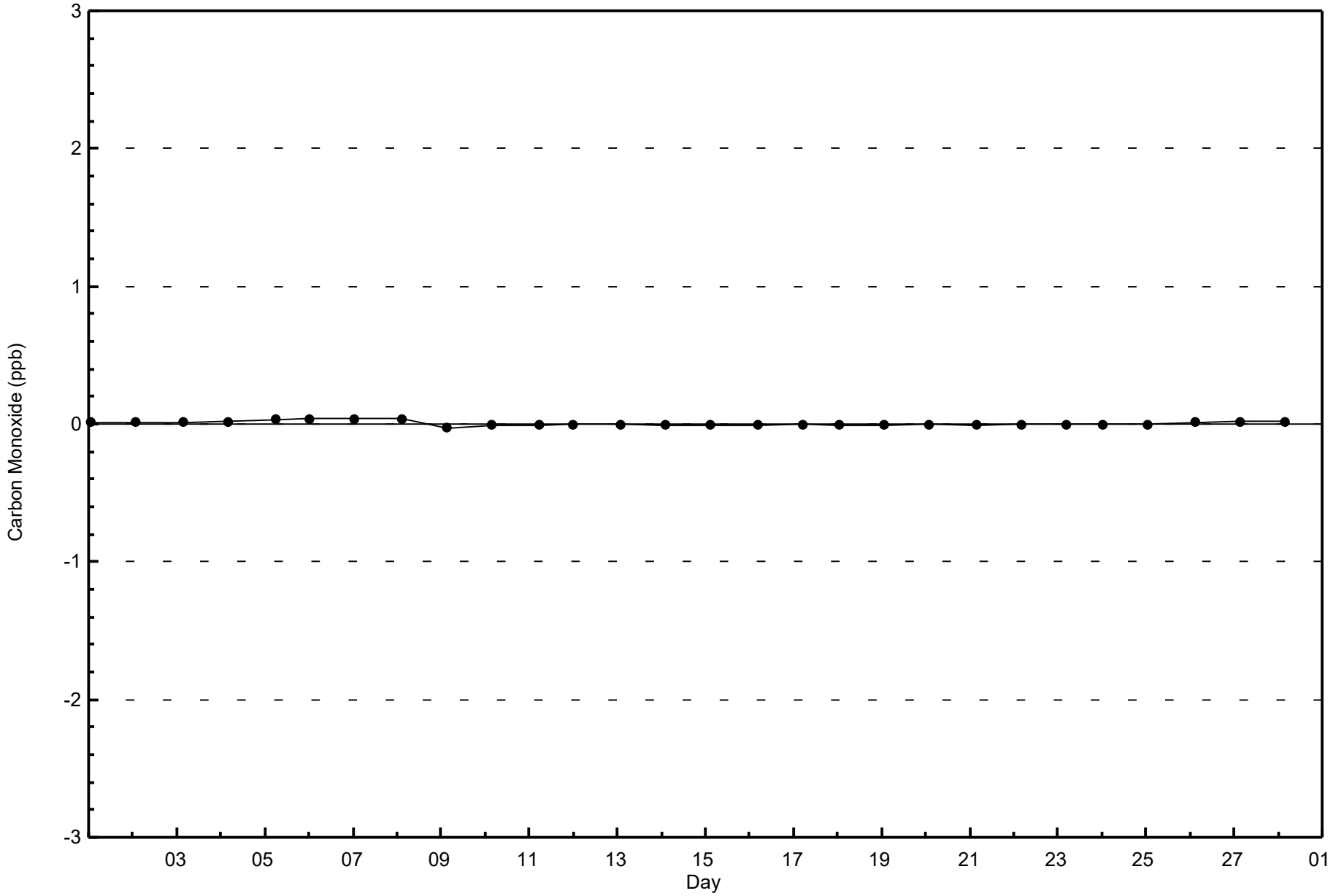
Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Carbon Monoxide (CO) - ppm  
Athabasca Valley

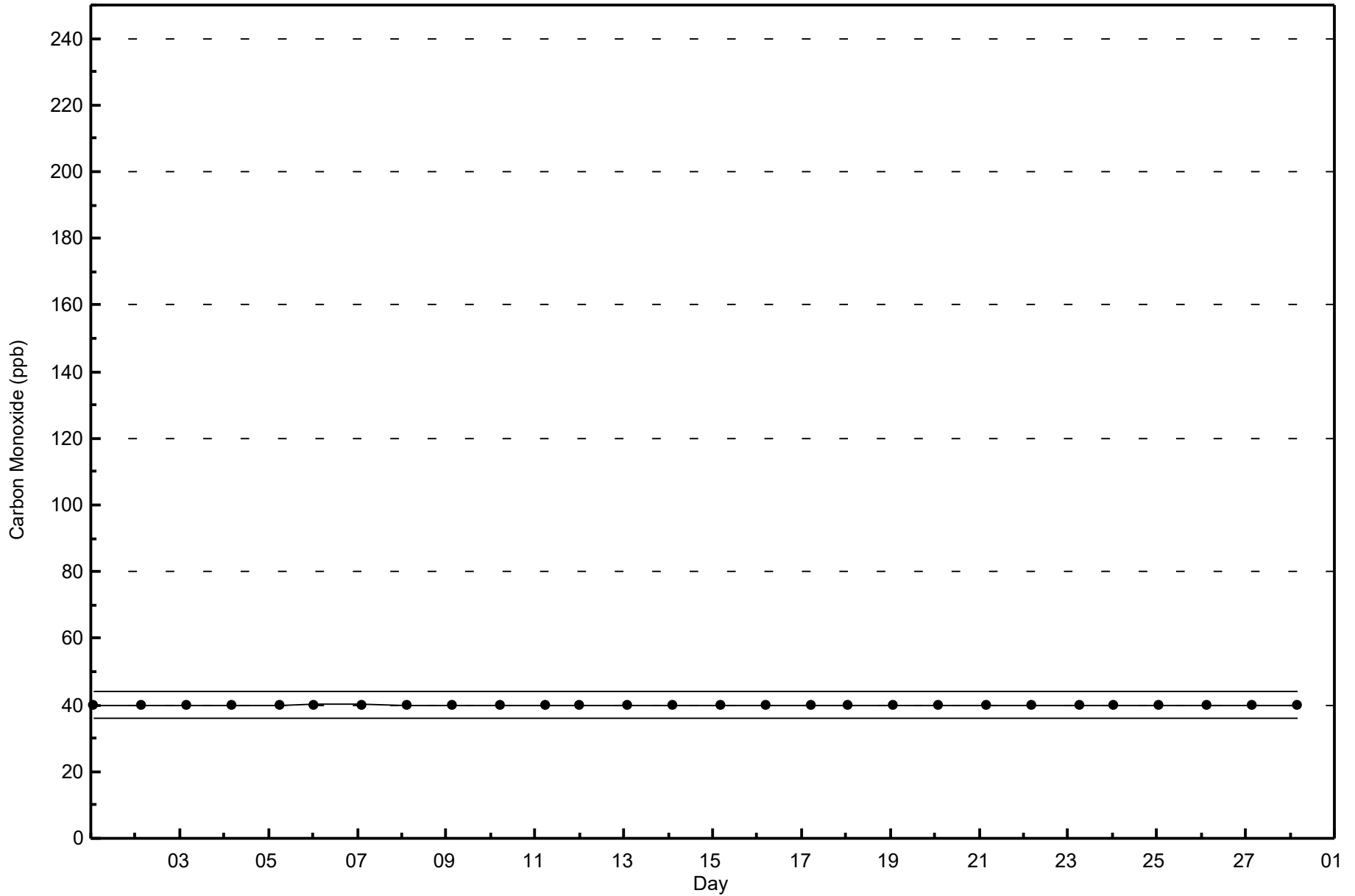






**Wood Buffalo Environmental Association**  
**Span Responses**

**Carbon Monoxide (CO) - ppb**  
**Athabasca Valley - February 2023**





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

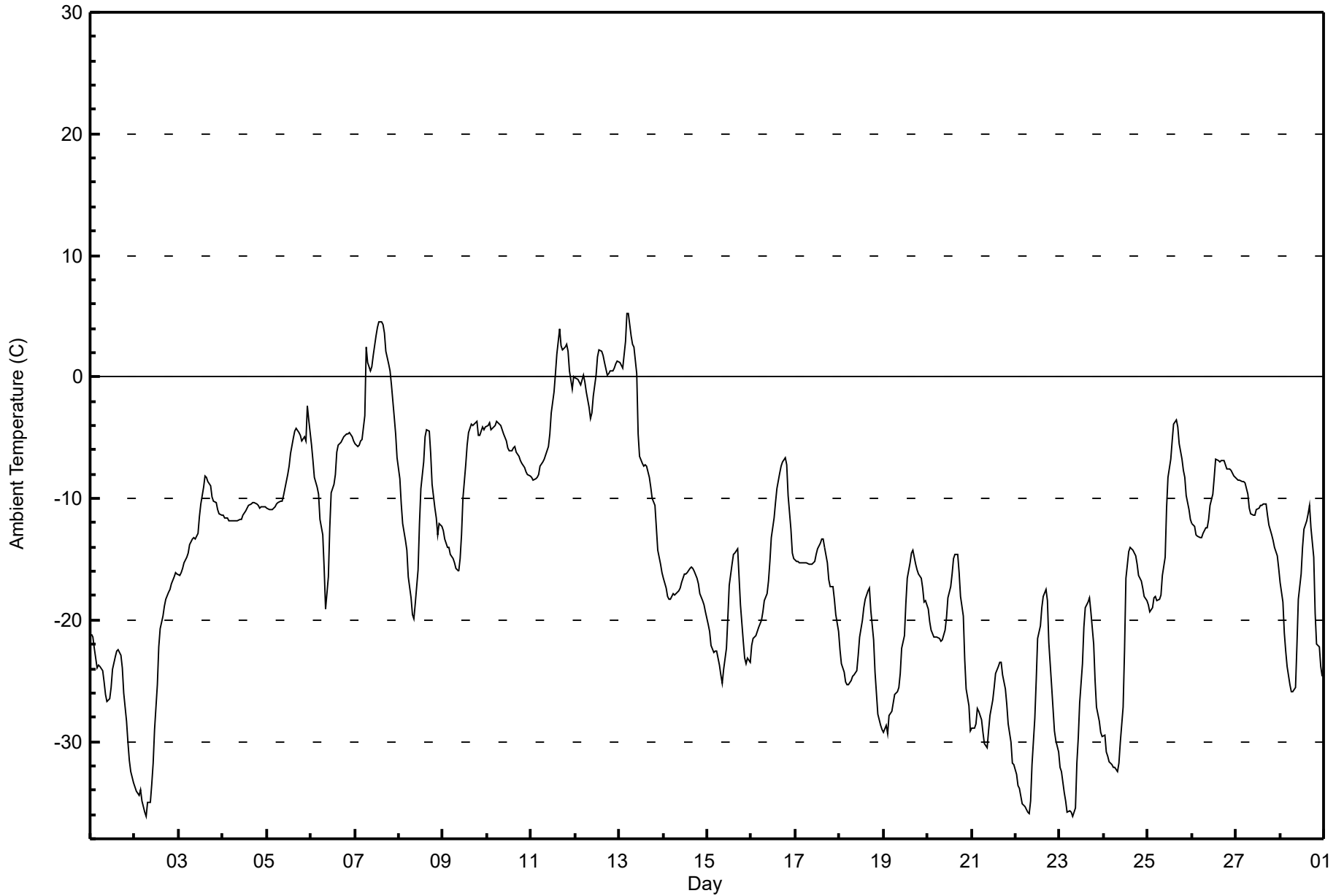
**Ambient Temperature (AT) - C**  
**Athabasca Valley - February 2023**

Maximum Value: 5.3 C on Feb 13 06:00      Maximum Daily Average: 0.0 C on Feb 12																						Hours in Service:	672			
Minimum Value: -36.2 C on Feb 2 07:00      Minimum Daily Average: -28.4 C on Feb 23																						Hours of Data:	672			
Maximum Diurnal Average: -10.2 C at hour 16      Minimum Diurnal Average: -18.2 C at hour 9																						Hours of Missing Data:	0			
Monthly Average: -14.91 C      Percentiles: P <sub>1</sub> = -35.7 P <sub>10</sub> = -28.5 Q <sub>1</sub> = -21.6 Median = -14.6 Q <sub>3</sub> = -7.9 P <sub>90</sub> = -3.6 P <sub>99</sub> = 3.7																						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-Feb	-21.2	-21.4	-22.4	-24.0	-23.7	-23.8	-24.1	-25.1	-26.1	-26.7	-26.5	-25.6	-24.0	-23.1	-22.5	-22.4	-22.9	-23.9	-26.0	-28.3	-30.1	-31.6	-32.5	-33.4	-25.5	-21.2
2-Feb	-33.7	-34.1	-34.5	-34.0	-34.8	-35.8	-36.2	-35.0	-35.1	-33.5	-31.8	-29.0	-25.3	-22.2	-20.7	-19.7	-18.9	-18.3	-17.8	-17.5	-17.0	-16.4	-16.0	-16.3	-26.4	-16.0
3-Feb	-16.4	-16.2	-15.8	-15.3	-14.8	-14.5	-13.8	-13.3	-13.2	-12.8	-11.5	-10.5	-9.1	-8.1	-8.3	-8.7	-9.0	-9.9	-10.2	-10.4	-10.9	-11.2	-11.3	-12.0	-8.1	-8.1
4-Feb	-11.4	-11.6	-11.6	-11.8	-11.8	-11.8	-11.8	-11.9	-11.9	-11.7	-11.7	-11.4	-11.1	-10.8	-10.6	-10.5	-10.3	-10.4	-10.5	-10.6	-10.8	-10.7	-10.6	-10.6	-11.2	-10.3
5-Feb	-10.8	-10.9	-10.9	-10.9	-10.7	-10.5	-10.3	-10.3	-10.2	-9.8	-9.2	-8.1	-7.4	-6.3	-5.1	-4.4	-4.3	-4.6	-4.8	-5.3	-4.9	-5.3	-2.4	-3.6	-7.5	-2.4
6-Feb	-5.6	-6.9	-8.3	-9.1	-9.7	-11.8	-13.0	-15.8	-19.1	-16.5	-12.4	-9.5	-8.9	-8.0	-6.2	-5.6	-5.3	-5.1	-4.9	-4.7	-4.6	-4.6	-5.0	-5.3	-8.6	-4.6
7-Feb	-5.5	-5.7	-5.6	-5.3	-5.1	-3.2	2.4	1.1	0.5	0.9	1.8	3.4	4.1	4.5	4.5	4.3	3.6	2.1	1.1	0.5	-0.6	-3.3	-4.7	-6.7	-0.5	4.5
8-Feb	-8.4	-10.4	-12.1	-13.5	-14.3	-16.5	-18.2	-19.6	-19.8	-18.6	-15.8	-12.0	-9.2	-6.9	-4.9	-4.3	-4.5	-6.3	-8.8	-10.7	-11.6	-13.0	-12.0	-12.3	-11.8	-4.3
9-Feb	-12.6	-13.4	-14.0	-14.0	-14.6	-14.9	-15.3	-15.8	-16.0	-14.9	-13.0	-10.0	-7.3	-5.6	-4.5	-3.9	-4.0	-3.9	-3.6	-4.8	-4.8	-4.1	-4.4	-4.1	-9.3	-3.6
10-Feb	-4.0	-3.8	-4.4	-4.2	-4.0	-3.7	-3.8	-4.0	-4.4	-4.7	-5.2	-5.8	-6.0	-6.1	-5.8	-5.7	-6.2	-6.6	-6.8	-7.1	-7.4	-7.8	-8.0	-8.1	-5.6	-3.7
11-Feb	-8.3	-8.5	-8.4	-8.3	-8.0	-7.3	-7.0	-6.8	-6.4	-5.7	-4.7	-2.9	-1.2	0.3	1.9	4.0	2.6	2.2	2.5	2.7	2.1	0.5	-1.0	0.0	-2.7	4.0
12-Feb	-0.1	-0.2	-0.5	-0.7	0.2	-0.4	-1.2	-2.5	-3.4	-3.0	-1.5	0.1	1.6	2.2	2.1	1.7	1.2	0.2	0.2	0.5	0.5	0.8	1.1	1.3	0.0	2.2
13-Feb	1.2	1.0	0.8	2.9	5.2	5.3	3.3	2.7	2.5	0.3	-4.6	-6.6	-7.1	-7.4	-7.2	-7.3	-8.2	-9.1	-9.9	-10.6	-12.4	-14.3	-15.4	-16.1	-4.6	5.3
14-Feb	-16.6	-17.4	-18.1	-18.3	-18.3	-17.9	-18.0	-17.8	-17.6	-17.4	-16.9	-16.3	-16.2	-16.1	-15.8	-15.6	-15.8	-16.0	-16.5	-17.1	-17.9	-18.5	-18.8	-19.4	-17.2	-15.6
15-Feb	-20.3	-20.9	-22.1	-22.7	-22.6	-22.6	-23.7	-24.5	-25.2	-24.0	-22.3	-19.8	-17.1	-15.4	-14.6	-14.5	-14.1	-16.5	-18.8	-21.7	-23.1	-23.6	-23.2	-23.5	-20.7	-14.1
16-Feb	-22.1	-21.5	-21.3	-20.9	-20.6	-20.0	-19.4	-18.5	-17.8	-16.8	-15.2	-13.2	-11.6	-10.4	-9.1	-7.9	-7.4	-6.9	-6.7	-7.2	-9.8	-12.5	-14.5	-14.9	-14.4	-6.7
17-Feb	-15.1	-15.2	-15.3	-15.3	-15.3	-15.3	-15.3	-15.4	-15.4	-15.4	-15.1	-14.6	-14.1	-13.6	-13.3	-13.4	-14.0	-15.3	-16.7	-17.3	-17.3	-18.3	-19.5	-21.0	-15.7	-13.3
18-Feb	-22.4	-23.7	-24.3	-25.1	-25.3	-25.3	-25.0	-24.7	-24.5	-24.2	-22.9	-21.4	-20.1	-18.9	-18.3	-17.6	-17.4	-19.2	-21.7	-24.2	-26.0	-27.8	-28.7	-29.0	-23.2	-17.4
19-Feb	-29.2	-28.6	-29.4	-27.9	-27.5	-26.9	-26.1	-25.9	-25.6	-24.4	-22.4	-21.2	-18.6	-16.6	-15.3	-14.5	-14.3	-15.4	-15.9	-16.2	-16.6	-17.4	-18.6	-18.4	-21.4	-14.3
20-Feb	-19.1	-20.1	-20.9	-21.4	-21.4	-21.4	-21.6	-21.8	-21.6	-20.9	-19.8	-18.2	-17.3	-16.2	-14.9	-14.6	-14.5	-16.1	-18.1	-19.7	-23.2	-25.6	-27.0	-29.1	-20.2	-14.5
21-Feb	-28.9	-28.9	-28.5	-27.3	-27.5	-28.2	-29.2	-30.2	-30.6	-29.2	-27.8	-26.6	-25.5	-24.4	-23.8	-23.5	-23.4	-24.5	-25.7	-26.9	-28.5	-30.0	-31.8	-31.9	-27.6	-23.4
22-Feb	-32.7	-33.6	-33.8	-35.1	-35.2	-35.4	-35.8	-36.0	-34.9	-31.8	-28.1	-24.9	-21.5	-20.5	-19.0	-18.0	-17.5	-18.4	-21.8	-25.4	-27.3	-29.1	-29.9	-30.8	-28.2	-17.5
23-Feb	-32.1	-32.5	-34.2	-34.9	-35.8	-35.7	-35.8	-36.1	-35.4	-31.8	-29.7	-26.8	-23.5	-20.6	-19.0	-18.5	-18.2	-19.4	-22.0	-25.0	-27.1	-28.3	-29.2	-29.5	-28.4	-18.2
24-Feb	-29.5	-30.8	-31.2	-31.7	-31.9	-32.1	-32.1	-32.4	-31.7	-30.1	-27.2	-22.5	-16.6	-14.3	-14.1	-14.2	-14.3	-14.7	-15.4	-16.3	-16.8	-17.4	-18.1	-18.4	-23.1	-14.1
25-Feb	-18.8	-19.4	-19.0	-18.2	-18.0	-18.4	-18.2	-17.9	-16.3	-14.9	-10.8	-8.2	-6.7	-5.2	-3.9	-3.5	-4.1	-5.5	-6.7	-7.7	-8.3	-9.7	-10.9	-11.7	-11.8	-3.5
26-Feb	-12.0	-12.3	-13.0	-13.1	-13.2	-13.3	-12.9	-12.4	-11.8	-10.6	-9.6	-8.3	-6.8	-6.9	-7.0	-6.8	-6.8	-7.3	-7.6	-7.6	-7.6	-7.6	-7.9	-8.1	-9.8	-6.8
27-Feb	-8.4	-8.5	-8.5	-8.6	-8.7	-8.7	-9.7	-10.9	-11.3	-11.4	-11.4	-10.9	-10.8	-10.6	-10.5	-10.4	-10.5	-11.3	-12.2	-13.0	-13.5	-14.0	-14.7	-15.7	-11.0	-8.4
28-Feb	-16.9	-18.5	-21.0	-22.6	-23.8	-25.3	-25.9	-25.9	-25.5	-22.1	-18.3	-16.2	-14.0	-12.5	-11.8	-11.3	-10.6	-12.4	-14.9	-19.4	-21.9	-22.2	-23.8	-24.7	-19.2	-10.6
																						Diurnal Average				
																						Diurnal Maximum				



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

**Ambient Temperature (AT) - C**  
**Athabasca Valley - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Athabasca Valley - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	193	28.72	28.72
-20 - 0	432	64.29	93.01
0 - 10	47	6.99	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



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

**Barometric Pressure (BP) - inHg**  
**Athabasca Valley - February 2023**

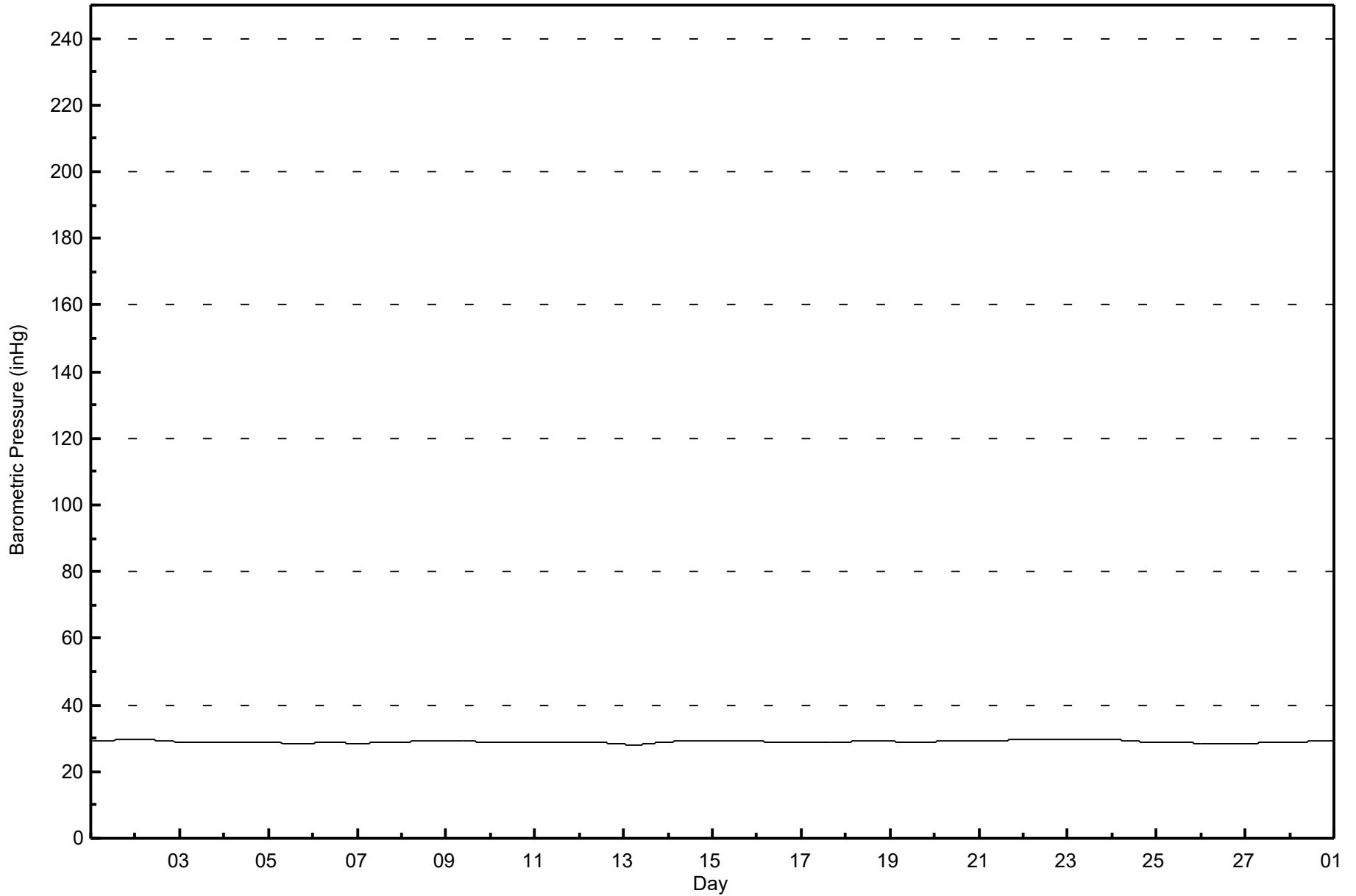
Maximum Value: 29.9 inHg on Feb 23 10:00      Maximum Daily Average: 29.8 inHg on Feb 23																						Hours in Service: 672					
Minimum Value: 28.1 inHg on Feb 13 05:00      Minimum Daily Average: 28.4 inHg on Feb 13																						Hours of Data: 672					
Maximum Diurnal Average: 29.0 inHg at hour 10      Minimum Diurnal Average: 28.9 inHg at hour 17																						Hours of Missing Data: 0					
Monthly Average: 28.96 inHg      Percentiles: P <sub>1</sub> = 28.1 P <sub>10</sub> = 28.5 Q <sub>1</sub> = 28.7 Median = 28.9 Q <sub>3</sub> = 29.2 P <sub>90</sub> = 29.5 P <sub>99</sub> = 29.8																						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-Feb	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.3	29.3	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.6	29.6	29.6	29.6	29.6	29.6	29.4	29.6
2-Feb	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.5	29.5	29.5	29.5	29.4	29.4	29.3	29.3	29.3	29.2	29.2	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.4	29.6
3-Feb	28.9	28.9	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.7	28.9
4-Feb	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	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	28.9
5-Feb	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	28.4	28.4	28.4	28.4	28.4	28.5	28.5	28.8
6-Feb	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.5	28.6	28.8
7-Feb	28.5	28.5	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.6	28.8
8-Feb	28.9	28.9	28.9	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.2
9-Feb	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	29.1	29.2
10-Feb	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9
11-Feb	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8
12-Feb	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	28.6	28.6	28.6	28.5	28.5	28.4	28.4	28.3	28.3	28.2	28.2	28.6	28.7
13-Feb	28.2	28.2	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.2	28.3	28.3	28.4	28.4	28.5	28.6	28.6	28.7	28.7	28.8	28.8	28.8	28.8	28.9	28.4	28.9
14-Feb	28.9	29.0	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	29.3	29.3	29.3	29.3	29.2	29.3	29.3
15-Feb	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3
16-Feb	29.2	29.1	29.1	29.0	29.0	29.0	28.9	28.9	28.8	28.8	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.7	28.7	28.7	28.8	28.8	28.9	28.9	28.8	28.8	29.2
17-Feb	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	29.0
18-Feb	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
19-Feb	29.1	29.0	29.0	29.0	29.0	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	28.9	28.9	28.9	28.9	28.9	29.0	29.0	28.9	29.1
20-Feb	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
21-Feb	29.1	29.1	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.6	29.6	29.6	29.6	29.4	29.6
22-Feb	29.6	29.6	29.6	29.6	29.6	29.6	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.8
23-Feb	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.9	29.9	29.8	29.8	29.8	29.8	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.6	29.6	29.8	29.9
24-Feb	29.6	29.6	29.5	29.5	29.5	29.4	29.4	29.4	29.3	29.3	29.2	29.1	29.1	29.0	29.0	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	29.2	29.6
25-Feb	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	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.8
26-Feb	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.6
27-Feb	28.5	28.5	28.5	28.5	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	28.8	28.8	28.8	28.8	28.8	28.7	28.8
28-Feb	28.9	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	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.1
																						Diurnal Average					
																						Diurnal Maximum					





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

**Barometric Pressure (BP) - inHg**  
**Athabasca Valley - February 2023**





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

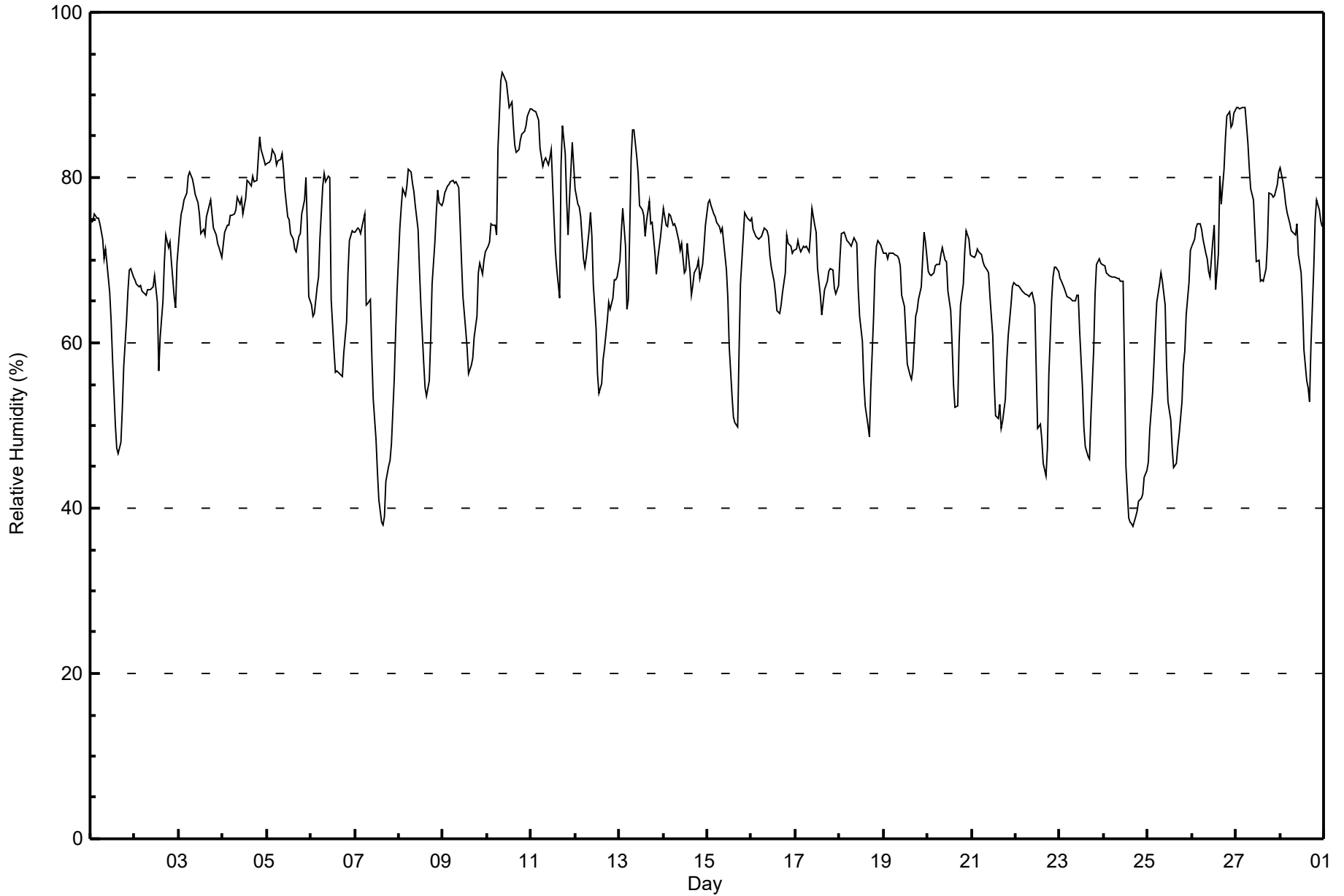
**Relative Humidity (RH) - %**  
**Athabasca Valley - February 2023**

Maximum Value: 92.6 % on Feb 10 09:00		Maximum Daily Average: 83.9 % on Feb 10		Hours in Service: 672																						
Minimum Value: 37.8 % on Feb 24 17:00		Minimum Daily Average: 53.9 % on Feb 24		Hours of Data: 672																						
Maximum Diurnal Average: 74.3 % at hour 9		Minimum Diurnal Average: 59.2 % at hour 15		Hours of Missing Data: 0																						
Monthly Average: 69.17 %		Percentiles: P <sub>1</sub> = 39.0 P <sub>10</sub> = 54.0 Q <sub>1</sub> = 65.3 Median = 70.6 Q <sub>3</sub> = 75.4 P <sub>90</sub> = 81.2 P <sub>99</sub> = 88.5		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-Feb	74.5	74.8	75.6	75.0	75.1	74.4	72.5	70.2	71.3	69.7	66.0	62.8	58.1	50.2	47.4	46.6	47.9	52.0	57.2	62.8	66.2	68.8	68.9	67.9	64.8	75.6
2-Feb	67.7	67.1	66.8	67.0	66.3	65.9	65.8	66.4	66.4	66.6	66.9	68.1	64.9	56.6	60.7	65.1	69.8	73.0	71.6	72.1	69.9	65.6	64.3	69.6	66.8	73.0
3-Feb	73.9	75.7	76.3	77.3	78.2	80.2	80.7	79.9	79.0	77.9	77.0	75.6	73.3	73.8	73.0	75.2	75.8	77.3	75.6	74.0	73.1	72.1	71.6	70.4	75.7	80.7
4-Feb	71.9	73.5	74.2	74.3	75.4	75.4	75.6	76.2	77.6	76.7	77.4	75.7	77.4	79.6	79.4	78.9	80.1	79.4	79.6	82.4	84.9	83.4	82.1	81.6	78.0	84.9
5-Feb	81.8	81.9	82.2	83.5	82.8	81.5	82.0	82.1	82.9	81.1	78.4	75.3	74.9	73.2	72.6	71.4	71.0	72.8	73.2	75.5	77.3	79.9	74.1	65.7	77.4	83.5
6-Feb	64.6	63.2	63.6	66.8	67.9	72.8	79.0	80.4	79.5	80.3	80.0	65.3	59.2	56.5	56.6	56.4	56.1	56.0	58.8	62.5	68.5	72.3	73.6	73.4	67.2	80.4
7-Feb	73.4	73.8	73.7	73.3	74.1	75.7	64.5	64.8	65.3	58.4	53.2	48.3	44.5	41.0	38.4	37.9	39.0	43.2	45.1	45.8	47.8	55.6	61.4	66.3	56.9	75.7
8-Feb	73.9	76.5	78.7	77.8	79.0	81.1	80.6	79.3	78.3	76.6	73.8	68.7	64.5	57.6	54.6	53.6	55.4	60.6	67.1	72.1	75.8	78.4	76.9	76.6	71.6	81.1
9-Feb	77.1	78.1	79.0	79.2	79.4	79.7	79.4	79.4	78.8	74.4	69.9	65.5	61.5	59.3	56.4	57.3	58.1	60.7	63.1	68.6	69.6	68.3	70.0	71.0	70.1	79.7
10-Feb	71.7	72.2	74.5	74.2	74.3	73.0	83.5	91.6	92.6	92.3	91.6	90.0	88.4	89.1	86.2	83.9	83.0	83.4	84.6	85.3	85.6	86.2	87.5	88.3	83.9	92.6
11-Feb	88.3	88.2	87.9	87.5	87.0	83.5	81.4	82.1	82.4	81.5	82.4	83.3	75.0	71.1	68.9	65.5	81.5	86.3	82.9	77.2	73.0	77.3	84.2	81.5	80.8	88.3
12-Feb	78.6	76.7	76.4	75.3	70.1	69.2	70.3	73.5	75.8	72.9	67.1	61.8	56.2	53.9	55.1	58.0	59.3	62.7	64.9	64.2	65.4	67.6	67.7	68.0	67.1	78.6
13-Feb	69.9	73.4	76.2	71.6	64.1	65.3	82.3	85.8	85.7	82.6	80.6	76.6	76.0	75.4	73.0	74.7	77.2	74.4	74.5	70.8	68.2	70.1	72.9	74.6	74.8	85.8
14-Feb	76.2	74.2	74.1	75.7	75.4	74.3	74.4	74.0	72.3	71.2	72.1	68.6	68.9	72.0	68.6	65.8	67.0	68.5	69.2	70.0	67.8	69.5	71.7	74.2	71.5	76.2
15-Feb	77.0	77.3	76.6	75.6	75.3	74.6	74.1	73.4	73.8	72.2	68.8	65.5	59.5	53.5	51.1	50.3	49.9	59.0	67.1	72.9	75.8	75.5	75.0	74.7	68.7	77.3
16-Feb	75.1	73.7	72.9	72.8	72.6	72.8	73.3	73.9	73.6	72.9	70.5	69.1	67.4	65.9	64.0	63.5	64.5	66.1	68.4	73.1	72.1	71.8	70.8	71.1	70.5	75.1
17-Feb	71.3	72.3	71.5	71.1	71.6	71.5	71.7	71.0	73.2	76.2	74.3	73.4	69.1	65.7	63.4	64.9	66.5	67.5	68.7	69.0	68.9	66.6	65.9	67.0	69.7	76.2
18-Feb	70.3	73.2	73.4	72.8	72.4	72.2	71.7	72.1	72.7	72.0	66.7	63.2	60.2	55.3	52.4	50.0	48.6	54.5	63.1	69.0	71.8	72.4	71.9	71.3	66.4	73.4
19-Feb	70.8	70.8	70.1	70.9	70.8	70.8	70.8	70.5	70.2	69.3	65.7	64.4	60.9	57.4	56.1	55.7	56.7	63.3	64.0	65.2	66.8	70.1	73.3	72.1	66.5	73.3
20-Feb	68.7	68.4	68.2	68.4	69.3	69.5	69.5	70.7	71.5	70.0	69.8	66.3	63.9	59.9	54.9	52.2	52.3	60.0	64.5	67.1	71.0	73.6	72.6	70.7	66.4	73.6
21-Feb	70.5	70.3	70.6	71.4	71.1	70.6	69.9	69.3	68.8	68.4	65.6	60.9	55.2	51.2	50.9	52.5	49.7	50.5	53.3	57.9	60.9	64.7	66.8	67.3	62.8	71.4
22-Feb	66.9	66.9	66.7	66.2	66.2	65.9	65.8	65.6	65.9	66.1	64.6	56.8	49.7	50.2	48.3	45.5	43.9	47.3	56.0	65.3	68.0	69.2	69.1	68.7	61.0	69.2
23-Feb	67.8	67.5	66.5	66.1	65.6	65.5	65.3	65.1	65.2	65.8	65.7	61.3	54.6	49.8	47.5	46.3	46.0	51.1	59.2	66.0	69.5	70.2	69.7	69.5	61.9	70.2
24-Feb	69.3	68.5	68.3	68.2	68.0	68.0	68.0	67.7	67.8	67.5	67.5	57.1	45.0	38.9	38.4	38.1	37.8	39.0	39.7	40.8	41.2	41.7	43.7	44.6	53.9	69.3
25-Feb	45.7	49.5	53.9	57.5	61.5	65.0	67.1	68.4	67.5	64.5	57.3	52.9	50.6	47.3	44.9	45.4	47.5	49.0	52.9	57.2	59.0	63.3	67.4	71.1	56.9	71.1
26-Feb	71.7	72.5	73.9	74.4	74.4	73.8	72.6	70.8	70.2	68.6	68.0	72.4	74.3	66.5	70.8	80.1	76.8	81.1	84.8	87.5	87.9	86.1	86.5	87.7	76.4	87.9
27-Feb	88.4	88.5	88.3	88.4	88.5	88.5	84.2	81.2	78.7	77.3	73.6	69.8	70.0	67.5	67.7	67.5	68.9	72.3	78.2	77.9	77.6	77.8	79.2	80.7	78.4	88.5
28-Feb	81.2	79.4	78.3	76.8	75.7	74.3	73.6	73.4	73.1	74.4	70.7	68.5	64.7	59.1	55.5	54.6	53.0	59.7	69.1	74.9	77.2	76.1	74.7	74.0	70.5	81.2
		72.8	73.1	73.5	73.5	73.3	73.4	73.9	74.2	74.3	73.1	70.9	67.4	63.8	60.6	59.2	60.1	63.2	66.3	68.8	70.0	71.2	71.9	72.1	Diurnal Average	
		88.4	88.5	88.3	88.4	88.5	84.2	91.6	92.6	92.3	91.6	90.0	88.4	89.1	86.2	83.9	83.0	86.3	84.8	87.5	87.9	86.2	87.5	88.3	Diurnal Maximum	



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

**Relative Humidity (RH) - %**  
**Athabasca Valley - February 2023**





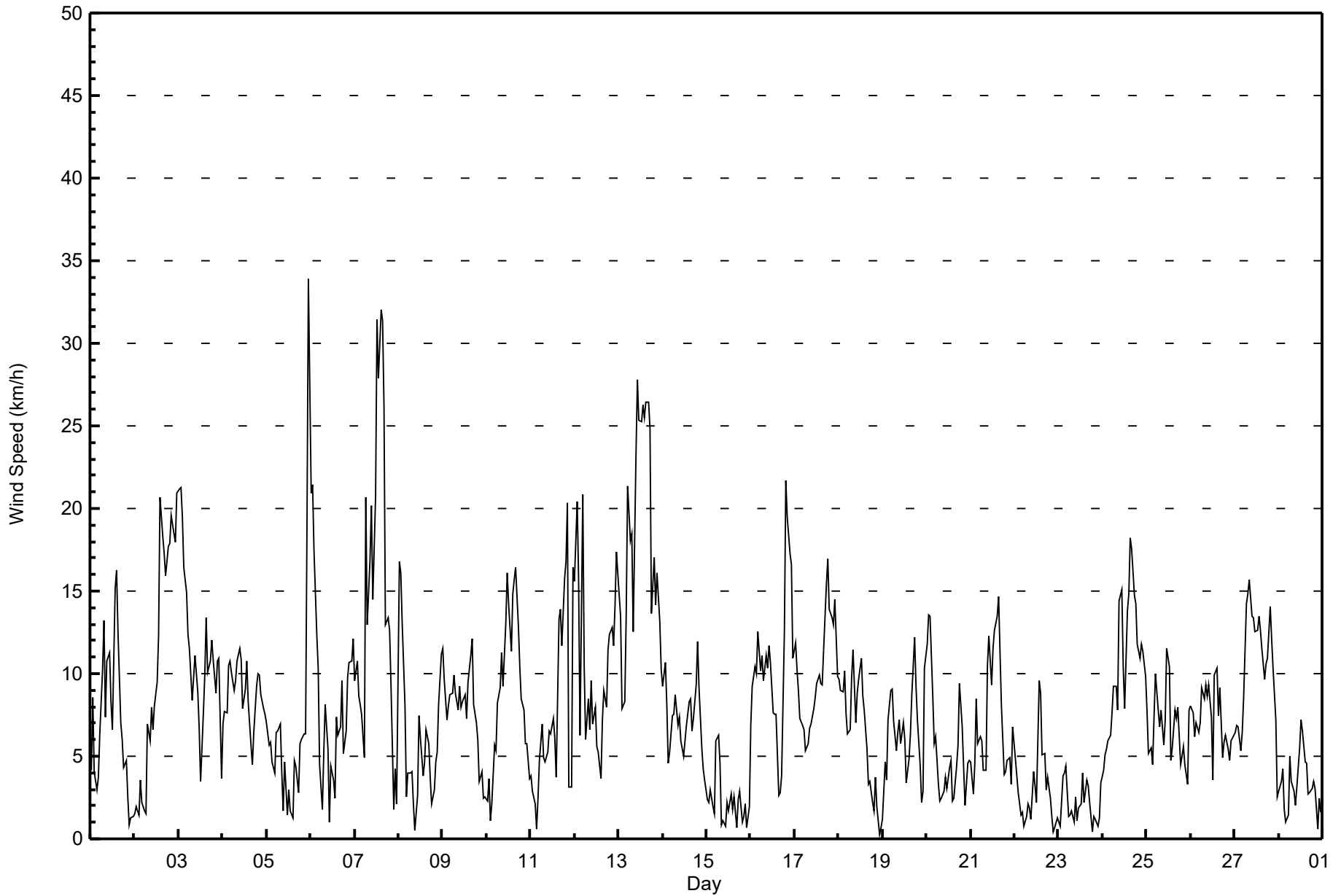
Maximum Speed: 34 km/h on Feb 6 00:00      Maximum Daily Speed Average: 11.5 km/h on Feb 7		Hours in Service: 672 Hours of Data: 672 Hours of Missing Data: 0 Percent Operational Time: 100.0																								
Minimum Speed Value: 0 km/h on Feb 18 23:00      Minimum Daily Speed Average: 0.4 km/h on Feb 15 Maximum Diurnal Speed Average: 4.2 km/h at hour 14      Minimum Diurnal Speed Average: 0.2 km/h at hour 4 Monthly Average Velocity: 1.5 km/h 328.9 deg      Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 2 Q <sub>1</sub> = 4 Median = 7 Q <sub>3</sub> = 11 P <sub>90</sub> = 15 P <sub>99</sub> = 26																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Feb	WNW4	NNW9	NNW4	NW3	N4	NNW6	NNW10	NNW13	N7	NNW11	NNW11	N8	N7	NNW15	NNW16	NNW13	NW7	W6	WSW4	SW5	SSW3	S1	E1	ENE1	NNW5.9	NNW16
2-Feb	S2	ESE2	S1	SSE4	S2	NNE2	SW1	SE7	SE6	SE8	SE7	SE8	SE9	SE12	SE21	SE18	SE17	SE16	SE18	SE18	SE20	SE19	SE18	SE21	SE10.4	SE21
3-Feb	SE21	SE21	SE20	SE16	SE15	SE12	SE12	SE8	SE10	SE11	SE9	SE7	NNE3	NNW8	NNW10	NNW13	N10	NNW11	NNW12	NNW11	NNW9	NNW11	NNW11	NNE4	E3.5	SE21
4-Feb	NNW7	N8	N8	NNW11	NNW11	NNW10	NNW9	NNW10	NNW11	NNW12	NNW11	N8	NNW9	NNW11	N8	NNW6	N4	N6	NNW9	NNW10	NNW10	NNW9	NNW8	N8	NNW8.8	NNW12
5-Feb	N7	N6	N6	N5	N4	NNW6	N7	NNW7	NNW4	WNW2	N5	W1	NNW3	NNW2	WSW1	SSW5	S4	S3	SW6	SSW6	SSW6	NW6	NNW19	NW34	NW4.3	NW34
6-Feb	NW21	NNW21	W17	W12	WSW10	WSW4	WNW2	NW5	WSW8	WSW5	WSW1	NNW4	NNW4	WNW2	SE7	SE6	SSE7	SE10	SSE5	SSE7	SE10	SE11	SSE11	SSE12	SW3.2	WNW21
7-Feb	SSE10	SE11	SE9	SSE8	SE8	WNW5	NNW21	W13	W17	W20	WSW14	WSW21	W31	W28	NNW32	W31	W26	W13	WSW13	WSW13	SW9	S2	SSW4	S2	W11.5	WNW32
8-Feb	NNW17	NNW16	NNW13	NNW8	N3	WSW4	SW4	WSW4	SW2	SE0	SE3	SE7	SE6	SE4	SSE5	SSE7	SSE6	SE4	SSE2	SW3	SSW5	SSW5	SSE8	SSE11	SSW1.0	NNW17
9-Feb	SSE11	SSE10	SSE7	SSE8	SE9	SE9	SE10	SE9	SE8	SE9	SE8	SE8	SE9	SE7	SE10	SE11	SE12	SE8	SE7	E6	SE3	SE4	SSE2	SE3	SE7.7	SE12
10-Feb	ESE2	SE4	NE1	NE2	N6	N5	NNW8	NNW9	NNW11	N9	N13	NNW16	NNW14	N11	NNW15	NNW16	NNW16	NNW13	NNW10	NNW8	NNW8	N6	N6	N4	NNW8.4	NNW16
11-Feb	NNW4	NNW3	NW2	SE1	E2	SSE5	SE7	SSE5	SE5	SSE5	SE7	SE6	SE7	SE6	SE4	WSW13	WSW14	WSW12	W16	NNW17	NNW20	NNW3	WSW3	WSW16	WSW3.6	WNW20
12-Feb	WSW16	WSW20	WSW16	WSW6	WSW21	WSW10	SSW6	SSW9	SW7	SW10	SSW7	SW8	SSW6	E5	ESE4	SE7	SE9	SE8	SE11	SE12	SE13	SE12	SE14	SE17	S6.5	WSW21
13-Feb	SE15	SE13	SE8	SW8	WSW14	WSW21	WSW18	WSW18	WSW13	NNW23	N28	N25	N25	NNW26	N25	NNW26	NNW26	NNW25	N14	N17	N14	N16	NNW13	NNW10	NNW11.5	N28
14-Feb	NNW9	NNW11	NNW8	NNW5	N5	N7	N8	NNW9	NW7	NNW7	NNE6	NNE5	N6	N7	NNW8	NNW9	N7	N7	N9	NNW12	N9	N5	N4	N4	NNW7.0	NNW12
15-Feb	NW2	WNW2	NNE3	NE2	E2	SE6	SE6	ESE5	NE1	W1	NW1	WNW2	NNW2	WNW3	N2	NW3	WNW1	NW2	W3	W1	NNE1	WNW2	ENE1	E2	N0.4	SE6
16-Feb	SE7	SE9	SE10	SE10	SE13	SE10	SE11	SE10	SE11	SE10	SE12	SE11	SE8	SSE8	SSE8	SE3	N3	N4	NNW13	NNW22	NNW20	N17	NNW17	N11	ESE2.9	NNW22
17-Feb	NNW12	NNW10	N9	N7	NNW7	NNW7	N5	NNW6	N7	N7	NNW8	NNW9	NNW9	NNW10	NNW9	N9	N11	NNW15	NNW17	NNW14	NNW13	NNW13	NNW14	N10	NNW9.9	NNW17
18-Feb	N10	N9	N9	NNW10	N8	N6	N7	NNW10	NNW11	NNW7	NNW9	NNW10	NNW11	N9	NNW8	NNW5	NW3	NNW3	W2	W2	WSW4	E2	NNW0	W1	NNW6.0	NNW11
19-Feb	SSE1	SE5	E4	SE7	SE9	SE9	SE7	ESE5	SE6	ESE7	ESE6	N7	N6	NNW3	N5	N6	N9	NNW12	N9	NNW7	NNW4	NW2	WNW3	N10	NE2.3	NNW12
20-Feb	N12	NNW14	NNW14	N9	N6	N6	NNE3	NNE2	N2	NW3	NW4	WNW3	NNW4	NW5	W2	W2	N4	N6	N9	N7	N4	N2	NW5	W5	NNW5.1	NNW14
21-Feb	W5	WNW3	NW5	NNW8	NNW6	NNW6	NNW6	NNW4	W4	NNW10	N12	N9	NNW12	NNW13	NNW13	NNW15	N11	N8	N4	N4	WSW5	SW5	SW3	SW7	NNW6.0	NNW15
22-Feb	SSW5	S4	SSW3	SSE1	SE2	SE1	S1	ESE2	E2	ENE1	E4	ESE3	WSW2	NNW10	NNW9	NW5	NW5	SW3	W4	SW2	WSW1	S0	E1	NNE1	W0.6	NNW10
23-Feb	N1	NNE1	W4	WSW4	WSW4	SSW1	WSW1	WNW2	NNE1	ENE3	NW1	W2	WNW2	NW4	NW2	NW4	WNW3	W2	SSE0	ENE1	ENE1	WSW1	SSE1	SSW3	WNW1.2	WSW4
24-Feb	SSW4	S5	S5	S6	SSE6	SSE8	SSE9	SSE9	SSE8	SE14	SE15	SE10	S8	SSW14	SSE15	S18	SSE18	SSE15	S14	SSE12	SSE11	SSE12	SSE11	S10	SSE10.4	SSE18
25-Feb	S8	S5	SSE6	SSE5	SSE7	SE10	SE8	ESE7	SE8	ESE6	SSW7	SE10	SW10	SW5	SSW6	SW8	SSW7	SSW8	SSE5	SE5	SE6	SE5	SE3	SE8	S5.3	SW11
26-Feb	SE8	SE8	SE6	SE7	SE6	SE7	SE9	SE8	SSE9	SSE9	SSE9	SE7	ESE4	E10	E10	ENE7	ENE9	NE5	NNE6	N6	N5	NE5	N6	N6	ESE4.8	E10
27-Feb	N6	NNW7	NNW7	NNW5	NNW6	NNW9	NW14	NNW15	NW16	NNW13	NNW13	N13	NNW13	NNW13	N13	NNW11	N10	N11	N11	NNW14	NNW12	NNW10	NNW7	NW3	NNW10.4	NW16
28-Feb	W3	W4	SW4	SSW2	SSW1	SW1	SW5	SW4	W3	NE2	ENE3	N5	NNW7	NNW7	NW5	NW5	NW3	NW3	W3	SW3	SW3	E1	E2	SSE2	WNW1.6	NNW7
NNW1.0 NNW0.9 NW0.8 WSW0.2 SSW0.7 WSW0.8 NNW0.8 NNW1.0 W0.9 N1.2 NNE1.5 NNW1.9 NNW3.4 NNW4.2 NNW3.4 NW3.1 NNW2.4 NNW2.3 NW2.4 NNW2.9 NNW1.8 NNE1.6 NNW1.2 NNW0.5																								Diurnal Average		
SE21 NNW21 SE20 SE16 WSW21 WSW21 WNW21 WSW18 W17 NNW23 N28 N25 W31 W28 WNW32 W31 NNW26 NNW25 SE18 NNW22 WNW20 SE19 NNW19 NW34																								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 (WS) - km/h**  
**Athabasca Valley - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 11 km/h on Feb 7 06:00														Hours in Service: 672 Hours of Data: 672 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0											
Minimum Value: 0 km/h on Feb 18 17:00																									
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> = 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-Feb	2	2	2	1	1	1	4	3	2	2	2	3	2	4	3	2	3	1	2	2	2	2	2	1	4
2-Feb	1	2	2	3	2	2	2	3	3	2	2	2	3	5	5	5	4	4	4	4	4	4	4	4	5
3-Feb	4	4	4	3	3	2	4	2	3	2	2	2	1	1	4	3	3	2	3	3	2	2	3	2	4
4-Feb	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	2	1	2	2	3
5-Feb	1	1	1	2	1	1	2	2	3	1	3	1	2	2	2	3	2	1	2	2	2	3	9	6	9
6-Feb	5	5	4	3	2	2	1	1	1	3	1	2	1	1	3	2	2	2	1	3	2	3	3	2	5
7-Feb	2	2	2	2	2	11	6	4	7	4	3	5	7	7	7	6	5	4	6	7	2	3	2	2	11
8-Feb	3	2	2	3	2	2	2	1	1	1	2	3	2	2	2	2	2	2	2	2	2	1	3	3	3
9-Feb	3	3	2	2	3	2	2	2	2	2	2	3	2	2	2	2	3	2	2	1	1	1	2	2	3
10-Feb	1	2	1	1	2	2	2	2	2	3	3	3	3	2	3	3	3	2	2	2	2	1	1	1	3
11-Feb	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	7	5	3	4	3	5	3	3	3	7
12-Feb	3	5	6	6	4	6	2	2	2	2	1	2	2	2	2	2	2	2	3	3	3	3	3	3	6
13-Feb	3	3	3	5	4	6	5	4	2	6	7	7	7	7	7	5	5	7	5	5	5	5	4	2	7
14-Feb	2	2	3	2	2	1	2	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	3
15-Feb	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
16-Feb	3	2	2	3	3	3	3	3	3	3	3	2	2	2	2	2	1	1	8	3	5	4	5	3	8
17-Feb	2	2	2	2	2	1	1	2	2	2	1	2	2	2	2	2	3	4	3	2	3	3	4	2	4
18-Feb	2	3	2	2	2	1	2	2	2	2	2	2	2	2	2	1	0	1	1	1	2	2	1	1	3
19-Feb	2	3	2	3	2	2	2	1	2	4	2	2	1	1	1	1	4	3	2	2	1	1	1	2	4
20-Feb	3	3	2	2	1	2	1	1	1	1	1	1	2	1	1	0	2	1	2	1	1	2	1	1	3
21-Feb	1	1	2	3	2	2	2	1	1	4	3	2	3	3	3	3	3	2	2	1	1	2	1	3	4
22-Feb	4	2	2	1	2	1	1	2	1	1	1	2	3	4	2	1	1	1	1	3	2	1	1	1	4
23-Feb	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
24-Feb	1	1	1	1	3	2	2	2	2	3	3	2	6	4	4	4	5	4	4	3	2	2	3	2	6
25-Feb	2	2	2	2	1	1	2	2	2	1	3	3	3	4	2	3	3	2	1	1	2	1	2	3	4
26-Feb	2	2	2	2	2	2	2	2	2	2	2	2	1	3	4	2	3	2	2	1	1	1	1	1	4
27-Feb	1	2	1	1	1	2	2	2	2	3	3	3	3	3	3	2	2	2	3	3	2	2	2	1	3
28-Feb	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2
														5 5 6 6 4 11 6 4 7 6 7 7 7 7 7 7 5 7 8 7 5 5 9 6											
Diurnal Maximum																									





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

**Wind Speed (WS) - km/h**  
**Athabasca Valley - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	242	36.01	36.01
6 - 11	291	43.30	79.32
12 - 19	107	15.92	95.24
20 - 28	28	4.17	99.40
29 - 38	4	0.60	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Athabasca Valley - February 2023**

<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	26	11	7	7	12	8	17	16	14	12	15	18	19	18	24	18	242
6 - 11	64	2	0	2	3	4	77	28	4	10	10	4	1	0	4	78	291
12 - 19	7	0	0	0	0	0	24	8	0	1	0	13	6	2	2	44	107
20 - 28	3	0	0	0	0	0	6	0	0	0	0	4	3	3	1	8	28
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0	4
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	100	13	7	9	15	12	124	52	18	23	25	39	31	24	32	148	672

Total Number of Valid Hours: 672

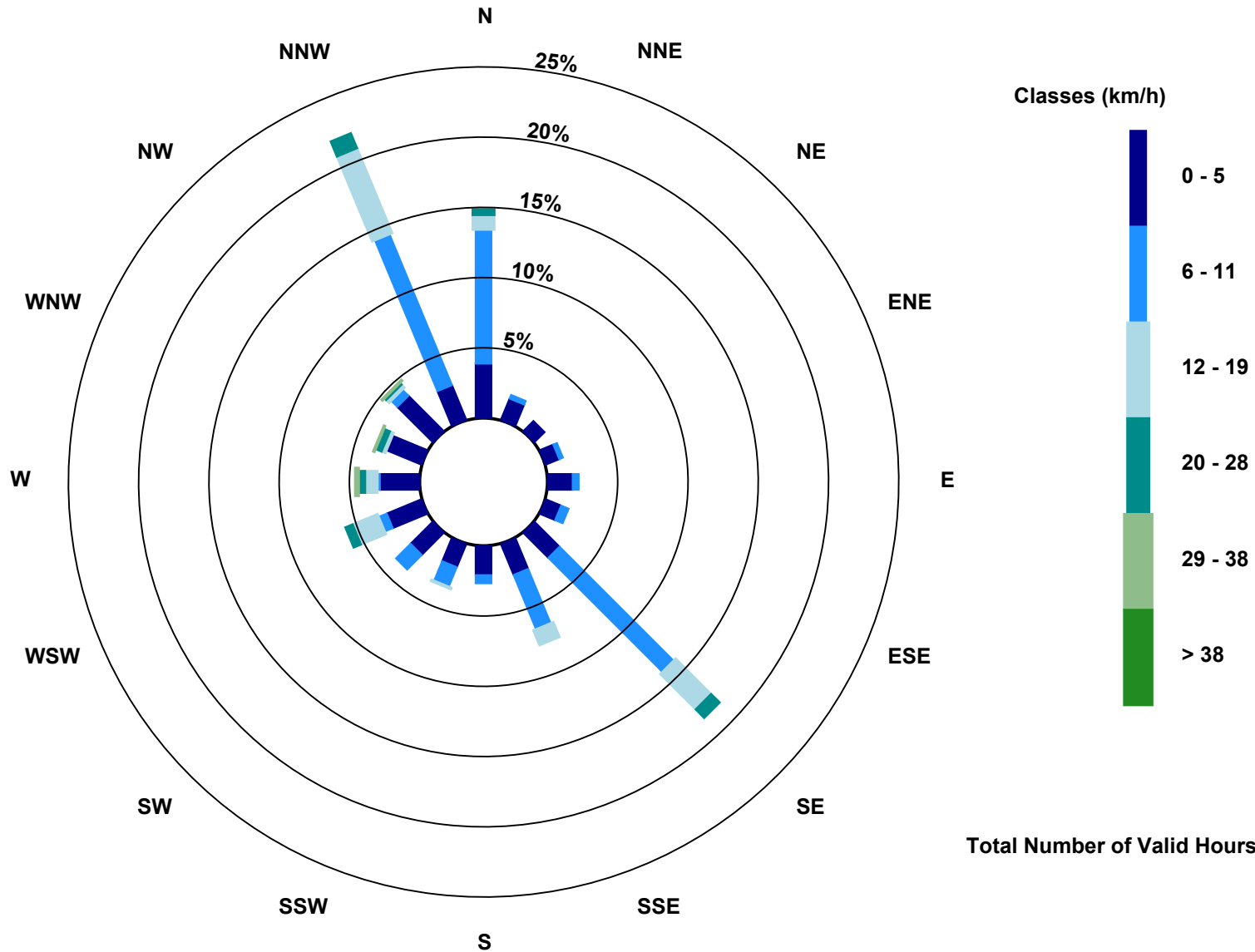
Total Number of Hours: 672





Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Athabasca Valley



Total Number of Valid Hours: 672



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

**Wind Direction (WD) - deg**  
**Athabasca Valley - February 2023**

Direction of Maximum Speed: 305 deg on Feb 6 00:00 Direction of Maximum Daily Speed Average: 261.3 deg on Feb 7	Hours in Service: 672 Hours of Data: 672 Hours of Missing Data: 0
Direction of Minimum Speed: 343 deg on Feb 18 23:00 Direction of Minimum Daily Speed Average: 0.4 deg on Feb 15	Percent Operational Time: 100.0
Monthly Average Direction: 328.9 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-Feb	288	344	339	315	352	338	345	341	355	347	348	353	6	333	331	329	320	262	246	227	199	171	87	75	333.6
2-Feb	169	120	180	158	172	29	228	131	139	139	134	141	143	132	127	130	129	135	135	131	130	129	128	128	132.7
3-Feb	127	127	128	129	134	142	144	143	142	142	140	140	17	330	345	342	351	339	345	339	340	346	336	22	94.2
4-Feb	346	350	349	348	345	344	346	343	342	347	347	352	346	338	353	335	4	353	339	343	347	336	341	350	345.6
5-Feb	349	357	355	349	350	347	350	328	340	284	356	278	341	340	247	201	190	190	220	210	213	322	292	305	308.4
6-Feb	305	284	278	262	252	255	295	312	254	256	237	342	345	285	131	139	153	145	152	154	146	145	153	151	230.9
7-Feb	152	146	146	151	140	291	303	276	266	265	243	256	276	281	284	272	276	274	245	248	228	184	199	186	261.3
8-Feb	332	330	336	334	10	244	231	244	217	141	126	144	142	132	154	151	147	146	164	214	196	193	159	153	199.0
9-Feb	154	149	148	152	144	145	145	135	134	141	139	135	138	140	136	134	129	129	130	88	137	145	154	138	138.6
10-Feb	111	135	51	41	350	352	339	348	348	353	350	347	346	350	337	338	336	333	331	343	348	359	351	352	345.8
11-Feb	348	340	324	125	83	159	145	163	143	151	138	141	145	127	142	243	245	242	268	289	296	299	244	246	236.9
12-Feb	249	248	248	242	247	237	212	213	214	223	206	217	206	82	103	145	138	132	133	134	132	130	138	146	191.1
13-Feb	139	144	144	221	238	256	256	249	249	347	350	353	349	347	351	341	339	345	353	353	358	352	346	340	332.4
14-Feb	342	315	329	328	354	349	349	338	314	343	12	24	351	356	343	345	352	6	350	340	350	351	353	357	345.3
15-Feb	308	300	16	37	89	133	133	122	52	259	312	299	335	291	350	315	296	313	270	270	26	298	75	82	355.2
16-Feb	134	138	142	142	143	139	136	135	140	137	141	136	141	155	147	133	7	10	336	334	342	349	348	351	101.7
17-Feb	330	341	350	350	339	336	4	345	357	352	344	344	336	343	344	351	352	346	340	341	344	346	343	356	344.8
18-Feb	354	357	359	341	1	357	349	347	344	348	340	345	347	350	342	339	307	335	265	281	252	86	343	261	345.0
19-Feb	152	132	86	141	133	142	130	117	127	116	120	355	349	342	359	356	349	347	355	346	341	321	293	356	39.8
20-Feb	352	345	342	358	4	1	13	22	8	316	318	286	333	325	279	276	352	1	350	350	356	356	307	281	342.8
21-Feb	267	303	311	334	328	343	333	336	280	339	349	353	345	341	345	342	355	0	351	354	250	217	218	219	332.7
22-Feb	201	188	193	165	146	128	172	104	93	74	92	122	248	337	339	320	304	230	261	223	250	187	88	26	275.7
23-Feb	7	23	259	247	246	210	248	283	20	67	320	274	302	319	323	308	300	279	164	70	68	248	164	213	281.3
24-Feb	192	188	179	173	160	157	156	150	149	144	141	137	182	192	167	169	165	163	169	163	159	156	155	175	162.6
25-Feb	180	169	164	167	149	144	139	116	134	116	207	234	235	221	210	217	200	199	149	145	138	128	143	137	171.6
26-Feb	130	139	125	134	138	131	130	144	150	155	155	146	118	89	91	77	78	56	28	2	10	40	355	4	107.5
27-Feb	356	344	340	346	342	332	320	331	325	343	346	349	335	343	349	346	355	350	349	344	338	335	338	326	340.5
28-Feb	278	261	222	205	209	226	234	236	274	50	76	349	337	341	320	321	305	311	272	232	214	87	85	150	290.5
309.1 294.4 311.7 241.1 200.5 246.1 283.9 300.8 277.9 352.8 12.7 342.5 327.4 336.5 344.1 318.4 328.8 336.3 323.5 330.6 332.1 13.9 344.7 293.3																									
Diurnal Average																									

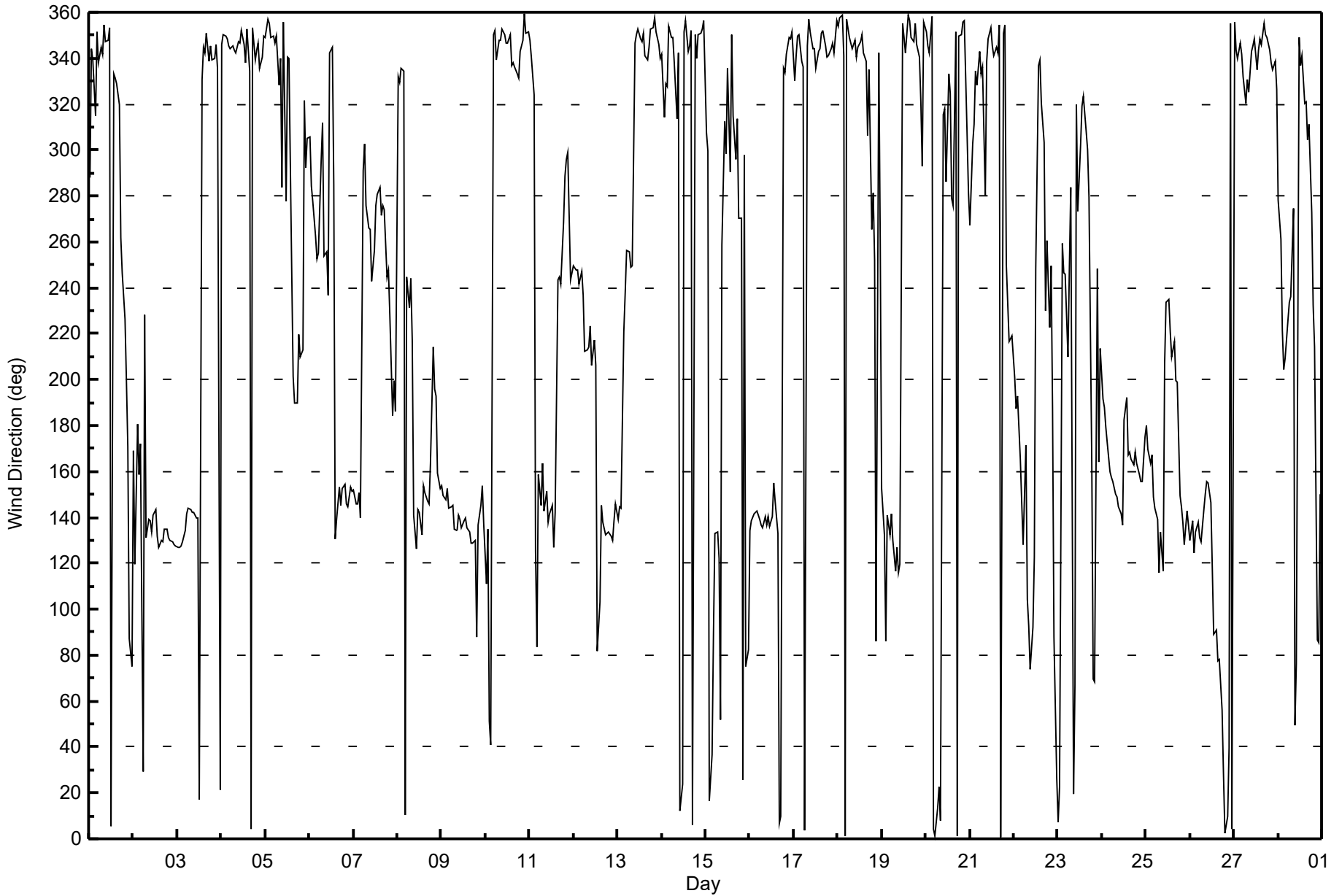
All monthly, daily, and diurnal averages have been calculated using vector methods



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

**Wind Direction (WD) - deg**  
**Athabasca Valley - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 101 deg on Feb 15 23:00		Hours in Service: 672 Hours of Data: 672 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																							
Minimum Value: 8 deg on Feb 8 02:00																									
Percentiles: P <sub>1</sub> = 9 P <sub>10</sub> = 12 Q <sub>1</sub> = 15 Median = 19 Q <sub>3</sub> = 30 P <sub>90</sub> = 66 P <sub>99</sub> = 90																									
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-Feb	37	17	30	25	29	13	18	13	19	16	17	20	25	15	12	10	13	20	35	28	55	81	99	68	99
2-Feb	76	73	81	63	80	72	89	38	47	21	32	25	19	18	15	15	15	15	14	14	12	12	12	11	89
3-Feb	11	11	11	12	14	14	15	22	19	15	18	18	48	10	17	13	19	10	16	12	20	16	11	30	48
4-Feb	51	18	18	13	11	13	13	12	12	15	15	19	18	15	17	25	30	19	10	17	20	13	18	17	51
5-Feb	17	19	20	22	22	16	20	19	44	44	47	74	56	78	87	60	27	33	12	13	13	55	22	9	87
6-Feb	10	14	15	12	10	26	65	20	10	64	82	47	33	48	26	19	20	15	22	21	18	17	18	14	82
7-Feb	15	13	14	13	14	81	13	18	14	11	11	16	11	13	14	12	10	9	14	15	12	95	67	77	95
8-Feb	9	8	9	21	39	36	22	16	74	94	83	22	30	59	49	27	22	40	77	62	23	21	25	19	94
9-Feb	17	18	22	18	19	18	16	19	20	17	19	19	16	18	14	14	16	19	22	12	32	30	67	69	69
10-Feb	56	51	74	51	24	22	14	16	16	27	18	17	16	19	14	12	9	9	12	14	15	19	17	22	74
11-Feb	19	27	41	80	55	25	16	23	26	22	20	19	9	20	47	21	13	12	13	11	12	85	77	11	85
12-Feb	12	11	23	73	11	43	33	22	22	11	17	16	21	31	35	14	12	20	15	16	15	16	13	11	73
13-Feb	13	12	19	45	14	12	12	11	13	28	21	21	20	19	22	14	13	18	20	20	20	20	19	16	45
14-Feb	14	15	16	28	19	17	16	10	11	15	23	31	20	21	12	14	18	19	19	12	17	14	16	24	31
15-Feb	27	30	39	63	89	26	22	38	87	84	83	23	47	31	58	29	76	39	24	75	30	42	101	67	101
16-Feb	29	20	13	17	15	21	19	17	18	20	15	15	15	14	15	79	48	28	14	8	15	18	18	19	79
17-Feb	11	14	17	16	16	19	19	23	21	18	14	14	10	14	15	18	18	16	10	11	14	16	13	17	23
18-Feb	17	19	19	14	20	19	20	17	14	14	13	14	16	16	14	17	21	14	54	62	23	89	95	88	95
19-Feb	80	42	52	25	18	17	22	24	19	34	39	30	19	39	30	18	19	17	19	18	20	37	38	18	80
20-Feb	18	16	11	17	23	18	25	51	36	15	18	28	27	14	50	21	36	20	14	17	23	60	17	24	60
21-Feb	28	34	22	20	23	20	22	23	25	20	17	22	17	22	16	12	19	20	22	19	20	24	45	41	45
22-Feb	52	46	66	66	77	84	78	78	69	73	35	59	94	22	13	16	12	31	34	85	85	93	86	62	94
23-Feb	72	62	27	17	32	77	78	58	76	28	68	39	34	20	63	25	19	33	87	68	84	74	65	33	87
24-Feb	20	18	21	20	22	22	17	18	22	12	11	13	73	23	18	13	13	14	15	15	15	14	13	17	73
25-Feb	17	42	45	48	14	8	13	29	33	23	60	18	20	79	26	23	21	19	28	17	19	33	82	28	82
26-Feb	19	21	22	23	24	19	17	18	14	16	12	17	42	18	20	20	13	24	27	16	19	29	16	19	42
27-Feb	18	14	13	18	12	10	8	9	9	16	17	17	18	18	17	16	19	19	19	14	11	9	11	34	34
28-Feb	32	26	27	55	89	87	52	21	41	50	43	21	10	19	8	10	24	12	14	52	45	82	22	57	89
	80	73	81	80	89	87	89	78	87	94	83	74	94	79	87	79	76	40	87	85	85	95	101	88	
	Diurnal Maximum																								





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS08 FORT CHIPEWYAN FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)

FEBRUARY 2023

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	630	31	42	98.36	4	0	1.9	0
TRS (ppb) Average	637	33	35	99.7	0.6	0	0.3	0
O3(ppb) Average	641	31	31	100	44.7	0	40.9	-
NO2(ppb) Average	636	33	36	99.55	33.6	0	7.8	-
NO(ppb) Average	636	33	36	99.55	13.1	-	2.2	-
NOX(ppb) Average	636	33	36	99.55	43.3	-	10.1	-
PM2.5(ug/m3) Average	670	2	2	100	18.5	0	5.4	0
CO(ppm) Average	637	32	35	99.55	0.1	0	0.1	-
CO2(ppm) Average	638	31	34	99.55	450.5	-	445	-
Temperature 2 m (C) Average	672	0	0	100	-6.6	-	-10.6	-
Relative Humidity (%) Average	672	0	0	100	95.2	-	88.7	-
Wind Speed 10 m (km/h) Average	672	0	0	100	42	-	22	-
Wind Direction 10 m (deg) Average	672	0	0	100	-	-	-	-
Leaf Wetness (% of range) Average	672	0	0	100	4.5	-	4.2	-
Global Solar Radiation (W/m2) Average	672	0	0	100	508.5	-	134.9	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	630	0.21	0.5	-	0	0	0	0	0.2	0.5	4
TRS (ppb) Average	637	0.19	0.1	-	0.1	0.1	0.2	0.2	0.2	0.2	0.6
O3(ppb) Average	641	34.89	4.1	-	3.4	30.9	32.6	34.8	37.6	39.8	44.7
NO2(ppb) Average	636	1.15	2.4	-	0	0	0.3	0.6	1.1	2.1	33.6
NO(ppb) Average	636	0.18	0.9	-	0	0	0	0	0.1	0.2	13.1
NOX(ppb) Average	636	1.33	3.1	-	0	0	0.3	0.7	1.2	2.3	43.3
PM2.5(ug/m3) Average	670	2.16	1.7	-	0.4	0.7	1.1	1.7	2.6	3.9	18.5
CO(ppm) Average	637	0.03	0	-	0	0	0	0	0	0.1	0.1
CO2(ppm) Average	638	438.3	4.3	-	426.7	432	436.2	438.5	441.3	443.8	450.5
Temperature 2 m (C) Average	672	-20.17	6.8	-	-34.9	-30.1	-25.6	-19.4	-15.2	-10.9	-6.6
Relative Humidity (%) Average	672	76.51	7.2	-	53.7	67.9	72.8	77.3	80.9	84.7	95.2
Wind Speed 10 m (km/h) Average	672	13.3	7	-	0	5	8	12	17	25	42
Wind Direction 10 m (deg) Average	672	-	-	-	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	672	0.45	1	-	0	0	0	0	0.5	1.1	4.5
Global Solar Radiation (W/m2) Average	672	75.34	128.2	-	0	0	0	0	114.3	287.5	508.5

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	08 Feb 2023 09:00	08 Feb 2023 17:00	9	Analyzer Failure - non responsive
SO2	28 Feb 2023 16:00	28 Feb 2023 17:00	2	Maintenance - WBEA internal audit
TRS	28 Feb 2023 15:00	28 Feb 2023 16:00	2	Maintenance - WBEA internal audit
NO2	28 Feb 2023 15:00	28 Feb 2023 17:00	3	Maintenance - WBEA internal audit
CO, CO2	03 Feb 2023 12:00	03 Feb 2023 14:00	3	Maintenance - verify daily QA response





Wood Buffalo Environmental Association

Summary of Hour Averages

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

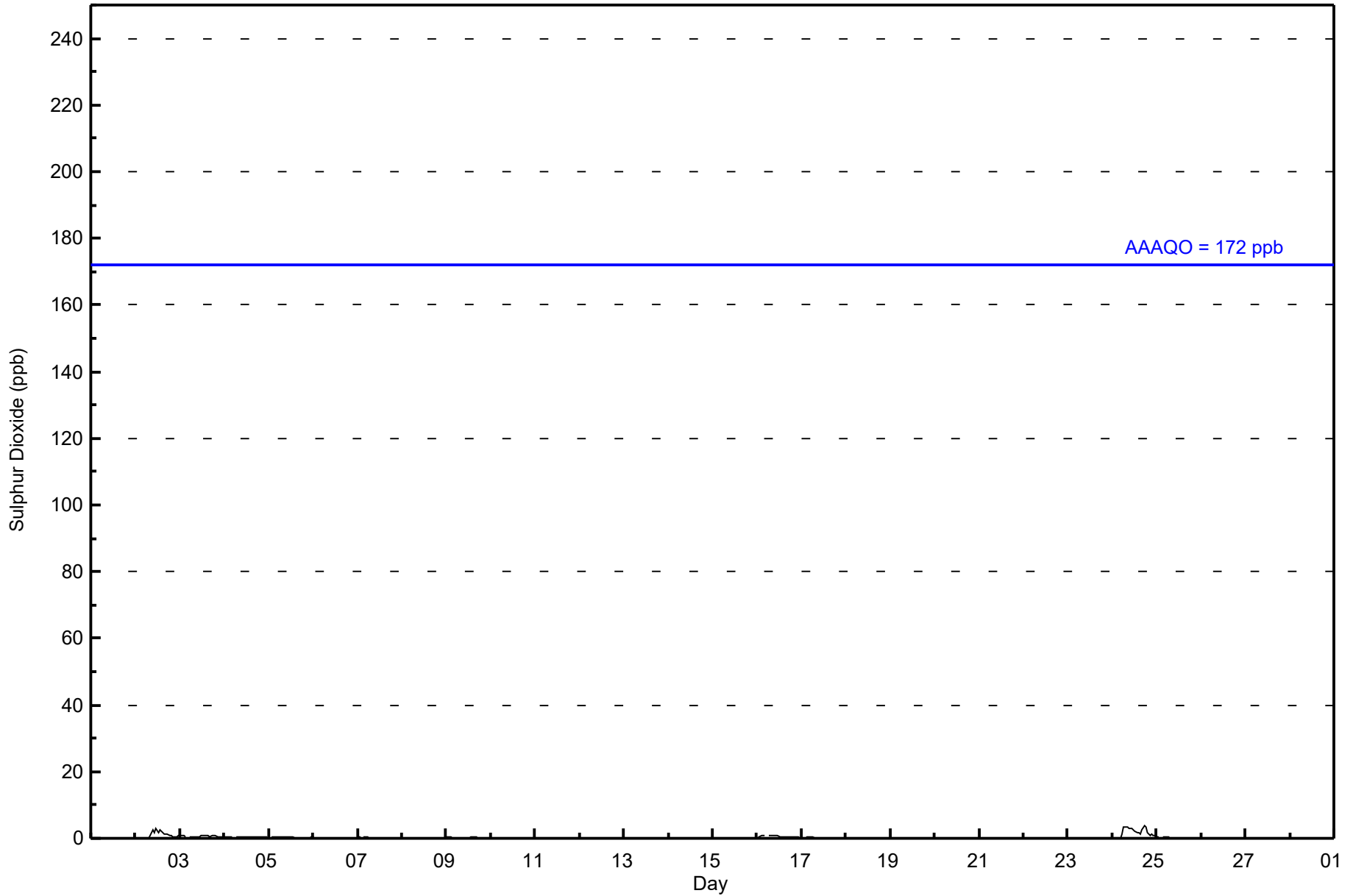
Fort Chipewyan - February 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																			Hours in Service: 672																									
Maximum Value: 4.0 ppb on Feb 24 18:00																			Maximum Daily Average: 1.9 ppb on Feb 24					Hours of Data: 630																				
Minimum Value: 0.0 ppb on Feb 1 02:00																			Minimum Daily Average: 0.0 ppb on Feb 12					Hours of Missing Data: 42																				
Maximum Diurnal Average: 0.3 ppb at hour 10																			Minimum Diurnal Average: 0.1 ppb at hour 24					Hours of Calibration: 31																				
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 = 0.0 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 0.5 P <sub>99</sub> = 2.9					Percent Operational Time: 98.4																				
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-Feb	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															
2-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	1.7	2.7	1.6	2.8	1.6	2.6	2.0	1.3	1.3	1.2	0.9	0.7	0.5	0.5	0.6	0.6	0.6	0.6	1.0	2.8																
3-Feb	0.7	0.7	0.7	0.6	Z	0.6	0.6	0.5	0.5	0.5	0.4	0.7	1.0	0.8	0.7	0.7	0.6	0.7	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.6	1.0																	
4-Feb	0.4	0.4	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	0.3	0.3	0.3	0.3	0.3	0.4																
5-Feb	Z	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	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3																
6-Feb	0.3	Z	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	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3															
7-Feb	0.2	0.2	Z	0.3	0.3	0.3	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3																
8-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	AF	AF	AF	AF	AF	AF	AF	AF	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	--	0.1	0.1																
9-Feb	0.2	0.3	0.3	0.2	Z	0.1	0.1	0.0	0.0	0.1	0.2	0.1	0.2	0.6	0.5	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6	0.6																
10-Feb	0.1	0.1	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.2	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	0.1	0.2	0.2																
11-Feb	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	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1																
12-Feb	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																
13-Feb	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																
14-Feb	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																
15-Feb	0.0	0.0	0.0	0.0	Z	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	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1																
16-Feb	0.0	0.3	0.8	0.8	0.9	Z	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.5	0.9	0.9																
17-Feb	Z	0.1	0.1	0.3	0.5	0.4	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	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.5	0.5																
18-Feb	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	0.0	0.1	0.1																
19-Feb	0.0	0.0	Z	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	0.1	0.1																
20-Feb	0.1	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	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2																
21-Feb	0.1	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	0.1	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																
22-Feb	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	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1																
23-Feb	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																
24-Feb	0.2	Z	0.2	0.2	0.2	1.1	3.2	3.4	3.5	3.0	3.0	2.6	2.0	1.9	1.8	1.3	2.3	4.0	3.3	1.5	1.0	1.4	1.0	0.7	0.7	1.9	4.0	4.0																
25-Feb	0.6	0.6	Z	0.4	0.3	0.3	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	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.6																
26-Feb	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	0.0	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	0.1																
27-Feb	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																
28-Feb	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	M	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																
																			0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	Diurnal Average	
																			0.7	0.7	0.8	0.8	0.9	1.1	3.2	3.4	3.5	3.0	3.0	2.8	2.0	2.6	2.0	1.3	2.3	4.0	3.3	1.5	1.0	1.4	1.0	0.7	Diurnal Maximum	
Z - zerospan C - Calibration M - Maintenance AF - Analyzer 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**  
**Fort Chipewyan - February 2023**





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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Fort Chipewyan - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	630	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: 630

Total Number of Hours: 672



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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Fort Chipewyan - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	20	14	37	84	111	25	7	12	4	10	17	11	39	82	104	53	630
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>	20	14	37	84	111	25	7	12	4	10	17	11	39	82	104	53	630

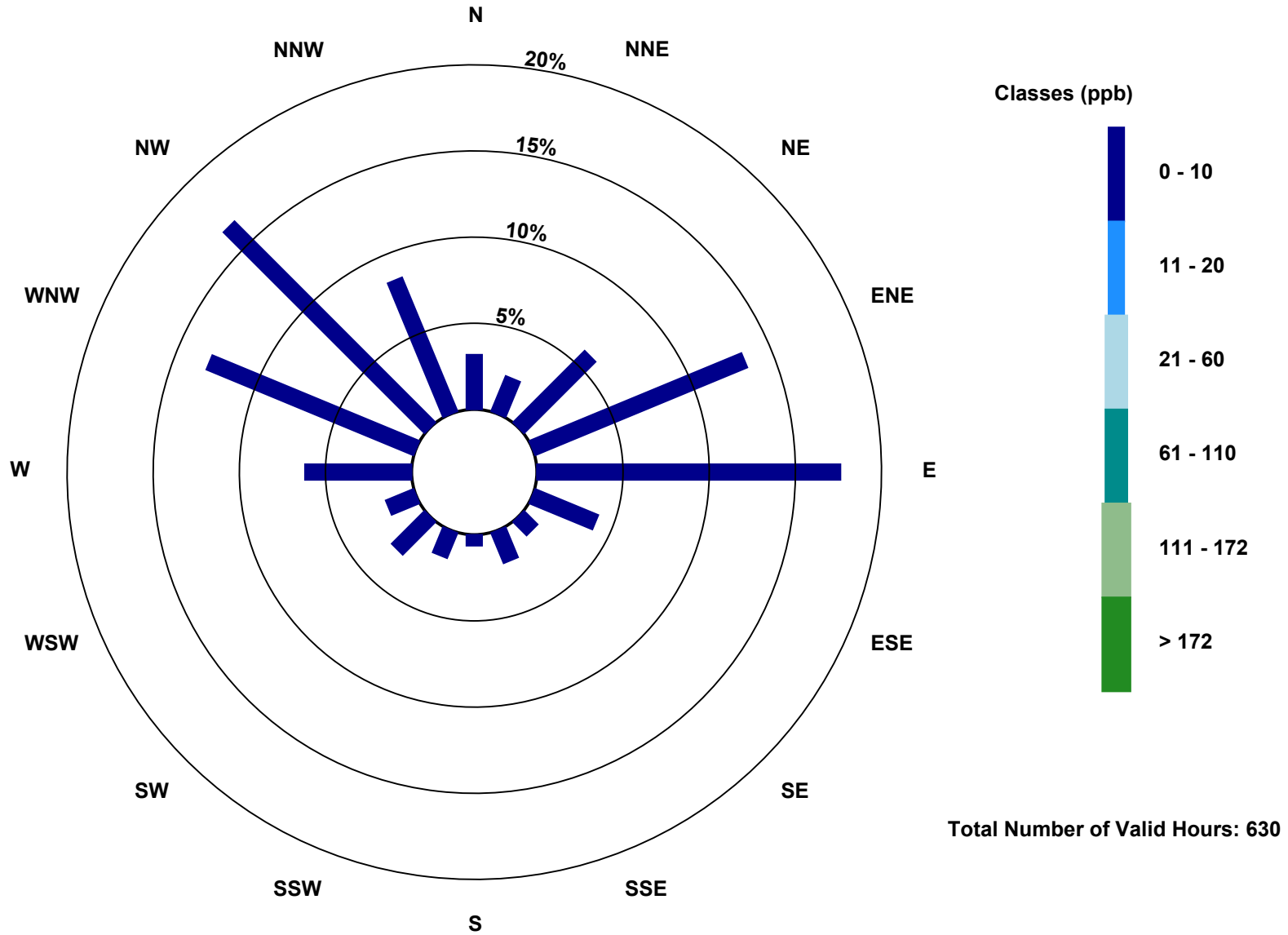
Total Number of Valid Hours: 630

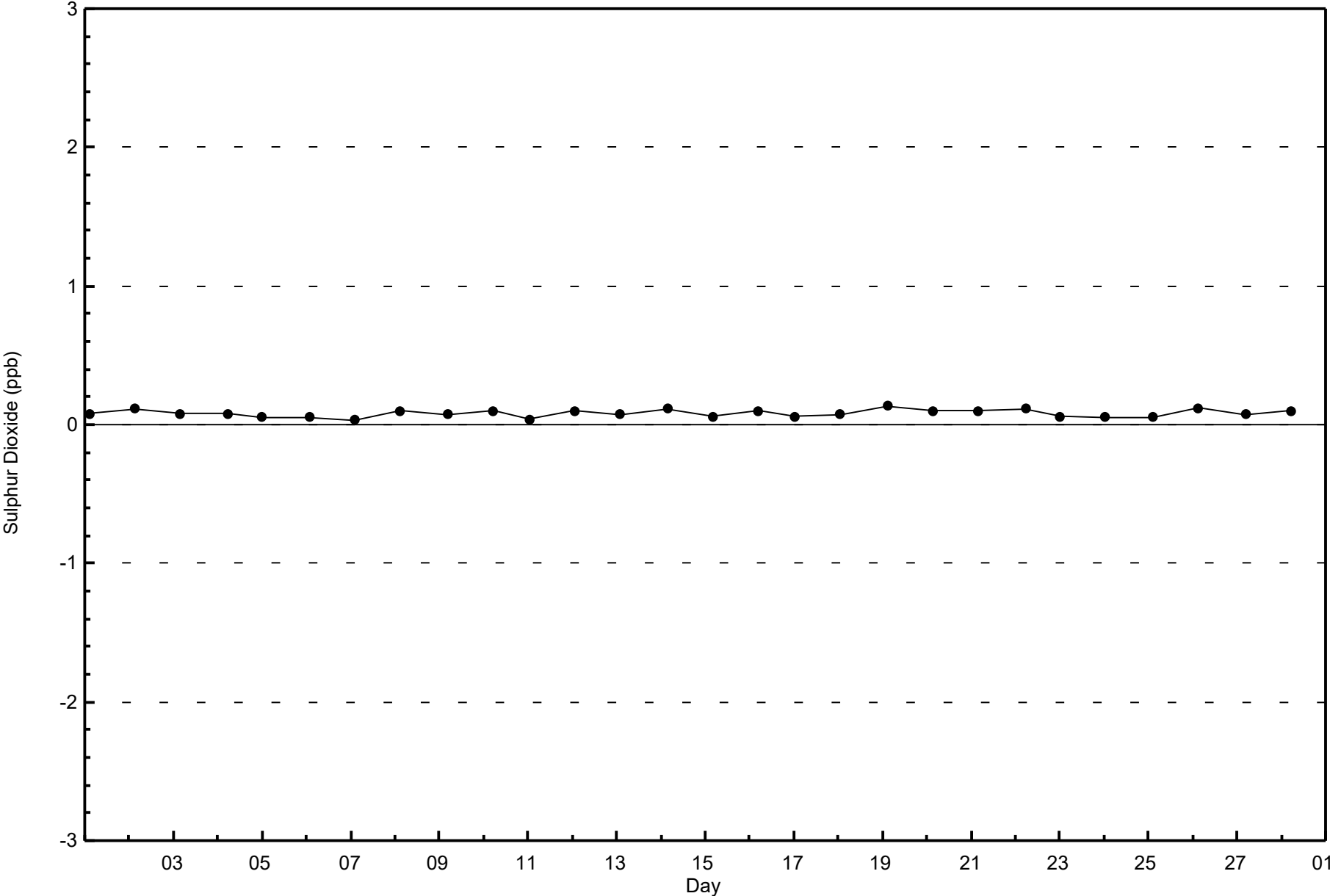
Total Number of Hours: 672

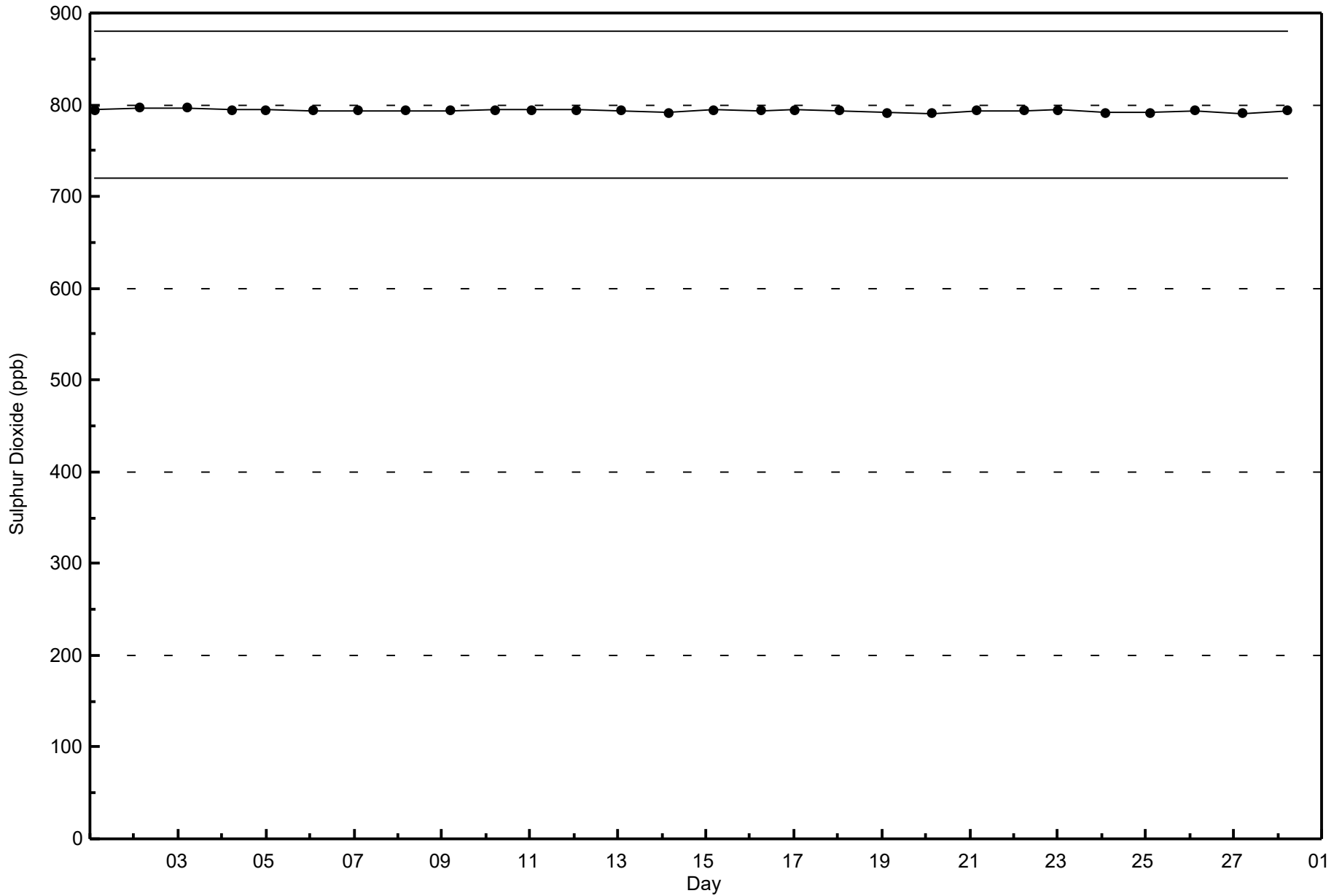


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









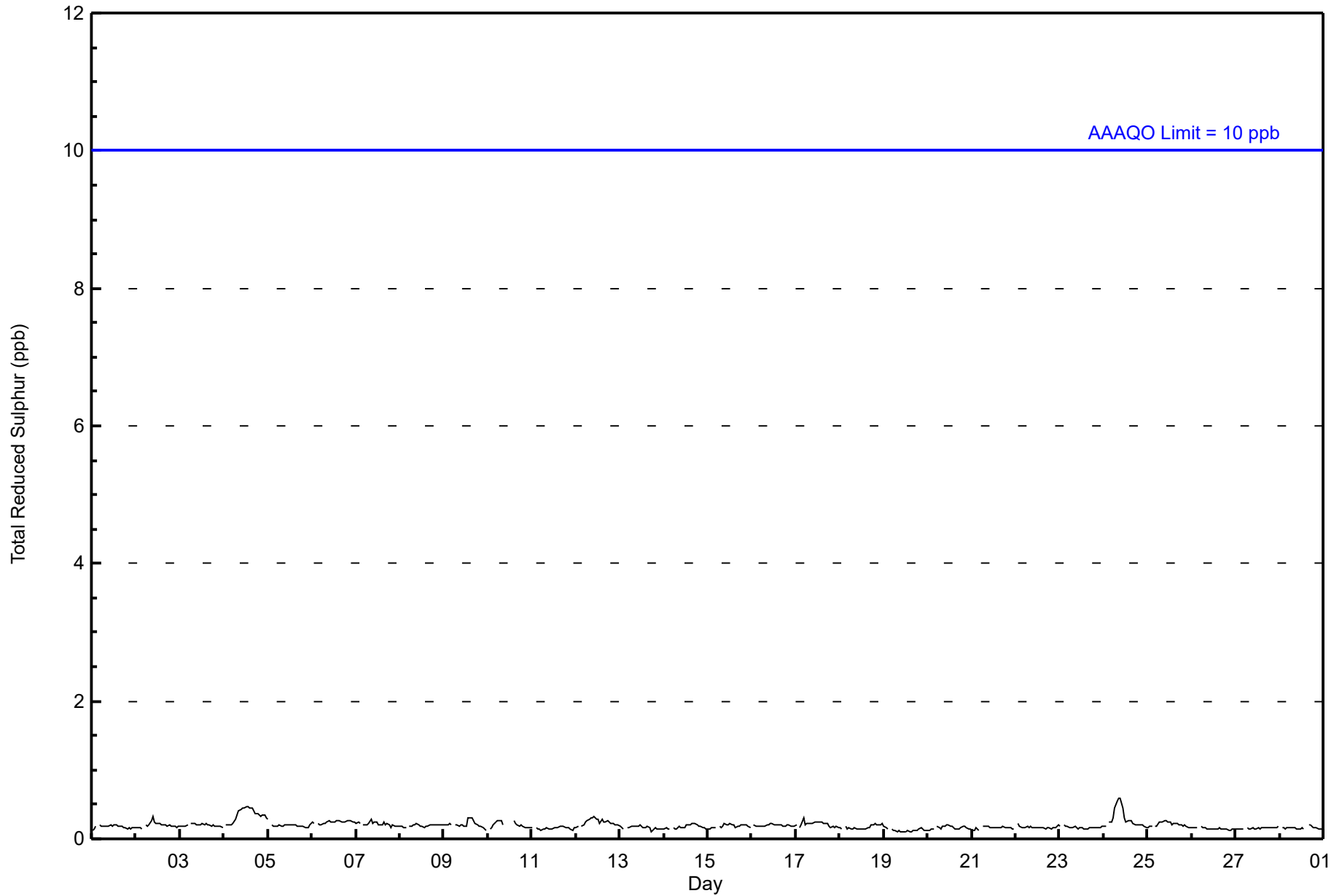
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0		Hours in Service: 672																									
Maximum Value: 0.6 ppb on Feb 24 09:00		Maximum Daily Average: 0.3 ppb on Feb 4																									
Minimum Value: 0.1 ppb on Feb 13 18:00		Minimum Daily Average: 0.1 ppb on Feb 19																									
Maximum Diurnal Average: 0.2 ppb at hour 10		Minimum Diurnal Average: 0.2 ppb at hour 3																									
Monthly Average: 0.19 ppb		Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.2 Median = 0.2 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 0.2 P <sub>99</sub> = 0.5																									
		Hours of Data: 637																									
		Hours of Missing Data: 35																									
		Hours of Calibration: 33																									
		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-Feb	0.1	0.1	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	0.1	0.2	0.1	0.2	0.2	0.2	0.2	
2-Feb	0.2	0.2	0.2	0.2	Z	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	0.2	0.2	0.2	0.3	
3-Feb	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
4-Feb	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.5	
5-Feb	0.3	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	0.3	
6-Feb	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	
7-Feb	0.2	0.2	0.2	Z	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	0.2	0.2	0.2	0.2	0.3	
8-Feb	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	0.2	0.2	
9-Feb	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	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.3	
10-Feb	Z	0.1	0.2	0.2	0.3	0.3	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	0.2	0.3	
11-Feb	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	
12-Feb	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	
13-Feb	0.2	0.2	0.1	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	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	
14-Feb	0.2	0.2	0.1	0.2	Z	0.2	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	0.2	0.2	0.2	0.2	0.2	
15-Feb	0.2	0.1	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	
16-Feb	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	
17-Feb	0.2	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	
18-Feb	0.2	0.2	Z	0.2	0.1	0.2	0.1	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	0.2	0.2	0.2	0.2	
19-Feb	0.2	0.2	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	0.2	0.1	0.1	0.1	0.1	0.2	
20-Feb	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	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	
21-Feb	0.1	0.1	0.2	0.1	0.1	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	0.1	0.1	0.2	0.2	
22-Feb	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	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
23-Feb	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	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
24-Feb	0.2	0.2	Z	0.2	0.2	0.3	0.4	0.6	0.6	0.6	0.5	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.6	
25-Feb	0.2	0.2	0.2	Z	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	0.2	0.2	0.2	0.2	0.2	0.3	
26-Feb	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	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
27-Feb	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.2	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	
28-Feb	Z	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	M	M	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2
																								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**  
**Fort Chipewyan - February 2023**





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

**Total Reduced Sulphur (TRS) - ppb**  
**Fort Chipewyan - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	637	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: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Fort Chipewyan - February 2023**

<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	19	15	35	86	116	23	8	13	4	10	19	10	41	80	105	53	637
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>	19	15	35	86	116	23	8	13	4	10	19	10	41	80	105	53	637

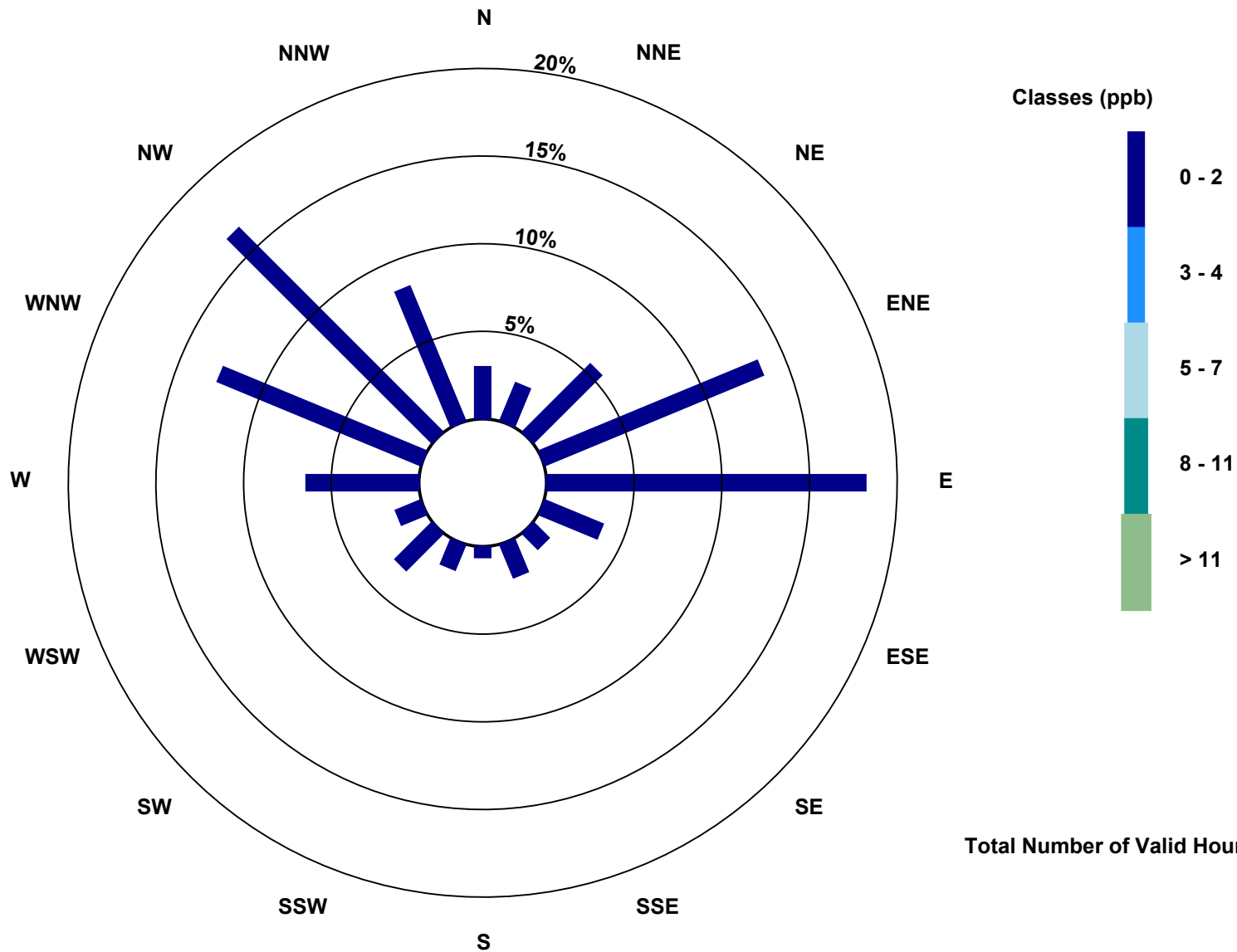
Total Number of Valid Hours: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association**  
**Wind Rose Feb 2023**

**Total Reduced Sulphur (TRS) - ppb**  
**Fort Chipewyan**

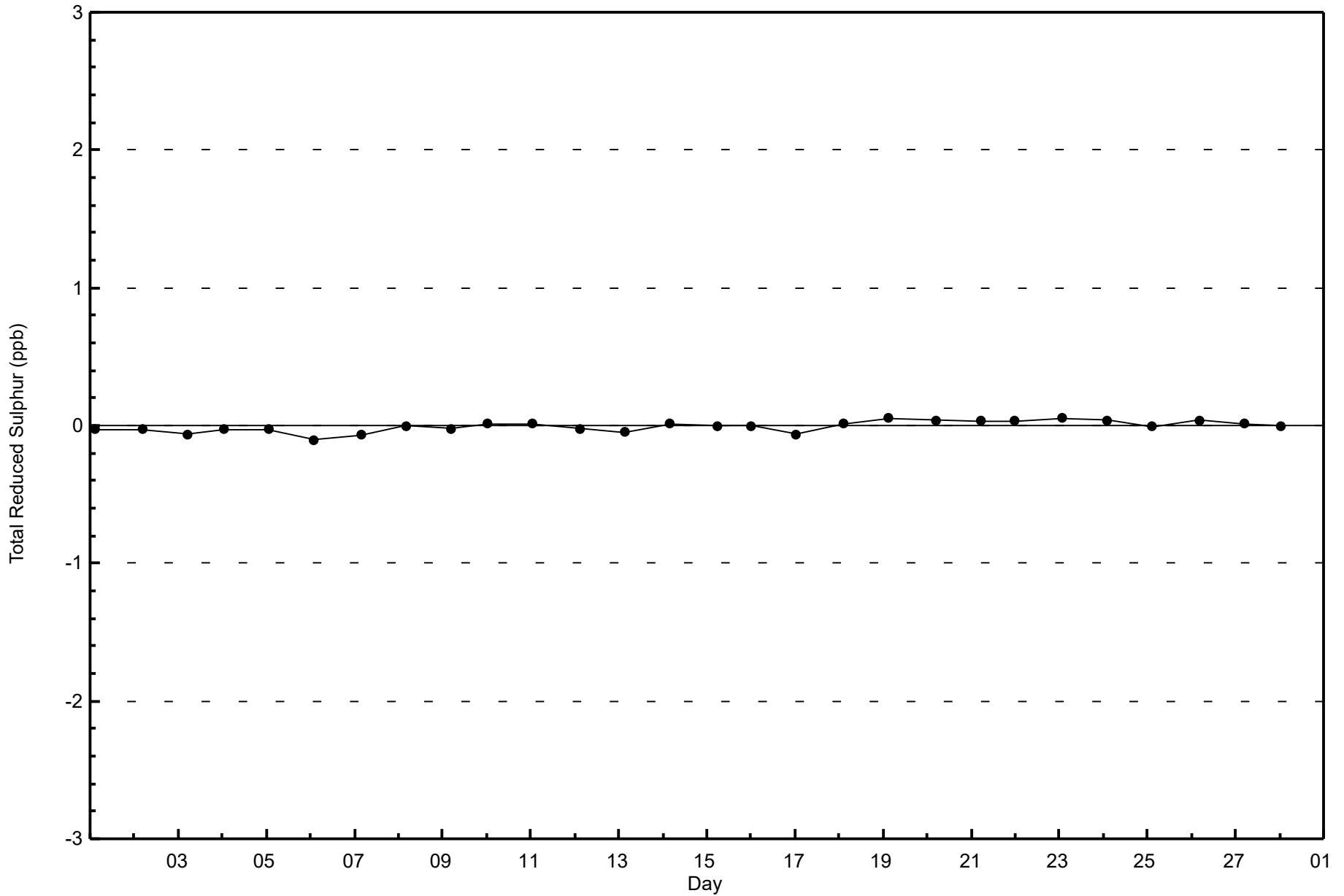


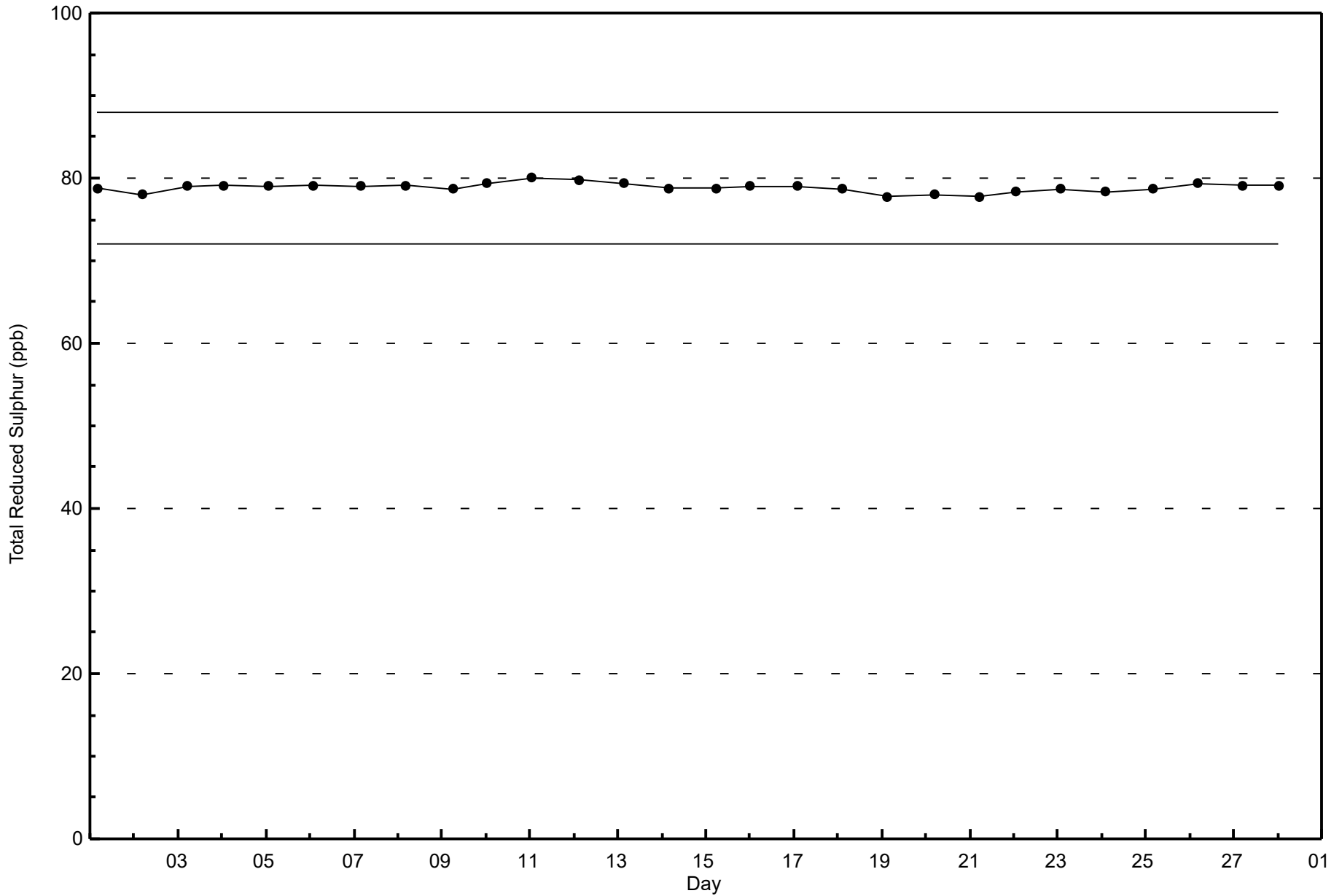
**Total Number of Valid Hours: 637**



Wood Buffalo Environmental Association  
Zero Responses

Total Reduced Sulphur (TRS) - ppb  
Fort Chipewyan - February 2023



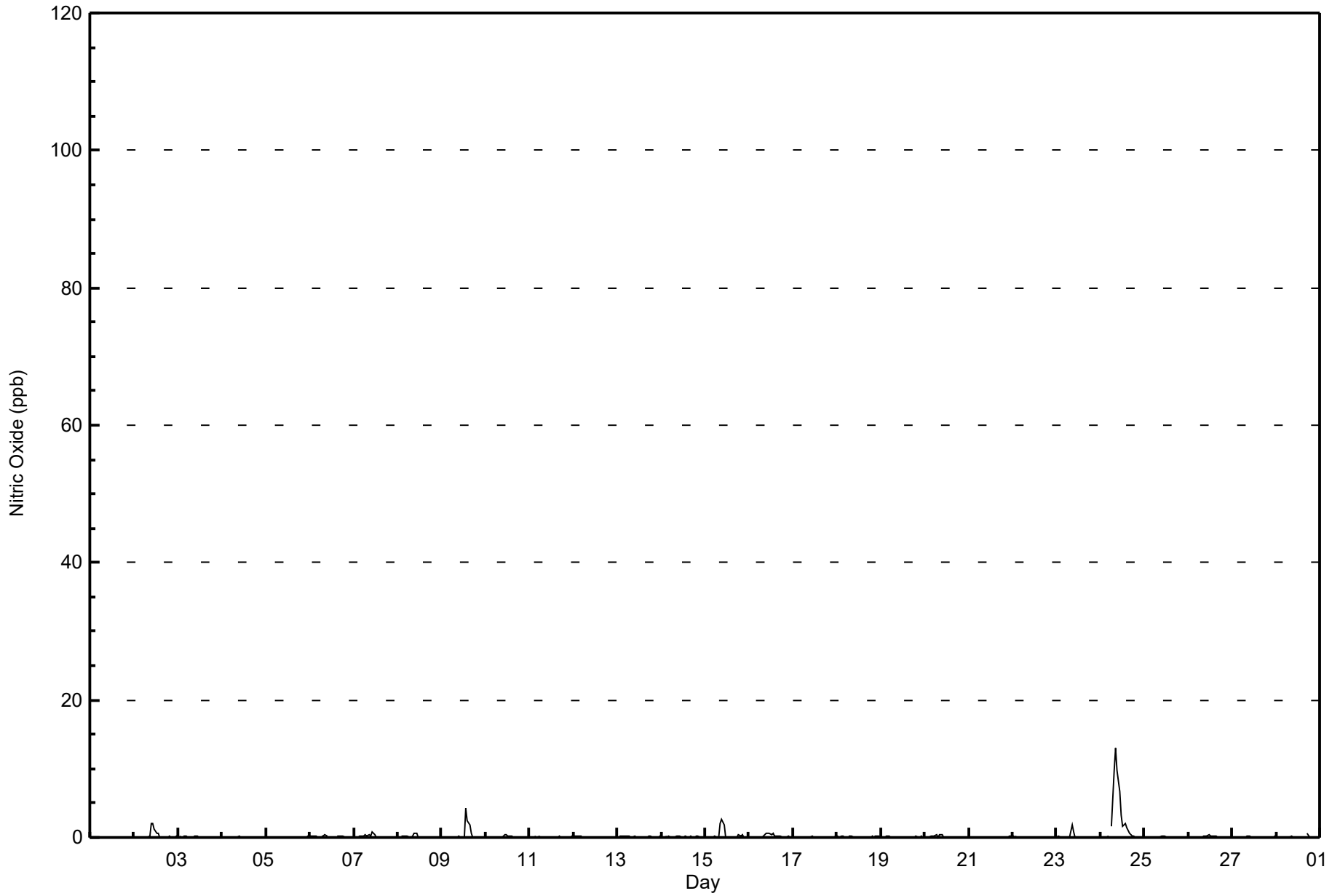






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Fort Chipewyan - February 2023**







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

**Nitric Oxide (NO) - ppb**  
**Fort Chipewyan - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	636	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: 636

Total Number of Hours: 672



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

**Nitric Oxide (NO) - ppb**  
**Fort Chipewyan - February 2023**

<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	20	14	41	87	114	22	6	13	4	10	18	10	40	80	105	52	636
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>	20	14	41	87	114	22	6	13	4	10	18	10	40	80	105	52	636

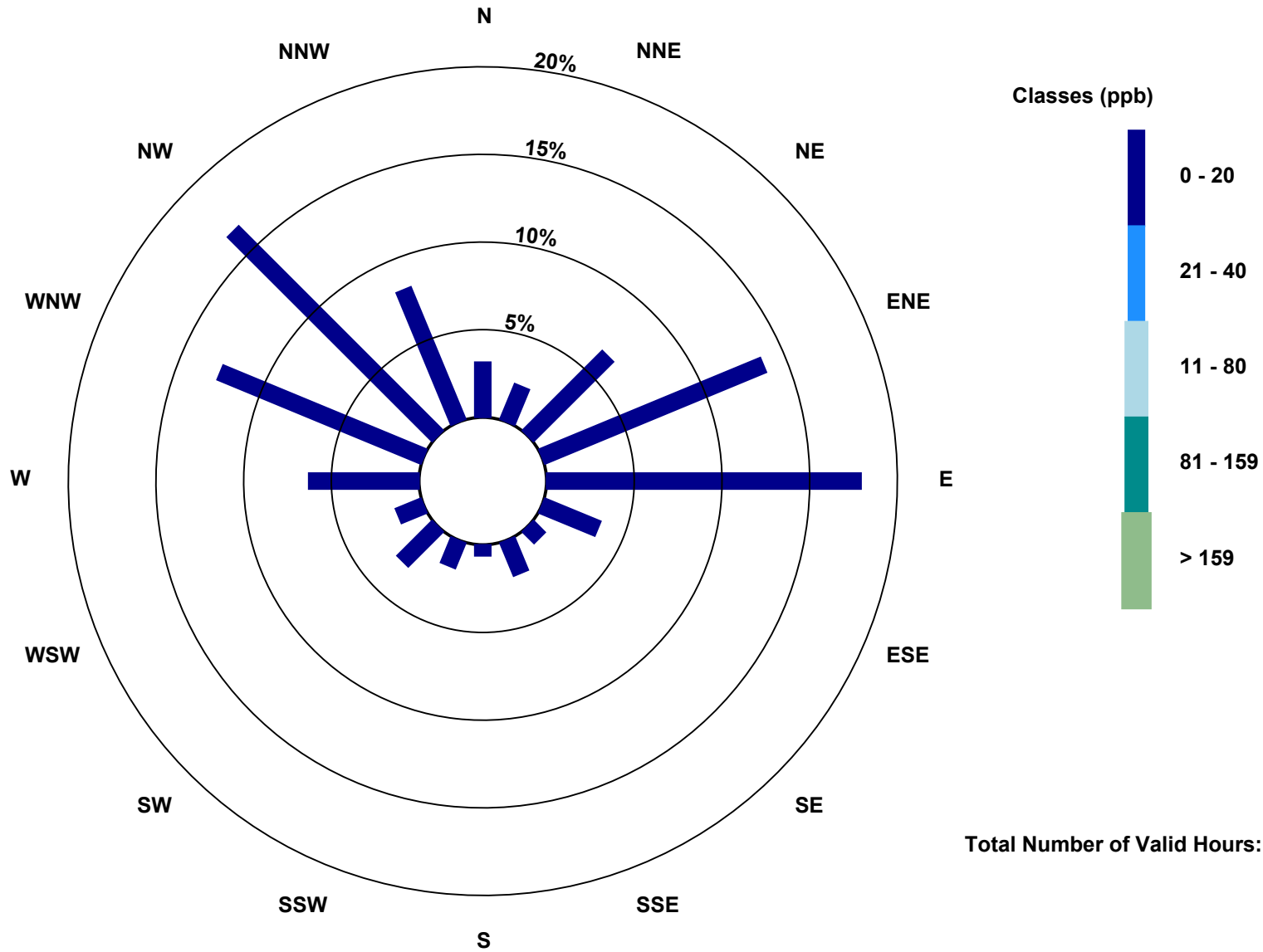
Total Number of Valid Hours: 636

Total Number of Hours: 672

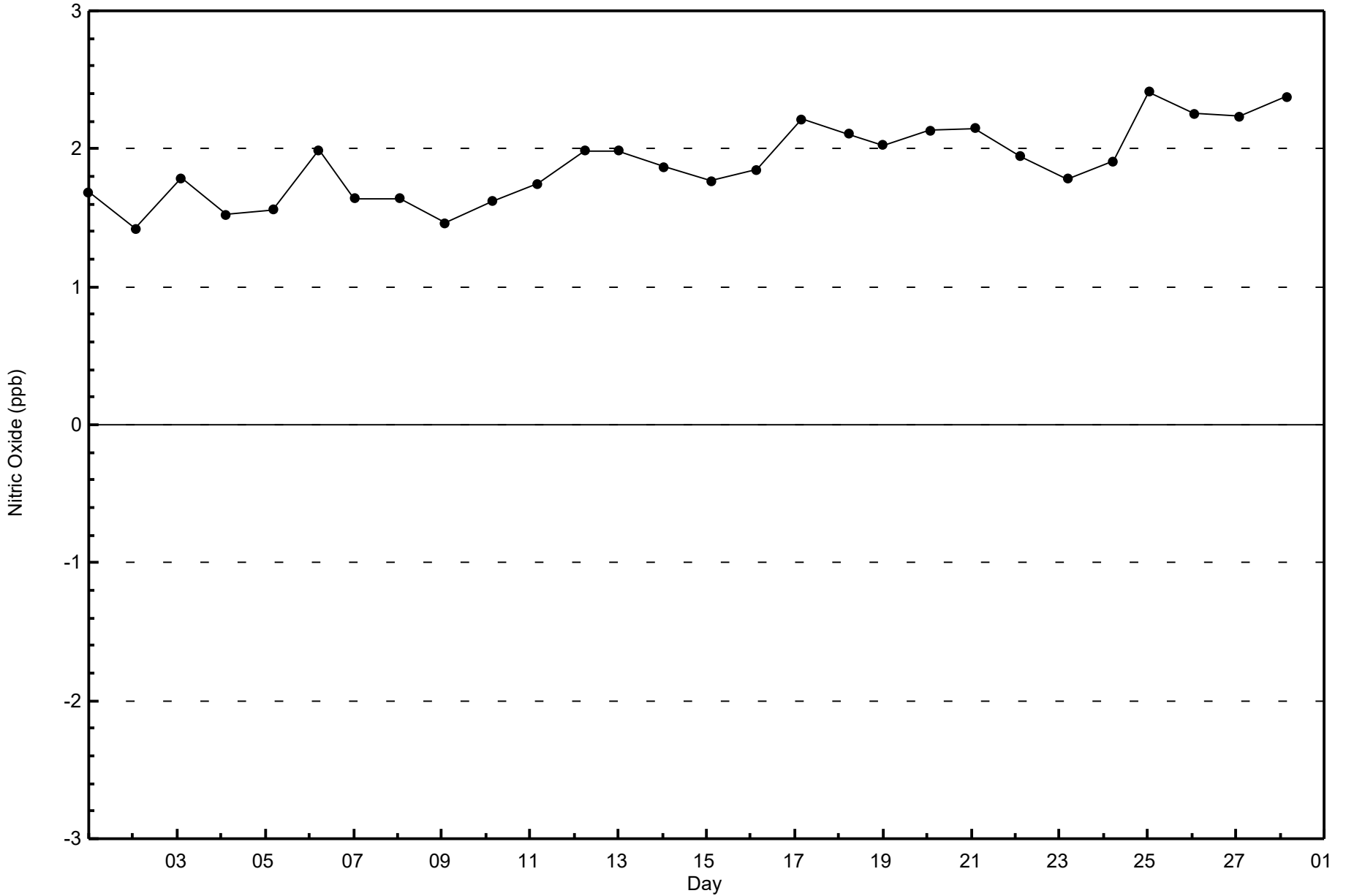


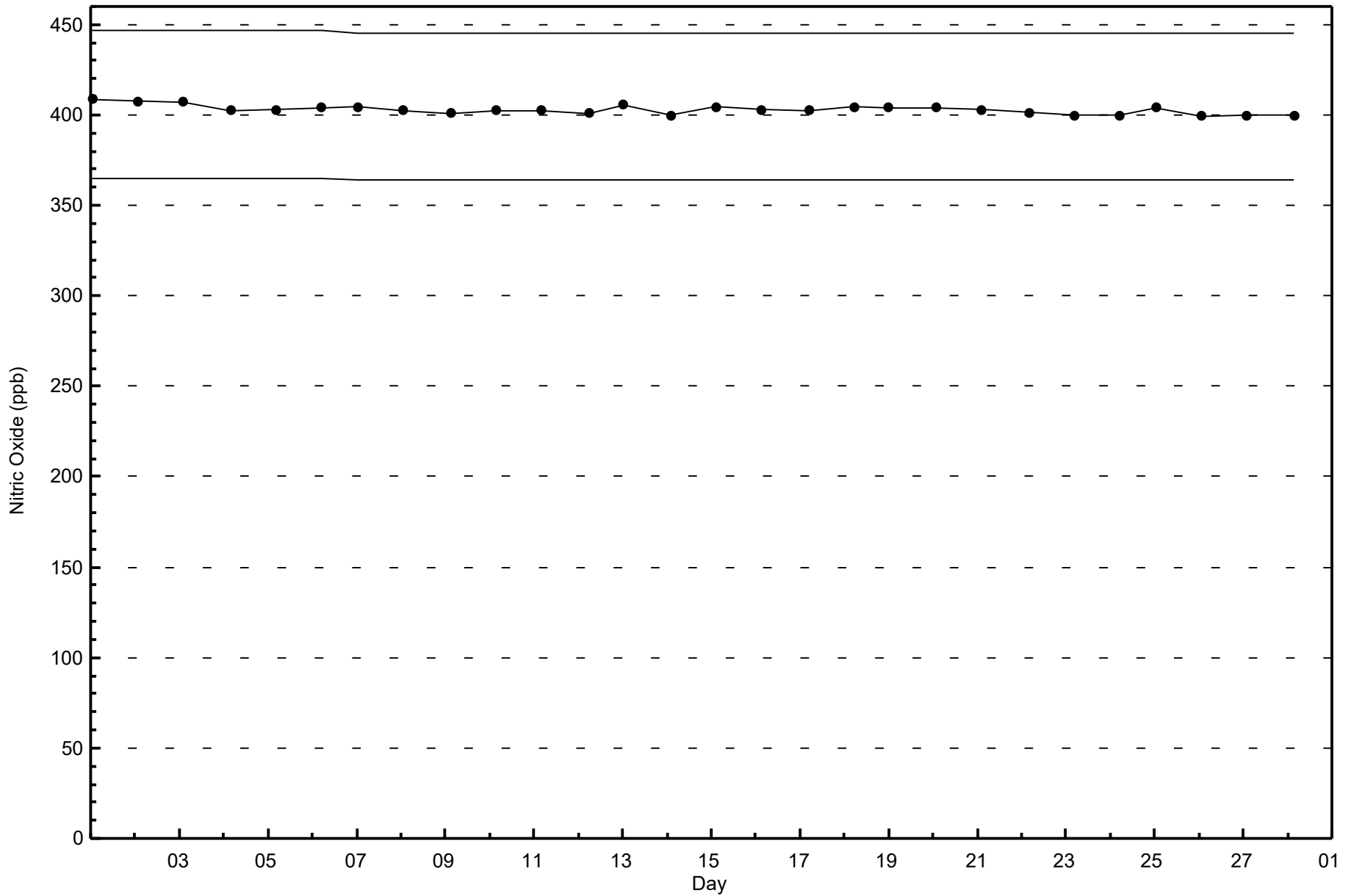
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitric Oxide (NO) - ppb  
Fort Chipewyan



Total Number of Valid Hours: 636







Wood Buffalo Environmental Association

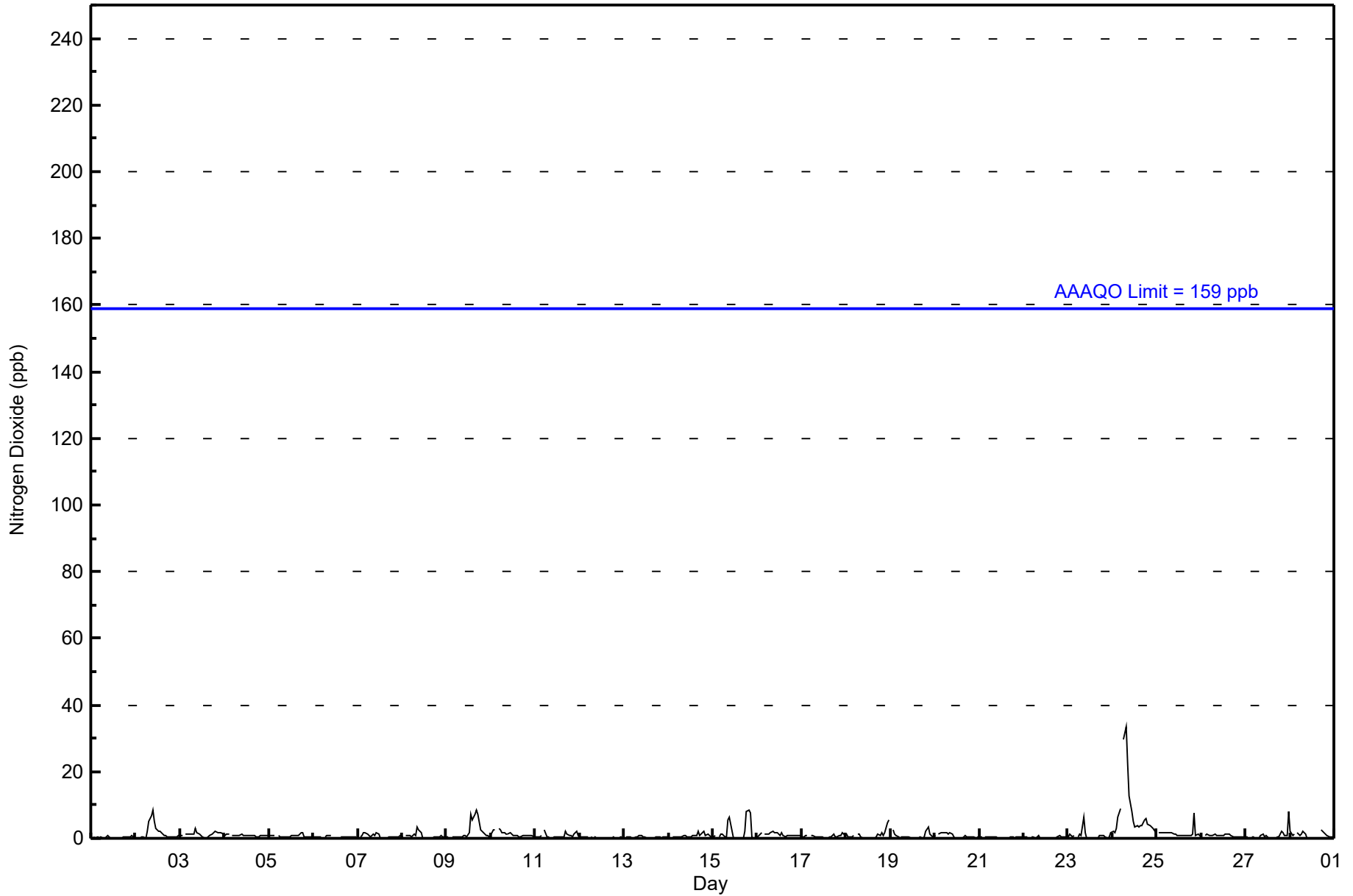
Summary of Hour Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort Chipewyan - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 33.6 ppb on Feb 24 08:00	Maximum Daily Average: 7.8 ppb on Feb 24		Hours of Data:	636
Minimum Value: 0.0 ppb on Feb 1 12:00	Minimum Daily Average: 0.2 ppb on Feb 12		Hours of Missing Data:	36
Maximum Diurnal Average: 2.4 ppb at hour 9	Minimum Diurnal Average: 0.5 ppb at hour 13		Hours of Calibration:	33
Monthly Average: 1.15 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.3 Median = 0.6 Q <sub>3</sub> = 1.1 P <sub>90</sub> = 2.1 P <sub>99</sub> = 8.4		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-Feb	Z	0.4	0.2	0.3	0.2	0.3	0.2	0.2	0.5	0.8	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.6	0.3	0.6	0.4	0.5	0.8	0.2	0.3	0.8
2-Feb	0.2	Z	0.2	0.6	0.3	0.2	2.3	5.1	6.8	8.5	4.9	2.8	2.0	2.1	1.7	0.9	0.8	0.5	0.4	0.6	0.5	0.5	0.6	0.8	1.9	8.5
3-Feb	0.8	1.0	Z	1.2	1.2	1.2	1.4	1.1	3.1	1.5	1.4	1.0	0.6	0.0	0.5	0.9	1.3	1.7	2.1	1.8	1.8	1.5	1.1	1.2	3.1	
4-Feb	1.0	1.1	1.2	Z	1.0	0.9	0.8	0.9	0.9	1.1	0.8	0.7	0.7	0.8	0.9	1.0	0.7	0.6	0.6	0.8	0.7	0.9	0.9	1.0	0.9	1.2
5-Feb	1.0	1.0	0.8	0.9	Z	0.7	0.5	0.6	0.6	0.6	0.5	0.6	0.7	0.7	0.9	1.0	0.9	1.8	1.9	0.4	0.5	0.5	0.5	0.5	0.8	1.9
6-Feb	0.5	0.5	0.4	0.4	0.4	Z	0.6	0.7	0.7	0.7	C	C	C	C	C	0.5	0.4	0.5	0.4	0.5	0.4	0.4	0.4	0.6	0.5	0.7
7-Feb	Z	0.6	0.7	1.5	1.7	1.1	0.7	0.6	1.3	0.7	1.7	1.2	0.2	0.0	0.0	0.2	0.5	0.3	0.3	0.3	0.3	0.3	0.4	0.9	0.7	1.7
8-Feb	0.4	Z	0.9	0.8	0.8	0.5	1.1	1.0	3.4	2.4	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.5	0.5	0.7	0.4	0.3	0.7	3.4
9-Feb	0.6	0.6	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.7	0.9	0.4	1.6	7.3	5.7	7.0	8.6	7.1	2.5	2.2	1.8	0.8	0.7	0.5	2.2	8.6
10-Feb	1.9	2.5	2.6	Z	3.1	2.5	1.6	1.7	1.4	1.2	1.6	1.2	0.7	1.0	1.0	0.6	0.5	0.8	0.8	0.8	0.8	0.7	0.7	0.6	1.3	3.1
11-Feb	0.6	0.6	0.5	0.7	Z	2.7	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.5	2.0	1.2	0.7	0.7	0.6	1.1	2.1	1.0	0.8	2.7
12-Feb	0.6	0.5	0.4	0.4	0.4	Z	0.3	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.1	0.1	0.2	0.4	0.6	0.2	0.6
13-Feb	Z	0.6	0.4	0.4	0.2	0.2	0.5	0.4	0.7	1.0	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.3	0.3	0.4	0.2	0.3	0.3	0.3	0.3	1.0
14-Feb	0.3	Z	0.4	0.4	0.5	0.4	0.4	0.6	1.0	1.0	0.6	0.4	0.5	0.7	0.8	0.9	2.0	0.7	1.6	2.2	1.0	1.3	1.0	0.6	0.8	2.2
15-Feb	0.6	0.8	Z	0.4	1.4	1.2	0.5	0.6	5.6	6.3	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	8.1	8.3	7.6	0.4	0.2	0.2	2.0	8.3
16-Feb	0.4	0.7	1.5	Z	1.4	1.3	1.3	1.6	2.1	1.9	1.6	1.7	0.9	1.6	0.7	0.6	0.8	1.0	0.9	0.9	1.0	1.0	0.7	0.7	1.1	2.1
17-Feb	0.5	0.4	0.7	0.7	Z	0.7	0.8	0.4	0.6	0.5	0.6	0.4	0.1	0.2	0.2	0.4	0.4	1.2	0.4	0.5	0.9	0.8	1.6	0.7	0.6	1.6
18-Feb	1.4	0.5	0.6	0.6	0.9	Z	1.2	1.2	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.1	0.7	1.9	0.8	1.5	4.7	5.3	1.0	5.3
19-Feb	Z	2.5	1.1	0.7	0.4	0.2	0.3	0.3	0.6	0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.4	0.2	0.5	2.0	3.3	1.1	1.0	0.5	0.7	3.3
20-Feb	0.7	Z	1.2	1.8	1.5	1.6	1.9	1.1	1.6	1.2	0.3	0.0	0.0	0.0	0.0	0.1	0.7	0.5	0.6	0.5	0.3	0.3	0.2	0.3	0.7	1.9
21-Feb	0.3	0.5	Z	0.5	0.3	0.4	0.5	0.5	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.2	0.3	0.5	0.4	0.4	0.3	0.6
22-Feb	0.4	0.3	0.5	Z	0.5	0.3	0.2	0.3	0.7	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.8	0.5	0.6	0.4	0.3	0.3	0.8
23-Feb	0.3	1.2	0.4	0.7	Z	0.6	1.1	0.8	6.2	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.7	0.9	0.3	0.2	0.3	1.5	0.8	6.2	
24-Feb	2.2	1.8	3.0	6.2	9.0	Z	29.7	33.6	22.5	12.6	8.1	4.9	3.3	3.7	3.6	3.7	4.0	5.7	5.9	4.4	4.0	3.6	2.9	1.8	7.8	33.6
25-Feb	Z	1.7	1.6	1.8	1.6	1.5	1.6	1.5	1.5	1.4	1.2	1.0	1.0	0.9	0.8	0.8	0.7	0.8	0.7	1.1	7.5	0.9	1.1	0.9	1.5	7.5
26-Feb	1.0	Z	1.0	1.4	0.8	0.9	0.9	1.1	1.0	1.0	0.9	0.9	0.8	1.3	1.2	1.4	0.8	0.6	0.4	0.4	0.3	0.3	0.3	0.3	0.8	1.4
27-Feb	0.3	0.3	Z	0.4	0.3	0.2	0.2	0.2	1.0	1.3	0.5	0.8	0.1	0.0	0.0	0.0	0.2	0.5	0.4	2.3	1.8	1.0	0.9	8.2	0.9	8.2
28-Feb	2.1	0.7	1.4	Z	1.5	0.9	1.3	2.1	1.4	0.0	0.0	0.0	0.0	0.0	M	M	M	2.4	1.6	1.4	0.9	0.3	0.3	0.3	0.9	2.4
0.8 0.9 0.9 1.0 1.2 0.9 1.9 2.1 2.4 1.8 1.1 0.7 0.5 0.8 0.7 0.7 1.0 1.2 1.2 1.4 1.4 0.8 0.9 1.1																								Diurnal Average		
2.2 2.5 3.0 6.2 9.0 2.7 29.7 33.6 22.5 12.6 8.1 4.9 3.3 7.3 5.7 7.0 8.6 7.1 8.1 8.3 7.6 3.6 4.7 8.2																								Diurnal Maximum		

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  
Fort Chipewyan - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	633	99.53	99.53
21 - 40	3	0.47	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: 636

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort Chipewyan - February 2023**

<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	14	41	87	114	20	5	13	4	10	18	10	40	80	105	52	633
21 - 40	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	3
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>	20	14	41	87	114	22	6	13	4	10	18	10	40	80	105	52	636

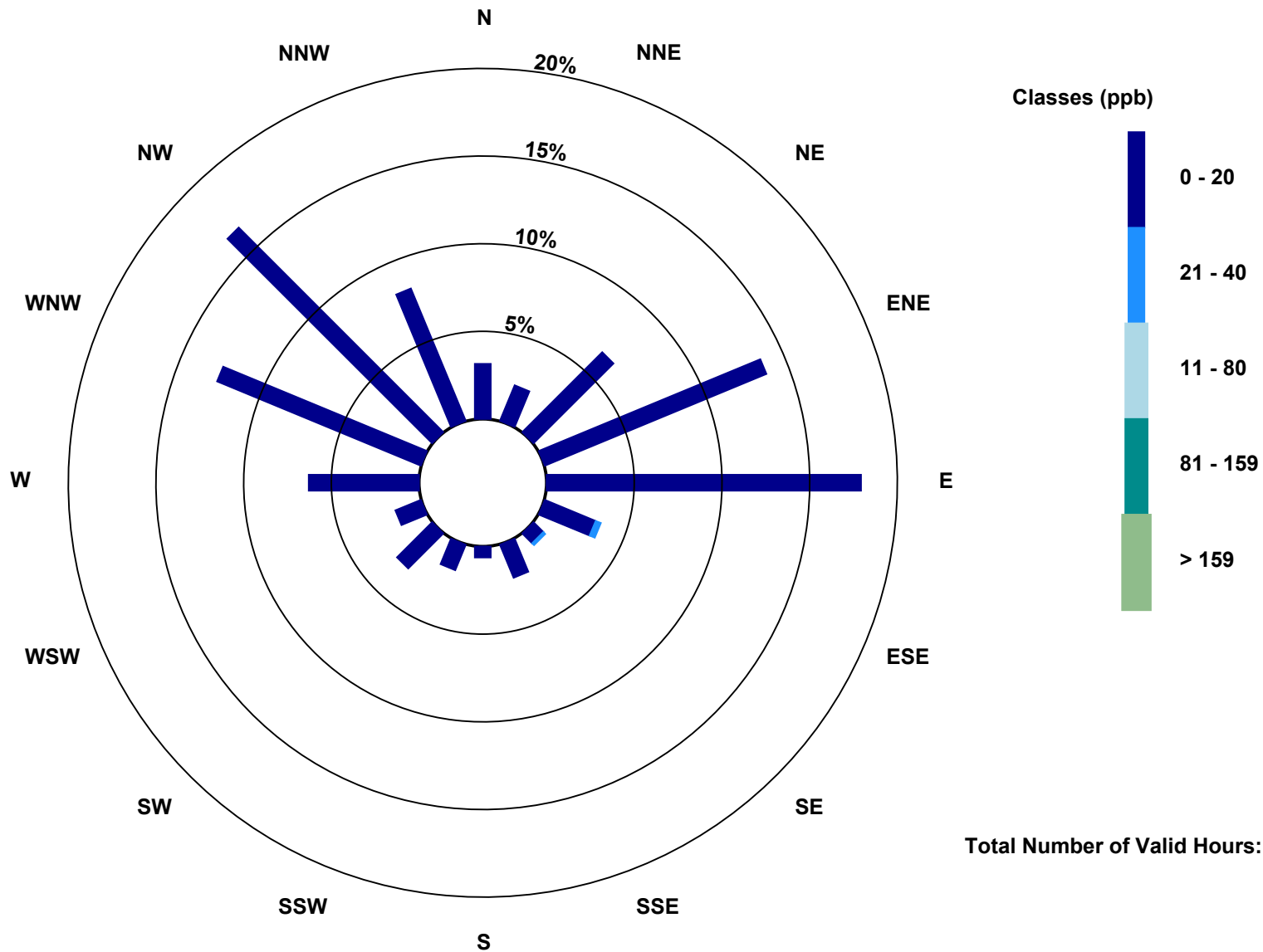
Total Number of Valid Hours: 636

Total Number of Hours: 672

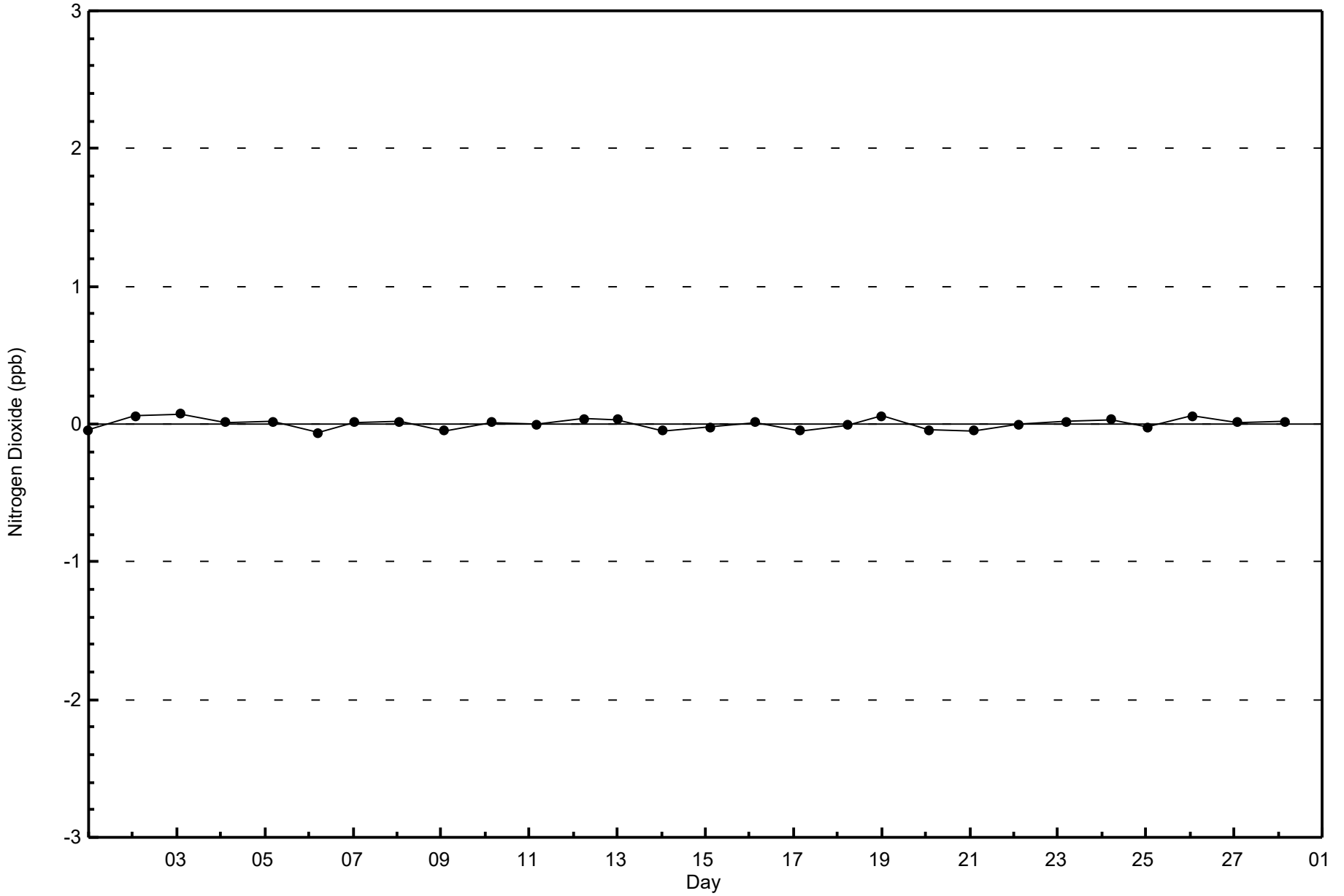


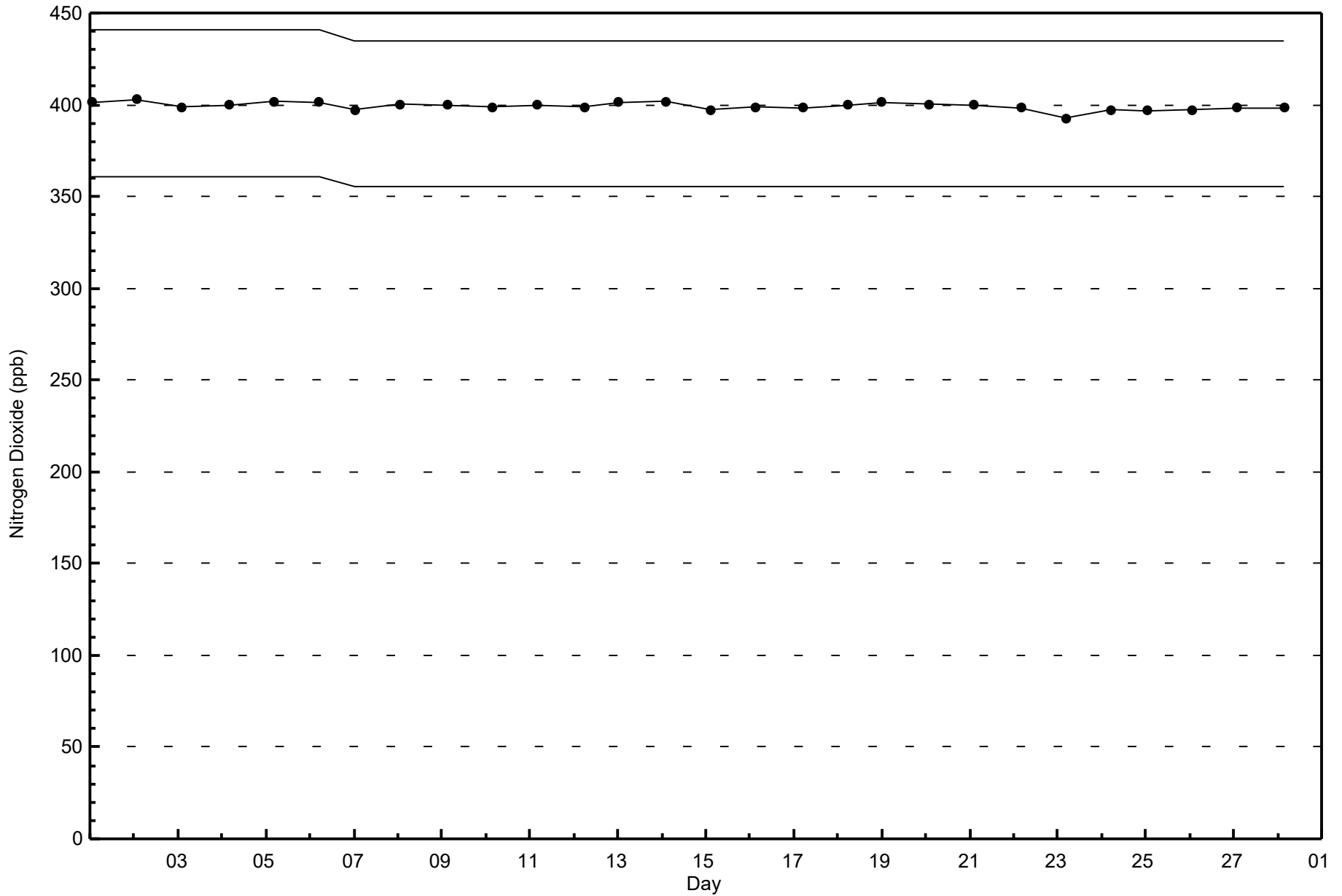
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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



Total Number of Valid Hours: 636



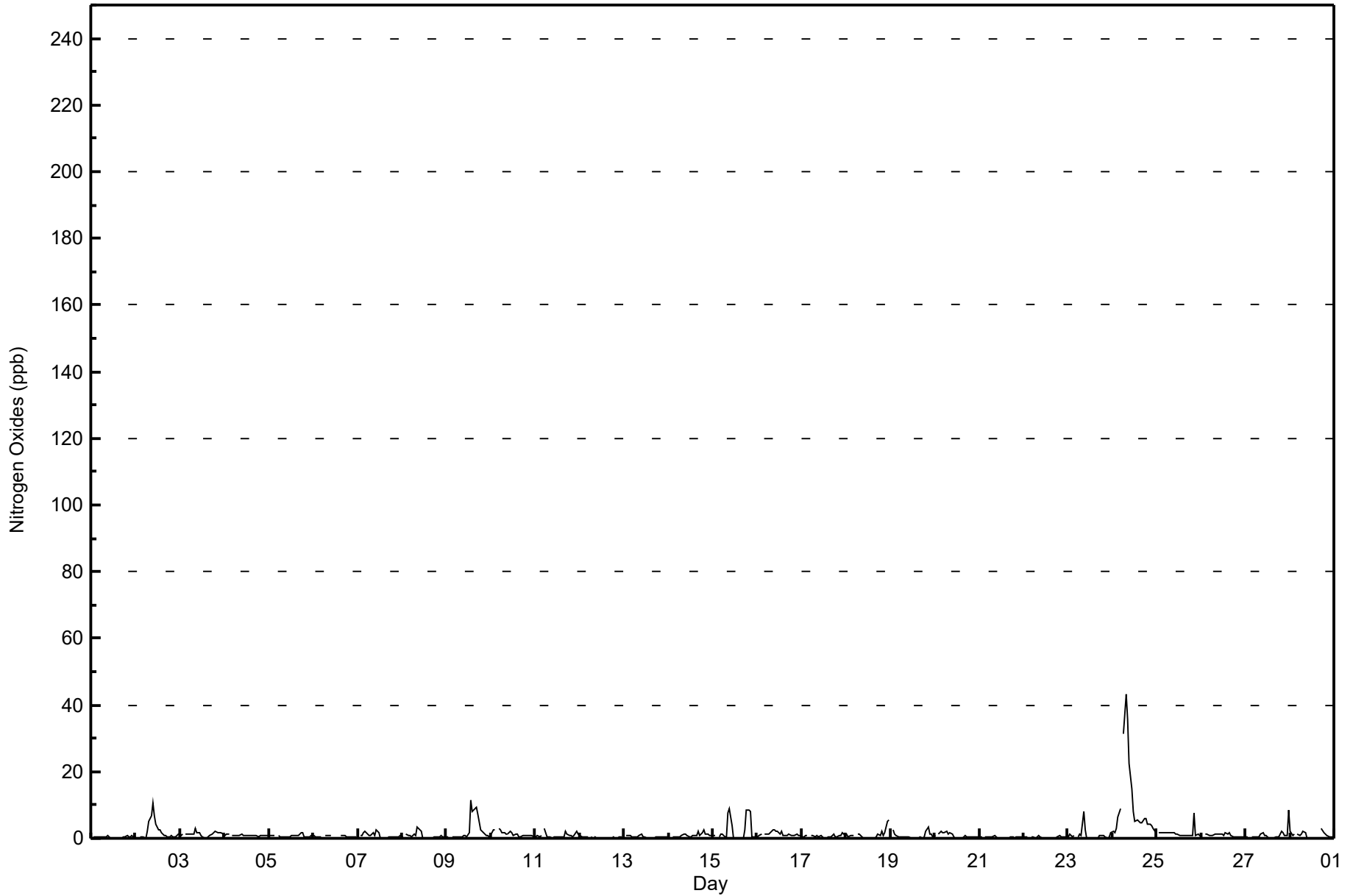




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Fort Chipewyan - February 2023**

Maximum Value: 43.3 ppb on Feb 24 08:00																						Hours in Service: 672				
Maximum Daily Average: 10.1 ppb on Feb 24																						Hours of Data: 636				
Minimum Value: 0.0 ppb on Feb 1 12:00																						Hours of Missing Data: 36				
Minimum Daily Average: 0.3 ppb on Feb 12																						Hours of Calibration: 33				
Maximum Diurnal Average: 3.1 ppb at hour 9																						Percent Operational Time: 99.6				
Minimum Diurnal Average: 0.6 ppb at hour 13																										
Monthly Average: 1.33 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> = 1.2 P <sub>90</sub> = 2.3 P <sub>99</sub> = 10.0																										
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-Feb	Z	0.4	0.2	0.3	0.3	0.3	0.2	0.2	0.5	0.9	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.6	0.3	0.6	0.4	0.5	0.8	0.2	0.3	0.9
2-Feb	0.2	Z	0.3	0.6	0.3	0.2	2.3	5.1	6.9	10.5	6.9	4.1	2.7	2.7	1.8	0.9	0.8	0.5	0.4	0.7	0.5	0.6	0.7	1.1	2.2	10.5
3-Feb	0.9	1.2	Z	1.3	1.3	1.3	1.4	1.1	3.1	1.6	1.7	1.0	0.6	0.0	0.5	0.9	1.3	1.7	2.1	1.8	1.8	1.5	1.1	1.3	3.1	
4-Feb	1.0	1.1	1.3	Z	1.0	0.9	0.9	0.9	0.9	1.2	0.9	0.8	0.7	0.8	0.9	1.0	0.7	0.6	0.6	0.8	0.7	0.9	0.9	1.0	0.9	1.3
5-Feb	1.0	1.0	0.8	0.9	Z	0.7	0.5	0.6	0.6	0.6	0.5	0.6	0.7	0.7	0.9	1.0	0.9	1.8	1.9	0.4	0.5	0.5	0.6	0.7	0.8	1.9
6-Feb	0.7	0.6	0.5	0.5	0.5	Z	0.8	1.0	1.0	1.0	C	C	C	C	C	0.8	0.7	0.7	0.5	0.6	0.4	0.4	0.5	0.6	0.6	1.0
7-Feb	Z	0.7	0.8	1.7	2.0	1.4	1.0	0.9	1.7	0.9	2.5	1.7	0.2	0.0	0.0	0.0	0.2	0.5	0.3	0.3	0.3	0.3	0.4	1.0	0.8	2.5
8-Feb	0.5	Z	1.1	0.9	0.9	0.6	1.2	1.0	3.6	3.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.5	0.5	0.7	0.4	0.3	0.8	3.6
9-Feb	0.6	0.6	Z	0.5	0.4	0.5	0.5	0.4	0.4	0.8	1.0	0.4	1.6	11.5	8.1	8.8	9.2	7.2	2.5	2.2	1.8	0.8	0.7	0.5	2.6	11.5
10-Feb	1.9	2.6	2.7	Z	3.1	2.5	1.6	1.7	1.4	1.3	2.0	1.6	0.9	1.2	1.2	0.6	0.5	0.8	0.8	0.8	0.8	0.7	0.7	0.6	1.4	3.1
11-Feb	0.6	0.7	0.6	0.8	Z	2.8	0.4	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.5	2.1	1.2	0.7	0.7	0.6	1.1	2.2	1.1	0.8	2.8
12-Feb	0.8	0.6	0.6	0.6	0.5	Z	0.3	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.1	0.1	0.2	0.4	0.6	0.3	0.8
13-Feb	Z	0.8	0.7	0.7	0.5	0.5	0.6	0.5	0.8	1.2	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.5	0.4	0.4	0.3	0.4	0.3	0.4	0.4	1.2
14-Feb	0.3	Z	0.5	0.5	0.6	0.5	0.5	0.7	1.1	1.2	0.8	0.4	0.6	0.9	0.9	0.9	2.2	0.7	1.6	2.3	1.1	1.3	1.0	0.7	0.9	2.3
15-Feb	0.6	0.9	Z	0.5	1.5	1.4	0.6	0.6	7.6	8.9	3.9	0.0	0.0	0.0	0.0	0.0	0.0	2.3	8.5	8.6	8.0	0.5	0.3	0.3	2.4	8.9
16-Feb	0.4	0.7	1.5	Z	1.4	1.3	1.3	1.6	2.4	2.4	2.2	2.3	1.3	2.3	0.9	0.8	0.9	1.1	1.0	1.0	1.0	1.1	0.8	0.8	1.3	2.4
17-Feb	0.5	0.4	0.8	0.8	Z	0.8	0.8	0.4	0.6	0.5	0.8	0.5	0.1	0.2	0.2	0.4	0.4	1.2	0.4	0.5	0.9	0.8	1.7	0.8	0.6	1.7
18-Feb	1.5	0.6	0.7	0.7	1.0	Z	1.4	1.4	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.1	0.7	2.0	0.8	1.6	4.9	5.4	1.1	5.4
19-Feb	Z	2.6	1.1	0.8	0.5	0.3	0.3	0.3	0.6	0.5	0.4	0.2	0.0	0.0	0.0	0.0	0.4	0.2	0.5	2.1	3.4	1.2	1.1	0.6	0.7	3.4
20-Feb	0.8	Z	1.3	2.0	1.7	1.8	2.3	1.1	1.9	1.5	0.3	0.0	0.0	0.0	0.0	0.1	0.7	0.5	0.6	0.5	0.3	0.3	0.2	0.3	0.8	2.3
21-Feb	0.4	0.5	Z	0.5	0.3	0.4	0.5	0.5	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.2	0.3	0.5	0.5	0.6	0.3	0.7
22-Feb	0.5	0.4	0.6	Z	0.5	0.3	0.2	0.3	0.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.8	0.5	0.6	0.4	0.3	0.3	0.8
23-Feb	0.3	1.4	0.5	0.8	Z	0.6	1.2	0.8	7.9	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.7	0.9	0.3	0.2	0.3	1.6	0.9	7.9
24-Feb	2.2	1.8	3.0	6.3	9.1	Z	31.4	43.3	35.6	22.4	14.8	8.2	5.0	5.7	5.0	4.8	4.6	5.9	6.0	4.4	4.0	3.6	2.9	1.8	10.1	43.3
25-Feb	Z	1.7	1.6	1.8	1.7	1.6	1.7	1.6	1.6	1.6	1.3	1.2	1.0	0.9	0.8	0.8	0.7	0.8	0.7	1.1	7.5	0.9	1.1	1.0	1.5	7.5
26-Feb	1.0	Z	1.1	1.4	0.9	1.0	1.0	1.2	1.1	1.2	1.2	1.2	1.0	1.5	1.4	1.6	0.8	0.6	0.4	0.4	0.3	0.3	0.3	0.3	0.9	1.6
27-Feb	0.3	0.4	Z	0.4	0.3	0.3	0.3	0.2	1.1	1.6	0.6	0.9	0.1	0.0	0.0	0.0	0.2	0.5	0.4	2.3	1.8	1.0	0.9	8.4	1.0	8.4
28-Feb	2.1	0.7	1.4	Z	1.5	0.9	1.3	2.1	1.5	0.0	0.0	0.0	0.0	0.0	M	M	M	3.0	1.7	1.4	0.9	0.3	0.3	0.3	1.0	3.0
0.8 1.0 1.0 1.1 1.3 1.0 2.0 2.5 3.1 2.4 1.7 0.9 0.6 1.1 0.9 0.9 1.0 1.3 1.2 1.4 1.4 0.8 0.9 1.2																						Diurnal Average				
2.2 2.6 3.0 6.3 9.1 2.8 31.4 43.3 35.6 22.4 14.8 8.2 5.0 11.5 8.1 8.8 9.2 7.2 8.5 8.6 8.0 3.6 4.9 8.4																						Diurnal Maximum				
Z - zerospan C - Calibration M - Maintenance																										





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Fort Chipewyan - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	632	99.37	99.37
21 - 40	3	0.47	99.84
41 - 80	1	0.16	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 636

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Fort Chipewyan - February 2023**

<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	20	14	41	87	114	19	5	13	4	10	18	10	40	80	105	52	632
21 - 40	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	3
11 - 80	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
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>	20	14	41	87	114	22	6	13	4	10	18	10	40	80	105	52	636

Total Number of Valid Hours: 636

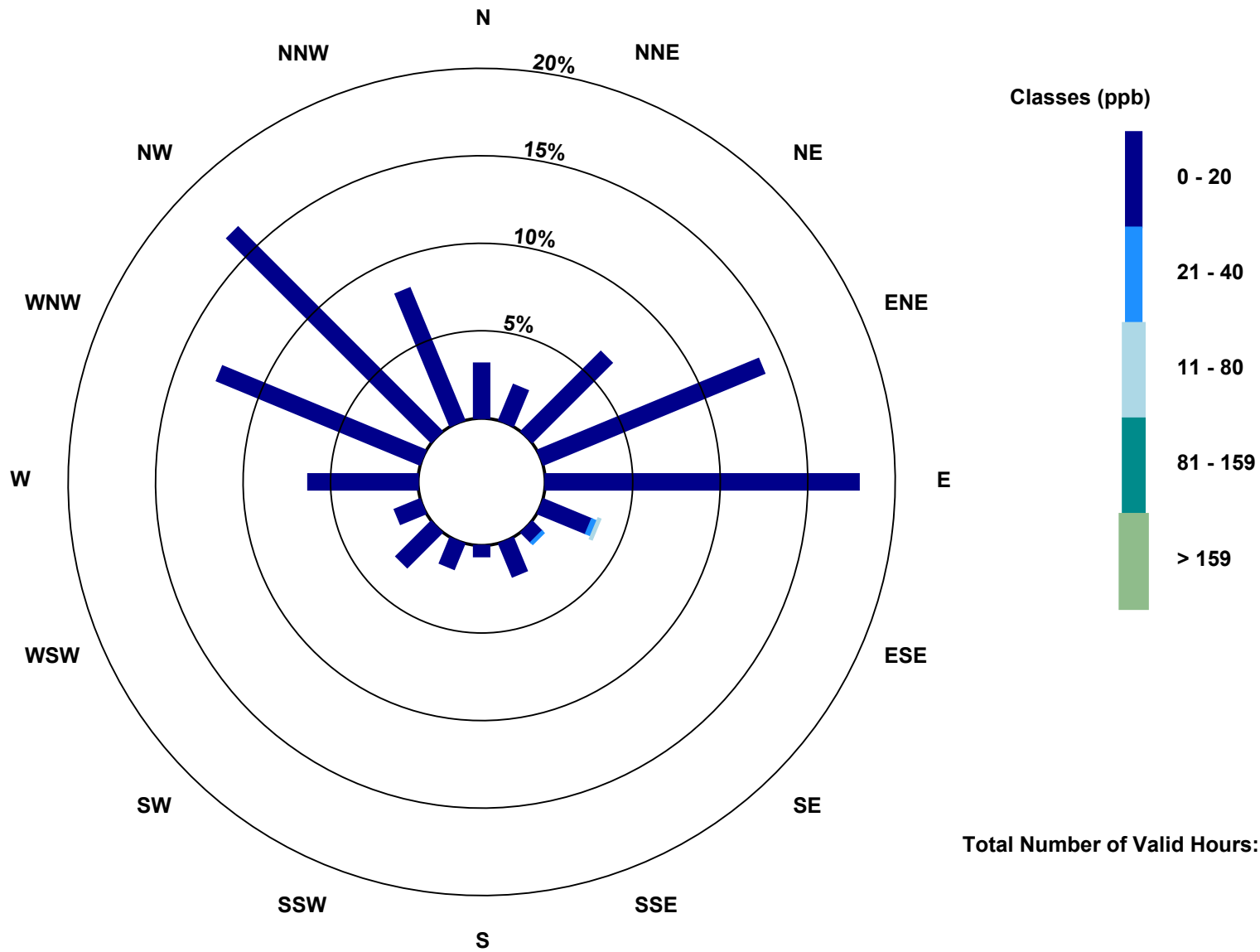
Total Number of Hours: 672



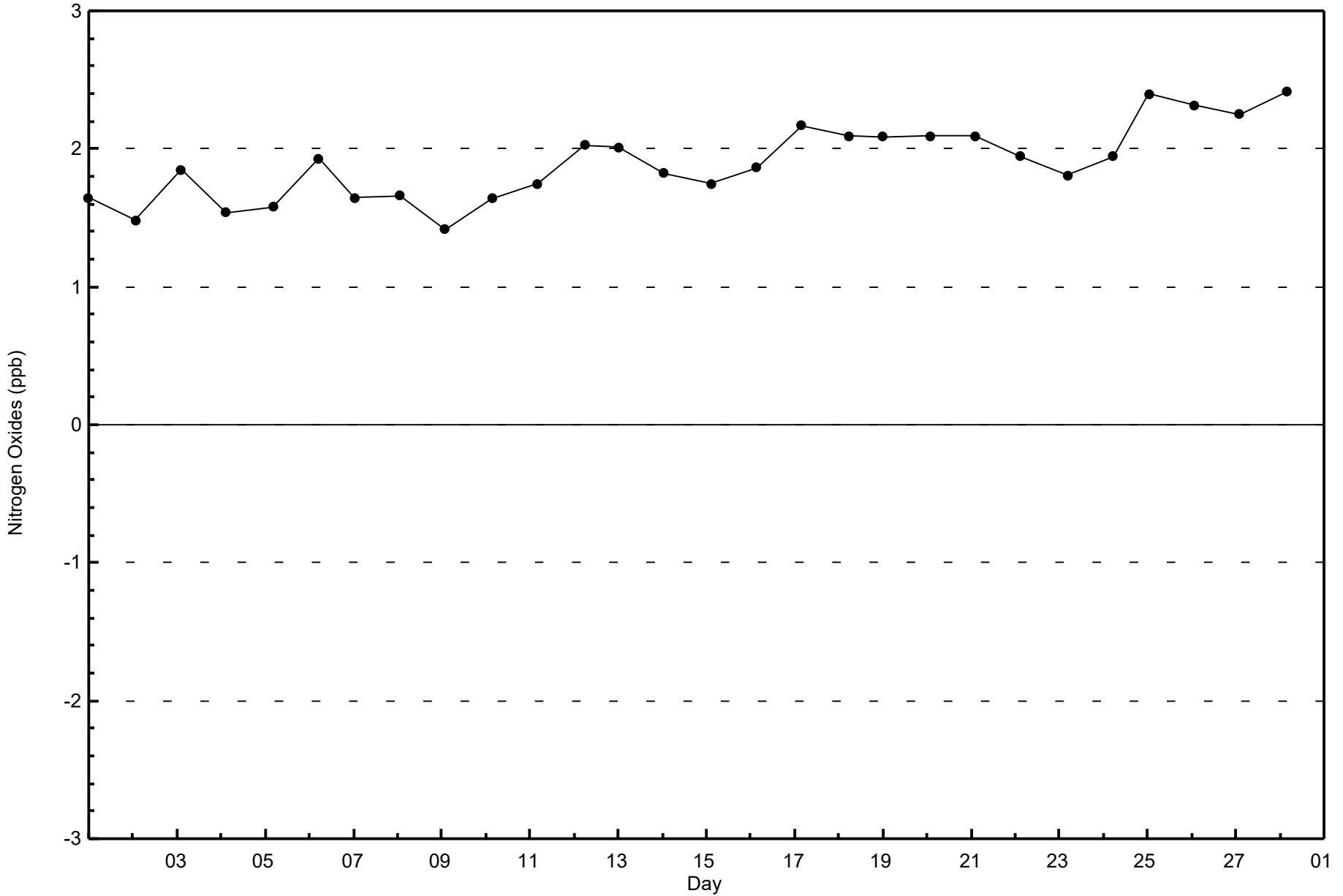


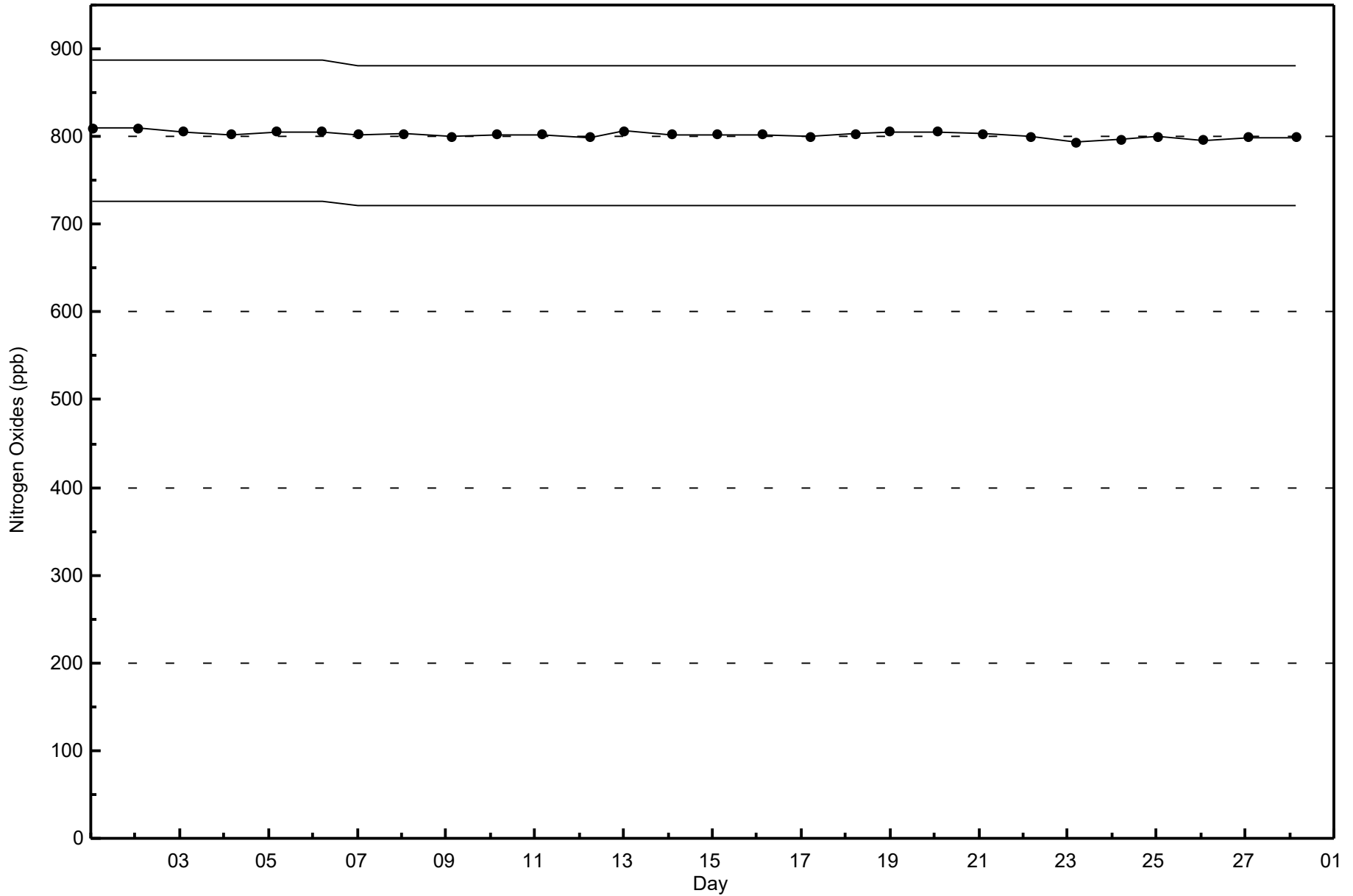
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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



Total Number of Valid Hours: 636





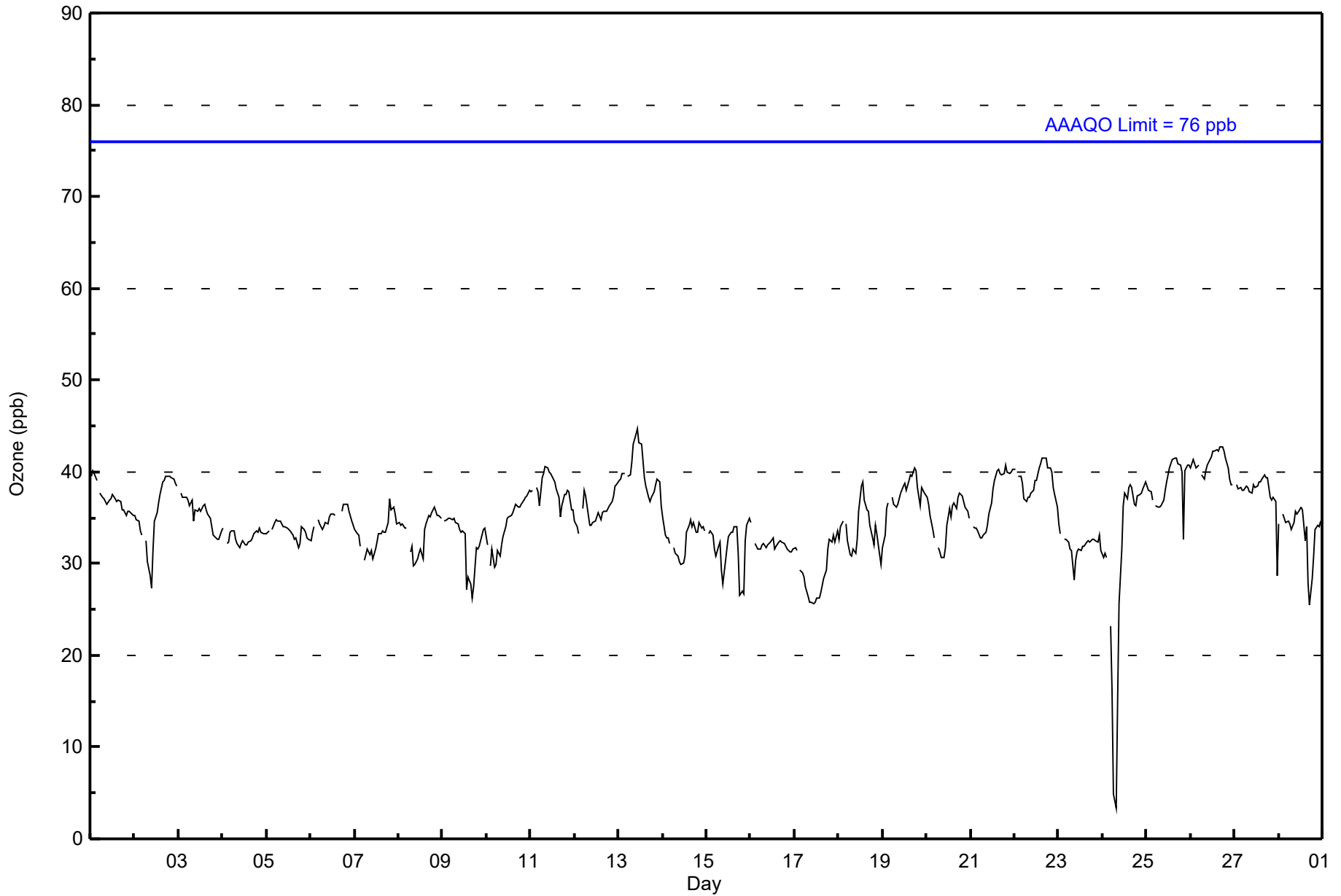


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 672																	Hours of Data: 641																												
Maximum Value: 44.7 ppb on Feb 13 11:00		Maximum Daily Average: 40.9 ppb on Feb 26																	Hours of Missing Data: 31																														
Minimum Value: 3.4 ppb on Feb 24 08:00		Minimum Daily Average: 29.0 ppb on Feb 17																	Hours of Calibration: 31																														
Maximum Diurnal Average: 35.9 ppb at hour 16		Minimum Diurnal Average: 33.0 ppb at hour 8																	Percent Operational Time: 100.0																														
Monthly Average: 34.89 ppb		Percentiles: P <sub>1</sub> = 25.6 P <sub>10</sub> = 30.9 Q <sub>1</sub> = 32.6 Median = 34.8 Q <sub>3</sub> = 37.6 P <sub>90</sub> = 39.8 P <sub>99</sub> = 42.6																																															
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-Feb	39.4	40.1	39.8	39.1	Z	37.7	37.2	37.1	36.8	36.5	37.0	37.0	37.5	37.1	36.7	36.9	36.7	35.8	35.9	35.3	35.6	35.6	35.5	35.2	37.0	40.1																							
2-Feb	35.2	34.8	34.7	33.5	33.1	Z	32.4	30.2	28.7	27.2	31.5	34.7	35.5	36.6	37.6	38.9	39.1	39.4	39.5	39.6	39.3	39.2	38.7	38.4	35.6	39.6																							
3-Feb	Z	37.7	37.2	37.2	37.2	36.8	36.3	36.9	34.7	35.9	35.7	36.1	35.7	36.2	36.5	35.9	35.4	34.9	34.0	33.1	32.9	32.6	32.7	33.6	35.4	37.7																							
4-Feb	33.8	Z	32.2	32.3	33.5	33.5	33.6	32.7	32.2	31.7	32.2	32.4	32.0	32.1	32.4	32.4	32.9	33.2	33.5	33.9	33.4	33.3	33.3	33.3	32.9	33.9																							
5-Feb	33.2	33.6	Z	33.8	34.5	34.8	34.6	34.7	34.3	34.0	34.0	33.8	32.6	33.5	33.1	32.7	32.8	31.8	32.2	34.0	33.7	33.4	32.9	32.7	33.5	34.8																							
6-Feb	32.5	33.4	34.1	Z	34.7	34.3	33.7	34.0	34.5	34.4	35.0	35.4	35.4	35.2	C	C	C	35.7	36.5	36.4	36.4	35.8	34.7	34.1	34.8	36.5																							
7-Feb	33.7	33.3	33.1	31.9	Z	30.3	31.0	31.6	31.0	31.4	30.5	31.6	32.3	33.2	33.2	33.6	33.5	33.3	34.5	37.1	35.8	36.1	35.4	34.3	33.1	37.1																							
8-Feb	34.5	34.1	34.3	33.9	33.8	Z	31.3	31.9	29.8	29.9	30.5	31.2	31.6	30.5	33.7	34.3	35.2	35.1	35.6	36.2	35.7	35.2	35.2	34.9	33.4	36.2																							
9-Feb	Z	34.6	34.7	35.0	34.9	34.8	34.9	34.5	34.4	33.7	33.5	33.6	33.2	27.1	28.6	27.8	26.3	27.4	31.8	31.6	31.9	33.2	33.6	33.9	32.4	35.0																							
10-Feb	32.1	Z	29.8	31.6	29.6	29.9	31.4	30.9	32.1	32.9	34.0	34.9	35.1	35.2	35.5	36.1	36.4	36.1	36.1	36.5	36.9	37.3	37.4	37.9	34.2	37.9																							
11-Feb	37.9	37.9	Z	38.3	37.8	36.3	39.4	39.9	40.5	40.4	40.0	39.8	39.3	38.8	38.2	37.2	35.1	36.3	37.5	37.6	38.0	37.9	35.8	35.9	38.1	40.5																							
12-Feb	34.7	34.0	33.2	Z	35.9	38.0	37.3	35.3	34.1	34.2	34.5	34.6	35.0	35.6	34.8	35.5	35.7	35.7	36.0	36.3	36.7	37.4	38.4	38.6	35.7	38.6																							
13-Feb	39.0	39.3	39.8	39.9	Z	39.5	39.7	41.1	43.1	44.1	44.7	43.2	43.0	41.2	39.4	38.5	37.2	36.8	37.3	37.9	38.6	39.1	38.9	36.4	39.9	44.7																							
14-Feb	35.2	33.0	32.8	32.8	32.2	Z	31.8	31.1	30.8	30.1	29.9	30.1	30.8	33.4	34.1	34.8	34.0	34.5	33.4	33.3	34.4	33.8	34.0	33.6	32.8	35.2																							
15-Feb	Z	33.2	33.6	33.0	31.6	30.8	31.8	32.3	29.2	27.8	30.4	31.7	33.0	33.4	33.3	34.0	34.1	31.1	26.6	27.0	26.6	32.4	34.2	35.0	31.6	35.0																							
16-Feb	34.5	Z	32.2	32.0	31.6	31.5	32.0	32.1	31.8	32.0	32.2	32.3	32.8	31.6	31.9	32.3	32.4	32.3	32.1	31.9	31.6	31.3	31.3	31.6	32.1	34.5																							
17-Feb	31.7	31.4	Z	29.4	28.9	28.5	27.5	26.4	25.8	25.8	25.7	25.8	26.2	26.2	26.9	27.5	28.4	29.2	31.6	32.7	32.3	33.0	32.4	33.6	29.0	33.6																							
18-Feb	32.7	34.1	34.6	Z	34.3	32.5	30.9	30.9	31.6	31.2	32.7	35.7	38.4	38.9	36.9	35.9	35.7	34.2	32.8	32.0	34.1	33.2	30.9	29.9	33.7	38.9																							
19-Feb	31.8	33.1	36.0	36.6	Z	37.3	36.4	36.1	36.5	37.1	37.7	38.4	38.8	37.9	39.0	39.6	39.6	40.5	40.1	38.3	36.3	38.2	38.0	37.6	37.4	40.5																							
20-Feb	37.2	36.5	35.3	33.8	32.7	Z	31.7	31.3	30.7	30.6	31.7	34.1	36.0	35.1	36.2	36.6	36.0	37.2	37.6	37.3	36.7	36.1	35.7	35.0	34.8	37.6																							
21-Feb	Z	34.0	33.9	33.8	33.6	32.9	32.8	33.1	33.5	34.2	35.3	36.6	38.1	39.1	40.2	40.3	39.9	39.7	39.9	40.7	40.0	39.8	40.0	40.3	37.0	40.7																							
22-Feb	40.3	Z	39.6	39.5	38.8	37.1	36.8	37.3	37.1	37.7	37.9	39.0	39.1	40.5	40.9	41.5	41.5	41.5	40.4	40.4	40.0	38.3	37.5	36.1	39.1	41.5																							
23-Feb	34.3	33.2	Z	32.6	32.7	32.3	31.6	31.4	28.3	30.3	31.2	31.6	31.5	31.8	31.9	32.3	32.5	32.4	32.6	32.7	32.4	32.3	33.2	31.4	32.0	34.3																							
24-Feb	30.6	31.2	30.7	Z	23.2	16.2	4.9	3.4	15.0	25.6	31.5	36.4	37.7	37.0	38.3	38.5	38.3	36.4	36.2	37.4	37.5	37.6	38.1	38.9	30.5	38.9																							
25-Feb	38.4	38.0	37.8	36.9	Z	36.3	36.1	36.1	36.2	36.9	37.9	38.9	40.4	40.9	41.4	41.5	41.5	40.8	40.8	39.9	32.7	40.2	40.8	40.7	38.7	41.5																							
26-Feb	40.5	41.3	40.9	40.4	40.7	Z	39.6	39.3	40.1	40.7	41.1	41.6	42.2	42.2	42.5	42.2	42.7	42.8	42.3	41.4	40.4	39.3	38.6	38.5	40.9	42.8																							
27-Feb	Z	38.5	38.2	38.2	37.9	38.0	38.4	38.3	37.8	37.7	38.6	38.3	38.5	38.9	39.0	39.2	39.6	39.4	39.4	37.3	36.9	37.2	36.8	28.6	37.9	39.6																							
28-Feb	34.4	Z	35.4	35.0	34.5	34.6	34.3	33.7	34.5	35.6	35.4	35.8	36.2	35.8	32.4	33.9	27.9	25.5	28.4	30.7	33.7	34.1	34.1	34.6	33.5	36.2																							
																								35.1	35.2	35.0	33.8	33.7	33.2	33.0	33.0	33.6	34.4	35.2	35.7	35.5	35.7	35.9	35.6	35.3	35.5	35.7	35.4	35.8	35.6	35.2	Diurnal Average		
																								40.5	41.3	40.9	40.4	40.7	39.5	39.7	41.1	43.1	44.1	44.7	43.2	43.0	42.2	42.5	42.2	42.7	42.8	42.3	41.4	40.4	40.2	40.8	40.7	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  
Fort Chipewyan - February 2023





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

**Ozone (O<sub>3</sub>) - ppb**  
**Fort Chipewyan - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	4	0.62	0.62
21 - 50	637	99.38	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 641

Total Number of Hours: 672



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

**Ozone (O<sub>3</sub>) - ppb**  
**Fort Chipewyan - February 2023**

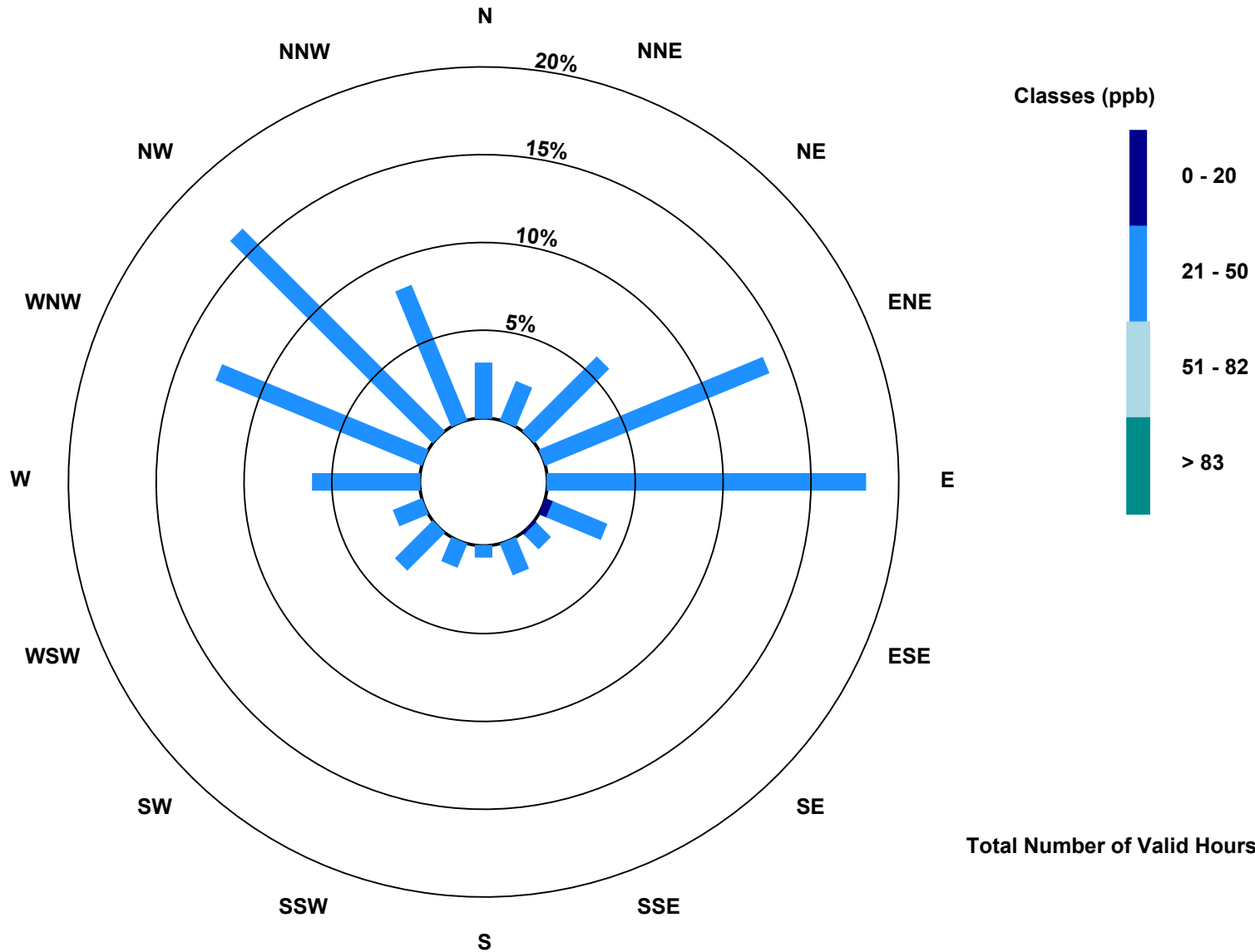
Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	4
21 - 50	20	15	38	88	116	21	7	12	4	9	19	11	39	81	104	53	637
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	20	15	38	88	116	24	8	12	4	9	19	11	39	81	104	53	641

Total Number of Valid Hours: 641  
 Total Number of Hours: 672

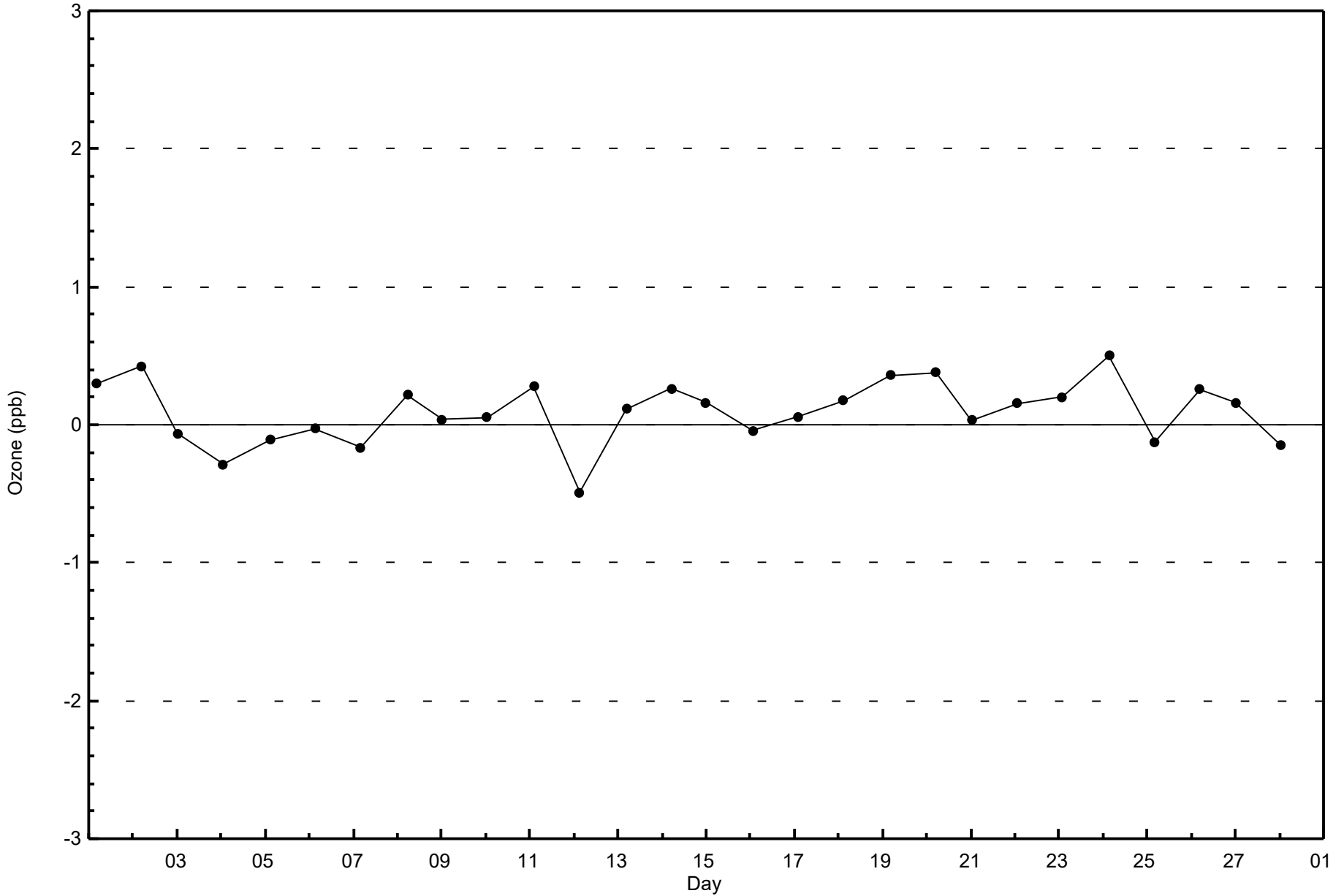


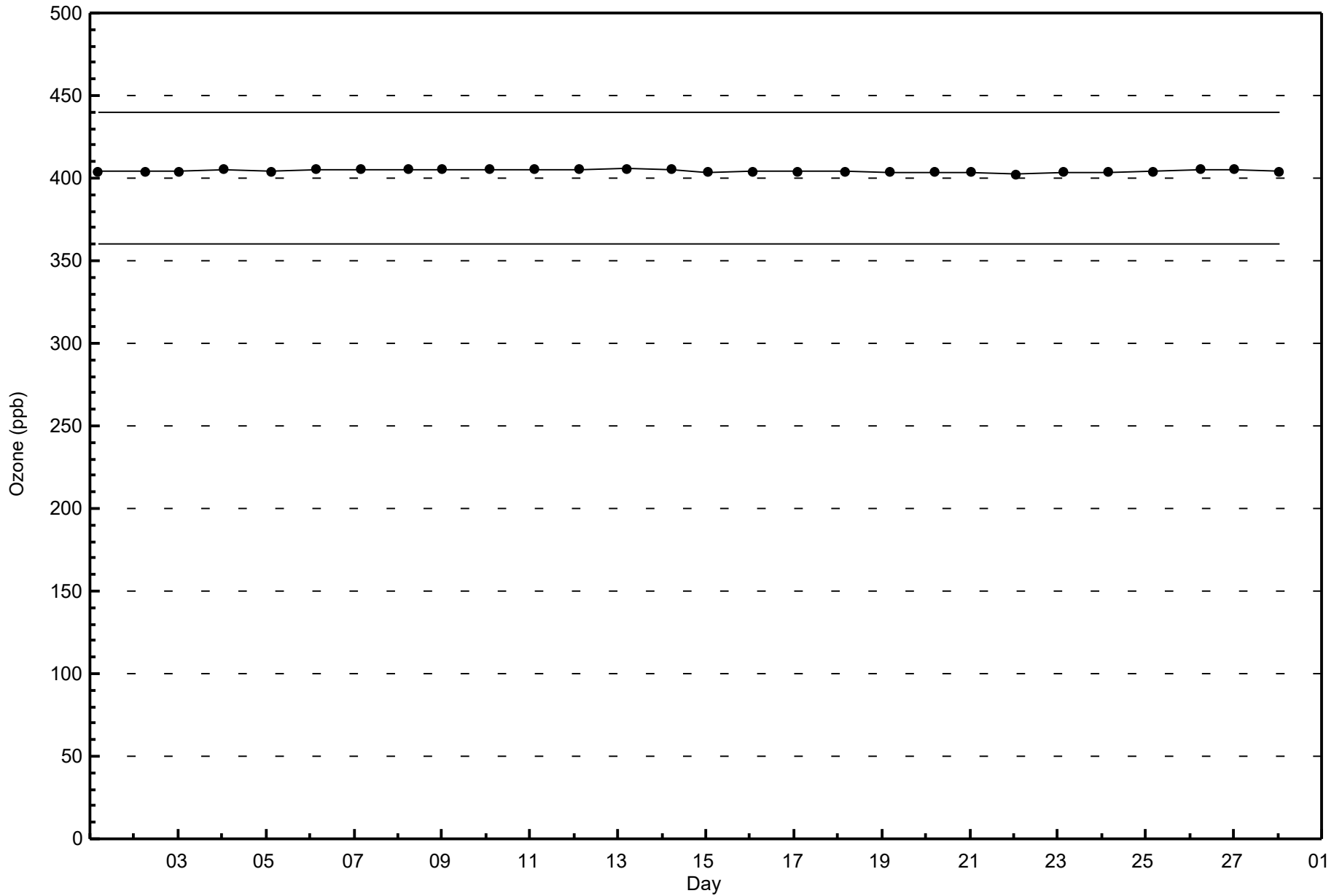
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Ozone (O<sub>3</sub>) - ppb  
Fort Chipewyan







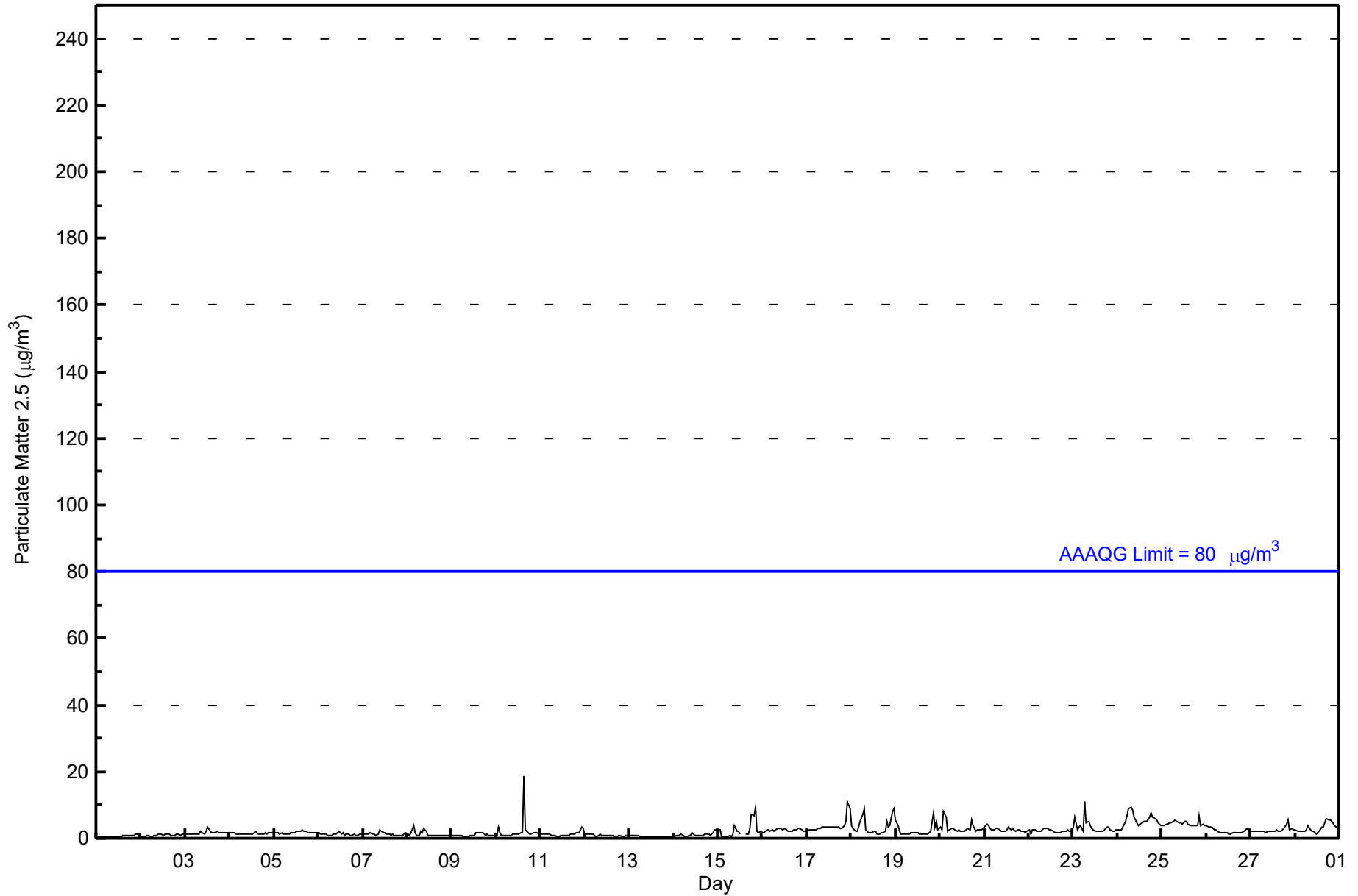




Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														672							
Maximum Value: 18.5 µg/m <sup>3</sup> on Feb 10 16:00		Maximum Daily Average: 5.4 µg/m <sup>3</sup> on Feb 24														Hours of Data:		670									
Minimum Value: 0.4 µg/m <sup>3</sup> on Feb 1 07:00		Minimum Daily Average: 0.5 µg/m <sup>3</sup> on Feb 13														Hours of Missing Data:		2									
Maximum Diurnal Average: 2.8 µg/m <sup>3</sup> at hour 21		Minimum Diurnal Average: 1.8 µg/m <sup>3</sup> at hour 12														Hours of Calibration:		2									
Monthly Average: 2.16 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.7 Q <sub>1</sub> = 1.1 Median = 1.7 Q <sub>3</sub> = 2.6 P <sub>90</sub> = 3.9 P <sub>99</sub> = 8.8														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-Feb	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	1.3	1.3	0.8	0.6	1.3	
2-Feb	0.5	0.6	0.5	0.9	0.7	0.6	0.6	0.6	0.8	1.1	1.1	1.2	1.0	1.2	1.2	1.1	1.0	1.0	1.0	1.1	1.2	1.0	1.1	1.2	0.9	1.2	
3-Feb	1.3	1.3	1.3	1.3	1.3	1.4	1.3	1.3	2.0	1.5	1.3	2.1	3.2	2.2	1.8	1.8	1.8	2.3	1.7	1.9	1.7	1.7	1.8	1.9	1.7	3.2	
4-Feb	1.7	1.7	1.6	1.4	1.3	1.4	1.3	1.2	1.2	1.3	1.2	1.3	1.3	1.6	2.0	1.4	1.3	1.3	1.4	1.6	1.4	1.6	1.6	1.7	1.5	2.0	
5-Feb	1.8	1.6	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.6	1.7	1.9	2.0	2.1	2.2	2.3	2.3	1.9	1.6	1.5	1.5	1.6	1.7	1.7	2.3	
6-Feb	1.5	1.3	1.4	1.3	1.1	1.0	0.9	0.8	1.2	1.3	1.6	2.2	1.3	1.9	1.1	1.3	1.2	0.9	0.9	1.1	1.0	1.0	1.1	1.2	1.2	2.2	
7-Feb	1.2	1.1	1.1	1.3	1.6	1.2	1.1	1.0	1.4	2.5	2.3	1.8	1.5	1.3	1.2	1.0	1.1	1.0	1.0	0.9	0.9	0.9	1.1	1.8	1.3	2.5	
8-Feb	1.1	1.0	1.7	3.7	1.8	0.9	0.9	2.0	1.7	3.1	2.0	0.9	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.9	0.8	0.9	1.3	3.7	
9-Feb	0.8	0.8	0.8	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.8	0.8	0.8	1.7	1.6	1.6	1.8	1.6	1.0	1.1	1.0	0.8	0.9	0.9	1.0	1.8	
10-Feb	1.0	3.4	1.8	1.0	0.8	0.7	0.8	1.0	1.0	1.1	1.3	1.3	1.4	1.5	1.7	18.5	2.6	1.5	1.4	1.4	1.5	1.6	1.5	1.4	2.1	18.5	
11-Feb	1.4	1.3	1.3	1.1	1.2	1.1	0.9	0.7	0.6	0.6	0.6	0.7	0.7	0.8	0.9	1.0	1.4	1.3	1.4	1.5	1.7	1.8	3.4	2.9	1.3	3.4	
12-Feb	1.2	1.2	1.2	1.3	1.1	0.7	0.6	0.7	1.3	1.0	1.0	1.1	0.9	0.8	0.9	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.8	0.9	0.9	1.3	
13-Feb	0.8	0.7	0.7	0.7	0.8	0.7	0.4	0.4	0.4	0.5	0.6	0.4	0.4	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.5	0.8	
14-Feb	0.5	0.8	0.8	0.9	1.2	0.7	0.6	0.6	0.8	0.8	1.6	0.9	1.0	1.0	0.9	0.8	0.7	1.2	1.1	1.4	1.1	1.9	2.7	2.6	1.1	2.7	
15-Feb	2.6	2.5	0.6	0.5	0.5	0.5	0.7	0.6	1.1	3.9	2.3	2.1	1.2	C	C	1.4	1.4	2.9	7.1	6.7	9.5	2.1	1.7	2.2	2.4	9.5	
16-Feb	1.6	1.8	2.5	2.5	2.3	2.4	2.2	2.4	2.8	2.8	2.8	2.7	2.9	2.6	2.3	2.1	2.3	2.5	2.7	3.0	2.8	2.6	2.3	2.2	2.5	3.0	
17-Feb	2.3	2.5	2.4	2.4	2.4	2.6	2.8	3.1	3.3	3.5	3.3	3.4	3.3	3.3	3.3	3.5	3.6	3.0	3.0	3.7	5.1	11.1	8.8	3.7	11.1		
18-Feb	3.9	2.9	2.1	2.1	3.2	4.9	7.0	8.8	2.6	1.6	1.8	1.5	2.1	2.1	1.5	1.4	1.6	1.7	2.2	5.3	3.2	3.9	8.2	8.8	3.5	8.8	
19-Feb	5.5	4.0	2.0	1.2	1.2	1.3	1.4	1.4	1.7	1.7	1.6	1.6	1.6	1.3	1.3	1.2	1.2	1.1	1.6	2.3	7.7	3.3	5.0	2.6	2.3	7.7	
20-Feb	3.3	2.7	7.8	6.5	1.9	2.5	2.8	3.1	2.6	2.3	2.5	2.1	2.1	1.9	2.4	3.2	2.5	5.5	3.7	2.2	2.4	2.5	2.6	2.9	3.1	7.8	
21-Feb	3.2	4.1	3.7	2.8	2.5	2.4	2.9	2.8	2.3	2.0	1.9	2.0	2.4	3.4	2.6	3.0	2.3	2.3	2.5	2.7	2.1	2.2	1.9	2.0	2.6	4.1	
22-Feb	2.5	1.3	2.6	2.5	2.3	2.1	2.2	2.4	2.8	2.8	3.1	2.5	2.3	2.0	1.9	1.9	1.9	1.7	2.1	2.0	2.1	2.4	2.1	2.1	2.2	3.1	
23-Feb	3.4	6.4	2.5	3.5	3.7	2.3	10.9	4.5	5.2	3.6	3.2	2.7	2.3	2.3	2.3	2.3	2.3	2.4	3.2	3.4	2.7	2.2	2.1	2.5	3.4	10.9	
24-Feb	2.7	2.5	2.5	3.5	4.9	7.0	8.7	9.4	8.5	6.4	4.8	3.7	4.0	4.9	5.2	5.1	5.3	6.4	7.4	6.2	6.0	5.4	4.6	3.9	5.4	9.4	
25-Feb	3.9	3.9	4.3	4.3	4.5	4.6	5.3	5.3	4.9	4.5	4.5	4.1	5.0	4.9	4.3	3.9	3.9	3.8	3.8	3.7	6.7	3.7	4.2	3.9	4.4	6.7	
26-Feb	3.9	3.3	3.4	3.2	2.6	2.7	2.1	1.7	1.9	1.5	1.5	1.7	1.3	1.3	1.7	1.8	1.6	1.6	1.7	1.8	2.2	2.5	2.9	2.7	2.2	3.9	
27-Feb	2.3	2.1	2.1	2.2	2.3	2.3	2.1	2.0	1.9	2.1	2.3	2.1	2.1	2.3	2.4	2.3	2.0	2.5	2.9	4.3	5.7	2.7	2.8	2.4	2.5	5.7	
28-Feb	2.6	2.1	2.0	2.2	2.1	1.9	2.5	4.0	2.7	2.1	2.1	1.4	1.6	2.0	3.5	3.5	4.8	5.7	5.6	5.4	5.2	3.7	3.5	3.3	3.2	5.7	
																								Diurnal Average		Diurnal Maximum	
																								2.1		5.5	
																								2.1		6.4	
																								2.0		7.8	
																								2.0		6.5	
																								1.9		4.9	
																								1.9		7.0	
																								2.3		10.9	
																								2.3		9.4	
																								2.1		8.5	
																								2.1		6.4	
																								2.0		4.8	
																								1.8		4.1	
																								1.8		5.0	
																								1.9		4.9	
																								1.9		5.2	
																								2.5		18.5	
																								1.9		5.3	
																								2.2		6.4	
																								2.3		7.4	
																								2.4		6.7	
																								2.8		9.5	
																								2.2		5.4	
																								2.7		11.1	
																								2.5		8.8	

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 Chipewyan - February 2023**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	640	95.52	95.52
6 - 15	29	4.33	99.85
16 - 25	1	0.15	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 670

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>  
Fort Chipewyan - February 2023**

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	18	15	41	87	117	21	7	12	2	7	20	11	41	81	106	54	640
6 - 15	2	0	0	4	4	4	1	1	1	3	0	0	0	3	4	2	29
16 - 25	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
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>	20	15	42	91	121	25	8	13	3	10	20	11	41	84	110	56	670

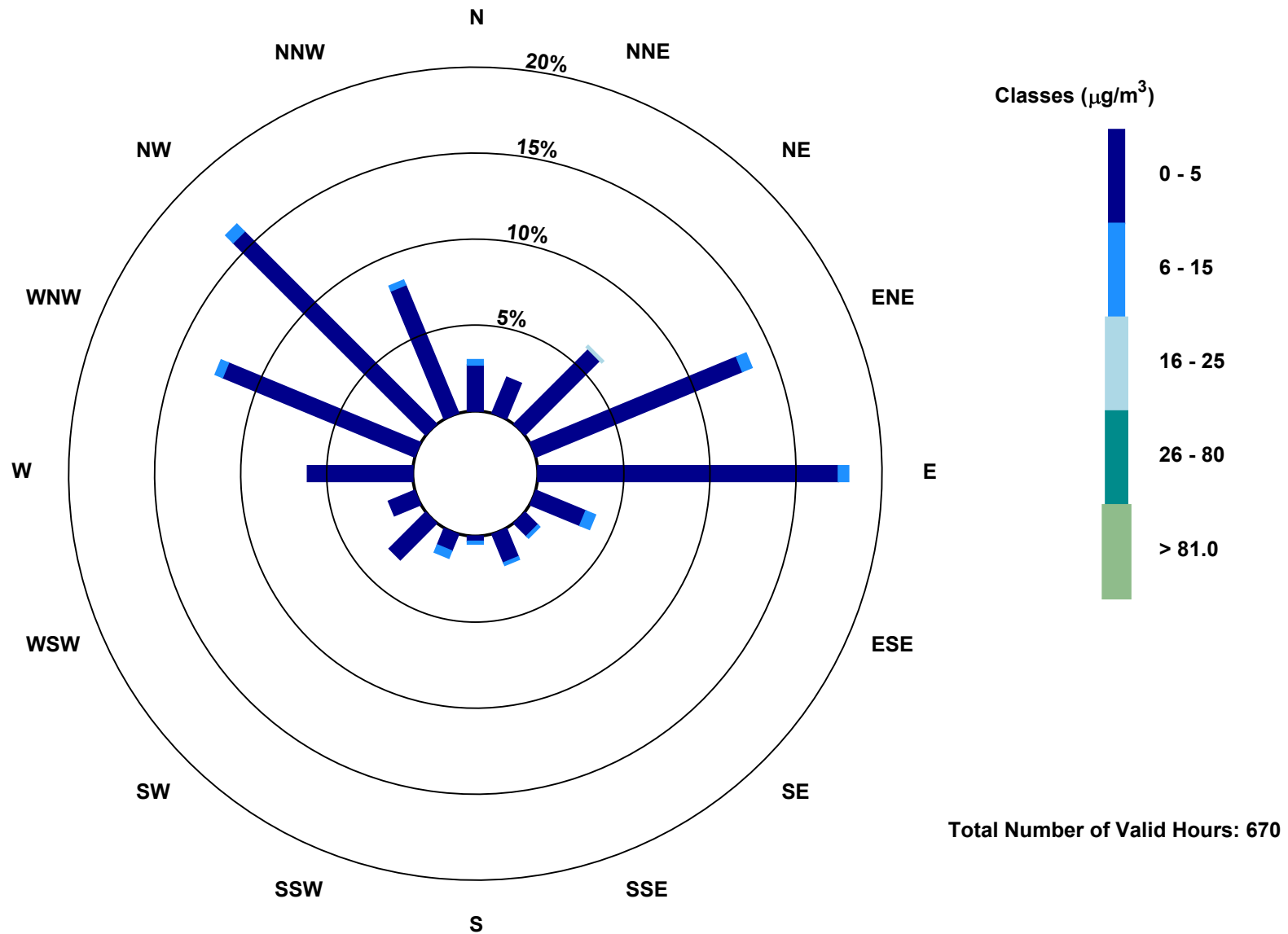
Total Number of Valid Hours: 670

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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





# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Carbon Monoxide (CO) - ppm

## Fort Chipewyan - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 0.1 ppm on Feb 15 21:00	Maximum Daily Average: 0.1 ppm on Feb 1		Hours of Data:	637
Minimum Value: 0.0 ppm on Feb 5 14:00	Minimum Daily Average: 0.0 ppm on Feb 26		Hours of Missing Data:	35
Maximum Diurnal Average: 0.0 ppm at hour 9	Minimum Diurnal Average: 0.0 ppm at hour 13		Hours of Calibration:	32
Monthly Average: 0.03 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		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-Feb	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	0.1
2-Feb	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	0.1
3-Feb	0.1	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	M	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
4-Feb	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	
5-Feb	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	
6-Feb	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	
7-Feb	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	0.1	
8-Feb	0.0	0.0	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
9-Feb	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	
10-Feb	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	
11-Feb	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	
12-Feb	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	
13-Feb	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	0.0	
14-Feb	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	C	C	C	C	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	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-Feb	0.0	0.0	0.0	Z	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	0.1	0.1	0.1	0.1	0.1	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-Feb	0.0	0.0	0.0	0.0	Z	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	0.0	0.0	0.0	0.1	0.1	
17-Feb	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	
18-Feb	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	0.0	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	
19-Feb	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	0.0	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	
20-Feb	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	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-Feb	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	0.1	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	
22-Feb	0.0	0.0	0.0	0.0	Z	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
23-Feb	0.0	0.1	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	0.0	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	
24-Feb	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	
25-Feb	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	0.1	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	
26-Feb	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	
27-Feb	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	
28-Feb	0.0	0.0	0.0	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	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
																								Diurnal Average												
																								Diurnal Maximum												

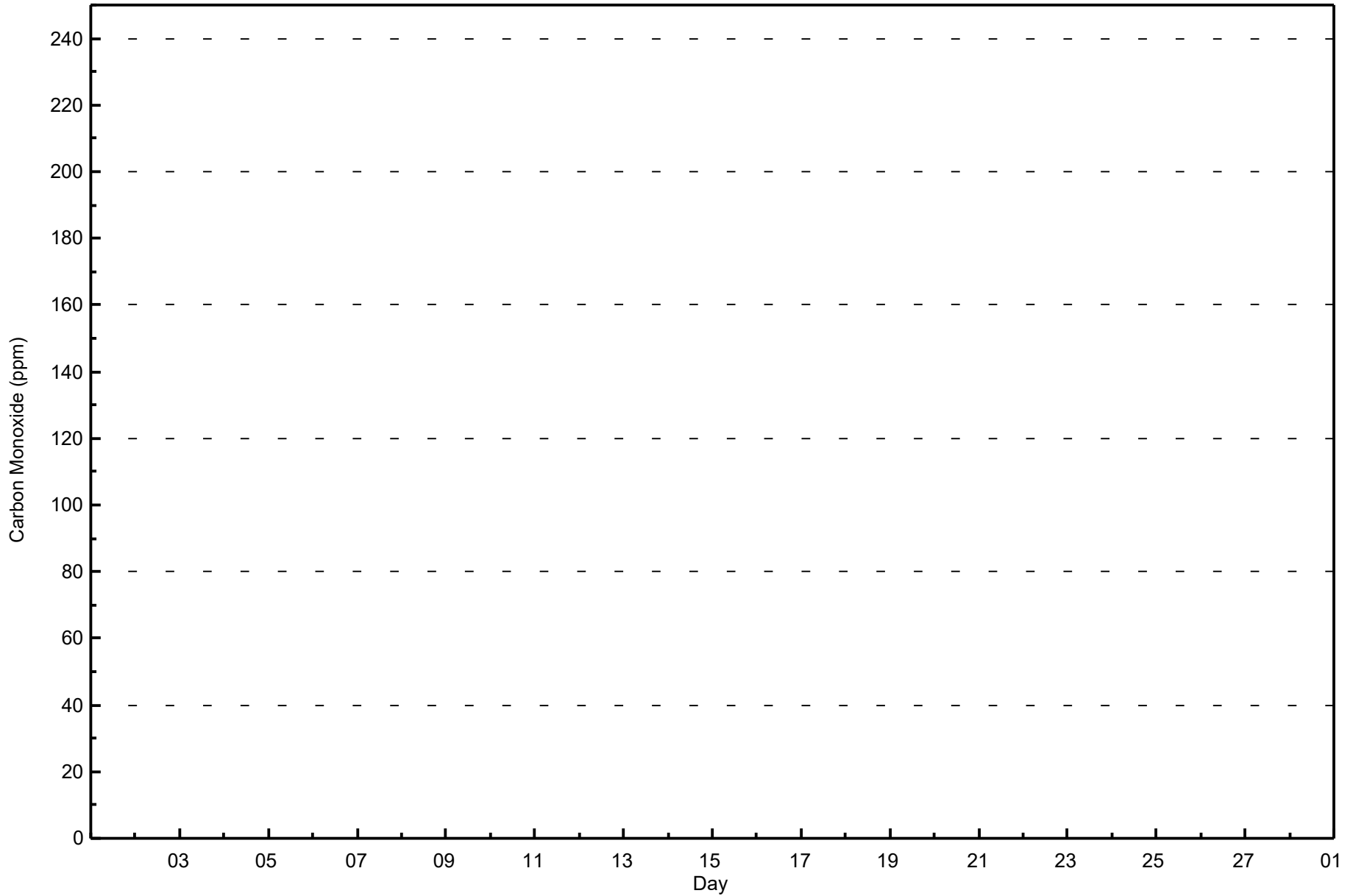
Z - zerospan      C - Calibration      M - Maintenance  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 13 ppm





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

**Carbon Monoxide (CO) - ppm**  
**Fort Chipewyan - February 2023**





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

**Carbon Monoxide (CO) - ppm**  
**Fort Chipewyan - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	637	100.00	100.00
0.4 - 0.5	0	0.00	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: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Carbon Monoxide (CO) - ppm  
Fort Chipewyan - February 2023**

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	18	14	41	87	117	25	7	13	4	9	18	11	41	78	99	55	637
0.4 - 0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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>	18	14	41	87	117	25	7	13	4	9	18	11	41	78	99	55	637

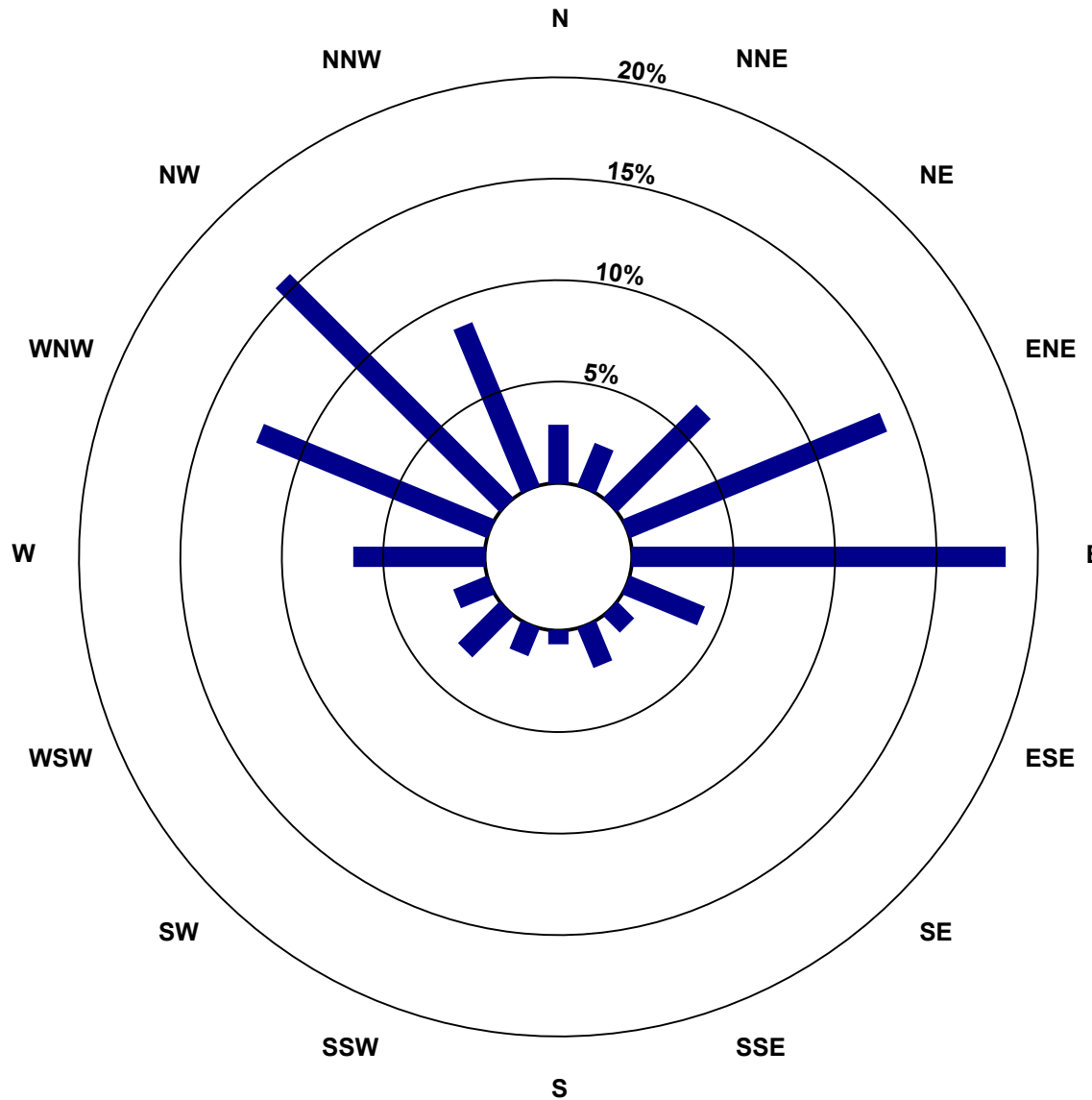
Total Number of Valid Hours: 637

Total Number of Hours: 672

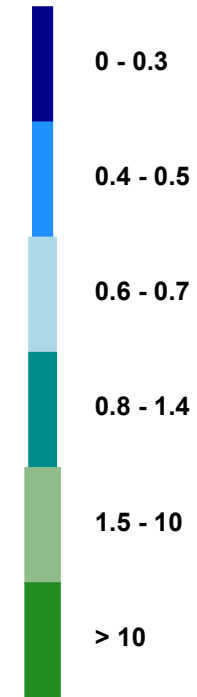


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Carbon Monoxide (CO) - ppm  
Fort Chipewyan



Classes (ppm)



Total Number of Valid Hours: 637



Wood Buffalo Environmental Association

Summary of Hour Averages

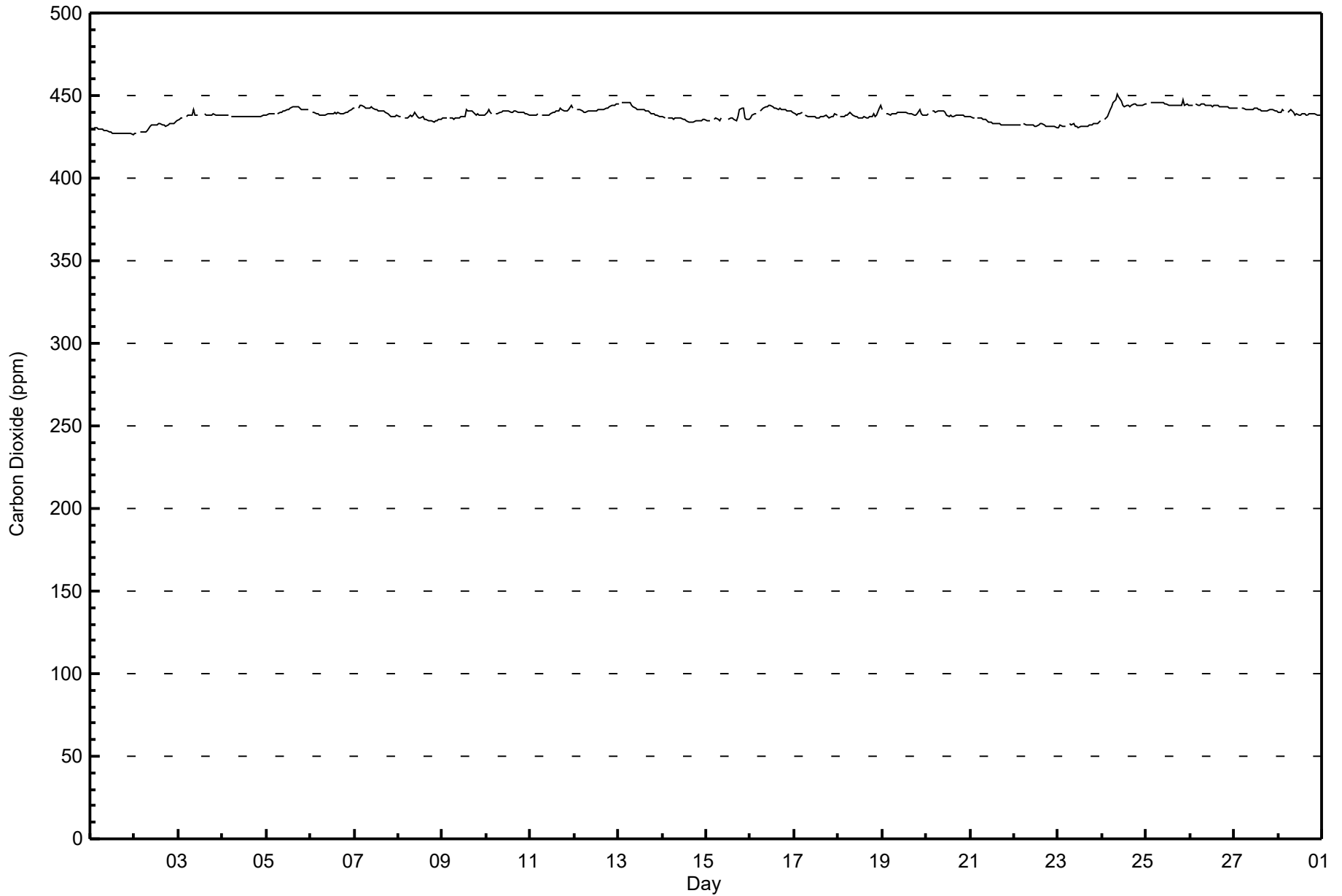
Carbon Dioxide (CO<sub>2</sub>) - ppm  
Fort Chipewyan - February 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	672					
Maximum Value: 450.5 ppm on Feb 24 09:00		Maximum Daily Average: 445.0 ppm on Feb 25																	Hours of Data:	638						
Minimum Value: 426.7 ppm on Feb 2 00:00		Minimum Daily Average: 428.2 ppm on Feb 1																	Hours of Missing Data:	34						
Maximum Diurnal Average: 438.9 ppm at hour 9		Minimum Diurnal Average: 437.5 ppm at hour 2																	Hours of Calibration:	31						
Monthly Average: 438.30 ppm		Percentiles: P <sub>1</sub> = 427.1 P <sub>10</sub> = 432.0 Q <sub>1</sub> = 436.2 Median = 438.5 Q <sub>3</sub> = 441.3 P <sub>90</sub> = 443.8 P <sub>99</sub> = 445.7																	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-Feb	431.3	Z	430.3	430.2	429.9	429.6	429.4	429.0	428.8	428.5	428.0	427.8	427.5	427.4	427.5	427.3	427.1	427.2	426.9	427.1	427.1	426.9	427.0	426.7	428.2	431.3
2-Feb	426.7	427.0	Z	427.9	428.0	428.2	428.2	429.0	431.0	432.3	431.9	432.5	431.8	433.1	433.5	431.9	431.8	431.6	431.9	432.6	432.7	433.4	434.1	435.0	431.1	435.0
3-Feb	435.4	436.1	436.7	Z	437.5	438.0	438.3	438.2	441.3	438.5	438.0	M	M	M	439.2	438.2	438.1	437.9	438.2	438.6	438.5	438.4	438.4	437.9	438.1	441.3
4-Feb	437.8	438.0	438.2	437.9	Z	437.3	437.1	437.2	437.5	437.2	437.2	437.0	437.3	437.6	437.6	437.1	437.0	436.9	436.9	437.2	436.9	437.6	437.9	438.2	437.4	438.2
5-Feb	438.4	438.6	438.6	439.0	438.6	Z	439.2	439.5	440.1	440.6	440.9	441.3	441.9	442.6	443.0	443.3	443.5	442.8	442.5	441.9	441.8	441.8	441.7	441.1	441.0	443.5
6-Feb	Z	440.1	439.5	439.1	438.6	438.4	438.4	438.5	438.6	439.1	438.9	439.1	439.7	439.3	439.8	439.4	439.3	439.4	440.1	440.2	440.9	441.7	442.0	439.5	442.0	
7-Feb	442.3	Z	442.6	443.8	444.1	443.4	442.6	442.1	442.2	442.9	442.6	441.5	441.3	440.9	440.8	440.5	440.4	440.1	439.3	438.0	437.6	437.2	437.2	440.9	444.1	
8-Feb	437.0	437.1	Z	436.9	436.5	436.1	437.9	437.4	438.4	439.5	437.2	436.7	436.9	437.2	435.5	435.2	434.7	434.6	434.4	434.2	434.6	435.1	435.2	435.4	436.3	439.5
9-Feb	436.1	436.1	436.4	Z	436.1	436.2	436.0	436.1	436.0	436.7	437.2	437.1	437.4	441.9	440.7	441.1	440.6	439.5	438.5	438.7	438.5	438.0	438.1	437.9	437.9	441.9
10-Feb	440.0	441.3	440.2	438.8	Z	439.1	439.3	439.9	440.0	440.3	441.0	440.7	440.5	440.1	440.0	440.5	440.3	439.9	439.9	439.6	439.5	439.0	438.7	438.3	439.9	441.3
11-Feb	438.4	438.5	438.1	438.3	438.8	Z	437.8	437.8	437.9	438.1	438.4	439.0	439.5	440.0	440.4	441.0	442.4	441.5	441.0	440.9	440.7	441.6	443.7	442.3	439.8	443.7
12-Feb	Z	441.8	441.7	441.5	440.6	440.1	440.2	440.7	441.1	440.9	440.7	440.7	441.0	441.2	441.8	441.6	441.7	442.2	442.8	443.5	443.8	444.0	444.4	444.9	441.9	444.9
13-Feb	445.2	Z	445.6	445.8	445.6	445.5	445.4	444.3	443.0	442.1	441.6	441.4	441.1	441.2	441.1	440.7	440.3	439.9	439.2	438.7	438.3	437.8	437.6	437.3	441.7	445.8
14-Feb	436.9	436.8	Z	436.2	436.1	436.4	435.8	436.0	436.2	436.1	436.2	435.6	435.4	434.7	434.2	434.0	434.1	434.3	434.5	434.7	434.9	434.8	435.4	435.3	435.4	436.9
15-Feb	435.2	434.9	434.5	Z	435.9	436.2	435.2	434.8	436.2	C	C	C	435.7	436.4	436.5	435.4	434.9	437.0	441.9	442.2	442.7	436.3	435.8	435.9	436.7	442.7
16-Feb	436.4	437.9	438.7	439.3	Z	440.7	441.2	442.1	443.0	443.6	443.9	444.0	443.5	442.8	442.2	441.8	442.0	441.8	441.7	441.5	441.1	440.9	440.4	439.9	441.3	444.0
17-Feb	439.1	438.4	438.8	439.1	439.7	Z	438.0	437.6	437.3	437.0	437.0	436.9	436.8	436.7	436.9	437.0	437.2	437.9	436.9	436.8	437.4	437.3	438.6	437.9	437.7	439.7
18-Feb	Z	437.5	437.3	437.5	437.8	438.3	439.7	439.4	438.0	437.5	437.1	436.6	436.2	436.2	436.9	436.8	436.7	437.2	437.1	438.7	437.4	438.3	442.6	443.8	438.0	443.8
19-Feb	441.4	Z	439.1	438.8	438.3	438.7	439.1	439.3	439.7	440.0	440.1	439.7	439.5	439.7	439.1	438.7	439.2	438.1	438.1	439.3	441.2	438.7	438.6	438.0	439.2	441.4
20-Feb	438.5	438.7	Z	440.3	440.5	440.2	441.0	440.9	440.6	440.9	439.7	438.2	437.6	437.9	437.6	437.6	437.9	438.0	437.9	437.7	437.9	437.7	437.4	437.2	438.8	441.0
21-Feb	437.0	436.8	436.7	Z	436.6	436.5	436.2	435.9	435.2	434.6	434.0	433.5	433.2	432.9	432.7	432.8	432.7	432.6	432.5	432.2	432.1	432.1	432.0	431.9	434.0	437.0
22-Feb	431.8	431.9	432.2	432.1	Z	432.6	432.5	432.3	432.4	431.9	432.1	431.7	431.8	431.9	433.0	433.0	432.1	431.6	431.7	431.6	431.2	431.2	430.9	430.9	431.9	433.0
23-Feb	430.9	432.0	431.0	431.5	431.5	Z	432.7	432.3	433.1	431.7	431.1	430.8	431.1	431.2	431.3	431.5	431.6	432.2	432.5	433.0	433.0	433.4	433.7	434.6	432.1	434.6
24-Feb	Z	435.5	436.0	437.3	441.3	443.5	445.5	447.8	450.5	449.3	446.8	443.7	442.9	444.4	443.8	443.3	443.9	444.7	444.7	444.2	444.1	444.3	444.5	444.5	443.8	450.5
25-Feb	445.0	Z	445.4	445.7	445.6	445.8	445.6	445.3	445.4	445.4	445.0	444.7	444.9	444.3	444.4	444.2	444.3	444.4	444.1	444.5	447.8	444.3	444.5	444.1	445.0	447.8
26-Feb	444.5	443.7	Z	444.9	444.1	444.3	444.7	444.9	444.3	443.8	443.8	443.7	443.6	443.9	444.1	443.8	443.4	443.2	443.1	443.0	442.8	442.8	442.7	442.6	443.7	444.9
27-Feb	442.5	442.5	442.4	Z	442.1	442.0	441.8	441.8	441.7	441.6	441.6	442.5	442.2	441.5	441.2	440.8	440.6	440.9	440.6	441.5	441.9	441.4	440.8	440.4	441.6	442.5
28-Feb	440.2	440.1	441.1	440.8	Z	440.2	440.4	441.4	439.9	438.4	438.6	438.3	438.0	438.8	438.7	438.1	438.3	439.3	439.1	439.1	438.6	438.2	438.5	438.6	439.2	441.4
437.8 437.5 438.3 438.4 438.4 438.6 438.5 438.6 438.9 438.8 438.5 438.3 438.0 438.4 438.3 438.1 438.1 438.1 438.1 438.3 438.4 438.0 438.3 438.2																								Diurnal Average		
445.2 443.7 445.6 445.8 445.6 445.8 445.6 447.8 450.5 449.3 446.8 444.7 444.4 444.4 444.4 444.2 444.3 444.7 444.7 444.5 447.8 444.3 444.5 444.9																								Diurnal Maximum		
Z - zerospan		C - Calibration					M - Maintenance																			



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

**Carbon Dioxide (CO<sub>2</sub>) - ppm**  
**Fort Chipewyan - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Carbon Dioxide (CO<sub>2</sub>) - ppm  
Fort Chipewyan - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
400 - 420	0	0.00	0.00
420 - 440	431	67.55	67.55
440 - 460	207	32.45	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: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Carbon Dioxide (CO<sub>2</sub>) - ppm  
Fort Chipewyan - February 2023**

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	13	3	9	42	85	17	6	7	1	3	10	9	29	64	88	45	431
440 - 460	5	11	32	45	32	8	1	5	3	6	8	2	11	15	13	10	207
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>	18	14	41	87	117	25	7	12	4	9	18	11	40	79	101	55	638

Total Number of Valid Hours: 638

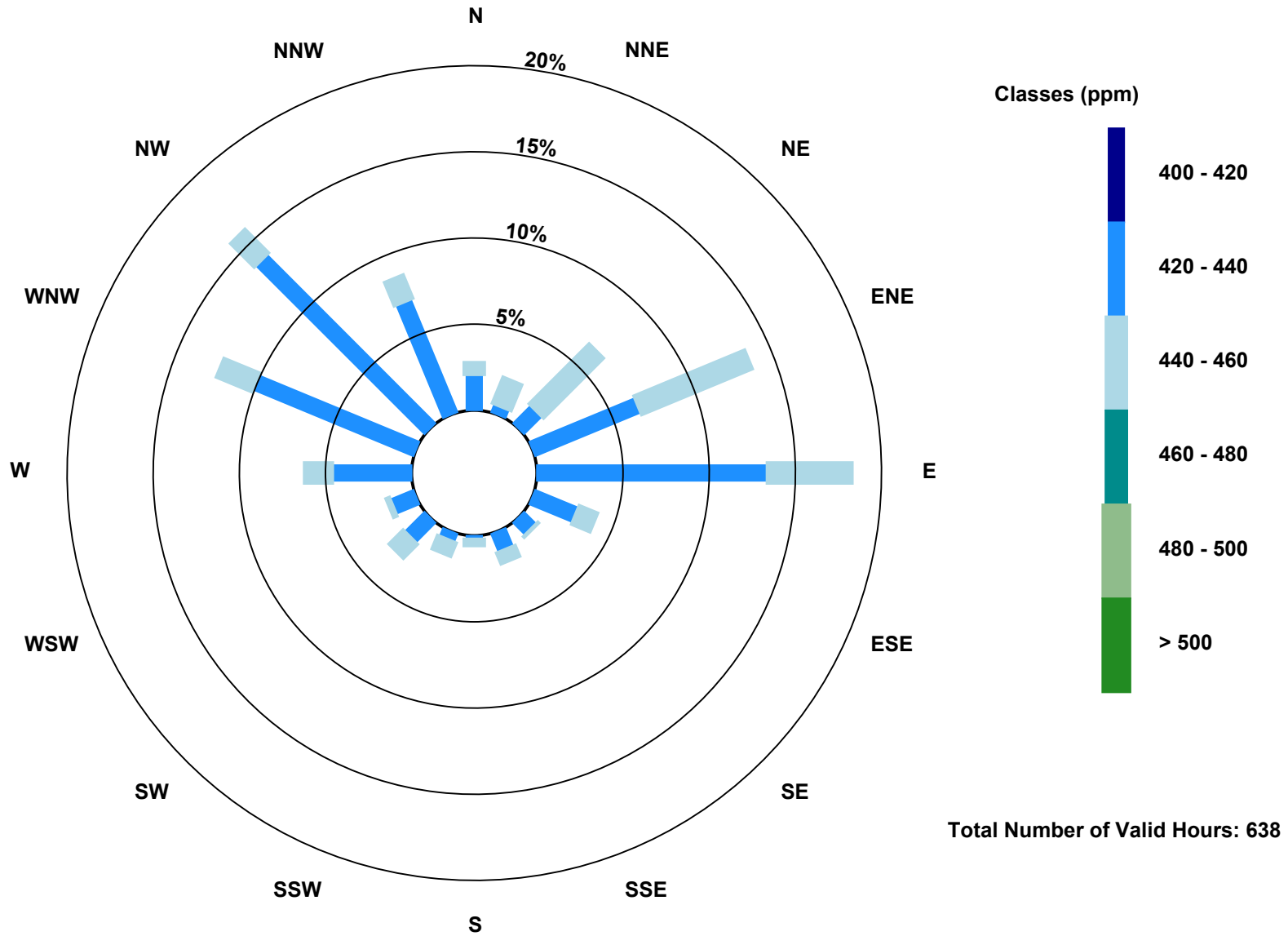
Total Number of Hours: 672





Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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

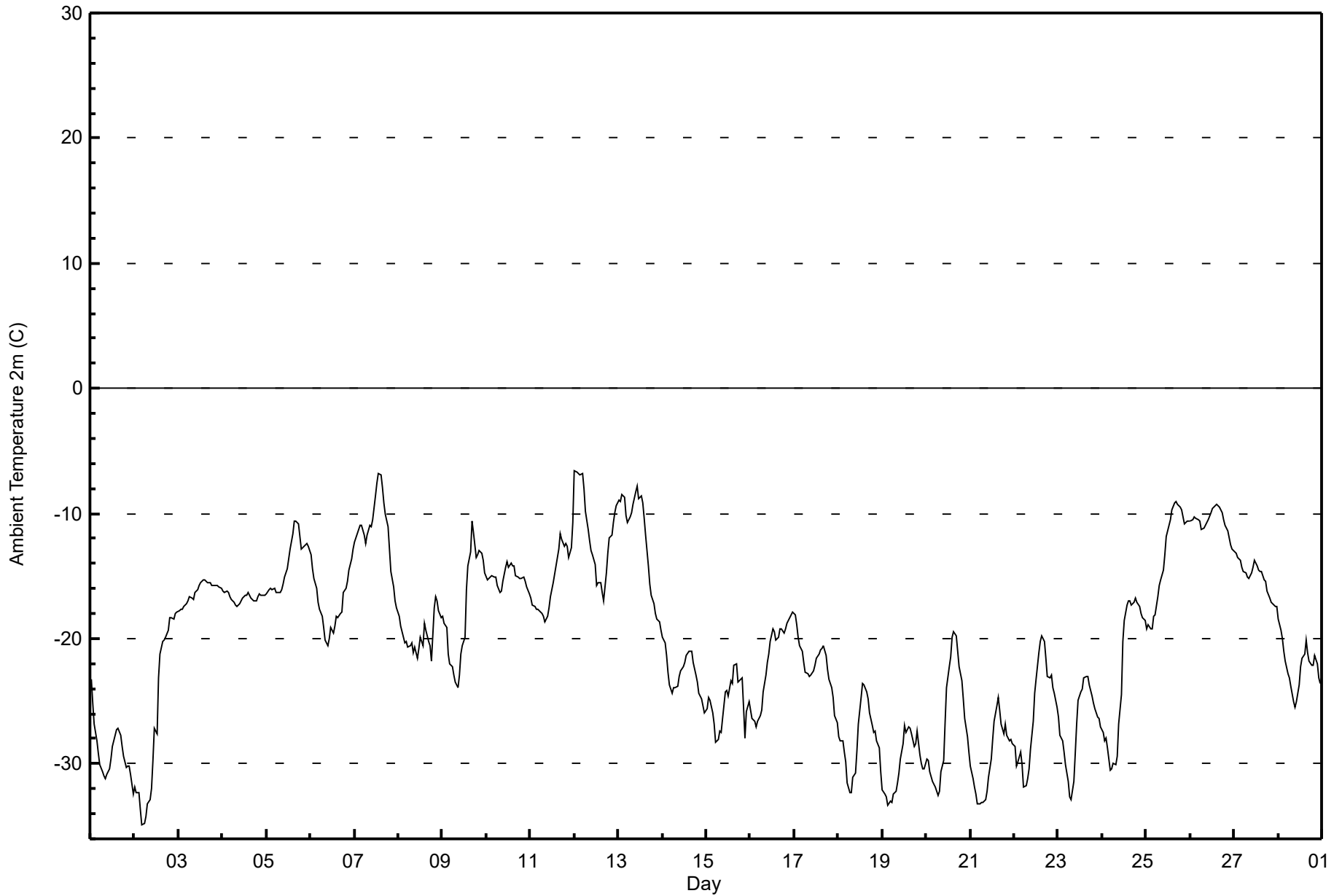




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Ambient Temperature 2m (AT 2m) - C**  
**Fort Chipewyan - February 2023**

Maximum Value: -6.6 C on Feb 12 01:00      Maximum Daily Average: -10.6 C on Feb 26																								Hours in Service: 672		
Minimum Value: -34.9 C on Feb 2 05:00      Minimum Daily Average: -30.1 C on Feb 19																								Hours of Data: 672		
Maximum Diurnal Average: -17.7 C at hour 16      Minimum Diurnal Average: -22.6 C at hour 7																								Hours of Missing Data: 0		
Monthly Average: -20.17 C      Percentiles: P <sub>1</sub> = -33.2 P <sub>10</sub> = -30.1 Q <sub>1</sub> = -25.6 Median = -19.4 Q <sub>3</sub> = -15.2 P <sub>90</sub> = -10.9 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-Feb	-23.3	-25.1	-26.9	-28.1	-29.2	-30.0	-30.6	-30.9	-31.2	-30.9	-30.4	-29.6	-28.6	-27.8	-27.3	-27.2	-27.7	-28.7	-29.4	-30.3	-30.2	-30.1	-30.8	-32.4	-29.0	-23.3
2-Feb	-31.9	-32.3	-32.3	-33.6	-34.9	-34.8	-34.2	-33.2	-32.9	-31.9	-29.7	-27.2	-27.6	-23.2	-21.2	-20.3	-20.1	-19.8	-19.4	-18.4	-18.4	-18.4	-18.0	-17.9	-26.3	-17.9
3-Feb	-17.8	-17.7	-17.6	-17.5	-17.2	-16.9	-16.7	-16.8	-16.8	-16.3	-16.1	-15.8	-15.5	-15.3	-15.3	-15.4	-15.5	-15.6	-15.7	-15.7	-15.7	-15.7	-15.9	-16.0	-16.3	-15.3
4-Feb	-16.2	-16.3	-16.2	-16.3	-16.6	-16.8	-17.1	-17.3	-17.4	-17.2	-17.0	-16.7	-16.5	-16.5	-16.3	-16.8	-16.8	-17.0	-16.9	-16.7	-16.4	-16.5	-16.5	-16.6	-16.7	-16.2
5-Feb	-16.4	-16.1	-15.9	-16.1	-16.0	-16.3	-16.4	-16.4	-16.1	-15.6	-15.1	-14.4	-13.6	-12.8	-11.6	-10.6	-10.6	-10.8	-11.9	-12.8	-12.7	-12.5	-12.4	-12.7	-14.0	-10.6
6-Feb	-13.2	-14.4	-15.2	-16.0	-17.1	-17.6	-18.2	-19.1	-20.1	-20.6	-20.0	-19.2	-19.6	-19.0	-18.2	-18.3	-18.0	-17.8	-16.3	-16.0	-15.4	-14.5	-13.6	-12.8	-17.1	-12.8
7-Feb	-12.3	-11.7	-11.3	-10.9	-11.0	-11.8	-12.4	-11.8	-11.0	-11.1	-10.5	-8.6	-7.6	-6.8	-6.9	-7.9	-9.2	-10.0	-11.0	-12.8	-14.7	-15.9	-17.0	-17.6	-11.3	-6.8
8-Feb	-18.3	-19.1	-19.4	-20.3	-20.3	-20.6	-20.6	-20.3	-21.1	-20.7	-21.6	-20.8	-19.9	-20.6	-18.7	-19.4	-20.3	-20.5	-21.8	-17.6	-16.7	-17.0	-17.7	-18.3	-19.6	-16.7
9-Feb	-18.3	-18.7	-19.1	-21.2	-22.0	-22.2	-22.9	-23.4	-23.9	-22.9	-21.2	-20.5	-19.9	-16.1	-14.2	-13.0	-10.6	-11.5	-13.6	-13.3	-12.9	-13.2	-13.8	-14.7	-17.6	-10.6
10-Feb	-15.3	-15.2	-15.1	-14.9	-15.1	-15.1	-15.7	-16.3	-16.2	-15.4	-14.3	-13.8	-14.3	-14.0	-14.2	-14.2	-15.0	-15.1	-15.2	-15.2	-15.1	-15.4	-15.8	-16.4	-15.1	-13.8
11-Feb	-16.8	-17.3	-17.4	-17.6	-17.7	-17.7	-18.0	-18.2	-18.6	-18.3	-17.5	-16.7	-15.6	-14.8	-14.2	-12.9	-11.6	-12.1	-12.6	-12.4	-12.6	-13.5	-12.7	-10.7	-15.3	-10.7
12-Feb	-6.6	-6.7	-6.8	-6.9	-6.8	-8.0	-9.8	-11.3	-12.2	-12.9	-13.2	-14.1	-15.7	-15.5	-15.5	-16.3	-17.0	-14.8	-13.2	-12.0	-11.7	-10.8	-10.0	-9.4	-11.6	-6.6
13-Feb	-8.9	-9.0	-8.5	-8.8	-10.1	-10.7	-10.3	-10.0	-9.3	-8.3	-7.8	-8.8	-8.6	-9.1	-10.4	-11.7	-14.2	-15.6	-16.6	-17.2	-18.0	-18.4	-18.7	-19.3	-12.0	-7.8
14-Feb	-19.9	-20.4	-21.3	-22.7	-23.7	-24.4	-23.9	-23.9	-23.8	-23.0	-22.6	-22.3	-21.9	-21.4	-21.1	-21.0	-21.1	-21.9	-22.9	-23.5	-24.4	-24.9	-25.4	-25.9	-22.8	-19.9
15-Feb	-25.6	-24.6	-25.0	-26.0	-26.8	-28.3	-28.1	-27.4	-27.5	-26.4	-24.3	-24.1	-24.6	-23.4	-23.5	-22.1	-22.0	-23.5	-23.4	-23.1	-25.4	-28.0	-25.9	-25.1	-25.2	-22.0
16-Feb	-25.7	-26.4	-26.7	-27.0	-26.6	-26.2	-25.7	-24.2	-22.9	-21.9	-21.2	-20.3	-19.3	-19.4	-20.1	-19.9	-19.3	-19.2	-19.5	-19.2	-18.8	-18.4	-18.1	-17.9	-21.8	-17.9
17-Feb	-18.1	-18.8	-19.9	-20.5	-21.0	-22.0	-22.7	-22.8	-23.0	-23.0	-22.6	-22.1	-21.6	-21.2	-20.9	-20.8	-20.6	-21.4	-22.4	-23.2	-24.0	-24.7	-26.1	-26.7	-22.1	-18.1
18-Feb	-27.8	-28.2	-28.2	-29.1	-29.8	-31.5	-32.3	-32.3	-31.1	-30.7	-29.0	-26.8	-24.7	-23.6	-23.7	-24.2	-24.8	-25.9	-26.9	-27.5	-27.4	-28.2	-28.7	-30.6	-28.0	-23.6
19-Feb	-32.0	-32.4	-32.7	-33.4	-33.0	-33.1	-32.4	-32.2	-31.5	-30.8	-29.6	-28.4	-26.9	-27.5	-27.1	-27.2	-27.6	-28.6	-28.4	-27.4	-29.2	-30.0	-30.4	-30.4	-30.1	-26.9
20-Feb	-29.6	-29.7	-30.7	-31.5	-31.7	-31.9	-32.5	-32.2	-30.6	-29.7	-26.7	-23.9	-22.2	-21.5	-19.9	-19.4	-19.8	-21.0	-22.3	-23.4	-24.8	-26.4	-27.8	-29.1	-26.6	-19.4
21-Feb	-30.1	-31.2	-31.9	-32.4	-33.2	-33.2	-33.1	-33.1	-32.8	-32.2	-31.1	-29.6	-28.1	-26.6	-25.4	-24.7	-25.8	-26.9	-27.6	-26.8	-27.7	-28.2	-28.1	-28.4	-29.5	-24.7
22-Feb	-28.6	-30.2	-29.8	-29.1	-30.1	-31.8	-31.8	-31.2	-30.4	-28.8	-26.6	-24.4	-23.3	-21.2	-20.3	-19.8	-20.3	-21.6	-23.1	-23.1	-22.9	-23.9	-24.4	-25.5	-25.9	-19.8
23-Feb	-26.3	-27.7	-28.2	-29.0	-30.1	-31.4	-32.6	-32.9	-31.4	-29.1	-26.8	-25.0	-24.2	-24.0	-23.1	-23.0	-23.7	-24.6	-25.1	-25.6	-26.2	-26.4	-27.1	-26.9	-23.0	
24-Feb	-27.5	-28.2	-27.9	-28.8	-30.5	-30.5	-29.9	-30.1	-29.4	-26.8	-24.5	-20.2	-18.6	-17.4	-17.0	-17.0	-17.3	-17.1	-16.7	-17.1	-17.4	-18.0	-18.3	-18.5	-22.7	-16.7
25-Feb	-19.2	-18.9	-19.3	-19.2	-18.2	-18.1	-16.7	-15.7	-15.3	-14.5	-13.3	-11.9	-10.9	-10.4	-9.7	-9.2	-9.1	-9.3	-9.4	-9.7	-10.2	-10.8	-10.7	-10.6	-13.3	-9.1
26-Feb	-10.6	-10.5	-10.3	-10.4	-10.5	-10.6	-11.2	-11.1	-10.9	-10.7	-10.5	-9.9	-9.6	-9.5	-9.3	-9.4	-9.5	-9.9	-10.5	-11.0	-11.4	-11.9	-12.5	-12.8	-10.6	-9.3
27-Feb	-13.1	-13.2	-13.5	-13.7	-14.3	-14.6	-14.8	-15.1	-15.2	-14.8	-14.3	-13.7	-14.1	-14.5	-14.6	-14.7	-15.4	-15.5	-16.1	-16.7	-17.1	-17.3	-17.4	-17.4	-15.0	-13.1
28-Feb	-18.4	-19.3	-20.1	-21.1	-21.8	-22.8	-23.2	-23.8	-25.0	-25.5	-25.1	-23.7	-22.2	-21.5	-21.2	-20.1	-21.1	-21.8	-22.1	-22.2	-21.3	-22.1	-23.1	-23.6	-22.2	-18.4
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C  
Fort Chipewyan - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	321	47.77	47.77
-20 - 0	351	52.23	100.00
0 - 10	0	0.00	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

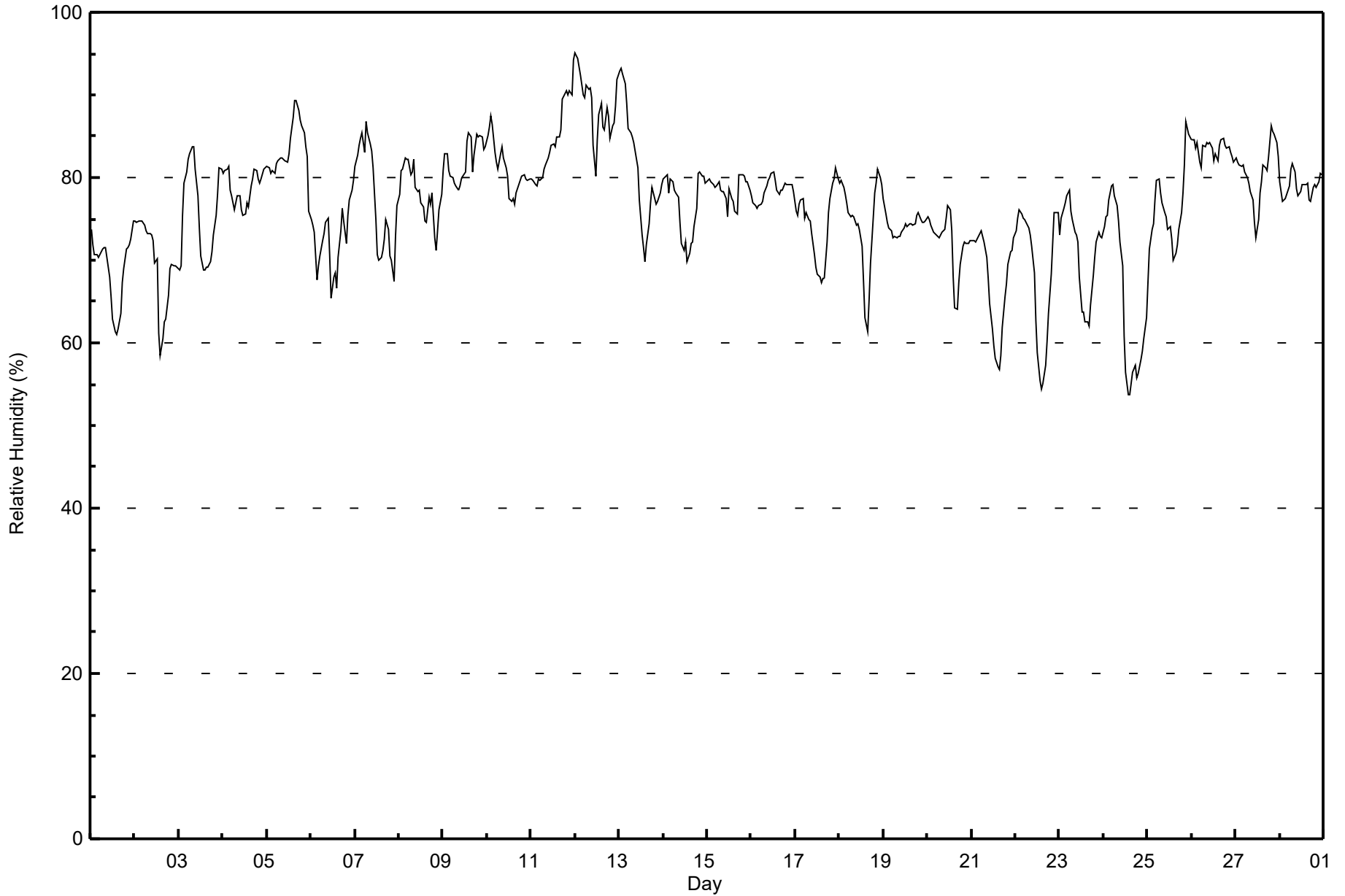
**Relative Humidity (RH) - %  
Fort Chipewyan - February 2023**

Maximum Value: 95.2 % on Feb 12 01:00      Maximum Daily Average: 88.7 % on Feb 12																						Hours in Service: 672 Hours of Data: 672				
Minimum Value: 53.7 % on Feb 24 14:00      Minimum Daily Average: 65.7 % on Feb 24 Maximum Diurnal Average: 79.0 % at hour 3      Minimum Diurnal Average: 71.7 % at hour 15 Monthly Average: 76.51 %      Percentiles: P <sub>1</sub> = 56.1 P <sub>10</sub> = 67.9 Q <sub>1</sub> = 72.8 Median = 77.3 Q <sub>3</sub> = 80.9 P <sub>90</sub> = 84.7 P <sub>99</sub> = 92.5																						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-Feb	73.7	71.8	70.7	70.7	70.3	70.7	71.3	71.4	71.5	70.3	68.0	65.6	63.0	61.4	61.0	61.6	63.5	67.3	68.9	71.3	71.5	71.8	72.6	74.7	69.0	74.7
2-Feb	74.7	74.6	74.8	74.7	74.8	74.2	73.5	73.2	73.3	73.1	72.4	69.6	70.1	61.2	58.4	60.6	62.5	62.9	65.7	68.9	69.5	69.3	69.3	69.2	69.6	74.8
3-Feb	68.9	69.4	75.4	79.3	80.8	82.2	82.9	83.7	83.7	81.0	77.8	74.0	70.6	68.7	68.9	69.2	69.1	69.8	71.0	73.0	75.5	78.0	81.2	81.1	75.6	83.7
4-Feb	80.4	80.9	81.1	81.3	78.5	77.8	76.1	77.0	77.8	77.8	76.1	75.4	75.6	77.0	76.4	79.1	79.9	81.1	80.9	79.8	79.4	79.8	81.0	81.2	78.8	81.3
5-Feb	81.4	81.2	80.6	80.9	80.5	81.8	82.0	82.4	82.4	82.2	82.0	81.8	82.9	84.8	87.3	89.3	89.4	88.2	87.0	86.3	85.5	83.7	82.5	75.9	83.4	89.4
6-Feb	75.0	74.2	73.4	67.6	69.4	70.5	72.4	73.2	74.6	75.1	70.6	65.4	67.9	68.5	66.6	70.4	73.5	76.3	74.7	72.0	75.5	77.3	78.4	79.7	72.6	79.7
7-Feb	81.3	82.8	83.9	84.8	85.4	83.1	86.7	85.5	84.0	83.2	81.1	75.0	70.8	70.1	70.4	71.2	72.6	74.9	73.7	70.6	69.9	67.5	72.9	76.6	77.4	86.7
8-Feb	78.0	80.8	81.0	82.3	82.2	82.2	80.4	80.7	82.2	78.8	78.3	78.5	76.9	76.5	74.7	74.6	77.6	76.8	78.1	72.8	71.2	73.6	76.0	77.9	78.0	82.3
9-Feb	80.9	82.9	82.9	80.8	80.2	80.0	79.4	79.0	78.5	79.0	79.9	80.1	80.7	84.5	85.4	85.0	80.7	82.8	85.3	84.9	85.2	85.0	83.4	83.7	82.1	85.4
10-Feb	85.2	86.1	87.4	86.5	83.1	81.8	81.1	82.9	83.7	82.4	81.2	80.2	77.5	77.1	77.5	76.9	78.1	79.2	79.7	80.2	80.3	79.9	79.7	79.9	81.1	87.4
11-Feb	79.8	79.6	79.2	79.0	79.9	79.6	80.0	81.0	81.5	82.5	83.1	83.9	84.0	83.8	84.9	84.9	85.8	89.5	90.2	90.4	90.1	90.6	90.0	94.2	84.5	94.2
12-Feb	95.2	94.4	93.4	92.4	90.0	89.6	91.2	90.6	90.9	89.6	83.9	80.1	84.5	87.6	89.0	86.1	85.8	88.4	87.5	84.7	86.3	86.6	88.6	91.9	88.7	95.2
13-Feb	92.9	93.2	92.6	91.3	89.0	86.0	85.5	84.8	84.3	82.2	81.1	77.3	73.0	71.5	69.8	71.8	74.4	77.0	78.8	77.5	76.8	77.1	78.1	79.1	81.0	93.2
14-Feb	79.8	80.2	80.3	78.1	79.9	79.5	78.4	78.1	77.6	74.5	72.1	71.1	72.3	69.8	70.9	72.1	72.2	74.1	76.3	80.5	80.7	80.2	80.1	79.4	76.6	80.7
15-Feb	79.7	79.9	79.4	79.2	78.8	79.0	79.4	78.4	78.3	78.3	77.5	75.2	78.7	77.5	77.1	75.9	75.6	80.3	80.4	80.4	80.3	79.5	79.4	78.5	78.6	80.4
16-Feb	77.7	76.9	76.6	76.3	76.5	76.8	77.2	78.1	79.0	79.6	80.0	80.5	80.6	79.6	78.5	77.9	78.5	78.5	79.3	79.2	79.2	79.2	79.1	78.4	78.5	80.6
17-Feb	76.0	75.4	76.8	77.3	77.5	75.1	75.8	74.9	74.7	73.2	70.7	69.2	68.3	68.0	67.3	67.8	67.8	72.2	75.8	77.4	79.3	79.8	81.2	79.9	74.2	81.2
18-Feb	79.3	79.6	78.8	77.9	76.9	75.8	75.2	75.5	75.3	74.2	74.4	73.7	71.7	67.5	63.0	61.3	65.2	69.7	75.3	78.1	79.3	81.0	80.0	79.2	74.5	81.0
19-Feb	77.4	75.6	74.5	73.9	73.5	72.7	72.8	72.8	72.8	72.9	73.4	73.8	74.4	74.0	74.4	74.3	74.3	74.4	75.4	75.7	74.9	74.7	74.6	74.7	74.2	77.4
20-Feb	75.2	74.9	74.2	73.5	73.2	73.1	72.6	73.1	73.4	73.7	75.2	76.5	76.2	73.5	68.0	64.2	64.1	67.2	69.4	71.7	72.2	72.1	72.0	72.4	72.1	76.5
21-Feb	72.4	72.3	72.3	72.6	72.9	73.5	72.8	72.1	70.3	67.7	64.8	61.7	59.7	58.2	57.1	56.7	58.5	61.9	65.6	67.0	69.5	71.0	71.2	72.6	67.3	73.5
22-Feb	73.5	75.1	76.1	75.6	75.0	74.9	74.3	74.0	73.0	71.6	68.4	62.8	58.8	55.3	54.4	55.1	57.4	60.2	63.6	68.3	72.0	75.7	75.7	75.7	68.6	76.1
23-Feb	73.1	75.1	76.3	76.9	77.9	78.4	75.9	74.9	73.4	73.0	72.3	67.9	63.8	63.8	62.5	62.1	64.6	68.2	70.4	72.2	73.4	72.9	72.8	71.0	78.4	
24-Feb	74.1	75.2	75.4	77.3	79.0	79.1	77.8	76.6	74.8	72.2	69.4	60.9	56.5	53.7	53.7	55.0	56.5	57.2	55.8	56.3	58.0	59.0	60.5	63.0	65.7	79.1
25-Feb	67.2	71.4	73.7	74.4	77.4	79.6	79.8	78.1	76.9	75.8	75.3	73.7	74.0	72.5	70.1	70.9	71.9	73.8	75.8	78.1	81.6	86.8	85.3	85.0	76.2	86.8
26-Feb	84.5	84.6	83.6	84.3	81.8	81.2	83.9	83.8	84.2	84.1	84.3	83.6	82.1	82.8	82.1	83.8	84.5	84.7	83.8	83.6	83.7	83.1	82.5	81.9	83.4	84.7
27-Feb	82.4	81.9	81.5	81.4	81.6	80.8	80.0	79.3	78.4	77.2	74.5	72.7	74.8	78.2	79.5	81.6	81.1	80.9	82.4	86.2	85.6	85.3	84.3	82.6	80.6	86.2
28-Feb	79.5	77.1	77.2	77.4	78.0	79.0	81.0	81.7	80.6	78.6	77.8	78.3	79.1	79.2	79.2	79.3	77.2	77.2	78.9	79.2	78.8	79.5	80.5	80.3	78.9	81.7
78.5 78.8 79.0 78.9 78.7 78.5 78.6 78.5 78.3 77.3 75.9 73.9 73.2 72.4 71.7 72.1 72.9 74.7 76.0 76.6 77.3 77.9 78.3 78.6																								Diurnal Average		
95.2 94.4 93.4 92.4 90.0 89.6 91.2 90.6 90.9 89.6 84.3 83.9 84.5 87.6 89.0 89.3 89.4 89.5 90.2 90.4 90.1 90.6 90.0 94.2																								Diurnal Maximum		



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

**Relative Humidity (RH) - %**  
**Fort Chipewyan - February 2023**





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

**Relative Humidity (RH) - %**  
**Fort Chipewyan - February 2023**

<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	21	3.13	3.13
60 - 80	443	65.92	69.05
80 - 100	208	30.95	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



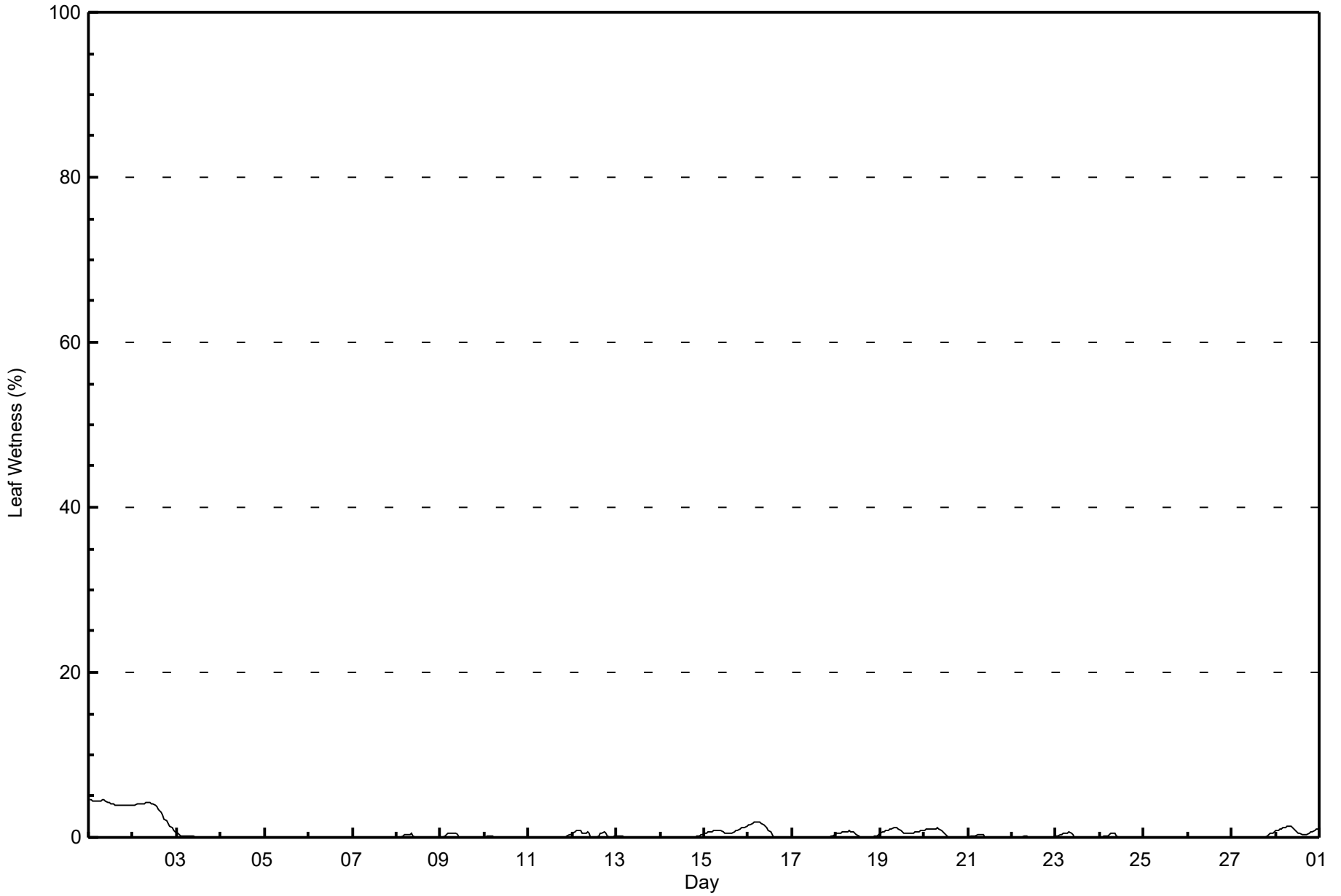
Maximum Value: 4.5 % on Feb 1 09:00		Maximum Daily Average: 4.2 % on Feb 1		Hours in Service: 672																							
Minimum Value: 0.0 % on Feb 3 11:00		Minimum Daily Average: 0.0 % on Feb 4		Hours of Data: 672																							
Maximum Diurnal Average: 0.7 % at hour 8		Minimum Diurnal Average: 0.3 % at hour 20		Hours of Missing Data: 0																							
Monthly Average: 0.45 %		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> = 0.5 P <sub>90</sub> = 1.1 P <sub>99</sub> = 4.5		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-Feb	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.4	4.3	4.2	4.1	4.0	4.0	3.9	3.8	3.8	3.8	3.8	3.9	3.9	3.9	3.9	4.2	4.5	
2-Feb	3.9	4.0	4.0	4.0	4.1	4.1	4.1	4.2	4.2	4.2	4.1	4.0	3.9	3.7	3.4	3.0	2.6	2.3	2.0	1.6	1.4	1.1	0.9	0.7	3.1	4.2	
3-Feb	0.4	0.3	0.2	0.2	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	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
4-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.1	0.3	0.4	0.4	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	0.1	0.4	
9-Feb	0.0	0.0	0.2	0.4	0.5	0.5	0.6	0.6	0.6	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	0.2	0.6	
10-Feb	0.0	0.1	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	0.0	0.0	0.0	0.2	0.2
11-Feb	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	0.2	0.3	0.4	0.0	0.4	
12-Feb	0.6	0.6	0.8	0.9	0.8	0.6	0.5	0.6	0.6	0.5	0.0	0.0	0.0	0.0	0.2	0.4	0.5	0.6	0.5	0.1	0.0	0.0	0.0	0.1	0.4	0.9	
13-Feb	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	0.1	0.1
14-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.3	0.4	0.0	0.4	
15-Feb	0.4	0.5	0.6	0.7	0.7	0.8	0.8	0.9	0.9	0.9	0.7	0.5	0.4	0.5	0.5	0.6	0.6	0.8	0.9	1.0	1.1	1.2	1.3	1.4	0.8	1.4	
16-Feb	1.5	1.6	1.7	1.8	1.9	1.9	1.8	1.7	1.6	1.3	1.1	0.9	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.9	
17-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.3	0.3	0.0	0.3	
18-Feb	0.4	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.6	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.8	0.8
19-Feb	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.2	1.1	1.0	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.8	1.2	1.2
20-Feb	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.0	0.9	0.7	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	0.5	1.1	
21-Feb	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
22-Feb	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	
23-Feb	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.6	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	
24-Feb	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.5	0.5	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	0.5	
25-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.4	0.5	0.7	0.1	0.7	
28-Feb	0.8	0.9	0.9	1.0	1.1	1.2	1.3	1.4	1.4	1.1	0.9	0.7	0.5	0.4	0.4	0.3	0.3	0.3	0.5	0.6	0.7	0.8	1.0	1.1	0.8	1.4	
																								Diurnal Average			
																								Diurnal Maximum			





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

**Leaf Wetness (LW) - %**  
**Fort Chipewyan - February 2023**





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

**Leaf Wetness (LW) - %**  
**Fort Chipewyan - February 2023**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	477	70.98	70.98
0.4 - 0.5	46	6.85	77.83
0.6 - 0.7	37	5.51	83.33
0.8 - 1.4	59	8.78	92.11
1.5 - 10	52	7.74	99.85
> 10	0	0.00	99.85

Total Number of Valid Hours: 672

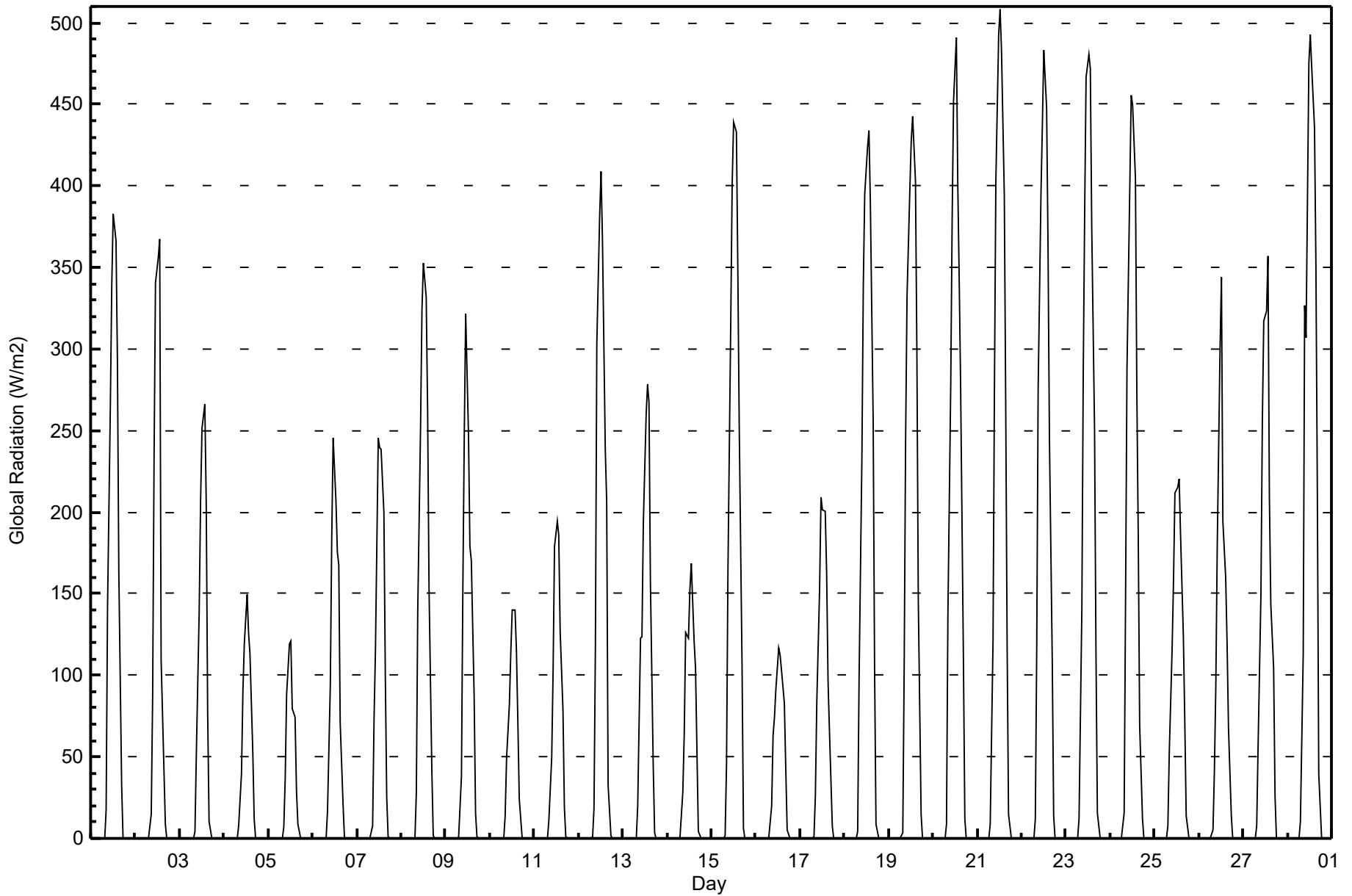
Total Number of Hours: 672



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

**Global Radiation (GR) - W/m2**  
**Fort Chipewyan - February 2023**

Maximum Value: 508.5 W/m2 on Feb 21 13:00      Maximum Daily Average: 134.9 W/m2 on Feb 28																							Hours in Service:	672		
Minimum Value: 0.0 W/m2 on Feb 2 21:00      Minimum Daily Average: 23.5 W/m2 on Feb 5																							Hours of Data:	672		
Maximum Diurnal Average: 316.4 W/m2 at hour 13      Minimum Diurnal Average: 0.0 W/m2 at hour 6																							Hours of Missing Data:	0		
Monthly Average: 75.34 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> = 114.3 P <sub>90</sub> = 287.5 P <sub>99</sub> = 476.7																							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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	17.3	141.4	265.2	338.6	383.3	366.3	294.1	163.5	33.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	83.5	383.3
2-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.4	87.8	233.8	340.8	356.2	367.7	110.1	42.1	8.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	65.1	367.7
3-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	53.1	139.3	207.6	251.5	266.5	204.9	77.5	10.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	50.7	266.5
4-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	40.0	89.6	119.1	149.2	125.9	113.6	53.3	11.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	29.6	149.2
5-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	36.6	88.3	119.7	120.8	79.3	74.0	29.3	8.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	23.5	120.8
6-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	16.1	94.2	184.4	245.2	206.7	175.6	168.0	71.2	21.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	49.3	245.2
7-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	72.2	115.2	245.9	239.3	238.9	200.0	100.7	25.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0	51.9	245.9
8-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	27.4	139.2	252.5	323.9	352.7	331.8	263.2	154.0	41.8	1.6	0.0	0.0	0.0	0.0	0.0	0.0	78.7	352.7
9-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	38.3	154.2	247.2	321.2	247.2	179.0	170.1	87.0	15.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	60.9	321.2
10-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	13.9	49.2	82.5	114.2	139.9	139.6	114.7	72.1	24.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	31.3	139.9
11-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	11.4	49.4	102.8	178.8	194.3	185.5	126.8	78.7	19.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0	39.5	194.3
12-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	18.3	117.7	303.3	381.6	408.9	367.3	238.8	206.6	33.3	1.7	0.0	0.0	0.0	0.0	0.0	0.0	86.6	408.9
13-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	19.9	122.5	123.3	193.5	260.6	278.3	267.2	157.9	45.3	3.1	0.0	0.0	0.0	0.0	0.0	0.0	61.3	278.3
14-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	28.8	63.8	125.9	123.1	152.5	168.8	120.9	104.3	54.7	4.2	0.0	0.0	0.0	0.0	0.0	0.0	39.5	168.8
15-Feb	0.1	0.1	0.0	0.0	0.0	0.0	0.0	1.4	46.0	164.0	316.9	401.5	438.9	432.7	349.6	253.3	106.1	6.2	0.1	0.0	0.0	0.0	0.0	0.0	104.9	438.9
16-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	20.1	62.8	74.4	91.2	116.4	112.4	103.2	82.8	43.1	4.9	0.0	0.0	0.0	0.0	0.0	0.0	29.7	116.4
17-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	26.3	83.4	153.0	208.9	201.3	200.7	162.2	95.6	65.4	7.7	0.0	0.0	0.1	0.0	0.0	0.0	50.2	208.9
18-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	97.9	233.4	339.1	395.1	423.9	434.2	390.3	255.9	103.9	8.9	0.0	0.0	0.0	0.0	0.0	0.0	112.0	434.2
19-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	106.0	244.8	331.8	397.3	428.2	442.4	403.2	297.3	145.8	14.4	0.0	0.1	0.0	0.0	0.0	0.0	117.3	442.4
20-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5	137.6	277.8	378.3	452.4	490.7	401.1	343.2	278.4	109.8	12.4	0.2	0.1	0.0	0.0	0.0	0.0	120.4	490.7
21-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.4	121.4	276.4	403.2	492.6	508.5	483.5	393.9	265.7	118.2	14.6	0.1	0.0	0.0	0.0	0.0	0.0	128.6	508.5
22-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.2	117.2	275.9	395.0	437.5	483.3	447.8	362.9	245.3	110.1	13.9	0.1	0.1	0.1	0.1	0.1	0.0	120.9	483.3
23-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5	140.9	287.3	385.0	467.1	480.6	472.1	374.7	250.8	114.6	15.8	0.1	0.0	0.0	0.0	0.0	0.0	125.1	480.6
24-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.7	147.9	287.5	399.1	455.2	449.1	404.7	273.5	183.8	68.8	12.2	0.1	0.0	0.0	0.0	0.0	0.0	112.4	455.2
25-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	53.1	115.6	158.0	211.8	215.0	220.7	185.5	123.3	72.1	13.8	0.1	0.0	0.0	0.0	0.0	0.0	57.4	220.7
26-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	41.6	93.0	178.2	300.0	343.6	194.7	160.2	119.6	67.6	13.8	0.1	0.0	0.0	0.0	0.0	0.0	63.2	343.6
27-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.8	56.8	149.5	255.3	317.2	323.7	356.7	208.9	143.6	104.7	25.6	0.3	0.0	0.0	0.0	0.0	0.0	81.3	356.7
28-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.3	113.1	326.7	306.5	475.2	492.8	472.8	435.5	351.4	213.6	39.5	0.6	0.0	0.0	0.0	0.0	0.0	134.9	492.8
																							Diurnal Average			
																							Diurnal Maximum			





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

**Global Radiation (GR) - W/m2**  
**Fort Chipewyan - February 2023**

<b>Concentration Ranges (W/m2)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	436	64.88	64.88
21 - 100	53	7.89	72.77
101 - 300	119	17.71	90.48
301 - 600	64	9.52	100.00
601 - 900	0	0.00	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



Maximum Speed: 42 km/h on Feb 13 03:00 Minimum Speed Value: 0 km/h on Feb 18 02:00 Maximum Diurnal Speed Average: 5.8 km/h at hour 8 Monthly Average Velocity: 4.6 km/h 36.4 deg		Maximum Daily Speed Average: 21.9 km/h on Feb 26 Minimum Daily Speed Average: 1.8 km/h on Feb 3 Minimum Diurnal Speed Average: 3.4 km/h at hour 17 Percentiles: P <sub>1</sub> = 2 P <sub>10</sub> = 5 Q <sub>1</sub> = 8 Median = 12 Q <sub>3</sub> = 17 P <sub>90</sub> = 25 P <sub>99</sub> = 33		Hours in Service: 672 Hours of Data: 672 Hours of Missing Data: 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-Feb	NW16	NW18	NW21	NW19	NW18	NW14	NW12	NW12	NW12	WNW11	NW16	WNW15	NW18	WNW15	WNW14	NW13	WNW11	WNW13	WNW13	WNW13	NW12	NW13	WNW8	SSW7	NW13.3	NW21	
2-Feb	SW6	SW5	SSW9	E7	E10	E10	ESE13	ESE13	E16	E18	ESE19	ESE21	E22	SE24	ESE24	ESE30	ESE30	ESE27	SE23	SSE28	SSE26	SSE25	SSE26	SSE27	SE16.9	ESE30	
3-Feb	SSE25	SE22	SE19	SE18	SE16	ESE16	ESE14	E10	ENE7	N5	NNW7	NW11	NW12	NW10	NW9	NW9	NW10	NW7	NNW7	NW5	NW5	NW4	NNW3	NNE4	E1.8	SSE25	
4-Feb	N3	NNW4	NW3	NNW5	N5	NNW5	N5	NNW5	NW4	NNW4	N5	NNW5	N4	ESE4	ESE5	E9	E11	E13	E10	ENE11	E13	ENE12	ENE15	ENE14	NE5.0	ENE15	
5-Feb	ENE15	ENE15	ENE17	ENE19	ENE24	ENE27	ENE27	ENE24	ENE24	ENE25	ENE28	ENE26	ENE25	ENE27	ENE27	ENE25	NE23	NNE10	NNW6	NW11	NW14	WNW17	WNW18	NW25	NE15.5	ENE28	
6-Feb	NW20	NW24	NW25	NW25	NW20	NW18	NW15	NW15	NW9	WNW8	W7	WSW6	ESE8	SE8	ESE10	E16	E20	E22	E25	E28	E31	E25	E28	ENE26	NE6.5	E31	
7-Feb	E23	E24	E17	ENE6	WNW8	WNW17	WNW18	WNW18	WNW14	WNW12	WNW7	NW8	W4	NNW10	NNW12	NNW12	NW14	NW10	NNW12	NNW13	N11	NNW9	NW6	NW7	NNW7.2	E24	
8-Feb	WNW7	WNW8	NW7	NW7	NW9	NNW7	NW3	NW3	W3	SSE2	E5	ENE6	E8	E8	E12	E11	E11	E12	E14	E22	E23	ENE21	ENE23	E26	ENE7.1	E26	
9-Feb	E24	E22	E22	E20	E17	E13	E8	E10	E10	E8	E8	E9	E9	ENE6	E7	ENE4	NNE5	E7	E8	E4	E6	E11	E11	E10	E10.6	E24	
10-Feb	E7	NE6	N3	NNE5	NNE6	NNE4	ENE10	NE10	NE13	NE18	ENE17	NE15	NE12	NE12	NE12	NE12	NE14	NE19	ENE23	ENE27	ENE29	ENE24	ENE25	ENE22	NE14.2	ENE29	
11-Feb	ENE19	ENE19	NE11	ENE10	ENE8	E4	ESE8	E12	E18	E17	E14	E15	E16	E17	E15	E14	E9	E10	E8	ESE5	E9	E10	E5	SW6	E10.7	ENE19	
12-Feb	WNW13	WNW13	NW13	NW13	NW13	NNW12	NNW10	NNW7	NW6	N6	N5	ESE4	E13	E17	E16	E16	E16	E21	ENE30	ENE33	ENE33	ENE31	ENE39	ENE38	ENE11.1	ENE39	
13-Feb	ENE36	ENE40	NE42	NE39	NE26	NNE28	NNE30	NE29	NE30	NNE27	NNE18	N15	N14	NNW16	NNW18	NNW18	NNW20	NNW13	NNW9	NNW11	NNW14	N9	NNW10	NNW11	NNE18.8	NE42	
14-Feb	N8	NW10	NW11	NW9	WNW6	W6	WNW9	WNW9	WNW9	NW9	NW10	WNW10	WNW10	WNW11	NW9	WNW9	WNW8	NW8	WNW7	W6	W6	W7	WNW8	WNW9	WNW8.1	NW11	
15-Feb	NW8	NNW7	NNW6	NNW5	NNW5	WNW6	WNW4	WNW4	WNW5	WNW5	W3	SSE2	E5	E5	S3	SW5	SW1	ENE6	ENE5	ENE7	E8	E12	E15	E18	NE2.2	E18	
16-Feb	E22	E24	E22	E22	E25	ENE26	ENE28	ENE28	ENE25	ENE24	ENE25	ENE20	NE16	NNE10	NNE8	N7	NNW8	NW10	NW9	NW9	WNW10	WNW11	NW11	NW10	ENE11.9	ENE28	
17-Feb	NNW10	NW10	NW12	NW11	WNW12	NW15	NW11	NW9	NW8	NW10	NW10	WNW10	NW10	NW10	NW9	NW8	WNW7	NW5	N5	NNW5	NW4	NNW5	NNW1	N4	NW8.3	NW15	
18-Feb	N2	SW0	NNW1	WNW2	WNW3	NNW5	NW5	NNW7	NNW8	NNW10	NW10	NW8	NW8	W7	WSW10	WSW11	WSW9	W7	W7	W4	W4	SSW2	SSE1	E7	WNW4.2	WSW11	
19-Feb	E9	E10	E11	E12	E15	E20	E19	E20	ENE18	ENE19	E19	E20	E17	E16	E16	E11	ESE5	E2	ENE3	N4	N2	WNW3	WNW9	WNW8	E10.2	E20	
20-Feb	WNW9	WNW11	WNW10	NW8	NW8	NW7	WNW9	NW11	NW9	WNW12	WNW11	NW12	WNW10	W11	NW16	NW16	NW13	NW13	NNW10	NNW9	NNW13	NNW10	NNW8	NNW11	NW10.1	NW16	
21-Feb	NNW13	NW11	NW12	NW11	WNW13	NW12	NW13	NW15	NW12	NW14	NW14	NW13	NW14	NW13	NW15	WNW15	W15	W15	WNW16	WNW15	WNW16	WNW21	NW20	WNW17	WNW13.9	WNW21	
22-Feb	WNW16	WNW15	WNW15	NW14	WNW12	W11	WNW16	WNW16	WNW15	W14	WNW9	W12	W10	W12	W14	W14	W12	W13	WNW13	NW10	NW9	NW9	NNW8	NNW9	WNW11.6	WNW16	
23-Feb	NW8	WNW7	W7	WNW10	WNW9	WNW8	WNW9	NW10	WNW9	WNW9	WNW9	W11	W12	W13	WSW13	W12	W10	W9	WSW7	WSW10	SW12	SW14	SW14	SW14	W9.1	SW14	
24-Feb	SW13	SW13	SW11	SSW7	E5	ESE5	SE5	ESE7	SE11	ESE7	ESE7	SSE18	SSE26	SSE26	SSE28	S26	S25	S27	SSW28	SSW21	SSW19	SSW17	SSW16	SSW15	S13.7	SSE28	
25-Feb	SW13	SW12	SW10	WSW9	SW10	W12	W14	W16	W17	W18	W16	W19	W16	W19	W16	W14	W10	W7	SW4	SW5	SW3	E5	E9	ENE9	ESE8	WSW8.0	W19
26-Feb	ENE8	E11	ENE12	ENE14	ENE18	ENE19	NE19	NE18	ENE20	ENE23	ENE24	ENE27	ENE29	ENE29	ENE28	NE26	NE25	NE26	NE28	NE30	NE27	NE26	NE25	NE22	ENE21.9	NE30	
27-Feb	NE21	NE21	NE20	NE20	NE16	NE17	NE17	NE18	NNE14	NE13	NE15	NE13	E14	E19	E18	E14	E12	E6	E6	NE1	NW6	NNW3	NNE6	N9	NE12.0	NE21	
28-Feb	NE10	ENE11	ENE9	ENE12	ENE10	ENE9	ENE7	ENE9	ENE9	E16	E18	E17	E17	E18	E16	E17	E17	ENE11	ENE15	ENE14	ENE18	ENE20	ENE18	E18	ENE13.6	ENE20	
NNE4.8 NNE4.9 NNE4.7 NNE5.5 NNE5.2 NNE5.2 NNE5.1 NNE5.8 NNE5.5 NNE5.6 NNE5.5 NE4.1 NE4.5 ENE3.8 NE3.6 NE3.4 NE3.4 NE3.6 NE3.9 NE4.2 NE4.8 NE4.7 NE5.1 NE4.9																								Diurnal Average			
ENE36 ENE40 NE42 NE39 NE26 NNE28 NNE30 NE29 NE30 NNE27 ENE28 ENE27 ENE29 ENE29 ENE28 ESE30 ESE30 S27 ENE30 ENE33 ENE33 ENE31 ENE39 ENE38																								Diurnal Maximum			

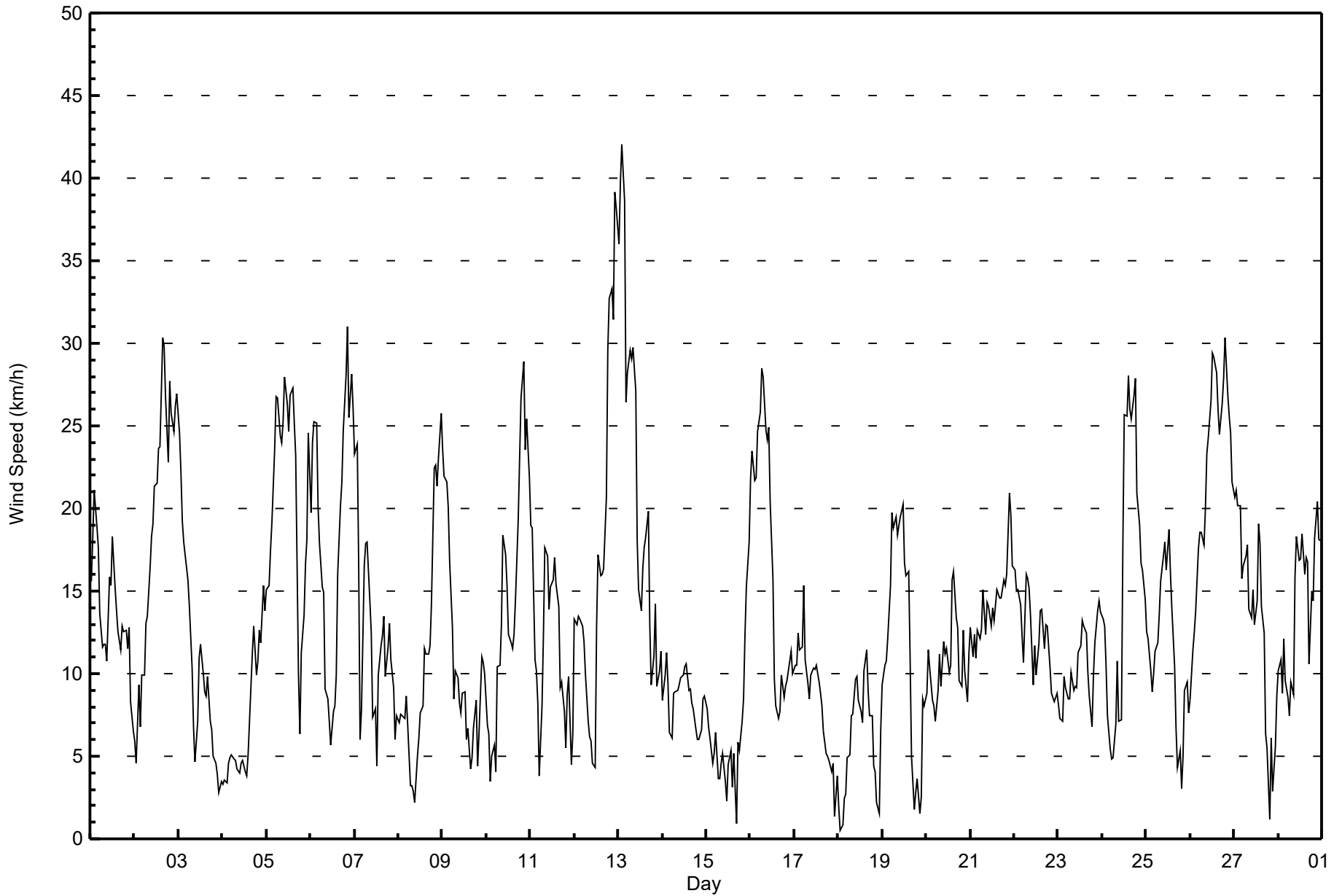
All monthly, daily, and diurnal averages have been calculated using vector methods



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

**Wind Speed (WS) - km/h**  
**Fort Chipewyan - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Feb 6 03:00 Minimum Value: 1 km/h on Feb 15 20:00 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: 672 Hours of Data: 672 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-Feb	5	5	6	5	5	4	4	3	4	3	4	4	5	5	4	4	2	2	2	2	2	2	3	2	6	
2-Feb	2	2	3	3	1	1	2	2	2	1	1	3	2	3	3	3	2	2	2	4	4	4	4	4	4	4
3-Feb	4	3	3	2	2	1	1	2	1	2	2	4	4	3	3	3	2	2	2	1	1	1	2	2	4	
4-Feb	1	1	1	1	1	1	1	1	1	2	1	2	2	1	2	1	1	1	2	2	1	2	2	2	2	2
5-Feb	2	2	3	3	4	3	3	3	4	3	3	3	3	3	3	3	4	5	2	3	3	4	4	7	7	
6-Feb	6	6	8	7	6	5	4	4	3	2	3	2	3	2	3	2	2	2	2	3	3	3	2	3	8	
7-Feb	3	2	5	3	3	6	5	4	4	4	2	3	2	4	4	4	4	3	5	5	4	3	1	1	6	
8-Feb	1	1	1	1	1	2	2	2	3	1	2	1	1	2	1	3	3	3	2	2	2	2	3	3	3	
9-Feb	3	3	2	1	2	2	1	1	1	2	1	1	2	1	2	2	1	2	3	1	2	2	3	2	3	
10-Feb	2	1	2	2	2	1	3	2	5	3	3	3	3	3	2	3	3	4	4	5	5	4	4	4	5	
11-Feb	3	4	4	2	2	2	1	3	1	1	2	2	1	2	2	2	2	1	2	1	2	1	2	3	4	
12-Feb	3	2	3	3	4	5	4	3	2	2	2	2	3	3	2	1	2	3	4	3	4	3	4	5	5	
13-Feb	5	6	6	6	7	6	6	7	7	7	6	5	5	6	6	7	7	5	4	4	5	5	4	4	7	
14-Feb	3	3	3	3	2	2	2	2	2	3	3	3	2	3	3	2	2	1	1	1	1	1	1	1	3	
15-Feb	1	1	2	1	1	1	1	1	1	2	1	1	1	1	1	1	2	1	2	1	1	2	4	2	4	
16-Feb	2	3	3	3	2	2	3	3	3	3	3	3	3	3	2	3	3	3	2	3	2	2	3	3	3	
17-Feb	3	3	3	3	3	4	3	2	2	3	3	3	3	3	3	2	2	1	1	1	1	1	2	2	4	
18-Feb	2	1	2	1	1	2	2	2	2	3	3	2	3	3	2	2	2	1	2	1	1	2	1	2	3	
19-Feb	3	1	1	1	2	2	2	3	3	3	2	2	2	2	2	3	1	1	1	1	2	2	1	2	3	
20-Feb	3	2	1	1	1	1	2	2	2	2	3	4	3	3	6	5	4	3	3	3	4	4	3	4	6	
21-Feb	4	3	3	3	3	3	4	4	4	4	4	4	4	4	5	4	3	3	3	3	3	4	4	3	5	
22-Feb	3	2	3	3	3	2	3	3	3	3	3	3	3	3	3	3	2	3	2	2	1	2	2	2	3	
23-Feb	2	2	1	1	2	2	2	1	1	2	3	3	3	3	3	3	3	2	1	3	2	2	1	2	3	
24-Feb	2	2	2	3	2	1	1	2	2	2	2	5	3	4	3	4	3	4	4	3	2	2	1	1	5	
25-Feb	1	2	2	1	1	1	3	3	3	4	4	4	5	4	4	3	3	1	1	2	3	1	2	2	5	
26-Feb	2	2	1	2	2	3	2	2	3	3	3	4	4	4	5	5	4	4	5	5	4	4	4	4	5	
27-Feb	4	4	4	4	4	4	4	4	3	3	4	3	4	2	2	1	1	1	1	1	3	2	2	2	4	
28-Feb	2	2	2	2	1	1	2	1	2	2	1	1	2	2	1	1	2	1	3	2	4	2	2	2	4	
																	Diurnal Maximum									







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

**Wind Speed (WS) - km/h**  
**Fort Chipewyan - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	86	12.80	12.80
6 - 11	242	36.01	48.81
12 - 19	220	32.74	81.55
20 - 28	104	15.48	97.02
29 - 38	16	2.38	99.40
> 38	4	0.60	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Fort Chipewyan - February 2023**

<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	13	4	1	3	9	6	1	3	1	1	6	1	5	7	10	15	86
6 - 11	6	5	4	21	40	8	1	0	0	3	6	7	17	45	51	28	242
12 - 19	1	3	19	22	47	6	3	1	0	4	8	3	19	31	41	12	220
20 - 28	0	2	13	34	25	3	3	9	3	2	0	0	0	1	8	1	104
29 - 38	0	1	3	9	1	2	0	0	0	0	0	0	0	0	0	0	16
> 38	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	4
<b>Totals</b>	<b>20</b>	<b>15</b>	<b>42</b>	<b>91</b>	<b>122</b>	<b>25</b>	<b>8</b>	<b>13</b>	<b>4</b>	<b>10</b>	<b>20</b>	<b>11</b>	<b>41</b>	<b>84</b>	<b>110</b>	<b>56</b>	<b>672</b>

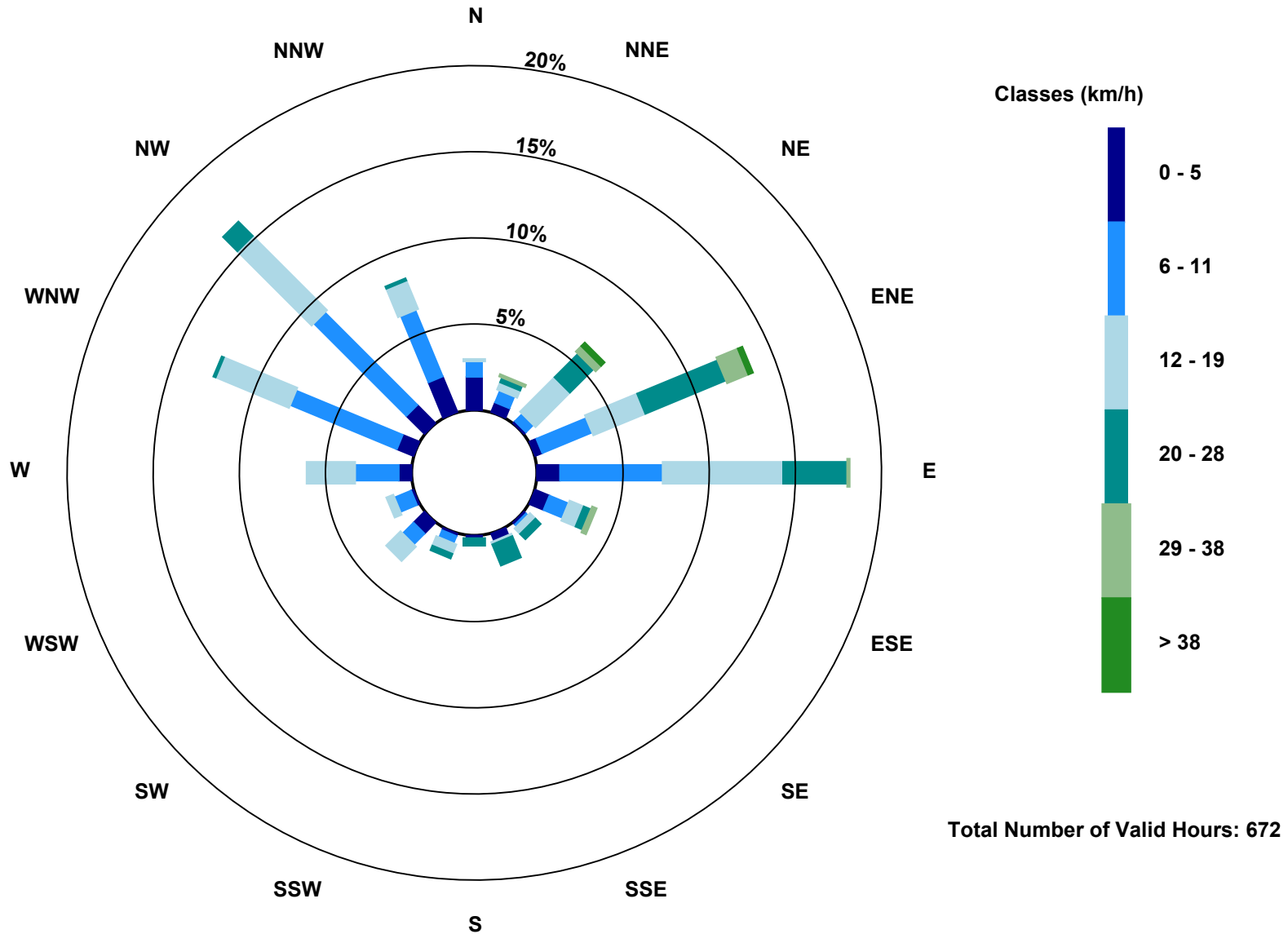
Total Number of Valid Hours: 672

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Fort Chipewyan





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

**Wind Direction (WD) - deg**  
**Fort Chipewyan - February 2023**

Direction of Maximum Speed: 56 deg on Feb 13 03:00 Direction of Maximum Daily Speed Average: 57.1 deg on Feb 26	Hours in Service: 672 Hours of Data: 672 Hours of Missing Data: 0
Direction of Minimum Speed: 230 deg on Feb 18 02:00 Direction of Minimum Daily Speed Average: 1.8 deg on Feb 3	Percent Operational Time: 100.0
Monthly Average Direction: 36.4 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-Feb	310	313	319	321	321	321	320	312	312	300	310	301	308	301	294	307	295	303	300	301	304	308	298	212	307.6	
2-Feb	221	215	208	97	84	86	105	103	89	93	102	112	92	126	119	118	119	111	126	152	148	148	154	154	124.3	
3-Feb	152	146	144	133	129	120	104	84	64	356	333	315	316	316	306	311	326	328	313	326	305	333	29	98.7		
4-Feb	352	348	319	342	1	348	349	345	326	341	350	337	1	105	111	95	90	86	77	82	71	69	66	55.0		
5-Feb	66	62	69	64	71	70	72	70	70	70	73	70	60	66	59	57	56	31	346	317	306	303	296	309	53.4	
6-Feb	309	314	318	317	313	310	305	310	305	284	280	244	117	142	123	88	95	84	86	80	85	84	80	78	36.8	
7-Feb	81	82	83	67	286	300	286	288	293	293	298	308	275	327	328	331	321	320	327	328	351	340	321	307	328.8	
8-Feb	295	294	307	313	326	330	313	314	271	148	79	73	79	91	80	93	92	84	89	81	79	78	78	83	70.2	
9-Feb	83	87	88	93	96	101	97	92	89	85	87	85	86	66	85	58	22	83	83	79	81	91	85	88	86.5	
10-Feb	79	53	1	18	12	23	75	45	53	50	58	54	42	56	48	39	44	52	58	57	57	59	60	57	52.9	
11-Feb	59	59	50	64	66	81	103	99	93	97	93	88	86	87	94	93	82	99	101	108	100	86	95	236	85.4	
12-Feb	289	289	309	306	323	330	335	332	323	353	3	115	82	82	86	89	87	81	77	77	76	74	72	69	58.3	
13-Feb	59	58	56	51	34	32	32	34	34	31	18	11	1	346	338	337	338	337	337	330	336	349	336	340	22.9	
14-Feb	351	320	316	322	301	265	287	289	290	309	312	294	291	302	318	303	295	308	273	285	273	273	280	291	291	300.1
15-Feb	314	334	340	345	334	302	302	293	284	289	281	162	93	95	189	230	236	75	74	74	83	85	86	85	46.0	
16-Feb	82	81	87	85	79	77	76	76	72	68	66	60	52	19	17	358	337	323	319	314	291	297	306	318	57.2	
17-Feb	327	326	312	309	303	312	308	311	310	304	307	298	310	314	304	308	299	317	353	344	310	329	336	350	313.2	
18-Feb	354	230	347	283	290	330	322	334	335	336	322	316	316	266	252	240	258	262	272	266	265	212	157	80	293.2	
19-Feb	80	79	85	83	89	86	82	80	76	76	80	84	85	91	85	87	112	92	57	352	1	282	292	290	79.9	
20-Feb	296	293	295	320	314	306	297	304	308	297	287	310	289	261	311	314	313	320	330	340	342	346	338	329	310.9	
21-Feb	328	320	315	306	299	305	312	319	315	314	315	312	315	311	308	290	273	280	287	290	288	298	304	301	303.6	
22-Feb	299	294	298	305	293	280	288	288	288	277	282	266	264	263	263	261	265	266	288	314	320	318	332	333	287.6	
23-Feb	323	295	266	284	284	291	292	306	297	293	298	274	263	264	255	259	263	261	254	238	232	227	222	225	265.7	
24-Feb	234	228	219	204	85	102	135	114	124	117	111	167	168	165	166	177	174	185	194	201	201	204	211	213	181.4	
25-Feb	219	223	234	238	233	230	259	270	268	266	265	268	275	279	273	279	271	236	226	219	81	84	73	104	255.5	
26-Feb	78	81	76	68	67	64	54	55	61	63	62	62	66	62	57	54	52	51	51	51	48	47	44	42	57.1	
27-Feb	41	45	42	44	37	35	38	36	31	36	48	46	79	87	82	83	83	81	94	45	305	338	15	10	49.4	
28-Feb	34	58	69	59	63	63	58	65	78	93	94	96	94	92	93	86	84	70	63	61	74	78	78	79	77.3	
	30.4	30.6	22.1	24.3	21.5	19.7	22.7	20.2	25.8	27.5	31.7	37.5	45.8	57.6	51.2	47.6	47.0	46.7	51.0	45.5	50.0	50.4	51.4	49.0		
	Diurnal Average																									

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



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

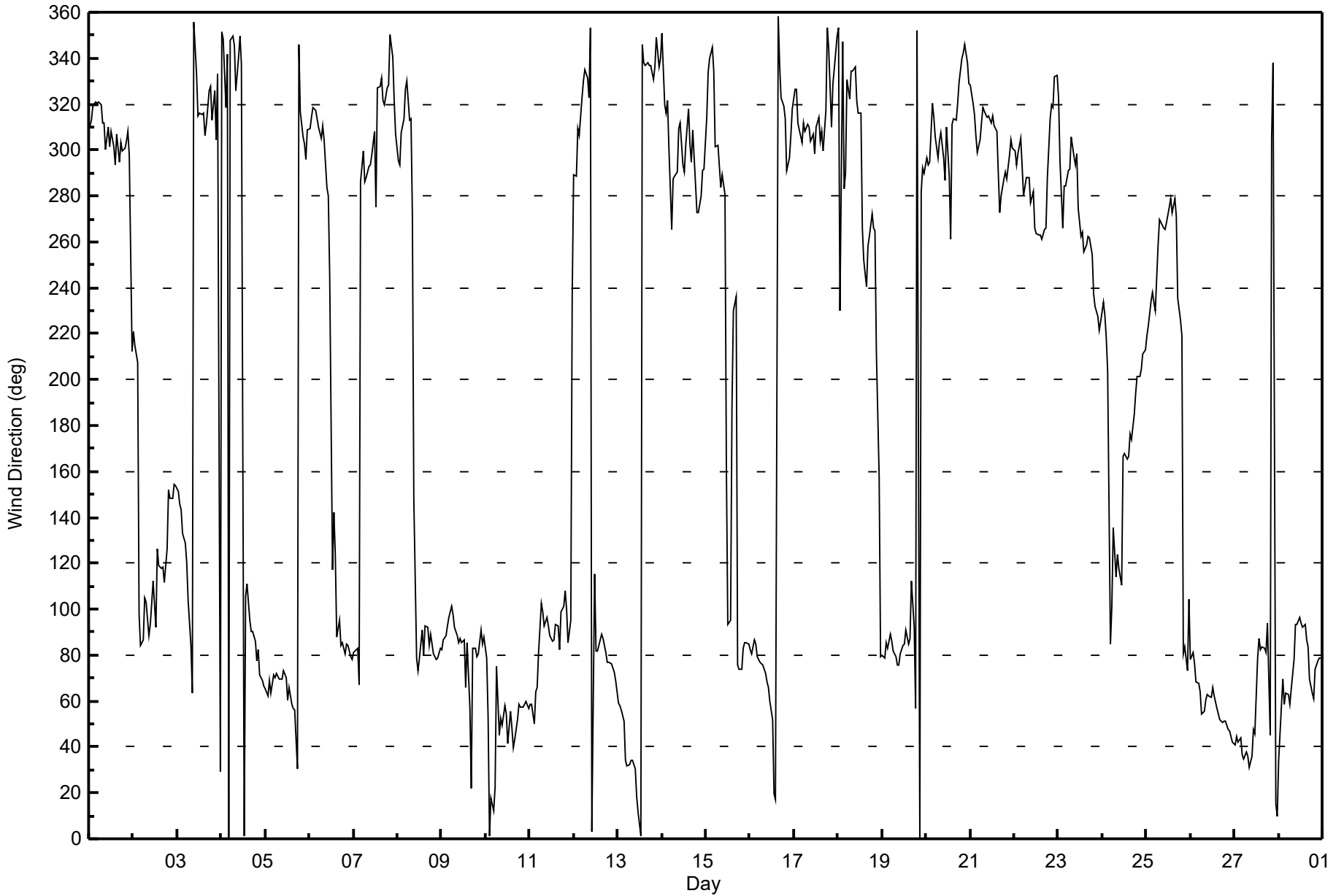
**Wind Direction (WD) - deg**  
**Fort Chipewyan - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 83 deg on Feb 18 01:00											Hours in Service: 672 Hours of Data: 672 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0														
Minimum Value: 3 deg on Feb 28 11:00																									
Percentiles: P <sub>1</sub> = 4 P <sub>10</sub> = 6 Q <sub>1</sub> = 8 Median = 13 Q <sub>3</sub> = 19 P <sub>90</sub> = 26 P <sub>99</sub> = 66																									
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-Feb	16	16	16	17	19	20	19	18	17	16	16	17	16	20	18	16	14	12	12	12	11	10	26	13	26
2-Feb	12	11	11	41	7	10	13	9	8	5	6	15	7	9	10	7	4	4	11	9	8	8	10	9	41
3-Feb	9	8	9	8	8	6	7	11	10	27	27	20	20	21	23	20	16	25	21	21	23	26	28	26	28
4-Feb	25	21	18	18	18	17	18	20	20	31	32	36	45	26	29	6	7	7	9	7	10	7	8	9	45
5-Feb	8	8	8	8	7	6	6	8	7	7	6	8	8	7	7	7	8	31	29	20	14	15	15	16	31
6-Feb	16	16	18	17	16	15	14	15	17	16	46	39	21	24	29	17	14	4	6	5	5	6	5	6	46
7-Feb	7	5	9	42	21	20	15	14	14	24	21	25	49	24	26	23	18	21	23	23	24	22	16	10	49
8-Feb	14	9	14	9	10	14	45	56	72	49	27	10	8	12	4	13	12	9	8	5	5	6	7	5	72
9-Feb	7	8	6	5	4	5	5	6	5	14	10	7	13	13	21	46	26	28	11	20	17	6	7	6	46
10-Feb	14	11	56	20	22	25	18	10	14	9	11	12	14	17	17	15	12	10	9	9	9	9	8	9	56
11-Feb	10	9	21	13	16	57	13	8	5	5	8	7	6	5	5	6	8	9	12	8	10	12	32	48	57
12-Feb	14	12	15	15	19	24	25	26	24	25	33	63	7	4	5	4	5	7	5	5	6	5	6	8	63
13-Feb	8	8	8	8	14	13	12	13	13	14	21	21	24	22	21	22	21	23	25	24	23	24	26	26	26
14-Feb	24	20	16	21	23	15	14	12	14	19	20	23	16	18	21	20	16	12	11	10	7	10	9	11	24
15-Feb	10	15	16	18	17	13	16	15	14	9	31	50	18	12	50	14	79	8	10	5	6	7	9	4	79
16-Feb	4	5	6	7	5	5	5	5	7	8	8	9	10	21	19	24	22	18	17	15	15	15	15	20	24
17-Feb	21	22	16	16	16	15	16	15	17	18	21	18	22	23	21	18	19	16	14	16	9	16	60	25	60
18-Feb	83	76	66	40	45	37	35	14	18	19	17	16	25	49	18	12	13	14	9	13	19	59	66	8	83
19-Feb	9	5	7	6	6	6	5	7	8	7	6	6	8	7	6	10	14	66	40	15	72	33	8	8	72
20-Feb	11	6	5	11	14	8	9	17	21	11	14	18	29	25	20	17	17	16	22	20	20	26	27	22	29
21-Feb	20	18	15	13	13	15	16	17	19	18	18	19	19	20	19	16	15	12	11	12	12	13	12	12	20
22-Feb	12	10	13	13	15	14	11	12	13	15	20	15	18	14	14	16	12	13	12	15	12	12	17	17	20
23-Feb	18	13	9	10	11	15	9	6	10	14	20	26	18	17	18	16	16	13	16	11	10	9	8	9	26
24-Feb	9	8	10	20	27	21	21	13	16	16	26	11	7	8	8	7	7	8	7	7	7	8	6	6	27
25-Feb	7	11	11	11	9	7	18	12	13	13	14	16	14	15	15	16	24	20	9	26	36	7	12	22	36
26-Feb	11	5	7	6	7	8	7	8	8	8	8	9	8	8	8	8	9	9	9	9	9	9	10	11	11
27-Feb	10	10	10	10	13	13	11	12	14	15	15	15	19	5	4	4	3	9	18	66	20	46	33	14	66
28-Feb	27	12	11	8	9	11	11	6	8	4	3	4	6	4	4	4	3	7	7	6	7	5	5	4	27
83	76	66	42	45	57	45	56	72	49	46	63	49	49	50	46	79	66	40	66	72	59	66	48		
Diurnal Maximum																									



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

**Wind Direction (WD) - deg**  
**Fort Chipewyan - February 2023**





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS09 BARGE LANDING FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)  
FEBRUARY 2023

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	635	32	37	99.26	19.7	0	5.8	0
TRS(ppb) Average	630	37	42	99.26	3.7	0	1.5	0
THC(ppm) Average	635	32	37	99.26	4.3	-	3	-
NMHC(ppm) Average	635	32	37	99.26	0.586	-	0.091	-
CH4(ppm) Average	635	32	37	99.26	4.1	-	2.9	-
NO2 (ppb) Average	635	33	37	99.4	52.9	0	37.8	-
NO (ppb) Average	635	33	37	99.4	168.3	-	51.9	-
NOX (ppb) Average	635	33	37	99.4	216.6	-	85.7	-
PM2.5(ug/m3) Average	665	2	7	99.26	41.6	0	17.3	0
Temperature (C) Average	672	0	0	100	3.8	-	-1.9	-
Relative Humidity (%) Average	672	0	0	100	93.4	-	88.1	-
Barometric Pressure (inHg) Average	672	0	0	100	29.7	-	29.7	-
Wind Speed 20 m (km/h) Average	671	0	1	99.85	30	-	17	-
Wind Direction 20 m (deg) Average	671	0	1	99.85	-	-	-	-

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



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	635	1.03	2.3	-	0	0	0.2	0.3	0.7	2.3	19.7
TRS(ppb) Average	630	0.63	0.4	-	0.3	0.3	0.4	0.5	0.7	1.1	3.7
THC(ppm) Average	635	2.22	0.3	-	1.9	2	2	2.1	2.3	2.6	4.3
NMHC(ppm) Average	635	0.021	0.058	-	0	0	0	0	0	0.1	0.586
CH4(ppm) Average	635	2.2	0.3	-	1.9	2	2	2.1	2.3	2.5	4.1
NO2 (ppb) Average	635	21.06	12.7	-	0.3	4.9	9.8	20.1	31.6	38.2	52.9
NO (ppb) Average	635	18.85	27.7	-	0	0.1	0.6	6.5	24.9	56.9	168.3
NOX (ppb) Average	635	39.92	38.2	-	0.3	5.9	12.7	27.8	56	93.9	216.6
PM2.5(ug/m3) Average	665	8.38	6	-	0.5	3.1	4.3	7	10.3	17	41.6
Temperature (C) Average	672	-16.22	9.1	-	-36.3	-29.6	-22.8	-15.5	-9.4	-4.9	3.8
Relative Humidity (%) Average	672	72.56	10.4	-	43.2	57.7	67.6	73.2	79.8	85.2	93.4
Barometric Pressure (inHg) Average	672	28.87	0.4	-	28	28.5	28.6	28.8	29.1	29.4	29.7
Wind Speed 20 m (km/h) Average	671	8.4	5	-	0	3	5	7	11	15	30
Wind Direction 20 m (deg) Average	671	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2, TRS,THC/NMHC/CH4, PM2.5	10 Feb 2023 16:00	10 Feb 2023 20:00	5	Station power failure
NO2	10 Feb 2023 16:00	10 Feb 2023 19:00	4	Station power failure
Wind Speed, Wind Direction	22 Feb 2023 23:00	22 Feb 2023 23:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Barge Landing - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 19.7 ppb on Feb 8 17:00	Maximum Daily Average: 5.8 ppb on Feb 24		Hours of Data:	635
Minimum Value: 0.0 ppb on Feb 1 17:00	Minimum Daily Average: 0.0 ppb on Feb 13		Hours of Missing Data:	37
Maximum Diurnal Average: 1.9 ppb at hour 14	Minimum Diurnal Average: 0.5 ppb at hour 5		Hours of Calibration:	32
Monthly Average: 1.03 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.2 Median = 0.3 Q <sub>3</sub> = 0.7 P <sub>90</sub> = 2.3 P <sub>99</sub> = 11.9		Percent Operational Time:	99.3

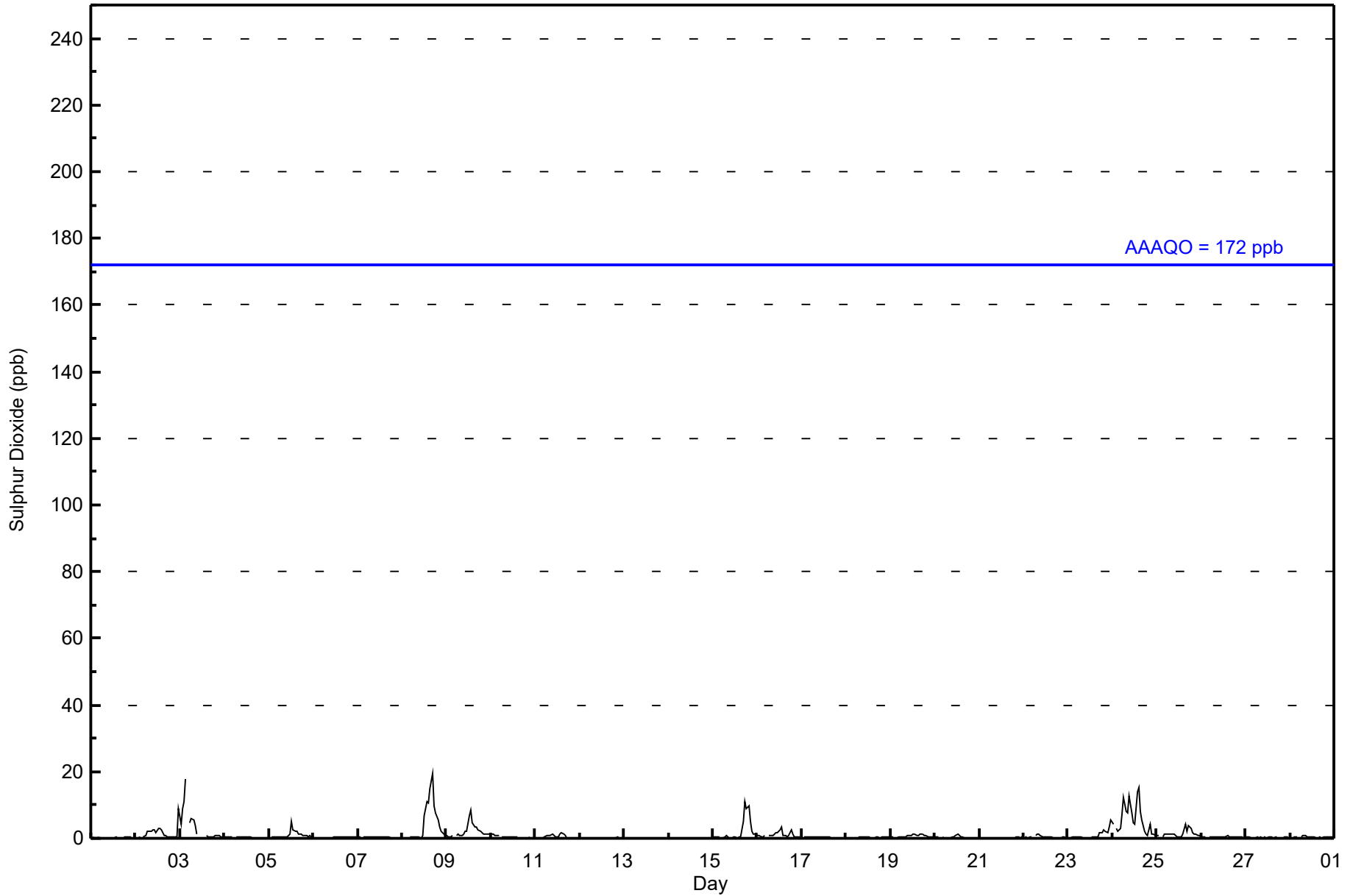
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Feb	0.2	0.2	Z	0.2	0.2	0.2	0.0	0.0	0.1	0.0	0.0	0.2	0.2	0.6	0.1	0.1	0.0	0.0	0.3	0.4	0.3	0.3	0.1	0.1	0.2	0.6																						
2-Feb	0.0	0.1	0.3	Z	0.4	0.9	2.3	2.3	2.1	2.7	2.4	1.7	3.1	3.1	2.4	1.0	0.8	0.6	0.4	0.4	0.4	0.5	0.6	9.1	1.6	9.1																						
3-Feb	4.2	9.0	11.1	17.8	Z	4.6	6.0	5.7	3.8	1.4	C	C	C	C	0.9	0.6	0.4	0.5	0.6	0.7	0.7	0.6	0.6	0.5	3.7	17.8																						
4-Feb	0.5	0.5	0.6	0.6	0.5	Z	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.3	0.6																						
5-Feb	Z	0.2	0.3	0.2	0.3	0.3	0.4	0.3	0.2	0.3	0.6	1.1	5.1	2.7	1.9	2.0	1.3	1.1	0.9	0.8	0.8	0.5	0.8	0.6	1.0	5.1																						
6-Feb	0.3	Z	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.5	0.5	0.6	0.6	0.3	0.6																						
7-Feb	0.6	0.6	Z	0.6	0.4	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.0	0.1	0.4	0.6																						
8-Feb	0.1	0.1	0.2	Z	0.2	0.3	0.4	0.5	0.5	0.2	0.2	0.8	6.9	11.0	10.5	14.7	19.7	9.6	7.7	5.6	3.5	2.0	1.6	1.0	4.2	19.7																						
9-Feb	0.7	0.5	0.5	1.0	Z	0.9	1.1	0.9	1.0	1.3	2.1	2.3	6.8	8.3	4.8	3.5	3.4	2.7	2.2	1.7	1.4	1.5	1.2	1.2	2.2	8.3																						
10-Feb	1.3	1.2	0.8	0.7	0.7	Z	0.3	0.3	0.2	0.2	0.4	0.3	0.4	0.4	0.4	PF	PF	PF	PF	PF	0.2	0.2	0.1	0.2	0.5	1.3																						
11-Feb	Z	0.2	0.2	0.1	0.2	0.4	0.9	0.7	0.7	1.1	0.7	0.4	0.5	1.1	1.8	1.4	0.7	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.5	1.8																						
12-Feb	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	0.2	0.2	0.1	0.0	0.0	0.0	0.2																						
13-Feb	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	0.1	0.1	0.1	0.1	0.0	0.1																						
14-Feb	0.1	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	0.2	0.1	0.1	0.1	0.1	0.2	0.0	0.1	0.1	0.1	0.2																						
15-Feb	0.3	0.4	0.3	0.3	Z	0.1	0.5	0.7	0.2	0.0	0.0	0.2	0.3	0.2	0.3	0.5	5.0	11.1	8.9	9.8	5.0	2.1	1.5	1.4	2.1	11.1																						
16-Feb	0.9	0.7	0.6	0.5	0.8	Z	1.1	0.7	0.7	1.2	1.6	1.6	2.8	3.6	1.0	0.7	0.6	0.8	2.5	1.3	0.6	0.5	0.6	0.6	1.1	3.6																						
17-Feb	Z	0.6	0.5	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.5	0.3	0.3	0.3	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.1	0.3	0.6																						
18-Feb	0.0	Z	0.1	0.1	0.0	0.0	0.0	0.2	0.6	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.4	0.4	0.5	0.4	0.2	0.6																						
19-Feb	0.4	0.3	Z	0.2	0.3	0.3	0.4	0.6	0.5	0.7	0.8	1.0	1.2	1.1	0.8	1.0	1.3	1.1	0.7	0.8	0.4	0.3	0.3	0.3	0.6	1.3																						
20-Feb	0.4	0.5	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.4	0.6	1.0	1.4	0.9	0.4	0.4	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.3	1.4																						
21-Feb	0.0	0.1	0.1	0.0	Z	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	0.0	0.3	0.5	0.2	0.3	0.1	0.5																						
22-Feb	0.1	0.3	0.1	0.4	0.5	Z	0.7	1.1	1.1	0.8	0.4	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.0	0.0	0.2	0.3	0.3	0.1	0.4	1.1																						
23-Feb	Z	0.1	0.3	0.3	0.3	0.4	0.4	0.5	0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.3	0.6	1.6	1.7	2.5	1.9	1.5	3.4	5.7	1.0	5.7																						
24-Feb	4.3	Z	3.0	2.3	3.1	7.4	12.4	8.2	7.8	12.5	7.7	4.7	4.4	14.0	15.2	8.0	5.6	2.1	1.3	0.7	4.3	1.3	1.5	0.7	5.8	15.2																						
25-Feb	0.7	0.8	Z	0.6	1.1	1.2	1.4	1.4	1.3	1.1	0.7	0.4	0.3	0.5	1.4	4.4	2.2	3.8	2.9	1.6	1.1	1.1	1.0	0.8	1.4	4.4																						
26-Feb	0.6	0.5	0.3	Z	0.5	0.4	0.4	0.4	0.4	0.6	0.6	0.6	0.6	0.6	0.7	0.5	0.4	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.4	0.7																						
27-Feb	0.2	0.3	0.2	0.2	Z	0.2	0.2	0.1	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3																					
28-Feb	0.2	0.2	0.2	0.4	0.3	Z	0.6	1.0	0.8	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.5	0.3	0.4	0.5	0.5	0.4	1.0																						
																								0.7	0.7	0.9	1.2	0.5	0.8	1.1	1.0	0.8	1.0	0.8	0.7	1.4	1.9	1.6	1.5	1.6	1.4	1.2	1.1	0.8	0.6	0.6	0.9	Diurnal Average
																								4.3	9.0	11.1	17.8	3.1	7.4	12.4	8.2	7.8	12.5	7.7	4.7	6.9	14.0	15.2	14.7	19.7	11.1	8.9	9.8	5.0	2.1	3.4	9.1	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  
Barge Landing - February 2023





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Barge Landing - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	625	98.43	98.43
11 - 20	10	1.57	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: 635

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Barge Landing - February 2023**

<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	58	93	51	38	10	7	26	55	67	37	23	35	19	11	27	67	624
11 - 20	0	0	0	0	0	0	0	4	4	1	0	1	0	0	0	0	10
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>	58	93	51	38	10	7	26	59	71	38	23	36	19	11	27	67	634

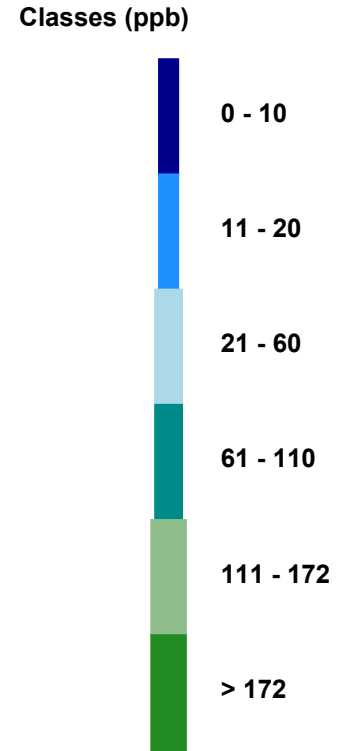
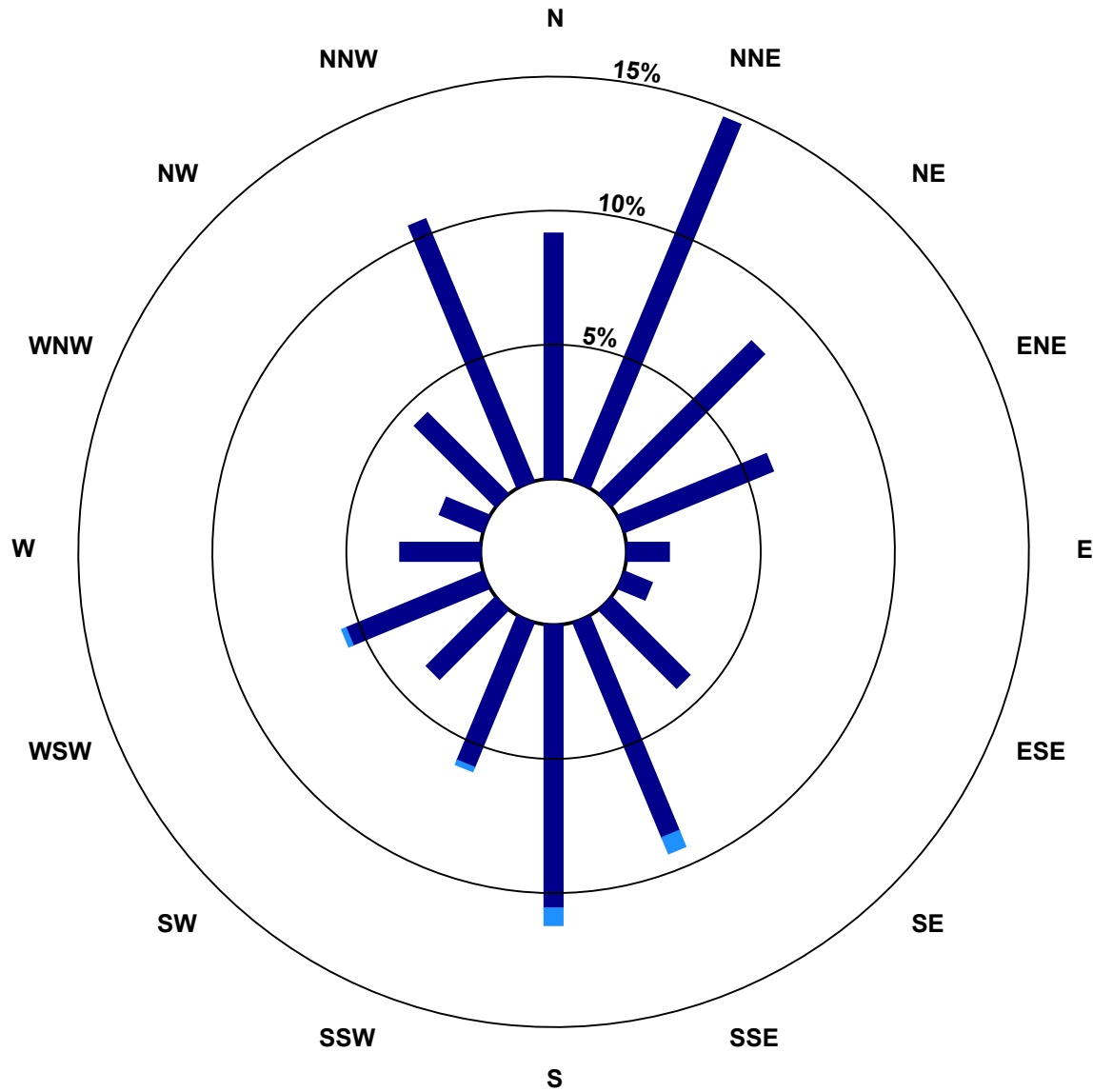
Total Number of Valid Hours: 634

Total Number of Hours: 672

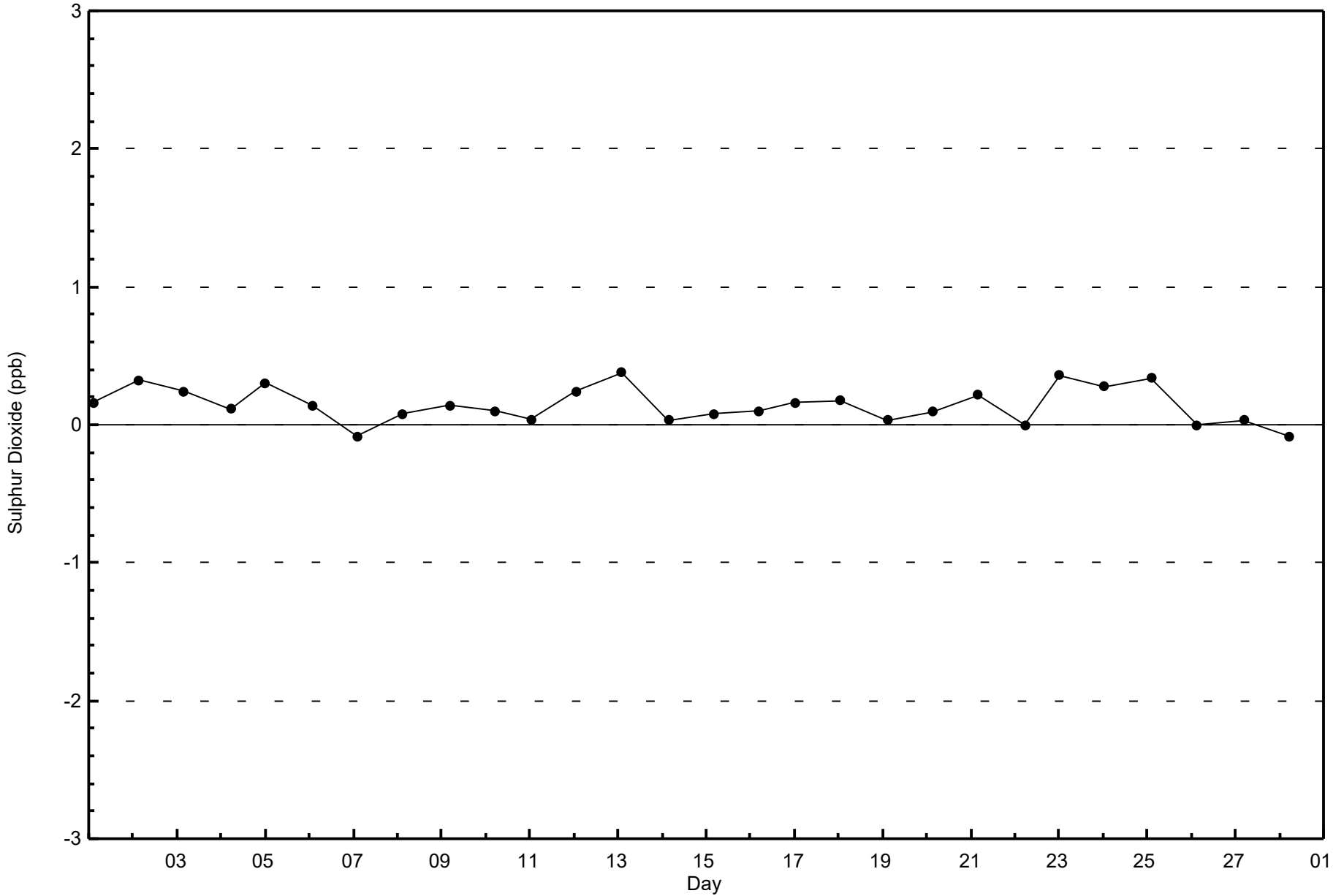


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

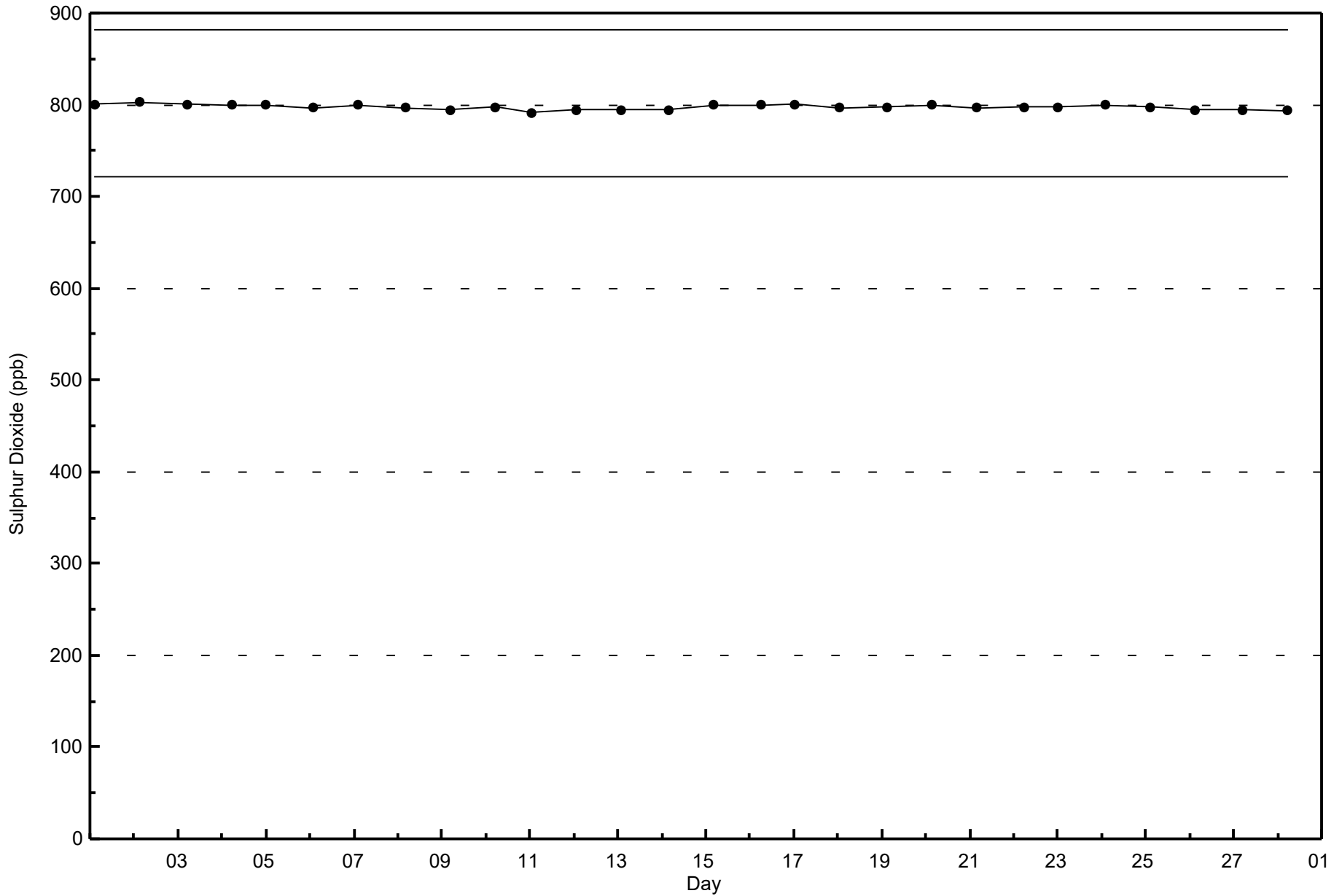
Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Barge Landing



Total Number of Valid Hours: 634

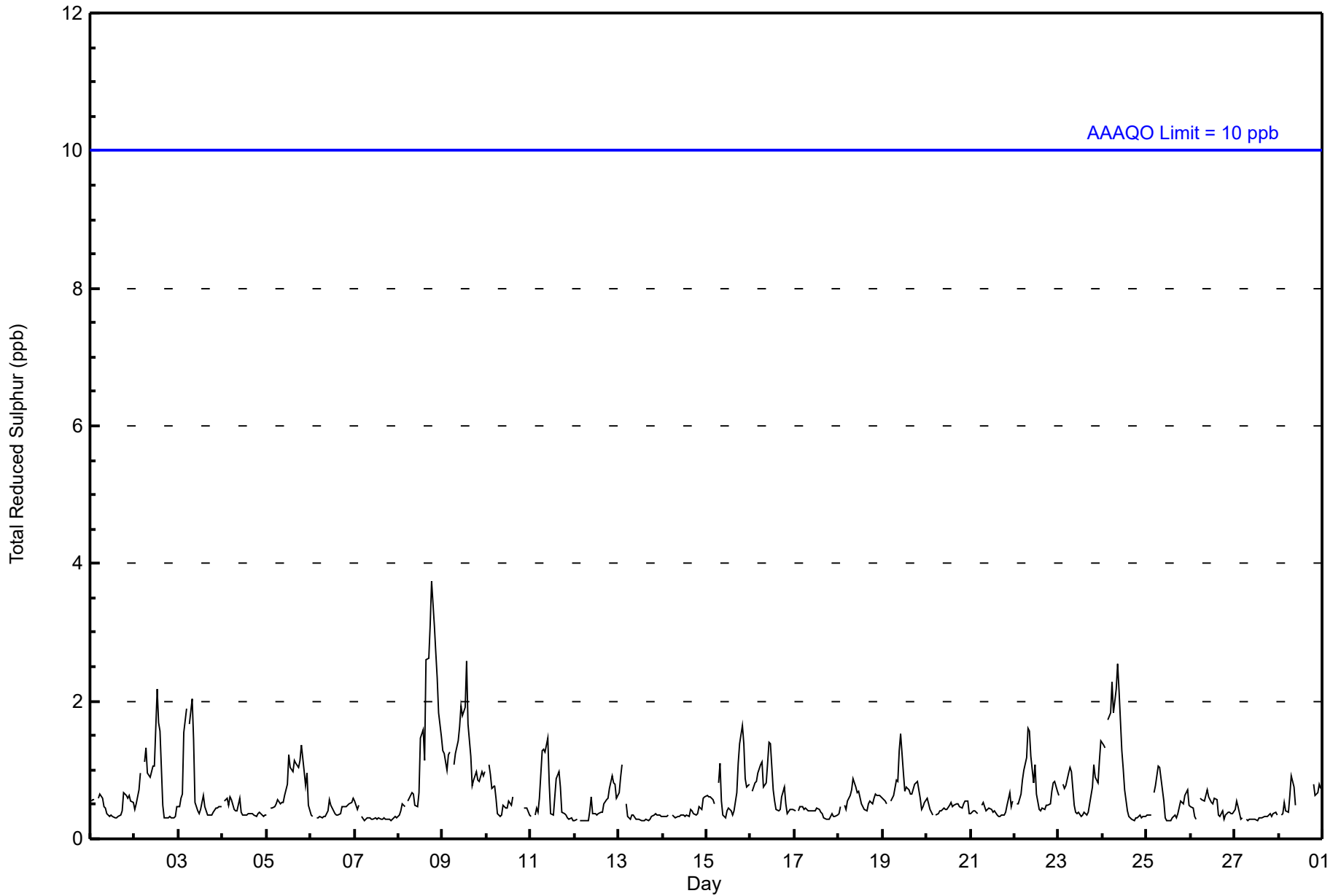








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														672								
Maximum Value: 3.7 ppb on Feb 8 19:00		Maximum Daily Average: 1.5 ppb on Feb 8														Hours of Data:		630										
Minimum Value: 0.3 ppb on Feb 12 08:00		Minimum Daily Average: 0.3 ppb on Feb 7														Hours of Missing Data:		42										
Maximum Diurnal Average: 0.8 ppb at hour 8		Minimum Diurnal Average: 0.5 ppb at hour 1														Hours of Calibration:		37										
Monthly Average: 0.63 ppb		Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 0.3 Q <sub>1</sub> = 0.4 Median = 0.5 Q <sub>3</sub> = 0.7 P <sub>90</sub> = 1.1 P <sub>99</sub> = 2.6														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-Feb	0.6	0.6	0.6	Z	0.6	0.7	0.6	0.5	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.7	0.8	2.2
2-Feb	0.4	0.5	0.7	1.0	Z	1.1	1.3	1.0	0.9	1.0	1.1	1.1	2.2	1.7	1.6	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.7	2.0	0.6
3-Feb	0.5	0.6	0.7	1.5	1.9	Z	1.7	2.0	1.4	0.5	0.4	0.4	0.4	0.6	0.5	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.6	1.4
4-Feb	Z	0.6	0.6	0.5	0.6	0.6	0.4	0.4	0.4	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.6	1.1
5-Feb	0.3	Z	0.4	0.4	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.8	1.2	1.0	1.0	1.1	1.1	1.0	1.1	1.4	1.0	0.8	1.0	0.5	0.4	0.6	1.5	0.9
6-Feb	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.5	0.4	0.4	0.4	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.4	0.6	1.7	0.6
7-Feb	0.6	0.4	0.5	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	0.9
8-Feb	0.3	0.4	0.5	0.5	Z	0.5	0.6	0.7	0.7	0.5	0.5	0.7	1.5	1.6	1.1	2.6	2.6	3.1	3.7	3.1	2.7	2.3	1.8	1.5	1.3	2.6	1.1	
9-Feb	1.3	1.2	1.0	1.2	1.3	Z	1.1	1.2	1.4	1.6	1.9	1.8	1.9	2.6	1.7	1.2	0.8	0.9	1.0	0.9	0.8	1.0	0.9	1.0	1.3	2.6	1.1	
10-Feb	Z	1.1	0.9	0.7	0.8	0.6	0.4	0.3	0.3	0.5	0.4	0.4	0.6	0.5	0.6	PF	PF	PF	PF	PF	0.4	0.4	0.4	0.3	0.5	1.1	0.9	
11-Feb	0.3	Z	0.3	0.4	0.4	0.6	1.3	1.3	1.3	1.5	0.8	0.4	0.3	0.6	0.9	1.0	0.8	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.6	1.5	0.9	
12-Feb	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.7	0.9	0.8	0.8	0.6	0.5	0.9	0.6	
13-Feb	0.7	0.9	1.1	Z	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	0.3	0.3	0.4	0.4	0.3	0.4	0.3	0.4	1.1	0.6	
14-Feb	0.3	0.3	0.3	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.5	0.4	0.6	0.6	0.4	0.6	0.6	
15-Feb	0.6	0.6	0.6	0.6	0.5	Z	0.8	1.1	0.5	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.7	1.1	1.4	1.7	1.4	0.9	0.8	0.8	0.7	1.7	0.6	
16-Feb	Z	0.7	0.8	0.8	1.0	1.1	1.1	0.8	0.8	1.1	1.4	1.4	0.7	0.6	0.4	0.4	0.4	0.6	0.8	0.5	0.4	0.4	0.4	0.4	0.7	1.4	0.6	
17-Feb	0.4	Z	0.4	0.5	0.5	0.4	0.4	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	0.4	0.3	0.3	0.3	0.4	0.5	0.5	
18-Feb	0.4	0.5	Z	0.5	0.4	0.6	0.6	0.7	0.9	0.8	0.7	0.7	0.5	0.5	0.4	0.4	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.9	0.6	
19-Feb	0.6	0.6	0.5	Z	0.5	0.6	0.6	0.9	0.8	1.3	1.5	1.0	0.7	0.8	0.7	0.7	0.7	0.8	0.8	0.8	0.6	0.4	0.5	0.5	0.7	1.5	0.6	
20-Feb	0.6	0.5	0.4	0.4	Z	0.3	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.6	0.5	0.4	0.5	0.6	0.6	
21-Feb	0.4	0.4	0.4	0.4	0.4	Z	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.5	0.7	0.5	0.5	0.4	0.7	0.6	
22-Feb	Z	0.5	0.5	0.6	0.9	1.0	1.2	1.6	1.6	1.2	0.8	1.1	0.7	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.7	0.8	0.8	0.7	0.8	1.6	0.6	
23-Feb	0.6	Z	0.8	0.7	0.8	1.0	1.0	1.0	0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.5	0.8	1.1	0.9	0.8	1.1	1.4	0.7	1.4	0.6	
24-Feb	1.4	1.3	Z	1.7	1.8	2.3	1.8	2.2	2.5	2.2	1.3	1.0	0.7	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	1.0	2.5	0.6	
25-Feb	0.3	0.3	0.3	Z	0.7	0.8	1.1	1.0	0.9	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.5	0.5	0.6	0.7	0.5	0.5	1.1	0.6	
26-Feb	0.5	0.4	0.3	0.3	Z	0.6	0.6	0.5	0.6	0.7	0.6	0.5	0.5	0.6	0.6	0.4	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.7	0.6	
27-Feb	0.4	0.6	0.5	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	0.6	0.6	
28-Feb	Z	0.3	0.4	0.5	0.4	0.4	0.6	0.9	0.8	0.5	C	C	C	C	C	C	C	C	C	C	0.8	0.6	0.7	0.8	0.7	--	0.9	
																								Diurnal Average		0.5		
																								Diurnal Maximum		1.4		
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**  
**Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb**  
**Barge Landing - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	622	98.73	98.73
3 - 4	8	1.27	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: 630

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Barge Landing - February 2023**

<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	57	90	47	38	9	7	25	65	69	34	22	32	21	10	28	67	621
3 - 4	0	0	0	1	1	0	0	1	1	1	0	1	0	0	1	1	8
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>	57	90	47	39	10	7	25	66	70	35	22	33	21	10	29	68	629

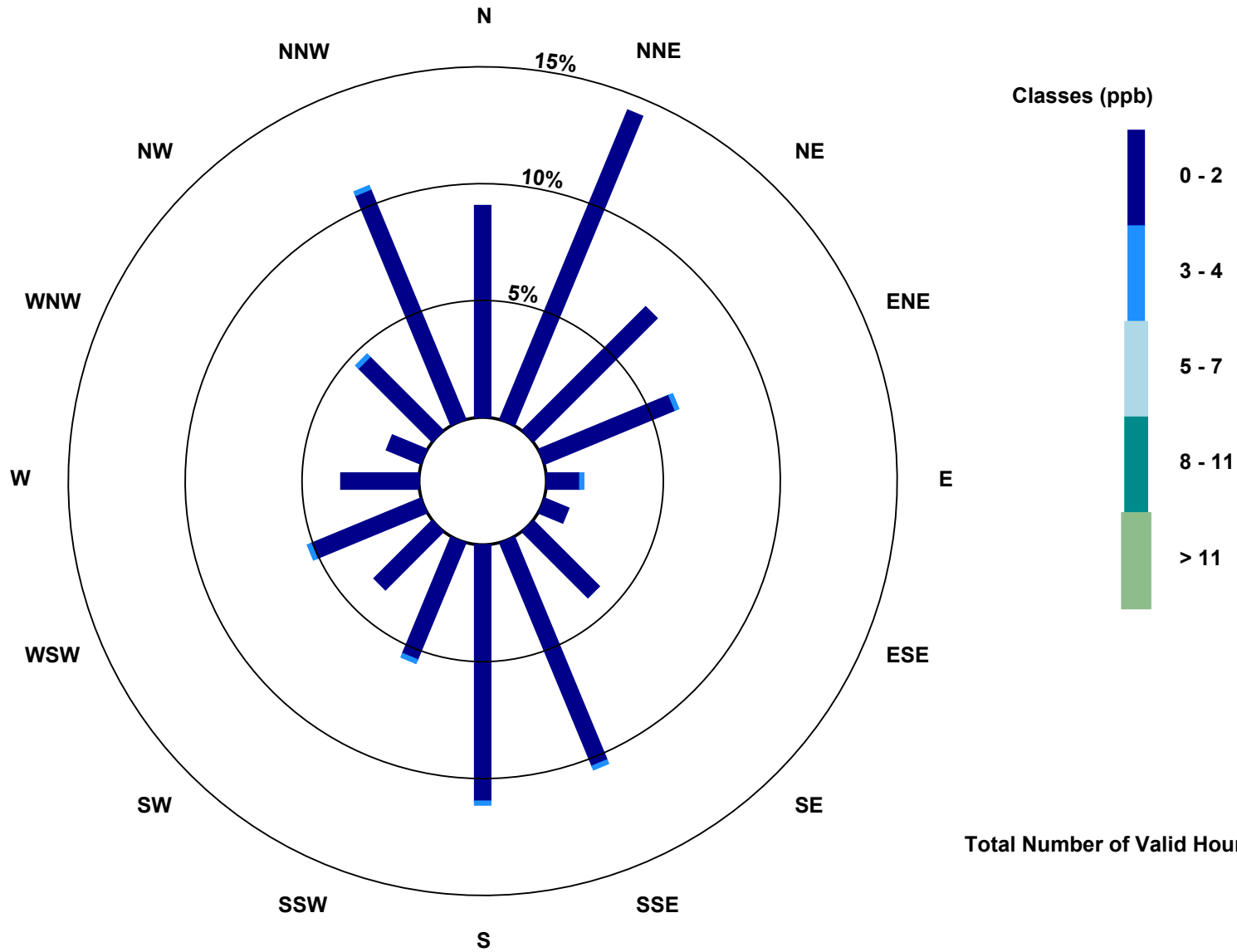
Total Number of Valid Hours: 629

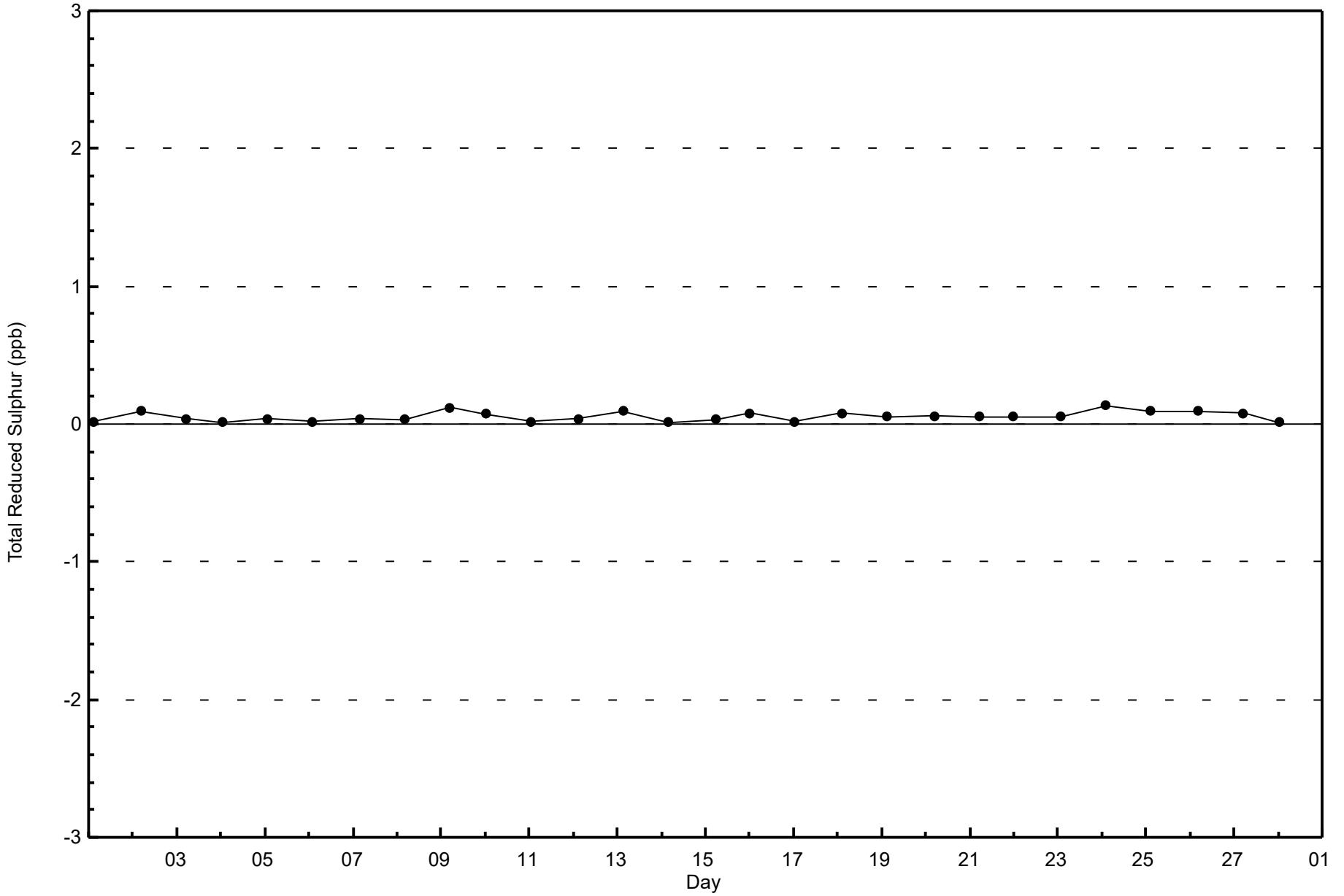
Total Number of Hours: 672

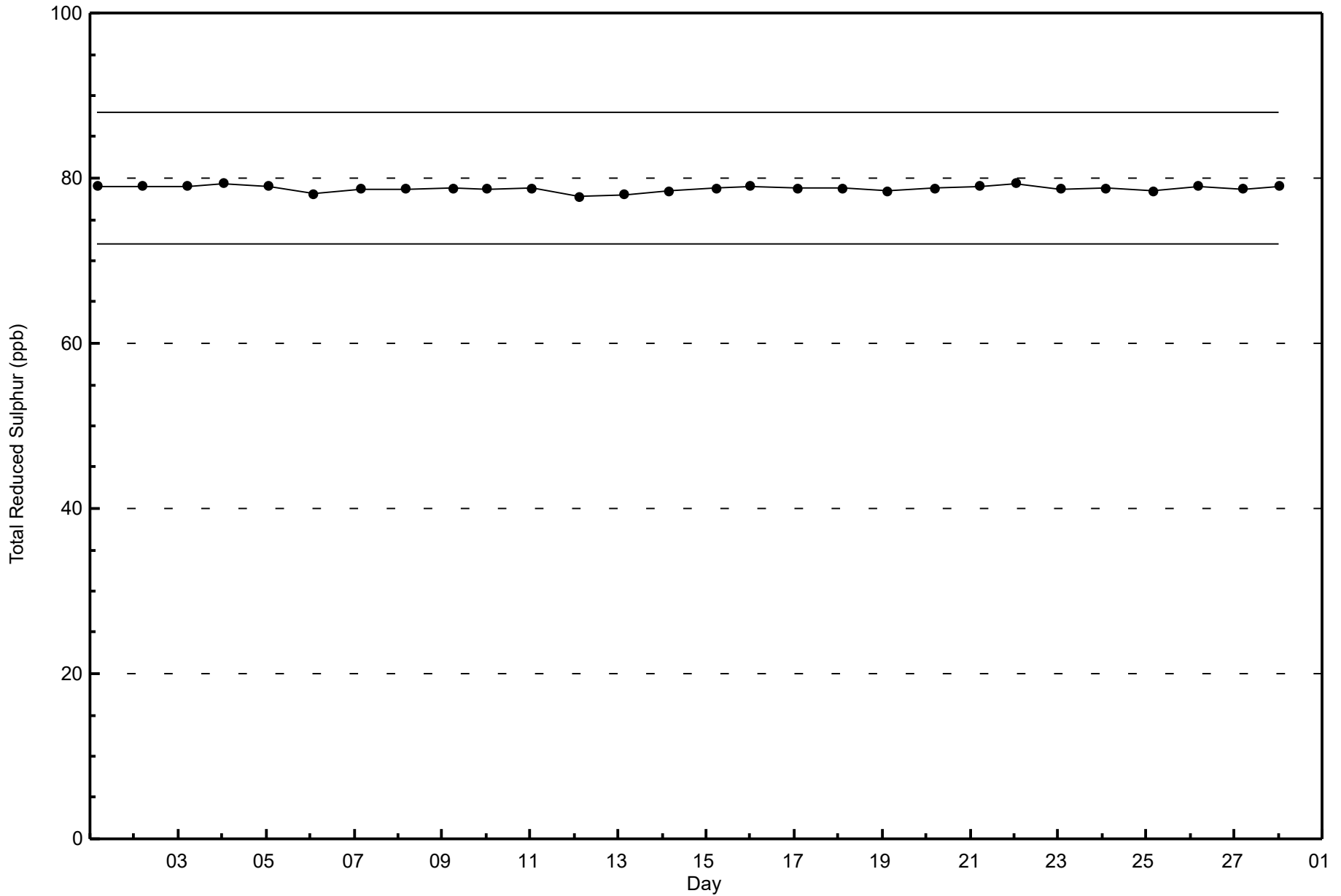


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Reduced Sulphur (TRS) - ppb  
Barge Landing











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

**Total Hydrocarbons (THC) - ppm**  
**Barge Landing - February 2023**

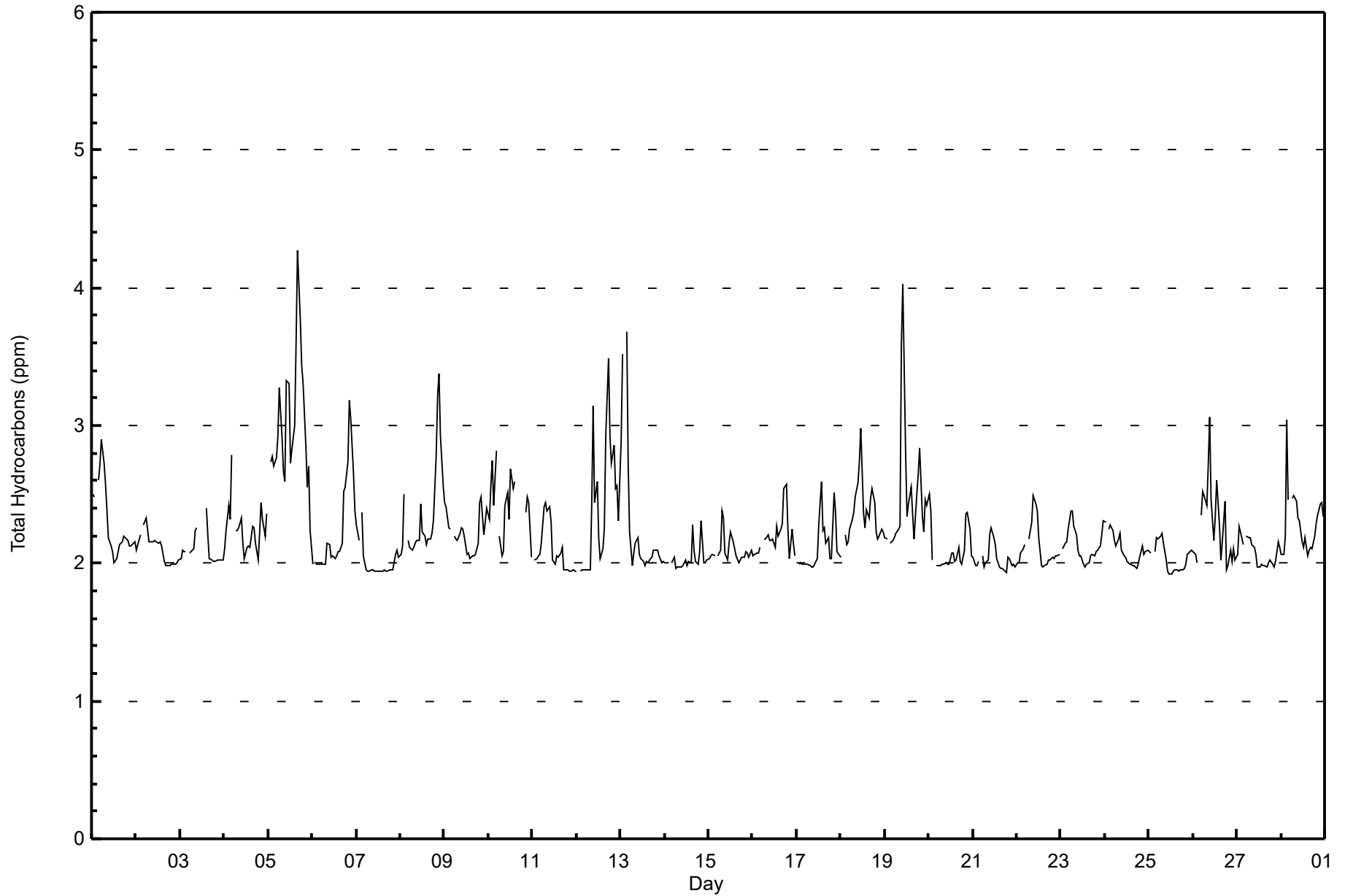
Maximum Value: 4.3 ppm on Feb 5 17:00		Maximum Daily Average: 3.0 ppm on Feb 5		Hours in Service: 672																						
Minimum Value: 1.9 ppm on Feb 25 13:00		Minimum Daily Average: 2.0 ppm on Feb 7		Hours of Data: 635																						
Maximum Diurnal Average: 2.3 ppm at hour 10		Minimum Diurnal Average: 2.2 ppm at hour 13		Hours of Missing Data: 37																						
Monthly Average: 2.22 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> = 2.3 P <sub>90</sub> = 2.6 P <sub>99</sub> = 3.5		Hours of Calibration: 32																						
				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-Feb	2.5	2.5	Z	2.6	2.7	2.9	2.7	2.6	2.4	2.2	2.1	2.1	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.3	2.9
2-Feb	2.1	2.1	2.2	Z	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3
3-Feb	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.3	C	C	C	C	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4
4-Feb	2.1	2.2	2.4	2.3	2.8	Z	2.1	2.2	2.2	2.3	2.3	2.1	2.0	2.1	2.1	2.1	2.3	2.3	2.1	2.0	2.2	2.4	2.3	2.2	2.4	2.8
5-Feb	Z	2.7	2.8	2.7	2.8	2.9	3.3	2.9	2.7	2.6	3.3	3.3	2.7	2.8	3.0	3.6	4.3	3.8	3.4	3.3	2.8	2.5	2.7	2.2	4.3	
6-Feb	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.5	2.6	2.7	3.2	3.1	2.6	2.4	3.2	
7-Feb	2.3	2.2	Z	2.4	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	1.9	1.9	2.0	1.9	2.1	2.1	2.4	
8-Feb	2.1	2.1	2.5	Z	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.4	2.2	2.2	2.1	2.2	2.2	2.2	2.3	2.8	3.2	3.4	2.9	2.6	3.4	
9-Feb	2.4	2.4	2.3	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.4	2.5	2.2	2.3	2.4	2.5	
10-Feb	2.3	2.6	2.7	2.4	2.8	Z	2.2	2.1	2.1	2.4	2.5	2.3	2.7	2.5	2.6	PF	PF	PF	PF	PF	2.4	2.5	2.4	2.0	2.8	
11-Feb	Z	2.0	2.0	2.1	2.1	2.1	2.4	2.4	2.4	2.4	2.3	2.0	2.0	2.1	2.0	2.1	2.1	2.0	1.9	2.0	1.9	1.9	1.9	1.9	2.4	
12-Feb	1.9	Z	1.9	1.9	1.9	2.0	2.0	2.0	2.4	3.1	2.4	2.6	2.2	2.0	2.1	2.3	2.9	3.5	2.9	2.7	2.9	2.5	2.6	2.3	3.5	
13-Feb	2.9	3.5	Z	3.7	2.7	2.2	2.0	2.1	2.1	2.2	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	3.7	
14-Feb	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	2.3	2.1	2.0	2.0	2.1	2.3	2.0	2.0	2.0	2.3	
15-Feb	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.4	2.3	2.1	2.0	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.4	
16-Feb	2.1	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.3	2.2	2.2	2.3	2.5	2.6	2.2	2.0	2.2	2.1	2.1	2.6	
17-Feb	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.6	2.2	2.3	2.1	2.2	2.0	2.0	2.5	2.4	2.1	2.1	2.6	
18-Feb	2.0	Z	2.2	2.1	2.2	2.2	2.3	2.4	2.5	2.6	2.7	3.0	2.4	2.3	2.4	2.3	2.5	2.5	2.4	2.2	2.2	2.2	2.3	2.2	3.0	
19-Feb	2.2	2.2	Z	2.1	2.2	2.2	2.2	2.2	2.3	3.6	4.0	2.8	2.3	2.4	2.5	2.4	2.2	2.5	2.6	2.8	2.3	2.2	2.5	2.4	4.0	
20-Feb	2.5	2.4	2.0	Z	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	2.0	2.0	2.1	2.4	2.4	2.2	2.1	2.5	
21-Feb	2.0	2.0	2.0	2.0	Z	2.1	2.0	2.0	2.0	2.2	2.3	2.2	2.1	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.3	
22-Feb	2.0	2.0	2.1	2.1	2.1	Z	2.2	2.2	2.3	2.5	2.4	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.5	
23-Feb	Z	2.1	2.1	2.2	2.3	2.4	2.4	2.3	2.2	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	2.3	2.4	
24-Feb	2.3	Z	2.2	2.3	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.3	
25-Feb	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.0	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.1	2.1	2.2	
26-Feb	2.1	2.1	2.0	Z	2.3	2.5	2.5	2.4	2.7	3.1	2.5	2.2	2.3	2.6	2.3	2.0	2.2	2.4	1.9	2.0	2.1	2.0	2.1	2.0	3.1	
27-Feb	2.1	2.3	2.2	2.1	Z	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	2.2	2.1	2.3	
28-Feb	2.1	2.1	2.2	3.0	2.5	Z	2.5	2.5	2.5	2.3	2.3	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.4	2.4	2.3	3.0	
																								Diurnal Average		
																								Diurnal Maximum		
																								2.2 2.9		
																								2.2 3.5		
																								2.2 2.8		
																								2.3 3.7		
																								2.3 2.8		
																								2.2 2.9		
																								2.2 3.3		
																								2.2 2.9		
																								2.3 2.7		
																								2.3 3.6		
																								2.3 4.0		
																								2.3 3.3		
																								2.2 2.7		
																								2.2 2.8		
																								2.2 3.0		
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																								2.2 3.3		
																								2.3 3.2		
																								2.2 3.4		
																								2.2 2.9		
																								2.2 2.6		

Z - zerospan      C - Calibration      PF - Power Failure



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

**Total Hydrocarbons (THC) - ppm**  
**Barge Landing - February 2023**





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

**Total Hydrocarbons (THC) - ppm**  
**Barge Landing - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	205	32.28	32.28
2.1 - 3.0	411	64.72	97.01
3.1 - 10.0	19	2.99	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 635

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Barge Landing - February 2023**

<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	13	30	28	27	5	4	7	21	17	6	5	26	10	1	1	4	205
2.1 - 3.0	45	62	23	10	4	3	18	37	51	30	16	9	9	10	24	59	410
3.1 - 10.0	0	1	0	1	1	0	1	1	3	2	2	1	0	0	2	4	19
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	58	93	51	38	10	7	26	59	71	38	23	36	19	11	27	67	634

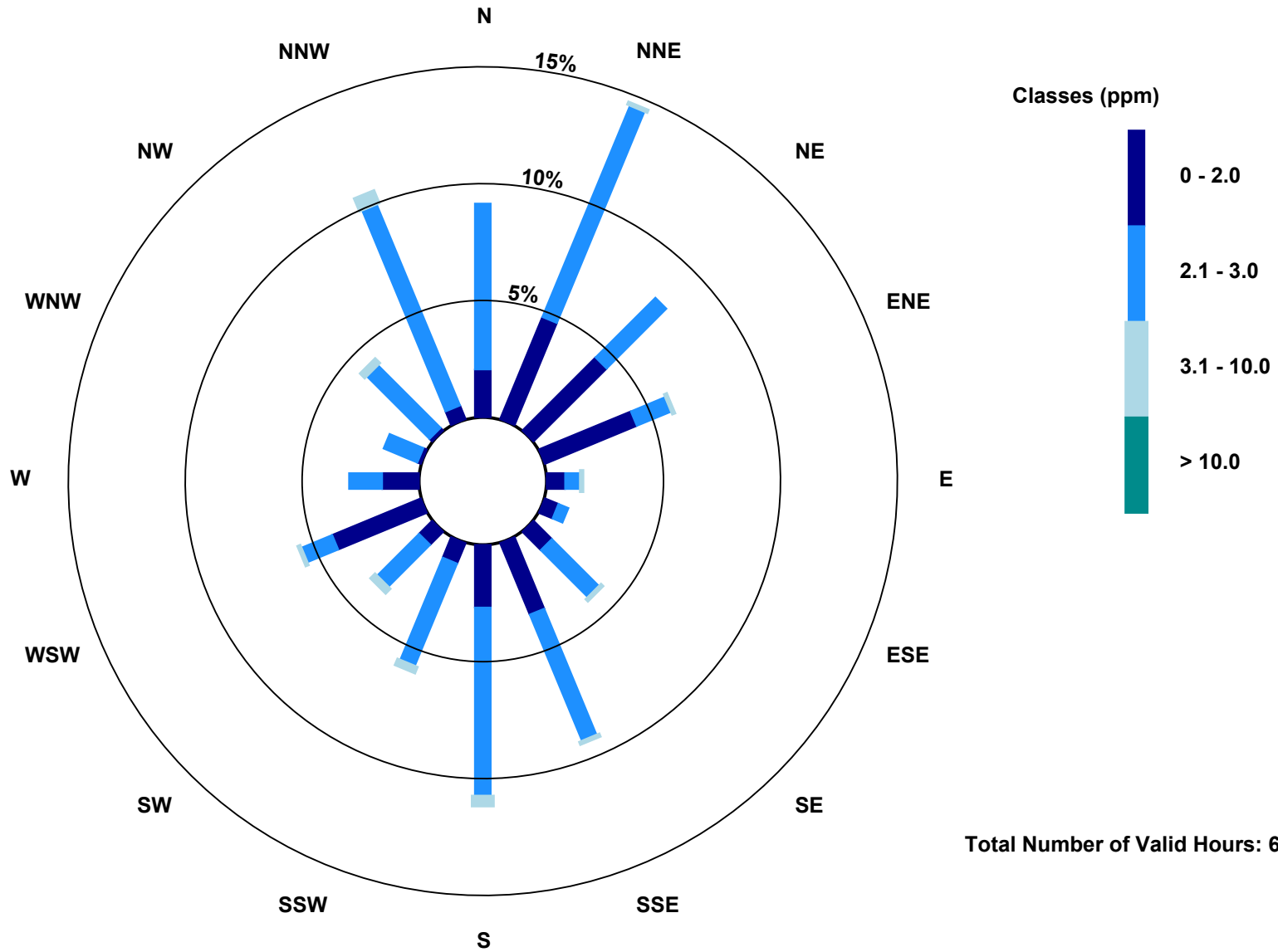
Total Number of Valid Hours: 634

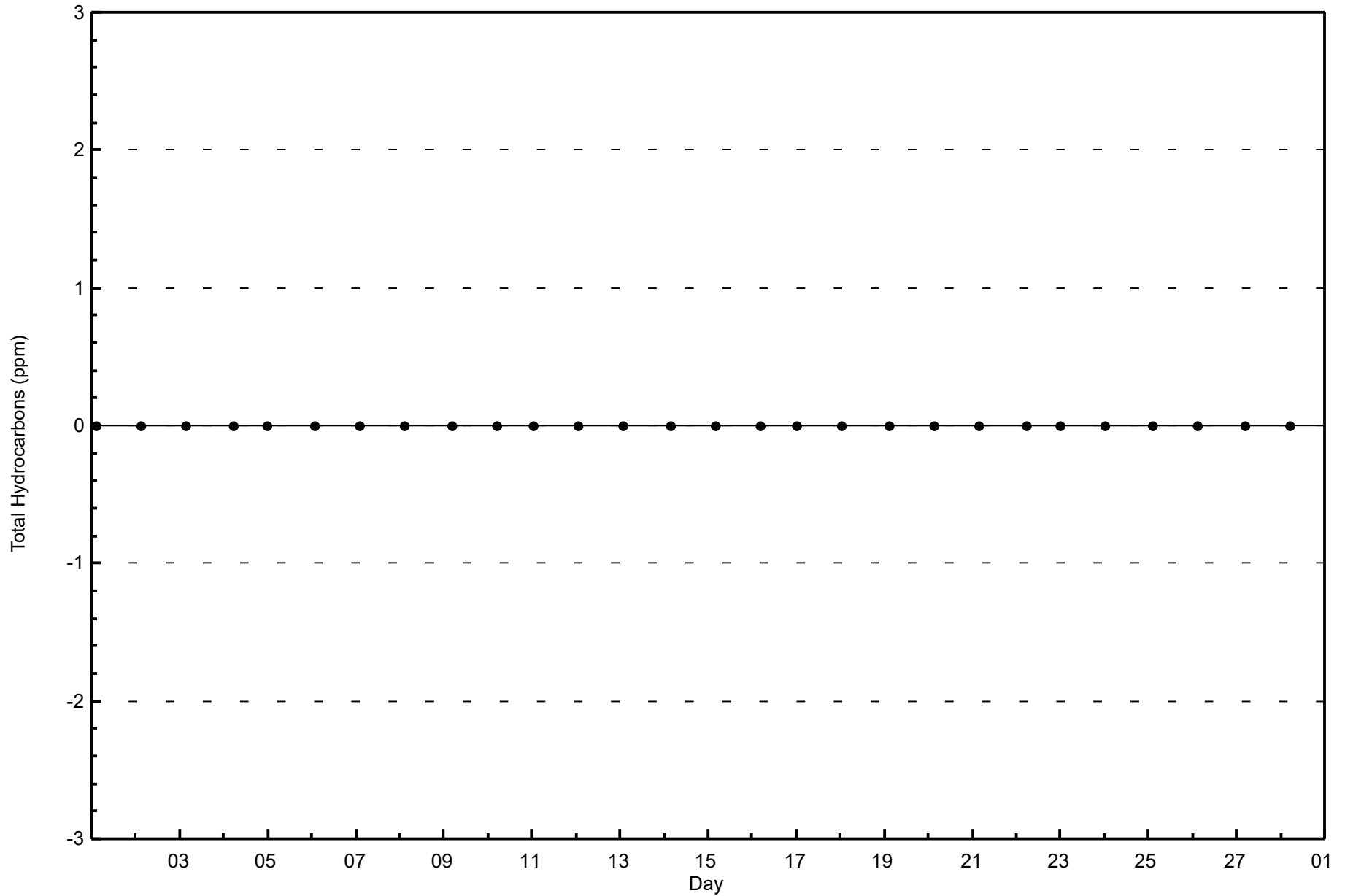
Total Number of Hours: 672

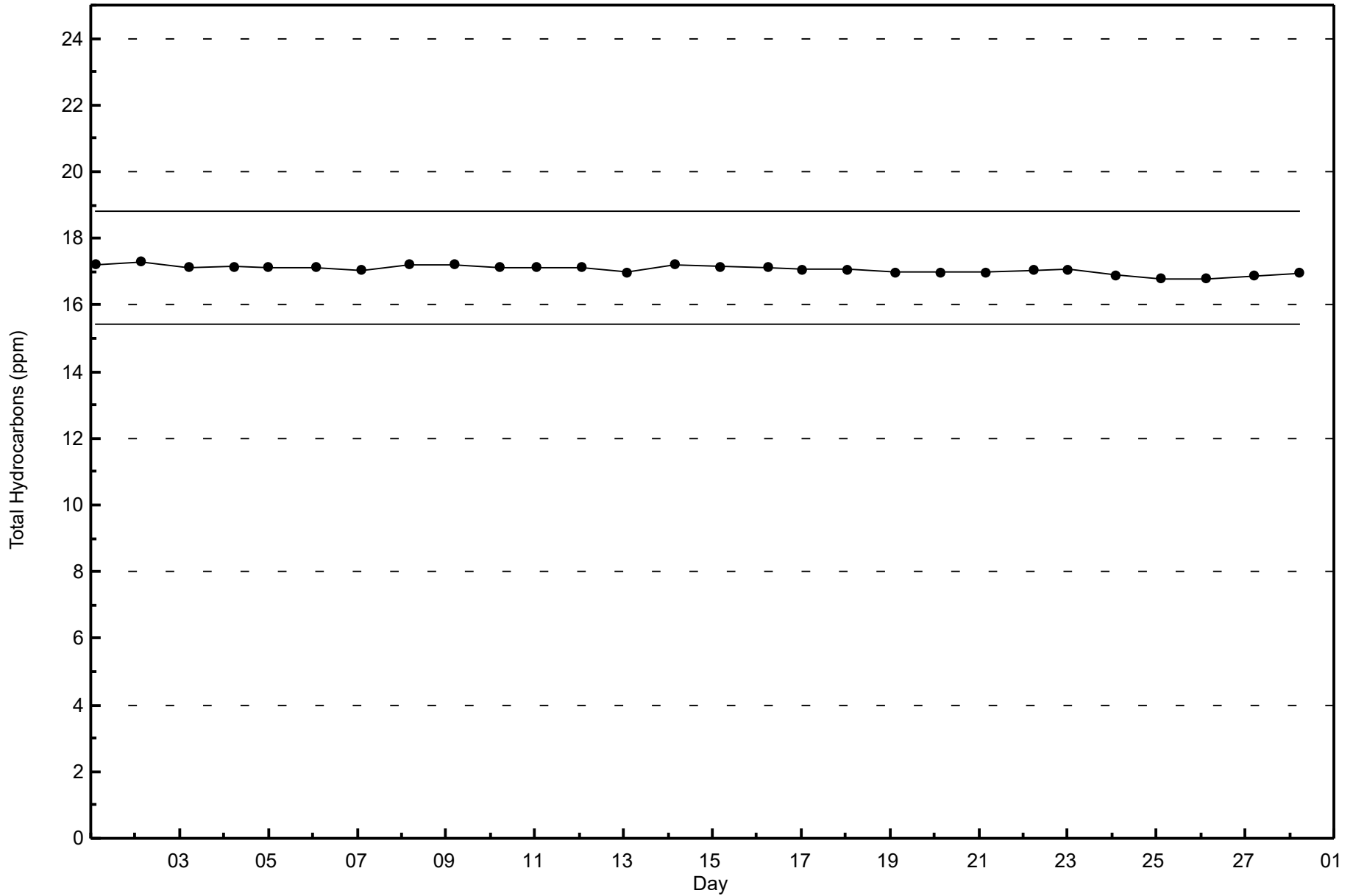


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Hydrocarbons (THC) - ppm  
Barge Landing



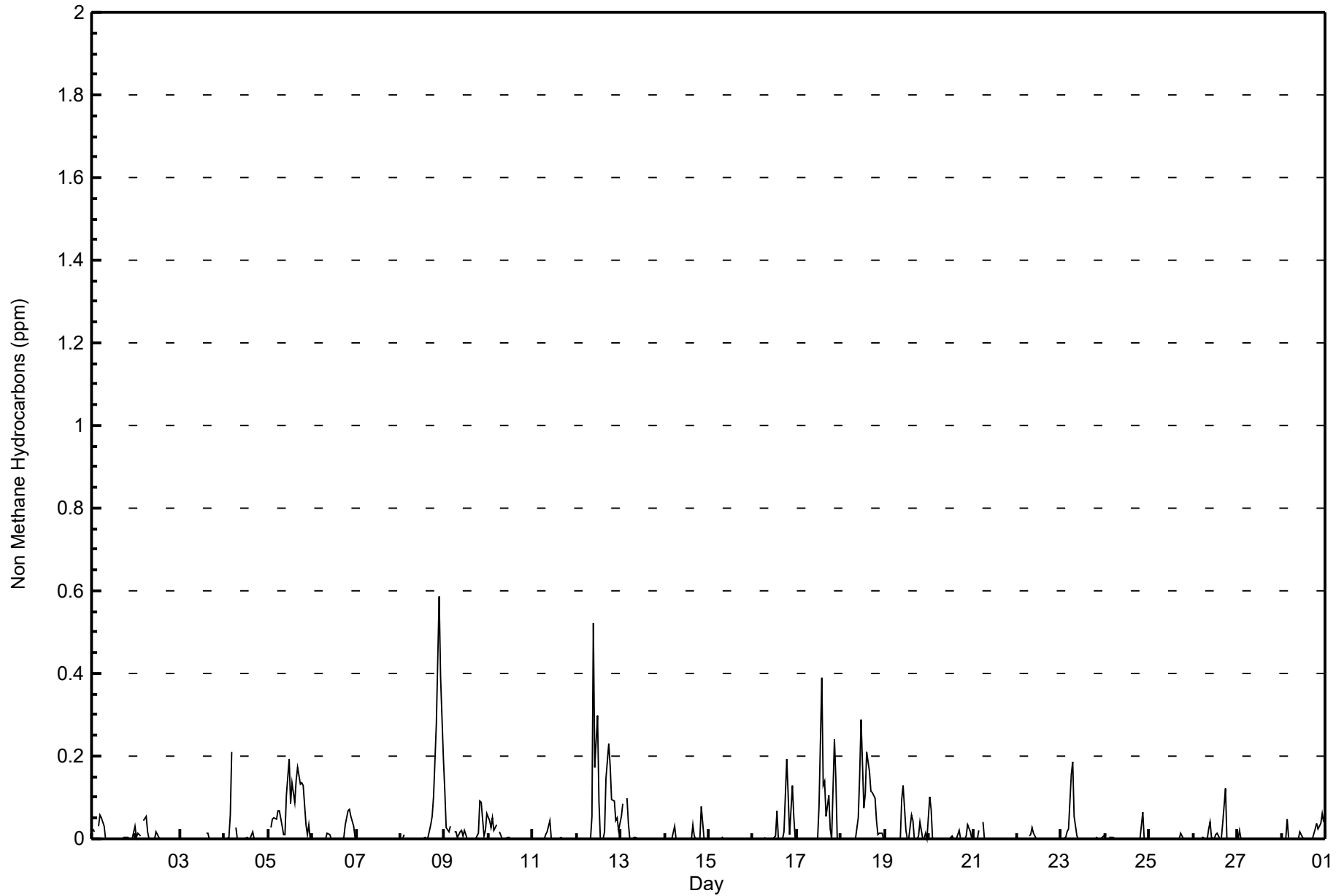






Maximum Value: 0.586 ppm on Feb 8 22:00																				Maximum Daily Average: 0.091 ppm on Feb 8					Hours in Service: 672	
Minimum Value: 0.000 ppm on Feb 1 09:00																				Minimum Daily Average: 0.000 ppm on Feb 7					Hours of Data: 635	
Maximum Diurnal Average: 0.041 ppm at hour 21																				Minimum Diurnal Average: 0.004 ppm at hour 8					Hours of Missing Data: 37	
Monthly Average: 0.021 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> = 0.3					Hours of Calibration: 32	
																									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-Feb	0.022	0.018	Z	0.031	0.058	0.052	0.029	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.004	0.003	0.000	0.000	0.000	0.031	0.011	0.058
2-Feb	0.003	0.012	0.006	Z	0.044	0.054	0.016	0.000	0.000	0.000	0.001	0.017	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.054
3-Feb	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	C	C	C	C	0.014	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.014	
4-Feb	0.000	0.002	0.005	0.058	0.209	Z	0.026	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.209	
5-Feb	Z	0.028	0.047	0.050	0.047	0.067	0.067	0.030	0.011	0.011	0.104	0.192	0.086	0.135	0.088	0.143	0.174	0.131	0.137	0.130	0.032	0.009	0.032	0.000	0.076	0.192
6-Feb	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.033	0.068	0.073	0.054	0.030	0.003	0.013	0.073
7-Feb	0.000	0.000	Z	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	0.001	0.000	0.000	0.001	
8-Feb	0.000	0.000	0.009	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.002	0.033	0.055	0.101	0.280	0.435	0.586	0.393	0.197	0.091	0.586
9-Feb	0.118	0.026	0.018	0.030	Z	0.018	0.018	0.005	0.018	0.022	0.008	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.090	0.087	0.007	0.020	0.060	0.025	0.118
10-Feb	0.046	0.027	0.051	0.021	0.032	Z	0.017	0.000	0.000	0.000	0.002	0.004	0.000	0.000	0.000	PF	PF	PF	PF	PF	0.000	0.000	0.000	0.000	0.011	0.051
11-Feb	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.017	0.043	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	0.003	0.043	
12-Feb	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.054	0.522	0.173	0.298	0.090	0.000	0.000	0.018	0.146	0.229	0.175	0.095	0.091	0.046	0.051	0.019	0.087	0.522
13-Feb	0.054	0.085	Z	0.097	0.037	0.000	0.000	0.003	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.012	0.097
14-Feb	0.000	0.000	0.000	Z	0.000	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.006	0.000	0.000	0.000	0.000	0.078	0.000	0.000	0.006	0.078
15-Feb	0.000	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	0.002	
16-Feb	0.000	0.000	0.000	0.000	0.000	Z	0.002	0.000	0.000	0.000	0.000	0.001	0.007	0.067	0.000	0.000	0.001	0.016	0.192	0.105	0.009	0.130	0.055	0.000	0.025	0.192
17-Feb	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.079	0.389	0.127	0.138	0.056	0.103	0.024	0.000	0.240	0.146	0.000	0.000	0.057	0.389
18-Feb	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.051	0.153	0.289	0.075	0.109	0.211	0.164	0.116	0.113	0.098	0.045	0.011	0.015	0.012	0.000	0.064	0.289
19-Feb	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.001	0.094	0.129	0.022	0.000	0.001	0.058	0.042	0.001	0.000	0.007	0.040	0.001	0.000	0.013	0.000	0.018	0.129
20-Feb	0.101	0.070	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.021	0.000	0.000	0.000	0.008	0.036	0.017	0.000	0.011	0.101
21-Feb	0.000	0.000	0.000	0.022	Z	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.040
22-Feb	0.000	0.000	0.000	0.000	0.000	Z	0.008	0.009	0.028	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	0.003	0.028
23-Feb	Z	0.000	0.002	0.019	0.023	0.157	0.188	0.053	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.003	0.007	0.020	0.188
24-Feb	0.011	Z	0.002	0.004	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	0.065	0.000	0.000	0.004	0.065
25-Feb	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	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.014
26-Feb	0.000	0.000	0.000	Z	0.003	0.002	0.000	0.000	0.025	0.040	0.003	0.000	0.009	0.012	0.000	0.000	0.038	0.121	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.121
27-Feb	0.000	0.019	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	0.019
28-Feb	0.000	0.000	0.001	0.048	0.004	Z	0.000	0.000	0.000	0.000	0.015	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.037	0.024	0.037	0.059	0.042	0.013	0.059
																				0.015 0.012 0.006 0.017 0.020 0.018 0.013 0.004 0.006 0.029 0.022 0.031 0.013 0.026 0.018 0.021 0.022 0.029 0.030 0.033 0.041 0.038 0.025 0.013					Diurnal Average	
																				0.118 0.085 0.051 0.097 0.209 0.157 0.188 0.053 0.054 0.522 0.173 0.298 0.090 0.389 0.211 0.164 0.174 0.229 0.192 0.280 0.435 0.586 0.393 0.197					Diurnal Maximum	
Z - zerospan			C - Calibration				PF - Power Failure																			







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Barge Landing - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	455	71.65	71.65
0.006 - 0.05	109	17.17	88.82
0.06 - 0.1	49	7.72	96.54
> 0.1	22	3.46	100.00

Total Number of Valid Hours: 635

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Barge Landing - February 2023**

<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	41	57	36	31	9	6	23	43	51	28	18	31	14	6	15	45	454
0.006 - 0.05	13	13	10	3	0	1	2	13	10	6	4	3	5	3	9	14	109
0.06 - 0.1	3	14	5	2	0	0	1	3	6	3	0	1	0	2	3	6	49
> 0.1	1	9	0	2	1	0	0	0	4	1	1	1	0	0	0	2	22
<b>Totals</b>	58	93	51	38	10	7	26	59	71	38	23	36	19	11	27	67	634

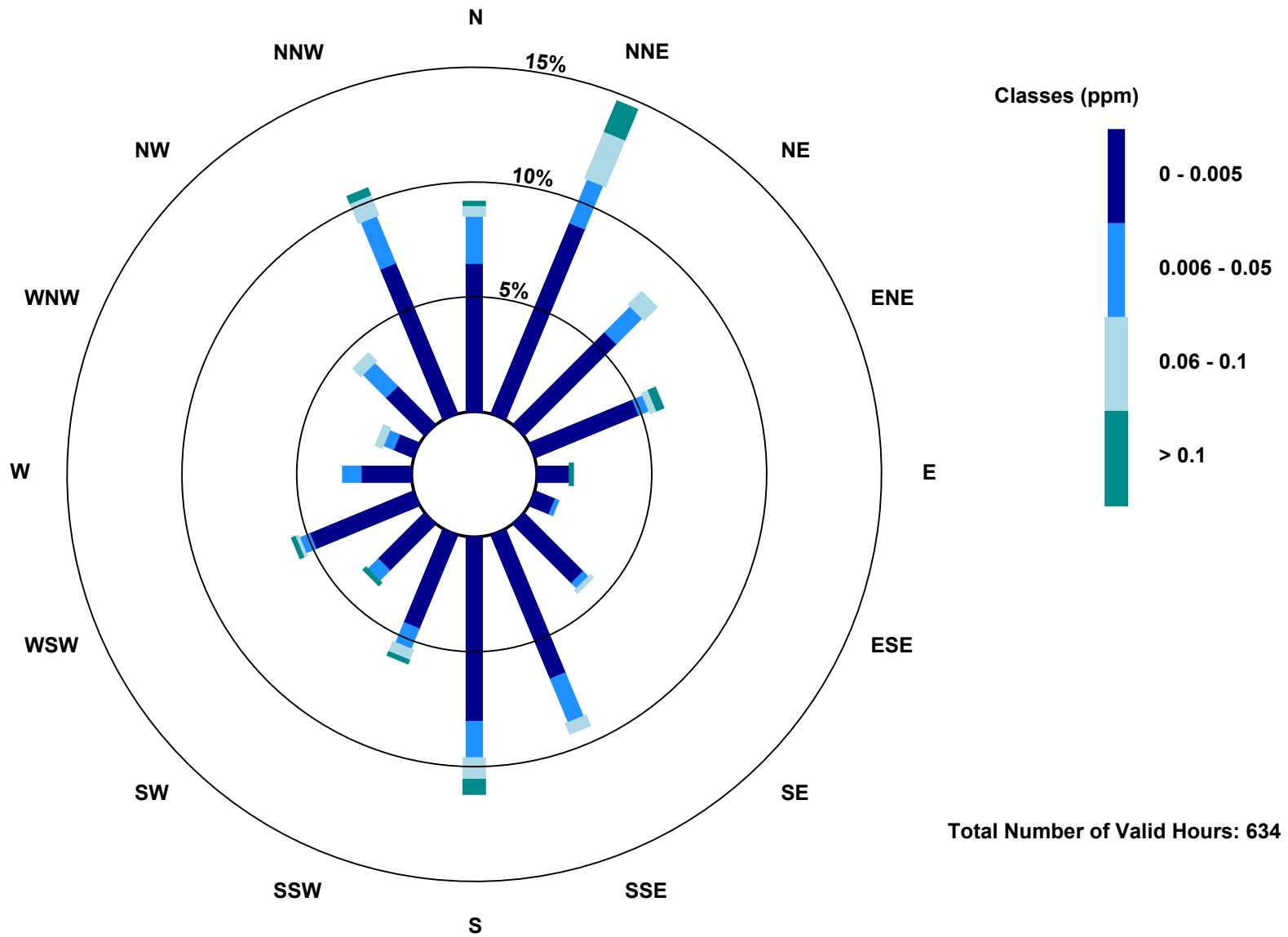
Total Number of Valid Hours: 634

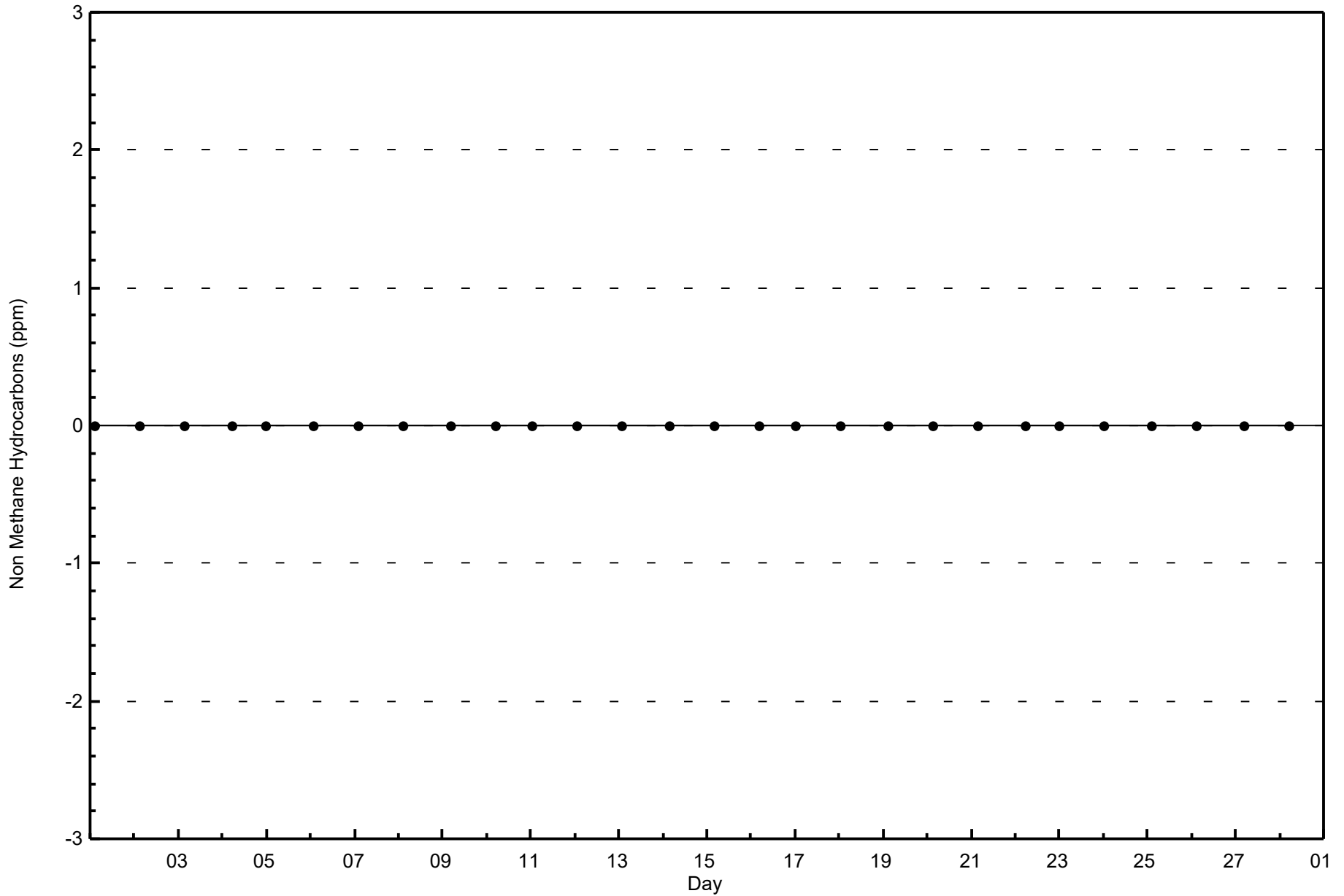
Total Number of Hours: 672

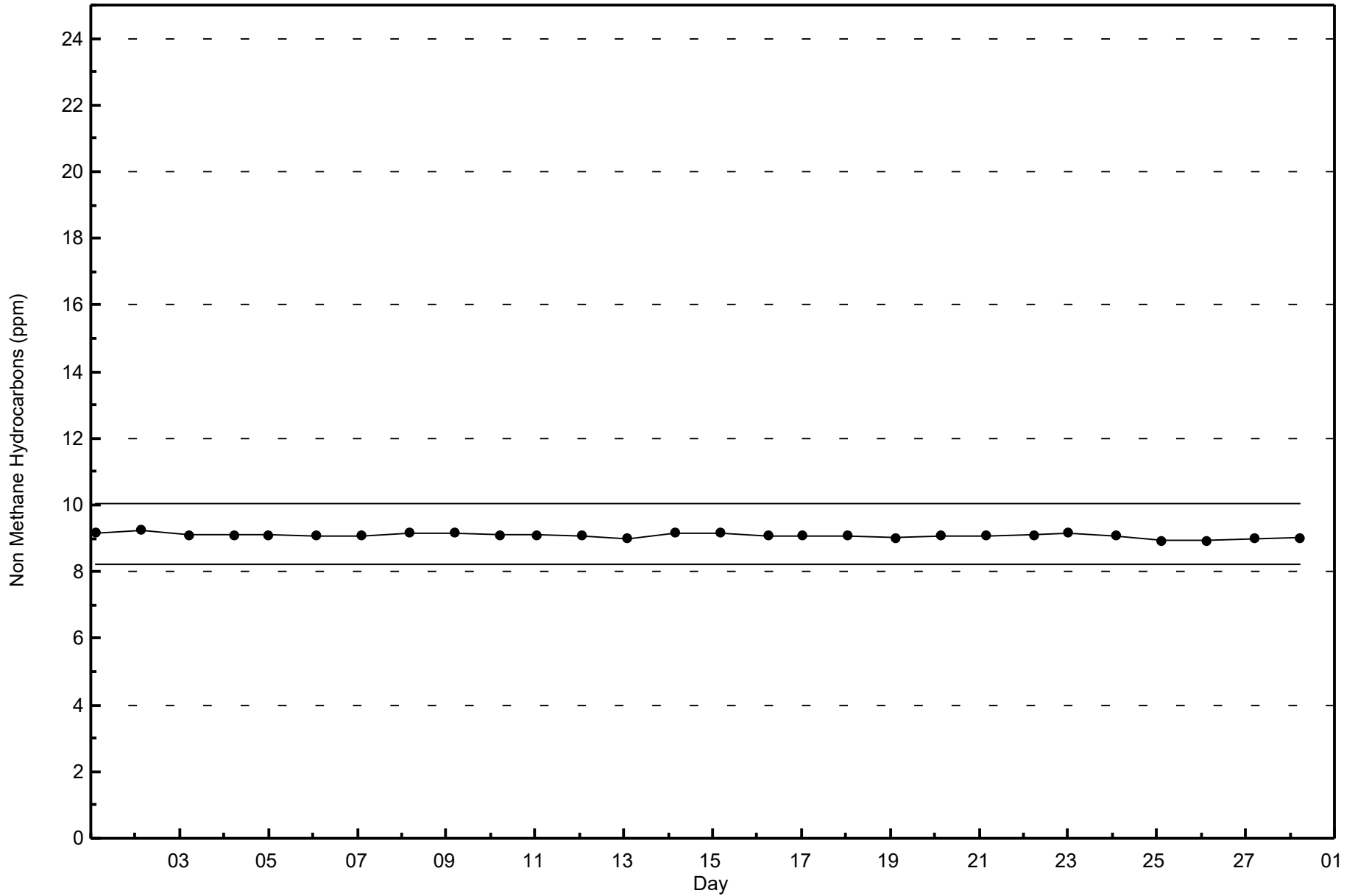


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Non Methane Hydrocarbons (NMHC) - ppm  
Barge Landing









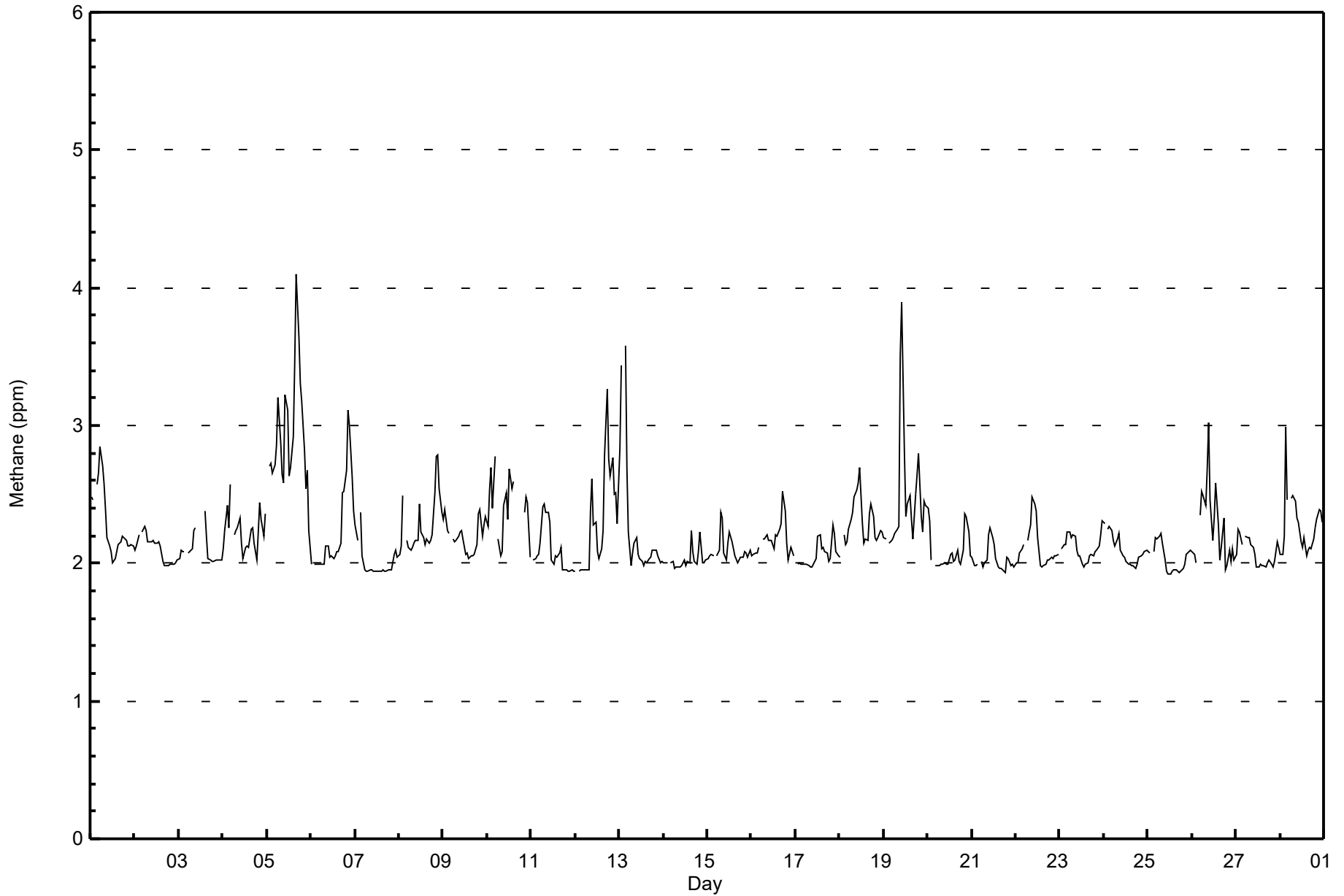
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Barge Landing - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 672														635							
Maximum Value: 4.1 ppm on Feb 5 17:00		Maximum Daily Average: 2.9 ppm on Feb 5		Hours of Data: 635														Hours of Missing Data: 37									
Minimum Value: 1.9 ppm on Feb 25 13:00		Minimum Daily Average: 2.0 ppm on Feb 7		Hours of Calibration: 32														Percent Operational Time: 99.3									
Maximum Diurnal Average: 2.3 ppm at hour 10		Minimum Diurnal Average: 2.1 ppm at hour 15		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> = 2.3 P <sub>90</sub> = 2.5 P <sub>99</sub> = 3.4																							
Monthly Average: 2.20 ppm																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Feb	2.5	2.5	Z	2.6	2.7	2.8	2.7	2.6	2.4	2.2	2.1	2.1	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.3	2.8	
2-Feb	2.1	2.1	2.2	Z	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	
3-Feb	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.3	C	C	C	C	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	
4-Feb	2.1	2.2	2.4	2.3	2.6	Z	2.2	2.2	2.3	2.3	2.1	2.0	2.1	2.1	2.1	2.2	2.3	2.1	2.0	2.2	2.4	2.3	2.2	2.4	2.2	2.6	
5-Feb	Z	2.7	2.7	2.7	2.7	2.9	3.2	2.9	2.6	2.6	3.2	3.1	2.6	2.7	2.9	3.5	4.1	3.6	3.3	3.2	2.8	2.5	2.7	2.2	2.9	4.1	
6-Feb	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.5	2.5	2.7	3.1	3.0	2.6	2.4	2.2	3.1	
7-Feb	2.3	2.2	Z	2.4	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	1.9	2.0	1.9	2.1	2.1	2.0	2.0	2.4	
8-Feb	2.1	2.1	2.5	Z	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.4	2.2	2.2	2.1	2.2	2.1	2.2	2.2	2.5	2.8	2.8	2.5	2.4	2.3	2.8	
9-Feb	2.3	2.4	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.4	2.4	2.2	2.3	2.3	2.2	2.4	
10-Feb	2.3	2.5	2.7	2.4	2.8	Z	2.2	2.1	2.1	2.4	2.5	2.3	2.7	2.5	2.6	PF	PF	PF	PF	PF	2.4	2.5	2.4	2.0	2.4	2.8	
11-Feb	Z	2.0	2.0	2.1	2.1	2.1	2.4	2.4	2.4	2.4	2.3	2.0	2.0	2.1	2.0	2.1	2.1	2.0	1.9	2.0	1.9	1.9	1.9	1.9	2.1	2.4	
12-Feb	1.9	Z	1.9	1.9	1.9	2.0	2.0	2.0	2.4	2.6	2.3	2.3	2.1	2.0	2.1	2.2	2.8	3.3	2.8	2.6	2.8	2.5	2.5	2.3	2.3	3.3	
13-Feb	2.8	3.4	Z	3.6	2.7	2.2	2.0	2.1	2.1	2.2	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	2.2	3.6	
14-Feb	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	2.2	2.1	2.0	2.0	2.1	2.2	2.0	2.0	2.0	2.0	2.2	2.2
15-Feb	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.4	2.3	2.1	2.0	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.4	
16-Feb	2.1	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.3	2.5	2.4	2.1	2.0	2.1	2.1	2.1	2.2	2.5	
17-Feb	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	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.3	2.2	2.1	2.1	2.1	2.3	
18-Feb	2.0	Z	2.2	2.1	2.2	2.2	2.3	2.4	2.5	2.5	2.6	2.7	2.3	2.1	2.2	2.2	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.7	
19-Feb	2.2	2.2	Z	2.1	2.2	2.2	2.2	2.2	2.3	3.5	3.9	2.8	2.3	2.4	2.5	2.3	2.2	2.5	2.6	2.8	2.3	2.2	2.4	2.4	2.5	3.9	
20-Feb	2.4	2.3	2.0	Z	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	2.0	2.0	2.1	2.4	2.3	2.2	2.1	2.1	2.4	
21-Feb	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.2	2.3	2.2	2.1	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.3	
22-Feb	2.0	2.0	2.1	2.1	2.1	Z	2.2	2.2	2.3	2.5	2.4	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.5	
23-Feb	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.1	2.3	
24-Feb	2.3	Z	2.2	2.3	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.3	
25-Feb	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.1	2.0	1.9	1.9	1.9	1.9	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	
26-Feb	2.1	2.1	2.0	Z	2.3	2.5	2.5	2.4	2.7	3.0	2.5	2.2	2.3	2.6	2.3	2.0	2.1	2.3	1.9	2.0	2.1	2.0	2.1	2.0	2.3	3.0	
27-Feb	2.1	2.2	2.2	2.1	Z	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	2.2	2.1	2.1	2.2	
28-Feb	2.1	2.1	2.2	3.0	2.5	Z	2.5	2.5	2.5	2.3	2.3	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.4	2.4	2.3	2.3	3.0	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan			C - Calibration			PF - Power Failure																					







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

**Methane (CH<sub>4</sub>) - ppm**  
**Barge Landing - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	206	32.44	32.44
2.1 - 3.0	415	65.35	97.80
3.1 - 10.0	14	2.20	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 635

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Barge Landing - February 2023**

<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	13	30	29	27	5	4	7	21	17	6	5	26	10	1	1	4	206
2.1 - 3.0	45	63	22	10	5	3	18	37	52	30	17	9	9	10	24	60	414
3.1 - 10.0	0	0	0	1	0	0	1	1	2	2	1	1	0	0	2	3	14
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	58	93	51	38	10	7	26	59	71	38	23	36	19	11	27	67	634

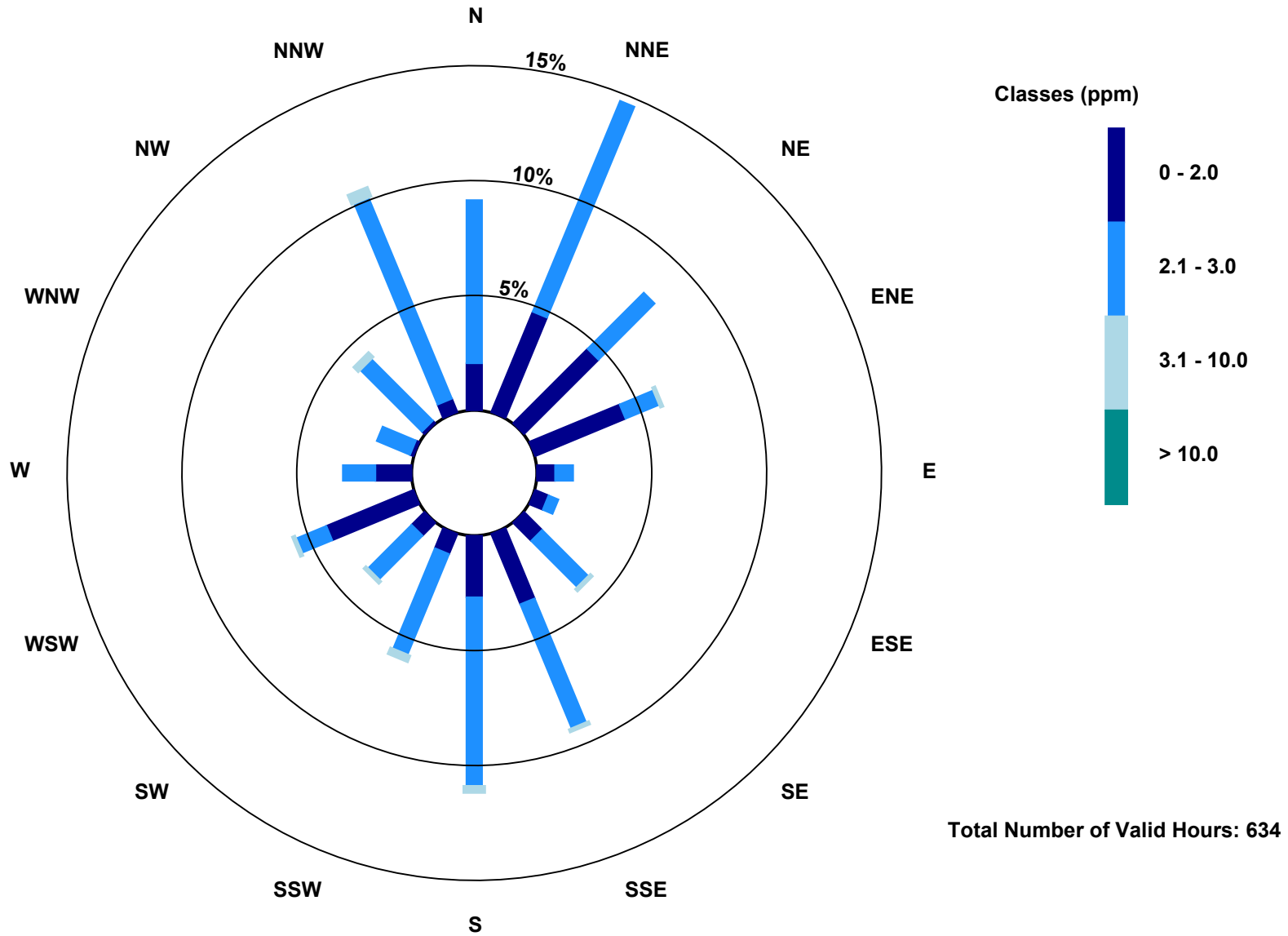
Total Number of Valid Hours: 634

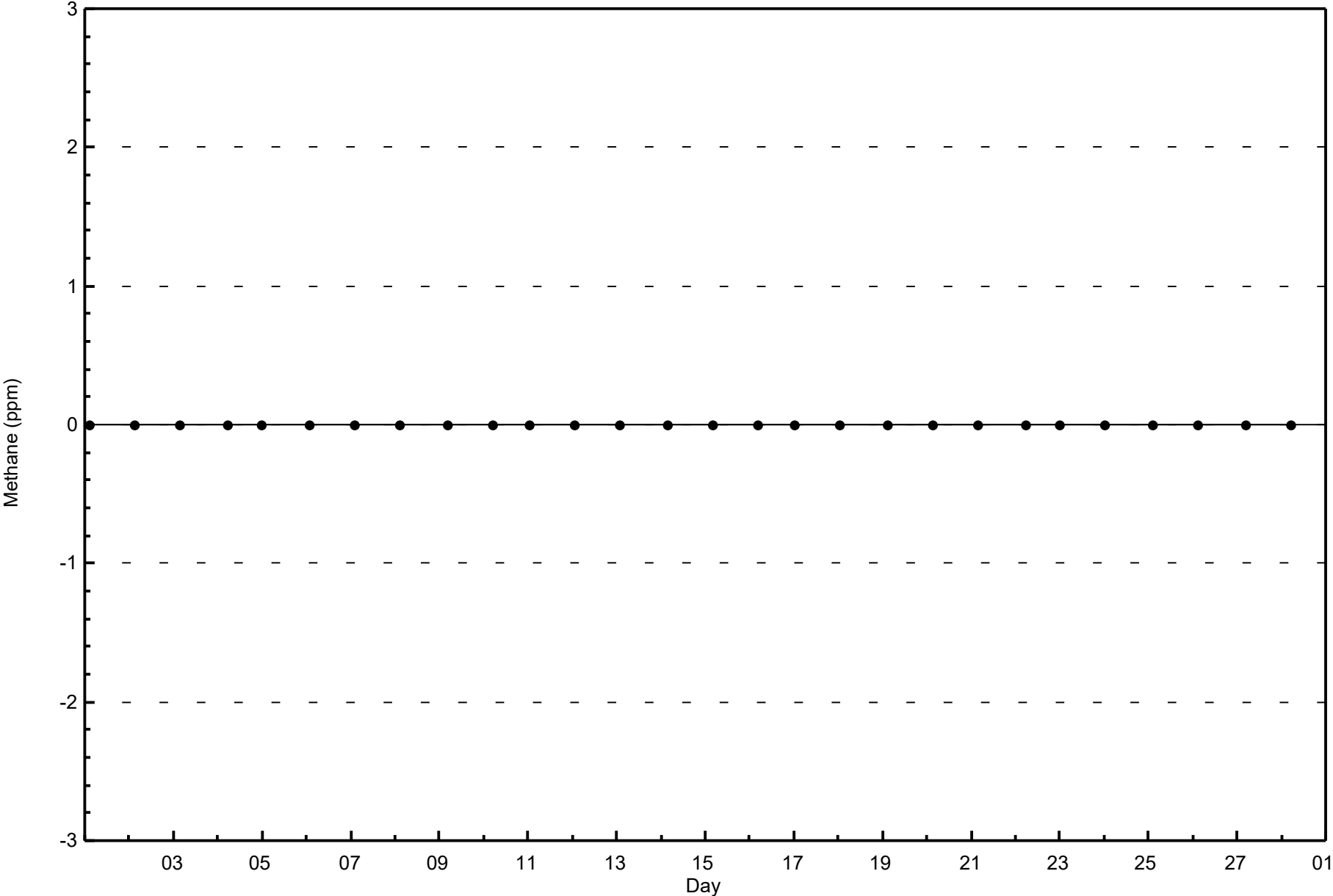
Total Number of Hours: 672

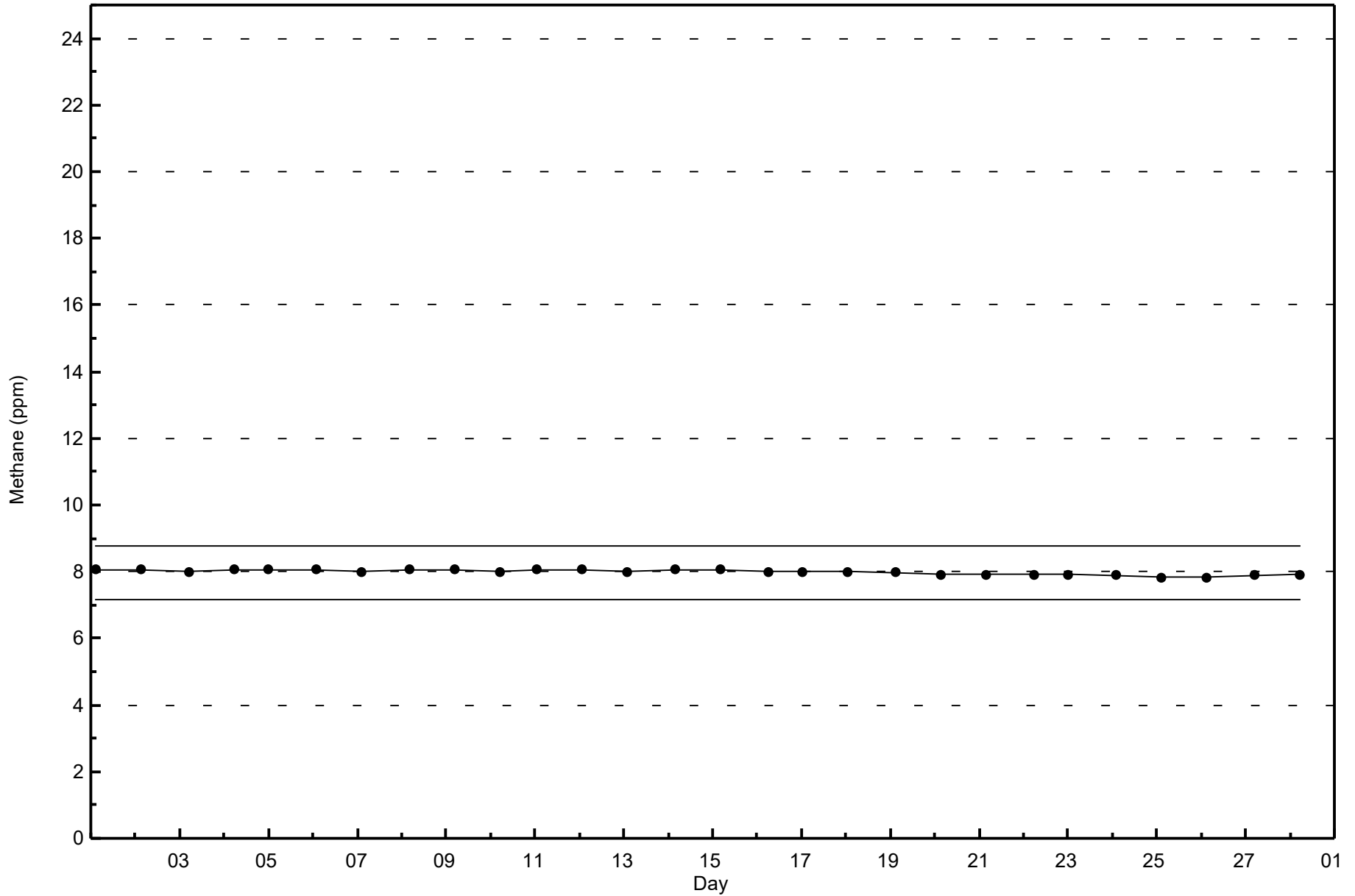


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Methane (CH<sub>4</sub>) - ppm  
Barge Landing

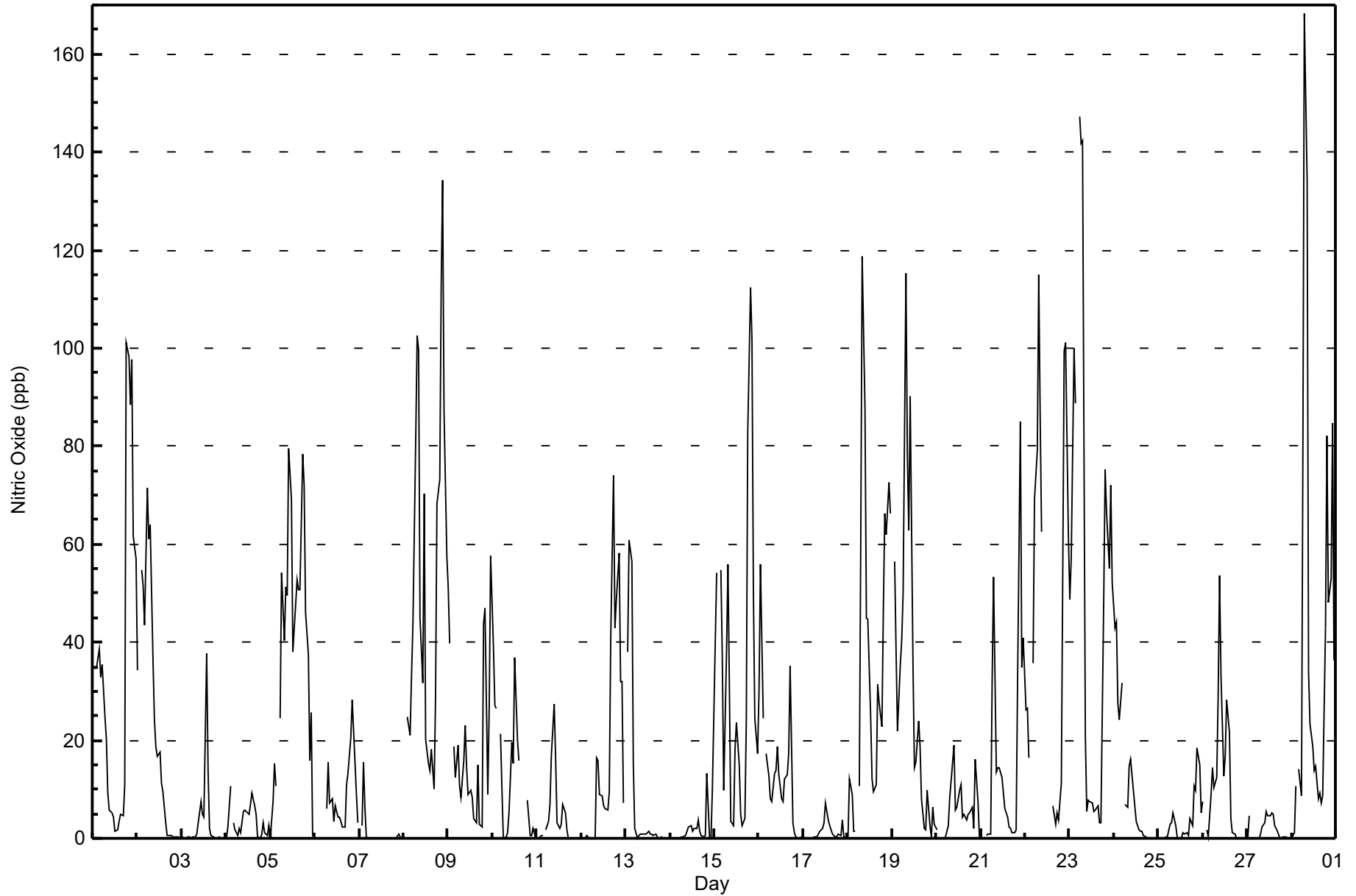








Maximum Value: 168.3 ppb on Feb 28 08:00      Maximum Daily Average: 51.9 ppb on Feb 8																						Hours in Service: 672 Hours of Data: 635				
Minimum Value: 0.0 ppb on Feb 6 01:00      Minimum Daily Average: 1.1 ppb on Feb 7 Maximum Diurnal Average: 36.1 ppb at hour 8      Minimum Diurnal Average: 7.3 ppb at hour 16 Monthly Average: 18.85 ppb      Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.6 Median = 6.5 Q <sub>3</sub> = 24.9 P <sub>90</sub> = 56.9 P <sub>99</sub> = 117.5																						Hours of Missing Data: 37 Hours of Calibration: 33 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-Feb	Z	34.7	34.8	38.6	32.8	35.4	24.9	20.0	9.2	5.7	5.3	4.4	1.4	1.8	3.5	4.9	4.7	11.0	101.3	98.1	88.4	97.7	61.6	57.2	33.8	101.3
2-Feb	34.1	Z	54.7	51.5	43.6	71.4	61.0	64.1	36.3	24.1	18.7	16.6	17.5	11.3	9.5	3.3	0.6	0.4	0.5	0.3	0.3	0.2	0.2	0.0	22.6	71.4
3-Feb	0.0	0.2	Z	0.3	0.2	0.1	0.4	0.3	0.8	3.2	7.4	4.9	4.3	37.6	13.6	1.9	0.6	0.2	0.1	0.1	0.2	0.0	0.0	0.0	3.3	37.6
4-Feb	0.0	2.2	10.6	Z	3.2	1.7	0.5	2.1	1.2	5.5	5.7	5.6	5.0	7.0	9.2	6.8	5.0	0.4	0.1	0.8	3.1	1.2	0.6	2.7	3.5	10.6
5-Feb	0.1	7.6	15.3	10.7	Z	24.4	54.1	40.4	51.3	49.6	79.6	69.1	38.1	43.0	52.7	50.6	50.7	78.3	72.0	46.0	37.5	15.7	25.5	0.6	39.7	79.6
6-Feb	0.0	0.0	0.0	0.0	0.0	Z	6.1	15.5	7.1	8.1	3.5	6.7	4.4	4.3	3.5	2.3	2.3	11.0	13.2	20.4	28.4	22.0	9.0	3.3	7.4	28.4
7-Feb	Z	2.5	15.7	6.4	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	0.9	0.2	0.1	1.1	15.7
8-Feb	0.1	Z	24.8	21.0	33.1	43.9	82.2	102.6	99.8	45.0	31.6	70.4	20.2	15.4	13.9	18.2	10.1	28.5	68.2	73.3	112.4	134.2	87.2	57.7	51.9	134.2
9-Feb	50.9	39.9	Z	18.7	12.5	19.1	10.6	8.4	15.8	23.1	14.3	8.9	9.7	8.4	4.1	3.1	15.0	3.0	2.4	43.8	47.1	8.8	26.7	57.6	19.6	57.6
10-Feb	38.9	27.0	26.4	Z	21.3	10.2	0.1	0.1	1.2	5.0	19.5	15.2	36.8	20.0	15.8	PF	PF	PF	PF	7.6	0.5	0.5	2.0	0.1	13.1	38.9
11-Feb	0.0	0.1	0.7	0.5	Z	1.8	3.6	6.8	16.9	27.5	16.3	3.1	1.9	2.7	6.8	5.2	1.9	0.0	0.0	0.0	0.0	0.1	0.0	0.0	4.2	27.5
12-Feb	0.0	0.0	0.0	0.5	0.0	Z	0.1	0.0	16.5	15.7	9.1	8.6	6.7	6.1	5.9	9.4	40.3	74.0	43.1	48.6	58.2	31.9	32.1	7.1	18.0	74.0
13-Feb	Z	38.1	60.8	56.6	15.3	2.1	0.0	0.6	0.8	1.0	0.9	1.0	1.5	1.0	0.9	0.7	0.9	0.2	0.1	0.2	0.1	0.1	0.0	0.0	7.9	60.8
14-Feb	0.0	Z	0.0	0.1	0.0	0.1	0.2	0.2	0.5	1.3	2.2	2.6	1.6	2.1	1.9	3.8	1.4	0.5	0.3	0.5	13.2	0.1	0.1	10.5	1.9	13.2
15-Feb	39.9	54.1	Z	54.9	36.9	9.7	38.0	55.8	31.5	3.6	2.7	18.2	23.6	15.0	4.8	2.7	4.0	24.1	82.6	112.4	101.6	50.7	24.6	17.3	35.2	112.4
16-Feb	30.2	55.9	24.6	Z	17.2	12.7	7.9	7.5	13.3	13.8	18.6	12.8	8.1	7.5	12.1	13.0	17.1	35.1	3.1	1.3	0.3	0.1	0.1	0.3	13.6	55.9
17-Feb	0.1	0.0	0.0	0.1	Z	0.1	0.2	0.3	0.7	1.3	2.0	3.2	7.2	3.6	2.7	1.7	0.9	0.3	0.2	0.7	0.5	3.7	0.4	0.1	1.3	7.2
18-Feb	0.4	12.1	8.8	1.5	1.3	Z	10.5	60.3	118.6	87.9	44.8	44.5	24.9	12.1	9.5	10.8	31.4	27.7	22.9	46.3	66.2	62.1	72.7	66.4	36.7	118.6
19-Feb	Z	56.6	38.4	22.0	35.4	40.3	50.3	115.2	78.3	63.0	90.2	35.2	14.5	15.6	24.1	18.6	8.1	2.1	1.9	9.8	2.5	0.4	6.5	2.8	31.8	115.2
20-Feb	1.8	Z	0.0	0.1	0.0	0.4	2.7	8.4	11.7	19.1	5.7	6.3	9.9	10.9	4.3	4.9	3.8	4.8	5.2	6.5	2.0	16.2	7.4	0.2	5.8	19.1
21-Feb	0.1	0.1	Z	0.4	0.8	0.9	31.8	53.2	13.5	14.5	14.4	12.5	9.1	6.1	4.2	2.2	2.0	1.2	1.1	1.7	31.3	84.9	34.8	40.9	15.7	84.9
22-Feb	26.3	26.6	16.5	Z	35.8	69.1	79.1	114.8	86.6	62.6	C	C	C	C	C	6.6	2.8	5.1	3.8	11.3	54.0	99.4	101.3	61.5	47.9	114.8
23-Feb	48.7	57.1	99.9	88.6	Z	147.1	141.7	142.3	20.9	5.4	7.7	7.5	7.3	5.5	5.9	6.8	3.3	3.1	48.7	75.3	66.5	54.9	71.9	52.3	50.8	147.1
24-Feb	43.0	44.0	27.6	24.3	31.7	Z	7.0	6.4	14.6	16.2	9.7	6.6	3.3	1.7	1.3	1.3	0.6	0.4	0.1	0.0	0.0	0.0	0.0	0.0	10.4	44.0
25-Feb	Z	0.0	0.1	0.1	0.2	0.4	2.9	3.3	5.2	2.7	0.3	0.1	0.1	1.2	1.0	1.2	0.7	4.0	2.5	10.6	9.9	18.6	15.0	5.3	3.7	18.6
26-Feb	7.6	Z	1.8	0.4	9.0	14.4	10.5	12.5	28.9	53.5	33.4	12.6	16.6	28.1	21.7	3.9	1.3	0.9	0.0	0.1	0.1	0.1	0.1	0.1	11.2	53.5
27-Feb	0.1	4.6	Z	0.0	0.0	0.0	0.0	0.7	2.3	3.3	5.4	4.5	4.5	5.2	4.9	2.7	1.3	0.5	0.1	0.4	0.4	0.2	0.0	0.0	1.8	5.4
28-Feb	0.1	1.1	10.7	Z	14.1	8.6	80.2	168.3	134.0	34.1	23.3	18.8	13.8	14.7	8.2	9.2	7.1	8.7	42.9	82.2	48.2	53.1	84.8	36.3	39.2	168.3
14.0 20.2 20.5 17.3 14.4 21.4 25.2 36.1 29.2 21.3 17.5 14.8 10.8 10.7 9.1 7.3 8.1 12.1 19.1 24.9 27.6 27.1 23.8 17.2																								Diurnal Average		
50.9 57.1 99.9 88.6 43.6 147.1 141.7 168.3 134.0 87.9 90.2 70.4 38.1 43.0 52.7 50.6 50.7 78.3 101.3 112.4 112.4 134.2 101.3 66.4																								Diurnal Maximum		
Z - zerspan			C - Calibration				PF - Power Failure																			





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Barge Landing - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	457	71.97	71.97
21 - 40	72	11.34	83.31
41 - 80	75	11.81	95.12
81 - 159	30	4.72	99.84
> 159	1	0.16	100.00

Total Number of Valid Hours: 635

Total Number of Hours: 672





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

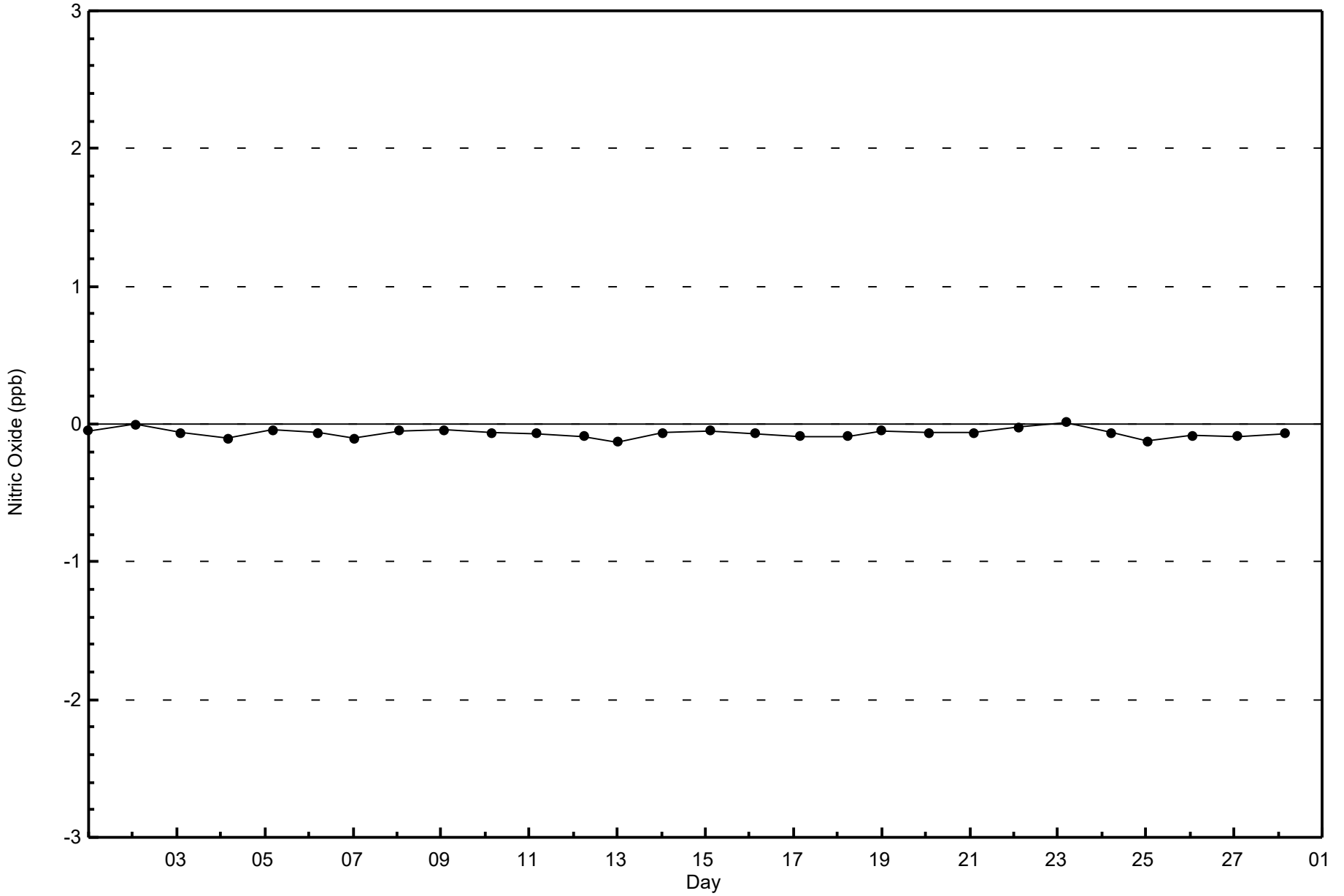
**Nitric Oxide (NO) - ppb**  
**Barge Landing - February 2023**

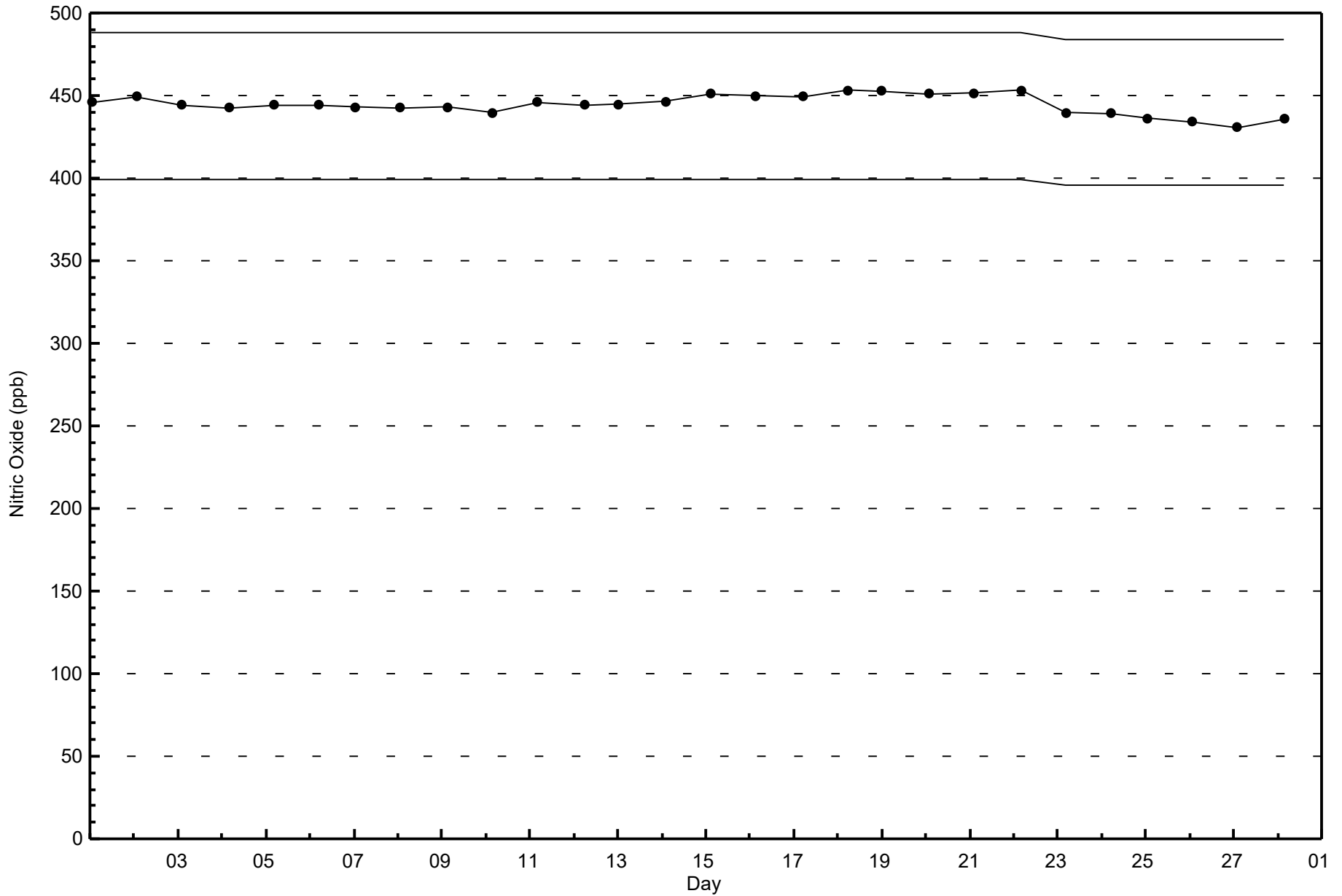
<b>Concentration</b> <b>Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	47	82	45	31	7	4	12	37	40	27	15	28	16	6	15	45	457
21 - 40	7	6	4	2	0	2	2	8	16	1	3	2	3	1	6	9	72
11 - 80	4	2	2	3	1	1	8	14	12	6	3	2	1	1	2	13	75
81 - 159	0	1	1	2	2	0	3	3	5	0	1	2	1	1	3	4	29
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>Totals</b>	58	91	52	38	10	7	25	62	73	34	22	34	21	9	27	71	634

Total Number of Valid Hours: 634

Total Number of Hours: 672









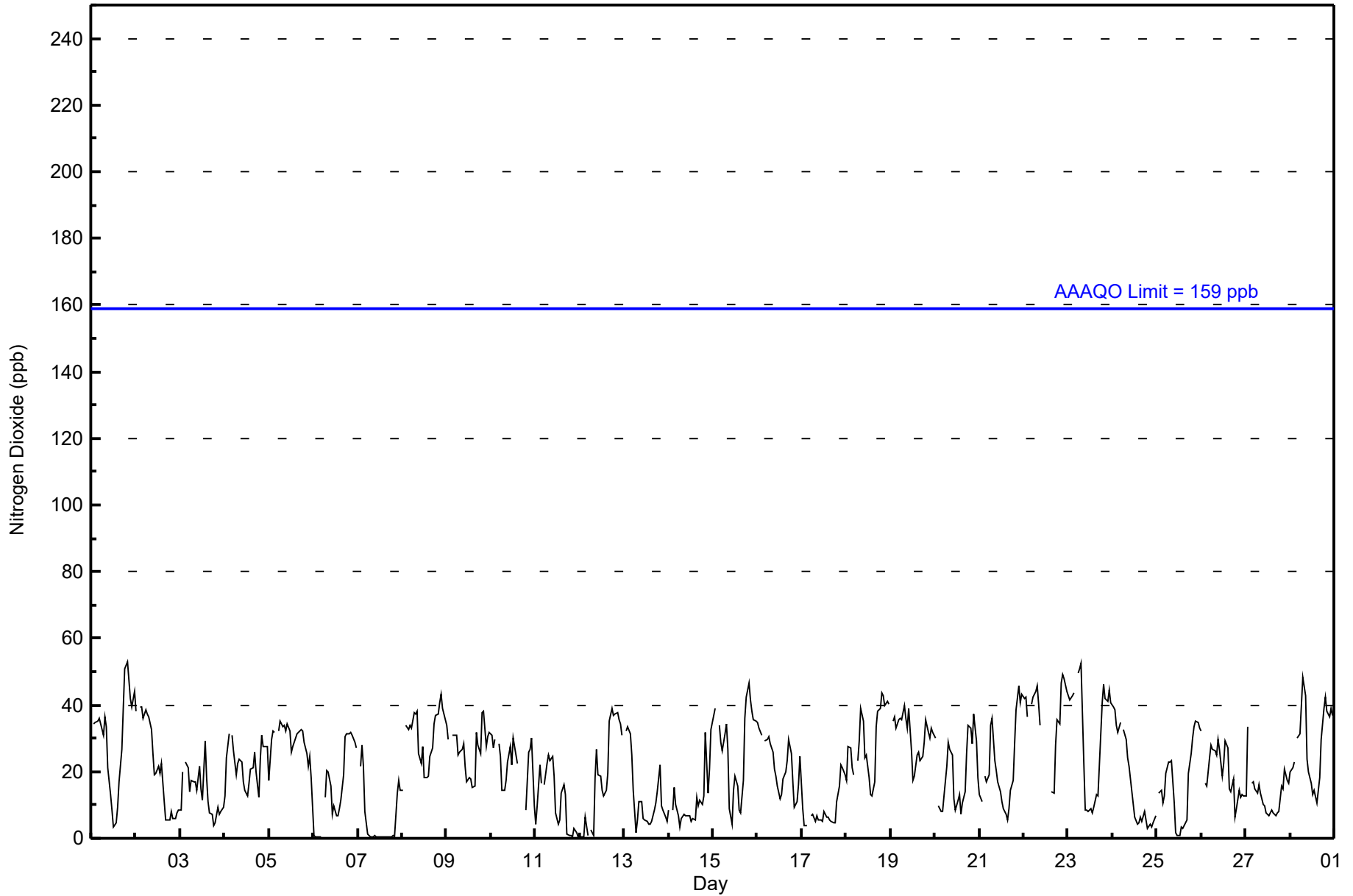
# Wood Buffalo Environmental Association

## Summary of Hour Averages

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

## Barge Landing - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																																																															
Maximum Value: 52.9 ppb on Feb 1 20:00		Maximum Daily Average: 37.8 ppb on Feb 22				Hours of Data:		635																																																															
Minimum Value: 0.3 ppb on Feb 7 17:00		Minimum Daily Average: 5.8 ppb on Feb 7				Hours of Missing Data:		37																																																															
Maximum Diurnal Average: 26.3 ppb at hour 21		Minimum Diurnal Average: 12.3 ppb at hour 13				Hours of Calibration:		33																																																															
Monthly Average: 21.06 ppb		Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 4.9 Q <sub>1</sub> = 9.8 Median = 20.1 Q <sub>3</sub> = 31.6 P <sub>90</sub> = 38.2 P <sub>99</sub> = 48.1				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-Feb	Z	34.4	34.9	35.1	36.1	34.2	31.1	36.4	33.5	21.1	13.0	8.6	3.2	4.7	9.4	16.9	26.8	38.9	51.0	52.9	47.5	41.8	39.6	44.0	30.2	52.9																																													
2-Feb	38.2	Z	39.5	39.3	36.1	38.4	37.3	36.4	32.8	25.3	19.1	19.3	21.7	19.5	22.4	11.0	5.4	5.4	5.4	8.2	5.9	5.9	7.5	8.4	21.2	39.5																																													
3-Feb	8.3	20.1	Z	22.7	21.2	14.1	17.2	17.0	17.1	14.4	21.7	14.7	11.6	29.3	18.1	11.0	7.7	7.2	3.7	4.6	9.3	7.0	7.9	9.5	13.7	29.3																																													
4-Feb	12.6	24.2	31.2	Z	30.8	26.1	18.9	22.4	23.7	22.9	17.1	14.2	12.8	16.7	20.7	21.2	26.0	19.8	12.4	23.8	31.0	27.7	27.4	27.4	22.2	31.2																																													
5-Feb	17.4	29.5	32.1	31.6	Z	32.3	35.0	33.3	33.9	32.0	34.4	32.3	25.8	27.5	30.2	31.2	31.6	32.7	32.0	28.9	25.4	21.8	24.7	18.3	29.3	35.0																																													
6-Feb	0.7	0.5	0.5	0.6	0.6	Z	12.4	20.4	20.0	15.7	7.2	9.8	6.9	6.7	8.7	11.4	19.0	30.7	31.4	31.5	31.7	30.8	28.9	27.3	15.4	31.7																																													
7-Feb	Z	21.8	27.9	21.8	8.1	1.1	0.7	0.6	0.6	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.3	0.4	0.5	0.8	0.4	13.4	17.4	14.3	5.8	27.9																																													
8-Feb	14.3	Z	33.8	32.8	33.8	33.1	37.6	37.4	38.1	25.4	22.5	27.7	18.3	18.2	18.7	24.4	27.2	34.2	37.0	37.4	40.5	43.2	39.0	35.6	30.9	43.2																																													
9-Feb	33.7	29.5	Z	30.8	30.8	30.9	24.9	25.9	26.6	28.4	21.5	17.1	18.1	18.0	15.4	15.7	31.7	28.0	25.6	37.6	38.2	27.5	30.4	31.6	26.9	38.2																																													
10-Feb	30.9	27.3	29.5	Z	28.5	24.4	14.2	14.4	17.4	22.7	27.7	21.9	30.1	24.9	22.4	PF	PF	PF	PF	8.3	25.7	26.7	30.2	9.8	23.0	30.9																																													
11-Feb	4.4	9.7	22.1	16.5	Z	16.0	22.3	24.8	23.3	24.7	18.8	7.7	4.1	5.7	13.7	16.0	13.2	1.2	0.9	0.8	0.5	3.1	1.6	0.5	10.9	24.8																																													
12-Feb	0.4	0.3	0.4	6.3	0.9	Z	2.7	0.9	18.4	26.7	19.1	18.5	14.3	12.7	14.2	19.6	35.1	38.8	36.7	37.3	37.6	35.4	34.2	30.8	19.2	38.8																																													
13-Feb	Z	32.2	33.5	31.5	24.9	14.6	1.7	5.5	10.9	11.2	6.1	5.4	5.2	4.4	4.4	4.9	8.5	10.4	14.0	21.9	9.9	8.5	6.4	5.1	12.2	33.5																																													
14-Feb	8.5	Z	8.5	15.1	10.3	6.6	3.5	5.9	7.2	6.7	6.9	6.7	4.9	5.9	5.5	12.1	9.9	11.3	10.0	12.7	31.6	13.5	20.6	32.5	11.1	32.5																																													
15-Feb	37.0	39.1	Z	33.7	28.9	26.1	31.2	34.5	26.8	8.9	4.4	14.4	18.8	15.5	8.6	7.7	17.4	36.0	42.4	46.6	41.7	38.2	35.7	35.0	27.3	46.6																																													
16-Feb	34.6	33.2	30.8	Z	29.2	29.6	30.3	28.5	25.9	20.6	18.5	15.8	11.8	13.0	18.0	19.9	23.5	29.7	25.3	17.1	9.2	10.9	16.0	24.7	22.4	34.6																																													
17-Feb	9.1	3.7	4.0	3.7	Z	6.9	7.4	5.2	6.9	5.5	5.4	5.0	7.9	6.4	6.2	5.5	5.2	4.5	4.5	11.1	15.6	21.9	21.1	18.9	8.3	21.9																																													
18-Feb	17.5	27.6	27.3	21.3	19.0	Z	23.4	29.1	39.1	35.1	24.1	24.9	18.2	13.1	12.8	16.8	33.4	38.1	39.0	43.8	42.7	40.0	40.9	40.1	29.0	43.8																																													
19-Feb	Z	35.2	36.4	33.2	35.7	35.9	35.6	39.7	36.2	33.2	39.0	26.3	17.3	18.8	25.0	25.8	23.2	24.5	28.8	35.5	31.9	30.1	33.0	31.8	31.0	39.7																																													
20-Feb	29.9	Z	9.7	8.0	8.0	12.6	21.8	28.7	26.8	25.2	11.7	8.6	11.3	13.0	7.3	10.4	14.0	25.5	33.8	33.1	28.3	37.3	29.3	18.2	19.7	37.3																																													
21-Feb	13.1	11.2	Z	18.7	17.1	19.1	34.1	36.2	23.1	20.2	16.9	13.9	11.1	9.0	7.1	5.7	9.0	14.5	17.4	28.5	38.4	45.9	40.8	43.1	21.5	45.9																																													
22-Feb	42.0	42.5	36.3	Z	40.2	42.4	44.2	45.6	40.3	33.8	C	C	C	C	C	14.1	13.6	27.9	35.5	34.5	46.4	49.3	47.7	43.9	37.8	49.3																																													
23-Feb	42.6	41.5	42.9	43.5	Z	49.4	50.7	52.4	22.4	8.6	8.3	8.1	8.8	7.6	9.2	13.0	12.7	22.0	40.6	46.3	42.1	41.0	44.7	40.7	30.4	52.4																																													
24-Feb	39.3	38.6	34.1	31.6	34.9	Z	32.5	29.8	24.3	21.5	13.8	10.2	6.3	4.2	4.5	6.3	5.1	7.9	5.6	3.1	4.1	3.4	4.5	6.7	16.2	39.3																																													
25-Feb	Z	13.4	14.6	10.8	12.9	19.4	23.0	22.7	23.3	10.8	1.5	0.8	0.7	3.6	3.0	4.6	5.6	19.4	25.4	30.2	33.6	35.2	34.7	32.9	16.6	35.2																																													
26-Feb	32.1	Z	16.4	15.6	24.0	27.8	26.8	26.1	24.8	29.7	26.5	18.7	22.6	29.1	27.1	15.0	13.9	17.8	6.4	9.1	14.6	12.3	13.0	12.7	20.1	32.1																																													
27-Feb	12.6	33.4	Z	16.5	16.9	14.7	13.4	16.3	13.4	10.0	9.9	7.8	6.9	7.5	8.5	7.7	6.7	7.5	7.9	15.5	14.7	20.9	17.5	16.6	13.2	33.4																																													
28-Feb	19.8	21.3	22.7	Z	30.2	31.2	39.7	48.3	42.8	23.9	19.9	16.4	13.1	14.4	10.7	14.4	18.4	29.8	38.8	42.5	38.1	36.6	38.8	36.8	28.2	48.3																																													
																								21.7	24.8	24.7	22.6	23.3	24.5	24.1	25.9	24.3	20.2	16.1	13.9	12.3	13.0	13.0	13.4	16.4	20.9	22.7	25.1	26.3	26.0	26.2	24.9	Diurnal Average																							
																								42.6	42.5	42.9	43.5	40.2	49.4	50.7	52.4	42.8	35.1	39.0	32.3	30.1	29.3	30.2	31.2	35.1	38.9	51.0	52.9	47.5	49.3	47.7	44.0	Diurnal Maximum																							
Z - zerospan																								C - Calibration																								PF - Power Failure																							
Alberta Ambient Air Quality Objectives (AAAQO):																								1-hr 159 ppb																																															





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Barge Landing - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	320	50.39	50.39
21 - 40	274	43.15	93.54
41 - 80	41	6.46	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 635

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Barge Landing - February 2023**

<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	26	68	40	27	5	1	3	24	29	16	12	27	14	4	4	20	320
21 - 40	31	21	10	11	4	6	16	34	36	15	9	4	6	4	21	46	274
11 - 80	1	2	2	0	1	0	6	4	8	3	1	3	1	1	2	5	40
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>	58	91	52	38	10	7	25	62	73	34	22	34	21	9	27	71	634

Total Number of Valid Hours: 634

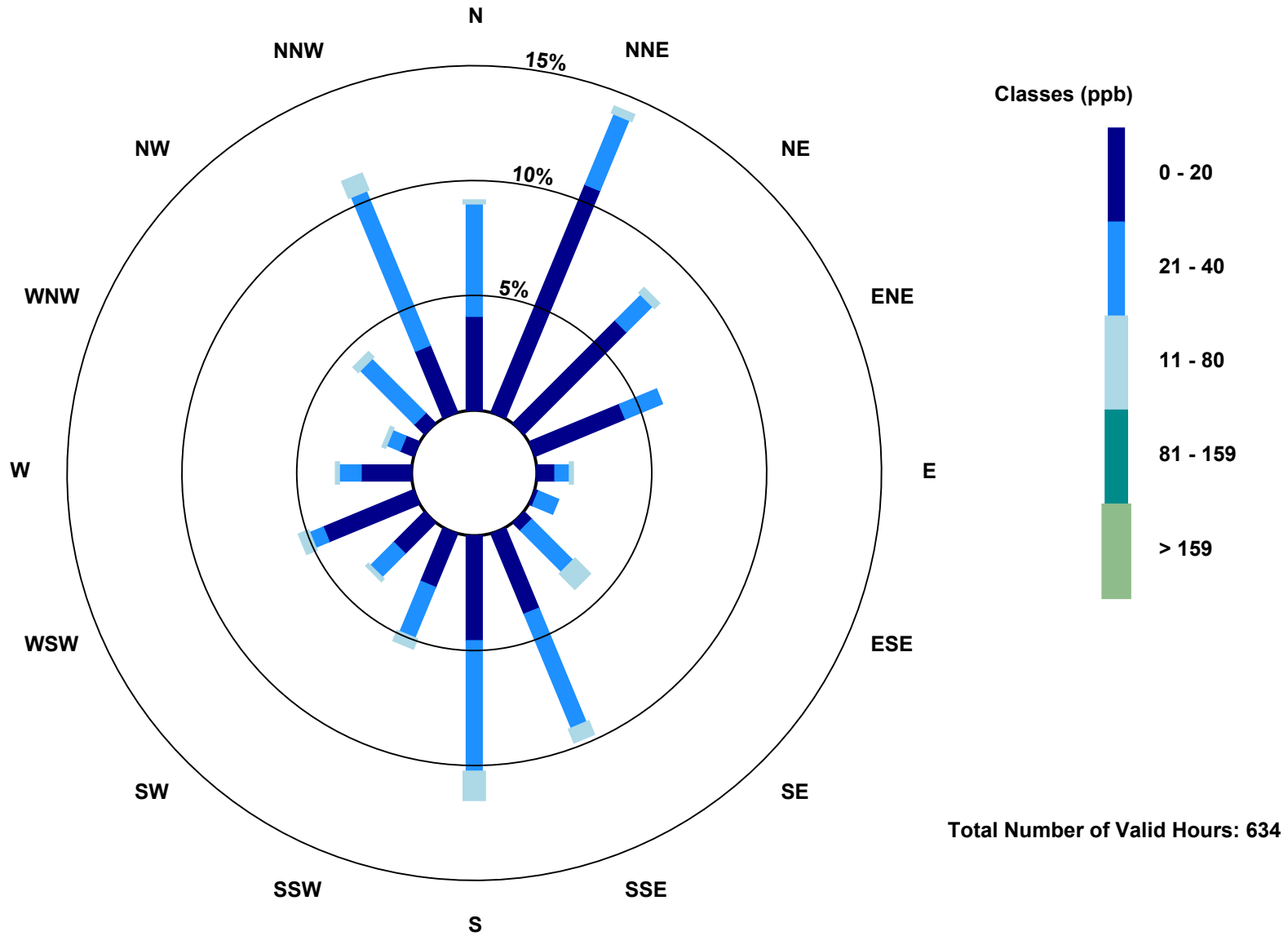
Total Number of Hours: 672

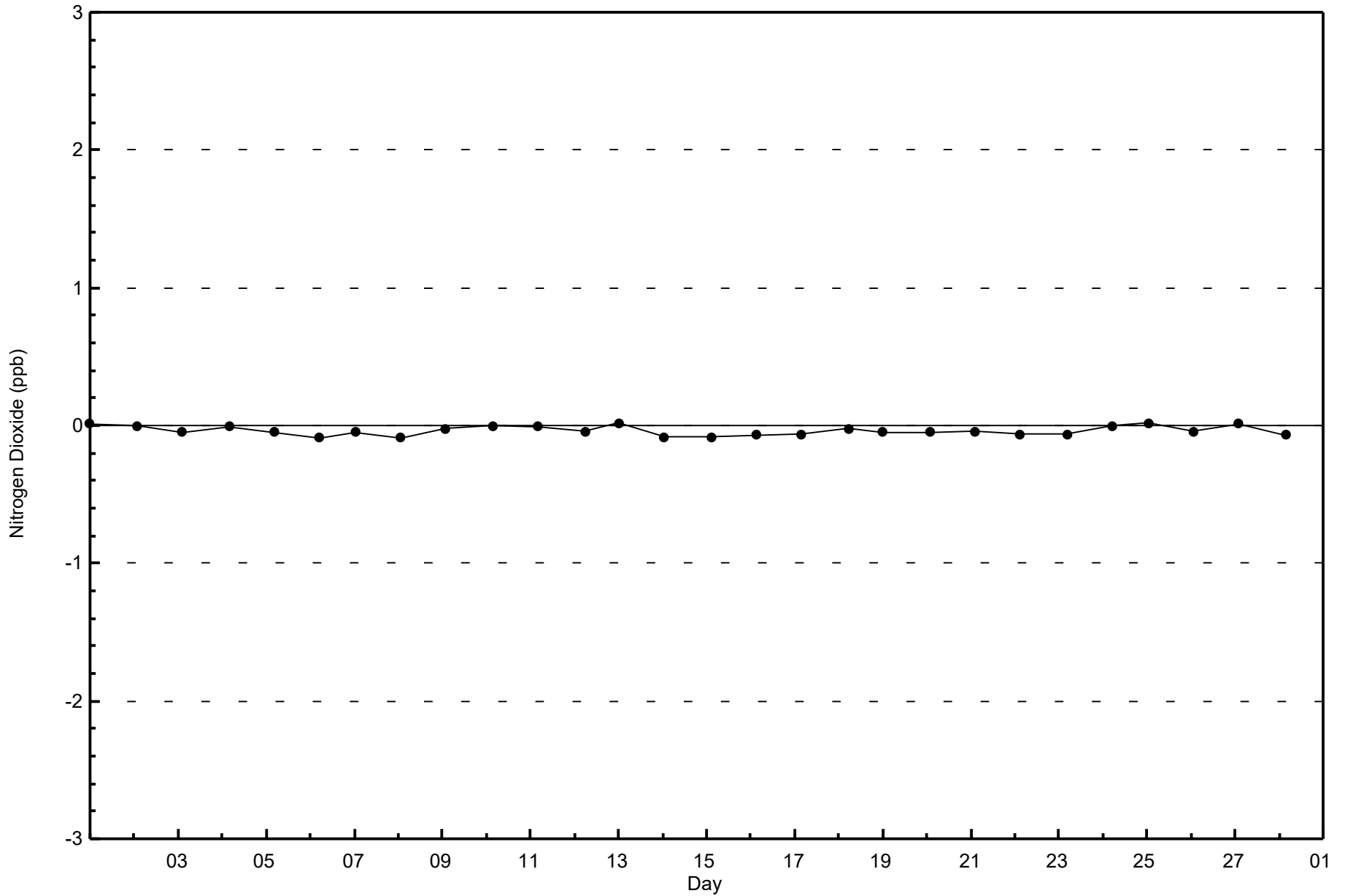


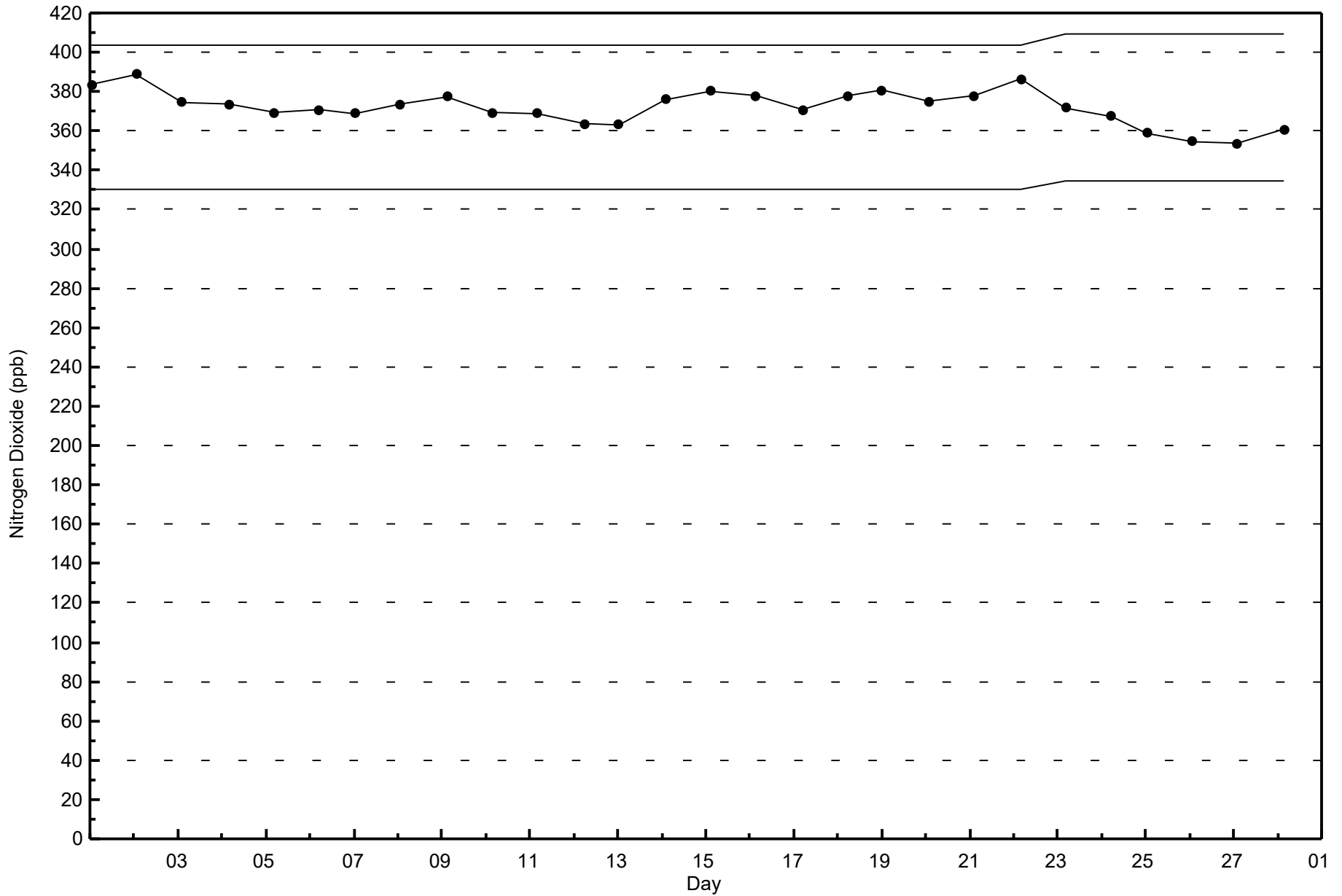


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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





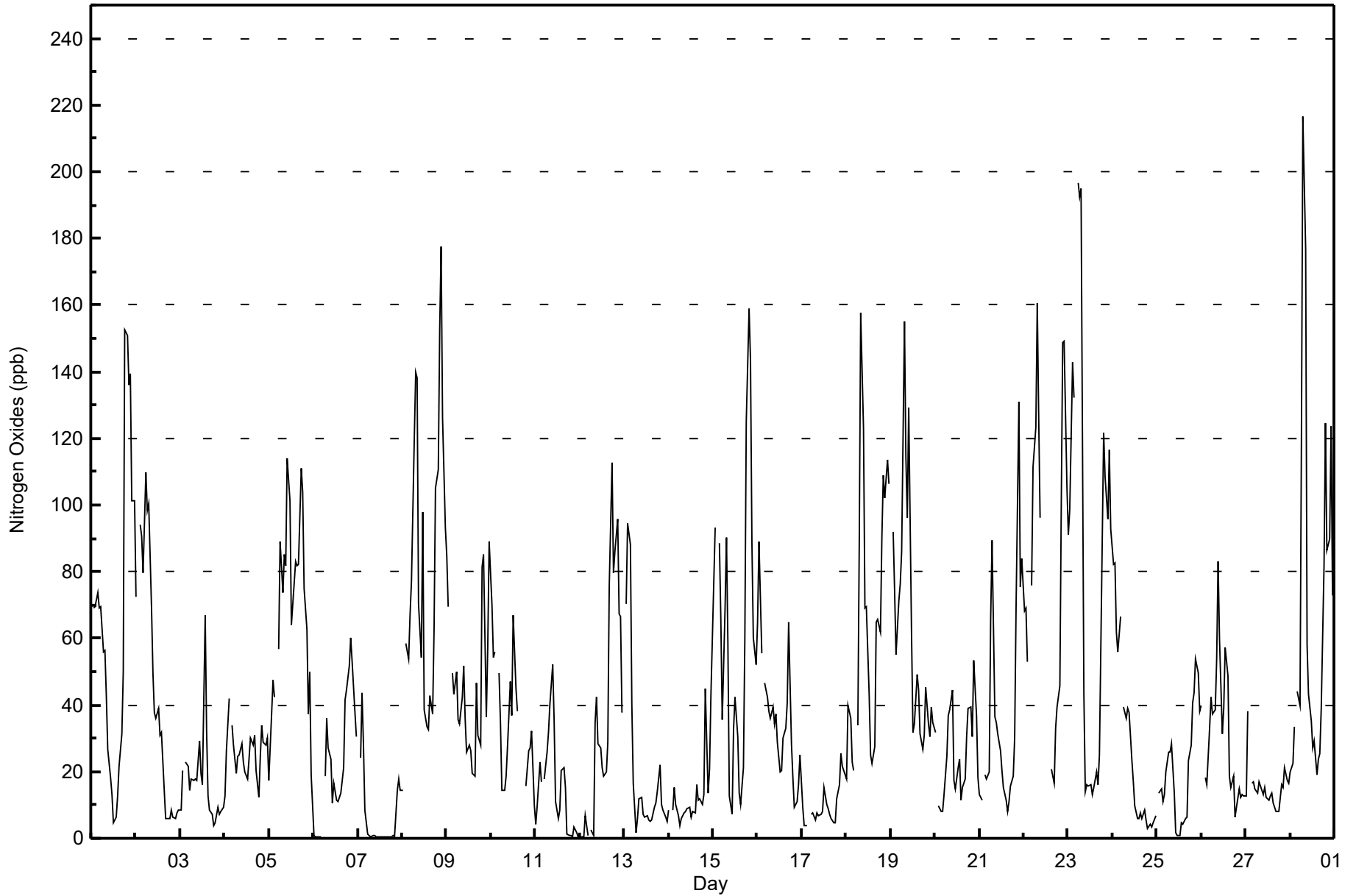




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Barge Landing - February 2023**

Maximum Value: 216.6 ppb on Feb 28 08:00      Maximum Daily Average: 85.7 ppb on Feb 22																						Hours in Service: 672					
Minimum Value: 0.3 ppb on Feb 7 17:00      Minimum Daily Average: 6.9 ppb on Feb 7																						Hours of Data: 635					
Maximum Diurnal Average: 61.9 ppb at hour 8      Minimum Diurnal Average: 20.7 ppb at hour 16																						Hours of Missing Data: 37					
Monthly Average: 39.92 ppb      Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 5.9 Q <sub>1</sub> = 12.7 Median = 27.8 Q <sub>3</sub> = 56.0 P <sub>90</sub> = 93.9 P <sub>99</sub> = 159.9																						Hours of Calibration: 33					
																						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-Feb	Z	69.1	69.7	73.7	68.9	69.6	56.0	56.4	42.7	26.8	18.3	13.0	4.6	6.5	12.9	21.8	31.5	49.9	152.3	151.0	135.9	139.5	101.2	101.2	64.0	152.3	
2-Feb	72.3	Z	94.2	90.8	79.7	109.8	98.3	100.5	69.1	49.4	37.8	35.9	39.2	30.8	31.9	14.3	6.0	5.8	5.9	8.5	6.2	6.1	7.7	8.4	43.9	109.8	
3-Feb	8.3	20.3	Z	23.0	21.4	14.2	17.6	17.3	17.9	17.6	29.1	19.6	15.9	66.9	31.7	12.9	8.3	7.4	3.8	4.7	9.5	7.0	7.9	9.5	17.0	66.9	
4-Feb	12.6	26.4	41.8	Z	34.0	27.8	19.4	24.5	24.9	28.4	22.8	19.8	17.8	23.7	29.9	28.0	31.0	20.2	12.5	24.6	34.1	28.9	28.0	30.1	25.7	41.8	
5-Feb	17.5	37.1	47.4	42.3	Z	56.7	89.1	73.7	85.2	81.6	114.0	101.4	63.9	70.5	82.9	81.8	82.3	111.0	104.0	74.9	62.9	37.5	50.2	18.9	69.0	114.0	
6-Feb	0.7	0.5	0.5	0.6	0.6	Z	18.5	35.9	27.1	23.8	10.7	16.5	11.3	11.0	12.2	13.7	21.3	41.7	44.6	51.9	60.1	52.8	37.9	30.6	22.8	60.1	
7-Feb	Z	24.3	43.6	28.2	8.3	1.1	0.7	0.6	0.6	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.3	0.4	0.5	0.8	0.4	14.3	17.6	14.4	6.9	43.6	
8-Feb	14.4	Z	58.6	53.8	66.9	77.0	119.8	140.0	137.9	70.4	54.1	98.1	38.5	33.6	32.6	42.6	37.3	62.7	105.2	110.7	152.9	177.4	126.2	93.3	82.8	177.4	
9-Feb	84.6	69.4	Z	49.5	43.3	50.0	35.5	34.3	42.4	51.5	35.8	26.0	27.8	26.4	19.5	18.8	46.7	31.0	28.0	81.4	85.3	36.3	57.1	89.2	46.5	89.2	
10-Feb	69.8	54.3	55.9	Z	49.8	34.6	14.3	14.5	18.6	27.7	47.2	37.1	66.9	44.9	38.2	PF	PF	PF	PF	15.9	26.2	27.2	32.2	9.9	36.1	69.8	
11-Feb	4.4	9.8	22.8	17.0	Z	17.8	25.9	31.6	40.2	52.2	35.1	10.8	6.0	8.4	20.5	21.2	15.1	1.2	0.9	0.8	0.5	3.2	1.6	0.5	15.1	52.2	
12-Feb	0.4	0.3	0.4	6.8	0.9	Z	2.8	0.9	34.9	42.4	28.2	27.1	21.0	18.8	20.1	29.0	75.4	112.9	79.8	85.9	95.8	67.3	66.3	37.9	37.2	112.9	
13-Feb	Z	70.3	94.3	88.1	40.2	16.7	1.7	6.1	11.7	12.2	7.0	6.4	6.7	5.4	5.3	5.6	9.4	10.6	14.1	22.1	10.0	8.6	6.4	5.1	20.2	94.3	
14-Feb	8.5	Z	8.5	15.2	10.3	6.7	3.7	6.1	7.7	8.0	9.1	9.3	6.5	8.0	7.4	15.9	11.3	11.8	10.3	13.2	44.8	13.6	20.7	43.0	13.0	44.8	
15-Feb	76.9	93.2	Z	88.6	65.8	35.8	69.2	90.3	58.3	12.5	7.1	32.6	42.4	30.5	13.4	10.4	21.4	60.1	125.0	159.0	143.3	88.9	60.3	52.3	62.5	159.0	
16-Feb	64.8	89.1	55.4	Z	46.4	42.3	38.2	36.0	39.2	34.4	37.1	28.6	19.9	20.5	30.1	32.9	40.6	64.8	28.4	18.4	9.5	11.0	16.1	25.0	36.0	89.1	
17-Feb	9.2	3.7	4.0	3.8	Z	7.0	7.6	5.5	7.6	6.8	7.4	8.2	15.1	10.0	8.9	7.2	6.1	4.8	4.7	11.8	16.1	25.6	21.5	19.0	9.6	25.6	
18-Feb	17.9	39.7	36.1	22.8	20.3	Z	33.9	89.4	157.7	123.0	68.9	69.4	43.1	25.2	22.3	27.6	64.8	65.8	61.9	90.1	108.9	102.1	113.6	106.5	65.7	157.7	
19-Feb	Z	91.8	74.8	55.2	71.1	76.2	85.9	154.9	114.5	96.2	129.2	61.5	31.8	34.4	49.1	44.4	31.3	26.6	30.7	45.3	34.4	30.5	39.5	34.6	62.8	154.9	
20-Feb	31.7	Z	9.7	8.1	8.0	13.0	24.5	37.1	38.5	44.3	17.4	14.9	21.2	23.9	11.6	15.3	17.8	30.3	39.0	39.6	30.3	53.5	36.7	18.4	25.4	53.5	
21-Feb	13.2	11.3	Z	19.1	17.9	20.0	65.9	89.4	36.6	34.7	31.3	26.4	20.2	15.1	11.3	7.9	11.0	15.7	18.5	30.2	69.7	130.8	75.6	84.0	37.2	130.8	
22-Feb	68.3	69.1	52.8	Z	76.0	111.5	123.3	160.4	126.9	96.4	Z	C	C	C	C	C	20.7	16.4	33.0	39.3	45.8	100.4	148.7	149.0	105.4	85.7	160.4
23-Feb	91.3	98.6	142.8	132.1	Z	196.5	192.4	194.7	43.3	14.0	16.0	15.6	16.1	13.1	15.1	19.8	16.0	25.1	89.3	121.6	108.6	95.9	116.6	93.0	81.2	196.5	
24-Feb	82.3	82.6	61.7	55.9	66.6	Z	39.5	36.2	38.9	37.7	23.5	16.8	9.6	5.9	5.8	7.6	5.7	8.3	5.7	3.1	4.1	3.4	4.5	6.7	26.6	82.6	
25-Feb	Z	13.4	14.7	10.9	13.1	19.8	25.9	26.0	28.5	13.5	1.8	0.9	0.8	4.8	4.0	5.8	6.3	23.4	27.9	40.8	43.5	53.8	49.7	38.2	20.3	53.8	
26-Feb	39.7	Z	18.2	16.0	33.0	42.2	37.3	38.6	53.7	83.2	59.9	31.3	39.2	57.2	48.8	18.9	15.2	18.7	6.4	9.2	14.7	12.4	13.1	12.8	31.3	83.2	
27-Feb	12.7	38.0	Z	16.5	16.9	14.7	13.4	17.0	15.7	13.3	15.3	12.3	11.4	12.7	13.4	10.4	8.0	8.0	8.0	15.9	15.1	21.1	17.5	16.6	15.0	38.0	
28-Feb	19.9	22.4	33.4	Z	44.3	39.8	119.9	216.6	176.8	58.0	43.2	35.2	26.9	29.1	18.9	23.6	25.5	38.5	81.7	124.7	86.3	89.7	123.6	73.1	67.4	216.6	
																						Diurnal Average					
																						Diurnal Maximum					
Z - zerspan      C - Calibration      PF - Power Failure																											





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

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Barge Landing - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	266	41.89	41.89
21 - 40	154	24.25	66.14
41 - 80	117	18.43	84.57
81 - 159	90	14.17	98.74
> 159	7	1.10	99.84

Total Number of Valid Hours: 635

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Barge Landing - February 2023**

<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	21	56	32	25	5	1	2	22	21	10	9	26	12	3	4	17	266
21 - 40	22	21	12	5	1	2	6	13	14	14	6	2	3	2	7	24	154
41 - 80	12	11	5	4	1	3	6	13	21	5	3	2	4	2	10	15	117
81 - 159	3	3	3	3	3	1	11	13	15	5	4	2	2	2	4	15	89
> 159	0	0	0	0	0	0	0	1	2	0	0	2	0	0	2	0	7
<b>Totals</b>	<b>58</b>	<b>91</b>	<b>52</b>	<b>37</b>	<b>10</b>	<b>7</b>	<b>25</b>	<b>62</b>	<b>73</b>	<b>34</b>	<b>22</b>	<b>34</b>	<b>21</b>	<b>9</b>	<b>27</b>	<b>71</b>	<b>633</b>

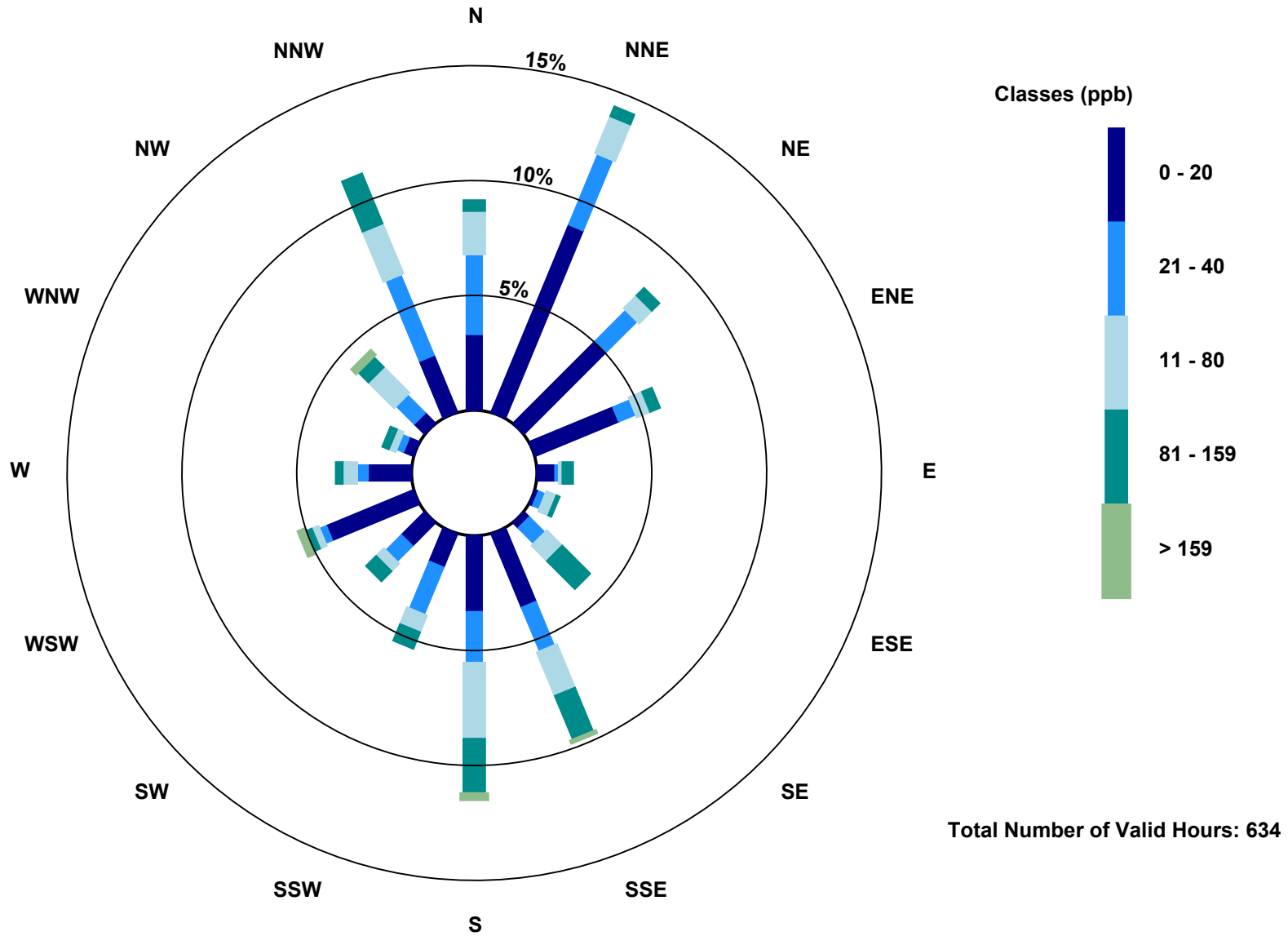
Total Number of Valid Hours: 634

Total Number of Hours: 672

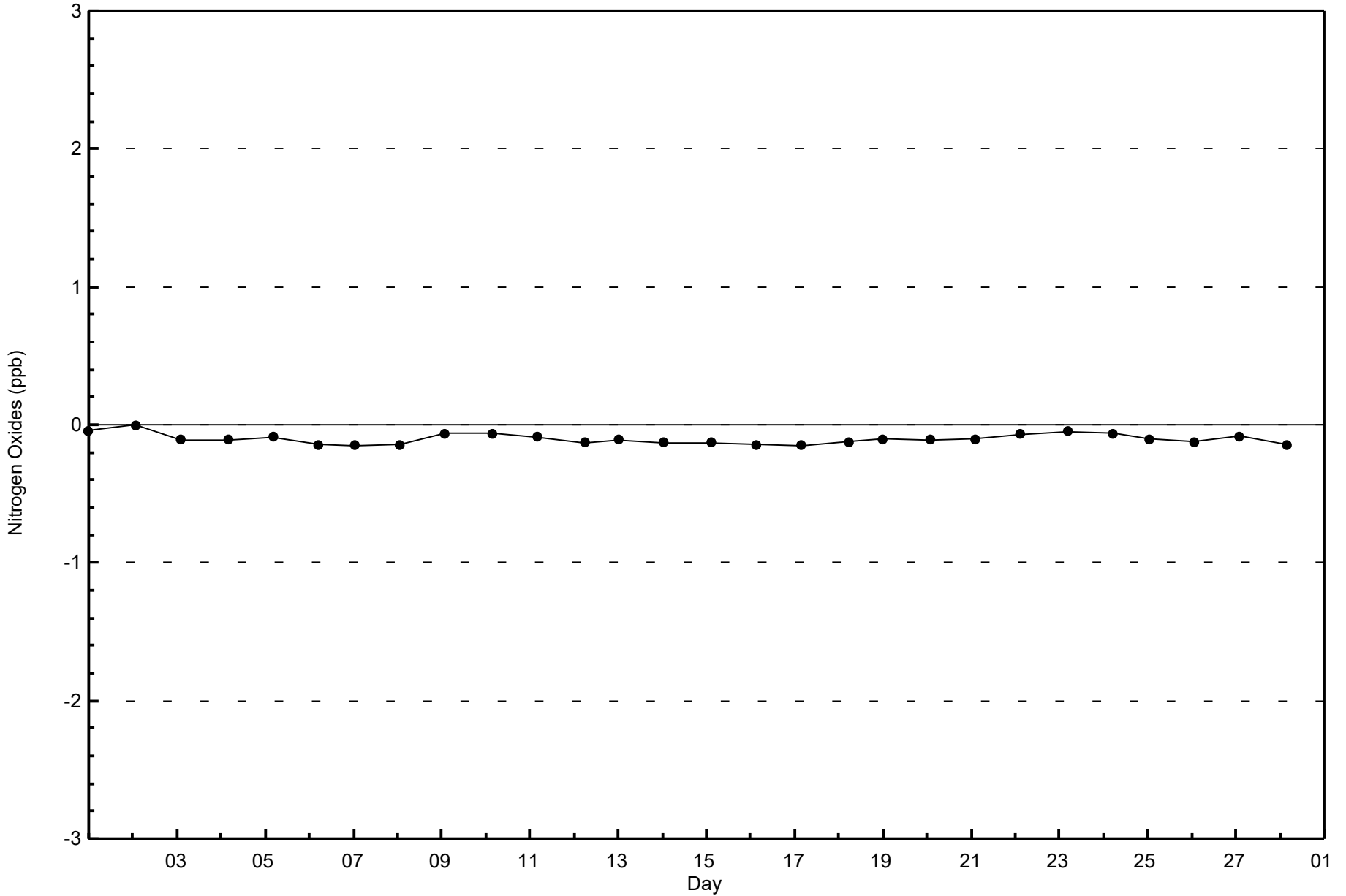


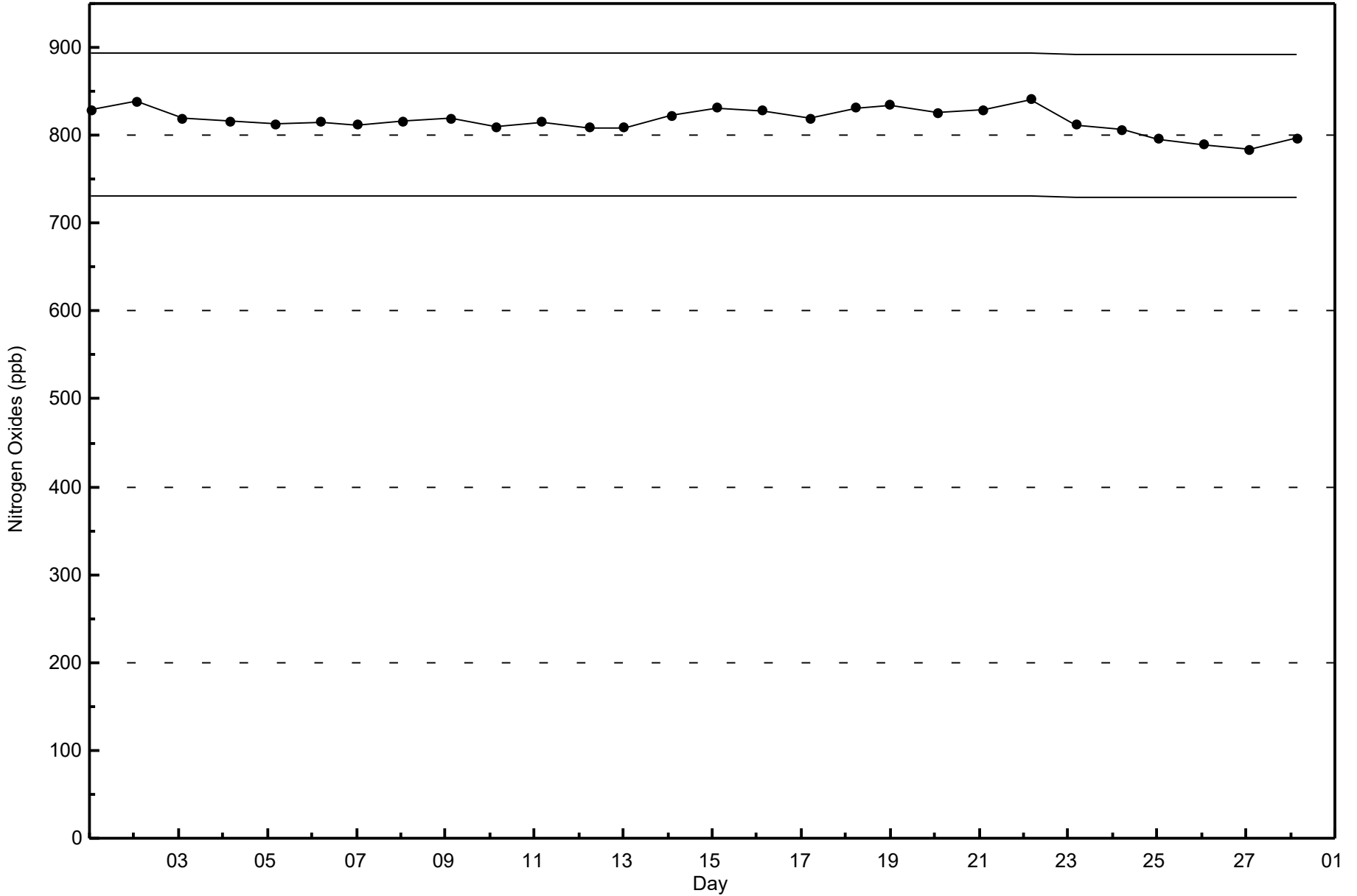
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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



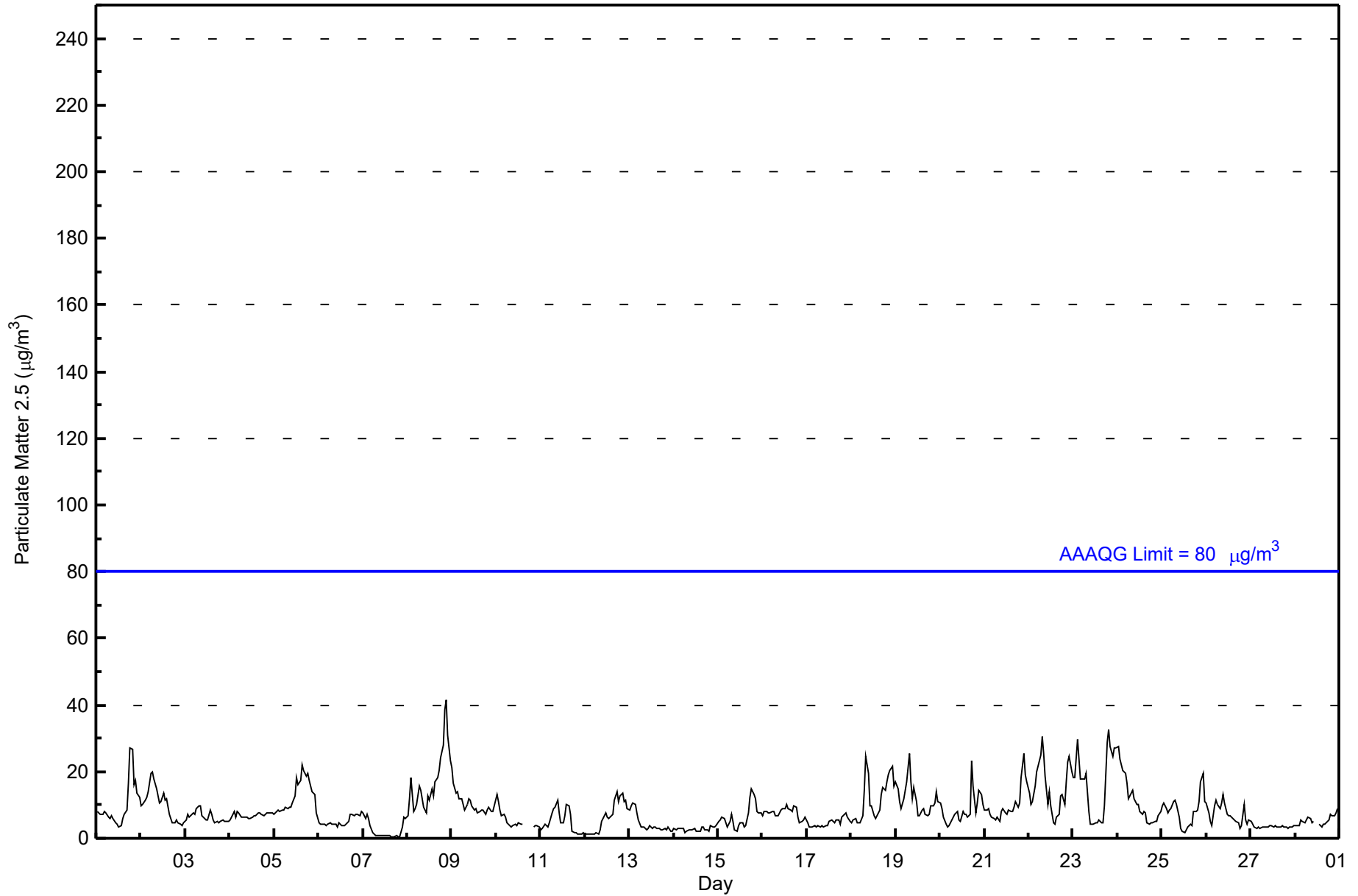








Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	672																										
Maximum Value: 41.6 µg/m <sup>3</sup> on Feb 8 22:00		Maximum Daily Average: 17.3 µg/m <sup>3</sup> on Feb 8															Hours of Data:	665																														
Minimum Value: 0.5 µg/m <sup>3</sup> on Feb 7 21:00		Minimum Daily Average: 2.5 µg/m <sup>3</sup> on Feb 7															Hours of Missing Data:	7																														
Maximum Diurnal Average: 11.0 µg/m <sup>3</sup> at hour 22		Minimum Diurnal Average: 6.4 µg/m <sup>3</sup> at hour 14															Hours of Calibration:	2																														
Monthly Average: 8.38 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 0.7 P <sub>10</sub> = 3.1 Q <sub>1</sub> = 4.3 Median = 7.0 Q <sub>3</sub> = 10.3 P <sub>90</sub> = 17.0 P <sub>99</sub> = 28.2															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-Feb	8.0	7.5	7.0	7.2	7.9	7.7	6.4	6.0	6.9	5.8	4.7	4.2	3.2	3.6	6.0	7.1	8.6	16.7	27.0	26.5	16.2	17.2	13.6	12.4	9.9	27.0																						
2-Feb	9.7	10.4	11.5	12.2	14.2	19.4	19.9	18.0	14.8	12.5	10.5	11.1	13.5	11.6	11.8	7.1	5.9	4.6	4.6	5.5	4.7	4.4	4.0	4.5	10.3	19.9																						
3-Feb	5.4	7.0	6.5	7.0	7.7	7.4	8.9	9.6	9.9	6.7	6.0	5.7	5.4	8.6	7.4	5.4	4.8	4.9	4.6	4.9	5.4	5.2	5.3	5.1	6.5	9.9																						
4-Feb	5.6	6.5	8.0	6.6	8.3	7.7	6.5	6.5	6.2	6.2	5.7	5.7	6.2	6.7	6.9	7.6	7.4	7.3	6.8	7.2	7.6	7.5	7.6	7.6	6.9	8.3																						
5-Feb	7.3	7.9	8.5	8.2	8.6	8.7	9.5	8.9	9.3	9.3	10.8	12.7	18.3	16.1	17.6	21.9	20.3	18.8	19.5	17.3	14.2	13.6	13.3	7.6	12.8	21.9																						
6-Feb	4.6	4.4	4.3	4.1	3.9	4.3	4.8	4.2	4.4	4.2	3.5	4.5	3.9	3.8	3.9	4.1	5.1	7.2	7.2	6.9	7.3	7.0	6.9	8.1	5.1	8.1																						
7-Feb	7.8	5.8	7.0	6.1	3.8	1.9	1.1	0.9	0.9	0.8	0.9	0.8	0.8	0.7	0.7	0.6	0.5	0.5	0.7	0.5	0.5	3.5	6.5	5.8	2.5	7.8																						
8-Feb	6.9	11.8	18.1	7.9	8.7	10.3	15.8	14.2	12.0	9.2	7.7	12.8	11.3	14.6	12.8	16.8	18.3	20.3	24.1	27.8	38.8	41.6	30.9	23.3	17.3	41.6																						
9-Feb	21.4	16.6	13.5	13.9	12.0	11.9	10.1	8.3	10.1	11.9	11.3	9.6	8.6	8.9	7.7	7.9	8.3	8.5	7.3	8.5	9.4	8.1	8.1	9.7	10.5	21.4																						
10-Feb	13.0	11.0	8.4	6.6	7.1	6.5	4.5	3.6	3.4	4.0	4.2	3.9	4.7	4.2	4.2	PF	PF	PF	PF	PF	3.6	3.7	3.9	3.4	5.5	13.0																						
11-Feb	2.5	3.1	4.0	3.8	3.6	4.7	7.6	8.7	9.4	11.4	7.7	4.6	4.6	6.7	10.4	9.7	7.1	2.2	1.8	1.6	1.1	1.2	1.2	1.8	5.0	11.4																						
12-Feb	1.3	1.1	1.1	1.5	1.2	1.4	1.5	1.4	2.5	5.2	5.9	7.5	6.5	6.1	6.9	7.1	11.6	13.9	10.8	12.8	13.6	11.2	11.3	9.0	6.3	13.9																						
13-Feb	8.5	9.7	10.6	10.3	7.6	5.4	3.5	3.6	3.2	2.4	3.2	3.7	3.1	3.4	3.2	2.9	2.9	2.7	2.4	3.1	2.6	3.2	2.3	2.0	4.4	10.6																						
14-Feb	2.9	2.6	2.8	2.9	2.8	2.8	1.9	2.2	2.5	2.5	2.6	2.8	2.3	2.3	2.0	3.3	3.3	2.6	2.7	2.2	3.9	3.4	3.4	3.8	2.8	3.9																						
15-Feb	5.0	5.6	6.1	6.0	4.9	3.5	4.9	7.1	4.9	2.4	2.2	3.9	4.9	4.5	3.5	3.7	7.5	12.2	14.7	13.2	11.9	8.2	7.5	7.8	6.5	14.7																						
16-Feb	7.0	7.9	8.0	7.6	7.7	8.1	8.1	6.8	6.9	7.7	8.5	9.1	8.9	10.0	9.1	8.3	7.9	9.7	9.4	6.5	4.6	5.0	5.6	6.4	7.7	10.0																						
17-Feb	4.6	3.6	3.3	3.4	3.6	3.5	3.7	3.3	3.9	3.5	3.8	3.6	5.3	5.5	5.0	4.9	5.6	5.6	4.4	6.4	7.1	7.7	6.4	5.1	4.7	7.7																						
18-Feb	4.6	5.6	5.8	4.8	4.5	4.8	7.0	14.3	24.6	19.4	9.9	9.6	6.7	5.9	6.8	8.3	13.0	15.1	14.3	17.0	19.0	20.5	21.7	15.6	11.6	24.6																						
19-Feb	17.1	14.8	11.0	8.7	12.0	14.5	17.0	25.5	17.0	11.9	15.1	10.9	6.7	6.6	8.6	8.8	7.4	6.7	7.0	9.8	9.6	10.5	13.8	11.0	11.7	25.5																						
20-Feb	10.6	8.7	6.3	4.3	3.6	3.8	5.5	6.3	7.2	7.9	5.6	5.3	8.0	7.3	7.1	6.2	7.3	23.3	15.5	7.8	10.7	14.5	13.3	10.1	8.6	23.3																						
21-Feb	8.4	8.6	9.1	7.3	6.4	6.1	5.5	6.4	5.2	8.0	8.8	7.8	7.4	8.7	8.1	8.1	9.4	10.8	9.2	10.7	18.3	25.3	19.1	17.1	10.0	25.3																						
22-Feb	13.4	10.2	11.0	15.5	20.0	21.7	25.2	30.5	25.3	18.7	10.2	14.2	9.7	4.7	4.3	6.3	7.3	12.6	13.2	10.0	17.0	23.0	24.5	20.1	15.4	30.5																						
23-Feb	18.3	18.1	29.8	23.6	17.6	17.7	17.8	19.3	8.2	4.1	4.1	4.4	4.5	4.5	5.6	4.5	4.6	9.6	28.8	32.5	27.7	24.4	27.0	27.0	16.0	32.5																						
24-Feb	27.7	23.7	21.9	20.3	19.5	16.6	11.7	13.5	14.3	11.8	10.2	10.2	8.2	7.3	8.0	7.4	4.6	4.2	4.8	4.5	5.1	5.2	6.8	8.2	11.5	27.7																						
25-Feb	9.8	10.4	9.0	7.4	8.4	9.0	10.9	11.4	10.0	6.3	2.8	2.0	1.9	2.5	3.3	4.4	3.7	8.2	8.1	8.4	11.2	17.0	19.3	10.9	8.2	19.3																						
26-Feb	10.7	7.8	4.9	4.0	9.9	11.4	10.0	8.9	10.5	13.1	10.6	7.1	6.7	6.7	5.9	5.6	5.0	4.5	2.9	3.9	10.1	5.4	4.3	5.3	7.3	13.1																						
27-Feb	5.1	4.4	3.5	3.1	3.2	3.1	3.2	3.3	3.6	3.5	3.7	3.6	3.4	3.6	3.4	3.6	3.3	3.9	3.5	3.4	3.1	3.3	3.5	3.7	3.5	5.1																						
28-Feb	3.7	3.7	3.7	5.4	5.2	4.7	5.5	6.2	6.1	4.6	5.3	C	C	4.1	3.5	4.2	4.4	4.6	5.5	7.2	6.9	6.6	7.6	9.0	5.4	9.0																						
																								9.0	8.5	8.7	7.8	8.0	8.2	8.5	9.2	8.7	7.7	6.6	6.7	6.5	6.4	6.6	6.9	7.2	8.9	9.7	9.8	10.4	11.0	10.7	9.3	Diurnal Average
																								27.7	23.7	29.8	23.6	20.0	21.7	25.2	30.5	25.3	19.4	15.1	14.2	18.3	16.1	17.6	21.9	20.3	23.3	28.8	32.5	38.8	41.6	30.9	27.0	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>) -  $\mu\text{g}/\text{m}^3$   
Barge Landing - February 2023**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	247	37.14	37.14
6 - 15	339	50.98	88.12
16 - 25	65	9.77	97.89
26 - 80	14	2.11	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 665

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Barge Landing - February 2023**

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	24	50	24	27	5	3	2	16	10	7	7	29	13	4	6	20	247
6 - 15	34	42	25	7	3	2	18	38	49	25	15	2	7	6	21	45	339
16 - 25	2	1	2	5	2	2	3	11	15	4	0	5	1	1	2	8	64
26 - 80	0	1	0	1	1	0	3	2	2	2	1	0	1	0	0	0	14
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	60	94	51	40	11	7	26	67	76	38	23	36	22	11	29	73	664

Total Number of Valid Hours: 664

Total Number of Hours: 672





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

**Ambient Temperature (AT) - C**  
**Barge Landing - February 2023**

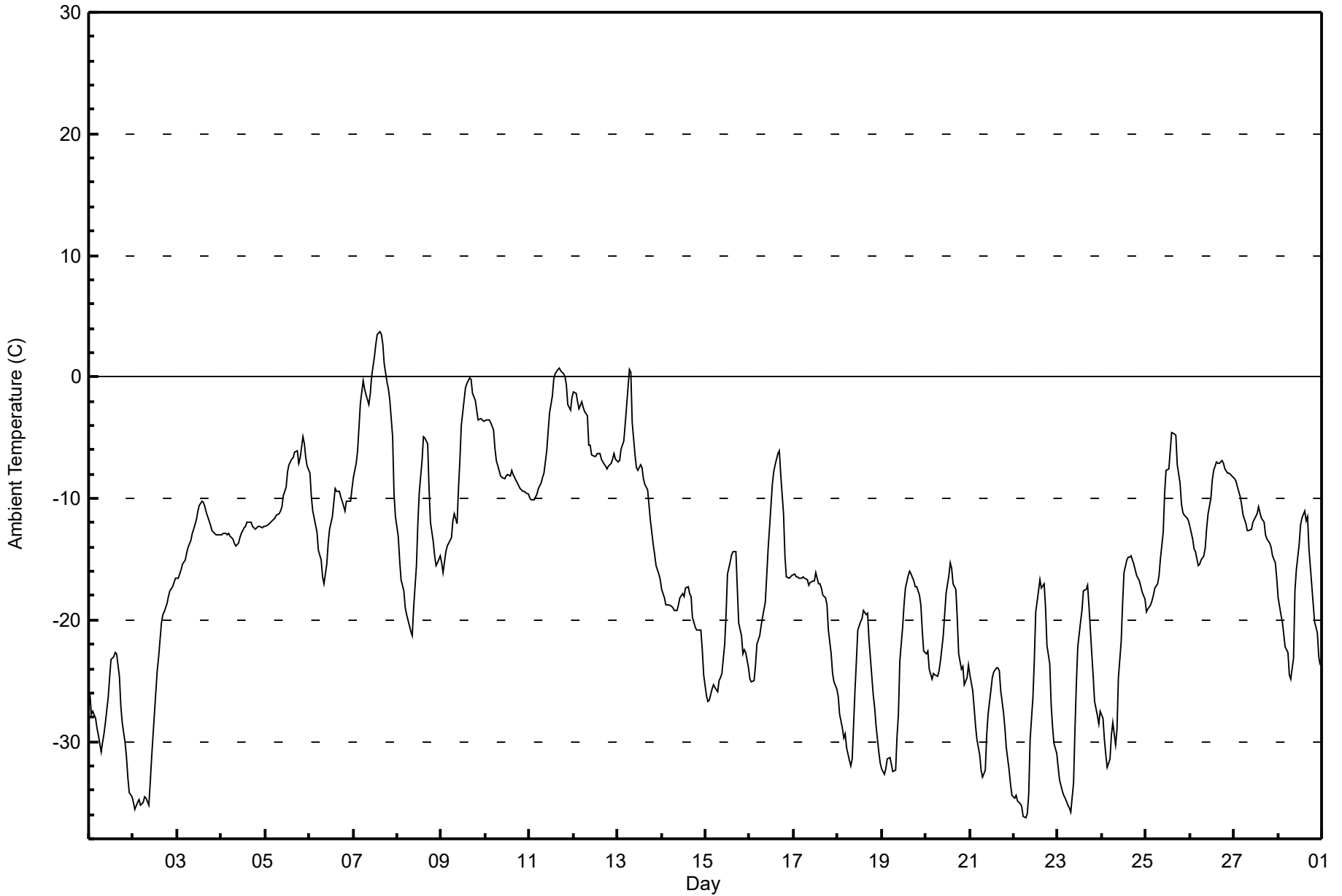
Maximum Value: 3.8 C on Feb 7 15:00      Maximum Daily Average: -1.9 C on Feb 7																						Hours in Service: 672 Hours of Data: 672				
Minimum Value: -36.3 C on Feb 22 07:00      Minimum Daily Average: -28.4 C on Feb 21 Maximum Diurnal Average: -11.5 C at hour 15      Minimum Diurnal Average: -19.5 C at hour 8 Monthly Average: -16.22 C      Percentiles: P <sub>1</sub> = -35.3 P <sub>10</sub> = -29.6 Q <sub>1</sub> = -22.8 Median = -15.5 Q <sub>3</sub> = -9.4 P <sub>90</sub> = -4.9 P <sub>99</sub> = 0.8																						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-Feb	-26.1	-27.7	-27.6	-28.1	-28.9	-29.5	-30.9	-30.1	-29.3	-28.4	-26.4	-24.8	-23.3	-23.0	-22.6	-22.7	-24.6	-27.1	-28.5	-30.1	-31.2	-32.9	-34.2	-34.6	-28.0	-22.6
2-Feb	-35.0	-35.6	-35.0	-34.8	-35.3	-35.0	-34.5	-34.6	-35.3	-33.4	-31.3	-29.5	-25.9	-24.2	-23.0	-20.3	-19.6	-19.3	-18.6	-18.1	-17.6	-17.3	-16.9	-16.6	-26.9	-16.6
3-Feb	-16.5	-16.3	-15.9	-15.5	-15.0	-14.5	-14.0	-13.4	-12.9	-12.5	-11.7	-11.0	-10.5	-10.2	-10.3	-10.7	-11.2	-11.8	-12.2	-12.6	-12.8	-13.0	-12.9	-13.0	-12.9	-10.2
4-Feb	-12.9	-12.8	-12.8	-13.0	-12.9	-13.1	-13.4	-13.7	-13.9	-13.7	-13.2	-12.9	-12.5	-12.3	-12.0	-12.0	-12.0	-12.3	-12.5	-12.4	-12.3	-12.3	-12.4	-12.3	-12.7	-12.0
5-Feb	-12.3	-12.2	-12.1	-11.9	-11.8	-11.6	-11.4	-11.3	-11.0	-10.7	-9.7	-9.1	-7.8	-7.3	-6.8	-6.6	-6.2	-6.1	-7.1	-6.6	-4.9	-5.5	-6.7	-7.3	-8.9	-4.9
6-Feb	-8.0	-9.9	-11.0	-12.2	-12.7	-14.3	-15.1	-16.4	-17.0	-15.4	-13.7	-12.5	-11.5	-10.4	-9.2	-9.4	-9.4	-9.9	-10.3	-11.1	-10.3	-10.2	-10.2	-9.2	-11.6	-8.0
7-Feb	-8.3	-7.1	-6.1	-4.1	-2.1	-0.3	-1.1	-1.5	-2.3	-1.5	0.0	1.7	2.7	3.4	3.8	3.5	2.7	1.0	-0.4	-1.0	-1.9	-4.9	-9.7	-11.5	-1.9	3.8
8-Feb	-13.1	-15.1	-16.7	-17.6	-19.0	-19.5	-20.4	-20.9	-21.3	-19.0	-15.5	-12.0	-9.6	-6.9	-4.9	-5.0	-5.5	-9.1	-12.0	-13.6	-14.7	-15.5	-15.3	-14.7	-14.0	-4.9
9-Feb	-15.3	-16.1	-14.4	-13.9	-13.7	-13.2	-11.8	-11.3	-12.0	-9.2	-6.9	-4.0	-1.9	-0.9	-0.6	-0.1	-0.2	-1.4	-1.9	-2.7	-3.6	-3.4	-3.6	-3.7	-6.9	-0.1
10-Feb	-3.6	-3.6	-3.5	-3.8	-4.4	-5.8	-6.9	-7.7	-8.1	-8.2	-8.4	-8.1	-8.0	-8.1	-7.7	-8.0	-8.3	-8.7	-8.9	-9.2	-9.4	-9.5	-9.5	-9.7	-7.4	-3.5
11-Feb	-10.0	-10.2	-10.1	-9.9	-9.6	-9.2	-8.7	-8.3	-7.9	-6.0	-4.4	-2.9	-1.6	-0.2	0.3	0.6	0.7	0.5	0.3	0.1	-0.7	-2.3	-2.7	-1.6	-4.3	0.7
12-Feb	-1.2	-1.3	-2.0	-2.6	-2.1	-2.5	-2.9	-3.2	-5.7	-5.7	-6.4	-6.6	-6.5	-6.3	-6.4	-6.7	-7.0	-7.4	-7.5	-7.4	-7.1	-6.8	-6.3	-6.8	-5.2	-1.2
13-Feb	-7.0	-6.9	-6.0	-5.3	-3.8	-2.4	0.6	0.3	-3.7	-6.4	-7.4	-7.7	-7.3	-7.5	-8.4	-8.8	-9.2	-10.6	-11.8	-13.8	-14.6	-15.5	-16.2	-16.7	-8.2	0.6
14-Feb	-17.5	-18.2	-18.8	-18.7	-18.8	-18.9	-19.0	-19.2	-19.3	-18.7	-18.2	-17.8	-18.1	-17.4	-17.3	-17.8	-18.0	-19.8	-20.6	-20.8	-20.9	-22.4	-24.6	-24.6	-19.2	-17.3
15-Feb	-26.3	-26.7	-26.6	-25.6	-25.3	-25.5	-25.9	-24.9	-24.8	-24.4	-22.0	-19.4	-16.3	-15.2	-14.6	-14.4	-14.4	-17.4	-20.2	-21.3	-22.8	-22.4	-22.7	-24.0	-21.8	-14.4
16-Feb	-24.8	-25.1	-25.0	-23.7	-22.0	-21.3	-20.5	-19.8	-18.5	-16.3	-14.1	-12.4	-8.9	-7.8	-7.2	-6.3	-6.1	-8.1	-11.3	-14.7	-16.5	-16.5	-16.4	-16.4	-15.8	-6.1
17-Feb	-16.2	-16.4	-16.5	-16.5	-16.5	-16.5	-16.6	-16.7	-17.1	-16.9	-16.8	-16.7	-16.1	-17.0	-17.1	-17.3	-17.9	-18.2	-18.8	-20.9	-22.8	-24.4	-25.0	-25.6	-18.4	-16.1
18-Feb	-26.3	-27.7	-28.9	-29.7	-29.4	-30.5	-31.6	-32.0	-31.4	-25.8	-23.4	-20.8	-20.1	-19.9	-19.2	-19.6	-19.4	-21.6	-24.6	-26.1	-27.2	-28.7	-30.8	-31.8	-26.1	-19.2
19-Feb	-32.2	-32.7	-32.3	-31.4	-31.4	-31.9	-32.4	-32.3	-29.6	-27.7	-23.4	-20.6	-18.7	-17.4	-16.3	-16.0	-16.2	-16.8	-17.2	-17.3	-18.0	-18.8	-20.8	-22.5	-23.9	-16.0
20-Feb	-22.7	-22.5	-24.0	-24.8	-24.5	-24.5	-24.6	-24.2	-23.4	-21.3	-19.5	-17.8	-16.4	-15.3	-15.7	-17.0	-17.5	-19.9	-22.8	-24.0	-23.9	-25.3	-24.8	-23.7	-21.7	-15.3
21-Feb	-24.5	-25.8	-27.1	-28.6	-29.8	-31.1	-32.4	-32.9	-32.4	-29.5	-27.7	-25.8	-24.7	-24.3	-23.9	-23.9	-24.2	-25.8	-27.6	-28.9	-30.5	-32.3	-33.5	-34.4	-28.4	-23.9
22-Feb	-34.6	-34.4	-34.9	-35.1	-35.4	-36.1	-36.3	-35.9	-34.3	-29.8	-26.4	-23.2	-19.3	-17.6	-16.6	-17.4	-17.0	-19.0	-22.1	-23.6	-27.0	-28.7	-30.1	-31.0	-27.7	-16.6
23-Feb	-32.1	-33.2	-34.1	-34.4	-34.7	-35.2	-35.4	-35.8	-33.4	-29.0	-25.2	-22.2	-20.1	-19.2	-17.6	-17.5	-17.1	-18.9	-22.7	-24.7	-26.7	-27.8	-28.6	-27.5	-27.2	-17.1
24-Feb	-28.1	-29.8	-31.1	-32.1	-31.4	-29.4	-28.4	-30.3	-29.0	-24.7	-21.7	-18.6	-16.1	-15.0	-14.8	-14.8	-14.7	-15.4	-15.8	-16.3	-16.8	-17.2	-17.7	-18.3	-22.0	-14.7
25-Feb	-19.3	-19.1	-18.7	-18.4	-17.9	-17.4	-17.0	-16.3	-15.0	-12.8	-9.5	-7.7	-7.6	-6.1	-4.6	-4.6	-4.8	-7.3	-8.8	-10.5	-11.2	-11.4	-11.7	-11.9	-12.1	-4.6
26-Feb	-12.3	-13.4	-14.2	-14.4	-15.5	-15.4	-15.0	-14.7	-14.0	-12.5	-11.3	-10.0	-8.6	-7.7	-7.0	-7.1	-7.1	-6.9	-7.1	-7.5	-7.9	-8.0	-8.0	-8.2	-10.6	-6.9
27-Feb	-8.4	-8.6	-9.0	-9.9	-10.6	-11.4	-12.0	-12.6	-12.7	-12.6	-11.9	-11.8	-11.2	-10.6	-11.1	-11.7	-12.0	-13.0	-13.3	-13.7	-14.0	-14.7	-15.3	-16.6	-12.0	-8.4
28-Feb	-18.2	-19.6	-20.2	-21.1	-22.2	-22.7	-24.5	-24.9	-23.2	-17.6	-15.8	-13.8	-12.2	-11.6	-11.0	-11.8	-11.4	-14.2	-17.1	-18.6	-20.1	-21.1	-23.0	-23.7	-18.3	-11.0
																								Diurnal Average		
																								Diurnal Maximum		





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

**Ambient Temperature (AT) - C**  
**Barge Landing - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Barge Landing - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	211	31.40	31.40
-20 - 0	446	66.37	97.77
0 - 10	15	2.23	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Relative Humidity (RH) - %**

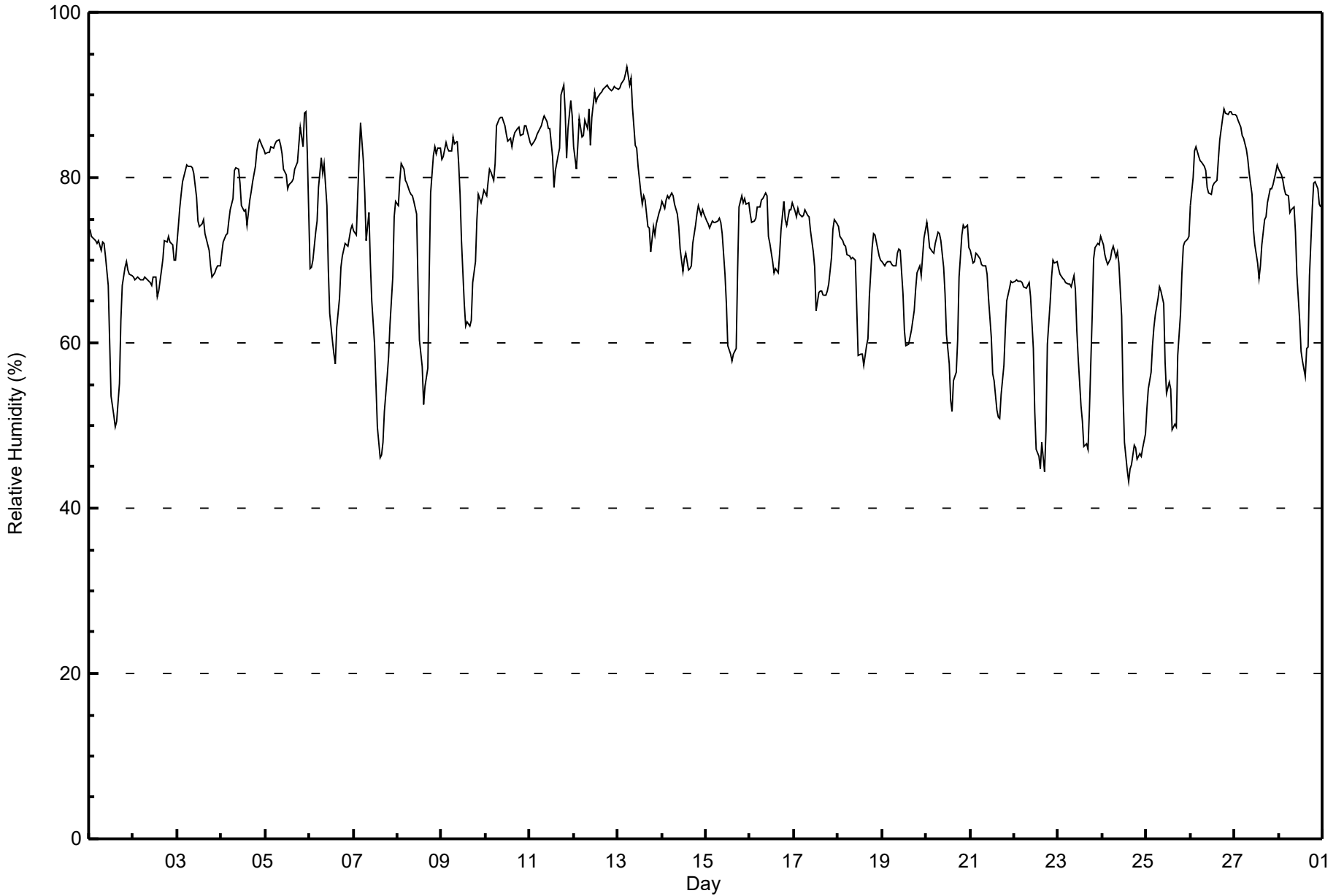
**Barge Landing - February 2023**

Maximum Value: 93.4 % on Feb 13 06:00		Maximum Daily Average: 88.1 % on Feb 12		Hours in Service: 672																							
Minimum Value: 43.2 % on Feb 24 15:00		Minimum Daily Average: 57.5 % on Feb 24		Hours of Data: 672																							
Maximum Diurnal Average: 77.1 % at hour 7		Minimum Diurnal Average: 63.2 % at hour 15		Hours of Missing Data: 0																							
Monthly Average: 72.56 %		Percentiles: P <sub>1</sub> = 46.1 P <sub>10</sub> = 57.7 Q <sub>1</sub> = 67.6 Median = 73.2 Q <sub>3</sub> = 79.8 P <sub>90</sub> = 85.2 P <sub>99</sub> = 91.2		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-Feb	73.8	72.8	72.8	72.4	72.0	72.3	71.1	72.2	72.1	70.5	67.0	60.2	53.5	51.2	49.9	50.5	55.0	62.7	67.0	69.1	69.8	68.8	68.2	68.1	66.0	73.8	
2-Feb	68.0	67.5	68.0	67.7	67.6	67.7	67.9	67.7	67.5	67.3	66.9	68.0	67.9	65.6	66.4	68.9	70.2	72.3	72.2	72.9	72.2	71.8	70.0	70.1	68.8	72.9	
3-Feb	74.1	76.3	77.9	79.5	80.9	81.5	81.4	81.4	81.2	80.5	77.6	74.7	74.1	74.3	74.9	73.2	72.5	71.2	69.4	68.0	68.4	68.9	69.3	69.3	75.0	81.5	
4-Feb	70.8	72.2	73.1	73.1	74.8	76.0	77.5	80.8	81.2	81.1	79.4	76.6	75.8	76.0	74.2	77.2	78.3	79.6	81.4	83.2	84.2	84.6	83.8	83.4	78.3	84.6	
5-Feb	83.0	83.0	83.1	83.7	83.5	84.1	84.5	84.6	83.9	82.9	81.0	80.4	78.6	79.1	79.5	79.8	81.0	81.8	84.2	86.2	83.8	87.8	88.0	83.1	82.9	88.0	
6-Feb	69.0	69.1	69.9	73.4	74.8	78.8	82.4	80.4	81.7	76.6	69.0	63.6	60.2	58.7	57.5	61.9	65.4	69.1	70.6	72.0	71.8	71.6	73.8	74.2	70.6	82.4	
7-Feb	73.5	73.0	78.0	82.6	86.6	82.0	78.2	72.3	75.8	69.7	65.1	59.8	54.9	49.9	46.2	46.5	48.0	51.7	55.9	58.3	62.2	68.0	75.2	77.1	66.3	86.6	
8-Feb	76.7	79.7	81.8	81.0	79.7	79.3	78.4	78.0	77.8	77.1	75.7	67.0	60.4	57.1	52.5	54.7	57.0	68.2	78.1	82.8	83.8	82.9	83.5	83.6	74.0	83.8	
9-Feb	82.2	82.5	84.2	83.5	83.2	83.3	84.9	84.0	84.4	81.7	78.0	72.3	64.7	62.0	62.6	62.0	62.7	67.3	69.8	74.9	77.9	77.0	77.6	78.6	75.9	84.9	
10-Feb	77.8	79.4	81.1	80.7	79.7	81.7	86.3	87.2	87.3	87.3	86.3	85.2	84.4	84.7	83.7	84.8	85.4	85.9	86.2	85.0	85.3	86.3	86.2	84.8	84.3	87.3	
11-Feb	84.3	84.0	84.4	84.7	85.3	85.6	86.3	86.9	87.5	86.7	86.0	86.0	82.6	78.8	80.9	82.7	83.6	89.9	91.3	87.9	82.4	85.9	89.3	87.5	85.4	91.3	
12-Feb	83.8	81.0	84.0	87.1	84.9	85.1	86.9	86.0	88.4	83.9	87.2	90.4	89.1	89.6	90.1	90.4	90.7	91.1	91.2	90.9	90.6	90.7	90.9	90.8	88.1	91.2	
13-Feb	90.7	90.9	91.4	91.9	92.6	93.4	91.3	92.1	88.5	83.8	83.6	81.4	78.1	76.7	77.8	77.3	74.1	73.9	71.0	74.0	73.1	74.4	75.8	76.3	82.2	93.4	
14-Feb	77.1	76.4	77.3	77.8	77.4	78.1	77.7	76.8	75.6	74.1	71.3	68.6	70.2	70.9	68.8	69.0	69.3	72.0	74.2	75.6	76.6	75.5	76.1	75.7	74.3	78.1	
15-Feb	74.7	74.4	73.8	74.7	74.6	74.5	74.7	75.1	74.6	73.3	68.4	64.7	59.6	58.7	57.7	58.6	59.2	68.6	76.4	77.8	76.9	77.5	76.7	76.9	70.9	77.8	
16-Feb	75.7	74.6	74.7	75.1	76.5	76.4	77.4	77.4	78.2	77.8	72.9	72.0	69.8	68.5	69.0	68.4	70.8	73.7	77.1	74.9	74.3	76.1	76.2	77.0	74.4	78.2	
17-Feb	75.9	75.3	76.3	75.6	75.2	75.5	76.2	75.4	75.3	73.5	71.0	69.1	63.9	66.0	66.2	66.2	65.8	65.7	66.3	67.2	70.4	73.7	74.9	74.5	71.5	76.3	
18-Feb	74.0	73.0	72.4	71.8	71.6	70.6	70.4	70.1	70.4	69.9	64.2	58.4	58.6	58.6	57.4	59.7	60.6	65.5	71.6	73.2	73.0	72.2	70.5	70.0	67.8	74.0	
19-Feb	69.8	69.2	69.6	69.9	69.8	69.4	69.3	69.3	70.9	71.3	71.2	65.9	61.6	59.6	59.8	60.6	61.6	63.9	66.5	68.5	69.4	68.2	70.6	72.7	67.4	72.7	
20-Feb	74.6	73.2	71.5	71.0	70.9	72.0	73.3	73.2	72.4	69.1	66.0	60.9	57.5	53.1	51.8	55.5	56.5	60.4	68.0	73.0	74.3	74.0	74.2	71.6	67.4	74.6	
21-Feb	71.2	69.6	69.8	70.8	70.7	70.1	69.6	69.4	69.4	68.4	65.5	60.7	56.3	55.5	51.9	51.1	50.9	53.7	57.2	61.4	65.1	66.7	67.5	67.3	63.7	71.2	
22-Feb	67.5	67.7	67.5	67.5	67.3	66.9	66.7	66.9	67.3	65.7	59.4	51.7	47.2	46.2	44.8	47.9	44.4	49.3	59.8	64.9	68.0	69.9	69.7	69.8	61.0	69.9	
23-Feb	69.0	68.3	67.8	67.7	67.4	67.2	67.1	66.8	68.2	66.5	61.5	58.1	52.5	50.6	47.5	47.9	47.1	51.8	63.3	70.2	71.5	72.1	71.8	72.9	63.1	72.9	
24-Feb	71.8	70.7	70.0	69.4	70.3	71.2	71.7	70.4	71.0	69.7	63.2	53.9	47.9	44.6	43.2	44.8	45.2	47.6	47.2	46.0	46.6	46.3	47.3	49.1	57.5	71.8	
25-Feb	52.0	54.5	56.4	59.7	61.9	63.5	65.4	66.7	66.3	64.7	57.7	53.9	55.3	54.4	49.4	50.1	49.9	58.4	63.5	68.5	71.7	72.3	72.5	72.9	60.9	72.9	
26-Feb	76.6	80.0	83.3	83.8	82.5	82.0	81.9	81.4	80.9	78.9	78.1	77.9	79.0	79.3	79.6	82.2	84.6	87.1	88.2	87.8	87.6	87.9	88.0	87.7	82.8	88.2	
27-Feb	87.7	87.5	87.0	86.1	85.1	84.7	83.4	82.2	80.6	77.9	73.8	71.9	69.7	67.8	69.2	71.9	74.9	75.2	76.9	78.7	78.7	79.1	80.6	81.5	78.8	87.7	
28-Feb	81.0	80.4	79.7	78.6	77.9	77.8	75.8	76.0	76.5	73.4	68.3	62.7	58.9	57.7	56.0	59.3	59.4	68.2	76.3	79.3	79.5	78.7	76.8	76.5	72.3	81.0	
		75.2	75.2	75.9	76.5	76.6	76.8	77.1	76.8	77.0	75.1	72.0	68.4	65.4	64.1	63.2	64.4	65.1	68.8	72.2	74.0	74.6	75.3	75.9	75.8	Diurnal Average	
		90.7	90.9	91.4	91.9	92.6	93.4	91.3	92.1	88.5	87.3	87.2	90.4	89.1	89.6	90.1	90.4	90.7	91.1	91.3	90.9	90.6	90.7	90.9	90.8	Diurnal Maximum	



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

**Relative Humidity (RH) - %**  
**Barge Landing - February 2023**



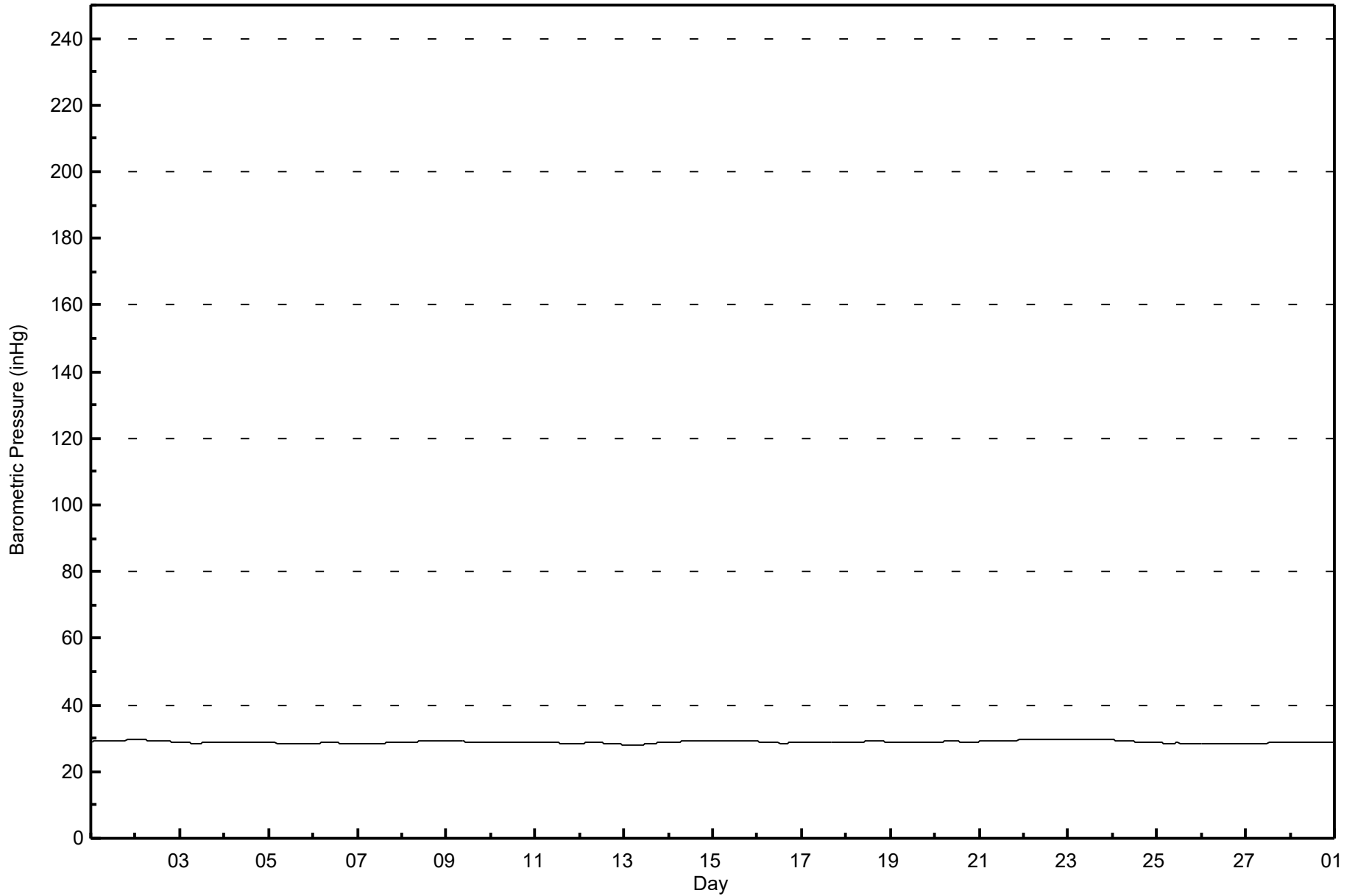


Maximum Value: 29.7 inHg on Feb 23 10:00      Maximum Daily Average: 29.7 inHg on Feb 23																						Hours in Service: 672					
Minimum Value: 28.0 inHg on Feb 13 06:00      Minimum Daily Average: 28.3 inHg on Feb 13																						Hours of Data: 672					
Maximum Diurnal Average: 28.9 inHg at hour 11      Minimum Diurnal Average: 28.9 inHg at hour 17																						Hours of Missing Data: 0					
Monthly Average: 28.87 inHg      Percentiles: P <sub>1</sub> = 28.1 P <sub>10</sub> = 28.5 Q <sub>1</sub> = 28.6 Median = 28.8 Q <sub>3</sub> = 29.1 P <sub>90</sub> = 29.4 P <sub>99</sub> = 29.7																						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-Feb	29.0	29.0	29.0	29.1	29.1	29.1	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.3	29.5
2-Feb	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.2	29.2	29.1	29.1	29.1	29.0	29.0	28.9	28.9	28.9	28.8	29.2	29.5	
3-Feb	28.8	28.8	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	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	28.6	28.8	
4-Feb	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	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	28.7	28.7	28.7	28.7	28.7	28.8
5-Feb	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	28.3	28.3	28.3	28.3	28.3	28.3	28.3	28.4	28.5	28.4	28.7	
6-Feb	28.5	28.5	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.4	28.4	28.4	28.4	28.6	28.7	
7-Feb	28.4	28.4	28.4	28.4	28.4	28.4	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.8	28.6	28.8	
8-Feb	28.8	28.8	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.1	
9-Feb	29.1	29.1	29.1	29.1	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	28.8	28.8	28.8	28.8	29.0	29.1	
10-Feb	28.8	28.8	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	
11-Feb	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.6	28.6	28.7	
12-Feb	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.5	28.5	28.5	28.4	28.4	28.3	28.2	28.2	28.1	28.5	28.6	
13-Feb	28.1	28.1	28.0	28.0	28.0	28.0	28.0	28.0	28.1	28.1	28.2	28.2	28.3	28.3	28.4	28.4	28.5	28.6	28.6	28.7	28.7	28.7	28.8	28.8	28.3	28.8	
14-Feb	28.8	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.2	
15-Feb	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	
16-Feb	29.0	29.0	29.0	28.9	28.9	28.9	28.8	28.8	28.7	28.7	28.6	28.6	28.6	28.6	28.5	28.5	28.6	28.6	28.7	28.7	28.8	28.8	28.8	28.8	28.7	29.0	
17-Feb	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	
18-Feb	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	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	
19-Feb	29.0	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.8	29.0	
20-Feb	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	29.0	29.0	
21-Feb	29.0	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.3	29.5	
22-Feb	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	29.7	29.7	29.6	29.7	
23-Feb	29.7	29.7	29.7	29.7	29.7	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	29.6	29.6	29.6	29.6	29.5	29.5	29.7	29.7	
24-Feb	29.5	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.2	29.2	29.1	29.1	29.0	29.0	28.9	28.9	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.6	29.0	29.5	
25-Feb	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.6	28.6	
26-Feb	28.5	28.5	28.5	28.5	28.5	28.5	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.5	
27-Feb	28.4	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.6	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	28.6	28.8	
28-Feb	28.8	28.8	28.8	28.8	28.8	28.8	28.9	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	28.9	29.0	
																								Diurnal Average			
																								Diurnal Maximum			



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

**Barometric Pressure (BP) - inHg**  
**Barge Landing - February 2023**





# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Wind Speed 20 m (WS20m) - km/h

## Barge Landing - February 2023

Maximum Speed: 30 km/h on Feb 13 14:00	Maximum Daily Speed Average: 14.5 km/h on Feb 24	Hours in Service: 672
Minimum Speed Value: 0 km/h on Feb 19 11:00	Minimum Daily Speed Average: 0.6 km/h on Feb 16	Hours of Data: 671
Maximum Diurnal Speed Average: 3.5 km/h at hour 18	Minimum Diurnal Speed Average: 0.2 km/h at hour 1	Hours of Missing Data: 1
Monthly Average Velocity: 1.0 km/h 24.0 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 3 Q <sub>1</sub> = 5 Median = 7 Q <sub>3</sub> = 11 P <sub>90</sub> = 15 P <sub>99</sub> = 25	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-Feb	NNW6	W3	NW3	WNW4	NNW7	N11	NNW10	N7	N9	NNW6	NW6	WNW4	NNW7	N8	NE6	ENE7	E7	ENE5	SW2	W6	WNW6	NNW5	SW3	SSW6	NNW3.7	N11
2-Feb	SSW8	S10	S10	SSE9	SSE7	SSE8	SSE10	SSE7	S6	S6	SSW6	SW6	SW2	W3	SSE2	SSE13	SSE20	SSE18	SSE20	SSE20	SSE21	SSE18	SSE18	SSE18	SSE10.5	SSE21
3-Feb	SSE17	SSE17	SSE15	SSE14	SSE13	S12	SSE12	S9	SSW5	SW6	S3	W1	NNW7	N7	NNE10	NNE9	NE11	NE11	ENE12	ENE9	ENE7	ENE7	ENE5	N4	SE4.0	SSE17
4-Feb	N4	N4	NNE5	NNE8	NNE9	NE8	N8	NNW9	NNW8	NNW8	N9	NNE10	NNE9	NNE9	NNE7	N5	NW6	NNW7	NNW7	NNW5	NNW5	NW7	NW6	NNW4	N6.4	NNE10
5-Feb	NNW4	N3	W2	NW2	WNW3	NNW5	NW5	NW6	NNW3	NW4	S4	SW3	SSE5	SSW5	S6	SSW5	SSW4	S5	SE8	SSE9	SW7	W6	NNW14	NW9	W1.6	NNW14
6-Feb	W14	W15	WSW16	WSW12	WSW13	WSW8	WSW8	S2	NNE8	NE5	ENE8	ENE9	ENE8	NNE5	N4	N3	N5	NNW8	NW5	WNW6	NW4	SW3	SW8	SSW6	WNW3.1	WSW16
7-Feb	SSW7	SSW9	S11	SSW8	SW8	W21	WSW16	WSW14	WSW17	WSW19	SW15	SW16	WSW24	WSW26	W26	W25	W17	WSW15	WSW9	WSW9	WNW11	N11	N14	N15	WSW11.9	WSW26
8-Feb	NNE12	N8	ENE3	SSE3	S5	SSE5	E4	NE3	NW2	NNW2	SSE2	S5	S8	S10	SSE7	SSW5	WSW3	NW2	NNW3	ENE3	E2	S7	S9	S10	SSE1.9	NNE12
9-Feb	S10	S9	SSE11	S12	SSE12	S10	SSW14	SSW13	SSW14	SSE11	S11	S13	S11	S12	SSE13	SSE11	S7	NNW7	N4	ENE4	NNE2	WSW3	ESE1	SSE6	S7.6	SSW14
10-Feb	W1	N8	NNW9	NNW10	N10	NNE14	NNE10	NNE12	NNE12	NNW9	NNE9	NNE10	NNE10	N9	N8	N10	N10	NNE9	NNE9	N10	NNW6	NNW5	N3	E7	N8.3	NNE14
11-Feb	ENE4	E4	ESE3	SE6	SSE5	SSE6	SSE6	SSE3	S6	S7	SSW8	S11	SSW13	S11	SSE9	SSW6	SW11	WSW14	W10	W12	W10	WSW8	WSW14	WSW18	SSW5.9	WSW18
12-Feb	WSW23	W16	WSW12	SSW6	WSW6	WSW7	W4	NW7	NNE6	NNE7	NNE11	NNE7	NE6	NNE5	NNE5	NNE6	N6	NNW7	NNW5	NNW5	WNW3	ENE1	NNW3	NW6	NW3.6	WSW23
13-Feb	NW5	NW9	SSE1	WSW5	SSW9	SW8	WSW15	NW10	NNE20	N22	N25	N27	N27	N30	N29	N26	N25	NNE19	NNE17	NNE11	NNE19	NNE17	NNE20	NNE18	N14.1	N30
14-Feb	NNE15	NNE17	NNE14	N8	NNE8	NE7	ENE9	ENE8	ENE7	ENE5	ENE6	NE6	NE5	ENE6	NE8	NNE9	NE8	NE10	NE7	NNW4	NNE6	ENE6	ENE4	E4	NE7.1	NNE17
15-Feb	SE5	SE6	SSE8	SE6	SSE5	SSW5	S4	SW5	W6	WSW5	WSW4	W5	WSW5	SSW7	SW6	SSW6	S7	SE8	SE7	SSE6	SE8	SE8	S4	SE3	S4.3	SSE8
16-Feb	SE6	S4	S4	SSW4	SSW3	NNW2	WNW1	SW3	SSW6	S7	SSW7	SW7	SSW9	SSW10	SSW8	SW5	NNE4	NNE12	NNE15	NE17	NE12	NNE10	NNE6	NNE5	ESE0.6	NE17
17-Feb	ENE5	ENE7	ENE6	ENE6	ENE4	E3	ENE5	ENE9	NE9	NE7	NE9	NNE10	NNE12	NNE13	NNE13	NNE14	NNE17	NNE14	NE15	NE14	NNE10	N9	NNW9	NNW10	NNE8.7	NNE17
18-Feb	NNW10	NNW8	NNW7	NNW6	NNW7	NW8	NNW9	N5	NW3	ENE2	N2	ENE3	NE5	N6	NNE6	NNE6	NNE5	NE8	NE8	NE8	NE1	N1	NNE3	ESE2	N4.4	NNW10
19-Feb	SE4	SE4	S3	SW3	S2	SE1	NNW3	NNW5	E3	NNW8	ENE0	NNE4	N3	NNW5	NW6	NW7	NW9	NW8	NNW9	NNW9	N9	NNW11	N8	NNE9	NNW3.9	NNW11
20-Feb	NNE8	NNE8	E9	E7	SSW1	SE3	SSE5	SE7	ESE3	SE4	SSW1	NE5	NE8	ENE11	NE12	NE12	NE10	ENE9	ENE8	N4	NNW8	N8	N12	NNE19	NE5.7	NNE19
21-Feb	NNE14	NNE17	N9	NNE9	NE9	NE9	NNE3	W3	N4	NNW5	WNW5	N4	NE9	NNE13	NNE14	NNE14	NNE12	NE10	NE14	NE7	WSW1	S4	S3	S7	NNE6.3	NNE17
22-Feb	S9	S9	S6	S7	SSE8	SSE8	SSE9	SSE9	SSE7	SSE4	SSW3	SSW2	SW3	NE3	ENE5	NE7	NE5	NE3	N3	NNW6	N2	NNW1	UO	WSW2	SSE2.6	SSE9
23-Feb	NNW5	NNW5	NNE1	NNW2	W0	S2	WSW3	WSW5	NW4	WNW1	WSW2	WSW4	ENE5	NE6	ENE4	SSE7	S7	SSE8	SE8	SE6	SE8	S6	SSW8	SSW9	S1.9	SSW9
24-Feb	SSE10	S9	S7	S8	S10	SSE12	SSE15	SSE10	SSE14	S15	S14	SSE18	S17	S20	S22	S18	S17	S16	S18	S18	S18	S17	S16	S15	S14.5	S22
25-Feb	S14	S12	S11	S11	SSE9	S8	SSE9	SE7	S6	SSW6	WSW7	SW10	SW9	S9	SSE12	SSE12	SSE9	SE9	SE9	SSE7	SE8	ESE9	SE7	SE4	SSE7.6	S14
26-Feb	SE7	E6	ESE9	SSE2	N4	NE4	N7	NE5	NE4	NNW4	NNW6	NNW7	NNW8	N11	N13	NNE14	NNE12	NNE13	NE8	NE11	NNE14	NE13	NNE13	NE13	NNE6.9	NNE14
27-Feb	NNE11	N9	N11	NNW14	NNW14	NNW14	NNW14	N13	N12	N15	NNE17	NNE17	NNE14	NNE16	NNE17	NNE14	NE11	NNE15	NNE14	NNE13	NNE15	NNE11	NNW9	N9	N12.6	NNE17
28-Feb	NNW8	NNW8	N6	WNW3	NW4	NW6	NNW5	NW3	NW2	NNW3	NNE4	NE6	NE7	NE7	NE6	NNE5	NNE3	NE3	NNW2	SE4	SSE6	S5	S7	SSE7	NNE2.0	NNW8

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 20 m (WS20m) - km/h**  
**Barge Landing - February 2023**

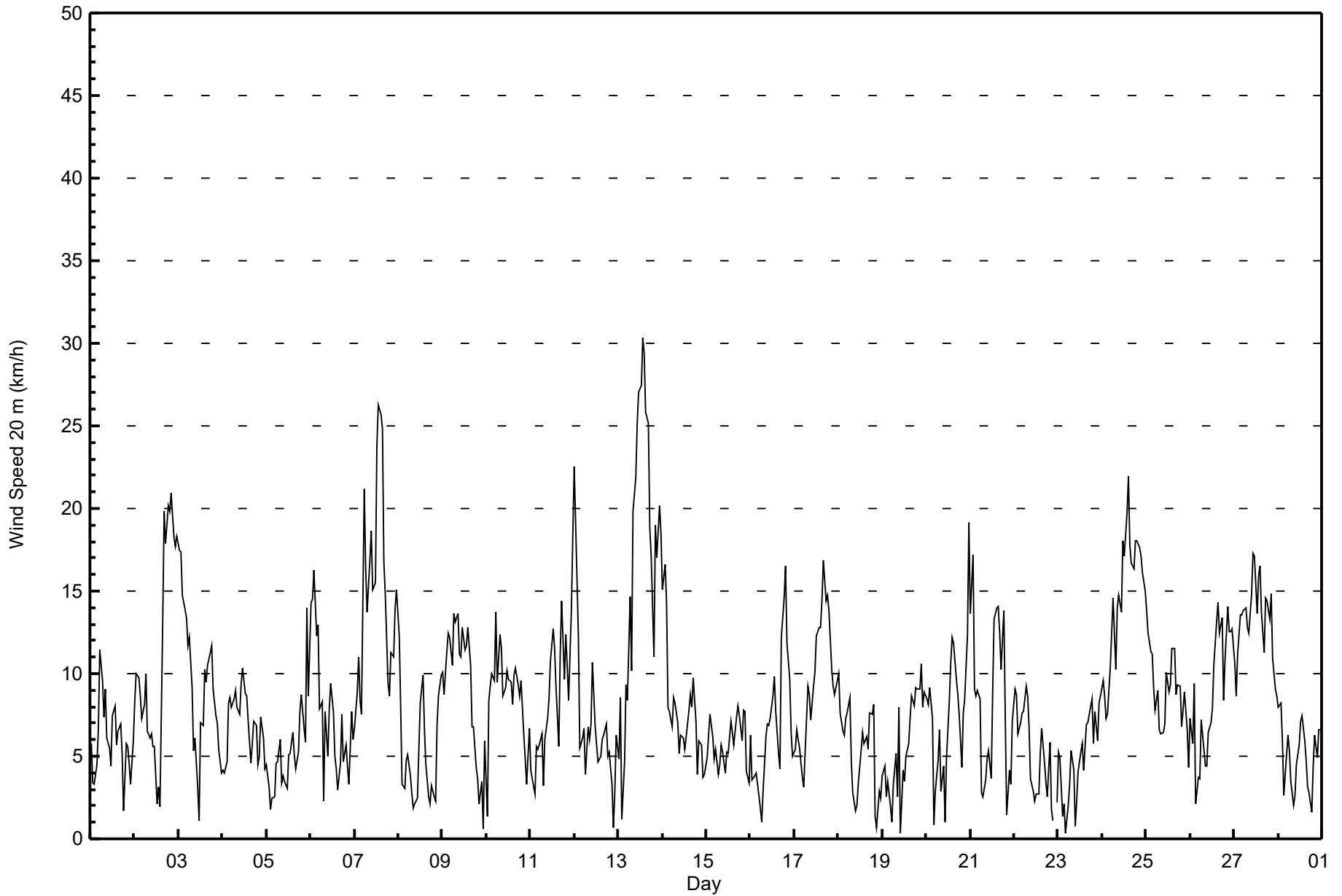
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Feb 13 14:00 Minimum Value: 0 km/h on Feb 28 08:00 Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 1 Median = 2 Q <sub>3</sub> = 3 P <sub>90</sub> = 4 P <sub>99</sub> = 7														Hours in Service: 672 Hours of Data: 671 Hours of Missing Data: 1 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-Feb	3	1	1	1	2	2	2	1	2	1	2	2	3	3	1	2	2	2	2	1	1	1	1	2	3		
2-Feb	2	2	2	2	1	1	2	2	1	1	1	2	1	1	2	6	5	4	5	5	5	4	4	4	6		
3-Feb	4	4	4	3	3	3	3	3	1	2	2	1	2	2	2	2	3	2	3	2	2	2	1	1	4		
4-Feb	1	1	1	2	2	2	2	2	2	2	3	3	2	2	2	1	1	1	1	2	1	2	1	2	3		
5-Feb	1	1	1	1	1	1	1	1	1	2	1	1	1	2	2	1	2	1	1	2	2	1	5	5	5		
6-Feb	4	5	6	2	2	2	2	3	4	3	2	2	2	2	1	2	2	1	2	1	2	1	1	1	6		
7-Feb	2	2	2	3	5	7	3	3	3	3	4	4	5	7	7	7	5	3	3	3	2	4	3	3	7		
8-Feb	3	1	1	1	1	1	1	1	1	1	1	3	3	2	2	1	2	1	1	2	1	1	1	1	3		
9-Feb	2	2	1	2	1	1	3	3	3	2	2	3	3	3	3	2	4	2	2	2	1	2	1	1	4		
10-Feb	1	1	2	2	2	4	2	3	3	2	2	3	3	3	2	2	3	2	2	2	2	1	1	2	4		
11-Feb	1	1	2	1	1	1	1	2	2	2	2	3	4	3	2	2	5	4	2	4	4	2	3	3	5		
12-Feb	4	5	4	3	3	3	3	2	2	3	3	2	1	1	1	1	2	1	2	1	2	2	2	3	5		
13-Feb	2	3	2	2	3	3	4	3	5	6	7	8	8	9	8	8	7	6	4	4	5	5	5	5	9		
14-Feb	5	4	4	2	2	2	2	2	2	1	1	1	1	2	2	2	2	1	3	1	2	2	1	1	5		
15-Feb	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1	2		
16-Feb	1	2	1	1	1	2	2	2	2	2	3	2	3	3	2	1	2	3	3	4	3	2	2	2	4		
17-Feb	1	1	1	2	1	1	2	2	2	2	2	2	3	3	3	3	3	3	3	3	2	2	1	1	3		
18-Feb	1	2	1	1	1	1	2	3	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	3		
19-Feb	2	2	2	1	1	1	2	1	1	3	2	1	2	2	2	2	2	1	1	1	2	3	4	2	4		
20-Feb	2	2	2	2	1	1	2	1	2	2	2	2	2	2	3	3	2	1	1	1	1	2	4	5	5		
21-Feb	4	4	3	2	2	2	2	1	2	2	1	2	3	3	3	4	2	2	1	3	1	1	2	1	4		
22-Feb	1	1	2	2	1	1	1	2	1	1	1	1	2	1	2	2	2	1	1	1	2	1	1	1	2		
23-Feb	3	2	1	1	1	1	1	2	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	2	3		
24-Feb	2	3	1	2	2	2	3	1	4	3	3	4	4	5	5	5	4	6	5	5	4	4	4	4	6		
25-Feb	3	3	2	2	2	1	2	2	1	1	3	2	2	3	3	3	2	2	1	1	1	1	1	1	3		
26-Feb	1	2	2	2	2	1	2	1	1	1	1	1	2	3	3	3	3	3	2	3	4	3	2	3	4		
27-Feb	2	2	3	3	4	3	5	4	4	4	4	4	3	4	4	3	3	3	4	3	3	2	2	1	5		
28-Feb	1	1	2	1	1	1	1	0	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	2		
														Diurnal Maximum													
UO - Unstable Operation																											





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

**Wind Speed 20 m (WS20m) - km/h**  
**Barge Landing - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h  
Barge Landing - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	205	30.55	30.55
6 - 11	319	47.54	78.09
12 - 19	125	18.63	96.72
20 - 28	20	2.98	99.70
29 - 38	2	0.30	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 671

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h  
Barge Landing - February 2023**

<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	20	15	13	18	6	5	8	12	16	12	10	12	9	8	13	28	205
6 - 11	28	37	31	21	5	2	18	32	40	22	11	8	5	3	16	40	319
12 - 19	7	42	9	1	0	0	0	19	18	4	2	13	5	0	0	5	125
20 - 28	6	2	0	0	0	0	0	4	2	0	0	3	3	0	0	0	20
29 - 38	2	0	0	0	0	0	0	0	0	0	0	0	0	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>	63	96	53	40	11	7	26	67	76	38	23	36	22	11	29	73	671

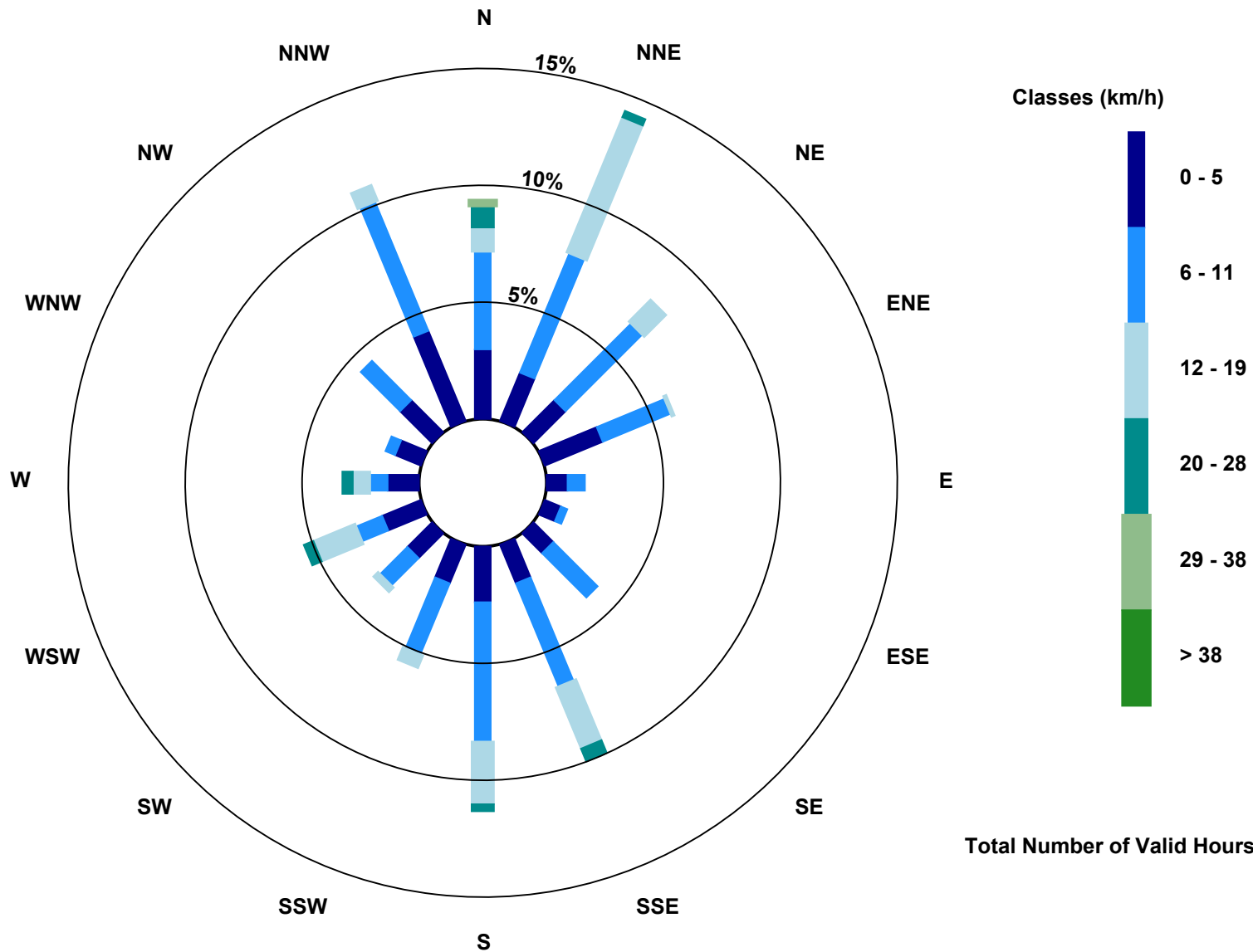
Total Number of Valid Hours: 671

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed 20 m (WS20m) - km/h  
Barge Landing





Direction of Maximum Speed: 357 deg on Feb 13 14:00		Hours in Service:	672
Direction of Maximum Daily Speed Average: 176.5 deg on Feb 24		Hours of Data:	671
Direction of Minimum Speed: 61 deg on Feb 19 11:00		Hours of Missing Data:	1
Direction of Minimum Daily Speed Average: 0.6 deg on Feb 16		Percent Operational Time:	99.9
Monthly Average Direction: 24.0 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-Feb	344	281	305	291	331	350	342	4	2	329	318	282	332	352	37	73	80	70	222	270	293	334	235	196	339.2
2-Feb	194	169	170	149	166	163	159	168	174	176	205	218	225	276	158	149	149	154	153	153	153	154	151	154	160.7
3-Feb	159	163	167	167	168	169	168	176	192	220	183	268	330	4	26	29	46	50	65	65	59	60	78	9	124.2
4-Feb	6	6	27	25	27	45	8	340	344	348	7	13	13	15	20	2	322	335	339	339	344	324	326	333	359.8
5-Feb	327	357	260	323	301	348	324	321	340	309	189	223	157	195	182	208	200	184	143	156	214	277	342	314	259.9
6-Feb	281	265	254	246	240	242	247	170	21	54	72	65	62	17	5	353	352	338	323	301	326	234	214	204	282.4
7-Feb	196	208	188	198	230	265	258	254	244	237	235	234	243	258	265	268	265	258	251	256	283	349	6	10	255.8
8-Feb	12	357	63	154	175	165	101	43	326	327	163	188	182	171	165	193	248	324	331	74	98	191	177	172	162.6
9-Feb	172	184	168	177	167	178	198	196	194	168	170	170	176	170	167	165	170	344	3	61	25	255	118	162	175.7
10-Feb	260	349	348	347	0	18	12	17	16	348	13	22	14	357	4	355	3	18	13	1	344	344	2	83	6.1
11-Feb	75	97	106	131	157	153	156	155	173	178	194	191	192	176	167	198	232	255	265	273	280	240	238	245	210.9
12-Feb	256	262	255	205	243	237	267	315	26	17	29	25	38	27	25	31	355	338	330	333	301	69	338	320	313.2
13-Feb	306	324	149	239	207	224	258	311	16	1	355	358	3	357	352	354	9	17	18	20	32	23	23	23	0.3
14-Feb	18	12	18	9	12	45	57	62	69	71	77	56	36	57	39	29	40	46	55	336	28	68	64	85	38.6
15-Feb	124	141	150	142	165	198	190	231	260	245	248	260	247	210	216	192	170	146	140	159	137	140	171	141	177.7
16-Feb	138	174	180	193	210	335	282	220	192	190	197	219	196	201	199	215	22	12	21	38	44	32	20	15	102.4
17-Feb	72	74	73	70	63	84	77	65	50	49	36	30	26	21	26	24	23	25	38	41	15	2	341	334	32.9
18-Feb	345	342	342	337	338	326	337	351	306	68	357	77	46	10	17	22	13	44	52	55	54	4	17	123	7.8
19-Feb	134	136	176	232	169	130	338	348	88	338	61	21	352	335	323	320	317	316	336	341	359	343	356	20	343.5
20-Feb	29	24	91	93	193	146	152	124	123	135	194	38	54	60	50	37	34	58	58	353	342	356	2	17	44.8
21-Feb	21	13	4	32	55	45	29	276	351	337	290	353	35	32	30	28	25	40	50	42	251	186	183	186	27.0
22-Feb	183	174	189	173	167	163	164	163	156	168	207	205	228	48	69	48	46	44	354	338	9	335	UO	241	158.7
23-Feb	330	341	26	342	261	170	239	240	305	291	244	243	63	45	76	160	176	168	143	125	131	170	195	204	171.6
24-Feb	167	169	174	175	169	161	167	165	159	171	179	162	173	181	181	179	184	172	190	185	184	184	187	188	176.5
25-Feb	177	182	181	172	166	177	149	137	179	200	251	236	230	182	157	158	152	136	143	147	142	116	131	132	167.8
26-Feb	132	98	121	161	358	53	358	51	48	339	336	332	337	0	10	15	15	32	56	43	31	36	32	41	28.6
27-Feb	31	4	349	342	344	345	348	354	359	358	20	23	21	20	24	25	34	25	25	18	21	13	345	349	9.4
28-Feb	336	347	352	292	316	325	327	323	326	342	19	43	51	54	50	33	26	42	339	144	154	170	188	160	15.1
3.3 329.3 167.6 176.8 195.4 212.4 237.5 320.0 14.5 318.2 343.0 0.9 10.1 11.0 28.7 25.5 27.2 31.2 47.4 39.2 33.4 31.2 8.2 41.3																									
Diurnal Average																									

UO - Unstable Operation

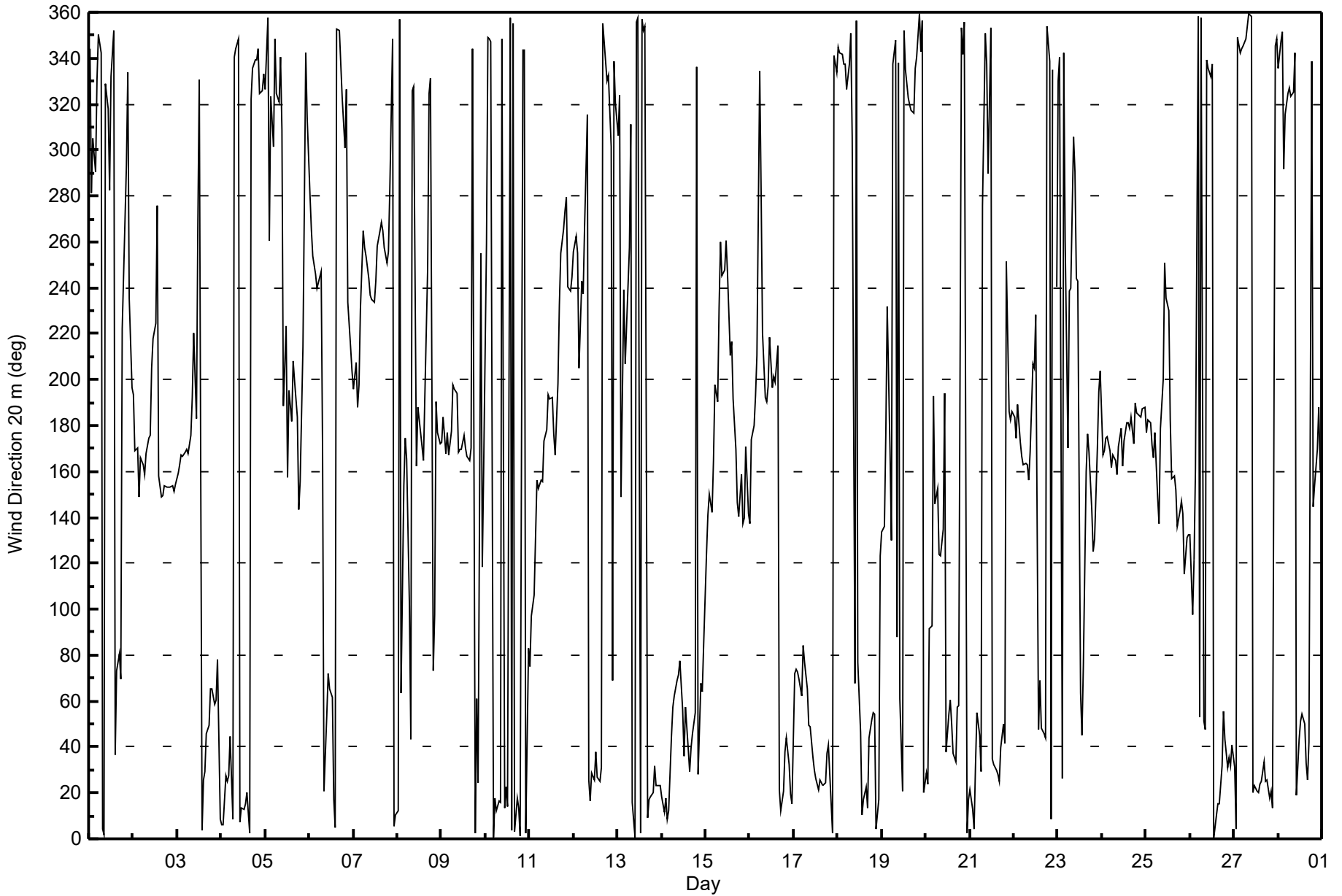
All monthly, daily, and diurnal averages have been calculated using vector methods



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

**Wind Direction 20 m (WD20m) - deg**  
**Barge Landing - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 100 deg on Feb 19 11:00 Minimum Value: 4 deg on Feb 18 01:00 Percentiles: P <sub>1</sub> = 6 P <sub>10</sub> = 10 Q <sub>1</sub> = 13 Median = 17 Q <sub>3</sub> = 25 P <sub>90</sub> = 42 P <sub>99</sub> = 88		Hours in Service: 672 Hours of Data: 671 Hours of Missing Data: 1 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-Feb	23	34	50	16	13	14	13	15	16	13	22	42	24	32	23	15	10	20	86	24	15	38	30	23	86	
2-Feb	14	17	14	7	11	9	8	7	22	18	22	19	69	33	67	16	12	13	13	13	13	14	12	12	69	
3-Feb	12	13	14	13	14	15	13	16	25	20	51	89	18	21	16	17	14	14	15	16	18	16	20	40	89	
4-Feb	17	21	29	13	13	14	23	15	14	19	18	17	18	17	16	27	16	14	14	18	25	16	18	16	29	
5-Feb	16	24	61	34	25	26	20	21	38	32	47	54	31	48	42	38	29	24	11	27	31	41	23	30	61	
6-Feb	15	20	13	11	9	12	15	64	37	51	21	15	16	34	41	41	27	11	13	15	13	42	8	12	64	
7-Feb	16	22	16	28	40	14	12	15	9	11	15	17	13	15	15	15	14	12	20	22	11	45	17	16	45	
8-Feb	12	11	40	39	7	13	39	26	49	56	49	36	30	21	32	38	36	28	27	33	59	10	7	7	59	
9-Feb	8	12	12	7	5	11	16	21	18	12	12	14	16	17	14	9	28	24	33	33	68	26	89	19	89	
10-Feb	72	14	19	15	17	15	14	13	16	15	17	13	16	21	22	19	17	13	18	19	18	25	43	19	72	
11-Feb	14	20	12	6	13	14	13	52	17	26	21	19	19	20	13	33	23	14	14	16	21	15	11	12	52	
12-Feb	12	15	19	37	52	57	65	37	35	25	14	25	21	21	22	15	19	16	20	14	27	90	38	37	90	
13-Feb	42	23	88	43	19	34	17	43	17	21	21	22	21	22	19	19	19	17	14	20	13	17	14	14	88	
14-Feb	16	19	15	19	16	17	14	15	16	18	20	21	18	20	21	16	14	6	34	20	21	20	23	21	34	
15-Feb	11	19	11	11	10	10	21	15	14	16	21	18	27	38	32	38	14	16	8	11	9	6	30	23	38	
16-Feb	12	46	17	24	23	86	79	71	20	18	26	19	26	17	23	24	77	15	15	14	15	15	25	19	86	
17-Feb	20	15	13	15	22	31	25	15	17	20	15	14	15	12	11	12	12	11	14	10	13	13	7	7	31	
18-Feb	4	10	9	8	11	22	12	20	16	47	46	39	30	18	22	15	14	10	9	8	77	94	17	40	94	
19-Feb	9	14	40	16	50	56	49	12	60	27	100	33	49	35	26	17	12	10	9	9	14	13	25	14	100	
20-Feb	12	16	11	11	81	42	36	6	33	32	88	40	20	15	18	14	13	8	8	31	9	12	17	17	88	
21-Feb	14	16	19	17	16	13	62	49	46	25	21	59	22	14	15	16	12	21	7	9	71	14	20	10	71	
22-Feb	6	9	11	11	7	6	10	13	10	31	36	62	66	72	28	20	20	15	52	18	86	68	UO	40	86	
23-Feb	46	18	61	41	96	74	33	17	17	49	34	29	45	25	71	24	17	9	10	7	5	25	10	14	96	
24-Feb	8	10	8	11	9	9	9	7	10	13	18	12	21	20	17	18	18	13	18	16	16	16	16	16	21	
25-Feb	15	15	18	11	9	16	23	29	18	25	24	18	22	34	21	13	15	10	14	15	9	9	15	13	34	
26-Feb	13	14	16	81	46	16	20	15	27	15	13	15	16	20	18	14	16	16	20	22	14	14	12	13	81	
27-Feb	13	19	18	17	17	17	20	19	20	20	14	13	16	14	12	14	16	13	14	13	12	14	17	10	20	
28-Feb	13	16	7	41	29	14	6	14	34	26	20	23	20	18	23	20	20	15	59	13	5	21	9	7	59	
		72	46	88	81	96	86	79	71	60	56	100	89	69	72	71	41	77	28	86	33	86	94	89	40	
		Diurnal Maximum																								
UO - Unstable Operation																										





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS11 LOWER CAMP FEBRUARY 2023**

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

March 31, 2023



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)  
FEBRUARY 2023

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	638	32	34	99.7	77.5	0	8.8	0
H2S (ppb) Average	639	33	33	100	9.4	0	1.8	0
THC (ppm) Average	638	32	34	99.7	3.8	-	3	-
CH4(ppm) Average	638	32	34	99.7	3.7	-	2.9	-
NMHC(ppm) Average	638	32	34	99.7	0.291	-	0.055	-
Temperature (C) Average	672	0	0	100	4.1	-	-1.2	-
Relative Humidity (%) Average	672	0	0	100	92.6	-	85.2	-
Barometric Pressure (inHg) Average	672	0	0	100	30	-	29.9	-
Wind Speed 10 m (km/h) Average	669	0	3	99.55	32	-	17	-
Wind Direction 10 m (deg) Average	669	0	3	99.55	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)  
FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	638	2.48	6.9	-	0	0	0.2	0.4	1.4	5.7	77.5
H2S (ppb) Average	639	0.6	0.8	-	0	0.1	0.2	0.4	0.8	1.3	9.4
THC (ppm) Average	638	2.28	0.2	-	2	2.1	2.1	2.2	2.4	2.6	3.8
CH4(ppm) Average	638	2.27	0.2	-	2	2.1	2.1	2.2	2.4	2.5	3.7
NMHC(ppm) Average	638	0.013	0.031	-	0	0	0	0	0	0.1	0.291
Temperature 2 m (C) Average	672	-16.08	9.8	-	-38.2	-30.5	-23.4	-15.1	-8.7	-4	4.1
Relative Humidity (%) Average	672	74.4	9.1	-	43.4	62.1	70.3	75.1	80.3	85	92.6
Barometric Pressure (inHg) Average	672	29.07	0.4	-	28.2	28.7	28.8	29	29.3	29.6	30
Wind Speed 10 m (km/h) Average	669	7.5	6	-	0	1	3	6	10	15	32
Wind Direction 10 m (deg) Average	669	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO <sub>2</sub> , THC/NMHC/CH <sub>4</sub>	08 Feb 2023 14:00	08 Feb 2023 15:00	2	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	23 Feb 2023 09:00	23 Feb 2023 09:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	28 Feb 2023 22:00	28 Feb 2023 23:00	2	Flat line in sensor output signal - Sensor frozen



# Wood Buffalo Environmental Association

## Summary of Hour Averages

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

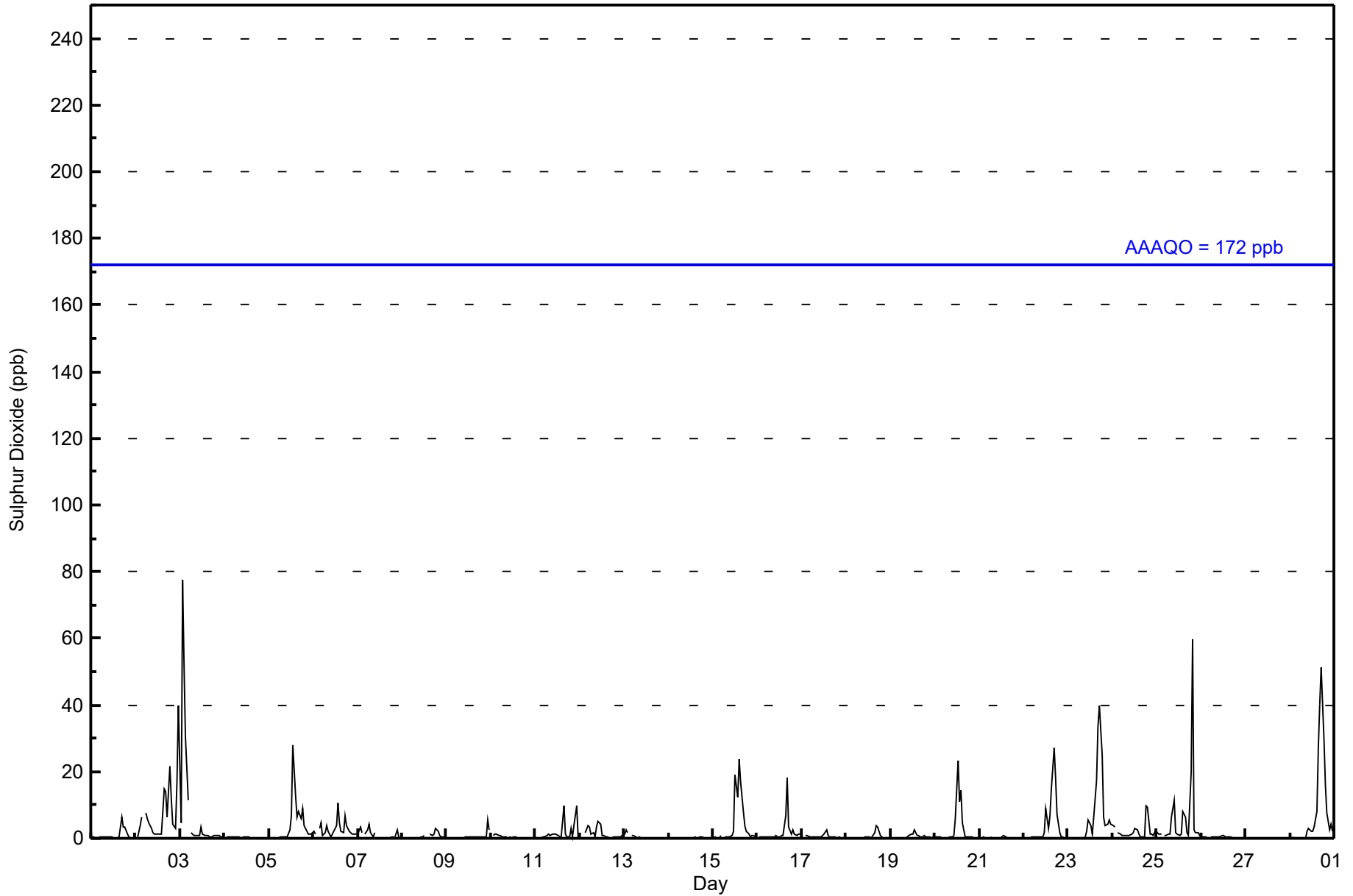
## Lower Camp - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																																								
Maximum Value: 77.5 ppb on Feb 3 02:00		Maximum Daily Average: 8.8 ppb on Feb 28				Hours of Data:		638																																								
Minimum Value: 0.0 ppb on Feb 1 23:00		Minimum Daily Average: 0.0 ppb on Feb 27				Hours of Missing Data:		34																																								
Maximum Diurnal Average: 6.1 ppb at hour 17		Minimum Diurnal Average: 0.7 ppb at hour 9				Hours of Calibration:		32																																								
Monthly Average: 2.48 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> = 1.4 P <sub>90</sub> = 5.7 P <sub>99</sub> = 37.4				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-Feb	0.3	0.3	0.2	Z	0.3	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.5	6.2	3.2	3.4	1.2	0.5	0.1	0.0	0.0	0.8	6.2																						
2-Feb	0.0	0.2	3.9	6.2	Z	7.5	6.1	4.8	3.0	1.8	1.2	1.2	1.1	1.2	14.7	13.9	6.3	21.6	11.7	4.2	3.1	17.1	39.6	7.5	39.6																							
3-Feb	4.8	77.5	52.6	30.6	11.5	Z	1.7	0.9	0.7	0.7	0.8	3.4	1.4	0.9	1.0	1.0	0.6	0.5	0.7	0.7	0.7	0.6	0.6	0.5	8.5	77.5																						
4-Feb	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.4																						
5-Feb	0.1	Z	0.2	0.1	0.2	0.1	0.2	0.3	0.3	0.4	0.6	2.7	6.9	28.2	12.6	6.4	7.9	6.0	8.7	3.8	2.3	1.4	1.4	1.3	4.0	28.2																						
6-Feb	2.0	1.3	Z	2.9	4.6	0.8	1.8	3.8	2.3	0.4	1.3	2.0	3.6	10.7	4.7	2.2	1.8	6.9	4.0	1.9	1.7	1.4	1.4	1.2	2.8	10.7																						
7-Feb	1.3	3.3	1.8	Z	1.2	2.6	4.4	1.9	0.4	1.5	C	C	C	C	0.1	0.0	0.1	0.0	0.3	0.2	0.0	2.7	0.4	0.0	1.2	4.4																						
8-Feb	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.9	M	M	1.2	0.8	1.2	3.0	2.0	0.8	0.5	0.4	0.3	0.6	3.0																						
9-Feb	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.1	0.2	0.2	0.2	0.3	0.5	0.6	0.4	0.5	0.5	0.6	0.4	0.5	0.4	0.4	5.5	2.7	0.7	5.5																						
10-Feb	Z	0.8	1.3	1.1	0.9	0.8	0.6	0.4	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.4	1.3																						
11-Feb	0.1	Z	0.1	0.1	0.3	0.5	0.8	1.1	0.8	1.4	1.5	1.2	0.7	0.5	0.4	9.7	1.2	0.5	0.3	3.2	0.6	3.7	9.9	0.4	1.7	9.9																						
12-Feb	0.2	0.2	Z	1.6	3.9	3.3	1.3	1.8	0.3	3.3	5.2	4.3	0.9	0.6	0.6	0.4	0.2	0.1	0.3	0.3	0.4	0.4	0.3	1.1	1.3	5.2																						
13-Feb	1.4	2.6	1.7	Z	1.0	0.7	0.3	0.2	0.3	0.1	0.2	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.4	2.6																						
14-Feb	0.0	0.0	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.1	0.3	0.1	0.2	0.3	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.3																					
15-Feb	0.1	0.5	0.1	0.1	1.0	Z	0.4	0.3	0.5	0.3	1.0	2.0	19.1	12.5	23.9	17.1	8.0	3.6	2.2	1.2	0.6	1.0	0.8	0.5	4.2	23.9																						
16-Feb	Z	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.5	0.4	0.7	0.9	6.7	18.2	3.5	1.5	2.5	1.1	0.9	1.1	1.1	1.9	18.2																						
17-Feb	0.9	Z	0.8	0.7	0.6	0.6	0.6	0.5	0.4	0.5	0.5	0.7	1.3	2.7	1.0	0.6	0.4	0.4	0.3	0.2	0.2	0.1	0.0	0.1	0.6	2.7																						
18-Feb	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.5	0.2	0.1	0.2	1.8	3.8	3.4	0.8	0.4	0.1	0.0	0.0	0.0	0.5	3.8																						
19-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.3	0.9	1.2	1.2	2.5	0.9	0.8	0.6	0.6	0.8	0.5	0.3	0.5	0.2	0.3	0.5	2.5																						
20-Feb	0.3	0.4	0.4	0.3	Z	0.2	0.1	0.1	0.2	0.4	0.9	5.9	23.3	11.0	14.5	4.8	0.6	0.6	0.3	0.3	0.3	0.1	0.1	0.1	2.8	23.3																						
21-Feb	0.1	0.1	0.3	0.2	0.2	Z	0.3	0.1	0.1	0.2	0.1	0.2	0.5	0.6	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.6																						
22-Feb	Z	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.5	1.7	8.8	2.9	6.6	14.7	27.3	18.2	7.0	1.7	0.6	0.3	0.2	0.1	4.0	27.3																						
23-Feb	0.1	Z	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.3	2.1	5.4	3.8	1.2	6.3	17.4	33.6	39.7	24.9	6.3	3.9	4.3	5.6	4.1	6.9	39.7																						
24-Feb	3.9	3.3	Z	1.8	1.5	1.0	0.9	0.7	0.7	0.7	1.3	1.9	2.8	2.6	1.2	0.5	0.6	0.4	9.7	9.4	1.4	1.1	0.9	2.5	2.2	9.7																						
25-Feb	1.8	1.1	1.1	Z	0.8	0.8	1.2	1.1	6.3	11.3	1.8	1.2	0.8	1.2	8.1	6.4	1.7	0.9	19.8	59.8	2.7	1.6	1.5	0.8	5.8	59.8																						
26-Feb	0.6	0.4	0.3	0.3	Z	0.4	0.3	0.3	0.4	0.4	0.5	0.7	0.7	0.5	0.4	0.4	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.7																						
27-Feb	0.2	0.2	0.2	0.2	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	0.2																						
28-Feb	Z	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	3.1	1.9	2.2	3.5	8.2	27.2	40.5	51.5	29.6	16.3	7.4	2.5	4.1	2.3	8.8	51.5																						
																								0.8	3.9	2.8	2.1	1.3	0.9	0.8	0.7	0.7	1.0	1.0	1.5	3.0	3.3	3.5	4.8	6.1	5.3	5.0	4.5	1.1	1.0	1.9	2.1	Diurnal Average
																								4.8	77.5	52.6	30.6	11.5	7.5	6.1	4.8	6.3	11.3	5.2	5.9	23.3	28.2	23.9	27.2	40.5	51.5	29.6	59.8	7.4	4.3	17.1	39.6	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**  
**Lower Camp - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Lower Camp - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	602	94.36	94.36
11 - 20	19	2.98	97.34
21 - 60	16	2.51	99.84
61 - 110	1	0.16	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Lower Camp - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	86	33	10	10	8	28	99	19	8	0	2	13	35	53	99	96	599
11 - 20	0	0	1	0	1	2	7	2	0	0	1	3	0	1	1	0	19
21 - 60	0	0	0	1	0	1	7	0	0	0	0	2	3	1	0	1	16
61 - 110	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
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>	86	33	11	11	9	31	114	21	8	0	3	18	38	55	100	97	635

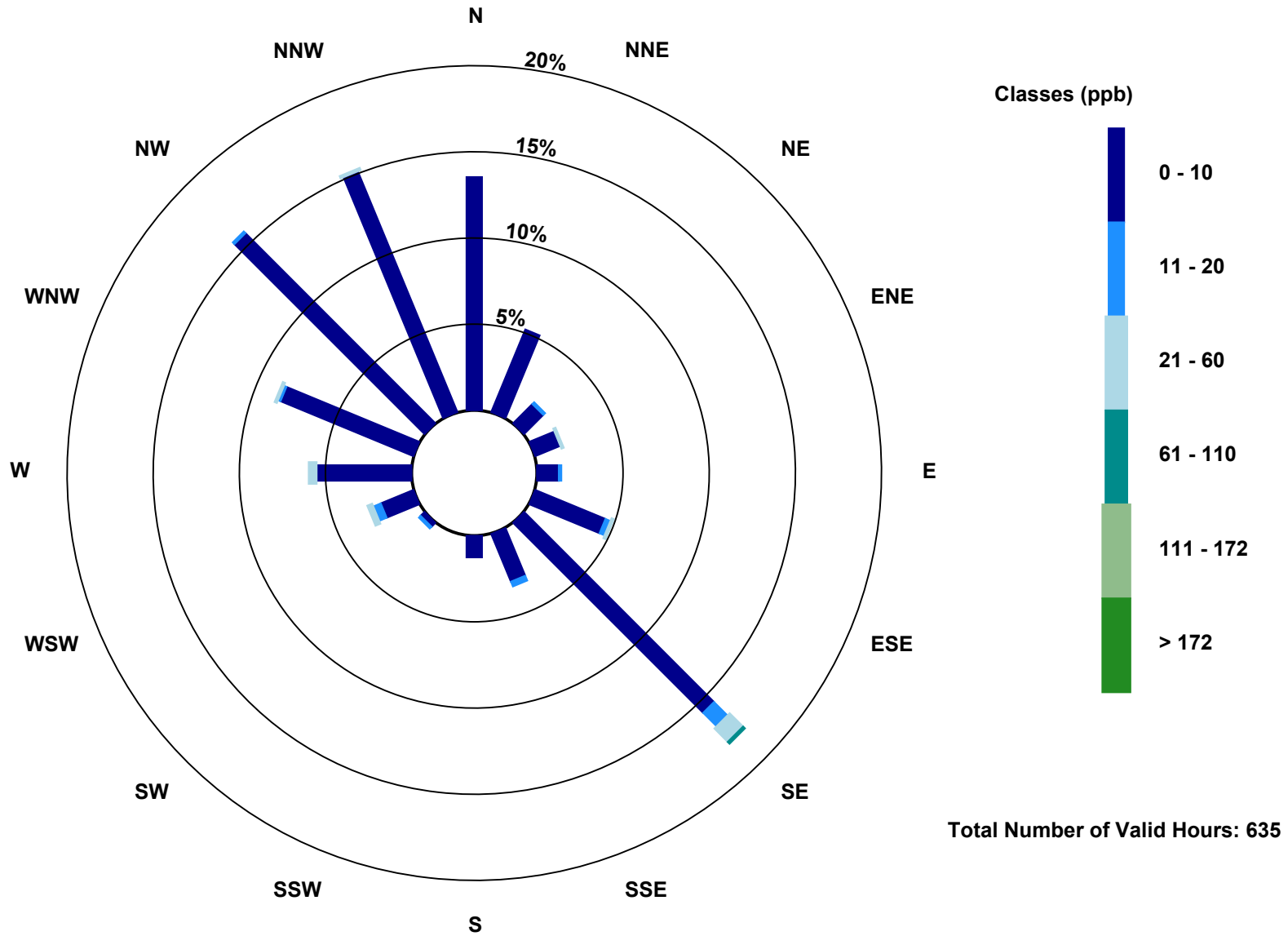
Total Number of Valid Hours: 635

Total Number of Hours: 672

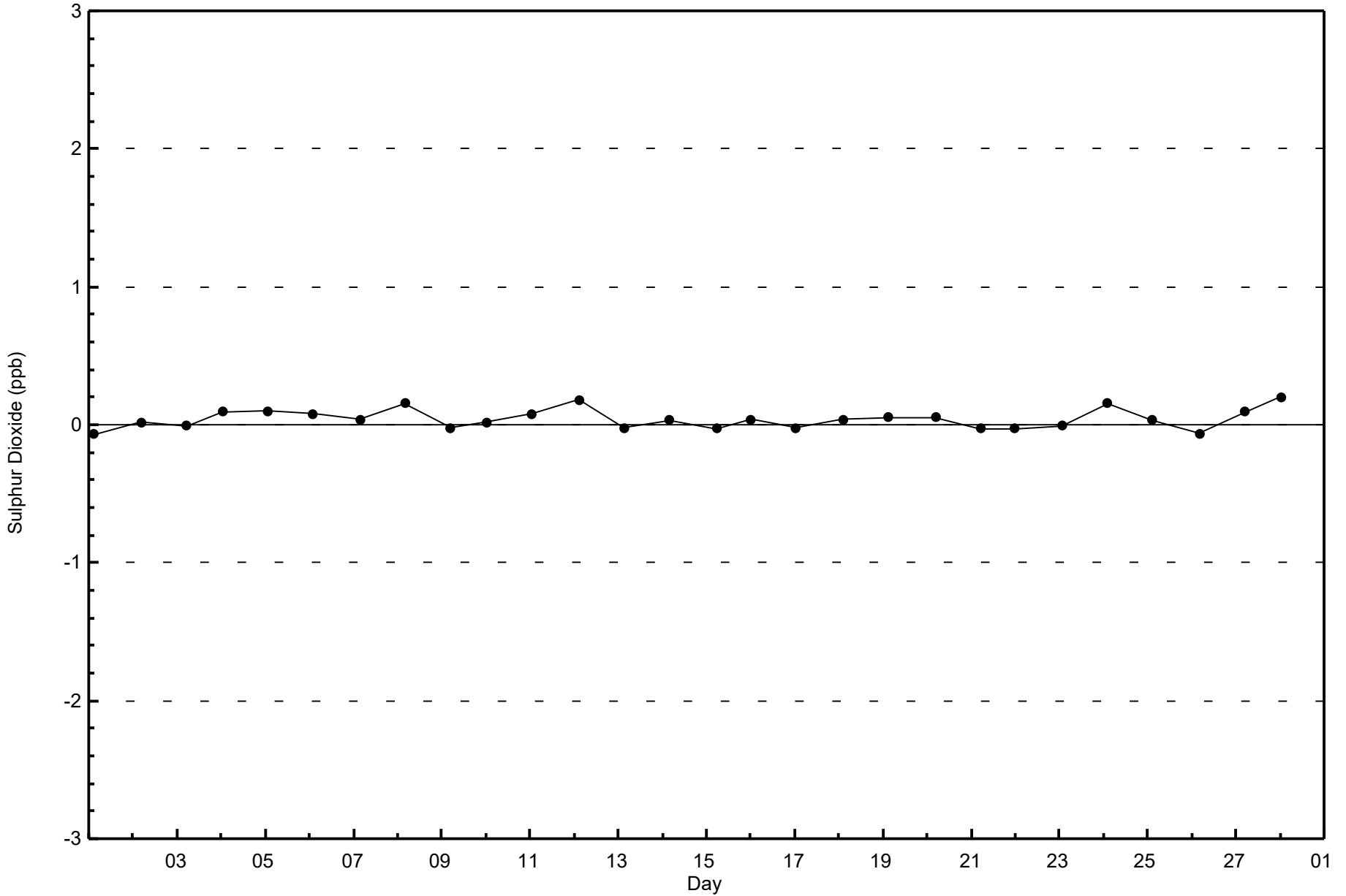


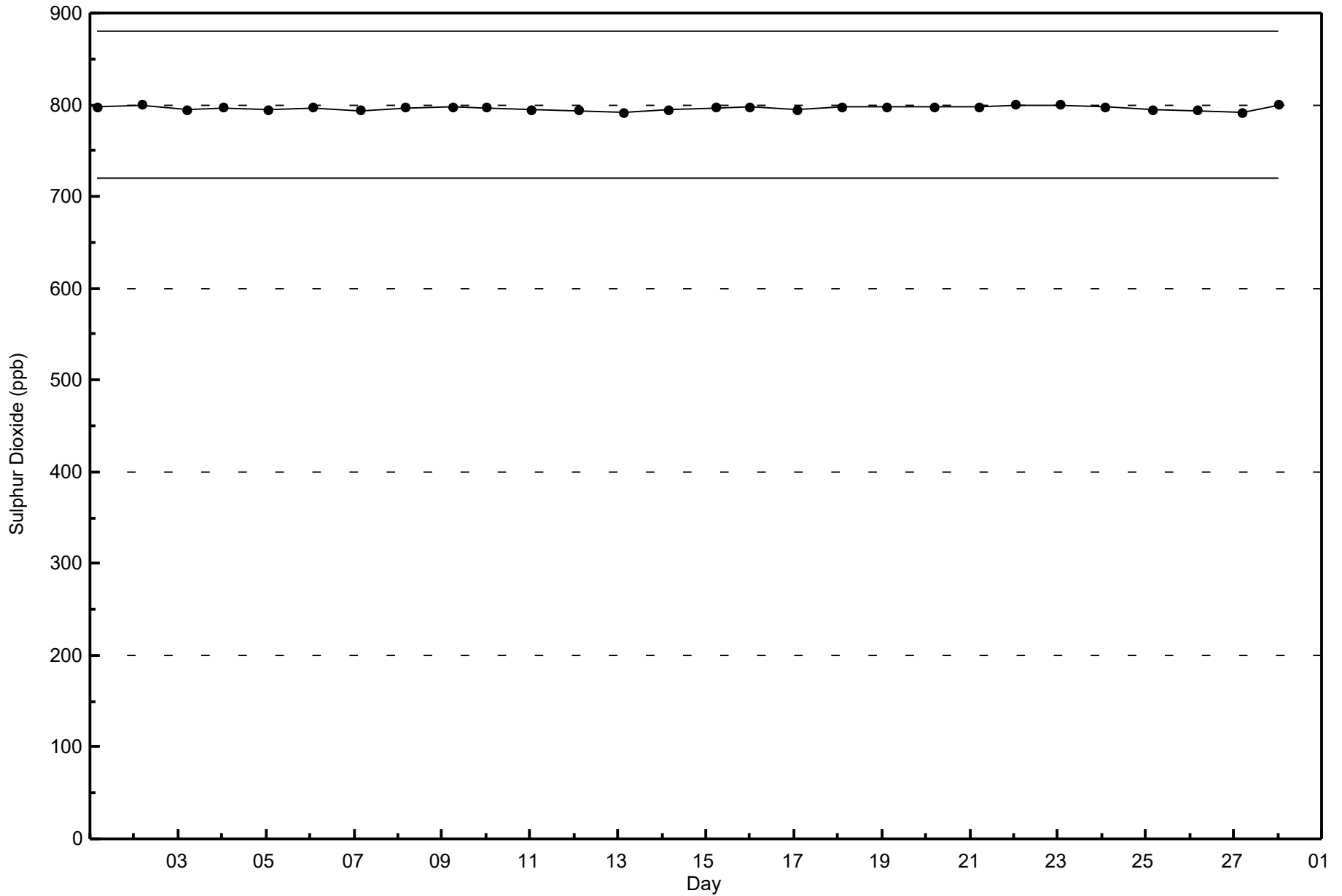
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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











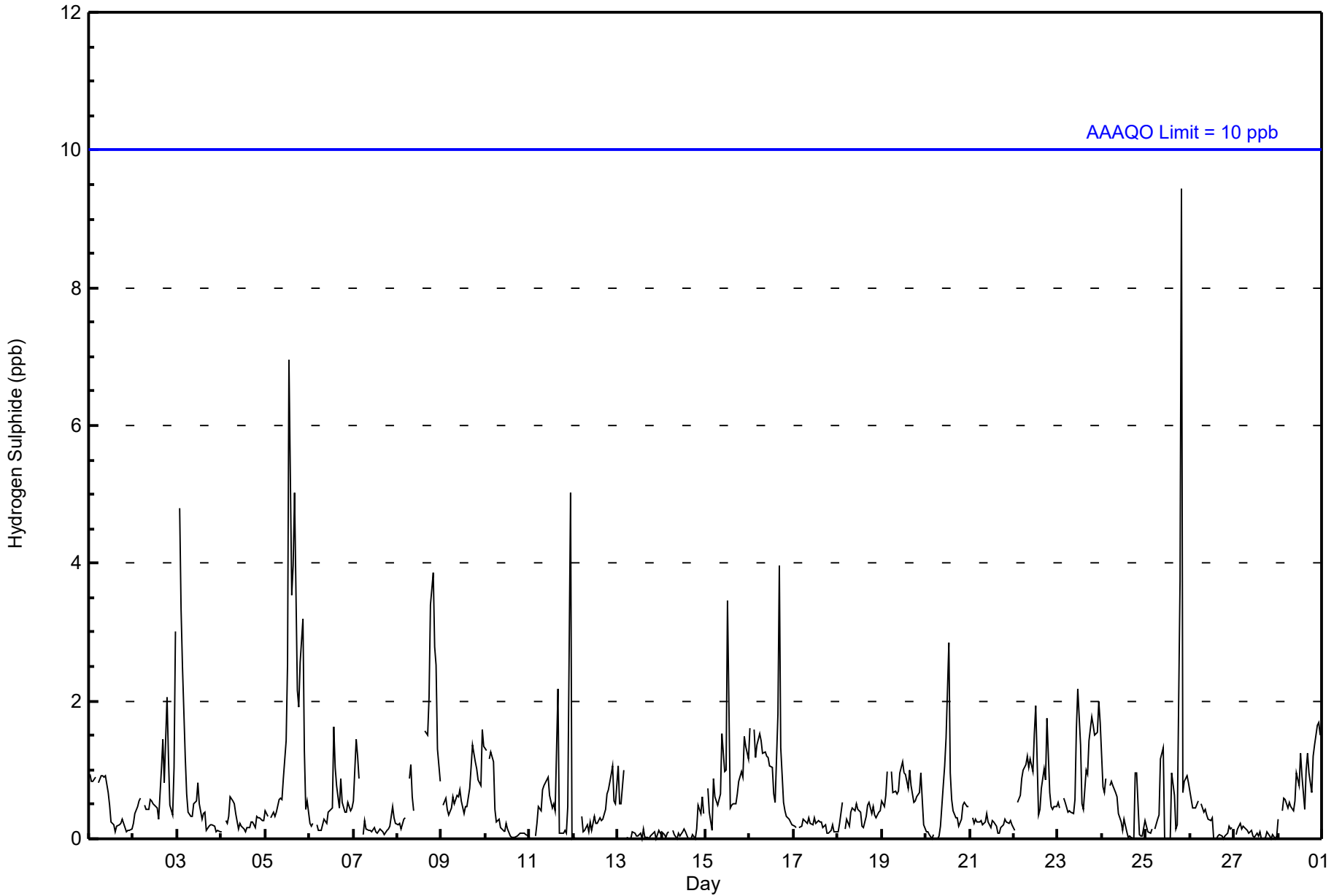
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Lower Camp - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 672														672						
Maximum Value: 9.4 ppb on Feb 25 20:00		Maximum Daily Average: 1.8 ppb on Feb 5		Hours of Data: 639														639								
Minimum Value: 0.0 ppb on Feb 11 01:00		Minimum Daily Average: 0.1 ppb on Feb 27		Hours of Missing Data: 33														33								
Maximum Diurnal Average: 1.0 ppb at hour 20		Minimum Diurnal Average: 0.4 ppb at hour 1		Hours of Calibration: 33														33								
Monthly Average: 0.60 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> = 0.8 P <sub>90</sub> = 1.3 P <sub>99</sub> = 3.9		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-Feb	0.9	0.8	0.8	0.9	Z	0.8	0.9	0.9	0.9	0.9	0.7	0.5	0.3	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.5	0.9
2-Feb	0.2	0.4	0.5	0.6	0.6	Z	0.5	0.4	0.4	0.6	0.6	0.5	0.5	0.4	0.3	1.0	1.4	0.8	2.1	1.2	0.5	0.3	1.0	3.0	0.8	3.0
3-Feb	Z	4.8	3.3	2.5	1.2	0.7	0.4	0.3	0.3	0.5	0.5	0.8	0.5	0.3	0.4	0.4	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.8	4.8
4-Feb	0.1	Z	0.3	0.2	0.3	0.6	0.5	0.5	0.4	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6
5-Feb	0.4	0.3	Z	0.3	0.4	0.3	0.4	0.6	0.6	0.6	0.9	1.4	2.5	7.0	3.5	4.0	5.0	2.2	1.9	2.6	3.2	1.3	0.4	0.5	1.8	7.0
6-Feb	0.2	0.2	0.2	Z	0.2	0.1	0.1	0.2	0.3	0.2	0.4	0.4	0.5	1.6	1.0	0.8	0.5	0.9	0.5	0.4	0.4	0.5	0.4	0.4	0.5	1.6
7-Feb	0.5	1.5	1.2	0.9	Z	0.1	0.3	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	0.5	0.3	0.2	0.3	1.5
8-Feb	0.2	0.2	0.1	0.3	0.3	Z	0.9	1.1	0.6	0.4	C	C	C	C	C	1.6	1.5	2.1	3.4	3.9	2.8	2.5	1.3	0.8	1.3	3.9
9-Feb	Z	0.5	0.6	0.4	0.4	0.4	0.6	0.5	0.6	0.6	0.7	0.6	0.4	0.5	0.5	0.7	1.0	1.4	1.1	1.0	0.9	0.8	1.6	1.3	0.7	1.6
10-Feb	1.3	Z	1.2	1.3	1.1	0.4	0.2	0.3	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.3	1.3
11-Feb	0.0	0.0	Z	0.0	0.2	0.5	0.4	0.7	0.8	0.9	0.9	0.6	0.5	0.5	0.4	2.2	0.1	0.1	0.1	0.1	0.1	0.5	5.0	0.0	0.6	5.0
12-Feb	0.0	0.0	0.0	Z	0.3	0.1	0.1	0.2	0.1	0.2	0.1	0.3	0.2	0.2	0.3	0.3	0.3	0.4	0.6	0.7	0.9	1.1	0.6	0.5	0.3	1.1
13-Feb	1.1	0.5	0.5	1.0	Z	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.2	1.1
14-Feb	0.1	0.1	0.0	0.1	0.1	Z	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.5	0.4	0.6	0.4	0.1	0.6
15-Feb	Z	0.7	0.4	0.1	0.9	0.6	0.5	0.6	0.6	1.5	1.0	1.0	3.5	0.4	0.5	0.5	0.5	0.7	0.8	1.0	0.9	1.5	1.4	1.2	0.9	3.5
16-Feb	1.6	Z	1.6	1.2	1.4	1.5	1.4	1.2	1.3	1.2	1.2	1.1	1.0	0.6	0.5	1.8	4.0	1.3	0.5	0.4	0.3	0.3	0.2	0.2	1.1	4.0
17-Feb	0.2	0.2	Z	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.3
18-Feb	0.1	0.2	0.5	Z	0.1	0.3	0.2	0.4	0.4	0.4	0.5	0.4	0.4	0.2	0.2	0.3	0.5	0.5	0.4	0.5	0.3	0.3	0.4	0.4	0.3	0.5
19-Feb	0.5	0.5	0.6	1.0	Z	1.0	0.7	0.7	0.7	0.7	0.9	1.1	1.0	0.9	0.7	1.0	0.8	0.5	0.5	0.6	0.7	1.0	0.6	0.2	0.7	1.1
20-Feb	0.1	0.1	0.1	0.0	0.1	Z	0.0	0.0	0.2	0.8	1.1	1.5	2.8	1.0	0.6	0.4	0.3	0.3	0.2	0.3	0.5	0.5	0.5	0.5	0.5	2.8
21-Feb	Z	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.4	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.4
22-Feb	0.1	Z	0.5	0.6	0.9	1.0	1.1	1.2	1.0	1.2	1.0	1.5	1.9	0.3	0.4	0.7	1.0	0.8	1.7	0.7	0.5	0.4	0.5	0.5	0.9	1.9
23-Feb	0.5	0.5	Z	0.6	0.5	0.4	0.4	0.4	0.4	0.6	1.6	2.2	1.4	0.5	0.4	1.0	0.9	1.4	1.8	1.6	1.5	1.6	2.0	1.7	1.0	2.2
24-Feb	0.7	0.7	0.9	Z	0.8	0.8	0.8	0.7	0.6	0.4	0.3	0.1	0.3	0.1	0.0	0.1	0.0	0.0	1.0	1.0	0.1	0.0	0.0	0.3	0.4	1.0
25-Feb	0.2	0.1	0.1	0.1	Z	0.1	0.3	0.4	1.2	1.3	0.0	0.0	0.0	0.0	1.0	0.6	0.1	0.2	3.7	9.4	0.7	0.8	0.9	0.8	1.0	9.4
26-Feb	0.7	0.4	0.4	0.5	0.6	Z	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.3	0.7
27-Feb	Z	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.2
28-Feb	0.3	Z	0.4	0.6	0.6	0.4	0.5	0.5	0.4	0.6	1.0	0.8	1.2	0.9	0.4	1.0	1.2	1.0	0.7	1.2	1.4	1.6	1.7	1.5	0.9	1.7
																								Diurnal Average		
																								Diurnal Maximum		
																								0.4 0.6 0.6 0.6 0.5 0.5 0.4 0.5 0.5 0.5 0.5 0.6 0.8 0.6 0.5 0.7 0.7 0.6 0.8 1.0 0.6 0.6 0.7 0.6 0.6 0.7 0.6		
																								1.6 4.8 3.3 2.5 1.4 1.5 1.4 1.2 1.3 1.5 1.6 2.2 3.5 7.0 3.5 4.0 5.0 2.2 3.7 9.4 3.2 2.5 5.0 3.0		
Z - zerospan C - Calibration																										
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  
Lower Camp - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	619	96.87	96.87
3 - 4	15	2.35	99.22
5 - 7	4	0.63	99.84
8 - 11	1	0.16	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Lower Camp - February 2023**

<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	82	30	12	10	8	29	104	23	7	0	3	16	39	55	99	99	616
3 - 4	0	0	0	1	1	1	4	1	1	0	0	1	0	0	3	2	15
5 - 7	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	4
8 - 11	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	<b>83</b>	<b>30</b>	<b>12</b>	<b>11</b>	<b>9</b>	<b>31</b>	<b>109</b>	<b>24</b>	<b>8</b>	<b>0</b>	<b>3</b>	<b>18</b>	<b>39</b>	<b>55</b>	<b>102</b>	<b>102</b>	<b>636</b>

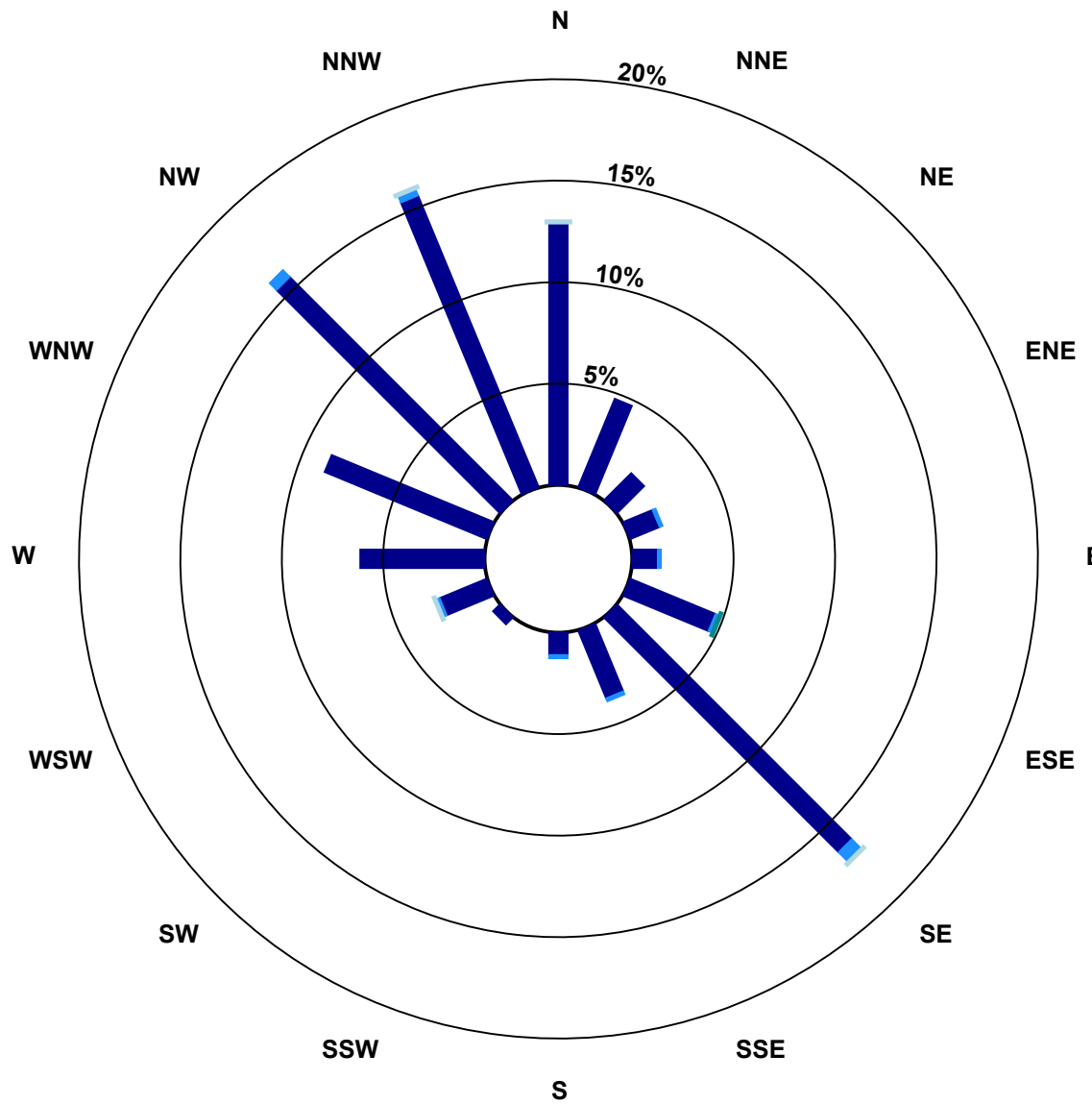
Total Number of Valid Hours: 636

Total Number of Hours: 672

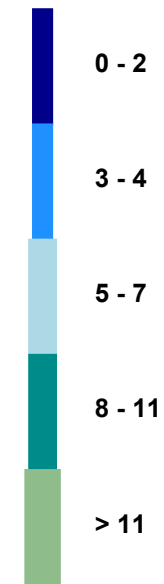


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

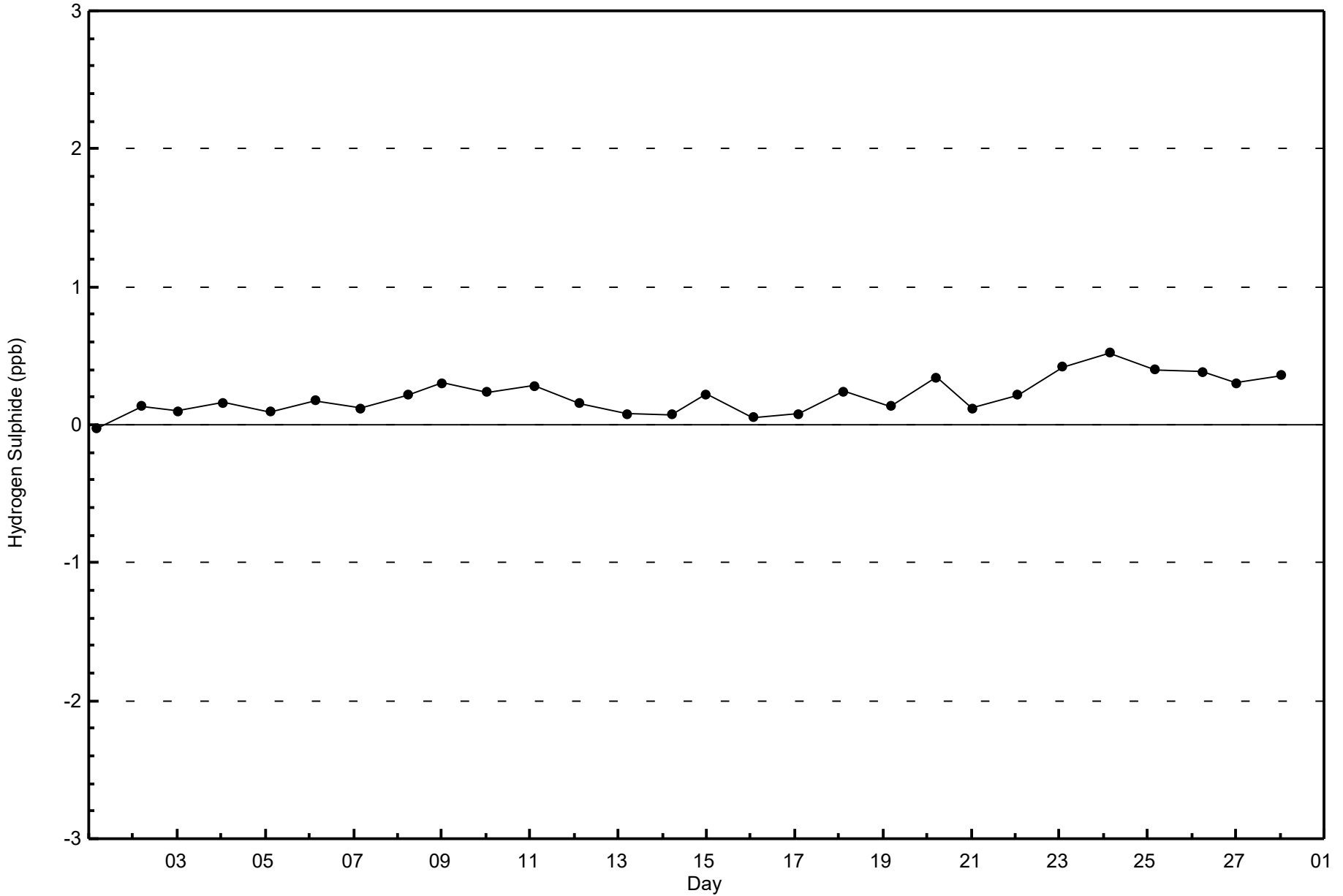
Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Lower Camp



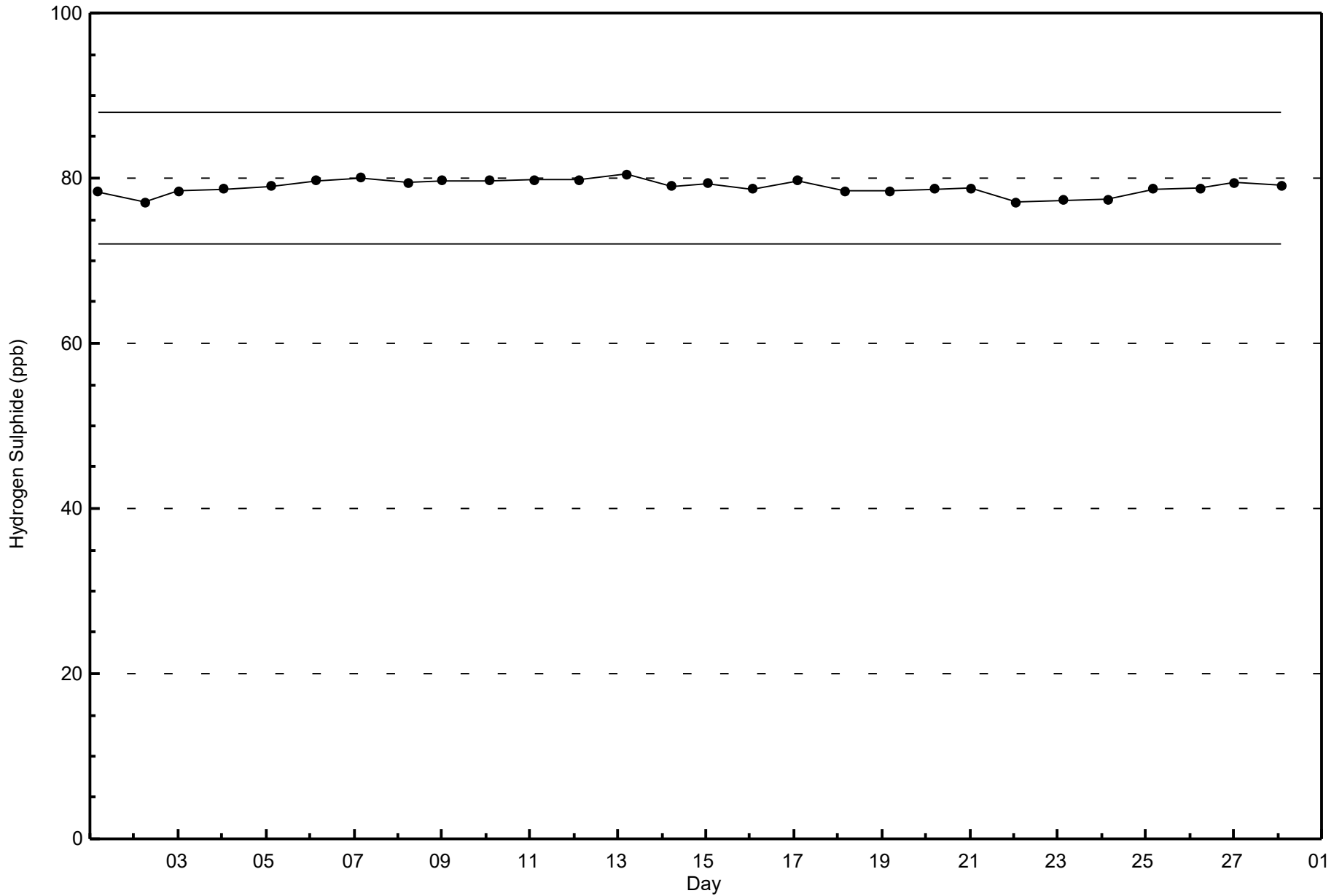
Classes (ppb)



Total Number of Valid Hours: 636









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

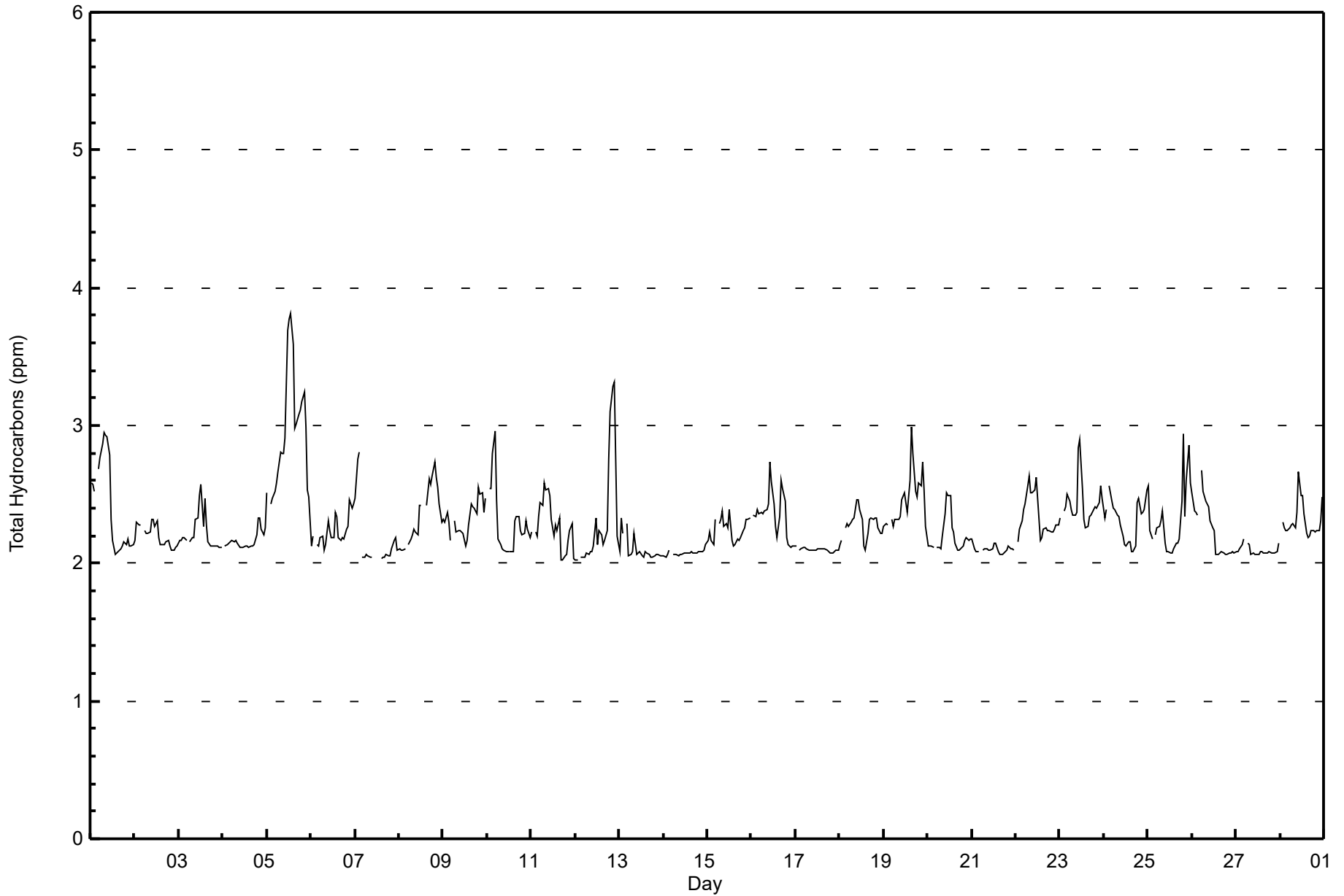
**Total Hydrocarbons (THC) - ppm**  
**Lower Camp - February 2023**

Maximum Value: 3.8 ppm on Feb 5 14:00		Maximum Daily Average: 3.0 ppm on Feb 5		Hours in Service: 672																							
Minimum Value: 2.0 ppm on Feb 12 02:00		Minimum Daily Average: 2.1 ppm on Feb 14		Hours of Data: 638																							
Maximum Diurnal Average: 2.4 ppm at hour 12		Minimum Diurnal Average: 2.2 ppm at hour 15		Hours of Missing Data: 34																							
Monthly Average: 2.28 ppm		Percentiles: P <sub>1</sub> = 2.0 P <sub>10</sub> = 2.1 Q <sub>1</sub> = 2.1 Median = 2.2 Q <sub>3</sub> = 2.4 P <sub>90</sub> = 2.6 P <sub>99</sub> = 3.2		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-Feb	2.6	2.6	2.5	Z	2.7	2.8	2.9	2.9	2.9	2.9	2.8	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.4	2.9	
2-Feb	2.2	2.3	2.3	2.3	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3	
3-Feb	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.3	2.3	2.5	2.6	2.3	2.5	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.6	
4-Feb	Z	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	2.3	2.3	2.2	2.2	2.3	2.2	2.3	
5-Feb	2.5	Z	2.4	2.5	2.5	2.6	2.7	2.8	2.8	2.8	2.9	3.7	3.8	3.8	3.6	3.0	3.0	3.1	3.1	3.2	3.2	3.0	2.5	2.5	3.0	3.8	
6-Feb	2.1	2.2	Z	2.1	2.1	2.2	2.2	2.1	2.1	2.3	2.2	2.2	2.2	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.5	2.4	2.4	2.2	2.5	
7-Feb	2.5	2.8	2.8	Z	2.0	2.0	2.1	2.1	2.0	2.0	C	C	C	C	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.8	
8-Feb	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.4	2.4	M	M	2.4	2.6	2.6	2.6	2.7	2.6	2.6	2.4	2.3	2.3	2.7	
9-Feb	2.3	2.3	2.4	2.3	2.2	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.3	2.4	2.4	2.4	2.4	2.6	2.5	2.5	2.4	2.5	2.3	2.6	
10-Feb	Z	2.5	2.5	2.8	3.0	2.5	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.2	2.3	3.0	
11-Feb	2.2	Z	2.2	2.2	2.3	2.4	2.4	2.6	2.5	2.5	2.5	2.3	2.2	2.3	2.2	2.3	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.0	2.3	2.6	
12-Feb	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.2	2.2	2.1	2.2	2.2	2.8	3.1	3.3	3.3	2.8	2.2	2.3	3.3	
13-Feb	2.1	2.3	2.2	Z	2.3	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.3	
14-Feb	2.1	2.0	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	
15-Feb	2.2	2.2	2.2	2.1	2.3	Z	2.3	2.3	2.4	2.3	2.3	2.4	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.4	
16-Feb	Z	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.7	2.6	2.4	2.3	2.2	2.3	2.6	2.5	2.4	2.2	2.1	2.1	2.1	2.1	2.4	2.7	
17-Feb	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	
18-Feb	2.1	2.2	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.5	2.4	2.3	2.1	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.5	
19-Feb	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.5	2.4	2.4	2.6	3.0	2.8	2.5	2.5	2.6	2.6	2.7	2.5	2.3	2.5	3.0	
20-Feb	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.4	2.5	2.5	2.5	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.5	
21-Feb	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	2.2	
22-Feb	Z	2.2	2.2	2.3	2.4	2.4	2.6	2.6	2.5	2.5	2.5	2.6	2.5	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.6	
23-Feb	2.3	Z	2.4	2.4	2.5	2.5	2.4	2.3	2.4	2.4	2.8	2.9	2.5	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.6	2.5	2.4	2.9	
24-Feb	2.3	2.4	Z	2.6	2.5	2.4	2.4	2.3	2.3	2.3	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.4	2.5	2.4	2.4	2.5	2.3	2.6	
25-Feb	2.6	2.2	2.2	Z	2.2	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	2.2	2.5	2.9	2.3	2.6	2.9	2.3	2.9	
26-Feb	2.5	2.4	2.4	2.4	Z	2.7	2.5	2.4	2.4	2.4	2.3	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	2.2	2.7	
27-Feb	2.1	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	2.1	2.1	2.2	
28-Feb	Z	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.7	2.5	2.5	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5	2.3	2.7	
																								Diurnal Average			
																								Diurnal Maximum			
																								2.2 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.4 2.3 2.2 2.2 2.2 2.2 2.2 2.3 2.3 2.3 2.3 2.3 2.2 2.2 2.6			
																								2.6 2.8 2.8 2.8 3.0 2.8 2.9 2.9 2.9 2.9 2.9 3.7 3.8 3.8 3.6 3.0 3.0 3.0 3.1 3.1 3.2 3.3 3.3 2.9 2.6			
Z - zerospan																								C - Calibration		M - Maintenance	



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

**Total Hydrocarbons (THC) - ppm**  
**Lower Camp - February 2023**





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

**Total Hydrocarbons (THC) - ppm**  
**Lower Camp - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	19	2.98	2.98
2.1 - 3.0	608	95.30	98.28
3.1 - 10.0	11	1.72	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Lower Camp - February 2023**

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	0	0	0	0	0	0	0	0	0	0	3	8	4	0	0	19
2.1 - 3.0	81	33	11	11	9	30	113	21	7	0	3	15	30	49	99	93	605
3.1 - 10.0	1	0	0	0	0	1	1	0	1	0	0	0	0	2	1	4	11
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	86	33	11	11	9	31	114	21	8	0	3	18	38	55	100	97	635

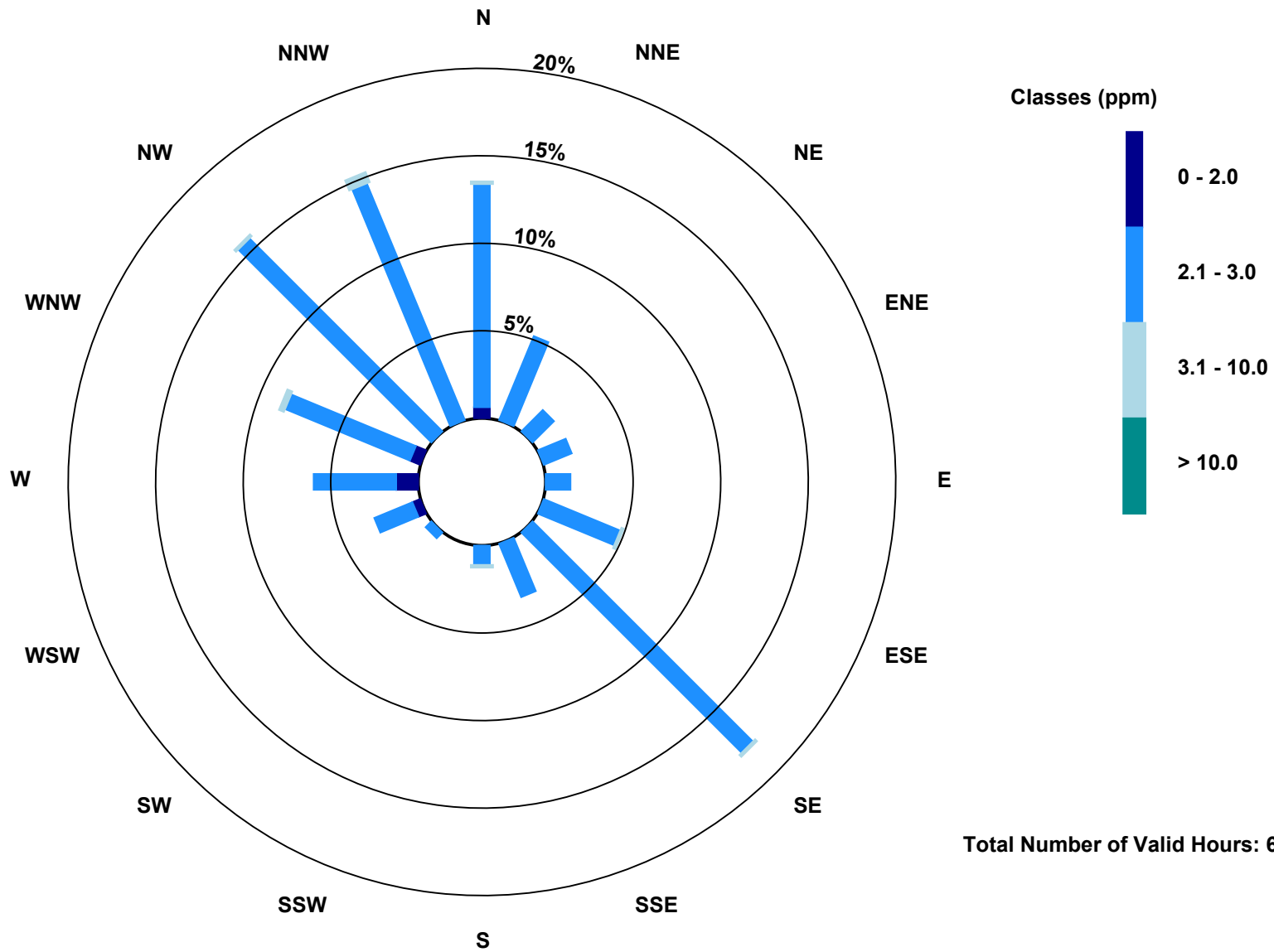
Total Number of Valid Hours: 635

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

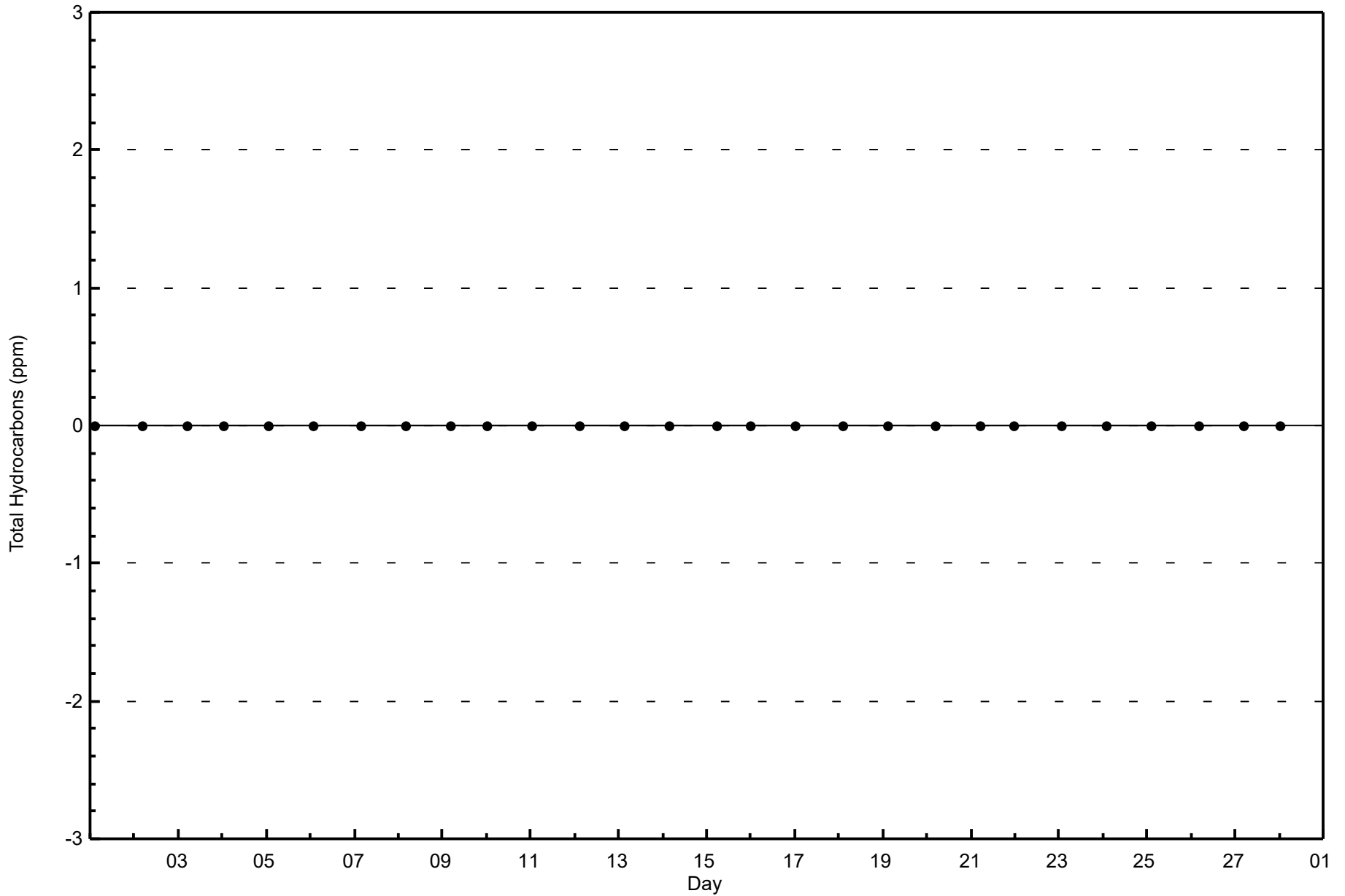
Total Hydrocarbons (THC) - ppm  
Lower Camp

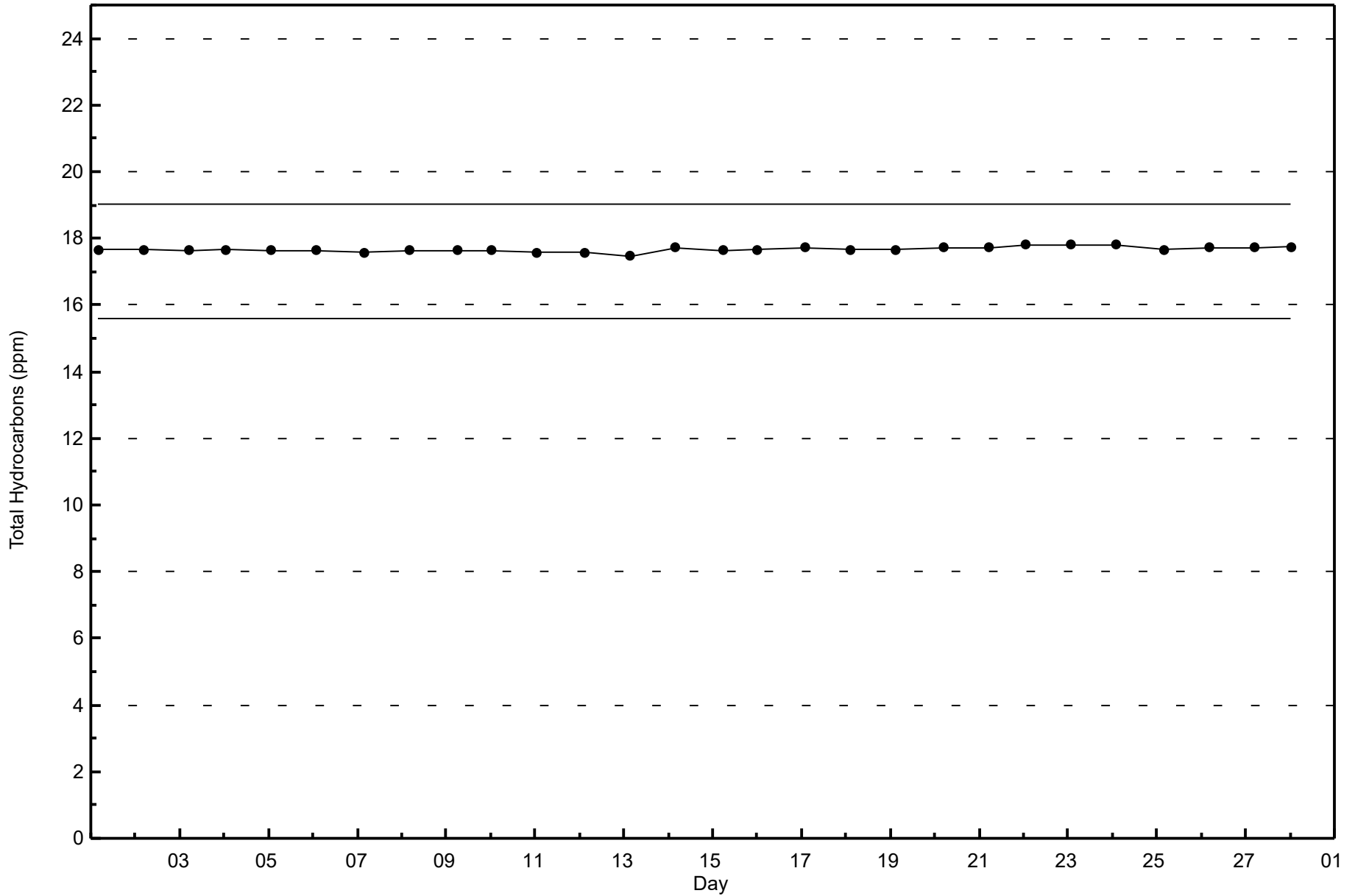




**Wood Buffalo Environmental Association**  
**Zero Responses**

**Total Hydrocarbons (THC) - ppm**  
**Lower Camp - February 2023**







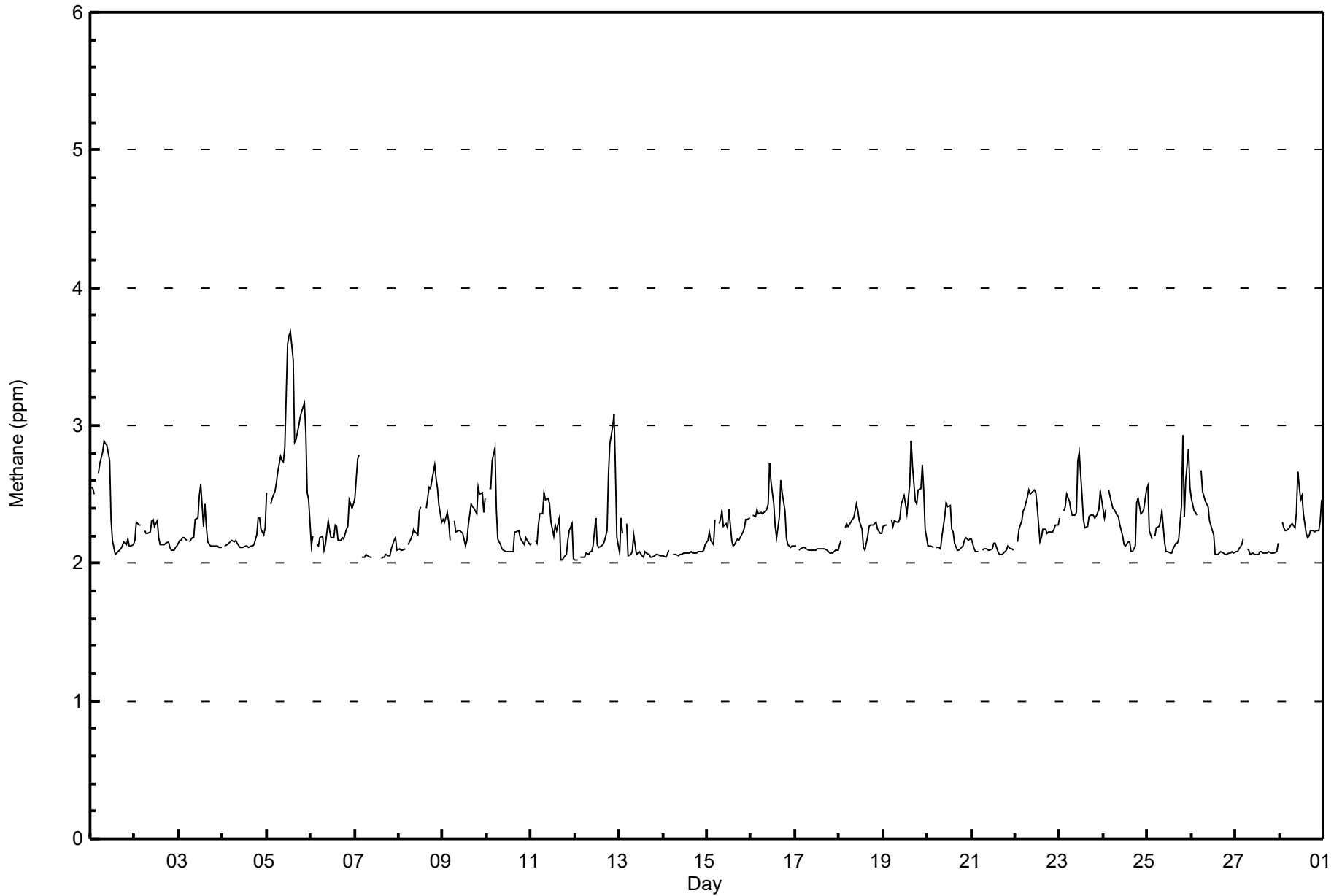


Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0		Hours in Service: 672																								
Maximum Value: 3.7 ppm on Feb 5 14:00		Maximum Daily Average: 2.9 ppm on Feb 5																								
Minimum Value: 2.0 ppm on Feb 12 02:00		Minimum Daily Average: 2.1 ppm on Feb 14																								
Maximum Diurnal Average: 2.3 ppm at hour 12		Minimum Diurnal Average: 2.2 ppm at hour 15																								
Monthly Average: 2.27 ppm		Percentiles: P <sub>1</sub> = 2.0 P <sub>10</sub> = 2.1 Q <sub>1</sub> = 2.1 Median = 2.2 Q <sub>3</sub> = 2.4 P <sub>90</sub> = 2.5 P <sub>99</sub> = 3.1																								
		Hours of Data: 638																								
		Hours of Missing Data: 34																								
		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-Feb	2.6	2.5	2.5	Z	2.7	2.7	2.8	2.9	2.9	2.9	2.8	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.4	2.9
2-Feb	2.2	2.3	2.3	2.3	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3
3-Feb	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.3	2.3	2.5	2.6	2.3	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.6
4-Feb	Z	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	2.3	2.3	2.2	2.2	2.3	2.3	2.3
5-Feb	2.5	Z	2.4	2.5	2.5	2.6	2.7	2.8	2.7	2.7	2.8	3.6	3.6	3.7	3.5	2.9	2.9	3.0	3.1	3.1	3.2	3.0	2.5	2.5	2.9	3.7
6-Feb	2.1	2.2	Z	2.1	2.1	2.2	2.2	2.1	2.1	2.3	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.5	2.4	2.4	2.2	2.5
7-Feb	2.5	2.8	2.8	Z	2.0	2.0	2.1	2.1	2.0	2.0	C	C	C	C	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.8
8-Feb	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.4	2.4	M	M	2.4	2.6	2.5	2.6	2.7	2.6	2.5	2.4	2.3	2.3	2.7
9-Feb	2.3	2.3	2.4	2.3	2.2	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.3	2.4	2.4	2.4	2.4	2.6	2.5	2.5	2.4	2.5	2.3	2.6
10-Feb	Z	2.5	2.5	2.7	2.8	2.4	2.2	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	2.1	2.2	2.2	2.1	2.2	2.8
11-Feb	2.2	Z	2.2	2.1	2.3	2.4	2.4	2.5	2.5	2.5	2.4	2.3	2.2	2.3	2.2	2.3	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.0	2.2	2.5
12-Feb	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.1	2.1	2.1	2.2	2.2	2.6	2.9	3.0	3.1	2.7	2.2	2.3	3.1
13-Feb	2.1	2.3	2.2	Z	2.3	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.3
14-Feb	2.1	2.0	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
15-Feb	2.2	2.2	2.2	2.1	2.3	Z	2.3	2.3	2.4	2.3	2.3	2.3	2.4	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.4
16-Feb	Z	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.7	2.6	2.4	2.3	2.2	2.3	2.6	2.5	2.4	2.2	2.1	2.1	2.1	2.1	2.4	2.7
17-Feb	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
18-Feb	2.1	2.2	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.1	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.4
19-Feb	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.4	2.4	2.6	2.9	2.7	2.5	2.4	2.5	2.5	2.7	2.5	2.3	2.4	2.9
20-Feb	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.3	2.4	2.4	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.4
21-Feb	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	2.2
22-Feb	Z	2.2	2.2	2.3	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.5
23-Feb	2.3	Z	2.4	2.4	2.5	2.5	2.4	2.3	2.4	2.4	2.7	2.8	2.5	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.4	2.5	2.5	2.4	2.8
24-Feb	2.3	2.4	Z	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.4	2.5	2.4	2.4	2.5	2.5	2.5
25-Feb	2.6	2.2	2.2	Z	2.2	2.3	2.3	2.3	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.9	2.3	2.6	2.8	2.6	2.3	2.9
26-Feb	2.5	2.4	2.4	2.3	Z	2.7	2.5	2.4	2.4	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	2.7
27-Feb	2.1	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	2.1	2.1	2.2
28-Feb	Z	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.7	2.5	2.5	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5	2.3	2.7
																								Diurnal Average		
																								Diurnal Maximum		
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										



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

**Methane (CH<sub>4</sub>) - ppm**  
**Lower Camp - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Lower Camp - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	19	2.98	2.98
2.1 - 3.0	611	95.77	98.75
3.1 - 10.0	8	1.25	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Lower Camp - February 2023**

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	0	0	0	0	0	0	0	0	0	0	3	8	4	0	0	19
2.1 - 3.0	81	33	11	11	9	30	113	21	7	0	3	15	30	50	99	95	608
3.1 - 10.0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	2	8
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	86	33	11	11	9	31	114	21	8	0	3	18	38	55	100	97	635

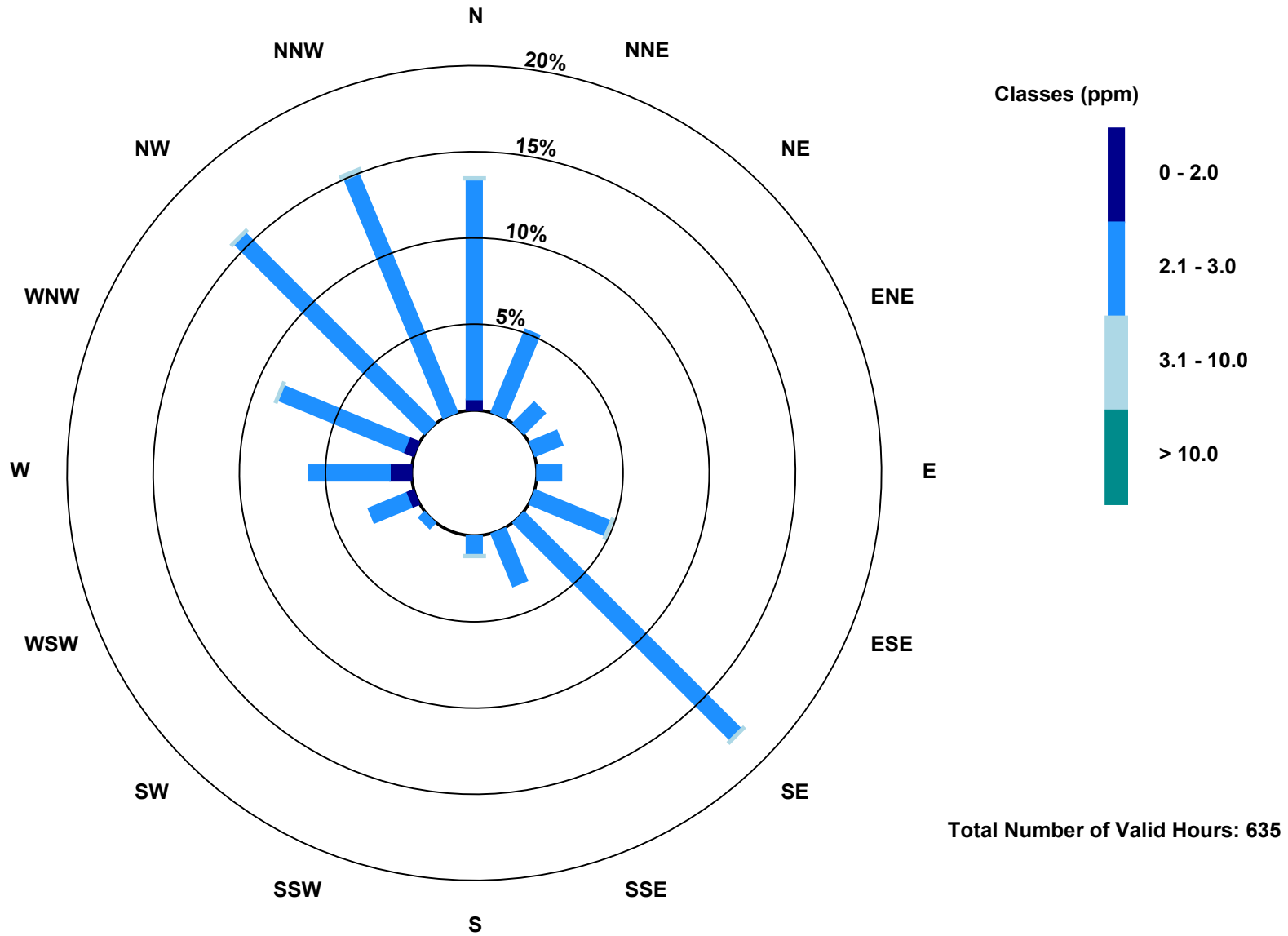
Total Number of Valid Hours: 635

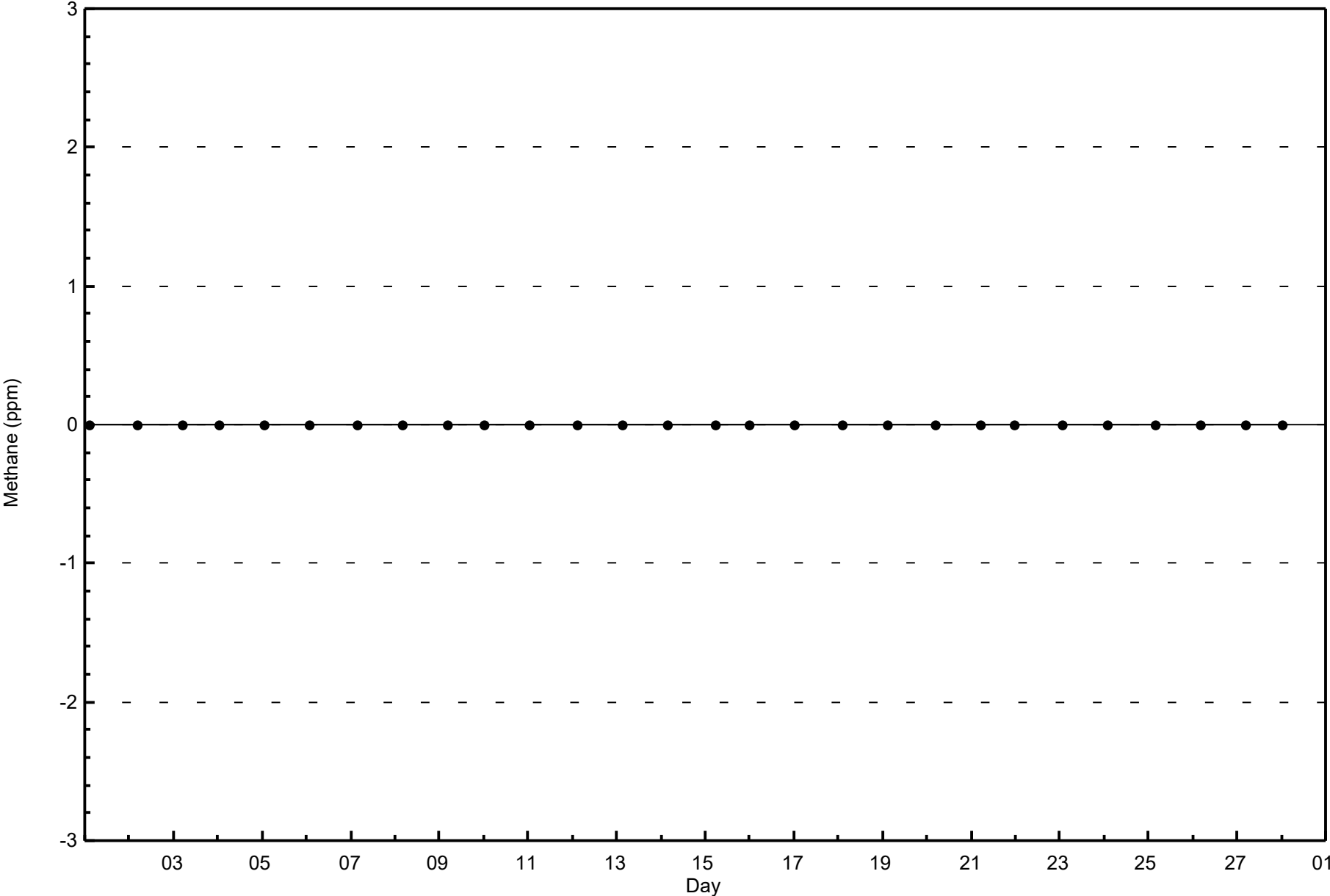
Total Number of Hours: 672

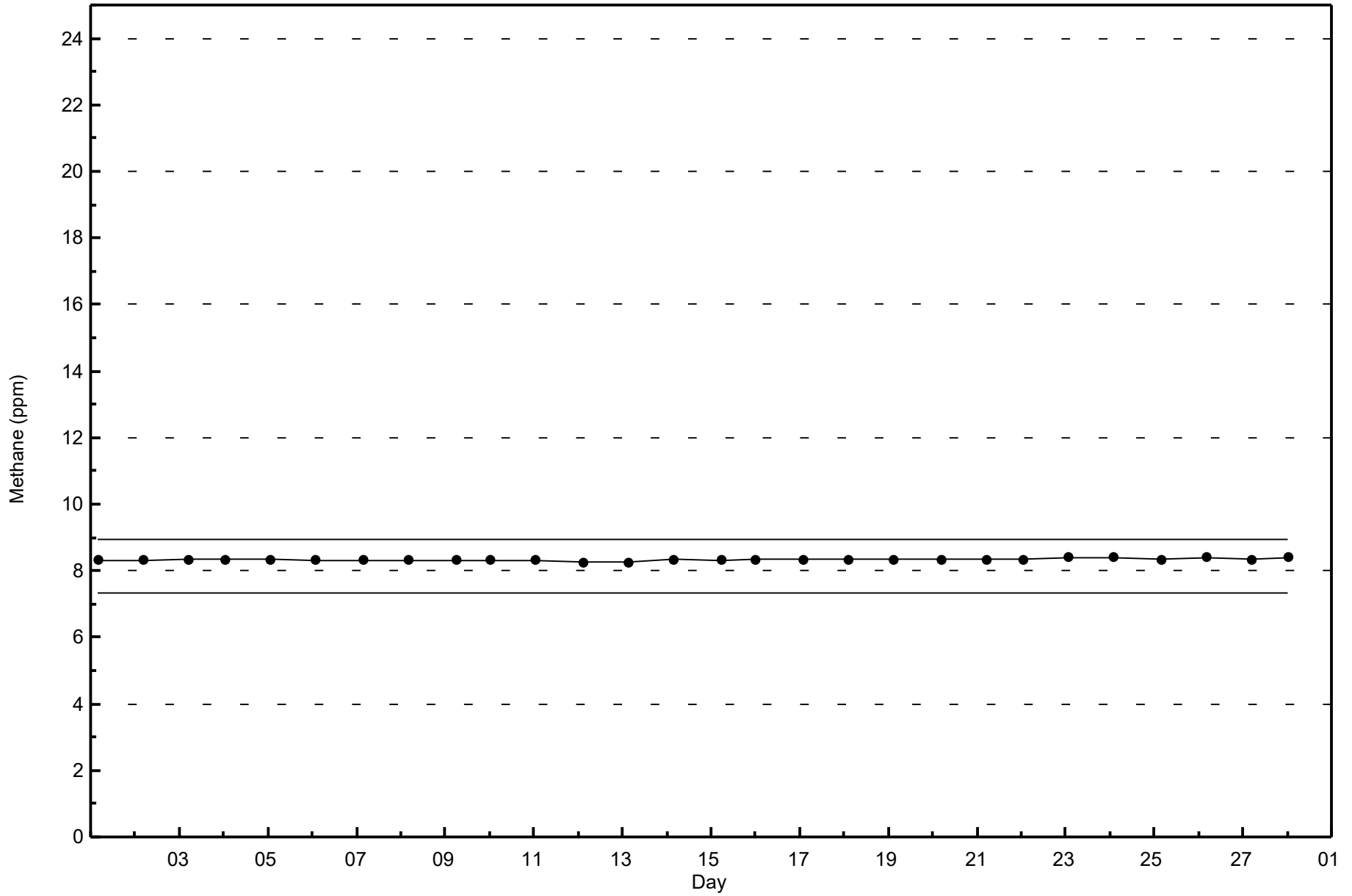


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Methane (CH<sub>4</sub>) - ppm  
Lower Camp









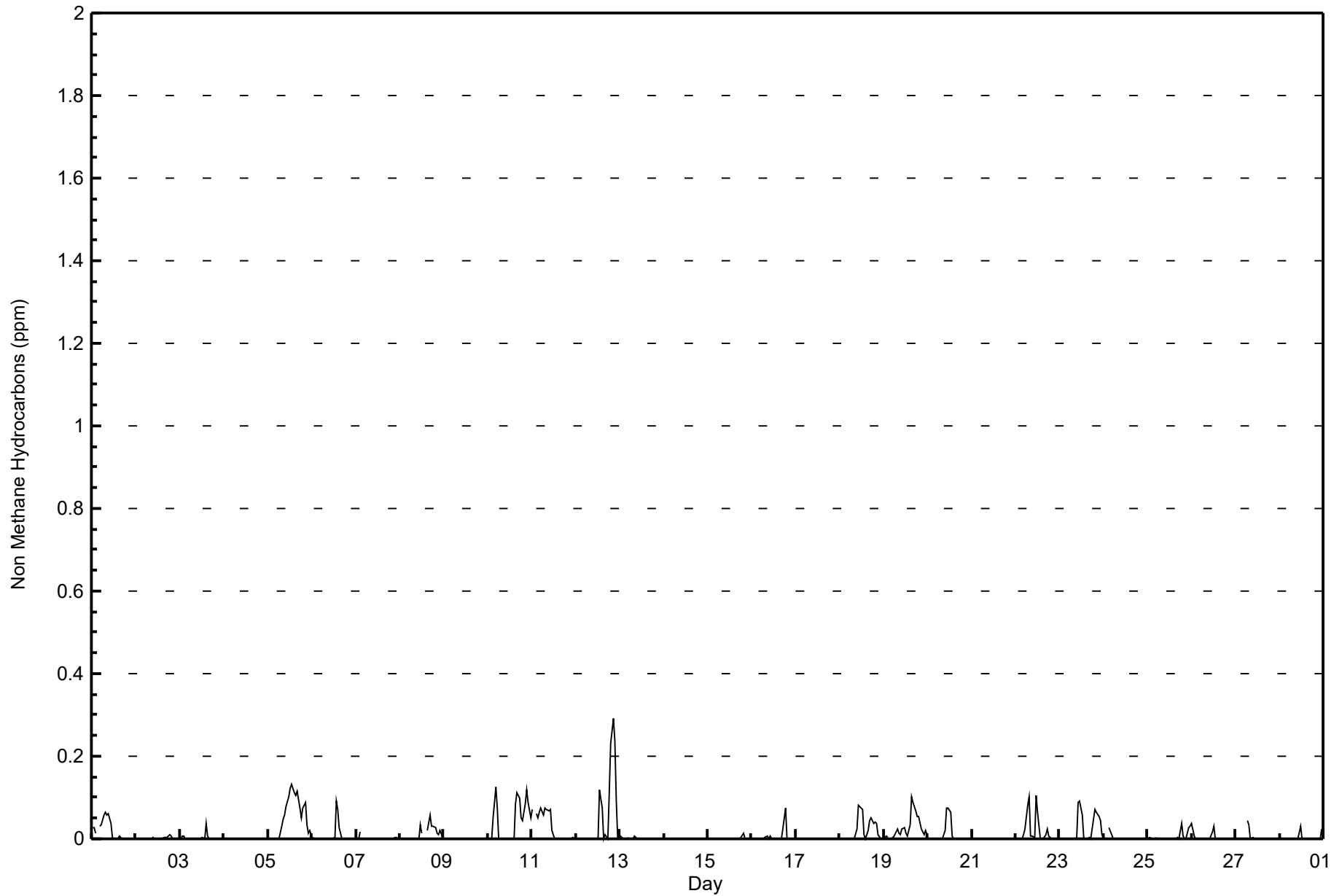
Maximum Value: 0.291 ppm on Feb 12 21:00		Maximum Daily Average: 0.055 ppm on Feb 5		Hours in Service: 672																							
Minimum Value: 0.000 ppm on Feb 1 13:00		Minimum Daily Average: 0.000 ppm on Feb 14		Hours of Data: 638																							
Maximum Diurnal Average: 0.022 ppm at hour 21		Minimum Diurnal Average: 0.002 ppm at hour 2		Hours of Missing Data: 34																							
Monthly Average: 0.013 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: 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-Feb	0.028	0.026	0.015	Z	0.030	0.035	0.059	0.063	0.058	0.061	0.037	0.002	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.063	
2-Feb	0.000	0.000	0.000	0.001	Z	0.001	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.004	0.002	0.002	0.011	0.006	0.001	0.001	0.000	0.000	0.001	0.011	
3-Feb	0.000	0.006	0.007	0.002	0.001	Z	0.000	0.000	0.000	0.001	0.000	0.000	0.002	0.000	0.039	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.039	
4-Feb	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	
5-Feb	0.000	Z	0.001	0.000	0.000	0.000	0.000	0.029	0.049	0.059	0.077	0.101	0.122	0.132	0.112	0.105	0.114	0.076	0.050	0.073	0.089	0.034	0.013	0.021	0.055	0.132	
6-Feb	0.000	0.003	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.093	0.070	0.027	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.009	0.093		
7-Feb	0.000	0.000	0.016	Z	0.000	0.000	0.001	0.000	0.000	0.000	0.000	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.001	0.016	
8-Feb	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.034	0.013	M	M	0.021	0.056	0.030	0.031	0.027	0.014	0.009	0.019	0.002	0.012	0.056	
9-Feb	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	0.000	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.002	
10-Feb	Z	0.001	0.000	0.051	0.124	0.076	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.113	0.099	0.052	0.044	0.085	0.118	0.088	0.050	0.043	0.124	
11-Feb	0.072	Z	0.060	0.051	0.065	0.073	0.059	0.075	0.072	0.068	0.070	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.030	0.075		
12-Feb	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	0.119	0.074	0.000	0.011	0.001	0.112	0.232	0.291	0.236	0.095	0.004	0.051	0.291	
13-Feb	0.007	0.003	0.000	Z	0.004	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	0.001	0.007		
14-Feb	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		
15-Feb	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	0.012	0.000	0.000	0.000	0.001	0.012		
16-Feb	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.006	0.001	0.005	0.000	0.000	0.000	0.000	0.000	0.023	0.074	0.000	0.000	0.000	0.000	0.000	0.005	0.074		
17-Feb	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		
18-Feb	0.000	0.000	Z	0.000	0.000	0.001	0.000	0.000	0.000	0.022	0.082	0.078	0.072	0.011	0.000	0.022	0.043	0.050	0.037	0.042	0.036	0.010	0.000	0.000	0.022	0.082	
19-Feb	0.000	0.007	0.003	Z	0.003	0.005	0.009	0.023	0.014	0.011	0.025	0.027	0.015	0.008	0.034	0.101	0.089	0.067	0.055	0.053	0.025	0.016	0.009	0.021	0.027	0.101	
20-Feb	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.020	0.076	0.075	0.064	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.076		
21-Feb	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		
22-Feb	Z	0.000	0.000	0.001	0.011	0.025	0.081	0.103	0.006	0.007	0.002	0.107	0.065	0.001	0.000	0.001	0.012	0.024	0.008	0.000	0.000	0.000	0.000	0.020	0.107		
23-Feb	0.001	Z	0.000	0.001	0.000	0.000	0.001	0.000	0.001	0.000	0.003	0.087	0.092	0.057	0.005	0.000	0.000	0.002	0.000	0.047	0.073	0.065	0.053	0.043	0.012	0.092	
24-Feb	0.000	0.001	Z	0.027	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	0.000	0.000	0.000	0.000	0.000	0.002	0.027		
25-Feb	0.000	0.002	0.001	Z	0.005	0.002	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.039	0.008	0.000	0.001	0.027	0.029	0.039		
26-Feb	0.036	0.005	0.000	0.001	Z	0.000	0.001	0.000	0.000	0.000	0.000	0.017	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.004	0.036		
27-Feb	0.000	0.000	0.001	0.000	0.000	Z	0.044	0.035	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	0.004	0.044		
28-Feb	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.029	0.001	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.029		
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan																								C - Calibration		M - Maintenance	





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

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Lower Camp - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Lower Camp - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	486	76.18	76.18
0.006 - 0.05	91	14.26	90.44
0.06 - 0.1	58	9.09	99.53
> 0.1	3	0.47	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Lower Camp - February 2023**

<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	78	32	8	7	6	20	83	18	6	0	3	13	34	38	62	75	483
0.006 - 0.05	4	1	3	3	1	7	15	3	1	0	0	3	2	12	25	11	91
0.06 - 0.1	3	0	0	1	2	4	16	0	1	0	0	2	2	5	13	9	58
> 0.1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3
<b>Totals</b>	86	33	11	11	9	31	114	21	8	0	3	18	38	55	100	97	635

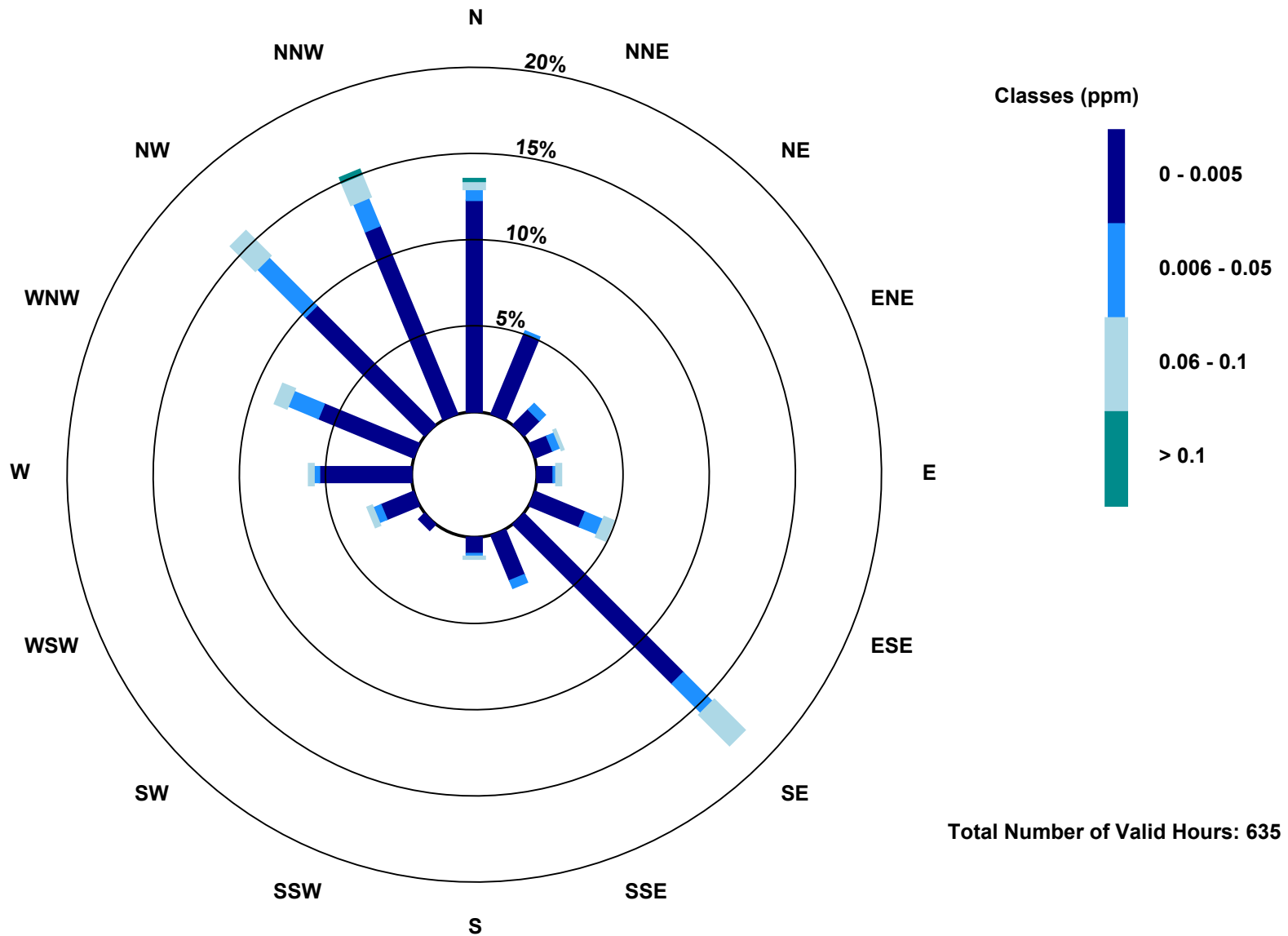
Total Number of Valid Hours: 635

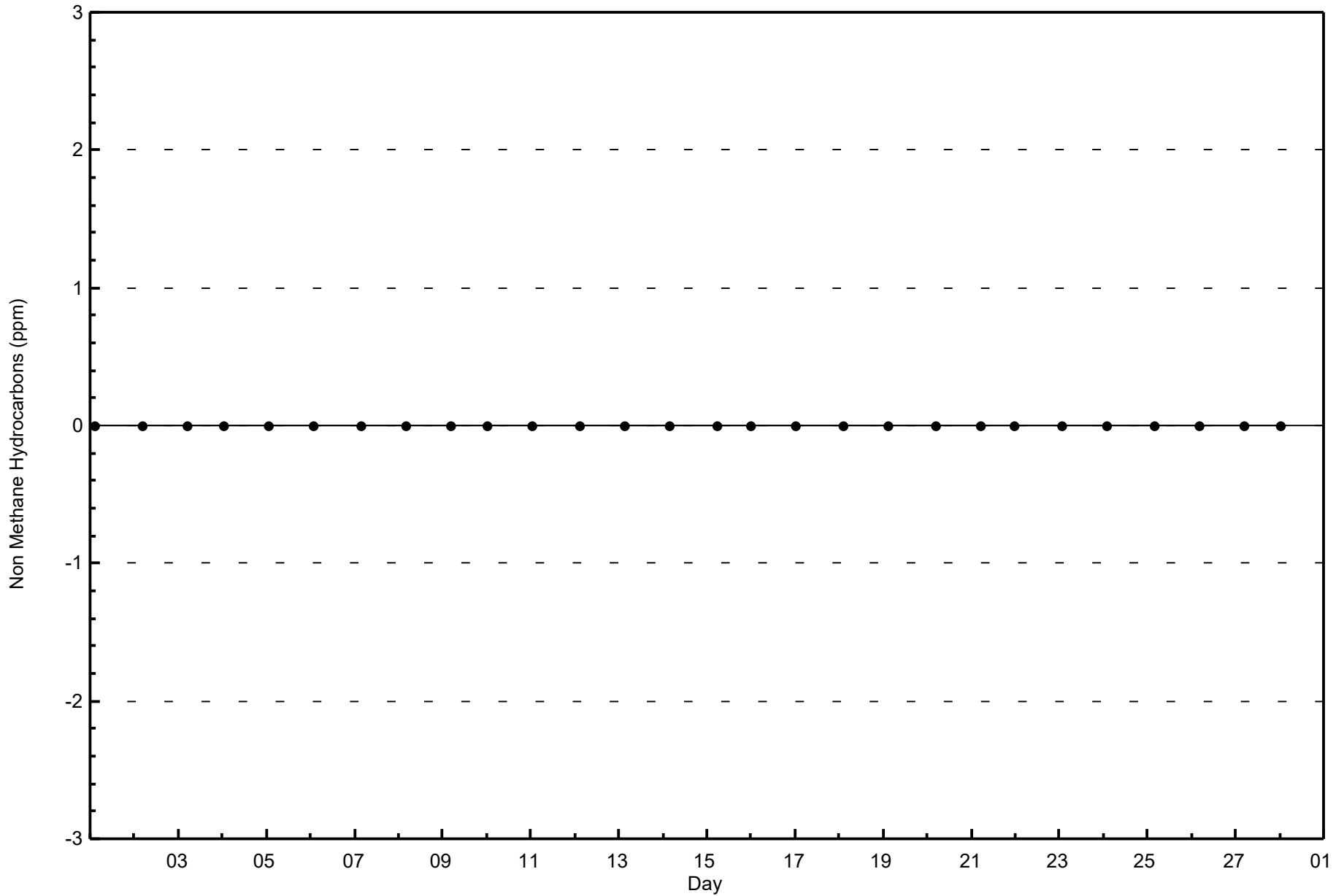
Total Number of Hours: 672

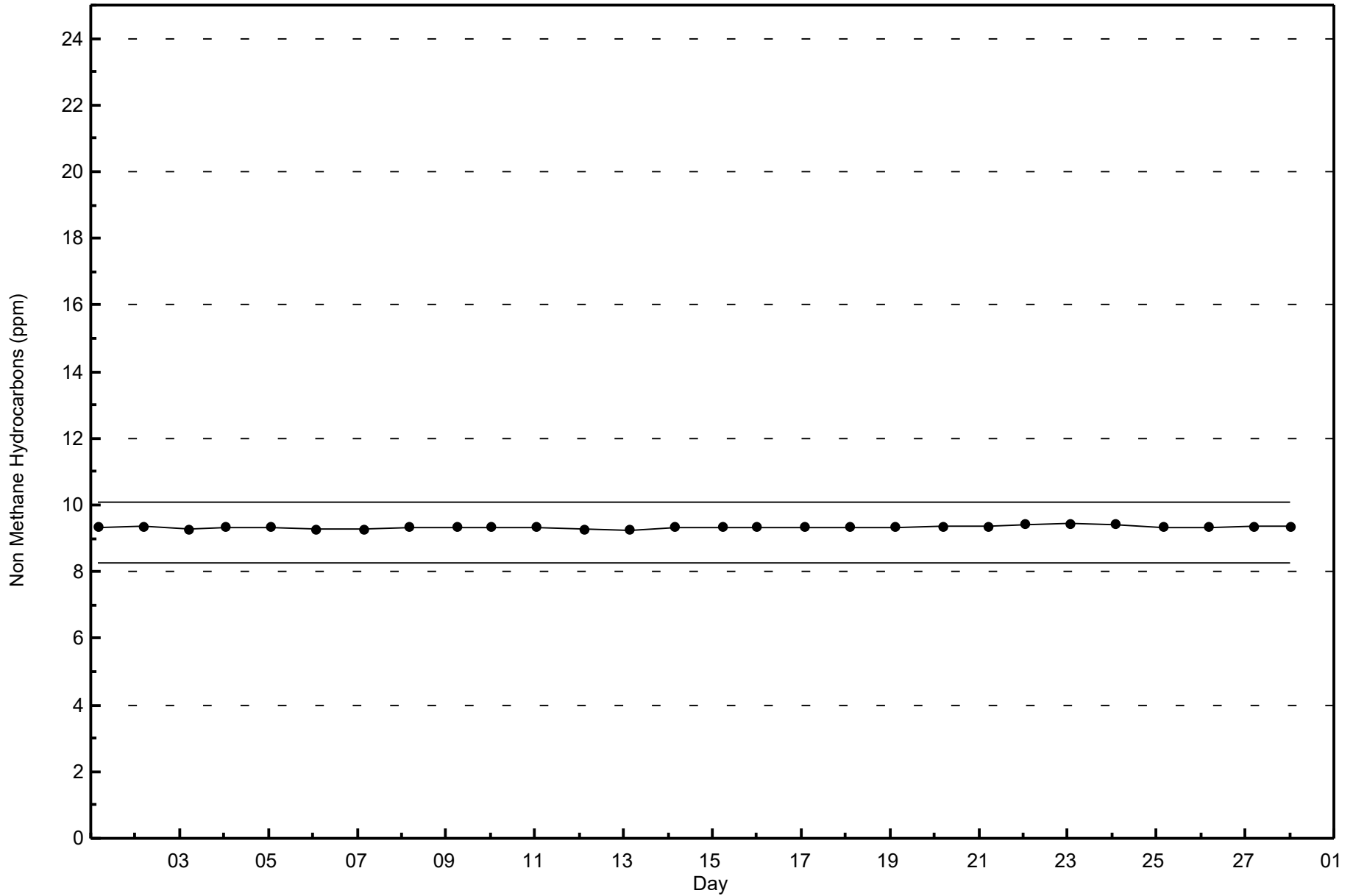


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Non Methane Hydrocarbons (NMHC) - ppm  
Lower Camp









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

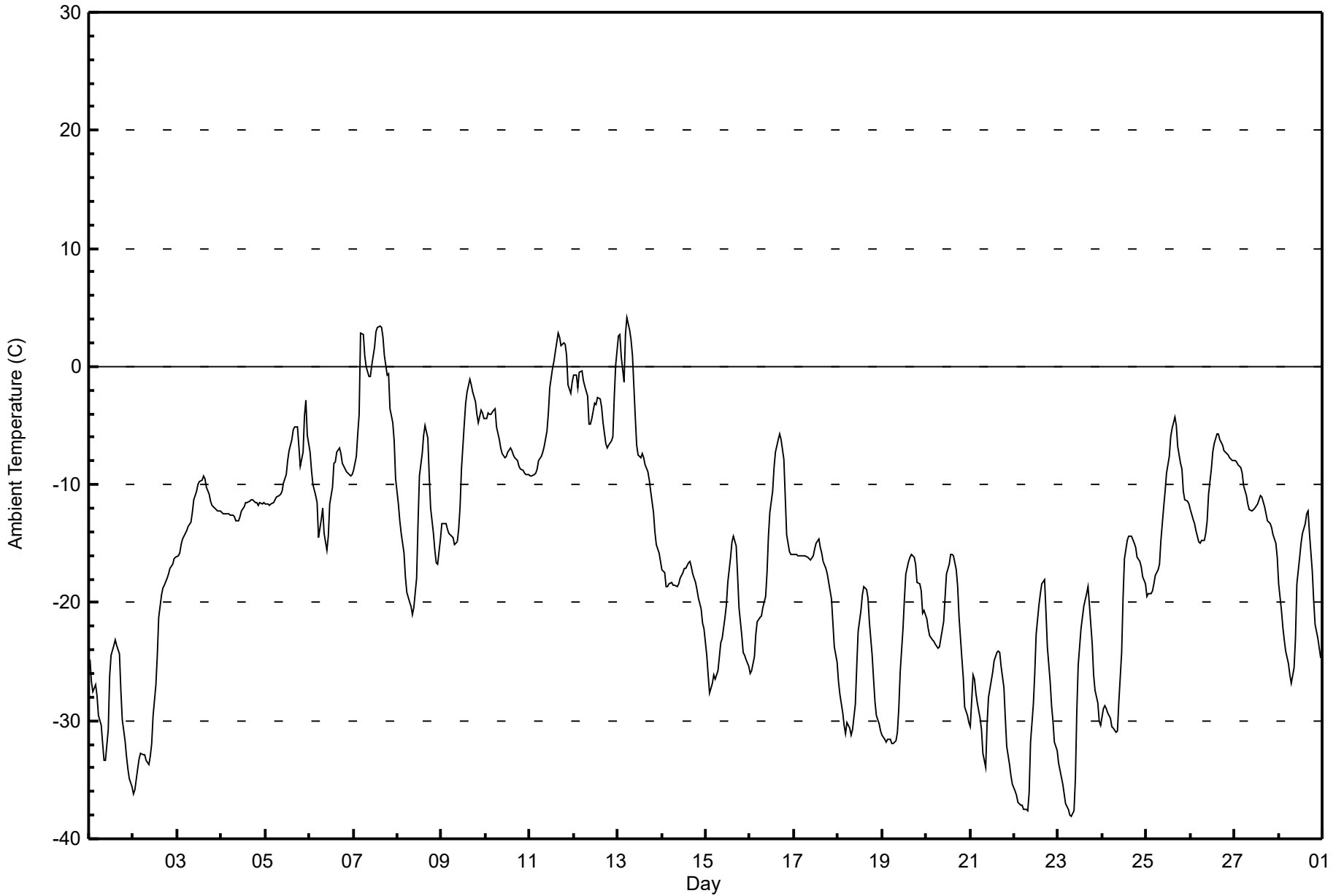
**Ambient Temperature (AT) - C**  
**Lower Camp - February 2023**

Maximum Value: 4.1 C on Feb 13 06:00		Maximum Daily Average: -1.2 C on Feb 7		Hours in Service: 672																							
Minimum Value: -38.2 C on Feb 23 08:00		Minimum Daily Average: -29.7 C on Feb 22		Hours of Data: 672																							
Maximum Diurnal Average: -11.0 C at hour 16		Minimum Diurnal Average: -19.3 C at hour 9		Hours of Missing Data: 0																							
Monthly Average: -16.08 C		Percentiles: P <sub>1</sub> = -37.2 P <sub>10</sub> = -30.5 Q <sub>1</sub> = -23.4 Median = -15.1 Q <sub>3</sub> = -8.7 P <sub>90</sub> = -4.0 P <sub>99</sub> = 2.8		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-Feb	-24.8	-26.7	-27.5	-26.9	-27.8	-29.5	-30.4	-32.0	-33.3	-33.3	-30.7	-26.2	-24.5	-23.6	-23.1	-23.7	-24.3	-27.5	-29.9	-31.7	-33.0	-34.1	-34.9	-35.6	-29.0	-23.1	
2-Feb	-36.2	-35.9	-34.0	-33.3	-32.8	-32.9	-32.9	-33.4	-33.7	-33.0	-31.9	-29.6	-27.0	-24.4	-21.2	-19.3	-18.8	-18.5	-17.9	-17.6	-17.1	-16.7	-16.3	-16.2	-26.3	-16.2	
3-Feb	-16.1	-15.8	-15.1	-14.6	-14.2	-13.9	-13.6	-13.1	-12.4	-11.3	-10.5	-10.0	-9.7	-9.6	-9.2	-9.5	-10.3	-10.8	-11.4	-11.7	-12.0	-12.1	-12.2	-12.2	-12.1	-9.2	
4-Feb	-12.4	-12.5	-12.5	-12.5	-12.5	-12.5	-12.6	-12.7	-13.0	-13.0	-12.7	-12.2	-11.8	-11.5	-11.5	-11.4	-11.3	-11.5	-11.5	-11.8	-11.6	-11.6	-11.7	-11.6	-12.1	-11.3	
5-Feb	-11.7	-11.7	-11.7	-11.7	-11.5	-11.3	-11.1	-10.9	-10.8	-10.5	-9.8	-9.2	-9.2	-7.9	-7.2	-6.2	-5.3	-5.1	-5.1	-6.8	-8.4	-7.2	-4.1	-2.9	-5.8	-8.5	-2.9
6-Feb	-7.3	-8.8	-10.0	-11.0	-11.6	-14.5	-13.0	-12.0	-14.1	-15.6	-14.4	-11.7	-10.2	-8.2	-8.0	-7.3	-6.9	-7.4	-8.2	-8.7	-8.9	-9.0	-9.3	-9.2	-10.2	-6.9	
7-Feb	-8.7	-7.6	-5.7	-4.0	2.9	2.7	0.9	0.0	-0.9	-0.8	0.1	1.7	2.9	3.3	3.4	3.3	2.5	1.0	-0.8	-0.6	-3.5	-4.8	-6.3	-9.5	-1.2	3.4	
8-Feb	-11.7	-13.0	-14.2	-15.8	-17.8	-19.1	-20.0	-20.3	-21.1	-20.4	-17.9	-13.3	-9.3	-7.3	-5.8	-5.0	-6.1	-9.3	-12.0	-14.1	-15.5	-16.6	-16.8	-14.6	-14.0	-5.0	
9-Feb	-13.3	-13.3	-13.2	-13.7	-14.1	-14.4	-14.5	-15.0	-14.9	-13.8	-11.9	-8.7	-4.9	-3.2	-2.2	-1.1	-1.5	-2.1	-3.0	-4.0	-4.8	-3.7	-3.9	-4.4	-8.3	-1.1	
10-Feb	-4.4	-4.0	-4.1	-4.0	-3.7	-3.6	-5.2	-6.1	-6.9	-7.4	-7.7	-7.6	-7.2	-6.9	-7.1	-7.5	-7.7	-8.0	-8.5	-8.6	-8.8	-9.0	-9.2	-9.2	-6.8	-3.6	
11-Feb	-9.2	-9.2	-9.2	-9.0	-8.7	-8.0	-7.6	-7.2	-6.8	-5.5	-3.9	-1.8	-0.2	0.5	1.2	2.8	2.4	1.8	2.0	1.9	0.9	-1.5	-2.2	-1.3	-3.2	2.8	
12-Feb	-0.7	-0.7	-1.8	-0.5	-0.4	-1.2	-1.7	-2.6	-4.9	-4.8	-4.4	-3.1	-3.2	-2.7	-2.7	-3.4	-4.7	-6.5	-6.9	-6.7	-6.4	-5.9	-2.6	0.1	-3.3	0.1	
13-Feb	2.6	2.7	0.8	-1.3	2.7	4.1	3.1	2.2	0.9	-4.3	-6.7	-7.5	-7.8	-7.4	-7.7	-8.4	-9.0	-9.6	-10.6	-12.4	-14.0	-15.1	-15.8	-16.5	-5.6	4.1	
14-Feb	-17.2	-17.4	-18.6	-18.6	-18.4	-18.3	-18.5	-18.6	-18.6	-18.5	-18.0	-17.5	-17.1	-17.1	-16.7	-16.5	-17.0	-17.6	-18.3	-18.9	-19.6	-20.5	-21.8	-22.2	-18.4	-16.5	
15-Feb	-24.4	-26.1	-27.7	-26.9	-26.1	-26.5	-25.7	-24.6	-23.4	-23.0	-21.3	-20.2	-18.3	-16.2	-14.9	-14.4	-15.2	-17.7	-20.4	-22.8	-24.2	-24.4	-24.8	-25.5	-22.3	-14.4	
16-Feb	-26.0	-25.8	-24.6	-22.6	-21.6	-21.3	-21.1	-20.5	-19.5	-17.5	-14.4	-12.3	-10.6	-8.6	-7.2	-6.1	-5.7	-6.2	-7.8	-11.0	-14.3	-15.6	-15.9	-15.9	-15.5	-5.7	
17-Feb	-15.9	-15.9	-16.0	-16.0	-16.0	-16.0	-16.0	-16.1	-16.3	-16.3	-16.1	-15.5	-15.0	-14.6	-15.3	-15.8	-16.5	-17.1	-17.5	-18.2	-19.7	-21.8	-23.8	-25.1	-17.2	-14.6	
18-Feb	-26.7	-27.8	-29.4	-30.4	-31.1	-30.1	-30.6	-31.2	-30.7	-28.6	-25.4	-22.4	-20.7	-19.3	-18.7	-18.8	-19.6	-21.6	-24.5	-26.4	-28.4	-29.5	-30.3	-30.9	-26.4	-18.7	
19-Feb	-31.2	-31.6	-31.9	-31.6	-31.5	-31.9	-32.0	-31.7	-30.9	-29.0	-25.9	-22.2	-19.7	-17.6	-16.5	-16.2	-16.0	-16.1	-16.8	-18.3	-18.4	-19.0	-20.9	-20.6	-24.1	-16.0	
20-Feb	-21.3	-22.2	-22.9	-23.2	-23.3	-23.5	-23.8	-23.8	-23.0	-21.6	-19.6	-17.5	-16.8	-15.9	-16.0	-16.0	-17.2	-18.7	-21.2	-24.7	-26.4	-28.8	-29.6	-30.1	-22.0	-15.9	
21-Feb	-30.5	-26.1	-26.4	-27.6	-28.5	-29.8	-30.7	-32.8	-33.9	-30.3	-28.0	-26.5	-25.8	-24.9	-24.3	-24.1	-24.2	-25.4	-27.2	-29.8	-32.1	-33.7	-34.6	-35.4	-28.9	-24.1	
22-Feb	-35.9	-36.3	-36.9	-37.2	-37.1	-37.5	-37.5	-37.6	-36.1	-31.8	-28.7	-26.0	-22.7	-20.1	-19.2	-18.4	-18.1	-20.8	-23.8	-26.7	-28.8	-30.1	-31.8	-32.5	-29.7	-18.1	
23-Feb	-33.6	-34.2	-35.4	-36.2	-37.0	-37.5	-38.0	-38.2	-37.7	-34.9	-29.3	-25.3	-22.2	-21.2	-20.3	-19.3	-18.6	-20.2	-23.5	-26.1	-27.4	-28.5	-30.1	-30.4	-29.4	-18.6	
24-Feb	-28.9	-28.7	-28.9	-29.4	-29.8	-30.5	-30.7	-31.0	-30.9	-28.3	-24.2	-19.6	-16.2	-14.7	-14.4	-14.4	-14.4	-15.0	-15.3	-16.1	-16.5	-17.0	-17.8	-18.3	-22.1	-14.4	
25-Feb	-19.5	-19.3	-19.2	-19.0	-18.4	-17.7	-17.2	-16.7	-14.7	-11.8	-10.5	-9.1	-7.6	-5.9	-5.2	-4.3	-5.0	-6.8	-8.2	-8.7	-10.6	-11.2	-11.4	-11.6	-12.1	-4.3	
26-Feb	-12.2	-12.9	-13.3	-13.8	-14.8	-15.0	-14.8	-14.7	-14.2	-13.0	-10.8	-8.7	-7.2	-6.5	-5.7	-5.8	-6.2	-6.6	-7.1	-7.2	-7.5	-7.8	-7.8	-8.0	-10.1	-5.7	
27-Feb	-8.0	-8.1	-8.3	-8.5	-9.1	-10.1	-11.0	-11.7	-12.1	-12.3	-12.2	-12.0	-11.7	-11.3	-10.9	-11.1	-11.9	-12.5	-13.1	-13.3	-13.6	-14.2	-14.9	-16.2	-11.6	-8.0	
28-Feb	-18.4	-20.7	-22.1	-23.2	-24.1	-25.2	-26.1	-26.8	-25.6	-23.1	-18.5	-16.1	-15.0	-14.1	-13.4	-12.5	-12.2	-14.1	-17.3	-19.8	-21.8	-23.0	-23.9	-24.7	-20.1	-12.2	
		-18.0	-18.2	-18.6	-18.7	-18.4	-18.8	-19.0	-19.3	-19.3	-18.3	-16.6	-14.7	-13.1	-12.0	-11.4	-11.0	-11.4	-12.5	-13.8	-15.1	-16.1	-16.8	-17.3	-17.6	Diurnal Average	
		2.6	2.7	0.8	-0.5	2.9	4.1	3.1	2.2	0.9	-0.8	0.1	1.7	2.9	3.3	3.4	3.3	2.5	1.8	2.0	1.9	0.9	-1.5	-2.2	0.1	Diurnal Maximum	



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

**Ambient Temperature (AT) - C**  
**Lower Camp - February 2023**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Lower Camp - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	216	32.14	32.14
-20 - 0	427	63.54	95.68
0 - 10	29	4.32	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

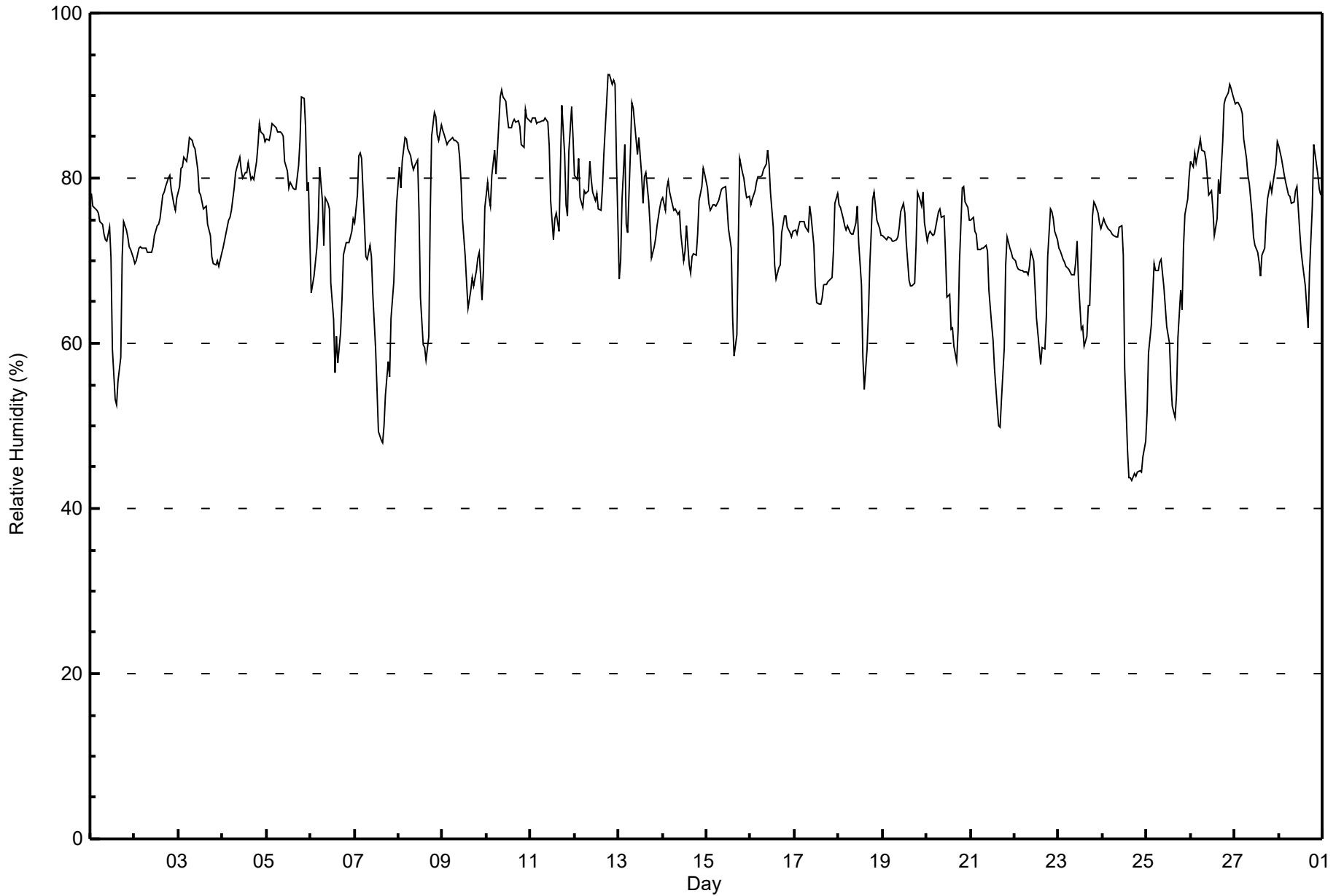
**Relative Humidity (RH) - %  
Lower Camp - February 2023**

Maximum Value: 92.6 % on Feb 12 19:00      Maximum Daily Average: 85.2 % on Feb 10																						Hours in Service: 672																									
Minimum Value: 43.4 % on Feb 24 17:00      Minimum Daily Average: 59.7 % on Feb 24																						Hours of Data: 672																									
Maximum Diurnal Average: 78.0 % at hour 9      Minimum Diurnal Average: 65.8 % at hour 15																						Hours of Missing Data: 0																									
Monthly Average: 74.40 %      Percentiles: P <sub>1</sub> = 44.5 P <sub>10</sub> = 62.1 Q <sub>1</sub> = 70.3 Median = 75.1 Q <sub>3</sub> = 80.3 P <sub>90</sub> = 85.0 P <sub>99</sub> = 90.7																						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-Feb	78.1	76.6	76.4	76.2	75.8	74.8	74.4	73.3	72.6	72.4	74.1	70.4	59.4	53.3	52.6	55.5	58.4	70.4	74.8	73.8	72.8	71.8	71.4	70.3	70.0	78.1																					
2-Feb	69.7	70.0	71.5	71.7	71.6	71.5	71.5	71.1	70.9	71.1	71.7	73.0	74.2	74.3	75.1	78.0	78.3	79.0	80.1	80.3	78.7	76.7	76.1	77.6	74.3	80.3																					
3-Feb	78.9	81.2	81.4	82.5	82.0	83.2	85.0	84.6	83.9	83.5	80.9	78.3	78.0	76.3	76.4	76.6	74.4	73.1	70.5	69.7	69.5	70.0	69.3	70.8	77.5	85.0																					
4-Feb	71.5	72.3	74.1	74.9	75.3	76.1	78.9	80.7	81.3	82.5	81.0	80.1	80.8	80.6	81.9	79.8	80.1	79.9	82.1	84.1	86.7	85.7	85.3	84.5	80.0	86.7																					
5-Feb	84.7	84.6	85.4	86.7	86.2	86.2	85.5	85.7	85.5	85.1	82.0	80.8	78.8	79.4	78.7	78.6	81.6	84.5	89.9	89.7	86.1	78.5	79.4	83.4	89.9																						
6-Feb	66.1	67.2	68.2	71.6	74.6	81.4	77.2	71.8	77.7	77.0	76.3	67.3	62.8	56.4	60.9	57.7	61.4	65.4	70.7	72.3	72.3	73.6	75.1	69.9	81.4																						
7-Feb	74.6	78.0	82.8	83.1	82.4	74.5	70.4	70.2	71.9	70.5	66.0	59.3	54.4	49.3	48.2	48.0	49.9	53.7	57.8	55.9	63.1	67.5	72.5	77.0	65.9	83.1																					
8-Feb	81.3	78.9	82.0	84.9	84.8	83.6	82.8	81.8	81.0	81.5	82.2	76.0	65.6	59.9	59.6	58.0	60.9	75.3	85.1	88.0	87.5	85.2	84.7	86.4	78.2	88.0																					
9-Feb	85.8	85.2	84.0	84.4	84.5	84.9	84.7	84.7	84.2	82.6	79.6	75.1	70.5	67.4	64.2	66.4	68.0	67.0	68.8	70.3	70.9	65.3	68.7	76.5	76.0	85.8																					
10-Feb	79.5	77.6	76.6	80.4	83.3	80.5	83.3	89.9	90.7	89.8	89.3	87.5	86.1	86.1	86.9	87.2	86.7	86.9	86.3	84.0	83.8	88.3	87.4	87.0	85.2	90.7																					
11-Feb	86.7	87.3	87.3	86.6	86.7	86.9	87.0	87.0	87.2	86.8	83.8	77.2	72.6	75.0	75.8	73.6	81.4	88.8	83.0	76.7	75.5	83.3	88.7	85.0	82.9	88.8																					
12-Feb	80.4	79.8	82.5	77.7	76.4	78.4	78.2	78.4	82.1	79.8	78.4	77.3	78.1	76.2	76.2	78.8	83.0	89.2	92.6	92.5	91.4	91.8	91.3	82.1	82.2	92.6																					
13-Feb	67.8	70.0	77.5	84.1	74.4	73.4	83.2	89.1	88.5	84.8	82.9	84.9	80.3	76.9	80.1	80.7	77.3	74.4	70.4	71.7	72.8	74.3	76.4	77.3	78.1	89.1																					
14-Feb	77.6	76.2	78.8	79.7	78.4	76.8	76.0	76.2	75.6	75.9	73.2	70.0	71.2	74.2	69.4	68.5	70.5	70.8	70.7	73.2	77.4	79.0	81.1	80.5	75.0	81.1																					
15-Feb	78.9	77.0	76.1	76.7	76.8	76.6	77.3	77.9	78.7	78.8	79.0	76.6	74.0	71.4	63.0	58.5	61.1	71.6	82.4	80.7	79.9	78.7	77.7	77.7	75.3	82.4																					
16-Feb	76.8	77.4	78.5	79.4	80.2	80.1	80.4	81.0	81.8	83.4	81.7	78.3	74.0	69.4	67.9	69.1	69.5	73.4	75.5	75.5	74.0	73.4	72.9	73.5	76.1	83.4																					
17-Feb	73.8	73.3	74.0	74.7	74.7	74.8	74.1	73.6	76.6	75.4	71.9	67.1	65.0	64.7	64.8	65.6	67.0	67.2	67.4	67.6	67.9	71.3	77.0	78.1	71.1	78.1																					
18-Feb	76.8	76.5	75.1	74.2	73.7	74.3	73.5	73.3	73.3	74.6	76.6	72.2	67.1	58.3	54.3	59.3	63.7	69.6	77.5	78.3	76.7	74.9	73.8	73.1	71.7	78.3																					
19-Feb	73.1	72.6	72.5	72.9	72.8	72.4	72.3	72.5	72.9	74.1	76.0	76.9	75.7	72.2	67.6	67.0	67.0	67.3	71.9	78.4	77.3	76.7	78.3	74.5	73.1	78.4																					
20-Feb	72.4	73.3	73.5	73.1	73.2	74.0	75.9	76.3	75.3	75.5	71.0	65.6	66.0	61.7	61.9	59.6	57.8	61.5	69.9	78.8	79.0	77.2	76.5	75.0	71.0	79.0																					
21-Feb	74.8	75.2	73.5	73.2	71.4	71.3	71.5	71.6	71.8	71.2	66.4	62.1	60.3	56.9	52.3	50.0	49.9	53.3	59.5	69.4	72.8	71.5	71.0	70.4	66.3	75.2																					
22-Feb	69.9	69.3	69.0	68.8	68.9	68.6	68.6	68.4	69.4	71.1	70.0	66.6	63.0	59.4	57.5	59.5	59.3	63.1	70.5	76.2	75.9	75.0	73.6	72.6	68.1	76.2																					
23-Feb	71.5	71.2	70.2	69.9	69.4	68.9	68.6	68.3	68.3	69.8	72.4	67.5	61.8	62.1	59.6	60.8	64.6	64.6	75.5	77.1	76.7	75.8	74.6	74.0	69.3	77.1																					
24-Feb	75.1	74.5	74.2	73.9	73.6	73.2	73.1	72.8	72.9	74.1	74.3	70.6	56.9	47.2	43.8	43.7	43.4	44.2	43.9	44.4	44.5	44.5	46.3	48.1	59.7	75.1																					
25-Feb	51.7	58.8	62.1	65.7	69.7	68.8	68.8	69.8	70.2	66.8	64.4	62.1	60.0	55.3	52.4	50.9	53.8	60.7	66.4	64.1	71.6	75.6	77.4	80.1	64.5	80.1																					
26-Feb	82.1	81.4	83.0	81.9	83.7	84.8	83.4	83.2	82.3	80.2	78.0	78.5	76.3	73.0	75.1	79.9	78.1	84.5	89.1	89.7	90.3	91.4	90.8	90.2	82.9	91.4																					
27-Feb	89.0	89.1	89.2	88.5	87.8	84.7	82.4	80.4	79.3	75.7	72.9	71.8	71.0	69.8	68.2	70.7	71.5	75.0	77.4	79.4	78.3	79.5	81.7	84.4	79.1	89.2																					
28-Feb	83.9	82.5	81.4	80.4	79.5	78.0	77.7	77.0	77.0	78.4	79.0	73.5	71.2	69.6	66.9	64.4	61.9	68.6	76.7	84.1	82.9	80.3	78.7	77.9	76.3	84.1																					
																						76.2	76.3	77.2	77.8	77.6	77.2	77.3	77.5	78.0	77.6	76.2	73.1	69.8	67.0	65.8	65.9	67.1	70.7	74.3	75.9	76.4	76.5	77.0	77.1	Diurnal Average	
																						89.0	89.1	89.2	88.5	87.8	86.9	87.0	89.9	90.7	89.8	89.3	87.5	86.1	86.1	86.9	87.2	86.7	89.2	92.6	92.5	91.4	91.8	91.3	90.2	Diurnal Maximum	



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

**Relative Humidity (RH) - %**  
**Lower Camp - February 2023**



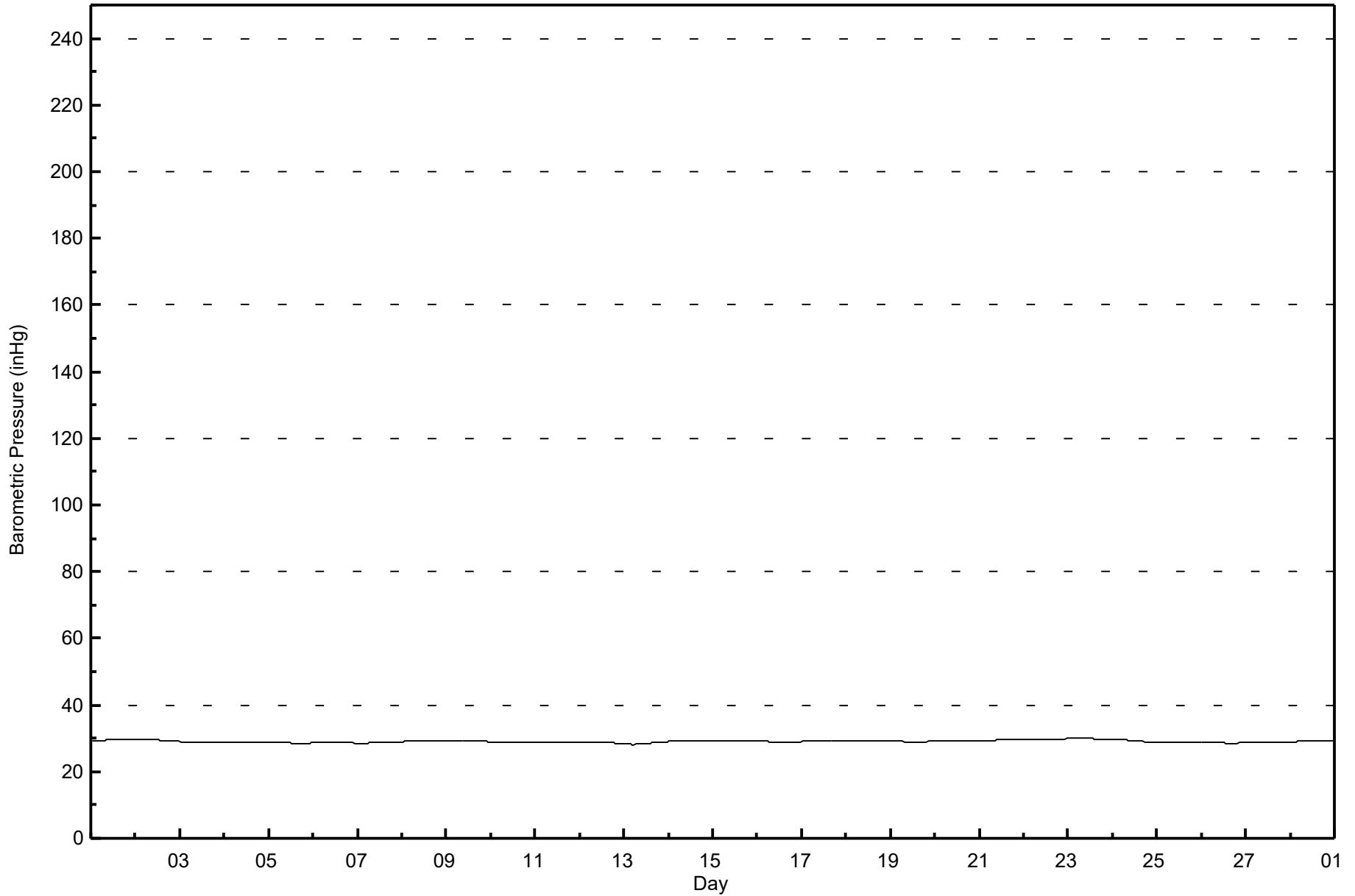


Maximum Value: 30.0 inHg on Feb 23 10:00      Maximum Daily Average: 29.9 inHg on Feb 23																						Hours in Service: 672																									
Minimum Value: 28.2 inHg on Feb 13 05:00      Minimum Daily Average: 28.5 inHg on Feb 13																						Hours of Data: 672																									
Maximum Diurnal Average: 29.1 inHg at hour 11      Minimum Diurnal Average: 29.1 inHg at hour 16																						Hours of Missing Data: 0																									
Monthly Average: 29.07 inHg      Percentiles: P <sub>1</sub> = 28.2 P <sub>10</sub> = 28.7 Q <sub>1</sub> = 28.8 Median = 29.0 Q <sub>3</sub> = 29.3 P <sub>90</sub> = 29.6 P <sub>99</sub> = 29.9																						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-Feb	29.2	29.2	29.3	29.3	29.3	29.3	29.4	29.4	29.5	29.5	29.5	29.5	29.6	29.6	29.6	29.6	29.6	29.6	29.7	29.7	29.7	29.7	29.7	29.7	29.5	29.7																					
2-Feb	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.6	29.6	29.6	29.6	29.5	29.5	29.4	29.4	29.3	29.3	29.3	29.2	29.2	29.2	29.1	29.1	29.1	29.5	29.7																					
3-Feb	29.0	29.0	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	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	29.0																					
4-Feb	28.9	28.9	28.9	28.9	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	28.9	28.9	28.9	28.9	28.9	29.0																					
5-Feb	28.9	28.9	28.9	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.9																					
6-Feb	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.8	28.9																					
7-Feb	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	29.0	28.7	29.0																					
8-Feb	29.0	29.0	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.3																					
9-Feb	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.2	29.3																					
10-Feb	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	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0																					
11-Feb	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.9																					
12-Feb	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	28.7	28.7	28.7	28.7	28.6	28.5	28.5	28.4	28.4	28.3	28.7	28.8																					
13-Feb	28.3	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.3	28.4	28.4	28.5	28.5	28.6	28.6	28.7	28.8	28.8	28.9	28.9	28.9	29.0	29.0	28.5	29.0																					
14-Feb	29.0	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.4																					
15-Feb	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	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	29.4	29.4																					
16-Feb	29.3	29.2	29.2	29.1	29.1	29.1	29.0	29.0	28.9	28.9	28.8	28.8	28.8	28.8	28.7	28.7	28.8	28.8	28.8	28.9	28.9	29.0	29.0	29.0	28.9	29.3																					
17-Feb	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1																					
18-Feb	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.3																					
19-Feb	29.2	29.2	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.0	29.2																					
20-Feb	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3																					
21-Feb	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	29.5	29.5	29.6	29.6	29.6	29.6	29.6	29.7	29.7	29.7	29.7	29.5	29.7																					
22-Feb	29.7	29.7	29.7	29.7	29.7	29.7	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.9	29.9	29.8	29.9																					
23-Feb	29.9	29.9	29.9	29.9	29.9	29.9	29.9	30.0	30.0	30.0	30.0	29.9	29.9	29.9	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.9	29.9	30.0																					
24-Feb	29.7	29.7	29.6	29.6	29.6	29.5	29.5	29.5	29.4	29.4	29.3	29.3	29.2	29.2	29.2	29.1	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	29.3	29.7																					
25-Feb	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.9																					
26-Feb	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7																					
27-Feb	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	29.0																					
28-Feb	29.0	29.0	29.0	29.0	29.0	29.1	29.1	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																					
																						29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	Diurnal Average	
																						29.9	29.9	29.9	29.9	29.9	29.9	30.0	30.0	30.0	30.0	29.9	29.9	29.9	29.9	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.9	29.9	29.9	Diurnal Maximum



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

**Barometric Pressure (BP) - inHg**  
**Lower Camp - February 2023**





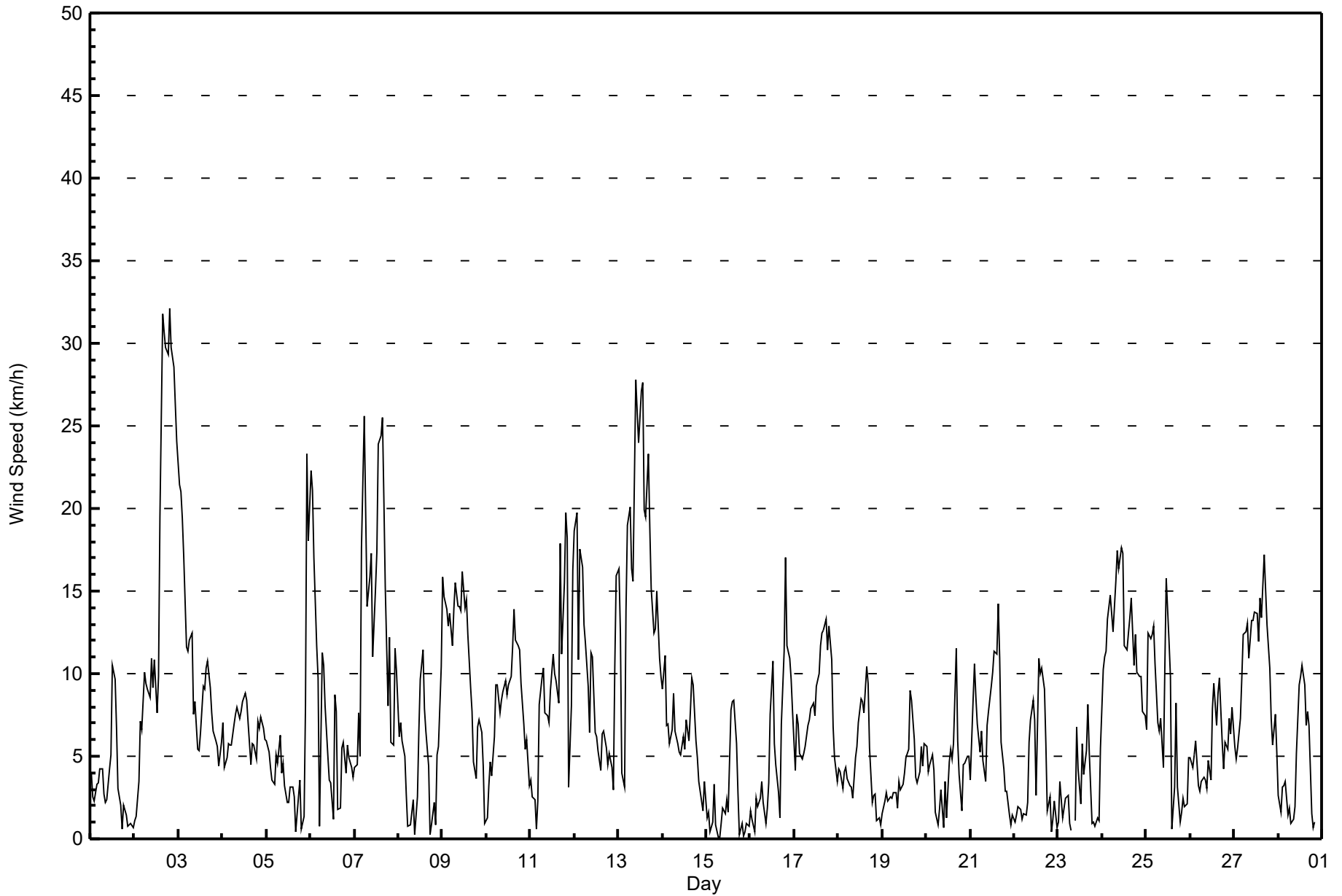
Maximum Speed: 32 km/h on Feb 2 20:00      Maximum Daily Speed Average: 16.1 km/h on Feb 2		Hours in Service: 672 Hours of Data: 669 Hours of Missing Data: 3 Percent Operational Time: 99.6																								
Minimum Speed Value: 0 km/h on Feb 15 08:00 Maximum Diurnal Speed Average: 2.6 km/h at hour 18 Monthly Average Velocity: 1.4 km/h 328.0 deg		Minimum Daily Speed Average: 0.7 km/h on Feb 23 Minimum Diurnal Speed Average: 0.2 km/h at hour 3 Percentiles: P <sub>1</sub> = 0 P <sub>10</sub> = 1 Q <sub>1</sub> = 3 Median = 6 Q <sub>3</sub> = 10 P <sub>90</sub> = 15 P <sub>99</sub> = 28																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Feb	WNW4	NNW3	NW2	NW3	NW3	NW4	WNW4	NW3	NNW2	NW2	NW4	NW5	NW11	N10	WNW7	NW3	SW2	NNW1	NW2	NNW1	NNE1	ENE1	NNE1	ENE1	NW3.0	NW11
2-Feb	ESE1	ESE1	SE3	SE7	SSE7	SE10	SE9	SE9	SE9	SE11	SE9	SE11	SSE8	SE10	SE20	SE32	SE31	SE30	SE29	SE32	SE30	SE29	SE26	SE24	SE16.1	SE32
3-Feb	SE21	SE21	SE19	SE17	SSE12	SSE11	SE12	SE12	SE8	SE8	SE5	N5	NNW6	NNW9	N9	N10	NNE11	NNE9	NNE8	NNE7	N6	NNE6	NNE4	N6	ESE4.2	SE21
4-Feb	N7	N4	NW5	NNW6	NNW6	NNW6	NW7	NW8	NNW8	N7	N8	N8	N9	N8	N7	NNW4	NW6	NNW6	NNW5	NW7	NW7	NW7	NW6	NW6	NNW6.3	N9
5-Feb	NW6	NNW5	NW4	NNW4	NNW3	N5	NW5	NW6	N4	NW5	WNW3	NW2	SE2	NNW3	ESE3	ENE3	N0	WNW3	WNW4	S1	NNW1	WNW8	WNW23	NW18	NW4.2	WNW23
6-Feb	WNW22	WNW21	W17	W12	W10	NNE1	W11	W10	W8	WNW5	W4	WNW3	SSE1	SE9	SE8	E2	N2	NNW5	NNW6	NNW4	NNW6	NNW5	WNW4	NNW4	WNW5.4	WNW22
7-Feb	NW4	SSE4	SE8	SE5	W18	WNW26	WNW20	WNW14	W16	W17	W11	W15	W17	W24	W24	WNW26	WNW21	W15	WNW8	W12	NW6	W6	NNW12	NNW10	W12.2	WNW26
8-Feb	NNW6	NW7	WNW6	WNW5	NNW3	N1	NNW1	NW2	NW2	WNW0	SE3	SE7	SE10	SE11	SE8	SE7	SE4	S0	NW1	NW2	NNW1	SE5	ESE6	SE10	SE1.5	SE11
9-Feb	SE16	SE15	SE14	SE13	SSE14	SSE12	SE14	SE16	SE14	SE14	SSE14	SE16	SE14	SE14	SE12	SE9	SE8	SE5	SE4	SE7	SE7	SSE6	SSE4	NNW1	SE10.8	SE16
10-Feb	NE1	NW3	WNW5	NNW4	NW6	NNW9	NNW9	NNW8	NW8	NW9	NW10	NNW9	NNW9	NNW10	NW12	NW14	NW12	NW12	NW11	NNW9	NNW7	NNW5	NW6	NNW3	NNW7.8	NW14
11-Feb	NW4	NNW3	N2	NE1	SE2	SE8	SE10	SE10	SE8	SE7	SE7	SE9	SE11	SE10	SSE10	SW8	WSW18	W11	W15	WNW20	NW18	WSW3	WSW8	W16	SW3.1	WNW20
12-Feb	W19	WNW20	NW11	W18	WSW16	WSW13	W12	W9	NNW6	W11	WSW11	W6	NNW6	NNW5	NNW4	NNW6	NNW7	N6	NNW5	NNW5	NNW4	N3	SE10	SE16	WNW6.2	WNW20
13-Feb	SSE16	SSE12	ESE4	NW3	W14	W19	W20	W16	N16	N28	N26	N24	N27	N28	NNW20	NNW19	N23	N19	N15	N12	N13	NNE15	N11	NNW10	N11.9	N28
14-Feb	NNW9	N11	NW7	NW7	NW6	N7	N9	NNE7	NNE6	NNW5	N5	N6	NNW5	N7	N6	N8	NE10	NNE9	N6	NNW5	NNW3	W2	N2	WNW3	N5.7	N11
15-Feb	NNE1	NW2	ENE0	NW1	NW3	NNW1	N0	WSW0	E1	N2	N2	NE2	E2	ESE8	SE8	SE8	SE6	SE3	ESE0	ENE1	NNW0	NW0	NNW1	SE1	ESE1.2	SE8
16-Feb	N2	NNE1	NNE0	ESE2	SE2	N2	NNW3	NW2	NNW1	SE2	SE3	SE8	SE11	SE6	SE5	SE3	NW1	NW7	N11	NNE17	N12	N11	NNW10	N8	NNE2.5	NNE17
17-Feb	NNE4	NNE8	N7	N5	NW5	NNW5	NE6	NE7	NNE7	NNE8	NNE8	N7	NNW9	N10	N12	N12	N13	NNE13	N11	N13	N11	NNW7	NW5	NW3	N7.7	NNE13
18-Feb	WNW4	NNW4	NW3	NW4	NW4	NW4	NW3	NNW3	NW2	WNW5	WNW6	WNW7	W8	NW8	WNW8	WSW10	W9	WNW6	NW2	NW3	NW3	N1	NNW1	NW1	WNW4.2	WSW10
19-Feb	NW2	NW2	NW3	NNW2	NW3	NW2	NW3	NW3	NNW2	NW3	WNW3	NW3	WNW4	WNW5	NW5	NW9	NW8	NW6	WNW4	NW3	NW4	NW6	NW4	NNW6	NW3.9	NW9
20-Feb	NNW6	N4	NNW4	WNW5	N4	NNE2	ENE1	SE2	ESE3	NNE1	SE3	ESE1	WSW5	WSW5	WSW5	NNW6	N12	NNW6	WNW4	NNW2	NW5	NW5	NW5	NW5	NW2.5	N12
21-Feb	WNW4	NNW8	N11	N9	N7	NW5	WNW7	NNW5	NW3	NW7	NW8	NW9	NW10	NNW11	N11	N14	NNW11	N6	N4	WNW3	NNW3	N1	N1	ESE1	NNW6.1	N14
22-Feb	ESE1	ESE1	ESE2	ESE2	NE1	ESE2	E1	ESE2	SE6	SE7	SE8	SE7	W3	W11	WSW10	WSW10	WSW9	WNW6	NW2	NNW3	NE0	E1	NNW2	E1	SSW1.4	W11
23-Feb	NNE1	WNW3	NNE1	NW2	NNW2	NW3	E1	ENE0	UO	SE1	SE7	SE4	WSW2	WNW6	WNW4	SE5	SE8	SE5	ENE1	ESE1	E1	NE1	NNW1	SE6	SE0.7	SE8
24-Feb	SE10	SE11	SSE11	SSE13	SE15	SE14	SE13	SE16	SE17	SE16	SE18	SE17	SSE12	S11	S12	SSE15	SSE10	S12	S10	S10	S10	S10	SSE8	SSE7	SSE12.2	SE18
25-Feb	SE7	SE12	SE12	SE12	SE13	SE11	SE7	SE7	SE7	SW4	W10	WSW16	W12	WSW10	NE1	ESE3	ESE8	SE3	SSE1	ESE2	ESE2	ENE2	ESE2	ESE5	SSE4.0	WSW16
26-Feb	ESE5	ESE4	ESE5	ESE6	NW3	WNW3	NW3	WNW4	NW4	N3	N5	ENE4	ESE8	E9	ESE7	ESE9	ESE10	ENE6	NNE4	N6	N5	N7	N6	N8	ENE2.9	ESE10
27-Feb	N6	NNW5	NNW5	NNW7	NNW10	NNW12	NNW13	NNW13	NNW11	N13	N13	N14	N14	N12	N15	NNE13	NNE17	NNE15	NNE13	N10	N7	NNW6	WNW8	WNW5	N10.1	NNE17
28-Feb	WNW3	NNW2	NW3	NNW3	NW3	NW1	NNW2	NNW1	NW1	NW2	WNW5	W9	W10	WSW11	W9	W7	W8	W7	WNW2	NE1	NE1	UO	UO	SE3	W3.5	WSW11
Diurnal Average: WNW0.7 NW0.5 NW0.2 WSW0.5 W2.0 WNW1.7 WNW1.8 WNW1.0 N0.8 NNW1.2 NNW1.0 NW1.1 NW2.0 NW2.3 NNW1.4 NNW1.6 N1.7 N2.6 NNW2.6 N2.6 N2.5 N2.5 N1.5 NNW1.9 NNW1.0																								Diurnal Average		
Diurnal Maximum: WNW22 WNW21 SE19 W18 W18 WNW26 W20 W16 SE17 N28 N26 N24 N27 N28 W24 SE32 SE31 SE30 SE29 SE32 SE30 SE29 SE26 SE24																								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 (WS) - km/h**  
**Lower Camp - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Feb 6 03:00 Minimum Value: 1 km/h on Feb 19 08:00 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: 672 Hours of Data: 669 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-Feb	1	1	1	2	1	1	1	1	1	1	1	2	3	3	2	2	2	1	1	1	1	1	1	1	3	
2-Feb	1	1	1	2	2	2	2	2	2	2	2	2	2	1	7	5	5	5	5	5	5	5	4	4	7	
3-Feb	4	4	4	4	5	3	2	2	3	2	1	2	2	2	2	2	2	2	2	2	1	1	1	3	5	
4-Feb	2	1	1	1	1	1	1	1	2	1	2	2	2	2	2	2	1	2	1	1	2	1	1	1	2	
5-Feb	1	1	1	1	1	1	1	1	2	2	3	1	1	2	3	3	1	2	1	2	1	4	5	4	5	
6-Feb	6	5	8	3	2	3	4	3	4	3	1	1	1	1	2	1	1	2	2	1	1	2	1	1	8	
7-Feb	1	2	3	5	5	6	5	3	3	3	3	3	4	6	5	4	3	2	3	3	2	4	2	6		
8-Feb	3	2	1	2	2	1	1	1	1	1	2	3	1	1	2	1	2	1	1	1	1	4	2	5	5	
9-Feb	2	3	2	3	2	3	3	3	2	2	3	2	2	2	3	2	2	2	2	2	2	2	2	1	3	
10-Feb	1	2	1	1	3	2	2	2	1	1	2	1	2	2	2	2	2	2	2	2	2	1	1	1	3	
11-Feb	1	1	1	1	2	2	2	1	2	1	2	2	1	1	2	5	4	3	4	6	5	3	5	3	6	
12-Feb	4	4	3	3	3	3	4	4	2	2	3	1	1	1	1	1	2	2	2	1	1	2	7	4	7	
13-Feb	4	4	3	2	6	5	5	3	5	6	6	6	7	6	6	5	6	4	4	3	3	4	3	2	7	
14-Feb	3	3	2	1	1	1	2	2	1	1	2	1	1	1	1	2	2	2	2	1	1	1	1	2	3	
15-Feb	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	2	
16-Feb	1	1	1	2	1	2	2	1	1	1	1	2	2	1	2	2	2	3	4	3	3	3	2	2	4	
17-Feb	1	1	1	2	1	1	1	2	2	1	2	2	2	2	2	3	3	2	2	3	3	2	1	1	3	
18-Feb	1	1	2	1	1	1	1	1	1	1	1	1	2	2	1	1	2	1	1	1	1	1	1	1	2	
19-Feb	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	2	1	2	1	1	1	2	2	
20-Feb	1	1	1	2	1	2	1	1	1	1	2	1	2	1	1	3	2	2	1	1	1	1	1	1	3	
21-Feb	3	2	2	2	2	1	1	2	1	2	2	2	3	3	3	4	3	1	1	1	1	1	1	1	4	
22-Feb	1	1	2	1	1	1	1	1	2	1	1	2	3	3	2	1	2	1	2	1	1	1	1	1	3	
23-Feb	1	1	1	1	1	1	1	1	UO	2	1	2	2	1	1	4	2	1	1	1	1	1	2	2	4	
24-Feb	3	2	4	3	3	2	2	2	2	2	2	4	4	4	5	4	5	3	5	4	3	3	3	3	5	
25-Feb	2	2	2	2	3	4	2	3	3	2	3	3	3	3	2	2	4	2	2	1	1	1	1	2	4	
26-Feb	1	2	2	3	1	1	1	1	1	1	2	2	2	2	2	2	4	2	1	1	2	1	1	1	4	
27-Feb	1	1	1	1	2	3	3	3	2	3	3	3	3	3	3	3	3	4	2	2	2	1	1	1	4	
28-Feb	1	1	2	1	1	2	1	1	1	1	1	2	1	2	1	1	1	2	1	1	1	UO	UO	1	2	
																	Diurnal Maximum									
UO - Unstable Operation																										







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Lower Camp - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	291	43.50	43.50
6 - 11	247	36.92	80.42
12 - 19	100	14.95	95.37
20 - 28	24	3.59	98.95
29 - 38	7	1.05	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 669

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Lower Camp - February 2023**

<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	25	13	9	10	8	24	25	4	2	0	2	6	3	34	70	56	291
6 - 11	40	14	3	1	1	8	54	9	4	0	1	8	20	12	31	41	247
12 - 19	18	7	0	0	0	0	27	12	2	0	0	4	17	2	6	5	100
20 - 28	6	0	0	0	0	0	5	0	0	0	0	0	3	9	0	1	24
29 - 38	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	7
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	89	34	12	11	9	32	118	25	8	0	3	18	43	57	107	103	669

Total Number of Valid Hours: 669

Total Number of Hours: 672





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

**Wind Direction (WD) - deg**  
**Lower Camp - February 2023**

Direction of Maximum Speed: 139 deg on Feb 2 20:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 139.7 deg on Feb 2	Hours of Data: 669
Direction of Minimum Speed: 248 deg on Feb 15 08:00	Direction of Minimum Daily Speed Average: 0.7 deg on Feb 23
Direction of Minimum Speed: 248 deg on Feb 15 08:00	Hours of Missing Data: 3
Monthly Average Direction: 328.0 deg	Percent Operational Time: 99.6

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-Feb	299	341	309	305	306	311	301	308	328	320	308	318	304	349	301	304	229	331	323	338	20	61	31	69	315.5
2-Feb	122	114	141	143	148	145	144	145	145	145	143	143	151	143	131	138	138	136	140	139	140	138	139	140	139.7
3-Feb	141	143	142	144	156	154	144	146	135	135	138	353	330	344	6	4	31	22	32	17	353	15	12	351	106.0
4-Feb	3	357	323	335	337	330	316	325	339	351	349	357	6	351	11	329	310	347	339	324	326	322	320	326	339.0
5-Feb	326	334	318	342	341	353	324	322	356	311	288	321	127	336	109	78	351	285	299	173	341	297	302	314	319.0
6-Feb	297	286	278	263	265	14	271	269	279	288	262	292	160	141	135	99	352	332	333	332	330	330	295	341	286.4
7-Feb	325	149	137	144	267	291	299	287	271	264	269	266	277	277	275	283	282	271	284	278	306	274	339	343	280.8
8-Feb	331	326	293	300	341	4	340	326	307	282	129	139	137	142	146	141	142	182	307	304	348	128	119	134	136.6
9-Feb	141	145	146	146	147	148	146	146	146	145	149	145	141	144	146	137	141	141	144	141	144	158	150	285	145.2
10-Feb	35	320	298	329	314	341	342	330	319	317	322	332	336	333	320	317	320	316	319	343	344	344	326	329	326.7
11-Feb	319	340	5	44	131	137	139	142	142	138	144	143	140	143	148	219	257	271	281	294	310	255	255	278	225.4
12-Feb	275	283	304	263	257	255	267	278	328	265	256	262	337	333	330	340	346	350	340	334	328	350	134	140	282.5
13-Feb	156	156	121	326	278	270	272	278	352	10	3	3	0	5	348	346	2	10	5	3	7	22	4	346	351.0
14-Feb	344	354	314	312	325	352	11	22	20	341	1	0	336	8	3	3	35	25	5	336	340	272	8	300	354.8
15-Feb	12	325	76	304	323	339	11	248	79	349	3	47	100	113	127	138	141	127	109	78	331	311	337	140	106.8
16-Feb	353	20	14	111	134	350	328	322	332	130	137	139	144	140	136	133	307	323	354	26	1	3	348	3	24.0
17-Feb	28	31	11	10	324	331	36	41	22	29	19	360	342	350	4	360	4	14	7	7	3	328	310	311	4.2
18-Feb	301	337	316	319	315	308	323	328	325	301	302	282	275	315	299	257	262	286	315	323	315	6	342	319	298.2
19-Feb	305	322	318	333	315	311	316	314	339	317	286	304	299	290	321	318	322	311	290	316	317	319	313	331	314.1
20-Feb	344	7	337	302	350	17	59	137	113	22	127	108	247	254	251	332	11	338	299	334	308	308	309	309	325.8
21-Feb	292	334	6	4	1	308	297	328	314	308	326	324	324	340	350	356	346	6	350	295	331	10	1	118	338.5
22-Feb	118	123	120	110	53	108	93	110	134	140	141	137	266	259	255	251	247	298	305	338	42	93	330	95	211.6
23-Feb	31	298	22	318	333	310	79	70	UO	139	139	144	254	294	293	135	144	140	57	102	93	38	297	137	143.9
24-Feb	145	145	148	147	145	140	142	145	142	143	139	139	155	173	176	164	165	167	181	177	174	169	163	166	154.4
25-Feb	146	142	144	140	134	131	132	134	142	233	259	255	265	248	39	121	120	127	157	104	102	73	109	121	159.8
26-Feb	117	114	123	116	319	300	311	303	313	351	7	60	104	91	113	121	118	78	25	8	1	11	8	7	59.8
27-Feb	2	347	343	336	329	342	344	348	345	355	353	358	355	352	3	16	25	16	17	9	6	341	302	293	355.2
28-Feb	298	327	326	334	318	326	343	336	307	315	293	263	260	256	259	277	275	275	286	52	50	UO	UO	126	280.1
298.9 318.7 313.9 245.4 275.6 289.0 293.8 285.1 355.1 333.5 329.3 323.3 314.7 323.4 326.8 330.3 349.1 350.9 344.1 352.1 352.3 1.5 329.2 339.6																									
Diurnal Average																									

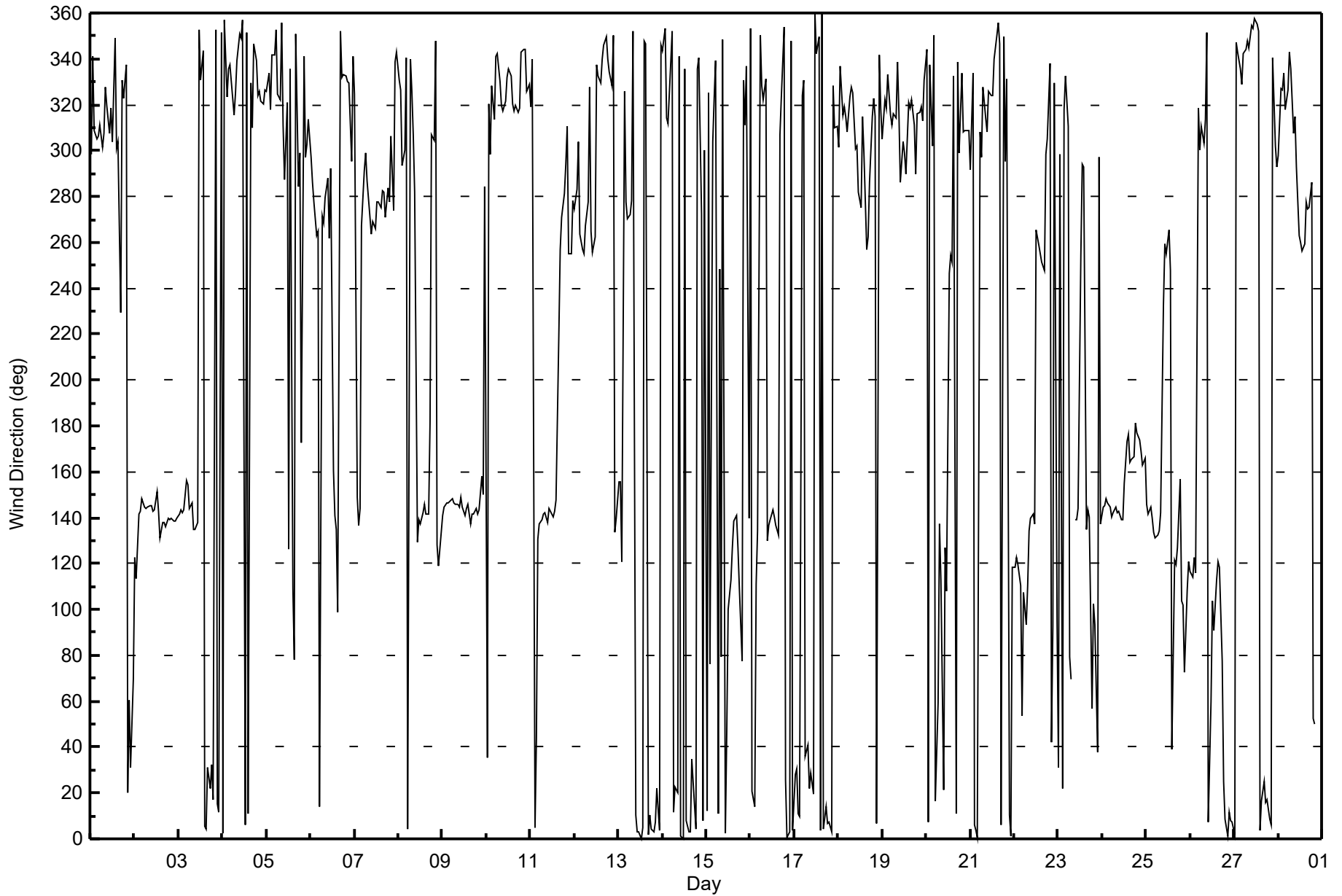
UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods



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

**Wind Direction (WD) - deg**  
**Lower Camp - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 97 deg on Feb 25 15:00 Minimum Value: 5 deg on Feb 24 09:00 Percentiles: P <sub>1</sub> = 6 P <sub>10</sub> = 10 Q <sub>1</sub> = 13 Median = 20 Q <sub>3</sub> = 37 P <sub>90</sub> = 61 P <sub>99</sub> = 93																			Hours in Service: 672 Hours of Data: 669 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-Feb	34	39	49	44	24	23	20	42	44	29	16	35	16	22	26	47	72	58	57	54	55	68	57	76	76
2-Feb	44	60	30	14	15	10	11	10	12	10	10	8	17	9	13	7	7	7	8	7	8	8	8	8	60
3-Feb	10	10	12	12	25	21	9	8	16	11	11	45	27	19	20	16	16	15	21	29	20	14	24	31	45
4-Feb	17	22	12	18	15	19	10	15	17	18	19	18	18	21	19	33	13	18	21	10	22	11	18	21	33
5-Feb	13	20	25	30	27	24	31	12	45	26	94	65	71	56	78	68	91	49	47	84	84	46	19	13	94
6-Feb	13	13	14	14	13	78	25	19	58	38	27	28	80	7	13	54	64	40	29	23	18	25	13	34	80
7-Feb	36	57	14	69	13	18	13	13	12	11	13	12	13	13	12	11	11	12	21	18	28	42	30	18	69
8-Feb	36	20	10	32	38	87	42	39	22	76	46	9	6	6	9	11	42	95	86	46	87	71	24	36	95
9-Feb	7	9	10	12	11	13	11	10	10	7	12	7	6	6	9	9	9	13	46	7	12	18	48	77	77
10-Feb	55	47	30	26	12	23	17	14	9	11	13	12	15	14	10	8	8	8	9	21	20	22	17	40	55
11-Feb	30	31	45	77	30	13	9	8	7	9	8	9	6	7	10	43	14	13	11	13	13	59	32	13	77
12-Feb	13	15	18	11	12	20	19	36	26	22	8	18	25	23	22	15	15	20	26	20	24	70	24	18	70
13-Feb	18	18	67	65	38	13	13	12	34	15	18	19	19	18	20	20	19	16	17	16	21	20	22	19	67
14-Feb	22	20	25	14	15	20	13	16	21	22	25	23	22	10	18	21	13	16	18	23	31	49	50	32	50
15-Feb	76	58	87	85	14	76	74	95	68	41	48	21	73	15	20	11	12	44	76	60	83	79	76	88	95
16-Feb	64	72	93	49	53	51	40	43	50	61	14	9	6	12	12	23	67	29	18	13	22	21	18	17	93
17-Feb	26	15	15	22	21	23	21	15	19	11	14	27	18	18	17	15	16	12	15	14	17	21	15	20	27
18-Feb	16	18	38	26	28	19	23	43	43	14	17	18	20	22	29	9	10	21	47	26	34	48	45	64	64
19-Feb	32	22	17	30	19	27	15	13	42	37	28	35	21	18	34	9	10	11	16	24	18	16	23	20	42
20-Feb	18	20	22	28	24	61	76	41	30	84	37	78	49	24	20	47	10	22	29	51	18	19	21	19	84
21-Feb	66	18	14	15	20	20	15	39	38	14	24	22	28	22	22	19	19	16	21	39	35	50	63	45	66
22-Feb	49	17	43	41	36	25	36	40	20	5	6	9	96	18	14	10	14	23	76	42	94	41	50	63	96
23-Feb	34	41	38	45	31	55	60	85	UO	93	6	50	82	27	36	46	8	15	74	30	70	58	91	12	93
24-Feb	13	11	16	11	7	7	8	6	5	6	7	11	27	31	28	25	24	24	28	27	25	24	24	30	31
25-Feb	21	10	8	7	6	15	22	34	38	57	20	13	16	22	97	75	17	40	96	73	53	46	41	23	97
26-Feb	21	20	23	37	51	33	38	20	36	29	24	51	27	20	22	14	15	22	34	12	19	12	13	8	51
27-Feb	18	19	15	13	11	17	18	18	18	18	19	16	19	20	16	19	10	10	9	12	15	21	10	15	21
28-Feb	31	49	35	23	19	43	27	48	71	45	22	12	9	9	9	13	13	17	80	70	56	UO	UO	10	80
Diurnal Maximum																								76	
UO - Unstable Operation																									





## **WOOD BUFFALO ENVIRONMENTAL ASSOCIATION**

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS13 FORT MCKAY SOUTH FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY SOUTH (AMS13)  
FEBRUARY 2023

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	640	31	32	99.85	30	0	4.4	0
TRS(ppb) Average	638	33	34	99.85	2.6	0	1.4	0
THC(ppm) Average	637	31	35	99.4	4.5	-	3	-
NMHC(ppm) Average	637	31	35	99.4	0.113	-	0.021	-
CH4(ppm) Average	637	31	35	99.4	4.5	-	3	-
O3(ppb) Average	640	31	32	99.85	40.5	0	30.2	-
NO2(ppb) Average	638	33	34	99.85	37.6	0	27.2	-
NO(ppb) Average	638	33	34	99.85	183.5	-	45.2	-
NOX(ppb) Average	638	33	34	99.85	213	-	72.4	-
PM2.5(ug/m3) Average	670	1	2	99.85	23.8	0	11.8	0
ET(C) Average	672	0	0	100	3.6	-	-1.6	-
RH(%) Average	672	0	0	100	95.3	-	89	-
WS(km/h) Average	668	0	4	99.4	29	-	14	-
WD(deg) Average	668	0	4	99.4	-	-	-	-

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



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS13)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	640	1.2	2.1	-	0.1	0.2	0.3	0.6	1.2	2.6	30
TRS(ppb) Average	638	0.79	0.4	-	0.4	0.4	0.5	0.6	1	1.4	2.6
THC(ppm) Average	637	2.31	0.3	-	2	2	2.1	2.2	2.4	2.7	4.5
NMHC(ppm) Average	637	0.002	0.011	-	0	0	0	0	0	0	0.113
CH4(ppm) Average	637	2.31	0.3	-	2	2	2.1	2.2	2.4	2.7	4.5
O3(ppb) Average	640	15.43	11.5	-	0.6	1.1	3.5	15.5	24.8	30.6	40.5
NO2(ppb) Average	638	15.96	9.5	-	0.3	3.9	8.1	14.7	24.2	29.2	37.6
NO(ppb) Average	638	14.99	29	-	0	0	0.1	2.4	15.5	44.3	183.5
NOX(ppb) Average	638	30.95	35.5	-	0.3	4.3	9	18.1	37.2	71.9	213
PM2.5(ug/m3) Average	670	5.78	3.7	-	0.4	2.1	3.3	5	7.2	10.2	23.8
Temperature 2 m (C) Average	672	-16.99	9.9	-	-39.5	-31.9	-23.8	-16.5	-9.3	-5.5	3.6
Relative Humidity (%) Average	672	75.26	10.1	-	45.9	61.5	69.6	76.1	82.1	88	95.3
Wind Speed 10 m (km/h) Average	668	6.1	5	-	0	1	2	5	9	12	29
Wind Direction 10 m (deg) Average	668	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS13)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2,O3, PM2.5, SO2, TRS	10 Feb 2023 16:00	10 Feb 2023 16:00	1	Station power failure
THC/NMHC/CH4	10 Feb 2023 16:00	10 Feb 2023 17:00	2	Station power failure
THC/NMHC/CH4	16 Feb 2023 11:00	16 Feb 2023 12:00	2	Maintenance - replaced support gas cylinder
Wind Speed, Wind Direction	18 Feb 2023 01:00	18 Feb 2023 01:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	18 Feb 2023 08:00	18 Feb 2023 08:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	19 Feb 2023 03:00	19 Feb 2023 03:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	28 Feb 2023 19:00	28 Feb 2023 19:00	1	Flat line in sensor output signal



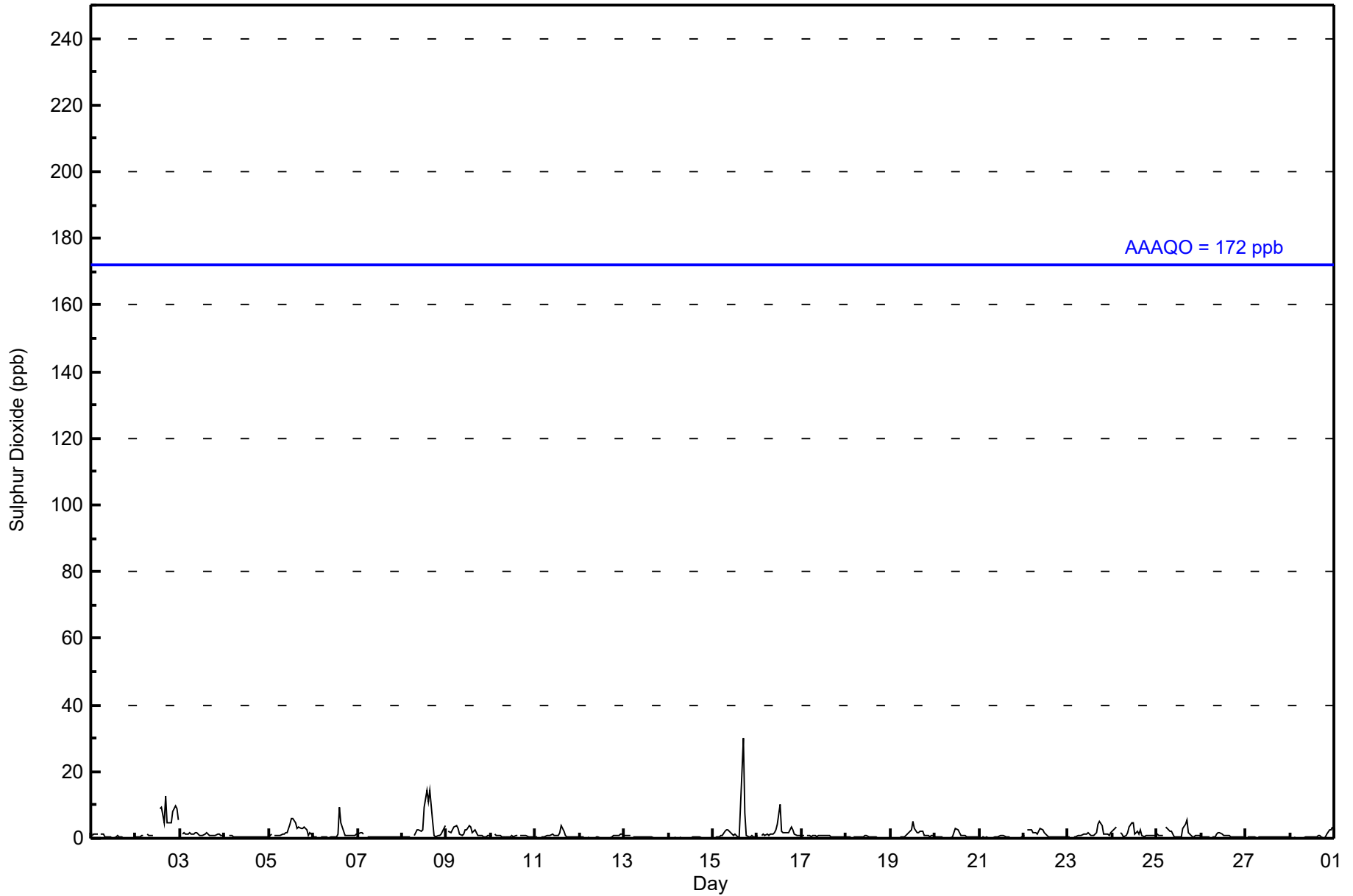
# Wood Buffalo Environmental Association

## Summary of Hour Averages

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

## Fort McKay South - February 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	672																												
Maximum Value: 30.0 ppb on Feb 15 17:00		Maximum Daily Average: 4.4 ppb on Feb 2		Hours of Data:																	640																												
Minimum Value: 0.1 ppb on Feb 21 21:00		Minimum Daily Average: 0.2 ppb on Feb 14		Hours of Missing Data:																	32																												
Maximum Diurnal Average: 2.8 ppb at hour 17		Minimum Diurnal Average: 0.7 ppb at hour 1		Hours of Calibration:																	31																												
Monthly Average: 1.20 ppb		Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 0.3 Median = 0.6 Q <sub>3</sub> = 1.2 P <sub>90</sub> = 2.6 P <sub>99</sub> = 10.0		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-Feb	1.0	1.2	1.3	1.2	Z	1.4	1.1	0.6	0.3	0.2	0.3	0.1	0.2	0.2	0.9	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	1.4																							
2-Feb	0.2	0.2	0.2	0.7	0.9	Z	1.3	0.9	0.7	0.8	C	C	C	9.0	9.4	4.6	12.7	4.7	4.8	4.9	8.2	9.9	8.7	5.7	4.4	12.7																							
3-Feb	Z	1.4	1.6	1.2	1.3	1.7	1.1	1.2	1.5	1.6	1.0	0.8	0.9	1.3	1.9	1.4	1.0	0.9	1.0	1.0	1.2	1.0	0.9	1.2	1.9																								
4-Feb	0.8	Z	0.8	1.1	0.8	0.6	0.6	0.6	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.5	0.3	0.4	0.5	1.1																								
5-Feb	0.4	1.3	Z	1.0	0.9	0.9	0.9	1.1	1.2	1.6	1.9	4.3	5.8	6.1	4.6	2.9	3.3	3.0	3.0	3.2	2.5	1.0	1.9	1.1	2.3	6.1																							
6-Feb	0.5	0.4	0.2	Z	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.4	0.4	1.4	9.3	4.5	2.3	1.0	0.8	0.7	0.8	0.7	0.8	1.2	1.2	9.3																							
7-Feb	1.2	1.6	1.5	1.3	Z	0.6	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.5	1.6																							
8-Feb	0.3	0.2	0.3	0.2	0.3	Z	0.7	1.6	2.6	2.4	2.3	2.8	9.1	14.4	11.2	14.5	5.3	0.8	0.6	0.7	0.9	1.2	2.3	3.9	3.4	14.5																							
9-Feb	Z	2.3	1.8	2.6	3.4	3.8	2.8	1.1	0.9	1.2	2.4	2.4	3.9	3.5	1.6	2.6	1.6	1.0	0.8	0.7	0.6	0.6	0.7	0.8	1.9	3.9																							
10-Feb	1.0	Z	1.2	1.0	1.0	0.8	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.7	0.7	PF	0.9	0.8	0.7	0.7	0.6	0.5	0.5	0.5	0.7	1.2																							
11-Feb	0.4	0.4	Z	0.4	0.4	0.4	0.7	0.6	0.8	1.1	1.0	0.7	0.7	1.5	3.9	2.3	0.9	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.8	3.9																							
12-Feb	0.3	0.3	0.3	Z	0.2	0.2	0.1	0.2	0.1	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.5	0.7	0.8	0.9	1.0	1.1	1.1	0.4	1.1																							
13-Feb	1.0	0.8	0.9	0.9	Z	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.3	1.0																							
14-Feb	0.2	0.1	0.2	0.2	0.2	Z	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.6	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6																							
15-Feb	Z	0.1	0.3	0.3	0.7	1.0	2.2	2.7	2.6	2.2	1.2	0.9	1.4	0.4	0.6	10.0	30.0	7.8	0.7	0.4	0.6	0.7	0.6	0.6	3.0	30.0																							
16-Feb	0.8	Z	1.0	1.1	1.0	1.1	1.0	1.1	1.1	1.7	2.5	4.3	10.1	1.9	1.7	1.7	1.7	1.8	3.6	2.6	1.2	1.0	0.9	0.9	2.0	10.1																							
17-Feb	0.9	1.0	Z	0.8	0.7	0.6	0.7	0.7	0.6	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.6	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.6	1.0																							
18-Feb	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.5	0.8	0.9	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.9																							
19-Feb	0.1	0.2	0.2	0.2	Z	0.4	0.4	0.5	0.7	1.1	1.8	2.5	5.2	3.1	1.8	1.6	2.1	2.1	0.9	0.7	0.8	0.6	0.8	0.8	1.3	5.2																							
20-Feb	0.5	0.5	0.4	0.5	0.4	Z	0.2	0.1	0.2	0.4	1.9	3.0	2.7	1.7	0.9	0.7	0.6	0.5	0.3	0.2	0.3	0.2	0.2	0.3	0.7	3.0																							
21-Feb	Z	0.3	0.4	0.2	0.3	0.2	0.1	0.1	0.2	0.4	0.5	0.7	0.9	0.7	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.9																							
22-Feb	0.8	Z	2.5	2.5	2.4	1.8	1.5	1.3	1.9	2.8	2.5	1.7	1.2	0.5	0.6	0.6	0.5	0.3	0.3	0.3	0.3	0.5	0.3	0.2	1.2	2.8																							
23-Feb	0.3	0.2	Z	0.3	0.4	0.7	0.8	0.7	1.2	1.2	1.2	1.5	0.8	0.9	0.8	1.7	4.1	4.9	3.7	1.2	1.2	1.2	0.8	1.5	1.4	4.9																							
24-Feb	2.5	2.9	3.4	Z	1.7	1.1	0.5	0.6	1.9	3.5	4.5	4.7	1.3	1.9	1.1	2.7	0.6	0.6	0.7	0.7	0.7	0.8	0.9	1.1	1.8	4.7																							
25-Feb	1.1	0.9	0.8	0.7	Z	3.2	2.6	2.3	2.0	0.6	0.5	0.5	0.3	0.5	3.1	4.0	5.6	1.8	0.7	0.4	0.6	0.9	0.7	0.7	1.5	5.6																							
26-Feb	0.6	0.5	0.6	0.5	0.4	Z	0.4	0.4	1.1	1.9	1.8	1.1	0.9	0.9	0.8	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.7	1.9																							
27-Feb	Z	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4																							
28-Feb	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.3	0.3	0.3	0.3	0.9	0.9	0.3	0.1	0.3	1.3	2.5	2.7	3.4	0.7	3.4																							
																								0.7	0.8	0.9	0.8	0.8	1.0	0.8	0.7	0.9	1.0	1.2	1.4	1.8	1.9	2.1	2.3	2.8	1.3	0.9	0.8	0.9	1.0	1.0	1.0	Diurnal Average	
																								2.5	2.9	3.4	2.6	3.4	3.8	2.8	2.7	2.6	3.5	4.5	4.7	10.1	14.4	11.2	14.5	30.0	7.8	4.8	4.9	8.2	9.9	8.7	5.7	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**  
**Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Fort McKay South - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	635	99.22	99.22
11 - 20	4	0.63	99.84
21 - 60	1	0.16	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: 640

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Fort McKay South - February 2023**

<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	160	71	11	3	2	7	23	46	63	27	45	65	29	21	23	35	631
11 - 20	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	4
21 - 60	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
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>	160	71	11	3	2	7	25	49	63	27	45	65	29	21	23	35	636

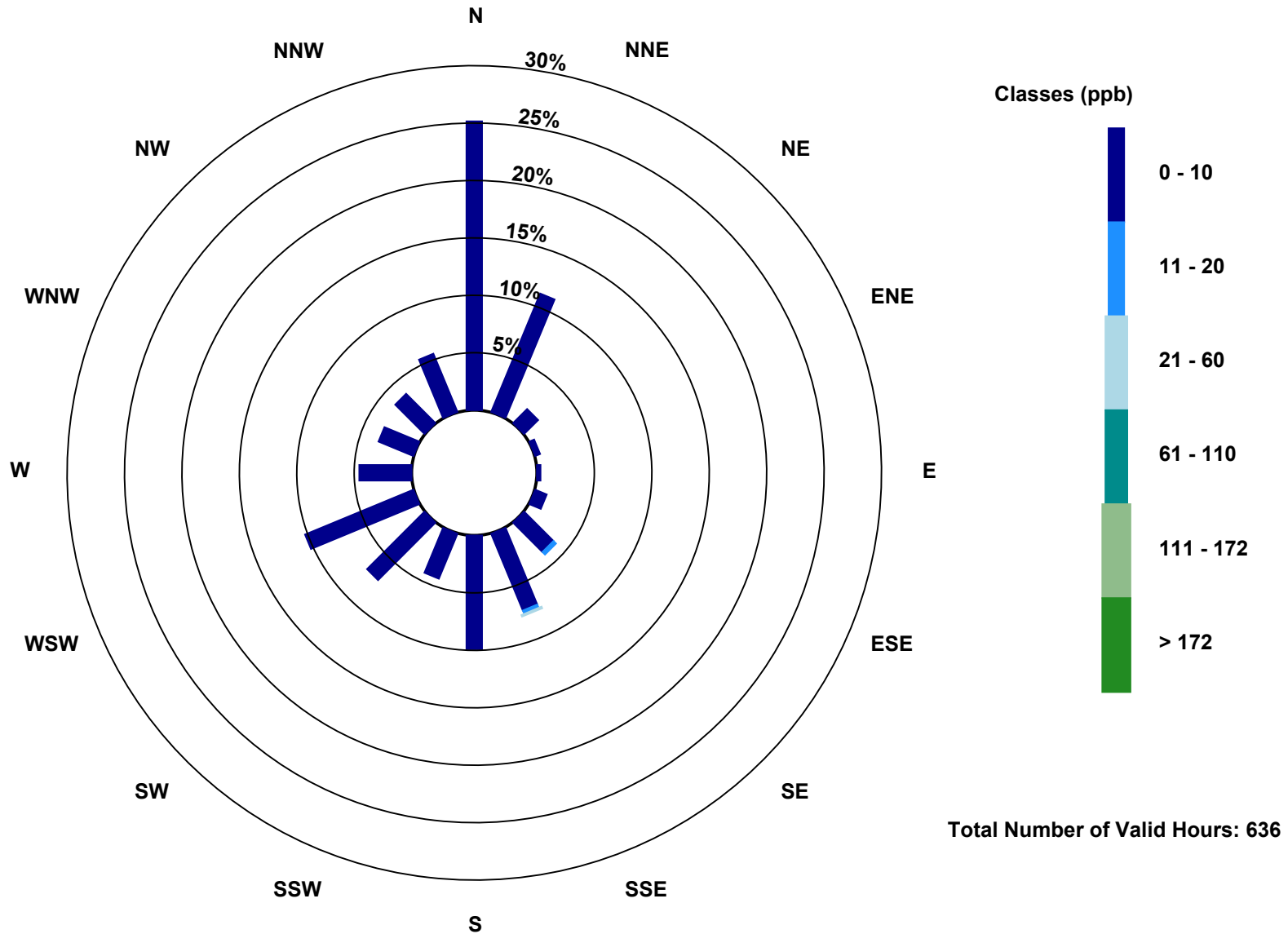
Total Number of Valid Hours: 636

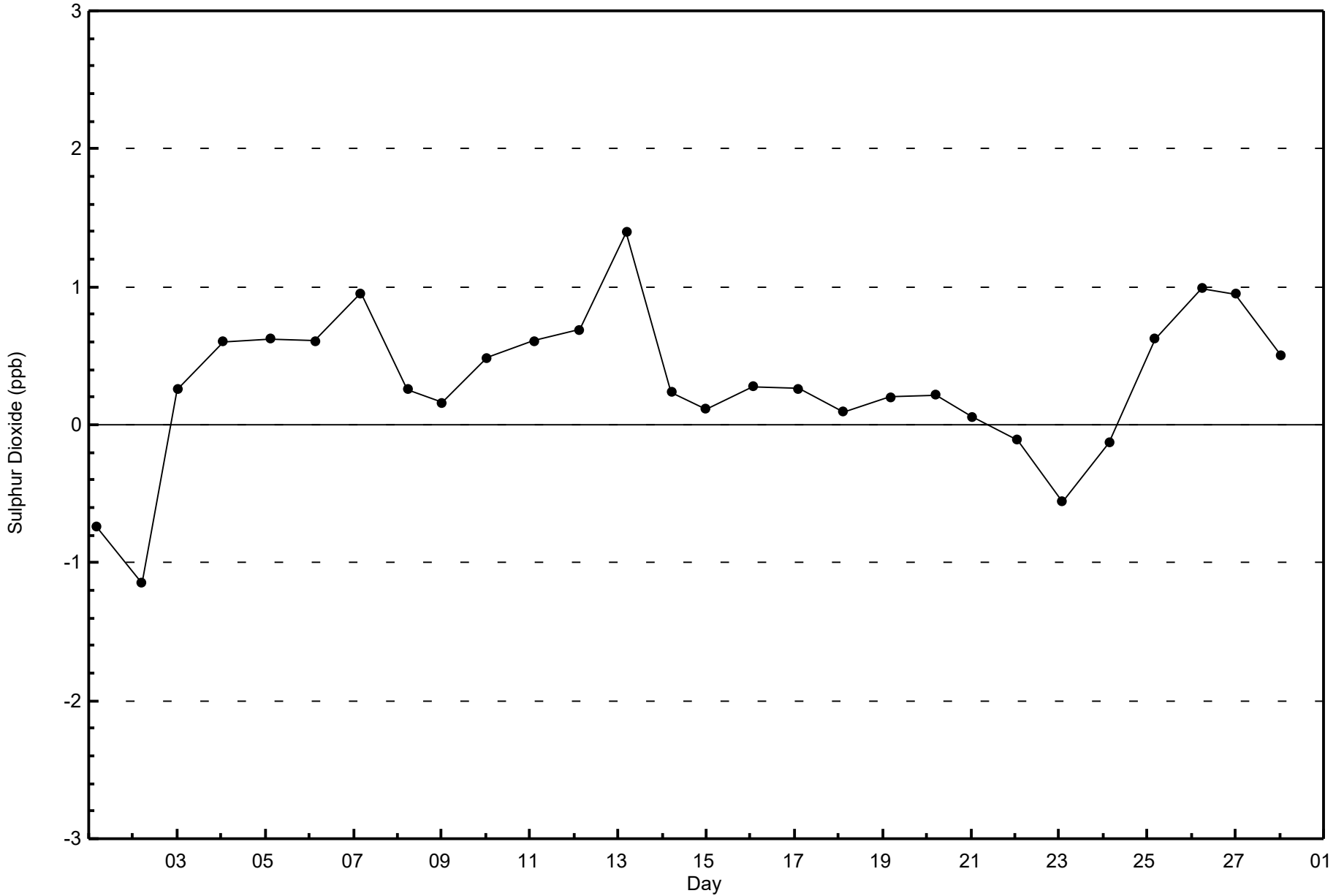
Total Number of Hours: 672



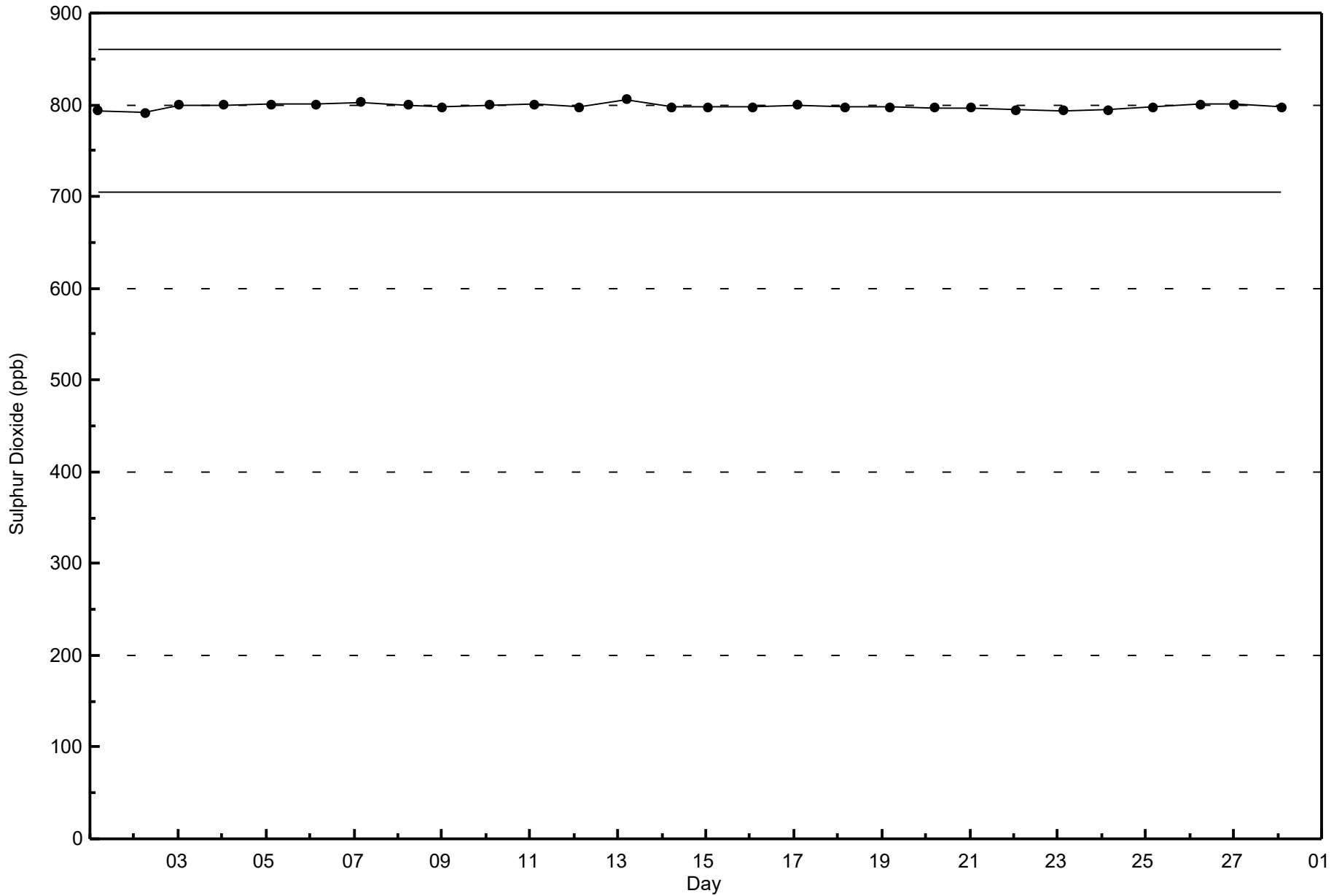
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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











Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

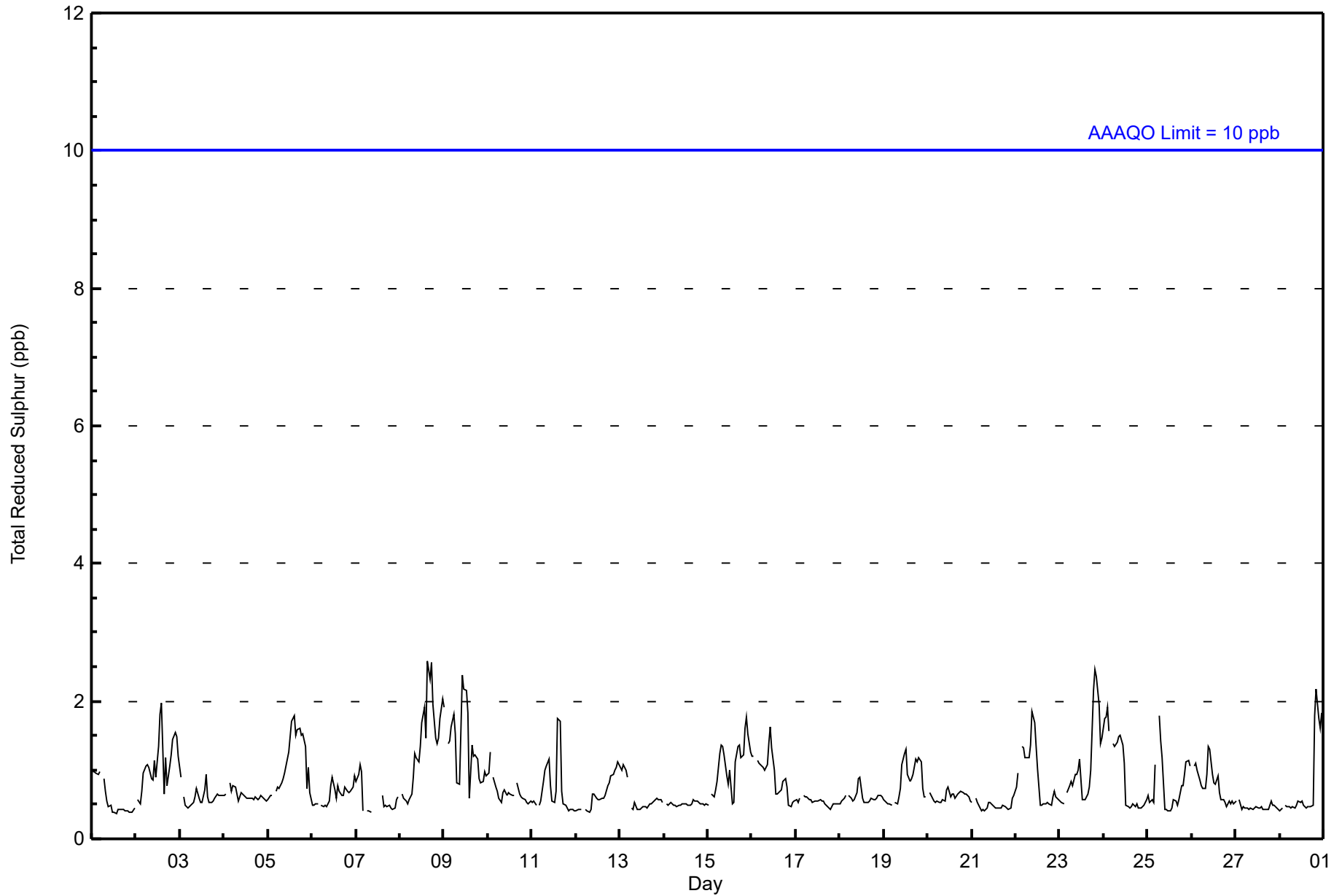
Fort McKay South - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 672																Daily Average		Daily Maximum			
Maximum Value: 2.6 ppb on Feb 8 16:00		Maximum Daily Average: 1.4 ppb on Feb 8		Hours of Data: 638																							
Minimum Value: 0.4 ppb on Feb 1 14:00		Minimum Daily Average: 0.5 ppb on Feb 27		Hours of Missing Data: 34																							
Maximum Diurnal Average: 0.9 ppb at hour 11		Minimum Diurnal Average: 0.7 ppb at hour 8		Hours of Calibration: 33																							
Monthly Average: 0.79 ppb		Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 0.5 Median = 0.6 Q <sub>3</sub> = 1.0 P <sub>90</sub> = 1.4 P <sub>99</sub> = 2.2		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-Feb	1.0	1.0	1.0	0.9	1.0	Z	0.9	0.7	0.6	0.5	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	0.6	1.0	
2-Feb	Z	0.6	0.5	0.7	1.0	1.1	1.1	1.0	0.9	0.9	1.1	0.9	1.4	1.8	2.0	0.6	1.2	0.8	1.1	1.2	1.4	1.5	1.5	1.2	1.1	2.0	
3-Feb	0.9	Z	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.6	0.5	0.5	0.7	0.9	0.6	0.5	0.5	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.9	
4-Feb	0.6	0.6	Z	0.8	0.7	0.8	0.7	0.7	0.5	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.8	
5-Feb	0.6	0.6	0.6	Z	0.7	0.7	0.7	0.8	0.9	0.9	1.0	1.3	1.5	1.7	1.8	1.5	1.6	1.6	1.5	1.5	1.3	0.7	1.0	0.7	1.1	1.8	
6-Feb	0.5	0.5	0.5	0.5	Z	0.5	0.5	0.5	0.5	0.6	0.8	0.9	0.7	0.6	0.8	0.7	0.6	0.6	0.8	0.7	0.7	0.7	0.7	0.9	0.6	0.9	
7-Feb	0.8	0.9	1.1	1.0	0.4	Z	0.4	0.4	0.4	C	C	C	C	C	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.6	0.6	0.6	1.1	
8-Feb	Z	0.6	0.6	0.5	0.5	0.6	0.7	0.9	1.2	1.2	1.1	1.3	1.7	1.9	1.5	2.6	2.3	2.6	1.9	1.5	1.4	1.5	1.8	2.0	1.4	2.6	
9-Feb	1.9	Z	1.4	1.4	1.6	1.8	1.5	0.8	0.8	1.6	2.4	2.2	2.2	1.8	0.6	1.4	1.2	1.2	1.2	0.9	0.8	0.8	1.0	0.9	1.4	2.4	
10-Feb	1.0	1.3	Z	0.9	0.8	0.7	0.6	0.5	0.7	0.7	0.6	0.7	0.6	0.6	0.6	PF	0.8	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.7	1.3	
11-Feb	0.5	0.6	0.5	Z	0.5	0.5	0.8	1.0	1.1	1.1	0.8	0.6	0.5	0.7	1.7	1.7	0.7	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.7	1.7	
12-Feb	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.8	0.9	0.9	1.0	1.0	1.1	0.6	1.1	
13-Feb	1.0	1.0	1.1	1.0	0.9	Z	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.5	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.6	1.1	
14-Feb	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	
15-Feb	0.5	Z	0.6	0.6	0.7	0.8	1.2	1.4	1.3	1.2	0.9	0.8	1.0	0.5	0.5	1.1	1.3	1.4	1.2	1.2	1.6	1.8	1.5	1.3	1.1	1.8	
16-Feb	1.2	1.2	Z	1.1	1.1	1.1	1.0	1.0	1.1	1.4	1.6	1.3	1.0	0.7	0.7	0.7	0.7	0.8	0.9	0.7	0.5	0.5	0.5	0.5	0.9	1.6	
17-Feb	0.6	0.5	0.6	Z	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	
18-Feb	0.5	0.5	0.6	0.6	Z	0.6	0.6	0.6	0.6	0.7	0.9	0.9	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.9	
19-Feb	0.6	0.5	0.5	0.5	0.5	Z	0.5	0.5	0.6	0.7	1.1	1.2	1.3	0.9	0.8	0.9	0.9	1.1	1.1	1.2	1.1	0.7	0.6	0.6	0.8	1.3	
20-Feb	Z	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.7	
21-Feb	0.5	Z	0.6	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.5	0.6	0.6	0.6	0.5	0.6	
22-Feb	0.8	1.0	Z	1.3	1.3	1.2	1.2	1.2	1.4	1.8	1.7	1.3	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.6	0.6	0.6	0.9	1.8	
23-Feb	0.5	0.5	0.5	Z	0.7	0.8	0.8	0.8	0.9	0.9	1.0	1.2	0.6	0.6	0.6	0.7	1.0	2.2	2.5	2.4	2.0	1.4	1.5	1.1	2.5		
24-Feb	1.7	1.8	1.9	1.6	Z	1.4	1.3	1.4	1.5	1.5	1.4	1.1	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.6	1.0	1.9		
25-Feb	0.6	0.5	0.6	0.5	1.1	Z	1.8	1.4	1.2	0.4	0.4	0.4	0.4	0.4	0.6	0.5	0.5	0.6	0.8	0.8	0.9	1.1	1.1	1.0	0.8	1.8	
26-Feb	Z	1.0	1.1	1.0	0.9	0.8	0.7	0.7	0.9	1.3	1.3	0.9	0.8	0.8	0.9	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.8	1.3	
27-Feb	0.5	Z	0.6	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.6	
28-Feb	0.4	0.4	Z	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	1.8	2.2	1.7	1.6	1.8	0.8	2.2		
																								Diurnal Average		Diurnal Maximum	
0.8 0.8 0.7 0.8 0.7 0.7 0.8 0.7 0.8 0.9 0.9 0.8 0.8 0.8 0.8 0.8 0.7 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8																								1.9 1.8 1.9 1.6 1.6 1.8 1.8 1.4 1.5 1.8 2.4 2.2 2.2 1.9 2.0 2.6 2.3 2.6 2.2 2.5 2.4 2.0 1.8 2.0			
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**  
**Fort McKay South - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Fort McKay South - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	636	99.69	99.69
3 - 4	2	0.31	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: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Fort McKay South - February 2023**

<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	158	71	12	3	3	8	25	50	62	28	45	61	29	21	22	34	632
3 - 4	0	0	0	0	0	0	0	1	0	0	0	1	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>	158	71	12	3	3	8	25	51	62	28	45	62	29	21	22	34	634

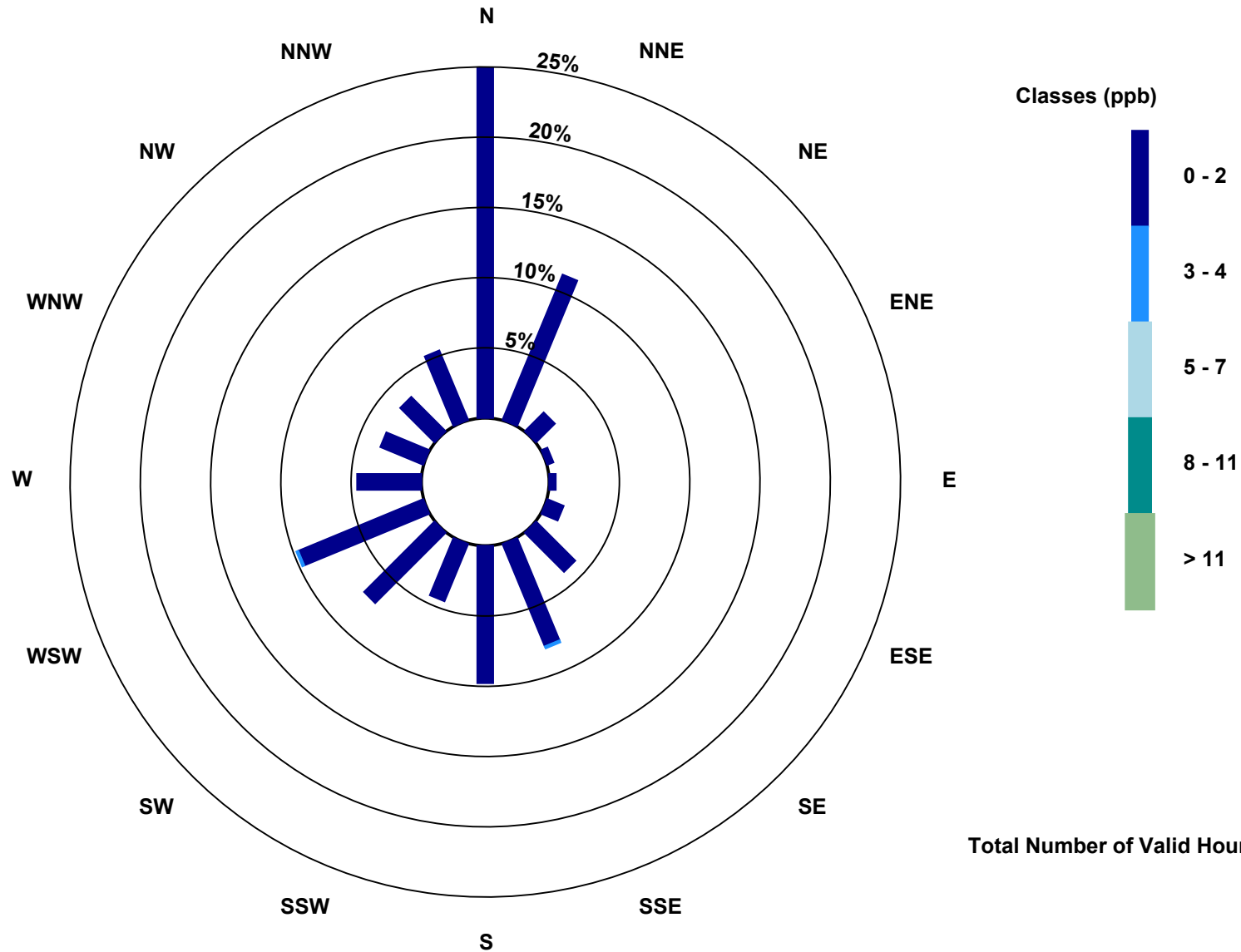
Total Number of Valid Hours: 634

Total Number of Hours: 672

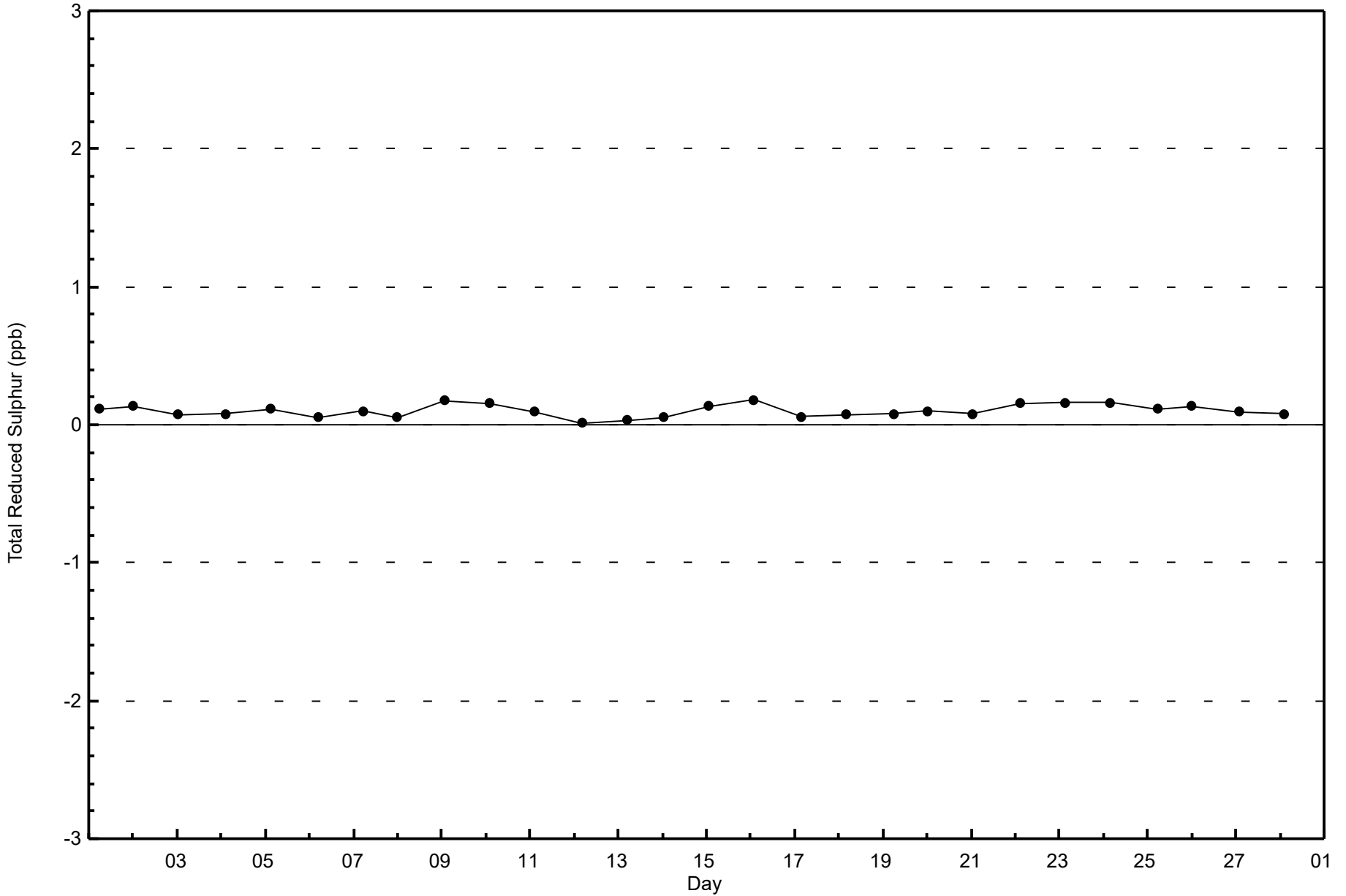


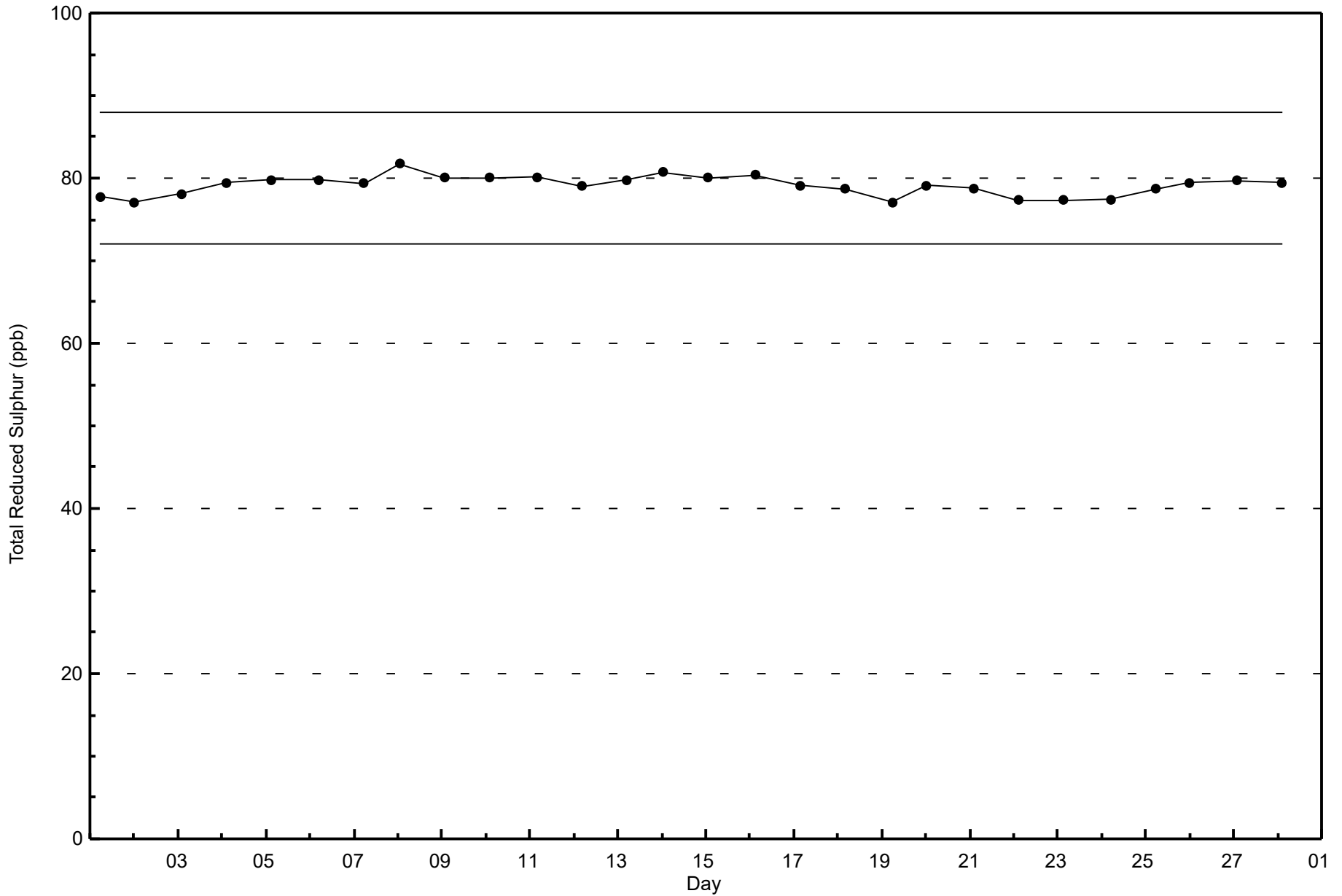
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Reduced Sulphur (TRS) - ppb  
Fort McKay South



Total Number of Valid Hours: 634









# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Total Hydrocarbons (THC) - ppm

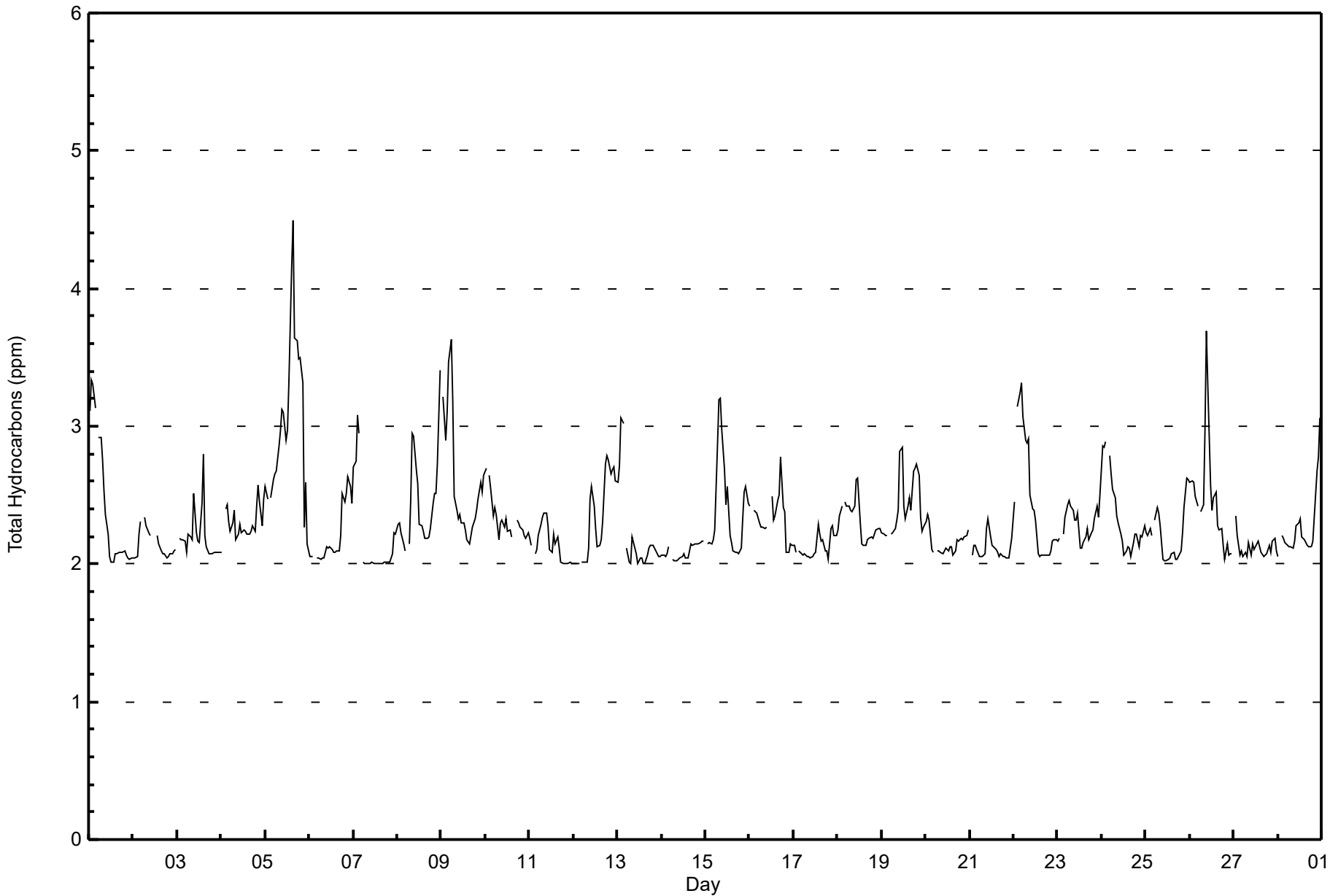
## Fort McKay South - February 2023

Maximum Value: 4.5 ppm on Feb 5 16:00		Maximum Daily Average: 3.0 ppm on Feb 5		Hours in Service: 672																								
Minimum Value: 2.0 ppm on Feb 11 21:00		Minimum Daily Average: 2.1 ppm on Feb 14		Hours of Data: 637																								
Maximum Diurnal Average: 2.5 ppm at hour 3		Minimum Diurnal Average: 2.2 ppm at hour 17		Hours of Missing Data: 35																								
Monthly Average: 2.31 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> = 2.4 P <sub>90</sub> = 2.7 P <sub>99</sub> = 3.5		Hours of Calibration: 31																								
				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-Feb	3.1	3.3	3.3	3.1	Z	2.9	2.9	2.8	2.5	2.4	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.4	3.3		
2-Feb	2.0	2.0	2.1	2.2	2.3	Z	2.3	2.3	2.2	2.2	C	C	C	2.2	2.2	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3	
3-Feb	Z	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.5	2.2	2.2	2.2	2.4	2.8	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.8	2.8	
4-Feb	2.1	Z	2.4	2.4	2.3	2.2	2.3	2.4	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.4	2.6	2.5	2.3	2.5	2.3	2.6	2.6	
5-Feb	2.6	2.5	Z	2.5	2.6	2.7	2.7	2.9	3.0	3.1	3.1	2.9	3.0	3.3	4.2	4.5	3.6	3.6	3.5	3.5	3.3	2.3	2.6	2.1	3.0	4.5	4.5	
6-Feb	2.1	2.1	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	2.1	2.2	2.5	2.5	2.5	2.6	2.6	2.4	2.2	2.6	2.6	
7-Feb	2.7	2.7	3.1	2.9	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	2.0	2.1	2.2	2.2	2.2	2.2	3.1	3.1
8-Feb	2.3	2.3	2.2	2.1	2.1	Z	2.1	2.5	2.9	2.9	2.7	2.6	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.5	2.5	2.7	3.4	2.4	3.4	3.4	
9-Feb	Z	3.2	2.9	3.1	3.5	3.6	3.2	2.5	2.4	2.3	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.5	2.6	2.5	2.6	2.6	3.6	3.6	
10-Feb	2.7	Z	2.6	2.6	2.3	2.4	2.4	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	PF	PF	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.7	2.7	
11-Feb	2.2	2.1	Z	2.1	2.1	2.2	2.3	2.3	2.4	2.4	2.3	2.1	2.1	2.2	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	2.4	
12-Feb	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.5	2.6	2.4	2.3	2.1	2.1	2.2	2.3	2.7	2.8	2.8	2.7	2.7	2.7	2.6	2.3	2.8	2.8	
13-Feb	2.6	2.7	3.1	3.0	Z	2.1	2.0	2.0	2.2	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	2.0	2.2	3.1	3.1	3.1	
14-Feb	2.1	2.1	2.1	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	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	2.1	2.2	2.2	2.2
15-Feb	Z	2.1	2.2	2.1	2.2	2.2	2.9	3.2	3.2	3.0	2.7	2.4	2.6	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.5	2.6	2.4	2.4	3.2	3.2
16-Feb	2.4	Z	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	M	M	2.5	2.3	2.3	2.5	2.5	2.8	2.4	2.4	2.1	2.1	2.1	2.1	2.3	2.8	2.8	
17-Feb	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.3	2.2	2.2	2.2	2.1	2.1	2.0	2.3	2.3	2.2	2.2	2.1	2.3	2.3	
18-Feb	2.3	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.6	2.6	2.3	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.6	2.6	
19-Feb	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.3	2.3	2.4	2.8	2.8	2.4	2.3	2.4	2.5	2.4	2.7	2.7	2.7	2.6	2.3	2.2	2.3	2.4	2.8	2.8	
20-Feb	2.3	2.4	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	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.4	
21-Feb	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.1	2.3	2.3	
22-Feb	2.4	Z	3.1	3.2	3.3	3.1	2.9	2.9	2.9	2.5	2.4	2.4	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.5	3.3	3.3	
23-Feb	2.2	2.2	Z	2.2	2.3	2.4	2.5	2.4	2.4	2.3	2.3	2.4	2.1	2.1	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.4	2.3	2.5	2.3	2.5	2.5	
24-Feb	2.9	2.8	2.9	Z	2.8	2.7	2.5	2.5	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.3	2.9	2.9	
25-Feb	2.2	2.2	2.3	2.2	Z	2.3	2.4	2.4	2.3	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.2	2.4	2.6	2.6	2.2	2.6	2.6	
26-Feb	2.6	2.6	2.6	2.5	2.4	Z	2.4	2.4	3.0	3.7	3.3	2.6	2.4	2.5	2.5	2.3	2.2	2.3	2.1	2.0	2.1	2.1	2.1	2.1	2.5	3.7	3.7	
27-Feb	Z	2.3	2.2	2.1	2.1	2.0	2.1	2.1	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	2.2	2.2	2.1	2.1	2.3	2.3	
28-Feb	2.1	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.3	2.7	2.8	3.1	3.1	3.1	
																								Diurnal Average				
																								Diurnal Maximum				
Z - zerospan      C - Calibration      M - Maintenance      PF - Power Failure																												



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

**Total Hydrocarbons (THC) - ppm**  
**Fort McKay South - February 2023**





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

**Total Hydrocarbons (THC) - ppm**  
**Fort McKay South - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	71	11.15	11.15
2.1 - 3.0	535	83.99	95.13
3.1 - 10.0	31	4.87	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Fort McKay South - February 2023**

<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	0	0	0	0	1	1	4	0	9	20	11	4	3	1	71
2.1 - 3.0	148	63	11	3	2	7	22	47	54	18	29	40	18	17	19	33	531
3.1 - 10.0	1	1	0	0	0	0	0	1	5	9	7	5	0	0	1	1	31
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	159	71	11	3	2	7	23	49	63	27	45	65	29	21	23	35	633

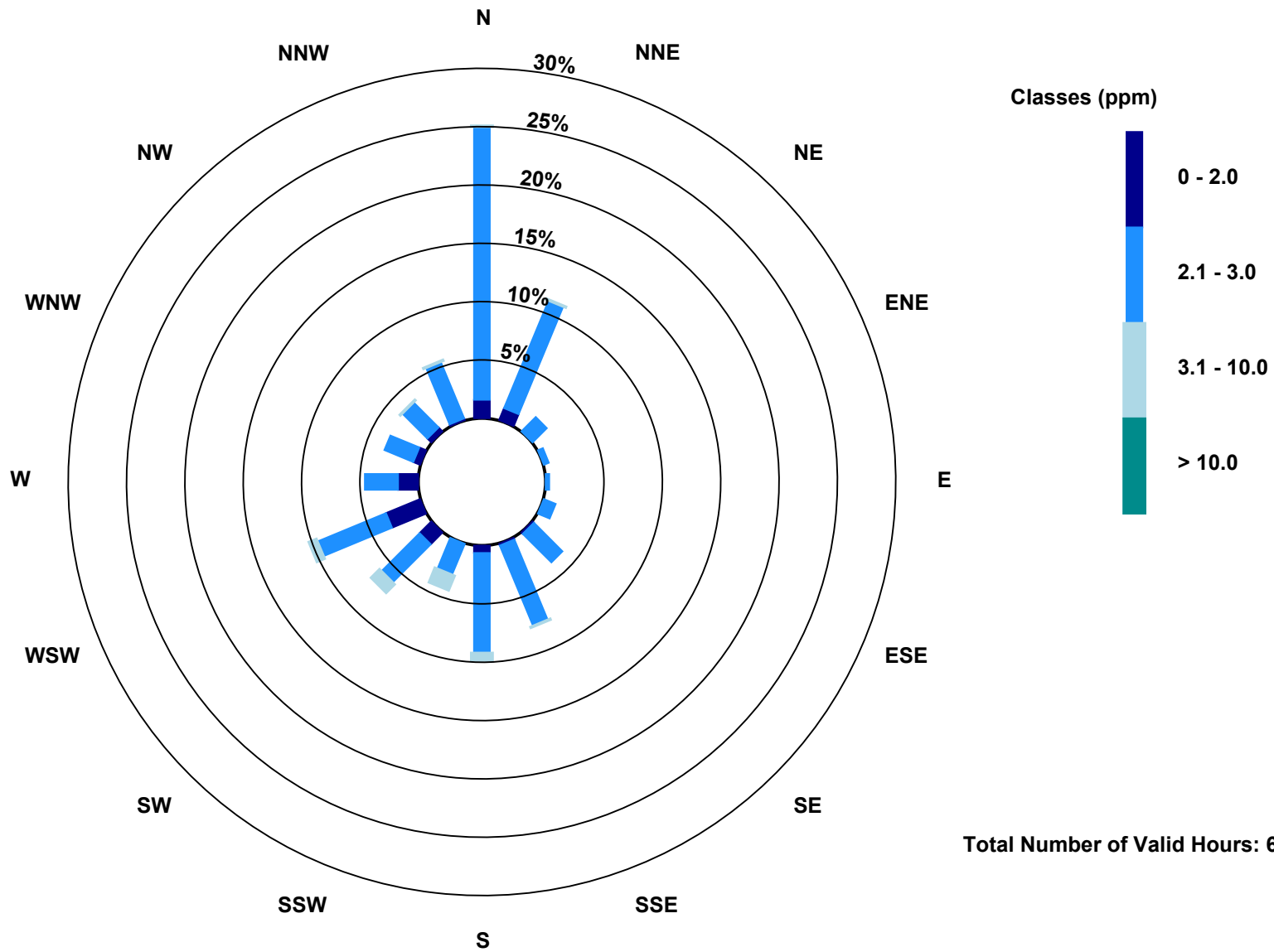
Total Number of Valid Hours: 633

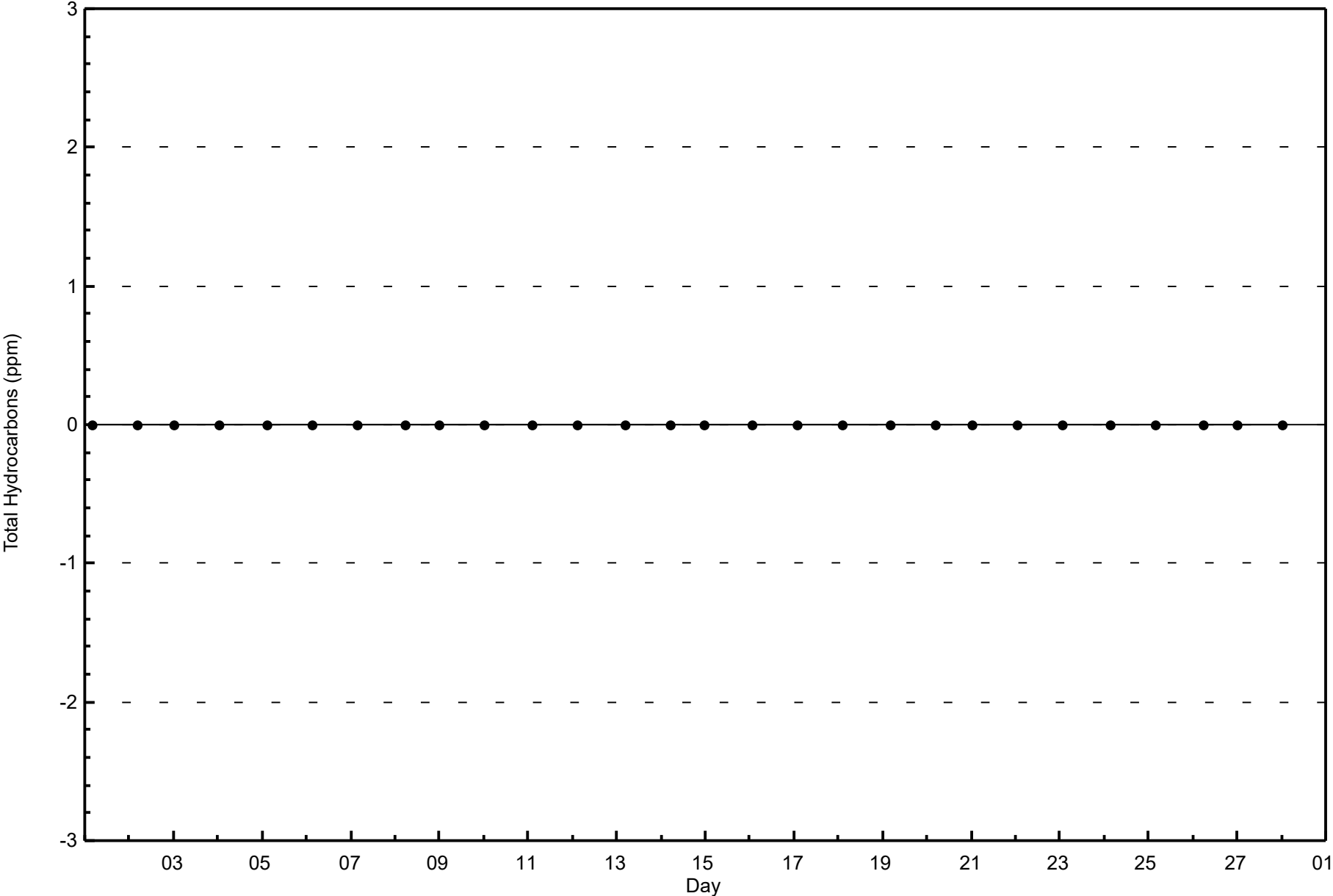
Total Number of Hours: 672

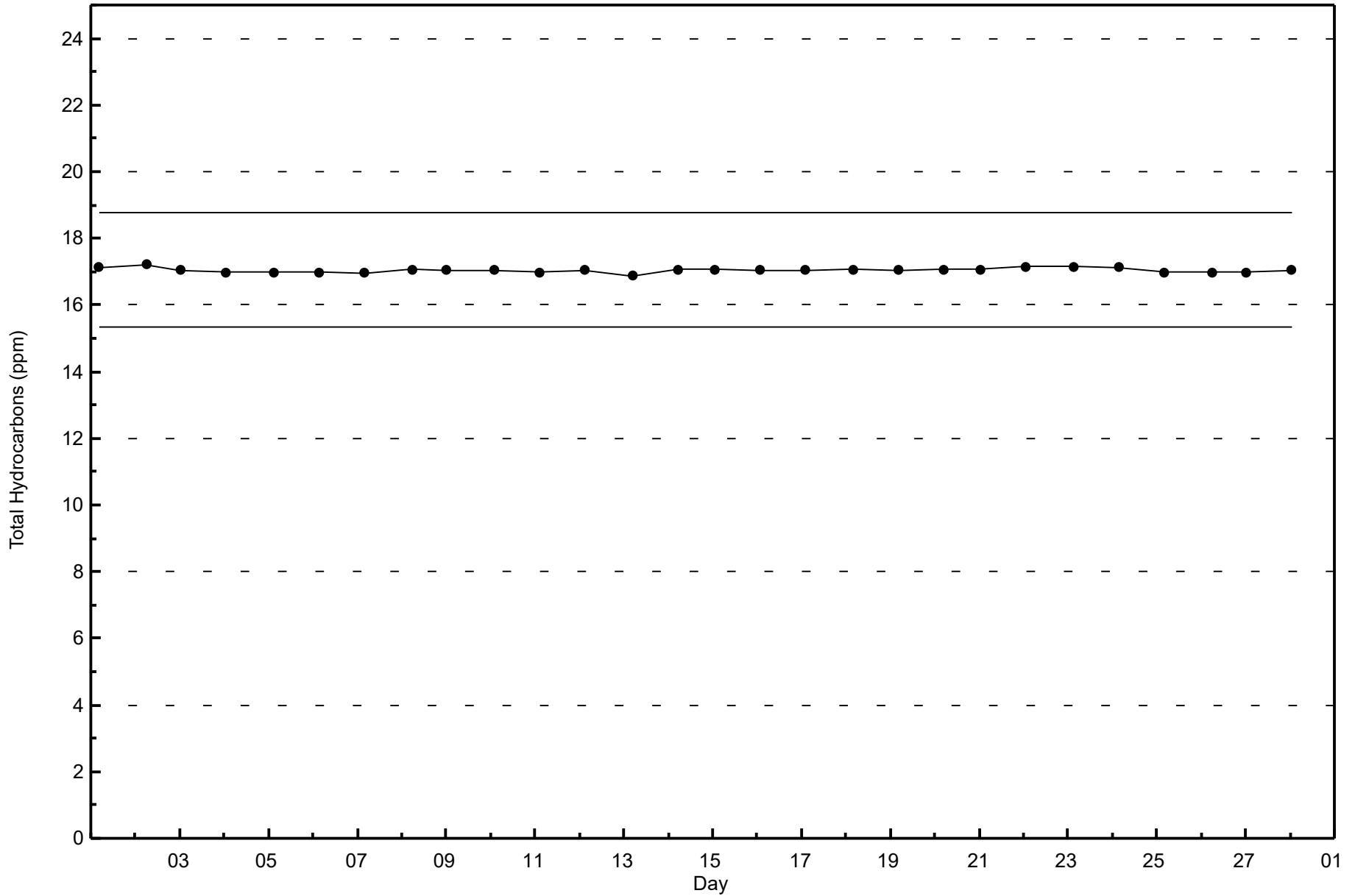


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Hydrocarbons (THC) - ppm  
Fort McKay South







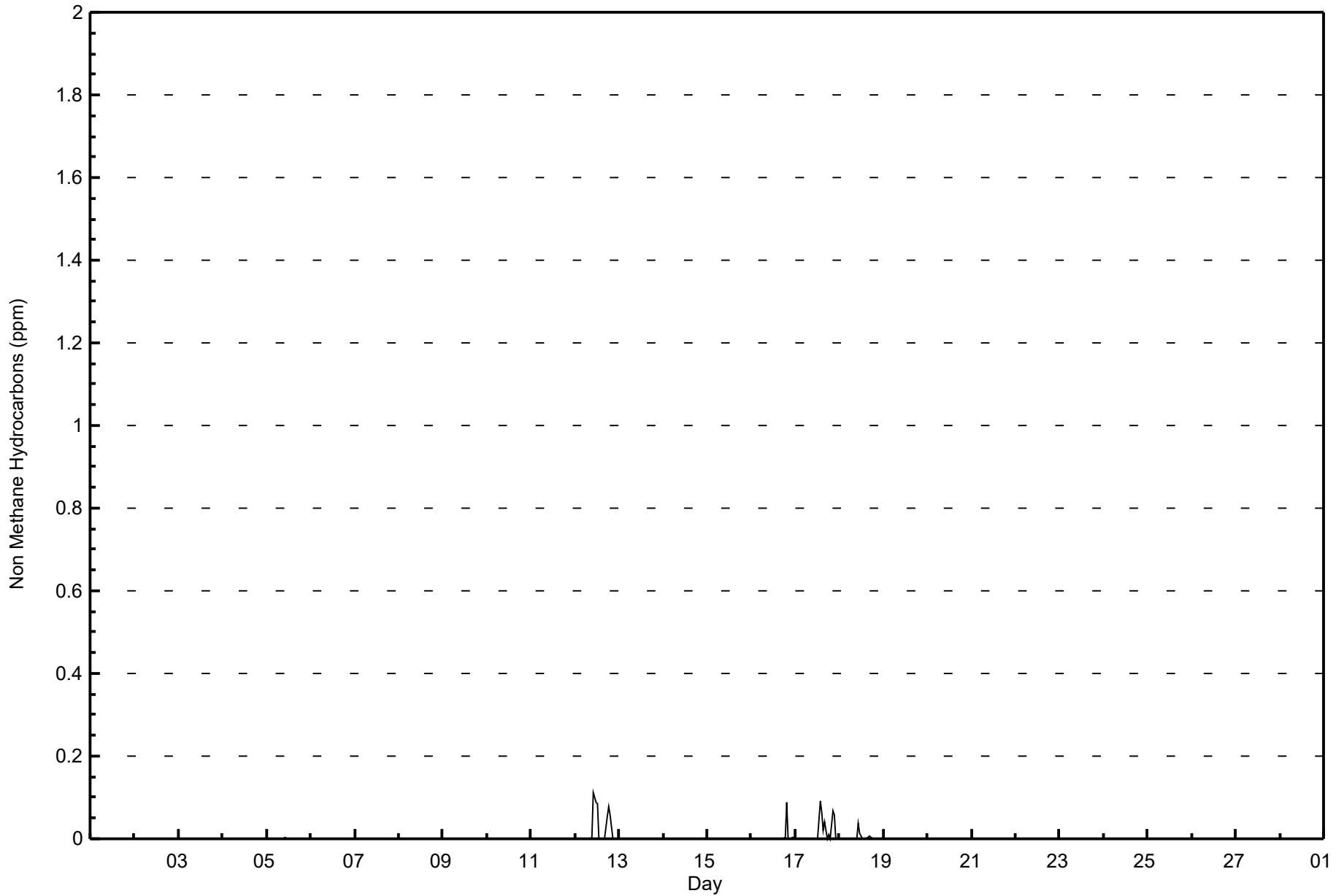






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Fort McKay South - February 2023**





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

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Fort McKay South - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	620	97.33	97.33
0.006 - 0.05	6	0.94	98.27
0.06 - 0.1	11	1.73	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Fort McKay South - February 2023**

<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	148	65	11	3	2	7	23	49	63	27	45	65	29	21	23	35	616
0.006 - 0.05	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
0.06 - 0.1	8	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	159	71	11	3	2	7	23	49	63	27	45	65	29	21	23	35	633

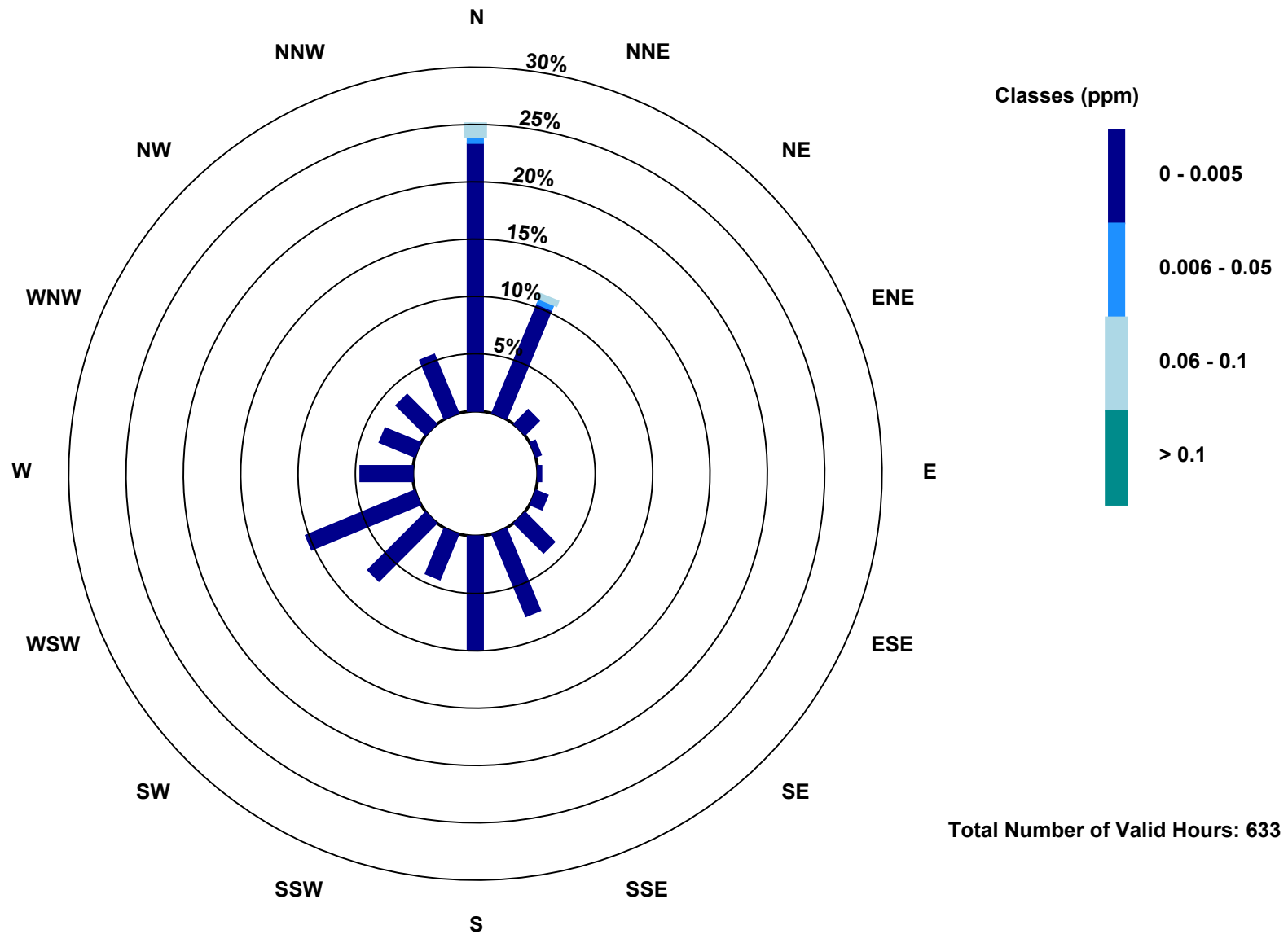
Total Number of Valid Hours: 633

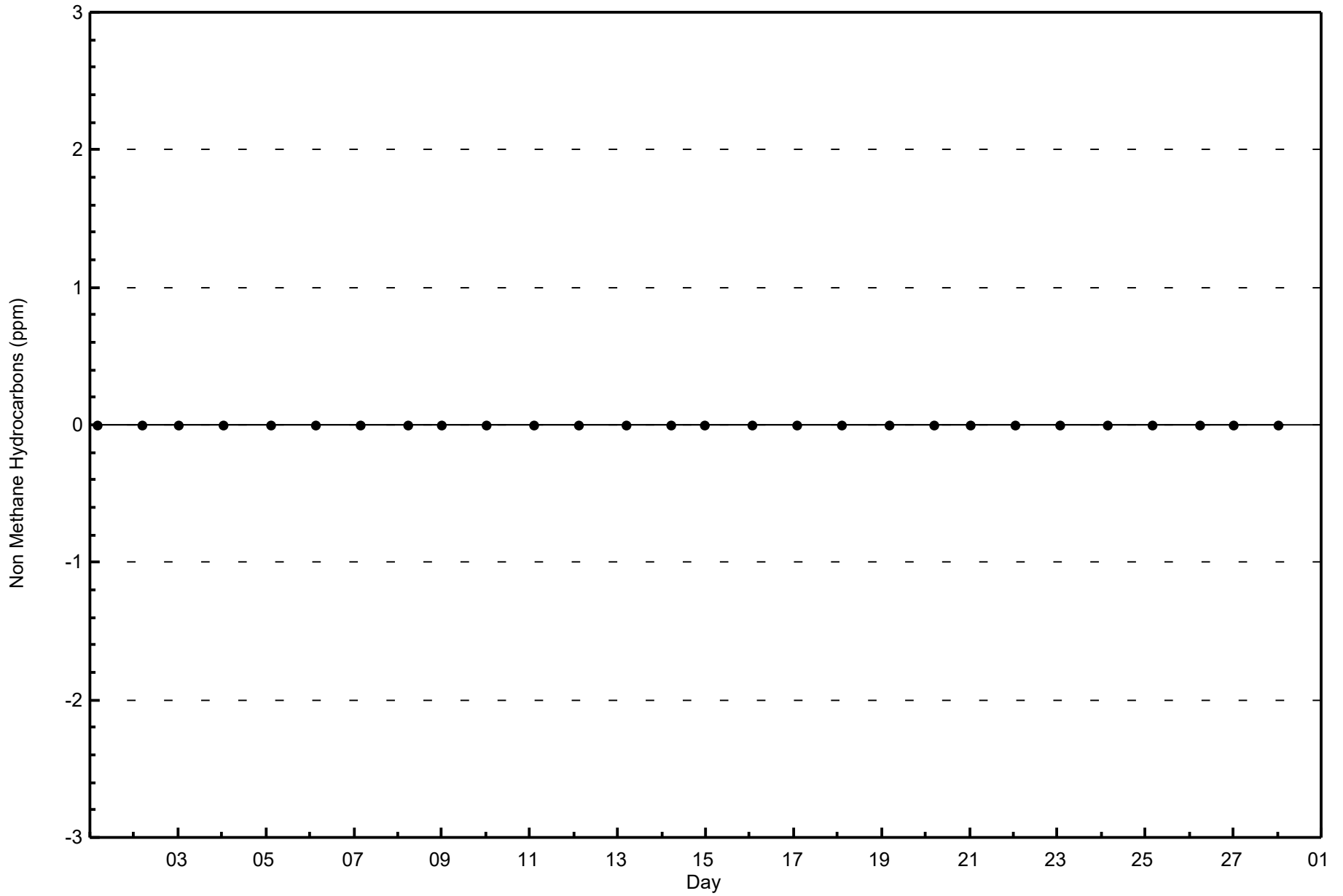
Total Number of Hours: 672

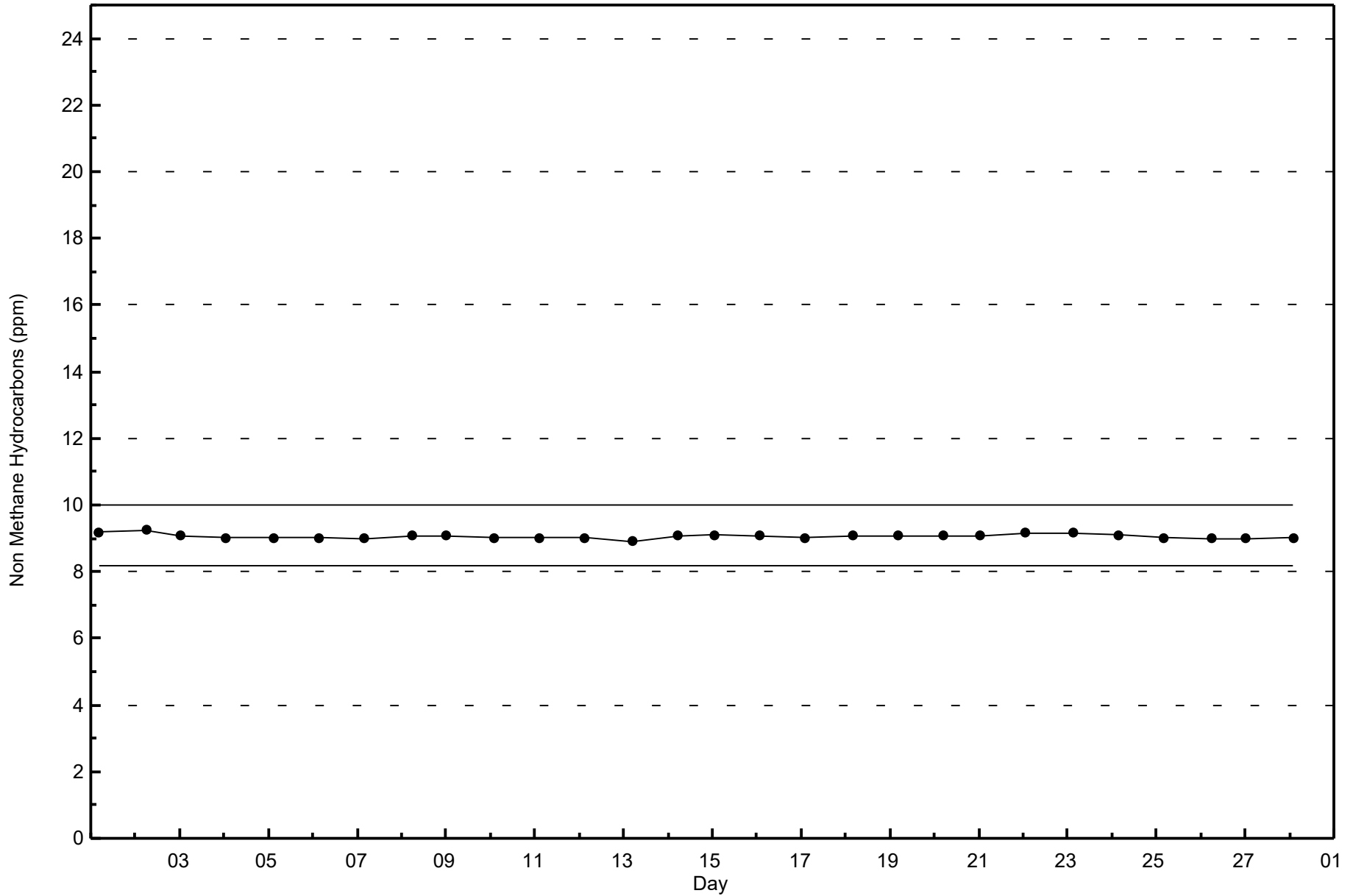


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Non Methane Hydrocarbons (NMHC) - ppm  
Fort McKay South









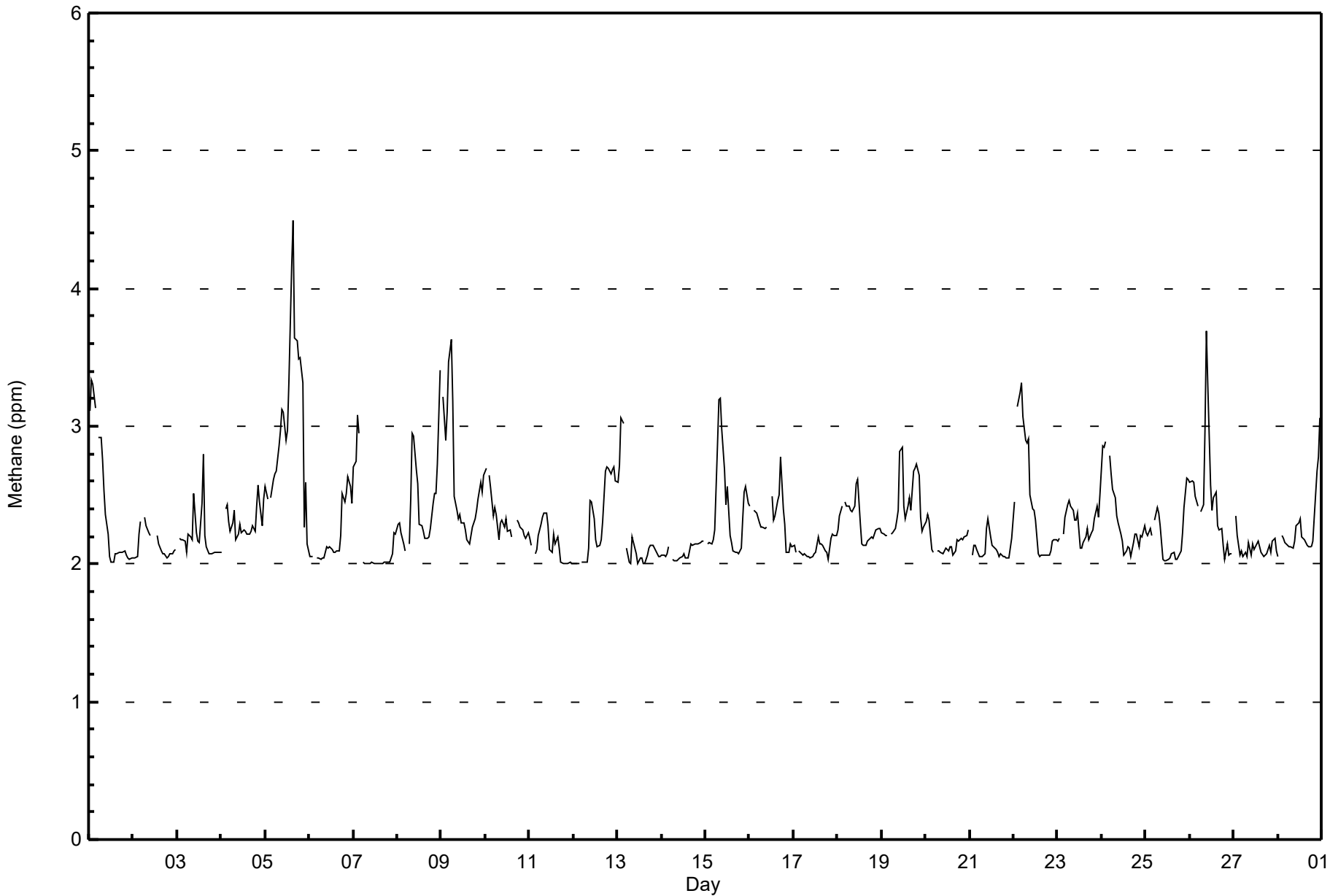
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort McKay South - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																		
Maximum Value: 4.5 ppm on Feb 5 16:00		Maximum Daily Average: 3.0 ppm on Feb 5				Hours of Data:		637																		
Minimum Value: 2.0 ppm on Feb 11 21:00		Minimum Daily Average: 2.1 ppm on Feb 14				Hours of Missing Data:		35																		
Maximum Diurnal Average: 2.5 ppm at hour 3		Minimum Diurnal Average: 2.2 ppm at hour 17				Hours of Calibration:		31																		
Monthly Average: 2.31 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> = 2.4 P <sub>90</sub> = 2.7 P <sub>99</sub> = 3.5				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-Feb	3.1	3.3	3.3	3.1	Z	2.9	2.9	2.8	2.5	2.4	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.4	3.3
2-Feb	2.0	2.0	2.1	2.2	2.3	Z	2.3	2.3	2.2	2.2	C	C	C	2.2	2.2	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.3
3-Feb	Z	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.5	2.2	2.2	2.2	2.4	2.8	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.8
4-Feb	2.1	Z	2.4	2.4	2.3	2.2	2.3	2.4	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.4	2.6	2.5	2.3	2.5	2.3	2.6
5-Feb	2.6	2.5	Z	2.5	2.6	2.7	2.7	2.9	3.0	3.1	3.1	2.9	3.0	3.3	4.2	4.5	3.6	3.6	3.5	3.5	3.3	2.3	2.6	2.1	3.0	4.5
6-Feb	2.1	2.1	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	2.1	2.2	2.5	2.5	2.5	2.6	2.6	2.4	2.2	2.6
7-Feb	2.7	2.7	3.1	2.9	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	2.2	2.2	2.2	2.2	3.1
8-Feb	2.3	2.3	2.2	2.1	2.1	Z	2.1	2.5	2.9	2.9	2.7	2.6	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.5	2.5	2.7	3.4	2.4	3.4
9-Feb	Z	3.2	2.9	3.1	3.5	3.6	3.2	2.5	2.4	2.3	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.5	2.6	2.5	2.6	2.6	3.6
10-Feb	2.7	Z	2.6	2.6	2.3	2.4	2.4	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	PF	PF	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.7
11-Feb	2.2	2.1	Z	2.1	2.1	2.2	2.3	2.3	2.4	2.4	2.3	2.1	2.1	2.2	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4
12-Feb	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.5	2.4	2.3	2.2	2.1	2.1	2.2	2.3	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.3	2.7
13-Feb	2.6	2.7	3.1	3.0	Z	2.1	2.0	2.0	2.2	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	2.0	2.2	3.1	
14-Feb	2.1	2.1	2.1	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	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	2.1	2.2
15-Feb	Z	2.1	2.2	2.1	2.2	2.2	2.9	3.2	3.2	3.0	2.7	2.4	2.6	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.3	2.5	2.6	2.4	2.4	3.2
16-Feb	2.4	Z	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	M	M	2.5	2.3	2.3	2.5	2.5	2.8	2.4	2.3	2.1	2.1	2.1	2.1	2.3	2.8
17-Feb	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.2	2.2	2.2	2.2	2.1	2.2
18-Feb	2.3	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.6	2.6	2.3	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.6
19-Feb	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.3	2.3	2.4	2.8	2.8	2.4	2.3	2.4	2.5	2.4	2.7	2.7	2.7	2.6	2.3	2.2	2.3	2.4	2.8
20-Feb	2.3	2.4	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	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4
21-Feb	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.1	2.3
22-Feb	2.4	Z	3.1	3.2	3.3	3.1	2.9	2.9	2.9	2.5	2.4	2.4	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.5	3.3
23-Feb	2.2	2.2	Z	2.2	2.3	2.4	2.5	2.4	2.4	2.3	2.3	2.4	2.1	2.1	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.4	2.3	2.5	2.3	2.5
24-Feb	2.9	2.8	2.9	Z	2.8	2.7	2.5	2.5	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.3	2.9
25-Feb	2.2	2.2	2.3	2.2	Z	2.3	2.4	2.4	2.3	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.1	2.2	2.4	2.6	2.6	2.2	2.6
26-Feb	2.6	2.6	2.6	2.5	2.4	Z	2.4	2.4	3.0	3.7	3.3	2.6	2.4	2.5	2.5	2.3	2.2	2.3	2.1	2.0	2.1	2.1	2.1	2.1	2.5	3.7
27-Feb	Z	2.3	2.2	2.1	2.1	2.0	2.1	2.1	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	2.2	2.2	2.1	2.1	2.3
28-Feb	2.1	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.3	2.7	2.8	3.1	2.3	3.1
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan      C - Calibration      M - Maintenance      PF - Power Failure																										







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

**Methane (CH<sub>4</sub>) - ppm**  
**Fort McKay South - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	71	11.15	11.15
2.1 - 3.0	535	83.99	95.13
3.1 - 10.0	31	4.87	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Fort McKay South - February 2023**

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	10	7	0	0	0	0	1	1	4	0	9	20	11	4	3	1	71
2.1 - 3.0	148	63	11	3	2	7	22	47	54	18	29	40	18	17	19	33	531
3.1 - 10.0	1	1	0	0	0	0	0	1	5	9	7	5	0	0	1	1	31
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	159	71	11	3	2	7	23	49	63	27	45	65	29	21	23	35	633

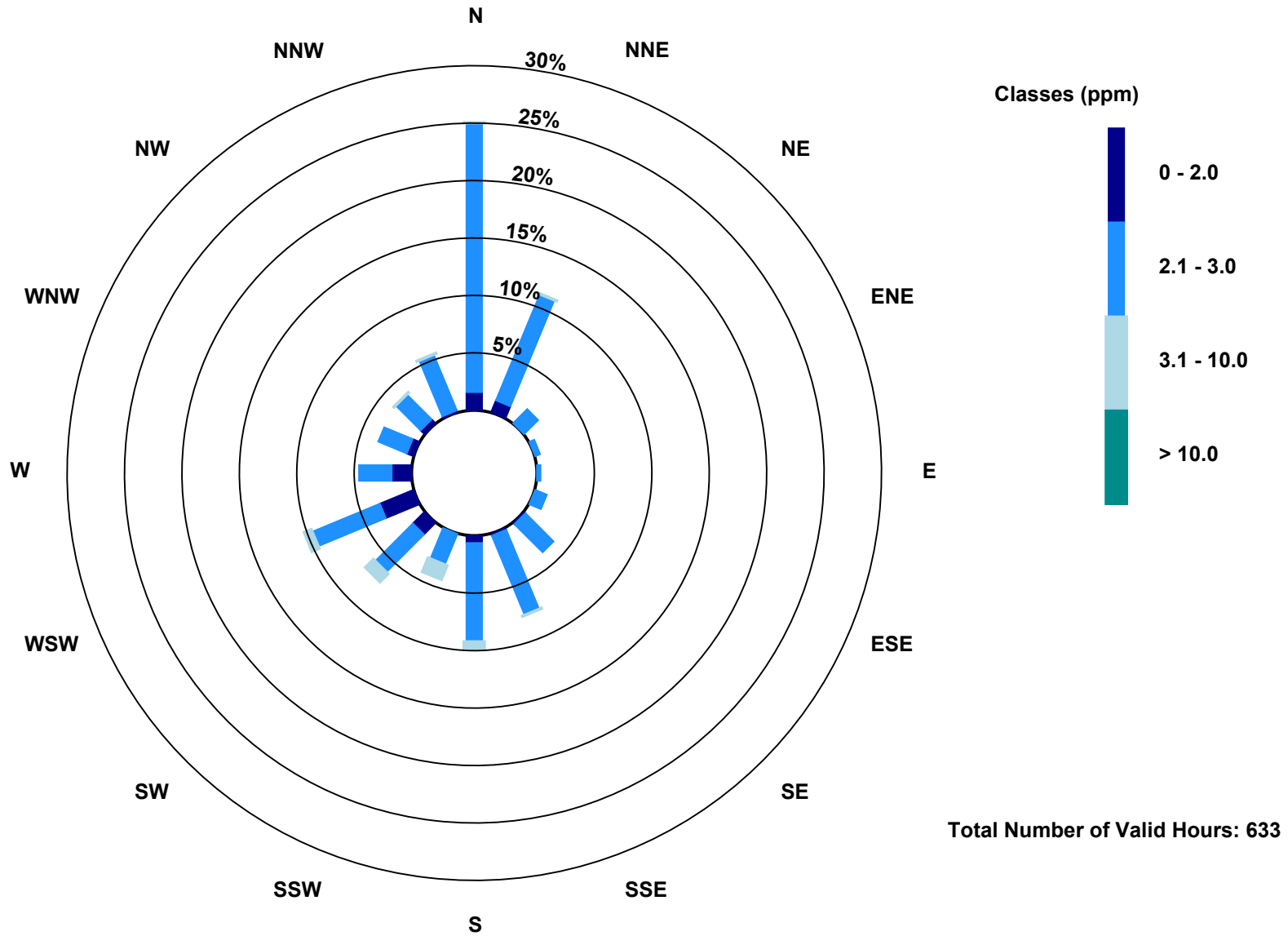
Total Number of Valid Hours: 633

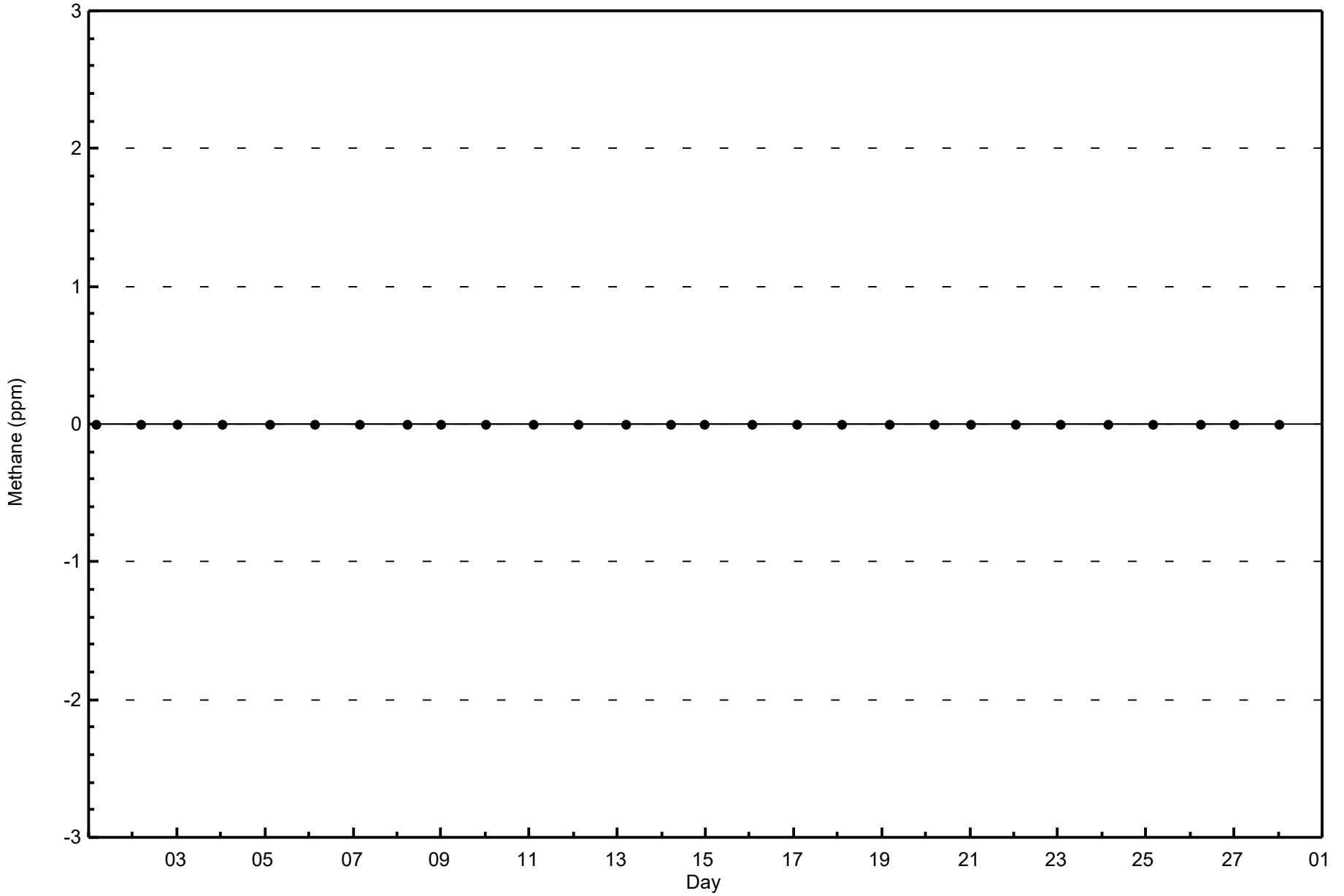
Total Number of Hours: 672

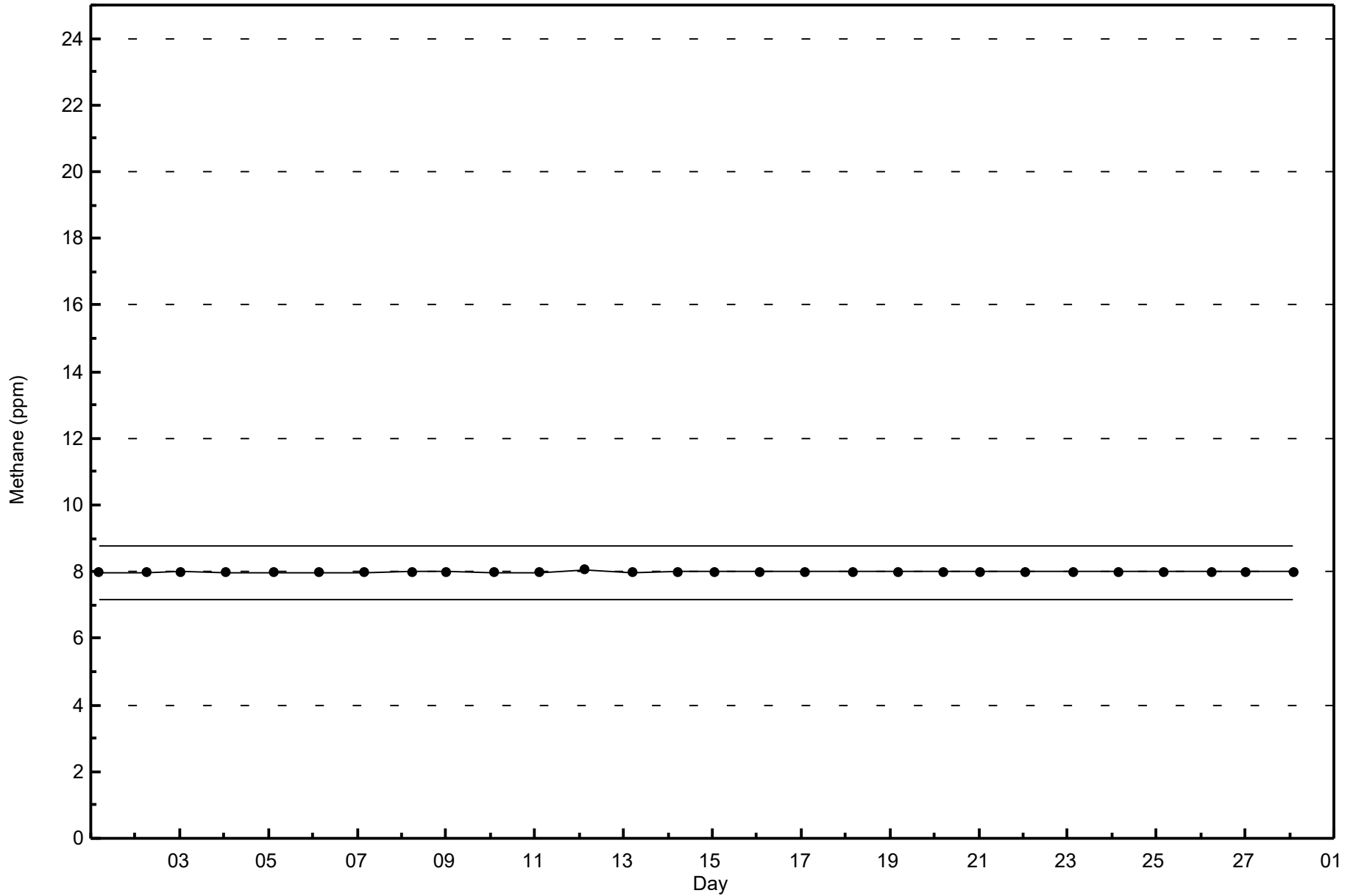


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









Wood Buffalo Environmental Association

Summary of Hour Averages

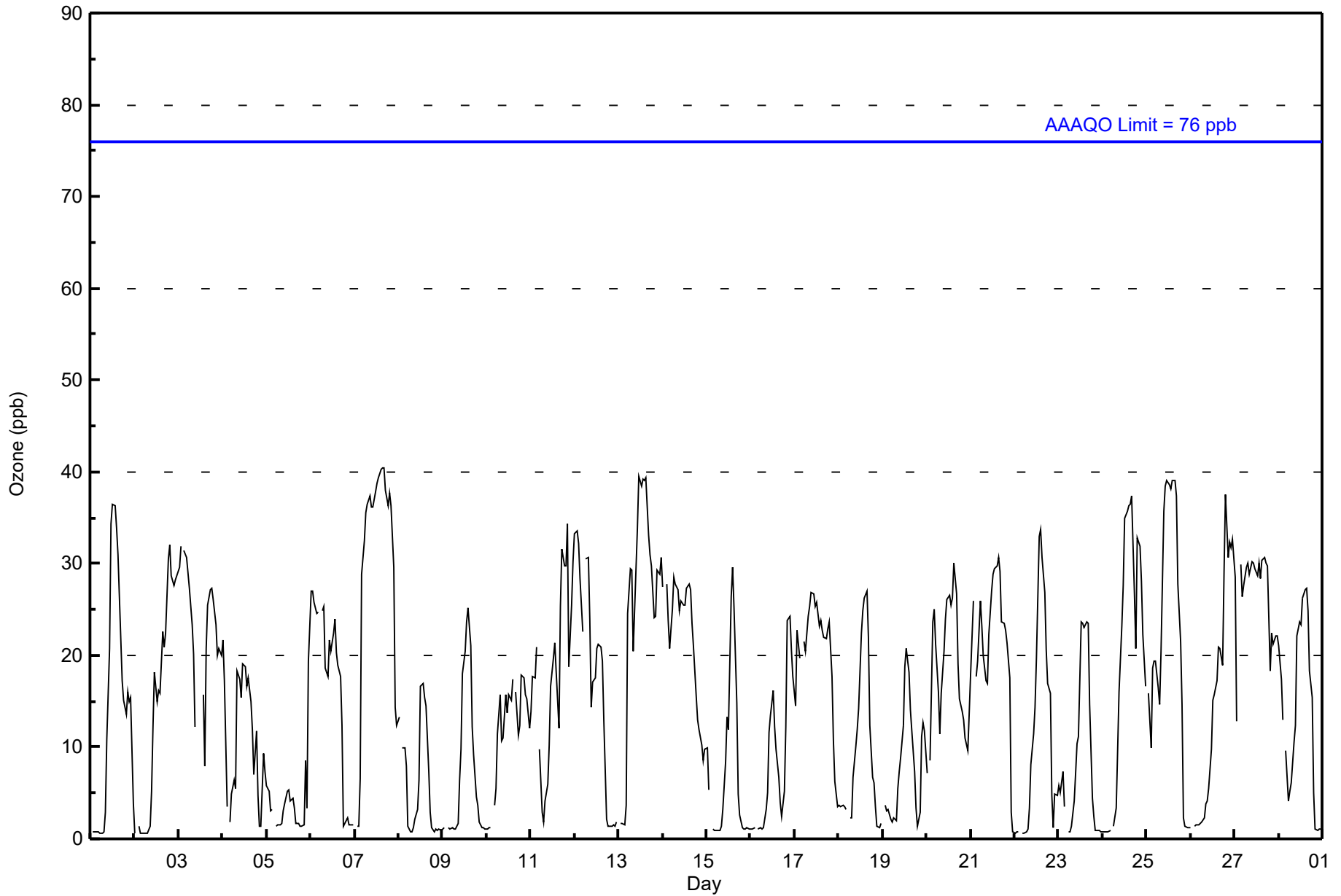
Ozone (O<sub>3</sub>) - ppb

Fort McKay South - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 40.5 ppb on Feb 7 16:00	Maximum Daily Average: 30.2 ppb on Feb 7		Hours of Data:	640
Minimum Value: 0.6 ppb on Feb 2 06:00	Minimum Daily Average: 4.0 ppb on Feb 5		Hours of Missing Data:	32
Maximum Diurnal Average: 24.3 ppb at hour 14	Minimum Diurnal Average: 8.6 ppb at hour 3		Hours of Calibration:	31
Monthly Average: 15.43 ppb	Percentiles: P <sub>1</sub> = 0.6 P <sub>10</sub> = 1.1 Q <sub>1</sub> = 3.5 Median = 15.5 Q <sub>3</sub> = 24.8 P <sub>90</sub> = 30.6 P <sub>99</sub> = 39.1		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-Feb	Z	0.8	0.8	0.8	0.7	0.6	0.6	0.7	2.9	10.9	20.7	34.3	36.5	36.3	33.8	30.9	21.9	17.2	15.1	13.6	15.9	14.9	15.4	3.9	14.3	36.5																								
2-Feb	0.6	Z	1.3	0.6	0.7	0.6	0.6	0.6	1.3	5.2	12.2	18.1	14.9	16.1	15.9	22.5	21.0	22.4	30.6	32.0	28.7	27.7	28.2	28.7	14.4	32.0																								
3-Feb	29.6	31.9	Z	31.4	30.7	29.0	27.3	23.4	20.2	12.3	C	C	C	15.7	8.0	20.8	25.5	27.1	27.2	26.1	23.3	20.0	20.7	20.0	23.5	31.9																								
4-Feb	21.6	17.2	3.5	Z	1.9	4.8	6.4	5.5	18.3	17.4	15.4	19.1	18.8	16.7	17.5	14.9	11.9	7.0	11.8	4.8	1.4	1.3	9.3	7.4	11.0	21.6																								
5-Feb	5.8	5.2	3.1	3.2	Z	1.4	1.5	1.5	1.7	3.0	3.8	5.2	5.3	4.1	4.4	3.3	1.7	1.6	1.4	1.4	1.5	8.6	3.4	19.3	4.0	19.3																								
6-Feb	27.0	27.0	25.8	24.5	24.8	Z	24.8	25.2	18.7	17.7	21.7	20.4	22.4	23.9	20.2	18.8	17.7	12.3	1.3	2.0	2.3	1.5	1.5	1.4	16.7	27.0																								
7-Feb	Z	1.4	1.4	6.5	28.8	32.5	35.5	36.5	37.4	36.1	36.2	37.8	38.7	39.4	40.2	40.5	40.5	38.0	36.3	37.6	36.3	29.6	14.3	12.4	30.2	40.5																								
8-Feb	13.3	Z	9.8	9.9	7.9	1.4	0.8	0.8	1.1	2.1	3.2	6.5	16.6	16.9	15.4	14.5	7.4	3.0	1.2	0.8	1.0	1.0	1.0	0.9	5.9	16.9																								
9-Feb	1.0	1.2	Z	1.2	1.1	1.3	1.1	1.1	1.7	6.3	9.7	18.0	20.5	23.7	25.1	21.0	12.2	9.2	4.6	3.7	1.8	1.2	1.1	1.1	7.3	25.1																								
10-Feb	1.1	1.2	1.2	Z	3.6	5.5	11.5	15.6	10.7	11.0	15.8	13.7	15.8	15.1	17.4	PF	16.0	11.3	12.4	17.8	17.6	15.6	15.2	12.1	11.7	17.8																								
11-Feb	13.9	17.7	17.6	21.0	Z	9.7	2.9	1.8	4.1	5.9	10.3	16.6	19.7	21.3	18.1	12.1	25.3	31.6	29.7	29.8	34.3	18.8	25.5	30.2	18.2	34.3																								
12-Feb	33.2	33.5	32.2	28.4	22.6	Z	30.5	30.6	24.0	14.3	17.1	17.5	20.7	21.1	21.0	19.3	12.9	2.2	1.4	1.4	1.4	1.5	1.4	1.9	17.0	33.5																								
13-Feb	Z	1.7	1.7	1.5	3.7	24.5	29.5	29.3	20.5	29.4	33.8	39.5	38.5	39.1	39.3	33.1	31.0	29.8	24.1	24.3	29.3	28.9	30.6	26.2	39.5																									
14-Feb	27.4	Z	27.7	23.7	20.7	25.0	28.5	27.8	27.1	24.9	25.9	25.4	25.5	27.3	27.8	27.1	23.4	21.1	15.5	12.9	12.0	10.2	8.6	9.7	22.0	28.5																								
15-Feb	9.9	5.3	Z	1.0	0.9	0.9	0.9	0.9	1.4	3.2	8.5	13.2	11.9	26.3	29.6	25.1	14.8	4.9	2.5	1.3	1.0	1.0	1.2	1.0	7.2	29.6																								
16-Feb	1.1	1.0	1.1	Z	1.0	1.2	1.1	1.1	3.3	5.1	11.6	13.4	16.1	12.2	9.7	6.8	4.0	2.4	5.2	12.2	23.8	24.3	20.6	17.7	8.5	24.3																								
17-Feb	14.5	22.7	21.2	19.6	Z	21.5	20.4	24.2	25.3	26.9	26.6	25.4	25.7	23.2	23.8	22.8	22.0	21.8	22.9	23.7	17.6	10.7	6.2	3.5	20.5	26.9																								
18-Feb	3.7	3.5	3.7	3.4	3.2	Z	2.3	2.3	6.7	10.0	11.8	14.1	22.4	24.9	26.2	27.0	22.0	12.3	6.7	6.2	3.6	1.4	1.2	1.6	9.6	27.0																								
19-Feb	Z	3.7	3.1	3.1	2.1	1.9	2.2	1.9	5.4	7.3	8.8	12.4	18.7	20.7	18.2	14.0	11.7	7.3	3.3	1.4	3.0	11.1	12.6	11.7	8.1	20.7																								
20-Feb	7.2	Z	8.6	23.6	25.0	21.2	16.0	11.5	15.9	20.5	23.9	26.1	26.6	25.5	26.3	30.0	26.7	19.0	15.2	13.9	12.9	11.0	9.6	13.7	18.7	30.0																								
21-Feb	18.0	26.0	Z	17.6	19.4	26.0	23.1	20.0	17.2	17.0	22.3	27.0	28.8	29.4	29.7	30.7	29.1	23.6	23.6	22.7	21.4	17.5	2.9	0.8	21.5	30.7																								
22-Feb	0.6	0.7	0.7	Z	0.6	0.7	0.8	1.1	3.4	8.1	11.4	14.3	19.7	32.9	33.7	30.7	26.8	20.5	16.9	15.8	4.7	1.3	4.9	4.8	11.1	33.7																								
23-Feb	5.7	5.1	7.3	3.6	Z	0.8	0.8	1.3	4.1	7.2	10.3	11.2	23.6	23.5	23.0	23.7	23.5	14.6	4.4	2.5	0.9	0.9	0.8	0.8	8.7	23.7																								
24-Feb	0.8	0.8	0.8	0.8	0.9	Z	1.4	3.3	9.6	16.0	23.3	27.6	35.0	35.7	36.4	36.5	37.4	26.7	20.7	32.8	31.9	28.1	22.3	16.7	19.4	37.4																								
25-Feb	Z	15.9	10.0	18.6	19.4	19.4	16.5	14.6	20.5	35.7	38.4	39.0	38.6	38.1	39.1	39.0	37.3	27.7	21.5	14.6	2.3	1.4	1.3	1.3	22.2	39.1																								
26-Feb	1.3	Z	1.4	1.5	1.6	1.7	1.8	2.2	3.9	4.0	5.5	9.8	15.1	15.7	17.2	20.9	20.8	18.9	29.0	37.5	30.7	32.3	31.8	32.6	14.7	37.5																								
27-Feb	28.5	12.8	Z	30.0	26.4	27.6	29.6	30.0	28.8	30.2	30.1	29.5	28.7	30.1	28.3	30.4	30.7	30.0	29.8	18.2	22.5	21.2	22.2	22.2	26.9	30.7																								
28-Feb	21.0	17.5	12.9	Z	9.7	4.1	5.1	6.2	10.5	12.3	22.1	23.6	23.4	26.2	27.1	27.3	24.8	18.4	15.4	5.0	1.1	0.9	1.0	1.0	13.8	27.3																								
																								12.5	11.0	8.6	12.0	10.7	11.0	11.6	11.5	12.4	14.3	17.8	20.7	23.3	24.3	24.0	24.1	21.5	17.3	15.6	14.9	13.5	12.3	11.2	11.0	Diurnal Average		
																								33.2	33.5	32.2	31.4	30.7	32.5	35.5	36.5	37.4	36.1	38.4	39.5	38.7	39.4	40.2	40.5	40.5	40.5	38.0	36.3	37.6	36.3	32.3	31.8	32.6	Diurnal Maximum	

Z - zerspan                      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**  
**Fort McKay South - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	400	62.50	62.50
21 - 50	240	37.50	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 640

Total Number of Hours: 672





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

**Ozone (O<sub>3</sub>) - ppb**  
**Fort McKay South - February 2023**

<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	87	24	3	2	2	7	20	20	45	26	38	45	15	16	18	28	396
21 - 50	69	48	9	1	1	1	5	32	16	1	10	18	14	4	5	6	240
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>	156	72	12	3	3	8	25	52	61	27	48	63	29	20	23	34	636

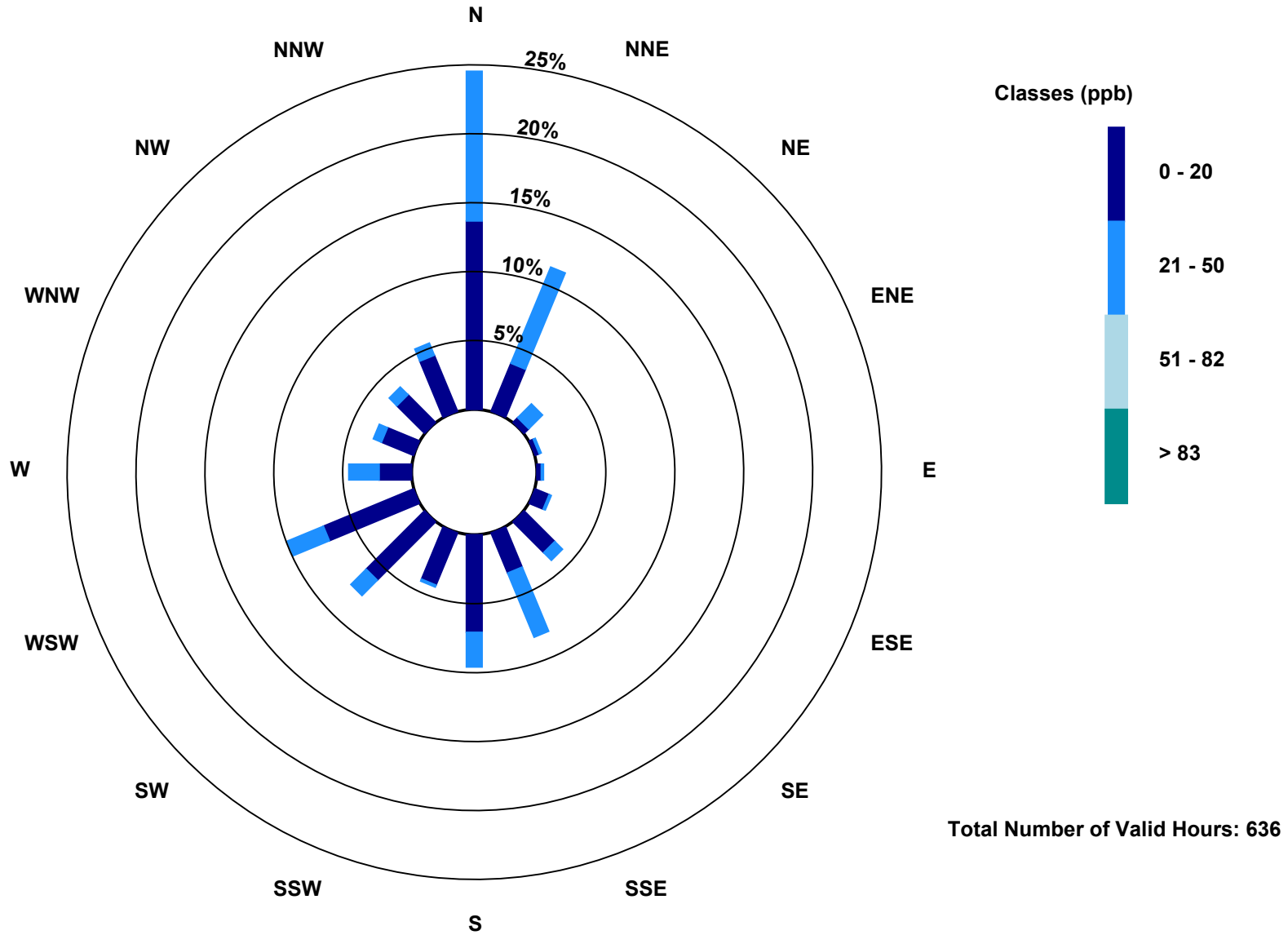
Total Number of Valid Hours: 636

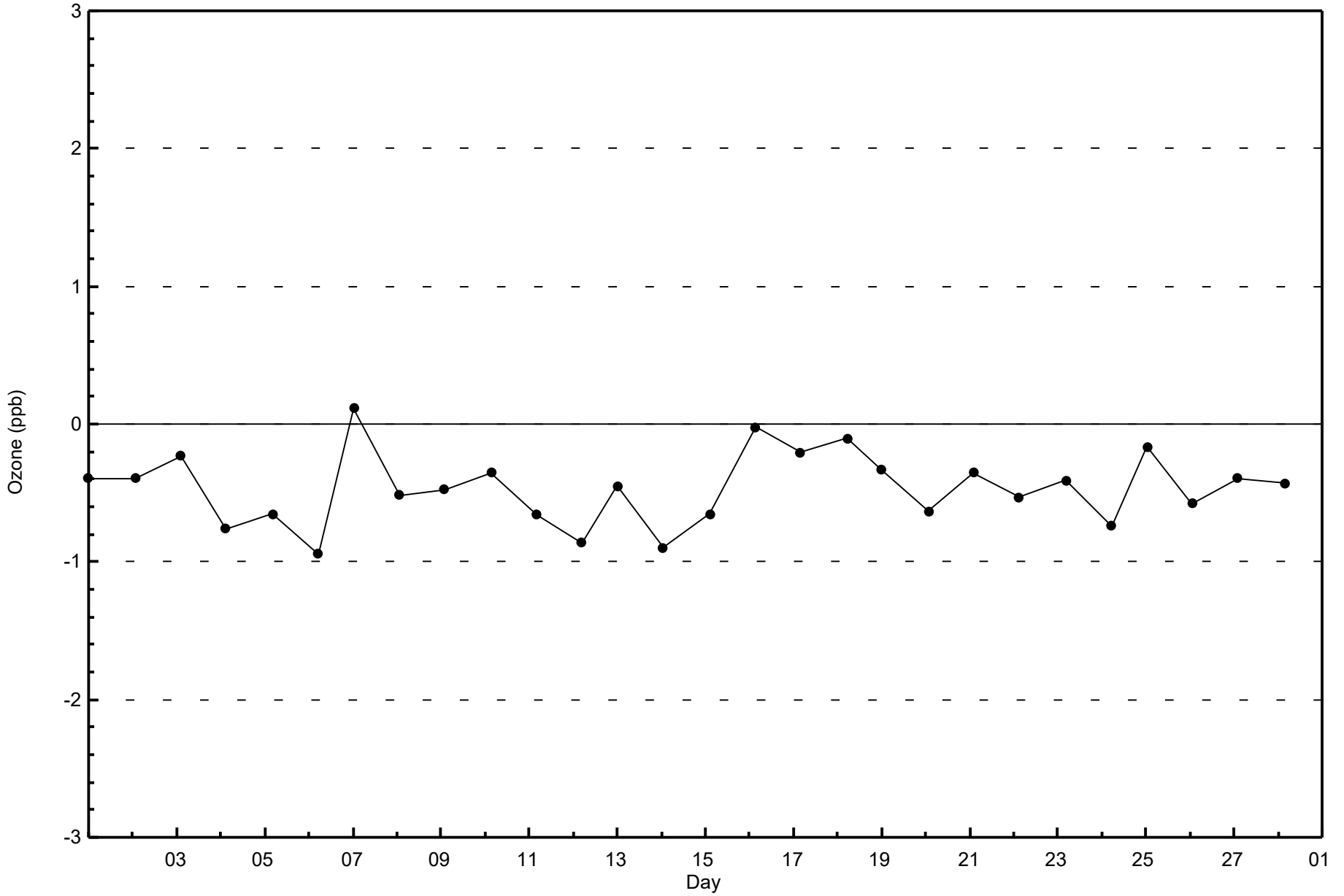
Total Number of Hours: 672

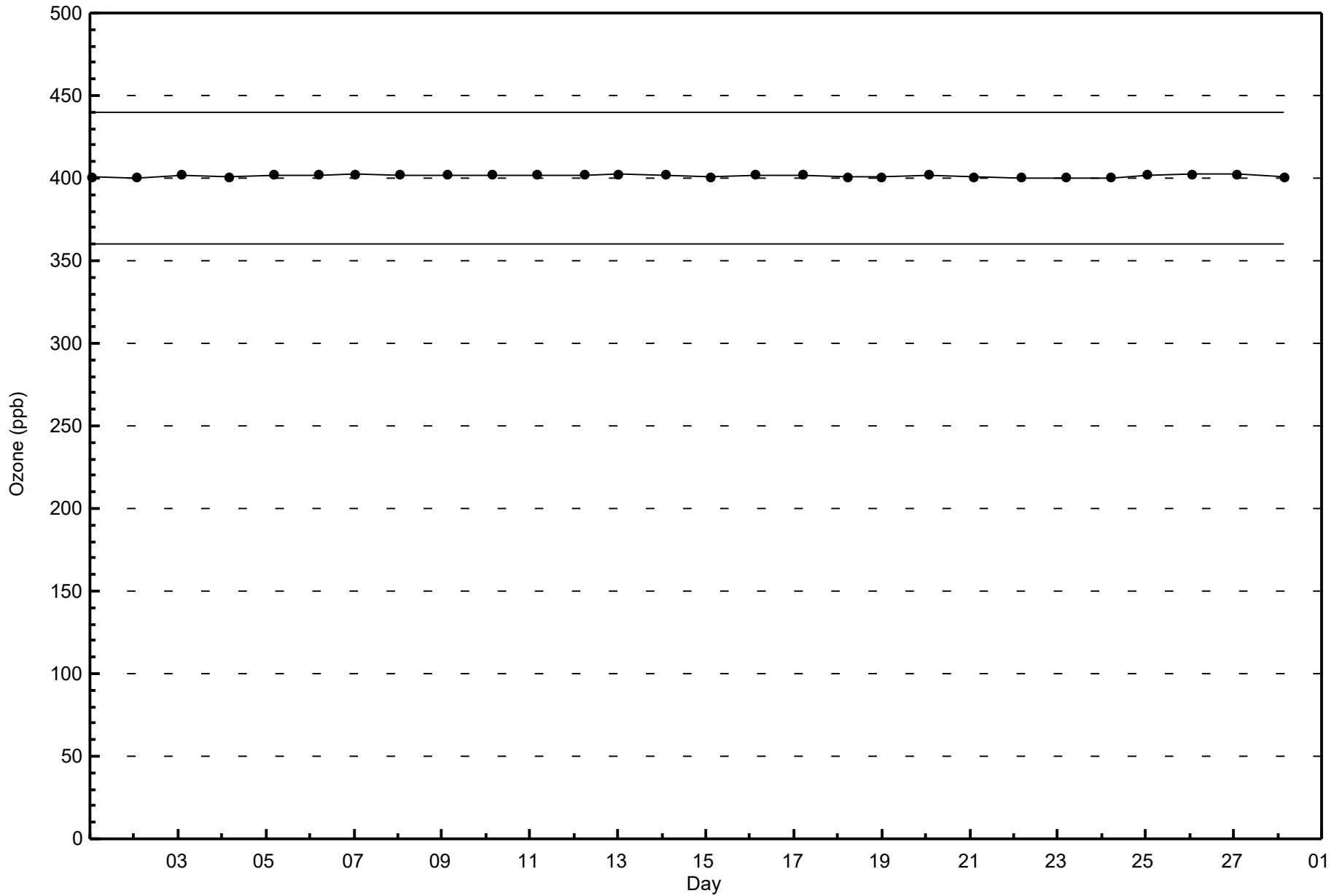


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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







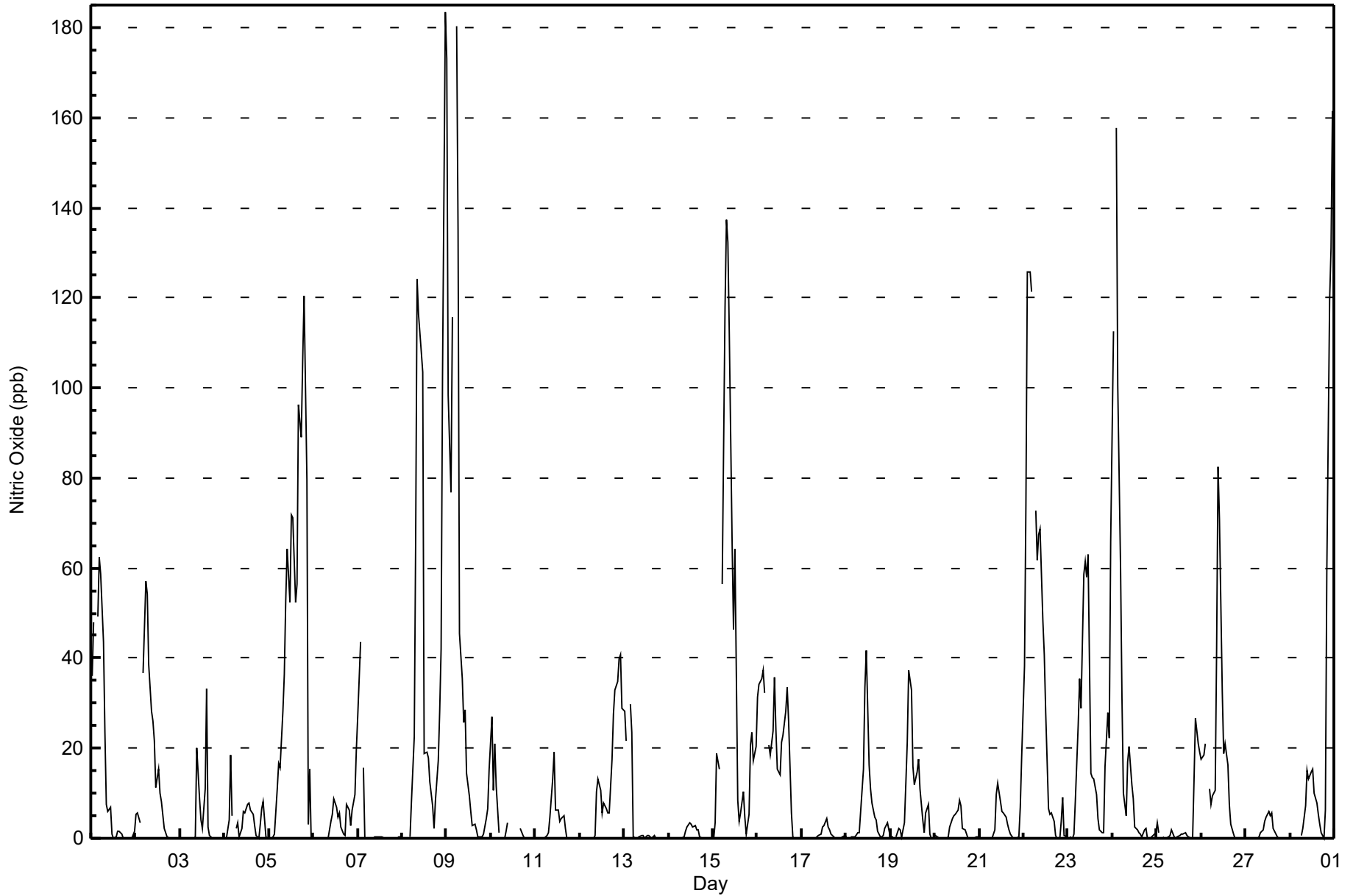


Maximum Value: 183.5 ppb on Feb 9 00:00      Maximum Daily Average: 45.2 ppb on Feb 5																						Hours in Service: 672 Hours of Data: 638				
Minimum Value: 0.0 ppb on Feb 2 19:00      Minimum Daily Average: 0.8 ppb on Feb 17																						Hours of Missing Data: 34 Hours of Calibration: 33				
Maximum Diurnal Average: 26.1 ppb at hour 10      Minimum Diurnal Average: 5.6 ppb at hour 18																						Percent Operational Time: 99.9				
Monthly Average: 14.99 ppb      Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.1 Median = 2.4 Q <sub>3</sub> = 15.5 P <sub>90</sub> = 44.3 P <sub>99</sub> = 133.9																										
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-Feb	36.2	48.0	Z	49.3	62.3	58.6	43.7	23.4	7.5	5.8	6.8	0.9	0.0	0.3	1.5	1.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	15.2	62.3
2-Feb	5.3	5.5	3.3	Z	36.8	57.2	54.3	38.5	28.3	26.0	21.7	11.2	15.4	10.1	8.0	2.3	1.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	14.2	57.2
3-Feb	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.4	20.2	8.6	3.9	2.0	11.1	33.2	2.4	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	3.6	33.2
4-Feb	0.0	0.0	3.9	18.5	5.0	Z	2.2	3.5	0.3	2.1	6.0	5.6	7.6	7.8	6.2	5.4	2.9	0.6	0.1	3.1	6.6	8.3	0.4	0.1	4.2	18.5
5-Feb	Z	0.1	0.3	0.8	10.8	16.7	15.7	28.2	36.4	52.7	64.3	52.3	71.8	71.3	52.5	56.3	96.4	89.1	106.0	120.5	79.7	3.2	15.3	0.1	45.2	120.5
6-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	3.7	5.4	8.7	7.0	4.8	5.7	2.5	0.9	0.7	7.5	6.2	2.8	6.2	9.7	19.9	4.0	19.9
7-Feb	27.2	43.6	Z	15.8	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	3.9	43.6
8-Feb	0.1	0.1	0.1	Z	0.3	8.2	22.7	66.9	124.1	116.3	108.0	103.4	18.8	19.0	17.8	12.4	7.2	2.3	8.5	17.4	28.2	41.9	102.6	183.5	43.9	183.5
9-Feb	173.2	98.6	76.9	115.6	Z	180.4	134.8	45.6	35.3	25.8	28.4	14.4	9.4	6.1	2.8	3.2	2.0	0.4	0.3	0.4	1.1	4.3	6.6	15.4	42.6	180.4
10-Feb	26.9	10.6	21.2	11.8	1.2	Z	0.1	0.1	1.5	3.5	C	C	C	C	C	PF	2.2	0.7	0.1	0.0	0.0	0.0	0.0	0.0	--	26.9
11-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.7	1.3	4.8	13.2	19.2	6.2	6.3	3.6	4.4	5.1	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	19.2
12-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.7	10.4	13.3	10.7	5.5	7.8	6.7	5.7	5.7	17.7	27.6	33.0	34.8	39.8	40.8	29.0	12.6	40.8
13-Feb	28.2	21.7	Z	29.7	23.4	0.3	0.0	0.0	0.3	0.5	0.8	0.0	0.7	0.5	0.3	0.1	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	4.7	29.7
14-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	1.7	2.6	3.5	3.2	2.5	2.7	2.0	1.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.9	3.5
15-Feb	0.0	3.3	18.7	15.5	Z	56.5	117.9	137.3	132.3	112.1	66.0	46.4	64.4	8.5	3.7	5.7	10.2	4.6	1.0	5.3	20.7	23.6	17.1	20.3	38.7	137.3
16-Feb	31.3	34.3	35.4	37.2	32.2	Z	20.7	18.4	23.7	35.6	24.1	15.4	14.1	21.3	23.0	28.1	33.6	26.0	5.5	0.5	0.0	0.0	0.1	0.1	20.0	37.2
17-Feb	Z	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.3	0.6	1.1	2.5	2.7	4.5	2.4	1.8	1.0	0.3	0.1	0.1	0.0	0.1	0.4	0.6	0.8	4.5
18-Feb	0.2	Z	0.2	0.2	0.2	0.2	1.2	1.2	5.8	15.4	33.5	41.7	16.3	11.0	7.7	4.8	4.0	1.6	0.4	0.2	0.5	2.2	3.4	2.0	6.7	41.7
19-Feb	0.4	0.2	Z	0.4	2.1	1.9	0.4	3.6	12.3	21.5	37.2	33.0	16.0	12.0	14.7	17.4	10.9	4.1	1.3	5.7	7.5	1.0	0.1	0.1	8.9	37.2
20-Feb	0.6	0.3	0.2	Z	0.0	0.0	0.0	0.4	2.6	4.4	5.1	5.5	6.3	8.5	7.2	2.1	1.9	0.9	0.1	0.1	0.0	0.1	0.2	0.5	2.0	8.5
21-Feb	0.1	0.1	0.1	0.1	Z	0.0	0.0	0.1	1.8	9.8	12.3	8.1	6.0	5.6	4.8	3.0	1.9	0.8	0.0	0.0	0.0	0.2	6.8	18.1	3.5	18.1
22-Feb	38.3	74.4	125.7	125.8	121.4	Z	72.9	61.9	67.4	68.8	48.3	40.8	27.8	6.6	5.2	5.5	3.8	0.7	0.1	0.0	3.7	9.1	0.5	0.3	39.5	125.8
23-Feb	Z	0.2	0.1	1.0	8.4	25.0	35.4	28.7	58.6	61.4	58.2	63.1	14.3	13.3	13.0	9.6	4.4	2.0	1.3	1.3	16.1	28.0	22.3	65.7	23.1	65.7
24-Feb	112.6	Z	157.9	100.7	59.9	30.9	9.9	5.1	16.8	20.2	12.0	8.8	2.7	1.9	1.4	1.0	0.4	1.9	2.0	0.0	0.1	0.3	0.7	1.3	23.9	157.9
25-Feb	3.5	1.2	Z	0.3	0.1	0.1	0.2	0.7	1.7	0.3	0.1	0.2	0.7	1.1	0.9	1.1	0.6	0.2	0.0	0.1	13.0	26.5	20.9	19.1	4.0	26.5
26-Feb	17.5	18.6	20.9	Z	11.0	7.5	9.5	10.8	41.9	82.6	70.7	32.7	18.9	21.0	16.2	7.5	3.0	1.0	0.1	0.0	0.0	0.0	0.0	0.0	17.0	82.6
27-Feb	0.0	0.1	0.1	0.0	Z	0.0	0.0	0.2	1.2	1.9	3.8	4.8	6.0	5.2	5.8	2.1	1.0	0.4	0.1	0.1	0.1	0.1	0.1	0.0	1.4	6.0
28-Feb	0.0	0.0	0.0	0.1	0.1	Z	0.6	2.1	7.3	15.1	13.3	14.6	15.3	10.2	7.8	5.4	3.0	1.1	0.1	6.2	59.0	119.3	131.1	161.5	24.9	161.5
20.9   15.0   20.2   22.7   16.3   19.3   19.4   17.1   21.9   26.1   24.9   20.0   13.3   10.2   9.5   7.2   7.3   5.6   5.8   7.1   9.8   11.2   13.6   19.3																						Diurnal Average				
173.2   98.6   157.9   125.8   121.4   180.4   134.8   137.3   132.3   116.3   108.0   103.4   71.8   71.3   52.5   56.3   96.4   89.1   106.0   120.5   79.7   119.3   131.1   183.5																						Diurnal Maximum				
Z - zerospan      C - Calibration      PF - Power Failure																										



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

**Nitric Oxide (NO) - ppb**  
**Fort McKay South - February 2023**





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

**Nitric Oxide (NO) - ppb**  
**Fort McKay South - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	507	79.47	79.47
21 - 40	60	9.40	88.87
41 - 80	42	6.58	95.45
81 - 159	25	3.92	99.37
> 159	4	0.63	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



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

**Nitric Oxide (NO) - ppb**  
**Fort McKay South - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	144	62	9	3	2	3	12	46	47	8	28	52	22	19	19	28	504
21 - 40	10	4	1	0	1	1	3	2	8	7	8	3	5	0	1	6	60
11 - 80	2	2	0	0	0	3	8	3	4	3	7	5	1	1	3	0	42
81 - 159	1	0	0	0	0	1	2	1	4	6	4	4	0	2	0	0	25
> 159	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	4
<b>Totals</b>	157	68	10	3	3	8	25	52	63	24	50	65	28	22	23	34	635

Total Number of Valid Hours: 635

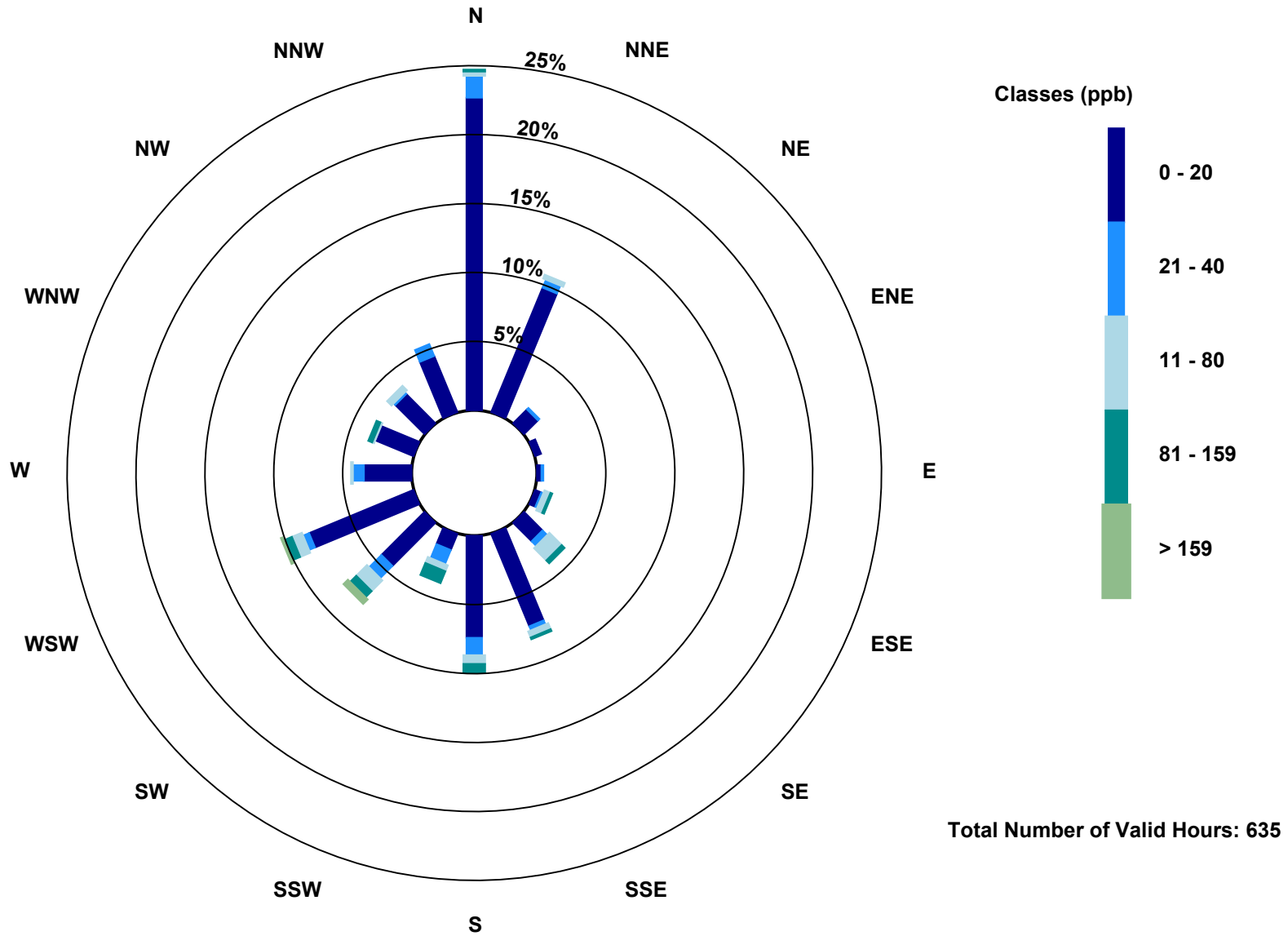
Total Number of Hours: 672

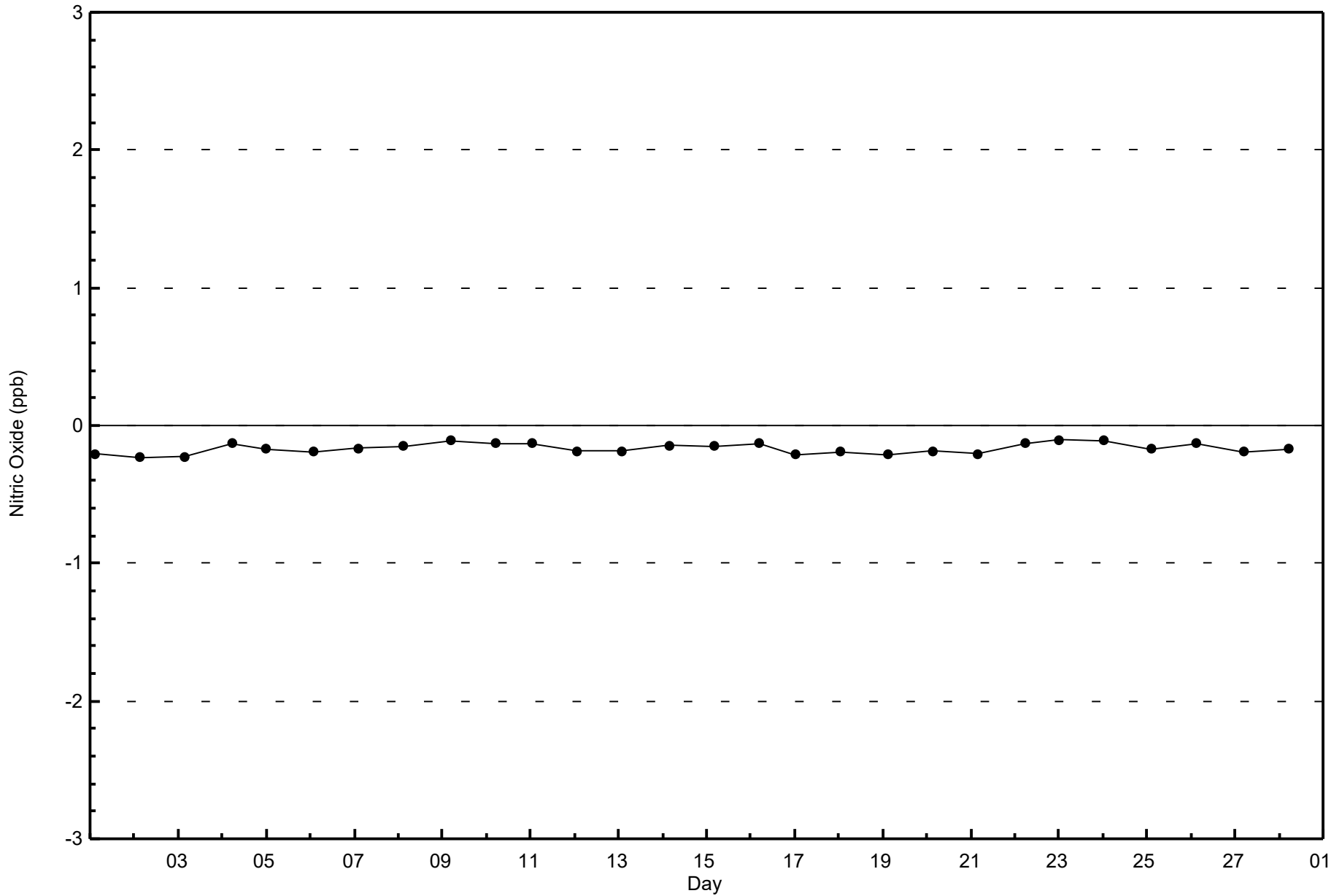


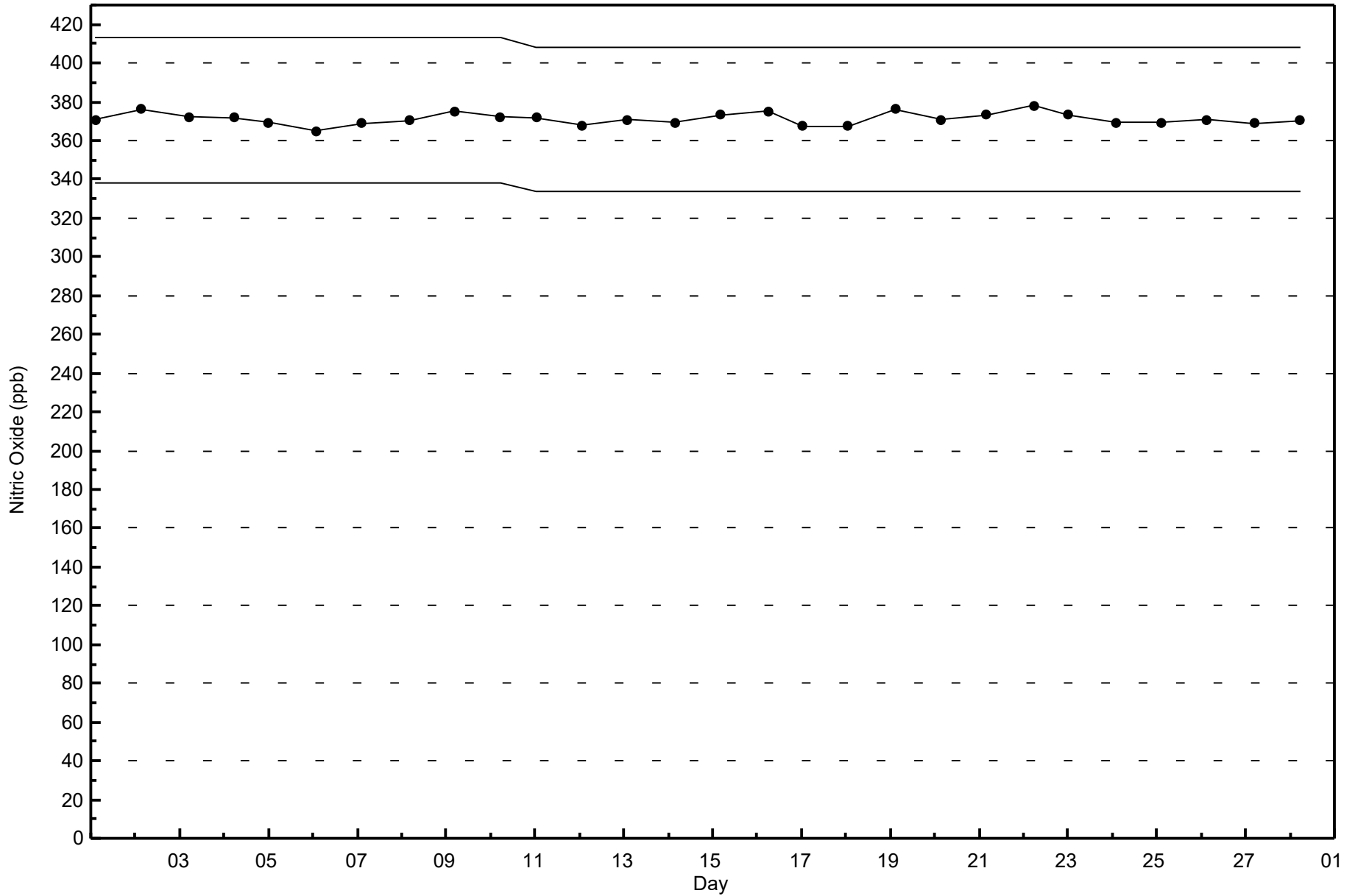


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitric Oxide (NO) - ppb  
Fort McKay South









Wood Buffalo Environmental Association

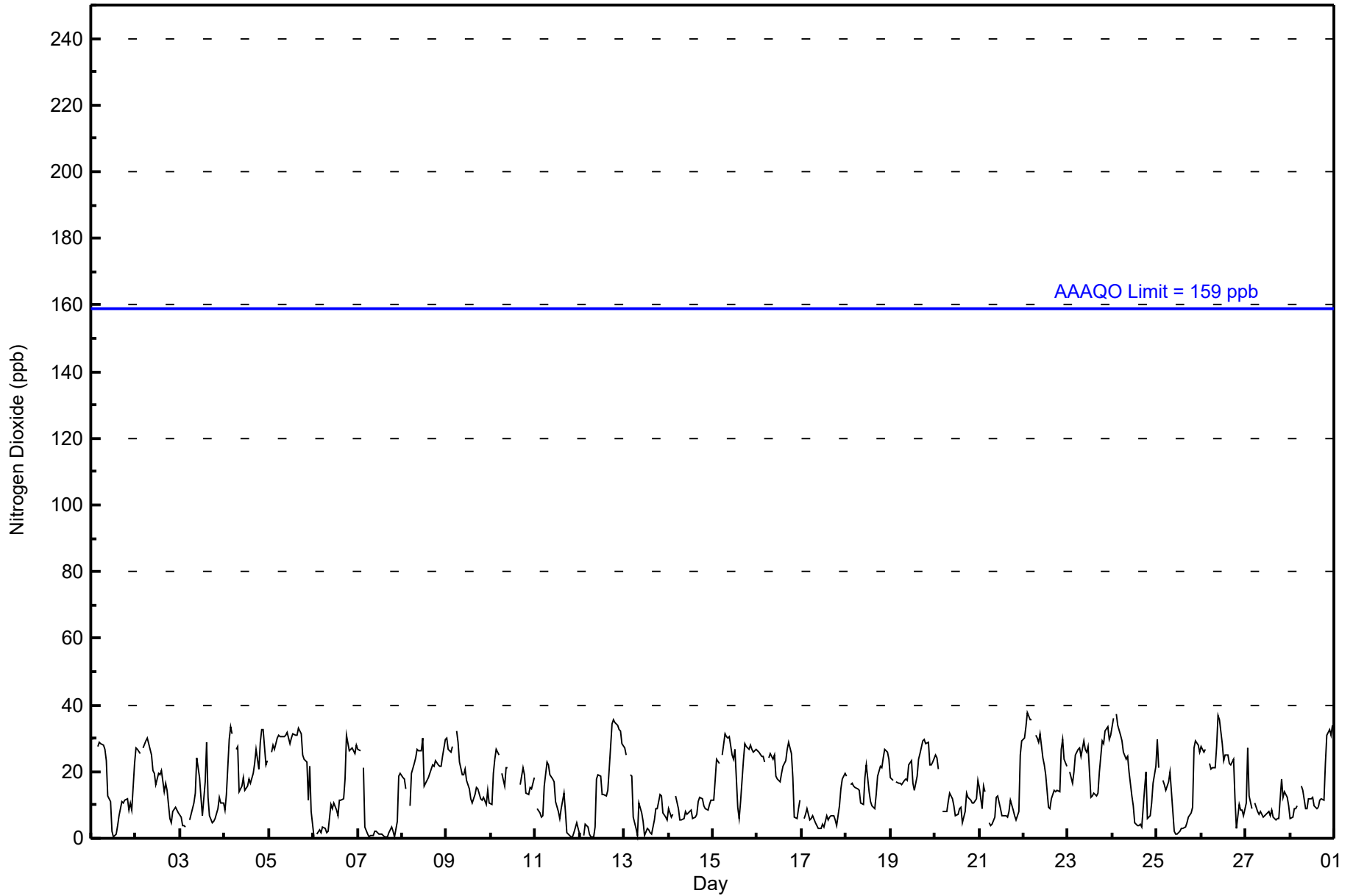
Summary of Hour Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort McKay South - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 37.6 ppb on Feb 22 03:00	Maximum Daily Average: 27.2 ppb on Feb 5		Hours of Data:	638
Minimum Value: 0.3 ppb on Feb 7 17:00	Minimum Daily Average: 6.1 ppb on Feb 7		Hours of Missing Data:	34
Maximum Diurnal Average: 19.3 ppb at hour 2	Minimum Diurnal Average: 11.1 ppb at hour 14		Hours of Calibration:	33
Monthly Average: 15.96 ppb	Percentiles: P <sub>1</sub> = 0.5 P <sub>10</sub> = 3.9 Q <sub>1</sub> = 8.1 Median = 14.7 Q <sub>3</sub> = 24.2 P <sub>90</sub> = 29.2 P <sub>99</sub> = 35.4		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-Feb	29.7	30.2	Z	27.7	28.9	28.5	28.0	26.9	23.1	12.7	11.2	2.3	0.4	1.1	3.9	6.6	11.2	10.8	11.4	11.9	8.6	10.5	8.4	22.3	15.5	30.2
2-Feb	27.1	26.7	25.4	Z	27.3	29.1	29.9	28.3	24.9	20.3	19.5	16.2	19.6	19.1	20.4	14.1	16.4	14.4	5.9	4.5	8.1	9.2	8.4	7.6	18.4	29.9
3-Feb	6.3	3.7	3.7	3.6	Z	5.5	7.0	10.8	13.4	24.0	18.1	12.2	6.8	16.8	29.0	12.3	6.8	4.8	6.0	6.0	8.7	12.1	10.6	10.7	10.3	29.0
4-Feb	8.6	13.1	29.5	33.5	31.5	Z	26.6	27.6	13.9	15.6	18.2	14.6	15.7	18.0	16.7	19.7	22.4	26.8	20.7	28.7	32.7	32.8	21.9	23.5	22.3	33.5
5-Feb	Z	25.8	27.8	26.7	30.2	31.0	30.5	30.5	30.3	31.1	31.7	28.3	30.2	31.3	30.8	31.1	33.1	31.3	25.2	23.8	22.9	11.3	21.8	7.9	27.2	33.1
6-Feb	0.6	Z	1.3	2.5	1.6	3.4	3.1	1.6	2.3	10.0	8.9	10.5	8.5	6.9	11.6	11.6	12.0	17.8	31.1	26.4	26.9	27.2	25.5	27.9	12.1	31.1
7-Feb	26.6	26.2	Z	21.1	3.2	1.1	0.5	0.9	0.7	2.1	2.1	1.3	1.1	1.2	0.6	0.5	0.3	1.9	3.2	2.1	0.3	5.2	18.5	19.3	6.1	26.6
8-Feb	18.4	17.8	14.7	Z	9.9	19.7	22.3	24.2	26.9	26.3	26.3	30.0	15.6	17.4	18.4	19.6	21.9	21.7	23.2	22.1	21.8	21.5	24.6	29.5	21.5	30.0
9-Feb	30.2	26.6	26.0	27.5	Z	32.1	29.0	23.0	19.2	19.0	20.9	17.3	14.9	12.0	10.8	13.1	15.1	15.0	12.0	11.3	12.4	10.2	14.2	10.5	18.4	32.1
10-Feb	10.3	19.4	23.7	26.5	25.1	Z	19.4	15.8	21.3	21.1	C	C	C	C	C	PF	15.9	21.0	19.2	13.6	13.1	15.1	15.0	18.1	--	26.5
11-Feb	Z	8.7	7.5	6.3	6.6	15.8	22.9	22.1	19.0	17.9	17.0	11.0	8.1	5.9	8.9	13.4	7.9	1.7	0.8	0.6	0.4	1.7	4.5	3.1	9.2	22.9
12-Feb	1.2	Z	0.8	4.1	3.3	1.1	0.3	0.3	3.6	17.7	19.2	18.8	13.2	13.1	12.5	14.5	20.8	34.3	35.4	34.8	33.9	32.6	32.2	28.4	16.4	35.4
13-Feb	27.1	25.0	Z	19.0	18.8	6.5	2.8	0.8	10.7	7.5	5.2	0.8	3.1	2.6	1.7	1.1	5.6	8.9	8.9	13.0	12.6	7.6	6.4	5.6	8.8	27.1
14-Feb	8.9	6.3	7.2	Z	12.5	9.0	5.4	5.5	5.9	8.2	7.2	8.0	8.3	6.1	6.3	7.1	11.0	12.1	11.7	9.9	8.9	8.5	10.2	11.3	8.5	12.5
15-Feb	11.4	17.2	23.7	22.4	Z	25.0	31.3	30.7	30.2	30.7	25.1	23.9	26.8	9.5	6.1	11.2	23.1	28.5	27.7	26.5	27.8	26.7	25.9	26.5	23.4	31.3
16-Feb	26.2	25.7	24.4	24.7	23.0	Z	24.2	25.5	23.6	25.1	18.7	17.6	17.1	19.4	21.4	23.5	26.6	28.7	25.5	18.3	6.5	5.9	9.0	11.5	20.5	28.7
17-Feb	Z	6.0	7.4	9.0	5.7	6.1	6.7	4.5	3.9	2.9	2.8	4.1	3.4	6.9	5.7	6.2	6.9	6.6	5.3	4.0	9.8	14.8	17.7	19.7	7.2	19.7
18-Feb	18.6	Z	16.3	16.4	15.5	15.2	14.8	14.2	10.4	10.3	18.4	22.0	13.8	10.9	9.9	9.0	13.1	18.5	21.5	21.0	24.0	26.8	26.0	23.6	17.0	26.8
19-Feb	18.4	17.2	Z	16.8	16.7	16.5	16.1	17.2	17.8	17.4	22.2	23.2	16.5	14.4	18.6	23.6	25.4	29.2	29.5	28.6	29.0	22.1	22.0	22.9	20.9	29.5
20-Feb	25.0	24.1	20.8	Z	8.0	8.0	8.2	11.1	13.7	12.0	9.7	6.9	7.0	9.1	9.5	4.8	8.1	13.5	12.3	11.4	10.5	10.7	12.0	17.4	11.9	25.0
21-Feb	15.4	9.1	15.8	14.0	Z	4.7	4.0	4.4	6.5	12.1	12.8	8.7	6.6	6.9	6.9	6.2	8.1	11.5	8.4	6.7	5.6	8.2	25.1	29.2	10.3	29.2
22-Feb	29.9	33.4	37.6	35.7	35.4	Z	31.1	29.9	28.9	31.3	24.0	22.2	19.0	9.4	8.9	12.0	14.3	13.9	14.2	13.8	26.7	29.8	23.9	21.6	23.8	37.6
23-Feb	Z	20.0	16.4	20.0	24.9	26.8	27.3	24.6	29.1	26.9	26.0	27.5	12.1	12.5	13.6	12.9	13.4	19.9	29.4	28.6	32.1	33.3	29.8	30.8	23.4	33.3
24-Feb	36.1	Z	37.4	33.8	30.8	29.4	25.9	23.8	24.4	19.9	12.6	9.8	4.5	4.0	3.9	4.2	3.6	15.0	20.1	5.9	6.9	10.8	16.5	21.6	17.4	37.4
25-Feb	29.7	21.0	Z	17.2	15.9	14.4	17.0	19.8	13.8	2.3	1.1	1.1	2.3	2.9	2.8	3.4	4.5	6.2	7.6	9.4	27.0	29.1	27.9	26.0	13.1	29.7
26-Feb	27.4	26.0	26.5	Z	22.5	20.9	21.3	21.1	27.4	37.0	35.8	28.3	23.5	25.2	25.2	22.5	22.2	23.6	11.8	3.0	10.2	8.3	8.6	6.7	21.1	37.0
27-Feb	10.5	27.0	12.7	8.7	Z	10.5	8.1	7.1	8.2	6.2	6.8	7.1	8.1	6.8	8.6	6.2	5.4	6.0	6.0	18.0	12.3	14.0	12.4	9.6	9.8	27.0
28-Feb	6.0	6.2	8.8	8.8	9.8	Z	15.8	14.2	8.7	9.1	11.9	12.0	12.3	9.6	9.0	9.3	11.4	12.0	11.6	22.4	30.8	32.6	31.1	33.9	14.7	33.9
18.7 19.3 18.1 18.5 17.7 15.7 17.1 16.7 16.5 17.0 16.1 14.3 11.8 11.1 11.9 11.8 13.8 16.3 15.9 15.2 16.8 17.1 18.2 18.8																								Diurnal Average		
36.1 33.4 37.6 35.7 35.4 32.1 31.3 30.7 30.3 37.0 35.8 30.0 30.2 31.3 30.8 31.1 33.1 34.3 35.4 34.8 33.9 33.3 32.2 33.9																								Diurnal Maximum		

Z - zerospan      C - Calibration      PF - Power Failure  
 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 McKay South - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	414	64.89	64.89
21 - 40	224	35.11	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: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort McKay South - February 2023**

<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	109	61	9	2	2	3	12	44	38	7	19	39	20	15	12	19	411
21 - 40	48	7	1	1	1	5	13	8	25	17	31	26	8	7	11	15	224
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>	157	68	10	3	3	8	25	52	63	24	50	65	28	22	23	34	635

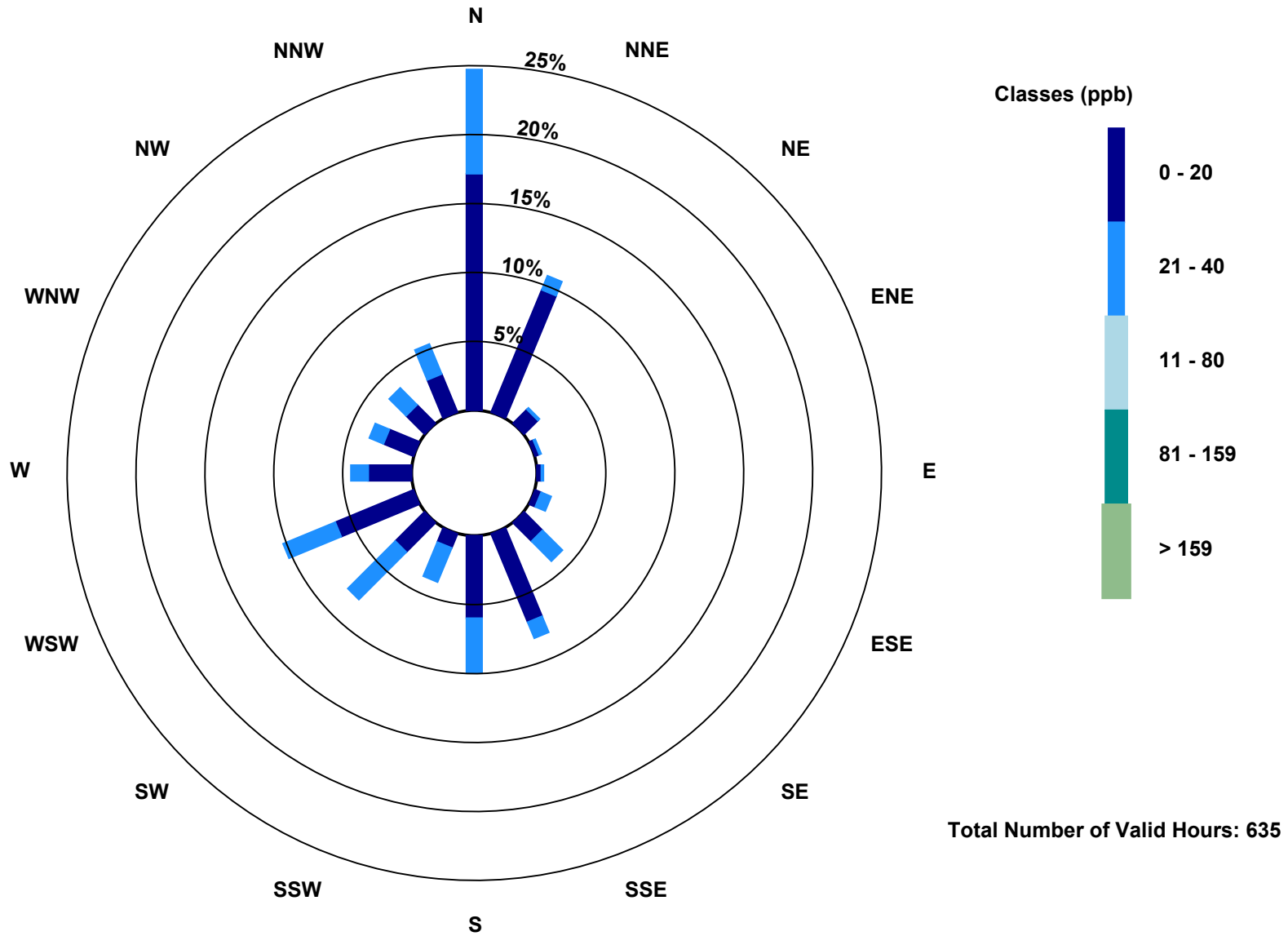
Total Number of Valid Hours: 635

Total Number of Hours: 672

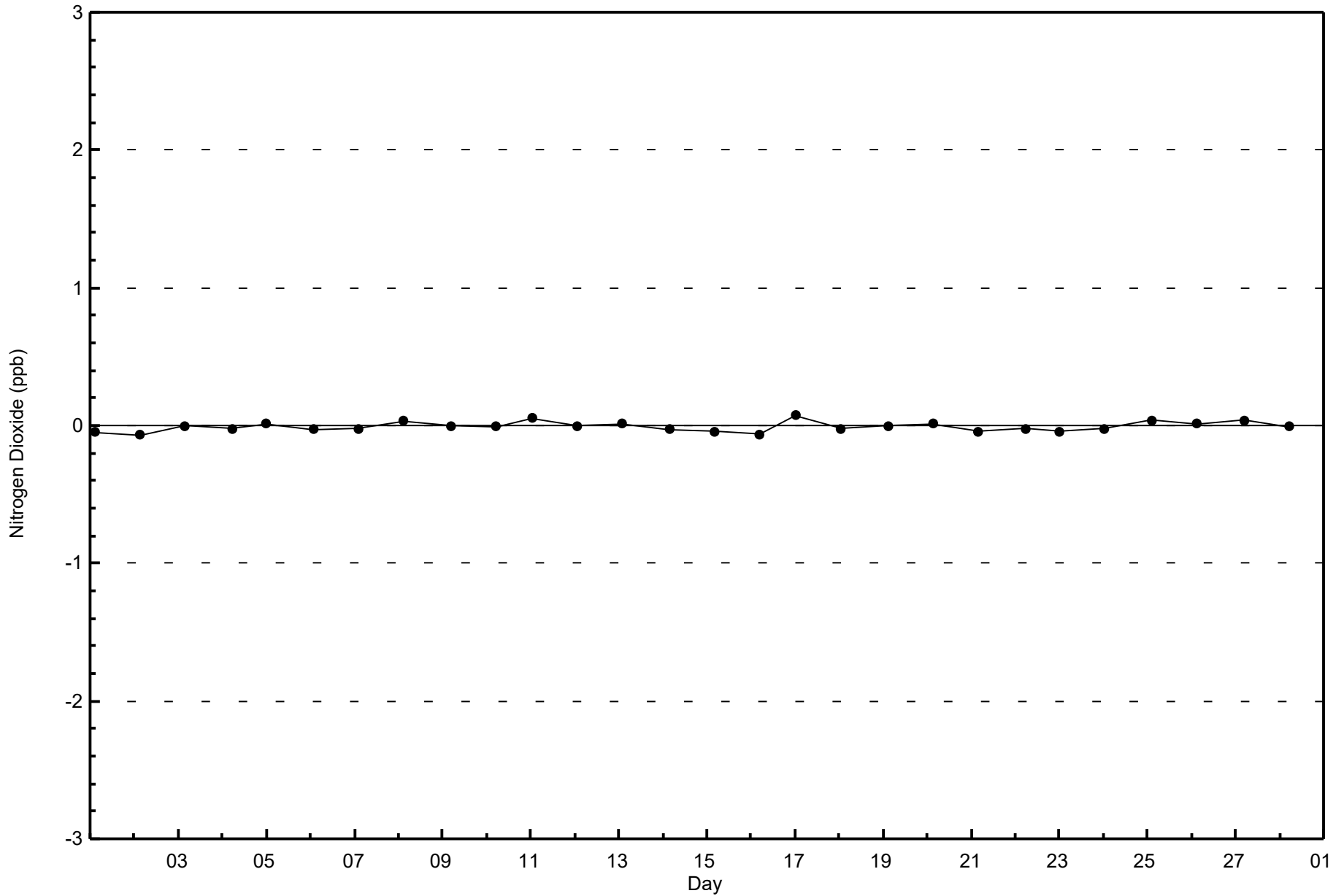


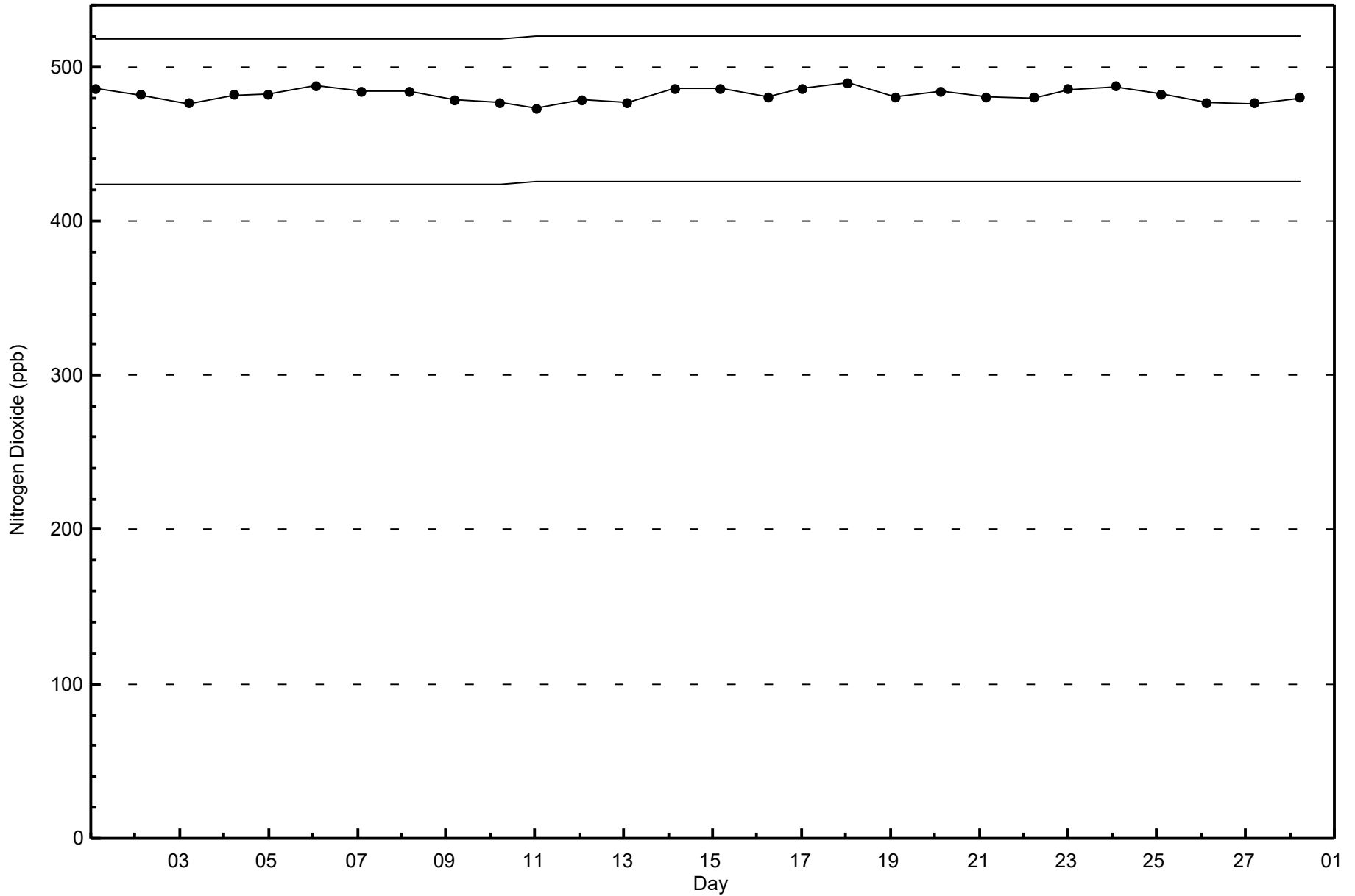
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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







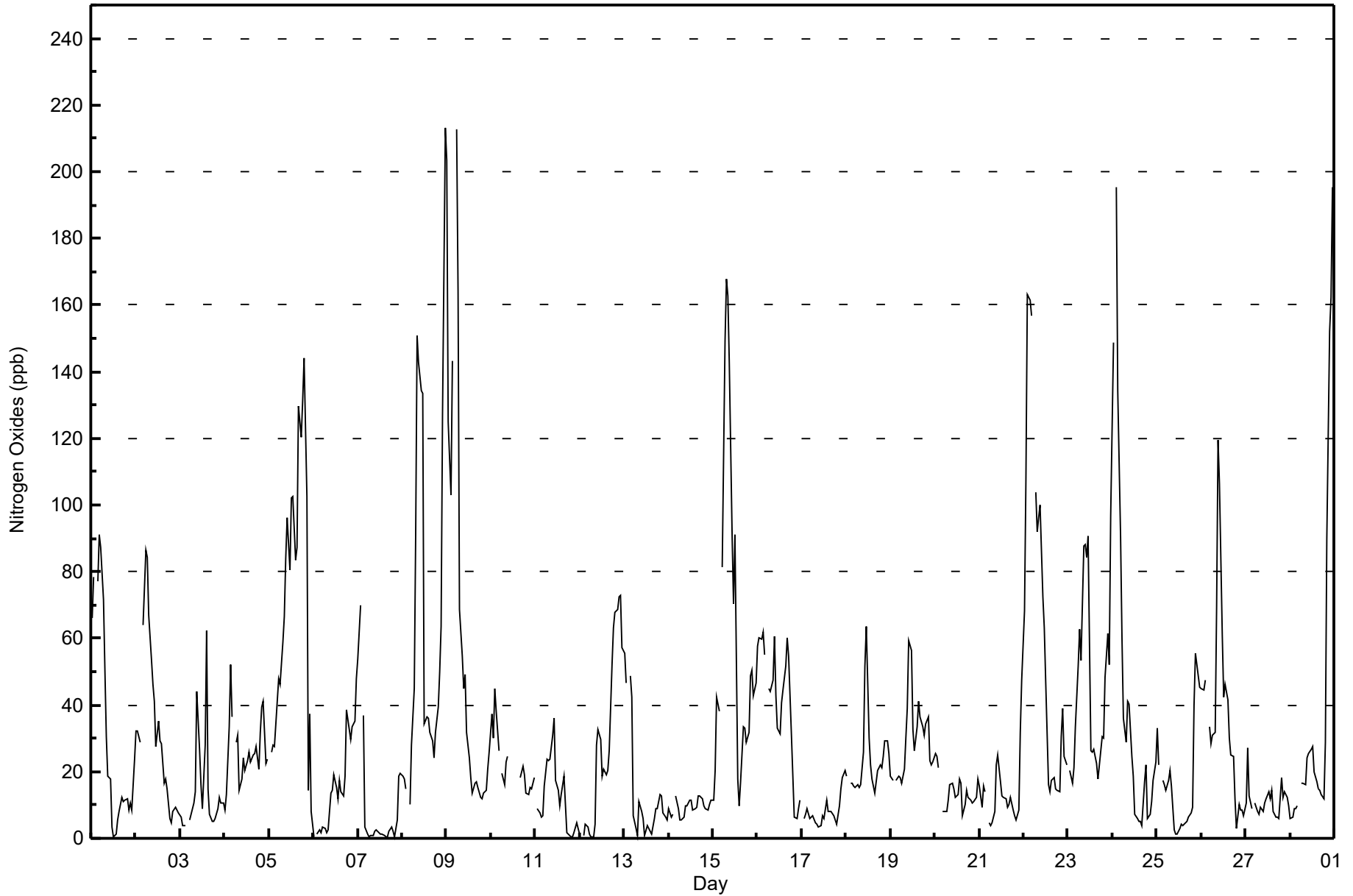




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Fort McKay South - February 2023**

Maximum Value: 213.0 ppb on Feb 9 00:00																						Maximum Daily Average: 72.4 ppb on Feb 5																						Hours in Service: 672			
Minimum Value: 0.3 ppb on Feb 12 08:00																						Minimum Daily Average: 8.0 ppb on Feb 17																						Hours of Data: 638			
Maximum Diurnal Average: 43.2 ppb at hour 10																						Minimum Diurnal Average: 19.0 ppb at hour 16																						Hours of Missing Data: 34			
Monthly Average: 30.95 ppb																						Percentiles: P <sub>1</sub> = 0.5 P <sub>10</sub> = 4.3 Q <sub>1</sub> = 9.0 Median = 18.1 Q <sub>3</sub> = 37.2 P <sub>90</sub> = 71.9 P <sub>99</sub> = 163.6																						Hours of Calibration: 33			
																						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-Feb	65.9	78.2	Z	77.0	91.2	87.1	71.7	50.3	30.6	18.5	18.0	3.2	0.4	1.4	5.4	8.1	12.2	10.8	11.4	11.9	8.6	10.5	8.4	23.8	30.6	91.2																					
2-Feb	32.4	32.2	28.7	Z	64.1	86.3	84.2	66.8	53.2	46.3	41.2	27.4	35.0	29.2	28.4	16.4	17.7	14.6	5.9	4.5	8.1	9.2	8.4	7.6	32.5	86.3																					
3-Feb	6.3	3.7	3.7	3.6	Z	5.5	7.0	10.8	13.8	44.2	26.7	16.1	8.8	27.9	62.2	14.7	7.3	4.9	4.9	6.0	8.7	12.1	10.6	10.7	13.9	62.2																					
4-Feb	8.6	13.1	33.4	52.0	36.5	Z	28.8	31.1	14.2	17.7	24.2	20.2	23.3	25.8	22.9	25.1	25.3	27.4	20.8	31.8	39.3	41.1	22.3	23.6	26.5	52.0																					
5-Feb	Z	25.9	28.1	27.5	41.0	47.7	46.2	58.7	66.7	83.8	96.0	80.6	102.0	102.6	83.3	87.4	129.5	120.4	131.2	144.3	102.6	14.5	37.1	8.0	72.4	144.3																					
6-Feb	0.6	Z	1.3	2.5	1.6	3.4	3.1	1.6	2.5	13.7	14.3	19.2	15.5	11.7	17.3	14.1	12.9	18.5	38.6	32.6	29.7	33.4	35.2	47.8	16.1	47.8																					
7-Feb	53.8	69.8	Z	36.9	3.2	1.1	0.5	0.9	0.7	2.3	2.5	1.5	1.3	1.4	0.7	0.5	0.3	1.9	3.2	2.1	0.3	5.3	18.7	19.6	9.9	69.8																					
8-Feb	18.5	17.9	14.8	Z	10.2	27.9	45.0	91.1	151.0	142.6	134.3	133.4	34.4	36.4	36.2	32.0	29.1	24.0	31.7	39.5	50.0	63.4	127.2	213.0	65.4	213.0																					
9-Feb	203.4	125.2	102.9	143.1	Z	212.5	163.8	68.6	54.5	44.8	49.3	31.7	24.3	18.1	13.6	16.3	17.1	15.4	12.3	11.7	13.5	14.5	20.8	25.9	61.0	212.5																					
10-Feb	37.2	30.0	44.9	38.3	26.3	Z	19.5	15.9	22.8	24.6	C	C	C	C	C	PF	18.1	21.7	19.3	13.6	13.1	15.1	15.0	18.1	--	44.9																					
11-Feb	Z	8.7	7.5	6.3	6.6	15.8	23.6	23.4	23.8	31.1	36.2	17.2	14.4	9.5	13.3	18.5	10.1	1.7	0.8	0.6	0.4	1.7	4.5	3.1	12.1	36.2																					
12-Feb	1.2	Z	0.8	4.1	3.3	1.1	0.3	0.3	4.3	28.1	32.5	29.5	18.7	20.9	19.2	20.2	26.5	52.0	63.0	67.8	68.7	72.4	73.0	57.4	28.9	73.0																					
13-Feb	55.3	46.7	Z	48.7	42.2	6.8	2.8	0.8	11.0	8.0	6.0	0.8	3.8	3.1	2.0	1.2	6.1	9.0	8.9	13.0	12.6	7.6	6.4	5.6	13.4	55.3																					
14-Feb	8.9	6.3	7.2	Z	12.5	9.0	5.4	5.5	6.2	9.9	9.8	11.5	11.5	8.6	9.0	9.1	12.9	12.5	11.7	9.9	8.9	8.5	10.2	11.3	9.4	12.9																					
15-Feb	11.4	20.5	42.4	37.9	Z	81.5	149.2	168.0	162.5	142.8	91.1	70.3	91.2	18.0	9.8	16.9	33.3	33.1	28.7	31.8	48.5	50.3	43.0	46.8	62.1	168.0																					
16-Feb	57.5	60.0	59.8	61.9	55.2	Z	44.9	43.9	47.3	60.7	42.8	33.0	31.2	40.7	44.4	51.6	60.2	54.7	31.0	18.8	6.5	5.9	9.1	11.6	40.6	61.9																					
17-Feb	Z	6.0	7.4	9.1	5.7	6.2	6.7	4.6	4.2	3.5	3.9	6.6	6.1	11.4	8.1	8.0	7.9	6.9	5.4	4.1	9.8	14.9	18.1	20.3	8.0	20.3																					
18-Feb	18.8	Z	16.5	16.6	15.7	15.4	16.0	15.4	16.2	25.7	51.9	63.7	30.1	21.9	17.6	13.8	17.1	20.1	21.9	21.2	24.5	29.0	29.4	25.6	23.7	63.7																					
19-Feb	18.8	17.4	Z	17.2	18.8	18.4	16.5	20.8	30.1	38.9	59.4	56.2	32.5	26.4	33.3	41.0	36.3	33.3	30.8	34.3	36.5	23.1	22.1	23.0	29.8	59.4																					
20-Feb	25.6	24.4	21.0	Z	8.0	8.0	8.2	11.5	16.3	16.4	14.8	12.4	13.3	17.6	16.7	6.9	10.0	14.4	12.4	11.5	10.5	10.8	12.2	17.9	13.9	25.6																					
21-Feb	15.5	9.2	15.9	14.1	Z	4.7	4.0	4.5	8.3	21.9	25.1	16.8	12.6	12.5	11.7	9.2	10.0	12.3	8.4	6.7	5.6	8.4	31.9	47.3	13.8	47.3																					
22-Feb	68.2	107.8	163.3	161.5	156.8	Z	104.0	91.8	96.3	100.1	72.3	63.0	46.8	16.0	14.1	17.5	18.1	14.6	14.3	13.8	30.4	38.9	24.4	21.9	63.3	163.3																					
23-Feb	Z	20.2	16.5	21.0	33.3	51.8	62.7	53.3	87.7	88.3	84.2	90.6	26.4	25.8	26.6	22.5	17.8	21.9	30.7	29.9	48.2	61.3	52.1	96.5	46.5	96.5																					
24-Feb	148.7	Z	195.3	134.5	90.7	60.3	35.8	28.9	41.2	40.1	24.6	18.6	7.2	5.9	5.3	5.2	4.0	16.9	22.1	5.9	7.0	11.1	17.2	22.9	41.3	195.3																					
25-Feb	33.2	22.2	Z	17.5	16.0	14.5	17.2	20.5	15.5	2.6	1.2	1.3	3.0	4.0	3.7	4.5	5.1	6.4	7.6	9.5	40.0	55.6	48.8	45.1	17.2	55.6																					
26-Feb	44.9	44.6	47.4	Z	33.5	28.4	30.8	31.9	69.3	119.6	106.5	61.0	42.4	46.2	41.4	30.0	25.2	24.6	11.9	3.0	10.2	8.3	8.6	6.7	38.1	119.6																					
27-Feb	10.5	27.1	12.8	8.7	Z	10.5	8.1	7.3	9.4	8.1	10.6	11.9	14.1	12.0	14.4	8.3	6.4	6.4	6.1	18.1	12.4	14.1	12.5	9.6	11.3	27.1																					
28-Feb	6.0	6.2	8.8	8.9	9.9	Z	16.4	16.3	16.0	24.2	25.2	26.6	27.6	19.8	16.8	14.7	14.4	13.1	11.7	28.6	89.8	151.9	162.2	195.4	39.6	195.4																					
																						39.6	34.3	38.3	41.3	34.0	35.0	36.5	33.7	38.4	43.2	40.9	34.2	25.1	21.3	21.4	19.0	21.1	21.9	21.7	22.4	26.6	28.3	31.8	38.1	Diurnal Average	
																						203.4	125.2	195.3	161.5	156.8	212.5	163.8	168.0	162.5	142.8	134.3	133.4	102.0	102.6	83.3	87.4	129.5	120.4	131.2	144.3	102.6	151.9	162.2	213.0	Diurnal Maximum	
Z - zerspan																						C - Calibration						PF - Power Failure																			





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Fort McKay South - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	349	54.70	54.70
21 - 40	139	21.79	76.49
41 - 80	91	14.26	90.75
81 - 159	47	7.37	98.12
> 159	11	1.72	99.84

Total Number of Valid Hours: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Fort McKay South - February 2023**

<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	95	51	9	2	2	2	5	33	26	4	17	39	19	14	11	17	346
21 - 40	43	11	0	1	0	1	6	12	20	4	10	12	3	3	4	9	139
11 - 80	18	5	1	0	1	2	5	5	9	8	9	7	5	2	6	8	91
81 - 159	1	1	0	0	0	3	8	2	6	6	10	4	1	3	2	0	47
> 159	0	0	0	0	0	0	0	0	2	2	4	3	0	0	0	0	11
<b>Totals</b>	157	68	10	3	3	8	24	52	63	24	50	65	28	22	23	34	634

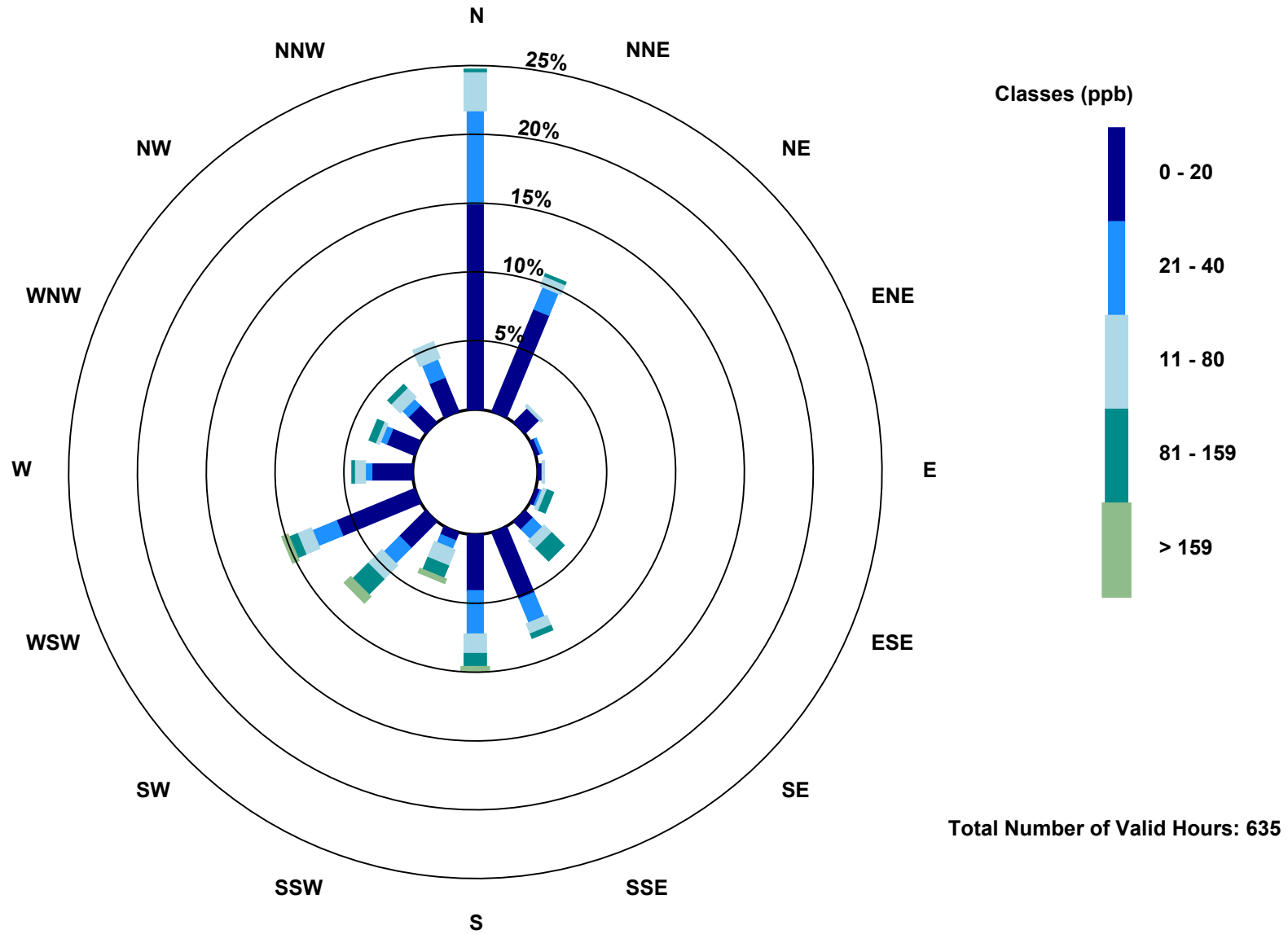
Total Number of Valid Hours: 635

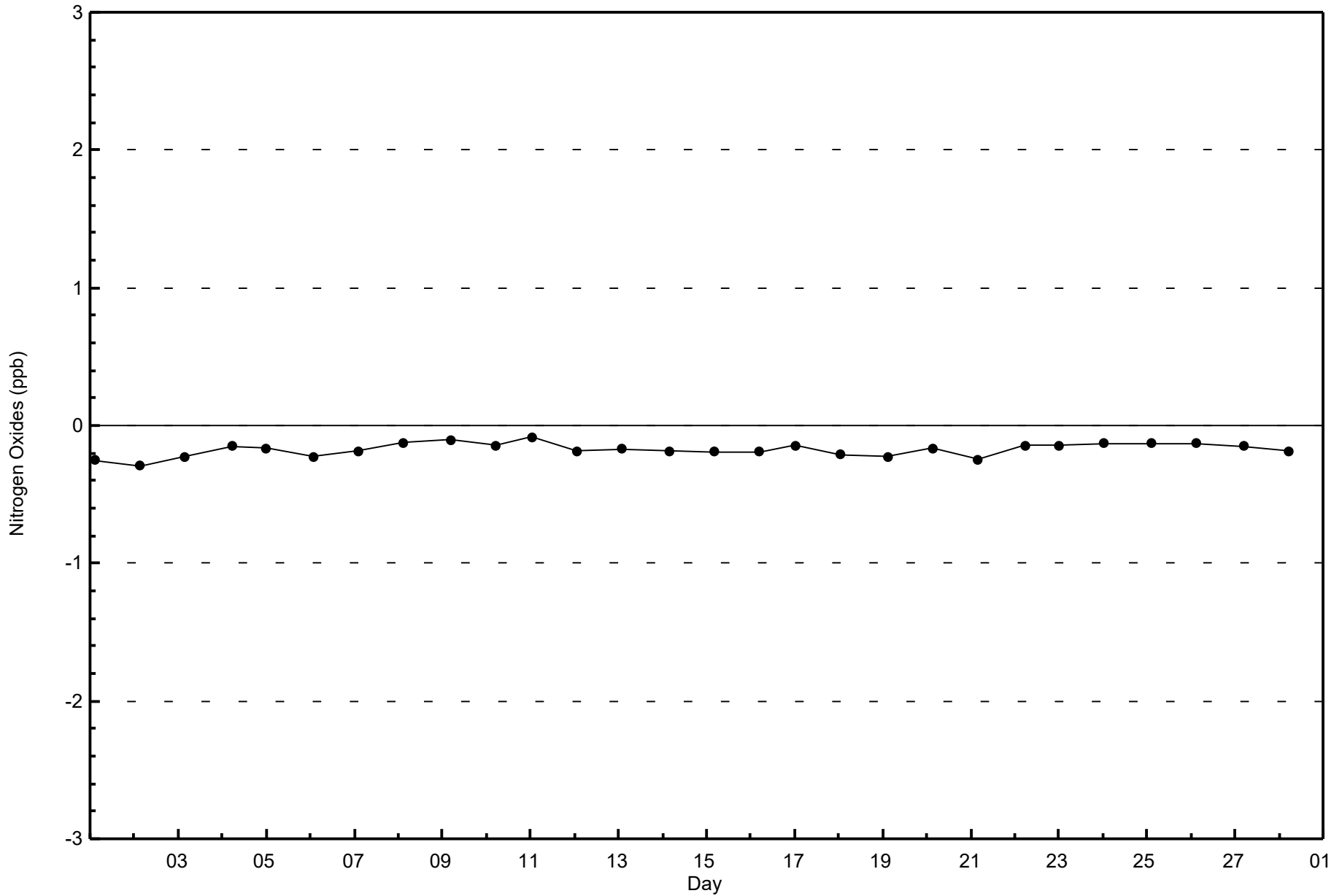
Total Number of Hours: 672



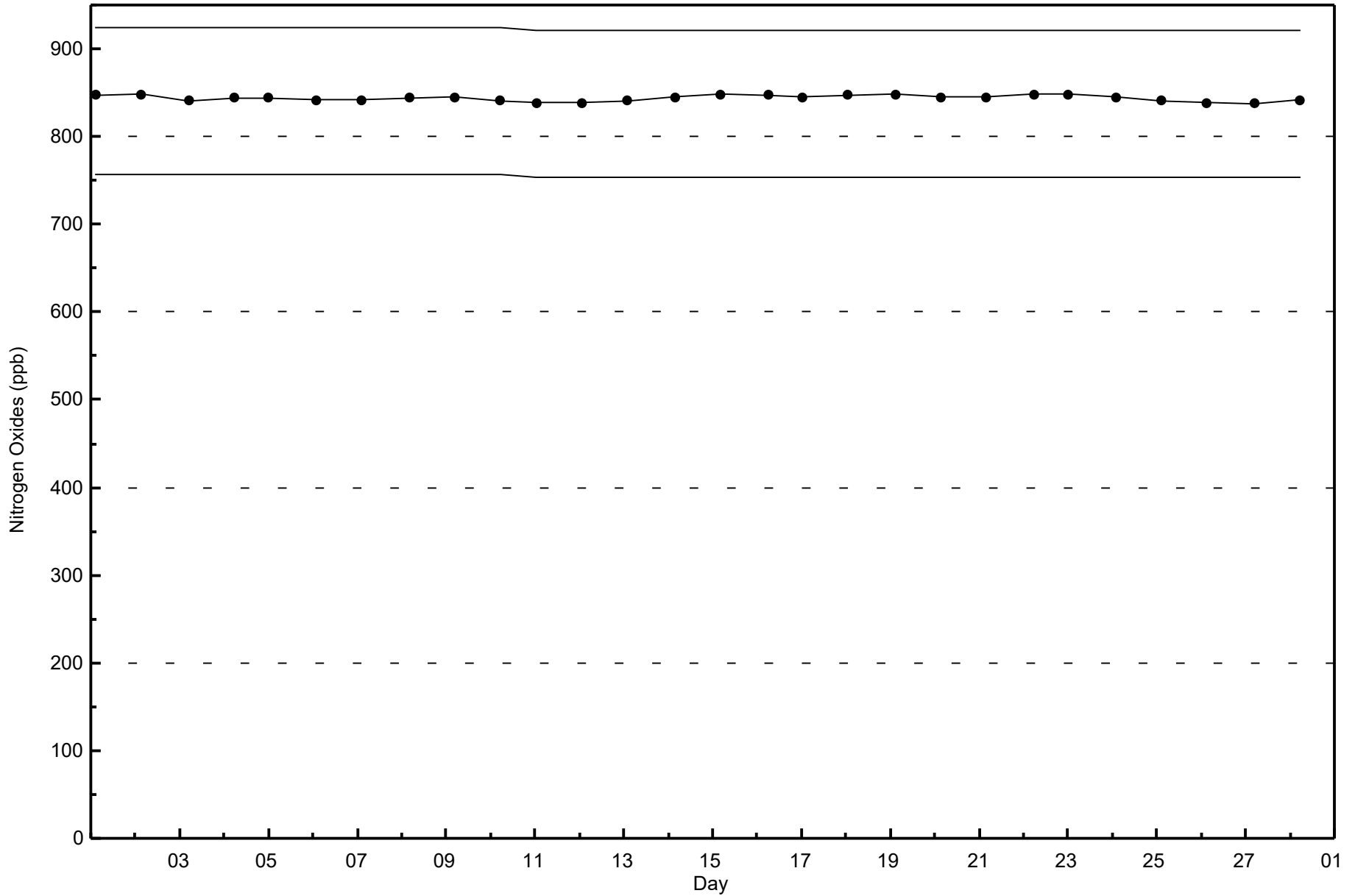
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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











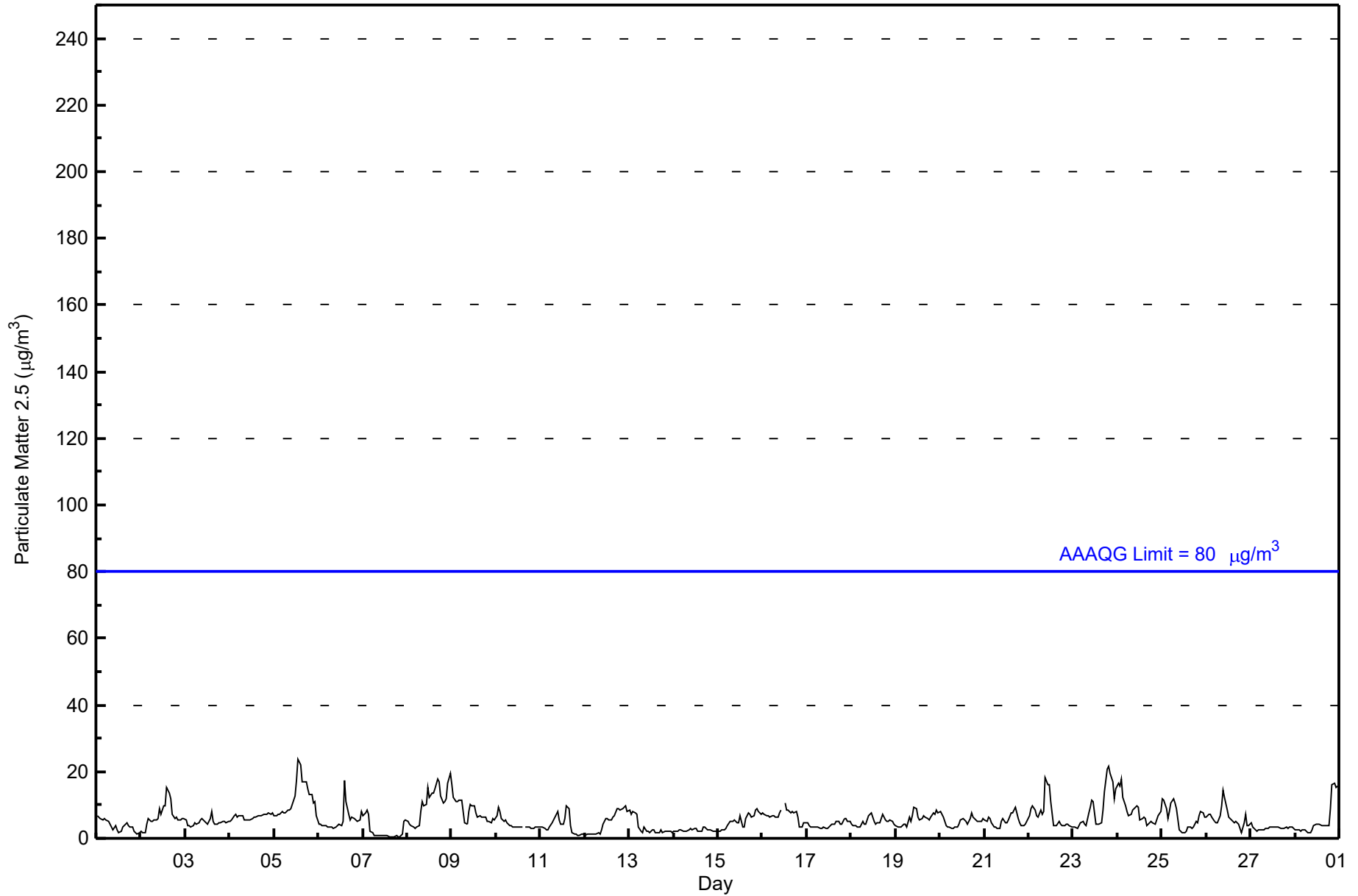
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort McKay South - February 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 23.8 µg/m <sup>3</sup> on Feb 5 14:00 Minimum Value: 0.4 µg/m <sup>3</sup> on Feb 7 21:00 Maximum Diurnal Average: 6.6 µg/m <sup>3</sup> at hour 15 Monthly Average: 5.78 µg/m <sup>3</sup>		Maximum Daily Average: 11.8 µg/m <sup>3</sup> on Feb 5 Minimum Daily Average: 2.3 µg/m <sup>3</sup> on Feb 7 Minimum Diurnal Average: 4.7 µg/m <sup>3</sup> at hour 7 Percentiles: P <sub>1</sub> = 0.7 P <sub>10</sub> = 2.1 Q <sub>1</sub> = 3.3 Median = 5.0 Q <sub>3</sub> = 7.2 P <sub>90</sub> = 10.2 P <sub>99</sub> = 17.9		Hours in Service: 672 Hours of Data: 670 Hours of Missing Data: 2 Hours of Calibration: 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-Feb	6.7	6.5	5.8	5.7	5.7	5.5	5.2	4.2	3.3	2.6	3.7	2.6	1.7	2.2	3.4	4.0	4.7	3.7	3.6	3.3	2.2	1.5	1.2	1.7	3.8	6.7	
2-Feb	2.0	1.8	1.8	4.2	5.7	5.2	5.2	5.4	5.4	6.0	8.9	7.1	9.9	9.6	15.2	13.6	12.1	7.3	6.0	6.2	5.7	5.7	5.8	5.9	6.7	15.2	
3-Feb	5.5	3.8	3.7	3.6	3.6	4.8	4.2	4.7	5.4	5.9	5.0	4.6	4.4	5.8	8.2	5.3	4.4	4.2	4.5	4.6	4.9	5.0	4.9	5.0	4.8	8.2	
4-Feb	5.0	5.4	6.7	7.2	6.6	6.7	6.8	6.6	5.6	5.7	5.6	5.3	6.0	6.2	6.7	6.8	6.8	7.1	7.4	7.3	7.4	7.3	7.5	7.5	6.5	7.5	
5-Feb	6.9	6.8	7.1	7.2	7.9	7.8	7.7	8.3	8.6	8.9	10.2	12.5	17.3	23.8	22.0	17.1	16.8	16.8	14.8	13.2	13.3	10.7	10.9	6.7	11.8	23.8	
6-Feb	4.3	4.1	3.9	3.7	3.6	3.6	3.3	3.2	3.0	3.5	3.6	4.1	3.9	5.0	17.3	11.0	7.0	5.5	6.4	5.7	5.4	5.3	5.4	8.1	5.4	17.3	
7-Feb	6.7	7.6	8.4	7.3	2.1	1.5	1.0	0.8	0.6	0.8	0.9	0.8	0.7	0.7	0.6	0.5	0.5	0.5	0.8	0.5	0.4	1.3	5.2	5.5	2.3	8.4	
8-Feb	5.1	4.3	3.8	3.4	3.1	3.2	3.7	8.0	11.2	9.6	10.0	15.2	12.4	13.6	13.8	14.7	17.8	16.7	12.7	10.5	11.0	11.7	16.5	19.4	10.5	19.4	
9-Feb	16.3	12.1	11.1	11.1	11.6	11.3	7.9	4.6	4.3	8.1	10.3	9.7	9.6	7.7	6.2	6.6	6.2	6.3	6.4	5.2	4.9	4.8	5.9	5.4	8.1	16.3	
10-Feb	6.8	9.5	7.9	6.0	5.1	5.4	4.8	3.6	3.7	3.5	3.3	3.5	3.4	3.5	3.4	PF	3.2	3.3	3.3	3.1	3.2	3.4	3.5	3.3	4.3	9.5	
11-Feb	3.3	3.2	3.1	2.7	2.6	3.5	4.6	5.4	6.3	8.0	5.6	4.2	4.0	5.8	9.6	9.0	3.8	1.6	1.5	1.1	0.8	0.9	1.1	1.3	3.9	9.6	
12-Feb	1.0	1.1	1.1	1.4	1.4	1.3	1.5	1.5	1.3	2.7	4.3	5.9	5.9	5.6	5.6	6.2	6.9	8.8	8.8	8.7	9.1	9.1	9.6	7.9	4.9	9.6	
13-Feb	8.3	7.2	8.3	7.4	7.1	3.5	2.2	1.8	3.2	1.9	2.0	1.9	2.3	2.5	1.8	1.7	1.9	2.4	1.7	2.1	2.3	2.2	2.0	1.7	3.3	8.3	
14-Feb	2.1	1.9	2.1	2.5	2.7	2.2	2.0	2.3	2.5	2.9	2.7	3.2	2.9	2.1	2.0	2.1	3.2	3.2	2.7	2.5	2.4	2.3	2.2	2.1	2.4	3.2	
15-Feb	2.0	2.0	2.7	2.5	3.0	3.6	5.1	5.1	5.2	5.5	4.5	4.5	6.9	3.3	3.3	6.0	7.7	7.2	6.5	6.8	8.3	8.7	8.0	7.4	5.2	8.7	
16-Feb	7.6	7.0	6.6	6.7	6.5	6.9	6.8	6.5	6.5	7.7	8.5	C	10.7	8.3	8.4	7.8	8.0	7.5	8.2	6.5	3.2	3.5	4.5	4.6	6.9	10.7	
17-Feb	4.8	3.6	3.2	3.5	3.2	3.4	3.3	2.9	3.1	3.2	2.9	3.2	3.4	4.1	4.1	4.2	5.0	5.2	4.4	4.3	5.9	6.0	5.2	4.9	4.0	6.0	
18-Feb	4.4	4.0	3.7	3.6	3.5	3.5	4.9	4.3	4.2	6.6	7.4	7.5	5.0	4.1	4.5	4.6	5.9	7.1	5.5	5.2	5.2	5.4	5.0	4.4	5.0	7.5	
19-Feb	3.8	3.5	3.3	3.6	4.3	4.1	3.2	6.4	5.0	6.7	9.3	8.8	6.4	5.4	5.8	6.7	6.6	5.9	5.5	6.3	7.5	7.0	8.4	7.5	5.9	9.3	
20-Feb	7.9	7.4	6.5	3.7	3.4	3.4	2.9	3.1	3.3	3.6	4.3	5.4	6.0	5.7	5.0	4.1	6.0	7.7	6.4	5.7	5.3	5.0	5.0	6.1	5.1	7.9	
21-Feb	5.5	5.0	6.5	6.0	4.5	3.4	3.2	3.0	3.1	5.0	6.1	4.9	4.8	5.7	7.5	7.8	8.7	9.5	5.9	4.5	3.9	3.8	4.2	5.1	5.3	9.5	
22-Feb	6.8	9.0	9.8	8.7	6.7	6.5	8.7	7.2	8.1	18.1	16.3	16.1	10.9	4.0	3.7	4.0	4.9	4.0	4.0	3.9	4.4	4.2	3.7	3.4	7.4	18.1	
23-Feb	3.4	3.2	2.9	3.7	4.7	4.9	4.2	3.8	7.6	9.3	11.2	10.9	4.4	4.1	4.1	4.6	8.6	13.9	20.8	21.5	19.7	16.9	11.7	14.9	9.0	21.5	
24-Feb	16.7	15.8	17.8	12.3	9.7	7.9	6.9	7.1	8.5	8.8	9.9	9.3	5.6	5.9	6.2	5.9	4.0	4.5	5.3	4.6	4.3	5.6	6.8	8.1	8.2	17.8	
25-Feb	12.0	11.4	9.0	6.1	8.1	10.5	12.0	10.6	8.7	2.5	1.9	1.6	1.7	2.2	3.3	3.2	2.9	3.4	4.9	4.7	6.8	8.0	7.5	6.5	6.2	12.0	
26-Feb	6.4	7.2	7.3	6.3	5.1	4.6	4.8	6.8	9.8	14.2	12.1	8.3	6.4	5.9	4.9	4.7	5.1	4.1	2.8	1.7	4.8	7.0	3.6	4.0	6.2	14.2	
27-Feb	4.6	3.5	2.8	2.3	2.6	2.7	2.6	2.5	3.0	3.1	3.3	3.4	3.6	3.5	3.5	3.3	3.0	3.2	3.1	3.3	2.9	3.2	3.2	3.1	3.1	4.6	
28-Feb	2.5	2.4	2.5	2.3	2.4	2.4	1.9	1.7	1.8	2.4	3.9	4.3	4.4	4.0	3.9	3.9	3.9	3.6	3.6	8.9	16.0	16.7	15.3	15.7	5.4	16.7	
																								Diurnal Average		Diurnal Maximum	
6.0 5.7 5.7 5.2 4.9 4.8 4.7 4.7 5.1 6.0 6.4 6.2 5.9 5.7 6.6 6.3 6.3 6.2 6.0 5.8 6.1 6.2 6.2 6.3																								16.7		18.1	
16.7 15.8 17.8 12.3 11.6 11.3 12.0 10.6 11.2 18.1 16.3 16.1 17.3 23.8 22.0 17.1 17.8 16.8 20.8 21.5 19.7 16.9 16.5 19.4																								16.7		18.1	
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>) -  $\mu\text{g}/\text{m}^3$**   
**Fort McKay South - February 2023**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	383	57.16	57.16
6 - 15	262	39.10	96.27
16 - 25	25	3.73	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 670

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>  
Fort McKay South - February 2023**

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	103	50	11	2	2	2	6	19	24	9	28	52	25	16	12	18	379
6 - 15	62	22	1	1	1	4	15	34	37	18	15	10	5	6	12	19	262
16 - 25	0	0	0	0	0	2	3	0	4	2	8	6	0	0	0	0	25
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>	165	72	12	3	3	8	24	53	65	29	51	68	30	22	24	37	666

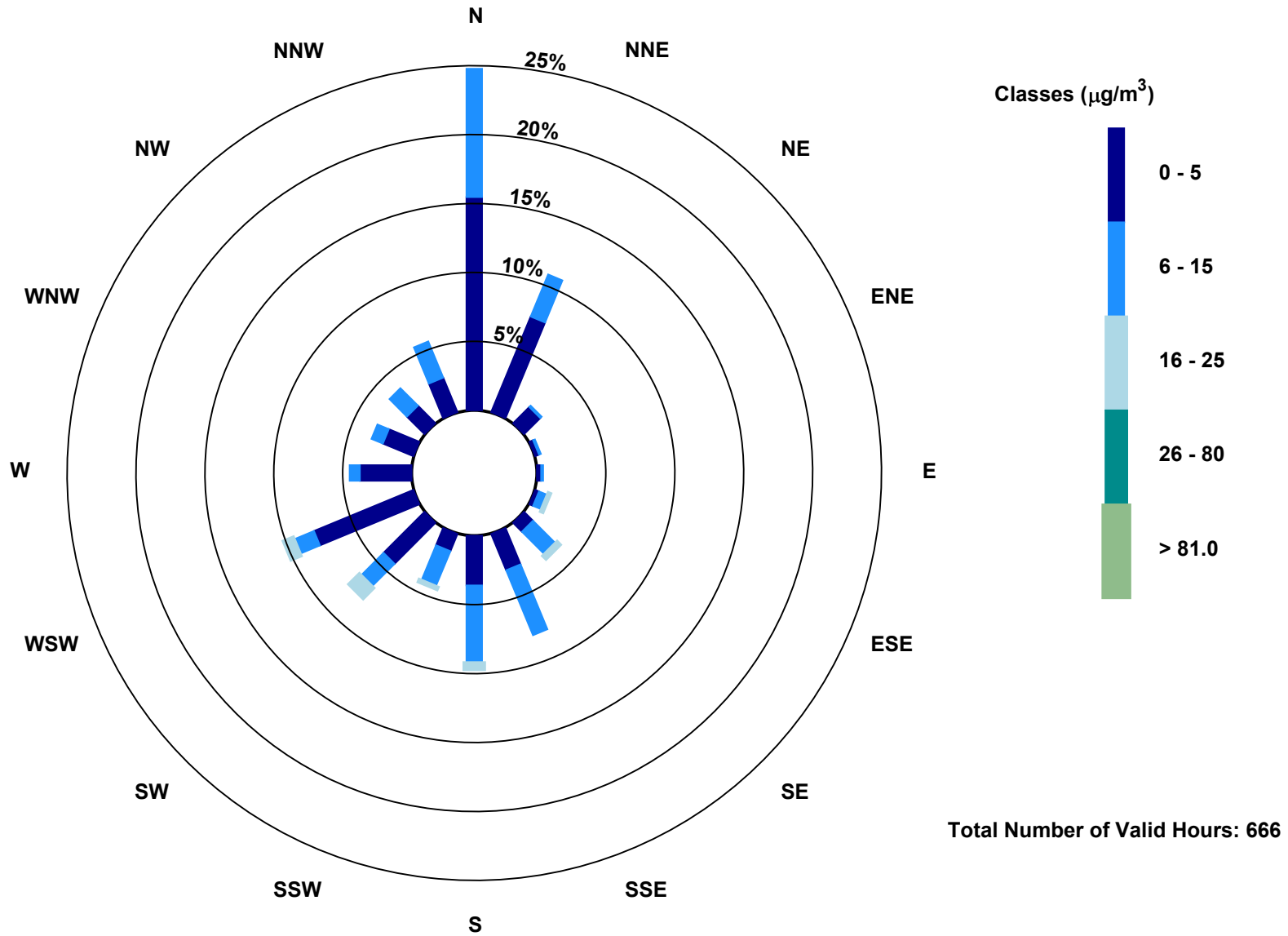
Total Number of Valid Hours: 666

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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**

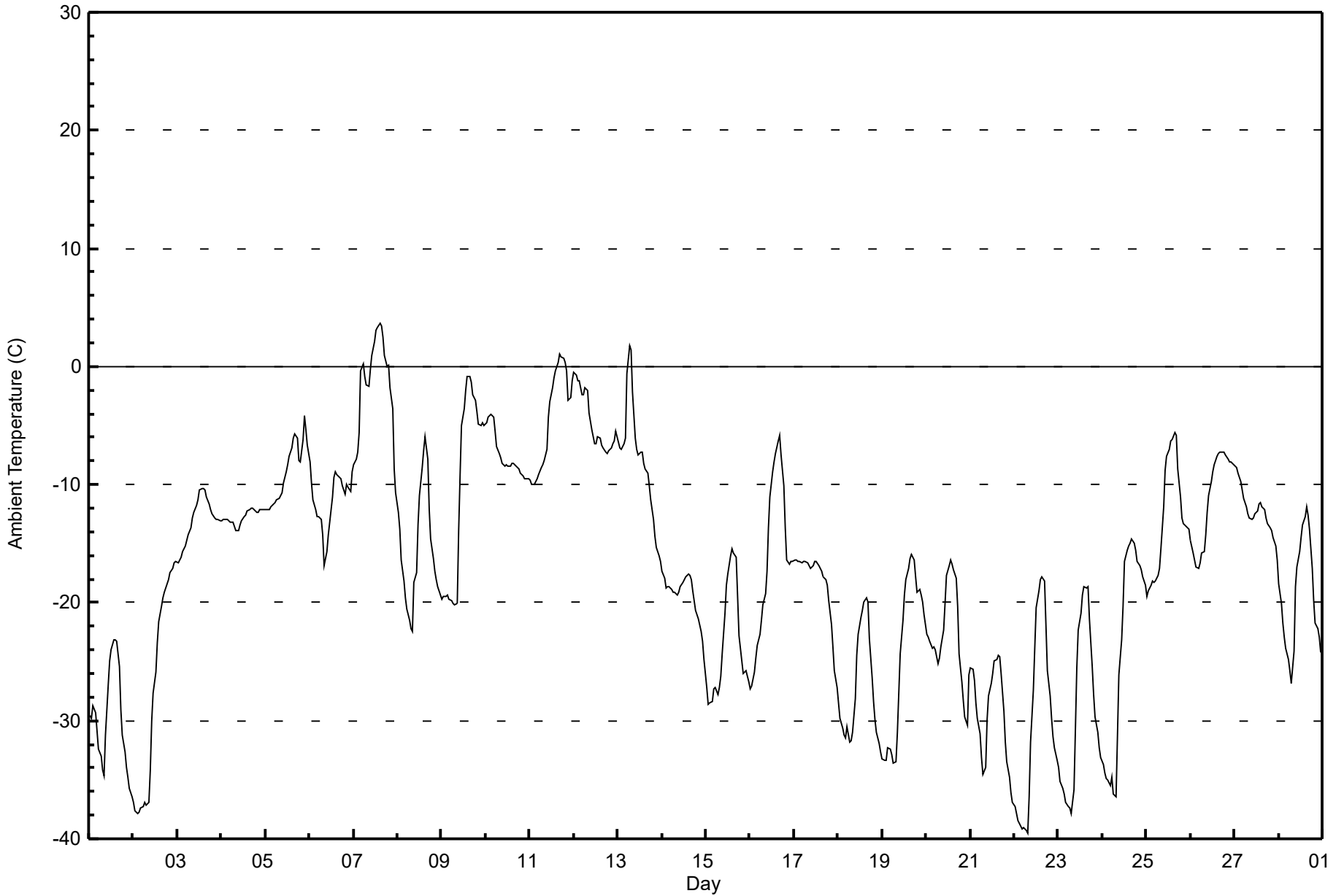
**Ambient Temperature (AT) - C**  
**Fort McKay South - February 2023**

Maximum Value: 3.6 C on Feb 7 15:00		Maximum Daily Average: -1.6 C on Feb 7		Hours in Service: 672																							
Minimum Value: -39.5 C on Feb 22 08:00		Minimum Daily Average: -30.2 C on Feb 22		Hours of Data: 672																							
Maximum Diurnal Average: -11.8 C at hour 16		Minimum Diurnal Average: -20.6 C at hour 8		Hours of Missing Data: 0																							
Monthly Average: -16.99 C		Percentiles: P <sub>1</sub> = -37.9 P <sub>10</sub> = -31.9 Q <sub>1</sub> = -23.8 Median = -16.5 Q <sub>3</sub> = -9.3 P <sub>90</sub> = -5.5 P <sub>99</sub> = 1.5		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-Feb	-29.5	-29.8	-28.7	-29.3	-30.9	-32.4	-33.0	-34.2	-34.7	-31.3	-26.9	-25.0	-24.0	-23.2	-23.1	-23.2	-25.4	-29.1	-31.2	-32.7	-33.9	-34.8	-35.7	-36.5	-29.9	-23.1	
2-Feb	-36.9	-37.7	-37.8	-37.7	-37.3	-37.3	-36.9	-37.2	-37.0	-34.2	-30.0	-27.6	-25.9	-23.4	-21.6	-20.3	-19.6	-19.1	-18.4	-18.0	-17.5	-17.1	-16.7	-16.5	-27.6	-16.5	
3-Feb	-16.6	-16.4	-16.1	-15.7	-15.2	-14.7	-14.3	-13.6	-12.9	-12.4	-11.8	-11.3	-10.5	-10.4	-10.3	-10.5	-11.1	-11.6	-12.1	-12.5	-12.8	-13.0	-13.0	-13.0	-13.0	-10.3	
4-Feb	-13.1	-13.0	-13.0	-13.0	-13.1	-13.1	-13.2	-13.5	-13.9	-13.8	-13.4	-13.1	-12.7	-12.6	-12.3	-12.1	-12.0	-12.0	-12.3	-12.4	-12.3	-12.1	-12.1	-12.1	-12.8	-12.0	
5-Feb	-12.2	-12.1	-12.1	-11.9	-11.6	-11.5	-11.3	-11.1	-10.9	-10.7	-9.9	-8.9	-8.3	-7.6	-6.9	-6.0	-5.8	-6.0	-7.9	-8.1	-6.2	-4.2	-5.4	-6.7	-8.9	-4.2	
6-Feb	-8.1	-9.8	-11.3	-12.2	-12.7	-12.8	-13.0	-14.3	-16.9	-15.6	-14.3	-13.2	-11.0	-9.4	-8.9	-9.1	-9.3	-9.5	-10.1	-10.8	-10.0	-10.2	-10.6	-8.9	-11.3	-8.1	
7-Feb	-8.3	-7.9	-7.2	-5.6	-0.4	0.2	-0.9	-1.5	-1.6	-0.2	0.9	2.2	3.1	3.3	3.6	3.4	2.5	0.9	0.0	0.1	-1.8	-3.6	-8.7	-10.7	-1.6	3.6	
8-Feb	-12.4	-13.7	-16.4	-18.2	-19.6	-20.6	-21.5	-22.2	-22.4	-18.3	-17.4	-13.5	-10.9	-8.6	-7.1	-6.0	-7.9	-12.1	-14.6	-16.3	-17.3	-18.1	-18.7	-19.3	-15.5	-6.0	
9-Feb	-19.7	-19.5	-19.4	-19.4	-19.7	-19.8	-20.0	-20.1	-20.0	-13.9	-9.2	-5.0	-3.5	-2.1	-0.8	-0.8	-1.3	-2.4	-2.9	-3.8	-4.9	-5.0	-4.8	-5.0	-10.1	-0.8	
10-Feb	-4.8	-4.3	-4.1	-4.1	-4.3	-5.5	-6.7	-7.3	-7.7	-8.2	-8.5	-8.3	-8.4	-8.5	-8.3	-8.2	-8.3	-8.5	-8.7	-9.0	-9.3	-9.4	-9.5	-9.5	-7.5	-4.1	
11-Feb	-9.7	-10.0	-9.9	-9.8	-9.5	-9.1	-8.6	-8.4	-8.0	-7.0	-4.3	-3.0	-1.8	-1.0	-0.3	0.3	1.1	0.8	0.6	0.4	-0.3	-2.9	-2.6	-1.2	-4.3	1.1	
12-Feb	-0.5	-0.7	-1.2	-1.2	-2.4	-2.4	-1.8	-2.0	-4.0	-4.6	-5.4	-6.5	-6.5	-6.0	-6.1	-6.6	-6.9	-7.2	-7.4	-7.2	-6.9	-6.6	-6.3	-5.5	-4.7	-0.5	
13-Feb	-6.5	-6.9	-7.0	-6.6	-6.0	-0.6	1.8	1.4	-2.2	-6.0	-7.1	-7.5	-7.3	-7.3	-8.2	-8.6	-9.0	-10.1	-11.3	-13.0	-14.4	-15.4	-16.0	-16.6	-7.9	1.8	
14-Feb	-17.3	-18.0	-18.7	-18.7	-18.7	-18.8	-19.1	-19.2	-19.3	-19.1	-18.6	-18.3	-18.1	-17.8	-17.5	-17.7	-18.0	-18.9	-20.7	-21.0	-21.4	-22.4	-23.2	-24.8	-19.4	-17.3	
15-Feb	-27.2	-28.6	-28.5	-28.4	-27.3	-27.2	-27.8	-27.1	-26.2	-24.3	-20.9	-18.5	-17.6	-16.1	-15.5	-15.8	-16.2	-19.4	-22.8	-25.0	-26.1	-25.9	-25.8	-26.7	-23.5	-15.5	
16-Feb	-27.3	-27.0	-25.9	-24.7	-23.7	-22.6	-21.5	-20.2	-19.2	-17.3	-13.6	-11.1	-8.9	-8.1	-7.4	-6.3	-5.8	-7.5	-10.1	-13.7	-16.4	-16.7	-16.6	-16.5	-16.2	-5.8	
17-Feb	-16.4	-16.4	-16.5	-16.5	-16.6	-16.6	-16.5	-16.6	-16.9	-17.0	-16.9	-16.5	-16.5	-16.9	-17.0	-17.3	-17.8	-18.1	-18.5	-19.9	-21.8	-23.8	-25.8	-27.2	-18.3	-16.4	
18-Feb	-28.5	-29.8	-30.6	-31.2	-31.5	-30.5	-31.8	-31.7	-31.0	-28.2	-24.5	-22.7	-21.3	-20.6	-20.0	-19.5	-19.9	-23.0	-26.3	-28.3	-29.9	-31.0	-32.0	-32.6	-27.4	-19.5	
19-Feb	-33.2	-33.4	-33.3	-32.3	-32.4	-32.8	-33.6	-33.5	-31.0	-27.6	-24.4	-21.5	-19.4	-18.1	-17.1	-16.3	-15.9	-16.4	-17.8	-19.2	-18.9	-19.4	-20.0	-21.0	-24.5	-15.9	
20-Feb	-22.7	-22.9	-23.3	-23.8	-23.8	-24.0	-25.2	-24.7	-23.7	-22.4	-20.1	-17.7	-16.8	-16.3	-16.8	-17.2	-17.9	-20.3	-24.4	-26.7	-28.3	-29.7	-30.4	-26.2	-22.7	-16.3	
21-Feb	-25.6	-25.6	-26.6	-28.5	-29.8	-31.1	-33.1	-34.5	-34.0	-29.9	-27.9	-26.9	-26.0	-24.9	-24.8	-24.4	-24.5	-26.0	-29.2	-31.9	-33.5	-34.8	-36.1	-36.9	-29.4	-24.4	
22-Feb	-37.3	-37.9	-38.5	-39.0	-39.1	-39.1	-39.3	-39.5	-36.5	-31.9	-27.5	-23.9	-20.4	-19.0	-18.0	-17.9	-18.1	-21.9	-25.7	-28.0	-29.8	-31.3	-32.2	-33.4	-30.2	-17.9	
23-Feb	-33.9	-35.1	-35.7	-36.2	-36.9	-37.3	-37.4	-37.9	-35.8	-30.8	-25.6	-22.3	-20.9	-19.4	-18.7	-18.8	-18.7	-21.3	-25.4	-27.8	-29.7	-31.0	-32.2	-33.2	-29.3	-18.7	
24-Feb	-33.7	-34.5	-34.8	-35.1	-35.5	-34.8	-36.2	-36.5	-31.3	-26.2	-23.2	-20.3	-16.5	-15.5	-15.3	-15.0	-14.7	-15.0	-15.6	-16.5	-16.8	-17.3	-17.8	-18.5	-24.0	-14.7	
25-Feb	-19.5	-18.9	-18.6	-18.2	-18.3	-18.2	-17.7	-17.1	-15.5	-11.9	-8.8	-7.6	-7.0	-6.3	-6.2	-5.6	-5.8	-8.7	-11.0	-12.8	-13.3	-13.4	-13.6	-13.8	-12.8	-5.6	
26-Feb	-14.7	-15.8	-16.4	-17.0	-17.1	-16.7	-15.8	-15.7	-14.3	-12.3	-10.9	-9.8	-9.0	-8.3	-7.6	-7.4	-7.3	-7.3	-7.2	-7.5	-7.8	-8.1	-8.1	-8.2	-11.3	-7.2	
27-Feb	-8.4	-8.6	-9.0	-9.7	-10.4	-11.1	-11.9	-12.5	-12.8	-12.9	-12.9	-12.5	-12.3	-11.7	-11.6	-11.9	-12.1	-12.8	-13.3	-13.6	-13.9	-14.4	-15.2	-16.4	-12.2	-8.4	
28-Feb	-18.4	-20.0	-21.7	-22.9	-23.8	-24.9	-25.8	-26.8	-24.1	-18.6	-17.0	-15.6	-14.5	-13.4	-12.7	-11.9	-12.6	-13.7	-17.1	-19.8	-21.7	-22.2	-22.9	-24.3	-19.4	-11.9	
		-19.4	-19.8	-20.1	-20.2	-20.3	-20.2	-20.4	-20.6	-20.1	-18.1	-16.1	-14.5	-13.3	-12.5	-12.0	-11.8	-12.1	-13.4	-15.1	-16.2	-17.0	-17.6	-18.3	-18.6	Diurnal Average	
		-0.5	-0.7	-1.2	-1.2	-0.4	0.2	1.8	1.4	-1.6	-0.2	0.9	2.2	3.1	3.3	3.6	3.4	2.5	0.9	0.6	0.4	-0.3	-2.9	-2.6	-1.2	Diurnal Maximum	



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

**Ambient Temperature (AT) - C**  
**Fort McKay South - February 2023**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Fort McKay South - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	222	33.04	33.04
-20 - 0	433	64.43	97.47
0 - 10	17	2.53	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Relative Humidity (RH) - %**

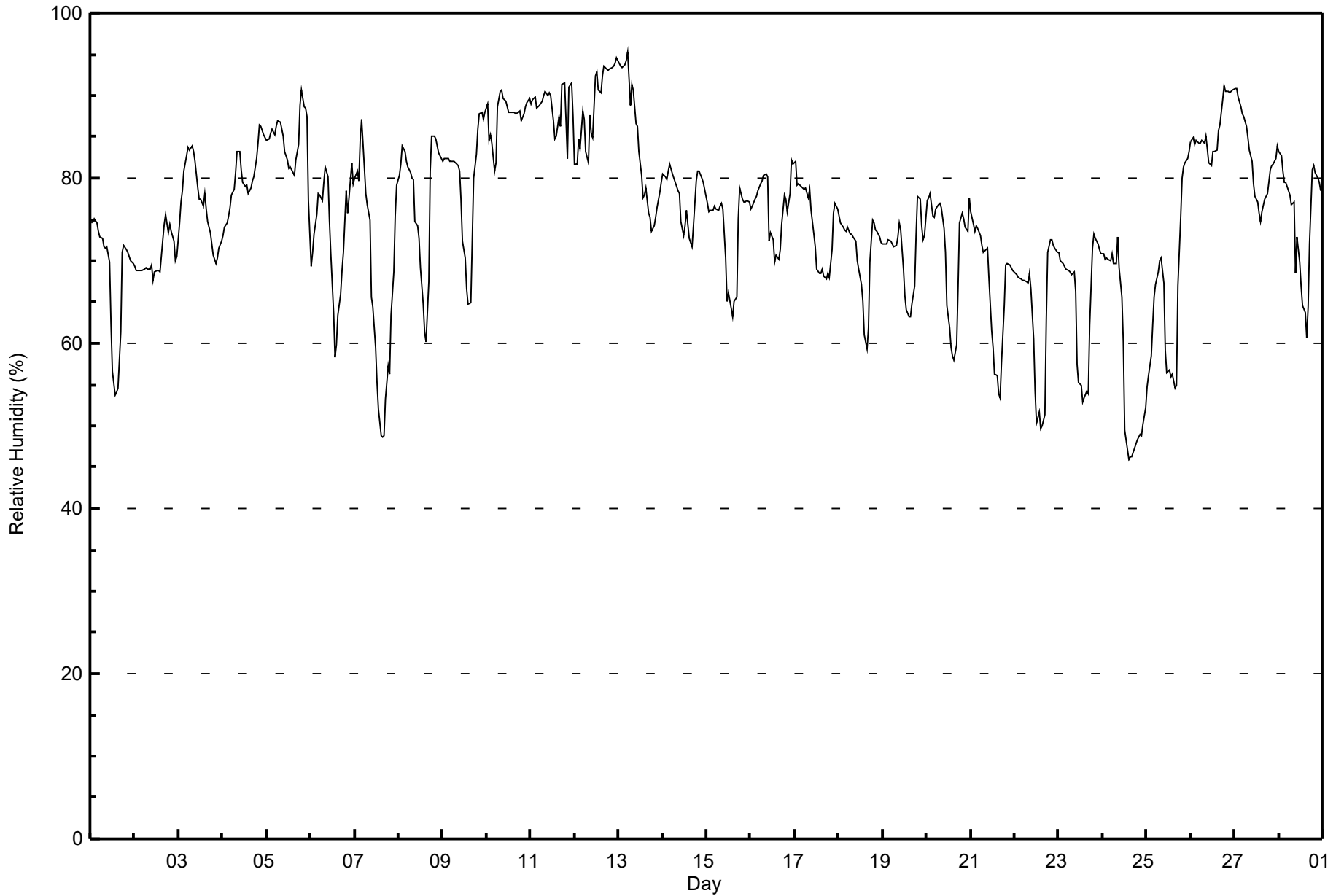
**Fort McKay South - February 2023**

Maximum Value: 95.3 % on Feb 13 06:00      Maximum Daily Average: 89.0 % on Feb 12																						Hours in Service: 672 Hours of Data: 672				
Minimum Value: 45.9 % on Feb 24 15:00      Minimum Daily Average: 58.7 % on Feb 24 Maximum Diurnal Average: 78.7 % at hour 9      Minimum Diurnal Average: 67.0 % at hour 15 Monthly Average: 75.26 %      Percentiles: P <sub>1</sub> = 48.5 P <sub>10</sub> = 61.5 Q <sub>1</sub> = 69.6 Median = 76.1 Q <sub>3</sub> = 82.1 P <sub>90</sub> = 88.0 P <sub>99</sub> = 93.5																						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-Feb	74.7	74.7	75.0	74.6	73.6	72.8	72.8	71.8	71.5	71.7	69.9	62.4	56.5	53.7	54.1	54.5	61.4	71.0	71.8	71.3	71.1	70.6	70.0	69.6	68.4	75.0
2-Feb	69.4	68.9	68.8	68.7	68.9	68.9	69.1	68.9	69.1	69.5	67.6	68.6	68.8	68.8	68.6	72.5	74.3	75.6	73.4	74.3	73.6	72.3	70.0	70.5	70.4	75.6
3-Feb	74.6	77.2	78.4	80.9	82.7	83.8	83.4	83.9	83.2	82.1	78.8	77.4	77.5	76.7	78.1	76.2	74.7	73.4	72.1	70.6	69.7	70.4	71.5	72.3	77.1	83.9
4-Feb	73.1	74.0	74.6	75.5	76.5	78.0	78.7	80.6	83.2	83.2	81.0	79.4	78.9	79.2	78.2	78.8	79.7	80.2	82.4	84.3	86.5	86.3	85.3	84.9	80.1	86.5
5-Feb	84.5	84.7	85.4	86.0	85.3	86.2	87.0	86.7	86.0	85.0	83.2	82.2	81.2	81.3	80.8	80.4	82.3	84.1	88.8	90.6	88.7	88.5	87.5	77.3	84.7	90.6
6-Feb	69.4	71.0	73.3	75.5	78.1	77.9	77.3	79.4	81.4	80.2	74.9	70.9	63.7	58.3	59.8	63.4	65.9	68.8	71.1	78.5	75.8	77.7	81.8	79.3	73.1	81.8
7-Feb	80.1	80.9	79.7	84.5	87.2	81.2	78.2	76.7	75.0	65.6	64.3	59.5	55.2	52.0	48.8	48.6	48.9	53.3	57.3	56.4	63.3	68.7	75.4	79.1	67.5	87.2
8-Feb	80.3	81.8	84.0	83.3	82.1	81.3	80.7	80.1	79.8	74.7	74.2	72.7	69.1	64.8	61.3	60.1	67.4	80.9	85.1	85.1	84.7	83.9	83.0	82.3	77.6	85.1
9-Feb	82.0	82.4	82.4	82.4	82.1	82.1	82.1	81.9	81.6	80.9	77.3	72.4	70.3	66.6	64.7	64.9	72.3	80.0	82.9	85.9	87.8	88.0	87.2	88.0	79.5	88.0
10-Feb	88.9	84.5	85.3	84.3	80.9	81.8	88.6	90.5	90.7	89.6	89.4	88.6	88.0	88.0	87.9	88.1	87.8	88.1	88.2	87.0	87.7	88.6	89.2	89.6	87.6	90.7
11-Feb	89.0	89.6	89.8	88.5	88.7	88.8	89.3	90.0	90.5	89.9	90.4	90.0	86.9	84.8	85.2	87.5	86.2	91.4	91.6	87.0	82.3	90.9	91.5	87.5	88.6	91.6
12-Feb	81.7	81.6	84.7	83.6	88.1	87.2	83.2	81.9	87.6	85.5	84.8	92.4	92.9	90.7	90.4	92.3	93.5	93.2	93.0	93.2	93.3	93.6	93.9	94.6	89.0	94.6
13-Feb	93.9	93.5	93.4	93.7	94.2	95.3	88.9	91.3	90.6	86.6	86.3	83.3	80.3	77.6	78.1	78.9	75.7	75.2	73.5	74.2	75.3	76.4	78.2	79.6	83.9	95.3
14-Feb	80.5	80.2	79.9	80.8	81.6	80.6	80.0	79.4	78.5	78.1	74.8	73.0	74.2	76.1	72.7	72.3	71.7	74.2	79.6	80.9	80.8	80.1	79.5	78.6	77.8	81.6
15-Feb	76.9	76.0	76.2	76.1	76.6	76.3	76.0	76.6	76.9	76.2	70.3	65.1	66.1	64.3	63.1	65.1	65.6	75.0	78.8	77.4	77.1	77.1	77.3	77.1	73.5	78.8
16-Feb	76.3	76.6	77.4	77.9	78.5	79.2	79.6	80.4	80.6	80.1	72.4	73.4	72.6	69.9	70.7	70.2	71.4	74.5	78.0	77.5	75.9	78.1	82.3	81.7	76.5	82.3
17-Feb	82.1	79.2	79.3	79.1	78.8	78.6	78.8	77.7	78.7	76.1	73.3	71.7	69.0	68.5	68.5	68.9	68.1	67.9	68.4	67.9	71.3	75.8	76.9	76.3	74.2	82.1
18-Feb	75.5	74.6	74.0	73.7	73.6	74.1	73.2	73.3	73.0	72.3	70.0	68.9	67.1	65.1	61.1	59.3	61.9	69.8	74.9	74.6	73.7	73.5	72.8	72.2	70.9	75.5
19-Feb	72.1	72.0	72.0	72.6	72.4	72.1	71.6	71.9	72.9	74.5	73.8	69.0	65.8	64.1	63.1	63.2	64.7	66.9	73.1	77.8	77.5	74.3	72.5	73.0	71.0	77.8
20-Feb	77.2	77.7	78.2	75.4	75.2	76.2	76.8	77.0	76.4	74.0	71.1	64.6	61.9	59.5	58.5	57.9	59.9	66.8	74.6	75.7	75.2	74.1	73.6	77.6	71.5	78.2
21-Feb	76.0	74.3	73.6	74.3	73.9	73.0	71.8	71.0	71.3	71.5	68.0	61.5	59.5	56.3	56.1	53.9	53.3	57.7	64.5	69.4	69.7	69.6	69.1	68.9	67.0	76.0
22-Feb	68.5	68.3	68.0	67.8	67.7	67.7	67.5	67.4	68.5	66.7	60.5	54.2	50.4	51.7	49.7	50.0	51.4	63.0	71.0	72.6	72.5	71.9	71.6	70.9	64.1	72.6
23-Feb	70.9	70.0	69.7	69.4	68.9	68.8	68.7	68.4	68.7	66.3	57.5	55.3	54.9	52.9	53.3	54.2	54.0	62.3	71.5	73.3	72.7	72.0	71.4	70.8	65.2	73.3
24-Feb	70.9	70.2	70.3	70.2	70.0	70.8	69.6	69.6	72.8	69.1	65.6	60.1	49.5	47.2	45.9	46.3	46.2	47.4	47.8	48.4	48.9	48.8	50.2	52.3	58.7	72.8
25-Feb	54.7	56.0	58.5	62.1	65.6	67.1	68.6	69.9	70.4	67.3	59.1	56.5	56.8	55.9	56.3	54.6	54.9	66.9	75.3	80.0	81.3	81.8	82.4	83.2	66.1	83.2
26-Feb	84.5	84.9	84.1	84.6	84.2	84.2	84.6	84.3	85.2	83.6	81.8	81.5	83.2	83.5	85.8	86.4	89.5	91.2	90.6	90.5	90.3	90.6	90.7	85.9	91.2	
27-Feb	90.8	90.8	89.9	88.7	87.9	87.5	86.3	84.8	83.5	82.0	79.4	77.9	77.2	75.7	74.7	76.0	77.5	77.8	78.2	80.9	81.6	81.6	82.5	83.8	82.4	90.8
28-Feb	83.2	82.7	80.8	79.5	79.5	78.5	78.0	76.8	77.1	68.5	72.8	69.8	67.0	64.6	63.7	60.7	64.5	72.0	80.9	81.5	80.8	79.9	79.6	78.6	75.0	83.2
77.9 77.8 78.1 78.3 78.7 78.6 78.2 78.3 78.7 76.8 74.0 71.5 69.4 67.8 67.0 67.3 68.6 73.1 76.4 77.4 77.5 78.0 78.5 78.2																								Diurnal Average		
93.9 93.5 93.4 93.7 94.2 95.3 89.3 91.3 90.7 89.9 90.4 92.4 92.9 90.7 90.4 92.3 93.5 93.2 93.0 93.2 93.3 93.6 93.9 94.6																								Diurnal Maximum		



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

**Relative Humidity (RH) - %**  
**Fort McKay South - February 2023**





Maximum Speed: 29 km/h on Feb 13 14:00	Maximum Daily Speed Average: 12.1 km/h on Feb 13	Hours in Service: 672
Minimum Speed Value: 0 km/h on Feb 25 23:00	Minimum Daily Speed Average: 0.3 km/h on Feb 22	Hours of Data: 668
Maximum Diurnal Speed Average: 2.9 km/h at hour 11	Minimum Diurnal Speed Average: 0.6 km/h at hour 3	Hours of Missing Data: 4
Monthly Average Velocity: 1.4 km/h 350.4 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 1 Q <sub>1</sub> = 2 Median = 5 Q <sub>3</sub> = 9 P <sub>90</sub> = 12 P <sub>99</sub> = 22	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-Feb	SW2	WSW3	NNW2	WSW2	WNW2	NW3	NW3	W2	W3	WNW3	N4	NW8	NW9	NNW10	N9	NNE6	NE3	WNW2	WSW4	WSW2	WSW1	WSW1	WNW1	S3	NW2.4	NNW10
2-Feb	SW1	SW2	SW2	SSW2	SSW2	SW2	SW1	SW1	SSW2	S2	SSE3	SSE9	ESE4	S8	SSE11	SSE14	SSE18	SSE16	SSE24	SSE24	SSE21	SSE19	SSE19	SSE22	SSE9.2	SSE24
3-Feb	SSE21	SSE18	SSE15	SSE14	SSE13	SSE11	SSE10	SSE8	S4	SW4	SSW3	N3	N6	N9	N10	NNE9	NNE8	NNE8	NE6	NE5	NNE6	NNE5	ENE2	N5	SE2.6	SSE21
4-Feb	N5	N5	N5	N7	N5	NNE6	N8	N9	N9	N9	N10	N10	N10	N9	N6	N5	N4	N4	N7	N6	N6	NNW6	NNW5	NNW3	N6.6	N10
5-Feb	NNW4	N3	S0	N2	NW1	N4	N3	NNW4	NNW2	NW2	SSE3	SE2	SE6	S5	S6	SW4	SW1	SSW2	S3	S5	SSW4	WSW7	NNW14	NW10	W0.9	NNW14
6-Feb	W13	W13	SW5	SW6	SW6	WSW6	WSW7	WSW7	NW5	N7	N7	NNW6	SSE3	SE2	ESE3	NNE4	N5	NNE6	N5	WNW1	NNE3	SE1	SSE4	S3	WNW2.2	W13
7-Feb	S3	SSE5	S6	SW5	WSW10	W12	W8	WSW6	W6	SW9	WSW8	SW10	WSW10	WSW17	WSW14	W11	W10	WSW8	WSW7	W8	NW5	NNW8	N14	N12	W6.3	WSW17
8-Feb	N9	N5	SW2	SW3	SW2	W1	W1	W1	WNW1	ESE0	SE2	SE5	SSE9	SE9	SE8	SSE7	S2	WSW2	WSW1	WSW3	SW2	WSW2	SW2	SW2	S1.4	SE9
9-Feb	WSW1	WSW1	WSW2	SSW2	SSW2	SW1	SSW3	SSW3	S5	S5	SSE4	SE9	SSE11	SSE9	SSE9	SE4	SSW2	NNW4	NNW2	WSW2	WSW1	S3	NW1	S2	S2.7	SSE11
10-Feb	SW1	N5	NNW6	N8	N13	N13	N11	N11	N10	N11	N11	N11	N12	N11	N12	N12	N12	N10	N9	N10	N7	N6	NNE4	NE3	N8.9	N13
11-Feb	NNE2	N2	E1	SSE4	S5	SSE4	S3	S3	S4	S4	S7	S11	S12	SSE11	SSE9	S4	SW9	WSW7	W5	W8	WNW8	SW4	SW7	SW8	SSW4.2	S12
12-Feb	WSW11	W11	W9	SW6	S4	WSW6	W10	W7	N5	N7	N11	NNE8	NNE6	N6	N6	N8	N9	N7	N5	N4	NNE1	E2	N1	SSW4	NW3.2	WSW11
13-Feb	NNW4	N4	SSW2	N2	SSW4	WSW10	WSW10	WNW8	N17	N18	N21	N25	N27	N29	N26	N21	N22	N16	N14	NNE9	NNE10	NNE11	NNE15	N13	N12.1	N29
14-Feb	N12	N12	N10	N6	N5	NNE6	NNE6	NNE6	NNE5	NNE4	NNE5	NNE5	N6	N6	N7	N9	NNE8	N6	NW2	WNW2	WNW2	WNW2	W2	W1	N5.1	N12
15-Feb	SW2	WSW2	WNW1	WNW2	WSW1	WSW2	WNW1	WSW2	WSW1	SSE1	ESE3	SSE4	SE7	S9	SSE8	SSE9	S3	WSW3	SW3	WSW1	W1	WNW1	NW1		S2.2	SSE9
16-Feb	SW2	NW1	NNW0	W1	N2	NNE2	SE1	SE1	S1	ESE1	SE3	SE4	S9	SSW7	SSW6	S4	N2	N12	NNE14	NNE15	NNE11	NNE7	NNE4	NNE4	NNE1.7	NNE15
17-Feb	NE3	NE4	NE3	NNE4	NNW3	N2	ENE2	NE4	NNE7	NNE7	NNE8	N8	N12	N13	N11	N13	N13	N10	NNE11	N10	N9	N5	NNW4	NW2	N6.7	N13
18-Feb	UO	WSW2	WSW2	WSW1	NNW2	WNW1	N2	UO	S2	NNE2	NNE4	NNE5	NNE6	N8	N8	N7	N7	NNW5	NW3	WSW2	WSW3	WSW1	WSW2	WSW1	N2.2	N8
19-Feb	WSW1	WSW1	UO	W1	NNW1	WNW1	NW1	WNW0	S2	N4	NNE4	NE5	NNW3	NNE6	NNE6	N6	NNW7	NW4	NNW3	NW3	NNW6	N7	N10	N7	N3.3	N10
20-Feb	N4	N3	ENE2	NE3	SE1	S1	S2	S2	S2	SE1	SE5	NE2	NNE4	N8	NNE11	NNE10	N8	N5	WNW2	W3	WSW1	WNW2	NW2	NNW9	N2.2	NNE11
21-Feb	N9	N11	N9	NNE3	NNE4	N3	W2	WSW3	WSW1	NNW5	NNE8	NNE9	NNE9	NNE10	NNE12	N12	NNE8	N5	NW3	WNW3	WSW4	WSW3	SSW2	SW2	N4.5	NNE12
22-Feb	SW2	SW1	SSW2	SW1	SSW1	SSW2	SW2	SSW3	S2	SE5	ESE3	SE3	SE2	NNE4	N5	N7	NNW6	NNW4	W3	SW2	W2	WSW2	WSW1	SW1	W0.3	NNE7
23-Feb	NNW2	WSW1	SW1	SW1	SSW1	SW1	WSW2	NNW1	SE1	ESE1	SE2	SE4	SSE4	SE4	SSE6	SSE8	SSE7	S5	SW2	WSW1	WSW2	WSW2	SW2	SW2	S1.9	SSE8
24-Feb	WSW1	SSW2	S3	SSW2	S4	S6	S7	S7	S9	SSE7	SSE13	SSE14	S19	S20	S22	S21	S20	S16	S16	S17	S16	S17	S15	S10	S11.6	S22
25-Feb	S9	S10	S9	SSE8	SSE6	S6	SSE5	S6	SSE7	WSW5	WNW8	WSW10	SW9	S11	SSE11	SSE10	SE6	S5	SSW2	SSW2	SSW2	S2	W0	NW1	S5.1	SSE11
26-Feb	NW1	NNW2	SW2	NW2	NNW1	N2	N4	N4	N6	N7	NNE7	NNE7	N8	N12	N14	N13	N12	N10	NNE5	NNE8	N10	N8	N9	N7	N6.3	N14
27-Feb	N7	N8	N12	N13	N14	N12	N12	N13	N16	N14	N16	N15	N13	N13	N14	NNE13	NNE11	NNE11	N10	N8	N9	N9	NNW9	NNW7	N11.5	N16
28-Feb	NW4	NNW3	SW1	WSW3	W1	WSW2	W1	WSW1	NNW1	NNE2	N8	NNE9	NNE8	NNE6	NE5	NNE2	E1	N2	UO	SW2	SW1	SW2	S1	SW1	N1.6	NNE9
WNW1.4 NW1.4 W0.6 W0.6 W0.8WNW1.3WNW1.3WNW1.3 N1.4 N2.2NNE2.9NNE2.6NNE1.8NNE2.3NNE2.7NNE2.9 N2.8 N2.7NNW1.6 NW1.0NNW1.3NNW0.9NNW1.4 NW1.1																								Diurnal Average		
SSE21 SSE18 SSE15 SSE14 N14 N13 N12 N13 N17 N18 N21 N25 N27 N29 N26 N21 N22 S16 SSE24 SSE24 SSE21 SSE19 SSE19 SSE22																								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**

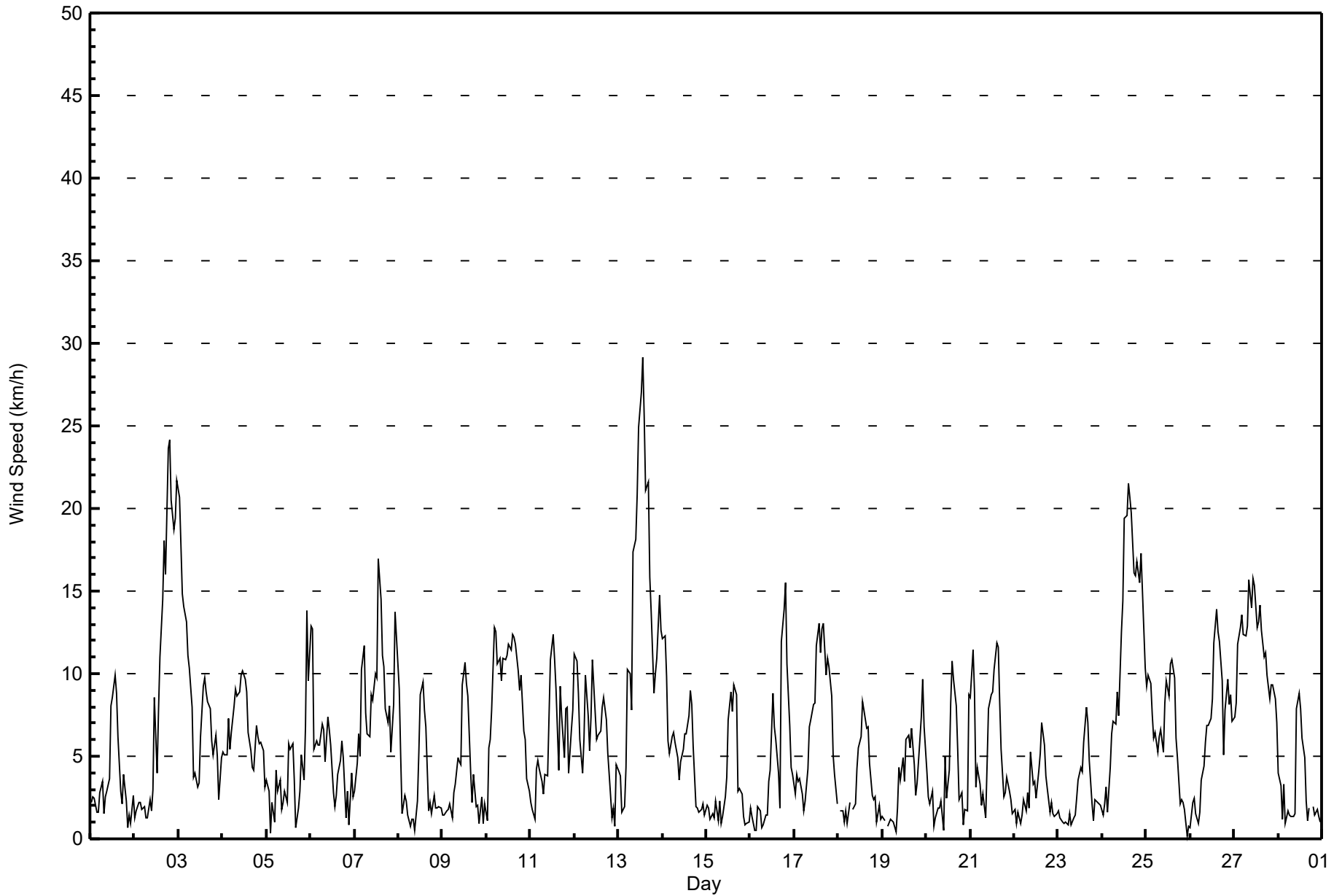
**Wind Speed (WS) - km/h**  
**Fort McKay South - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Feb 13 13:00														Hours in Service: 672 Hours of Data: 668 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.4												
Minimum Value: 0 km/h on Feb 20 19:00																										
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																										
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-Feb	1	1	1	1	1	2	2	1	1	1	1	3	3	3	3	2	1	1	1	1	1	1	1	1	1	3
2-Feb	1	1	1	1	1	1	1	1	2	1	2	2	1	1	4	3	4	4	5	5	5	5	4	4	4	5
3-Feb	4	3	3	3	2	2	2	2	1	2	2	2	3	2	2	2	2	2	2	2	2	1	1	2	4	4
4-Feb	1	1	1	2	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2
5-Feb	1	1	1	1	1	1	1	1	1	2	1	2	1	2	2	2	1	1	1	1	2	2	4	3	4	4
6-Feb	4	4	2	2	2	2	2	1	2	2	1	1	1	2	1	2	1	1	2	1	1	1	1	1	1	4
7-Feb	1	2	2	3	4	5	3	2	2	4	3	4	4	5	5	5	4	3	3	3	2	6	3	2	6	
8-Feb	3	3	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	3
9-Feb	1	1	1	1	1	1	1	1	1	1	2	3	2	2	3	1	2	1	1	1	1	1	1	2	3	3
10-Feb	2	1	1	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	3
11-Feb	1	1	1	1	1	1	1	1	1	1	2	2	3	2	1	2	4	3	2	3	4	1	3	3	4	4
12-Feb	4	4	3	2	1	2	3	2	1	1	2	2	2	1	1	1	1	1	2	1	1	1	2	2	4	4
13-Feb	1	2	1	1	2	5	4	4	4	4	5	6	7	6	6	6	5	5	3	2	2	3	4	3	7	4
14-Feb	3	4	3	2	2	1	1	2	2	1	1	2	1	2	2	2	1	1	1	1	1	1	1	1	1	4
15-Feb	1	1	2	1	1	1	1	1	1	1	1	1	3	2	2	1	1	2	1	1	1	1	1	1	1	3
16-Feb	1	1	1	1	1	2	1	1	1	1	1	2	3	1	2	1	2	3	3	3	3	2	1	1	3	3
17-Feb	1	1	2	1	1	2	1	1	2	2	2	2	2	2	2	3	3	3	2	2	2	1	2	1	3	3
18-Feb	UO	1	1	1	1	1	1	UO	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	2	2
19-Feb	1	1	UO	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	2	2	2	2	2
20-Feb	1	2	1	1	1	1	1	1	1	1	2	2	2	3	2	2	2	2	0	1	1	1	2	1	3	3
21-Feb	2	3	3	1	2	1	1	1	1	4	2	2	2	3	3	3	3	1	1	1	1	1	1	1	4	4
22-Feb	1	1	1	1	1	1	2	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	2	2
23-Feb	2	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1	2	2
24-Feb	1	1	2	1	2	2	1	3	1	3	2	3	5	4	4	4	4	4	4	3	3	3	3	3	5	5
25-Feb	2	2	2	1	1	1	2	2	2	3	3	4	3	3	3	2	1	2	1	1	1	1	1	1	4	4
26-Feb	1	1	1	1	1	1	1	1	2	1	1	1	1	2	2	2	2	2	1	2	2	2	2	1	2	2
27-Feb	1	2	2	3	3	3	3	3	4	3	3	4	3	4	3	3	2	3	3	2	2	2	2	1	4	4
28-Feb	1	1	1	1	1	1	1	1	1	2	1	2	1	2	2	1	1	1	UO	1	1	1	1	1	2	2
														Diurnal Maximum												
UO - Unstable Operation																										



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

**Wind Speed (WS) - km/h**  
**Fort McKay South - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Fort McKay South - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	360	53.89	53.89
6 - 11	224	33.53	87.43
12 - 19	68	10.18	97.60
20 - 28	15	2.25	99.85
29 - 38	1	0.15	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 668

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Fort McKay South - February 2023**

<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	42	25	11	3	3	8	19	13	35	27	42	49	18	19	21	25	360
6 - 11	80	41	1	0	0	0	6	24	18	2	9	17	9	3	3	11	224
12 - 19	37	6	0	0	0	0	0	11	8	0	0	2	3	0	0	1	68
20 - 28	6	0	0	0	0	0	0	5	4	0	0	0	0	0	0	0	15
29 - 38	1	0	0	0	0	0	0	0	0	0	0	0	0	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>	166	72	12	3	3	8	25	53	65	29	51	68	30	22	24	37	668

Total Number of Valid Hours: 668

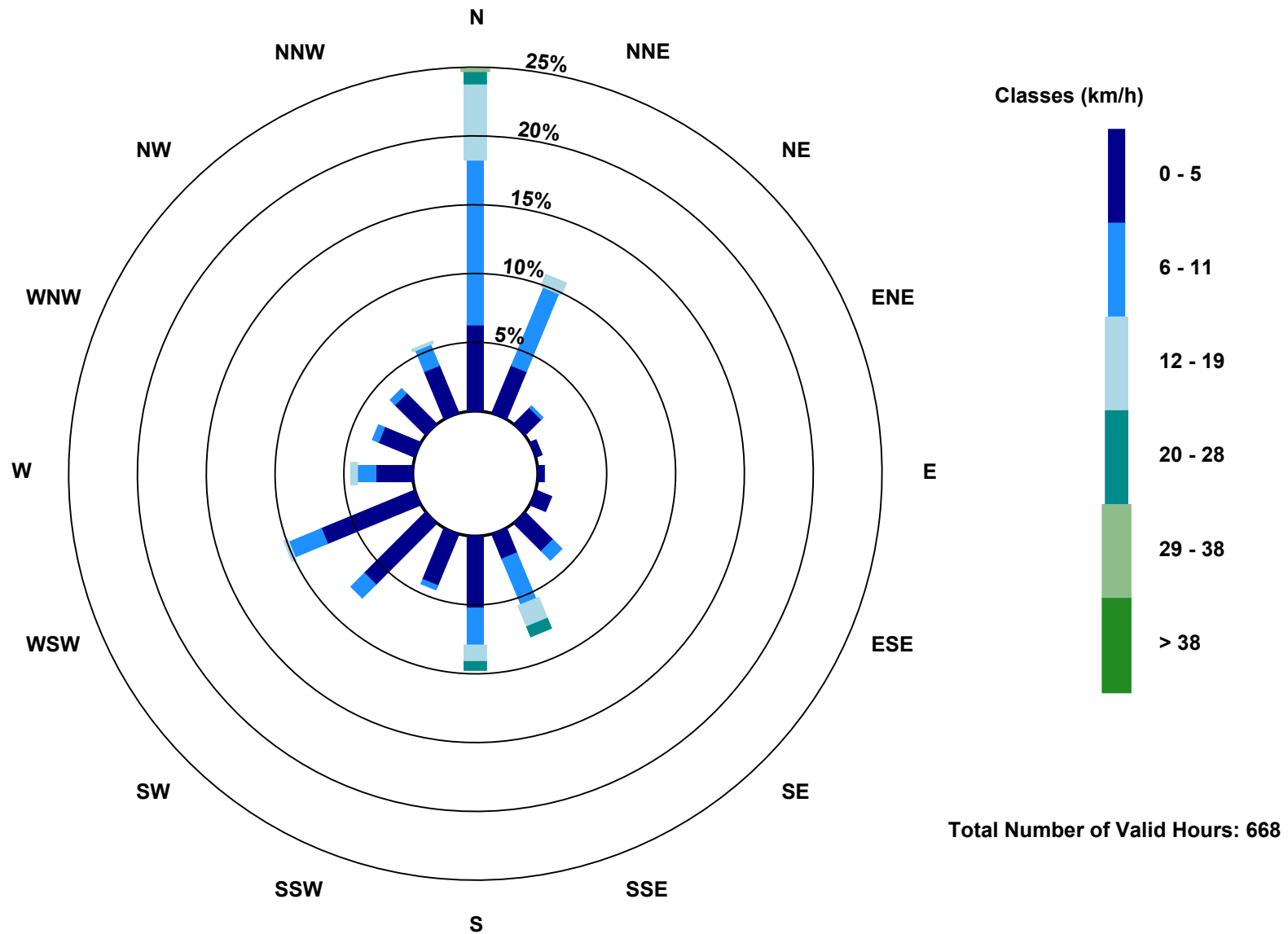
Total Number of Hours: 672





Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Fort McKay South





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

**Wind Direction (WD) - deg**  
**Fort McKay South - February 2023**

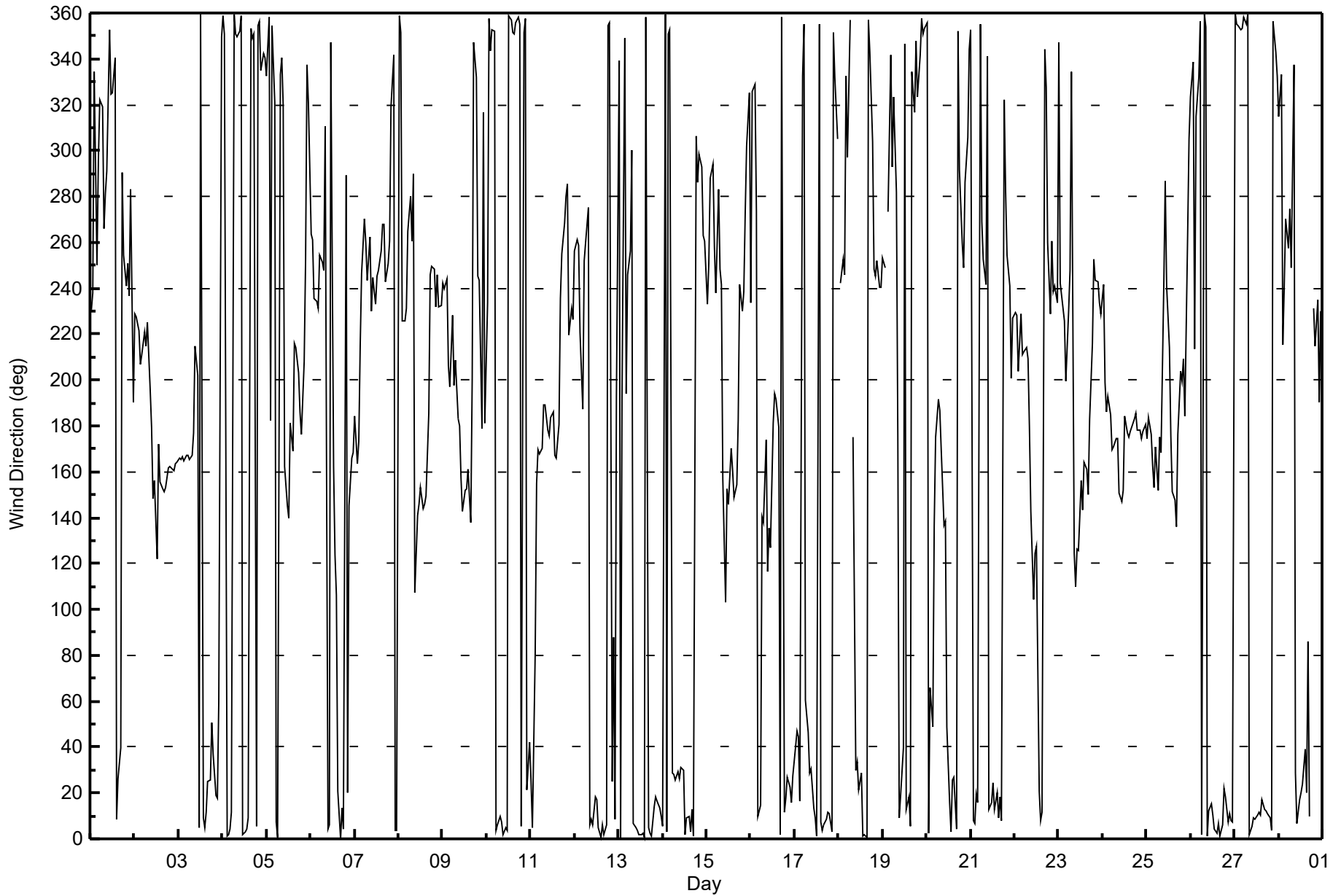
Direction of Maximum Speed: 2 deg on Feb 13 14:00 Direction of Maximum Daily Speed Average: 359.0 deg on Feb 13																							Hours in Service: 672			
Direction of Minimum Speed: 263 deg on Feb 25 23:00 Direction of Minimum Daily Speed Average: 0.3 deg on Feb 22																							Hours of Data: 668			
Monthly Average Direction: 350.4 deg																							Hours of Missing Data: 4			
																							Percent Operational Time: 99.4			
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-Feb	230	238	334	250	296	322	319	266	281	291	353	325	325	340	8	27	40	290	254	241	251	237	283	190	320.0	
2-Feb	229	227	221	207	211	221	215	225	196	179	149	156	122	172	155	152	151	153	162	162	161	160	164	164	162.4	
3-Feb	166	165	166	165	167	167	165	167	167	177	215	202	5	360	9	5	12	25	25	51	36	19	18	60	350	130.7
4-Feb	359	351	1	2	4	12	359	351	350	352	359	2	3	4	9	353	349	351	6	355	335	335	342	341	357.0	
5-Feb	333	358	183	355	321	8	1	333	340	320	162	145	140	181	169	216	214	203	186	176	208	253	338	321	280.9	
6-Feb	264	261	235	234	231	255	251	247	310	4	6	347	162	124	106	21	0	13	4	289	20	145	166	169	284.8	
7-Feb	184	164	173	215	246	270	260	244	263	230	245	233	245	248	256	268	268	243	251	260	319	342	4	4	259.9	
8-Feb	359	352	226	226	231	265	280	260	290	107	141	146	153	144	146	150	185	246	249	248	232	246	232	232	180.3	
9-Feb	242	240	244	206	197	228	198	209	183	180	158	143	152	153	161	138	200	347	332	245	244	179	317	181	173.6	
10-Feb	234	358	344	353	352	3	6	10	7	2	5	4	359	357	351	351	355	358	355	5	352	358	22	42	359.3	
11-Feb	26	5	81	155	170	168	170	189	189	178	176	184	186	167	166	181	236	255	268	280	285	220	231	226	203.3	
12-Feb	256	261	259	221	187	252	260	275	6	8	6	18	17	5	1	6	2	6	354	356	25	88	9	193	322.5	
13-Feb	339	0	192	349	194	246	257	300	7	5	4	2	2	2	1	358	5	2	1	14	18	16	13	10	359.0	
14-Feb	5	359	3	351	353	29	28	25	29	26	31	30	2	9	10	3	13	1	307	286	299	293	263	261	5.7	
15-Feb	233	251	288	294	258	238	283	248	242	157	103	152	146	170	160	149	154	182	241	230	239	273	302	326	179.7	
16-Feb	234	326	329	273	10	15	140	138	174	117	135	127	181	194	192	180	2	358	12	17	27	22	16	28	29.4	
17-Feb	40	47	45	17	333	355	60	47	28	31	13	9	1	355	7	4	6	9	12	11	3	352	332	305	9.5	
18-Feb	UO	243	252	246	333	297	357	UO	175	30	33	21	29	1	2	1	357	343	304	248	245	252	240	241	349.6	
19-Feb	253	249	UO	274	342	293	323	282	176	9	19	40	347	13	18	6	334	316	348	323	342	357	351	353	352.1	
20-Feb	356	3	66	49	137	175	191	187	170	136	139	49	16	3	25	27	4	352	292	260	249	286	306	344	9.8	
21-Feb	353	8	6	20	16	355	269	253	242	341	13	16	24	13	20	9	18	8	322	282	254	241	201	227	1.7	
22-Feb	229	228	204	229	211	212	214	209	180	143	104	124	128	21	8	11	344	328	260	229	260	238	241	234	261.5	
23-Feb	347	242	231	226	200	230	248	334	124	110	126	126	156	143	164	161	150	183	216	253	244	243	234	229	175.6	
24-Feb	242	199	186	193	185	170	171	175	174	151	147	152	184	177	175	177	179	183	185	178	178	174	177	181	175.5	
25-Feb	175	184	176	163	153	171	152	175	168	242	287	241	214	176	151	148	136	176	204	200	210	184	263	305	181.2	
26-Feb	324	338	214	315	332	356	2	360	354	1	12	15	10	4	2	7	1	6	22	18	7	11	8	8	5.1	
27-Feb	360	355	355	353	353	358	355	359	2	5	9	9	10	11	10	17	13	12	11	9	3	356	343	333	2.8	
28-Feb	315	333	216	241	270	257	275	249	338	29	7	17	20	24	39	20	86	10	UO	231	215	235	190	230	354.1	
297.2 307.7 265.6 271.0 267.3 284.6 285.5 292.9 350.8 3.0 19.8 26.3 23.9 12.8 28.4 23.5 9.2 352.5 340.6 321.2 338.0 329.1 339.8 319.5 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 (WD) - deg**  
**Fort McKay South - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 97 deg on Feb 12 23:00 Minimum Value: 6 deg on Feb 21 21:00 Percentiles: P <sub>1</sub> = 8 P <sub>10</sub> = 12 Q <sub>1</sub> = 15 Median = 23 Q <sub>3</sub> = 38 P <sub>90</sub> = 57 P <sub>99</sub> = 89																			Hours in Service: 672 Hours of Data: 668 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.4						
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-Feb	29	38	52	65	28	40	39	62	34	35	29	31	35	30	27	21	27	27	18	28	65	32	66	18	66
2-Feb	64	39	24	24	19	43	34	42	52	53	54	15	31	15	12	12	10	12	11	11	11	11	10	11	64
3-Feb	11	11	12	10	10	10	9	11	18	34	54	57	33	12	15	14	18	19	31	30	17	16	42	37	57
4-Feb	12	12	14	13	14	14	14	14	14	14	16	14	17	14	19	18	15	21	14	15	19	19	22	29	29
5-Feb	23	29	92	56	56	31	33	39	56	55	60	73	17	36	39	51	88	55	33	13	53	20	18	33	92
6-Feb	23	21	29	29	25	23	17	11	49	16	16	16	72	81	61	29	17	16	16	81	22	79	26	42	81
7-Feb	35	16	13	37	22	29	26	29	32	27	41	34	37	23	27	31	31	27	31	37	33	47	13	14	47
8-Feb	14	36	51	28	21	48	48	22	49	64	37	9	13	9	9	10	54	30	28	23	28	40	15	16	64
9-Feb	37	51	27	28	38	42	45	24	13	9	17	12	12	12	25	26	60	24	18	43	61	32	79	69	79
10-Feb	71	14	13	10	13	14	13	13	13	13	14	14	14	14	13	14	13	14	15	15	18	14	27	33	71
11-Feb	30	48	70	14	15	19	19	28	14	23	18	14	15	13	9	25	25	32	37	28	27	29	20	25	70
12-Feb	29	30	29	28	37	29	23	26	27	12	14	28	26	22	15	13	13	13	14	16	89	53	97	59	97
13-Feb	46	63	82	83	49	26	28	43	19	15	17	18	18	19	17	18	16	16	14	17	14	15	15	16	83
14-Feb	17	15	15	19	22	19	16	17	20	26	30	23	16	24	22	16	14	11	43	20	47	32	33	46	47
15-Feb	22	45	77	34	23	17	62	22	50	68	29	37	18	26	16	8	9	24	15	6	40	53	42	34	77
16-Feb	43	38	63	57	27	37	92	92	79	65	23	36	20	29	32	44	92	13	14	15	17	17	17	18	92
17-Feb	26	22	21	23	23	70	58	24	22	19	21	22	14	14	15	15	15	16	15	14	12	11	29	37	70
18-Feb	UO	30	39	48	29	81	23	UO	16	36	11	20	33	21	21	16	12	13	17	29	15	48	25	55	81
19-Feb	32	51	UO	45	57	49	45	73	52	29	36	23	41	17	19	20	17	18	16	12	11	14	13	16	73
20-Feb	17	26	38	22	83	56	36	27	63	93	21	56	53	29	18	19	17	13	28	7	56	65	57	12	93
21-Feb	13	15	15	30	21	27	21	32	65	68	21	22	26	24	22	20	20	16	28	32	6	22	30	37	68
22-Feb	17	55	70	86	45	21	70	30	58	8	37	35	54	45	37	31	18	19	20	52	44	53	28	45	86
23-Feb	54	60	49	72	62	62	33	67	69	53	26	30	53	40	32	15	24	13	15	39	18	22	40	20	72
24-Feb	45	21	19	34	14	12	6	9	9	12	7	22	20	15	11	11	11	11	13	10	10	10	11	13	45
25-Feb	11	16	11	7	7	14	57	27	27	55	42	33	29	26	13	14	19	9	22	31	49	72	79	77	79
26-Feb	67	38	24	50	46	66	14	8	12	13	11	10	13	13	14	14	14	13	22	17	14	14	14	14	67
27-Feb	13	12	14	15	14	15	15	14	16	15	14	16	16	16	16	18	16	16	15	13	15	15	12	10	18
28-Feb	20	29	60	11	43	45	55	51	56	51	14	14	20	36	38	69	83	24	UO	48	41	29	28	58	83
71 63 92 86 83 81 92 92 79 93 60 73 72 81 61 69 92 55 43 81 89 79 97 77																								Diurnal Maximum	
UO - Unstable Operation																									





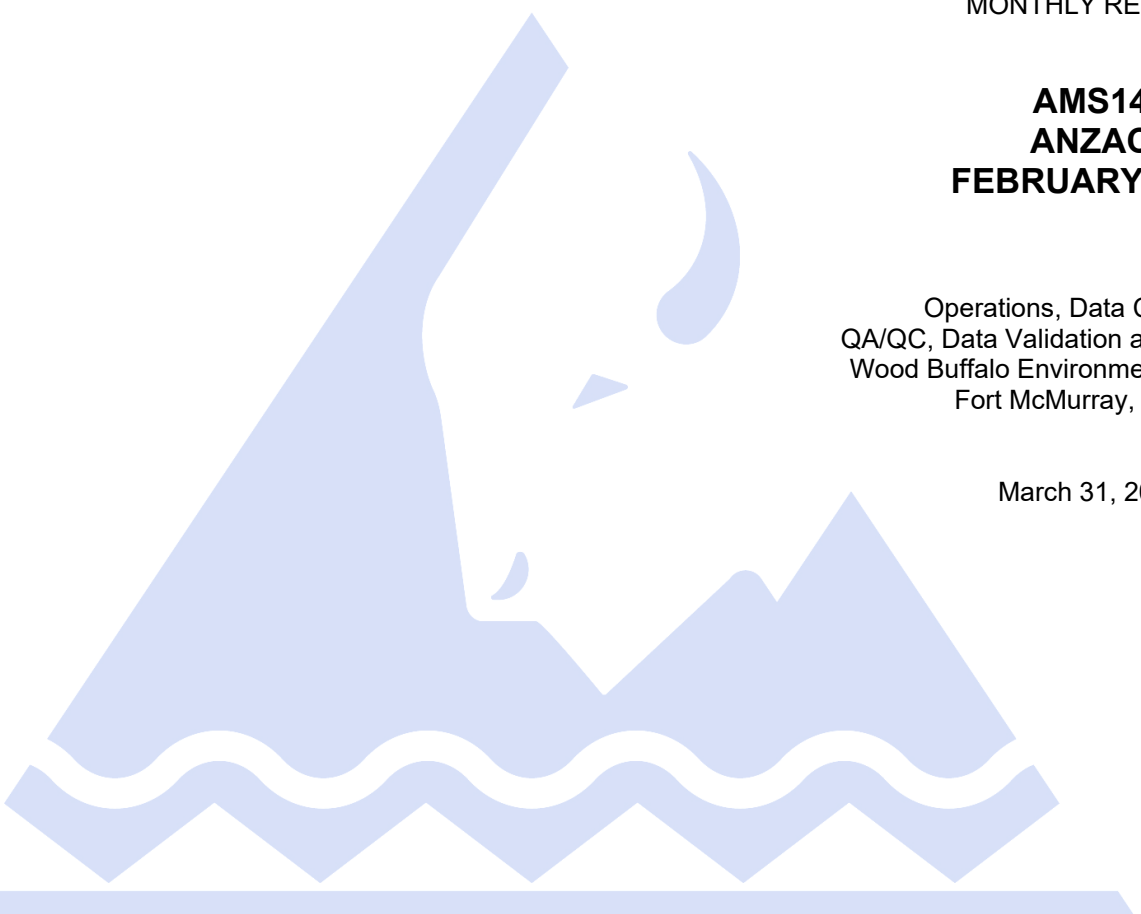
## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

**AMS14  
ANZAC  
FEBRUARY 2023**

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

March 31, 2023



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)  
FEBRUARY 2023

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	641	31	31	100	31.4	0	8	0
TRS(ppb) Average	639	33	33	100	1.5	0	0.6	0
THC(ppm) Average	641	31	31	100	2.9	-	2.2	-
NMHC(ppm) Average	641	31	31	100	0.441	-	0.065	-
CH4(ppm) Average	641	31	31	100	2.6	-	2.2	-
NO2(ppb) Average	638	34	34	100	36.5	0	11.8	-
NO(ppb) Average	638	34	34	100	25.9	-	5.3	-
NOX(ppb) Average	638	34	34	100	62.4	-	16.9	-
O3(ppb) Average	637	32	35	99.55	45.5	0	39.5	-
PM2.5(ug/m3) Average	671	1	1	100	214.3	2	23.9	0
AT 2m(C) Average	672	0	0	100	5	-	1	-
RH(%) Average	672	0	0	100	97.3	-	92.3	-
WS(km/h) Average	664	0	8	98.81	31	-	20	-
WD(deg) Average	664	0	8	98.81	-	-	-	-
Leaf Wetness (% of range) Average	671	0	1	99.85	62.7	-	14.5	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	641	1.72	2.9	-	0	0.1	0.2	0.7	1.9	4.9	31.4
TRS(ppb) Average	639	0.32	0.2	-	0.1	0.2	0.2	0.3	0.4	0.5	1.5
THC(ppm) Average	641	2.1	0.1	-	2	2	2	2.1	2.1	2.2	2.9
NMHC (ppm) Average	641	0.01	0.041	-	0	0	0	0	0	0	0.441
CH4(ppm) Average	641	2.09	0.1	-	2	2	2	2.1	2.1	2.2	2.6
NO2(ppb) Average	638	5.6	5.9	-	0.2	0.8	1.5	3.5	7	12.9	36.5
NO(ppb) Average	638	1.19	2.4	-	0	0	0.1	0.3	1.3	3.1	25.9
NOX(ppb) Average	638	6.79	7.4	-	0.2	0.9	1.8	4.3	8.7	15.2	62.4
O3(ppb) Average	637	27.5	8.8	-	0.1	14.9	22.2	28.7	34.4	37.7	45.5
PM2.5(ug/m3) Average	671	4.57	12.3	-	0.4	1.1	2	3.1	4.5	7.1	214.3
Temperature 2 m (C) Average	672	-13.72	9.9	-	-34.8	-27.1	-20.7	-14.1	-6	0.5	5
Relative Humidity (%) Average	672	74.34	12.2	-	42.2	56.7	66.9	75.1	83	91	97.3
Wind Speed 20 m (km/h) Average	664	10.3	6	-	0	4	6	9	13	19	31
Wind Direction 20 m (deg) Average	664	234.2	-	-	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	671	1.77	6.3	-	0	0	0	0	0.7	5.7	62.7

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
O3	10 Feb 2023 23:00	10 Feb 2023 23:00	1	Unstable Operation - excessive baseline drift
O3	20 Feb 2023 00:00	20 Feb 2023 01:00	2	Unstable Operation - excessive baseline drift
Wind Speed, Wind Direction	03 Feb 2023 21:00	04 Feb 2023 02:00	6	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	11 Feb 2023 00:00	11 Feb 2023 01:00	2	Flat line in sensor output signal - Sensor frozen
Surface Leaf Wetness	13 Feb 2023 09:00	13 Feb 2023 09:00	1	Sensor operated out of range





Wood Buffalo Environmental Association

Summary of Hour Averages

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

Anzac - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 31.4 ppb on Feb 20 06:00	Maximum Daily Average: 8.0 ppb on Feb 20		Hours of Data:	641
Minimum Value: 0.0 ppb on Feb 1 07:00	Minimum Daily Average: 0.1 ppb on Feb 13		Hours of Missing Data:	31
Maximum Diurnal Average: 2.3 ppb at hour 15	Minimum Diurnal Average: 0.6 ppb at hour 1		Hours of Calibration:	31
Monthly Average: 1.72 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.2 Median = 0.7 Q <sub>3</sub> = 1.9 P <sub>90</sub> = 4.9 P <sub>99</sub> = 13.4		Percent Operational Time:	100.0

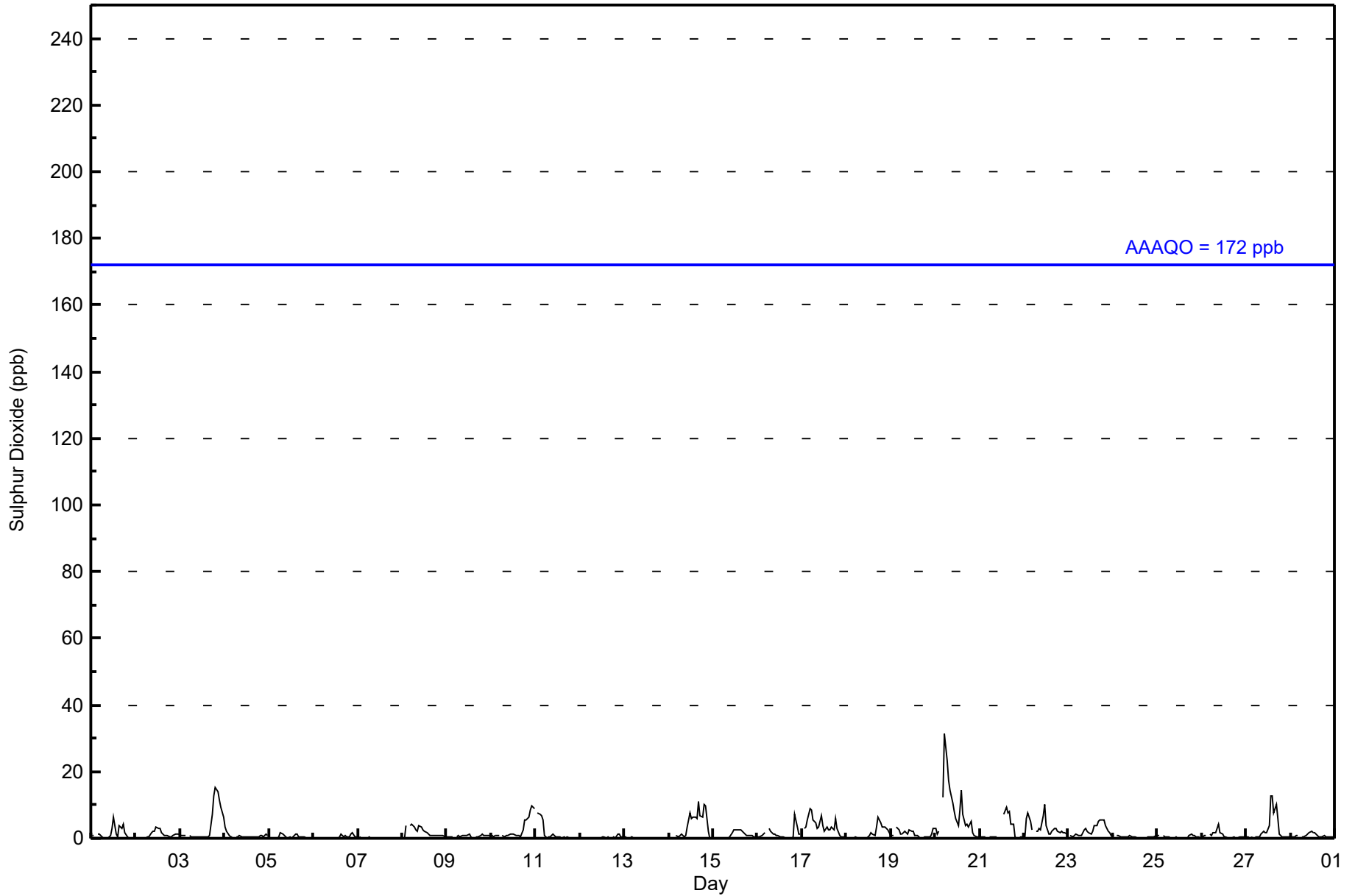
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Feb	0.7	1.0	Z	1.1	1.2	0.7	0.0	0.0	0.0	0.0	0.9	2.8	6.2	1.2	0.6	3.9	2.9	4.2	1.9	0.4	0.2	0.1	0.1	0.0	1.3	6.2
2-Feb	0.1	0.1	0.0	Z	0.1	0.0	0.5	0.5	1.6	2.2	2.2	3.4	3.0	2.8	1.8	1.0	0.8	0.9	0.6	0.6	1.0	1.2	1.2	1.2	1.2	3.4
3-Feb	1.0	0.9	0.7	0.7	Z	0.7	0.4	0.6	0.6	0.6	0.6	0.4	0.3	0.4	0.3	0.4	0.7	7.3	12.9	15.4	13.8	11.6	9.2	6.5	15.4	
4-Feb	3.2	2.0	0.9	0.6	0.4	Z	0.4	0.4	0.7	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.8	0.9	0.2	1.3	0.8	3.2	
5-Feb	Z	0.1	0.1	0.0	0.1	0.5	1.8	1.2	0.7	0.5	0.1	0.3	0.2	0.4	1.3	1.4	0.6	0.2	0.4	0.4	0.0	0.0	0.1	0.0	0.5	1.8
6-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.5	1.4	0.3	0.7	0.2	0.3	1.5	1.9	0.5	0.5	0.4	1.9
7-Feb	0.2	0.2	Z	0.2	0.2	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	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.2
8-Feb	0.0	0.2	4.0	Z	3.7	4.2	3.3	2.4	2.0	3.6	3.6	2.6	2.2	1.6	1.2	1.1	1.0	1.1	0.8	0.8	0.7	0.9	0.7	0.6	1.8	4.2
9-Feb	0.4	0.4	0.5	0.5	Z	0.6	0.8	0.6	0.9	1.1	0.8	0.7	1.1	0.2	0.1	0.1	0.2	0.4	0.8	1.2	1.0	0.9	1.0	1.0	0.7	1.2
10-Feb	0.7	0.6	0.8	0.9	0.7	Z	0.7	0.6	0.8	0.9	1.2	1.4	1.1	0.7	0.7	0.6	0.6	2.6	5.6	5.4	6.2	8.3	9.7	8.9	2.6	9.7
11-Feb	Z	7.6	7.0	6.6	5.7	1.0	0.2	0.3	0.4	1.2	0.7	0.5	0.3	0.5	0.2	0.4	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.2	1.5	7.6
12-Feb	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.6	0.5	0.1	0.5	0.2	0.1	0.4	0.2	1.2	1.3	0.5	0.3	0.3	1.3
13-Feb	0.3	0.4	Z	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.5
14-Feb	0.0	0.1	0.1	Z	1.0	0.6	1.0	1.1	0.6	0.8	3.2	7.8	6.1	6.5	6.4	5.8	11.0	6.8	6.2	10.0	9.9	2.0	0.1	0.0	3.8	11.0
15-Feb	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	1.6	2.6	2.5	2.4	2.7	2.4	1.8	1.3	1.0	0.7	0.8	0.9	0.6	0.6	1.0	2.7
16-Feb	0.6	0.5	0.7	1.3	1.8	Z	2.8	2.0	1.1	1.1	0.8	0.7	0.4	0.6	0.3	0.2	0.2	0.1	0.1	0.5	7.2	3.2	1.3	1.1	1.2	7.2
17-Feb	Z	2.9	3.2	5.5	9.0	8.4	5.6	4.6	3.1	3.4	6.6	3.7	2.2	3.5	2.7	2.4	3.3	2.7	6.0	3.1	0.7	0.4	0.4	0.2	3.6	9.0
18-Feb	0.2	Z	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.0	0.2	0.7	1.7	1.3	0.8	3.2	6.2	4.7	3.3	3.3	3.5	2.4	1.8	1.5	6.2
19-Feb	1.0	0.7	Z	3.2	2.4	1.4	1.4	2.1	1.5	1.4	2.5	2.3	2.2	1.0	1.0	0.3	0.2	0.2	0.3	0.2	0.2	0.3	1.1	2.8	1.3	3.2
20-Feb	3.0	1.3	2.3	Z	12.3	31.4	23.4	17.5	14.5	10.6	8.1	6.1	3.8	8.3	14.5	7.0	3.9	4.4	3.5	4.9	1.7	0.9	0.6	0.5	8.0	31.4
21-Feb	0.4	0.5	0.4	0.4	Z	0.4	0.3	0.3	0.3	0.4	C	C	C	7.2	9.5	7.5	8.0	4.2	4.1	0.4	0.2	0.2	0.3	0.2	2.3	9.5
22-Feb	0.4	6.0	7.4	4.9	2.4	Z	2.2	2.1	2.8	2.6	6.7	10.0	3.7	1.4	1.4	2.0	3.0	3.0	2.2	1.9	2.1	1.7	1.6	1.2	3.2	10.0
23-Feb	Z	0.9	0.5	0.8	1.1	0.7	0.9	1.0	2.3	2.9	1.9	1.7	1.4	2.1	3.8	3.7	5.1	5.6	5.4	5.7	3.7	2.0	1.6	0.9	2.4	5.7
24-Feb	0.8	Z	0.7	0.8	0.3	0.2	0.3	0.2	0.3	0.8	0.6	0.3	0.3	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.3	0.5	0.6	0.7	0.4	0.8
25-Feb	0.9	1.0	Z	0.7	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.9	1.4	1.1	0.7	0.4	0.2	0.4	1.4
26-Feb	0.1	0.7	0.7	Z	1.2	1.0	1.7	1.9	2.8	4.2	1.9	1.4	0.6	0.3	0.2	0.2	0.1	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.9	4.2
27-Feb	0.3	0.3	0.2	0.2	Z	0.2	0.3	0.4	1.4	2.0	1.8	1.7	3.7	12.9	12.6	7.7	10.0	5.8	1.1	0.4	0.3	0.2	0.3	0.3	2.8	12.9
28-Feb	0.3	0.3	0.5	0.8	0.7	Z	0.5	0.5	0.9	1.2	1.5	2.2	1.8	1.6	0.8	0.5	0.5	0.6	0.7	0.6	0.5	0.3	0.3	0.4	0.8	2.2
	0.6	1.2	1.4	1.3	2.0	2.3	1.8	1.5	1.4	1.5	1.8	2.0	1.6	2.1	2.3	1.8	2.1	2.2	2.2	2.1	2.1	1.5	1.3	1.1	Diurnal Average	
	3.2	7.6	7.4	6.6	12.3	31.4	23.4	17.5	14.5	10.6	8.1	10.0	6.2	12.9	14.5	7.7	11.0	7.3	12.9	15.4	13.8	11.6	9.7	8.9	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 - February 2023





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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Anzac - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	627	97.82	97.82
11 - 20	12	1.87	99.69
21 - 60	2	0.31	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: 641

Total Number of Hours: 672



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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Anzac - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	9	10	15	17	30	48	71	24	29	25	9	47	102	71	76	39	622
11 - 20	1	0	0	0	0	0	0	0	0	0	0	0	1	3	1	4	10
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2
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>	10	10	15	17	30	48	71	24	29	25	9	47	104	75	77	43	634

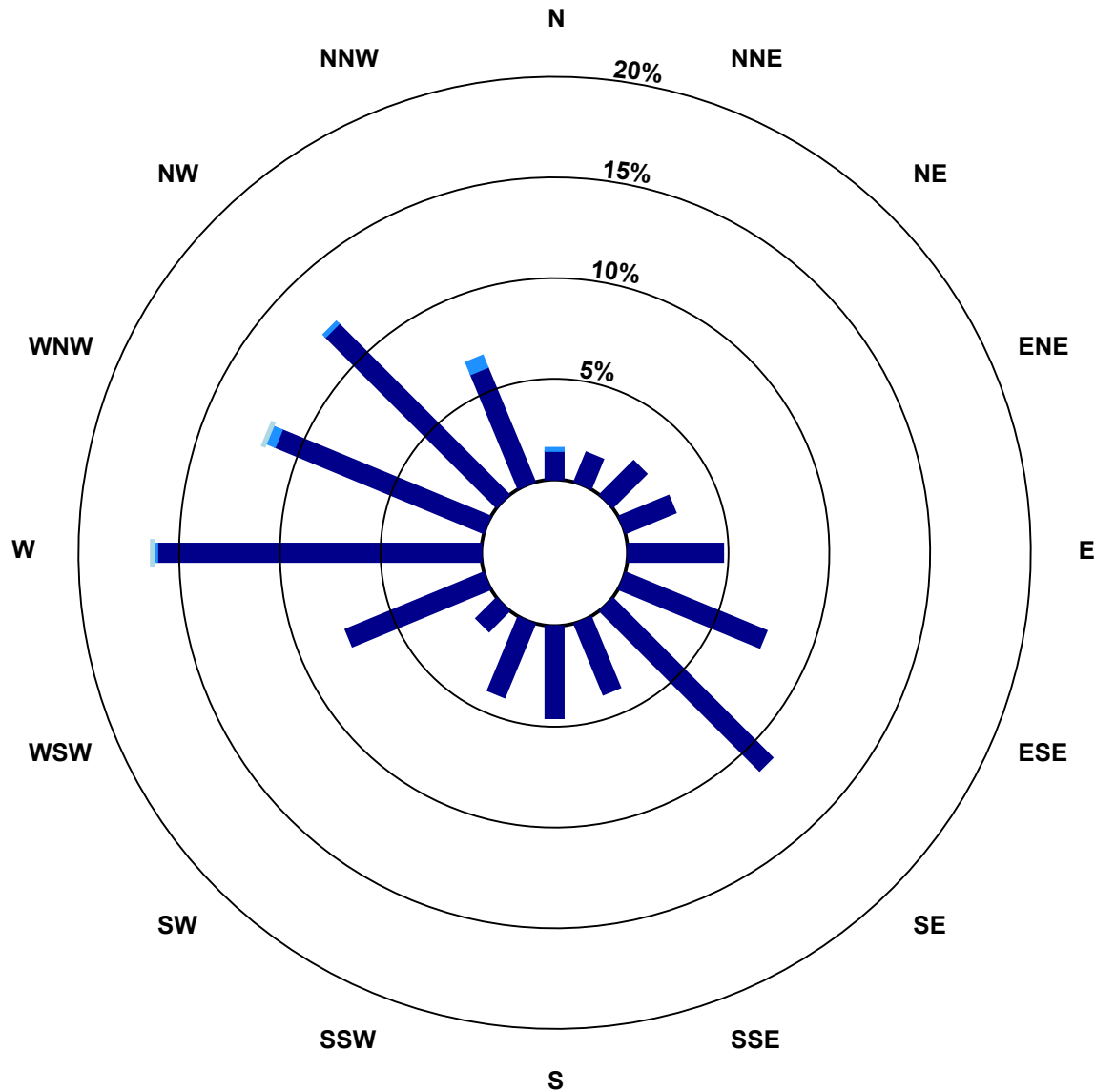
Total Number of Valid Hours: 634

Total Number of Hours: 672

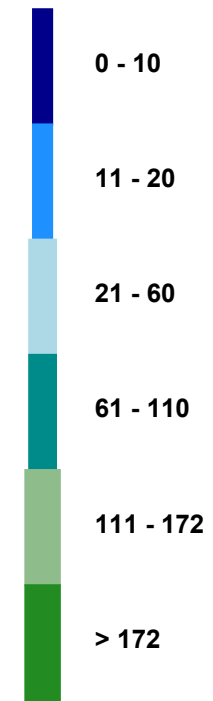


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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



Classes (ppb)

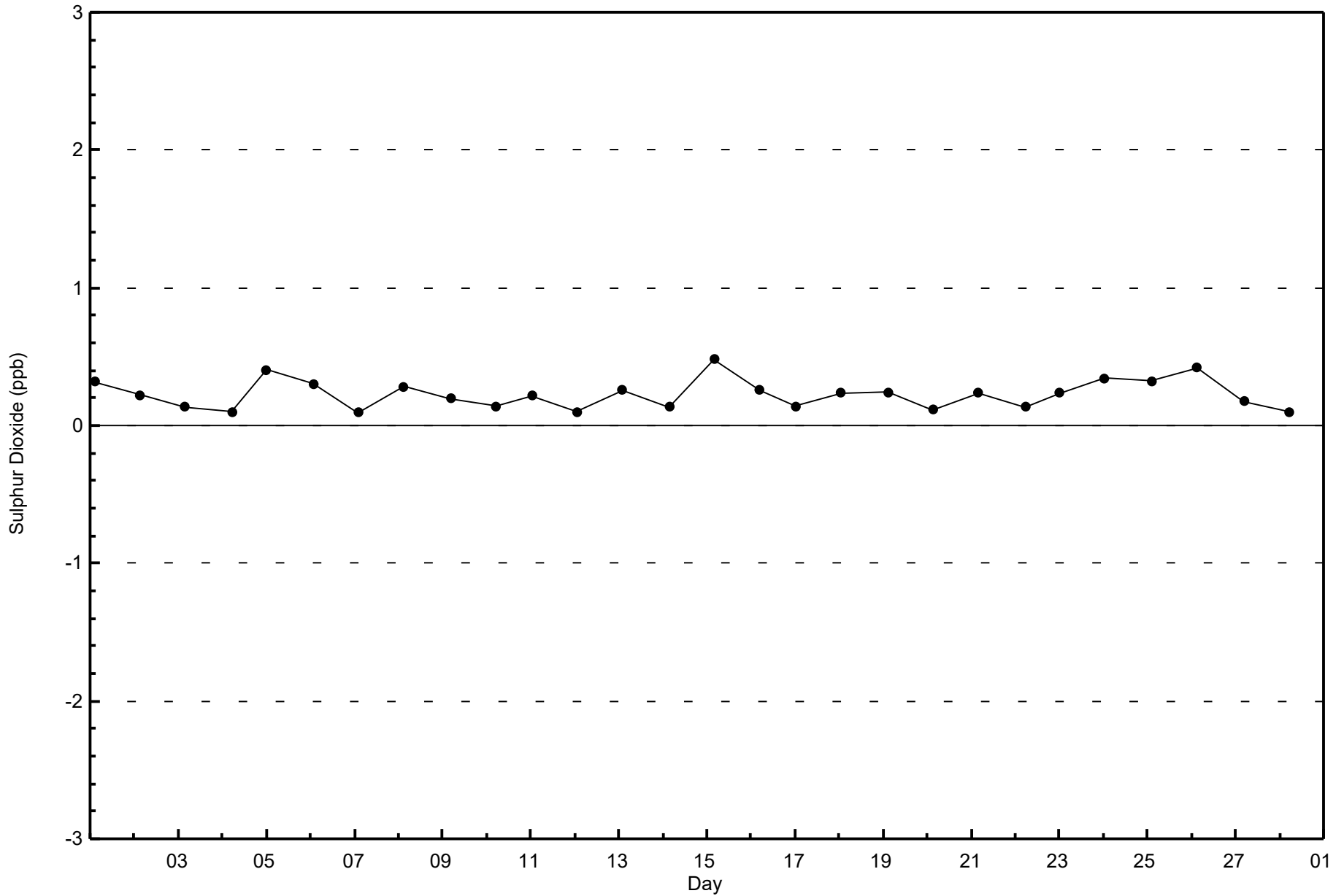


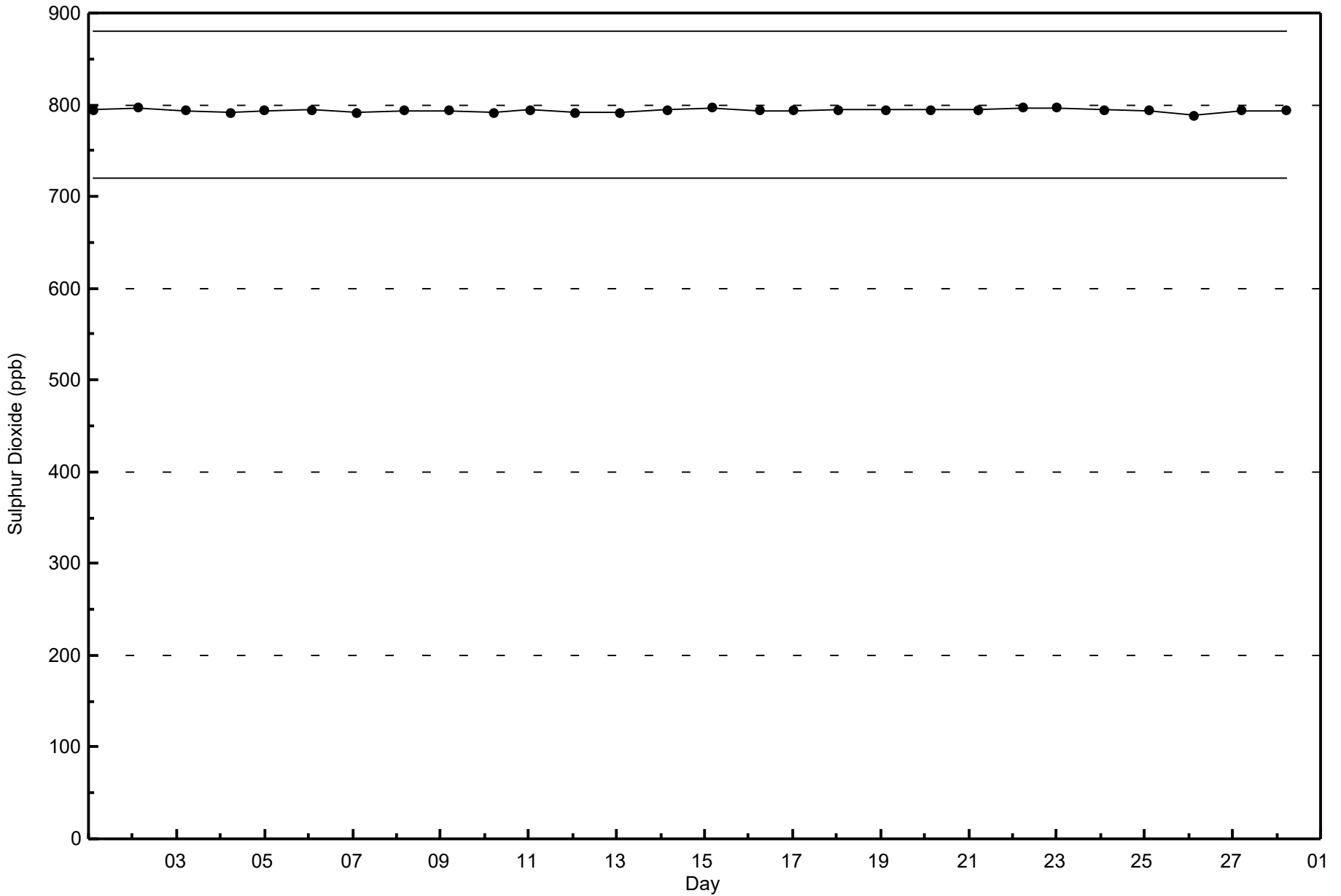
Total Number of Valid Hours: 634



Wood Buffalo Environmental Association  
Zero Responses

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Anzac - February 2023





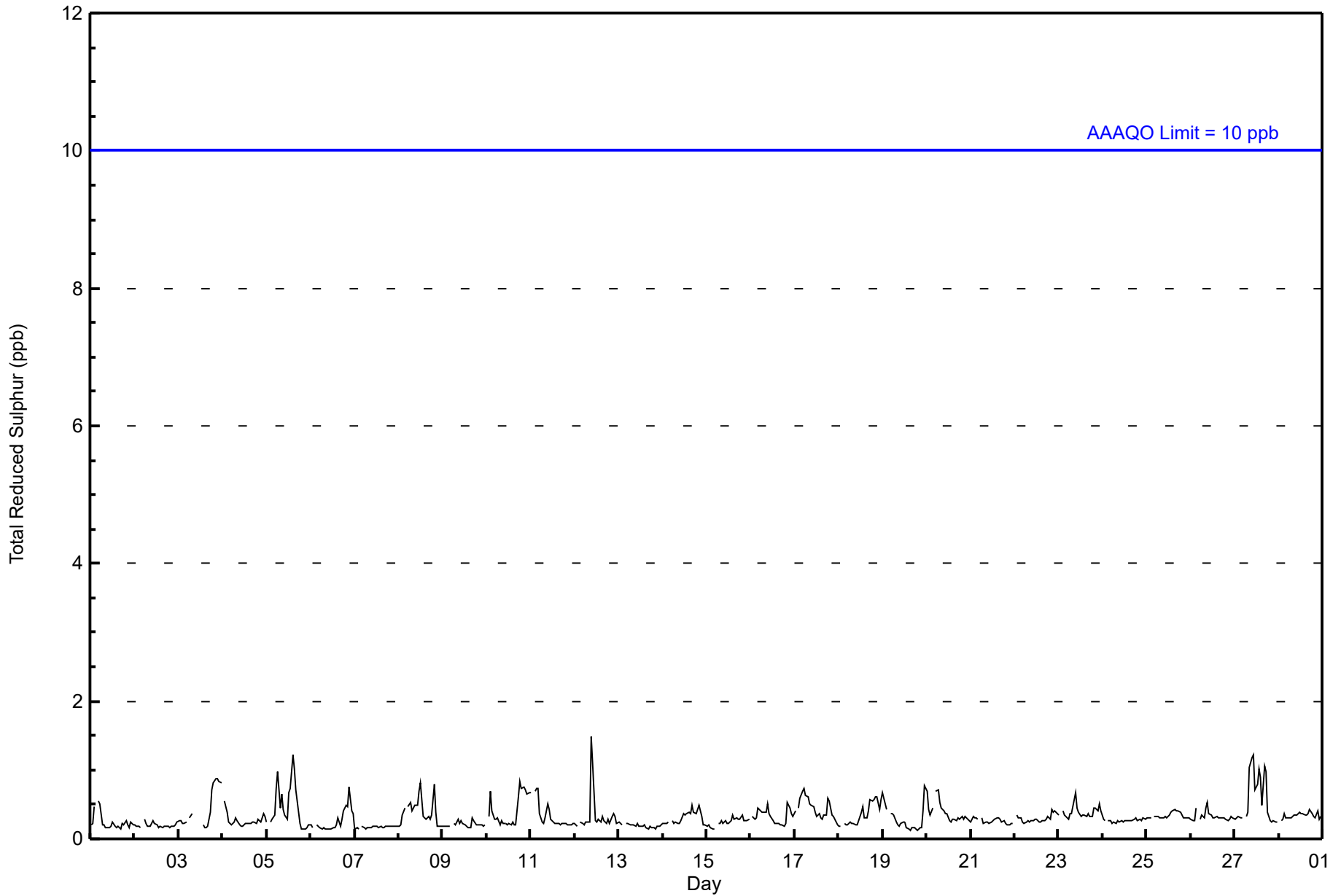






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Reduced Sulphur (TRS) - ppb**  
**Anzac - February 2023**





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

**Total Reduced Sulphur (TRS) - ppb**  
**Anzac - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	639	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: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Anzac - February 2023**

<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	10	9	14	17	31	50	69	23	29	26	9	48	102	72	80	43	632
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>	10	9	14	17	31	50	69	23	29	26	9	48	102	72	80	43	632

Total Number of Valid Hours: 632

Total Number of Hours: 672

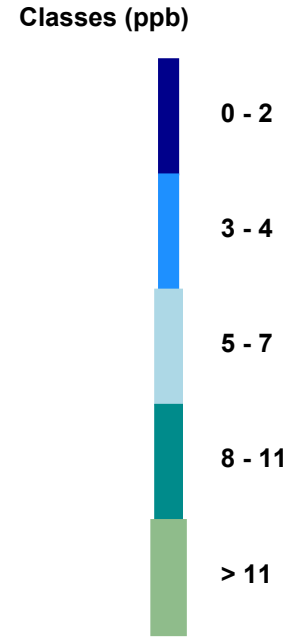
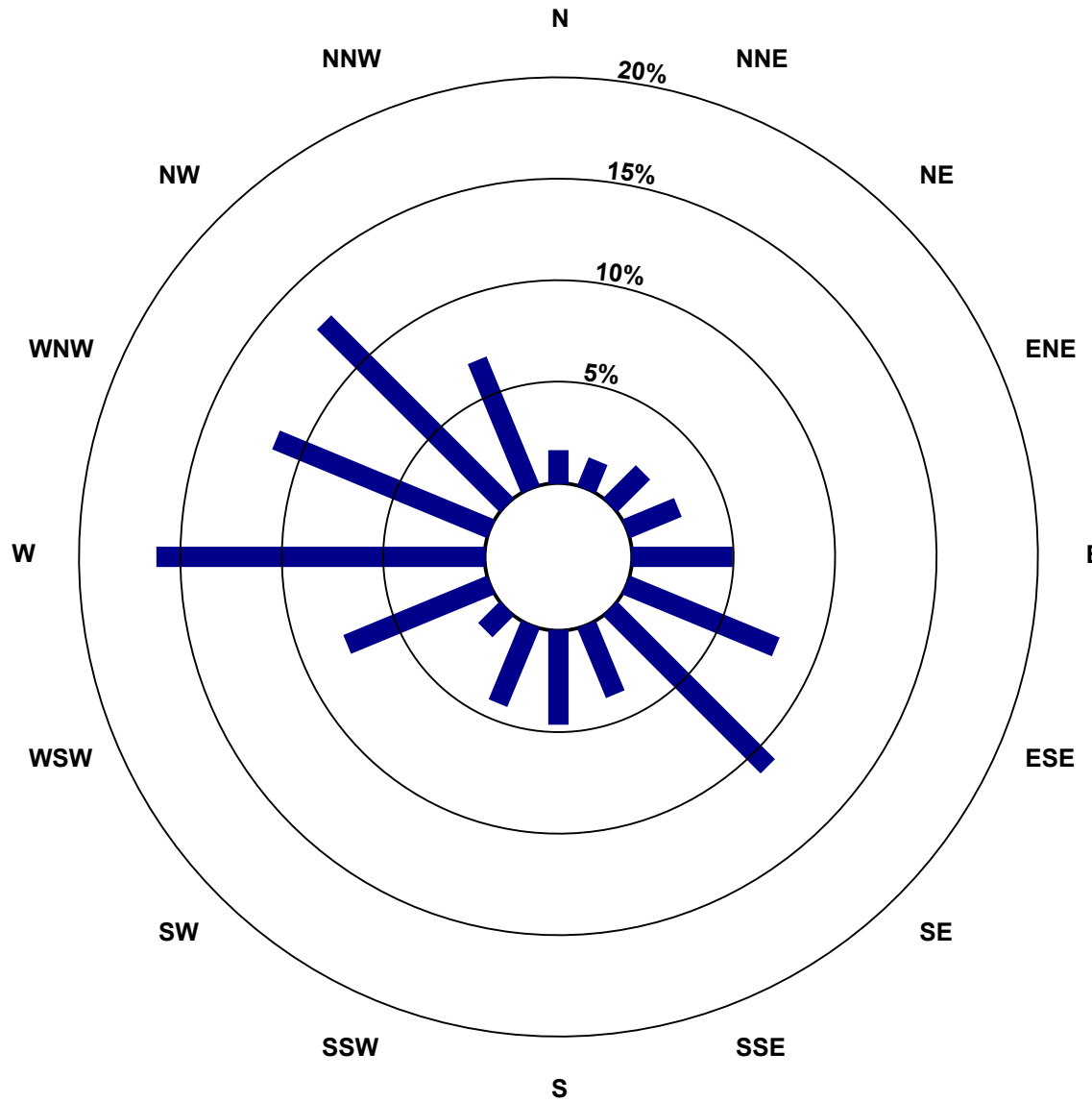


# Wood Buffalo Environmental Association

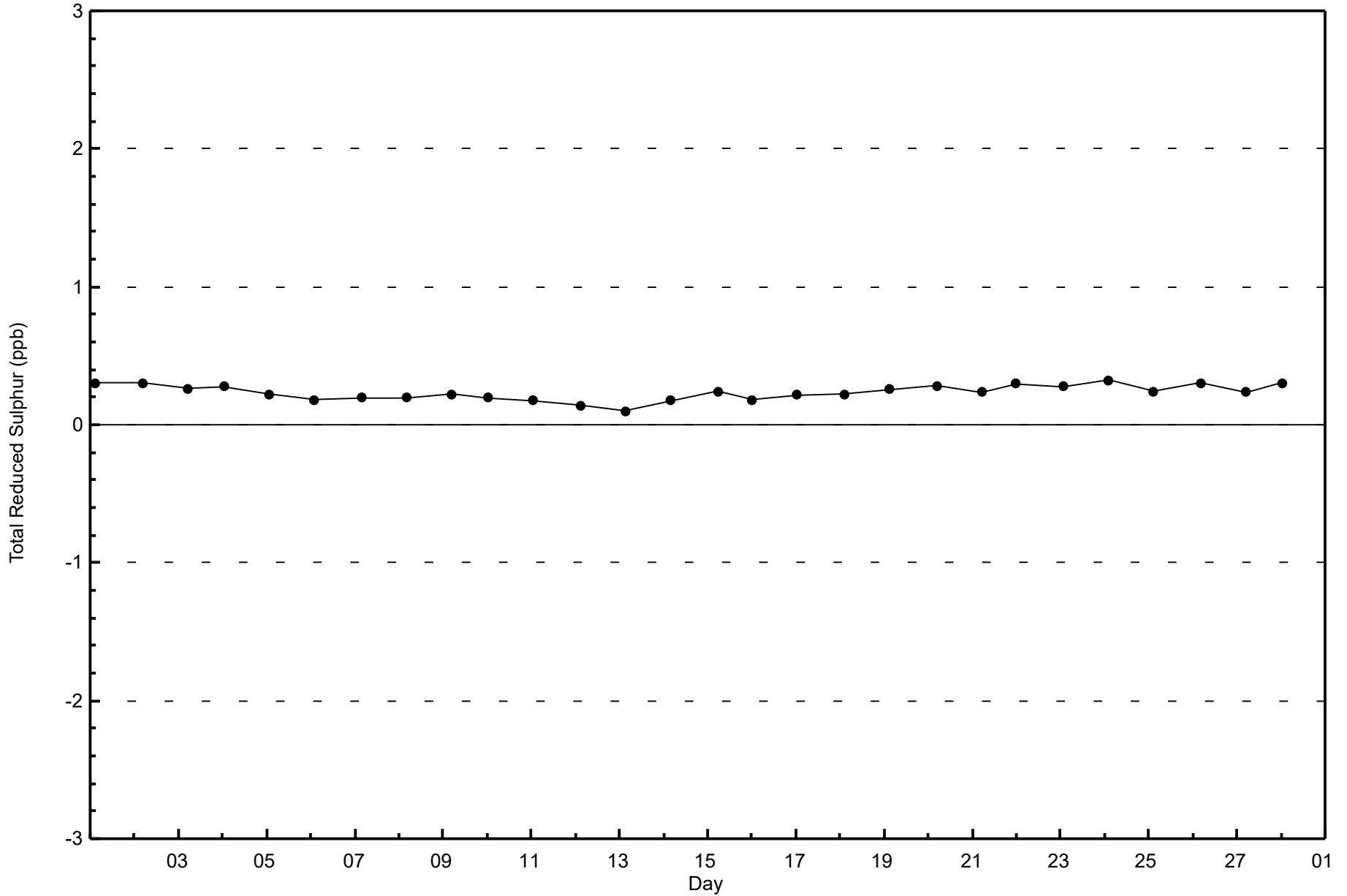
## Wind Rose Feb 2023

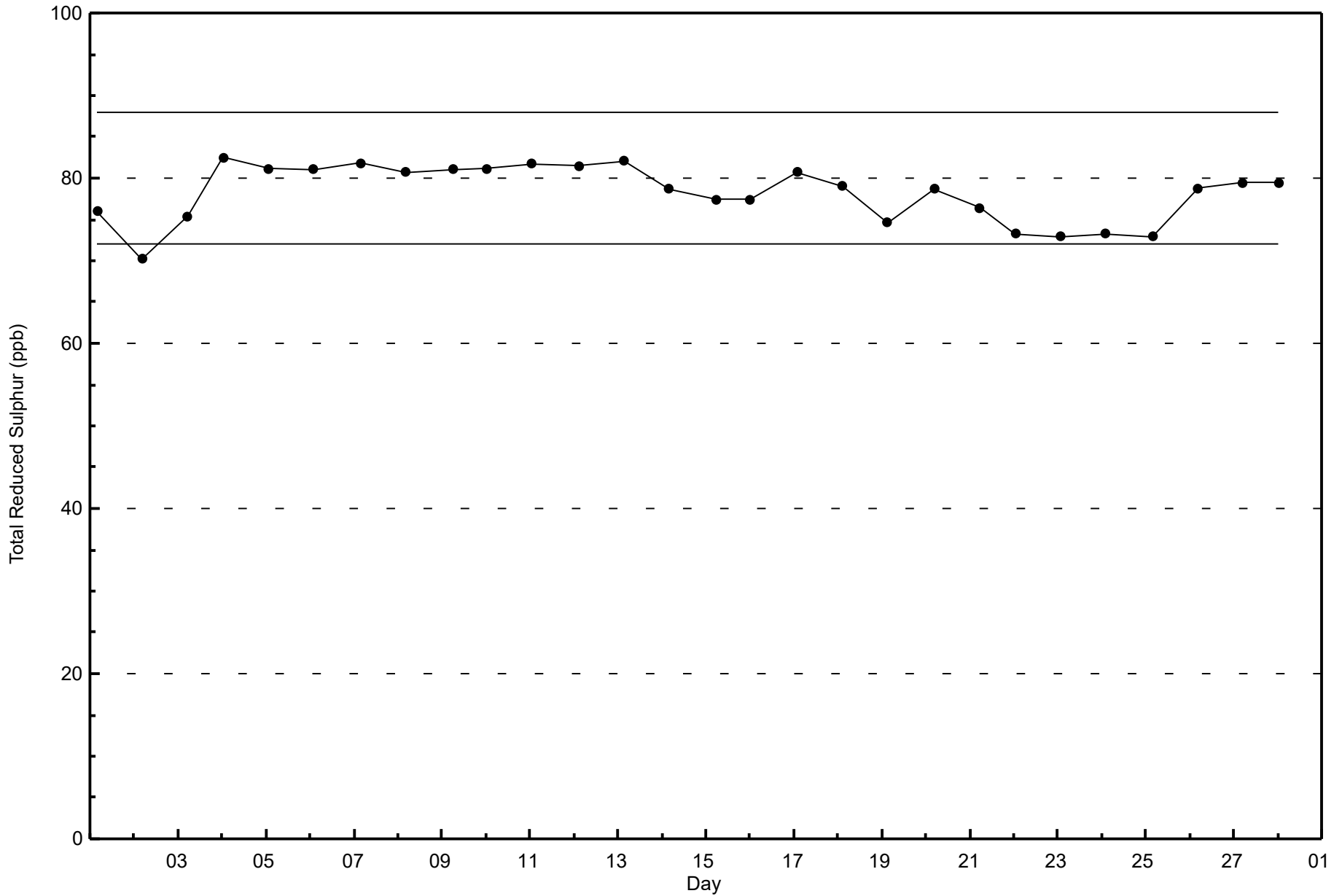
# Total Reduced Sulphur (TRS) - ppb

## Anzac



Total Number of Valid Hours: 632



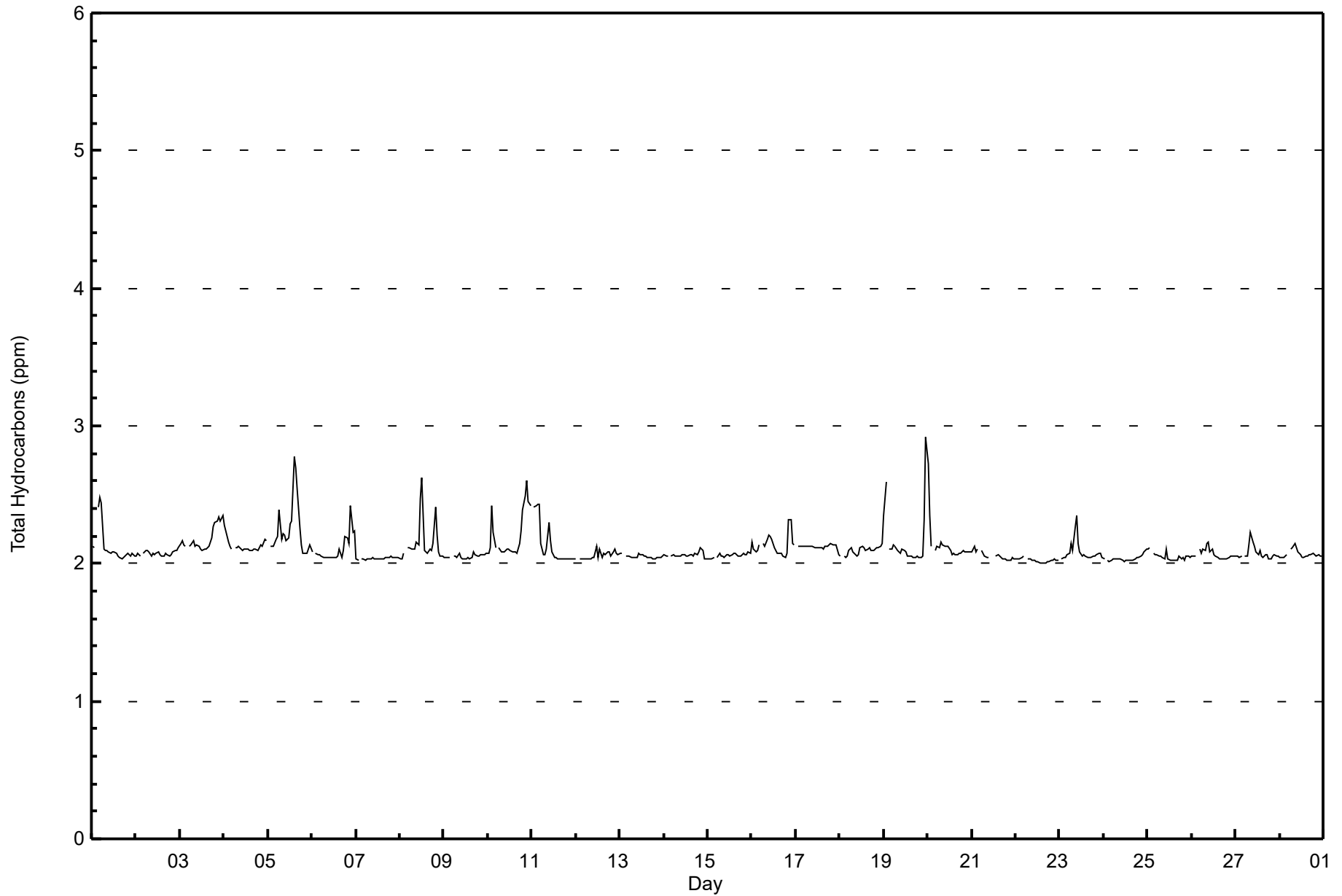






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Anzac - February 2023**







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

**Total Hydrocarbons (THC) - ppm**  
**Anzac - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	192	29.95	29.95
2.1 - 3.0	449	70.05	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 641

Total Number of Hours: 672



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

**Total Hydrocarbons (THC) - ppm**  
**Anzac - February 2023**

<b>Concentration</b> <b>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 - 2.0	4	3	1	6	5	1	2	6	14	12	4	35	49	19	23	8	192
2.1 - 3.0	6	7	14	11	25	47	69	18	15	13	5	12	55	56	54	35	442
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>	10	10	15	17	30	48	71	24	29	25	9	47	104	75	77	43	634

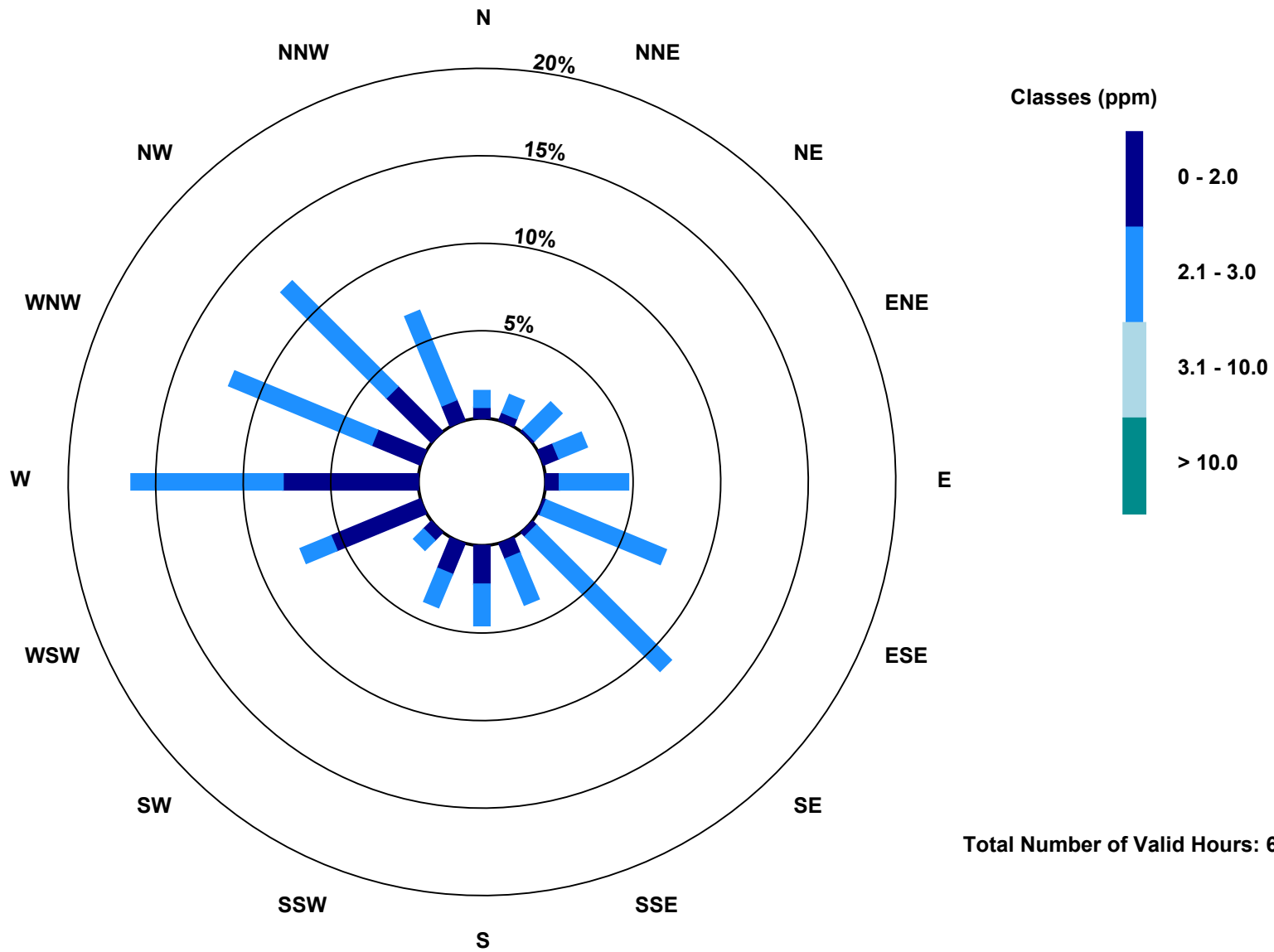
Total Number of Valid Hours: 634

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Hydrocarbons (THC) - ppm  
Anzac



Total Number of Valid Hours: 634

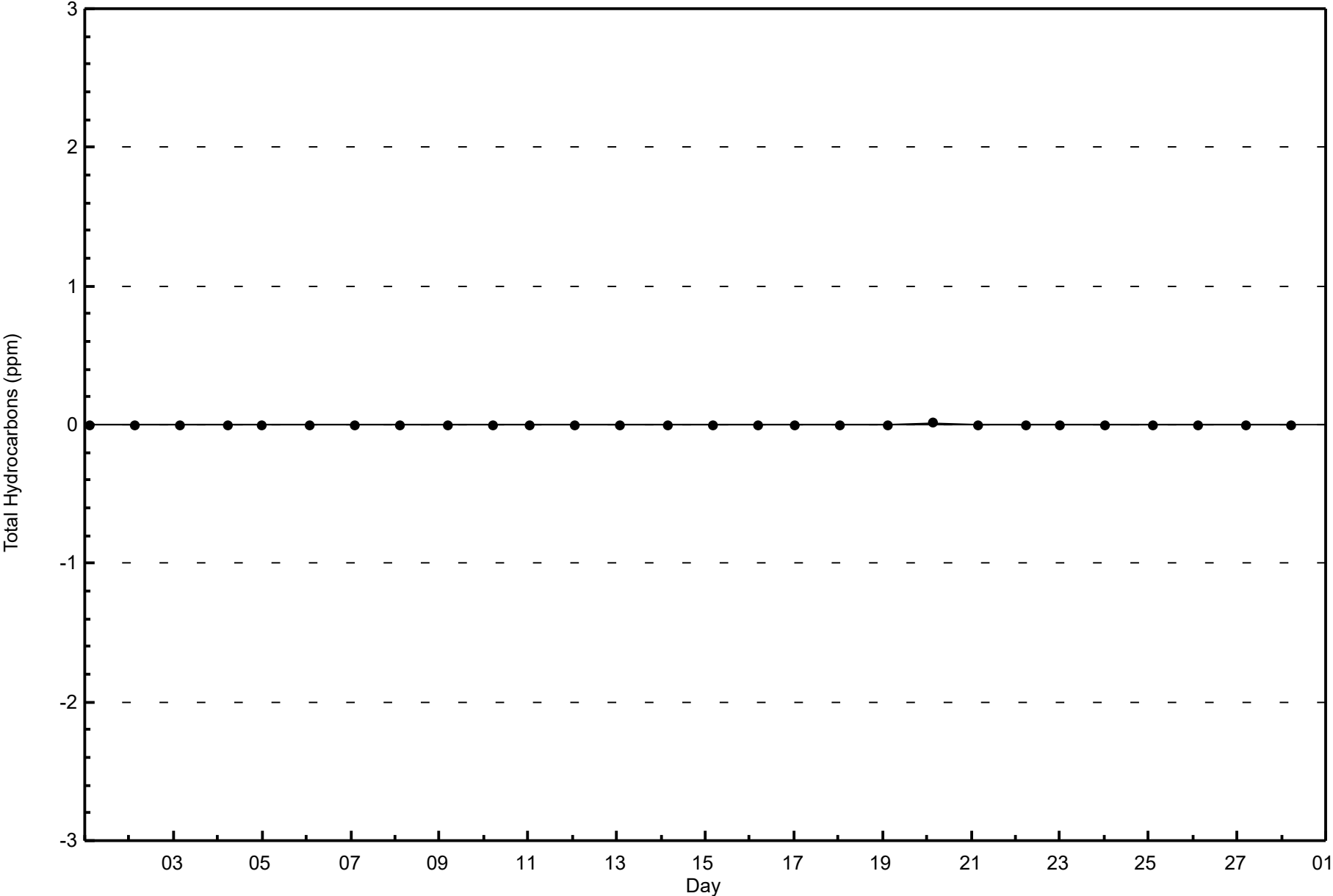


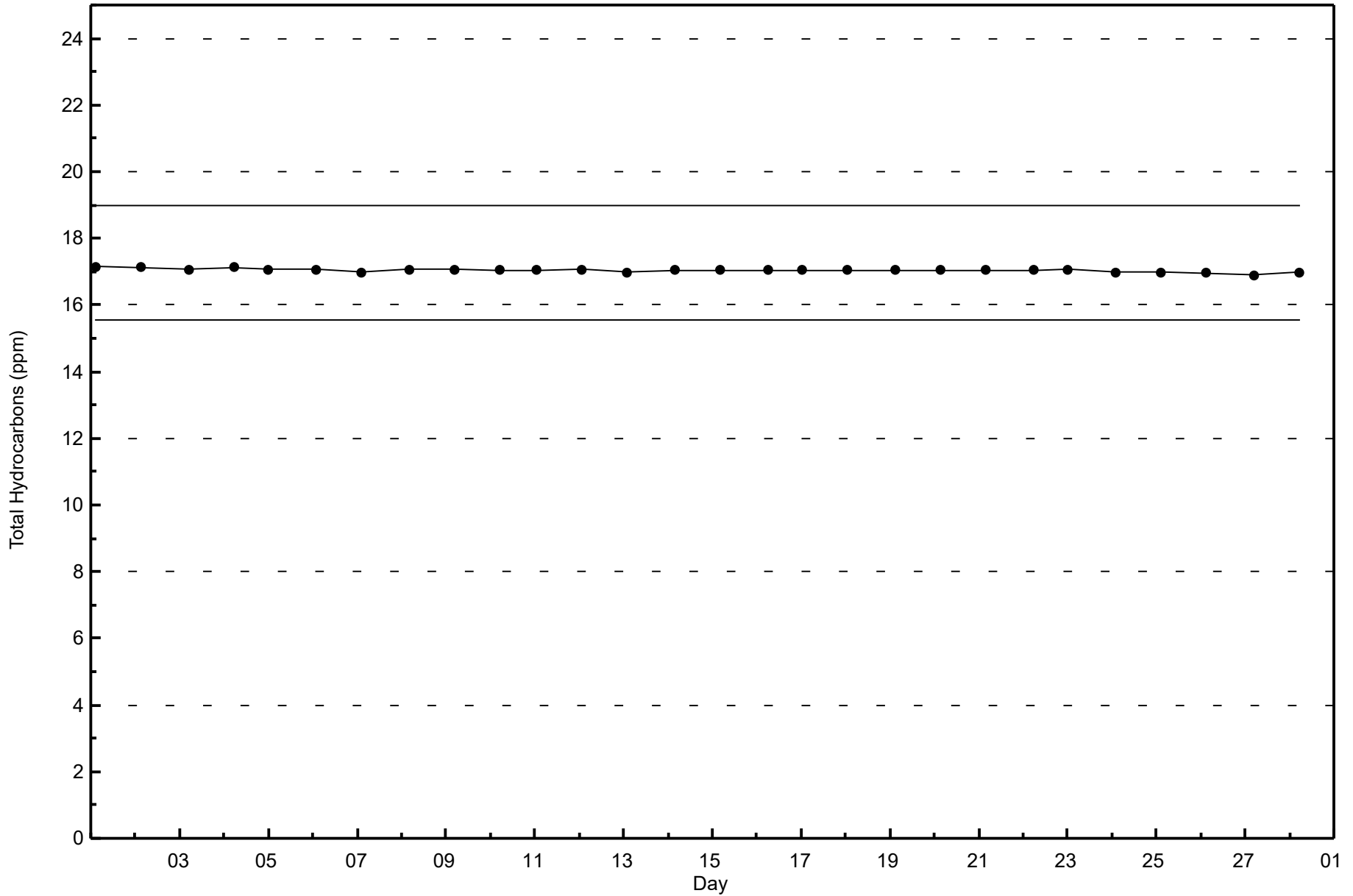
Wood Buffalo Environmental Association

Zero Responses

Total Hydrocarbons (THC) - ppm

Anzac - February 2023







Summary of Hour Averages

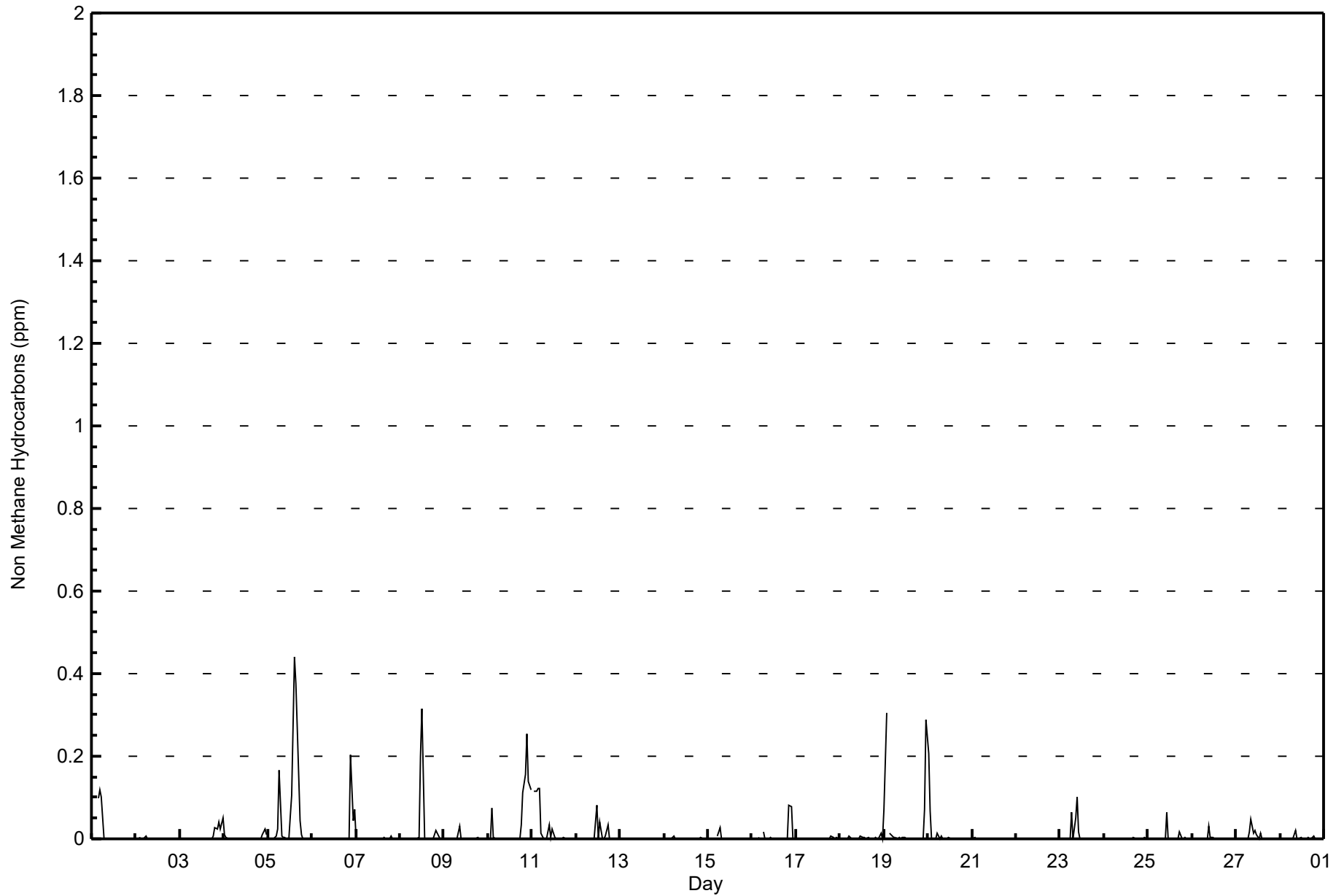
Anzac - February 2023

Maximum Value: 0.441 ppm on Feb 5 15:00																				Maximum Daily Average: 0.065 ppm on Feb 5					Hours in Service: 672		
Minimum Value: 0.000 ppm on Feb 1 01:00																				Minimum Daily Average: 0.000 ppm on Feb 13					Hours of Data: 641		
Maximum Diurnal Average: 0.021 ppm at hour 22																				Minimum Diurnal Average: 0.001 ppm at hour 8					Hours of Missing Data: 31		
Monthly Average: 0.010 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: 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-Feb	0.000	0.000	Z	0.098	0.119	0.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.119	
2-Feb	0.000	0.000	0.002	Z	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	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
3-Feb	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	0.005	0.026	0.024	0.040	0.023	0.050	0.007	0.050	
4-Feb	0.011	0.003	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	0.010	0.023	0.009	0.002	0.023	0.023	
5-Feb	Z	0.000	0.000	0.000	0.006	0.023	0.166	0.007	0.003	0.005	0.000	0.000	0.053	0.103	0.441	0.378	0.267	0.045	0.009	0.000	0.000	0.000	0.000	0.000	0.065	0.441	
6-Feb	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	0.202	0.044	0.072	0.014	0.202		
7-Feb	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	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.006	
8-Feb	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.201	0.315	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.012	0.007	0.000	0.000	0.024	0.315	
9-Feb	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.031	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	0.001	0.002	0.031	0.031	
10-Feb	0.000	0.000	0.073	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	0.032	0.112	0.155	0.255	0.138	0.120	0.039	0.255	
11-Feb	Z	0.115	0.116	0.123	0.122	0.013	0.000	0.000	0.000	0.033	0.003	0.023	0.004	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.123	
12-Feb	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.082	0.000	0.042	0.000	0.000	0.005	0.034	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.082	
13-Feb	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	
14-Feb	0.000	0.000	0.000	Z	0.000	0.006	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.005	0.001	0.000	0.000	0.001	0.006	
15-Feb	0.000	0.001	0.000	0.000	Z	0.006	0.027	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	0.001	0.001	0.000	0.000	0.002	0.027	
16-Feb	0.000	0.000	0.000	0.001	0.003	Z	0.017	0.000	0.000	0.001	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.082	0.077	0.000	0.000	0.000	0.008	0.082	
17-Feb	Z	0.001	0.000	0.001	0.002	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.005	0.002	0.000	0.003	0.000	0.001	0.005	
18-Feb	0.001	Z	0.000	0.001	0.000	0.005	0.000	0.000	0.001	0.001	0.001	0.008	0.003	0.003	0.000	0.004	0.000	0.000	0.000	0.003	0.000	0.001	0.014	0.001	0.002	0.014	
19-Feb	0.071	0.306	Z	0.013	0.007	0.003	0.003	0.001	0.002	0.002	0.003	0.002	0.001	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.070	0.287	0.034	0.306	
20-Feb	0.206	0.069	0.000	Z	0.002	0.013	0.001	0.006	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.013	0.206	
21-Feb	0.000	0.002	0.000	0.001	Z	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	0.000	0.000	0.000	0.000	0.002	
22-Feb	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	
23-Feb	Z	0.001	0.000	0.000	0.000	0.000	0.065	0.000	0.049	0.102	0.016	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.010	0.102		
24-Feb	0.000	Z	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	0.003	0.000	0.000	0.000	0.000	0.003	0.001	0.000	0.003	0.003	
25-Feb	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.064	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.000	0.001	0.003	0.002	0.000	0.004	0.064		
26-Feb	0.000	0.000	0.000	Z	0.000	0.001	0.000	0.000	0.000	0.030	0.003	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	0.002	0.030	
27-Feb	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.017	0.047	0.013	0.019	0.011	0.000	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.047	
28-Feb	0.000	0.000	0.000	0.000	0.000	Z	0.001	0.000	0.020	0.000	0.000	0.003	0.000	0.000	0.000	0.003	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.001	0.020	
																								Diurnal Average			
																								Diurnal Maximum			
0.012 0.021 0.008 0.010 0.011 0.008 0.010 0.001 0.005 0.007 0.004 0.012 0.014 0.006 0.016 0.014 0.010 0.004 0.002 0.006 0.010 0.021 0.011 0.019																											
0.206 0.306 0.116 0.123 0.122 0.100 0.166 0.017 0.049 0.102 0.064 0.201 0.315 0.103 0.441 0.378 0.267 0.045 0.032 0.112 0.155 0.255 0.138 0.287																											
Z - zerospan C - Calibration																											



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

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Anzac - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Anzac - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	558	87.05	87.05
0.006 - 0.05	49	7.64	94.70
0.06 - 0.1	22	3.43	98.13
> 0.1	12	1.87	100.00

Total Number of Valid Hours: 641

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Anzac - February 2023**

<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	10	9	15	16	27	40	57	22	28	22	7	42	89	62	71	40	557
0.006 - 0.05	0	0	0	1	3	5	8	0	1	3	2	2	8	9	1	1	44
0.06 - 0.1	0	1	0	0	0	1	2	0	0	0	0	3	5	3	4	2	21
> 0.1	0	0	0	0	0	2	4	2	0	0	0	0	2	1	1	0	12
<b>Totals</b>	10	10	15	17	30	48	71	24	29	25	9	47	104	75	77	43	634

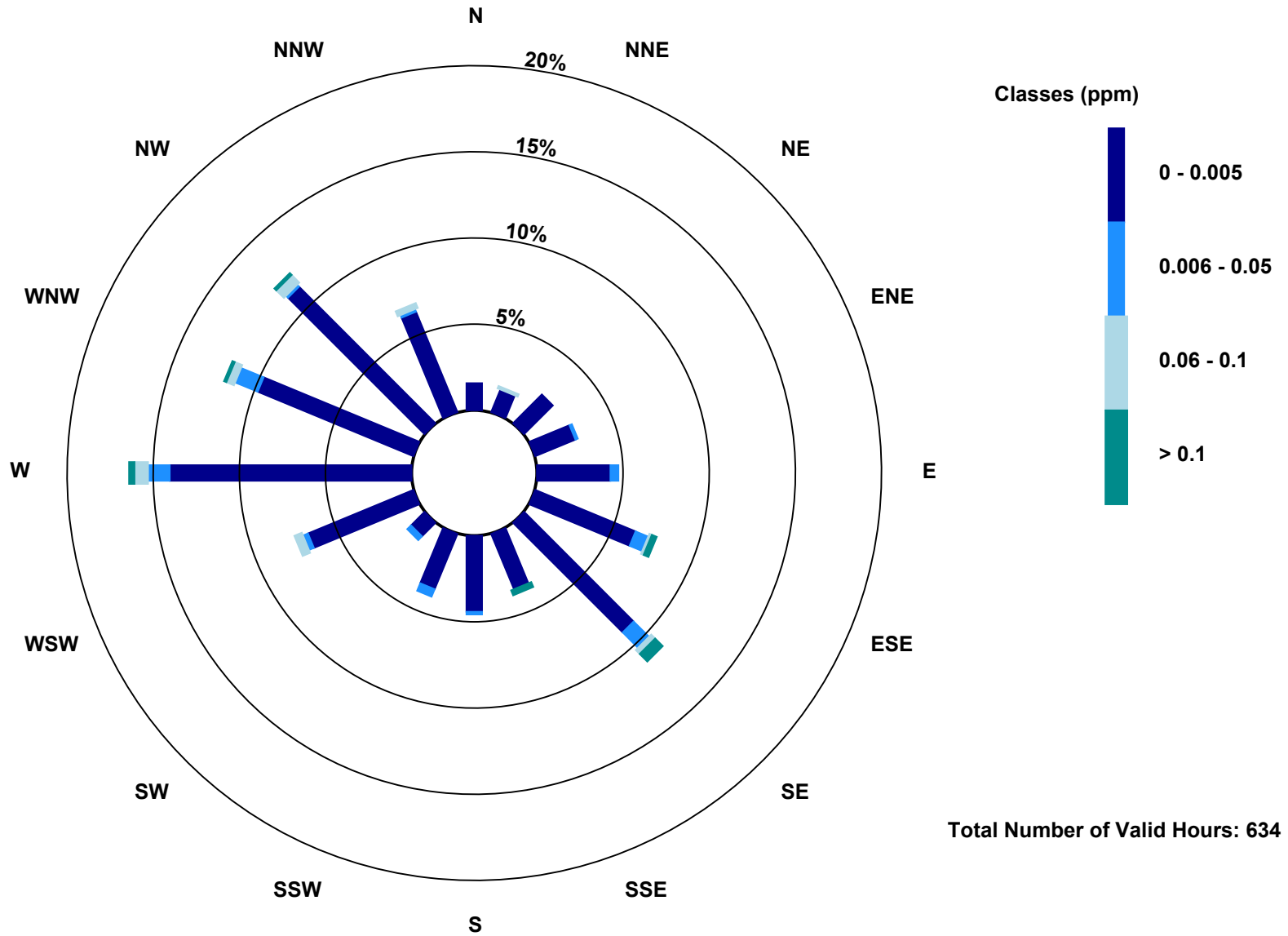
Total Number of Valid Hours: 634

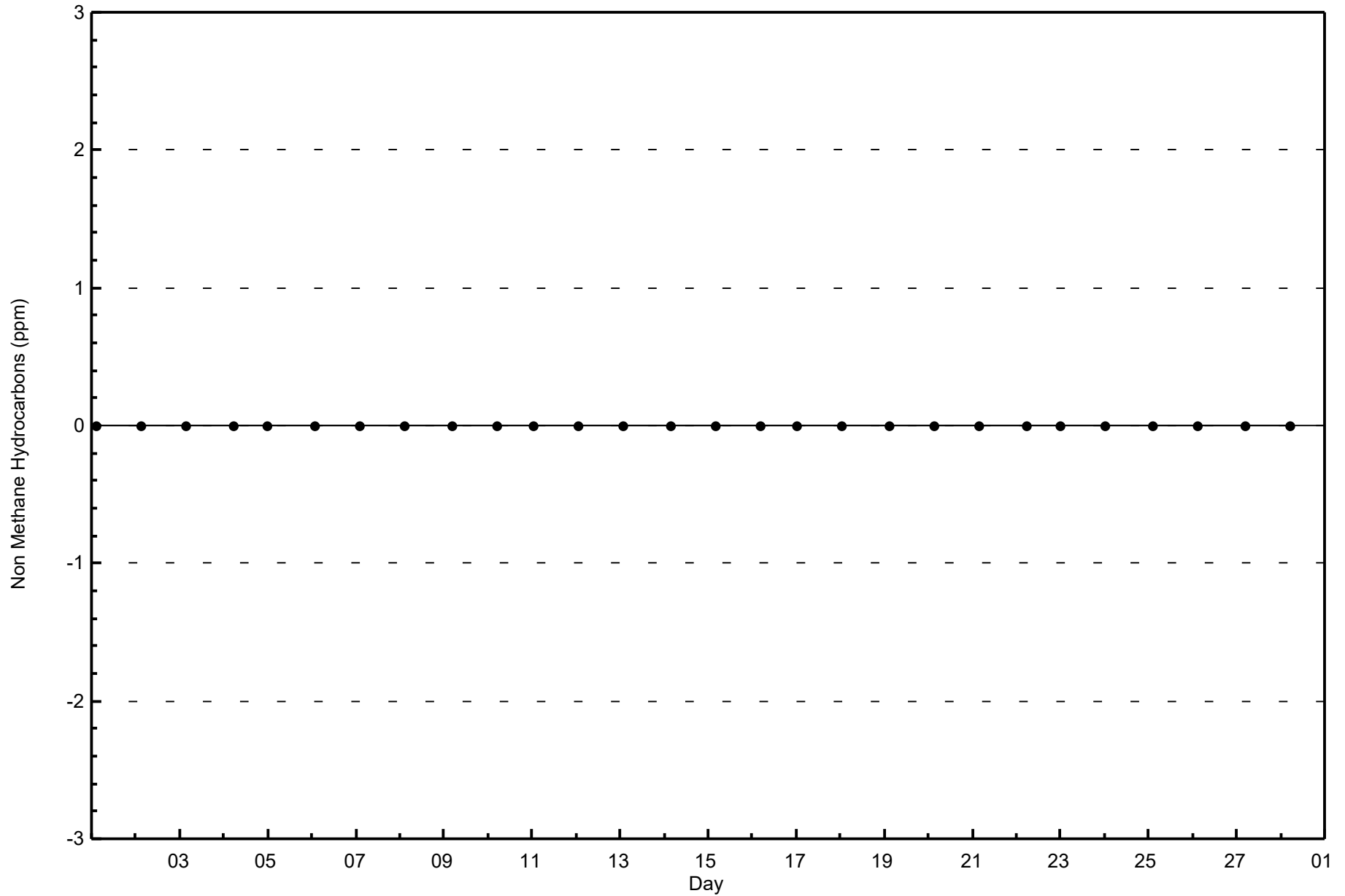
Total Number of Hours: 672

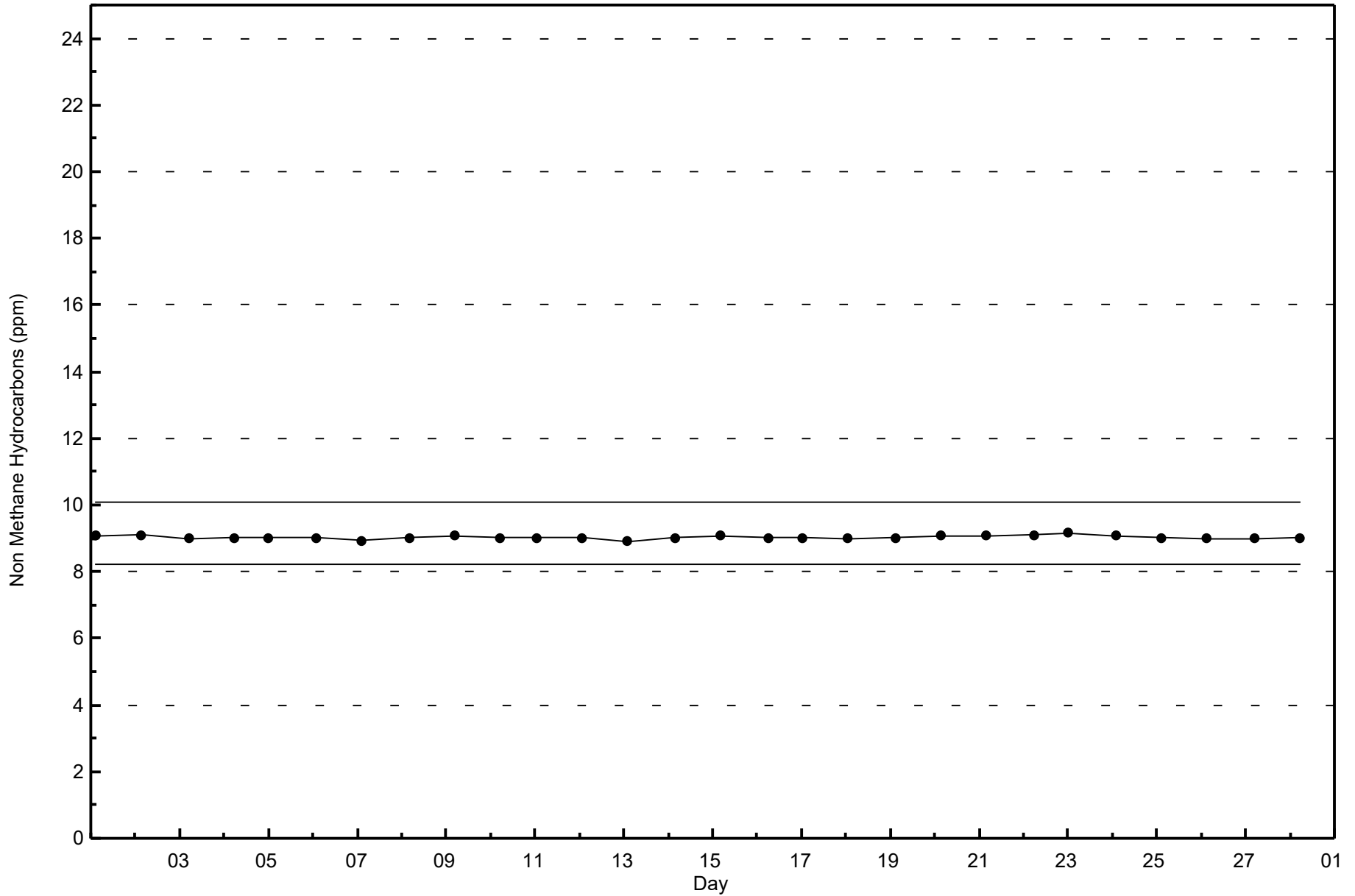


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Non Methane Hydrocarbons (NMHC) - ppm  
Anzac





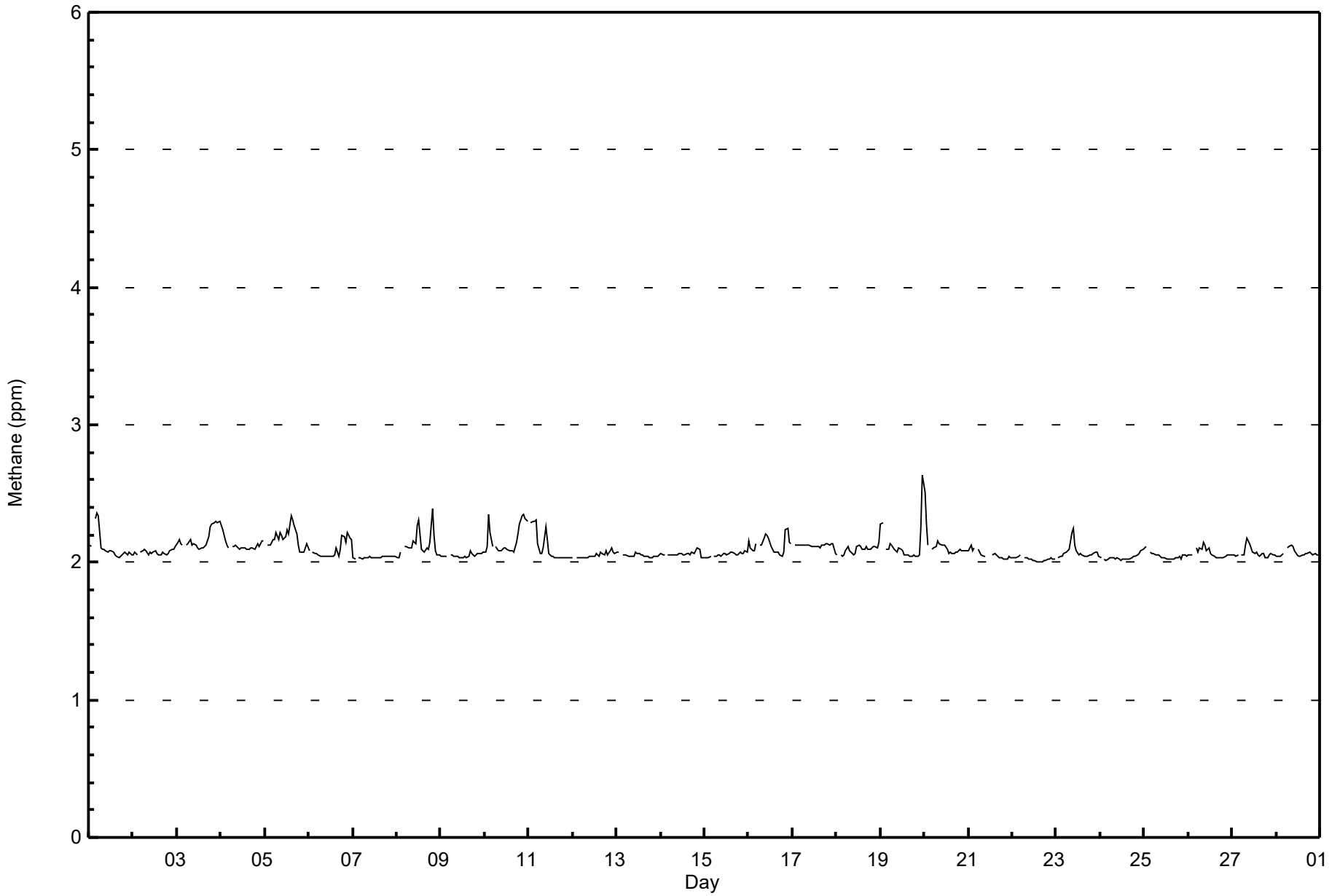






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Methane (CH<sub>4</sub>) - ppm**  
**Anzac - February 2023**





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

**Methane (CH<sub>4</sub>) - ppm**  
**Anzac - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	198	30.89	30.89
2.1 - 3.0	443	69.11	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 641

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Anzac - February 2023**

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	3	1	6	5	1	3	6	14	12	6	37	50	19	23	8	198
2.1 - 3.0	6	7	14	11	25	47	68	18	15	13	3	10	54	56	54	35	436
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>	10	10	15	17	30	48	71	24	29	25	9	47	104	75	77	43	634

Total Number of Valid Hours: 634

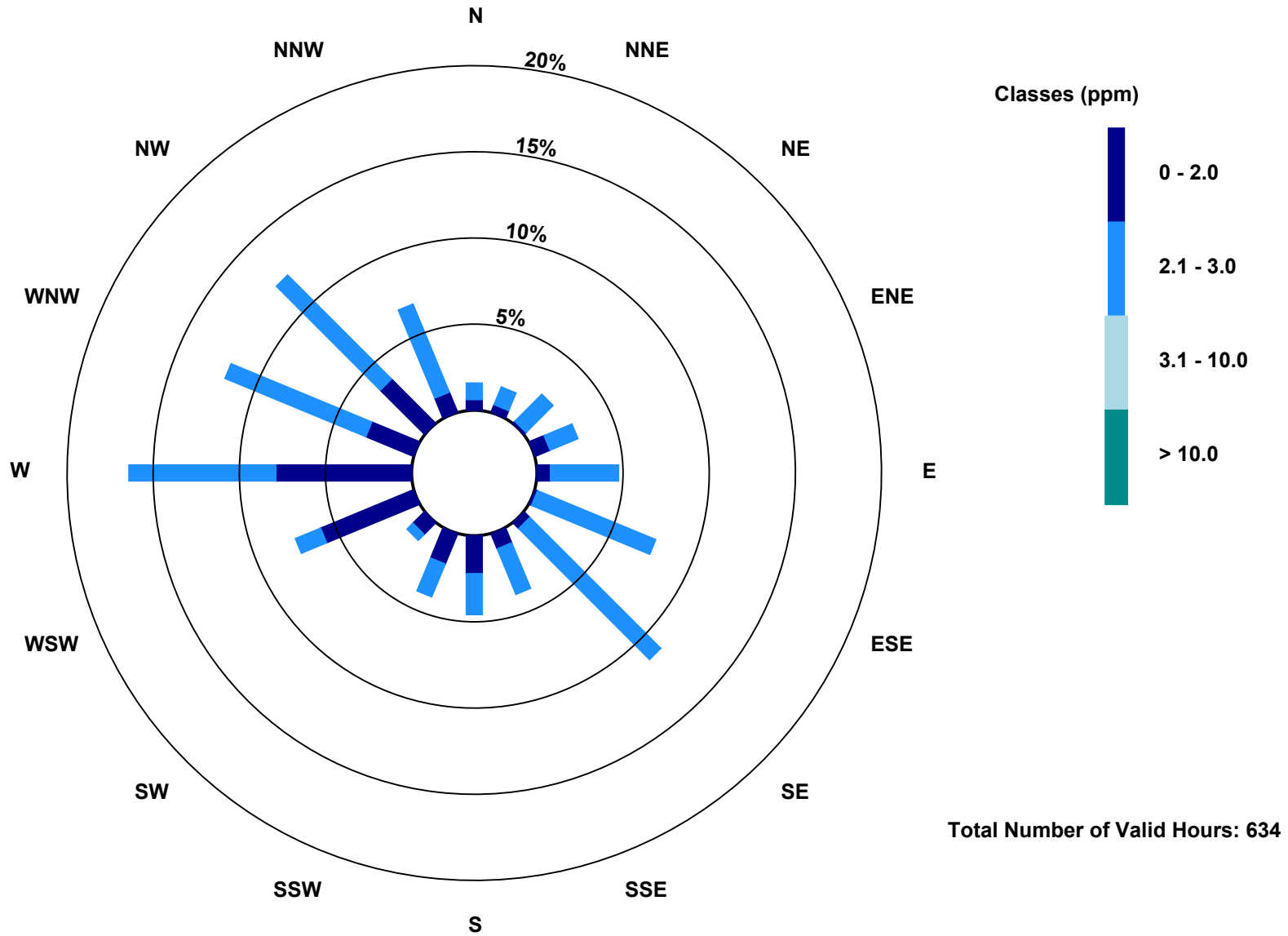
Total Number of Hours: 672





Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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



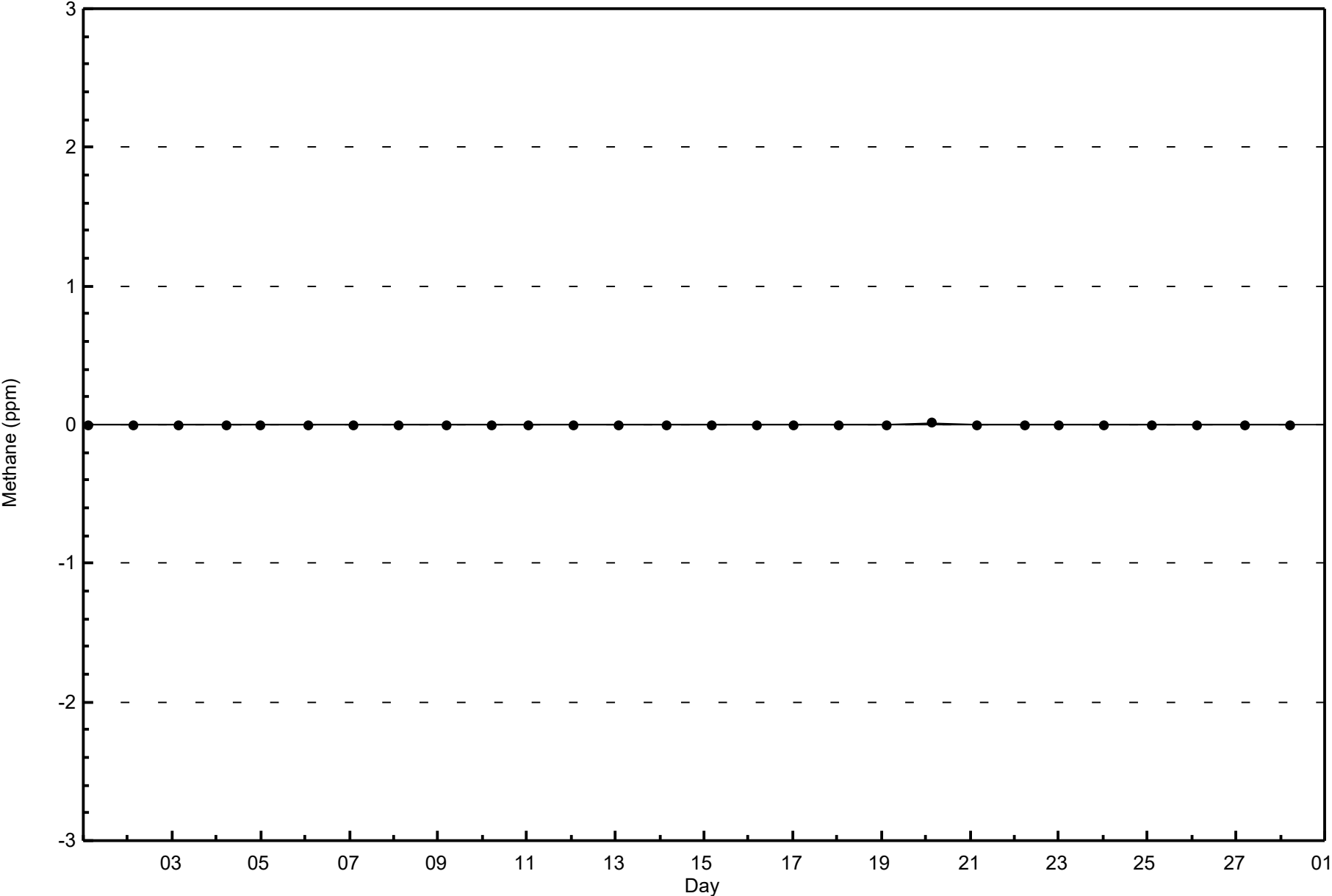


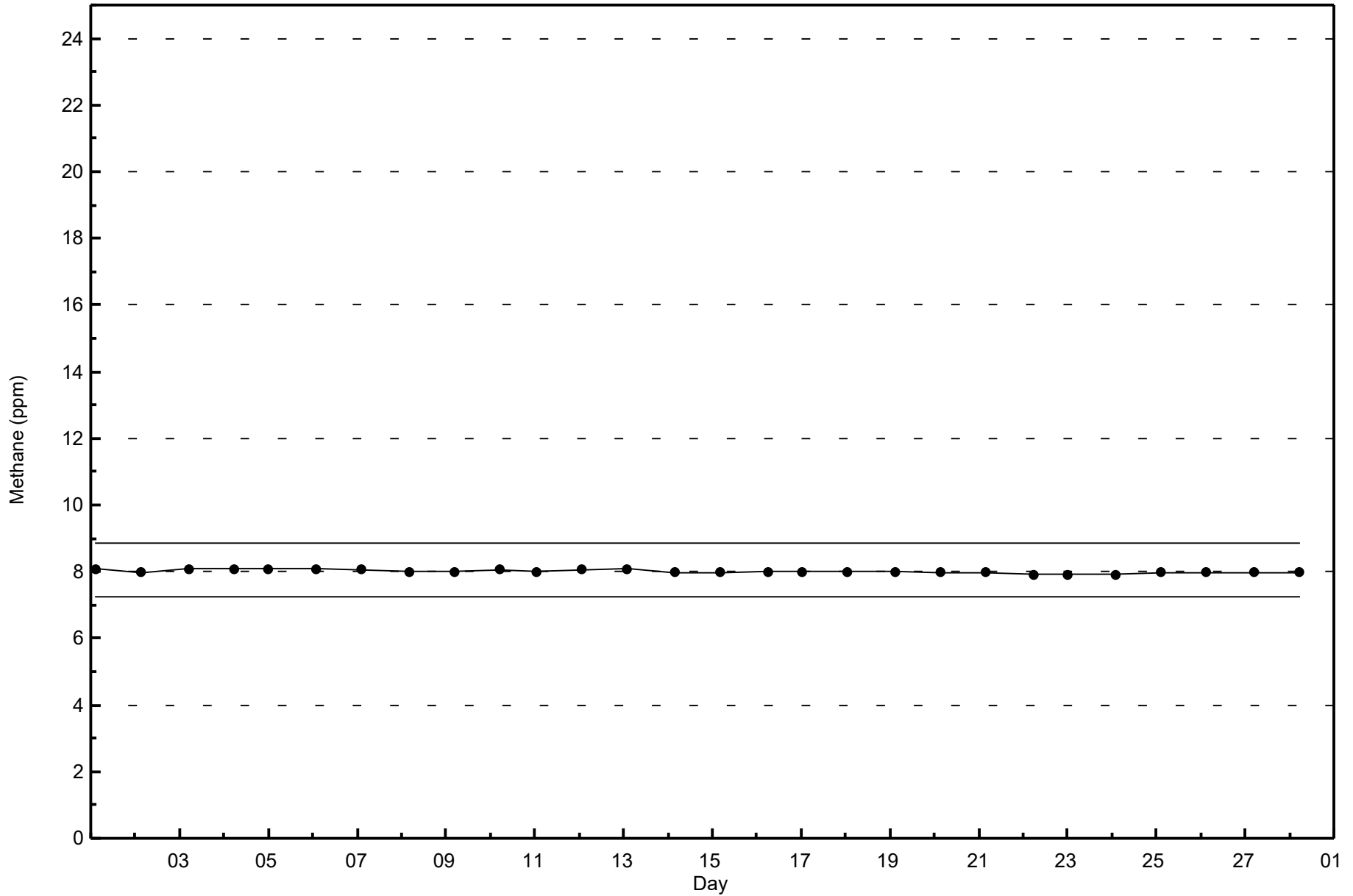
Wood Buffalo Environmental Association

Zero Responses

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

Anzac - February 2023



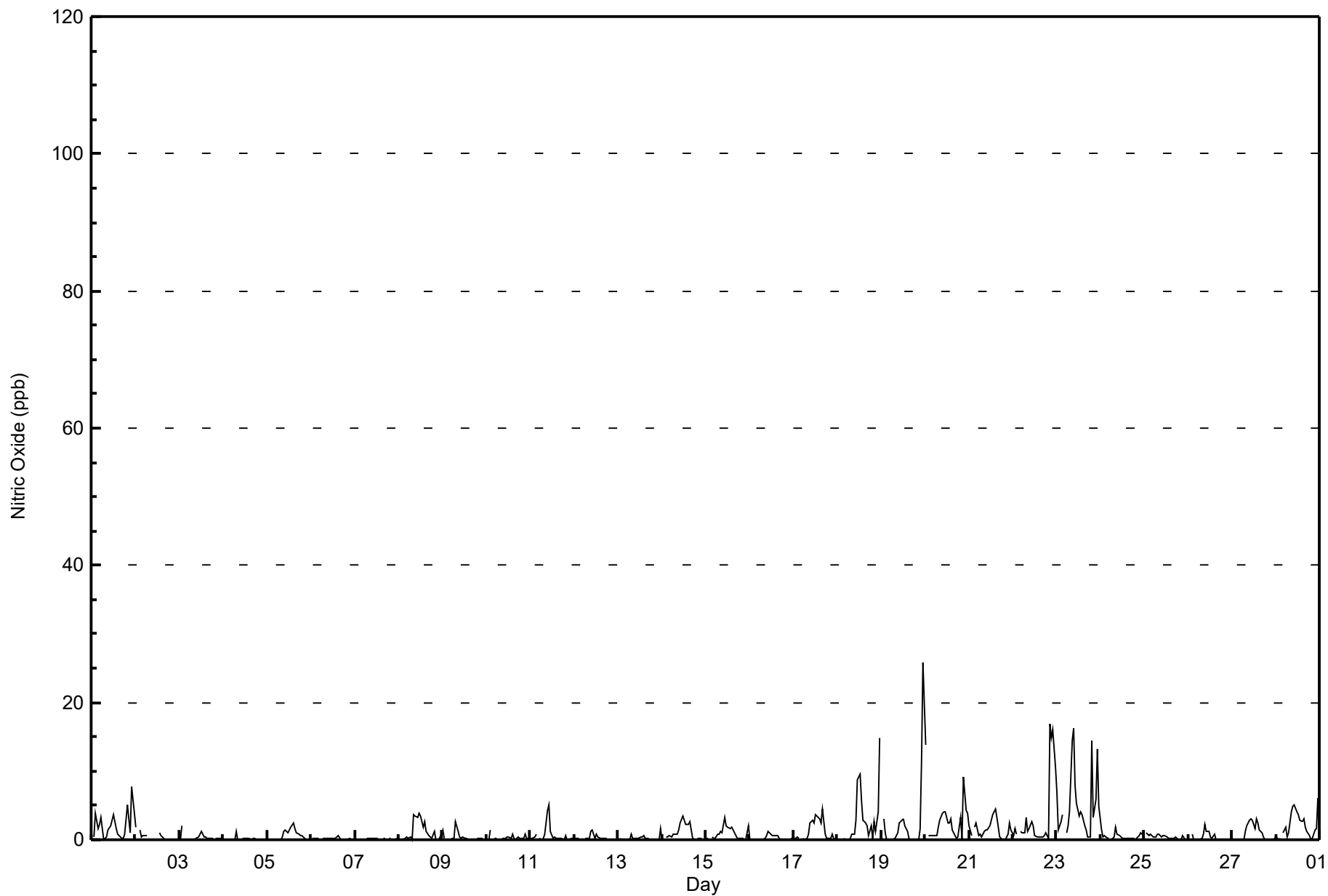






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Nitric Oxide (NO) - ppb**  
**Anzac - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Anzac - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	637	99.84	99.84
21 - 40	1	0.16	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: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Anzac - February 2023**

<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	9	10	16	17	31	44	69	23	28	24	11	48	100	75	82	42	629
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	1	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>	9	10	16	17	31	44	69	23	28	24	11	48	101	75	82	42	630

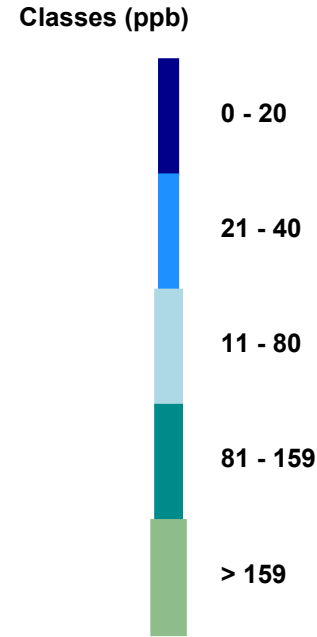
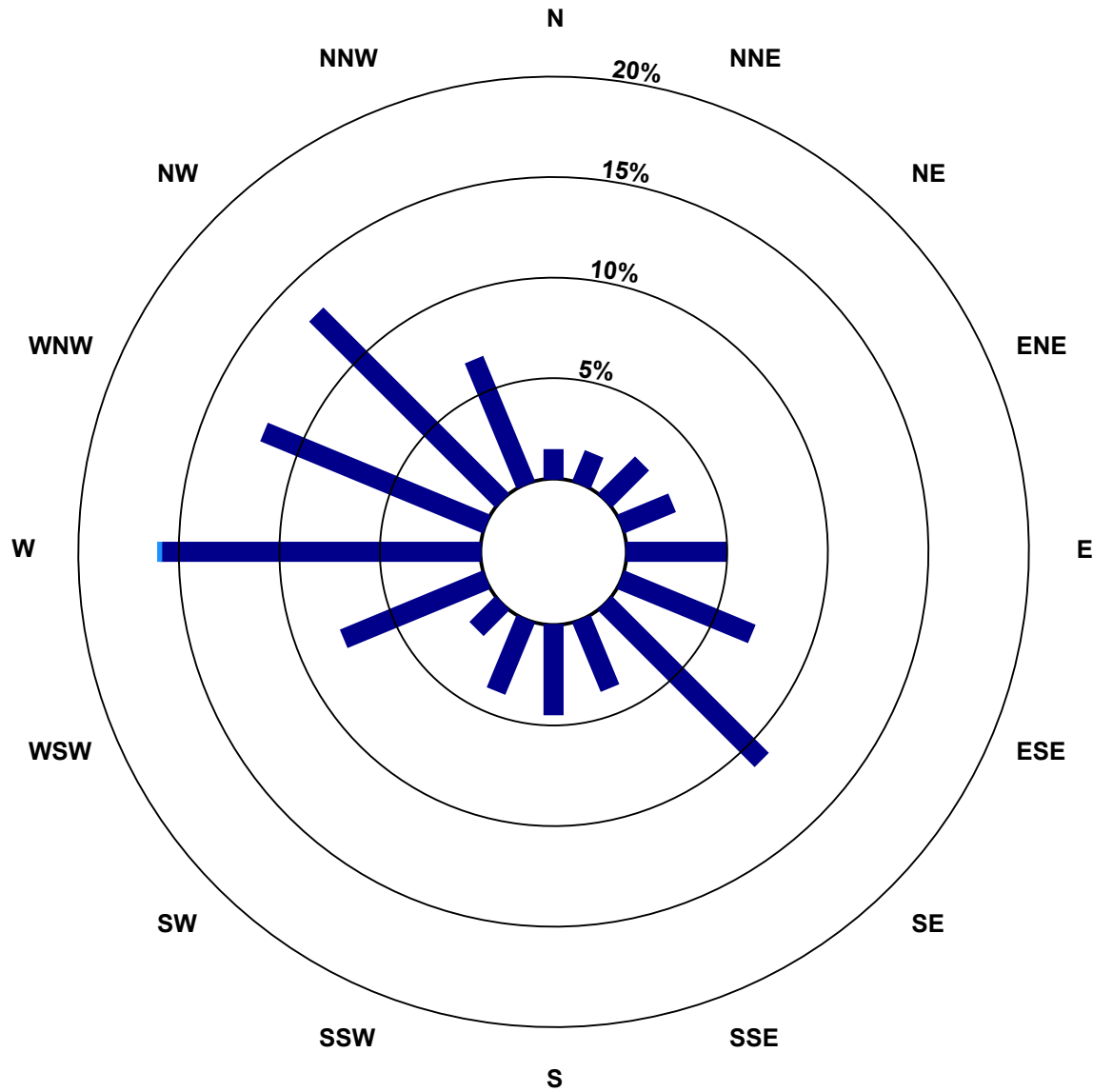
Total Number of Valid Hours: 630

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitric Oxide (NO) - ppb  
Anzac



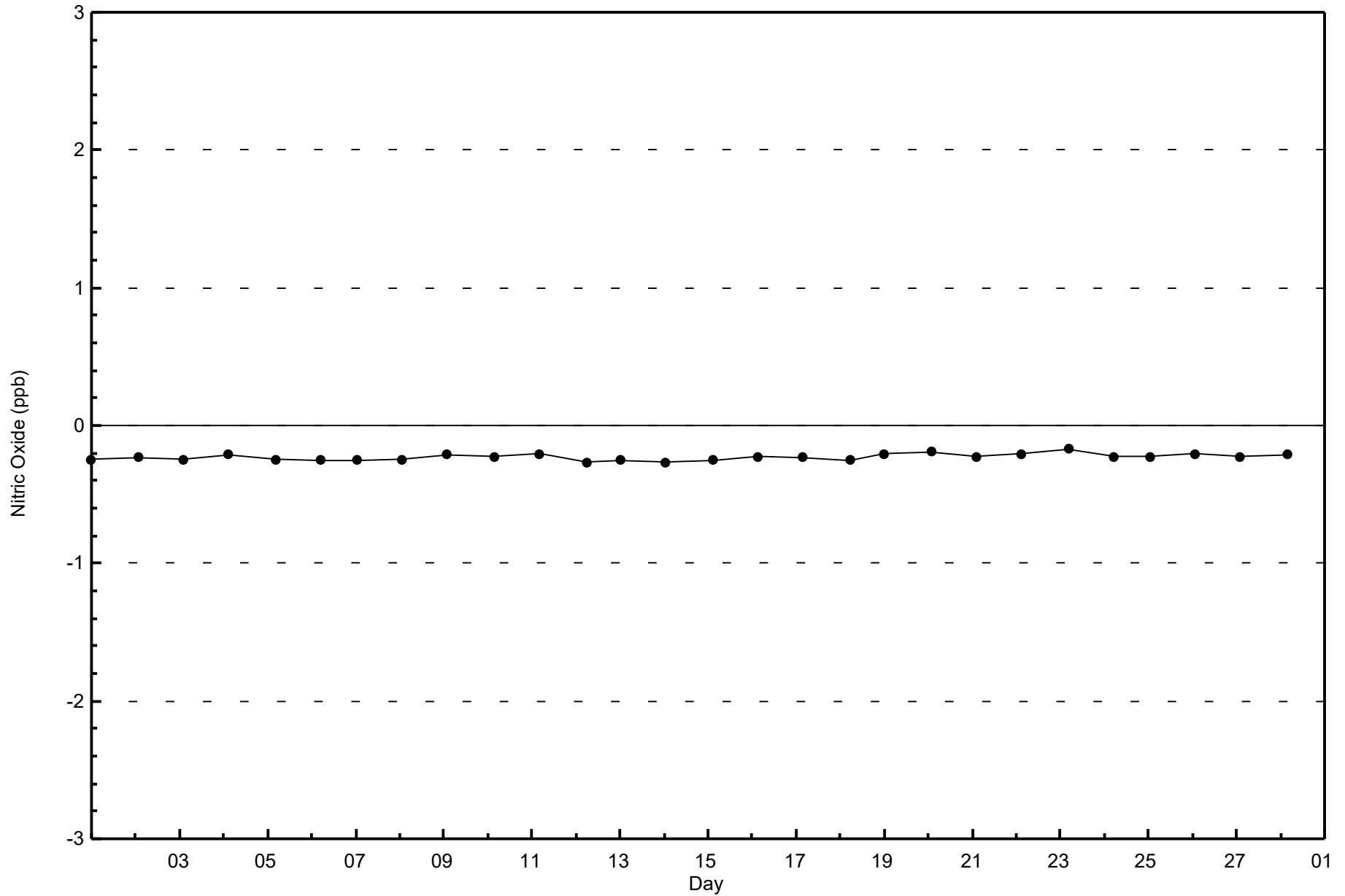
Total Number of Valid Hours: 630





Wood Buffalo Environmental Association  
Zero Responses

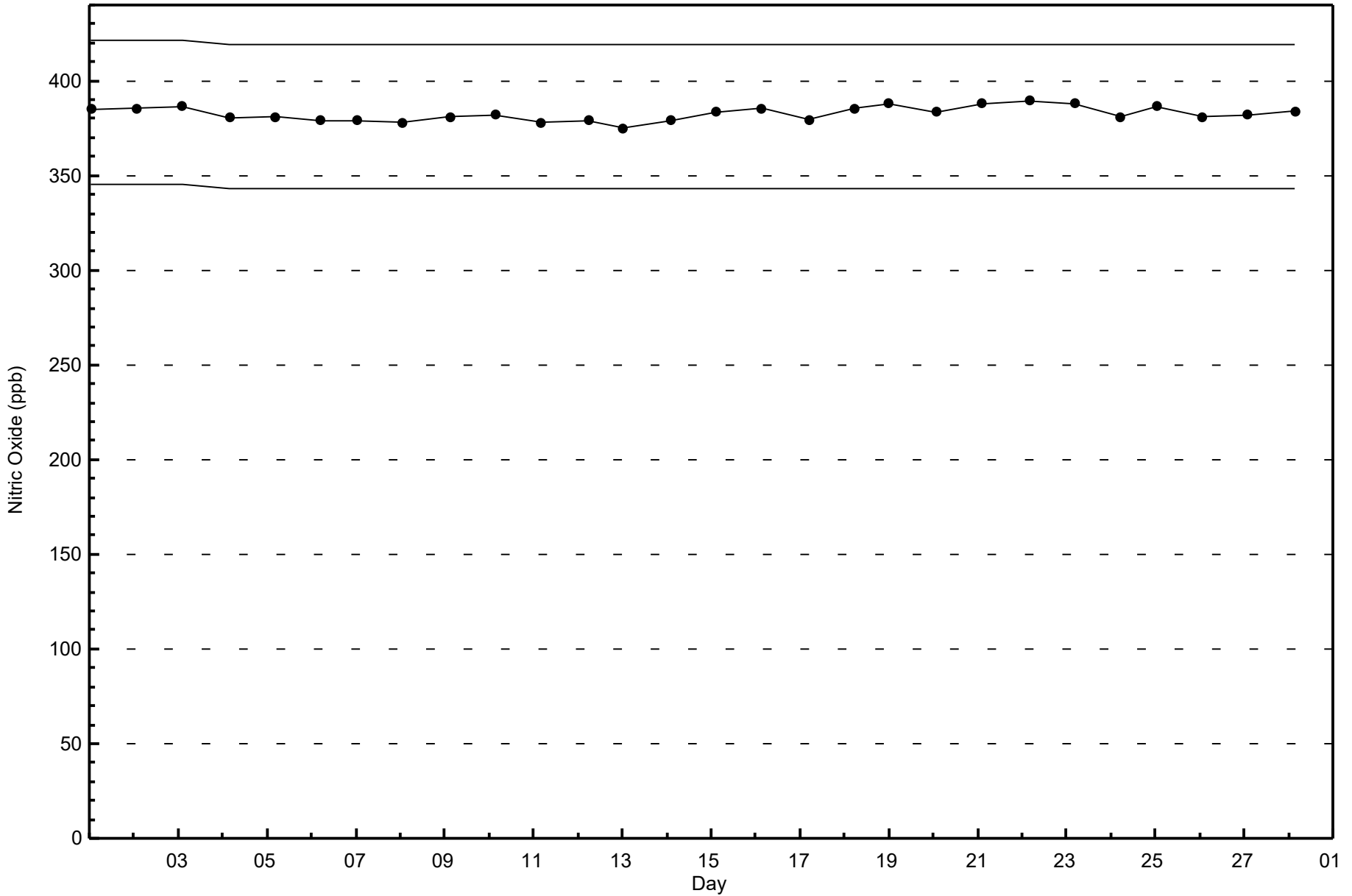
Nitric Oxide (NO) - ppb  
Anzac - February 2023





Wood Buffalo Environmental Association  
Span Responses

Nitric Oxide (NO) - ppb  
Anzac - February 2023





# Wood Buffalo Environmental Association

## Summary of Hour Averages

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

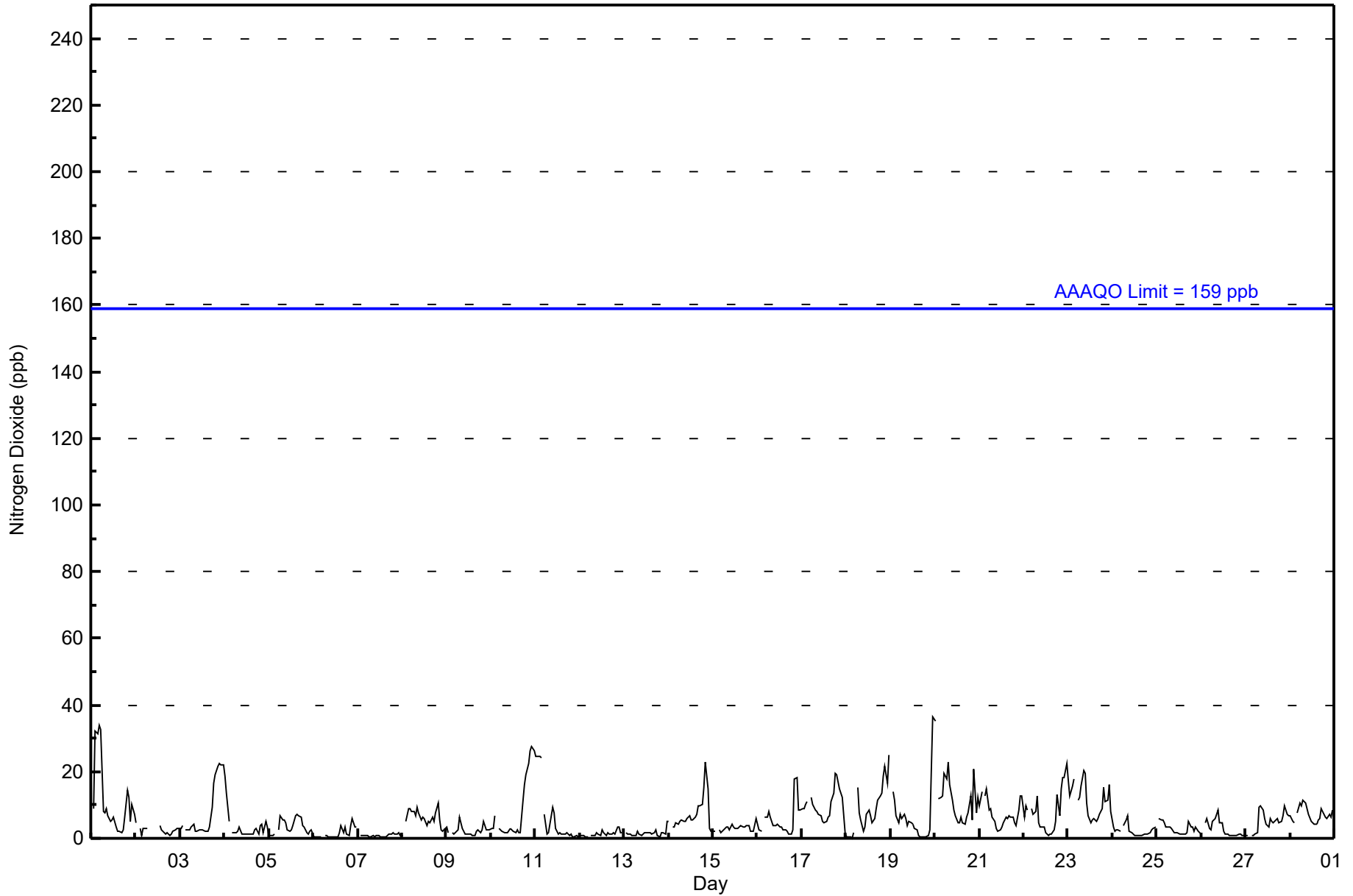
## Anzac - February 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 672																	672					
Maximum Value: 36.5 ppb on Feb 20 00:00		Maximum Daily Average: 11.8 ppb on Feb 20																	Hours of Data: 638							
Minimum Value: 0.2 ppb on Feb 18 04:00		Minimum Daily Average: 0.9 ppb on Feb 7																	Hours of Missing Data: 34							
Maximum Diurnal Average: 8.5 ppb at hour 24		Minimum Diurnal Average: 3.0 ppb at hour 14																	Hours of Calibration: 34							
Monthly Average: 5.60 ppb		Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.8 Q <sub>1</sub> = 1.5 Median = 3.5 Q <sub>3</sub> = 7.0 P <sub>90</sub> = 12.9 P <sub>99</sub> = 27.0																	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-Feb	Z	9.1	32.0	31.4	33.7	32.5	8.1	7.7	9.1	6.7	5.0	5.3	6.2	3.2	2.1	2.1	1.5	2.6	6.3	14.2	12.1	4.9	10.3	7.2	11.0	33.7
2-Feb	4.7	Z	3.1	0.9	3.0	3.0	2.8	C	C	C	C	C	C	3.7	2.7	1.5	1.2	1.6	1.0	1.3	2.2	2.7	2.9	3.0	--	4.7
3-Feb	2.9	3.9	Z	2.4	2.5	2.6	3.4	4.1	2.3	2.3	2.4	2.6	2.6	2.2	2.0	2.2	3.2	9.5	16.5	19.2	21.7	22.5	22.0	22.1	7.7	22.5
4-Feb	18.7	13.7	4.9	Z	1.8	1.6	1.5	2.3	3.4	1.3	1.2	1.2	1.4	1.4	1.3	1.2	2.5	2.9	1.3	3.9	4.1	1.7	4.9	3.4	3.5	18.7
5-Feb	1.0	1.0	0.9	1.2	Z	2.5	6.6	5.7	5.4	4.5	2.5	2.3	2.7	3.8	6.8	7.0	6.6	6.2	4.0	3.4	1.5	1.3	2.0	2.6	3.5	7.0
6-Feb	0.6	0.6	0.6	0.5	0.6	Z	0.8	0.8	0.5	0.4	0.4	0.4	0.5	0.5	1.8	3.8	1.5	3.6	1.4	1.0	3.8	5.8	3.2	3.3	1.6	5.8
7-Feb	Z	0.8	0.8	0.8	0.8	0.8	0.6	0.5	0.7	0.6	0.7	0.7	0.5	0.4	0.5	0.5	0.9	1.2	1.4	1.7	1.4	1.3	1.9	1.0	0.9	1.9
8-Feb	0.8	Z	5.2	9.0	8.8	8.1	8.2	6.8	9.3	7.8	5.5	6.3	6.0	3.7	5.0	4.8	6.4	5.0	7.6	10.4	5.3	2.6	2.1	3.1	6.0	10.4
9-Feb	3.4	1.8	Z	1.5	1.2	2.0	2.6	6.3	3.1	2.3	1.2	1.3	1.1	1.2	0.9	0.8	2.3	2.4	1.7	2.7	5.1	2.7	2.5	2.5	2.3	6.3
10-Feb	2.8	3.1	6.9	Z	3.1	2.7	2.0	1.6	1.5	1.8	2.8	2.6	2.2	1.9	2.4	1.8	1.9	11.4	16.3	18.9	22.6	26.3	27.4	26.1	8.3	27.4
11-Feb	24.7	24.7	24.4	24.2	Z	7.0	1.4	1.5	4.1	9.5	7.7	3.1	1.2	1.5	1.3	1.3	1.6	0.8	1.2	0.5	0.6	0.7	0.6	6.3	24.7	
12-Feb	0.7	0.7	0.7	0.6	0.6	Z	0.8	0.7	0.9	1.8	1.1	0.7	2.6	1.5	0.8	1.6	1.1	1.4	1.8	1.3	3.2	3.6	1.5	1.5	1.4	3.6
13-Feb	Z	1.8	1.3	1.1	0.8	0.8	0.7	2.2	1.2	0.8	1.4	1.6	1.8	1.5	1.8	1.3	1.7	2.6	0.8	0.4	1.7	1.5	1.2	5.0	1.5	5.0
14-Feb	5.0	Z	3.6	3.3	4.5	4.1	5.1	5.5	5.0	5.1	5.9	6.8	5.5	5.5	6.2	7.0	9.7	9.9	10.1	15.1	22.9	14.9	3.0	2.3	7.2	22.9
15-Feb	2.3	2.3	Z	2.6	1.7	2.2	2.9	3.2	3.5	2.7	4.3	3.2	3.0	3.0	3.5	3.7	3.5	3.6	4.0	3.8	2.3	2.1	2.0	6.0	3.1	6.0
16-Feb	4.2	2.4	2.1	Z	6.4	6.5	8.0	6.4	4.0	4.0	4.0	4.4	3.4	3.3	2.5	2.7	2.0	1.4	1.2	2.7	17.7	18.1	8.5	8.5	5.4	18.1
17-Feb	8.7	9.1	10.3	11.1	Z	12.2	10.0	8.6	7.9	7.4	6.6	4.9	4.7	5.2	6.2	6.8	10.9	13.6	19.6	19.1	14.7	13.5	12.2	1.9	9.8	19.6
18-Feb	0.4	0.4	0.6	0.2	1.9	Z	15.4	7.7	5.5	2.3	3.5	7.1	8.6	6.9	4.7	5.8	9.1	11.5	12.9	13.6	18.7	21.6	16.6	24.9	8.7	24.9
19-Feb	Z	14.0	11.3	6.7	4.7	7.2	5.8	7.2	5.8	3.8	5.2	4.5	4.3	3.0	2.5	0.7	0.5	0.4	0.4	0.4	0.7	2.6	20.1	36.5	6.4	36.5
20-Feb	35.3	Z	11.8	12.1	12.9	19.6	17.9	22.8	15.9	11.3	8.6	6.7	4.8	4.6	6.5	4.6	4.1	6.2	7.6	12.8	5.4	20.6	7.6	12.1	11.8	35.3
21-Feb	9.8	13.9	Z	12.9	14.9	8.6	8.7	6.2	5.1	2.9	2.3	2.6	3.6	4.5	6.3	6.1	6.8	6.5	6.3	4.5	3.8	8.6	12.5	12.6	7.4	14.9
22-Feb	6.5	9.9	8.5	Z	9.1	7.1	7.9	12.6	4.6	3.2	3.4	3.2	1.5	1.0	1.1	1.4	2.7	5.1	13.1	6.7	14.7	18.3	18.3	22.3	7.9	22.3
23-Feb	17.5	12.6	15.7	17.8	Z	11.3	12.3	15.5	20.4	19.3	10.4	6.8	4.7	5.6	6.1	4.9	6.1	7.4	8.7	15.3	11.1	11.5	15.9	7.9	11.5	20.4
24-Feb	3.6	2.3	2.6	2.4	2.1	Z	3.9	5.4	6.6	2.3	1.7	1.1	0.8	0.7	0.8	0.8	0.9	1.2	1.4	1.3	1.7	2.4	3.1	3.3	2.3	6.6
25-Feb	Z	5.9	5.7	5.5	4.6	3.5	3.4	3.6	3.1	1.9	1.7	1.5	1.3	1.2	1.2	1.2	1.8	5.1	3.6	3.3	2.0	3.3	2.3	1.9	3.0	5.9
26-Feb	1.3	Z	4.6	5.9	3.1	2.4	5.0	6.0	7.1	8.5	4.8	4.6	2.1	1.4	1.3	1.0	0.9	0.9	0.8	0.9	1.1	1.1	1.0	0.9	2.9	8.5
27-Feb	0.9	0.8	Z	0.9	0.8	1.2	1.5	9.5	9.7	8.6	6.1	4.1	3.4	6.1	5.2	4.6	5.7	5.8	4.6	5.1	6.9	9.7	7.2	6.7	5.0	9.7
28-Feb	6.7	5.0	4.5	Z	7.7	10.6	9.9	11.5	10.6	8.7	7.4	5.2	4.6	4.1	4.4	5.5	6.1	8.8	7.3	6.3	6.0	7.1	6.4	8.6	7.1	11.5
7.1 6.1 7.0 6.7 5.5 6.7 5.6 6.4 5.8 4.9 4.0 3.5 3.2 3.0 3.1 3.1 3.7 5.0 5.8 6.8 7.7 8.3 7.8 8.5																								Diurnal Average		
35.3 24.7 32.0 31.4 33.7 32.5 17.9 22.8 20.4 19.3 10.4 7.1 8.6 6.9 6.8 7.0 10.9 13.6 19.6 19.2 22.9 26.3 27.4 36.5																								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  
Anzac - February 2023





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

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Anzac - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	614	96.24	96.24
21 - 40	24	3.76	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: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Anzac - February 2023**

<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	8	9	16	17	31	44	67	23	28	24	11	48	98	71	77	40	612
21 - 40	1	1	0	0	0	0	2	0	0	0	0	0	3	4	5	2	18
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>	9	10	16	17	31	44	69	23	28	24	11	48	101	75	82	42	630

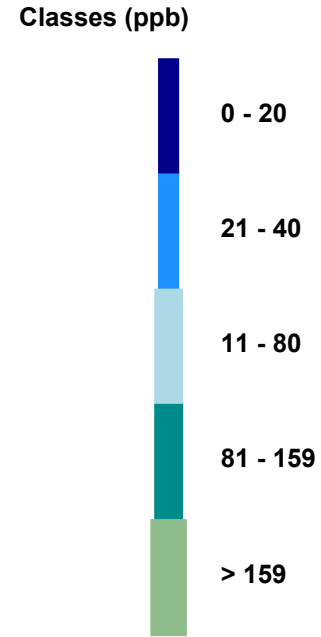
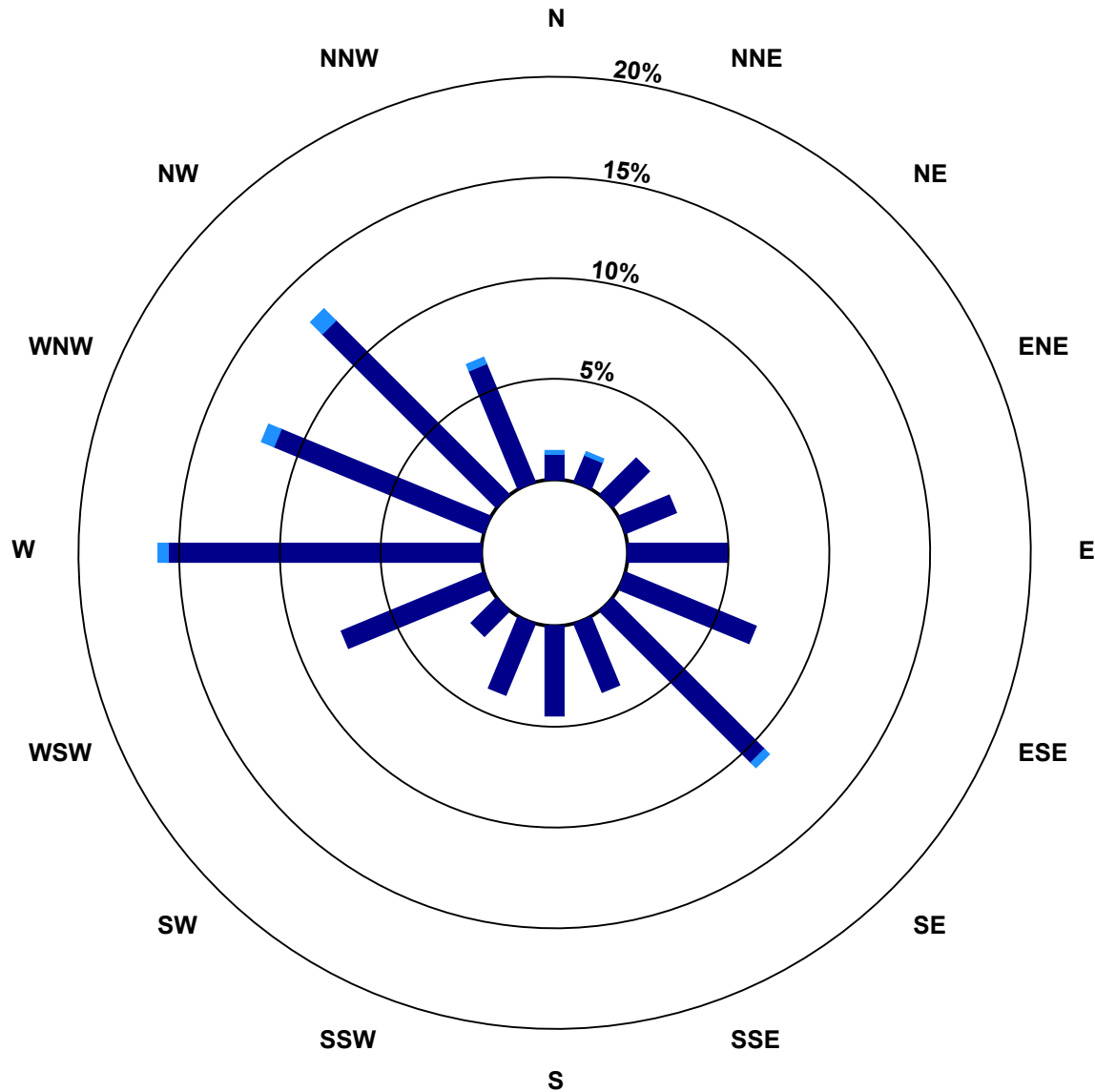
Total Number of Valid Hours: 630

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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

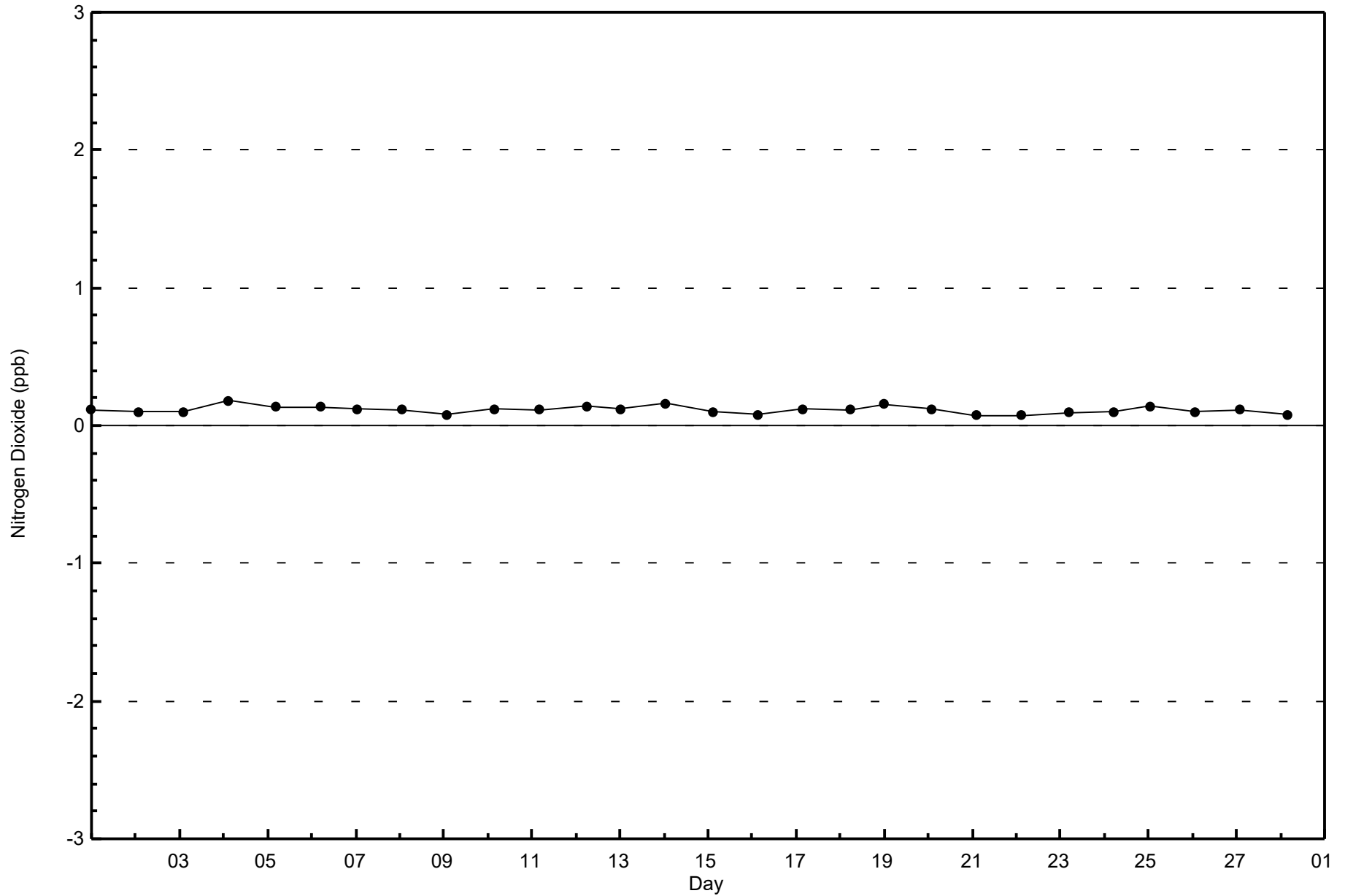


Total Number of Valid Hours: 630

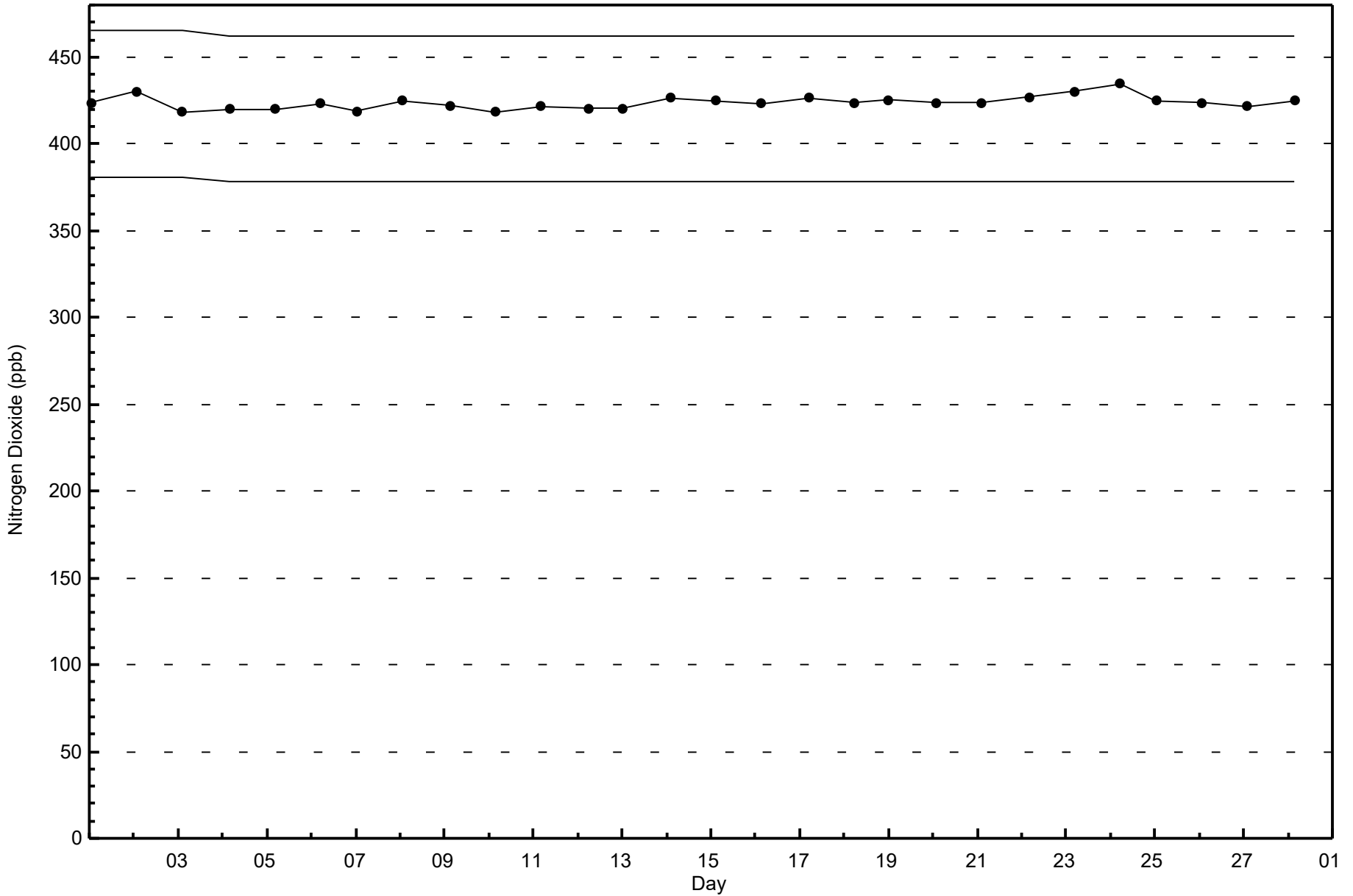


Wood Buffalo Environmental Association  
Zero Responses

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Anzac - February 2023









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

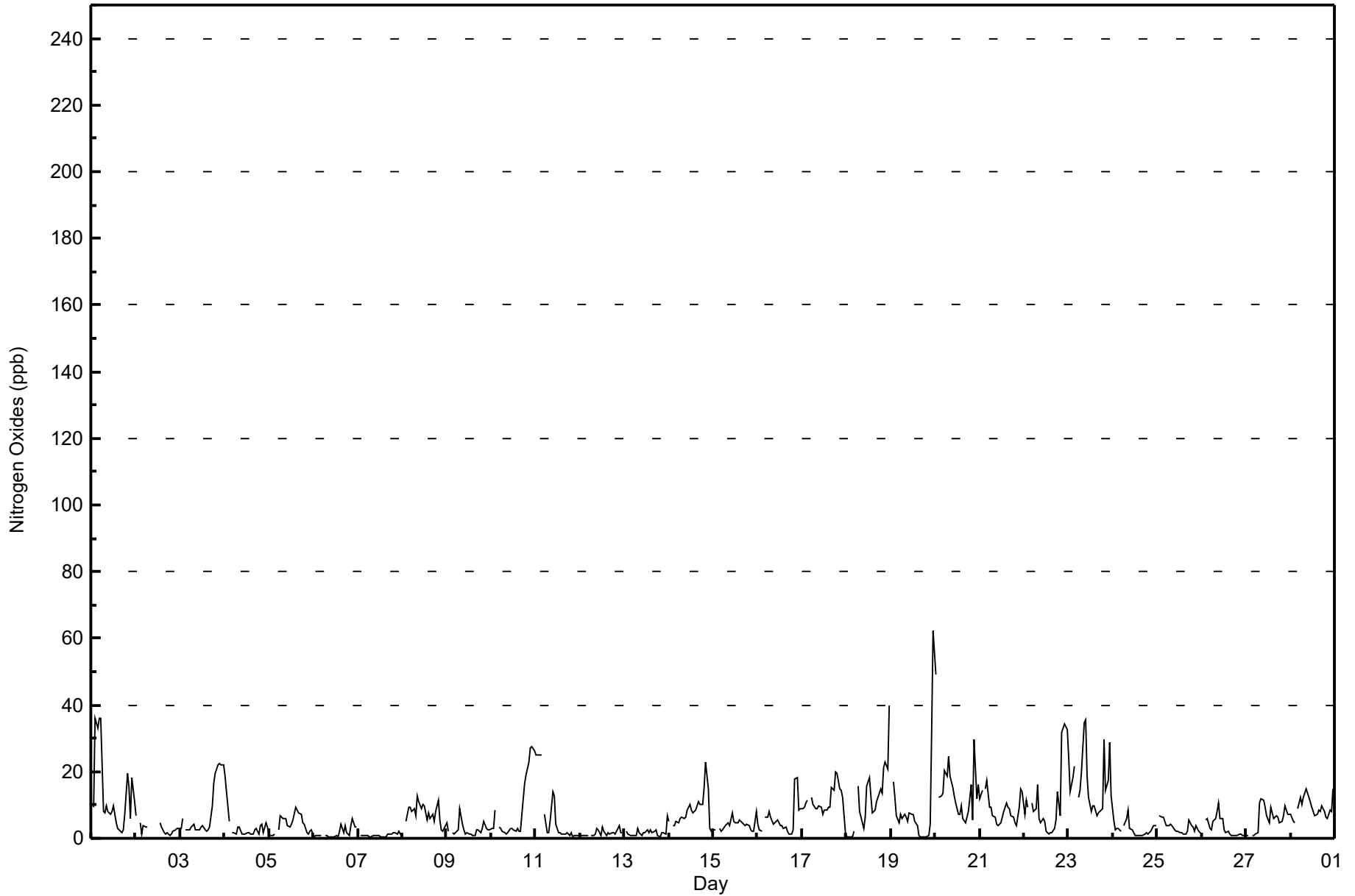
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Anzac - February 2023**

Maximum Value: 62.4 ppb on Feb 20 00:00		Maximum Daily Average: 16.9 ppb on Feb 23		Hours in Service: 672																																												
Minimum Value: 0.2 ppb on Feb 18 04:00		Minimum Daily Average: 1.0 ppb on Feb 7		Hours of Data: 638																																												
Maximum Diurnal Average: 11.3 ppb at hour 24		Minimum Diurnal Average: 4.1 ppb at hour 16		Hours of Missing Data: 34																																												
Monthly Average: 6.79 ppb		Percentiles: P <sub>1</sub> = 0.5 P <sub>10</sub> = 0.9 Q <sub>1</sub> = 1.8 Median = 4.3 Q <sub>3</sub> = 8.7 P <sub>90</sub> = 15.2 P <sub>99</sub> = 35.3		Hours of Calibration: 34																																												
				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-Feb	Z	9.4	35.9	33.1	35.9	35.8	8.2	7.8	9.6	8.1	7.0	8.1	9.9	4.8	2.9	2.6	1.7	2.7	7.2	19.3	15.1	5.9	18.1	11.1	13.1	35.9																						
2-Feb	6.6	Z	4.6	1.3	3.6	3.5	3.4	C	C	C	C	C	C	4.7	3.3	1.6	1.2	1.6	1.0	1.3	2.2	2.7	2.9	3.0	--	6.6																						
3-Feb	2.9	6.0	Z	2.4	2.5	2.6	3.4	4.1	2.4	2.5	2.7	3.3	3.9	2.5	2.3	2.4	3.3	9.6	16.6	19.3	21.8	22.6	22.1	22.2	8.0	22.6																						
4-Feb	18.8	13.8	4.9	Z	1.8	1.6	1.5	3.5	3.5	1.4	1.3	1.3	1.7	1.5	1.4	1.3	2.6	3.1	1.3	3.9	4.1	1.7	4.9	3.4	3.7	18.8																						
5-Feb	1.0	1.0	0.9	1.2	Z	2.5	6.7	5.8	5.8	5.8	3.9	3.3	4.1	5.6	9.3	8.6	7.5	7.1	4.6	4.1	1.6	1.3	2.1	2.6	4.2	9.3																						
6-Feb	0.6	0.8	0.8	0.7	0.8	Z	1.0	1.0	0.6	0.5	0.5	0.5	0.6	0.6	2.3	4.3	1.6	3.7	1.5	1.0	3.9	6.0	3.3	3.4	1.8	6.0																						
7-Feb	Z	0.9	0.9	0.9	0.9	0.9	0.6	0.6	0.8	0.8	0.9	0.9	0.6	0.5	0.6	0.6	1.1	1.2	1.4	1.9	1.5	1.4	2.0	1.2	1.0	2.0																						
8-Feb	0.9	Z	5.3	9.2	9.2	8.2	8.7	6.9	12.9	11.2	8.7	10.2	9.5	5.6	7.6	6.0	7.0	5.3	7.9	11.6	5.4	2.7	2.1	3.9	7.2	12.9																						
9-Feb	4.8	2.1	Z	1.5	1.2	2.1	2.7	9.0	4.3	2.7	1.5	1.6	1.4	1.4	1.0	0.9	2.4	2.4	1.7	2.8	5.3	2.8	2.5	2.6	2.6	9.0																						
10-Feb	2.8	3.1	8.3	Z	3.3	2.9	2.0	1.6	1.5	1.9	3.1	2.9	2.6	2.2	3.1	2.0	2.0	11.9	16.6	19.1	22.9	27.1	27.7	26.3	8.6	27.7																						
11-Feb	24.9	24.9	24.8	25.0	Z	7.1	1.5	1.6	5.0	13.8	12.7	4.4	1.5	1.9	1.5	1.5	1.4	1.8	0.8	1.8	0.6	0.7	0.8	0.8	7.0	25.0																						
12-Feb	0.9	0.8	0.8	0.7	0.7	Z	0.9	0.8	1.1	3.1	2.6	0.9	3.4	2.0	1.0	1.8	1.2	1.6	1.8	1.3	3.2	3.7	1.5	1.6	1.6	3.7																						
13-Feb	Z	2.0	1.3	1.1	0.9	0.9	0.8	2.9	1.5	0.9	1.6	1.8	2.3	1.9	2.3	1.6	2.0	2.7	0.8	0.4	1.7	1.5	1.2	6.6	1.8	6.6																						
14-Feb	5.1	Z	3.9	3.8	5.1	4.6	5.9	6.3	5.8	6.5	8.4	10.2	8.4	7.7	8.5	9.6	11.1	10.1	10.2	15.2	23.1	15.0	3.0	2.3	8.3	23.1																						
15-Feb	2.5	2.5	Z	3.1	1.9	2.5	3.8	4.1	4.6	3.7	7.6	5.2	4.8	4.7	5.4	5.1	4.1	3.7	4.1	3.9	2.4	2.2	2.1	8.0	4.0	8.0																						
16-Feb	4.2	2.4	2.1	Z	6.4	6.5	8.1	6.5	4.3	4.6	5.1	5.4	4.0	3.9	3.1	3.3	2.2	1.5	1.3	2.7	17.8	18.2	8.6	8.7	5.7	18.2																						
17-Feb	8.9	9.3	10.6	11.3	Z	12.3	10.1	8.8	8.7	9.8	9.5	7.3	8.5	8.4	9.3	9.3	15.4	14.3	19.8	19.3	14.8	14.3	12.5	1.9	11.1	19.8																						
18-Feb	0.4	0.4	0.6	0.2	2.1	Z	15.5	7.9	6.4	3.2	6.3	15.9	18.2	12.6	7.5	8.3	11.1	12.1	14.8	13.8	21.3	22.9	20.7	39.8	11.4	39.8																						
19-Feb	Z	17.1	12.3	6.8	4.7	7.2	5.8	7.3	6.5	4.9	7.7	7.3	7.4	5.0	3.7	0.8	0.5	0.4	0.4	0.4	0.7	4.2	31.6	62.4	8.9	62.4																						
20-Feb	49.0	Z	12.3	12.8	13.6	20.3	18.5	24.5	18.7	15.2	12.8	10.7	7.3	7.0	9.6	6.1	4.7	6.5	8.0	16.1	5.4	29.8	11.9	16.0	14.6	49.0																						
21-Feb	11.9	14.5	Z	14.7	17.4	9.2	9.4	6.7	6.4	4.2	3.7	4.5	6.5	8.2	10.8	9.4	8.7	6.9	6.3	4.5	3.8	9.4	15.0	14.0	9.0	17.4																						
22-Feb	7.2	11.5	9.4	Z	10.4	8.1	8.9	15.9	5.8	4.8	6.0	5.1	2.2	1.4	1.5	1.8	3.1	5.7	14.0	6.9	31.6	33.1	34.5	32.8	11.4	34.5																						
23-Feb	24.3	14.1	18.3	21.4	Z	12.3	14.4	19.7	34.8	35.6	18.4	12.1	8.1	9.6	9.8	6.9	7.5	7.9	9.1	29.8	14.4	17.4	29.0	12.7	16.9	35.6																						
24-Feb	5.1	2.7	3.1	2.8	2.3	Z	4.0	5.8	8.4	3.1	2.3	1.5	1.0	0.9	1.0	1.0	1.0	1.4	1.6	1.4	2.1	3.1	4.0	3.9	2.8	8.4																						
25-Feb	Z	6.9	6.3	6.3	5.3	3.9	3.8	4.4	3.8	2.4	2.3	2.0	1.6	1.5	1.4	1.4	2.0	5.6	3.6	3.3	2.0	3.8	2.3	1.9	3.4	6.9																						
26-Feb	1.3	Z	5.5	5.9	3.1	2.4	5.0	6.1	7.9	10.7	5.9	5.8	2.6	1.6	2.1	1.1	0.9	0.9	0.8	0.9	1.1	1.1	1.0	0.9	3.3	10.7																						
27-Feb	0.9	0.8	Z	0.9	0.8	1.2	1.6	10.7	11.8	11.5	9.2	6.9	4.9	9.2	7.7	6.1	6.8	6.2	4.7	5.1	6.9	9.8	7.3	7.0	6.0	11.8																						
28-Feb	7.1	5.1	4.6	Z	8.7	12.4	10.3	12.4	14.7	13.6	12.5	9.3	8.2	6.9	7.1	8.6	7.9	10.0	7.9	6.3	6.1	8.5	8.1	14.7	9.2	14.7																						
																								8.4	6.6	7.7	7.3	5.9	7.1	5.9	7.1	7.3	6.9	6.1	5.5	5.0	4.4	4.5	4.1	4.4	5.3	6.1	7.8	8.7	9.7	10.1	11.3	Diurnal Average
																								49.0	24.9	35.9	33.1	35.9	35.8	18.5	24.5	34.8	35.6	18.4	15.9	18.2	12.6	10.8	9.6	15.4	14.3	19.8	29.8	31.6	33.1	34.5	62.4	Diurnal Maximum
Z - zerspan																								C - Calibration																								



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

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Anzac - February 2023**





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

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Anzac - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	602	94.36	94.36
21 - 40	34	5.33	99.69
41 - 80	2	0.31	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Anzac - February 2023**

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	9	16	17	31	44	65	23	26	24	10	44	96	70	77	40	600
21 - 40	1	1	0	0	0	0	4	0	2	0	1	4	3	5	5	2	28
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	2	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>	9	10	16	17	31	44	69	23	28	24	11	48	101	75	82	42	630

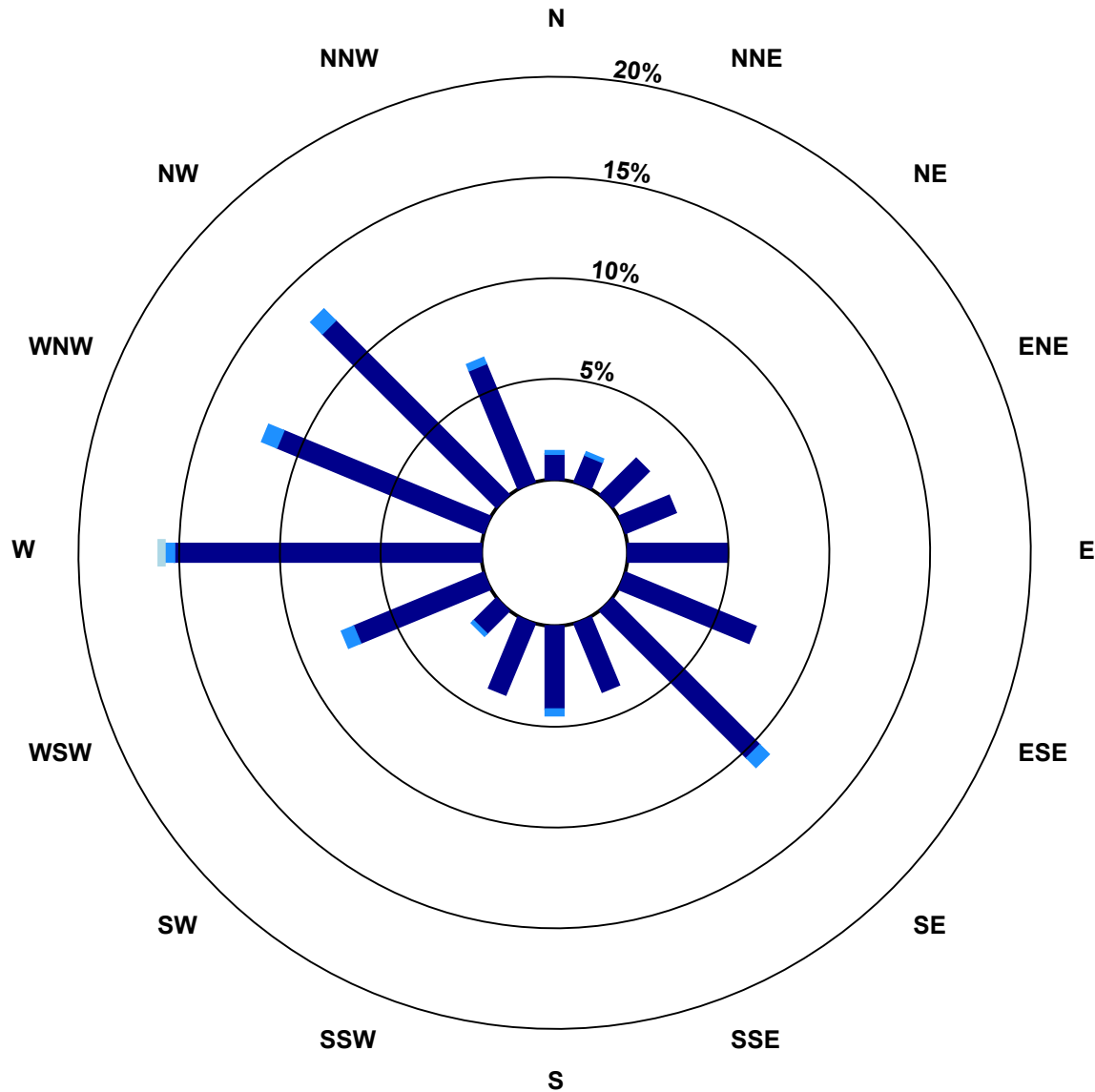
Total Number of Valid Hours: 630

Total Number of Hours: 672

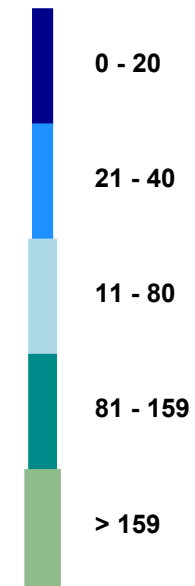


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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



Classes (ppb)

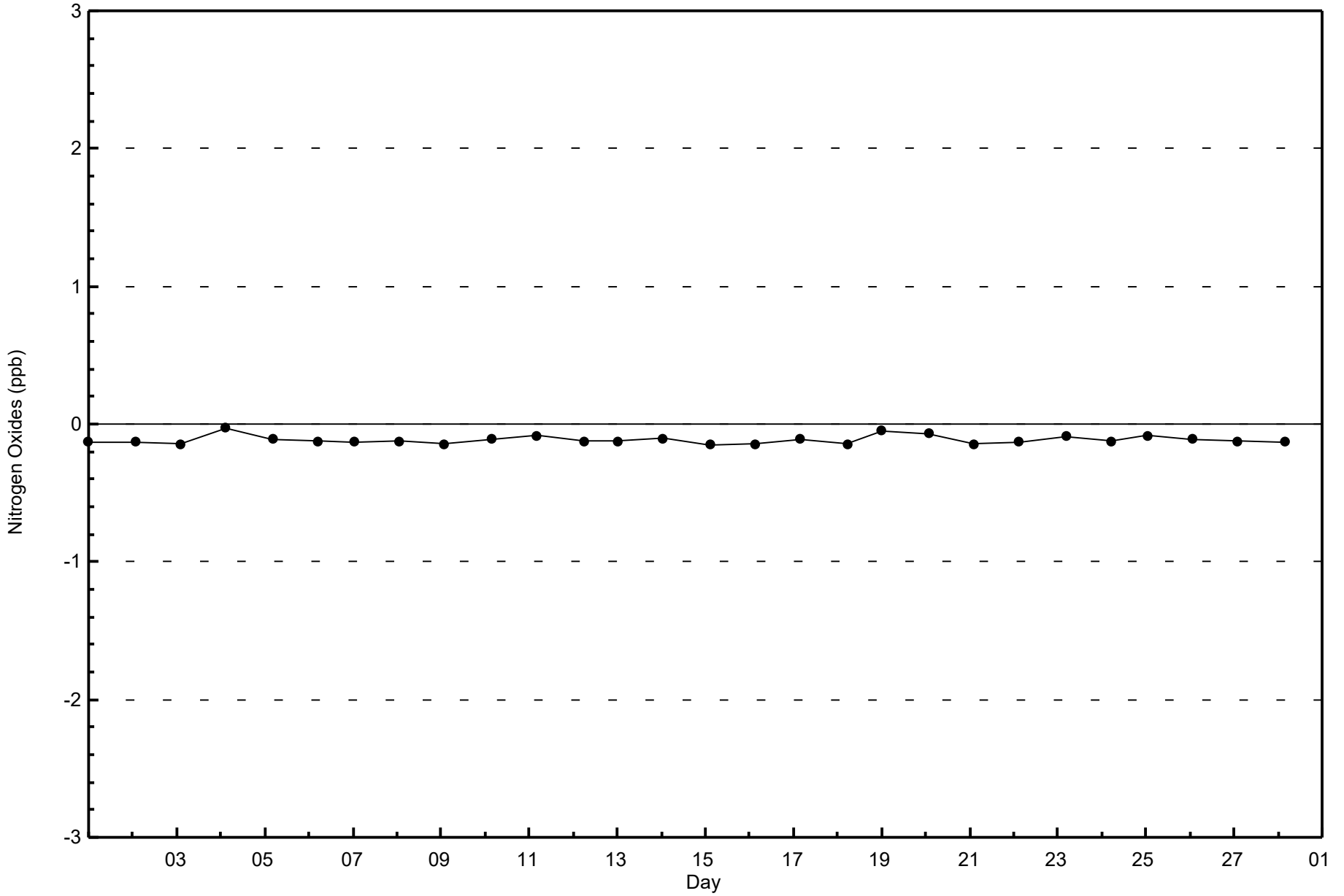


Total Number of Valid Hours: 630



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

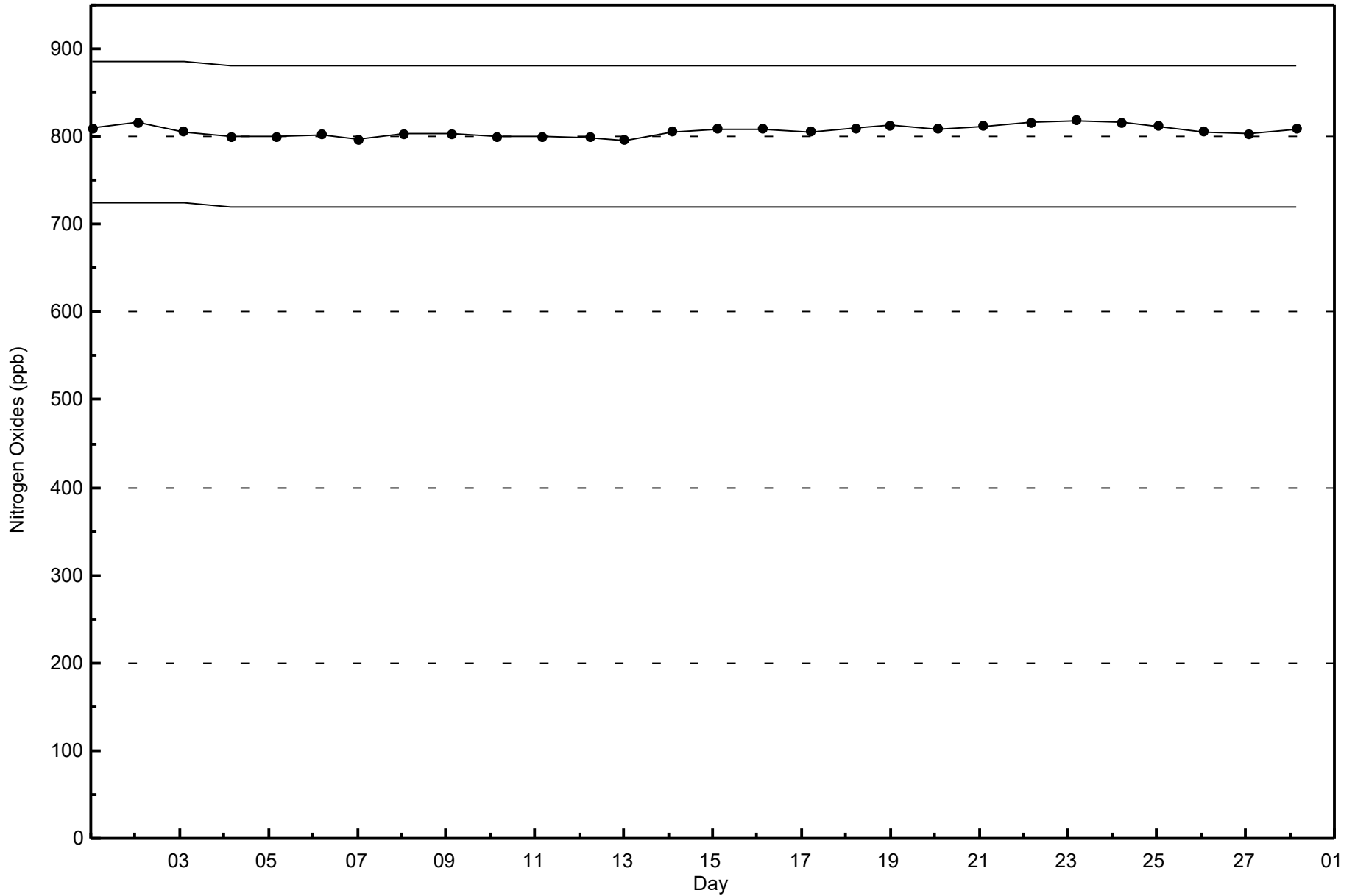
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Anzac - February 2023**





**Wood Buffalo Environmental Association**  
**Span Responses**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Anzac - February 2023**







# Wood Buffalo Environmental Association

## Summary of Hour Averages

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

Anzac - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 45.5 ppb on Feb 12 14:00	Maximum Daily Average: 39.5 ppb on Feb 7		Hours of Data:	637
Minimum Value: 0.1 ppb on Feb 11 00:00	Minimum Daily Average: 15.5 ppb on Feb 17		Hours of Missing Data:	35
Maximum Diurnal Average: 31.9 ppb at hour 16	Minimum Diurnal Average: 24.4 ppb at hour 22		Hours of Calibration:	32
Monthly Average: 27.50 ppb	Percentiles: P <sub>1</sub> = 1.5 P <sub>10</sub> = 14.9 Q <sub>1</sub> = 22.2 Median = 28.7 Q <sub>3</sub> = 34.4 P <sub>90</sub> = 37.7 P <sub>99</sub> = 40.9		Percent Operational Time:	99.6

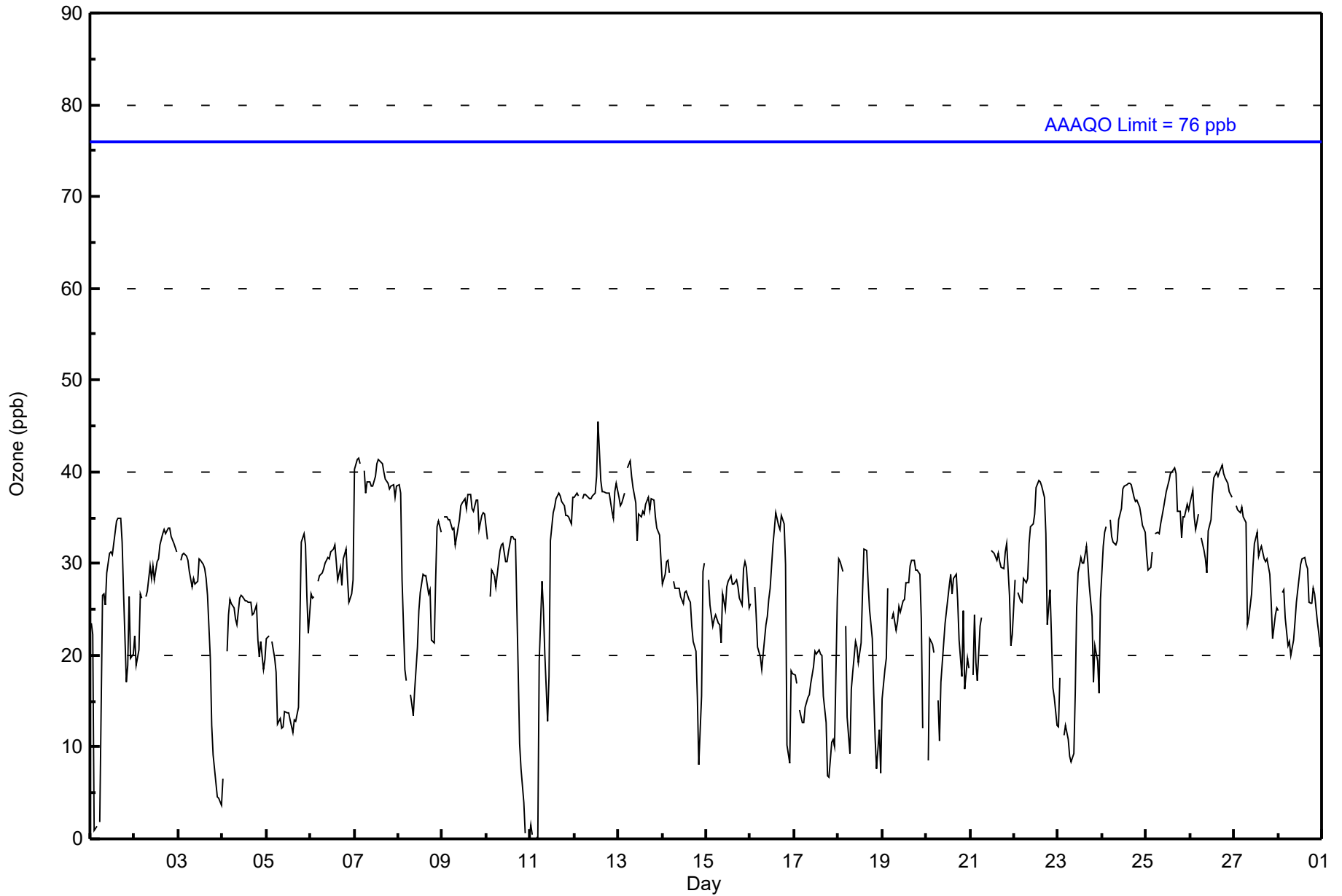
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Feb	23.5	22.2	0.9	1.4	Z	1.9	26.6	26.6	25.5	29.0	31.2	31.3	31.0	33.4	34.7	34.9	34.9	32.4	26.9	17.1	18.9	26.4	19.7	20.2	23.9	34.9																						
2-Feb	22.1	18.9	20.5	26.7	26.2	Z	26.5	27.0	29.7	28.3	29.7	28.3	30.2	30.5	32.0	33.3	33.8	33.3	33.9	33.8	32.9	32.2	31.7	31.3	29.3	33.9																						
3-Feb	Z	30.4	30.9	31.1	30.8	30.3	29.1	27.5	28.4	27.7	28.1	30.6	30.4	29.9	29.4	28.3	26.6	19.6	12.4	9.1	6.0	4.6	4.4	3.6	23.0	31.1																						
4-Feb	6.5	Z	20.4	24.5	26.1	25.6	25.1	24.0	23.3	26.2	26.5	26.4	25.9	25.8	25.8	24.5	24.6	25.5	21.7	19.9	21.5	18.4	19.5	23.2	26.5																							
5-Feb	21.7	22.1	Z	21.6	19.7	18.1	12.5	13.1	12.1	12.2	13.9	13.8	13.7	12.9	11.5	12.9	12.8	14.3	23.7	32.3	33.2	32.1	26.4	22.4	18.7	33.2																						
6-Feb	26.7	26.2	26.3	Z	28.1	28.7	28.9	29.4	30.1	30.6	30.5	31.3	31.5	32.0	30.2	28.2	29.6	27.6	30.4	31.6	28.4	25.7	26.7	28.3	29.0	32.0																						
7-Feb	40.3	41.4	41.5	40.9	Z	40.1	37.7	38.8	38.9	38.4	38.5	39.6	40.9	41.3	41.0	40.8	40.0	39.3	38.7	38.2	38.4	38.5	37.2	38.4	39.5	41.5																						
8-Feb	38.5	37.7	28.2	18.4	17.2	Z	15.7	14.6	13.4	16.2	20.9	24.9	26.9	28.8	28.6	28.7	26.6	27.2	21.6	21.3	28.2	34.0	34.6	33.5	25.5	38.5																						
9-Feb	Z	35.0	35.1	34.8	34.7	33.7	33.9	32.0	33.9	34.8	36.3	36.7	37.0	36.1	37.4	37.6	36.0	35.7	36.9	36.9	33.7	35.2	35.6	35.4	35.4	37.6																						
10-Feb	32.6	Z	26.4	29.3	28.6	27.4	28.9	31.5	32.0	32.1	30.2	30.2	31.3	33.0	32.9	32.6	32.7	18.1	10.3	7.6	4.0	0.6	UO	0.1	24.2	33.0																						
11-Feb	1.5	0.4	Z	0.2	0.1	19.4	28.0	25.1	20.1	12.8	17.7	32.6	35.6	36.1	37.1	37.6	37.4	36.8	36.4	35.2	35.3	35.1	34.3	37.2	25.7	37.6																						
12-Feb	37.2	37.7	37.3	Z	37.1	37.5	37.6	37.3	37.0	37.0	37.3	37.6	39.5	45.5	39.0	37.8	37.8	37.8	37.7	37.6	35.7	35.0	37.9	38.7	37.9	45.5																						
13-Feb	37.2	36.3	36.6	37.6	Z	40.4	41.2	39.6	38.3	36.6	32.4	35.4	35.0	35.8	35.4	36.5	37.2	35.8	37.1	37.0	35.0	33.9	33.1	30.3	36.3	41.2																						
14-Feb	27.8	28.8	30.2	30.4	29.0	Z	28.1	27.2	27.3	27.3	26.3	25.6	26.9	27.0	26.0	25.8	23.3	21.6	20.4	15.4	8.1	15.5	29.2	30.1	25.1	30.4																						
15-Feb	Z	28.2	25.5	23.1	23.9	24.5	23.4	23.3	21.4	26.7	25.0	27.4	28.1	28.6	27.7	27.8	28.2	27.5	26.2	25.4	29.4	30.2	29.7	25.1	26.4	30.2																						
16-Feb	25.6	Z	27.5	24.4	20.9	19.8	18.5	20.1	23.3	24.3	26.1	27.3	32.0	33.8	35.5	34.2	33.8	35.2	34.4	29.9	10.3	8.2	18.3	18.1	25.3	35.5																						
17-Feb	17.8	17.0	Z	14.1	12.7	12.7	14.3	15.4	15.7	16.9	18.8	20.4	20.1	20.7	20.2	19.9	15.6	12.7	6.9	6.7	10.5	10.8	10.1	26.2	15.5	26.2																						
18-Feb	30.6	30.2	29.1	Z	23.2	13.2	9.3	16.4	18.2	21.5	20.9	19.2	21.3	26.8	31.5	31.4	27.9	25.0	21.8	15.9	11.0	7.6	12.0	7.2	20.5	31.5																						
19-Feb	15.2	18.5	19.7	27.3	Z	23.9	24.6	22.8	23.6	25.4	24.8	25.9	26.1	27.9	27.8	29.8	30.4	30.3	29.3	29.2	28.8	24.0	12.0	UO	24.9	30.4																						
20-Feb	UO	8.5	21.8	21.1	20.2	Z	15.1	10.6	17.0	21.4	23.5	24.8	27.6	28.8	26.6	28.3	28.8	25.9	21.7	17.8	24.8	16.2	19.6	18.7	21.3	28.8																						
21-Feb	Z	17.8	24.4	19.3	17.3	23.1	24.0	C	C	C	C	31.5	31.3	31.1	30.3	31.1	30.2	29.7	29.5	31.3	32.3	26.6	21.0	22.2	26.5	32.3																						
22-Feb	28.2	Z	26.8	26.0	25.8	28.4	28.0	28.3	32.2	34.0	34.3	35.4	38.3	39.0	38.9	38.4	37.2	33.2	23.3	27.2	22.0	16.5	15.4	12.4	29.1	39.0																						
23-Feb	12.3	17.5	Z	11.3	12.4	10.8	9.0	8.4	9.2	15.8	25.2	28.9	30.7	30.1	30.0	31.9	30.0	27.6	24.3	17.1	21.0	19.3	15.8	26.1	20.2	31.9																						
24-Feb	31.8	33.4	34.0	Z	34.7	32.9	32.4	32.0	32.5	34.8	36.0	38.2	38.5	38.6	38.7	38.8	38.6	37.2	36.7	36.9	36.1	35.3	34.2	33.3	35.5	38.8																						
25-Feb	31.0	29.3	29.5	31.3	Z	33.3	33.4	33.2	34.3	36.0	37.0	37.9	39.1	39.7	40.0	40.4	39.9	35.6	35.7	32.8	35.0	35.1	36.4	35.9	35.3	40.4																						
26-Feb	36.6	37.9	35.1	33.7	35.4	Z	32.8	31.5	30.5	29.0	33.5	34.8	37.5	39.4	39.9	39.5	40.0	40.7	39.8	39.4	38.7	37.8	37.6	37.3	36.5	40.7																						
27-Feb	Z	36.3	35.9	35.6	36.1	35.1	34.5	23.3	24.1	26.7	29.8	32.1	33.4	30.8	31.5	31.9	30.5	30.2	30.5	28.9	25.7	21.9	24.4	25.1	30.2	36.3																						
28-Feb	24.8	Z	26.9	27.1	24.0	21.0	21.5	20.0	21.6	23.6	25.8	28.6	29.9	30.5	30.6	30.0	29.5	25.8	25.7	27.3	26.7	23.6	22.4	20.9	25.6	30.6																						
																								25.9	26.6	27.9	24.6	24.5	25.3	25.7	25.2	25.7	26.9	28.1	29.9	31.1	31.9	31.8	31.9	31.2	29.3	27.8	26.5	25.4	24.4	25.1	25.1	Diurnal Average
																								40.3	41.4	41.5	40.9	37.1	40.4	41.2	39.6	38.9	38.4	38.5	39.6	40.9	45.5	41.0	40.8	40.0	40.7	39.8	39.4	38.7	38.5	37.9	38.7	Diurnal Maximum

Z - zerospan                      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 - February 2023





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

**Ozone (O<sub>3</sub>) - ppb**  
**Anzac - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	128	20.09	20.09
21 - 50	509	79.91	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb  
Anzac - February 2023**

<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	3	3	2	3	3	9	15	2	6	1	1	6	20	19	17	11	121
21 - 50	6	7	14	13	28	39	56	22	23	24	8	43	82	53	59	32	509
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>	<b>9</b>	<b>10</b>	<b>16</b>	<b>16</b>	<b>31</b>	<b>48</b>	<b>71</b>	<b>24</b>	<b>29</b>	<b>25</b>	<b>9</b>	<b>49</b>	<b>102</b>	<b>72</b>	<b>76</b>	<b>43</b>	<b>630</b>

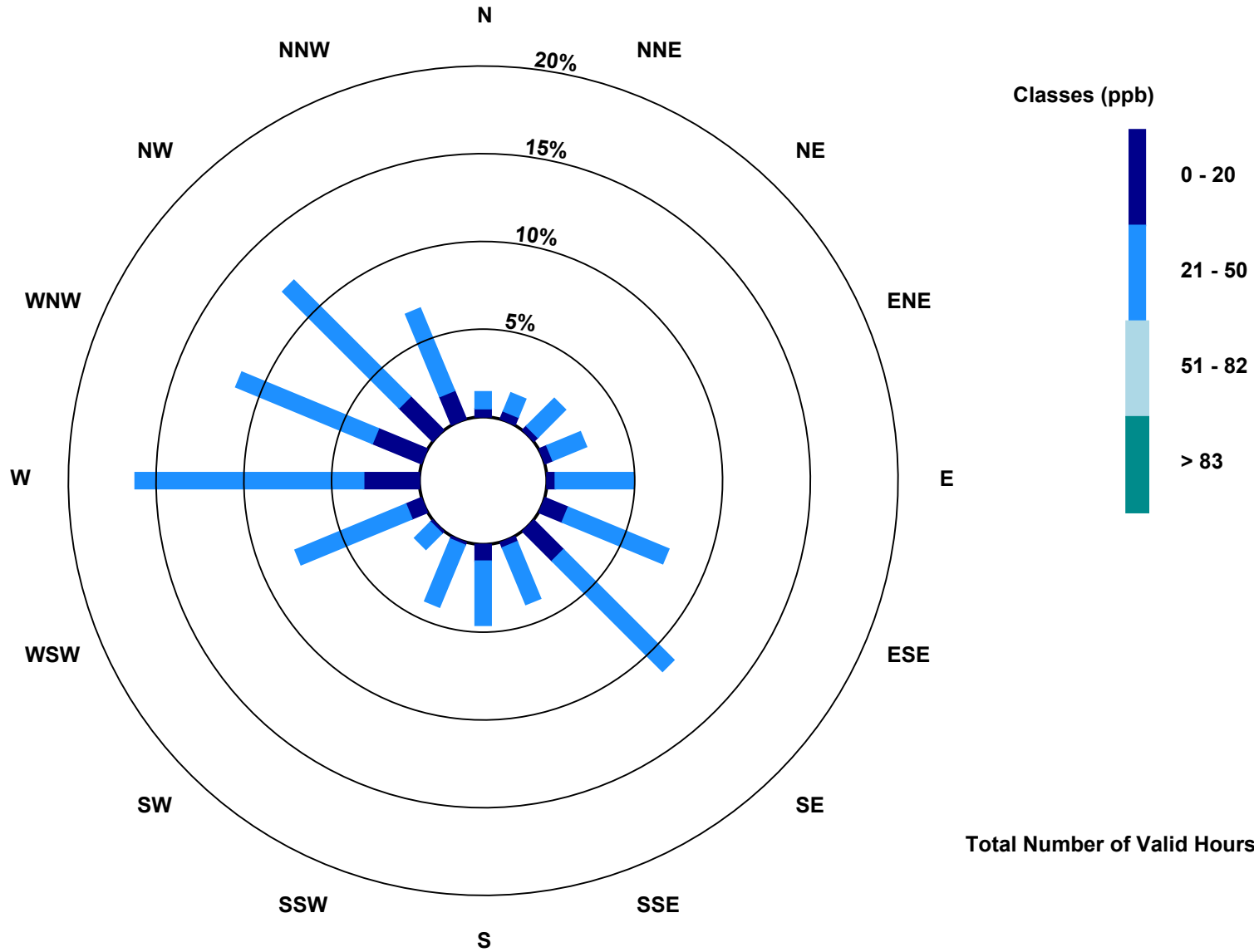
Total Number of Valid Hours: 630

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Ozone ( $O_3$ ) - ppb  
Anzac

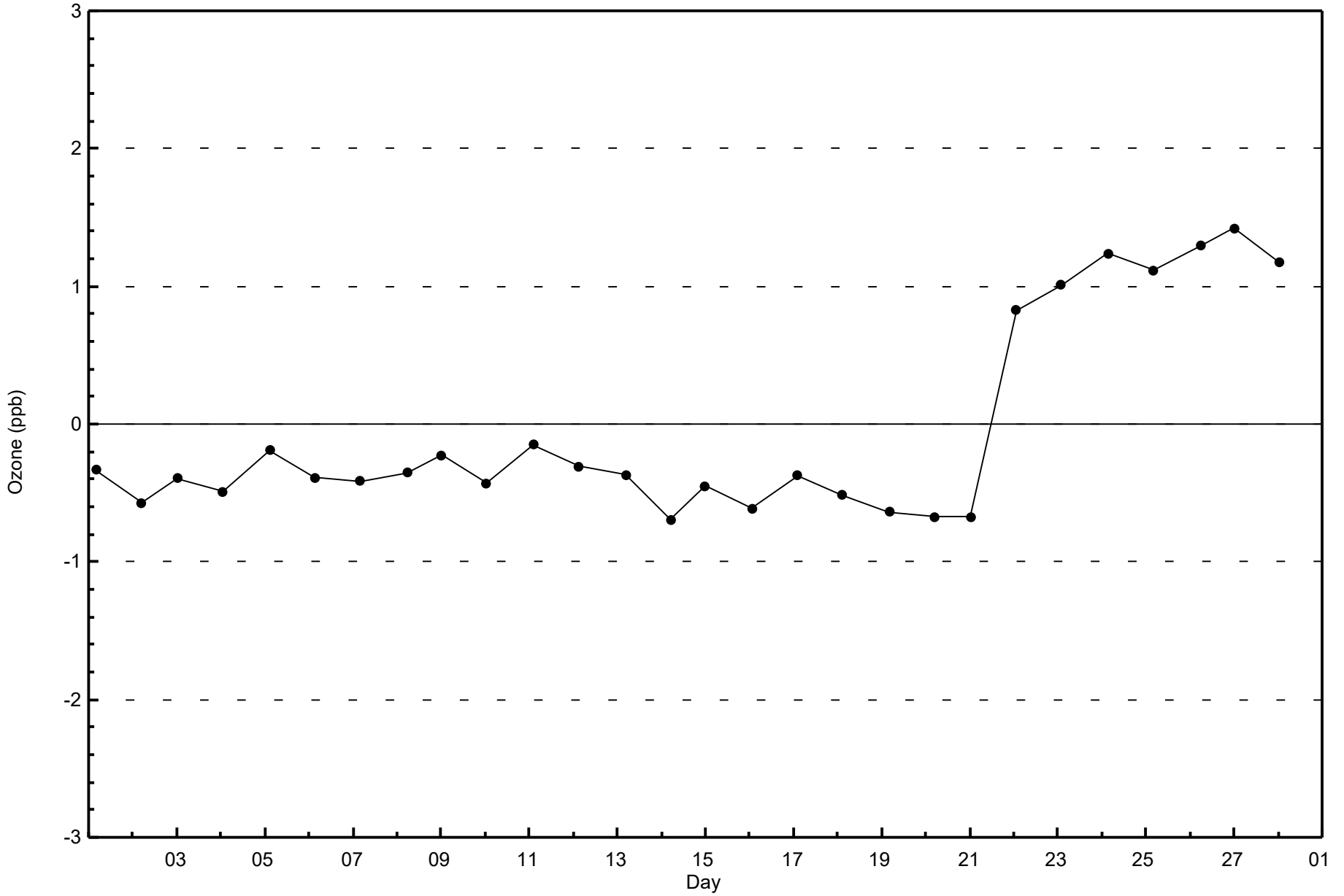


Total Number of Valid Hours: 630



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

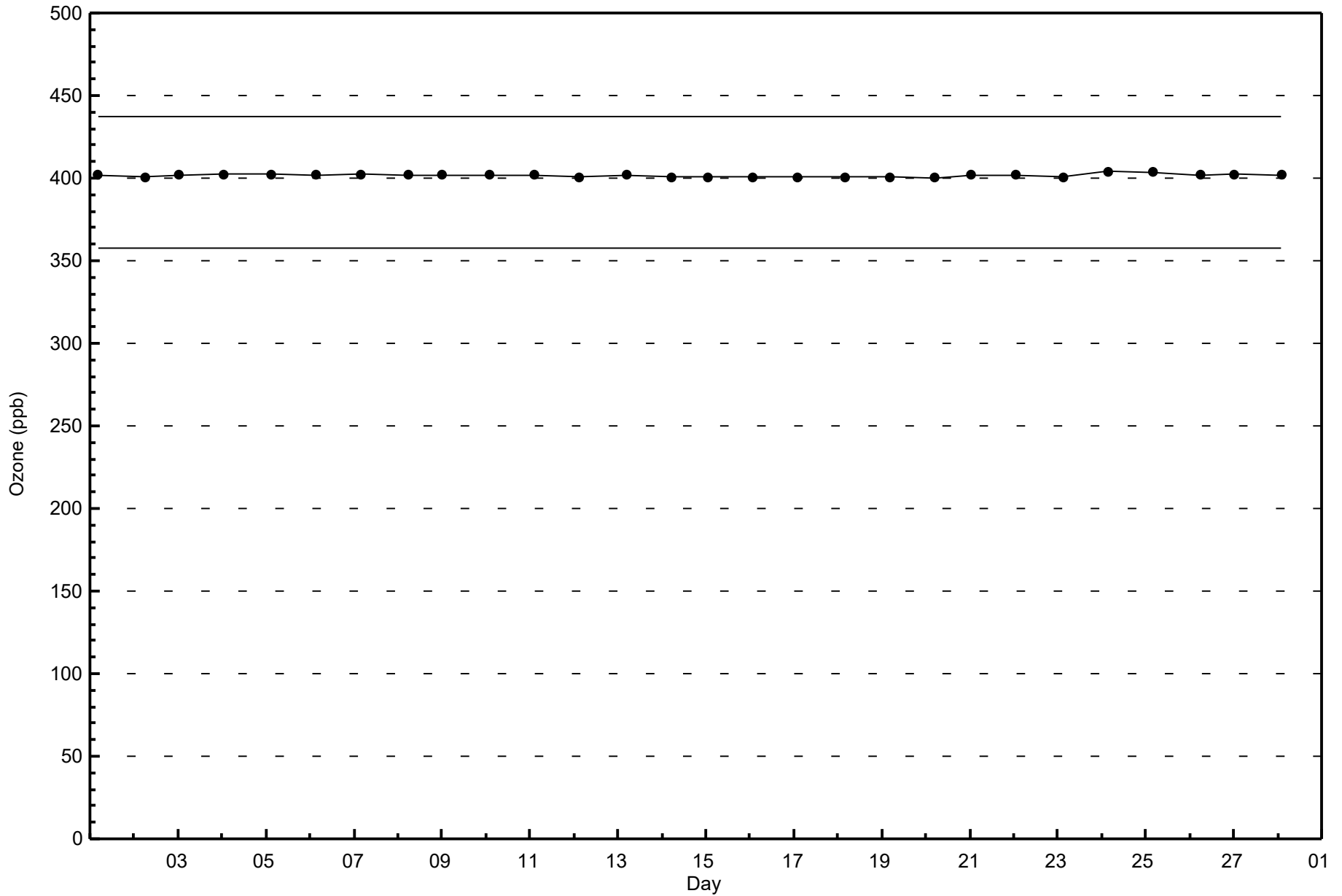
**Ozone (O<sub>3</sub>) - ppb**  
**Anzac - February 2023**





Wood Buffalo Environmental Association  
Span Responses

Ozone (O<sub>3</sub>) - ppb  
Anzac - February 2023





# Wood Buffalo Environmental Association

## Summary of Hour Averages

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

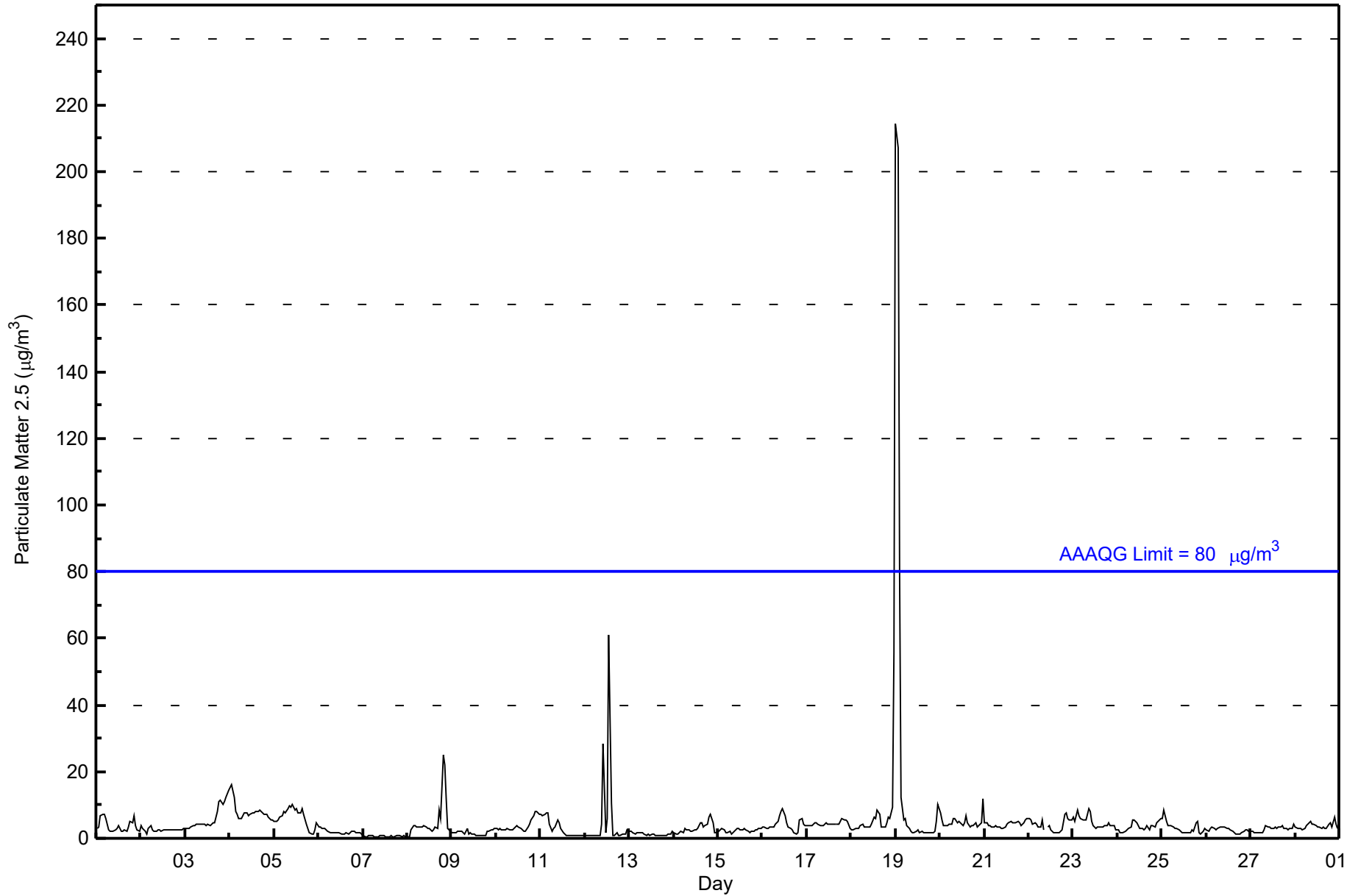
## Anzac - February 2023

Number of Exceedences (AAAQO):	1-hr: 2	24-hr: 0	Hours in Service:	672
Maximum Value: 214.3 µg/m <sup>3</sup> on Feb 19 01:00	Maximum Daily Average: 23.9 µg/m <sup>3</sup> on Feb 19		Hours of Data:	671
Minimum Value: 0.4 µg/m <sup>3</sup> on Feb 7 14:00	Minimum Daily Average: 0.7 µg/m <sup>3</sup> on Feb 7		Hours of Missing Data:	1
Maximum Diurnal Average: 11.4 µg/m <sup>3</sup> at hour 1	Minimum Diurnal Average: 2.9 µg/m <sup>3</sup> at hour 17		Hours of Calibration:	1
Monthly Average: 4.57 µg/m <sup>3</sup>	Percentiles: P <sub>1</sub> = 0.5 P <sub>10</sub> = 1.1 Q <sub>1</sub> = 2.0 Median = 3.1 Q <sub>3</sub> = 4.5 P <sub>90</sub> = 7.1 P <sub>99</sub> = 23.0		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-Feb	3.1	3.3	7.0	7.1	7.4	6.0	2.4	2.1	2.1	2.1	2.5	2.9	3.9	2.3	2.0	2.4	2.0	3.3	4.9	4.7	6.9	3.7	2.4	2.1	3.7	7.4
2-Feb	3.8	3.0	2.0	1.4	2.8	3.9	2.7	2.2	2.2	2.6	2.5	2.2	2.6	2.4	2.5	2.5	2.7	2.7	2.6	2.6	2.6	2.5	2.6	2.8	2.6	3.9
3-Feb	3.1	3.1	3.1	3.4	3.7	3.8	4.1	4.3	4.2	4.3	4.4	3.9	4.0	3.7	4.1	4.5	4.5	8.0	11.2	11.3	10.3	10.9	12.1	14.2	6.0	14.2
4-Feb	15.2	16.2	12.2	8.2	7.1	5.9	5.8	6.9	7.7	7.6	7.0	7.7	7.8	8.0	8.0	8.3	7.9	7.3	7.3	7.1	6.5	5.7	5.3	8.1	16.2	
5-Feb	4.9	5.1	5.6	6.3	6.8	7.9	7.7	8.7	9.7	9.5	10.1	8.4	8.7	7.7	7.5	8.9	7.1	4.2	2.9	1.7	1.3	1.3	2.6	4.6	6.2	10.1
6-Feb	3.3	3.3	3.2	2.8	2.6	2.0	1.8	1.8	1.8	1.8	1.8	1.5	1.4	1.3	1.5	1.6	1.4	1.6	2.3	2.0	1.7	1.8	1.9	1.4	2.0	3.3
7-Feb	1.0	0.6	0.6	1.0	0.9	0.7	0.6	0.5	0.5	0.7	0.7	0.7	0.6	0.4	0.5	0.8	0.5	0.6	0.7	0.7	0.9	0.5	0.7	0.6	0.7	1.0
8-Feb	0.5	0.6	2.4	3.7	3.6	3.5	3.2	3.3	3.3	3.8	3.6	3.0	3.1	2.3	2.4	3.5	2.8	8.5	5.9	25.1	22.2	11.8	3.1	2.1	5.3	25.1
9-Feb	1.8	1.7	1.7	2.1	2.1	1.9	1.5	1.4	3.1	1.1	1.8	1.2	1.1	1.0	0.8	0.7	0.9	0.8	0.8	1.9	2.0	2.6	2.7	2.9	1.7	3.1
10-Feb	2.8	2.7	3.0	2.6	2.5	2.5	2.8	2.5	2.5	2.7	3.5	3.8	3.2	2.9	2.5	2.2	2.0	3.3	4.2	5.4	6.9	7.9	7.9	7.3	3.7	7.9
11-Feb	7.1	7.0	7.2	7.5	7.6	4.2	2.1	2.8	3.5	5.6	4.7	2.8	1.7	1.4	1.0	0.9	0.7	0.7	0.7	0.8	0.8	0.7	0.8	0.9	3.1	7.6
12-Feb	0.8	0.7	0.9	0.9	0.9	0.9	0.8	0.9	0.9	4.3	28.3	1.7	5.9	61.1	10.4	0.9	0.8	1.6	1.0	1.0	1.3	1.4	1.2	2.7	5.5	61.1
13-Feb	2.0	2.0	1.5	1.4	1.8	1.8	1.7	1.7	1.2	1.1	1.2	0.8	1.1	1.3	1.0	1.0	1.0	1.0	0.8	0.7	0.9	1.2	1.4	2.0	1.3	2.0
14-Feb	1.5	1.4	1.5	1.5	2.3	1.9	2.8	2.7	2.4	2.1	2.2	2.3	2.4	2.8	4.5	4.5	3.5	3.9	4.3	6.3	7.4	4.8	1.5	1.6	3.0	7.4
15-Feb	2.3	2.4	2.9	2.7	1.8	1.9	2.1	1.4	1.5	2.0	2.9	2.9	2.8	2.7	2.9	2.6	2.3	1.9	2.1	2.3	2.4	2.3	2.9	2.9	2.4	2.9
16-Feb	3.6	3.3	3.1	2.9	3.3	3.5	3.6	4.0	5.2	6.7	7.9	8.7	6.6	4.8	3.4	3.1	2.4	1.5	1.2	1.9	5.6	5.8	4.1	4.0	4.2	8.7
17-Feb	3.8	3.8	3.9	3.9	4.6	4.7	4.1	3.8	3.9	3.8	4.5	4.1	4.2	4.4	4.1	4.0	4.3	4.1	5.0	6.1	5.6	5.3	5.2	2.8	4.3	6.1
18-Feb	2.6	2.7	2.9	2.8	3.0	3.6	4.1	3.5	3.5	3.3	3.6	4.1	6.2	6.1	8.7	7.4	3.5	3.4	3.5	4.8	6.5	6.0	9.4	56.1	6.7	56.1
19-Feb	214.3	207.4	79.1	12.4	5.5	5.8	3.9	3.1	2.3	1.8	1.8	2.1	2.6	1.8	1.9	1.8	1.8	1.8	1.8	1.7	1.6	2.0	5.2	10.0	23.9	214.3
20-Feb	7.7	5.6	4.0	3.7	3.6	4.2	4.2	6.0	5.8	4.8	4.9	4.8	4.0	4.5	6.8	4.5	3.5	3.7	4.0	4.5	3.3	3.9	4.6	11.9	4.9	11.9
21-Feb	4.5	4.6	3.6	3.8	3.6	3.4	3.8	3.6	3.4	3.2	3.1	3.4	4.3	4.5	5.0	4.8	4.6	4.8	5.1	4.7	4.0	4.7	5.5	6.0	4.2	6.0
22-Feb	5.8	5.7	4.3	4.8	4.4	3.6	3.3	5.6	2.8	C	3.4	3.8	2.4	1.6	1.6	1.6	1.8	2.1	2.4	7.0	7.5	6.1	5.4	5.5	4.0	7.5
23-Feb	6.3	5.2	8.5	6.8	6.0	5.5	5.4	5.5	8.7	7.9	5.2	3.8	3.0	3.3	3.5	3.2	3.5	3.7	3.9	4.6	3.7	3.9	3.8	2.5	4.9	8.7
24-Feb	2.7	1.5	1.9	1.8	2.2	2.6	2.9	3.4	5.6	5.5	4.8	4.0	3.1	2.8	2.5	3.0	3.8	2.5	3.8	3.7	3.5	4.6	4.9	5.9	3.5	5.9
25-Feb	6.1	8.3	4.9	4.0	3.7	3.7	3.4	3.1	2.8	2.4	2.3	1.8	1.6	1.6	1.5	1.6	2.5	2.1	4.6	4.9	1.5	1.4	2.1	2.9	3.1	8.3
26-Feb	2.6	2.2	2.8	3.2	3.1	2.7	3.1	3.2	3.4	3.6	3.2	3.2	2.9	2.5	2.0	1.6	1.4	1.1	1.5	1.6	2.3	2.6	2.6	2.2	2.5	3.6
27-Feb	2.1	1.9	1.7	1.8	1.7	1.7	1.7	2.6	3.6	3.4	3.2	2.9	2.8	3.3	3.1	3.3	3.5	3.9	2.9	2.8	2.6	3.1	2.9	4.0	2.8	4.0
28-Feb	3.4	3.1	3.1	2.8	2.7	3.1	4.0	4.3	4.9	4.0	4.0	4.0	3.5	3.4	3.1	3.3	3.0	3.2	4.0	4.7	3.2	6.4	4.1	3.1	3.7	6.4
11.4 11.0 6.4 3.8 3.6 3.5 3.2 3.4 3.7 3.8 4.6 3.4 3.5 5.2 3.5 3.1 2.9 3.1 3.4 4.5 4.5 4.1 3.9 6.1																								Diurnal Average		
214.3 207.4 79.1 12.4 7.6 7.9 7.7 8.7 9.7 9.5 28.3 8.7 8.7 61.1 10.4 8.9 8.3 8.5 11.2 25.1 22.2 11.8 12.1 56.1																								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 - February 2023**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	550	81.97	81.97
6 - 15	112	16.69	98.66
16 - 25	3	0.45	99.11
26 - 80	4	0.60	99.70
> 81.0	2	0.30	100.00

Total Number of Valid Hours: 671

Total Number of Hours: 672



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

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Anzac - February 2023**

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	10	6	13	11	23	37	57	22	26	22	8	47	92	67	71	38	550
6 - 15	0	4	4	6	8	13	13	3	3	3	3	3	14	11	11	6	105
16 - 25	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
26 - 80	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	4
> 81.0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
<b>Totals</b>	10	10	17	17	31	50	74	25	29	27	11	50	108	78	82	44	663

Total Number of Valid Hours: 663

Total Number of Hours: 672



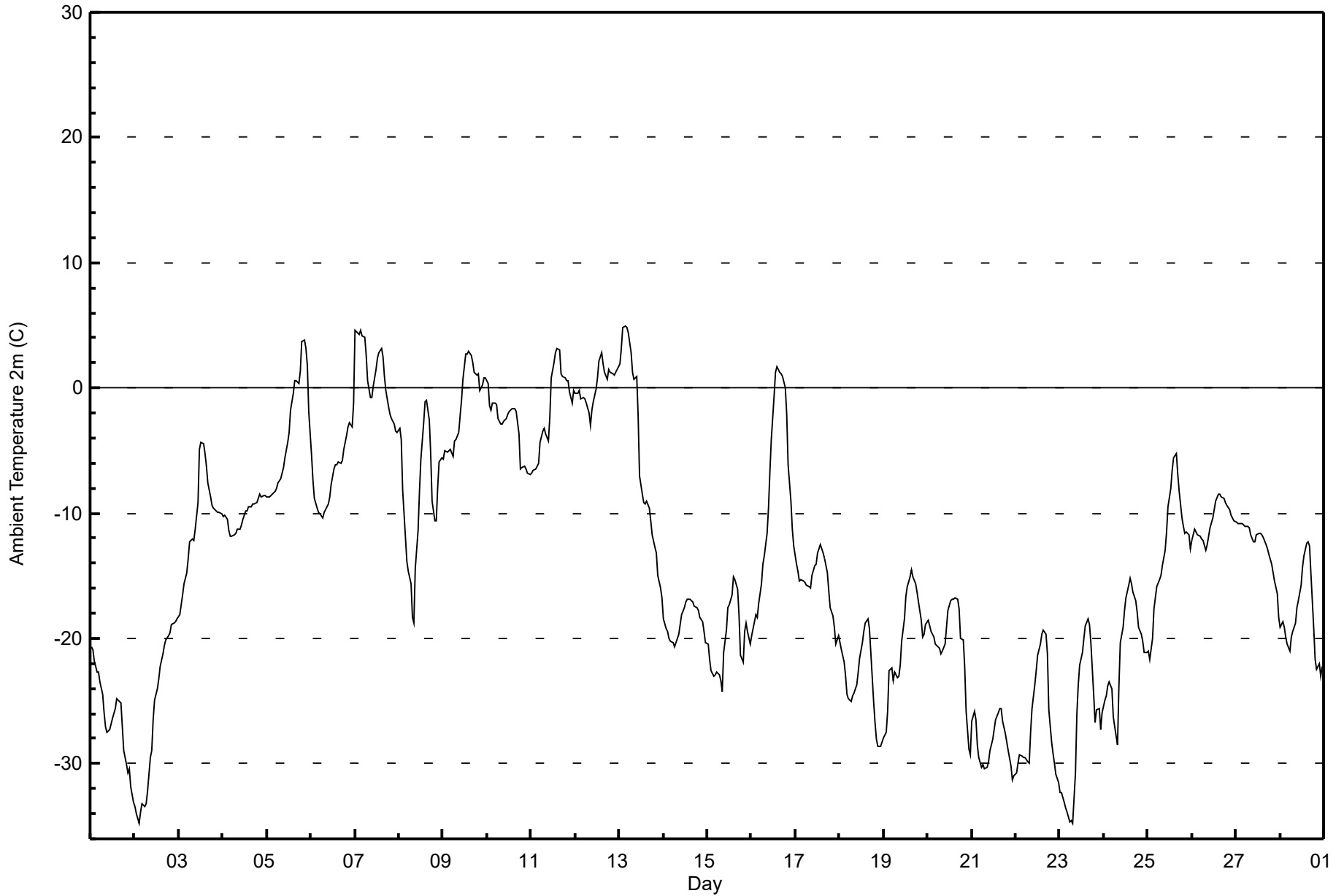


Maximum Value: 5.0 C on Feb 13 04:00      Maximum Daily Average: 1.0 C on Feb 7																						Hours in Service:	672			
Minimum Value: -34.8 C on Feb 23 08:00      Minimum Daily Average: -28.3 C on Feb 21																						Hours of Data:	672			
Maximum Diurnal Average: -10.0 C at hour 16      Minimum Diurnal Average: -16.1 C at hour 8																						Hours of Missing Data:	0			
Monthly Average: -13.72 C      Percentiles: P <sub>1</sub> = -33.6 P <sub>10</sub> = -27.1 Q <sub>1</sub> = -20.7 Median = -14.1 Q <sub>3</sub> = -6.0 P <sub>90</sub> = 0.5 P <sub>99</sub> = 4.3																						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-Feb	-20.7	-20.9	-21.8	-22.6	-22.7	-23.5	-24.5	-25.9	-27.1	-27.5	-27.3	-26.8	-26.4	-25.6	-24.8	-24.9	-25.2	-27.1	-28.9	-30.1	-30.7	-30.4	-31.9	-33.1	-26.3	-20.7
2-Feb	-33.5	-33.9	-34.8	-33.9	-33.2	-33.4	-33.3	-32.2	-29.5	-28.9	-26.5	-25.0	-24.0	-23.3	-22.2	-21.2	-20.5	-20.1	-19.8	-19.5	-18.9	-18.8	-18.7	-18.5	-26.0	-18.5
3-Feb	-18.1	-17.4	-16.5	-15.6	-14.7	-13.7	-12.3	-12.1	-12.2	-11.3	-9.2	-4.9	-4.4	-4.4	-5.2	-6.2	-7.6	-8.7	-9.4	-9.6	-9.8	-9.9	-9.9	-10.1	-10.5	-4.4
4-Feb	-10.3	-10.1	-10.5	-11.3	-11.9	-11.8	-11.8	-11.6	-11.3	-11.3	-10.9	-10.5	-9.8	-9.8	-9.5	-9.5	-9.3	-9.2	-9.2	-8.8	-8.5	-8.7	-8.6	-8.6	-10.1	-8.5
5-Feb	-8.8	-8.7	-8.6	-8.5	-8.3	-8.0	-7.6	-7.3	-6.8	-6.3	-5.5	-4.4	-3.6	-1.8	-0.5	0.5	0.5	0.4	1.3	3.7	3.8	3.2	1.9	-1.8	-3.4	3.8
6-Feb	-5.4	-7.4	-8.9	-9.6	-9.9	-10.1	-10.4	-9.9	-9.8	-9.2	-8.7	-7.7	-6.4	-6.1	-6.1	-5.9	-6.0	-5.8	-4.9	-3.8	-3.1	-2.8	-3.1	-1.2	-6.8	-1.2
7-Feb	4.6	4.3	4.3	4.6	4.1	4.1	2.5	0.5	-0.7	-0.7	0.1	1.5	2.3	2.8	3.1	2.5	0.9	-0.2	-1.6	-2.1	-2.4	-2.9	-3.5	-3.5	1.0	4.6
8-Feb	-3.3	-4.1	-8.1	-12.0	-13.8	-14.7	-15.6	-18.3	-18.7	-14.4	-11.4	-8.3	-5.7	-2.8	-1.1	-1.0	-2.6	-5.2	-9.0	-10.6	-10.6	-7.9	-5.9	-5.6	-8.8	-1.0
9-Feb	-5.7	-5.0	-5.1	-5.0	-4.9	-5.4	-4.3	-4.1	-3.6	-2.2	-0.9	0.7	2.7	2.7	2.9	2.6	2.0	1.3	1.0	1.2	-0.2	0.2	0.8	0.8	-1.1	2.9
10-Feb	0.4	-1.5	-1.8	-1.2	-1.2	-1.4	-2.4	-2.9	-2.9	-2.6	-2.4	-2.1	-1.9	-1.6	-1.6	-1.6	-1.9	-3.6	-6.4	-6.3	-6.2	-6.4	-6.8	-6.9	-3.1	0.4
11-Feb	-6.8	-6.6	-6.5	-6.2	-6.0	-4.3	-3.5	-3.3	-3.7	-4.3	-2.3	0.8	2.0	2.8	3.2	3.0	1.1	0.9	0.8	0.6	0.6	-0.3	-1.3	-0.2	-1.6	3.2
12-Feb	-0.4	-0.4	-0.2	-0.9	-0.7	-0.8	-1.2	-2.0	-3.0	-1.8	-1.1	-0.1	0.8	2.2	2.8	1.9	1.2	0.7	1.4	1.2	1.1	1.0	1.3	1.5	0.2	2.8
13-Feb	2.0	3.2	4.8	5.0	4.9	4.4	2.8	1.3	0.7	0.9	-2.2	-7.1	-8.5	-9.2	-9.3	-9.1	-9.6	-10.6	-11.7	-12.7	-13.2	-15.0	-16.0	-16.7	-5.0	5.0
14-Feb	-18.4	-19.3	-19.5	-20.0	-20.3	-20.4	-20.7	-20.4	-19.7	-18.9	-18.1	-17.5	-17.1	-16.9	-17.0	-17.1	-17.4	-17.5	-17.8	-18.3	-18.7	-19.5	-20.3	-20.3	-18.7	-16.9
15-Feb	-20.4	-21.7	-22.6	-23.0	-22.9	-22.7	-22.9	-23.3	-24.3	-21.2	-19.4	-17.6	-17.3	-16.5	-15.1	-15.3	-16.1	-18.2	-21.3	-21.9	-19.4	-18.8	-19.5	-20.4	-20.1	-15.1
16-Feb	-19.7	-19.2	-18.0	-18.4	-17.2	-15.6	-14.1	-13.4	-11.7	-9.6	-6.7	-4.1	-0.6	1.2	1.8	1.3	1.2	0.9	0.0	-2.1	-6.1	-9.0	-11.3	-12.6	-8.5	1.8
17-Feb	-14.1	-14.7	-15.4	-15.3	-15.4	-15.6	-15.8	-15.9	-16.0	-15.0	-14.2	-14.1	-13.2	-12.5	-12.8	-13.2	-13.6	-14.7	-16.2	-17.6	-18.2	-19.1	-20.5	-19.8	-15.5	-12.5
18-Feb	-20.4	-20.9	-21.9	-23.0	-24.5	-24.9	-25.0	-24.6	-24.3	-23.7	-22.7	-21.6	-20.4	-19.4	-18.8	-18.4	-19.2	-21.1	-25.0	-26.7	-28.0	-28.6	-28.6	-28.2	-23.3	-18.4
19-Feb	-27.9	-27.5	-25.8	-22.6	-22.4	-23.4	-22.6	-23.1	-23.0	-22.1	-20.3	-18.4	-16.7	-15.9	-15.0	-14.5	-15.1	-15.6	-16.3	-17.1	-18.6	-19.9	-19.7	-18.8	-20.1	-14.5
20-Feb	-18.6	-19.0	-19.4	-19.9	-20.5	-20.6	-20.8	-21.2	-21.1	-20.4	-19.1	-17.8	-16.9	-16.8	-16.9	-16.7	-16.9	-17.7	-20.1	-20.1	-22.3	-25.8	-28.8	-29.3	-20.3	-16.7
21-Feb	-26.5	-25.8	-26.5	-28.5	-29.5	-30.2	-30.0	-30.5	-30.3	-29.8	-28.9	-28.0	-27.3	-26.4	-25.9	-25.6	-25.6	-26.6	-27.6	-28.2	-28.9	-30.2	-31.3	-31.0	-28.3	-25.6
22-Feb	-30.7	-30.0	-29.2	-29.4	-29.5	-29.5	-29.8	-30.0	-27.5	-25.6	-23.8	-22.6	-21.4	-20.4	-19.7	-19.3	-19.6	-21.3	-25.8	-28.3	-29.2	-30.0	-30.9	-31.5	-26.5	-19.3
23-Feb	-32.3	-32.3	-33.1	-33.6	-33.9	-34.7	-34.5	-34.8	-30.7	-26.1	-23.7	-22.1	-21.2	-20.0	-19.0	-18.4	-18.8	-20.3	-24.5	-26.7	-25.7	-25.6	-27.3	-25.9	-26.9	-18.4
24-Feb	-24.9	-24.6	-23.8	-23.5	-24.0	-26.3	-27.0	-28.5	-23.8	-20.3	-19.1	-17.7	-16.8	-15.8	-15.2	-15.7	-16.3	-17.0	-17.9	-19.1	-19.7	-20.2	-21.2	-21.1	-20.8	-15.2
25-Feb	-21.0	-21.7	-20.0	-17.7	-16.7	-15.9	-15.3	-14.9	-14.2	-13.0	-11.5	-9.5	-8.0	-6.6	-5.5	-5.3	-6.9	-8.3	-10.4	-11.1	-11.6	-11.5	-11.8	-12.8	-12.5	-5.3
26-Feb	-12.2	-11.3	-11.5	-11.7	-11.8	-12.0	-12.2	-13.0	-12.5	-11.8	-11.1	-10.3	-9.7	-9.1	-8.5	-8.4	-8.7	-8.8	-9.2	-9.4	-9.8	-10.1	-10.3	-10.6	-10.6	-8.4
27-Feb	-10.7	-10.8	-10.8	-10.9	-11.0	-11.0	-11.1	-11.1	-11.7	-12.3	-12.2	-11.7	-11.6	-11.6	-11.7	-11.9	-12.5	-12.8	-13.3	-14.1	-14.7	-15.4	-16.5	-18.4	-12.5	-10.7
28-Feb	-19.1	-18.7	-19.1	-19.9	-20.4	-21.1	-19.9	-19.4	-18.7	-17.6	-17.0	-15.7	-14.3	-13.4	-12.4	-12.2	-12.6	-14.8	-19.2	-21.7	-22.4	-22.0	-23.0	-22.3	-18.2	-12.2
																						Diurnal Average				
																						Diurnal Maximum				



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

**Ambient Temperature 2m (AT 2m) - C**  
**Anzac - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C  
Anzac - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	192	28.57	28.57
-20 - 0	406	60.42	88.99
0 - 10	74	11.01	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Relative Humidity (RH) - %**

**Anzac - February 2023**

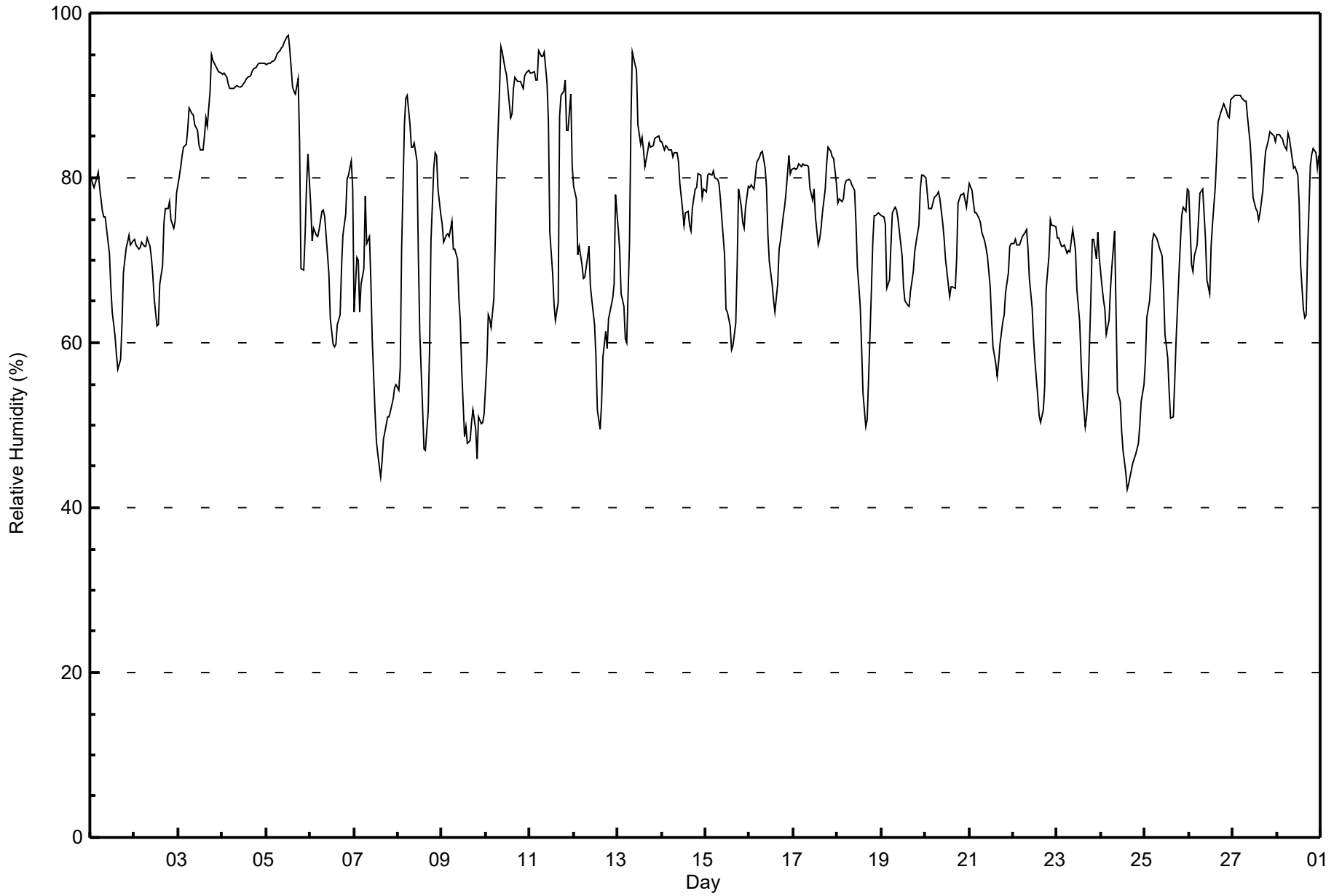
Maximum Value: 97.3 % on Feb 5 13:00      Maximum Daily Average: 92.3 % on Feb 4																						Hours in Service: 672 Hours of Data: 672				
Minimum Value: 42.2 % on Feb 24 15:00      Minimum Daily Average: 54.7 % on Feb 24 Maximum Diurnal Average: 80.2 % at hour 8      Minimum Diurnal Average: 64.5 % at hour 15 Monthly Average: 74.34 %      Percentiles: P <sub>1</sub> = 45.8 P <sub>10</sub> = 56.7 Q <sub>1</sub> = 66.9 Median = 75.1 Q <sub>3</sub> = 83.0 P <sub>90</sub> = 91.0 P <sub>99</sub> = 95.5																						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-Feb	80.0	79.3	78.7	79.9	80.6	78.8	75.9	75.3	75.2	73.7	70.8	66.8	63.7	60.9	58.6	56.7	57.9	62.5	68.5	71.6	72.3	73.1	71.9	72.4	71.1	80.6
2-Feb	72.5	71.8	71.3	71.6	72.2	71.8	71.8	72.7	71.7	70.3	68.3	65.5	62.1	62.3	67.1	69.3	74.6	76.3	76.2	77.1	75.0	73.9	74.8	78.2	71.6	78.2
3-Feb	80.1	81.3	82.7	83.7	84.0	86.0	88.4	87.8	87.7	86.4	85.8	84.1	83.3	83.4	85.0	87.4	86.3	90.5	94.9	94.2	93.5	93.2	92.9	92.7	87.3	94.9
4-Feb	92.6	92.7	92.1	91.4	90.9	90.9	90.9	91.1	91.2	91.0	91.3	91.8	92.0	92.2	92.4	92.9	93.2	93.4	93.7	93.9	93.8	93.9	93.9	93.9	92.3	93.9
5-Feb	93.8	93.9	93.9	94.0	94.3	94.5	95.0	95.4	95.8	95.9	96.4	97.1	97.3	95.6	91.0	90.5	90.1	92.1	84.4	69.0	68.8	73.2	79.1	83.0	89.8	97.3
6-Feb	76.6	72.4	73.9	73.0	72.9	73.7	75.9	76.2	75.2	70.7	68.3	62.9	59.8	59.5	59.8	62.3	63.5	68.9	73.1	75.5	79.9	80.3	82.1	78.8	71.5	82.1
7-Feb	63.8	70.3	70.0	63.7	67.1	69.0	77.9	72.1	72.9	67.5	60.4	51.6	48.0	46.5	43.7	45.5	48.3	49.1	51.0	51.0	51.7	53.2	54.5	54.9	58.5	77.9
8-Feb	54.2	56.9	71.3	86.4	89.6	90.0	86.5	83.8	83.8	84.3	82.1	70.4	61.2	52.0	47.1	47.0	51.7	59.3	72.3	81.2	83.1	82.7	78.7	75.7	72.1	90.0
9-Feb	74.4	72.3	73.0	73.3	72.9	74.8	71.4	71.3	70.2	65.2	62.6	56.7	48.6	49.8	47.8	48.2	50.3	51.8	49.5	45.9	51.0	50.2	50.4	51.4	59.7	74.8
10-Feb	57.9	63.3	62.9	61.9	65.4	72.5	80.7	90.5	95.9	95.2	93.3	92.5	90.8	87.4	87.8	90.8	92.2	91.7	91.7	91.6	90.9	92.3	92.7	93.0	84.4	95.9
11-Feb	92.7	92.8	92.8	91.8	91.8	95.4	94.7	94.7	95.3	91.6	86.8	73.5	68.4	64.8	62.6	64.9	87.5	90.0	90.4	91.9	85.7	85.8	90.2	81.5	85.7	95.4
12-Feb	78.9	77.4	70.7	71.7	69.5	67.8	68.0	70.3	71.7	67.0	65.3	62.2	58.4	51.9	49.4	52.5	58.3	61.3	59.3	62.8	64.6	65.4	67.1	77.9	65.4	78.9
13-Feb	73.7	71.1	65.9	64.4	60.5	60.0	72.1	86.6	95.3	93.7	93.1	86.5	84.0	84.8	83.4	81.3	83.2	84.3	83.8	83.8	84.7	85.0	85.1	84.5	80.4	95.3
14-Feb	84.4	83.5	83.9	83.7	83.5	83.5	82.6	83.0	83.0	82.0	79.4	76.1	74.3	75.7	75.9	74.3	73.6	76.4	78.6	78.7	80.5	80.4	77.6	78.6	79.7	84.4
15-Feb	78.3	80.3	80.6	80.3	80.8	80.0	79.9	79.3	77.5	75.1	70.7	64.1	63.7	62.0	59.1	59.7	62.4	69.3	78.6	76.5	74.5	74.0	76.5	79.0	73.4	80.8
16-Feb	78.8	79.1	78.7	80.1	81.9	82.5	83.1	83.3	81.3	78.9	73.1	69.9	67.2	65.3	63.7	67.0	71.3	72.4	75.4	76.5	78.3	82.7	80.6	81.1	76.3	83.3
17-Feb	81.3	81.0	81.2	81.6	81.3	81.6	81.5	81.5	81.3	78.7	77.3	78.6	75.3	71.9	72.6	73.9	75.8	78.6	81.7	83.7	83.2	82.6	82.3	79.3	79.5	83.7
18-Feb	77.0	77.4	77.1	77.4	79.1	79.7	79.9	79.7	79.2	78.5	74.5	69.1	64.6	59.6	53.8	49.8	50.6	55.6	66.3	72.3	75.4	75.4	75.8	75.7	71.0	79.9
19-Feb	75.4	75.2	74.4	66.5	67.6	71.8	75.7	76.5	76.1	75.1	73.5	70.5	66.8	65.1	64.5	64.4	66.2	68.6	71.1	72.2	74.3	78.6	80.4	80.3	72.1	80.4
20-Feb	80.0	78.2	76.2	76.3	77.0	77.7	77.9	78.2	77.5	74.6	72.7	70.2	67.2	65.6	66.7	66.8	66.7	70.2	76.9	77.9	77.9	78.2	76.4	78.0	74.4	80.0
21-Feb	79.3	78.5	77.0	75.7	75.7	75.1	74.6	73.4	72.3	71.6	70.5	66.7	62.7	59.5	57.5	55.8	57.7	59.9	62.6	63.4	66.0	68.4	71.7	72.0	68.7	79.3
22-Feb	72.0	72.6	71.9	71.8	72.3	73.0	73.4	73.7	71.6	67.7	64.3	60.5	57.8	53.6	51.3	50.3	51.9	54.8	66.4	70.5	74.9	74.2	74.2	74.0	66.6	74.9
23-Feb	72.7	72.8	71.7	71.7	71.9	70.8	71.2	71.0	73.7	72.5	71.2	66.5	62.5	57.8	54.0	49.9	51.2	54.1	65.5	72.6	72.5	70.2	73.3	70.4	67.2	73.7
24-Feb	66.8	65.3	64.0	61.0	62.7	66.5	69.2	73.5	63.9	54.1	52.8	49.4	47.0	44.2	42.2	42.8	43.8	45.5	45.9	47.8	49.9	52.9	54.9	54.7	73.5	
25-Feb	57.8	63.0	65.1	67.6	72.3	73.2	72.6	72.2	71.6	70.6	66.5	61.1	58.1	54.0	50.8	50.9	55.5	60.5	68.3	72.0	75.4	76.5	75.9	78.7	66.3	78.7
26-Feb	78.5	69.4	68.6	70.5	71.9	74.9	78.1	78.6	75.5	72.5	67.6	65.9	71.8	74.5	79.0	82.7	86.8	88.0	88.4	89.0	88.1	87.4	87.2	89.5	78.5	89.5
27-Feb	89.8	90.0	90.1	90.0	89.9	89.7	89.4	89.4	87.5	84.1	81.0	77.7	76.3	76.0	74.8	75.8	78.4	81.2	83.2	84.6	85.6	85.3	85.2	84.4	84.1	90.1
28-Feb	85.2	85.2	85.0	84.8	84.1	83.5	85.4	84.7	82.3	81.1	81.4	80.3	77.0	69.5	64.0	63.0	63.4	71.0	81.6	82.8	83.5	83.1	81.2	82.8	79.4	85.4
76.7 76.7 76.6 76.6 77.3 78.2 79.4 80.2 79.9 77.5 75.0 71.0 68.2 65.9 64.5 64.9 67.6 70.6 74.2 75.3 76.2 76.7 77.3 77.7																								Diurnal Average		
93.8 93.9 93.9 94.0 94.3 95.4 95.0 95.4 95.9 95.9 96.4 97.1 97.3 95.6 64.5 64.9 67.6 70.6 74.2 75.3 76.2 76.7 77.3 77.7																								Diurnal Maximum		





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

**Relative Humidity (RH) - %**  
**Anzac - February 2023**





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

**Relative Humidity (RH) - %**  
**Anzac - February 2023**

<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	91	13.54	13.54
60 - 80	357	53.13	66.67
80 - 100	224	33.33	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



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

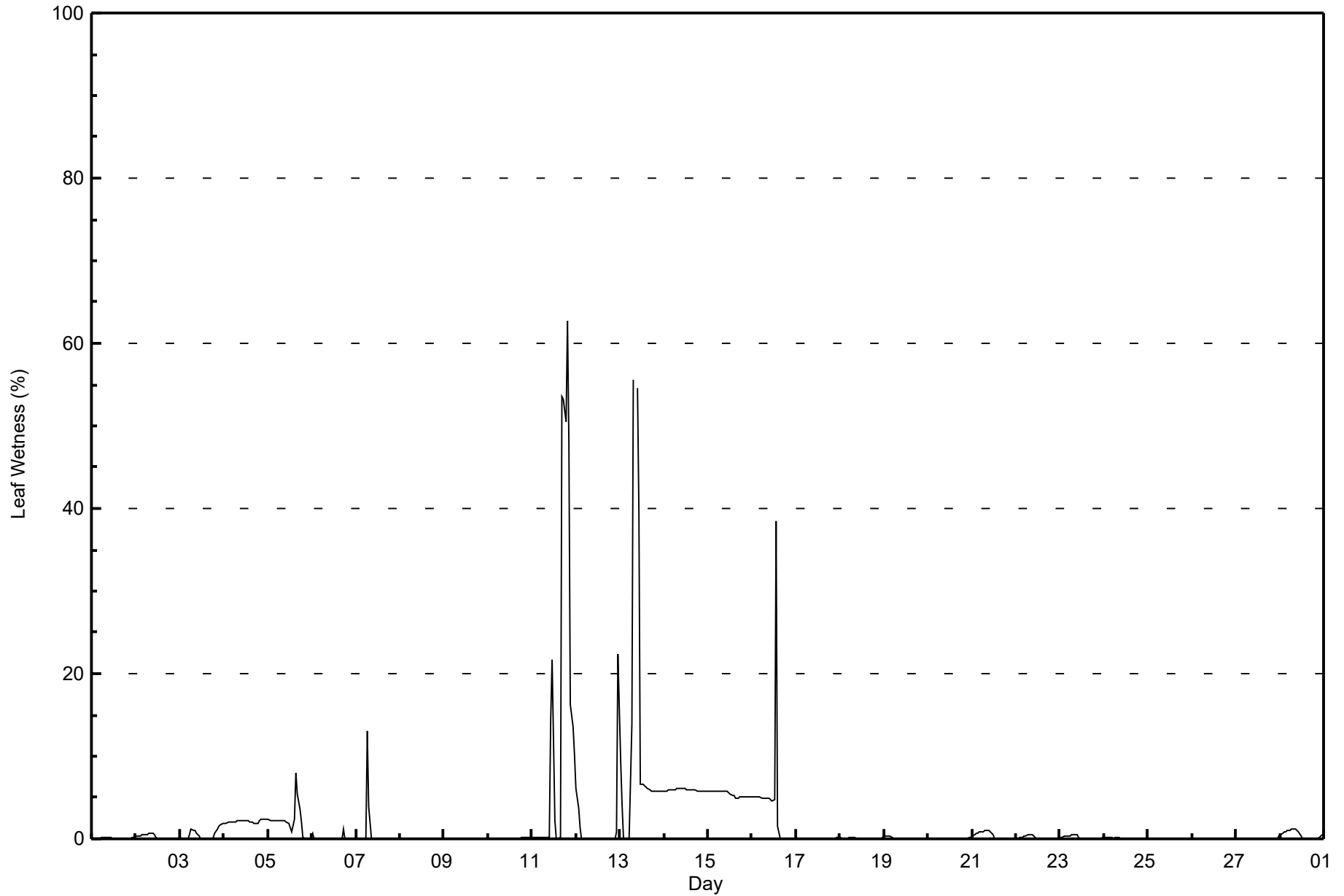
**Leaf Wetness (LW) - %**  
**Anzac - February 2023**

Maximum Value: 62.7 % on Feb 11 20:00		Maximum Daily Average: 14.5 % on Feb 11		Hours in Service: 672																						
Minimum Value: 0.0 % on Feb 1 01:00		Minimum Daily Average: 0.0 % on Feb 9		Hours of Data: 671																						
Maximum Diurnal Average: 3.1 % at hour 8		Minimum Diurnal Average: 0.8 % at hour 15		Hours of Missing Data: 1																						
Monthly Average: 1.77 %		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> = 0.7 P <sub>90</sub> = 5.7 P <sub>99</sub> = 42.1		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-Feb	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	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	0.1	0.2	0.1	0.2
2-Feb	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.6	0.5	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	0.7
3-Feb	0.0	0.0	0.0	0.0	0.0	0.5	1.2	1.1	1.0	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.2	1.6	1.7	1.8	0.5	1.8
4-Feb	1.9	1.9	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.0	2.0	1.9	1.9	1.9	2.2	2.4	2.4	2.4	2.3	2.1	2.4
5-Feb	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.0	1.8	1.4	0.9	2.4	8.0	5.5	3.5	2.0	0.1	0.0	0.0	0.0	0.0	2.1	8.0
6-Feb	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	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.3
7-Feb	0.0	0.1	0.0	0.0	0.0	0.0	13.1	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	13.1
8-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.2	0.0	0.2
11-Feb	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	14.5	21.6	2.2	0.0	0.0	0.1	53.5	53.2	50.5	62.7	47.9	16.2	13.6	10.2	14.5	62.7
12-Feb	6.1	3.7	1.4	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	0.0	0.0	0.0	0.0	0.0	0.9	22.4	1.4	22.4	
13-Feb	9.4	4.1	0.0	0.0	0.0	0.0	13.9	55.7	OR	54.6	39.6	6.7	6.6	6.5	6.3	6.1	5.9	5.8	5.7	5.7	5.7	5.7	5.7	5.8	11.1	55.7
14-Feb	5.8	5.8	5.9	5.9	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.9	5.9	5.9	5.9	5.9	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.9	6.0
15-Feb	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.7	5.6	5.5	5.3	5.2	5.0	5.0	5.0	5.0	5.1	5.1	5.0	5.0	5.0	5.4	5.8
16-Feb	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.9	4.9	4.8	4.5	4.7	38.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	38.5
17-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.2
18-Feb	0.1	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.2
19-Feb	0.3	0.4	0.4	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	0.4
20-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.2
21-Feb	0.3	0.5	0.6	0.7	0.8	0.9	0.9	1.0	1.0	0.9	0.8	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	0.4	1.0
22-Feb	0.0	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.5	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.5
23-Feb	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5	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	0.1	0.1	0.2	0.5
24-Feb	0.2	0.2	0.2	0.2	0.1	0.1	0.1	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	0.1	0.2
25-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3
28-Feb	0.5	0.7	0.8	0.9	1.0	1.1	1.2	1.2	1.2	1.1	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.4	0.5	1.2
																								Diurnal Average		
																								Diurnal Maximum		
1.4 1.1 0.9 0.9 0.9 0.9 1.9 3.1 1.0 2.9 2.8 1.8 1.0 2.1 0.8 1.0 2.8 2.7 2.5 2.9 2.4 1.3 1.3 2.0																										
9.4 5.8 5.9 5.9 6.0 6.0 13.9 55.7 6.0 54.6 39.6 21.6 6.6 38.5 6.3 8.0 53.5 53.2 50.5 62.7 47.9 16.2 13.6 22.4																										
OR - Out of Range																										



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

**Leaf Wetness (LW) - %**  
**Anzac - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Leaf Wetness (LW) - %  
Anzac - February 2023**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	470	70.04	70.04
0.4 - 0.5	24	3.58	73.62
0.6 - 0.7	10	1.49	75.11
0.8 - 1.4	25	3.73	78.84
1.5 - 10	124	18.48	97.32
> 10	17	2.53	99.85

Total Number of Valid Hours: 671

Total Number of Hours: 672



Maximum Speed: 31 km/h on Feb 6 03:00	Maximum Daily Speed Average: 16.4 km/h on Feb 7	Hours in Service: 672
Minimum Speed Value: 0 km/h on Feb 17 10:00	Minimum Daily Speed Average: 1.5 km/h on Feb 3	Hours of Data: 664
Maximum Diurnal Speed Average: 5.3 km/h at hour 7	Minimum Diurnal Speed Average: 2.0 km/h at hour 21	Hours of Missing Data: 8
Monthly Average Velocity: 3.6 km/h 268.1 deg	Percentiles: P <sub>1</sub> = 2 P <sub>10</sub> = 4 Q <sub>1</sub> = 6 Median = 9 Q <sub>3</sub> = 13 P <sub>90</sub> = 19 P <sub>99</sub> = 26	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-Feb	NNW7	NW11	NW10	WNW9	NW9	NNW14	NNW17	NW16	NW17	NW19	NW17	NW18	NW18	NW19	NW19	NW16	NW11	NW8	WNW8	W8	W9	WNW8	WSW7	WSW5	NW11.7	NW19
2-Feb	SSW4	S5	S4	SSE7	SSE9	SSE9	SE11	SE11	SE13	ESE11	ESE13	ESE14	ESE18	SE22	SE21	SE19	ESE22	SE22	SE21	SE19	SE19	SE19	SE17	SE15	SE14.0	SE22
3-Feb	SE13	SE11	SE12	SE11	SE12	SE8	ESE5	NNE5	NE4	NE4	NW6	W15	NNW15	NNW13	NNW15	NW12	NNW12	NNW10	NW7	NNW5	UO	UO	UO	UO	NW1.5	W15
4-Feb	UO	UO	ENE5	NE6	ENE7	E6	E4	ESE5	ENE4	ENE5	NE3	NE2	ENE2	NNE4	NNE4	NE3	ESE5	E7	ESE7	E7	E6	ESE5	ENE3	ENE4.2	E7	
5-Feb	NE2	NE3	ENE3	ESE4	ESE5	SE5	ESE6	ESE5	ESE2	SE3	SE4	NNE3	E3	ESE4	ESE5	SE6	SE8	E7	SW10	WSW17	W18	W17	NNW24	WNW26	SW2.5	WNW26
6-Feb	WNW28	NNW29	W31	W29	W24	W20	NNW22	WNW22	NNW18	NNW18	NNW17	NNW11	W6	E5	ESE8	ESE10	ESE11	SE10	SE12	SE10	SE8	SE5	SE6	WSW7	W8.3	W31
7-Feb	WSW21	WSW20	WSW17	WSW21	WSW17	WSW17	NNW24	W23	W21	W19	WSW18	WSW18	W25	W22	W19	W19	WSW15	WSW10	WSW8	W9	W9	W8	W10	W13	W16.4	W25
8-Feb	W16	W14	NW12	WNW9	W10	WNW9	W5	NE5	SE4	SE5	SE5	SSE5	SSE4	SE3	SSE5	SE6	SE7	SE6	SE7	SSW6	SSW6	SSW9	SSW9	SSW9	SW3.1	W16
9-Feb	SSW9	SSW10	SSW10	SSW9	SSW8	SW9	WSW11	WSW12	WSW12	WSW10	W10	WSW8	S3	S10	S9	SSE7	ESE9	SSE11	SSE11	S8	S5	SSW8	SSW10	SSW7	SSW7.3	WSW12
10-Feb	SSE4	ESE5	SE7	SSE7	ESE3	SE4	NE9	E5	E6	ESE11	ESE10	E10	E11	E10	E9	NE6	NNE5	WNW6	W9	WNW7	WNW6	NW5	NNW3	UO	E3.0	ESE11
11-Feb	UO	NNE3	NW2	W2	W2	W11	W12	W10	S3	SE5	S2	WSW10	W11	WSW13	WSW14	SW19	WSW19	WSW19	WSW22	W21	W23	W17	W16	WSW20	WSW10.9	W23
12-Feb	WSW19	WSW19	WSW18	W19	W21	WSW21	WSW22	W18	W14	W15	W14	W10	W7	W5	E1	ENE4	SSE9	SE10	SE10	SE12	ESE12	ESE12	SE12	SSE18	SW7.5	WSW22
13-Feb	SSE14	S12	SW18	SW21	SW23	WSW26	WSW21	WSW18	W17	W17	NNW24	NW25	NW23	NW25	NW24	NW27	NW25	NW28	NNW24	NW19	NW18	NW14	NW15	WNW14	WNW15.4	NW28
14-Feb	WNW12	WNW12	WNW14	WNW11	WNW10	WNW9	W7	W7	W7	W7	W7	W7	NW6	NNW7	NNW10	NNW12	NNW9	NW7	NW6	NW9	NW9	NW9	NNW7	NNW6	NW7.9	WNW14
15-Feb	WNW3	WSW2	W2	NW1	NE3	SE2	SE5	SSE7	SE6	SSE7	SE4	E3	ENE3	ENE5	SE5	E6	E6	E6	E8	SE8	SE11	SE10	SE11	SE7	ESE4.3	SE11
16-Feb	SE6	SE9	ESE8	ESE8	ESE8	ESE8	E9	ESE10	ESE7	SE8	SE13	SSE11	S11	SW8	WSW16	W18	W16	WNW20	WNW21	NW24	NW22	NW19	NW15	WNW9	W3.0	NW24
17-Feb	W11	WNW8	W9	W8	W9	WNW6	WNW6	WNW4	NNW2	SSE0	ENE3	NE5	NE5	NNW5	N7	NNW8	NNW7	NNW9	NW8	NNW9	NW8	NW5	NW7	NNW9	NW5.3	W11
18-Feb	NNW8	NW8	NNW8	N6	NNW6	NNW5	NNW5	NNW5	NNW6	NW6	WNW7	W8	W9	W10	W10	WNW8	NNW8	NW6	WNW5	SW3	S4	SE6	SE6	SE9	WNW3.8	W10
19-Feb	SE9	SE10	SE9	SE11	ESE12	ESE10	ESE10	ESE10	ESE10	ESE11	ESE13	ESE14	E10	E9	ESE9	E8	ENE7	NNE6	NNE7	NNE6	NE3	NW3	WSW5	W8	ESE6.6	ESE14
20-Feb	W10	W11	WNW11	W9	W10	WNW10	W10	WNW6	NNW7	N6	N5	NNW7	NNW9	NW11	NNW10	NNW10	NNW7	NW5	NW6	N9	N8	N5	WNW6	WNW8	NW7.1	W11
21-Feb	WNW10	NW13	NW12	WNW10	W10	WNW12	WNW12	NW15	NW17	NW17	NW17	NW19	NW19	NW19	NW21	NW20	NW16	NW14	NW14	NW15	NW12	WNW9	W9	W10	NW13.8	NW21
22-Feb	WNW11	W9	WNW12	W11	W11	W11	W10	W11	W11	W11	W11	W13	WNW11	NNW9	NNW8	NNW8	NNW6	NNW5	NW5	WNW5	WSW5	WSW6	W5	WNW4	WNW7.9	W13
23-Feb	SW6	W4	SW5	WSW5	WNW5	WSW7	W8	WNW7	W6	WNW6	NW7	NNW7	NNW8	NNW10	NNW9	NW9	NNW8	N4	ESE4	SE7	SSE9	SSE10	S9	SSW8	W3.0	SSE10
24-Feb	SSW8	SSW9	SSW10	SSW11	SSW11	SSW5	SSW7	SSW6	SW6	SSE8	S19	S19	S17	S17	S16	S18	S18	S16	S18	S19	S15	S15	S12	S10	S12.5	S19
25-Feb	SSW9	SSW7	WSW8	W15	W18	W19	W19	W18	W17	W16	WSW16	WSW14	WSW14	WSW11	WSW9	WSW9	W8	WSW6	S4	SSE6	SE4	SSE7	SSW6	SSE4	WSW9.4	W19
26-Feb	SE9	SE11	SE8	ESE9	SE11	SE9	ESE11	ESE10	ESE10	ESE9	ESE11	E11	E11	E13	E12	ENE12	ENE13	E10	ENE12	ENE12	ENE13	E9	E8	NE5	E9.6	E13
27-Feb	NE4	N6	N6	NNW7	NNW7	NW8	NW9	NNW10	NNW13	NNW13	NNW14	NNW14	NNW16	NNW15	NNW16	NNW14	NW14	NW12	WNW10	NW12	NW10	NNW10	NNW10	W9	NW10.1	WNW16
28-Feb	W9	WNW8	W7	W7	W6	W5	WNW5	WNW4	W3	W3	WSW4	W8	WNW5	W5	WNW4	W5	WNW5	W5	W4	NNW3	NE2	SSE6	ESE6	SE9	W3.6	W9

WSW5.1	WSW4.8	WSW4.9	WSW5.2	WSW5.1	W5.2	W5.3	W4.7	W4.1	W3.3	W3.4	W4.3	W4.1	NNW3.7	NNW3.7	NNW3.5	NW2.1	NNW2.1	W2.4	W2.5	W2.0	WSW2.1	WSW3.1	WSW4.2	Diurnal Average	
WNW28	WNW29	W31	W29	W24	WSW26	WNW24	W23	W21	W19	NNW24	NW25	W25	NNW25	NW24	NW27	NW25	NW28	NNW24	NW24	W23	SE19	WNW24	WNW26	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**

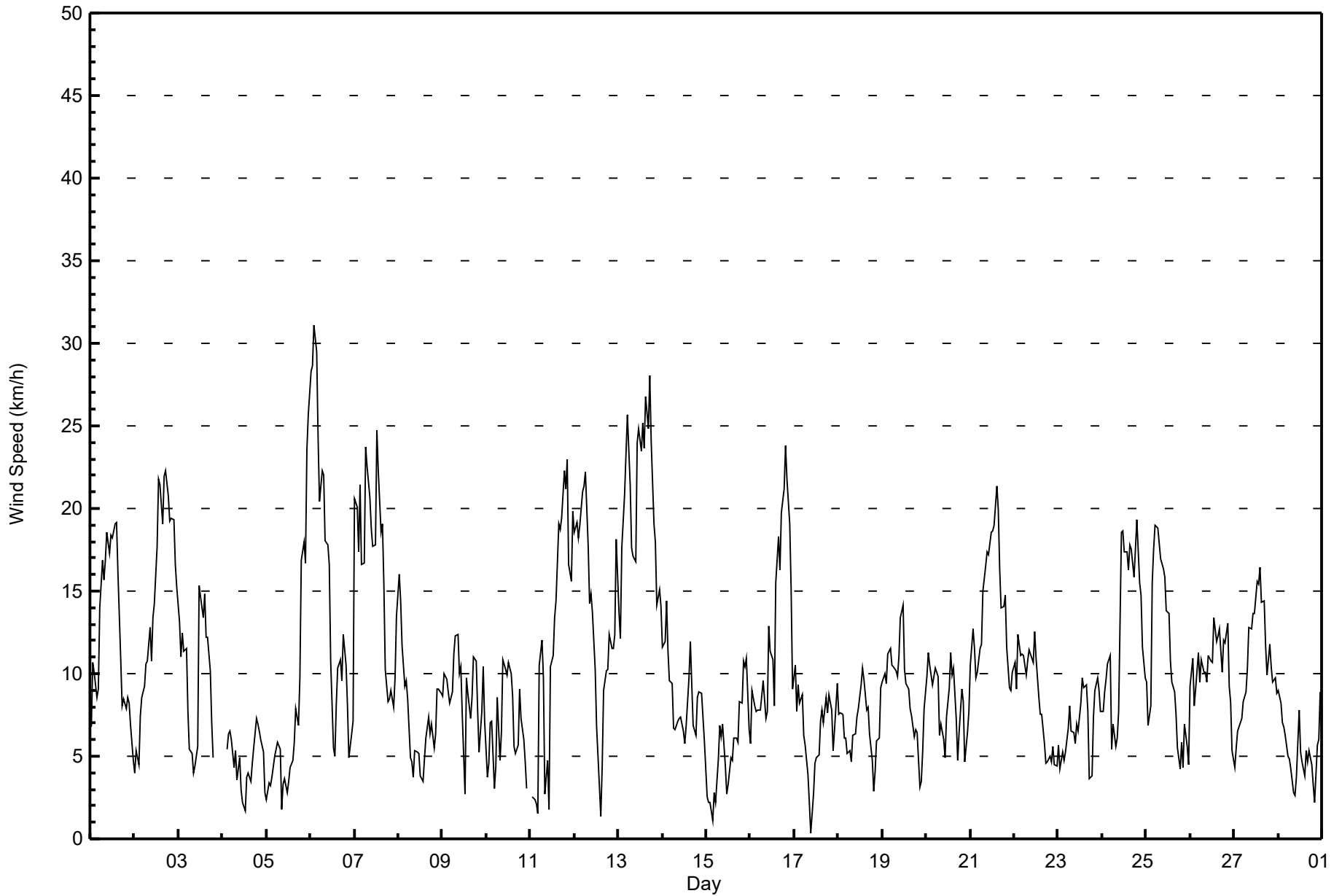
**Wind Speed (WS) - km/h**  
**Anzac - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Feb 7 07:00 Minimum Value: 0 km/h on Feb 28 20:00 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> = 5 P <sub>99</sub> = 8																	Hours in Service: 672 Hours of Data: 664 Hours of Missing Data: 8 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-Feb	2	3	3	2	3	2	4	3	4	4	4	5	4	5	4	4	3	1	1	1	1	2	1	2	5	
2-Feb	1	1	1	1	2	1	2	3	3	2	3	4	4	5	5	5	5	5	5	4	4	4	4	3	5	
3-Feb	3	3	3	2	3	2	1	2	2	2	4	4	4	4	4	3	3	3	1	1	UO	UO	UO	UO	4	
4-Feb	UO	UO	1	2	1	1	2	2	1	1	1	1	2	1	1	1	1	1	2	2	2	1	2	1	2	
5-Feb	1	1	2	1	1	2	2	2	1	2	3	2	1	1	2	1	2	1	2	5	5	4	7	7	7	
6-Feb	8	8	8	8	6	5	5	6	5	4	4	4	2	2	2	2	2	3	2	2	2	1	2	5	8	
7-Feb	8	6	5	6	4	4	8	6	5	5	5	5	8	7	6	6	4	3	2	2	2	2	2	4	8	
8-Feb	4	3	3	2	2	2	2	1	2	1	1	1	1	1	2	1	2	2	1	1	1	1	2	2	4	
9-Feb	2	2	2	2	2	2	2	2	3	2	3	2	2	3	3	2	2	2	3	2	1	2	2	1	3	
10-Feb	1	1	2	3	1	2	2	1	2	3	3	3	3	2	2	1	1	2	2	2	1	1	2	UO	3	
11-Feb	UO	1	1	1	2	4	3	3	1	1	2	3	3	4	4	6	5	5	6	5	6	5	4	6	6	
12-Feb	5	6	5	5	6	6	6	5	4	4	3	3	2	2	1	1	2	2	2	2	2	3	4	4	6	
13-Feb	5	4	6	6	7	6	7	8	5	4	7	6	6	7	5	6	7	6	5	5	4	3	3	3	8	
14-Feb	2	3	3	3	2	2	1	1	2	2	2	2	2	2	2	3	2	2	2	2	2	2	1	2	3	
15-Feb	1	1	1	1	1	1	2	1	1	1	1	2	2	1	1	1	1	1	1	2	2	2	2	2	2	
16-Feb	2	3	3	2	2	2	2	2	2	2	3	2	2	5	5	5	4	5	6	6	5	5	3	2	6	
17-Feb	2	2	2	2	2	1	2	1	1	1	1	1	1	1	1	2	2	1	1	2	2	1	1	2	2	
18-Feb	2	1	2	1	1	1	1	1	1	1	2	2	3	2	2	2	2	1	1	1	1	1	2	1	3	
19-Feb	1	1	2	2	2	2	3	2	2	3	3	3	2	2	2	2	2	1	1	1	1	1	2	1	3	
20-Feb	2	3	2	2	2	3	2	1	1	1	1	2	2	2	2	2	2	1	2	1	2	2	1	2	3	
21-Feb	2	2	3	2	2	2	2	4	4	4	3	4	4	5	5	5	5	3	3	4	2	2	2	2	5	
22-Feb	2	2	3	2	2	2	2	2	2	3	2	3	3	2	2	1	1	1	1	1	1	1	1	1	3	
23-Feb	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	2	1	1	1	1	2	
24-Feb	1	2	2	4	3	2	2	1	3	3	5	6	5	5	4	5	5	4	5	6	5	4	3	3	6	
25-Feb	2	2	4	4	5	5	5	4	4	4	4	4	4	3	3	2	2	1	1	1	1	1	1	1	5	
26-Feb	3	2	2	2	2	3	2	2	2	3	2	3	3	3	3	3	3	3	3	3	3	2	3	1	3	
27-Feb	1	1	1	1	1	1	1	3	3	3	3	3	4	3	4	3	3	3	3	2	2	2	2	2	4	
28-Feb	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	0	1	2	1	1	2	
																	Diurnal Maximum									
UO - Unstable Operation																										



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

**Wind Speed (WS) - km/h**  
**Anzac - February 2023**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Anzac - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	133	20.03	20.03
6 - 11	326	49.10	69.13
12 - 19	156	23.49	92.62
20 - 28	46	6.93	99.55
29 - 38	3	0.45	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 664

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Anzac - February 2023**

<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	3	7	14	10	6	13	15	6	8	3	1	6	14	11	7	9	133
6 - 11	7	3	3	2	23	28	41	17	7	24	6	14	55	36	31	29	326
12 - 19	0	0	0	5	2	8	14	2	14	0	2	21	29	22	33	4	156
20 - 28	0	0	0	0	0	1	4	0	0	0	2	9	9	8	11	2	46
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	<b>10</b>	<b>10</b>	<b>17</b>	<b>17</b>	<b>31</b>	<b>50</b>	<b>74</b>	<b>25</b>	<b>29</b>	<b>27</b>	<b>11</b>	<b>50</b>	<b>109</b>	<b>78</b>	<b>82</b>	<b>44</b>	<b>664</b>

Total Number of Valid Hours: 664

Total Number of Hours: 672





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

**Wind Direction (WD) - deg**  
**Anzac - February 2023**

Direction of Maximum Speed: 273 deg on Feb 6 03:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 261.6 deg on Feb 7	Hours of Data: 664
Direction of Minimum Speed: 158 deg on Feb 17 10:00	Hours of Missing Data: 8
Direction of Minimum Daily Speed Average: 1.5 deg on Feb 3	Percent Operational Time: 98.8
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-Feb	346	321	305	283	308	340	332	317	315	318	312	311	306	309	306	310	310	319	290	268	276	291	249	241	308.7
2-Feb	204	187	172	151	150	148	142	132	130	120	120	111	121	131	133	127	123	127	134	133	136	136	131	124	132.2
3-Feb	125	125	124	127	129	135	119	27	51	46	323	268	284	292	297	314	343	328	313	327	UO	UO	UO	UO	324.6
4-Feb	UO	UO	61	40	58	79	90	107	71	58	37	41	66	29	33	47	123	93	95	113	93	100	118	64	78.1
5-Feb	36	42	70	119	117	125	119	120	120	143	142	13	81	117	121	132	146	169	227	243	267	270	287	282	234.1
6-Feb	284	282	273	274	277	275	283	286	286	295	296	298	278	84	109	114	104	124	129	127	130	124	137	243	273.8
7-Feb	248	245	245	255	256	253	286	281	263	260	252	250	261	263	279	270	256	250	254	273	266	276	265	273	261.6
8-Feb	278	280	313	285	273	296	268	45	132	142	128	153	165	144	153	145	145	132	145	200	197	195	206	199	216.7
9-Feb	199	201	197	209	213	233	250	242	242	252	260	256	186	189	184	157	118	148	168	180	182	194	202	202	206.1
10-Feb	166	111	140	149	122	141	55	92	96	105	106	92	96	84	82	40	15	287	272	292	300	306	334	UO	90.0
11-Feb	UO	21	308	261	267	272	272	281	183	139	173	255	259	244	241	235	240	241	257	263	278	275	260	258	256.6
12-Feb	255	252	254	264	263	258	258	266	259	267	267	269	262	267	80	78	152	140	131	132	109	112	140	161	236.2
13-Feb	166	189	222	229	235	240	253	258	266	267	328	311	307	311	314	324	322	319	329	324	313	309	313	300	290.6
14-Feb	291	293	299	296	296	300	271	273	273	270	265	272	324	340	333	332	340	313	317	315	316	320	335	330	305.3
15-Feb	288	250	266	311	39	133	140	152	144	152	145	92	76	71	145	95	82	88	100	125	129	131	136	127	122.7
16-Feb	124	128	119	102	114	109	97	113	113	124	143	147	189	228	250	260	273	292	288	306	324	325	317	292	270.1
17-Feb	272	284	274	276	278	291	286	299	329	158	71	34	42	335	352	345	340	321	310	309	313	307	324	333	312.0
18-Feb	341	324	335	3	329	331	340	330	334	322	302	269	260	264	266	289	327	322	296	214	176	145	134	140	303.1
19-Feb	137	131	128	125	123	116	117	110	104	104	119	116	94	88	102	96	75	32	25	20	39	318	257	274	105.6
20-Feb	276	280	292	280	276	287	279	285	327	352	349	338	311	324	342	343	347	314	320	352	9	2	297	302	313.4
21-Feb	291	305	304	289	280	301	298	306	310	320	316	316	313	314	315	319	317	317	309	320	318	288	267	263	307.4
22-Feb	283	275	282	279	278	277	272	277	280	278	279	270	287	313	328	345	344	332	308	293	255	241	274	282	285.9
23-Feb	233	269	232	256	283	258	266	282	270	287	320	336	346	333	317	317	348	354	114	145	153	160	185	194	274.9
24-Feb	196	197	201	203	204	202	201	203	216	155	181	179	174	169	179	169	171	173	180	180	187	185	183	177	182.7
25-Feb	197	202	238	260	264	271	270	268	259	264	258	255	254	258	252	257	267	234	188	166	138	154	202	164	249.2
26-Feb	135	136	125	114	128	126	106	105	117	120	121	100	92	84	87	66	71	82	69	75	73	82	87	55	97.3
27-Feb	40	9	356	342	331	318	304	296	295	295	299	283	290	295	296	296	305	308	303	314	316	302	300	270	304.3
28-Feb	268	283	278	276	273	268	283	283	274	275	257	259	290	270	296	278	290	262	280	337	49	148	122	141	269.3
249.9 255.2 258.7 255.1 255.2 262.4 271.6 275.3 271.2 274.3 273.8 274.1 279.2 288.5 289.3 303.5 315.8 286.6 266.3 269.1 276.4 240.0 239.8 242.4																									
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 (WD) - deg**  
**Anzac - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 672
Maximum Value: 90 deg on Feb 17 10:00	Hours of Data: 664
Minimum Value: 3 deg on Feb 23 22:00	Hours of Missing Data: 8
Percentiles: P <sub>1</sub> = 8 P <sub>10</sub> = 12 Q <sub>1</sub> = 13 Median = 16 Q <sub>3</sub> = 19 P <sub>90</sub> = 26 P <sub>99</sub> = 64	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-Feb	18	14	15	14	24	11	12	13	12	12	15	16	14	15	15	15	13	9	12	14	14	14	10	14	24
2-Feb	17	8	12	7	7	8	10	11	12	17	14	15	14	14	14	14	14	14	14	13	13	13	14	15	17
3-Feb	14	14	14	13	15	14	20	40	44	32	42	17	16	16	17	13	15	14	15	UO	UO	UO	UO	44	
4-Feb	UO	UO	19	13	18	16	26	22	24	17	28	34	53	26	29	28	19	18	15	16	21	17	18	31	53
5-Feb	16	16	22	24	17	20	20	21	70	70	60	50	39	17	52	14	9	21	14	16	17	16	17	70	
6-Feb	17	17	16	16	16	17	16	15	17	16	16	22	32	31	18	17	15	17	12	13	15	21	16	51	51
7-Feb	19	16	16	17	18	18	18	18	17	16	18	17	17	18	19	17	18	16	15	15	16	14	14	15	19
8-Feb	15	16	21	16	10	14	27	58	26	12	22	23	22	20	22	13	13	12	14	26	31	14	12	13	58
9-Feb	13	14	12	14	19	21	13	12	12	16	15	20	67	23	25	17	14	12	16	17	14	14	15	12	67
10-Feb	49	33	11	45	49	40	21	22	17	14	14	17	17	17	18	22	18	38	15	16	16	20	20	UO	49
11-Feb	UO	17	33	45	68	24	17	20	62	22	66	17	18	17	18	15	15	16	16	17	16	17	17	18	68
12-Feb	18	18	18	19	17	17	17	17	16	16	15	17	29	30	77	17	11	12	13	13	13	16	20	13	77
13-Feb	20	26	18	17	16	16	17	17	18	18	29	13	14	13	13	12	14	12	12	13	14	12	12	13	29
14-Feb	14	13	12	15	12	12	13	14	15	16	17	25	27	18	15	12	14	13	13	16	13	16	16	17	27
15-Feb	38	35	31	43	21	63	20	10	10	11	17	54	60	37	36	22	17	9	12	12	11	12	11	16	63
16-Feb	19	14	21	17	15	16	20	18	18	15	11	12	23	32	18	17	17	16	16	15	13	12	13	22	32
17-Feb	15	14	12	14	14	16	21	26	54	90	54	24	32	25	19	16	16	10	12	12	14	11	12	11	90
18-Feb	15	13	15	14	24	19	19	24	15	14	27	21	17	16	18	31	15	13	16	32	25	11	10	9	32
19-Feb	9	10	10	12	12	15	16	13	15	16	14	15	24	21	19	22	20	13	13	19	54	22	20	13	54
20-Feb	13	16	15	16	15	15	15	15	16	15	19	20	22	18	16	16	15	18	14	15	9	21	11	9	22
21-Feb	10	11	13	11	10	12	12	15	13	14	15	15	16	17	14	14	12	12	10	12	12	19	17	11	19
22-Feb	13	15	12	13	11	13	13	14	14	16	17	17	22	22	24	15	14	12	15	11	12	12	19	28	28
23-Feb	19	29	15	16	19	9	11	9	14	15	22	32	22	18	19	22	15	24	22	9	8	3	8	7	32
24-Feb	10	14	13	13	11	27	10	22	18	24	16	17	19	17	15	15	16	18	16	16	20	18	18	14	27
25-Feb	15	16	40	15	16	16	17	16	15	16	15	17	17	21	22	21	20	14	15	15	13	9	25	29	40
26-Feb	10	11	12	13	13	15	14	13	15	17	16	15	17	15	15	19	14	17	14	15	15	16	15	13	19
27-Feb	17	12	12	11	10	11	12	13	14	15	14	19	15	17	15	16	13	13	12	13	13	12	12	12	19
28-Feb	11	12	13	14	12	13	17	19	18	24	25	16	37	48	52	26	20	16	6	25	30	16	14	8	52
	49	35	40	45	68	63	27	58	70	90	66	54	67	48	77	31	20	38	22	32	54	22	25	51	

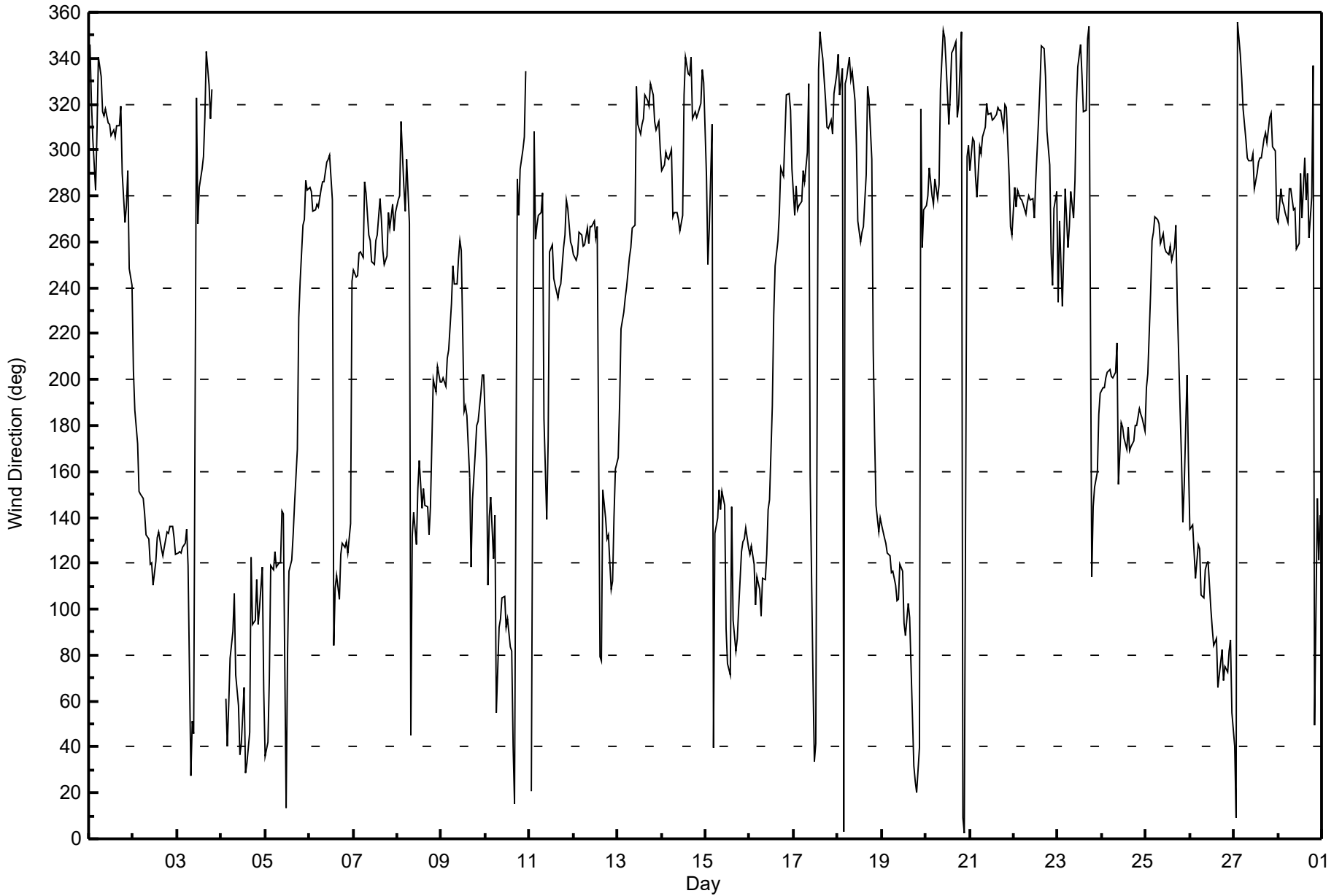
Diurnal Maximum

UO - Unstable Operation



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

**Wind Direction (WD) - deg**  
**Anzac - February 2023**





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

**AMS17  
WAPASU  
FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)  
 FEBRUARY 2023

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	640	31	32	99.85	28	0	6.9	0
H2S (ppb) Average	638	33	34	99.85	1.9	0	0.5	0
THC (ppm) Average	640	31	32	99.85	2.9	-	2.4	-
O3 (ppb) Average	640	31	32	99.85	47.7	0	42.6	-
NO2 (ppb) Average	639	33	33	100	30	0	11.3	-
NO (ppb) Average	639	33	33	100	30.6	-	3.2	-
NOX (ppb) Average	639	33	33	100	58.8	-	14.1	-
PM2.5 (ug/m3) Average	671	1	1	100	10.5	0	6.3	0
Temperature 2 m (C) Average	672	0	0	100	1.6	-	-2.4	-
Relative Humidity (%) Average	672	0	0	100	98.9	-	93.2	-
Wind Speed 10 m (km/h) Average	670	0	2	99.7	24	-	16	-
Wind Direction 10 m (deg) Average	670	0	2	99.7	-	-	-	-
Precipitation (mm) Total	672	0	0	100	2.3	-	5.6	-

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



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	640	1.11	2.9	-	0	0	0	0.2	0.7	2.6	28
H2S (ppb) Average	638	0.15	0.2	-	0	0	0	0.1	0.2	0.3	1.9
THC (ppm) Average	640	2.32	0.1	-	2.2	2.3	2.3	2.3	2.3	2.4	2.9
O3 (ppb) Average	640	29.62	8.9	-	2.2	17.5	24.9	31	35.9	39.2	47.7
NO2 (ppb) Average	639	5.21	5.7	-	0	0.5	1.4	3	6.9	12.7	30
NO (ppb) Average	639	0.89	2.4	-	0	0	0	0.1	0.7	2.2	30.6
NOX (ppb) Average	639	6.09	7.1	-	0	0.6	1.6	3.5	8.2	15.1	58.8
PM2.5 (ug/m3) Average	671	3.08	1.7	-	0.4	1.2	1.9	2.7	3.9	5.4	10.5
Temperature 2 m (C) Average	672	-16.11	9.6	-	-38.7	-29.5	-22.5	-16.1	-8.6	-2.7	1.6
Relative Humidity (%) Average	672	78.81	9.6	-	52.2	65.5	72.8	79.2	86.2	91	98.9
Wind Speed 10 m (km/h) Average	670	7.8	4	-	0	3	4	7	10	14	24
Wind Direction 10 m (deg) Average	670	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	672	-	-	24.79	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)  
 FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, O3, SO2, THC	23 Feb 2023 14:00	23 Feb 2023 14:00	1	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	01 Feb 2023 18:00	01 Feb 2023 18:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	28 Feb 2023 08:00	28 Feb 2023 08:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

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

Wapasu - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 28.0 ppb on Feb 11 07:00	Maximum Daily Average: 6.9 ppb on Feb 11		Hours of Data:	640
Minimum Value: 0.0 ppb on Feb 2 03:00	Minimum Daily Average: 0.0 ppb on Feb 27		Hours of Missing Data:	32
Maximum Diurnal Average: 2.3 ppb at hour 4	Minimum Diurnal Average: 0.5 ppb at hour 20		Hours of Calibration:	31
Monthly Average: 1.11 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> = 2.6 P <sub>99</sub> = 15.8		Percent Operational Time:	99.9

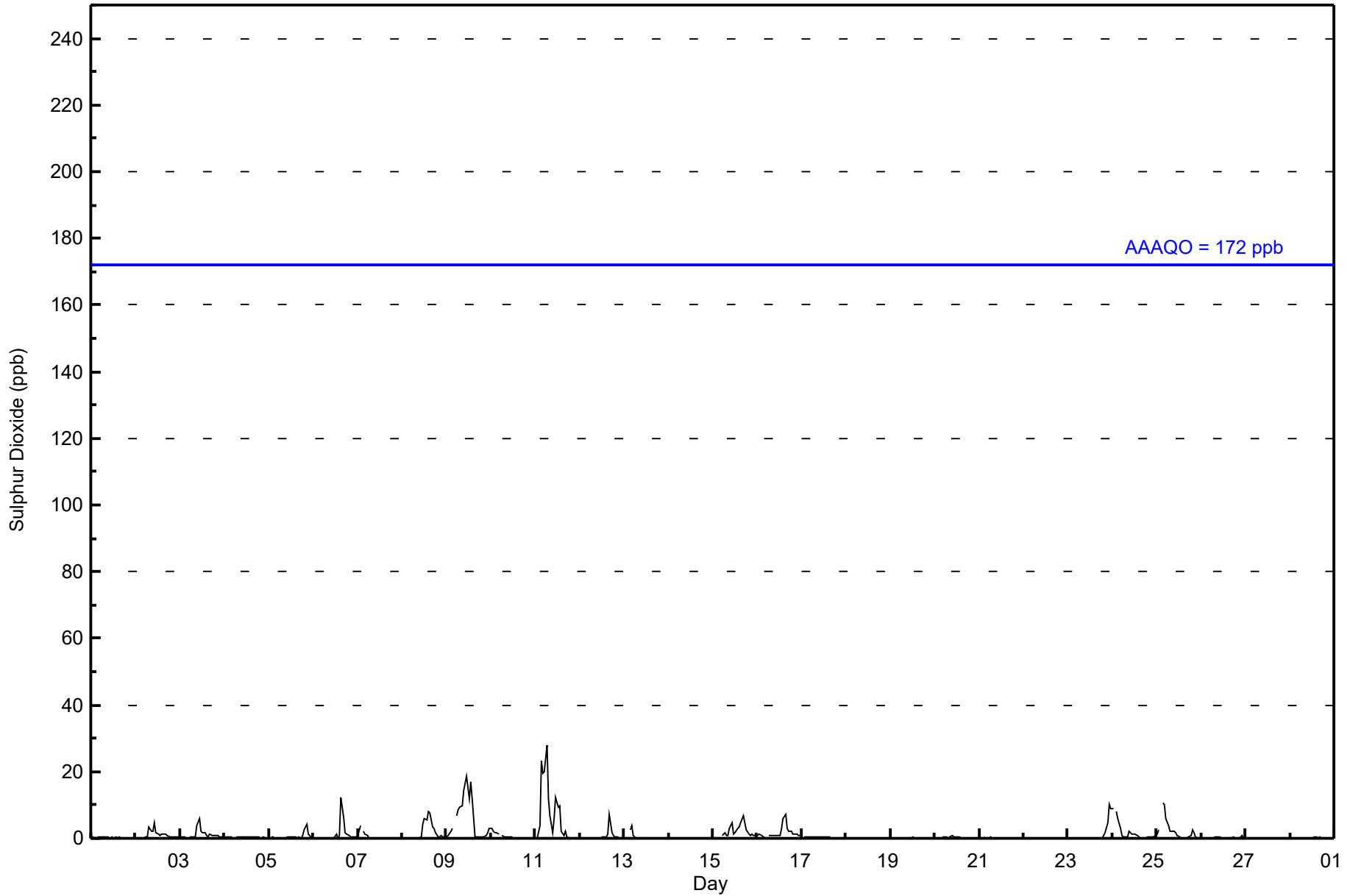
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Feb	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.3																							
2-Feb	0.1	0.0	0.0	Z	0.1	0.3	0.4	3.4	2.3	2.0	4.5	1.6	1.1	1.1	1.2	1.2	1.1	0.8	0.5	0.6	0.5	0.5	0.6	0.5	1.1	4.5																							
3-Feb	0.5	0.4	0.5	0.4	Z	0.4	0.3	0.2	0.6	3.7	5.8	2.3	1.8	1.6	0.9	0.5	1.1	1.0	0.8	0.8	0.7	0.5	0.4	0.4	1.1	5.8																							
4-Feb	0.3	0.3	0.3	0.3	0.4	Z	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.6																							
5-Feb	Z	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.4	0.4	0.4	0.3	0.4	0.2	0.2	0.2	0.2	0.7	2.4	4.2	1.3	0.7	0.0	0.6	4.2																						
6-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1	0.2	0.7	12.2	6.4	1.9	1.4	0.7	0.4	0.3	0.3	0.3	1.1	12.2																							
7-Feb	0.8	3.9	Z	2.2	1.2	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	0.4	3.9																							
8-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.3	4.3	5.9	5.4	8.0	7.8	3.6	3.1	1.5	0.5	0.5	0.7	0.5	0.5	1.9	8.0																							
9-Feb	0.5	0.7	2.2	3.0	Z	6.6	8.4	9.3	9.9	14.5	16.5	18.7	12.1	17.0	11.7	0.5	0.5	0.5	0.6	0.4	0.5	0.6	1.8	2.9	6.1	18.7																							
10-Feb	2.9	2.3	1.9	1.9	1.1	Z	0.7	0.4	0.5	0.5	0.3	0.3	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	2.9																							
11-Feb	Z	0.0	3.8	23.3	19.4	19.9	28.0	12.0	6.8	1.9	5.8	12.4	9.2	9.8	2.1	0.9	2.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	6.9	28.0																							
12-Feb	0.3	Z	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.4	0.2	1.4	7.4	1.7	1.0	0.5	0.2	0.1	0.1	0.2	0.6	7.4																							
13-Feb	0.2	0.2	Z	2.6	3.7	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	0.0	0.0	0.0	0.0	0.0	0.0	0.3	3.7																							
14-Feb	0.0	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.1	C	C	C	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																						
15-Feb	0.0	0.1	0.1	0.0	Z	1.0	1.6	1.0	0.9	3.0	4.8	1.3	1.8	3.1	3.4	4.8	6.7	4.7	2.5	1.1	1.0	1.2	1.0	0.8	2.0	6.7																							
16-Feb	0.8	1.2	0.8	0.6	0.5	Z	0.7	0.7	0.7	0.8	1.0	1.0	0.7	3.1	6.0	7.3	3.1	2.2	2.2	1.3	1.4	1.2	0.8	0.7	1.7	7.3																							
17-Feb	Z	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.5	0.5	0.4	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.5																							
18-Feb	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1																						
19-Feb	0.2	0.2	Z	0.2	0.1	0.2	0.2	0.0	0.0	0.0	0.1	0.2	0.3	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3																						
20-Feb	0.0	0.0	0.0	Z	0.2	0.3	0.4	0.1	0.6	1.0	0.6	0.4	0.3	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0																							
21-Feb	0.0	0.1	0.0	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.1	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	0.2	0.2																						
22-Feb	0.1	0.1	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	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2																						
23-Feb	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	M	0.0	0.0	0.0	0.0	0.0	1.0	1.8	4.7	10.2	9.1	1.2	10.2																							
24-Feb	9.0	Z	8.2	6.1	2.9	1.0	0.5	0.3	0.5	2.0	1.4	1.4	1.4	0.7	0.3	0.0	0.1	0.1	0.1	0.3	0.3	0.3	0.4	0.6	1.7	9.0																							
25-Feb	1.1	2.6	Z	10.5	10.3	5.7	4.0	2.2	2.3	1.9	1.8	0.8	0.3	0.2	0.1	0.0	0.0	0.2	0.9	2.7	1.5	0.5	0.1	0.1	2.2	10.5																							
26-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.5	0.4	0.4	0.2	0.2	0.2	0.0	0.0	0.1	0.0	0.6	0.1	0.0	0.0	0.4	1.0	0.2	0.2	1.0																							
27-Feb	0.1	0.1	0.2	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	0.2	0.2																						
28-Feb	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	0.4	0.5	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.5																						
																								0.7	0.6	0.8	2.3	1.8	1.7	1.7	1.1	1.0	1.2	1.6	1.7	1.4	1.7	1.3	1.4	1.2	0.6	0.5	0.5	0.5	0.5	0.7	0.6	Diurnal Average	
																								9.0	3.9	8.2	23.3	19.4	19.9	28.0	12.0	9.9	14.5	16.5	18.7	12.1	17.0	11.7	12.2	7.4	4.7	2.5	2.7	4.2	4.7	10.2	9.1	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  
Wapasu - February 2023





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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Wapasu - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	627	97.97	97.97
11 - 20	11	1.72	99.69
21 - 60	2	0.31	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: 640

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Wapasu - February 2023**

<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	99	52	43	21	15	17	63	83	48	33	35	23	16	5	11	61	625
11 - 20	0	0	0	0	0	0	0	1	5	5	0	0	0	0	0	0	11
21 - 60	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
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>	99	52	43	21	15	17	63	84	53	40	35	23	16	5	11	61	638

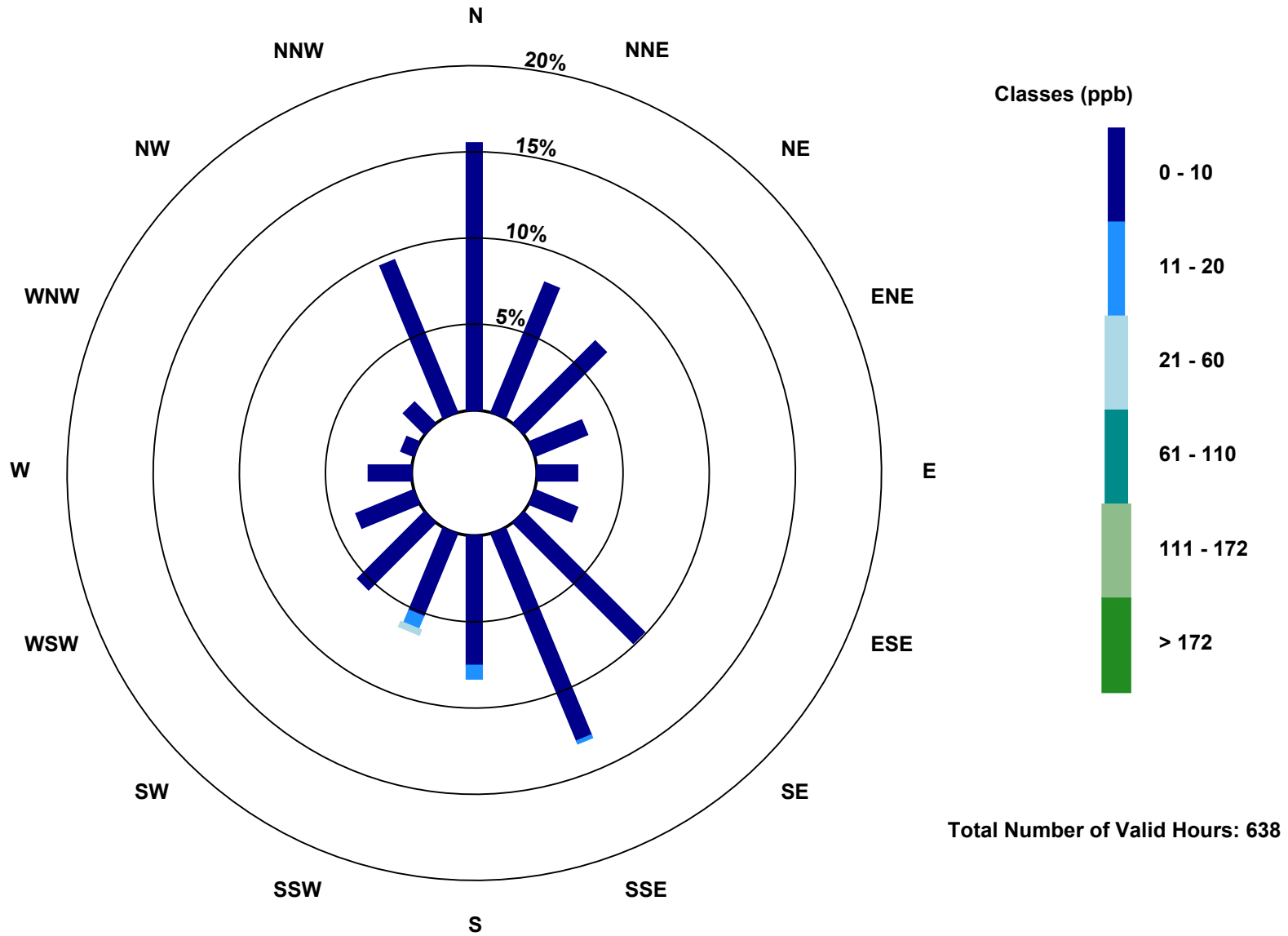
Total Number of Valid Hours: 638

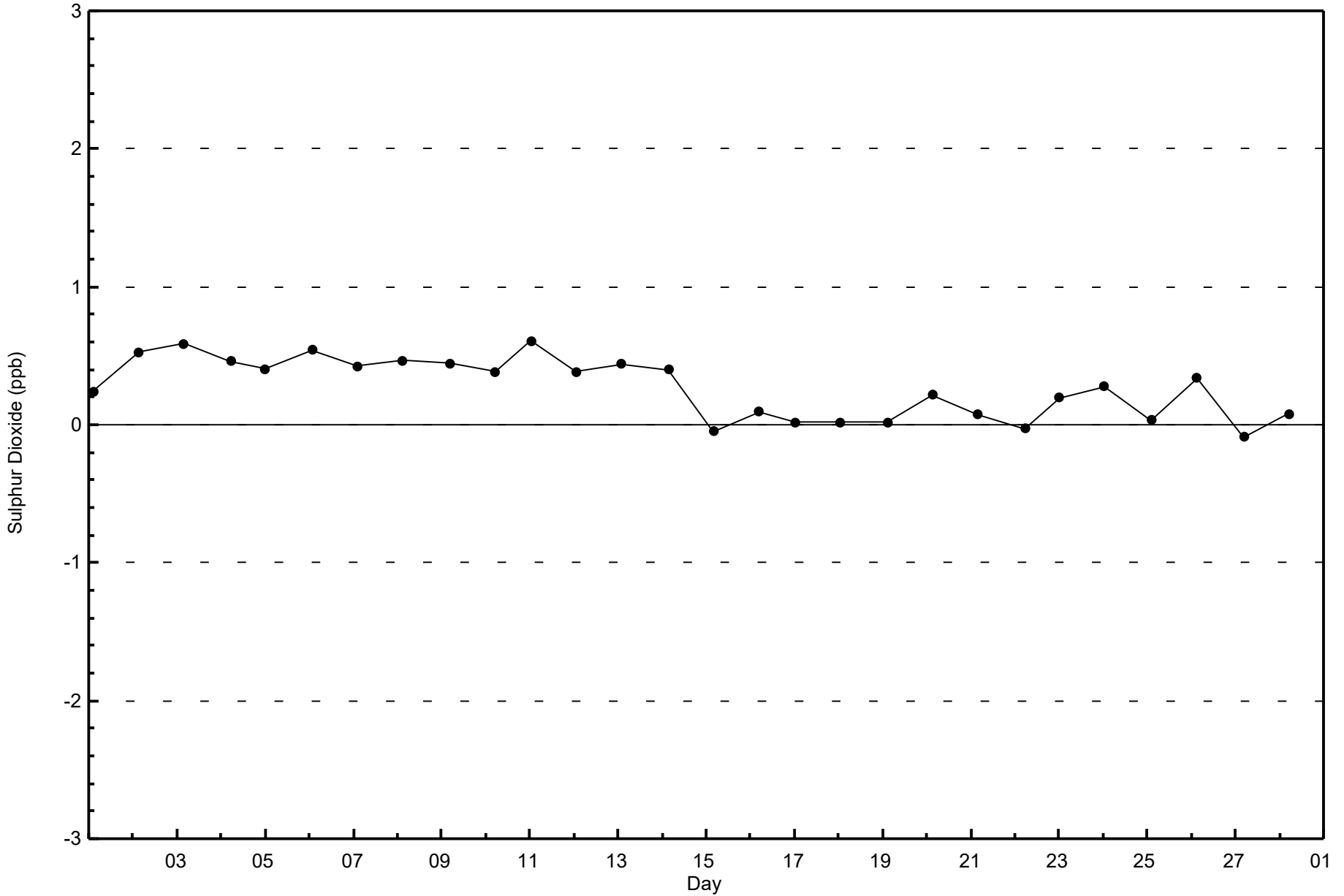
Total Number of Hours: 672



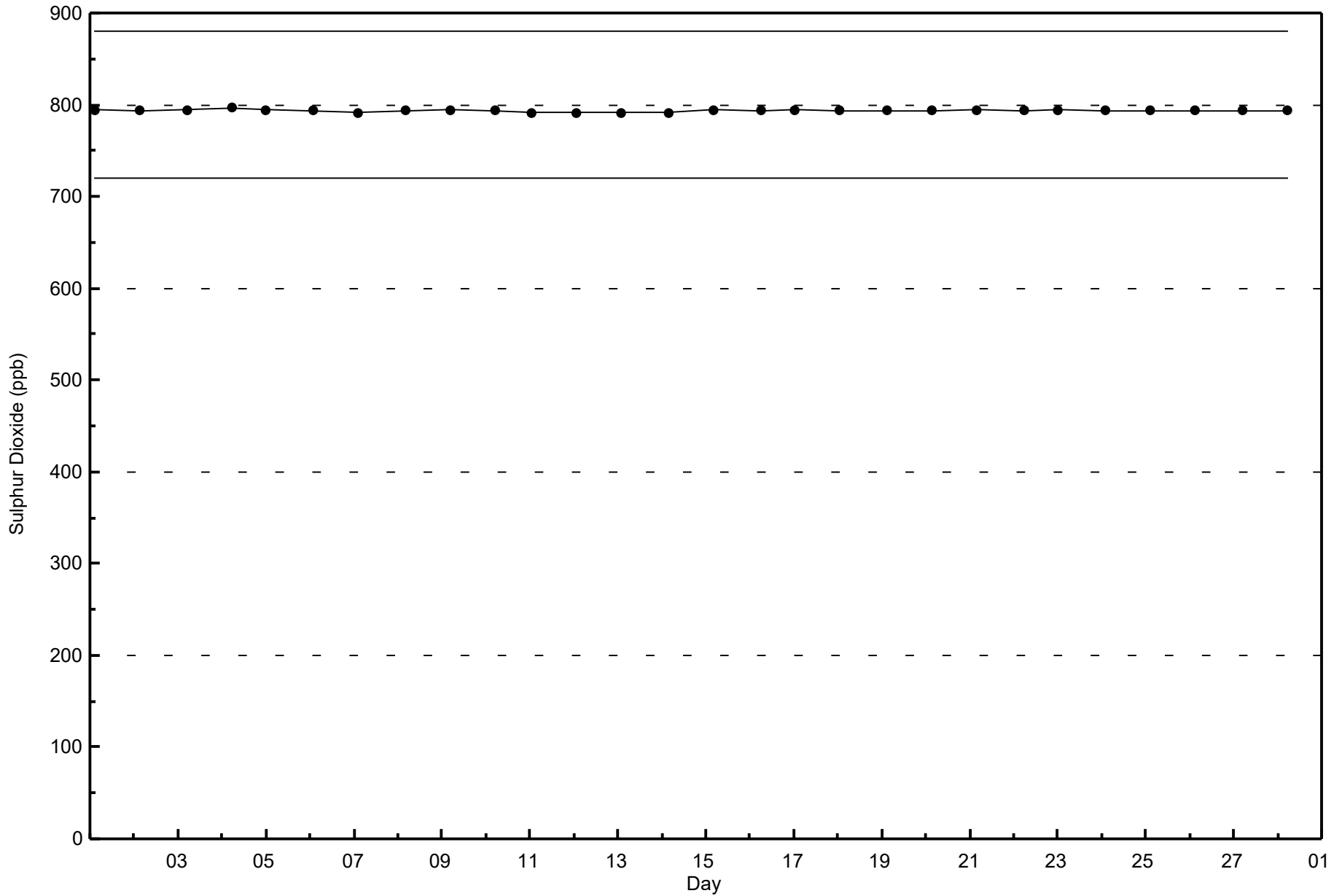
**Wood Buffalo Environmental Association**  
**Wind Rose Feb 2023**

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

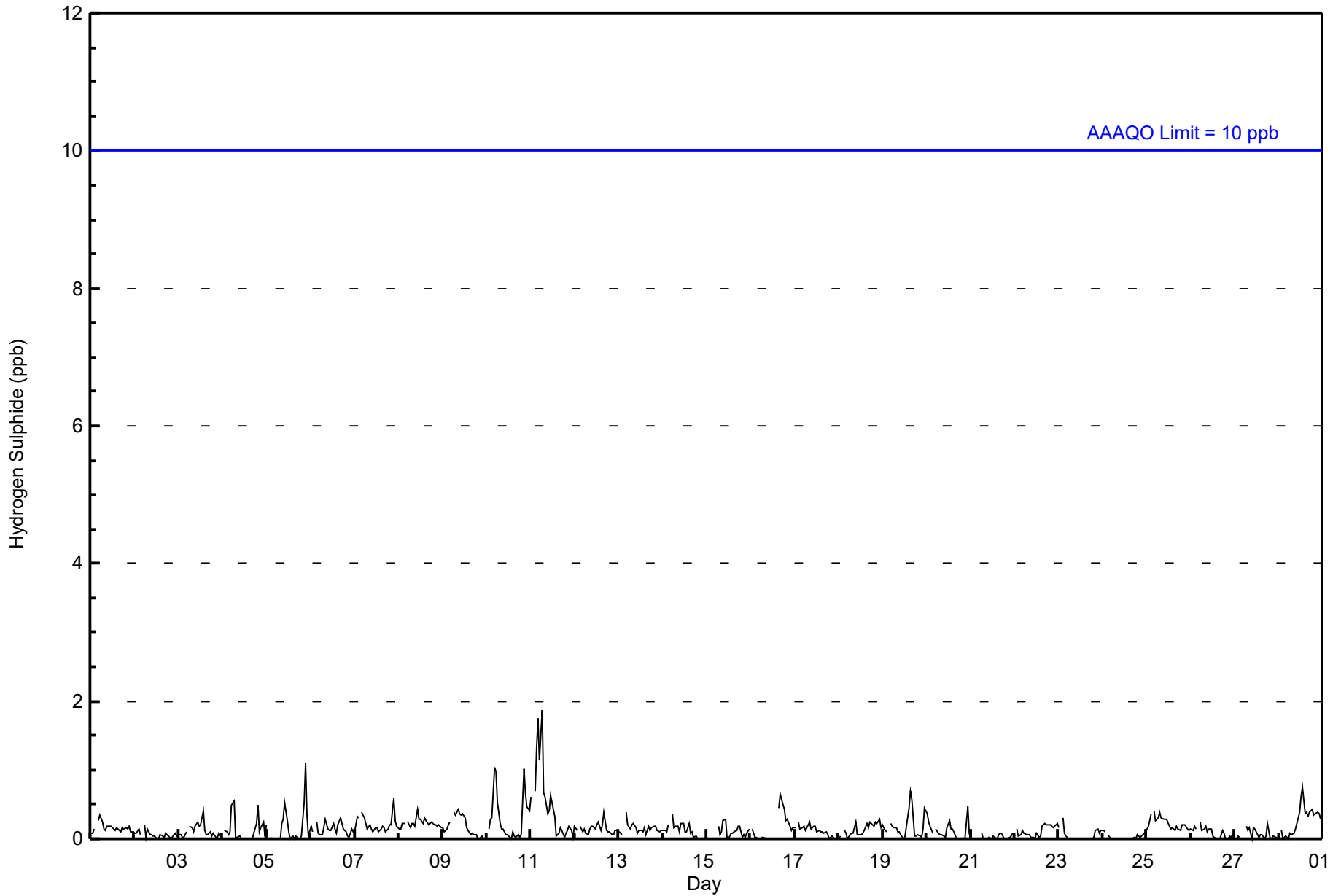














**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Wapasu - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	638	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: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Wapasu - February 2023**

<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	104	52	41	24	15	16	64	85	51	39	30	23	16	5	12	59	636
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>	104	52	41	24	15	16	64	85	51	39	30	23	16	5	12	59	636

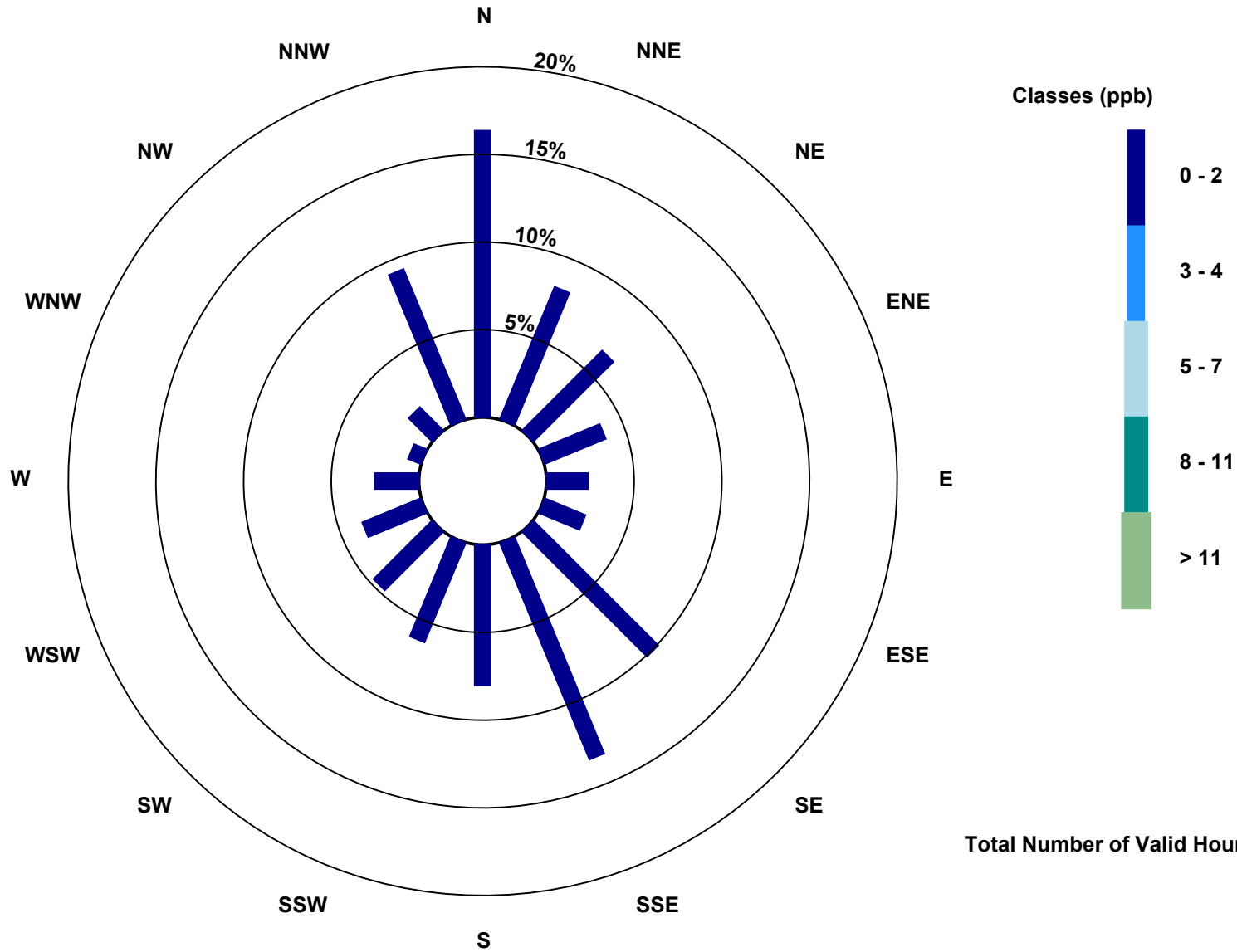
Total Number of Valid Hours: 636

Total Number of Hours: 672

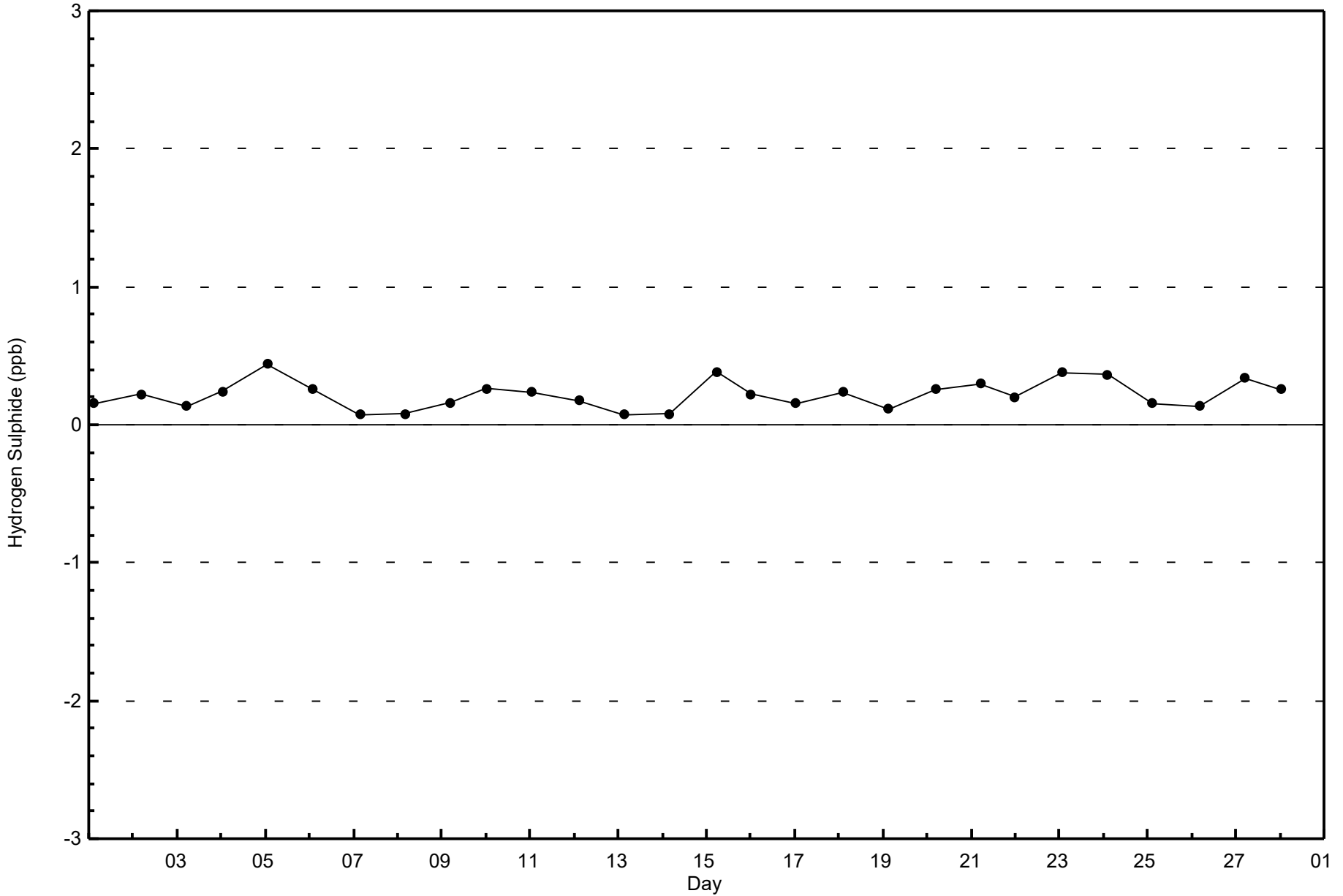


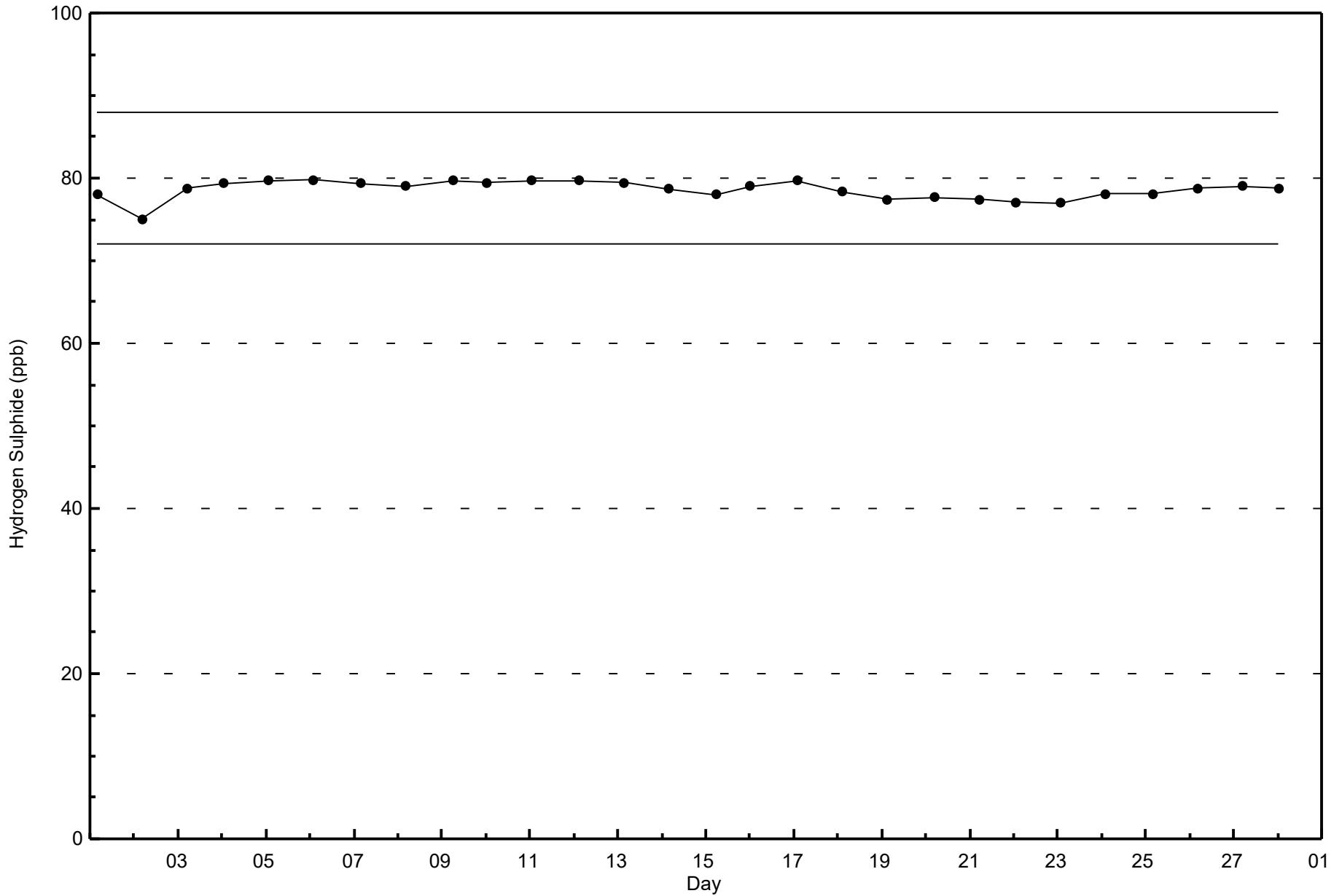
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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



Total Number of Valid Hours: 636





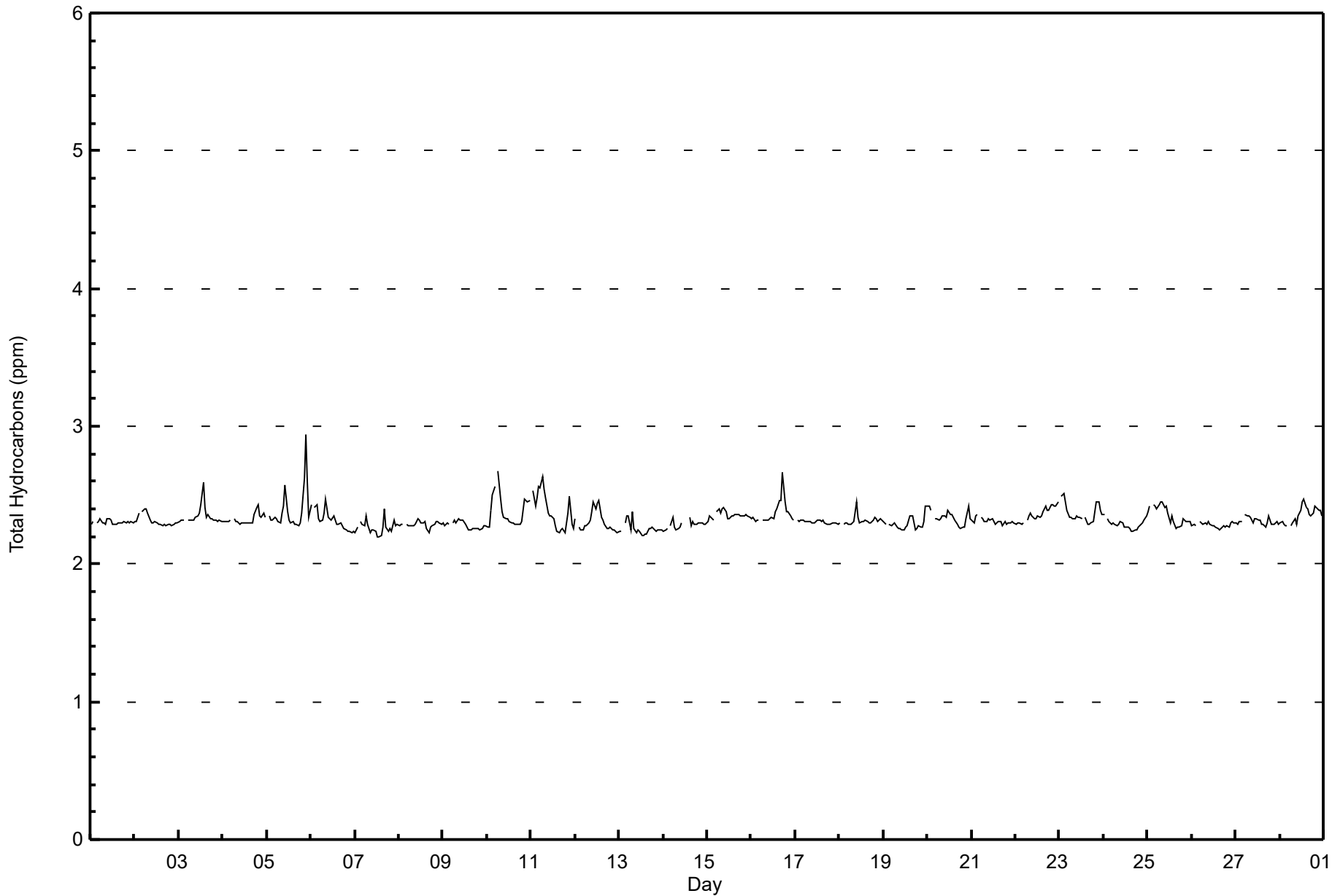




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Total Hydrocarbons (THC) - ppm**  
**Wapasu - February 2023**

Maximum Value: 2.9 ppm on Feb 5 22:00		Maximum Daily Average: 2.4 ppm on Feb 5		Hours in Service: 672																							
Minimum Value: 2.2 ppm on Feb 7 14:00		Minimum Daily Average: 2.3 ppm on Feb 13		Hours of Data: 640																							
Maximum Diurnal Average: 2.3 ppm at hour 22		Minimum Diurnal Average: 2.3 ppm at hour 16		Hours of Missing Data: 32																							
Monthly Average: 2.32 ppm		Percentiles: P <sub>1</sub> = 2.2 P <sub>10</sub> = 2.3 Q <sub>1</sub> = 2.3 Median = 2.3 Q <sub>3</sub> = 2.3 P <sub>90</sub> = 2.4 P <sub>99</sub> = 2.6		Hours of Calibration: 31																							
				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-Feb	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	2.3
2-Feb	2.3	2.3	2.4	Z	2.4	2.4	2.4	2.4	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
3-Feb	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.6	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
4-Feb	2.3	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	2.4	2.4	2.4	2.3	2.3	2.4	2.3	2.4	2.3	2.3
5-Feb	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.6	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.6	2.9	2.6	2.3	2.4	2.9
6-Feb	2.4	Z	2.4	2.4	2.3	2.3	2.3	2.4	2.5	2.3	2.3	2.3	2.4	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	2.5
7-Feb	2.2	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.4
8-Feb	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	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
9-Feb	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	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
10-Feb	2.3	2.3	2.4	2.5	2.6	Z	2.7	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.5	2.4	2.5	2.4	2.7	2.7
11-Feb	Z	2.5	2.4	2.5	2.6	2.6	2.6	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.3	2.2	2.3	2.4	2.5	2.3	2.3	2.4	2.6	2.6
12-Feb	2.3	Z	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.5	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.5
13-Feb	2.2	2.2	Z	2.3	2.3	2.3	2.3	2.4	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4
14-Feb	2.2	2.2	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	C	C	C	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
15-Feb	2.3	2.3	2.3	2.3	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.3	2.4	2.4
16-Feb	2.3	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5	2.5	2.7	2.5	2.4	2.4	2.3	2.3	2.3	2.4	2.7	2.7
17-Feb	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
18-Feb	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	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	2.4
19-Feb	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.4	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4
20-Feb	2.4	2.4	2.4	Z	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.4
21-Feb	2.3	2.3	2.3	2.4	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	2.4
22-Feb	2.3	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5
23-Feb	Z	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	M	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.5	2.4	2.4	2.4	2.5	2.5
24-Feb	2.4	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	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.4
25-Feb	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.5	2.5	2.4	2.4	2.4	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	2.4	2.5
26-Feb	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	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
27-Feb	2.3	2.3	2.3	2.3	Z	2.4	2.4	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	2.4
28-Feb	2.3	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan                      C - Calibration                      M - Maintenance																											





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

**Total Hydrocarbons (THC) - ppm**  
**Wapasu - February 2023**

<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	640	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: 640

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

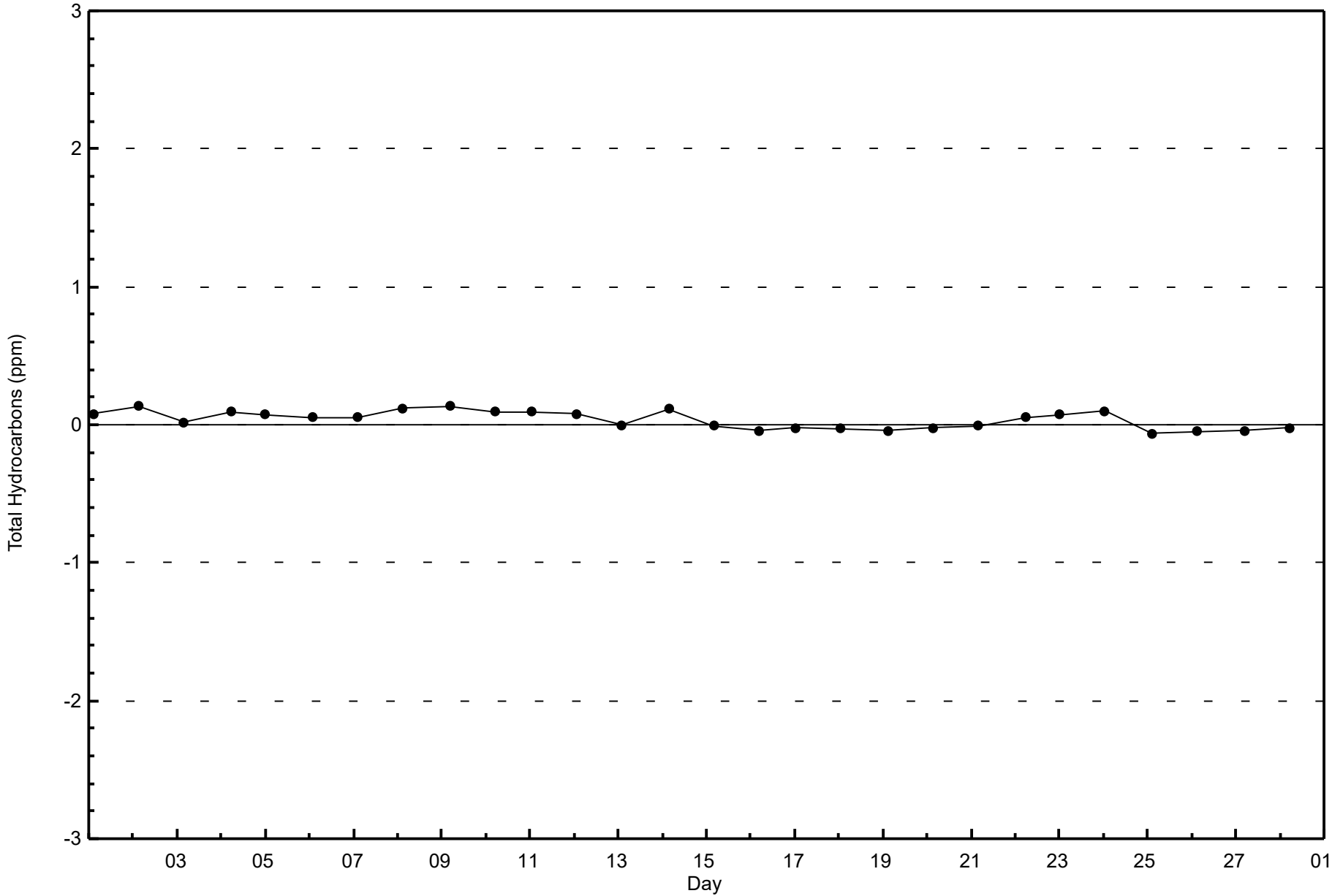
**Total Hydrocarbons (THC) - ppm  
Wapasu - February 2023**

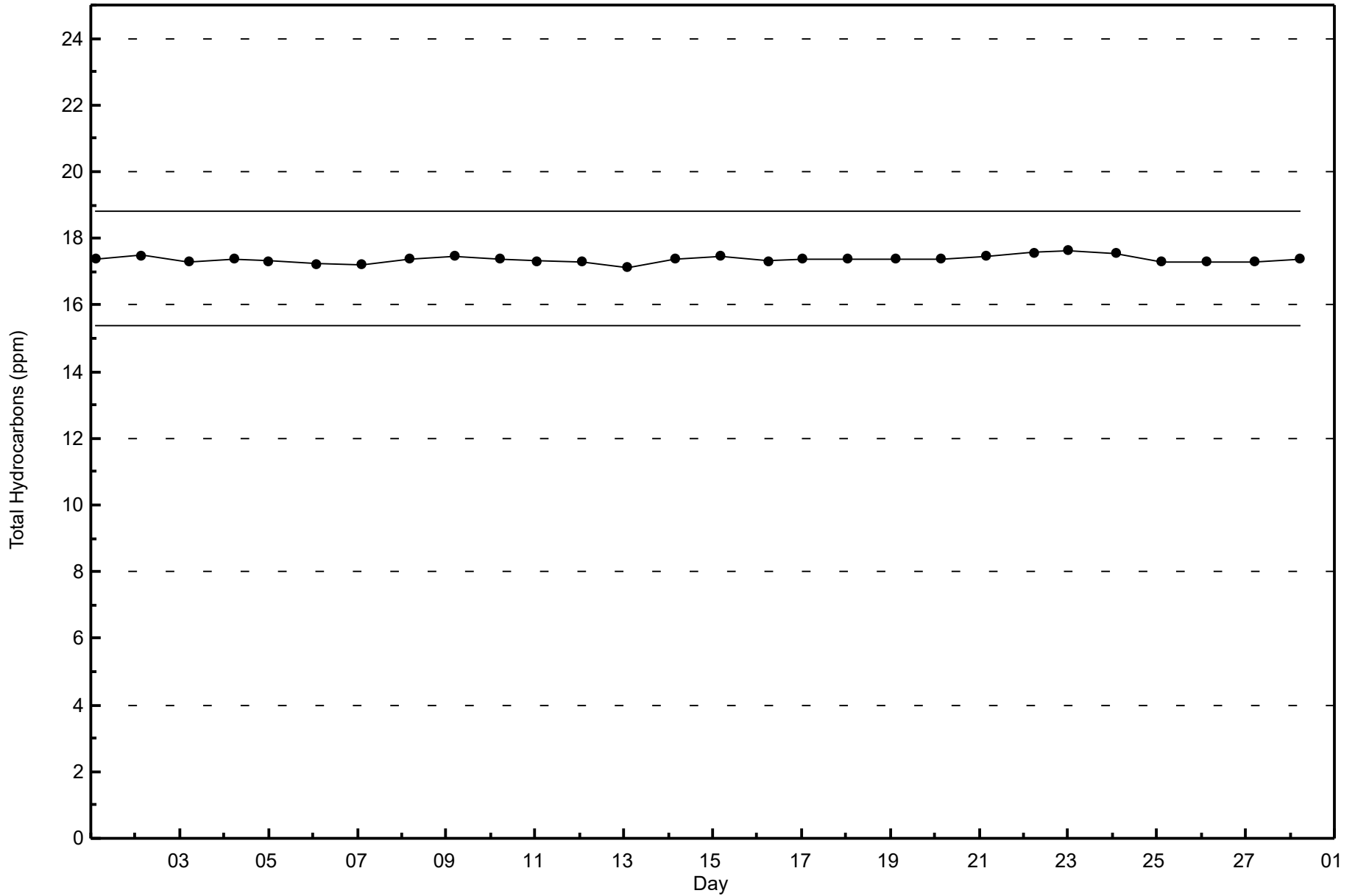
<b>Concentration Ranges (ppm)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	99	52	43	21	15	17	63	84	53	40	35	23	16	5	11	61	638
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	99	52	43	21	15	17	63	84	53	40	35	23	16	5	11	61	638

Total Number of Valid Hours: 638

Total Number of Hours: 672









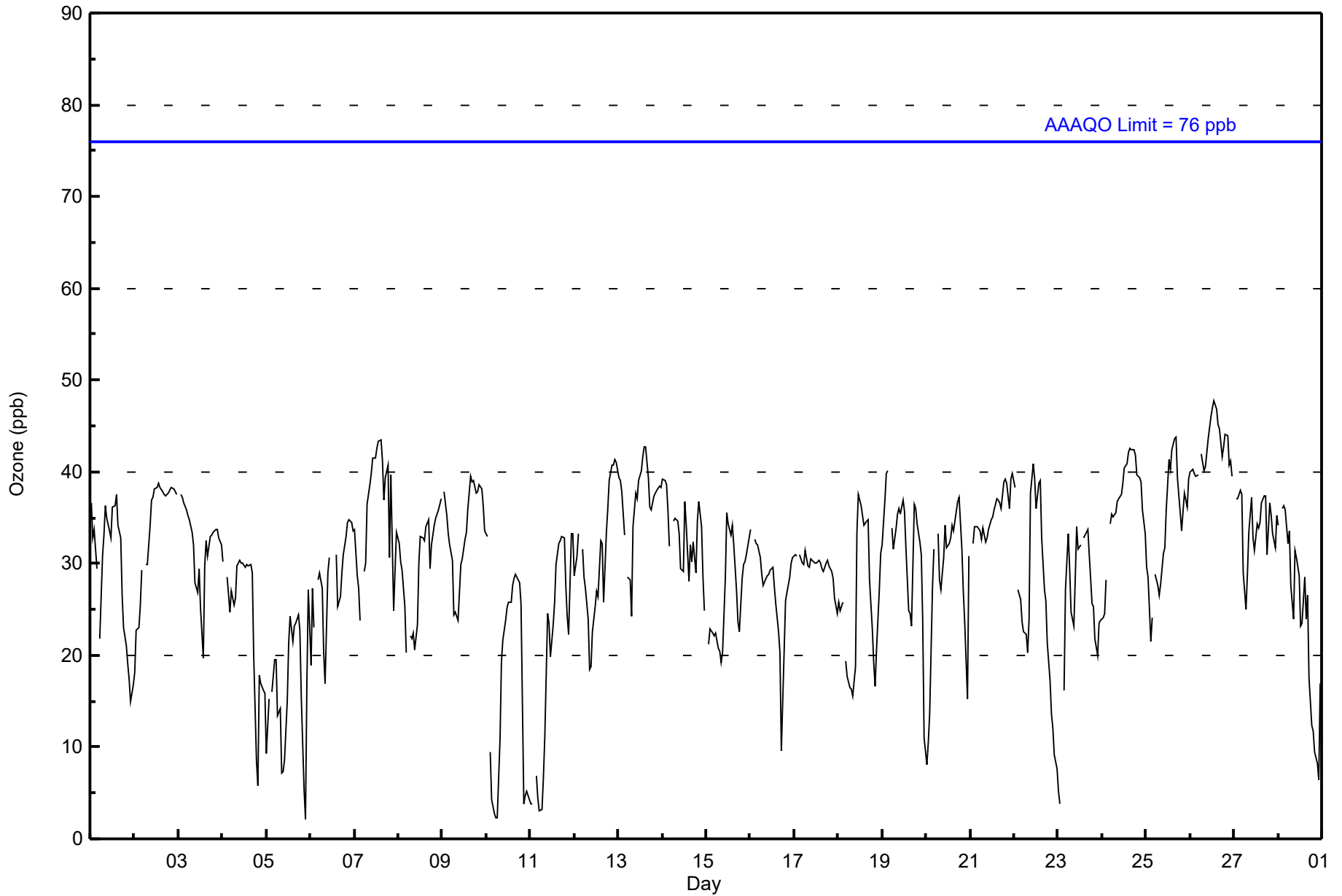
Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	672																											
Maximum Value: 47.7 ppb on Feb 26 14:00		Maximum Daily Average: 42.6 ppb on Feb 26																	Hours of Data:	640																												
Minimum Value: 2.2 ppb on Feb 5 22:00		Minimum Daily Average: 16.2 ppb on Feb 5																	Hours of Missing Data:	32																												
Maximum Diurnal Average: 33.8 ppb at hour 15		Minimum Diurnal Average: 26.2 ppb at hour 8																	Hours of Calibration:	31																												
Monthly Average: 29.62 ppb		Percentiles: P <sub>1</sub> = 3.7 P <sub>10</sub> = 17.5 Q <sub>1</sub> = 24.9 Median = 31.0 Q <sub>3</sub> = 35.9 P <sub>90</sub> = 39.2 P <sub>99</sub> = 44.1																	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-Feb	36.6	32.8	33.7	29.4	Z	21.9	30.9	33.1	36.4	34.9	33.6	32.8	36.2	36.3	37.5	34.2	32.8	26.5	23.1	21.1	19.1	17.4	15.0	16.8	29.2	37.5																						
2-Feb	18.2	22.8	23.1	25.5	Z	29.3	Z	29.9	29.9	34.2	36.9	37.2	38.2	38.3	38.8	38.2	37.8	37.5	37.4	37.6	37.9	38.4	38.1	37.8	37.5	33.9	38.8																					
3-Feb	Z	37.5	37.2	36.5	35.8	35.3	34.7	33.4	32.1	28.0	26.8	29.4	25.2	19.7	29.8	32.4	30.9	33.0	33.0	33.4	33.7	33.7	32.9	32.0	32.0	37.5																						
4-Feb	30.1	Z	28.6	26.8	24.7	27.0	25.4	26.2	29.8	30.3	30.0	30.1	29.6	29.8	29.7	29.9	29.0	20.0	8.3	5.8	17.9	16.9	16.1	15.8	24.2	30.3																						
5-Feb	9.3	15.2	Z	16.0	19.5	19.6	13.5	14.2	7.2	7.4	8.5	15.2	21.3	24.2	21.5	23.2	23.5	24.4	22.7	15.4	5.3	2.2	16.9	27.2	16.2	27.2																						
6-Feb	18.8	27.3	23.0	Z	28.3	29.1	27.2	20.3	17.0	28.9	30.7	C	C	C	31.0	25.3	26.3	29.0	31.0	32.9	34.4	34.7	34.5	33.6	28.2	34.7																						
7-Feb	33.7	28.7	27.3	23.8	Z	29.1	30.1	36.5	38.6	39.8	41.4	41.5	42.5	43.3	43.4	41.2	36.9	39.3	40.8	30.7	39.7	24.9	29.3	33.4	35.5	43.4																						
8-Feb	32.2	30.3	29.4	25.4	20.3	Z	22.2	21.8	22.4	20.6	23.3	30.1	33.0	32.7	32.5	34.1	34.8	29.5	32.0	34.2	35.0	35.4	35.8	37.1	29.8	37.1																						
9-Feb	Z	37.9	35.3	33.2	32.1	30.3	24.5	24.7	23.8	26.9	29.8	30.5	32.6	33.3	36.0	39.5	39.0	39.0	37.6	37.9	38.5	38.1	36.2	33.5	33.5	39.5																						
10-Feb	33.0	Z	9.5	4.3	2.7	2.3	2.2	10.9	19.3	21.6	23.8	25.2	25.8	25.8	27.5	28.4	28.9	28.3	27.9	25.6	3.8	4.7	5.2	4.3	17.0	33.0																						
11-Feb	3.7	3.8	Z	6.9	4.5	3.0	3.1	6.8	11.1	24.6	23.4	19.8	23.3	25.8	29.9	32.2	32.5	33.0	32.8	27.7	24.2	22.2	33.3	33.2	20.0	33.3																						
12-Feb	28.6	30.9	33.3	Z	31.5	28.5	27.3	23.9	18.5	18.8	22.6	25.3	27.0	26.4	32.5	32.1	25.7	33.4	36.0	39.0	40.7	40.8	41.3	41.0	30.7	41.3																						
13-Feb	39.4	39.1	37.9	33.2	Z	28.5	28.2	24.2	34.1	37.7	37.1	39.1	40.1	41.6	42.8	42.7	39.4	36.1	35.9	37.3	37.6	38.0	38.4	38.3	36.8	42.8																						
14-Feb	39.2	39.1	38.5	35.7	31.9	Z	34.6	34.9	34.6	33.2	29.5	29.2	36.8	34.4	28.1	32.0	30.2	32.4	29.0	34.7	36.7	33.9	28.5	24.8	33.1	39.2																						
15-Feb	Z	21.1	22.8	22.4	22.1	22.5	20.7	20.5	19.2	20.2	28.6	35.5	34.2	33.1	34.1	32.0	27.0	23.7	22.6	28.3	29.9	30.2	31.0	32.7	26.7	35.5																						
16-Feb	33.7	Z	32.6	32.2	32.0	30.6	28.8	27.6	28.4	28.7	28.9	29.3	29.5	27.5	25.7	22.5	20.3	9.7	20.5	25.9	26.9	28.6	30.1	30.7	27.4	33.7																						
17-Feb	30.9	30.8	Z	30.9	30.0	29.8	31.4	29.8	29.6	30.5	30.2	30.0	30.1	30.4	30.1	29.5	29.2	30.0	30.4	29.8	29.1	28.3	26.2	24.6	29.6	31.4																						
18-Feb	25.7	24.9	25.8	Z	19.4	17.7	16.5	16.4	15.5	18.7	33.4	37.5	36.3	35.3	34.1	34.7	34.8	28.2	22.8	19.2	16.7	20.6	27.2	31.1	25.8	37.5																						
19-Feb	32.0	36.9	39.8	40.1	Z	33.8	31.6	33.9	35.4	36.0	35.4	36.9	35.6	31.8	24.9	24.5	23.2	36.5	35.9	34.3	32.4	31.0	23.8	11.0	32.0	40.1																						
20-Feb	8.1	10.6	13.7	27.4	31.5	Z	33.2	28.2	27.2	30.7	34.2	31.7	32.2	32.8	34.1	33.6	35.7	36.7	37.2	31.6	27.1	23.7	15.3	30.8	28.1	37.2																						
21-Feb	Z	32.3	34.0	34.0	34.0	33.6	32.6	33.9	32.3	32.8	33.7	34.8	35.1	35.9	37.0	36.8	36.6	36.0	38.8	39.2	38.7	36.0	39.2	39.8	35.5	39.8																						
22-Feb	38.3	Z	27.2	26.1	23.6	22.6	22.3	20.3	23.9	37.7	40.9	39.2	35.9	38.8	39.1	32.8	27.2	26.0	21.3	17.2	13.6	12.0	9.1	7.6	26.2	40.9																						
23-Feb	5.2	3.8	Z	16.1	27.1	33.2	29.4	24.7	23.2	28.4	34.0	31.6	32.1	M	32.9	33.3	33.7	30.9	25.6	25.2	21.7	20.0	23.6	23.8	25.4	34.0																						
24-Feb	24.2	24.6	28.3	Z	34.3	35.4	35.1	35.5	36.8	37.1	37.6	38.7	40.4	40.9	42.1	42.6	42.3	42.4	41.7	39.6	39.4	38.9	35.9	33.3	36.8	42.6																						
25-Feb	29.6	28.5	21.5	24.2	Z	28.8	27.7	26.6	27.7	31.1	31.7	35.8	41.3	40.2	42.4	43.6	43.7	39.4	35.6	33.6	35.7	37.6	36.2	39.2	34.0	43.7																						
26-Feb	40.0	40.2	39.8	39.5	39.7	Z	41.9	40.1	40.6	42.1	43.6	46.1	47.1	47.7	46.8	45.2	44.6	41.6	42.7	44.1	44.0	40.8	41.2	39.5	42.6	47.7																						
27-Feb	Z	37.0	37.0	38.0	37.6	28.9	25.1	28.9	33.3	37.2	32.8	31.4	34.3	33.8	34.5	36.6	37.4	37.4	30.9	36.6	35.2	33.3	31.7	35.2	34.1	38.0																						
28-Feb	34.2	Z	36.0	36.4	35.9	32.2	33.6	27.6	23.9	31.4	30.7	28.7	23.2	23.4	28.5	23.9	26.5	17.6	12.4	11.7	9.4	8.2	6.4	17.0	24.3	36.4																						
27.2																								27.7	29.8	27.7	27.3	26.3	26.6	26.2	27.0	29.7	31.2	32.4	33.3	33.2	33.8	33.5	32.5	31.3	30.2	29.6	28.7	27.5	27.8	28.7	Diurnal Average	
40.0																								40.2	39.8	40.1	39.7	35.4	41.9	40.1	40.6	42.1	43.6	46.1	47.1	47.7	46.8	45.2	44.6	42.4	42.7	44.1	44.0	40.8	41.3	41.0	Diurnal Maximum	
Z - zerospan            C - Calibration            M - Maintenance																																																
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb																																																





Wood Buffalo Environmental Association  
Hourly Averages

Ozone (O<sub>3</sub>) - ppb  
Wapasu - February 2023





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

**Ozone (O<sub>3</sub>) - ppb**  
**Wapasu - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	90	14.06	14.06
21 - 50	550	85.94	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 640

Total Number of Hours: 672



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

**Ozone (O<sub>3</sub>) - ppb**  
**Wapasu - February 2023**

<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	10	8	7	6	6	6	10	6	3	10	3	0	1	3	5	6	90
21 - 50	95	45	33	16	8	9	53	79	49	30	31	22	14	3	7	54	548
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>	105	53	40	22	14	15	63	85	52	40	34	22	15	6	12	60	638

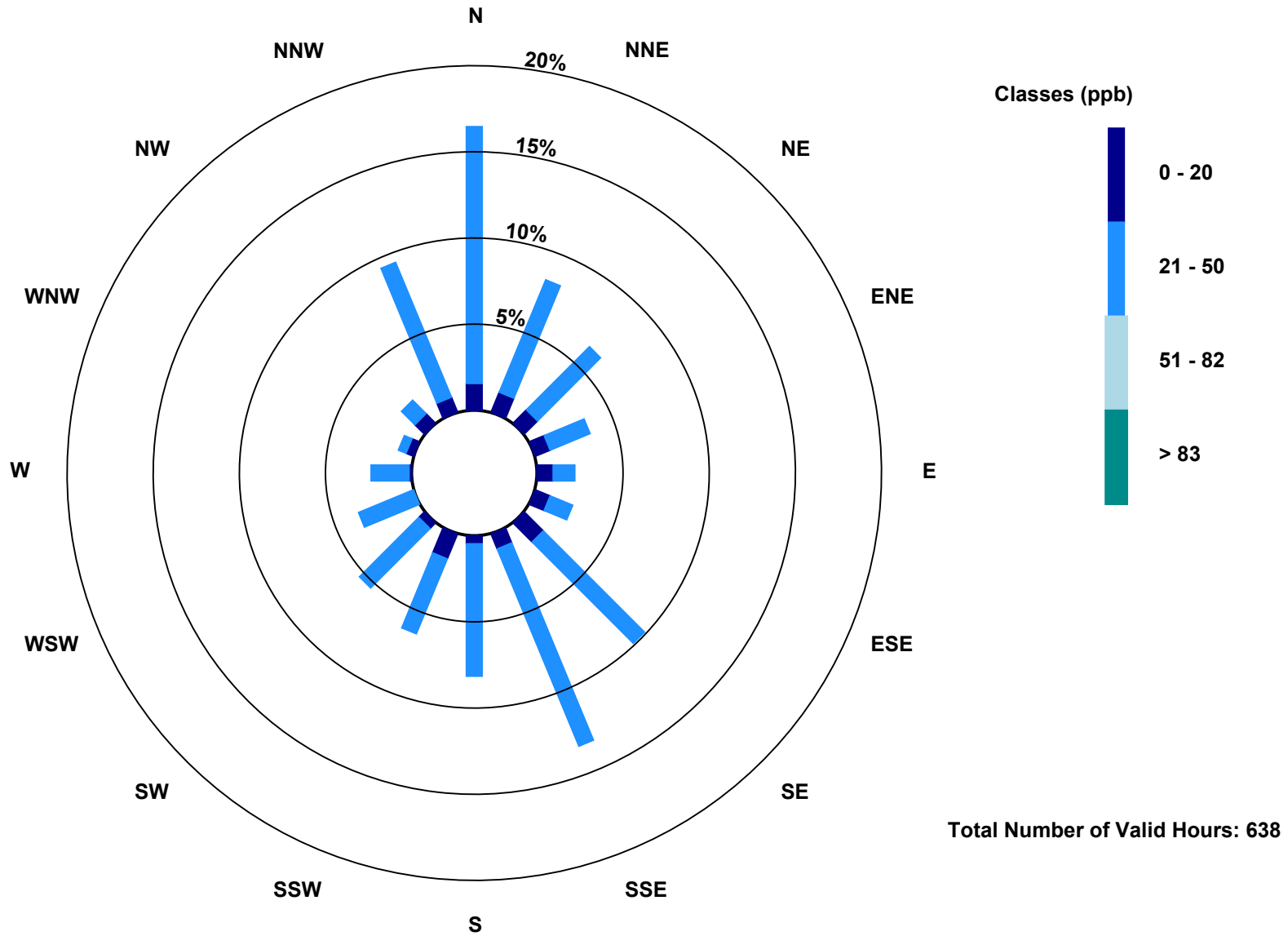
Total Number of Valid Hours: 638

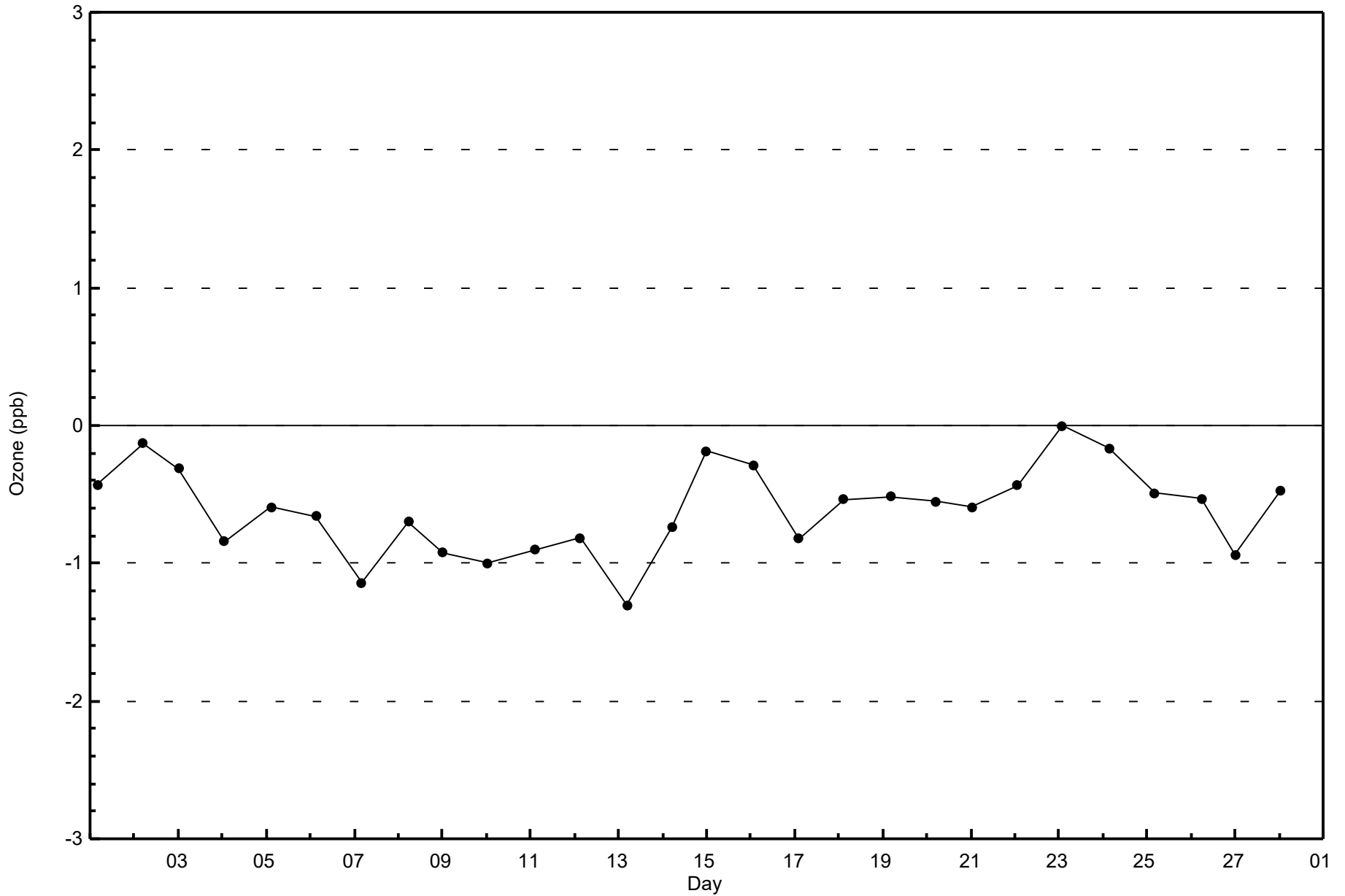
Total Number of Hours: 672

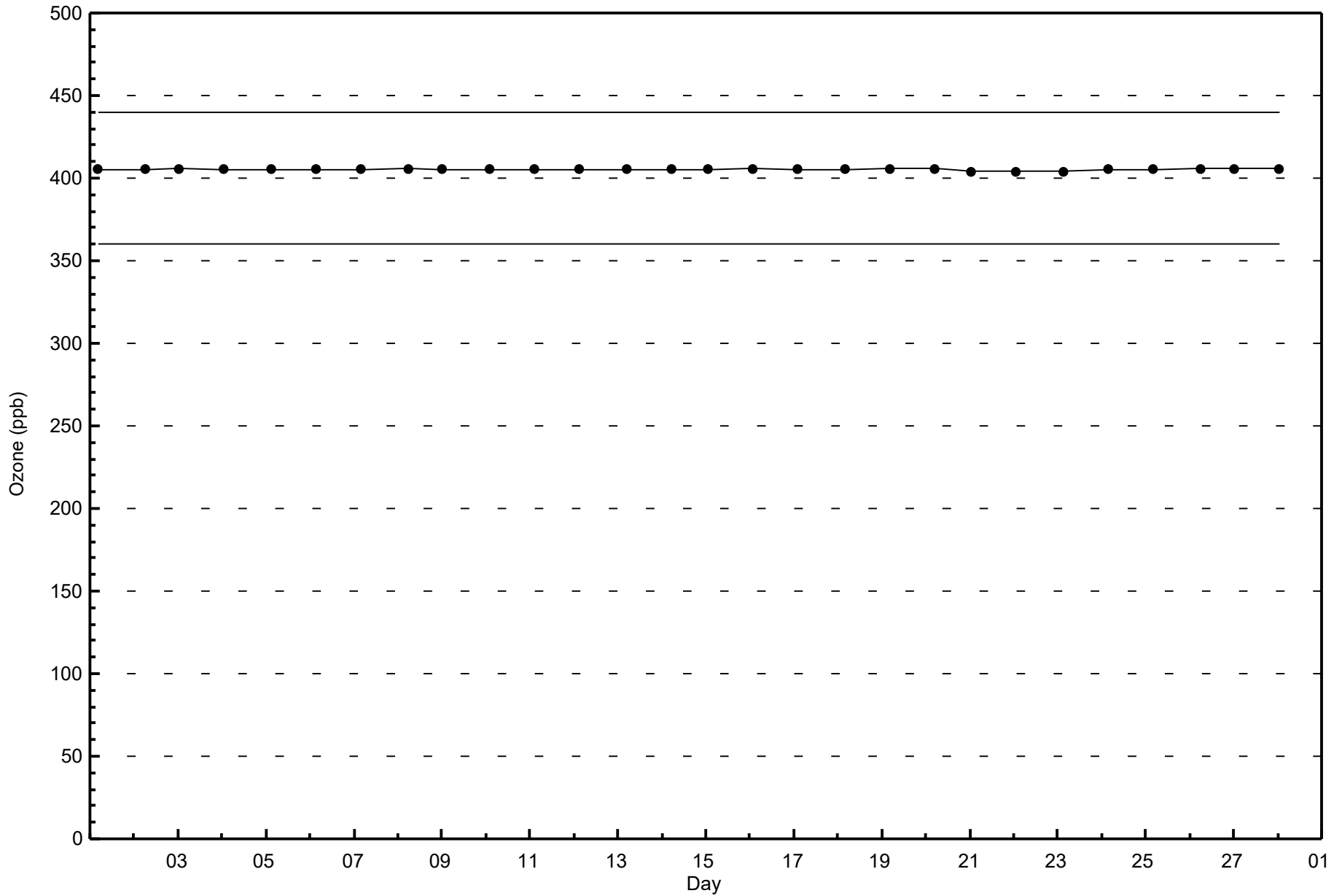


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Ozone (O<sub>3</sub>) - ppb  
Wapasu









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

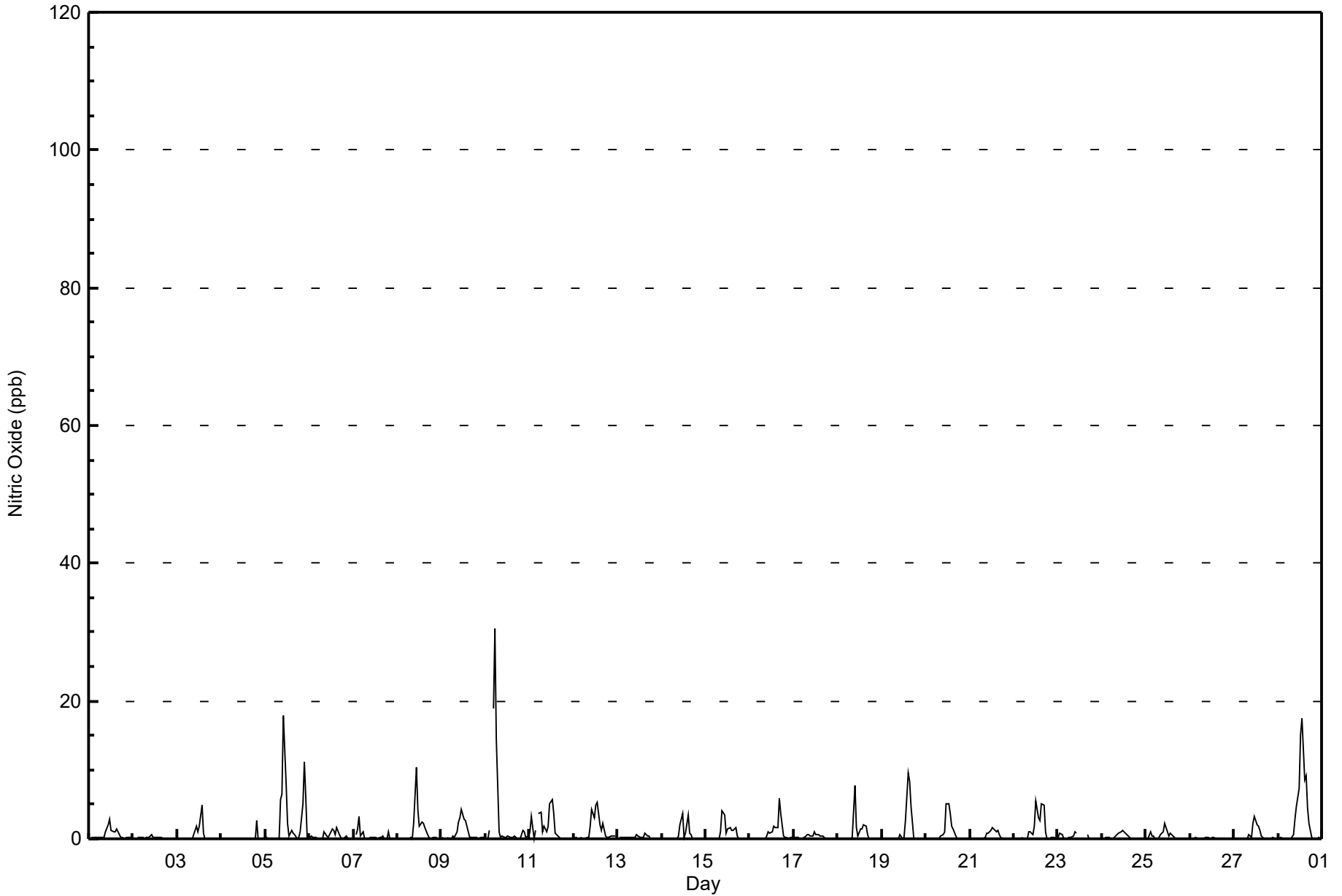
**Nitric Oxide (NO) - ppb**  
**Wapasu - February 2023**

Maximum Value: 30.6 ppb on Feb 10 06:00		Maximum Daily Average: 3.2 ppb on Feb 28		Hours in Service: 672																							
Minimum Value: 0.0 ppb on Feb 2 18:00		Minimum Daily Average: 0.0 ppb on Feb 26		Hours of Data: 639																							
Maximum Diurnal Average: 2.3 ppb at hour 11		Minimum Diurnal Average: 0.1 ppb at hour 24		Hours of Missing Data: 33																							
Monthly Average: 0.89 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> = 0.7 P <sub>90</sub> = 2.2 P <sub>99</sub> = 10.8		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-Feb	Z	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	1.0	2.1	2.9	1.2	1.1	1.0	1.4	0.6	0.2	0.1	0.1	0.3	0.1	0.2	0.1	0.6	2.9	
2-Feb	0.1	Z	0.2	0.1	0.2	0.1	0.0	0.1	0.1	0.3	0.6	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	0.6	
3-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.8	0.9	1.9	4.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	4.9	
4-Feb	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	2.7	0.0	0.0	0.1	0.1	2.7	0.1	
5-Feb	0.4	0.0	0.0	0.0	Z	0.0	0.1	0.0	5.7	6.5	17.9	8.0	2.2	0.5	1.3	0.9	0.5	0.1	0.2	1.0	5.2	11.1	6.1	0.2	2.9	17.9	
6-Feb	0.2	0.3	0.3	0.2	0.1	Z	0.1	0.1	0.9	0.4	0.3	0.6	1.4	1.3	0.6	1.6	0.7	0.2	0.1	0.3	0.3	0.1	0.1	0.1	0.4	1.6	
7-Feb	Z	0.6	1.4	3.2	0.4	1.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.2	0.3	0.4	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.4	3.2	
8-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	2.3	10.3	4.3	1.9	2.5	2.2	1.6	0.5	0.2	0.1	0.2	0.2	0.2	0.1	0.0	1.2	10.3	
9-Feb	0.0	0.2	Z	0.1	0.1	0.0	0.4	0.2	1.0	2.3	3.1	4.3	2.8	2.7	1.8	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.9	4.3	
10-Feb	0.0	0.1	1.3	Z	19.0	30.6	14.4	1.1	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.0	0.1	0.1	1.3	0.9	0.2	0.3	3.1	30.6	
11-Feb	1.0	3.2	0.0	1.3	Z	3.7	3.8	0.9	1.8	0.9	1.8	5.1	5.7	3.7	0.8	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	5.7	
12-Feb	0.0	0.1	0.0	0.1	0.1	Z	0.1	0.1	0.2	1.8	4.2	3.1	4.8	5.2	2.0	1.2	2.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	1.2	5.2	
13-Feb	Z	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.6	0.3	0.2	0.1	0.2	0.8	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	
14-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.1	3.7	0.2	0.8	3.5	0.9	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.7	
15-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	1.0	4.1	3.6	0.8	1.4	1.7	1.3	1.3	1.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.7	4.1	
16-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.4	1.0	0.8	0.9	1.8	1.7	1.7	6.0	3.7	0.4	0.1	0.2	0.1	0.1	0.2	0.8	6.0	
17-Feb	0.2	0.2	0.1	0.3	Z	0.2	0.2	0.7	0.6	0.4	0.5	0.9	0.7	0.7	0.5	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.9	
18-Feb	0.0	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.2	7.7	1.6	0.3	1.4	1.4	2.0	1.8	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.7	7.7	
19-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.3	2.7	9.6	8.3	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	9.6	
20-Feb	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.7	1.0	5.0	5.1	3.6	1.9	1.4	0.4	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.9	5.1	
21-Feb	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.3	0.8	0.9	1.2	1.7	1.4	1.1	1.1	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.7	
22-Feb	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.9	1.1	0.5	1.9	5.6	3.0	2.7	5.1	4.8	0.9	0.0	0.0	0.2	0.2	0.2	0.0	1.2	5.6	
23-Feb	0.3	0.9	0.6	0.0	Z	0.1	0.1	0.1	0.5	1.0	0.7	C	C	C	C	C	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.0	
24-Feb	0.0	0.0	0.2	0.2	0.2	Z	0.1	0.3	0.6	0.7	1.0	1.2	1.0	0.7	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.2	
25-Feb	Z	0.1	0.9	0.5	0.4	0.0	0.0	0.2	0.6	1.1	2.3	1.6	0.5	0.8	0.6	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.3	
26-Feb	0.0	Z	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
27-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.6	0.2	2.2	3.2	2.1	1.8	1.3	0.4	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.5	3.2	
28-Feb	0.0	0.1	0.1	Z	0.0	0.0	0.1	0.0	0.7	2.7	4.8	7.3	15.0	17.5	8.6	9.2	4.4	2.1	0.2	0.0	0.0	0.0	0.2	0.0	3.2	17.5	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.1 0.3 0.2 0.3 0.9 1.5 0.7 0.2 0.6 1.4 2.3 2.2 2.2 2.2 1.7 1.5 1.1 0.3 0.1 0.2 0.3 0.5 0.3 0.1			
																								1.0 3.2 1.4 3.2 19.0 30.6 14.4 1.1 5.7 7.7 17.9 8.0 15.0 17.5 9.6 9.2 6.0 3.7 0.4 2.7 5.2 11.1 6.1 0.4			
Z - zerospan																								C - Calibration			



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

**Nitric Oxide (NO) - ppb**  
**Wapasu - February 2023**







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

**Nitric Oxide (NO) - ppb**  
**Wapasu - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	638	99.84	99.84
21 - 40	1	0.16	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: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Wapasu - February 2023**

<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	102	50	42	23	15	16	61	83	54	39	35	23	14	6	12	61	636
21 - 40	1	0	0	0	0	0	0	0	0	0	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>	103	50	42	23	15	16	61	83	54	39	35	23	14	6	12	61	637

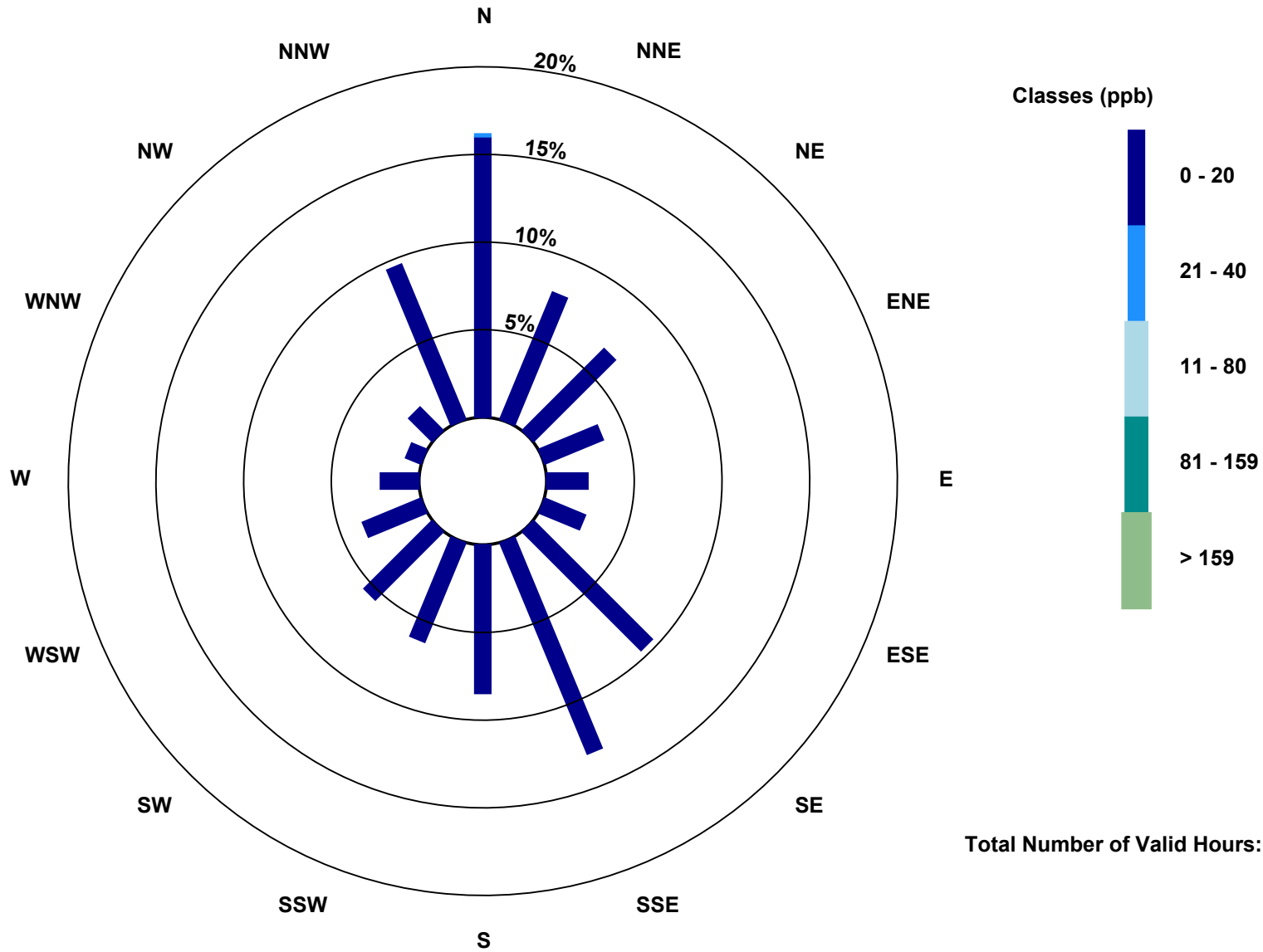
Total Number of Valid Hours: 637

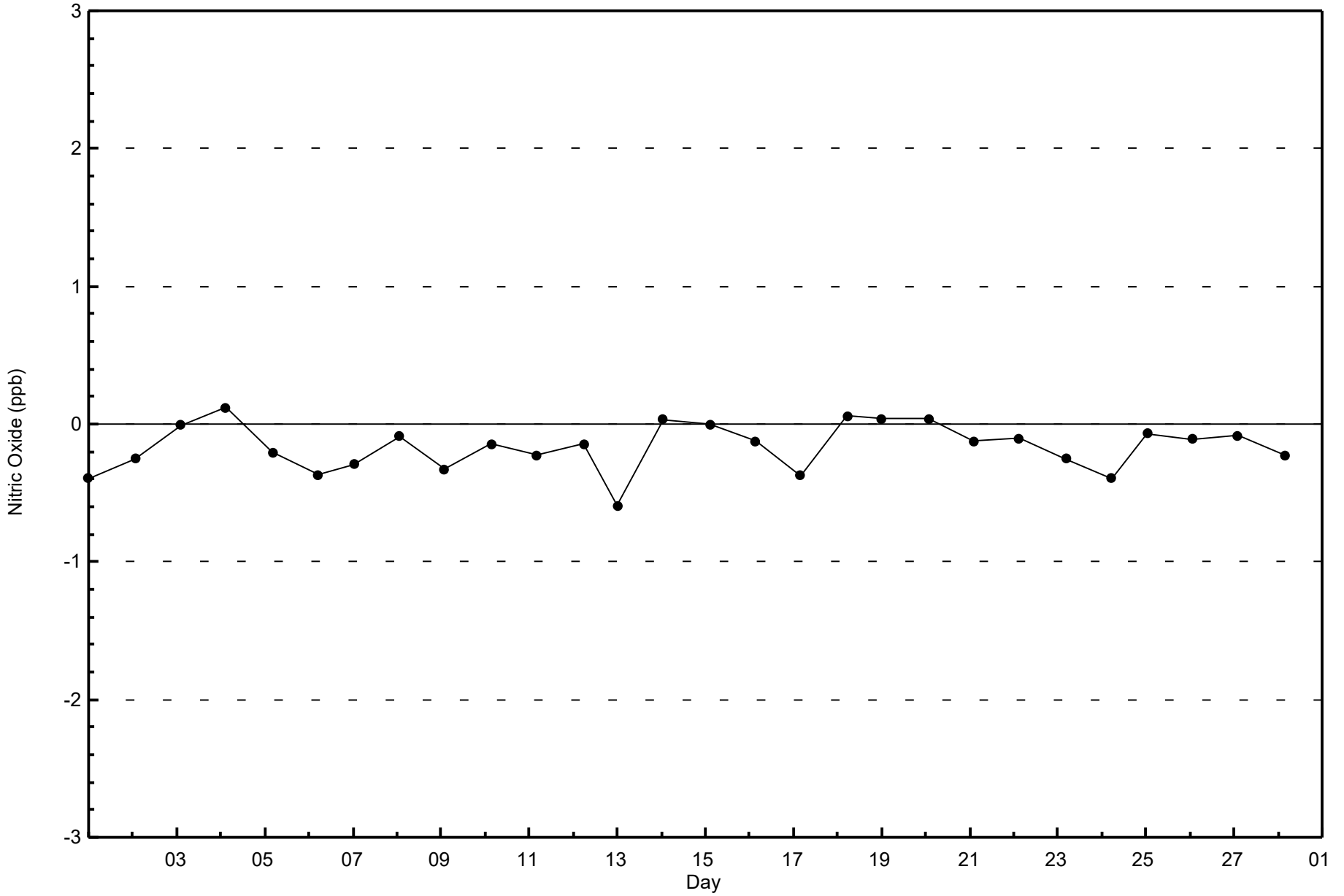
Total Number of Hours: 672

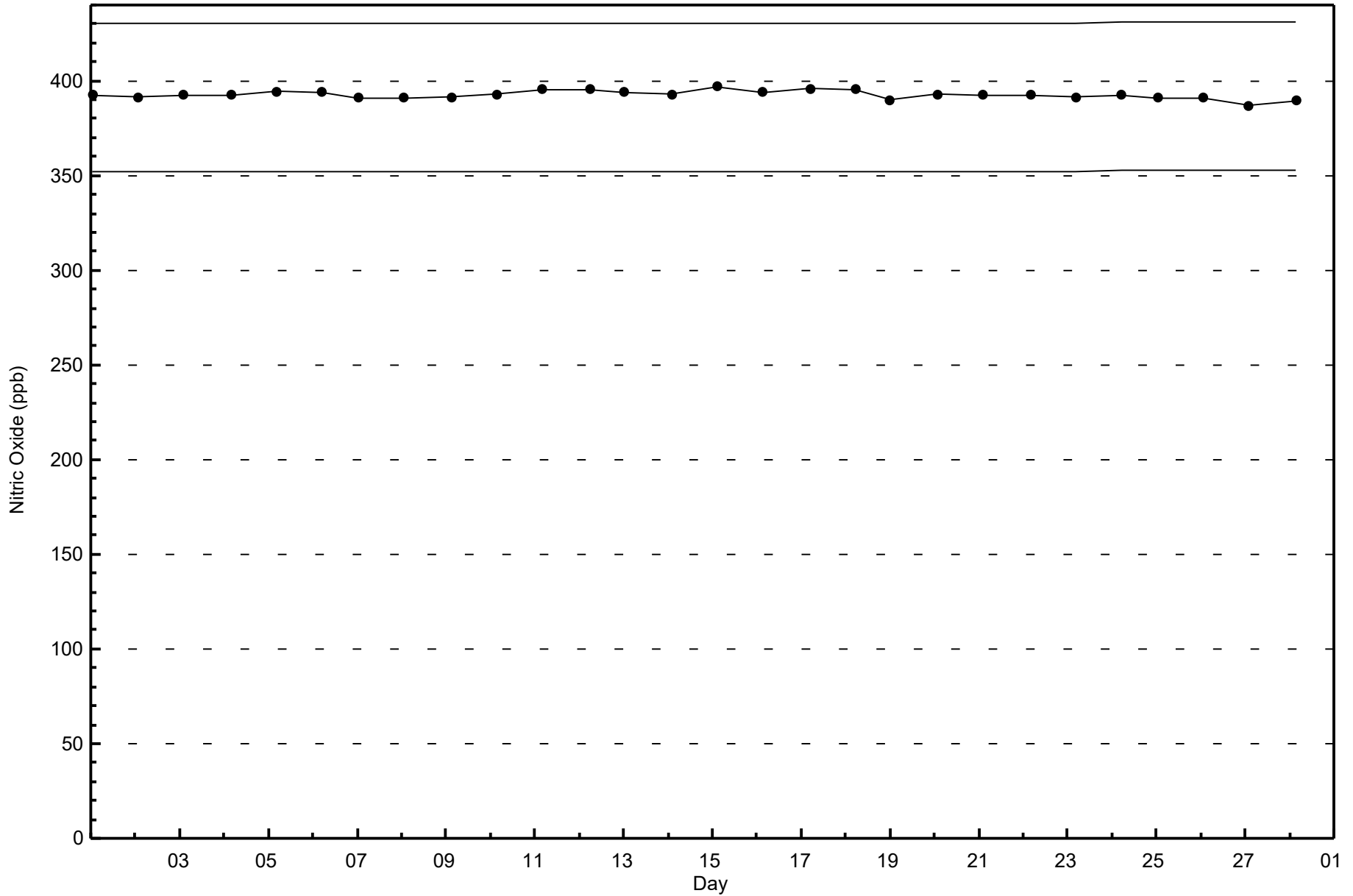


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitric Oxide (NO) - ppb  
Wapasu









# Wood Buffalo Environmental Association

## Summary of Hour Averages

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

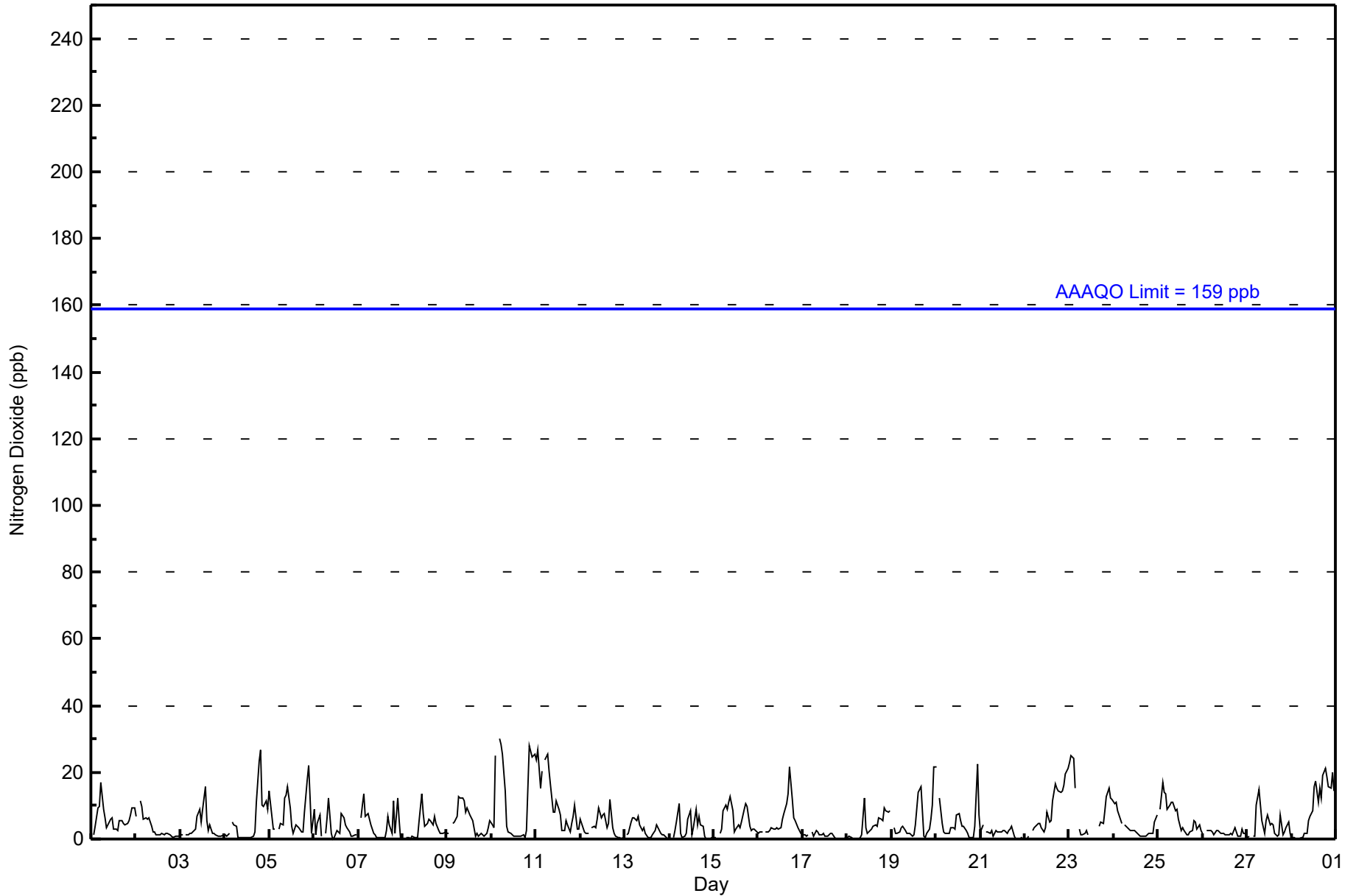
## Wapasu - February 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 672																	Hours of Data: 639																											
Maximum Value: 30.0 ppb on Feb 10 05:00		Maximum Daily Average: 11.3 ppb on Feb 11																	Hours of Missing Data: 33																													
Minimum Value: 0.0 ppb on Feb 8 01:00		Minimum Daily Average: 1.1 ppb on Feb 17																	Hours of Calibration: 33																													
Maximum Diurnal Average: 6.8 ppb at hour 6		Minimum Diurnal Average: 3.9 ppb at hour 13																	Percent Operational Time: 100.0																													
Monthly Average: 5.21 ppb		Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 1.4 Median = 3.0 Q <sub>3</sub> = 6.9 P <sub>90</sub> = 12.7 P <sub>99</sub> = 25.5																																														
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-Feb	Z	1.4	3.7	9.3	9.8	17.0	9.0	6.5	3.3	4.4	5.8	6.4	2.8	2.9	2.6	5.7	5.6	4.8	4.1	4.5	5.6	7.1	9.3	9.2	6.1	17.0																						
2-Feb	6.9	Z	11.4	9.8	6.0	6.4	5.8	6.2	4.0	2.1	2.1	1.3	1.4	1.3	1.5	1.3	1.6	1.6	1.2	0.8	0.6	0.7	1.0	0.9	3.3	11.4																						
3-Feb	1.1	1.1	Z	1.3	1.4	1.6	1.6	2.5	3.0	6.9	8.9	5.1	8.8	15.7	5.7	2.5	4.2	1.6	1.5	1.3	1.0	0.9	0.7	1.4	3.5	15.7																						
4-Feb	1.4	0.9	1.6	Z	4.9	4.4	3.8	0.6	0.5	0.4	0.5	0.3	0.5	0.5	1.0	2.0	11.2	23.4	26.5	10.3	9.9	11.4	8.7	5.4	26.5																							
5-Feb	14.3	6.7	2.9	3.0	Z	3.1	4.6	4.3	12.1	13.2	15.6	9.3	3.8	1.6	4.1	3.9	3.5	2.0	2.3	8.1	17.9	22.2	12.1	1.6	7.5	22.2																						
6-Feb	9.1	1.3	4.7	7.3	0.8	Z	1.7	6.5	12.3	1.6	0.2	0.6	2.7	2.1	1.9	7.5	6.2	4.3	3.4	2.2	1.0	0.7	1.1	1.4	3.5	12.3																						
7-Feb	Z	6.2	10.2	13.4	6.6	7.8	5.8	4.2	1.9	1.4	0.5	0.5	0.5	0.4	0.5	2.7	6.8	4.1	1.7	11.6	1.5	12.4	5.6	0.1	4.6	13.4																						
8-Feb	0.0	Z	0.3	0.4	0.1	0.9	0.5	0.4	0.5	5.1	13.7	7.5	3.7	4.8	6.1	5.7	4.1	6.8	4.7	2.5	1.9	1.6	1.5	2.0	3.3	13.7																						
9-Feb	1.9	1.6	Z	4.5	5.2	6.6	12.5	12.4	12.2	11.3	8.2	9.2	7.2	6.5	5.4	1.0	1.6	0.9	1.7	1.4	0.7	1.5	3.2	5.3	5.3	12.5																						
10-Feb	4.1	3.3	25.1	Z	30.0	28.2	25.4	14.6	3.7	2.1	1.5	1.2	1.0	0.9	0.7	0.7	0.8	1.1	0.6	2.7	28.1	26.1	24.7	25.4	11.0	30.0																						
11-Feb	23.8	26.5	15.1	20.3	Z	23.6	25.5	20.2	16.1	8.0	8.2	11.6	9.0	7.0	2.7	2.6	5.3	4.1	2.0	4.8	6.6	10.1	2.9	2.8	11.3	26.5																						
12-Feb	5.9	3.4	2.0	1.9	1.6	Z	3.6	3.8	3.6	5.8	9.4	6.4	7.3	7.7	3.6	4.5	12.0	3.5	1.8	0.9	0.3	0.4	0.2	0.5	3.9	12.0																						
13-Feb	Z	1.2	1.9	5.0	6.4	6.3	5.4	6.8	4.4	2.5	3.6	1.7	0.4	0.3	0.6	1.4	2.6	4.4	3.4	1.6	1.2	1.1	0.4	0.2	2.7	6.8																						
14-Feb	0.1	Z	0.6	2.4	4.9	10.7	1.5	0.4	0.7	1.9	6.1	8.6	1.4	3.2	8.8	4.2	6.6	4.1	3.7	1.0	0.1	0.1	0.1	0.4	3.1	10.7																						
15-Feb	0.4	0.4	Z	1.8	2.9	8.5	10.3	9.1	11.2	12.9	8.3	2.2	3.1	4.1	3.5	4.9	8.8	10.5	9.9	3.7	2.7	2.9	2.8	2.2	5.5	12.9																						
16-Feb	1.8	2.2	2.2	Z	2.1	2.0	2.6	3.2	3.0	3.1	3.3	3.0	3.4	5.9	7.6	10.5	13.7	21.7	11.7	6.5	5.5	3.6	2.4	1.6	5.3	21.7																						
17-Feb	1.3	1.2	0.9	1.1	Z	2.0	0.9	2.7	2.2	1.2	1.2	1.6	1.0	0.9	1.2	1.7	1.8	0.3	0.1	0.2	0.2	0.2	0.2	0.3	1.1	2.7																						
18-Feb	0.5	0.9	0.3	0.0	0.0	Z	0.2	0.4	1.1	12.4	3.6	1.6	2.5	2.8	3.9	4.3	3.9	6.3	5.9	5.5	9.2	8.5	8.2	8.3	3.9	12.4																						
19-Feb	Z	3.3	1.8	1.8	2.0	3.3	3.9	2.5	1.6	1.5	1.9	0.9	1.2	4.2	14.1	14.8	15.8	1.0	0.4	1.7	2.9	5.9	10.1	21.5	5.1	21.5																						
20-Feb	21.5	Z	12.3	4.7	2.3	1.5	1.6	1.7	3.5	3.6	3.1	7.2	7.5	5.4	3.7	4.0	2.6	1.7	0.3	0.5	0.5	4.0	22.4	7.2	5.3	22.4																						
21-Feb	2.1	4.4	Z	2.3	2.0	1.7	2.7	1.0	2.4	2.3	2.0	2.2	2.5	2.5	1.9	2.5	3.1	3.7	0.8	0.0	0.1	0.1	0.3	0.1	1.9	4.4																						
22-Feb	0.1	0.1	0.7	Z	2.4	3.6	4.3	4.5	4.7	3.5	2.0	3.6	8.2	5.1	5.4	11.5	16.4	15.3	14.3	13.8	14.6	16.2	19.7	21.3	8.3	21.3																						
23-Feb	23.0	24.8	24.0	15.1	Z	2.9	1.3	1.3	1.7	2.4	1.4	C	C	C	C	C	3.8	4.9	4.5	8.4	12.6	15.1	12.1	12.0	9.5	24.8																						
24-Feb	10.8	11.0	8.5	7.4	4.5	Z	4.4	3.6	3.1	2.5	2.7	2.7	2.1	1.4	0.9	0.8	0.7	0.9	1.1	1.8	1.7	1.9	4.9	7.1	3.8	11.0																						
25-Feb	Z	8.9	16.8	13.9	13.4	9.0	10.1	11.2	11.1	8.6	8.9	5.9	2.7	3.5	2.5	1.4	1.2	2.0	2.7	5.7	4.9	3.1	4.1	2.5	6.7	16.8																						
26-Feb	1.9	Z	2.5	2.5	2.7	2.1	1.3	2.4	2.6	2.2	1.8	1.5	1.4	1.2	1.3	1.5	1.1	3.3	2.2	0.9	0.7	3.0	1.9	1.6	1.9	3.3																						
27-Feb	0.6	0.8	Z	0.7	0.8	10.2	15.0	10.2	5.7	1.9	5.6	7.1	4.4	4.8	4.2	1.9	0.9	1.3	7.1	1.1	2.2	3.2	4.9	1.9	4.2	15.0																						
28-Feb	0.6	0.4	0.1	Z	0.2	0.3	0.3	1.5	1.6	5.5	6.6	8.5	15.5	17.5	11.2	15.1	12.4	19.1	21.3	18.8	15.8	15.3	19.8	14.5	9.6	21.3																						
																								5.8	4.9	6.5	5.6	4.7	6.8	5.9	5.2	4.8	4.7	4.9	4.4	3.9	4.2	3.9	4.4	5.3	5.2	4.9	4.9	5.4	6.4	6.7	5.8	Diurnal Average
																								23.8	26.5	25.1	20.3	30.0	28.2	25.5	20.2	16.1	13.2	15.6	11.6	15.5	17.5	14.1	15.1	16.4	21.7	23.4	26.5	28.1	26.1	24.7	25.4	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 - February 2023





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Wapasu - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	615	96.24	96.24
21 - 40	24	3.76	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: 639

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Wapasu - February 2023**

<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	98	49	37	21	13	16	61	83	54	37	34	23	14	5	10	58	613
21 - 40	5	1	5	2	2	0	0	0	0	2	1	0	0	1	2	3	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>	103	50	42	23	15	16	61	83	54	39	35	23	14	6	12	61	637

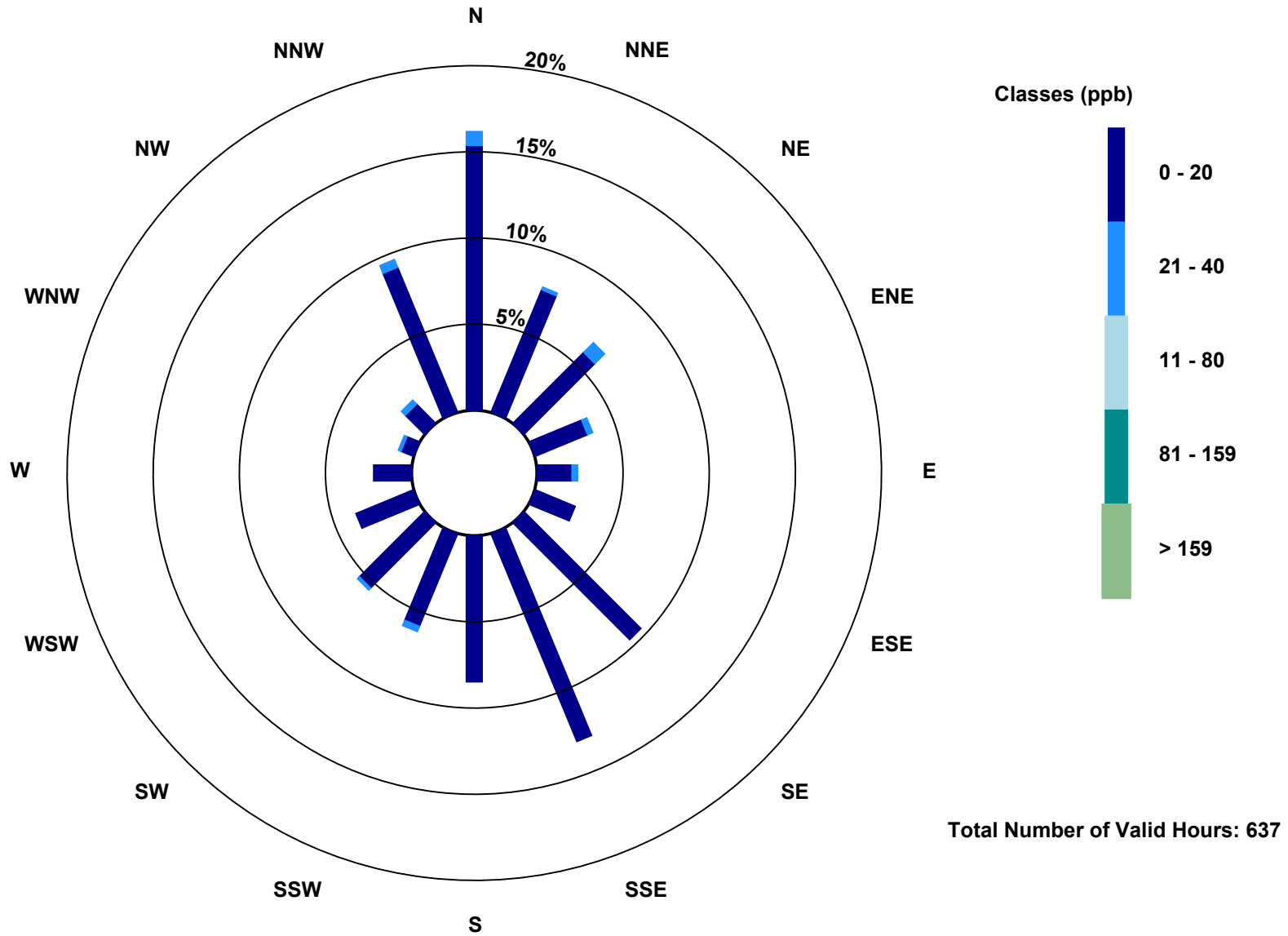
Total Number of Valid Hours: 637

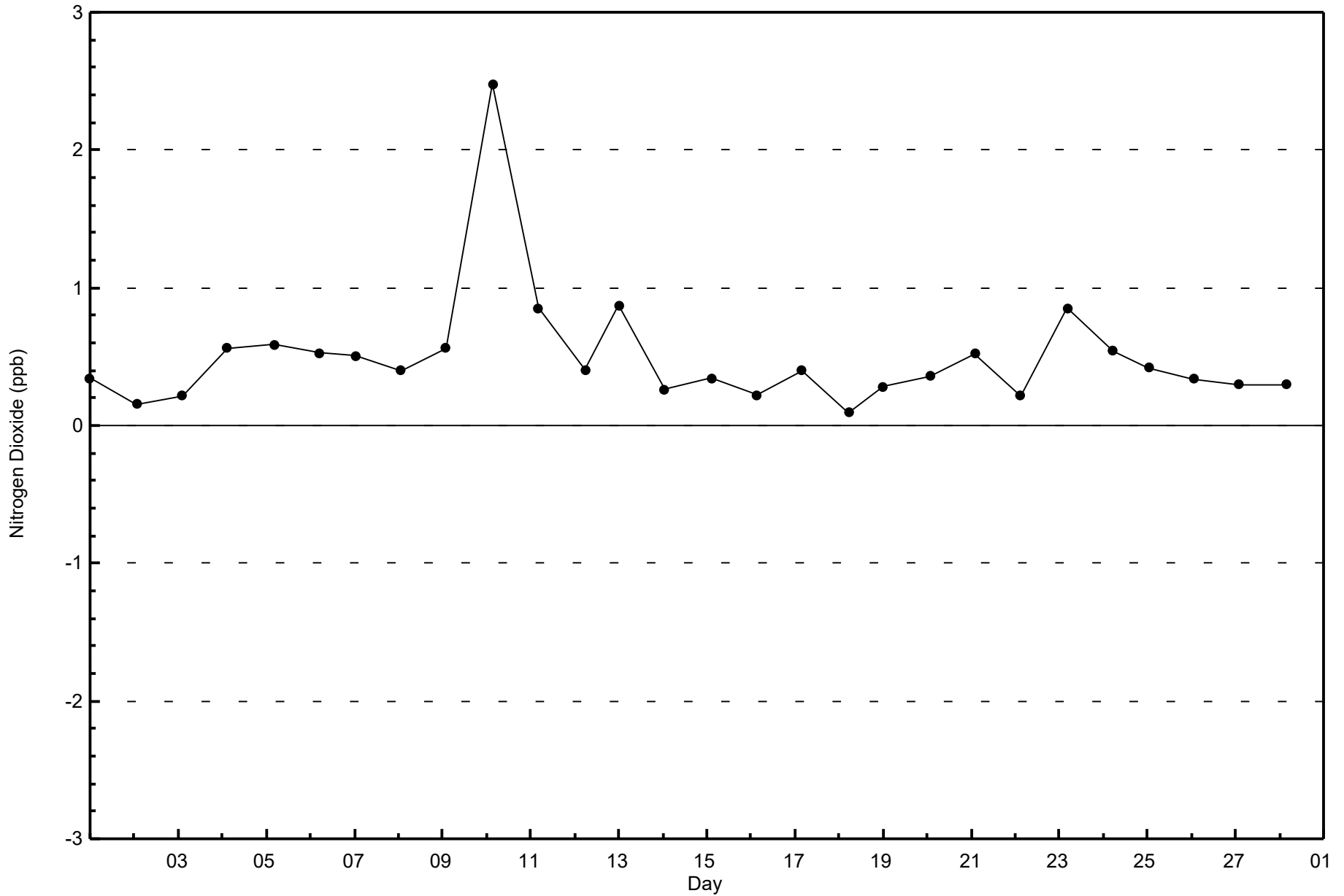
Total Number of Hours: 672

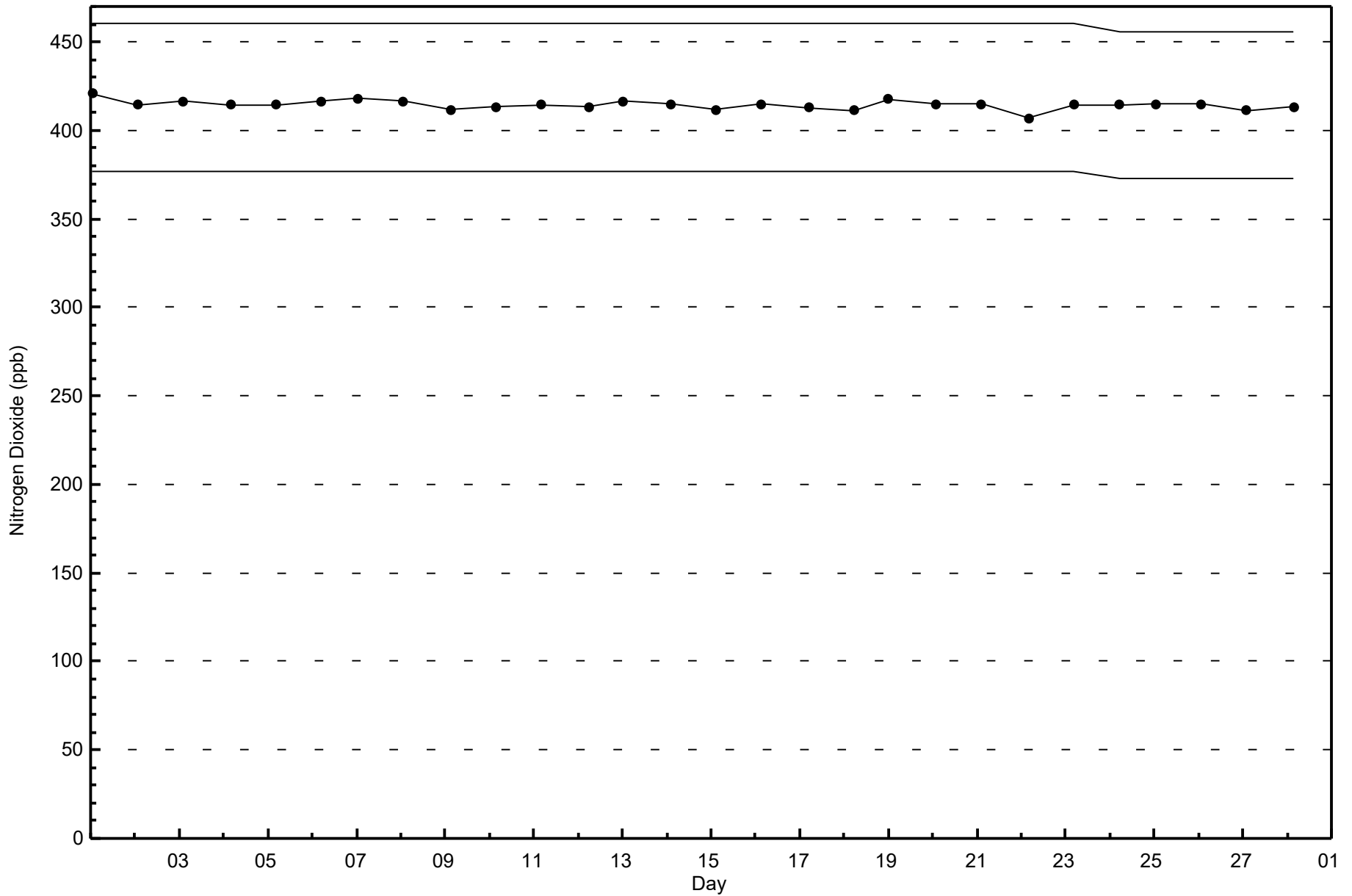


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









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

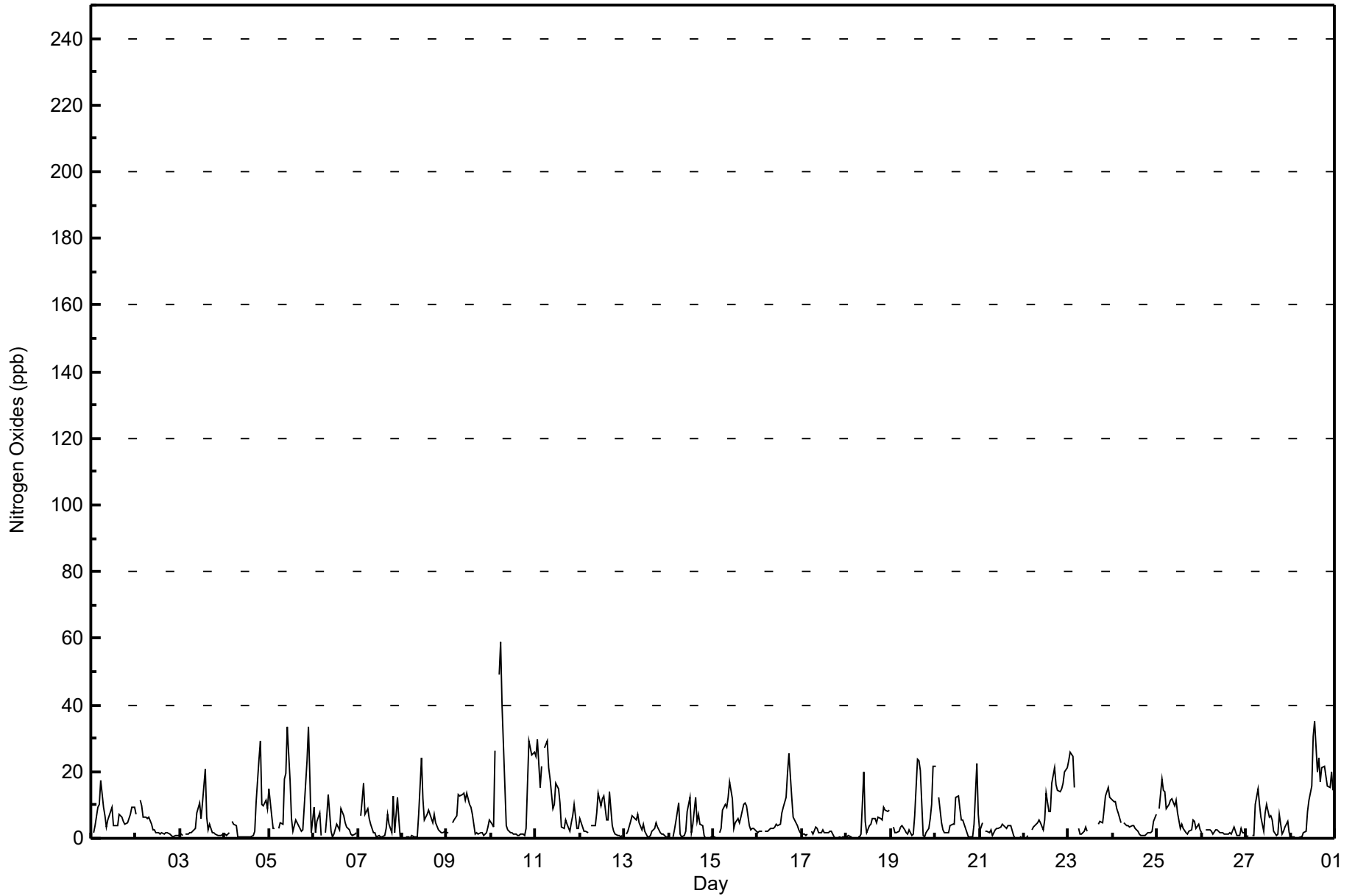
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Wapasu - February 2023**

Maximum Value: 58.8 ppb on Feb 10 06:00																				Maximum Daily Average: 14.1 ppb on Feb 10					Hours in Service: 672	
Minimum Value: 0.0 ppb on Feb 8 01:00																				Minimum Daily Average: 1.4 ppb on Feb 17					Hours of Data: 639	
Maximum Diurnal Average: 8.3 ppb at hour 6																				Minimum Diurnal Average: 5.0 ppb at hour 19					Hours of Missing Data: 33	
Monthly Average: 6.09 ppb																				Percentiles: P <sub>1</sub> = 0.1 P <sub>10</sub> = 0.6 Q <sub>1</sub> = 1.6 Median = 3.5 Q <sub>3</sub> = 8.2 P <sub>90</sub> = 15.1 P <sub>99</sub> = 30.2					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-Feb	Z	1.7	4.0	9.5	10.0	17.3	9.2	6.7	3.5	5.4	7.9	9.3	4.0	4.0	3.6	7.1	6.2	5.0	4.2	4.6	5.9	7.2	9.5	9.3	6.7	17.3
2-Feb	7.0	Z	11.6	9.9	6.2	6.5	5.8	6.3	4.1	2.4	2.7	1.5	1.6	1.5	1.7	1.4	1.7	1.6	1.2	0.8	0.6	0.7	1.0	0.9	3.4	11.6
3-Feb	1.1	1.1	Z	1.3	1.4	1.6	1.6	2.5	3.0	7.6	10.7	6.0	10.7	20.6	6.5	2.5	4.2	1.6	1.5	1.3	1.0	0.9	0.7	1.4	3.9	20.6
4-Feb	1.4	0.9	1.6	Z	4.9	4.4	3.8	0.6	0.5	0.4	0.5	0.3	0.5	0.5	1.0	2.0	11.2	23.5	29.2	10.3	9.9	11.4	8.8	5.6	29.2	
5-Feb	14.7	6.7	2.9	3.0	Z	3.1	4.7	4.3	17.8	19.7	33.5	17.3	6.0	2.1	5.4	4.8	4.0	2.1	2.5	9.1	23.1	33.3	18.2	1.8	10.4	33.5
6-Feb	9.3	1.6	5.0	7.5	0.9	Z	1.8	6.6	13.2	2.0	0.5	1.2	4.1	3.4	2.5	9.1	6.9	4.5	3.5	2.5	1.3	0.8	1.2	1.5	4.0	13.2
7-Feb	Z	6.8	11.6	16.6	7.0	8.8	5.8	4.2	1.9	1.5	0.6	0.7	0.6	0.4	0.7	3.0	7.2	4.1	1.7	12.5	1.5	12.4	5.6	0.1	5.0	16.6
8-Feb	0.0	Z	0.3	0.4	0.1	0.9	0.5	0.5	0.6	7.4	24.0	11.8	5.6	7.3	8.3	7.3	4.6	7.0	4.8	2.7	2.1	1.8	1.6	2.0	4.4	24.0
9-Feb	1.9	1.8	Z	4.6	5.3	6.6	12.9	12.6	13.2	13.6	11.3	13.5	10.0	9.2	7.2	1.3	1.8	1.1	1.8	1.6	0.8	1.6	3.4	5.4	6.2	13.6
10-Feb	4.1	3.4	26.4	Z	49.0	58.8	39.8	15.7	3.9	2.4	1.7	1.5	1.3	1.2	1.0	0.9	1.1	1.1	0.7	2.8	29.4	27.0	24.9	25.7	14.1	58.8
11-Feb	24.8	29.7	15.1	21.6	Z	27.3	29.3	21.1	17.9	8.9	10.0	16.7	14.7	10.7	3.5	3.1	5.6	4.1	2.0	4.8	6.6	10.1	2.9	2.8	12.7	29.7
12-Feb	5.9	3.5	2.0	2.0	1.7	Z	3.7	3.9	3.8	7.6	13.6	9.5	12.1	12.9	5.6	5.7	14.2	3.8	2.1	1.2	0.7	0.8	0.6	0.9	5.1	14.2
13-Feb	Z	1.4	2.1	5.3	6.7	6.5	5.6	7.0	4.6	2.7	4.2	2.0	0.6	0.4	0.8	2.2	3.0	4.7	3.4	1.6	1.2	1.1	0.4	0.2	2.9	7.0
14-Feb	0.1	Z	0.6	2.4	4.9	10.7	1.5	0.4	0.7	2.2	8.2	12.3	1.6	4.0	12.3	5.1	7.3	4.2	3.7	1.0	0.1	0.1	0.1	0.4	3.7	12.3
15-Feb	0.4	0.4	Z	1.8	2.9	8.5	10.3	9.1	12.2	17.0	11.9	3.0	4.5	5.8	4.8	6.2	10.4	10.8	9.9	3.7	2.7	2.9	2.8	2.2	6.3	17.0
16-Feb	1.8	2.2	2.2	Z	2.1	2.0	2.6	3.2	3.0	3.5	4.3	3.8	4.3	7.7	9.3	12.2	19.7	25.4	12.1	6.6	5.7	3.7	2.5	1.8	6.2	25.4
17-Feb	1.5	1.4	1.0	1.4	Z	2.2	1.1	3.4	2.8	1.6	1.7	2.5	1.7	1.6	1.7	2.1	2.2	0.3	0.1	0.2	0.2	0.2	0.2	0.3	1.4	3.4
18-Feb	0.5	1.0	0.3	0.0	0.0	Z	0.2	0.4	1.3	20.1	5.2	1.9	3.9	4.2	5.9	6.1	4.5	6.4	5.9	5.5	9.2	8.5	8.2	8.3	4.7	20.1
19-Feb	Z	3.3	1.8	1.8	2.0	3.3	3.9	2.5	1.6	1.5	2.4	1.0	1.5	6.9	23.7	23.1	20.5	1.0	0.4	1.7	2.9	5.9	10.1	21.5	6.3	23.7
20-Feb	21.6	Z	12.3	4.7	2.3	1.5	1.6	1.7	3.9	4.3	4.1	12.2	12.6	9.0	5.6	5.4	3.0	1.7	0.3	0.5	0.5	4.1	22.4	7.2	6.2	22.4
21-Feb	2.1	4.5	Z	2.3	2.0	1.7	2.7	1.0	2.7	3.1	2.9	3.4	4.2	3.9	3.0	3.6	3.8	3.9	0.8	0.0	0.1	0.1	0.3	0.1	2.3	4.5
22-Feb	0.1	0.1	0.7	Z	2.5	3.6	4.3	4.5	5.6	4.6	2.5	5.5	13.8	8.1	8.1	16.6	21.2	16.2	14.3	13.8	14.8	16.4	19.9	21.3	9.5	21.3
23-Feb	23.3	25.7	24.6	15.1	Z	3.0	1.4	1.4	2.2	3.4	2.1	C	C	C	C	C	4.4	4.9	4.5	8.4	12.6	15.1	12.1	12.0	9.8	25.7
24-Feb	10.8	11.0	8.7	7.6	4.7	Z	4.5	3.9	3.7	3.2	3.7	3.9	3.1	2.1	1.2	1.0	0.7	0.9	1.1	1.8	1.7	1.9	4.9	7.1	4.1	11.0
25-Feb	Z	9.0	17.7	14.4	13.8	9.0	10.1	11.4	11.7	9.7	11.2	7.5	3.2	4.3	3.1	1.5	1.3	2.0	2.7	5.7	4.9	3.1	4.1	2.5	7.1	17.7
26-Feb	1.9	Z	2.5	2.6	2.7	2.1	1.3	2.4	2.7	2.3	1.9	1.6	1.5	1.3	1.3	1.5	1.1	3.3	2.2	0.9	0.7	3.0	1.9	1.6	1.9	3.3
27-Feb	0.6	0.8	Z	0.7	0.8	10.2	15.0	10.3	6.3	2.1	7.8	10.3	6.5	6.6	5.5	2.3	0.9	1.4	7.1	1.2	2.3	3.3	4.9	1.9	4.7	15.0
28-Feb	0.6	0.5	0.2	Z	0.2	0.3	0.4	1.5	2.3	8.2	11.4	15.8	30.5	35.0	19.8	24.3	16.8	21.2	21.5	18.8	15.8	15.3	20.0	14.5	12.8	35.0
																								Diurnal Average		
																								Diurnal Maximum		
5.9 5.1 6.8 5.9 5.6 8.3 6.6 5.3 5.4 6.0 7.2 6.5 6.1 6.5 5.7 5.9 6.4 5.6 5.0 5.2 5.7 6.8 7.0 5.8																										
24.8 29.7 26.4 21.6 49.0 58.8 39.8 21.1 17.9 20.1 33.5 17.3 30.5 35.0 23.7 24.3 21.2 25.4 23.5 29.2 29.4 33.3 24.9 25.7																										
Z - zerospan C - Calibration																										



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

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Wapasu - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Wapasu - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	601	94.05	94.05
21 - 40	36	5.63	99.69
41 - 80	2	0.31	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 639

Total Number of Hours: 672



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

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Wapasu - February 2023**

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	49	37	21	13	16	61	83	53	35	33	23	13	5	7	55	599
21 - 40	6	1	5	2	2	0	0	0	1	4	2	0	1	1	5	6	36
11 - 80	2	0	0	0	0	0	0	0	0	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>	103	50	42	23	15	16	61	83	54	39	35	23	14	6	12	61	637

Total Number of Valid Hours: 637

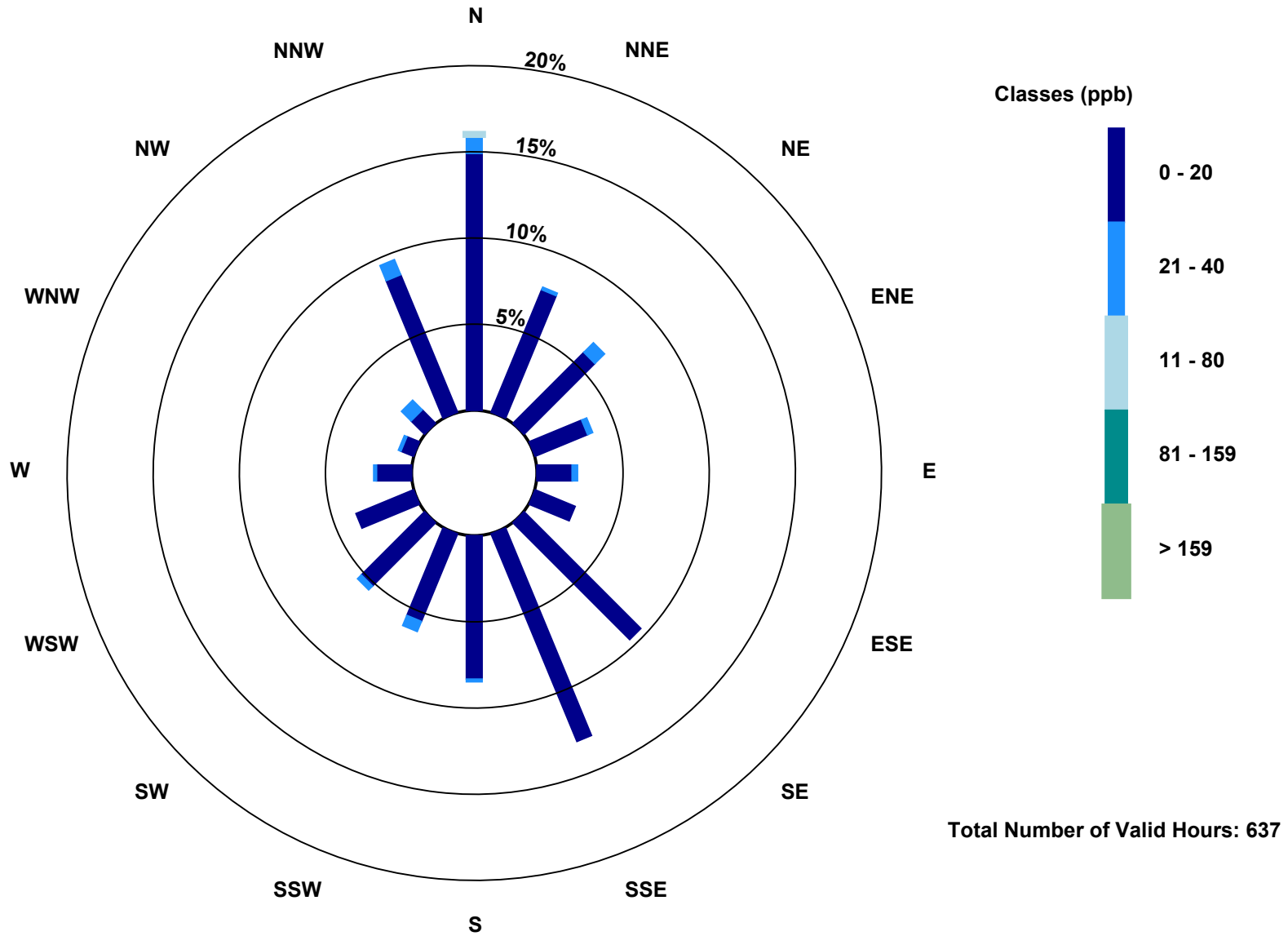
Total Number of Hours: 672

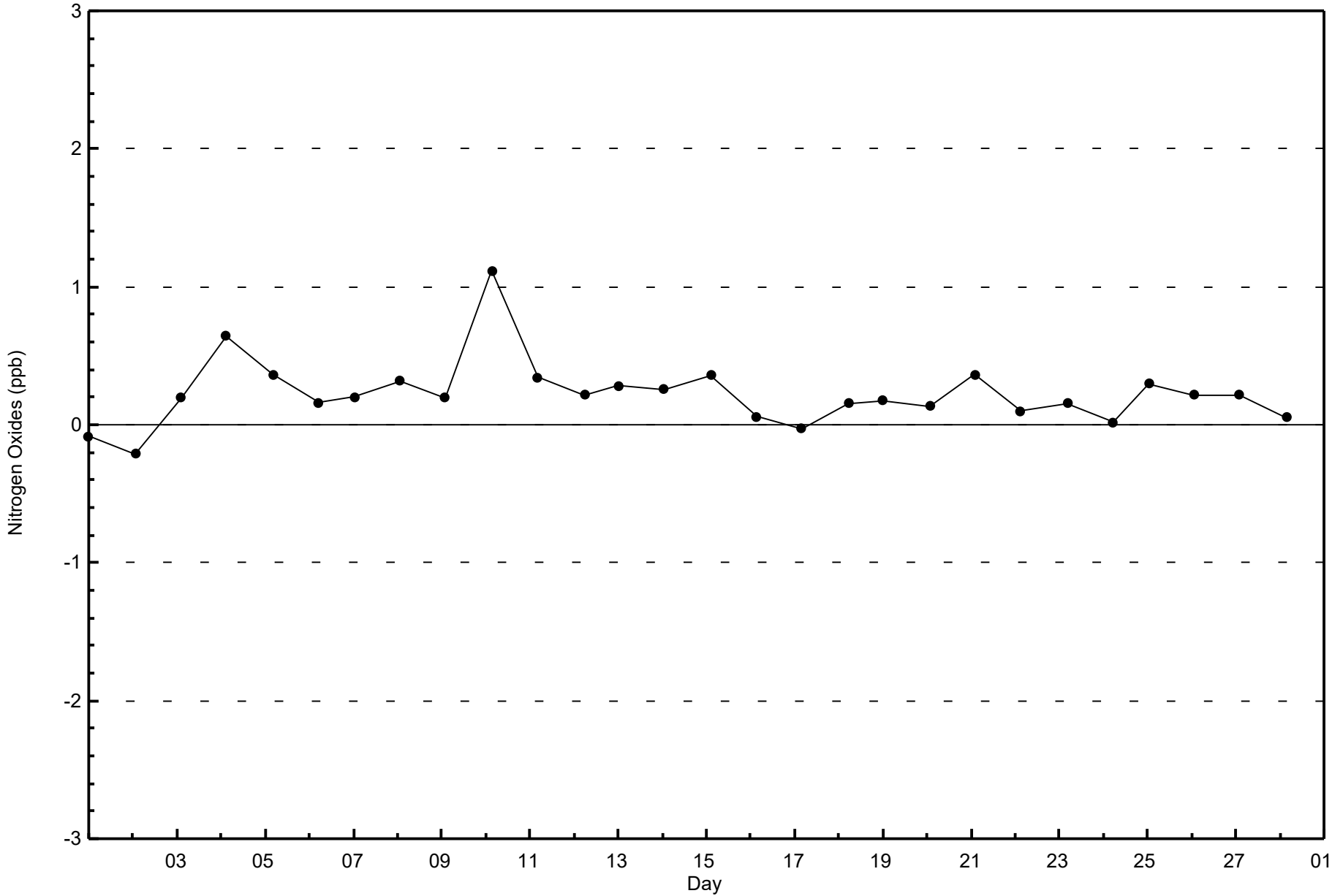


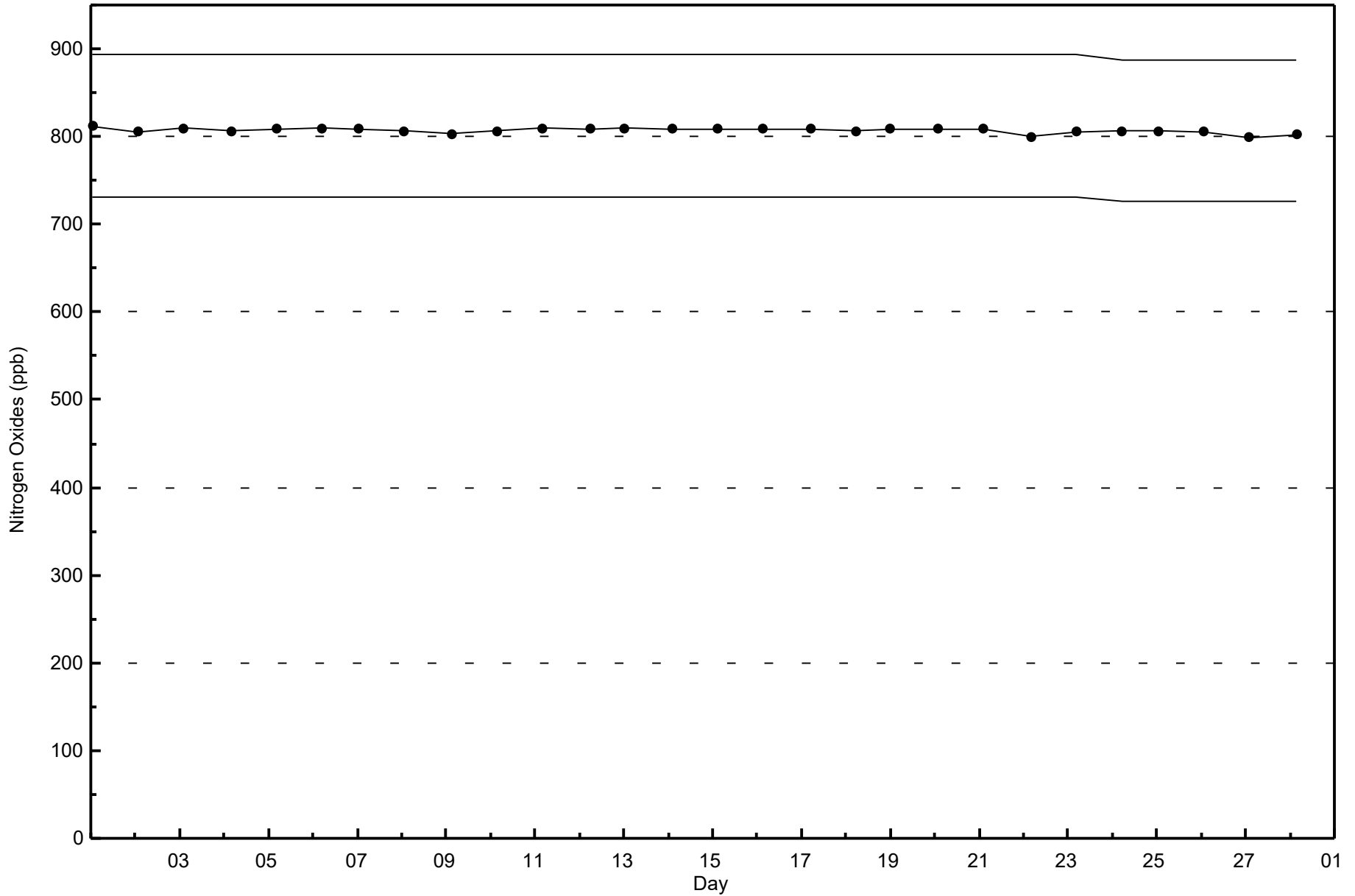


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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

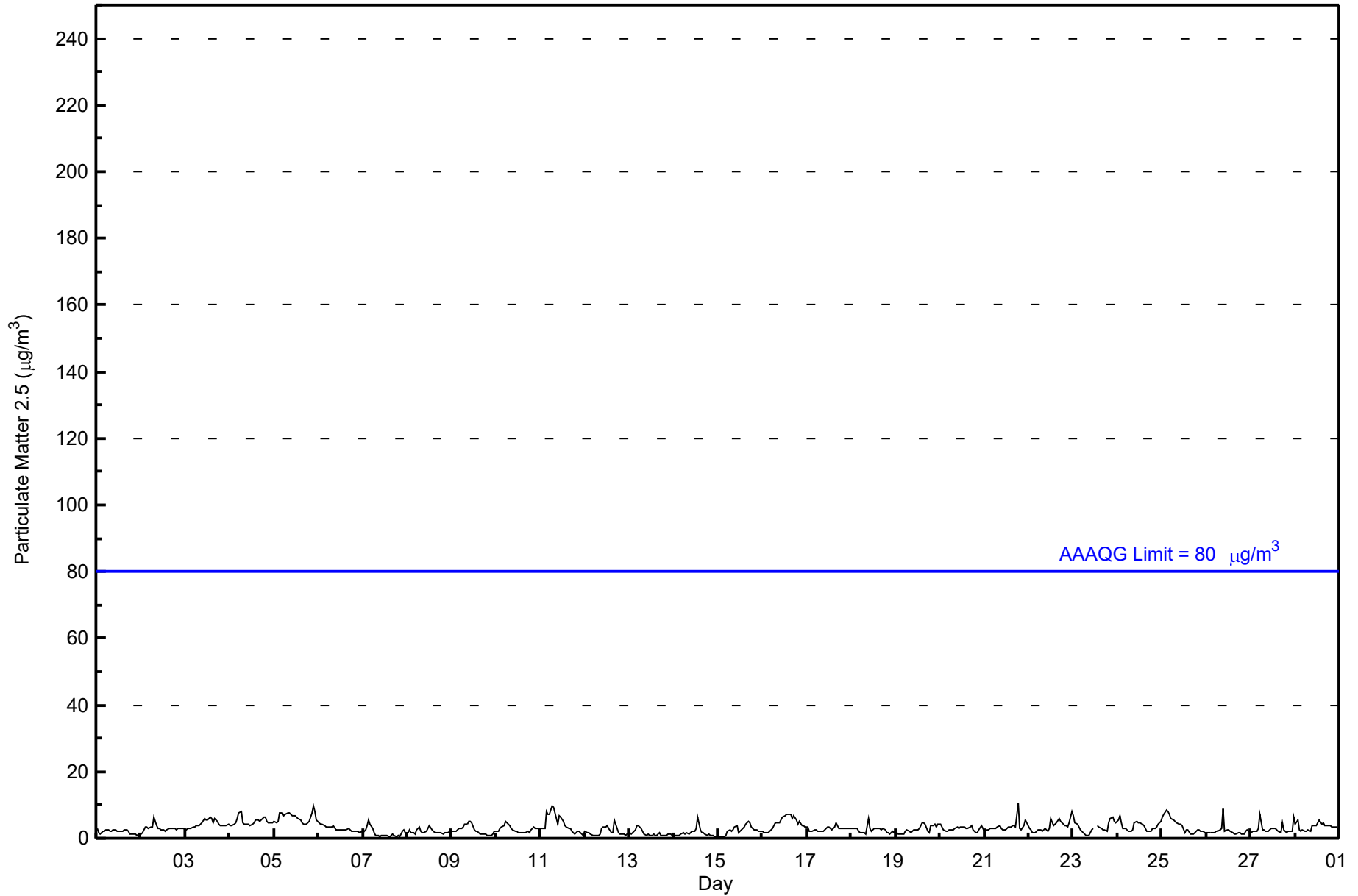








Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 672																	672																											
Maximum Value: 10.5 µg/m <sup>3</sup> on Feb 21 19:00		Maximum Daily Average: 6.3 µg/m <sup>3</sup> on Feb 5																	Hours of Data: 671																													
Minimum Value: 0.4 µg/m <sup>3</sup> on Feb 15 02:00		Minimum Daily Average: 1.5 µg/m <sup>3</sup> on Feb 13																	Hours of Missing Data: 1																													
Maximum Diurnal Average: 3.5 µg/m <sup>3</sup> at hour 10		Minimum Diurnal Average: 2.6 µg/m <sup>3</sup> at hour 20																	Hours of Calibration: 1																													
Monthly Average: 3.08 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 = 2.7 Q <sub>3</sub> = 3.9 P <sub>90</sub> = 5.4 P <sub>99</sub> = 8.1																	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-Feb	2.8	1.5	1.4	2.0	2.3	2.7	2.6	2.3	1.9	2.4	2.6	2.3	2.0	2.2	2.3	2.6	2.7	2.0	1.4	1.2	1.1	1.1	1.0	1.2	2.0	2.8																						
2-Feb	1.2	1.8	3.2	3.4	3.1	3.4	3.3	6.3	3.8	2.8	2.9	2.6	2.5	2.3	2.5	2.8	3.0	3.1	3.0	2.7	2.9	2.9	2.9	2.9	3.0	6.3																						
3-Feb	2.7	2.8	2.9	3.2	3.4	3.4	3.7	3.9	4.2	4.7	6.0	5.5	5.4	6.4	5.8	4.6	5.8	5.0	4.1	3.9	3.8	4.0	4.0	4.1	4.3	6.4																						
4-Feb	3.9	3.8	4.2	4.7	5.8	7.8	7.9	4.6	4.1	4.1	4.2	4.0	4.2	4.7	5.3	5.3	5.0	5.5	6.3	6.3	5.1	4.9	4.9	4.7	5.1	7.9																						
5-Feb	4.9	4.5	5.1	7.7	7.7	6.9	7.1	7.6	7.6	7.3	7.0	6.9	6.5	5.8	5.5	4.6	4.4	4.2	4.5	5.2	7.7	9.9	8.1	5.5	6.3	9.9																						
6-Feb	4.8	4.4	4.3	3.9	3.5	3.2	3.3	3.5	3.7	2.6	2.4	2.4	2.4	2.3	2.3	2.7	3.0	2.6	2.2	2.1	2.2	2.1	1.9	1.9	2.9	4.8																						
7-Feb	1.8	2.4	3.9	5.4	4.1	3.1	1.5	1.0	0.8	0.6	0.7	0.9	0.7	0.6	0.5	0.7	1.3	0.8	0.5	0.7	0.5	2.3	2.7	1.6	1.6	5.4																						
8-Feb	1.6	2.6	1.7	1.6	1.4	2.7	3.3	2.0	1.6	1.7	2.0	3.0	3.7	2.5	2.2	1.8	1.5	1.7	1.5	1.5	1.5	1.6	1.5	1.9	2.0	3.7																						
9-Feb	2.0	2.1	2.3	2.5	2.8	3.1	3.5	4.1	4.1	5.0	5.1	4.6	2.3	2.0	1.9	1.2	1.2	1.1	1.1	0.9	0.8	1.0	1.4	1.9	2.4	5.1																						
10-Feb	2.3	2.2	3.0	3.3	3.9	5.1	4.5	3.7	2.8	2.4	2.3	2.1	1.9	1.8	1.8	1.8	2.3	1.8	2.7	3.3	3.1	2.9	3.0	2.7	5.1																							
11-Feb	2.8	3.2	3.0	8.0	7.3	7.3	9.7	9.3	7.6	4.3	6.7	6.2	5.1	4.0	3.3	2.8	3.0	2.2	1.4	1.8	2.3	1.9	1.1	1.1	4.4	9.7																						
12-Feb	1.9	1.8	1.5	1.1	0.9	0.9	0.9	1.0	1.1	3.1	3.3	3.5	3.6	3.1	1.8	1.8	5.3	3.1	1.5	1.1	1.1	1.1	1.0	1.5	2.0	5.3																						
13-Feb	1.6	1.5	1.7	2.7	3.9	3.7	2.8	2.2	1.2	0.9	1.1	1.0	1.0	1.3	0.9	0.9	1.5	1.0	1.0	1.0	1.0	1.1	1.1	0.9	1.5	3.9																						
14-Feb	0.8	0.9	0.8	1.0	1.4	1.8	1.3	1.5	1.4	1.6	2.0	2.1	2.9	6.2	2.3	1.8	1.5	1.1	1.0	1.5	0.8	0.7	0.6	0.5	1.6	6.2																						
15-Feb	0.5	0.4	0.5	0.6	0.8	2.0	2.6	2.3	2.6	3.4	3.8	1.9	2.1	2.9	3.3	4.2	5.1	4.5	3.6	2.7	2.4	2.4	2.1	2.1	2.4	5.1																						
16-Feb	2.0	1.8	1.7	1.8	1.9	2.8	3.9	4.8	4.8	4.8	5.6	6.5	6.8	7.0	7.2	7.1	5.7	6.6	5.7	4.1	4.9	3.6	3.8	3.2	4.5	7.2																						
17-Feb	3.2	2.2	2.2	2.2	2.5	2.5	2.1	2.2	2.3	2.3	2.9	3.3	3.5	2.4	2.8	3.4	4.8	2.9	3.0	3.0	3.0	3.0	2.9	2.8	2.8	4.8																						
18-Feb	2.8	2.9	2.9	2.8	2.0	1.6	1.5	1.5	1.5	6.1	3.1	2.2	3.0	2.8	3.1	3.0	2.6	3.0	2.5	1.9	1.7	1.4	2.2	1.6	2.5	6.1																						
19-Feb	2.1	1.4	1.2	1.2	1.3	2.0	2.6	2.1	1.7	2.2	2.7	2.4	2.4	2.9	4.5	4.6	4.1	2.0	1.9	3.8	3.6	4.4	3.5	4.3	2.7	4.6																						
20-Feb	4.1	3.4	2.5	2.0	2.0	2.5	2.5	2.6	3.1	3.4	2.9	3.2	3.6	3.3	2.9	2.8	3.4	4.0	2.3	1.8	1.6	2.4	3.8	2.9	2.9	4.1																						
21-Feb	2.3	2.4	2.6	2.8	2.8	3.1	2.9	3.4	3.7	3.0	2.7	2.7	3.0	3.2	3.5	3.7	3.7	3.3	10.5	3.0	2.5	3.6	5.5	4.5	3.5	10.5																						
22-Feb	3.1	2.5	1.6	1.8	2.1	2.3	2.4	2.1	2.4	2.8	2.1	3.2	5.8	3.8	4.1	4.8	5.9	5.2	4.5	4.0	3.7	3.5	4.8	7.9	3.6	7.9																						
23-Feb	6.7	4.7	4.1	3.5	2.7	1.6	1.3	1.0	1.0	1.7	2.4	3.1	C	3.6	3.4	3.0	2.5	2.5	2.0	4.5	5.8	6.4	5.1	4.8	3.4	6.7																						
24-Feb	5.4	6.9	4.5	3.1	2.8	2.4	2.3	2.2	2.7	4.8	5.2	4.6	4.6	4.1	3.8	2.9	2.3	2.1	2.2	2.9	3.1	3.4	4.3	5.3	3.7	6.9																						
25-Feb	6.3	7.4	8.3	8.1	7.2	6.0	5.4	5.2	4.6	4.1	4.3	3.6	1.9	2.4	2.5	1.3	1.1	1.3	1.9	2.7	2.4	1.9	2.0	1.8	3.9	8.3																						
26-Feb	1.7	1.7	1.6	1.5	1.6	1.9	2.3	2.3	2.8	8.9	2.3	2.5	2.3	2.0	1.6	1.2	1.2	1.6	1.6	1.3	1.4	2.0	2.5	2.3	2.2	8.9																						
27-Feb	1.9	2.0	2.0	2.2	2.9	7.1	2.3	2.4	2.3	2.0	2.5	2.9	2.8	2.8	2.6	2.1	1.7	4.5	2.4	1.7	2.1	2.2	2.2	6.4	2.7	7.1																						
28-Feb	4.4	5.7	2.4	2.2	2.3	2.2	2.3	2.6	2.1	3.6	3.8	3.9	4.6	5.3	4.2	4.7	4.0	3.9	3.7	3.6	3.3	3.3	3.4	3.3	3.5	5.7																						
																								2.9	2.9	2.8	3.1	3.1	3.4	3.3	3.2	3.0	3.5	3.4	3.3	3.4	3.4	3.1	3.0	3.2	3.0	2.8	2.6	2.7	2.9	3.0	3.1	Diurnal Average
																								6.7	7.4	8.3	8.1	7.7	7.8	9.7	9.3	7.6	8.9	7.0	6.9	6.8	7.0	7.2	7.1	5.9	6.6	10.5	6.3	7.7	9.9	8.1	7.9	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 - February 2023**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	607	90.46	90.46
6 - 15	64	9.54	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: 671

Total Number of Hours: 672



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

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>**  
**Wapasu - February 2023**

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	97	48	42	23	14	17	65	83	49	29	29	21	15	5	12	56	605
6 - 15	9	7	2	2	1	0	1	6	6	12	8	2	1	1	1	5	64
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	55	44	25	15	17	66	89	55	41	37	23	16	6	13	61	669

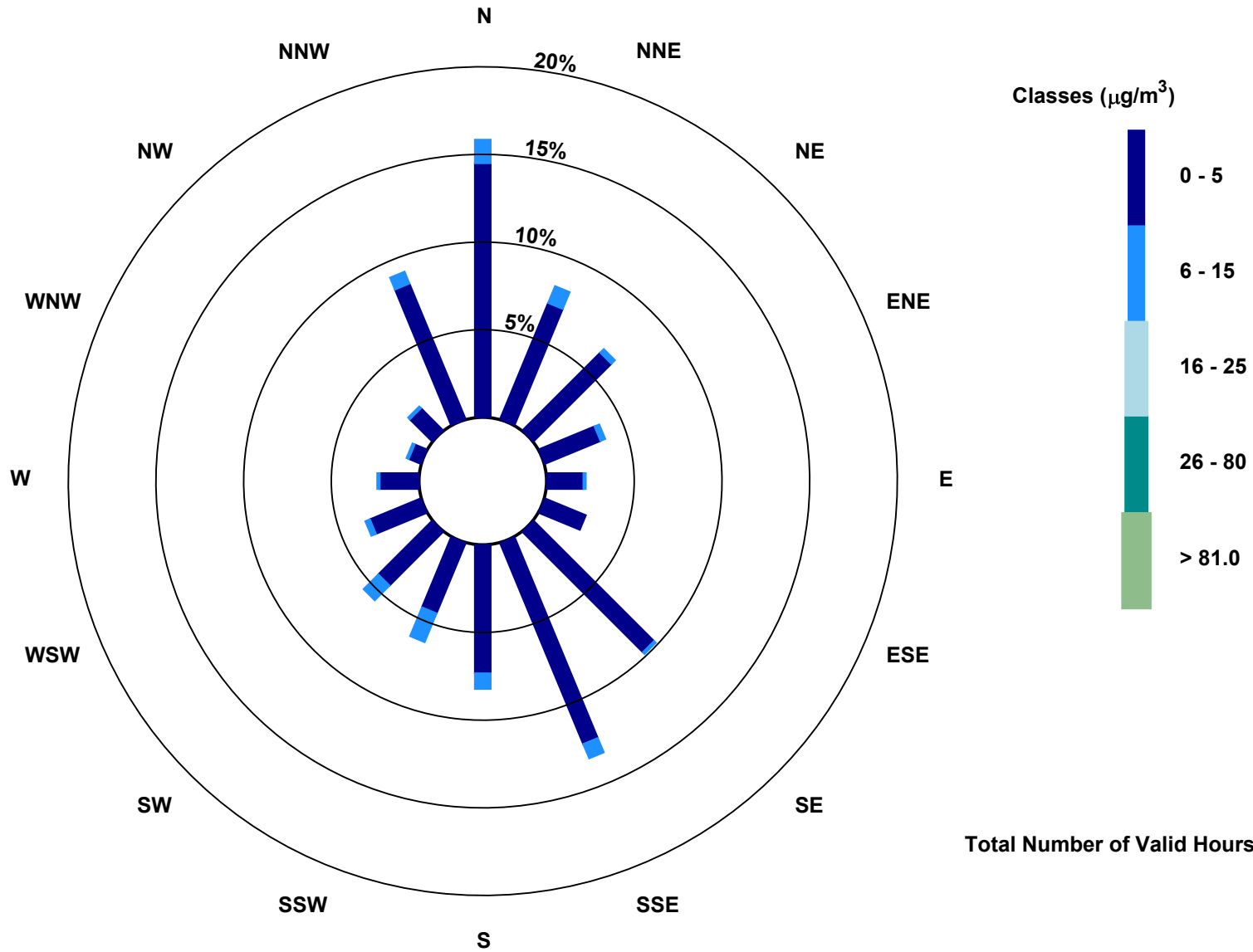
Total Number of Valid Hours: 669

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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





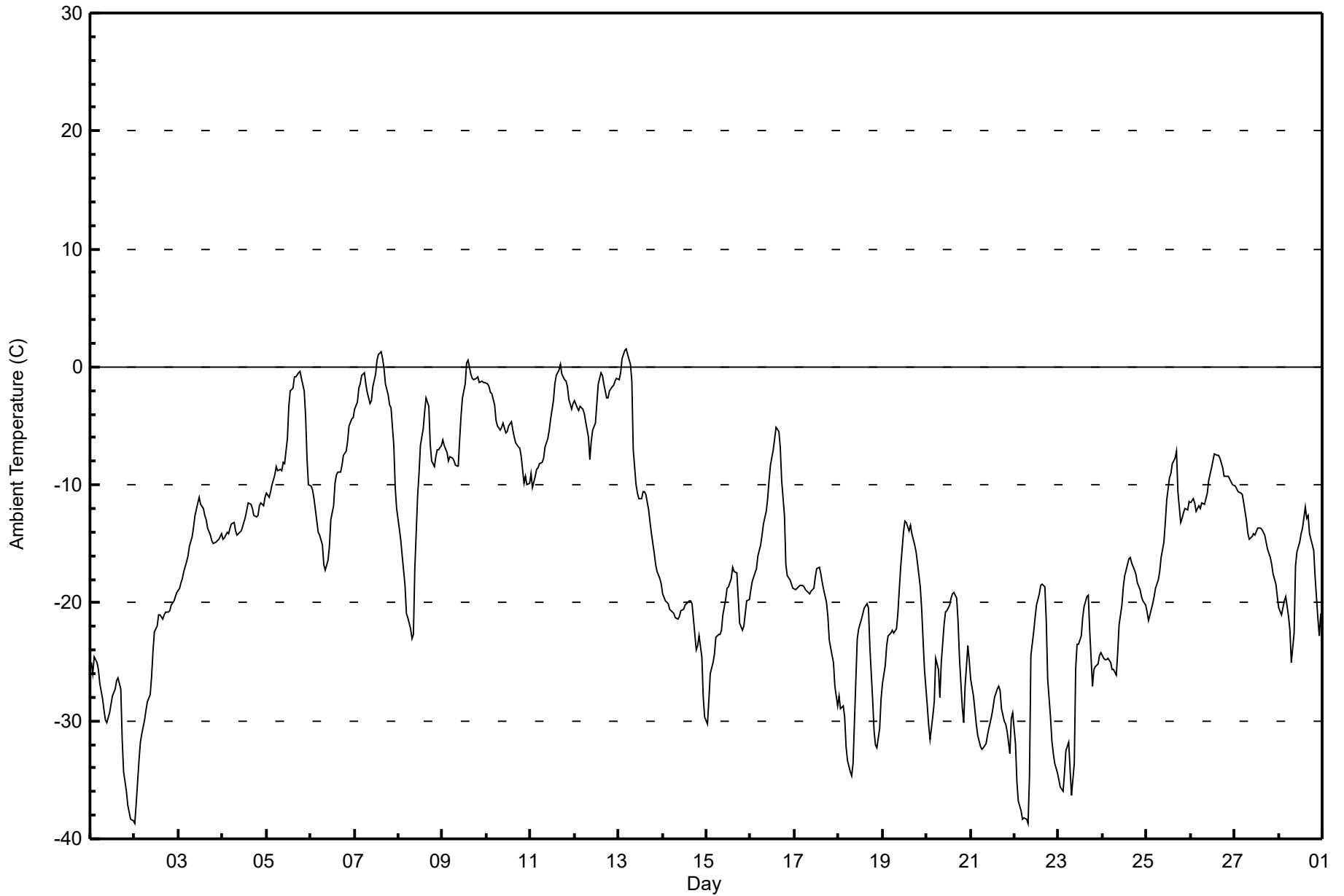


Maximum Value: 1.6 C on Feb 13 05:00      Maximum Daily Average: -2.4 C on Feb 7																						Hours in Service:	672																								
Minimum Value: -38.7 C on Feb 2 01:00      Minimum Daily Average: -29.9 C on Feb 1																						Hours of Data:	672																								
Maximum Diurnal Average: -12.1 C at hour 15      Minimum Diurnal Average: -18.9 C at hour 8																						Hours of Missing Data:	0																								
Monthly Average: -16.11 C      Percentiles: P <sub>1</sub> = -37.9 P <sub>10</sub> = -29.5 Q <sub>1</sub> = -22.5 Median = -16.1 Q <sub>3</sub> = -8.6 P <sub>90</sub> = -2.7 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-Feb	-25.0	-26.0	-24.6	-25.1	-25.6	-26.9	-28.1	-29.1	-29.9	-30.1	-29.3	-28.6	-27.9	-27.3	-26.6	-26.4	-27.3	-31.6	-34.3	-36.0	-37.1	-37.8	-38.3	-38.5	-29.9	-24.6																					
2-Feb	-38.7	-37.0	-33.3	-31.8	-31.1	-29.9	-29.1	-28.4	-27.7	-26.2	-24.1	-22.5	-22.0	-21.1	-21.0	-21.4	-21.0	-20.8	-20.8	-20.7	-20.2	-19.8	-19.5	-19.1	-25.3	-19.1																					
3-Feb	-18.7	-18.3	-18.0	-17.3	-16.5	-16.0	-15.2	-14.3	-13.5	-12.6	-11.5	-11.1	-11.6	-12.0	-12.6	-12.9	-13.7	-14.3	-14.7	-15.0	-14.9	-14.8	-14.6	-14.2	-14.5	-11.1																					
4-Feb	-14.6	-14.5	-14.1	-14.2	-13.7	-13.3	-13.2	-14.0	-14.2	-14.0	-13.9	-13.6	-12.7	-12.1	-11.5	-11.6	-12.0	-12.6	-12.7	-12.6	-11.7	-11.6	-11.8	-11.1	-13.0	-11.1																					
5-Feb	-10.7	-11.0	-10.6	-10.0	-9.1	-8.4	-8.8	-8.7	-8.8	-8.1	-8.2	-6.1	-3.4	-2.1	-1.8	-0.8	-0.9	-0.5	-0.4	-1.0	-2.1	-4.2	-7.8	-10.0	-6.0	-0.4																					
6-Feb	-10.1	-10.5	-11.1	-13.1	-14.0	-14.3	-15.1	-16.8	-17.2	-16.4	-15.2	-13.0	-11.7	-9.9	-9.2	-8.9	-8.9	-8.3	-7.5	-7.1	-6.3	-4.9	-4.4	-4.3	-10.8	-4.3																					
7-Feb	-3.6	-3.0	-1.8	-1.4	-0.7	-0.4	-1.4	-2.2	-3.1	-2.8	-1.7	-0.6	0.6	1.0	1.3	0.8	-0.1	-1.4	-2.4	-3.3	-3.5	-6.7	-10.2	-12.0	-2.4	1.3																					
8-Feb	-13.7	-14.7	-16.0	-18.5	-20.9	-21.2	-22.2	-23.1	-22.7	-17.1	-11.0	-9.0	-6.6	-5.3	-3.9	-2.7	-3.3	-6.6	-8.0	-8.4	-7.6	-7.0	-7.0	-6.6	-11.8	-2.7																					
9-Feb	-6.2	-6.6	-7.2	-7.9	-7.6	-7.8	-8.0	-8.3	-8.4	-6.1	-4.1	-2.6	-1.4	0.3	0.6	-0.6	-0.9	-1.0	-1.0	-0.9	-1.3	-1.2	-1.3	-1.3	-3.8	0.6																					
10-Feb	-1.5	-1.6	-2.1	-2.3	-3.3	-4.5	-5.0	-5.4	-5.2	-4.8	-5.6	-5.5	-5.0	-4.7	-5.4	-5.9	-6.4	-6.7	-6.9	-7.7	-9.9	-9.3	-10.0	-9.9	-5.6	-1.5																					
11-Feb	-9.1	-10.2	-9.3	-8.7	-8.6	-8.2	-8.1	-7.8	-6.8	-6.1	-5.4	-4.4	-2.9	-1.4	-0.8	-0.3	0.2	-0.6	-1.0	-1.3	-1.7	-2.7	-3.5	-3.1	-4.7	0.2																					
12-Feb	-2.9	-3.5	-3.7	-3.3	-3.6	-3.9	-4.6	-5.9	-7.9	-6.4	-5.4	-4.8	-3.1	-1.4	-0.5	-0.8	-1.5	-2.6	-2.6	-2.1	-1.7	-1.5	-1.3	-1.0	-3.2	-0.5																					
13-Feb	-1.1	-0.5	0.6	1.4	1.6	1.1	0.2	-1.2	-7.1	-10.0	-10.7	-11.2	-11.1	-10.5	-10.6	-10.8	-12.1	-13.1	-14.1	-15.8	-16.8	-17.3	-18.0	-18.4	-8.6	1.6																					
14-Feb	-19.2	-19.8	-20.0	-20.1	-20.5	-20.8	-21.0	-21.3	-21.4	-21.2	-20.7	-20.6	-20.2	-20.0	-19.8	-19.8	-20.1	-21.3	-24.0	-23.7	-22.8	-24.6	-28.0	-29.7	-21.7	-19.2																					
15-Feb	-30.3	-28.3	-26.0	-25.1	-24.3	-22.9	-22.6	-22.7	-22.3	-21.0	-19.7	-18.8	-18.6	-17.9	-17.0	-17.3	-17.5	-19.5	-21.7	-22.3	-22.0	-20.9	-19.8	-19.7	-21.6	-17.0																					
16-Feb	-18.9	-18.2	-17.4	-17.1	-16.0	-15.0	-14.2	-13.3	-12.3	-11.1	-9.7	-8.3	-7.0	-6.0	-5.1	-5.4	-6.8	-9.6	-12.6	-16.7	-17.7	-18.1	-18.4	-18.8	-13.1	-5.1																					
17-Feb	-18.9	-18.7	-18.7	-18.5	-18.5	-18.6	-18.8	-19.1	-19.2	-19.0	-18.8	-17.8	-17.1	-17.0	-17.5	-18.3	-18.9	-20.0	-21.2	-23.2	-24.4	-25.1	-27.1	-28.7	-20.1	-17.0																					
18-Feb	-27.9	-29.0	-28.8	-29.6	-32.1	-33.4	-34.3	-34.7	-33.6	-26.5	-23.0	-22.2	-21.4	-20.9	-20.4	-20.0	-20.4	-23.8	-28.2	-30.9	-32.1	-32.3	-30.7	-28.2	-27.7	-20.0																					
19-Feb	-26.8	-25.2	-23.7	-22.8	-22.5	-22.3	-22.5	-22.2	-20.9	-18.9	-17.0	-14.1	-13.1	-13.2	-13.9	-13.4	-14.1	-15.1	-15.6	-16.7	-18.7	-20.6	-23.1	-25.7	-19.3	-13.1																					
20-Feb	-28.7	-30.4	-31.6	-29.6	-28.3	-24.7	-25.6	-28.0	-25.1	-21.8	-20.8	-20.6	-20.2	-19.6	-19.2	-19.2	-19.6	-21.6	-24.7	-28.8	-30.1	-27.1	-23.6	-24.9	-24.7	-19.2																					
21-Feb	-26.5	-27.9	-29.1	-30.2	-31.3	-32.1	-32.4	-32.3	-31.9	-31.3	-30.6	-29.5	-28.8	-28.0	-27.3	-27.1	-27.4	-29.0	-30.1	-30.3	-30.9	-32.7	-29.8	-29.4	-29.8	-26.5																					
22-Feb	-31.9	-35.1	-36.8	-37.6	-38.4	-38.3	-38.3	-38.7	-34.7	-24.4	-22.4	-21.2	-20.1	-19.2	-18.6	-18.5	-18.7	-21.6	-26.5	-29.7	-31.6	-32.8	-33.6	-34.4	-29.3	-18.5																					
23-Feb	-35.0	-35.6	-36.0	-34.4	-32.5	-31.8	-34.0	-36.3	-33.6	-25.5	-23.6	-23.5	-22.8	-21.3	-20.3	-19.5	-19.4	-22.3	-27.1	-25.7	-25.4	-25.2	-24.5	-24.2	-27.5	-19.4																					
24-Feb	-24.7	-24.9	-24.9	-24.7	-25.1	-25.6	-25.6	-26.1	-24.3	-21.9	-20.2	-18.7	-17.7	-16.8	-16.3	-16.1	-16.7	-17.2	-17.6	-18.3	-18.9	-19.5	-19.9	-20.2	-20.9	-16.1																					
25-Feb	-20.8	-21.5	-20.6	-20.1	-19.4	-18.8	-18.1	-17.4	-16.2	-14.8	-13.2	-11.3	-9.4	-9.1	-8.2	-7.7	-7.2	-10.6	-13.2	-12.8	-12.4	-12.0	-12.1	-11.4	-14.1	-7.2																					
26-Feb	-11.5	-11.1	-11.6	-12.3	-11.8	-12.1	-11.6	-11.7	-11.2	-10.7	-9.6	-8.6	-7.9	-7.4	-7.5	-7.4	-7.8	-8.6	-9.3	-9.3	-9.3	-9.5	-9.7	-10.0	-9.9	-7.4																					
27-Feb	-10.1	-10.3	-10.6	-10.7	-10.9	-11.5	-13.1	-14.1	-14.6	-14.4	-14.2	-14.2	-13.7	-13.7	-13.7	-13.8	-14.3	-14.8	-15.5	-16.2	-16.7	-17.6	-18.4	-19.5	-14.0	-10.1																					
28-Feb	-20.4	-21.0	-20.4	-19.8	-19.5	-21.2	-22.4	-25.1	-22.6	-16.9	-15.7	-14.9	-14.1	-13.6	-11.9	-12.8	-12.6	-14.2	-15.0	-15.6	-17.8	-21.4	-22.8	-20.9	-18.0	-11.9																					
																						-18.1	-18.4	-18.1	-18.0	-18.0	-18.0	-18.3	-18.9	-18.4	-16.4	-15.2	-14.2	-13.2	-12.5	-12.1	-12.1	-12.5	-13.9	-15.3	-16.1	-16.6	-17.1	-17.5	-17.7	Diurnal Average	
																						-1.1	-0.5	0.6	1.4	1.6	1.1	0.2	-1.2	-3.1	-2.8	-1.7	-0.6	0.6	1.0	1.3	0.8	0.2	-0.5	-0.4	-0.9	-1.3	-1.2	-1.3	-1.0	Diurnal Maximum	



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

**Ambient Temperature (AT) - C**  
**Wapasu - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Wapasu - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	237	35.27	35.27
-20 - 0	423	62.95	98.21
0 - 10	12	1.79	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Relative Humidity (RH) - %**

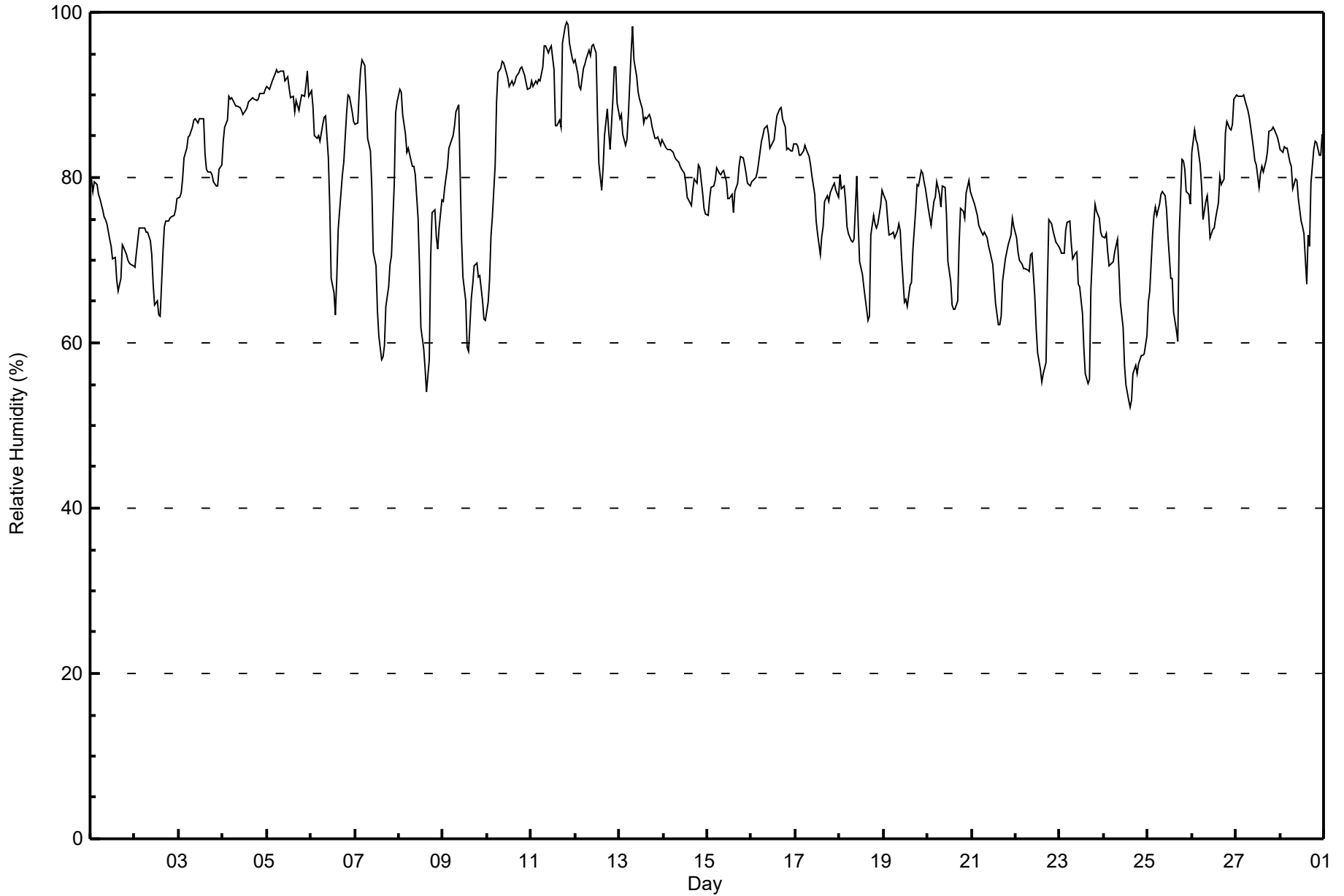
**Wapasu - February 2023**

Maximum Value: 98.9 % on Feb 11 20:00      Maximum Daily Average: 93.2 % on Feb 11																						Hours in Service:	672																									
Minimum Value: 52.2 % on Feb 24 15:00      Minimum Daily Average: 62.4 % on Feb 24																						Hours of Data:	672																									
Maximum Diurnal Average: 82.1 % at hour 8      Minimum Diurnal Average: 71.5 % at hour 15																						Hours of Missing Data:	0																									
Monthly Average: 78.81 %      Percentiles: P <sub>1</sub> = 55.5 P <sub>10</sub> = 65.5 Q <sub>1</sub> = 72.8 Median = 79.2 Q <sub>3</sub> = 86.2 P <sub>90</sub> = 91.0 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-Feb	79.9	78.4	79.5	79.2	77.9	77.4	76.1	75.3	74.9	74.4	72.6	71.6	70.2	70.4	67.6	66.2	67.7	71.9	71.5	70.7	70.1	69.7	69.4	69.3	73.0	79.9																						
2-Feb	69.1	70.8	73.9	73.9	73.8	74.0	73.4	73.4	72.3	70.7	67.1	64.6	65.0	63.3	63.2	71.1	74.1	74.7	74.8	75.1	75.2	75.4	76.2	77.4	71.8	77.4																						
3-Feb	77.6	78.2	79.8	82.4	83.6	84.9	85.0	86.2	87.0	87.1	86.6	87.1	87.0	87.1	82.8	80.9	80.7	80.7	80.3	79.5	79.0	79.0	81.0	81.6	82.7	87.1																						
4-Feb	84.4	86.1	86.9	89.9	89.5	89.6	89.1	88.7	88.6	88.5	88.1	87.7	88.1	88.6	89.1	89.6	89.6	89.5	89.4	89.4	90.1	90.2	90.2	90.7	88.8	90.7																						
5-Feb	91.0	90.8	91.2	91.8	92.5	93.0	92.7	92.8	92.8	93.0	91.7	92.2	90.9	89.7	89.8	88.0	89.2	88.1	89.1	90.0	89.8	91.2	92.9	89.8	91.0	93.0																						
6-Feb	90.5	88.6	85.0	84.7	85.1	84.5	86.5	87.2	87.4	82.3	76.4	67.7	66.1	63.4	67.8	73.7	78.2	80.4	81.9	87.8	90.0	89.9	87.9	86.7	81.7	90.5																						
7-Feb	86.5	86.6	90.4	93.0	94.2	93.6	89.6	84.7	83.3	78.8	70.9	69.3	63.9	60.8	57.9	58.2	59.6	64.3	66.8	69.4	70.4	79.1	87.8	89.2	77.0	94.2																						
8-Feb	90.7	90.3	87.6	85.2	83.0	83.6	82.0	81.4	81.4	80.3	75.0	69.4	61.9	59.3	56.9	54.1	58.0	70.6	75.7	76.1	72.8	71.4	73.8	77.2	74.9	90.7																						
9-Feb	77.1	78.9	81.3	83.6	84.1	85.0	86.3	87.9	88.8	80.7	72.7	68.0	65.1	59.5	59.0	65.5	67.0	69.4	69.6	68.0	68.2	65.2	62.8	62.8	73.2	88.8																						
10-Feb	64.9	67.7	72.9	75.3	81.5	89.1	92.7	93.2	94.1	93.8	92.7	92.1	91.1	91.7	91.2	91.4	92.3	92.8	93.2	93.4	92.3	91.5	90.7	90.8	88.0	94.1																						
11-Feb	91.7	91.1	91.7	91.4	91.8	91.6	93.4	96.0	96.0	95.1	95.6	95.9	93.0	86.2	86.2	87.0	86.1	96.3	98.3	98.9	98.5	96.4	94.3	94.0	93.2	98.9																						
12-Feb	94.2	92.5	91.0	90.7	93.2	93.7	94.4	95.5	94.7	95.9	96.1	95.1	87.5	81.6	78.5	81.2	85.1	88.3	85.5	83.3	89.5	93.4	93.5	89.0	90.1	96.1																						
13-Feb	87.2	87.6	85.3	83.9	84.7	87.5	95.1	98.4	94.2	92.2	90.3	89.5	88.4	86.7	87.3	87.1	87.6	87.2	86.1	84.7	84.8	84.9	83.9	84.6	87.9	98.4																						
14-Feb	84.3	83.6	83.3	83.4	83.4	83.0	82.6	82.2	81.9	81.4	80.9	80.5	79.3	77.6	76.9	76.6	78.5	79.9	79.4	81.5	81.3	78.2	76.3	75.6	80.5	84.3																						
15-Feb	75.5	77.5	78.9	78.9	79.7	81.3	80.6	80.4	80.6	80.8	79.5	77.5	77.5	78.0	75.8	78.3	79.3	81.4	82.6	82.4	81.5	80.6	79.3	78.9	79.5	82.6																						
16-Feb	79.5	79.7	80.0	80.7	81.9	84.4	85.1	86.0	86.2	85.3	83.6	83.9	84.6	86.1	87.5	88.4	88.5	87.1	86.1	83.5	83.5	83.2	83.3	84.0	84.2	88.5																						
17-Feb	84.1	83.7	82.7	82.7	83.2	83.9	83.3	82.6	81.5	80.1	78.0	74.8	73.3	70.6	72.9	74.0	77.1	77.7	77.1	78.2	79.1	79.2	78.4	77.7	79.0	84.1																						
18-Feb	80.3	78.6	79.0	77.1	74.0	73.2	72.4	72.2	72.5	80.2	74.4	69.9	68.3	66.8	65.4	62.7	63.3	73.1	75.5	74.4	74.0	74.4	76.7	78.4	73.2	80.3																						
19-Feb	77.9	77.1	74.9	73.1	73.3	73.3	72.8	73.5	74.4	73.6	70.2	65.0	65.3	64.5	67.0	67.2	71.2	76.1	79.1	78.9	80.8	80.4	79.5	78.6	73.7	80.8																						
20-Feb	76.2	75.3	74.3	77.1	77.6	79.4	77.9	76.4	78.9	78.9	75.5	69.9	67.5	64.7	64.0	64.0	65.2	72.0	76.3	76.0	75.1	78.2	79.6	78.4	74.1	79.6																						
21-Feb	77.9	76.7	76.1	75.4	74.2	73.5	73.1	73.4	72.8	71.8	71.0	69.5	67.1	64.8	62.3	62.2	63.3	67.5	70.1	70.9	71.8	73.1	75.0	74.1	71.1	77.9																						
22-Feb	72.7	71.0	69.9	69.5	68.9	69.0	68.8	68.6	70.8	70.9	65.5	61.6	58.8	56.8	55.2	56.3	57.5	67.2	74.9	74.4	73.5	72.9	72.3	71.7	67.4	74.9																						
23-Feb	71.4	70.9	70.8	73.6	74.6	74.8	72.0	70.1	70.8	71.0	67.1	66.8	63.5	59.4	56.4	55.2	55.6	66.4	74.0	76.8	75.9	75.1	73.4	72.8	69.1	76.8																						
24-Feb	72.7	73.2	71.1	69.4	69.7	69.8	71.0	72.5	69.0	64.8	61.9	57.3	54.8	53.0	52.2	53.0	56.3	57.2	56.3	57.4	58.4	58.4	58.6	60.8	62.4	73.2																						
25-Feb	64.9	66.2	73.1	75.4	76.5	75.4	76.8	78.0	78.2	77.9	76.1	72.9	67.7	67.8	63.7	61.5	60.1	73.1	82.2	82.0	80.9	78.3	77.9	76.7	73.5	82.2																						
26-Feb	83.1	85.7	84.6	84.0	81.5	79.0	74.9	77.1	77.9	75.5	72.7	73.6	74.0	75.1	76.9	80.1	79.2	79.8	85.5	86.8	86.0	85.8	86.4	89.4	80.6	89.4																						
27-Feb	90.0	89.8	89.8	89.8	90.0	89.4	88.2	87.4	86.1	83.6	82.1	81.5	78.9	80.5	81.4	80.7	82.0	83.3	85.6	85.8	86.1	85.7	85.0	84.2	85.3	90.0																						
28-Feb	83.3	83.1	83.7	83.5	83.5	81.9	81.4	78.6	79.9	79.7	77.4	74.8	74.1	73.3	67.0	73.1	71.6	79.3	83.4	84.5	84.3	82.8	82.7	85.3	79.7	85.3																						
																								80.7	80.7	81.0	81.4	81.7	82.1	82.0	82.1	82.0	81.0	78.3	76.1	74.0	72.4	71.5	72.4	73.7	77.7	79.7	80.0	80.1	80.1	80.3	80.3	Diurnal Average
																								94.2	92.5	91.7	93.0	94.2	93.7	95.1	98.4	96.0	95.9	96.1	95.9	93.0	91.7	91.2	91.4	92.3	96.3	98.3	98.9	98.5	96.4	94.3	94.0	Diurnal Maximum



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

**Relative Humidity (RH) - %**  
**Wapasu - February 2023**





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

**Relative Humidity (RH) - %**  
**Wapasu - February 2023**

<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	30	4.46	4.46
60 - 80	329	48.96	53.42
80 - 100	313	46.58	100.00

Total Number of Valid Hours: 672

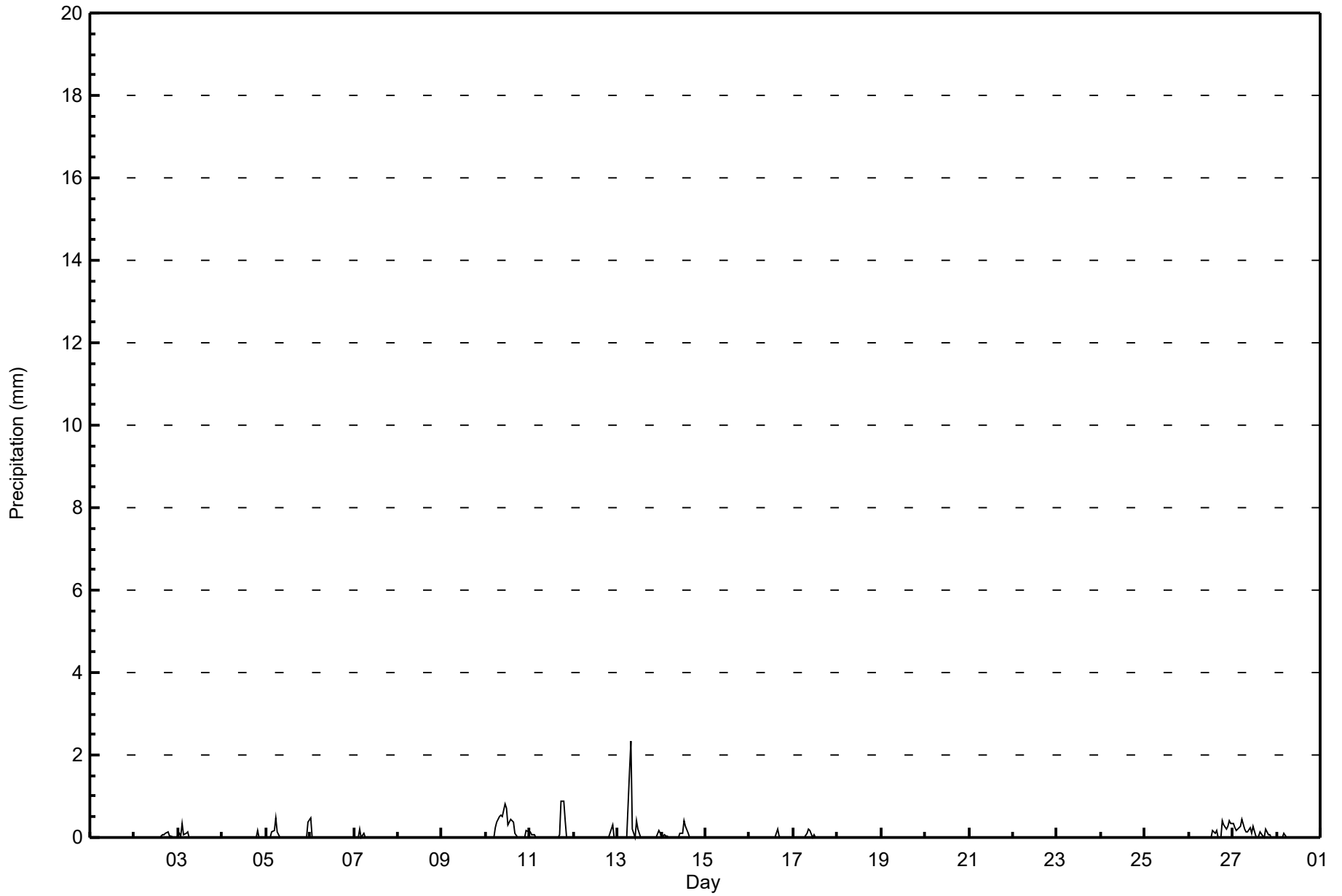
Total Number of Hours: 672





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

**Precipitation (PC) - mm**  
**Wapasu - February 2023**







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

**Wind Speed (WS) - km/h**  
**Wapasu - February 2023**

Maximum Speed: 24 km/h on Feb 2 18:00	Maximum Daily Speed Average: 15.5 km/h on Feb 2	Hours in Service: 672
Minimum Speed Value: 0 km/h on Feb 11 00:00	Minimum Daily Speed Average: 1.2 km/h on Feb 23	Hours of Data: 670
Maximum Diurnal Speed Average: 2.5 km/h at hour 23	Minimum Diurnal Speed Average: 0.3 km/h at hour 10	Hours of Missing Data: 2
Monthly Average Velocity: 0.7 km/h 157.1 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 3 Q <sub>1</sub> = 4 Median = 7 Q <sub>3</sub> = 10 P <sub>90</sub> = 14 P <sub>99</sub> = 21	Percent Operational Time: 99.7

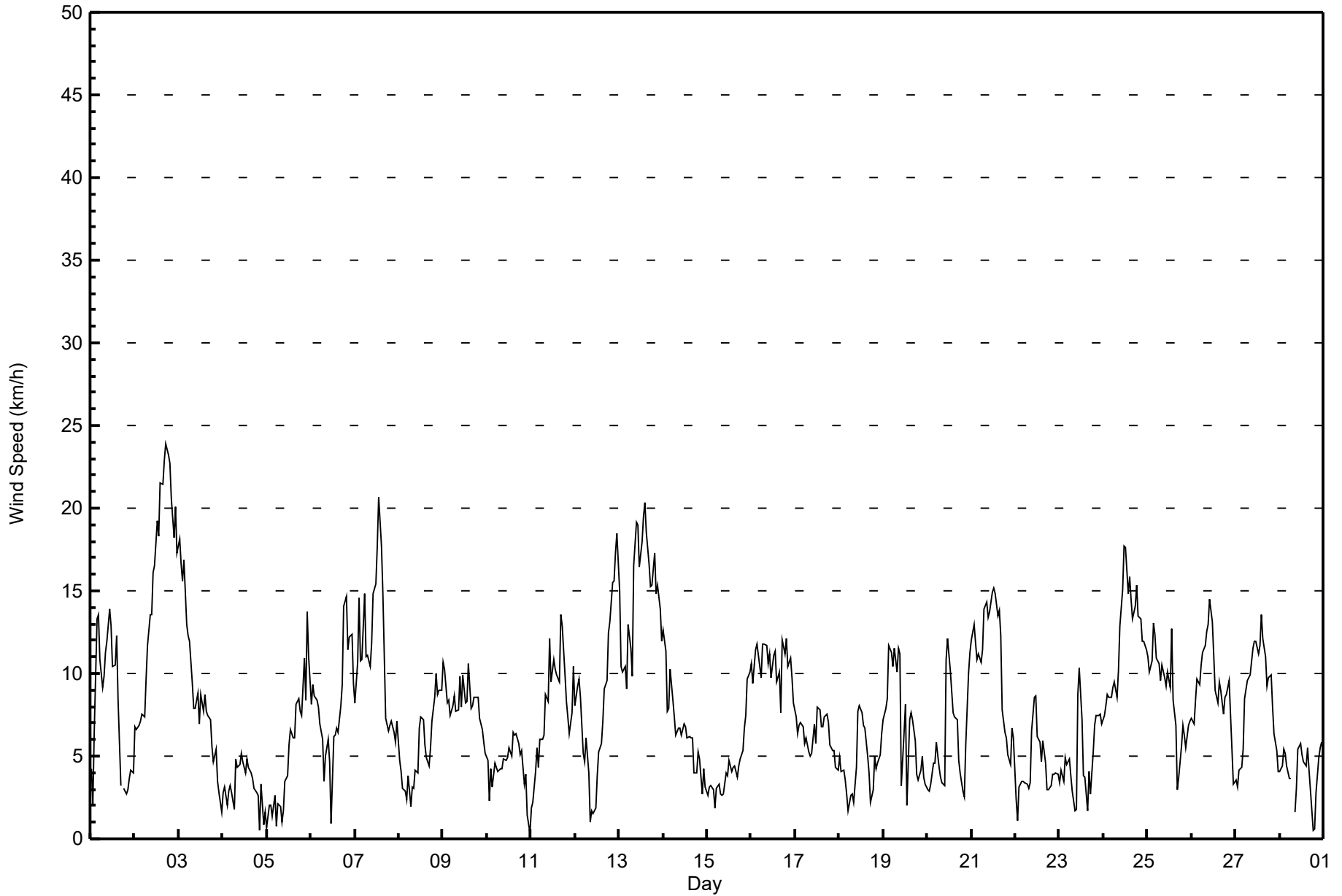
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Feb	NE4	ESE2	N6 NNW13 NNW14 NNW11	N9	N10	N11 NNW12 NNW14 NNW13 NNW10 NNW11 NNW12 NNW8	NW3	UO	SE3	ESE3	SE3	SE4	SE4	SE4	SE4	SE4	SE4	SE3	SE3	SE3	SE4	SE4	SE4	SE4	NNW6.2	NNW14
2-Feb	SE7	SE7	SSE7	SSE7	SSE8	SSE7	SSE10	SSE12	SSE14	SSE14	SSE16	SSE17	SSE19	SSE18	SSE22	SSE21	SE23	SSE24	SSE23	SSE23	SSE21	SSE18	SSE20	SSE17	SSE15.5	SSE24
3-Feb	SSE18	SSE17	SSE16	SSE17	SSE13	S12	S12	S9	S8	SSW8	WSW9	W7	NNW9	N8	N9	N8	NNE7	NNE7	NNE6	NE5	NE5	NNE3	ENE3	ESE2	SSE3.0	SSE18
4-Feb	N3	ENE3	NE2	NNE3	NE3	ENE3	NNW2	NNW5	NNE4	N5	N5	NNE5	NNE4	N5	NNW4	N4	NNW4	NNW3	N3	NE3	N1	N3	ENE1	NNW2	N2.8	N5
5-Feb	NNE1	NNE2	ENE2	SSE1	SSE3	SSW1	NNE2	NNW2	SSW1	NNW2	W3	SSW4	S6	S7	S6	S6	S8	S8	S8	SSW7	SW11	NNW8	N14	N11	SW1.6	N14
6-Feb	NW8	NW9	WNW9	W8	W8	W7	W6	NW3	NNE5	NE6	ENE5	ESE1	SSW6	S6	SSW7	SSE6	SSE8	SE9	SE14	SSE15	SSE11	SSE12	SSE12	S9	S3.3	SSE15
7-Feb	S8	SSW11	SW15	SW11	SW11	WSW15	W11	WSW11	WSW10	WSW12	WSW15	WSW15	WSW18	WSW21	W18	W15	W11	W7	WSW7	SW7	WSW7	NW6	NNE6	NNE7	WSW9.6	WSW21
8-Feb	NE5	NNE4	NE3	NE3	ESE2	ENE4	E2	E3	SE3	SE4	SSW4	SSW7	S7	SSW7	SSW6	S5	S4	SSE6	SSE7	SSE9	SSE10	SSE9	SSE9	SSE9	SSE3.8	SSE10
9-Feb	SSE11	SSE10	SSE8	S8	S7	S8	SSW9	S8	SSW8	SSW10	S8	SSW10	S8	S8	S11	S8	SSE8	SSE9	SE9	SE9	SSE7	SSE7	S6	S5	S7.9	SSE11
10-Feb	SSE5	NE2	ENE4	NE3	N5	N4	NE4	NNE4	NNE4	N5	N5	N5	NNE6	N5	NNE6	NNE6	NE6	NE6	NNE5	N5	N3	NW4	NW1	E0	NNE3.8	NNE6
11-Feb	WNW2	SW2	S4	SSW6	SSW4	SSW6	SSW6	S6	SW9	SW8	SW12	SSW9	SSW11	SSW10	S10	SSW10	SW14	WSW13	W10	W8	W7	WSW6	SW8	SW10	SW7.2	SW14
12-Feb	SW8	SW9	SW10	WSW9	WSW5	SW5	SW6	SW4	ENE1	E2	WNW2	E2	SSW4	SW5	S6	S7	SSE9	SE10	SE12	SSE13	SSE15	SSE16	SSE17	SSE19	S6.3	SSE19
13-Feb	SSE15	S10	S10	SW10	SW9	WSW13	WSW12	NNW10	NNW17	NNW19	NNW19	N16	N18	N20	N20	N19	NNW17	NNW15	N15	N17	N15	N15	N14	N12	NNW9.2	N20
14-Feb	N13	N11	N8	NNW8	NNW10	NNW8	NNE7	NNE6	N7	N7	NNW6	N7	N7	N6	N6	N6	N6	N4	NNE4	NNE5	NNE5	ENE3	ENE4	NE3	N6.2	N13
15-Feb	ESE3	SSE3	SE3	SE3	SSE2	SSW3	SSE3	SSE3	S3	S3	SW4	WSW4	W5	WSW4	S4	S4	S4	S4	SSE5	SSE5	SSE7	SE7	SSE10	SSE10	S3.6	SSE10
16-Feb	SSE11	SSE9	SSE11	SSE12	SSE11	SSE10	SSE12	SSE12	SSE12	SSE11	S11	S10	SSW11	SW11	SW9	WSW10	WNW8	N12	N11	N12	NNE10	N11	N10	N8	SSE3.0	N12
17-Feb	NNE7	NNE6	NNE7	NNE7	NNE7	NNE6	NNE6	N5	N5	N5	N7	N6	N8	N8	NNE7	NNE7	NNE7	NE8	NE7	NE6	NE5	NE5	NE4	NE4	NNE6.0	N8
18-Feb	NE5	ENE4	ENE4	E4	ESE3	ESE2	E3	E3	ENE2	NNE4	N8	N8	NNW8	NNW7	NNW7	N5	N4	N2	ESE3	SE5	SE4	SE5	SE5	SE6	NE2.2	N8
19-Feb	SE7	SE8	SE8	SE12	SE11	SE10	SE11	SE10	SE11	SE11	SSE3	SSE6	S8	WNW2	NNW7	N8	NNW7	NNE6	NNE4	N4	N4	N5	N4	NNW3	SE3.1	SE12
20-Feb	NE3	ENE3	NE3	ENE5	NE5	NE6	NE4	ENE4	ENE3	N3	NNW11	N12	N10	N9	N8	N7	N7	NE5	NE4	E3	ENE3	NNW6	NNW10	N11	NNE5.2	N12
21-Feb	N12	N13	N12	N11	N11	N11	N11	N14	N14	N13	NNW14	NNW15	NNW15	NNW15	N13	NNW14	NNW12	N8	NNE6	NNE6	NE5	NNE4	NNE7	NE6	N10.6	NNW15
22-Feb	NE2	SE1	SE3	SE3	SE4	SE3	ESE3	SE3	NE3	NNE7	NNE9	N9	N6	NNW6	NW5	NNW6	N5	NE3	SE3	E3	SE4	ESE4	ESE4	E4	NE2.2	N9
23-Feb	ENE3	NE4	NE3	NE5	ENE5	ENE5	E4	SE3	SE2	NNW2	N9	N10	NNW7	NW4	W4	SW2	SW4	S3	SE5	SSE7	SSE7	SSE7	SSE8	S7	E1.2	N10
24-Feb	SSE7	SSE8	SSE9	S9	SSE9	SSE9	S9	S9	S10	S13	SSW15	SSW18	SSW15	SSW15	S16	S14	S13	S14	S15	SSW13	SSW13	SSW12	SSW12	SSW11	S11.9	SSW18
25-Feb	SSW11	SSW10	SSW11	SW13	SW12	SW11	SW10	SW10	SW11	SW10	SW9	SW10	WSW9	SW13	SW8	WSW7	WSW3	SE4	SE6	SE7	SE6	SE5	SE7	SE7	SSW7.2	SW13
26-Feb	SE7	SE7	SE8	SE10	SE9	SE10	SE11	SE12	SE13	SE13	SE15	SE13	SE11	SE9	ESE8	ESE9	ESE9	E8	E9	ENE9	ENE10	E7	E5	NE3	ESE8.8	SE15
27-Feb	NE4	NNE3	NNE4	NNE4	N5	NNW9	NNW10	NNW10	NNW10	N12	NNW12	NNW12	NNW11	NNW12	NNW14	N12	N11	N9	N10	N10	N8	NNW6	N5	NNE4	N8.4	NNW14
28-Feb	NNE4	NNE4	NE5	NE5	NE4	NNE4	NE4	UO	E2	N3	NNW5	NNW6	NW5	NW5	NW4	N6	NNW4	NW3	NNE0	SSW1	SE3	SE5	SE6	SE6	NNE2.0	SSE6
SE2.2 SE1.9 SSE2.0 SSE1.8 S1.4SSW1.4 S1.4 SSE0.9 SE0.6 NW0.3NNW2.0NNW1.9 W2.1NNW2.3NNW1.7 NW1.2 NW0.6 E1.2 ESE2.2 ESE2.5 SE2.4 SE1.8 ESE2.5 SE2.2																								Diurnal Average		
SSE18 SSE17 SSE16 SSE17 NNW14 WSW15 S12 N14 NNW17 NNW19 NNW19 SSW18 SSE19 WSW21 SSE22 SSE21 SE23 SSE24 SSE23 SSE23 SSE21 SSE18 SSE20 SSE19																								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 (WS) - km/h**  
**Wapasu - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Wapasu - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	240	35.82	35.82
6 - 11	308	45.97	81.79
12 - 19	111	16.57	98.36
20 - 28	11	1.64	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 670

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Wapasu - February 2023**

<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	32	28	36	23	12	14	27	10	11	8	7	4	3	4	9	12	240
6 - 11	49	27	8	2	3	3	30	45	36	25	24	10	11	2	4	29	308
12 - 19	23	0	0	0	0	0	8	27	8	8	6	8	2	0	0	21	111
20 - 28	2	0	0	0	0	0	1	7	0	0	0	1	0	0	0	0	11
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>106</b>	<b>55</b>	<b>44</b>	<b>25</b>	<b>15</b>	<b>17</b>	<b>66</b>	<b>89</b>	<b>55</b>	<b>41</b>	<b>37</b>	<b>23</b>	<b>16</b>	<b>6</b>	<b>13</b>	<b>62</b>	<b>670</b>

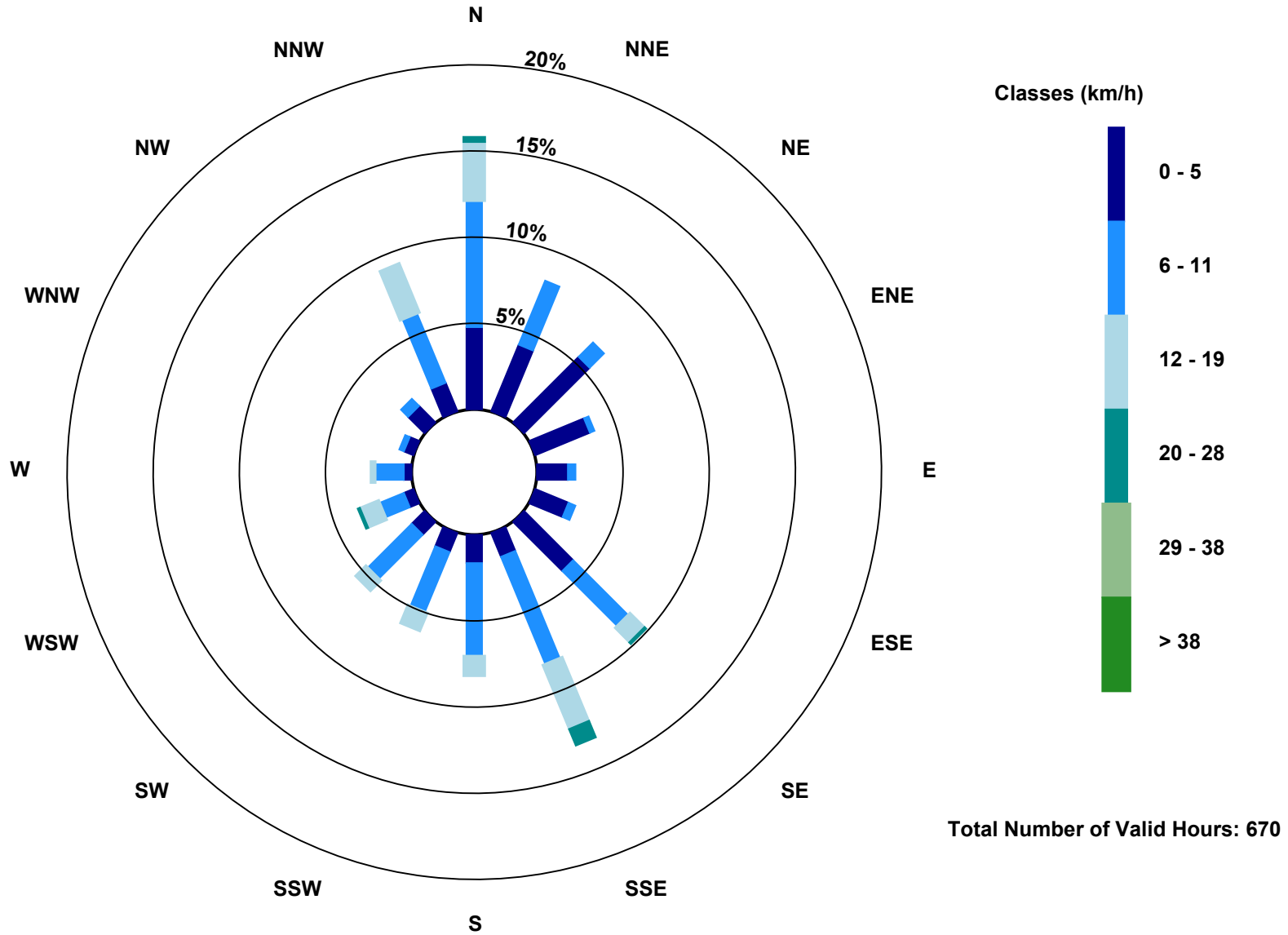
Total Number of Valid Hours: 670

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Wapasu





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

**Wind Speed (WS) - km/h**  
**Wapasu - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Feb 2 21:00 Minimum Value: 0 km/h on Feb 8 08:00 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: 672 Hours of Data: 670 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-Feb	1	1	3	4	3	3	3	3	3	3	3	3	3	3	3	3	1	UO	1	1	1	1	1	1	4																
2-Feb	1	1	1	1	1	2	3	3	3	4	5	5	5	5	6	6	6	7	6	6	7	6	6	5	7																
3-Feb	5	5	5	5	4	4	4	3	2	2	2	2	2	3	2	2	2	2	2	2	2	2	1	1	5																
4-Feb	1	1	1	1	1	2	1	2	1	1	1	2	1	1	1	1	1	1	1	1	1	2	2	2	2																
5-Feb	1	1	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	2	2	3	3	4	3	4																
6-Feb	2	3	3	3	3	2	2	1	1	2	2	1	2	2	2	2	3	3	3	4	4	4	4	3	4																
7-Feb	3	4	4	3	3	5	4	3	2	3	5	5	6	6	6	5	5	2	1	2	2	2	2	2	6																
8-Feb	1	1	1	1	1	1	1	0	1	1	2	2	2	2	2	2	1	1	1	2	2	2	2	2	2																
9-Feb	3	3	2	3	2	2	2	2	2	3	3	4	2	3	4	3	2	2	2	2	2	2	2	1	4																
10-Feb	1	1	1	1	2	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	2	2	2	1	2																
11-Feb	2	2	2	2	1	2	2	2	3	2	5	3	3	3	3	3	4	4	4	3	2	2	2	3	5																
12-Feb	2	2	2	3	1	1	1	2	2	1	2	1	1	2	2	2	3	2	3	3	4	5	4	5	5																
13-Feb	5	4	3	3	3	4	3	4	4	4	5	5	6	6	6	6	5	4	4	5	5	5	5	4	6																
14-Feb	4	4	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	0	1	4																
15-Feb	1	1	1	1	1	1	1	1	1	1	2	2	2	1	2	2	1	1	1	1	1	2	2	3	3																
16-Feb	3	2	3	3	3	3	3	3	3	4	4	3	4	3	3	3	3	3	4	5	4	4	3	3	5																
17-Feb	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	3																
18-Feb	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2																
19-Feb	1	2	2	3	3	2	3	2	3	3	3	2	3	2	2	2	2	2	1	1	1	1	1	1	3																
20-Feb	1	1	1	1	1	1	1	1	2	4	3	3	3	3	2	2	3	1	1	1	1	3	2	3	4																
21-Feb	3	4	3	3	3	3	4	4	4	4	4	4	4	4	4	4	3	3	2	2	1	1	2	1	4																
22-Feb	2	1	1	1	1	1	0	1	1	3	3	3	2	2	2	2	1	1	1	1	1	1	1	1	3																
23-Feb	1	1	1	1	1	1	1	1	1	2	3	3	2	2	2	1	1	1	1	1	1	1	1	1	3																
24-Feb	1	2	2	2	2	2	3	2	4	4	5	6	6	6	5	5	5	5	5	4	4	4	4	4	6																
25-Feb	3	3	4	4	3	3	3	2	2	2	3	2	3	3	3	3	2	1	1	1	1	1	2	1	4																
26-Feb	2	1	2	2	2	2	3	3	3	4	4	4	3	3	3	3	3	3	3	3	3	3	2	1	4																
27-Feb	1	1	1	1	2	2	2	2	3	3	3	3	3	3	3	4	3	3	3	3	3	2	1	2	4																
28-Feb	1	1	1	1	1	1	1	UO	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1	1	2																
																	5	5	5	5	4	5	4	4	4	4	4	5	6	6	6	6	6	6	7	6	6	7	6	6	5
Diurnal Maximum																																									
UO - Unstable Operation																																									



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

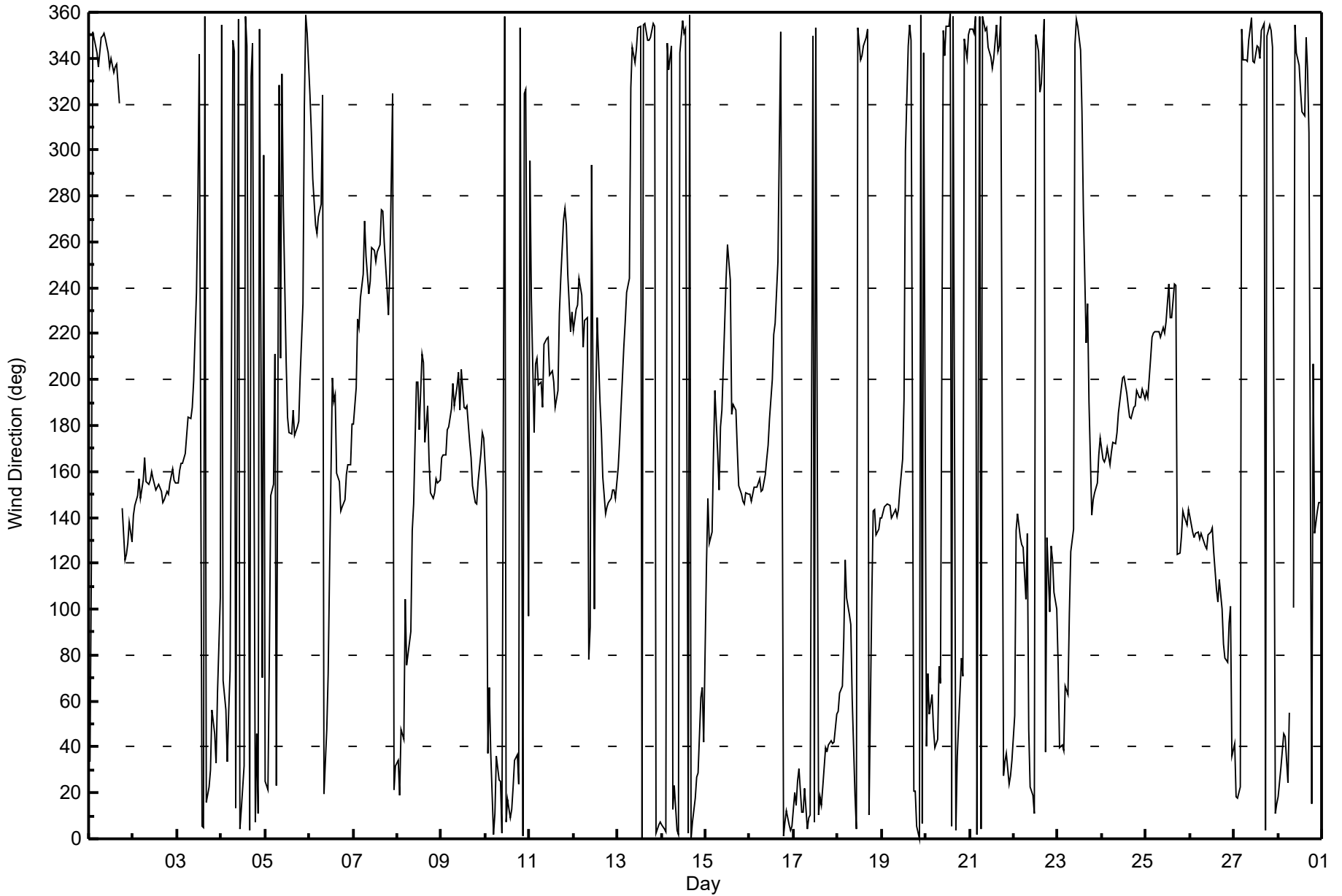
**Wind Direction (WD) - deg**  
**Wapasu - February 2023**

Direction of Maximum Speed: 147 deg on Feb 2 18:00																						Hours in Service: 672			
Direction of Maximum Daily Speed Average: 153.3 deg on Feb 2																						Hours of Data: 670			
Direction of Minimum Speed: 97 deg on Feb 11 00:00											Direction of Minimum Daily Speed Average: 1.2 deg on Feb 23											Hours of Missing Data: 2			
Monthly Average Direction: 157.1 deg																						Percent Operational Time: 99.7			
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-Feb	34	121	351	345	343	336	349	350	351	348	342	336	340	334	336	338	321	UO	144	121	124	129	138	129	348.1
2-Feb	141	146	149	157	148	156	166	156	154	156	160	157	152	153	154	151	146	147	152	150	155	161	156	155	153.3
3-Feb	155	161	164	164	168	176	184	183	188	200	238	278	342	5	5	358	16	22	30	56	46	33	63	105	158.6
4-Feb	355	69	56	33	56	73	348	343	13	357	4	13	32	358	346	4	332	347	7	46	11	353	70	298	9.8
5-Feb	25	21	78	149	154	211	23	328	209	333	275	208	184	177	176	187	176	179	182	201	233	319	359	351	214.0
6-Feb	324	308	287	267	264	271	277	324	20	48	72	118	201	190	193	160	156	143	145	148	159	163	163	181	184.7
7-Feb	180	197	226	223	235	246	269	254	238	243	258	256	251	256	259	274	274	260	240	228	246	325	21	32	250.3
8-Feb	34	19	48	44	104	76	85	90	134	146	199	199	178	211	207	172	188	165	151	148	151	157	155	156	154.5
9-Feb	166	167	167	178	179	187	198	188	197	203	186	204	188	187	188	172	166	154	146	146	156	168	177	175	177.3
10-Feb	151	37	66	38	2	11	36	25	25	2	358	8	17	9	13	23	34	37	24	353	1	325	326	97	18.7
11-Feb	295	235	177	207	209	198	199	188	215	218	218	202	204	199	188	196	229	244	270	274	268	246	221	229	220.3
12-Feb	221	231	233	244	237	214	226	227	78	92	294	100	192	227	191	177	158	142	144	147	148	152	152	148	175.1
13-Feb	161	173	187	214	225	238	244	327	345	338	344	353	354	0	354	355	348	348	349	355	354	3	6	7	342.2
14-Feb	6	4	3	347	335	345	13	23	4	2	342	356	351	353	2	359	0	7	18	27	28	62	66	42	3.8
15-Feb	120	148	129	134	168	195	168	152	180	187	224	244	259	243	185	189	187	170	154	150	147	146	151	150	168.8
16-Feb	150	147	153	153	153	157	151	152	159	166	171	183	200	220	225	251	303	352	1	7	12	6	4	5	164.0
17-Feb	20	15	25	30	12	12	22	4	9	10	350	7	353	10	18	15	22	40	38	41	43	41	42	54	20.4
18-Feb	55	63	67	87	121	105	98	93	61	19	4	354	339	341	345	349	353	10	105	143	143	133	135	140	47.1
19-Feb	140	145	145	146	145	140	141	144	141	143	152	165	191	299	345	354	348	21	21	6	0	359	7	342	127.7
20-Feb	40	72	54	63	48	40	43	75	68	352	341	354	354	359	5	358	4	36	51	79	71	348	340	350	12.7
21-Feb	353	353	351	358	2	358	4	358	352	353	344	340	336	340	355	343	345	358	28	33	37	24	28	34	355.5
22-Feb	53	134	142	131	128	127	105	133	47	23	19	11	351	343	325	329	357	38	131	99	128	122	107	100	51.2
23-Feb	76	40	41	39	67	63	99	125	135	346	357	354	344	317	274	216	233	190	141	148	151	155	167	174	94.3
24-Feb	165	164	166	170	163	168	173	172	177	186	196	201	201	194	189	184	183	188	188	195	192	192	196	192	185.9
25-Feb	195	192	209	219	220	221	221	221	218	223	220	225	242	227	227	242	241	124	125	132	143	140	137	143	206.1
26-Feb	140	134	131	133	134	130	133	129	127	126	132	134	136	125	109	103	113	100	85	78	77	94	101	36	118.9
27-Feb	41	18	18	23	353	339	339	339	348	357	339	338	345	345	340	352	355	3	350	354	352	345	11	15	350.9
28-Feb	18	31	38	46	44	24	55	UO	101	354	342	337	326	317	315	349	335	307	15	207	133	143	146	146	16.0
130.3 143.3 154.5 164.8 172.9 192.4 178.4 158.2 135.5 315.5 300.8 295.0 277.1 281.5 289.7 314.4 319.2 98.0 116.2 119.2 133.8 123.8 121.1 128.4																								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 (WD) - deg**  
**Wapasu - February 2023**







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

**Wind Direction (WD) - deg**  
**Wapasu - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 105 deg on Feb 6 12:00 Minimum Value: 5 deg on Feb 2 01:00 Percentiles: P <sub>1</sub> = 8 P <sub>10</sub> = 16 Q <sub>1</sub> = 19 Median = 24 Q <sub>3</sub> = 28 P <sub>90</sub> = 38 P <sub>99</sub> = 84																		Hours in Service: 672 Hours of Data: 670 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-Feb	26	25	23	18	18	14	19	22	24	18	18	19	21	19	17	18	15	UO	13	22	23	10	9	12	26				
2-Feb	5	7	9	13	13	19	23	20	17	22	23	23	20	21	20	21	19	19	19	20	23	24	21	20	24				
3-Feb	20	25	26	25	28	29	28	29	25	29	22	39	19	25	29	24	29	30	27	32	23	35	26	68	68				
4-Feb	55	24	52	46	26	38	45	37	29	25	25	36	32	23	25	22	25	39	33	42	97	38	81	76	97				
5-Feb	84	43	20	42	23	78	59	63	77	58	54	41	30	33	45	47	27	29	27	25	32	31	27	23	84				
6-Feb	19	22	29	27	30	28	28	36	24	27	41	105	31	32	29	25	27	18	17	24	23	23	26	30	105				
7-Feb	28	30	20	20	18	25	26	24	16	20	25	25	24	24	25	27	27	26	19	17	19	29	30	24	30				
8-Feb	26	33	27	24	29	10	63	16	21	7	35	29	29	26	29	27	22	16	13	15	14	16	15	17	63				
9-Feb	22	22	23	25	28	25	21	24	23	22	29	26	29	29	27	26	24	18	18	17	21	23	20	22	29				
10-Feb	15	65	27	31	26	26	21	24	23	24	21	24	27	27	27	28	28	25	27	28	47	33	90	95	95				
11-Feb	89	58	31	39	29	26	27	28	23	18	18	28	24	26	29	27	18	21	27	27	26	23	17	16	89				
12-Feb	17	15	14	24	21	15	11	18	84	70	71	62	33	29	34	26	22	17	18	18	17	20	19	19	84				
13-Feb	24	31	27	26	17	19	20	31	20	16	19	24	25	27	25	24	22	20	20	24	24	27	28	29	31				
14-Feb	28	28	27	22	16	21	28	28	27	26	25	28	25	27	25	27	24	21	16	19	23	32	8	18	32				
15-Feb	20	26	31	33	54	19	18	17	20	28	27	43	27	39	35	28	24	14	11	11	12	16	17	18	54				
16-Feb	18	18	18	19	20	20	19	19	24	26	27	29	27	19	25	22	32	24	25	29	29	28	27	28	32				
17-Feb	29	29	29	25	29	30	29	28	27	29	22	33	28	30	31	28	31	23	24	22	20	16	16	15	33				
18-Feb	18	13	12	16	39	54	21	11	44	27	27	26	25	28	26	31	29	50	25	9	9	12	8	8	54				
19-Feb	8	14	17	17	16	17	18	17	16	20	91	35	28	80	21	21	19	27	25	21	17	21	22	24	91				
20-Feb	23	19	23	11	25	18	16	17	20	70	22	24	28	28	29	29	27	22	10	19	40	20	15	22	70				
21-Feb	22	20	20	27	27	23	28	24	22	25	22	20	20	19	25	20	18	26	24	19	18	20	21	19	28				
22-Feb	45	69	31	17	25	16	16	20	44	27	31	31	33	40	56	32	25	24	33	25	19	20	14	20	69				
23-Feb	27	18	26	20	12	20	24	34	52	75	27	24	33	58	56	81	29	30	10	6	10	11	13	18	81				
24-Feb	12	13	17	18	16	23	22	22	26	27	27	27	26	30	29	29	28	28	28	27	26	28	27	27	30				
25-Feb	26	27	24	17	17	15	15	16	17	18	17	17	18	17	18	35	27	49	16	12	11	13	12	13	15	49			
26-Feb	17	13	15	16	16	15	17	18	19	20	18	21	24	24	29	23	25	24	23	24	24	28	31	26	31				
27-Feb	24	22	25	27	20	19	15	15	20	24	19	19	23	22	17	24	25	26	20	23	21	18	25	24	27				
28-Feb	18	18	18	18	16	20	13	UO	49	31	28	38	43	49	54	30	26	29	76	85	24	9	5	7	85				
																		Diurnal Maximum						89 69 52 46 54 78 63 63 84 75 91 105 43 80 56 81 49 50 76 85 97 38 90 95					
UO - Unstable Operation																													



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS18 STONY MOUNTAIN FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)  
FEBRUARY 2023

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	638	31	34	99.55	9.9	0	3.3	0
TRS(ppb) Average	637	33	35	99.7	0.6	0	0.3	0
THC(ppm) Average	638	31	34	99.55	2.2	-	2.2	-
NMHC(ppm) Average	638	31	34	99.55	0.005	-	0	-
CH4(ppm) Average	638	31	34	99.55	2.2	-	2.2	-
O3 (ppb) Average	639	32	33	99.85	43.7	0	41.2	-
NO2 (ppb) Average	639	33	33	100	13.5	0	4.7	-
NO (ppb) Average	639	33	33	100	19.4	-	1	-
NOX (ppb) Average	639	33	33	100	23.6	-	5	-
PM2.5 (ug/m3) Average	671	1	1	100	24.2	0	6.8	0
CO(ppm) Average	640	31	32	99.85	0.2	0	0.2	0
CO2(ppm) Average	637	34	35	99.85	452.4	0	449.9	0
Temperature 2 m (C) Average	672	0	0	100	4.2	-	1.3	-
Relative Humidity (%) Average	672	0	0	100	96.8	-	88.9	-
Wind Speed 20 m (km/h) Average	671	0	1	99.85	29	-	19	-
Wind Direction 20 m (deg) Average	671	0	1	99.85	-	-	-	-
Precipitation (mm) Total	672	0	0	100	0.9	-	2.9	-
Leaf Wetness (% of range) Average	672	0	0	100	67.3	-	10.3	-
Global Solar Radiation (W/m2) Average	672	0	0	100	532.5	-	113.1	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)  
FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	638	0.92	1.4	-	0	0.1	0.2	0.4	1.1	2.3	9.9
TRS (ppb) Average	637	0.21	0.1	-	0.1	0.1	0.2	0.2	0.3	0.3	0.6
THC (ppm) Average	638	2.08	0	-	2	2	2.1	2.1	2.1	2.1	2.2
NMHC(ppm) Average	638	0	0	-	0	0	0	0	0	0	0.005
CH4(ppm) Average	638	2.08	0	-	2	2	2.1	2.1	2.1	2.1	2.2
O3 (ppb) Average	639	33.74	5.4	-	16.8	25.9	30.8	34.5	38	40.1	43.7
NO2 (ppb) Average	639	2.04	1.8	-	0.1	0.4	0.7	1.5	2.7	4.3	13.5
NO (ppb) Average	639	0.19	0.8	-	0	0	0	0	0.1	0.6	19.4
NOX (ppb) Average	639	2.23	2.1	-	0.1	0.5	0.8	1.6	3	4.6	23.6
PM2.5 (ug/m3) Average	671	2.73	2	-	0.4	1	1.4	2.2	3.5	5.5	24.2
CO(ppm) Average	640	0.15	0	-	0.1	0.1	0.1	0.1	0.2	0.2	0.2
CO2(ppm) Average	637	440.35	4.6	-	431	435.3	437	439.6	443.5	446.8	452.4
Temperature 2 m (C) Average	672	-11.54	9.5	-	-32.4	-23.7	-19.1	-11.9	-2.2	0.7	4.2
Relative Humidity (%) Average	672	70.39	13	-	31.1	51.2	62.1	72.4	79.4	85.2	96.8
Wind Speed 10 m (km/h) Average	671	12	5	-	1	6	8	12	16	19	29
Wind Direction 10 m (deg) Average	671	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	672	-	-	9.55	-	-	-	-	-	-	-
Surface Wetness (% of range) Average	672	2.44	3.6	-	1	1.5	1.7	1.9	2.2	3	67.3
Global Solar Radiation (W/m2) Average	672	59.12	102.1	-	0	0	0	0.6	94.1	203.9	532.5

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)  
 FEBRUARY 2023

MONTHLY SUMMARY

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	03 Feb 2023 12:00	03 Feb 2023 13:00	2	Maintenance - station operator activities
THC/NMHC/CH4	03 Feb 2023 12:00	03 Feb 2023 13:00	2	Maintenance - replaced support gas cylinder
TRS	08 Feb 2023 12:00	08 Feb 2023 12:00	1	Maintenance - station operator activities
CO, CO2 O3, SO2, THC, TRS	22 Feb 2023 15:00	22 Feb 2023 15:00	1	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	14 Feb 2023 08:00	14 Feb 2023 08:00	1	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association

Summary of Hour Averages

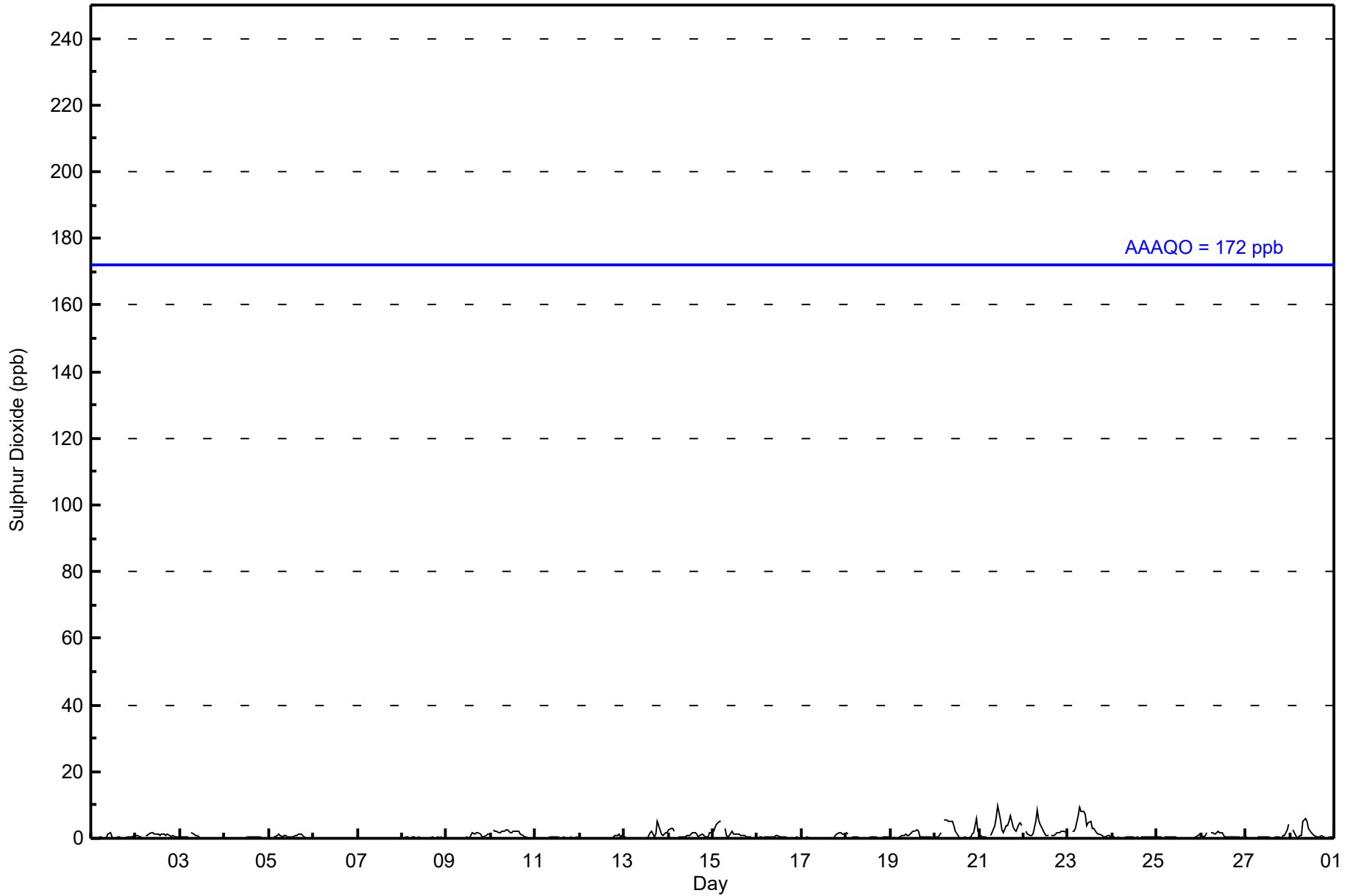
Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Stony Mountain - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																																									
Maximum Value: 9.9 ppb on Feb 21 11:00		Maximum Daily Average: 3.3 ppb on Feb 23				Hours of Data:		638																																									
Minimum Value: 0.0 ppb on Feb 1 01:00		Minimum Daily Average: 0.0 ppb on Feb 6				Hours of Missing Data:		34																																									
Maximum Diurnal Average: 1.5 ppb at hour 10		Minimum Diurnal Average: 0.6 ppb at hour 20				Hours of Calibration:		31																																									
Monthly Average: 0.92 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> = 1.1 P <sub>90</sub> = 2.3 P <sub>99</sub> = 6.7				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-Feb	0.0	0.0	0.0	Z	0.4	0.4	0.0	0.1	0.0	1.3	1.6	0.5	0.0	0.1	0.3	0.3	0.2	0.1	0.2	0.3	0.5	0.3	0.5	1.0	0.4	1.6																							
2-Feb	0.8	0.7	0.6	0.3	Z	1.0	0.8	1.2	1.8	1.6	1.2	1.3	1.1	1.0	1.4	1.1	0.7	1.4	1.0	0.5	0.9	0.5	0.4	0.3	0.9	1.8																							
3-Feb	0.2	0.3	0.3	0.4	0.6	Z	1.6	1.5	1.0	0.8	0.5	M	M	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.2	0.4	1.6																							
4-Feb	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.4	0.3	0.4	0.5	0.5	0.6	0.6	0.3	0.1	0.1	0.1	0.0	0.2	0.6																							
5-Feb	0.1	Z	0.1	0.3	0.9	1.3	0.8	0.6	0.7	0.7	0.6	0.5	0.5	0.6	0.7	0.9	1.4	1.1	0.7	0.3	0.2	0.1	0.1	0.0	0.6	1.4																							
6-Feb	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	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1																						
7-Feb	0.0	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.2																						
8-Feb	0.2	0.2	0.3	0.5	Z	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.1	0.2	0.5																							
9-Feb	0.2	0.1	0.1	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.8	1.5	1.5	1.6	1.5	1.1	0.6	0.6	0.9	1.1	1.5	0.6	1.6																							
10-Feb	Z	2.4	2.2	2.1	1.9	1.9	2.3	2.3	2.7	2.5	1.6	1.8	1.9	2.3	2.2	2.0	1.4	0.7	0.3	0.3	0.2	0.0	0.0	0.1	1.5	2.7																							
11-Feb	0.1	Z	0.0	0.1	0.1	0.1	0.0	0.1	0.2	0.4	0.3	0.4	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	0.4																							
12-Feb	0.1	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.9	0.7	1.3	0.4	0.7	0.3	1.3																							
13-Feb	0.6	0.2	0.2	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.7	1.5	2.0	0.6	1.3	5.0	2.4	1.3	1.0	1.5	1.9	0.9	5.0																							
14-Feb	2.6	3.1	2.8	2.0	Z	0.5	0.5	0.6	0.6	0.4	0.8	0.9	1.1	1.5	1.6	1.2	0.5	0.7	1.2	0.8	0.3	0.4	1.6	1.8	1.2	3.1																							
15-Feb	2.3	3.4	4.1	5.1	5.1	Z	3.0	0.8	0.5	0.9	2.1	1.4	1.3	1.4	1.5	1.0	0.8	0.7	0.6	0.5	0.3	0.1	0.0	0.0	1.6	5.1																							
16-Feb	Z	0.2	0.5	0.2	0.3	0.5	0.4	0.4	0.5	0.5	0.6	0.8	0.5	0.5	0.4	0.2	0.1	0.1	0.0	0.1	0.0	0.3	0.2	0.2	0.3	0.8																							
17-Feb	0.4	Z	0.1	0.6	0.2	0.1	0.0	0.0	0.0	0.1	0.0	C	C	C	0.0	0.0	0.0	0.0	0.8	1.4	1.6	1.5	1.2	1.2	0.5	1.6																							
18-Feb	1.8	1.4	Z	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.1	0.3	0.6	0.3	0.4	0.4	1.8																							
19-Feb	0.3	0.2	0.3	Z	0.5	0.6	0.8	0.8	1.2	0.7	0.9	1.6	2.3	2.1	2.4	2.0	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.8	2.4																							
20-Feb	0.3	0.4	0.2	1.9	Z	5.6	5.4	5.1	5.2	4.9	3.7	2.0	0.8	0.2	0.1	0.1	0.3	0.1	0.2	0.3	1.3	1.9	6.0	2.3	2.1	6.0																							
21-Feb	1.2	0.6	0.6	0.4	0.5	Z	0.8	1.9	3.8	6.3	9.9	5.5	2.4	1.8	3.8	3.7	4.9	6.6	3.5	2.4	1.9	4.2	4.7	3.6	3.3	9.9																							
22-Feb	Z	2.3	1.3	1.0	0.8	1.2	5.2	8.7	5.3	4.1	2.5	1.5	1.0	0.8	M	0.7	0.8	1.3	1.7	1.8	2.1	2.2	2.0	1.9	2.3	8.7																							
23-Feb	1.7	Z	2.1	2.0	2.8	6.7	9.3	8.1	7.9	7.1	3.8	4.7	5.2	3.0	2.8	1.8	1.3	1.1	0.8	0.5	0.6	0.7	1.0	0.6	3.3	9.3																							
24-Feb	0.4	0.3	Z	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.4	0.3	0.1	0.2	0.2	0.2	0.2	0.4	0.4	0.5	0.4	0.4	0.3	0.4	0.3	0.5																							
25-Feb	0.5	0.5	0.5	Z	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.9	1.5	0.3	1.5																							
26-Feb	0.7	0.6	1.0	1.7	Z	1.5	1.5	1.4	1.8	2.0	1.9	1.8	1.0	0.5	0.5	0.4	0.3	0.3	0.4	0.2	0.2	0.1	0.2	0.2	0.9	2.0																							
27-Feb	0.2	0.1	0.2	0.1	0.1	Z	0.4	0.2	0.4	0.6	0.5	0.4	0.4	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.8	0.8	2.3	4.3	0.6	4.3																							
28-Feb	Z	2.5	1.7	0.7	0.2	0.7	0.8	5.0	6.0	5.1	2.8	1.8	1.3	0.7	0.5	0.4	0.3	0.8	0.6	0.2	0.2	0.3	0.3	0.3	1.4	6.0																							
																								0.6	0.8	0.8	0.9	0.7	1.0	1.2	1.4	1.5	1.5	1.3	1.1	0.9	0.7	0.8	0.8	0.6	0.7	0.7	0.6	0.6	0.7	0.9	0.9	Diurnal Average	
																								2.6	3.4	4.1	5.1	5.1	6.7	9.3	8.7	7.9	7.1	9.9	5.5	5.2	3.0	3.8	3.7	4.9	6.6	5.0	2.4	2.1	4.2	6.0	4.3	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  
Stony Mountain - February 2023





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Stony Mountain - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	638	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: 638

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Stony Mountain - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	61	34	34	27	25	16	14	21	30	79	55	43	47	47	48	56	637
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>	61	34	34	27	25	16	14	21	30	79	55	43	47	47	48	56	637

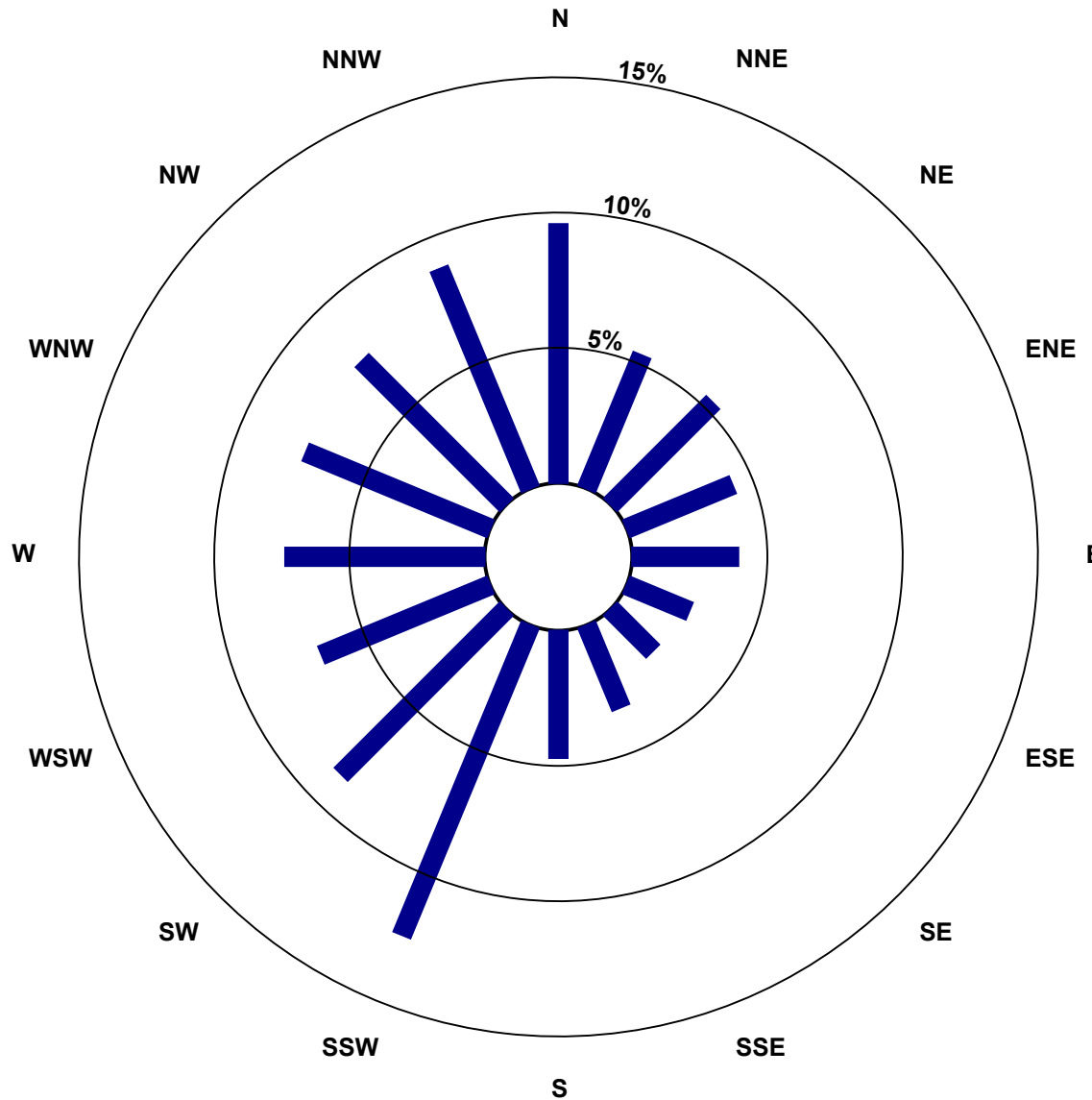
Total Number of Valid Hours: 637

Total Number of Hours: 672

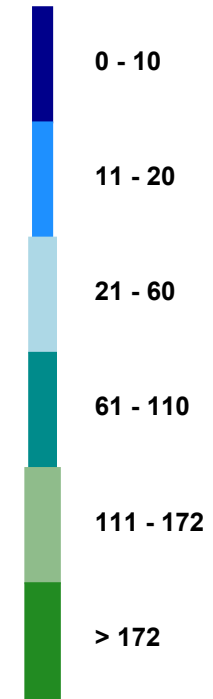


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

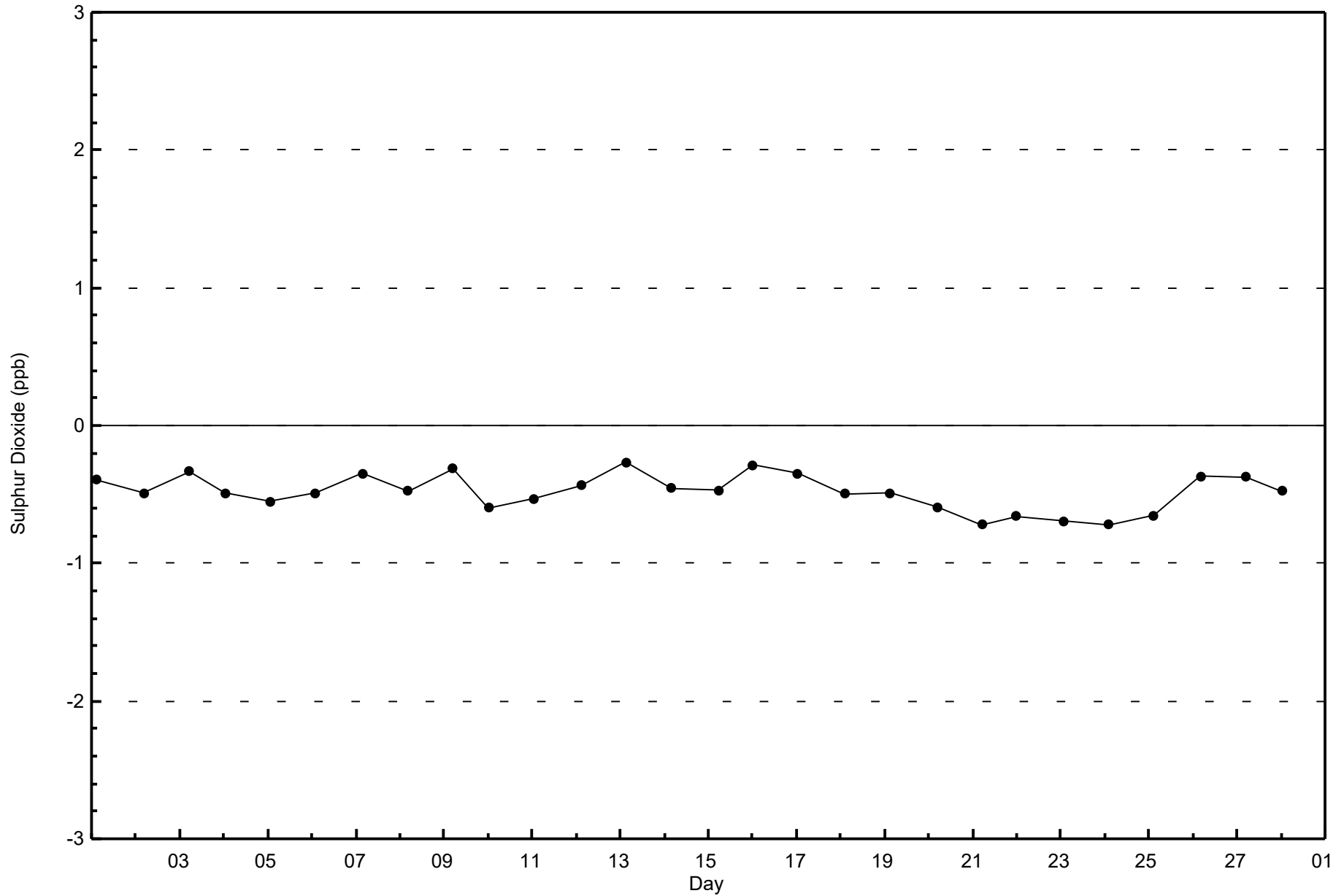
Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Stony Mountain

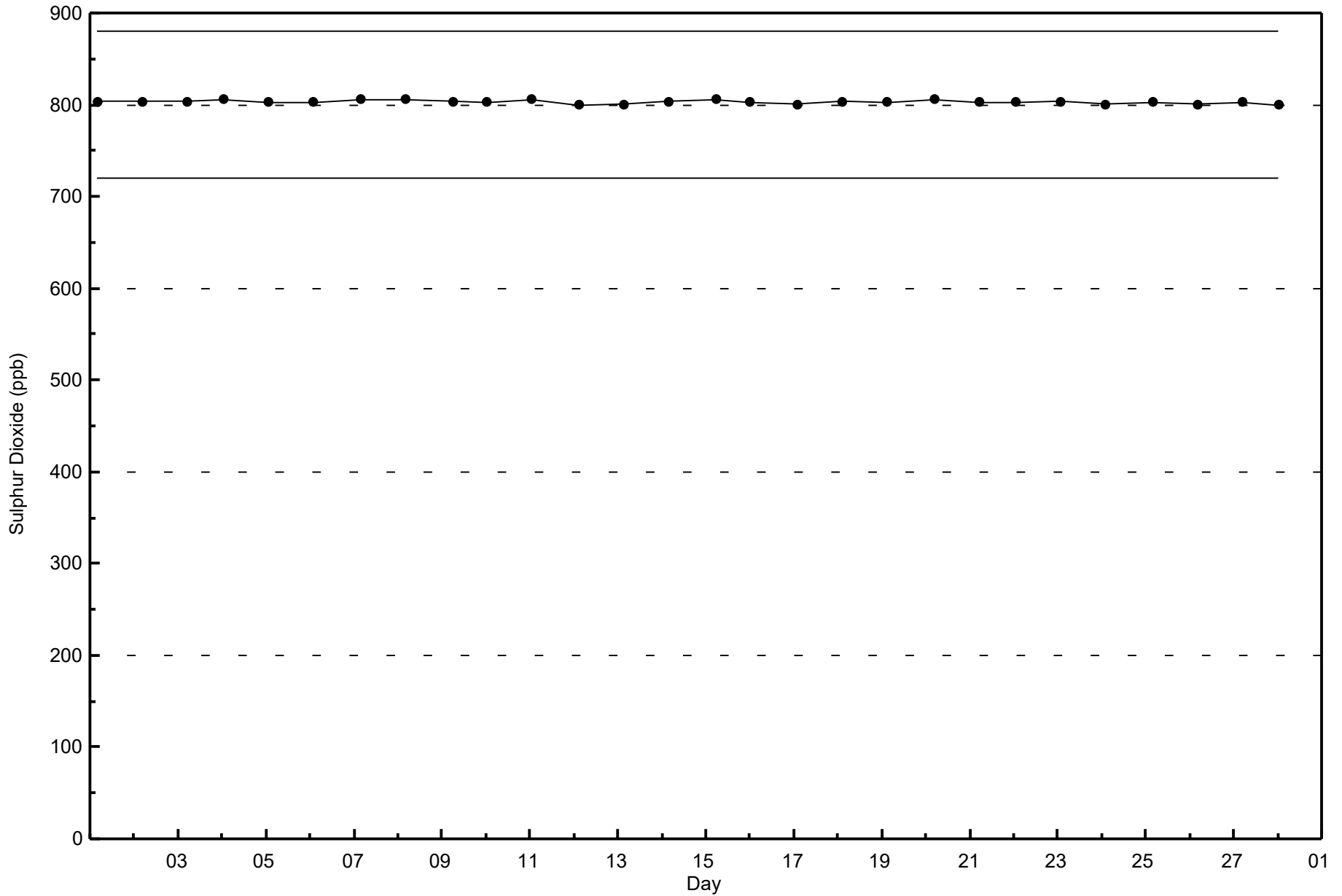


Classes (ppb)

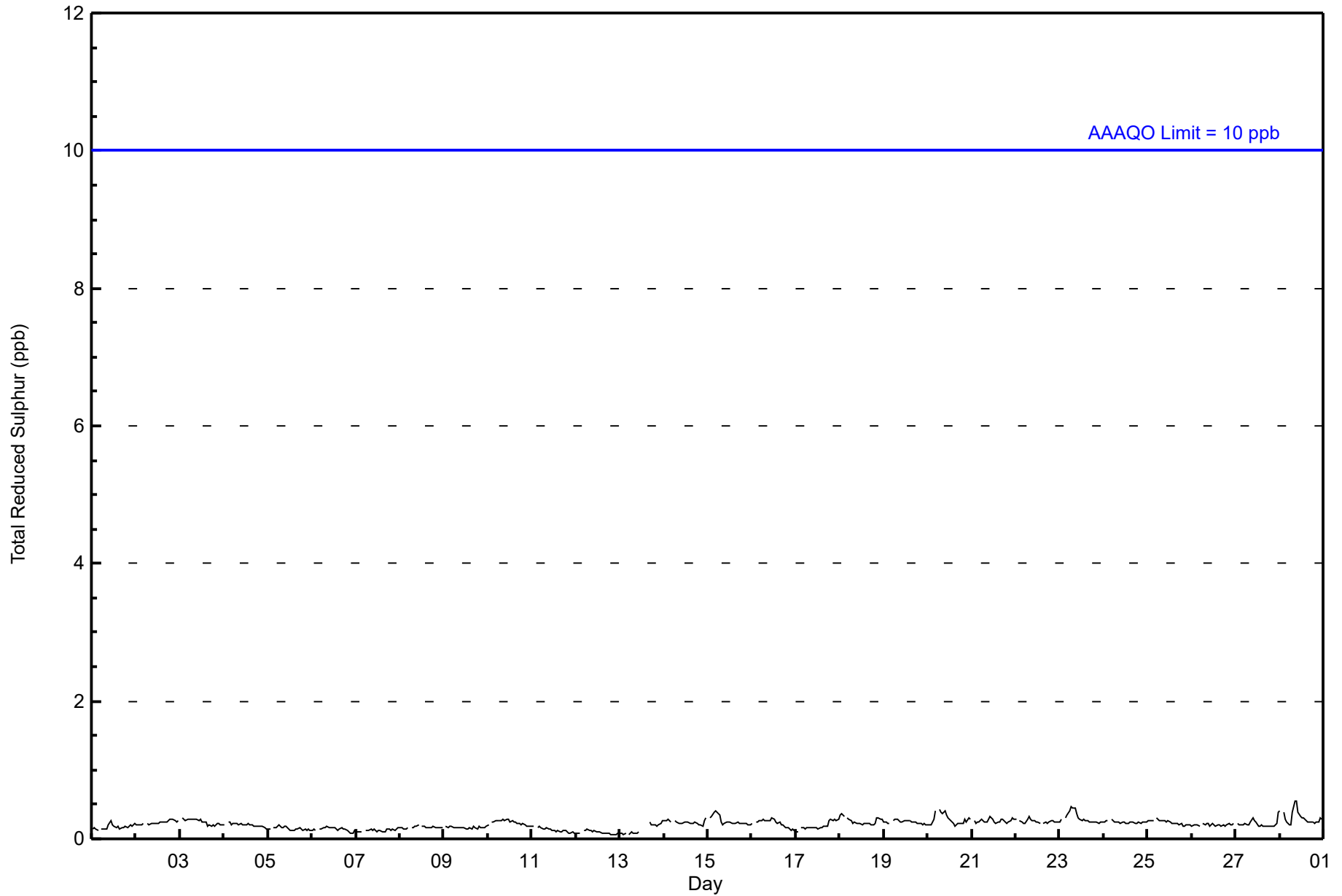


Total Number of Valid Hours: 637











**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Stony Mountain - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	637	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: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Stony Mountain - February 2023**

<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	58	34	33	25	25	16	14	21	30	79	57	44	48	47	47	58	636
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>	58	34	33	25	25	16	14	21	30	79	57	44	48	47	47	58	636

Total Number of Valid Hours: 636

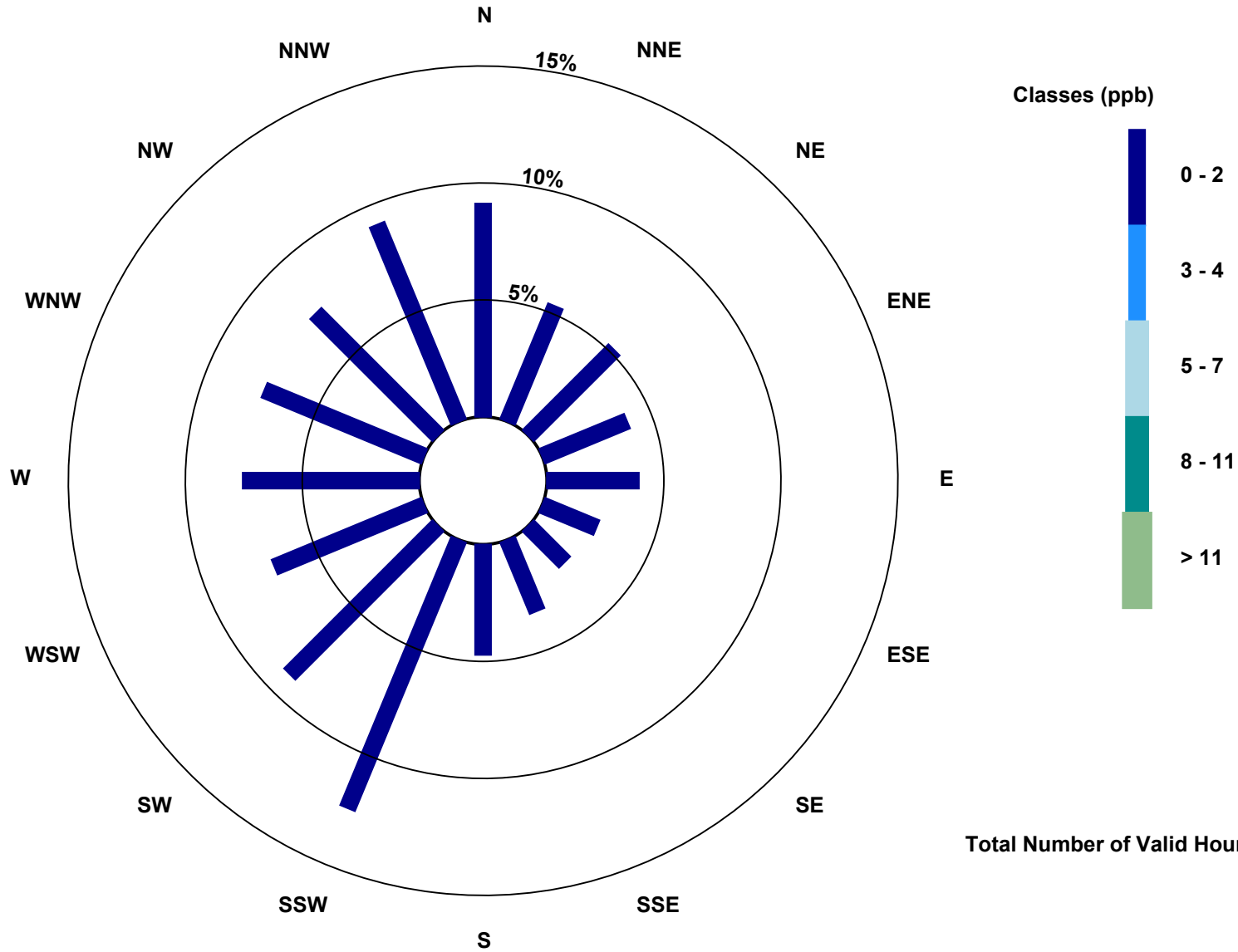
Total Number of Hours: 672

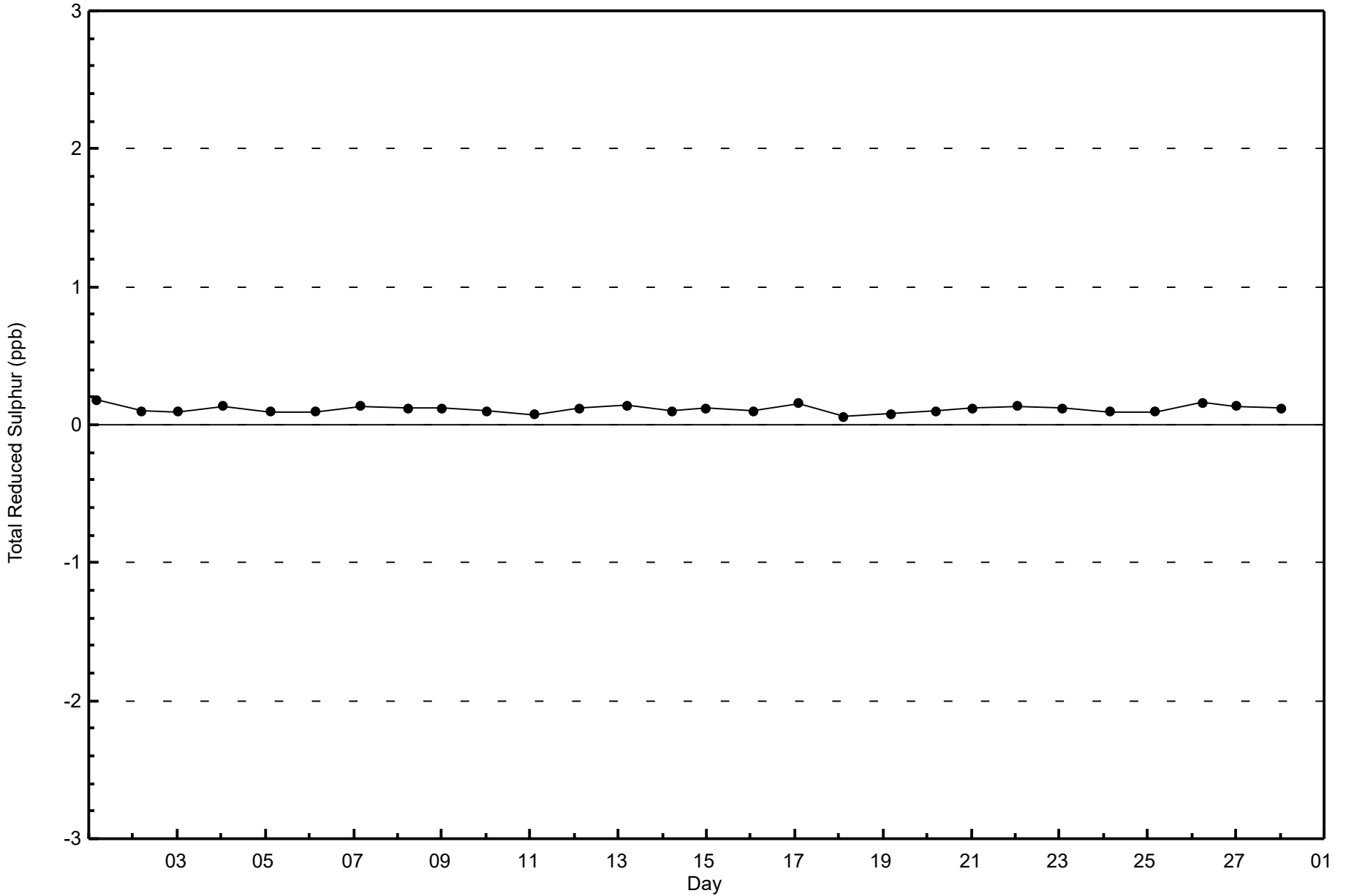


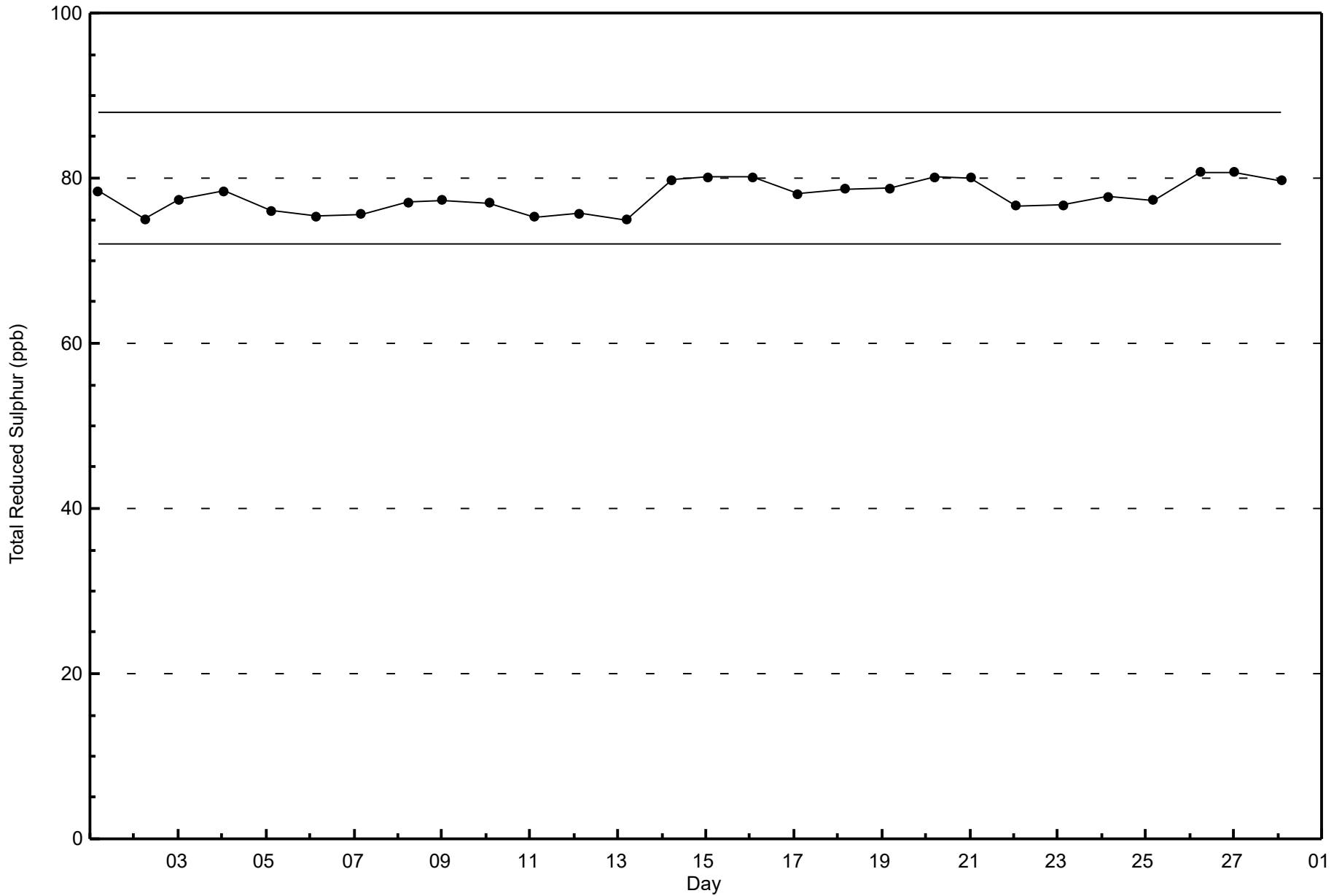


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Reduced Sulphur (TRS) - ppb  
Stony Mountain





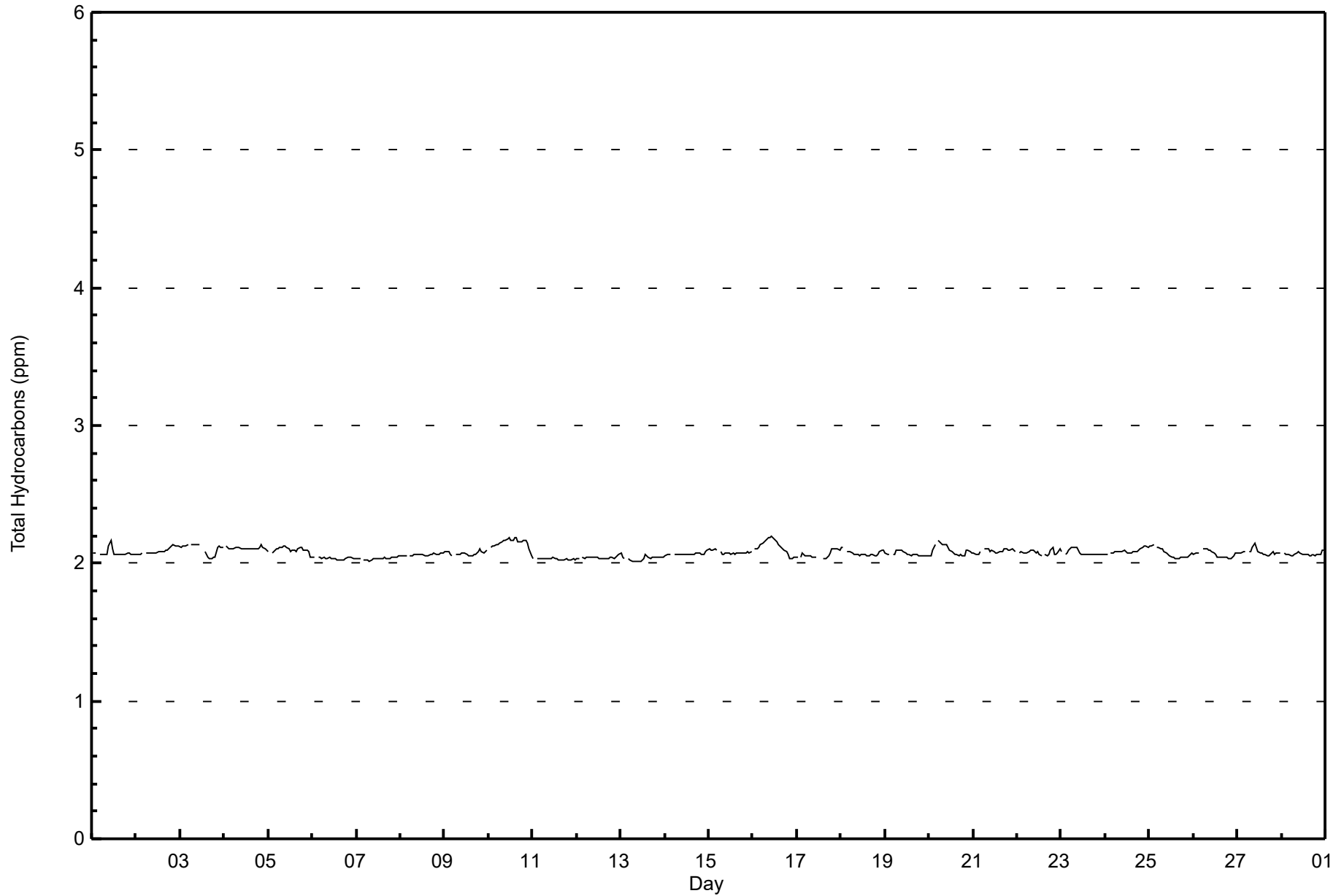






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Stony Mountain - February 2023**





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

**Total Hydrocarbons (THC) - ppm**  
**Stony Mountain - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	149	23.35	23.35
2.1 - 3.0	489	76.65	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Stony Mountain - February 2023**

<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	0	0	8	1	0	0	0	3	10	11	27	37	25	9	8	149
2.1 - 3.0	51	34	34	19	24	16	14	21	27	69	44	16	10	22	39	48	488
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>	61	34	34	27	25	16	14	21	30	79	55	43	47	47	48	56	637

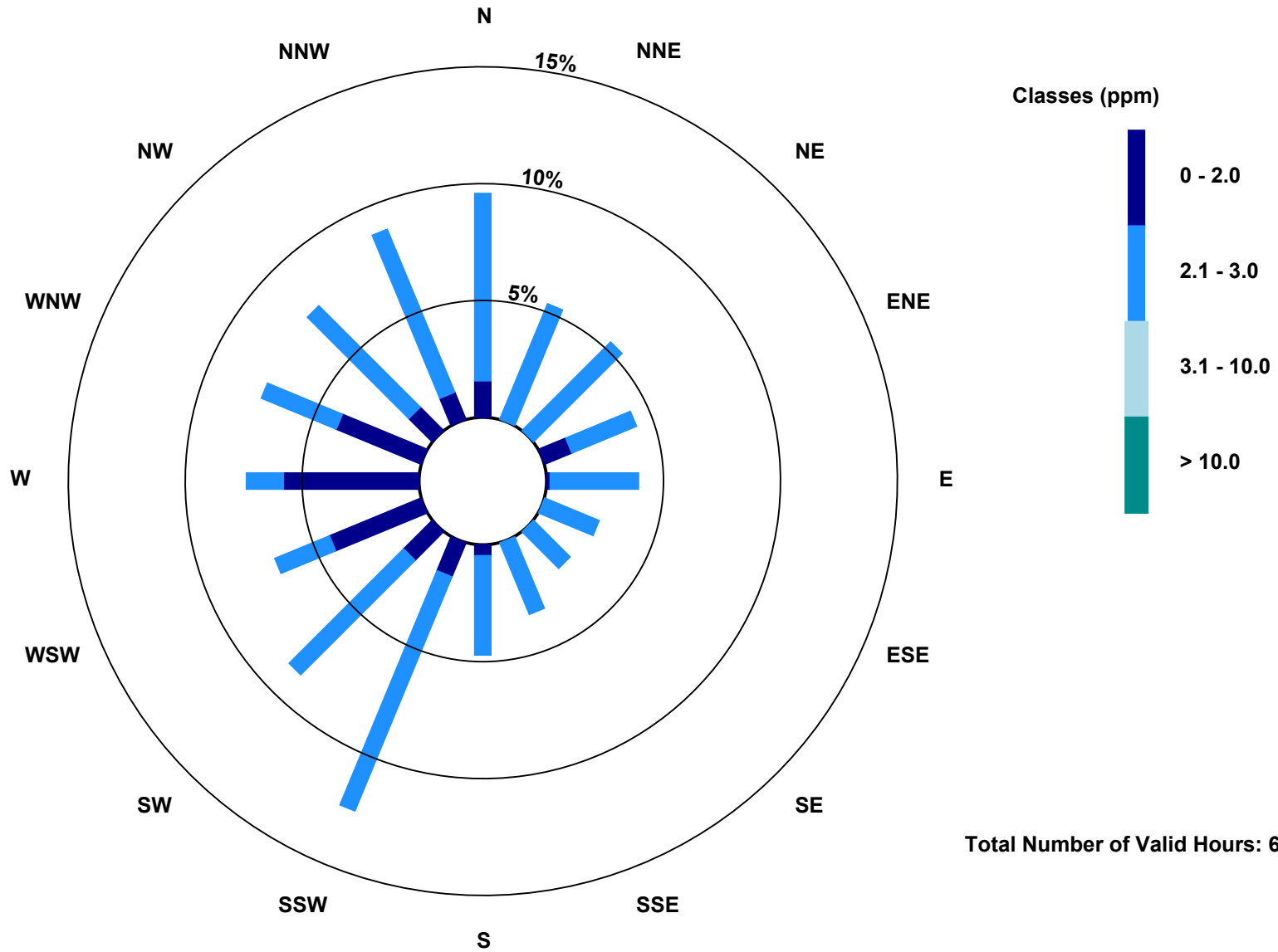
Total Number of Valid Hours: 637

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Hydrocarbons (THC) - ppm  
Stony Mountain





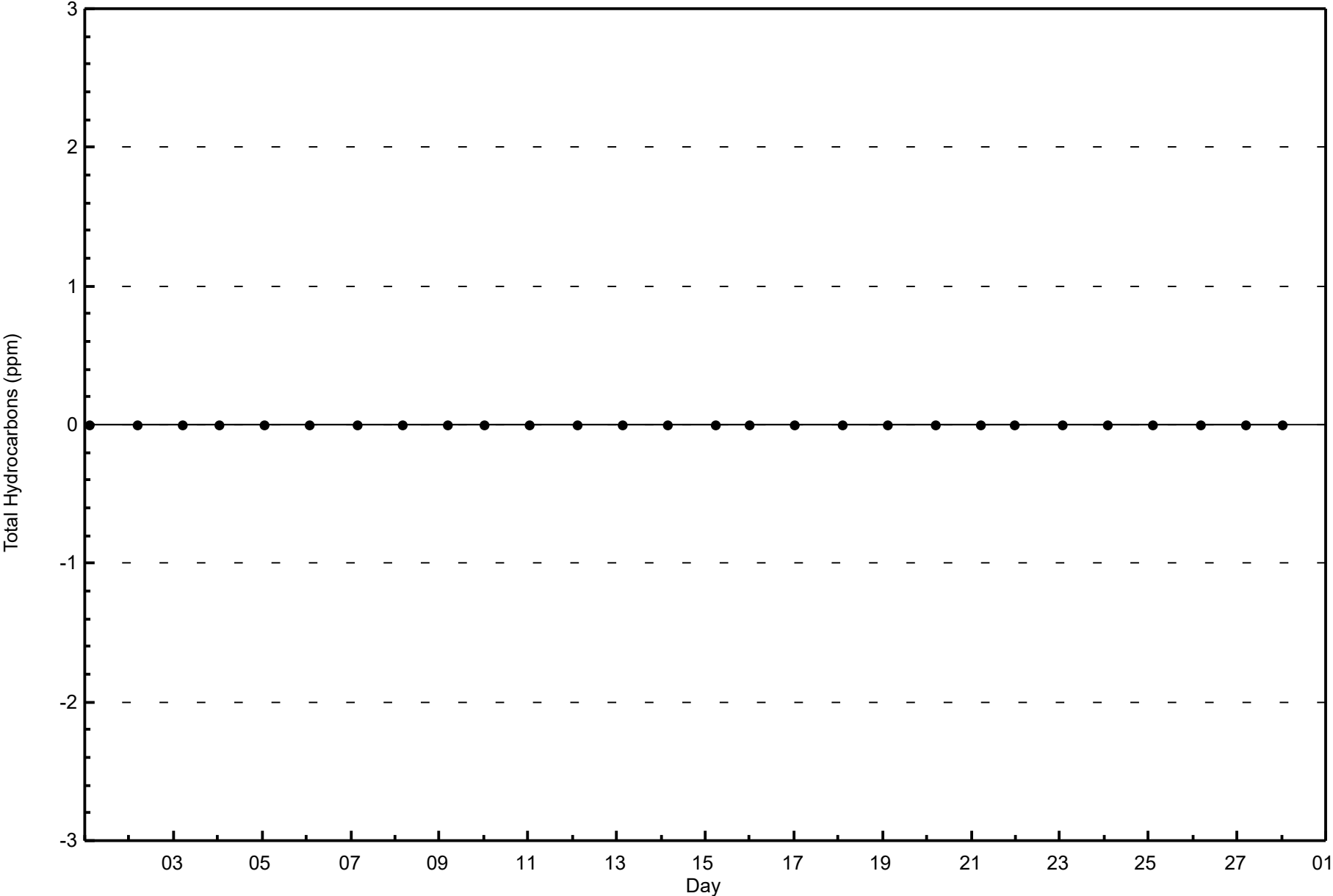


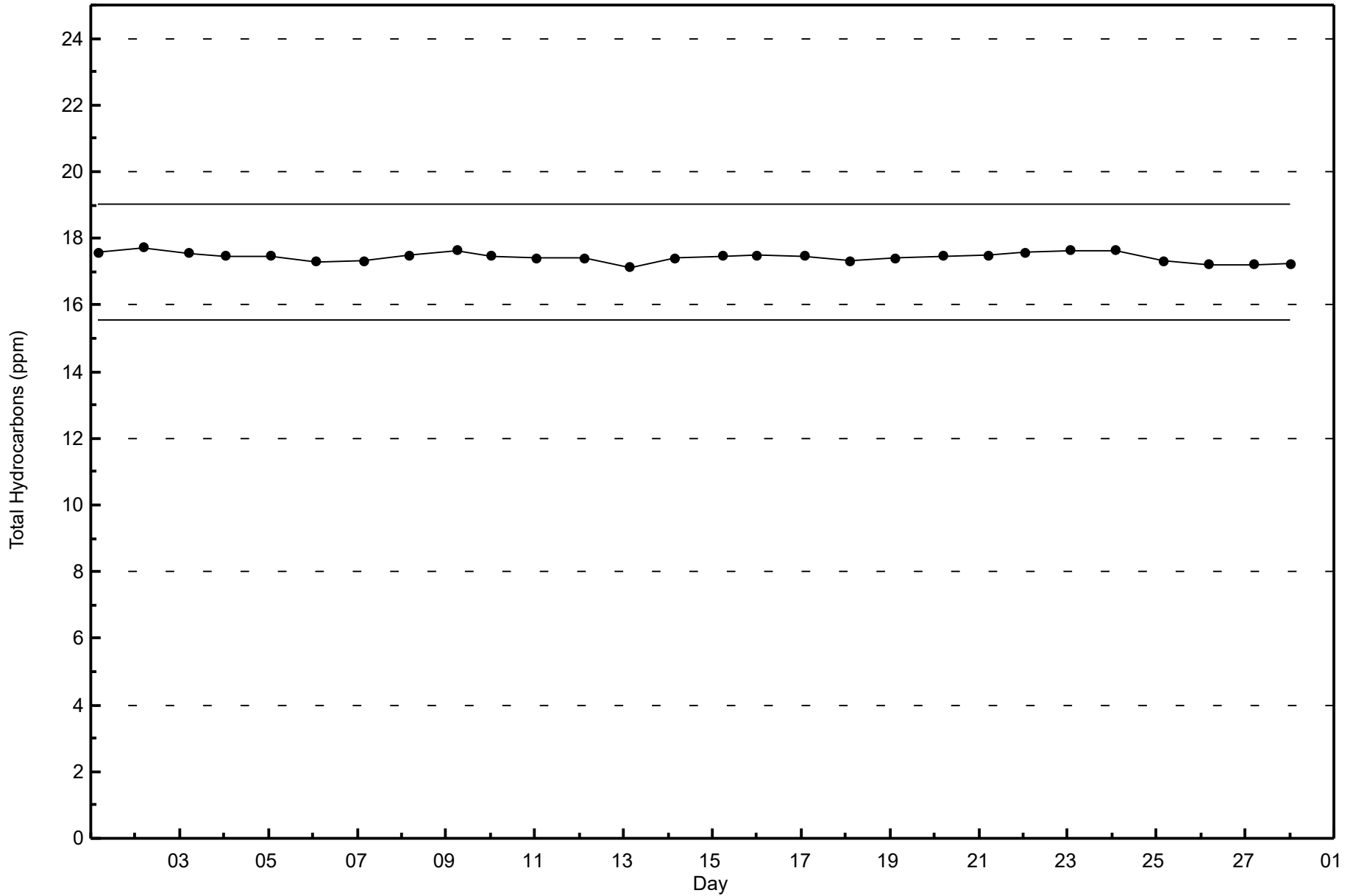
Wood Buffalo Environmental Association

Zero Responses

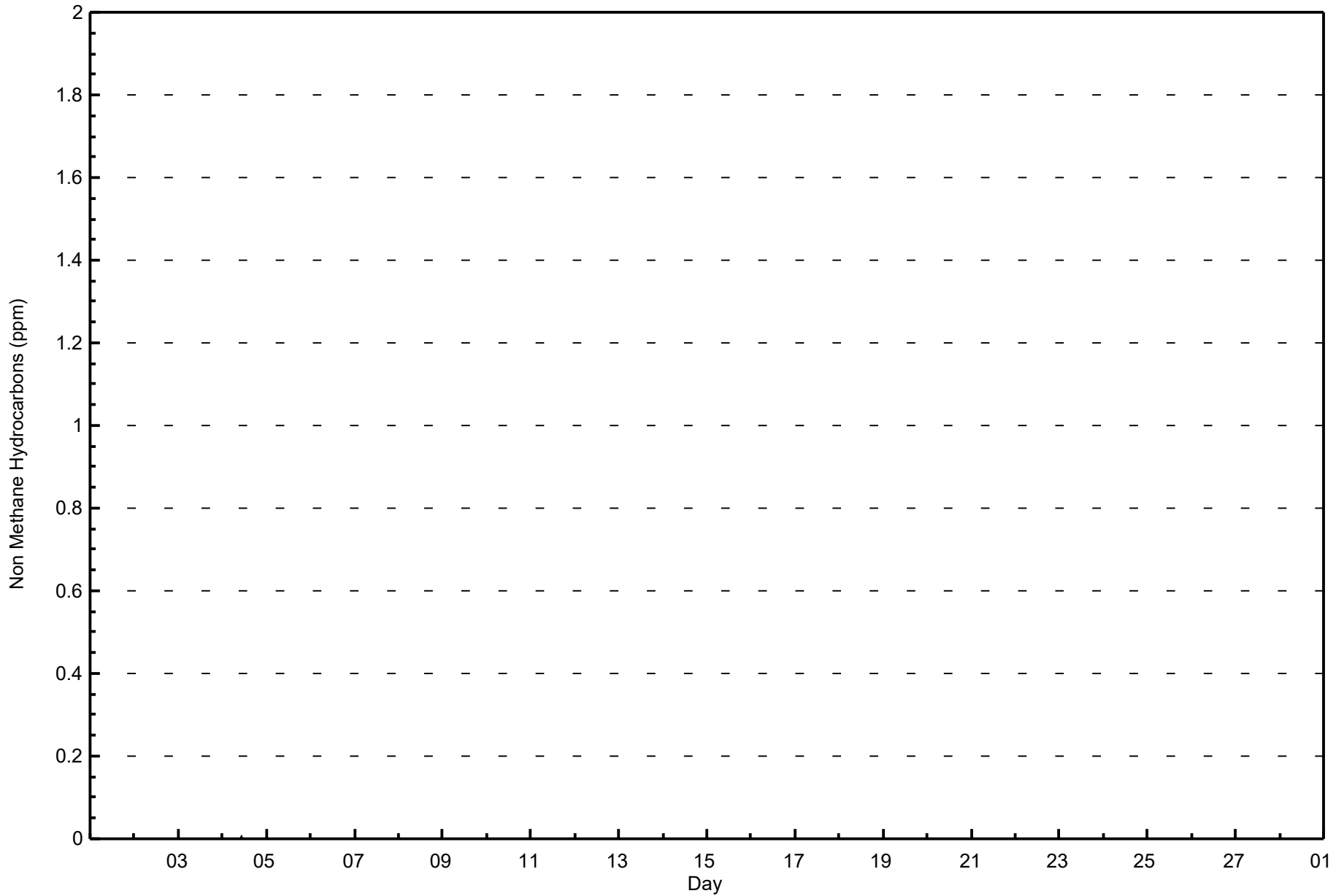
Total Hydrocarbons (THC) - ppm

Stony Mountain - February 2023











**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Stony Mountain - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	638	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: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Stony Mountain - February 2023**

<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	34	34	27	25	16	14	21	30	79	55	43	47	47	48	56	637
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>	61	34	34	27	25	16	14	21	30	79	55	43	47	47	48	56	637

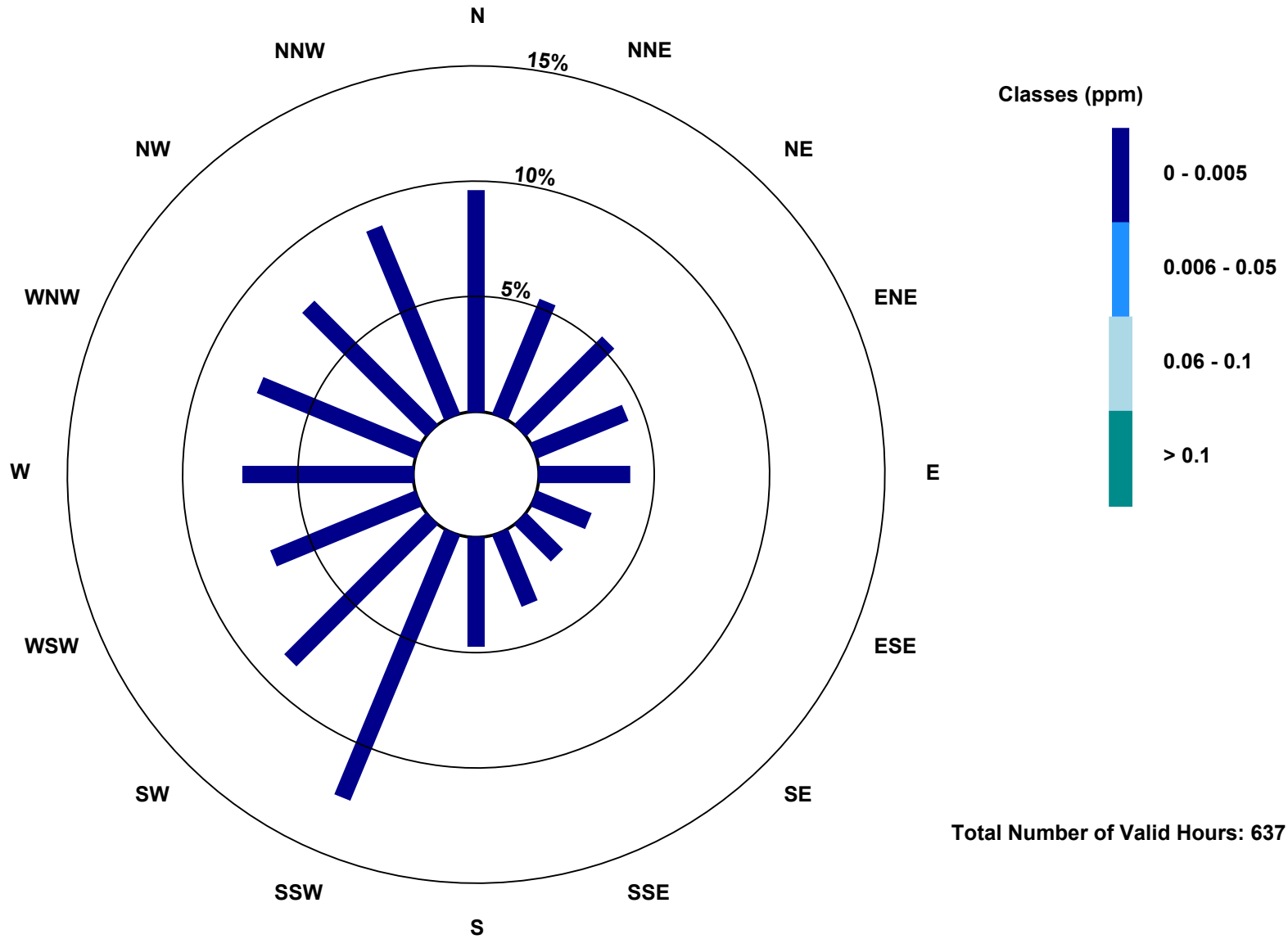
Total Number of Valid Hours: 637

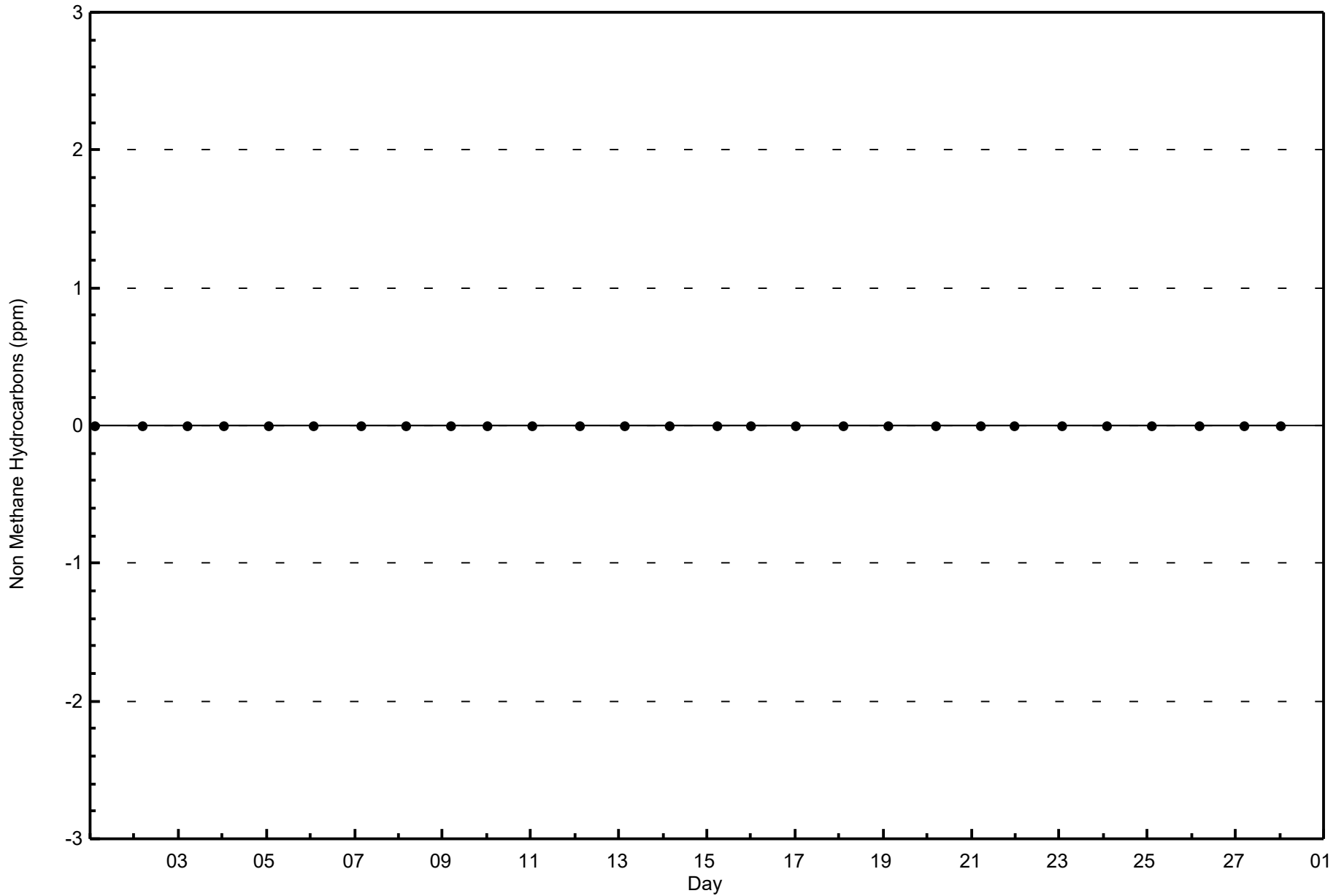
Total Number of Hours: 672



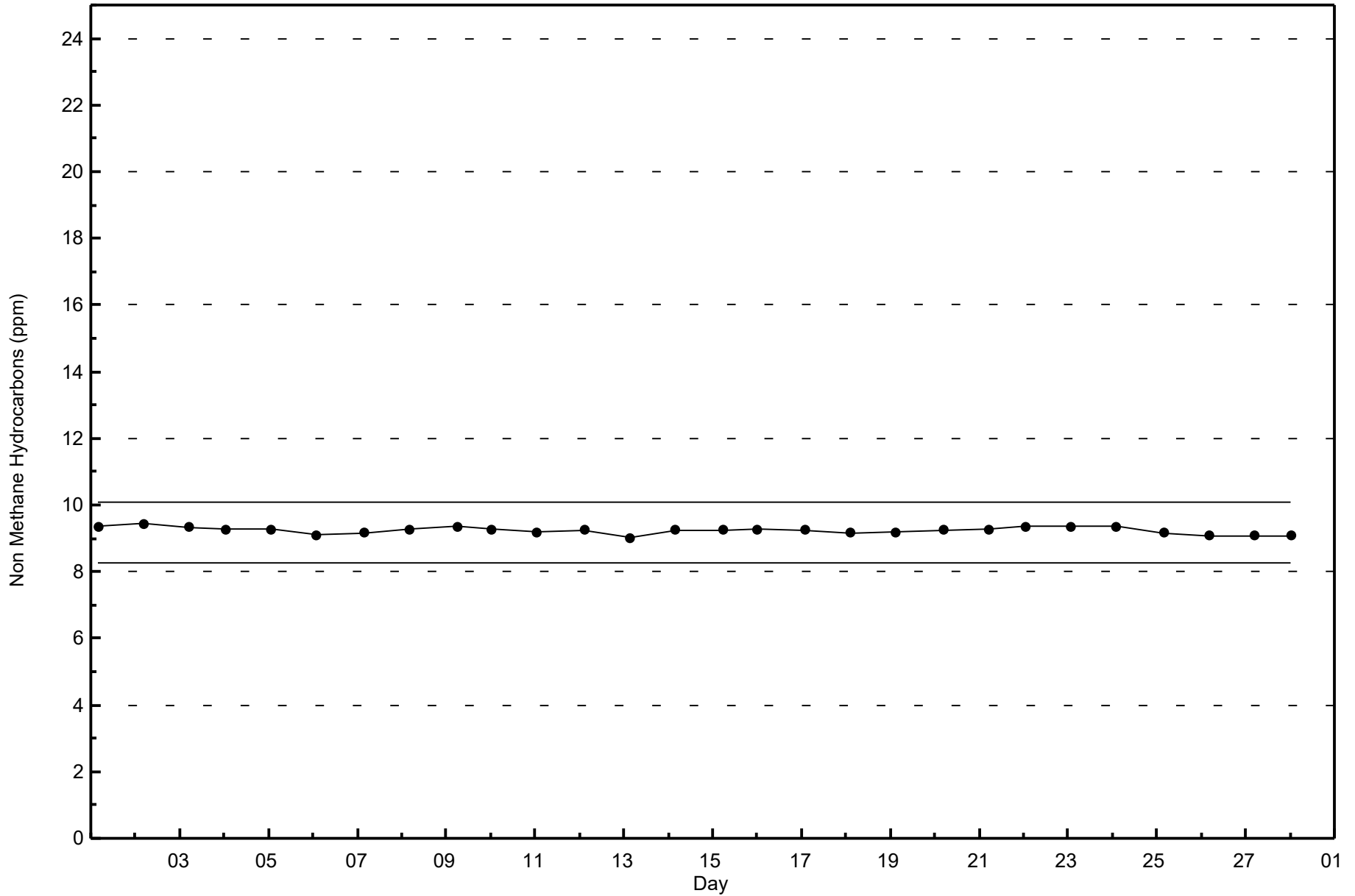
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Non Methane Hydrocarbons (NMHC) - ppm  
Stony Mountain

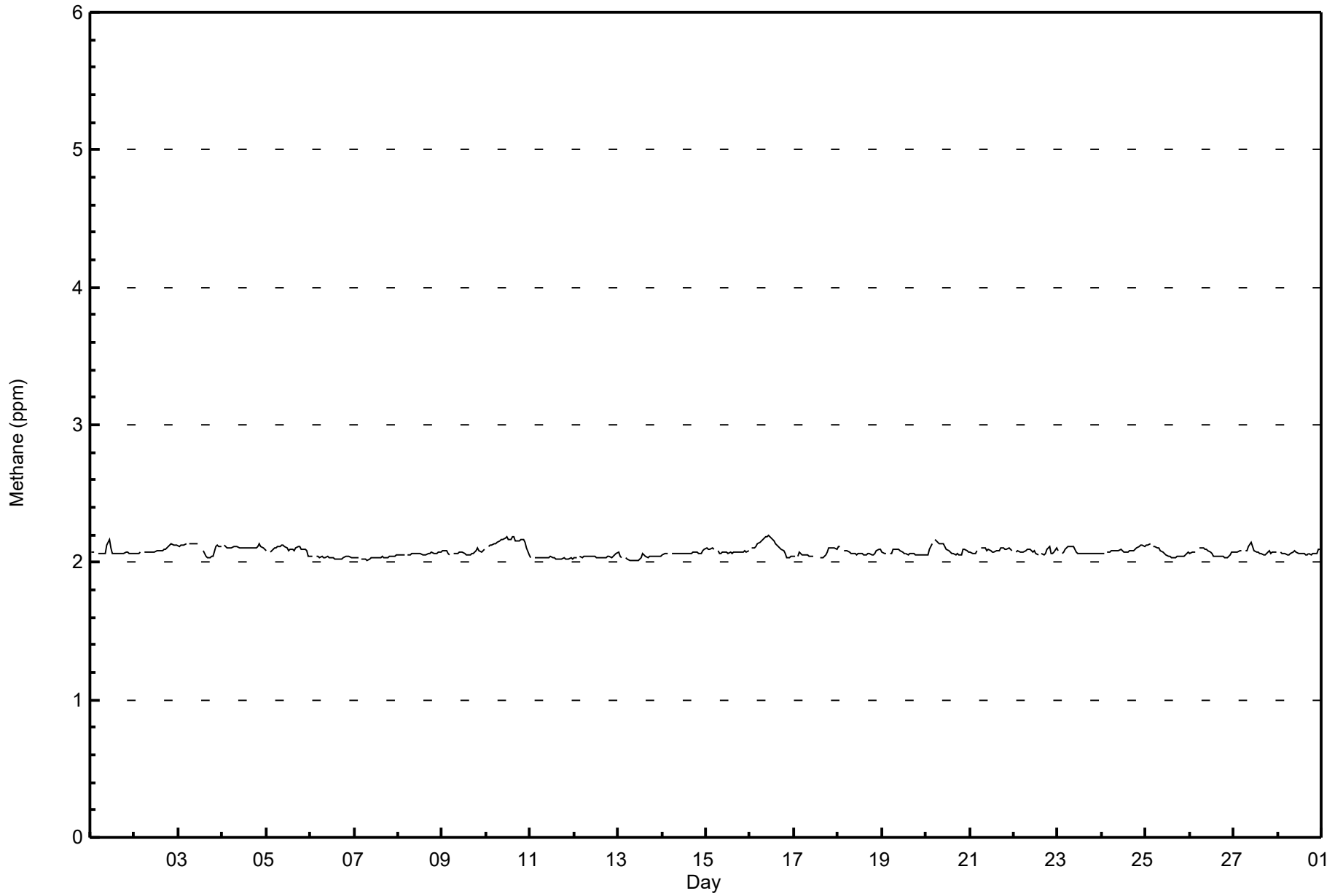














**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm**  
**Stony Mountain - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	149	23.35	23.35
2.1 - 3.0	489	76.65	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Stony Mountain - February 2023**

<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	0	0	8	1	0	0	0	3	10	11	27	37	25	9	8	149
2.1 - 3.0	51	34	34	19	24	16	14	21	27	69	44	16	10	22	39	48	488
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>	61	34	34	27	25	16	14	21	30	79	55	43	47	47	48	56	637

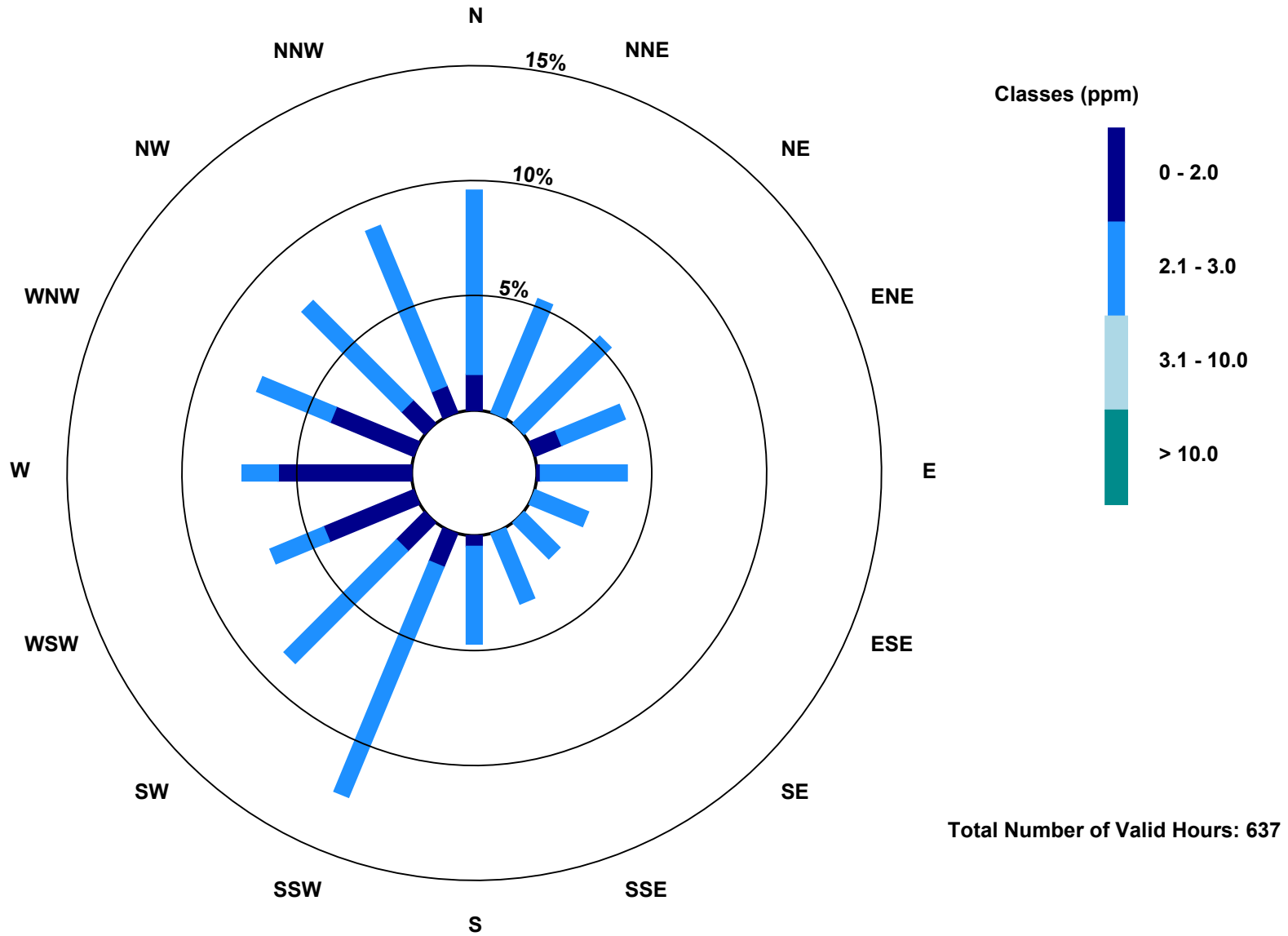
Total Number of Valid Hours: 637

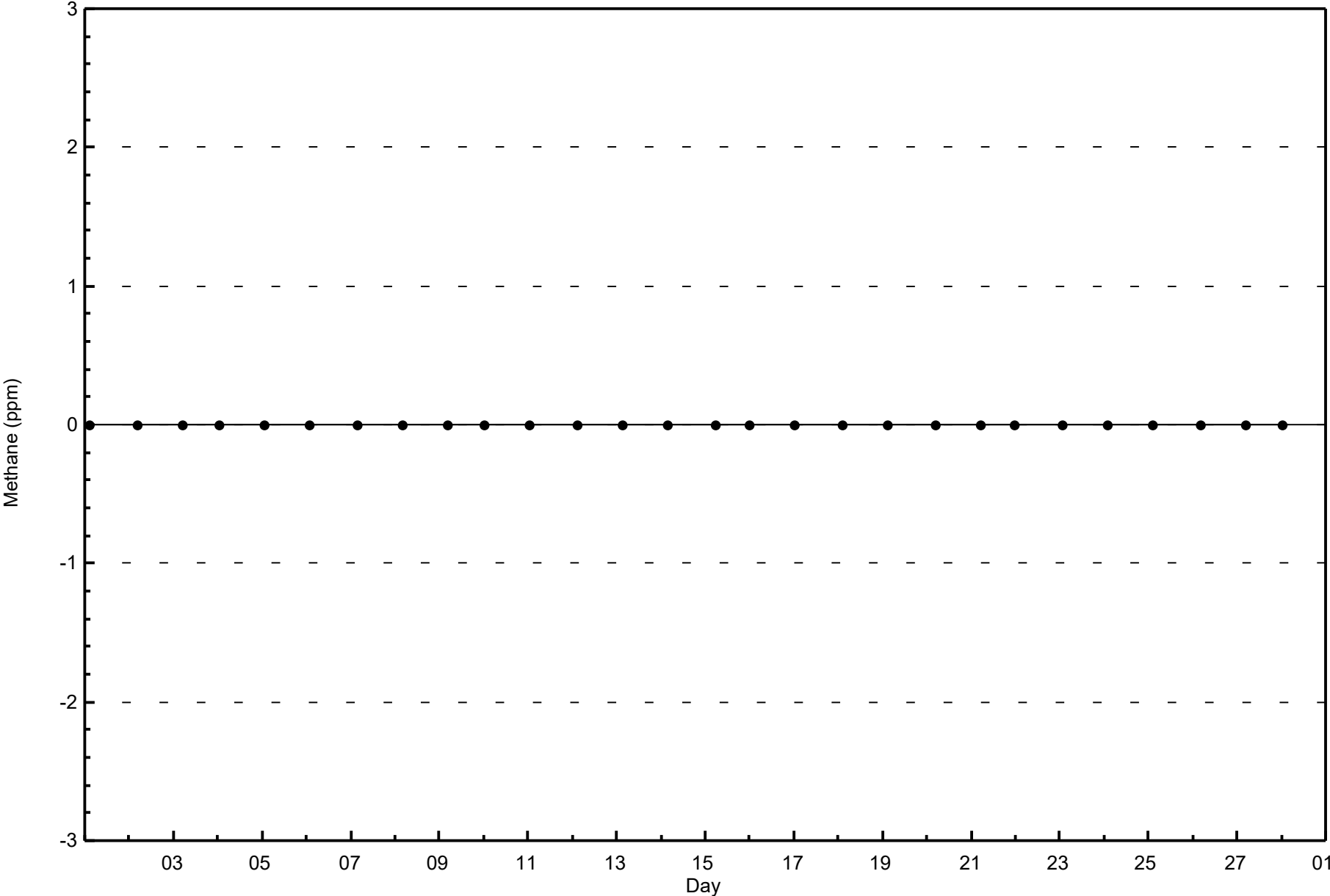
Total Number of Hours: 672

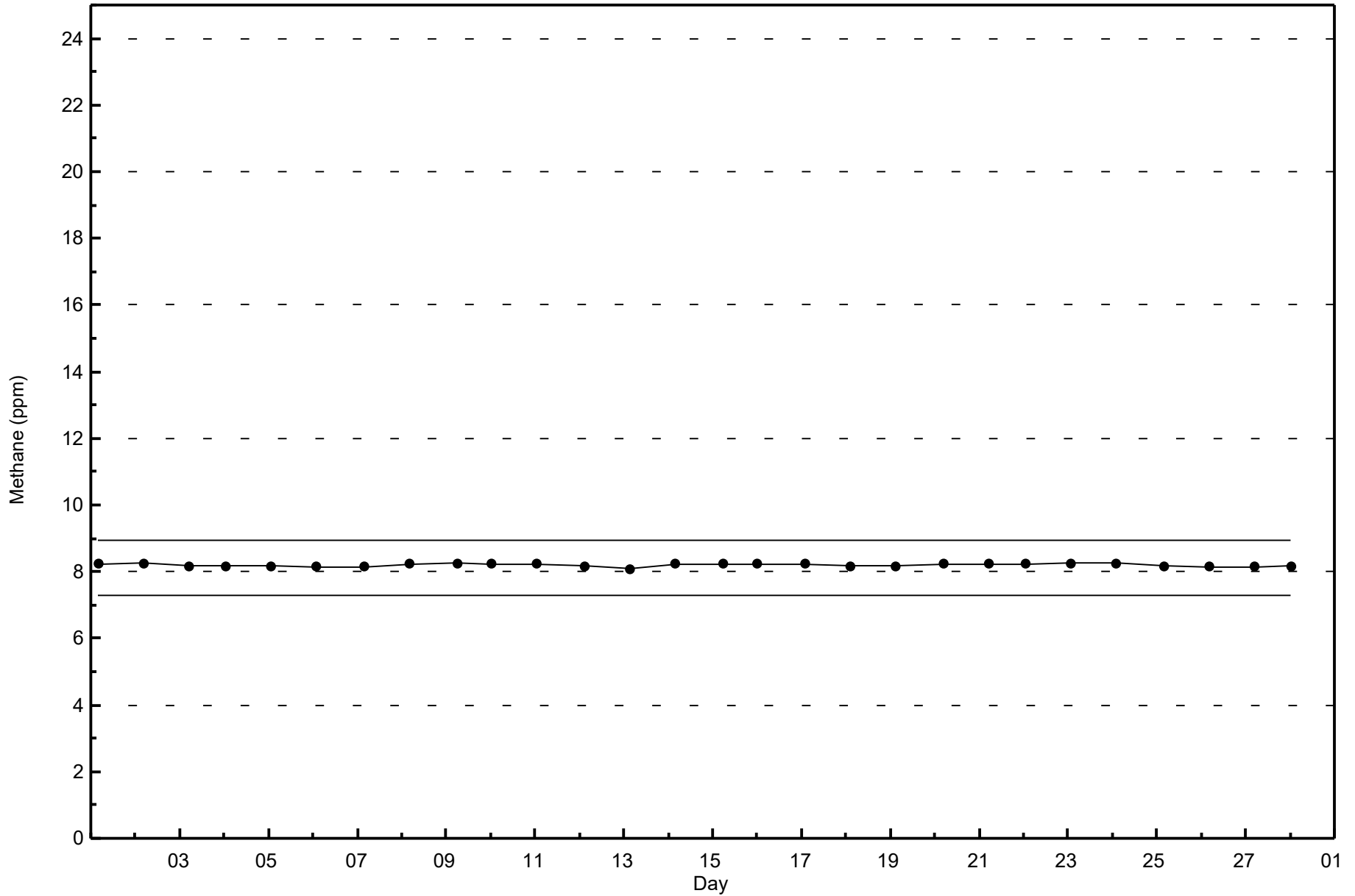


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Methane (CH<sub>4</sub>) - ppm  
Stony Mountain









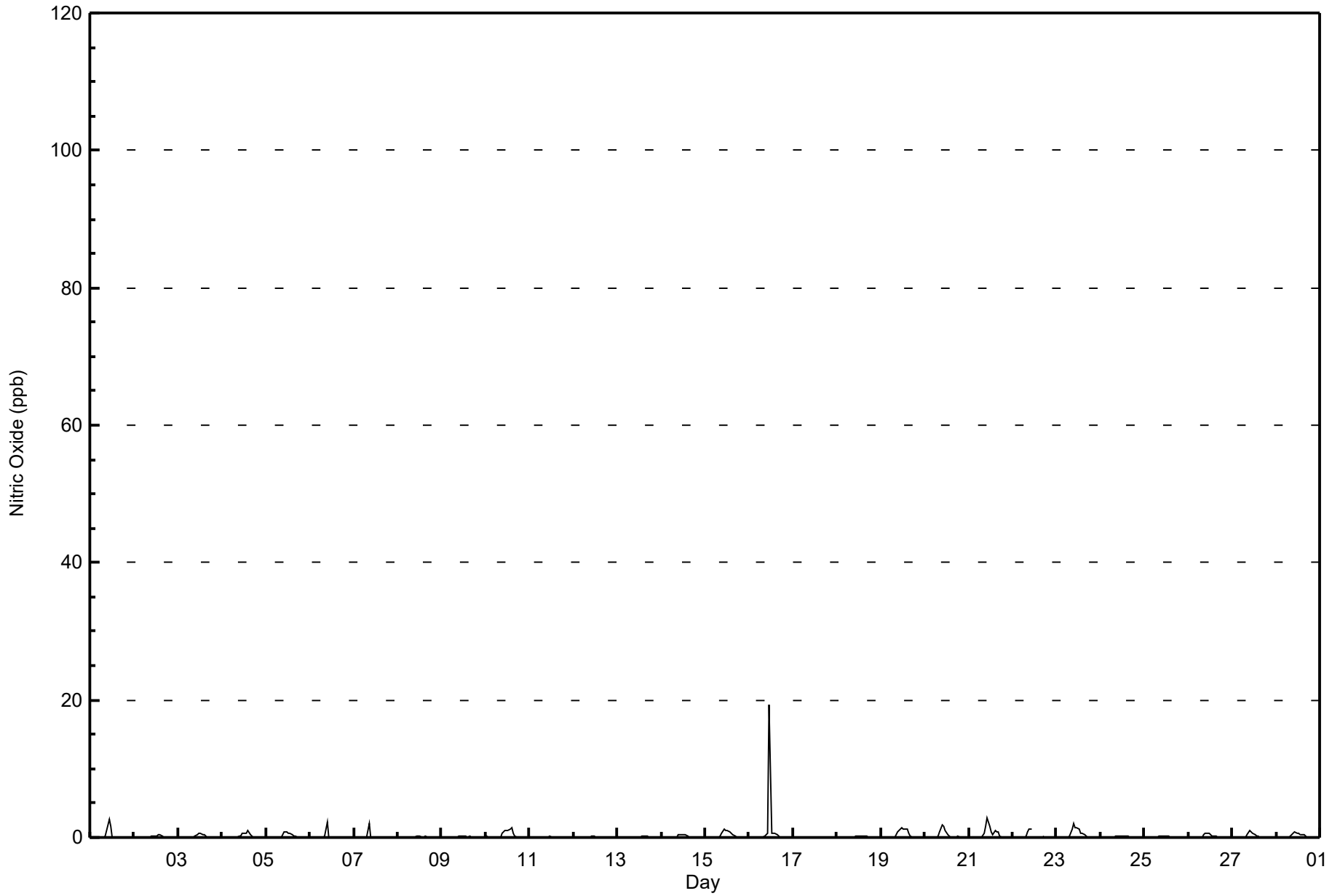


Maximum Value: 19.4 ppb on Feb 16 12:00																				Maximum Daily Average: 1.0 ppb on Feb 16					Hours in Service:	672
Minimum Value: 0.0 ppb on Feb 1 02:00																				Minimum Daily Average: 0.0 ppb on Feb 17					Hours of Data:	639
Maximum Diurnal Average: 1.3 ppb at hour 12																				Minimum Diurnal Average: 0.0 ppb at hour 4					Hours of Missing Data:	33
Monthly Average: 0.19 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> = 0.6 P <sub>99</sub> = 1.7					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-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.9	2.7	1.6	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	2.7
2-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
3-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.6	0.6	0.5	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6
4-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.6	0.5	0.6	0.9	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9
5-Feb	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.4	0.7	0.7	0.6	0.6	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
6-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	2.3	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	2.3
7-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	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	0.1	2.0
8-Feb	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
9-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
10-Feb	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.7	1.1	1.0	1.0	1.3	1.5	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.5
11-Feb	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
12-Feb	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
13-Feb	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	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
14-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.4	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
15-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.6	1.1	0.9	1.0	0.9	0.5	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.1
16-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	0.5	0.6	19.4	0.7	0.6	0.6	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	19.4
17-Feb	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
18-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
19-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.8	1.1	1.4	1.3	1.2	1.2	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.4
20-Feb	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.1	0.9	1.7	1.6	1.0	0.5	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	1.7
21-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.7	1.7	2.8	1.7	0.8	0.5	1.0	0.9	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.8
22-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.8	1.3	1.2	C	C	C	C	C	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3
23-Feb	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.2	1.1	2.1	1.5	1.4	1.2	0.7	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.1
24-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.3	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	0.0	0.1	0.3
25-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
26-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.6	0.5	0.5	0.4	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6
27-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.3	0.9	0.8	0.6	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9
28-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.3	0.7	0.8	0.6	0.6	0.5	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
0.0																								Diurnal Average		
0.1																								Diurnal Maximum		
Z - zerospan																										
C - Calibration																										



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

**Nitric Oxide (NO) - ppb**  
**Stony Mountain - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Stony Mountain - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	639	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: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Stony Mountain - February 2023**

<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	61	33	33	26	25	15	15	19	33	76	57	43	52	46	48	56	638
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>	61	33	33	26	25	15	15	19	33	76	57	43	52	46	48	56	638

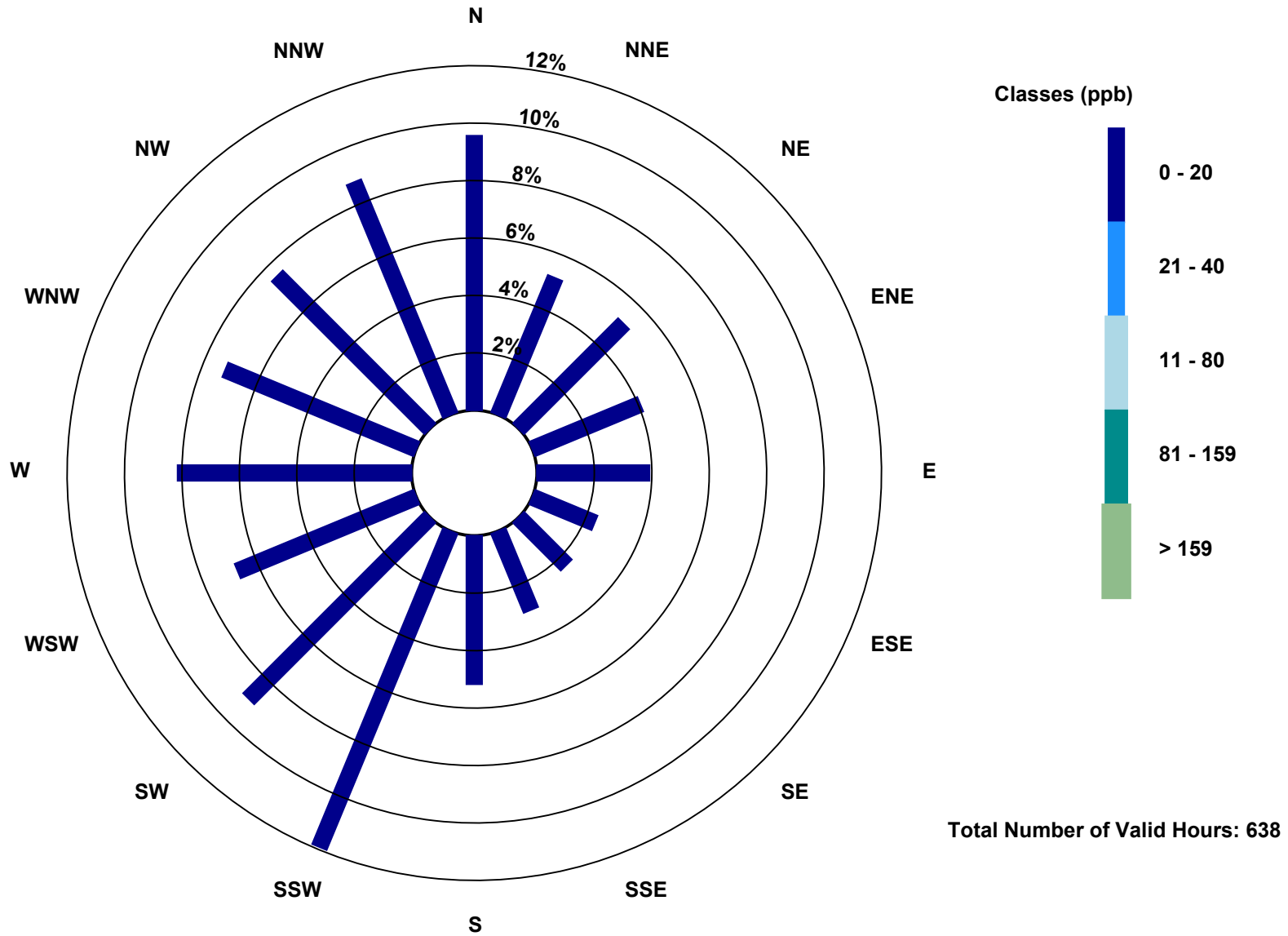
Total Number of Valid Hours: 638

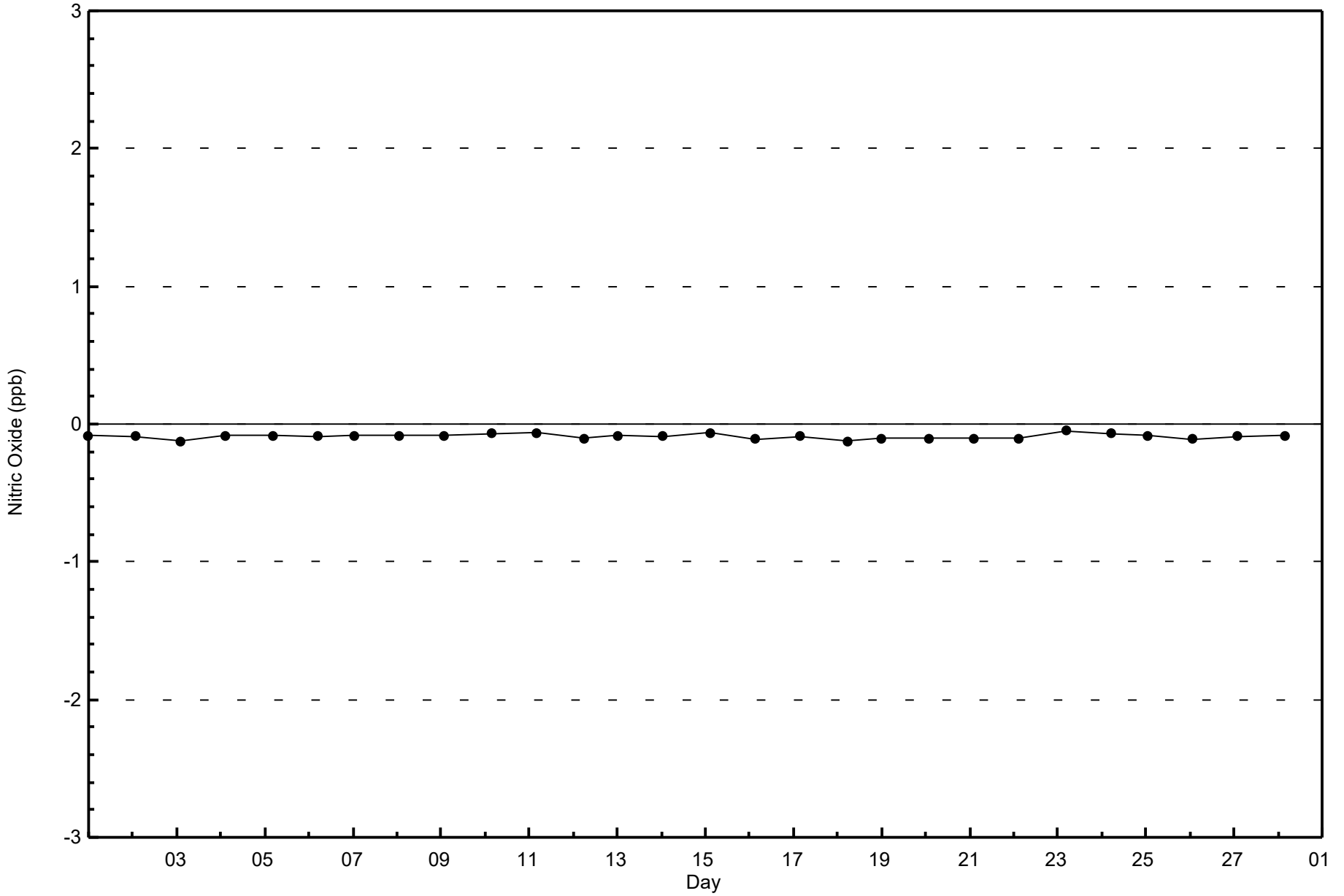
Total Number of Hours: 672

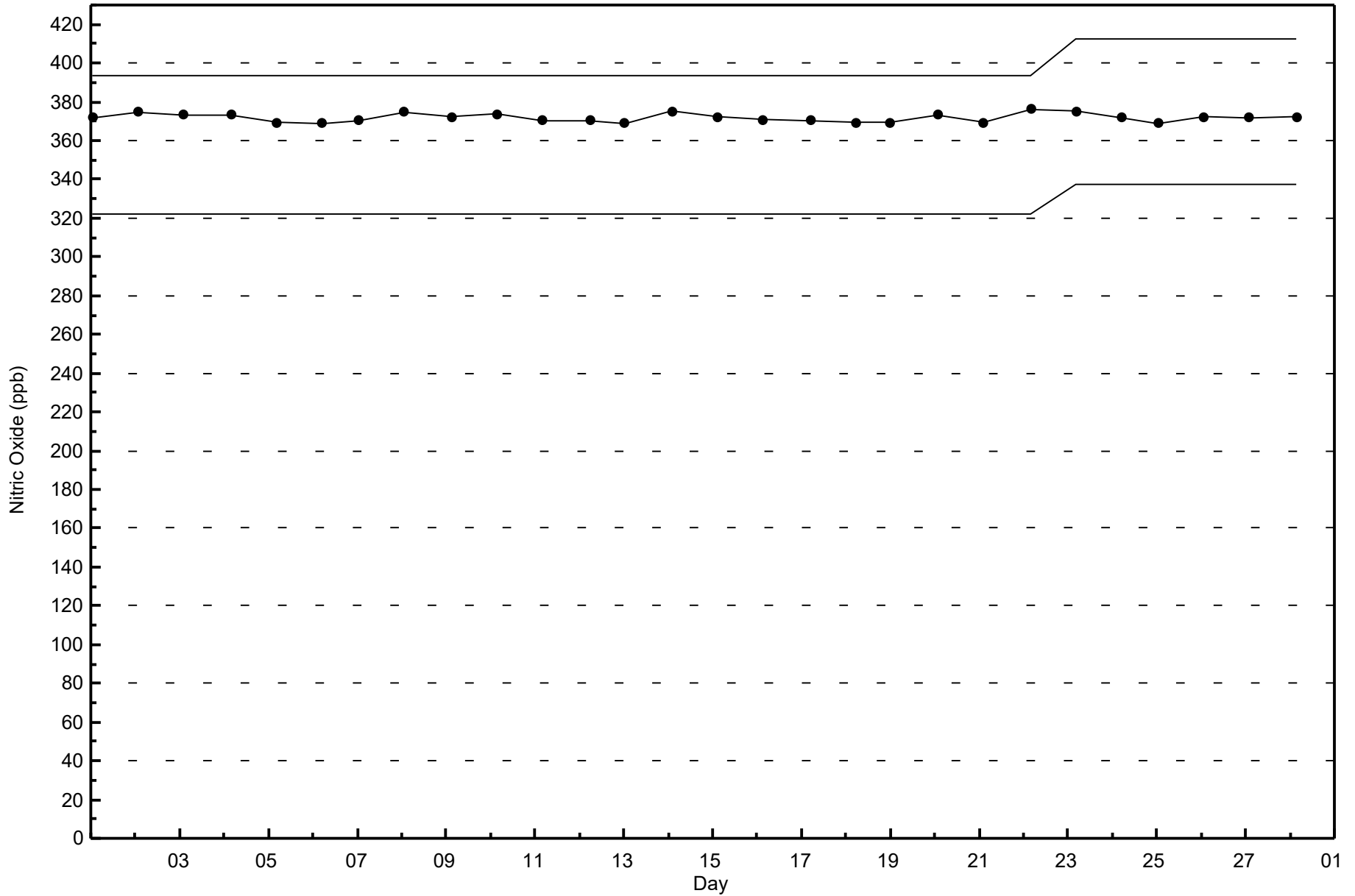


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitric Oxide (NO) - ppb  
Stony Mountain









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Stony Mountain - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 13.5 ppb on Feb 20 06:00	Maximum Daily Average: 4.7 ppb on Feb 10		Hours of Data:	639
Minimum Value: 0.1 ppb on Feb 6 04:00	Minimum Daily Average: 0.5 ppb on Feb 7		Hours of Missing Data:	33
Maximum Diurnal Average: 2.9 ppb at hour 6	Minimum Diurnal Average: 1.4 ppb at hour 14		Hours of Calibration:	33
Monthly Average: 2.04 ppb	Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 0.7 Median = 1.5 Q <sub>3</sub> = 2.7 P <sub>90</sub> = 4.3 P <sub>99</sub> = 8.6		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-Feb	Z	0.8	0.6	0.2	0.4	0.3	0.2	0.6	0.7	5.1	7.0	2.6	0.4	0.3	0.4	0.4	0.4	0.9	0.4	0.7	0.8	0.5	0.6	0.6	1.1	7.0
2-Feb	0.6	Z	0.6	0.6	1.1	1.3	1.2	2.2	2.3	1.1	1.0	1.2	1.6	1.9	2.2	2.1	1.6	3.1	3.2	2.6	3.1	2.8	2.6	2.5	1.8	3.2
3-Feb	2.2	2.1	Z	2.3	2.6	3.3	4.1	4.1	3.7	3.2	3.2	3.0	2.8	2.4	2.0	1.5	1.3	1.1	1.0	0.9	2.4	2.4	2.7	2.2	2.5	4.1
4-Feb	2.4	2.6	2.1	Z	1.9	1.9	2.1	2.6	2.7	2.2	1.5	1.4	1.6	2.0	2.5	2.8	2.9	2.8	2.9	2.6	2.2	2.2	2.1	1.6	2.2	2.9
5-Feb	1.4	1.4	1.4	1.9	Z	3.2	2.9	2.9	3.1	3.7	3.2	2.7	2.4	2.7	2.9	3.1	3.9	4.2	3.8	2.7	2.6	2.4	1.9	0.9	2.7	4.2
6-Feb	0.7	0.3	0.2	0.1	0.1	Z	0.2	0.3	0.6	0.6	0.5	0.4	0.4	0.4	0.5	0.5	0.6	0.8	1.1	1.3	1.6	1.5	1.2	1.2	0.7	1.6
7-Feb	Z	1.2	0.9	0.8	0.7	0.7	0.6	0.8	1.0	0.2	0.3	0.3	0.3	0.3	0.5	0.4	0.5	0.4	0.3	0.4	0.4	0.5	0.5	0.5	0.5	1.2
8-Feb	0.6	Z	0.7	0.8	0.7	0.6	0.6	0.6	0.7	0.9	0.9	0.8	0.7	0.5	0.4	0.5	0.6	0.8	1.0	0.9	1.0	1.3	1.4	1.4	0.8	1.4
9-Feb	1.5	1.5	Z	0.9	0.7	0.8	0.8	0.8	0.9	1.1	1.2	1.1	1.1	0.8	0.9	1.4	2.0	2.5	3.3	3.2	2.2	2.1	2.7	3.4	1.6	3.4
10-Feb	4.3	4.2	4.1	Z	4.0	4.2	4.4	4.4	5.3	6.3	6.4	5.4	5.0	4.9	5.6	6.0	6.3	6.0	5.7	5.2	4.3	3.3	2.1	1.1	4.7	6.4
11-Feb	0.8	0.7	0.7	0.7	Z	0.7	0.6	0.6	0.7	0.8	0.6	0.6	0.6	0.5	0.5	0.6	0.7	0.7	0.6	0.4	0.3	0.3	0.3	0.3	0.6	0.8
12-Feb	0.3	0.4	0.4	0.5	0.5	Z	0.5	0.5	0.6	0.5	0.5	0.6	0.5	0.4	0.5	0.5	0.6	0.7	1.0	1.3	1.2	1.5	1.6	2.1	0.7	2.1
13-Feb	Z	1.5	1.4	1.5	1.1	0.6	0.4	0.4	0.4	0.4	0.5	0.4	1.6	2.7	2.2	1.3	1.8	2.9	2.4	2.2	1.3	1.5	1.9	1.3	2.9	
14-Feb	2.4	Z	2.4	1.7	1.4	1.2	1.3	1.4	1.4	1.7	1.2	1.3	1.4	1.2	1.1	1.3	0.9	1.2	1.7	1.2	0.4	0.5	3.7	4.8	1.6	4.8
15-Feb	5.3	5.0	Z	7.1	6.6	6.2	5.5	2.7	2.0	2.0	2.3	1.7	1.7	1.7	1.5	1.6	1.6	1.6	1.5	2.3	3.3	2.2	1.4	1.9	3.0	7.1
16-Feb	2.7	2.8	2.7	Z	2.9	3.4	3.5	3.7	3.7	4.0	4.4	4.2	4.4	4.2	4.0	3.7	3.3	3.0	2.2	1.6	0.9	0.8	0.4	0.5	2.9	4.4
17-Feb	0.6	0.5	0.4	1.7	Z	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.3	0.3	1.2	4.5	4.3	4.1	4.9	4.5	4.6	1.5	4.9
18-Feb	8.8	9.2	4.6	2.7	2.1	Z	1.2	0.9	0.6	0.4	0.6	0.3	0.4	0.3	0.5	0.5	1.0	0.6	0.4	0.5	1.3	1.9	1.5	1.2	1.8	9.2
19-Feb	Z	1.7	2.0	2.2	2.3	2.5	3.4	4.1	4.0	3.3	2.7	2.3	2.3	2.0	2.2	2.3	1.1	0.6	0.6	0.8	0.4	0.3	0.3	0.3	1.9	4.1
20-Feb	0.7	Z	0.9	5.3	12.6	13.5	10.9	9.0	7.8	6.3	4.0	2.6	1.5	0.7	0.4	0.4	0.5	0.4	1.0	0.9	4.1	3.9	6.0	3.6	4.2	13.5
21-Feb	2.0	1.6	Z	2.4	3.6	5.3	4.7	4.3	3.9	3.6	4.1	2.4	1.2	1.0	1.9	2.0	3.3	5.0	5.4	4.3	4.4	7.4	6.9	6.4	3.8	7.4
22-Feb	4.9	3.9	3.2	Z	2.5	2.3	3.9	6.2	4.5	3.1	2.3	C	C	C	C	C	1.3	2.1	4.0	5.3	2.2	1.8	2.0	3.5	3.3	6.2
23-Feb	2.9	2.3	2.5	3.0	Z	7.6	9.1	8.2	7.6	6.4	3.6	2.7	2.4	1.5	1.5	1.4	1.2	1.0	0.9	0.6	0.8	0.8	0.9	1.0	3.0	9.1
24-Feb	0.9	0.9	1.5	1.9	1.8	Z	1.6	1.4	1.2	1.3	1.0	0.9	0.8	0.9	0.8	1.0	1.0	1.0	1.1	1.6	2.1	2.2	2.2	2.6	1.4	2.6
25-Feb	Z	3.3	3.8	3.8	3.4	3.2	3.1	3.0	2.3	1.8	1.3	1.1	1.0	0.9	0.8	0.7	0.6	0.9	1.1	1.1	1.2	1.5	2.4	2.8	2.0	3.8
26-Feb	2.9	Z	2.8	3.5	4.0	4.6	4.9	5.1	5.5	4.7	3.9	3.4	2.2	1.3	1.5	1.3	1.1	1.2	1.1	0.8	0.9	0.8	0.8	1.0	2.6	5.5
27-Feb	1.3	1.0	Z	0.7	0.7	0.8	1.0	1.2	2.6	3.4	2.4	1.4	1.1	0.8	0.7	0.6	0.5	0.6	0.5	0.6	1.4	1.9	2.7	3.1	1.3	3.4
28-Feb	2.8	2.3	2.1	Z	1.7	1.1	1.2	2.7	2.7	2.5	2.2	1.4	1.2	1.1	1.1	1.0	1.0	2.2	2.7	1.6	1.4	1.7	3.6	2.3	1.9	3.6
																								Diurnal Average	Diurnal Maximum	
																								2.3	8.8	
																								2.2	9.2	
																								1.8	4.6	
																								2.0	7.1	
																								2.5	12.6	
																								2.9	13.5	
																								2.7	10.9	
																								2.7	9.0	
																								2.6	7.8	
																								2.5	6.3	
																								2.3	4.0	
																								1.7	2.6	
																								1.5	1.5	
																								1.4	0.7	
																								1.5	0.4	
																								1.5	0.4	
																								1.5	0.5	
																								1.7	0.6	
																								2.0	0.9	
																								1.9	0.9	
																								1.9	4.1	
																								2.0	3.9	
																								2.2	6.0	
																								2.1	3.6	

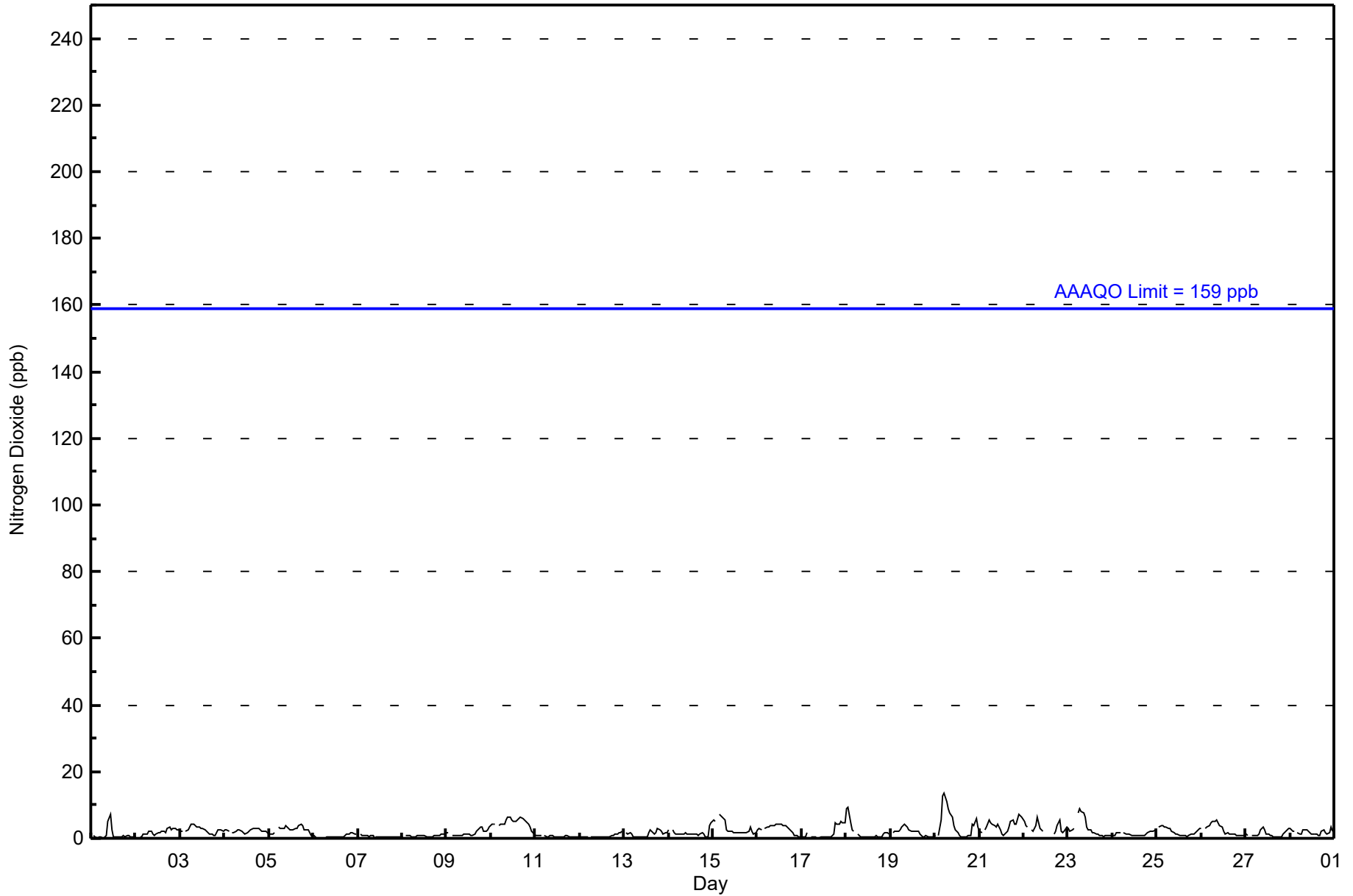
Z - zerospan C - Calibration  
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb





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

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Stony Mountain - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Stony Mountain - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	639	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: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Stony Mountain - February 2023**

<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	61	33	33	26	25	15	15	19	33	76	57	43	52	46	48	56	638
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>	61	33	33	26	25	15	15	19	33	76	57	43	52	46	48	56	638

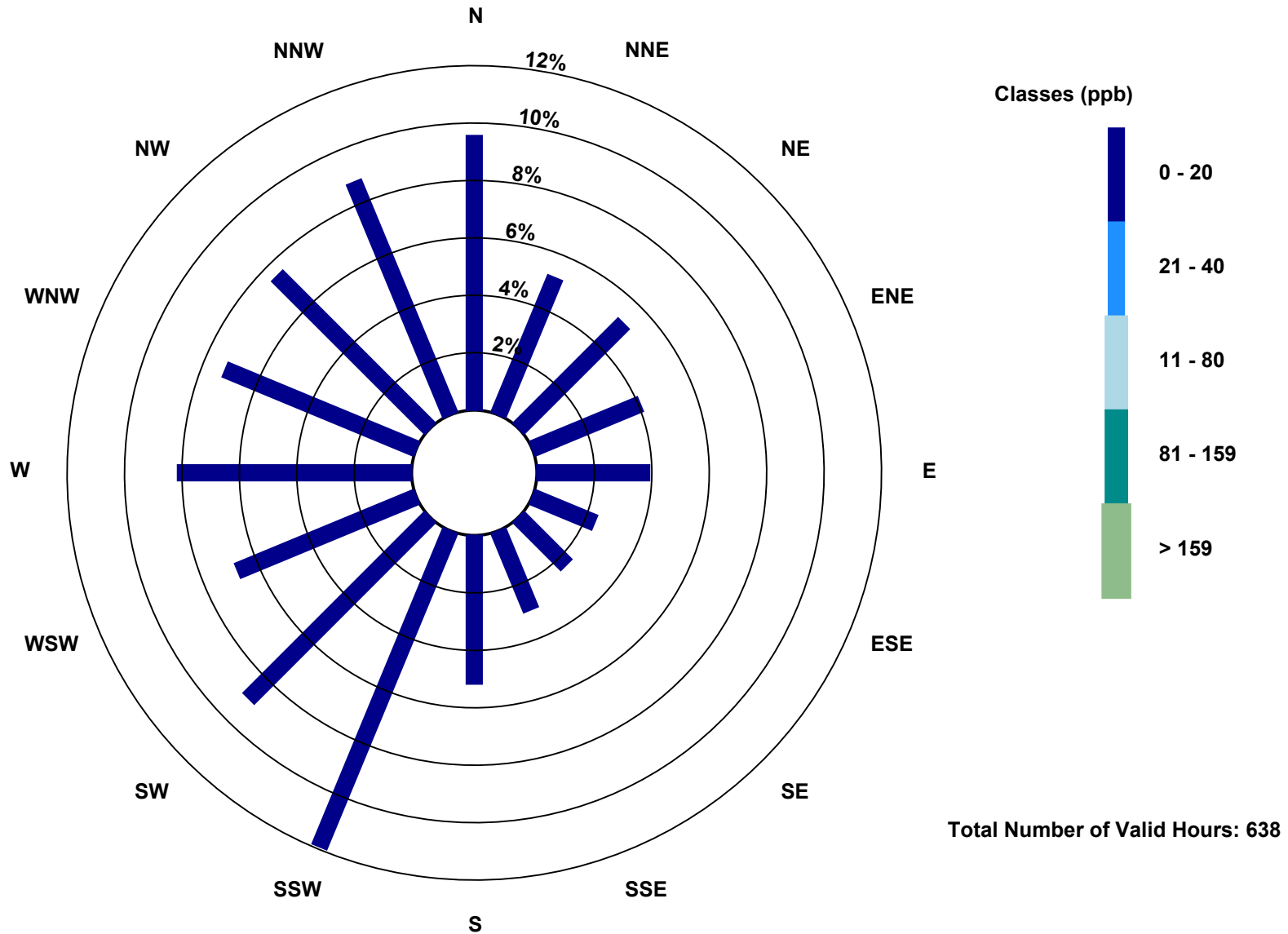
Total Number of Valid Hours: 638

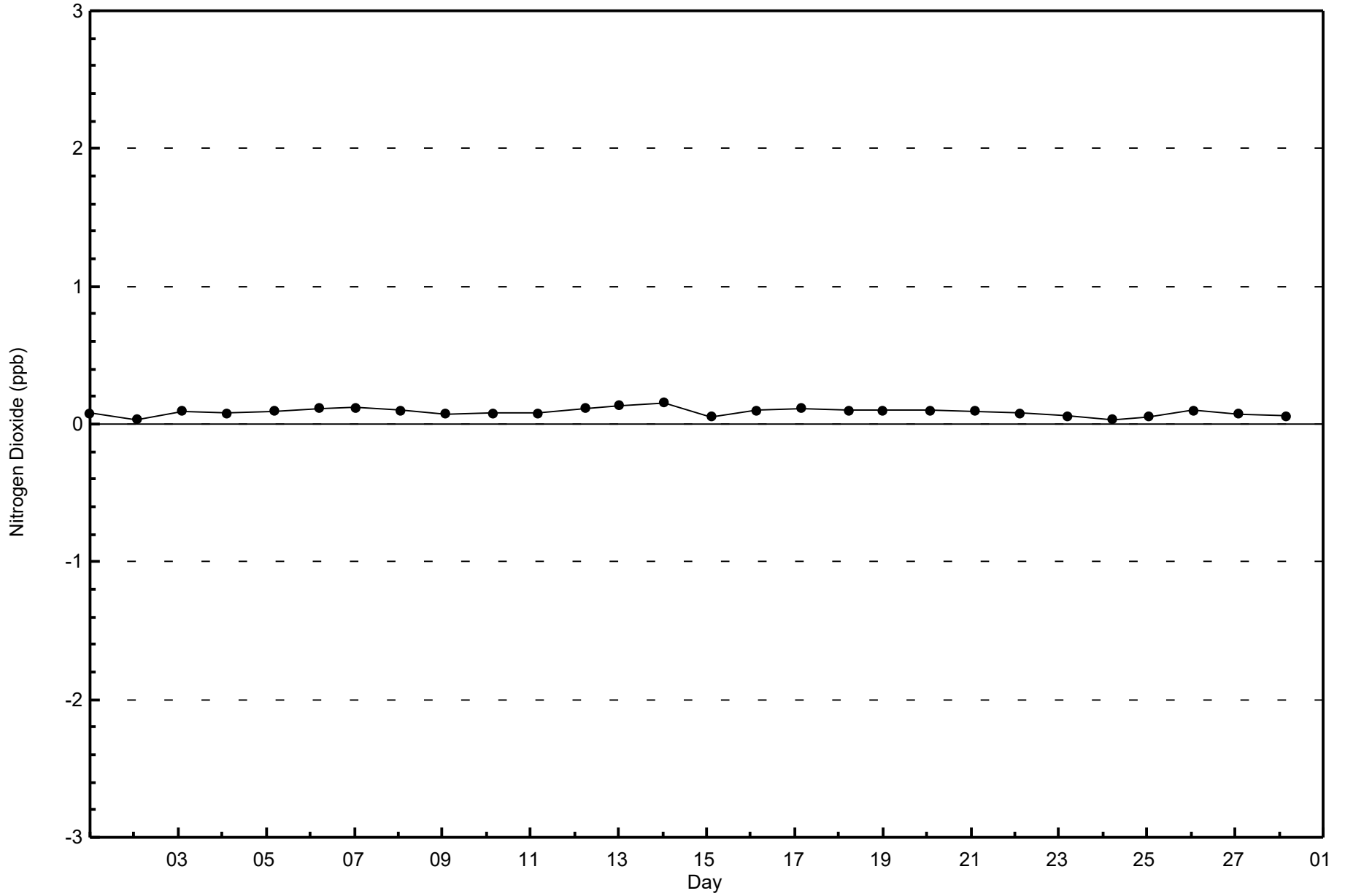
Total Number of Hours: 672

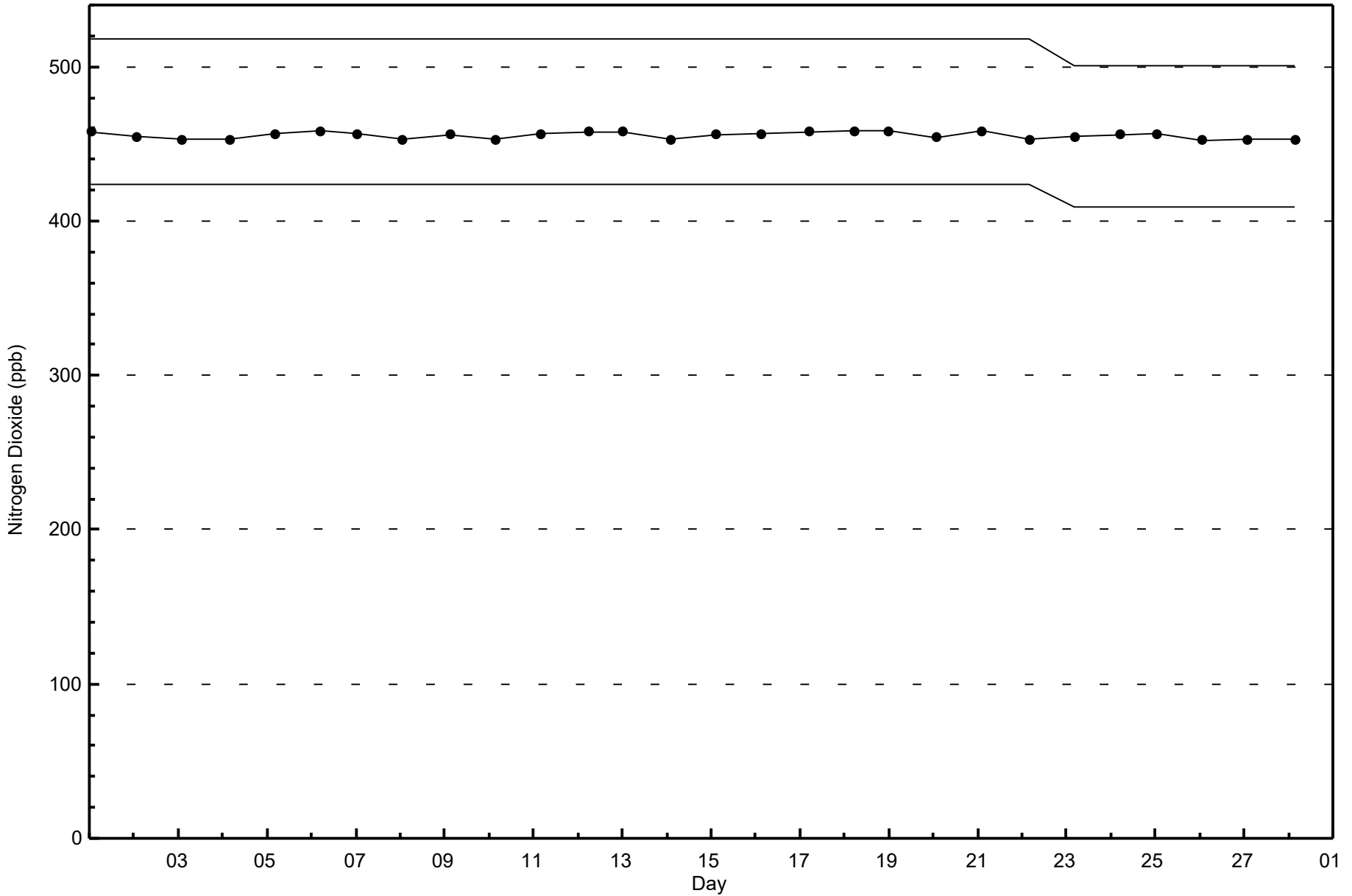


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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







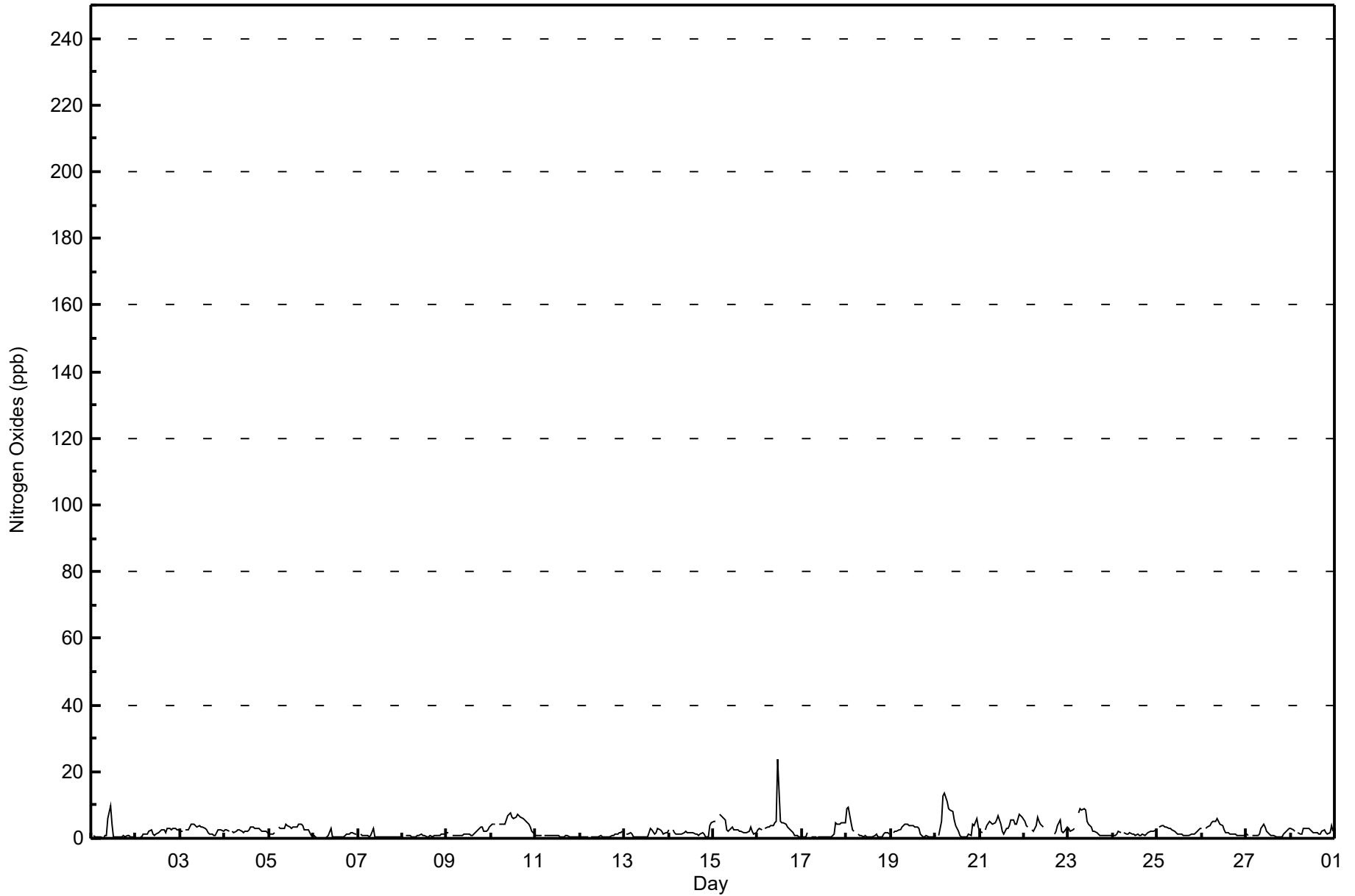


**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Stony Mountain - February 2023**

Maximum Value: 23.6 ppb on Feb 16 12:00		Maximum Daily Average: 5.0 ppb on Feb 10		Hours in Service: 672																						
Minimum Value: 0.1 ppb on Feb 6 05:00		Minimum Daily Average: 0.6 ppb on Feb 11		Hours of Data: 639																						
Maximum Diurnal Average: 3.1 ppb at hour 10		Minimum Diurnal Average: 1.6 ppb at hour 17		Hours of Missing Data: 33																						
Monthly Average: 2.23 ppb		Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.8 Median = 1.6 Q <sub>3</sub> = 3.0 P <sub>90</sub> = 4.6 P <sub>99</sub> = 9.1		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-Feb	Z	0.8	0.6	0.2	0.4	0.3	0.2	0.7	0.9	6.0	9.7	4.2	0.5	0.3	0.5	0.4	0.4	0.9	0.4	0.7	0.8	0.5	0.6	0.6	1.3	9.7
2-Feb	0.6	Z	0.6	0.6	1.1	1.3	1.2	2.2	2.4	1.2	1.1	1.4	1.9	2.2	2.5	2.3	1.7	3.1	3.2	2.6	3.1	2.8	2.6	2.5	1.9	3.2
3-Feb	2.2	2.1	Z	2.3	2.6	3.3	4.1	4.1	3.8	3.5	3.7	3.6	3.4	2.9	2.4	1.7	1.3	1.1	1.0	0.9	2.4	2.4	2.7	2.2	2.6	4.1
4-Feb	2.4	2.6	2.1	Z	1.9	1.9	2.1	2.6	2.7	2.3	1.8	2.0	2.1	2.6	3.4	3.3	3.0	2.8	2.9	2.6	2.2	2.2	2.1	1.6	2.4	3.4
5-Feb	1.4	1.4	1.4	1.9	Z	3.2	2.9	2.9	3.2	4.1	3.9	3.4	3.0	3.3	3.4	3.4	4.0	4.2	3.8	2.7	2.6	2.4	1.9	0.9	2.8	4.2
6-Feb	0.7	0.3	0.2	0.1	0.1	Z	0.2	0.3	0.7	2.9	0.5	0.5	0.5	0.4	0.5	0.5	0.6	0.8	1.1	1.3	1.6	1.5	1.2	1.2	0.8	2.9
7-Feb	Z	1.2	0.9	0.8	0.7	0.7	0.6	0.9	3.0	0.2	0.3	0.3	0.3	0.3	0.5	0.4	0.5	0.4	0.3	0.4	0.4	0.5	0.5	0.5	0.6	3.0
8-Feb	0.6	Z	0.7	0.8	0.7	0.6	0.6	0.6	0.7	1.0	1.1	1.0	0.9	0.6	0.5	0.6	0.6	0.8	1.0	0.9	1.0	1.3	1.4	1.4	0.8	1.4
9-Feb	1.5	1.5	Z	0.9	0.7	0.8	0.8	0.8	0.9	1.2	1.4	1.4	1.4	0.9	1.0	1.5	2.1	2.5	3.3	3.2	2.2	2.1	2.7	3.4	1.7	3.4
10-Feb	4.4	4.2	4.1	Z	4.0	4.2	4.4	4.4	5.4	7.0	7.5	6.4	6.0	6.2	7.1	6.6	6.5	6.0	5.7	5.2	4.3	3.3	2.1	1.1	5.0	7.5
11-Feb	0.8	0.7	0.7	0.7	Z	0.7	0.6	0.6	0.7	0.8	0.7	0.7	0.7	0.6	0.5	0.6	0.7	0.7	0.6	0.4	0.3	0.3	0.3	0.3	0.6	0.8
12-Feb	0.3	0.4	0.4	0.5	0.5	Z	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.6	0.5	0.5	0.6	0.7	1.0	1.3	1.2	1.5	1.6	2.1	0.8	2.1
13-Feb	Z	1.5	1.4	1.5	1.1	0.6	0.4	0.4	0.4	0.4	0.4	0.5	0.4	1.7	2.9	2.4	1.4	1.8	2.9	2.4	2.2	1.3	1.5	1.9	1.4	2.9
14-Feb	2.4	Z	2.4	1.7	1.4	1.2	1.3	1.4	1.5	2.0	1.5	1.6	1.8	1.6	1.4	1.4	0.9	1.2	1.7	1.2	0.4	0.5	3.7	4.8	1.7	4.8
15-Feb	5.3	5.0	Z	7.1	6.6	6.2	5.5	2.7	2.1	2.6	3.4	2.6	2.7	2.6	2.0	2.1	1.8	1.6	1.5	2.3	3.3	2.2	1.4	1.9	3.2	7.1
16-Feb	2.7	2.8	2.7	Z	2.9	3.4	3.5	3.7	4.0	4.5	5.0	23.6	5.1	4.8	4.6	4.1	3.5	3.0	2.2	1.6	0.9	0.8	0.4	0.5	3.9	23.6
17-Feb	0.6	0.5	0.4	1.7	Z	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.5	0.4	0.3	0.3	1.2	4.6	4.3	4.1	4.9	4.5	4.6	1.5	4.9
18-Feb	8.8	9.2	4.6	2.7	2.1	Z	1.2	0.9	0.7	0.5	0.7	0.4	0.5	0.5	0.6	0.7	1.2	0.6	0.4	0.5	1.3	1.9	1.5	1.2	1.9	9.2
19-Feb	Z	1.7	2.0	2.2	2.3	2.5	3.4	4.2	4.4	4.1	3.8	3.7	3.6	3.2	3.4	3.0	1.2	0.6	0.6	0.8	0.4	0.3	0.3	0.3	2.3	4.4
20-Feb	0.7	Z	0.9	5.3	12.6	13.6	10.9	9.1	8.7	8.0	5.6	3.6	2.0	0.8	0.5	0.5	0.5	0.4	1.1	0.9	4.1	3.9	6.0	3.6	4.5	13.6
21-Feb	2.0	1.6	Z	2.4	3.6	5.3	4.7	4.4	4.6	5.3	6.9	4.1	2.0	1.5	2.9	2.9	4.0	5.3	5.4	4.3	4.4	7.4	6.9	6.4	4.3	7.4
22-Feb	4.9	3.9	3.2	Z	2.5	2.3	3.9	6.3	5.3	4.4	3.5	C	C	C	C	C	1.4	2.1	4.0	5.3	2.2	1.8	2.0	3.5	3.5	6.3
23-Feb	2.9	2.3	2.5	3.0	Z	7.6	9.1	8.4	8.7	8.5	5.1	4.1	3.6	2.2	2.0	1.7	1.3	1.0	0.9	0.6	0.8	0.8	0.9	1.0	3.4	9.1
24-Feb	0.9	0.9	1.5	1.9	1.8	Z	1.6	1.4	1.3	1.6	1.2	1.1	1.0	1.1	1.0	1.1	1.1	1.0	1.1	1.6	2.1	2.2	2.2	2.6	1.5	2.6
25-Feb	Z	3.3	3.8	3.8	3.4	3.2	3.1	3.0	2.5	2.0	1.6	1.3	1.1	1.1	0.9	0.8	0.7	0.9	1.1	1.1	1.2	1.5	2.4	2.8	2.0	3.8
26-Feb	2.9	Z	2.8	3.5	4.0	4.6	4.9	5.2	5.9	5.3	4.4	3.9	2.6	1.5	1.7	1.4	1.2	1.2	1.1	0.8	0.9	0.8	0.8	1.0	2.7	5.9
27-Feb	1.3	1.0	Z	0.7	0.7	0.8	1.0	1.2	2.9	4.3	3.2	2.0	1.4	1.0	0.8	0.7	0.5	0.6	0.5	0.6	1.4	1.9	2.7	3.1	1.5	4.3
28-Feb	2.8	2.3	2.1	Z	1.7	1.1	1.2	2.8	3.0	3.2	3.0	2.0	1.8	1.6	1.5	1.3	1.2	2.3	2.7	1.6	1.4	1.7	3.6	2.3	2.1	3.6
																								Diurnal Average		
																								Diurnal Maximum		
																								2.3 8.8		
																								2.2 9.2		
																								1.8 4.6		
																								2.0 7.1		
																								2.5 12.6		
																								2.9 13.6		
																								2.6 10.9		
																								2.7 9.1		
																								2.9 8.7		
																								3.1 8.5		
																								2.9 9.7		
																								3.0 23.6		
																								1.9 6.0		
																								1.7 6.2		
																								1.8 7.1		
																								1.7 6.6		
																								1.6 6.5		
																								1.7 6.0		
																								2.0 5.7		
																								1.9 5.3		
																								1.9 4.4		
																								2.0 7.4		
																								2.2 6.9		
																								2.1 6.4		

Z - zerospan      C - Calibration







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Stony Mountain - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	638	99.84	99.84
21 - 40	1	0.16	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: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Stony Mountain - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	61	33	33	26	25	15	15	19	33	75	57	43	52	46	48	56	637
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>	61	33	33	26	25	15	15	19	33	76	57	43	52	46	48	56	638

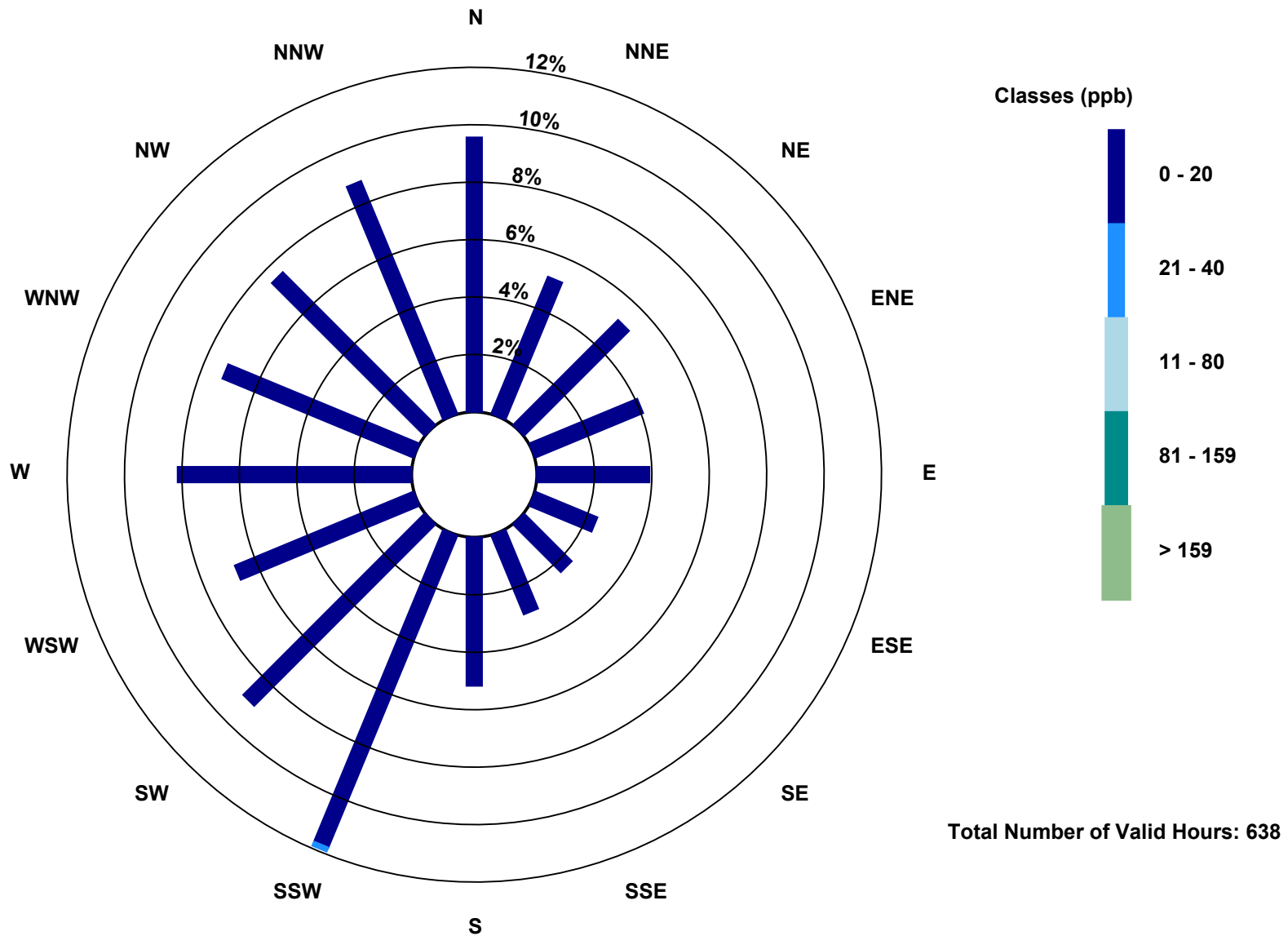
Total Number of Valid Hours: 638

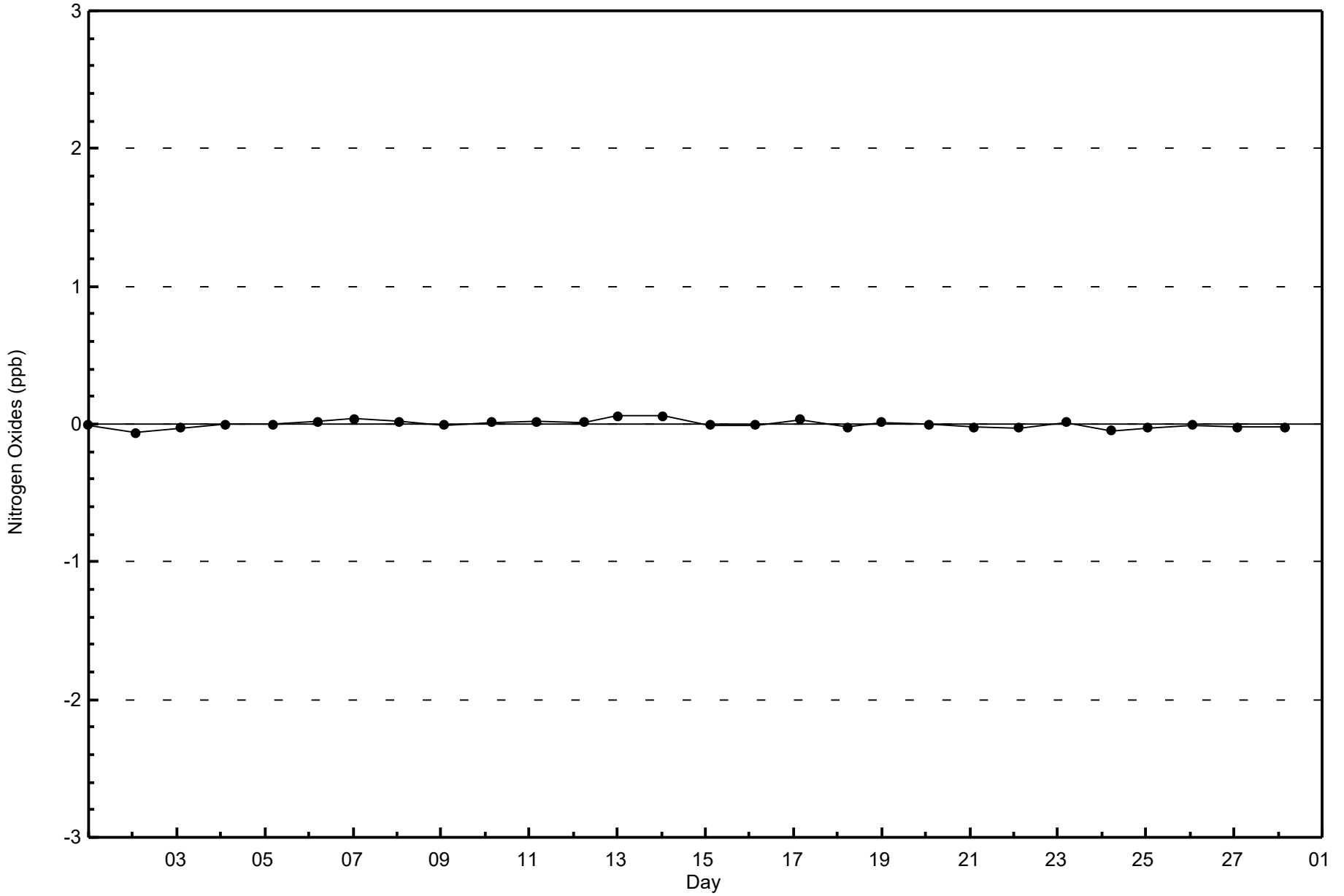
Total Number of Hours: 672

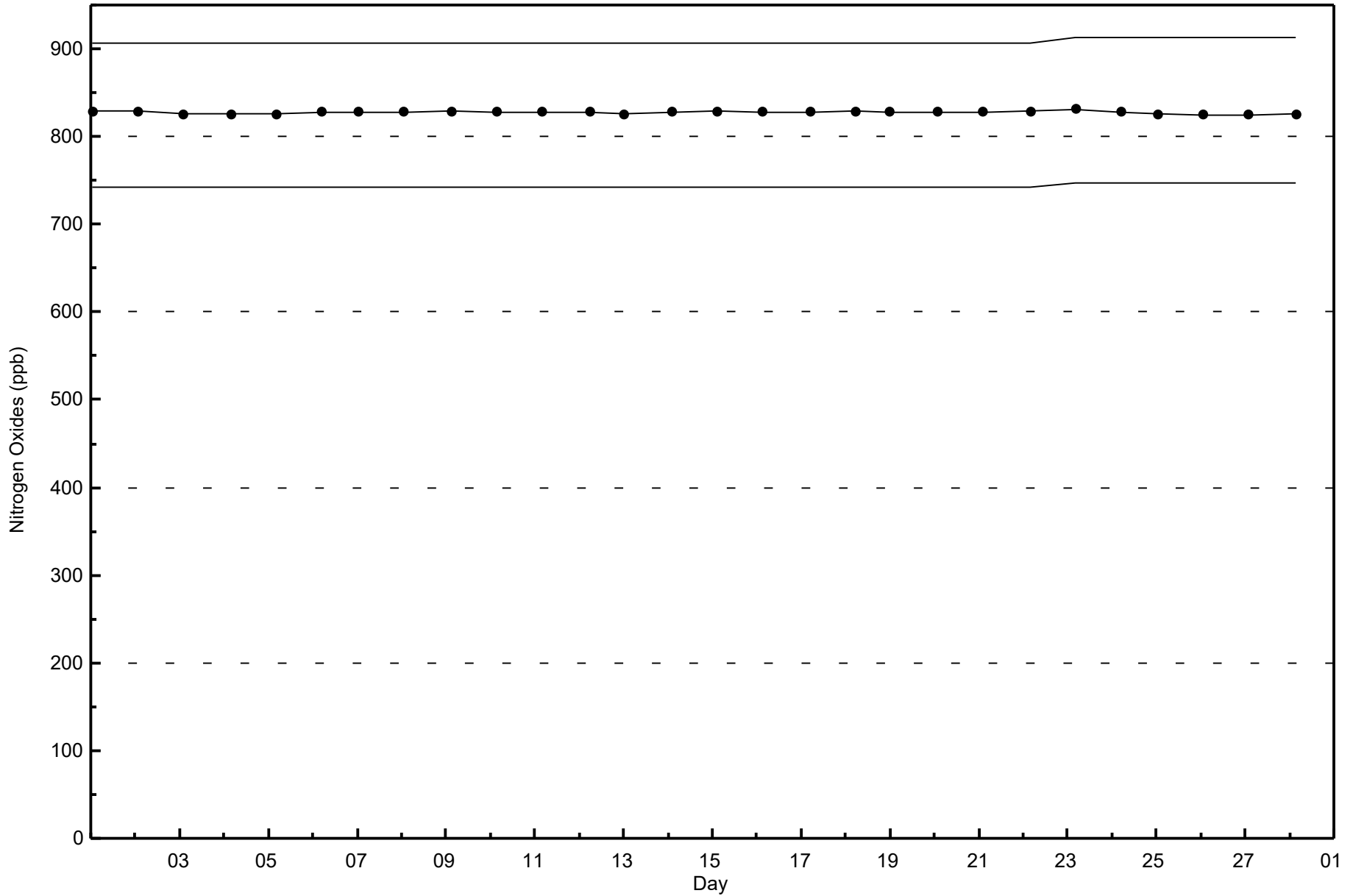


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









Summary of Hour Averages

Stony Mountain - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 43.7 ppb on Feb 25 16:00	Maximum Daily Average: 41.2 ppb on Feb 7		Hours of Data:	639
Minimum Value: 16.8 ppb on Feb 18 01:00	Minimum Daily Average: 21.4 ppb on Feb 4		Hours of Missing Data:	33
Maximum Diurnal Average: 36.2 ppb at hour 16	Minimum Diurnal Average: 30.8 ppb at hour 6		Hours of Calibration:	32
Monthly Average: 33.74 ppb	Percentiles: P <sub>1</sub> = 19.4 P <sub>10</sub> = 25.9 Q <sub>1</sub> = 30.8 Median = 34.5 Q <sub>3</sub> = 38.0 P <sub>90</sub> = 40.1 P <sub>99</sub> = 42.4		Percent Operational Time:	99.9

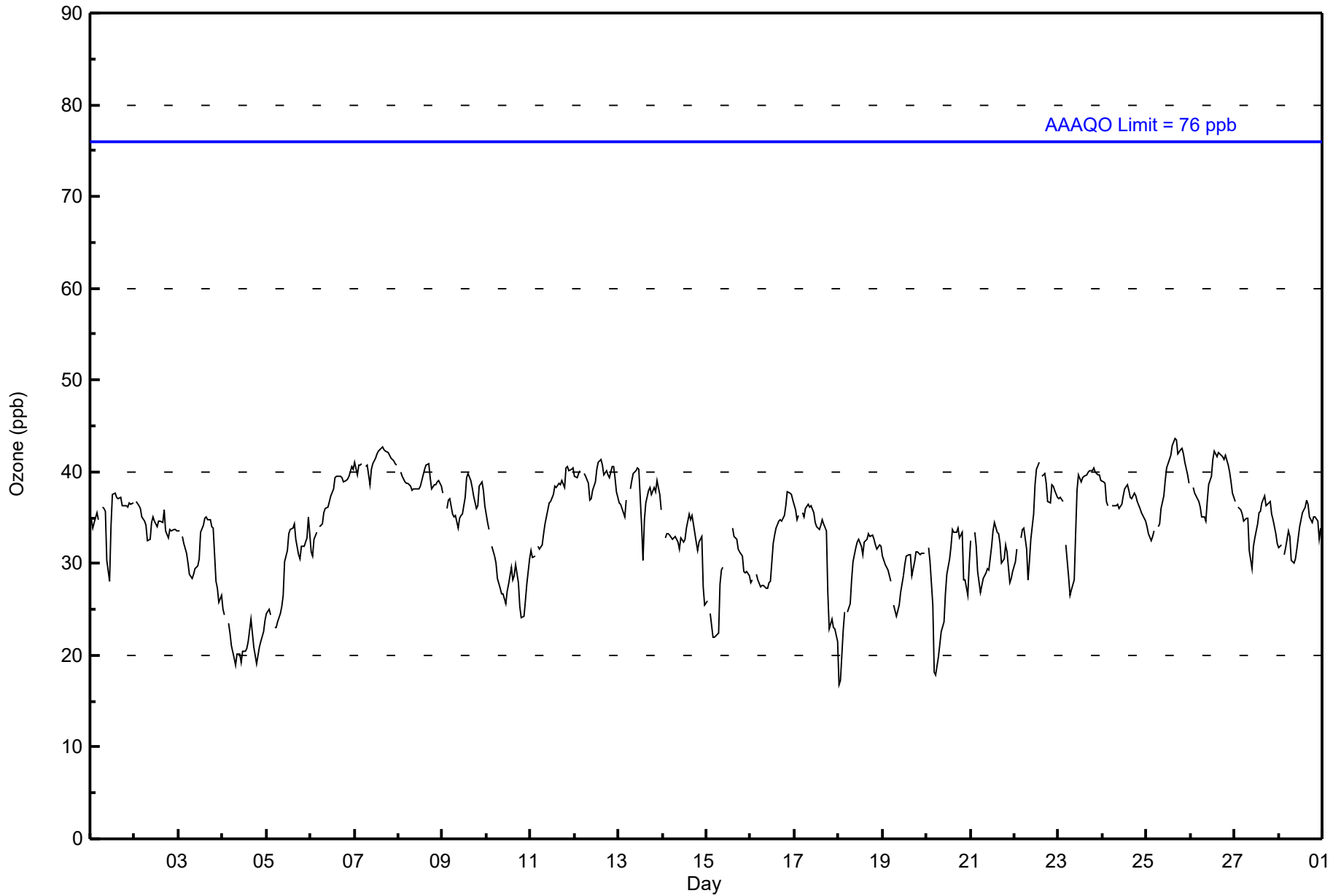
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Feb	34.8	33.9	34.5	35.6	34.8	Z	36.1	36.0	35.6	30.3	28.1	34.0	37.5	37.6	37.3	37.1	37.3	36.3	36.3	36.3	36.2	36.5	36.5	36.6	35.4	37.6																						
2-Feb	Z	36.8	36.2	36.0	35.1	34.6	34.1	32.6	32.7	34.5	35.0	34.6	34.0	34.6	34.6	34.4	35.9	33.6	32.9	33.8	33.5	33.7	33.7	33.5	34.4	36.8																						
3-Feb	33.6	Z	32.9	32.1	31.2	30.0	28.9	28.4	28.8	29.4	29.7	30.4	33.4	34.1	34.9	35.2	34.8	34.7	34.0	33.9	28.1	27.3	25.7	26.6	31.2	35.2																						
4-Feb	25.0	24.3	Z	23.6	22.5	21.1	19.6	19.0	20.2	20.2	19.3	20.5	20.4	20.8	21.5	24.0	22.5	20.9	19.0	20.0	20.8	21.5	22.5	23.8	21.4	25.0																						
5-Feb	24.6	25.0	24.5	Z	23.0	23.1	23.6	24.6	25.3	26.5	30.3	31.4	33.3	33.7	33.9	34.3	32.7	31.0	30.5	31.8	32.0	32.3	32.8	35.1	29.4	35.1																						
6-Feb	31.3	30.9	32.7	33.4	Z	34.0	34.4	35.5	36.0	36.2	36.8	37.4	38.1	39.3	39.5	39.4	39.6	39.3	38.9	39.0	39.2	39.6	40.6	40.3	37.0	40.6																						
7-Feb	41.0	39.6	40.7	40.7	40.9	Z	40.6	40.7	38.6	40.3	40.8	41.5	42.0	42.2	42.6	42.6	42.4	42.3	42.1	41.7	41.5	41.2	41.0	40.8	41.2	42.6																						
8-Feb	Z	40.0	39.5	38.9	38.7	38.7	38.4	38.0	38.1	38.2	38.1	38.1	38.5	39.7	40.3	40.7	40.9	39.3	38.2	38.6	38.6	39.0	39.0	38.4	39.0	40.9																						
9-Feb	37.7	Z	36.0	36.9	37.0	35.4	35.2	35.2	33.8	34.9	35.2	35.5	37.2	39.3	39.8	39.0	38.2	37.3	36.0	36.4	38.4	38.9	38.0	36.3	36.9	39.8																						
10-Feb	34.4	33.7	Z	31.8	30.8	30.0	28.3	27.3	26.7	26.7	25.6	26.9	27.8	29.7	28.2	28.7	29.9	28.0	25.3	24.1	24.2	25.9	27.8	30.5	28.4	34.4																						
11-Feb	31.3	30.7	30.8	Z	31.8	31.6	32.0	33.2	34.3	35.8	36.6	36.8	37.5	38.5	38.4	38.7	38.6	39.0	38.3	40.5	40.6	40.2	40.3	40.4	36.3	40.6																						
12-Feb	39.5	39.4	39.9	40.1	Z	39.8	39.6	38.8	36.9	37.1	37.9	38.9	40.3	41.1	41.4	40.7	39.7	40.1	39.7	39.4	40.6	40.6	39.3	37.8	39.5	41.4																						
13-Feb	36.6	36.5	36.0	35.1	36.8	Z	38.2	39.0	39.8	40.2	40.4	40.2	34.2	30.3	34.8	36.6	38.0	38.3	37.4	38.3	37.8	39.0	37.5	35.9	37.3	40.4																						
14-Feb	Z	32.8	33.2	33.3	33.1	32.6	32.8	33.0	32.3	31.6	32.8	32.3	32.7	33.9	35.4	34.8	35.3	34.4	32.3	31.4	32.3	32.9	27.4	25.5	32.5	35.4																						
15-Feb	25.9	Z	24.6	22.0	21.9	22.1	22.4	27.7	29.3	29.6	C	C	C	C	33.8	33.0	32.6	31.5	31.3	30.8	29.1	29.1	29.1	28.6	28.1	33.8																						
16-Feb	27.9	28.2	Z	28.8	28.2	27.5	27.6	27.6	27.3	27.3	27.9	28.1	32.2	33.1	33.9	34.6	34.7	34.6	35.3	36.3	37.8	37.7	37.6	36.9	31.8	37.8																						
17-Feb	35.9	34.8	35.3	Z	35.5	35.1	36.0	36.4	36.1	36.4	35.5	34.5	34.0	33.8	34.1	34.8	34.3	33.6	26.8	22.8	24.0	23.0	22.9	21.6	32.0	36.4																						
18-Feb	16.8	17.2	22.8	24.7	Z	24.7	25.6	28.2	30.2	31.7	32.4	32.7	31.9	31.0	32.3	32.6	33.2	32.9	33.2	32.6	32.1	31.6	32.1	31.9	29.3	33.2																						
19-Feb	30.8	29.8	29.6	29.3	28.1	Z	25.5	24.3	24.9	25.5	26.8	28.6	30.0	30.7	31.0	31.0	28.7	30.1	31.2	31.2	30.9	31.1	31.1	31.2	29.2	31.2																						
20-Feb	Z	31.7	30.1	25.4	18.2	17.9	19.8	21.1	22.5	23.7	26.6	28.8	30.5	31.9	33.7	33.5	33.4	33.9	32.8	33.4	28.2	28.2	26.5	29.9	27.9	33.9																						
21-Feb	32.4	Z	33.5	32.0	29.2	26.8	27.6	28.3	29.0	29.4	29.4	31.9	33.6	34.5	33.5	33.3	32.2	30.0	30.5	32.0	31.3	27.9	28.3	29.1	30.7	34.5																						
22-Feb	30.2	31.5	Z	32.8	33.7	33.8	31.5	28.2	30.2	32.6	35.3	38.6	40.3	41.0	M	39.5	39.8	38.8	36.8	36.6	38.6	38.5	38.0	37.3	35.6	41.0																						
23-Feb	37.1	37.2	36.7	Z	32.0	28.6	26.6	27.2	28.2	33.3	38.0	39.7	38.9	39.3	39.6	39.6	40.0	40.1	40.2	40.4	39.9	39.6	39.7	39.1	36.6	40.4																						
24-Feb	38.9	38.7	36.8	36.3	Z	36.2	36.2	36.4	36.4	36.1	36.4	37.4	38.2	38.6	38.0	37.3	37.1	37.7	37.4	36.7	36.0	35.6	35.3	34.7	36.9	38.9																						
25-Feb	34.0	33.3	32.5	32.9	33.5	Z	34.0	34.2	35.9	37.4	39.1	40.5	41.4	41.8	42.9	43.7	43.4	42.0	42.4	42.6	42.0	41.0	39.6	38.7	38.7	43.7																						
26-Feb	Z	38.3	37.7	37.4	36.8	36.1	35.1	35.0	34.6	36.8	38.6	39.4	41.3	42.3	41.6	42.0	41.9	41.6	41.4	41.7	40.8	40.0	38.9	37.7	39.0	42.3																						
27-Feb	36.8	Z	36.2	35.8	35.4	34.7	35.0	34.9	31.5	29.4	31.9	32.8	34.3	35.5	35.7	36.6	37.3	36.3	36.4	36.7	35.4	34.7	33.3	32.2	34.7	37.3																						
28-Feb	31.7	32.0	Z	31.0	31.8	33.6	32.9	30.3	30.0	30.5	31.6	34.0	34.7	35.5	36.2	37.0	36.5	35.1	34.4	35.1	35.0	34.6	32.7	33.8	33.5	37.0																						
																								32.5	32.9	33.6	32.7	31.7	30.8	31.3	31.5	31.6	32.2	33.2	34.3	35.1	35.7	35.9	36.2	36.1	35.5	34.7	34.8	34.5	34.3	33.8	33.7	Diurnal Average
																								41.0	40.0	40.7	40.7	40.9	39.8	40.6	40.7	39.8	40.3	40.8	41.5	42.0	42.3	42.9	43.7	43.4	42.3	42.4	42.6	42.0	41.2	41.0	40.8	Diurnal Maximum

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



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

**Ozone (O<sub>3</sub>) - ppb**  
**Stony Mountain - February 2023**





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

**Ozone (O<sub>3</sub>) - ppb**  
**Stony Mountain - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	14	2.19	2.19
21 - 50	625	97.81	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 639

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb  
Stony Mountain - February 2023**

<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	1	4	1	1	1	0	1	1	0	1	0	0	0	0	3	0	14
21 - 50	58	30	32	25	22	15	13	19	31	78	57	42	51	47	45	59	624
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>	<b>59</b>	<b>34</b>	<b>33</b>	<b>26</b>	<b>23</b>	<b>15</b>	<b>14</b>	<b>20</b>	<b>31</b>	<b>79</b>	<b>57</b>	<b>42</b>	<b>51</b>	<b>47</b>	<b>48</b>	<b>59</b>	<b>638</b>

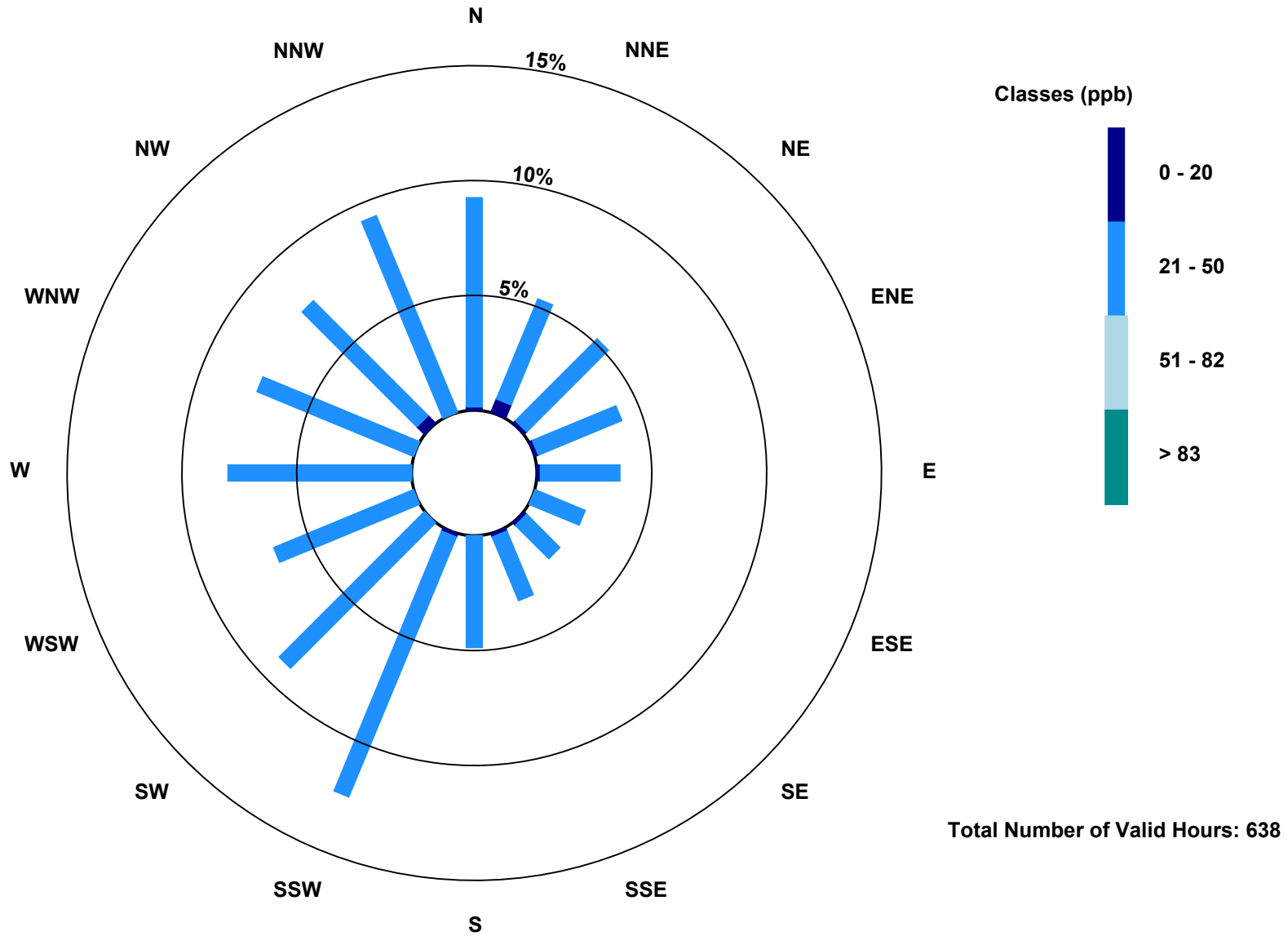
Total Number of Valid Hours: 638

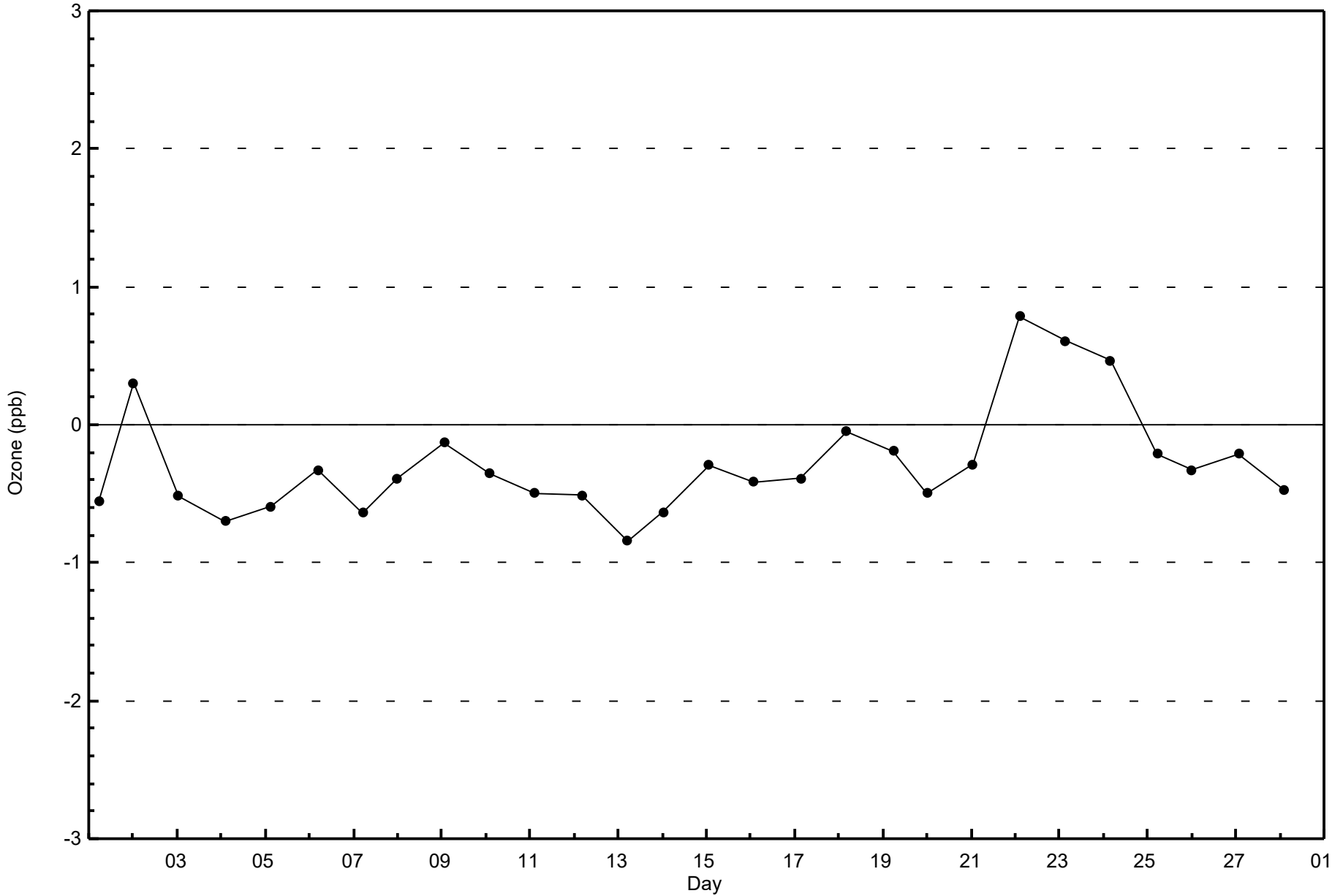
Total Number of Hours: 672

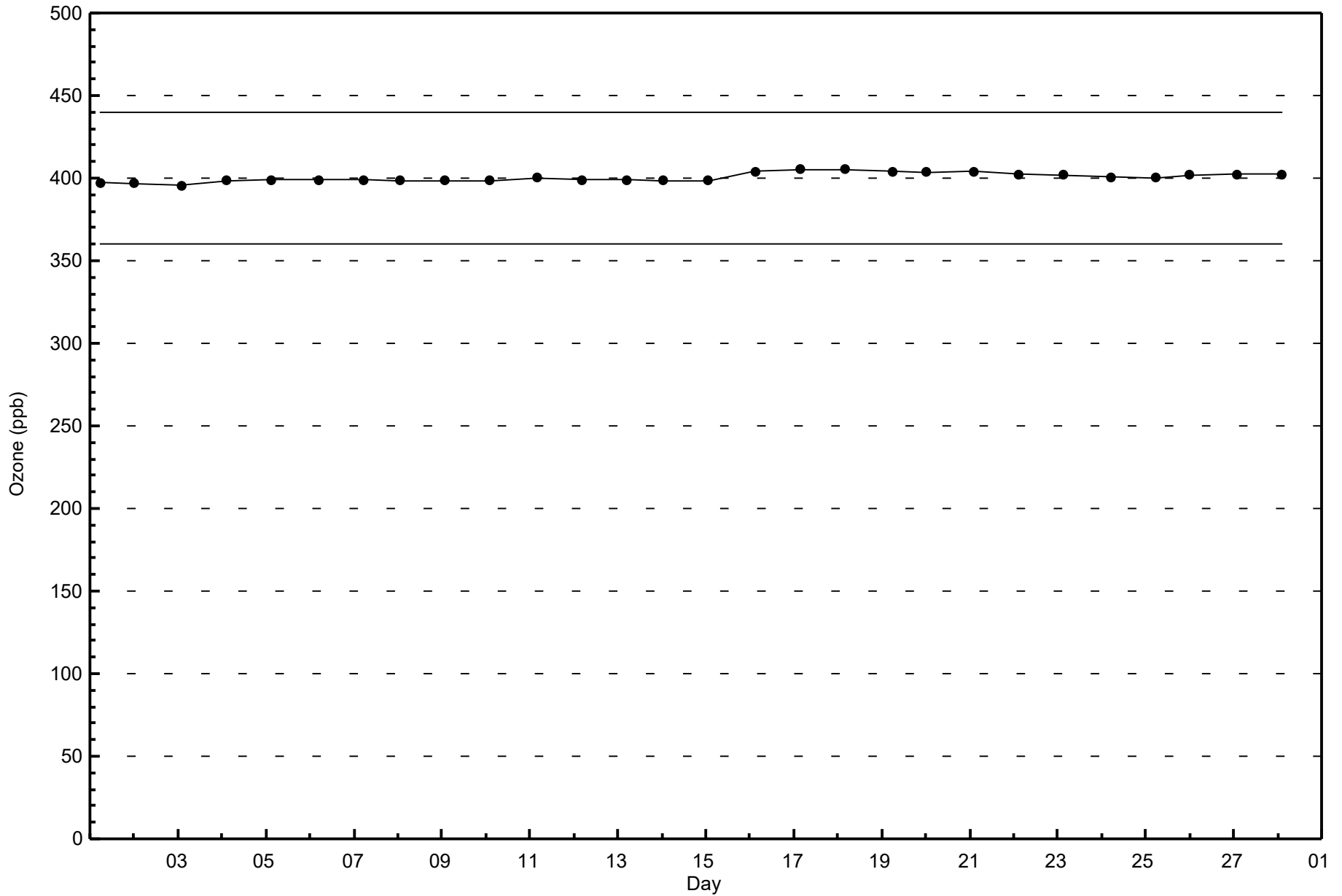


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Ozone (O<sub>3</sub>) - ppb  
Stony Mountain









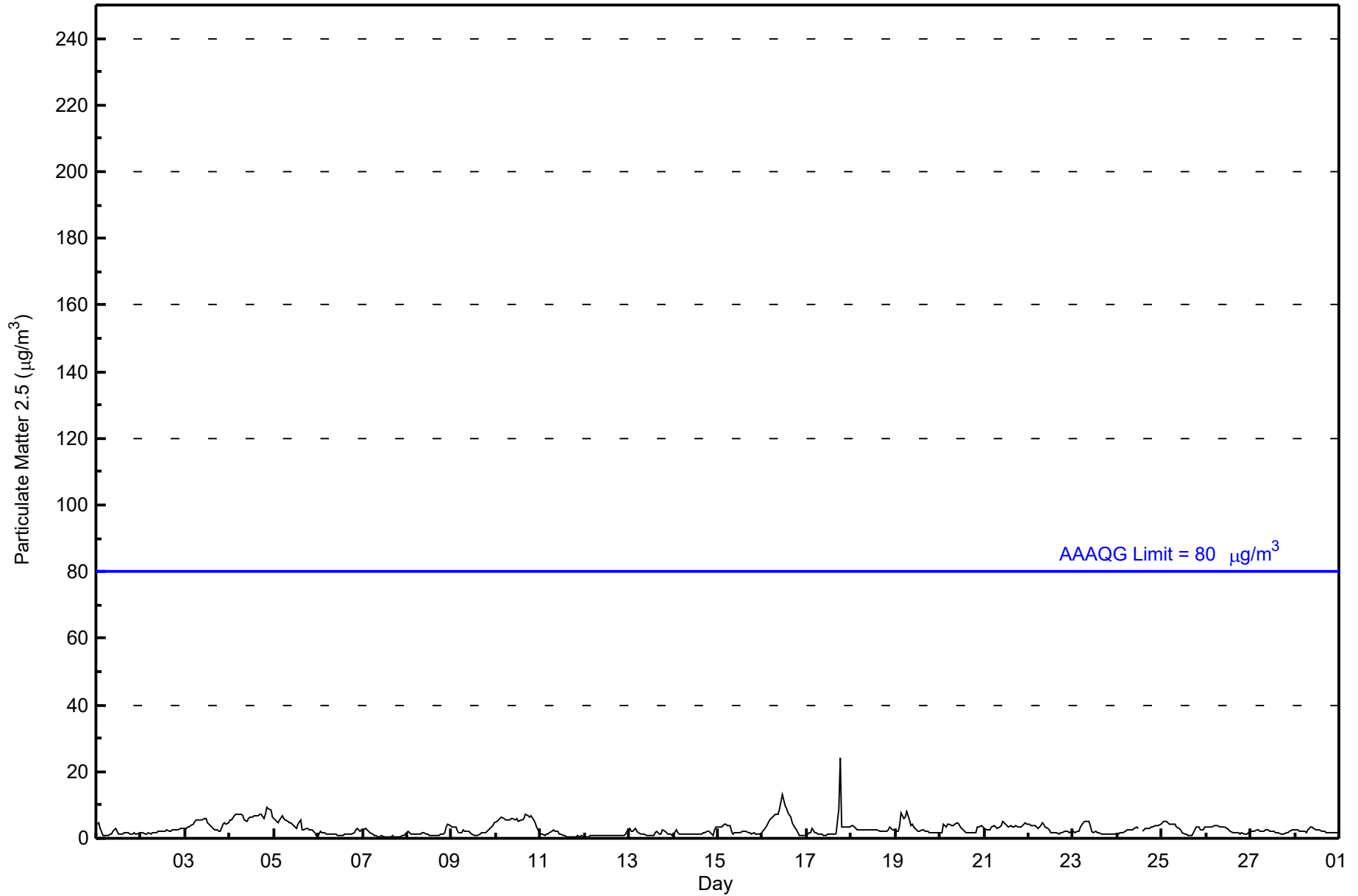
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Stony Mountain - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														672							
Maximum Value: 24.2 µg/m <sup>3</sup> on Feb 17 19:00		Maximum Daily Average: 6.8 µg/m <sup>3</sup> on Feb 4		Hours of Data:														671									
Minimum Value: 0.4 µg/m <sup>3</sup> on Feb 11 17:00		Minimum Daily Average: 0.9 µg/m <sup>3</sup> on Feb 12		Hours of Missing Data:														1									
Maximum Diurnal Average: 3.2 µg/m <sup>3</sup> at hour 7		Minimum Diurnal Average: 2.2 µg/m <sup>3</sup> at hour 17		Hours of Calibration:														1									
Monthly Average: 2.73 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 0.5 P <sub>10</sub> = 1.0 Q <sub>1</sub> = 1.4 Median = 2.2 Q <sub>3</sub> = 3.5 P <sub>90</sub> = 5.5 P <sub>99</sub> = 8.8		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-Feb	4.3	4.7	2.9	0.8	1.0	1.0	1.0	1.1	1.2	2.2	3.0	2.1	1.4	1.3	1.4	1.5	1.5	1.5	1.4	1.4	1.5	1.4	1.5	1.5	1.8	4.7	
2-Feb	1.6	1.6	1.4	1.4	1.5	1.5	1.5	1.6	1.9	2.2	2.1	2.1	2.3	2.3	2.3	2.2	2.5	2.7	2.6	2.6	2.8	2.8	2.8	2.1	2.8		
3-Feb	3.0	3.2	3.5	4.0	4.4	5.0	5.5	5.7	5.6	5.7	5.9	5.7	4.5	3.8	3.2	2.8	2.5	2.4	2.2	2.1	4.4	4.8	4.1	4.5	4.1	5.9	
4-Feb	5.4	5.7	7.0	7.2	7.1	7.1	7.2	6.7	5.3	5.0	6.1	6.2	6.2	6.7	6.7	7.2	7.3	5.9	7.3	9.3	8.9	8.4	6.5	6.8	9.3		
5-Feb	6.0	5.2	4.7	5.5	6.6	5.9	5.4	4.9	4.6	4.6	4.1	3.4	2.9	4.2	5.4	2.4	2.4	2.8	3.0	2.4	2.4	2.3	1.8	1.0	3.9	6.6	
6-Feb	1.3	1.9	1.6	1.6	1.4	1.1	1.2	1.2	1.2	1.1	1.0	0.9	0.9	1.0	1.4	1.4	1.3	1.4	1.4	1.5	2.3	3.1	2.3	2.6	1.5	3.1	
7-Feb	2.4	3.0	2.4	2.1	1.7	1.2	1.1	0.9	0.6	0.6	0.7	0.6	0.5	0.5	0.5	0.6	0.7	0.6	0.6	0.5	0.5	0.9	1.0	1.4	1.1	3.0	
8-Feb	2.2	1.8	1.4	1.3	1.2	1.1	1.2	1.3	1.6	1.6	1.4	1.2	1.0	0.8	0.7	0.7	0.6	0.8	1.3	1.4	1.6	3.6	4.1	3.8	1.6	4.1	
9-Feb	3.3	3.4	3.2	2.1	1.5	1.8	2.4	2.1	2.1	2.0	1.7	1.3	0.9	0.6	0.8	1.2	1.7	1.5	1.9	2.1	2.7	3.3	3.8	4.6	2.2	4.6	
10-Feb	5.1	5.5	5.8	6.3	6.1	5.7	5.7	5.5	5.8	5.9	5.7	5.7	5.3	5.6	5.5	5.9	7.4	6.9	6.4	6.6	5.5	4.5	3.3	1.7	5.6	7.4	
11-Feb	1.2	1.3	0.9	1.2	1.3	1.7	2.2	2.3	2.3	2.1	1.5	1.2	1.0	0.7	0.5	0.5	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6	1.1	2.3	
12-Feb	0.6	0.6	0.6	0.7	0.9	1.0	1.0	0.9	0.8	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.9	1.0	1.0	0.9	1.0	1.4	2.1	0.9	2.1
13-Feb	2.9	2.3	2.1	2.9	2.0	1.5	1.4	1.3	1.2	1.0	0.8	0.8	0.8	1.0	1.8	2.1	1.2	1.3	2.7	2.2	1.6	1.3	1.1	1.0	1.6	2.9	
14-Feb	1.3	2.4	1.7	1.2	1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.2	1.2	1.1	1.1	1.3	1.5	1.6	2.1	2.1	1.5	1.0	2.7	3.4	1.6	3.4	
15-Feb	3.4	3.2	3.4	4.1	4.3	4.0	3.7	1.9	1.4	1.5	1.6	1.6	1.6	1.9	1.9	1.9	1.9	1.7	1.5	1.5	1.5	1.3	1.1	1.5	2.2	4.3	
16-Feb	2.1	2.7	3.7	4.5	5.3	6.3	6.7	7.0	7.4	9.0	10.9	13.1	9.8	8.8	7.8	6.2	4.6	3.8	2.7	1.6	0.9	0.7	0.8	1.0	5.3	13.1	
17-Feb	1.2	1.5	1.9	2.8	1.6	1.6	1.4	1.1	1.1	1.0	1.0	1.1	1.3	1.3	1.3	1.4	1.5	8.8	24.2	3.2	3.3	3.4	3.3	3.4	3.1	24.2	
18-Feb	3.7	3.8	3.1	2.7	2.6	2.5	2.4	2.6	2.5	2.5	2.6	2.6	2.6	2.6	2.3	2.2	2.1	2.1	2.2	2.3	2.6	3.3	2.5	2.5	2.6	3.8	
19-Feb	2.3	2.2	3.9	7.8	5.9	6.4	7.9	5.7	3.9	4.4	3.3	2.6	2.3	2.3	2.5	2.3	2.0	1.9	1.9	1.9	1.9	1.8	1.7	1.7	3.4	7.9	
20-Feb	1.6	1.8	4.3	3.2	4.2	4.3	4.0	4.0	4.4	4.8	4.1	3.4	2.7	2.3	1.9	1.8	1.7	1.6	1.7	1.7	3.2	3.2	4.0	3.4	3.0	4.8	
21-Feb	2.8	2.4	2.4	2.5	3.4	3.8	3.4	3.1	3.3	3.9	4.9	4.4	3.7	3.5	3.6	3.4	3.6	3.9	3.4	3.2	3.3	4.2	4.6	4.3	3.5	4.9	
22-Feb	4.2	4.0	3.6	3.6	3.4	3.1	3.7	4.7	4.2	3.5	2.8	2.3	1.8	1.6	1.7	1.6	1.5	1.6	1.9	1.9	1.9	2.0	1.9	2.0	2.7	4.7	
23-Feb	2.0	1.9	2.0	2.1	3.4	4.6	5.2	4.9	5.0	3.7	2.2	1.7	2.0	1.8	1.7	1.5	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	2.3	5.2	
24-Feb	1.4	1.6	1.6	1.8	2.2	2.5	2.5	2.6	2.7	3.0	3.3	2.8	C	2.3	2.4	2.8	2.9	3.1	3.4	3.5	3.6	3.9	4.0	4.3	2.8	4.3	
25-Feb	4.6	5.0	5.2	4.8	4.4	4.3	4.2	4.1	3.6	3.2	2.7	1.8	1.4	1.2	1.0	0.9	0.9	1.7	3.2	3.5	3.3	2.4	2.7	3.2	3.1	5.2	
26-Feb	3.2	3.3	3.6	3.6	3.6	3.7	3.7	3.5	3.6	3.5	3.2	3.0	2.6	2.1	1.8	1.7	1.6	1.5	1.4	1.6	1.4	1.1	1.2	1.8	2.5	3.7	
27-Feb	2.2	2.2	2.2	2.4	2.4	2.0	2.2	2.0	2.4	2.5	2.1	2.0	1.9	1.8	1.6	1.5	1.4	1.4	1.4	1.6	1.8	2.0	2.3	2.6	2.0	2.6	
28-Feb	2.5	2.4	2.2	2.1	2.0	1.9	1.8	2.6	3.3	3.3	2.9	2.7	2.7	2.5	2.3	2.1	2.0	1.7	1.8	1.8	1.6	1.6	1.8	1.7	2.2	3.3	
																								Diurnal Average			
																								Diurnal Maximum			
																								2.8 2.9 2.9 3.1 3.1 3.1 3.2 3.1 3.0 3.1 3.0 2.8 2.5 2.4 2.4 2.2 2.2 2.4 3.0 2.3 2.5 2.6 2.6 2.6 2.6			
																								6.0 5.7 7.0 7.8 7.1 7.1 7.9 7.0 7.4 9.0 10.9 13.1 9.8 8.8 7.8 6.7 7.4 8.8 24.2 7.3 9.3 8.9 8.4 6.5			
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>) -  $\mu\text{g}/\text{m}^3$   
Stony Mountain - February 2023**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	606	90.31	90.31
6 - 15	64	9.54	99.85
16 - 25	1	0.15	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 671

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Stony Mountain - February 2023**

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	62	33	34	25	21	12	11	18	30	61	49	44	52	50	45	58	605
6 - 15	2	2	1	2	5	4	4	3	3	19	11	1	0	0	5	2	64
16 - 25	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
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>	64	36	35	27	26	16	15	21	33	80	60	45	52	50	50	60	670

Total Number of Valid Hours: 670

Total Number of Hours: 672



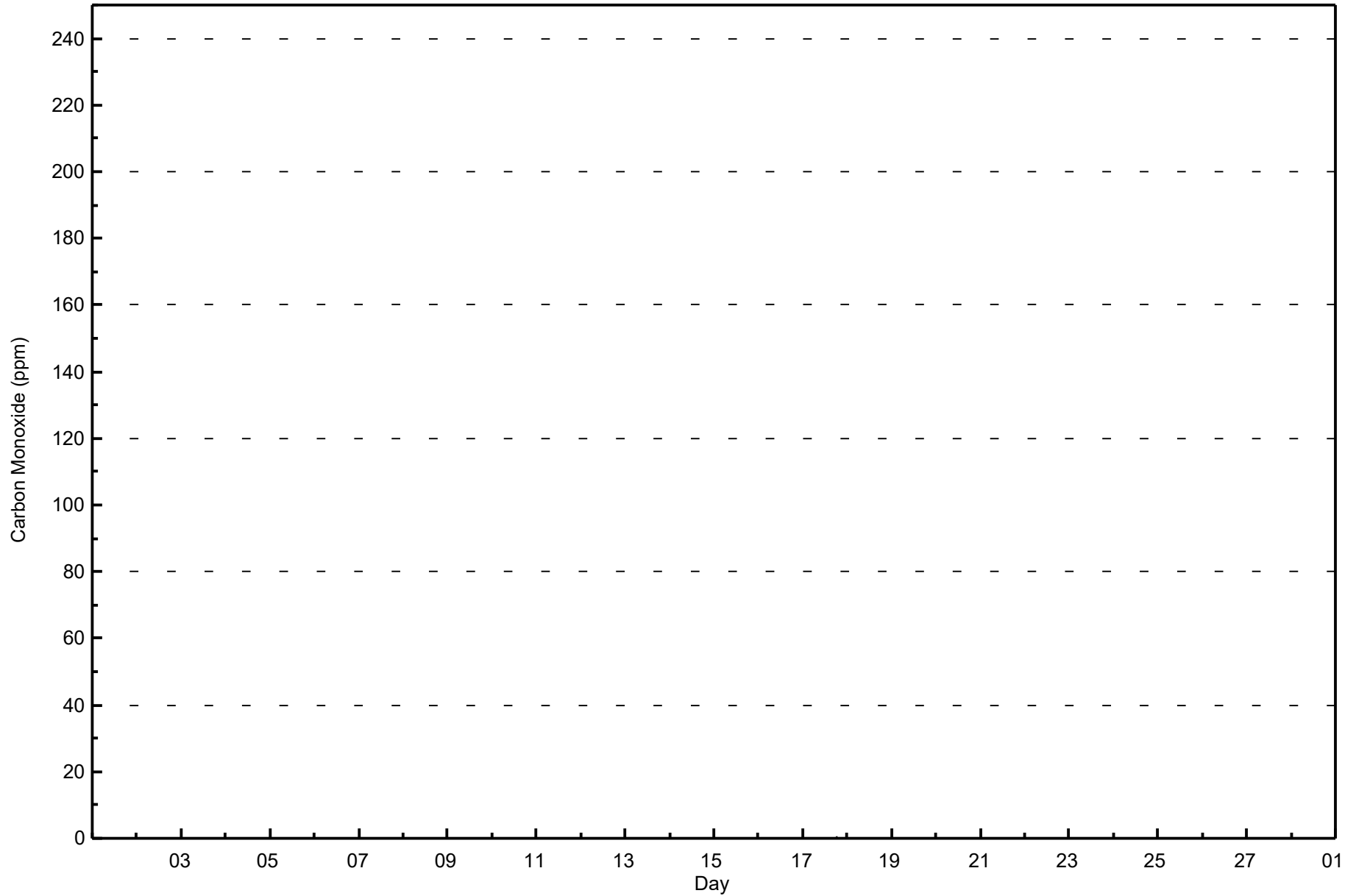






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Carbon Monoxide (CO) - ppm**  
**Stony Mountain - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Carbon Monoxide (CO) - ppm  
Stony Mountain - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	640	100.00	100.00
0.4 - 0.5	0	0.00	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: 640

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Carbon Monoxide (CO) - ppm  
Stony Mountain - February 2023**

<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 - 0.3	61	34	35	26	25	15	15	20	32	74	56	43	50	50	46	57	639
0.4 - 0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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>	61	34	35	26	25	15	15	20	32	74	56	43	50	50	46	57	639

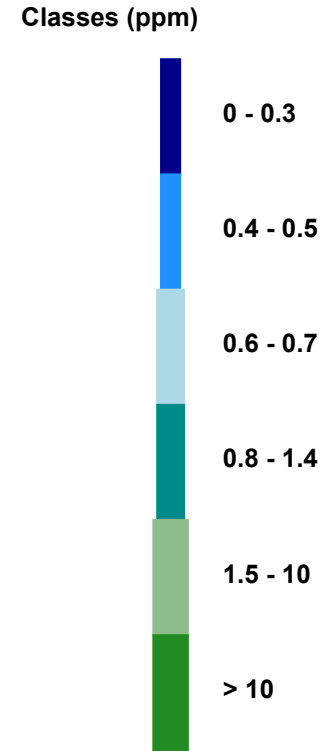
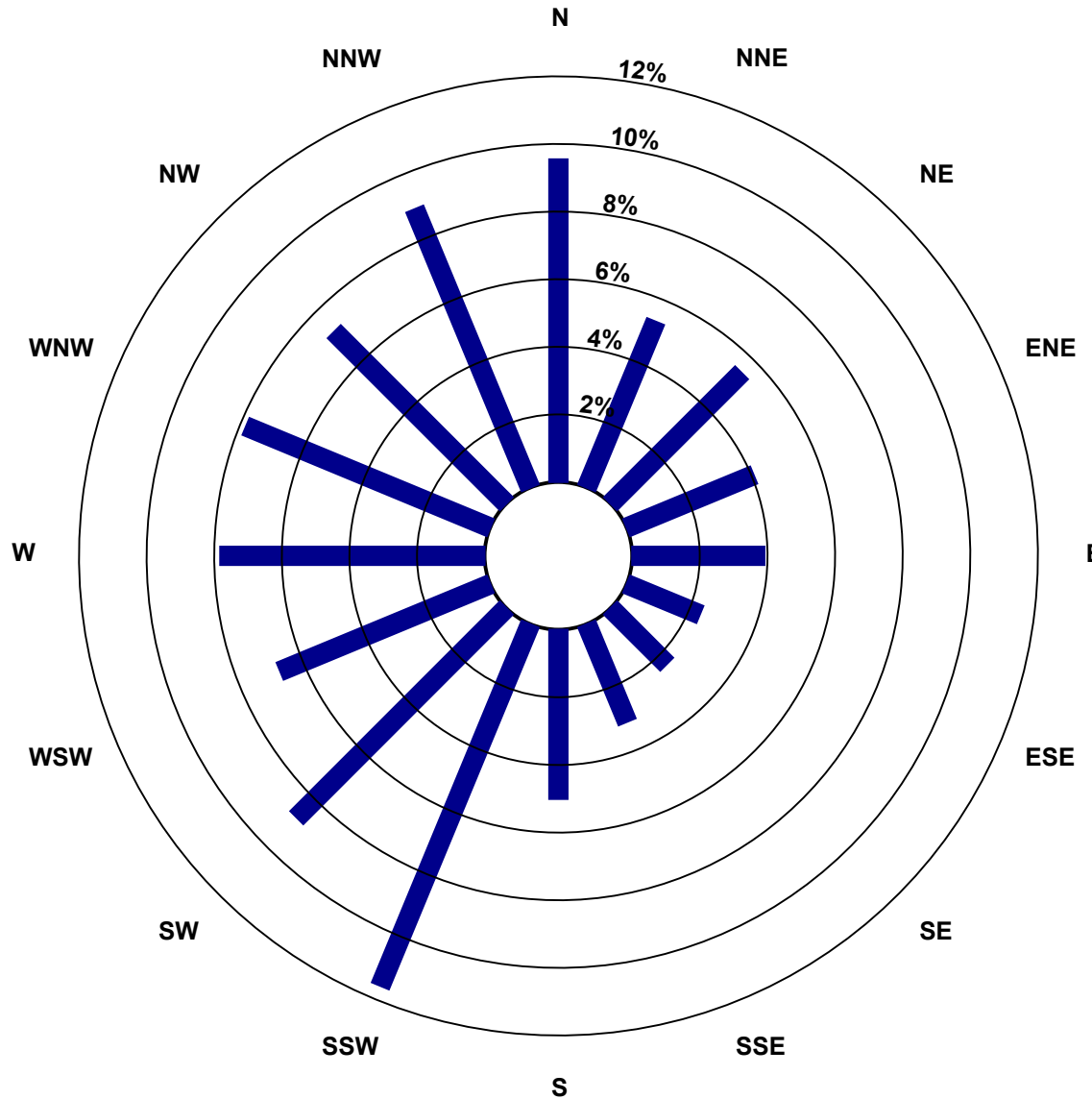
Total Number of Valid Hours: 639

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Carbon Monoxide (CO) - ppm  
Stony Mountain



Total Number of Valid Hours: 639

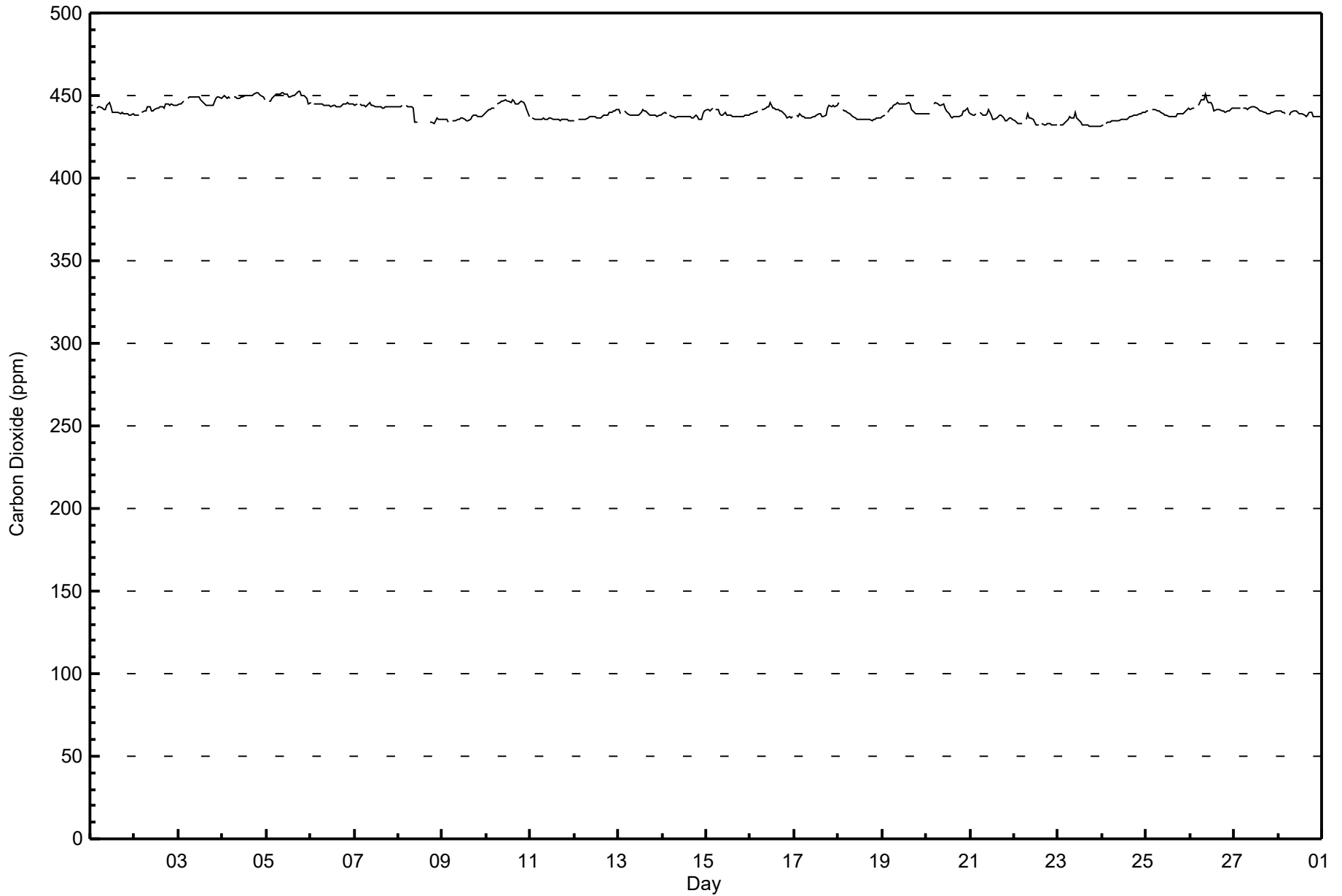


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	672						
Maximum Value: 452.4 ppm on Feb 5 19:00		Maximum Daily Average: 449.9 ppm on Feb 5																	Hours of Data:		637						
Minimum Value: 431.0 ppm on Feb 23 21:00		Minimum Daily Average: 433.5 ppm on Feb 23																	Hours of Missing Data:		35						
Maximum Diurnal Average: 441.5 ppm at hour 9		Minimum Diurnal Average: 439.6 ppm at hour 17																	Hours of Calibration:		34						
Monthly Average: 440.35 ppm		Percentiles: P <sub>1</sub> = 431.7 P <sub>10</sub> = 435.3 Q <sub>1</sub> = 437.0 Median = 439.6 Q <sub>3</sub> = 443.5 P <sub>90</sub> = 446.8 P <sub>99</sub> = 451.2																	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-Feb	443.7	444.1	Z	442.6	443.1	443.0	442.0	441.8	441.5	443.9	445.7	443.1	440.1	439.9	439.9	439.8	439.3	439.6	439.3	438.7	439.1	438.5	438.4	438.8	441.1	445.7	
2-Feb	438.5	438.3	438.5	Z	439.9	440.7	440.9	443.3	443.5	440.8	440.8	441.4	442.3	442.5	443.2	443.4	442.4	444.6	445.2	444.0	444.6	444.3	444.1	444.3	442.2	445.2	
3-Feb	445.1	445.1	445.6	446.3	Z	447.9	448.9	449.4	449.1	448.9	449.1	449.2	447.5	446.0	444.9	443.8	444.2	443.8	444.2	444.3	448.7	449.4	449.1	448.0	446.9	449.4	
4-Feb	449.2	449.8	448.5	448.8	448.6	Z	449.3	449.1	448.5	448.5	449.5	449.4	449.7	450.0	450.1	450.1	451.2	451.9	451.5	450.9	450.2	449.2	447.8	449.6	451.9		
5-Feb	Z	446.8	446.9	448.0	450.0	451.0	451.0	450.9	451.4	451.7	450.9	450.4	449.5	449.3	449.8	450.0	451.2	452.4	452.4	450.4	450.0	449.5	448.3	445.1	449.9	452.4	
6-Feb	445.7	Z	445.3	445.0	444.8	444.6	444.5	444.0	444.3	444.0	443.8	443.6	443.8	443.7	443.3	443.1	443.3	443.9	444.6	445.2	445.5	445.3	444.5	444.7	444.4	445.7	
7-Feb	444.1	444.7	Z	444.6	444.1	443.7	443.5	443.8	446.1	444.3	444.0	443.3	442.9	442.9	443.0	442.5	442.5	442.9	442.9	443.0	443.2	443.2	443.3	443.2	443.6	446.1	
8-Feb	443.4	443.5	443.7	Z	443.7	443.1	443.1	443.2	442.1	433.9	434.2	C	C	C	C	C	C	433.6	434.0	433.4	434.3	436.1	436.0	435.7	--	443.7	
9-Feb	435.5	435.6	435.4	434.1	Z	435.0	435.1	435.0	435.6	435.5	436.1	436.1	435.6	434.8	434.9	436.0	437.4	438.4	438.1	437.6	437.2	437.6	438.4	439.4	436.3	439.4	
10-Feb	441.1	441.4	441.6	442.2	442.5	Z	444.6	445.5	446.5	446.8	447.5	447.0	446.6	445.7	447.1	446.7	444.6	444.9	446.1	446.6	445.9	444.3	441.4	437.6	444.5	447.5	
11-Feb	Z	436.3	435.8	435.6	435.9	435.8	436.0	436.1	435.9	435.8	436.1	436.1	435.9	435.6	435.7	435.4	435.2	435.3	435.4	435.5	435.3	435.0	434.8	434.8	435.6	436.3	
12-Feb	435.1	Z	435.4	435.6	435.5	435.6	435.8	436.3	437.0	437.0	437.0	437.0	436.8	436.3	436.4	437.0	438.0	438.0	438.5	440.0	439.5	440.9	440.9	441.9	437.5	441.9	
13-Feb	441.7	439.3	Z	440.5	439.8	438.8	438.4	438.4	438.5	438.2	438.1	438.3	439.6	441.6	440.8	440.4	438.9	438.4	438.5	438.2	438.1	437.4	437.8	438.3	439.0	441.7	
14-Feb	438.8	440.0	439.3	Z	437.8	437.6	436.9	436.6	437.0	437.4	437.0	436.9	437.0	437.1	436.9	437.0	436.2	436.4	437.8	437.4	435.9	435.7	439.3	440.7	437.5	440.7	
15-Feb	441.3	441.3	441.0	442.1	Z	441.4	441.3	438.8	438.5	438.5	439.5	438.1	438.3	438.1	437.6	437.2	437.3	437.2	436.9	436.9	437.4	438.3	438.5	438.4	438.9	442.1	
16-Feb	438.8	439.0	439.8	439.8	440.6	Z	441.6	441.7	442.3	443.0	443.4	445.4	442.2	442.0	441.8	441.1	440.5	440.3	439.3	438.1	436.8	436.9	436.6	437.1	440.4	445.4	
17-Feb	Z	438.0	437.6	439.2	437.2	437.0	436.6	436.4	436.6	436.4	436.9	437.5	438.0	438.6	439.0	437.4	437.6	438.6	442.5	443.9	443.4	443.7	443.6	444.1	439.1	444.1	
18-Feb	445.9	Z	441.6	440.5	440.5	440.2	439.3	438.1	437.0	436.4	436.0	435.6	435.6	435.7	435.5	435.7	435.8	435.3	435.2	435.2	435.4	436.0	436.3	436.7	437.4	445.9	
19-Feb	437.2	438.2	Z	440.0	442.0	442.6	443.7	444.6	446.1	445.3	445.2	445.1	445.3	445.1	445.8	445.2	441.6	440.0	439.3	439.2	439.3	439.0	438.7	438.6	442.0	446.1	
20-Feb	438.6	438.7	439.1	Z	444.8	445.7	444.8	444.2	444.5	444.6	442.4	440.5	438.8	437.4	436.8	437.0	437.3	437.1	437.5	437.7	441.0	441.0	442.0	439.9	440.5	445.7	
21-Feb	438.8	437.9	437.9	438.6	Z	439.5	438.6	438.5	438.6	438.7	441.4	437.9	436.0	435.5	436.7	437.0	438.2	438.5	436.1	435.0	434.9	436.5	436.0	435.6	437.5	441.4	
22-Feb	434.8	434.2	433.5	433.1	432.8	Z	435.6	438.8	436.6	436.3	436.0	433.9	432.4	431.9	M	432.8	431.9	432.5	433.3	433.3	432.5	432.2	432.3	432.4	433.8	438.8	
23-Feb	Z	432.4	432.4	432.8	433.9	435.9	437.4	436.9	436.6	439.5	436.3	435.7	433.5	432.1	432.0	432.0	431.9	431.2	431.4	431.0	431.0	431.0	431.2	431.6	433.5	439.5	
24-Feb	432.1	Z	433.4	433.7	434.0	434.4	434.7	434.8	434.9	435.1	435.5	435.4	435.2	435.7	436.3	437.1	437.5	437.7	438.0	438.5	438.9	439.2	439.5	439.8	436.1	439.8	
25-Feb	440.4	440.9	Z	441.4	441.1	441.3	441.0	440.9	440.0	439.2	438.4	437.8	437.6	437.7	437.5	437.5	437.7	438.6	438.8	438.9	439.1	439.6	441.2	442.7	439.5	442.7	
26-Feb	441.9	442.1	442.7	Z	443.7	445.7	447.2	447.8	450.5	447.6	445.4	445.8	443.7	441.0	441.8	441.8	441.2	440.7	440.8	439.9	440.3	440.5	441.2	442.2	443.3	450.5	
27-Feb	442.6	442.3	442.1	442.1	Z	442.7	442.6	441.7	442.1	443.2	443.5	443.3	442.4	441.5	440.9	440.4	439.8	439.6	439.3	439.3	439.4	439.8	440.1	440.4	440.8	441.4	443.5
28-Feb	440.9	440.5	440.2	440.0	438.6	Z	438.3	439.8	440.6	440.5	440.4	439.2	439.0	438.6	438.1	437.5	437.8	440.0	439.6	437.6	437.1	437.0	437.6	437.6	439.0	440.9	
		440.6	440.4	439.9	440.3	440.7	441.0	441.2	441.3	441.5	441.1	441.1	440.9	440.2	439.9	440.2	439.8	439.6	439.7	439.9	439.7	439.8	440.0	440.0	439.9	Diurnal Average	
		449.2	449.8	448.5	448.8	450.0	451.0	451.0	450.9	451.4	451.7	450.9	450.4	449.7	450.0	450.1	450.1	451.2	452.4	452.4	451.5	450.9	450.2	449.2	448.0	Diurnal Maximum	
Z - zerspan		C - Calibration					M - Maintenance																				



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

**Carbon Dioxide (CO<sub>2</sub>) - ppm**  
**Stony Mountain - February 2023**







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

**Carbon Dioxide (CO<sub>2</sub>) - ppm**  
**Stony Mountain - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
400 - 420	0	0.00	0.00
420 - 440	357	56.04	56.04
440 - 460	280	43.96	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: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Carbon Dioxide (CO<sub>2</sub>) - ppm  
Stony Mountain - February 2023**

<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	
400 - 420	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420 - 440	47	22	24	11	8	8	6	6	17	39	31	27	25	26	19	40	356
440 - 460	14	13	11	15	17	7	9	14	16	37	26	15	23	20	28	15	280
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>	61	35	35	26	25	15	15	20	33	76	57	42	48	46	47	55	636

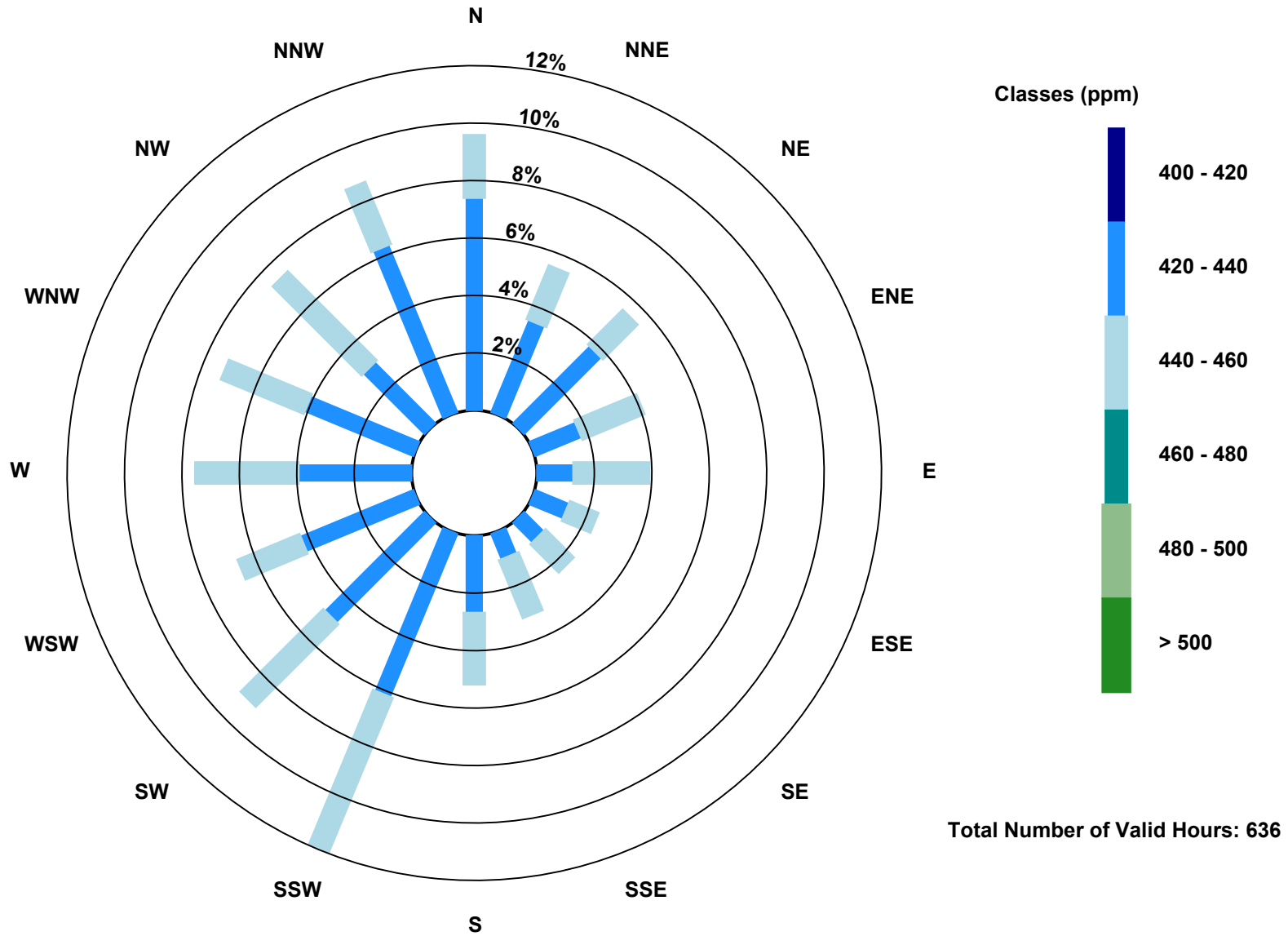
Total Number of Valid Hours: 636

Total Number of Hours: 672



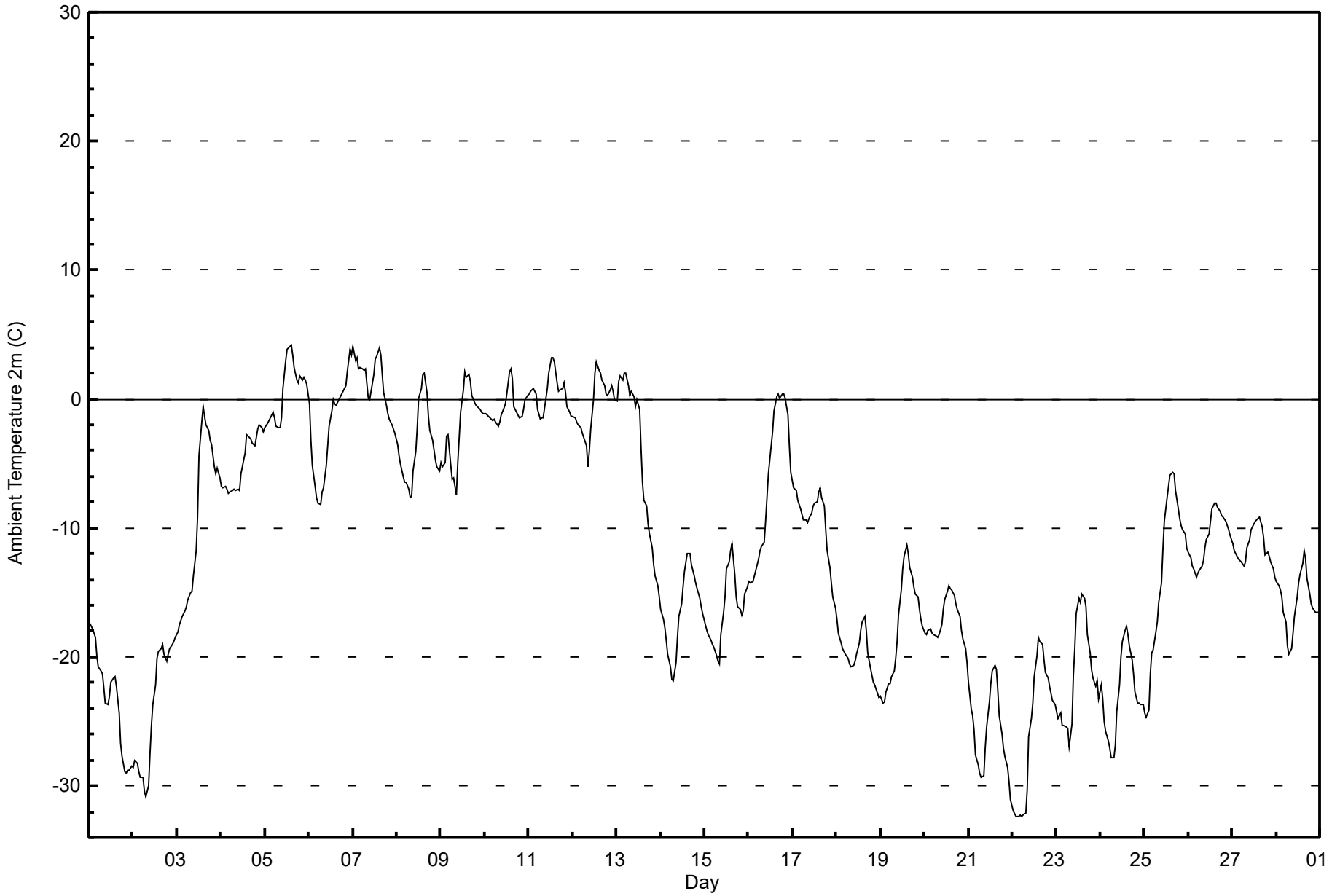
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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





Maximum Value: 4.2 C on Feb 5 15:00		Maximum Daily Average: 1.3 C on Feb 7		Hours in Service: 672																							
Minimum Value: -32.4 C on Feb 22 06:00		Minimum Daily Average: -25.7 C on Feb 21		Hours of Data: 672																							
Maximum Diurnal Average: -7.7 C at hour 15		Minimum Diurnal Average: -14.4 C at hour 8		Hours of Missing Data: 0																							
Monthly Average: -11.54 C		Percentiles: P <sub>1</sub> = -32.0 P <sub>10</sub> = -23.7 Q <sub>1</sub> = -19.1 Median = -11.9 Q <sub>3</sub> = -2.2 P <sub>90</sub> = 0.7 P <sub>99</sub> = 3.4		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-Feb	-17.4	-17.7	-17.9	-18.5	-19.9	-20.7	-21.1	-21.3	-22.4	-23.6	-23.7	-23.1	-22.0	-21.6	-21.6	-22.3	-24.4	-26.7	-27.7	-28.9	-29.0	-28.8	-28.8	-28.5	-23.2	-17.4	
2-Feb	-28.6	-28.0	-28.2	-28.9	-29.3	-29.4	-30.4	-30.9	-30.0	-27.5	-25.3	-23.7	-22.1	-20.1	-19.6	-19.3	-19.0	-19.8	-20.3	-19.8	-19.3	-19.0	-18.8	-18.5	-24.0	-18.5	
3-Feb	-18.1	-17.5	-17.2	-16.9	-16.4	-16.0	-15.6	-15.0	-14.9	-13.8	-11.7	-9.2	-4.4	-1.8	-0.6	-1.4	-2.0	-2.4	-3.2	-3.6	-5.3	-5.8	-5.4	-6.1	-9.3	-0.6	
4-Feb	-6.8	-6.9	-6.8	-7.0	-7.3	-7.2	-7.1	-7.0	-7.1	-7.0	-7.1	-5.8	-4.7	-4.1	-2.8	-2.9	-3.1	-3.5	-3.7	-3.0	-2.3	-2.0	-2.2	-2.5	-5.0	-2.0	
5-Feb	-2.3	-1.9	-1.7	-1.5	-1.0	-1.5	-2.1	-2.2	-2.2	-1.5	0.8	3.0	3.9	3.9	4.2	3.4	2.5	1.5	1.3	1.7	1.4	1.7	1.5	1.1	0.6	4.2	
6-Feb	-0.3	-3.2	-5.2	-6.8	-7.6	-8.1	-8.2	-7.2	-6.9	-5.2	-3.7	-2.1	-1.0	-0.1	-0.4	-0.5	0.0	0.2	0.4	0.9	1.0	2.1	3.8	3.4	-2.3	3.8	
7-Feb	4.1	3.0	3.2	2.4	2.4	2.3	2.2	2.3	0.1	0.0	0.6	1.9	3.2	3.3	3.9	3.4	1.9	0.5	-0.5	-1.2	-1.6	-2.0	-2.3	-2.6	1.3	4.1	
8-Feb	-3.6	-4.4	-5.1	-6.0	-6.4	-6.4	-7.0	-7.6	-7.5	-5.6	-4.1	-2.2	0.1	0.9	1.9	2.0	0.5	-1.4	-2.5	-3.2	-3.9	-4.7	-5.3	-5.6	-3.6	2.0	
9-Feb	-4.9	-5.3	-5.0	-2.9	-2.7	-5.1	-6.3	-6.1	-7.5	-4.9	-2.9	-1.0	0.7	2.2	1.7	1.9	1.4	0.3	-0.2	-0.5	-0.6	-0.9	-1.0	-1.1	-2.1	2.2	
10-Feb	-1.1	-1.3	-1.4	-1.5	-1.6	-1.5	-1.8	-2.1	-1.8	-1.2	-0.7	-0.4	0.4	2.1	2.4	1.6	-0.6	-1.1	-1.2	-1.4	-1.3	-0.8	-0.1	0.3	-0.7	2.4	
11-Feb	0.4	0.6	0.8	0.6	0.4	-0.8	-1.5	-1.5	-1.4	0.0	0.8	2.0	3.2	3.3	2.9	1.2	0.6	0.7	0.8	1.3	0.5	-0.5	-1.1	-1.3	0.5	3.3	
12-Feb	-1.4	-1.5	-1.7	-2.0	-2.3	-2.7	-3.0	-3.6	-5.3	-4.1	-2.3	-0.1	2.0	2.8	2.2	2.0	1.5	1.0	0.4	0.2	0.7	1.1	0.6	0.0	-0.6	2.8	
13-Feb	-0.2	1.4	1.8	1.5	2.0	2.0	1.1	0.3	0.6	0.2	-0.6	0.0	-0.8	-3.9	-6.5	-7.9	-8.3	-9.6	-10.5	-11.5	-12.8	-13.7	-14.5	-15.4	-4.4	2.0	
14-Feb	-16.4	-17.1	-17.7	-18.7	-19.8	-20.7	-21.7	-21.9	-20.4	-18.5	-16.9	-15.8	-14.6	-13.4	-11.9	-11.9	-12.0	-12.8	-13.7	-14.2	-14.7	-15.5	-16.1	-16.6	-16.4	-11.9	
15-Feb	-17.5	-17.9	-18.3	-18.7	-19.0	-19.3	-19.9	-20.3	-20.5	-18.3	-16.6	-15.3	-13.2	-12.6	-11.8	-11.2	-13.6	-15.3	-16.1	-16.4	-16.8	-16.4	-15.2	-14.5	-16.5	-11.2	
16-Feb	-14.2	-14.3	-14.1	-13.8	-13.2	-12.4	-11.8	-11.4	-11.1	-9.5	-7.7	-5.8	-3.6	-2.5	-0.9	0.1	0.3	0.1	0.4	0.4	0.1	-1.2	-3.6	-5.7	-6.5	0.4	
17-Feb	-6.9	-7.0	-7.1	-7.8	-8.5	-8.9	-9.3	-9.4	-9.6	-9.2	-8.8	-8.3	-8.0	-8.0	-7.2	-6.9	-7.6	-8.2	-10.2	-11.8	-13.0	-14.2	-15.3	-16.2	-9.5	-6.9	
18-Feb	-17.1	-18.2	-18.9	-19.4	-19.6	-19.8	-20.1	-20.6	-20.8	-20.7	-20.3	-19.8	-18.9	-17.9	-17.3	-16.8	-18.0	-19.6	-20.9	-21.4	-21.9	-22.1	-22.8	-23.1	-19.8	-16.8	
19-Feb	-23.1	-23.5	-23.5	-22.7	-22.0	-22.0	-21.5	-21.0	-20.2	-18.8	-16.8	-14.8	-13.2	-12.2	-11.3	-12.0	-13.0	-13.8	-14.6	-15.1	-15.3	-16.3	-17.1	-17.6	-17.6	-11.3	
20-Feb	-18.1	-18.3	-17.9	-17.9	-18.2	-18.3	-18.4	-18.5	-18.3	-17.5	-16.3	-15.6	-14.9	-14.5	-14.7	-14.8	-15.2	-15.9	-16.4	-16.9	-17.9	-18.6	-19.4	-20.5	-17.2	-14.5	
21-Feb	-21.9	-24.0	-24.6	-25.6	-27.6	-28.4	-29.0	-29.4	-29.2	-27.1	-25.5	-23.5	-22.1	-21.1	-20.7	-20.9	-22.6	-24.6	-26.0	-27.0	-27.7	-28.6	-29.7	-31.1	-25.7	-20.7	
22-Feb	-32.0	-32.2	-32.4	-32.4	-32.2	-32.4	-32.2	-32.2	-30.4	-26.2	-24.8	-23.6	-21.5	-19.9	-18.5	-18.8	-19.1	-20.2	-21.2	-21.6	-22.3	-22.8	-23.4	-23.7	-25.7	-18.5	
23-Feb	-24.2	-24.8	-24.4	-25.3	-25.3	-25.5	-25.5	-27.0	-25.2	-21.4	-19.4	-16.7	-15.5	-15.8	-15.2	-15.5	-16.1	-18.3	-19.7	-20.9	-21.6	-22.3	-21.9	-23.3	-21.3	-15.2	
24-Feb	-22.2	-23.3	-25.0	-25.8	-26.5	-27.1	-27.8	-27.8	-26.8	-24.2	-22.2	-20.0	-18.8	-18.0	-17.6	-18.2	-19.1	-20.3	-21.3	-22.7	-23.5	-23.6	-23.7	-23.7	-22.9	-17.6	
25-Feb	-24.3	-24.6	-24.1	-21.3	-19.7	-19.5	-18.0	-17.3	-15.8	-14.3	-11.7	-9.5	-7.7	-6.8	-5.9	-5.7	-5.9	-7.1	-8.5	-9.3	-9.8	-10.1	-10.4	-11.5	-13.3	-5.7	
26-Feb	-11.9	-12.4	-12.9	-13.2	-13.8	-13.5	-13.3	-12.9	-12.5	-11.5	-10.9	-10.4	-9.5	-8.5	-8.1	-8.1	-8.4	-8.8	-9.1	-9.2	-9.5	-9.8	-10.1	-10.6	-10.8	-8.1	
27-Feb	-11.2	-11.8	-12.0	-12.5	-12.5	-12.7	-12.9	-12.7	-11.6	-10.9	-10.1	-9.9	-9.5	-9.3	-9.2	-9.2	-9.9	-10.8	-12.1	-11.9	-12.2	-12.6	-13.2	-13.9	-11.4	-9.2	
28-Feb	-14.2	-14.5	-14.8	-15.4	-16.5	-17.3	-19.1	-19.8	-19.3	-18.1	-16.9	-15.3	-14.3	-13.6	-12.7	-11.8	-12.4	-13.9	-15.1	-15.8	-16.2	-16.5	-16.5	-16.6	-15.7	-11.8	
		-12.7	-13.1	-13.3	-13.5	-13.7	-14.0	-14.3	-14.4	-14.2	-12.9	-11.6	-10.2	-8.8	-8.1	-7.7	-7.9	-8.6	-9.6	-10.4	-10.8	-11.2	-11.6	-11.9	-12.3	Diurnal Average	
		4.1	3.0	3.2	2.4	2.4	2.3	2.2	2.3	0.6	0.2	0.8	3.0	3.9	3.9	4.2	3.4	2.5	1.5	1.3	1.7	1.4	2.1	3.8	3.4	Diurnal Maximum	





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C  
Stony Mountain - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	142	21.13	21.13
-20 - 0	432	64.29	85.42
0 - 10	98	14.58	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

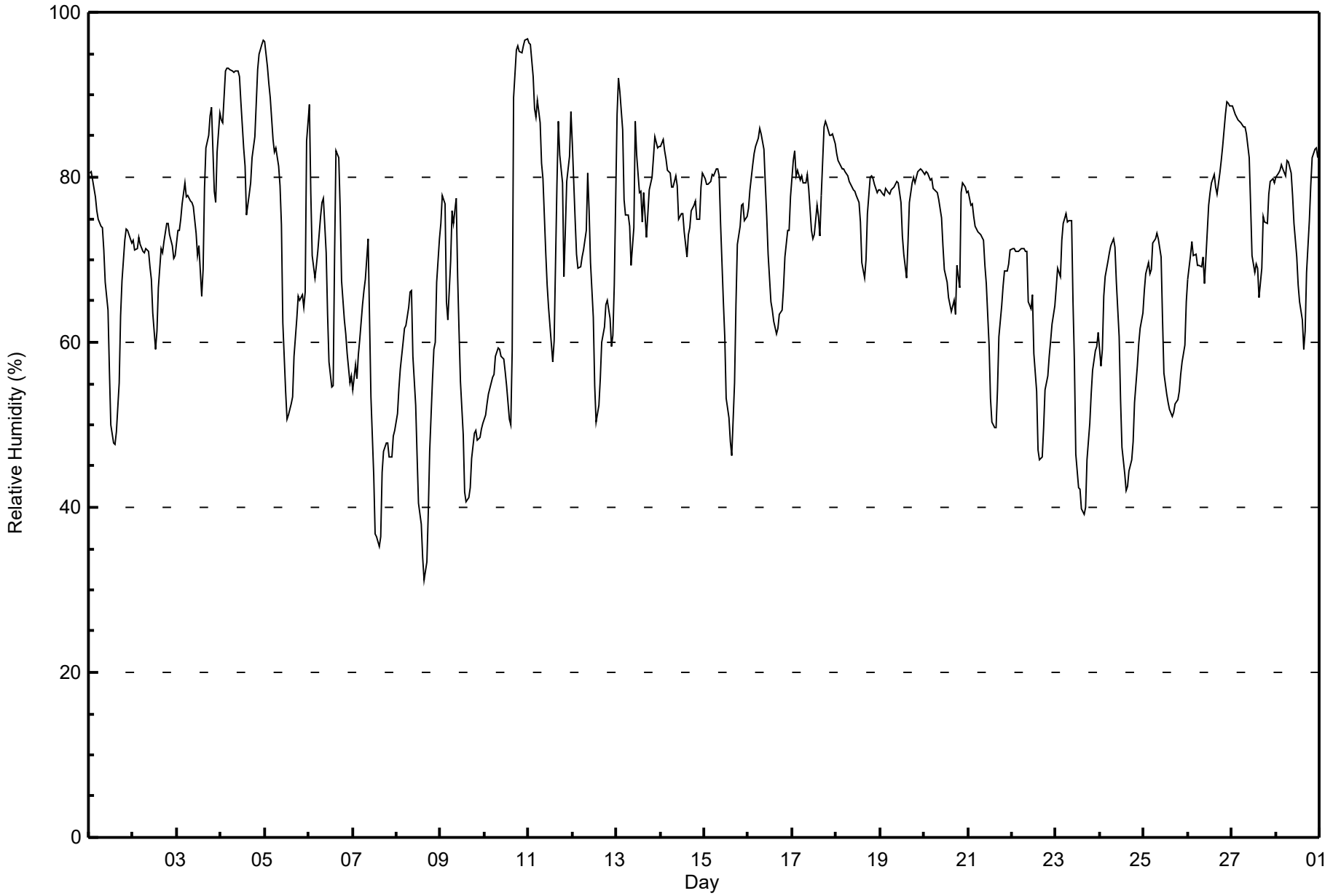
**Relative Humidity (RH) - %  
Stony Mountain - February 2023**

Maximum Value: 96.8 % on Feb 11 00:00      Maximum Daily Average: 88.9 % on Feb 4																						Hours in Service: 672 Hours of Data: 672				
Minimum Value: 31.1 % on Feb 8 16:00      Minimum Daily Average: 51.6 % on Feb 7 Maximum Diurnal Average: 76.4 % at hour 2      Minimum Diurnal Average: 58.2 % at hour 15 Monthly Average: 70.39 %      Percentiles: P <sub>1</sub> = 37.6 P <sub>10</sub> = 51.2 Q <sub>1</sub> = 62.1 Median = 72.4 Q <sub>3</sub> = 79.4 P <sub>90</sub> = 85.2 P <sub>99</sub> = 96.0																						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-Feb	80.5	80.7	79.6	77.6	75.9	74.9	74.0	74.0	71.1	67.2	63.8	56.7	50.0	47.8	47.6	49.2	55.1	63.3	67.5	72.4	73.7	73.5	73.1	72.0	67.5	80.7
2-Feb	72.4	71.2	71.3	72.7	71.9	71.1	70.8	71.3	71.0	69.2	67.7	63.6	59.1	61.3	66.6	71.4	70.9	72.1	74.3	74.4	73.1	71.7	70.2	70.5	70.0	74.4
3-Feb	73.6	73.6	74.9	76.8	79.3	77.7	77.7	77.2	76.9	76.5	73.2	70.5	71.6	65.5	68.7	78.6	83.6	85.2	87.5	88.4	78.3	76.9	83.0	87.8	77.6	88.4
4-Feb	86.9	86.6	92.9	93.2	93.3	93.1	93.0	92.7	92.9	92.8	92.2	89.2	83.5	81.4	75.4	77.9	79.4	82.3	84.9	89.1	93.1	95.0	96.2	96.7	88.9	96.7
5-Feb	96.4	93.4	91.4	89.6	84.6	83.0	83.5	81.4	79.1	74.2	62.4	54.1	50.6	51.3	52.6	53.4	58.3	62.9	65.5	65.2	65.8	64.3	66.1	84.4	71.4	96.4
6-Feb	88.7	78.1	70.5	67.8	69.4	71.1	75.2	77.0	77.4	70.8	63.4	57.7	54.6	54.7	70.6	83.2	82.4	76.2	67.4	62.7	61.1	58.6	55.1	55.9	68.7	88.7
7-Feb	54.2	57.4	55.6	58.5	60.4	64.5	66.3	67.6	72.5	62.9	53.3	43.9	36.8	36.5	35.3	36.4	44.2	46.8	47.9	47.9	46.1	46.1	48.6	49.3	51.6	72.5
8-Feb	51.3	54.4	56.7	59.9	61.7	62.0	64.2	66.1	66.2	58.3	52.4	46.3	40.5	37.9	34.0	31.1	33.4	39.2	46.7	55.5	59.1	60.0	67.2	72.6	53.2	72.6
9-Feb	74.5	77.9	76.8	65.0	62.6	69.8	75.9	74.4	77.5	68.0	61.4	55.3	48.8	41.9	40.6	41.2	42.4	45.9	48.9	49.3	48.2	48.5	49.5	50.2	58.1	77.9
10-Feb	51.2	52.5	53.7	54.3	55.7	56.1	58.4	59.3	59.1	58.4	57.9	56.4	54.7	50.6	49.9	58.9	89.6	95.5	95.9	95.3	95.1	95.9	96.6	96.8	68.7	96.8
11-Feb	96.3	96.1	92.3	88.2	87.4	89.3	86.6	81.7	79.8	70.8	67.0	64.3	59.8	57.6	60.3	79.2	86.8	82.8	79.3	68.0	73.6	79.5	82.5	87.9	79.0	96.3
12-Feb	84.1	74.9	70.7	69.0	69.1	70.3	71.2	73.6	80.5	75.9	69.7	63.1	54.7	50.4	52.4	55.6	60.0	61.9	64.5	65.0	62.8	59.4	60.9	67.0	66.1	84.1
13-Feb	87.6	92.1	90.3	85.8	77.2	75.5	75.5	74.1	69.4	73.8	86.7	82.7	78.1	78.3	74.5	78.1	72.7	75.6	78.6	79.9	82.4	84.8	83.6	83.7	80.0	92.1
14-Feb	83.8	84.6	83.2	82.2	80.9	80.5	78.9	78.8	80.2	79.0	74.8	75.5	75.6	73.4	70.4	73.0	73.9	75.9	76.6	77.1	75.0	75.0	78.8	80.5	77.8	84.6
15-Feb	79.9	79.1	79.2	79.5	80.3	80.1	81.0	80.9	80.2	74.3	64.8	60.7	53.2	50.9	47.9	46.3	55.0	64.5	71.9	74.1	76.7	76.8	74.7	75.2	70.3	81.0
16-Feb	76.3	78.5	81.5	82.8	83.7	84.8	85.9	85.2	83.4	79.2	75.3	70.8	65.0	63.9	62.5	61.0	61.7	63.4	63.9	66.6	70.4	73.5	73.6	77.6	73.8	85.9
17-Feb	82.1	83.2	80.2	80.8	79.7	80.2	79.2	79.3	80.3	78.7	73.5	72.5	73.1	76.7	75.2	72.9	77.9	86.1	86.7	86.3	85.2	85.2	85.2	84.1	80.2	86.7
18-Feb	82.9	82.0	81.4	81.1	80.9	80.6	80.2	79.6	79.1	78.6	78.2	77.9	77.0	74.6	69.7	67.8	70.0	75.7	80.0	80.2	79.9	79.1	78.2	78.5	78.0	82.9
19-Feb	78.5	78.0	77.9	78.6	78.1	78.0	78.4	78.8	79.2	79.6	79.4	76.9	72.8	70.6	67.9	72.1	76.9	79.4	79.9	79.3	80.6	80.9	81.0	80.9	77.6	81.0
20-Feb	80.4	80.6	80.4	79.7	79.8	78.7	78.4	78.2	77.3	75.2	71.7	68.8	67.3	65.4	64.6	63.7	65.1	63.5	69.3	66.6	78.1	79.3	78.8	78.1	73.7	80.6
21-Feb	78.3	76.6	76.8	75.2	74.1	73.4	73.2	73.1	72.4	69.4	67.1	59.7	53.3	50.3	49.6	49.7	54.2	60.7	64.4	66.9	68.6	68.6	69.4	71.2	66.5	78.3
22-Feb	71.3	71.4	71.0	71.1	71.2	71.3	71.4	71.1	71.0	64.9	64.0	65.7	58.7	54.1	47.0	45.7	46.2	49.7	54.2	56.0	58.4	60.2	62.1	64.4	62.2	71.4
23-Feb	66.6	68.9	67.9	72.3	74.4	75.7	74.5	74.7	74.8	64.9	57.7	46.5	42.4	42.2	39.8	39.2	39.9	45.8	50.2	53.7	56.6	59.1	59.6	61.2	58.7	75.7
24-Feb	57.1	59.2	65.5	68.0	69.9	70.8	71.7	72.5	71.5	67.2	60.7	53.0	47.2	44.1	42.1	42.5	44.4	45.8	47.9	52.8	57.1	59.8	61.8	63.5	58.2	72.5
25-Feb	66.3	68.4	69.6	68.3	68.8	72.1	72.6	73.2	72.5	70.3	62.9	56.3	53.8	52.6	51.8	51.1	51.6	52.5	53.1	54.1	56.1	57.7	59.7	64.9	61.7	73.2
26-Feb	67.6	70.4	72.2	70.5	70.7	69.2	69.4	69.2	70.4	67.1	70.1	76.7	78.1	79.3	80.3	78.8	78.0	80.6	82.0	83.7	87.6	89.2	88.9	88.7	76.6	89.2
27-Feb	88.6	88.1	87.6	87.0	86.8	86.6	86.2	86.1	85.2	82.4	76.7	70.6	68.5	69.5	69.1	65.5	68.9	75.2	74.7	74.5	78.0	79.5	79.8	79.4	78.9	88.6
28-Feb	79.9	80.6	80.9	81.6	81.0	80.1	82.1	81.8	80.5	77.7	74.3	70.4	67.0	65.0	62.7	59.2	61.4	68.5	74.7	79.0	82.4	83.4	83.6	82.4	75.8	83.6
76.3 76.4 76.1 75.6 75.3 75.7 76.3 76.2 76.1 72.4 68.7 64.5 60.6 58.8 58.2 60.1 63.7 67.0 69.2 70.1 71.5 72.2 73.1 75.2																								Diurnal Average		
96.4 96.1 92.9 93.2 93.3 93.1 93.0 92.7 92.9 92.8 92.2 89.2 83.5 81.4 80.3 83.2 89.6 95.5 95.9 95.3 95.1 95.9 96.6 96.8																								Diurnal Maximum		



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

**Relative Humidity (RH) - %**  
**Stony Mountain - February 2023**







# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Precipitation (PC) - mm

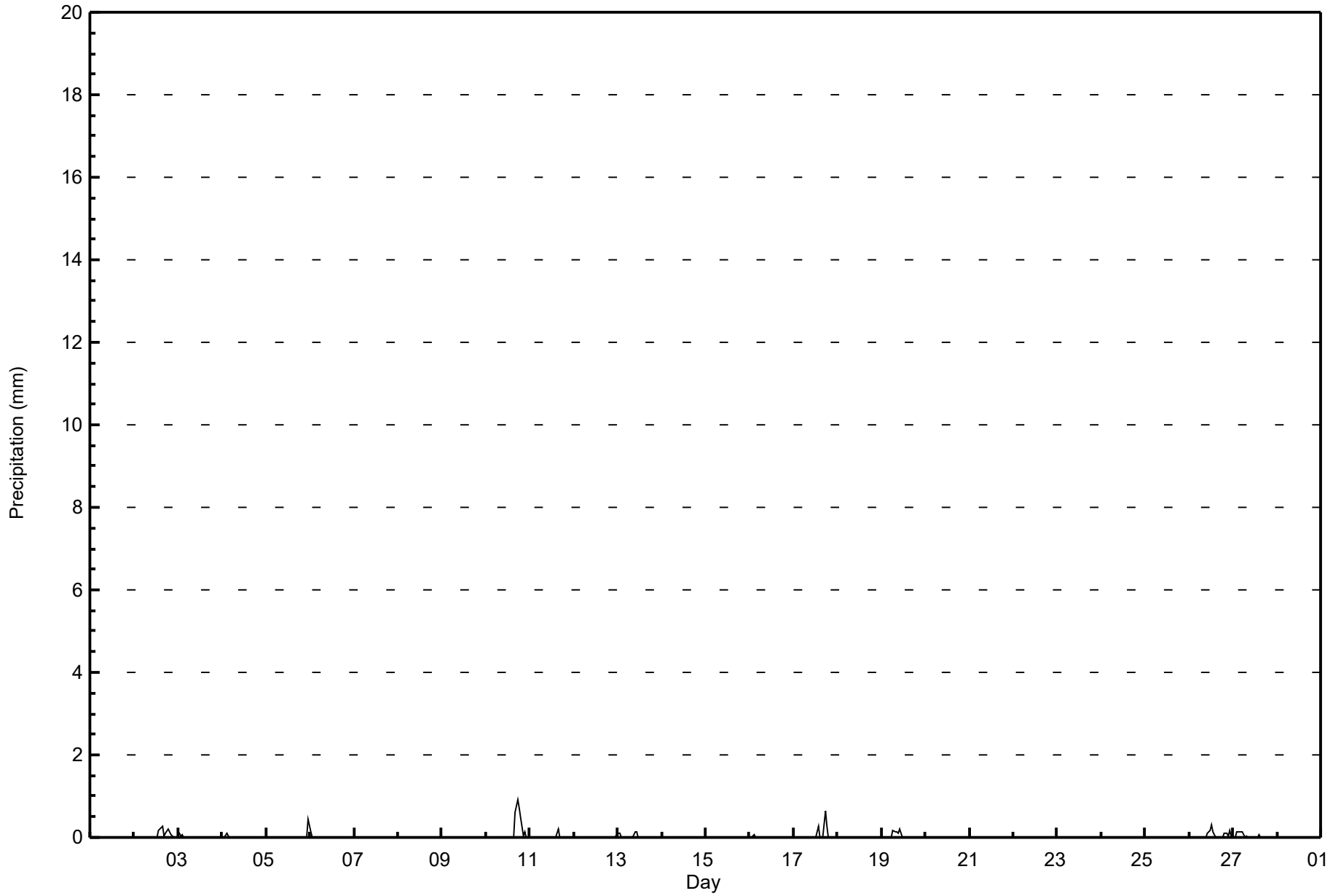
## Stony Mountain - February 2023

Maximum Value: 0.9 mm on Feb 10 18:00		Maximum Daily Total: 2.9 mm on Feb 10		Hours in Service: 672																														
Minimum Value: 0.0 mm on Feb 1 01:00		Minimum Daily Total: 0.0 mm on Feb 1		Hours of Data: 672																														
Maximum Diurnal Total: 1.7 mm at hour 18		Minimum Diurnal Total: 0.1 mm at hour 9		Hours of Missing Data: 0																														
Monthly Total: 9.55 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> = 0.3		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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	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	0.3	0.1	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	0.0	1.2	0.3
3-Feb	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	0.0	0.0	0.0	0.2	0.1		
4-Feb	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	0.0	0.1	0.1		
5-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4		
6-Feb	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2		
7-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.9	0.7	0.5	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.9		
11-Feb	0.0	0.0	0.0	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	0.0	0.0	0.0	0.2	0.2		
12-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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		
13-Feb	0.1	0.1	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	0.5	0.1		
14-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	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	0.1		
17-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	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	1.2	0.6		
18-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.2	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	0.8	0.2	0.2	0.2	
20-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.1	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	1.2	0.3	1.2	0.3	
27-Feb	0.0	0.0	0.1	0.1	0.2	0.1	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.2	0.7	0.2	
28-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.5	0.2	0.3	0.6	0.3	0.5	0.7	1.7	1.2	0.7	0.2	0.2	0.2	0.2	0.5	Diurnal Average							
		0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.3	0.6	0.9	0.7	0.5	0.1	0.2	0.2	0.4	Diurnal Maximum								



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

**Precipitation (PC) - mm**  
**Stony Mountain - February 2023**





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

**Precipitation (PC) - mm**  
**Stony Mountain - February 2023**

<b>Concentration Ranges (mm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	666	99.11	99.11
0.4 - 0.5	2	0.30	99.40
0.6 - 0.7	3	0.45	99.85
0.8 - 1.4	1	0.15	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Leaf Wetness (LW) - %**

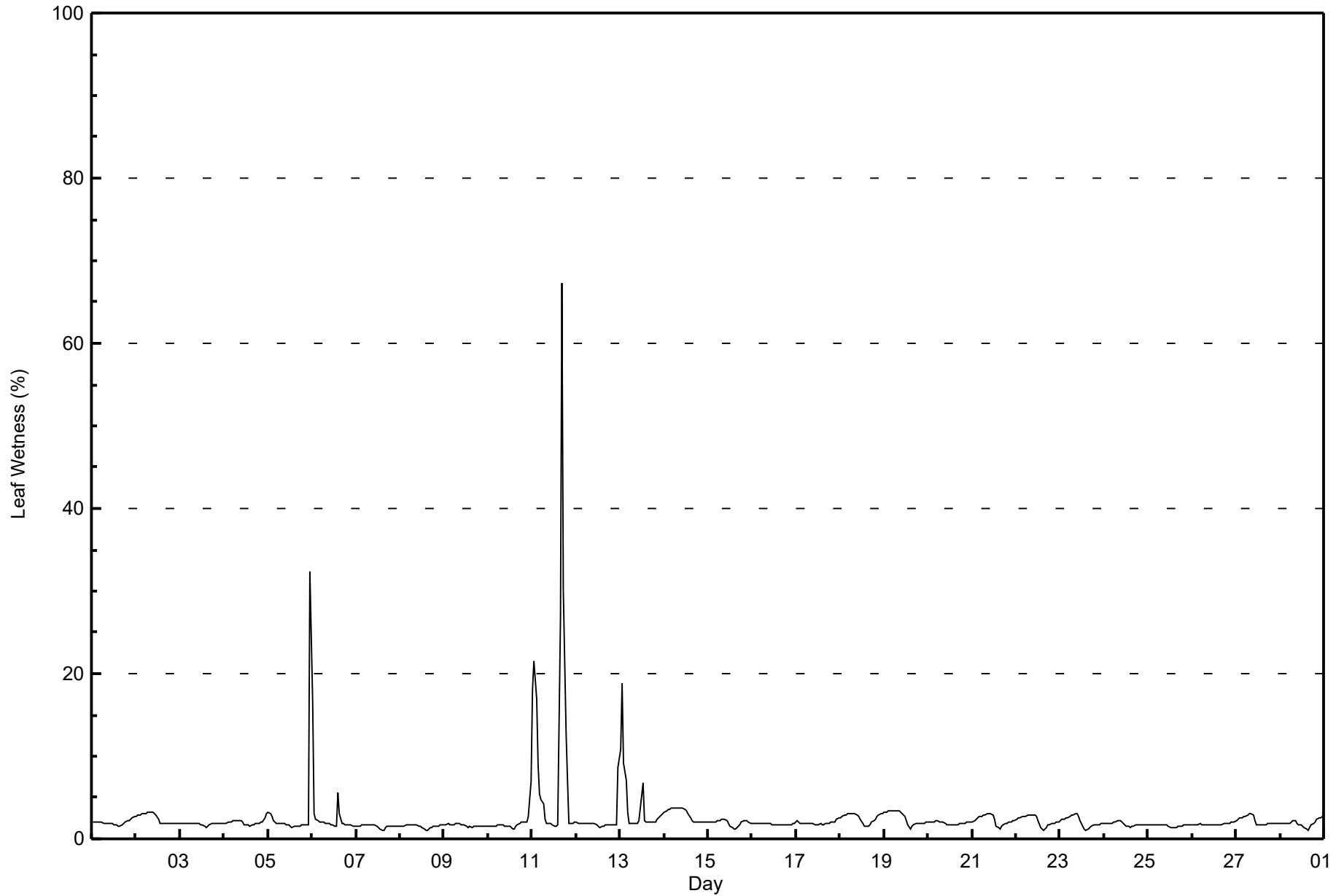
**Stony Mountain - February 2023**

Maximum Value: 67.3 % on Feb 11 17:00		Maximum Daily Average: 10.3 % on Feb 11		Hours in Service: 672																							
Minimum Value: 1.0 % on Feb 28 16:00		Minimum Daily Average: 1.5 % on Feb 8		Hours of Data: 672																							
Maximum Diurnal Average: 4.0 % at hour 17		Minimum Diurnal Average: 1.6 % at hour 14		Hours of Missing Data: 0																							
Monthly Average: 2.44 %		Percentiles: P <sub>1</sub> = 1.1 P <sub>10</sub> = 1.5 Q <sub>1</sub> = 1.7 Median = 1.9 Q <sub>3</sub> = 2.2 P <sub>90</sub> = 3.0 P <sub>99</sub> = 17.2		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-Feb	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.8	1.7	1.6	1.4	1.5	1.8	1.9	2.0	2.1	2.3	2.4	2.5	2.6	2.0	2.6	
2-Feb	2.7	2.8	2.9	3.0	3.0	3.1	3.2	3.2	3.2	3.2	3.1	2.8	2.3	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.5	3.2	
3-Feb	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.7	1.6	1.4	1.6	1.8	1.8	1.9	1.9	1.9	1.8	1.8	1.9	1.8	1.9
4-Feb	1.9	1.9	2.0	2.0	2.1	2.2	2.2	2.2	2.1	2.1	2.0	1.7	1.7	1.7	1.5	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.5	3.1	2.0	3.1	
5-Feb	3.2	3.0	2.7	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.7	1.6	1.5	1.4	1.4	1.5	1.5	1.6	1.6	1.6	1.6	1.7	32.3	3.1	32.3	
6-Feb	16.6	3.1	2.4	2.2	2.0	2.0	2.0	1.9	1.9	1.8	1.7	1.7	1.5	1.5	5.7	3.1	1.9	1.8	1.8	1.7	1.7	1.7	1.6	1.6	2.7	16.6	
7-Feb	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.8	1.7	1.7	1.6	1.4	1.2	1.1	1.1	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.8	
8-Feb	1.5	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.6	1.6	1.5	1.3	1.2	1.0	1.0	1.3	1.4	1.5	1.5	1.6	1.6	1.6	1.7	1.5	1.7	
9-Feb	1.7	1.8	1.8	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.7	1.6	1.5	1.4	1.4	1.3	1.5	1.5	1.6	1.6	1.5	1.5	1.5	1.6	1.6	1.8	
10-Feb	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.6	1.5	1.5	1.4	1.3	1.2	1.5	1.8	1.9	2.0	2.0	2.0	2.1	2.7	7.0	1.9	7.0	
11-Feb	17.9	21.6	16.9	9.1	5.4	4.8	4.2	2.4	1.9	1.8	1.8	1.8	1.6	1.6	1.7	26.8	67.3	30.2	12.9	7.2	1.9	1.9	1.9	2.0	10.3	67.3	
12-Feb	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.7	1.6	1.4	1.5	1.5	1.6	1.7	1.7	1.8	1.7	1.7	1.7	8.6	2.0	8.6
13-Feb	10.9	18.9	9.2	7.1	3.2	1.9	1.9	1.9	1.9	1.8	1.9	2.2	3.8	6.7	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.3	2.6	2.9	3.1	4.0	18.9
14-Feb	3.2	3.4	3.5	3.6	3.7	3.7	3.7	3.8	3.8	3.8	3.7	3.6	3.5	3.3	3.0	2.5	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.9	3.8
15-Feb	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.3	2.4	2.4	2.2	1.9	1.5	1.4	1.2	1.2	1.6	1.8	2.0	2.2	2.2	2.2	2.1	1.9	2.0	2.4	
16-Feb	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.7	1.7	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.8	1.8	1.9	1.8	1.9
17-Feb	2.1	2.1	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.7	1.8	1.7	1.7	1.8	1.9	1.9	2.0	2.0	2.1	2.3	2.5	1.9	2.5
18-Feb	2.6	2.7	2.9	3.0	3.0	3.0	3.0	3.0	3.0	2.9	2.8	2.4	1.9	1.5	1.5	1.6	1.7	2.0	2.2	2.5	2.7	2.8	3.0	3.1	2.5	3.1	
19-Feb	3.2	3.3	3.3	3.4	3.4	3.4	3.4	3.3	3.3	3.3	3.2	3.1	2.8	2.2	1.7	1.3	1.5	1.7	1.8	1.8	1.9	1.9	1.9	1.9	2.0	2.5	3.4
20-Feb	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	1.9	1.8	1.8	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.9	2.0	2.0	2.1	1.9	2.1	
21-Feb	2.1	2.2	2.4	2.5	2.7	2.8	2.9	2.9	3.0	3.0	3.0	2.9	2.3	1.5	1.3	1.3	1.5	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.3	3.0	
22-Feb	2.4	2.5	2.5	2.6	2.7	2.8	2.9	2.9	2.9	2.9	3.0	2.9	2.8	2.2	1.3	1.2	1.1	1.3	1.7	1.8	1.8	1.9	1.9	2.0	2.1	2.2	3.0
23-Feb	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.0	2.8	2.3	1.5	1.2	1.1	1.1	1.3	1.6	1.7	1.7	1.7	1.8	1.8	1.9	2.1	3.0	
24-Feb	1.8	1.8	1.8	1.8	1.9	2.0	2.1	2.2	2.2	2.2	1.9	1.7	1.6	1.5	1.4	1.5	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	2.2
25-Feb	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.6	1.6	1.4	1.4	1.4	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.8
26-Feb	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.6	1.6	1.6	1.7	1.6	1.7	1.7	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	1.8	2.1
27-Feb	2.2	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.0	2.8	2.3	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.9	1.9	1.9	2.2	3.0
28-Feb	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.2	2.2	1.9	1.7	1.7	1.5	1.4	1.2	1.0	1.3	1.6	1.9	2.1	2.3	2.5	2.6	2.7	1.9	2.7	
		3.5	3.5	3.0	2.6	2.4	2.3	2.3	2.3	2.2	2.1	2.0	1.9	1.6	1.6	2.5	4.0	2.8	2.2	2.0	1.9	1.9	2.0	3.6	Diurnal Average		
		17.9	21.6	16.9	9.1	5.4	4.8	4.2	3.8	3.8	3.7	3.6	3.8	6.7	3.0	5.7	26.8	67.3	30.2	12.9	7.2	2.7	2.8	3.0	32.3	Diurnal Maximum	



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

**Leaf Wetness (LW) - %**  
**Stony Mountain - February 2023**





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

**Leaf Wetness (LW) - %**  
**Stony Mountain - February 2023**

<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	45	6.70	6.70
1.5 - 10	603	89.73	96.43
> 10	11	1.64	98.07

Total Number of Valid Hours: 672

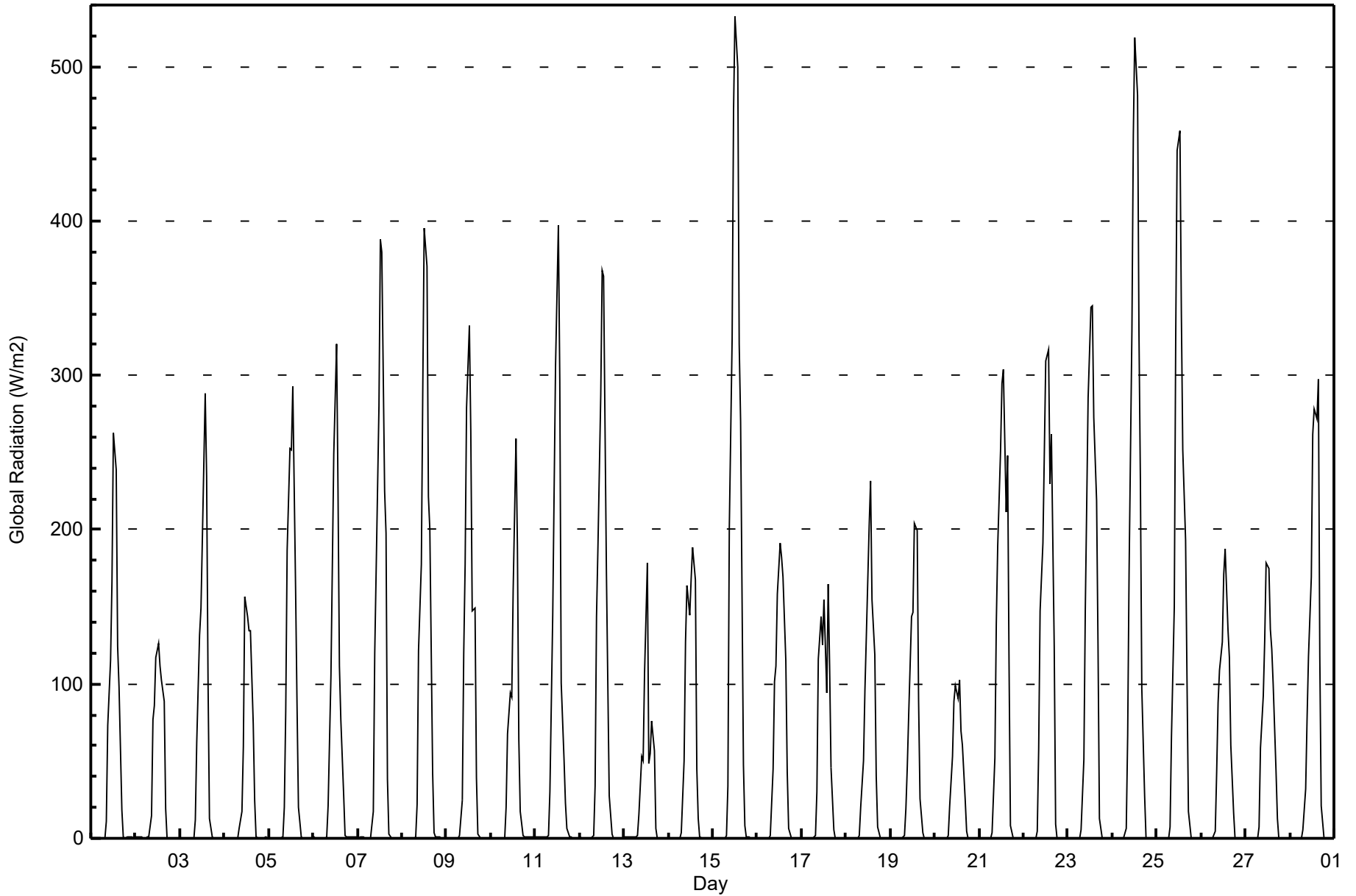
Total Number of Hours: 672



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

**Global Radiation (GR) - W/m2**  
**Stony Mountain - February 2023**

Maximum Value: 532.5 W/m2 on Feb 15 13:00      Maximum Daily Average: 113.1 W/m2 on Feb 24																							Hours in Service:	672		
Minimum Value: 0.0 W/m2 on Feb 1 01:00      Minimum Daily Average: 25.7 W/m2 on Feb 20																							Hours of Data:	672		
Maximum Diurnal Average: 269.2 W/m2 at hour 13      Minimum Diurnal Average: 0.1 W/m2 at hour 6																							Hours of Missing Data:	0		
Monthly Average: 59.12 W/m2      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> = 94.1 P <sub>90</sub> = 203.9 P <sub>99</sub> = 448.9																							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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	10.7	73.4	115.5	166.9	263.1	239.3	124.5	98.0	17.9	0.9	0.2	0.5	0.6	0.5	0.5	0.4	46.4	263.1
2-Feb	0.7	0.8	0.7	0.6	0.4	0.4	0.5	0.7	15.0	76.7	85.8	117.3	125.9	112.1	102.9	88.6	19.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	31.2	125.9
3-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	12.1	62.1	131.8	149.2	194.7	288.0	234.7	101.9	13.0	1.1	0.3	0.0	0.0	0.0	0.0	0.0	49.5	288.0
4-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	6.2	17.1	59.2	156.6	144.0	134.3	134.9	73.7	25.1	0.7	0.0	0.0	0.0	0.1	0.5	0.2	31.4	156.6
5-Feb	0.0	0.0	0.0	0.1	0.1	0.3	0.1	0.5	20.1	82.3	186.6	252.3	251.6	292.9	160.6	86.1	19.9	0.8	0.0	0.0	0.0	0.0	0.0	0.4	56.4	292.9
6-Feb	0.5	0.0	0.0	0.0	0.0	0.0	0.1	0.7	20.8	105.0	176.8	248.5	320.3	225.8	112.0	76.8	28.6	2.3	0.8	0.8	0.8	0.8	0.8	0.6	55.1	320.3
7-Feb	0.3	0.6	0.7	0.5	0.5	0.3	0.3	0.3	17.3	119.8	173.3	279.8	388.5	379.9	225.5	197.7	38.4	2.7	0.1	0.0	0.0	0.0	0.0	0.1	76.1	388.5
8-Feb	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.7	21.8	121.8	177.7	289.8	395.3	370.4	221.3	200.8	41.8	3.5	0.5	0.6	0.6	0.3	0.4	0.1	77.0	395.3
9-Feb	0.0	0.1	0.3	0.3	0.2	0.2	0.4	1.5	24.6	120.0	177.4	279.4	331.9	263.2	147.6	148.8	39.8	2.4	0.0	0.0	0.0	0.0	0.0	0.0	64.1	331.9
10-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	19.7	67.8	94.2	91.8	160.7	259.1	189.5	63.8	17.6	1.7	0.8	0.8	0.8	0.8	1.1	1.3	40.5	259.1
11-Feb	0.9	0.9	1.0	1.1	1.0	0.9	0.8	1.6	30.6	144.8	226.4	306.8	397.0	296.1	100.4	51.6	23.3	6.6	0.7	0.5	0.3	0.3	0.3	0.4	66.4	397.0
12-Feb	0.5	0.1	0.0	0.0	0.0	0.0	0.1	1.8	33.5	144.0	188.5	287.4	368.2	364.4	173.0	99.5	27.2	3.0	0.1	0.0	0.1	0.0	0.0	0.1	70.5	368.2
13-Feb	0.9	1.2	1.1	0.9	0.8	0.8	0.7	2.0	15.3	53.1	50.2	107.0	178.2	48.1	55.2	76.2	57.0	6.2	0.0	0.0	0.0	0.0	0.0	0.0	27.3	178.2
14-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.3	3.7	50.3	127.5	164.0	144.6	168.8	188.7	167.7	44.4	12.4	1.1	0.0	0.0	0.0	0.0	0.0	0.0	44.7	188.7
15-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	34.0	201.1	324.2	471.5	532.5	500.2	320.7	269.7	47.3	8.7	0.7	0.5	0.1	0.0	0.0	0.0	113.0	532.5
16-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	45.1	101.2	111.3	158.2	190.9	182.0	169.6	115.1	42.7	6.5	0.2	0.2	0.2	0.0	0.0	0.0	46.9	190.9
17-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	29.9	116.5	144.1	125.6	154.7	94.0	164.4	111.9	46.1	5.9	0.0	0.0	0.0	0.0	0.0	0.0	41.5	164.4
18-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	20.3	50.3	96.2	130.8	202.4	231.2	154.6	119.0	40.4	7.3	0.2	0.3	0.5	0.2	0.3	0.2	44.0	231.2
19-Feb	0.2	0.1	0.1	0.0	0.0	0.0	0.0	1.4	19.4	46.6	80.3	143.5	146.5	204.0	199.4	88.4	26.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	40.0	204.0
20-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	20.9	52.8	88.5	99.2	90.6	102.9	69.6	60.3	24.8	4.7	0.0	0.0	0.0	0.0	0.0	0.0	25.7	102.9
21-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	52.5	138.8	189.6	251.1	294.8	303.9	211.1	248.1	114.9	8.3	0.1	0.0	0.0	0.0	0.0	0.0	75.7	303.9
22-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	57.5	147.7	191.7	249.5	309.2	316.8	229.4	261.7	124.7	8.8	0.0	0.0	0.0	0.0	0.0	0.0	79.2	316.8
23-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	51.2	148.1	216.3	285.1	344.3	345.2	272.6	219.0	125.8	12.4	0.1	0.0	0.0	0.1	0.2	0.0	84.4	345.2
24-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	66.8	173.3	328.9	455.8	518.9	481.3	326.8	231.5	96.9	27.6	0.2	0.1	0.0	0.0	0.0	0.1	113.1	518.9
25-Feb	0.1	0.1	0.1	0.0	0.0	0.0	0.0	7.2	66.0	150.2	323.6	446.0	458.3	340.1	251.5	192.9	102.4	17.1	0.2	0.0	0.0	0.0	0.1	0.1	98.2	458.3
26-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	43.0	88.0	108.8	127.3	170.8	187.9	135.9	116.9	60.3	16.4	0.2	0.0	0.0	0.0	0.0	0.0	44.2	187.9
27-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.2	58.5	92.5	128.6	178.4	174.5	135.5	122.3	100.2	43.5	12.5	0.3	0.0	0.0	0.0	0.0	0.0	43.9	178.4
28-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	31.7	78.1	118.4	169.1	261.9	278.1	271.7	297.5	117.7	21.4	0.3	0.0	0.0	0.0	0.0	0.0	68.8	297.5
																							Diurnal Average			
																							Diurnal Maximum			







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

**Global Radiation (GR) - W/m2**  
**Stony Mountain - February 2023**

<b>Concentration Ranges (W/m2)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	435	64.73	64.73
21 - 100	77	11.46	76.19
101 - 300	131	19.49	95.68
301 - 600	29	4.32	100.00
601 - 900	0	0.00	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



Maximum Speed: 29 km/h on Feb 6 01:00	Maximum Daily Speed Average: 17.6 km/h on Feb 24	Hours in Service: 672
Minimum Speed Value: 1 km/h on Feb 4 14:00	Minimum Daily Speed Average: 2.9 km/h on Feb 23	Hours of Data: 671
Maximum Diurnal Speed Average: 6.6 km/h at hour 8	Minimum Diurnal Speed Average: 2.7 km/h at hour 18	Hours of Missing Data: 1
Monthly Average Velocity: 4.5 km/h 260.3 deg	Percentiles: P <sub>1</sub> = 2 P <sub>10</sub> = 6 Q <sub>1</sub> = 8 Median = 12 Q <sub>3</sub> = 16 P <sub>90</sub> = 19 P <sub>99</sub> = 25	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-Feb	NW11	NW10	NNW11	NNW15	N15	N13	N13	NNW13	N20	N18	N16	N17	NNW16	NNW13	NNW14	NNW14	N10	N9	N8	NNW7	NW7	WNW7	WNW6	NW4	NNW11.5	N20	
2-Feb	WSW5	SW9	SW10	SSW11	SSW14	SSW14	S13	S14	S16	S19	SSE17	SSE20	SSE18	SSE16	SSE18	SSE18	SSE18	SSE18	SSE16	S18	S20	S18	S19	S16	S14.7	S20	
3-Feb	S17	SSW19	SSW21	SSW22	SSW22	SSW20	SSW22	SSW26	SW25	SW21	SW14	SW13	W15	NW14	NNW14	NW14	NW12	NW11	NNW7	N8	SW4	WNW2	ENE5	ENE8	SW9.1	SSW26	
4-Feb	S6	E4	E5	ESE5	ESE6	E5	SE7	NE5	E6	NNE4	N4	ENE2	NNE3	ESE1	E3	ESE3	E5	SE5	SSE7	SSW12	SW11	SSW12	SSW14	SW16	SSE3.1	SW16	
5-Feb	SW16	SW17	SW14	SSW14	SSW18	SSW18	SW18	SW20	SSW18	SSW18	SW17	SSW14	SSW17	SSW16	SW12	SW12	SW14	SW15	WSW15	WSW15	WSW16	W19	WNW22	WNW20	SW14.8	WNW22	
6-Feb	NW29	NW26	NW23	NW21	NW20	WNW15	W18	W21	WNW18	W13	W13	W12	WSW12	WSW12	WSW13	SW12	SSW13	SSW18	SSW17	SW17	SW17	WSW18	WSW19	WSW18	W13.5	NW29	
7-Feb	WSW16	SW16	WSW19	WSW20	W20	W20	W19	WNW18	NW23	WNW17	WNW16	W16	W17	W20	W18	W18	W16	W14	W14	W14	W15	WNW14	NW15	WNW13	W16.0	NW23	
8-Feb	WNW12	WNW12	NW12	NW11	WNW12	WNW12	WNW12	WNW13	WNW16	WNW16	WNW12	WNW10	W9	WNW11	W10	WNW10	W8	WSW10	SW12	SW13	SW14	SW16	SW18	SW18	W10.6	SW18	
9-Feb	SW16	SW15	WSW14	W17	WSW16	WSW16	SW16	SW17	SW16	SW16	SW14	SSW13	SSW16	SSW16	SSW14	S11	S12	S14	S16	SSW18	SSW20	SSW18	SSW16	SW13	SW14.5	SSW20	
10-Feb	SW9	SSW12	SW12	SSW11	SSW11	SSW7	S8	SSE7	SSW7	NNE5	E5	SW4	SE4	NW2	N6	NW7	NW8	NW9	NW12	NW10	NW10	WNW10	WNW11	WNW12	W4.2	WNW12	
11-Feb	WNW12	W11	W14	WNW15	WNW14	W11	W13	WSW15	WSW16	W17	W17	WSW16	WSW15	WSW17	WSW16	W21	WSW17	W13	WSW14	WNW23	WNW24	WNW18	WNW15	W15	W15.1	WNW24	
12-Feb	W18	W19	W19	WNW19	WNW18	WNW18	W17	WSW12	SW13	SW14	SW14	WSW12	WSW11	WSW12	WSW12	SSW10	SSW13	SSW14	S14	S14	S16	SSW19	SSW22	SSW19	SW12.2	SSW22	
13-Feb	SSW20	SW18	SW20	SW17	WSW18	WSW18	WSW18	WSW18	WSW18	WSW19	W16	W16	W18	NW23	NNW24	N24	N22	N20	N19	N19	N15	N14	N13	N11	NNW13	WNW10.7	N24
14-Feb	NNW12	NNW10	N10	N10	N9	N7	NNE4	UO	SE3	S2	NW2	SW3	SSW5	SW6	W9	WNW8	NNW12	N11	NNW11	NNW11	NNW14	NNW12	N6	NNE5	NNW6.0	NNW14	
15-Feb	ENE6	E5	E6	E6	ESE5	E4	ENE4	E6	ESE5	ESE5	E4	NE4	ESE4	SE7	SSE6	WSW5	SSW7	SSW8	SSW8	SSW8	S9	S11	SSW13	SSW14	WSSE3.9	SSW14	
16-Feb	S14	S16	S17	SSW20	SSW20	SSW20	SSW23	SSW24	SSW26	SSW25	SSW24	SSW23	SSW23	SW20	SW18	WSW19	WSW16	WSW16	W16	NW15	NNW18	NNW21	NNW16	NNW11	SW13.4	SSW26	
17-Feb	NNW10	N10	N13	N12	NNW13	NNW12	NNW11	NW7	WNW6	W8	W7	WNW8	WNW9	W7	WNW8	WNW7	WNW8	NNW7	NNE9	NE8	NE10	NE8	NE8	NE9	NNW6.6	N13	
18-Feb	NNE9	NNE8	NNE9	NE9	NE8	NE8	NE8	NE7	NNE6	NNE6	NE7	NE6	NNE6	NNE5	NE5	NE4	ENE5	E5	E6	ESE7	SE7	ESE8	SE9	SSE10	ENE5.2	SSE10	
19-Feb	SSE11	S11	SSW10	S12	S9	SSE7	SE8	SE8	ESE8	ESE8	ESE7	E7	E8	E9	ENE7	NE8	NE8	NNE7	NE7	NNE7	NNE6	NNE7	NNE7	N6	ESE4.0	S12	
20-Feb	N7	NNW8	NNW9	NNW10	NW10	NW10	NW9	NNW11	NW10	NW12	NW9	NW12	WNW10	NW12	NNW12	NNW11	N9	N7	N6	N8	NE6	NE7	NNE10	NE9	NNW8.1	NW12	
21-Feb	NE8	NNE6	N8	N9	NNW10	NNW9	NNW9	NNW11	NNW11	NNW10	N11	N11	NNW12	N12	N14	N13	N15	N14	N12	N10	N12	N15	N11	NNE7	N10.5	N15	
22-Feb	NNW7	NNW8	NW9	NW8	NW9	NW10	NW10	NW10	NW8	NW4	N5	NNE6	NNE6	N6	N6	NNE8	NE9	NE9	NE10	ENE10	NE11	NE11	ENE9	ENE9	N5.9	NE11	
23-Feb	ENE8	NE7	ENE8	ENE8	ENE8	ENE8	ENE7	NE5	NNE4	ESE1	SSE5	NW2	NNW5	N8	N6	N5	NNW6	NW6	WNW8	NW7	N5	NNE3	SSE3	SW12	NNE2.9	SW12	
24-Feb	WSW14	SW12	SW14	SW13	SW15	SW16	SSW17	SSW17	SSW16	SSW13	S18	SSW17	SSW21	SSW20	SSW21	SSW19	S18	S19	SSW19	SSW23	SSW26	SSW23	SSW21	SSW21	SSW17.6	SSW26	
25-Feb	SW19	SSW21	WSW18	W17	W16	WSW14	W18	WSW16	W14	W12	WNW13	W13	WNW12	W11	W9	W11	SW10	SSW10	SW14	SSW12	SSW13	S13	S12	WSW11.9	SW21		
26-Feb	S10	SSE10	SSE9	SSE10	SE12	SE12	SE10	SE8	E6	E7	E8	E11	E12	ENE14	ENE13	ENE15	ENE14	ENE11	ENE10	E10	ENE7	ENE7	ENE6	NE5	E7.9	ENE15	
27-Feb	NNE7	N5	NNW7	NNW8	NNW8	NNW10	NW12	NW12	NNW11	NNW12	NW13	NNW14	NNW13	NW14	NNW13	NW14	NW14	NNW13	NNW12	NNW8	N6	N5	NNE7	NNE6	NNW9.7	NNW14	
28-Feb	NNE5	NNE5	NNE5	NE6	NNE7	N6	N5	N7	N6	NNE3	NNE5	NE6	NE6	NE8	NE7	ENE7	ESE7	E7	E8	ESE7	E8	SE9	SE10	SSE10	ENE4.6	SE10	
WSW4.9WSW5.4WSW5.4 W5.3 W5.5 W5.5WSW5.9WSW6.0WSW6.2WSW5.5WSW4.7 W4.7 W4.4 W4.4WNW4.1WNW4.1 W3.0 W2.7 W2.8WSW3.1WSW3.0WSW3.4WSW3.6WSW4.2																								Diurnal Average			
NW29 NW26 NW23 SSW22 SSW22 SSW20 SSW23 SSW26 SSW26 SSW25 SSW24 SSW23 NW23 NNW24 N24 N22 N20 N19 N19 SSW23 SSW26 SSW23 SSW22 SSW21																								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**

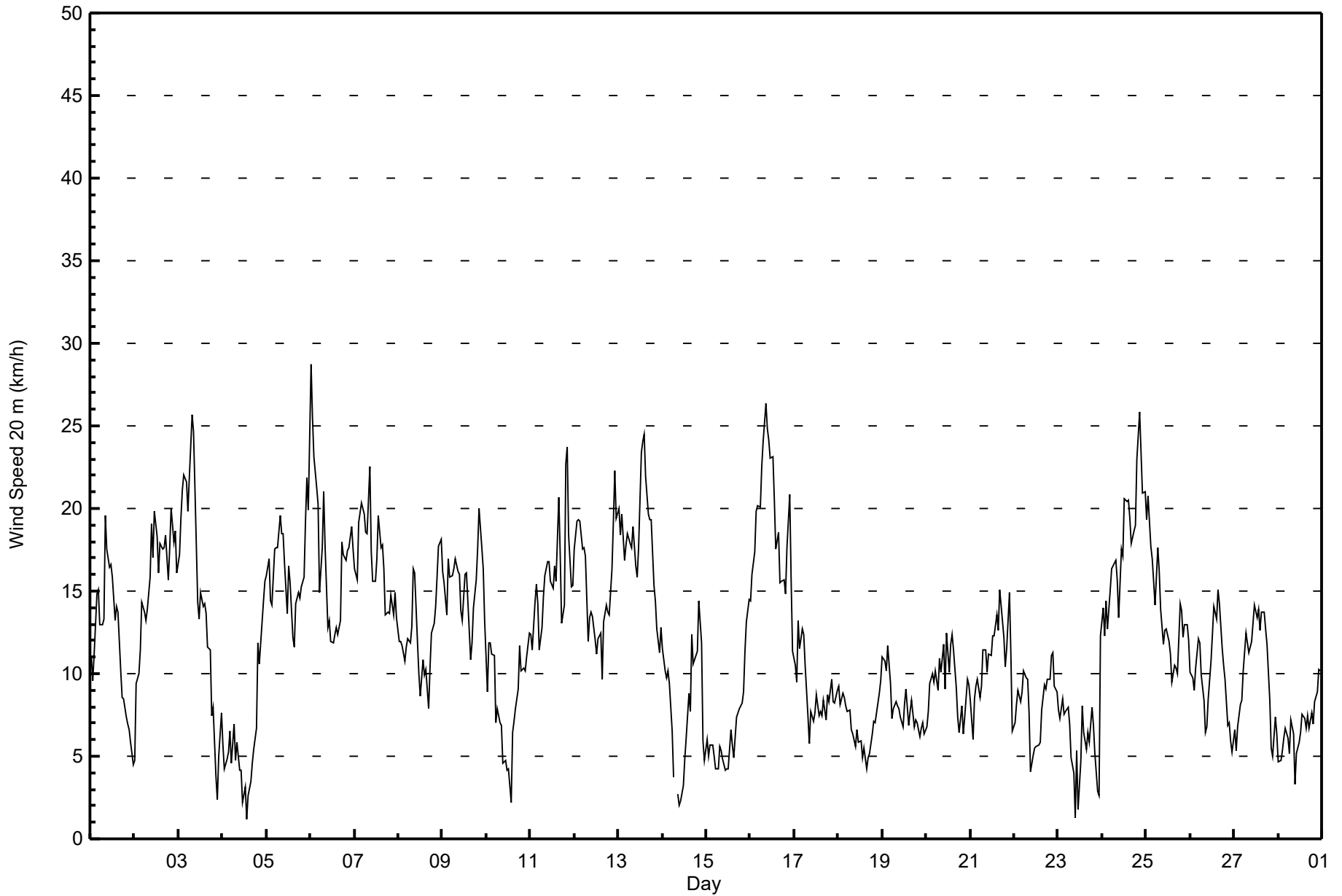
**Wind Speed 20 m (WS20m) - km/h**  
**Stony Mountain - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Feb 6 01:00														Hours in Service: 672 Hours of Data: 671 Hours of Missing Data: 1 Hours of Calibration: 0 Percent Operational Time: 99.9											
Minimum Value: 0 km/h on Feb 18 21:00																									
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> = 6 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-Feb	3	2	3	4	5	4	4	4	6	5	5	5	5	5	4	5	3	2	2	1	1	1	1	1	6
2-Feb	2	2	2	2	3	3	2	2	3	5	5	5	5	5	5	5	6	5	4	5	6	5	5	5	6
3-Feb	5	6	7	6	6	6	6	6	6	6	4	4	5	4	5	5	4	3	2	2	2	1	1	2	7
4-Feb	2	1	1	1	1	1	2	1	2	1	2	1	1	1	1	2	1	2	2	3	2	3	3	4	4
5-Feb	3	4	3	3	4	4	4	4	4	5	4	3	4	5	3	3	4	4	3	4	4	6	6	6	6
6-Feb	10	8	7	7	6	4	5	6	5	4	4	4	4	4	4	4	4	4	4	4	5	5	6	5	10
7-Feb	5	4	5	6	6	6	6	6	7	5	6	5	6	7	6	6	5	4	4	4	4	4	4	4	7
8-Feb	3	3	3	2	3	3	3	3	4	4	3	3	2	4	3	3	2	3	3	3	3	3	4	4	4
9-Feb	4	3	3	5	5	3	3	4	3	3	3	3	4	5	4	3	3	3	3	4	5	4	4	4	5
10-Feb	3	3	3	3	3	3	2	1	2	2	2	3	2	2	2	3	2	2	3	3	3	3	3	4	4
11-Feb	4	3	4	5	4	3	3	4	4	5	6	5	5	5	6	8	6	5	5	8	8	6	5	5	8
12-Feb	5	5	5	5	5	5	5	3	3	3	3	4	3	4	3	3	3	3	3	3	4	5	6	5	6
13-Feb	5	5	6	5	5	6	5	5	6	6	5	5	8	7	7	8	6	6	6	5	4	3	3	3	8
14-Feb	2	2	2	2	2	1	1	UO	1	1	1	1	2	2	3	3	4	3	3	4	5	3	2	2	5
15-Feb	2	1	1	2	1	1	2	2	2	1	2	2	2	3	3	2	2	1	1	1	1	2	3	3	3
16-Feb	4	4	4	4	5	4	5	6	6	6	6	6	5	5	5	5	5	5	5	4	5	7	5	3	7
17-Feb	2	2	4	4	4	4	3	3	2	2	3	2	3	2	2	3	3	2	3	2	2	2	2	2	4
18-Feb	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	1	1	1	1	0	1	1	1	2
19-Feb	2	2	2	2	2	1	2	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
20-Feb	1	1	2	2	2	2	3	3	2	3	3	3	4	3	4	3	3	2	2	2	2	3	2	3	4
21-Feb	3	1	2	2	2	2	2	2	2	3	3	4	3	4	4	4	5	4	3	2	3	4	3	1	5
22-Feb	1	1	1	1	2	2	2	2	1	1	2	2	2	2	2	3	2	2	2	2	2	2	1	1	3
23-Feb	1	2	2	1	1	1	1	1	1	2	2	2	3	3	2	2	2	1	1	1	1	2	3	2	3
24-Feb	3	3	3	3	3	3	4	4	4	4	6	6	6	6	6	6	6	6	5	7	7	7	6	5	7
25-Feb	5	5	4	5	4	4	5	4	4	4	4	4	4	4	3	3	4	3	4	3	3	3	3	2	5
26-Feb	2	2	2	2	2	2	2	2	2	2	2	3	3	4	4	4	4	3	3	2	2	2	1	1	4
27-Feb	1	1	2	2	2	2	3	3	3	3	4	4	4	4	4	4	4	4	3	3	2	1	2	2	4
28-Feb	1	2	2	2	2	1	1	2	2	1	1	3	2	3	3	2	2	1	1	1	1	1	1	2	3
	10	8	7	7	6	6	6	6	7	6	6	6	8	7	7	8	6	6	6	8	8	7	6	6	
Diurnal Maximum																									
UO - Unstable Operation																									



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

**Wind Speed 20 m (WS20m) - km/h**  
**Stony Mountain - February 2023**





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

**Wind Speed 20 m (WS20m) - km/h**  
**Stony Mountain - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	67	9.99	9.99
6 - 11	258	38.45	48.44
12 - 19	288	42.92	91.36
20 - 28	57	8.49	99.85
29 - 38	1	0.15	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 671

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h  
Stony Mountain - February 2023**

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	13	6	5	9	8	3	2	1	1	3	2	0	1	5	1	67
6 - 11	32	23	29	18	16	8	10	10	7	13	6	2	12	16	23	33	258
12 - 19	21	0	0	4	1	0	2	8	24	40	45	40	35	29	15	24	288
20 - 28	4	0	0	0	0	0	0	1	1	27	6	1	5	4	6	2	57
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	64	36	35	27	26	16	15	21	33	81	60	45	52	50	50	60	671

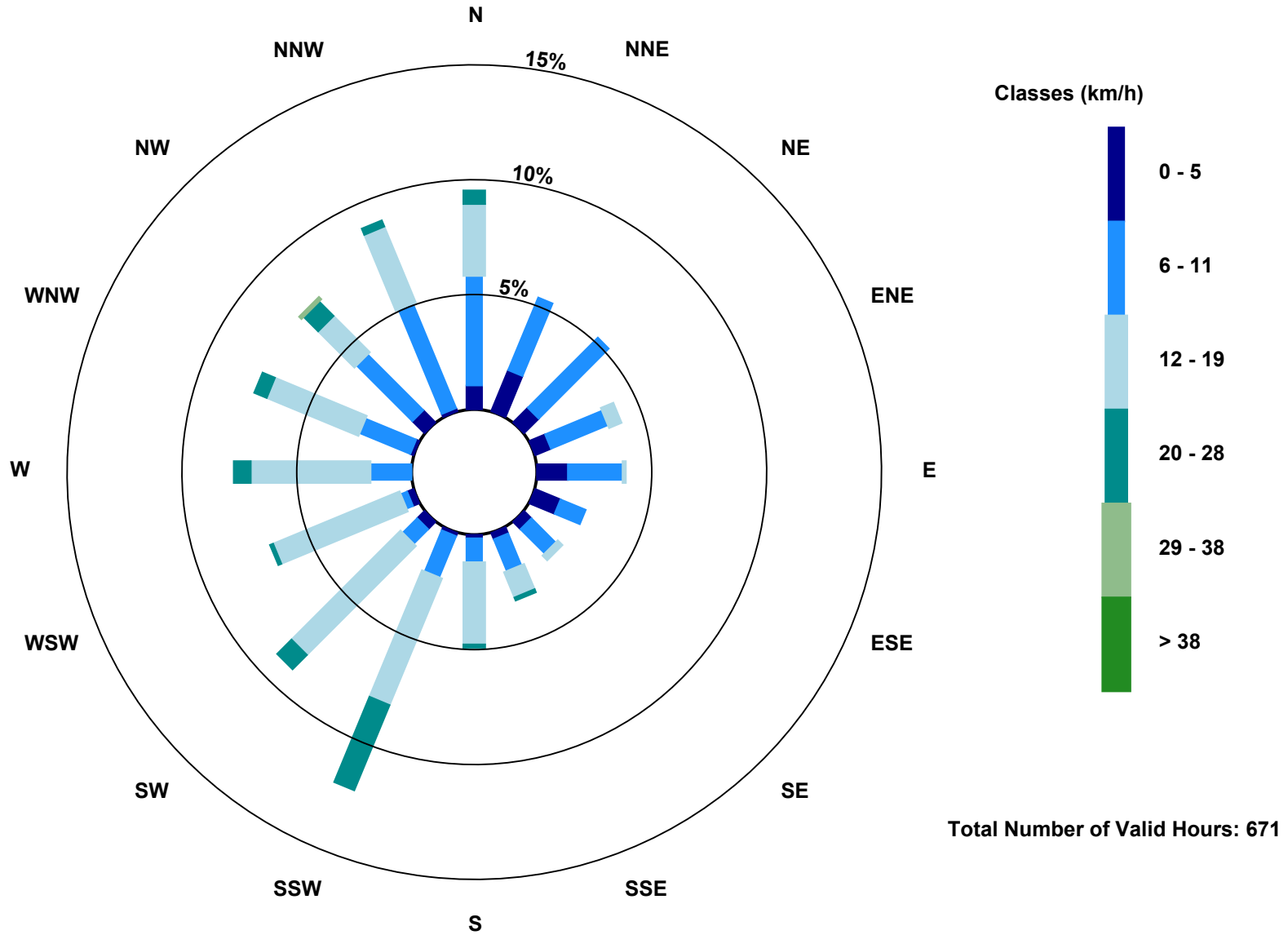
Total Number of Valid Hours: 671

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed 20 m (WS20m) - km/h  
Stony Mountain





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

**Wind Direction 20 m (WD20m) - deg**  
**Stony Mountain - February 2023**

Direction of Maximum Speed: 317 deg on Feb 6 01:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 204.7 deg on Feb 24	Hours of Data: 671
Direction of Minimum Speed: 106 deg on Feb 4 14:00	Hours of Missing Data: 1
Direction of Minimum Daily Speed Average: 2.9 deg on Feb 23	Percent Operational Time: 99.9
Monthly Average Direction: 260.3 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-Feb	307	314	328	341	356	354	350	346	350	351	352	349	345	342	344	343	354	349	351	341	323	302	287	315	341.7
2-Feb	250	220	216	207	200	198	184	184	188	172	166	166	163	156	157	154	158	160	162	171	183	185	187	190	177.4
3-Feb	189	202	195	199	198	209	209	211	215	217	226	234	271	304	327	321	316	322	340	350	218	301	57	73	229.0
4-Feb	170	89	93	115	120	98	130	50	87	19	1	75	26	106	99	117	100	131	160	195	219	210	209	224	157.0
5-Feb	223	223	215	211	209	210	216	217	213	213	216	209	204	202	221	218	230	229	243	246	253	269	282	292	228.2
6-Feb	317	322	315	314	309	289	274	280	284	280	272	264	251	247	246	218	201	201	210	218	221	239	256	249	267.5
7-Feb	256	234	245	251	261	269	269	283	311	293	289	278	277	277	276	266	261	261	276	279	280	293	304	293	273.9
8-Feb	287	293	306	306	300	299	297	290	287	284	290	295	279	294	280	289	270	237	234	229	227	224	223	222	270.3
9-Feb	217	219	239	259	258	238	233	236	229	228	223	211	207	206	201	183	179	180	190	203	213	212	213	216	217.4
10-Feb	228	213	215	209	204	213	182	160	198	33	79	219	127	324	351	326	318	324	310	304	304	295	299	294	262.8
11-Feb	292	273	271	286	290	268	260	257	256	262	261	250	253	252	247	261	258	259	254	291	297	300	285	271	269.6
12-Feb	265	275	281	284	286	289	280	251	229	229	236	246	240	245	242	210	192	197	186	174	186	193	198	202	235.7
13-Feb	212	215	220	221	242	248	255	251	257	263	269	279	321	336	350	353	356	354	355	356	352	351	350	346	297.9
14-Feb	341	336	350	354	356	355	13	UO	133	176	312	229	201	216	280	289	329	350	344	337	337	343	5	31	336.0
15-Feb	76	85	91	99	105	81	60	79	106	119	94	43	115	139	160	238	212	213	203	199	187	191	198	199	156.7
16-Feb	189	189	191	194	196	192	196	204	204	207	207	208	210	217	224	237	243	257	277	310	327	336	338	344	222.6
17-Feb	343	351	349	353	340	331	334	326	294	275	275	293	303	280	297	293	297	340	28	49	54	53	51	35	339.2
18-Feb	30	29	30	45	46	44	46	38	30	14	48	38	33	30	39	55	74	97	99	115	131	122	137	158	61.6
19-Feb	163	189	192	183	172	147	138	133	117	118	114	80	89	93	69	37	34	26	35	31	14	26	18	7	102.3
20-Feb	359	346	337	333	321	320	318	329	322	321	310	311	301	315	336	339	350	4	2	10	55	52	33	45	340.0
21-Feb	46	14	7	2	343	332	329	331	334	347	351	351	345	350	357	353	357	354	4	4	5	7	8	15	355.1
22-Feb	348	328	318	315	314	322	313	306	304	313	7	24	20	360	357	25	47	48	53	58	49	52	57	63	6.3
23-Feb	75	55	57	77	75	70	59	56	18	119	162	312	342	11	2	350	345	324	292	320	349	32	165	233	24.7
24-Feb	249	229	219	221	221	215	211	213	211	201	184	197	198	202	195	197	190	189	192	196	200	205	209	208	204.7
25-Feb	218	229	238	262	262	247	261	258	265	279	286	281	282	273	279	265	232	210	215	217	207	199	187	184	243.1
26-Feb	172	164	149	155	144	140	140	132	89	86	84	83	84	73	64	69	67	59	71	82	65	71	58	52	96.5
27-Feb	15	2	348	345	333	328	325	320	327	333	321	330	335	324	331	324	313	329	330	338	8	8	20	23	334.8
28-Feb	20	21	29	45	28	9	355	350	352	23	26	53	49	52	56	60	103	96	90	107	98	127	135	153	63.7
	255.7	251.7	258.7	261.7	261.7	259.4	254.3	254.8	257.4	256.2	256.9	260.8	264.2	273.2	288.4	286.2	276.8	264.4	262.2	258.5	254.4	255.9	247.2	241.7	
	Diurnal Average																								

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

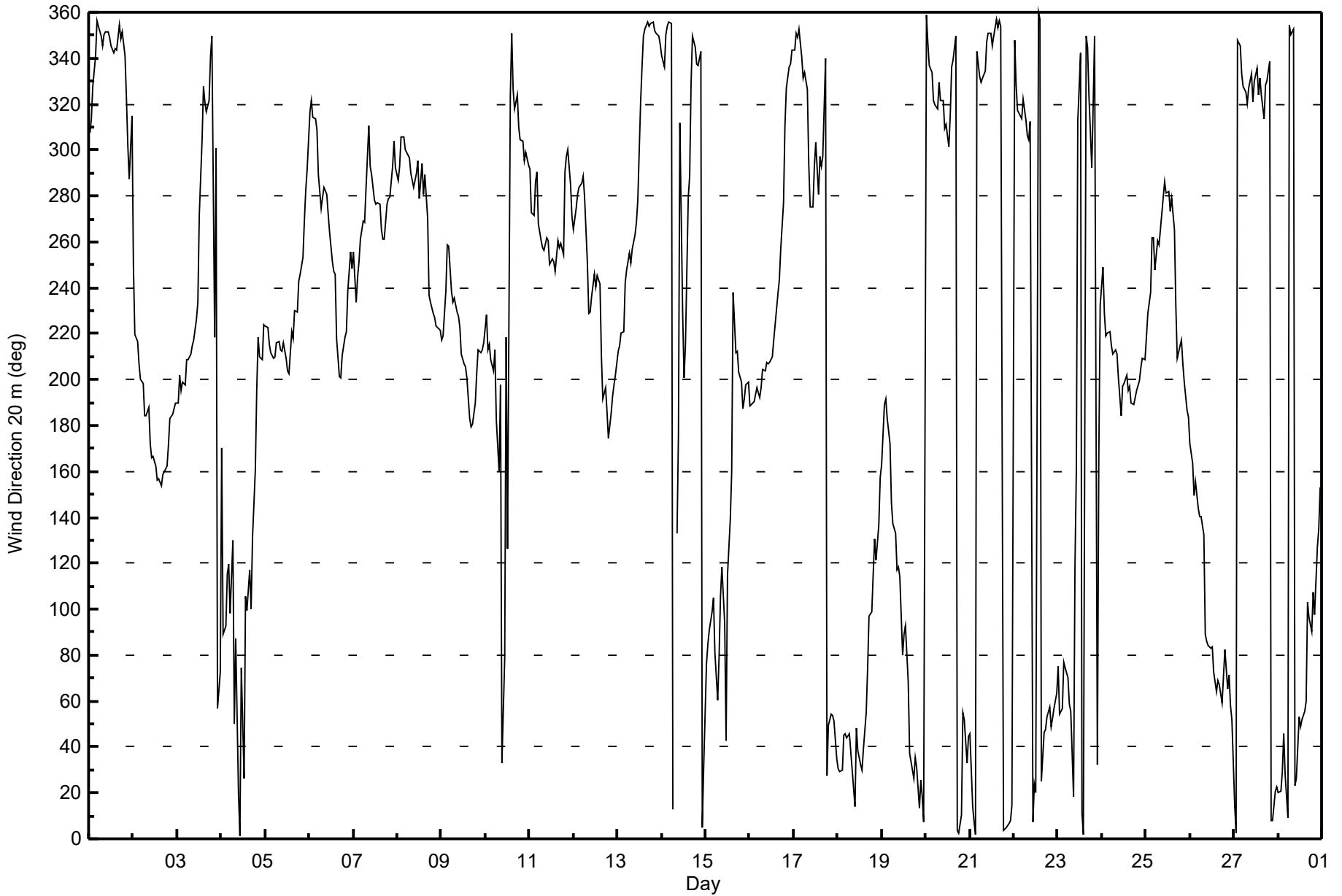




**Wood Buffalo Environmental Association**  
**Summary of Hour Standard Deviations**

**Wind Direction 20 m (WD20m) - deg**  
**Stony Mountain - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 92 deg on Feb 23 12:00		Hours in Service: 672 Hours of Data: 671 Hours of Missing Data: 1 Hours of Calibration: 0 Percent Operational Time: 99.9																									
Minimum Value: 6 deg on Feb 18 22:00																											
Percentiles: P <sub>1</sub> = 9 P <sub>10</sub> = 13 Q <sub>1</sub> = 16 Median = 20 Q <sub>3</sub> = 23 P <sub>90</sub> = 29 P <sub>99</sub> = 62																											
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-Feb	20	19	17	17	16	17	16	18	16	16	17	18	18	23	20	17	15	12	12	9	12	13	22	46	46		
2-Feb	19	8	11	13	13	14	13	13	18	19	19	19	19	20	20	20	21	20	19	21	24	23	22	23	24		
3-Feb	22	24	22	21	21	25	21	19	21	20	23	22	28	24	22	22	19	21	17	19	55	55	20	24	55		
4-Feb	23	27	20	15	16	20	18	17	29	26	43	55	27	77	62	59	21	27	18	18	18	19	17	19	77		
5-Feb	17	18	16	17	17	18	17	18	18	19	21	19	19	23	22	21	20	22	20	19	21	24	22	22	24		
6-Feb	23	19	21	22	21	26	23	23	22	25	25	27	29	29	26	25	21	19	19	18	20	23	25	22	29		
7-Feb	26	21	22	23	23	24	23	27	21	23	25	25	27	29	25	26	24	23	21	22	22	22	20	22	29		
8-Feb	20	22	19	17	19	17	18	20	20	23	23	26	28	26	26	23	20	19	18	17	17	17	17	17	28		
9-Feb	16	17	20	23	23	17	17	16	14	17	18	21	21	24	23	22	19	16	17	20	20	19	19	24	24		
10-Feb	29	24	22	18	16	29	17	13	43	34	29	66	44	90	21	23	22	20	19	21	19	20	20	21	90		
11-Feb	22	24	23	23	23	21	22	22	24	26	26	27	28	26	26	25	25	27	29	23	22	23	24	24	29		
12-Feb	24	22	22	21	21	21	21	23	17	19	20	26	27	28	25	28	18	19	17	17	20	18	19	19	28		
13-Feb	19	20	22	22	22	24	23	23	25	27	25	24	25	22	16	16	18	15	17	17	15	15	13	13	27		
14-Feb	13	12	12	13	12	10	19	UO	17	59	58	52	33	32	34	28	22	17	16	17	18	14	18	30	59		
15-Feb	22	19	15	21	16	30	17	18	19	29	46	43	63	43	53	54	25	13	15	12	10	14	16	19	63		
16-Feb	21	20	18	18	18	19	18	19	17	20	20	20	20	20	23	24	21	23	23	23	18	18	16	14	24		
17-Feb	13	15	16	17	17	19	19	20	32	23	36	30	31	29	28	28	25	20	32	15	13	14	16	15	36		
18-Feb	17	16	17	16	16	15	18	19	20	22	18	21	28	29	25	32	14	9	9	13	7	6	8	10	32		
19-Feb	11	12	12	12	15	12	11	12	12	15	15	26	21	22	35	21	18	17	19	21	17	16	15	12	35		
20-Feb	11	10	13	14	15	18	18	16	18	18	25	23	29	25	23	21	19	16	16	24	15	16	19	18	29		
21-Feb	15	13	13	14	13	14	12	12	14	15	17	19	18	21	19	20	16	15	13	11	13	14	13	12	21		
22-Feb	14	11	10	12	10	13	14	14	15	30	26	35	30	30	36	27	19	13	12	12	12	12	11	9	36		
23-Feb	10	16	14	10	9	10	13	21	24	85	37	92	59	32	41	57	20	20	11	16	11	17	73	18	92		
24-Feb	18	17	17	17	17	16	17	18	20	28	25	27	24	26	26	25	24	22	21	22	20	21	22	21	28		
25-Feb	21	20	23	25	24	21	24	23	24	30	24	29	30	29	32	31	29	21	21	18	19	19	17	14	32		
26-Feb	14	12	13	13	11	12	11	19	16	17	15	15	18	19	16	16	16	16	17	16	14	15	14	21	21		
27-Feb	14	11	13	13	16	15	16	18	19	19	24	23	22	22	21	21	22	18	16	20	16	15	18	19	24		
28-Feb	15	18	15	22	19	16	11	12	14	28	28	34	34	31	31	30	21	13	14	12	13	8	9	13	34		
		29	27	23	25	24	30	24	27	43	85	58	92	63	90	62	59	29	27	32	24	55	55	73	46		
		Diurnal Maximum																									
UO - Unstable Operation																											





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS19 FIREBAG FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)  
 FEBRUARY 2023

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	621	32	51	97.17	23.8	0	4.6	0
H2S (ppb) Average	639	33	33	100	3.4	0	0.7	0
THC (ppm) Average	621	32	51	97.17	2.7	-	2.4	-
NO2 (ppb) Average	639	33	33	100	63.3	0	18	-
NO (ppb) Average	639	33	33	100	101.6	-	16.7	-
NOX (ppb) Average	639	33	33	100	164.9	-	34.7	-
Temperature 2 m (C) Average	672	0	0	100	1.1	-	-3	-
Relative Humidity (%) Average	672	0	0	100	100	-	95.4	-
Wind Speed 10 m (km/h) Average	664	0	8	98.81	29	-	22	-
Wind Direction 10 m (deg) Average	664	0	8	98.81	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	621	1.17	2.6	-	0	0	0.1	0.3	0.9	3.3	23.8
H2S (ppb) Average	639	0.19	0.3	-	0	0	0.1	0.1	0.2	0.4	3.4
THC (ppm) Average	621	2.27	0.1	-	2.1	2.2	2.2	2.3	2.3	2.3	2.7
NO2 (ppb) Average	639	6.77	9.5	-	0.1	0.2	1	3.7	8.4	16.6	63.3
NO (ppb) Average	639	2.98	9.3	-	0	0	0	0.5	1.7	5.7	101.6
NOX (ppb) Average	639	9.75	18	-	0.1	0.2	1.1	4.6	10.1	21.5	164.9
Temperature 2 m (C) Average	672	-16.07	9	-	-34.3	-28.5	-22.9	-16.6	-9	-3	1.1
Relative Humidity (%) Average	672	79.72	9.1	-	54.3	68	74.1	79.6	85.8	93.1	100
Wind Speed 10 m (km/h) Average	664	11.3	6	-	0	3	7	10	15	20	29
Wind Direction 10 m (deg) Average	664	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2, THC	07 Feb 2023 16:00	08 Feb 2023 04:00	13	Unstable Operation - sample line disconnected
SO2, THC	08 Feb 2023 06:00	08 Feb 2023 11:00	6	Unstable Operation - sample line disconnected
Wind Speed, Wind Direction	01 Feb 2023 22:00	02 Feb 2023 01:00	4	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	04 Feb 2023 15:00	04 Feb 2023 15:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	08 Feb 2023 15:00	08 Feb 2023 16:00	2	Maintenance - station operator activities
Wind Speed, Wind Direction	22 Feb 2023 22:00	22 Feb 2023 22:00	1	Flat line in sensor output signal - Sensor frozen



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

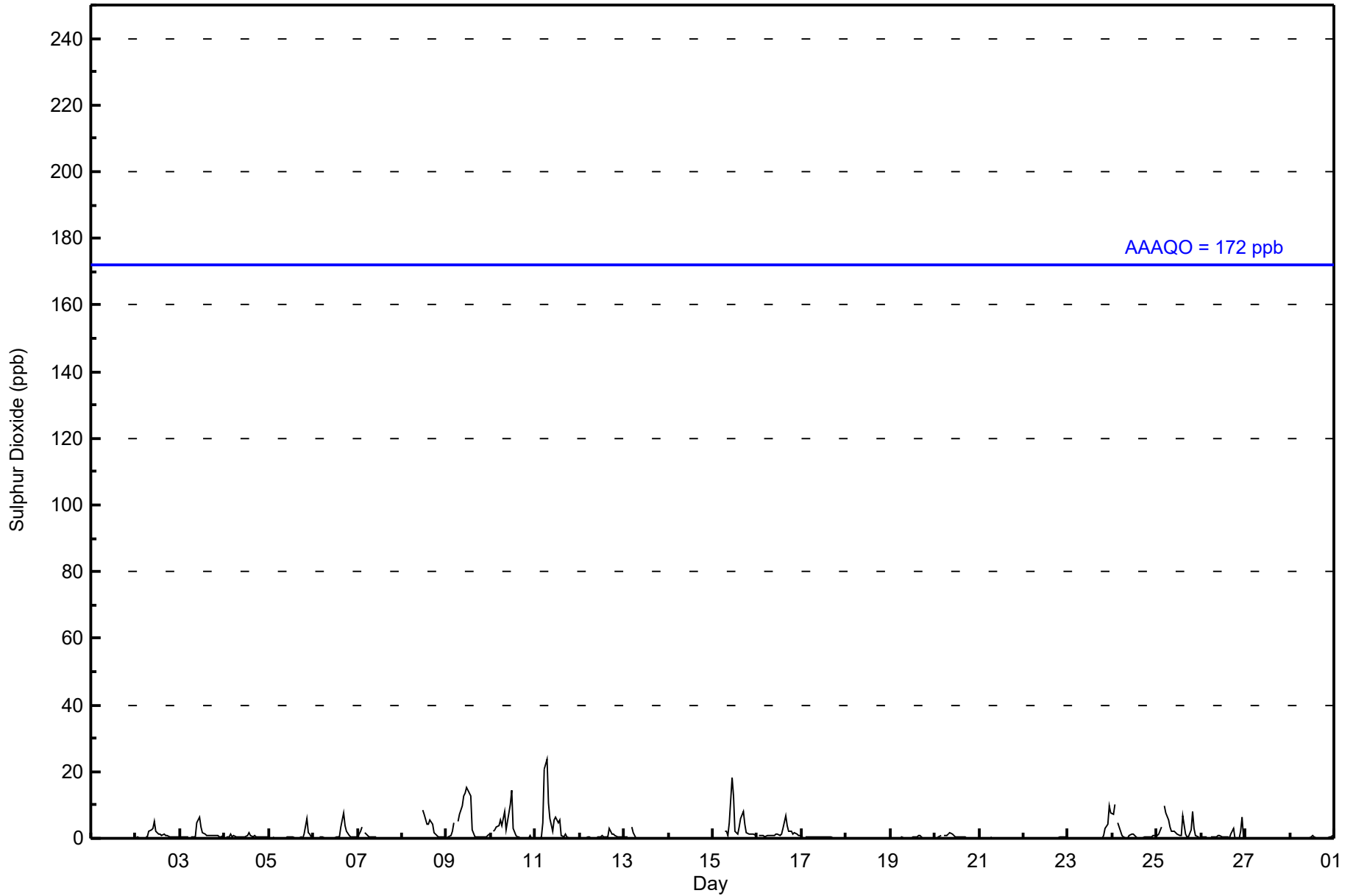
**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Firebag - February 2023**

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:	672																														
Maximum Value: 23.8 ppb on Feb 11 07:00		Maximum Daily Average: 4.6 ppb on Feb 9			Hours of Data:	621																													
Minimum Value: 0.0 ppb on Feb 1 19:00		Minimum Daily Average: 0.0 ppb on Feb 1			Hours of Missing Data:	51																													
Maximum Diurnal Average: 2.6 ppb at hour 12		Minimum Diurnal Average: 0.5 ppb at hour 1			Hours of Calibration:	32																													
Monthly Average: 1.17 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> = 0.9 P <sub>90</sub> = 3.3 P <sub>99</sub> = 13.3			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-Feb	0.1	0.1	0.0	Z	0.1	0.1	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	0.0	0.0	0.0	0.0							
2-Feb	0.1	0.3	0.2	0.1	Z	0.3	0.5	2.2	2.6	2.8	5.0	2.2	1.3	1.2	1.0	1.2	1.0	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	1.1	5.0							
3-Feb	0.4	0.3	0.4	0.4	0.4	Z	0.3	0.3	0.6	4.6	6.4	3.4	1.7	1.2	1.0	0.7	1.0	0.9	1.0	0.8	0.7	0.6	0.4	1.0	1.2	6.4	0.5	1.8							
4-Feb	Z	0.6	0.4	1.1	0.4	0.8	0.3	0.3	0.4	0.3	0.5	1.0	1.8	0.8	0.4	0.9	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.5	1.8	0.6	5.9							
5-Feb	0.2	Z	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	1.1	5.9	1.5	1.2	0.3	0.6	5.9	0.9	7.5							
6-Feb	0.2	0.1	Z	0.3	0.3	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.3	0.3	0.2	3.4	7.5	4.0	2.1	0.7	0.4	0.4	0.4	0.3	0.9	7.5	--	3.4							
7-Feb	0.4	2.0	3.4	Z	1.6	0.9	0.5	0.6	0.3	0.3	0.3	C	C	C	C	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	8.4	--	8.4							
8-Feb	UO	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	8.4	7.1	4.0	4.2	5.6	4.3	1.8	1.1	0.5	0.5	0.4	0.4	0.5	4.6	15.4	4.6	15.4						
9-Feb	0.2	0.2	0.7	2.0	4.8	Z	5.0	7.0	9.5	12.5	13.6	15.4	13.4	12.8	2.6	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.9	1.5	3.0	14.5	3.0	14.5							
10-Feb	Z	2.2	2.7	3.2	3.9	5.5	3.8	8.0	2.6	5.3	10.3	14.5	2.9	0.7	0.6	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.9	0.2	0.2	4.1	23.8	4.1	23.8						
11-Feb	0.2	Z	0.0	0.3	4.8	20.8	23.8	10.4	5.7	2.3	5.6	6.3	4.8	5.7	0.8	0.4	1.3	0.4	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.6	3.1	0.6	3.1						
12-Feb	0.2	0.1	Z	0.2	0.4	0.4	0.2	0.1	0.1	0.1	0.3	0.4	0.8	0.6	0.5	0.6	3.1	1.4	1.2	0.8	0.5	0.3	0.3	0.4	0.6	3.1	0.6	3.1							
13-Feb	0.3	0.3	0.4	Z	3.2	1.5	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	0.3	3.2	0.3	3.2						
14-Feb	0.0	0.0	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	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1						
15-Feb	0.0	0.0	0.0	0.0	0.0	Z	2.1	2.0	0.9	4.8	18.1	12.7	2.0	1.3	3.3	5.8	7.9	4.1	1.6	1.2	1.3	1.4	1.2	0.9	3.2	18.1	3.2	18.1							
16-Feb	Z	0.9	1.0	0.7	0.6	0.7	0.9	0.9	0.9	0.9	1.2	1.3	0.9	1.1	2.8	6.8	3.8	2.0	2.2	1.3	1.7	1.1	0.9	0.7	1.5	6.8	1.5	6.8							
17-Feb	0.5	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.6	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.3	0.6	0.3	0.6							
18-Feb	0.1	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2						
19-Feb	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	1.1	0.7	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	1.1	0.2	1.1	0.2						
20-Feb	0.1	0.1	0.3	0.8	Z	0.7	1.0	1.5	1.5	1.3	0.7	0.5	0.4	0.5	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.5	1.5	0.5	1.5							
21-Feb	0.1	0.1	0.1	0.2	0.2	Z	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.3						
22-Feb	Z	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	0.2	0.2	0.1	0.0	0.2	0.4	0.5	0.2	0.3	0.1	0.5	0.1	0.5							
23-Feb	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	1.0	3.1	4.3	9.9	7.6	1.1	9.9	1.1	9.9							
24-Feb	7.1	10.4	Z	4.6	1.9	0.7	0.4	0.2	0.2	1.0	1.2	1.1	1.0	0.0	0.0	0.0	0.0	0.3	0.3	0.4	0.4	0.5	0.7	0.9	1.4	10.4	1.4	10.4							
25-Feb	1.1	1.5	3.6	Z	9.8	7.5	5.4	3.6	2.0	2.0	1.5	1.2	0.8	0.6	6.8	1.1	0.4	0.6	2.4	7.8	2.9	0.8	0.4	0.2	2.8	9.8	2.8	9.8							
26-Feb	0.3	0.4	0.4	0.4	Z	0.5	0.4	0.6	0.6	0.7	0.7	0.6	0.6	0.4	0.4	0.2	1.1	2.8	0.2	0.0	0.0	2.1	6.2	0.4	0.9	6.2	0.9	6.2							
27-Feb	0.1	0.0	0.0	0.0	0.0	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.2	0.1	0.2							
28-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.5	1.0	0.3	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.4	0.3	0.8	0.2	1.0	0.2	1.0						
Diurnal Average		0.5	0.9	0.6	0.7	1.4	1.9	1.7	1.4	1.1	1.5	2.5	2.6	1.5	1.3	1.0	1.1	1.3	0.8	0.5	0.7	0.7	0.6	0.9	0.6	1.17	4.6	1.17	4.6						
Diurnal Maximum		7.1	10.4	3.6	4.6	9.8	20.8	23.8	10.4	9.5	12.5	18.1	15.4	13.4	12.8	6.8	6.8	7.9	4.1	2.4	7.8	5.9	4.3	9.9	7.6	23.8	23.8	23.8	23.8						
Z - zerospan			C - Calibration			UO - Unstable Operation																													
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 - February 2023**







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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Firebag - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	611	98.39	98.39
11 - 20	8	1.29	99.68
21 - 60	2	0.32	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: 621

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Firebag - February 2023**

<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	41	19	15	11	21	32	43	68	57	33	32	16	14	14	79	108	603
11 - 20	0	0	0	0	1	0	0	0	2	3	1	1	0	0	0	0	8
21 - 60	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
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>41</b>	<b>19</b>	<b>15</b>	<b>11</b>	<b>22</b>	<b>32</b>	<b>43</b>	<b>68</b>	<b>59</b>	<b>38</b>	<b>33</b>	<b>17</b>	<b>14</b>	<b>14</b>	<b>79</b>	<b>108</b>	<b>613</b>

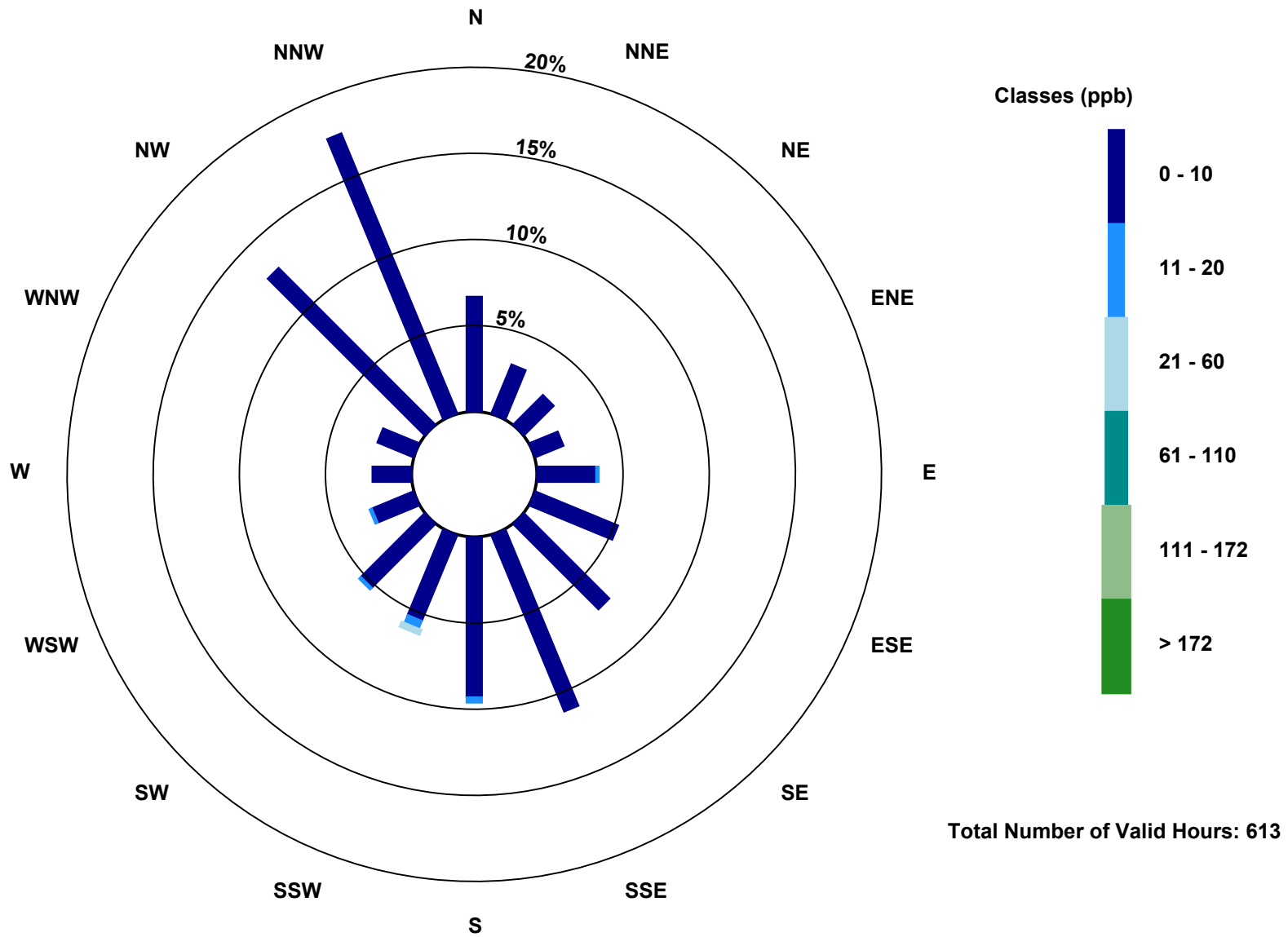
Total Number of Valid Hours: 613

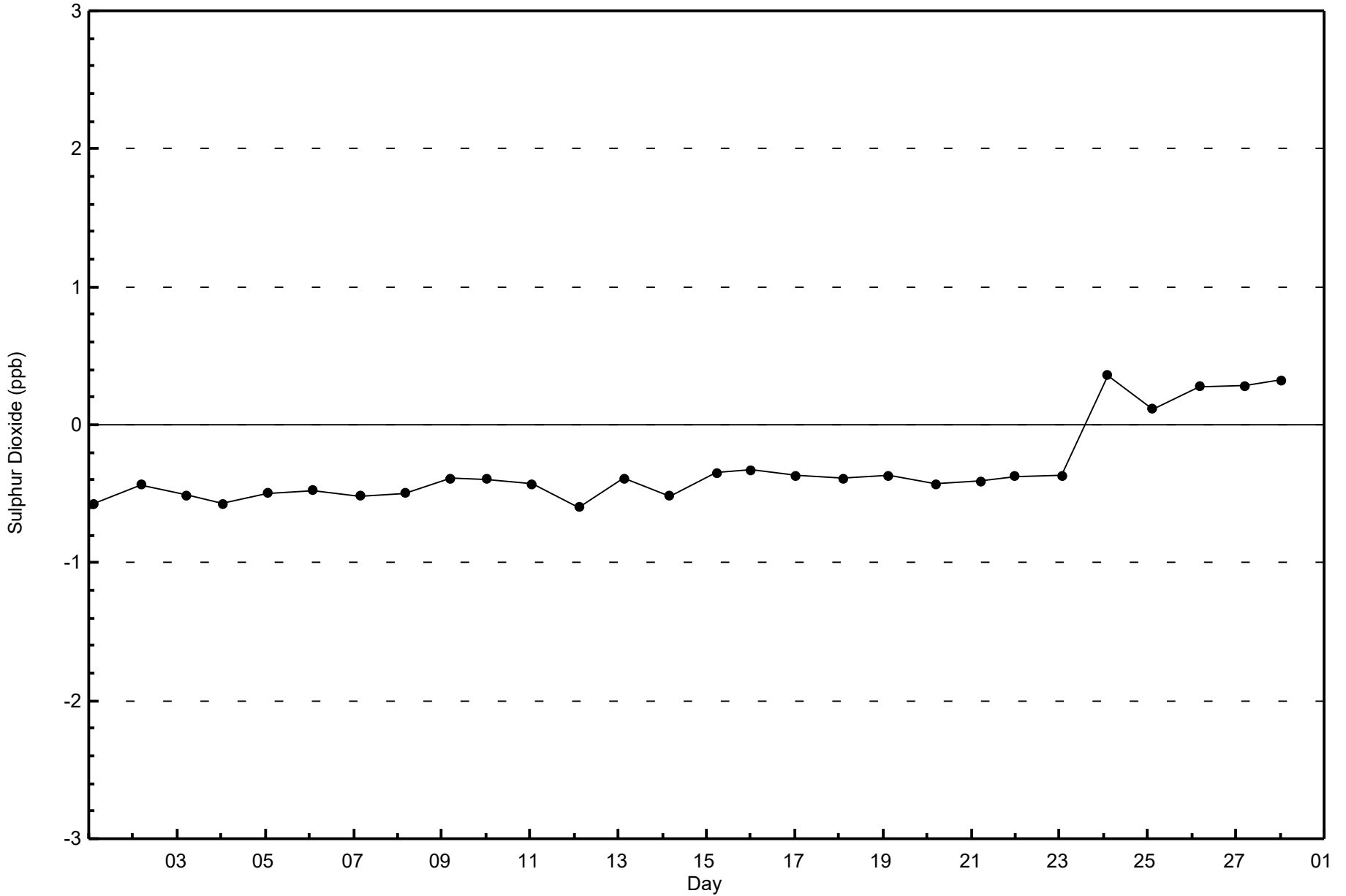
Total Number of Hours: 672

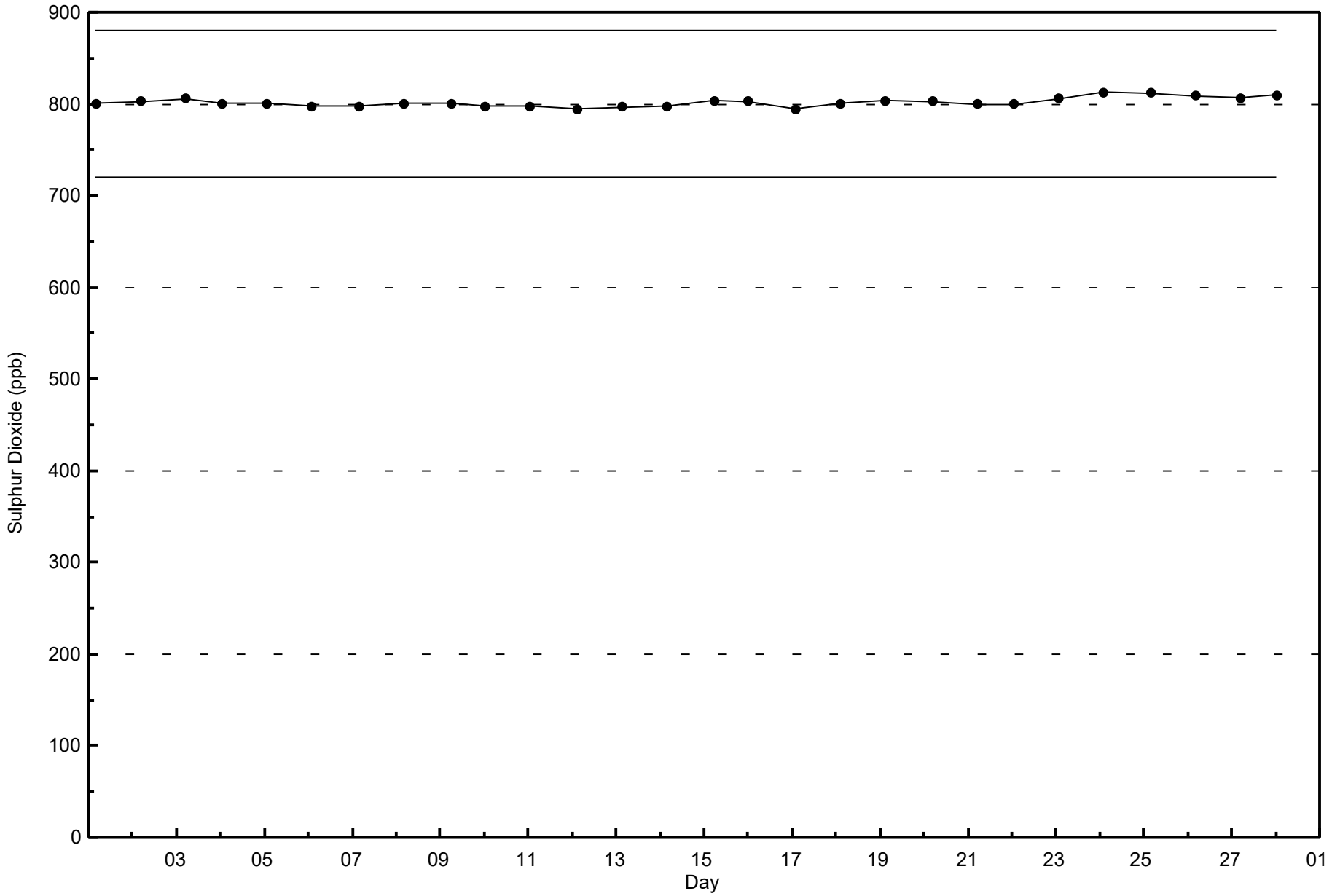


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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







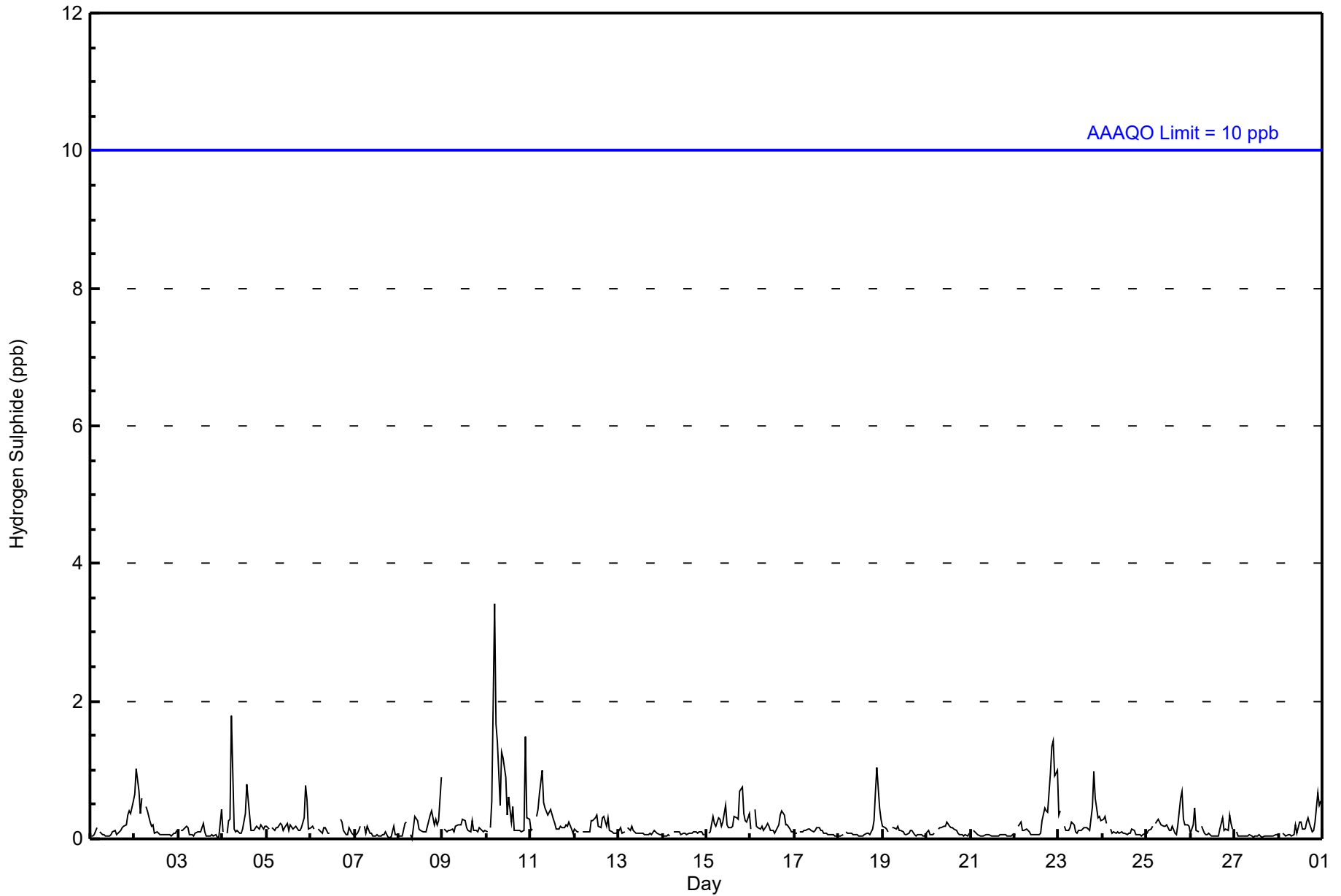


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	672																											
Maximum Value: 3.4 ppb on Feb 10 05:00		Maximum Daily Average: 0.7 ppb on Feb 10																	Hours of Data:	639																													
Minimum Value: 0.0 ppb on Feb 8 08:00		Minimum Daily Average: 0.0 ppb on Feb 27																	Hours of Missing Data:	33																													
Maximum Diurnal Average: 0.3 ppb at hour 22		Minimum Diurnal Average: 0.1 ppb at hour 16																	Hours of Calibration:	33																													
Monthly Average: 0.19 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> = 0.4 P <sub>99</sub> = 1.3																	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-Feb	0.0	0.0	0.1	0.2	Z	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.1	0.5																							
2-Feb	0.6	1.0	0.7	0.4	0.6	Z	0.5	0.4	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	0.1	0.1	0.3	1.0																							
3-Feb	Z	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.4	0.1	0.4																							
4-Feb	0.1	Z	0.1	0.3	0.3	1.8	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.8	0.6	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.3	1.8																							
5-Feb	0.2	0.2	Z	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.8	0.6	0.1	0.2	0.8																							
6-Feb	0.2	0.2	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.1	0.1	C	C	C	C	C	0.3	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.3																							
7-Feb	0.0	0.1	0.1	0.2	Z	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.1	0.2																							
8-Feb	0.0	0.0	0.0	0.2	0.2	Z	0.1	0.0	0.2	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.2	0.3	0.2	0.3	0.9	0.2	0.9																							
9-Feb	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.3																							
10-Feb	0.1	Z	0.2	0.6	3.4	1.7	1.4	0.5	1.3	1.2	0.9	0.3	0.6	0.2	0.5	0.1	0.1	0.1	0.1	0.1	0.1	1.5	0.3	0.3	0.7	3.4																							
11-Feb	0.1	0.1	Z	0.3	0.4	0.6	1.0	0.5	0.4	0.4	0.4	0.4	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.3	1.0																							
12-Feb	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.3																							
13-Feb	0.1	0.2	0.1	0.1	Z	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	0.1	0.1	0.1	0.1	0.2																							
14-Feb	0.0	0.1	0.1	0.1	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	0.1	0.1	0.1	0.1	0.1																							
15-Feb	Z	0.1	0.1	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.5	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.7	0.8	0.4	0.3	0.3	0.4	0.3	0.8																							
16-Feb	0.2	Z	0.4	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.4																							
17-Feb	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	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	0.1	0.0	0.0	0.1	0.2																							
18-Feb	0.0	0.0	0.1	Z	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	0.1	0.1	0.1	0.3	0.7	1.0	0.4	0.3	1.0																							
19-Feb	0.2	0.2	0.1	0.1	Z	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	0.0	0.1	0.1	0.0	0.0	0.1	0.2																							
20-Feb	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.3																							
21-Feb	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1																							
22-Feb	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	0.3	0.4	0.4	0.4	1.0	1.3	1.4	0.9	1.0	0.4	1.4																							
23-Feb	0.4	0.4	Z	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.5	1.0	0.6	0.3	0.3	0.3	0.3	1.0																							
24-Feb	0.3	0.3	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	0.0	0.1	0.1	0.1	0.3																							
25-Feb	0.1	0.1	0.1	0.2	Z	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.6	0.7	0.3	0.2	0.2	0.2	0.7																							
26-Feb	0.1	0.2	0.5	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.5																							
27-Feb	Z	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1																							
28-Feb	0.0	Z	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.1	0.3	0.3	0.1	0.1	0.2	0.3	0.2	0.1	0.1	0.2	0.7	0.5	0.6	0.2	0.7																							
																								0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	Diurnal Average		
																								0.6	1.0	0.7	0.6	3.4	1.8	1.4	0.5	1.3	1.2	0.9	0.4	0.6	0.8	0.6	0.3	0.4	0.4	0.7	1.0	1.3	1.5	0.9	1.0	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**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Firebag - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Firebag - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	638	99.84	99.84
3 - 4	1	0.16	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: 639

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Firebag - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	42	22	15	12	22	32	42	65	61	37	35	23	16	16	80	110	630
3 - 4	0	0	0	0	1	0	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>	42	22	15	12	23	32	42	65	61	37	35	23	16	16	80	110	631

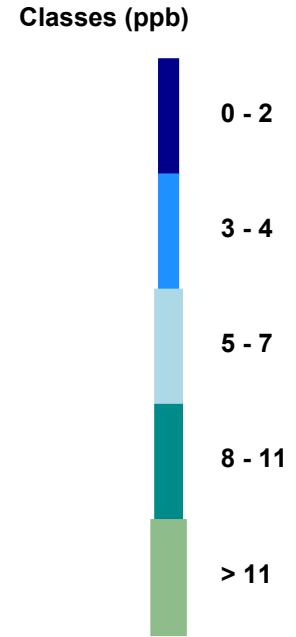
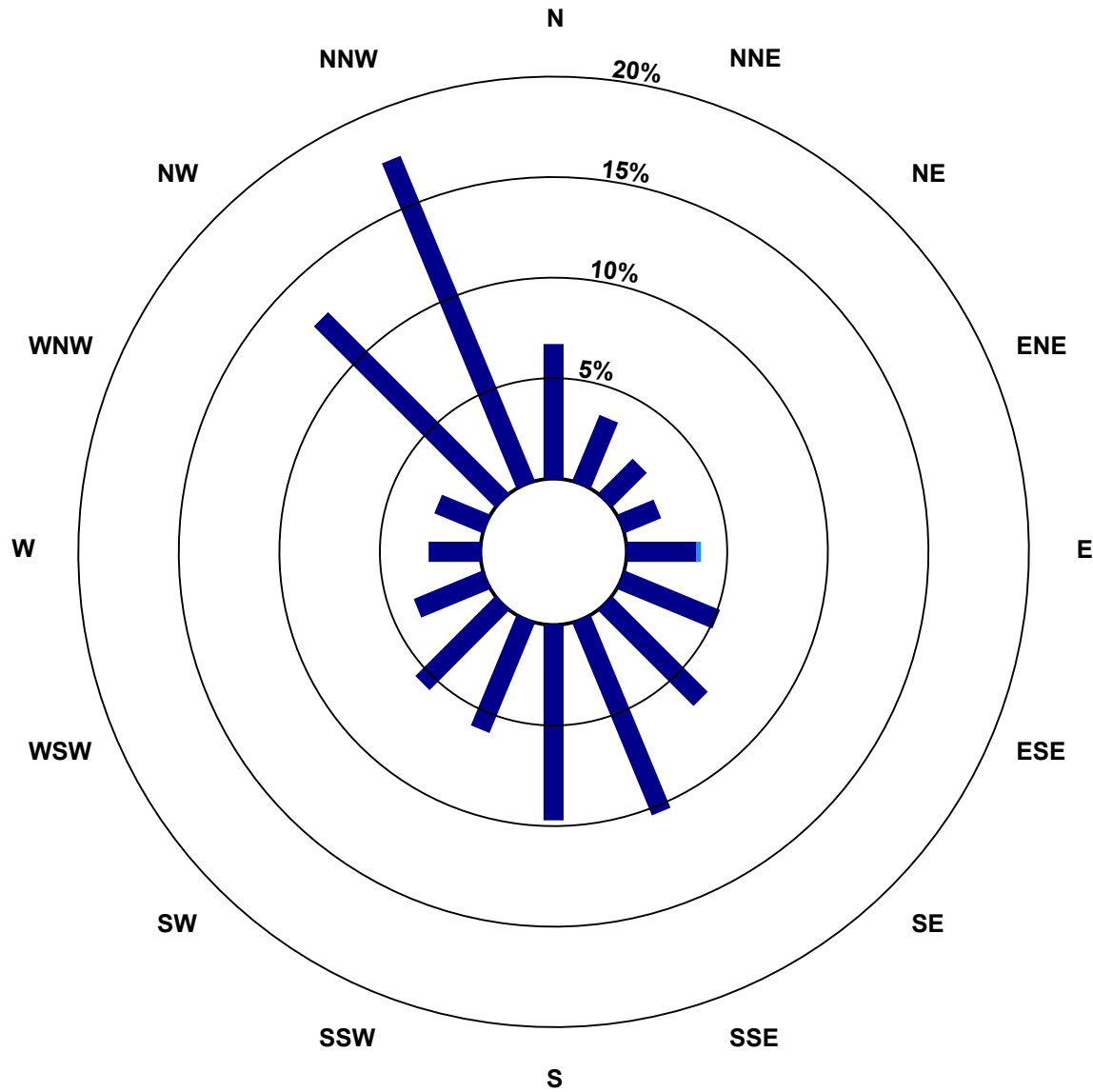
Total Number of Valid Hours: 631

Total Number of Hours: 672

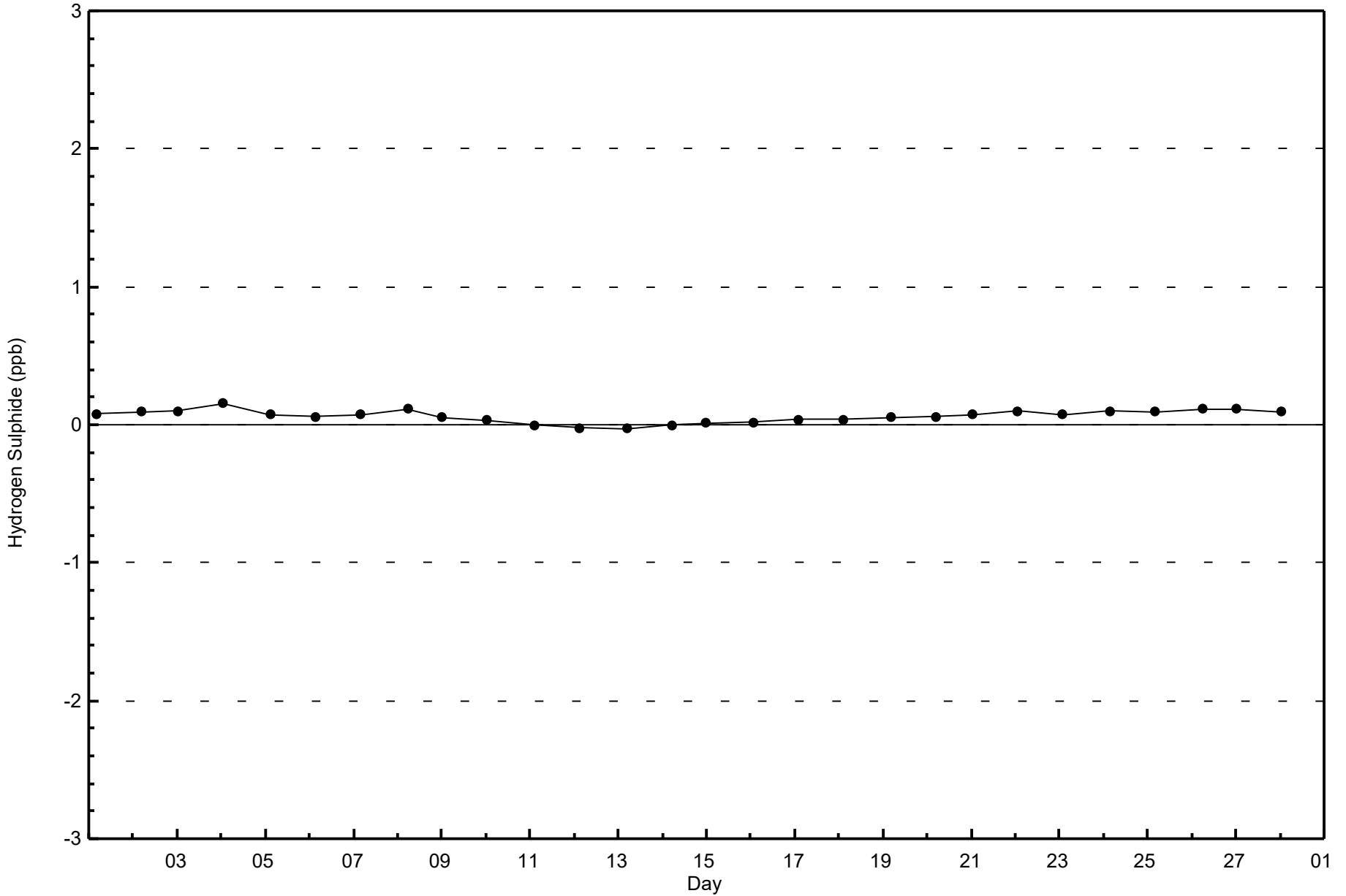


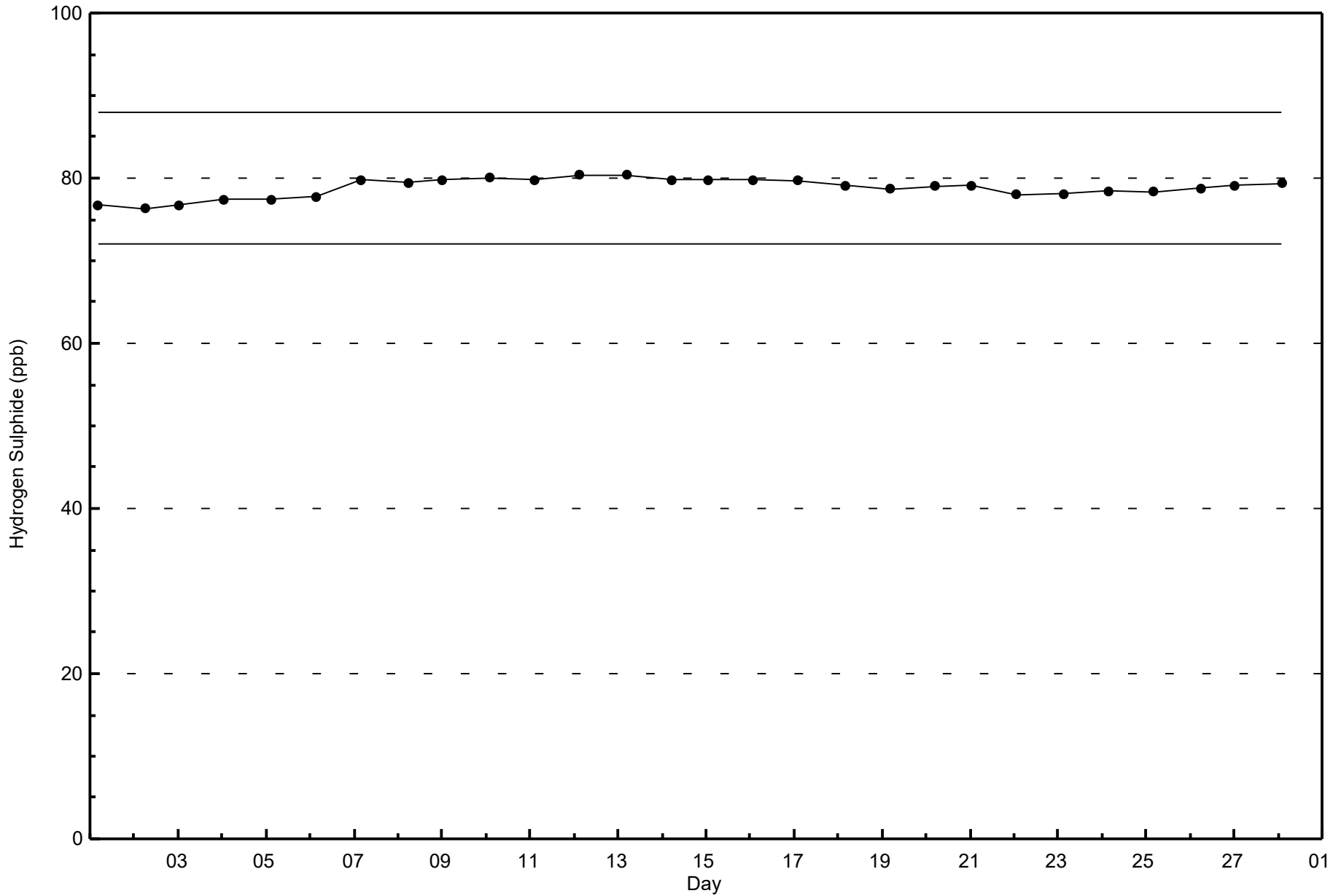
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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



Total Number of Valid Hours: 631







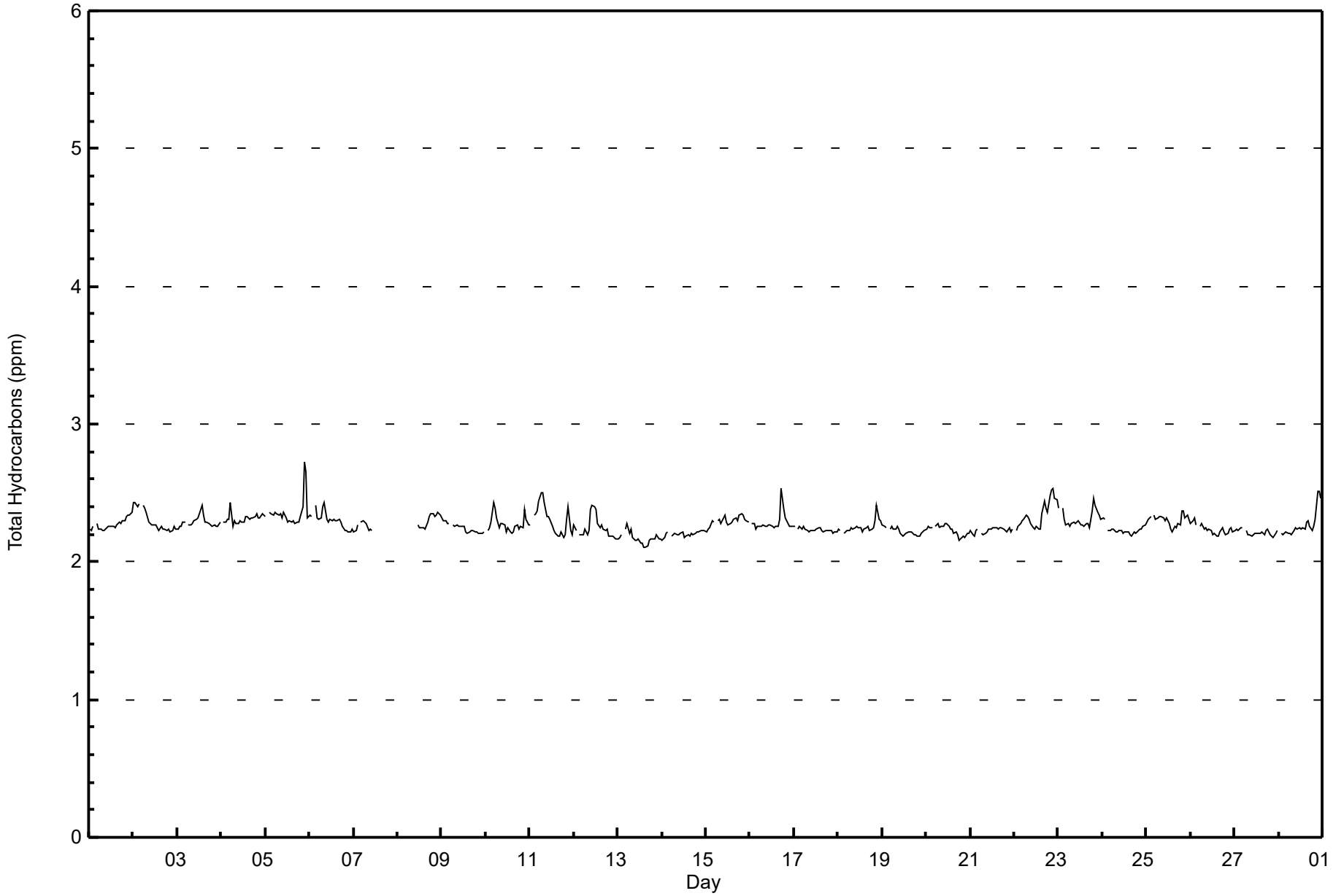
Maximum Value: 2.7 ppm on Feb 5 22:00		Maximum Daily Average: 2.4 ppm on Feb 5		Hours in Service: 672																							
Minimum Value: 2.1 ppm on Feb 13 15:00		Minimum Daily Average: 2.2 ppm on Feb 13		Hours of Data: 621																							
Maximum Diurnal Average: 2.3 ppm at hour 22		Minimum Diurnal Average: 2.2 ppm at hour 15		Hours of Missing Data: 51																							
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> = 2.3 P <sub>99</sub> = 2.5		Hours of Calibration: 32																							
				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-Feb	2.2	2.2	2.3	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	
2-Feb	2.4	2.4	2.4	2.4	Z	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.4	
3-Feb	2.2	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	
4-Feb	Z	2.3	2.3	2.3	2.3	2.4	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	2.4	2.3	2.3	2.4	2.3	2.3	2.4	
5-Feb	2.3	Z	2.4	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.7	2.7	2.3	2.4	2.7	
6-Feb	2.3	2.3	Z	2.4	2.3	2.3	2.3	2.4	2.4	2.3	2.3	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	2.3	2.4	
7-Feb	2.2	2.2	2.3	Z	2.3	2.3	2.3	2.3	2.2	2.2	2.2	C	C	C	C	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	2.3
8-Feb	UO	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.3	2.3	2.4	2.3	--	2.4	
9-Feb	2.3	2.3	2.3	2.3	2.3	Z	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	2.3	2.3
10-Feb	Z	2.2	2.2	2.3	2.4	2.4	2.3	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.2	2.4	2.3	2.3	2.3	2.4	
11-Feb	2.3	Z	2.3	2.3	2.4	2.4	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.2	2.2	2.3	2.5	
12-Feb	2.3	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	
13-Feb	2.2	2.2	2.2	Z	2.2	2.3	2.2	2.2	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	2.2	2.3	
14-Feb	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	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	
15-Feb	2.2	2.2	2.2	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	
16-Feb	Z	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	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.5	
17-Feb	2.3	Z	2.2	2.3	2.2	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	2.2	2.2	2.2	2.2	2.3	
18-Feb	2.2	2.2	Z	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	2.3	2.2	2.2	2.3	2.3	2.4	2.3	2.3	2.3	2.4	
19-Feb	2.3	2.3	2.3	Z	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	2.3	
20-Feb	2.2	2.3	2.2	2.3	Z	2.3	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	2.3	
21-Feb	2.2	2.2	2.2	2.2	2.2	Z	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	2.3	2.2	2.2	2.2	2.3	
22-Feb	Z	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.5	
23-Feb	2.4	Z	2.4	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	2.4	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.5	
24-Feb	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	2.3	2.3	2.3	
25-Feb	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.4	
26-Feb	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	2.3	
27-Feb	2.2	2.2	2.2	2.3	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	2.2	2.2	2.2	2.3	
28-Feb	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	2.3	2.2	2.3	2.3	2.5	2.5	2.5	2.3	2.5	
																								Diurnal Average			
																								Diurnal Maximum			
																								2.3			
																								2.4			

Z - zerospan                      C - Calibration                      UO - Unstable Operation



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

**Total Hydrocarbons (THC) - ppm**  
**Firebag - February 2023**





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

**Total Hydrocarbons (THC) - ppm**  
**Firebag - February 2023**

<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	621	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: 621

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Firebag - February 2023**

<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	41	19	15	11	22	32	43	68	59	38	33	17	14	14	79	108	613
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>	41	19	15	11	22	32	43	68	59	38	33	17	14	14	79	108	613

Total Number of Valid Hours: 613

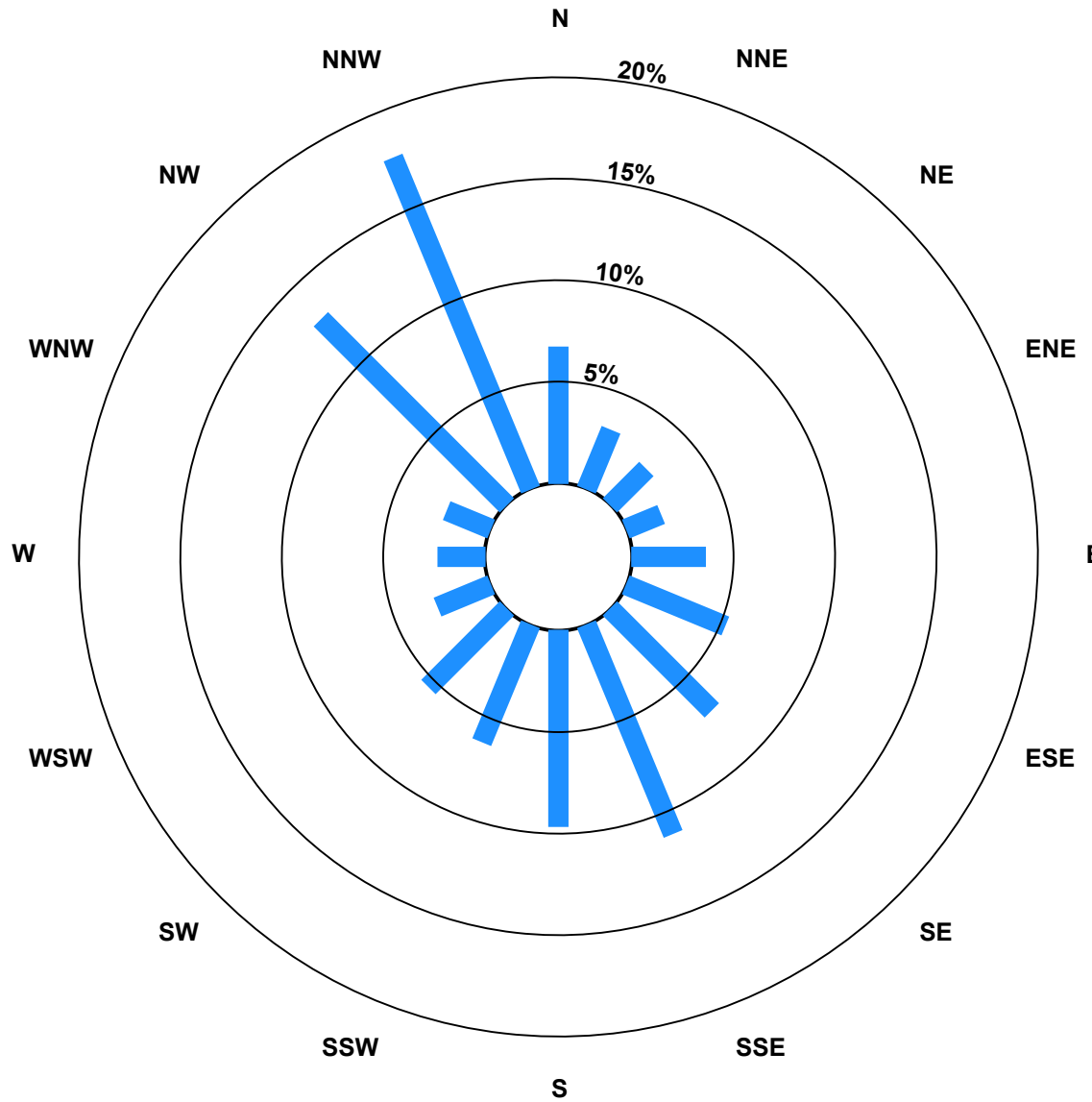
Total Number of Hours: 672



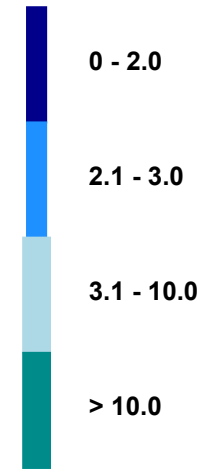


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

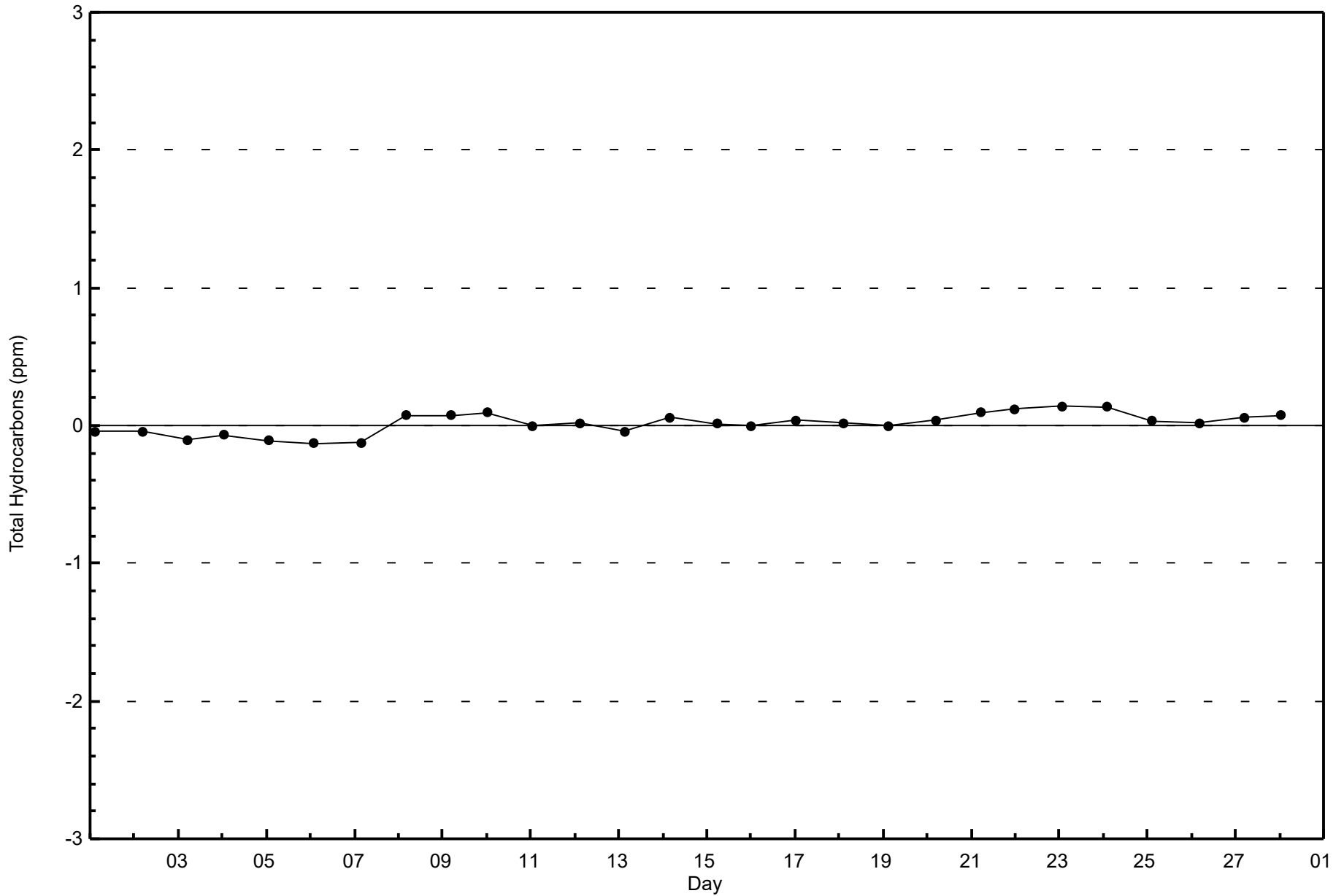
Total Hydrocarbons (THC) - ppm  
Firebag

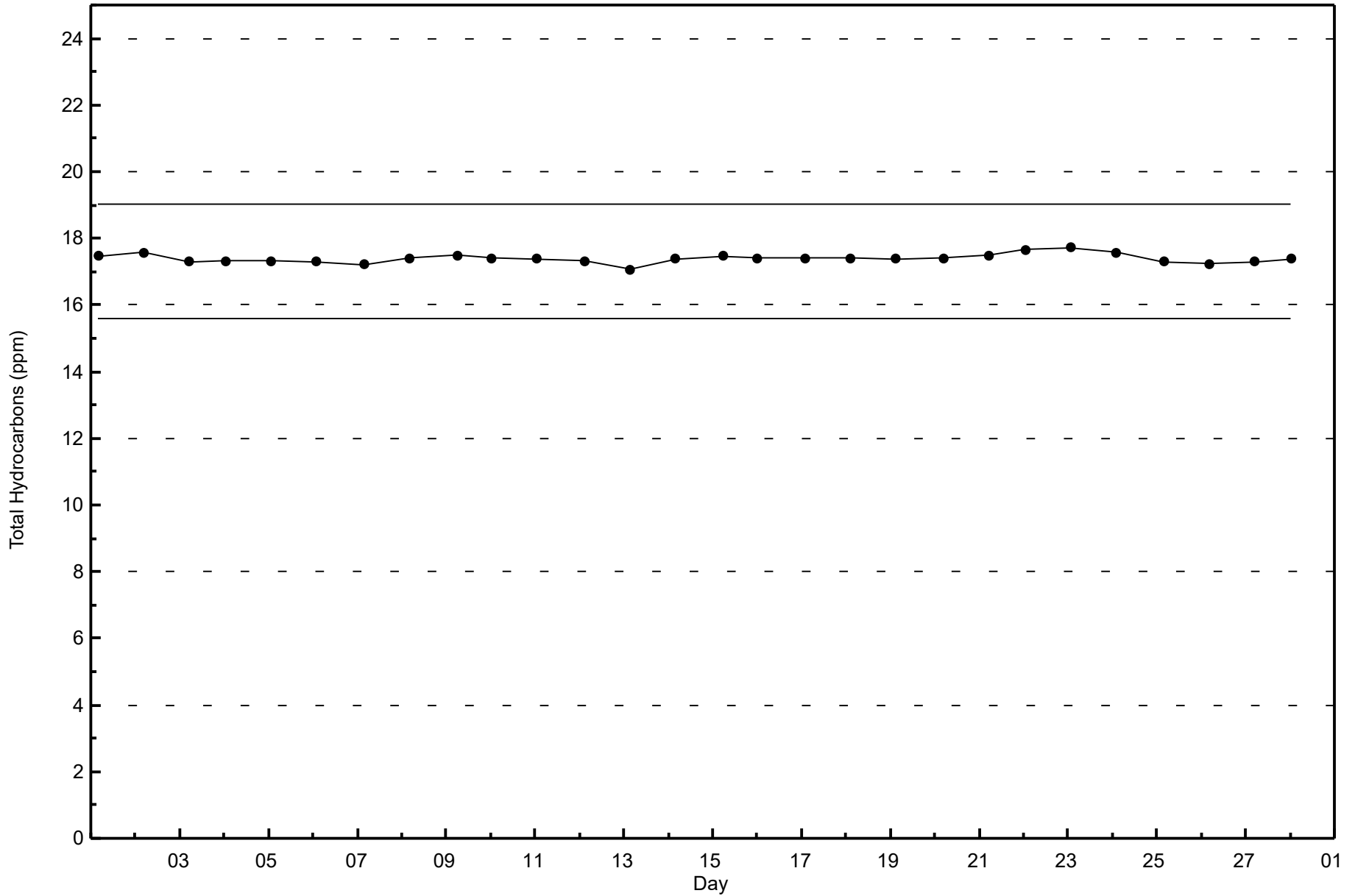


Classes (ppm)



Total Number of Valid Hours: 613







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

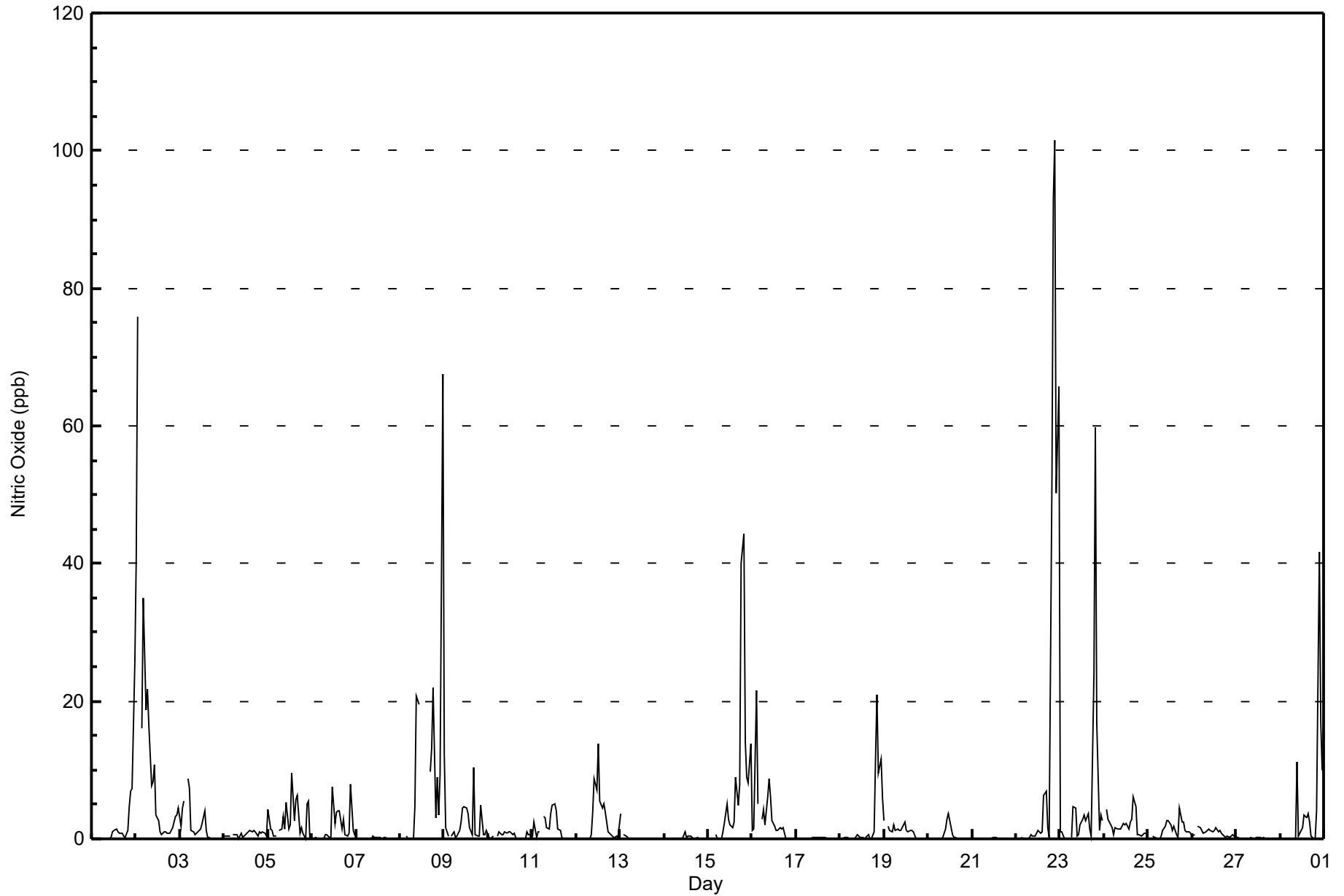
**Nitric Oxide (NO) - ppb**  
**Firebag - February 2023**

Maximum Value: 101.6 ppb on Feb 22 22:00																						Maximum Daily Average: 16.7 ppb on Feb 22																						Hours in Service: 672			
Minimum Value: 0.0 ppb on Feb 1 01:00																						Minimum Daily Average: 0.0 ppb on Feb 21																						Hours of Data: 639			
Maximum Diurnal Average: 7.2 ppb at hour 24																						Minimum Diurnal Average: 1.3 ppb at hour 8																						Hours of Missing Data: 33			
Monthly Average: 2.98 ppb																						Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.0 Median = 0.5 Q <sub>3</sub> = 1.7 P <sub>90</sub> = 5.7 P <sub>99</sub> = 51.5																						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-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	1.3	1.5	1.0	0.7	0.8	0.4	0.3	1.3	4.7	6.9	7.4	25.6	2.3	25.6																					
2-Feb	40.8	75.8	Z	16.1	35.0	18.6	21.7	16.5	7.6	8.3	10.8	3.4	2.7	1.1	0.7	1.1	1.1	0.8	0.8	1.2	1.6	3.2	3.4	4.6	12.0	75.8																					
3-Feb	1.9	4.5	5.4	Z	8.7	7.2	1.2	1.0	0.7	0.8	1.3	1.4	2.2	4.0	1.2	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	1.8	8.7																					
4-Feb	0.4	0.3	0.4	0.4	Z	0.6	0.7	0.5	0.0	0.9	0.1	0.4	0.8	1.0	1.3	1.1	1.2	0.9	0.4	1.0	0.8	1.1	0.7	0.4	0.7	1.3																					
5-Feb	4.3	1.4	1.2	0.3	0.5	Z	1.2	1.3	3.2	1.4	5.3	1.5	2.0	9.6	2.6	5.6	6.3	0.9	1.6	0.7	0.1	5.0	5.4	0.0	2.7	9.6																					
6-Feb	Z	0.0	0.1	0.0	0.0	0.0	0.0	0.7	0.6	0.2	0.2	7.4	2.3	3.8	4.0	4.1	1.5	2.9	0.7	0.4	0.8	7.9	1.2	0.6	1.7	7.9																					
7-Feb	0.9	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.9																					
8-Feb	0.0	0.0	Z	0.3	0.0	0.0	0.0	0.0	4.7	20.8	19.5	C	C	C	C	C	9.7	13.2	22.0	3.1	9.0	3.5	9.4	67.5	10.2	67.5																					
9-Feb	12.3	1.6	0.5	Z	0.4	1.0	0.1	0.3	1.1	2.5	4.4	4.8	4.4	3.7	1.7	0.7	10.3	0.7	0.3	0.4	5.0	0.7	0.6	1.3	2.6	12.3																					
10-Feb	0.3	0.1	0.2	0.4	Z	0.4	1.1	0.6	0.5	1.0	0.9	0.9	1.0	0.5	0.9	0.3	0.1	0.0	0.0	0.1	0.0	1.0	0.6	0.6	0.5	1.1																					
11-Feb	0.3	2.5	0.2	1.0	0.9	Z	3.3	3.0	1.7	1.5	3.6	5.0	5.0	4.0	1.5	1.3	0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.1	1.5	5.0																					
12-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.6	3.8	8.7	7.2	13.9	5.5	4.4	5.1	4.0	0.9	0.9	0.7	0.2	0.2	0.3	0.2	2.5	13.9																					
13-Feb	3.7	Z	0.5	0.3	0.3	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	0.0	0.0	0.0	0.0	0.2	3.7																					
14-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	1.1	0.2	0.4	0.4	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	1.1																					
15-Feb	0.0	0.0	0.0	Z	0.6	0.0	0.0	0.1	0.9	2.1	5.1	2.9	2.0	1.7	2.5	8.9	4.9	8.0	40.1	44.3	13.9	8.9	8.0	13.8	7.3	44.3																					
16-Feb	1.2	1.4	21.5	5.1	Z	2.8	4.3	2.1	6.1	8.7	6.2	2.7	1.9	1.2	1.1	1.7	1.5	1.6	0.0	0.0	0.0	0.0	0.0	0.0	3.1	21.5																					
17-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.3																					
18-Feb	Z	0.0	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.5	0.5	0.3	0.1	0.0	0.1	0.7	0.1	0.0	1.0	11.6	20.9	9.6	11.5	5.9	2.8	20.9																					
19-Feb	2.7	Z	1.8	1.3	1.0	2.1	1.3	1.4	1.2	1.3	1.6	2.4	1.2	1.1	1.2	1.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.7																					
20-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.3	1.5	2.8	3.8	1.6	0.5	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.8																					
21-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.2																					
22-Feb	0.0	0.0	0.0	0.3	Z	0.0	0.0	0.2	0.7	0.4	0.4	0.8	1.2	0.8	1.0	6.3	7.0	1.6	0.2	52.2	93.0	101.6	50.3	65.6	16.7	101.6																					
23-Feb	1.1	1.0	0.1	0.0	0.0	Z	0.3	4.7	4.4	0.4	0.6	2.1	2.9	3.4	2.7	3.6	1.5	0.4	24.0	59.8	16.9	1.3	3.4	2.6	6.0	59.8																					
24-Feb	Z	4.2	2.8	2.4	1.6	0.7	1.6	1.4	1.4	2.3	2.1	2.1	1.4	2.5	2.9	6.1	4.7	0.6	0.7	0.5	0.5	0.9	0.9	2.0	6.1																						
25-Feb	1.0	Z	0.5	0.2	0.2	0.0	0.1	0.4	1.1	1.8	2.6	2.6	2.1	1.1	1.8	0.7	0.3	4.4	2.4	2.5	1.2	0.9	1.0	0.8	1.3	4.4																					
26-Feb	0.5	0.7	Z	1.8	1.5	1.3	0.9	1.1	1.3	1.5	1.2	1.0	1.2	1.6	1.0	1.3	0.8	0.4	0.2	0.3	0.3	0.4	0.5	0.4	0.9	1.8																					
27-Feb	0.2	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	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	0.2																					
28-Feb	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	11.2	0.4	1.3	1.6	3.5	3.0	3.6	2.5	0.4	0.0	0.0	4.2	41.7	16.8	10.0	4.4	41.7																					
																						3.0	4.1	1.5	1.3	2.2	1.5	1.4	1.3	1.4	2.6	2.8	2.1	2.0	1.9	1.4	1.9	2.2	1.5	3.4	6.4	6.2	7.0	4.4	7.2	Diurnal Average	
																						40.8	75.8	21.5	16.1	35.0	18.6	21.7	16.5	7.6	20.8	19.5	7.4	13.9	9.6	4.4	8.9	10.3	13.2	40.1	59.8	93.0	101.6	50.3	67.5	Diurnal Maximum	
Z - zerospan																						C - Calibration																									



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

**Nitric Oxide (NO) - ppb**  
**Firebag - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Firebag - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	619	96.87	96.87
21 - 40	9	1.41	98.28
41 - 80	9	1.41	99.69
81 - 159	2	0.31	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Firebag - February 2023**

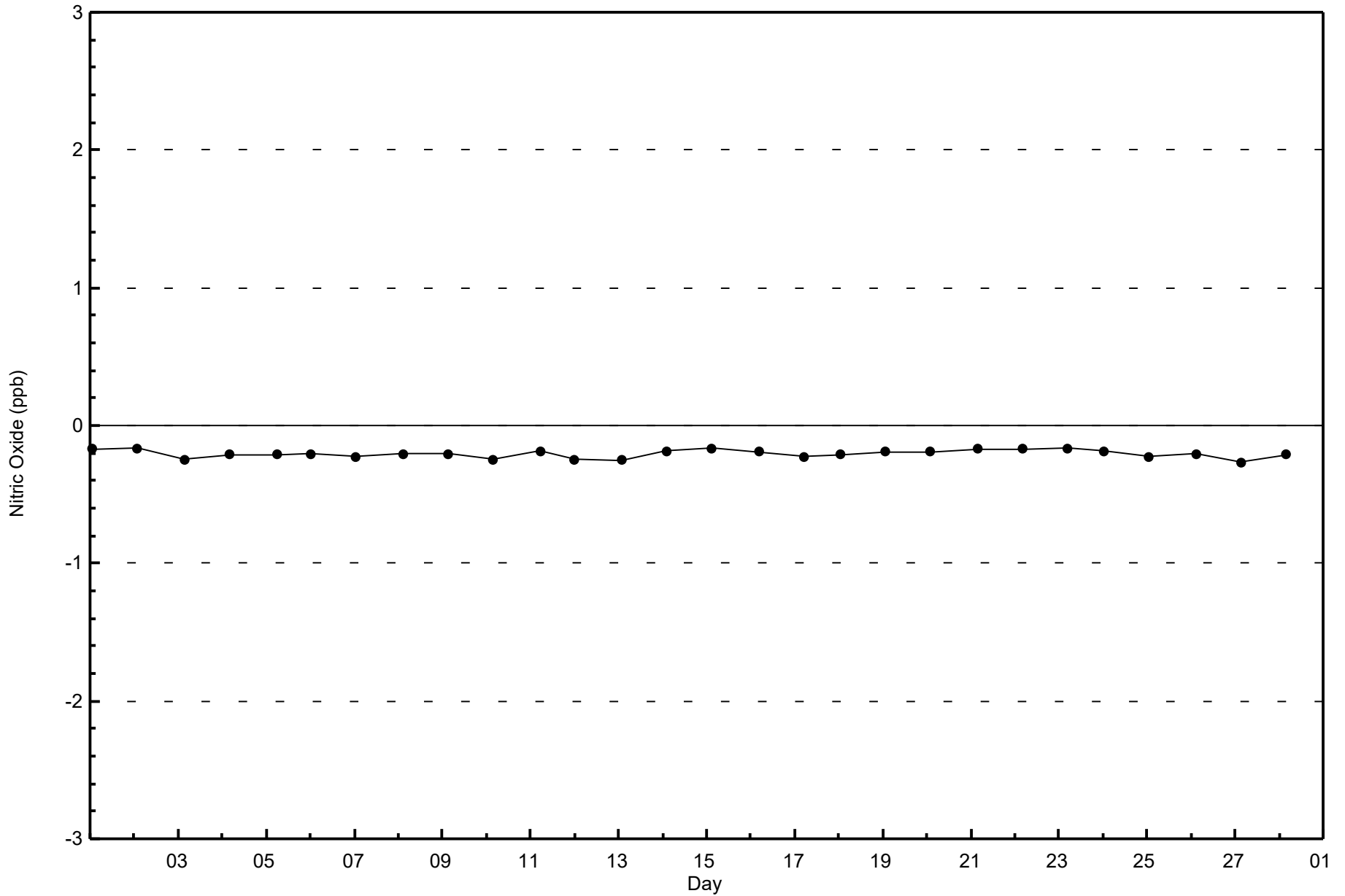
<b>Concentration Ranges (ppb)</b>	<b>Wind Direction</b>																<b>Totals</b>
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	41	20	16	12	20	32	43	58	57	39	31	25	17	16	79	110	616
21 - 40	0	0	0	0	1	1	0	4	2	0	0	0	0	0	0	0	8
11 - 80	0	0	0	0	0	0	0	5	0	0	1	0	0	0	1	1	8
81 - 159	0	1	0	0	0	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>	41	21	16	12	21	33	43	67	59	39	32	25	17	16	80	111	633

Total Number of Valid Hours: 633

Total Number of Hours: 672



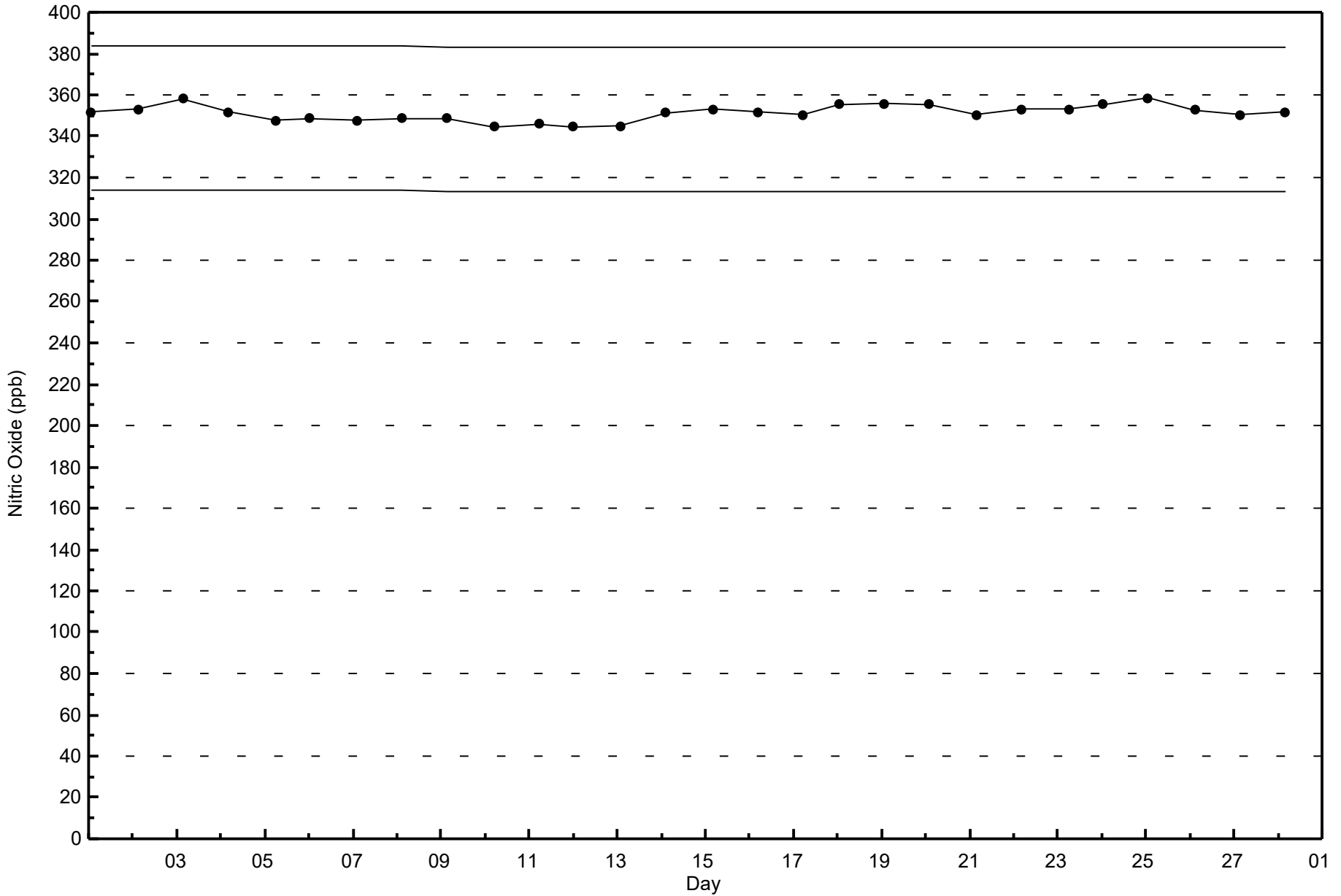






Wood Buffalo Environmental Association  
Span Responses

Nitric Oxide (NO) - ppb  
Firebag - February 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

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

Firebag - February 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 672
Maximum Value: 63.3 ppb on Feb 22 22:00	Maximum Daily Average: 18.0 ppb on Feb 22
Minimum Value: 0.1 ppb on Feb 13 21:00	Minimum Daily Average: 0.3 ppb on Feb 21
Maximum Diurnal Average: 12.1 ppb at hour 22	Minimum Diurnal Average: 2.8 ppb at hour 15
Monthly Average: 6.77 ppb	Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 1.0 Median = 3.7 Q <sub>3</sub> = 8.4 P <sub>90</sub> = 16.6 P <sub>99</sub> = 49.3
	Hours of Data: 639
	Hours of Missing Data: 33
	Hours of Calibration: 33
	Percent Operational Time: 100.0

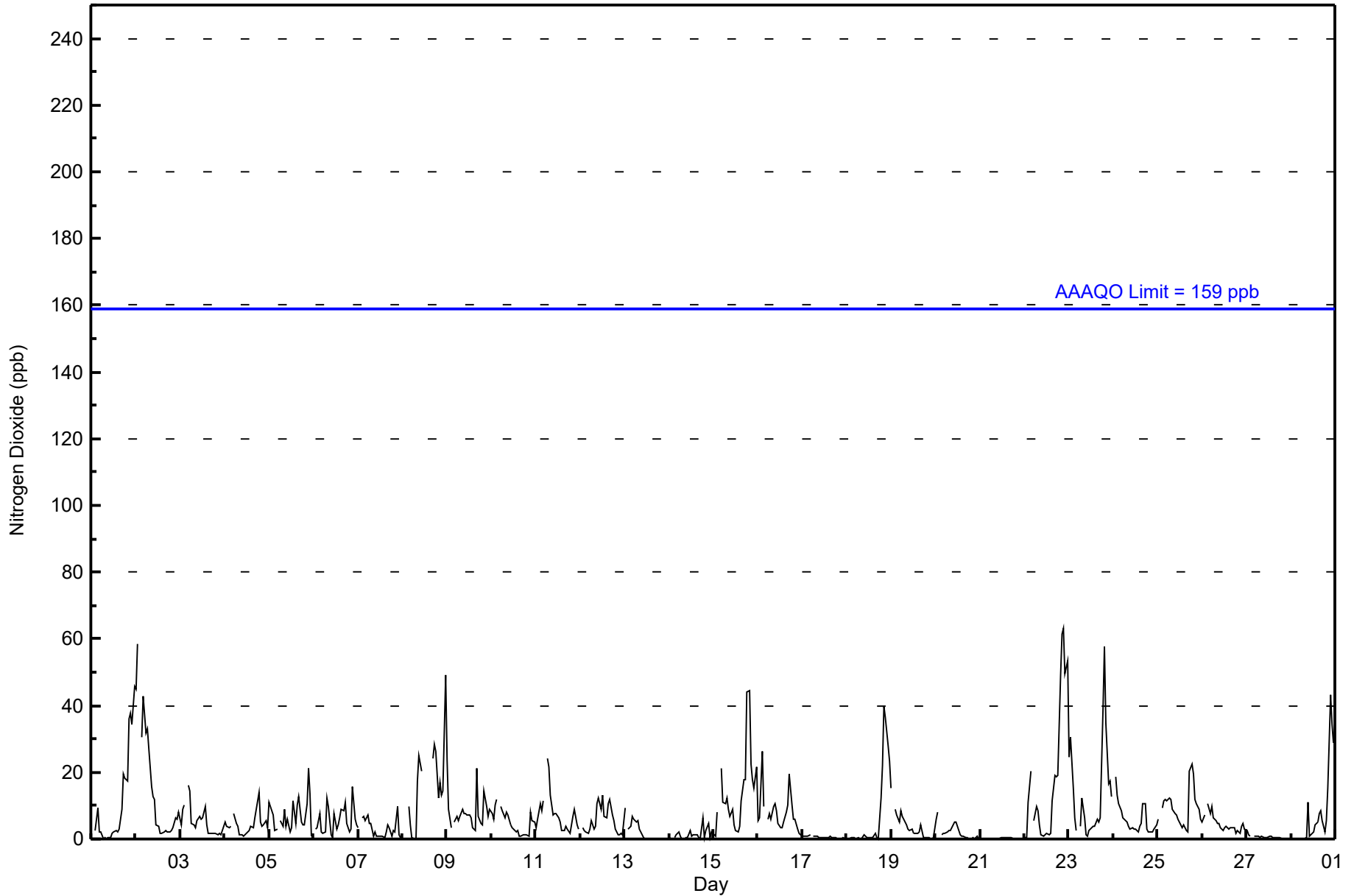
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Feb	0.7	Z	2.6	9.2	2.0	2.0	0.2	0.3	0.2	0.3	0.6	1.8	2.2	2.7	2.3	3.0	9.1	19.4	18.2	17.2	36.2	37.6	34.4	45.6	10.8	45.6
2-Feb	45.1	58.5	Z	30.7	42.6	31.9	33.0	27.3	15.8	12.6	11.9	4.3	3.8	1.9	1.5	2.3	2.4	2.2	2.2	2.5	3.6	6.2	6.0	7.9	15.5	58.5
3-Feb	4.4	8.7	10.0	Z	16.1	14.2	4.5	4.1	3.5	5.5	6.6	5.8	6.2	9.8	4.2	1.8	1.9	1.9	1.8	1.7	1.4	1.5	1.3	3.7	5.2	16.1
4-Feb	5.0	3.9	3.2	4.0	Z	7.8	4.6	3.8	1.2	1.1	0.8	1.1	2.0	2.5	3.7	3.6	6.4	8.9	13.9	5.0	3.9	4.3	5.4	3.5	4.3	13.9
5-Feb	10.9	8.4	7.4	2.7	2.9	Z	5.3	3.7	8.8	4.0	5.9	2.3	3.3	11.3	4.5	10.3	12.9	4.9	4.3	4.4	10.8	21.0	13.7	0.9	7.2	21.0
6-Feb	Z	3.1	3.3	7.5	2.3	1.8	2.3	12.1	9.7	1.2	0.6	7.8	3.0	4.2	6.4	9.1	8.5	10.9	4.6	2.2	2.8	15.5	5.9	4.3	5.6	15.5
7-Feb	3.2	Z	6.5	6.6	5.4	7.4	4.6	4.6	0.9	2.2	0.9	0.7	0.9	0.7	0.5	2.0	4.4	3.2	1.0	2.5	2.0	9.7	1.3	0.3	3.1	9.7
8-Feb	0.2	0.2	Z	9.8	4.1	0.3	0.2	0.2	17.4	25.0	20.4	C	C	C	C	C	24.0	28.2	26.2	12.4	16.8	13.1	14.3	49.3	14.6	49.3
9-Feb	23.9	8.7	3.2	Z	5.1	6.8	5.4	6.7	9.0	7.6	7.6	7.1	7.4	6.4	3.6	2.7	21.2	6.9	4.8	4.1	14.4	9.6	6.8	9.1	8.2	23.9
10-Feb	7.6	6.1	10.3	11.8	Z	9.9	8.6	6.3	7.9	7.2	4.3	3.4	3.0	2.1	2.6	1.0	1.0	1.1	1.1	1.2	1.0	7.9	5.6	4.9	5.0	11.8
11-Feb	3.3	6.0	10.6	8.3	11.5	Z	24.2	21.5	13.3	7.1	7.5	7.6	6.2	5.0	2.5	2.7	3.7	3.1	1.9	4.2	6.7	9.1	4.4	3.1	7.5	24.2
12-Feb	Z	3.4	2.5	2.2	1.7	2.9	5.5	2.8	4.0	10.4	12.3	9.1	13.2	6.7	6.2	10.5	11.8	7.0	5.3	3.0	1.3	1.4	1.7	1.4	5.5	13.2
13-Feb	9.2	Z	2.8	3.7	6.7	6.0	5.2	5.6	2.8	1.4	0.5	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	2.0	9.2
14-Feb	0.3	0.2	Z	0.6	1.3	2.0	1.0	0.2	0.2	0.4	0.5	2.5	0.8	1.1	1.1	1.2	0.6	0.2	6.5	0.3	2.5	4.7	0.4	2.1	1.3	6.5
15-Feb	1.3	1.0	7.9	Z	21.3	11.2	10.4	12.2	8.7	6.9	8.8	4.4	2.7	2.3	3.7	11.4	17.7	17.6	43.9	44.5	22.5	18.0	15.4	21.5	13.7	44.5
16-Feb	5.6	6.4	26.2	9.9	Z	6.1	7.6	6.0	9.7	10.7	8.4	4.8	3.5	3.5	5.0	8.1	10.1	19.5	10.1	6.1	5.8	2.9	1.8	1.3	7.8	26.2
17-Feb	1.0	1.0	0.8	0.9	1.2	Z	0.9	0.8	0.7	0.6	0.4	0.5	0.5	0.5	0.6	0.7	0.6	0.4	0.3	0.2	0.2	0.2	0.3	0.2	0.6	1.2
18-Feb	Z	0.2	0.4	0.4	0.6	0.2	0.4	0.2	0.2	1.2	0.9	0.5	0.4	0.3	0.4	1.6	0.6	0.2	12.3	22.1	39.7	36.6	27.9	23.2	7.4	39.7
19-Feb	15.4	Z	9.1	7.0	5.0	8.5	6.9	5.1	4.1	3.0	2.7	2.9	1.5	1.5	1.9	2.3	4.2	0.4	0.3	0.3	0.3	0.2	0.2	0.3	3.6	15.4
20-Feb	6.1	7.9	Z	1.1	1.6	1.5	2.2	2.7	2.4	4.4	4.9	5.0	2.4	1.2	1.0	1.0	0.6	0.3	0.2	0.2	0.3	0.2	0.8	0.2	2.1	7.9
21-Feb	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.5
22-Feb	0.4	0.6	11.1	20.3	Z	5.7	9.8	8.4	4.1	1.4	0.8	1.4	1.8	1.4	1.8	11.4	19.1	18.8	19.2	49.2	61.4	63.3	49.6	53.3	18.0	63.3
23-Feb	24.7	30.7	15.3	6.2	2.6	Z	3.7	12.3	6.4	1.1	1.0	2.5	3.3	4.0	3.8	6.1	5.1	6.3	38.8	57.8	34.9	16.6	17.4	12.8	13.6	57.8
24-Feb	Z	18.6	13.0	10.5	8.5	6.2	6.0	4.9	3.7	2.8	3.5	2.9	2.8	2.3	3.7	4.6	10.4	10.5	2.9	2.0	2.1	2.3	3.1	4.3	5.7	18.6
25-Feb	5.8	Z	9.4	11.3	12.0	11.6	12.2	11.7	9.1	7.5	7.1	6.0	4.2	3.3	4.2	2.4	2.0	20.3	22.5	19.3	12.0	10.4	8.9	6.1	9.5	22.5
26-Feb	5.1	7.4	Z	10.4	7.7	9.6	6.5	5.6	4.7	4.5	3.4	2.7	3.3	3.9	3.0	3.5	3.2	3.6	1.9	2.5	1.9	4.0	4.7	3.1	4.6	10.4
27-Feb	2.7	1.4	0.8	Z	0.7	0.7	0.9	0.4	0.9	0.3	0.3	0.5	0.8	0.8	0.5	0.6	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.6	2.7
28-Feb	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	11.2	0.7	1.8	2.2	4.3	4.9	7.5	8.5	5.5	2.3	5.5	15.3	43.1	34.3	28.7	7.7	43.1
	7.6	7.9	6.8	7.6	7.1	6.4	6.2	6.1	5.4	5.1	4.4	3.3	3.0	3.1	2.8	4.1	6.8	7.2	8.8	9.7	10.7	12.1	9.5	10.4		Diurnal Average
	45.1	58.5	26.2	30.7	42.6	31.9	33.0	27.3	17.4	25.0	20.4	9.1	13.2	11.3	6.4	11.4	24.0	28.2	43.9	57.8	61.4	63.3	49.6	53.3		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**  
**Firebag - February 2023**





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

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Firebag - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	593	92.80	92.80
21 - 40	32	5.01	97.81
41 - 80	14	2.19	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Firebag - February 2023**

<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	41	20	15	12	19	31	38	51	54	38	31	24	17	14	79	108	592
21 - 40	0	0	1	0	2	2	5	9	5	1	0	1	0	2	0	2	30
41 - 80	0	1	0	0	0	0	0	7	0	0	1	0	0	0	1	1	11
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	21	16	12	21	33	43	67	59	39	32	25	17	16	80	111	633

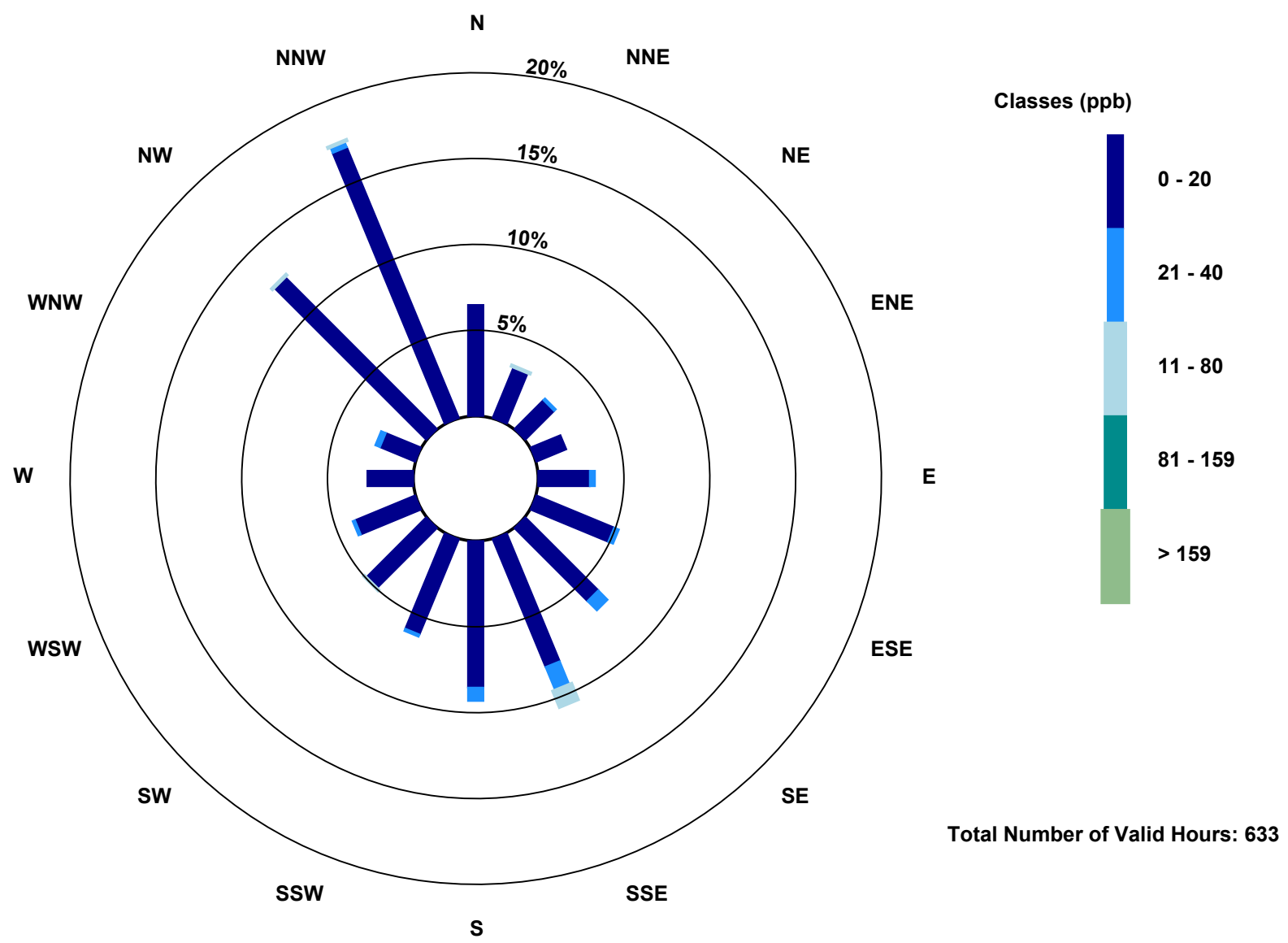
Total Number of Valid Hours: 633

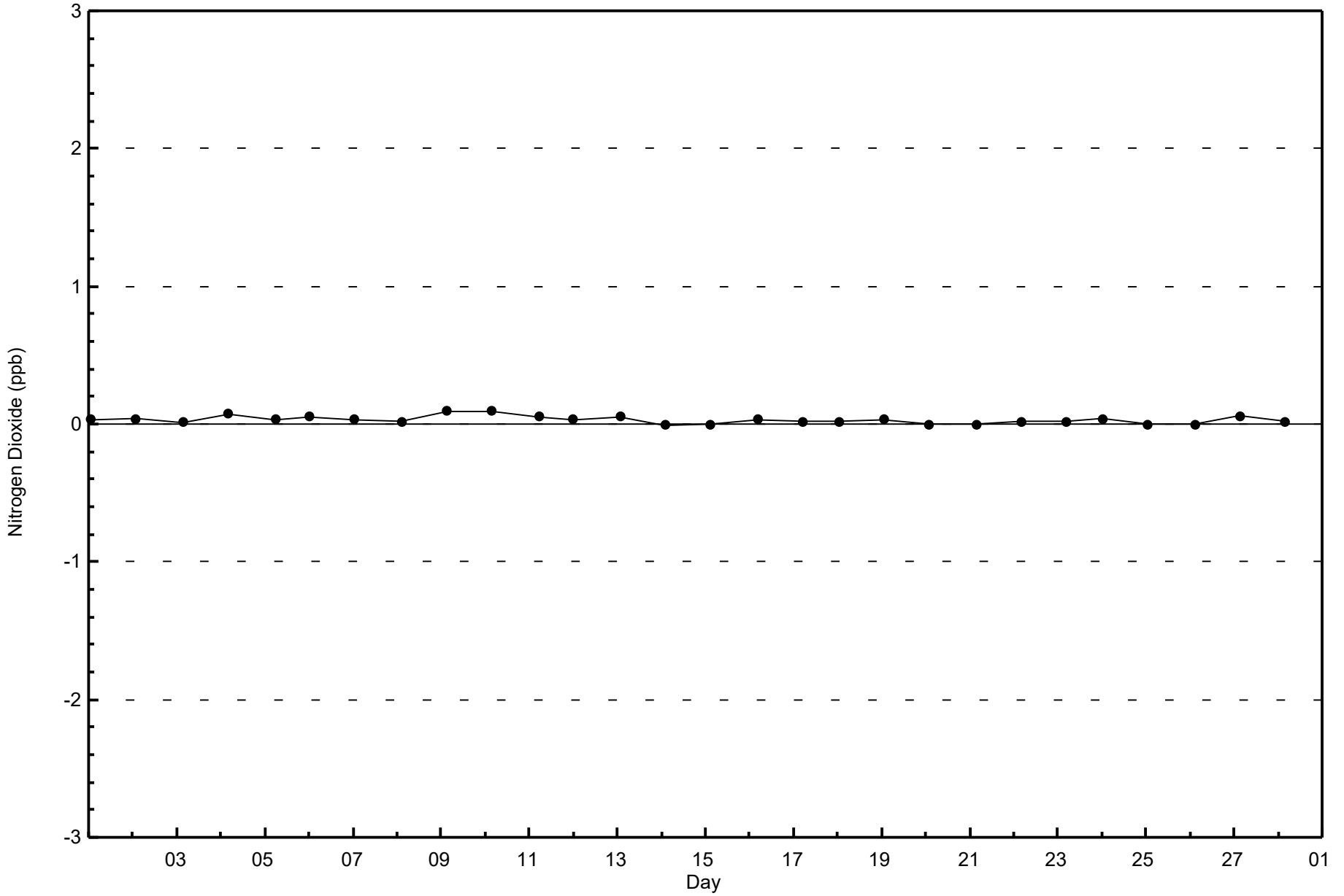
Total Number of Hours: 672



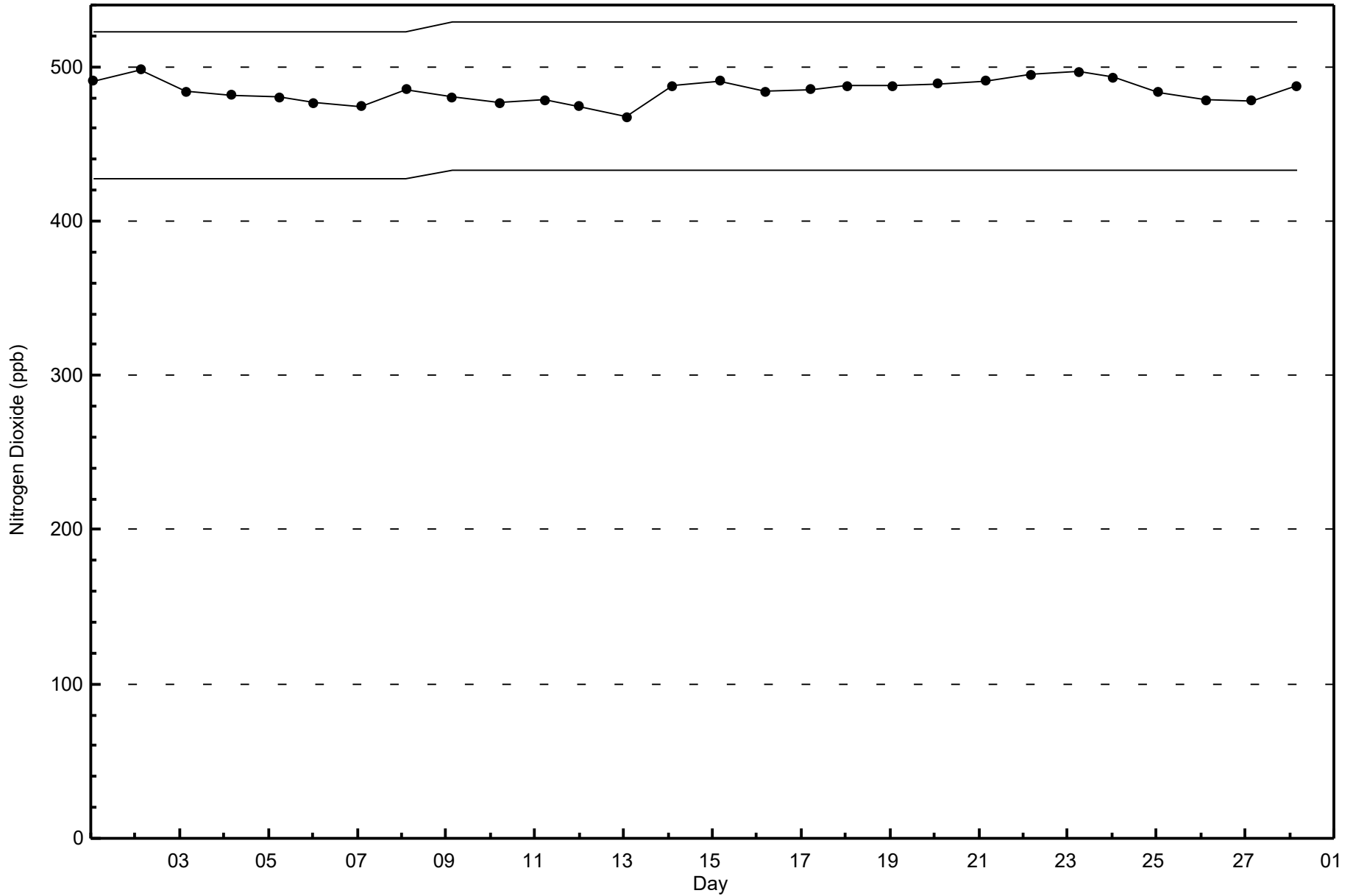
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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







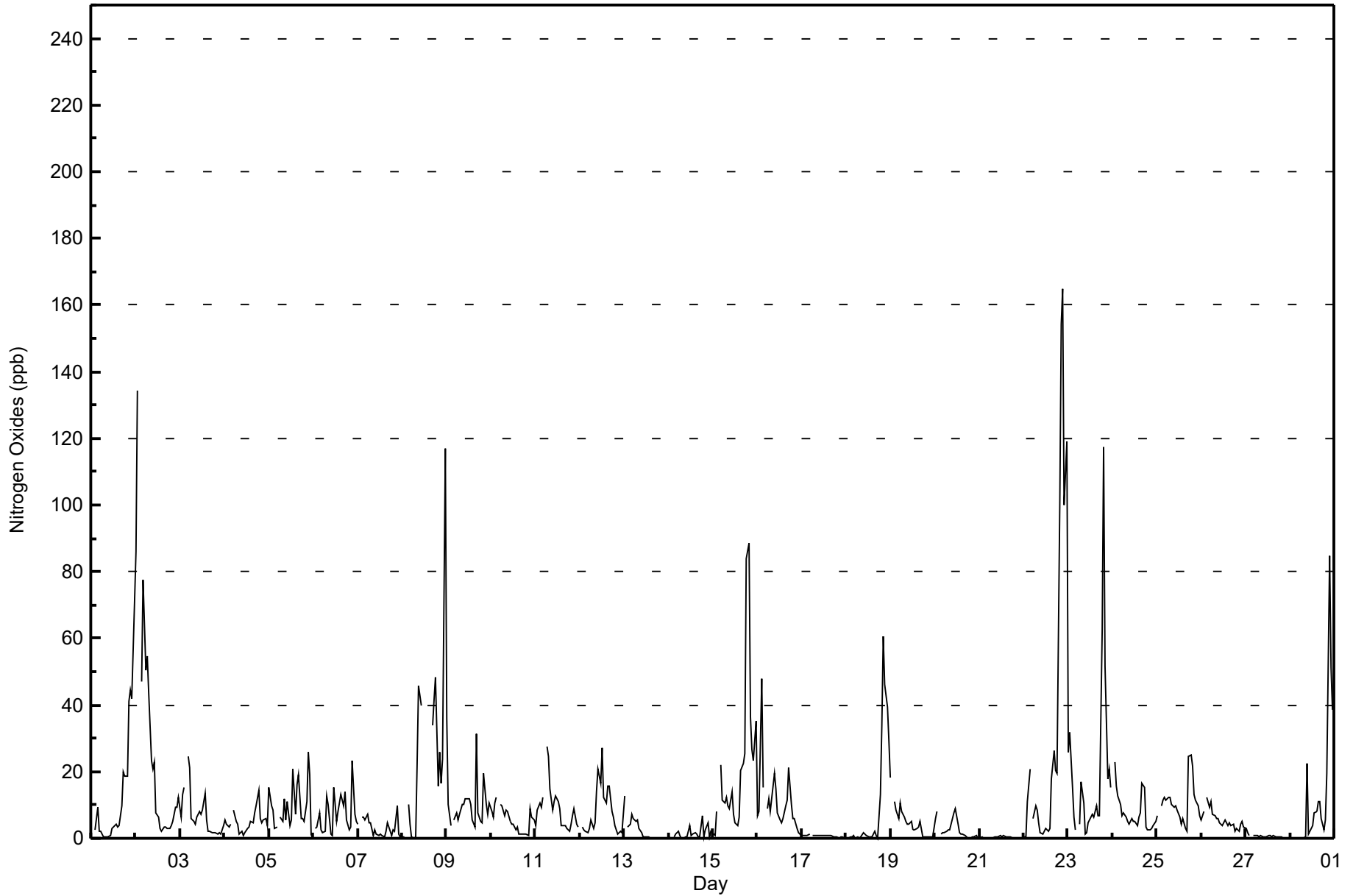




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Firebag - February 2023**

Maximum Value: 164.9 ppb on Feb 22 22:00																						Maximum Daily Average: 34.7 ppb on Feb 22																						Hours in Service: 672			
Minimum Value: 0.1 ppb on Feb 14 00:00																						Minimum Daily Average: 0.3 ppb on Feb 21																						Hours of Data: 639			
Maximum Diurnal Average: 19.1 ppb at hour 22																						Minimum Diurnal Average: 4.1 ppb at hour 15																						Hours of Missing Data: 33			
Monthly Average: 9.75 ppb																						Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 1.1 Median = 4.6 Q <sub>3</sub> = 10.1 P <sub>90</sub> = 21.5 P <sub>99</sub> = 100.8																						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-Feb	0.7	Z	2.6	9.2	2.0	2.0	0.2	0.3	0.2	0.3	0.8	2.8	3.5	4.2	3.3	3.7	9.9	19.8	18.5	18.5	40.9	44.5	41.8	71.2	13.1	71.2																					
2-Feb	85.9	134.3	Z	46.8	77.6	50.5	54.7	43.8	23.4	20.9	22.7	7.7	6.5	3.0	2.2	3.4	3.5	3.0	3.0	3.7	5.2	9.4	9.4	12.5	27.5	134.3																					
3-Feb	6.3	13.2	15.4	Z	24.8	21.4	5.7	5.1	4.2	6.3	7.9	7.2	8.4	13.8	5.4	2.1	2.0	1.9	1.8	1.7	1.4	1.6	1.4	3.8	7.1	24.8																					
4-Feb	5.4	4.2	3.6	4.4	Z	8.4	5.3	4.3	1.2	2.0	0.9	1.5	2.8	3.5	5.0	4.7	7.6	9.8	14.3	6.0	4.7	5.4	6.1	3.9	5.0	14.3																					
5-Feb	15.2	9.8	8.6	3.0	3.4	Z	6.5	5.0	12.0	5.4	11.2	3.8	5.3	20.9	7.1	15.9	19.2	5.8	5.9	5.1	10.9	26.0	19.1	0.9	9.8	26.0																					
6-Feb	Z	3.1	3.4	7.5	2.3	1.8	2.3	12.8	10.3	1.4	0.8	15.2	5.3	8.0	10.4	13.2	10.0	13.8	5.3	2.6	3.6	23.4	7.1	4.9	7.3	23.4																					
7-Feb	4.1	Z	6.5	6.6	5.4	7.4	4.6	4.6	1.0	2.6	1.1	0.9	1.1	0.9	0.6	2.2	4.7	3.2	1.0	2.5	2.0	9.8	1.3	0.3	3.2	9.8																					
8-Feb	0.2	0.2	Z	10.1	4.1	0.3	0.2	0.2	22.1	45.8	39.9	C	C	C	C	C	33.7	41.4	48.2	15.5	25.8	16.6	23.7	116.8	24.7	116.8																					
9-Feb	36.2	10.3	3.7	Z	5.5	7.8	5.5	7.0	10.1	10.1	12.0	11.9	11.8	10.1	5.3	3.4	31.5	7.6	5.1	4.5	19.4	10.3	7.4	10.4	10.7	36.2																					
10-Feb	7.9	6.2	10.5	12.2	Z	10.3	9.7	6.9	8.4	8.2	5.2	4.3	4.0	2.6	3.5	1.3	1.1	1.1	1.1	1.3	1.0	8.9	6.2	5.5	5.5	12.2																					
11-Feb	3.6	8.5	10.8	9.3	12.4	Z	27.5	24.5	15.0	8.6	11.1	12.6	11.2	9.0	4.0	4.0	3.9	3.1	1.9	4.3	6.8	9.1	4.4	3.2	9.1	27.5																					
12-Feb	Z	3.4	2.5	2.2	1.7	2.9	5.6	2.8	4.6	14.2	21.0	16.3	27.1	12.2	10.6	15.6	15.8	7.9	6.2	3.7	1.5	1.6	2.0	1.6	8.0	27.1																					
13-Feb	12.9	Z	3.3	4.0	7.0	6.0	5.2	5.6	2.9	1.5	0.6	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	2.2	12.9																					
14-Feb	0.3	0.2	Z	0.6	1.3	2.0	1.0	0.2	0.2	0.5	0.6	3.6	1.0	1.5	1.5	1.4	0.6	0.2	6.6	0.3	2.5	4.7	0.4	2.1	1.4	6.6																					
15-Feb	1.3	1.0	7.9	Z	21.9	11.2	10.4	12.3	9.6	9.0	13.9	7.3	4.7	4.0	6.2	20.3	22.6	25.6	84.0	88.8	36.4	26.9	23.4	35.3	21.0	88.8																					
16-Feb	6.8	7.8	47.7	15.0	Z	8.9	11.9	8.1	15.8	19.4	14.6	7.5	5.4	4.7	6.1	9.8	11.6	21.1	10.1	6.1	5.8	2.9	1.8	1.3	10.9	47.7																					
17-Feb	1.0	1.0	0.8	0.9	1.2	Z	0.9	0.8	0.8	0.7	0.6	0.7	0.8	0.8	0.8	0.9	0.7	0.4	0.3	0.2	0.2	0.2	0.4	0.2	0.7	1.2																					
18-Feb	Z	0.2	0.5	0.5	0.8	0.2	0.4	0.2	0.2	1.7	1.4	0.8	0.5	0.3	0.5	2.3	0.7	0.2	13.3	33.7	60.6	46.2	39.4	29.1	10.2	60.6																					
19-Feb	18.1	Z	10.9	8.3	6.0	10.6	8.2	6.5	5.3	4.3	4.3	5.3	2.7	2.6	3.1	3.4	5.2	0.4	0.3	0.3	0.3	0.2	0.2	0.3	4.6	18.1																					
20-Feb	6.1	7.9	Z	1.1	1.6	1.5	2.2	2.7	2.7	5.9	7.7	8.8	4.0	1.7	1.2	1.2	0.7	0.3	0.2	0.2	0.3	0.2	0.8	0.2	2.6	8.8																					
21-Feb	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.7	0.6	0.7	0.6	0.4	0.5	0.5	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.7																					
22-Feb	0.4	0.6	11.1	20.6	Z	5.7	9.8	8.6	4.8	1.8	1.2	2.2	3.0	2.2	2.8	17.7	26.1	20.4	19.4	101.4	154.4	164.9	99.9	118.9	34.7	164.9																					
23-Feb	25.8	31.7	15.4	6.2	2.6	Z	4.0	17.0	10.8	1.5	1.6	4.6	6.2	7.4	6.5	9.7	6.6	6.7	62.8	117.6	51.8	17.9	20.8	15.4	19.6	117.6																					
24-Feb	Z	22.8	15.8	12.9	10.1	6.9	7.6	6.3	5.1	4.2	5.8	5.0	4.9	3.7	6.2	7.5	16.5	15.2	3.5	2.7	2.6	2.8	4.0	5.2	7.7	22.8																					
25-Feb	6.8	Z	9.9	11.5	12.2	11.6	12.3	12.1	10.2	9.3	9.7	8.6	6.3	4.4	6.0	3.1	2.3	24.7	24.9	21.8	13.2	11.3	9.9	6.9	10.8	24.9																					
26-Feb	5.6	8.1	Z	12.2	9.2	10.9	7.4	6.7	6.0	6.0	4.6	3.7	4.5	5.5	4.0	4.8	4.0	4.0	2.1	2.8	2.2	4.4	5.2	3.5	5.5	12.2																					
27-Feb	2.9	1.5	0.8	Z	0.7	0.7	0.9	0.4	1.0	0.4	0.4	0.6	1.0	0.9	0.6	0.7	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.7	2.9																					
28-Feb	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.4	22.4	1.1	3.1	3.8	7.8	7.9	11.1	11.0	5.9	2.3	5.5	19.5	84.8	51.1	38.7	12.1	84.8																					
																						10.6	12.0	8.3	8.9	9.3	7.9	7.5	7.3	6.7	7.7	7.2	5.5	5.1	5.1	4.1	6.1	9.0	8.7	12.2	16.1	16.9	19.1	13.8	17.6	Diurnal Average	
																						85.9	134.3	47.7	46.8	77.6	50.5	54.7	43.8	23.4	45.8	39.9	16.3	27.1	20.9	10.6	20.3	33.7	41.4	84.0	117.6	154.4	164.9	99.9	118.9	Diurnal Maximum	
Z - zerospan      C - Calibration																																															





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Firebag - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	568	88.89	88.89
21 - 40	41	6.42	95.31
41 - 80	18	2.82	98.12
81 - 159	11	1.72	99.84
> 159	1	0.16	100.00

Total Number of Valid Hours: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Firebag - February 2023**

<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	41	20	14	11	19	29	34	47	46	37	31	23	17	14	77	107	567
21 - 40	0	0	2	1	1	2	8	8	9	2	0	2	0	1	2	3	41
41 - 80	0	0	0	0	1	2	1	6	4	0	0	0	0	1	0	0	15
81 - 159	0	1	0	0	0	0	0	6	0	0	1	0	0	0	1	1	10
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	41	21	16	12	21	33	43	67	59	39	32	25	17	16	80	111	633

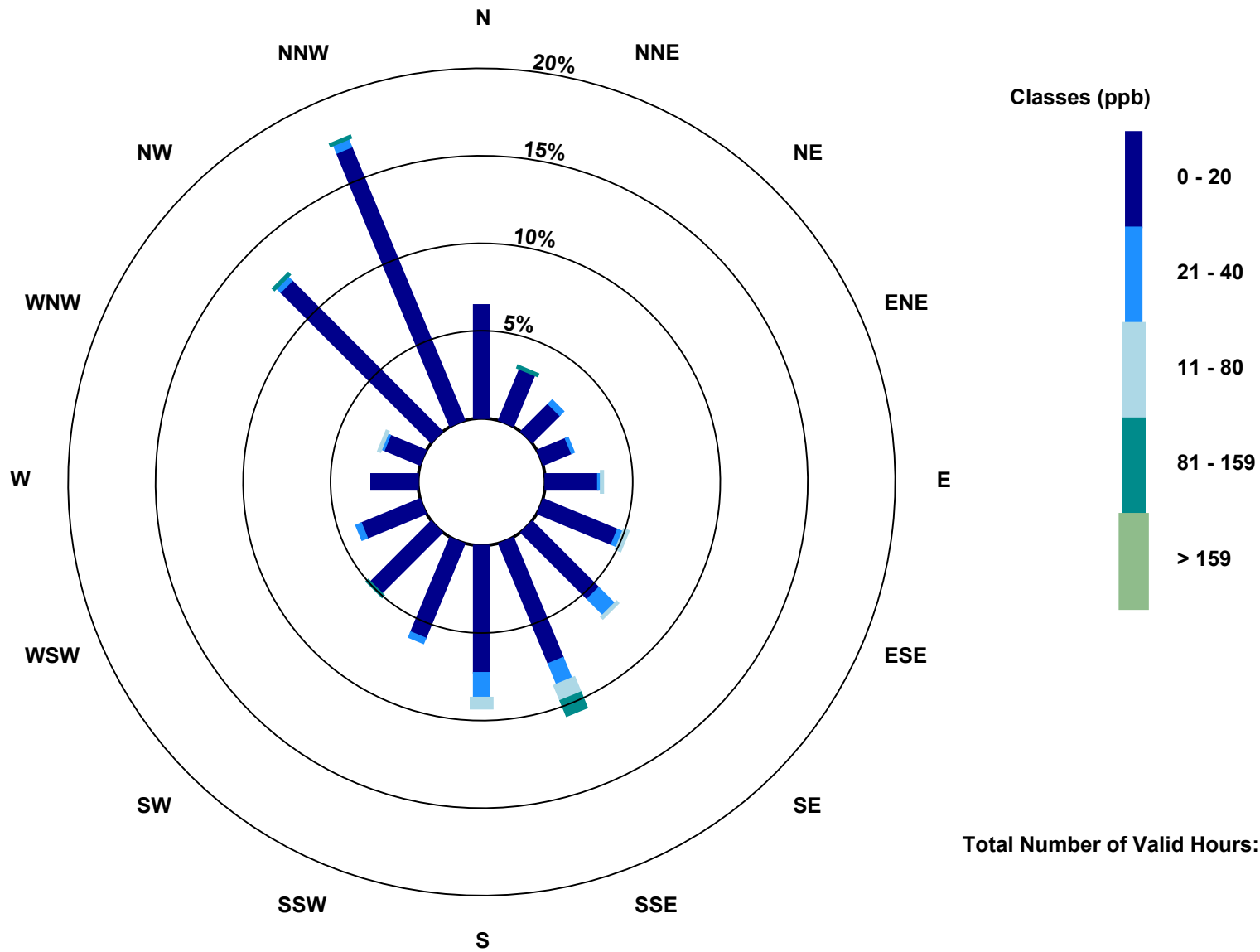
Total Number of Valid Hours: 633

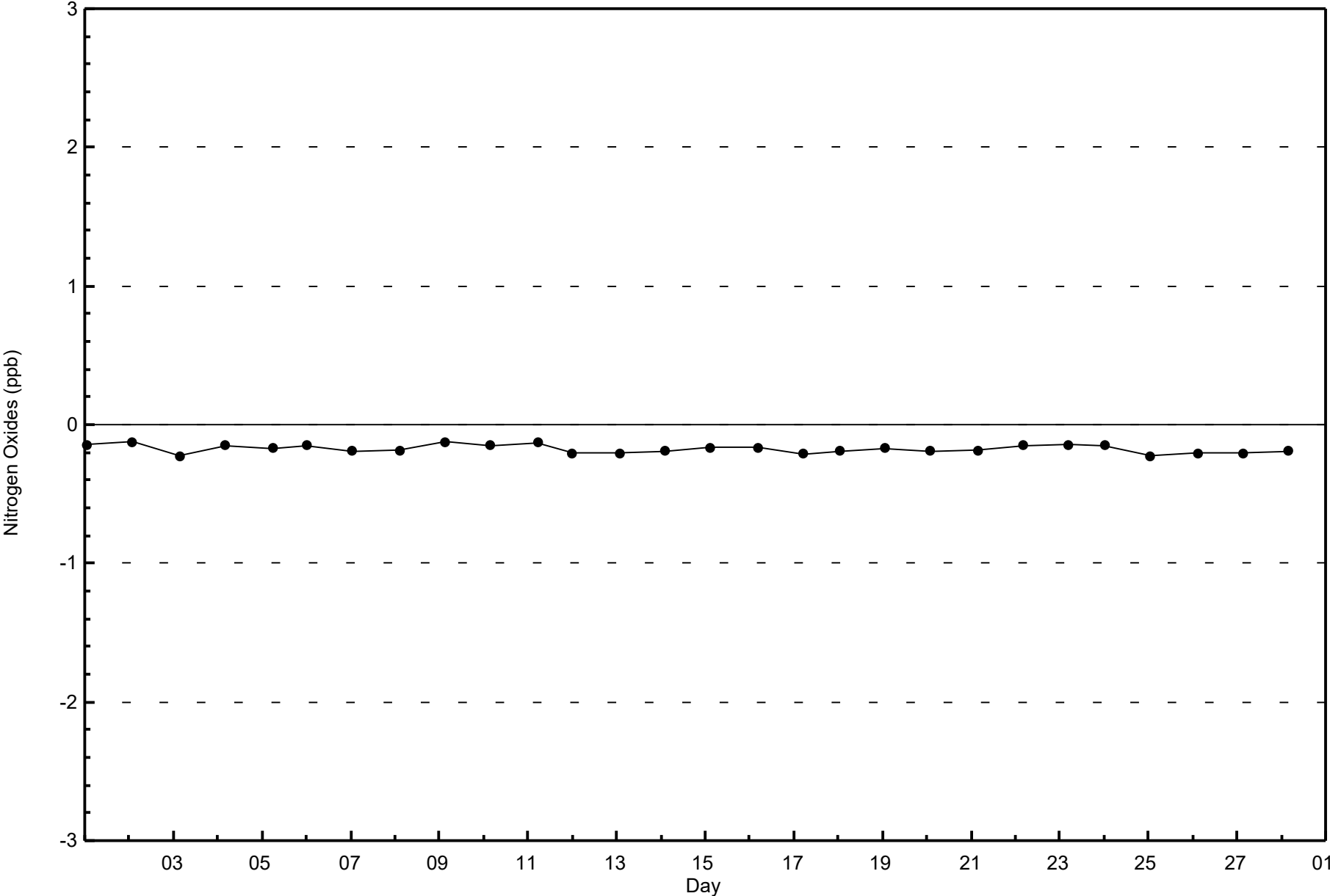
Total Number of Hours: 672

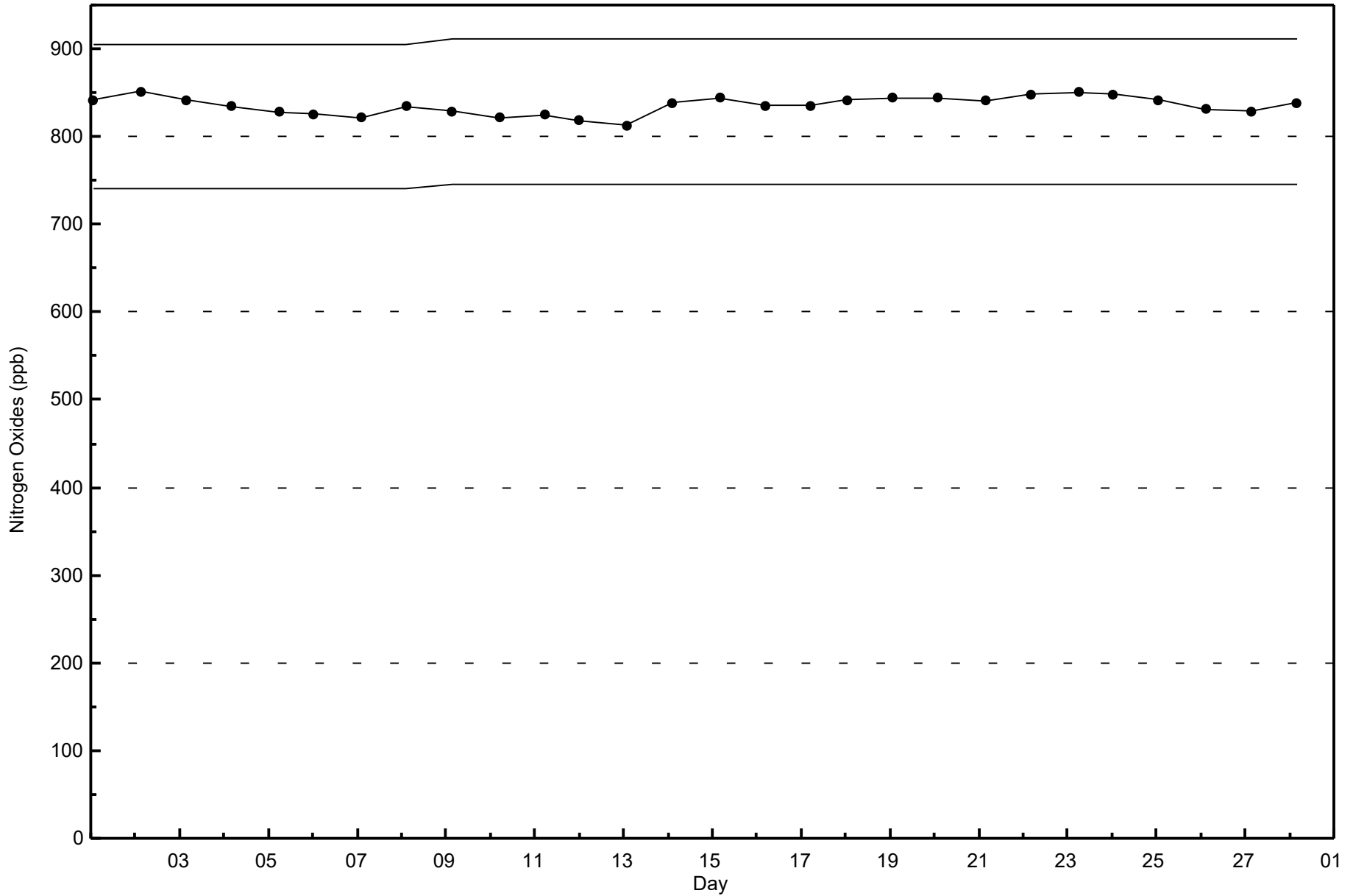


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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











**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Ambient Temperature (AT) - C**

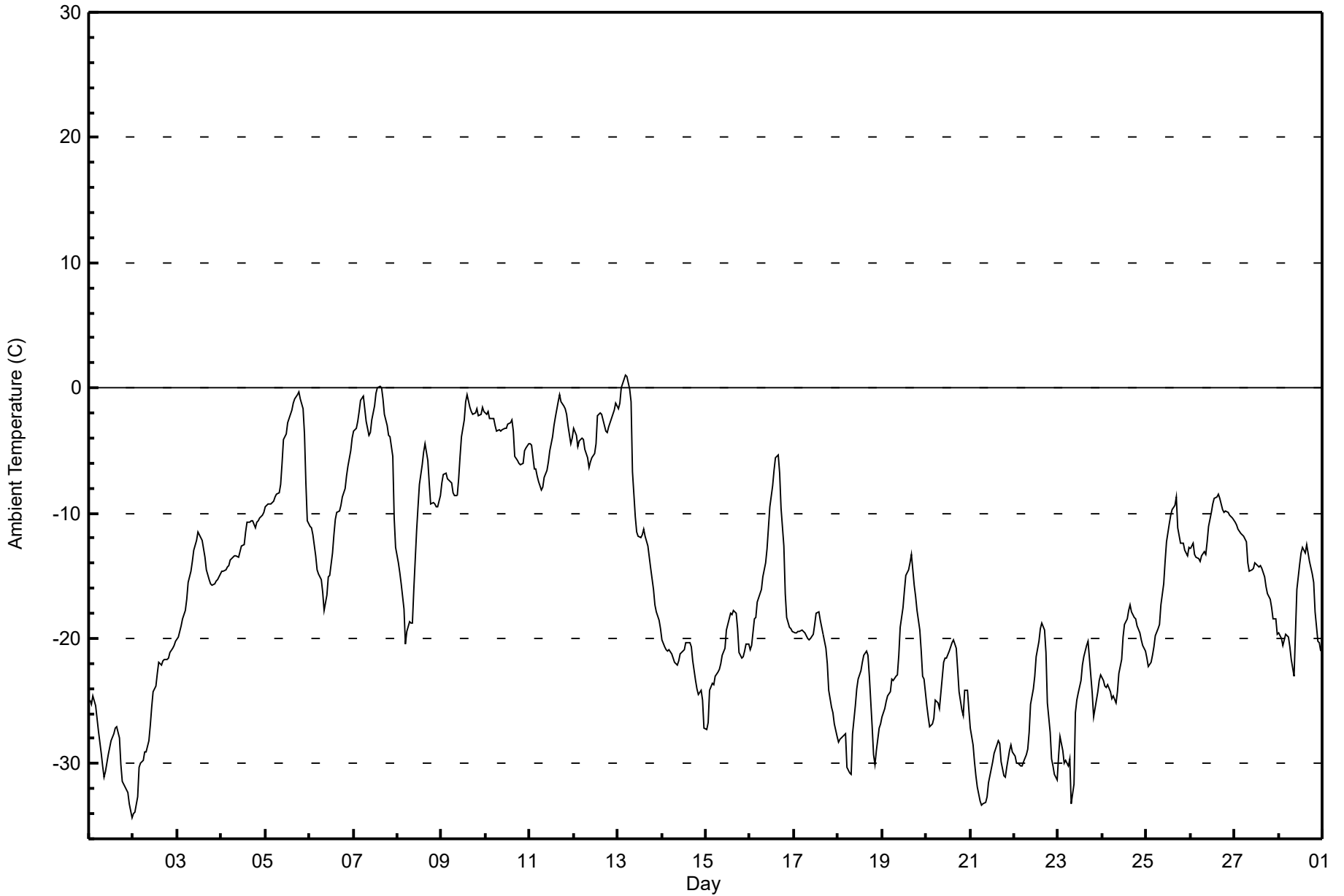
**Firebag - February 2023**

Maximum Value: 1.1 C on Feb 13 05:00      Maximum Daily Average: -3.0 C on Feb 7																						Hours in Service:	672																								
Minimum Value: -34.3 C on Feb 2 00:00      Minimum Daily Average: -30.3 C on Feb 21																						Hours of Data:	672																								
Maximum Diurnal Average: -12.7 C at hour 16      Minimum Diurnal Average: -18.1 C at hour 8																						Hours of Missing Data:	0																								
Monthly Average: -16.07 C      Percentiles: P <sub>1</sub> = -33.1 P <sub>10</sub> = -28.5 Q <sub>1</sub> = -22.9 Median = -16.6 Q <sub>3</sub> = -9.0 P <sub>90</sub> = -3.0 P <sub>99</sub> = -0.1																						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-Feb	-25.0	-25.3	-24.6	-25.3	-26.4	-27.4	-29.2	-30.2	-31.0	-30.6	-29.2	-28.7	-28.2	-27.6	-27.2	-27.1	-27.9	-30.1	-31.4	-31.9	-32.0	-32.3	-33.2	-34.3	-29.0	-24.6																					
2-Feb	-34.0	-33.8	-32.6	-30.3	-30.0	-29.7	-29.1	-29.1	-28.2	-27.0	-25.5	-24.3	-23.8	-22.8	-22.0	-22.1	-21.8	-21.7	-21.7	-21.6	-21.2	-20.8	-20.6	-20.2	-25.6	-20.2																					
3-Feb	-19.9	-19.5	-19.1	-18.4	-17.8	-16.8	-15.5	-14.6	-13.8	-12.9	-12.1	-11.5	-11.7	-12.1	-12.8	-13.5	-14.5	-15.3	-15.6	-15.8	-15.6	-15.4	-15.3	-14.9	-15.2	-11.5																					
4-Feb	-14.7	-14.6	-14.5	-14.3	-14.2	-13.7	-13.6	-13.4	-13.4	-13.5	-13.1	-12.6	-11.5	-10.7	-10.8	-10.6	-10.6	-11.1	-10.7	-10.6	-10.4	-10.2	-9.9	-12.3	-9.9																						
5-Feb	-9.4	-9.3	-9.2	-9.2	-9.1	-8.7	-8.5	-8.4	-7.7	-6.0	-4.1	-3.7	-2.8	-2.4	-1.8	-1.2	-0.9	-0.6	-0.3	-0.8	-1.7	-3.7	-7.5	-10.6	-5.3	-0.3																					
6-Feb	-11.0	-11.2	-11.7	-13.4	-14.5	-14.9	-15.3	-16.3	-17.8	-16.6	-15.0	-15.0	-13.2	-11.7	-10.5	-10.0	-9.8	-9.4	-8.7	-8.0	-7.0	-6.2	-5.0	-4.0	-11.5	-4.0																					
7-Feb	-3.5	-3.2	-2.7	-1.9	-1.0	-0.7	-1.7	-2.7	-3.8	-3.6	-2.6	-1.5	-0.5	0.1	0.2	0.0	-0.9	-2.1	-3.0	-3.7	-3.9	-5.4	-10.4	-12.7	-3.0	0.2																					
8-Feb	-14.0	-14.8	-15.7	-17.7	-20.5	-19.4	-18.6	-18.8	-18.8	-16.1	-11.4	-9.4	-7.7	-6.1	-5.2	-4.5	-5.8	-7.6	-9.2	-9.2	-9.3	-9.4	-9.5	-8.5	-12.0	-4.5																					
9-Feb	-7.6	-6.9	-6.8	-7.3	-7.4	-7.6	-8.4	-8.6	-8.6	-7.3	-5.5	-3.9	-2.6	-1.1	-0.6	-1.5	-1.9	-2.2	-2.0	-1.7	-2.2	-2.1	-1.5	-1.9	-4.5	-0.6																					
10-Feb	-2.1	-1.8	-2.4	-2.4	-2.5	-3.0	-3.4	-3.4	-3.4	-3.3	-3.2	-3.2	-2.9	-2.8	-2.6	-3.5	-5.5	-5.8	-6.0	-6.1	-6.0	-5.0	-4.8	-4.4	-3.7	-1.8																					
11-Feb	-4.4	-4.6	-6.4	-6.5	-7.0	-7.5	-8.1	-8.0	-7.2	-6.6	-5.9	-5.0	-3.9	-3.0	-2.3	-1.1	-0.6	-1.1	-1.5	-1.7	-2.1	-3.0	-4.4	-4.1	-4.4	-0.6																					
12-Feb	-3.3	-3.8	-4.7	-4.2	-4.0	-4.1	-4.9	-5.5	-6.3	-5.9	-5.6	-5.3	-4.5	-2.2	-2.0	-2.2	-2.5	-3.4	-3.6	-3.1	-2.4	-2.1	-1.8	-1.2	-3.7	-1.2																					
13-Feb	-1.6	-1.2	0.0	0.7	1.1	0.9	-0.1	-1.2	-6.7	-10.3	-11.5	-11.8	-12.0	-11.7	-11.2	-11.9	-12.6	-13.6	-14.4	-16.0	-17.3	-17.9	-18.6	-19.2	-9.1	1.1																					
14-Feb	-20.1	-20.7	-20.9	-21.0	-20.8	-21.2	-21.6	-21.9	-22.1	-21.8	-21.3	-21.0	-20.9	-20.4	-20.4	-20.4	-20.7	-21.8	-23.3	-24.1	-24.4	-24.2	-25.0	-27.1	-22.0	-20.1																					
15-Feb	-27.3	-26.8	-24.2	-23.6	-23.7	-23.0	-22.7	-22.5	-22.1	-21.4	-20.8	-19.4	-18.9	-18.0	-18.1	-17.8	-18.0	-19.2	-21.2	-21.6	-21.4	-21.0	-20.5	-20.4	-21.4	-17.8																					
16-Feb	-20.9	-20.6	-18.5	-18.4	-17.1	-16.4	-16.0	-15.1	-14.0	-12.9	-11.1	-9.5	-7.8	-6.6	-5.6	-5.4	-6.8	-9.6	-12.7	-16.5	-18.4	-19.1	-19.2	-19.4	-14.1	-5.4																					
17-Feb	-19.5	-19.5	-19.5	-19.4	-19.3	-19.4	-19.6	-20.0	-20.1	-20.0	-19.6	-18.9	-18.0	-17.8	-18.5	-19.1	-19.7	-20.8	-22.0	-24.1	-25.5	-25.9	-26.8	-27.9	-20.9	-17.8																					
18-Feb	-28.3	-28.0	-27.9	-27.7	-27.7	-30.3	-30.8	-30.8	-27.6	-25.3	-24.1	-23.2	-22.5	-21.9	-21.3	-21.0	-21.4	-23.0	-27.0	-29.2	-30.0	-29.0	-27.2	-26.8	-26.3	-21.0																					
19-Feb	-26.3	-25.6	-25.1	-24.6	-24.3	-23.3	-23.3	-23.1	-22.9	-21.3	-19.2	-17.6	-16.1	-14.9	-14.5	-14.0	-13.2	-15.8	-16.7	-17.7	-19.3	-21.0	-23.1	-23.3	-20.2	-13.2																					
20-Feb	-25.4	-26.2	-27.0	-26.9	-26.3	-24.9	-25.1	-25.6	-24.4	-21.9	-21.5	-21.6	-21.0	-20.6	-20.4	-20.1	-20.8	-22.4	-24.3	-25.7	-26.2	-24.2	-24.1	-25.7	-23.9	-20.1																					
21-Feb	-27.2	-28.5	-29.8	-30.9	-31.9	-32.9	-33.3	-33.2	-33.0	-32.6	-31.5	-30.4	-29.8	-29.2	-28.5	-28.1	-28.4	-29.8	-30.9	-31.1	-30.2	-29.0	-28.5	-29.1	-30.3	-27.2																					
22-Feb	-29.4	-29.9	-30.0	-30.2	-30.1	-29.8	-29.3	-28.8	-27.5	-25.2	-24.0	-23.0	-21.5	-20.2	-19.2	-18.8	-19.3	-21.1	-25.1	-27.5	-29.6	-30.2	-30.8	-31.3	-26.3	-18.8																					
23-Feb	-29.4	-27.8	-29.0	-30.0	-29.8	-30.1	-29.7	-33.2	-31.6	-25.9	-25.0	-24.4	-23.3	-22.2	-21.5	-20.6	-20.2	-21.6	-24.3	-26.3	-25.6	-24.3	-23.3	-22.9	-25.9	-20.2																					
24-Feb	-23.4	-23.8	-23.9	-23.7	-24.2	-24.8	-24.6	-25.1	-24.2	-22.8	-21.7	-19.9	-18.9	-18.4	-17.8	-17.4	-17.8	-18.3	-18.5	-19.0	-19.6	-20.1	-20.6	-21.0	-21.2	-17.4																					
25-Feb	-21.6	-22.2	-22.0	-21.3	-20.7	-19.8	-19.3	-18.9	-17.4	-15.7	-13.8	-12.3	-10.9	-10.2	-9.7	-9.3	-8.7	-11.2	-12.4	-12.4	-12.4	-12.9	-13.3	-12.7	-15.0	-8.7																					
26-Feb	-12.8	-12.4	-13.3	-13.5	-13.7	-13.9	-13.4	-13.1	-13.2	-12.3	-11.0	-9.9	-9.2	-8.9	-8.7	-8.5	-8.8	-9.7	-10.0	-9.8	-10.0	-10.1	-10.3	-10.4	-11.1	-8.5																					
27-Feb	-10.7	-11.0	-11.3	-11.6	-11.7	-11.8	-12.3	-13.9	-14.7	-14.6	-14.4	-14.0	-14.2	-14.2	-14.2	-14.4	-15.0	-15.8	-16.4	-16.9	-17.6	-18.5	-18.5	-19.6	-14.5	-10.7																					
28-Feb	-19.6	-20.0	-20.5	-20.1	-19.7	-19.9	-20.6	-21.6	-23.0	-19.6	-16.1	-14.1	-13.2	-12.7	-13.1	-12.5	-13.2	-13.9	-14.9	-15.5	-17.8	-20.2	-20.3	-21.0	-17.6	-12.5																					
																						-17.6	-17.6	-17.6	-17.6	-17.6	-17.7	-17.8	-18.1	-18.0	-16.9	-15.7	-14.8	-14.0	-13.3	-12.9	-12.7	-13.1	-14.2	-15.3	-16.0	-16.4	-16.6	-16.9	-17.3	Diurnal Average	
																						-1.6	-1.2	0.0	0.7	1.1	0.9	-0.1	-1.2	-3.4	-3.3	-2.6	-1.5	-0.5	0.1	0.2	0.0	-0.6	-0.6	-0.3	-0.8	-1.7	-2.1	-1.5	-1.2	Diurnal Maximum	



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

**Ambient Temperature (AT) - C**  
**Firebag - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Firebag - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	258	38.39	38.39
-20 - 0	408	60.71	99.11
0 - 10	6	0.89	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Relative Humidity (RH) - %**

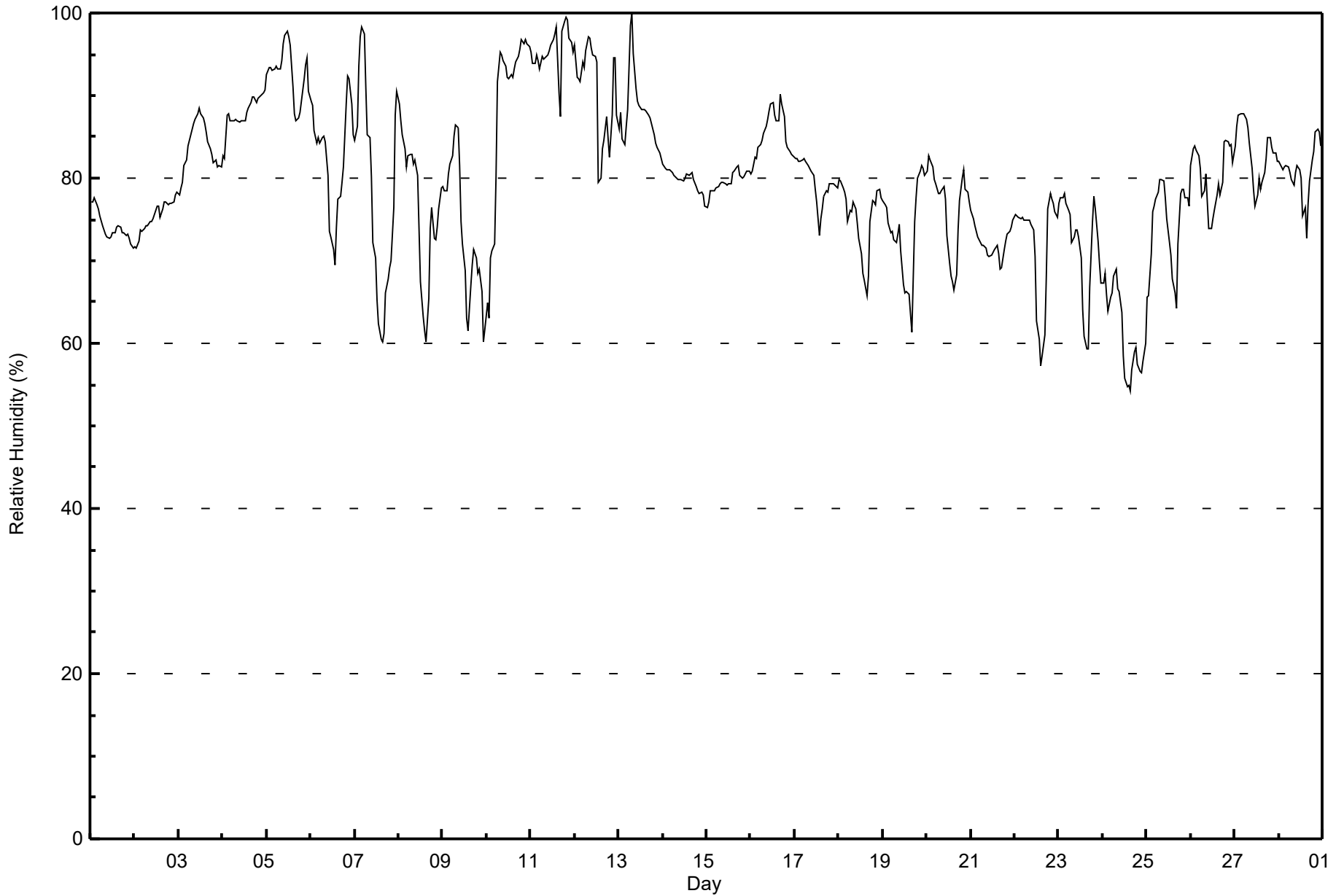
**Firebag - February 2023**

Maximum Value: 100.0 % on Feb 13 08:00      Maximum Daily Average: 95.4 % on Feb 11																						Hours in Service:	672																							
Minimum Value: 54.3 % on Feb 24 16:00      Minimum Daily Average: 61.4 % on Feb 24																						Hours of Data:	672																							
Maximum Diurnal Average: 82.4 % at hour 8      Minimum Diurnal Average: 74.8 % at hour 16																						Hours of Missing Data:	0																							
Monthly Average: 79.72 %      Percentiles: P <sub>1</sub> = 57.2 P <sub>10</sub> = 68.0 Q <sub>1</sub> = 74.1 Median = 79.6 Q <sub>3</sub> = 85.8 P <sub>90</sub> = 93.1 P <sub>99</sub> = 98.0																						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-Feb	77.1	77.1	77.7	76.8	76.2	75.5	74.2	73.8	73.1	72.9	72.7	73.0	73.3	73.4	74.1	74.2	74.1	73.4	73.3	73.1	73.1	72.8	72.1	71.6	74.1	77.7																				
2-Feb	71.7	71.6	72.5	73.8	73.6	73.9	74.2	74.2	74.7	74.7	75.2	75.7	76.7	76.6	75.3	76.3	77.1	77.2	76.9	77.0	76.9	77.1	77.9	78.4	75.4	78.4																				
3-Feb	78.0	78.9	79.4	81.5	82.2	83.8	84.6	86.0	86.6	87.1	87.8	88.5	87.8	87.4	86.6	85.5	84.5	83.5	82.9	81.9	82.2	81.3	81.6	81.4	83.8	88.5																				
4-Feb	82.7	82.4	87.6	87.8	86.9	86.9	87.0	87.1	86.9	86.8	87.0	87.0	88.0	88.5	89.2	89.9	89.9	89.2	89.7	89.8	90.0	90.3	90.6	90.6	87.8	90.6																				
5-Feb	92.5	93.4	93.4	93.0	93.3	93.6	93.3	93.3	94.3	96.3	97.4	97.9	97.1	96.0	91.0	87.8	87.0	87.3	88.0	89.4	92.1	93.7	94.5	90.4	92.7	97.9																				
6-Feb	89.3	88.8	85.8	84.2	85.0	84.3	84.9	85.0	84.4	80.4	73.6	72.9	71.4	69.6	74.1	77.5	77.8	79.5	81.4	89.0	92.3	92.0	89.0	85.3	82.4	92.3																				
7-Feb	84.5	86.3	93.5	97.1	98.3	97.4	90.9	85.3	85.0	80.2	72.2	70.4	65.2	62.3	60.6	60.1	61.2	66.2	67.9	69.1	70.0	76.5	87.7	90.5	78.3	98.3																				
8-Feb	88.9	86.9	85.3	83.6	81.4	82.7	82.9	82.9	81.7	82.3	80.4	73.9	67.4	63.2	61.5	60.2	65.4	73.9	76.4	72.7	72.6	74.1	76.3	78.8	76.5	88.9																				
9-Feb	78.9	78.6	78.5	80.6	81.7	82.7	85.1	86.5	86.2	81.5	74.8	72.1	68.9	63.0	61.6	66.9	69.5	71.4	70.3	68.5	68.9	66.2	60.2	61.7	73.5	86.5																				
10-Feb	64.9	63.0	70.4	71.1	72.0	80.1	91.7	95.3	95.0	94.2	93.5	92.2	92.0	92.5	92.2	93.2	94.0	94.8	95.6	96.8	96.2	96.8	96.3	95.9	88.3	96.8																				
11-Feb	95.3	93.9	93.9	94.9	94.3	93.2	94.7	94.5	94.7	95.0	95.4	96.1	96.7	97.4	98.3	90.4	87.5	97.7	99.0	99.5	99.2	97.0	96.5	95.2	95.4	99.5																				
12-Feb	96.1	92.3	92.0	91.8	94.0	93.4	95.4	97.1	97.0	95.7	94.9	94.7	94.0	79.6	80.0	83.6	84.6	87.5	85.0	82.5	87.7	94.6	94.6	87.6	90.7	97.1																				
13-Feb	85.9	88.0	84.7	84.1	86.2	88.3	98.6	100.0	95.2	90.9	89.3	88.8	88.4	88.3	88.3	88.2	87.6	87.3	86.7	85.3	84.2	83.7	83.0	82.4	88.1	100.0																				
14-Feb	81.7	81.2	81.0	81.0	81.0	80.7	80.3	80.1	79.9	79.8	79.8	79.7	80.0	80.4	80.4	80.5	80.7	79.9	78.9	78.4	78.2	78.4	78.0	76.5	79.9	81.7																				
15-Feb	76.4	77.1	78.5	78.5	78.4	78.9	79.1	79.2	79.5	79.6	79.4	79.1	79.3	79.4	80.7	80.8	81.3	81.5	80.3	80.1	80.2	80.5	80.9	80.8	79.6	81.5																				
16-Feb	80.5	80.8	82.5	82.4	83.7	84.1	84.6	85.4	86.3	87.1	88.1	89.0	89.1	87.6	87.0	87.0	90.2	88.9	87.4	84.4	83.7	83.2	82.8	82.7	85.3	90.2																				
17-Feb	82.4	82.3	82.0	82.1	82.3	82.3	82.0	81.6	81.2	80.9	80.4	78.7	77.2	73.0	75.2	76.3	77.8	78.5	78.2	79.3	79.3	79.3	79.1	78.8	79.6	82.4																				
18-Feb	79.9	79.7	78.9	78.3	77.5	74.8	76.1	76.0	77.1	76.3	74.6	72.8	70.9	68.4	67.7	65.8	68.2	74.7	77.3	77.1	76.7	78.5	78.7	77.7	75.1	79.9																				
19-Feb	77.3	76.8	76.4	74.5	73.4	73.5	72.5	72.3	73.3	74.4	71.1	67.2	66.1	66.3	65.9	63.6	61.4	74.7	77.6	79.9	80.8	81.5	81.2	80.4	73.4	81.5																				
20-Feb	80.9	82.7	82.2	81.4	79.9	79.2	78.1	78.2	78.5	79.0	77.5	73.0	69.6	68.1	67.4	66.4	68.4	73.8	77.3	80.1	81.0	78.7	78.4	77.0	76.5	82.7																				
21-Feb	76.1	75.1	74.2	73.5	72.9	72.1	71.9	71.8	71.5	70.7	70.6	70.7	70.9	71.3	71.8	70.9	68.9	69.2	71.4	72.3	73.2	73.6	74.0	74.9	72.2	76.1																				
22-Feb	75.6	75.4	75.2	75.1	75.2	74.9	75.0	75.0	74.8	74.4	73.7	70.6	62.6	60.4	57.3	58.5	61.1	68.0	76.3	78.2	77.5	76.9	75.9	75.2	71.8	78.2																				
23-Feb	76.9	77.7	77.7	78.2	76.9	76.0	75.5	72.2	72.8	73.8	73.8	72.9	70.3	64.0	60.8	59.3	59.4	66.8	74.8	77.8	76.2	72.4	69.7	67.3	71.8	78.2																				
24-Feb	67.3	68.5	65.9	63.9	65.7	66.0	68.1	68.9	66.6	66.3	63.7	58.5	55.7	54.7	54.9	54.3	56.8	58.9	59.5	57.4	56.6	56.4	57.8	60.0	61.4	68.9																				
25-Feb	65.6	65.7	70.8	75.9	76.7	77.5	78.4	79.8	79.9	79.6	77.7	75.1	72.3	70.7	67.8	66.2	64.3	72.1	78.1	78.6	78.6	77.6	77.6	76.6	74.3	79.9																				
26-Feb	81.5	83.5	83.9	83.4	82.8	81.2	77.7	78.4	80.5	77.2	73.8	73.9	75.1	76.1	77.9	79.4	78.0	79.5	84.4	84.6	84.4	84.0	84.1	81.9	80.3	84.6																				
27-Feb	83.9	86.2	87.7	87.8	87.8	87.7	87.2	86.1	84.2	81.1	78.7	76.7	78.0	80.0	78.7	79.5	80.6	82.4	84.9	84.8	83.8	83.1	83.0	82.0	83.2	87.8																				
28-Feb	82.0	81.4	81.0	81.3	81.6	81.3	80.8	79.9	79.1	80.7	81.6	81.0	80.0	75.4	76.5	72.7	76.9	79.6	82.2	83.2	85.7	86.0	85.5	84.0	80.8	86.0																				
																						80.5	80.5	81.2	81.3	81.5	81.6	82.3	82.4	82.1	81.4	79.9	78.6	77.2	75.5	75.1	74.8	75.5	78.5	80.0	80.4	80.8	80.9	80.9	80.2	Diurnal Average
																						96.1	93.9	93.9	97.1	98.3	97.4	98.6	100.0	97.0	96.3	97.4	97.9	97.1	97.4	98.3	93.2	94.0	97.7	99.0	99.5	99.2	97.0	96.5	95.9	Diurnal Maximum



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

**Relative Humidity (RH) - %**  
**Firebag - February 2023**





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

**Relative Humidity (RH) - %**  
**Firebag - February 2023**

<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	16	2.38	2.38
60 - 80	336	50.00	52.38
80 - 100	319	47.47	99.85

Total Number of Valid Hours: 672

Total Number of Hours: 672

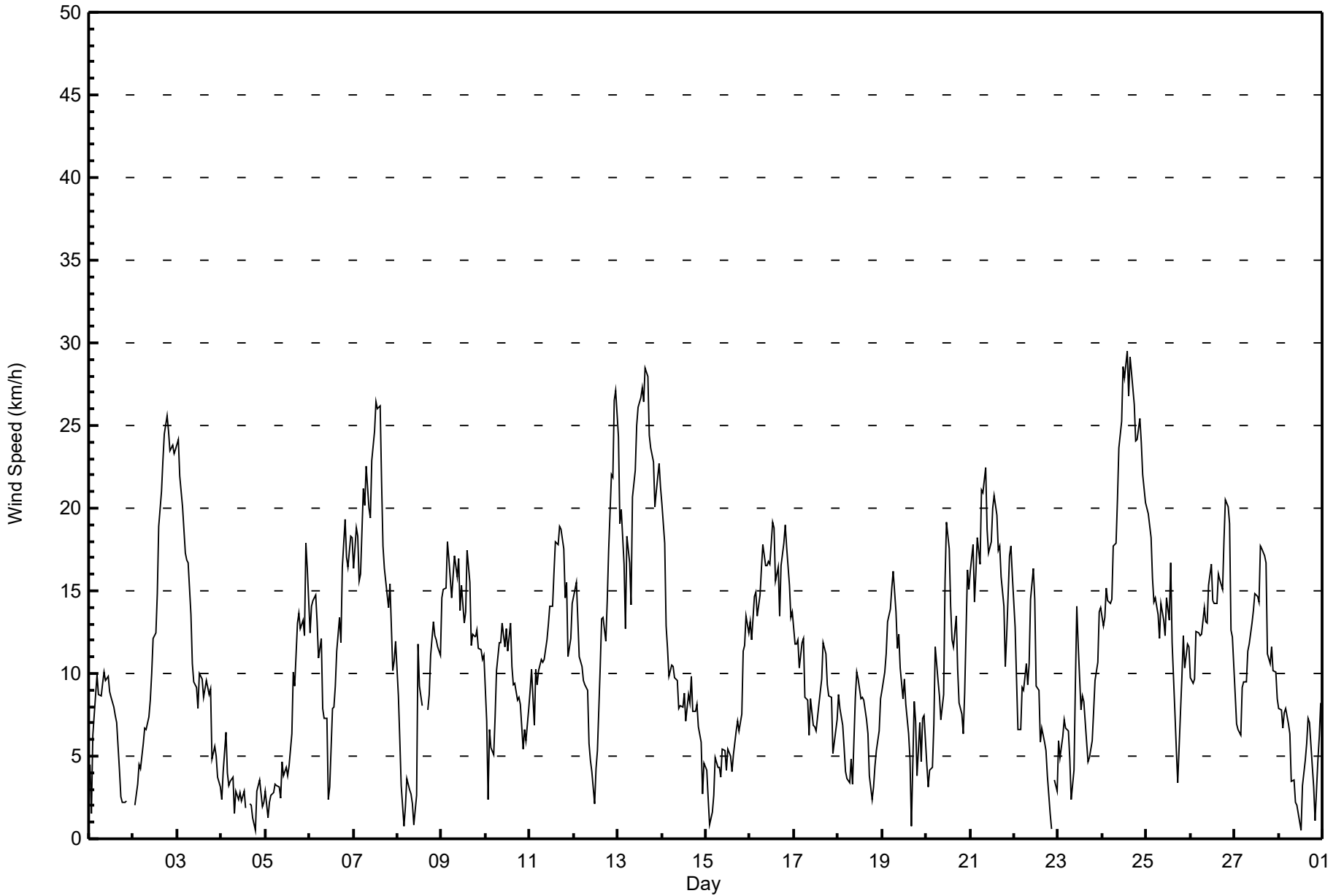


Maximum Speed: 29 km/h on Feb 24 14:00 Minimum Speed Value: 0 km/h on Feb 4 19:00 Maximum Diurnal Speed Average: 3.5 km/h at hour 12 Monthly Average Velocity: 1.6 km/h 233.9 deg		Maximum Daily Speed Average: 21.6 km/h on Feb 24 Minimum Daily Speed Average: 2.0 km/h on Feb 4 Minimum Diurnal Speed Average: 0.5 km/h at hour 19 Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 3 Q <sub>1</sub> = 7 Median = 10 Q <sub>3</sub> = 15 P <sub>90</sub> = 20 P <sub>99</sub> = 28		Hours in Service: 672 Hours of Data: 664 Hours of Missing Data: 8 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-Feb	N5	N2	NNW6	NW9	NNW10	NNW9	NNW9	NNW9	NNW10	NNW10	NNW10	NW9	NW9	NW8	NW7	NW7	WNW4	WNW3	WNW2	WNW2	WNW2	UO	UO	UO	NW6.5	NNW10
2-Feb	UO	SSE2	S3	S4	SSE4	SSE6	S7	SSE7	SSE7	SSE8	SSE10	SSE12	SSE12	SSE15	SSE19	SSE21	SE23	SE25	SSE26	SSE25	SSE23	SSE24	SSE23	SSE24	SSE14.2	SSE26
3-Feb	SSE24	SSE22	SSE21	SSE20	S17	S17	SSW17	SSW14	SSW11	SW9	WSW9	W8	NW10	NNW10	N9	NNW9	N10	N9	N9	NE5	NNE6	NE5	NE4	ESE3	S3.7	SSE24
4-Feb	S2	E4	SE6	E4	E3	E3	ESE4	SE2	NNE3	NNE2	NNE3	NE2	NE3	NE2	UO	ESE2	SSE2	SSE1	W0	ESE3	SE3	ESE4	SSE2	SSE2	ESE2.0	SE6
5-Feb	SSE3	S1	SSE2	SSE3	SSE3	SSE3	ESE3	SE3	SSE2	SSE5	SSW4	SSW4	SSW4	S4	SSW6	SSE10	S9	SSW13	SSW14	SW13	WSW13	WNW12	NNW18	NNW16	SSW3.3	NNW18
6-Feb	NW12	WNW14	WNW14	W15	W13	W11	W12	WNW8	N7	N7	NNE2	SE3	SSW8	S8	S9	SSE11	SSE13	SE12	SSE16	SSE19	SSE17	S16	S18	S18	SSW5.2	SSE19
7-Feb	SSW16	SSW19	SW18	WSW16	WSW16	WSW21	W20	W23	WSW20	WSW19	WSW23	WSW25	WSW26	WSW26	W26	W22	W18	WSW16	WSW15	WSW14	WSW15	WNW10	N11	N12	WSW16.6	WSW26
8-Feb	NNE9	NNE6	NE3	E1	NW2	N4	NNW3	NNE3	ENE2	ESE1	SSW3	SW12	SSW9	SW8	M	M	SSE8	SSE9	SSE11	SE13	SSE12	SE12	SE12	SSE11	SSE3.8	SE13
9-Feb	SSE15	S15	S15	S18	SSW17	SSW15	SSW16	SSW17	SSW16	SSW17	S14	SSW15	SSW13	S14	S17	S16	SSE12	SE12	SE12	SE13	SSE12	S11	S11	S11	S13.4	S18
10-Feb	S7	SSW2	NNE7	NE6	E5	ENE7	E10	E12	ENE12	ENE13	E12	E13	ENE11	ENE13	NE10	NNE9	N9	NNE8	NNE9	NNE8	N5	E7	ESE6	ESE8	ENE7.0	ENE13
11-Feb	SE9	SSE10	SSW7	S10	S9	SSW10	SSW11	S11	SSW11	SW12	SSW13	SSW14	S14	S16	S18	SSW18	SW19	SW19	WSW18	W15	W16	WSW11	SW12	SW14	SSW11.4	SW19
12-Feb	SW15	SW16	SW13	WSW11	WSW10	SW10	SW9	WSW9	W6	W5	WSW4	SSE2	SE4	S5	SSE10	SSE13	SE13	ESE12	ESE14	SE17	SE22	SE22	SE27	SE27	SSE8.2	SE27
13-Feb	SSE24	SSE19	S20	SSW17	SSW13	SW18	SW17	WNW14	NW21	NW22	NW25	NW26	NNW27	NNW27	NNW26	NNW28	NNW28	NW24	NW24	NNW23	NNW20	NNW21	NNW23	NNW21	NW13.2	NNW28
14-Feb	NNW20	NNW18	NNW13	NNW12	NW10	NW10	NNW10	NNW10	NNW10	NNW8	NW8	NW8	NW9	NNW7	NNW9	NNW8	NW10	NNW8	NW8	NNW8	NW7	NNW6	N3	N5	NNW9.1	NNW20
15-Feb	N4	NW2	NW1	S2	WSW3	SW5	SW4	WSW4	SW5	SW5	WSW4	SW5	S5	S4	SSE5	S7	S7	SSE7	SSE8	SE11	SE12	SE14	SSE12	S4.2	SE14	
16-Feb	SE13	SE12	SSE15	SE15	SE13	SE15	SE16	SE18	SE17	SSE17	SSE17	S17	S19	SSW19	SW16	SW16	W13	NW17	NNW18	NNW19	NNW18	NNW15	NNW13	NNW14	S4.4	S19
17-Feb	NNW12	NNW12	NNW12	NNW10	NNW12	NNW12	NNW9	NNW8	NNW6	N8	N7	NNW7	N7	N8	N9	N10	N12	N11	N9	N9	N9	N5	NNE6	N7	N8.8	NNW12
18-Feb	N9	NNE8	NE7	NE6	NE4	N4	NNW3	NNW5	NW3	NNW9	NNW10	NNW10	NNW8	NNW9	NNW8	NW7	NNW6	N4	NNW2	NE3	E4	ESE5	SE7	SE9	N4.2	NNW10
19-Feb	SE9	SE10	SE11	SE13	SE14	SE15	SE16	ESE14	ESE12	ESE12	ESE10	ESE8	ESE10	ESE8	ESE6	ESE5	SE1	N8	N7	N4	NNW7	NNW5	NNW7	NNW7	ESE6.0	SE16
20-Feb	NW4	NW3	NNW4	N4	NNW7	NW12	NNW10	NNW9	NNW7	WNW9	NW16	NW19	NW18	NNW14	NW12	NW12	NNW13	N10	NNW8	NNW8	NW6	NW9	NW16	NW15	NW10.0	NW19
21-Feb	NNW16	NNW18	NW14	NW16	NW18	NW17	NNW21	NNW21	NW22	NW19	NW17	NW18	NW20	NW21	NW20	NW17	NW18	NW16	NNW14	NNW10	NNW12	NNW17	NNW18	NNW16	NW17.2	NW22
22-Feb	NNW13	NW10	NW7	NW7	NW9	NW9	NW11	NW9	NNW11	NNW14	N16	NNW14	NNW9	NNW9	NW6	NW7	NNW6	NNW5	NNE4	SW2	NNE1	UO	NW4	NNW3	NNW7.6	N16
23-Feb	NNW6	NNW5	NNW6	N7	NNE7	NNE7	NE5	NNE2	NW4	NW9	NW14	NW12	NW8	W9	W8	WNW6	SW5	SW5	S6	SSE8	S10	S11	S14	S14	WNW2.5	NW14
24-Feb	S13	S13	S15	S14	S14	S15	S18	S18	S21	S24	S25	S29	S28	S29	SSE27	SSE29	SSE28	SSE26	SSE24	S24	S25	S24	S22	S20	S21.6	S29
25-Feb	S20	S20	SSW18	SSW16	SSW14	SSW15	SSW14	SW12	SSW14	SW13	SW12	SW15	SSW13	SSW17	SW12	SW8	SW5	ESE3	E8	ESE10	ESE12	ESE10	ESE12	ESE12	SSW9.9	S20
26-Feb	SE10	ESE9	E10	E13	E12	ESE12	ESE12	E14	E13	E13	ESE15	ESE17	ESE14	E14	E14	E16	E16	ENE15	ENE18	ENE21	ENE20	ENE19	E13	ENE12	E13.6	ENE21
27-Feb	NE9	NE7	N7	NNE6	N9	NNW9	NW10	NW11	NW12	NW13	NW14	NW15	NW15	NW14	NW18	NW18	NNW17	NNW17	NNW11	NW11	NW12	NW10	NNW10	NNW9	NNW10.9	NW18
28-Feb	NNW8	NNW8	NNW7	N8	NNW8	N7	N6	N4	NW4	NE2	NNE2	SSE1	NNW1	W3	WNW5	NW6	NW7	NNW7	NNW4	WNW3	N1	SSE5	SE6	SE8	NNW3.0	SE8
S1.6 SSW2.0 SSW2.4 SSW2.6 SW2.3 SW2.7 WSW2.0 WSW2.2 W2.4 W2.3 W3.0 WSW3.5 WSW3.3 WSW3.2 WSW3.1 WSW3.2 W1.5 NW0.8 ENE0.5 SE1.1 SSE1.3 SSE1.8 SE1.6 SSE1.7 SSE24 SSE22 SSE21 SSE20 NW18 WSW21 NNW21 W23 NW22 S24 S25 S29 S28 S29 SSE27 SSE29 SSE28 SSE26 SSE25 S25 S24 SE27 SE27																								Diurnal Average 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 (WS) - km/h**  
**Firebag - February 2023**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Firebag - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	133	20.03	20.03
6 - 11	226	34.04	54.07
12 - 19	233	35.09	89.16
20 - 28	69	10.39	99.55
29 - 38	3	0.45	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 664

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Firebag - February 2023**

<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	13	10	11	1	7	10	6	17	9	5	10	5	1	8	9	11	133
6 - 11	27	13	6	2	4	10	11	16	16	8	5	5	5	4	33	61	226
12 - 19	3	0	0	7	13	13	23	19	25	29	20	9	7	4	31	30	233
20 - 28	0	0	0	2	0	0	5	17	12	0	0	6	4	0	10	13	69
29 - 38	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	3
> 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>23</b>	<b>17</b>	<b>12</b>	<b>24</b>	<b>33</b>	<b>45</b>	<b>70</b>	<b>64</b>	<b>42</b>	<b>35</b>	<b>25</b>	<b>17</b>	<b>16</b>	<b>83</b>	<b>115</b>	<b>664</b>

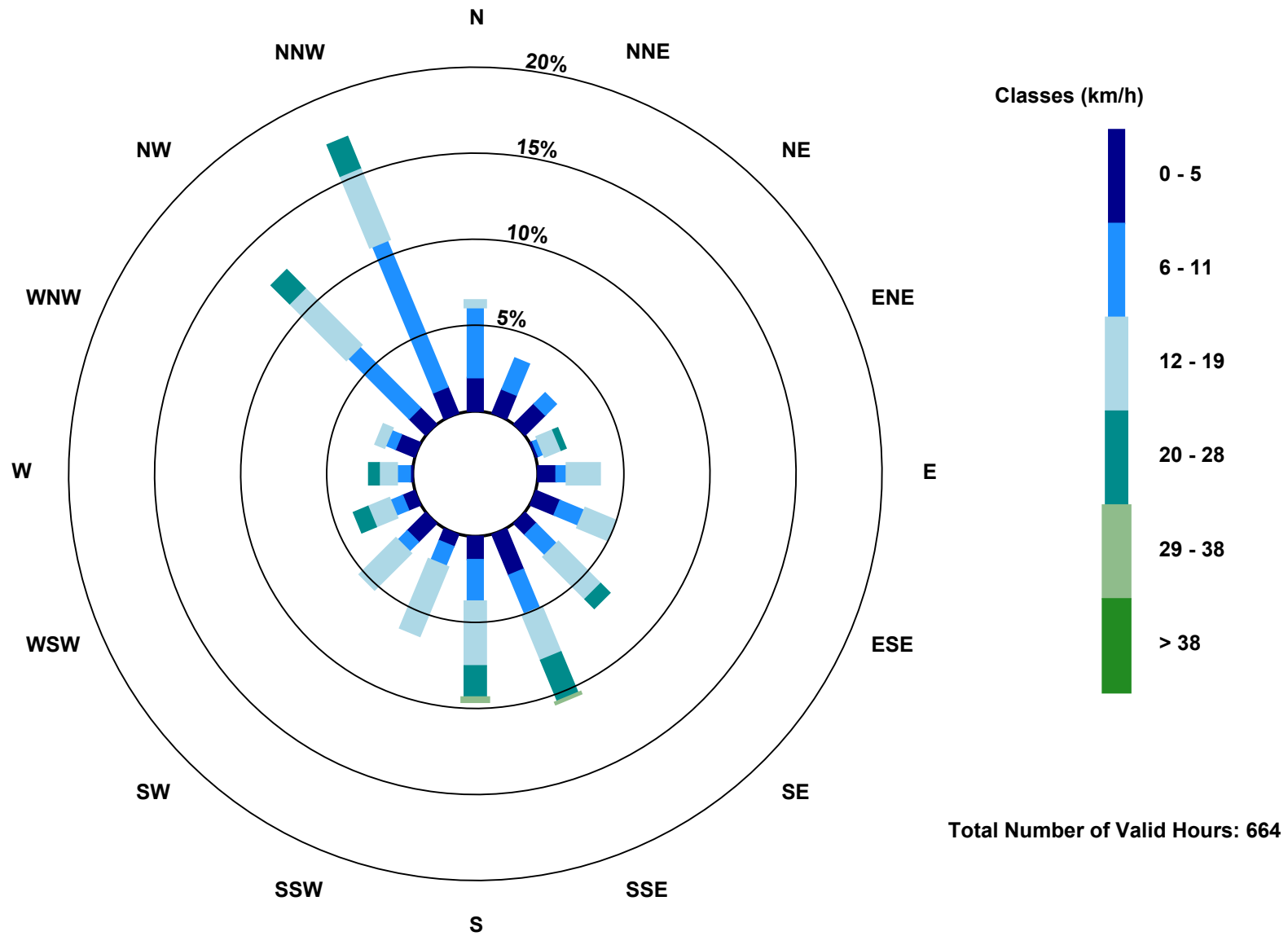
Total Number of Valid Hours: 664

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Firebag





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

**Wind Speed (WS) - km/h**  
**Firebag - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Feb 7 14:00 Minimum Value: 0 km/h on Feb 1 20:00 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														Hours in Service: 672 Hours of Data: 664 Hours of Missing Data: 8 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-Feb	1	1	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	1	0	0	0	UO	UO	UO	2
2-Feb	UO	0	1	1	1	1	1	1	1	1	2	2	2	2	3	3	4	4	4	4	4	4	4	4	4
3-Feb	4	3	3	3	2	3	2	4	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	4
4-Feb	1	1	1	1	1	1	1	1	1	0	0	0	0	1	UO	1	1	1	1	1	1	1	1	1	1
5-Feb	0	1	0	0	0	0	1	1	1	1	1	1	0	1	2	1	2	2	2	2	3	3	5	3	5
6-Feb	3	3	4	3	3	3	3	1	1	1	2	1	2	1	2	2	2	2	3	3	3	3	2	2	4
7-Feb	2	3	3	3	4	6	5	5	4	4	6	6	6	7	7	6	5	3	2	2	3	2	2	2	7
8-Feb	2	1	1	1	1	1	0	0	1	1	2	2	2	2	M	M	1	1	1	1	2	1	2	1	2
9-Feb	2	2	2	2	2	2	2	2	2	2	2	3	3	2	4	3	2	1	1	2	2	1	2	1	4
10-Feb	3	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	3
11-Feb	1	2	1	2	2	2	2	2	2	3	3	3	2	3	3	3	3	4	5	3	3	3	3	3	5
12-Feb	3	3	3	3	2	2	1	2	1	1	1	2	1	2	2	2	2	2	2	3	3	3	4	5	5
13-Feb	4	3	3	4	2	4	3	5	5	4	5	6	6	6	6	6	6	5	5	4	4	5	4	5	6
14-Feb	5	4	4	3	2	2	2	2	2	2	2	2	2	1	2	2	2	2	1	1	1	1	1	2	5
15-Feb	0	1	1	1	2	1	1	1	1	1	1	2	2	1	1	2	1	1	1	1	1	1	2	1	2
16-Feb	1	1	2	2	2	2	2	2	2	2	3	2	3	3	3	3	3	3	4	4	3	4	2	3	4
17-Feb	3	2	2	2	3	3	2	2	1	2	2	1	2	2	2	2	2	2	2	1	1	1	1	1	3
18-Feb	1	1	1	1	1	1	0	1	1	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	2
19-Feb	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	1	1	1	1	2
20-Feb	1	1	1	1	2	2	2	1	2	3	3	4	4	3	3	3	3	2	1	1	2	2	3	3	4
21-Feb	3	4	2	3	4	3	4	3	4	4	4	4	4	4	4	3	3	3	2	2	2	3	4	3	4
22-Feb	3	2	2	2	1	1	3	2	2	3	3	4	3	2	2	2	1	2	2	1	1	UO	1	4	4
23-Feb	2	1	1	1	1	1	2	1	1	4	3	3	2	2	2	2	1	1	1	0	1	1	2	2	4
24-Feb	1	1	2	2	1	2	2	2	4	4	4	5	4	4	5	4	5	3	4	4	4	4	4	3	5
25-Feb	3	3	3	2	2	2	2	2	2	2	2	2	2	3	4	3	2	1	1	2	1	1	2	1	4
26-Feb	1	1	2	2	2	2	3	2	2	2	3	3	3	2	2	3	3	3	3	3	3	4	4	2	4
27-Feb	2	2	1	1	1	1	1	2	2	2	3	3	3	3	3	3	3	4	2	2	2	2	2	1	4
28-Feb	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	3	2	1	1	2	2	1	1	1	3
														Diurnal Maximum											
M - Maintenance														UO - Unstable Operation											



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

**Wind Direction (WD) - deg**  
**Firebag - February 2023**

Direction of Maximum Speed: 172 deg on Feb 24 14:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 175.8 deg on Feb 24	Hours of Data: 664
Direction of Minimum Speed: 279 deg on Feb 4 19:00	Hours of Missing Data: 8
Direction of Minimum Daily Speed Average: 2.0 deg on Feb 4	Percent Operational Time: 98.8
Monthly Average Direction: 233.9 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-Feb	355	359	334	326	328	329	336	341	337	336	331	323	313	313	311	314	299	300	285	284	295	UO	UO	UO	325.2
2-Feb	UO	158	182	182	168	161	170	163	159	161	165	159	157	153	151	152	144	146	150	152	155	159	159	161	155.6
3-Feb	157	162	163	168	169	179	193	203	213	226	252	274	321	339	349	345	358	6	1	34	29	42	44	103	184.4
4-Feb	173	91	127	97	93	95	114	127	21	30	28	36	51	50	UO	116	156	167	279	103	131	114	152	160	101.6
5-Feb	166	185	151	151	152	153	117	131	165	157	197	203	200	176	200	168	181	192	203	215	140	293	347	344	208.3
6-Feb	321	300	288	270	270	273	277	300	349	3	24	143	198	183	184	153	153	143	148	150	158	171	186	190	204.4
7-Feb	199	211	229	238	250	249	273	263	252	250	257	256	251	257	261	271	271	258	247	246	254	285	358	6	255.1
8-Feb	17	13	43	80	326	11	348	27	64	122	197	215	204	214	M	M	160	165	148	144	147	145	145	159	154.0
9-Feb	163	169	179	189	198	194	205	200	198	198	189	199	195	184	178	170	153	138	141	138	149	170	180	185	179.6
10-Feb	182	202	19	51	86	69	87	88	69	76	81	86	67	67	49	22	5	20	26	25	8	85	106	111	64.2
11-Feb	124	152	206	184	182	195	195	189	203	215	202	196	190	191	188	192	217	235	253	264	260	245	217	217	208.3
12-Feb	223	228	219	243	242	233	235	238	265	281	247	168	126	175	166	147	141	119	114	125	133	136	140	133	167.4
13-Feb	150	158	180	199	206	224	234	286	305	313	316	324	331	342	335	334	333	326	325	328	331	334	340	341	314.3
14-Feb	334	336	338	331	317	309	332	339	336	332	312	305	326	330	333	327	325	335	325	334	325	329	359	351	329.4
15-Feb	356	324	324	177	258	224	219	233	240	229	219	237	217	189	185	167	180	174	149	154	145	144	146	147	178.0
16-Feb	135	132	148	141	142	138	137	137	143	147	161	172	189	208	219	234	267	317	338	337	341	333	330	328	178.2
17-Feb	340	334	337	340	335	337	346	343	335	349	349	334	353	353	355	352	3	4	2	4	9	6	20	11	349.9
18-Feb	8	18	36	36	35	9	346	336	326	334	338	344	329	328	328	326	346	352	343	35	83	112	124	128	1.1
19-Feb	129	132	132	136	136	136	129	122	114	115	108	109	116	111	107	114	133	6	10	350	341	331	340	332	111.3
20-Feb	311	320	348	356	333	326	327	331	334	301	311	316	321	327	314	316	334	353	348	335	325	319	320	324	324.9
21-Feb	327	330	323	319	326	323	329	327	323	325	319	309	316	309	321	317	320	324	338	332	330	339	337	334	324.4
22-Feb	331	317	308	305	317	313	321	319	330	341	349	344	332	331	319	319	331	343	19	218	30	UO	314	334	328.9
23-Feb	330	341	338	354	13	12	36	27	311	320	323	325	311	277	276	287	232	221	182	163	172	176	184	187	282.8
24-Feb	187	188	185	188	184	173	184	179	181	180	179	182	178	172	166	162	156	160	167	178	179	179	184	182	175.8
25-Feb	189	185	197	201	205	212	212	216	212	214	220	221	212	213	217	226	227	121	99	110	114	117	120	123	191.7
26-Feb	130	115	100	101	101	104	111	98	93	96	109	114	106	94	87	92	87	77	65	68	65	78	85	62	91.0
27-Feb	43	44	8	15	357	337	322	316	314	320	318	318	312	313	318	319	330	336	340	326	323	324	338	333	330.0
28-Feb	348	344	341	352	345	356	1	0	315	43	31	154	346	259	282	320	322	340	343	293	1	151	138	135	344.1
	175.8	193.9	206.9	210.4	232.5	234.4	238.4	249.1	267.7	271.9	272.2	257.4	255.3	250.2	253.7	252.8	268.5	315.6	68.1	141.6	159.6	153.5	142.3	146.7	

Diurnal Average

M - Maintenance

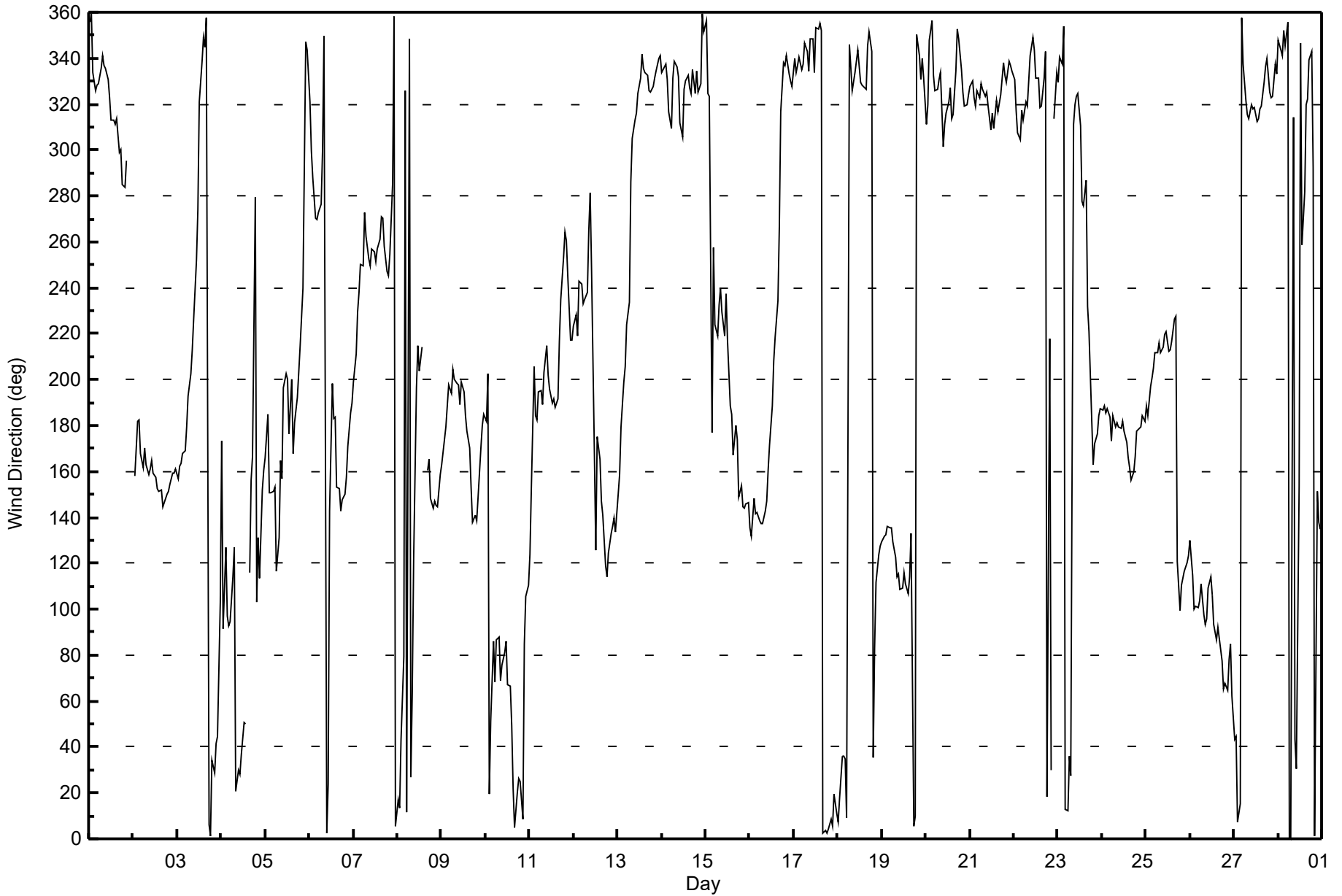
UO - Unstable Operation

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



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

**Wind Direction (WD) - deg**  
**Firebag - February 2023**





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

**Wind Direction (WD) - deg**  
**Firebag - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 95 deg on Feb 28 13:00	Hours in Service: 672 Hours of Data: 664 Hours of Missing Data: 8 Hours of Calibration: 0 Percent Operational Time: 98.8
Minimum Value: 3 deg on Feb 18 00:00	
Percentiles: P <sub>1</sub> = 5 P <sub>10</sub> = 8 Q <sub>1</sub> = 9 Median = 11 Q <sub>3</sub> = 15 P <sub>90</sub> = 23 P <sub>99</sub> = 70	

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-Feb	13	19	13	13	11	11	13	12	12	12	12	13	14	14	15	13	11	18	18	18	14	UO	UO	UO	19
2-Feb	UO	22	10	8	9	9	8	7	8	8	8	8	8	9	9	10	10	9	9	9	10	8	8	8	22
3-Feb	8	8	8	9	9	8	8	14	10	15	15	26	16	13	14	15	14	14	13	24	14	24	31	44	44
4-Feb	43	16	16	25	33	25	20	53	16	24	16	12	14	32	UO	27	14	19	81	16	17	20	51	45	81
5-Feb	12	25	18	11	10	10	18	20	27	8	24	11	13	11	22	14	17	9	8	9	17	18	16	14	27
6-Feb	12	14	15	15	14	15	14	17	15	13	55	25	15	15	14	14	8	9	8	8	7	9	6	7	55
7-Feb	9	12	11	10	12	14	14	13	11	11	12	13	13	14	14	15	15	12	10	10	11	22	11	13	22
8-Feb	11	14	15	33	25	7	23	22	6	18	39	16	11	21	M	M	5	10	8	7	6	6	7	5	39
9-Feb	5	6	7	8	8	8	8	7	8	8	7	10	10	8	10	8	10	6	6	6	8	8	7	6	10
10-Feb	11	58	28	15	21	16	10	12	9	12	13	9	11	11	14	26	11	10	10	12	22	11	15	13	58
11-Feb	10	15	21	11	13	10	9	9	11	11	11	11	9	9	9	9	12	12	15	13	13	15	10	11	21
12-Feb	10	10	9	18	12	12	9	11	24	26	34	70	17	21	12	8	11	11	11	9	8	9	8	9	70
13-Feb	9	9	10	13	11	13	12	25	11	11	10	11	12	15	14	11	13	11	11	10	12	13	13	11	25
14-Feb	12	12	13	12	13	14	13	13	13	17	17	17	14	17	14	16	16	10	9	6	11	8	20	12	20
15-Feb	8	33	64	61	57	13	13	14	21	15	20	39	31	21	24	17	10	10	6	7	6	6	7	9	64
16-Feb	7	7	7	7	8	7	7	8	7	9	9	9	11	11	13	13	18	17	11	12	12	11	11	10	18
17-Feb	12	12	13	12	12	12	14	14	17	16	14	20	28	22	14	14	14	13	13	10	9	12	11	3	28
18-Feb	6	9	8	10	17	11	13	12	12	10	13	15	17	18	19	15	17	12	23	36	15	17	14	8	36
19-Feb	7	5	7	6	7	8	8	9	10	11	12	14	11	18	22	27	80	12	10	34	10	10	7	14	80
20-Feb	12	35	16	15	11	9	9	6	14	13	14	13	14	14	15	18	10	10	8	9	14	11	11	10	35
21-Feb	10	10	10	10	9	10	9	10	11	12	13	14	12	12	14	13	10	11	7	7	9	10	10	9	14
22-Feb	9	7	11	15	7	8	9	9	11	12	14	13	18	17	23	25	14	10	52	73	74	UO	18	22	74
23-Feb	23	12	17	16	10	9	12	39	11	10	11	15	25	22	17	29	28	7	15	3	6	5	5	7	39
24-Feb	6	5	6	6	6	8	8	9	9	9	10	10	10	10	10	8	7	7	7	10	8	9	9	9	10
25-Feb	9	10	9	8	9	9	10	10	9	11	11	10	12	13	19	19	28	35	8	8	8	8	7	8	35
26-Feb	10	11	11	9	11	11	12	11	10	11	12	11	13	13	10	11	15	14	10	11	10	11	13	10	15
27-Feb	17	25	11	15	11	11	13	9	11	12	14	14	14	14	11	12	13	12	10	11	9	10	13	11	25
28-Feb	10	9	10	10	8	11	11	9	24	39	46	70	95	70	34	78	13	10	23	22	58	11	8	5	95
	43	58	64	61	57	25	23	53	27	39	55	70	95	70	34	78	80	35	81	73	74	24	51	45	

Diurnal Maximum

M - Maintenance UO - Unstable Operation



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS20 MACKAY RIVER FEBRUARY 2023**

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

March 31, 2023



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS20)

FEBRUARY 2023

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	637	32	35	99.55	18.3	0	4.9	0
H2S (ppb) Average	636	33	36	99.55	2.2	0	0.9	0
THC (ppm) Average	637	32	35	99.55	3.8	-	2.7	-
NO2 (ppb) Average	638	34	34	100	34.3	0	22.9	-
NO (ppb) Average	638	34	34	100	46.9	-	6.2	-
NOX (ppb) Average	638	34	34	100	81.2	-	29.1	-
Temperature 2 m (C) Average	670	0	2	99.7	3.2	-	-0.6	-
Relative Humidity (%) Average	670	0	2	99.7	97	-	91.3	-
Wind Speed 10 m (km/h) Average	639	0	33	95.09	18	-	11	-
Wind Direction 10 m (deg) Average	639	0	33	95.09	-	-	-	-
Precipitation (mm) Total	672	0	0	100	2.1	-	8	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS20)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	637	1.18	2.3	-	0	0	0.1	0.4	1.2	2.9	18.3
H2S (ppb) Average	636	0.36	0.3	-	0	0.1	0.2	0.3	0.4	0.7	2.2
THC (ppm) Average	637	2.43	0.1	-	2.2	2.3	2.3	2.4	2.5	2.6	3.8
NO2 (ppb) Average	638	5.62	7.2	-	0.2	0.5	0.8	2.5	7.8	15.7	34.3
NO (ppb) Average	638	0.93	3.1	-	0	0	0	0	0.3	2.2	46.9
NOX (ppb) Average	638	6.55	9.4	-	0.2	0.5	0.9	2.7	8.3	17.8	81.2
Temperature 2 m (C) Average	670	-14.56	9.8	-	-37.9	-27.5	-21	-14.1	-7.1	-1.2	3.2
Relative Humidity (%) Average	670	76.21	11.7	-	36.8	59.2	70.1	79.1	84.3	89.4	97
Wind Speed 10 m (km/h) Average	639	5.6	3	-	0	2	3	5	7	10	18
Wind Direction 10 m (deg) Average	639	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	672	-	-	28.23	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -MACKAY RIVER (AMS20)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2, H2S, THC	02 Feb 2023 13:00	02 Feb 2023 13:00	1	Maintenance - sample manifold cleaned
SO2, H2S, THC	02 Feb 2023 15:00	02 Feb 2023 16:00	2	Maintenance - station logger/modem reset
Temperature 2m, Relative Humidity	02 Feb 2023 15:00	02 Feb 2023 16:00	2	Maintenance - station logger/modem reset
Wind Speed, Wind Direction	02 Feb 2023 15:00	02 Feb 2023 16:00	2	Maintenance - station logger/modem reset
Wind Speed, Wind Direction	13 Feb 2023 10:00	14 Feb 2023 13:00	28	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	14 Feb 2023 14:00	14 Feb 2023 14:00	1	Maintenance - tower brought down
Wind Speed, Wind Direction	21 Feb 2023 07:00	21 Feb 2023 07:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	28 Feb 2023 01:00	28 Feb 2023 01:00	1	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association

Summary of Hour Averages

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

Mackay River - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 18.3 ppb on Feb 23 11:00	Maximum Daily Average: 4.9 ppb on Feb 23		Hours of Data:	637
Minimum Value: 0.0 ppb on Feb 1 15:00	Minimum Daily Average: 0.0 ppb on Feb 6		Hours of Missing Data:	35
Maximum Diurnal Average: 1.8 ppb at hour 14	Minimum Diurnal Average: 0.6 ppb at hour 7		Hours of Calibration:	32
Monthly Average: 1.18 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> = 1.2 P <sub>90</sub> = 2.9 P <sub>99</sub> = 12.6		Percent Operational Time:	99.6

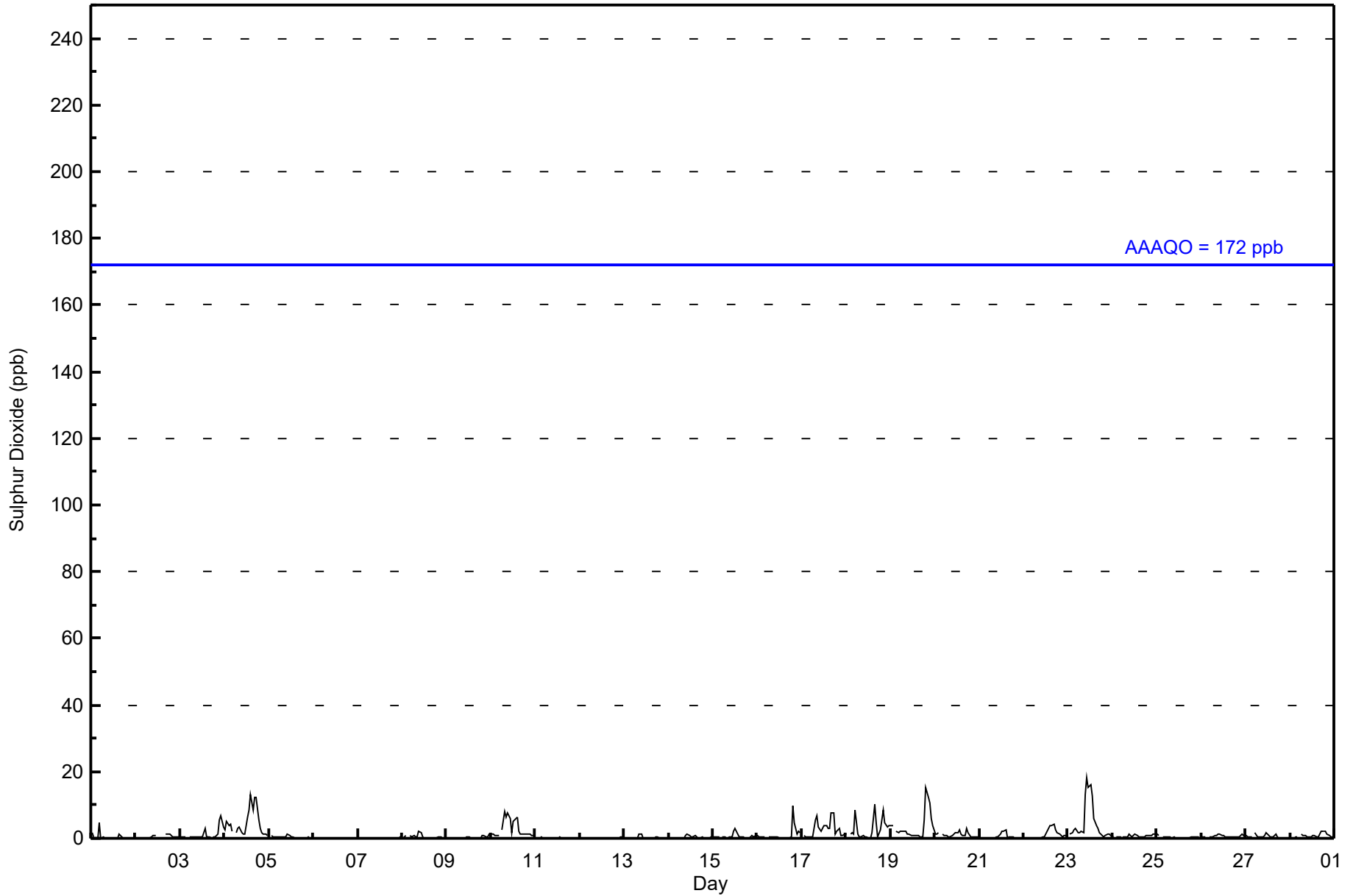
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Feb	1.5	0.6	Z	0.1	4.7	0.1	0.3	0.1	0.1	0.2	C	C	C	C	0.0	1.4	0.6	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.5	4.7																							
2-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.5	0.8	0.7	0.9	M	0.9	M	M	1.4	1.3	1.2	0.9	0.6	0.5	0.5	0.5	0.5	1.4																							
3-Feb	0.6	0.5	0.5	0.5	Z	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	3.1	0.3	0.3	0.2	0.2	0.3	0.5	1.5	5.4	6.7	3.3	1.2	6.7																							
4-Feb	2.6	5.1	3.7	4.1	2.0	Z	1.9	2.8	3.5	1.9	1.1	1.2	6.3	8.5	13.2	8.4	12.1	12.2	5.5	3.0	1.9	1.2	1.5	1.0	4.5	13.2																							
5-Feb	Z	0.7	0.6	0.5	0.6	0.6	0.5	0.5	0.4	0.6	1.3	0.7	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.1	0.4	1.3																							
6-Feb	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	0.1	0.0	0.0	0.0	0.0	0.1																							
7-Feb	0.0	0.1	Z	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	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2																							
8-Feb	0.2	0.2	0.8	Z	0.8	0.4	0.7	0.5	0.4	2.2	1.6	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.1	0.5	2.2																							
9-Feb	0.1	0.2	0.1	0.1	Z	0.1	0.0	0.0	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.7	0.9	0.4	0.4	1.2	0.3	1.2																							
10-Feb	1.4	1.5	0.8	1.0	1.0	Z	2.6	7.8	6.3	7.5	5.8	1.8	5.0	6.0	6.2	2.3	1.3	1.2	1.1	1.4	1.2	1.3	1.0	1.0	2.9	7.8																							
11-Feb	Z	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3																							
12-Feb	0.1	Z	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	0.1	0.1	0.1	0.2	0.3	0.1	0.3																							
13-Feb	0.2	0.2	Z	0.1	0.1	0.1	0.0	0.1	1.2	1.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.5	0.1	0.1	0.1	0.0	0.0	0.2	1.2																							
14-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.7	1.2	0.7	0.5	0.4	0.8	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.4	0.3	1.2																							
15-Feb	0.5	0.5	0.5	0.5	Z	0.3	0.2	0.1	0.0	0.3	0.6	2.1	2.9	1.3	0.3	0.5	0.5	0.1	0.1	0.1	0.3	0.7	0.6	0.7	0.6	2.9																							
16-Feb	0.9	0.6	0.5	0.5	0.2	Z	0.5	0.4	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.3	9.9	4.5	1.2	2.1	1.8	1.1	9.9																							
17-Feb	Z	0.7	0.5	0.4	0.4	0.4	0.3	5.6	6.9	3.3	2.3	3.1	3.7	3.8	3.0	2.9	7.8	7.8	1.4	2.0	2.8	1.0	0.9	1.1	2.7	7.8																							
18-Feb	1.1	Z	1.4	1.8	1.1	8.3	1.1	0.4	0.4	0.7	0.5	0.2	0.2	0.2	1.5	10.1	4.6	0.6	2.5	5.3	8.6	4.8	3.5	3.8	2.7	10.1																							
19-Feb	3.9	3.6	Z	2.0	1.8	1.9	2.2	2.0	2.0	1.3	1.1	0.9	0.8	0.7	0.9	0.7	0.5	0.6	5.4	15.2	12.1	10.8	6.1	3.7	3.5	15.2																							
20-Feb	1.4	1.3	1.7	Z	1.3	0.8	0.7	0.6	0.5	0.8	1.2	1.7	1.8	2.5	1.2	0.9	0.6	3.0	1.7	0.5	0.3	0.2	0.2	0.3	1.1	3.0																							
21-Feb	0.2	0.1	0.2	0.2	Z	0.2	0.1	0.1	0.2	0.4	0.4	1.3	2.3	2.2	2.6	0.2	0.3	0.5	0.2	0.1	0.1	0.0	0.1	0.0	0.5	2.6																							
22-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	0.4	1.2	2.8	3.7	4.0	4.4	2.5	1.8	1.2	0.7	0.6	0.7	0.7	1.1	4.4																							
23-Feb	Z	1.4	1.9	2.5	2.8	1.7	1.9	1.9	1.7	13.0	18.3	15.3	16.3	12.7	6.1	3.8	2.9	1.9	1.0	0.6	1.0	1.2	1.4	0.9	4.9	18.3																							
24-Feb	0.6	Z	0.4	0.2	0.2	0.2	0.3	0.4	1.2	0.6	0.8	1.1	1.0	0.6	0.3	0.4	0.4	0.4	0.7	0.7	0.8	1.0	1.3	1.3	0.6	1.3																							
25-Feb	1.1	0.8	Z	0.5	0.4	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	0.4	0.3	0.3	0.2	0.3	1.1																							
26-Feb	0.3	0.3	0.4	Z	0.6	0.4	0.6	0.8	0.8	1.2	1.2	0.9	0.9	0.5	0.6	0.4	0.4	0.3	0.3	0.2	0.3	0.8	1.3	0.9	0.6	1.3																							
27-Feb	0.8	0.6	0.4	0.4	Z	1.5	0.5	0.3	0.3	0.3	1.0	1.5	0.9	0.5	0.4	0.5	1.4	0.4	0.2	0.1	0.2	0.1	0.1	0.1	0.5	1.5																							
28-Feb	0.1	0.1	0.1	0.3	0.4	Z	1.2	1.0	0.9	0.4	0.2	0.3	0.9	0.9	0.6	0.5	1.2	2.3	2.3	2.3	1.3	0.9	0.6	0.5	0.8	2.3																							
																								0.7	0.8	0.6	0.7	0.8	0.8	0.6	0.9	1.0	1.4	1.5	1.3	1.8	1.8	1.6	1.4	1.5	1.3	1.0	1.6	1.4	1.2	1.1	0.9	Diurnal Average	
																								3.9	5.1	3.7	4.1	4.7	8.3	2.6	7.8	6.9	13.0	18.3	15.3	16.3	12.7	13.2	10.1	12.1	12.2	5.5	15.2	12.1	10.8	6.7	3.8	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**  
**Mackay River - February 2023**





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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Mackay River - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	626	98.27	98.27
11 - 20	11	1.73	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: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Mackay River - February 2023**

<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	67	26	8	12	30	84	34	68	36	19	49	37	14	24	48	596
11 - 20	3	0	1	0	2	0	0	0	0	1	0	0	0	1	1	2	11
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>43</b>	<b>67</b>	<b>27</b>	<b>8</b>	<b>14</b>	<b>30</b>	<b>84</b>	<b>34</b>	<b>68</b>	<b>37</b>	<b>19</b>	<b>49</b>	<b>37</b>	<b>15</b>	<b>25</b>	<b>50</b>	<b>607</b>

Total Number of Valid Hours: 607

Total Number of Hours: 672

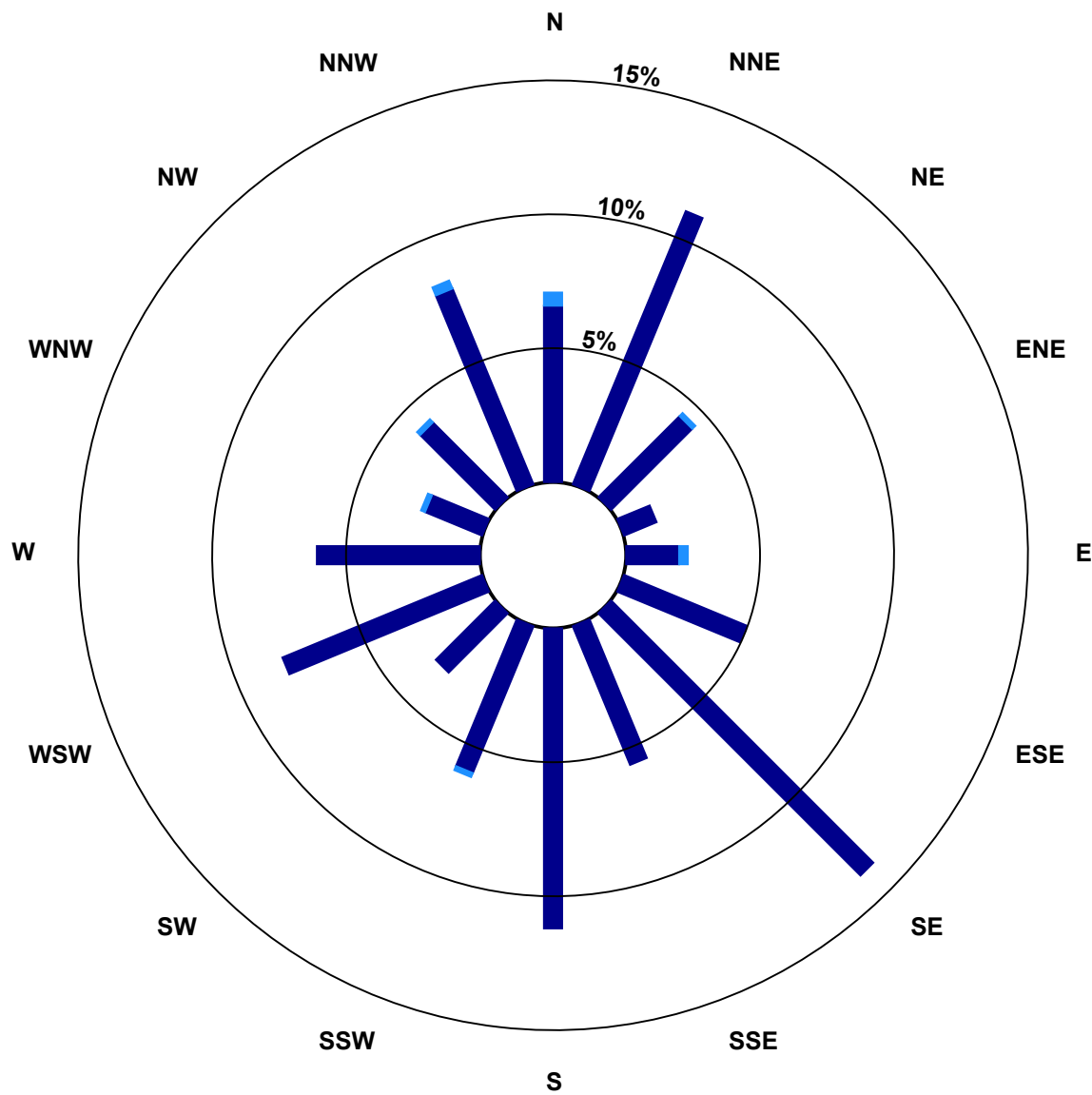


# Wood Buffalo Environmental Association

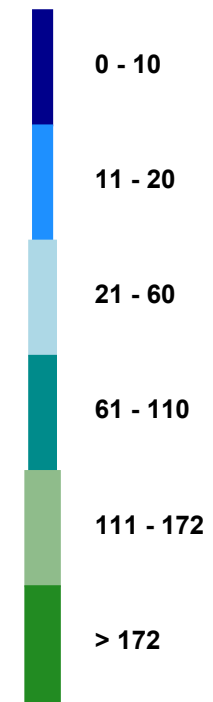
## Wind Rose Feb 2023

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

## Mackay River

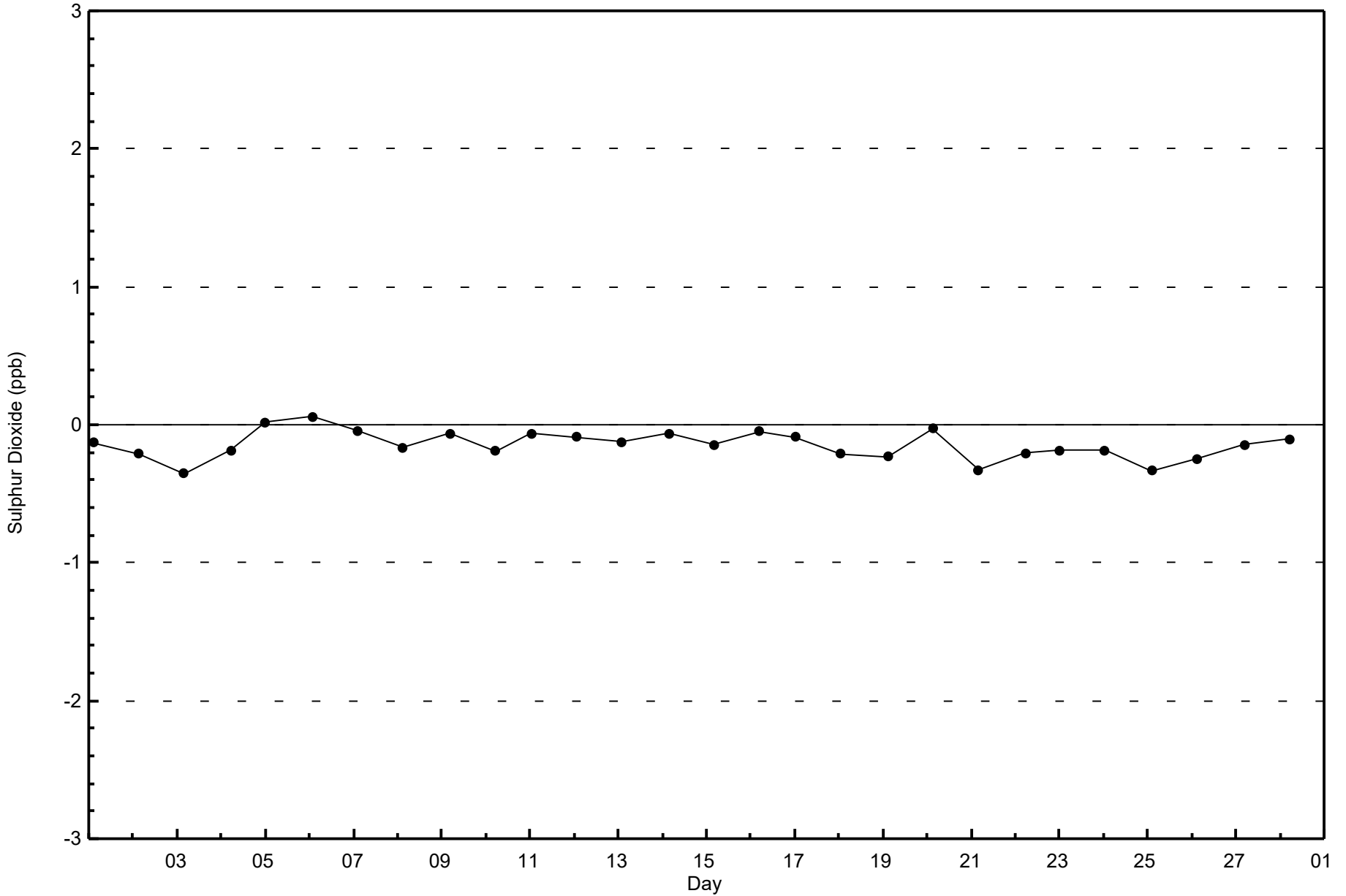


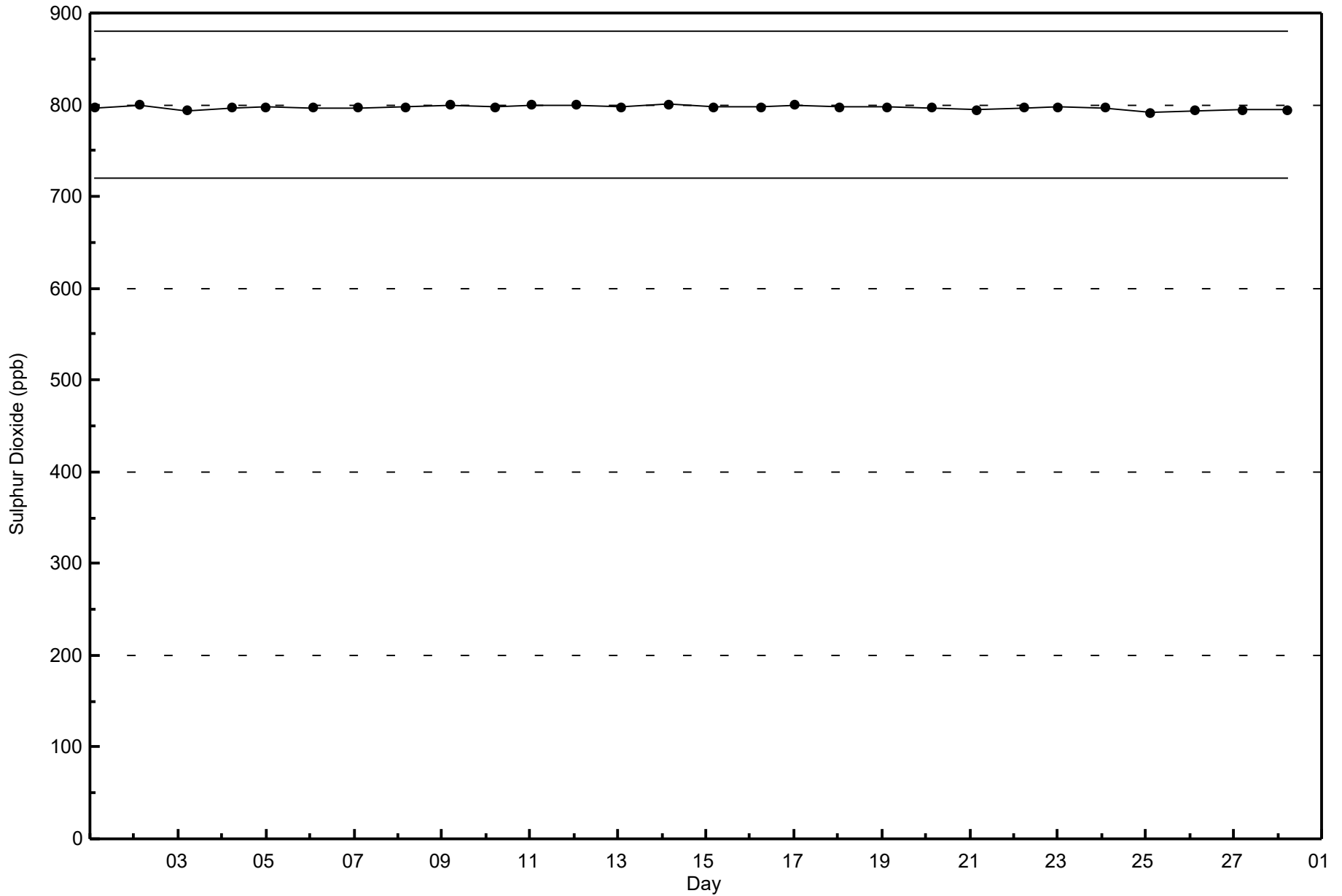
Classes (ppb)



Total Number of Valid Hours: 607









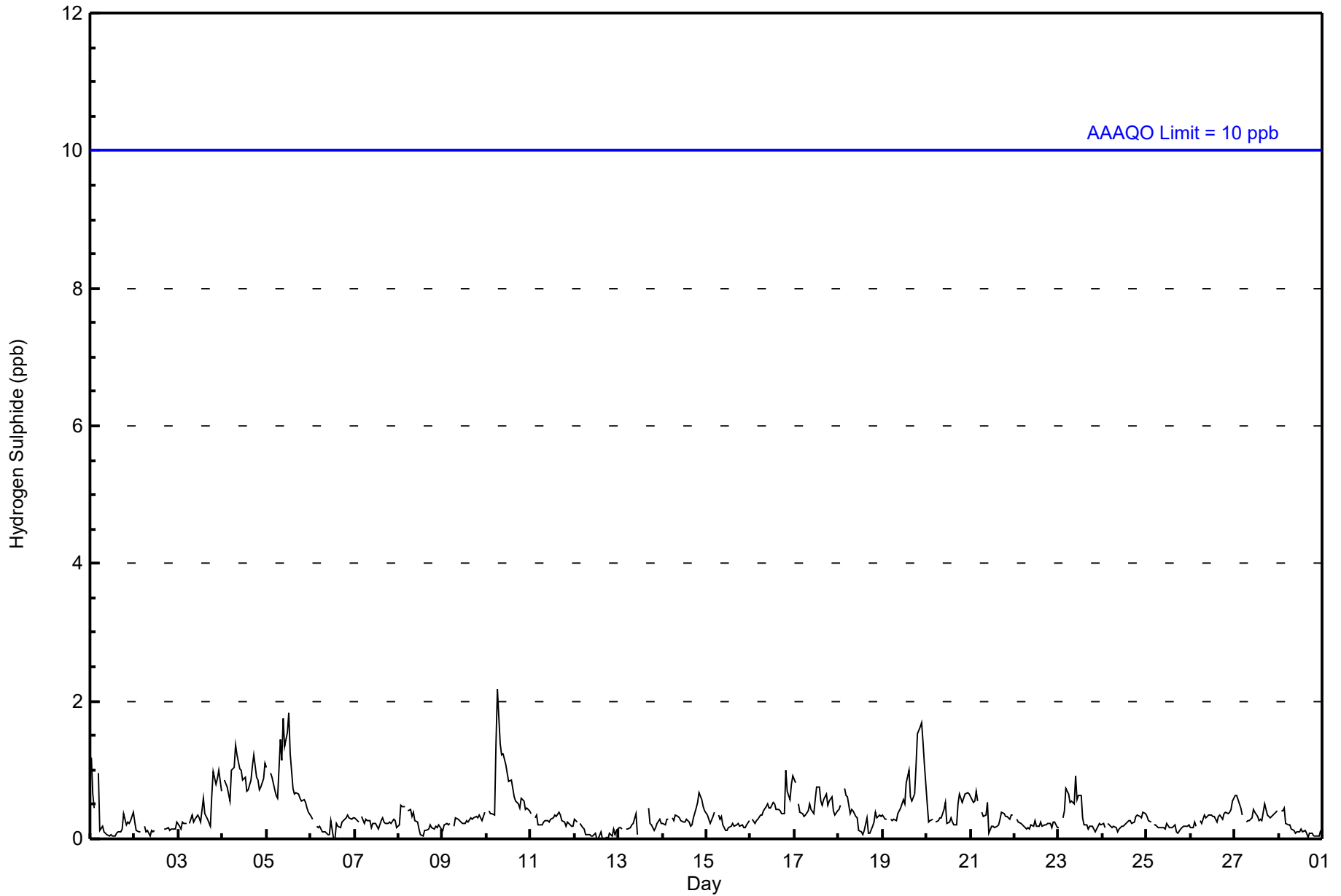
# Wood Buffalo Environmental Association

## Summary of Hour Averages

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

## Mackay River - February 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 672																	672																											
Maximum Value: 2.2 ppb on Feb 10 07:00		Maximum Daily Average: 0.9 ppb on Feb 4																	Hours of Data: 636																													
Minimum Value: 0.0 ppb on Feb 6 13:00		Minimum Daily Average: 0.1 ppb on Feb 12																	Hours of Missing Data: 36																													
Maximum Diurnal Average: 0.4 ppb at hour 23		Minimum Diurnal Average: 0.3 ppb at hour 17																	Hours of Calibration: 33																													
Monthly Average: 0.36 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.2 Median = 0.3 Q <sub>3</sub> = 0.4 P <sub>90</sub> = 0.7 P <sub>99</sub> = 1.5																	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-Feb	1.2	0.6	0.5	Z	1.0	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.4	0.2	0.2	0.2	0.3	0.4	0.3	1.2																						
2-Feb	0.2	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.0	0.1	0.1	0.1	M	0.1	M	M	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.3	0.1	0.3																						
3-Feb	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.6	0.4	0.3	0.3	0.2	0.6	1.0	0.8	0.9	1.0	0.7	0.4	1.0																						
4-Feb	Z	0.8	0.8	0.6	0.5	1.0	1.0	1.4	1.2	1.0	1.0	0.9	0.9	0.7	0.8	1.1	1.2	0.9	0.8	0.7	0.7	0.9	1.1	0.9	1.4																							
5-Feb	1.0	Z	1.0	0.9	0.7	0.6	0.6	1.4	1.1	1.7	1.3	1.5	1.8	1.2	0.7	0.6	0.7	0.6	0.6	0.5	0.6	0.5	0.5	0.4	0.9	1.8																						
6-Feb	0.3	0.3	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.0	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3																						
7-Feb	0.3	0.3	0.3	Z	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3																						
8-Feb	0.2	0.5	0.5	0.5	Z	0.4	0.4	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.5																						
9-Feb	0.1	0.2	0.2	0.2	0.2	Z	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.4																						
10-Feb	Z	0.4	0.4	0.4	0.3	1.4	2.2	1.4	1.2	1.2	1.1	1.0	0.8	0.9	0.7	0.6	0.5	0.5	0.4	0.6	0.5	0.4	0.4	0.4	0.8	2.2																						
11-Feb	0.4	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.4																						
12-Feb	0.3	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.3																					
13-Feb	0.2	0.2	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.4	0.1	C	C	C	C	C	0.4	0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.2	0.4																						
14-Feb	0.2	0.2	0.3	0.3	Z	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.5	0.5	0.7	0.6	0.5	0.4	0.3	0.7																						
15-Feb	0.3	0.3	0.2	0.3	0.4	Z	0.4	0.3	0.3	0.2	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	0.3	0.2	0.4																						
16-Feb	Z	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	1.0	0.7	0.6	0.8	0.9	0.5	1.0																						
17-Feb	0.8	Z	0.5	0.4	0.4	0.3	0.3	0.4	0.5	0.4	0.4	0.6	0.7	0.8	0.5	0.5	0.6	0.7	0.5	0.5	0.6	0.4	0.3	0.4	0.5	0.8																						
18-Feb	0.4	0.5	Z	0.7	0.6	0.6	0.4	0.4	0.4	0.3	0.3	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.7																						
19-Feb	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.6	0.5	0.8	1.0	0.6	0.5	0.6	1.1	1.5	1.6	1.7	1.4	1.1	0.7	1.7																						
20-Feb	0.5	0.3	0.3	0.3	Z	0.2	0.3	0.3	0.3	0.4	0.5	0.2	0.2	0.3	0.3	0.2	0.2	0.5	0.6	0.5	0.6	0.6	0.7	0.6	0.4	0.7																						
21-Feb	0.6	0.5	0.6	0.7	0.6	Z	0.4	0.3	0.3	0.5	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.7																						
22-Feb	Z	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.1	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	0.2	0.3																						
23-Feb	0.2	Z	0.3	0.4	0.7	0.6	0.5	0.6	0.5	0.9	0.6	0.6	0.6	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.4	0.9																						
24-Feb	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.2	0.4																						
25-Feb	0.3	0.3	0.2	Z	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	0.2	0.2	0.2	0.2	0.2	0.3																						
26-Feb	0.2	0.2	0.2	0.2	Z	0.3	0.2	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.6	0.3	0.6																						
27-Feb	0.6	0.6	0.6	0.5	0.3	Z	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.6																						
28-Feb	Z	0.4	0.4	0.4	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	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.4																						
0.4																								0.3	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	0.3	0.4	0.4	0.4	0.4	0.4	0.4	Diurnal Average	
1.2																								0.8	1.0	0.9	1.0	1.4	2.2	1.4	1.2	1.7	1.3	1.5	1.8	1.2	1.0	0.8	1.1	1.2	1.1	1.5	1.6	1.7	1.4	1.1	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  
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Mackay River - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	636	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: 636

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Mackay River - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	44	68	28	8	14	29	83	35	66	39	19	49	36	14	29	51	612
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>	44	68	28	8	14	29	83	35	66	39	19	49	36	14	29	51	612

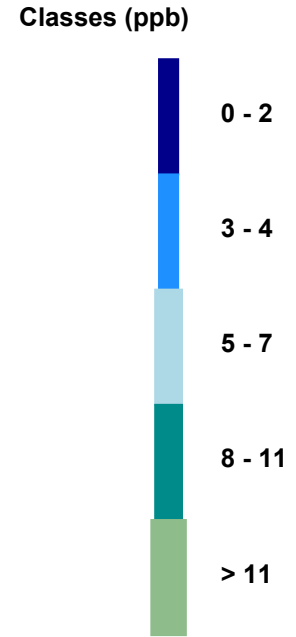
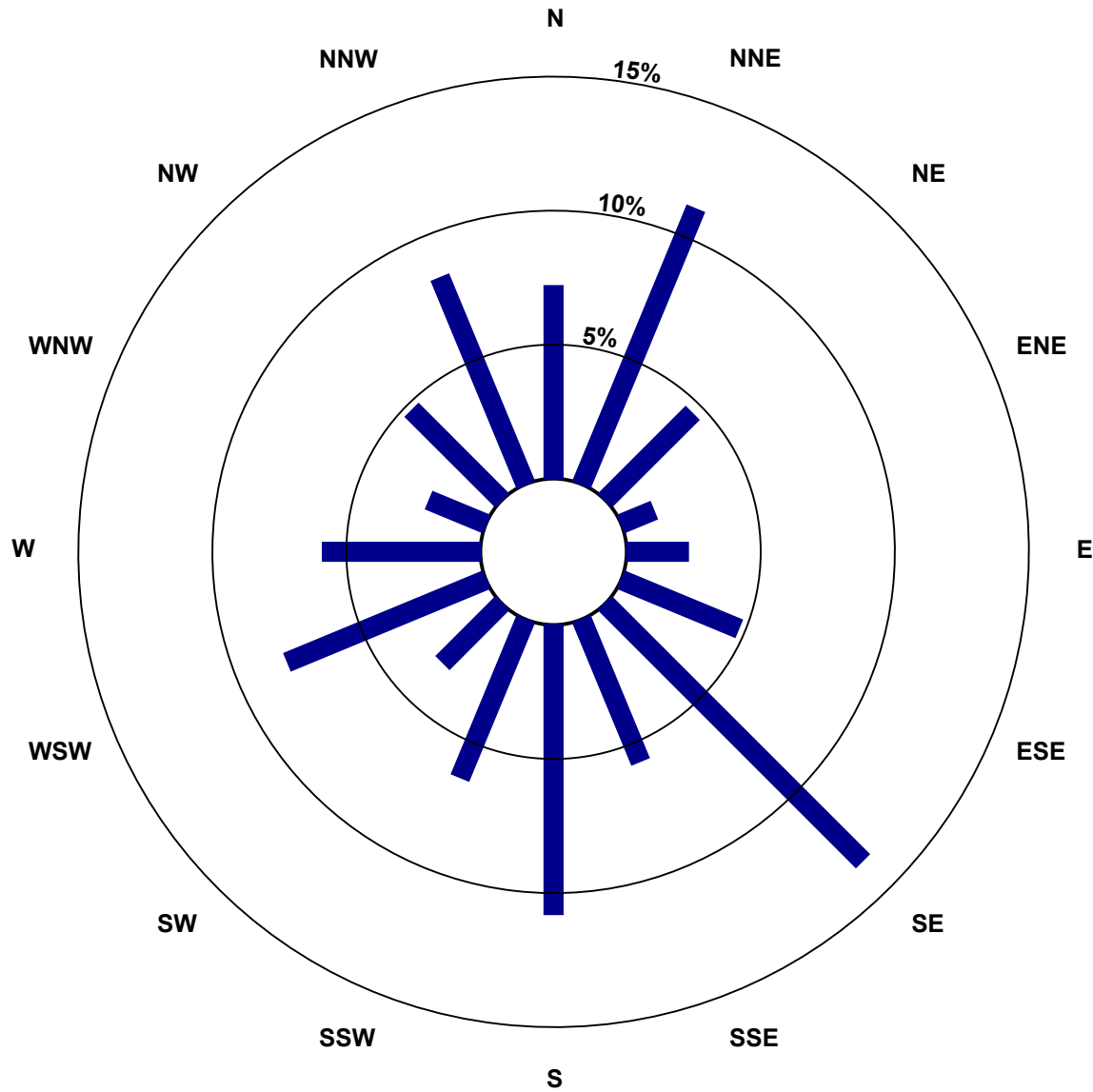
Total Number of Valid Hours: 612

Total Number of Hours: 672

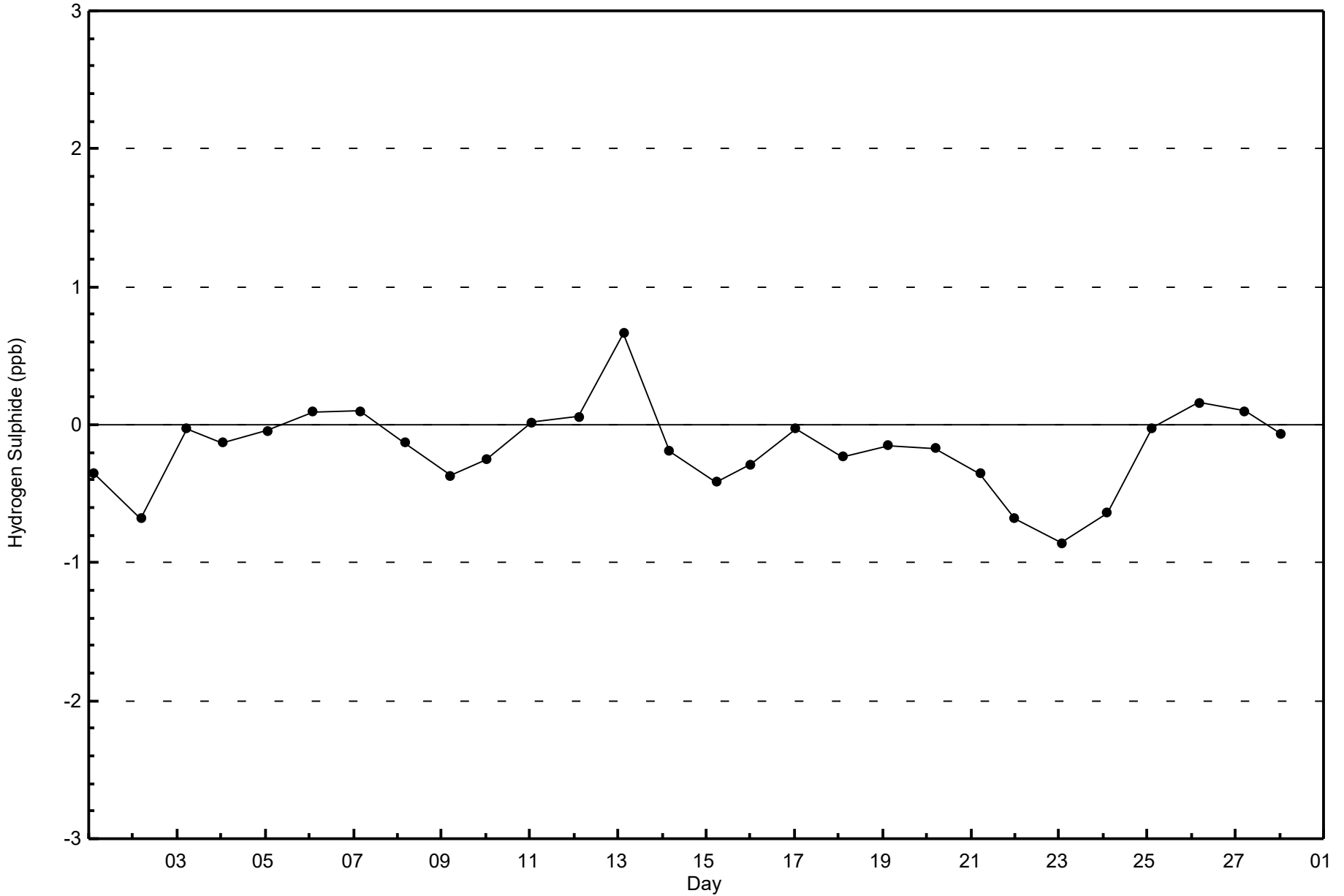


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

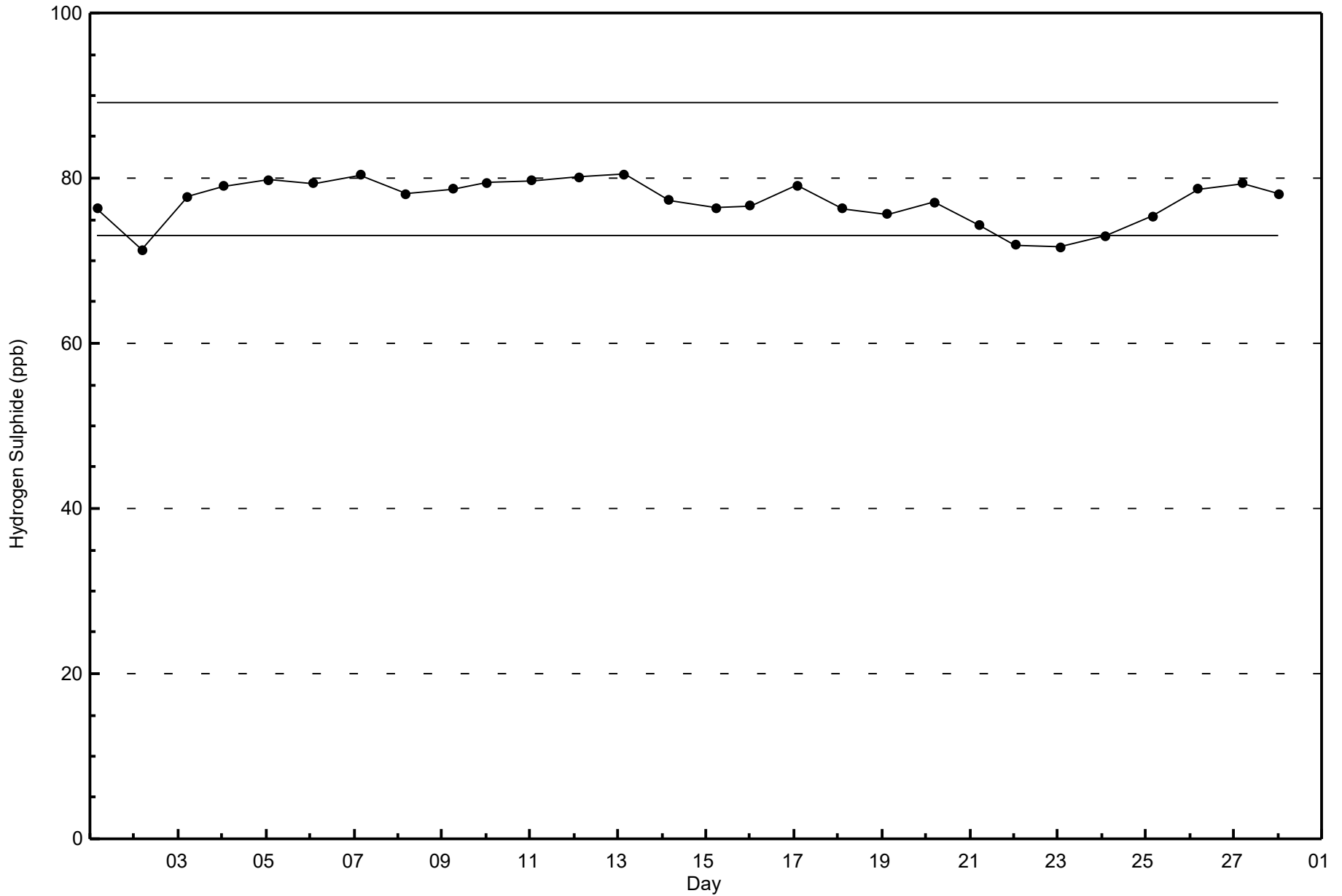
Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Mackay River



Total Number of Valid Hours: 612





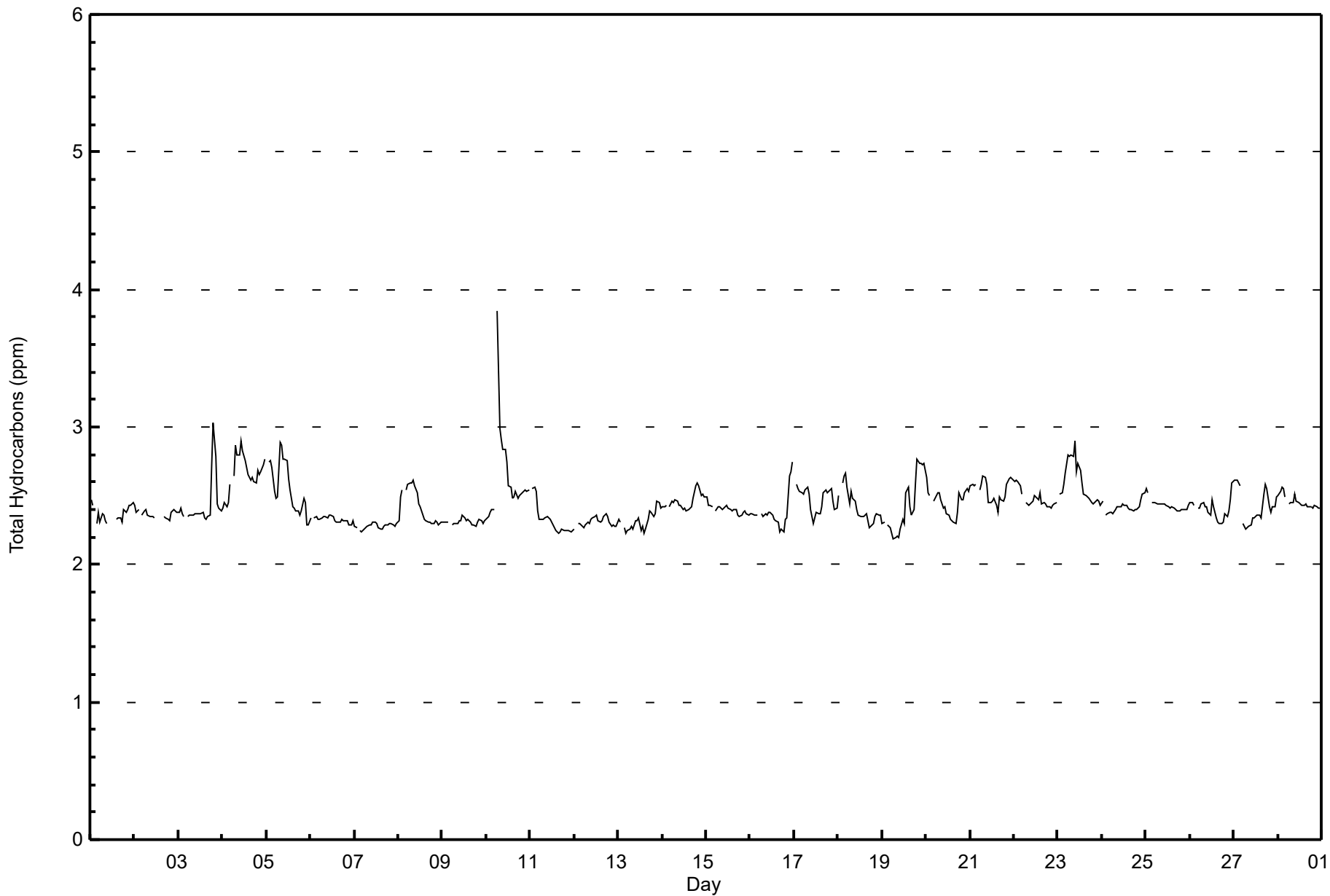






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Mackay River - February 2023**





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

**Total Hydrocarbons (THC) - ppm**  
**Mackay River - February 2023**

<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	636	99.84	99.84
3.1 - 10.0	1	0.16	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Mackay River - February 2023**

<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	43	66	27	8	14	30	84	34	68	37	19	49	37	15	25	50	606
3.1 - 10.0	0	1	0	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>	43	67	27	8	14	30	84	34	68	37	19	49	37	15	25	50	607

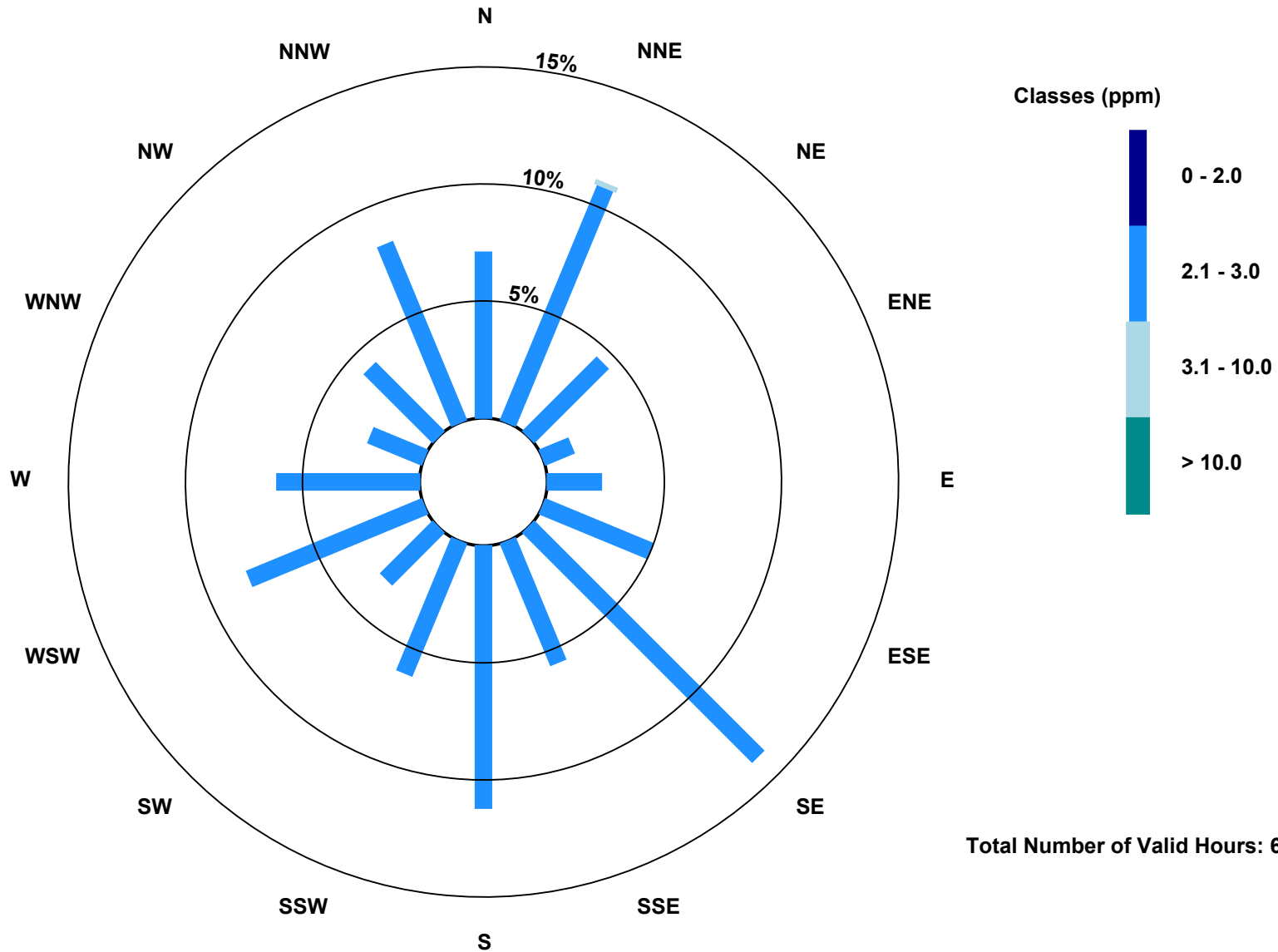
Total Number of Valid Hours: 607

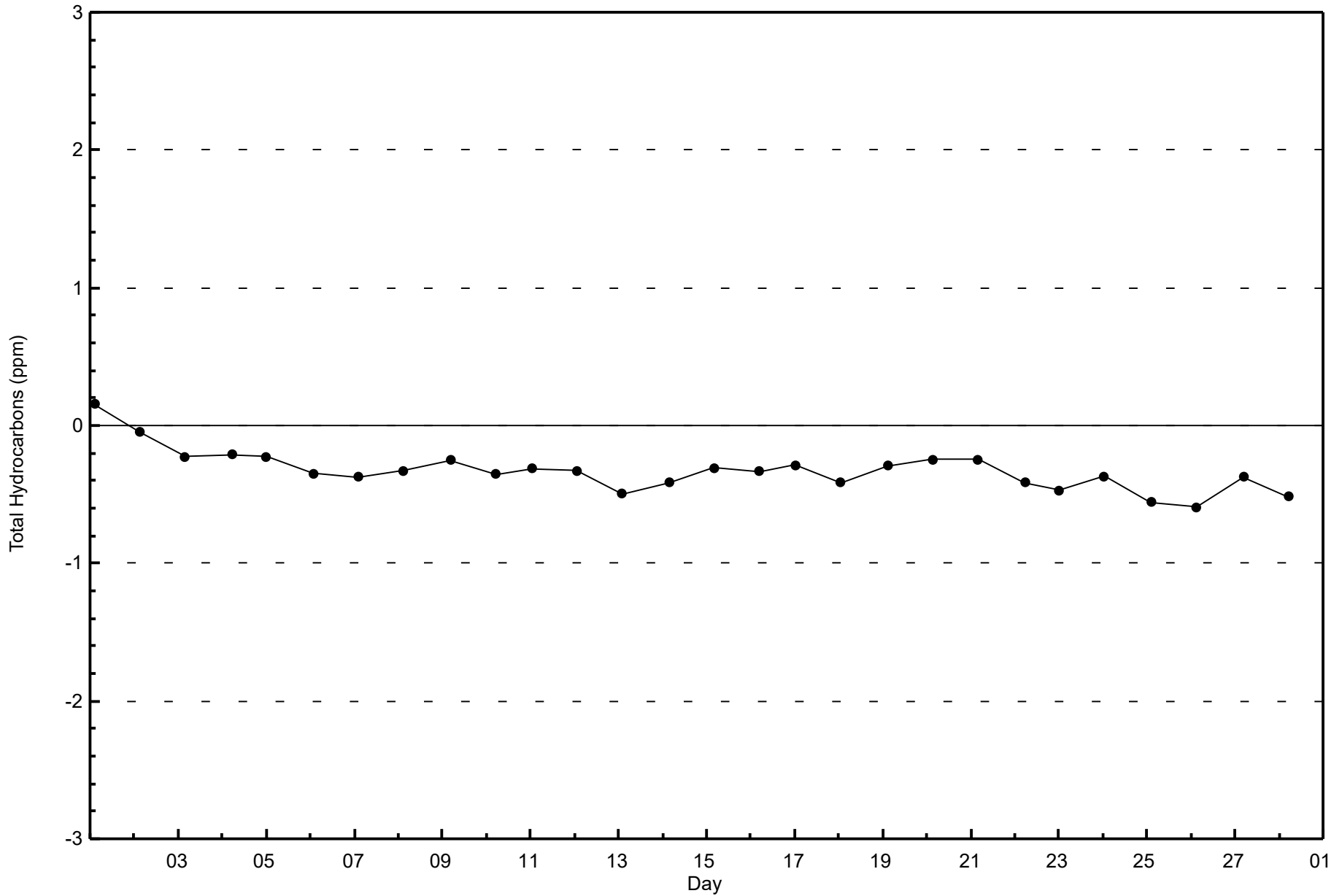
Total Number of Hours: 672

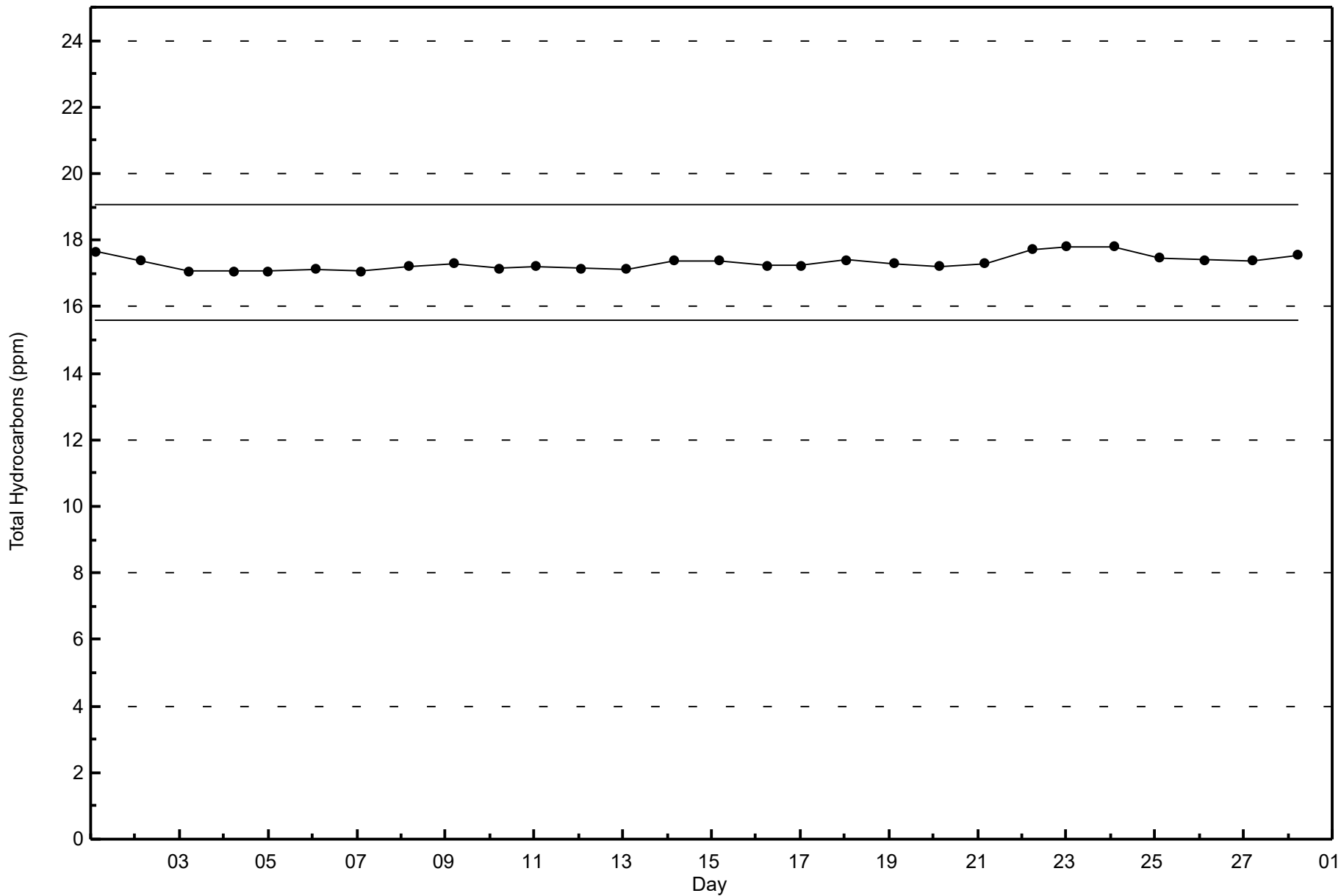


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Hydrocarbons (THC) - ppm  
Mackay River









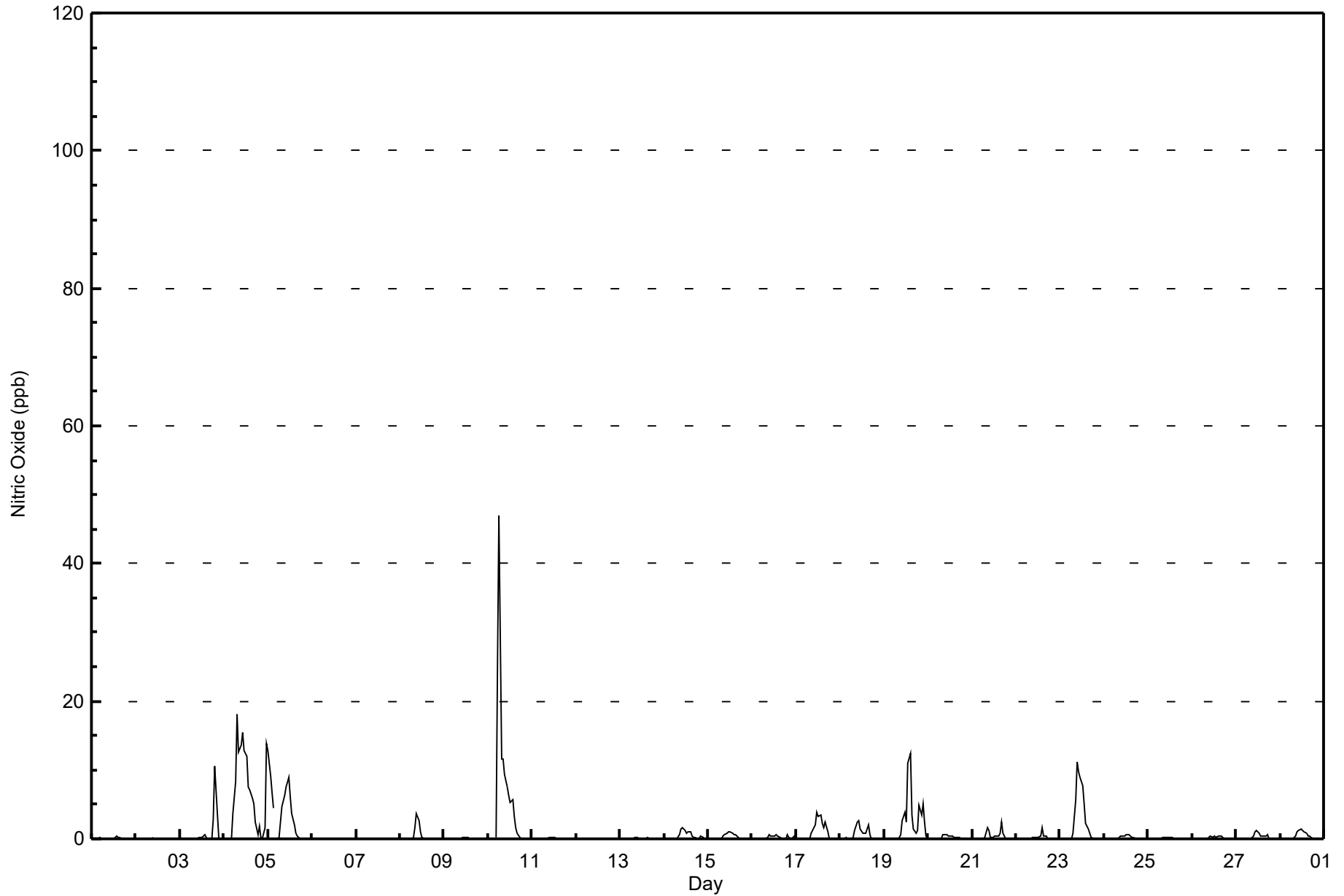


Maximum Value: 46.9 ppb on Feb 10 07:00																				Maximum Daily Average: 6.2 ppb on Feb 4					Hours in Service: 672	
Minimum Value: 0.0 ppb on Feb 2 18:00																				Minimum Daily Average: 0.0 ppb on Feb 7					Hours of Data: 638	
Maximum Diurnal Average: 2.1 ppb at hour 11																				Minimum Diurnal Average: 0.0 ppb at hour 5					Hours of Missing Data: 34	
Monthly Average: 0.93 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> = 0.3 P <sub>90</sub> = 2.2 P <sub>99</sub> = 12.8					Hours of Calibration: 34	
																									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-Feb	Z	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
2-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	C	C	C	C	C	C	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.2
3-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.5	0.2	0.1	0.0	0.0	2.8	10.5	3.4	0.0	0.0	0.0	0.8	10.5	
4-Feb	0.0	0.0	0.0	Z	0.0	3.6	8.4	18.0	12.7	13.7	15.4	12.8	11.9	7.5	7.1	6.0	5.1	2.5	0.6	1.7	0.3	0.1	1.7	13.9	6.2	18.0
5-Feb	12.9	9.2	6.7	4.5	Z	0.0	0.3	4.6	5.5	6.2	7.5	9.0	6.0	3.6	2.0	0.8	0.4	0.0	0.0	0.0	0.1	0.0	0.0	3.4	12.9	
6-Feb	0.0	0.0	0.0	0.0	0.0	Z	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	0.0	0.0	0.0	0.0	0.1
7-Feb	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
8-Feb	0.0	Z	0.1	0.1	0.1	0.1	0.1	1.6	3.6	2.6	0.9	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.6	
9-Feb	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
10-Feb	0.0	0.0	0.0	Z	0.1	24.9	46.9	11.6	11.5	9.4	7.6	6.3	5.4	5.8	3.3	1.7	0.8	0.2	0.0	0.0	0.0	0.0	0.0	5.9	46.9	
11-Feb	0.0	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
12-Feb	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	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
13-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	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	0.2
14-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.6	1.4	1.5	1.1	0.9	0.9	1.0	0.3	0.2	0.1	0.0	0.4	0.1	0.1	0.1	0.0	0.4	1.5	
15-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.4	0.6	0.8	0.9	1.0	0.7	0.5	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.0	
16-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.5	0.4	0.5	0.5	0.6	0.3	0.2	0.1	0.0	0.6	0.2	0.0	0.2	0.3	0.2	0.6	
17-Feb	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.7	1.2	2.0	3.8	3.2	3.5	2.2	1.7	2.4	1.1	0.0	0.0	0.0	0.0	0.0	1.0	3.8	
18-Feb	0.0	0.0	0.1	0.2	0.1	Z	0.0	0.1	1.2	2.5	2.6	1.3	0.8	0.8	0.9	2.1	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.6	2.6	
19-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	2.6	3.9	2.4	11.1	12.4	3.5	1.5	0.7	1.3	4.8	3.4	5.2	2.4	0.5	2.5	12.4	
20-Feb	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.6	0.6	0.6	0.6	0.5	0.5	0.3	0.2	0.1	0.1	0.3	0.0	0.0	0.0	0.1	0.1	0.2	0.6	
21-Feb	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.2	1.6	1.3	0.3	0.3	0.4	0.4	0.8	2.5	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.5	
22-Feb	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	1.6	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.6	
23-Feb	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.8	5.7	11.1	9.8	9.0	7.6	5.1	2.3	1.5	0.8	0.3	0.0	0.0	0.0	0.0	0.0	2.4	11.1	
24-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.2	0.4	0.4	0.4	0.6	0.5	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.6	
25-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	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	0.2	
26-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.3	0.5	0.2	0.3	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	
27-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.4	0.9	1.2	0.8	0.3	0.4	0.4	0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.2	
28-Feb	0.1	0.1	0.0	Z	0.0	0.0	0.0	0.1	0.5	1.1	1.2	1.4	1.2	1.0	0.7	0.5	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.4	1.4	
0.6 0.4 0.3 0.2 0.0 1.2 2.0 1.3 1.6 2.0 2.1 2.0 1.7 1.6 1.4 0.8 0.6 0.3 0.2 0.6 0.3 0.2 0.2 0.5																								Diurnal Average		
12.9 9.2 6.7 4.5 0.3 24.9 46.9 18.0 12.7 13.7 15.4 12.8 11.9 11.1 12.4 6.0 5.1 2.5 2.8 10.5 3.4 5.2 2.4 13.9																								Diurnal Maximum		
Z - zerospan C - Calibration																										



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

**Nitric Oxide (NO) - ppb**  
**Mackay River - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Mackay River - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	636	99.69	99.69
21 - 40	1	0.16	99.84
41 - 80	1	0.16	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Mackay River - February 2023**

<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	42	65	26	8	13	29	82	36	64	41	20	48	37	15	27	53	606
21 - 40	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11 - 80	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
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>	42	66	27	8	13	29	82	36	64	41	20	48	37	15	27	53	608

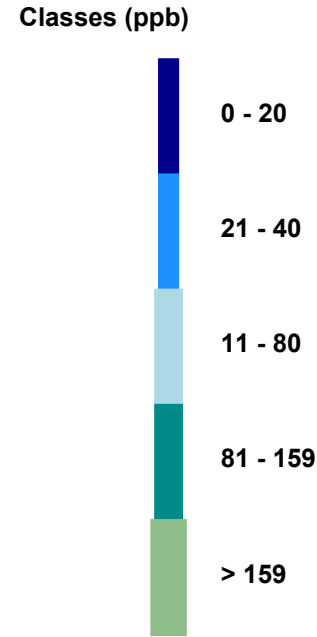
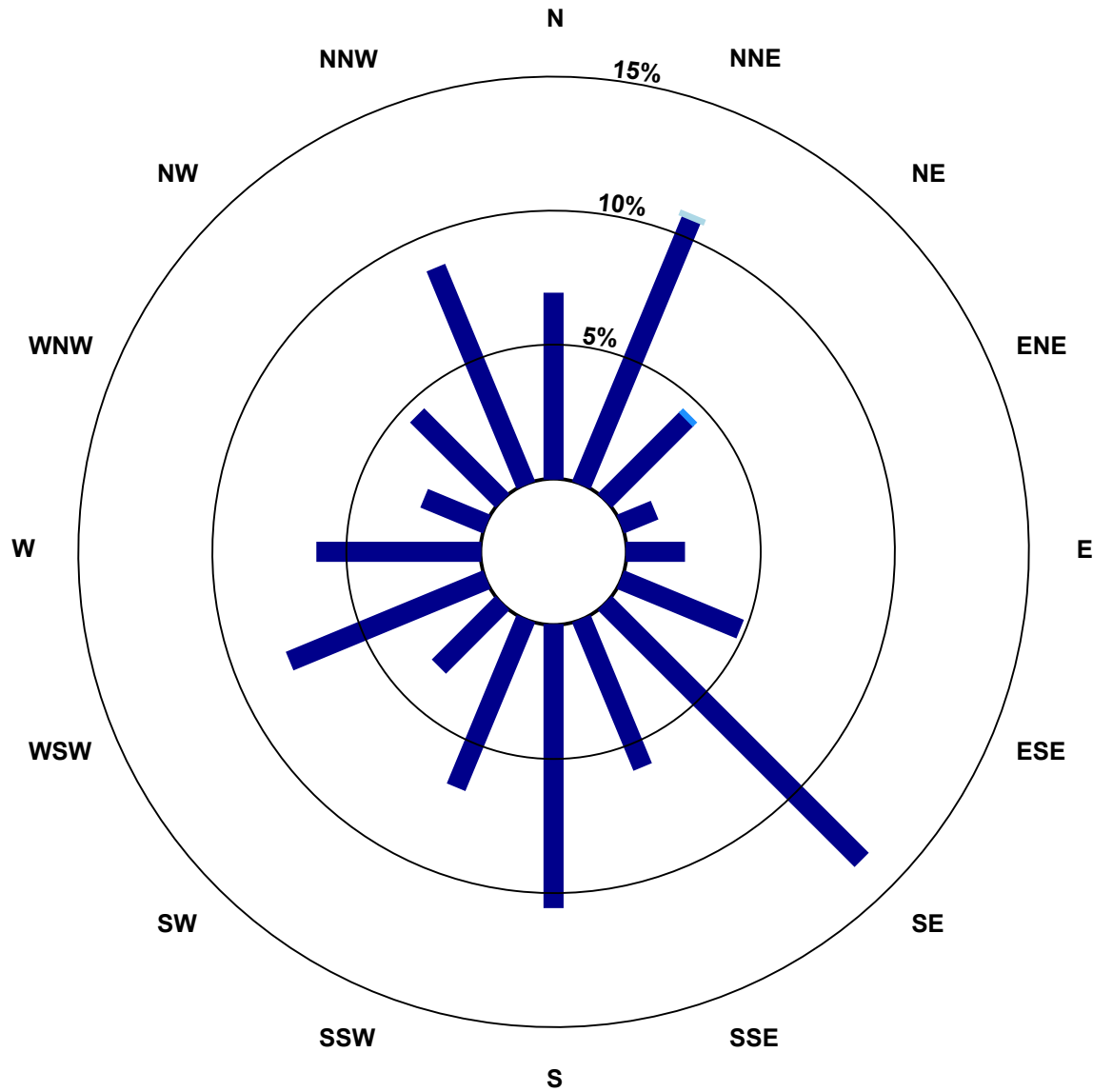
Total Number of Valid Hours: 608

Total Number of Hours: 672

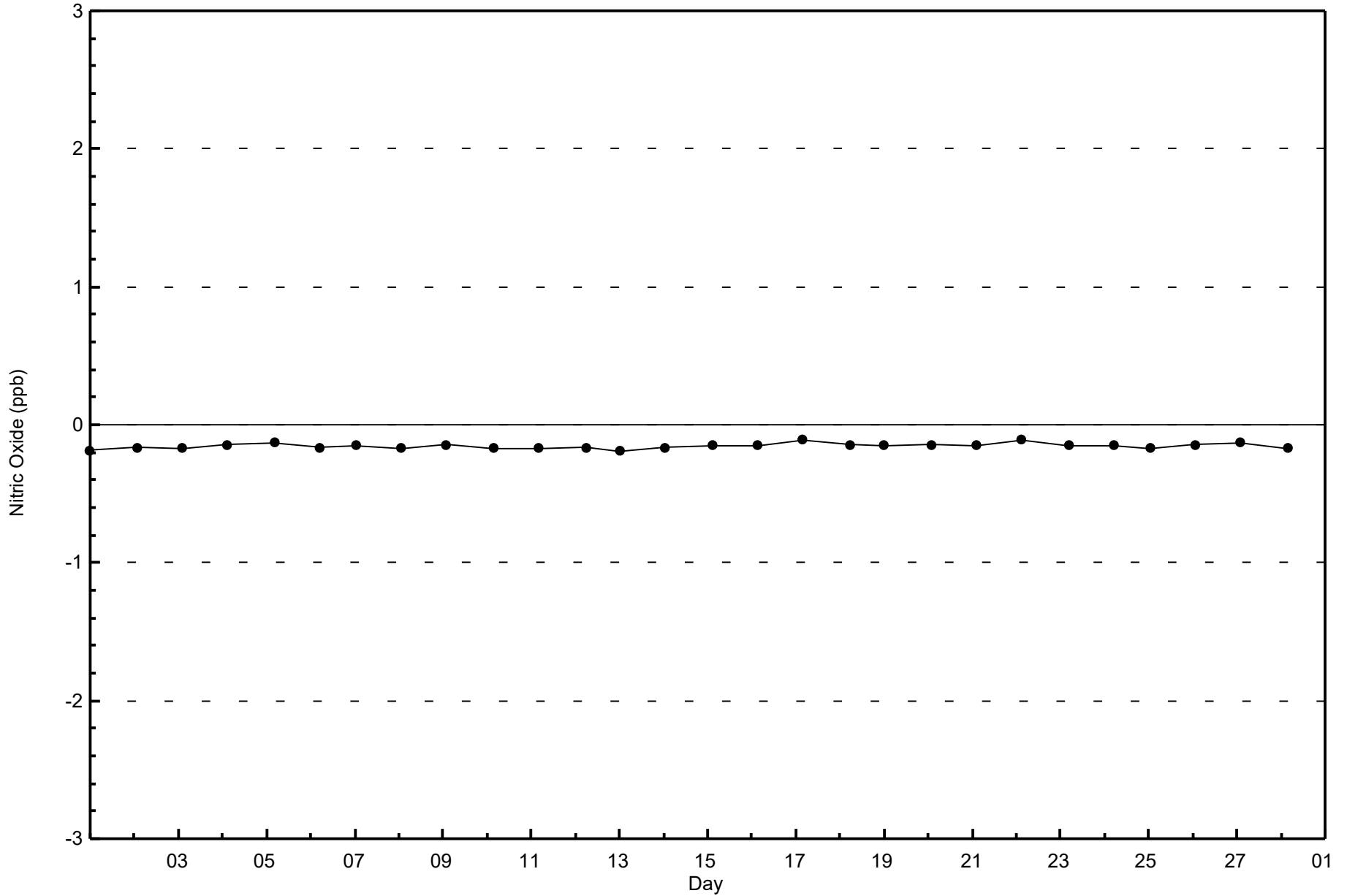


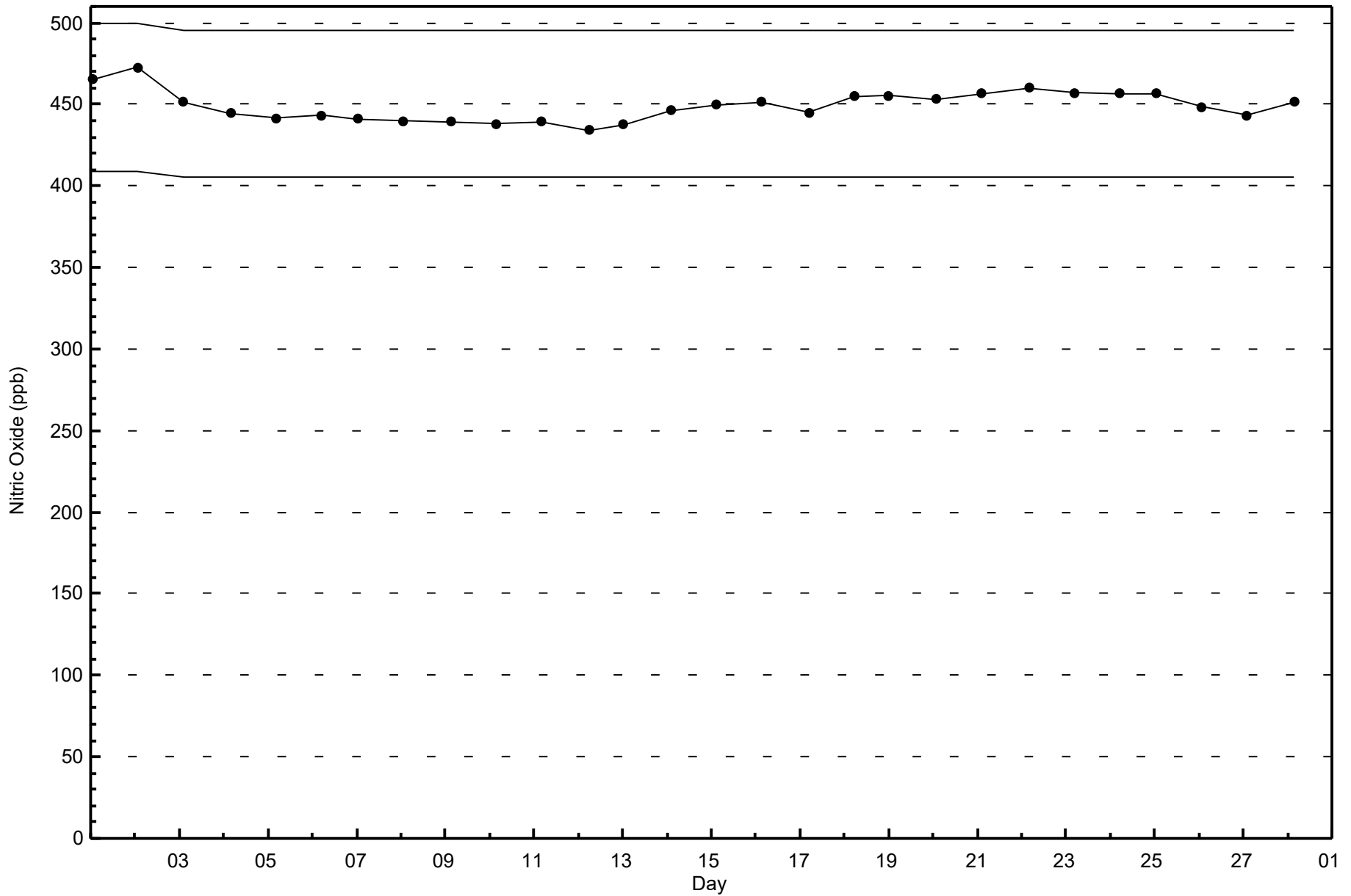
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitric Oxide (NO) - ppb  
Mackay River



Total Number of Valid Hours: 608







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

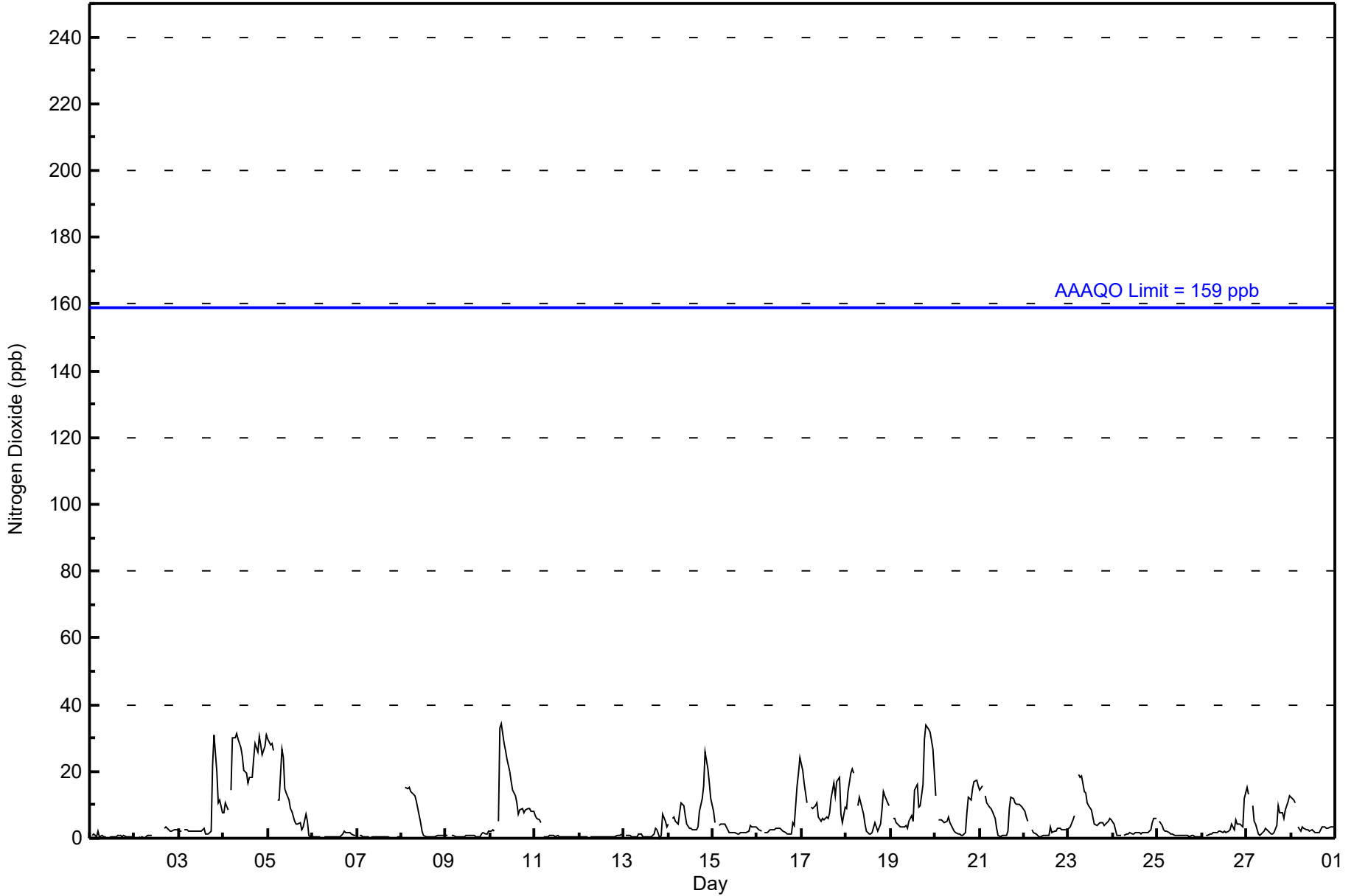
**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Mackay River - February 2023**

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 34.3 ppb on Feb 10 07:00	Maximum Daily Average: 22.9 ppb on Feb 4		Hours of Data:	638
Minimum Value: 0.2 ppb on Feb 1 10:00	Minimum Daily Average: 0.4 ppb on Feb 7		Hours of Missing Data:	34
Maximum Diurnal Average: 7.8 ppb at hour 21	Minimum Diurnal Average: 2.9 ppb at hour 16		Hours of Calibration:	34
Monthly Average: 5.62 ppb	Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.8 Median = 2.5 Q <sub>3</sub> = 7.8 P <sub>90</sub> = 15.7 P <sub>99</sub> = 30.9		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-Feb	Z	0.9	1.3	0.4	2.3	0.3	0.7	0.4	0.5	0.2	0.2	0.3	0.3	0.6	0.6	0.8	0.8	0.5	0.8	0.6	0.6	0.5	0.5	0.6	0.6	2.3
2-Feb	0.5	Z	0.3	0.2	0.3	0.2	0.4	0.9	0.9	0.9	C	C	C	C	C	C	2.8	3.2	2.7	2.2	2.1	2.5	2.5	2.4	--	3.2
3-Feb	2.3	2.3	Z	2.4	2.4	2.3	2.2	2.1	2.0	2.1	2.1	2.0	2.1	3.1	1.4	1.3	1.4	2.3	21.9	30.9	19.8	10.6	11.4	7.8	6.0	30.9
4-Feb	7.7	10.4	8.6	Z	14.2	29.9	30.2	31.2	29.6	27.2	24.7	20.4	19.4	16.7	18.1	18.3	23.6	28.4	25.8	30.4	27.9	25.1	27.6	30.9	22.9	31.2
5-Feb	29.7	28.1	28.2	26.1	Z	11.3	11.5	26.5	24.0	14.9	13.6	11.5	9.1	7.9	5.0	4.3	4.3	4.5	2.7	3.5	7.1	5.1	0.8	0.5	12.2	29.7
6-Feb	0.4	0.4	0.4	0.3	0.3	Z	0.3	0.3	0.4	0.4	0.4	0.5	0.3	0.3	0.3	0.4	1.1	2.2	1.8	1.7	1.7	1.1	0.9	0.8	0.7	2.2
7-Feb	Z	0.8	0.7	0.6	0.6	0.5	0.4	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.8
8-Feb	0.4	Z	15.3	14.9	15.2	13.8	13.2	12.8	11.2	9.1	4.8	2.0	0.9	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	5.3	15.3
9-Feb	0.8	0.8	Z	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.6	0.7	0.7	0.8	0.7	0.7	0.6	0.5	0.5	1.2	1.5	1.3	1.3	2.0	0.8	2.0
10-Feb	2.3	2.6	2.2	Z	4.9	33.2	34.3	28.4	26.4	23.8	19.8	16.9	14.5	12.9	10.4	7.4	8.6	8.7	7.6	8.3	8.8	8.7	8.2	7.9	13.3	34.3
11-Feb	6.9	5.8	5.4	4.7	Z	0.6	0.5	0.6	0.8	0.9	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.3	1.4	6.9
12-Feb	0.3	0.3	0.4	0.4	0.4	Z	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.7	1.0	1.0	1.1	0.5	1.1
13-Feb	Z	1.0	0.9	0.7	0.5	0.5	0.5	0.4	1.1	1.1	0.5	0.3	0.4	0.4	0.3	0.4	1.2	3.1	2.7	0.2	1.0	7.1	5.1	3.6	1.4	7.1
14-Feb	4.3	Z	6.0	6.2	5.1	4.2	7.5	10.7	9.9	6.8	4.4	3.0	2.8	2.7	2.6	2.4	3.2	8.0	11.7	15.8	25.8	20.7	16.7	11.7	8.4	25.8
15-Feb	8.1	4.6	Z	3.9	4.3	4.3	4.1	3.5	2.6	1.6	1.6	1.7	1.7	1.4	1.2	1.6	1.8	1.6	1.5	2.2	3.8	3.5	3.2	3.2	2.9	8.1
16-Feb	2.9	2.5	2.0	Z	1.6	1.9	2.3	2.5	2.5	2.6	2.9	3.0	2.9	2.6	2.2	1.5	1.3	1.2	1.2	4.7	3.8	15.8	19.5	24.2	4.7	24.2
17-Feb	20.4	16.7	13.4	10.8	Z	9.5	8.9	9.8	10.8	6.4	5.0	5.9	5.5	6.5	5.9	7.6	11.7	16.4	12.5	16.9	18.3	7.4	4.8	9.4	10.5	20.4
18-Feb	9.1	14.0	19.4	20.6	19.4	Z	9.6	12.1	10.5	7.3	4.1	2.0	1.4	1.4	1.8	4.7	3.2	2.0	4.1	8.4	13.9	12.9	10.8	9.7	8.8	20.6
19-Feb	Z	6.1	6.0	4.6	3.7	3.4	3.2	3.6	3.8	3.0	5.1	6.6	5.0	14.2	16.2	9.3	9.7	16.3	29.5	34.0	32.5	31.6	29.4	26.8	13.2	34.0
20-Feb	12.6	Z	5.4	5.7	5.1	4.5	5.1	6.2	4.8	2.9	2.3	1.5	1.3	1.3	0.8	0.8	1.8	7.8	12.1	11.4	14.7	16.8	17.2	15.7	6.9	17.2
21-Feb	14.3	15.8	Z	12.7	10.6	9.4	8.9	8.0	5.8	2.8	0.7	0.6	0.8	0.8	0.9	2.1	8.9	12.2	11.7	10.5	10.0	10.1	9.7	9.2	7.7	15.8
22-Feb	8.0	6.3	4.9	Z	2.5	1.8	1.2	0.8	0.5	0.6	0.7	0.7	0.7	0.9	3.5	1.7	2.2	2.2	2.8	3.0	2.6	2.4	2.5	2.7	2.4	8.0
23-Feb	2.8	3.6	5.6	6.7	Z	19.1	18.4	18.7	14.0	13.6	10.6	9.7	8.4	6.5	4.1	3.8	4.2	4.7	4.5	4.0	4.2	5.1	6.0	5.5	8.0	19.1
24-Feb	4.1	2.5	1.0	0.7	0.8	Z	1.0	1.2	1.3	1.5	1.2	1.3	1.6	1.7	1.6	1.2	1.6	1.7	1.7	1.7	2.6	4.6	5.9	6.1	2.1	6.1
25-Feb	Z	5.1	4.0	2.7	2.3	2.0	1.6	1.4	1.2	0.9	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.7	0.7	0.6	0.6	0.5	0.5	1.3	5.1
26-Feb	0.6	Z	0.9	1.0	1.2	1.2	1.5	1.8	1.6	2.2	2.1	1.8	2.3	1.6	2.1	2.6	4.3	2.6	5.5	4.3	4.3	3.7	3.5	11.7	2.8	11.7
27-Feb	15.3	13.1	Z	9.8	5.0	4.2	1.2	0.9	1.3	2.1	2.8	2.7	1.8	1.4	1.4	1.5	3.8	9.6	7.8	7.6	6.0	8.4	10.9	12.8	5.7	15.3
28-Feb	12.2	11.4	10.6	Z	3.4	2.3	3.3	3.0	2.7	2.5	2.0	2.4	2.1	1.8	1.6	1.7	2.4	3.2	3.2	3.1	3.1	3.5	3.5	3.3	3.8	12.2
7.2 6.7 6.2 6.0 4.5 6.7 6.2 6.7 6.1 5.0 4.2 3.7 3.3 3.3 3.2 2.9 3.8 5.2 6.4 7.5 7.8 7.6 7.3 7.6																								Diurnal Average		
29.7 28.1 28.2 26.1 19.4 33.2 34.3 31.2 29.6 27.2 24.7 20.4 19.4 16.7 18.1 18.3 23.6 28.4 29.5 34.0 32.5 31.6 29.4 30.9																								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  
Mackay River - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	601	94.20	94.20
21 - 40	37	5.80	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: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Mackay River - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	37	47	24	7	10	29	82	36	64	41	20	48	37	15	25	49	571
21 - 40	5	19	3	1	3	0	0	0	0	0	0	0	0	0	2	4	37
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>	42	66	27	8	13	29	82	36	64	41	20	48	37	15	27	53	608

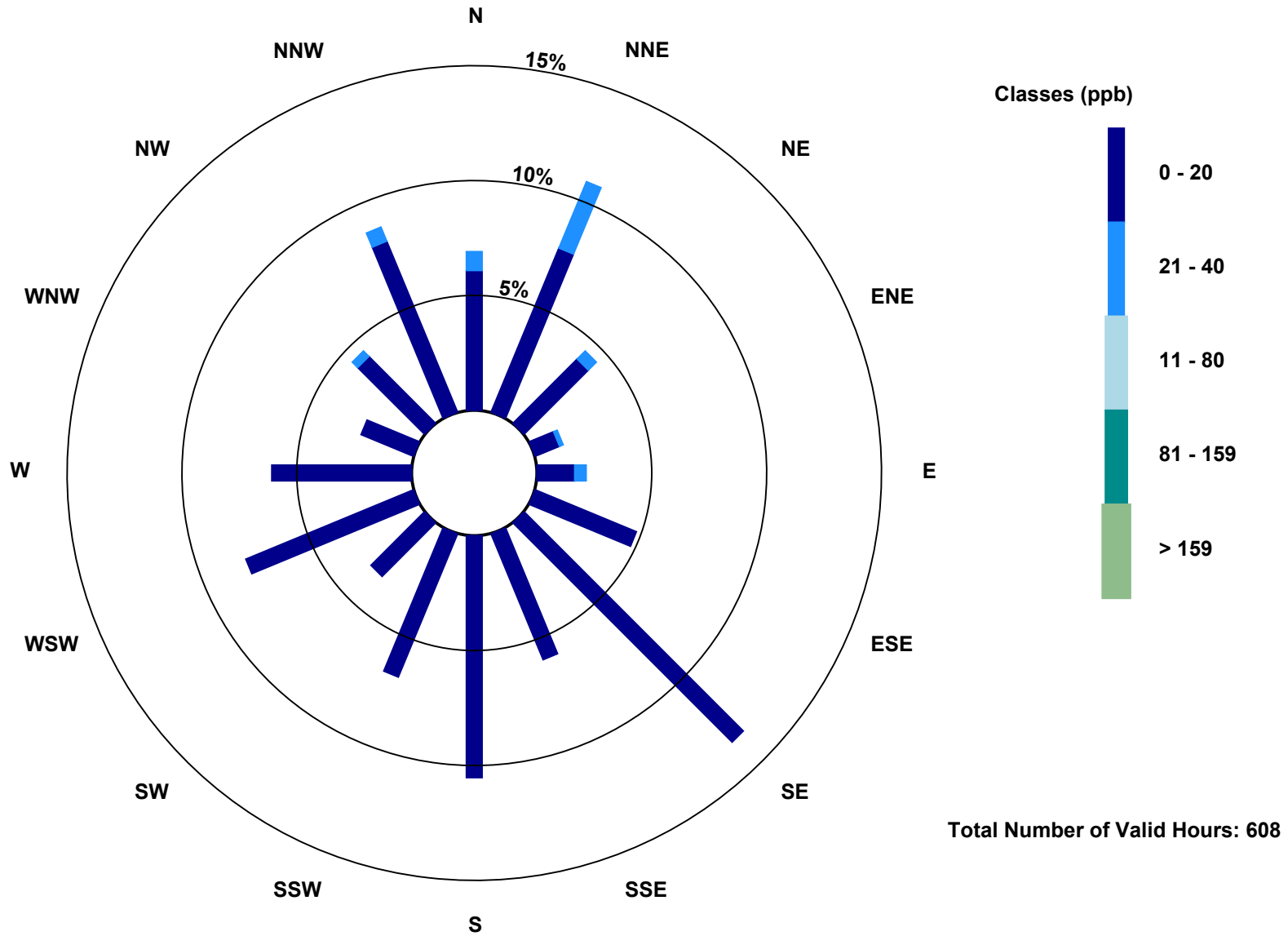
Total Number of Valid Hours: 608

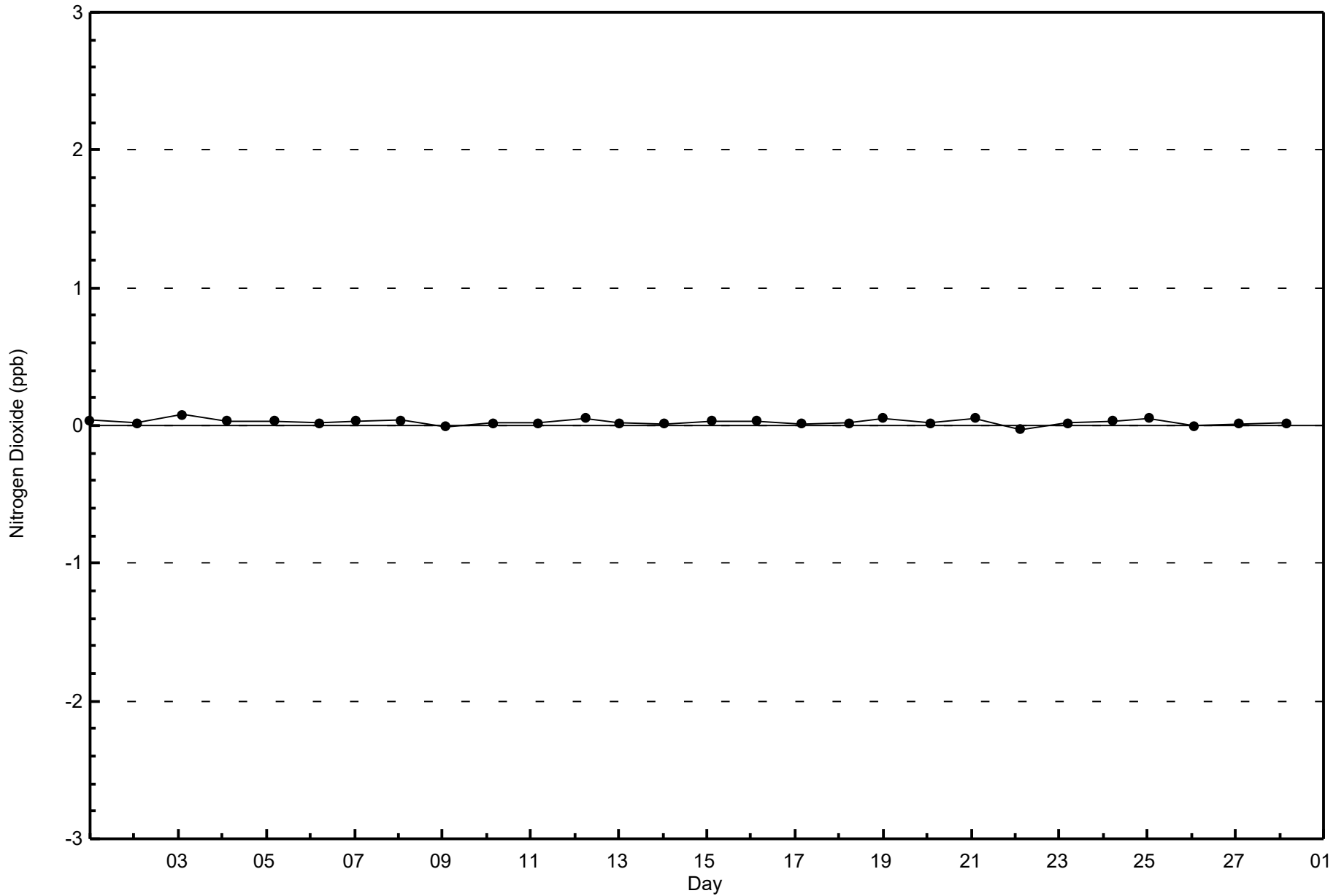
Total Number of Hours: 672

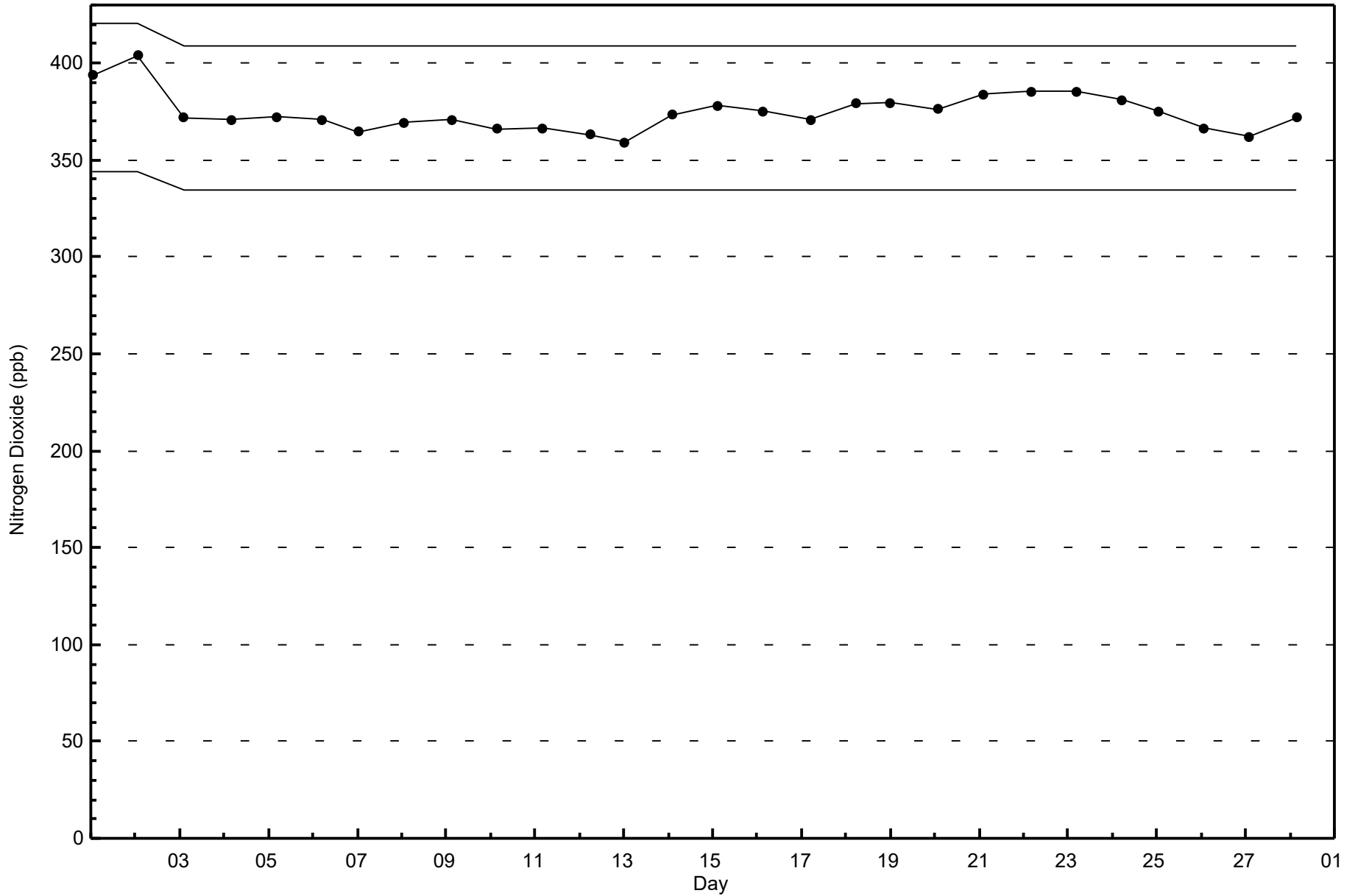


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









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

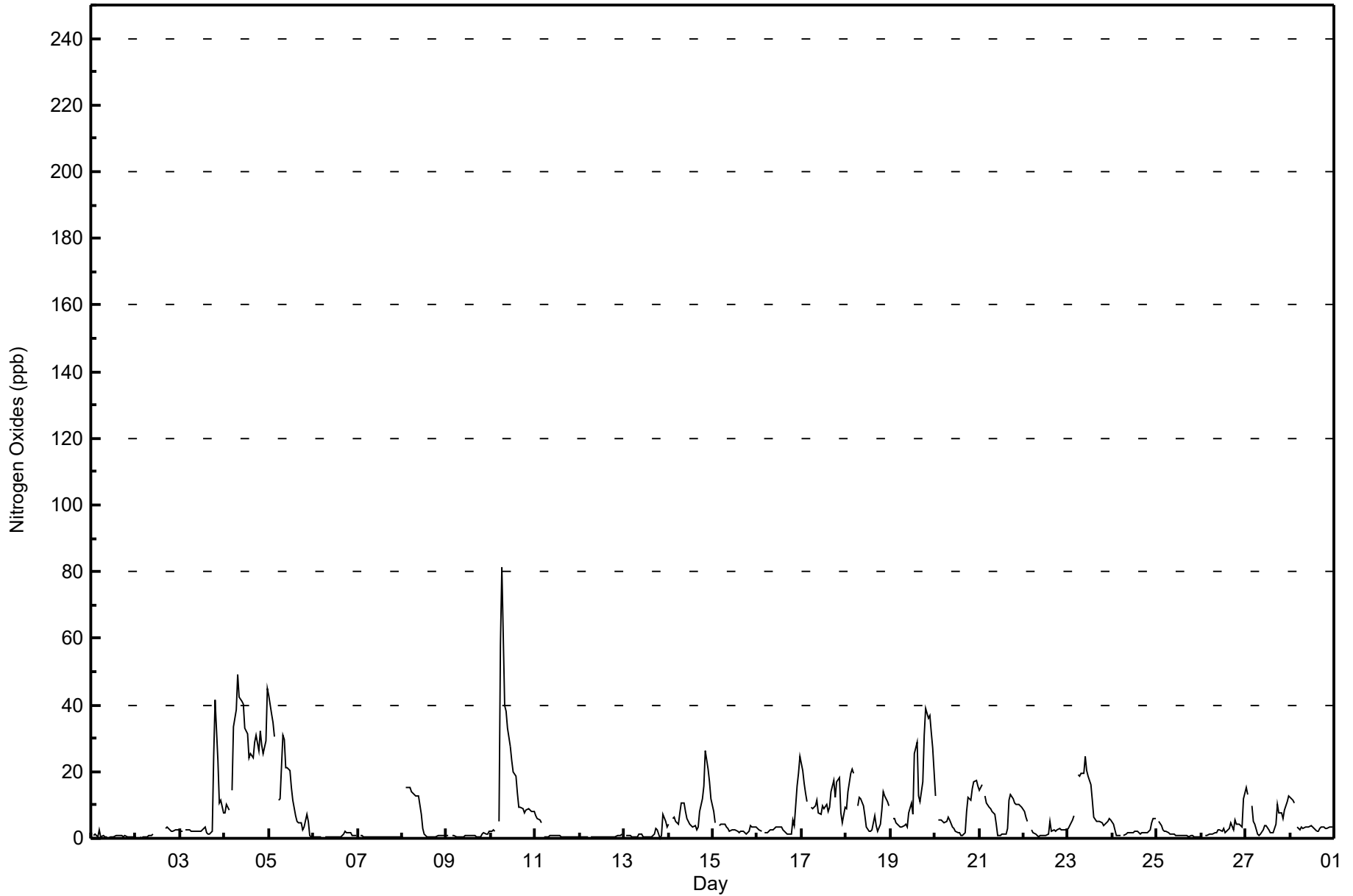
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Mackay River - February 2023**

Maximum Value: 81.2 ppb on Feb 10 07:00																				Maximum Daily Average: 29.1 ppb on Feb 4					Hours in Service:	672
Minimum Value: 0.2 ppb on Feb 2 04:00																				Minimum Daily Average: 0.4 ppb on Feb 7					Hours of Data:	638
Maximum Diurnal Average: 8.2 ppb at hour 7																				Minimum Diurnal Average: 3.7 ppb at hour 16					Hours of Missing Data:	34
Monthly Average: 6.55 ppb																				Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.5 Q <sub>1</sub> = 0.9 Median = 2.7 Q <sub>3</sub> = 8.3 P <sub>90</sub> = 17.8 P <sub>99</sub> = 41.2					Hours of Calibration:	34
																									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-Feb	Z	0.9	1.3	0.4	2.6	0.3	0.7	0.4	0.5	0.2	0.2	0.3	0.4	0.9	0.7	1.0	0.8	0.5	0.8	0.6	0.6	0.5	0.5	0.6	0.7	2.6
2-Feb	0.5	Z	0.3	0.2	0.3	0.2	0.4	0.9	1.0	1.1	C	C	C	C	C	C	2.9	3.2	2.7	2.2	2.1	2.5	2.5	2.4	--	3.2
3-Feb	2.3	2.3	Z	2.4	2.4	2.3	2.2	2.1	2.0	2.2	2.3	2.3	2.4	3.6	1.6	1.4	1.4	2.3	24.7	41.4	23.2	10.6	11.4	7.8	6.8	41.4
4-Feb	7.7	10.4	8.6	Z	14.2	33.5	38.6	42.3	42.3	40.9	40.1	33.2	31.3	24.2	25.2	24.3	28.7	30.9	26.4	32.1	28.2	25.2	29.3	44.8	29.1	49.2
5-Feb	42.6	37.3	34.9	30.6	Z	11.3	11.8	31.1	29.5	21.1	21.1	20.5	15.1	11.5	7.0	5.1	4.7	4.5	2.7	3.5	7.1	5.2	0.8	0.5	15.6	42.6
6-Feb	0.4	0.4	0.4	0.3	0.3	Z	0.3	0.3	0.4	0.5	0.5	0.6	0.3	0.3	0.3	0.4	1.1	2.2	1.8	1.7	1.7	1.1	0.9	0.8	0.7	2.2
7-Feb	Z	0.8	0.7	0.6	0.6	0.5	0.4	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.8
8-Feb	0.4	Z	15.4	15.0	15.3	13.9	13.3	12.9	12.8	12.7	7.4	2.9	1.1	0.6	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	5.7	15.4
9-Feb	0.8	0.8	Z	0.8	0.7	0.6	0.6	0.5	0.5	0.6	0.7	0.8	0.8	0.9	0.8	0.7	0.6	0.5	0.5	1.2	1.5	1.3	1.3	2.0	0.8	2.0
10-Feb	2.3	2.6	2.2	Z	5.0	58.1	81.2	40.0	37.9	33.2	27.4	23.2	19.9	18.7	13.7	9.1	9.4	8.9	7.6	8.3	8.8	8.7	8.2	7.9	19.2	81.2
11-Feb	6.9	5.9	5.4	4.7	Z	0.6	0.5	0.6	0.8	1.0	0.9	0.8	0.8	0.7	0.6	0.6	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.3	1.5	6.9
12-Feb	0.3	0.3	0.4	0.4	0.4	Z	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.7	1.0	1.0	1.1	0.6	1.1
13-Feb	Z	1.0	0.9	0.7	0.5	0.5	0.5	0.4	1.3	1.2	0.5	0.3	0.4	0.5	0.3	0.5	1.3	3.1	2.7	0.2	1.0	7.1	5.1	3.6	1.5	7.1
14-Feb	4.3	Z	6.0	6.2	5.1	4.2	7.5	10.8	10.5	8.2	5.9	4.1	3.7	3.6	3.6	2.7	3.4	8.1	11.7	15.8	26.2	20.8	16.8	11.7	8.7	26.2
15-Feb	8.1	4.6	Z	3.9	4.3	4.3	4.1	3.5	3.0	2.2	2.4	2.6	2.7	2.1	1.7	2.1	2.1	1.6	1.5	2.2	3.8	3.5	3.2	3.2	3.2	8.1
16-Feb	2.9	2.5	2.0	Z	1.6	1.9	2.3	2.5	2.7	3.1	3.3	3.5	3.4	3.2	2.5	1.7	1.4	1.2	1.2	5.3	4.0	15.8	19.7	24.5	4.9	24.5
17-Feb	20.5	16.7	13.4	10.8	Z	9.5	8.9	9.8	11.5	7.6	7.0	9.7	8.7	10.0	8.1	9.3	14.1	17.5	12.5	16.9	18.3	7.4	4.8	9.4	11.4	20.5
18-Feb	9.1	14.0	19.5	20.8	19.5	Z	9.6	12.2	11.7	9.8	6.7	3.3	2.2	2.2	2.7	6.8	3.9	2.1	4.1	8.4	13.9	12.9	10.8	9.7	9.4	20.8
19-Feb	Z	6.1	6.0	4.6	3.7	3.4	3.2	3.6	4.1	3.6	7.7	10.5	7.4	25.3	28.6	12.8	11.2	17.0	30.8	38.8	35.9	36.8	31.8	27.3	15.7	38.8
20-Feb	12.7	Z	5.4	5.7	5.1	4.5	5.1	6.3	5.4	3.5	2.9	2.0	1.8	1.6	1.0	0.9	1.9	8.1	12.1	11.4	14.7	16.8	17.3	15.8	7.0	17.3
21-Feb	14.4	15.9	Z	12.7	10.6	9.4	8.9	8.2	7.4	4.1	1.0	0.9	1.2	1.2	1.3	2.9	11.4	13.1	11.7	10.5	10.0	10.1	9.7	9.2	8.1	15.9
22-Feb	8.0	6.3	4.9	Z	2.5	1.8	1.2	0.8	0.5	0.7	0.9	0.9	0.9	1.2	5.1	2.2	2.5	2.3	2.8	3.0	2.6	2.4	2.5	2.7	2.5	8.0
23-Feb	2.8	3.6	5.6	6.7	Z	19.2	18.5	19.5	19.7	24.7	20.4	18.7	16.0	11.6	6.4	5.3	5.0	5.0	4.5	4.0	4.2	5.1	6.0	5.5	10.3	24.7
24-Feb	4.1	2.5	1.0	0.7	0.8	Z	1.0	1.2	1.5	1.9	1.6	1.7	2.2	2.2	1.9	1.4	1.8	1.8	1.7	1.7	2.6	4.6	5.9	6.1	2.2	6.1
25-Feb	Z	5.1	4.0	2.7	2.3	2.0	1.6	1.4	1.3	1.1	0.9	0.9	0.9	0.9	0.9	0.9	0.7	0.7	0.6	0.7	0.6	0.6	0.5	0.5	1.4	5.1
26-Feb	0.6	Z	0.9	1.0	1.2	1.2	1.5	1.8	1.7	2.5	2.4	2.1	2.8	1.8	2.4	3.0	4.6	2.7	5.5	4.3	4.3	3.7	3.5	11.7	2.9	11.7
27-Feb	15.3	13.1	Z	9.8	5.0	4.2	1.2	0.9	1.4	2.5	3.7	3.9	2.6	1.7	1.8	1.9	4.3	10.2	7.8	7.6	6.0	8.4	10.9	12.8	6.0	15.3
28-Feb	12.3	11.5	10.6	Z	3.4	2.3	3.3	3.1	3.2	3.6	3.2	3.8	3.3	2.8	2.3	2.2	2.8	3.4	3.2	3.1	3.1	3.5	3.5	3.3	4.2	12.3
																				7.8 7.2 6.5 6.2 4.5 7.9 8.2 8.0 7.7 6.9 6.4 5.7 4.9 5.0 4.5 3.7 4.4 5.5 6.6 8.1 8.1 7.7 7.5 8.1					Diurnal Average	
																				42.6 37.3 34.9 30.6 19.5 58.1 81.2 49.2 42.3 40.9 40.1 33.2 31.3 25.3 28.6 24.3 28.7 30.9 30.8 41.4 35.9 36.8 31.8 44.8					Diurnal Maximum	
Z - zerospan																				C - Calibration						



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

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Mackay River - February 2023**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Mackay River - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	588	92.16	92.16
21 - 40	42	6.58	98.75
41 - 80	7	1.10	99.84
81 - 159	0	0.00	99.84
> 159	0	0.00	99.84

Total Number of Valid Hours: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Mackay River - February 2023**

<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	34	43	21	7	9	29	82	36	64	41	20	48	37	15	25	47	558
21 - 40	7	18	4	1	4	0	0	0	0	0	0	0	0	0	2	6	42
11 - 80	1	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	7
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>	42	65	27	8	13	29	82	36	64	41	20	48	37	15	27	53	607

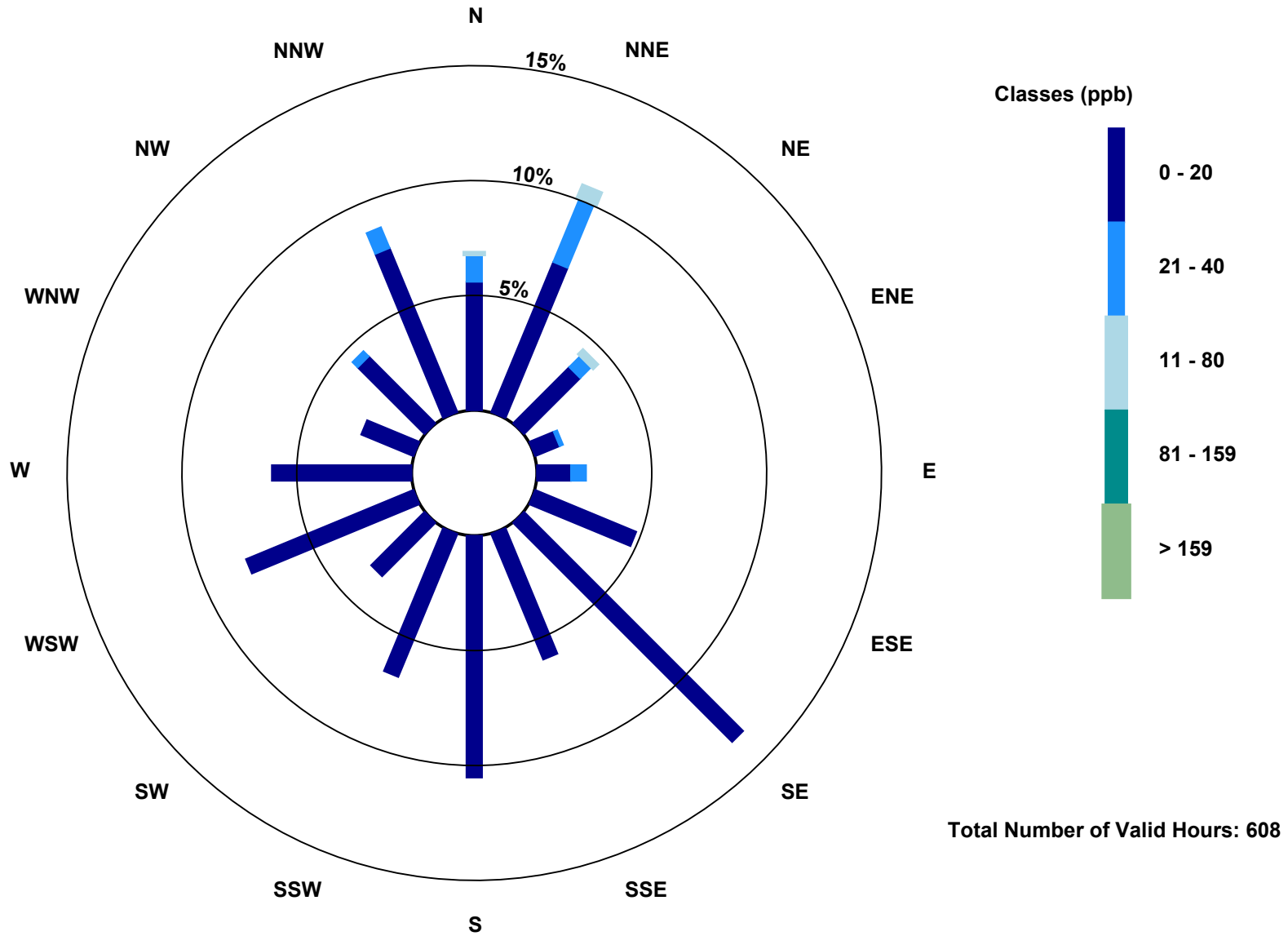
Total Number of Valid Hours: 608

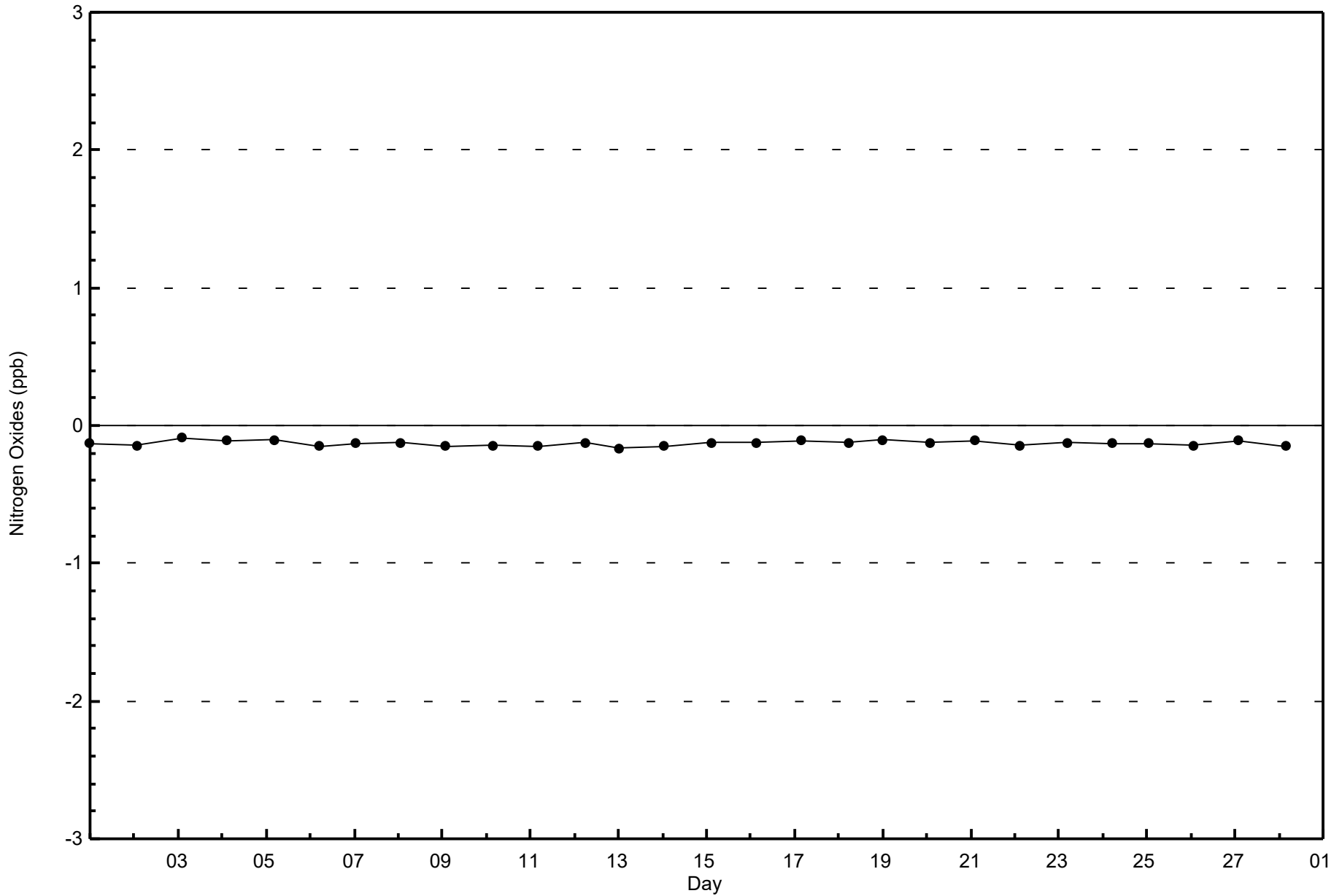
Total Number of Hours: 672

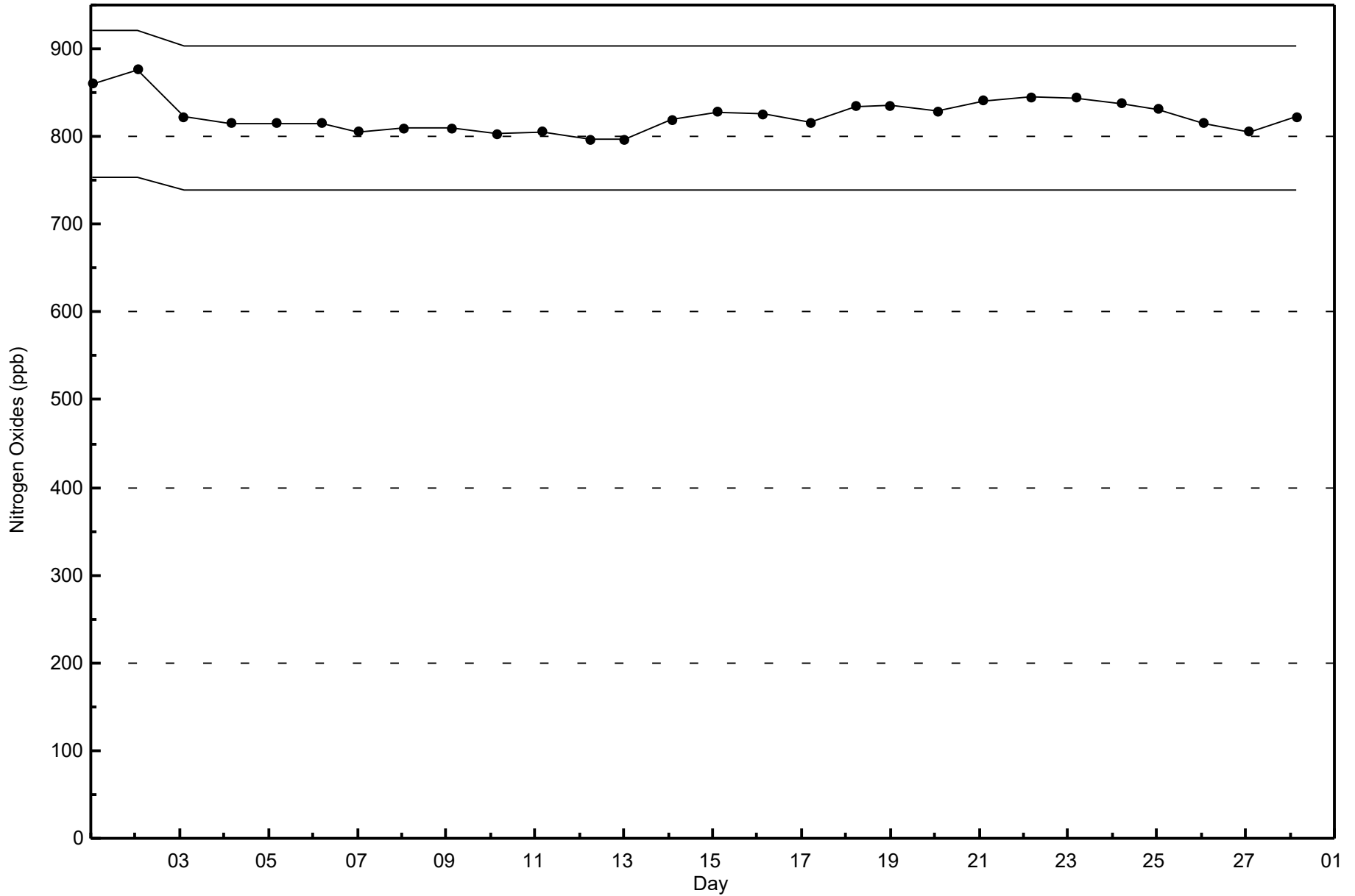


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









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

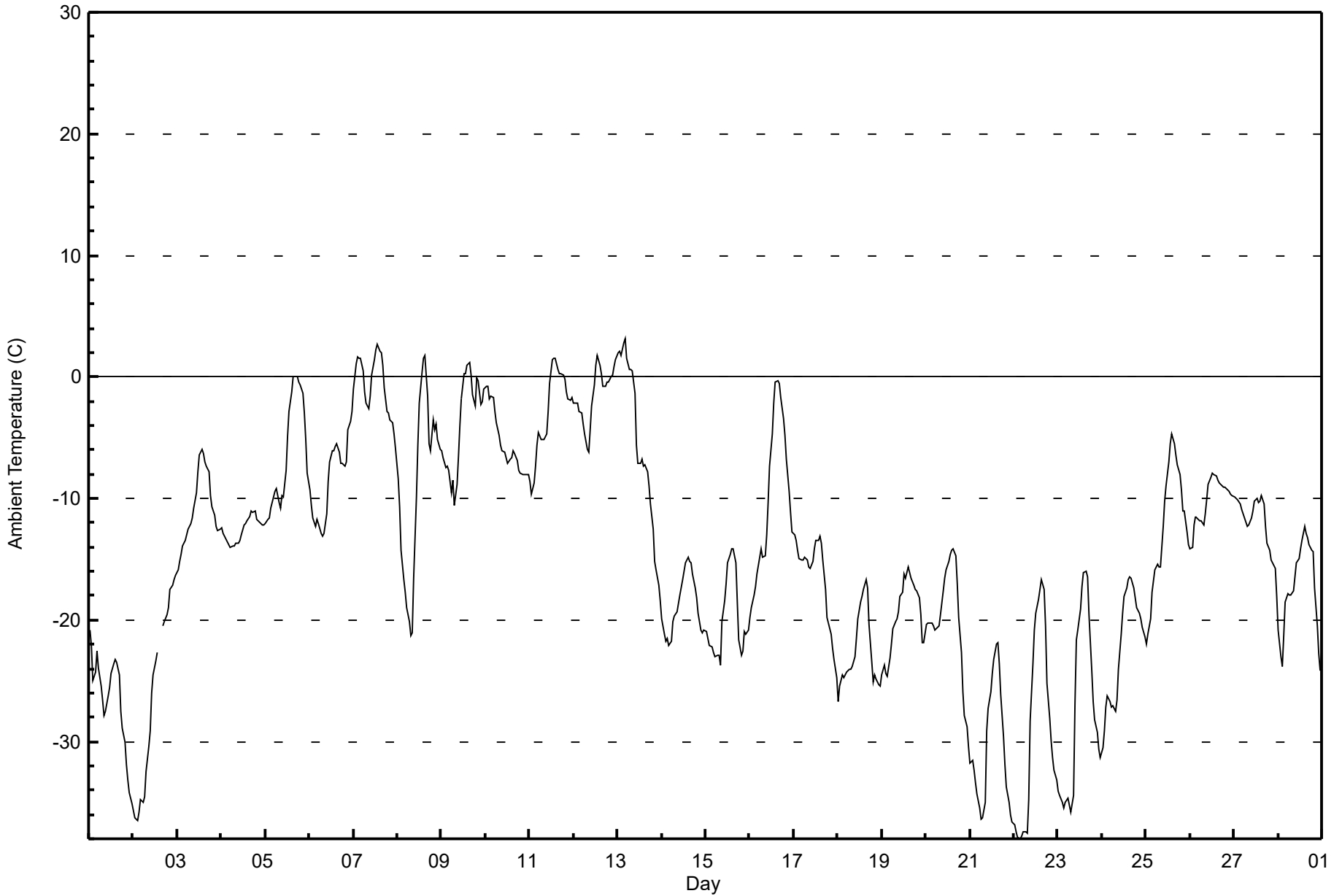
**Ambient Temperature (AT) - C**  
**Mackay River - February 2023**

Maximum Value: 3.2 C on Feb 13 05:00		Maximum Daily Average: -0.6 C on Feb 7		Hours in Service: 672																							
Minimum Value: -37.9 C on Feb 22 04:00		Minimum Daily Average: -30.5 C on Feb 21		Hours of Data: 670																							
Maximum Diurnal Average: -9.3 C at hour 15		Minimum Diurnal Average: -17.5 C at hour 8		Hours of Missing Data: 2																							
Monthly Average: -14.56 C		Percentiles: P <sub>1</sub> = -37.0 P <sub>10</sub> = -27.5 Q <sub>1</sub> = -21.0 Median = -14.1 Q <sub>3</sub> = -7.1 P <sub>90</sub> = -1.2 P <sub>99</sub> = 2.0		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-Feb	-20.8	-22.1	-25.0	-24.3	-22.5	-23.9	-25.5	-26.5	-27.9	-27.5	-26.2	-25.5	-24.4	-23.5	-23.2	-23.4	-24.5	-27.5	-28.9	-30.0	-31.8	-33.2	-34.2	-35.1	-26.6	-20.8	
2-Feb	-35.7	-36.3	-36.5	-35.8	-34.8	-35.0	-34.5	-32.5	-30.4	-29.1	-26.0	-24.5	-23.4	-22.7	M	M	-20.5	-20.2	-19.6	-18.9	-17.5	-17.1	-16.7	-16.4	-26.5	-16.4	
3-Feb	-15.8	-15.2	-14.6	-13.9	-13.5	-13.0	-12.5	-12.1	-11.6	-10.8	-9.5	-7.8	-6.4	-6.0	-6.3	-6.9	-7.3	-7.8	-9.8	-10.7	-11.3	-12.3	-12.6	-12.5	-10.9	-6.0	
4-Feb	-12.4	-12.9	-13.3	-13.6	-13.8	-14.0	-13.9	-13.9	-13.7	-13.7	-13.5	-13.0	-12.2	-12.1	-11.8	-11.4	-11.1	-11.1	-11.0	-11.7	-11.8	-11.9	-12.2	-12.2	-12.6	-11.0	
5-Feb	-12.0	-11.7	-11.6	-10.8	-9.9	-9.5	-9.2	-10.4	-10.7	-9.7	-9.9	-9.7	-9.9	-9.9	-1.2	0.0	0.0	0.0	-0.4	-0.7	-1.4	-3.0	-5.2	-7.9	-6.3	0.0	
6-Feb	-9.3	-10.5	-11.6	-12.3	-11.7	-12.1	-12.9	-13.1	-12.9	-11.3	-8.6	-7.0	-6.1	-6.1	-5.7	-5.5	-6.2	-7.1	-7.1	-7.3	-7.0	-4.4	-3.7	-2.8	-8.4	-2.8	
7-Feb	-1.0	1.0	1.7	1.5	1.5	0.5	-1.2	-2.2	-2.7	-1.6	0.2	1.4	2.2	2.7	2.2	2.0	0.9	-0.9	-2.9	-3.0	-3.6	-3.7	-4.7	-5.9	-0.6	2.7	
8-Feb	-8.4	-10.7	-14.2	-16.7	-17.7	-19.0	-20.2	-21.3	-21.1	-16.5	-9.9	-5.6	-2.1	0.4	1.6	1.8	-1.6	-5.4	-6.1	-3.5	-4.3	-3.9	-5.1	-5.9	-9.0	1.8	
9-Feb	-6.1	-6.6	-7.5	-7.4	-7.7	-9.6	-8.5	-10.6	-8.9	-6.6	-4.0	-1.8	0.2	0.2	1.0	1.2	0.2	-1.5	-2.4	-0.1	-0.3	-2.2	-2.0	-1.1	-3.8	1.2	
10-Feb	-0.8	-0.8	-1.8	-1.6	-1.7	-2.9	-3.7	-4.8	-5.6	-6.1	-6.2	-6.6	-7.1	-6.7	-6.6	-6.1	-6.4	-6.9	-7.7	-7.9	-8.0	-8.1	-8.0	-8.0	-5.4	-0.8	
11-Feb	-8.6	-9.6	-8.8	-7.3	-5.6	-4.6	-5.1	-5.1	-5.1	-4.7	-2.9	-0.6	1.4	1.5	1.6	0.7	0.3	0.2	0.1	-0.2	-1.2	-1.8	-1.9	-1.7	-2.9	1.6	
12-Feb	-2.1	-2.1	-2.1	-2.8	-3.0	-3.9	-4.7	-6.0	-6.2	-4.3	-2.4	-0.7	0.9	1.7	1.0	0.3	-0.8	-0.8	-0.4	-0.4	0.0	0.2	0.9	1.4	-1.5	1.7	
13-Feb	2.0	2.1	1.8	2.8	3.2	1.6	0.7	0.6	0.5	-1.3	-5.6	-7.1	-7.2	-6.8	-7.4	-7.2	-7.8	-8.9	-10.5	-12.6	-15.2	-15.9	-17.2	-18.4	-5.6	3.2	
14-Feb	-19.9	-21.1	-21.7	-21.5	-22.1	-21.7	-20.1	-19.7	-19.3	-18.7	-17.9	-16.6	-16.0	-15.3	-14.8	-15.1	-15.3	-16.2	-17.3	-18.2	-19.5	-20.9	-21.1	-20.8	-18.8	-14.8	
15-Feb	-20.9	-21.5	-22.1	-22.2	-22.7	-23.1	-22.9	-22.9	-23.7	-20.2	-18.4	-17.0	-15.3	-14.5	-14.2	-14.2	-15.3	-18.5	-21.7	-22.9	-22.6	-20.9	-21.2	-20.9	-20.0	-14.2	
16-Feb	-19.7	-19.0	-17.9	-17.2	-16.2	-14.9	-14.1	-14.8	-14.7	-13.0	-10.4	-7.4	-4.7	-2.2	-0.5	-0.3	-0.6	-1.7	-3.4	-4.9	-6.8	-9.4	-11.1	-12.7	-9.9	-0.3	
17-Feb	-13.0	-13.4	-14.3	-15.0	-15.0	-15.0	-14.8	-15.1	-15.7	-15.7	-15.2	-14.1	-13.4	-13.5	-13.1	-13.7	-15.1	-17.5	-19.8	-20.2	-21.2	-22.4	-23.3	-24.8	-16.4	-13.0	
18-Feb	-26.7	-25.4	-24.6	-24.7	-24.5	-24.3	-24.1	-24.0	-23.9	-23.1	-21.5	-19.9	-18.5	-18.0	-17.4	-16.7	-17.4	-20.4	-23.5	-25.1	-24.5	-24.9	-25.3	-25.4	-22.7	-16.7	
19-Feb	-24.5	-23.7	-24.4	-24.7	-23.2	-22.0	-20.7	-20.2	-19.9	-19.3	-18.1	-17.7	-16.2	-16.5	-15.7	-16.1	-16.6	-17.2	-17.5	-17.6	-18.2	-19.6	-21.9	-21.9	-19.7	-15.7	
20-Feb	-20.3	-20.2	-20.3	-20.3	-20.5	-20.9	-20.6	-20.5	-19.5	-17.6	-16.5	-15.9	-15.2	-14.6	-14.2	-14.1	-14.7	-17.0	-19.8	-22.6	-25.9	-27.9	-28.8	-30.3	-19.9	-14.1	
21-Feb	-31.8	-31.5	-32.3	-33.4	-34.3	-35.5	-36.4	-36.3	-35.0	-29.1	-27.3	-25.9	-24.4	-23.3	-22.0	-21.8	-23.5	-26.2	-29.5	-31.9	-33.8	-35.0	-36.0	-36.6	-30.5	-21.8	
22-Feb	-36.9	-37.4	-37.9	-37.9	-37.8	-37.4	-37.4	-37.5	-34.7	-28.3	-23.5	-20.9	-19.4	-18.3	-17.4	-16.7	-17.4	-20.5	-25.2	-28.1	-30.0	-31.3	-32.3	-33.2	-29.1	-16.7	
23-Feb	-34.0	-34.4	-35.1	-35.4	-35.0	-34.7	-35.2	-35.9	-34.4	-26.9	-21.6	-20.9	-19.0	-17.2	-16.0	-16.0	-16.5	-19.6	-24.2	-26.7	-28.2	-29.3	-30.6	-31.3	-27.4	-16.0	
24-Feb	-30.5	-29.1	-27.2	-26.2	-26.7	-27.2	-27.1	-27.5	-26.5	-24.1	-21.2	-19.4	-18.0	-17.3	-16.7	-16.4	-16.6	-17.4	-18.2	-19.0	-19.5	-19.9	-20.6	-21.4	-22.2	-16.4	
25-Feb	-22.0	-21.2	-19.9	-17.7	-16.7	-15.9	-15.4	-15.7	-15.7	-12.3	-10.2	-9.0	-7.0	-5.5	-4.7	-5.5	-6.4	-7.2	-8.0	-9.3	-11.0	-11.0	-12.8	-13.9	-12.2	-4.7	
26-Feb	-14.2	-14.1	-12.2	-11.5	-11.7	-11.8	-11.8	-12.2	-11.3	-10.1	-8.9	-8.2	-7.9	-8.0	-8.2	-8.5	-8.7	-9.0	-9.1	-9.1	-9.3	-9.4	-9.6	-9.8	-10.2	-7.9	
27-Feb	-9.9	-10.0	-10.1	-10.4	-11.0	-11.3	-11.9	-12.3	-12.1	-11.6	-11.0	-10.2	-10.0	-10.4	-10.2	-9.8	-10.4	-12.3	-13.7	-14.3	-15.1	-15.3	-15.7	-18.1	-12.0	-9.8	
28-Feb	-20.8	-23.0	-23.9	-21.2	-18.5	-17.8	-17.9	-18.0	-17.6	-16.5	-15.3	-14.9	-14.1	-13.4	-12.2	-12.9	-13.2	-13.8	-14.2	-14.4	-17.4	-20.5	-22.8	-24.2	-17.4	-12.2	
		-17.0	-17.2	-17.4	-17.2	-16.9	-17.1	-17.2	-17.5	-17.1	-15.3	-13.6	-12.3	-11.0	-10.3	-9.3	-9.4	-10.4	-11.9	-13.3	-14.0	-14.9	-15.5	-16.3	-16.8	Diurnal Average	
		2.0	2.1	1.8	2.8	3.2	1.6	0.7	0.6	0.5	-1.3	0.2	1.4	2.2	2.7	2.2	2.0	0.9	0.2	0.1	-0.1	0.0	0.2	0.9	1.4	Diurnal Maximum	
M - Maintenance																											



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

**Ambient Temperature (AT) - C**  
**Mackay River - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Mackay River - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	197	29.40	29.40
-20 - 0	428	63.88	93.28
0 - 10	45	6.72	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 670

Total Number of Hours: 672





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

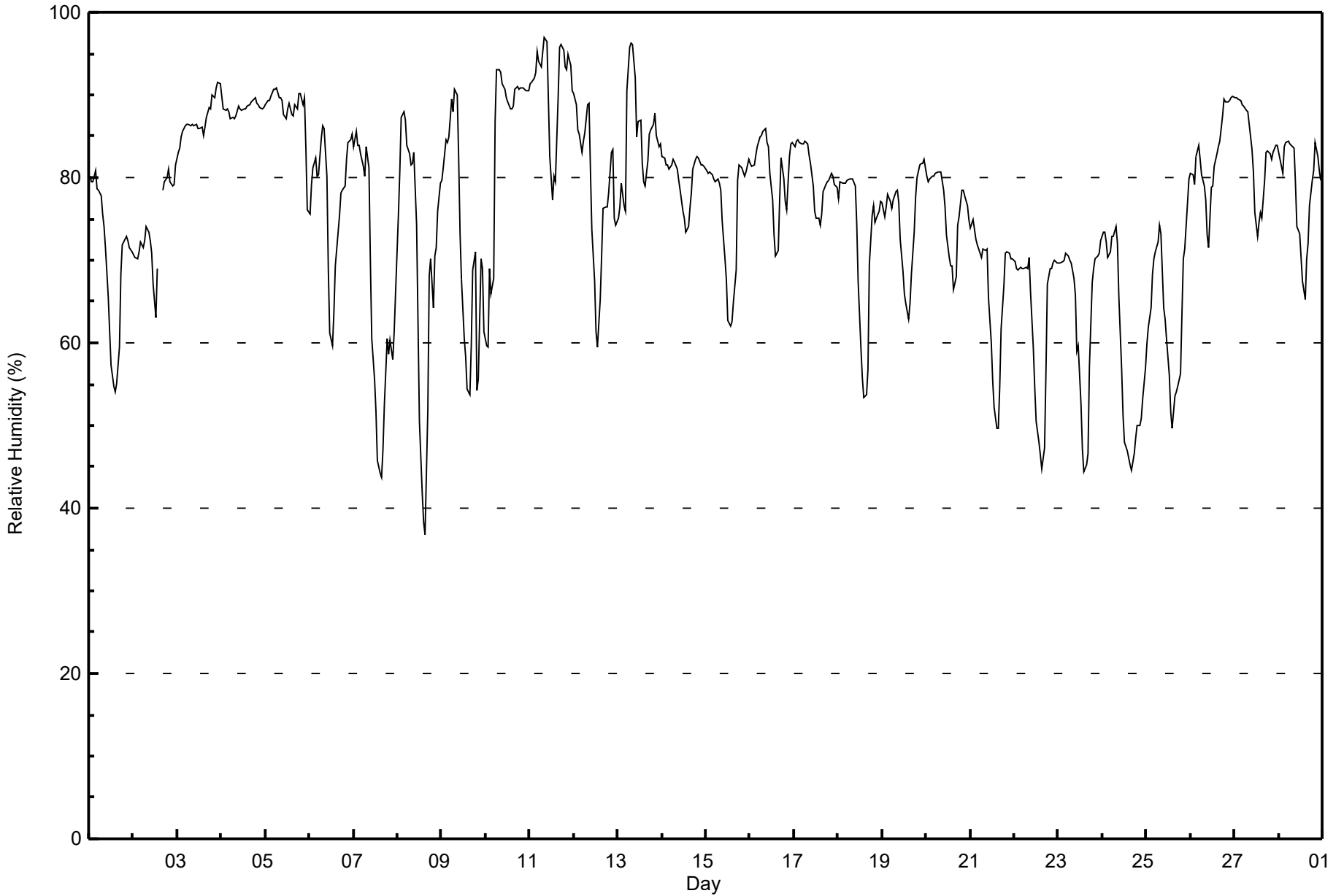
**Relative Humidity (RH) - %**  
**Mackay River - February 2023**

Maximum Value: 97.0 % on Feb 11 09:00      Maximum Daily Average: 91.3 % on Feb 11																						Hours in Service: 672 Hours of Data: 670																									
Minimum Value: 36.8 % on Feb 8 16:00      Minimum Daily Average: 58.8 % on Feb 24 Maximum Diurnal Average: 82.4 % at hour 8      Minimum Diurnal Average: 65.2 % at hour 15 Monthly Average: 76.21 %      Percentiles: P <sub>1</sub> = 44.7 P <sub>10</sub> = 59.2 Q <sub>1</sub> = 70.1 Median = 79.1 Q <sub>3</sub> = 84.3 P <sub>90</sub> = 89.4 P <sub>99</sub> = 95.5																						Hours of Missing Data: 2 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-Feb	80.1	79.4	79.5	80.8	78.6	78.5	77.8	75.5	74.1	71.5	65.6	61.4	57.2	54.8	54.1	55.0	59.5	68.4	71.9	72.6	72.8	72.3	71.6	71.1	70.2	80.8																					
2-Feb	70.7	70.4	70.2	71.1	72.1	71.6	72.4	74.1	73.4	72.3	70.8	67.1	63.1	68.9	M	M	78.4	79.4	80.0	81.0	79.5	79.0	79.2	81.6	73.9	81.6																					
3-Feb	83.1	83.6	84.9	85.7	86.3	86.5	86.4	86.3	86.4	86.2	86.5	85.9	86.0	86.2	85.0	86.1	87.3	88.5	88.4	90.0	89.7	90.8	91.5	91.4	87.0	91.5																					
4-Feb	89.9	88.3	88.2	88.3	88.0	87.2	87.2	87.2	87.4	88.6	88.3	88.1	88.3	88.4	88.6	88.8	89.2	89.3	89.7	89.0	88.9	88.5	88.3	88.5	88.4	89.9																					
5-Feb	88.9	89.4	89.4	89.9	90.6	90.8	90.8	89.6	89.7	89.3	87.6	87.1	88.3	88.9	87.6	87.5	88.8	88.2	90.1	90.1	88.9	89.7	83.5	76.1	88.4	90.8																					
6-Feb	75.5	79.1	81.2	82.3	80.2	80.3	84.8	86.2	85.9	80.2	68.9	61.1	59.6	63.7	69.4	71.3	75.4	78.2	78.4	79.0	82.2	84.3	84.6	85.2	77.4	86.2																					
7-Feb	83.7	85.6	83.9	83.9	82.9	81.3	80.2	83.7	81.3	70.0	60.6	55.5	51.7	45.7	44.2	43.8	47.1	52.6	60.5	58.6	60.3	57.9	61.4	66.0	65.9	85.6																					
8-Feb	75.4	80.6	87.3	88.0	86.9	83.9	82.9	81.5	81.8	83.1	74.3	62.4	50.6	41.8	38.4	36.8	51.8	68.1	70.2	64.2	70.5	71.5	75.9	79.4	70.3	88.0																					
9-Feb	79.6	81.2	84.6	84.3	84.9	89.5	87.9	90.6	89.9	82.3	73.2	67.6	60.6	58.3	54.4	53.7	59.7	68.8	71.0	54.3	55.6	70.1	69.0	61.4	72.2	90.6																					
10-Feb	59.7	59.6	69.0	65.9	67.9	86.8	93.0	93.0	92.6	91.4	90.6	89.7	89.1	88.3	88.2	88.7	90.6	91.0	90.7	90.8	90.8	90.7	90.6	90.5	85.0	93.0																					
11-Feb	91.3	91.5	92.1	92.8	95.2	94.1	93.4	95.3	97.0	96.4	89.6	82.5	77.2	80.2	79.5	89.8	95.8	96.2	95.4	93.3	93.0	94.9	93.6	90.5	91.3	97.0																					
12-Feb	90.1	88.8	85.8	85.2	83.1	84.3	85.4	88.8	89.0	81.0	73.8	67.5	61.4	59.4	65.3	70.6	76.3	76.4	76.4	78.2	83.1	83.4	75.1	74.2	78.4	90.1																					
13-Feb	75.1	76.5	79.3	76.7	75.9	90.5	95.8	96.3	96.1	92.0	84.9	86.8	87.0	81.6	79.5	79.0	82.0	85.3	85.8	86.5	87.8	85.1	83.8	84.0	84.7	96.3																					
14-Feb	82.6	82.5	81.5	81.5	81.1	81.5	82.2	81.8	81.0	79.7	78.5	76.0	75.2	73.5	74.1	76.3	78.2	81.0	82.3	82.5	82.4	81.6	81.5	81.3	80.0	82.6																					
15-Feb	80.8	80.5	80.6	80.3	79.9	79.6	79.8	79.4	78.4	74.7	70.3	67.7	62.7	62.1	62.6	64.9	68.8	79.7	81.6	81.1	80.7	80.1	80.7	82.1	75.8	82.1																					
16-Feb	81.7	81.4	81.5	82.8	83.7	84.9	85.2	85.5	85.9	84.3	83.8	80.5	77.3	73.0	70.5	71.2	77.3	82.4	79.9	77.1	76.1	82.6	84.1	84.3	80.7	85.9																					
17-Feb	83.8	84.4	84.6	84.3	84.1	84.0	84.5	84.1	82.8	81.7	79.0	75.9	75.1	75.1	74.3	75.7	78.3	79.2	79.5	79.7	80.5	80.1	79.1	78.8	80.3	84.6																					
18-Feb	77.4	79.5	79.4	79.4	79.3	79.6	79.8	79.8	79.8	78.9	74.4	67.5	59.3	55.7	53.4	53.7	56.8	69.5	75.4	76.6	74.5	75.1	76.0	77.0	72.4	79.8																					
19-Feb	76.9	75.2	76.5	77.9	77.1	76.3	77.3	78.2	78.5	77.0	72.5	68.7	65.9	64.7	62.9	64.8	68.3	73.4	77.6	80.0	81.6	81.7	81.7	82.2	74.9	82.2																					
20-Feb	80.1	79.5	79.9	80.2	80.1	80.6	80.7	80.7	80.7	78.4	76.5	73.0	70.3	69.3	69.3	66.4	68.0	74.2	75.2	78.4	78.4	77.9	76.6	74.9	76.2	80.7																					
21-Feb	74.0	74.9	73.6	72.6	71.9	70.8	70.3	71.4	71.2	71.4	65.4	60.0	55.4	52.1	49.7	49.7	54.6	61.6	67.0	70.8	71.0	70.8	70.1	70.2	66.3	74.9																					
22-Feb	69.9	69.0	68.8	69.1	69.0	69.0	69.1	69.0	70.3	66.0	59.3	54.6	50.6	47.9	46.4	44.8	47.3	56.7	67.1	69.0	69.0	69.7	70.0	69.7	63.0	70.3																					
23-Feb	69.6	69.7	69.9	70.0	70.9	70.5	70.0	69.6	67.7	65.7	59.0	59.7	52.5	47.2	44.4	45.2	46.6	57.2	67.3	68.9	70.2	70.6	70.8	72.3	63.6	72.3																					
24-Feb	73.4	73.4	72.2	70.4	71.0	72.8	74.1	72.0	65.5	56.7	51.2	47.9	46.9	46.0	45.3	44.5	46.6	48.4	50.0	49.9	50.8	53.1	57.0	58.8	74.1																						
25-Feb	59.8	61.9	64.3	68.4	70.1	70.9	72.2	74.2	73.2	64.3	62.9	60.5	56.2	51.7	49.7	53.5	54.1	54.7	56.2	63.4	70.1	71.3	77.0	79.8	64.2	79.8																					
26-Feb	80.6	80.4	79.1	82.5	83.9	82.1	80.4	79.0	77.2	73.1	71.5	78.8	79.0	81.3	82.9	83.7	84.4	87.5	89.5	89.2	89.2	89.3	89.7	89.8	82.7	89.8																					
27-Feb	89.7	89.6	89.6	89.4	88.9	88.6	88.2	87.9	86.5	83.4	80.6	75.8	72.9	74.6	75.8	75.1	79.6	83.0	83.2	82.9	82.3	83.1	83.9	84.0	83.3	89.7																					
28-Feb	83.1	81.4	80.5	83.8	84.3	84.5	84.1	83.9	83.5	79.3	74.1	73.3	70.3	67.5	65.2	70.2	72.1	76.7	79.6	80.8	84.2	82.5	80.8	79.7	78.6	84.5																					
																						78.8	79.2	79.9	80.3	80.3	81.5	82.0	82.4	81.9	78.9	74.3	70.9	67.5	66.0	65.2	66.3	70.0	74.8	77.1	77.1	78.0	78.8	78.7	78.7	Diurnal Average	
																						91.3	91.5	92.1	92.8	95.2	94.1	95.8	96.3	97.0	96.4	90.6	89.7	89.1	88.9	88.6	89.8	95.8	96.2	95.4	93.3	93.0	94.9	93.6	91.4	Diurnal Maximum	
M - Maintenance																																															



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

**Relative Humidity (RH) - %**  
**Mackay River - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %  
Mackay River - February 2023**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	2	0.30	0.30
40 - 60	75	11.19	11.49
60 - 80	295	44.03	55.52
80 - 100	298	44.48	100.00

Total Number of Valid Hours: 670

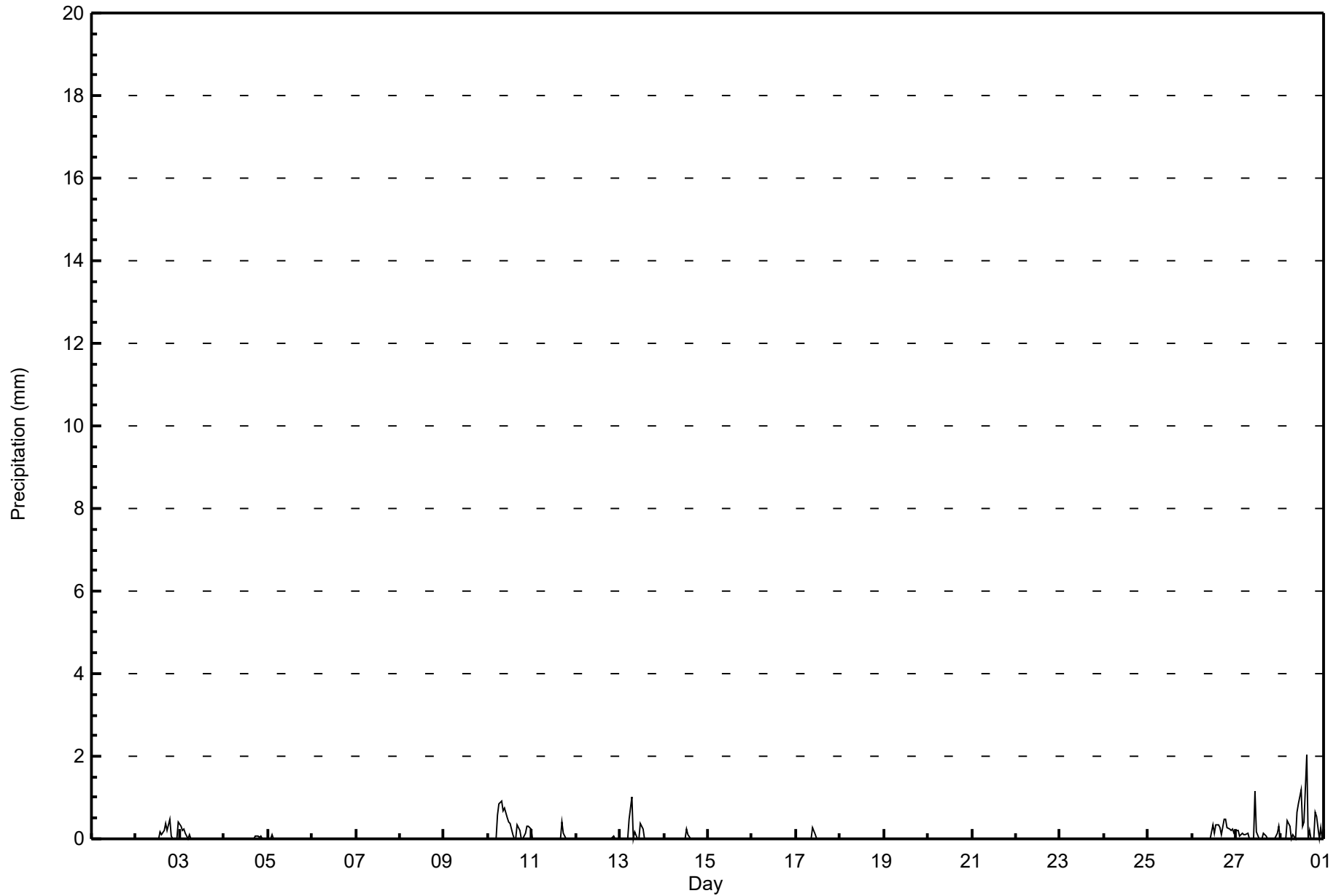
Total Number of Hours: 672





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

**Precipitation (PC) - mm**  
**Mackay River - February 2023**





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

**Precipitation (PC) - mm**  
**Mackay River - February 2023**

<b>Concentration Ranges (mm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.3	646	96.13	96.13
0.4 - 0.5	13	1.93	98.07
0.6 - 0.7	5	0.74	98.81
0.8 - 1.4	7	1.04	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: 672



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Mackay River - February 2023

Maximum Speed: 18 km/h on Feb 6 00:00	Maximum Daily Speed Average: 11.4 km/h on Feb 24	Hours in Service: 672
Minimum Speed Value: 0 km/h on Feb 23 11:00	Minimum Daily Speed Average: 0.5 km/h on Feb 22	Hours of Data: 639
Maximum Diurnal Speed Average: 2.0 km/h at hour 24	Minimum Diurnal Speed Average: 0.2 km/h at hour 17	Hours of Missing Data: 33
Monthly Average Velocity: 0.8 km/h 220.8 deg	Percentiles: P <sub>1</sub> = 0 P <sub>10</sub> = 2 Q <sub>1</sub> = 3 Median = 5 Q <sub>3</sub> = 7 P <sub>90</sub> = 10 P <sub>99</sub> = 15	Percent Operational Time: 95.1

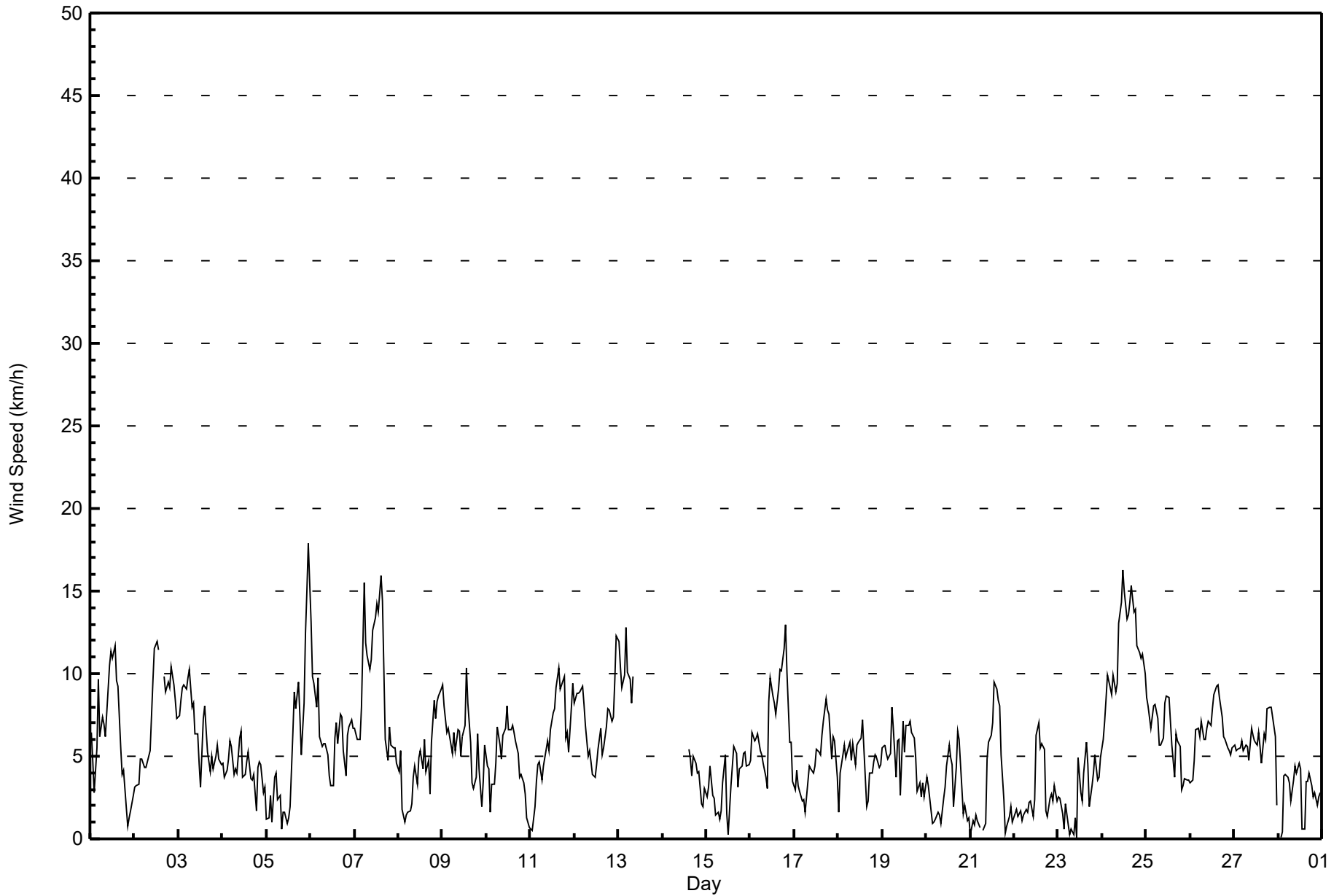
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Feb	NW6	NW5	WSW3	W5	NW10	NNW6	NW7	NW7	NNW6	NNW8	NW11	NW11	NW11	NW12	NW10	NW9	NW6	WNW4	NW4	WNW2	SE1	SSE1	SSE2	SE3	NW5.5	NW12	
2-Feb	SE3	SE3	SE3	SSE5	SE5	SE4	SE4	SSE5	SE5	SE7	SE10	SE12	SE12	ESE11	M	M	ESE10	ESE9	SE10	SE9	SSE10	SSE9	SSE8	SSE7	SE7.2	SE12	
3-Feb	SSE7	SSE8	S9	S9	SSW9	SSW10	SSW10	SSW8	SSW8	SSW6	SSW6	SW5	W3	NW7	NNW8	NNW7	N5	N4	NNE5	NE4	NE5	ENE6	E5	ESE4	SSW2.3	SSW10	
4-Feb	NNE5	NNE4	NNE4	NNE5	NNE6	NNE6	NNE4	NNE4	NNE4	NNE6	NNE7	NE4	N4	NNE5	NE5	E4	E4	E2	N4	NNE5	NNE4	N3	NNE3	NNE4.0	NNE7		
5-Feb	N1	NNW1	NNE3	NNE1	E4	ESE4	E2	NW3	ENE1	NNW2	NNE2	WNW1	SSE1	S2	S6	S9	S8	S9	SSW7	WSW5	W8WNW12	WNW15	WNW18	WSW2.2	WNW18		
6-Feb	WNW13	W10	W9	W8	W10	W6	WSW6	WSW6	W6	W5	WNW4	W3	SE3	SE6	SE7	ESE6	ESE8	SE7	ESE5	SE4	SSE6	S7	SSW7	SSW7	SW3.0	WNW13	
7-Feb	WSW7	WSW6	W6	W6	W8WNW15	W12	W11	WSW10	WSW11	WSW13	WSW13	W14	W14	W16	W14	W10	WSW6	WSW5	W7	WSW6	WSW6	WSW5	WSW5	W9.1	W16		
8-Feb	W4	NNE5	NNE2	NNE1	SSE1	SE2	SE2	SE2	SE4	SSE4	SSW3	SW5	SW5	SW4	SW6	SW4	SSW5	SSE3	SSW6	SSW8	SSW7	S8	S9	S9	SSW3.3	S9	
9-Feb	S9	S8	S6	SSW7	SSW6	SSW5	SSW6	S5	SSW7	S7	S5	S6	S7	S10	S8	SSE6	SE3	SE3	SSE4	S6	SSW4	SE2	SE3	S6	S5.6	S10	
10-Feb	SSE4	SSE4	ENE2	NE3	NE3	NE5	NNE7	NNE6	NNE5	NNE6	NNE7	NNE8	NNE7	N7	N7	N6	N6	N5	NNE4	N4	NNE3	NNE3	ENE1	S1	NNE3.8	NNE8	
11-Feb	SW1	S0	SSW2	SW3	WSW4	WSW5	WSW4	SW4	SW5	SW6	SSW5	SW7	SW8	SSW8	SW9	SW10	WSW9	WSW9	W10	W6	W6	WSW5	WSW8	WSW9	WSW5.6	SW10	
12-Feb	WSW8	WSW9	WSW9	WSW9	W9	WSW8	WSW7	WSW5	WSW5	WSW5	WSW4	WSW4	SW5	S5	S7	SE5	SE5	SE7	SE8	SE8	SSE7	SE7	SSE10	S12	SSW4.3	S12	
13-Feb	S12	S10	SSW9	SW10	WSW13	WSW10	WSW10	WSW8	WNW10	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	WSW13	
14-Feb	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	N5	N5	NNE4	NNE5	N5	N4	NNE4	NNE2	ESE2	SE3	---	N5
15-Feb	ESE3	SSE3	SSE4	SSE3	SSE2	S1	S2	S1	ESE2	SE3	SSE5	ESE1	E0	E3	SSE4	SE6	SE5	SE3	SE4	SE4	SE5	ESE5	SE4	SE4	SE3.2	SE6	
16-Feb	SE5	SE6	SE6	SE6	SE6	SE5	SE5	SE5	SE4	SE3	S8	SSW10	SSW9	SSW8	WSW8	W9	W10	WNW10	WNW11	NW13	NW10	NNE6	NNW6	NNW4	SW1.8	NW13	
17-Feb	NNW3	NNW4	NNW3	NNW3	N2	NE2	ESE2	E3	E4	E4	NE4	NE4	N5	NNE5	NNE5	N6	NNE7	NNE9	NNE8	NNE8	NNE5	NE6	NNE6	NE4	NNE4.1	NNE9	
18-Feb	NNE2	NNE4	NNE5	NNE6	NNE5	NNE5	NNE6	N5	N6	NNE5	N6	NNE6	N6	NNW7	NW5	NNE2	SE2	SE4	SE4	SE5	SE5	SE5	SSE4	SE4	NNE2.5	NNW7	
19-Feb	SE5	SE6	SE5	SE5	ESE5	ESE8	ESE7	E4	ESE6	ESE6	NNW3	N7	N5	NNW7	N7	NNW7	N6	N6	NE5	N3	NW3	N3	NNW3	NNW3	NE2.3	ESE8	
20-Feb	N4	NNW3	N2	NNW1	WNW1	SE1	S2	SSW1	W1	NNW2	NNW3	NNW4	NNW6	NNW5	N5	NW2	N4	NNE7	NNE6	NNE3	NNE2	N2	WSW1	SE1	N2.2	NNE7	
21-Feb	NE0	NNW1	W1	S1	SSE1	SE1	UO	SW0	NW1	NNW5	NW6	NNW6	NNW7	NNW10	NW9	NNW8	NNE8	NNE5	NE2	SSE0	S1	SSE1	SSE2	SSW1	NNW2.4	NNW10	
22-Feb	SSW2	SE2	S1	S2	SW1	SSW1	SW2	W2	WSW2	WSW2	NNW1	NW2	NW6	NNW7	NW6	N6	NNE5	NE2	SE1	SE2	SE3	SE2	SE3	SE2	NW0.5	NNW7	
23-Feb	SE3	SE2	ESE2	SE1	NNE2	NNW1	S0	S1	NNE0	N1	SSW0	NNW5	N3	WNW2	WSW4	WNW6	W4	SSW2	SSE3	SSE4	SE5	SE4	SSE4	S5	SSW0.7	WNW6	
24-Feb	S6	S7	S8	S10	S9	S9	S10	S9	S9	S13	S14	S16	S15	S13	S14	S14	S15	S14	S14	S12	S11	SSW11	SSW11	SSW10	S11.4	S16	
25-Feb	SSW9	SSW8	SSW7	WSW7	W8	W8	W7	WSW6	WSW6	WSW6	WSW8	W9	WSW9	W7	W6	WSW4	SSW6	S6	S6	SSE3	SE3	SE4	SE4	SE4	SW4.8	W9	
26-Feb	SE3	ESE4	ESE5	ESE7	ESE7	ESE6	ESE7	ESE6	ESE6	ESE7	E7	E7	ENE8	ENE9	NE9	ENE9	NE9	NE7	NE6	NE6	NE6	NE5	NNE5	NNE6	ENE5.6	ENE9	
27-Feb	NNE6	N5	N5	NNW5	NNW6	NNW5	NNW6	NNW6	N5	N7	N6	N6	NNW6	NNW6	NNW6	NNW5	N6	NNE6	NE8	NNE8	NE8	NE7	NE6	NE2	N5.4	NNE8	
28-Feb	UO	S0	S0	NW4	NNW4	NNW4	NNW3	NNW2	NNW4	NNW4	NNE4	NNW5	NNW4	NW1	ESE1	N3	SE3	S4	SSW3	S3	SE3	SE2	SE3	SSE3	NNW0.8	NNW5	
SSW1.8SSW1.5SSW1.6 SW1.7WSW1.5WSW1.2 SW1.4 SW1.4 SW1.1SSW0.6WSW0.8WNW1.2WNW1.4WNW1.6WNW1.9WNW1.5 E0.2 ESE0.8 SE0.8 SE0.6 SSE1.0 SE1.2 S1.5 S2.0																								Diurnal Average			
WNW13 S10 W9 S10 WSW13WNW15 W12 W11WSW10 S13 S14 S16 S15 W14 W16 W14 S15 S14 S14 NW13 S11WNW12WNW15WNW18																								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 (WS) - km/h**  
**Mackay River - February 2023**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Mackay River - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	340	53.21	53.21
6 - 11	269	42.10	95.31
12 - 19	30	4.69	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: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Mackay River - February 2023**

<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	27	44	17	4	12	15	69	27	21	13	13	19	9	6	10	34	340
6 - 11	17	26	11	4	2	16	17	10	35	29	7	29	25	4	17	20	269
12 - 19	0	0	0	0	0	0	2	0	13	0	0	3	5	5	2	0	30
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>	44	70	28	8	14	31	88	37	69	42	20	51	39	15	29	54	639

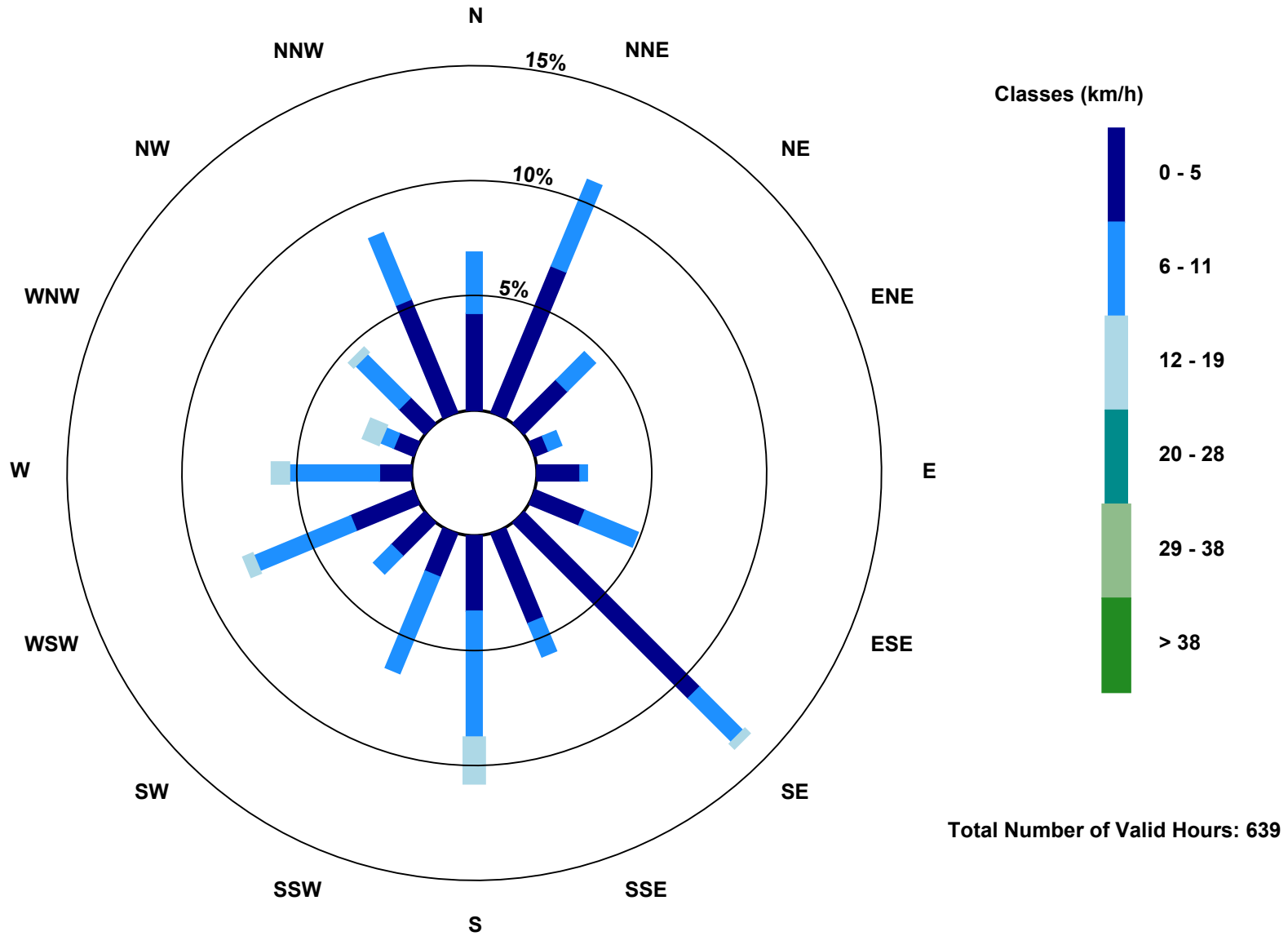
Total Number of Valid Hours: 639

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Mackay River





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

**Wind Speed (WS) - km/h**  
**Mackay River - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Feb 7 15:00 Minimum Value: 0 km/h on Feb 23 00:00 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> = 6														Hours in Service: 672 Hours of Data: 639 Hours of Missing Data: 33 Hours of Calibration: 0 Percent Operational Time: 95.1											
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-Feb	2	2	1	3	4	2	2	2	2	3	3	3	3	3	3	3	2	2	2	1	1	1	1	1	4
2-Feb	1	1	1	1	1	1	1	1	1	2	3	4	4	3	M	M	3	3	3	3	4	3	2	2	4
3-Feb	3	3	3	3	3	3	3	2	3	2	2	2	2	3	2	2	2	2	2	2	2	2	1	2	3
4-Feb	1	1	1	1	2	2	1	1	1	2	2	2	2	1	2	1	1	1	1	1	1	2	1	1	2
5-Feb	1	1	1	1	1	1	1	1	1	2	2	2	1	2	2	2	2	2	2	2	2	4	4	6	6
6-Feb	5	4	4	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	5
7-Feb	3	2	2	2	4	6	5	4	4	5	5	6	7	6	7	6	5	3	2	3	2	2	2	2	7
8-Feb	2	2	2	1	1	1	1	1	1	1	1	2	2	2	3	2	1	1	2	2	2	2	2	2	3
9-Feb	2	2	1	2	1	1	2	2	1	2	1	2	3	3	2	2	1	1	1	1	2	1	1	1	3
10-Feb	1	2	1	1	2	1	2	2	2	2	2	2	2	2	1	2	2	2	1	1	1	1	1	1	2
11-Feb	1	1	1	1	2	2	1	2	2	2	2	2	3	2	3	4	4	4	4	6	4	3	4	4	6
12-Feb	4	4	4	4	4	3	3	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	3	3	4
13-Feb	3	3	3	4	6	5	4	3	5	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	6
14-Feb	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	2	1	1	1	1	1	1	1	2	2
15-Feb	1	1	1	1	1	1	1	1	1	1	1	2	1	2	2	2	1	1	1	1	1	1	1	1	2
16-Feb	1	2	2	2	2	2	1	1	1	1	3	3	3	2	3	4	4	3	4	4	4	2	2	1	4
17-Feb	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	2	1	2	2	1	1	3
18-Feb	1	2	2	2	2	2	2	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2
19-Feb	2	2	2	2	1	2	2	1	2	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	2
20-Feb	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	3	2	2	1	2	1	1	1	3
21-Feb	1	1	1	1	1	1	UO	1	1	2	2	2	3	3	3	3	2	2	1	1	1	1	1	1	3
22-Feb	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	0	2
23-Feb	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	2	1	1	1	1	1	1	2	3
24-Feb	1	2	2	2	2	2	2	2	3	4	5	5	5	4	5	5	5	4	5	4	4	4	3	3	5
25-Feb	2	2	2	3	3	3	3	2	2	2	3	4	3	3	2	2	2	2	1	1	1	1	1	1	4
26-Feb	1	1	1	2	2	1	2	1	2	2	3	2	3	3	3	3	3	2	2	2	2	2	1	2	3
27-Feb	2	1	2	1	2	1	1	1	2	2	2	2	2	2	2	1	2	2	3	3	3	3	2	1	3
28-Feb	UO	1	1	1	1	2	1	1	1	1	2	2	1	1	2	2	2	1	1	2	1	1	0	0	2
														Diurnal Maximum											
M - Maintenance														UO - Unstable Operation											



# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Wind Direction (WD) - deg

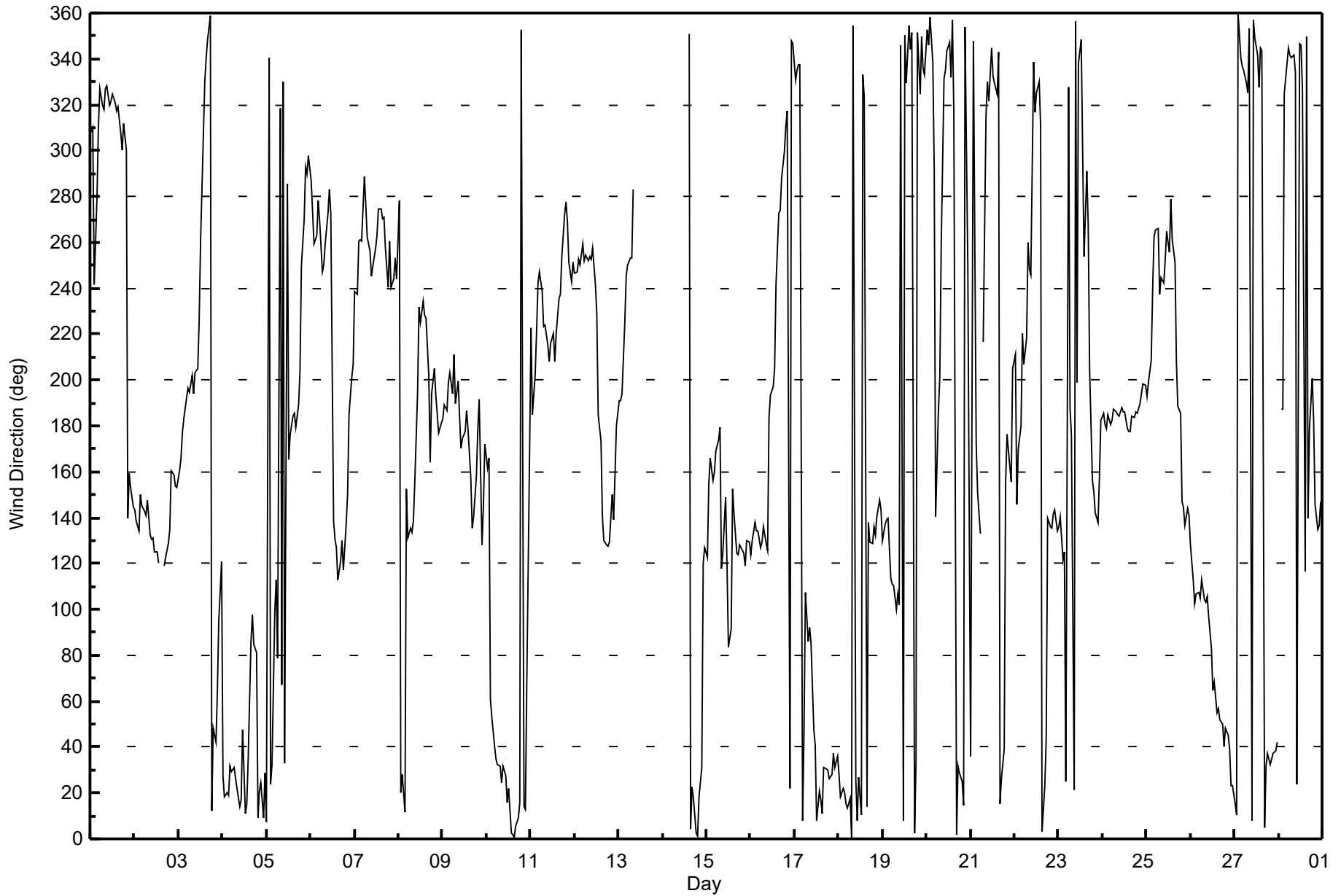
## Mackay River - February 2023

Direction of Maximum Speed: 298 deg on Feb 6 00:00																						Hours in Service: 672				
Direction of Maximum Daily Speed Average: 185.2 deg on Feb 24																						Hours of Data: 639				
Direction of Minimum Speed: 199 deg on Feb 23 11:00											Direction of Minimum Daily Speed Average: 0.5 deg on Feb 22											Hours of Missing Data: 33				
Monthly Average Direction: 220.8 deg																						Percent Operational Time: 95.1				
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-Feb	308	310	242	279	310	327	320	318	327	328	320	321	325	321	318	319	307	300	312	300	140	160	153	145	314.9	
2-Feb	144	138	134	150	145	143	141	148	133	131	131	125	125	120	M	M	119	123	129	135	161	159	154	153	136.5	
3-Feb	160	166	177	183	192	197	195	202	194	203	205	227	260	307	330	341	349	359	12	48	42	65	95	121	191.4	
4-Feb	27	18	20	19	32	30	31	26	22	14	17	48	11	15	35	86	97	85	81	9	21	24	9	29	29.8	
5-Feb	8	341	24	33	99	113	79	319	67	330	33	286	166	176	184	186	180	189	204	250	270	293	290	298	251.6	
6-Feb	287	273	260	263	278	270	247	250	259	272	283	273	139	131	127	113	121	130	117	137	150	185	201	207	223.3	
7-Feb	239	237	260	261	260	289	277	262	256	245	249	257	263	275	275	270	271	258	241	261	240	244	253	244	261.5	
8-Feb	278	20	28	12	152	131	135	134	139	156	195	232	225	234	228	227	202	164	194	205	193	185	177	181	194.5	
9-Feb	183	189	187	199	203	194	211	190	199	184	170	175	178	187	179	158	136	140	158	178	192	128	145	172	181.2	
10-Feb	162	166	61	53	40	35	32	31	24	32	27	16	22	2	2	1	6	9	16	353	14	13	68	169	23.0	
11-Feb	223	185	203	222	242	247	239	223	224	215	208	216	220	208	221	235	237	254	272	278	269	252	243	251	237.4	
12-Feb	247	247	253	250	259	252	255	252	254	252	258	242	229	185	173	141	130	128	128	129	150	139	159	180	204.7	
13-Feb	191	191	194	225	245	250	253	253	283	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
14-Feb	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	351	4	23	18	3	2	19	31	120	127	--
15-Feb	123	155	166	156	160	169	174	180	118	125	149	120	84	91	153	141	124	124	128	126	124	119	130	130	135.6	
16-Feb	124	130	138	134	134	127	129	136	129	126	184	193	197	205	242	273	274	288	300	311	317	22	348	347	227.0	
17-Feb	331	335	337	338	8	47	107	86	92	86	47	41	8	21	17	11	31	30	30	26	28	37	31	36	28.7	
18-Feb	28	18	22	20	15	14	18	1	355	26	8	27	10	333	323	14	138	130	129	136	133	141	148	143	33.3	
19-Feb	130	137	139	140	113	111	110	100	107	102	346	8	350	329	354	344	352	2	34	352	325	350	336	333	45.1	
20-Feb	353	346	358	339	292	140	187	201	259	332	335	343	347	332	357	317	2	31	28	25	15	354	250	141	354.8	
21-Feb	36	348	259	172	151	133	UO	216	315	330	322	345	333	329	325	343	15	26	39	155	176	163	156	205	341.7	
22-Feb	211	146	170	180	220	207	218	260	249	246	339	317	325	330	311	3	23	44	140	136	135	142	143	134	314.0	
23-Feb	136	140	121	125	25	328	188	176	21	356	199	338	349	300	254	291	267	205	156	152	142	138	157	183	192.2	
24-Feb	185	180	179	185	181	182	187	186	185	188	186	186	179	177	178	184	183	186	185	190	194	198	198	198	185.2	
25-Feb	193	199	208	239	262	265	266	237	245	242	253	265	256	279	261	252	207	189	185	147	145	137	144	141	230.2	
26-Feb	128	113	102	107	107	105	113	105	103	106	97	83	65	69	55	57	52	50	40	48	45	39	23	23	74.6	
27-Feb	15	11	360	340	337	335	330	325	353	8	357	349	342	328	345	344	5	32	37	32	35	37	38	42	3.5	
28-Feb	UO	187	188	325	331	345	342	340	342	334	24	346	346	326	116	350	140	179	201	183	146	135	137	147	348.5	
203.4 193.0 194.7 216.2 240.7 241.6 231.5 233.0 231.0 209.4 247.0 282.2 286.2 291.4 287.0 303.7 96.3 109.7 124.2 137.3 152.1 134.4 173.1 186.5																										
Diurnal Average																										
M - Maintenance UO - Unstable Operation																										
All monthly, daily, and diurnal averages have been calculated using vector methods																										



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

**Wind Direction (WD) - deg**  
**Mackay River - February 2023**





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

**Wind Direction (WD) - deg**  
**Mackay River - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 672
Maximum Value: 105 deg on Feb 28 14:00	Hours of Data: 639
Minimum Value: 7 deg on Mar 1 00:00	Hours of Missing Data: 33
Percentiles: P <sub>1</sub> = 10 P <sub>10</sub> = 17 Q <sub>1</sub> = 22 Median = 26 Q <sub>3</sub> = 41 P <sub>90</sub> = 54 P <sub>99</sub> = 97	Hours of Calibration: 0
	Percent Operational Time: 95.1

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-Feb	25	26	16	21	22	17	16	18	23	22	22	20	22	21	28	22	25	26	27	58	66	32	16	19	66
2-Feb	15	17	17	9	11	14	17	22	22	21	22	21	22	20	M	M	20	22	22	21	26	26	24	26	26
3-Feb	26	27	24	24	26	24	23	25	23	25	44	68	29	23	25	26	34	26	34	28	26	26	32	68	
4-Feb	23	24	22	22	23	23	23	27	22	23	25	41	36	30	25	32	27	30	80	24	24	26	39	80	
5-Feb	52	63	41	77	27	27	46	51	90	87	80	97	84	82	30	21	17	16	20	42	41	26	28	97	
6-Feb	29	40	44	41	31	41	44	43	37	41	60	61	50	22	22	22	20	22	27	22	20	30	24	61	
7-Feb	43	41	43	49	48	27	37	42	47	47	46	51	44	41	38	41	43	42	39	45	46	45	45	51	
8-Feb	35	30	45	73	26	39	26	26	10	20	43	49	33	56	42	43	26	37	19	20	17	14	14	73	
9-Feb	15	16	15	19	18	18	19	18	19	20	23	21	26	23	21	24	26	20	18	18	33	47	18	47	
10-Feb	21	30	39	26	40	21	21	23	22	23	23	23	25	24	24	24	23	24	26	24	31	24	54	79	
11-Feb	67	76	41	29	50	49	48	36	40	31	29	31	33	27	33	41	41	49	39	40	34	44	47	76	
12-Feb	47	49	45	48	45	49	47	47	45	50	64	62	48	33	28	25	18	16	17	19	28	24	25	64	
13-Feb	25	20	22	34	47	45	44	50	35	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	50	
14-Feb	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	30	28	24	22	19	22	14	32	28	34	
15-Feb	33	25	13	25	26	39	64	78	15	26	29	96	102	69	66	33	21	14	9	11	11	12	14	102	
16-Feb	15	22	23	20	21	25	24	21	26	36	20	21	24	24	45	37	39	27	23	22	34	23	26	45	
17-Feb	29	20	18	30	24	31	40	43	31	32	35	34	36	36	33	25	22	22	22	23	20	21	21	43	
18-Feb	24	19	29	25	25	27	24	24	25	33	29	35	41	30	47	80	78	13	15	13	16	19	19	80	
19-Feb	17	19	22	25	17	17	16	29	17	22	75	28	36	24	27	29	25	22	27	41	16	18	16	75	
20-Feb	23	23	18	72	77	33	31	36	68	38	53	33	30	37	40	78	71	21	23	19	70	22	35	78	
21-Feb	100	62	48	36	28	74	UO	62	56	20	30	34	40	29	30	29	24	17	23	91	62	31	22	100	
22-Feb	37	20	51	32	46	48	28	31	38	56	100	93	35	30	46	55	28	54	46	16	12	14	10	100	
23-Feb	15	13	33	66	15	53	89	71	72	72	101	39	78	85	68	47	52	47	13	20	12	7	16	101	
24-Feb	14	13	13	14	15	16	17	18	22	23	26	26	24	25	26	24	24	22	22	22	23	23	23	21	26
25-Feb	20	22	30	47	45	45	40	53	47	45	50	47	47	51	56	54	27	20	19	28	13	15	16	18	56
26-Feb	14	14	20	19	15	18	17	16	19	19	28	32	32	33	25	27	27	26	25	26	25	24	22	24	33
27-Feb	24	22	24	21	21	20	19	19	29	24	27	35	44	24	28	30	39	25	25	24	23	26	22	52	52
28-Feb	UO	74	93	22	22	26	33	31	25	28	54	55	41	105	105	66	62	26	40	54	8	30	10	7	105
	100	76	93	77	77	74	89	78	90	87	101	97	102	105	105	80	78	54	80	91	70	47	54	79	

Diurnal Maximum

M - Maintenance UO - Unstable Operation



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

**AMS21  
CONKLIN  
FEBRUARY 2023**

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

March 31, 2023



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS21)  
 FEBRUARY 2023

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	639	31	33	99.7	8	0	2.4	0
TRS(ppb) Average	637	33	35	99.7	0.6	0	0.5	0
THC(ppm) Average	636	34	36	99.7	2.3	-	2.2	-
NMHC(ppm) Average	636	34	36	99.7	0.116	-	0.018	-
CH4(ppm) Average	636	34	36	99.7	2.3	-	2.2	-
O3 (ppb) Average	640	32	32	100	45.3	0	41	-
NO2 (ppb) Average	637	33	35	99.7	21	0	5.1	-
NO (ppb) Average	637	33	35	99.7	7.8	-	0.9	-
NOX (ppb) Average	637	33	35	99.7	28.1	-	5.5	-
PM2.5 (ug/m3) Average	671	1	1	100	21.6	0	8.1	0
Temperature 2 m (C) Average	672	0	0	100	5.3	-	0.9	-
Relative Humidity (%) Average	672	0	0	100	96.4	-	87.1	-
Wind Speed 10 m (km/h) Average	670	0	2	99.7	22	-	14	-
Wind Direction 10 m (deg) Average	670	0	2	99.7	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS21)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	639	0.77	1.1	-	0	0	0.1	0.3	1	2	8
TRS (ppb) Average	637	0.39	0.1	-	0.1	0.3	0.4	0.4	0.4	0.5	0.6
THC (ppm) Average	636	2.1	0	-	2	2	2.1	2.1	2.1	2.2	2.3
NMHC(ppm) Average	636	0.003	0.009	-	0	0	0	0	0	0	0.116
CH4(ppm) Average	636	2.1	0	-	2	2	2.1	2.1	2.1	2.2	2.3
O3 (ppb) Average	640	32.05	7.8	-	9.6	20.3	26.2	33.8	38.4	41.3	45.3
NO2 (ppb) Average	637	2.83	2.2	-	0.3	0.7	1.2	2.4	3.8	5.5	21
NO (ppb) Average	637	0.43	0.9	-	0	0	0	0.1	0.4	1.1	7.8
NOX (ppb) Average	637	3.26	2.6	-	0.3	0.8	1.4	2.6	4.4	6.3	28.1
PM2.5 (ug/m3) Average	671	3.75	2.6	-	0.5	1.3	2	3.2	4.8	6.6	21.6
Temperature 2 m (C) Average	672	-12.36	11.1	-	-39.1	-29.5	-19	-11.9	-2.4	1.4	5.3
Relative Humidity (%) Average	672	70.54	12.4	-	33	51.7	63.6	72.3	78.8	85.1	96.4
Wind Speed 10 m (km/h) Average	670	6.9	4	-	0	2	3	6	10	13	22
Wind Direction 10 m (deg) Average	670	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS 21)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2, SO2, THC/NMHC/CH4, TRS	03 Feb 2023 10:00	03 Feb 2023 11:00	2	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	08 Feb 2023 10:00	08 Feb 2023 10:00	1	Maintenance - station operator activities
Wind Speed, Wind Direction	14 Feb 2023 08:00	14 Feb 2023 08:00	1	Flat line in sensor output signal - Sensor frozen

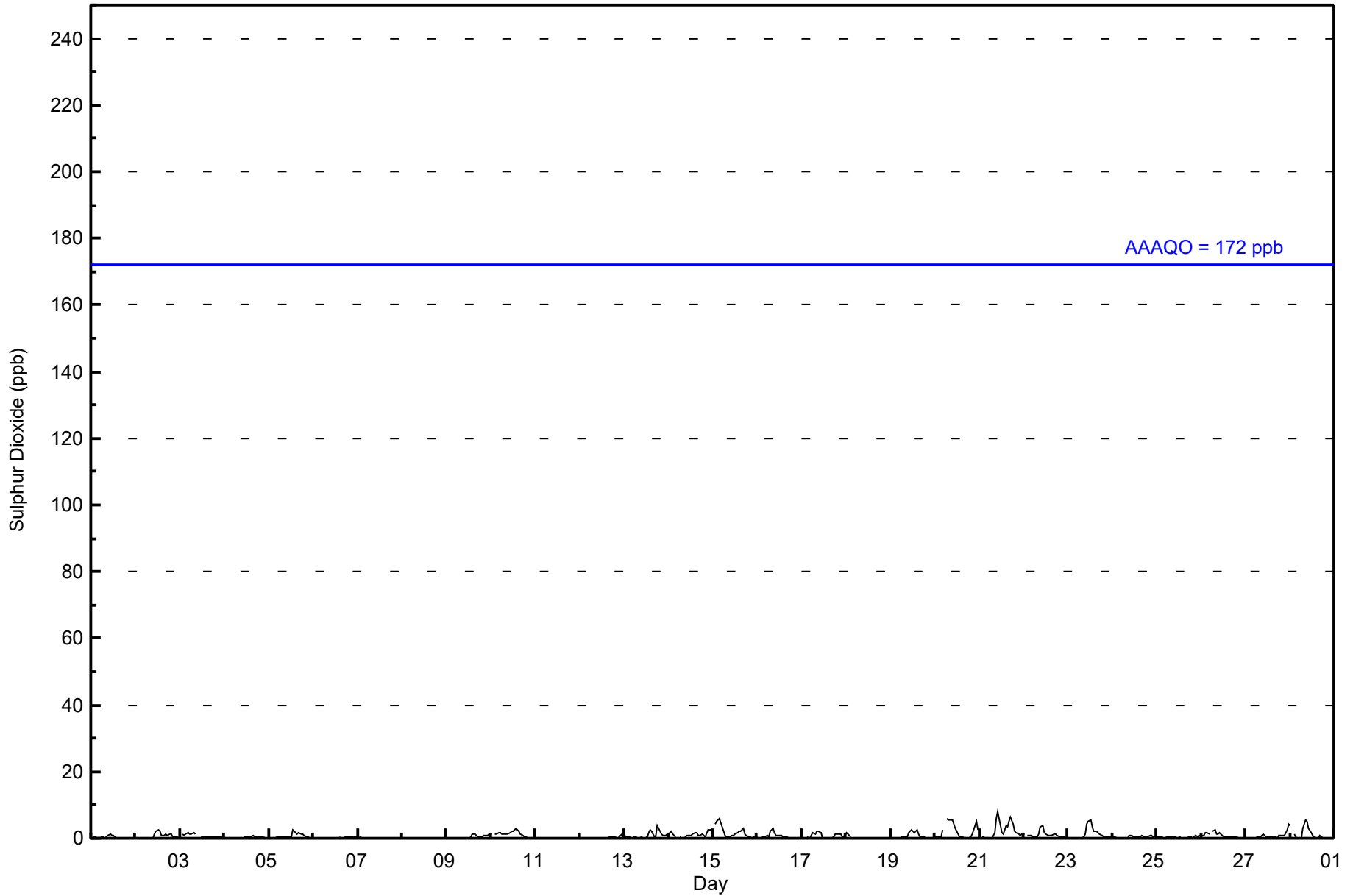


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 672																	672					
Maximum Value: 8.0 ppb on Feb 21 11:00		Maximum Daily Average: 2.4 ppb on Feb 21																	Hours of Data: 639							
Minimum Value: 0.0 ppb on Feb 1 21:00		Minimum Daily Average: 0.0 ppb on Feb 11																	Hours of Missing Data: 33							
Maximum Diurnal Average: 1.5 ppb at hour 11		Minimum Diurnal Average: 0.5 ppb at hour 21																	Hours of Calibration: 31							
Monthly Average: 0.77 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> = 1.0 P <sub>90</sub> = 2.0 P <sub>99</sub> = 5.6																	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-Feb	0.2	0.2	0.3	0.2	Z	0.6	0.4	0.1	0.3	1.0	1.5	0.8	0.7	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.3	1.5
2-Feb	0.0	0.1	0.1	0.1	0.1	Z	0.1	0.0	0.0	0.0	1.2	2.1	2.4	2.3	0.9	1.0	1.4	1.0	1.1	1.2	0.5	0.5	0.5	0.6	0.7	2.4
3-Feb	Z	1.1	1.0	1.3	1.6	1.1	1.4	1.7	1.3	M	M	0.5	0.5	0.6	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.7	1.7
4-Feb	0.1	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	0.6	0.9	0.5	0.2	0.5	0.4	0.4	0.3	0.1	0.0	0.3	0.9
5-Feb	0.0	0.0	Z	0.0	0.3	0.2	0.3	0.3	0.5	0.6	0.6	0.4	0.5	2.6	1.6	1.4	1.8	1.3	1.2	0.9	0.5	0.4	0.2	0.2	0.7	2.6
6-Feb	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.2	C	C	C	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.3
7-Feb	0.2	0.3	0.2	0.2	Z	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.3
8-Feb	0.1	0.1	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	0.1	0.1	0.1	0.1	0.1	0.0	0.1
9-Feb	Z	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.5	1.2	1.5	0.9	0.6	0.5	0.4	0.8	0.7	1.1	1.2	0.5	1.5
10-Feb	1.4	Z	1.1	1.4	1.8	1.6	1.4	1.3	1.1	1.4	1.9	2.1	2.1	3.0	2.5	2.2	1.2	0.8	0.4	0.3	0.2	0.1	0.0	0.0	1.3	3.0
11-Feb	0.0	0.0	Z	0.1	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	0.0	0.0	0.1	0.0	0.1
12-Feb	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	0.1	0.1	0.1	0.4	0.6	0.3	0.3	0.2	0.3	1.0	1.5	0.2	1.5
13-Feb	0.7	0.4	0.4	0.4	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	1.5	2.4	2.0	0.6	1.0	3.7	2.1	1.3	0.6	1.0	1.4	0.9	3.7	
14-Feb	1.5	2.0	1.4	0.8	0.6	Z	0.2	0.1	0.2	0.3	1.0	0.8	0.8	1.1	1.5	0.9	1.0	1.2	0.7	0.4	2.5	2.6	2.4	1.1	2.6	
15-Feb	Z	4.1	5.2	5.7	4.8	3.6	0.9	0.5	0.6	0.6	0.9	1.0	1.1	1.8	2.1	2.2	3.1	1.3	0.8	0.3	0.3	0.2	0.2	0.3	1.8	5.7
16-Feb	0.4	Z	0.4	0.4	0.5	0.8	0.6	2.2	2.8	1.8	0.8	0.8	0.7	0.6	0.5	0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.7	2.8	
17-Feb	0.1	0.1	Z	0.4	0.1	0.9	1.6	1.4	1.9	2.1	1.6	0.2	0.1	0.0	0.1	0.0	0.1	0.6	1.3	1.3	1.4	1.1	0.6	1.0	0.8	2.1
18-Feb	1.5	1.1	0.4	Z	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.2	1.5
19-Feb	0.0	0.0	0.1	0.1	Z	0.1	0.3	0.2	0.2	0.4	1.6	2.3	2.1	1.8	2.6	1.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.6	2.6
20-Feb	0.3	0.2	0.3	0.6	2.4	Z	5.9	5.7	5.7	5.4	4.2	2.8	1.2	0.3	0.3	0.2	0.2	0.2	0.2	0.6	1.5	2.3	5.2	2.3	2.1	5.9
21-Feb	Z	0.4	0.2	0.1	0.1	0.2	0.1	0.2	1.7	6.0	8.0	4.0	1.6	1.2	3.7	3.6	5.2	6.5	4.2	2.3	1.5	1.1	1.0	1.2	2.4	8.0
22-Feb	1.3	Z	0.8	0.7	0.7	0.6	0.6	0.6	1.4	3.3	3.8	1.9	1.4	1.0	1.1	1.0	1.1	1.3	0.7	0.5	0.4	0.3	0.2	0.2	1.1	3.8
23-Feb	0.2	0.2	Z	0.1	0.1	0.2	0.1	0.1	0.2	1.1	4.3	4.9	5.5	3.5	2.3	1.9	1.6	1.3	0.8	0.5	0.3	0.2	0.3	0.4	1.3	5.5
24-Feb	0.4	0.2	0.3	Z	0.2	0.2	0.1	0.1	0.1	0.8	0.8	0.4	0.3	0.3	0.3	0.6	0.7	0.6	0.5	0.6	0.7	0.9	0.4	0.5	0.4	0.9
25-Feb	0.6	0.5	0.5	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	1.0	0.6	0.7	0.4	1.0
26-Feb	0.7	1.0	1.7	1.7	1.4	Z	2.2	2.4	1.2	1.4	1.8	0.8	0.4	0.6	0.6	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.9	2.4
27-Feb	Z	0.2	0.1	0.1	0.1	0.2	0.4	0.3	0.4	1.1	0.9	0.6	0.6	0.6	0.3	0.5	0.3	0.2	0.7	0.7	1.0	0.9	2.6	4.2	0.7	4.2
28-Feb	3.7	Z	1.4	0.6	0.1	0.0	0.0	3.1	5.5	4.9	2.9	1.9	0.9	0.4	0.2	0.1	0.7	0.5	0.2	0.0	0.0	0.0	0.0	0.0	1.2	5.5
0.6 0.5 0.7 0.7 0.7 0.5 0.6 0.8 0.9 1.2 1.5 1.1 0.9 0.9 0.9 0.8 0.8 0.7 0.7 0.5 0.5 0.5 0.7 0.7																								Diurnal Average		
3.7 4.1 5.2 5.7 4.8 3.6 5.9 5.7 5.7 6.0 8.0 4.9 5.5 3.5 3.7 3.6 5.2 6.5 4.2 2.3 1.5 2.5 5.2 4.2																								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**  
**Conklin - February 2023**





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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Conklin - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	639	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: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Conklin - February 2023**

<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	36	30	15	12	14	18	34	55	64	63	66	33	35	34	57	71	637
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>36</b>	<b>30</b>	<b>15</b>	<b>12</b>	<b>14</b>	<b>18</b>	<b>34</b>	<b>55</b>	<b>64</b>	<b>63</b>	<b>66</b>	<b>33</b>	<b>35</b>	<b>34</b>	<b>57</b>	<b>71</b>	<b>637</b>

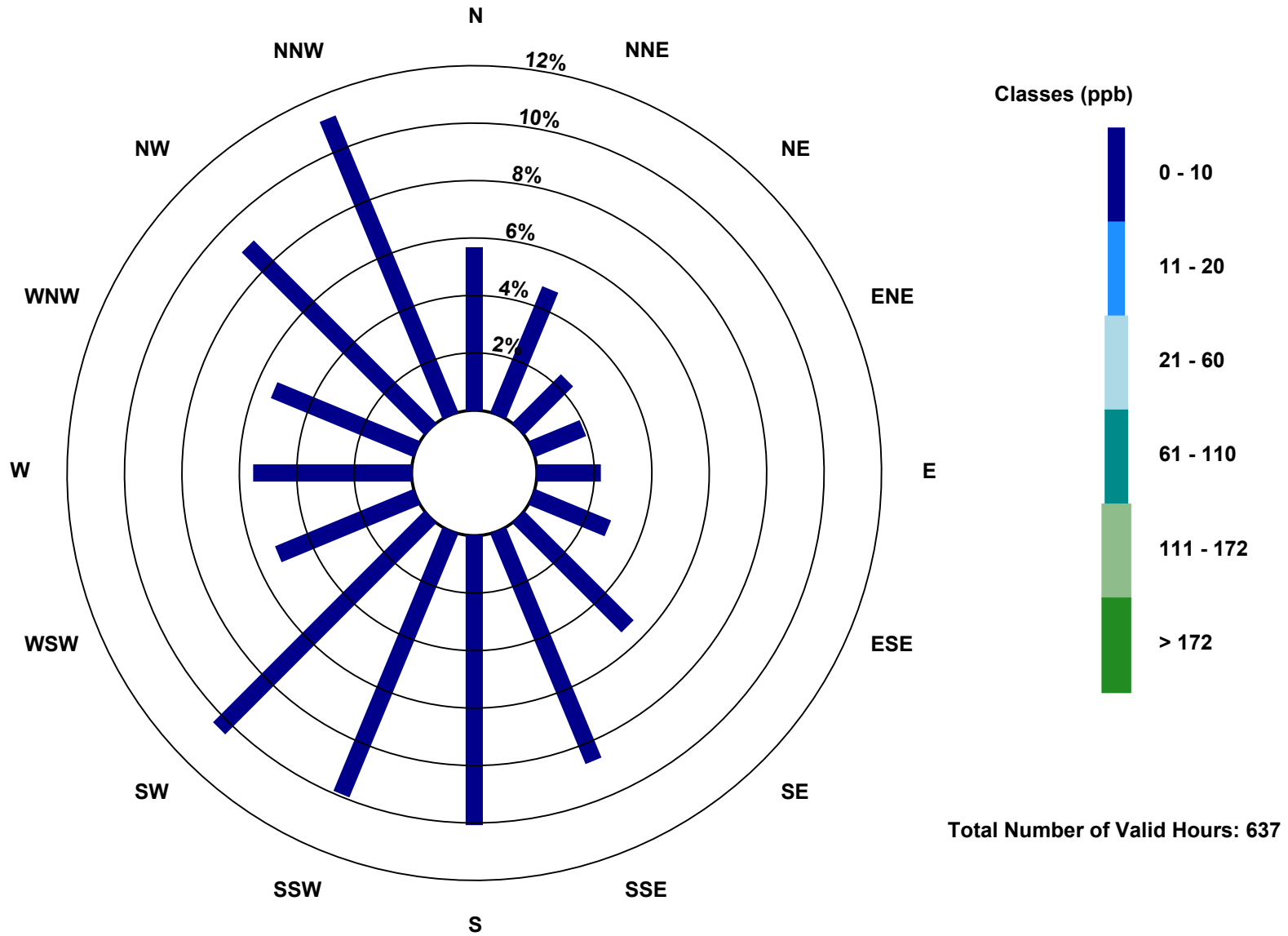
Total Number of Valid Hours: 637

Total Number of Hours: 672

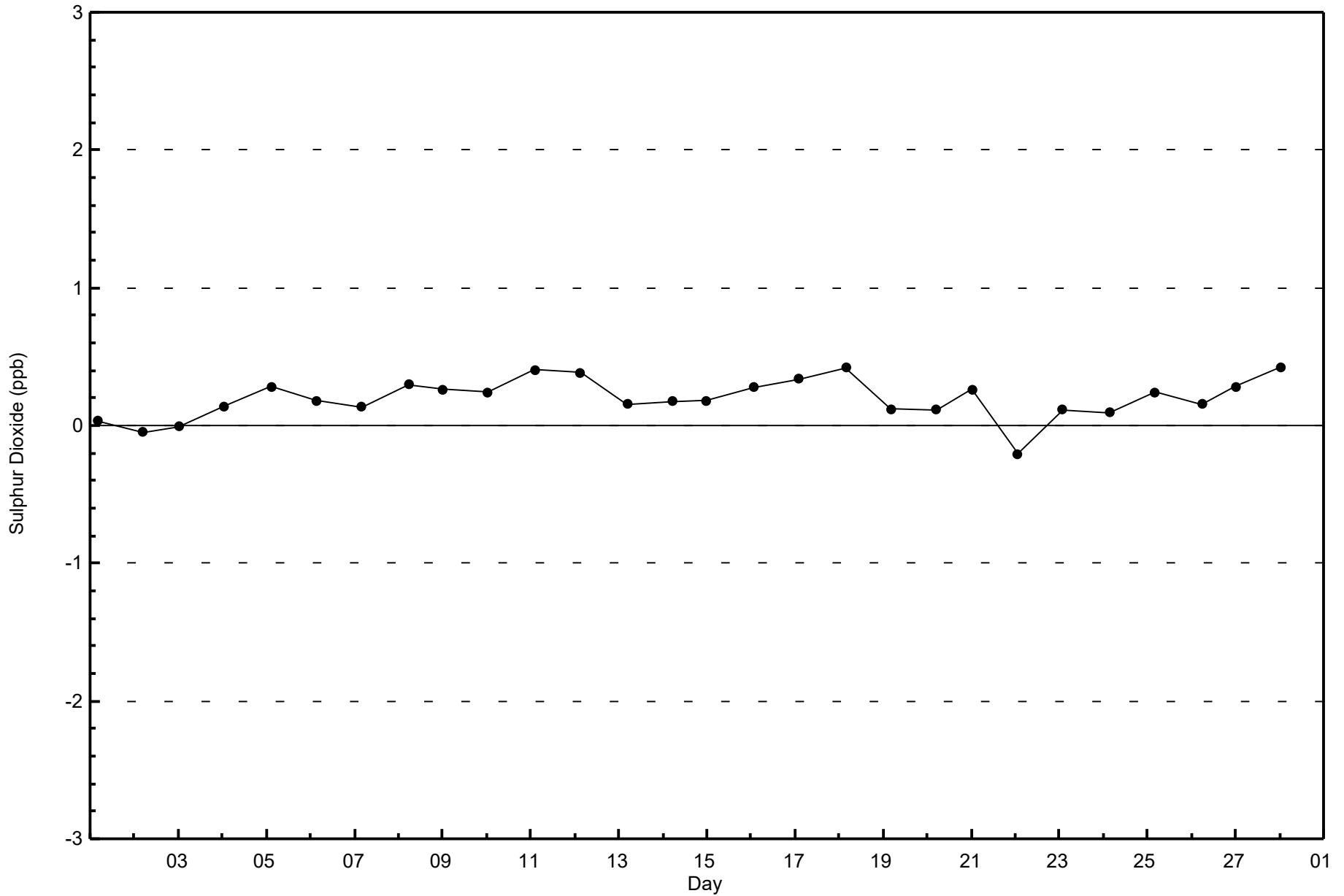


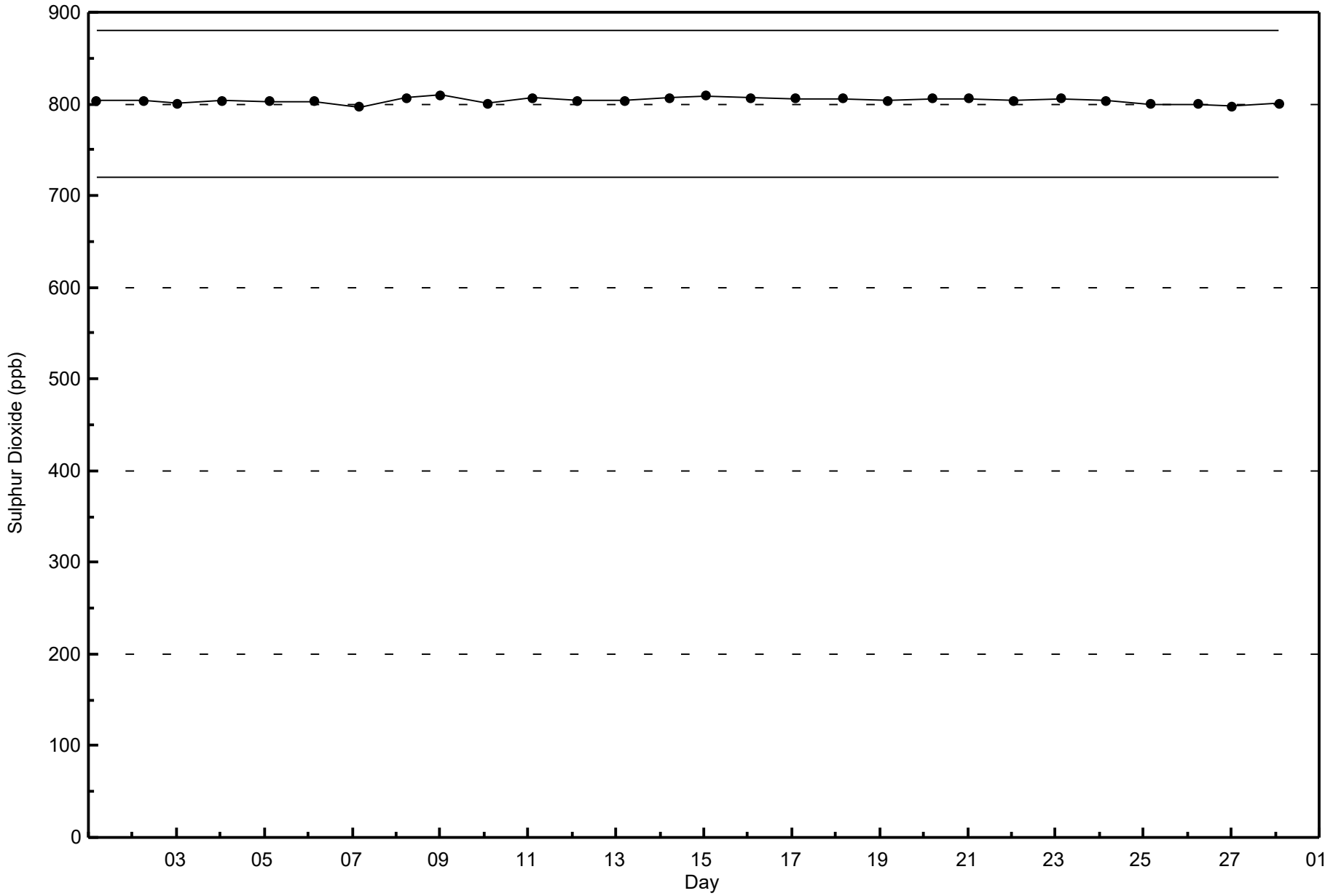
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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











Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

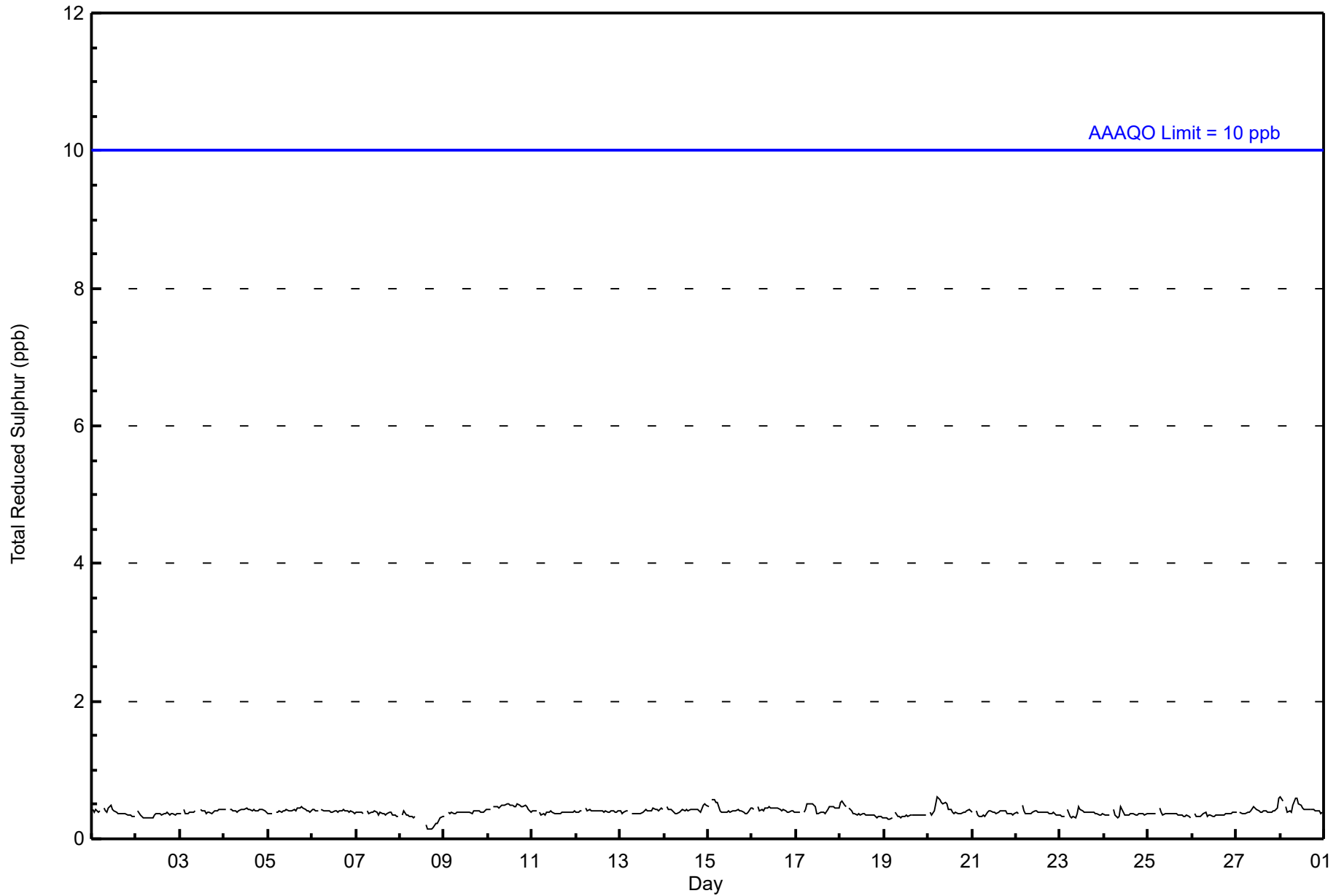
Conklin - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																				
Maximum Value: 0.6 ppb on Feb 20 06:00		Maximum Daily Average: 0.5 ppb on Feb 10				Hours of Data:		637																				
Minimum Value: 0.1 ppb on Feb 8 16:00		Minimum Daily Average: 0.3 ppb on Feb 8				Hours of Missing Data:		35																				
Maximum Diurnal Average: 0.4 ppb at hour 11		Minimum Diurnal Average: 0.4 ppb at hour 16				Hours of Calibration:		33																				
Monthly Average: 0.39 ppb		Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.3 Q <sub>1</sub> = 0.4 Median = 0.4 Q <sub>3</sub> = 0.4 P <sub>90</sub> = 0.5 P <sub>99</sub> = 0.6				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-Feb	0.4	0.4	0.4	0.4	0.4	Z	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.5		
2-Feb	Z	0.4	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	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.4
3-Feb	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	M	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	0.4	0.4	0.4	0.4	0.4
4-Feb	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	0.4
5-Feb	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	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5
6-Feb	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	0.4
7-Feb	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	0.4	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.4
8-Feb	Z	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	C	C	C	C	C	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4
9-Feb	0.3	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	0.4	0.4
10-Feb	0.4	0.4	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5
11-Feb	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	0.4	0.4
12-Feb	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	0.4
13-Feb	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	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
14-Feb	Z	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	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
15-Feb	0.5	Z	0.6	0.6	0.5	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	0.4	0.4	0.4	0.4	0.4	0.4	0.6
16-Feb	0.4	0.4	Z	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.4	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	0.4	0.4	0.4	0.5
17-Feb	0.4	0.4	0.4	Z	0.4	0.4	0.5	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	0.5	0.5	0.5	0.4	0.5	0.4	0.5	0.5
18-Feb	0.5	0.5	0.5	0.5	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	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	0.4
19-Feb	0.3	0.3	0.3	0.3	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	0.4
20-Feb	Z	0.4	0.4	0.4	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6
21-Feb	0.4	Z	0.4	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	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4
22-Feb	0.4	0.4	Z	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	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
23-Feb	0.3	0.3	0.3	Z	0.4	0.3	0.3	0.3	0.3	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	0.3	0.3	0.4	0.4	0.4	0.5
24-Feb	0.3	0.4	0.4	0.3	Z	0.4	0.3	0.3	0.3	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.5
25-Feb	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	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
26-Feb	Z	0.4	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	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
27-Feb	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	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	0.6	0.6
28-Feb	0.6	0.6	Z	0.5	0.4	0.4	0.4	0.5	0.6	0.6	0.5	0.5	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	0.6
																								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**  
**Conklin - February 2023**





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

**Total Reduced Sulphur (TRS) - ppb**  
**Conklin - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	637	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: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Conklin - February 2023**

<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	40	29	16	13	14	18	34	55	62	63	67	35	36	30	56	68	636
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>	40	29	16	13	14	18	34	55	62	63	67	35	36	30	56	68	636

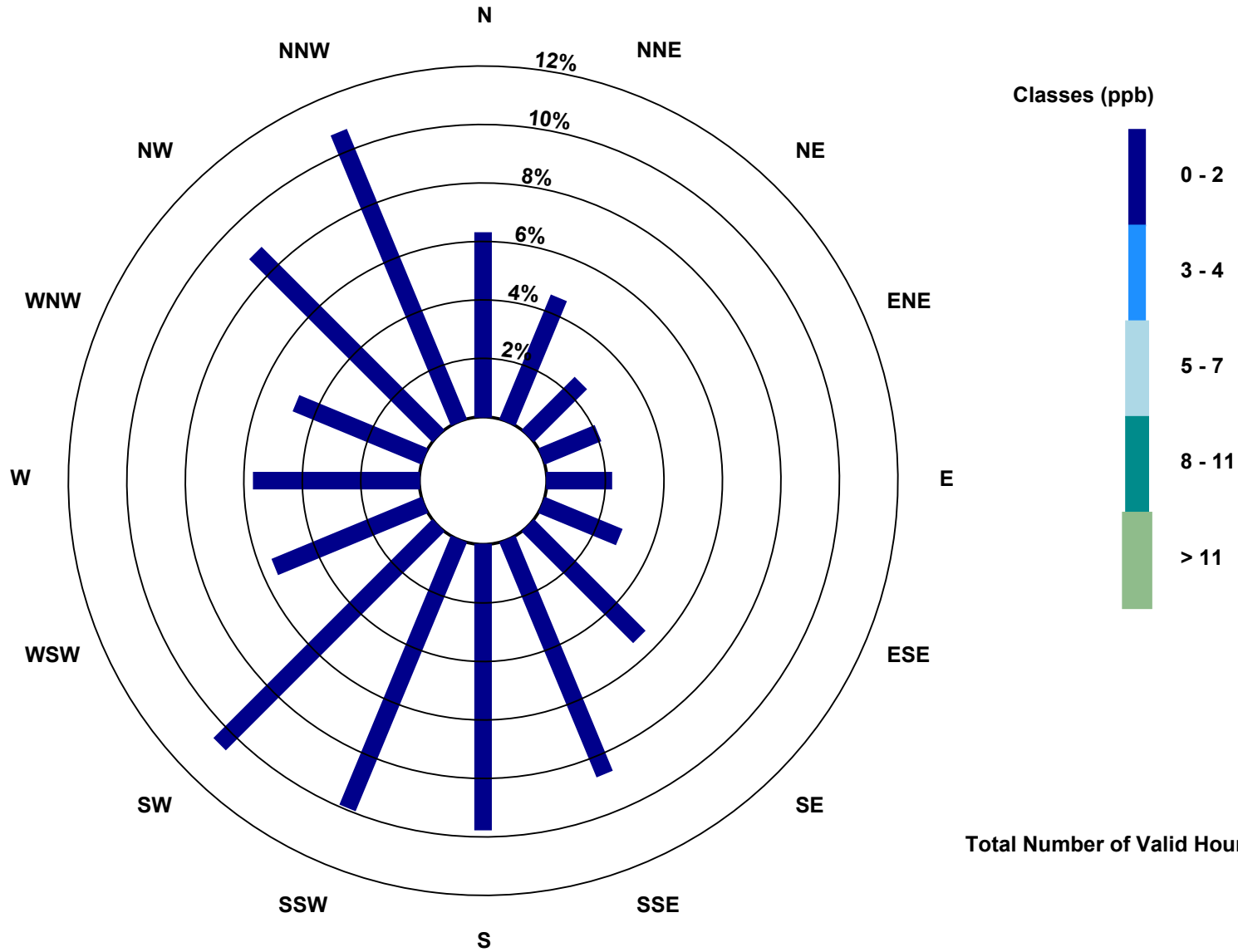
Total Number of Valid Hours: 636

Total Number of Hours: 672

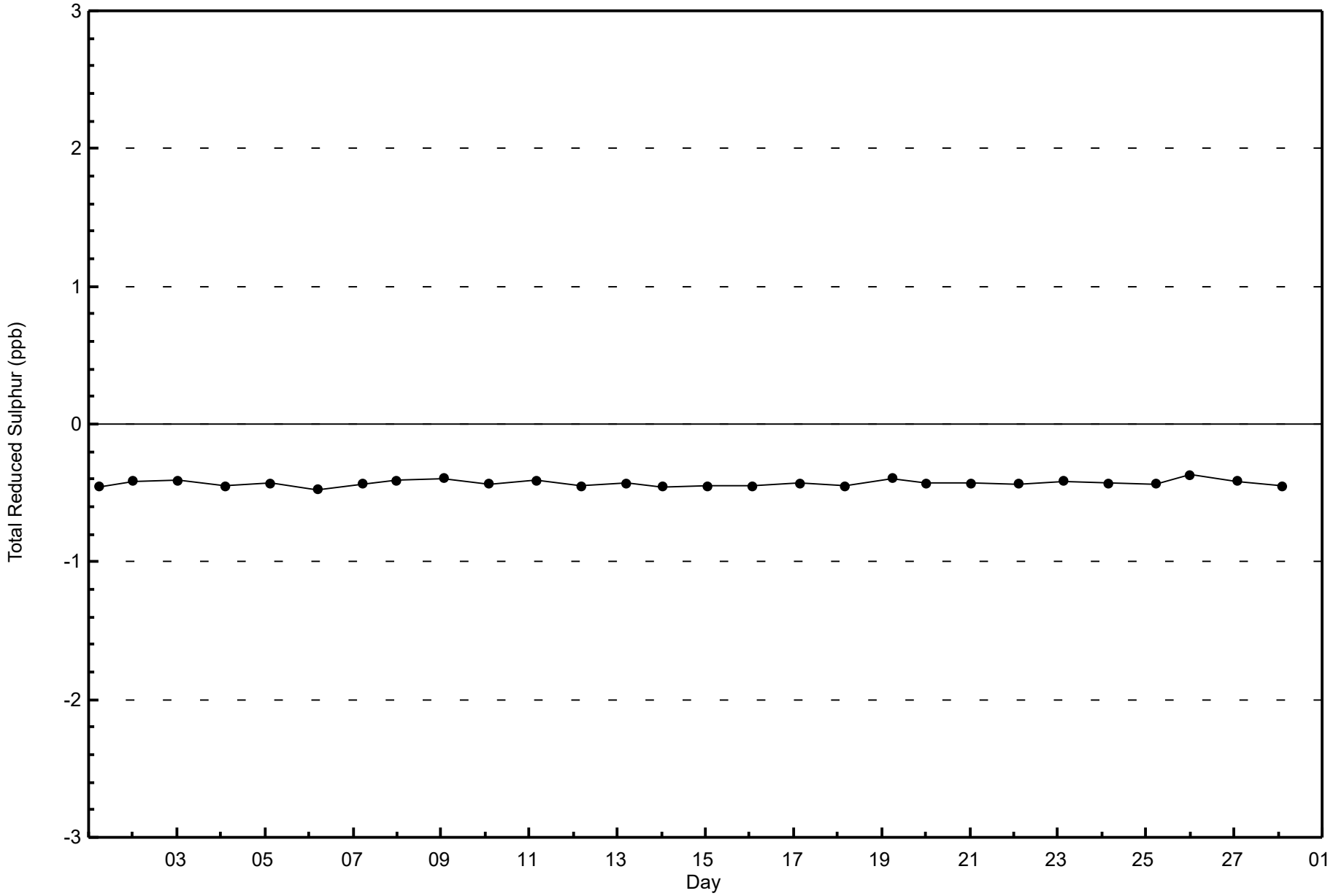


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

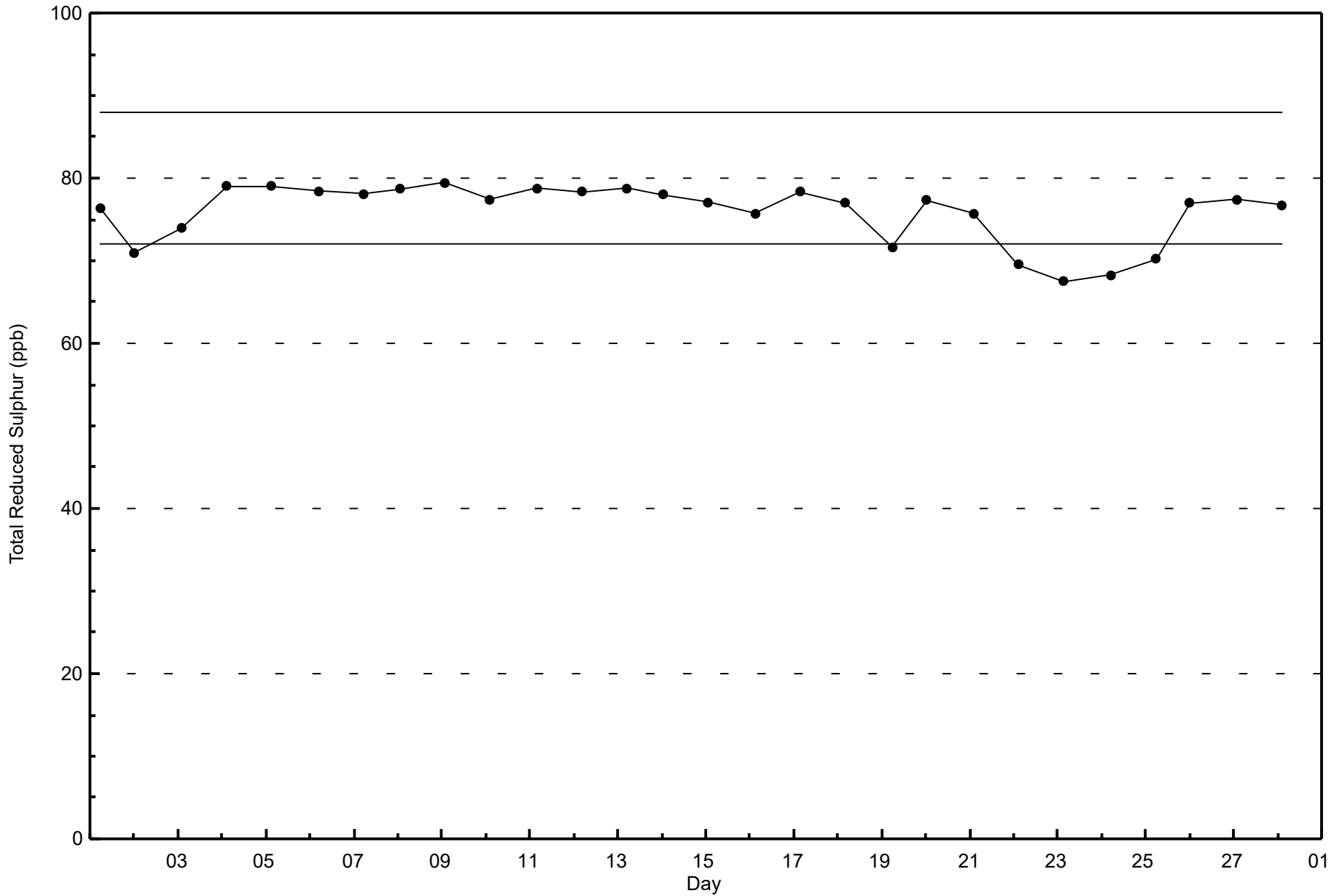
Total Reduced Sulphur (TRS) - ppb  
Conklin



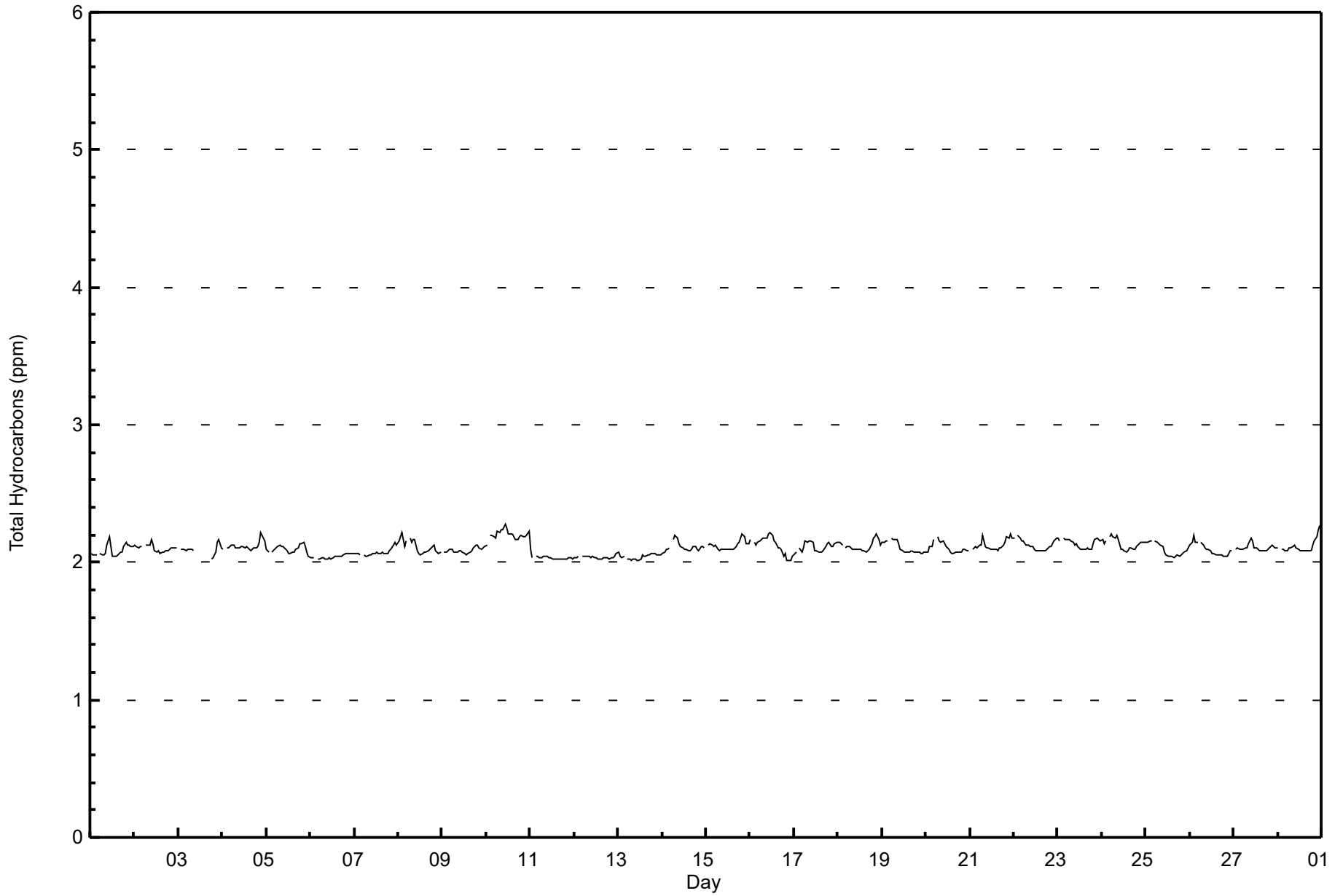
Total Number of Valid Hours: 636













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

**Total Hydrocarbons (THC) - ppm**  
**Conklin - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	96	15.09	15.09
2.1 - 3.0	540	84.91	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 636

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Conklin - February 2023**

<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	1	2	0	0	0	1	4	7	18	22	20	6	7	8	96
2.1 - 3.0	36	30	14	10	14	18	34	54	60	56	48	11	17	28	46	62	538
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>	36	30	15	12	14	18	34	55	64	63	66	33	37	34	53	70	634

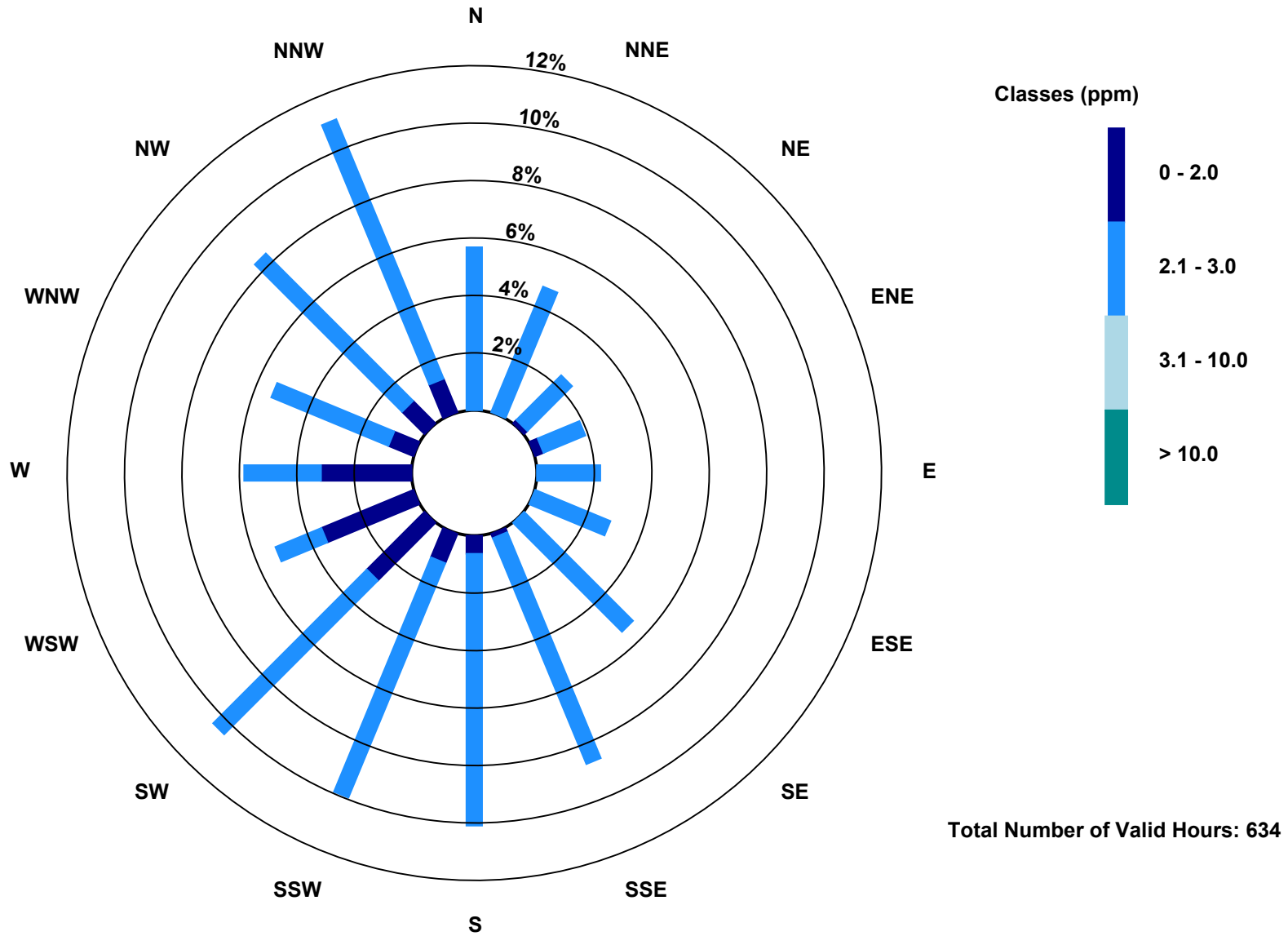
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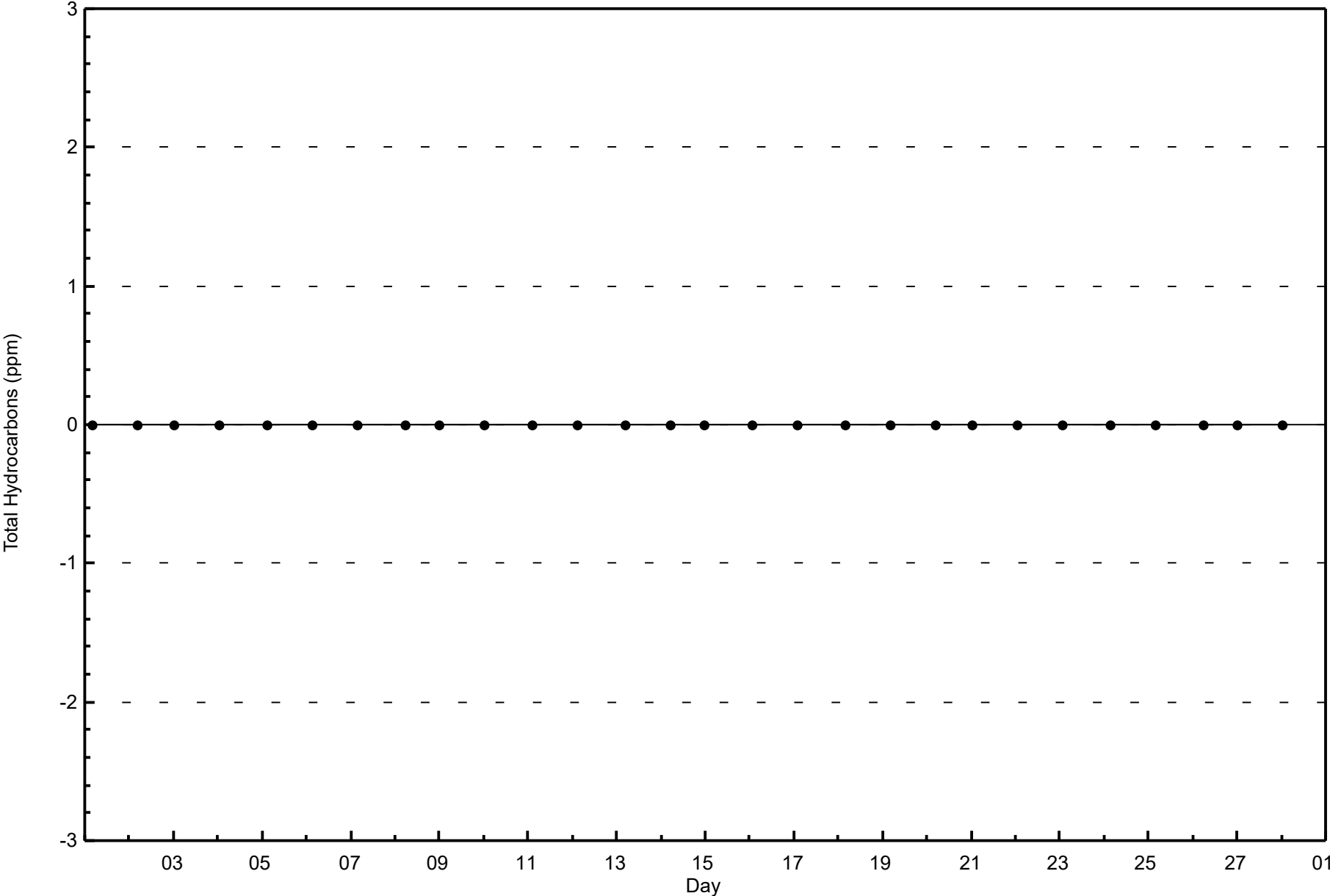
Total Number of Hours: 672

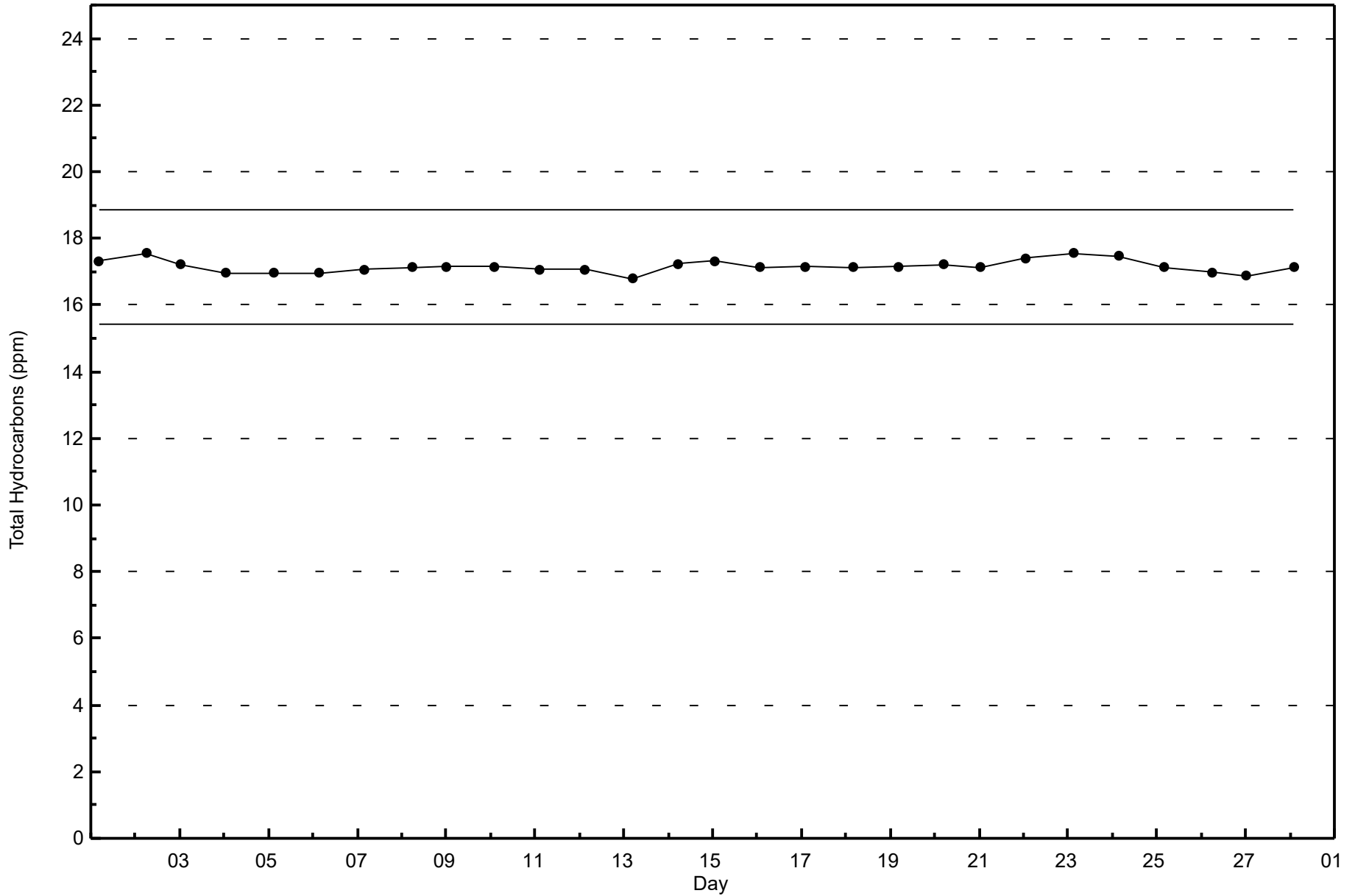


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Hydrocarbons (THC) - ppm  
Conklin







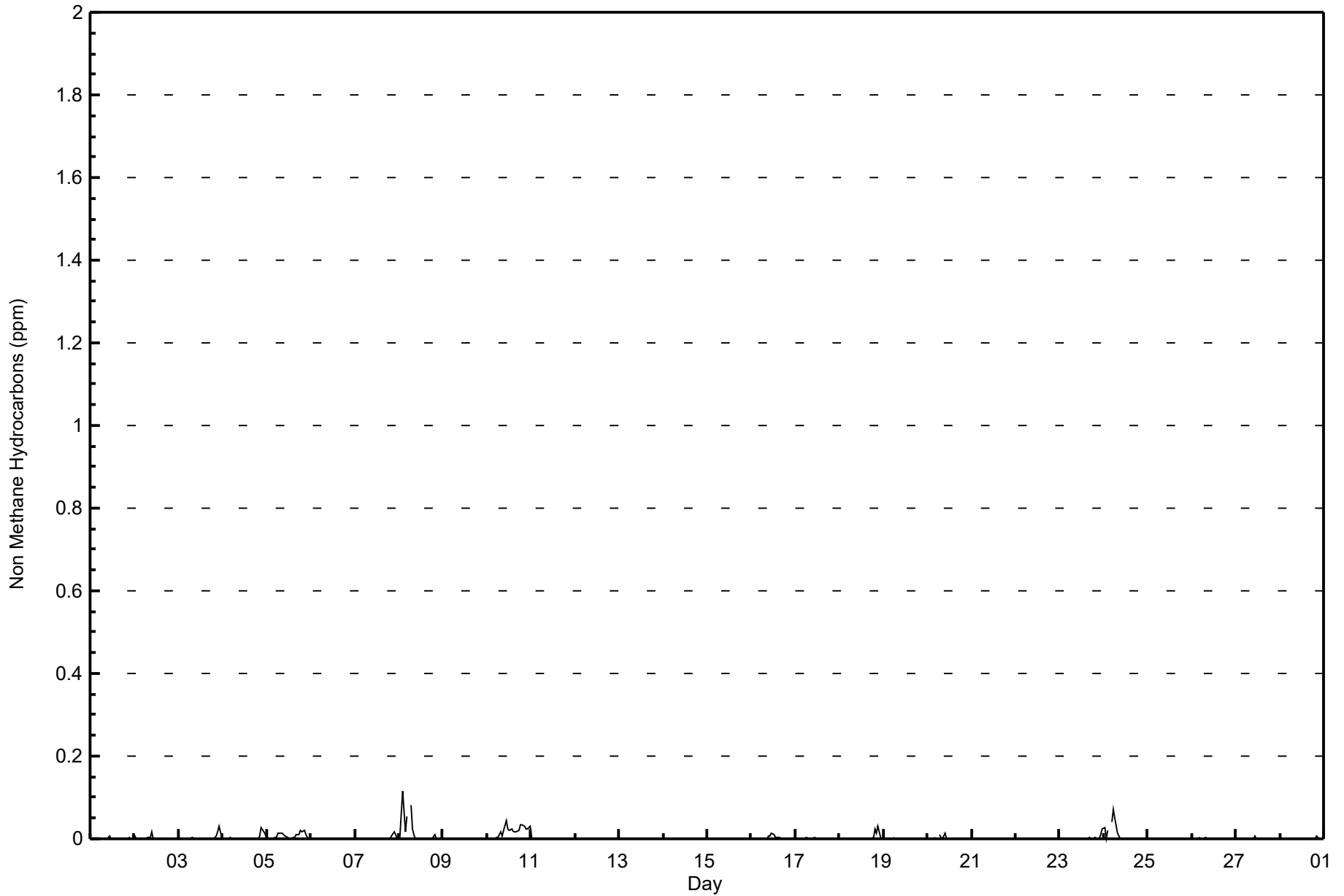




Summary of Hour Averages

Conklin - February 2023

Maximum Value: 0.116 ppm on Feb 8 03:00		Maximum Daily Average: 0.018 ppm on Feb 10		Hours in Service: 672																							
Minimum Value: 0.000 ppm on Feb 1 01:00		Minimum Daily Average: 0.000 ppm on Feb 25		Hours of Data: 636																							
Maximum Diurnal Average: 0.006 ppm at hour 3		Minimum Diurnal Average: 0.001 ppm at hour 16		Hours of Missing Data: 36																							
Monthly Average: 0.003 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: 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-Feb	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.006	0.001	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	0.006
2-Feb	0.006	0.000	0.000	0.002	0.000	Z	0.000	0.002	0.003	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016
3-Feb	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	M	M	0.000	C	C	C	C	C	C	0.000	0.000	0.007	0.016	0.031	0.002	--	0.031	
4-Feb	0.000	Z	0.001	0.001	0.002	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.007	0.029	0.017	0.011	0.003	0.029	
5-Feb	0.003	0.001	Z	0.000	0.002	0.005	0.013	0.013	0.013	0.010	0.006	0.002	0.002	0.001	0.003	0.003	0.010	0.009	0.019	0.019	0.021	0.011	0.002	0.001	0.007	0.021	
6-Feb	0.001	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	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	
7-Feb	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	0.005	0.016	0.009	0.001	0.001	0.016		
8-Feb	0.004	0.059	0.116	0.015	0.053	Z	0.083	0.023	0.009	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.000	0.000	0.000	0.000	0.016	0.116	
9-Feb	Z	0.000	0.000	0.000	0.002	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	0.002	
10-Feb	0.000	Z	0.000	0.001	0.002	0.002	0.003	0.016	0.008	0.019	0.044	0.023	0.020	0.023	0.018	0.016	0.018	0.019	0.033	0.035	0.029	0.025	0.025	0.029	0.018	0.044	
11-Feb	0.005	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	0.001	0.000	0.000	0.000	0.000	0.005	
12-Feb	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	
13-Feb	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	
14-Feb	0.000	0.000	0.000	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	0.001	
15-Feb	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	0.001	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.002	
16-Feb	0.001	Z	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.005	0.007	0.013	0.012	0.002	0.003	0.003	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.013	
17-Feb	0.000	0.000	Z	0.000	0.000	0.000	0.002	0.002	0.001	0.002	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	0.003	
18-Feb	0.000	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	0.003	0.022	0.012	0.029	0.005	0.002	0.003	0.029	
19-Feb	0.000	0.000	0.000	0.000	Z	0.002	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	0.002	
20-Feb	0.000	0.000	0.000	0.000	0.004	Z	0.009	0.003	0.002	0.012	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	0.001	0.012	
21-Feb	Z	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	0.000	0.000	0.000	0.000	0.001	
22-Feb	0.000	Z	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	
23-Feb	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	0.000	0.002	0.000	0.000	0.005	0.000	0.000	0.009	0.022	0.002	0.022	
24-Feb	0.028	0.000	0.022	Z	0.041	0.072	0.050	0.012	0.006	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	0.010	0.072	
25-Feb	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	
26-Feb	0.000	0.001	0.001	0.001	0.002	Z	0.001	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	0.000	0.000	0.003	
27-Feb	Z	0.000	0.000	0.000	0.000	0.000	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	0.005	
28-Feb	0.000	Z	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	0.005	0.001	0.000	0.000	0.000	0.005	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan                      C - Calibration                      M - Maintenance																											





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

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Conklin - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	571	89.78	89.78
0.006 - 0.05	61	9.59	99.37
0.06 - 0.1	4	0.63	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 636

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Conklin - February 2023**

<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	32	29	15	10	14	17	29	45	50	56	59	30	36	30	49	68	569
0.006 - 0.05	4	1	0	2	0	1	5	8	12	7	7	3	1	4	4	2	61
0.06 - 0.1	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	4
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	36	30	15	12	14	18	34	55	64	63	66	33	37	34	53	70	634

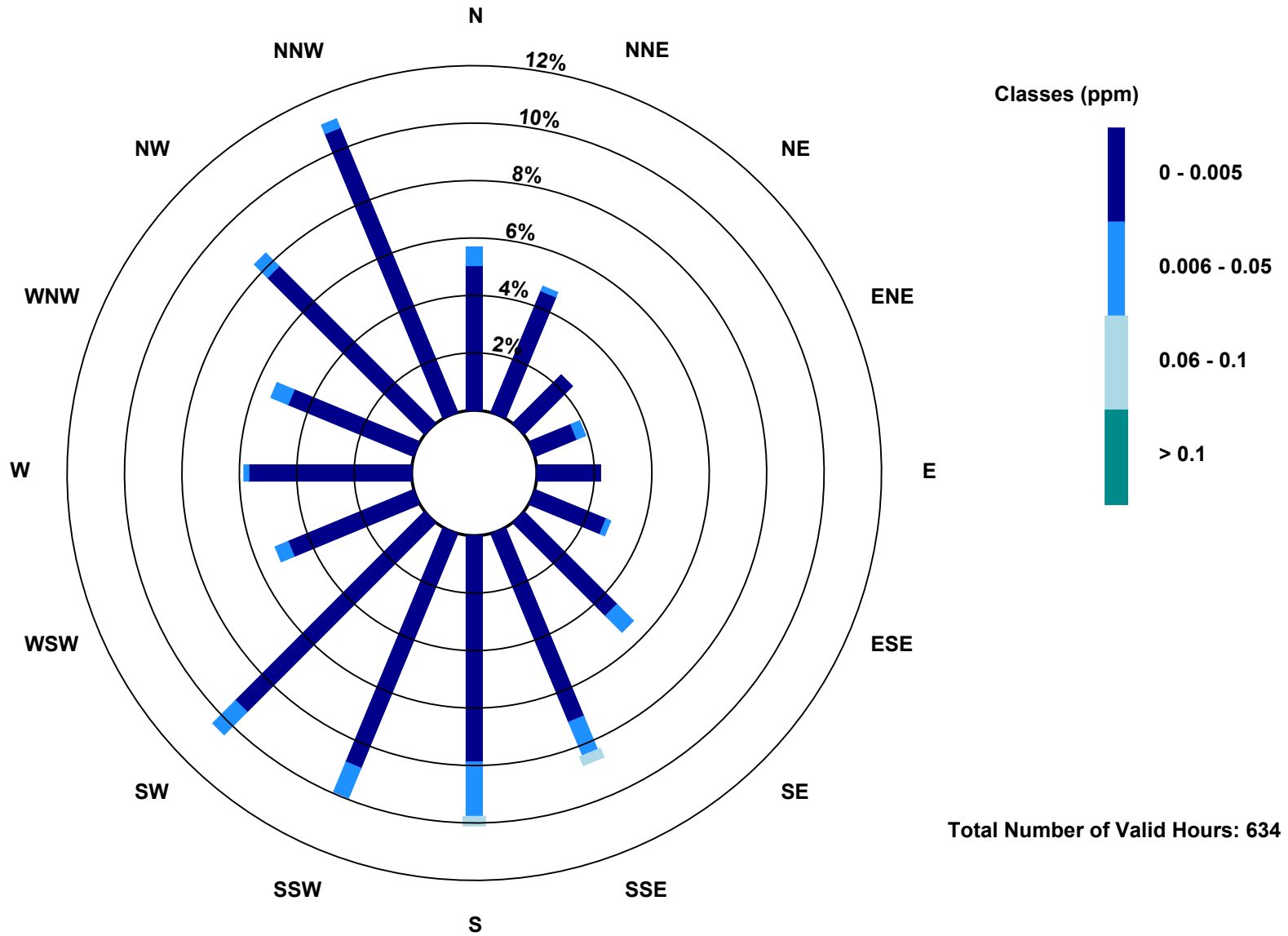
Total Number of Valid Hours: 634

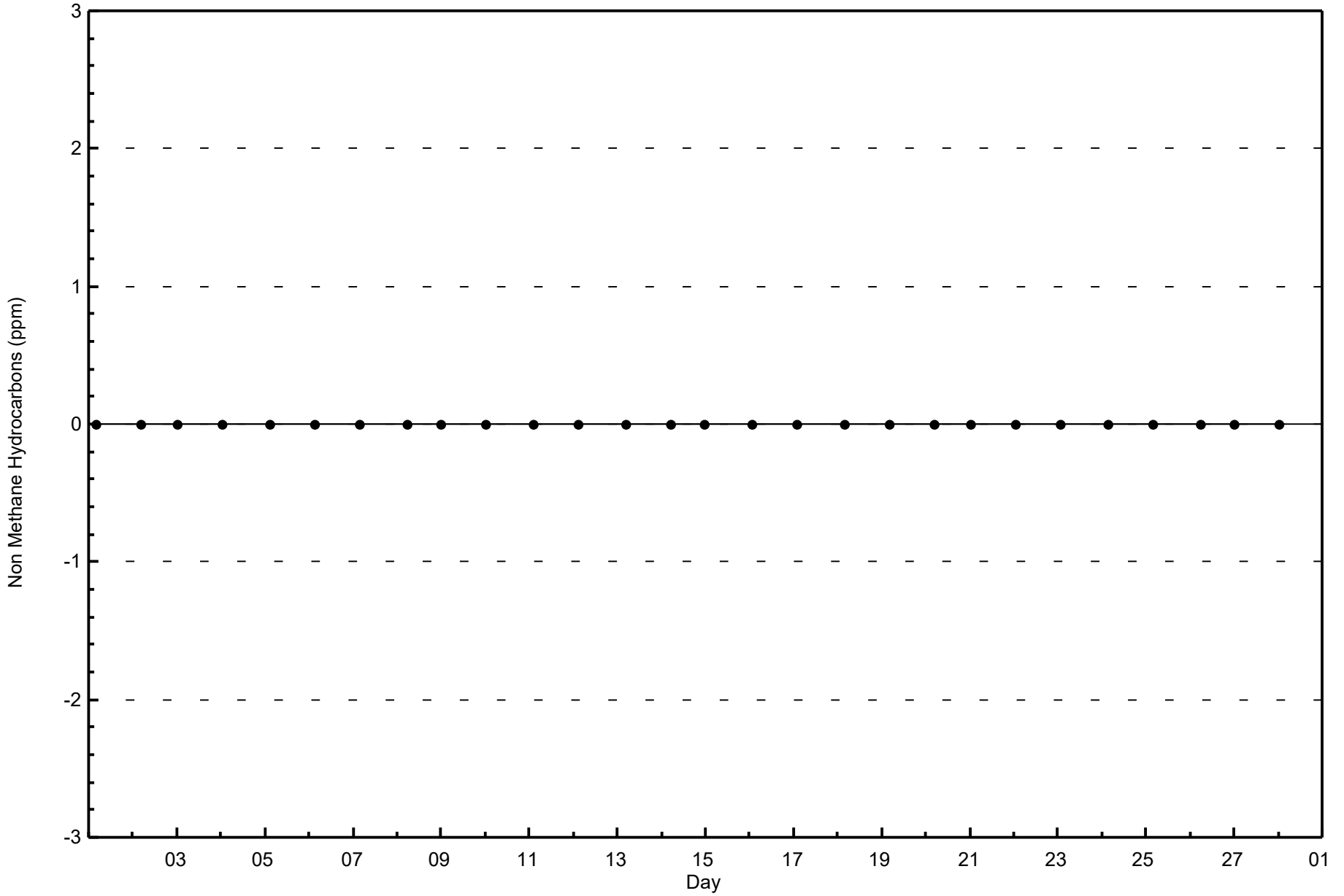
Total Number of Hours: 672

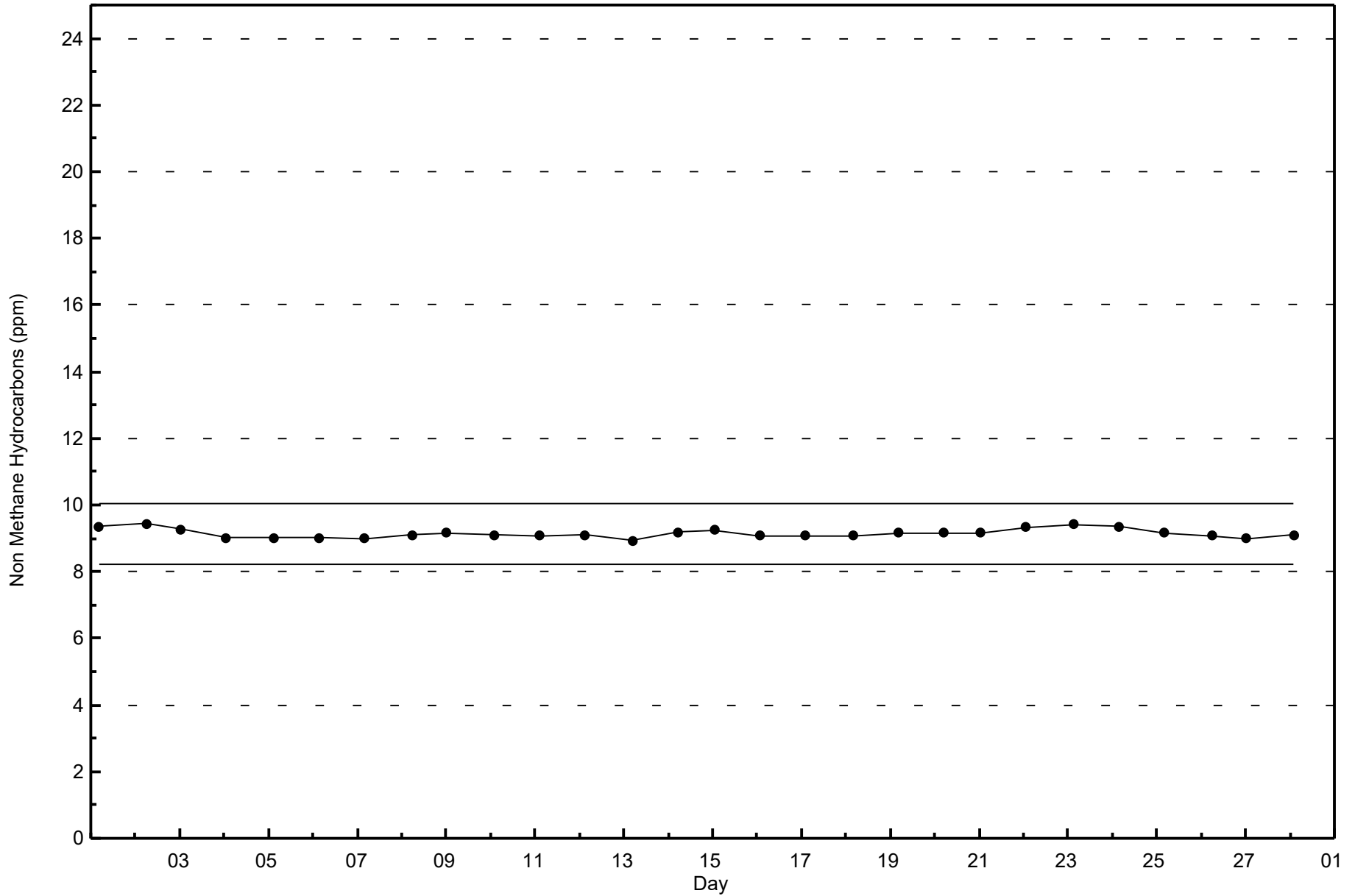


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Non Methane Hydrocarbons (NMHC) - ppm  
Conklin







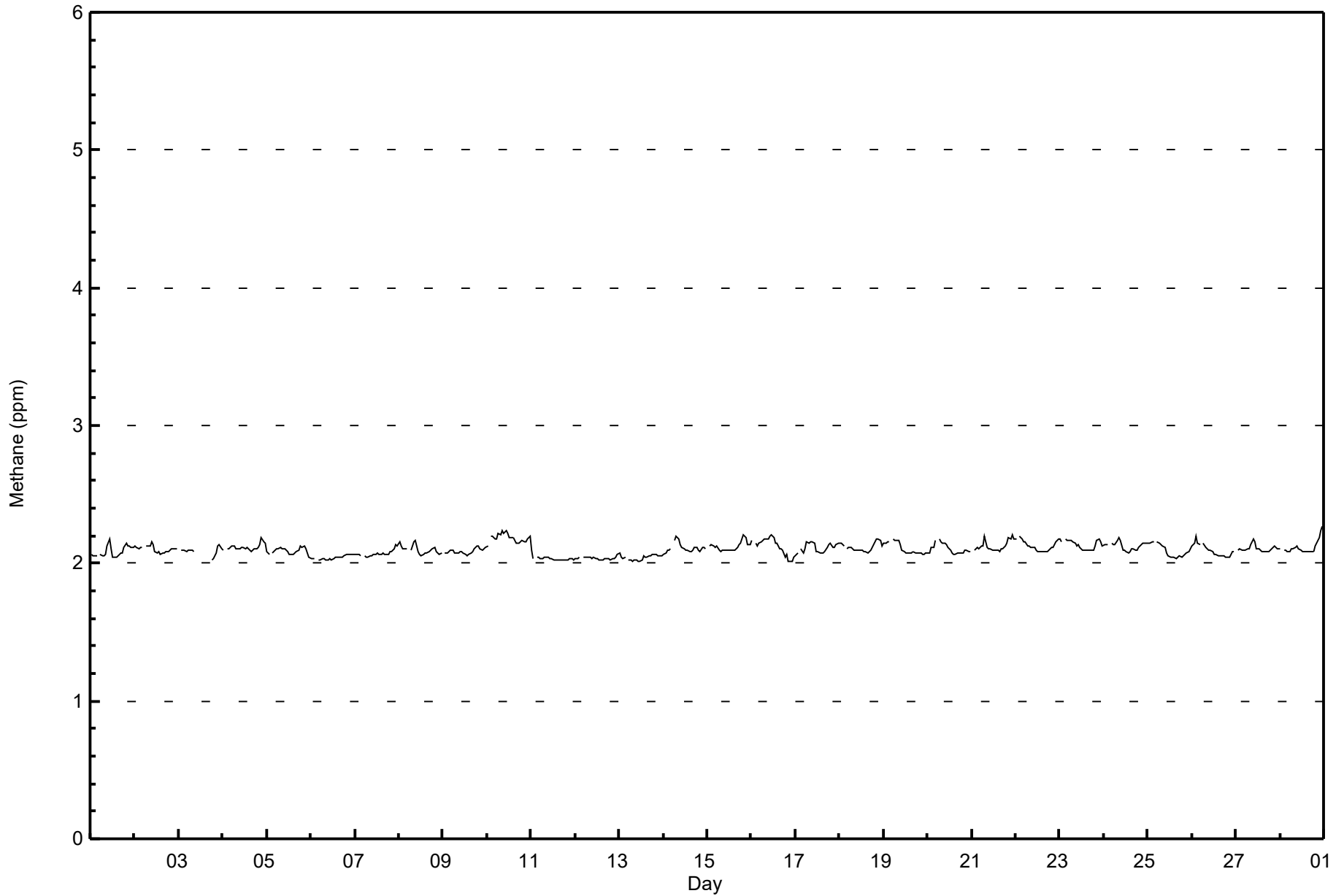






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Methane (CH<sub>4</sub>) - ppm**  
**Conklin - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Conklin - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	96	15.09	15.09
2.1 - 3.0	540	84.91	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 636

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Conklin - February 2023**

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	1	2	0	0	0	1	4	7	18	22	20	6	7	8	96
2.1 - 3.0	36	30	14	10	14	18	34	54	60	56	48	11	17	28	46	62	538
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>	36	30	15	12	14	18	34	55	64	63	66	33	37	34	53	70	634

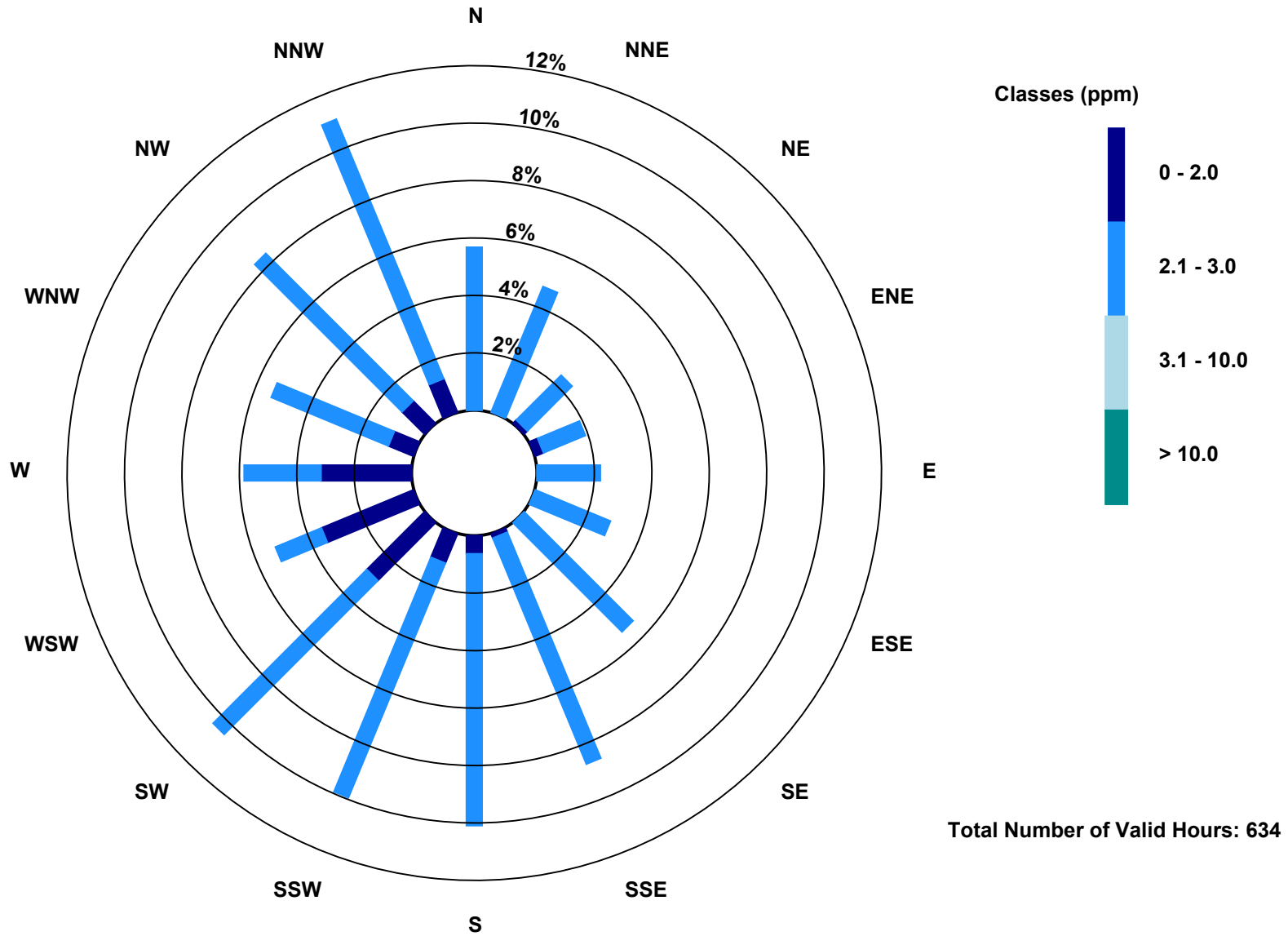
Total Number of Valid Hours: 634

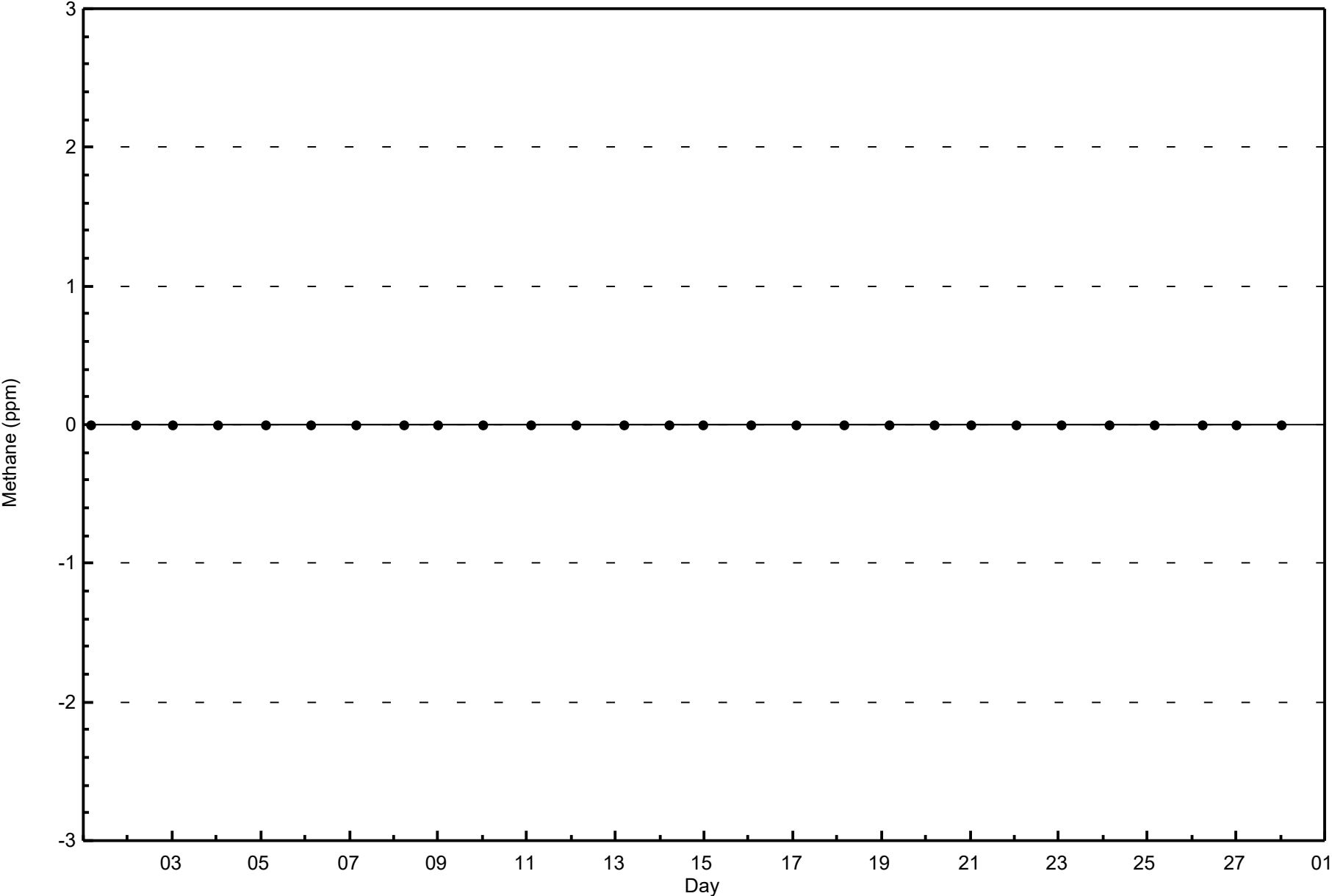
Total Number of Hours: 672

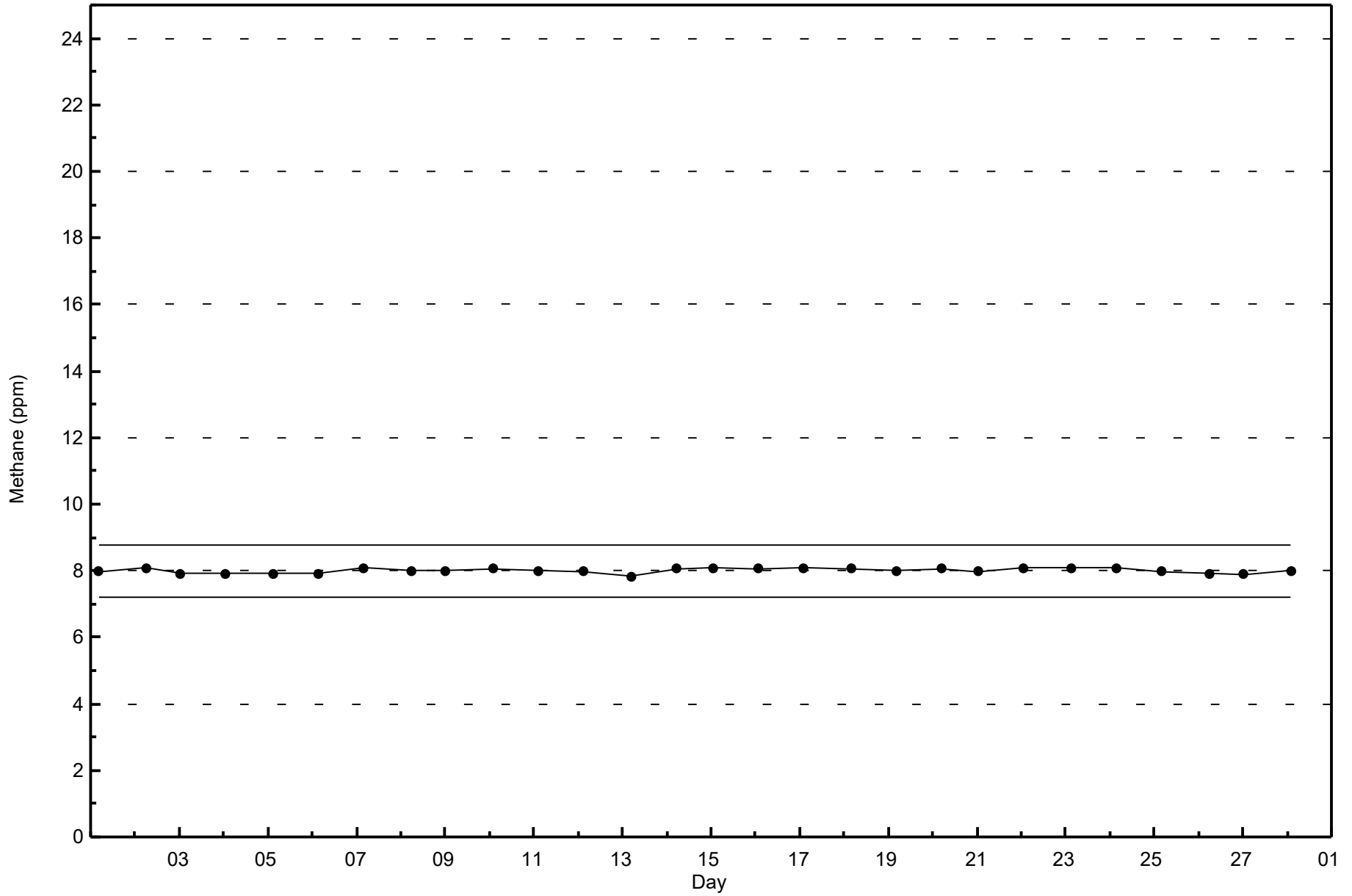


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









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

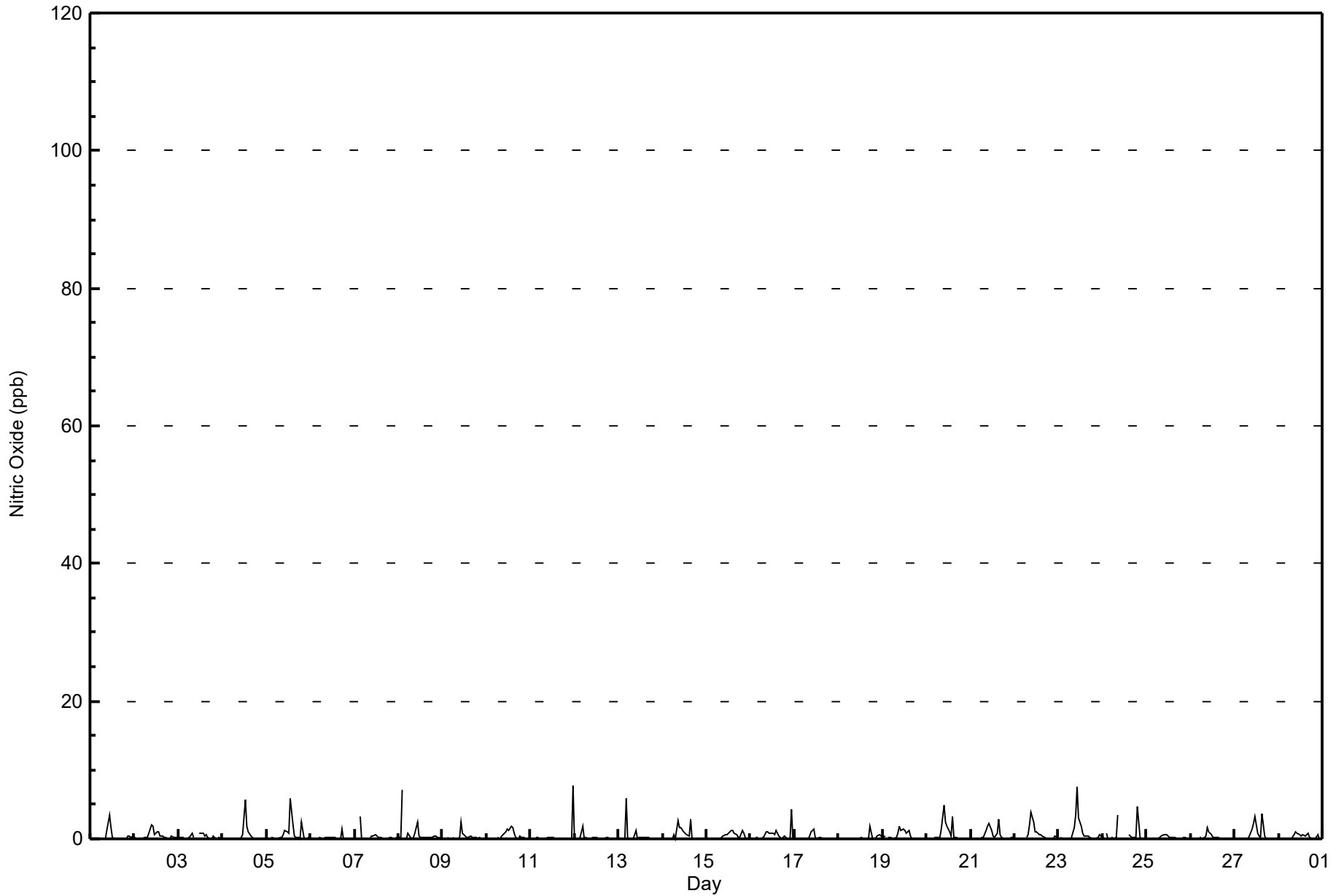
**Nitric Oxide (NO) - ppb**  
**Conklin - February 2023**

Maximum Value: 7.8 ppb on Feb 12 00:00      Maximum Daily Average: 0.9 ppb on Feb 23		Hours in Service: 672 Hours of Data: 637 Hours of Missing Data: 35 Hours of Calibration: 33 Percent Operational Time: 99.7																								
Minimum Value: 0.0 ppb on Feb 1 01:00 Maximum Diurnal Average: 1.5 ppb at hour 11 Monthly Average: 0.43 ppb		Minimum Daily Average: 0.1 ppb on Feb 6 Minimum Diurnal Average: 0.1 ppb at hour 2 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> = 1.1 P <sub>99</sub> = 4.8																								
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-Feb	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.1	1.2	3.5	1.7	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.4	0.3	0.2	0.4	0.4	3.5	
2-Feb	0.1	0.1	0.0	Z	0.0	0.3	0.3	0.2	1.4	2.0	1.8	0.5	1.0	0.9	0.4	0.4	0.2	0.1	0.1	0.1	0.3	0.2	0.2	0.2	0.5	2.0
3-Feb	0.2	0.2	0.3	0.1	Z	0.2	0.2	0.8	0.2	M	M	0.8	0.9	0.9	0.5	0.7	0.2	0.0	0.0	0.4	0.1	0.1	0.2	0.0	0.3	0.9
4-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.3	0.6	5.7	1.7	0.9	0.4	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.4	5.7
5-Feb	Z	0.0	0.1	0.2	0.0	0.0	0.0	0.2	0.2	0.6	1.2	1.0	0.8	5.9	2.1	0.5	0.2	0.1	0.0	2.4	0.1	0.0	0.1	0.2	0.7	5.9
6-Feb	0.1	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.0	0.0	0.1	1.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	1.3
7-Feb	0.0	0.0	Z	3.3	0.0	0.1	0.0	0.0	0.1	0.4	0.4	0.7	0.4	0.3	0.1	0.1	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.2	0.3	3.3
8-Feb	0.2	0.2	7.1	Z	0.1	0.7	0.3	0.0	0.3	0.7	2.5	0.4	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.3	0.4	0.2	0.2	0.1	0.7	7.1
9-Feb	0.1	0.0	0.0	0.2	Z	0.2	0.1	0.1	0.1	0.3	2.4	0.9	0.4	0.2	0.2	0.3	0.2	0.1	0.3	0.1	0.1	0.0	0.0	0.0	0.3	2.4
10-Feb	0.0	0.0	0.0	0.0	0.1	Z	0.1	0.1	0.4	0.6	1.0	1.4	1.3	1.8	1.6	0.8	0.2	0.0	0.4	0.2	0.2	0.0	0.0	0.0	0.4	1.8
11-Feb	Z	0.0	0.0	0.1	0.2	0.1	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	0.1	0.1	0.1	7.8	0.4	7.8
12-Feb	0.0	Z	0.1	0.1	1.9	0.0	0.1	0.0	0.1	0.1	0.1	0.3	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.0	0.1	0.0	0.1	0.0	0.2	1.9
13-Feb	0.0	0.0	Z	0.0	5.8	0.0	0.1	0.0	0.0	1.2	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	0.4	5.8
14-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.6	0.0	2.6	1.7	1.6	1.1	0.8	0.7	0.4	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.8
15-Feb	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	1.1	1.1	0.8	0.6	0.1	0.2	1.2	0.7	0.3	0.0	0.0	0.4	1.2
16-Feb	0.0	0.0	0.1	0.1	0.2	Z	0.2	0.1	1.0	1.0	0.7	0.8	0.9	0.7	1.1	0.5	0.2	0.1	0.4	0.1	0.0	0.0	4.3	0.0	0.6	4.3
17-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.5	1.1	1.4	0.2	0.1	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	1.4
18-Feb	0.1	Z	0.1	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	0.1	1.8	0.0	0.0	0.1	0.3	0.6	0.3	0.2	1.8
19-Feb	0.3	0.3	Z	0.2	0.1	0.0	0.1	0.3	0.9	1.8	1.3	1.5	1.1	0.9	1.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.8
20-Feb	0.0	0.0	0.0	Z	0.1	0.1	0.2	0.2	1.4	4.8	2.4	1.8	1.0	0.5	3.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	4.8
21-Feb	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.2	1.3	1.8	2.2	1.3	0.5	0.2	0.9	2.8	0.7	0.3	0.0	0.0	0.0	0.0	0.1	0.1	0.6	2.8
22-Feb	0.0	0.0	0.0	0.1	0.0	Z	0.2	0.6	2.0	3.8	2.5	1.0	0.9	0.6	0.5	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.4	0.2	0.6	3.8
23-Feb	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.6	3.4	7.5	3.0	1.8	0.9	0.5	0.4	0.4	0.1	0.1	0.0	0.0	0.1	0.6	0.4	0.9	7.5
24-Feb	0.2	Z	0.9	0.1	0.1	0.2	0.1	0.3	3.5	C	C	C	C	C	0.7	0.4	0.2	0.2	0.2	4.7	0.2	0.1	0.0	0.0	0.7	4.7
25-Feb	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.2	0.4	0.6	0.6	0.7	0.3	0.3	0.3	0.1	0.1	0.1	0.0	0.1	0.3	0.2	0.1	0.0	0.2	0.7
26-Feb	0.1	0.0	0.1	Z	0.0	0.1	0.0	0.1	0.4	1.5	1.0	0.6	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.5
27-Feb	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.5	1.5	2.2	3.2	0.8	0.3	0.2	3.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	3.6
28-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.5	1.0	0.8	0.6	0.5	0.6	0.4	0.7	0.8	0.3	0.0	0.0	0.0	0.6	0.1	0.0	0.3	1.0
0.1   0.1   0.4   0.2   0.4   0.1   0.1   0.1   0.7   1.2   1.5   0.9   0.8   0.7   0.6   0.6   0.2   0.2   0.1   0.4   0.1   0.1   0.3   0.4 0.3   0.3   7.1   3.3   5.8   0.7   0.6   0.8   3.5   4.8   7.5   3.2   5.7   5.9   3.2   3.6   0.8   1.8   0.4   4.7   0.7   0.6   4.3   7.8																								Diurnal Average	Diurnal Maximum	
Z - zerospan			C - Calibration			M - Maintenance																				



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

**Nitric Oxide (NO) - ppb**  
**Conklin - February 2023**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Conklin - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	637	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: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Conklin - February 2023**

<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	40	29	14	14	14	18	35	55	62	60	66	33	37	34	55	69	635
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>	40	29	14	14	14	18	35	55	62	60	66	33	37	34	55	69	635

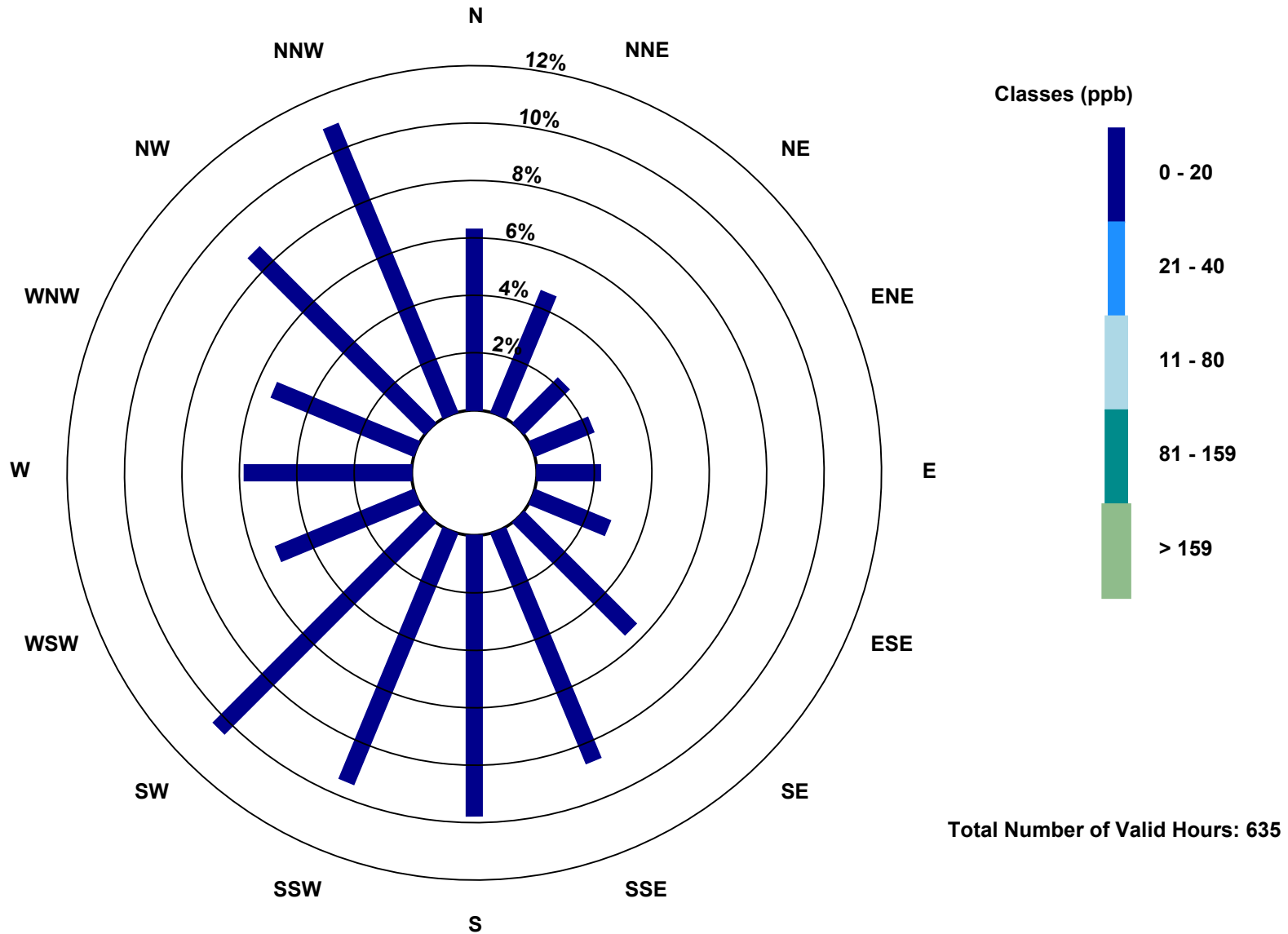
Total Number of Valid Hours: 635

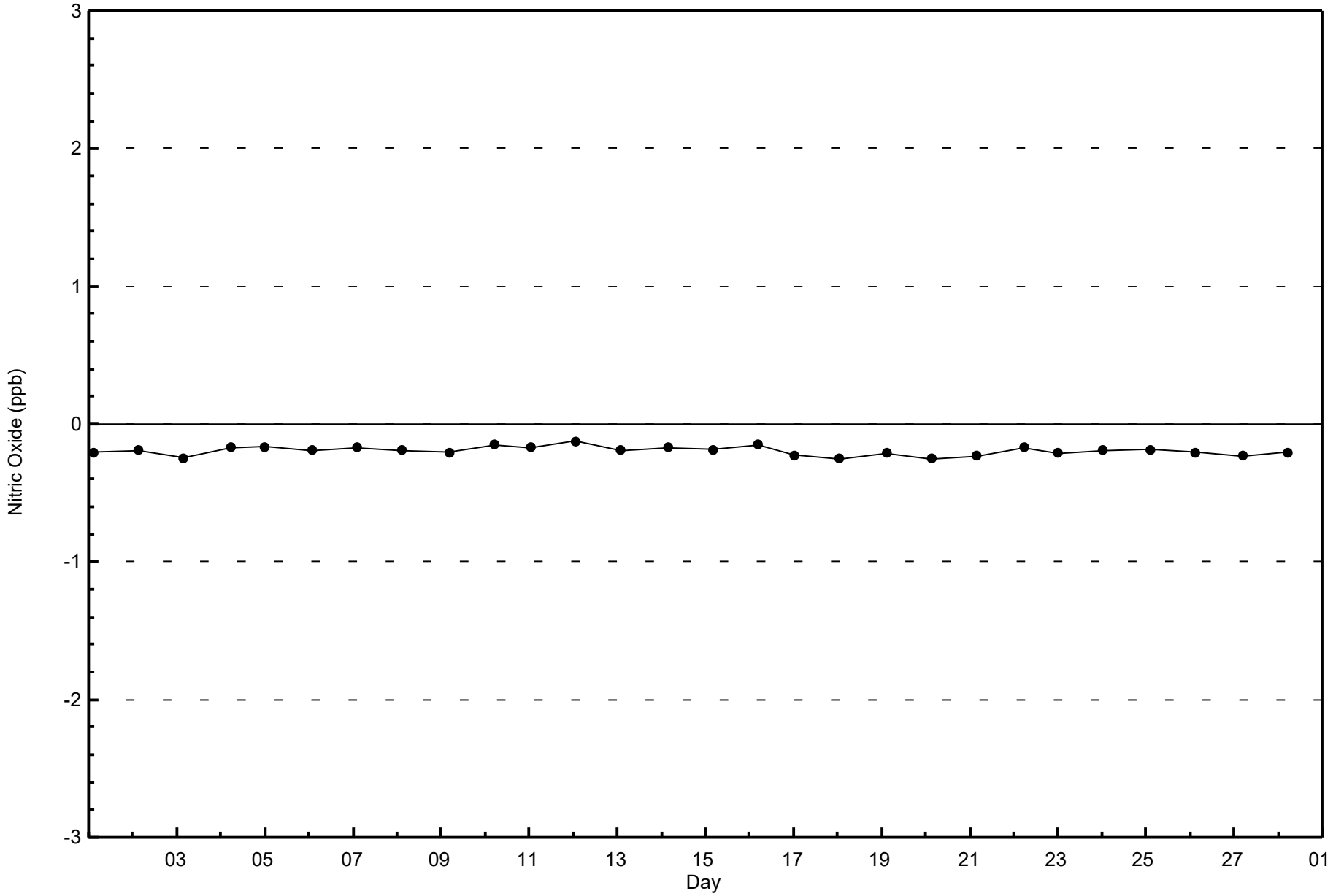
Total Number of Hours: 672

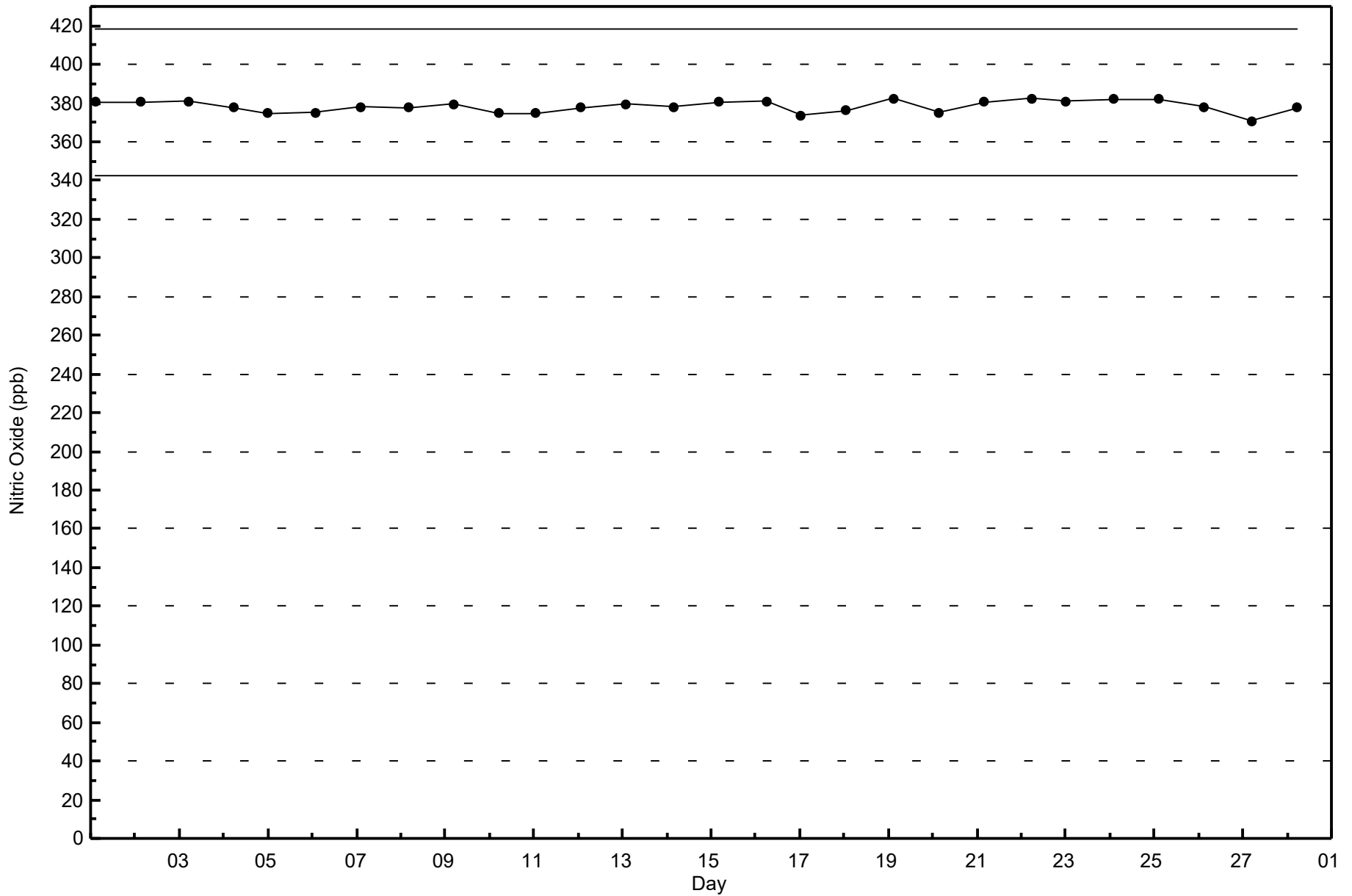


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitric Oxide (NO) - ppb  
Conklin









Wood Buffalo Environmental Association

Summary of Hour Averages

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

Conklin - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 21.0 ppb on Feb 8 03:00	Maximum Daily Average: 5.1 ppb on Feb 10		Hours of Data:	637
Minimum Value: 0.3 ppb on Feb 1 08:00	Minimum Daily Average: 1.0 ppb on Feb 11		Hours of Missing Data:	35
Maximum Diurnal Average: 3.7 ppb at hour 3	Minimum Diurnal Average: 1.7 ppb at hour 15		Hours of Calibration:	33
Monthly Average: 2.83 ppb	Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 0.7 Q <sub>1</sub> = 1.2 Median = 2.4 Q <sub>3</sub> = 3.8 P <sub>90</sub> = 5.5 P <sub>99</sub> = 10.5		Percent Operational Time:	99.7

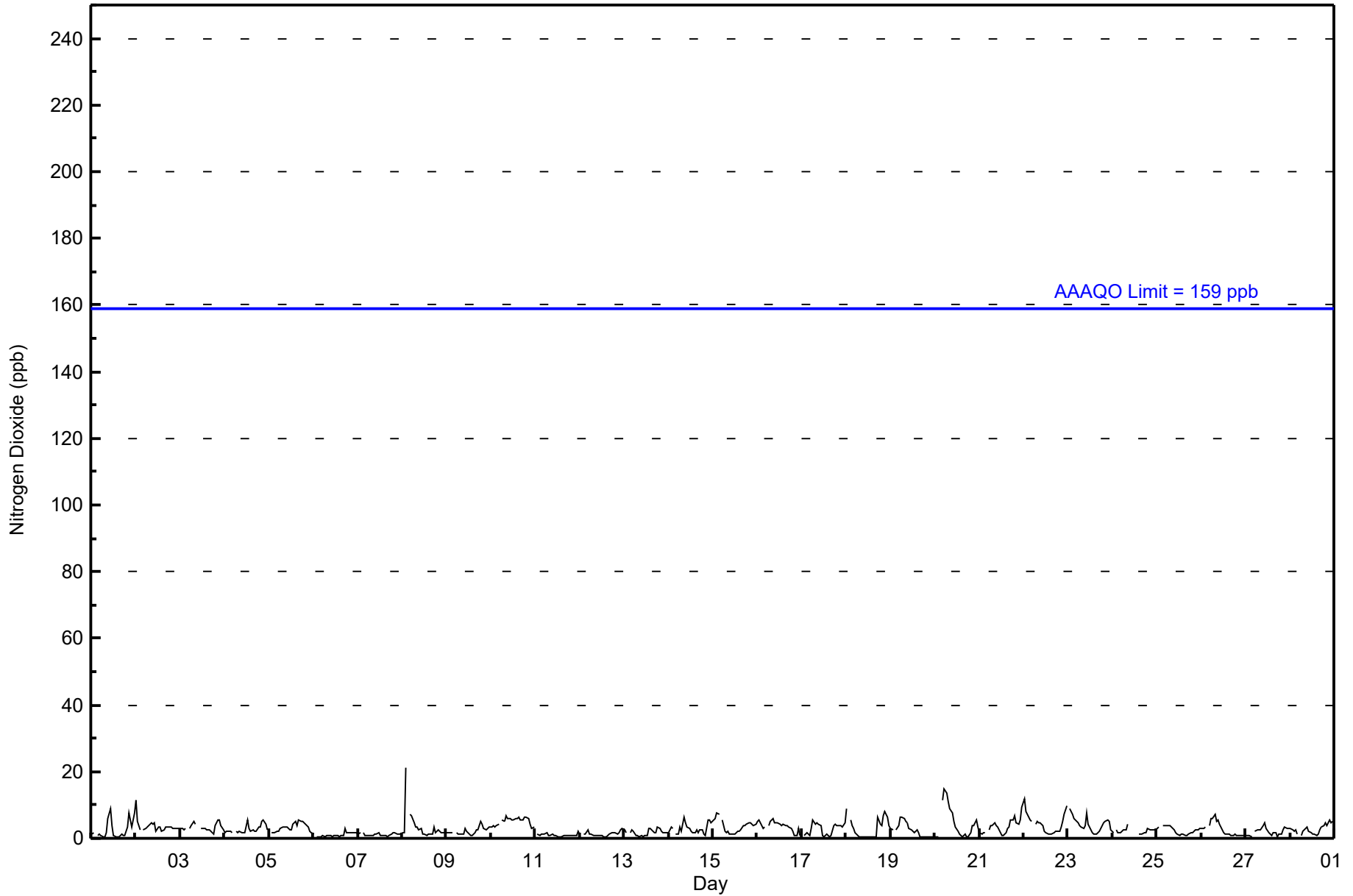
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Feb	1.4	1.6	Z	0.8	1.2	0.9	0.6	0.3	1.6	6.1	8.9	3.7	0.8	0.4	0.3	0.4	1.2	1.0	0.9	3.2	7.5	5.3	3.5	7.8	2.6	8.9
2-Feb	11.3	4.9	2.4	Z	2.4	2.8	3.2	3.8	4.8	4.2	4.6	2.0	3.2	3.5	2.1	2.4	3.4	3.5	3.6	3.5	3.0	2.9	3.0	3.0	3.6	11.3
3-Feb	2.8	2.8	2.7	3.0	Z	3.1	4.0	5.1	4.2	M	M	2.9	2.9	3.1	2.5	2.5	2.7	1.5	1.2	3.7	5.5	5.5	3.7	2.6	3.2	5.5
4-Feb	1.7	2.0	2.1	2.1	1.8	Z	2.2	1.6	2.3	1.7	1.7	1.7	5.3	2.8	2.1	2.5	2.1	2.1	3.2	3.4	5.2	5.6	4.2	2.7	2.7	5.6
5-Feb	Z	1.6	1.7	1.9	2.2	2.2	2.9	3.3	3.4	3.6	3.4	2.7	2.5	4.4	5.2	4.0	5.6	4.9	5.0	4.7	4.0	3.5	2.3	1.5	3.3	5.6
6-Feb	1.1	Z	0.5	0.6	0.6	0.8	0.5	0.9	0.9	0.9	0.6	0.8	0.7	0.8	0.6	0.7	0.8	3.0	1.9	1.6	1.7	1.8	1.6	1.5	1.1	3.0
7-Feb	1.4	1.5	Z	1.9	0.9	0.8	0.8	0.8	0.9	1.2	1.2	1.5	1.0	0.7	0.7	0.7	0.6	0.9	1.2	1.5	1.6	1.4	1.3	1.3	1.1	1.9
8-Feb	1.5	1.6	21.0	Z	7.4	6.9	4.6	3.4	3.3	2.4	3.0	1.3	1.1	0.9	1.1	1.2	1.4	3.5	1.9	2.6	2.0	1.9	1.8	1.6	3.4	21.0
9-Feb	1.6	1.6	1.6	1.8	Z	1.6	1.2	1.3	1.4	1.3	2.8	2.3	1.2	0.9	1.0	1.9	2.4	2.5	4.9	4.2	3.1	2.6	3.0	3.3	2.2	4.9
10-Feb	3.6	3.7	3.4	3.7	4.1	Z	5.3	5.0	6.8	6.0	5.8	5.6	5.6	6.0	6.0	6.2	5.7	5.4	6.3	6.2	6.0	4.3	3.1	3.3	5.1	6.8
11-Feb	Z	1.1	1.0	1.4	1.3	1.3	1.7	1.0	1.0	1.1	0.8	0.7	0.6	0.6	0.5	0.7	0.8	1.0	0.9	0.9	0.8	0.9	1.0	2.3	1.0	2.3
12-Feb	1.2	Z	1.1	1.2	2.6	1.2	1.3	1.0	0.8	0.7	0.8	0.7	0.7	0.5	0.6	0.7	1.2	1.8	1.9	1.6	1.2	1.7	2.7	3.0	1.3	3.0
13-Feb	2.4	1.5	Z	1.6	2.5	2.3	0.7	0.7	0.6	0.9	0.6	0.8	0.8	3.1	3.1	2.6	1.9	1.8	3.3	2.8	2.2	1.5	1.5	1.7	1.8	3.3
14-Feb	1.8	3.6	2.8	Z	1.4	1.2	3.3	2.1	6.3	4.7	3.4	3.0	2.2	1.7	1.5	2.5	1.8	2.6	2.4	1.3	0.7	5.6	5.3	4.7	2.9	6.3
15-Feb	5.4	5.8	7.5	7.1	Z	5.6	2.1	1.6	2.0	1.3	1.4	1.2	1.3	2.0	2.3	2.5	4.0	3.8	4.3	4.5	4.8	4.2	3.8	4.4	3.6	7.5
16-Feb	4.9	5.4	3.8	3.0	3.3	Z	3.9	5.0	6.0	4.8	4.7	4.5	4.4	4.0	4.3	4.0	3.8	3.5	3.1	2.3	1.0	0.7	2.8	0.7	3.6	6.0
17-Feb	Z	0.7	1.3	1.7	0.7	2.8	5.3	4.2	4.6	4.1	3.7	0.7	0.6	1.1	0.9	0.5	0.7	3.9	4.2	3.9	3.7	4.0	3.6	4.6	2.7	5.3
18-Feb	8.7	Z	5.3	3.9	2.8	1.8	0.9	0.5	0.4	0.4	0.3	0.3	0.4	0.3	0.4	0.4	0.5	6.3	4.1	4.0	6.8	7.9	6.5	3.7	2.9	8.7
19-Feb	3.0	2.7	Z	2.4	3.7	6.2	6.2	6.1	5.0	4.6	3.1	2.7	2.2	1.6	2.4	1.5	0.6	0.5	0.4	0.5	0.4	0.3	0.3	0.4	2.5	6.2
20-Feb	0.6	0.5	0.6	Z	11.6	15.0	13.6	11.0	9.0	7.8	5.0	3.4	2.3	1.1	1.0	0.6	1.2	0.6	0.5	1.9	3.7	3.8	5.5	3.5	4.5	15.0
21-Feb	1.5	1.3	1.8	1.7	Z	2.4	3.9	3.7	4.8	3.7	3.3	1.9	0.9	0.7	1.7	2.9	3.2	5.5	5.6	6.6	4.8	4.2	5.3	9.4	3.5	9.4
22-Feb	11.9	8.1	7.2	5.7	4.9	Z	4.4	4.9	4.7	4.8	3.8	2.0	1.7	1.2	1.2	1.2	1.5	2.1	2.0	2.2	3.4	4.9	7.0	9.6	4.4	11.9
23-Feb	Z	9.1	7.2	5.9	5.5	4.5	3.8	3.4	2.9	3.9	7.5	4.3	2.7	1.7	1.2	1.4	1.9	2.2	3.8	4.6	4.9	5.5	4.9	2.7	4.2	9.1
24-Feb	1.9	Z	2.5	1.5	1.9	2.1	2.5	2.4	4.1	C	C	C	C	C	1.1	1.2	1.3	1.5	1.7	2.9	2.5	2.5	2.4	2.6	2.1	4.1
25-Feb	3.1	3.3	Z	3.7	3.9	3.9	4.0	3.9	3.2	2.7	1.9	1.3	1.0	1.1	1.2	0.9	0.9	1.4	1.5	1.7	2.2	2.7	2.5	2.9	2.4	4.0
26-Feb	2.9	2.8	3.5	Z	3.7	5.8	6.0	7.4	4.9	5.7	4.3	2.5	1.5	1.4	1.4	1.1	1.0	0.9	1.3	0.7	0.8	0.7	0.9	1.0	2.7	7.4
27-Feb	1.0	1.0	0.9	0.6	Z	2.2	2.5	2.5	2.7	3.8	4.6	3.1	1.8	1.2	0.8	1.9	1.8	0.6	1.1	1.3	2.6	3.6	3.1	3.1	2.1	4.6
28-Feb	2.9	2.4	2.2	2.4	1.4	Z	0.9	2.2	3.1	3.3	2.1	1.5	1.1	1.3	1.0	1.4	2.4	3.6	3.7	4.6	4.0	5.3	4.6	4.9	2.7	5.3
	3.3	2.9	3.7	2.6	3.1	3.4	3.3	3.2	3.4	3.3	3.2	2.2	1.9	1.8	1.7	1.8	2.0	2.6	2.7	3.0	3.2	3.4	3.3	3.4		Diurnal Average
	11.9	9.1	21.0	7.1	11.6	15.0	13.6	11.0	9.0	7.8	8.9	5.6	5.6	6.0	6.0	6.2	5.7	6.3	6.3	6.6	7.5	7.9	7.0	9.6		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**  
**Conklin - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Conklin - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	636	99.84	99.84
21 - 40	1	0.16	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: 637

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Conklin - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	40	29	14	14	14	18	35	55	61	60	66	33	37	34	55	69	634
21 - 40	0	0	0	0	0	0	0	0	1	0	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>	40	29	14	14	14	18	35	55	62	60	66	33	37	34	55	69	635

Total Number of Valid Hours: 635

Total Number of Hours: 672

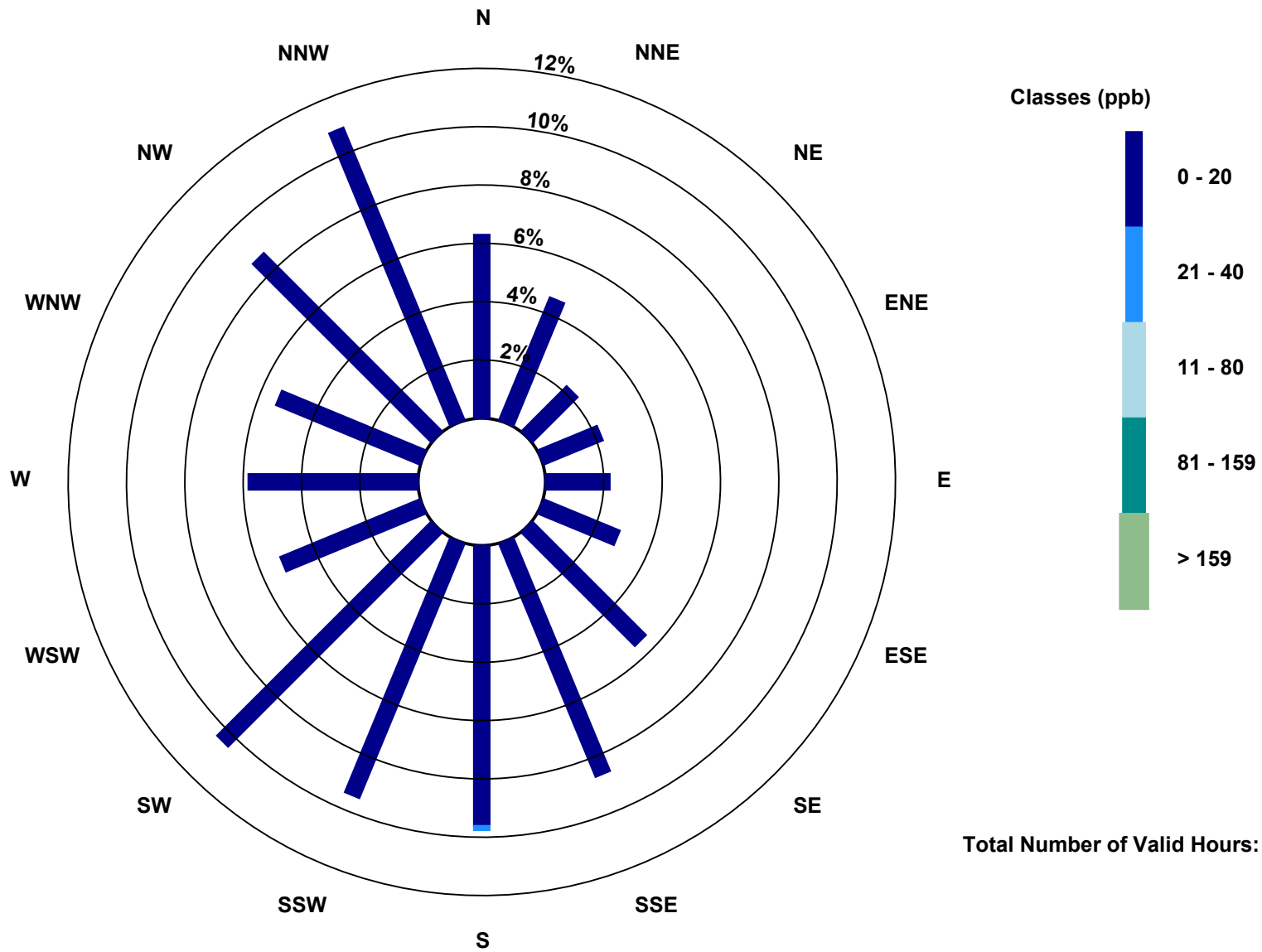


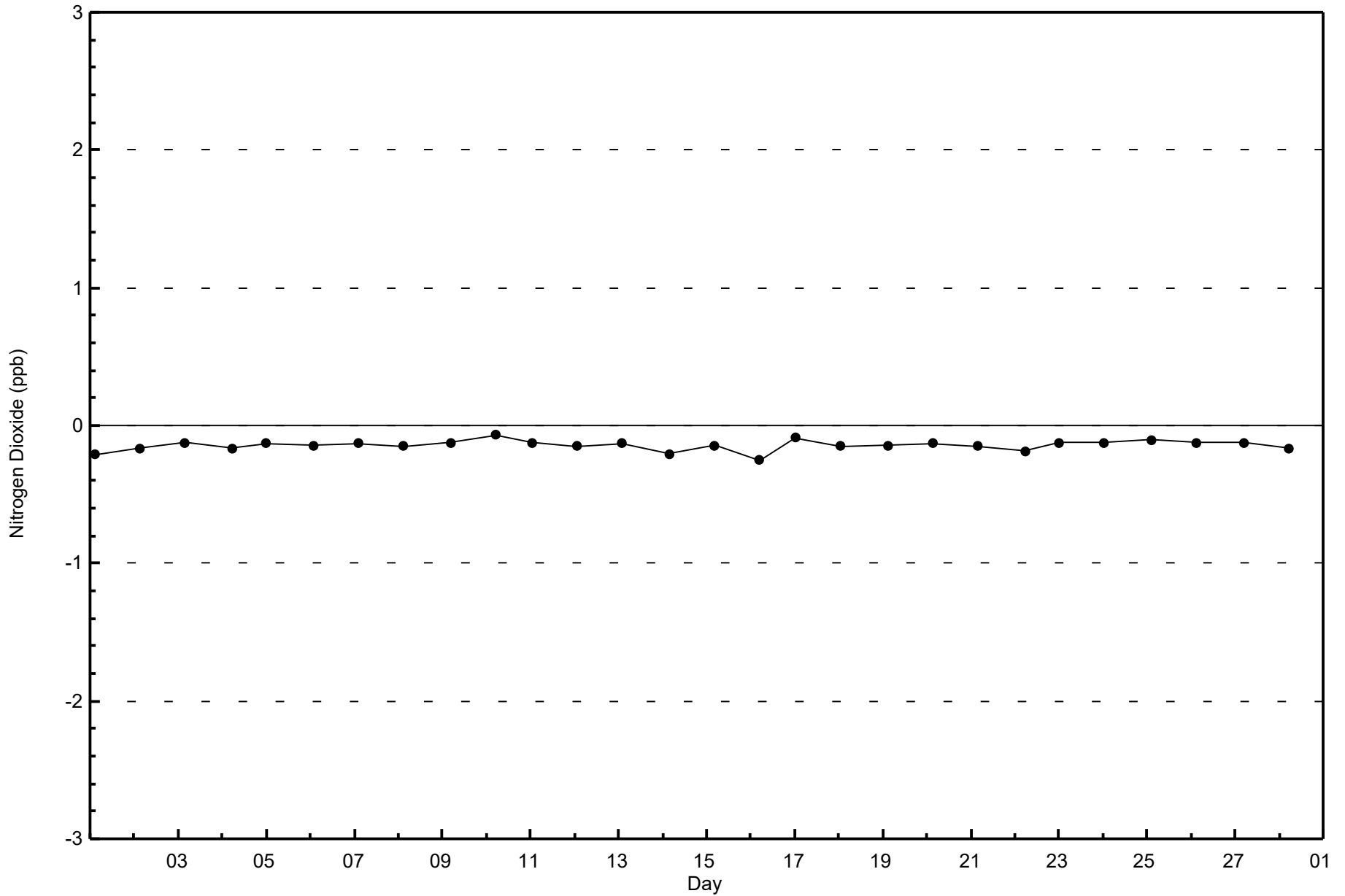
# Wood Buffalo Environmental Association

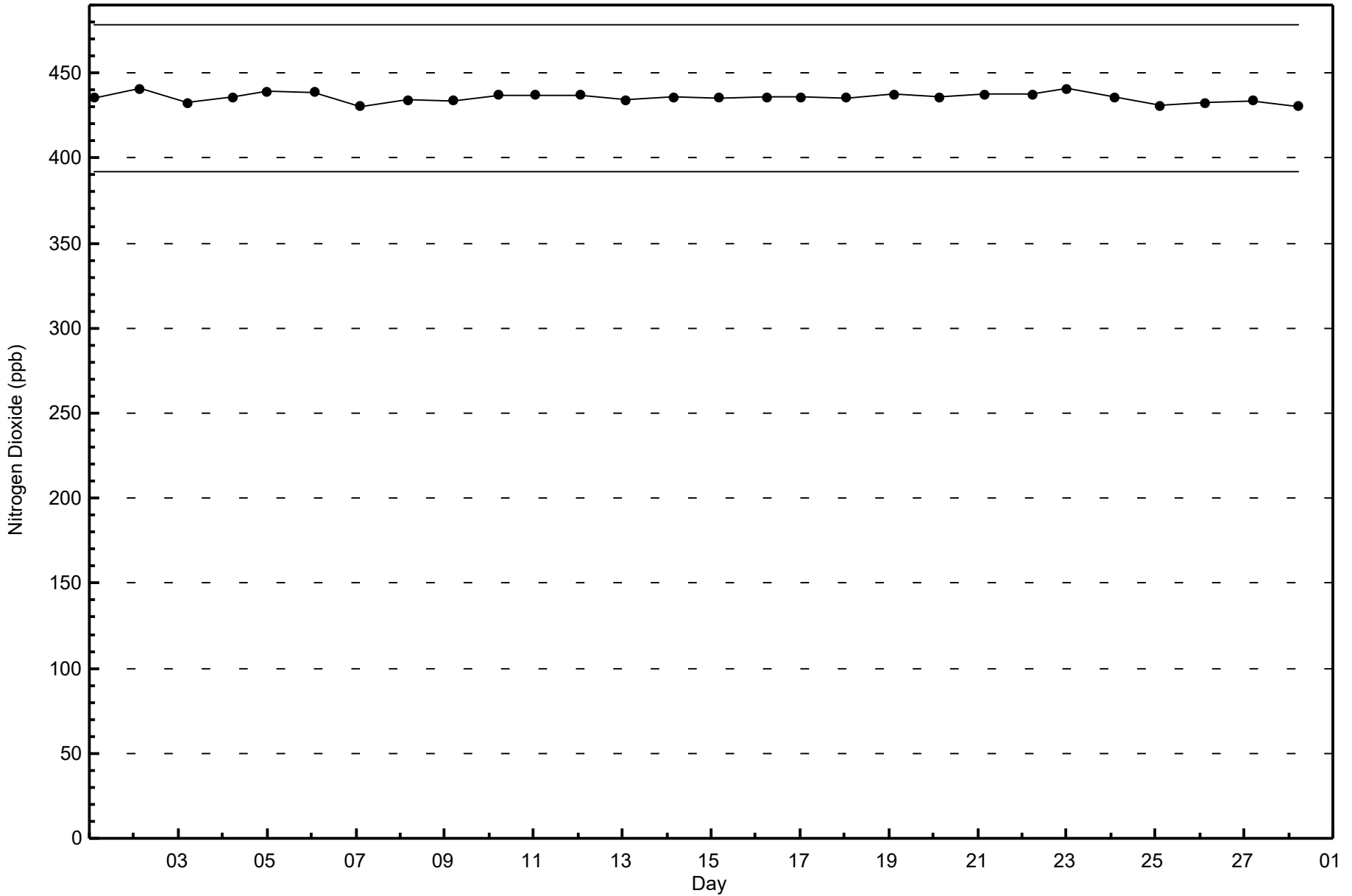
## Wind Rose Feb 2023

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

## Conklin





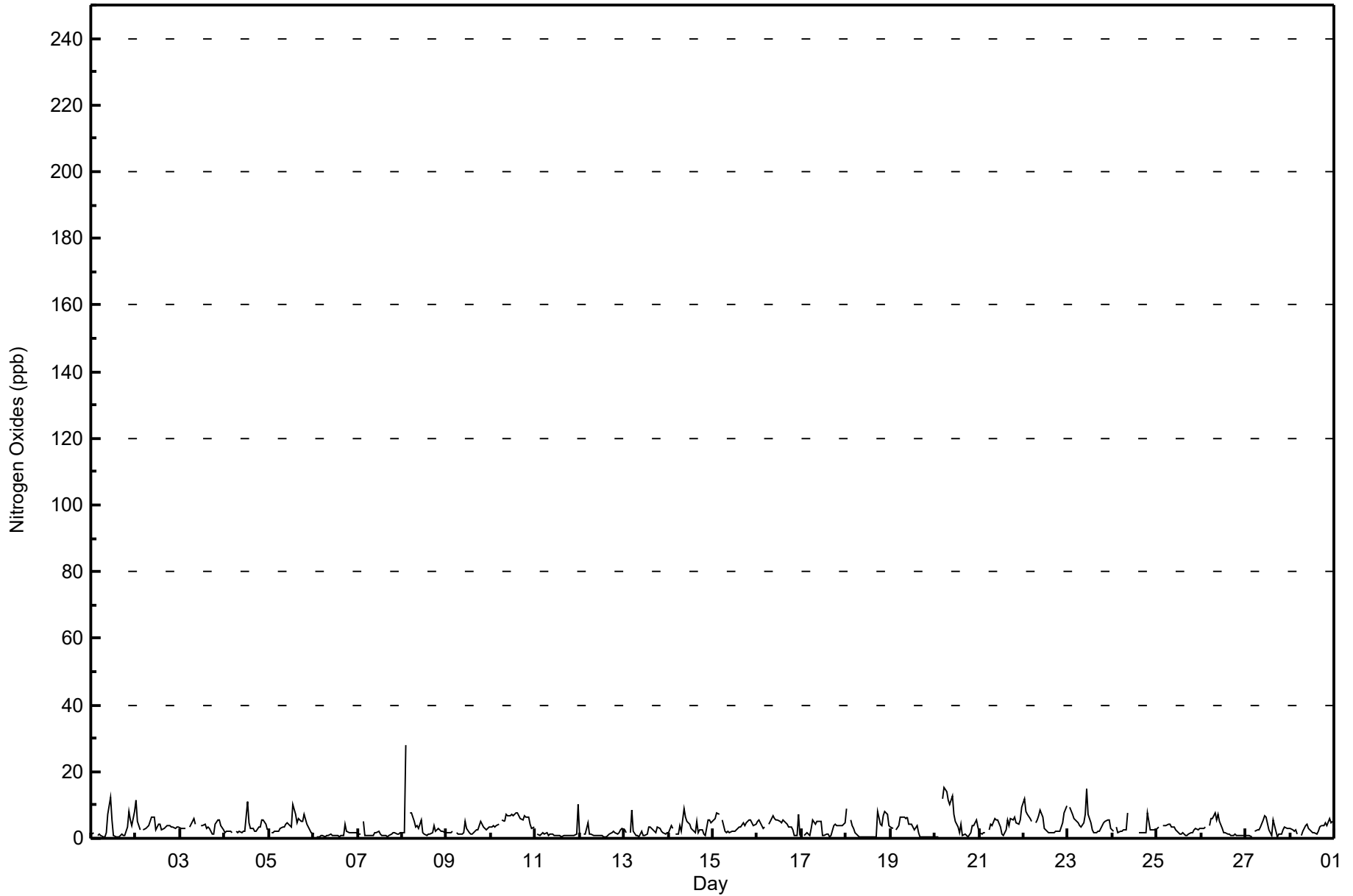




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Conklin - February 2023**

Maximum Value: 28.1 ppb on Feb 8 03:00		Maximum Daily Average: 5.5 ppb on Feb 10		Hours in Service: 672																																													
Minimum Value: 0.3 ppb on Feb 1 08:00		Minimum Daily Average: 1.2 ppb on Feb 6		Hours of Data: 637																																													
Maximum Diurnal Average: 4.7 ppb at hour 11		Minimum Diurnal Average: 2.2 ppb at hour 17		Hours of Missing Data: 35																																													
Monthly Average: 3.26 ppb		Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.8 Q <sub>1</sub> = 1.4 Median = 2.6 Q <sub>3</sub> = 4.4 P <sub>90</sub> = 6.3 P <sub>99</sub> = 11.8		Hours of Calibration: 33																																													
				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-Feb	1.4	1.7	Z	0.8	1.2	0.9	0.6	0.3	1.7	7.3	12.4	5.4	1.0	0.5	0.3	0.4	1.2	1.0	0.9	3.3	7.9	5.6	3.7	8.2	2.9	12.4																							
2-Feb	11.4	5.0	2.4	Z	2.4	3.1	3.5	4.0	6.2	6.2	6.4	2.5	4.2	4.4	2.5	2.8	3.6	3.6	3.7	3.6	3.3	3.1	3.2	3.2	4.1	11.4																							
3-Feb	3.0	3.0	3.0	3.1	Z	3.3	4.2	5.9	4.4	M	M	3.7	3.8	4.0	3.0	3.2	2.9	1.5	1.2	4.1	5.6	5.6	3.9	2.6	3.6	5.9																							
4-Feb	1.7	2.0	2.1	2.1	1.8	Z	2.2	1.6	2.3	1.8	2.0	2.3	11.0	4.5	3.0	2.9	2.2	2.1	3.3	3.4	5.3	5.7	4.2	2.7	3.1	11.0																							
5-Feb	Z	1.6	1.8	2.1	2.2	2.2	2.9	3.5	3.6	4.2	4.6	3.7	3.3	10.3	7.3	4.5	5.8	5.0	5.0	7.1	4.1	3.5	2.4	1.7	4.0	10.3																							
6-Feb	1.2	Z	0.5	0.6	0.7	0.9	0.6	1.0	1.0	1.1	0.7	1.0	0.9	1.0	0.6	0.7	0.9	4.3	2.0	1.6	1.7	1.8	1.6	1.5	1.2	4.3																							
7-Feb	1.4	1.5	Z	5.2	0.9	0.9	0.8	0.8	1.0	1.6	1.6	2.2	1.4	1.0	0.8	0.8	0.6	0.9	1.2	1.7	1.7	1.4	1.3	1.5	1.4	5.2																							
8-Feb	1.7	1.8	28.1	Z	7.5	7.6	4.9	3.4	3.6	3.1	5.5	1.7	1.4	1.1	1.3	1.4	1.5	3.7	2.0	2.9	2.4	2.1	2.0	1.7	4.0	28.1																							
9-Feb	1.7	1.6	1.6	2.0	Z	1.8	1.3	1.4	1.5	1.6	5.2	3.2	1.6	1.1	1.2	2.2	2.6	2.6	5.2	4.3	3.2	2.6	3.0	3.3	2.4	5.2																							
10-Feb	3.6	3.7	3.4	3.7	4.2	Z	5.4	5.1	7.2	6.6	6.8	7.0	6.9	7.8	7.6	7.0	5.9	5.4	6.7	6.4	6.2	4.3	3.1	3.3	5.5	7.8																							
11-Feb	Z	1.1	1.0	1.5	1.5	1.4	1.7	1.0	1.1	1.3	0.9	0.8	0.7	0.7	0.5	0.7	0.8	1.0	0.9	0.9	0.9	1.0	1.1	10.1	1.4	10.1																							
12-Feb	1.2	Z	1.2	1.3	4.5	1.2	1.4	1.0	0.9	0.8	0.9	1.0	0.8	0.6	0.6	0.7	1.3	1.9	2.1	1.6	1.3	1.7	2.8	3.0	1.5	4.5																							
13-Feb	2.4	1.5	Z	1.6	8.3	2.3	0.8	0.7	0.6	2.1	0.7	1.0	1.1	3.3	3.4	2.8	2.0	1.8	3.3	2.8	2.2	1.5	1.5	1.7	2.2	8.3																							
14-Feb	1.8	3.6	2.8	Z	1.4	1.2	3.9	2.1	8.9	6.4	5.0	4.1	3.0	2.4	1.9	5.3	1.8	2.6	2.4	1.3	0.7	5.6	5.3	4.7	3.4	8.9																							
15-Feb	5.4	5.8	7.5	7.1	Z	5.6	2.1	1.6	2.1	1.6	2.0	1.9	2.0	3.1	3.4	3.3	4.6	3.9	4.5	5.7	5.5	4.5	3.8	4.4	4.0	7.5																							
16-Feb	4.9	5.4	3.9	3.1	3.5	Z	4.1	5.1	7.0	5.8	5.4	5.3	5.3	4.7	5.4	4.5	4.0	3.6	3.5	2.4	1.0	0.7	7.1	0.7	4.2	7.1																							
17-Feb	Z	0.7	1.3	1.7	0.7	2.8	5.4	4.3	5.1	5.2	5.1	0.9	0.7	1.4	1.1	0.6	0.8	4.0	4.2	3.9	3.7	4.0	3.7	4.7	2.9	5.4																							
18-Feb	8.8	Z	5.4	3.9	2.8	1.8	0.9	0.5	0.4	0.4	0.3	0.4	0.5	0.4	0.4	0.4	0.6	8.1	4.1	4.0	6.9	8.2	7.1	4.0	3.0	8.8																							
19-Feb	3.3	3.0	Z	2.6	3.8	6.2	6.3	6.4	5.9	6.4	4.4	4.2	3.3	2.5	3.6	1.9	0.6	0.5	0.4	0.5	0.4	0.3	0.3	0.4	2.9	6.4																							
20-Feb	0.6	0.5	0.6	Z	11.7	15.1	13.8	11.2	10.4	12.6	7.4	5.2	3.3	1.6	4.2	0.7	1.3	0.6	0.5	1.9	3.7	3.8	5.5	3.5	5.2	15.1																							
21-Feb	1.5	1.3	1.8	1.7	Z	2.5	4.1	3.9	6.1	5.5	5.5	3.2	1.4	0.9	2.6	5.7	3.9	5.8	5.6	6.6	4.8	4.2	5.4	9.5	4.1	9.5																							
22-Feb	11.9	8.1	7.2	5.8	4.9	Z	4.6	5.5	6.7	8.6	6.3	3.0	2.6	1.8	1.7	1.5	1.7	2.2	2.0	2.2	3.4	4.9	7.4	9.8	4.9	11.9																							
23-Feb	Z	9.2	7.3	6.0	5.6	4.6	3.9	3.6	4.5	7.3	15.0	7.3	4.5	2.6	1.7	1.8	2.3	2.3	3.9	4.6	4.9	5.6	5.5	3.1	5.1	15.0																							
24-Feb	2.1	Z	3.4	1.6	2.0	2.3	2.6	2.7	7.6	C	C	C	C	C	1.8	1.6	1.5	1.7	1.9	7.6	2.7	2.6	2.4	2.6	2.8	7.6																							
25-Feb	3.1	3.3	Z	3.7	3.9	4.0	4.1	4.1	3.6	3.3	2.5	2.0	1.3	1.4	1.5	1.0	1.0	1.5	1.5	1.8	2.5	2.9	2.6	2.9	2.6	4.1																							
26-Feb	3.0	2.8	3.6	Z	3.7	5.9	6.0	7.5	5.3	7.2	5.3	3.1	1.8	1.6	1.5	1.2	1.0	0.9	1.3	0.7	0.8	0.7	0.9	1.0	2.9	7.5																							
27-Feb	1.0	1.0	0.9	0.6	Z	2.2	2.5	2.6	3.2	5.3	6.8	6.3	2.6	1.5	1.0	5.5	2.2	0.6	1.1	1.3	2.6	3.6	3.1	3.1	2.6	6.8																							
28-Feb	2.9	2.4	2.2	2.4	1.4	Z	0.9	2.3	3.6	4.3	2.9	2.1	1.6	1.9	1.4	2.1	3.2	3.9	3.7	4.6	4.0	5.9	4.7	4.9	3.0	5.9																							
																								3.4	3.0	4.0	2.8	3.5	3.5	3.4	3.3	4.1	4.5	4.7	3.1	2.7	2.5	2.3	2.4	2.2	2.7	2.8	3.3	3.3	3.5	3.5	3.7	Diurnal Average	
																								11.9	9.2	28.1	7.1	11.7	15.1	13.8	11.2	10.4	12.6	15.0	7.3	11.0	10.3	7.6	7.0	5.9	8.1	6.7	7.6	7.9	8.2	7.4	10.1	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance																					





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Conklin - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	636	99.84	99.84
21 - 40	1	0.16	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: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Conklin - February 2023**

<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	40	29	14	14	14	18	35	55	61	60	66	33	37	34	55	69	634
21 - 40	0	0	0	0	0	0	0	0	1	0	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>	<b>40</b>	<b>29</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>18</b>	<b>35</b>	<b>55</b>	<b>62</b>	<b>60</b>	<b>66</b>	<b>33</b>	<b>37</b>	<b>34</b>	<b>55</b>	<b>69</b>	<b>635</b>

Total Number of Valid Hours: 635

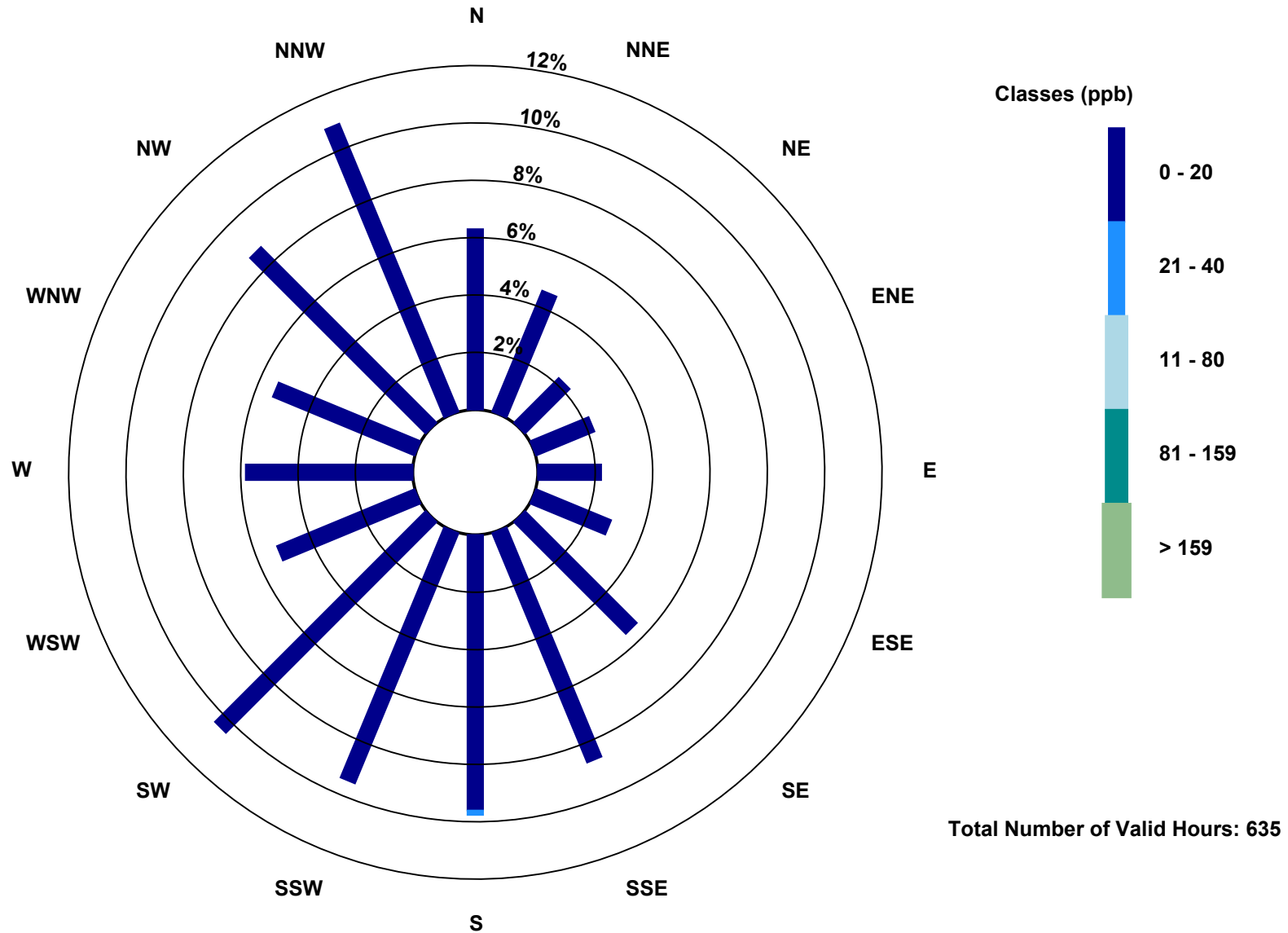
Total Number of Hours: 672

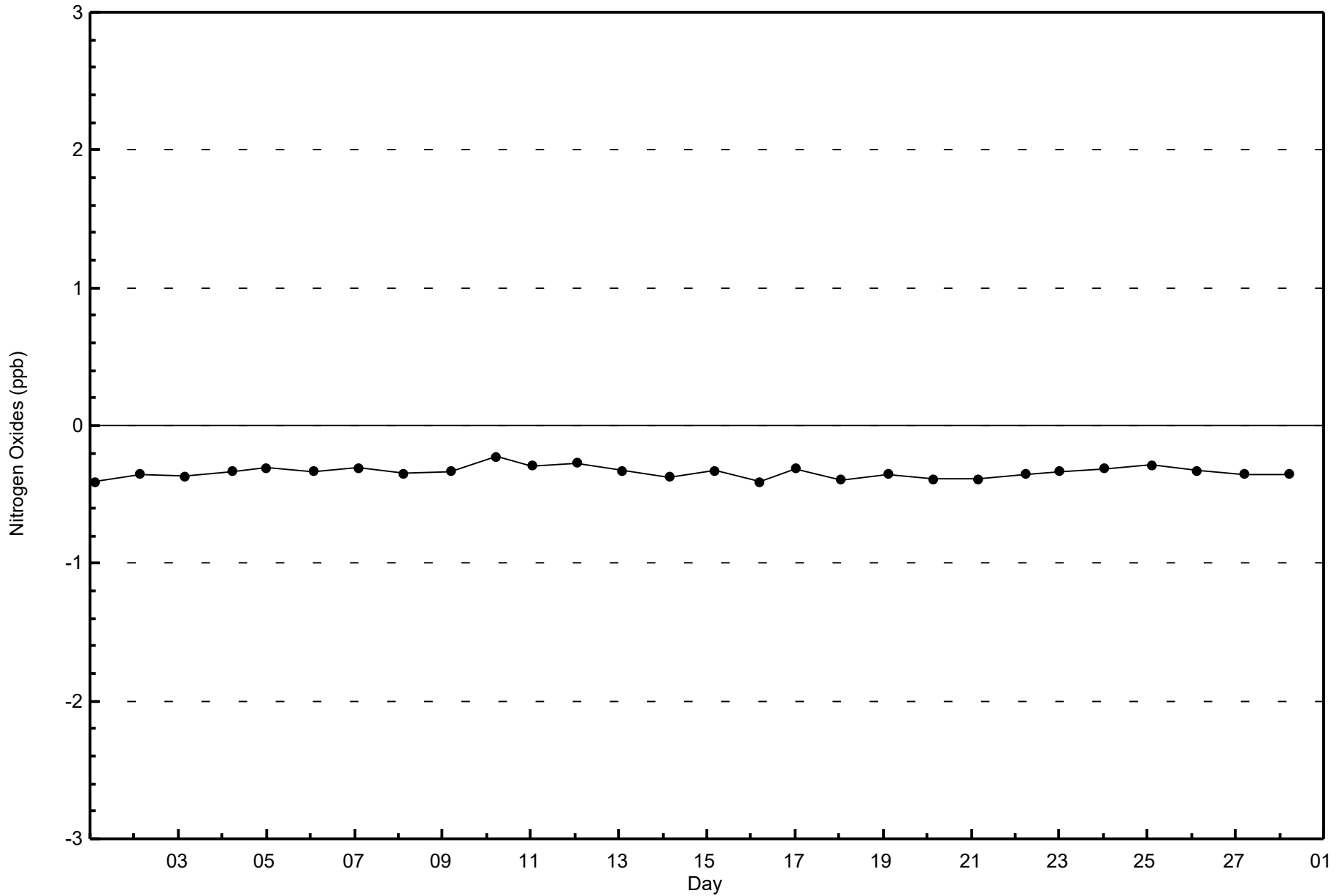


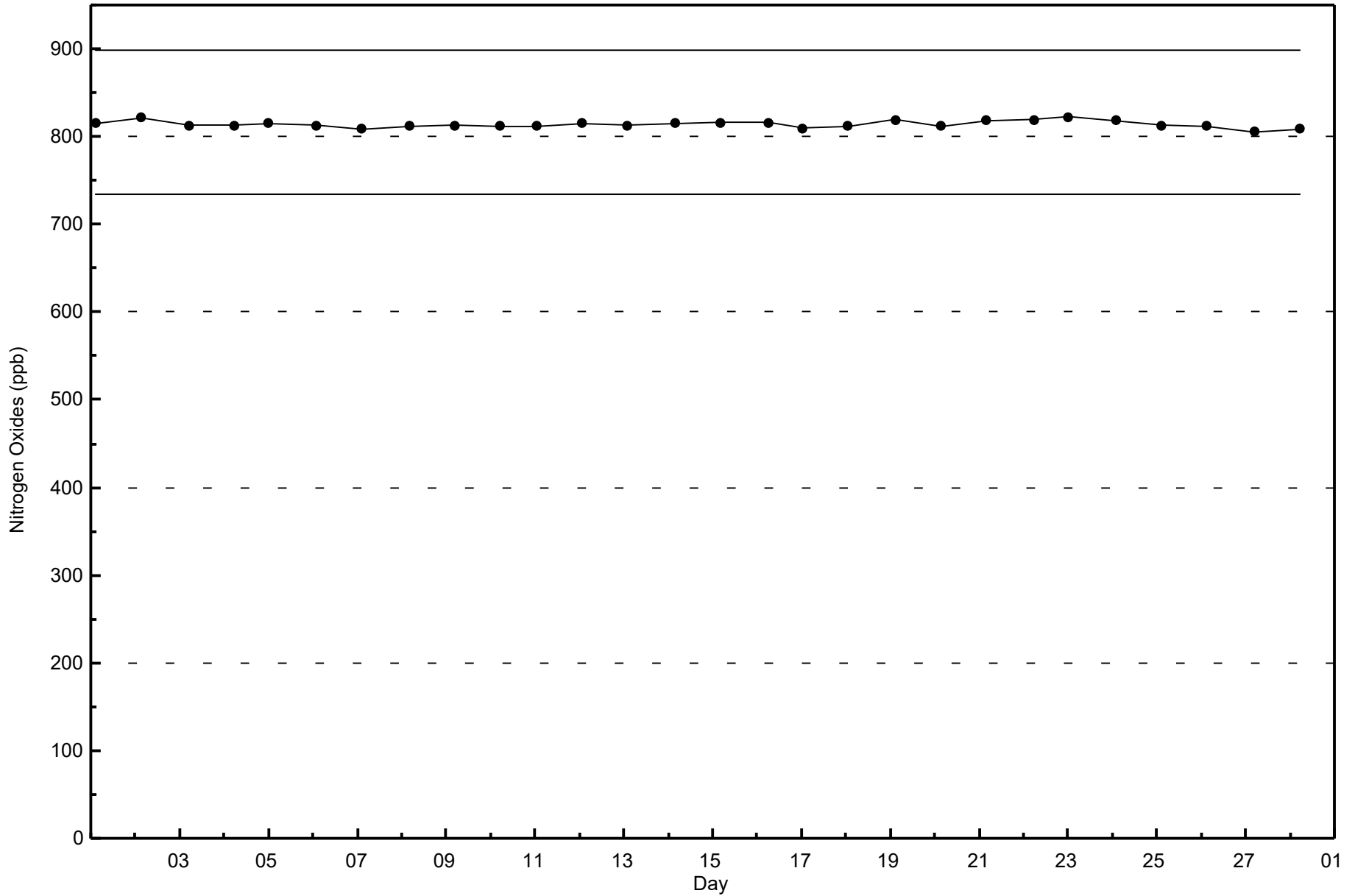


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









Wood Buffalo Environmental Association

Summary of Hour Averages

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

Conklin - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 45.3 ppb on Feb 25 16:00	Maximum Daily Average: 41.0 ppb on Feb 12		Hours of Data:	640
Minimum Value: 9.6 ppb on Feb 4 23:00	Minimum Daily Average: 19.3 ppb on Feb 4		Hours of Missing Data:	32
Maximum Diurnal Average: 37.5 ppb at hour 16	Minimum Diurnal Average: 27.7 ppb at hour 6		Hours of Calibration:	32
Monthly Average: 32.05 ppb	Percentiles: P <sub>1</sub> = 14.2 P <sub>10</sub> = 20.3 Q <sub>1</sub> = 26.2 Median = 33.8 Q <sub>3</sub> = 38.4 P <sub>90</sub> = 41.3 P <sub>99</sub> = 44.2		Percent Operational Time:	100.0

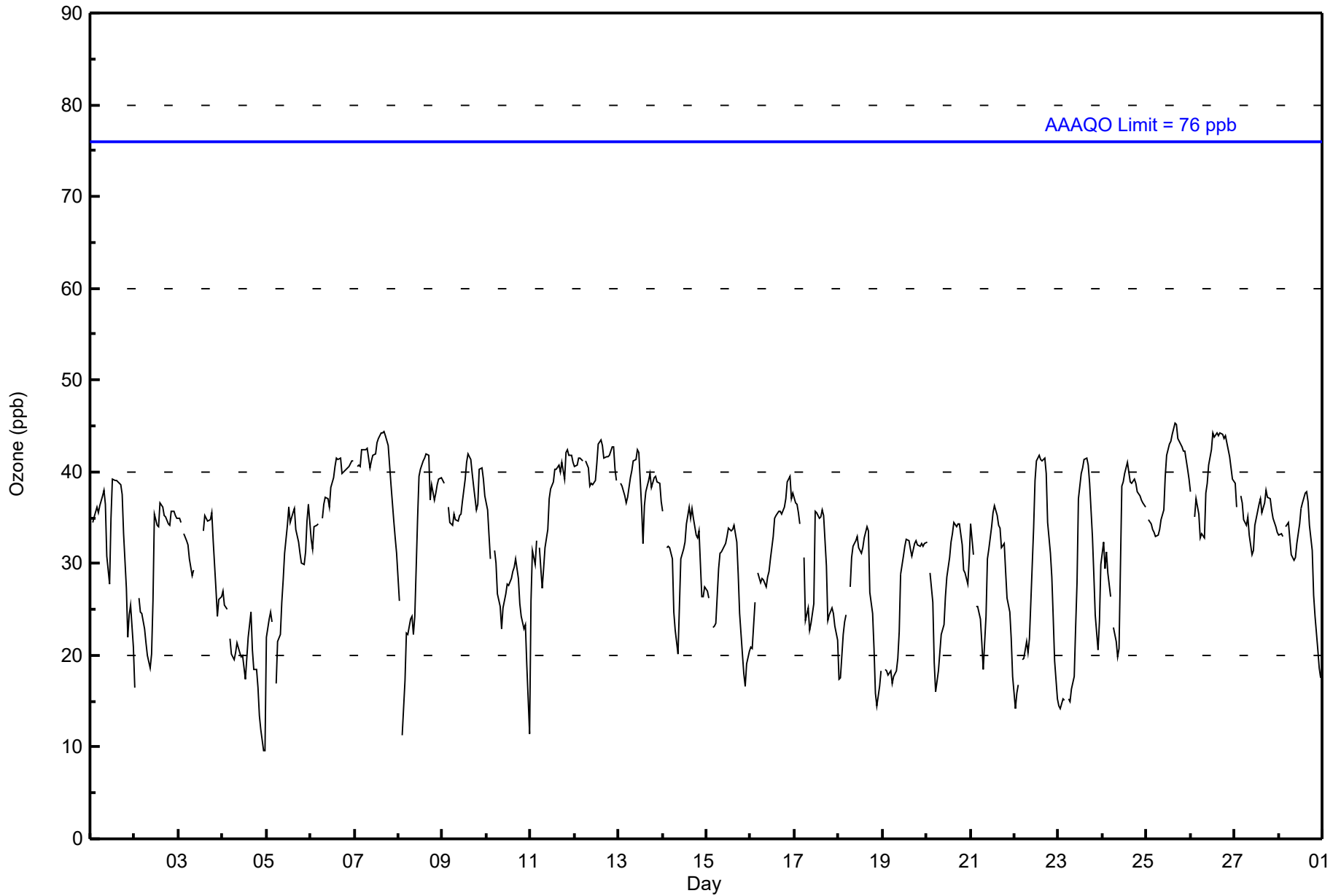
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Feb	Z	34.4	35.1	36.2	35.6	36.2	37.3	38.0	36.4	30.8	27.8	34.9	39.1	39.0	39.0	38.9	38.7	37.6	33.3	27.3	22.0	24.4	25.5	20.9	33.4	39.1
2-Feb	16.5	Z	26.2	24.7	24.6	22.8	21.4	19.9	18.7	20.1	26.0	35.3	34.2	33.9	36.6	36.1	35.2	35.0	34.3	34.1	35.7	35.7	35.3	35.0	29.5	36.6
3-Feb	34.9	34.4	Z	33.2	32.5	32.0	30.5	28.6	29.3	C	C	C	C	33.5	35.3	34.9	34.6	34.8	35.5	32.5	27.1	24.3	26.1	26.4	31.6	35.5
4-Feb	27.0	25.4	25.1	Z	21.8	20.1	19.6	20.3	21.3	20.3	19.8	20.0	17.4	19.7	21.9	24.7	20.5	18.5	18.4	16.5	13.5	11.9	9.6	9.7	19.3	27.0
5-Feb	22.0	24.0	24.7	23.6	Z	17.0	21.5	22.3	25.8	28.2	31.1	34.1	36.1	34.5	35.6	35.9	33.8	32.3	31.0	30.0	29.9	31.3	34.6	36.4	29.4	36.4
6-Feb	32.7	31.6	34.0	34.1	34.4	Z	34.9	36.5	37.3	37.1	36.1	38.3	39.3	40.5	41.5	41.3	41.4	39.8	40.0	40.3	40.5	40.5	41.2	41.1	38.0	41.5
7-Feb	Z	40.6	40.7	40.6	42.4	42.4	42.5	42.6	40.4	41.2	41.8	42.0	43.2	43.6	44.3	44.3	44.3	43.9	42.9	40.8	38.7	34.6	32.9	31.1	40.9	44.3
8-Feb	26.0	Z	11.2	17.2	22.4	22.3	24.0	24.2	22.3	24.2	35.0	39.5	40.3	41.2	41.6	42.0	41.8	36.9	38.6	36.9	37.6	38.6	39.3	39.4	32.3	42.0
9-Feb	39.0	38.7	Z	36.2	34.5	34.2	35.4	34.7	34.6	35.3	35.4	36.7	39.2	41.1	42.0	41.4	39.8	38.5	35.8	36.5	40.3	40.5	39.1	37.4	37.7	42.0
10-Feb	35.8	33.1	30.5	Z	31.4	30.1	26.7	25.3	22.9	25.1	26.7	27.7	27.6	28.3	29.1	29.6	30.6	28.3	25.6	24.3	22.8	23.3	18.9	11.4	26.7	35.8
11-Feb	26.0	31.5	29.9	32.5	Z	31.7	27.3	29.4	31.7	33.8	37.0	38.2	38.9	40.3	40.2	40.8	40.0	41.0	39.2	42.1	42.4	41.8	41.8	41.1	36.5	42.4
12-Feb	40.5	40.7	41.4	41.5	41.1	Z	41.2	40.5	38.4	38.7	38.6	39.1	40.9	43.0	43.4	42.8	41.4	41.7	41.6	41.9	42.7	42.7	40.3	39.0	41.0	43.4
13-Feb	Z	38.8	38.5	37.3	36.7	37.2	39.4	40.2	41.2	41.4	42.3	42.1	36.1	32.2	36.3	37.8	39.1	39.8	38.3	39.3	39.4	38.9	38.8	36.8	38.6	42.3
14-Feb	35.7	Z	31.8	31.9	31.7	30.6	24.6	22.8	20.1	25.3	30.6	31.5	32.4	34.4	36.2	35.0	36.0	34.9	33.0	32.9	33.6	26.4	26.4	27.5	30.7	36.2
15-Feb	27.0	26.3	Z	23.1	23.2	23.5	29.4	31.2	31.2	31.5	32.2	33.0	33.9	33.6	33.8	34.2	32.3	28.9	24.6	20.2	17.9	16.7	19.1	20.4	27.3	34.2
16-Feb	20.9	20.8	25.8	Z	28.9	27.9	28.4	28.2	27.4	28.5	29.2	30.5	32.9	34.9	35.2	35.7	35.7	35.4	36.1	37.0	38.9	39.5	37.1	37.7	31.8	39.5
17-Feb	36.6	36.4	35.6	34.3	Z	30.7	23.8	25.2	22.7	23.5	25.6	35.7	35.6	34.9	35.1	35.9	35.3	29.8	23.9	24.3	25.1	24.5	23.2	21.6	29.5	36.6
18-Feb	17.4	17.6	22.3	23.7	24.4	Z	27.5	30.7	31.9	32.4	32.9	31.8	31.2	31.8	32.9	34.0	33.6	26.9	24.6	20.8	15.9	14.5	16.6	18.2	25.8	34.0
19-Feb	Z	18.5	18.3	17.9	18.3	17.0	17.7	18.3	19.7	22.5	28.8	30.8	31.9	32.7	32.6	31.5	30.8	32.1	32.6	32.0	31.9	32.2	31.8	32.3	26.6	32.7
20-Feb	32.4	Z	28.9	25.8	19.2	16.0	18.3	20.3	22.2	23.3	26.4	28.5	30.7	32.4	33.3	34.5	34.0	34.3	34.3	32.1	29.3	28.9	27.8	30.5	28.0	34.5
21-Feb	34.3	31.0	Z	25.3	25.3	24.0	21.4	18.4	24.2	30.6	31.6	34.0	35.6	36.3	35.2	34.2	33.8	31.7	32.2	29.2	26.2	24.7	21.8	17.7	28.6	36.3
22-Feb	14.2	15.8	16.8	Z	19.5	19.7	21.5	20.4	21.8	25.8	33.9	39.0	41.1	41.9	41.4	41.2	41.5	39.8	34.4	31.1	28.5	24.1	19.3	15.3	28.2	41.9
23-Feb	14.6	14.2	15.3	15.1	Z	15.2	15.0	16.3	17.7	23.0	27.9	37.0	39.9	40.5	41.3	41.5	40.8	38.8	33.0	28.9	24.5	20.6	23.6	29.8	26.7	41.5
24-Feb	32.4	29.4	31.3	29.0	26.4	Z	23.1	21.6	19.9	20.7	38.4	39.0	39.9	41.0	40.0	38.8	38.8	39.2	38.7	37.9	37.3	36.9	36.6	36.1	33.6	41.0
25-Feb	Z	34.8	34.3	33.7	33.4	32.9	33.0	33.8	34.7	35.8	39.5	41.8	43.0	43.4	44.1	45.3	45.1	43.7	43.1	42.7	42.2	42.2	40.2	39.1	39.2	45.3
26-Feb	37.9	Z	35.1	37.1	35.3	32.8	33.3	32.8	37.7	38.8	40.7	42.4	44.3	43.8	44.2	43.9	44.3	44.1	43.6	43.9	42.4	41.7	40.5	39.3	40.0	44.3
27-Feb	38.8	36.2	Z	37.3	36.6	34.8	34.2	35.1	33.1	31.0	31.4	34.2	35.7	36.5	37.1	35.5	36.6	37.9	37.2	37.1	35.9	34.9	34.1	33.4	35.4	38.8
28-Feb	33.1	33.2	32.9	Z	34.0	34.4	32.7	31.0	30.3	30.6	32.2	34.3	36.0	36.6	37.7	37.8	36.8	34.2	31.5	26.5	24.3	20.5	18.6	17.6	31.2	37.8
29.4 29.9 28.9 30.1 29.7 27.7 28.1 28.2 28.4 29.6 32.6 35.2 36.2 36.6 37.4 37.5 37.0 35.7 34.2 32.8 31.7 30.6 30.0 29.4																								Diurnal Average		
40.5 40.7 41.4 41.5 42.4 42.4 42.5 42.6 41.2 41.4 42.3 42.4 44.3 43.8 44.3 45.3 45.1 44.1 43.6 43.9 42.7 42.7 41.8 41.1																								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**  
**Conklin - February 2023**





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

**Ozone (O<sub>3</sub>) - ppb**  
**Conklin - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	69	10.78	10.78
21 - 50	571	89.22	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 640

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb  
Conklin - February 2023**

<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	6	2	1	2	1	1	13	16	12	4	2	0	1	1	7	0	69
21 - 50	35	26	15	12	11	18	22	34	52	60	64	35	35	32	49	69	569
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>	41	28	16	14	12	19	35	50	64	64	66	35	36	33	56	69	638

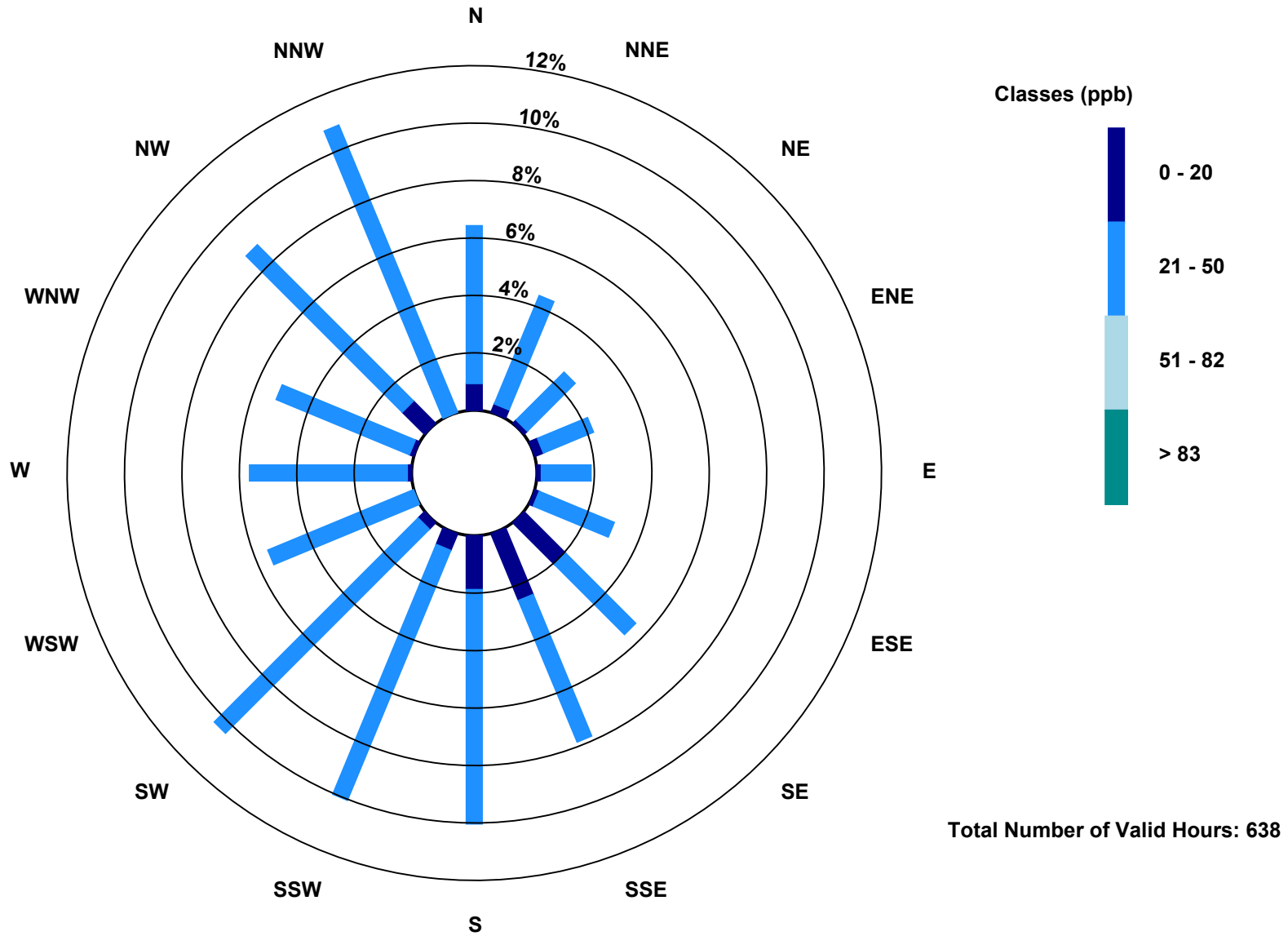
Total Number of Valid Hours: 638

Total Number of Hours: 672

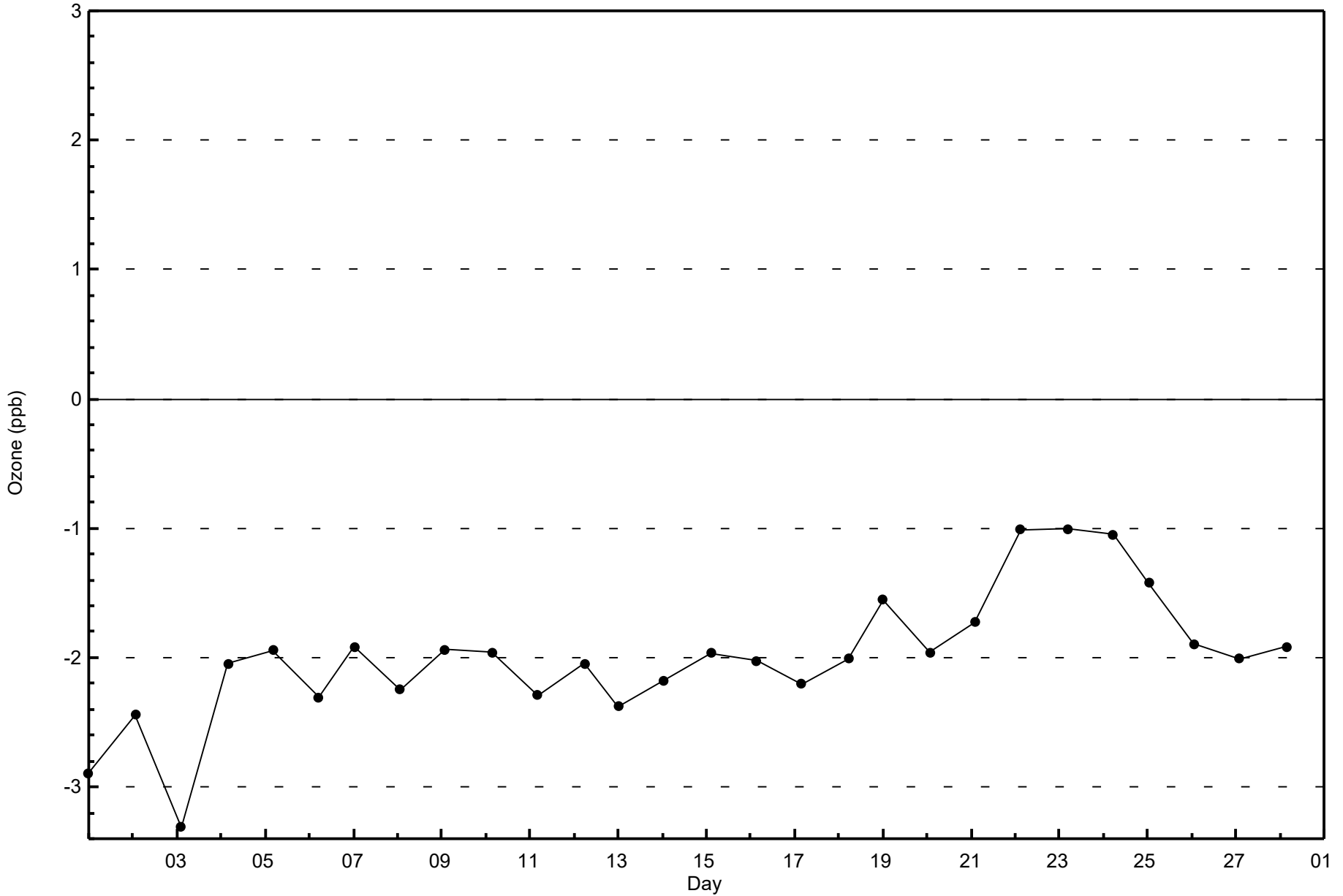


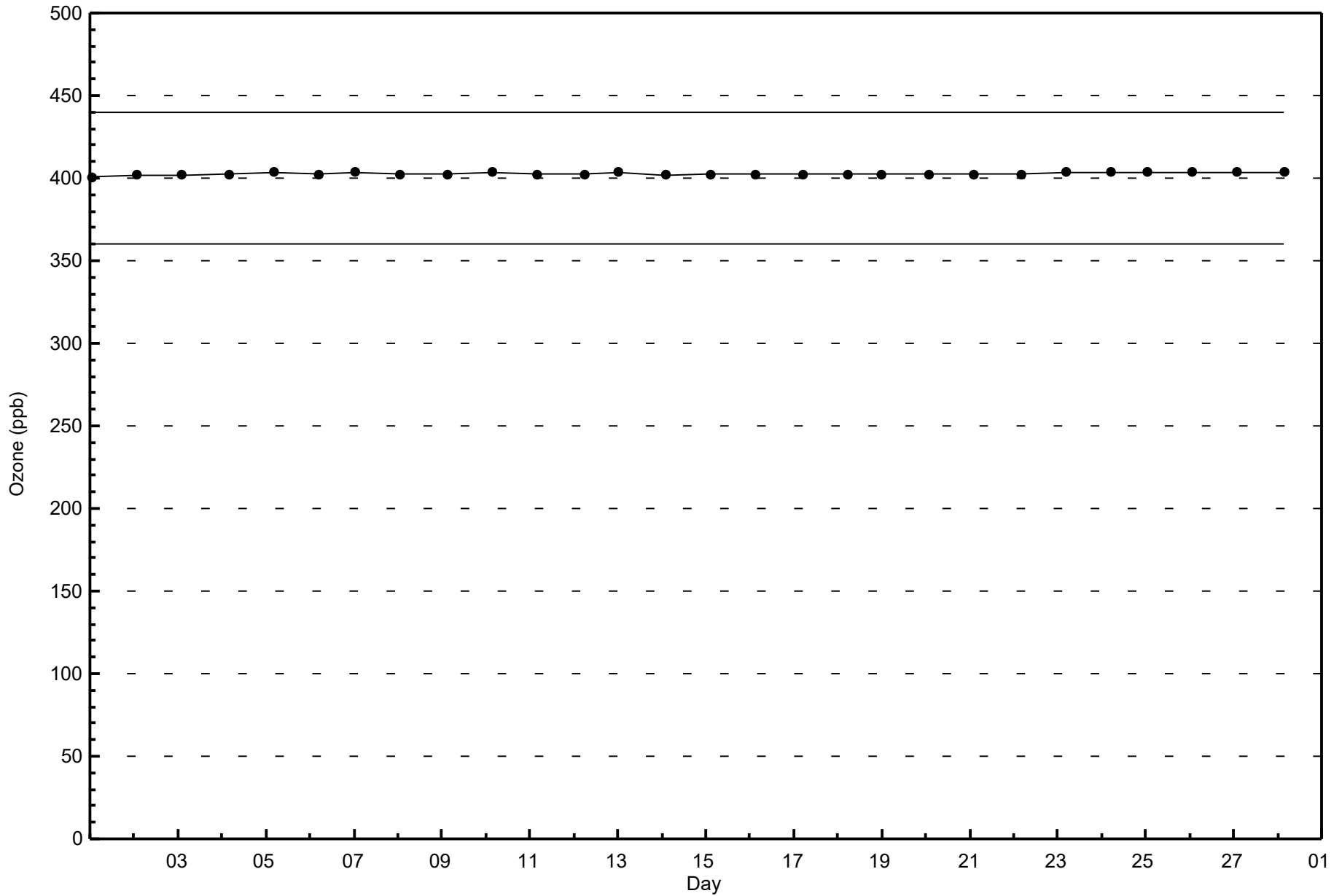
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Ozone (O<sub>3</sub>) - ppb  
Conklin







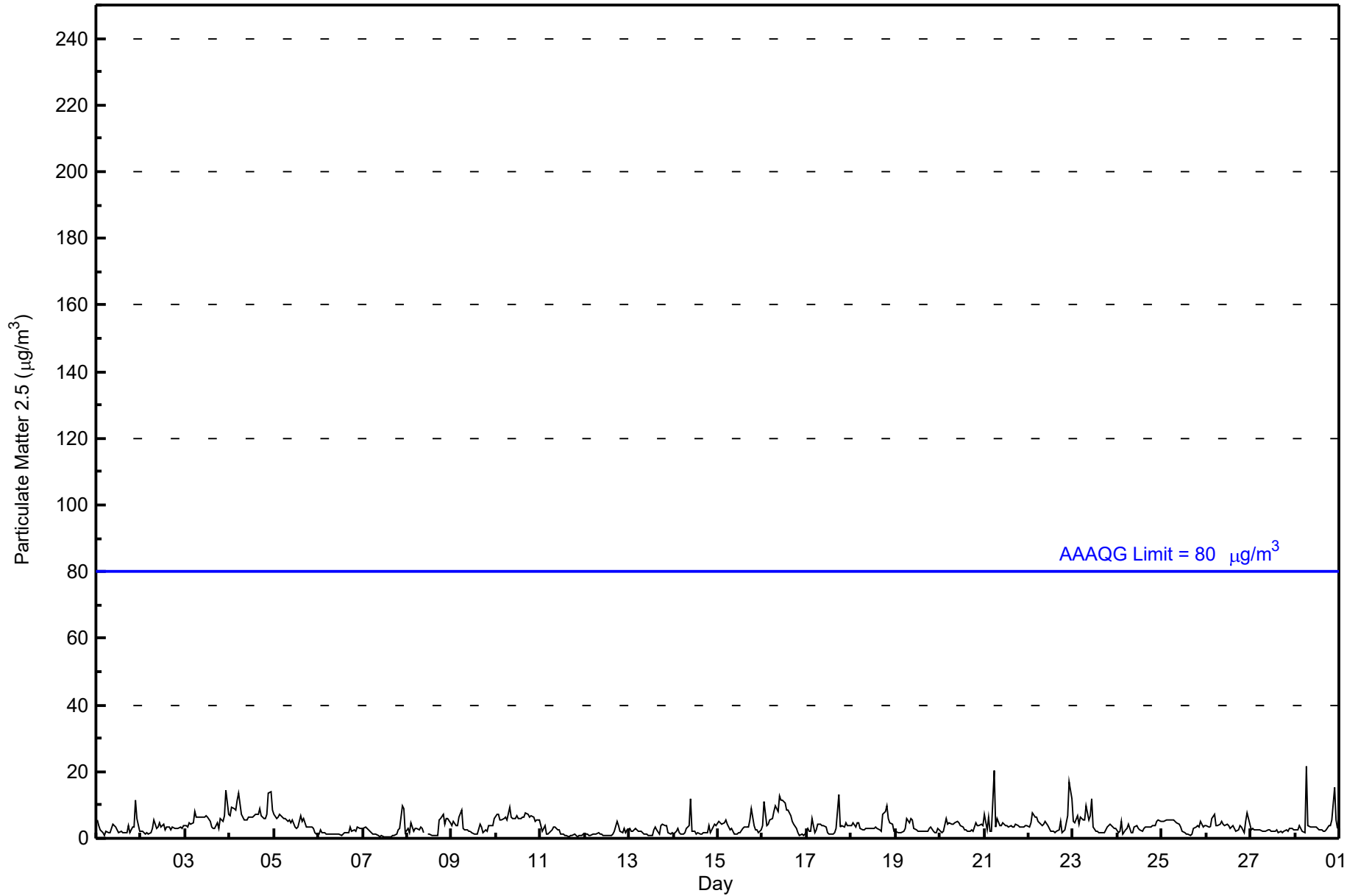




Summary of Hour Averages

Conklin - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 672														672																													
Maximum Value: 21.6 µg/m <sup>3</sup> on Feb 28 07:00				Maximum Daily Average: 8.1 µg/m <sup>3</sup> on Feb 4		Hours of Data: 671														671																													
Minimum Value: 0.5 µg/m <sup>3</sup> on Feb 7 15:00				Minimum Daily Average: 1.6 µg/m <sup>3</sup> on Feb 12		Hours of Missing Data: 1														1																													
Maximum Diurnal Average: 5.1 µg/m <sup>3</sup> at hour 22				Minimum Diurnal Average: 2.7 µg/m <sup>3</sup> at hour 14		Hours of Calibration: 1														1																													
Monthly Average: 3.75 µg/m <sup>3</sup>				Percentiles: P <sub>1</sub> = 0.6 P <sub>10</sub> = 1.3 Q <sub>1</sub> = 2.0 Median = 3.2 Q <sub>3</sub> = 4.8 P <sub>90</sub> = 6.6 P <sub>99</sub> = 13.5		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-Feb	5.3	3.9	2.4	1.8	1.0	2.2	1.6	1.5	2.9	4.2	3.5	2.6	1.7	2.0	1.9	1.6	1.7	3.7	1.9	3.4	3.5	11.5	5.9	2.0	3.1	11.5																							
2-Feb	2.0	1.9	1.1	1.7	1.4	1.7	3.0	5.6	3.1	3.4	4.5	3.4	4.1	2.7	3.6	3.3	2.7	3.3	3.1	2.9	3.1	3.2	3.1	3.6	3.0	5.6																							
3-Feb	3.6	3.5	4.6	4.3	4.6	8.1	6.6	6.1	6.3	6.3	6.5	6.7	6.3	5.0	3.5	3.0	3.0	4.8	2.8	6.1	5.1	6.7	14.5	7.4	5.6	14.5																							
4-Feb	6.8	9.4	8.8	8.6	11.4	13.4	7.2	6.2	5.6	5.4	6.5	6.4	6.2	7.0	7.1	7.3	8.9	6.8	6.0	5.9	7.4	13.5	14.0	8.3	8.1	14.0																							
5-Feb	7.3	5.8	6.3	7.1	6.4	5.9	6.0	5.0	5.7	4.6	5.4	3.4	3.1	3.4	7.0	5.1	5.9	3.3	3.4	3.3	3.2	3.2	1.9	1.1	4.7	7.3																							
6-Feb	1.3	2.5	1.8	1.7	1.5	1.2	1.5	1.3	1.4	1.2	1.3	1.1	1.0	1.1	1.5	1.6	1.8	3.4	2.1	2.5	2.2	3.3	3.0	3.2	1.8	3.4																							
7-Feb	3.1	3.2	2.8	2.5	2.2	1.4	1.2	1.1	1.0	0.6	0.7	0.6	0.6	0.6	0.5	0.6	0.8	1.0	1.1	2.6	3.0	9.9	8.8	1.8	2.2	9.9																							
8-Feb	3.1	1.6	4.6	2.0	3.0	3.0	2.6	3.6	2.8	1.8	C	1.4	1.2	1.0	0.9	0.9	1.0	5.6	5.8	7.4	4.1	5.8	5.9	4.8	3.2	7.4																							
9-Feb	4.0	5.3	3.7	3.9	6.2	8.3	3.0	2.7	2.5	2.3	2.2	1.7	1.3	1.2	1.4	4.3	3.4	1.9	2.5	2.3	3.9	3.6	3.9	5.9	3.4	8.3																							
10-Feb	7.0	7.4	5.6	5.4	5.8	6.3	5.6	9.5	6.4	5.9	6.0	6.8	5.7	5.8	6.4	6.4	7.7	7.3	6.5	7.0	6.5	5.2	5.6	5.6	6.4	9.5																							
11-Feb	3.9	2.3	3.8	1.2	1.4	1.5	2.4	3.4	3.3	2.4	2.6	1.2	1.2	0.9	0.7	0.6	0.7	1.0	1.1	0.8	0.6	0.7	0.8	1.3	1.7	3.9																							
12-Feb	1.1	1.2	0.7	0.8	1.1	1.2	1.3	1.5	1.4	1.2	0.9	0.9	1.0	1.0	1.0	1.2	2.0	5.1	3.6	2.0	1.5	3.1	1.6	2.6	1.6	5.1																							
13-Feb	3.1	2.2	1.9	2.8	2.6	2.0	1.9	1.6	1.4	1.2	1.0	0.8	0.8	2.7	3.2	2.6	1.3	4.0	4.2	3.8	4.0	1.9	1.1	1.7	2.2	4.2																							
14-Feb	1.5	1.9	3.2	1.5	1.1	1.2	1.8	3.0	3.8	11.7	1.9	2.0	1.4	1.7	1.3	1.4	1.7	1.8	1.9	3.8	1.6	3.5	4.1	3.8	2.6	11.7																							
15-Feb	5.0	4.7	4.3	4.7	5.6	4.1	2.6	2.8	2.1	1.5	1.4	1.8	1.5	2.8	3.3	3.4	3.5	5.5	8.9	3.9	2.3	2.7	1.9	2.6	3.5	8.9																							
16-Feb	3.9	10.9	3.7	4.3	5.5	6.1	7.9	9.6	8.2	12.6	11.5	11.6	10.8	8.5	8.4	6.8	5.1	4.3	3.0	1.8	0.9	1.5	0.9	1.2	6.2	12.6																							
17-Feb	3.0	2.0	2.2	6.1	1.7	2.5	4.3	4.2	3.9	3.6	3.3	1.5	1.2	1.3	1.4	1.6	2.8	13.2	3.4	3.6	3.5	4.5	3.7	3.7	3.4	13.2																							
18-Feb	4.0	4.8	3.4	4.7	4.7	3.0	2.5	2.6	2.8	2.9	2.9	2.8	3.1	3.2	2.9	2.4	2.2	7.3	8.3	9.7	5.7	4.9	4.1	2.3	4.1	9.7																							
19-Feb	1.9	1.8	1.8	1.6	1.9	2.8	6.0	4.8	5.8	5.6	3.0	2.6	2.3	2.3	2.3	2.2	2.1	2.1	2.9	3.4	2.1	1.8	1.7	2.9	2.8	6.0																							
20-Feb	2.0	1.9	2.3	6.1	4.3	4.6	4.4	4.3	4.5	5.0	4.6	3.9	3.2	2.5	2.4	2.1	1.9	2.4	2.0	4.8	3.8	3.7	4.1	3.8	3.5	6.1																							
21-Feb	7.1	2.5	6.2	2.2	2.1	20.4	3.3	5.8	3.6	4.0	4.5	4.0	3.7	3.5	3.7	3.6	3.5	4.2	3.8	3.5	3.6	3.6	3.9	4.0	4.6	20.4																							
22-Feb	3.6	4.6	7.4	6.3	6.3	5.2	4.1	3.8	4.4	4.9	3.7	2.9	2.3	1.9	1.9	2.0	2.4	4.9	1.7	2.4	4.5	6.9	16.9	11.7	4.9	16.9																							
23-Feb	5.3	4.5	6.8	4.4	6.3	5.6	5.5	9.6	5.4	6.7	11.7	3.2	2.3	2.1	1.7	1.5	1.6	1.6	3.5	3.7	4.0	3.4	3.0	3.2	4.4	11.7																							
24-Feb	1.8	1.9	5.3	1.3	2.7	2.8	4.1	1.5	1.8	3.6	3.8	3.1	2.7	2.3	3.0	3.3	3.5	3.4	3.6	3.9	3.9	5.0	5.4	4.9	3.3	5.4																							
25-Feb	5.0	5.3	5.4	5.5	5.5	5.5	5.5	5.1	4.8	4.4	3.2	2.2	1.6	1.3	1.2	1.1	1.2	2.8	3.2	3.7	3.3	5.2	3.5	3.6	3.7	5.5																							
26-Feb	3.7	3.2	3.4	5.8	7.3	3.9	3.8	4.2	5.3	4.0	3.7	4.1	3.8	2.9	3.7	2.8	2.1	2.7	4.0	3.3	1.7	5.2	7.8	5.9	4.1	7.8																							
27-Feb	2.6	3.0	2.4	2.4	2.5	2.4	2.3	2.3	2.2	2.6	2.5	2.1	2.2	2.0	2.6	1.8	2.0	1.5	2.0	2.4	2.0	2.9	2.9	2.7	2.4	3.0																							
28-Feb	2.7	2.4	4.0	2.9	2.0	1.8	21.6	3.7	3.5	3.6	3.2	3.2	2.9	2.7	2.4	2.2	2.2	2.6	3.7	3.6	5.7	15.3	5.5	3.0	4.4	21.6																							
																								3.7	3.8	3.9	3.7	3.9	4.6	4.4	4.2	3.8	4.2	3.9	3.1	2.8	2.7	2.9	2.7	2.8	4.0	3.6	3.8	3.5	5.1	5.0	3.9	Diurnal Average	
																								7.3	10.9	8.8	8.6	11.4	20.4	21.6	9.6	8.2	12.6	11.7	11.6	10.8	8.5	8.4	7.3	8.9	13.2	8.9	9.7	7.4	15.3	16.9	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>) -  $\mu\text{g}/\text{m}^3$**   
**Conklin - February 2023**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	541	80.63	80.63
6 - 15	127	18.93	99.55
16 - 25	3	0.45	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 671

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>  
Conklin - February 2023**

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	35	27	11	10	10	10	26	41	52	46	53	34	36	29	53	66	539
6 - 15	6	3	5	4	4	9	10	16	14	20	16	4	2	4	5	5	127
16 - 25	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	3
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>	41	30	16	14	14	19	36	58	66	66	69	38	38	33	59	72	669

Total Number of Valid Hours: 669

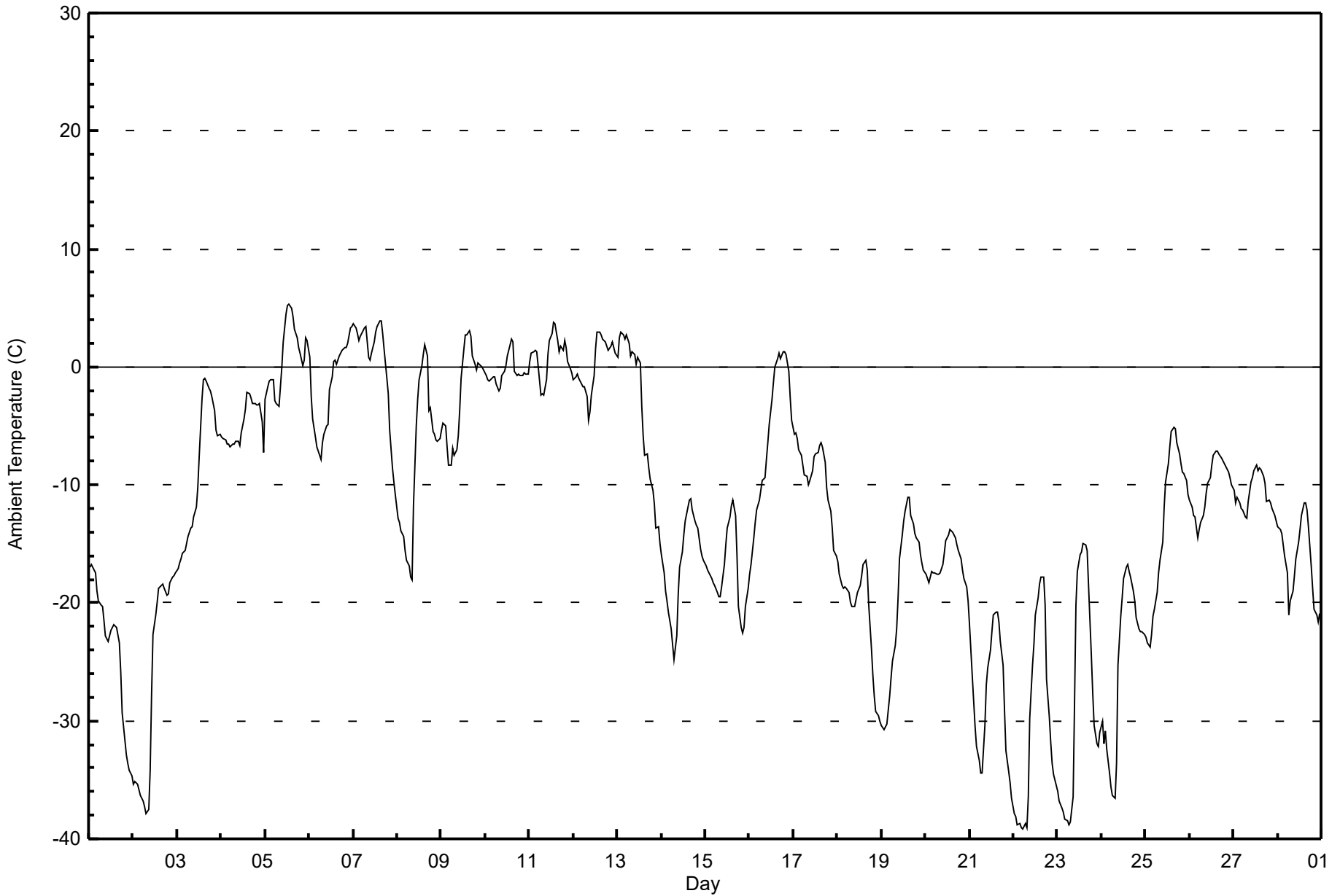
Total Number of Hours: 672





Maximum Value: 5.3 C on Feb 5 14:00		Maximum Daily Average: 0.9 C on Feb 5		Hours in Service: 672																							
Minimum Value: -39.1 C on Feb 22 06:00		Minimum Daily Average: -30.4 C on Feb 22		Hours of Data: 672																							
Maximum Diurnal Average: -7.3 C at hour 15		Minimum Diurnal Average: -16.1 C at hour 8		Hours of Missing Data: 0																							
Monthly Average: -12.36 C		Percentiles: P <sub>1</sub> = -38.6 P <sub>10</sub> = -29.5 Q <sub>1</sub> = -19.0 Median = -11.9 Q <sub>3</sub> = -2.4 P <sub>90</sub> = 1.4 P <sub>99</sub> = 3.8		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-Feb	-16.9	-16.8	-16.9	-17.5	-19.0	-19.8	-20.2	-20.4	-21.5	-22.8	-23.3	-22.9	-22.4	-21.9	-21.9	-22.1	-23.4	-25.8	-29.4	-31.7	-32.9	-33.6	-34.2	-34.7	-23.8	-16.8	
2-Feb	-35.4	-35.1	-35.3	-35.9	-36.3	-36.8	-37.3	-37.8	-37.5	-34.2	-27.8	-22.6	-21.0	-20.0	-18.8	-18.5	-18.4	-18.8	-19.3	-19.2	-18.2	-17.8	-17.6	-17.4	-26.5	-17.4	
3-Feb	-17.1	-16.7	-16.3	-15.8	-15.6	-15.0	-14.3	-13.6	-13.5	-12.7	-11.9	-10.2	-7.6	-2.7	-1.1	-1.0	-1.2	-1.8	-2.1	-2.5	-3.7	-5.4	-5.8	-5.7	-8.9	-1.0	
4-Feb	-6.0	-6.0	-6.2	-6.5	-6.5	-6.8	-6.5	-6.5	-6.4	-6.3	-6.7	-5.6	-4.4	-3.5	-2.2	-2.3	-2.6	-3.1	-3.1	-3.2	-3.2	-3.1	-4.7	-7.3	-4.9	-2.2	
5-Feb	-2.8	-1.7	-1.2	-1.1	-1.1	-2.8	-3.1	-3.4	-1.6	0.0	2.1	4.5	5.3	5.3	4.9	4.3	3.2	2.5	1.7	1.2	0.1	0.5	2.5	2.2	0.9	5.3	
6-Feb	0.8	-2.5	-4.5	-6.0	-6.8	-7.2	-7.9	-6.4	-5.7	-5.0	-4.9	-1.9	-0.8	0.4	0.5	0.2	0.9	1.1	1.4	1.6	1.6	2.0	3.4	3.5	-1.8	3.5	
7-Feb	3.6	3.3	2.8	2.3	2.6	3.1	3.3	3.4	0.8	0.6	1.2	2.2	2.9	3.5	3.9	3.9	2.8	1.5	-1.0	-2.3	-5.4	-8.6	-9.7	-10.8	0.4	3.9	
8-Feb	-12.8	-13.2	-13.9	-14.4	-15.5	-16.4	-16.9	-17.8	-18.0	-11.8	-5.0	-2.8	-1.1	0.1	1.0	1.9	1.0	-3.7	-3.5	-5.4	-5.7	-6.1	-6.4	-6.1	-8.0	1.9	
9-Feb	-5.3	-4.8	-4.9	-6.8	-8.3	-8.3	-6.9	-7.5	-7.1	-5.9	-3.6	-1.0	1.5	2.7	2.7	3.1	2.6	1.0	0.3	-0.2	0.4	0.1	0.0	-0.3	-2.4	3.1	
10-Feb	-0.7	-1.0	-1.2	-1.0	-0.8	-0.9	-1.5	-2.0	-1.8	-0.7	-0.4	0.1	0.9	1.9	2.3	2.1	-0.4	-0.7	-0.6	-0.7	-0.7	-0.5	-0.6	-0.6	-0.4	2.3	
11-Feb	0.4	1.1	1.3	1.4	1.3	0.1	-2.4	-2.3	-2.4	-1.1	1.1	2.2	2.9	3.8	3.7	2.3	1.3	1.7	1.4	2.2	1.6	0.5	-0.1	-0.5	0.9	3.8	
12-Feb	-1.1	-0.9	-0.6	-1.0	-1.4	-1.7	-1.7	-2.5	-4.6	-3.8	-2.4	-0.7	1.5	3.0	2.9	2.8	2.4	2.1	1.7	1.4	1.7	2.1	1.7	1.2	0.1	3.0	
13-Feb	0.8	2.5	3.0	2.7	2.4	2.7	2.0	0.9	1.3	1.1	0.2	0.9	0.4	-3.3	-5.8	-7.5	-7.4	-8.6	-9.5	-10.4	-11.6	-13.7	-13.5	-14.9	-3.6	3.0	
14-Feb	-15.9	-17.4	-19.0	-19.9	-20.8	-22.2	-23.5	-24.8	-22.8	-19.3	-17.0	-15.7	-14.3	-13.1	-11.9	-11.3	-11.1	-12.2	-13.1	-13.4	-13.7	-15.5	-16.0	-16.4	-16.7	-11.1	
15-Feb	-16.8	-17.2	-17.4	-17.9	-18.3	-18.5	-19.1	-19.4	-19.5	-18.6	-16.7	-15.1	-13.7	-12.7	-11.8	-11.3	-12.5	-16.0	-20.3	-22.1	-22.6	-22.1	-20.3	-18.7	-17.4	-11.3	
16-Feb	-17.6	-16.8	-14.5	-13.2	-12.2	-11.3	-10.4	-9.7	-9.4	-7.9	-6.5	-4.9	-2.7	-1.4	-0.1	0.7	1.1	0.6	1.3	1.3	1.0	-0.4	-2.6	-4.5	-5.8	1.3	
17-Feb	-5.7	-5.6	-6.0	-7.0	-7.5	-8.3	-9.1	-9.2	-9.9	-9.7	-8.8	-7.6	-7.4	-7.2	-6.7	-6.4	-6.8	-8.1	-10.2	-11.3	-12.2	-13.6	-15.5	-16.0	-9.0	-5.6	
18-Feb	-16.5	-17.6	-18.5	-18.7	-18.7	-18.7	-19.1	-19.9	-20.3	-20.3	-19.7	-19.2	-18.5	-17.7	-16.8	-16.4	-17.3	-20.0	-23.9	-26.1	-27.9	-29.2	-29.5	-30.1	-20.9	-16.4	
19-Feb	-30.4	-30.8	-30.5	-30.2	-27.9	-26.4	-24.9	-23.6	-22.2	-19.5	-16.3	-14.3	-13.1	-12.3	-11.1	-11.1	-12.6	-13.3	-14.1	-14.4	-14.8	-15.9	-16.6	-17.2	-19.3	-11.1	
20-Feb	-17.6	-17.9	-18.2	-17.4	-17.5	-17.4	-17.5	-17.5	-17.4	-16.7	-15.8	-14.8	-14.2	-13.8	-13.9	-14.1	-14.5	-15.1	-15.6	-16.3	-17.3	-18.0	-18.6	-19.8	-16.5	-13.8	
21-Feb	-21.9	-26.2	-28.4	-30.5	-32.2	-33.4	-34.4	-34.4	-30.4	-27.0	-25.5	-24.0	-22.4	-21.0	-20.7	-20.8	-21.6	-23.2	-25.2	-29.1	-32.5	-34.3	-35.3	-36.6	-28.0	-20.7	
22-Feb	-37.8	-38.1	-38.8	-38.7	-39.1	-39.1	-38.7	-39.0	-36.4	-29.8	-25.3	-23.5	-21.0	-19.6	-18.4	-17.9	-17.8	-20.2	-26.4	-29.6	-31.8	-33.6	-34.5	-35.5	-30.4	-17.8	
23-Feb	-36.0	-36.8	-37.4	-37.8	-38.3	-38.5	-38.8	-38.5	-36.4	-28.5	-20.2	-17.3	-15.9	-15.7	-14.9	-15.1	-15.5	-18.5	-24.4	-27.7	-30.4	-31.9	-32.2	-30.9	-28.2	-14.9	
24-Feb	-30.0	-32.0	-30.9	-32.5	-34.5	-35.6	-36.3	-36.6	-33.6	-25.2	-21.2	-19.6	-17.9	-17.0	-16.8	-17.3	-17.8	-18.9	-19.8	-21.2	-22.3	-22.4	-22.5	-22.6	-25.2	-16.8	
25-Feb	-23.0	-23.4	-23.7	-22.7	-21.1	-20.5	-19.1	-17.4	-16.3	-14.8	-11.9	-9.7	-8.2	-6.8	-5.5	-5.2	-5.2	-6.4	-7.3	-8.2	-9.0	-9.1	-9.7	-10.8	-13.1	-5.2	
26-Feb	-11.3	-11.9	-12.6	-12.7	-14.4	-13.8	-13.2	-12.6	-11.9	-10.7	-9.9	-9.4	-8.4	-7.5	-7.1	-7.2	-7.3	-7.7	-8.0	-8.2	-8.7	-8.9	-9.4	-9.9	-10.1	-7.1	
27-Feb	-10.4	-11.5	-11.1	-11.5	-12.0	-12.1	-12.8	-12.8	-11.4	-9.7	-9.4	-8.8	-8.3	-8.8	-8.5	-8.7	-9.3	-9.9	-11.4	-11.3	-11.6	-12.0	-12.6	-13.1	-10.8	-8.3	
28-Feb	-13.5	-13.8	-14.1	-15.0	-16.1	-17.4	-21.0	-19.8	-19.0	-17.7	-16.3	-14.9	-13.8	-12.6	-11.6	-11.5	-12.1	-13.5	-16.9	-18.8	-20.5	-21.1	-21.6	-20.9	-16.4	-11.5	
		-14.2	-14.6	-14.8	-15.2	-15.6	-15.8	-16.1	-16.1	-15.5	-13.5	-11.5	-9.9	-8.6	-7.8	-7.3	-7.3	-7.8	-9.1	-10.6	-11.6	-12.5	-13.3	-13.6	-14.1	Diurnal Average	
		3.6	3.3	3.0	2.7	2.6	3.1	3.3	3.4	1.3	1.1	2.1	4.5	5.3	5.3	4.9	4.3	3.2	2.5	1.7	2.2	1.7	2.1	3.4	3.5	Diurnal Maximum	







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Conklin - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	147	21.88	21.88
-20 - 0	413	61.46	83.33
0 - 10	112	16.67	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Relative Humidity (RH) - %**

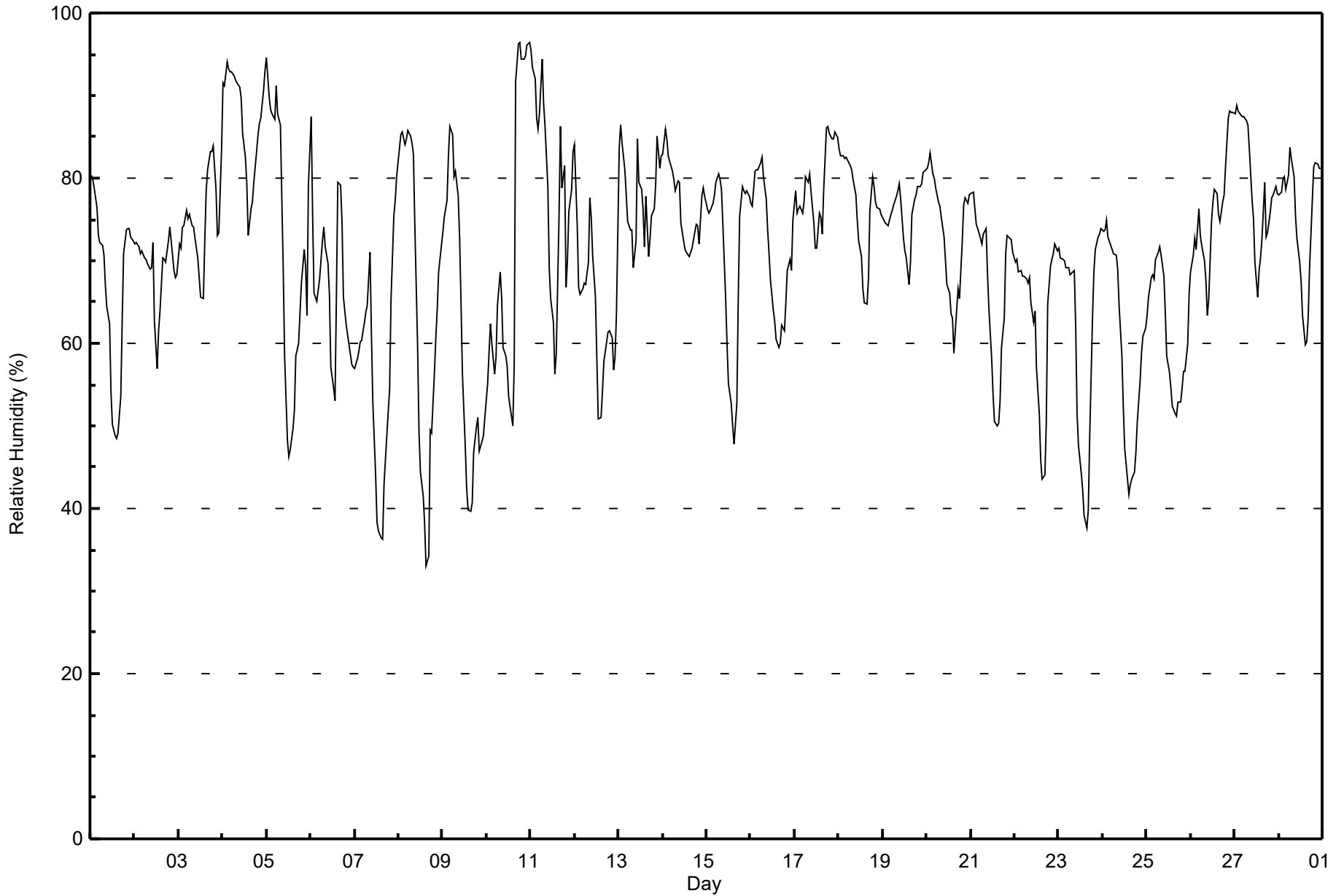
**Conklin - February 2023**

Maximum Value: 96.4 % on Feb 11 00:00      Maximum Daily Average: 87.1 % on Feb 4																						Hours in Service: 672 Hours of Data: 672				
Minimum Value: 33.0 % on Feb 8 16:00      Minimum Daily Average: 56.5 % on Feb 7																						Hours of Missing Data: 0 Hours of Calibration: 0				
Maximum Diurnal Average: 77.7 % at hour 1      Minimum Diurnal Average: 57.4 % at hour 15																						Percent Operational Time: 100.0				
Monthly Average: 70.54 %      Percentiles: P <sub>1</sub> = 38.2 P <sub>10</sub> = 51.7 Q <sub>1</sub> = 63.6 Median = 72.3 Q <sub>3</sub> = 78.8 P <sub>90</sub> = 85.1 P <sub>99</sub> = 94.5																										
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-Feb	80.3	79.9	78.8	76.4	73.1	72.3	71.9	70.6	66.9	64.5	62.4	54.0	50.1	48.8	48.5	49.1	53.6	62.7	70.8	73.7	73.9	73.9	72.9	72.4	66.7	80.3
2-Feb	72.0	72.3	71.6	70.8	71.2	70.4	70.2	69.6	69.0	69.1	72.3	62.8	56.9	61.5	63.9	70.4	70.2	69.9	72.4	74.1	72.3	68.8	67.9	68.2	69.1	74.1
3-Feb	72.1	71.6	74.0	74.3	76.1	75.1	75.5	74.3	74.1	72.8	70.4	68.0	65.6	65.4	72.6	78.5	81.0	83.2	83.2	83.9	78.7	73.1	73.4	83.6	75.0	83.9
4-Feb	91.5	91.2	94.0	93.2	92.9	92.8	92.3	91.9	91.5	91.0	89.7	85.5	82.5	79.3	73.1	76.3	77.1	79.5	83.2	85.3	86.7	87.2	90.6	93.1	87.1	94.0
5-Feb	94.5	89.9	88.4	87.9	87.1	91.3	87.8	86.4	77.6	69.1	58.5	48.4	46.2	47.1	49.7	51.8	58.4	60.1	63.8	67.3	71.3	69.4	63.4	79.1	70.6	94.5
6-Feb	87.4	75.6	66.0	65.1	66.4	67.8	72.4	74.0	71.7	69.6	66.0	57.0	54.5	53.1	65.8	79.6	79.2	74.8	65.6	62.2	61.1	59.9	57.5	57.1	67.1	87.4
7-Feb	57.0	58.1	58.9	60.1	60.3	62.5	63.7	64.5	71.1	61.2	52.8	44.1	38.3	37.3	36.5	36.3	42.8	46.0	51.7	54.4	65.3	75.4	77.2	80.2	56.5	80.2
8-Feb	83.5	85.2	85.5	84.1	84.7	85.8	85.1	84.3	82.9	74.5	59.5	49.2	44.5	41.5	38.1	33.0	34.3	49.5	49.1	56.5	60.7	64.0	68.6	71.8	64.8	85.8
9-Feb	73.3	75.3	77.3	82.8	86.2	85.3	80.1	80.8	77.8	72.8	65.0	56.3	47.6	42.5	39.9	39.7	40.7	46.7	49.9	51.0	47.0	48.2	48.9	51.0	61.1	86.2
10-Feb	55.1	58.8	62.4	60.0	56.3	58.4	64.6	68.6	65.7	59.4	58.5	57.1	53.6	51.1	50.0	57.4	91.7	96.2	96.4	94.4	94.3	94.7	96.2	96.4	70.7	96.4
11-Feb	95.5	93.5	92.0	87.3	86.0	87.8	94.5	89.1	86.2	78.9	69.1	65.4	62.6	56.2	58.6	75.4	86.3	78.8	81.6	66.8	70.0	76.0	78.7	83.2	79.1	95.5
12-Feb	84.0	74.3	66.8	65.9	66.5	67.3	67.1	69.8	77.7	75.2	70.7	65.5	58.1	50.9	51.0	54.0	57.9	60.1	61.4	61.6	60.7	56.8	58.3	63.6	64.4	84.0
13-Feb	83.7	86.4	84.3	81.0	78.0	74.7	73.8	73.8	69.1	72.5	84.8	79.5	78.7	76.2	71.7	77.8	70.5	72.7	75.5	76.3	79.1	85.0	81.1	82.7	77.9	86.4
14-Feb	83.0	85.9	84.7	82.7	82.0	80.9	79.9	78.4	79.6	79.4	74.6	72.4	71.4	71.0	70.5	71.0	71.5	72.6	74.4	74.2	72.0	77.8	78.9	77.7	76.9	85.9
15-Feb	76.2	75.8	76.2	77.0	78.0	79.5	80.5	79.8	78.7	74.4	65.3	59.8	55.1	52.7	50.1	47.8	52.7	65.4	75.5	79.0	78.5	78.1	78.4	77.7	70.5	80.5
16-Feb	76.9	76.6	80.8	81.1	81.1	81.9	82.5	80.1	77.4	73.7	70.8	67.6	64.1	62.8	60.4	59.5	59.9	62.3	61.6	64.9	68.8	70.2	68.8	74.9	71.2	82.5
17-Feb	78.4	75.8	76.3	76.7	75.7	77.1	80.1	79.5	80.5	78.2	74.7	71.6	71.6	75.8	75.2	73.2	78.5	86.1	86.3	85.5	84.7	84.7	85.5	85.0	79.0	86.3
18-Feb	83.5	82.8	82.7	82.4	82.5	82.2	81.5	81.0	79.7	78.0	74.9	72.4	70.5	66.7	64.9	64.7	67.8	76.1	80.2	79.0	77.1	76.4	76.2	75.6	76.6	83.5
19-Feb	75.2	74.5	74.4	74.3	75.7	76.2	76.7	77.8	78.5	79.4	77.4	72.7	71.2	70.4	67.1	69.9	75.7	77.4	78.0	79.0	79.0	79.3	80.7	80.8	75.9	80.8
20-Feb	81.1	81.9	83.1	80.6	80.0	78.8	77.2	76.7	75.3	72.9	70.0	67.1	66.1	63.6	63.0	58.8	64.1	66.6	65.4	72.3	76.8	77.6	77.0	78.0	73.1	83.1
21-Feb	78.1	78.4	76.3	74.4	73.9	72.7	72.0	73.2	73.8	68.5	64.2	58.1	53.8	50.5	49.9	50.3	53.0	59.6	63.0	70.9	73.0	72.6	72.5	71.0	66.8	78.4
22-Feb	69.9	70.2	68.7	68.9	68.1	68.1	67.8	67.4	68.0	64.9	62.6	63.9	56.9	51.5	46.0	43.5	44.0	50.4	64.8	69.3	70.2	70.9	72.0	71.2	63.3	72.0
23-Feb	71.5	70.3	70.1	70.1	69.1	69.1	68.4	68.5	68.9	62.1	51.3	47.6	44.3	42.2	39.2	37.7	39.8	48.6	63.1	68.6	71.3	72.9	73.3	73.8	60.9	73.8
24-Feb	73.6	73.7	74.9	72.9	71.8	71.4	70.8	70.6	69.0	64.5	58.4	52.3	47.2	43.5	41.6	42.8	43.5	44.3	46.8	50.6	55.4	58.9	60.8	61.9	59.2	74.9
25-Feb	63.4	65.6	68.0	68.3	67.8	70.1	71.1	71.7	70.6	68.1	63.7	58.4	56.5	54.6	52.3	51.6	51.2	53.0	52.9	54.5	56.6	56.7	59.9	66.0	61.3	71.7
26-Feb	68.6	70.7	72.7	71.3	76.3	73.1	71.8	70.0	67.6	63.5	65.3	74.7	77.0	78.6	78.2	75.7	74.8	77.1	78.0	81.4	87.3	88.2	87.9	87.9	75.7	88.2
27-Feb	87.8	88.8	88.2	87.7	87.5	87.5	86.9	86.5	83.5	77.3	75.1	69.7	65.6	68.8	70.3	72.6	79.4	72.8	73.4	75.9	77.7	78.0	79.0	78.1	79.1	88.8
28-Feb	77.9	78.3	79.9	80.2	78.6	80.4	83.7	82.4	80.2	75.5	72.7	69.8	67.5	63.5	59.8	60.2	62.9	68.9	77.3	81.3	81.9	81.7	81.3	81.2	75.3	83.7
77.7 77.2 77.0 76.3 76.2 76.4 76.8 76.5 75.4 71.8 67.9 63.3 59.9 58.1 57.4 59.2 62.9 66.5 69.5 71.2 72.5 73.4 73.8 75.8																								Diurnal Average		
95.5 93.5 94.0 93.2 92.9 92.8 94.5 91.9 91.5 91.0 89.7 85.5 82.5 79.3 78.2 79.6 91.7 96.2 96.4 94.4 94.3 94.7 96.2 96.4																								Diurnal Maximum		



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

**Relative Humidity (RH) - %**  
**Conklin - February 2023**





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

**Wind Speed (WS) - km/h**  
**Conklin - February 2023**

Maximum Speed: 22 km/h on Feb 13 15:00	Maximum Daily Speed Average: 9.6 km/h on Feb 7	Hours in Service: 672
Minimum Speed Value: 0 km/h on Feb 1 19:00	Minimum Daily Speed Average: 0.5 km/h on Feb 10	Hours of Data: 670
Maximum Diurnal Speed Average: 3.9 km/h at hour 15	Minimum Diurnal Speed Average: 2.0 km/h at hour 24	Hours of Missing Data: 2
Monthly Average Velocity: 2.6 km/h 253.1 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 2 Q <sub>1</sub> = 3 Median = 6 Q <sub>3</sub> = 10 P <sub>90</sub> = 13 P <sub>99</sub> = 18	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-Feb	NW3	WNW4	NW5	N11	N12	NNW11	NNW10	NNW12	NNW16	NNW15	NNW15	NNW16	NNW15	NNW14	NNW14	NNW13	N11	NNW4	S0	S2	SSW3	S3	S3	S3	NNW7.8	NNW16
2-Feb	S3	SSE4	SSE4	SSE3	SSE4	SSE4	SSE3	SSE3	SSE3	S1	SE3	SSE9	SSE10	SE10	SSE16	SSE15	SSE15	S15	SSE12	SSE11	S12	S13	S12	SSW11	SSE7.8	SSE16
3-Feb	SSW13	SSW13	S11	SSW12	SSW12	SSW9	SSW7	SW10	SW8	WSW10	WSW10	SW11	WSW7	NW5	NW9	NW7	NW5	NNW5	NNW6	NNW4	SW4	SSW3	S2	E4	SW5.2	SSW13
4-Feb	ESE4	ENE3	ESE3	E2	ESE3	NE2	ESE3	NNE3	E3	N5	N7	NW2	SW2	NW1	ESE1	SE3	NE4	E2	SE4	SE3	N1	SE1	N3	ENE2	ENE1.4	N7
5-Feb	SW9	SW10	SW7	SSW6	SSE2	SE2	SE3	S4	SSW7	SW5	SW6	SW6	SSW10	SW11	SW8	SW6	SW5	WSW9	WSW12	SW12	SW11	WSW11	W13	WNW13	SW6.9	W13
6-Feb	NW15	NW16	NW13	NW11	NW10	WNW9	WSW8	W11	W11	W8	SW7	W9	W8	WSW9	WSW12	SW7	SSW6	SSW10	SSW14	SW14	SW13	SW13	WSW12	SW12	W8.5	NW16
7-Feb	SW9	SW11	WSW12	WSW13	WSW14	WSW15	W15	W14	NW12	WNW11	WNW10	W12	W14	W16	W15	W14	W15	W10	WNW5	WSW6	SSW5	S3	WNW1	S5	W9.6	W16
8-Feb	S4	SSE4	S3	SSW3	S3	S3	S3	S3	S2	M	WNW4	WNW5	WNW5	WNW6	WNW5	W6	W6	SSW6	SW7	SSW7	SSW8	SSW8	SSW10	SSW12	SW4.0	SSW12
9-Feb	SSW11	SSW11	SSW9	SSW8	SSW7	SSW9	SW13	SW11	SW14	SW16	SW12	SW9	SW11	SSW13	SW8	S8	S8	S7	S8	SSE7	SSW12	SSW14	SSW8	NNW1	SSW9.3	SW16
10-Feb	W2	SSE1	S1	SSE3	SSE5	WSW1	SE3	SSE2	SSE2	ENE3	SE5	SW2	ESE3	NNE3	N4	NW5	NW7	NNW3	WNW4	WNW5	W4	WNW3	N1	SE1	WNW0.5	NW7
11-Feb	W5	WSW5	WSW8	W10	W9	WSW6	SSW5	SW8	SW9	SW10	SW10	SW11	SW12	WSW14	SW12	WSW17	WSW12	WSW10	SW9	W14	W15	WNW11	W10	W10	WSW9.3	WSW17
12-Feb	WSW8	WSW11	W12	W12	W9	W9	W12	WSW9	WSW13	SW13	SW11	SW9	SW9	WSW9	WSW8	SSW7	S8	SSW9	S8	S6	SSE8	S11	SSW14	SSW16	SW8.3	SSW16
13-Feb	SSW16	SSW14	SW14	SW10	SW12	SW14	WSW14	SW12	WSW12	WSW14	WSW13	W12	WNW13	NNW20	NNW22	NNW21	NNW18	NNW17	NNW18	NNW14	NNW10	NNW6	NW9	NW7	WNW8.7	NNW22
14-Feb	NW6	NW4	NW5	NNW5	NNW4	N2	SE1	UO	SSE2	SSW1	S3	S3	SSE3	SSW6	WSW5	W4	NW8	NNW9	NNW7	NW8	NNW10	NNE5	NE4	NE4	NW2.6	NNW10
15-Feb	ENE4	ENE3	E3	E4	NE2	NNE2	NNE4	NE3	E2	ESE4	SE5	SSE3	S1	SE4	SE4	SE3	SE4	S2	SSE2	SSE3	SSE4	SSE4	SE5	SE3	ESE2.5	SE5
16-Feb	SE3	ESE1	SSE7	SSE8	S8	SSE8	S9	SSW14	SSW15	SSW18	SSW19	SSW19	SSW19	SW12	SW14	SW14	SW13	SW12	WSW11	WNW8	NW10	NW15	NNW13	NW9	SW7.8	SSW19
17-Feb	NNW8	NNW12	NNW9	NNW10	NW9	NNW5	NNW1	NE3	ESE5	ESE4	SE4	WNW4	WNW6	WNW5	WNW5	NW6	NNW6	N7	N6	NNE5	NE6	NNE4	N3	N5	NNW4.2	NNW12
18-Feb	NNE5	N5	N6	N4	N4	N4	NNE7	N6	NNE7	N7	NNE6	NNE5	N8	N7	NNE5	ENE3	ESE3	S1	S1	S2	SSE2	SSE1	S3	SSE2	NNE3.1	N8
19-Feb	SE3	SE3	SE4	SSE3	SE3	SE2	SSW1	SW1	WNW1	ESE0	ESE5	E5	ESE6	ESE8	E6	NNE6	N7	N6	N4	N4	N6	N6	NNE4	N5	ENE2.1	ESE8
20-Feb	NNW3	NNW2	NNW2	NW5	NW4	NW4	NW4	NW6	NW5	NW6	WNW5	WNW7	WNW6	WNW8	NW9	NNW10	N9	N5	N5	NNE5	NE4	NNE5	NNE9	NNE6	NNW4.8	NNW10
21-Feb	NE4	NNW3	NNW2	NNW3	NNW3	NNW2	N2	ENE1	NW4	NNW8	NNW11	NNW11	NNW11	NNW9	NNW11	NW10	NNW12	NNW11	N8	NNW4	NNW4	NNW2	NNE0	W1	NNW5.5	NNW12
22-Feb	NW1	SSW1	S1	S2	SSW1	S2	S3	S2	S2	S2	NW5	N6	NNW2	NNW5	N4	N7	NNE6	NE4	NNW2	SW1	SSW1	SSE1	SSE1	S1	N0.8	N7
23-Feb	S2	S1	S2	SSE2	SSE1	SSE1	SSE1	SSE1	S1	SSE2	SSE1	NNE1	WNW3	NNW7	NW5	NW4	NW4	WNW1	WSW1	SSW1	S3	S3	SSE3	S5	SW0.7	NNW7
24-Feb	S5	S5	S6	SSE4	SSE2	SSE2	SSE1	SSE2	SE2	SSE3	SSW15	S16	SSW14	SSW16	SSW17	SSW16	SSW14	SSW13	S12	SSW14	S15	SSW14	SSW13	SSW12	SSW9.5	SSW17
25-Feb	SW12	SW13	SW12	SW8	SW8	SW8	SW9	SW7	SW7	SW7	W7	W8	W9	W7	W7	W9	SW8	SSW7	SW8	SSW4	S5	S5	SE4	SE5	SW6.7	SW13
26-Feb	SE4	SSE5	SE5	ESE4	SE3	SE4	ESE3	E3	ENE3	E5	E6	E6	E7	NE9	NE10	ENE10	ENE9	NE7	ENE6	ENE4	NE3	ENE3	NE3	NNE3	E4.5	NE10
27-Feb	N4	NW3	NNW5	NW5	NW4	NW5	NW4	NW5	NW6	NW9	WNW7	WNW7	WNW8	NW9	NW9	NW9	NNW9	NW8	NW7	NNW6	NNW5	NNW4	N5	NNW6	NW6.0	NNW9
28-Feb	N5	N4	NNE4	NNE5	NNE5	NNE3	NW3	NNW5	NNW4	NW3	NW4	N5	NNE4	ENE5	ESE2	SE8	SE7	ESE4	NNE1	SSE1	SSE1	S2	SSE2	SE3	NE1.6	SE8

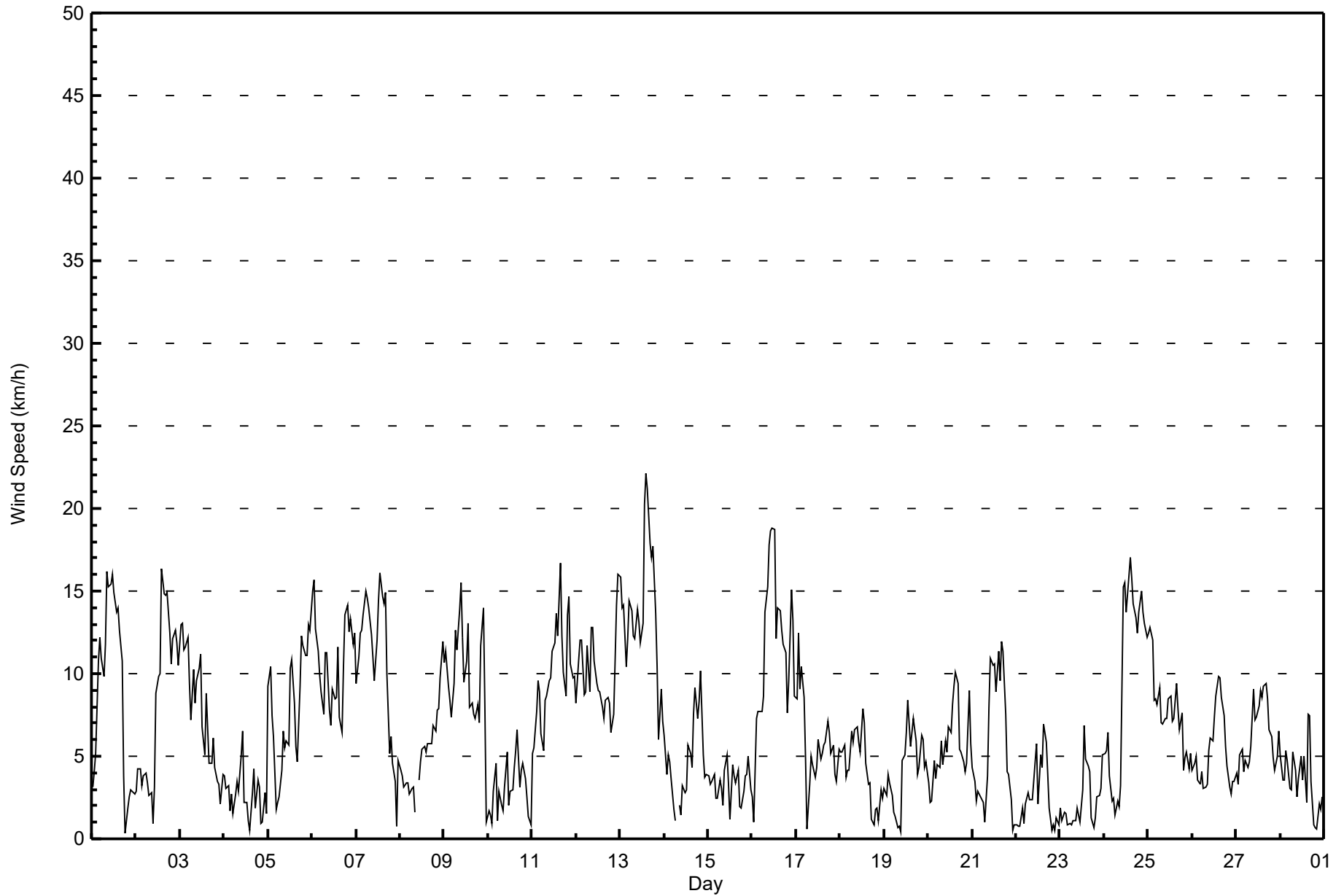
SW2.4WSW2.8WSW2.7WSW2.2WSW2.1WSW2.4WSW2.5WSW2.8WSW2.9WSW3.3WSW3.3WSW3.8WSW3.7 W3.6 W3.9 W3.3WNW2.2 W2.1WSW2.3WSW2.1WSW2.5 SW2.6WSW2.0 SW2.0  
 SSW16 NW16 SW14WSW13WSW14WSW15 W15 W14NNW16 SSW18 SSW19 SSW19 SSW19NNW20 NNW22 NNW21 NNW18 NNW17 NNW18 SW14 S15 NW15 SSW14 SSW16  
 Diurnal Average  
 Diurnal 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 (WS) - km/h**  
**Conklin - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Conklin - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	324	48.36	48.36
6 - 11	224	33.43	81.79
12 - 19	119	17.76	99.55
20 - 28	3	0.45	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 670

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Conklin - February 2023**

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	23	23	12	11	10	17	33	46	47	12	7	4	5	17	29	28	324
6 - 11	17	7	4	3	4	2	3	8	12	24	40	17	19	14	25	25	224
12 - 19	1	0	0	0	0	0	0	4	7	30	22	17	14	3	5	16	119
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	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>	41	30	16	14	14	19	36	58	66	66	69	38	38	34	59	72	670

Total Number of Valid Hours: 670

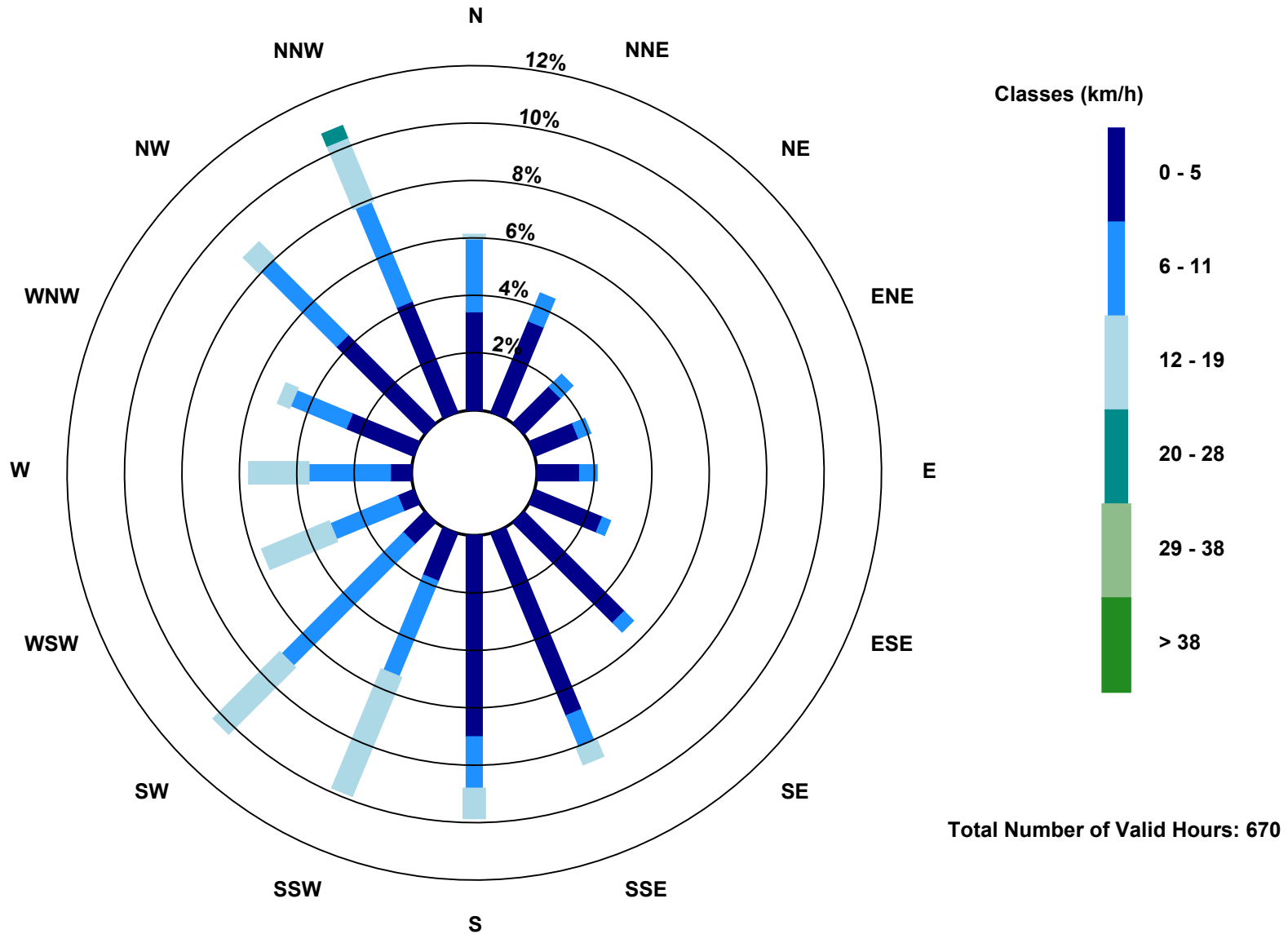
Total Number of Hours: 672





Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Conklin





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

**Wind Speed (WS) - km/h**  
**Conklin - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Feb 13 14:00 Minimum Value: 0 km/h on Mar 1 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: 672 Hours of Data: 670 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-Feb	1	2	2	5	3	4	4	3	5	5	4	5	5	4	4	4	3	2	1	1	1	1	1	1	5
2-Feb	1	1	1	1	1	1	1	1	1	1	2	3	3	4	5	4	4	5	4	2	4	4	3	3	5
3-Feb	4	4	3	4	4	3	2	4	3	3	4	3	3	4	3	2	2	2	2	2	2	2	2	4	
4-Feb	1	1	1	1	1	1	1	1	2	2	2	1	1	2	2	1	2	1	1	1	1	1	1	2	
5-Feb	3	3	3	2	1	1	2	2	2	3	4	2	3	4	3	2	1	3	4	3	3	3	5	5	
6-Feb	7	6	6	5	4	3	3	4	4	3	2	3	3	3	4	3	3	3	3	4	3	4	4	3	
7-Feb	3	3	3	3	4	5	5	5	6	5	4	5	6	6	6	6	6	3	2	2	1	1	1	1	
8-Feb	1	1	1	1	1	1	1	1	1	M	2	2	2	2	2	3	2	2	2	1	2	2	2	3	
9-Feb	2	2	3	2	1	3	3	3	3	4	4	3	4	4	3	3	2	2	2	2	4	4	5	2	
10-Feb	2	1	1	2	1	1	1	1	1	1	1	2	1	2	2	3	2	1	2	2	1	1	1	3	
11-Feb	3	2	4	3	3	2	2	2	2	3	3	3	4	5	4	7	4	4	3	6	6	4	3	3	
12-Feb	3	4	4	5	4	3	4	3	3	3	3	3	3	3	3	3	2	2	2	2	3	4	4	5	
13-Feb	4	4	4	3	3	4	4	3	4	5	4	4	6	8	6	6	5	5	6	4	3	1	2	2	
14-Feb	2	1	1	1	1	2	1	UO	0	1	1	2	1	2	2	2	4	3	2	3	3	2	1	1	
15-Feb	1	1	1	1	1	1	1	1	1	2	1	1	2	2	2	2	2	2	1	1	1	1	1	2	
16-Feb	1	1	2	2	2	2	3	4	4	5	6	5	5	5	4	4	3	3	4	3	4	5	5	3	
17-Feb	3	4	3	3	3	2	2	2	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1	
18-Feb	1	2	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	
19-Feb	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	2	2	1	1	2	2	1	1	
20-Feb	1	1	1	1	2	1	2	2	2	2	2	2	3	3	4	3	3	2	2	1	1	2	3	2	
21-Feb	2	1	2	1	1	0	1	1	2	3	3	3	3	3	4	4	4	3	2	1	1	1	1	1	
22-Feb	1	1	1	1	1	1	1	1	1	1	3	2	2	2	2	3	2	2	1	1	1	1	1	3	
23-Feb	1	1	1	1	1	1	1	1	1	1	1	1	3	3	3	2	2	1	2	1	1	1	1	3	
24-Feb	1	1	1	1	1	1	1	1	1	4	4	5	5	5	5	4	4	4	4	6	5	4	4	6	
25-Feb	4	4	4	3	2	2	3	2	2	2	3	4	4	3	3	3	2	3	3	2	2	1	1	1	
26-Feb	1	1	1	1	2	2	1	1	1	2	2	2	3	3	3	3	3	3	2	2	1	1	1	1	
27-Feb	1	1	1	1	1	1	1	1	2	4	3	3	3	4	3	4	3	3	2	2	1	1	1	2	
28-Feb	2	1	1	2	2	1	1	1	1	1	1	2	2	2	3	2	1	1	1	1	1	1	1	0	
														Diurnal Maximum											
M - Maintenance														UO - Unstable Operation											



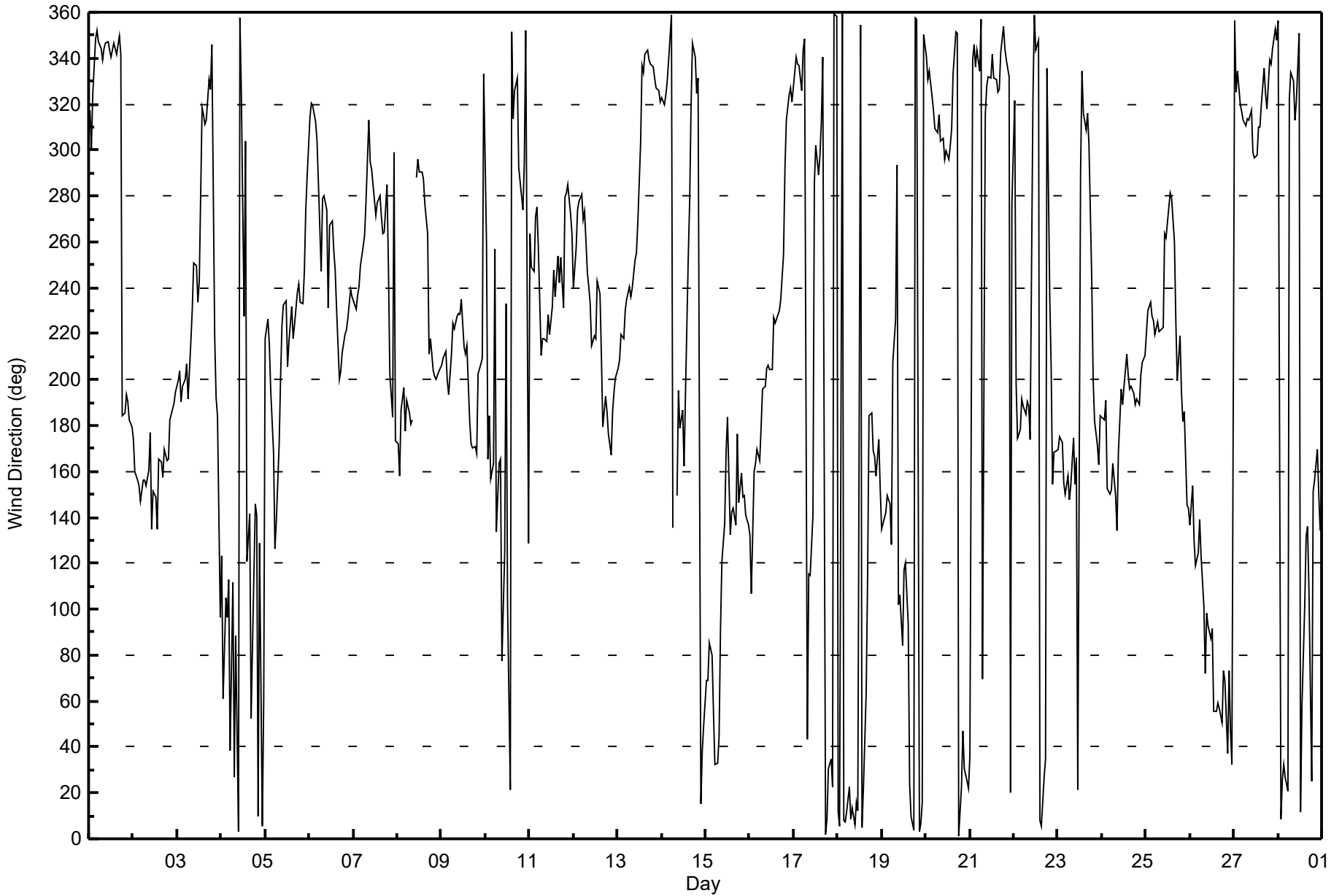
**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction (WD) - deg**  
**Conklin - February 2023**

Direction of Maximum Speed: 334 deg on Feb 13 15:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 263.7 deg on Feb 7	Hours of Data: 670
Direction of Minimum Speed: 184 deg on Feb 1 19:00	Hours of Missing Data: 2
Direction of Minimum Daily Speed Average: 0.5 deg on Feb 10	Percent Operational Time: 99.7
Monthly Average Direction: 253.1 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-Feb	317	301	325	349	352	347	344	339	344	346	347	343	340	347	344	341	350	342	184	186	193	191	183	179	341.8
2-Feb	174	160	156	154	147	156	156	154	160	177	135	151	149	135	165	164	158	170	165	165	182	188	190	195	165.7
3-Feb	200	204	191	197	200	207	192	217	231	251	250	234	243	318	315	311	313	331	327	346	219	192	184	97	229.6
4-Feb	123	61	105	96	113	39	112	27	88	3	357	326	227	304	121	141	53	85	146	141	10	129	6	61	69.2
5-Feb	218	226	216	195	168	126	139	171	200	223	232	234	205	216	232	218	224	238	242	234	233	247	274	288	229.7
6-Feb	315	321	319	312	305	286	247	279	280	274	231	267	269	256	248	231	200	204	212	219	222	226	239	236	259.7
7-Feb	235	231	237	240	250	258	263	278	313	295	292	278	272	277	280	271	264	264	285	249	202	184	299	174	263.7
8-Feb	172	158	186	197	178	191	185	181	182	M	288	296	291	290	288	277	264	211	218	204	202	200	202	205	219.8
9-Feb	206	210	212	200	193	211	225	222	227	229	228	235	214	211	215	182	172	170	171	168	202	207	209	333	208.9
10-Feb	259	165	184	157	163	257	134	164	165	78	125	233	103	21	351	313	326	331	292	286	274	295	352	129	291.9
11-Feb	263	249	247	271	275	257	210	218	218	216	229	219	232	248	236	254	242	253	231	279	281	285	272	263	249.5
12-Feb	240	257	274	278	281	269	273	247	240	233	215	219	218	243	237	210	179	193	186	176	167	186	195	201	227.4
13-Feb	205	209	220	218	230	235	241	236	240	252	255	269	303	337	334	342	344	339	337	336	331	327	326	321	288.3
14-Feb	323	320	324	330	340	359	136	UO	150	195	179	187	162	193	253	277	319	346	340	325	332	15	38	49	325.5
15-Feb	69	69	85	80	55	33	33	44	91	121	137	168	184	132	142	144	136	176	147	159	149	149	141	137	118.6
16-Feb	133	107	160	163	170	165	179	196	197	205	206	204	204	227	224	228	230	235	255	292	313	324	327	321	221.2
17-Feb	334	341	337	337	326	344	348	43	115	115	141	286	302	289	298	313	340	2	9	31	35	23	360	358	345.8
18-Feb	12	5	360	8	7	11	23	9	13	6	16	12	354	5	22	64	114	184	185	169	167	158	174	153	17.0
19-Feb	135	140	142	149	146	128	208	227	293	102	106	84	117	120	94	24	10	3	358	357	3	7	16	350	59.7
20-Feb	340	331	334	323	317	309	308	315	304	305	296	299	296	302	310	333	352	351	1	22	47	30	25	22	332.7
21-Feb	36	339	346	336	343	334	357	70	315	328	332	331	341	331	331	326	327	343	354	344	339	332	20	277	336.7
22-Feb	322	198	175	178	192	188	185	190	189	174	322	359	343	348	8	6	27	34	335	236	206	154	168	169	355.9
23-Feb	169	175	173	155	150	158	148	154	174	154	166	21	291	334	316	309	316	302	243	199	182	171	163	184	230.2
24-Feb	183	183	191	153	150	152	163	150	134	168	189	197	211	202	196	197	194	189	192	189	202	207	210	194.1	
25-Feb	221	230	234	227	226	220	225	221	222	223	264	262	275	281	279	260	225	200	219	195	182	186	145	144	229.4
26-Feb	136	154	130	119	125	139	123	101	72	98	93	87	91	56	55	59	57	51	73	69	37	73	47	32	80.7
27-Feb	356	325	335	320	317	313	310	313	313	317	299	297	298	310	310	320	336	324	318	340	337	344	353	348	321.2
28-Feb	356	9	25	32	27	21	322	334	330	313	321	351	12	58	102	132	136	108	25	151	156	169	150	134	34.5
	235.7	243.1	239.1	250.8	252.4	250.9	238.8	247.3	249.7	255.5	248.2	256.3	256.0	279.5	278.4	278.0	283.5	266.5	251.4	246.4	236.4	227.9	238.7	232.2	
	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 (WD) - deg**  
**Conklin - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 109 deg on Feb 4 15:00 Minimum Value: 8 deg on Feb 28 23:00 Percentiles: P <sub>1</sub> = 11 P <sub>10</sub> = 16 Q <sub>1</sub> = 19 Median = 23 Q <sub>3</sub> = 33 P <sub>90</sub> = 57 P <sub>99</sub> = 90																			Hours in Service: 672 Hours of Data: 670 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-Feb	30	30	20	20	19	19	21	19	18	19	21	22	22	25	22	20	18	19	66	23	20	20	22	21	66
2-Feb	19	16	19	20	10	13	14	21	17	85	86	20	23	22	17	17	15	17	16	16	20	20	19	20	86
3-Feb	21	20	21	24	21	26	25	24	28	28	23	21	45	66	30	29	33	21	25	22	63	38	66	41	66
4-Feb	29	30	36	47	35	56	41	25	45	18	16	55	23	77	109	29	37	54	28	48	77	57	22	70	109
5-Feb	20	21	25	20	74	56	68	50	30	66	58	28	19	22	25	27	35	22	20	18	18	27	31	28	74
6-Feb	30	25	27	28	32	29	32	27	25	40	19	29	30	27	23	24	30	19	16	16	15	17	23	19	40
7-Feb	19	20	19	18	18	19	21	29	30	31	32	28	28	28	30	26	21	20	29	29	14	22	105	24	105
8-Feb	21	16	32	25	24	26	19	26	41	M	62	33	32	34	35	33	17	17	19	18	17	17	16	15	62
9-Feb	15	17	20	13	14	24	19	20	18	18	19	20	22	19	25	20	19	15	12	16	21	16	41	81	81
10-Feb	66	63	78	43	19	100	51	22	77	42	16	74	49	59	43	24	16	20	34	32	30	35	71	49	100
11-Feb	38	24	26	25	26	25	18	21	21	22	27	21	25	23	20	25	19	25	23	30	29	31	25	23	38
12-Feb	21	25	26	28	29	27	26	27	15	18	19	20	22	23	23	28	15	18	16	19	19	18	18	16	29
13-Feb	15	17	21	24	19	18	15	18	18	26	22	25	31	25	20	19	19	18	19	18	18	12	16	15	31
14-Feb	15	15	16	14	18	10	59	UO	23	52	42	55	44	30	43	34	26	20	19	23	29	26	25	59	
15-Feb	28	38	34	34	44	51	21	48	78	28	26	37	92	60	64	37	36	70	43	16	11	13	10	22	92
16-Feb	40	70	15	16	17	16	22	20	19	17	17	16	15	25	24	20	19	17	23	32	23	19	19	17	70
17-Feb	19	17	22	20	20	38	84	40	19	22	36	42	29	33	28	26	24	26	20	27	23	24	26	19	84
18-Feb	24	21	21	26	25	26	23	21	23	25	32	45	28	35	54	58	35	58	70	19	27	79	19	22	79
19-Feb	15	17	12	15	22	49	44	57	69	98	25	39	25	22	44	37	23	21	25	23	18	19	17	16	98
20-Feb	19	27	18	17	23	23	30	21	31	28	34	30	34	31	26	24	21	19	18	21	26	27	22	31	34
21-Feb	24	13	22	36	22	22	37	74	24	24	22	25	23	31	23	25	20	18	15	34	16	34	92	60	92
22-Feb	67	76	77	22	73	23	31	17	65	31	48	48	89	48	70	38	37	17	36	75	63	78	22	50	89
23-Feb	19	74	20	23	34	45	57	62	64	22	67	85	75	36	49	32	29	43	57	70	18	17	25	18	85
24-Feb	11	12	10	20	12	13	15	12	18	65	20	22	26	22	18	20	19	18	20	20	21	21	21	22	65
25-Feb	23	23	23	24	21	22	25	27	23	20	34	32	33	34	32	23	24	18	21	37	29	22	21	17	37
26-Feb	15	16	13	28	34	17	20	37	39	27	28	33	30	33	30	33	30	29	34	34	33	37	34	33	39
27-Feb	18	12	20	15	15	20	22	20	22	25	30	31	32	27	26	26	20	20	18	16	20	21	20	16	32
28-Feb	20	21	20	23	21	30	28	17	23	43	43	41	77	56	100	20	18	21	71	54	80	23	8	18	100
																			Diurnal Maximum						
M - Maintenance UO - Unstable Operation																									



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

**AMS22**  
**JANVIER**  
**FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)  
 FEBRUARY 2023

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	638	33	34	99.85	7.9	0	3.1	0
TRS(ppb) Average	638	34	34	100	0.5	0	0.2	0
THC(ppm) Average	638	33	34	99.85	2.2	-	2.1	-
NMHC(ppm) Average	638	33	34	99.85	0.09	-	0.006	-
CH4(ppm) Average	638	33	34	99.85	2.2	-	2.1	-
O3 (ppb) Average	639	32	33	99.85	46.5	0	43.9	-
NO2 (ppb) Average	637	34	35	99.85	13	0	5.3	-
NO (ppb) Average	637	34	35	99.85	4.7	-	1	-
NOX (ppb) Average	637	34	35	99.85	15	-	5.9	-
PM2.5 (ug/m3) Average	669	3	3	100	32.9	0	8	0
Temperature 2 m (C) Average	672	0	0	100	6.1	-	1.8	-
Relative Humidity (%) Average	672	0	0	100	94.1	-	85.9	-
Wind Speed 20 m (km/h) Average	670	0	2	99.7	25	-	15	-
Wind Direction 20 m (deg) Average	670	0	2	99.7	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	638	0.73	1.2	-	0	0	0.1	0.3	0.8	1.7	7.9
TRS (ppb) Average	638	0.12	0.1	-	0	0.1	0.1	0.1	0.1	0.2	0.5
THC (ppm) Average	638	2.03	0.1	-	1.9	2	2	2	2.1	2.1	2.2
NMHC(ppm) Average	638	0	0.004	-	0	0	0	0	0	0	0.09
CH4(ppm) Average	638	2.03	0	-	1.9	2	2	2	2.1	2.1	2.2
O3 (ppb) Average	639	33.91	6.7	-	10.5	25.4	29	34.6	39.1	42.3	46.5
NO2 (ppb) Average	637	2.18	2.1	-	0	0.1	0.6	1.8	2.9	4.8	13
NO (ppb) Average	637	0.36	0.6	-	0	0	0	0.1	0.4	1	4.7
NOX (ppb) Average	637	2.54	2.4	-	0	0.2	0.7	2	3.5	5.9	15
PM2.5 (ug/m3) Average	669	3.28	2.4	-	0.4	1.1	1.8	3	3.9	5.8	32.9
Temperature 2 m (C) Average	672	-12.18	10.3	-	-35.4	-26.8	-19.2	-12.2	-3.4	1.4	6.1
Relative Humidity (%) Average	672	67.62	12.9	-	30.7	48.9	59.6	68.7	75.5	84.7	94.1
Wind Speed 20 m (km/h) Average	670	8.2	5	-	1	3	5	8	11	14	25
Wind Direction 20 m (deg) Average	670	-	-	-	-	-	-	-	-	-	-



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2, O3, SO2, THC/NMHC/CH4	24 Feb 2023 17:00	24 Feb 2023 17:00	1	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	11 Feb 2023 00:00	11 Feb 2023 00:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	23 Feb 2023 21:00	23 Feb 2023 21:00	1	Flat line in sensor output signal - Sensor frozen



# Wood Buffalo Environmental Association

## Summary of Hour Averages

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

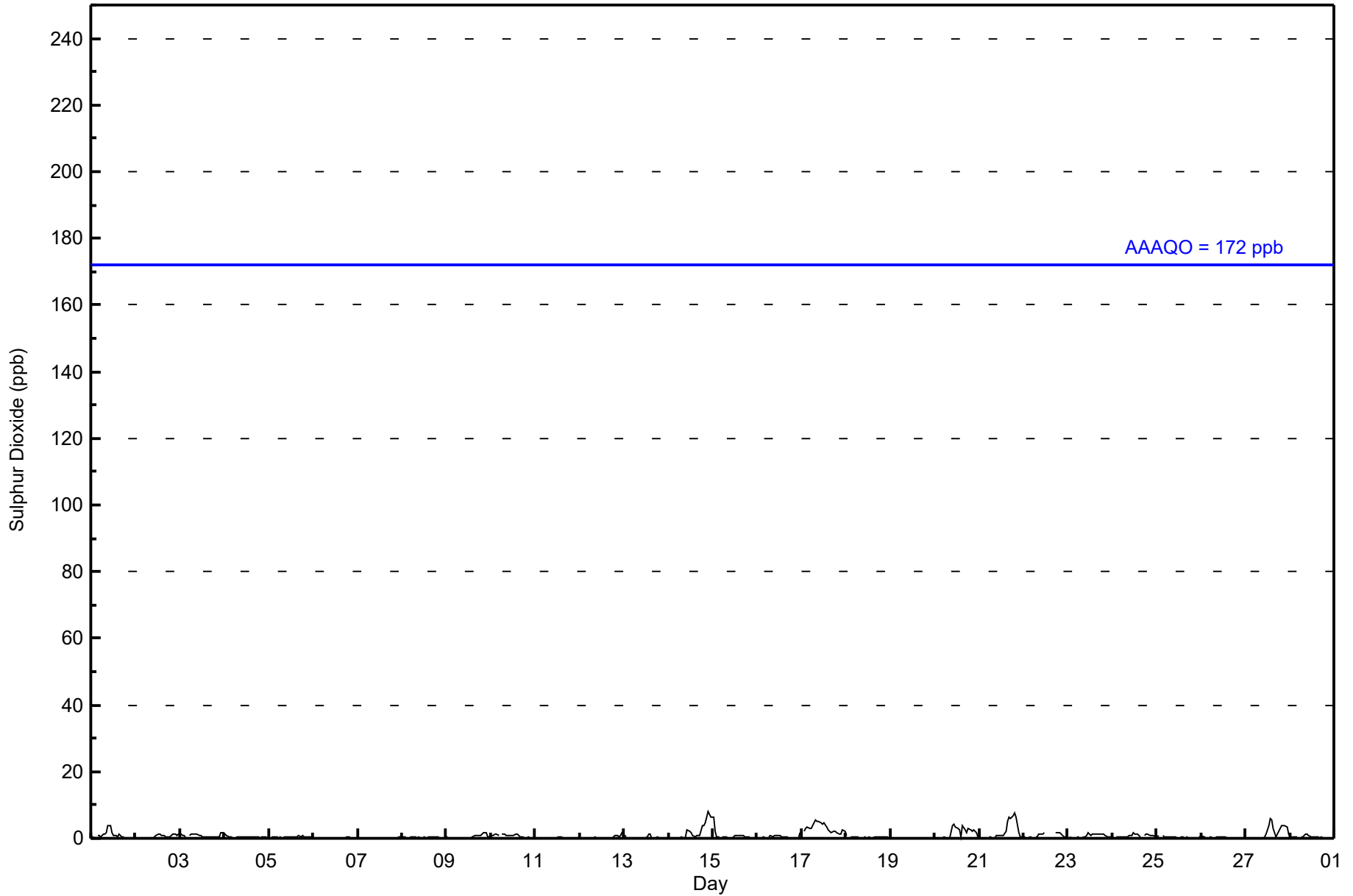
## Janvier - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																																								
Maximum Value: 7.9 ppb on Feb 14 22:00		Maximum Daily Average: 3.1 ppb on Feb 17		Minimum Value: 0.0 ppb on Feb 1 20:00		Minimum Daily Average: 0.1 ppb on Feb 19		Hours of Data: 638																																								
Maximum Diurnal Average: 1.1 ppb at hour 20		Minimum Diurnal Average: 0.4 ppb at hour 6		Hours of Missing Data: 34		Hours of Calibration: 33		Percent Operational Time: 99.9																																								
Monthly Average: 0.73 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> = 0.8 P <sub>90</sub> = 1.7 P <sub>99</sub> = 6.2																																														
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-Feb	0.3	0.2	Z	0.8	0.8	0.5	1.3	1.2	1.6	3.8	3.6	1.8	1.0	1.0	0.5	1.1	0.5	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.9	3.8																						
2-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	1.3	1.3	0.9	0.7	0.6	0.6	0.5	0.8	1.1	1.1	0.9	1.2	0.5	1.3																						
3-Feb	1.1	0.9	0.7	0.6	Z	1.0	1.1	1.4	1.4	1.1	0.7	0.7	0.6	0.6	0.6	0.3	0.3	0.2	0.3	0.2	0.3	0.5	1.7	1.6	0.8	1.7																						
4-Feb	1.1	0.9	0.5	0.5	0.3	Z	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.4	1.1																						
5-Feb	Z	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.6	0.7	0.6	0.4	0.3	0.3	0.4	0.4	0.7																						
6-Feb	0.2	Z	0.0	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	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.3																						
7-Feb	0.1	0.1	Z	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	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2																						
8-Feb	0.4	0.4	0.3	Z	0.3	0.3	0.2	0.2	0.1	0.3	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.4																						
9-Feb	0.3	0.2	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.7	1.0	0.8	0.8	1.3	1.7	1.6	0.6	0.6	0.5	1.7																						
10-Feb	0.8	0.9	1.1	1.5	0.7	Z	1.1	1.1	1.0	0.9	0.9	0.7	0.8	1.1	1.1	0.7	0.4	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.7	1.5																						
11-Feb	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.0	0.1	0.3																						
12-Feb	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.0	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.7	0.9	0.5	0.6	1.5	0.3	1.5																						
13-Feb	0.9	0.4	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.5	1.2	0.1	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.2	1.5																						
14-Feb	0.1	0.1	0.2	Z	0.2	0.2	0.1	0.3	0.1	0.2	2.6	2.2	1.7	1.0	0.6	0.7	0.7	0.8	3.8	3.8	4.5	7.9	7.2	6.2	2.0	7.9																						
15-Feb	6.5	2.3	0.5	0.4	Z	0.3	0.3	0.2	0.2	0.1	0.1	0.5	0.9	0.9	0.9	0.8	0.8	0.6	0.3	0.3	0.2	0.1	0.0	0.0	0.7	6.5																						
16-Feb	0.1	0.1	0.1	0.3	0.5	Z	0.5	0.9	0.6	0.8	0.9	0.8	0.7	0.6	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.0	0.0	1.6	0.4	1.6																						
17-Feb	Z	2.2	3.0	3.4	3.1	3.0	3.7	5.6	5.2	4.9	4.8	4.3	4.7	3.6	2.5	2.1	1.8	2.1	2.0	1.6	1.3	1.4	2.6	2.1	3.1	5.6																						
18-Feb	1.0	Z	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.3	0.4	0.2	0.5	0.5	0.4	0.3	0.3	0.1	0.3	1.0																						
19-Feb	0.1	0.1	Z	0.1	0.1	0.1	0.1	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	0.0	0.0	0.1	0.1																						
20-Feb	0.0	0.0	0.0	Z	0.1	0.3	0.1	0.2	0.1	3.7	4.1	3.5	3.1	2.3	0.3	3.7	2.4	1.9	2.9	2.8	2.2	2.7	1.5	0.5	1.7	4.1																						
21-Feb	0.2	0.0	0.1	0.1	Z	0.5	0.3	0.1	0.1	0.7	0.7	0.9	0.8	1.0	2.0	5.0	6.3	6.1	6.9	7.8	6.2	1.8	0.5	0.4	2.1	7.8																						
22-Feb	0.3	0.2	0.2	0.2	0.3	Z	0.3	0.3	1.1	1.3	1.3	1.7	C	C	C	C	C	1.6	1.8	1.8	1.4	0.7	0.6	0.3	0.9	1.8																						
23-Feb	Z	0.2	0.1	0.1	0.1	0.3	0.1	0.2	0.2	0.6	0.7	1.6	1.0	1.4	1.2	1.3	1.2	1.4	1.2	1.3	0.9	0.6	0.4	0.3	0.7	1.6																						
24-Feb	0.5	Z	0.4	0.3	0.3	0.2	0.2	0.3	0.6	0.8	0.7	1.5	1.4	1.3	0.8	0.6	M	1.0	1.4	1.1	0.9	0.7	0.7	0.6	0.7	1.5																						
25-Feb	0.6	0.7	Z	0.7	0.6	0.6	0.6	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.4	0.3	0.7																						
26-Feb	0.7	0.5	0.4	Z	0.4	0.3	0.1	0.2	0.3	0.4	0.5	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.7																						
27-Feb	0.1	0.0	0.1	0.0	Z	0.1	0.1	0.0	0.1	0.1	0.4	1.5	4.0	5.8	5.5	2.8	0.6	1.2	2.0	4.0	3.8	3.7	3.6	1.4	1.8	5.8																						
28-Feb	0.6	0.4	0.3	0.3	0.2	Z	0.3	0.4	1.2	1.4	0.7	0.6	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.4	1.4																						
																								0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.8	0.9	0.9	0.9	1.0	0.8	0.9	0.7	0.8	1.0	1.1	1.0	0.9	0.8	0.7	Diurnal Average
																								6.5	2.3	3.0	3.4	3.1	3.0	3.7	5.6	5.2	4.9	4.8	4.3	4.7	5.8	5.5	5.0	6.3	6.1	6.9	7.8	6.2	7.9	7.2	6.2	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**  
**Janvier - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Janvier - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	638	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: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Janvier - February 2023**

<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	57	116	44	18	9	6	7	20	40	110	96	36	22	20	17	18	636
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>57</b>	<b>116</b>	<b>44</b>	<b>18</b>	<b>9</b>	<b>6</b>	<b>7</b>	<b>20</b>	<b>40</b>	<b>110</b>	<b>96</b>	<b>36</b>	<b>22</b>	<b>20</b>	<b>17</b>	<b>18</b>	<b>636</b>

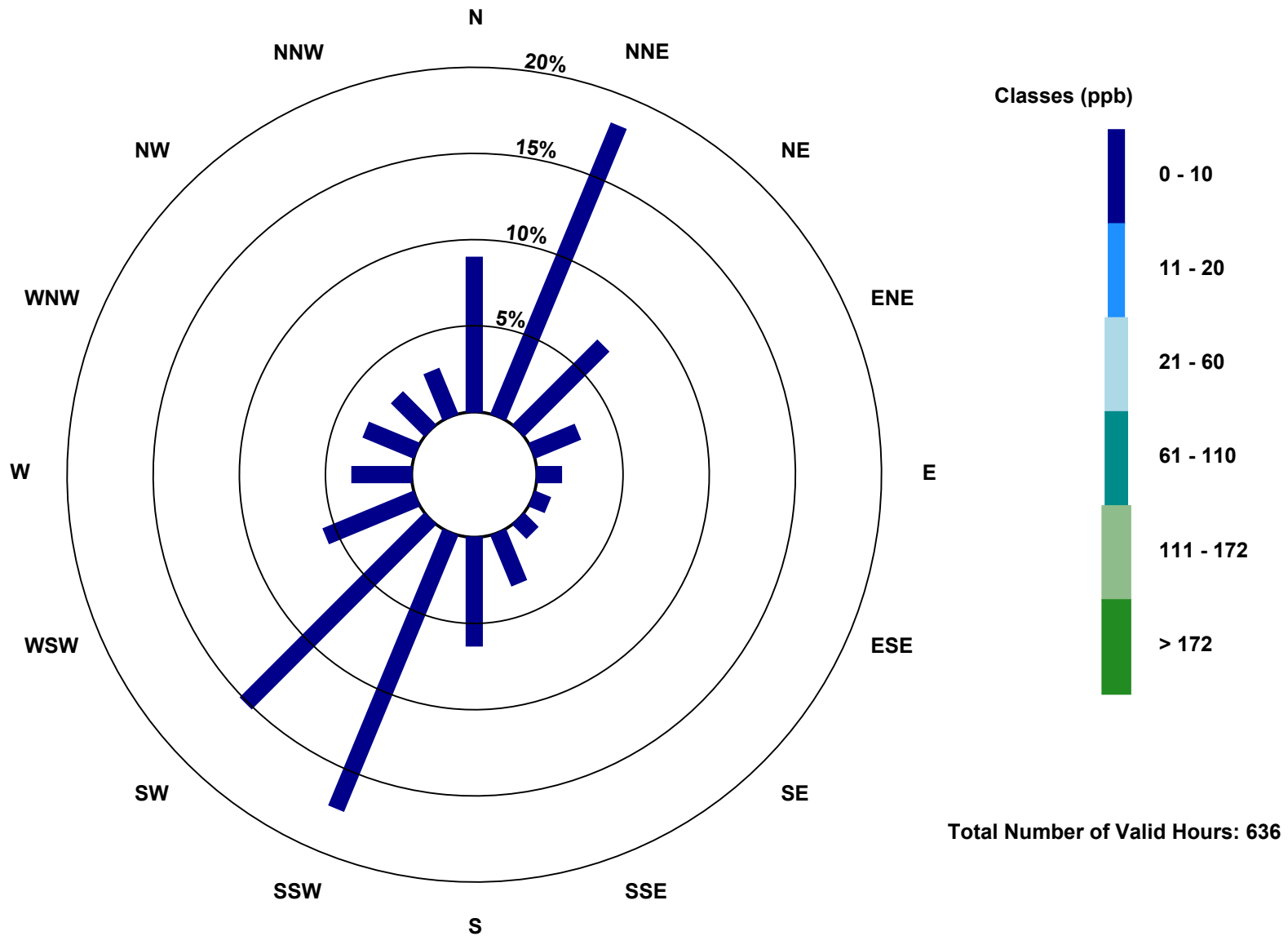
Total Number of Valid Hours: 636

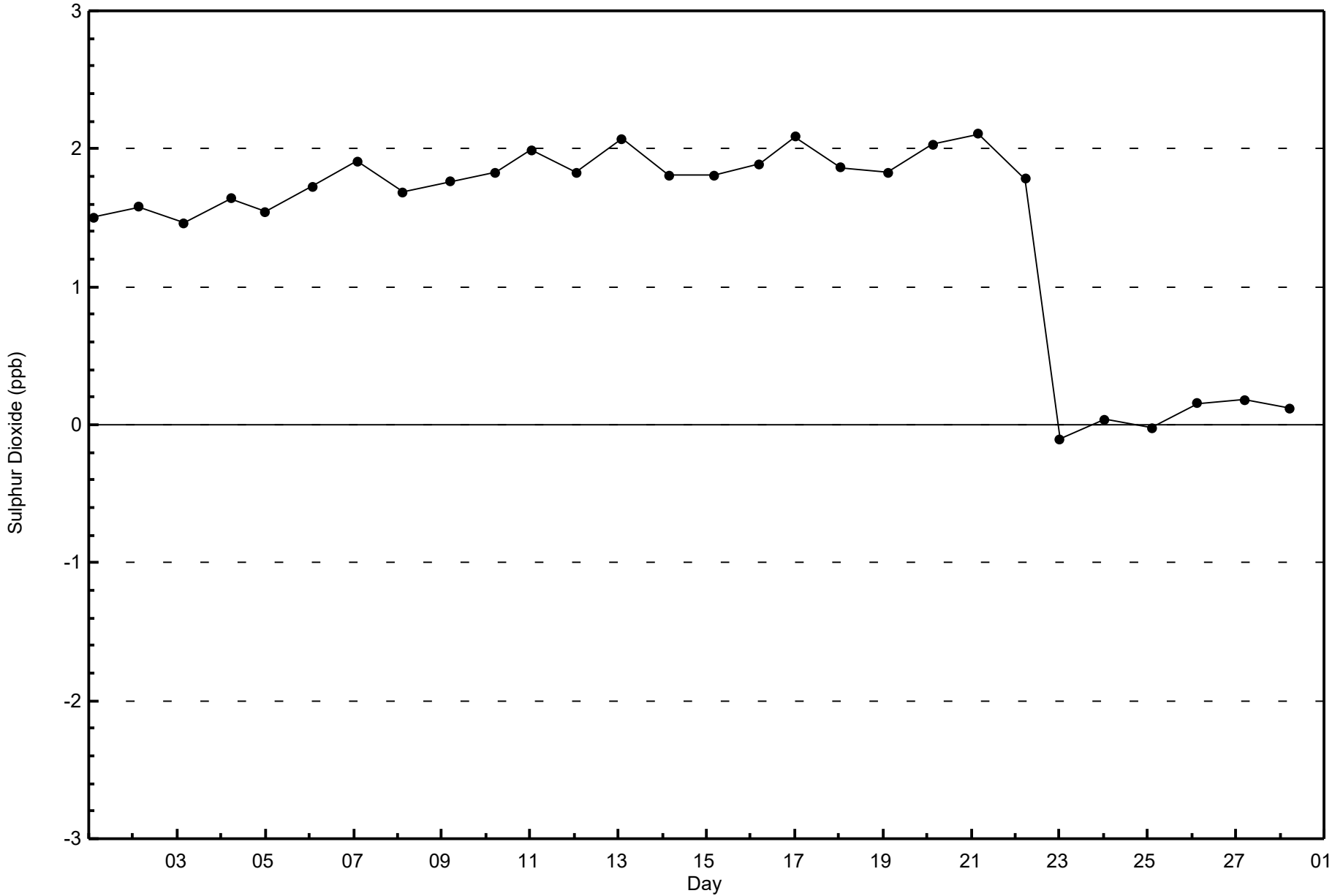
Total Number of Hours: 672

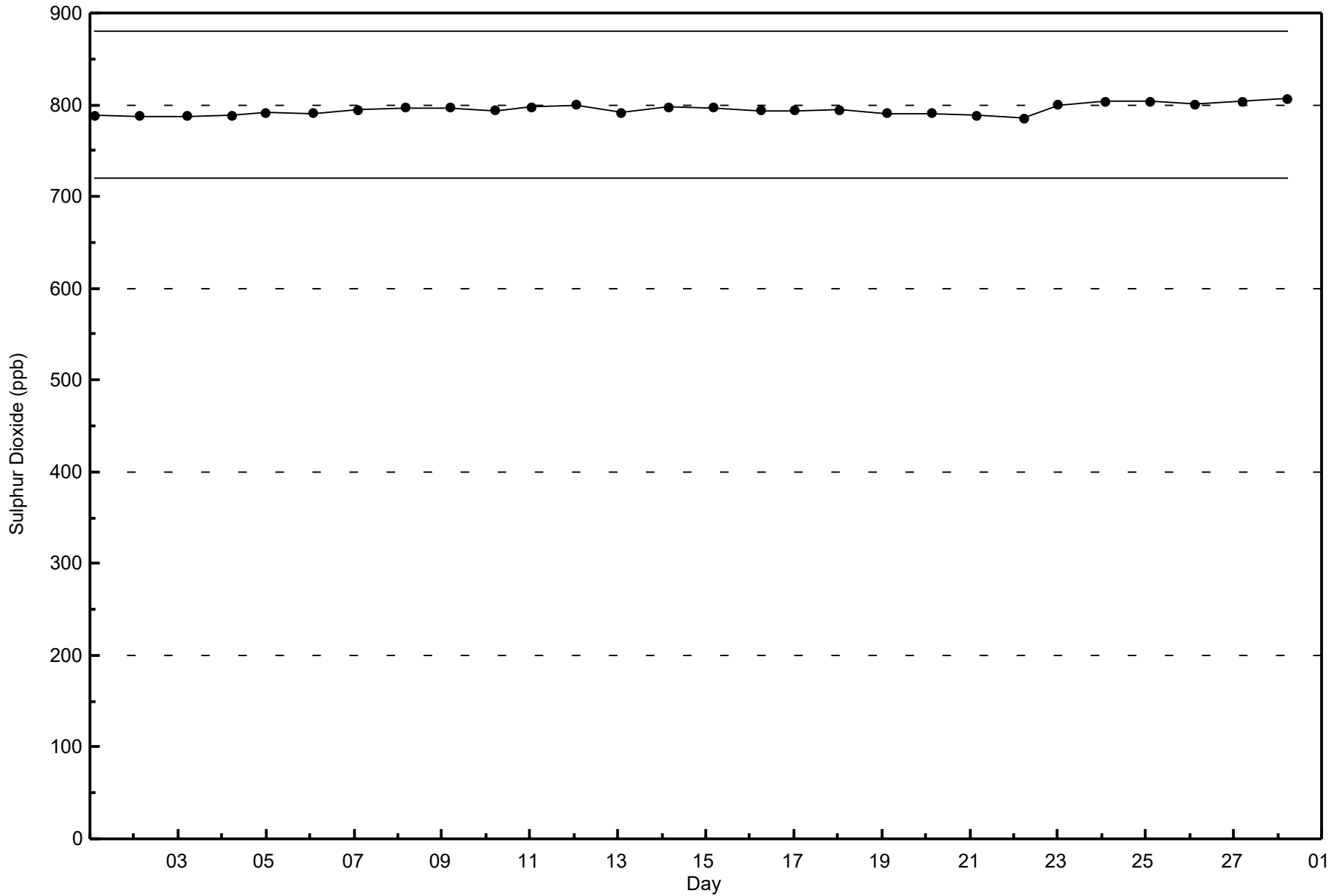


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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

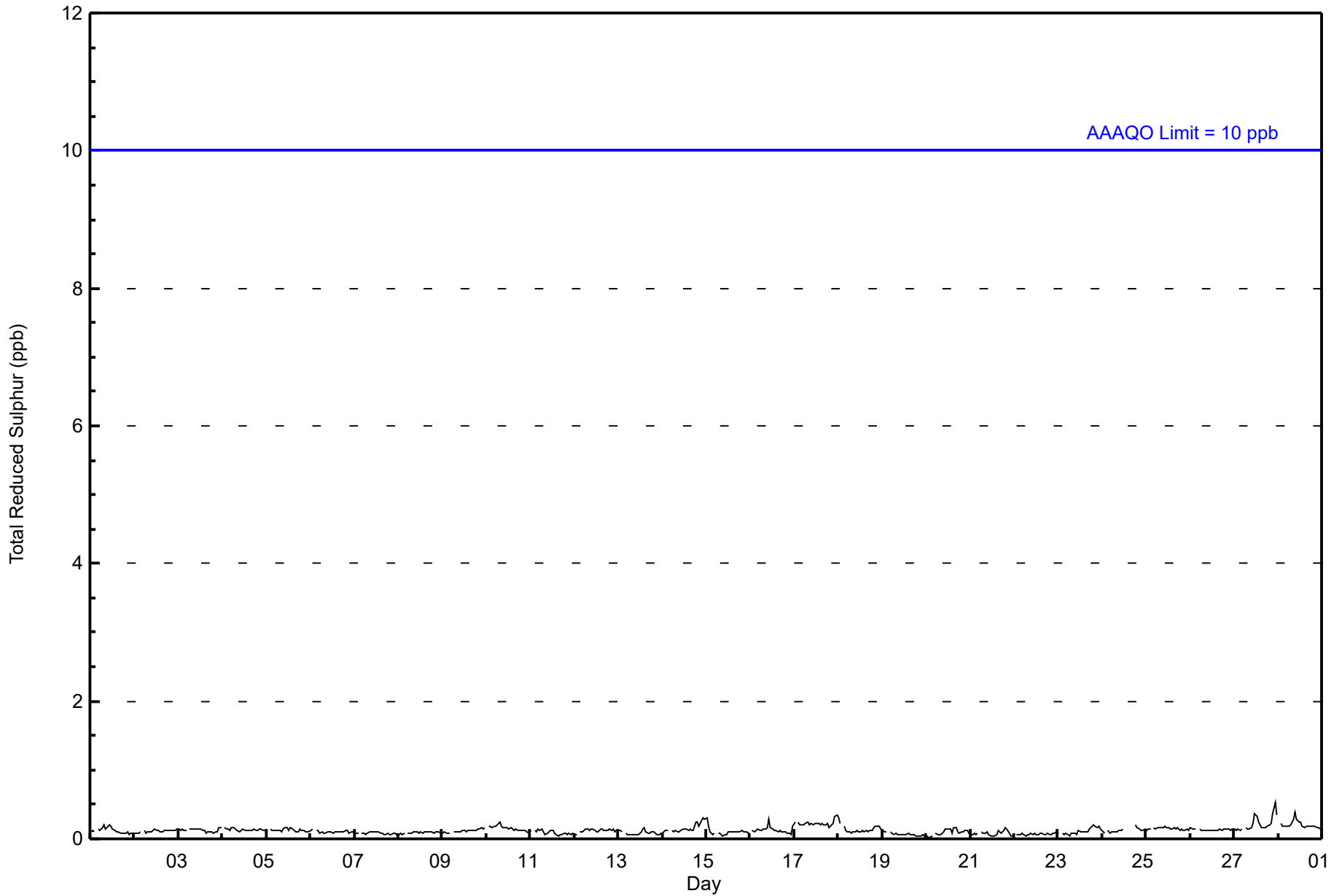














**Wood Buffalo Environmental Association**  
**Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb**  
**Janvier - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	638	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: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Janvier - February 2023**

<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	58	118	43	20	9	6	7	19	40	109	94	36	23	18	17	19	636
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>	58	118	43	20	9	6	7	19	40	109	94	36	23	18	17	19	636

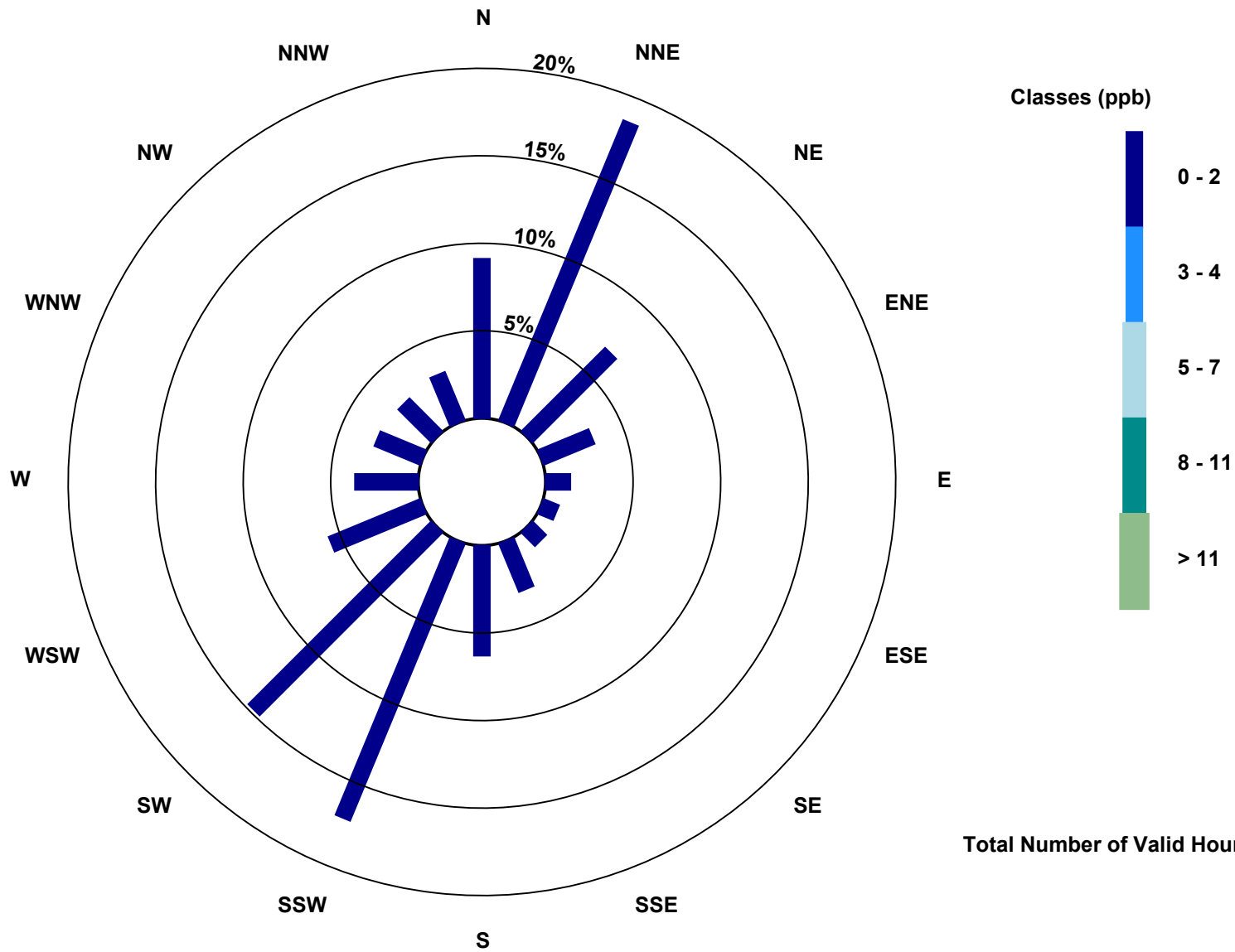
Total Number of Valid Hours: 636

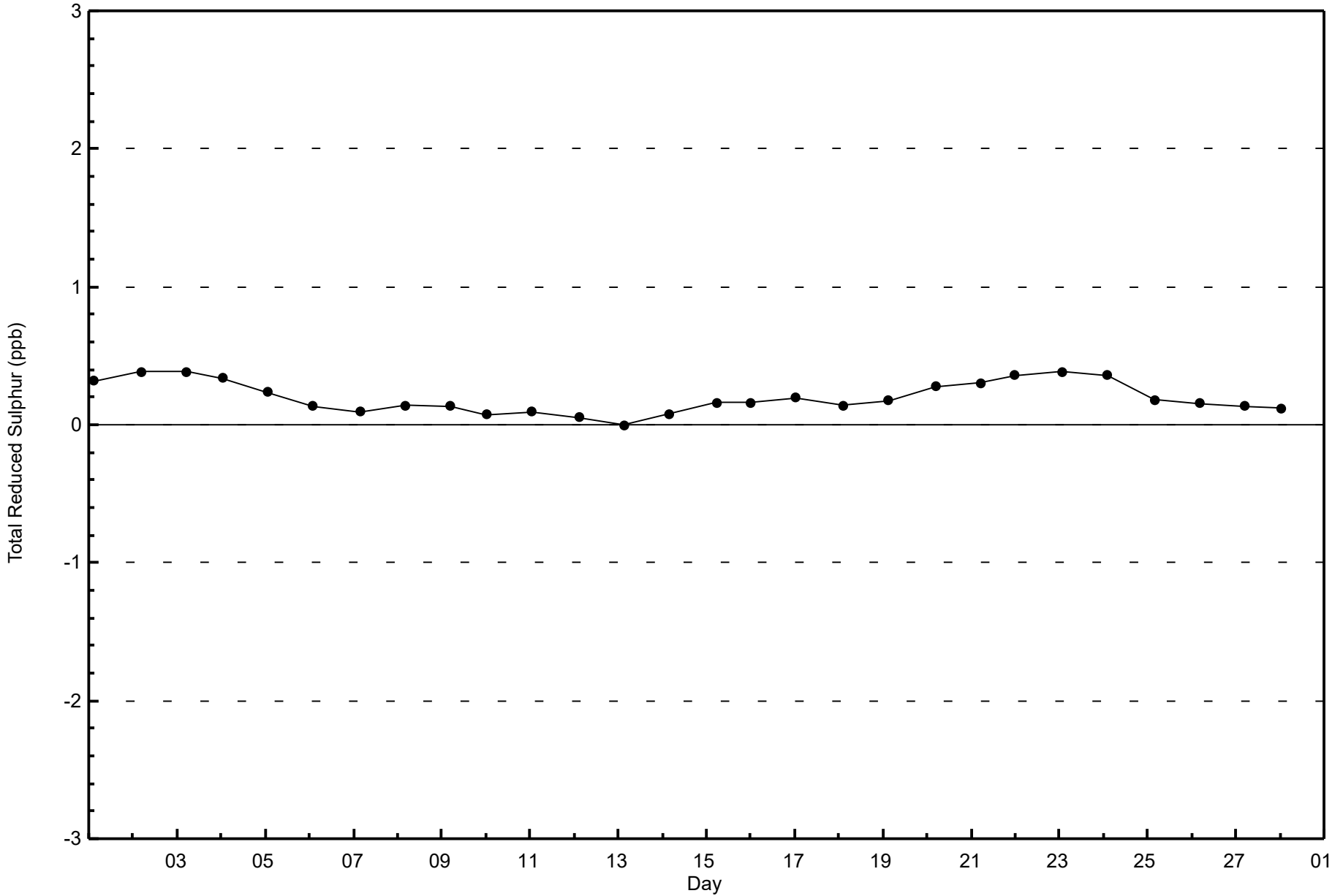
Total Number of Hours: 672

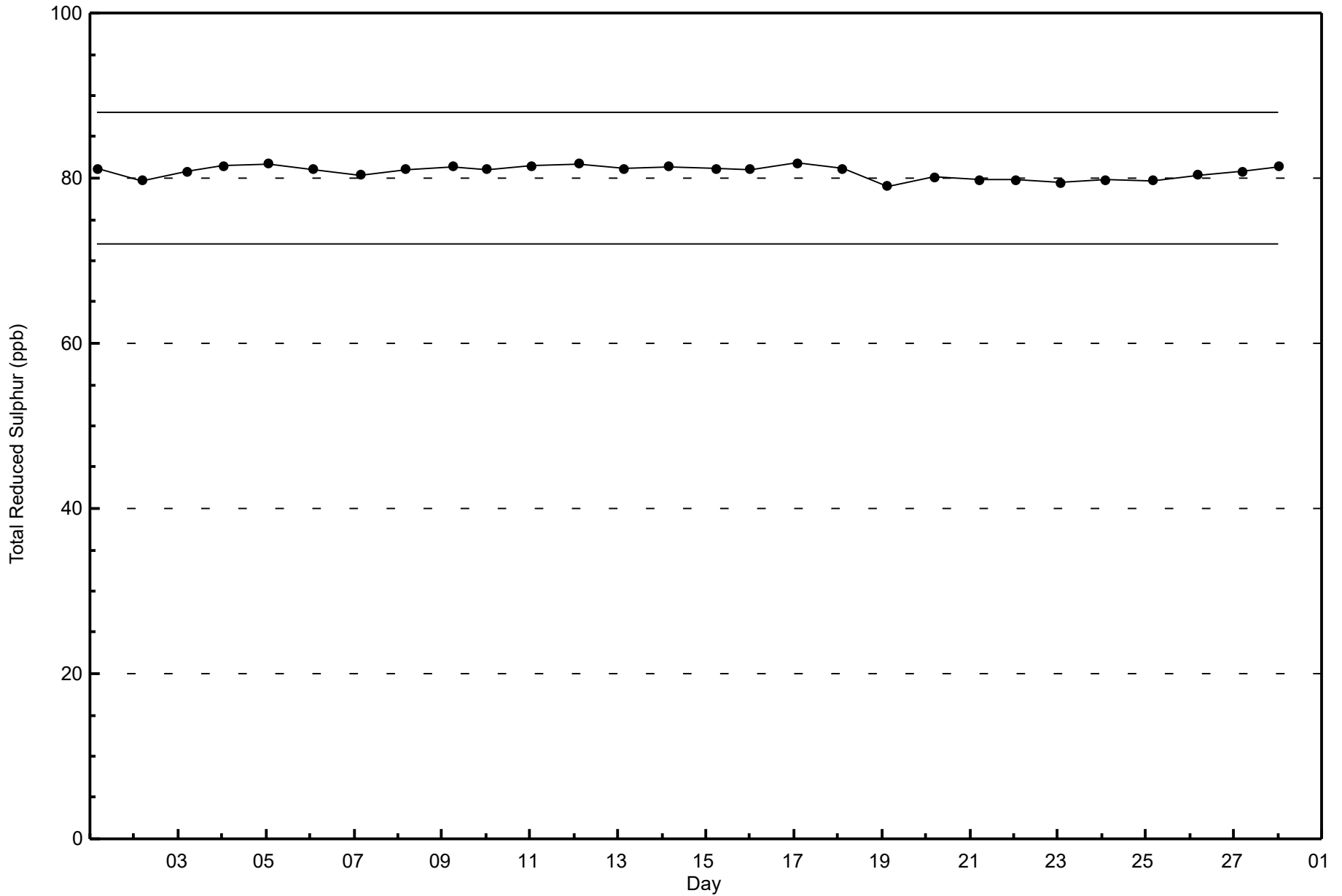


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Reduced Sulphur (TRS) - ppb  
Janvier









Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Janvier - February 2023

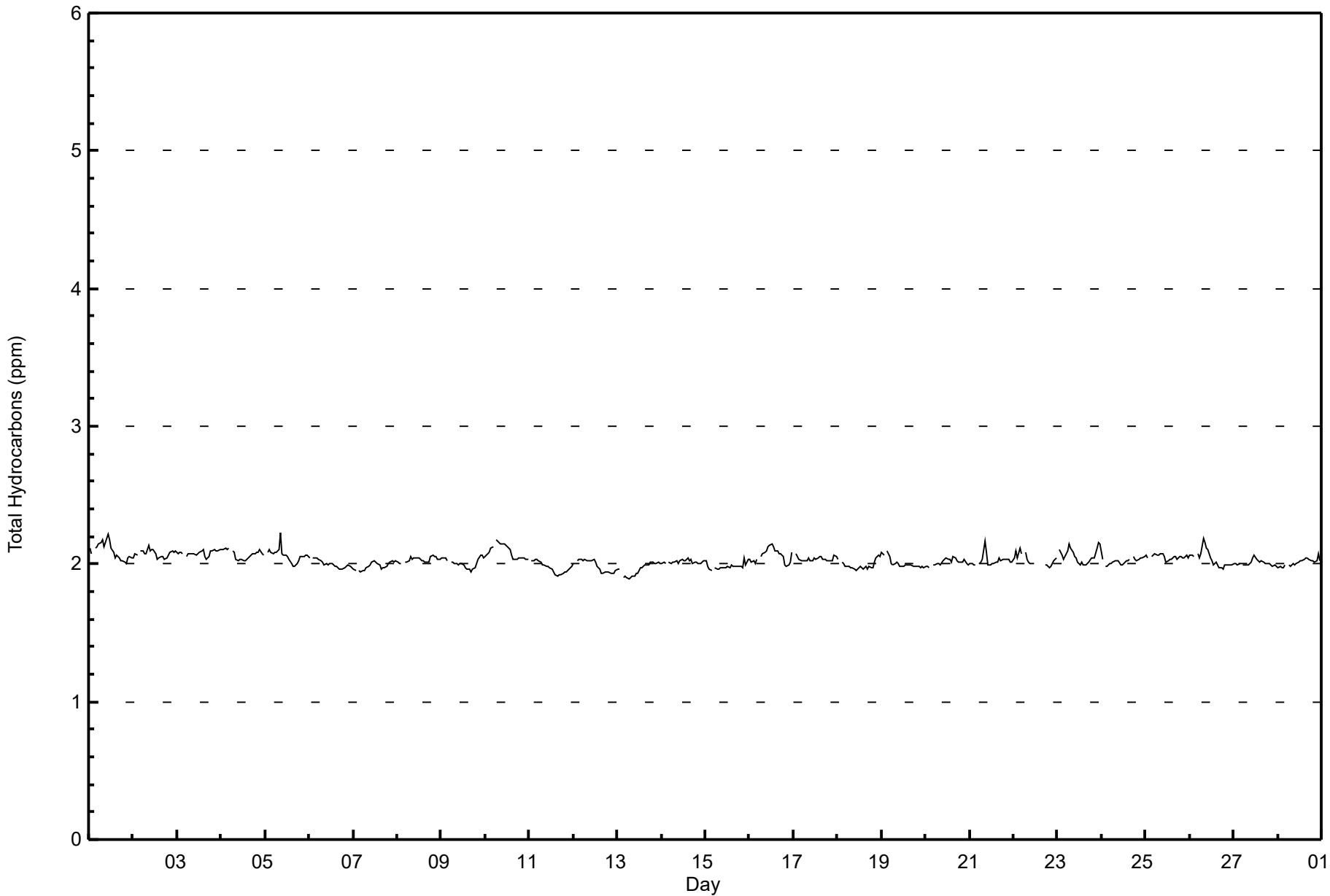
Maximum Value: 2.2 ppm on Feb 5 09:00																				Maximum Daily Average: 2.1 ppm on Feb 1					Hours in Service: 672									
Minimum Value: 1.9 ppm on Feb 13 07:00																				Minimum Daily Average: 2.0 ppm on Feb 13					Hours of Data: 638									
Maximum Diurnal Average: 2.0 ppm at hour 9																				Minimum Diurnal Average: 2.0 ppm at hour 18					Hours of Missing Data: 34									
Monthly Average: 2.03 ppm																				Percentiles: P <sub>1</sub> = 1.9 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: 33									
																									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-Feb	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
2-Feb	2.0	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	2.1	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	2.1	2.1	2.1	2.1
3-Feb	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	2.0	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
4-Feb	2.1	2.1	2.1	2.1	2.1	Z	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
5-Feb	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	2.0	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	2.2
6-Feb	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	2.0	2.0	2.0	2.0	2.0
7-Feb	2.0	2.0	Z	2.0	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	2.0	2.0	2.0	2.0	2.0	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-Feb	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	2.1	2.1	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
9-Feb	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	1.9	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	2.1
10-Feb	2.1	2.1	2.1	2.1	2.1	Z	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	2.0	2.0	2.2
11-Feb	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	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	2.0
12-Feb	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	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-Feb	2.0	2.0	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
14-Feb	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	2.0	2.0	2.0	2.0	2.0
15-Feb	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	2.0	2.0	2.0	2.0	2.0
16-Feb	2.0	2.0	2.0	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	2.1	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
17-Feb	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	2.1	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	2.1	2.1	2.1	2.1
18-Feb	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	2.0	2.0	2.0	2.0	2.1
19-Feb	2.1	2.1	Z	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	2.0	2.0	2.1
20-Feb	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	2.0	2.0	2.0	2.0	2.0	2.0	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-Feb	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
22-Feb	2.0	2.1	2.0	2.1	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.0	C	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	2.0	2.0	2.1
23-Feb	Z	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	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
24-Feb	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	2.0	2.0	2.0	2.0	2.1
25-Feb	2.1	2.0	Z	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	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
26-Feb	2.1	2.1	2.1	Z	2.1	2.0	2.1	2.2	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
27-Feb	2.0	2.0	2.0	2.0	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
28-Feb	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	2.0	2.0	2.0	2.0	2.1
																								Diurnal Average										
																								Diurnal Maximum										
Z - zerospan      C - Calibration      M - Maintenance																																		





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

**Total Hydrocarbons (THC) - ppm**  
**Janvier - February 2023**





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

**Total Hydrocarbons (THC) - ppm**  
**Janvier - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	464	72.73	72.73
2.1 - 3.0	174	27.27	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



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

**Total Hydrocarbons (THC) - ppm**  
**Janvier - February 2023**

<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	44	91	35	18	7	3	5	11	25	61	62	32	21	19	16	12	462
2.1 - 3.0	13	25	9	0	2	3	2	9	15	49	34	4	1	1	1	6	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>	57	116	44	18	9	6	7	20	40	110	96	36	22	20	17	18	636

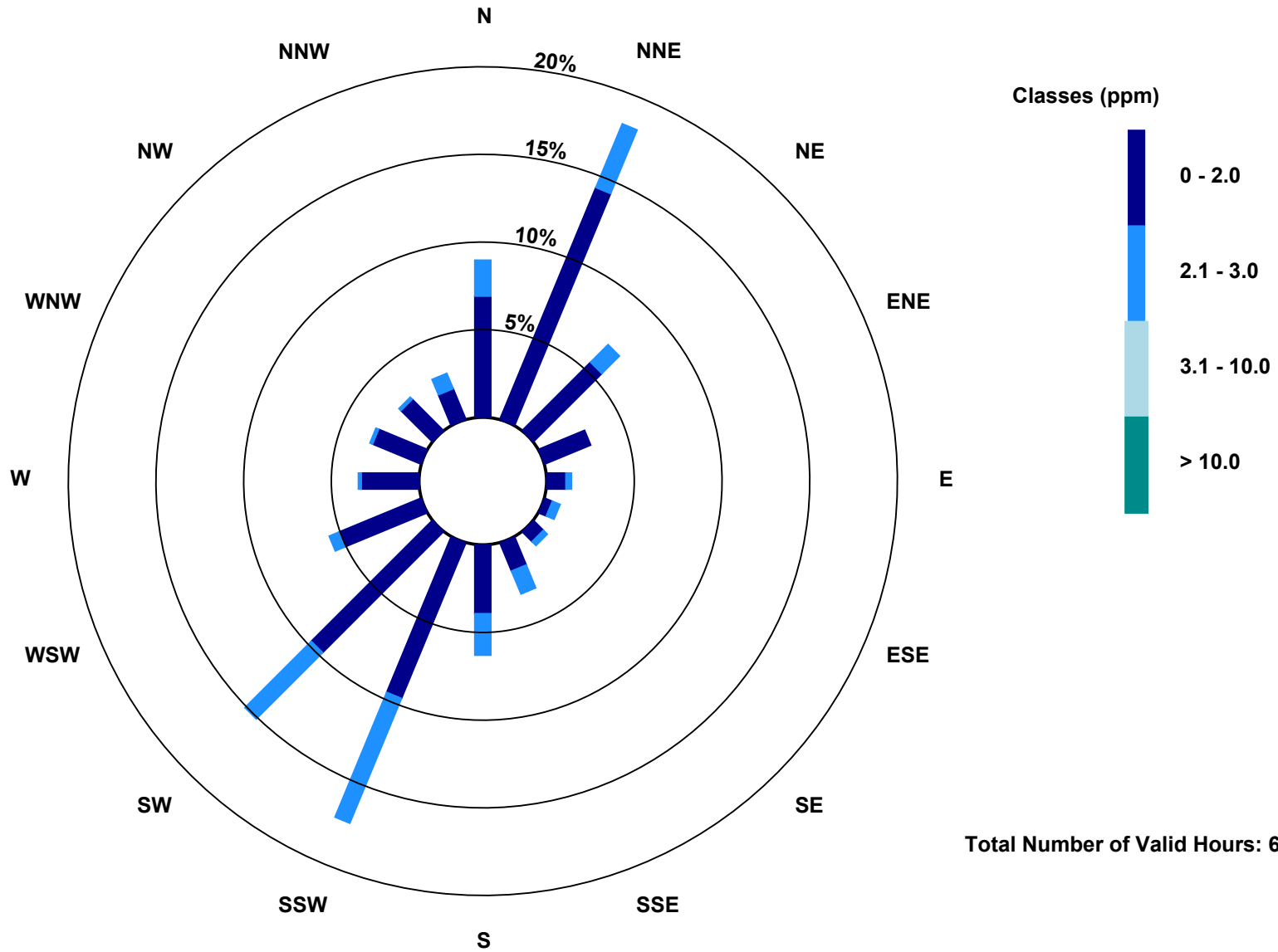
Total Number of Valid Hours: 636

Total Number of Hours: 672

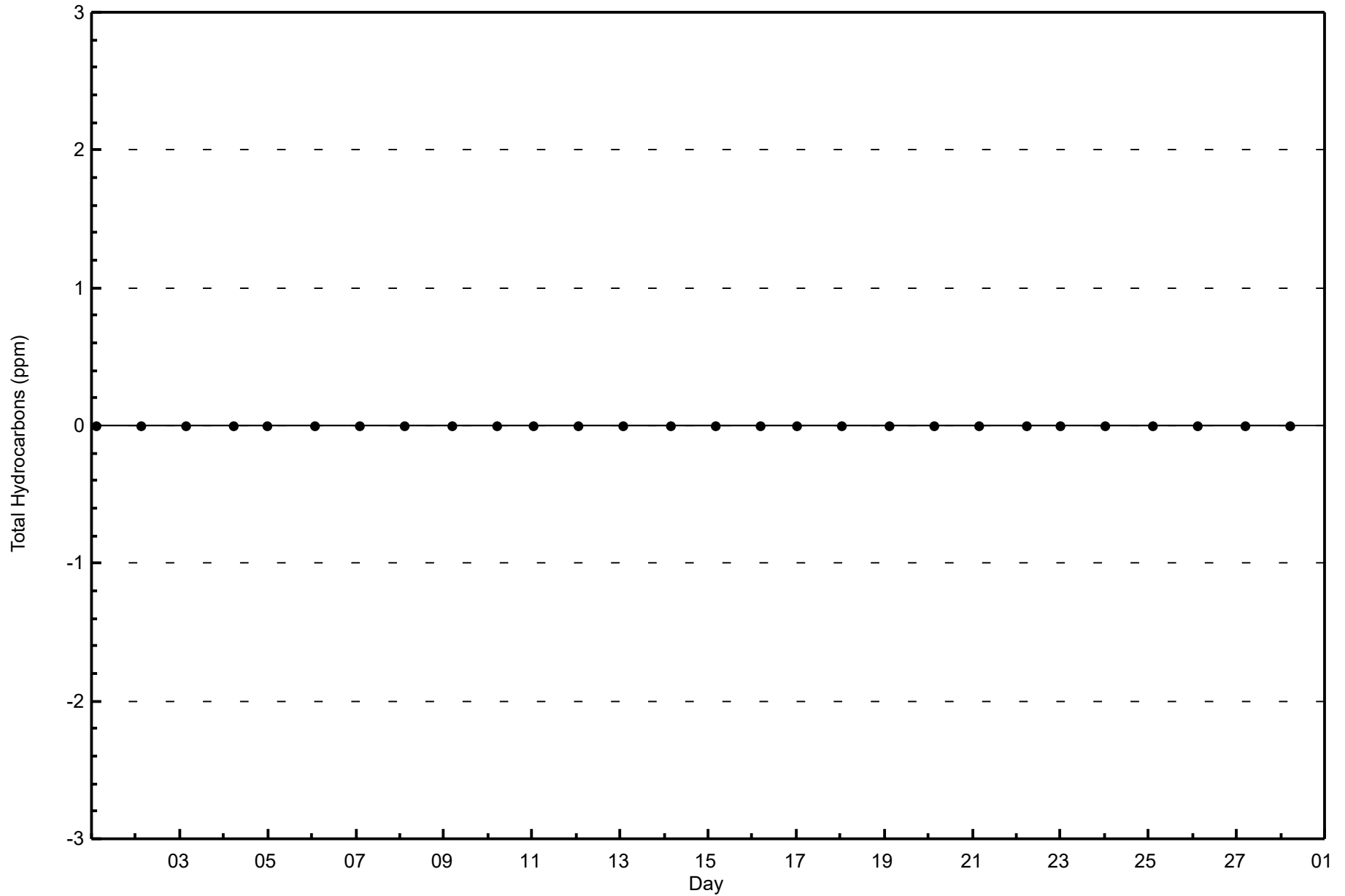


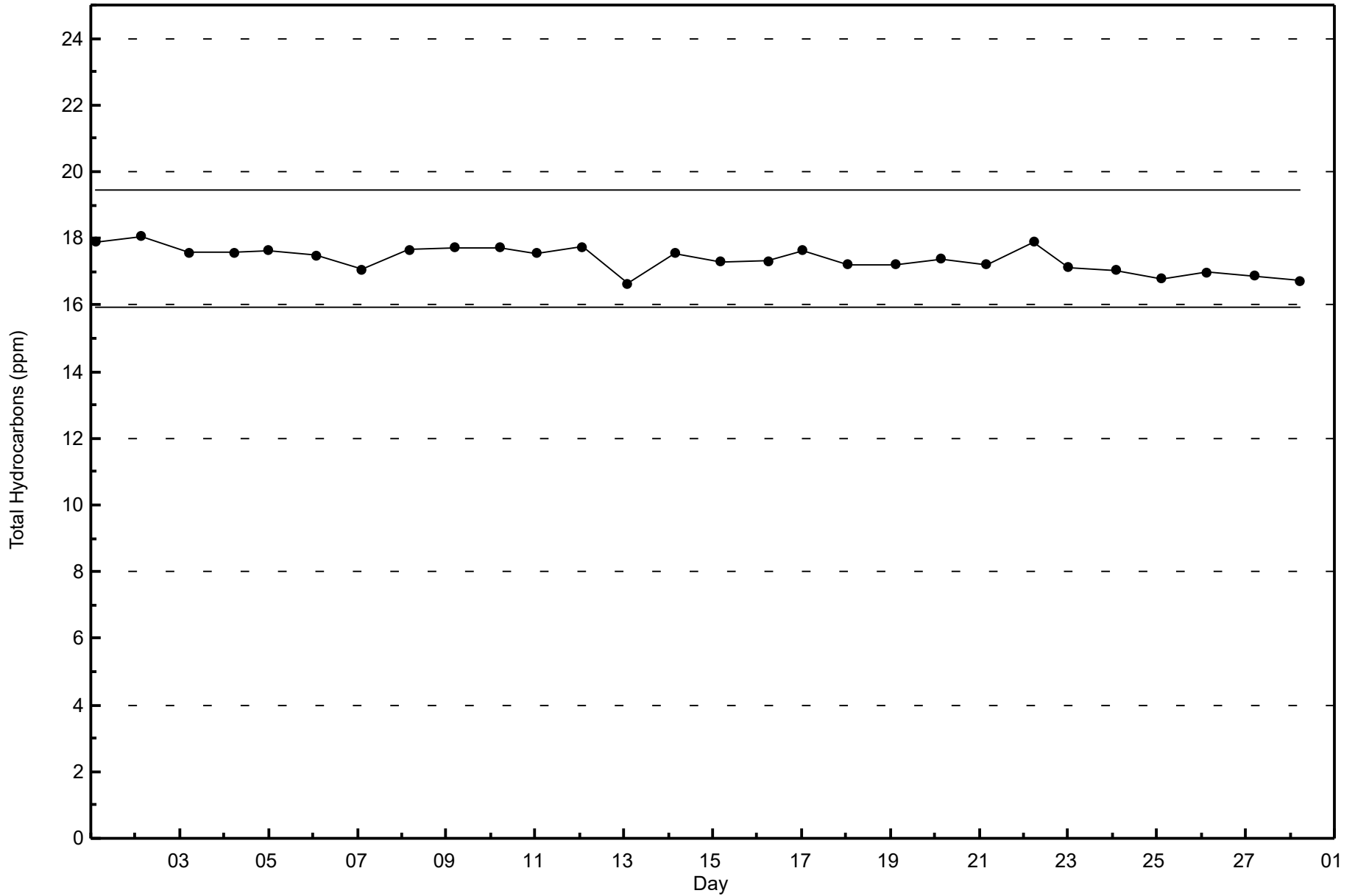
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Hydrocarbons (THC) - ppm  
Janvier

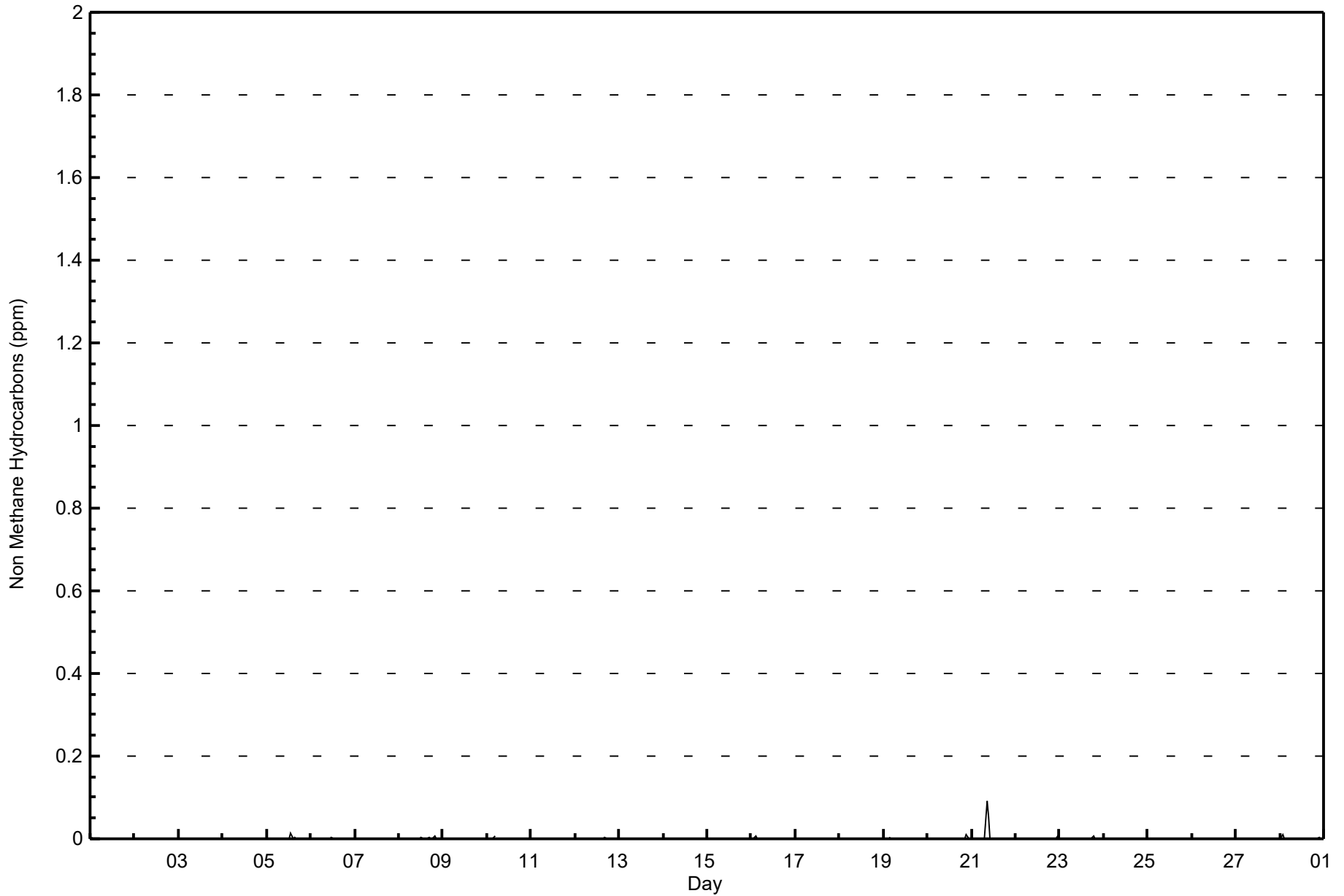


Total Number of Valid Hours: 636













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

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Janvier - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	629	98.59	98.59
0.006 - 0.05	7	1.10	99.69
0.06 - 0.1	2	0.31	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



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

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Janvier - February 2023**

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	57	113	44	18	9	6	7	20	39	108	96	35	22	20	17	16	627
0.006 - 0.05	0	3	0	0	0	0	0	0	1	2	0	1	0	0	0	0	7
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>	57	116	44	18	9	6	7	20	40	110	96	36	22	20	17	18	636

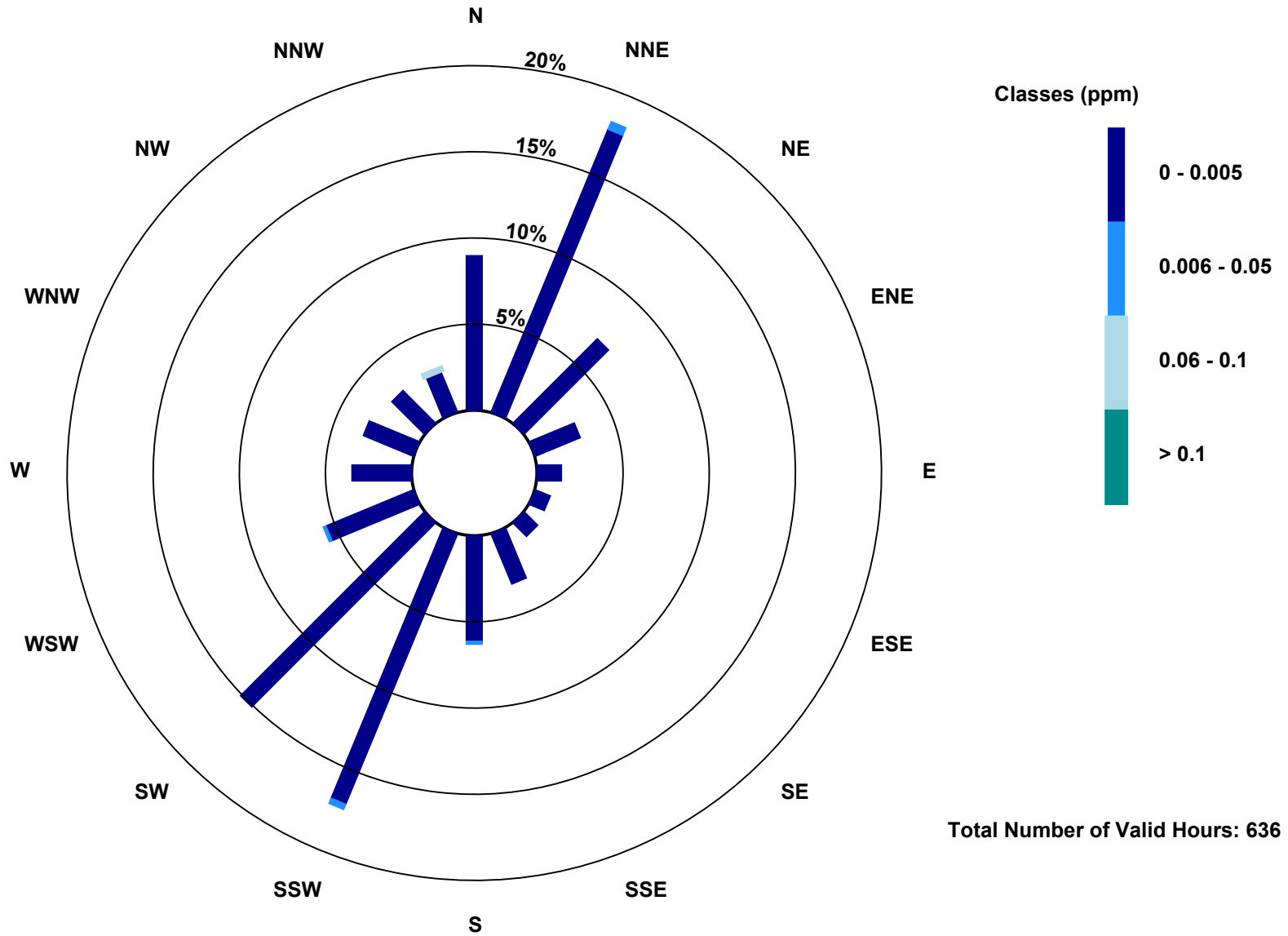
Total Number of Valid Hours: 636

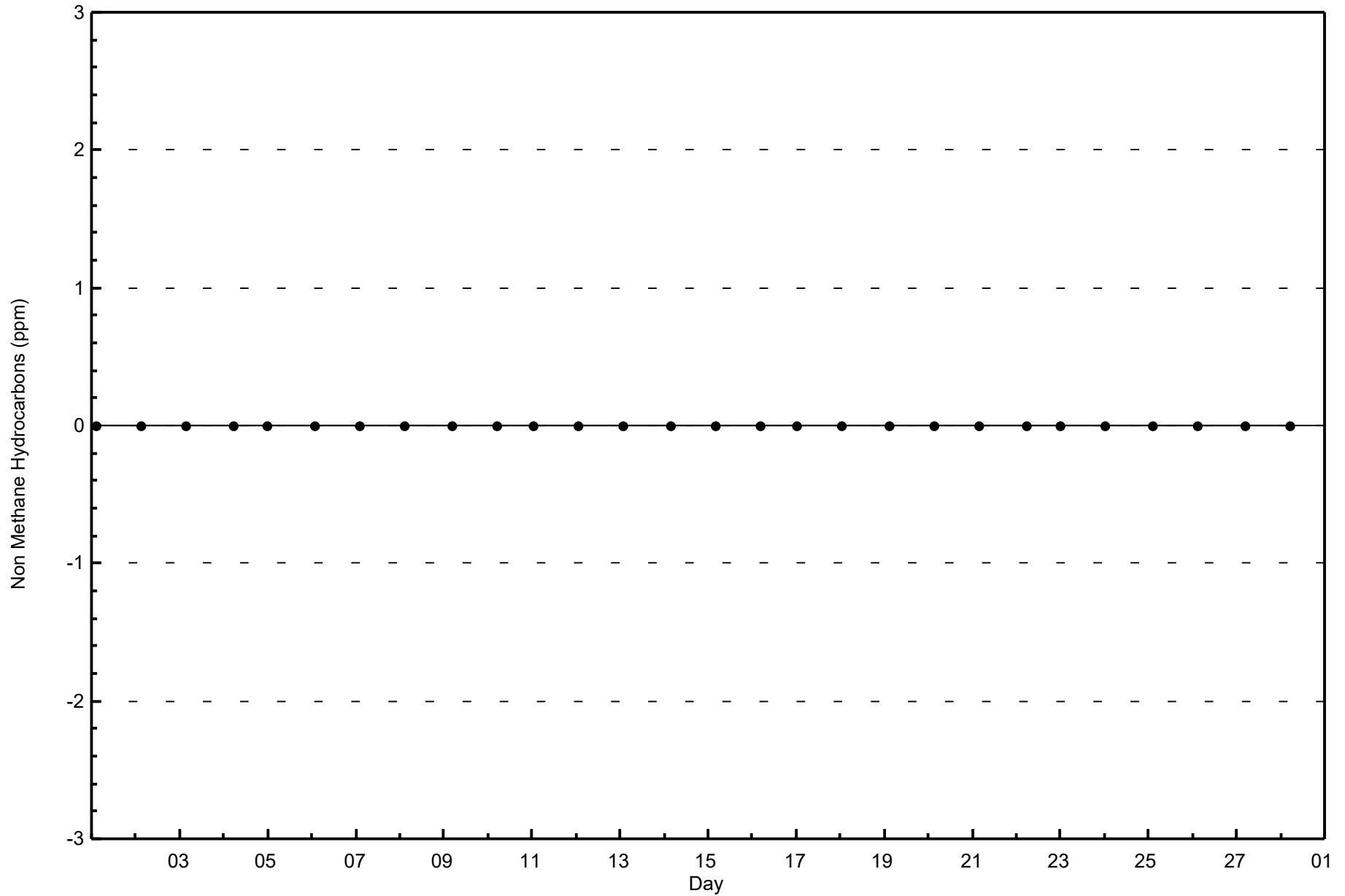
Total Number of Hours: 672

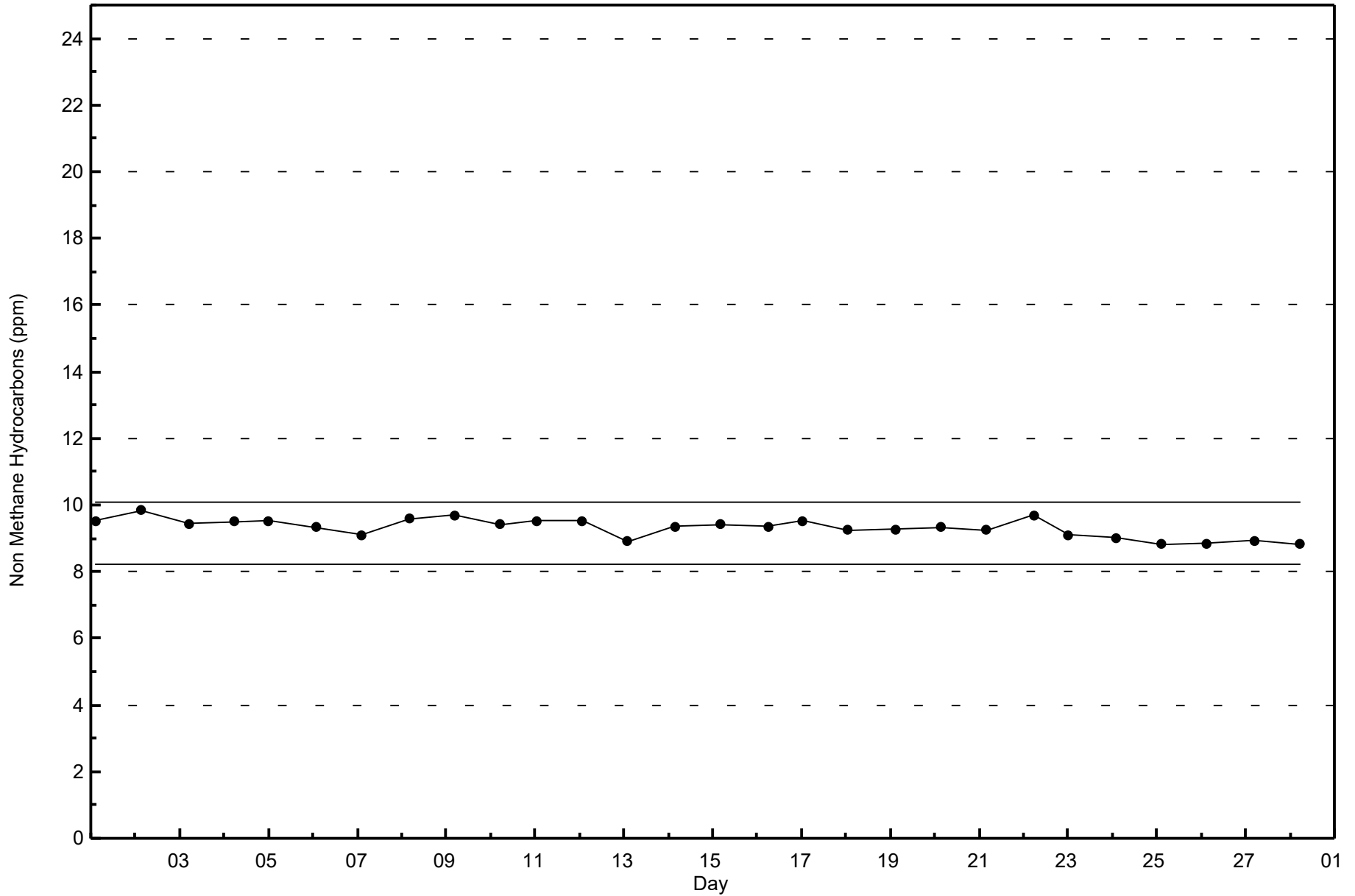


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Non Methane Hydrocarbons (NMHC) - ppm  
Janvier





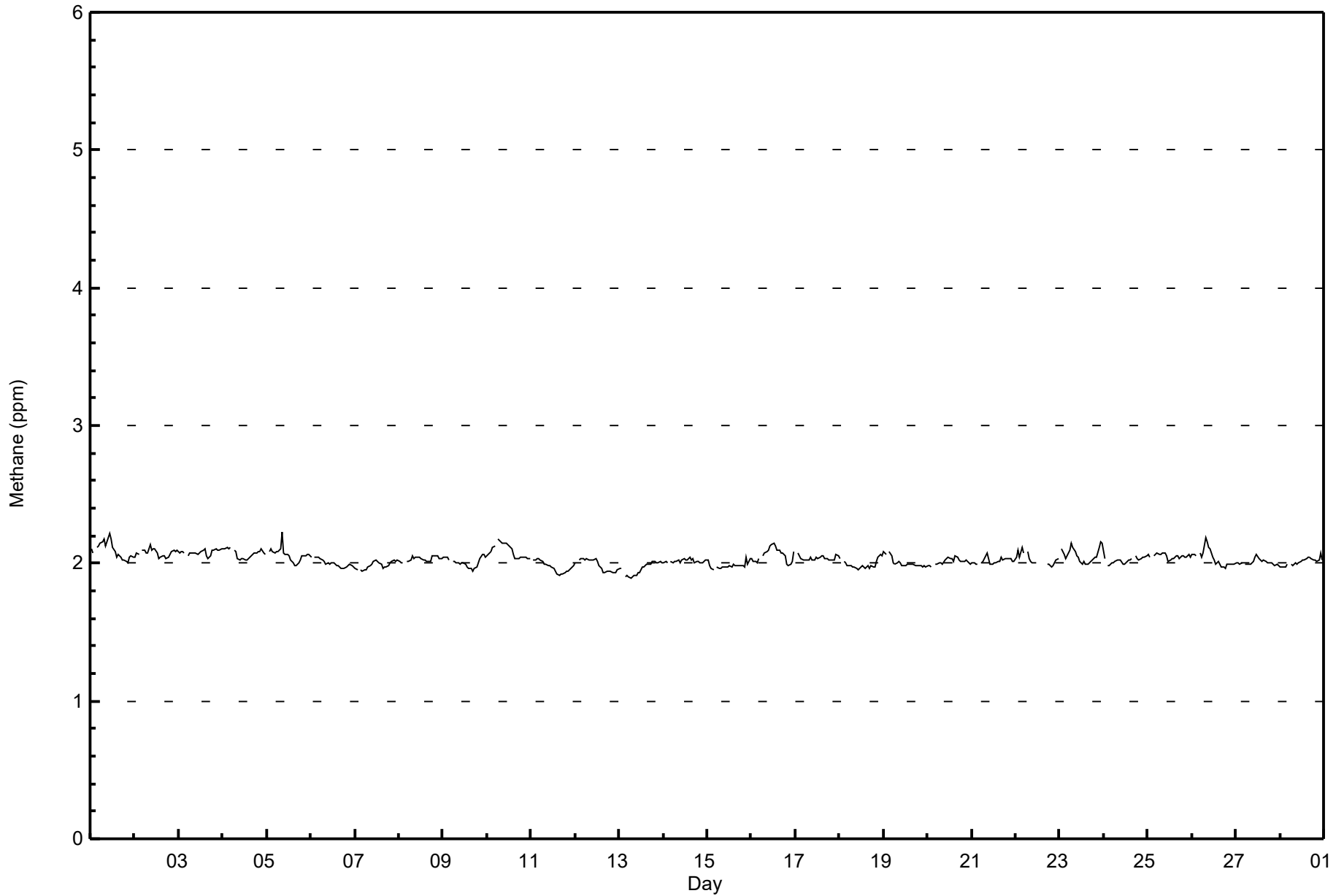






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Methane (CH<sub>4</sub>) - ppm**  
**Janvier - February 2023**





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

**Methane (CH<sub>4</sub>) - ppm**  
**Janvier - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	465	72.88	72.88
2.1 - 3.0	173	27.12	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Janvier - February 2023**

<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	44	91	35	18	7	3	5	11	25	61	62	32	21	19	16	13	463
2.1 - 3.0	13	25	9	0	2	3	2	9	15	49	34	4	1	1	1	5	173
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>	57	116	44	18	9	6	7	20	40	110	96	36	22	20	17	18	636

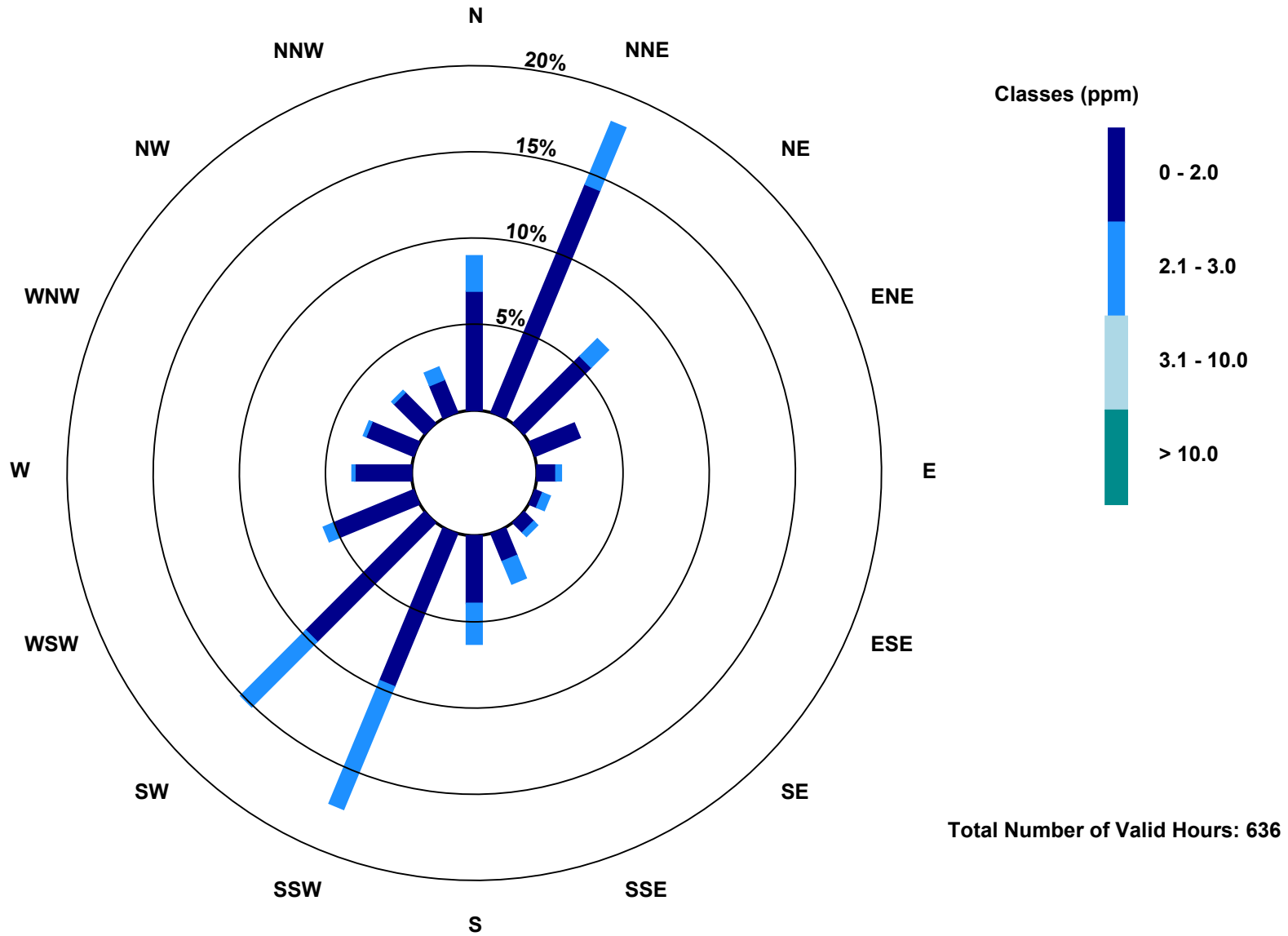
Total Number of Valid Hours: 636

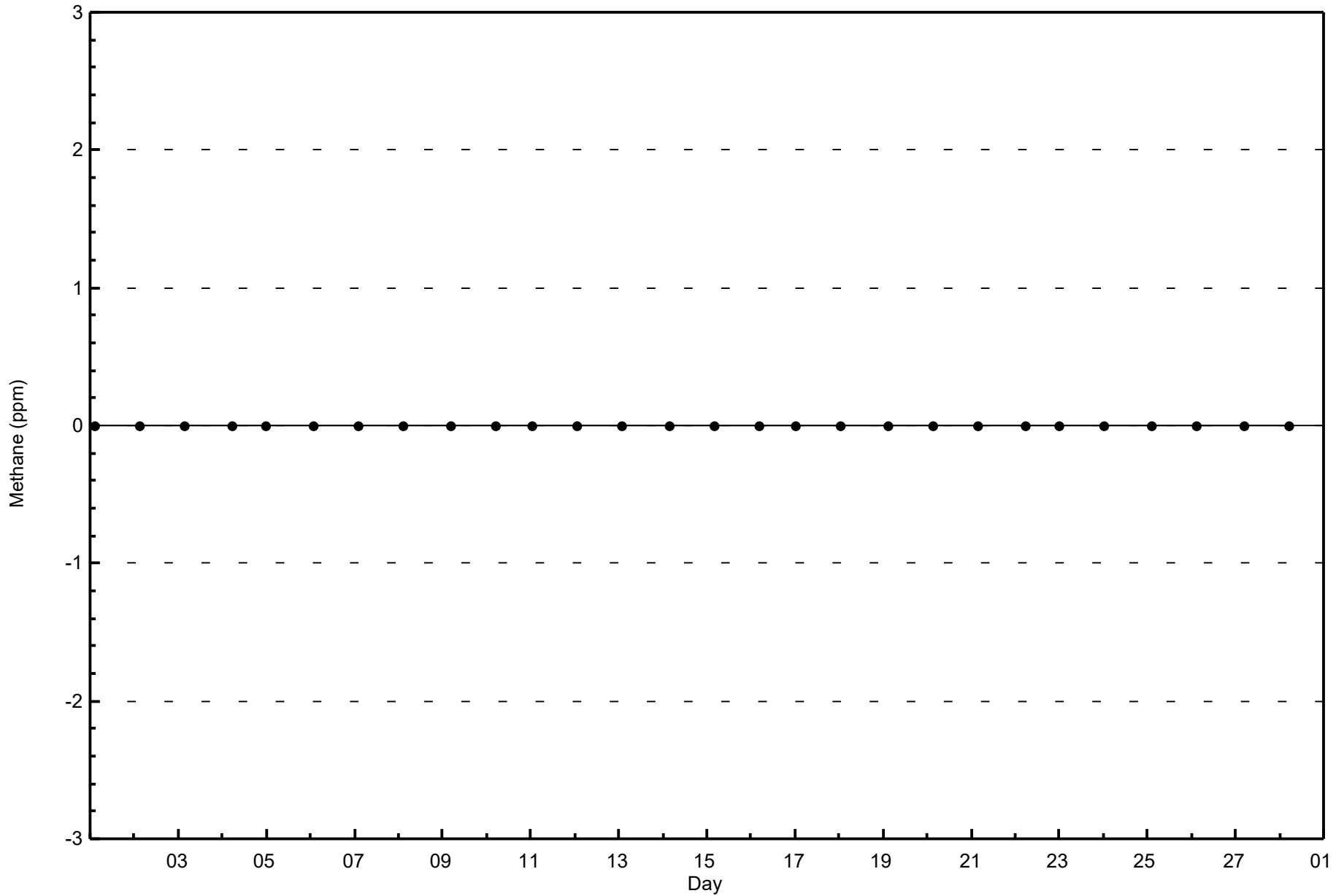
Total Number of Hours: 672

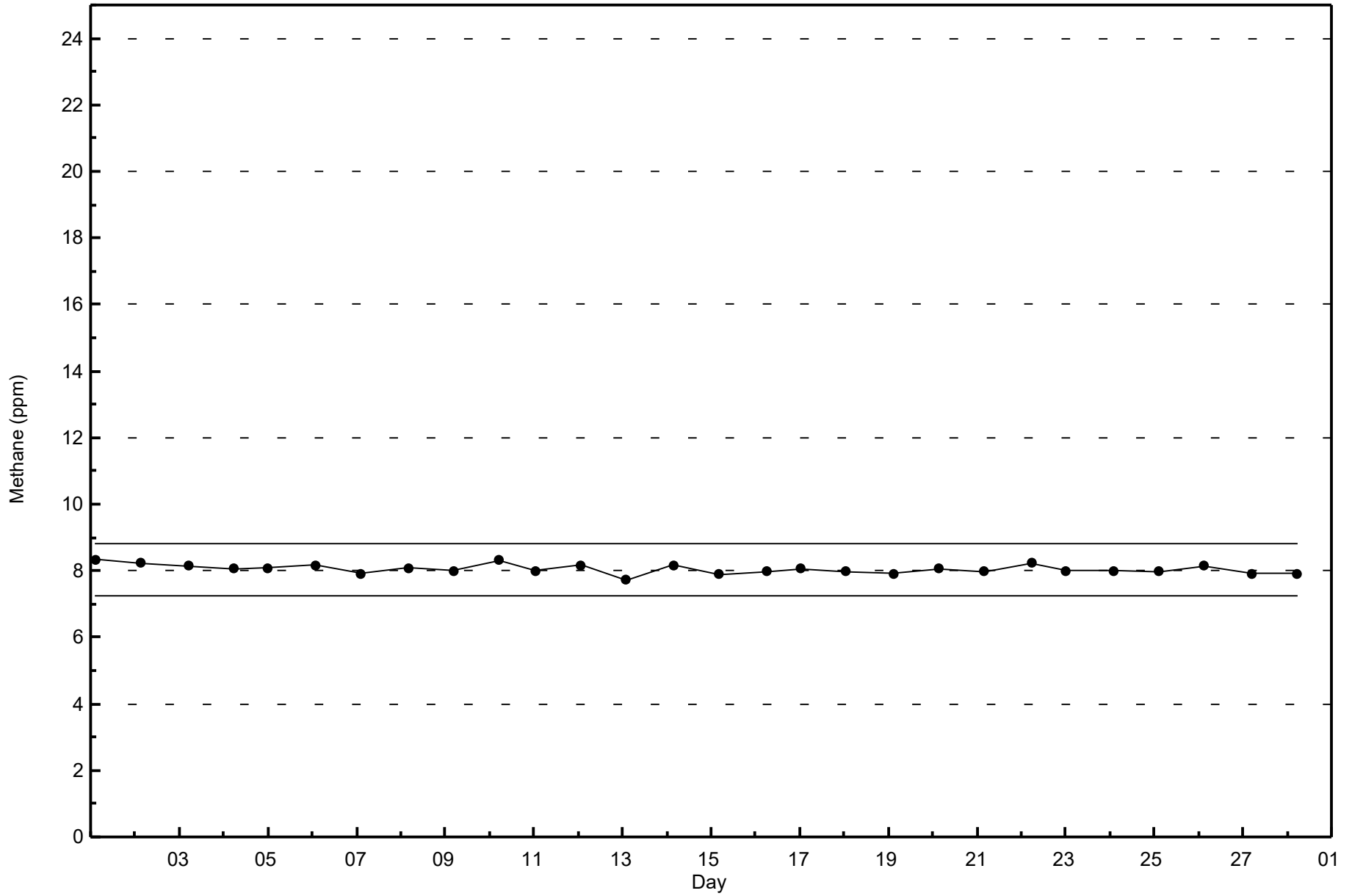


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









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

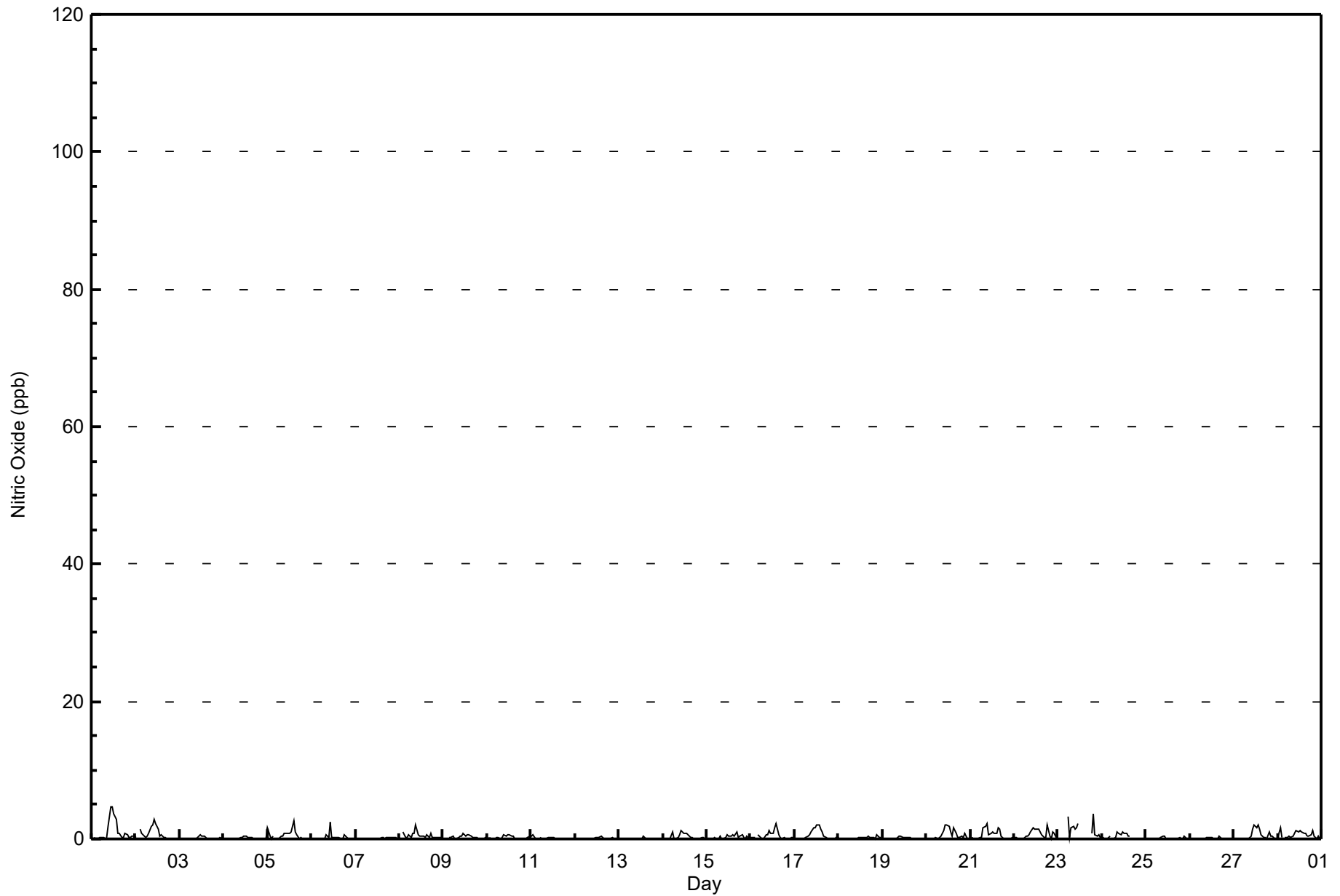
**Nitric Oxide (NO) - ppb**  
**Janvier - February 2023**

Maximum Value: 4.7 ppb on Feb 1 12:00		Maximum Daily Average: 1.0 ppb on Feb 1		Hours in Service: 672																						
Minimum Value: 0.0 ppb on Feb 2 19:00		Minimum Daily Average: 0.0 ppb on Feb 13		Hours of Data: 637																						
Maximum Diurnal Average: 1.0 ppb at hour 11		Minimum Diurnal Average: 0.1 ppb at hour 7		Hours of Missing Data: 35																						
Monthly Average: 0.36 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> = 1.0 P <sub>99</sub> = 2.7		Hours of Calibration: 34																						
				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-Feb	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.8	4.6	4.7	3.7	2.8	0.8	0.8	0.3	0.2	0.7	0.5	0.2	0.2	0.4	0.4	1.0	4.7
2-Feb	0.2	Z	1.4	0.8	0.6	0.2	0.4	0.8	1.8	2.1	2.9	2.1	1.5	0.5	0.5	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.9
3-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.6	0.5	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.6
4-Feb	0.0	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.1	0.1	0.3	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	0.4
5-Feb	1.5	0.3	0.1	0.4	Z	0.0	0.1	0.3	0.4	0.9	0.8	0.9	0.8	1.0	2.6	1.0	0.6	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.5	2.6
6-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.6	0.2	2.5	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.5	0.2	0.0	0.0	0.1	0.0	0.2	2.5
7-Feb	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	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2
8-Feb	0.1	Z	1.0	0.3	0.2	0.5	0.1	0.9	0.8	2.1	0.6	0.4	0.3	0.3	0.2	0.6	0.2	0.8	0.2	0.1	0.2	0.2	0.2	0.1	0.5	2.1
9-Feb	0.1	0.0	Z	0.3	0.2	0.3	0.0	0.0	0.2	0.4	0.5	0.8	0.4	0.5	0.7	0.3	0.2	0.2	0.1	0.0	0.1	0.1	0.0	0.2	0.3	0.8
10-Feb	0.1	0.2	0.1	Z	0.0	0.1	0.1	0.1	0.1	0.5	0.4	0.5	0.6	0.5	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.2	0.6
11-Feb	0.5	0.6	0.0	0.0	Z	0.2	0.0	0.0	0.1	0.3	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.6
12-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.3	0.5	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.5
13-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3
14-Feb	0.0	Z	0.0	0.0	0.0	1.1	0.0	0.0	0.3	0.5	1.2	0.9	0.8	0.9	0.4	0.3	0.2	0.0	0.0	0.1	0.0	0.2	0.2	0.0	0.3	1.2
15-Feb	0.0	0.0	Z	0.0	0.3	0.1	0.1	0.4	0.1	0.1	0.1	0.7	0.5	0.5	0.5	0.4	0.9	0.2	0.5	0.6	0.3	0.1	0.3	0.1	0.3	0.9
16-Feb	0.1	0.2	0.2	Z	0.5	0.1	0.1	0.1	0.5	0.6	1.3	0.8	0.8	1.6	2.2	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.5	2.2
17-Feb	0.0	0.1	0.0	0.1	Z	0.1	0.2	0.4	0.5	1.1	1.7	1.6	1.9	2.1	1.3	0.9	0.5	0.1	0.0	0.0	0.0	0.1	0.1	0.4	0.6	2.1
18-Feb	0.0	0.0	0.0	0.1	0.0	Z	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.2	0.1	0.3	0.4	0.3	0.2	0.2	0.1	0.6	0.2	0.2	0.1	0.6
19-Feb	Z	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.4	0.4	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4
20-Feb	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.2	0.3	1.2	2.0	2.1	1.9	1.1	0.3	1.6	0.8	0.2	0.2	0.4	0.3	0.8	0.1	0.1	0.6	2.1
21-Feb	0.1	0.2	Z	0.1	0.1	0.1	0.2	1.7	1.9	2.1	0.7	0.9	0.9	0.7	0.9	1.6	1.4	0.4	0.0	0.0	0.1	0.1	0.1	0.1	0.6	2.1
22-Feb	0.1	0.1	0.1	Z	0.1	0.0	0.5	0.4	0.5	1.1	1.7	1.4	1.4	1.4	1.1	0.7	0.2	0.2	2.0	0.3	0.0	1.1	0.8	0.0	0.7	2.0
23-Feb	0.0	0.0	0.0	0.0	Z	3.2	0.1	1.6	1.8	1.4	1.6	2.3	C	C	C	C	C	C	0.7	3.7	0.6	0.5	0.5	0.2	--	3.7
24-Feb	0.1	0.0	0.0	0.1	0.4	Z	0.1	0.2	1.0	0.8	0.7	0.9	0.8	0.8	0.5	0.5	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.0
25-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.5	0.0	0.1	0.1	0.5
26-Feb	0.3	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.1	0.1	0.1	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
27-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.4	2.0	1.6	2.1	1.4	0.6	0.2	0.1	0.0	1.0	0.5	0.4	0.1	0.1	0.5	2.1
28-Feb	0.1	1.6	0.1	Z	0.2	0.1	0.4	0.2	0.4	0.8	1.2	1.0	1.1	1.0	0.8	0.8	0.5	0.5	0.5	1.2	0.3	0.0	0.4	0.0	0.6	1.6
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan                      C - Calibration                      M - Maintenance																										



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

**Nitric Oxide (NO) - ppb**  
**Janvier - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Janvier - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	637	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: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Janvier - February 2023**

<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	55	122	43	17	8	5	8	18	40	113	94	37	21	19	17	18	635
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>	55	122	43	17	8	5	8	18	40	113	94	37	21	19	17	18	635

Total Number of Valid Hours: 635

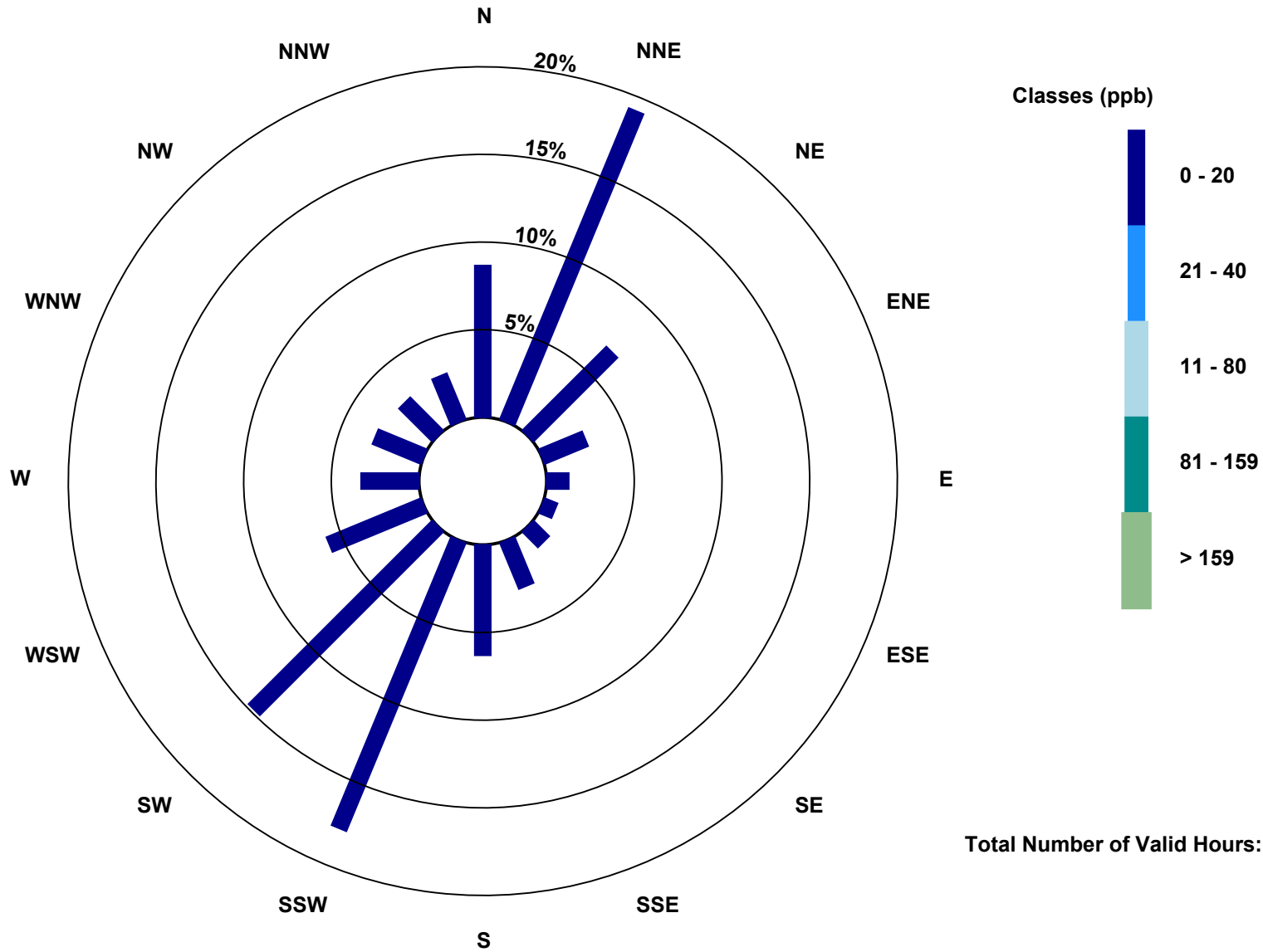
Total Number of Hours: 672





Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitric Oxide (NO) - ppb  
Janvier

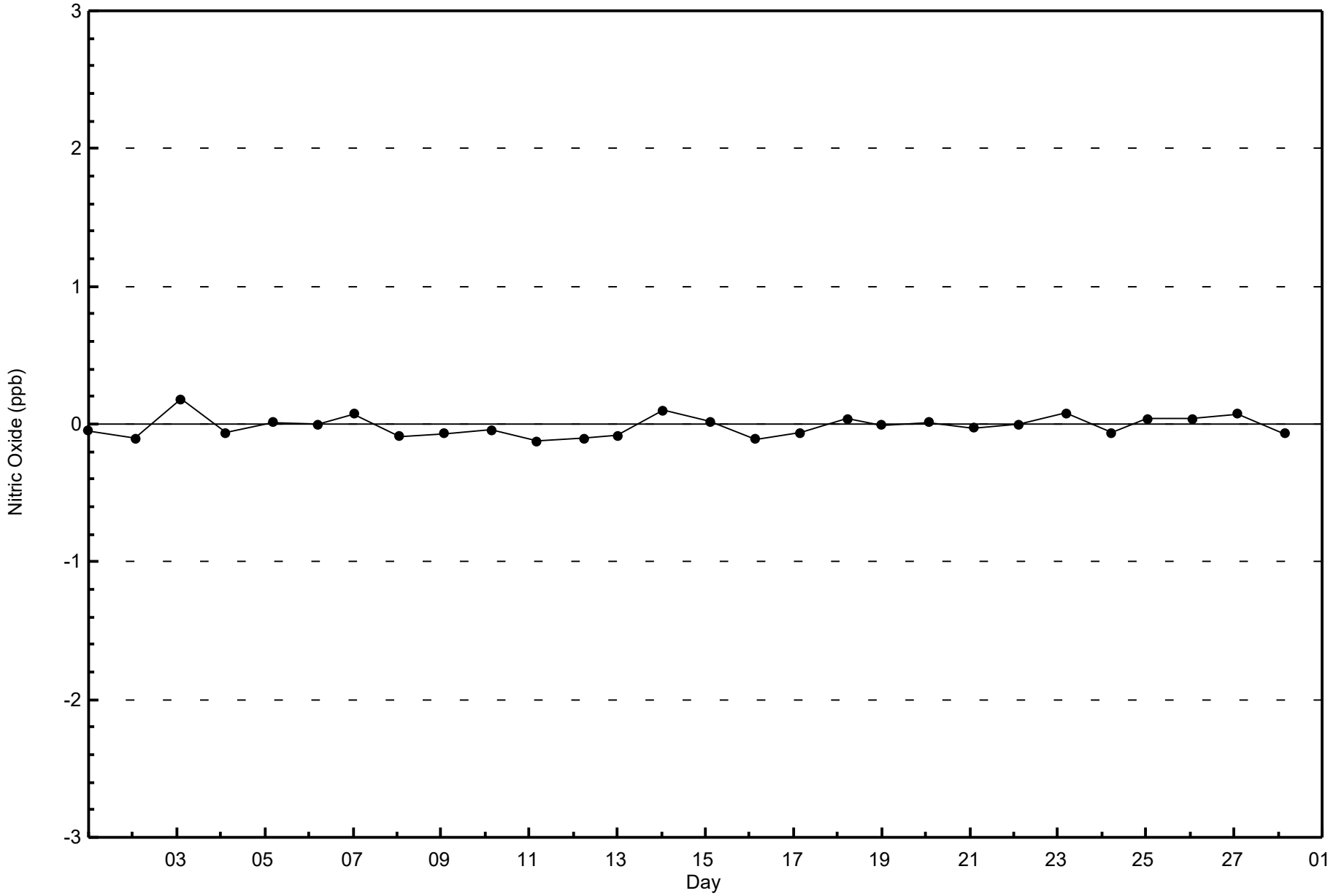


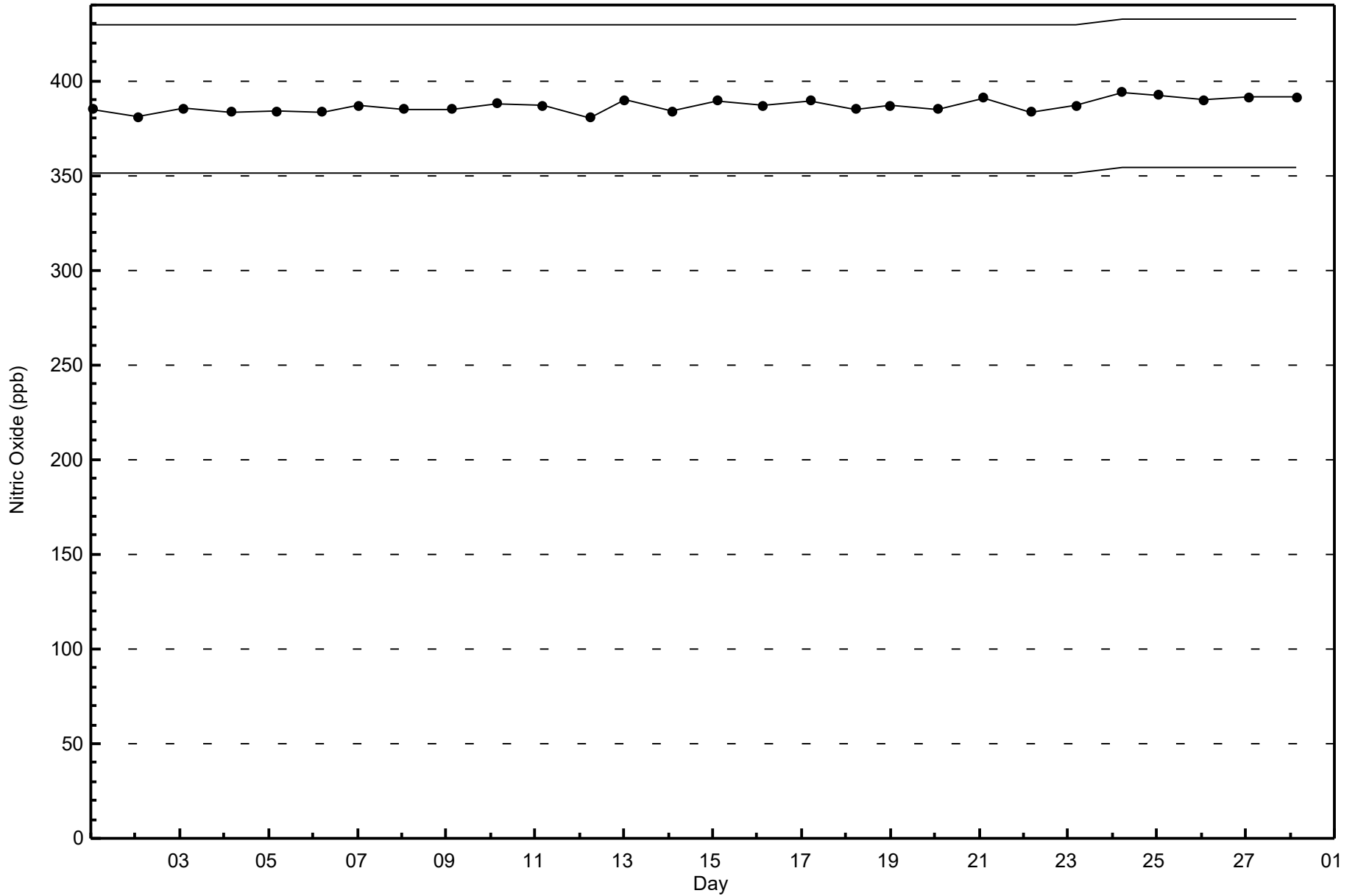
Total Number of Valid Hours: 635



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

**Nitric Oxide (NO) - ppb**  
**Janvier - February 2023**







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

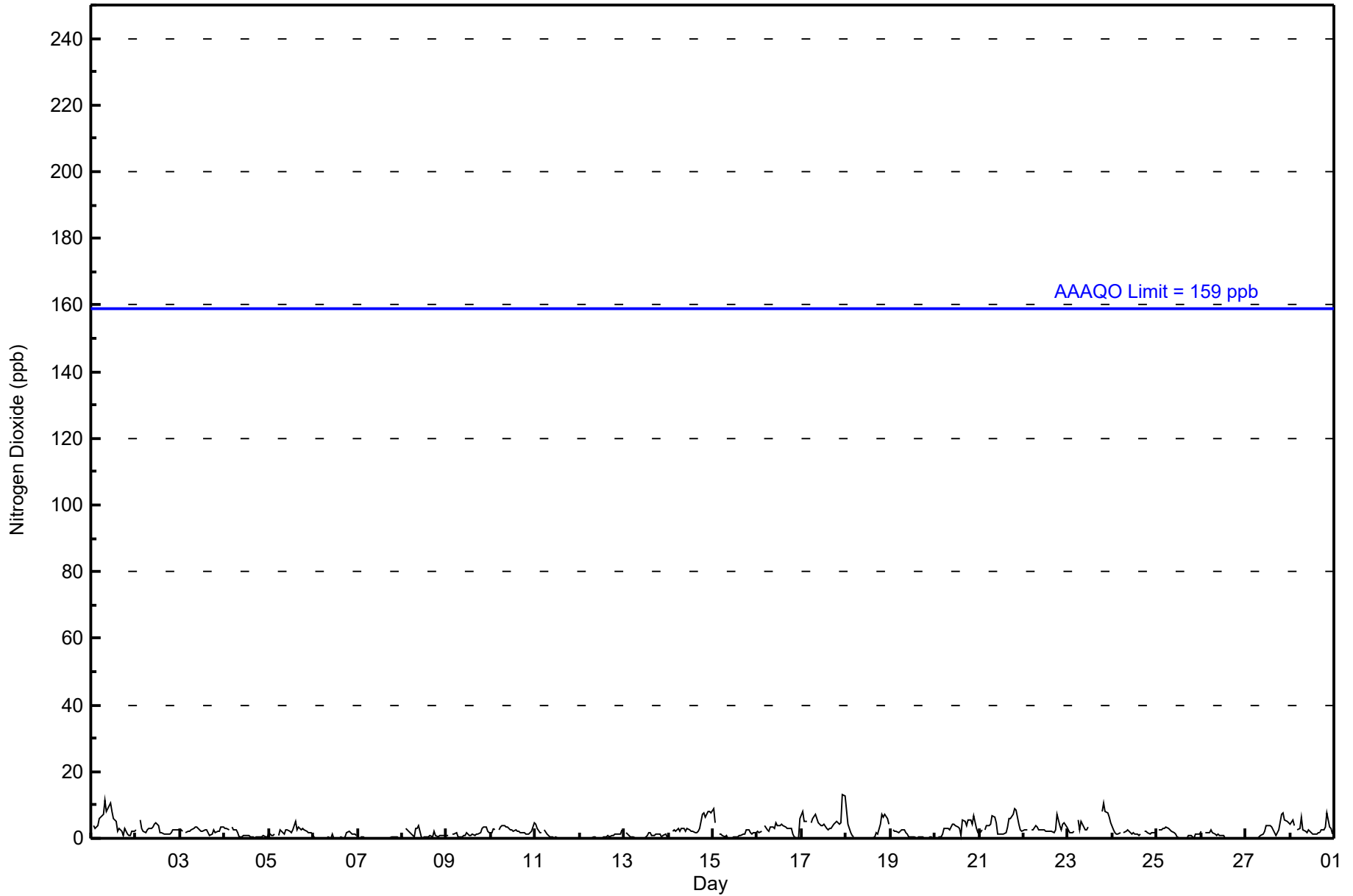
**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Janvier - February 2023**

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 672																	672																												
Maximum Value: 13.0 ppb on Feb 17 23:00		Maximum Daily Average: 5.3 ppb on Feb 17																	Hours of Data: 637																														
Minimum Value: 0.0 ppb on Feb 6 02:00		Minimum Daily Average: 0.2 ppb on Feb 7																	Hours of Missing Data: 35																														
Maximum Diurnal Average: 3.0 ppb at hour 20		Minimum Diurnal Average: 1.4 ppb at hour 15																	Hours of Calibration: 34																														
Monthly Average: 2.18 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.6 Median = 1.8 Q <sub>3</sub> = 2.9 P <sub>90</sub> = 4.8 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-Feb	Z	3.8	2.9	3.8	6.0	6.5	7.1	11.3	8.0	9.1	10.4	8.2	6.0	4.9	2.1	3.0	2.1	0.9	3.0	1.4	0.8	0.9	2.1	2.0	4.6	11.3																							
2-Feb	2.4	Z	5.3	2.9	2.2	1.6	2.6	2.9	2.9	3.2	4.1	4.6	4.0	1.7	1.6	1.4	1.3	1.3	1.2	1.8	2.7	2.7	2.4	2.6	2.6	5.3																							
3-Feb	2.6	2.3	Z	1.9	2.0	2.2	2.5	3.0	3.5	3.3	2.5	2.3	2.3	2.5	1.9	1.0	1.4	2.5	1.9	2.1	2.1	3.6	3.3	2.4	3.6																								
4-Feb	3.1	2.8	2.5	Z	3.2	2.5	2.7	1.7	0.4	0.6	0.8	0.9	0.8	0.7	0.4	0.3	0.2	0.4	0.4	0.5	0.4	0.9	0.3	0.3	1.2	3.2																							
5-Feb	1.6	0.9	0.8	1.1	Z	1.0	2.4	1.5	1.2	2.7	2.5	2.0	1.8	2.7	5.2	2.7	3.3	2.5	3.1	2.7	2.2	1.8	1.6	1.6	2.1	5.2																							
6-Feb	0.4	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.5	0.0	1.4	0.0	0.0	0.0	0.1	0.3	0.1	0.3	1.9	2.1	1.5	1.1	1.1	0.7	0.5	2.1																							
7-Feb	Z	0.6	0.4	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	0.1	0.3	0.3	0.5	0.5	0.2	0.2	0.2	0.6																							
8-Feb	0.3	Z	2.9	2.2	1.5	1.4	0.5	3.1	2.8	3.7	0.6	0.2	0.4	0.4	0.3	0.8	0.4	2.1	1.0	0.6	0.8	0.8	0.9	0.8	1.2	3.7																							
9-Feb	1.0	1.0	Z	1.2	1.3	1.6	0.6	0.5	0.5	0.8	0.9	1.8	0.8	0.7	1.2	0.7	1.1	1.1	1.5	2.8	3.3	3.5	2.2	1.6	1.4	3.5																							
10-Feb	1.5	2.9	2.6	Z	2.6	3.3	3.8	3.9	3.3	3.2	2.6	2.4	2.2	2.4	2.3	2.1	1.7	1.7	1.7	1.3	1.4	1.7	2.0	4.5	2.5	4.5																							
11-Feb	4.4	3.1	1.6	1.8	Z	2.5	1.2	0.7	0.4	0.6	0.1	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.8	4.4																							
12-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.3	0.4	0.0	0.0	0.2	0.1	0.3	0.6	0.9	0.4	0.7	0.8	1.1	1.1	1.2	1.2	2.6	0.5	2.6																							
13-Feb	Z	1.7	1.2	0.6	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.8	1.7	0.8	0.8	1.1	1.4	1.1	0.6	0.7	1.4	0.6	0.8	1.8																							
14-Feb	0.5	Z	2.2	2.6	2.3	3.1	2.2	3.0	3.0	2.1	3.1	2.4	2.1	2.0	1.5	1.8	2.0	2.9	7.2	7.7	6.5	8.2	8.2	7.8	3.7	8.2																							
15-Feb	9.1	4.7	Z	1.3	1.4	0.8	0.5	0.7	0.1	0.0	0.1	0.4	0.6	0.6	0.8	0.8	1.3	1.2	2.7	2.5	1.8	1.4	1.8	1.5	1.6	9.1																							
16-Feb	2.0	1.9	2.2	Z	3.8	2.6	2.3	3.3	3.5	3.1	4.8	3.9	3.7	4.3	3.9	3.4	3.0	3.0	2.9	1.2	0.3	0.2	0.1	5.9	2.8	5.9																							
17-Feb	7.9	5.0	5.0	5.0	Z	4.6	6.0	7.3	5.9	4.5	3.9	3.7	4.1	3.0	2.6	2.9	3.1	4.1	4.6	4.9	4.3	4.6	13.0	12.7	5.3	13.0																							
18-Feb	8.3	4.1	1.9	0.8	0.3	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.5	1.6	1.4	4.1	7.0	6.4	7.1	6.0	4.3	2.4	8.3																							
19-Feb	Z	2.4	2.3	2.3	1.9	2.1	2.7	2.4	1.9	1.1	0.5	0.4	0.3	0.3	0.2	0.4	0.3	0.3	0.2	0.2	0.2	0.4	0.4	0.1	1.0	2.7																							
20-Feb	0.1	Z	0.3	0.3	1.2	2.9	2.9	2.8	2.7	4.3	4.3	3.8	3.4	3.1	0.9	5.5	5.1	4.0	5.5	5.6	4.4	6.7	3.1	1.9	3.3	6.7																							
21-Feb	1.4	2.5	Z	2.6	3.9	4.0	4.2	6.8	6.5	4.6	1.2	1.4	1.3	1.2	1.7	3.4	5.8	5.9	7.2	8.8	8.5	4.1	2.5	2.0	4.0	8.8																							
22-Feb	2.4	2.4	2.5	Z	2.5	2.5	3.9	3.2	2.6	2.5	2.4	2.4	2.1	2.3	2.3	2.1	1.5	2.5	7.3	4.0	2.4	4.2	4.8	3.6	3.0	7.3																							
23-Feb	2.5	1.9	1.8	2.1	Z	5.4	2.6	4.9	3.5	2.4	2.4	3.3	C	C	C	C	C	C	8.1	10.5	8.1	7.6	6.5	4.8	--	10.5																							
24-Feb	2.5	1.6	1.4	1.2	1.6	Z	1.8	2.0	2.6	2.0	1.3	1.5	1.2	1.2	1.0	1.2	M	2.0	2.1	1.5	1.4	1.7	1.8	1.8	1.7	2.6																							
25-Feb	Z	2.6	2.7	2.9	3.1	3.2	2.9	2.6	2.1	1.8	1.1	0.4	0.2	0.1	0.2	0.1	0.1	0.7	0.9	0.4	0.2	1.3	1.1	1.1	1.4	3.2																							
26-Feb	2.0	Z	1.6	1.7	1.5	2.5	1.8	1.2	0.8	1.3	0.9	0.7	0.7	0.1	0.1	0.0	0.2	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.8	2.5																							
27-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.4	0.7	1.2	2.3	3.7	4.0	3.9	3.5	2.4	1.0	1.8	2.6	7.2	7.5	5.5	4.9	4.5	2.5	7.5																							
28-Feb	4.3	5.6	3.7	Z	2.6	3.1	6.5	2.4	2.0	1.9	2.4	1.6	1.3	1.2	1.4	1.6	1.8	2.7	2.7	3.4	7.8	3.6	2.8	1.4	2.9	7.8																							
																								2.6	2.3	2.1	1.7	1.9	2.5	2.3	2.6	2.2	2.1	2.0	1.9	1.7	1.5	1.4	1.5	1.5	1.7	2.7	3.0	2.8	2.7	2.7	2.7	Diurnal Average	
																								9.1	5.6	5.3	5.0	6.0	6.5	7.1	11.3	8.0	9.1	10.4	8.2	6.0	4.9	5.2	5.5	5.8	5.9	8.1	10.5	8.5	8.2	13.0	12.7	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**  
**Janvier - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Janvier - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	637	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: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Janvier - February 2023**

<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	55	122	43	17	8	5	8	18	40	113	94	37	21	19	17	18	635
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>	55	122	43	17	8	5	8	18	40	113	94	37	21	19	17	18	635

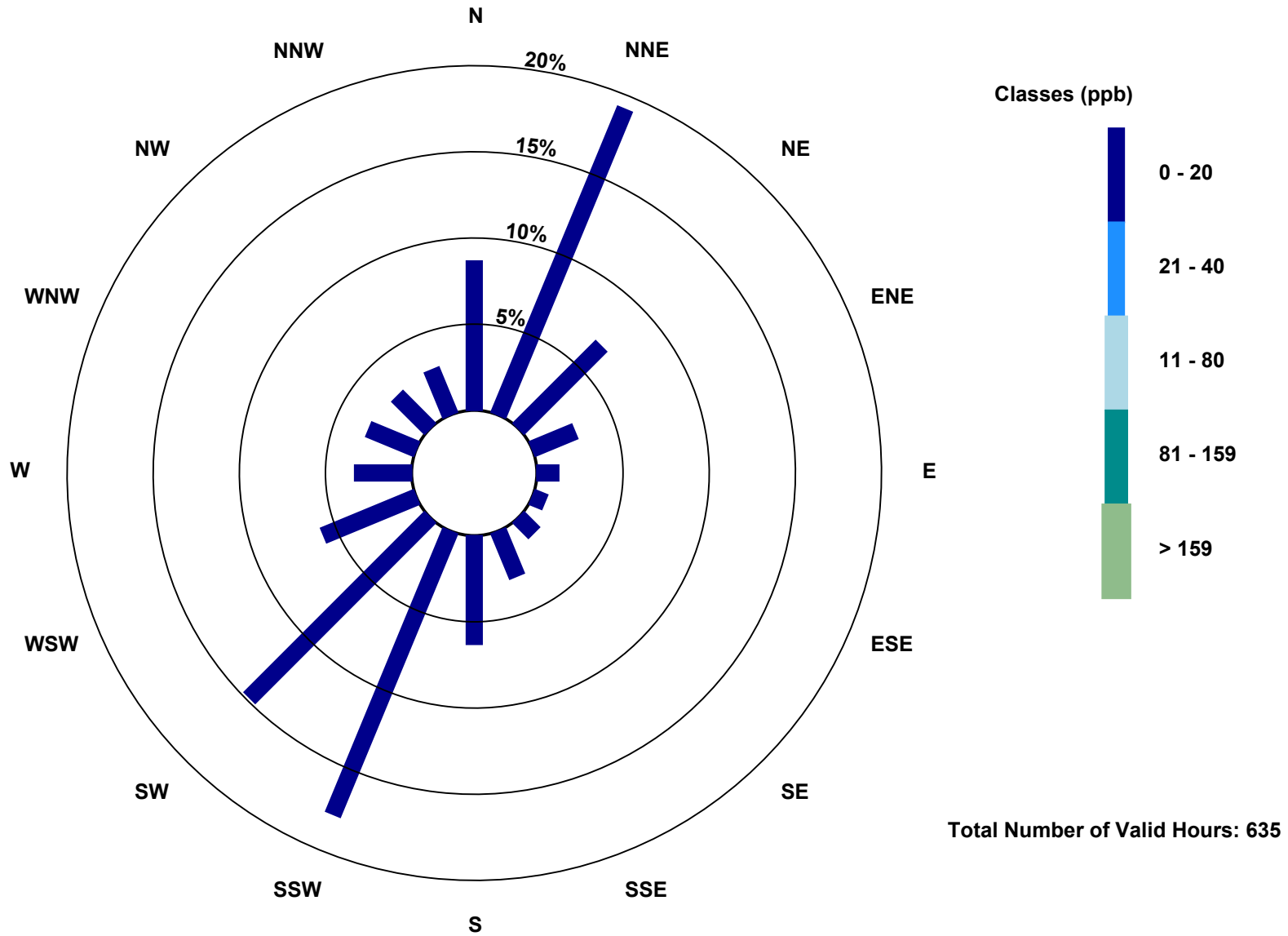
Total Number of Valid Hours: 635

Total Number of Hours: 672

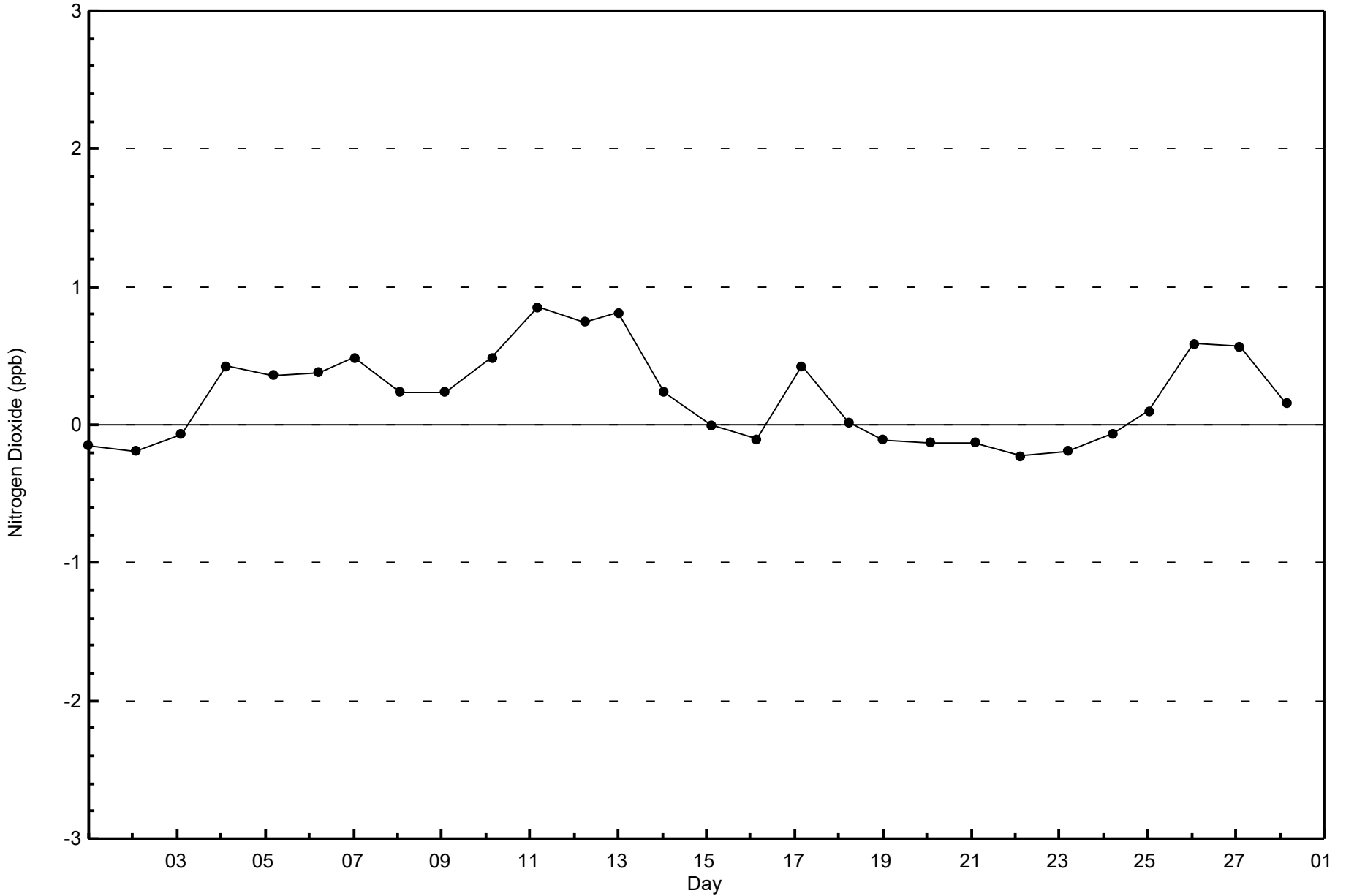


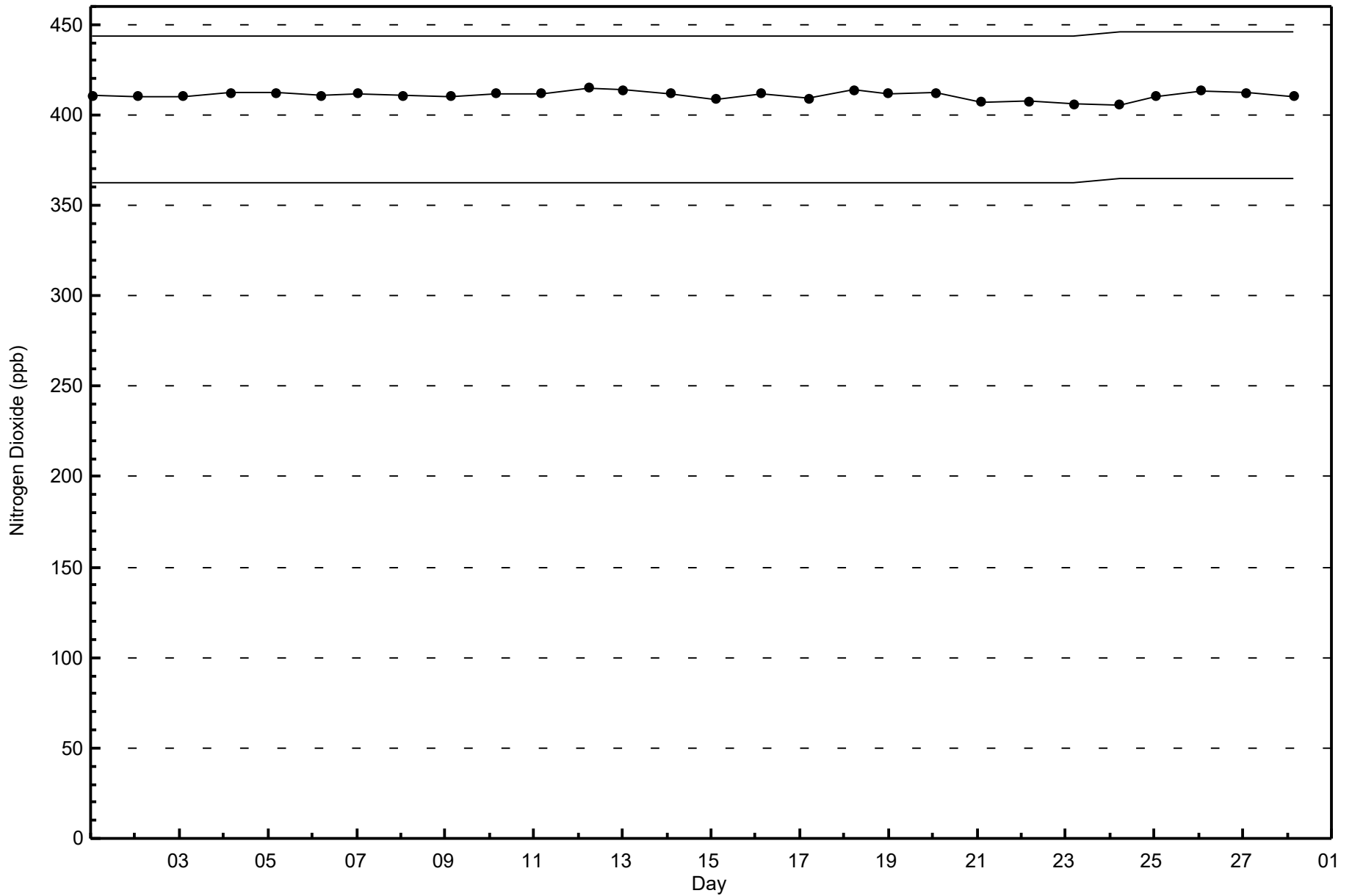
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









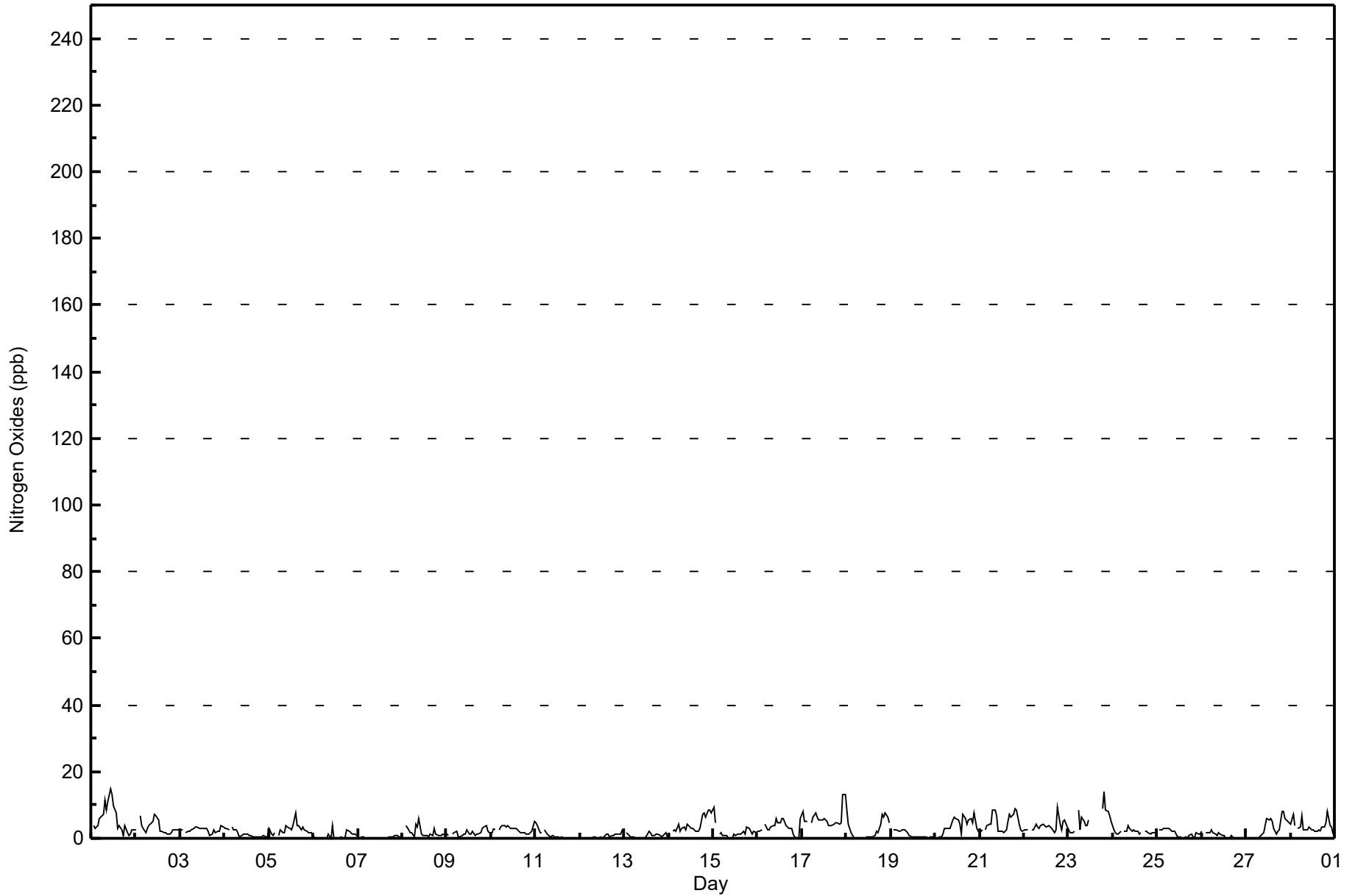


**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Janvier - February 2023**

Maximum Value: 15.0 ppb on Feb 1 11:00		Maximum Daily Average: 5.9 ppb on Feb 17		Hours in Service: 672																						
Minimum Value: 0.0 ppb on Feb 6 02:00		Minimum Daily Average: 0.2 ppb on Feb 7		Hours of Data: 637																						
Maximum Diurnal Average: 3.3 ppb at hour 20		Minimum Diurnal Average: 1.8 ppb at hour 4		Hours of Missing Data: 35																						
Monthly Average: 2.54 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 0.7 Median = 2.0 Q <sub>3</sub> = 3.5 P <sub>90</sub> = 5.9 P <sub>99</sub> = 10.5		Hours of Calibration: 34																						
				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-Feb	Z	3.9	3.0	3.9	6.1	6.6	7.2	11.4	8.3	10.9	15.0	12.9	9.7	7.7	2.9	3.8	2.4	1.1	3.7	1.9	1.0	1.1	2.5	2.4	5.6	15.0
2-Feb	2.6	Z	6.7	3.7	2.8	1.8	3.0	3.7	4.7	5.3	7.0	6.7	5.5	2.2	2.1	1.6	1.5	1.4	1.2	1.8	2.7	2.7	2.4	2.6	3.3	7.0
3-Feb	2.6	2.3	Z	1.9	2.0	2.2	2.5	3.0	3.5	3.4	2.8	2.9	2.8	2.8	2.0	1.0	1.4	2.5	1.9	2.1	2.2	3.7	3.3	2.5	3.7	
4-Feb	3.1	2.8	2.5	Z	3.3	2.6	2.7	1.7	0.5	0.7	1.1	1.3	1.2	1.0	0.6	0.5	0.3	0.4	0.4	0.5	0.4	0.9	0.3	0.3	1.3	3.3
5-Feb	3.1	1.2	0.9	1.5	Z	1.0	2.5	1.8	1.6	3.6	3.3	2.9	2.6	3.7	7.8	3.7	3.9	2.6	3.2	2.7	2.2	1.8	1.6	1.6	2.6	7.8
6-Feb	0.4	0.0	0.0	0.0	0.0	Z	0.0	0.1	1.1	0.2	3.9	0.2	0.2	0.2	0.2	0.4	0.1	0.4	2.4	2.3	1.5	1.1	1.2	0.7	0.7	3.9
7-Feb	Z	0.6	0.4	0.5	0.2	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	0.4	0.5	0.7	0.7	0.3	0.3	0.2	0.7
8-Feb	0.4	Z	3.9	2.5	1.7	1.9	0.6	4.0	3.6	5.8	1.2	0.6	0.7	0.7	0.5	1.4	0.6	2.9	1.2	0.7	1.0	1.0	1.1	0.9	1.7	5.8
9-Feb	1.1	1.0	Z	1.5	1.5	1.9	0.6	0.5	0.7	1.2	1.4	2.6	1.2	1.2	1.9	1.0	1.3	1.3	1.6	2.8	3.4	3.6	2.2	1.8	1.6	3.6
10-Feb	1.6	3.1	2.7	Z	2.6	3.4	3.9	4.0	3.4	3.7	3.0	2.9	2.8	2.9	2.7	2.2	1.7	1.7	1.7	1.3	1.4	1.8	2.1	4.9	2.7	4.9
11-Feb	4.9	3.7	1.6	1.8	Z	2.7	1.2	0.7	0.5	0.9	0.2	0.5	0.3	0.2	0.2	0.1	0.2	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.9	4.9
12-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.3	0.4	0.1	0.1	0.4	0.2	0.6	1.1	1.2	0.4	0.7	0.8	1.1	1.2	1.2	1.2	2.6	0.6	2.6
13-Feb	Z	1.7	1.2	0.6	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.1	1.8	0.8	0.8	1.1	1.4	1.1	0.6	0.7	1.5	0.6	0.8	2.1
14-Feb	0.5	Z	2.2	2.6	2.3	4.2	2.2	3.0	3.3	2.6	4.3	3.3	2.9	2.9	1.9	2.1	2.2	2.9	7.2	7.8	6.5	8.4	8.4	7.8	4.0	8.4
15-Feb	9.1	4.7	Z	1.3	1.7	0.9	0.6	1.1	0.2	0.1	0.2	1.1	1.1	1.1	1.3	1.2	2.2	1.4	3.2	3.1	2.1	1.5	2.1	1.6	1.9	9.1
16-Feb	2.1	2.1	2.4	Z	4.3	2.7	2.4	3.4	4.0	3.7	6.1	4.7	4.5	5.9	6.1	3.9	3.2	3.1	3.0	1.2	0.3	0.2	0.2	6.1	3.3	6.1
17-Feb	7.9	5.1	5.0	5.1	Z	4.7	6.2	7.7	6.4	5.6	5.6	5.3	6.0	5.1	3.9	3.8	3.6	4.2	4.6	4.9	4.3	4.7	13.1	13.1	5.9	13.1
18-Feb	8.3	4.1	1.9	0.9	0.3	Z	0.1	0.0	0.1	0.0	0.0	0.2	0.4	0.3	0.2	0.8	2.0	1.7	4.3	7.2	6.5	7.7	6.2	4.5	2.5	8.3
19-Feb	Z	2.4	2.4	2.4	2.0	2.1	2.7	2.5	2.1	1.5	0.9	0.6	0.5	0.5	0.3	0.5	0.3	0.3	0.2	0.2	0.2	0.4	0.4	0.2	1.1	2.7
20-Feb	0.1	Z	0.3	0.3	1.2	3.0	2.9	3.0	3.0	5.5	6.3	5.9	5.3	4.2	1.2	7.1	5.9	4.2	5.7	6.0	4.7	7.5	3.2	2.0	3.9	7.5
21-Feb	1.5	2.7	Z	2.7	4.0	4.1	4.4	8.5	8.4	6.7	1.9	2.3	2.2	1.9	2.6	5.0	7.2	6.3	7.2	8.8	8.6	4.2	2.6	2.1	4.6	8.8
22-Feb	2.5	2.5	2.6	Z	2.6	2.5	4.4	3.6	3.1	3.6	4.1	3.8	3.5	3.7	3.4	2.8	1.7	2.7	9.3	4.3	2.4	5.3	5.6	3.6	3.6	9.3
23-Feb	2.5	1.9	1.8	2.1	Z	8.6	2.7	6.5	5.3	3.8	4.0	5.6	C	C	C	C	C	C	8.8	14.2	8.7	8.1	7.0	5.0	--	14.2
24-Feb	2.6	1.6	1.4	1.3	2.0	Z	1.9	2.2	3.6	2.8	2.0	2.4	2.0	2.0	1.5	1.7	M	2.0	2.1	1.5	1.4	1.7	1.8	1.8	2.0	3.6
25-Feb	Z	2.6	2.7	2.9	3.1	3.2	2.9	2.6	2.2	2.1	1.4	0.5	0.3	0.2	0.2	0.2	0.1	0.7	1.1	0.4	0.2	1.8	1.1	1.2	1.5	3.2
26-Feb	2.3	Z	1.6	1.7	1.5	2.5	1.8	1.2	0.9	1.5	1.2	0.8	0.8	0.2	0.1	0.0	0.7	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.8	2.5
27-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.4	0.7	1.6	3.7	5.7	5.6	6.0	4.9	3.0	1.2	1.9	2.6	8.2	8.0	5.9	5.0	4.6	3.0	8.2
28-Feb	4.4	7.2	3.8	Z	2.8	3.2	6.9	2.6	2.4	2.7	3.6	2.6	2.4	2.2	2.2	2.4	2.3	3.2	3.2	4.6	8.1	3.6	3.2	1.4	3.5	8.1
																								Diurnal Average		
																								Diurnal Maximum		
																								2.8 9.1		
																								2.5 7.2		
																								2.2 6.7		
																								1.8 5.1		
																								2.0 6.1		
																								2.8 8.6		
																								2.4 7.2		
																								2.8 11.4		
																								2.6 8.4		
																								2.9 10.9		
																								3.0 15.0		
																								2.8 12.9		
																								2.4 9.7		
																								2.3 7.7		
																								2.0 7.8		
																								2.0 7.1		
																								1.8 7.2		
																								1.9 6.3		
																								3.0 9.3		
																								2.9 8.7		
																								2.9 8.4		
																								2.8 13.1		
																								2.8 13.1		

Z - zerospan      C - Calibration      M - Maintenance





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Janvier - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	637	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: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Janvier - February 2023**

<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	55	122	43	17	8	5	8	18	40	113	94	37	21	19	17	18	635
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>	55	122	43	17	8	5	8	18	40	113	94	37	21	19	17	18	635

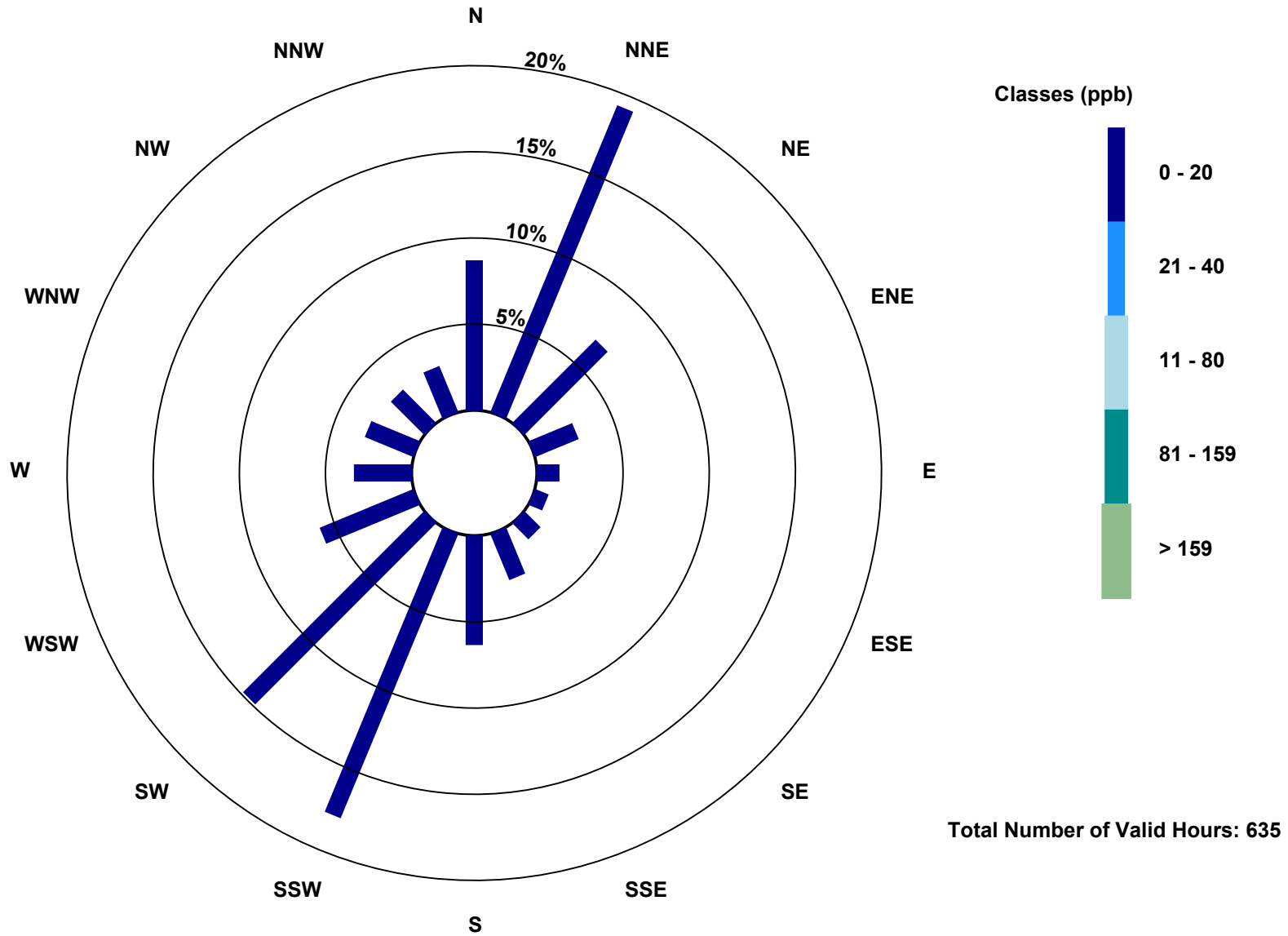
Total Number of Valid Hours: 635

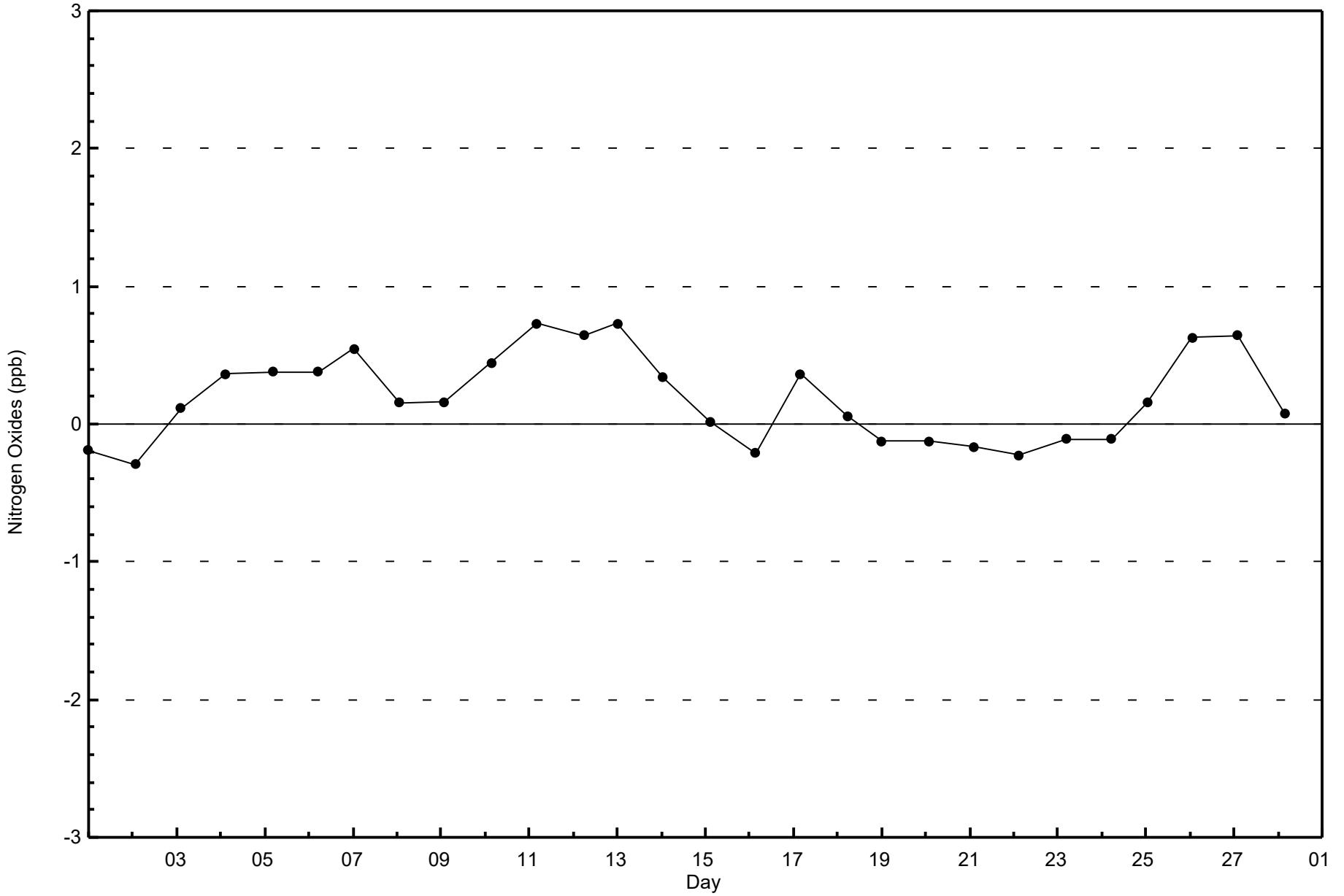
Total Number of Hours: 672



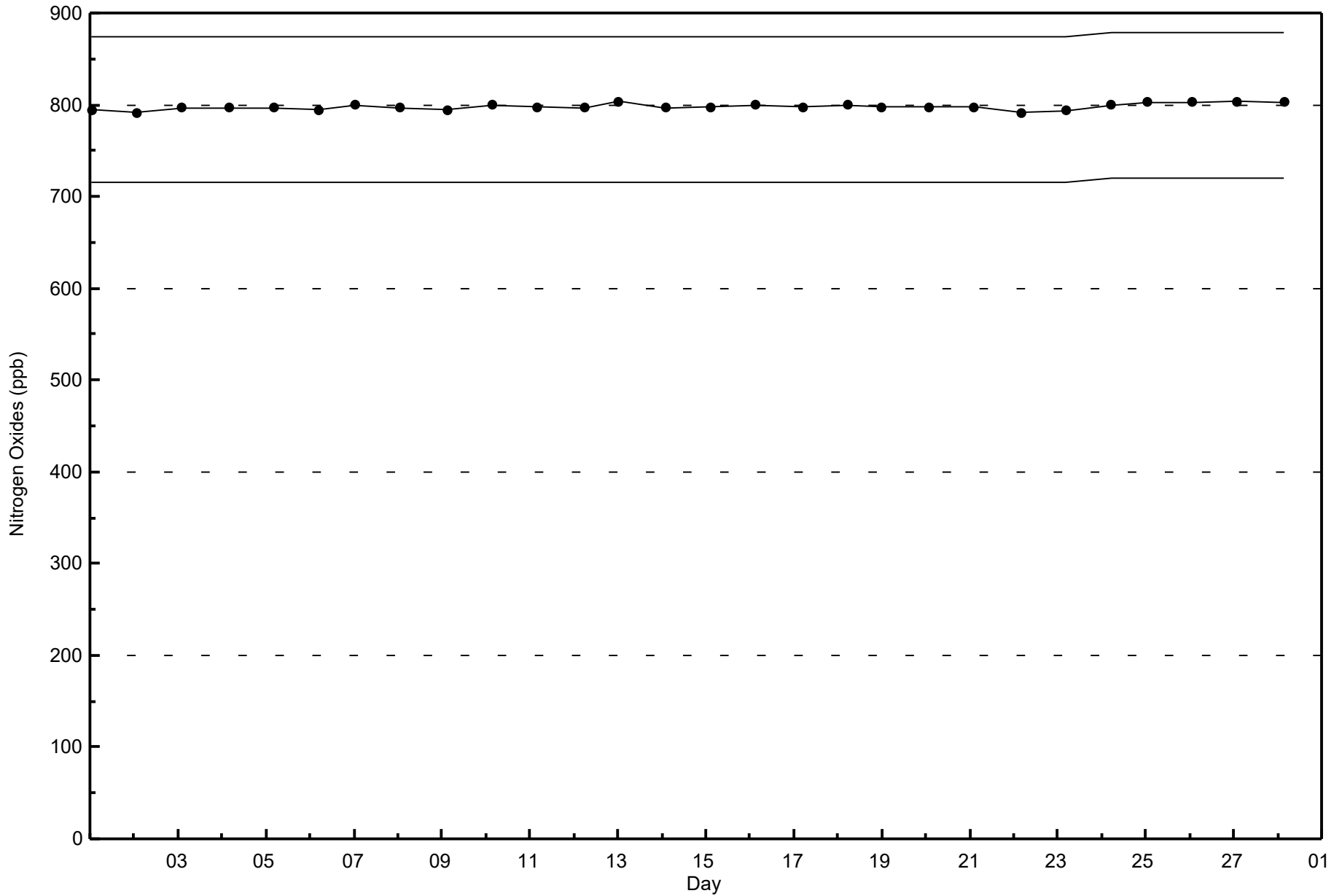
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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











# Wood Buffalo Environmental Association

## Summary of Hour Averages

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

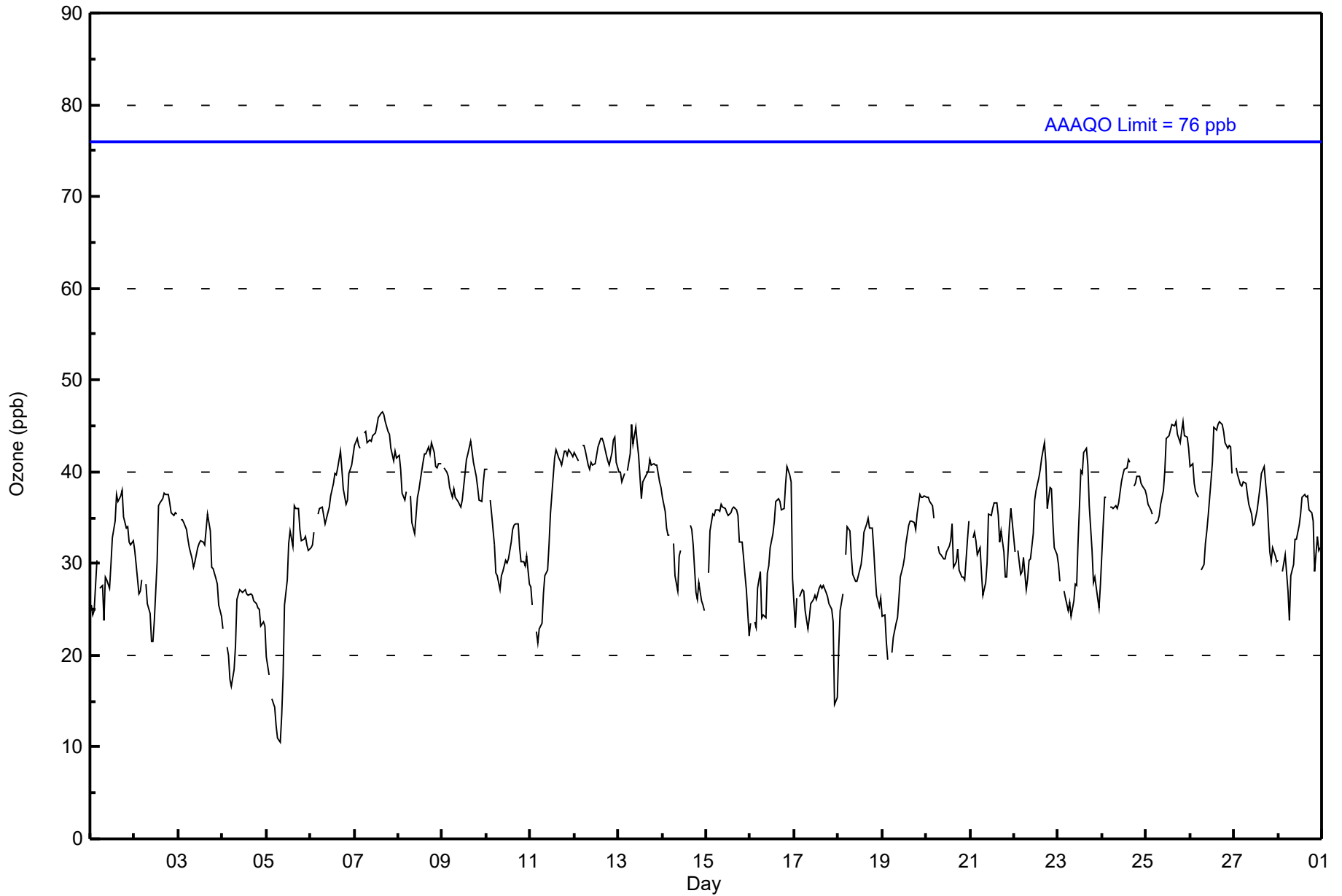
Janvier - February 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	672																											
Maximum Value: 46.5 ppb on Feb 7 16:00		Maximum Daily Average: 43.9 ppb on Feb 7																	Hours of Data:	639																												
Minimum Value: 10.5 ppb on Feb 5 08:00		Minimum Daily Average: 23.9 ppb on Feb 4																	Hours of Missing Data:	33																												
Maximum Diurnal Average: 38.0 ppb at hour 16		Minimum Diurnal Average: 30.2 ppb at hour 8																	Hours of Calibration:	32																												
Monthly Average: 33.91 ppb		Percentiles: P <sub>1</sub> = 15.3 P <sub>10</sub> = 25.4 Q <sub>1</sub> = 29.0 Median = 34.6 Q <sub>3</sub> = 39.1 P <sub>90</sub> = 42.3 P <sub>99</sub> = 45.4																	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-Feb	25.5	24.4	24.8	30.4	Z	27.2	27.6	23.8	28.6	28.2	27.3	29.9	32.9	34.6	37.6	36.8	37.4	38.0	35.2	33.9	34.0	32.3	32.0	32.5	31.1	38.0																						
2-Feb	31.4	30.0	26.7	27.0	28.3	Z	27.7	25.7	24.5	21.5	21.5	23.8	30.2	36.3	36.6	37.1	37.7	37.6	37.5	36.6	35.6	35.3	35.5	35.4	31.3	37.7																						
3-Feb	Z	34.8	34.8	34.5	33.7	32.7	31.7	30.5	29.6	30.2	31.8	32.1	32.5	32.3	32.0	33.7	35.4	33.5	29.6	29.4	28.4	27.8	25.5	24.3	31.3	35.4																						
4-Feb	22.9	Z	20.8	19.9	17.4	16.6	18.4	21.1	26.1	27.1	26.9	26.8	27.2	26.7	26.6	26.7	26.5	25.9	25.7	25.1	25.1	23.2	23.7	23.1	23.9	27.2																						
5-Feb	19.8	17.8	Z	15.2	14.3	12.3	11.0	10.5	13.4	17.8	25.5	28.2	32.2	33.6	31.8	36.3	35.9	36.0	33.8	32.6	32.6	32.9	32.1	31.4	25.5	36.3																						
6-Feb	31.7	32.0	33.4	Z	35.4	35.9	36.1	35.2	34.3	35.6	36.1	37.3	38.8	39.7	39.7	40.4	42.3	40.3	38.2	36.4	36.9	39.8	40.8	41.9	37.3	42.3																						
7-Feb	42.9	43.7	42.8	42.5	Z	44.3	44.4	43.1	43.5	43.3	43.9	44.3	45.0	46.0	46.4	46.5	46.2	45.4	44.4	44.0	42.6	41.2	42.3	41.4	43.9	46.5																						
8-Feb	41.8	40.3	37.6	36.9	37.9	Z	37.4	34.5	33.9	33.2	37.2	38.0	39.1	41.0	41.9	41.9	42.8	42.0	43.2	42.0	40.5	40.4	40.9	40.8	39.4	43.2																						
9-Feb	Z	40.5	40.0	39.5	38.3	37.2	38.2	37.3	36.8	36.4	36.2	37.0	39.9	41.4	41.9	43.4	42.2	41.0	39.5	38.2	36.9	36.8	38.8	40.2	39.0	43.4																						
10-Feb	40.3	Z	36.9	35.4	32.0	29.0	28.7	27.2	28.7	29.1	30.4	30.1	30.5	32.3	33.8	34.1	34.3	34.3	31.7	30.2	30.2	29.7	30.9	27.8	31.6	40.3																						
11-Feb	27.5	25.4	Z	22.5	21.4	22.9	23.5	26.7	28.7	29.3	32.0	35.3	39.5	41.5	42.3	41.5	41.2	40.7	42.2	42.2	41.7	42.4	42.0	41.7	34.5	42.4																						
12-Feb	42.1	41.5	41.1	Z	42.8	42.8	42.3	40.8	40.3	41.0	40.8	40.9	41.7	42.7	43.6	43.6	43.2	41.9	41.2	40.7	42.1	43.5	43.7	41.0	42.0	43.7																						
13-Feb	39.9	40.0	38.8	39.8	Z	40.2	41.9	45.2	43.1	44.9	43.1	41.8	37.0	38.9	39.2	39.6	40.2	41.4	40.7	40.8	40.7	40.7	38.9	38.2	40.7	45.2																						
14-Feb	37.2	35.6	33.9	33.0	33.2	Z	32.2	28.7	26.9	30.8	31.4	C	C	C	C	34.2	33.8	32.0	26.8	26.1	27.9	26.0	25.4	24.9	30.5	37.2																						
15-Feb	Z	28.9	33.6	35.4	35.3	35.8	35.8	35.7	36.4	36.1	36.0	35.5	35.3	35.5	36.0	36.2	35.9	35.2	32.3	32.4	30.6	28.8	27.1	22.1	33.6	36.4																						
16-Feb	23.4	Z	23.6	23.0	27.3	29.2	24.0	24.5	24.1	29.0	29.7	31.7	33.2	34.6	36.8	37.1	36.8	35.8	36.0	38.6	40.6	39.6	38.9	28.4	31.6	40.6																						
17-Feb	23.0	26.2	Z	26.3	27.2	27.0	24.9	22.8	24.1	25.6	26.1	26.5	26.1	27.4	27.6	27.3	27.7	26.9	26.4	25.6	25.1	23.6	14.6	15.4	24.9	27.7																						
18-Feb	20.8	24.9	26.7	Z	30.9	34.1	33.6	30.8	28.8	28.0	28.0	28.7	29.9	31.3	33.4	34.4	34.9	33.9	33.9	31.5	28.8	26.5	25.3	26.2	29.8	34.9																						
19-Feb	24.3	24.5	21.5	19.5	Z	20.2	21.9	23.5	24.2	26.2	28.6	29.8	30.7	32.2	34.1	34.6	34.6	34.4	33.7	35.4	37.6	37.2	37.2	37.4	29.7	37.6																						
20-Feb	37.3	37.2	36.8	36.4	35.0	Z	31.9	31.2	31.0	30.5	30.5	31.2	31.8	32.5	34.4	29.6	30.3	31.5	29.3	28.5	28.5	28.2	32.7	34.7	32.2	37.3																						
21-Feb	Z	32.8	33.4	32.5	30.9	31.7	29.0	26.5	27.9	30.1	35.3	35.3	36.0	36.6	36.7	35.2	32.4	33.5	31.2	28.6	28.5	34.2	36.0	34.4	32.6	36.7																						
22-Feb	31.3	Z	31.4	28.8	29.1	30.7	27.1	28.4	30.4	30.5	33.3	36.9	38.0	39.3	40.3	41.6	43.1	41.1	36.0	38.2	38.1	34.4	31.7	31.0	34.4	43.1																						
23-Feb	29.9	28.0	Z	27.0	26.3	24.9	25.8	24.3	26.0	27.7	27.6	32.4	40.1	39.8	42.1	42.6	40.7	36.3	31.5	27.9	28.5	26.3	25.2	27.8	30.8	42.6																						
24-Feb	34.4	37.3	37.3	Z	36.1	36.1	35.9	36.3	36.0	36.5	38.9	39.6	40.2	40.4	41.3	41.1	M	38.5	38.8	39.6	39.5	38.8	38.4	38.0	38.1	41.3																						
25-Feb	37.3	36.5	35.9	35.4	Z	34.4	34.6	35.2	36.4	37.9	40.1	43.7	43.9	44.6	45.1	45.0	45.4	44.2	43.2	44.4	45.5	44.0	43.9	42.6	40.8	45.5																						
26-Feb	40.5	40.8	38.8	37.8	37.3	Z	29.4	29.9	32.1	33.6	35.3	39.1	41.1	44.8	44.6	45.2	45.4	45.1	44.3	43.1	42.6	42.8	42.7	39.7	39.8	45.4																						
27-Feb	Z	40.4	39.7	38.6	38.5	39.0	38.8	37.6	36.5	35.5	34.1	34.3	35.8	37.1	38.3	39.7	40.6	38.8	37.1	31.3	30.2	31.7	30.8	30.3	36.3	40.6																						
28-Feb	30.3	Z	29.2	30.1	30.9	26.9	23.8	28.7	29.9	32.7	32.6	34.2	35.4	37.2	37.5	37.2	37.3	35.9	35.5	34.7	29.1	32.9	31.5	31.8	32.4	37.5																						
32.0																								33.2	33.3	31.1	31.3	30.9	30.6	30.2	30.8	31.7	32.9	34.2	35.7	37.1	37.8	38.0	37.9	37.2	35.7	34.9	34.6	34.3	33.9	33.0	Diurnal Average	
42.9																								43.7	42.8	42.5	42.8	44.3	44.4	45.2	43.5	44.9	43.9	44.3	45.0	46.0	46.4	46.5	46.2	45.4	44.4	44.4	45.5	44.0	43.9	42.6	Diurnal Maximum	
Z - zerospan            C - Calibration            M - Maintenance																																																
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb																																																



Wood Buffalo Environmental Association  
Hourly Averages

Ozone (O<sub>3</sub>) - ppb  
Janvier - February 2023





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb  
Janvier - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	17	2.66	2.66
21 - 50	622	97.34	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Ozone (O<sub>3</sub>) - ppb  
Janvier - February 2023**

<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	6	1	0	0	2	1	1	3	2	1	0	0	0	0	0	17
21 - 50	58	112	42	20	9	4	5	20	39	108	93	34	22	19	17	18	620
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>	<b>58</b>	<b>118</b>	<b>43</b>	<b>20</b>	<b>9</b>	<b>6</b>	<b>6</b>	<b>21</b>	<b>42</b>	<b>110</b>	<b>94</b>	<b>34</b>	<b>22</b>	<b>19</b>	<b>17</b>	<b>18</b>	<b>637</b>

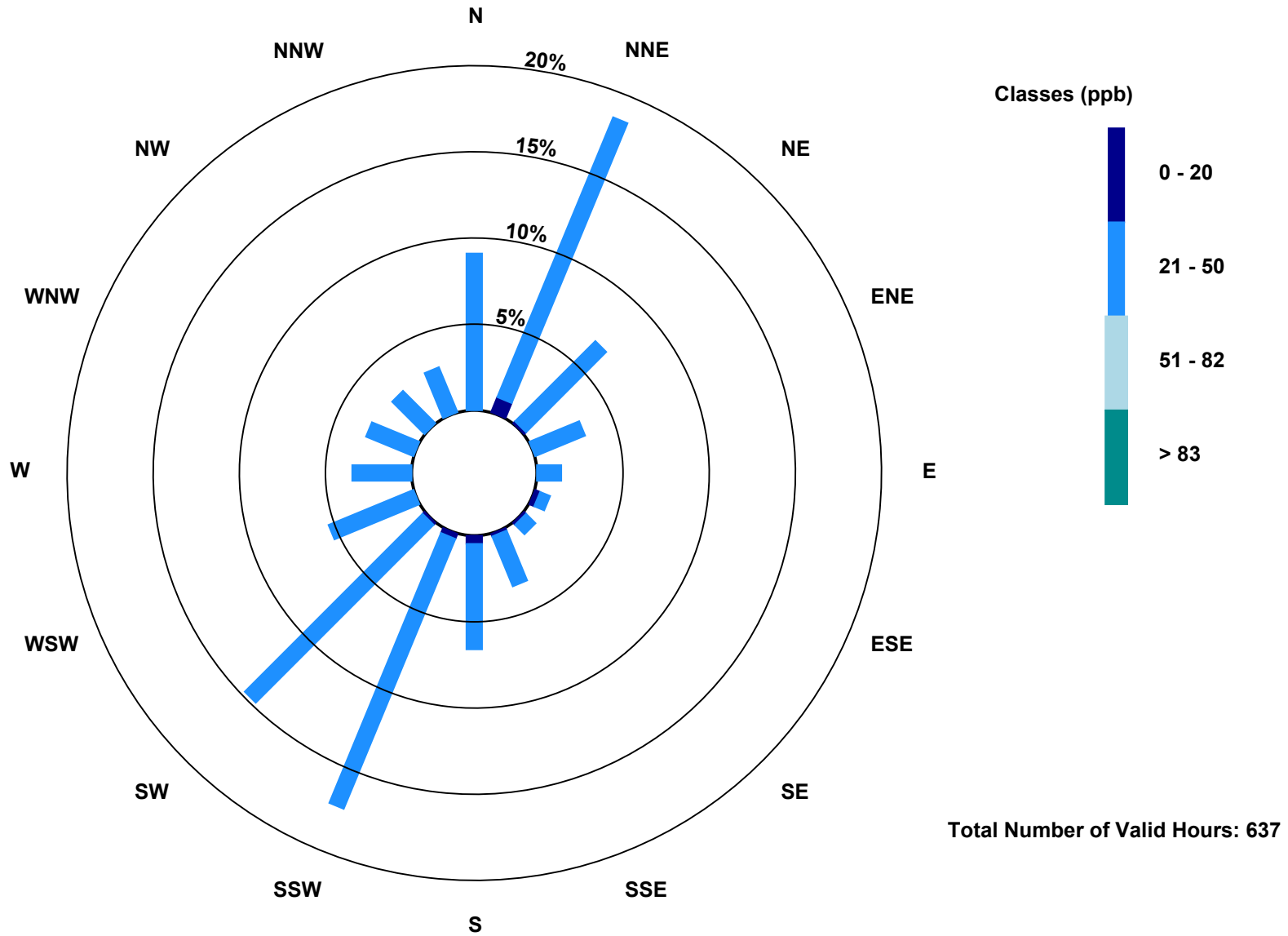
Total Number of Valid Hours: 637

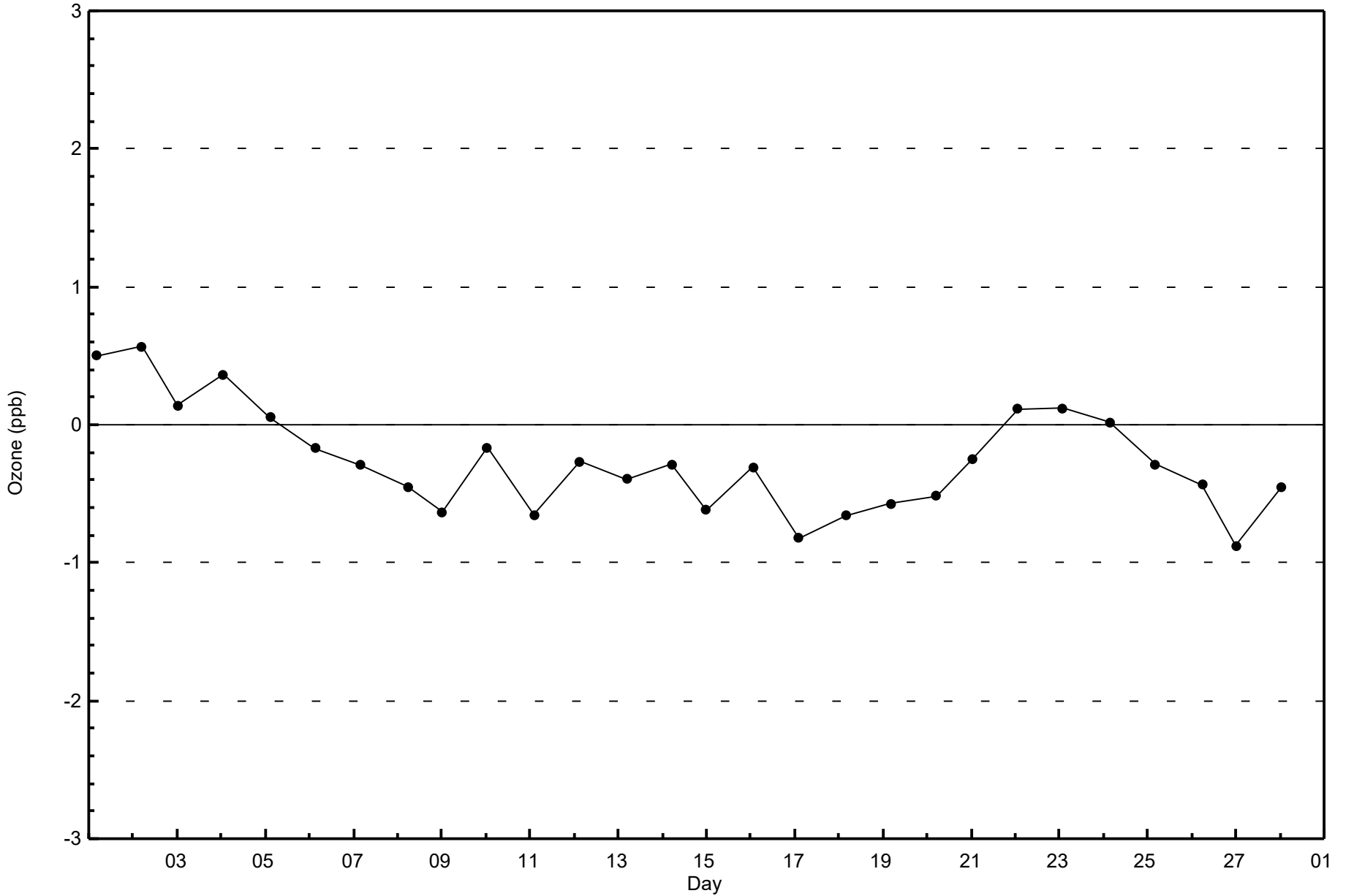
Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Ozone (O<sub>3</sub>) - ppb  
Janvier

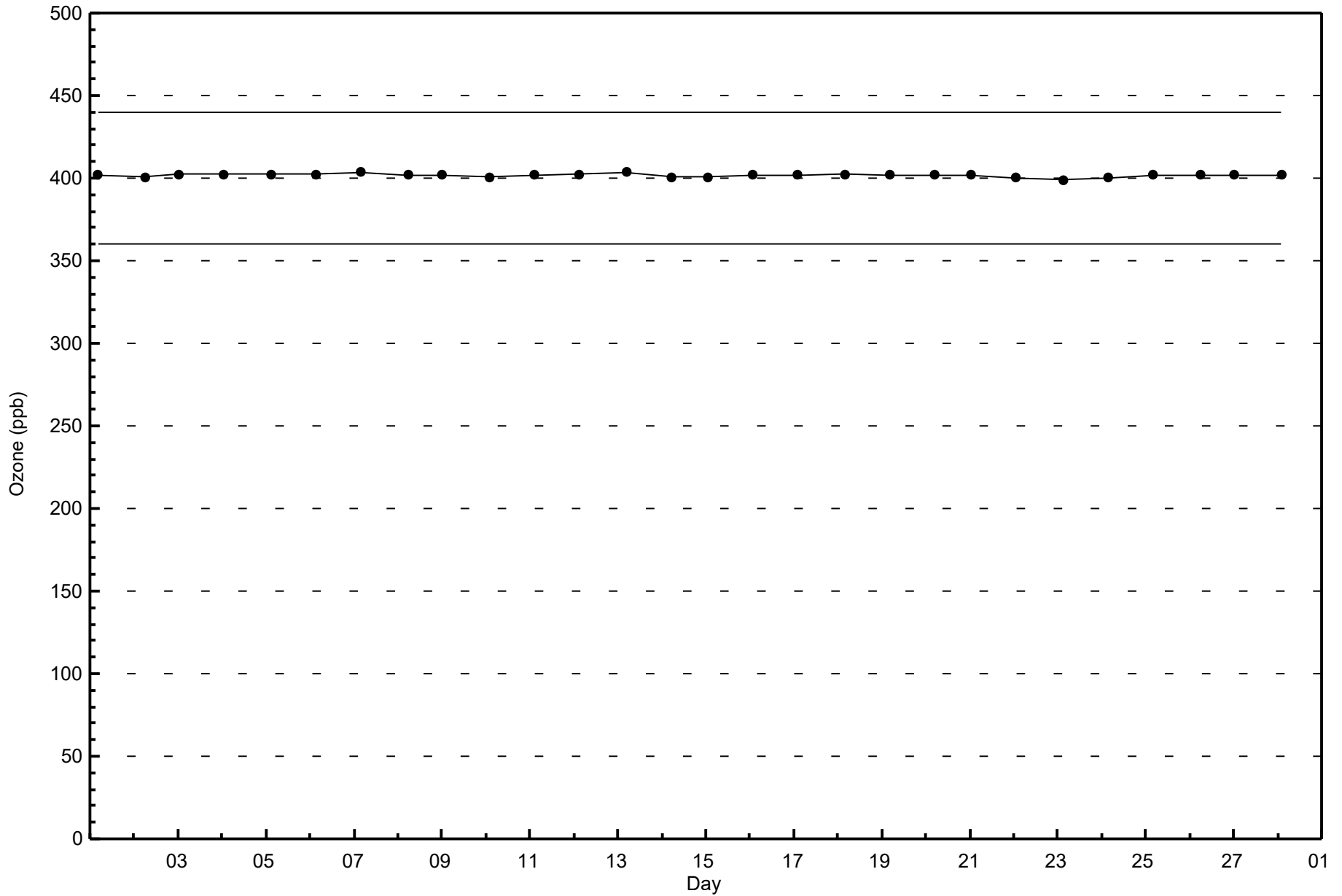






Wood Buffalo Environmental Association  
Span Responses

Ozone (O<sub>3</sub>) - ppb  
Janvier - February 2023



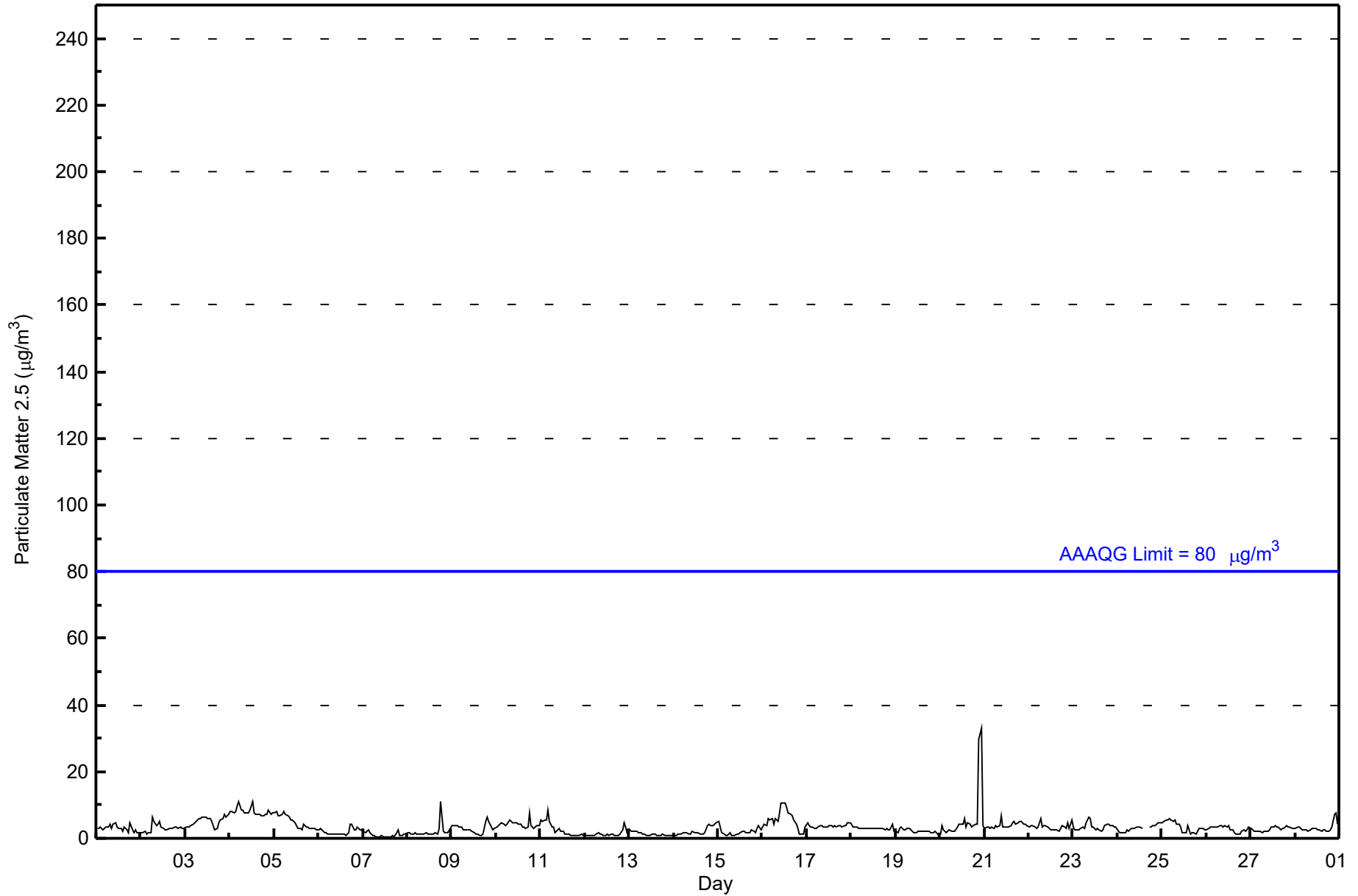




Summary of Hour Averages

Janvier - February 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 672																	672																												
Maximum Value: 32.9 µg/m <sup>3</sup> on Feb 20 23:00		Maximum Daily Average: 8.0 µg/m <sup>3</sup> on Feb 4																	Hours of Data: 669																														
Minimum Value: 0.4 µg/m <sup>3</sup> on Feb 7 16:00		Minimum Daily Average: 1.1 µg/m <sup>3</sup> on Feb 7																	Hours of Missing Data: 3																														
Maximum Diurnal Average: 4.4 µg/m <sup>3</sup> at hour 23		Minimum Diurnal Average: 2.6 µg/m <sup>3</sup> at hour 17																	Hours of Calibration: 3																														
Monthly Average: 3.28 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 0.6 P <sub>10</sub> = 1.1 Q <sub>1</sub> = 1.8 Median = 3.0 Q <sub>3</sub> = 3.9 P <sub>90</sub> = 5.8 P <sub>99</sub> = 10.5																	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-Feb	3.0	2.9	3.3	2.5	3.0	3.3	3.2	4.1	3.0	4.2	4.5	3.6	2.9	2.8	2.0	3.3	2.4	1.8	4.8	2.7	1.9	2.4	1.6	1.6	2.9	4.8																							
2-Feb	1.5	1.5	2.2	1.4	1.6	1.8	6.3	5.1	3.8	4.4	5.0	3.3	3.2	2.5	2.5	2.8	2.8	3.2	3.3	3.4	3.1	3.3	2.9	3.1	3.1	6.3																							
3-Feb	3.2	3.3	3.4	3.7	4.2	4.8	5.1	6.1	6.0	6.4	6.2	6.3	5.9	5.8	5.3	4.0	2.7	3.0	4.7	5.6	6.1	7.1	6.3	7.1	5.1	7.1																							
4-Feb	7.9	8.1	7.8	8.0	9.9	11.1	8.5	8.6	7.6	7.5	7.8	8.4	11.0	7.5	7.2	7.3	7.1	6.9	6.7	7.2	7.3	8.5	7.2	7.4	8.0	11.1																							
5-Feb	7.6	7.9	7.0	6.7	7.1	8.2	7.3	7.0	6.4	5.6	5.3	4.6	3.7	3.1	3.0	2.4	4.3	3.5	3.6	3.2	3.1	2.9	2.9	2.6	4.9	8.2																							
6-Feb	2.5	2.9	2.5	1.8	1.8	1.4	1.1	1.2	1.3	1.4	1.4	1.3	1.2	1.2	1.1	1.1	1.7	4.2	4.1	2.4	2.5	3.5	2.7	2.7	2.0	4.2																							
7-Feb	2.0	1.6	2.2	2.7	1.5	1.0	0.7	0.6	0.4	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.6	0.4	1.7	2.6	0.7	0.8	1.2	1.2	1.1	2.7																							
8-Feb	1.7	1.7	1.1	1.1	1.8	1.3	1.2	1.1	1.3	1.3	1.6	1.4	1.3	1.5	1.4	1.8	1.5	2.9	11.1	2.1	1.5	1.5	1.7	2.8	2.0	11.1																							
9-Feb	3.9	3.9	3.6	3.8	3.4	3.2	2.6	2.4	2.4	2.5	2.5	2.1	1.6	1.2	1.1	0.8	0.9	1.1	4.9	6.4	5.0	3.2	2.7	3.1	2.9	6.4																							
10-Feb	3.4	3.7	4.2	4.6	4.2	3.8	4.4	5.4	5.0	4.8	4.6	4.5	4.1	4.0	3.6	3.2	2.8	3.3	7.6	3.7	3.1	3.2	3.9	3.9	4.1	7.6																							
11-Feb	5.7	4.9	5.5	5.5	8.3	4.9	3.4	3.4	1.9	2.4	2.8	2.2	2.2	1.3	1.4	1.1	0.7	0.9	0.7	0.7	0.7	1.0	1.2	0.8	2.6	8.3																							
12-Feb	0.8	0.8	0.9	0.7	0.8	0.8	1.1	1.8	1.2	1.1	1.0	1.0	1.1	1.0	1.1	1.3	1.0	0.9	1.0	1.4	2.7	4.6	3.4	1.7	1.4	4.6																							
13-Feb	2.5	2.3	2.1	2.0	2.0	1.8	1.6	1.3	1.3	0.9	0.9	1.0	1.2	1.1	1.1	1.0	0.9	1.0	1.2	0.9	0.9	0.8	0.8	0.8	1.3	2.5																							
14-Feb	0.9	0.9	1.1	1.2	1.3	1.5	1.6	1.5	1.3	1.4	2.0	1.8	1.7	1.5	1.3	1.4	1.4	1.8	3.6	4.2	3.7	3.9	4.3	4.7	2.1	4.7																							
15-Feb	5.2	3.5	1.8	1.2	1.0	1.0	1.6	0.9	1.0	1.0	1.1	1.4	1.8	1.9	1.9	1.9	1.9	1.9	2.6	2.1	1.8	3.1	3.7	2.7	2.0	5.2																							
16-Feb	3.6	4.3	3.7	5.8	5.5	5.9	4.4	5.7	4.9	7.7	10.6	10.7	10.5	9.4	7.7	7.2	6.7	5.4	4.1	3.0	1.1	1.2	1.4	3.4	5.6	10.7																							
17-Feb	4.5	3.7	3.5	3.4	3.1	3.1	3.4	3.7	3.6	3.4	3.4	3.5	3.9	3.7	3.6	3.6	3.4	3.8	3.8	3.6	3.7	3.9	4.5	4.6	3.7	4.6																							
18-Feb	4.0	3.4	3.2	3.3	2.8	2.9	2.9	3.1	3.0	3.0	2.9	3.0	2.9	3.0	2.9	2.8	2.8	2.9	2.5	2.9	2.7	2.5	4.1	2.3	3.0	4.1																							
19-Feb	2.0	1.8	3.0	3.5	2.5	2.6	2.8	3.1	2.7	2.0	1.7	1.6	2.0	2.0	1.9	2.0	2.2	2.1	2.1	1.8	1.8	2.2	1.6	1.4	2.2	3.5																							
20-Feb	1.4	3.9	2.7	1.7	2.2	2.5	2.3	2.3	2.3	3.6	4.1	4.1	4.1	5.8	3.5	4.5	4.2	3.5	3.9	4.3	4.2	29.7	32.9	3.7	5.7	32.9																							
21-Feb	3.0	3.4	3.5	3.2	3.2	3.2	3.8	3.5	3.6	6.6	3.4	3.4	3.4	3.4	3.7	4.5	5.1	4.2	4.5	5.0	5.2	4.3	4.1	3.7	4.0	6.6																							
22-Feb	3.3	3.7	3.9	3.4	3.1	3.3	6.1	3.5	3.9	3.9	3.6	3.1	2.6	2.5	2.5	2.4	2.2	3.1	3.6	3.3	3.1	4.5	3.0	5.5	3.4	6.1																							
23-Feb	3.5	2.4	2.7	2.6	2.9	3.6	2.9	4.7	6.2	5.9	3.3	3.6	2.6	2.8	2.4	1.9	2.5	3.7	4.1	4.1	3.7	3.9	3.5	3.2	3.4	6.2																							
24-Feb	2.2	1.7	1.8	1.9	1.8	2.4	2.2	2.9	3.0	3.0	3.3	3.5	3.3	3.0	C	C	C	3.4	3.5	3.6	3.8	4.3	4.6	4.7	3.0	4.7																							
25-Feb	4.9	5.2	5.5	5.6	5.9	5.4	4.9	5.4	4.3	4.1	3.5	1.5	1.7	1.5	3.6	1.5	1.7	1.8	1.2	2.0	3.1	3.1	3.2	2.5	3.5	5.9																							
26-Feb	2.5	2.9	3.2	3.5	3.5	3.5	3.3	3.7	3.6	3.3	3.7	3.6	3.6	2.5	2.4	1.9	1.5	1.3	1.3	2.0	2.6	2.2	2.5	3.4	2.8	3.7																							
27-Feb	3.0	2.7	2.2	2.2	1.9	1.9	1.8	2.0	2.2	2.1	2.6	3.3	3.4	3.7	3.6	3.4	2.5	3.0	3.0	3.7	3.6	3.2	3.1	2.8	2.8	3.7																							
28-Feb	2.8	3.2	3.3	3.0	2.6	2.6	2.4	2.2	2.5	3.1	3.1	2.8	2.6	2.4	2.2	2.4	2.5	2.0	2.0	2.4	3.2	7.4	7.7	4.4	3.1	7.7																							
																								3.3	3.3	3.2	3.2	3.3	3.3	3.4	3.2	3.5	3.5	3.3	3.2	3.0	2.8	2.7	2.6	2.7	3.6	3.2	3.1	4.4	4.4	3.3	Diurnal Average		
																								7.9	8.1	7.8	8.0	9.9	11.1	8.5	8.6	7.6	7.7	10.6	10.7	11.0	9.4	7.7	7.3	7.1	6.9	11.1	7.2	7.3	29.7	32.9	7.4	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 - February 2023**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	593	88.64	88.64
6 - 15	74	11.06	99.70
16 - 25	0	0.00	99.70
26 - 80	2	0.30	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 669

Total Number of Hours: 672



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

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - µg/m<sup>3</sup>**  
**Janvier - February 2023**

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	108	39	20	9	4	8	20	33	106	83	36	20	18	18	14	591
6 - 15	4	13	6	0	0	2	0	1	10	11	16	1	3	2	0	5	74
16 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26 - 80	0	2	0	0	0	0	0	0	0	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>	59	123	45	20	9	6	8	21	43	117	99	37	23	20	18	19	667

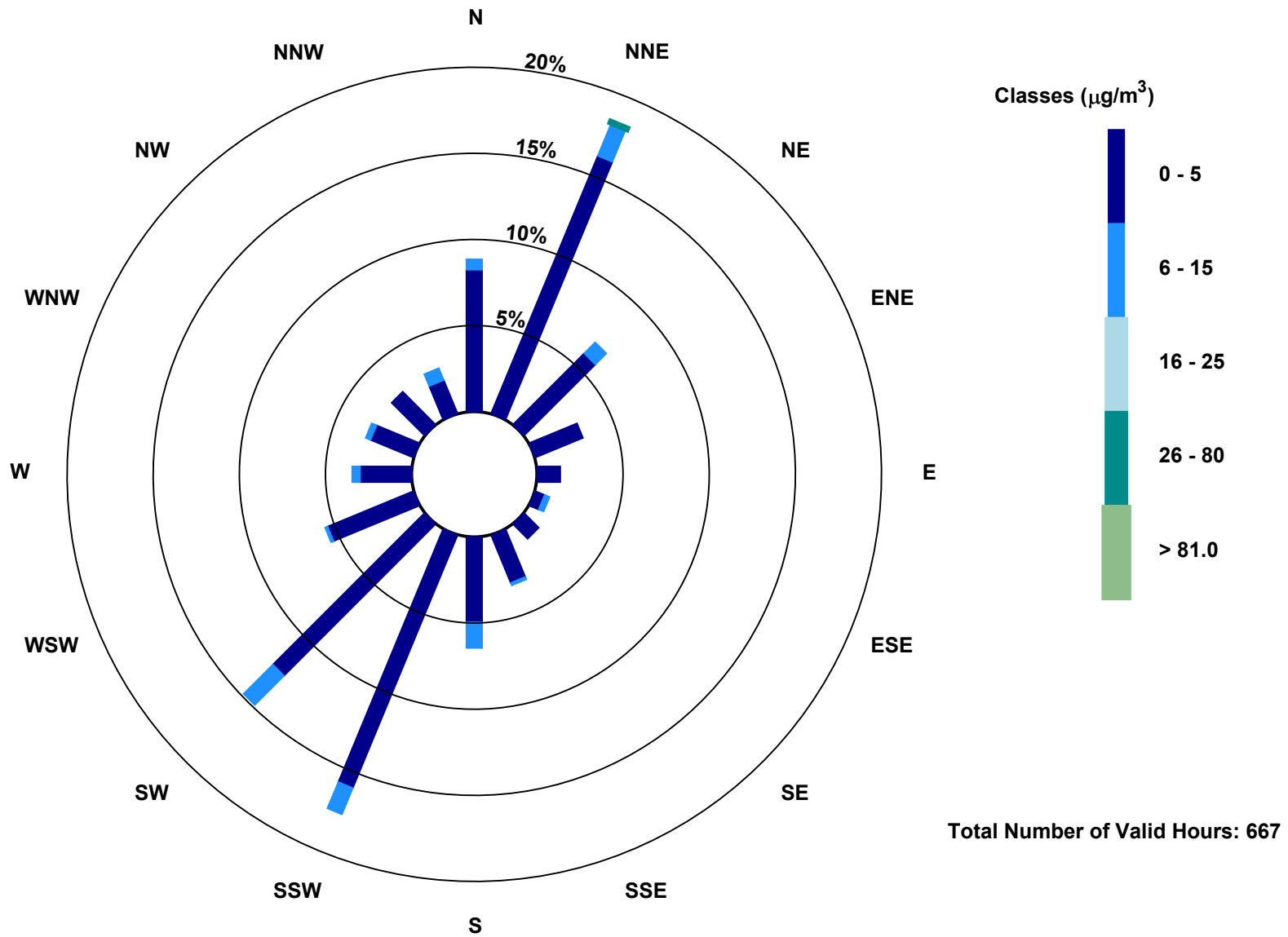
Total Number of Valid Hours: 667

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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





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

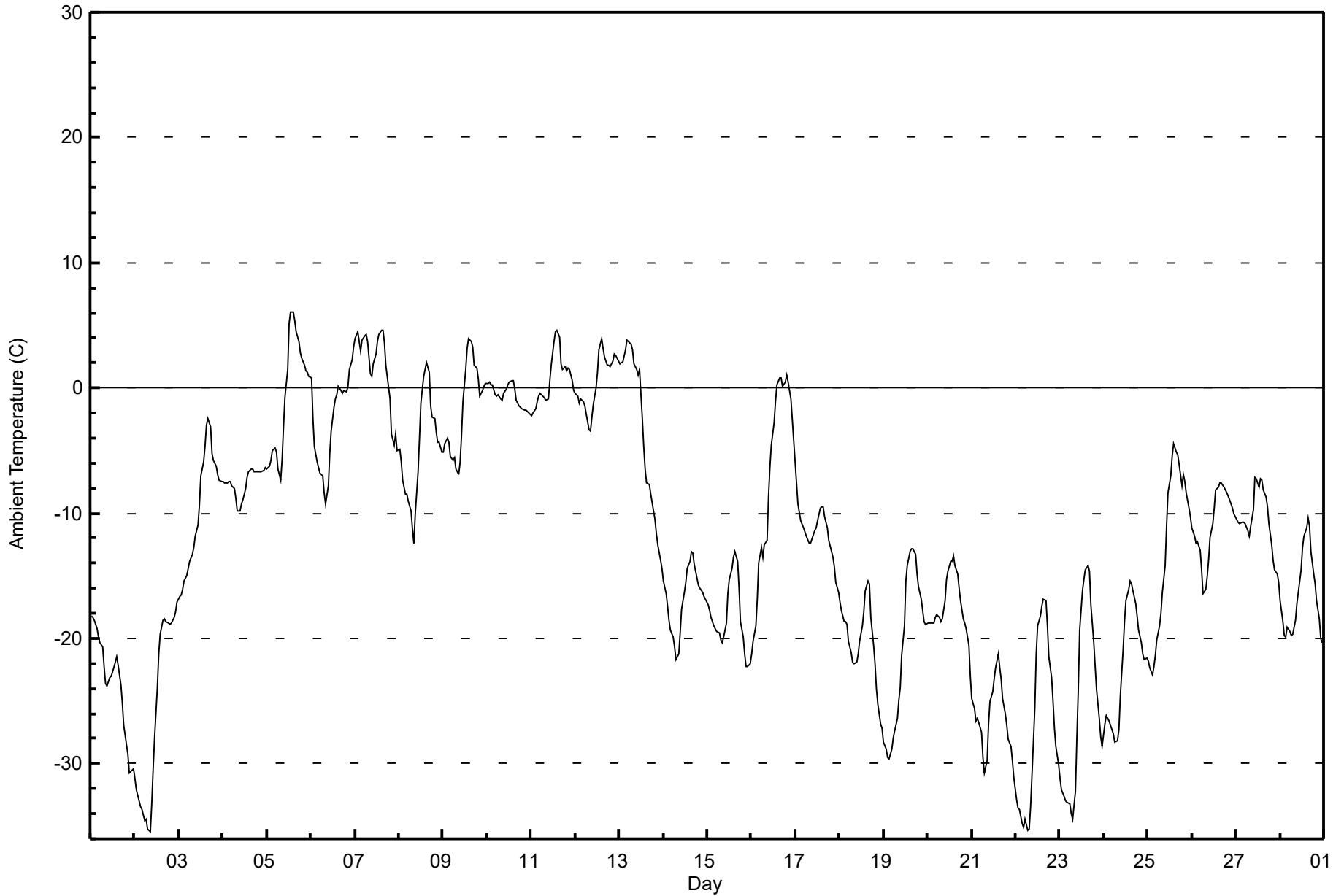
**Ambient Temperature (AT) - C**  
**Janvier - February 2023**

Maximum Value: 6.1 C on Feb 5 15:00		Maximum Daily Average: 1.8 C on Feb 7		Hours in Service: 672																							
Minimum Value: -35.4 C on Feb 2 09:00		Minimum Daily Average: -27.0 C on Feb 22		Hours of Data: 672																							
Maximum Diurnal Average: -7.6 C at hour 16		Minimum Diurnal Average: -15.7 C at hour 8		Hours of Missing Data: 0																							
Monthly Average: -12.18 C		Percentiles: P <sub>1</sub> = -34.5 P <sub>10</sub> = -26.8 Q <sub>1</sub> = -19.2 Median = -12.2 Q <sub>3</sub> = -3.4 P <sub>90</sub> = 1.4 P <sub>99</sub> = 4.6		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-Feb	-18.2	-18.4	-18.6	-19.2	-19.9	-20.4	-20.7	-22.2	-23.6	-23.8	-23.2	-23.0	-22.7	-22.0	-21.5	-22.1	-23.7	-25.2	-26.9	-28.5	-29.3	-30.7	-30.7	-30.5	-23.5	-18.2	
2-Feb	-31.1	-32.1	-33.0	-33.5	-33.6	-34.5	-34.5	-35.3	-35.4	-33.2	-30.4	-28.0	-24.0	-21.3	-19.7	-18.6	-18.5	-18.7	-18.8	-18.9	-18.7	-18.3	-17.8	-17.1	-26.0	-17.1	
3-Feb	-16.6	-16.5	-16.1	-15.4	-14.9	-14.4	-13.9	-13.3	-12.7	-11.8	-11.0	-9.3	-7.0	-5.9	-4.7	-3.0	-2.4	-3.1	-5.2	-5.8	-6.2	-6.9	-7.3	-7.5	-9.6	-2.4	
4-Feb	-7.5	-7.5	-7.6	-7.5	-7.5	-7.8	-8.1	-8.8	-9.8	-9.8	-9.3	-8.9	-8.1	-7.1	-6.7	-6.4	-6.5	-6.7	-6.7	-6.7	-6.7	-6.7	-6.5	-6.3	-7.5	-6.3	
5-Feb	-6.5	-6.2	-5.8	-5.0	-4.8	-5.1	-6.5	-7.4	-5.7	-3.2	-0.7	1.5	5.1	6.1	6.1	5.4	4.5	3.7	2.8	2.4	1.8	1.3	1.2	0.9	-0.6	6.1	
6-Feb	0.8	-2.4	-4.7	-6.0	-6.3	-6.8	-7.1	-8.4	-9.3	-7.8	-5.2	-3.4	-1.6	-0.9	-0.5	0.2	-0.2	-0.4	-0.2	-0.3	0.2	1.5	2.2	3.2	-2.7	3.2	
7-Feb	4.0	4.5	3.7	2.9	3.8	4.1	4.3	3.7	1.1	0.9	1.9	2.7	3.7	4.3	4.6	4.6	3.5	1.8	0.0	-0.9	-3.7	-4.6	-3.7	-5.1	1.8	4.6	
8-Feb	-4.8	-5.9	-7.3	-8.5	-8.4	-9.1	-9.9	-11.3	-12.4	-10.1	-6.7	-4.0	-1.2	0.9	1.5	2.0	1.3	-1.4	-2.4	-2.4	-3.6	-4.3	-4.4	-5.1	-4.9	2.0	
9-Feb	-5.1	-4.5	-4.0	-4.3	-5.4	-5.8	-5.6	-6.4	-6.9	-6.0	-3.8	-1.1	1.5	3.2	4.0	3.7	3.2	1.9	1.6	0.7	-0.7	-0.2	0.2	0.4	-1.7	4.0	
10-Feb	0.4	0.4	0.3	0.2	-0.5	-0.7	-0.6	-0.8	-1.0	-0.5	-0.1	0.2	0.5	0.6	0.6	-0.1	-1.0	-1.5	-1.6	-1.7	-1.8	-1.7	-1.9	-2.1	-0.6	0.6	
11-Feb	-2.2	-2.0	-1.7	-1.1	-0.6	-0.4	-0.7	-0.7	-1.0	-0.9	0.6	1.8	3.7	4.4	4.6	4.1	1.9	1.4	1.7	1.3	1.6	1.4	0.6	-0.2	0.7	4.6	
12-Feb	-0.5	-0.6	-1.2	-0.9	-1.1	-1.5	-2.1	-3.3	-3.4	-2.3	-1.3	0.0	1.3	3.0	4.0	3.2	2.4	1.8	1.8	1.7	2.1	2.7	2.6	2.3	0.5	4.0	
13-Feb	1.9	2.0	2.1	3.0	3.8	3.7	3.5	3.1	1.9	1.4	1.0	1.5	-2.4	-4.6	-6.4	-7.6	-7.7	-8.5	-9.2	-10.5	-11.6	-12.5	-13.7	-14.4	-3.3	3.8	
14-Feb	-15.4	-16.4	-17.4	-18.5	-19.3	-19.9	-20.6	-21.6	-21.3	-19.5	-17.7	-16.4	-15.5	-14.4	-13.8	-13.1	-13.1	-14.1	-15.2	-15.7	-16.0	-16.3	-16.6	-16.9	-16.9	-13.1	
15-Feb	-17.3	-17.8	-18.3	-19.0	-19.2	-19.4	-19.6	-20.1	-20.4	-19.9	-18.8	-16.5	-15.4	-14.4	-13.6	-13.0	-13.8	-16.0	-18.7	-19.9	-21.3	-22.2	-22.2	-22.1	-18.3	-13.0	
16-Feb	-21.2	-20.3	-19.1	-16.8	-14.0	-12.7	-13.5	-12.5	-12.2	-8.7	-6.3	-4.5	-2.8	-1.1	0.2	0.8	0.8	0.2	0.4	1.0	0.5	-0.9	-2.6	-4.2	-7.1	1.0	
17-Feb	-7.6	-9.3	-9.9	-10.6	-11.1	-11.5	-11.9	-12.4	-12.4	-12.1	-11.4	-11.1	-10.6	-9.6	-9.4	-9.5	-10.3	-11.1	-12.1	-12.6	-13.6	-14.2	-15.5	-16.3	-11.5	-7.6	
18-Feb	-17.1	-17.8	-18.7	-18.6	-18.9	-20.2	-21.2	-21.9	-22.1	-21.9	-21.2	-20.2	-19.0	-17.9	-16.2	-15.4	-15.6	-18.3	-20.5	-22.1	-24.0	-25.3	-26.8	-27.2	-20.3	-15.4	
19-Feb	-28.3	-28.9	-29.5	-29.7	-28.9	-28.0	-27.4	-26.4	-25.0	-23.9	-21.4	-19.0	-15.4	-14.2	-13.1	-12.8	-12.9	-13.3	-14.8	-15.8	-16.8	-17.7	-18.6	-18.8	-20.8	-12.8	
20-Feb	-18.7	-18.8	-18.8	-18.8	-18.3	-18.1	-18.3	-18.7	-18.5	-17.0	-15.4	-14.6	-13.9	-13.8	-13.4	-14.2	-14.8	-15.9	-16.9	-18.4	-18.8	-19.2	-20.5	-23.0	-17.4	-13.4	
21-Feb	-24.8	-25.6	-26.6	-26.4	-26.7	-27.5	-29.5	-30.8	-29.7	-26.8	-25.0	-24.2	-23.2	-22.3	-21.3	-22.4	-23.2	-24.8	-26.0	-27.0	-28.0	-28.7	-29.7	-31.1	-26.3	-21.3	
22-Feb	-32.8	-33.6	-33.7	-34.7	-35.1	-34.4	-35.3	-35.2	-33.5	-30.8	-25.6	-21.3	-19.0	-18.2	-17.4	-16.9	-17.0	-19.0	-21.5	-23.1	-25.0	-27.1	-28.6	-30.1	-27.0	-16.9	
23-Feb	-31.2	-32.1	-32.6	-33.0	-33.1	-33.2	-34.0	-34.5	-32.2	-27.9	-24.1	-19.3	-16.2	-15.3	-14.5	-14.2	-14.6	-17.3	-20.2	-22.1	-24.0	-26.4	-27.9	-28.6	-25.4	-14.2	
24-Feb	-26.8	-26.1	-26.4	-26.6	-27.2	-27.6	-28.3	-28.1	-27.2	-24.6	-20.9	-18.6	-17.0	-16.1	-15.4	-15.6	-16.3	-17.3	-18.2	-19.3	-20.4	-21.2	-21.6	-21.6	-22.0	-15.4	
25-Feb	-21.8	-22.3	-22.9	-22.2	-21.3	-20.1	-19.0	-18.0	-16.3	-14.2	-11.1	-8.3	-7.1	-5.5	-4.5	-5.1	-5.3	-6.2	-7.8	-6.9	-7.4	-8.4	-9.6	-10.3	-12.6	-4.5	
26-Feb	-11.2	-11.8	-12.5	-12.3	-12.9	-14.6	-16.5	-16.1	-15.0	-13.8	-12.0	-10.8	-9.6	-8.1	-7.9	-7.6	-7.5	-7.9	-8.2	-8.4	-9.0	-9.3	-9.6	-10.1	-10.9	-7.5	
27-Feb	-10.5	-10.7	-10.8	-10.7	-10.7	-10.8	-11.3	-11.8	-11.1	-9.7	-7.2	-7.2	-7.9	-7.2	-7.3	-8.2	-8.7	-9.5	-10.8	-12.5	-13.8	-14.5	-14.8	-15.6	-10.6	-7.2	
28-Feb	-17.0	-18.7	-19.8	-19.9	-19.1	-19.4	-19.8	-19.6	-18.5	-17.2	-16.3	-14.5	-12.7	-11.8	-11.2	-10.4	-11.0	-13.0	-14.8	-15.7	-17.0	-18.4	-20.0	-20.4	-16.5	-10.4	
		-13.8	-14.3	-14.7	-14.8	-14.7	-14.9	-15.3	-15.7	-15.5	-14.1	-12.2	-10.6	-9.2	-8.2	-7.6	-7.6	-8.1	-9.2	-10.3	-11.0	-11.8	-12.5	-13.0	-13.5	Diurnal Average	
		4.0	4.5	3.7	3.0	3.8	4.1	4.3	3.7	1.9	1.4	1.9	2.7	5.1	6.1	6.1	5.4	4.5	3.7	2.8	2.4	2.1	2.7	2.6	3.2	Diurnal Maximum	



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

**Ambient Temperature (AT) - C**  
**Janvier - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Janvier - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	151	22.47	22.47
-20 - 0	418	62.20	84.67
0 - 10	103	15.33	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672





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

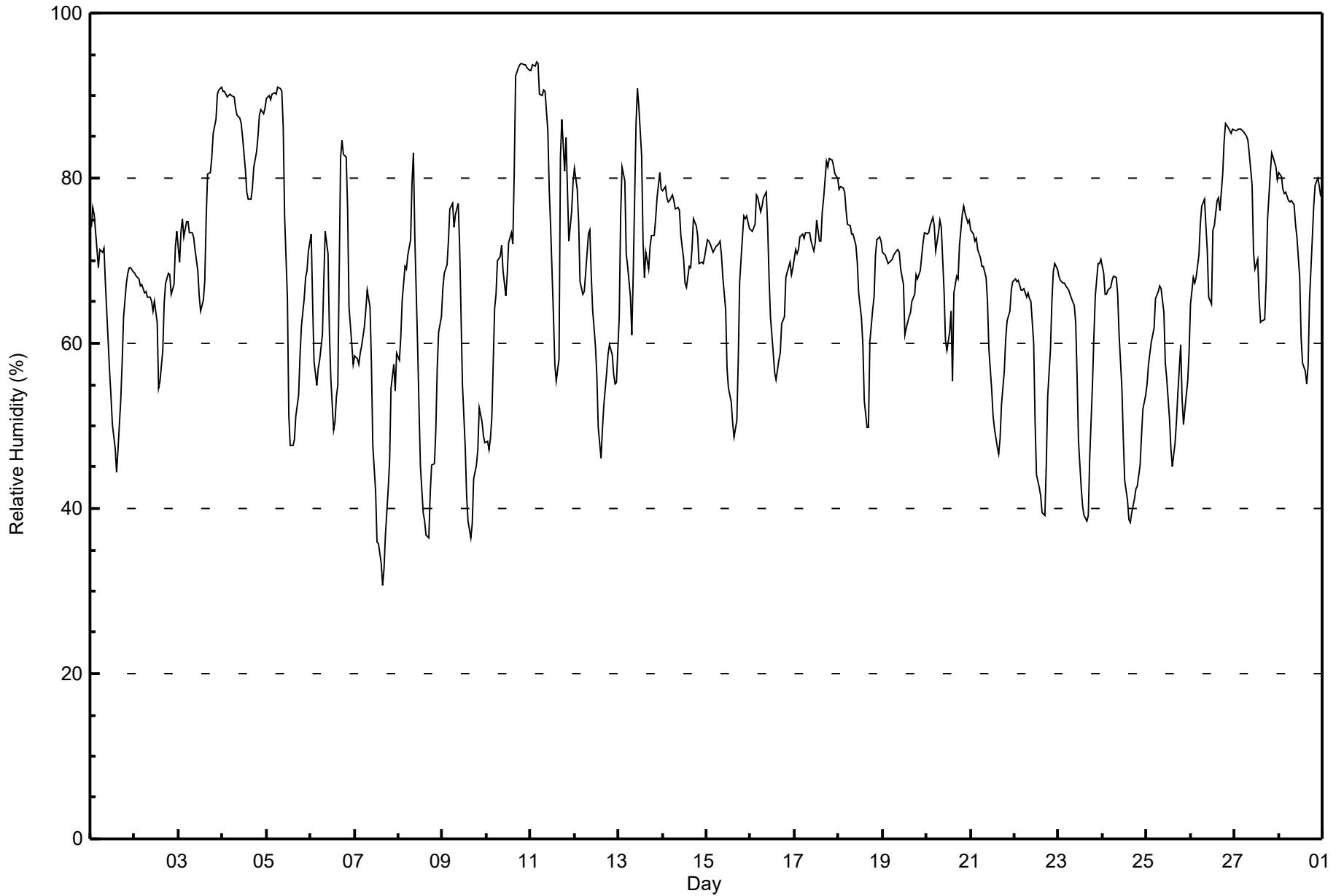
**Relative Humidity (RH) - %**  
**Janvier - February 2023**

Maximum Value: 94.1 % on Feb 11 04:00      Maximum Daily Average: 85.9 % on Feb 4																						Hours in Service: 672 Hours of Data: 672				
Minimum Value: 30.7 % on Feb 7 16:00      Minimum Daily Average: 50.6 % on Feb 7 Maximum Diurnal Average: 73.9 % at hour 8      Minimum Diurnal Average: 54.5 % at hour 15 Monthly Average: 67.62 %      Percentiles: P <sub>1</sub> = 36.7 P <sub>10</sub> = 48.9 Q <sub>1</sub> = 59.6 Median = 68.7 Q <sub>3</sub> = 75.5 P <sub>90</sub> = 84.7 P <sub>99</sub> = 93.6																						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-Feb	74.0	76.5	75.6	71.3	69.2	71.4	71.0	71.5	67.2	63.7	56.6	53.5	50.2	47.3	44.5	47.2	53.3	57.8	63.3	67.3	68.5	69.1	69.2	68.6	63.7	76.5
2-Feb	68.5	68.2	67.8	67.0	67.0	66.1	66.3	65.5	65.6	65.1	64.0	65.1	62.6	54.5	55.3	59.2	65.0	67.2	68.5	68.3	65.9	67.1	71.6	73.6	65.6	73.6
3-Feb	69.9	73.6	75.0	72.9	74.7	74.8	73.3	73.4	72.9	71.4	68.9	65.8	64.0	65.2	67.7	75.3	80.4	80.7	82.6	85.5	87.1	90.2	90.7	91.1	76.1	91.1
4-Feb	90.6	90.5	89.9	90.1	90.2	90.0	89.8	88.5	87.6	87.3	86.6	84.9	81.0	78.3	77.4	77.4	78.8	81.3	83.3	85.1	87.7	88.4	87.8	88.4	85.9	90.6
5-Feb	89.6	89.9	89.4	90.2	90.3	90.2	91.1	90.9	90.5	86.3	75.5	65.4	51.4	47.7	47.6	48.2	51.2	53.8	58.5	62.0	65.4	68.0	68.7	71.2	72.2	91.1
6-Feb	73.2	65.0	57.7	55.0	56.9	57.9	61.1	67.6	73.5	70.8	61.4	55.8	49.5	50.6	53.6	54.9	82.6	84.7	82.9	82.6	76.3	64.4	59.7	57.5	64.8	84.7
7-Feb	58.4	58.1	57.5	58.7	59.6	62.0	64.0	66.5	64.4	57.6	47.6	42.1	36.0	35.7	33.4	30.7	32.6	36.7	42.3	45.8	54.6	57.4	54.3	58.8	50.6	66.5
8-Feb	57.9	60.9	65.3	69.3	69.0	70.8	72.6	79.4	83.0	72.8	59.6	52.2	45.0	39.5	38.4	36.8	36.5	41.9	45.2	45.5	49.5	57.0	61.3	63.2	57.2	83.0
9-Feb	66.7	68.5	69.6	72.3	76.3	77.0	74.0	75.5	76.9	71.8	63.6	55.1	47.5	41.5	38.5	36.5	38.1	43.5	45.3	47.1	52.3	50.5	48.9	48.0	57.7	77.0
10-Feb	48.1	47.1	48.5	51.0	64.3	66.0	70.0	70.5	71.9	68.9	65.8	68.3	72.3	73.5	72.1	80.7	92.3	93.3	93.8	93.9	93.8	93.8	93.4	93.1	74.4	93.9
11-Feb	93.1	93.8	93.6	94.1	93.9	90.1	90.1	90.6	90.5	85.7	78.6	74.1	63.4	57.5	55.4	58.2	82.5	87.1	80.9	84.9	78.6	72.3	76.0	79.5	81.0	94.1
12-Feb	81.2	78.7	74.7	67.4	66.0	66.3	68.5	73.1	73.6	68.4	64.1	59.7	56.1	49.8	46.0	49.6	52.6	56.5	58.6	59.8	58.6	56.4	55.1	55.2	62.3	81.2
13-Feb	63.3	75.4	81.3	79.7	70.9	69.3	65.5	61.0	68.5	86.7	90.8	88.6	82.8	72.4	68.0	71.1	69.0	71.7	73.1	73.1	75.0	77.7	80.8	78.7	74.8	90.8
14-Feb	78.5	78.9	77.7	77.1	77.3	77.9	77.2	76.3	76.4	76.1	73.1	70.1	67.2	66.8	69.3	69.2	71.5	75.0	74.2	73.1	69.6	69.9	69.7	70.4	73.4	78.9
15-Feb	72.6	72.3	72.0	71.1	71.3	71.7	72.1	72.4	70.8	68.0	64.0	56.9	54.7	52.9	50.4	48.6	50.7	58.1	67.5	72.9	75.5	75.1	75.4	73.9	66.3	75.5
16-Feb	73.8	73.5	74.4	78.0	77.6	75.9	76.6	77.6	78.3	74.2	67.9	63.2	58.8	56.5	55.6	58.0	58.8	62.4	63.2	67.9	68.6	69.8	68.2	69.2	68.7	78.3
17-Feb	71.3	70.9	71.4	72.9	73.2	72.7	73.3	73.4	73.3	72.4	71.1	72.2	75.0	72.4	72.3	75.9	77.7	82.0	81.4	82.4	82.3	81.6	80.6	79.9	75.5	82.4
18-Feb	78.7	79.0	78.8	78.3	76.1	74.4	74.3	73.2	73.2	71.8	69.8	66.1	63.0	59.9	53.0	49.9	49.8	60.1	64.1	65.6	70.6	72.6	72.9	72.3	68.7	79.0
19-Feb	71.0	70.7	70.1	69.7	69.9	70.1	70.6	71.1	71.4	71.0	69.0	67.2	61.0	61.8	63.2	63.7	65.1	66.0	68.3	67.8	68.9	70.6	72.2	73.3	68.5	73.3
20-Feb	73.3	73.4	74.3	75.2	74.3	71.2	73.4	75.0	74.0	66.3	60.3	59.2	61.4	63.9	55.4	66.0	68.2	67.8	71.9	75.6	76.7	75.7	74.6	75.0	70.1	76.7
21-Feb	73.8	73.2	72.4	72.8	71.4	70.4	69.4	69.4	67.9	65.1	59.3	54.4	51.2	49.6	47.4	46.6	48.5	52.5	56.7	60.5	62.8	64.0	66.5	67.5	62.2	73.8
22-Feb	67.8	67.4	67.7	66.5	66.5	66.6	65.6	66.1	65.5	65.1	60.0	50.6	44.1	42.6	41.5	39.5	39.2	45.3	53.5	59.3	65.1	68.6	69.7	69.0	58.9	69.7
23-Feb	68.1	67.6	67.2	67.2	66.9	66.5	66.0	65.4	64.5	62.6	55.9	48.2	42.4	40.2	39.1	38.4	39.1	46.0	55.2	60.9	65.8	69.6	69.7	70.1	58.4	70.1
24-Feb	68.5	65.9	65.9	66.4	66.8	67.6	68.1	68.0	65.9	61.1	54.6	48.5	43.4	41.1	38.6	38.3	39.4	41.2	42.4	42.8	45.2	48.9	52.1	53.7	53.9	68.5
25-Feb	55.1	57.4	60.2	60.9	61.8	65.4	66.3	66.9	66.5	63.7	57.6	55.8	50.9	47.3	45.1	47.9	50.7	54.0	59.8	53.2	50.1	52.0	55.5	58.9	56.8	66.9
26-Feb	64.7	68.0	67.2	67.9	70.6	74.5	76.6	77.4	74.3	71.2	65.7	64.7	73.6	74.2	77.2	77.6	76.0	80.5	84.4	86.6	86.2	85.8	85.4	85.9	75.7	86.6
27-Feb	85.8	85.8	86.0	86.0	85.8	85.6	85.0	84.6	82.9	79.2	71.1	68.9	70.2	65.4	62.5	62.8	62.9	67.5	74.9	80.7	83.1	82.6	81.3	79.9	77.5	86.0
28-Feb	80.7	80.1	78.7	78.2	78.3	77.3	77.1	77.3	76.8	74.4	72.9	67.9	60.8	57.7	56.6	55.0	57.2	65.3	72.7	76.6	79.2	80.0	79.0	77.8	72.4	80.7
72.1 72.5 72.5 72.4 72.7 72.8 73.2 73.9 73.9 71.4 66.3 62.3 58.5 55.9 54.5 55.8 59.6 63.6 66.7 68.8 70.1 70.7 71.1 71.6																								Diurnal Average		
93.1 93.8 93.6 94.1 93.9 90.2 91.1 90.9 90.5 87.3 90.8 88.6 82.8 78.3 77.4 80.7 92.3 93.3 93.8 93.9 93.8 93.8 93.4 93.1																								Diurnal Maximum		



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

**Relative Humidity (RH) - %**  
**Janvier - February 2023**





Maximum Speed: 25 km/h on Feb 7 14:00	Maximum Daily Speed Average: 14.1 km/h on Feb 24	Hours in Service: 672
Minimum Speed Value: 1 km/h on Feb 28 16:00	Minimum Daily Speed Average: 0.9 km/h on Feb 10	Hours of Data: 670
Maximum Diurnal Speed Average: 4.0 km/h at hour 6	Minimum Diurnal Speed Average: 0.7 km/h at hour 19	Hours of Missing Data: 2
Monthly Average Velocity: 2.4 km/h 245.5 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> = 20	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-Feb	SW2	SW4	NNE7	NNE10	N7	NNW4	NNE9	NNE10	N11	N9	N10	NNE10	NNE13	NNE9	N9	NNE9	N6	NNW5	NW3	W3	SW4	SW5	SSW8	SSW9	N4.6	NNE13
2-Feb	SSW8	SSW6	SSW8	SSW7	SSW9	SSW7	SSW8	SSW5	S4	SSW2	WSW1	NNE2	SSE6	SSE10	SSE10	SSE12	SSE14	SSE15	S14	S14	S12	S12	S12	SSW14	S8.1	SSE15
3-Feb	SSW16	SSW15	SSW15	SSW16	SSW17	SW18	SW17	SW16	SW16	SW17	SW20	SW17	WSW14	SW9	SW7	NW9	NW7	N6	NE8	NE6	NE6	NE7	NE6	NNE4	SW7.6	SW20
4-Feb	NE1	SSW5	W2	ESE1	NNE3	NNE4	NNE3	NNE5	N6	NNE7	NNE5	NNE6	NNE6	N2	NNE4	N5	NNE3	NNW2	NNE1	NNW2	N2	NNW2	WNW1	S3	NNE2.5	NNE7
5-Feb	S5	S6	S6	S4	SSE2	ESE1	NE1	SSW3	SSW10	SW8	SSW12	SW10	SW11	WSW6	SW3	SSW12	SW12	SW13	SW12	SW13	SW12	SW12	SW10	SW7.7	SW13	
6-Feb	WNW20	NW18	WNW15	WNW16	WNW15	WNW12	WSW8	SW8	SW8	SW10	SW9	WSW8	WSW5	SSW7	SSW6	S5	SSW8	SSE5	SSE7	SSW6	SW9	SW12	SW13	SW13	WSW7.5	WNW20
7-Feb	SW13	SW11	SSW13	SW14	WSW14	W14	W18	WNW20	WNW20	WNW21	WNW19	W18	W21	W25	W21	WNW22	WNW15	WNW11	W9	W7	SW6	S9	SSW10	SSW9	W13.2	W25
8-Feb	SW12	SW10	SSW9	SSW10	SW9	SSW10	SSW10	SSW5	SSW4	SW6	SSW6	SW4	WSW6	SW7	SSW9	SSW10	WSW8	SW6	SSW10	SSW12	SSW11	SSW12	SSW12	SSW12	SSW8.5	SSW12
9-Feb	SSW13	SW12	SW13	SW12	SW11	SSW12	SSW14	SSW15	SSW15	SSW12	SW11	SW11	SW11	SW12	SW10	SSW11	SSW8	S9	S12	S8	S7	SSW8	SSW8	SSW8	SSW10.5	SSW15
10-Feb	SSW10	SSW10	SSW9	S5	ESE2	SSW5	SSE4	SE3	E6	NE4	E4	NNE6	NNE6	N8	NNE8	N4	N5	NNE5	NNW3	NNW3	N2	NNE2	NE2	UO	ENE0.9	SSW10
11-Feb	S2	S3	SW4	W5	W6	W6	SW7	SW10	SW9	SW10	SW10	SSW11	WSW14	WSW16	WSW12	WSW15	WSW14	WSW13	WSW15	W14	WNW20	WNW19	W13	WSW12	WSW9.8	WNW20
12-Feb	WSW12	WSW11	WSW7	W13	W15	W14	SW10	SW8	SW10	SW13	WSW13	SW10	SW11	WSW11	SW10	SSW9	S9	S8	S9	S9	S10	S11	S12	S13	SW9.3	W15
13-Feb	SSW11	SSW17	SW15	SW16	SW18	SW16	WSW16	W16	SW10	WSW13	WSW13	W14	N19	N14	N16	N15	N17	N16	N17	N13	N10	N6	N9	WNW6.5	N19	
14-Feb	N7	N9	NNE9	NNE7	NNE7	NE8	ENE5	NNE3	SW4	SW5	SW5	SW5	SW7	WSW5	WSW5	SSW4	N4	NNE7	NNE9	NNE9	N9	NNE7	NNE8	NNE8	N3.4	NNE9
15-Feb	NNE8	NE7	NE7	E6	ENE4	NE4	NE4	E5	E6	E5	ENE5	ENE4	NE6	ENE7	ENE6	NE5	E6	E6	SE1	S1	SE2	SW2	ESE2	ESE3	ENE4.0	NNE8
16-Feb	SSE3	SE2	S6	S6	S9	S8	SSE6	S7	SSW9	SSW12	SW14	SSW16	SSW16	SW13	SW14	SW14	SW13	SW8	WSW8	WNW13	NW14	NNW12	N11	N9	SW6.3	SSW16
17-Feb	N12	NNE11	NNE8	NNE9	N6	NNE7	NE8	NE7	ENE4	E5	ENE6	ENE5	NE5	NNE6	NNE7	N7	NNE9	NNE8	NNE9	NNE8	NNE7	NNE9	NNE9	NNE9	NNE7.0	N12
18-Feb	NNE8	NNE8	NNE7	NNE8	NNE10	NNE9	NNE8	NNE10	NNE9	NNE8	NNE8	NNE9	NE9	NE8	NE4	NE4	NE4	NE4	NNE6	ENE2	SSW2	S3	SSW4	S3	NNE5.4	NNE10
19-Feb	SSE2	SSE2	SSE2	SE2	NE1	NNE2	N3	NNE3	NNE4	N5	NNE6	NNE7	NNE5	NNE8	N12	NNE11	NNE7	NE8	NNE8	NNE10	NNE7	NNE7	NNE5	NNE5	NNE4.9	N12
20-Feb	N3	NW2	WSW2	SW5	WNW1	NW2	NW1	W2	S2	NW3	NE2	NE3	NE5	WNW3	NNW9	NNE9	NE10	NNE9	NNE7	NE5	NNE6	NNE8	NNE8	NNE4	NNE3.3	NE10
21-Feb	NNW2	NW3	NNW6	N8	N7	N6	NNW3	NW2	NNW4	NNW7	N10	NNW11	NNE13	NNE12	NNE11	NNE16	NNE13	NNE12	NNE9	N7	N7	NNE8	NNE5	NNE3	N7.3	NNE16
22-Feb	SSW4	SSW7	SSW6	SSW6	SSW8	SSW11	SSW6	SSW10	SSW10	SSW7	S4	ENE3	ENE3	NE7	NNE8	NNE8	NNE8	NNE8	NNE6	NNE6	NNE2	WSW2	S2	SSW2	SSW1.1	SSW11
23-Feb	SSW1	SSW4	SSW3	SSW3	SSW8	SSW6	SSW7	SSW6	SSW6	SW3	WSW2	WSW3	S3	ENE7	ENE7	E7	ENE5	NE5	NNE3	NNE1	UO	SSW3	SSW6	SSW9	S2.2	SSW9
24-Feb	SSW12	SSW13	SSW13	SSW12	SSW11	SW12	SSW12	SSW11	SSW11	SW7	SW11	SSW17	SSW17	S16	SSW17	SSW17	SSW17	SSW14	SSW16	SSW18	SSW20	SSW19	SW16	SSW15	SSW14.1	SSW20
25-Feb	SSW13	SSW12	SSW14	SW14	SW12	SW14	SW13	SW12	SW12	SW10	W11	SSW12	WSW10	SW10	SW12	SW9	S6	S7	SSW12	SSW9	SSW9	S6	SSE8	SW10.1	SSW14	
26-Feb	SSE9	SSE8	S6	SE2	SSE4	SE4	NE3	N3	N3	NNE5	NNE5	NNE6	NNE6	ENE11	NE13	NE13	ENE9	ENE8	NE6	NE7	NE7	ENE7	NE5	NNE5	ENE4.6	NE13
27-Feb	NNE6	NNE4	N4	NNW3	NNW3	NW4	NW5	WNW6	WNW4	NW3	NNE5	N7	NW8	NW10	NW11	NW14	NNW11	NNW9	N7	N5	N5	N5	N6	N6	NNW5.7	NW14
28-Feb	NNE6	NNE4	NNE1	N3	N3	W3	WSW2	W1	SW3	NNE3	NNE5	NNE4	NE6	NE8	NNE5	N1	NE5	ESE2	NNE2	NE3	NNE2	NNE3	SSW3	SE1	NNE2.2	NE8

SW3.3 SW3.7 SW3.5 SW3.5WSW3.7WSW4.0 SW3.6WSW3.5 SW3.7WSW3.8WSW3.4 W3.1 W2.5WNW2.1WNW2.1WNW1.5 NW1.1 N0.7WNW0.7 W1.2 W1.6WSW1.7 SW2.2 SW2.7	Diurnal Average
WNW20 NW18 SSW15 SSW16 SW18 SW18 W18WNW20WNW20WNW21 SW20 W18 W21 W25 W21WNW22 N17 N16 N17 SSW18 SSW20 SSW19 SW16 SSW15	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**

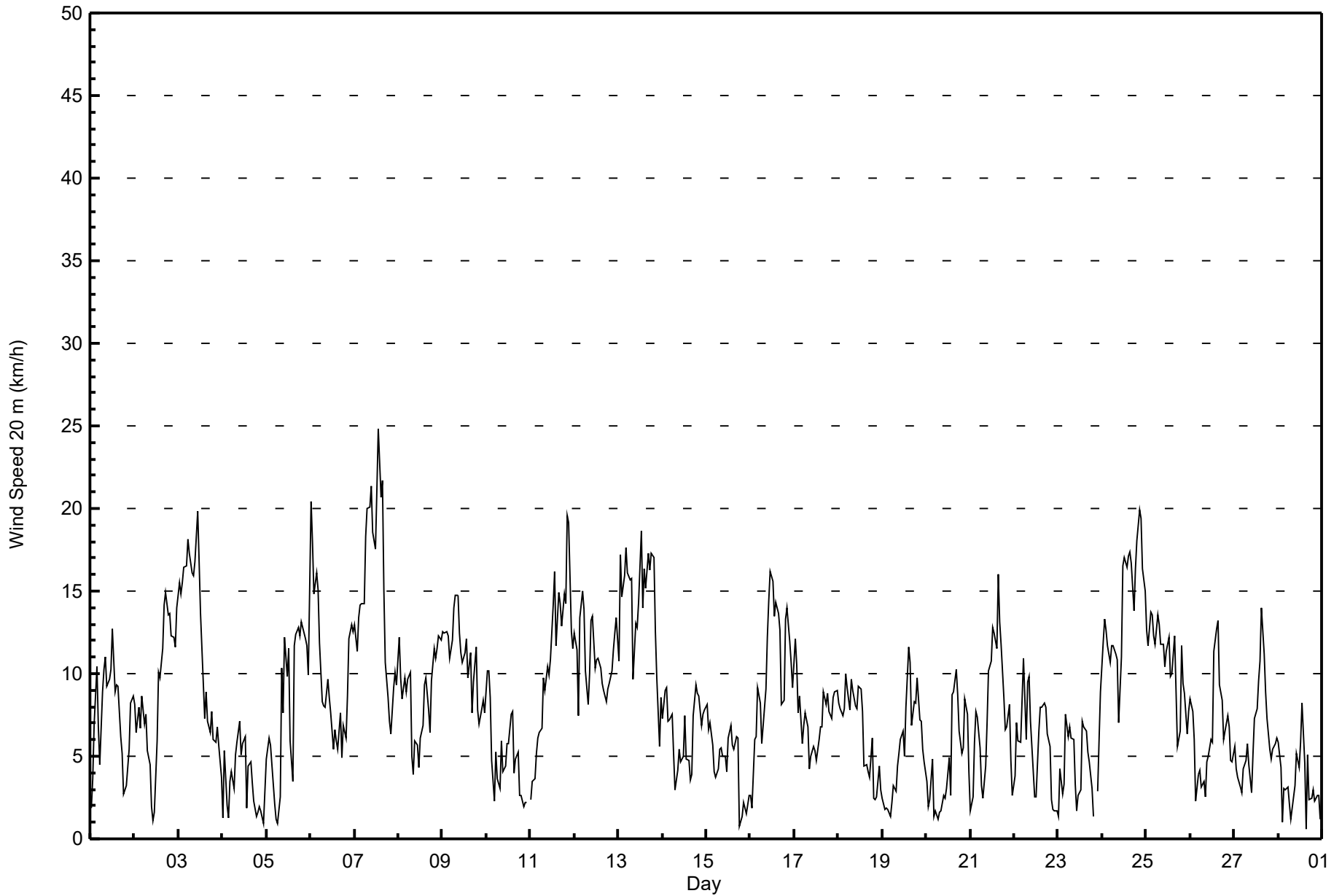
**Wind Speed 20 m (WS20m) - km/h**  
**Janvier - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Feb 6 01:00 Minimum Value: 1 km/h on Feb 15 21:00 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> = 7																	Hours in Service: 672 Hours of Data: 670 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-Feb	1	2	4	3	3	1	4	4	4	4	4	3	3	4	4	3	3	2	1	1	1	2	1	2	4	4
2-Feb	1	2	2	2	2	2	2	1	1	1	1	1	3	4	3	4	5	5	4	4	4	4	3	4	5	
3-Feb	4	4	4	4	4	5	5	5	4	5	5	5	4	3	2	4	3	3	1	1	2	2	1	2	5	
4-Feb	1	1	1	1	1	1	1	2	2	2	1	1	2	1	2	2	1	1	1	1	1	1	1	1	2	
5-Feb	2	1	1	2	2	1	1	2	3	3	3	3	3	3	1	2	2	4	3	3	3	3	3	2	4	
6-Feb	8	8	7	6	4	3	3	2	2	2	2	2	2	2	4	3	1	2	1	2	3	3	3	3	8	
7-Feb	3	3	3	3	4	4	5	6	6	6	6	5	7	8	6	7	4	4	2	2	1	2	2	2	8	
8-Feb	2	2	2	1	2	1	1	2	2	2	1	2	2	3	3	2	2	1	2	2	2	2	2	2	3	
9-Feb	2	3	3	3	2	2	3	3	3	3	3	3	3	3	3	3	2	3	2	2	2	2	2	1	3	
10-Feb	2	2	2	3	1	2	2	2	2	1	2	2	1	3	2	1	2	1	1	1	1	1	1	UO	3	
11-Feb	1	1	1	1	1	2	2	2	2	2	2	2	5	5	4	7	5	4	5	4	6	5	4	3	7	
12-Feb	4	4	3	4	4	4	3	2	3	3	3	3	3	3	3	2	2	3	2	2	3	3	3	4	4	
13-Feb	3	4	4	4	4	5	4	5	3	5	4	5	7	7	6	6	7	6	7	6	4	5	2	4	7	
14-Feb	2	3	3	2	2	1	2	2	1	1	1	2	2	2	1	2	2	2	3	3	3	2	2	2	3	
15-Feb	3	2	2	1	1	1	1	2	2	2	1	1	2	2	2	1	2	2	1	1	1	1	1	1	3	
16-Feb	1	1	1	2	2	3	2	2	3	3	4	4	4	4	4	4	3	2	3	4	6	5	5	4	6	
17-Feb	4	3	2	3	2	2	1	1	1	1	2	2	1	1	2	2	2	2	2	2	2	2	2	2	4	
18-Feb	2	2	2	2	3	2	2	3	2	2	2	2	2	2	1	1	2	1	1	2	1	1	1	1	3	
19-Feb	1	1	2	1	1	1	1	1	1	1	1	1	1	2	3	3	2	2	2	3	2	2	2	1	3	
20-Feb	1	1	1	1	1	1	1	1	1	1	1	1	2	3	3	2	3	2	1	1	1	3	2	1	3	
21-Feb	1	1	2	2	2	2	2	2	2	3	4	4	4	3	3	4	4	4	2	2	2	3	2	1	4	
22-Feb	2	2	1	1	2	2	2	2	3	3	1	1	1	3	2	2	2	2	2	1	1	1	1	1	3	
23-Feb	1	1	1	1	1	1	1	1	1	2	1	1	2	2	1	2	1	1	2	1	UO	2	1	1	2	
24-Feb	2	2	2	2	3	2	2	2	2	3	6	5	5	5	5	4	4	4	4	5	5	6	4	4	6	
25-Feb	3	3	3	4	3	3	3	3	3	3	4	3	3	4	4	3	3	1	2	4	2	1	2	2	4	
26-Feb	2	2	1	1	2	1	1	1	1	1	1	2	1	3	3	4	3	2	1	2	1	2	2	1	4	
27-Feb	1	1	1	1	1	1	1	1	1	1	2	3	3	4	4	5	5	4	3	2	1	1	2	2	5	
28-Feb	1	1	1	1	2	1	1	1	1	2	2	2	2	2	2	2	3	1	1	1	1	1	2	1	3	
8 8 7 6 4 5 5 6 6 6 6 5 7 8 6 7 7 6 7 6 6 6 5 4																								Diurnal Maximum		
UO - Unstable Operation																										



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

**Wind Speed 20 m (WS20m) - km/h**  
**Janvier - February 2023**





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

**Wind Speed 20 m (WS20m) - km/h**  
**Janvier - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	205	30.60	30.60
6 - 11	300	44.78	75.37
12 - 19	154	22.99	98.36
20 - 28	11	1.64	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 670

Total Number of Hours: 672



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

**Wind Speed 20 m (WS20m) - km/h**  
**Janvier - February 2023**

<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	19	39	22	11	3	6	8	9	14	18	15	9	6	4	10	12	205
6 - 11	29	78	21	9	6	0	0	8	21	58	40	13	4	2	5	6	300
12 - 19	11	6	2	0	0	0	0	4	8	43	43	15	10	8	3	1	154
20 - 28	0	0	0	0	0	0	0	0	0	1	1	0	3	6	0	0	11
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>59</b>	<b>123</b>	<b>45</b>	<b>20</b>	<b>9</b>	<b>6</b>	<b>8</b>	<b>21</b>	<b>43</b>	<b>120</b>	<b>99</b>	<b>37</b>	<b>23</b>	<b>20</b>	<b>18</b>	<b>19</b>	<b>670</b>

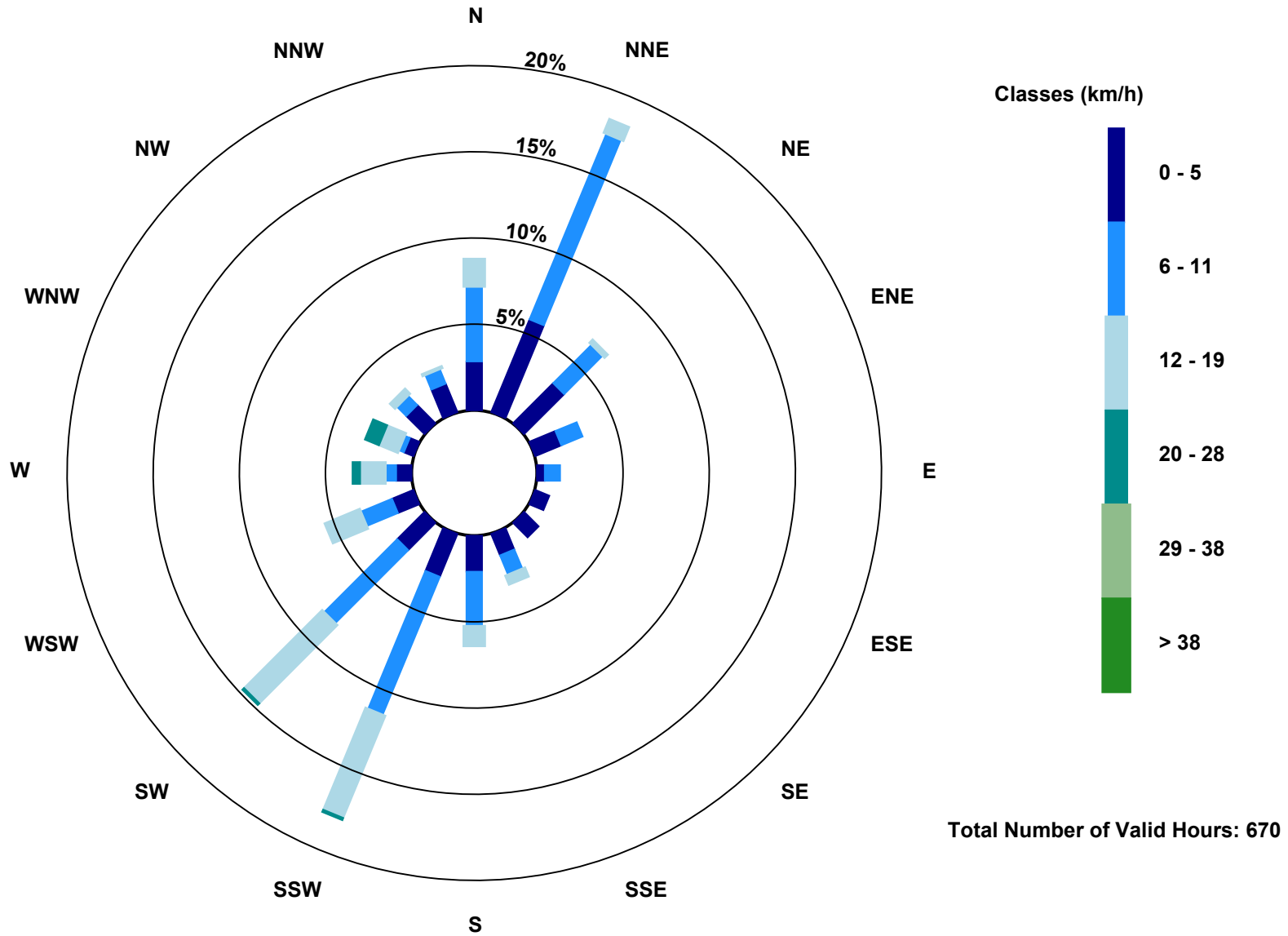
Total Number of Valid Hours: 670

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed 20 m (WS20m) - km/h  
Janvier







Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg

Janvier - February 2023

Direction of Maximum Speed: 275 deg on Feb 7 14:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 204.7 deg on Feb 24	Hours of Data: 670
Direction of Minimum Speed: 0 deg on Feb 28 16:00	Hours of Missing Data: 2
Direction of Minimum Daily Speed Average: 0.9 deg on Feb 10	Percent Operational Time: 99.7
Monthly Average Direction: 245.5 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-Feb	219	217	14	12	359	329	15	12	360	356	4	17	30	15	355	14	4	333	316	263	235	219	208	208	356.7
2-Feb	209	200	206	205	202	199	201	195	188	203	243	14	147	152	153	153	161	163	169	174	174	171	178	194	177.9
3-Feb	197	200	199	208	209	215	215	221	224	225	228	235	241	227	230	311	319	4	42	43	42	36	35	33	223.5
4-Feb	39	212	260	116	23	16	25	19	8	25	29	21	25	358	20	6	28	345	17	345	2	340	290	185	14.4
5-Feb	184	173	169	178	157	103	36	207	208	225	211	223	227	240	227	207	214	222	230	224	225	231	220	224	215.8
6-Feb	295	307	299	296	282	284	252	223	221	227	228	246	239	208	195	169	204	168	167	197	218	224	218	223	247.4
7-Feb	233	224	210	232	251	261	270	289	294	291	282	269	266	275	275	284	288	287	263	265	218	181	208	207	263.7
8-Feb	216	227	212	208	223	211	204	201	204	221	209	217	240	219	213	200	242	216	206	213	208	203	210	209	213.2
9-Feb	213	218	220	226	214	203	204	211	208	209	229	231	232	233	217	211	196	175	187	178	182	205	208	205	210.6
10-Feb	194	202	198	191	116	198	155	130	80	48	84	31	15	3	20	2	11	22	344	331	356	25	34	UO	60.8
11-Feb	186	188	219	268	276	269	231	236	219	217	225	206	245	251	243	242	243	247	258	267	291	294	275	257	251.3
12-Feb	253	254	251	271	279	264	234	216	217	233	239	233	231	237	233	207	191	180	182	173	169	186	184	190	224.1
13-Feb	212	201	217	221	225	234	249	260	231	258	248	269	357	355	0	357	0	356	356	359	1	9	4	5	298.9
14-Feb	11	10	15	23	27	38	61	26	231	232	231	235	219	243	249	200	2	23	27	15	11	20	22	23	8.1
15-Feb	33	38	51	91	71	45	56	85	85	86	77	75	51	60	73	56	94	101	132	173	126	227	110	120	71.7
16-Feb	148	140	172	181	191	182	162	186	200	212	218	212	211	218	222	226	219	236	257	298	326	328	351	0	227.3
17-Feb	8	17	21	21	4	22	39	45	66	79	77	70	46	17	18	11	27	23	23	22	20	19	20	13	26.5
18-Feb	16	20	22	26	17	18	17	21	26	22	24	31	37	39	36	41	51	53	32	57	211	188	203	175	28.4
19-Feb	168	160	150	139	51	21	5	15	15	10	16	21	18	15	10	24	24	39	27	30	24	22	16	13	23.4
20-Feb	2	326	241	221	303	309	321	266	172	312	43	40	42	302	332	32	36	31	31	40	25	20	30	18	14.6
21-Feb	341	318	348	6	358	4	335	313	346	332	3	347	17	29	19	28	17	12	12	353	1	17	25	20	7.1
22-Feb	208	204	203	198	210	204	203	209	207	206	189	66	63	45	22	19	18	22	25	30	17	238	172	200	197.3
23-Feb	192	203	195	194	203	206	204	210	211	215	243	249	176	77	75	87	57	37	32	14	UO	198	202	205	181.6
24-Feb	209	207	208	211	212	217	208	208	205	226	225	200	198	185	198	195	196	192	199	198	207	212	214	213	204.7
25-Feb	209	212	210	225	219	227	219	227	227	233	236	259	234	255	235	223	227	184	182	207	208	203	180	165	219.9
26-Feb	160	151	171	144	153	124	53	9	357	16	15	14	22	59	55	56	70	62	43	46	51	67	53	20	61.9
27-Feb	23	16	2	348	340	322	306	295	296	305	16	352	318	323	311	308	330	339	350	7	353	7	2	7	336.5
28-Feb	21	21	21	350	357	269	247	265	227	27	13	28	47	44	26	0	46	120	21	49	25	28	212	126	25.2
228.2 221.7 220.2 234.4 241.6 239.4 231.7 239.4 230.9 249.3 250.1 261.5 270.1 285.5 295.3 289.3 310.7 358.0 295.5 269.3 263.9 246.6 220.4 216.5																									
Diurnal Average																									

UO - Unstable Operation

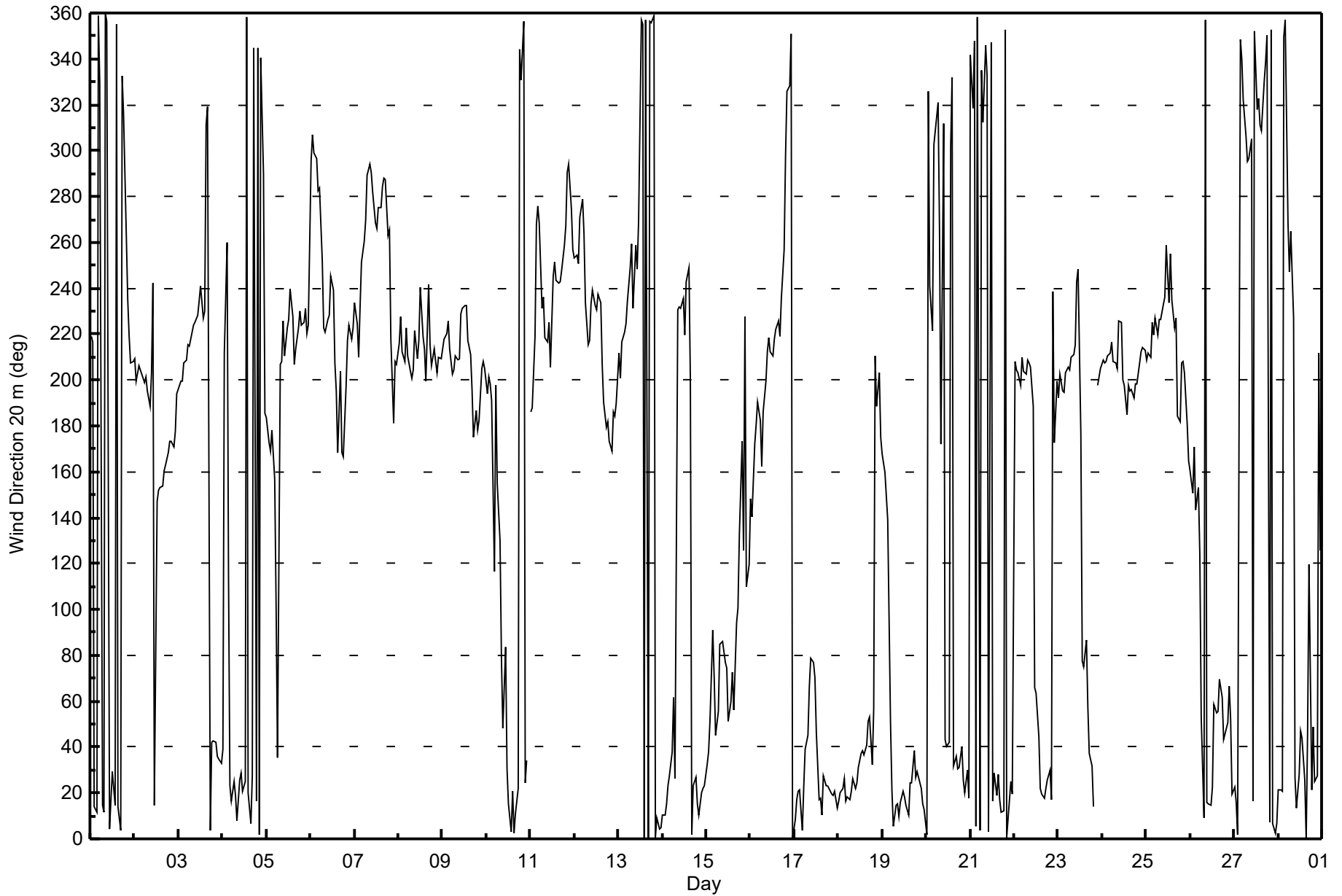
All monthly, daily, and diurnal averages have been calculated using vector methods



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

**Wind Direction 20 m (WD20m) - deg**  
**Janvier - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 107 deg on Feb 28 16:00 Minimum Value: 6 deg on Feb 28 21:00 Percentiles: P <sub>1</sub> = 8 P <sub>10</sub> = 12 Q <sub>1</sub> = 16 Median = 20 Q <sub>3</sub> = 27 P <sub>90</sub> = 38 P <sub>99</sub> = 75																			Hours in Service: 672 Hours of Data: 670 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-Feb	12	23	57	21	29	27	24	21	23	29	29	20	15	36	34	23	27	25	30	28	19	12	11	12	57																						
2-Feb	9	15	13	12	9	13	10	9	21	52	71	54	36	26	26	24	23	23	22	20	20	20	17	17	71																						
3-Feb	16	17	16	17	19	19	19	20	17	19	19	19	19	22	28	35	42	11	15	18	14	11	37	42																							
4-Feb	67	19	36	64	11	16	18	22	19	17	15	21	20	59	34	37	43	25	33	55	57	47	85	14	85																						
5-Feb	21	19	20	19	77	80	69	68	10	30	17	28	20	27	38	14	15	17	18	17	17	17	16	21	80																						
6-Feb	19	22	25	22	19	19	33	20	20	17	22	29	37	24	24	33	30	18	17	14	13	15	17	18	37																						
7-Feb	19	19	15	20	18	20	19	22	20	18	19	21	20	20	22	19	16	14	14	20	25	19	10	13	25																						
8-Feb	12	13	18	12	15	10	9	17	21	20	22	36	23	27	22	14	25	25	11	15	14	11	12	12	36																						
9-Feb	15	16	16	16	14	10	13	15	13	17	21	20	20	21	21	17	21	15	15	18	18	16	16	18	21																						
10-Feb	13	14	14	52	52	22	21	52	19	28	23	25	30	29	21	28	27	15	28	36	28	20	20	UO	52																						
11-Feb	28	21	16	30	13	21	18	14	18	17	18	17	25	21	26	27	22	22	20	20	19	17	21	22	30																						
12-Feb	20	20	31	20	18	21	20	19	16	19	19	23	21	23	21	16	15	18	14	16	20	20	17	16	31																						
13-Feb	21	16	18	19	19	22	19	22	37	24	20	28	30	29	28	32	30	32	32	27	27	25	25	28	37																						
14-Feb	19	20	18	15	15	8	15	58	19	18	26	32	30	45	37	69	35	16	15	18	20	16	16	18	69																						
15-Feb	15	22	17	17	19	22	22	20	21	24	22	39	21	22	29	25	17	16	86	65	19	29	48	36	86																						
16-Feb	28	55	14	14	15	17	21	17	12	18	19	18	18	19	19	20	21	16	25	19	32	37	37	35	55																						
17-Feb	22	18	16	17	24	18	12	13	31	22	26	41	26	20	20	26	14	16	14	16	15	15	15	20	41																						
18-Feb	18	12	13	13	18	16	19	20	16	19	22	15	14	12	36	26	38	26	9	58	66	23	16	28	66																						
19-Feb	33	30	44	41	23	24	25	27	22	21	19	17	29	18	18	18	17	17	22	15	14	15	17	16	44																						
20-Feb	20	38	22	16	88	60	72	43	42	42	45	52	21	93	36	14	11	12	10	11	11	15	12	9	93																						
21-Feb	59	15	18	17	21	17	28	42	37	31	31	34	21	17	19	13	18	19	17	22	19	17	12	60	60																						
22-Feb	44	10	9	8	7	7	14	9	11	15	29	56	49	22	23	21	16	12	9	6	31	32	44	55	56																						
23-Feb	52	12	18	10	8	7	7	9	8	36	45	56	64	25	17	26	21	10	38	50	UO	9	6	10	64																						
24-Feb	8	10	10	11	13	13	11	11	12	25	31	23	21	23	22	20	19	17	17	16	19	18	19	19	31																						
25-Feb	16	17	16	19	18	18	15	16	20	21	24	26	22	35	35	20	20	23	17	16	16	11	18	16	35																						
26-Feb	16	19	21	73	26	15	37	13	36	14	20	19	18	16	15	17	21	18	14	16	15	19	34	15	73																						
27-Feb	14	19	18	29	33	29	16	13	16	28	31	37	31	31	29	23	39	42	34	18	20	14	20	18	42																						
28-Feb	10	13	16	18	39	29	42	35	27	73	27	45	25	18	57	107	18	29	22	25	6	47	46	17	107																						
Diurnal Maximum																								67	55	57	73	88	80	72	68	42	73	71	56	64	93	57	107	43	42	86	65	66	47	85	60
UO - Unstable Operation																																															





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS23 FORT HILLS FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)  
 FEBRUARY 2023

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	639	32	33	99.85	33.7	0	4.7	0
TRS(ppb) Average	631	33	41	98.81	2.6	0	1	0
THC(ppm) Average	639	31	33	99.7	6	-	3.1	-
NMHC(ppm) Average	638	32	34	99.7	0.846	-	0.279	-
CH4(ppm) Average	638	32	34	99.7	5.3	-	2.8	-
NO2 (ppb) Average	589	32	83	92.41	55.5	0	31	-
NO (ppb) Average	589	32	83	92.41	222.4	-	59.1	-
NOX (ppb) Average	589	32	83	92.41	277.9	-	89.1	-
PM2.5 (ug/m3) Average	670	2	2	100	46.7	0	16.2	0
Temperature 2 m (C) Average	672	0	0	100	3	-	-2.4	-
Relative Humidity (%) Average	672	0	0	100	94.3	-	90.2	-
Wind Speed 10 m (km/h) Average	666	0	6	99.11	37	-	21	-
Wind Direction 10 m (deg) Average	666	0	6	99.11	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	639	1.08	2.7	-	0	0	0.1	0.3	0.8	2.7	33.7
TRS (ppb) Average	631	0.43	0.3	-	0.2	0.2	0.2	0.3	0.5	0.9	2.6
THC (ppm) Average	639	2.4	0.5	-	1.9	2	2	2.2	2.6	3	6
NMHC(ppm) Average	638	0.113	0.142	-	0	0	0	0.1	0.2	0.3	0.846
CH4(ppm) Average	638	2.29	0.4	-	1.9	2	2	2.2	2.4	2.7	5.3
NO2 (ppb) Average	589	19.43	11.4	-	0.4	4.9	10.2	17.9	28.8	35.5	55.5
NO (ppb) Average	589	14.37	24.3	-	0	0	0.8	4.3	16.6	39.7	222.4
NOX (ppb) Average	589	33.8	33	-	0.4	5.8	12.2	23.4	43.8	72.7	277.9
PM2.5 (ug/m3) Average	670	6.52	4.7	-	0.6	2.7	3.7	5.3	8.1	11.2	46.7
Temperature 2 m (C) Average	672	-16.53	8.7	-	-35.2	-29.2	-23.1	-16.3	-10.2	-6	3
Relative Humidity (%) Average	672	75.37	9.7	-	44.9	61.7	70.6	75.7	83.1	86.8	94.3
Wind Speed 10 m (km/h) Average	666	9.2	7	-	0	2	4	8	13	18	37
Wind Direction 10 m (deg) Average	666	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
TRS	14 Feb 2023 12:00	14 Feb 2023 17:00	6	Maintenance - replaced sample pump
TRS	24 Feb 2023 10:00	24 Feb 2023 11:00	2	Maintenance - verify daily QA response
THC/NMHC/CH4	24 Feb 2023 09:00	24 Feb 2023 10:00	2	Maintenance - verify daily QA response
SO2	24 Feb 2023 10:00	24 Feb 2023 10:00	1	Maintenance - verify daily QA response
NO2	22 Feb 2023 05:00	23 Feb 2023 04:00	24	Unstable Operation - span outside AMD criteria
NO2	23 Feb 2023 06:00	23 Feb 2023 11:00	6	Unstable Operation - span outside AMD criteria
NO2	23 Feb 2023 12:00	24 Feb 2023 08:00	21	Maintenance - replaced analyzer and verify daily QA check
Wind Speed, Wind Direction	09 Feb 2023 23:00	09 Feb 2023 23:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	18 Feb 2023 16:00	18 Feb 2023 16:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	19 Feb 2023 08:00	19 Feb 2023 08:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	23 Feb 2023 20:00	23 Feb 2023 21:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	28 Feb 2023 05:00	28 Feb 2023 05:00	1	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort Hills - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 33.7 ppb on Feb 15 21:00	Maximum Daily Average: 4.7 ppb on Feb 3		Hours of Data:	639
Minimum Value: 0.0 ppb on Feb 1 15:00	Minimum Daily Average: 0.0 ppb on Feb 14		Hours of Missing Data:	33
Maximum Diurnal Average: 1.9 ppb at hour 21	Minimum Diurnal Average: 0.5 ppb at hour 10		Hours of Calibration:	32
Monthly Average: 1.08 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> = 0.8 P <sub>90</sub> = 2.7 P <sub>99</sub> = 13.0		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-Feb	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.0	0.2	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	
2-Feb	0.0	0.0	0.1	Z	2.0	2.6	2.9	4.2	4.2	2.3	3.8	2.6	2.2	3.5	4.0	2.6	1.6	1.1	0.8	0.6	0.6	0.9	1.4	9.7	2.3	9.7	
3-Feb	16.8	12.8	19.1	28.9	Z	5.3	5.0	4.9	2.8	1.2	0.9	1.0	1.0	0.9	0.8	0.6	0.7	0.7	0.9	1.0	1.0	1.0	0.9	0.8	4.7	28.9	
4-Feb	0.8	0.8	0.8	0.8	0.7	Z	0.5	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.4	0.8	
5-Feb	Z	0.1	0.4	0.2	0.1	0.3	0.3	0.3	0.3	1.0	1.9	4.1	7.2	11.3	4.6	2.9	1.6	1.2	1.0	1.1	0.9	1.5	0.9	0.4	1.9	11.3	
6-Feb	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.1	0.3	0.3	0.5	0.7	0.3	0.2	0.3	0.7	
7-Feb	0.3	0.3	Z	0.1	0.2	0.3	0.2	1.0	0.7	0.2	0.1	0.1	0.2	0.8	0.1	0.0	0.1	1.3	0.3	0.1	0.0	0.0	0.0	0.0	0.3	1.3	
8-Feb	0.0	0.0	0.0	Z	0.0	0.2	0.6	0.4	0.0	0.0	0.0	0.2	3.2	9.9	7.4	7.9	7.8	5.4	3.9	4.1	4.6	5.1	3.7	3.7	3.0	9.9	
9-Feb	1.9	2.9	4.9	2.0	Z	0.6	0.4	0.3	0.3	0.2	0.4	0.7	0.8	2.0	4.2	3.3	3.4	2.4	1.9	2.7	2.6	1.8	1.5	2.0	1.9	4.9	
10-Feb	1.1	0.7	0.8	0.7	0.4	Z	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.3	1.1	
11-Feb	Z	0.1	0.3	0.4	0.6	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.1	0.4	0.2	0.1	0.2	0.0	0.0	0.2	0.6	
12-Feb	0.2	Z	0.1	0.1	0.0	0.1	0.1	0.4	0.5	0.0	0.1	0.1	0.1	0.2	0.2	0.3	1.1	1.3	0.2	0.2	0.2	0.2	0.2	0.4	0.3	1.3	
13-Feb	0.9	1.2	Z	0.7	0.2	0.1	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	0.2	1.2	
14-Feb	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	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	
15-Feb	0.1	0.6	1.0	0.8	Z	0.3	0.4	0.3	0.2	0.1	0.2	0.2	0.6	0.8	0.8	0.6	0.5	0.7	3.5	16.4	33.7	18.9	13.1	4.9	4.3	33.7	
16-Feb	2.8	1.6	1.5	2.8	2.7	Z	2.0	1.7	1.9	0.8	0.9	4.7	2.8	1.0	0.5	0.6	1.3	3.3	2.5	0.9	0.6	0.7	0.7	0.6	1.7	4.7	
17-Feb	Z	0.6	0.7	0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.3	0.7	
18-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.4	0.3	0.2	0.2	0.5	
19-Feb	0.2	0.8	Z	0.2	0.3	0.6	0.7	0.8	1.5	2.3	2.4	1.6	1.3	1.7	1.9	1.2	1.1	0.8	1.2	0.5	0.7	1.4	1.4	1.5	1.1	2.4	
20-Feb	1.1	0.7	0.6	Z	0.6	0.5	0.5	0.3	0.5	0.9	1.1	1.7	1.5	0.7	0.6	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.6	1.7	
21-Feb	0.1	0.1	0.1	0.1	Z	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	0.1	0.0	0.2	0.1	0.2	
22-Feb	0.1	0.0	0.0	0.0	0.0	Z	0.1	0.8	0.7	1.0	0.6	0.5	0.7	0.8	0.4	0.4	0.3	0.2	0.1	0.1	0.2	0.7	0.2	0.2	0.4	1.0	
23-Feb	Z	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.4	0.8	0.7	0.4	0.6	1.2	0.7	0.7	0.4	0.3	0.3	0.5	1.8	5.0	4.9	0.9	5.0	
24-Feb	5.3	Z	5.5	4.5	5.4	5.6	5.6	3.4	2.2	M	2.7	2.4	1.0	0.7	0.9	0.6	0.3	0.2	0.2	0.3	0.4	0.5	0.5	0.5	2.2	5.6	
25-Feb	0.5	0.4	Z	0.4	0.3	0.4	0.3	0.4	0.3	0.3	0.3	1.1	1.4	0.3	0.3	0.6	5.2	3.9	11.1	7.4	5.9	3.8	2.2	1.6	2.1	11.1	
26-Feb	1.3	1.0	0.8	Z	1.1	0.6	0.5	0.8	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.5	1.3	
27-Feb	0.1	0.2	0.1	0.1	Z	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.2	0.1	0.2
28-Feb	0.7	0.4	0.2	0.1	0.1	Z	0.1	0.0	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.7	
	1.4	1.1	1.6	1.9	0.7	0.8	0.8	0.8	0.6	0.5	0.7	0.9	1.0	1.4	1.1	0.9	1.0	0.9	1.1	1.3	1.9	1.4	1.2	1.2		Diurnal Average	
	16.8	12.8	19.1	28.9	5.4	5.6	5.6	4.9	4.2	2.3	3.8	4.7	7.2	11.3	7.4	7.9	7.8	5.4	11.1	16.4	33.7	18.9	13.1	9.7		Diurnal Maximum	

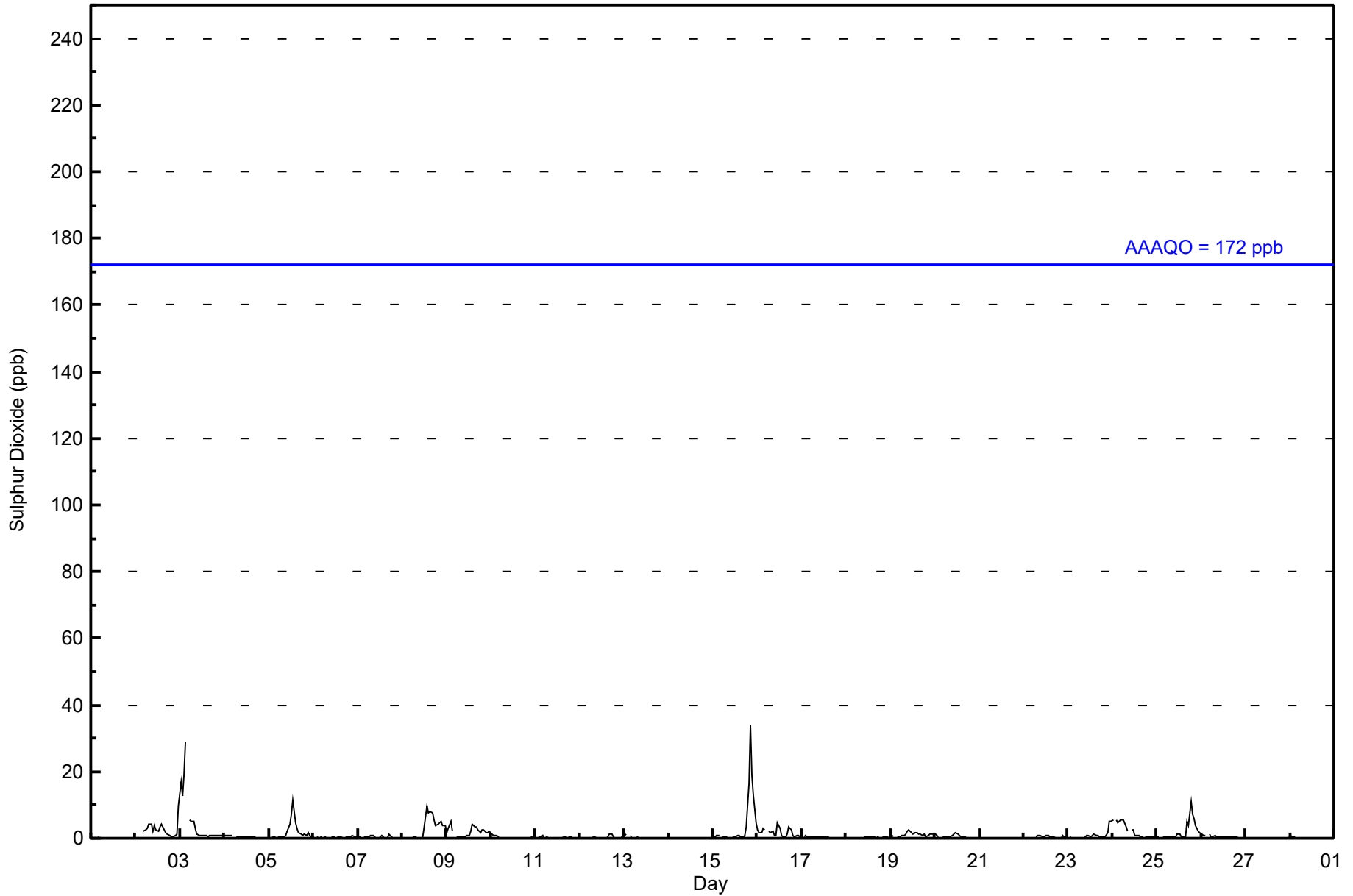
Z - zerospan      C - Calibration      M - Maintenance  
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb    24-hr 48 ppb





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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Fort Hills - February 2023**





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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Fort Hills - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	629	98.44	98.44
11 - 20	8	1.25	99.69
21 - 60	2	0.31	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: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Fort Hills - February 2023**

<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	86	103	19	27	6	21	60	88	45	38	24	14	19	16	18	39	623
11 - 20	0	0	0	0	0	1	0	3	4	0	0	0	0	0	0	0	8
21 - 60	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
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>	86	103	19	27	6	22	60	92	50	38	24	14	19	16	18	39	633

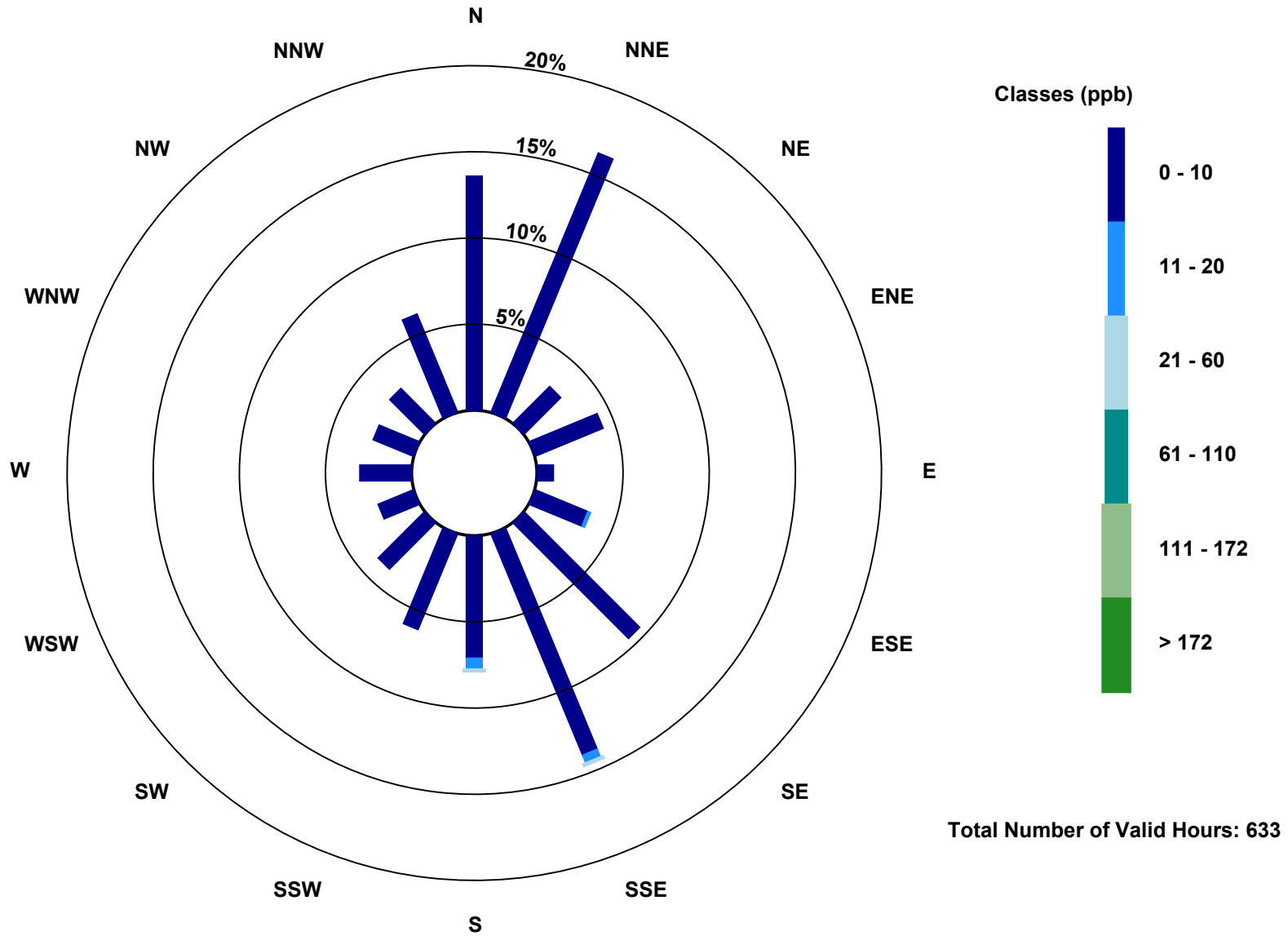
Total Number of Valid Hours: 633

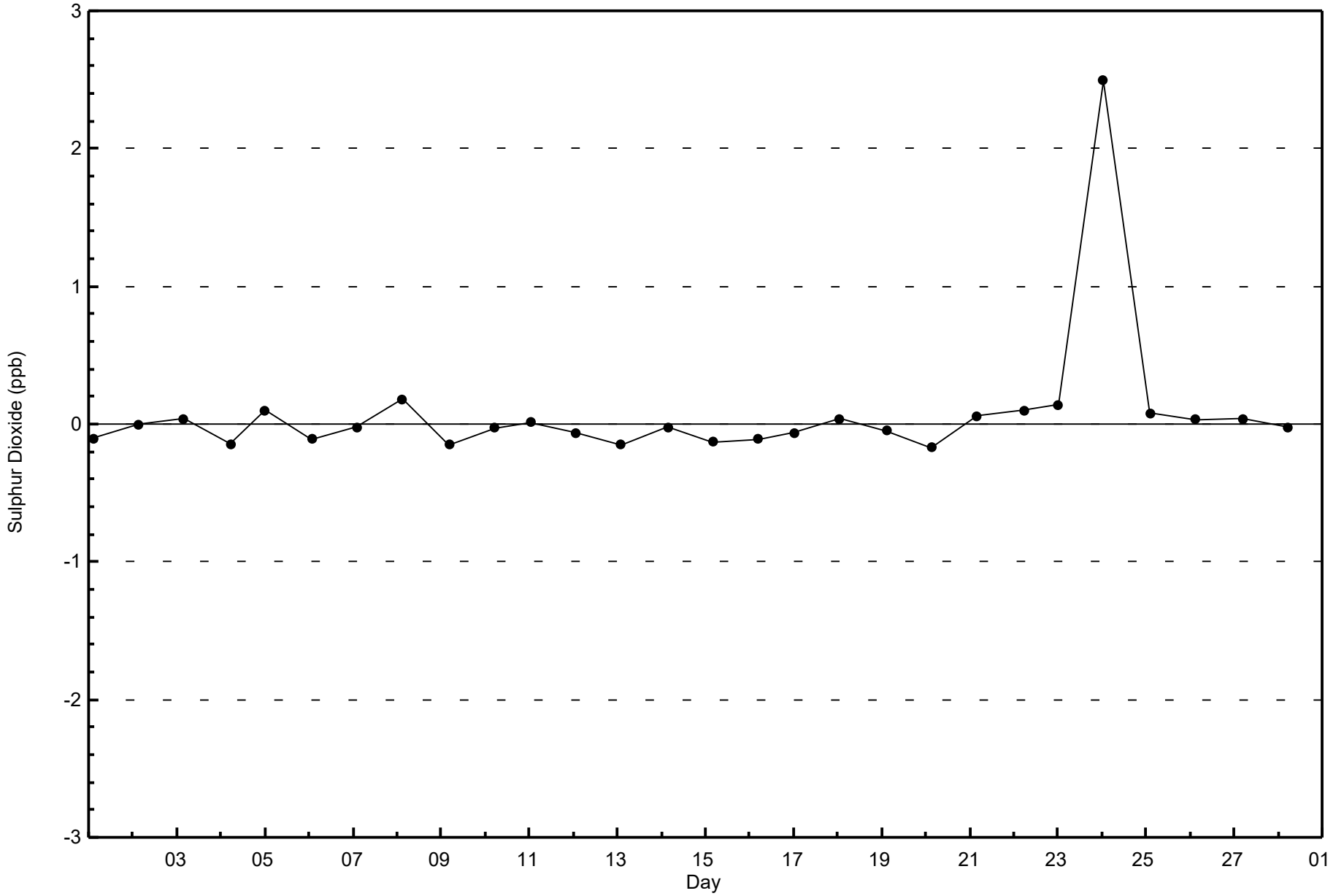
Total Number of Hours: 672

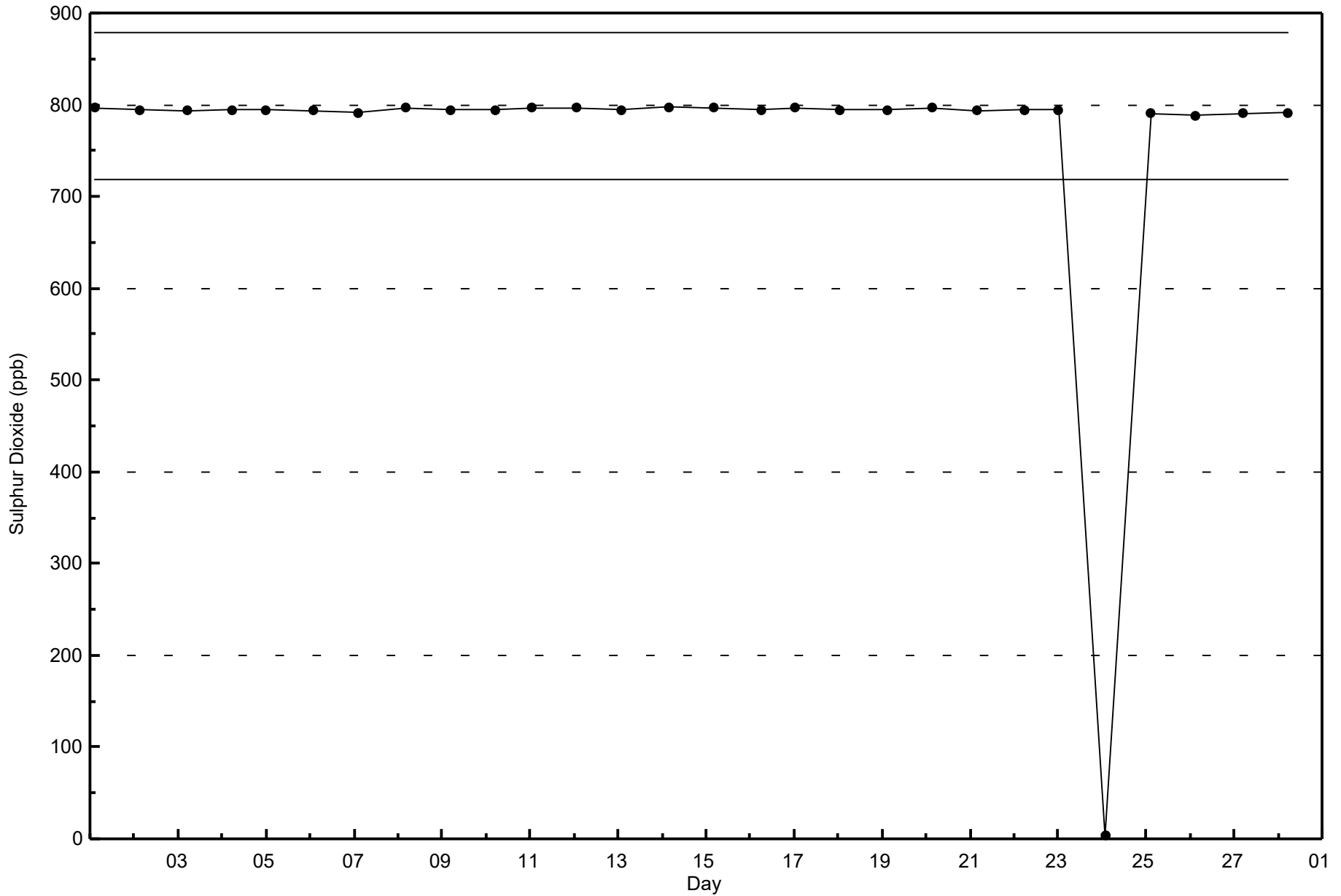


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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



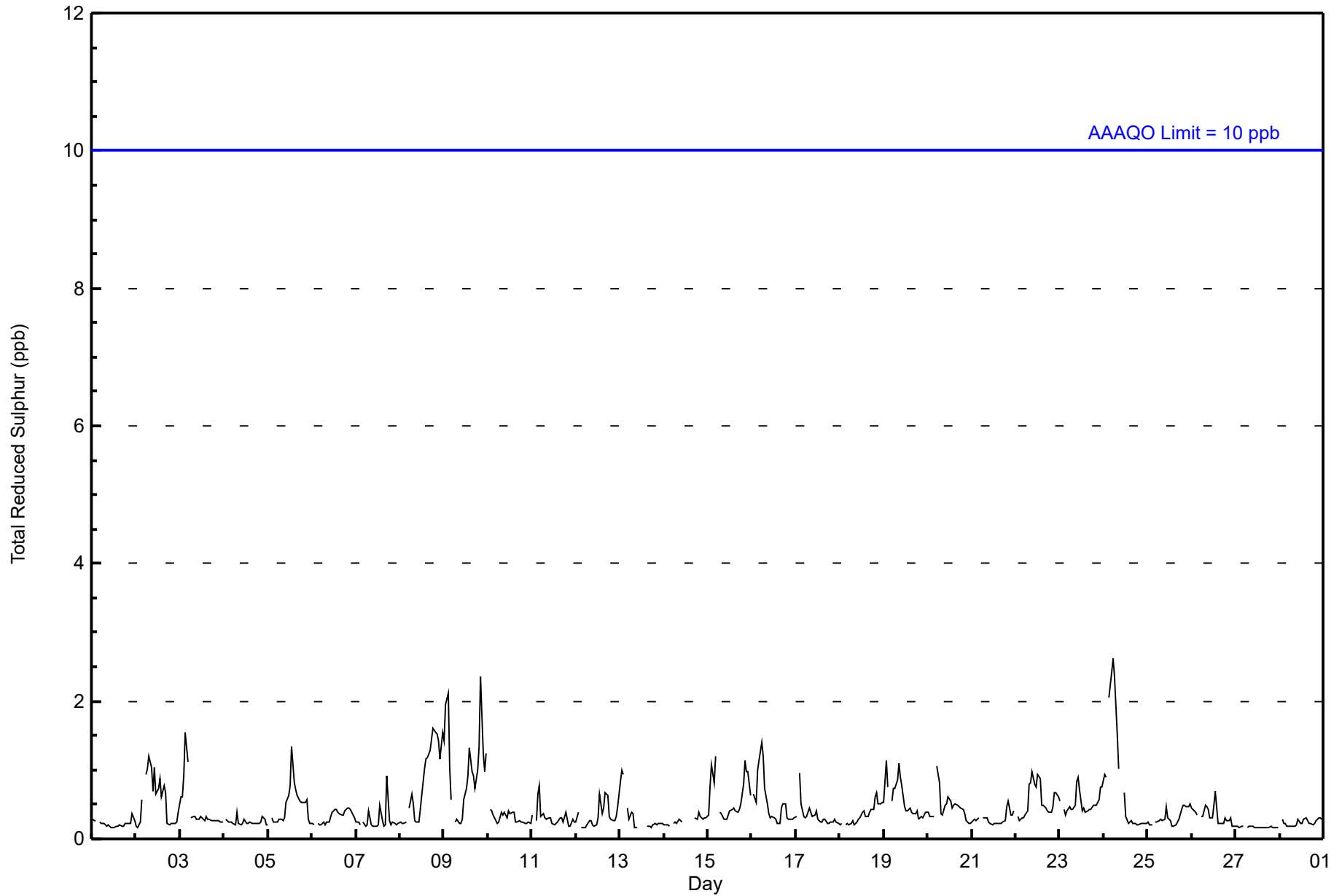






Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 672														Daily Average		Daily Maximum					
Maximum Value: 2.6 ppb on Feb 24 06:00		Maximum Daily Average: 1.0 ppb on Feb 9		Hours of Data: 631														Hours of Missing Data: 41		Hours of Calibration: 33							
Minimum Value: 0.2 ppb on Feb 12 04:00		Minimum Daily Average: 0.2 ppb on Feb 27		Hours of Calibration: 33														Percent Operational Time: 98.8									
Maximum Diurnal Average: 0.5 ppb at hour 4		Minimum Diurnal Average: 0.4 ppb at hour 10		Percentiles: P <sub>1</sub> = 0.2 P <sub>10</sub> = 0.2 Q <sub>1</sub> = 0.2 Median = 0.3 Q <sub>3</sub> = 0.5 P <sub>90</sub> = 0.9 P <sub>99</sub> = 1.9																							
Monthly Average: 0.43 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-Feb	0.3	0.3	0.3	Z	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	0.2	0.2	0.2	0.2	0.2	0.4	0.3	0.2	0.4	
2-Feb	0.2	0.2	0.2	0.6	Z	0.9	1.0	1.2	1.0	0.7	1.0	0.6	0.7	0.9	0.6	0.8	0.7	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.6	1.2	
3-Feb	0.6	0.6	0.9	1.5	1.1	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	0.4	1.5		
4-Feb	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.4	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	0.3	0.2	0.4		
5-Feb	0.2	Z	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.5	0.6	0.8	1.3	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.6	0.3	0.5	1.3		
6-Feb	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.4	0.3	0.3	0.5		
7-Feb	0.2	0.3	0.2	Z	0.2	0.2	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.5	0.3	0.2	0.2	0.9	0.3	0.2	0.2	0.2	0.2	0.3	0.9		
8-Feb	0.2	0.2	0.2	0.2	Z	0.4	0.7	0.5	0.3	0.2	0.2	0.4	0.6	1.0	1.2	1.2	1.3	1.4	1.6	1.5	1.5	1.4	1.2	0.8	1.6		
9-Feb	1.4	2.0	2.1	1.0	0.6	Z	0.2	0.3	0.2	0.2	0.3	0.6	0.7	0.9	1.3	1.0	0.9	0.7	1.0	1.3	2.4	1.2	1.0	1.0	2.4		
10-Feb	Z	0.4	0.4	0.4	0.3	0.2	0.2	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.4		
11-Feb	0.4	Z	0.3	0.7	0.8	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.3	0.8		
12-Feb	0.2	0.4	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.6	0.4	0.4	0.7	0.6	0.3	0.3	0.3	0.3	0.5	0.3	0.7		
13-Feb	0.8	1.0	0.9	Z	0.5	0.3	0.4	0.4	0.2	0.2	C	C	C	C	C	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	1.0		
14-Feb	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.3	0.2	M	M	M	M	M	M	0.3	0.3	0.4	0.3	0.3	0.3	--	0.4		
15-Feb	0.3	0.8	1.1	0.8	1.2	Z	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.8	1.1	1.0	1.0	0.6	1.2		
16-Feb	Z	0.6	0.5	1.0	1.1	1.4	1.2	0.7	0.5	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.4	0.5	0.5	0.3	0.3	0.3	0.3	0.5	1.4		
17-Feb	0.3	Z	1.0	0.5	0.3	0.3	0.3	0.5	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	1.0		
18-Feb	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.6	0.7	0.5	0.5	0.4	0.7		
19-Feb	0.5	1.1	0.8	Z	0.6	0.7	0.7	0.9	1.1	0.9	0.8	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.6	1.1		
20-Feb	0.4	0.3	0.3	0.3	Z	1.1	0.8	0.4	0.3	0.5	0.5	0.6	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.2	0.5	1.1		
21-Feb	0.2	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.5	0.3	0.3	0.3	0.5		
22-Feb	Z	0.3	0.3	0.3	0.3	0.3	0.4	0.8	0.8	1.0	0.8	0.8	0.9	0.9	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.7	0.7	0.6	1.0		
23-Feb	0.5	Z	0.4	0.3	0.4	0.5	0.4	0.4	0.5	0.8	0.9	0.7	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.8	0.7	0.5	0.9		
24-Feb	0.9	0.9	Z	2.0	2.4	2.6	2.4	1.5	1.0	M	M	0.7	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.8	2.6		
25-Feb	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.3	0.3	0.3	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.5	0.3	0.5		
26-Feb	0.4	0.4	0.4	0.4	Z	0.3	0.3	0.5	0.5	0.4	0.3	0.3	0.5	0.7	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.7		
27-Feb	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
28-Feb	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3		
																								Diurnal Average		Diurnal Maximum	
																								0.4		1.4	
																								0.5		2.0	
																								0.5		2.1	
																								0.5		2.0	
																								0.5		2.4	
																								0.5		2.6	
																								0.5		2.4	
																								0.4		1.5	
																								0.4		1.1	
																								0.4		1.0	
																								0.4		1.0	
																								0.4		0.8	
																								0.4		0.9	
																								0.5		1.3	
																								0.4		1.3	
																								0.4		1.2	
																								0.4		1.3	
																								0.4		1.4	
																								0.4		1.6	
																								0.4		1.5	
																								0.5		2.4	
																								0.4		1.4	
																								0.4		1.2	
																								0.4		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**  
**Fort Hills - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	630	99.84	99.84
3 - 4	1	0.16	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: 631

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Fort Hills - February 2023**

<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	79	105	17	23	6	22	59	89	52	35	26	13	20	15	22	41	624
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>	79	105	17	23	6	22	59	90	52	35	26	13	20	15	22	41	625

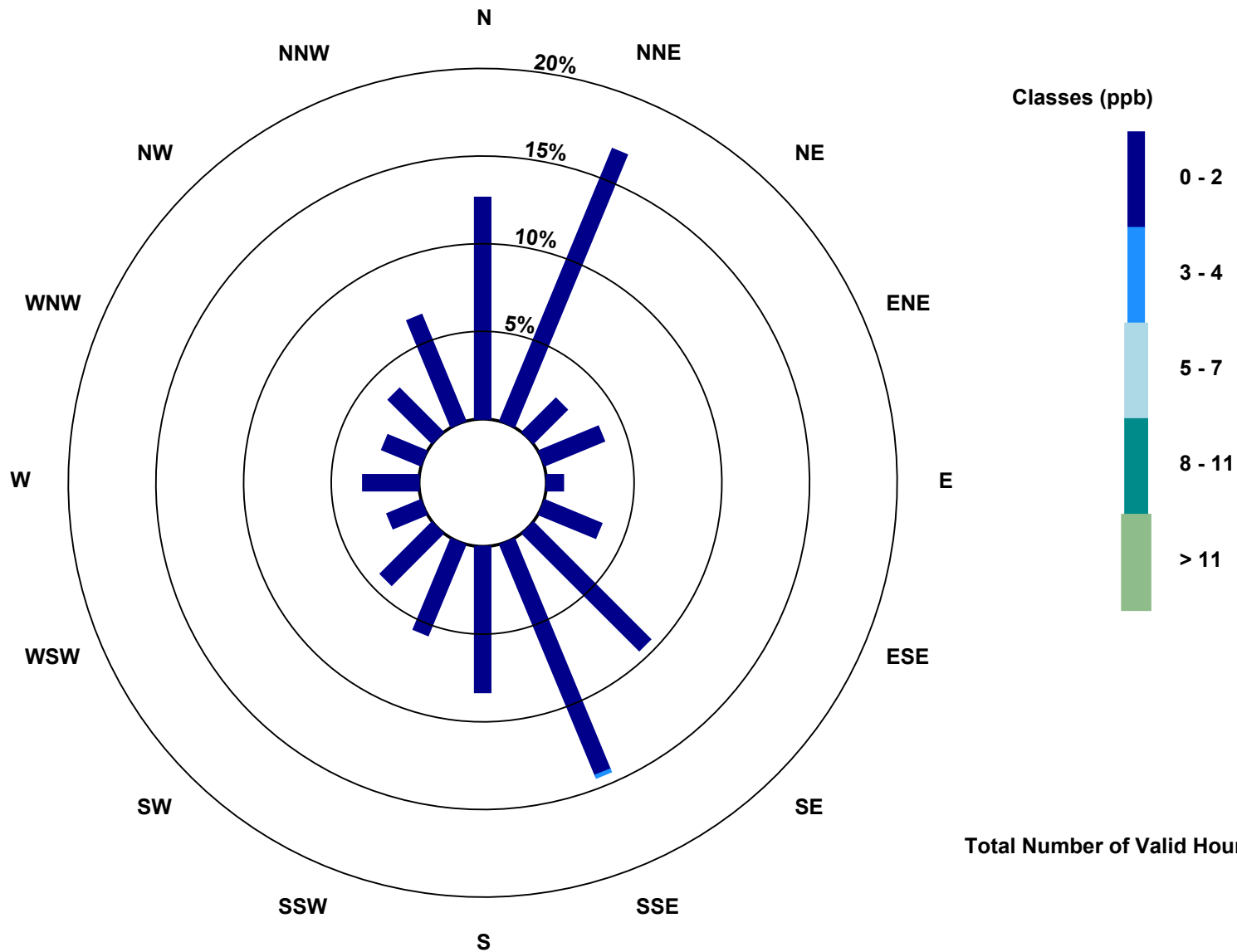
Total Number of Valid Hours: 625

Total Number of Hours: 672

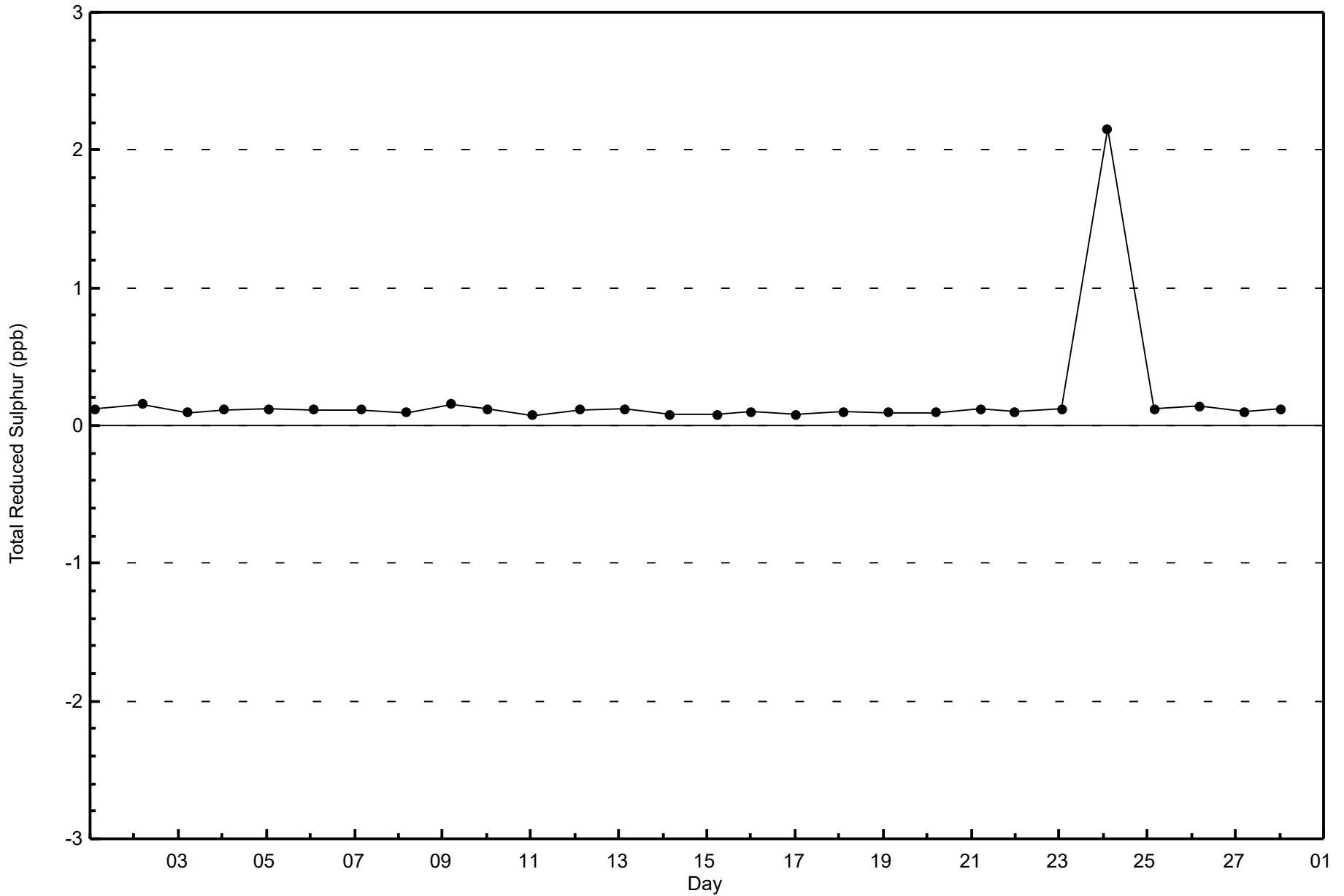


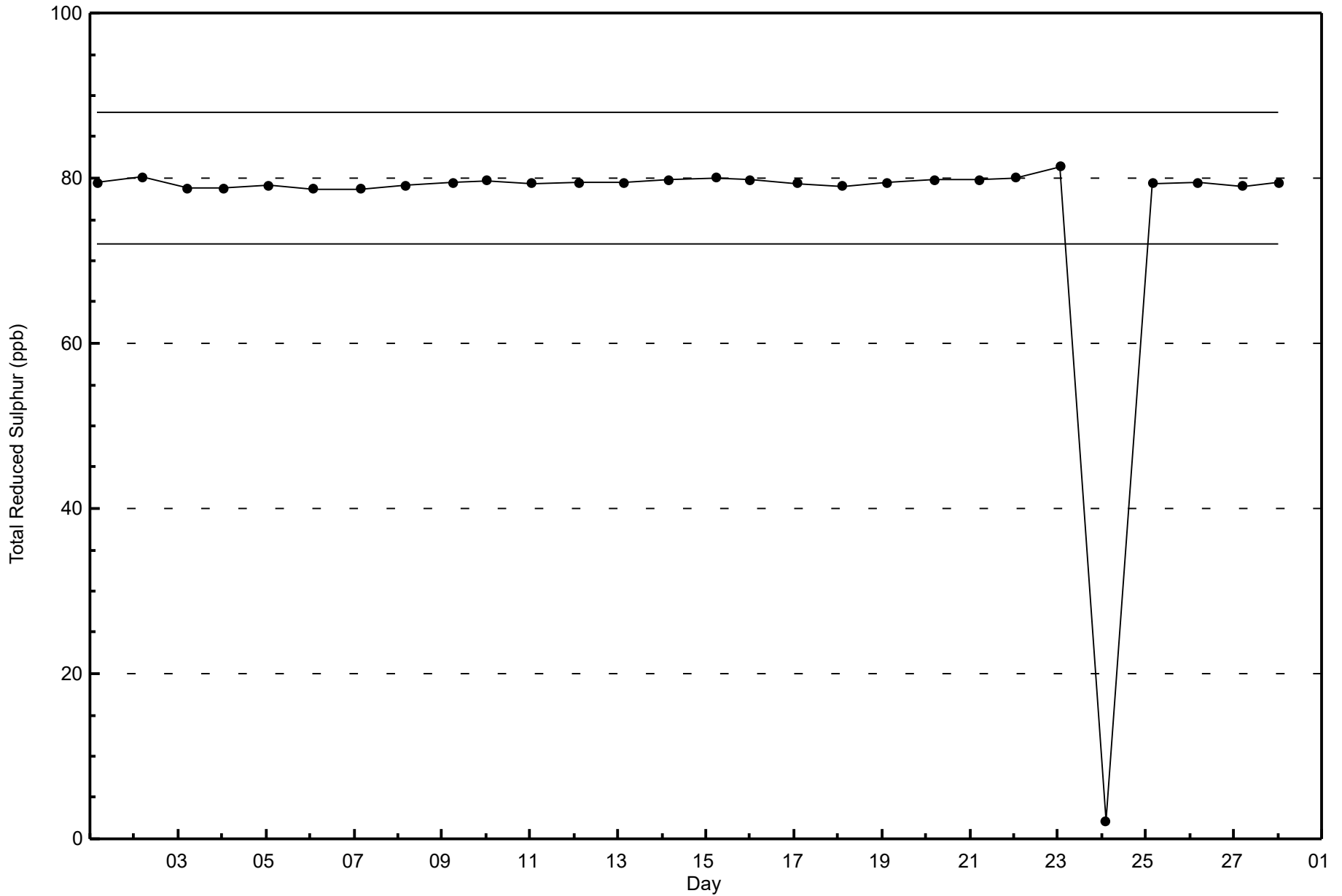
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Reduced Sulphur (TRS) - ppb  
Fort Hills



Total Number of Valid Hours: 625







Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

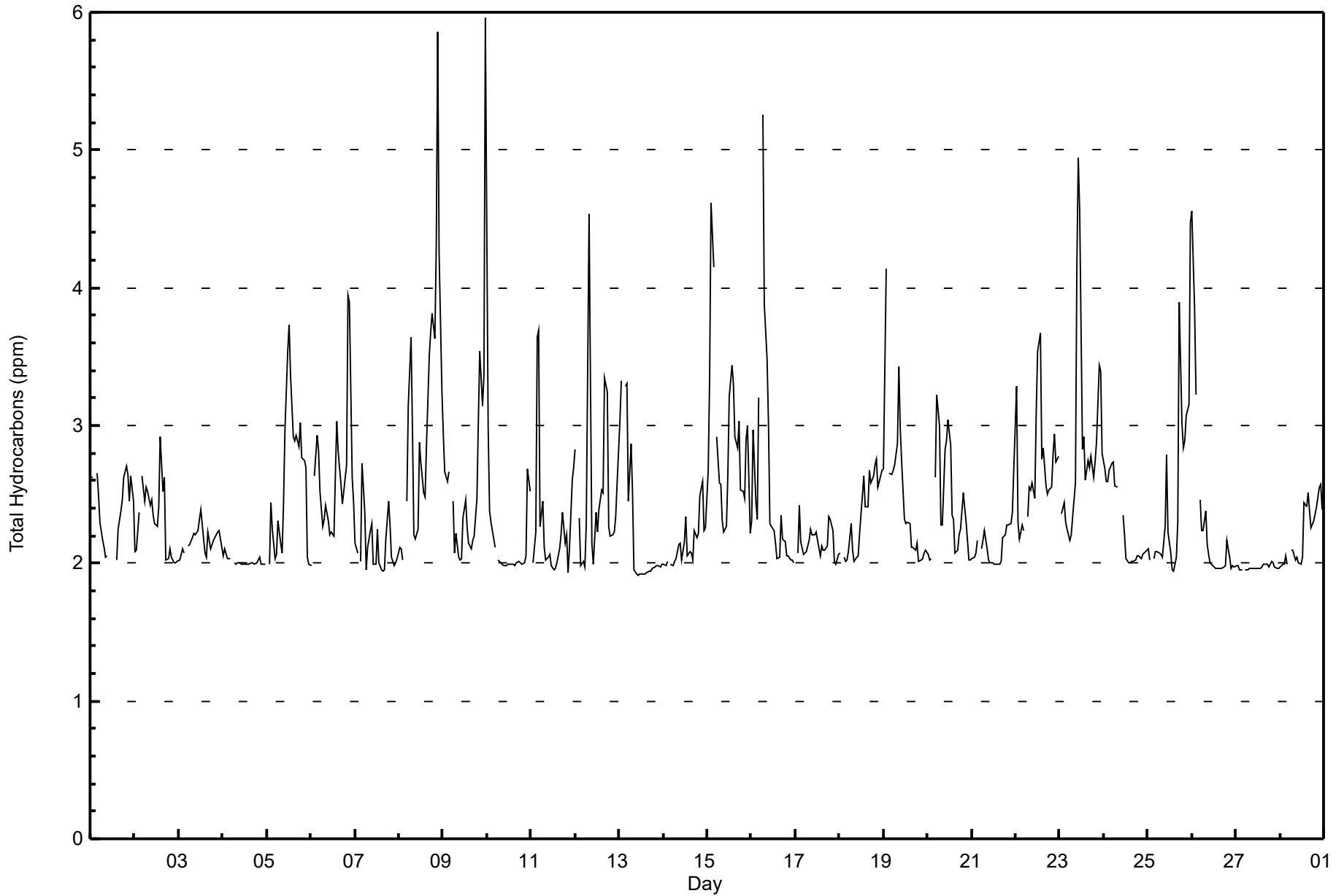
Fort Hills - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																																								
Maximum Value: 6.0 ppm on Feb 10 00:00		Maximum Daily Average: 3.1 ppm on Feb 8		Hours of Data:		639		Hours of Missing Data: 33																																								
Minimum Value: 1.9 ppm on Feb 13 11:00		Minimum Daily Average: 2.0 ppm on Feb 27		Hours of Calibration:		31		Percent Operational Time: 99.7																																								
Maximum Diurnal Average: 2.5 ppm at hour 22		Minimum Diurnal Average: 2.3 ppm at hour 16		Percentiles: P <sub>1</sub> = 1.9 P <sub>10</sub> = 2.0 Q <sub>1</sub> = 2.0 Median = 2.2 Q <sub>3</sub> = 2.6 P <sub>90</sub> = 3.0 P <sub>99</sub> = 4.5																																												
Monthly Average: 2.40 ppm																																																
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Feb	2.6	2.6	Z	2.7	2.5	2.3	2.2	2.1	2.0	2.1	C	C	C	C	2.0	2.3	2.4	2.5	2.6	2.7	2.6	2.5	2.6	2.4	2.4	2.7																						
2-Feb	2.1	2.1	2.4	Z	2.6	2.5	2.6	2.5	2.4	2.5	2.3	2.3	2.3	2.4	2.9	2.5	2.6	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.3	2.9																						
3-Feb	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.4	2.2	2.1	2.0	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.2	2.4																						
4-Feb	2.1	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																						
5-Feb	Z	2.0	2.4	2.2	2.0	2.1	2.3	2.1	2.1	2.4	3.0	3.5	3.7	3.4	2.9	2.9	2.9	2.9	3.0	2.8	2.7	2.7	2.0	2.0	2.6	3.7																						
6-Feb	2.0	Z	2.6	2.9	2.8	2.5	2.3	2.3	2.4	2.3	2.2	2.2	2.2	2.6	3.0	2.8	2.6	2.4	2.5	2.7	3.9	3.9	2.6	2.4	2.6	3.9																						
7-Feb	2.1	2.1	Z	2.0	2.7	2.4	1.9	2.1	2.2	2.3	2.0	2.0	2.2	2.0	1.9	1.9	2.0	2.2	2.4	2.3	2.0	2.0	2.0	2.0	2.1	2.7																						
8-Feb	2.1	2.1	2.0	Z	2.5	3.1	3.6	3.0	2.2	2.2	2.2	2.9	2.7	2.5	2.5	2.9	3.5	3.7	3.8	3.6	4.3	5.9	4.2	3.3	3.1	5.9																						
9-Feb	2.9	2.7	2.6	2.7	Z	2.5	2.1	2.2	2.0	2.0	2.0	2.3	2.5	2.3	2.1	2.1	2.2	2.2	2.5	3.0	3.5	3.1	3.4	6.0	2.6	6.0																						
10-Feb	3.0	2.4	2.3	2.2	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	2.7	2.5	2.1	3.0																						
11-Feb	Z	2.0	2.2	3.6	3.7	2.3	2.5	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.4	2.1	2.2	1.9	2.1	2.6	2.7	2.3	3.7																						
12-Feb	2.8	Z	2.3	2.0	2.0	2.0	2.3	4.5	3.3	2.1	2.0	2.4	2.2	2.4	2.5	2.5	3.4	3.2	2.3	2.2	2.2	2.2	2.3	2.6	2.5	4.5																						
13-Feb	3.0	3.3	Z	3.3	3.3	2.4	2.9	2.5	2.0	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	2.3	3.3																						
14-Feb	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.2	2.3	2.1	2.1	2.1	2.0	2.2	2.2	2.2	2.5	2.6	2.2	2.3	2.1	2.6																						
15-Feb	2.7	3.3	4.6	4.1	Z	2.9	2.6	2.6	2.3	2.2	2.3	2.6	3.2	3.4	3.3	2.9	2.8	3.0	2.5	2.5	2.5	2.9	3.0	2.2	2.9	4.6																						
16-Feb	2.3	3.0	2.5	2.3	3.2	Z	5.3	3.9	3.5	3.0	2.3	2.3	2.2	2.1	2.0	2.0	2.4	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.6	5.3																						
17-Feb	Z	2.1	2.4	2.2	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	2.3	2.3	2.2	2.0	2.0	2.1	2.2	2.4																						
18-Feb	2.1	Z	2.0	2.0	2.0	2.1	2.3	2.1	2.0	2.0	2.1	2.2	2.5	2.6	2.4	2.4	2.7	2.6	2.6	2.7	2.8	2.6	2.6	2.7	2.4	2.8																						
19-Feb	2.7	4.1	Z	2.7	2.6	2.7	2.7	2.9	3.4	3.0	2.7	2.3	2.3	2.3	2.3	2.1	2.1	2.1	2.2	2.0	2.0	2.0	2.1	2.1	2.5	4.1																						
20-Feb	2.1	2.0	2.0	Z	2.6	3.2	3.0	2.3	2.3	2.8	2.9	3.0	2.9	2.3	2.3	2.1	2.1	2.2	2.2	2.5	2.4	2.3	2.0	2.0	2.4	3.2																						
21-Feb	2.0	2.0	2.1	2.2	Z	2.1	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.3	2.3	2.3	2.4	2.7	2.1	2.7																						
22-Feb	3.3	2.3	2.2	2.3	2.2	Z	2.3	2.5	2.5	2.6	2.5	3.1	3.5	3.7	2.8	2.8	2.6	2.5	2.5	2.6	2.8	2.9	2.7	2.8	2.7	3.7																						
23-Feb	Z	2.4	2.4	2.3	2.2	2.2	2.2	2.3	2.6	4.2	4.9	4.6	2.8	2.9	2.6	2.7	2.7	2.8	2.6	2.7	2.9	3.4	3.4	2.8	2.9	4.9																						
24-Feb	2.7	2.6	2.6	2.7	2.7	2.7	2.6	2.6	M	M	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.3	2.7																						
25-Feb	2.1	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.3	2.8	2.2	2.1	1.9	1.9	2.0	2.3	3.9	3.0	2.8	2.9	3.1	3.1	2.5	4.5																						
26-Feb	4.6	3.8	3.2	Z	2.5	2.2	2.2	2.4	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.0	2.0	2.0	2.0	2.3	4.6																						
27-Feb	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																					
28-Feb	2.0	2.0	2.0	2.1	2.0	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.4	2.4	2.5	2.4	2.3	2.3	2.4	2.4	2.5	2.6	2.4	2.2	2.6																						
																								2.5	2.4	2.4	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	Diurnal Average
																								4.6	4.1	4.6	4.1	3.7	3.2	5.3	4.5	3.5	4.2	4.9	4.6	3.7	3.7	3.3	2.9	3.5	3.9	3.8	3.6	4.3	5.9	4.2	6.0	Diurnal Maximum
Z - zerospan																								C - Calibration				M - Maintenance																				



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

**Total Hydrocarbons (THC) - ppm**  
**Fort Hills - February 2023**





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

**Total Hydrocarbons (THC) - ppm**  
**Fort Hills - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	193	30.20	30.20
2.1 - 3.0	389	60.88	91.08
3.1 - 10.0	57	8.92	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 639

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Fort Hills - February 2023**

<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	70	0	1	0	0	1	11	11	10	3	1	5	11	7	9	192
2.1 - 3.0	31	31	16	24	5	15	47	71	31	26	17	13	13	5	11	29	385
3.1 - 10.0	3	2	3	2	1	7	12	10	8	2	4	0	1	0	0	1	56
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	86	103	19	27	6	22	60	92	50	38	24	14	19	16	18	39	633

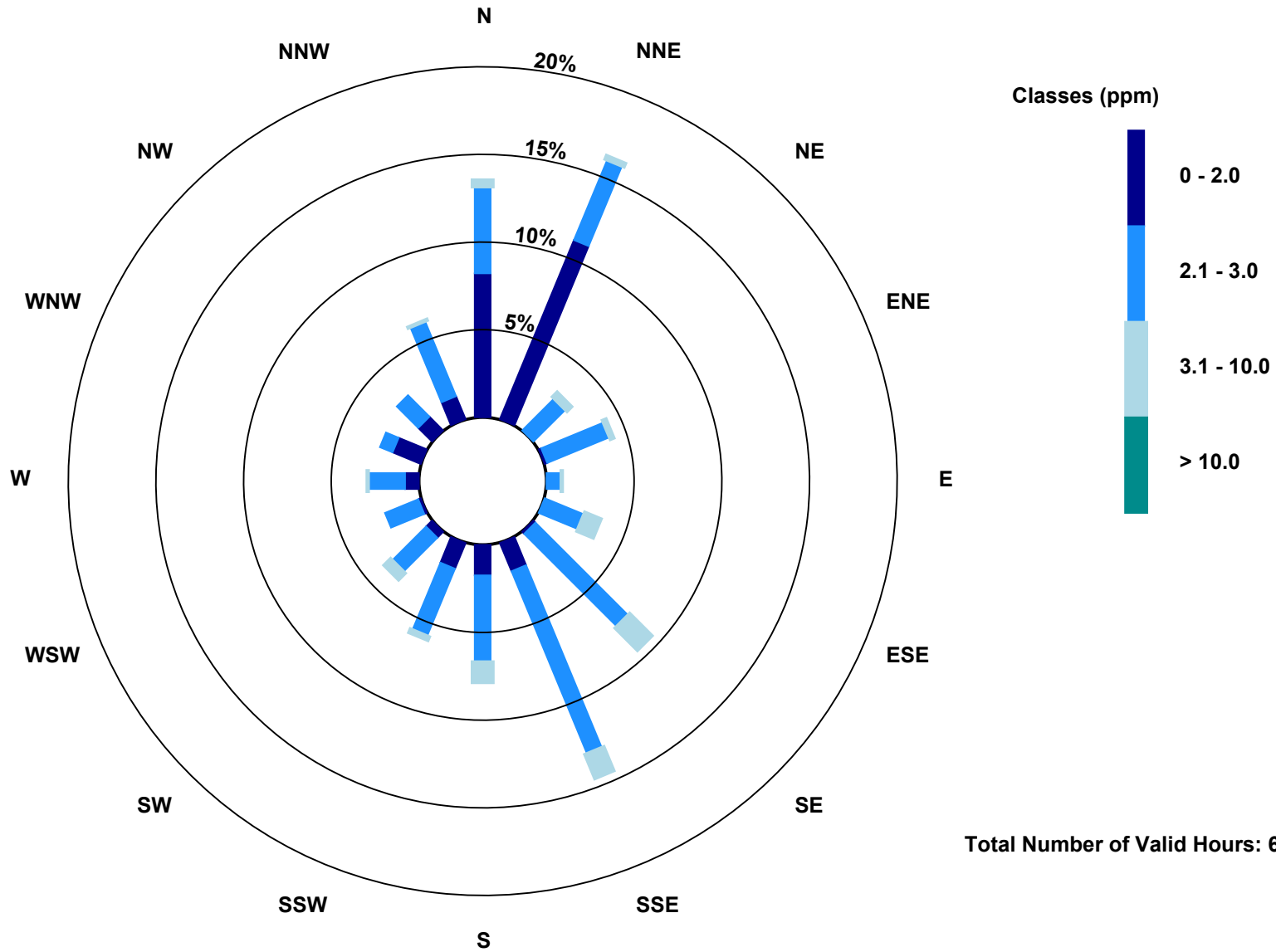
Total Number of Valid Hours: 633

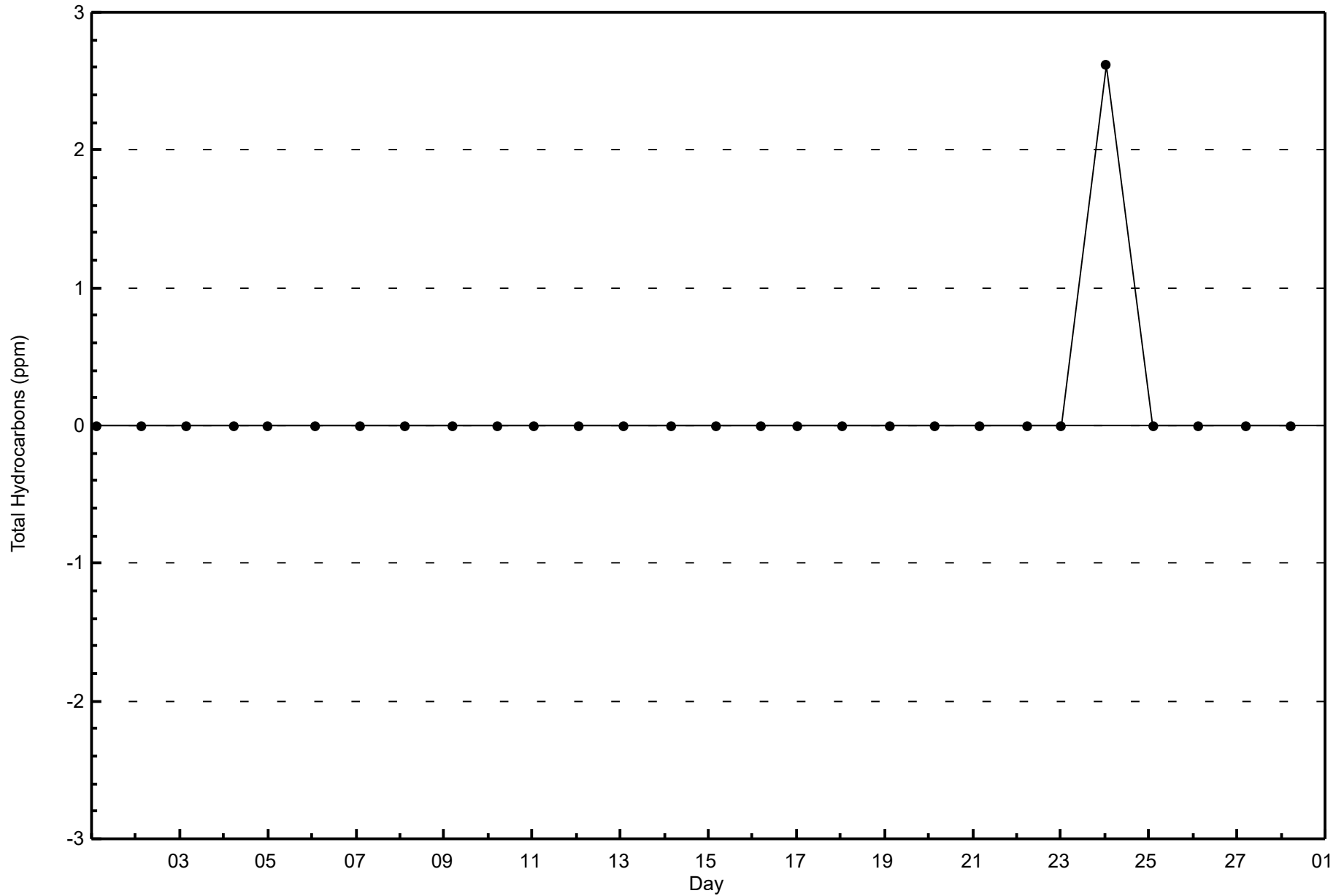
Total Number of Hours: 672

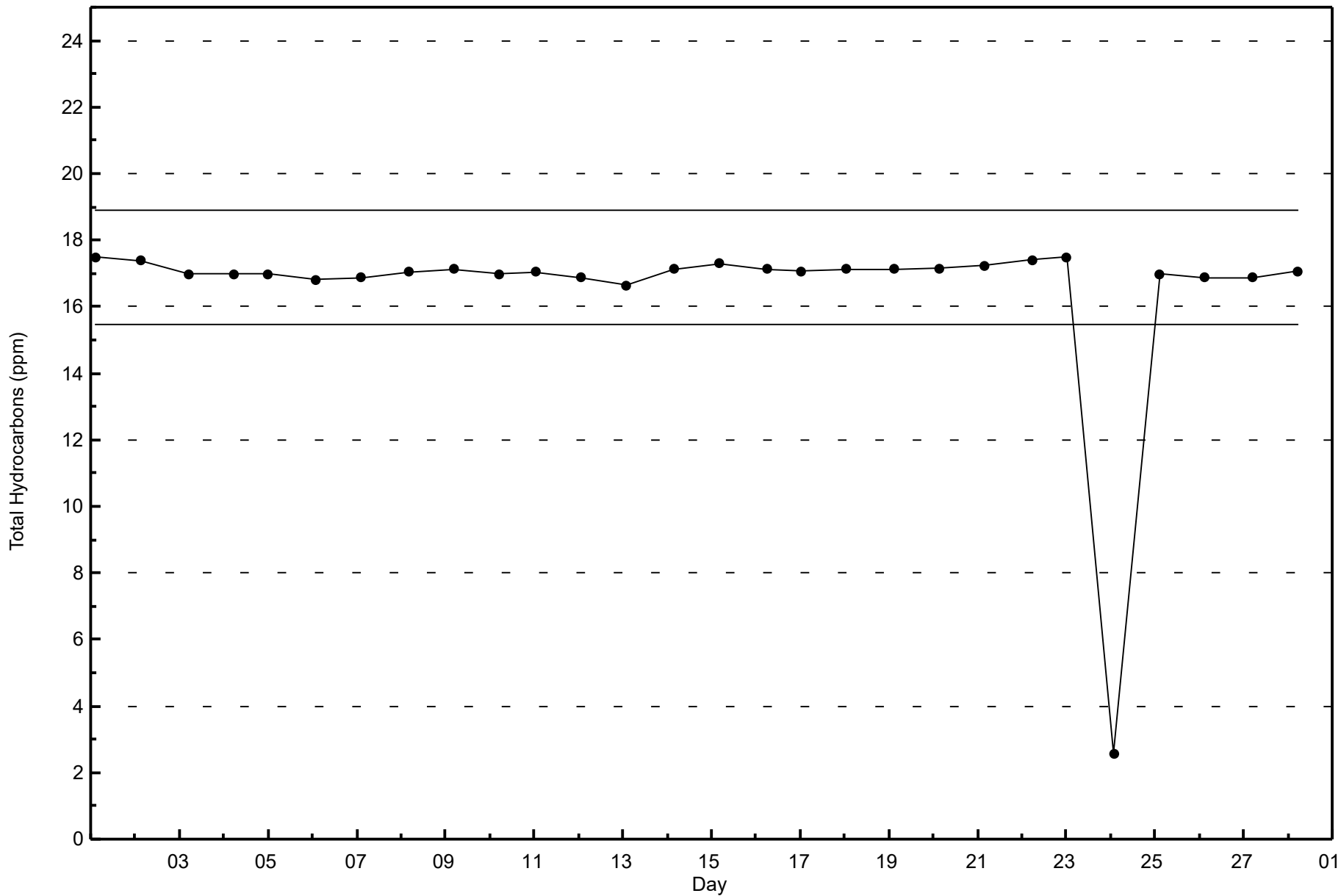


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Hydrocarbons (THC) - ppm  
Fort Hills





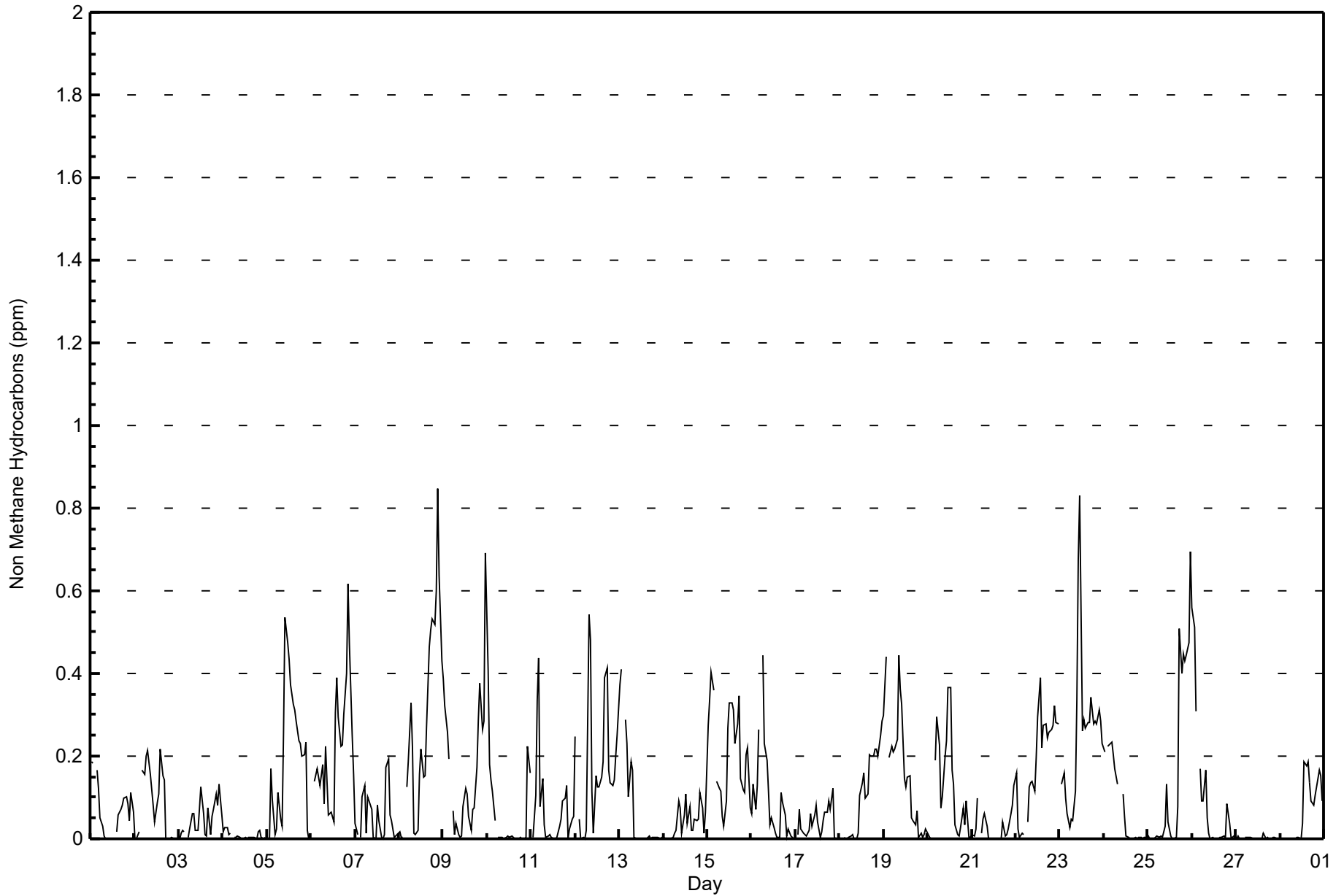




Summary of Hour Averages

Fort Hills - February 2023

Maximum Value: 0.846 ppm on Feb 8 22:00		Maximum Daily Average: 0.279 ppm on Feb 8		Hours in Service: 672																						
Minimum Value: 0.000 ppm on Feb 1 09:00		Minimum Daily Average: 0.002 ppm on Feb 27		Hours of Data: 638																						
Maximum Diurnal Average: 0.144 ppm at hour 22		Minimum Diurnal Average: 0.074 ppm at hour 10		Hours of Missing Data: 34																						
Monthly Average: 0.113 ppm		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> = 0.6		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-Feb	0.187	0.182	Z	0.167	0.122	0.051	0.032	0.007	0.000	0.001	C	C	C	C	0.018	0.057	0.071	0.082	0.100	0.101	0.086	0.043	0.112	0.063	0.078	0.187
2-Feb	0.001	0.002	0.018	Z	0.168	0.157	0.199	0.214	0.158	0.118	0.082	0.042	0.088	0.109	0.217	0.153	0.141	0.001	0.000	0.001	0.003	0.001	0.000	0.001	0.081	0.217
3-Feb	0.000	0.013	0.020	0.016	Z	0.003	0.023	0.060	0.062	0.019	0.020	0.070	0.125	0.060	0.011	0.007	0.073	0.011	0.054	0.073	0.109	0.082	0.131	0.056	0.048	0.131
4-Feb	0.018	0.029	0.026	0.011	0.015	Z	0.005	0.002	0.006	0.004	0.001	0.000	0.002	0.000	0.002	0.004	0.003	0.003	0.001	0.015	0.022	0.003	0.001	0.002	0.008	0.029
5-Feb	Z	0.000	0.171	0.094	0.009	0.025	0.111	0.047	0.029	0.256	0.536	0.474	0.432	0.374	0.325	0.313	0.285	0.238	0.230	0.199	0.204	0.235	0.020	0.001	0.200	0.536
6-Feb	0.000	Z	0.138	0.168	0.151	0.127	0.180	0.083	0.225	0.057	0.063	0.064	0.040	0.306	0.390	0.296	0.225	0.228	0.303	0.399	0.616	0.473	0.249	0.156	0.215	0.616
7-Feb	0.038	0.010	Z	0.004	0.101	0.130	0.015	0.100	0.081	0.070	0.003	0.000	0.081	0.044	0.004	0.002	0.009	0.174	0.194	0.057	0.044	0.002	0.006	0.010	0.051	0.194
8-Feb	0.018	0.004	0.004	Z	0.125	0.187	0.330	0.219	0.014	0.010	0.020	0.156	0.217	0.150	0.152	0.268	0.466	0.506	0.534	0.518	0.600	0.846	0.636	0.430	0.279	0.846
9-Feb	0.386	0.321	0.259	0.195	Z	0.068	0.009	0.037	0.009	0.004	0.007	0.078	0.122	0.108	0.055	0.021	0.072	0.075	0.172	0.289	0.376	0.266	0.283	0.691	0.170	0.691
10-Feb	0.407	0.179	0.142	0.114	0.045	Z	0.003	0.004	0.002	0.001	0.003	0.007	0.003	0.006	0.003	0.000	0.001	0.001	0.002	0.001	0.001	0.005	0.223	0.159	0.057	0.407
11-Feb	Z	0.004	0.107	0.335	0.436	0.077	0.146	0.033	0.004	0.006	0.010	0.004	0.001	0.001	0.002	0.031	0.046	0.091	0.097	0.128	0.000	0.024	0.049	0.056	0.073	0.436
12-Feb	0.246	Z	0.047	0.002	0.004	0.002	0.021	0.541	0.482	0.115	0.014	0.154	0.127	0.126	0.148	0.185	0.390	0.415	0.165	0.135	0.130	0.141	0.199	0.252	0.176	0.541
13-Feb	0.373	0.412	Z	0.289	0.230	0.101	0.186	0.168	0.004	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.008	0.002	0.005	0.002	0.004	0.002	0.000	0.005	0.078	0.412
14-Feb	0.005	0.002	0.001	Z	0.001	0.003	0.015	0.019	0.091	0.073	0.015	0.058	0.110	0.039	0.078	0.019	0.021	0.046	0.044	0.049	0.111	0.073	0.015	0.063	0.041	0.111
15-Feb	0.276	0.335	0.404	0.359	Z	0.140	0.122	0.117	0.056	0.031	0.090	0.267	0.327	0.329	0.313	0.230	0.279	0.346	0.147	0.120	0.111	0.202	0.219	0.073	0.213	0.404
16-Feb	0.062	0.134	0.071	0.129	0.266	Z	0.444	0.230	0.189	0.114	0.035	0.050	0.028	0.013	0.003	0.002	0.113	0.087	0.057	0.008	0.022	0.005	0.002	0.000	0.090	0.444
17-Feb	Z	0.009	0.073	0.025	0.013	0.011	0.007	0.022	0.061	0.030	0.058	0.081	0.041	0.005	0.018	0.045	0.065	0.065	0.092	0.072	0.122	0.003	0.001	0.001	0.040	0.122
18-Feb	0.003	Z	0.003	0.000	0.002	0.003	0.006	0.012	0.001	0.002	0.013	0.104	0.135	0.160	0.097	0.108	0.203	0.201	0.199	0.218	0.216	0.200	0.251	0.286	0.105	0.286
19-Feb	0.298	0.441	Z	0.197	0.223	0.211	0.216	0.240	0.444	0.363	0.325	0.146	0.126	0.149	0.152	0.051	0.046	0.032	0.067	0.003	0.014	0.004	0.010	0.022	0.164	0.444
20-Feb	0.010	0.003	0.001	Z	0.189	0.294	0.229	0.075	0.100	0.200	0.236	0.368	0.366	0.167	0.133	0.034	0.012	0.006	0.026	0.075	0.035	0.092	0.004	0.002	0.115	0.368
21-Feb	0.009	0.007	0.023	0.099	Z	0.015	0.046	0.061	0.032	0.001	0.000	0.001	0.001	0.001	0.001	0.002	0.001	0.039	0.008	0.011	0.025	0.060	0.081	0.127	0.028	0.127
22-Feb	0.159	0.025	0.005	0.014	0.010	Z	0.042	0.125	0.137	0.138	0.115	0.198	0.294	0.391	0.221	0.273	0.278	0.244	0.257	0.264	0.275	0.324	0.282	0.278	0.189	0.391
23-Feb	Z	0.131	0.160	0.099	0.061	0.027	0.047	0.044	0.115	0.337	0.676	0.831	0.261	0.288	0.269	0.282	0.282	0.344	0.277	0.286	0.279	0.312	0.285	0.232	0.257	0.831
24-Feb	0.211	Z	0.223	0.228	0.235	0.203	0.170	0.131	M	M	0.108	0.053	0.005	0.002	0.000	0.001	0.001	0.002	0.001	0.004	0.002	0.001	0.003	0.003	0.076	0.235
25-Feb	0.008	0.001	Z	0.002	0.003	0.007	0.002	0.007	0.003	0.030	0.132	0.041	0.006	0.000	0.002	0.002	0.078	0.508	0.398	0.449	0.429	0.446	0.474	0.695	0.162	0.695
26-Feb	0.559	0.512	0.307	Z	0.168	0.090	0.092	0.166	0.050	0.014	0.001	0.003	0.002	0.000	0.001	0.005	0.003	0.007	0.003	0.085	0.036	0.003	0.004	0.005	0.092	0.559
27-Feb	0.002	0.007	0.000	0.001	Z	0.002	0.002	0.002	0.003	0.000	0.000	0.002	0.001	0.001	0.000	0.012	0.001	0.004	0.001	0.001	0.003	0.003	0.001	0.001	0.002	0.012
28-Feb	0.000	0.000	0.000	0.002	0.000	Z	0.000	0.001	0.001	0.003	0.002	0.002	0.036	0.186	0.175	0.187	0.134	0.090	0.083	0.106	0.124	0.168	0.154	0.092	0.067	0.187
																								Diurnal Average		
																								Diurnal Maximum		
0.137 0.115 0.096 0.111 0.112 0.084 0.096 0.099 0.087 0.074 0.095 0.120 0.110 0.112 0.100 0.093 0.118 0.137 0.126 0.131 0.143 0.144 0.132 0.134																										
0.559 0.512 0.404 0.359 0.436 0.294 0.444 0.541 0.482 0.363 0.676 0.831 0.432 0.391 0.390 0.313 0.466 0.508 0.534 0.518 0.616 0.846 0.636 0.695																										
Z - zerospan			C - Calibration			M - Maintenance																				





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Fort Hills - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	180	28.21	28.21
0.006 - 0.05	134	21.00	49.22
0.06 - 0.1	138	21.63	70.85
> 0.1	186	29.15	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Fort Hills - February 2023**

<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	45	54	1	0	0	0	1	15	16	10	3	1	4	9	9	11	179
0.006 - 0.05	19	28	6	12	1	0	4	12	12	13	6	1	4	2	2	12	134
0.06 - 0.1	12	15	7	9	3	3	17	27	7	10	6	6	6	0	2	7	137
> 0.1	10	6	5	6	2	19	38	37	15	5	9	6	5	5	5	9	182
<b>Totals</b>	<b>86</b>	<b>103</b>	<b>19</b>	<b>27</b>	<b>6</b>	<b>22</b>	<b>60</b>	<b>91</b>	<b>50</b>	<b>38</b>	<b>24</b>	<b>14</b>	<b>19</b>	<b>16</b>	<b>18</b>	<b>39</b>	<b>632</b>

Total Number of Valid Hours: 632

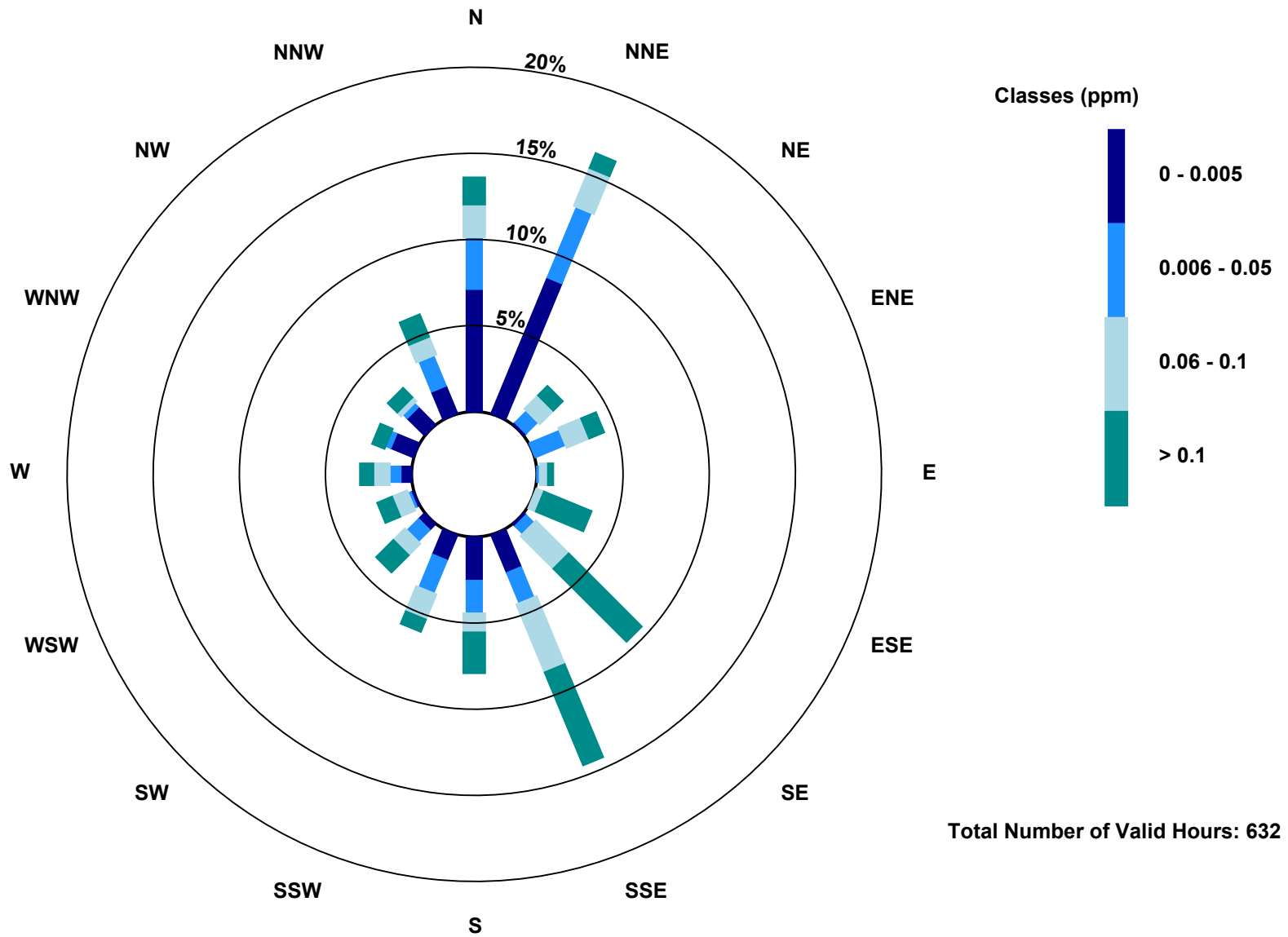
Total Number of Hours: 672

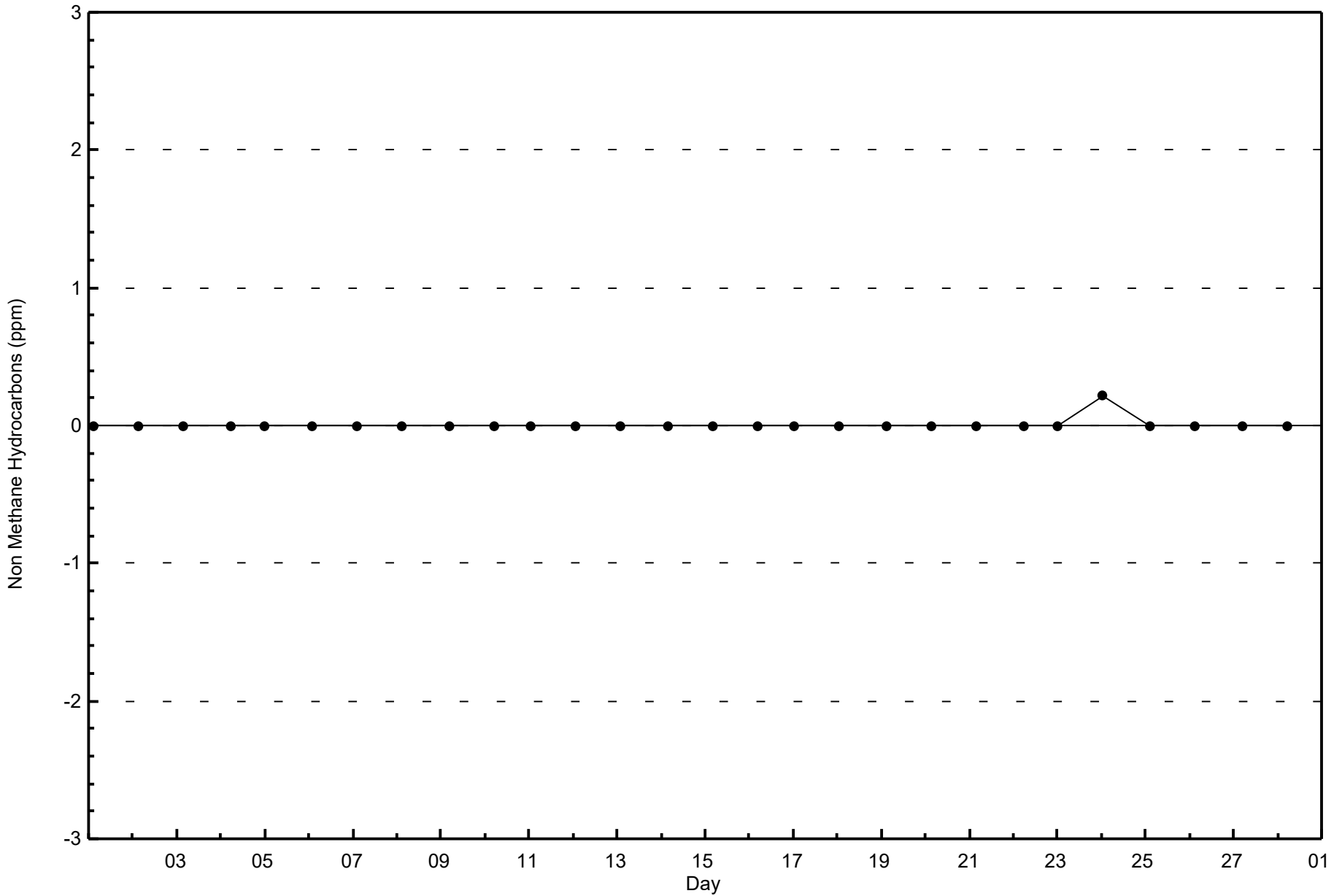


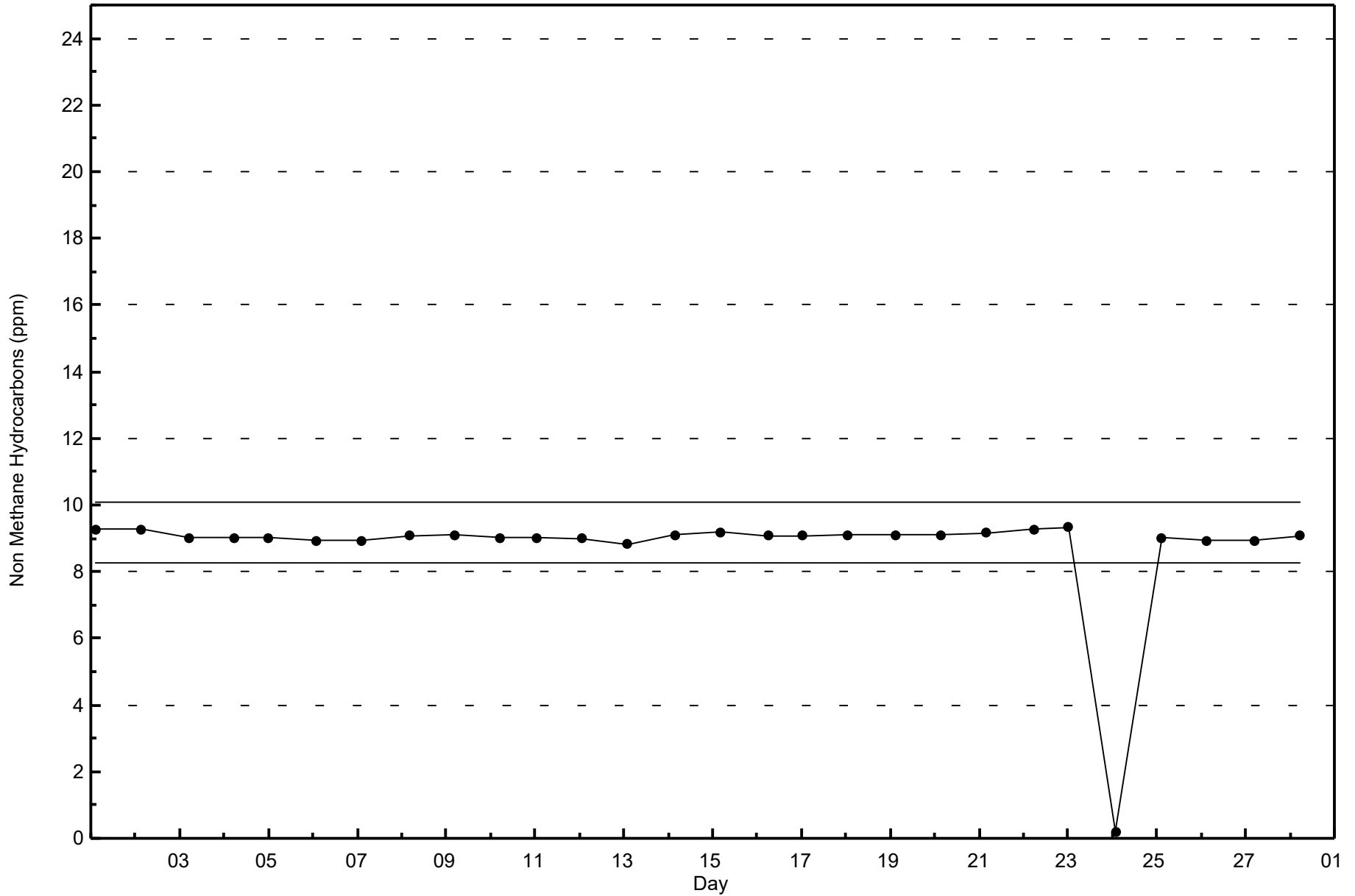


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Non Methane Hydrocarbons (NMHC) - ppm  
Fort Hills









Wood Buffalo Environmental Association

Summary of Hour Averages

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

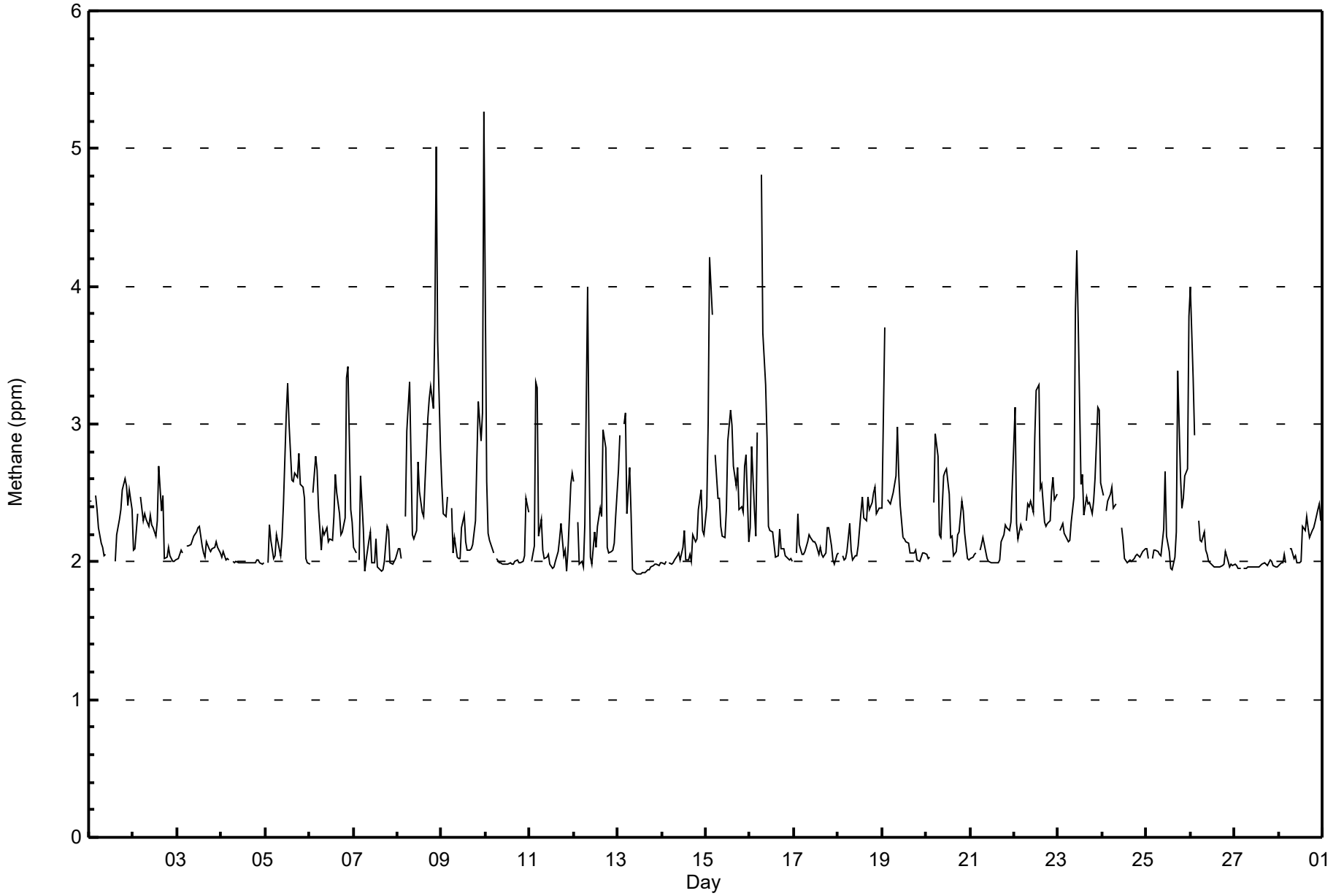
Fort Hills - February 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 672																	638																												
Maximum Value: 5.3 ppm on Feb 10 00:00		Maximum Daily Average: 2.8 ppm on Feb 8																	Hours of Data: 638																														
Minimum Value: 1.9 ppm on Feb 13 11:00		Minimum Daily Average: 2.0 ppm on Feb 27																	Hours of Missing Data: 34																														
Maximum Diurnal Average: 2.4 ppm at hour 22		Minimum Diurnal Average: 2.2 ppm at hour 16																	Hours of Calibration: 32																														
Monthly Average: 2.29 ppm		Percentiles: P <sub>1</sub> = 1.9 P <sub>10</sub> = 2.0 Q <sub>1</sub> = 2.0 Median = 2.2 Q <sub>3</sub> = 2.4 P <sub>90</sub> = 2.7 P <sub>99</sub> = 3.9																	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-Feb	2.4	2.4	Z	2.5	2.4	2.2	2.1	2.1	2.0	2.1	C	C	C	C	2.0	2.2	2.3	2.4	2.5	2.6	2.6	2.4	2.5	2.4	2.3	2.6																							
2-Feb	2.1	2.1	2.4	Z	2.5	2.3	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.7	2.4	2.5	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.7																						
3-Feb	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.1	2.1	2.0	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																						
4-Feb	2.0	2.1	2.0	2.0	2.0	Z	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																						
5-Feb	Z	2.0	2.3	2.2	2.0	2.0	2.2	2.1	2.0	2.2	2.4	3.1	3.3	3.0	2.6	2.6	2.6	2.6	2.8	2.6	2.5	2.5	2.0	2.0	2.4	3.3																							
6-Feb	2.0	Z	2.5	2.8	2.7	2.4	2.1	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.6	2.5	2.3	2.2	2.2	2.3	3.3	3.4	2.4	2.3	2.4	3.4																							
7-Feb	2.1	2.1	Z	2.0	2.6	2.2	1.9	2.0	2.2	2.2	2.0	2.0	2.2	2.0	1.9	1.9	1.9	2.0	2.3	2.2	2.0	2.0	2.0	2.0	2.1	2.6																							
8-Feb	2.1	2.1	2.0	Z	2.3	3.0	3.3	2.8	2.2	2.2	2.2	2.7	2.5	2.4	2.3	2.6	3.0	3.2	3.3	3.1	3.7	5.0	3.6	2.8	2.8	5.0																							
9-Feb	2.6	2.3	2.3	2.5	Z	2.4	2.1	2.2	2.0	2.0	2.0	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.3	2.7	3.2	2.9	3.1	5.3	2.5	5.3																							
10-Feb	2.6	2.2	2.2	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	2.5	2.4	2.1	2.6																							
11-Feb	Z	2.0	2.1	3.3	3.3	2.2	2.3	2.1	2.0	2.0	2.1	2.0	1.9	2.0	2.0	2.1	2.2	2.3	2.0	2.1	1.9	2.1	2.6	2.6	2.2	3.3																							
12-Feb	2.6	Z	2.3	2.0	2.0	2.0	2.3	4.0	2.8	2.0	2.0	2.2	2.1	2.3	2.4	2.3	3.0	2.8	2.1	2.1	2.1	2.1	2.1	2.3	2.3	4.0																							
13-Feb	2.7	2.9	Z	3.0	3.1	2.3	2.7	2.3	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	2.2	3.1																							
14-Feb	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.2	2.0	2.0	2.1	2.0	2.2	2.1	2.2	2.4	2.5	2.2	2.2	2.1	2.5																							
15-Feb	2.4	3.0	4.2	3.8	Z	2.8	2.5	2.5	2.3	2.2	2.2	2.4	2.9	3.1	3.0	2.7	2.6	2.7	2.4	2.4	2.4	2.7	2.8	2.1	2.7	4.2																							
16-Feb	2.3	2.8	2.4	2.2	2.9	Z	4.8	3.7	3.3	2.9	2.3	2.2	2.2	2.1	2.0	2.0	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.5	4.8																							
17-Feb	Z	2.1	2.3	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.2	2.2	2.1	2.0	2.0	2.1	2.1	2.3																							
18-Feb	2.1	Z	2.0	2.0	2.0	2.1	2.3	2.1	2.0	2.0	2.0	2.1	2.4	2.5	2.3	2.3	2.5	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.2	2.5																							
19-Feb	2.4	3.7	Z	2.5	2.4	2.5	2.5	2.6	3.0	2.6	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.3	3.7																							
20-Feb	2.1	2.0	2.0	Z	2.4	2.9	2.8	2.2	2.2	2.6	2.7	2.7	2.5	2.2	2.2	2.0	2.1	2.2	2.2	2.4	2.4	2.2	2.0	2.0	2.3	2.9																							
21-Feb	2.0	2.0	2.1	2.1	Z	2.1	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.3	2.2	2.3	2.6	2.1	2.6																							
22-Feb	3.1	2.3	2.2	2.3	2.2	Z	2.3	2.4	2.4	2.4	2.4	2.9	3.2	3.3	2.5	2.6	2.3	2.3	2.3	2.3	2.5	2.6	2.5	2.5	2.5	3.3																							
23-Feb	Z	2.2	2.3	2.2	2.2	2.1	2.2	2.3	2.5	3.8	4.3	3.7	2.6	2.6	2.3	2.5	2.4	2.4	2.3	2.4	2.6	3.1	3.1	2.6	2.6	4.3																							
24-Feb	2.5	Z	2.4	2.4	2.5	2.5	2.4	2.4	M	M	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.2	2.5																							
25-Feb	2.1	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.0	2.2	2.7	2.2	2.1	1.9	1.9	2.0	2.2	3.4	2.6	2.4	2.5	2.6	2.7	3.8	2.3	3.8																							
26-Feb	4.0	3.3	2.9	Z	2.3	2.2	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	2.1	2.0	2.0	2.0	2.0	2.2	4.0																							
27-Feb	2.0	2.0	2.0	1.9	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																						
28-Feb	2.0	2.0	2.0	2.1	2.0	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.3	2.1	2.4																							
																								2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.4	2.3	2.4	Diurnal Average	
																								4.0	3.7	4.2	3.8	3.3	3.0	4.8	4.0	3.3	3.8	4.3	3.7	3.3	3.3	3.0	2.7	3.0	3.4	3.3	3.1	3.7	5.0	3.6	5.3	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance																					



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

**Methane (CH<sub>4</sub>) - ppm**  
**Fort Hills - February 2023**





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

**Methane (CH<sub>4</sub>) - ppm**  
**Fort Hills - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	209	32.76	32.76
2.1 - 3.0	392	61.44	94.20
3.1 - 10.0	37	5.80	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Fort Hills - February 2023**

<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	54	74	2	3	1	0	1	11	11	10	3	2	7	11	7	11	208
2.1 - 3.0	31	28	14	23	5	18	50	73	33	27	18	12	12	5	11	28	388
3.1 - 10.0	1	1	3	1	0	4	9	7	6	1	3	0	0	0	0	0	36
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	86	103	19	27	6	22	60	91	50	38	24	14	19	16	18	39	632

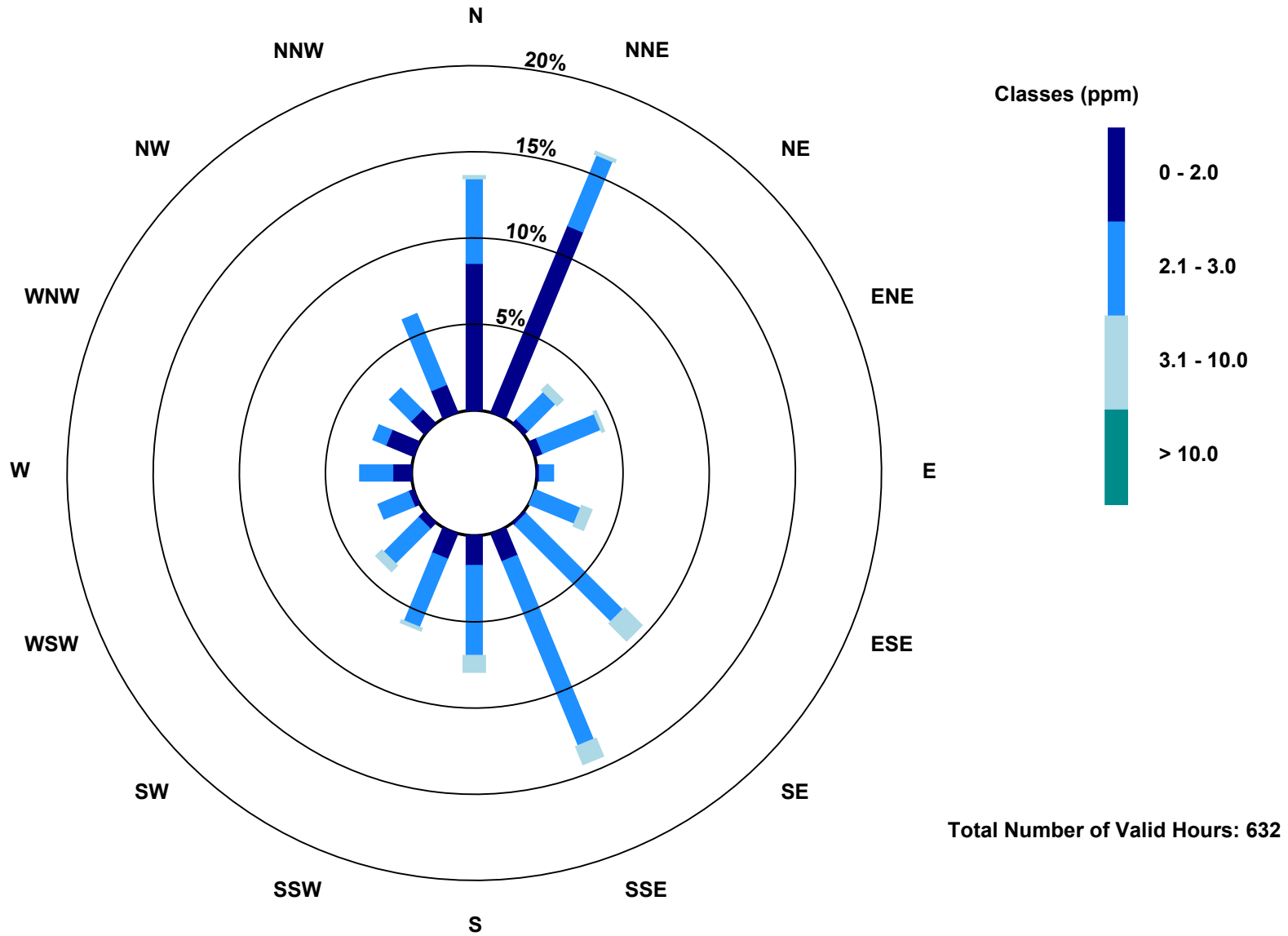
Total Number of Valid Hours: 632

Total Number of Hours: 672

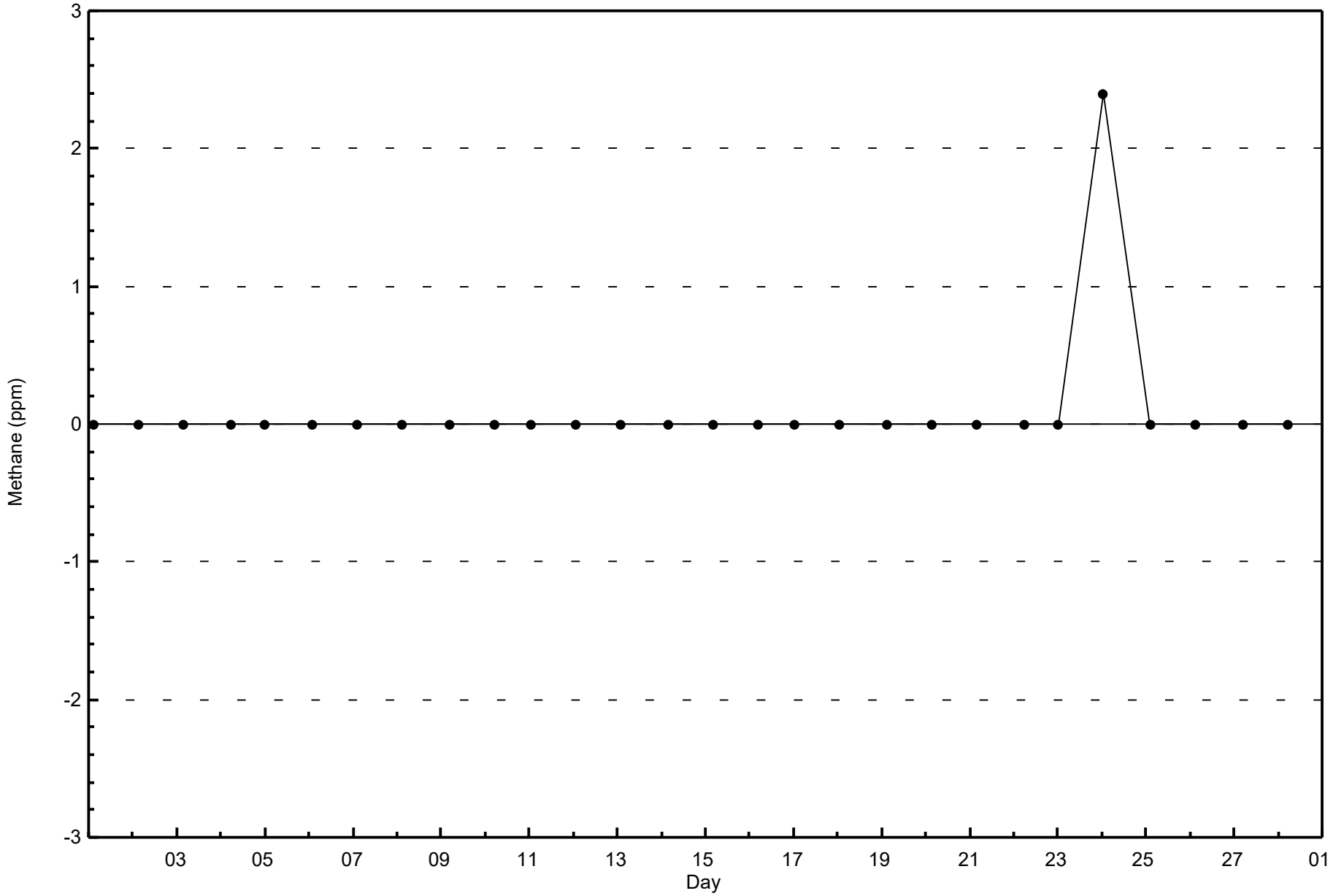


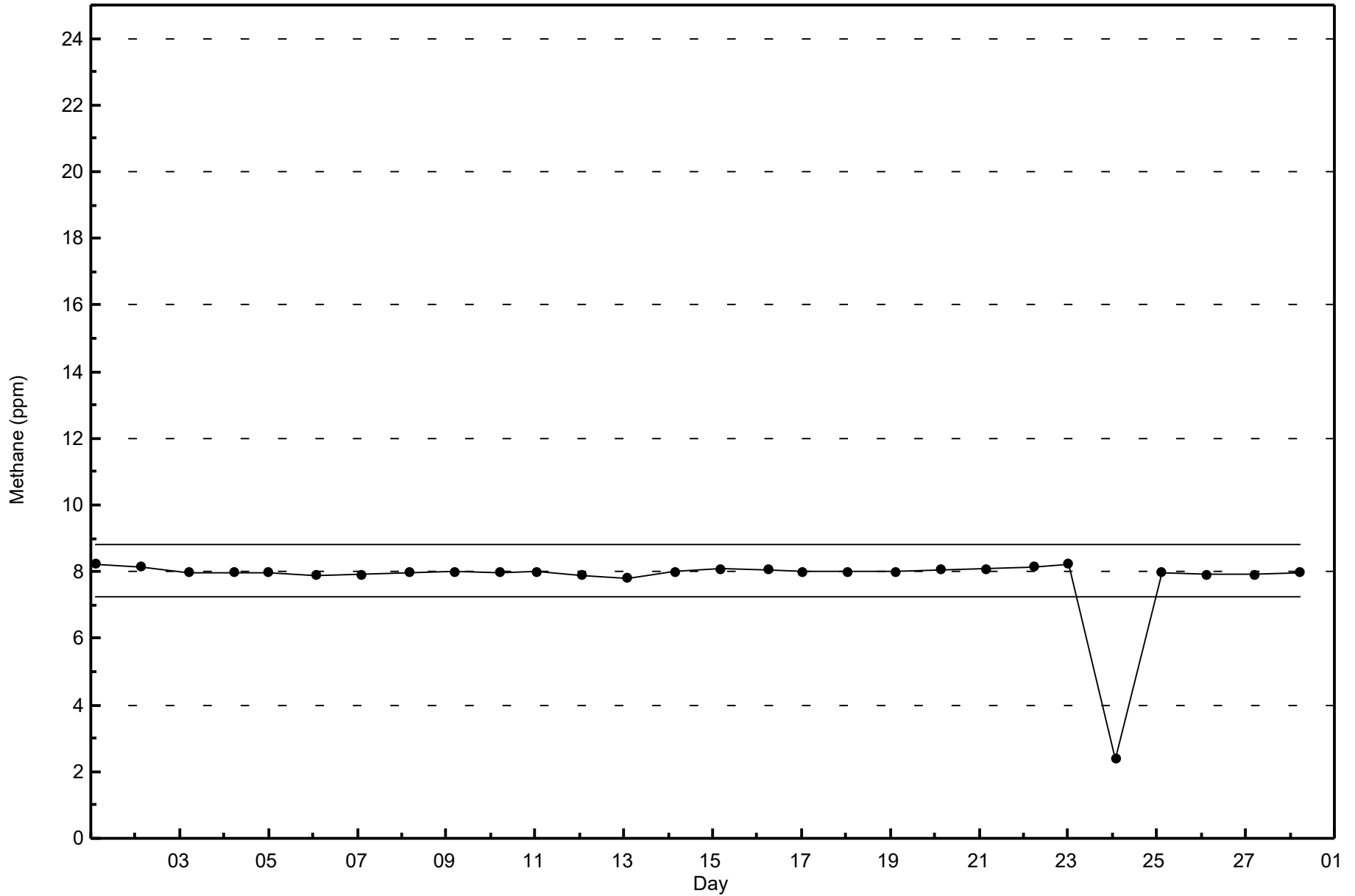
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Methane (CH<sub>4</sub>) - ppm  
Fort Hills











Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Fort Hills - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 222.4 ppb on Feb 8 22:00	Maximum Daily Average: 59.1 ppb on Feb 8		Hours of Data:	589
Minimum Value: 0.0 ppb on Feb 2 18:00	Minimum Daily Average: 1.4 ppb on Feb 7		Hours of Missing Data:	83
Maximum Diurnal Average: 18.3 ppb at hour 22	Minimum Diurnal Average: 11.2 ppb at hour 10		Hours of Calibration:	32
Monthly Average: 14.37 ppb	Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.8 Median = 4.3 Q <sub>3</sub> = 16.6 P <sub>90</sub> = 39.7 P <sub>99</sub> = 115.2		Percent Operational Time:	92.4

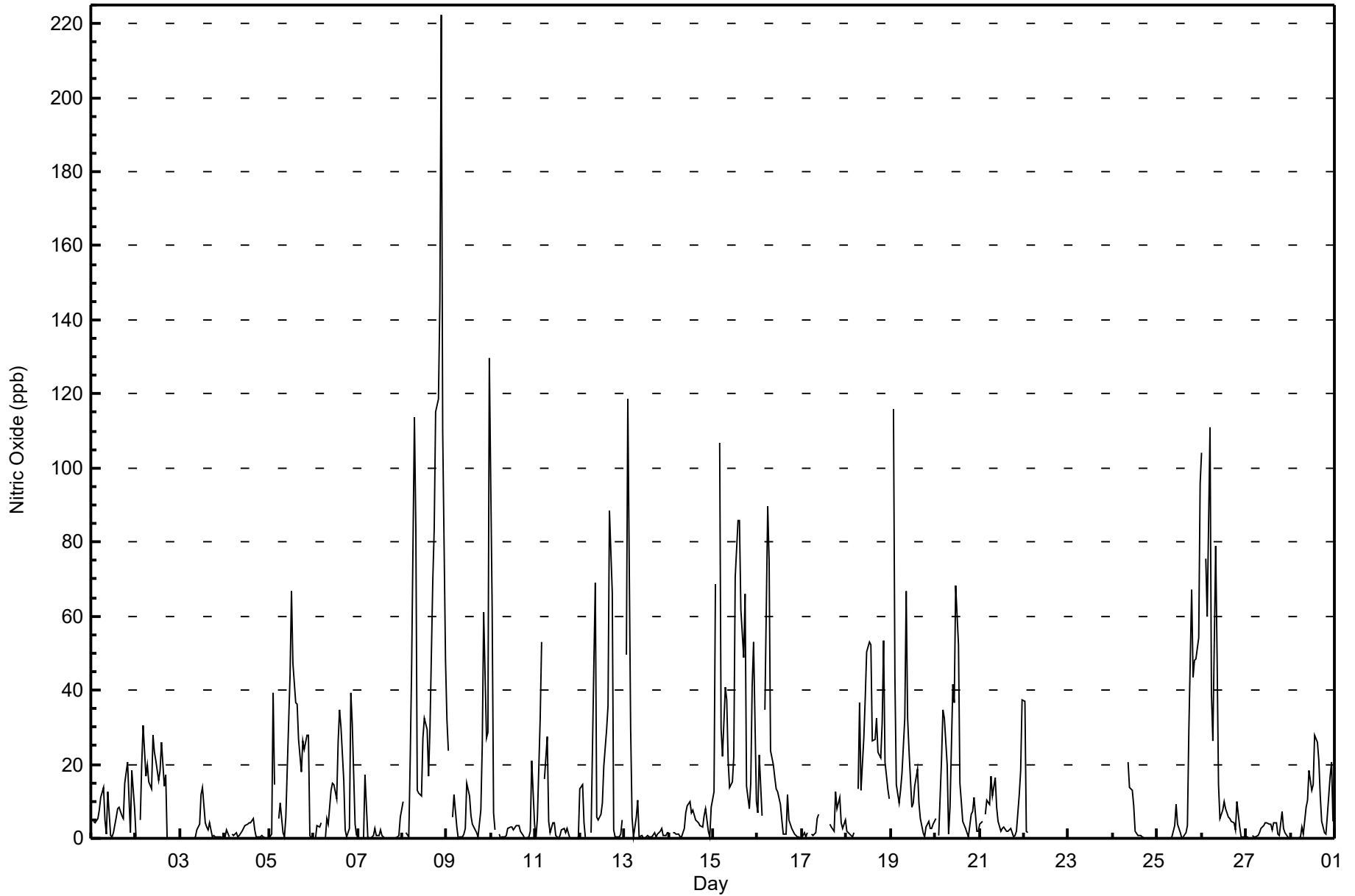
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Feb	Z	4.6	4.2	5.3	7.6	11.0	13.8	5.0	1.0	12.8	0.8	0.2	1.4	5.5	8.0	8.5	6.0	5.5	14.9	20.6	10.9	1.7	18.2	8.1	7.6	20.6																							
2-Feb	0.3	Z	5.1	19.8	30.6	16.8	20.0	15.4	13.5	28.0	23.3	21.1	15.5	18.5	25.8	14.0	17.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.4	30.6																							
3-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.4	2.4	3.6	11.7	13.7	4.3	3.1	2.4	4.3	0.5	0.9	0.5	0.3	0.4	0.3	0.0	2.1	13.7																							
4-Feb	0.6	2.4	0.5	Z	1.1	0.7	1.3	0.6	0.9	1.8	2.8	3.3	3.7	4.4	4.4	5.4	2.3	0.5	0.3	0.5	0.9	0.3	0.0	0.0	1.7	5.4																							
5-Feb	0.0	1.0	39.1	14.6	Z	5.2	9.5	1.6	0.4	5.8	18.7	44.2	66.8	47.3	36.8	36.1	26.8	17.9	26.4	24.2	27.9	28.0	0.9	0.0	20.8	66.8																							
6-Feb	0.0	0.0	3.3	3.0	4.1	Z	0.0	5.3	4.0	13.2	14.8	14.3	10.6	25.9	34.8	30.0	15.5	2.1	0.3	2.8	39.4	30.7	4.0	0.8	11.3	39.4																							
7-Feb	Z	0.0	0.0	0.0	17.1	0.3	0.0	0.0	0.8	2.5	0.7	0.7	2.4	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	5.7	1.4	17.1																							
8-Feb	9.9	Z	1.6	0.3	21.0	45.7	113.7	83.6	12.9	12.0	11.6	27.3	32.4	29.5	16.9	29.6	69.8	83.6	115.1	118.6	144.7	222.4	109.6	48.0	59.1	222.4																							
9-Feb	32.0	23.7	Z	5.7	11.7	3.1	0.0	0.5	0.2	1.0	2.8	15.0	11.6	6.0	3.7	2.4	1.5	0.3	7.5	25.3	61.0	26.9	28.8	129.6	17.4	129.6																							
10-Feb	62.1	6.8	2.3	Z	1.3	0.2	0.3	0.3	0.6	2.6	2.9	3.0	2.5	3.4	3.3	3.5	1.8	0.7	0.2	0.2	0.4	2.1	21.1	3.9	5.4	62.1																							
11-Feb	0.2	5.3	32.4	53.0	Z	16.2	27.6	4.5	1.4	4.1	4.2	0.8	0.1	0.9	2.4	2.5	1.5	2.8	0.0	0.2	0.0	0.0	0.0	0.2	7.0	53.0																							
12-Feb	13.4	14.5	4.1	0.0	0.0	Z	1.5	47.6	69.0	5.9	4.9	6.5	9.5	19.4	29.3	35.7	88.3	66.3	2.2	0.3	0.4	0.3	1.0	5.1	18.5	88.3																							
13-Feb	Z	49.5	118.7	29.7	5.7	0.3	5.9	10.5	0.4	0.7	0.1	0.1	0.8	0.3	0.5	0.3	1.7	0.6	1.2	2.1	2.8	0.9	0.6	1.4	10.2	118.7																							
14-Feb	1.6	Z	1.7	1.7	1.2	1.1	0.5	0.5	2.7	6.8	8.7	9.9	6.9	7.5	4.8	4.5	4.4	3.6	3.2	6.1	8.1	1.8	0.3	8.6	4.2	9.9																							
15-Feb	12.4	68.7	Z	106.6	29.6	22.0	40.7	37.5	20.9	13.8	15.4	22.1	70.4	85.7	85.9	61.7	48.7	65.8	14.1	7.9	15.0	41.0	52.8	9.8	41.2	106.6																							
16-Feb	7.0	22.6	6.0	Z	34.7	89.6	74.8	23.5	20.0	16.3	13.4	12.7	9.1	4.8	1.0	1.0	11.7	4.9	2.5	1.8	1.1	0.5	0.3	0.0	15.6	89.6																							
17-Feb	0.6	1.6	0.4	1.6	Z	1.0	0.8	1.6	5.2	6.6	Z	C	C	C	C	C	3.9	3.0	1.9	12.7	8.0	11.2	4.3	2.6	4.9	4.0	12.7																						
18-Feb	2.0	1.6	0.8	0.5	1.4	Z	13.3	36.8	12.9	27.0	37.8	50.5	53.1	52.1	26.5	26.8	32.6	23.3	21.9	31.3	53.5	20.6	13.3	10.6	23.9	53.5																							
19-Feb	Z	115.9	43.7	14.5	9.6	12.8	17.7	32.5	66.6	32.6	23.6	8.5	9.6	14.3	18.7	9.4	5.2	1.7	0.2	2.9	4.6	2.7	2.8	3.8	19.7	115.9																							
20-Feb	5.4	Z	0.7	21.2	34.8	32.4	20.0	1.3	8.4	41.4	36.4	68.3	52.2	15.0	10.0	4.5	2.7	1.4	0.4	6.3	7.3	11.1	1.9	1.8	16.7	68.3																							
21-Feb	3.7	4.5	Z	6.5	10.3	9.2	16.6	11.5	16.5	8.4	4.4	2.0	2.6	3.0	2.0	1.7	2.2	2.5	0.2	0.6	1.9	12.0	18.3	37.2	7.7	37.2																							
22-Feb	37.1	2.0	1.7	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	37.1																						
23-Feb	UO	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--																						
24-Feb	M	M	M	M	M	M	M	M	M	20.5	13.8	12.8	8.8	1.8	0.6	0.7	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	20.5	20.5																						
25-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.5	9.3	3.7	1.6	0.1	0.5	1.6	3.3	29.0	67.0	43.4	47.9	48.3	54.2	95.8	17.8	95.8																							
26-Feb	103.9	Z	75.3	59.9	110.9	38.9	26.2	79.1	48.7	14.4	5.2	7.7	9.8	8.2	5.8	5.2	4.5	4.3	2.5	10.0	2.9	0.5	0.5	0.4	27.2	110.9																							
27-Feb	0.3	0.3	Z	0.7	0.5	0.3	0.7	1.5	2.8	3.4	4.1	4.1	3.7	3.9	2.4	4.1	4.3	1.0	0.6	7.4	2.8	1.7	0.5	0.0	2.2	7.4																							
28-Feb	0.0	0.0	0.0	Z	0.0	0.4	3.2	1.3	8.3	10.5	18.4	12.9	14.5	27.8	25.9	21.0	11.4	4.4	1.7	1.2	5.9	16.6	20.8	4.5	9.2	27.8																							
																								13.9	15.5	16.3	16.4	15.1	14.0	16.3	16.1	13.1	11.2	11.2	14.4	16.2	15.6	14.1	12.2	14.3	12.5	11.4	12.4	17.3	18.3	13.6	14.6	Diurnal Average	
																								103.9	115.9	118.7	106.6	110.9	89.6	113.7	83.6	69.0	41.4	37.8	68.3	70.4	85.7	85.9	61.7	88.3	83.6	115.1	118.6	144.7	222.4	109.6	129.6	Diurnal Maximum	

Z - zerospan      C - Calibration      M - Maintenance      UO - Unstable Operation



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

**Nitric Oxide (NO) - ppb**  
**Fort Hills - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Fort Hills - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	461	78.27	78.27
21 - 40	69	11.71	89.98
41 - 80	40	6.79	96.77
81 - 159	18	3.06	99.83
> 159	1	0.17	100.00

Total Number of Valid Hours: 589

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Fort Hills - February 2023**

<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	67	99	10	22	3	2	27	52	35	29	21	13	13	15	19	33	460
21 - 40	7	1	2	3	2	3	11	16	8	4	4	0	1	2	0	2	66
41 - 80	4	3	0	1	1	8	5	7	4	4	0	1	0	0	0	2	40
81 - 159	3	0	3	1	0	2	3	3	1	0	0	0	1	0	0	1	18
> 159	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
<b>Totals</b>	81	103	15	27	6	15	46	78	49	37	25	14	15	17	19	38	585

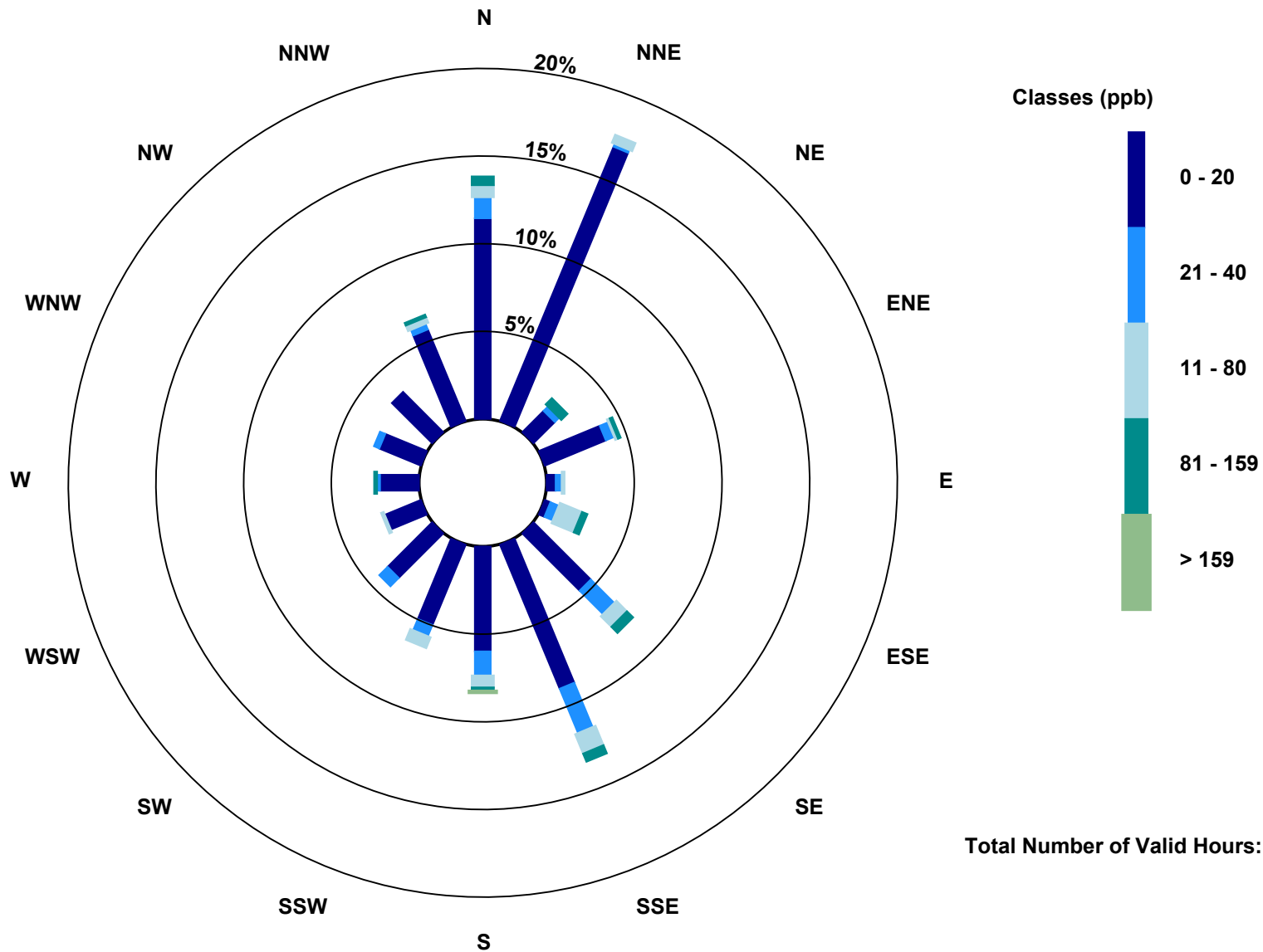
Total Number of Valid Hours: 585

Total Number of Hours: 672

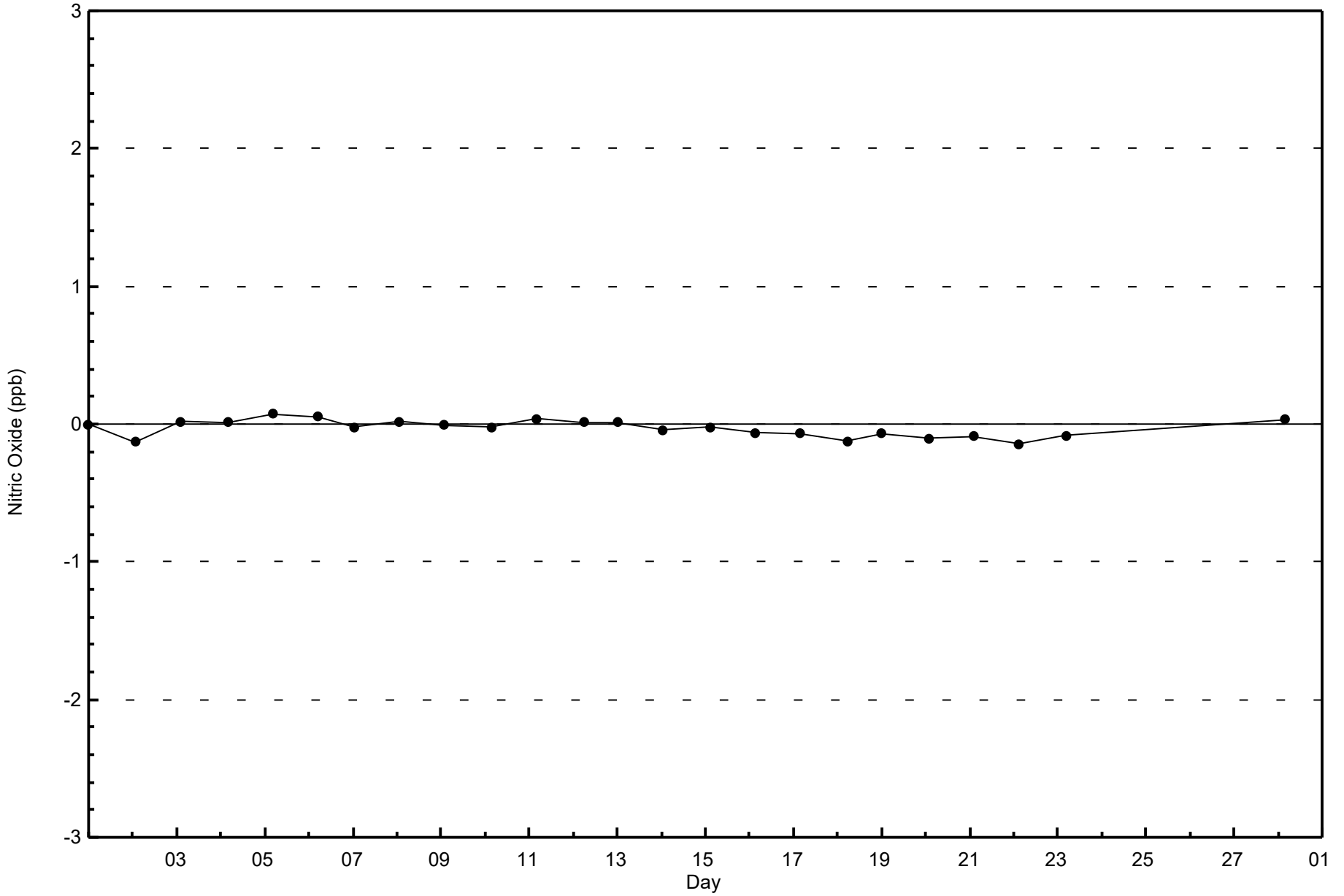


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

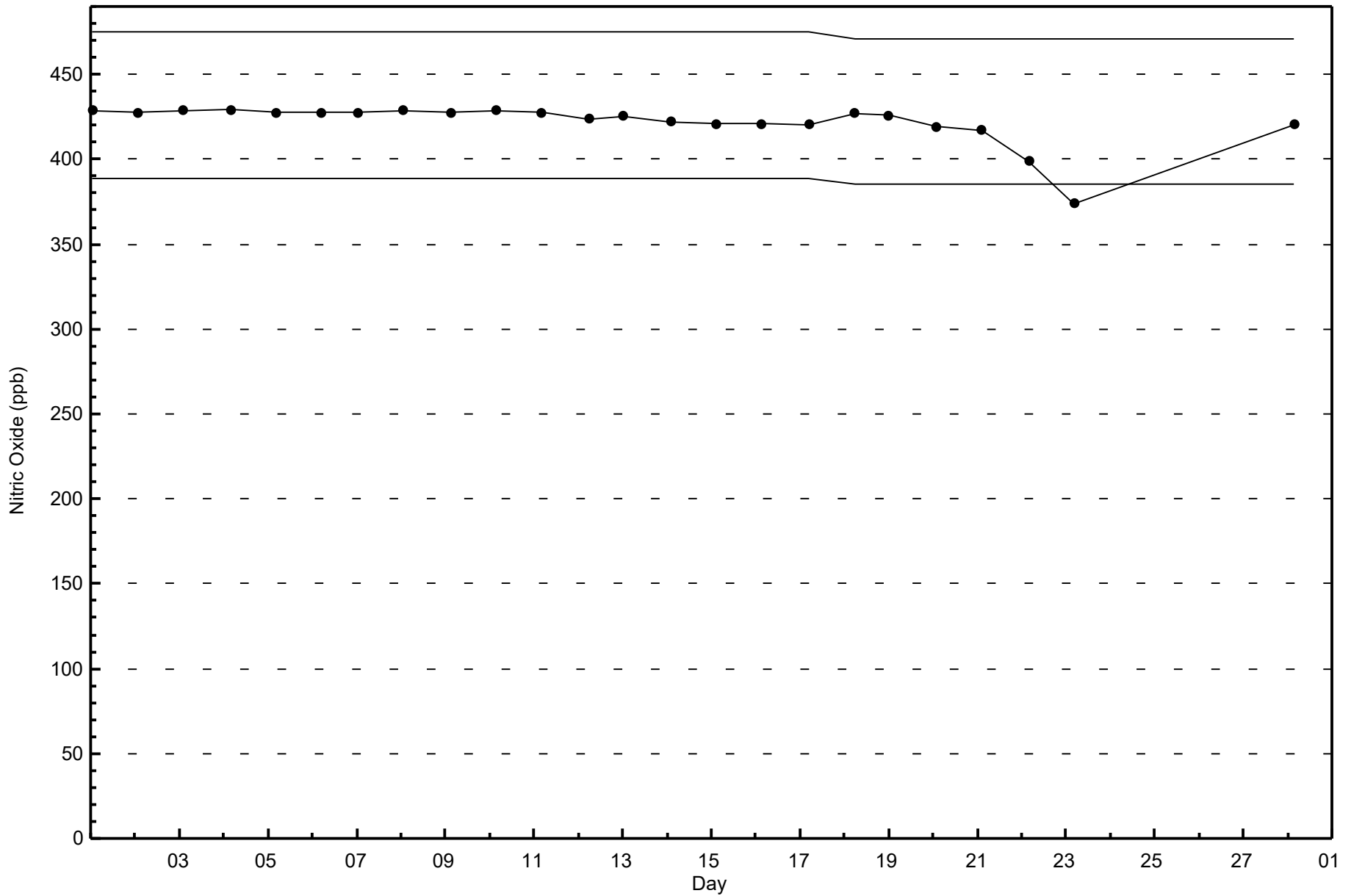
Nitric Oxide (NO) - ppb  
Fort Hills



Total Number of Valid Hours: 585









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

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Fort Hills - February 2023**

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 55.5 ppb on Feb 8 22:00	Maximum Daily Average: 31.0 ppb on Feb 15		Hours of Data:	589
Minimum Value: 0.4 ppb on Feb 6 01:00	Minimum Daily Average: 8.3 ppb on Feb 7		Hours of Missing Data:	83
Maximum Diurnal Average: 25.1 ppb at hour 21	Minimum Diurnal Average: 11.9 ppb at hour 12		Hours of Calibration:	32
Monthly Average: 19.43 ppb	Percentiles: P <sub>1</sub> = 0.8 P <sub>10</sub> = 4.9 Q <sub>1</sub> = 10.2 Median = 17.9 Q <sub>3</sub> = 28.8 P <sub>90</sub> = 35.5 P <sub>99</sub> = 43.4		Percent Operational Time:	92.4

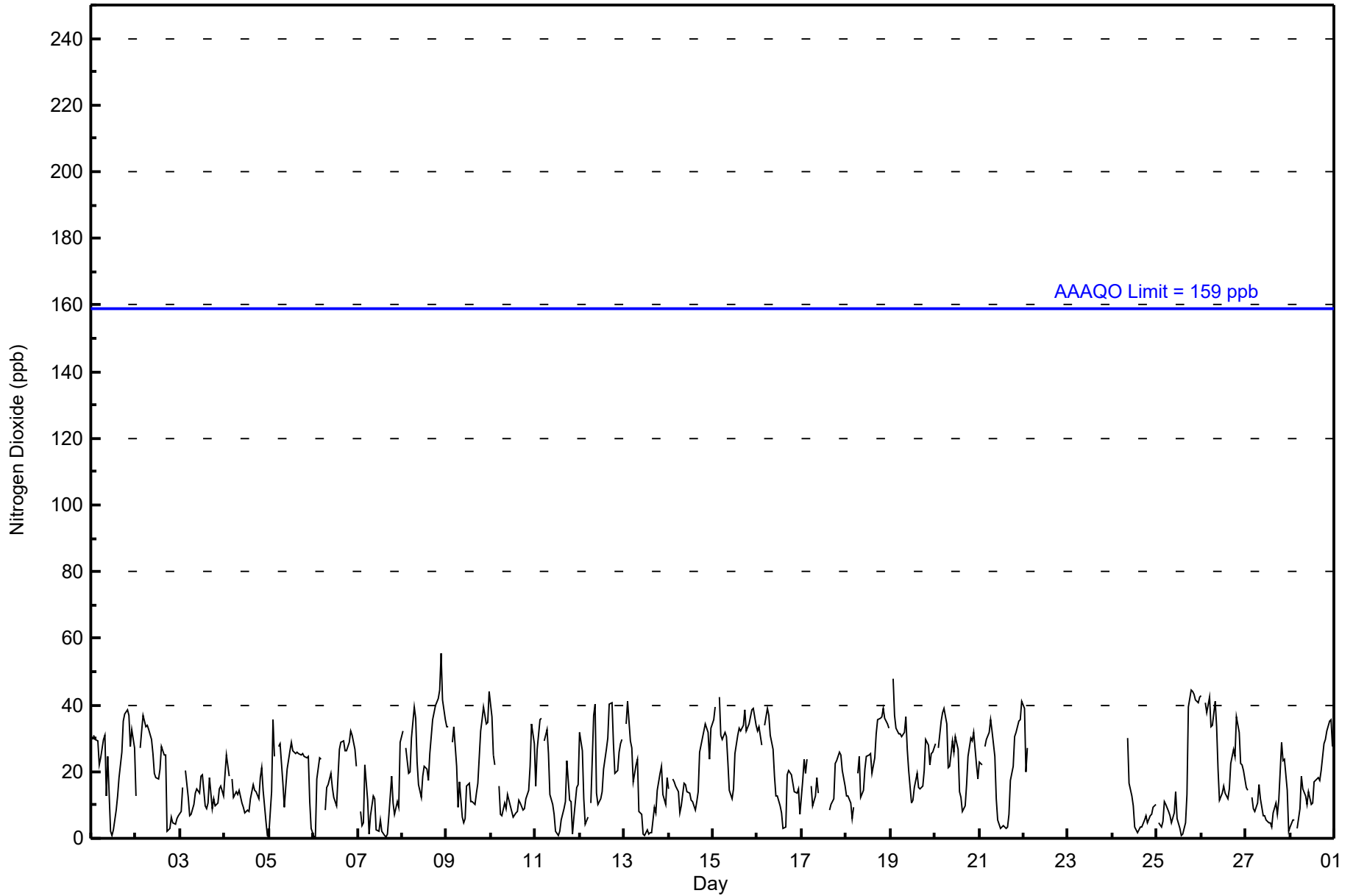
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Feb	Z	31.1	29.7	29.1	22.1	24.1	29.7	31.0	12.5	24.4	2.2	0.7	2.4	8.5	12.7	18.1	25.9	35.0	37.1	38.4	36.8	27.4	32.5	27.0	23.4	38.4	
2-Feb	12.8	Z	27.3	32.2	36.7	33.6	34.0	32.7	29.5	25.6	19.6	18.2	17.7	20.6	27.6	24.9	25.1	2.3	3.0	6.3	4.7	4.1	5.8	6.8	19.6	36.7	
3-Feb	7.9	15.2	Z	20.3	12.4	6.7	7.3	10.3	13.5	14.7	13.5	18.7	19.2	9.9	9.0	10.5	18.1	8.9	11.9	9.6	10.6	14.8	15.5	12.7	12.7	20.3	
4-Feb	18.9	24.8	18.6	Z	17.8	12.1	14.1	13.2	14.4	10.5	9.2	7.8	8.3	7.9	11.7	16.1	14.3	14.0	11.8	18.2	21.1	14.5	5.0	0.9	13.3	24.8	
5-Feb	0.8	14.1	35.7	24.4	Z	27.4	28.5	16.5	9.3	15.2	20.7	26.4	28.8	26.2	25.5	25.9	25.6	25.1	25.6	24.4	24.3	24.4	11.0	2.8	21.2	35.7	
6-Feb	0.4	0.5	17.7	24.3	23.8	Z	8.4	15.2	16.0	19.6	15.4	12.3	9.8	18.4	26.8	28.7	29.3	26.3	26.1	28.8	32.2	31.0	26.8	21.7	20.0	32.2	
7-Feb	Z	7.9	3.9	4.5	22.1	11.5	1.3	6.9	12.6	11.8	2.7	2.2	5.5	2.3	1.0	0.5	1.2	6.7	18.5	10.7	7.0	10.9	9.5	28.8	8.3	28.8	
8-Feb	32.0	Z	27.2	19.4	19.9	30.1	39.3	36.0	22.9	15.9	12.2	18.5	21.4	20.6	17.2	25.5	35.8	37.8	39.8	41.8	44.6	55.5	41.7	35.5	30.0	55.5	
9-Feb	33.4	33.5	Z	28.8	33.3	21.6	9.5	16.8	6.2	4.7	5.8	15.6	16.4	11.1	11.2	10.3	13.7	16.6	32.2	35.7	39.2	34.2	34.9	43.9	22.1	43.9	
10-Feb	36.6	24.9	22.1	Z	15.7	7.2	6.7	10.7	8.9	13.1	9.6	8.2	6.2	7.6	8.1	11.4	10.7	8.5	9.1	11.8	14.5	21.6	34.3	28.5	14.6	36.6	
11-Feb	15.5	26.6	35.6	36.1	Z	29.3	32.7	25.5	13.1	10.0	7.3	2.1	0.7	2.0	5.3	9.0	11.1	23.1	11.5	11.1	1.2	6.2	15.1	15.9	15.0	36.1	
12-Feb	31.8	26.1	11.8	4.4	6.4	Z	10.7	37.0	40.2	13.6	10.3	11.9	13.9	20.8	26.7	30.1	40.4	40.5	28.5	19.5	20.4	25.7	28.6	29.6	23.0	40.5	
13-Feb	Z	34.4	41.2	29.4	27.3	17.0	22.2	23.9	8.0	7.4	1.2	1.0	2.7	1.2	1.8	1.9	9.5	7.5	14.6	19.4	21.6	13.2	10.2	18.1	14.6	41.2	
14-Feb	14.7	Z	18.0	17.1	15.7	14.1	7.8	9.6	16.6	16.1	14.1	13.5	11.3	10.9	8.4	11.1	14.1	26.0	29.9	32.2	34.5	31.6	23.8	33.1	18.4	34.5	
15-Feb	35.8	39.6	Z	42.3	31.0	29.8	31.8	30.6	22.8	14.3	11.7	14.7	25.3	30.9	33.1	32.3	33.8	38.7	32.0	34.2	36.6	38.5	38.9	34.1	31.0	42.3	
16-Feb	32.1	33.3	27.8	Z	34.0	39.0	36.8	30.9	26.5	18.8	12.7	12.9	9.9	7.8	3.0	3.3	19.1	20.2	19.2	16.5	13.8	13.7	14.7	7.4	19.7	39.0	
17-Feb	17.4	23.7	19.4	23.8	Z	15.7	9.9	12.5	18.1	13.5	C	C	C	C	C	8.5	10.0	11.7	22.5	23.1	26.0	25.0	20.3	15.7	17.6	26.0	
18-Feb	12.9	12.9	10.7	5.9	9.3	Z	19.5	24.7	12.2	14.4	20.9	24.6	24.8	25.4	19.3	24.1	31.3	35.6	36.0	36.4	38.8	36.0	34.5	33.0	23.6	38.8	
19-Feb	Z	47.9	36.9	33.1	31.5	31.4	30.6	31.9	36.6	26.9	20.2	10.4	11.5	15.1	19.4	15.2	14.7	15.7	20.2	29.6	27.9	21.9	25.4	26.0	25.2	47.9	
20-Feb	28.2	Z	27.1	35.3	37.7	38.8	34.2	21.1	21.7	29.2	25.7	30.6	26.9	14.0	12.2	8.0	9.7	16.3	24.4	30.0	29.2	31.9	22.0	17.9	24.9	38.8	
21-Feb	22.8	22.2	Z	27.5	29.6	31.9	35.5	32.3	24.7	12.0	5.5	2.8	3.5	3.9	2.8	3.5	7.2	17.5	21.5	30.6	31.7	35.2	35.4	41.0	20.9	41.0	
22-Feb	38.8	20.1	27.3	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	38.8
23-Feb	UO	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
24-Feb	M	M	M	M	Z	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	30.1
25-Feb	Z	4.6	3.5	5.2	11.1	10.1	8.2	6.6	4.5	7.6	13.9	5.8	3.1	0.7	1.4	4.7	13.1	39.4	44.6	43.9	43.3	41.4	40.7	42.3	17.4	44.6	
26-Feb	42.8	Z	40.8	37.8	42.5	33.5	33.9	41.1	33.4	20.7	11.6	13.5	15.8	13.6	12.0	15.0	22.4	26.8	24.7	36.3	31.6	22.6	21.9	20.3	26.7	42.8	
27-Feb	15.1	14.2	Z	12.2	9.0	8.1	10.8	16.0	12.0	6.9	6.7	5.4	4.7	4.6	3.4	7.8	10.4	7.4	11.5	28.9	23.3	23.6	14.6	2.3	11.3	28.9	
28-Feb	3.4	5.7	5.5	Z	3.1	9.1	18.6	14.7	12.7	10.2	14.0	10.0	10.7	17.1	17.8	18.3	17.3	20.3	28.5	29.5	32.3	35.3	35.4	27.5	17.3	35.4	
21.6 22.1 23.2 23.5 22.4 21.9 20.9 21.9 18.4 15.1 12.0 11.9 12.1 12.1 12.8 14.2 18.0 20.5 22.8 25.1 25.1 24.9 23.4 22.4																								Diurnal Average			
42.8 47.9 41.2 42.3 42.5 39.0 39.3 41.1 40.2 29.2 25.7 30.6 28.8 30.9 33.1 32.3 40.4 40.5 44.6 43.9 44.6 55.5 41.7 43.9																								Diurnal Maximum			

Z - zerospan                      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**  
**Fort Hills - February 2023**





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

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Fort Hills - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	333	56.54	56.54
21 - 40	236	40.07	96.60
41 - 80	20	3.40	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 589

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Fort Hills - February 2023**

<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	55	71	7	18	3	2	14	28	33	25	12	6	11	13	15	19	332
21 - 40	24	31	6	9	3	11	26	46	13	12	13	8	4	4	4	19	233
11 - 80	2	1	2	0	0	2	6	4	3	0	0	0	0	0	0	0	20
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>	81	103	15	27	6	15	46	78	49	37	25	14	15	17	19	38	585

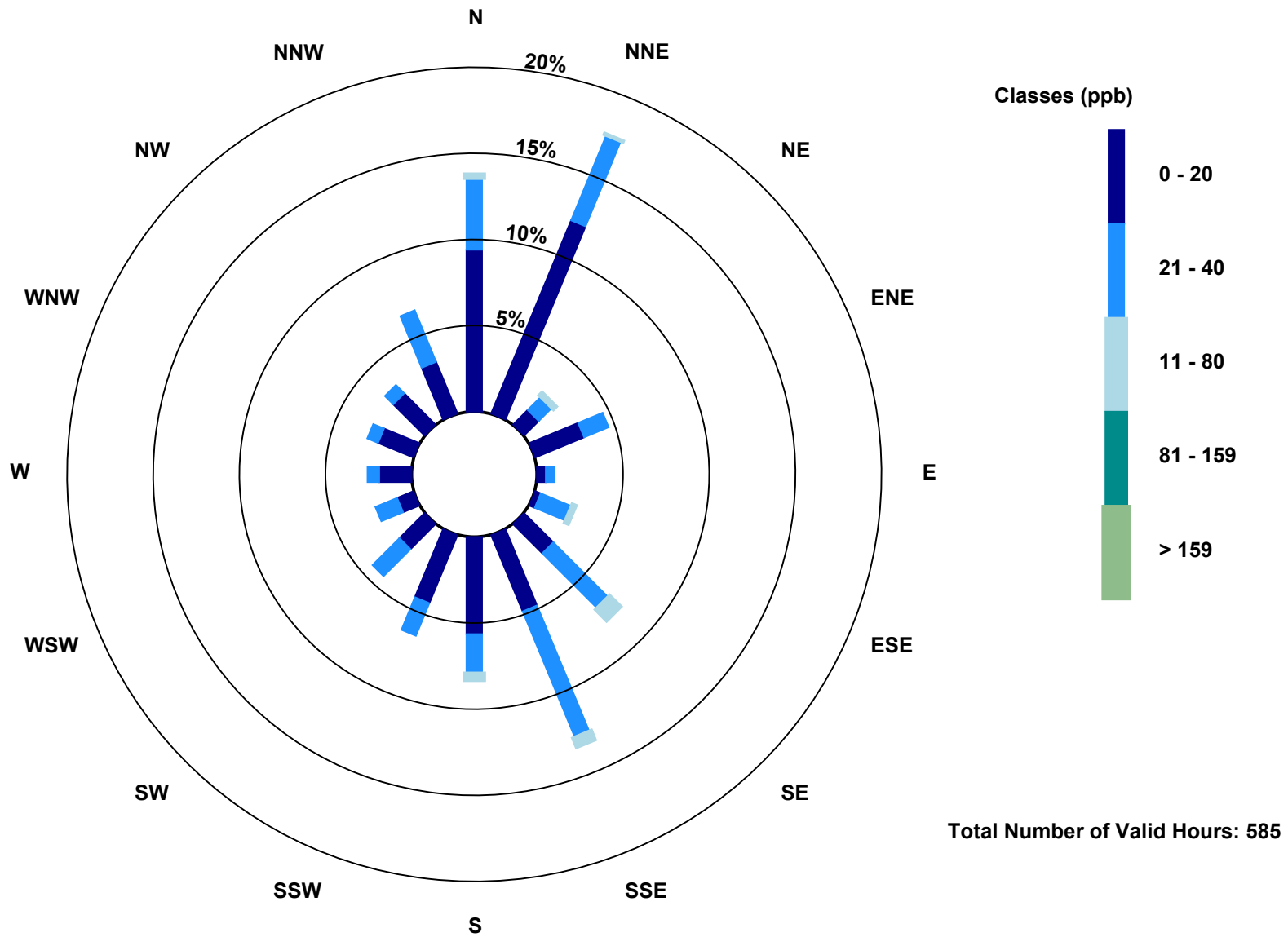
Total Number of Valid Hours: 585

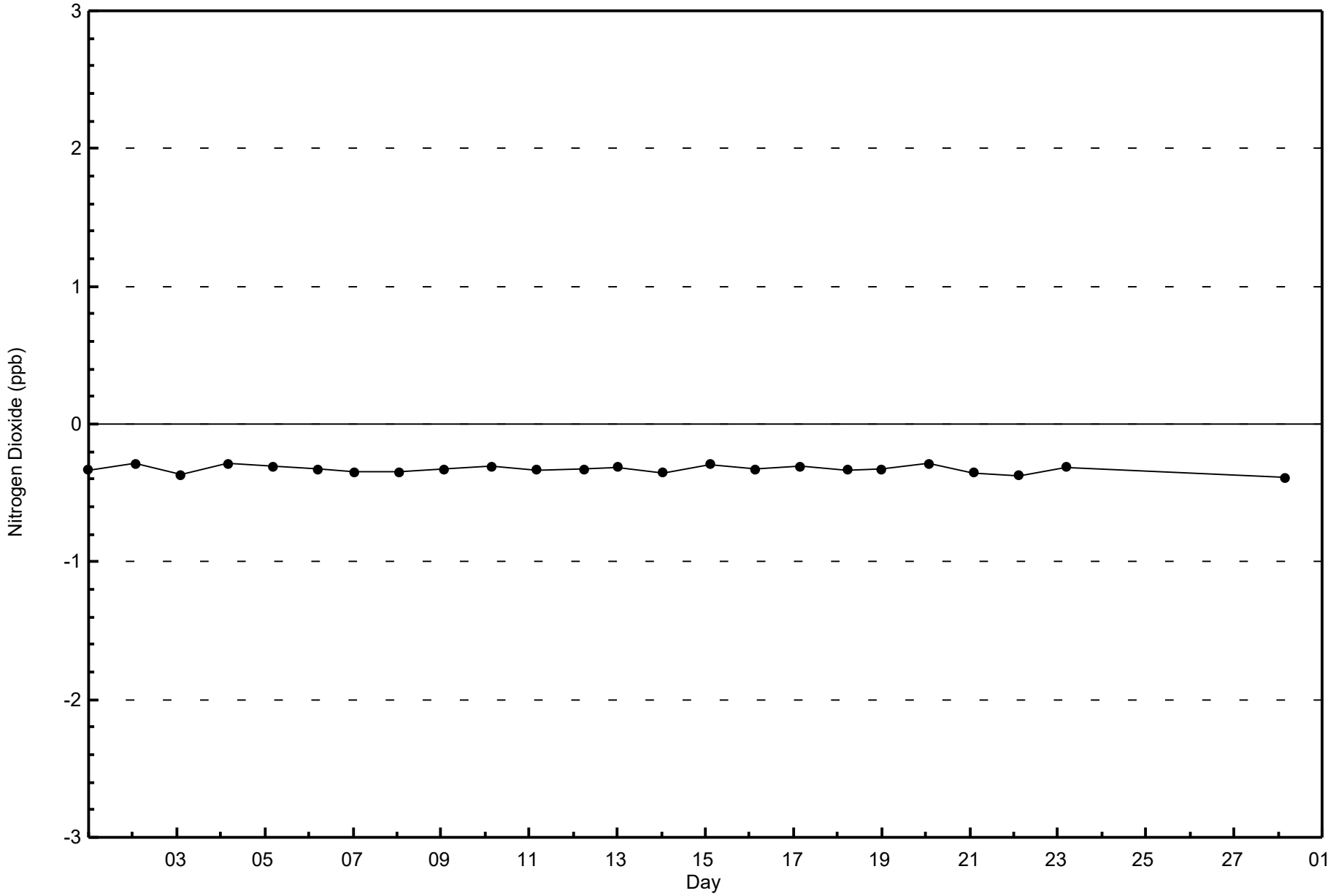
Total Number of Hours: 672

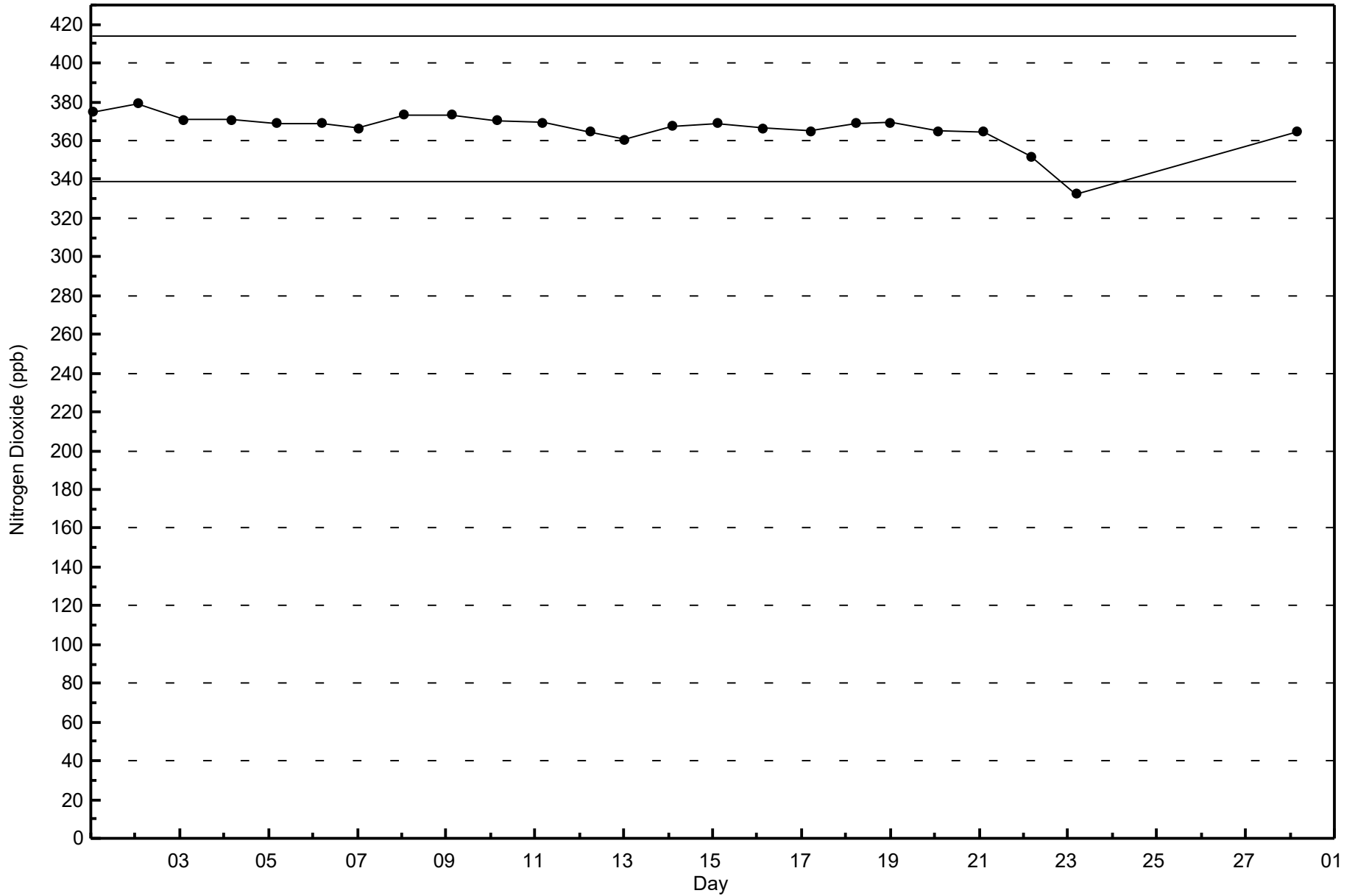


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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











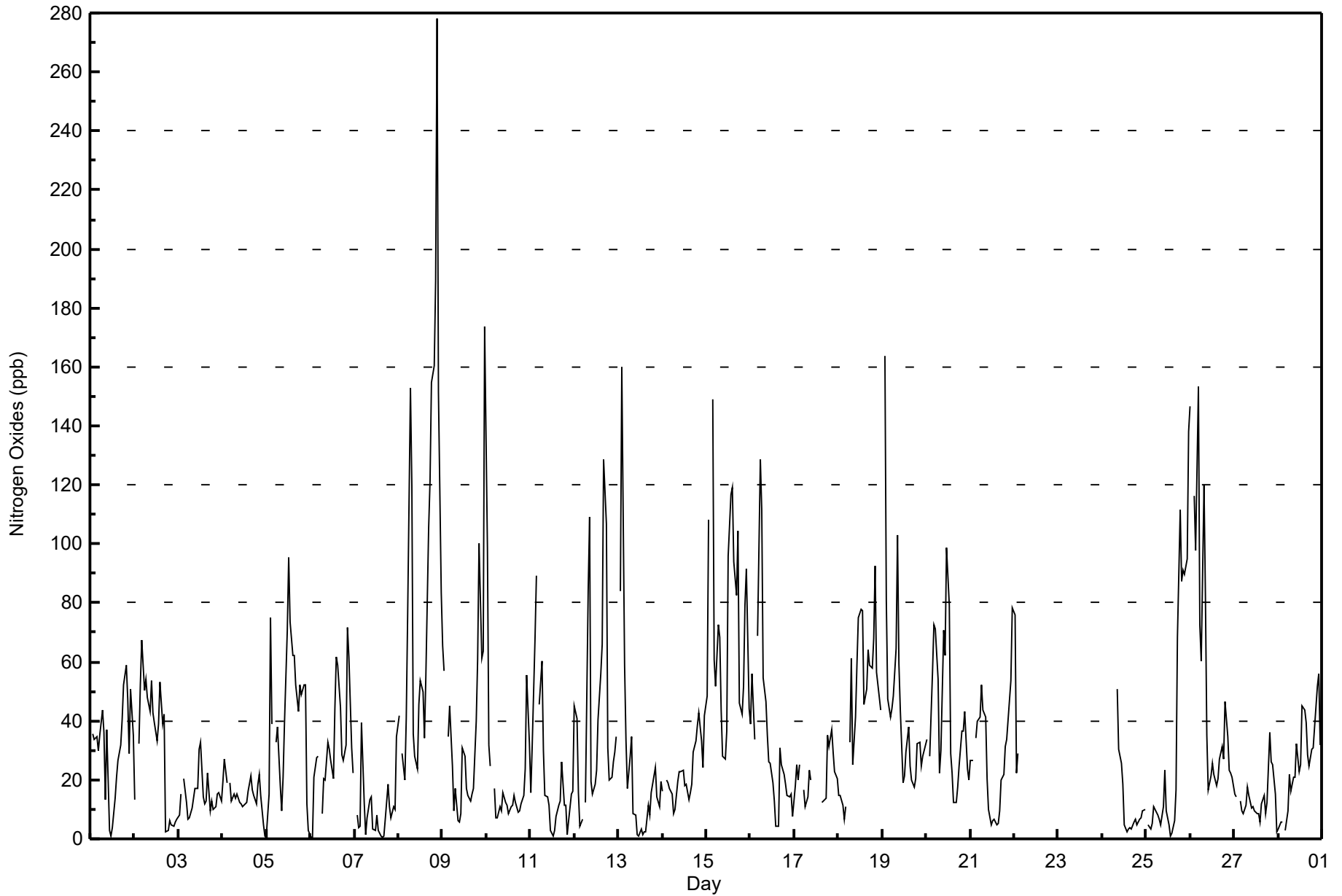
**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Fort Hills - February 2023**

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 277.9 ppb on Feb 8 22:00	Maximum Daily Average: 89.1 ppb on Feb 8		Hours of Data:	589
Minimum Value: 0.4 ppb on Feb 6 01:00	Minimum Daily Average: 9.6 ppb on Feb 7		Hours of Missing Data:	83
Maximum Diurnal Average: 43.2 ppb at hour 22	Minimum Diurnal Average: 23.2 ppb at hour 11		Hours of Calibration:	32
Monthly Average: 33.80 ppb	Percentiles: P <sub>1</sub> = 0.9 P <sub>10</sub> = 5.8 Q <sub>1</sub> = 12.2 Median = 23.4 Q <sub>3</sub> = 43.8 P <sub>90</sub> = 72.7 P <sub>99</sub> = 155.5		Percent Operational Time:	92.4

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-Feb	Z	35.7	33.9	34.4	29.7	35.1	43.5	36.0	13.5	37.2	3.0	0.9	3.8	14.0	20.7	26.6	31.9	40.5	52.0	59.0	47.7	29.1	50.7	35.1	31.0	59.0	
2-Feb	13.1	Z	32.4	52.0	67.3	50.4	54.0	48.1	43.0	53.6	42.9	39.3	33.2	39.1	53.4	38.9	42.3	2.3	3.0	6.3	4.7	4.1	5.8	6.8	32.0	67.3	
3-Feb	7.9	15.2	Z	20.3	12.4	6.7	7.3	10.3	13.9	17.1	17.1	30.4	32.9	14.2	12.1	12.9	22.4	9.4	12.8	10.1	10.9	15.2	15.8	12.7	14.8	32.9	
4-Feb	19.5	27.2	19.1	Z	18.9	12.8	15.4	13.8	15.3	12.3	12.0	11.1	12.0	12.3	16.1	21.5	16.6	14.5	12.1	18.7	22.0	14.8	5.0	0.9	14.9	27.2	
5-Feb	0.8	15.1	74.8	39.0	Z	32.6	38.0	18.1	9.7	21.0	39.4	70.6	95.6	73.5	62.3	62.0	52.4	43.0	52.0	48.6	52.2	52.4	11.9	2.8	42.1	95.6	
6-Feb	0.4	0.5	21.0	27.3	27.9	Z	8.4	20.5	20.0	32.8	30.2	26.6	20.4	44.3	61.6	58.7	44.8	28.4	26.4	31.6	71.6	61.7	30.8	22.5	31.2	71.6	
7-Feb	Z	7.9	3.9	4.5	39.2	11.8	1.3	6.9	13.4	14.3	3.4	2.9	7.9	3.0	1.0	0.5	1.2	6.7	18.5	10.7	7.0	11.1	10.1	34.5	9.6	39.2	
8-Feb	41.9	Z	28.8	19.7	40.9	75.8	153.0	119.6	35.8	27.9	23.8	45.8	53.8	50.1	34.1	55.1	105.6	121.4	154.9	160.4	189.3	277.9	151.3	83.5	89.1	277.9	
9-Feb	65.4	57.2	Z	34.5	45.0	24.7	9.5	17.3	6.4	5.7	8.6	30.6	28.0	17.1	14.9	12.7	15.2	16.9	39.7	61.0	100.2	61.1	63.7	173.5	39.5	173.5	
10-Feb	98.7	31.7	24.4	Z	17.0	7.4	7.0	11.0	9.5	15.7	12.5	11.2	8.7	11.0	11.4	14.9	12.5	9.2	9.3	12.0	14.9	23.7	55.4	32.4	20.1	98.7	
11-Feb	15.7	31.9	68.0	89.1	Z	45.5	60.3	30.0	14.5	14.1	11.5	2.9	0.8	2.9	7.7	11.5	12.6	25.9	11.5	11.3	1.2	6.2	15.1	16.1	22.0	89.1	
12-Feb	45.2	40.6	15.9	4.4	6.4	Z	12.2	84.6	109.2	19.5	15.2	18.4	23.4	40.2	56.0	65.8	128.7	106.8	30.7	19.8	20.8	26.0	29.6	34.7	41.5	128.7	
13-Feb	Z	83.9	159.9	59.1	33.0	17.3	28.1	34.4	8.4	8.1	1.3	1.1	3.5	1.5	2.3	2.2	11.2	8.1	15.8	21.5	24.4	14.1	10.8	19.5	24.8	159.9	
14-Feb	16.3	Z	19.7	18.8	16.9	15.2	8.3	10.1	19.3	22.9	22.8	23.4	18.2	18.4	13.2	15.6	18.5	29.6	33.1	38.3	42.6	33.4	24.1	41.7	22.6	42.6	
15-Feb	48.2	108.3	Z	148.9	60.6	51.8	72.5	68.1	43.7	28.1	27.1	36.8	95.7	116.6	119.0	94.0	82.5	104.5	46.1	42.1	51.6	79.5	91.7	43.9	72.2	148.9	
16-Feb	39.1	55.9	33.8	Z	68.7	128.6	111.6	54.4	46.5	35.1	26.1	25.6	19.0	12.6	4.0	4.3	30.8	25.1	21.7	18.3	14.9	14.2	15.0	7.4	35.3	128.6	
17-Feb	18.0	25.3	19.8	25.4	Z	16.7	10.7	14.1	23.3	20.1	Z	Z	Z	Z	Z	12.4	13.0	13.6	35.2	31.1	37.2	29.3	22.9	20.6	21.6	37.2	
18-Feb	14.9	14.5	11.5	6.4	10.7	Z	32.8	61.5	25.1	41.4	58.7	75.1	77.9	77.5	45.8	50.9	63.9	58.9	57.9	67.7	92.3	56.6	47.8	43.6	47.5	92.3	
19-Feb	Z	163.8	80.6	47.6	41.1	44.2	48.3	64.4	103.2	59.5	43.8	18.9	21.1	29.4	38.1	24.6	19.9	17.4	20.4	32.5	32.5	24.6	28.2	29.8	45.0	163.8	
20-Feb	33.6	Z	27.8	56.5	72.5	71.2	54.2	22.4	30.1	70.6	62.1	98.9	79.1	29.0	22.2	12.5	12.4	17.7	24.8	36.3	36.5	43.0	23.9	19.7	41.6	98.9	
21-Feb	26.5	26.7	Z	34.0	39.9	41.1	52.1	43.8	41.2	20.4	9.9	4.8	6.1	6.9	4.8	5.2	9.4	20.0	21.7	31.2	33.6	47.2	53.7	78.2	28.6	78.2	
22-Feb	75.9	22.1	29.0	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	75.9
23-Feb	UO	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
24-Feb	M	M	M	M	Z	M	M	M	M	50.6	30.4	25.5	18.5	5.0	2.3	3.1	3.9	3.5	5.5	6.8	4.6	6.6	7.3	9.3	10.2	--	50.6
25-Feb	Z	4.6	3.5	5.2	11.1	10.1	8.2	6.6	4.9	11.1	23.2	9.5	4.7	0.8	1.9	6.3	16.4	68.4	111.6	87.3	91.2	89.7	94.9	138.1	35.2	138.1	
26-Feb	146.7	Z	116.1	97.7	153.4	72.4	60.1	120.2	82.1	35.1	16.8	21.2	25.6	21.8	17.8	20.2	26.9	31.1	27.2	46.3	34.5	23.1	22.4	20.7	53.9	153.4	
27-Feb	15.4	14.5	Z	12.9	9.5	8.4	11.5	17.5	14.8	10.3	10.8	9.5	8.4	8.5	5.8	11.9	14.7	8.4	12.1	36.3	26.1	25.3	15.1	2.3	13.5	36.3	
28-Feb	3.4	5.7	5.5	Z	3.1	9.5	21.8	16.0	21.0	20.7	32.4	22.9	25.2	44.9	43.7	39.3	28.7	24.7	30.2	30.7	38.2	51.9	56.2	32.0	26.4	56.2	
																								Diurnal Average	Diurnal Maximum		
																								35.6	146.7		
																								37.5	163.8		
																								39.5	159.9		
																								39.9	148.9		
																								37.5	153.4		
																								35.9	128.6		
																								37.2	153.0		
																								38.0	120.2		
																								31.5	109.2		
																								26.3	70.6		
																								23.2	62.1		
																								26.3	98.9		
																								28.4	95.7		
																								27.7	116.6		
																								26.9	119.0		
																								26.3	94.0		
																								32.2	128.7		
																								33.0	121.4		
																								34.1	154.9		
																								37.5	160.4		
																								42.5	189.3		
																								43.2	277.9		
																								37.0	151.3		
																								37.0	173.5		

Z - zerospan                      C - Calibration                      M - Maintenance                      UO - Unstable Operation





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Fort Hills - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	262	44.48	44.48
21 - 40	159	26.99	71.48
41 - 80	119	20.20	91.68
81 - 159	42	7.13	98.81
> 159	6	1.02	99.83

Total Number of Valid Hours: 589

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Fort Hills - February 2023**

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	62	4	13	2	0	5	24	28	20	9	4	10	9	11	16	261
21 - 40	20	33	5	9	1	2	15	15	4	8	8	8	3	5	7	16	159
11 - 80	10	5	3	3	2	5	18	34	11	7	8	2	1	3	1	3	116
81 - 159	7	3	1	2	1	8	7	3	5	1	0	0	1	0	0	3	42
> 159	0	0	2	0	0	0	1	2	1	0	0	0	0	0	0	0	6
<b>Totals</b>	81	103	15	27	6	15	46	78	49	36	25	14	15	17	19	38	584

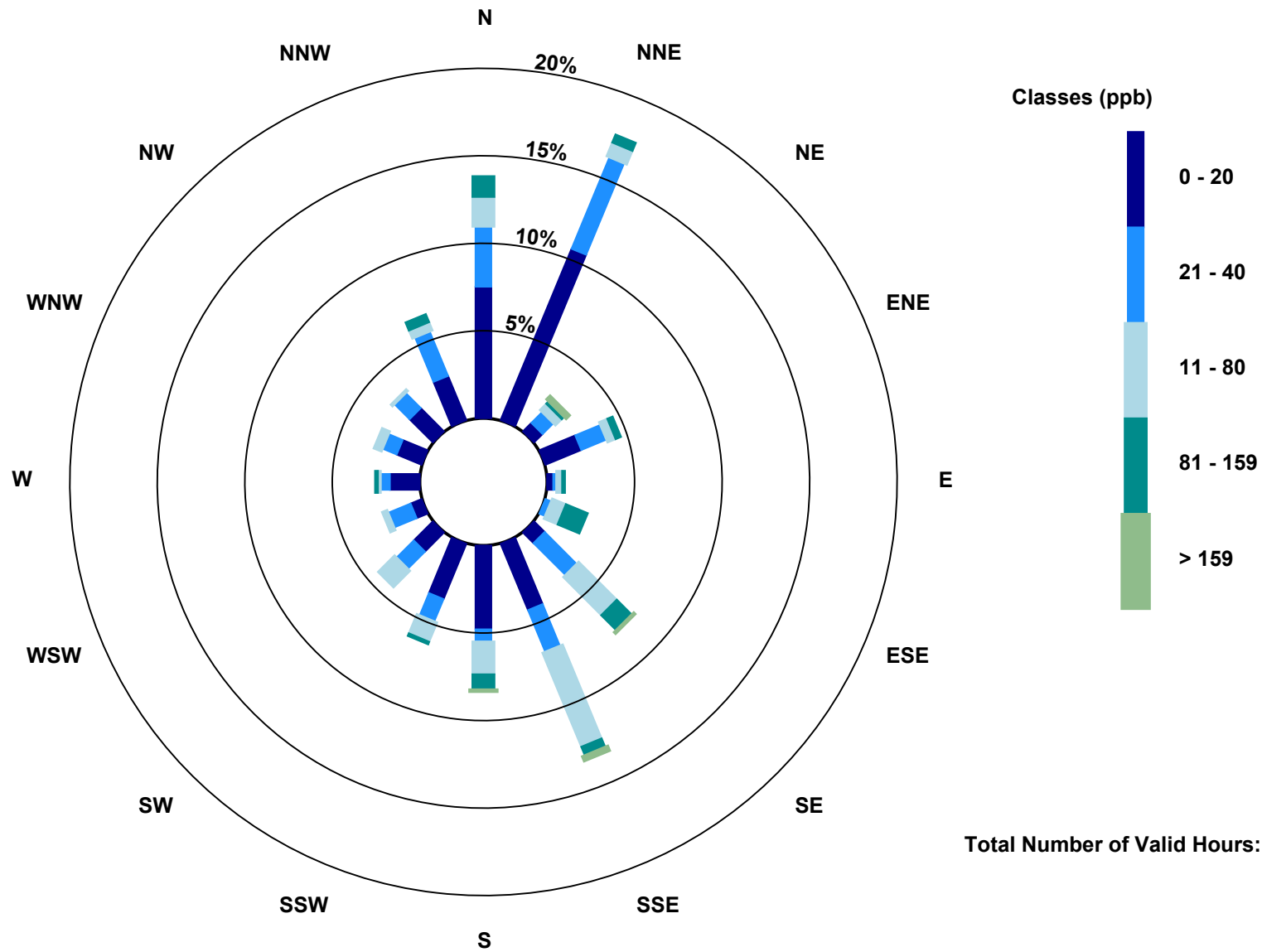
Total Number of Valid Hours: 585

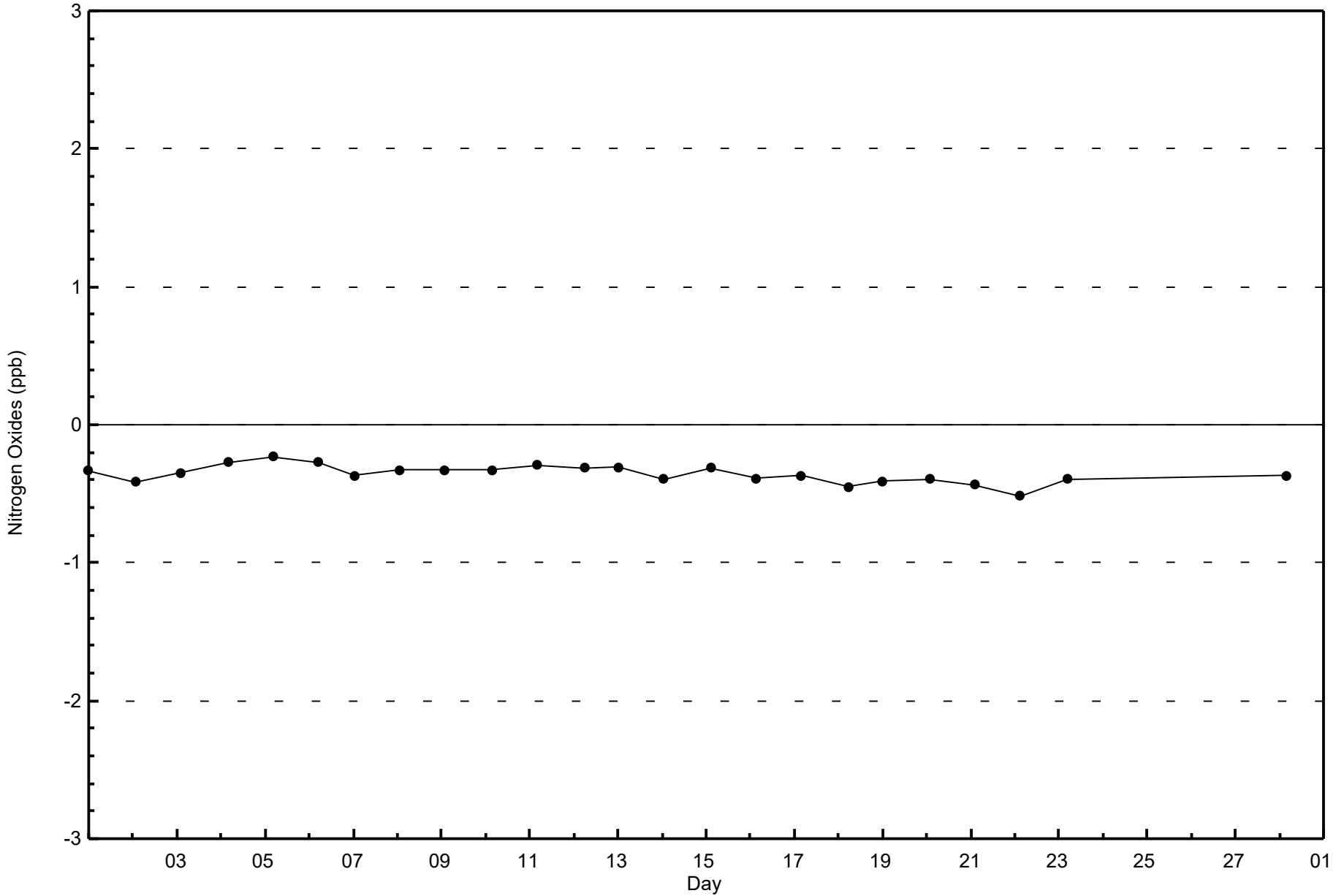
Total Number of Hours: 672

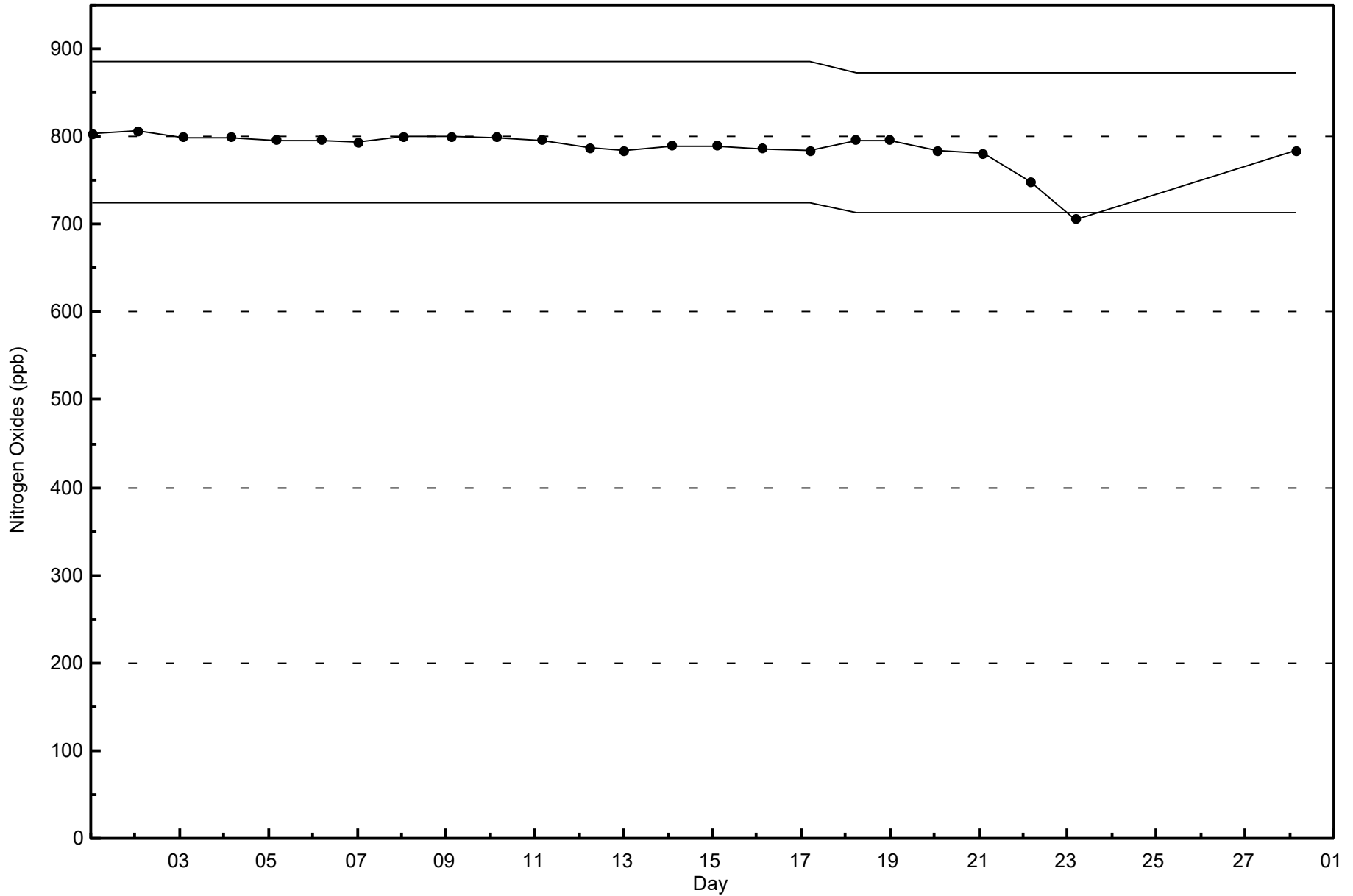


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









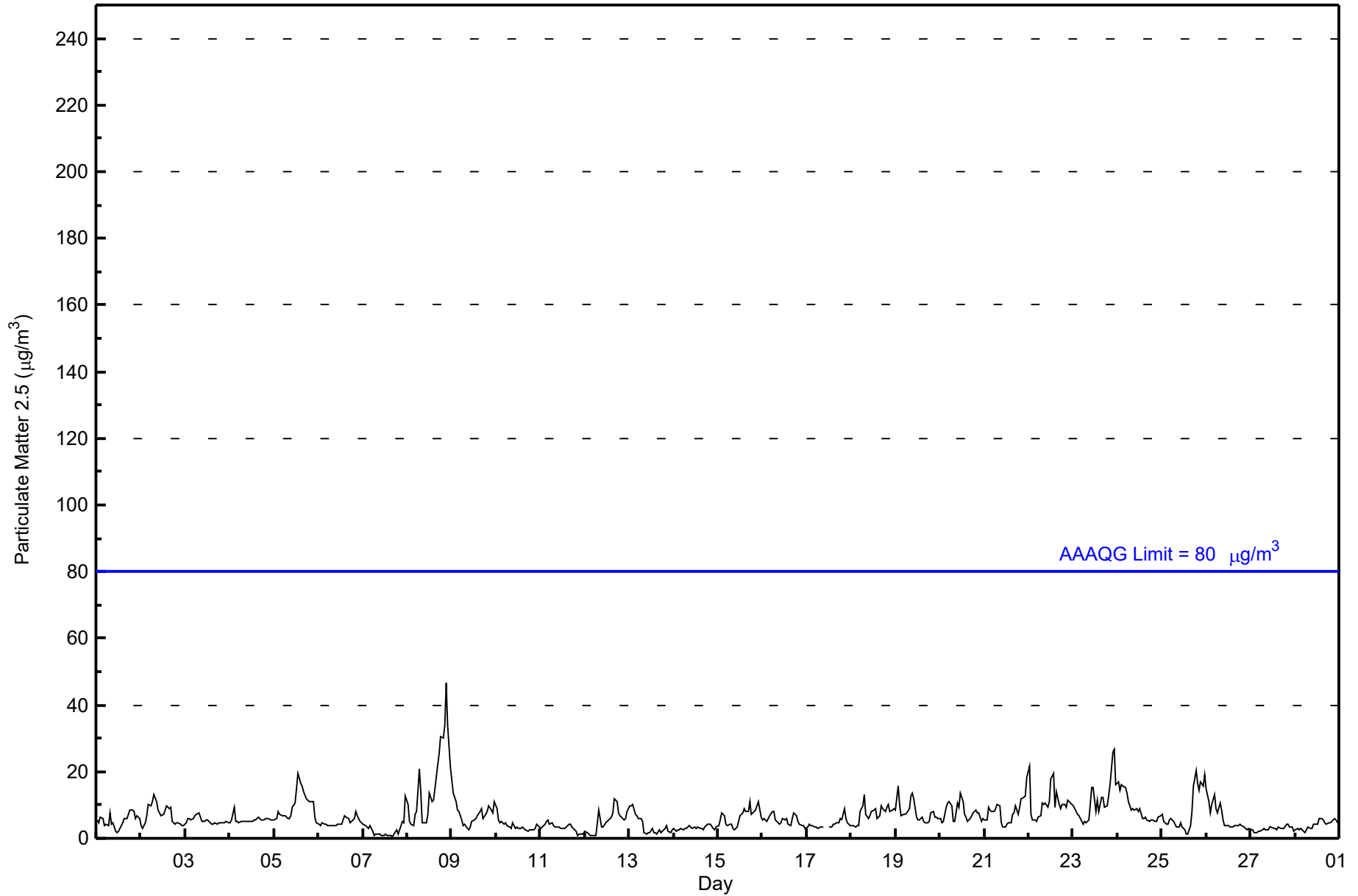
Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 46.7 µg/m <sup>3</sup> on Feb 8 22:00	Maximum Daily Average: 16.2 µg/m <sup>3</sup> on Feb 8		Hours of Data:	670
Minimum Value: 0.6 µg/m <sup>3</sup> on Feb 7 17:00	Minimum Daily Average: 2.5 µg/m <sup>3</sup> on Feb 7		Hours of Missing Data:	2
Maximum Diurnal Average: 8.5 µg/m <sup>3</sup> at hour 22	Minimum Diurnal Average: 5.2 µg/m <sup>3</sup> at hour 10		Hours of Calibration:	2
Monthly Average: 6.52 µg/m <sup>3</sup>	Percentiles: P <sub>1</sub> = 0.8 P <sub>10</sub> = 2.7 Q <sub>1</sub> = 3.7 Median = 5.3 Q <sub>3</sub> = 8.1 P <sub>90</sub> = 11.2 P <sub>99</sub> = 25.6		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-Feb	5.3	4.8	6.3	5.8	3.8	4.1	3.8	7.7	4.2	4.7	2.2	1.9	2.0	3.8	4.8	5.7	5.8	7.4	8.7	8.5	8.3	6.0	6.9	6.1	5.4	8.7																						
2-Feb	3.6	3.1	4.7	6.7	10.1	9.9	10.9	13.3	11.1	8.5	7.8	7.0	7.4	8.3	9.9	9.1	9.5	5.2	4.1	4.8	4.5	4.2	3.7	3.7	7.1	13.3																						
3-Feb	4.8	6.0	6.0	5.7	5.7	6.8	7.4	7.7	6.5	5.1	5.0	5.5	5.5	4.6	4.3	4.2	4.6	4.4	4.5	4.6	4.9	4.8	5.1	4.9	5.4	7.7																						
4-Feb	4.8	5.4	9.5	5.3	5.0	4.7	4.9	4.9	5.3	4.9	4.9	5.1	5.1	5.6	5.7	6.2	6.0	5.7	5.7	6.0	5.9	5.9	5.5	5.7	5.6	9.5																						
5-Feb	5.6	5.9	8.2	7.2	6.7	6.6	7.0	6.1	5.9	6.8	9.2	10.8	15.0	19.4	16.5	15.7	13.9	11.8	11.3	10.9	11.0	11.2	6.4	4.6	9.7	19.4																						
6-Feb	4.1	3.9	4.5	4.4	4.1	3.9	3.8	3.9	4.0	4.0	4.4	4.2	4.1	5.6	6.7	6.5	5.9	4.7	5.1	6.0	7.9	6.8	5.0	4.5	4.9	7.9																						
7-Feb	4.1	4.0	3.2	2.9	3.8	2.0	0.9	1.2	1.2	1.3	0.8	0.7	1.1	1.0	0.7	0.7	0.6	1.1	2.7	1.2	2.7	5.0	4.5	12.6	2.5	12.6																						
8-Feb	10.0	5.2	4.4	3.8	7.3	8.0	20.6	14.2	4.6	4.5	4.7	7.0	13.7	10.9	11.3	15.0	22.0	25.4	30.7	30.1	33.8	46.7	33.9	21.4	16.2	46.7																						
9-Feb	17.5	13.7	10.9	8.5	7.9	5.3	3.7	4.3	3.0	2.8	3.3	5.1	5.7	5.8	7.0	8.0	9.1	5.9	7.4	8.2	10.0	8.3	7.8	11.0	7.5	17.5																						
10-Feb	9.1	5.4	4.8	5.1	4.3	4.8	3.9	3.3	2.9	4.5	3.1	3.2	3.0	2.8	3.2	2.9	2.5	2.3	2.3	2.6	2.5	2.9	4.1	3.5	3.7	9.1																						
11-Feb	3.0	3.3	4.2	4.9	5.6	4.2	4.5	3.9	3.3	3.3	3.5	3.2	2.9	3.0	3.5	4.4	4.3	3.2	2.7	2.3	0.9	1.1	1.3	1.2	3.2	5.6																						
12-Feb	2.0	1.9	1.1	0.7	0.9	0.7	0.9	8.4	6.1	3.6	3.4	4.5	5.2	5.6	6.5	7.5	11.8	11.1	7.6	6.8	5.8	5.7	6.0	7.9	5.1	11.8																						
13-Feb	9.6	9.6	10.3	7.1	6.8	5.9	5.7	5.1	1.8	1.5	1.5	1.7	3.0	1.7	1.8	1.4	2.4	1.8	2.0	2.9	3.7	2.1	1.6	2.5	3.9	10.3																						
14-Feb	2.8	2.1	2.6	2.7	2.8	2.7	2.8	3.1	3.6	3.5	3.0	3.3	2.9	3.3	3.1	2.8	2.7	3.5	4.3	4.1	4.3	2.9	2.3	3.3	3.1	4.3																						
15-Feb	3.8	5.5	7.7	6.7	4.2	3.7	4.0	4.0	3.1	2.5	3.4	5.1	6.7	7.5	9.0	7.9	8.2	11.2	7.3	8.1	8.6	9.7	10.9	6.2	6.5	11.2																						
16-Feb	5.3	5.8	5.0	6.1	6.9	8.2	8.1	5.4	4.8	4.4	4.5	5.9	5.6	5.8	4.3	3.7	5.8	7.5	6.7	5.0	4.3	3.6	3.7	3.0	5.4	8.2																						
17-Feb	3.5	4.3	3.8	3.8	3.6	3.6	3.0	3.3	3.5	3.4	C	C	3.5	3.3	4.0	4.4	4.5	4.7	6.0	5.7	8.9	5.7	4.5	3.6	4.3	8.9																						
18-Feb	3.7	3.8	3.4	3.7	3.8	7.9	9.9	13.0	7.3	5.8	6.9	8.3	8.5	8.9	6.1	6.8	9.7	9.1	7.9	9.5	10.3	8.1	8.7	9.1	7.5	13.0																						
19-Feb	8.6	15.7	10.1	6.7	7.1	7.4	7.6	8.8	12.8	13.4	12.0	6.3	5.4	5.5	6.4	5.2	4.6	4.7	5.2	7.7	8.2	6.3	6.4	5.8	7.8	15.7																						
20-Feb	6.0	4.8	5.0	9.4	10.4	11.2	9.6	5.2	5.3	10.5	9.4	13.6	10.9	7.3	6.5	5.3	5.8	7.0	7.8	8.5	7.4	7.7	4.9	6.1	7.7	13.6																						
21-Feb	5.6	5.7	9.3	8.4	8.0	7.9	9.1	10.2	9.6	4.7	3.6	3.2	4.1	4.5	4.5	7.2	7.5	9.7	7.3	9.5	12.0	12.2	12.5	18.2	8.1	18.2																						
22-Feb	21.5	7.3	5.6	5.6	5.1	6.3	6.9	10.4	10.4	10.5	9.3	10.8	17.7	19.6	9.3	13.8	10.2	8.9	10.1	10.1	9.4	11.4	10.8	10.3	10.5	21.5																						
23-Feb	9.8	8.8	7.4	6.6	6.1	4.4	5.1	4.5	5.4	10.3	15.2	15.2	7.9	11.3	7.9	12.3	12.2	9.2	9.9	12.6	16.1	26.0	26.6	16.3	11.1	26.6																						
24-Feb	17.0	14.6	16.2	15.8	15.1	13.4	10.9	8.5	8.9	8.6	8.7	8.1	8.8	5.7	5.7	6.5	5.6	4.9	5.7	5.5	4.9	5.2	6.5	6.6	9.1	17.0																						
25-Feb	7.0	4.9	4.3	4.3	5.7	5.8	5.0	4.1	3.4	3.2	4.5	3.2	2.5	1.4	1.4	3.8	8.0	15.6	20.3	16.4	14.4	16.7	15.9	19.2	8.0	20.3																						
26-Feb	15.0	11.1	7.6	10.2	13.3	8.7	7.6	10.7	8.5	5.3	3.8	3.7	3.7	3.6	3.4	3.8	3.8	3.6	4.1	3.7	3.3	3.0	2.7	2.9	6.1	15.0																						
27-Feb	2.7	2.4	1.5	1.8	2.1	2.3	2.5	2.8	2.6	2.7	3.3	3.2	3.1	3.0	2.5	3.3	3.2	2.9	2.9	4.4	4.1	3.5	3.3	2.3	2.8	4.4																						
28-Feb	2.7	2.8	2.7	2.8	2.4	1.8	2.5	3.5	3.0	2.9	4.2	4.2	4.3	6.0	6.0	5.5	4.7	4.3	4.5	4.7	5.1	5.8	5.5	4.5	4.0	6.0																						
																								7.1	6.1	6.1	5.8	6.0	5.8	6.2	6.5	5.4	5.2	5.4	5.7	6.1	6.2	5.8	6.4	7.0	7.0	7.3	7.5	8.0	8.5	7.7	7.4	Diurnal Average
																								21.5	15.7	16.2	15.8	15.1	13.4	20.6	14.2	12.8	13.4	15.2	15.2	17.7	19.6	16.5	15.7	22.0	25.4	30.7	30.1	33.8	46.7	33.9	21.4	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 Hills - February 2023**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	344	51.34	51.34
6 - 15	295	44.03	95.37
16 - 25	24	3.58	98.96
26 - 80	7	1.04	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 670

Total Number of Hours: 672



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

**Particulate Matter 2.5 (PM<sub>2.5</sub>) - μg/m<sup>3</sup>**  
**Fort Hills - February 2023**

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	80	11	15	4	2	13	36	18	23	17	11	13	11	14	20	343
6 - 15	34	27	5	11	1	17	41	51	32	17	9	3	7	6	8	22	291
16 - 25	0	0	1	1	1	3	8	7	2	0	0	0	0	0	0	0	23
26 - 80	1	0	1	0	0	0	0	3	2	0	0	0	0	0	0	0	7
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	90	107	18	27	6	22	62	97	54	40	26	14	20	17	22	42	664

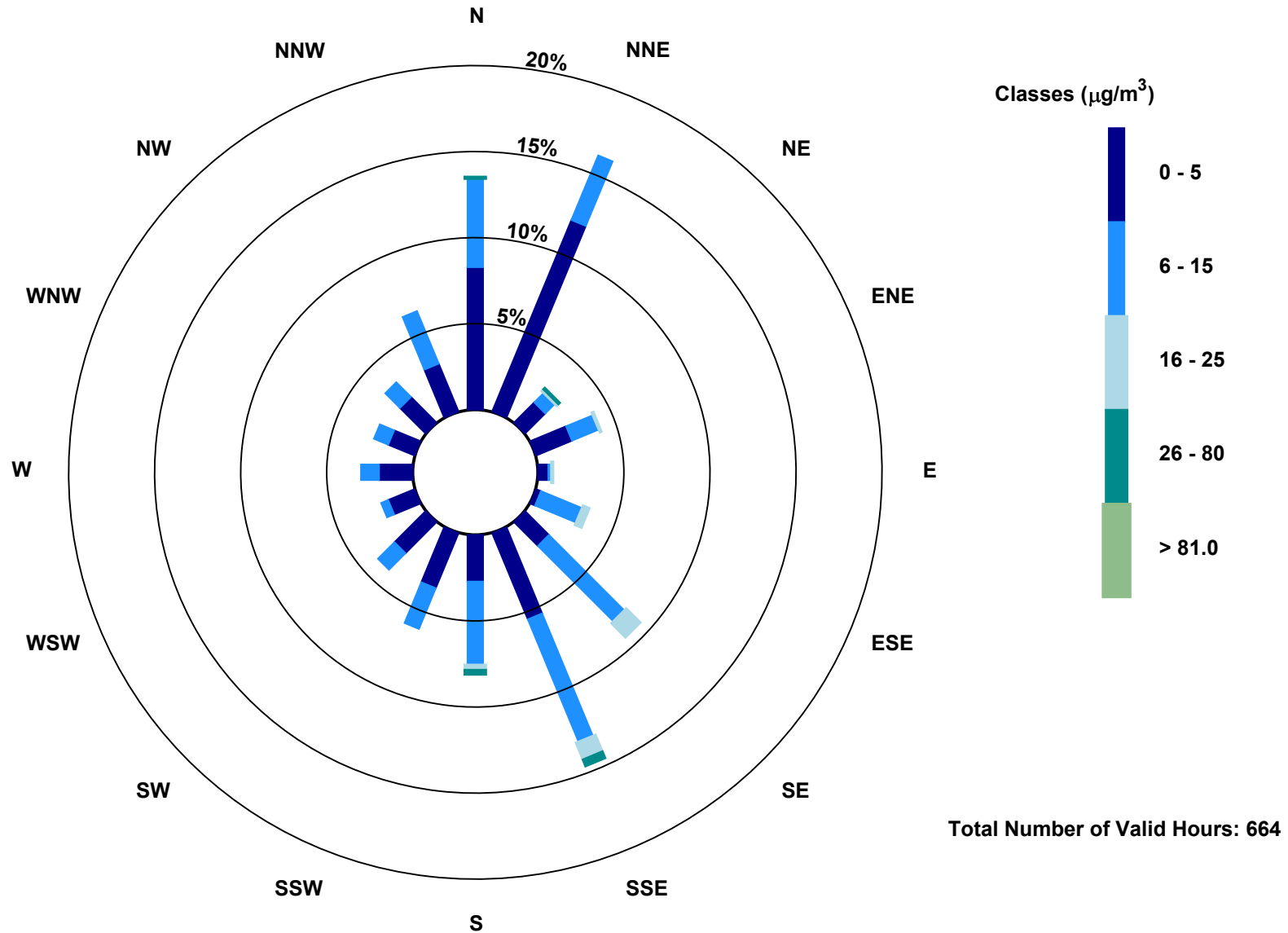
Total Number of Valid Hours: 664

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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





**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Ambient Temperature (AT) - C**

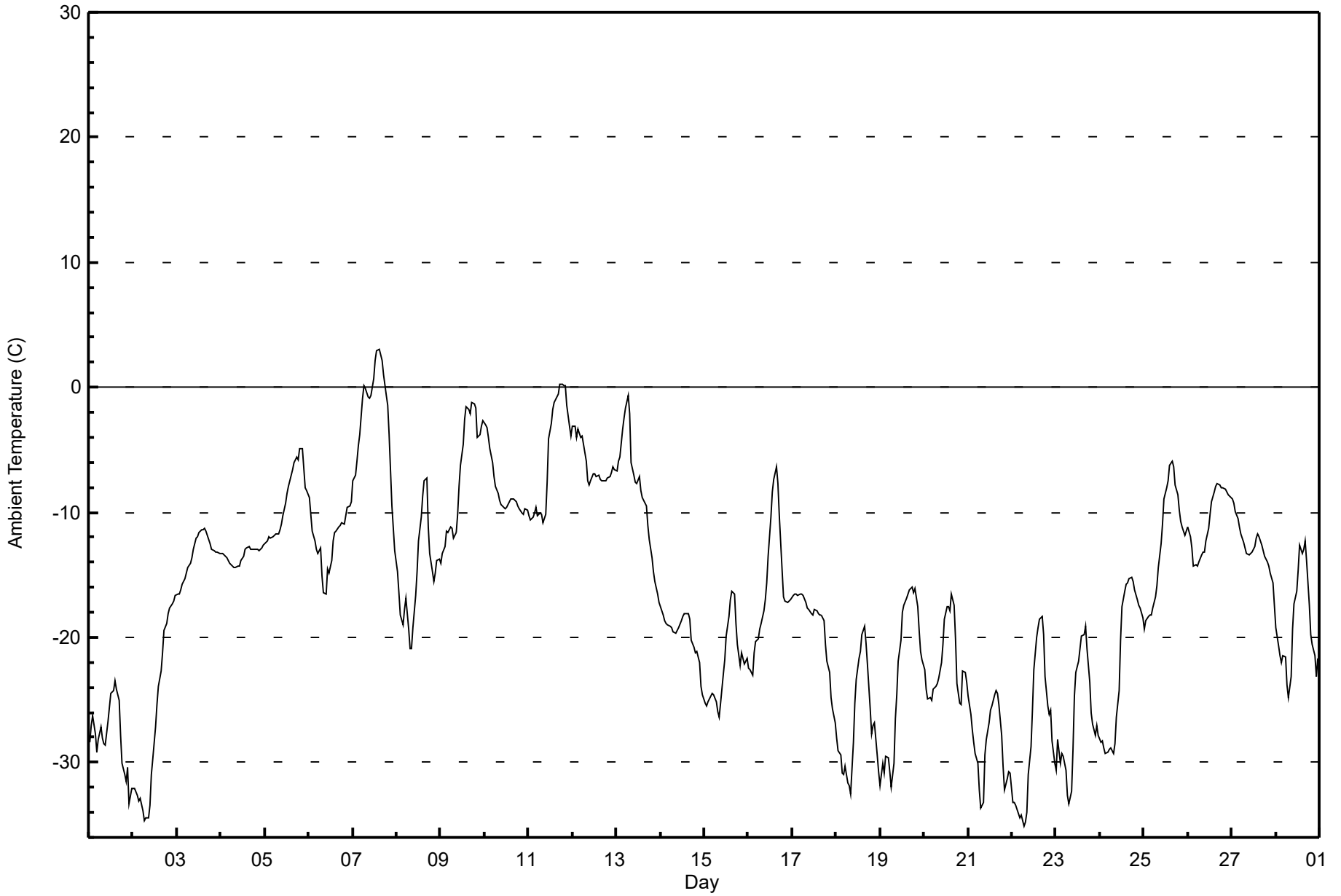
**Fort Hills - February 2023**

Maximum Value: 3.0 C on Feb 7 15:00		Maximum Daily Average: -2.4 C on Feb 7		Hours in Service: 672																							
Minimum Value: -35.2 C on Feb 22 07:00		Minimum Daily Average: -28.4 C on Feb 21		Hours of Data: 672																							
Maximum Diurnal Average: -12.5 C at hour 16		Minimum Diurnal Average: -19.4 C at hour 8		Hours of Missing Data: 0																							
Monthly Average: -16.53 C		Percentiles: P <sub>1</sub> = -34.1 P <sub>10</sub> = -29.2 Q <sub>1</sub> = -23.1 Median = -16.3 Q <sub>3</sub> = -10.2 P <sub>90</sub> = -6.0 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-Feb	-28.4	-27.0	-26.2	-27.7	-29.2	-28.1	-27.2	-28.0	-28.5	-28.6	-26.7	-25.6	-24.5	-24.2	-23.4	-24.1	-25.0	-27.8	-30.1	-31.0	-31.5	-30.4	-33.3	-32.1	-27.9	-23.4	
2-Feb	-32.1	-32.1	-32.6	-33.1	-32.9	-33.8	-34.6	-34.4	-34.4	-33.4	-31.0	-29.8	-27.1	-25.4	-23.9	-22.7	-21.2	-19.4	-18.8	-18.1	-17.7	-17.3	-17.1	-16.7	-26.7	-16.7	
3-Feb	-16.6	-16.5	-16.2	-15.7	-15.3	-14.8	-14.4	-14.1	-13.7	-12.9	-12.1	-12.0	-11.6	-11.4	-11.4	-11.3	-11.5	-12.1	-12.5	-12.9	-13.1	-13.2	-13.2	-13.3	-13.4	-11.3	
4-Feb	-13.3	-13.3	-13.5	-13.7	-13.8	-14.1	-14.3	-14.5	-14.4	-14.3	-14.3	-13.9	-13.6	-13.0	-12.8	-12.7	-12.9	-12.9	-13.0	-13.0	-12.9	-13.0	-12.9	-12.7	-13.4	-12.7	
5-Feb	-12.5	-12.3	-11.9	-12.1	-12.0	-11.9	-11.7	-11.7	-11.4	-11.0	-10.2	-9.3	-8.5	-7.9	-7.0	-6.6	-6.0	-5.5	-5.8	-4.9	-4.9	-6.4	-8.0	-8.3	-9.1	-4.9	
6-Feb	-8.8	-10.2	-11.5	-12.3	-13.0	-13.3	-12.8	-15.0	-16.4	-16.6	-14.5	-14.8	-13.9	-12.3	-11.6	-11.5	-11.1	-11.0	-10.9	-11.0	-10.2	-9.6	-9.5	-9.1	-12.1	-8.8	
7-Feb	-7.5	-7.0	-6.0	-4.7	-3.8	-0.9	0.1	-0.1	-0.7	-0.9	-0.6	0.7	2.2	2.9	3.0	2.6	2.1	1.0	-0.6	-1.4	-3.8	-9.5	-11.2	-13.1	-2.4	3.0	
8-Feb	-14.8	-16.4	-18.3	-19.0	-17.8	-16.9	-19.3	-20.9	-20.9	-19.2	-16.6	-14.7	-12.3	-10.3	-8.7	-7.4	-7.3	-11.2	-13.3	-14.7	-15.6	-14.8	-13.8	-13.8	-14.9	-7.3	
9-Feb	-14.1	-13.3	-12.7	-11.5	-11.6	-11.1	-11.3	-12.1	-11.6	-10.2	-7.9	-6.3	-4.6	-2.5	-1.6	-1.8	-2.1	-1.3	-1.3	-1.7	-4.1	-3.8	-3.1	-2.6	-6.8	-1.3	
10-Feb	-3.0	-3.3	-4.0	-4.9	-6.0	-7.1	-7.9	-8.5	-9.1	-9.4	-9.6	-9.7	-9.6	-9.2	-8.9	-8.9	-8.9	-9.2	-9.5	-9.7	-10.1	-10.1	-9.7	-9.8	-8.2	-3.0	
11-Feb	-10.3	-10.7	-10.4	-10.0	-9.6	-10.3	-10.0	-10.1	-10.8	-10.2	-7.6	-4.1	-2.8	-1.8	-1.2	-0.8	-0.5	0.2	0.2	0.1	0.1	-1.5	-3.1	-3.9	-5.4	0.2	
12-Feb	-3.1	-3.1	-4.0	-3.4	-4.0	-3.9	-4.6	-5.9	-7.5	-7.8	-7.5	-7.0	-7.0	-7.1	-7.0	-7.4	-7.5	-7.4	-7.4	-7.3	-7.1	-6.8	-6.4	-6.6	-6.1	-3.1	
13-Feb	-6.7	-5.9	-5.6	-3.3	-2.4	-1.7	-0.6	-2.1	-6.0	-7.1	-7.6	-7.7	-7.1	-8.3	-8.8	-9.0	-9.5	-11.0	-12.1	-13.6	-14.7	-15.5	-16.5	-17.2	-8.3	-0.6	
14-Feb	-17.5	-18.2	-18.7	-18.8	-19.0	-19.1	-19.3	-19.6	-19.6	-19.5	-19.2	-18.7	-18.3	-18.1	-18.1	-18.1	-18.5	-20.2	-20.8	-21.3	-21.2	-22.0	-24.0	-24.5	-19.7	-17.5	
15-Feb	-25.3	-25.5	-25.2	-24.7	-24.5	-24.6	-25.1	-26.0	-26.4	-25.3	-22.9	-21.8	-19.9	-18.4	-17.0	-16.3	-16.6	-18.8	-20.6	-22.3	-21.2	-21.6	-22.1	-21.7	-22.2	-16.3	
16-Feb	-22.5	-22.6	-23.0	-21.2	-20.3	-20.1	-19.4	-18.8	-17.9	-16.9	-15.7	-13.5	-10.4	-8.4	-7.4	-6.4	-7.7	-10.3	-14.6	-16.8	-17.1	-17.2	-17.1	-17.0	-15.9	-6.4	
17-Feb	-16.6	-16.6	-16.5	-16.6	-16.6	-16.5	-16.7	-17.2	-17.6	-17.8	-18.1	-18.2	-17.8	-17.9	-18.1	-18.3	-18.2	-18.7	-20.6	-21.9	-22.8	-24.8	-25.8	-26.8	-19.0	-16.5	
18-Feb	-28.1	-29.1	-29.4	-30.9	-31.0	-30.3	-31.6	-31.9	-32.5	-28.4	-25.2	-23.3	-21.6	-21.1	-19.8	-19.2	-20.5	-22.1	-25.7	-27.7	-27.1	-26.8	-29.4	-30.7	-26.8	-19.2	
19-Feb	-31.9	-30.0	-30.8	-29.5	-29.6	-30.8	-32.0	-30.0	-26.5	-24.6	-21.9	-20.2	-18.0	-17.5	-16.9	-16.5	-16.2	-15.9	-16.4	-16.1	-17.6	-19.5	-21.1	-21.8	-23.0	-15.9	
20-Feb	-22.6	-24.1	-24.9	-24.9	-25.0	-24.2	-23.9	-23.7	-23.2	-22.0	-20.5	-18.6	-17.6	-17.6	-17.8	-16.6	-17.4	-20.1	-23.7	-25.2	-25.3	-22.7	-22.8	-23.6	-22.0	-16.6	
21-Feb	-24.7	-26.2	-27.4	-28.4	-29.3	-30.0	-32.2	-33.6	-33.2	-29.4	-28.1	-26.9	-25.9	-25.4	-24.5	-24.3	-24.4	-25.3	-27.9	-30.3	-32.2	-31.3	-30.7	-30.9	-28.4	-24.3	
22-Feb	-33.2	-33.2	-33.4	-34.1	-34.4	-34.3	-35.2	-34.8	-34.0	-31.0	-28.7	-25.8	-22.6	-20.0	-19.3	-18.5	-18.4	-19.8	-23.2	-25.5	-26.2	-25.8	-28.3	-30.0	-27.9	-18.4	
23-Feb	-30.6	-28.2	-30.0	-29.3	-29.5	-30.7	-32.7	-33.3	-32.3	-28.9	-24.7	-22.8	-21.9	-20.9	-19.9	-19.7	-19.1	-20.9	-23.6	-26.1	-26.9	-27.8	-27.1	-27.8	-26.4	-19.1	
24-Feb	-28.4	-28.3	-28.8	-29.3	-29.2	-28.9	-28.9	-29.2	-28.5	-26.3	-24.2	-20.2	-17.5	-16.4	-15.7	-15.6	-15.3	-15.2	-15.5	-16.2	-16.9	-17.5	-17.7	-18.4	-22.0	-15.2	
25-Feb	-19.3	-18.7	-18.4	-18.3	-18.2	-17.6	-16.8	-15.9	-14.4	-12.5	-10.9	-8.9	-8.0	-7.5	-6.2	-5.9	-6.4	-7.8	-8.6	-9.8	-10.7	-11.1	-11.9	-11.5	-12.3	-5.9	
26-Feb	-11.2	-11.9	-12.9	-14.4	-14.2	-14.3	-13.9	-13.4	-13.2	-13.2	-12.3	-11.3	-10.1	-9.1	-8.4	-7.9	-7.7	-7.9	-8.0	-8.0	-8.2	-8.4	-8.6	-8.8	-10.7	-7.7	
27-Feb	-8.9	-9.3	-10.0	-10.5	-11.2	-11.8	-12.4	-12.8	-13.3	-13.4	-13.3	-13.2	-12.7	-12.0	-11.7	-12.0	-12.6	-13.0	-13.5	-14.0	-14.3	-14.8	-15.6	-17.4	-12.7	-8.9	
28-Feb	-19.2	-20.6	-21.4	-22.0	-21.4	-21.5	-23.9	-24.8	-23.2	-19.3	-17.3	-16.3	-14.6	-12.6	-13.3	-13.0	-12.3	-13.8	-17.4	-19.8	-20.6	-21.5	-23.2	-21.6	-18.9	-12.3	
		-18.3	-18.3	-18.7	-18.7	-18.7	-18.7	-19.0	-19.4	-19.3	-18.2	-16.8	-15.5	-14.2	-13.3	-12.8	-12.5	-12.6	-13.5	-14.8	-15.7	-16.2	-16.6	-17.3	-17.6	Diurnal Average	
		-3.0	-3.1	-4.0	-3.3	-2.4	-0.9	0.1	-0.1	-0.7	-0.9	-0.6	0.7	2.2	2.9	3.0	2.6	2.1	1.0	0.2	0.1	0.1	-1.5	-3.1	-2.6	Diurnal Maximum	



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

**Ambient Temperature (AT) - C**  
**Fort Hills - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Fort Hills - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	222	33.04	33.04
-20 - 0	438	65.18	98.21
0 - 10	12	1.79	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



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

**Relative Humidity (RH) - %**  
**Fort Hills - February 2023**

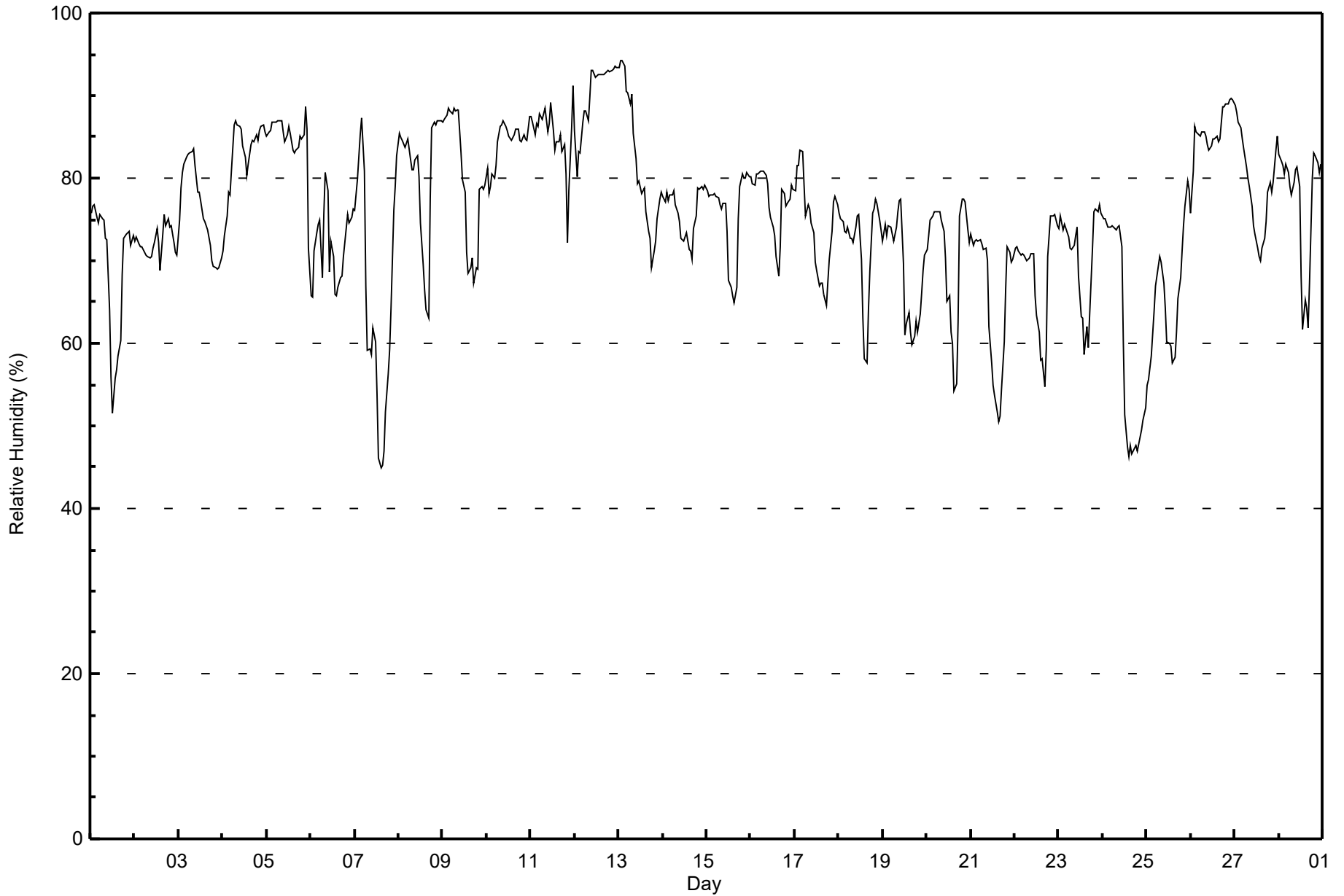
Maximum Value: 94.3 % on Feb 13 03:00      Maximum Daily Average: 90.2 % on Feb 12																						Hours in Service: 672 Hours of Data: 672				
Minimum Value: 44.9 % on Feb 7 15:00      Minimum Daily Average: 60.7 % on Feb 24 Maximum Diurnal Average: 79.3 % at hour 5      Minimum Diurnal Average: 67.8 % at hour 16 Monthly Average: 75.37 %      Percentiles: P <sub>1</sub> = 47.2 P <sub>10</sub> = 61.7 Q <sub>1</sub> = 70.6 Median = 75.7 Q <sub>3</sub> = 83.1 P <sub>90</sub> = 86.8 P <sub>99</sub> = 93.1																						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-Feb	75.8	76.6	76.7	75.3	74.6	75.6	75.1	75.0	72.6	72.5	64.0	55.9	51.5	55.7	56.7	58.5	60.3	68.4	72.7	73.2	73.3	73.6	71.8	73.1	69.1	76.7
2-Feb	72.5	72.9	72.1	71.8	71.7	71.0	70.6	70.6	70.4	70.5	71.5	72.2	73.8	72.1	68.9	73.1	75.7	74.2	75.0	74.1	74.3	72.3	71.0	70.6	72.2	75.7
3-Feb	74.9	78.9	80.7	81.7	82.6	83.0	83.0	83.3	83.6	81.6	78.4	78.2	77.4	75.1	74.8	74.2	73.7	71.9	70.1	69.3	69.2	69.0	69.2	70.3	76.4	83.6
4-Feb	71.2	73.1	75.5	78.3	78.0	80.9	86.4	86.9	86.4	86.2	85.9	83.9	82.6	80.3	81.7	84.1	84.5	84.3	85.2	84.6	85.8	86.3	86.4	85.7	82.7	86.9
5-Feb	85.1	85.6	85.7	86.8	86.8	86.9	87.0	87.0	86.9	85.6	84.4	85.3	86.2	85.5	83.5	83.1	83.3	85.0	84.7	85.2	88.6	85.9	71.5	85.0	88.6	86.6
6-Feb	65.7	65.6	71.1	73.3	74.4	75.0	68.0	75.6	80.7	78.5	68.6	72.4	70.6	65.9	65.7	66.7	68.0	68.1	70.5	73.8	75.7	74.5	75.3	76.3	71.7	80.7
7-Feb	76.1	79.8	82.5	85.2	87.2	80.8	66.9	59.1	59.3	58.6	61.9	60.1	54.0	46.1	44.9	45.3	47.0	51.7	56.3	59.2	64.2	76.0	79.1	82.8	65.2	87.2
8-Feb	85.5	84.9	84.6	83.8	84.2	84.7	82.2	81.1	81.0	82.2	82.7	80.2	74.5	69.4	66.4	64.0	63.1	77.4	86.1	86.8	86.5	87.0	87.0	86.9	80.5	87.0
9-Feb	86.7	87.2	87.7	88.4	88.2	87.8	88.5	88.1	88.3	85.8	83.1	79.9	78.4	71.1	68.5	69.1	70.3	67.3	69.1	69.0	78.6	78.9	78.7	79.2	79.9	88.5
10-Feb	81.2	78.1	78.9	80.5	79.9	81.5	84.5	86.2	86.5	86.9	86.3	85.8	85.1	84.5	85.0	85.3	85.9	85.9	84.6	84.4	85.3	84.7	84.6	87.5	84.1	87.5
11-Feb	87.4	86.8	85.3	86.6	86.2	87.8	87.1	87.8	88.5	85.6	86.5	89.2	85.7	83.4	84.4	84.5	85.2	83.2	84.1	80.4	72.1	78.5	86.1	91.2	85.2	91.2
12-Feb	85.7	80.2	83.2	83.1	86.8	88.2	88.2	87.0	89.8	93.0	93.0	92.3	92.3	92.6	92.5	92.6	92.6	93.0	93.0	92.9	93.0	93.2	93.6	93.3	90.2	93.6
13-Feb	93.4	94.2	94.3	93.6	90.5	90.4	88.9	90.1	85.4	82.4	79.4	79.7	78.1	78.5	78.7	75.9	73.6	72.7	69.1	71.3	72.4	75.0	77.4	78.2	81.8	94.3
14-Feb	77.7	77.2	78.3	77.3	78.0	77.9	78.4	76.8	75.8	74.7	72.7	72.3	73.0	73.4	71.4	71.1	70.1	73.9	75.4	78.8	78.6	79.0	78.6	79.1	75.8	79.1
15-Feb	78.5	77.9	77.9	77.9	78.1	77.9	77.6	76.8	76.3	76.9	76.9	73.5	67.7	66.8	65.7	64.9	66.8	75.0	79.1	80.5	80.1	80.0	80.8	80.2	75.6	80.8
16-Feb	80.2	79.4	79.1	80.5	80.6	80.9	80.9	80.9	80.4	79.3	76.5	75.2	74.0	73.1	70.6	68.2	71.7	78.6	78.1	76.6	77.0	77.5	79.1	78.7	77.4	80.9
17-Feb	78.5	81.5	81.5	83.3	83.2	79.1	75.4	76.8	76.3	74.6	73.4	69.8	68.9	67.0	67.3	67.2	66.0	64.5	67.4	70.2	73.6	77.2	77.8	76.8	74.1	83.3
18-Feb	75.8	75.2	74.7	73.5	73.3	74.1	72.7	72.7	72.1	74.1	75.5	75.6	70.1	63.1	58.1	57.6	64.1	68.8	75.7	76.2	77.4	76.9	75.0	73.8	71.9	77.4
19-Feb	72.4	74.4	73.0	74.2	74.0	73.2	72.4	74.0	76.0	77.3	77.4	69.7	61.0	62.3	63.7	61.3	59.8	60.8	62.8	61.4	63.5	66.2	68.7	70.6	68.8	77.4
20-Feb	71.3	73.0	74.9	75.4	76.0	76.0	75.9	75.9	74.9	73.5	70.3	65.1	65.7	61.4	60.0	54.3	55.1	62.5	75.4	77.5	77.5	77.2	73.7	72.2	70.6	77.5
21-Feb	73.2	71.9	72.4	72.5	72.4	72.5	72.0	71.3	71.6	70.0	62.1	57.7	55.0	53.8	51.6	50.6	51.2	54.3	60.2	66.7	71.8	71.0	69.9	70.2	65.2	73.2
22-Feb	71.6	71.6	71.2	70.7	70.8	70.7	70.0	70.2	70.4	70.8	70.8	65.7	63.3	61.3	58.0	58.2	54.7	59.3	70.6	75.5	75.5	75.5	75.6	74.3	68.6	75.6
23-Feb	73.9	75.4	73.7	74.4	73.8	72.8	71.6	71.3	71.9	73.1	74.1	68.2	63.2	63.1	58.6	62.1	59.6	63.6	71.5	75.9	76.3	76.0	76.8	75.8	70.7	76.8
24-Feb	75.0	75.0	74.5	74.1	74.1	74.3	74.0	73.7	74.1	74.3	71.7	60.4	51.3	47.4	46.2	47.6	46.6	47.2	47.5	47.0	48.6	49.5	50.7	52.1	60.7	75.0
25-Feb	54.9	55.6	58.5	61.2	63.9	66.9	69.3	70.5	69.8	67.3	64.2	60.1	60.0	59.7	57.6	58.3	61.3	65.5	68.0	71.2	74.2	76.6	79.7	78.7	65.5	79.7
26-Feb	75.7	80.8	86.4	85.6	85.2	85.1	85.5	85.5	85.1	84.1	83.4	83.9	84.7	84.8	85.2	84.5	84.8	88.6	88.6	88.9	89.1	89.5	89.6	89.4	85.6	89.6
27-Feb	88.9	87.9	86.8	86.1	84.8	83.6	81.4	80.1	79.0	76.5	74.2	73.2	71.5	70.6	70.0	71.4	72.8	74.8	78.2	79.4	78.2	79.5	83.4	85.0	79.1	88.9
28-Feb	82.9	82.0	81.5	80.5	81.6	80.7	79.0	78.0	79.4	81.1	81.3	79.0	68.2	61.7	65.2	64.3	61.9	67.3	80.0	83.1	82.7	81.9	80.7	81.8	76.9	83.1
77.6 77.9 78.7 79.1 79.3 79.3 78.3 78.3 78.3 77.7 76.1 73.7 71.0 68.9 67.9 67.8 68.2 71.0 74.3 75.4 76.4 77.5 78.1 78.0																								Diurnal Average		
93.4 94.2 94.3 93.6 90.5 90.4 88.9 90.1 89.8 93.0 93.0 92.3 92.3 92.6 92.5 92.6 92.6 93.0 93.0 92.9 93.0 93.2 93.6 93.3																								Diurnal Maximum		





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

**Relative Humidity (RH) - %**  
**Fort Hills - February 2023**





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

**Relative Humidity (RH) - %**  
**Fort Hills - February 2023**

<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	54	8.04	8.04
60 - 80	395	58.78	66.82
80 - 100	223	33.18	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



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

**Wind Speed (WS) - km/h**  
**Fort Hills - February 2023**

Maximum Speed: 37 km/h on Feb 13 13:00	Maximum Daily Speed Average: 16.9 km/h on Feb 27	Hours in Service: 672
Minimum Speed Value: 0 km/h on Feb 14 22:00	Minimum Daily Speed Average: 0.3 km/h on Feb 28	Hours of Data: 666
Maximum Diurnal Speed Average: 3.4 km/h at hour 17	Minimum Diurnal Speed Average: 0.5 km/h at hour 6	Hours of Missing Data: 6
Monthly Average Velocity: 1.5 km/h 47.8 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 2 Q <sub>1</sub> = 4 Median = 8 Q <sub>3</sub> = 13 P <sub>90</sub> = 18 P <sub>99</sub> = 29	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-Feb	SW1	WSW2	NNW3	WNW2	NNW6	NNW9	N6	NNE10	NNE12	NNW6	NW8	NW10	NNW5	NNE7	ENE3	SE7	SSE5	SSE3	SW3	SSW2	SW4	W1	S4	SSE5	NNW1.9	NNE12
2-Feb	SSE6	SSE8	SSE8	SE9	SSE7	SSE8	SE10	SSE8	SSE7	SSE6	SSW8	SW6	S4	WSW5	SW1	SE3	SSE10	SSE19	SSE18	SSE22	SSE25	SSE25	SSE21	SSE23	SSE10.6	SSE25
3-Feb	S23	S18	S18	S18	S17	S17	SSW17	SSW12	SSE12	SSE8	S1	N7	N10	NNE13	N11	NNE8	ENE9	ENE9	ENE10	ENE9	ENE8	ENE6	ENE5	NNW4	SE4.2	S23
4-Feb	NE3	N5	N9	N10	NNE13	N14	N14	N14	N15	N14	N12	N11	N11	N10	N8	N7	N7	N8	N9	N7	N7	NNW6	NNW6	WNW3	N9.2	N15
5-Feb	NW3	N2	SSE2	NW3	NNW4	NNW4	NNW6	NNW5	NNW3	NW2	SSE6	SSE6	SE12	SSE12	S10	SSE13	SSE12	SSE12	SSE10	SSE12	WNW2	N14	N14	NW16	SSE1.3	NW16
6-Feb	WNW15	WNW15	WSW9	SW11	WSW9	W9	WNW10	NNE3	ENE8	NNW4	E2	SE7	SE9	SE5	ESE3	NNW2	NNW5	NNW4	WSW2	SSW3	SSE5	S9	SSE9	SSE11	WSW2.1	WNW15
7-Feb	SSE13	S14	SSE15	SSE12	SSE12	W13	WNW16	W20	WSW18	SW19	SW21	SW21	WSW26	W29	W26	W24	W21	W13	SW7	W5	NNW11	N21	NNE16	NNE7	WSW10.1	W29
8-Feb	NNE4	N2	SW2	SW5	SE4	ESE5	NE2	NNW3	NNW4	WSW2	SSW4	SE8	SE11	SE13	SE10	SE7	E2	ENE2	N2	NE0	SSE4	S6	SSE8	SSE9	SE3.0	SE13
9-Feb	SSE7	SSE10	SE11	SE12	SE13	SE12	SSE8	SE10	SSE8	SSE11	SSE12	SE11	SSE13	SSE15	S16	SSE9	S3	SSE6	SE7	SE5	S2	W2	UO	NE2	SSE8.5	S16
10-Feb	N10	NNE17	N18	NNE16	NNE14	NNE18	NNE16	NNE17	NNE17	N17	NNE19	N19	N18	NNE17	NNE18	N18	NNE16	NNE16	NNE15	N11	NNE12	NNE11	NE4	N3	NNE14.9	N19
11-Feb	NNW7	N6	E2	SE6	ESE3	N3	N2	NNW1	NW2	WNW1	SSW7	S14	SSW19	S19	S14	S10	SSW8	WSW14	WSW10	W8	WNW11	SSW13	SSW10	SSW10	SSW5.2	S19
12-Feb	WSW11	SSE3	SSW12	SSW9	SSW8	SSW11	S1	NE10	NNE7	N12	NNE10	E4	ESE5	SE4	E3	NE3	N5	N8	NNW7	NNW5	NNW4	W0	NW3	NW4	N0.9	SSW12
13-Feb	NNE3	ENE1	SSE8	SSW16	SW12	SSW13	WSW8	NNE19	NNE29	N25	N36	N35	N37	N35	N34	N30	NNE28	N22	NNE22	NNE17	NNE17	NNE20	NNE22	NNE16	N16.5	N37
14-Feb	NNE17	NNE18	NNE14	NNE13	NNE12	NNE11	NNE11	NNE10	NNE8	NNE6	NNE7	NE5	ENE3	ENE5	ENE6	ENE5	ENE8	ENE4	ENE3	N2	NE3	SSE0	SSW3	S4	NNE6.5	NNE18
15-Feb	SSE5	S5	SSE6	S4	S2	SE4	SSE5	S4	SSW3	S2	SE3	SE6	ESE6	ESE9	ESE8	ESE8	ESE8	SE7	SSE6	SSE4	SSE6	S5	SE6	SSE4.7	ESE9	
16-Feb	SSE6	S4	SE4	SSE5	SW2	W2	SSW5	SW6	SW6	SW8	SSW9	SSW11	SSW13	S14	SSW12	WSW3	NNE13	NNE17	NNE19	NNE14	NNE13	NNE10	N4	NW2	S0.4	NNE19
17-Feb	SW1	SSW1	S1	SW3	W1	NNE5	NNE9	NE10	NE9	NE9	NE11	NNE9	NE9	NE12	NE10	NNE11	NNE13	NNE12	NE10	NE12	NNE9	NNW5	NW3	NW4	NE6.4	NNE13
18-Feb	NNW4	NW2	NNW4	NW3	NNW4	NNW3	N4	N4	WNW3	NNE1	N3	SSW1	SSW2	WSW3	ENE0	UO	S3	SSE3	ENE1	ENE0	NNW4	NNW4	WNW3	SSW2	NNW1.4	NNW4
19-Feb	S3	SE4	SSW3	SSE3	SE3	SE3	S1	UO	N3	N3	WNW4	SSE2	NE1	N5	N8	NNW8	NNW8	NW6	NW3	NNE13	NNE18	NNE20	NNE13	N12	N4.4	NNE20
20-Feb	NNE15	N9	WNW1	S4	SSE4	SE7	SE4	SE7	SE4	SSE7	ESE4	ESE4	ESE5	ENE7	ENE8	E5	ENE6	ENE6	ENE2	NNW4	NNW5	NNE12	NNE15	NNE18	ENE3.9	NNE18
21-Feb	NNE14	NNE17	NNE14	NNE13	NNE11	NNE8	NW2	SW2	N1	N5	N6	NW5	NNE11	NNE15	NNE17	NNE20	NNE15	NE8	ENE4	ENE2	SW5	S5	SE6	SE5	NNE6.7	NNE20
22-Feb	SSE4	SSE5	SSE5	SE4	SSE7	SSE5	SSE6	SSE6	SSE6	SE5	ESE6	SE8	ESE8	ESE7	SE8	SE5	SE3	SW3	W3	W2	N2	NNW5	NW3	NW4	SE3.4	ESE8
23-Feb	N6	N8	W3	N4	N4	NNW4	SSW4	SSE3	SSE2	S3	SE4	SE5	SSE7	SE8	ESE7	SE9	ESE6	ESE7	SE3	UO	UO	S4	SSE7	SSE7	SE2.6	SE9
24-Feb	SSE8	SSE9	SE11	SE11	SE13	SSE14	SSE16	SSE16	SSE11	S15	SSW11	S15	S26	S28	S27	S24	S24	S21	S20	S22	S19	S16	S17	S15	S16.3	S28
25-Feb	S13	SSW16	SSW15	SSW14	SSE10	SE10	SSE11	SSE11	SSW13	SW13	SW14	SW15	SW15	SSW16	SSE12	SE15	SE13	SE11	ESE9	SE3	ESE3	SE3	S2	SE5	S8.6	SSW16
26-Feb	SE4	SE5	SE2	N5	N5	N5	N5	NNE9	N9	N11	N13	N14	N14	N16	N18	NNE20	NNE18	NNE19	NNE19	NNE13	NNE12	N14	NNE16	NNE16	NNE10.9	NNE20
27-Feb	N18	N19	N20	N21	N21	N20	N18	N19	N20	N22	NNE22	NNE22	NNE20	NNE17	NNE18	NNE16	NNE18	NNE16	NNE14	NNE13	NNE15	NNE14	N9	W5	NNE16.9	NNE22
28-Feb	WNW4	WNW4	NNW2	NW3	UO	N4	W2	NW2	WNW2	WNW2	NW2	N5	N4	ESE3	S4	SE5	S2	SSE3	SSE4	ESE2	SSW2	SW1	S3	SE5	W0.3	N5
ENE0.9 ENE1.1 SE1.5 SSE1.5 ESE1.4 NE0.5 N0.6 NNE2.1 NNE2.5 N1.8 N2.0 NNE1.1 E1.4 E1.9 ENE2.0 NE2.8 NE3.4 NE2.5 NE2.4 NE2.2 NNE2.6 NNE2.8 NE1.6 E0.5																								Diurnal Average		
S23 N19 N20 N21 N21 N20 N18 W20 NNE29 N25 N36 N35 N37 N35 N34 N30 NNE28 N22 NNE22 S22 SSE25 SSE25 NNE22 SSE23																								Diurnal Maximum		

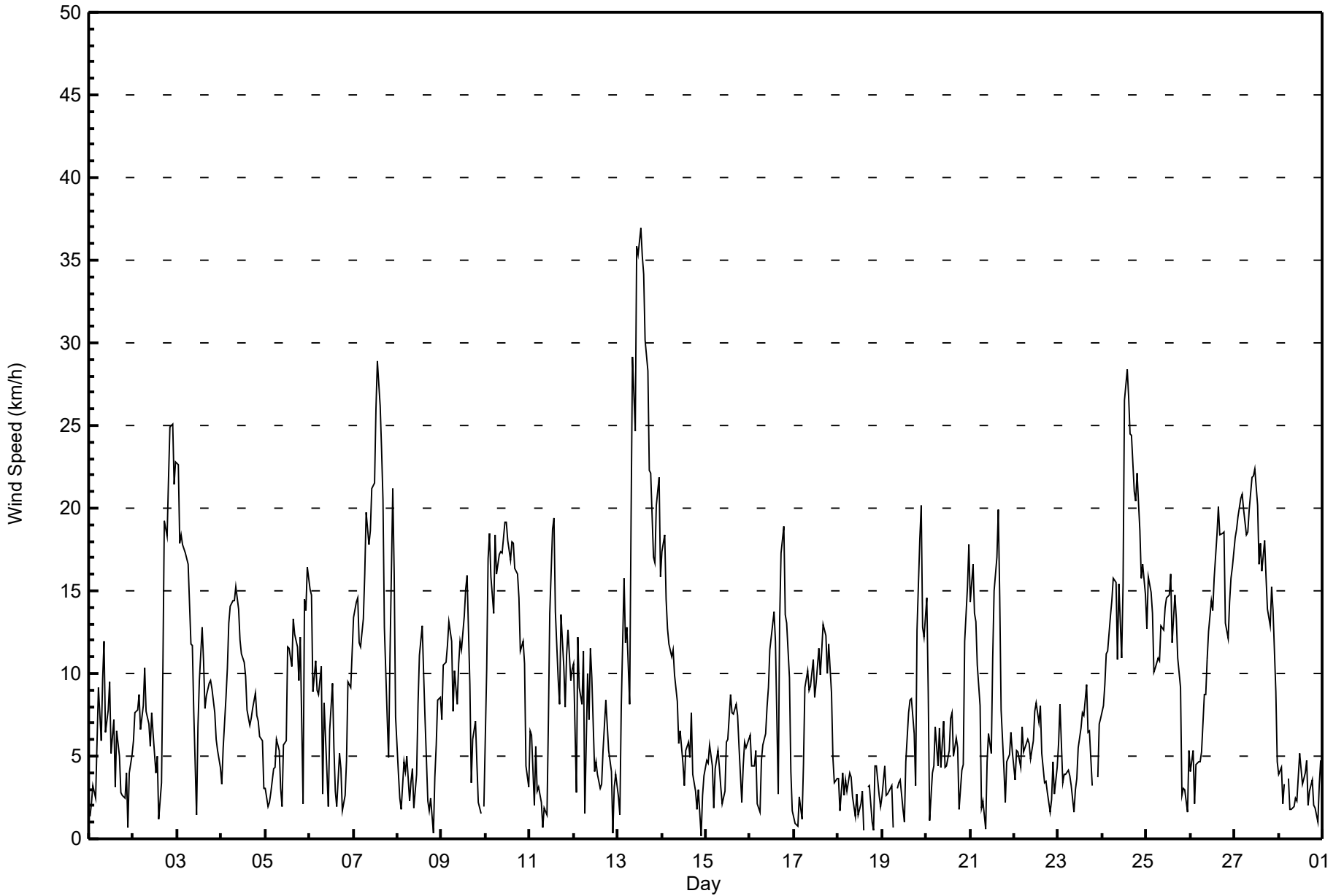
UO - Unstable Operation

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



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

**Wind Speed (WS) - km/h**  
**Fort Hills - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Fort Hills - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	255	38.29	38.29
6 - 11	199	29.88	68.17
12 - 19	164	24.62	92.79
20 - 28	40	6.01	98.80
29 - 38	8	1.20	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 666

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Fort Hills - February 2023**

<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	26	5	9	15	6	10	26	30	24	14	12	6	11	12	18	31	255
6 - 11	28	24	8	12	0	12	28	43	4	11	6	5	2	2	3	11	199
12 - 19	22	67	2	0	0	0	8	19	18	14	6	2	2	3	1	0	164
20 - 28	8	11	0	0	0	0	0	5	8	1	2	1	4	0	0	0	40
29 - 38	6	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	8
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	<b>90</b>	<b>108</b>	<b>19</b>	<b>27</b>	<b>6</b>	<b>22</b>	<b>62</b>	<b>97</b>	<b>54</b>	<b>40</b>	<b>26</b>	<b>14</b>	<b>20</b>	<b>17</b>	<b>22</b>	<b>42</b>	<b>666</b>

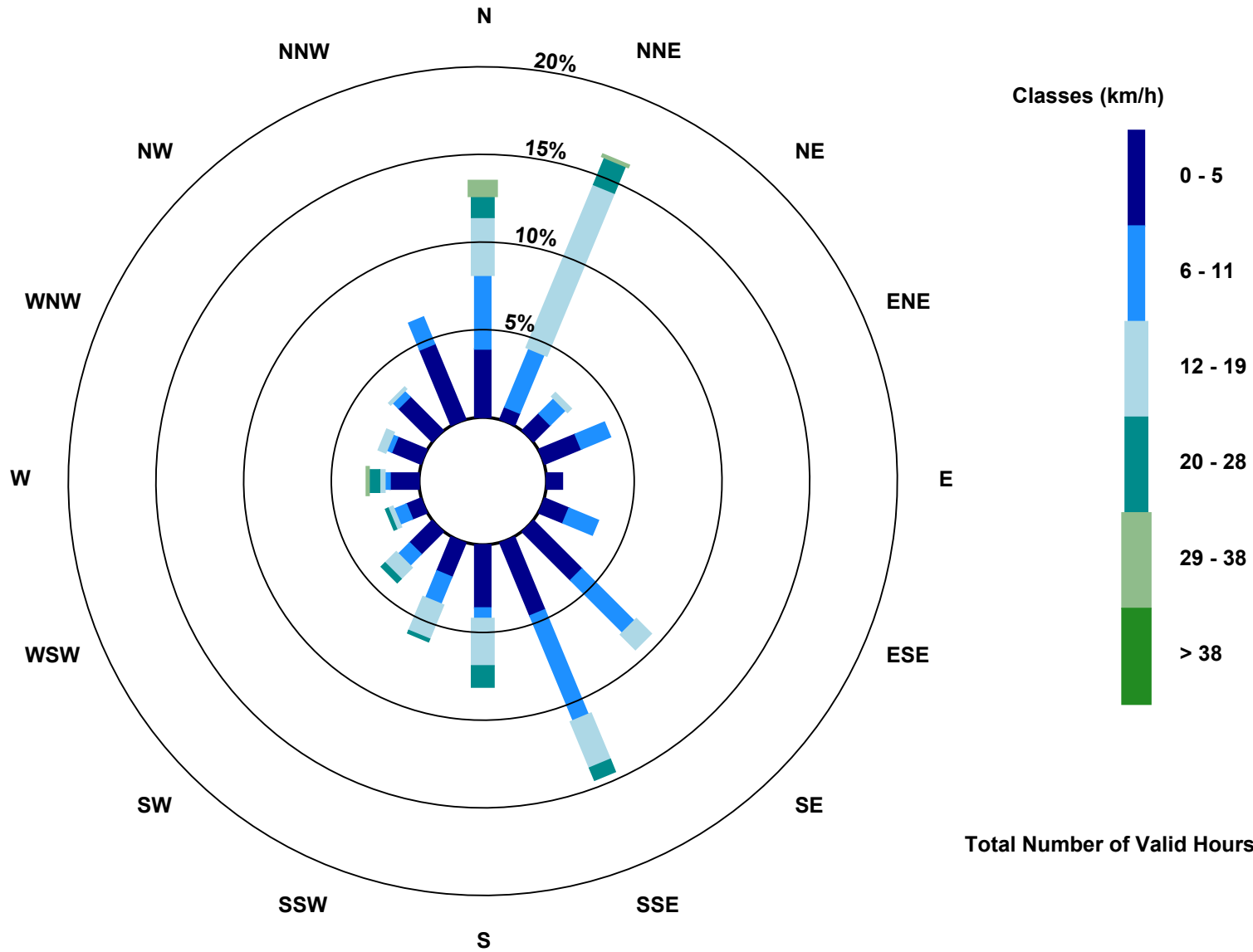
Total Number of Valid Hours: 666

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Fort Hills



Total Number of Valid Hours: 666



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

**Wind Speed (WS) - km/h**  
**Fort Hills - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Feb 13 12:00														Hours in Service: 672 Hours of Data: 666 Hours of Missing Data: 6 Hours of Calibration: 0 Percent Operational Time: 99.1												
Minimum Value: 0 km/h on Feb 8 11:00																										
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> = 3 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-Feb	1	2	2	1	1	2	2	1	2	1	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	3
2-Feb	2	1	1	2	2	1	2	2	1	1	3	1	2	2	1	1	7	2	2	3	4	3	3	3	3	7
3-Feb	3	3	2	2	2	2	3	3	2	4	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	4
4-Feb	1	2	1	2	2	2	2	3	2	2	2	2	1	2	1	1	1	1	1	2	2	1	1	1	1	3
5-Feb	1	1	1	1	1	1	1	2	1	1	2	1	3	3	3	2	2	2	3	2	2	7	4	4	7	
6-Feb	4	4	2	2	2	2	4	2	2	1	2	1	2	1	1	1	2	2	1	1	1	1	1	1	1	4
7-Feb	2	4	2	2	2	5	4	4	3	3	3	3	4	6	6	6	5	5	3	3	4	4	4	4	3	6
8-Feb	1	1	1	1	1	1	1	1	1	1	0	2	1	1	1	1	2	1	1	1	1	1	1	1	1	2
9-Feb	2	1	2	2	1	1	1	2	2	2	2	2	2	2	3	2	1	1	1	1	2	2	UO	3	3	
10-Feb	3	3	3	2	4	4	3	2	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	1	1	4
11-Feb	2	2	1	1	1	1	1	1	2	1	3	2	3	3	2	2	2	2	2	3	5	2	2	2	2	5
12-Feb	3	3	3	2	1	2	3	2	2	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	3
13-Feb	1	2	3	3	3	3	2	7	5	4	6	8	8	8	6	6	5	6	4	3	3	4	4	3	8	
14-Feb	3	4	3	2	3	3	2	2	1	2	1	1	1	1	1	1	2	1	2	1	1	1	1	1	1	4
15-Feb	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2
16-Feb	1	2	1	1	1	1	1	1	1	1	1	2	3	2	2	2	3	3	4	3	3	2	2	1	4	
17-Feb	1	1	1	1	1	3	2	2	2	1	2	2	2	2	1	2	3	2	3	3	1	2	1	1	3	
18-Feb	1	1	1	1	1	2	1	2	1	1	1	1	1	1	1	UO	1	1	1	1	1	1	1	1	1	2
19-Feb	1	2	1	1	2	1	1	UO	3	1	2	1	1	2	2	1	1	1	1	3	4	3	3	4	4	
20-Feb	3	3	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	2	1	1	3	2	3	3	
21-Feb	3	3	2	2	3	2	1	1	1	1	2	2	4	3	4	4	3	2	2	1	2	1	2	1	4	
22-Feb	1	2	2	2	1	1	1	1	2	1	1	1	1	2	1	1	1	1	1	1	2	1	1	2	2	
23-Feb	3	3	1	2	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	UO	UO	1	2	2	3	
24-Feb	2	1	2	2	2	3	2	3	2	2	2	4	5	4	4	4	4	3	3	3	3	2	2	2	5	
25-Feb	2	3	2	2	2	2	2	1	2	2	2	3	4	2	3	2	2	1	1	2	1	1	1	1	4	
26-Feb	2	2	2	1	1	1	2	1	2	2	2	2	2	2	3	3	2	2	3	3	2	3	2	2	3	
27-Feb	2	3	3	3	3	3	3	3	3	4	4	3	3	3	3	3	3	3	2	2	2	2	1	1	4	
28-Feb	1	1	0	1	UO	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	
														4 4 3 3 4 5 4 7 5 4 6 8 8 8 6 6 7 6 4 3 5 7 4 4												
Diurnal Maximum																										
UO - Unstable Operation																										





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

**Wind Direction (WD) - deg**  
**Fort Hills - February 2023**

Direction of Maximum Speed: 7 deg on Feb 13 13:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 12.9 deg on Feb 27	Hours of Data: 666
Direction of Minimum Speed: 166 deg on Feb 14 22:00	Hours of Missing Data: 6
Direction of Minimum Daily Speed Average: 0.3 deg on Feb 28	Percent Operational Time: 99.1
Monthly Average Direction: 47.8 deg	

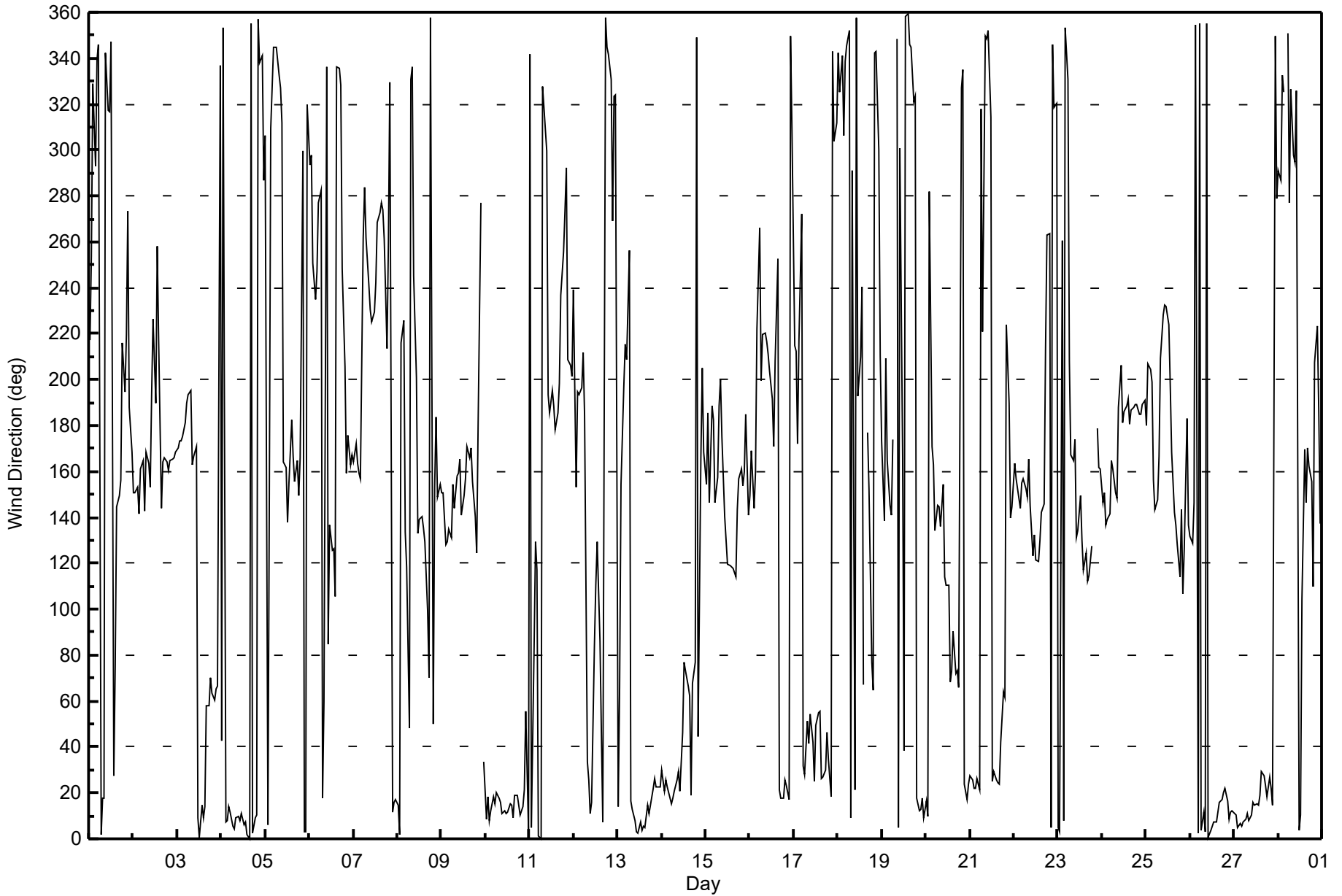
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Feb	217	254	329	293	339	346	2	17	18	343	317	317	347	27	75	145	149	156	216	195	220	273	188	168	347.0
2-Feb	151	151	153	142	161	165	143	168	163	153	194	227	190	258	217	144	164	166	164	161	165	165	166	168	165.4
3-Feb	170	174	173	175	181	190	193	195	163	167	171	9	1	15	9	14	58	58	70	63	60	65	67	337	143.4
4-Feb	42	353	7	8	14	11	6	4	9	10	8	11	6	7	2	0	355	3	9	10	357	338	341	287	4.9
5-Feb	306	6	149	309	345	345	345	333	327	312	164	162	138	155	182	167	156	165	150	166	299	3	3	320	158.4
6-Feb	293	298	251	235	247	277	283	18	60	336	85	137	125	126	105	336	335	328	248	205	159	176	163	167	238.6
7-Feb	164	172	163	159	157	262	284	262	242	231	225	230	243	268	273	277	274	261	214	260	329	11	16	17	251.6
8-Feb	15	2	216	226	134	118	48	331	336	246	201	133	139	140	136	130	99	70	357	50	153	184	149	154	140.1
9-Feb	150	151	128	129	135	131	154	144	158	159	165	141	150	157	171	166	170	156	140	125	179	277	UO	34	149.2
10-Feb	9	18	8	12	18	15	20	17	16	11	12	11	11	15	14	9	19	19	15	10	14	21	56	3	14.7
11-Feb	342	5	85	129	117	1	0	328	319	300	193	186	195	189	178	186	199	237	256	273	292	209	206	201	210.3
12-Feb	239	153	195	193	196	212	184	34	26	11	16	84	111	130	86	46	7	357	345	342	331	269	324	324	357.3
13-Feb	14	66	155	197	215	208	256	16	13	8	3	2	7	4	6	5	15	11	15	22	26	23	22	22	9.3
14-Feb	30	21	25	23	20	15	18	21	26	29	21	46	77	73	66	62	19	68	77	349	45	166	205	169	30.9
15-Feb	155	185	147	189	183	146	157	188	200	175	140	130	120	119	118	118	114	143	157	161	154	160	185	141	146.8
16-Feb	149	169	144	160	222	266	200	220	220	217	211	204	192	171	208	253	21	18	18	26	23	17	350	309	175.0
17-Feb	215	213	172	217	272	32	28	51	42	54	42	25	50	55	56	26	27	30	47	35	18	343	304	312	34.5
18-Feb	343	325	341	306	338	345	352	9	291	22	358	193	210	240	67	UO	177	152	77	64	342	343	300	211	329.9
19-Feb	173	138	209	165	145	141	174	UO	349	5	301	167	39	358	360	346	345	321	324	18	12	13	17	9	6.6
20-Feb	16	10	282	171	163	134	145	145	136	155	114	111	110	68	73	90	72	73	66	327	335	24	17	24	61.1
21-Feb	27	26	22	22	26	21	318	221	349	349	352	314	25	29	26	24	24	42	64	62	224	190	140	145	25.9
22-Feb	163	157	153	144	155	157	153	149	165	145	123	132	121	121	130	142	146	214	263	264	5	346	318	320	145.4
23-Feb	5	3	261	8	354	331	208	167	165	174	131	134	149	130	117	124	112	115	127	UO	UO	179	162	161	129.2
24-Feb	147	151	137	139	141	165	161	151	149	188	206	181	186	189	191	181	187	188	189	189	185	185	189	191	178.0
25-Feb	180	207	204	199	156	143	147	167	209	228	233	232	224	198	168	142	137	128	114	143	107	126	183	137	181.2
26-Feb	132	129	146	355	2	355	4	12	3	355	0	4	5	8	7	12	16	17	20	22	16	9	12	12	11.9
27-Feb	11	10	5	7	5	7	9	11	8	10	16	15	15	15	19	29	27	23	18	27	22	15	350	279	12.9
28-Feb	291	287	332	325	UO	351	277	326	298	295	326	3	10	104	169	146	170	162	156	110	207	223	187	137	260.8
Diurnal Average																									
	63.3	59.4	135.0	151.0	116.7	46.0	5.1	32.0	18.9	357.4	354.9	30.1	92.7	81.8	61.1	54.1	43.3	51.2	53.1	46.1	18.9	25.5	42.3	89.1	

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



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

**Wind Direction (WD) - deg**  
**Fort Hills - February 2023**





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

**Wind Direction (WD) - deg**  
**Fort Hills - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 92 deg on Feb 21 09:00 Minimum Value: 5 deg on Feb 12 06:00 Percentiles: P <sub>1</sub> = 7 P <sub>10</sub> = 8 Q <sub>1</sub> = 10 Median = 14 Q <sub>3</sub> = 26 P <sub>90</sub> = 48 P <sub>99</sub> = 85																		Hours in Service: 672 Hours of Data: 666 Hours of Missing Data: 6 Hours of Calibration: 0 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-Feb	68	56	48	42	21	11	20	6	9	13	13	24	48	15	49	16	18	22	34	40	15	73	19	11	73
2-Feb	25	11	11	15	13	10	9	12	15	16	20	10	46	30	82	20	14	7	7	7	8	7	7	8	82
3-Feb	7	8	7	8	8	9	9	8	13	33	82	14	13	8	9	16	21	10	10	9	9	12	22	28	82
4-Feb	18	16	11	8	7	8	10	10	9	12	11	8	10	10	11	10	14	11	10	10	19	14	19	21	21
5-Feb	21	66	26	59	19	31	13	21	26	57	24	23	14	17	30	11	12	16	19	15	77	19	14	18	77
6-Feb	15	15	12	14	20	10	62	68	18	28	60	14	15	29	47	57	22	22	54	41	14	16	11	14	68
7-Feb	19	14	8	14	27	29	20	13	9	12	7	8	13	10	11	11	11	18	32	64	53	10	12	13	64
8-Feb	15	46	62	8	27	18	26	23	10	61	24	19	7	8	8	15	68	54	22	81	26	20	10	8	81
9-Feb	21	9	14	9	8	11	25	14	24	15	19	19	15	11	18	15	24	21	16	18	73	57	UO	80	80
10-Feb	8	7	9	10	10	9	8	7	9	10	7	8	11	9	10	11	10	10	10	9	8	10	27	34	34
11-Feb	20	15	61	15	31	49	37	74	59	64	28	11	8	10	8	15	28	9	13	28	22	9	13	18	74
12-Feb	15	75	17	13	11	5	86	16	31	11	11	34	37	37	41	45	11	10	9	18	29	89	37	27	89
13-Feb	63	84	17	16	12	9	60	12	9	12	17	16	14	16	15	14	11	11	11	10	10	10	10	10	84
14-Feb	11	11	9	10	9	9	8	9	15	25	28	35	37	20	15	23	12	22	39	55	29	89	57	28	89
15-Feb	11	17	17	45	33	20	15	23	14	50	14	10	12	8	11	9	9	20	14	29	17	8	10	17	50
16-Feb	11	32	12	19	38	45	23	13	18	15	11	10	14	16	11	70	9	9	10	13	11	10	49	41	70
17-Feb	70	69	90	35	74	68	13	10	14	11	13	22	23	10	11	17	12	12	12	15	10	20	23	21	90
18-Feb	26	43	12	51	12	46	11	23	45	17	19	65	27	32	90	UO	10	22	47	58	13	14	27	39	90
19-Feb	26	20	45	39	29	16	80	UO	57	60	30	67	82	27	13	12	8	14	27	8	8	8	9	12	82
20-Feb	8	10	71	19	14	8	39	14	27	13	37	25	37	23	17	26	12	12	46	15	15	14	7	9	71
21-Feb	10	9	7	7	11	5	59	20	92	21	17	31	21	14	12	9	9	20	36	13	40	14	32	21	92
22-Feb	26	19	19	19	7	10	11	10	14	13	8	11	11	18	11	17	17	19	20	24	69	14	32	26	69
23-Feb	18	17	41	70	15	26	29	21	40	26	12	15	19	26	21	16	21	14	17	UO	UO	32	12	11	70
24-Feb	10	9	11	12	9	7	7	9	14	12	9	16	12	10	11	10	9	8	8	8	8	8	7	7	16
25-Feb	13	8	9	16	9	9	22	19	9	12	8	13	13	15	20	10	8	5	12	62	26	23	86	13	86
26-Feb	26	14	76	32	13	12	9	7	11	12	12	11	11	10	9	8	7	7	7	10	11	9	7	7	76
27-Feb	7	10	10	10	10	11	12	9	11	11	9	8	9	9	9	10	9	9	8	10	8	9	12	26	26
28-Feb	12	19	12	14	UO	12	44	44	30	27	47	11	21	45	20	12	54	18	21	35	59	59	19	15	59
Diurnal Maximum																									
70 84 90 70 74 68 86 74 92 64 82 67 82 45 90 70 68 54 54 81 77 89 86 80																									
UO - Unstable Operation																									



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS25 WASKŌW OHCI PIMÂTISIWIN FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMÂTISIWIN (AMS25)  
 FEBRUARY 2023

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	0	0	672	0	--	0	--	0
H2S(ppb) Average	0	0	672	0	--	0	--	0
Temperature 2 m (C) Average	0	0	672	0	--	0	--	0
Relative Humidity (%) Average	0	0	672	0	--	-	--	-
Wind Speed 10 m (km/h) Average	0	0	672	0	--	0	--	0
Wind Direction 10 m (deg) Average	0	0	672	0	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMĀTISIWIN (AMS25)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile							
					Min	P10	Q1	Median	Q3	P90	Max	
SO2 (ppb) Average	0	--	--	-	--	0	0	0	0	0	0	--
H2S (ppb) Average	0	--	--	-	--	0	0	0	0	0	0	--
Temperature 2 m (C) Average	0	--	--	-	--	0	0	0	0	0	0	--
Relative Humidity (%) Average	0	--	--	-	--	0	0	0	0	0	0	--
Wind Speed 10 m (km/h) Average	0	--	--	-	--	0	0	0	0	0	0	--
Wind Direction 10 m (deg) Average	0	-	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMÂTISIWIN (AMS25)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	01 Feb 2023 01:00	01 Mar 2023 00:00	672	Station power failure



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0		Hours in Service: 672	
Maximum Value: -- ppb on Feb 1 00:00		Maximum Daily Average: -- ppb on Jan 31	
Minimum Value: -- ppb on Feb 1 00:00		Hours of Data: 0	
Maximum Diurnal Average: -- ppb at hour 0		Hours of Missing Data: 672	
Monthly Average: -- ppb		Hours of Calibration: 0	
Minimum Daily Average: -- ppb on Jan 31		Percent Operational Time: 0.0	
Minimum Diurnal Average: -- ppb at hour 0		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-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--	
2-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
3-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
4-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
5-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
6-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
7-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
8-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
9-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
10-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
11-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
12-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
13-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
14-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
15-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
16-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
17-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
18-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
19-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
20-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
21-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
22-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
23-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
24-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
25-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
26-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
27-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
28-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
-- --																								Diurnal Average			
-- --																								Diurnal Maximum			

PF - Power Failure

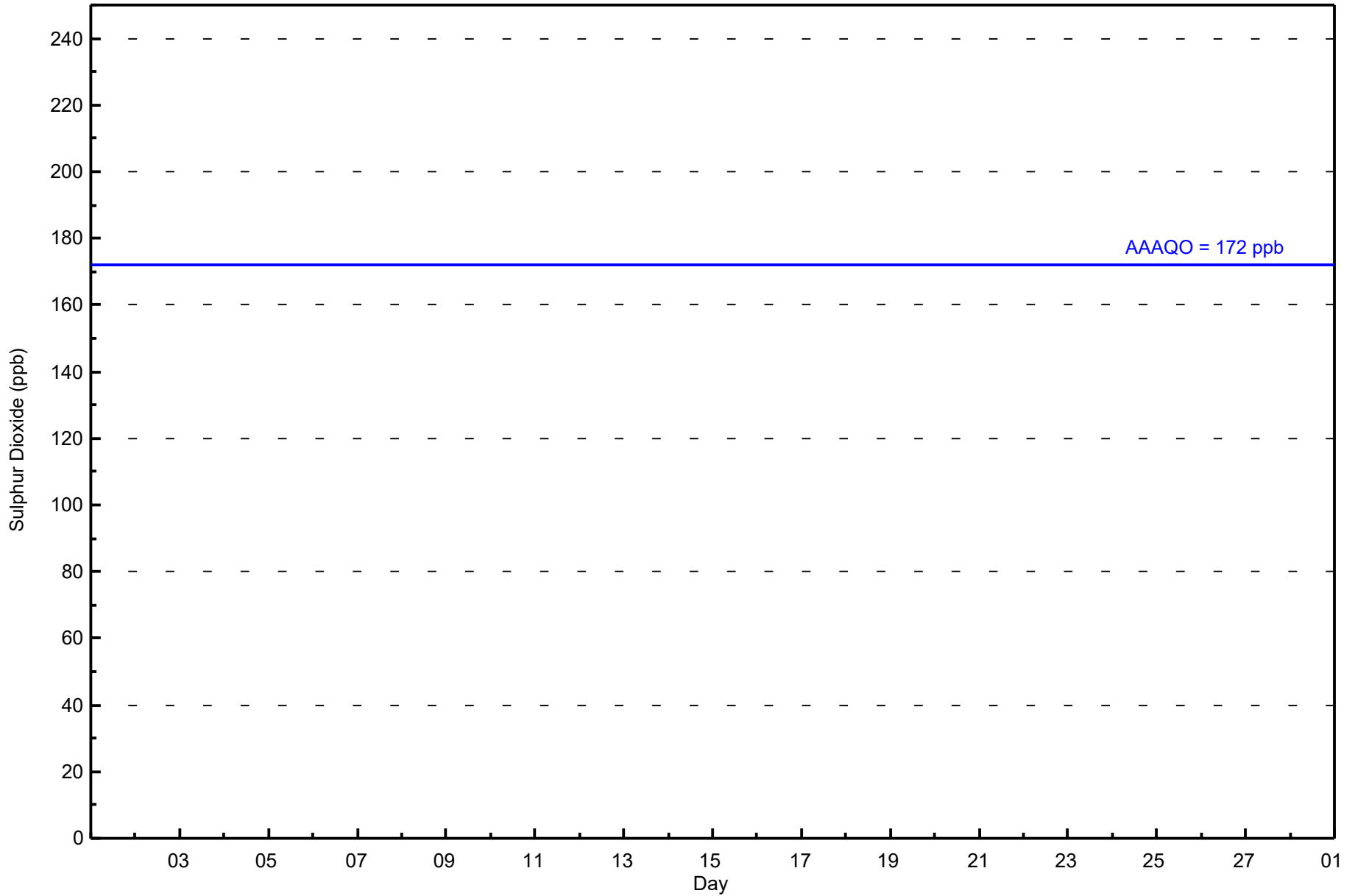
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb





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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Waskow ohci Pimatisiwin - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Waskow ohci Pimatisiwin - February 2023**

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

Total Number of Valid Hours: 0

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Waskow ohci Pimatisiwin - February 2023**

<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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

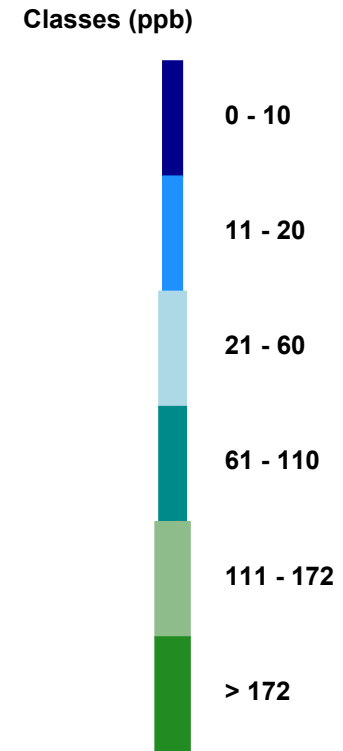
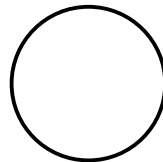
Total Number of Valid Hours: 0

Total Number of Hours: 672

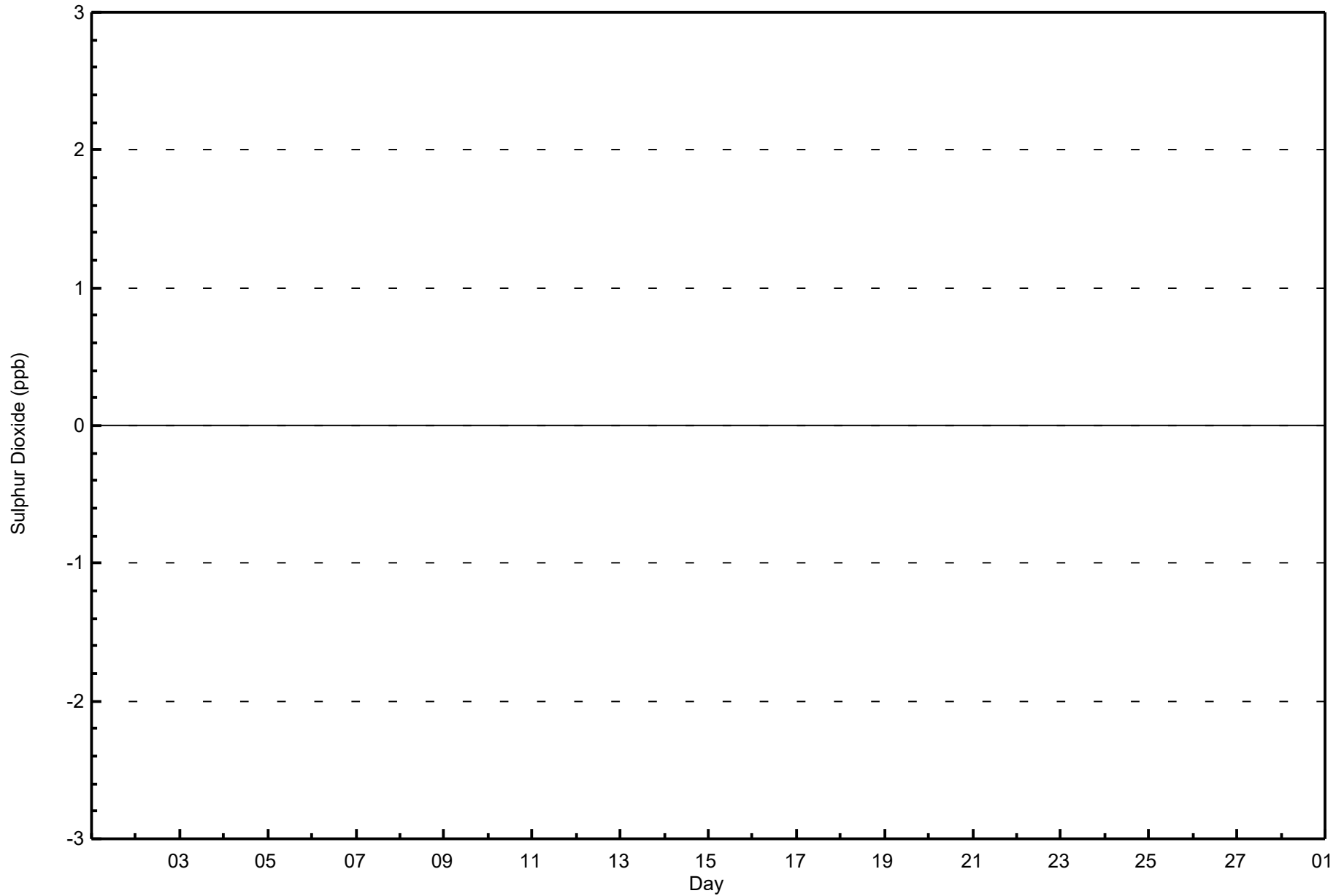


**Wood Buffalo Environmental Association**  
**Wind Rose Feb 2023**

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



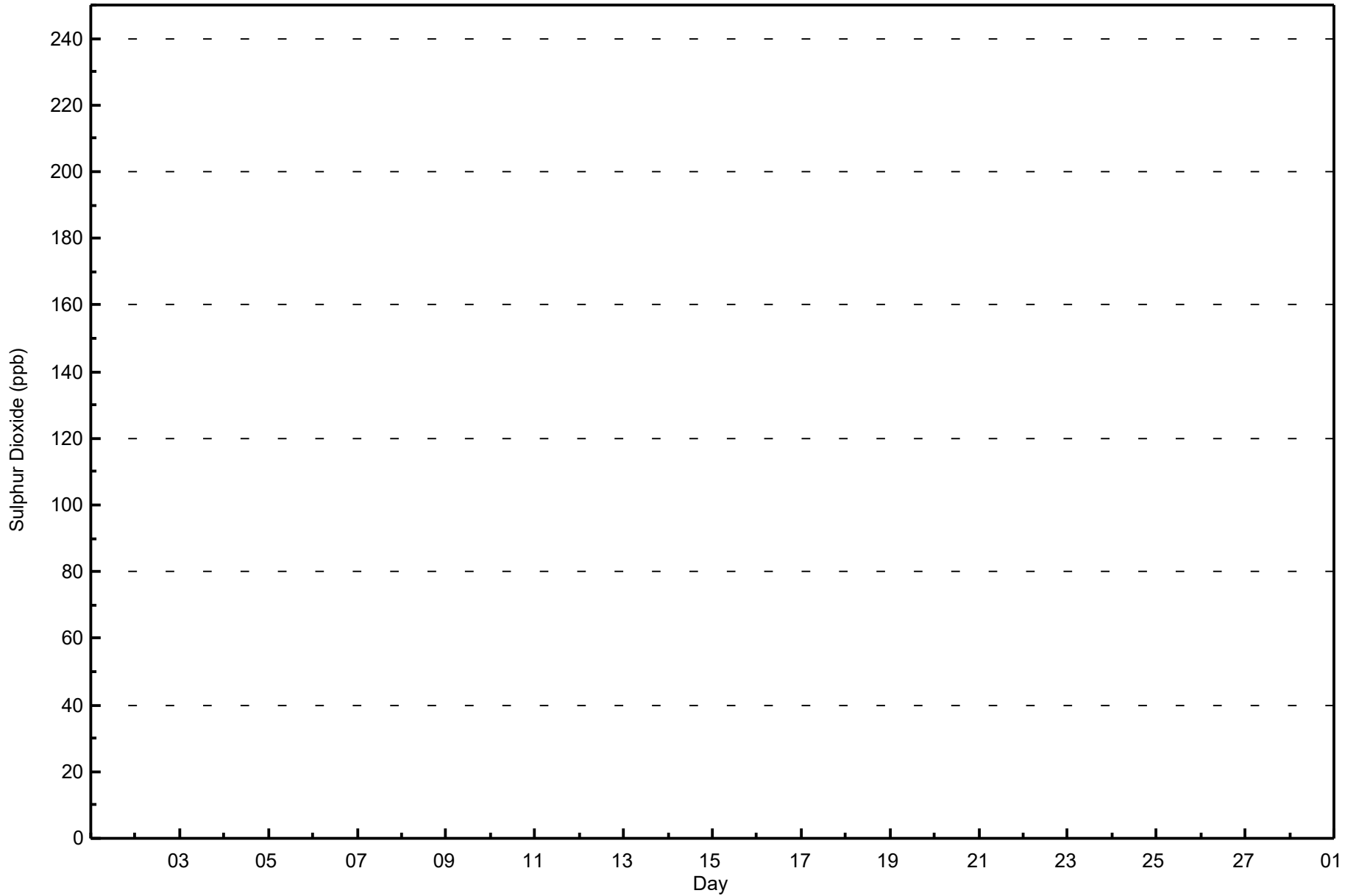
**Total Number of Valid Hours: 0**





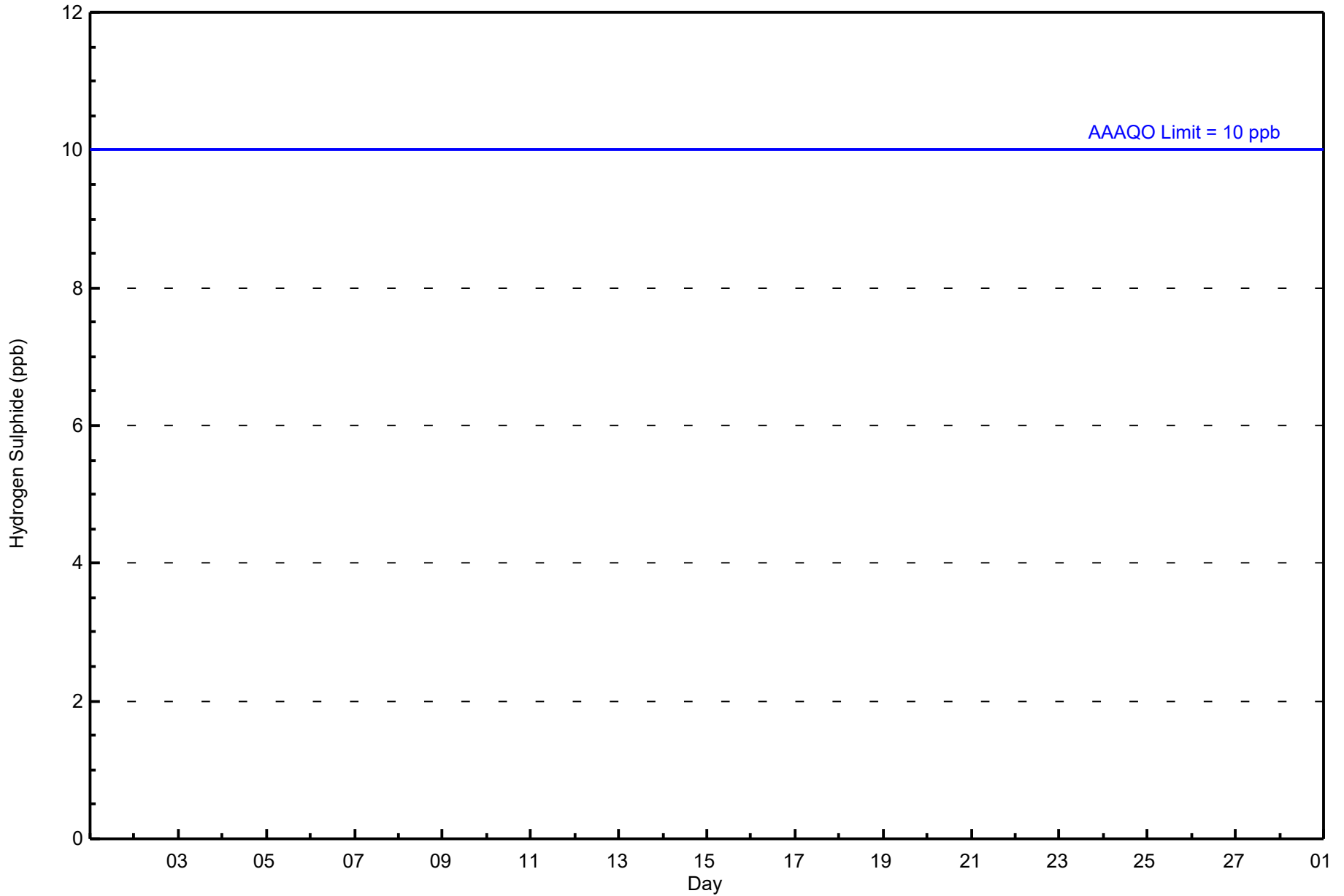
**Wood Buffalo Environmental Association**  
**Span Responses**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Waskow ohci Pimatisiwin - February 2023**





Number of Exceedences (AAAQO):		1-hr: 0    24-hr: 0		Hours in Service: 672																							
Maximum Value: -- ppb on Feb 1 00:00		Maximum Daily Average: -- ppb on Jan 31		Hours of Data: 0																							
Minimum Value: -- ppb on Feb 1 00:00		Minimum Daily Average: -- ppb on Jan 31		Hours of Missing Data: 672																							
Maximum Diurnal Average: -- ppb at hour 0		Minimum Diurnal Average: -- ppb at hour 0		Hours of Calibration: 0																							
Monthly Average: -- 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> = 0.0 P <sub>99</sub> = 0.0		Percent Operational Time: 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-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--	
2-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
3-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
4-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
5-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
6-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
7-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
8-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
9-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
10-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
11-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
12-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
13-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
14-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
15-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
16-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
17-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
18-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
19-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
20-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
21-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
22-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
23-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
24-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
25-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
26-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
27-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
28-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
--																								Diurnal Average			
--																								Diurnal Maximum			
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  
Waskow ohci Pimatisiwin - February 2023**

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

Total Number of Valid Hours: 0

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Waskow ohci Pimatisiwin - February 2023**

Concentration Ranges (ppb)	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
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

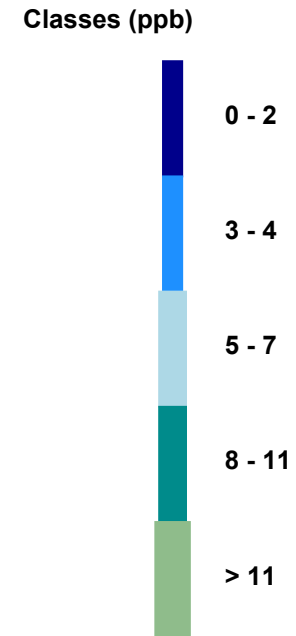
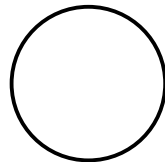
Total Number of Valid Hours: 0

Total Number of Hours: 672

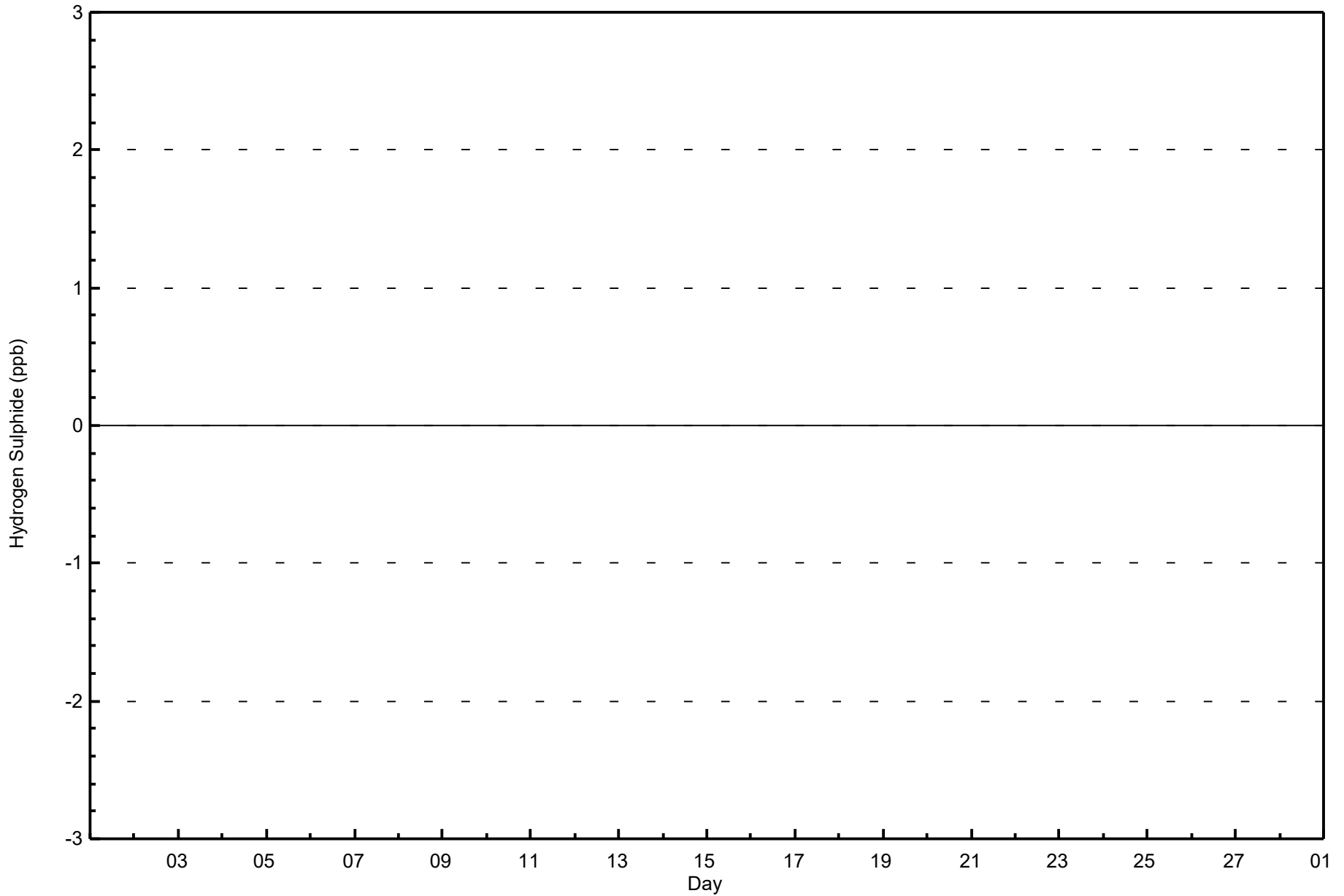


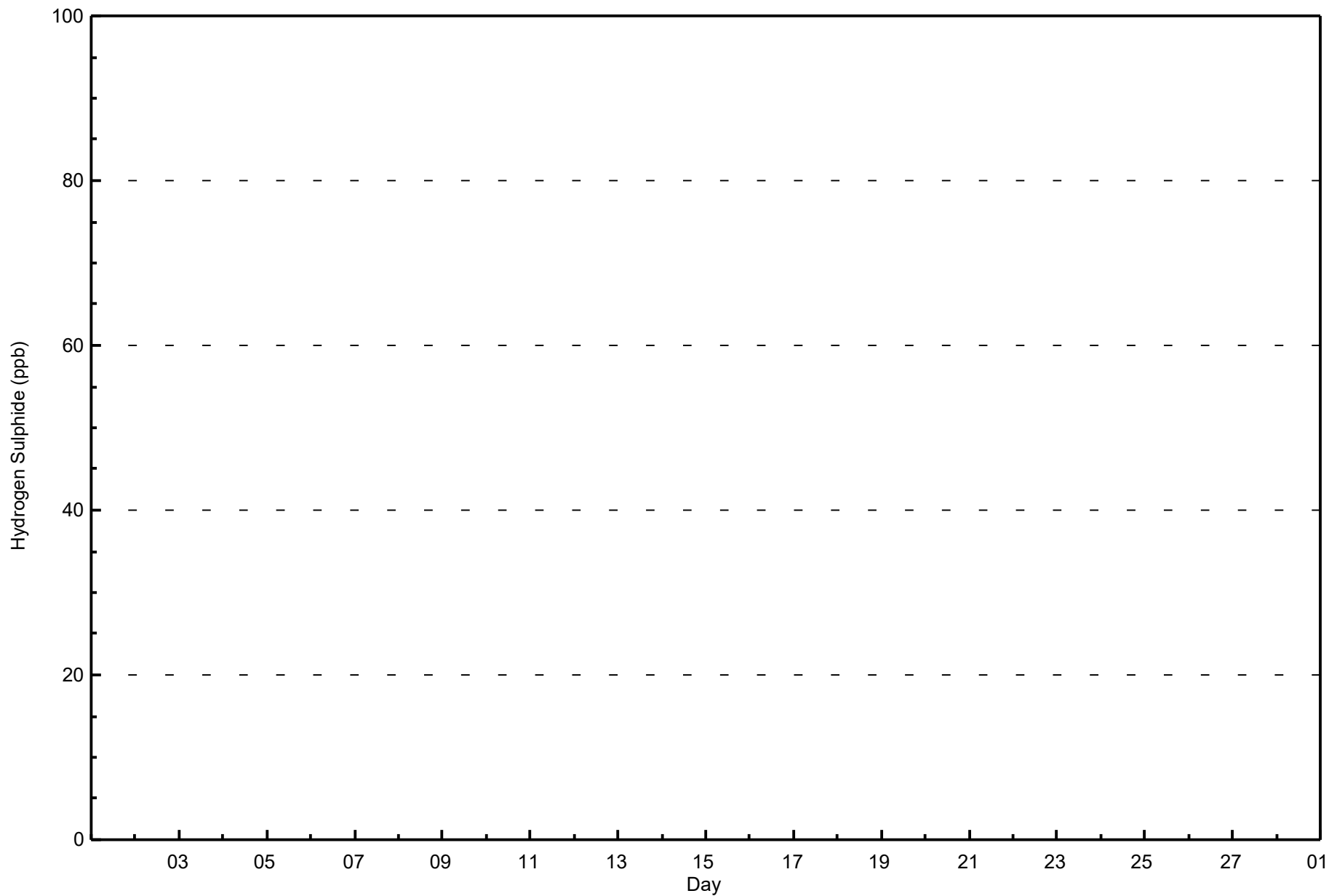
**Wood Buffalo Environmental Association**  
**Wind Rose Feb 2023**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Waskow ohci Pimatisiwin**



**Total Number of Valid Hours: 0**





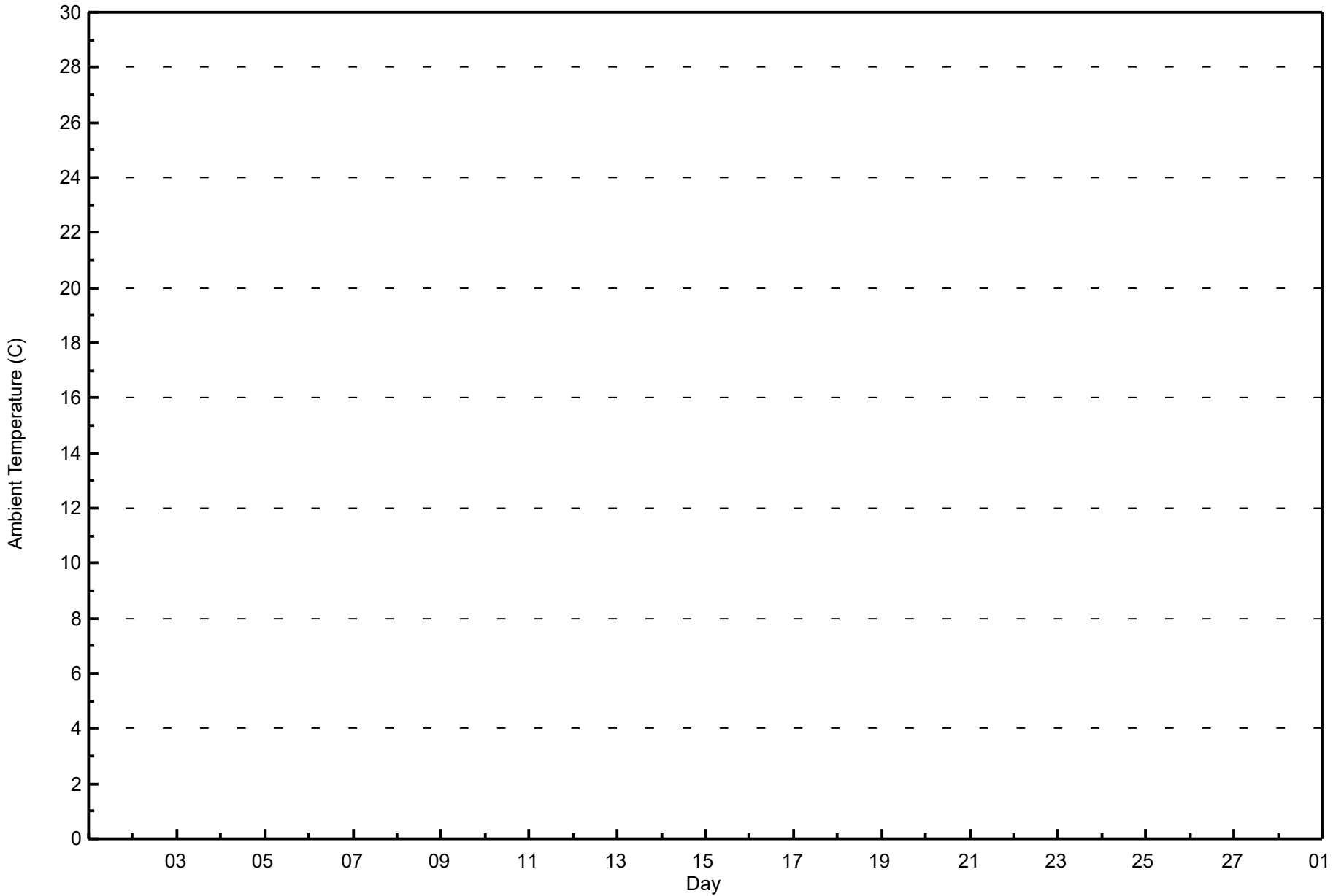


Maximum Value: -- C on Feb 1 00:00		Maximum Daily Average: -- C on Jan 31		Hours in Service: 672																							
Minimum Value: -- C on Feb 1 00:00		Minimum Daily Average: -- C on Jan 31		Hours of Data: 0																							
Maximum Diurnal Average: -- C at hour 0		Minimum Diurnal Average: -- C at hour 0		Hours of Missing Data: 672																							
Monthly Average: -- C		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: 0																							
				Percent Operational Time: 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-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--	
2-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
3-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
4-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
5-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
6-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
7-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
8-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
9-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
10-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
11-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
12-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
13-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
14-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
15-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
16-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
17-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
18-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
19-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
20-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
21-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
22-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
23-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
24-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
25-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
26-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
27-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
28-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
-- --																								Diurnal Average			
-- --																								Diurnal Maximum			
PF - Power Failure																											



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

**Ambient Temperature (AT) - C**  
**Waskow ohci Pimatisiwin - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Waskow ohci Pimatisiwin - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	0	0.00	0.00
10 - 20	0	0.00	0.00
> 20	0	0.00	0.00

Total Number of Valid Hours: 0

Total Number of Hours: 672



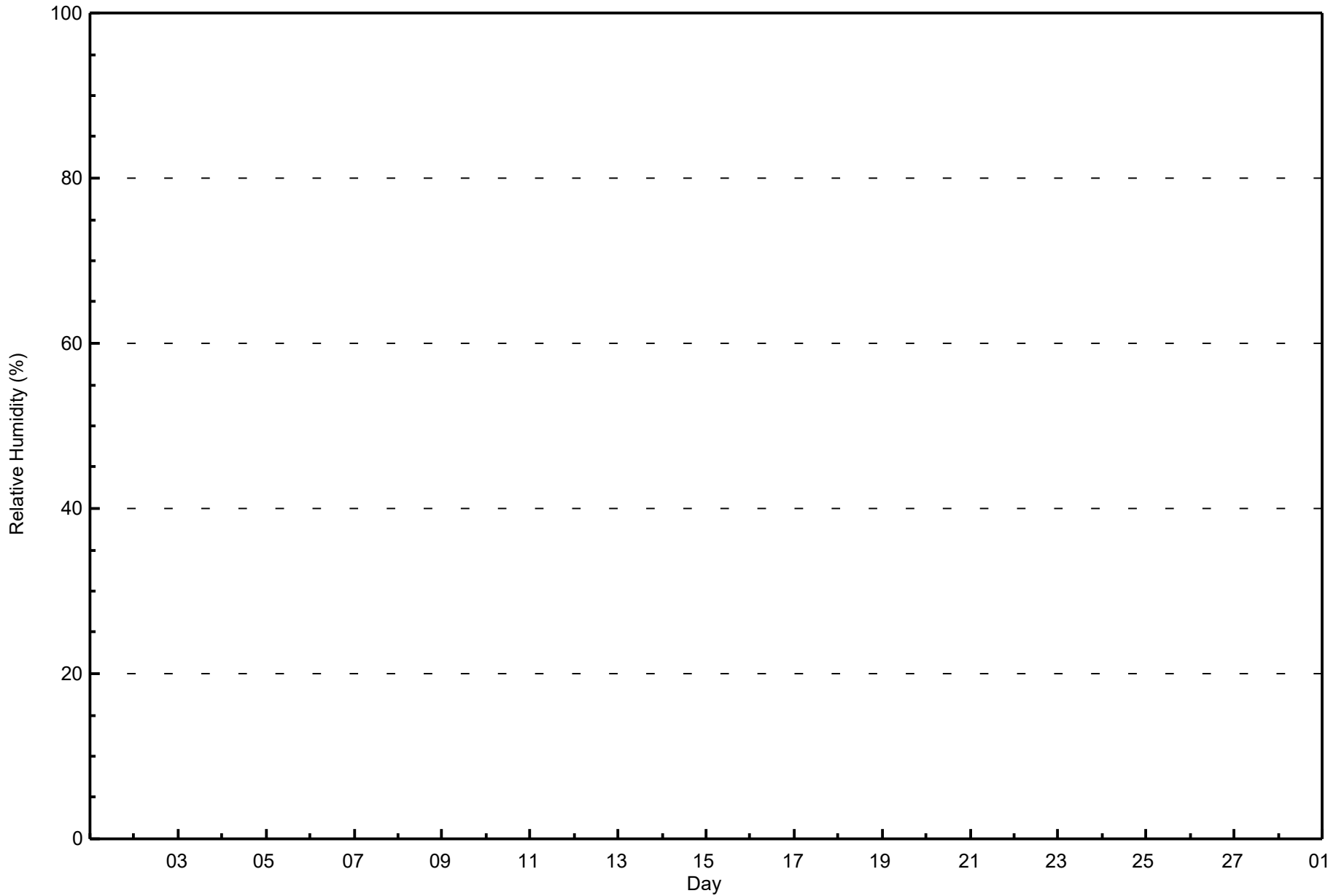


Maximum Value: -- % on Feb 1 00:00																				Maximum Daily Average: -- % on Jan 31					Hours in Service:	672		
Minimum Value: -- % on Feb 1 00:00																				Minimum Daily Average: -- % on Jan 31					Hours of Data:	0		
Maximum Diurnal Average: -- % at hour 0																				Minimum Diurnal Average: -- % at hour 0					Hours of Missing Data:	672		
Monthly Average: -- %																				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:	0		
																									Percent Operational Time:	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-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--	
2-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
3-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
4-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
5-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
6-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
7-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
8-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
9-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
10-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
11-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
12-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
13-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
14-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
15-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
16-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
17-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
18-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
19-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
20-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
21-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
22-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
23-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
24-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
25-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
26-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
27-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
28-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
--																								Diurnal Average				
--																								Diurnal Maximum				
PF - Power Failure																												



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

**Relative Humidity (RH) - %**  
**Waskow ohci Pimatisiwin - February 2023**





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

**Relative Humidity (RH) - %**  
**Waskow ohci Pimatisiwin - February 2023**

<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	0	0.00	0.00
80 - 100	0	0.00	0.00

Total Number of Valid Hours: 0

Total Number of Hours: 672



Maximum Speed: -- km/h on Feb 1 00:00	Maximum Daily Speed Average: 0.0 km/h on Jan 1	Hours in Service: 672
Minimum Speed Value: -- km/h on Feb 1 00:00	Minimum Daily Speed Average: 0.0 km/h on Jan 1	Hours of Data: 0
Maximum Diurnal Speed Average: -- km/h at hour 0	Minimum Diurnal Speed Average: -- km/h at hour 0	Hours of Missing Data: 672
Monthly Average Velocity: -- km/h -- deg	Percentiles: $P_1 = 0$ $P_{10} = 0$ $Q_1 = 0$ Median = 0 $Q_3 = 0$ $P_{90} = 0$ $P_{99} = 0$	Percent Operational Time: 0.0

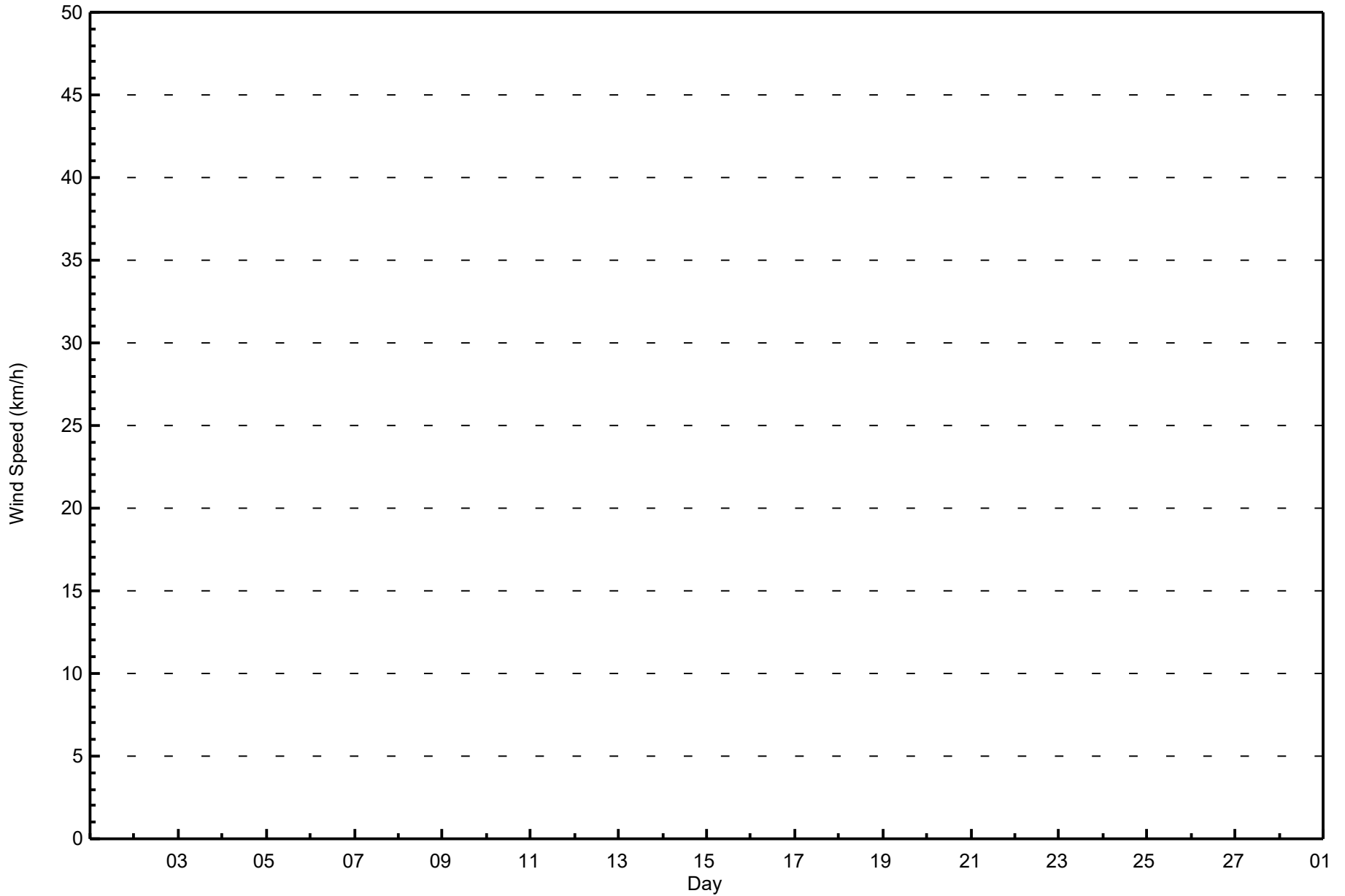
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	---	---
2-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF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

PF - Power Failure  
 All monthly, daily, and diurnal averages have been calculated using vector methods



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

**Wind Speed (WS) - km/h**  
**Waskow ohci Pimatisiwin - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Waskow ohci Pimatisiwin - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	0	0.00	0.00
6 - 11	0	0.00	0.00
12 - 19	0	0.00	0.00
20 - 28	0	0.00	0.00
29 - 38	0	0.00	0.00
> 38	0	0.00	0.00

Total Number of Valid Hours: 0  
Total Number of Hours: 672



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

**Wind Speed (WS) - km/h**  
**Waskow ohci Pimatisiwin - February 2023**

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 - 19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

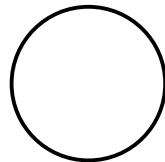
Total Number of Valid Hours: 0

Total Number of Hours: 672

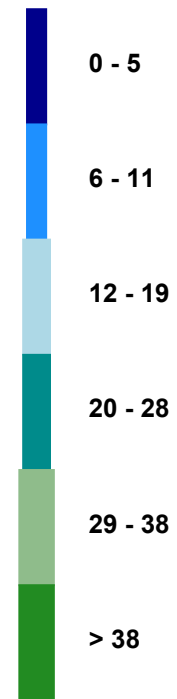


**Wood Buffalo Environmental Association**  
**Wind Rose Feb 2023**

**Wind Speed (WS) - km/h**  
**Waskow ohci Pimatisiwin**



**Classes (km/h)**



**Total Number of Valid Hours: 0**





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

**Wind Speed (WS) - km/h**

**Waskow ohci Pimatisiwin - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 672
Maximum Value: -- km/h on Feb 1 00:00	Hours of Data: 0
Minimum Value: -- km/h on Feb 1 00:00	Hours of Missing Data: 672
Percentiles: P <sub>1</sub> = 0 P <sub>10</sub> = 0 Q <sub>1</sub> = 0 Median = 0 Q <sub>3</sub> = 0 P <sub>90</sub> = 0 P <sub>99</sub> = 0	Hours of Calibration: 0
	Percent Operational Time: 0.0

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-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	
2-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
3-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
4-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
5-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
6-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
7-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
8-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
9-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
10-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
11-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
12-Feb	PF	PF	PF	PF	PF	PF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
13-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
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	Diurnal Maximum																										

PF - Power Failure      NF - Not Flagged



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

**Wind Direction (WD) - deg**  
**Waskow ohci Pimatisiwin - February 2023**

Direction of Maximum Speed: -- deg on Feb 1 00:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 0.0 deg on Jan 1	Hours of Data: 0
Direction of Minimum Speed: -- deg on Feb 1 00:00	Hours of Missing Data: 672
Direction of Minimum Daily Speed Average: 0.0 deg on Jan 1	Percent Operational Time: 0.0
Monthly Average Direction: -- deg	

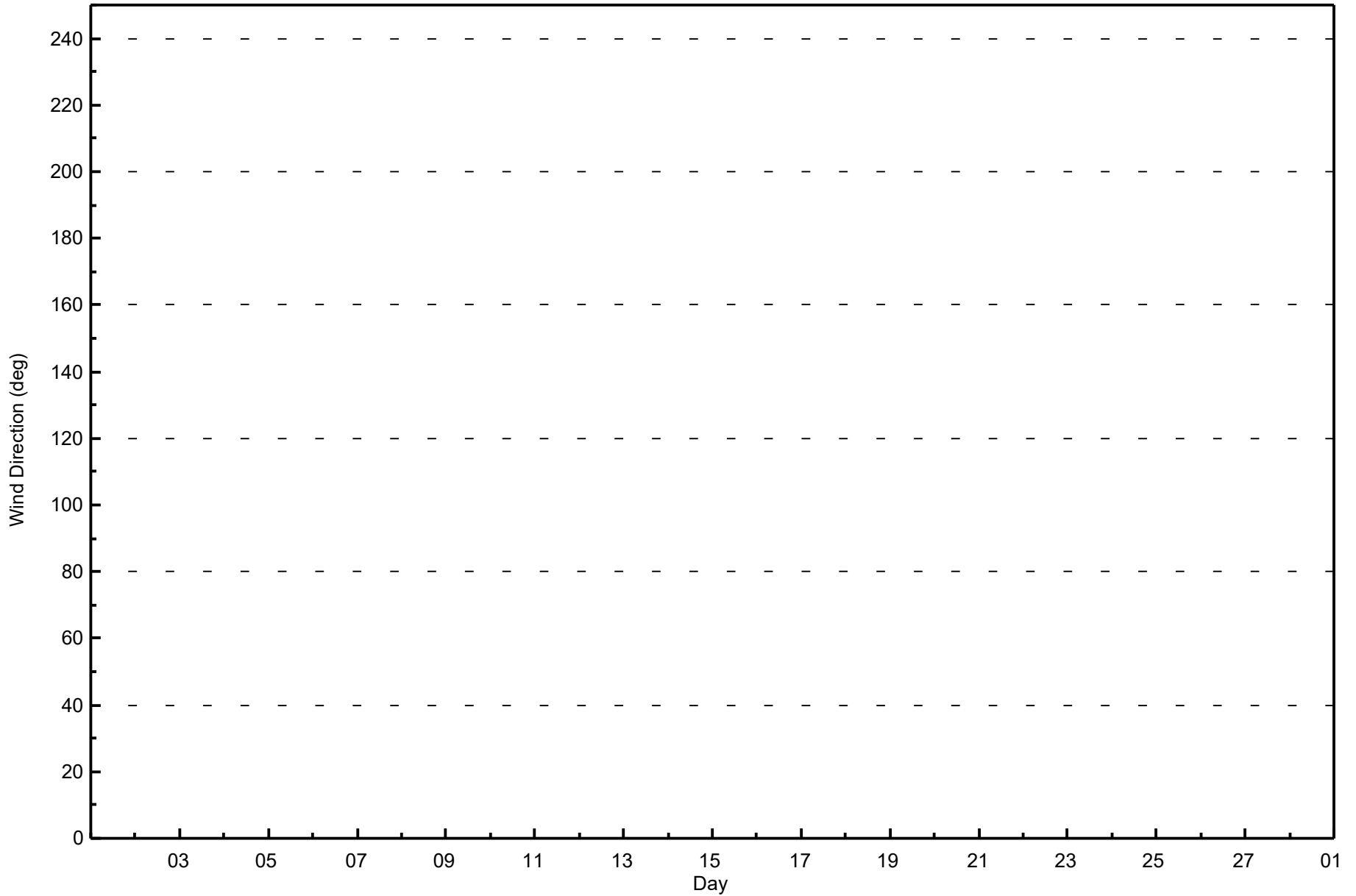
Day	Hourly Period Ending At (MST)																								Daily Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	
2-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF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

PF - Power Failure  
 All monthly, daily, and diurnal averages have been calculated using vector methods



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

**Wind Direction (WD) - deg**  
**Waskow ohci Pimatisiwin - February 2023**





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

**Wind Direction (WD) - deg**

**Waskow ohci Pimatisiwin - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 672
Maximum Value: -- deg on Feb 1 00:00	Hours of Data: 0
Minimum Value: -- deg on Feb 1 00:00	Hours of Missing Data: 672
Percentiles: P <sub>1</sub> = 0 P <sub>10</sub> = 0 Q <sub>1</sub> = 0 Median = 0 Q <sub>3</sub> = 0 P <sub>90</sub> = 0 P <sub>99</sub> = 0	Hours of Calibration: 0
	Percent Operational Time: 0.0

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-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	
2-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
3-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
4-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
5-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
6-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
7-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
8-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
9-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
10-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
11-Feb	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
12-Feb	PF	PF	PF	PF	PF	PF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
13-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	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-Feb	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	--
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	Diurnal Maximum																										

PF - Power Failure      NF - Not Flagged



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS26 CHRISTINA LAKE FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)  
 FEBRUARY 2023

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	638	32	34	99.7	26.4	0	4.6	0
H2S (ppb) Average	637	33	35	99.7	1	0	0.3	0
NO2 (ppb) Average	636	33	36	99.55	28.1	0	10.9	-
NO (ppb) Average	636	33	36	99.55	56.9	-	7.5	-
NOX (ppb) Average	636	33	36	99.55	85	-	18.5	-
Temperature 2 m (C) Average	672	0	0	100	6.2	-	1.7	-
Relative Humidity (%) Average	672	0	0	100	96.1	-	88.6	-
Wind Speed 10 m (km/h) Average	670	0	2	99.7	32	-	21	-
Wind Direction 10 m (deg) Average	670	0	2	99.7	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	638	1.5	2.5	-	0	0	0.3	0.7	1.7	3.6	26.4
H2S (ppb) Average	637	0.09	0.1	-	0	0	0	0	0.1	0.3	1
NO2 (ppb) Average	636	5.05	3.7	-	0.4	1.6	2.7	4.2	6.3	9.3	28.1
NO (ppb) Average	636	1.63	3.3	-	0	0	0.1	0.7	2	3.7	56.9
NOX (ppb) Average	636	6.67	6.2	-	0.5	1.8	3	5.2	8.2	12.8	85
Temperature 2 m (C) Average	672	-11.51	10.3	-	-36.3	-25.7	-18.8	-11.4	-1.9	1.5	6.2
Relative Humidity (%) Average	672	70.11	12	-	34.3	53.4	62.5	72	78.1	83	96.1
Wind Speed 10 m (km/h) Average	670	11.1	5	-	1	4	7	10	15	19	32
Wind Direction 10 m (deg) Average	670	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2, SO2	15 Feb 2023 14:00	15 Feb 2023 15:00	2	Maintenance - sample manifold cleaned
H2S	16 Feb 2023 10:00	16 Feb 2023 11:00	2	Maintenance - reinitiated daily QA check
NO2	27 Feb 2023 02:00	27 Feb 2023 02:00	1	DAS Failure - negative baseline dips
Wind Speed, Wind Direction	15 Feb 2023 14:00	15 Feb 2023 15:00	2	Maintenance - station operator activities





# Wood Buffalo Environmental Association

## Summary of Hour Averages

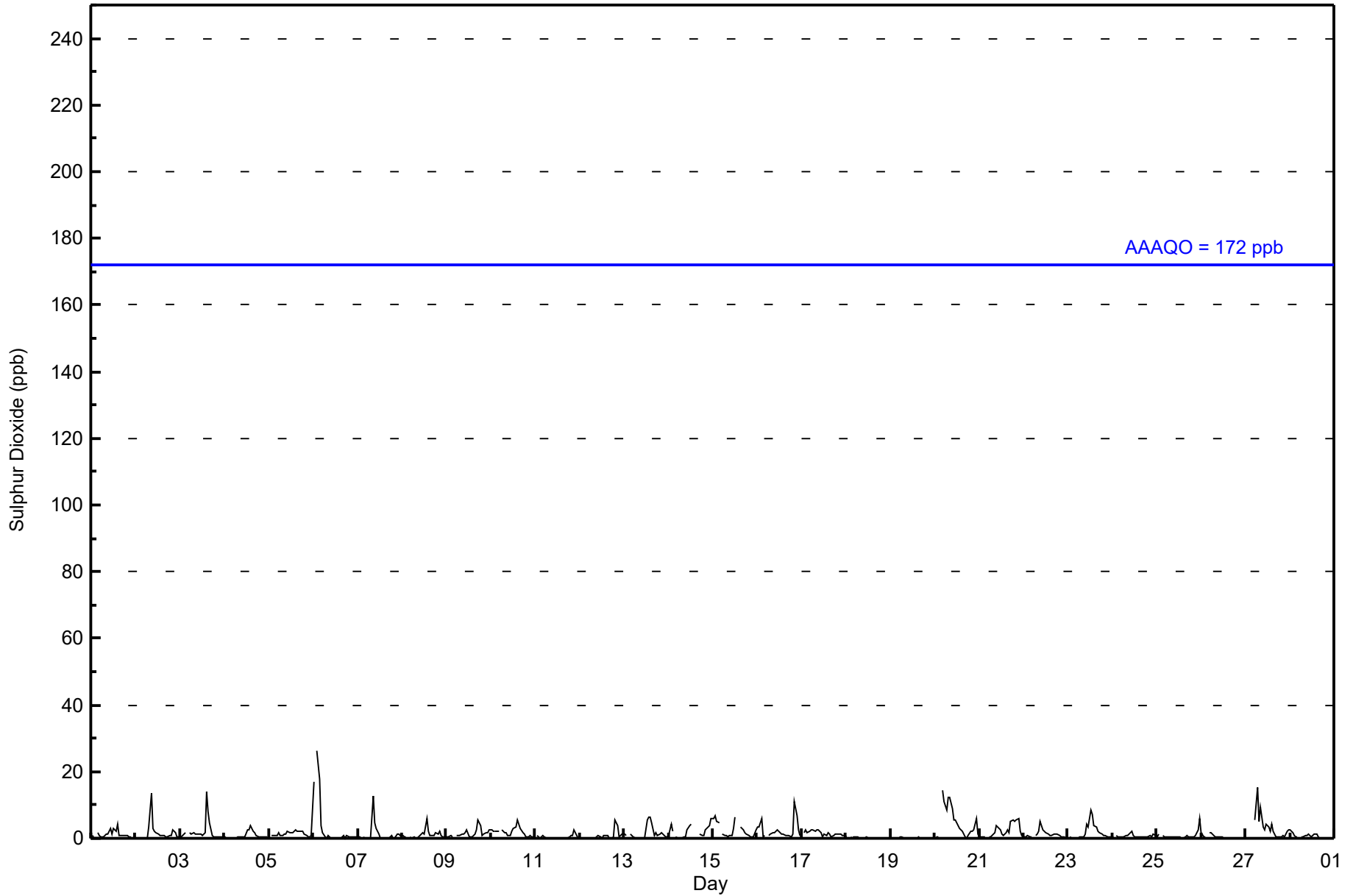
# Sulphur Dioxide (SO<sub>2</sub>) - ppb Christina Lake - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																			
Maximum Value: 26.4 ppb on Feb 6 03:00		Maximum Daily Average: 4.6 ppb on Feb 20				Hours of Data:		638																			
Minimum Value: 0.0 ppb on Feb 2 06:00		Minimum Daily Average: 0.1 ppb on Feb 19				Hours of Missing Data:		34																			
Maximum Diurnal Average: 2.4 ppb at hour 9		Minimum Diurnal Average: 1.0 ppb at hour 19				Hours of Calibration:		32																			
Monthly Average: 1.50 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> = 1.7 P <sub>90</sub> = 3.6 P <sub>99</sub> = 13.2				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-Feb	0.7	0.5	Z	1.6	0.6	0.4	0.4	1.0	1.5	1.3	2.9	1.3	2.8	1.9	4.4	1.0	0.7	0.9	0.8	0.9	0.5	0.3	0.2	0.3	1.2	4.4	
2-Feb	0.1	0.1	0.1	Z	0.1	0.0	0.0	3.2	13.6	2.8	2.2	1.9	1.4	1.0	0.8	0.9	0.6	0.4	0.6	1.0	2.4	1.7	0.4	0.4	1.6	13.6	
3-Feb	0.5	0.9	1.4	1.9	Z	1.8	1.3	1.9	1.2	1.1	1.2	1.4	0.8	1.6	13.8	7.9	4.6	0.8	0.4	0.4	0.4	0.4	0.6	0.5	2.0	13.8	
4-Feb	0.2	0.2	0.1	0.1	0.1	Z	0.2	0.2	0.5	0.5	0.4	0.4	2.7	2.5	3.7	2.3	1.5	0.7	0.4	0.6	0.4	0.6	0.4	0.3	0.8	3.7	
5-Feb	Z	0.7	0.7	0.7	0.7	1.5	1.0	0.8	1.3	1.1	2.2	1.6	1.8	1.6	2.7	2.3	2.2	2.0	2.1	1.3	0.7	0.4	0.4	0.6	1.3	2.7	
6-Feb	16.9	Z	26.4	17.9	3.6	1.7	0.4	0.1	1.0	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.7	0.1	0.9	0.3	0.3	0.6	0.4	0.2	3.1	26.4	
7-Feb	0.2	0.6	Z	0.2	0.0	0.0	0.0	0.0	12.5	4.7	2.8	1.4	0.1	0.1	0.1	0.0	0.0	0.0	1.0	0.2	0.1	1.1	1.4	0.7	1.2	12.5	
8-Feb	0.6	0.5	0.3	Z	0.2	0.2	0.4	0.2	0.1	0.4	1.3	1.5	1.2	6.1	1.9	0.8	0.7	0.7	1.7	1.3	2.0	0.8	0.4	0.4	1.0	6.1	
9-Feb	0.4	0.6	1.0	0.6	Z	1.0	0.9	0.7	1.4	1.4	1.8	2.4	0.3	0.5	0.5	1.2	2.4	5.5	3.7	0.9	1.4	1.6	1.6	2.7	1.5	5.5	
10-Feb	2.7	2.1	2.2	2.1	2.1	Z	2.5	1.7	1.5	0.9	0.9	2.0	2.8	3.6	5.3	4.2	2.8	1.8	1.2	0.4	0.4	0.7	0.5	0.5	2.0	5.3	
11-Feb	Z	0.8	0.1	0.4	0.7	0.4	0.1	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.0	2.5	0.9	0.0	0.4	2.5	
12-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	0.5	0.2	0.8	0.9	0.7	0.2	0.2	0.4	5.5	3.8	0.5	0.9	1.4	0.7	5.5	
13-Feb	1.1	0.6	Z	1.3	0.7	0.2	0.1	0.1	0.1	0.1	0.1	0.0	5.7	6.5	6.5	4.8	0.9	1.6	1.0	1.5	1.6	1.1	0.4	0.5	1.6	6.5	
14-Feb	0.8	4.3	1.9	Z	0.3	0.2	0.2	0.1	0.3	0.6	2.4	3.8	4.4	C	C	C	C	1.3	1.0	0.8	2.5	3.2	3.8	5.9	2.0	5.9	
15-Feb	6.1	6.9	5.3	4.6	Z	1.1	1.1	0.6	0.5	0.7	0.9	3.1	6.3	M	M	3.5	2.7	1.9	1.4	0.9	0.5	0.5	0.4	2.4	2.4	6.9	
16-Feb	3.2	3.2	5.9	0.6	0.7	Z	0.6	1.4	1.6	1.6	1.9	2.4	1.8	1.4	1.3	1.0	0.8	0.7	0.3	1.2	11.2	6.9	2.7	0.9	2.3	11.2	
17-Feb	Z	1.6	2.3	1.8	2.1	2.6	2.4	2.3	2.6	2.4	1.9	0.4	1.1	1.0	1.5	1.1	0.4	0.9	1.1	1.2	1.4	1.3	0.7	0.7	1.5	2.6	
18-Feb	0.5	Z	0.3	0.1	0.5	0.5	0.3	0.1	0.0	0.0	0.0	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	0.1	0.5	
19-Feb	0.0	0.0	Z	0.0	0.1	0.2	0.3	0.1	0.1	0.0	0.2	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
20-Feb	0.0	0.4	0.3	Z	14.4	10.9	8.5	12.3	12.5	9.0	5.7	5.6	3.8	2.9	2.4	2.1	0.3	0.0	0.9	2.0	2.2	2.4	5.8	1.4	4.6	14.4	
21-Feb	0.3	0.2	0.3	0.5	Z	0.4	0.4	0.7	1.5	3.6	3.2	2.7	1.2	0.8	1.9	2.4	1.6	5.2	5.3	5.1	5.5	5.8	1.9	0.6	2.2	5.8	
22-Feb	0.5	0.6	0.8	0.5	0.4	Z	0.9	1.1	2.2	4.9	2.6	1.9	1.8	1.3	0.9	0.8	1.2	1.5	1.4	1.0	0.6	0.2	0.3	0.2	1.2	4.9	
23-Feb	Z	0.3	0.2	0.1	0.2	0.2	0.3	0.4	0.4	1.3	4.1	3.6	8.5	7.2	4.0	3.3	2.0	1.5	1.1	1.0	0.9	0.6	0.6	0.6	1.8	8.5	
24-Feb	0.5	Z	0.7	0.5	0.4	0.4	0.5	1.0	0.7	1.3	2.1	0.7	0.5	0.5	0.6	0.6	0.6	0.5	0.6	0.6	1.0	0.5	1.2	0.7	0.7	2.1	
25-Feb	0.6	1.4	Z	1.0	0.4	0.4	0.4	0.4	0.3	0.6	0.6	0.4	0.3	0.1	0.2	0.3	0.8	0.6	0.6	0.3	0.3	0.8	2.7	5.7	0.8	5.7	
26-Feb	1.8	0.5	0.6	Z	1.8	1.8	1.2	0.5	0.3	0.3	0.4	0.3	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.8	
27-Feb	0.0	0.0	0.0	0.0	Z	5.3	15.1	5.2	9.2	3.3	2.5	4.3	3.2	1.9	4.3	1.9	0.3	0.3	0.3	0.5	0.7	0.6	2.0	2.7	2.8	15.1	
28-Feb	2.7	1.7	0.8	0.3	0.3	Z	0.4	0.3	0.7	0.8	1.2	0.4	0.7	1.3	1.2	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.6	2.7	
		1.7	1.2	2.2	1.6	1.3	1.4	1.3	2.4	1.6	1.7	1.6	1.9	1.7	2.3	1.6	1.0	1.0	1.0	1.1	1.5	1.3	1.1	1.1	Diurnal Average		
		16.9	6.9	26.4	17.9	14.4	10.9	15.1	12.3	13.6	9.0	5.7	5.6	8.5	7.2	13.8	7.9	4.6	5.5	5.3	5.5	11.2	6.9	5.8	5.9	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**  
**Christina Lake - February 2023**





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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Christina Lake - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	626	98.12	98.12
11 - 20	11	1.72	99.84
21 - 60	1	0.16	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: 638

Total Number of Hours: 672



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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Christina Lake - February 2023**

<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	10	45	46	33	41	17	5	36	55	81	69	84	22	15	35	32	626
11 - 20	0	0	0	0	0	0	0	0	1	0	0	0	0	4	6	0	11
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
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>	10	45	46	33	41	17	5	36	56	81	69	84	22	20	41	32	638

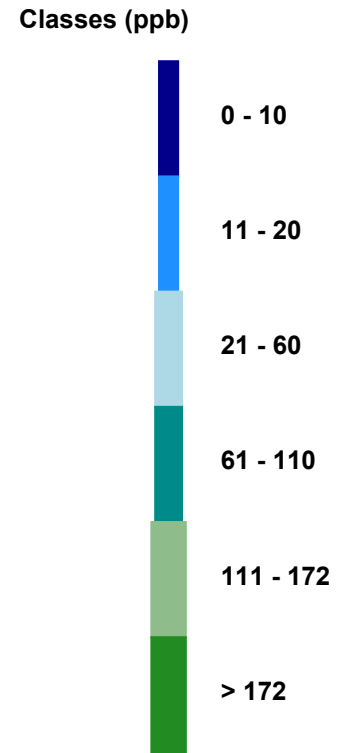
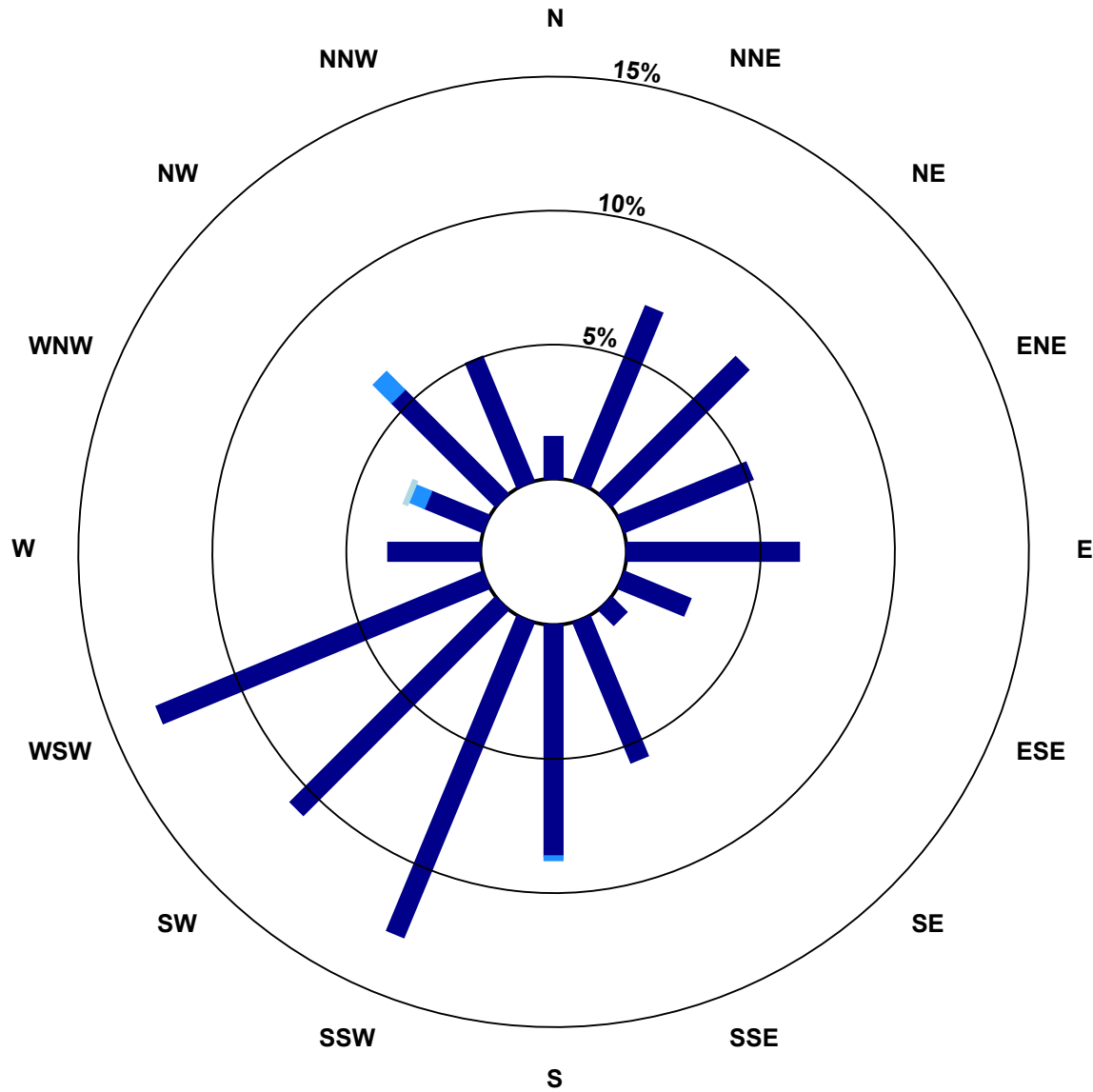
Total Number of Valid Hours: 638

Total Number of Hours: 672

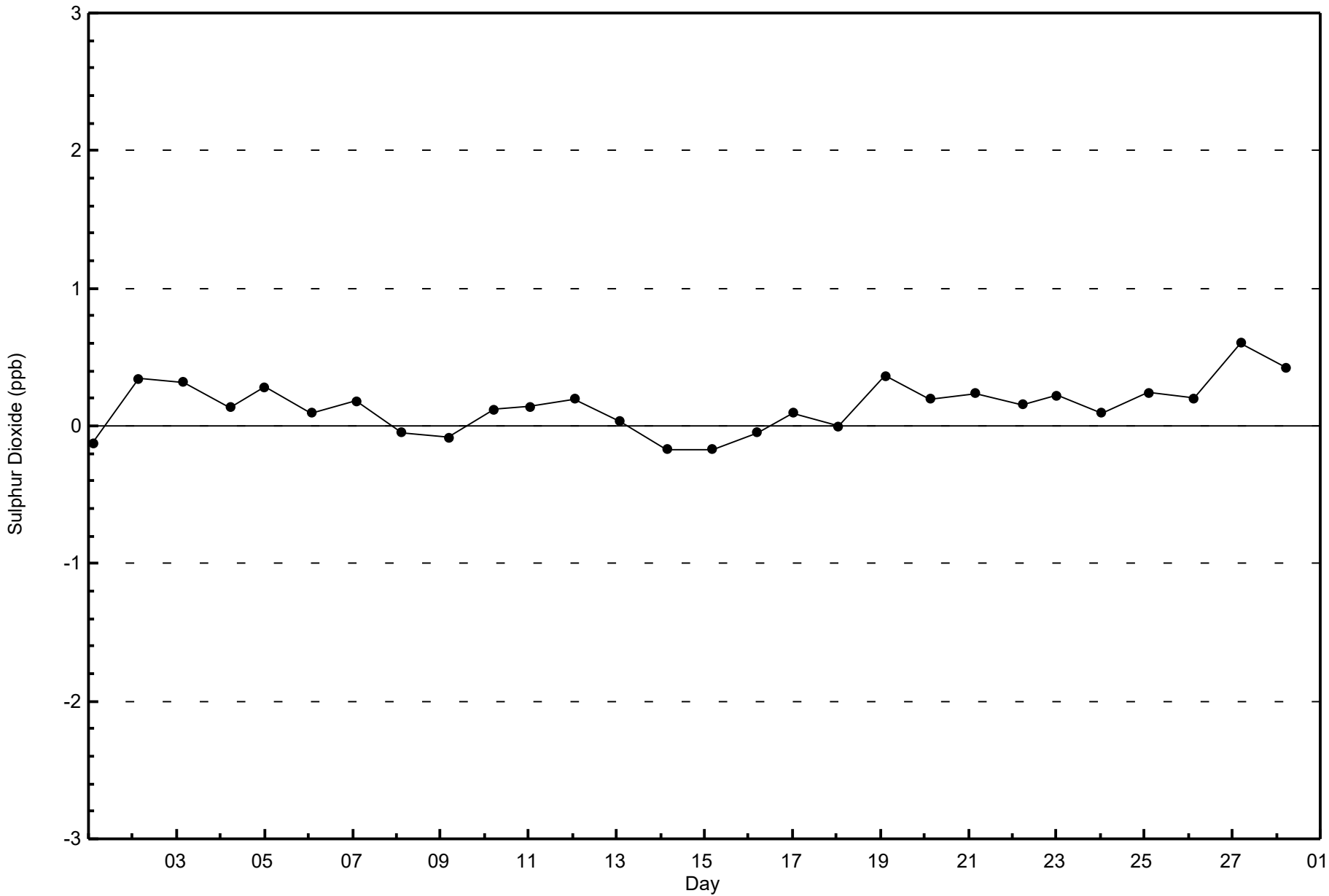


**Wood Buffalo Environmental Association  
Wind Rose Feb 2023**

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



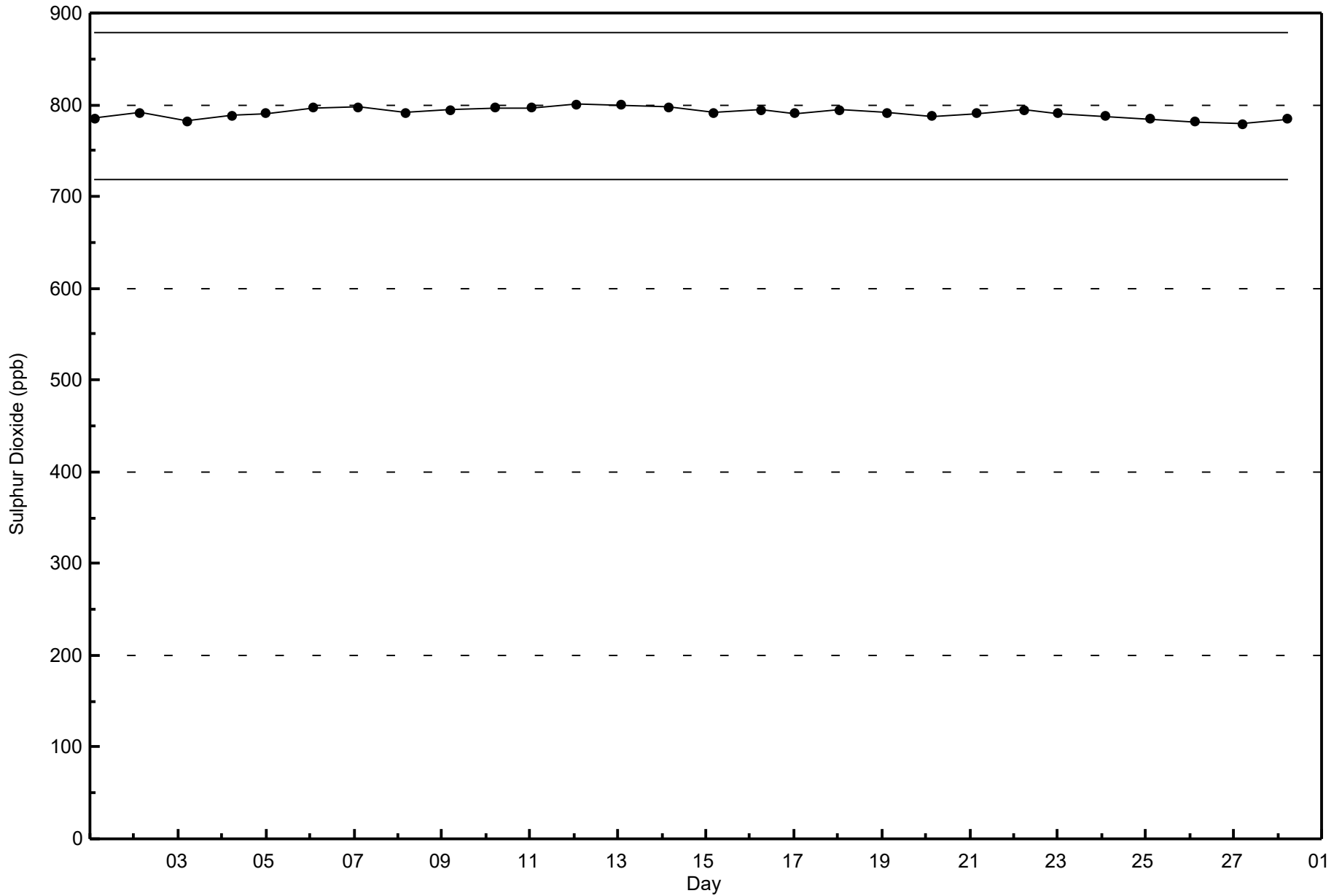
**Total Number of Valid Hours: 638**





**Wood Buffalo Environmental Association**  
**Span Responses**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Christina Lake - February 2023**





# Wood Buffalo Environmental Association Summary of Hour Averages

# Hydrogen Sulphide (H<sub>2</sub>S) - ppb Christina Lake - February 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 672																																																				
Maximum Value: 1.0 ppb on Feb 8 20:00		Maximum Daily Average: 0.3 ppb on Feb 14		Hours of Data: 637	Hours of Missing Data: 35																																																			
Minimum Value: 0.0 ppb on Feb 1 03:00		Minimum Daily Average: 0.0 ppb on Feb 26		Hours of Calibration: 33	Percent Operational Time: 99.7																																																			
Maximum Diurnal Average: 0.1 ppb at hour 2		Minimum Diurnal Average: 0.1 ppb at hour 16																																																						
Monthly Average: 0.09 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> = 0.3 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-Feb	0.0	0.1	0.0	Z	0.0	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	0.1	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																								
2-Feb	0.0	0.1	0.2	0.1	Z	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	0.0	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																							
3-Feb	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.4																					
4-Feb	Z	0.1	0.2	0.2	0.3	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	0.1	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	0.0	0.1	0.3																					
5-Feb	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.3	0.0	0.0	0.0	0.1	0.0	0.3	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	0.0	0.1	0.4																						
6-Feb	0.1	0.2	Z	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	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	0.0	0.1	0.2																						
7-Feb	0.2	0.2	0.2	Z	0.2	0.2	0.1	0.1	0.3	0.4	0.3	0.2	0.1	0.1	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	0.4																						
8-Feb	0.1	0.0	0.2	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	0.2	0.1	1.0	0.5	0.3	0.6	0.3	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0																						
9-Feb	0.2	0.1	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3																						
10-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.3	0.5	0.2	0.2	0.3	0.1	0.2	0.4	0.1	0.1	0.2	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5																							
11-Feb	0.1	Z	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3																						
12-Feb	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-Feb	0.1	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.2	0.2	0.2	0.2	0.2	0.5																						
14-Feb	0.3	0.6	0.7	0.4	Z	0.3	0.1	0.2	0.2	0.1	0.2	0.3	0.2	0.3	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	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.7																					
15-Feb	0.2	0.3	0.2	0.2	0.2	Z	0.2	0.0	0.1	0.1	0.0	C	C	C	C	C	0.1	0.0	0.0	0.0	0.3	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3																						
16-Feb	Z	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.1	M	M	0.3	0.2	0.2	0.0	0.0	0.0	0.0	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	0.1	0.3																						
17-Feb	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-Feb	0.0	0.0	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.2	0.4	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7																						
19-Feb	0.4	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4																						
20-Feb	0.1	0.0	0.0	0.0	Z	0.4	0.1	0.2	0.1	0.1	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4																						
21-Feb	0.0	0.0	0.1	0.1	0.0	Z	0.8	0.6	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	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	0.8																						
22-Feb	Z	0.1	0.2	0.0	0.0	0.1	0.2	0.1	0.1	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4																						
23-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.7	0.4	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7																						
24-Feb	0.3	0.3	Z	0.3	0.1	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5																						
25-Feb	0.7	0.5	0.2	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	0.2	0.1	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	0.1	0.7																						
26-Feb	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																						
27-Feb	0.0	0.0	0.0	0.0	0.5	Z	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5																						
28-Feb	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																						
																								0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	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
																								0.7	0.6	0.7	0.4	0.5	0.4	0.8	0.6	0.5	0.7	0.4	0.3	0.5	0.4	0.3	0.4	0.4	0.4	0.4	0.4	1.0	0.5	0.3	0.6	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Diurnal Maximum

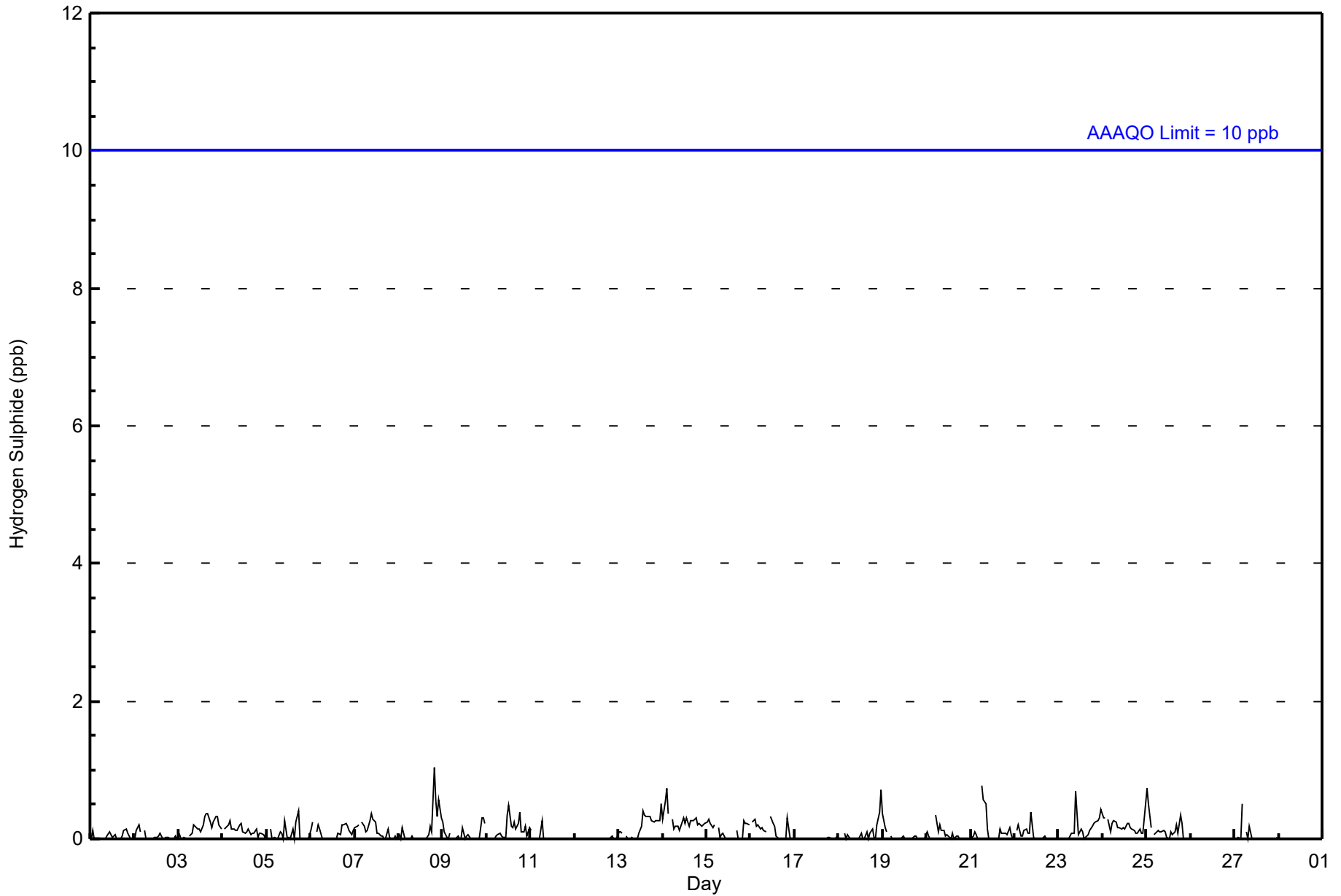
Z - zerospan          C - Calibration          M - Maintenance  
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb    24-hr 3 ppb





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

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Christina Lake - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Christina Lake - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	637	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: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Christina Lake - February 2023**

<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	12	44	44	30	42	17	4	38	57	78	73	83	23	21	41	30	637
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>	12	44	44	30	42	17	4	38	57	78	73	83	23	21	41	30	637

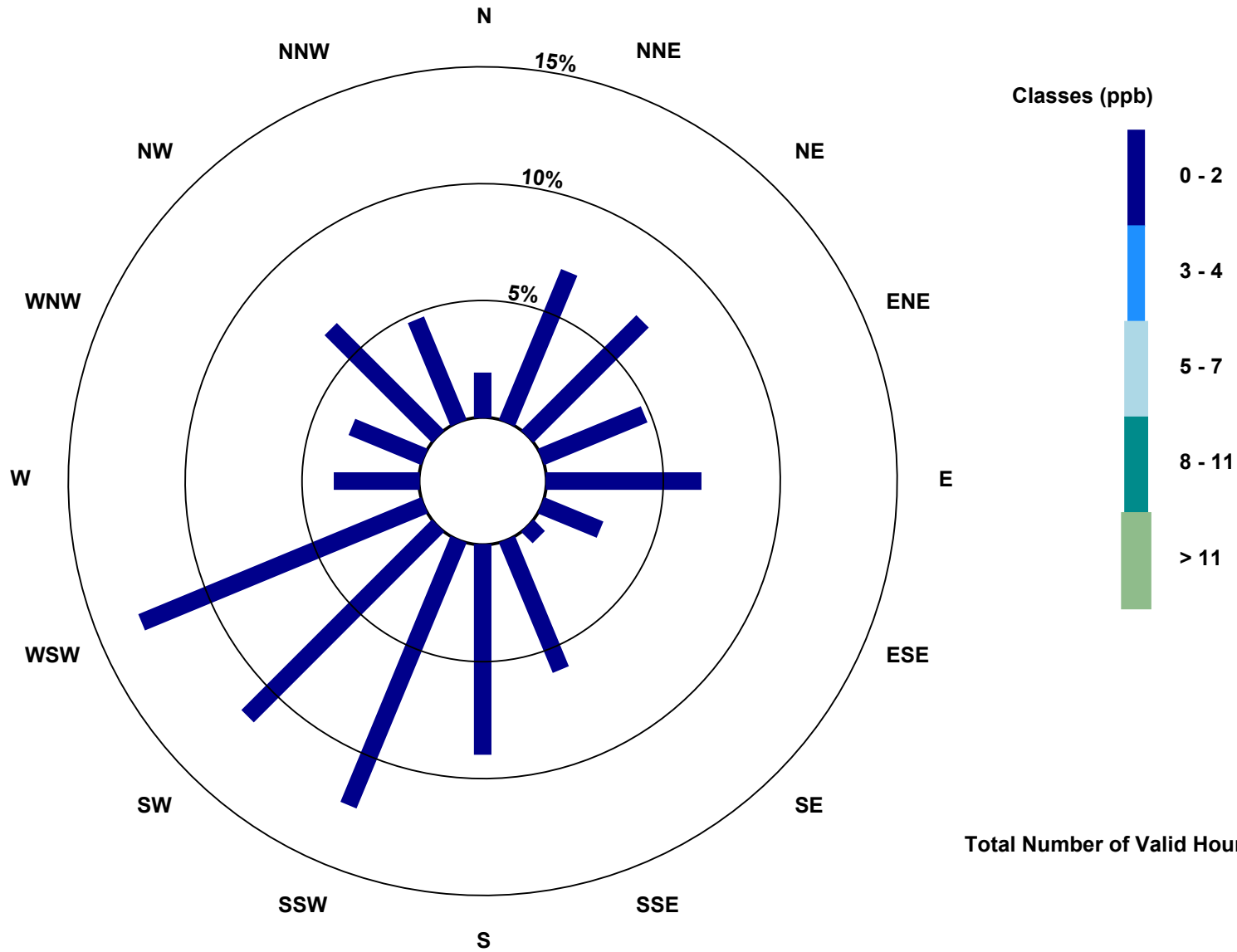
Total Number of Valid Hours: 637

Total Number of Hours: 672

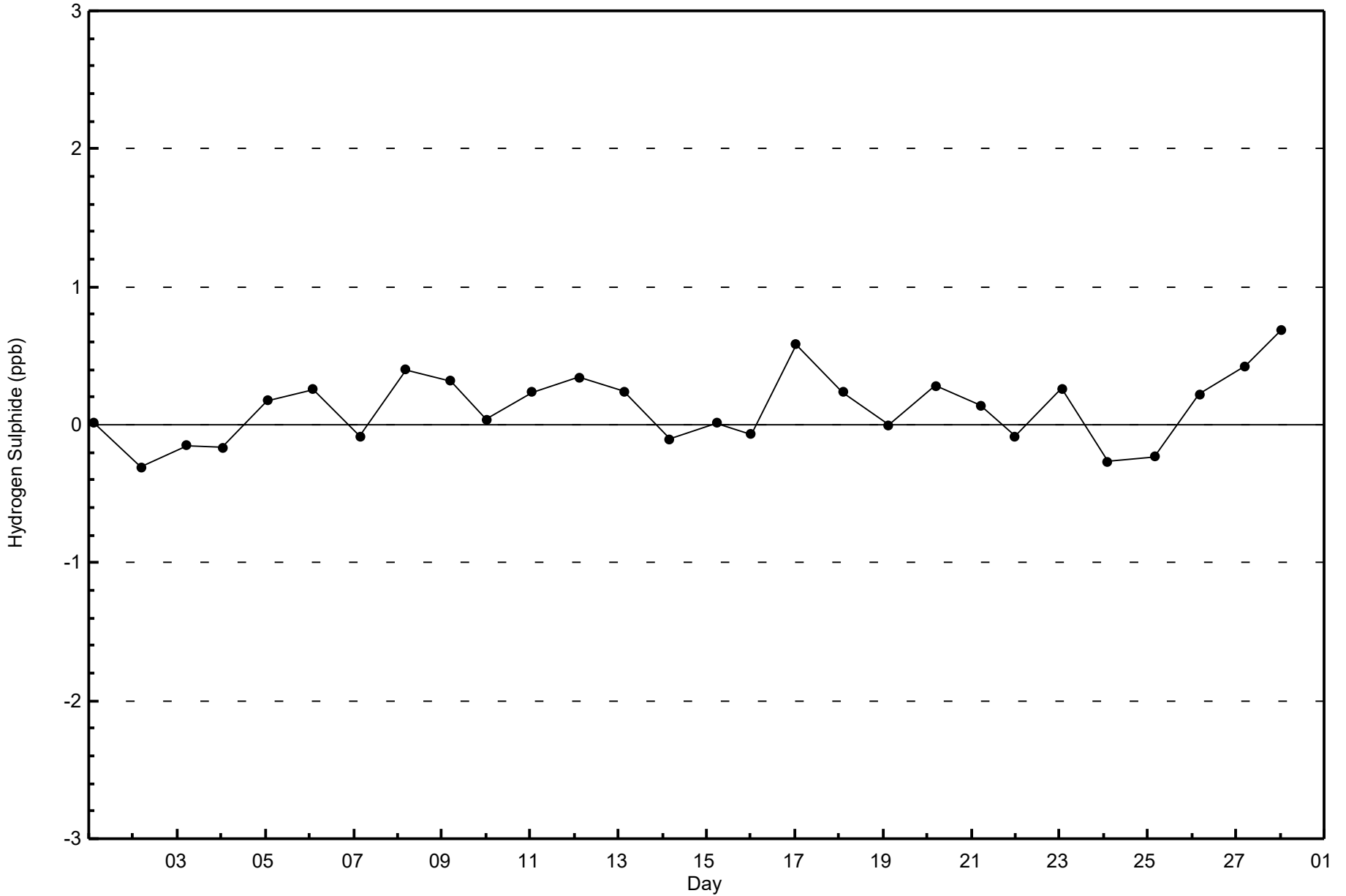


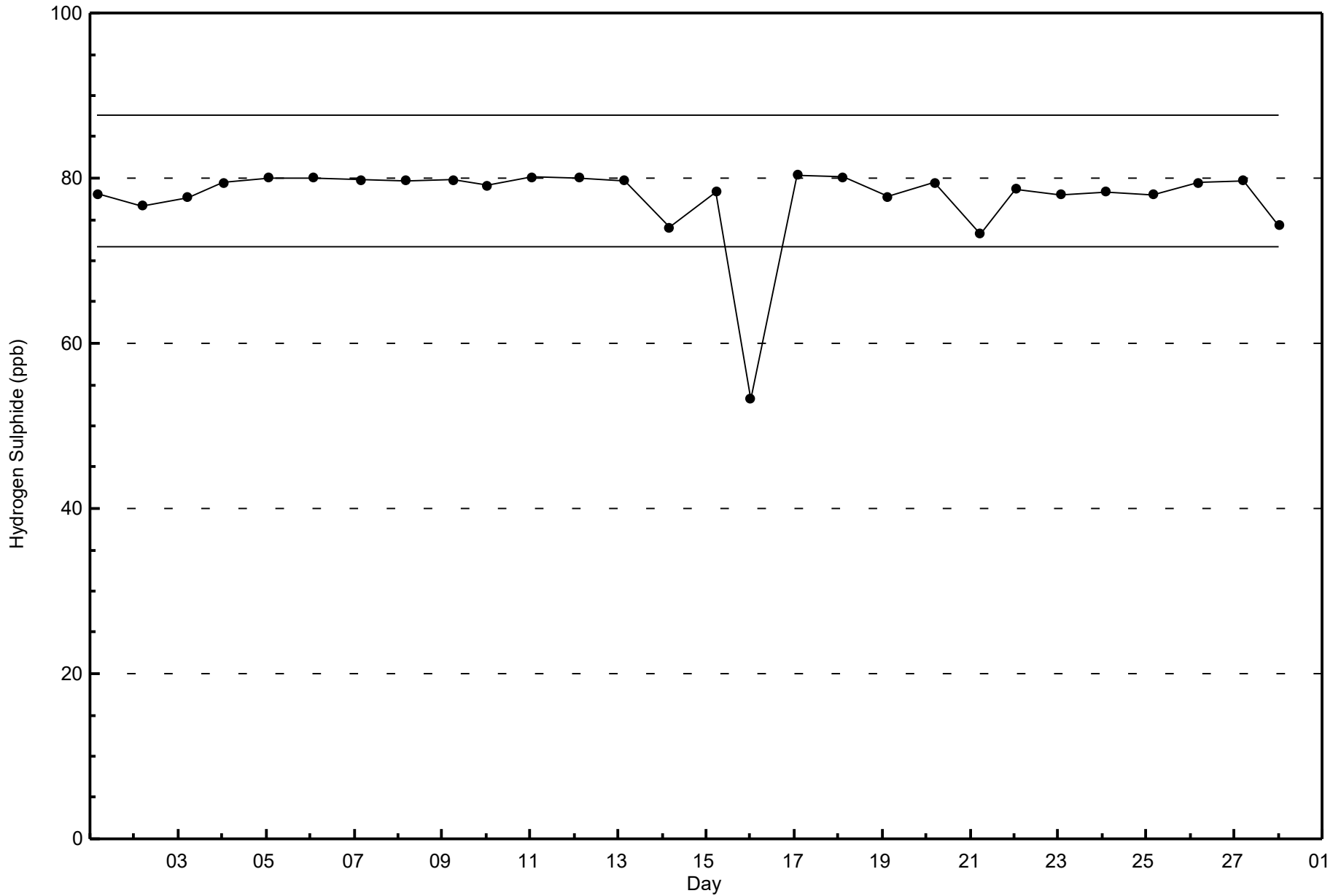
**Wood Buffalo Environmental Association**  
**Wind Rose Feb 2023**

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



**Total Number of Valid Hours: 637**







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

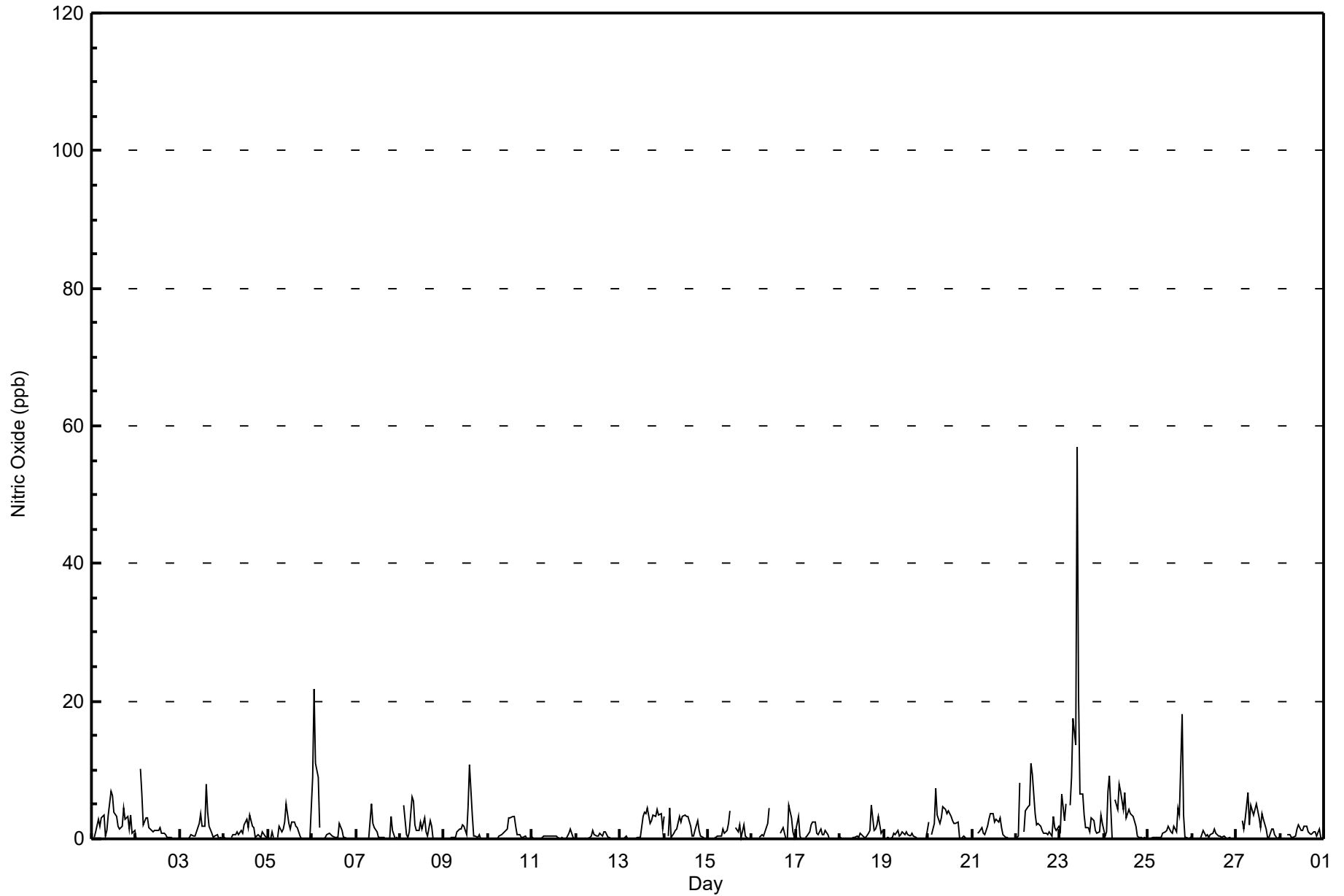
**Nitric Oxide (NO) - ppb**  
**Christina Lake - February 2023**

Maximum Value: 56.9 ppb on Feb 23 10:00																					Maximum Daily Average: 7.5 ppb on Feb 23					Hours in Service: 672	
Minimum Value: 0.0 ppb on Feb 5 19:00										Minimum Daily Average: 0.3 ppb on Feb 11						Hours of Data: 636											
Maximum Diurnal Average: 4.1 ppb at hour 10										Minimum Diurnal Average: 0.3 ppb at hour 24						Hours of Missing Data: 36											
Monthly Average: 1.63 ppb										Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.1 Median = 0.7 Q <sub>3</sub> = 2.0 P <sub>90</sub> = 3.7 P <sub>99</sub> = 11.0						Hours of Calibration: 33											
																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-Feb	Z	0.1	1.0	2.8	1.8	3.0	3.4	0.4	1.2	3.5	6.9	6.4	3.8	3.3	1.8	1.5	1.9	4.5	2.7	3.3	1.4	3.4	0.7	1.3	2.6	6.9	
2-Feb	0.0	Z	10.2	6.4	2.0	3.0	3.1	1.6	1.3	1.1	1.2	1.2	1.3	1.7	0.8	0.8	0.7	0.2	0.1	0.1	0.0	0.0	0.1	0.0	1.6	10.2	
3-Feb	0.1	0.1	Z	0.0	0.0	0.2	0.5	0.4	0.4	1.1	2.2	3.7	1.8	1.8	8.0	3.8	1.7	0.8	0.1	0.5	0.6	0.1	0.1	0.0	1.2	8.0	
4-Feb	0.3	0.0	0.1	Z	0.3	0.6	0.7	1.0	0.6	1.2	0.8	2.0	2.9	1.7	3.4	1.8	1.5	0.3	0.7	0.4	0.2	0.9	0.4	0.1	1.0	3.4	
5-Feb	0.1	0.1	1.0	0.3	Z	0.3	1.9	1.0	1.5	2.5	5.1	2.2	1.4	2.4	2.4	1.8	1.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.1	5.1	
6-Feb	9.0	21.7	11.1	9.0	1.6	Z	0.0	0.2	0.5	0.9	0.6	0.4	0.3	0.2	0.2	2.3	1.2	0.2	0.3	0.1	0.0	0.0	0.0	0.0	2.6	21.7	
7-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	2.2	1.6	1.0	0.2	0.3	0.2	0.1	0.1	0.0	0.1	3.3	1.3	0.0	0.2	0.0	0.7	5.1	
8-Feb	0.0	Z	4.8	0.5	0.2	1.1	6.2	5.4	2.0	1.2	1.2	2.5	1.5	3.0	1.0	0.3	2.6	1.7	0.0	0.1	0.0	0.0	0.0	0.0	1.5	6.2	
9-Feb	0.0	0.1	Z	0.1	0.2	0.1	0.3	1.0	1.4	1.4	2.0	1.8	0.7	4.6	10.9	3.6	0.4	0.4	0.1	0.6	0.0	0.0	0.0	0.0	1.3	10.9	
10-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.4	0.7	0.9	1.0	1.5	3.0	3.0	3.2	3.3	1.8	0.6	0.7	0.1	0.2	0.3	0.1	0.1	0.1	0.9	3.3	
11-Feb	0.3	0.1	0.0	0.1	Z	0.1	0.4	0.3	0.4	0.5	0.5	0.5	0.4	0.4	0.1	0.1	0.1	0.1	0.0	0.3	0.7	1.3	0.3	0.0	0.3	1.3	
12-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.5	1.3	0.7	0.5	0.3	0.8	0.3	1.1	1.1	0.1	0.2	0.0	0.0	0.0	0.1	0.0	0.3	1.3	
13-Feb	Z	0.1	0.0	0.5	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.2	3.2	3.9	3.7	4.5	2.2	2.6	3.4	3.3	4.2	3.4	3.7	1.5	1.8	4.5	
14-Feb	3.3	Z	0.5	4.5	0.1	0.7	1.3	1.4	3.3	2.5	3.2	3.5	3.3	3.3	1.9	0.5	0.4	1.3	2.7	1.1	0.4	0.1	0.1	0.1	1.7	4.5	
15-Feb	0.1	0.0	Z	0.1	0.3	0.3	0.4	0.4	1.5	0.9	1.3	2.3	4.1	M	M	1.6	1.0	2.0	0.2	2.1	0.3	0.1	0.0	0.0	0.9	4.1	
16-Feb	0.0	0.1	0.0	Z	0.1	0.5	0.4	1.0	2.1	4.5	C	C	C	C	C	0.7	1.2	1.7	0.0	0.1	4.8	3.0	0.9	0.2	1.2	4.8	
17-Feb	2.3	3.3	0.4	0.0	Z	0.2	0.3	1.0	2.0	2.4	2.5	0.8	0.7	1.5	0.7	0.6	1.2	0.6	0.0	0.1	0.1	0.0	0.1	0.0	0.9	3.3	
18-Feb	0.1	0.1	0.0	0.1	0.1	Z	0.1	0.1	0.2	0.5	0.2	0.8	0.5	0.2	0.3	0.7	1.3	4.9	1.3	1.4	2.0	3.3	0.8	1.2	0.9	4.9	
19-Feb	Z	0.2	0.2	0.1	0.2	0.8	0.7	1.2	0.5	0.7	1.0	0.7	1.1	0.7	0.4	0.8	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.4	1.2	
20-Feb	2.5	Z	0.7	2.2	7.3	3.5	2.2	3.1	4.7	4.2	3.7	4.2	3.3	2.6	2.2	2.2	2.4	0.1	0.1	0.3	0.1	0.1	0.1	0.0	2.2	7.3	
21-Feb	0.0	0.0	Z	0.7	1.0	1.6	0.9	0.6	1.8	2.9	3.7	3.6	2.4	2.8	2.4	3.0	1.7	0.5	0.1	0.1	0.1	0.0	0.0	0.0	1.3	3.7	
22-Feb	0.2	0.3	8.2	Z	1.1	4.0	4.7	4.9	10.9	9.4	3.8	2.0	2.2	1.8	1.3	0.8	0.9	0.6	0.9	0.3	3.3	1.6	1.3	1.8	2.9	10.9	
23-Feb	1.3	6.5	2.7	5.1	Z	4.8	8.9	17.5	13.7	56.9	20.8	6.4	6.5	3.5	1.6	1.5	1.0	3.1	2.7	1.1	0.9	1.0	3.5	2.2	7.5	56.9	
24-Feb	0.3	1.0	7.0	9.2	0.0	Z	5.7	4.3	7.9	6.9	4.4	6.8	3.1	4.2	3.6	3.4	3.3	1.9	0.5	0.2	0.2	0.1	0.1	0.0	3.2	9.2	
25-Feb	Z	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.7	1.1	1.1	1.9	0.9	0.9	1.9	1.1	4.6	3.5	18.1	3.4	0.2	0.2	0.0	0.2	1.8	18.1	
26-Feb	0.0	Z	0.0	0.0	0.0	0.6	1.1	0.3	0.6	0.3	0.6	0.9	1.3	0.8	0.4	0.3	0.3	0.4	0.2	0.0	0.2	0.0	0.0	0.1	0.4	1.3	
27-Feb	0.1	DF	Z	2.6	1.5	2.8	6.8	2.1	4.8	3.4	4.2	5.1	3.0	1.7	3.6	2.8	1.4	0.3	0.1	1.4	1.4	0.6	0.0	0.3	2.3	6.8	
28-Feb	0.1	0.1	0.0	Z	0.6	0.5	0.1	0.1	0.3	1.5	2.1	1.1	1.3	1.9	1.9	1.0	0.8	0.6	1.0	1.0	0.4	1.4	0.1	0.0	0.8	2.1	
0.9 1.5 2.1 1.9 0.8 1.2 1.8 1.8 2.5 4.1 2.8 2.4 2.0 2.0 2.3 1.6 1.3 1.2 1.3 0.9 0.8 0.7 0.5 0.3																								Diurnal Average			
9.0 21.7 11.1 9.2 7.3 4.8 8.9 17.5 13.7 56.9 20.8 6.8 6.5 4.6 10.9 4.5 4.6 4.9 18.1 3.4 4.8 3.4 3.7 2.2																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance DF - DAS Failure																											



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

**Nitric Oxide (NO) - ppb**  
**Christina Lake - February 2023**







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

**Nitric Oxide (NO) - ppb**  
**Christina Lake - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	633	99.53	99.53
21 - 40	2	0.31	99.84
41 - 80	1	0.16	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 636

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Christina Lake - February 2023**

<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	12	45	42	33	43	17	5	34	56	76	70	84	22	21	42	31	633
21 - 40	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	2
41 - 80	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
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>	12	45	42	33	43	17	5	35	57	76	70	84	22	22	42	31	636

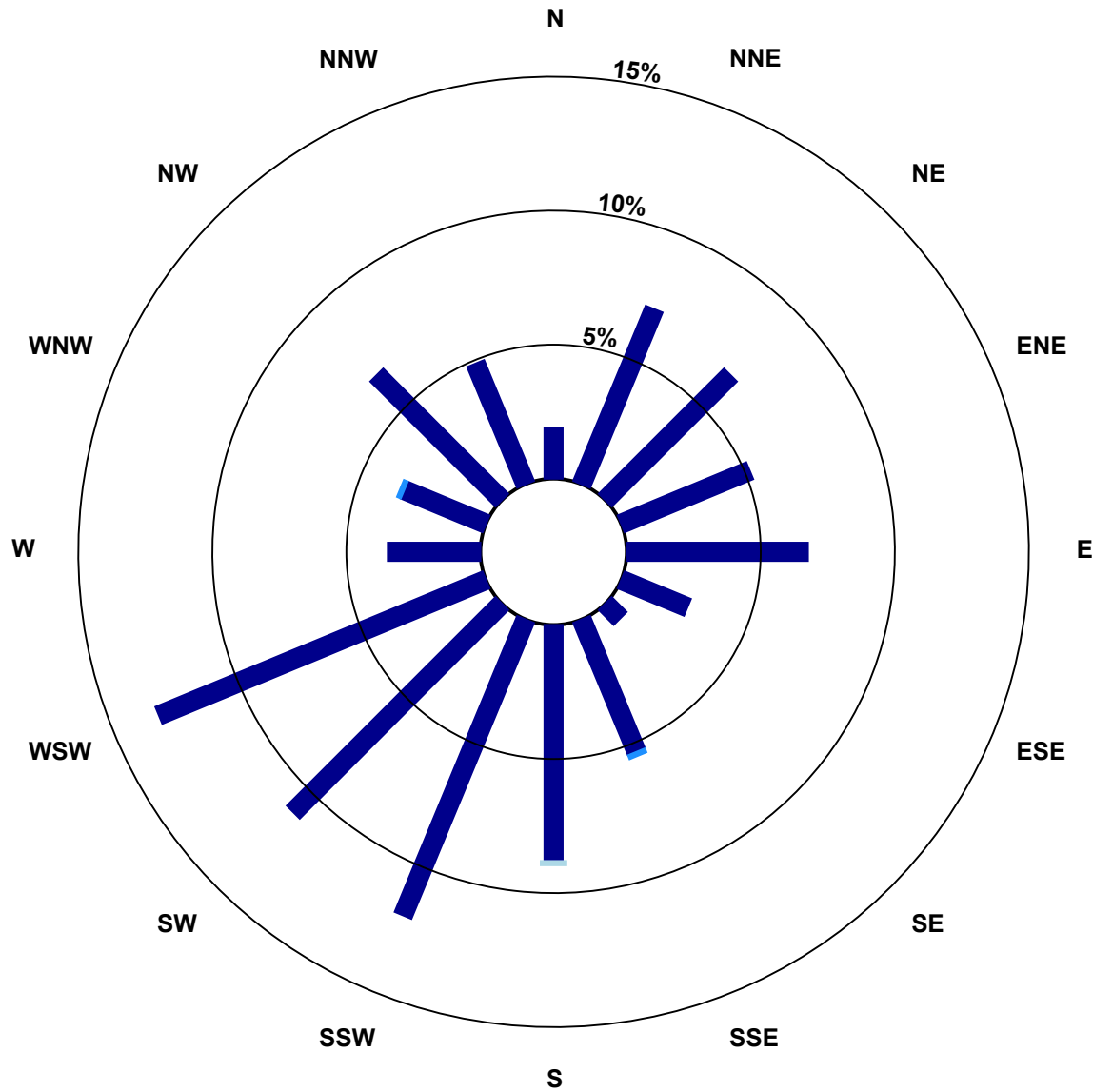
Total Number of Valid Hours: 636

Total Number of Hours: 672

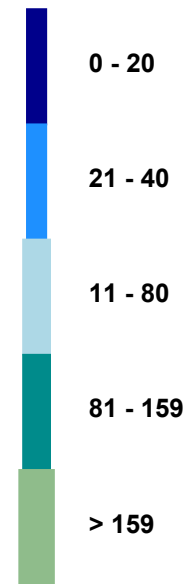


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

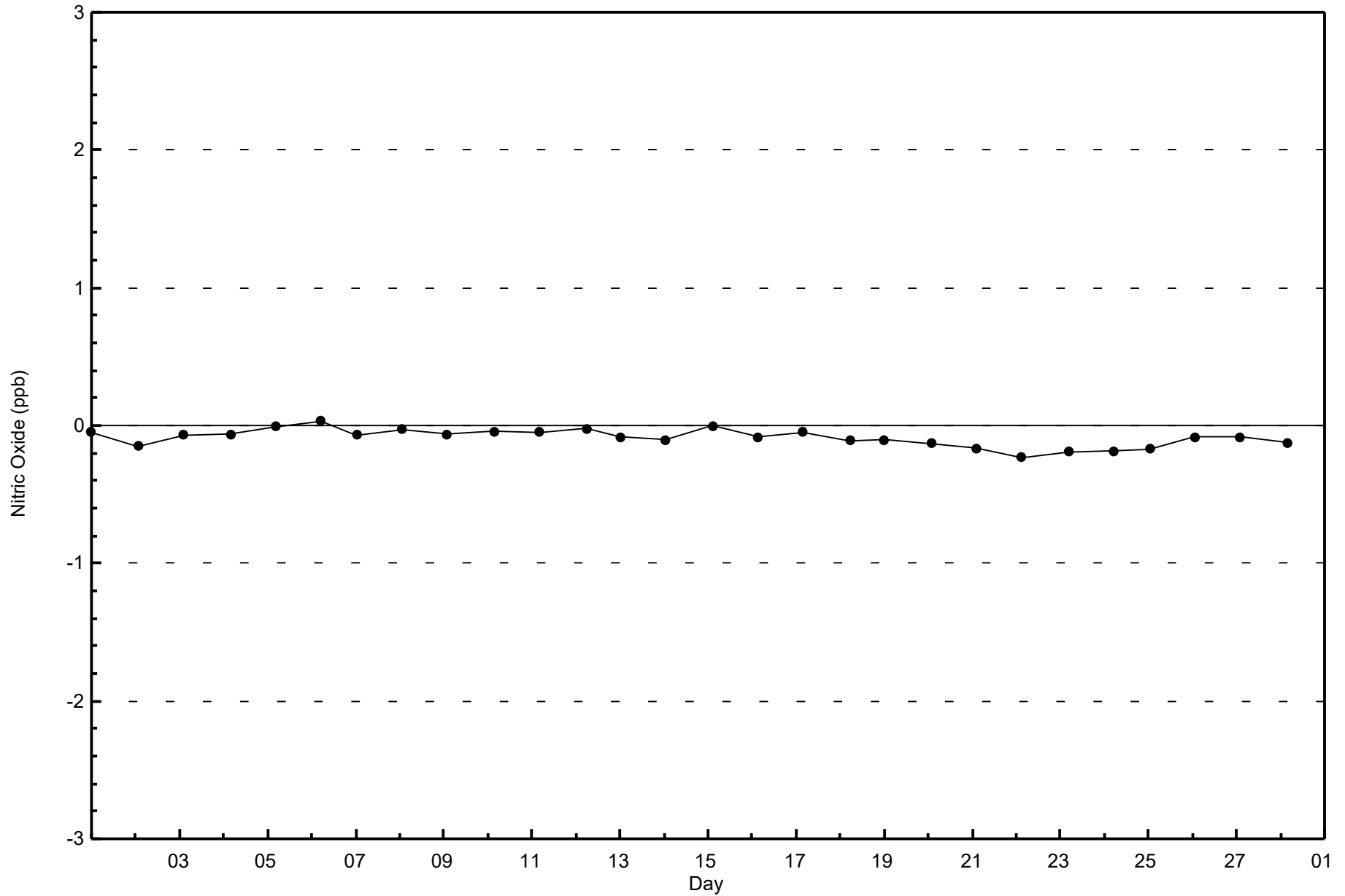
Nitric Oxide (NO) - ppb  
Christina Lake

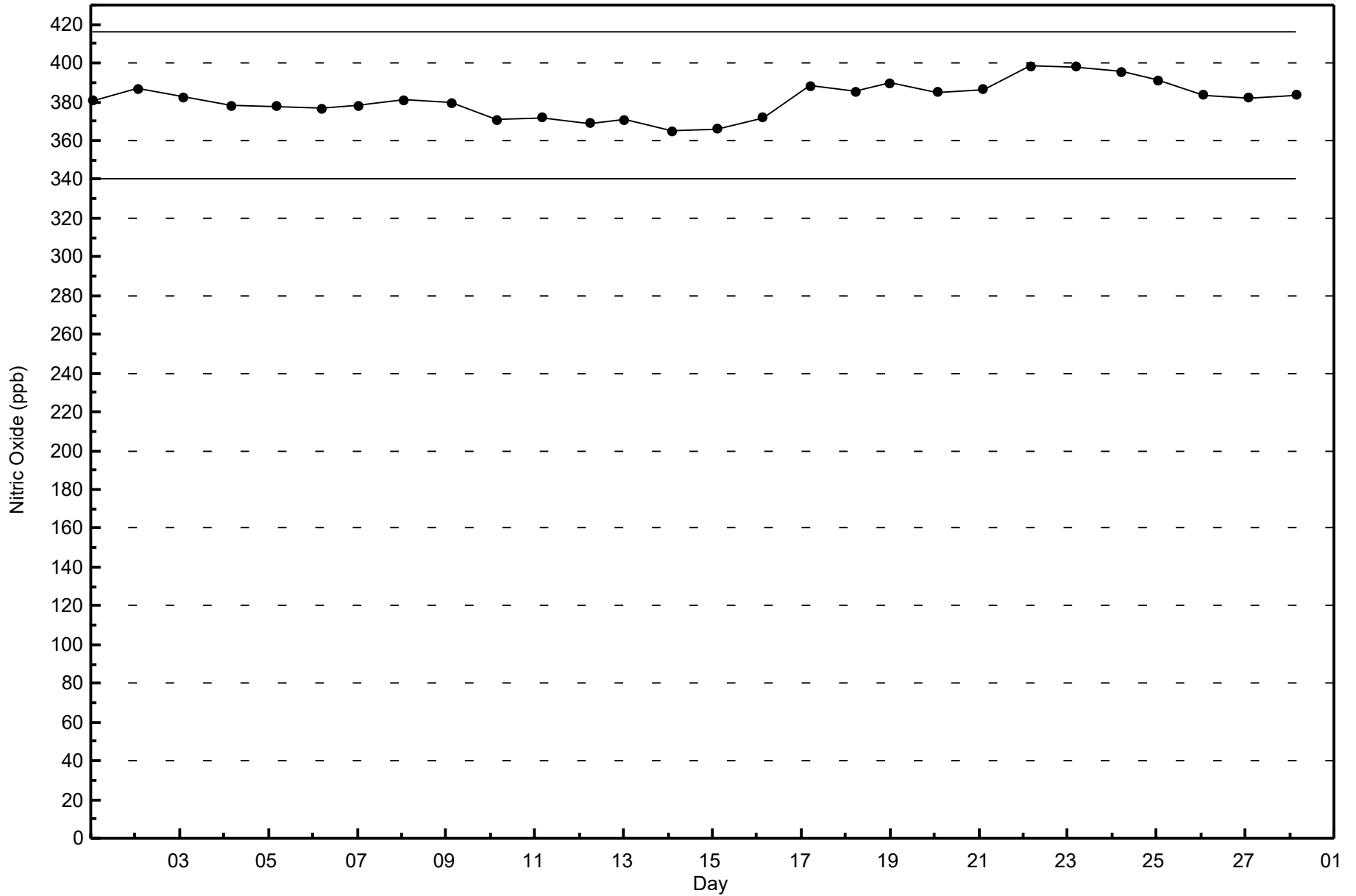


Classes (ppb)



Total Number of Valid Hours: 636







# Wood Buffalo Environmental Association

## Summary of Hour Averages

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

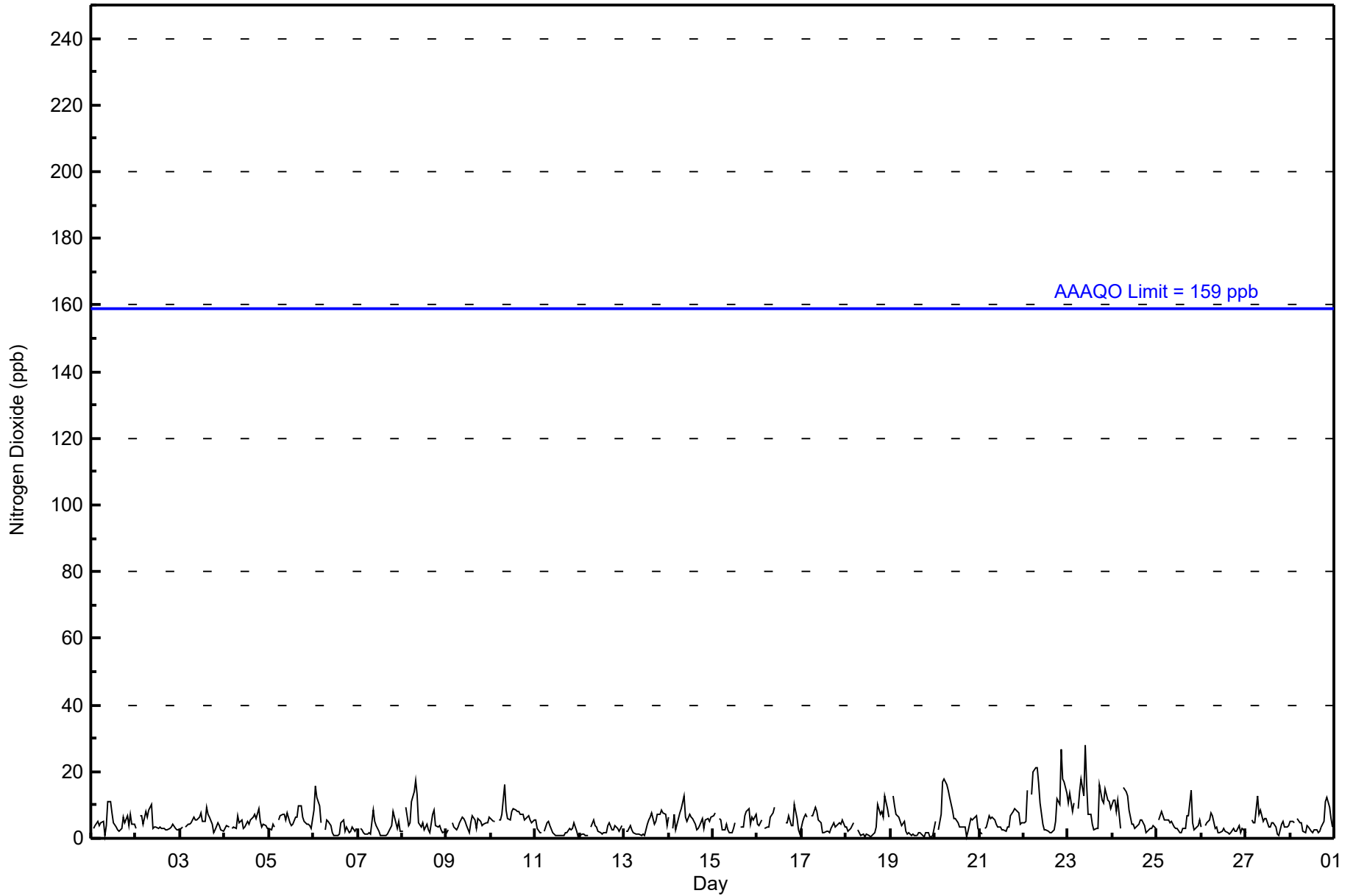
## Christina Lake - February 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 672																	672					
Maximum Value: 28.1 ppb on Feb 23 10:00		Maximum Daily Average: 10.9 ppb on Feb 23																	Hours of Data: 636							
Minimum Value: 0.4 ppb on Feb 18 14:00		Minimum Daily Average: 2.3 ppb on Feb 11																	Hours of Missing Data: 36							
Maximum Diurnal Average: 7.6 ppb at hour 8		Minimum Diurnal Average: 3.2 ppb at hour 14																	Hours of Calibration: 33							
Monthly Average: 5.05 ppb		Percentiles: P <sub>1</sub> = 0.6 P <sub>10</sub> = 1.6 Q <sub>1</sub> = 2.7 Median = 4.2 Q <sub>3</sub> = 6.3 P <sub>90</sub> = 9.3 P <sub>99</sub> = 17.7																	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-Feb	Z	3.0	3.8	4.9	4.0	4.7	5.1	1.0	4.0	10.9	11.0	7.7	4.6	3.3	2.4	2.0	2.9	6.5	4.5	6.8	4.0	7.2	4.2	4.3	4.9	11.0
2-Feb	2.9	Z	6.9	6.6	4.4	8.1	6.2	8.4	10.2	2.8	3.5	3.2	2.9	3.2	3.0	3.0	2.7	2.5	2.8	3.3	4.1	2.9	2.5	2.5	4.3	10.2
3-Feb	2.9	3.2	Z	3.6	4.1	4.2	4.7	6.2	5.4	5.4	6.5	7.5	5.0	5.0	9.4	7.1	6.2	4.1	1.6	2.6	4.6	4.0	2.6	2.2	4.7	9.4
4-Feb	2.8	3.7	3.4	Z	2.9	3.5	2.8	6.6	4.7	5.4	2.8	3.4	5.0	4.1	5.4	6.3	7.3	6.1	8.9	5.0	3.4	4.2	3.7	2.8	4.5	8.9
5-Feb	2.9	2.6	4.3	3.4	Z	5.3	6.9	7.3	7.3	5.4	7.7	4.6	3.9	4.4	6.2	6.5	9.7	9.8	6.5	4.9	4.2	4.2	3.9	2.8	5.4	9.8
6-Feb	8.6	15.6	12.2	9.7	4.5	Z	2.6	5.5	5.1	3.9	1.8	1.0	1.0	1.0	1.4	4.8	5.4	2.0	3.6	1.7	2.2	3.3	2.3	2.8	4.4	15.6
7-Feb	Z	2.8	2.6	1.5	1.2	1.4	1.6	1.4	8.6	5.2	3.7	2.2	0.8	0.9	1.0	0.9	1.4	2.0	4.0	8.1	6.2	3.1	5.2	2.0	2.9	8.6
8-Feb	2.0	Z	9.2	3.9	4.5	11.1	14.1	17.3	13.2	4.5	3.2	4.6	2.6	4.2	2.7	1.8	7.0	8.6	4.0	3.5	4.0	2.4	1.9	2.0	5.8	17.3
9-Feb	1.8	2.7	Z	4.6	3.2	2.7	3.6	4.8	6.5	5.8	5.0	3.9	1.7	4.5	6.8	5.5	3.1	5.8	5.1	4.0	4.2	4.5	4.8	6.2	4.4	6.8
10-Feb	5.7	5.2	5.2	Z	5.4	5.3	7.3	16.1	8.4	5.9	5.3	8.0	8.7	8.6	8.0	7.9	7.1	7.1	5.7	6.1	6.9	5.5	4.8	5.4	6.9	16.1
11-Feb	5.3	2.8	1.5	1.5	Z	2.2	4.8	5.1	3.9	1.8	1.4	1.0	1.0	1.0	0.9	0.7	1.5	1.6	2.9	2.4	2.8	4.8	2.3	0.6	2.3	5.3
12-Feb	0.8	1.4	1.1	0.8	0.9	Z	3.3	5.3	4.0	3.2	2.1	1.6	1.1	1.9	1.8	3.8	4.6	2.7	2.5	3.9	2.8	2.0	3.0	3.8	2.5	5.3
13-Feb	Z	2.0	2.1	3.8	2.4	1.6	1.4	1.1	1.1	1.0	1.1	1.0	4.1	5.7	6.5	7.5	4.2	5.0	7.0	7.3	8.6	7.5	7.1	3.9	4.0	8.6
14-Feb	6.4	Z	3.1	7.3	2.6	6.0	7.6	8.7	12.6	6.4	5.2	7.0	6.3	5.9	4.3	2.7	3.1	4.0	5.9	3.0	5.3	5.8	5.1	6.3	5.7	12.6
15-Feb	6.6	7.7	Z	6.0	5.6	2.7	2.5	4.2	2.4	1.9	1.7	3.0	4.5	M	M	3.2	3.5	6.8	7.9	8.8	4.4	6.3	5.4	7.1	4.9	8.8
16-Feb	4.4	3.9	5.6	Z	2.9	3.4	3.4	6.4	7.7	9.2	C	C	C	C	C	4.5	4.8	6.7	3.8	3.7	10.2	6.0	2.5	1.1	5.0	10.2
17-Feb	5.0	6.4	7.0	6.3	Z	6.9	6.9	9.4	8.1	5.5	4.7	1.8	1.9	2.3	2.2	1.7	3.0	4.5	3.5	3.8	4.6	4.1	5.6	3.2	4.7	9.4
18-Feb	3.2	2.1	3.0	3.7	4.7	Z	2.5	1.5	0.7	1.4	0.5	1.2	0.8	0.4	0.7	1.5	3.3	10.2	7.2	8.0	6.3	12.6	8.8	6.2	3.9	12.6
19-Feb	Z	12.7	9.6	7.4	6.3	5.2	3.8	4.9	2.3	1.4	1.5	1.0	1.4	0.9	0.8	1.7	1.6	1.0	0.6	1.5	1.6	0.5	0.6	0.7	3.0	12.7
20-Feb	4.9	Z	2.4	7.2	17.1	17.8	16.2	14.6	12.2	8.4	5.8	5.9	4.6	3.5	3.5	3.2	3.4	0.6	2.2	6.0	5.6	6.0	6.8	2.9	7.0	17.8
21-Feb	2.2	1.3	Z	2.9	3.6	6.6	6.1	6.5	5.5	4.2	3.5	3.4	2.5	2.7	2.3	3.5	3.3	6.9	8.2	9.1	8.6	7.5	4.1	4.5	4.7	9.1
22-Feb	4.5	5.0	14.2	Z	13.2	19.9	21.1	21.1	16.7	10.8	4.3	2.5	2.6	2.3	1.9	1.6	2.6	4.9	12.0	10.2	26.5	17.6	17.0	13.6	10.7	26.5
23-Feb	10.5	13.7	7.9	10.5	Z	8.7	13.8	17.7	12.6	28.1	16.1	7.0	7.4	4.3	2.5	3.0	3.1	15.9	11.4	10.8	15.0	11.4	11.0	9.0	10.9	28.1
24-Feb	11.3	11.3	7.9	11.3	2.8	Z	15.4	13.9	12.7	8.4	4.3	4.2	2.8	3.9	4.2	5.3	5.5	3.8	1.7	2.3	3.1	2.8	3.9	3.1	6.3	15.4
25-Feb	Z	5.4	8.1	6.6	5.4	5.5	5.7	4.7	4.9	3.6	2.8	3.0	1.7	1.9	3.0	2.9	6.7	6.8	14.2	4.5	2.7	2.8	3.8	5.7	4.9	14.2
26-Feb	3.3	Z	3.8	4.6	5.6	7.5	6.6	3.1	3.2	1.6	1.9	2.3	2.8	2.3	1.8	1.4	1.6	3.1	2.1	2.0	3.8	1.6	2.9	2.5	3.1	7.5
27-Feb	1.6	DF	Z	5.4	4.7	4.8	12.8	7.2	8.3	5.2	6.0	6.0	3.6	3.3	4.5	4.6	3.3	1.1	0.9	4.3	4.9	3.2	3.3	4.0	4.7	12.8
28-Feb	4.9	5.1	4.7	Z	5.8	4.7	4.6	2.2	1.7	3.7	3.5	2.0	1.9	2.4	2.5	1.8	2.2	3.5	5.0	11.0	12.3	9.3	6.1	3.2	4.5	12.3
4.5 5.4 5.6 5.4 4.9 6.2 6.9 7.6 6.9 5.8 4.3 3.7 3.2 3.2 3.5 3.6 4.1 5.1 5.2 5.3 6.2 5.5 4.8 4.1																								Diurnal Average		
11.3 15.6 14.2 11.3 17.1 19.9 21.1 21.1 16.7 28.1 16.1 8.0 8.7 8.6 9.4 7.9 9.7 15.9 14.2 11.0 26.5 17.6 17.0 13.6																								Diurnal Maximum		
Z - zerospan 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**  
**Christina Lake - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Christina Lake - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	632	99.37	99.37
21 - 40	4	0.63	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: 636

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Christina Lake - February 2023**

<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	12	45	42	32	43	17	5	35	56	76	68	84	22	22	42	31	632
21 - 40	0	0	0	1	0	0	0	0	1	0	2	0	0	0	0	0	4
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>	12	45	42	33	43	17	5	35	57	76	70	84	22	22	42	31	636

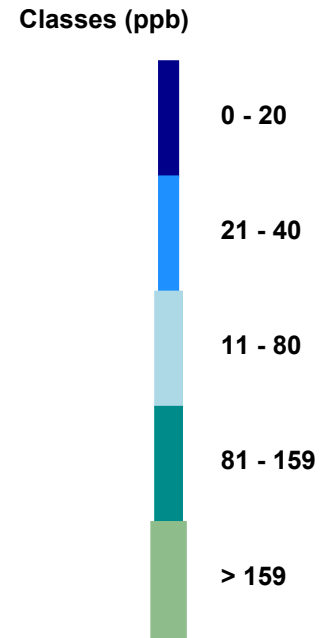
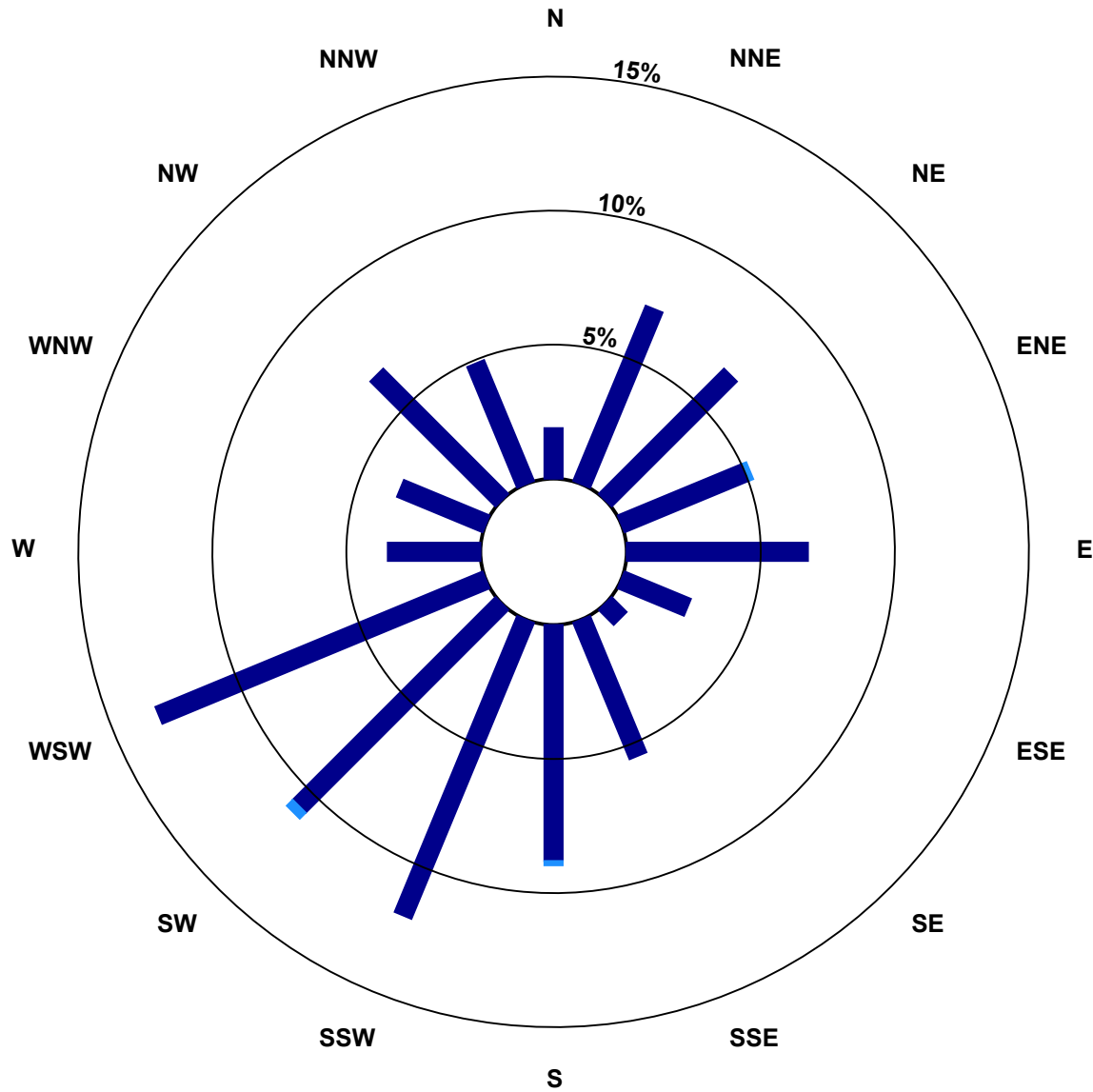
Total Number of Valid Hours: 636

Total Number of Hours: 672

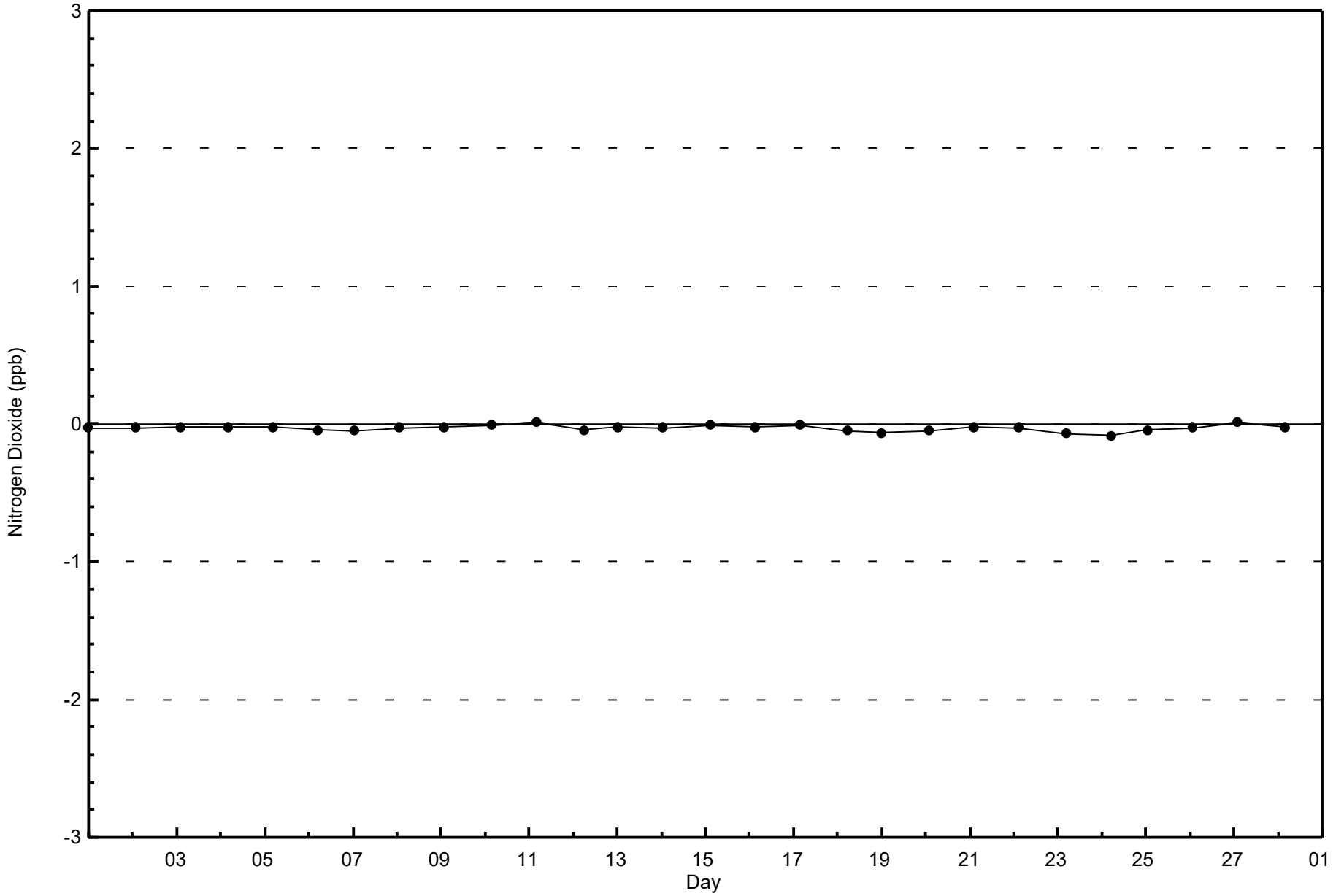


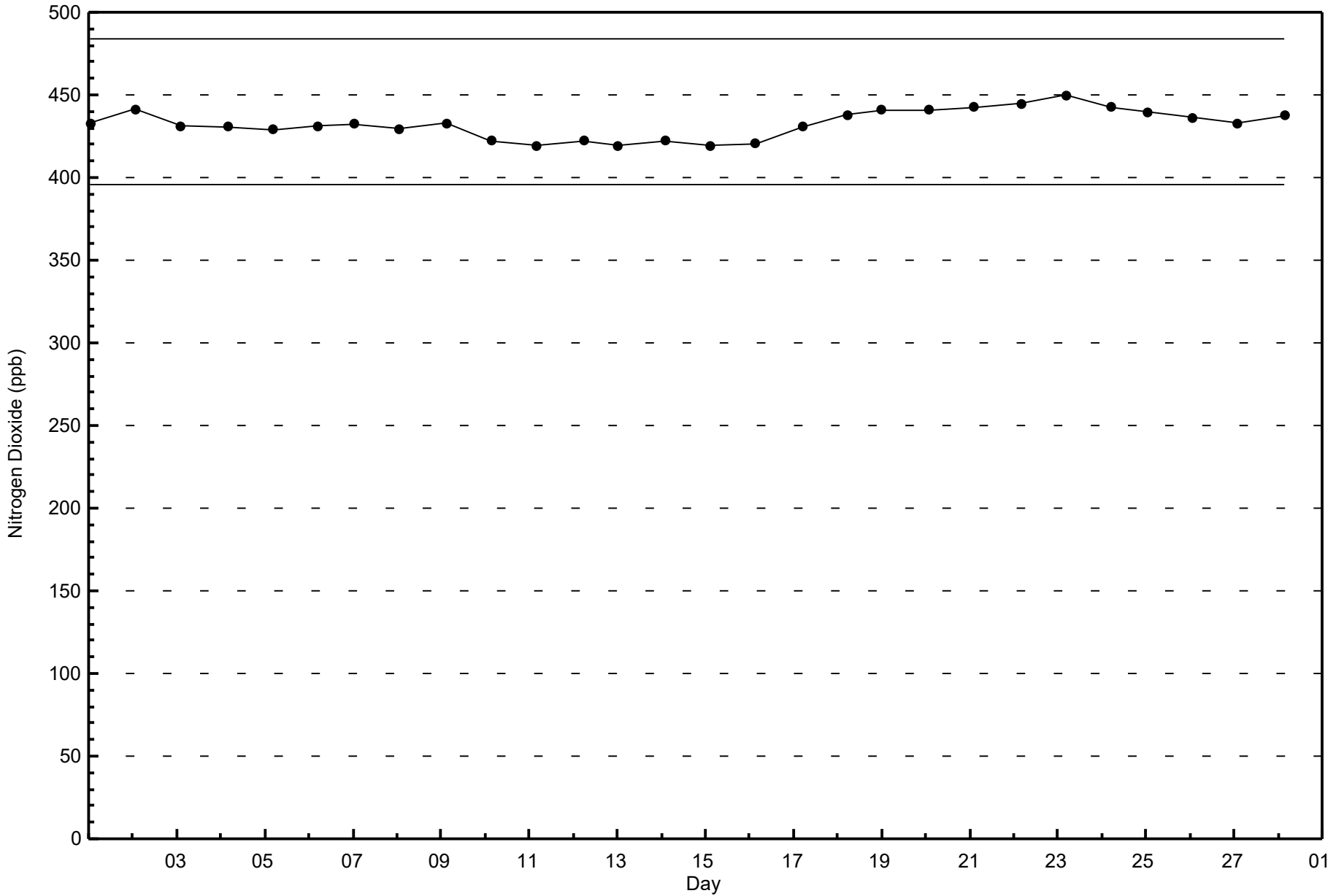
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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



Total Number of Valid Hours: 636







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

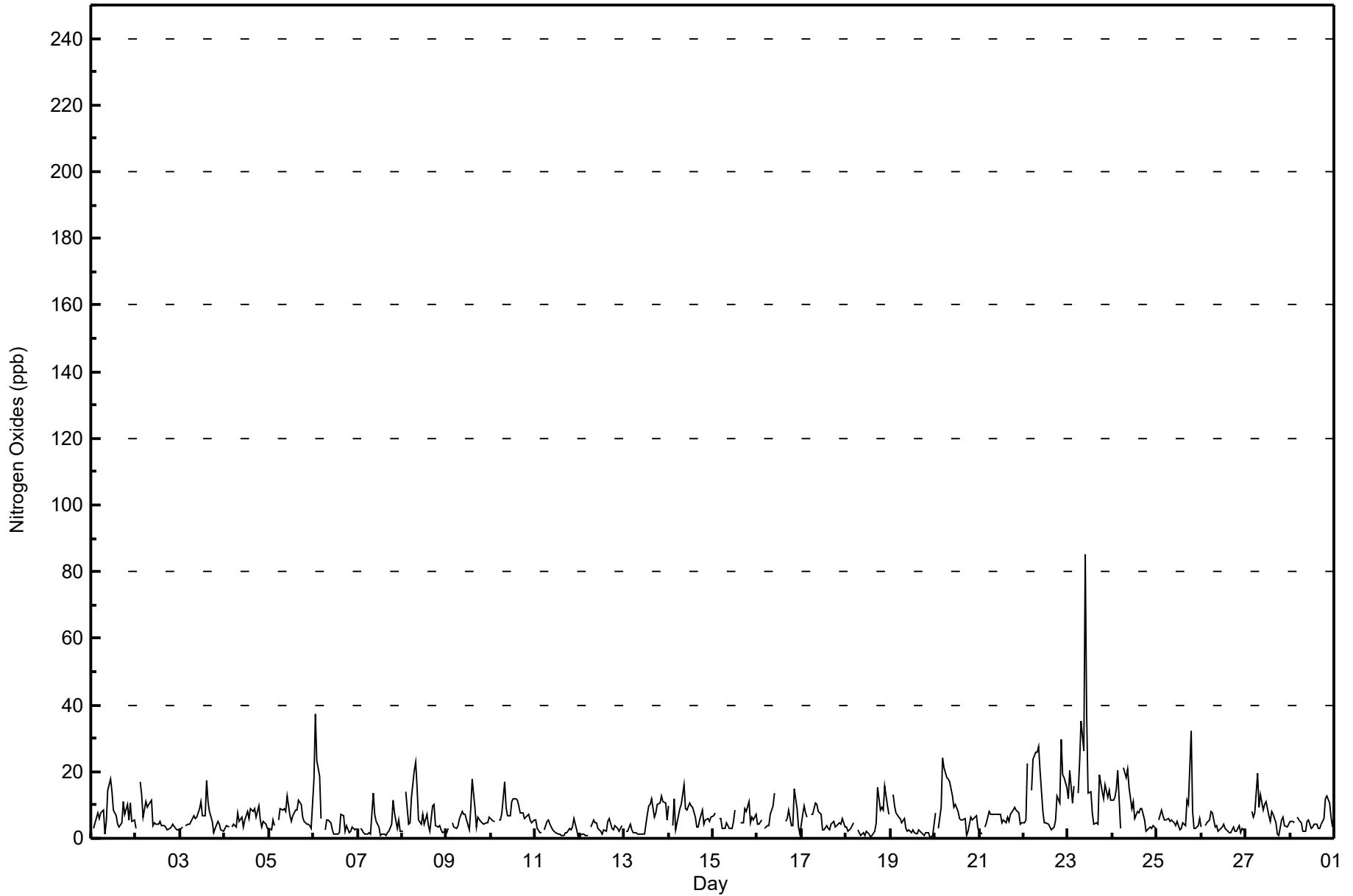
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Christina Lake - February 2023**

Maximum Value: 85.0 ppb on Feb 23 10:00      Maximum Daily Average: 18.5 ppb on Feb 23																					Hours in Service: 672 Hours of Data: 636					
Minimum Value: 0.5 ppb on Feb 19 22:00      Minimum Daily Average: 2.7 ppb on Feb 11 Maximum Diurnal Average: 9.9 ppb at hour 10      Minimum Diurnal Average: 4.4 ppb at hour 24 Monthly Average: 6.67 ppb      Percentiles: P <sub>1</sub> = 0.7 P <sub>10</sub> = 1.8 Q <sub>1</sub> = 3.0 Median = 5.2 Q <sub>3</sub> = 8.2 P <sub>90</sub> = 12.8 P <sub>99</sub> = 27.2																					Hours of Missing Data: 36 Hours of Calibration: 33 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-Feb	Z	3.1	4.8	7.7	5.8	7.7	8.5	1.4	5.2	14.4	17.9	14.1	8.4	6.6	4.2	3.5	4.8	11.0	7.2	10.1	5.4	10.6	4.9	5.6	7.5	17.9
2-Feb	2.9	Z	17.1	13.0	6.4	11.1	9.3	10.0	11.5	3.9	4.7	4.4	4.2	4.9	3.8	3.8	3.4	2.7	2.9	3.4	4.1	2.9	2.6	2.5	5.9	17.1
3-Feb	3.0	3.3	Z	3.6	4.1	4.4	5.2	6.6	5.8	6.5	8.7	11.2	6.8	6.8	17.4	10.9	7.9	4.9	1.7	3.1	5.2	4.1	2.7	2.2	5.9	17.4
4-Feb	3.1	3.7	3.5	Z	3.2	4.1	3.5	7.6	5.3	6.6	3.6	5.4	7.9	5.8	8.8	8.1	8.8	6.4	9.6	5.4	3.6	5.1	4.1	2.9	5.5	9.6
5-Feb	3.0	2.7	5.3	3.7	Z	5.6	8.8	8.3	8.8	7.9	12.8	6.8	5.3	6.8	8.6	8.3	11.4	10.2	6.5	4.9	4.2	4.2	3.9	2.8	6.6	12.8
6-Feb	17.6	37.3	23.3	18.7	6.1	Z	2.6	5.7	5.6	4.8	2.4	1.4	1.3	1.2	1.6	7.1	6.6	2.2	3.9	1.8	2.2	3.3	2.3	2.8	7.0	37.3
7-Feb	Z	2.8	2.6	1.5	1.2	1.4	1.6	1.4	13.7	7.4	5.3	3.2	1.0	1.2	1.2	1.0	1.5	2.0	4.1	11.4	7.5	3.1	5.4	2.0	3.6	13.7
8-Feb	2.0	Z	14.0	4.4	4.7	12.2	20.3	22.7	15.2	5.7	4.4	7.1	4.1	7.2	3.7	2.1	9.6	10.3	4.0	3.6	4.0	2.4	1.9	2.0	7.3	22.7
9-Feb	1.8	2.8	Z	4.7	3.4	2.8	3.9	5.8	7.9	7.2	7.0	5.7	2.4	9.1	17.7	9.1	3.5	6.2	5.2	4.6	4.2	4.5	4.8	6.2	5.7	17.7
10-Feb	5.7	5.2	5.2	Z	5.4	5.3	7.7	16.8	9.3	6.9	6.8	11.0	11.7	11.8	11.3	9.7	7.7	7.8	5.8	6.3	7.2	5.6	4.9	5.5	7.9	16.8
11-Feb	5.6	2.9	1.5	1.6	Z	2.3	5.2	5.4	4.3	2.3	1.9	1.5	1.4	1.4	1.0	0.8	1.6	1.7	2.9	2.7	3.5	6.1	2.6	0.6	2.7	6.1
12-Feb	0.8	1.4	1.1	0.8	0.9	Z	3.3	5.4	4.5	4.5	2.8	2.1	1.4	2.7	2.1	4.9	5.7	2.8	2.7	3.9	2.8	2.0	3.1	3.8	2.8	5.7
13-Feb	Z	2.1	2.1	4.3	2.4	1.7	1.5	1.1	1.2	1.1	1.2	1.2	7.3	9.6	10.2	12.0	6.4	7.6	10.4	10.6	12.8	10.9	10.8	5.4	5.8	12.8
14-Feb	9.7	Z	3.6	11.8	2.7	6.7	8.9	10.1	15.9	8.9	8.4	10.5	9.6	9.2	6.2	3.2	3.5	5.3	8.6	4.1	5.7	5.9	5.2	6.4	7.4	15.9
15-Feb	6.7	7.7	Z	6.1	5.9	3.0	2.9	4.6	3.9	2.8	3.0	5.3	8.6	M	M	4.8	4.5	8.8	8.1	10.9	4.7	6.4	5.4	7.1	5.8	10.9
16-Feb	4.4	4.0	5.6	Z	3.0	3.9	3.8	7.4	9.8	13.7	C	C	C	C	C	5.2	6.0	8.4	3.8	3.8	15.0	9.0	3.4	1.3	6.2	15.0
17-Feb	7.3	9.7	7.4	6.3	Z	7.1	7.2	10.4	10.1	7.9	7.2	2.6	2.6	3.8	2.9	2.3	4.2	5.1	3.5	3.9	4.7	4.1	5.7	3.2	5.6	10.4
18-Feb	3.3	2.2	3.0	3.8	4.8	Z	2.6	1.6	0.9	1.9	0.7	2.0	1.3	0.6	1.0	2.2	4.6	15.1	8.5	9.4	8.3	15.9	9.6	7.4	4.8	15.9
19-Feb	Z	12.9	9.8	7.5	6.5	6.0	4.5	6.1	2.8	2.1	2.5	1.7	2.5	1.6	1.2	2.5	2.1	1.2	0.7	1.5	1.6	0.5	0.6	0.7	3.4	12.9
20-Feb	7.4	Z	3.1	9.4	24.4	21.3	18.4	17.7	16.9	12.6	9.5	10.1	7.9	6.1	5.7	5.4	5.8	0.7	2.3	6.3	5.7	6.1	6.9	2.9	9.2	24.4
21-Feb	2.2	1.3	Z	3.6	4.6	8.2	7.0	7.1	7.3	7.1	7.2	7.0	4.9	5.5	4.7	6.5	5.0	7.4	8.3	9.2	8.7	7.5	4.1	4.5	6.0	9.2
22-Feb	4.7	5.3	22.4	Z	14.3	23.9	25.8	26.0	27.6	20.2	8.1	4.5	4.8	4.1	3.2	2.4	3.5	5.5	12.9	10.5	29.8	19.2	18.3	15.4	13.6	29.8
23-Feb	11.8	20.2	10.6	15.6	Z	13.5	22.7	35.2	26.3	85.0	36.9	13.4	13.9	7.8	4.1	4.5	4.1	19.0	14.1	11.9	15.9	12.4	14.5	11.2	18.5	85.0
24-Feb	11.6	12.3	14.9	20.5	2.8	Z	21.1	18.2	20.6	15.3	8.7	11.0	5.9	8.1	7.8	8.7	8.8	5.7	2.2	2.5	3.3	2.9	4.0	3.1	9.6	21.1
25-Feb	Z	5.5	8.3	6.7	5.6	5.7	5.9	4.9	5.6	4.7	3.9	4.9	2.6	2.8	4.9	4.0	11.3	10.3	32.3	7.9	2.9	3.0	3.8	5.9	6.7	32.3
26-Feb	3.3	Z	3.8	4.6	5.6	8.1	7.7	3.4	3.8	1.9	2.5	3.2	4.1	3.1	2.2	1.7	1.9	3.5	2.3	2.0	4.0	1.6	2.9	2.6	3.5	8.1
27-Feb	1.7	DF	Z	8.0	6.2	7.6	19.6	9.3	13.1	8.6	10.2	11.1	6.6	5.0	8.1	7.4	4.7	1.4	1.0	5.7	6.3	3.8	3.3	4.3	7.0	19.6
28-Feb	5.0	5.2	4.7	Z	6.4	5.2	4.7	2.3	2.0	5.2	5.6	3.1	3.2	4.3	4.4	2.8	3.0	4.1	6.0	12.0	12.7	10.7	6.2	3.2	5.3	12.7
5.4 7.0 7.7 7.3 5.7 7.5 8.7 9.4 9.5 9.9 7.2 6.1 5.2 5.3 5.7 5.2 5.4 6.3 6.5 6.2 7.0 6.2 5.3 4.4																								Diurnal Average		
17.6 37.3 23.3 20.5 24.4 23.9 25.8 35.2 27.6 85.0 36.9 14.1 13.9 11.8 17.7 12.0 11.4 19.0 32.3 12.0 29.8 19.2 18.3 15.4																								Diurnal Maximum		
Z - zerospan      C - Calibration      M - Maintenance      DF - DAS Failure																										



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

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Christina Lake - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Christina Lake - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	616	96.86	96.86
21 - 40	19	2.99	99.84
41 - 80	0	0.00	99.84
81 - 159	1	0.16	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 636

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Christina Lake - February 2023**

<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	12	45	42	32	43	17	5	32	56	68	67	84	22	20	40	31	616
21 - 40	0	0	0	1	0	0	0	3	0	8	3	0	0	2	2	0	19
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	1	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>	12	45	42	33	43	17	5	35	57	76	70	84	22	22	42	31	636

Total Number of Valid Hours: 636

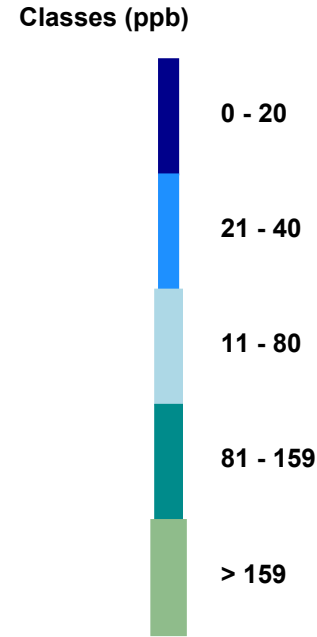
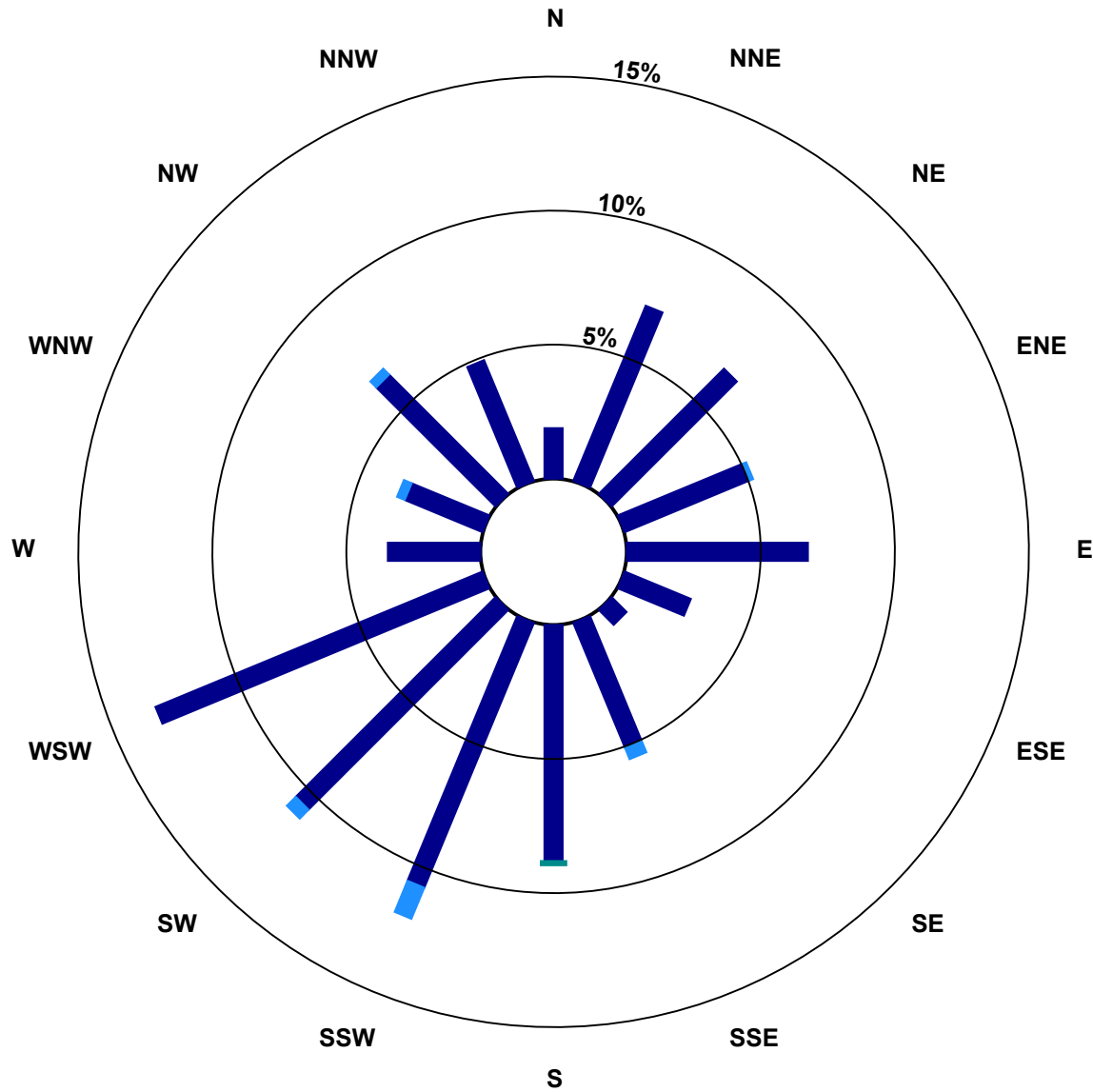
Total Number of Hours: 672



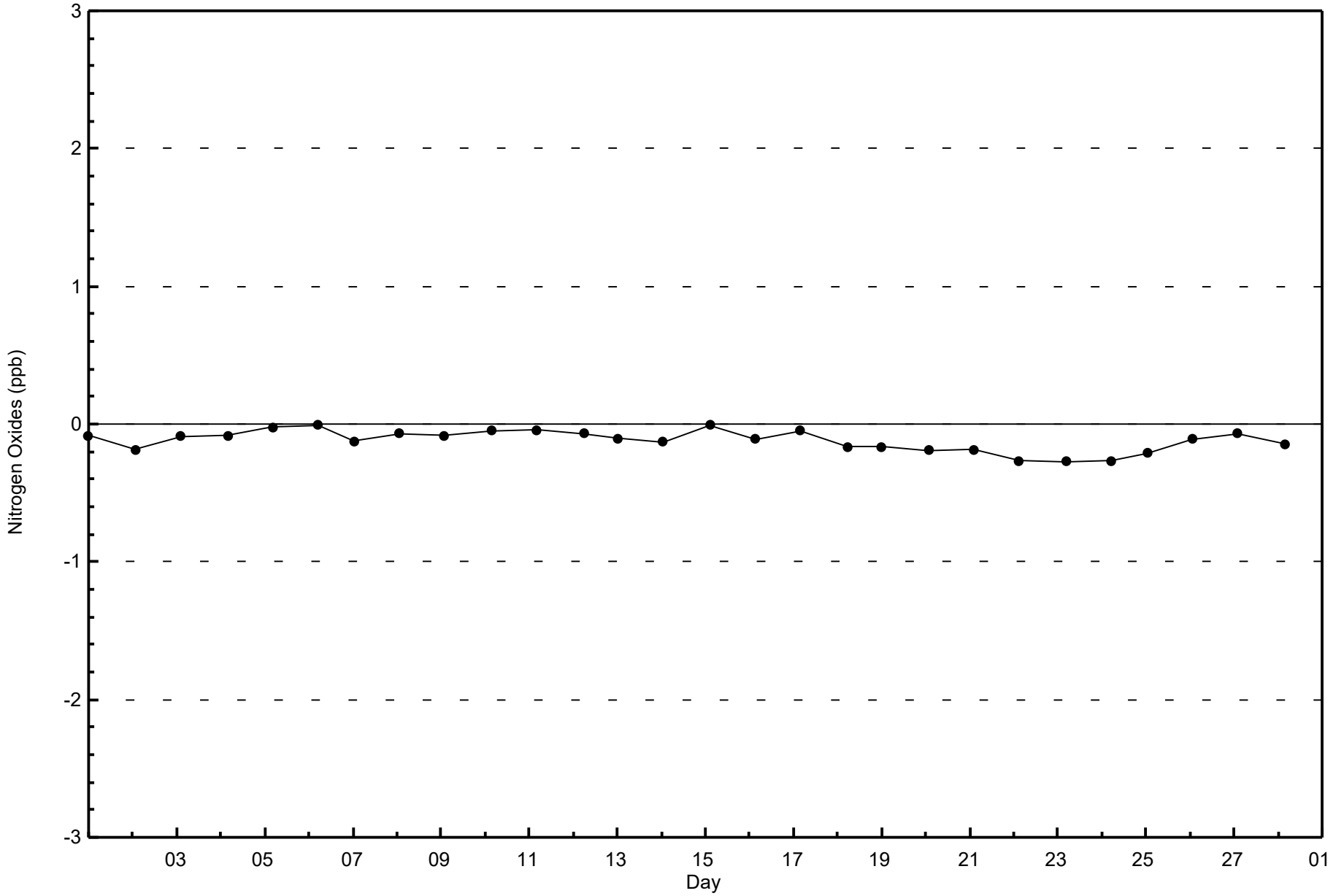


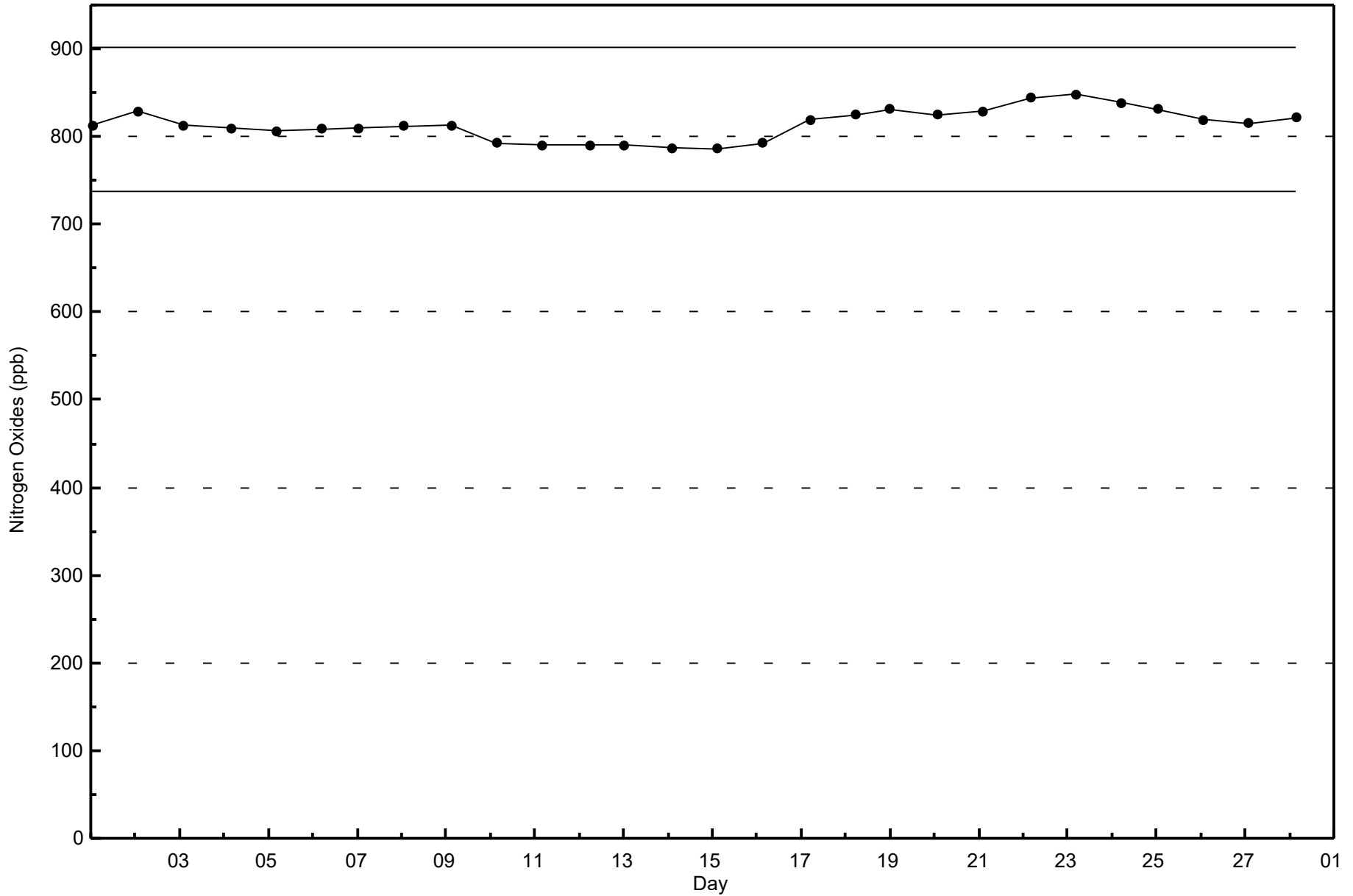
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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



Total Number of Valid Hours: 636







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

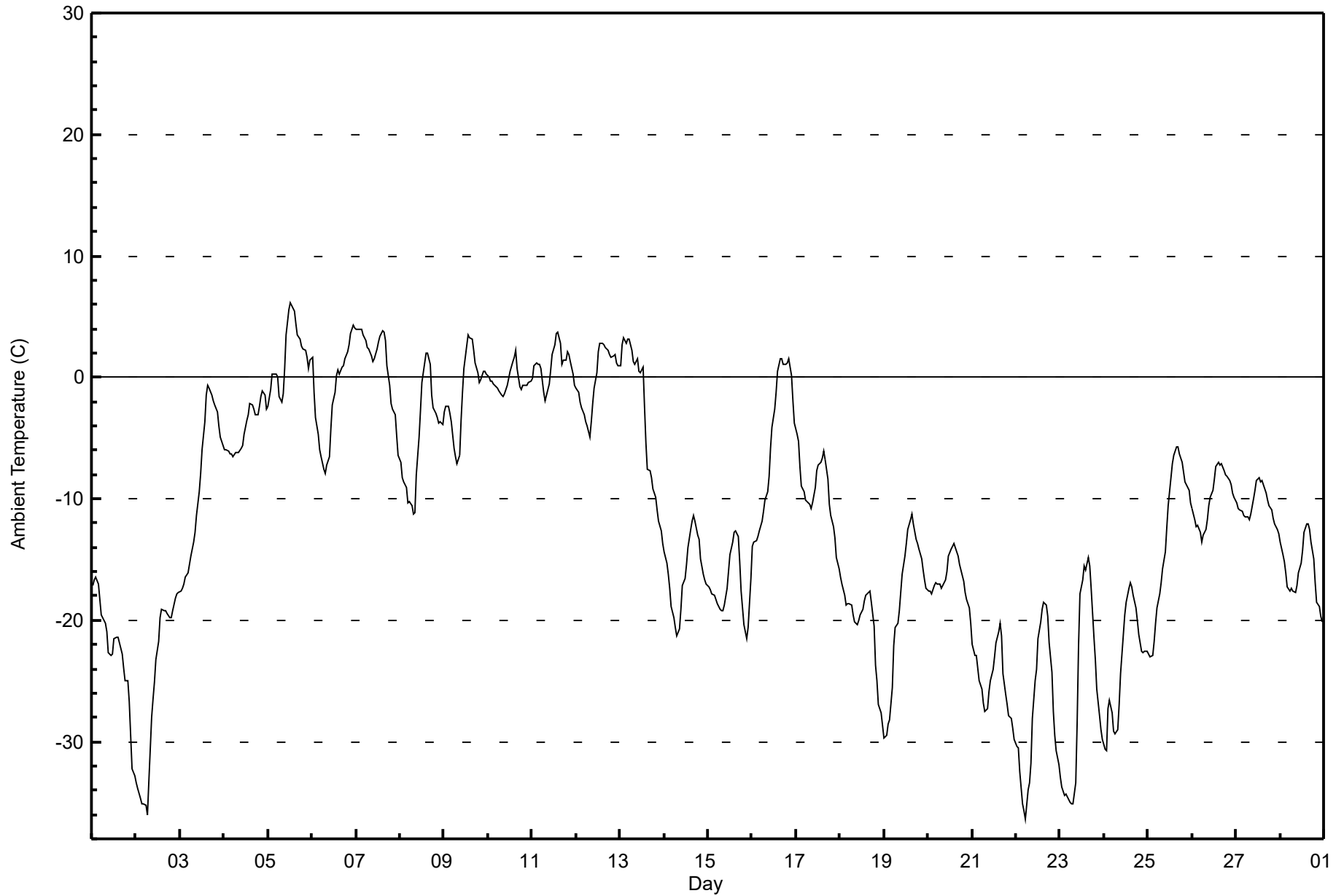
**Ambient Temperature (AT) - C**  
**Christina Lake - February 2023**

Maximum Value: 6.2 C on Feb 5 13:00		Maximum Daily Average: 1.7 C on Feb 5		Hours in Service: 672																						
Minimum Value: -36.3 C on Feb 22 06:00		Minimum Daily Average: -27.5 C on Feb 22		Hours of Data: 672																						
Maximum Diurnal Average: -7.4 C at hour 16		Minimum Diurnal Average: -14.6 C at hour 8		Hours of Missing Data: 0																						
Monthly Average: -11.51 C		Percentiles: P <sub>1</sub> = -35.1 P <sub>10</sub> = -25.7 Q <sub>1</sub> = -18.8 Median = -11.4 Q <sub>3</sub> = -1.9 P <sub>90</sub> = 1.5 P <sub>99</sub> = 4.0		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-Feb	-17.1	-16.7	-16.5	-17.1	-18.3	-19.5	-20.1	-20.2	-20.9	-22.6	-23.0	-22.8	-21.5	-21.4	-21.4	-21.9	-22.8	-23.9	-25.0	-24.9	-26.7	-29.5	-32.2	-32.9	-22.4	-16.5
2-Feb	-33.4	-33.9	-34.7	-35.1	-35.1	-35.3	-36.0	-33.3	-28.0	-26.5	-25.1	-23.3	-21.8	-19.8	-19.1	-19.2	-19.2	-19.5	-19.7	-19.7	-19.2	-18.1	-17.9	-17.8	-25.4	-17.8
3-Feb	-17.6	-17.3	-17.0	-16.4	-16.1	-15.4	-14.7	-13.6	-12.7	-11.3	-9.4	-7.9	-5.9	-3.6	-1.4	-0.6	-0.9	-1.5	-1.9	-2.3	-2.8	-4.0	-5.0	-5.6	-8.5	-0.6
4-Feb	-5.9	-6.0	-6.1	-6.3	-6.3	-6.5	-6.2	-6.2	-6.2	-5.8	-5.6	-4.6	-3.5	-3.1	-2.2	-2.3	-2.6	-3.0	-3.1	-2.4	-1.6	-1.1	-1.4	-2.6	-4.2	-1.1
5-Feb	-2.4	-1.0	0.2	0.2	0.2	0.0	-1.6	-2.0	-1.3	0.7	3.5	5.6	6.2	5.9	5.5	4.5	3.5	3.1	2.6	2.3	2.2	1.7	0.7	1.4	1.7	6.2
6-Feb	1.6	-1.2	-3.3	-4.7	-6.0	-6.6	-7.5	-7.9	-7.2	-6.5	-4.2	-2.3	-1.2	0.1	0.6	0.3	0.9	0.9	1.6	2.1	2.7	3.6	4.3	4.1	-1.5	4.3
7-Feb	3.9	3.9	4.0	3.9	3.5	3.1	2.4	2.3	1.8	1.3	1.5	2.4	2.9	3.4	3.9	3.8	3.0	0.9	-0.6	-2.2	-2.6	-3.1	-4.8	-6.4	1.3	4.0
8-Feb	-7.0	-8.3	-8.7	-9.1	-10.3	-10.2	-10.6	-11.3	-11.1	-8.0	-5.0	-2.7	-0.5	1.2	2.0	1.9	1.1	-1.5	-2.6	-3.0	-3.4	-3.8	-3.7	-3.9	-4.9	2.0
9-Feb	-2.8	-2.4	-2.4	-3.0	-3.7	-5.8	-6.5	-7.2	-6.5	-3.5	-1.3	0.7	2.5	3.4	3.3	3.1	2.2	1.2	0.4	-0.4	-0.2	0.5	0.5	0.3	-1.1	3.4
10-Feb	0.0	-0.3	-0.3	-0.5	-0.7	-0.9	-1.1	-1.5	-1.6	-1.4	-0.7	-0.1	0.5	1.3	1.6	2.2	0.8	-0.8	-0.9	-0.7	-0.7	-0.7	-0.5	-0.3	-0.3	2.2
11-Feb	-0.1	0.9	1.1	1.1	1.1	0.8	-1.3	-1.9	-1.5	-0.5	0.6	1.8	2.7	3.6	3.8	2.8	1.1	1.4	1.4	2.1	1.9	1.2	0.2	-0.7	1.0	3.8
12-Feb	-0.8	-1.3	-2.0	-2.5	-3.0	-3.6	-4.0	-4.9	-3.7	-2.2	-0.9	0.4	2.1	2.8	2.9	2.7	2.5	2.2	1.8	1.7	1.8	1.9	1.1	0.9	-0.2	2.9
13-Feb	1.0	2.7	3.3	2.8	3.1	3.1	2.2	1.3	1.1	1.5	0.5	0.4	0.9	-2.4	-5.4	-7.6	-7.7	-8.3	-9.2	-9.9	-10.9	-11.9	-12.6	-13.7	-3.2	3.3
14-Feb	-14.4	-15.3	-16.2	-17.4	-18.9	-19.8	-20.6	-21.2	-20.7	-19.2	-17.2	-16.6	-15.4	-14.0	-12.6	-11.8	-11.4	-11.9	-13.0	-13.3	-14.9	-16.2	-16.6	-17.0	-16.1	-11.4
15-Feb	-17.3	-17.5	-17.8	-18.0	-18.2	-18.7	-19.1	-19.2	-19.2	-18.8	-17.4	-16.0	-14.6	-13.6	-12.8	-12.7	-13.1	-15.1	-17.6	-20.4	-21.0	-21.5	-20.6	-16.6	-17.4	-12.7
16-Feb	-13.9	-13.6	-13.5	-13.2	-12.6	-11.8	-11.0	-10.1	-9.4	-8.1	-5.8	-4.2	-2.6	-1.2	0.5	1.5	1.5	1.1	1.1	1.1	1.5	0.1	-2.0	-3.7	-5.3	1.5
17-Feb	-4.7	-5.2	-7.3	-8.9	-9.4	-10.1	-10.2	-10.5	-10.8	-10.4	-9.1	-7.6	-7.2	-7.0	-6.7	-6.1	-6.7	-8.3	-10.5	-11.4	-12.3	-13.3	-14.8	-15.7	-9.3	-4.7
18-Feb	-16.5	-17.1	-17.9	-18.7	-18.7	-18.6	-18.8	-19.6	-20.1	-20.3	-20.1	-19.6	-19.1	-18.5	-18.0	-17.7	-17.6	-18.6	-20.5	-23.7	-25.0	-26.9	-27.6	-28.7	-20.3	-16.5
19-Feb	-29.7	-29.5	-28.5	-28.2	-25.6	-22.1	-20.6	-20.3	-19.3	-17.8	-16.2	-14.7	-13.7	-12.5	-11.7	-11.2	-12.1	-13.4	-13.7	-14.2	-15.0	-15.9	-16.7	-17.4	-18.3	-11.2
20-Feb	-17.6	-17.6	-17.8	-17.2	-16.9	-17.0	-17.0	-17.4	-17.2	-16.7	-16.0	-14.7	-14.2	-13.9	-13.7	-14.1	-14.7	-15.4	-15.9	-16.8	-17.8	-18.3	-19.0	-20.3	-16.5	-13.7
21-Feb	-21.9	-22.9	-22.9	-23.9	-25.0	-25.7	-26.8	-27.5	-27.3	-25.9	-25.0	-24.1	-23.0	-21.9	-20.9	-20.2	-21.3	-24.4	-26.1	-26.9	-27.9	-28.0	-28.8	-29.8	-24.9	-20.2
22-Feb	-30.4	-30.6	-32.4	-35.2	-35.6	-36.3	-33.9	-33.4	-31.8	-28.1	-25.0	-24.0	-21.5	-20.2	-19.1	-18.5	-18.7	-19.7	-21.9	-24.2	-27.5	-29.5	-30.8	-31.9	-27.5	-18.5
23-Feb	-32.9	-33.7	-34.4	-34.3	-34.6	-35.0	-35.1	-35.1	-33.4	-28.4	-22.1	-17.8	-16.7	-15.5	-15.8	-14.8	-15.5	-17.3	-21.4	-23.3	-25.7	-27.9	-29.1	-29.8	-26.2	-14.8
24-Feb	-30.6	-30.8	-27.3	-26.6	-27.6	-29.1	-29.4	-29.0	-27.0	-24.4	-21.1	-19.6	-18.5	-17.4	-16.9	-17.3	-18.0	-19.0	-20.0	-21.2	-22.6	-22.7	-22.6	-22.6	-23.4	-16.9
25-Feb	-22.8	-23.0	-22.9	-21.7	-20.3	-19.0	-17.9	-16.9	-15.8	-14.3	-12.4	-10.5	-8.3	-7.1	-6.5	-5.8	-5.7	-6.3	-7.0	-7.8	-8.6	-8.9	-9.3	-10.3	-12.9	-5.7
26-Feb	-10.8	-11.7	-12.3	-12.2	-12.7	-13.5	-13.0	-12.5	-11.7	-10.6	-9.9	-9.3	-8.4	-7.4	-7.0	-7.2	-7.1	-7.6	-8.0	-8.2	-8.5	-8.8	-9.6	-9.9	-9.9	-7.0
27-Feb	-10.4	-10.8	-10.9	-11.0	-11.4	-11.4	-11.5	-11.7	-11.2	-10.0	-9.3	-8.5	-8.2	-8.6	-8.5	-8.9	-9.5	-10.1	-10.5	-10.9	-11.6	-12.1	-12.5	-12.9	-10.5	-8.2
28-Feb	-13.5	-14.5	-15.2	-16.1	-17.2	-17.6	-17.4	-17.6	-17.7	-17.2	-16.1	-15.2	-14.3	-12.7	-12.0	-12.1	-12.5	-13.6	-15.0	-16.9	-18.5	-18.9	-19.7	-20.2	-15.9	-12.0
																								Diurnal Average		
																								Diurnal Maximum		



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

**Ambient Temperature (AT) - C**  
**Christina Lake - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Christina Lake - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	139	20.68	20.68
-20 - 0	411	61.16	81.85
0 - 10	122	18.15	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

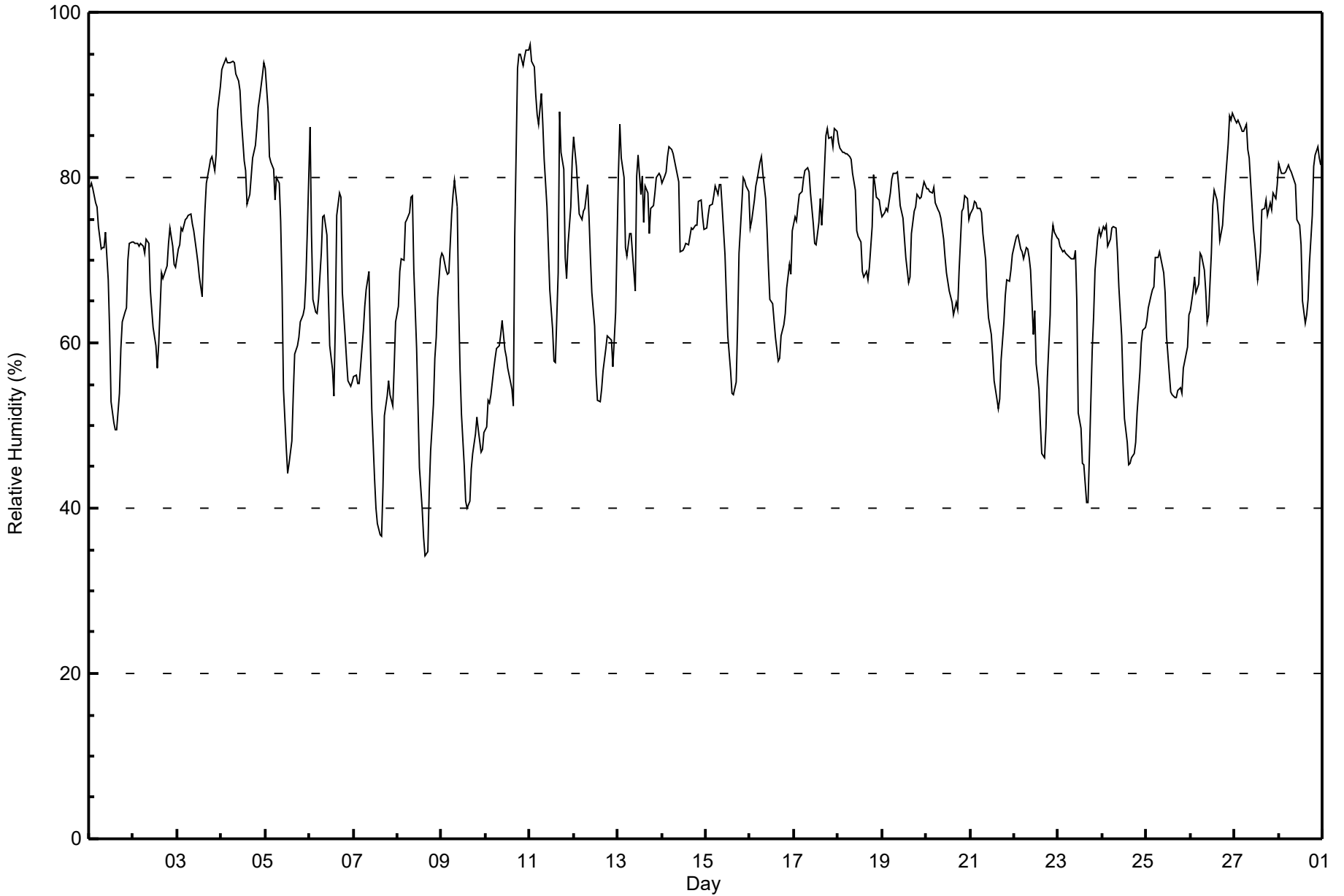
**Relative Humidity (RH) - %  
Christina Lake - February 2023**

Maximum Value: 96.1 % on Feb 11 01:00      Maximum Daily Average: 88.6 % on Feb 4																						Hours in Service: 672 Hours of Data: 672				
Minimum Value: 34.3 % on Feb 8 16:00      Minimum Daily Average: 53.2 % on Feb 7 Maximum Diurnal Average: 76.6 % at hour 8      Minimum Diurnal Average: 58.7 % at hour 15 Monthly Average: 70.11 %      Percentiles: P <sub>1</sub> = 39.9 P <sub>10</sub> = 53.4 Q <sub>1</sub> = 62.5 Median = 72.0 Q <sub>3</sub> = 78.1 P <sub>90</sub> = 83.0 P <sub>99</sub> = 94.2																						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-Feb	78.8	79.3	78.7	76.9	76.5	74.1	71.4	71.5	71.6	73.3	67.6	61.3	52.9	50.4	49.5	49.5	53.8	59.3	62.5	63.8	64.3	70.1	72.0	72.2	66.7	79.3
2-Feb	72.1	72.0	72.0	71.8	72.0	71.7	70.9	72.5	72.0	66.5	64.1	61.8	59.6	57.0	59.8	68.4	67.9	68.4	69.4	72.0	73.8	71.7	69.5	69.2	68.6	73.8
3-Feb	71.3	71.9	73.9	73.5	75.0	75.0	75.4	75.6	74.3	73.6	71.0	69.6	68.0	65.5	71.9	76.0	79.3	81.2	82.2	82.6	80.8	82.8	88.2	91.0	76.2	91.0
4-Feb	93.0	93.6	94.4	94.0	93.9	93.8	94.1	93.9	92.6	91.7	90.4	87.0	82.1	80.9	76.7	78.0	80.2	82.4	84.0	86.0	88.5	89.6	92.3	93.9	88.6	94.4
5-Feb	93.2	88.3	82.6	81.9	81.1	77.3	79.9	79.3	74.7	66.7	54.4	47.2	44.2	45.4	48.1	53.7	58.6	59.7	60.7	62.5	63.3	64.2	67.6	73.4	67.0	93.2
6-Feb	86.1	73.2	65.3	63.7	63.5	65.3	70.9	75.3	75.5	73.1	66.0	59.6	56.7	53.6	62.2	75.5	78.1	77.6	66.2	60.9	57.9	55.4	54.8	55.3	66.3	86.1
7-Feb	56.0	56.1	55.2	55.0	57.1	61.5	64.3	66.5	68.6	59.9	52.1	43.6	40.1	38.2	36.7	36.6	42.6	51.2	53.6	55.5	53.8	52.3	57.1	62.5	53.2	68.6
8-Feb	64.4	68.6	70.2	70.0	74.6	74.9	75.7	77.6	77.7	68.8	59.4	52.2	44.9	39.9	36.4	34.3	34.8	42.1	47.0	52.5	58.2	60.7	65.4	70.2	59.2	77.7
9-Feb	70.9	70.6	68.8	68.3	68.4	75.6	77.9	79.7	76.5	64.8	56.9	51.3	45.1	40.9	39.9	40.9	44.7	46.6	48.9	51.1	49.5	46.9	47.1	49.2	57.5	79.7
10-Feb	49.9	53.1	52.6	53.7	56.7	58.1	59.3	59.7	61.0	62.8	59.1	58.2	56.9	55.2	54.3	52.4	72.8	93.2	95.0	95.0	93.6	94.6	95.4	95.4	68.3	95.4
11-Feb	96.1	94.1	93.4	90.0	87.6	86.4	90.1	86.7	82.2	76.5	71.6	66.4	61.7	57.9	57.7	68.4	87.9	83.1	81.0	70.3	67.9	71.9	76.4	82.0	78.6	96.1
12-Feb	84.9	81.4	78.5	75.5	74.9	76.0	76.3	79.1	75.3	70.4	66.1	62.1	56.1	53.0	52.9	54.5	56.7	59.3	60.8	60.6	60.4	57.1	60.3	63.7	66.5	84.9
13-Feb	80.6	86.5	82.3	80.0	71.5	70.6	73.2	73.3	70.9	66.2	80.1	82.8	77.9	80.2	74.6	79.0	78.1	73.3	76.3	76.7	78.1	80.0	80.6	80.3	77.2	86.5
14-Feb	79.3	80.1	80.6	82.6	83.7	83.4	82.9	82.0	80.4	79.5	71.0	71.2	71.5	72.1	71.8	72.9	73.9	73.7	74.2	74.3	77.1	77.3	75.3	73.7	76.8	83.7
15-Feb	73.8	75.4	76.7	76.7	77.8	79.0	77.9	79.1	79.2	76.4	70.7	65.7	60.8	56.6	53.9	53.7	55.3	62.0	70.8	76.8	80.0	79.7	79.1	78.2	71.5	80.0
16-Feb	74.0	74.7	77.2	78.9	79.9	81.8	82.6	80.5	77.5	73.8	69.1	65.3	64.8	62.7	60.6	57.7	58.2	60.9	62.2	63.5	66.6	69.5	68.2	73.6	70.2	82.6
17-Feb	75.3	74.8	76.4	78.0	78.4	79.8	80.9	81.2	80.7	78.1	74.4	72.0	71.8	74.6	77.5	74.2	77.4	85.0	86.0	84.7	84.9	83.8	85.9	85.5	79.2	86.0
18-Feb	84.3	83.5	83.1	83.1	82.8	82.8	82.5	82.2	80.6	78.5	73.5	72.9	72.2	68.6	68.0	68.6	67.6	69.1	74.2	80.3	79.2	77.6	77.2	76.2	77.0	84.3
19-Feb	75.3	75.8	76.2	76.0	78.1	79.8	80.5	80.5	80.7	78.8	76.6	75.1	72.8	70.3	67.2	68.0	73.2	76.0	76.5	78.0	77.5	77.6	78.7	79.5	76.2	80.7
20-Feb	78.7	78.6	78.4	78.2	78.8	76.9	76.1	75.7	75.1	72.6	70.4	68.5	66.2	65.5	64.9	63.3	65.0	64.0	68.7	76.0	76.3	77.8	77.5	75.0	72.8	78.8
21-Feb	75.6	76.2	77.2	76.9	76.2	76.3	75.7	73.3	70.0	65.6	63.1	61.0	58.5	55.4	53.2	52.1	53.2	58.0	62.6	65.7	67.6	67.4	68.9	70.7	66.7	77.2
22-Feb	72.2	72.8	73.0	71.4	71.0	70.2	71.5	71.3	70.3	68.8	61.1	63.8	57.5	54.5	50.2	46.5	46.1	49.7	55.7	63.4	72.4	74.2	73.4	72.7	64.7	74.2
23-Feb	72.5	71.8	71.1	71.3	70.8	70.4	70.3	70.2	70.2	71.2	65.0	51.5	49.7	45.4	45.3	40.7	40.7	46.4	59.2	63.2	68.8	72.9	73.7	72.9	62.7	73.7
24-Feb	74.0	73.7	74.3	71.7	72.5	73.9	74.1	73.8	71.1	66.8	60.8	55.2	50.8	48.0	45.2	45.4	46.1	46.7	47.9	51.5	56.4	60.0	61.5	61.9	61.0	74.3
25-Feb	62.8	64.2	65.7	66.5	66.8	70.4	70.4	71.1	70.2	68.4	66.2	60.9	56.2	54.1	53.7	53.4	53.4	54.3	54.6	53.9	57.0	57.8	59.5	63.4	61.5	71.1
26-Feb	63.9	66.3	68.0	66.1	67.1	70.9	70.5	68.8	66.4	62.6	63.4	70.8	76.7	78.6	77.3	75.4	72.3	74.2	77.1	79.5	84.0	87.4	86.9	87.7	73.4	87.7
27-Feb	86.9	86.5	86.9	86.1	85.6	85.6	86.5	83.3	82.3	76.7	73.7	72.1	67.6	69.0	71.0	76.1	76.3	77.3	75.4	77.0	76.1	78.2	77.5	79.1	78.9	86.9
28-Feb	81.8	80.5	80.5	80.5	80.7	81.6	81.0	80.7	79.7	79.2	74.9	74.2	71.9	65.1	62.3	63.4	65.3	69.7	75.4	81.4	82.8	83.7	82.4	81.5	76.7	83.7
76.0 75.8 75.5 74.9 75.1 75.8 76.5 76.6 75.3 71.8 67.6 64.4 61.3 59.2 58.7 59.9 62.8 65.9 68.1 70.0 71.3 72.2 73.3 74.6																								Diurnal Average		
96.1 94.1 94.4 94.0 93.9 93.8 94.1 93.9 92.6 91.7 90.4 87.0 82.1 80.9 77.5 79.0 87.9 93.2 95.0 95.0 93.6 94.6 95.4 95.4																								Diurnal Maximum		



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

**Relative Humidity (RH) - %**  
**Christina Lake - February 2023**







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

**Relative Humidity (RH) - %**  
**Christina Lake - February 2023**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	8	1.19	1.19
40 - 60	132	19.64	20.83
60 - 80	406	60.42	81.25
80 - 100	126	18.75	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



Maximum Speed: 32 km/h on Feb 6 02:00	Maximum Daily Speed Average: 15.9 km/h on Feb 7	Hours in Service: 672
Minimum Speed Value: 1 km/h on Feb 4 13:00	Minimum Daily Speed Average: 2.1 km/h on Feb 22	Hours of Data: 670
Maximum Diurnal Speed Average: 5.2 km/h at hour 14	Minimum Diurnal Speed Average: 1.8 km/h at hour 18	Hours of Missing Data: 2
Monthly Average Velocity: 3.4 km/h 256.0 deg	Percentiles: P <sub>1</sub> = 2 P <sub>10</sub> = 4 Q <sub>1</sub> = 7 Median = 10 Q <sub>3</sub> = 15 P <sub>90</sub> = 19 P <sub>99</sub> = 25	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-Feb	WSW10	WSW10	NNW10	NW18	N16	NNW19	NNW20	NW20	NNW19	N15	NNW18	NW21	NW20	NW20	NW21	NW23	NW19	NNW19	N11	NNW12	W4	SW5	SSW5	SSW4	NW13.0	NW23
2-Feb	SSW3	SSW3	S2	S3	SSW3	SSE3	E5	S7	S12	SSE16	SSE15	SSE12	SSE16	SSE16	SSE20	SSE20	SSE21	SSE21	SSE19	SSE17	S15	S15	S16	S14	SSE11.9	SSE21
3-Feb	SSW16	SSW15	SSW14	SSW14	SSW14	SSW11	S10	SSW10	SW13	SW10	SW8	SW10	WSW9	WSW10	NNW16	NNW15	NNW13	NW12	NW14	NW11	WVW7	NE7	ENE8	ENE11	WSW6.3	SSW16
4-Feb	E6	ENE7	E7	ESE6	ESE5	E4	E5	ENE6	E7	NE4	NNE7	E3	ESE1	NE4	ESE3	S2	ENE6	E3	E2	S7	SSW6	S6	S7	SSW9	ESE3.1	SSW9
5-Feb	SSW9	SSW10	SSW8	S6	S4	SSE4	S5	S6	S6	S10	SW8	S5	SSW13	SSW11	SSW8	S8	SW7	SW10	WSW13	WSW15	WSW15	WSW16	WSW14	W15	SW8.3	WSW16
6-Feb	WVW25	WVW32	WVW26	WVW25	W19	W16	WSW11	WSW11	WSW13	WSW12	W12	W14	WSW13	WSW12	WSW14	SW11	SSW8	S9	SSW12	SW17	SW16	SW18	WSW19	SW19	WSW13.7	WVW32
7-Feb	WSW17	SW17	WSW21	WSW23	WSW22	WSW20	WSW20	WSW19	WVW23	W23	W19	W16	WSW17	W22	WSW21	WSW20	WSW15	WSW10	WSW9	SW10	SW9	WSW10	SW7	SSW9	WSW15.9	WSW23
8-Feb	SSW8	SSW6	SW10	SSW8	SW7	SW11	SW12	SSW9	SW7	WSW10	SW11	SW11	WSW9	WVW10	W10	WSW11	WSW8	SW12	SW11	SW11	SW11	SW11	SW14	SW13	SW9.6	SW14
9-Feb	SW14	SW15	SW14	SW14	SW10	SSW12	SSW12	S9	SSW6	SW13	SW11	SW12	SW15	SW17	SSW11	S12	S12	S13	S14	S11	SSW8	SW13	SW11	SSW5	SSW11.3	SW17
10-Feb	SSE4	S6	SSE4	SSE5	SSE6	SSE4	SSE7	SSE5	S4	E7	ESE7	SSW5	ESE4	ENE2	NE7	WVW5	NW15	NW11	W9	WSW11	WSW11	WSW11	SW8	SSE1	SW2.2	NW15
11-Feb	SW6	WSW10	WSW11	WSW12	WSW12	WSW11	SW10	SW10	SW12	WSW15	WSW15	WSW16	WSW19	WSW18	WSW17	WSW22	WSW17	WSW15	SW15	W19	W26	W23	W16	WSW13	WSW14.5	W26
12-Feb	WSW15	WSW14	WSW12	WSW11	WSW11	SW12	SW11	WSW10	WSW11	SW12	WSW14	WSW14	WSW11	SW11	SW10	SW9	SSW8	SSW10	SSW12	S14	S16	S19	SSW18	SSW18	SW11.4	S19
13-Feb	SSW18	SW20	SW20	SW16	SW19	WSW22	WSW19	WSW18	WSW19	WSW20	WSW18	WSW15	WVW19	NNW30	NNW31	NNW28	N22	N23	NNW25	NNW24	NNW22	NNW17	NNW17	NW16	WVW13.6	NNW31
14-Feb	NNW18	NW22	NW15	N13	NNE10	NE8	ENE8	E6	ESE4	E5	SE2	S3	SSW4	SW6	SW7	WSW9	W8	NNW16	NNW15	NW16	NNE12	NNE10	NE11	NE11	NNW5.6	NW22
15-Feb	NE10	ENE8	E8	ENE7	E7	E8	E7	E7	E7	E8	ENE8	ENE6	ENE6	M	M	ENE7	E7	SE7	S6	S6	S6	SSE5	S4	S6	E5.2	NE10
16-Feb	S10	S10	S14	S14	S12	S13	SSW16	S9	SSW13	SSW11	SSW11	SW17	SSW22	SW17	SW19	WSW20	WSW18	WSW17	WSW15	W13	NW19	NW23	NW22	NW19	SW10.6	NW23
17-Feb	NW18	NNW19	NNE12	NE10	NE11	NE10	ENE5	ENE7	E7	E7	E5	WSW9	W9	WSW7	WSW8	WVW9	NW11	NNE11	NNE13	NE12	NE10	NE9	NE7	NNE10	NNE5.5	NNW19
18-Feb	NNE10	NNE9	NNE10	NE10	NE9	NE9	NNE11	NNE9	NNE12	NNE10	NNE12	NNE9	NNE10	NNE9	NE9	NE10	NE9	E5	ESE6	S4	SSW4	SSE2	SSW5	S4	NE6.2	NNE12
19-Feb	SSE3	SSE2	E4	E5	ESE3	E6	E7	E7	ESE7	SE8	ESE9	ESE8	ENE9	E10	ESE8	ENE6	NNE13	NNE11	NNE9	NE8	NE8	NNE10	NNE9	NNE10	ENE6.0	NNE13
20-Feb	NNW10	NNW13	NNE7	NW12	NW18	NW16	WVW12	NW19	NW13	NW12	W9	WVW8	WVW12	WVW14	WVW14	NW17	N14	NNE12	NNE10	NE12	ENE9	NE10	NNE14	NE16	NNW9.4	NW19
21-Feb	NNE8	NNE7	NNW11	N13	N12	NW8	NW12	NW13	NW18	NW14	NNW15	NNW13	NNW13	NNW15	N15	N16	N19	NNE16	NNE12	NNE10	NNE11	NNE13	NNE10	NE7	N11.3	N19
22-Feb	NE5	NNE6	SSW2	SSW3	SSW3	SSE3	SW4	SW3	SSW2	E1	NE4	NE7	E4	NE7	NE8	NNE9	NE10	NNE10	NE8	ENE4	ENE3	SSW4	SSW6	SSW5	NE2.1	NNE10
23-Feb	SSW5	SSW4	SSW3	SSW4	SSW4	SSW3	SSW4	SSW4	SSW3	S3	SSE3	ENE3	ENE4	NNE6	NE10	W1	SE3	S4	S5	SSE3	S4	SSW5	SW5	SSW4	S2.2	NE10
24-Feb	SSW4	S5	S6	SSW7	S5	SSE5	SSE5	SSE6	S7	S10	SSW16	SSW21	SSW21	SSW20	SSW20	SSW19	SSW18	SSW18	SSW19	SSW17	SSW18	SSW17	SSW16	SSW13.1	SSW21	
25-Feb	SW15	SW14	SW13	WSW13	WSW13	WSW12	W12	W13	W12	WSW12	WSW12	WSW13	WSW13	SW12	WSW12	SW12	SW11	SSW10	SW11	SW8	S6	SSW9	S9	S8	WSW10.5	SW15
26-Feb	SSE9	SSE8	SSE8	SSE12	SE7	ESE6	ESE7	ESE7	E7	E9	E10	E12	E14	E15	ENE17	ENE16	ENE17	ENE15	E13	ENE9	ENE7	ENE5	E6	E7	E8.8	ENE17
27-Feb	NE8	NE8	NNE7	NNW15	NW14	NW21	NW16	WVW14	NW16	NW20	NW18	WVW17	NW17	WVW17	NW17	NNW17	NW15	NW20	NW19	NW16	NNW12	NNE9	NNE10	N8	NW13.1	NW21
28-Feb	NE10	NE12	ENE11	NE12	NE9	ESE6	NNE5	NNE7	NE7	NE7	ENE5	NE8	NE6	NE6	NE7	ENE8	E8	E7	E5	SSE4	SSE4	S5	SSE3	E6	ENE5.7	NE12

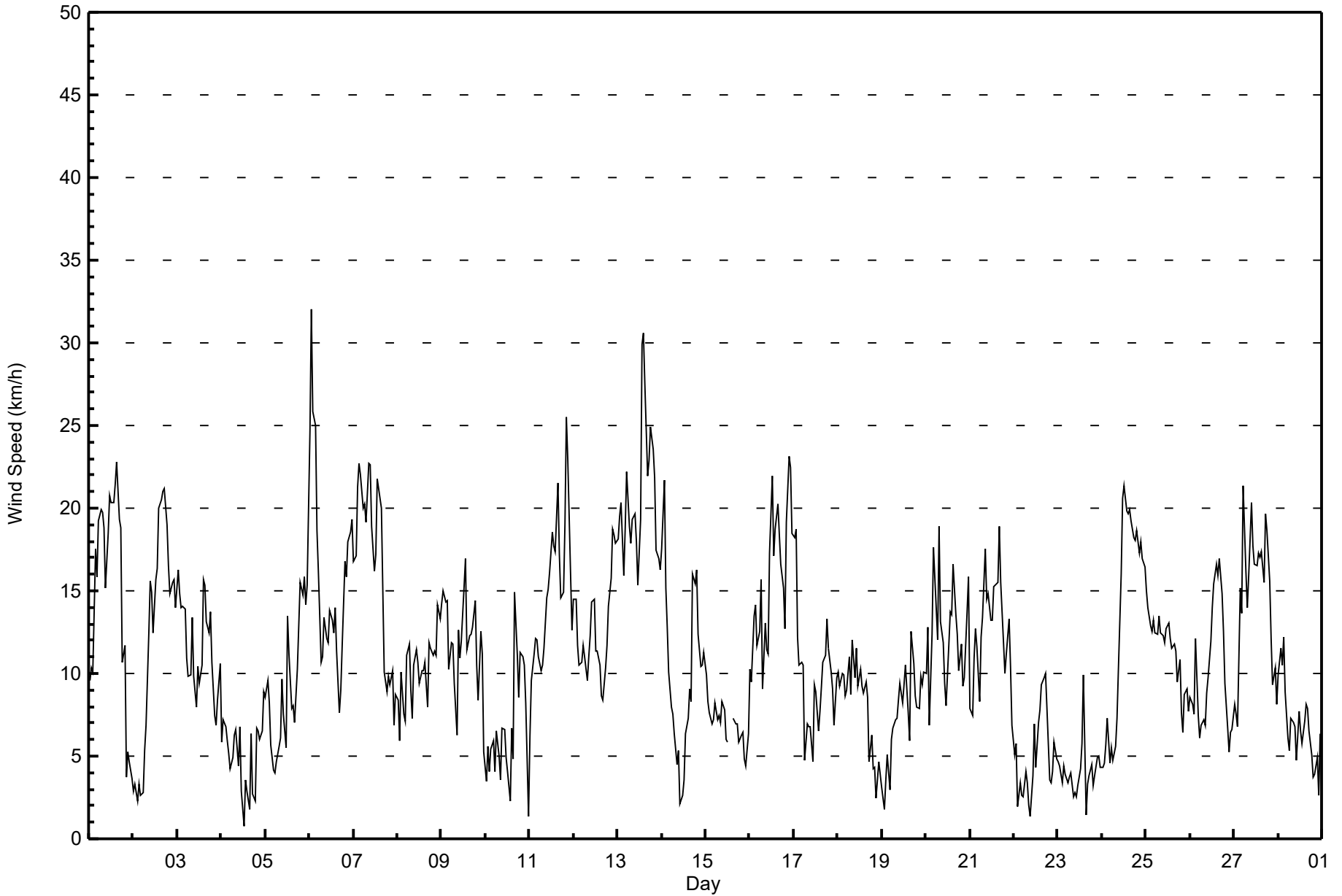
WSW3.4	WSW3.8	WSW3.6	WSW3.3	WSW3.1	WSW3.3	WSW3.3	WSW3.1	WSW3.7	WSW3.4	WSW3.5	WSW4.7	WSW5.2	W5.2	W4.8	W4.7	NNW2.8	NNW1.8	W2.5	WSW3.4	WSW3.0	WSW3.3	WSW3.0	SW2.2	Diurnal Average
WVW25	WVW32	WVW26	WVW25	WSW22	WSW22	WSW20	NW20	WVW23	W23	W19	NNW21	SSW22	NNW30	NNW31	NNW28	N22	NNW23	NNW25	NNW24	W26	NW23	NW22	SW19	Diurnal Maximum

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



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

**Wind Speed (WS) - km/h**  
**Christina Lake - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Christina Lake - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	108	16.12	16.12
6 - 11	274	40.90	57.01
12 - 19	235	35.07	92.09
20 - 28	50	7.46	99.55
29 - 38	3	0.45	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 670

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Christina Lake - February 2023**

<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	0	1	4	8	14	6	2	20	18	28	4	0	2	1	0	0	108
6 - 11	2	34	37	21	26	12	3	6	26	28	35	28	5	5	3	3	274
12 - 19	9	11	5	4	4	0	0	9	15	23	34	48	12	11	29	21	235
20 - 28	1	0	0	0	0	0	0	4	0	6	2	11	4	4	11	7	50
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	3
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	<b>12</b>	<b>46</b>	<b>46</b>	<b>33</b>	<b>44</b>	<b>18</b>	<b>5</b>	<b>39</b>	<b>59</b>	<b>85</b>	<b>75</b>	<b>87</b>	<b>23</b>	<b>22</b>	<b>43</b>	<b>33</b>	<b>670</b>

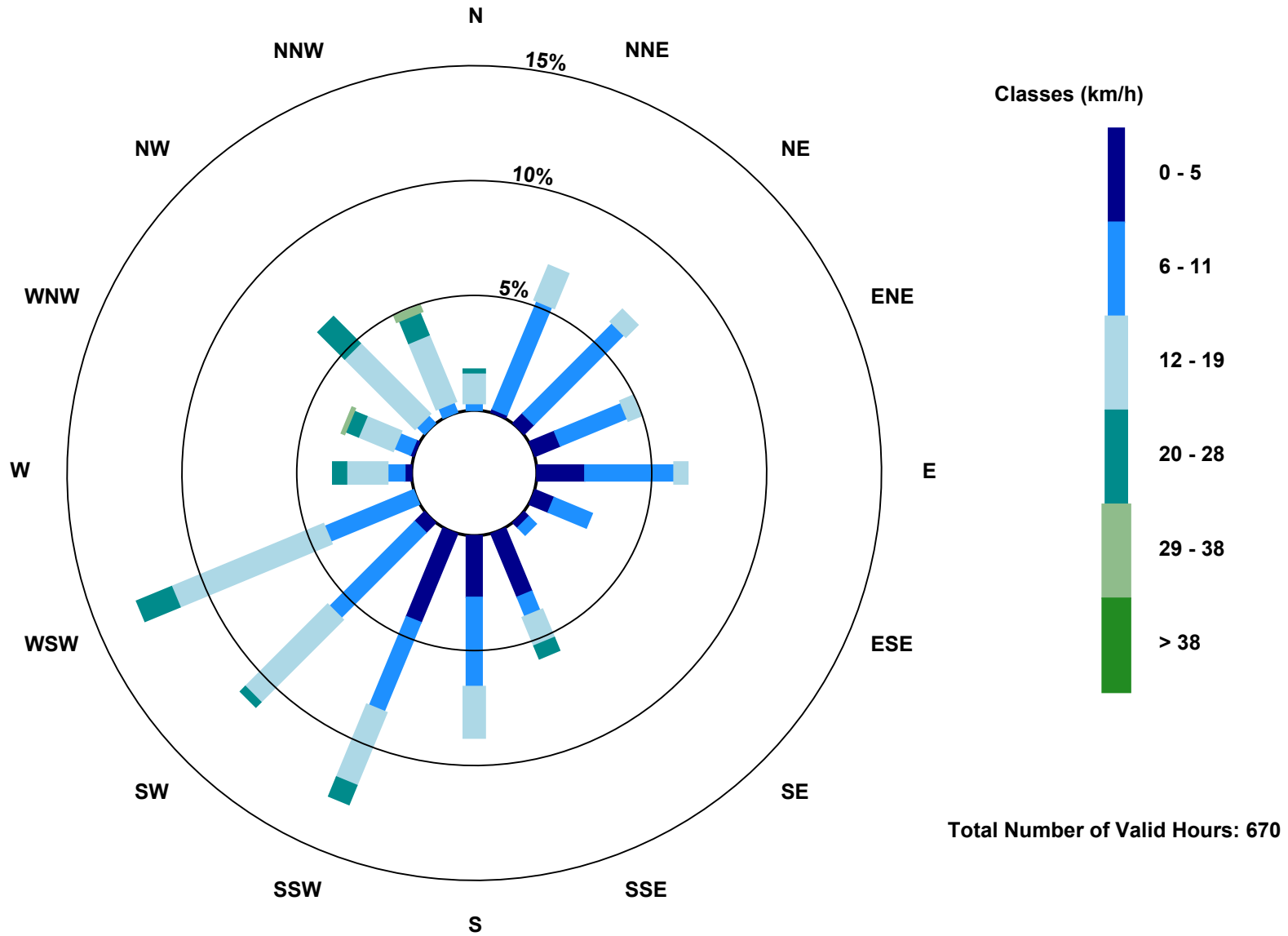
Total Number of Valid Hours: 670

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Christina Lake





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

**Wind Speed (WS) - km/h**  
**Christina Lake - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Feb 13 13:00														Hours in Service: 672 Hours of Data: 670 Hours of Missing Data: 2 Hours of Calibration: 0 Percent Operational Time: 99.7											
Minimum Value: 1 km/h on Feb 28 20:00																									
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> = 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-Feb	3	3	4	3	3	4	5	4	4	4	4	4	4	4	4	4	4	3	6	3	3	2	1	1	6
2-Feb	1	1	1	1	2	1	2	4	3	3	3	3	4	4	5	4	5	5	5	4	4	4	4	3	5
3-Feb	4	4	3	4	3	3	2	3	3	2	2	3	3	3	6	5	4	3	2	3	3	4	1	2	6
4-Feb	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	3	1	2	2	1	2	2	3
5-Feb	1	2	4	2	1	1	2	2	2	2	3	2	4	3	2	2	1	2	3	4	4	4	3	5	5
6-Feb	9	8	7	6	5	4	3	3	3	2	3	4	3	4	4	3	2	2	3	3	3	4	4	3	9
7-Feb	4	4	4	6	6	5	4	5	6	6	5	5	5	6	6	6	5	2	2	2	2	2	3	2	6
8-Feb	3	2	2	3	4	1	2	2	2	2	2	2	3	3	3	3	2	2	2	2	2	2	2	2	4
9-Feb	2	2	3	2	3	2	2	2	2	2	2	3	4	4	3	3	2	3	3	3	3	3	3	2	4
10-Feb	1	1	1	1	2	2	2	1	2	1	1	3	2	2	3	3	5	2	2	2	2	1	3	1	5
11-Feb	2	2	3	3	3	2	2	2	3	4	4	5	4	5	4	7	4	3	3	6	7	6	5	3	7
12-Feb	4	3	3	2	3	2	2	2	3	3	3	3	3	2	2	2	2	2	2	3	3	4	4	4	4
13-Feb	4	5	5	3	5	5	4	4	5	6	5	4	10	6	6	6	5	5	5	5	4	5	6	4	10
14-Feb	4	3	3	4	1	1	1	1	1	1	1	2	2	2	2	2	4	3	4	3	3	2	2	1	4
15-Feb	2	1	1	1	2	1	1	2	1	1	1	1	1	M	M	1	1	1	2	2	1	2	2	2	2
16-Feb	2	2	3	3	3	3	4	3	3	3	3	5	4	5	5	4	3	4	3	5	5	5	4	5	5
17-Feb	5	4	4	2	4	2	1	1	2	1	1	3	4	2	2	3	3	4	2	2	2	2	1	2	5
18-Feb	2	1	2	2	1	2	2	1	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	2
19-Feb	1	1	1	1	2	1	1	1	2	2	2	2	2	2	2	2	4	2	2	2	2	1	1	1	4
20-Feb	3	3	2	6	3	4	4	3	4	3	4	3	4	4	4	3	3	2	2	3	2	1	3	3	6
21-Feb	2	1	4	2	2	2	2	2	3	3	3	3	3	4	3	4	4	3	2	3	2	3	2	2	4
22-Feb	1	3	1	2	2	1	3	2	2	1	3	2	1	2	3	2	1	1	1	1	1	2	1	1	3
23-Feb	1	1	1	1	1	1	1	1	1	1	1	2	1	3	2	2	2	2	2	2	1	1	1	1	3
24-Feb	1	2	1	1	2	1	2	2	3	2	5	5	5	5	4	4	4	4	5	4	5	5	4	4	5
25-Feb	3	4	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	2	2	2	4
26-Feb	2	2	1	2	2	1	1	1	1	2	2	2	3	3	3	3	3	3	2	2	1	1	1	1	3
27-Feb	1	1	1	2	4	2	4	3	3	4	4	4	5	4	4	4	3	3	3	4	3	2	2	2	5
28-Feb	2	1	1	1	2	2	2	1	1	2	2	2	2	2	3	2	2	1	1	1	1	1	1	2	3
														9 8 7 6 6 5 5 5 6 6 5 5 10 6 6 7 5 5 6 6 7 6 6 5											
Diurnal Maximum																									
M - Maintenance																									

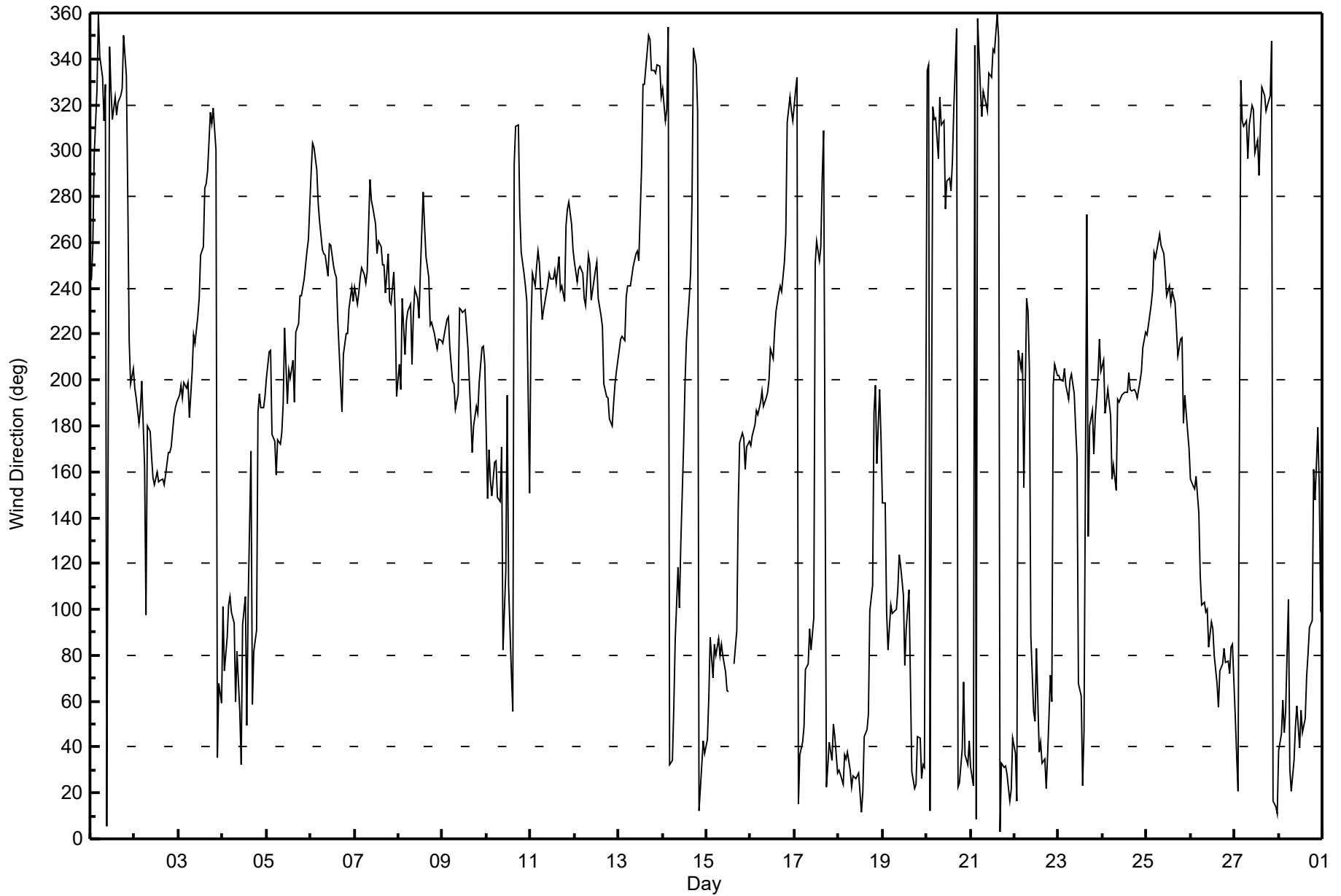


**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Wind Direction (WD) - deg**  
**Christina Lake - February 2023**

Direction of Maximum Speed: 303 deg on Feb 6 02:00																							Hours in Service:	672	
Direction of Maximum Daily Speed Average: 251.4 deg on Feb 7																							Hours of Data:	670	
Direction of Minimum Speed: 106 deg on Feb 4 13:00											Direction of Minimum Daily Speed Average: 2.1 deg on Feb 22												Hours of Missing Data:	2	
Monthly Average Direction: 256.0 deg																							Percent Operational Time:	99.7	
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-Feb	244	257	298	326	359	341	332	313	329	5	345	326	313	323	315	321	324	327	350	333	280	217	198	205	323.0
2-Feb	197	192	181	187	199	162	98	180	177	167	157	154	160	156	156	157	154	159	168	168	171	185	188	191	166.3
3-Feb	194	198	192	199	196	199	184	204	220	216	228	236	255	258	283	285	291	317	312	319	300	35	67	59	239.3
4-Feb	101	73	88	102	105	99	94	60	82	55	32	93	106	49	104	169	59	82	91	186	194	188	188	193	106.1
5-Feb	201	212	213	176	173	159	174	172	177	190	223	190	204	201	209	190	221	225	237	237	244	250	257	261	218.3
6-Feb	291	303	301	292	277	269	257	255	255	245	259	259	250	247	245	226	199	186	211	220	221	231	240	234	257.0
7-Feb	240	233	238	245	249	246	242	247	288	278	275	268	255	260	258	250	250	238	255	235	233	247	229	193	251.4
8-Feb	207	196	235	211	226	230	233	207	229	240	236	227	248	282	266	254	244	224	225	220	216	214	218	217	229.5
9-Feb	216	220	226	227	214	199	199	187	194	231	230	230	230	223	213	184	169	180	188	185	199	214	215	207	209.0
10-Feb	148	170	156	149	164	165	149	147	171	82	117	193	110	72	55	294	311	311	273	256	247	241	234	151	214.7
11-Feb	224	246	241	249	256	251	226	230	234	242	246	244	244	248	242	254	239	241	234	267	275	278	268	257	250.2
12-Feb	251	243	248	249	246	236	232	254	251	235	239	248	251	236	228	223	199	193	192	183	180	190	198	204	223.6
13-Feb	213	218	219	217	236	241	241	245	250	255	256	252	293	329	329	336	350	349	335	335	334	337	337	323	291.4
14-Feb	327	313	318	354	32	34	58	87	119	101	129	172	198	217	236	246	278	345	337	317	12	33	43	37	347.1
15-Feb	43	62	88	70	85	80	87	80	85	80	72	65	64	M	M	76	91	144	173	177	174	161	171	173	95.2
16-Feb	172	176	180	186	185	190	195	189	192	195	200	214	209	222	230	238	241	239	252	264	312	323	318	313	230.3
17-Feb	326	332	15	36	42	49	74	76	91	82	97	251	261	252	258	288	309	23	32	42	34	50	45	28	12.1
18-Feb	30	28	24	37	35	38	30	23	27	26	27	29	12	20	45	48	54	100	110	186	197	163	196	175	38.1
19-Feb	147	147	99	82	102	98	99	100	108	124	119	106	76	91	109	69	29	22	24	44	44	26	33	31	71.4
20-Feb	335	337	12	319	314	314	297	323	311	313	275	287	288	283	295	319	354	23	25	39	69	37	32	43	334.2
21-Feb	31	23	346	9	357	326	315	326	320	317	334	332	344	343	360	349	3	33	31	32	28	16	22	44	355.4
22-Feb	37	16	213	205	212	153	235	230	204	88	55	51	83	38	42	33	35	22	37	71	60	198	207	202	49.4
23-Feb	202	200	199	205	198	192	200	202	194	180	166	68	62	23	47	272	132	180	187	168	184	202	218	204	180.2
24-Feb	208	186	191	196	185	157	163	152	191	190	193	194	195	195	203	196	195	196	195	192	200	204	214	221	196.2
25-Feb	220	224	233	239	256	253	260	264	259	255	247	237	241	234	238	234	223	210	218	218	181	193	178	170	232.9
26-Feb	157	154	153	158	142	115	102	103	99	100	83	95	91	80	68	57	73	77	83	77	77	72	84	85	93.6
27-Feb	54	37	21	331	313	311	313	296	311	320	318	299	305	289	310	328	324	317	320	324	348	16	14	11	323.2
28-Feb	38	46	60	46	56	104	31	20	34	49	58	40	56	47	53	71	81	92	95	161	148	179	154	99	62.6
245.0	257.9	247.5	256.7	258.4	252.4	242.9	252.1	257.3	249.7	252.5	246.9	250.6	265.3	272.0	275.4	293.5	290.3	264.7	251.9	249.8	246.5	240.4	229.2		
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 (WD) - deg**  
**Christina Lake - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 101 deg on Feb 23 16:00 Minimum Value: 6 deg on Feb 15 20:00 Percentiles: P <sub>1</sub> = 7 P <sub>10</sub> = 10 Q <sub>1</sub> = 12 Median = 15 Q <sub>3</sub> = 20 P <sub>90</sub> = 31 P <sub>99</sub> = 76																			Hours in Service: 672 Hours of Data: 670 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-Feb	30	21	27	13	24	18	13	10	29	23	20	17	17	17	11	14	14	12	23	19	68	36	18	17	68
2-Feb	27	25	28	38	31	25	17	28	13	12	14	13	13	13	12	13	12	14	12	12	15	13	13	13	38
3-Feb	13	14	14	14	14	17	14	18	13	13	19	14	20	20	29	19	21	13	10	23	57	69	23	14	69
4-Feb	17	7	13	11	12	12	20	19	23	32	15	45	90	34	54	48	16	62	42	15	15	16	13	12	90
5-Feb	12	17	27	25	42	38	41	25	22	15	21	32	13	15	17	16	20	12	13	12	14	17	18	18	42
6-Feb	22	14	17	14	16	16	17	17	17	12	19	18	16	19	17	14	17	17	15	10	10	13	13	10	22
7-Feb	13	11	12	14	16	13	11	14	22	14	17	18	19	20	19	17	17	9	24	10	13	13	37	19	37
8-Feb	28	44	9	25	52	9	7	11	13	10	9	13	25	25	22	18	20	12	8	9	9	10	10	10	52
9-Feb	10	10	10	11	17	8	9	13	19	10	12	13	13	14	22	17	10	11	12	12	17	13	13	33	33
10-Feb	31	12	25	16	11	47	14	14	35	12	18	47	42	68	33	80	30	12	29	16	13	9	29	87	87
11-Feb	29	13	12	16	17	18	8	12	13	15	15	14	16	16	13	18	12	12	11	20	15	15	18	17	29
12-Feb	17	13	15	14	15	13	14	16	16	14	13	15	19	14	14	13	15	11	10	10	12	11	12	12	19
13-Feb	13	14	15	18	12	12	12	14	16	19	18	17	31	15	16	11	20	19	11	11	10	16	20	11	31
14-Feb	13	7	10	29	7	13	16	10	22	18	57	76	46	21	23	19	33	25	18	14	35	11	11	9	76
15-Feb	13	13	13	12	17	8	11	10	10	10	11	15	15	M	M	12	16	18	16	6	7	17	20	16	20
16-Feb	12	13	12	12	15	14	13	17	14	15	14	14	12	15	13	15	12	13	17	18	17	14	11	10	18
17-Feb	15	13	36	9	27	8	26	18	13	14	27	30	23	30	25	27	19	27	9	9	10	14	10	8	36
18-Feb	10	9	9	9	8	9	9	10	12	17	13	17	17	18	15	15	10	39	10	24	18	50	25	18	50
19-Feb	28	44	19	9	51	7	10	8	12	12	11	28	18	18	31	19	14	11	12	16	21	9	8	10	51
20-Feb	24	22	33	13	8	12	23	8	21	17	34	30	22	19	23	12	26	10	10	8	11	11	9	10	34
21-Feb	13	6	28	15	23	28	9	10	10	13	18	20	24	20	24	23	19	8	7	15	9	14	13	12	28
22-Feb	24	35	94	46	64	60	78	65	68	86	45	23	38	51	25	19	15	7	6	17	27	13	8	9	94
23-Feb	9	9	13	9	12	9	8	9	22	22	47	47	43	62	16	101	66	41	34	63	23	10	14	18	101
24-Feb	12	15	7	10	11	10	17	11	16	15	16	19	17	14	17	15	14	13	12	12	15	15	14	14	19
25-Feb	13	12	14	15	18	18	19	18	18	18	19	19	19	18	16	20	12	12	11	17	16	12	11	12	20
26-Feb	14	14	13	11	22	20	10	10	12	14	11	12	11	11	16	10	12	10	10	11	9	10	9	11	22
27-Feb	10	9	18	9	12	7	12	17	16	10	14	22	21	21	21	13	17	9	9	17	21	21	13	16	22
28-Feb	12	11	11	8	12	20	23	12	11	22	24	19	32	38	47	16	14	10	18	13	22	9	29	9	47
																			31 44 94 46 64 60 78 65 68 86 57 76 90 68 54 101 66 62 42 63 68 69 37 87						
Diurnal Maximum																									
M - Maintenance																									



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

**AMS27**  
**JACKFISH 2/3**  
**FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)  
 FEBRUARY 2023

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	639	31	33	99.7	8.5	0	2.2	0
H2S (ppb) Average	636	33	36	99.55	1.5	0	0.3	0
NO2 (ppb) Average	636	33	36	99.55	12.6	0	5.2	-
NO (ppb) Average	636	33	36	99.55	11.4	-	1	-
NOX (ppb) Average	636	33	36	99.55	24	-	5.6	-
Temperature 2 m (C) Average	670	0	2	99.7	4.7	-	0.5	-
Relative Humidity (%) Average	670	0	2	99.7	97.3	-	88.4	-
Wind Speed 10 m (km/h) Average	669	0	3	99.55	19	-	13	-
Wind Direction 10 m (deg) Average	669	0	3	99.55	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	639	0.96	1.2	-	0	0.1	0.2	0.6	1.3	2.3	8.5
H2S (ppb) Average	636	0.2	0.1	-	0	0.1	0.1	0.2	0.3	0.3	1.5
NO2 (ppb) Average	636	2.3	1.9	-	0	0.4	0.9	1.8	3.2	4.6	12.6
NO (ppb) Average	636	0.34	0.7	-	0	0	0	0.1	0.4	0.8	11.4
NOX (ppb) Average	636	2.64	2.2	-	0	0.6	1.1	2.1	3.7	5.1	24
Temperature 2 m (C) Average	670	-11.74	9.5	-	-33.6	-24.2	-18.9	-12.2	-2.6	0.6	4.7
Relative Humidity (%) Average	670	71.46	12	-	34.6	53.6	64.3	73.4	79.6	84.7	97.3
Wind Speed 10 m (km/h) Average	669	7.6	4	-	1	3	5	7	10	13	19
Wind Direction 10 m (deg) Average	669	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	05 Feb 2023 00:00	05 Feb 2023 00:00	1	DAS Failure - data not recorded
ALL PARAMETERS	13 Feb 2023 09:00	13 Feb 2023 09:00	1	DAS Failure - data not recorded
H2S, NO2	14 Feb 2023 12:00	14 Feb 2023 12:00	1	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	14 Feb 2023 13:00	14 Feb 2023 13:00	1	Maintenance - station operator activities



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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Jackfish 2/3 - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0		Hours in Service: 672	
Maximum Value: 8.5 ppb on Feb 22 13:00		Maximum Daily Average: 2.2 ppb on Feb 20	
Minimum Value: 0.0 ppb on Feb 1 07:00		Hours of Data: 639	
Maximum Diurnal Average: 1.6 ppb at hour 13		Hours of Missing Data: 33	
Monthly Average: 0.96 ppb		Hours of Calibration: 31	
Minimum Daily Average: 0.1 ppb on Feb 8		Percent Operational Time: 99.7	
Minimum Diurnal Average: 0.6 ppb at hour 20		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.2 Median = 0.6 Q <sub>3</sub> = 1.3 P <sub>90</sub> = 2.3 P <sub>99</sub> = 6.1	

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-Feb	1.4	1.6	Z	0.1	0.2	0.1	0.0	0.0	0.0	0.4	0.8	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.6																						
2-Feb	0.2	0.1	0.0	Z	0.1	0.4	0.3	0.6	1.8	1.7	1.6	1.8	2.0	0.9	0.6	0.7	0.8	0.8	0.8	0.6	0.8	1.1	1.4	0.4	0.8	2.0																						
3-Feb	0.4	0.4	0.4	0.4	Z	1.0	1.4	1.9	1.0	0.7	0.6	0.6	1.4	1.1	0.9	0.5	0.8	1.4	0.9	0.3	0.3	0.3	0.4	0.5	0.8	1.9																						
4-Feb	0.3	0.3	0.3	0.2	0.2	Z	0.1	0.0	0.1	0.1	0.1	0.3	1.4	1.9	2.6	2.2	4.3	3.4	1.1	0.2	0.1	0.1	0.1	DF	0.9	4.3																						
5-Feb	Z	0.0	0.0	0.0	0.7	0.7	0.4	0.4	0.3	0.4	0.4	0.5	0.5	2.3	2.1	2.5	1.7	1.8	1.5	2.0	2.1	1.5	0.7	0.3	1.0	2.5																						
6-Feb	0.4	Z	2.3	4.2	0.4	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.7	1.0	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.9	0.6	0.6	4.2																						
7-Feb	1.0	0.6	Z	0.7	0.2	0.2	1.4	0.2	2.4	0.7	0.3	0.1	0.1	0.1	0.1	0.1	0.8	0.8	0.9	0.1	0.1	0.9	0.3	0.1	0.5	2.4																						
8-Feb	0.1	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	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	0.2	0.2	0.1	0.2																						
9-Feb	0.2	0.3	0.3	0.6	Z	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.7	0.7	1.2	1.0	1.1	0.8	0.8	1.0	1.3	2.0	0.6	2.0																						
10-Feb	2.7	2.5	2.1	2.1	1.9	Z	1.6	1.7	1.3	2.1	1.7	1.3	2.2	2.4	6.2	3.9	3.2	2.5	1.8	0.3	0.2	0.1	0.1	0.1	1.9	6.2																						
11-Feb	Z	0.0	0.1	0.0	0.0	0.0	0.3	0.9	0.7	1.0	1.0	0.8	0.6	0.2	0.6	0.1	0.1	0.4	0.3	0.2	0.1	0.2	0.0	0.0	0.3	1.0																						
12-Feb	0.6	Z	0.0	0.0	0.4	0.6	0.5	0.1	0.5	0.2	0.5	0.9	1.2	0.5	0.0	0.0	0.0	0.0	0.0	0.8	0.2	0.8	1.5	0.7	0.4	1.5																						
13-Feb	0.6	0.3	Z	0.2	0.5	0.3	0.7	0.8	DF	0.8	0.1	0.0	0.3	0.8	1.5	1.9	0.8	0.3	1.0	1.3	0.8	0.5	0.4	0.7	0.7	1.9																						
14-Feb	0.8	1.5	1.6	Z	0.4	0.1	0.1	0.1	2.7	1.5	2.3	C	C	C	1.4	1.1	1.1	0.3	1.2	0.8	0.5	2.0	2.2	2.4	1.2	2.7																						
15-Feb	4.9	4.6	4.6	4.2	Z	2.7	2.1	1.2	0.8	1.4	2.2	2.5	2.9	1.8	1.5	1.5	1.1	0.6	0.3	0.4	0.4	0.4	0.4	0.4	1.9	4.9																						
16-Feb	0.5	1.4	1.3	1.2	1.9	Z	2.1	0.6	0.7	0.8	0.9	0.8	0.7	0.8	0.7	0.5	0.6	0.9	0.4	0.2	4.3	0.3	0.3	0.2	1.0	4.3																						
17-Feb	Z	0.0	0.0	1.2	0.2	0.2	1.1	1.2	0.2	0.1	0.1	0.3	0.3	0.1	0.1	0.1	0.4	0.5	0.8	1.8	1.0	0.9	0.9	0.7	0.5	1.8																						
18-Feb	1.2	Z	0.4	1.4	0.5	0.1	0.1	0.6	1.0	2.6	1.5	3.9	6.2	1.0	0.2	0.3	0.5	0.5	0.3	0.2	0.2	0.2	0.4	0.5	1.0	6.2																						
19-Feb	0.3	0.2	Z	0.2	0.3	0.6	1.1	0.9	0.5	0.3	0.4	0.8	0.4	0.9	0.3	2.2	2.0	0.3	0.3	0.1	0.0	0.1	0.0	0.0	0.5	2.2																						
20-Feb	0.1	0.1	0.1	Z	0.6	2.8	4.1	4.7	4.6	4.4	4.3	2.4	2.7	1.2	2.2	0.1	0.2	0.2	0.2	0.6	2.2	1.8	6.6	3.7	2.2	6.6																						
21-Feb	1.3	0.3	0.2	0.5	Z	0.0	0.1	0.4	1.4	2.8	3.7	4.5	1.8	0.7	0.7	2.9	2.6	3.9	3.0	1.4	2.6	3.4	3.2	1.3	1.9	4.5																						
22-Feb	0.5	0.4	0.8	0.8	0.7	Z	0.7	1.2	2.3	1.9	1.4	3.0	8.5	6.4	2.7	0.9	1.9	1.0	1.0	1.7	1.8	1.9	1.1	0.9	1.9	8.5																						
23-Feb	Z	0.9	1.2	1.4	1.4	1.7	1.9	1.5	1.8	3.4	0.8	1.8	3.2	5.9	5.8	3.8	2.9	1.7	1.4	1.1	0.6	0.6	0.9	0.4	2.0	5.9																						
24-Feb	0.3	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.8	0.6	0.3	0.3	0.1	0.6	0.6	0.2	0.3	0.2	0.1	0.2	0.2	0.3	0.8																						
25-Feb	0.3	0.3	Z	0.9	1.1	1.7	1.2	0.3	0.2	0.4	0.2	0.2	0.2	0.4	0.2	0.6	0.2	0.2	0.1	0.2	0.1	0.2	1.3	1.5	0.5	1.7																						
26-Feb	0.8	0.6	0.7	Z	1.7	1.6	1.2	0.9	0.6	0.4	0.5	0.7	1.4	1.2	1.6	1.1	0.5	1.2	0.6	0.6	0.3	0.2	0.1	0.2	0.8	1.7																						
27-Feb	0.2	0.0	0.0	0.0	Z	0.0	0.2	0.4	1.3	0.7	0.7	1.1	1.0	0.9	1.0	0.6	2.0	0.7	0.5	0.1	0.4	0.6	1.3	2.0	0.7	2.0																						
28-Feb	2.8	2.2	1.4	1.0	0.5	Z	0.5	0.6	0.6	1.1	6.2	8.0	3.6	2.2	3.5	2.7	2.1	0.4	0.3	0.6	0.7	0.3	0.1	0.0	1.8	8.0																						
																								0.9	0.8	0.8	0.9	0.6	0.7	0.8	0.8	1.0	1.1	1.2	1.4	1.6	1.3	1.4	1.1	1.2	0.9	0.7	0.6	0.8	0.7	0.9	0.7	Diurnal Average
																								4.9	4.6	4.6	4.2	1.9	2.8	4.1	4.7	4.6	4.4	6.2	8.0	8.5	6.4	6.2	3.9	4.3	3.9	3.0	2.0	4.3	3.4	6.6	3.7	Diurnal Maximum

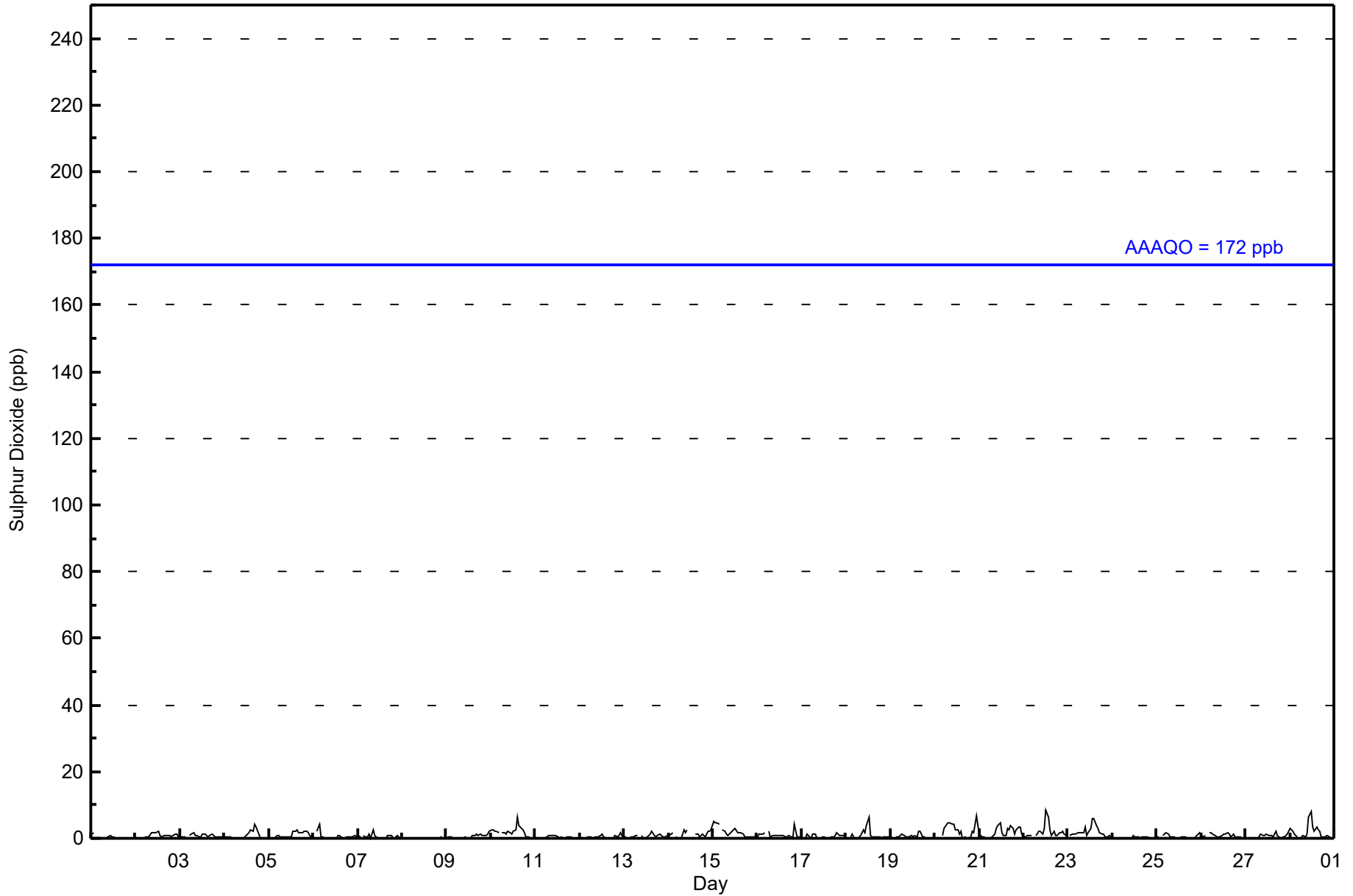
  

Z - zerospan	C - Calibration	DF - DAS Failure
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb		



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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Jackfish 2/3 - February 2023**







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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Jackfish 2/3 - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	639	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: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Jackfish 2/3 - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	10	45	46	33	41	17	5	36	55	79	70	84	23	20	41	32	637
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>	10	45	46	33	41	17	5	36	55	79	70	84	23	20	41	32	637

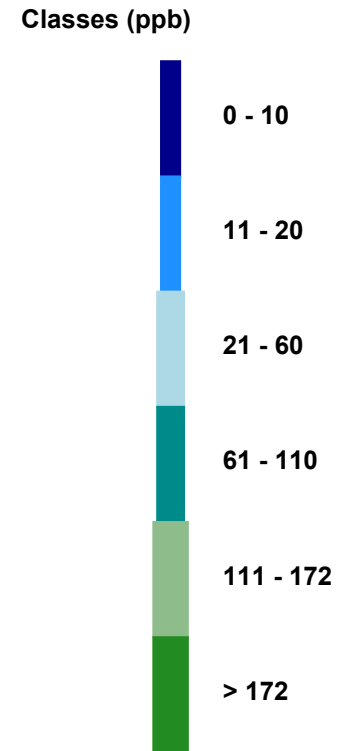
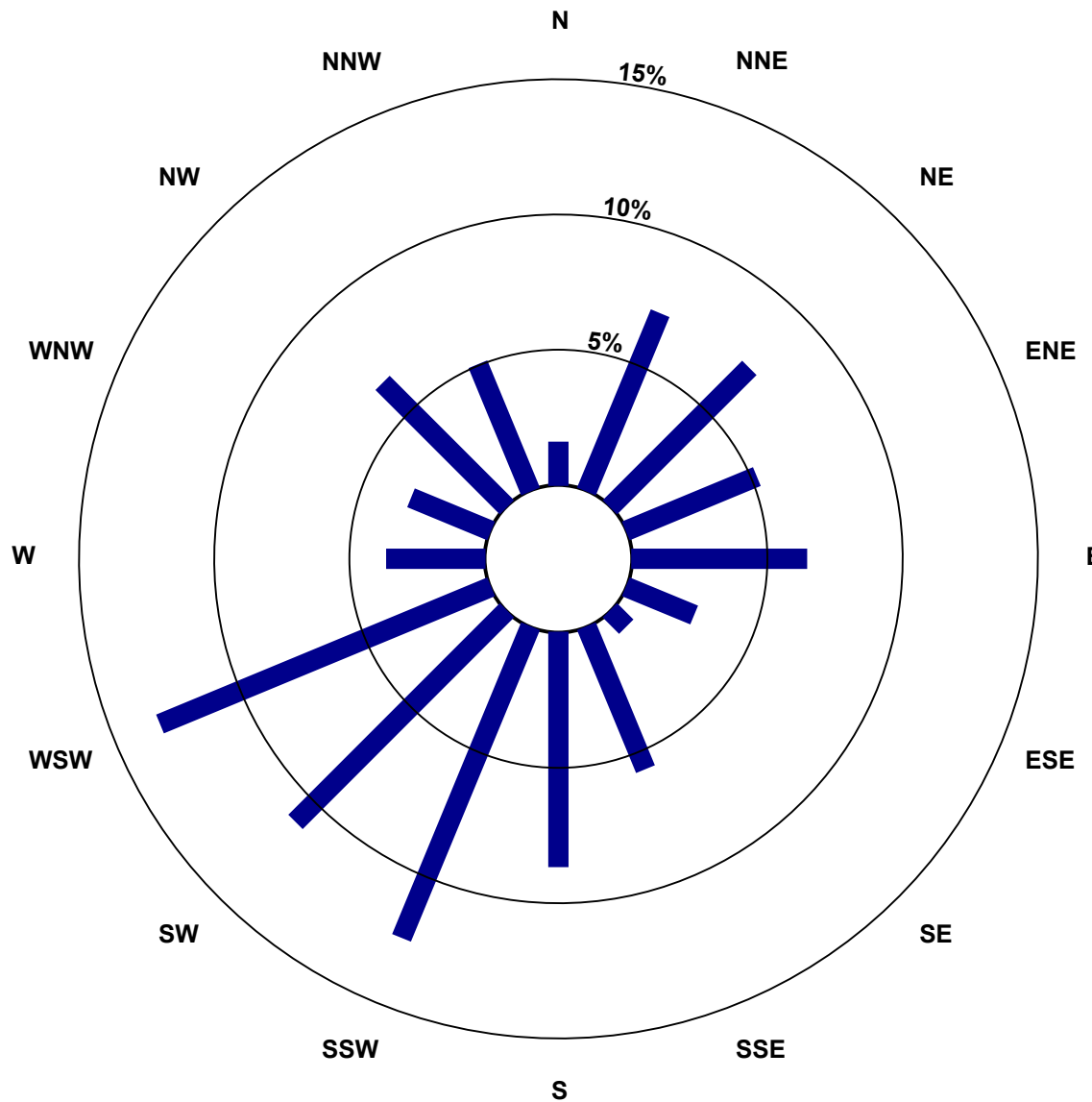
Total Number of Valid Hours: 637

Total Number of Hours: 672

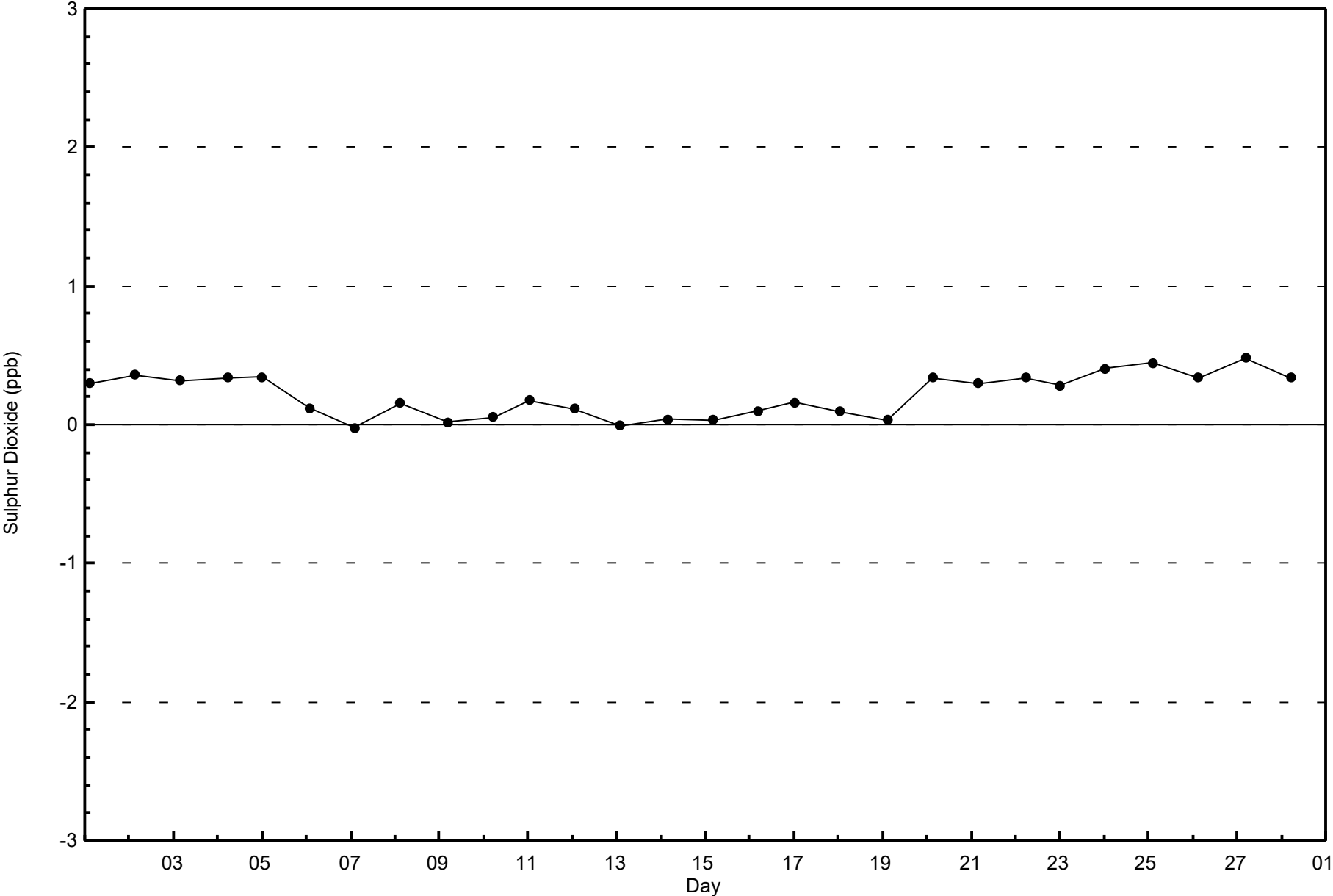


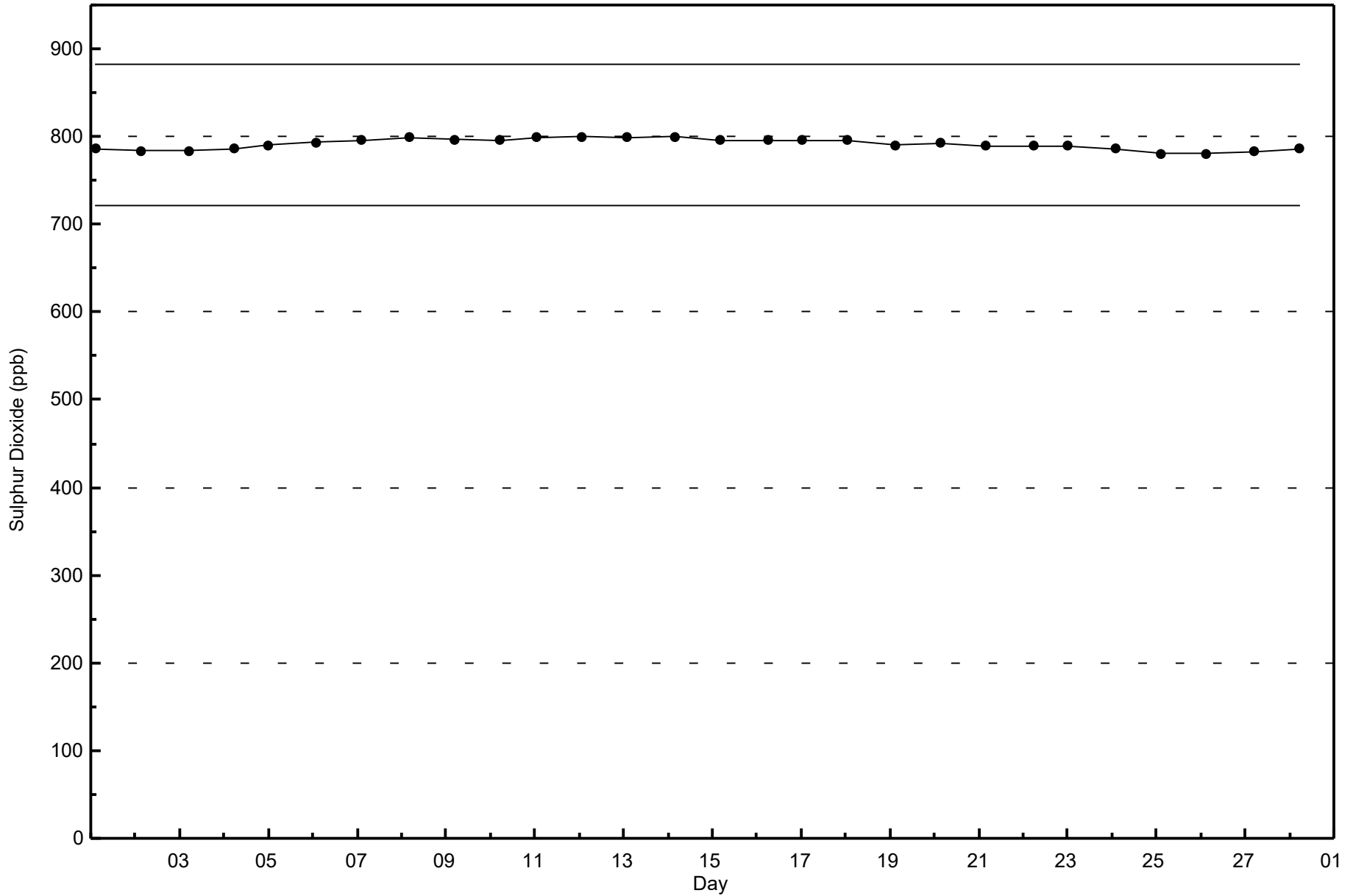
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Jackfish 2/3



Total Number of Valid Hours: 637







Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H2S) - ppb

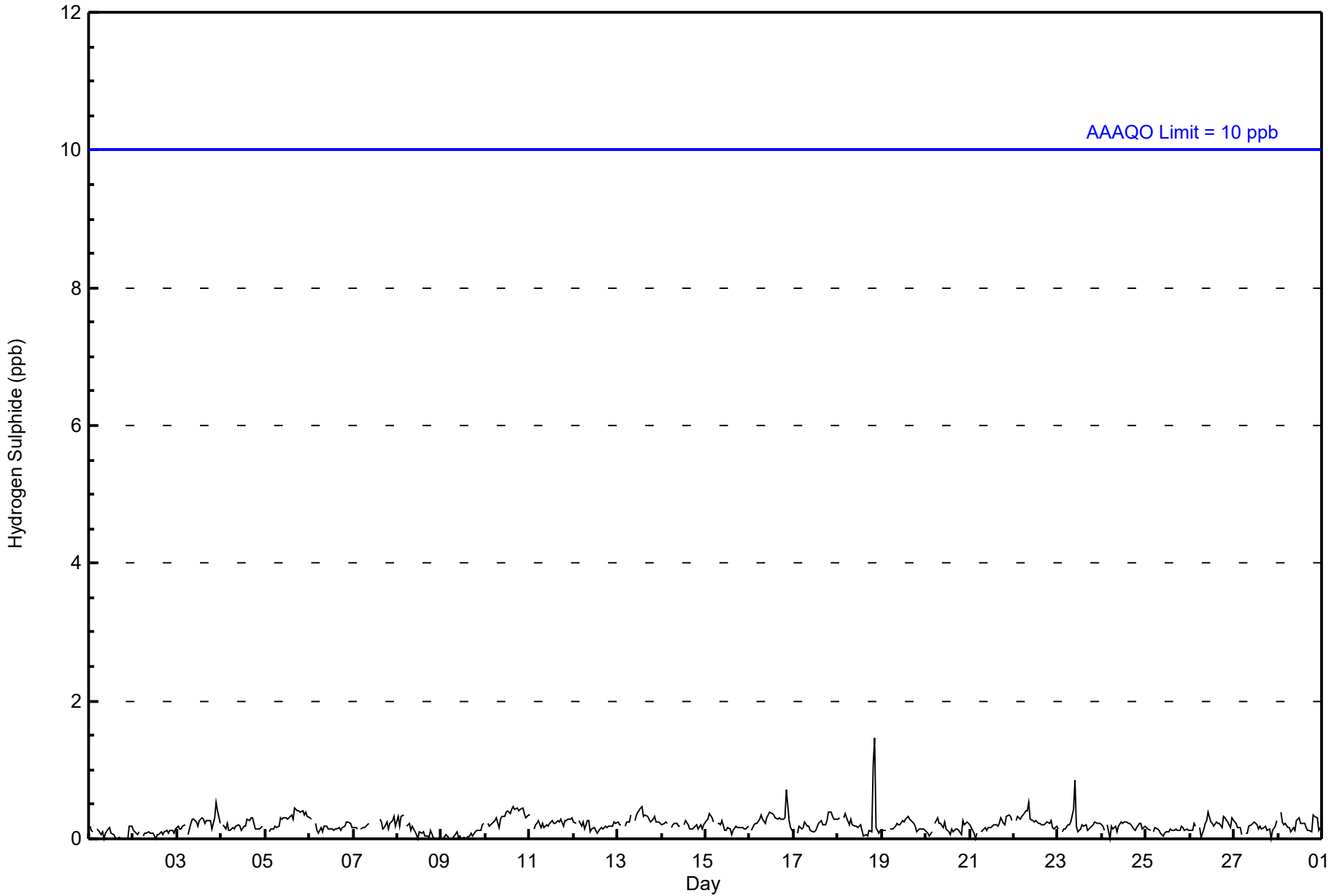
Jackfish 2/3 - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:																672					
Maximum Value: 1.5 ppb on Feb 18 21:00		Maximum Daily Average: 0.3 ppb on Feb 10		Hours of Data:																636							
Minimum Value: 0.0 ppb on Feb 1 09:00		Minimum Daily Average: 0.1 ppb on Feb 9		Hours of Missing Data:																36							
Maximum Diurnal Average: 0.3 ppb at hour 21		Minimum Diurnal Average: 0.2 ppb at hour 3		Hours of Calibration:																33							
Monthly Average: 0.20 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> = 0.3 P <sub>99</sub> = 0.5		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-Feb	0.2	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.2	
2-Feb	0.1	0.1	0.1	0.1	Z	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
3-Feb	0.2	0.1	0.1	0.2	0.2	Z	0.1	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.1	0.3	0.5	0.4	0.2	0.2	
4-Feb	Z	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.2	DF	0.2	
5-Feb	0.2	Z	0.1	0.1	0.1	0.2	0.2	0.2	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	0.3	0.4	0.3	0.4	
6-Feb	0.3	0.3	Z	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
7-Feb	0.2	0.2	0.1	Z	0.2	0.2	0.2	0.2	0.2	C	C	C	C	C	0.3	0.2	0.2	0.2	0.3	0.1	0.2	0.3	0.3	0.2	0.2	0.2	
8-Feb	0.3	0.2	0.3	0.3	Z	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
9-Feb	0.0	0.0	0.1	0.0	0.0	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	
10-Feb	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	
11-Feb	0.3	Z	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	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	
12-Feb	0.2	0.2	Z	0.3	0.2	0.2	0.1	0.3	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	
13-Feb	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.3	DF	0.3	0.3	0.4	0.4	0.5	0.3	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.3	
14-Feb	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	M	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.2	
15-Feb	0.3	0.3	0.4	0.3	0.2	Z	0.2	0.2	0.2	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	
16-Feb	Z	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.7	0.3	0.2	0.1	0.3	
17-Feb	0.1	Z	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.2	
18-Feb	0.3	0.3	Z	0.3	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.1	0.0	0.1	0.1	1.1	1.5	0.2	0.1	0.1	0.3	1.5	
19-Feb	0.1	0.1	0.1	Z	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	
20-Feb	0.1	0.1	0.0	0.1	Z	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.3	0.2	0.2	0.2	0.2	0.3	
21-Feb	0.2	0.1	0.1	0.0	0.1	Z	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.2	
22-Feb	Z	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.2	0.3	
23-Feb	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.9	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
24-Feb	0.2	0.1	Z	0.2	0.0	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
25-Feb	0.2	0.1	0.1	Z	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	0.2	0.1	0.1	0.1	0.1	
26-Feb	0.1	0.1	0.2	0.2	Z	0.2	0.0	0.1	0.2	0.3	0.4	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	
27-Feb	0.3	0.2	0.2	0.2	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.2	0.3	0.2	0.3	
28-Feb	Z	0.4	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.3	0.3	0.1	0.2	0.2	0.4	
																								Diurnal Average			
																								Diurnal Maximum			
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**  
**Hourly Averages**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Jackfish 2/3 - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Jackfish 2/3 - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	636	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: 636

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Jackfish 2/3 - February 2023**

<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	19	47	44	29	14	11	10	17	44	69	73	109	42	26	36	45	635
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>	19	47	44	29	14	11	10	17	44	69	73	109	42	26	36	45	635

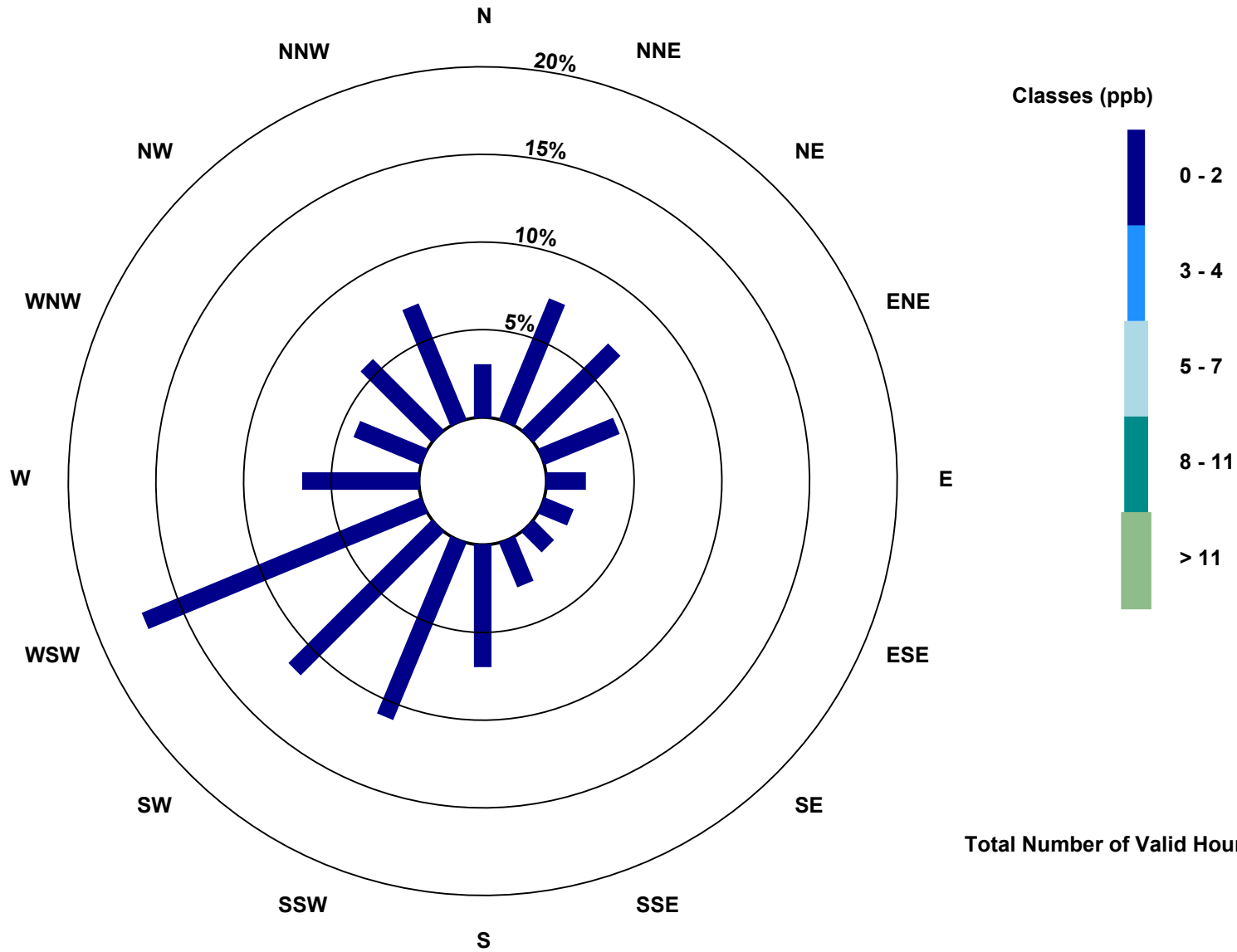
Total Number of Valid Hours: 635

Total Number of Hours: 672

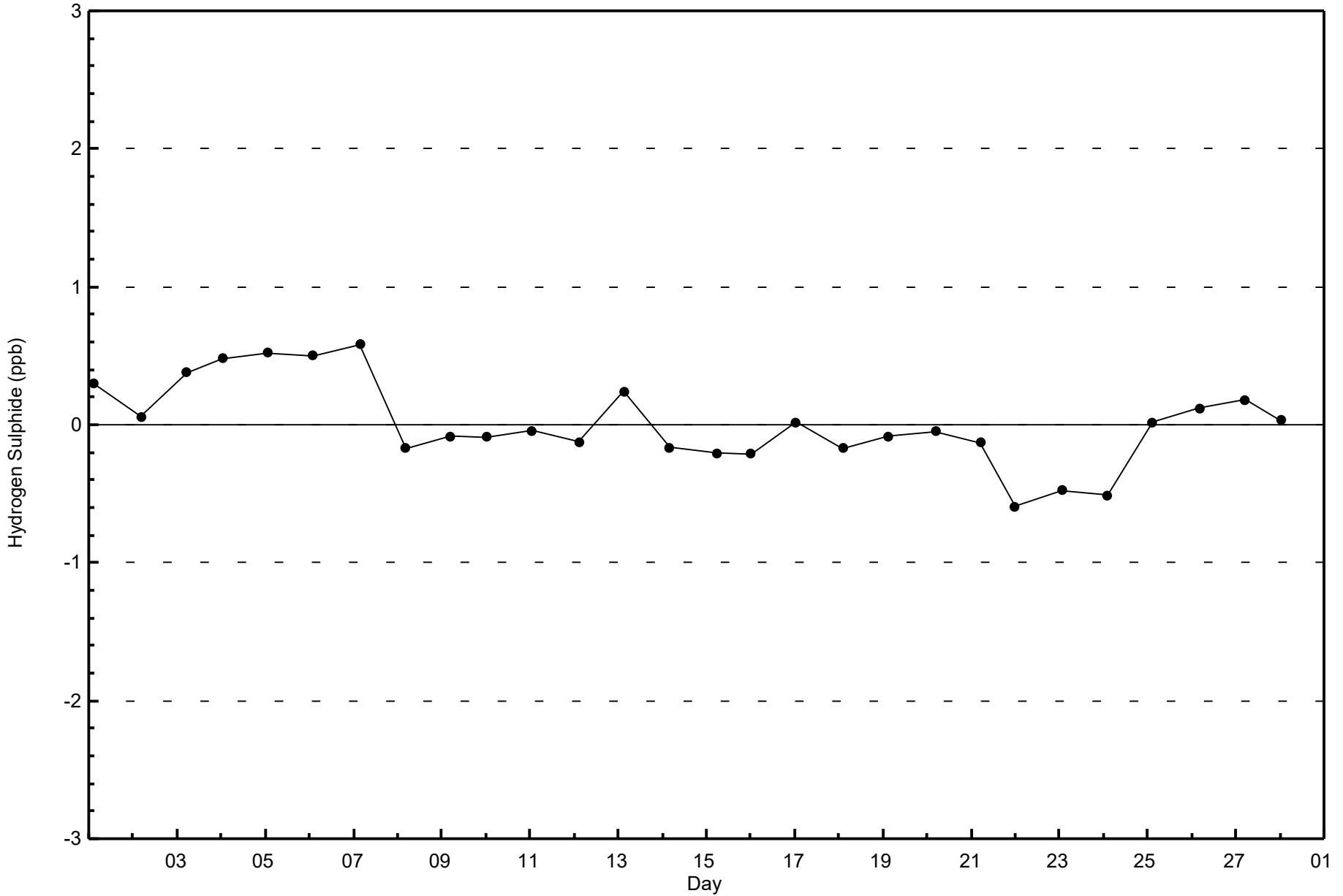


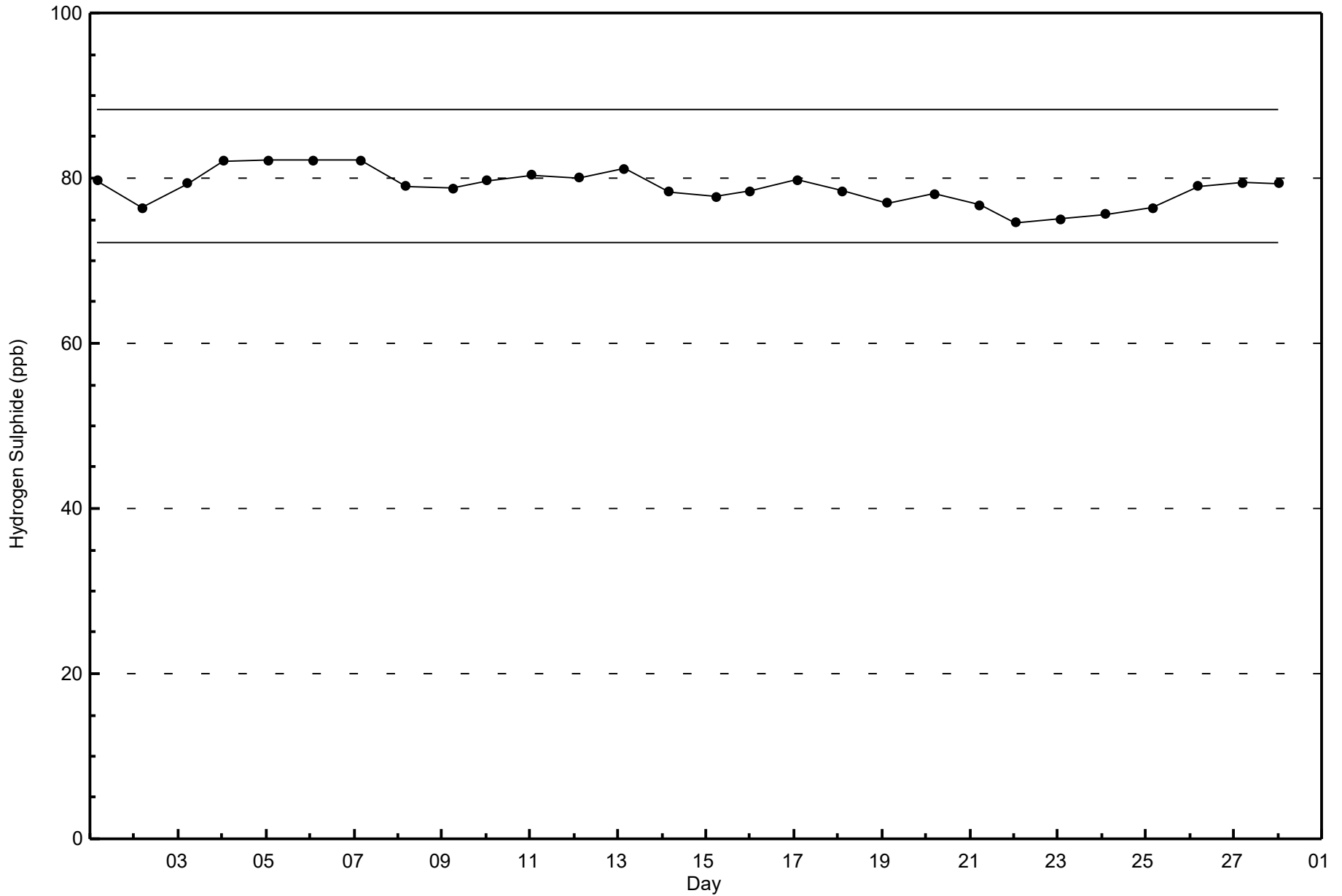
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Jackfish 2/3



Total Number of Valid Hours: 635





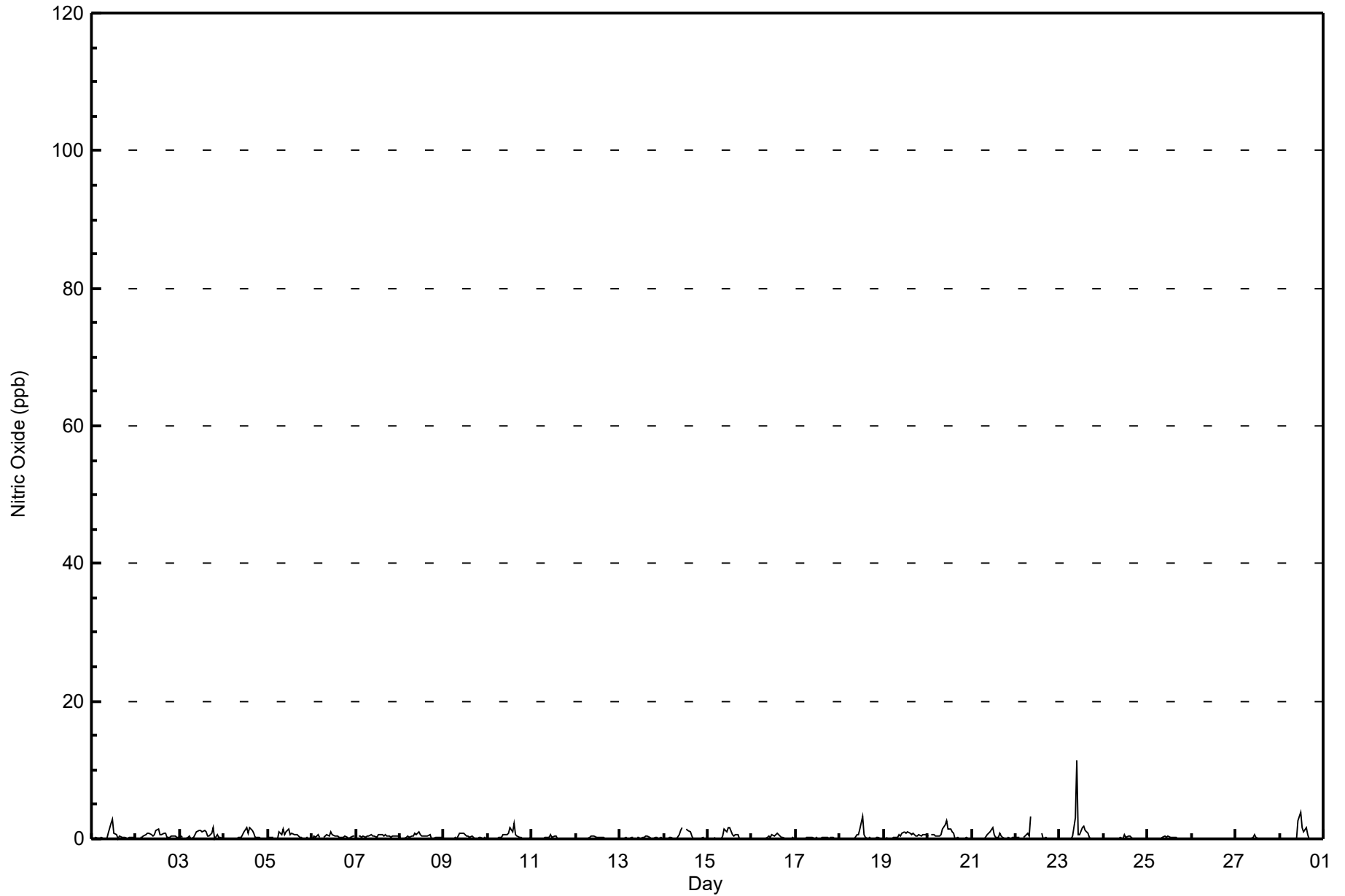


Maximum Value: 11.4 ppb on Feb 23 10:00																				Maximum Daily Average: 1.0 ppb on Feb 23					Hours in Service:	672
Minimum Value: 0.0 ppb on Feb 1 02:00																				Minimum Daily Average: 0.0 ppb on Feb 26					Hours of Data:	636
Maximum Diurnal Average: 1.0 ppb at hour 12																				Minimum Diurnal Average: 0.1 ppb at hour 1					Hours of Missing Data:	36
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 = 0.1 Q <sub>3</sub> = 0.4 P <sub>90</sub> = 0.8 P <sub>99</sub> = 2.7					Hours of Calibration:	33
																									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-Feb	Z	0.0	0.2	0.0	0.0	0.2	0.1	0.1	0.0	0.8	2.3	2.9	0.8	0.5	0.1	0.3	0.2	0.3	0.2	0.0	0.2	0.1	0.1	0.3	0.4	2.9
2-Feb	0.1	Z	0.3	0.2	0.3	0.6	0.8	0.8	0.6	0.5	0.6	1.2	1.3	0.7	0.7	0.8	0.7	0.1	0.1	0.4	0.4	0.4	0.1	0.3	0.5	1.3
3-Feb	0.3	0.2	Z	0.1	0.3	0.3	0.1	0.2	0.5	0.9	1.3	1.3	1.1	1.3	0.9	0.3	0.4	0.9	1.6	0.0	0.7	0.2	0.2	0.0	0.6	1.6
4-Feb	0.0	0.1	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.3	0.6	1.1	1.6	0.8	1.7	1.2	0.8	0.1	0.2	0.1	0.0	0.1	0.0	DF	0.4	1.7
5-Feb	0.3	0.1	0.2	0.1	Z	0.0	1.0	0.6	1.4	0.6	1.0	1.5	0.7	0.7	0.6	0.5	0.7	0.1	0.2	0.0	0.0	0.1	0.0	0.0	0.5	1.5
6-Feb	0.0	0.4	0.3	0.6	0.1	Z	0.2	0.3	0.7	0.4	1.0	0.6	0.4	0.4	0.5	0.2	0.3	0.3	0.3	0.3	0.1	0.2	0.5	0.3	0.4	1.0
7-Feb	Z	0.4	0.3	0.2	0.4	0.3	0.5	0.4	0.6	0.5	0.4	0.2	0.6	0.7	0.6	0.5	0.5	0.5	0.4	0.3	0.4	0.4	0.3	0.4	0.4	0.7
8-Feb	0.2	Z	0.1	0.1	0.4	0.2	0.4	0.5	0.8	0.7	0.9	0.6	0.4	0.5	0.3	0.3	0.6	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.9
9-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.0	0.8	0.9	0.8	0.7	0.4	0.4	0.3	0.3	0.2	0.0	0.0	0.2	0.1	0.0	0.3	0.0	0.2	0.9
10-Feb	0.1	0.1	0.1	Z	0.0	0.1	0.3	0.1	0.6	0.6	0.7	0.8	1.6	1.1	2.2	0.7	0.5	0.1	0.3	0.0	0.0	0.0	0.0	0.1	0.4	2.2
11-Feb	0.0	0.0	0.1	0.0	Z	0.1	0.0	0.2	0.3	0.3	0.6	0.3	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.6
12-Feb	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.3	0.3	0.4	0.3	0.2	0.2	0.1	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
13-Feb	Z	0.0	0.0	0.2	0.0	0.1	0.2	0.1	DF	0.2	0.3	0.1	0.2	0.1	0.3	0.3	0.2	0.0	0.1	0.2	0.2	0.0	0.2	0.0	0.1	0.3
14-Feb	0.0	Z	0.0	0.2	0.1	0.0	0.1	0.0	0.7	1.2	1.6	M	1.5	1.3	1.0	0.3	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.4	1.6
15-Feb	0.0	0.0	Z	0.1	0.0	0.1	0.0	0.0	0.3	1.3	1.1	1.6	1.6	0.6	0.5	0.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.6
16-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.4	0.3	0.5	0.4	0.6	0.8	0.4	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.2	0.8
17-Feb	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.3	0.2	0.2	0.0	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.3
18-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.7	0.6	1.5	3.2	0.6	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.0	0.1	0.3	3.2
19-Feb	Z	0.2	0.0	0.0	0.1	0.2	0.2	0.2	0.5	0.5	0.8	1.1	0.7	0.9	0.8	0.6	0.8	0.4	0.5	0.7	0.5	0.6	0.5	0.5	0.5	1.1
20-Feb	0.4	Z	0.6	0.7	0.5	0.5	0.5	0.5	1.4	2.0	2.7	1.5	1.4	1.0	0.7	0.1	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.6	2.7
21-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.6	0.8	1.0	1.6	0.6	0.3	0.1	0.7	0.5	0.3	0.0	0.1	0.2	0.0	0.1	0.2	0.3	1.6
22-Feb	0.3	0.2	0.1	Z	0.2	0.3	0.8	0.5	3.3	C	C	C	C	C	0.8	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	3.3
23-Feb	0.0	0.0	0.0	0.1	Z	0.0	0.0	0.3	3.0	11.4	0.7	0.7	1.5	1.9	1.3	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	11.4
24-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.7	0.2	0.4	0.5	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.7
25-Feb	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.3	0.4	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	0.4
26-Feb	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
27-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
28-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	2.7	3.9	1.6	1.1	1.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.9
																								Diurnal Average		
																								Diurnal Maximum		
0.1 0.1 0.1 0.1 0.1 0.1 0.2 0.2 0.6 1.0 0.9 1.0 0.8 0.6 0.6 0.4 0.3 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.4 0.4 0.6 0.7 0.5 0.6 1.0 0.8 3.3 11.4 2.7 3.9 3.2 1.9 2.2 1.2 0.8 0.9 1.6 0.7 0.7 0.6 0.5 0.5																										
Z - zerospan      C - Calibration      M - Maintenance      DF - DAS Failure																										



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

**Nitric Oxide (NO) - ppb**  
**Jackfish 2/3 - February 2023**





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

**Nitric Oxide (NO) - ppb**  
**Jackfish 2/3 - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	636	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: 636

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Jackfish 2/3 - February 2023**

<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	18	47	41	28	13	11	10	18	43	68	74	108	47	27	37	45	635
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>	18	47	41	28	13	11	10	18	43	68	74	108	47	27	37	45	635

Total Number of Valid Hours: 635

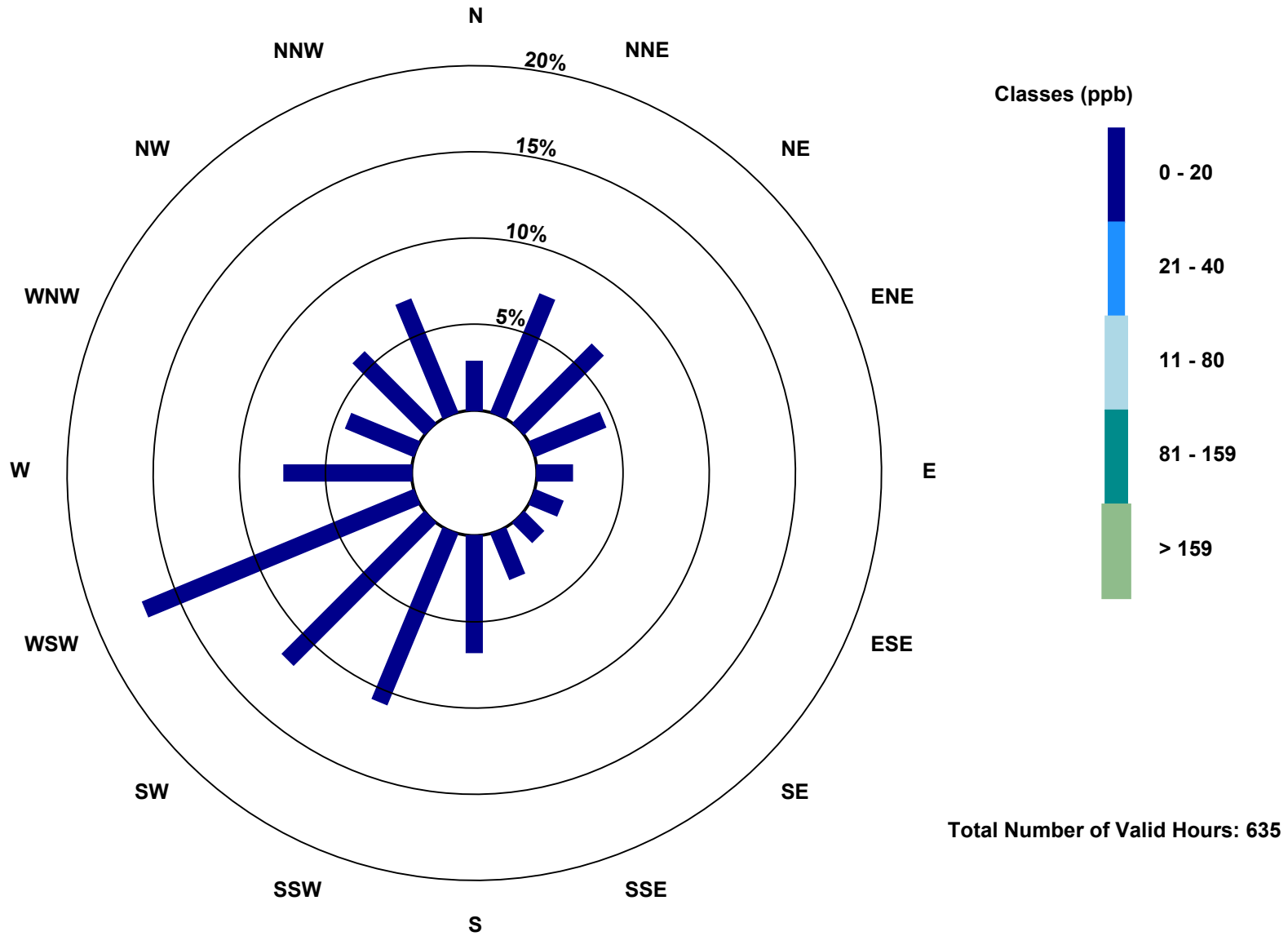
Total Number of Hours: 672

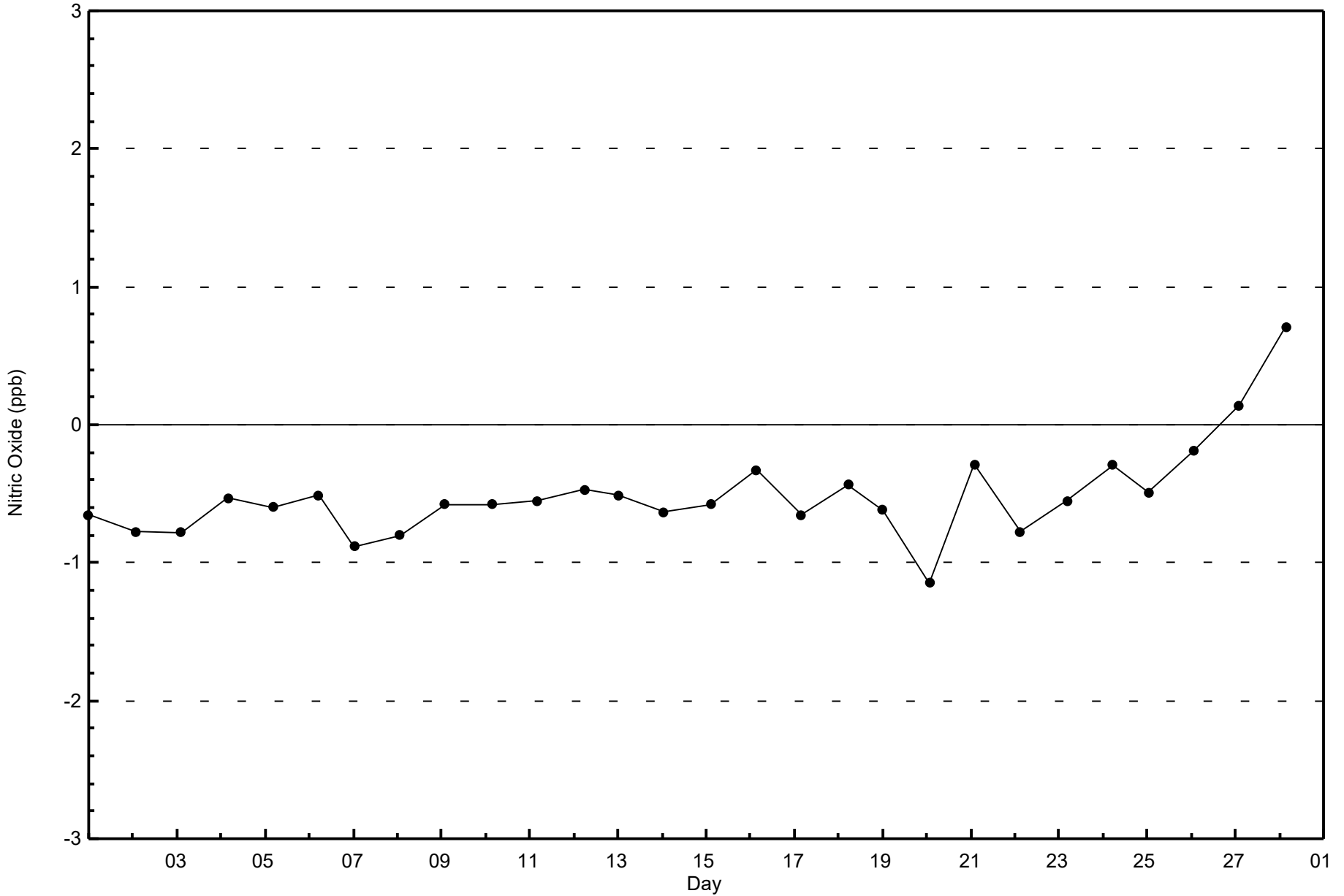


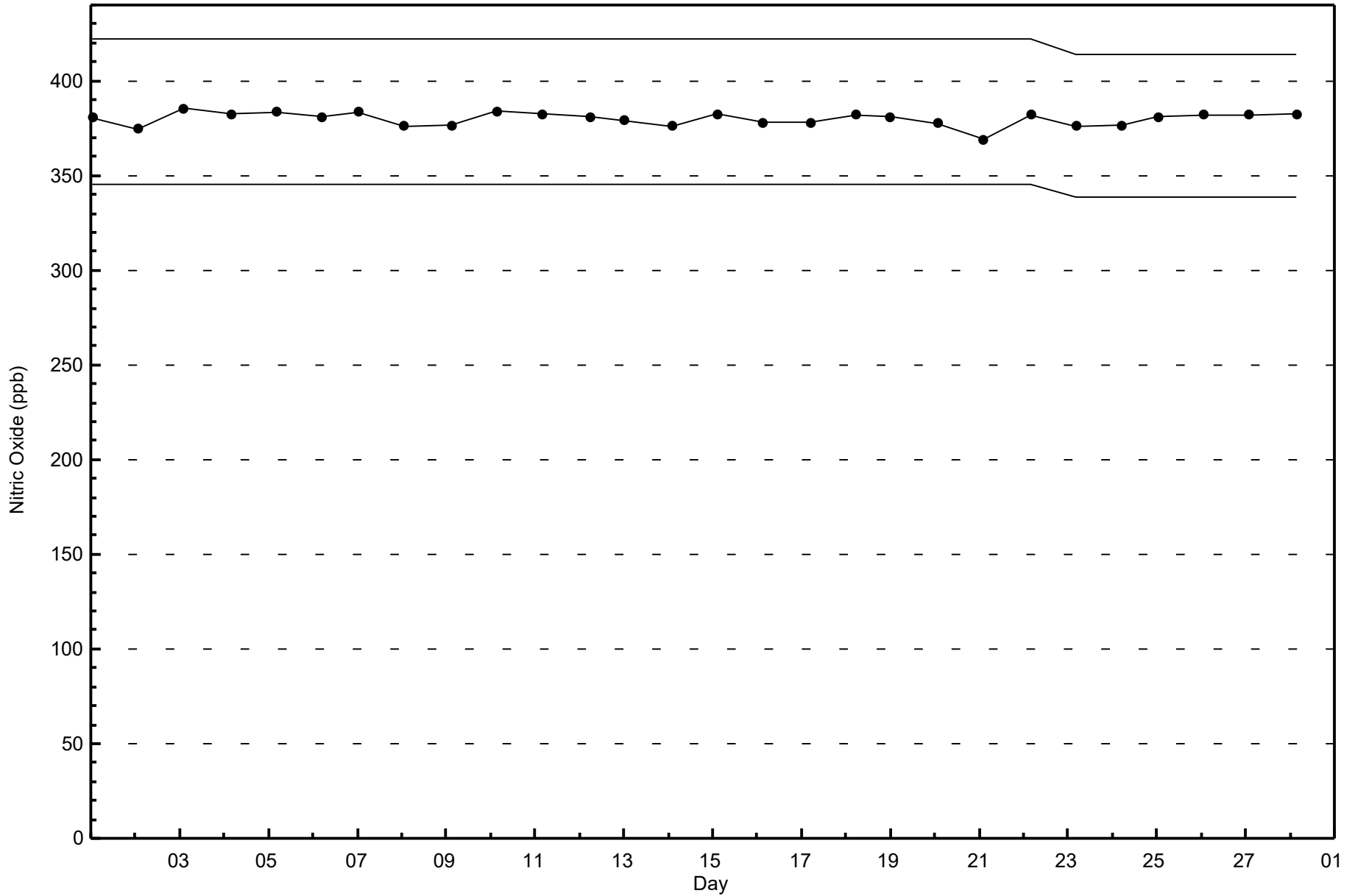


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitric Oxide (NO) - ppb  
Jackfish 2/3









Wood Buffalo Environmental Association

Summary of Hour Averages

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

Jackfish 2/3 - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 12.6 ppb on Feb 23 10:00	Maximum Daily Average: 5.2 ppb on Feb 10		Hours of Data:	636
Minimum Value: 0.0 ppb on Feb 11 04:00	Minimum Daily Average: 0.6 ppb on Feb 11		Hours of Missing Data:	36
Maximum Diurnal Average: 3.3 ppb at hour 9	Minimum Diurnal Average: 1.7 ppb at hour 14		Hours of Calibration:	33
Monthly Average: 2.30 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> = 3.2 P <sub>90</sub> = 4.6 P <sub>99</sub> = 9.3		Percent Operational Time:	99.6

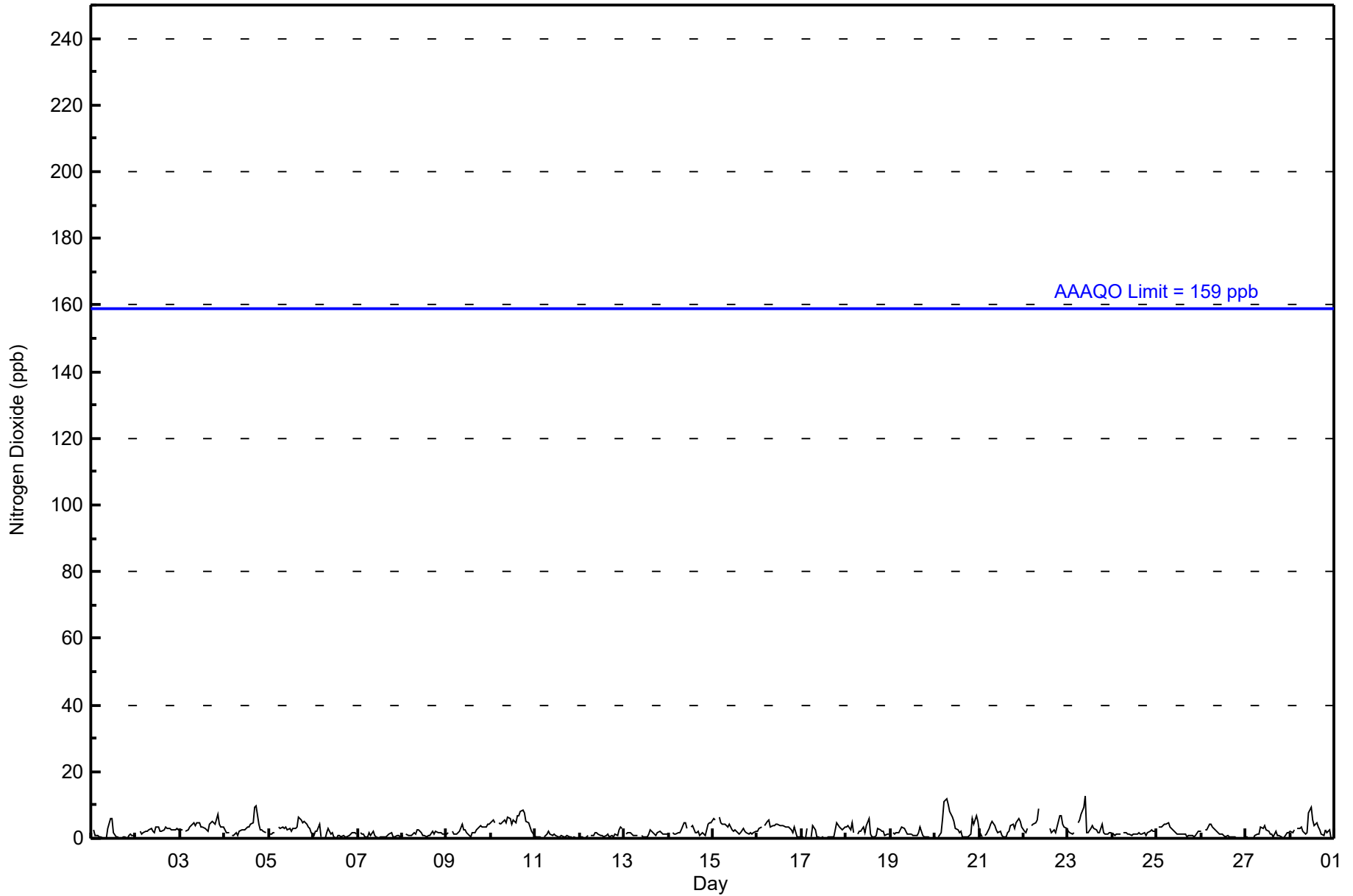
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Feb	Z	2.7	0.9	0.9	0.3	0.4	0.2	0.2	0.2	3.0	6.0	5.8	1.7	0.3	0.3	0.2	0.2	0.3	0.5	0.2	0.7	1.3	0.8	0.7	1.2	6.0																						
2-Feb	0.9	Z	2.0	1.4	1.6	2.1	2.1	2.4	3.1	2.0	1.5	3.6	3.4	2.2	2.0	2.5	3.6	2.9	2.8	2.6	2.4	2.6	3.0	2.4	2.4	3.6																						
3-Feb	2.5	2.4	Z	2.3	2.6	3.2	3.7	4.6	3.9	4.6	4.5	3.3	3.4	3.1	2.7	2.3	4.3	5.0	4.6	4.4	7.4	4.3	3.2	3.3	3.7	7.4																						
4-Feb	2.5	1.8	1.6	Z	0.7	1.0	1.6	0.9	2.1	2.5	2.7	2.7	3.2	3.4	4.3	4.5	9.4	9.8	4.2	2.5	2.4	2.0	1.6	DF	3.1	9.8																						
5-Feb	1.4	1.4	1.6	1.8	Z	3.2	3.1	3.2	3.0	3.3	2.7	3.0	2.0	2.8	2.9	3.6	6.2	5.6	4.7	5.0	4.3	3.6	3.0	1.7	3.2	6.2																						
6-Feb	1.0	2.1	2.2	4.2	0.4	Z	0.1	1.8	2.9	1.3	1.7	0.6	0.2	0.7	1.0	0.6	0.9	0.4	0.6	0.9	1.4	1.6	1.8	1.4	1.3	4.2																						
7-Feb	Z	1.5	1.1	1.1	0.5	0.5	1.8	0.7	2.1	0.9	0.3	0.2	0.4	0.5	0.5	0.3	0.7	1.1	1.6	0.4	0.6	0.7	1.0	0.4	0.8	2.1																						
8-Feb	0.9	Z	1.1	0.8	0.7	0.8	1.5	1.1	2.5	2.4	1.7	0.8	0.9	0.5	0.8	1.0	2.3	1.1	2.2	1.5	1.8	1.6	1.2	1.2	1.3	2.5																						
9-Feb	1.2	1.7	Z	2.3	1.4	1.3	1.7	2.3	4.4	2.5	2.4	1.9	1.0	0.6	1.5	1.8	2.4	3.0	3.9	3.4	3.2	3.5	4.1	4.4	2.4	4.4																						
10-Feb	5.0	5.3	4.8	Z	4.7	4.2	4.7	5.3	4.7	6.4	6.0	4.4	5.5	4.8	6.8	6.6	8.0	8.5	7.7	5.1	4.8	3.5	2.2	0.8	5.2	8.5																						
11-Feb	0.4	0.4	0.6	0.0	Z	0.6	1.2	2.0	1.2	1.0	1.3	0.8	0.6	0.4	0.7	0.4	0.3	0.8	0.6	0.4	0.0	0.3	0.0	0.0	0.6	2.0																						
12-Feb	0.6	0.4	0.0	0.0	0.9	Z	0.9	1.0	1.9	1.7	1.3	1.0	0.8	0.5	0.9	1.3	0.5	0.8	0.4	1.3	0.9	2.4	3.6	2.9	1.1	3.6																						
13-Feb	Z	1.4	1.5	1.8	1.3	0.7	0.9	0.9	DF	1.0	0.4	0.5	0.6	1.3	2.7	2.3	1.4	0.8	1.7	2.0	1.6	1.1	1.1	1.1	1.3	2.7																						
14-Feb	1.2	Z	1.8	1.4	1.2	1.6	1.8	2.6	4.8	4.6	3.1	M	3.4	3.7	1.7	1.6	2.1	0.8	1.8	1.4	0.8	4.2	4.7	4.7	2.5	4.8																						
15-Feb	6.0	5.4	Z	6.2	4.7	4.2	4.4	3.9	3.2	4.1	2.7	2.1	2.5	1.6	1.2	1.8	2.8	2.2	1.5	1.3	1.5	1.3	1.6	2.1	3.0	6.2																						
16-Feb	2.3	3.0	3.6	Z	4.0	5.0	5.3	3.3	3.8	4.0	4.4	4.4	3.9	3.7	3.7	3.5	3.5	3.6	2.4	1.7	3.4	0.6	0.4	0.3	3.2	5.3																						
17-Feb	0.3	0.0	0.0	3.1	Z	0.3	3.9	2.6	0.5	0.4	0.2	0.5	0.2	0.2	0.3	0.3	0.5	0.5	2.7	4.5	3.4	2.8	2.6	3.2	1.4	4.5																						
18-Feb	3.6	3.8	2.6	4.7	1.9	Z	1.1	2.2	2.1	3.2	1.6	4.0	6.1	1.1	0.3	0.3	1.0	2.9	2.4	2.0	2.0	0.8	1.3	1.4	2.3	6.1																						
19-Feb	Z	1.5	1.4	1.8	1.8	2.5	3.6	3.0	2.2	1.4	1.3	1.4	0.7	1.0	1.0	1.7	3.3	0.9	0.5	0.4	0.4	0.2	0.2	0.2	1.4	3.6																						
20-Feb	0.4	Z	0.6	1.9	5.9	11.1	11.8	10.0	8.0	6.2	4.9	2.8	2.5	1.6	2.0	0.6	0.6	0.5	0.4	1.3	5.9	4.3	6.7	5.1	4.1	11.8																						
21-Feb	2.3	0.5	Z	1.0	1.3	3.1	4.1	5.0	4.0	2.5	1.8	2.3	1.0	0.5	0.5	1.7	2.1	3.7	4.1	2.8	4.6	6.0	5.1	3.5	2.8	6.0																						
22-Feb	2.1	1.8	3.0	Z	3.8	4.1	4.6	5.4	9.0	C	C	C	C	C	2.9	1.6	2.6	1.9	3.4	6.7	6.6	4.3	3.5	3.0	3.9	9.0																						
23-Feb	2.3	1.7	1.4	1.9	Z	4.6	5.7	7.0	9.2	12.6	1.6	1.5	2.9	3.7	3.1	2.4	1.7	1.6	4.4	1.7	1.3	1.2	1.7	1.5	3.3	12.6																						
24-Feb	1.4	1.0	1.4	1.1	1.1	Z	1.8	1.6	1.4	1.2	0.8	1.2	1.3	1.1	1.5	1.3	1.4	1.7	0.9	1.5	2.3	2.4	2.2	2.3	1.5	2.4																						
25-Feb	Z	3.2	3.5	3.9	4.3	4.4	4.5	3.4	3.1	2.3	1.5	1.2	1.2	1.3	1.1	1.2	0.6	0.7	1.0	0.9	0.5	0.9	2.2	2.3	2.1	4.5																						
26-Feb	2.1	Z	2.5	2.5	4.1	4.1	3.5	2.4	2.0	1.9	1.2	1.1	0.8	0.5	0.7	0.6	0.3	0.6	0.3	0.2	0.0	0.0	0.0	0.0	1.4	4.1																						
27-Feb	0.4	0.6	Z	0.0	0.1	0.8	1.4	1.3	3.4	2.9	3.8	2.6	2.2	1.3	1.4	0.6	2.1	0.7	0.7	0.6	0.0	0.6	1.6	1.9	1.3	3.8																						
28-Feb	2.1	1.7	2.4	Z	2.9	3.0	3.4	2.2	1.4	1.8	7.5	9.4	5.5	4.0	4.6	3.3	2.4	1.2	1.0	2.4	1.5	2.7	0.1	0.0	2.9	9.4																						
																								1.9	2.0	1.8	2.0	2.2	2.8	3.0	2.9	3.3	3.0	2.6	2.4	2.1	1.7	1.9	1.8	2.4	2.3	2.3	2.1	2.3	2.2	2.2	1.9	Diurnal Average
																								6.0	5.4	4.8	6.2	5.9	11.1	11.8	10.0	9.2	12.6	7.5	9.4	6.1	4.8	6.8	6.6	9.4	9.8	7.7	6.7	7.4	6.0	6.7	5.1	Diurnal Maximum

Z - zerospan      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 - February 2023**





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

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Jackfish 2/3 - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	636	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: 636

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Jackfish 2/3 - February 2023**

<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	18	47	41	28	13	11	10	18	43	68	74	108	47	27	37	45	635
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>	18	47	41	28	13	11	10	18	43	68	74	108	47	27	37	45	635

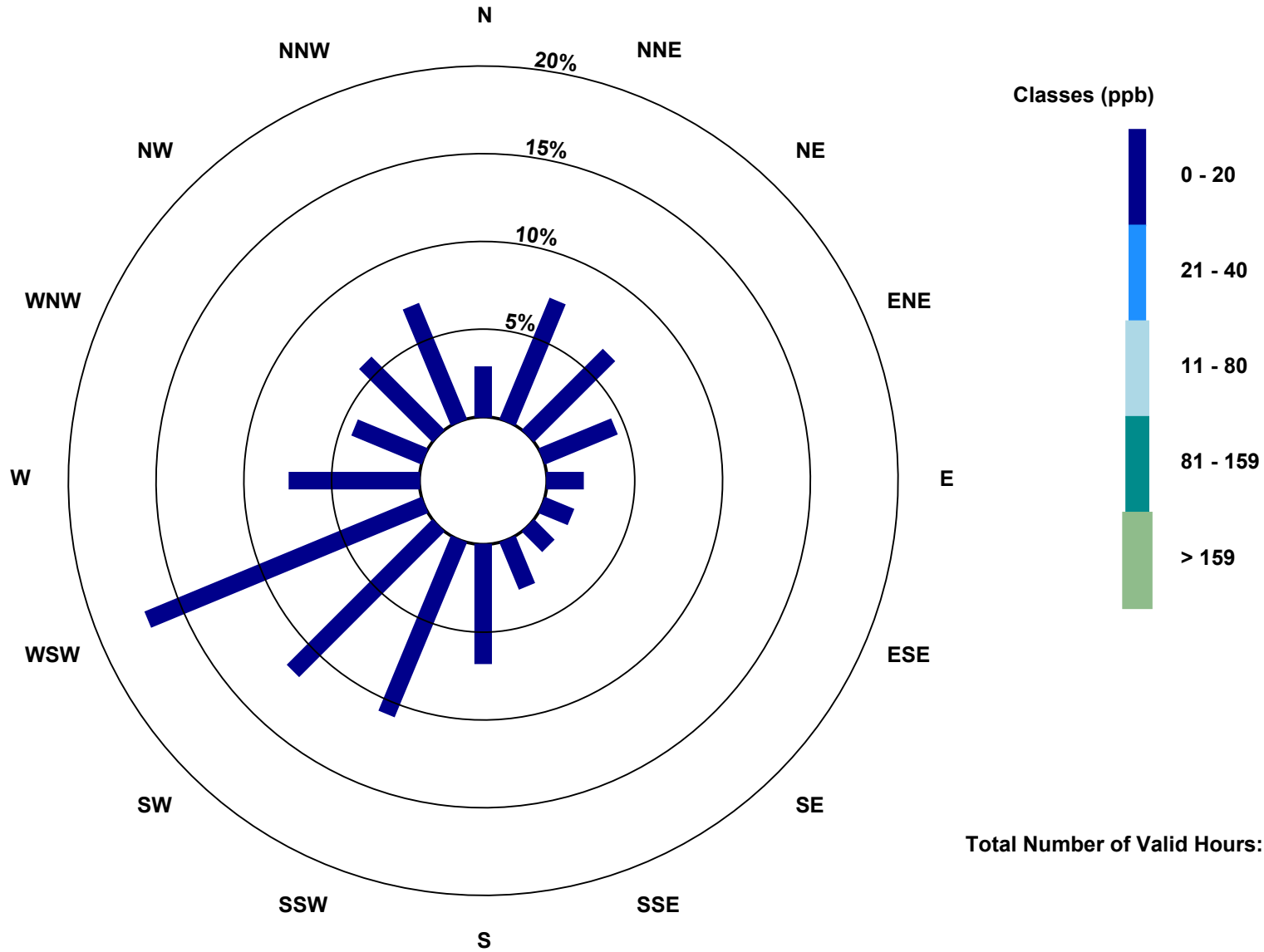
Total Number of Valid Hours: 635

Total Number of Hours: 672



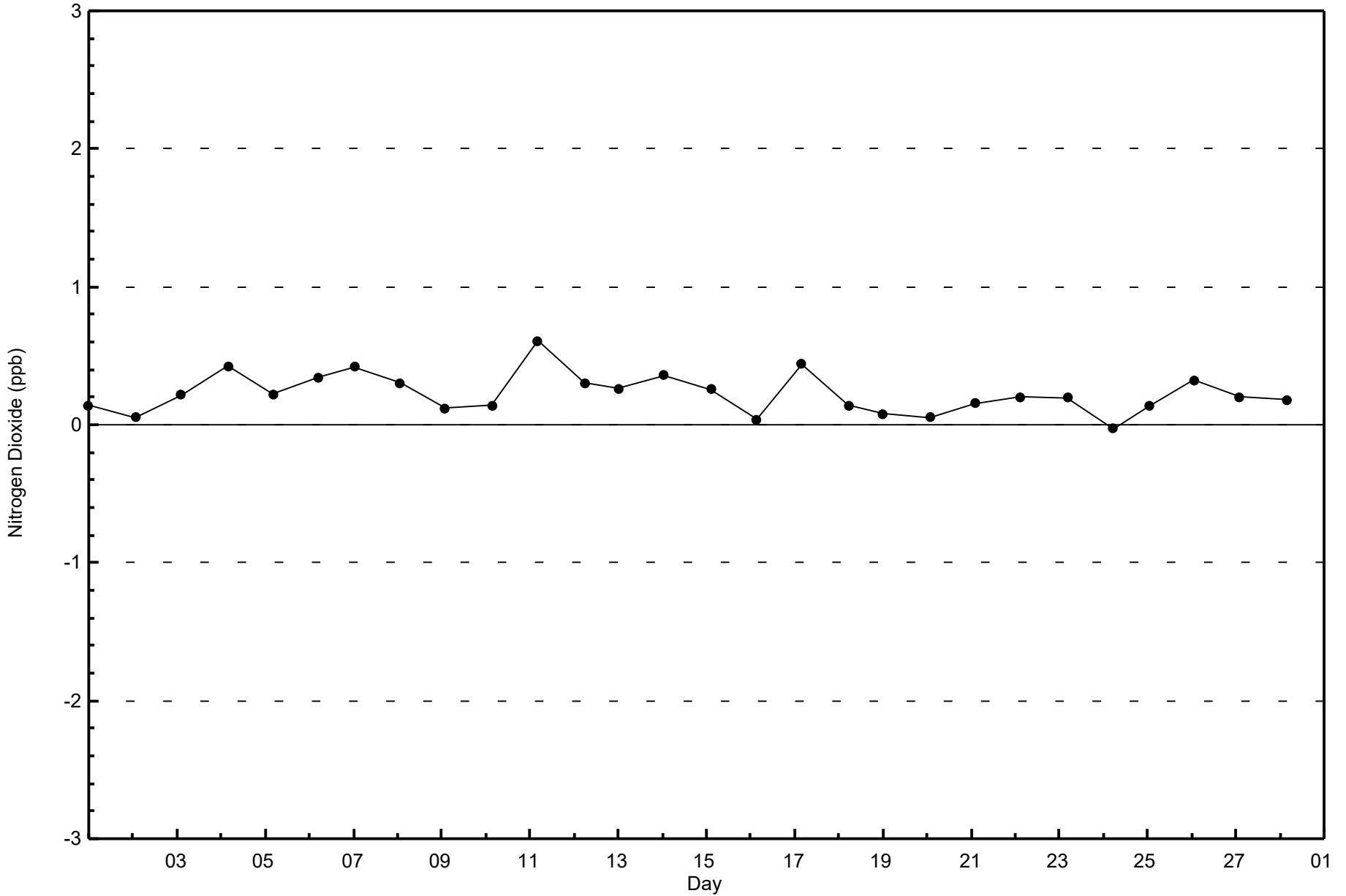
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

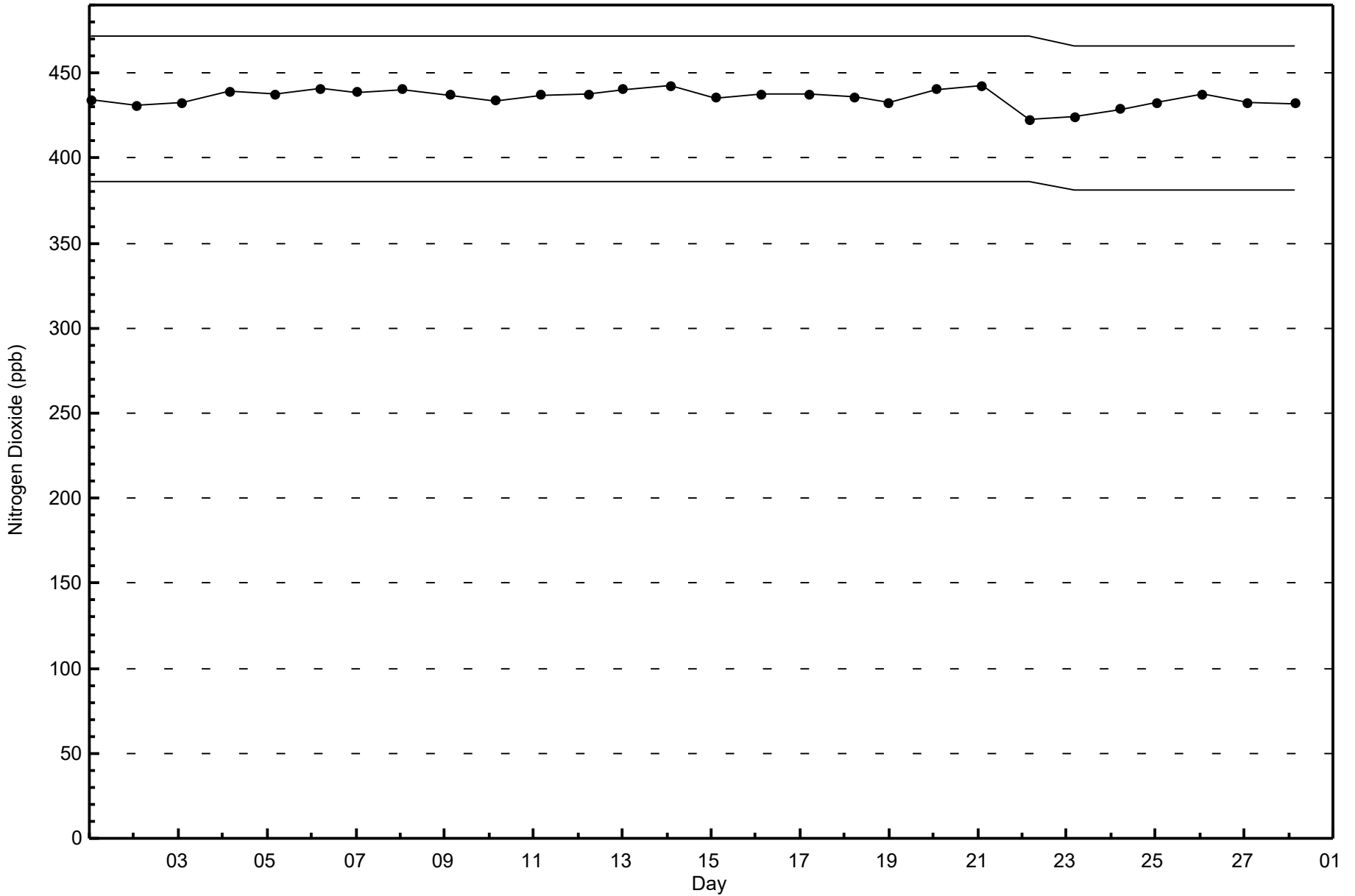
Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Jackfish 2/3



Total Number of Valid Hours: 635









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

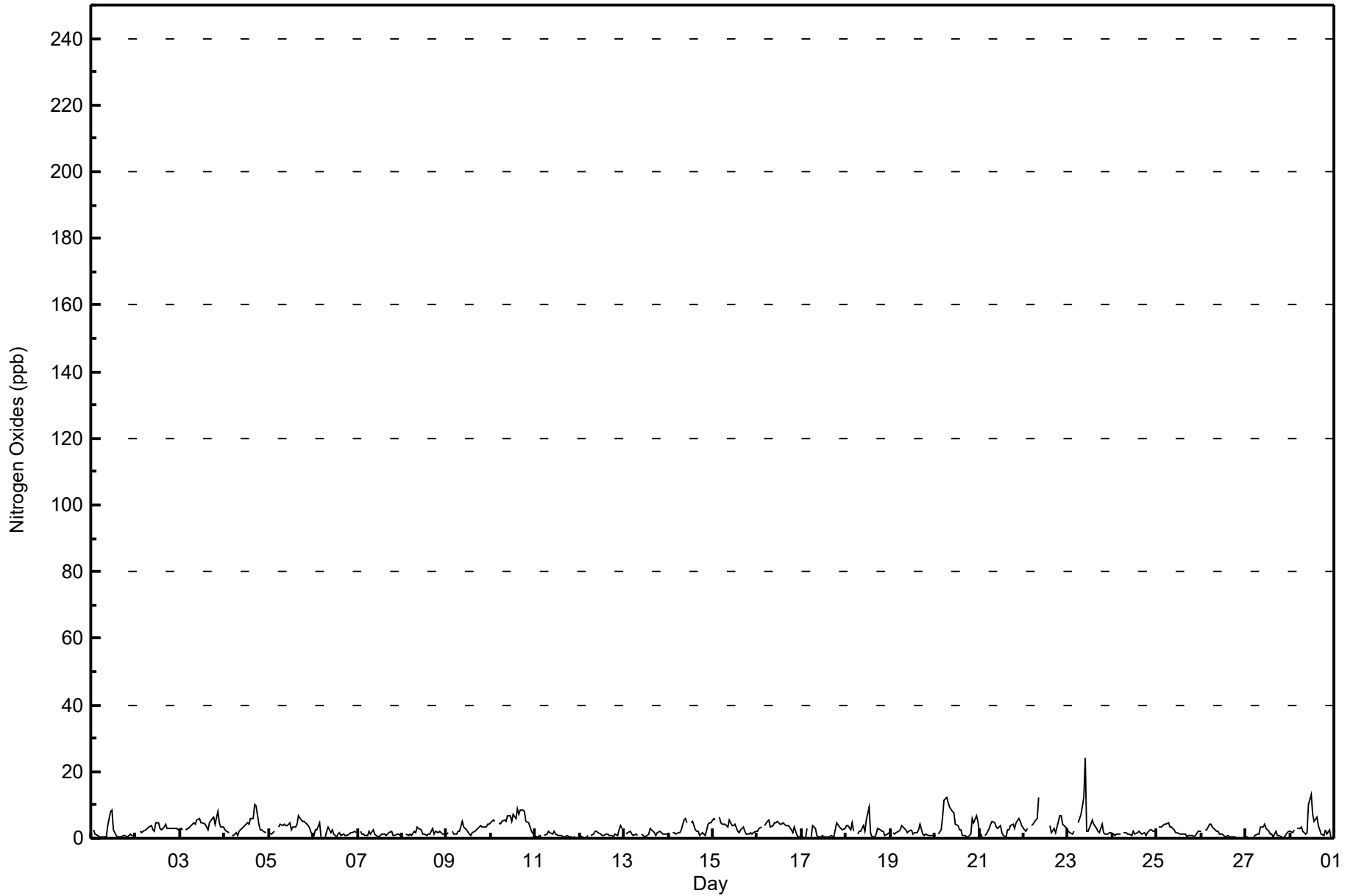
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Jackfish 2/3 - February 2023**

Maximum Value: 24.0 ppb on Feb 23 10:00																				Maximum Daily Average: 5.6 ppb on Feb 10					Hours in Service: 672	
Minimum Value: 0.0 ppb on Feb 11 04:00																				Minimum Daily Average: 0.7 ppb on Feb 11					Hours of Data: 636	
Maximum Diurnal Average: 4.0 ppb at hour 10																				Minimum Diurnal Average: 1.9 ppb at hour 3					Hours of Missing Data: 36	
Monthly Average: 2.64 ppb																				Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.6 Q <sub>1</sub> = 1.1 Median = 2.1 Q <sub>3</sub> = 3.7 P <sub>90</sub> = 5.1 P <sub>99</sub> = 10.4					Hours of Calibration: 33	
																									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-Feb	Z	2.7	1.1	0.9	0.3	0.6	0.3	0.3	0.2	3.8	8.3	8.7	2.5	0.8	0.4	0.5	0.4	0.6	0.7	0.2	0.9	1.4	0.9	1.0	1.6	8.7
2-Feb	1.0	Z	2.3	1.6	1.9	2.7	2.9	3.2	3.7	2.5	2.1	4.8	4.7	2.9	2.7	3.3	4.3	3.0	2.9	3.0	2.8	3.0	3.1	2.7	2.9	4.8
3-Feb	2.8	2.6	Z	2.4	2.9	3.5	3.8	4.8	4.4	5.5	5.8	4.6	4.5	4.4	3.6	2.6	4.7	5.9	6.2	4.4	8.1	4.5	3.4	3.3	4.3	8.1
4-Feb	2.5	1.9	1.6	Z	0.7	1.0	1.6	1.0	2.3	2.8	3.3	3.8	4.8	4.2	6.0	5.7	10.2	9.9	4.4	2.6	2.4	2.1	1.6	DF	3.5	10.2
5-Feb	1.7	1.5	1.8	1.9	Z	3.2	4.1	3.8	4.4	3.9	3.7	4.5	2.7	3.5	3.5	4.1	6.9	5.7	4.9	5.0	4.3	3.7	3.0	1.7	3.6	6.9
6-Feb	1.0	2.5	2.5	4.8	0.5	Z	0.3	2.1	3.6	1.7	2.7	1.2	0.6	1.1	1.5	0.8	1.2	0.7	0.9	1.2	1.5	1.8	2.3	1.7	1.7	4.8
7-Feb	Z	1.9	1.4	1.3	0.9	0.8	2.3	1.1	2.7	1.4	0.7	0.4	1.0	1.2	1.1	0.8	1.2	1.6	2.0	0.7	1.0	1.1	1.3	0.8	1.3	2.7
8-Feb	1.1	Z	1.2	0.9	1.1	1.0	1.9	1.6	3.3	3.1	2.6	1.4	1.3	1.0	1.1	1.3	2.9	1.1	2.3	1.6	2.0	1.8	1.4	1.4	1.7	3.3
9-Feb	1.2	1.7	Z	2.3	1.4	1.3	1.9	2.3	5.2	3.4	3.2	2.6	1.4	1.0	1.8	2.1	2.6	3.0	3.9	3.6	3.3	3.5	4.4	4.4	2.7	5.2
10-Feb	5.1	5.4	4.9	Z	4.7	4.3	5.0	5.4	5.3	7.0	6.7	5.2	7.1	5.9	9.0	7.3	8.5	8.6	8.0	5.1	4.8	3.5	2.2	0.9	5.6	9.0
11-Feb	0.4	0.4	0.7	0.0	Z	0.7	1.2	2.2	1.5	1.3	1.9	1.1	0.9	0.8	0.7	0.4	0.3	0.8	0.6	0.4	0.0	0.4	0.0	0.0	0.7	2.2
12-Feb	0.7	0.4	0.0	0.0	0.9	Z	0.9	1.3	2.2	2.1	1.6	1.2	1.0	0.6	1.2	1.5	0.6	0.8	0.4	1.3	0.9	2.4	3.6	2.9	1.2	3.6
13-Feb	Z	1.4	1.5	2.0	1.3	0.8	1.1	1.0	DF	1.2	0.7	0.6	0.8	1.4	3.0	2.6	1.6	0.8	1.8	2.2	1.8	1.1	1.3	1.1	1.4	3.0
14-Feb	1.2	Z	1.8	1.6	1.3	1.6	1.9	2.6	5.5	5.8	4.7	M	4.9	5.0	2.7	1.9	2.2	0.9	1.8	1.4	0.9	4.3	4.7	4.7	2.9	5.8
15-Feb	6.0	5.4	Z	6.3	4.7	4.3	4.4	3.9	3.5	5.4	3.8	3.7	4.1	2.2	1.7	2.4	3.3	2.2	1.5	1.3	1.5	1.3	1.6	2.1	3.3	6.3
16-Feb	2.3	3.0	3.6	Z	4.0	5.0	5.3	3.3	3.9	4.4	4.7	4.9	4.3	4.3	4.5	3.9	3.7	3.7	2.5	1.7	3.4	0.7	0.5	0.3	3.4	5.3
17-Feb	0.3	0.0	0.0	3.1	Z	0.3	4.0	2.9	0.7	0.6	0.2	0.7	0.3	0.3	0.5	0.4	0.7	0.6	2.7	4.6	3.5	2.8	2.6	3.2	1.5	4.6
18-Feb	3.6	3.8	2.6	4.7	1.9	Z	1.1	2.2	2.1	3.9	2.2	5.5	9.3	1.7	0.5	0.4	1.1	3.0	2.4	2.0	2.1	1.0	1.3	1.5	2.6	9.3
19-Feb	Z	1.7	1.4	1.8	1.9	2.7	3.8	3.2	2.7	1.9	2.1	2.5	1.4	1.9	1.8	2.3	4.1	1.3	1.0	1.1	0.9	0.8	0.7	0.7	1.9	4.1
20-Feb	0.8	Z	1.2	2.6	6.4	11.6	12.3	10.5	9.4	8.2	7.6	4.3	3.9	2.6	2.7	0.7	0.8	0.5	0.4	1.3	5.9	4.5	6.7	5.1	4.8	12.3
21-Feb	2.3	0.5	Z	1.0	1.3	3.1	4.1	5.0	4.6	3.3	2.8	3.9	1.6	0.8	0.6	2.4	2.6	4.0	4.1	2.9	4.8	6.0	5.2	3.7	3.1	6.0
22-Feb	2.4	2.0	3.1	Z	4.0	4.4	5.4	5.9	12.3	C	C	C	C	C	3.7	1.7	2.8	1.9	3.4	6.7	6.6	4.3	3.6	3.0	4.3	12.3
23-Feb	2.3	1.7	1.4	2.0	Z	4.6	5.7	7.3	12.2	24.0	2.3	2.2	4.4	5.6	4.4	3.1	2.0	1.6	4.4	1.7	1.3	1.2	1.7	1.5	4.3	24.0
24-Feb	1.4	1.0	1.4	1.1	1.1	Z	1.8	1.6	1.4	1.3	0.8	1.9	1.5	1.5	2.0	1.6	1.4	1.7	0.9	1.5	2.4	2.4	2.3	2.3	1.6	2.4
25-Feb	Z	3.3	3.6	3.9	4.3	4.4	4.5	3.4	3.2	2.7	1.8	1.6	1.4	1.5	1.2	1.3	0.6	0.7	1.0	0.9	0.5	0.9	2.2	2.3	2.2	4.5
26-Feb	2.1	Z	2.5	2.5	4.1	4.1	3.5	2.4	2.0	1.9	1.2	1.1	0.8	0.5	0.7	0.6	0.3	0.6	0.3	0.2	0.0	0.0	0.0	0.0	1.4	4.1
27-Feb	0.4	0.6	Z	0.0	0.1	0.8	1.4	1.3	3.4	3.2	4.4	2.9	2.2	1.3	1.4	0.6	2.1	0.7	0.7	0.6	0.0	0.6	1.6	1.9	1.4	4.4
28-Feb	2.1	1.7	2.4	Z	2.9	3.0	3.4	2.2	1.4	1.8	10.2	13.3	7.1	5.1	6.2	3.8	2.4	1.2	1.0	2.4	1.5	2.7	0.1	0.0	3.4	13.3
1.9 2.0 1.9 2.1 2.3 2.9 3.2 3.1 4.0 4.0 3.4 3.4 3.0 2.3 2.5 2.2 2.7 2.4 2.4 2.2 2.5 2.3 2.3 2.0																								Diurnal Average		
6.0 5.4 4.9 6.3 6.4 11.6 12.3 10.5 12.3 24.0 10.2 13.3 9.3 5.9 9.0 7.3 10.2 9.9 8.0 6.7 8.1 6.0 6.7 5.1																								Diurnal Maximum		
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 - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Jackfish 2/3 - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	635	99.84	99.84
21 - 40	1	0.16	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: 636

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Jackfish 2/3 - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	18	47	41	28	13	11	10	18	43	68	74	108	47	26	37	45	634
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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>	18	47	41	28	13	11	10	18	43	68	74	108	47	27	37	45	635

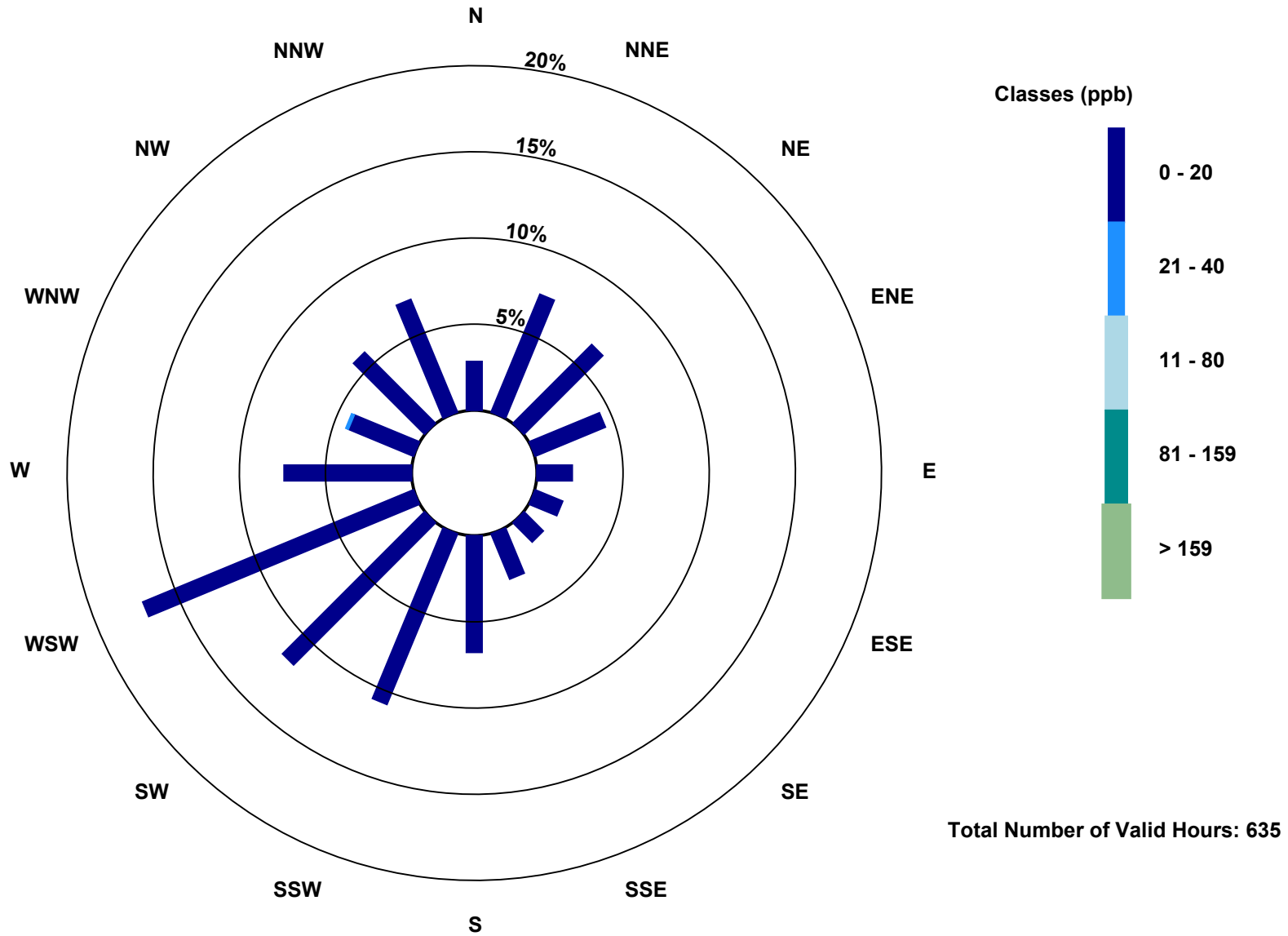
Total Number of Valid Hours: 635

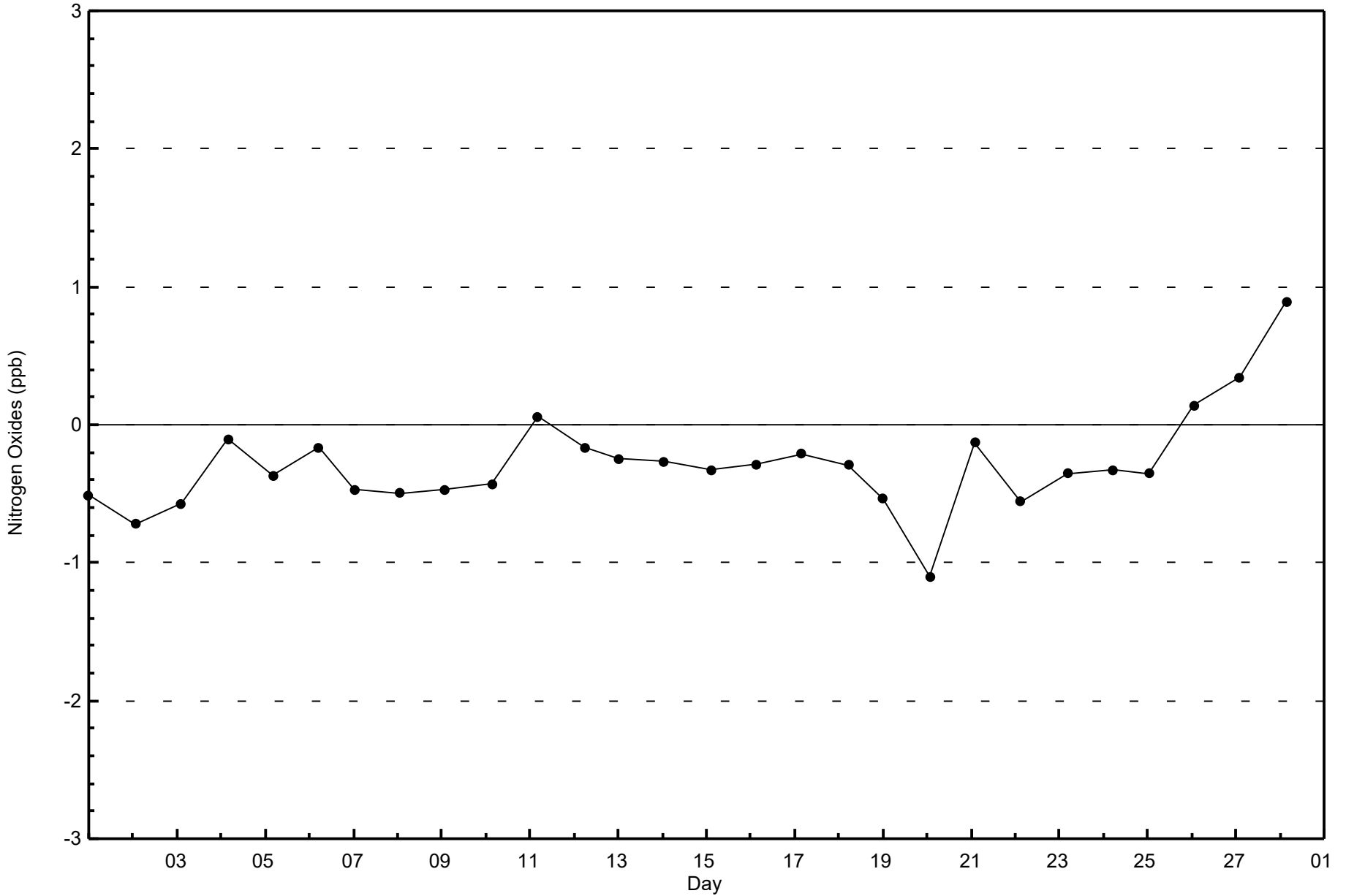
Total Number of Hours: 672



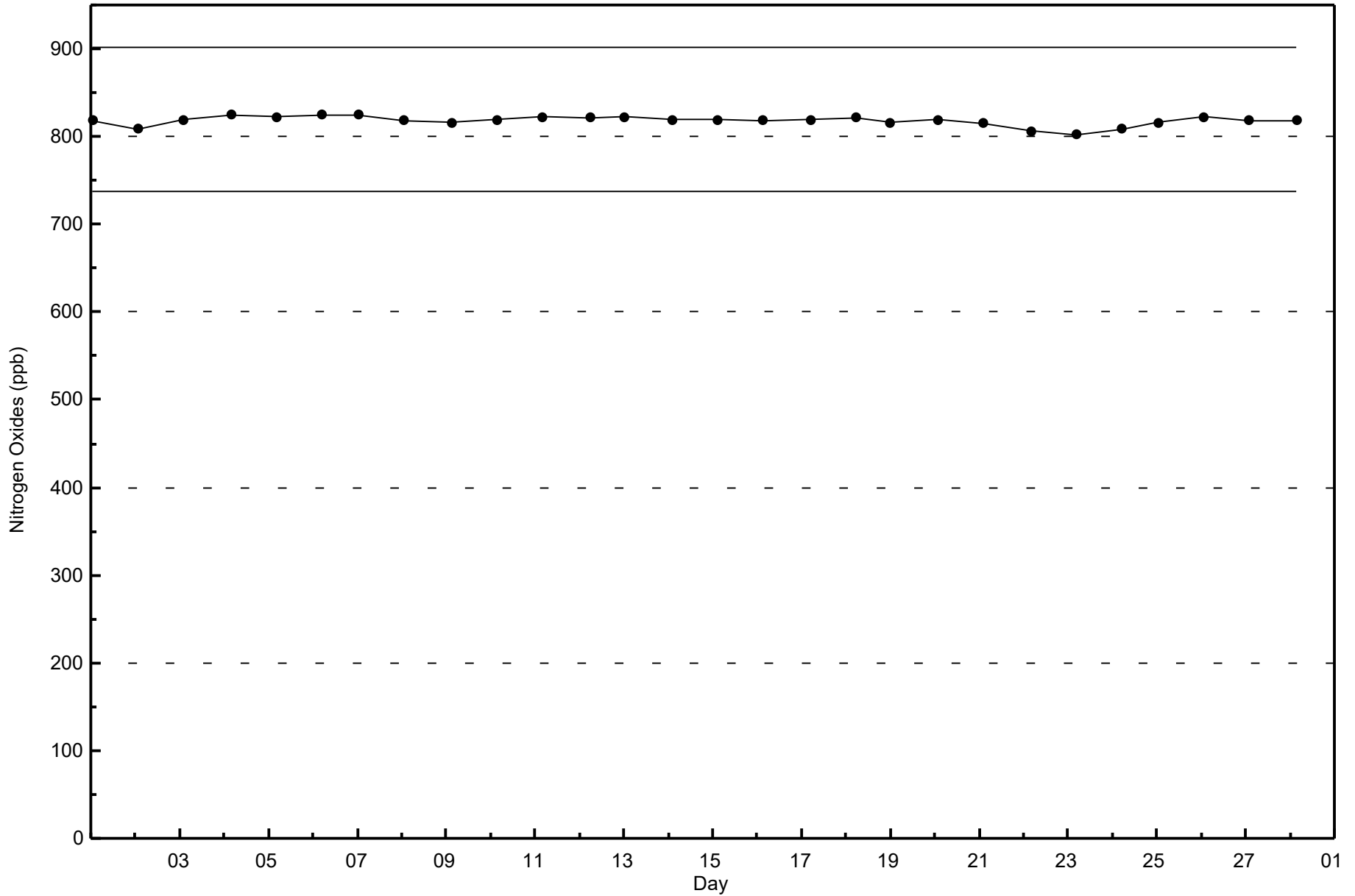
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Jackfish 2/3











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

**Ambient Temperature (AT) - C**  
**Jackfish 2/3 - February 2023**

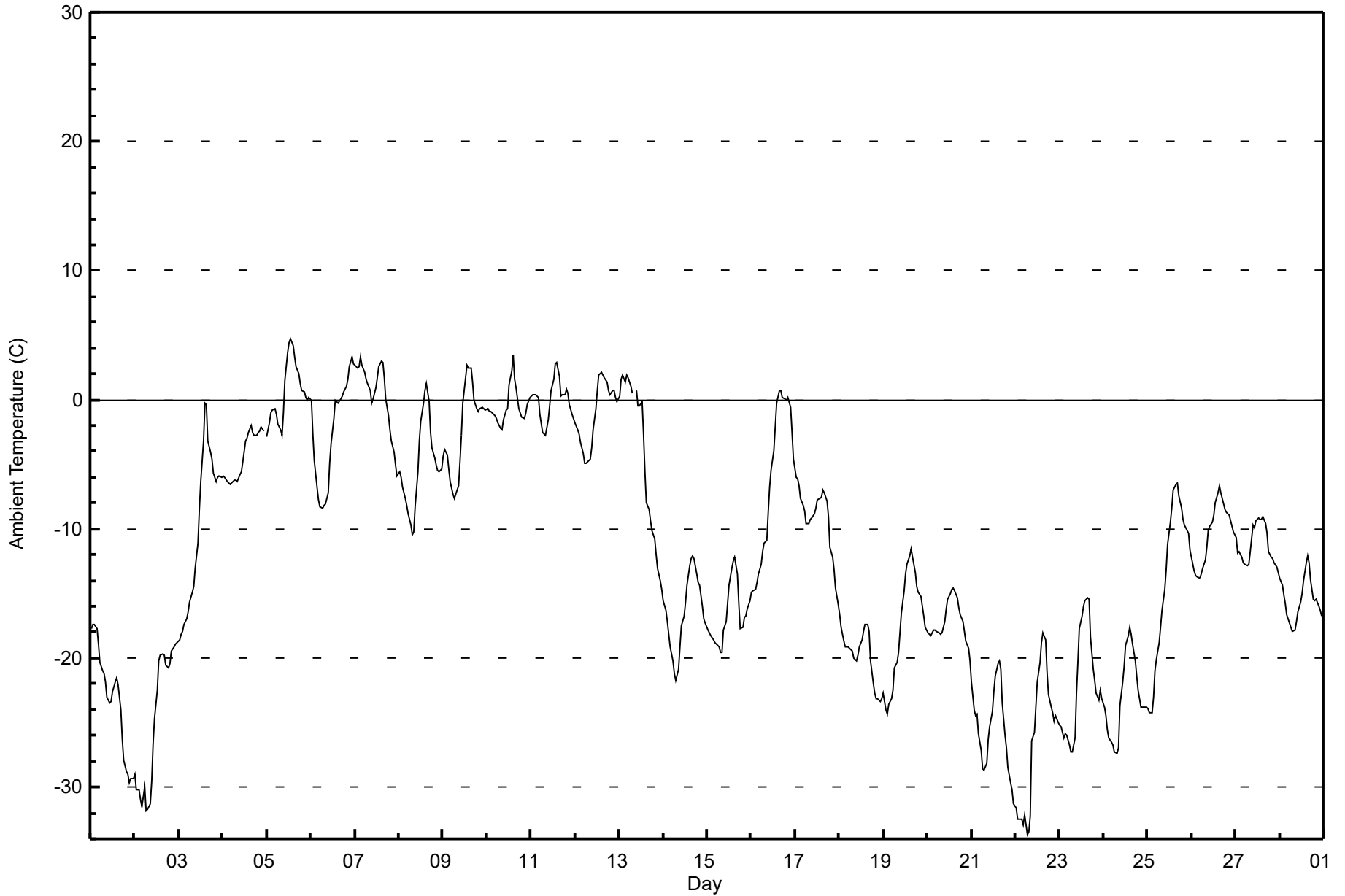
Maximum Value: 4.7 C on Feb 5 14:00		Maximum Daily Average: 0.5 C on Feb 5		Hours in Service: 672																																												
Minimum Value: -33.6 C on Feb 22 07:00		Minimum Daily Average: -26.4 C on Feb 22		Hours of Data: 670																																												
Maximum Diurnal Average: -7.7 C at hour 15		Minimum Diurnal Average: -14.8 C at hour 9		Hours of Missing Data: 2																																												
Monthly Average: -11.74 C		Percentiles: P <sub>1</sub> = -32.2 P <sub>10</sub> = -24.2 Q <sub>1</sub> = -18.9 Median = -12.2 Q <sub>3</sub> = -2.6 P <sub>90</sub> = 0.6 P <sub>99</sub> = 3.3		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-Feb	-17.7	-17.4	-17.4	-17.8	-18.9	-20.3	-21.0	-21.2	-21.8	-23.1	-23.5	-23.4	-22.6	-21.8	-21.6	-22.1	-24.0	-26.2	-27.9	-28.8	-29.0	-29.7	-29.4	-29.3	-23.2	-17.4																						
2-Feb	-29.0	-30.2	-30.2	-31.0	-31.5	-30.0	-31.9	-31.8	-31.3	-29.6	-26.6	-24.7	-22.5	-20.2	-19.8	-19.6	-19.8	-20.6	-20.8	-20.4	-19.4	-19.1	-18.9	-18.8	-24.9	-18.8																						
3-Feb	-18.6	-18.2	-17.9	-17.4	-16.9	-16.4	-15.6	-14.9	-14.5	-13.1	-11.1	-8.5	-6.3	-3.2	-0.2	-0.3	-3.2	-4.1	-4.6	-5.7	-6.3	-6.1	-5.9	-6.0	-9.8	-0.2																						
4-Feb	-5.9	-6.0	-6.3	-6.4	-6.6	-6.5	-6.2	-6.2	-6.4	-5.8	-5.6	-4.8	-3.1	-3.0	-2.5	-2.0	-2.5	-2.8	-2.7	-2.5	-2.4	-2.1	-2.5	DF	-4.4	-2.0																						
5-Feb	-2.9	-1.7	-1.1	-0.8	-0.7	-1.1	-1.9	-2.3	-2.7	-1.1	1.5	3.7	4.4	4.7	4.2	3.3	2.6	2.0	1.3	0.7	0.6	0.2	-0.1	0.2	0.5	4.7																						
6-Feb	0.0	-2.6	-4.8	-6.8	-7.8	-8.3	-8.5	-8.2	-8.1	-7.2	-4.9	-3.5	-1.4	0.0	-0.1	-0.2	0.0	0.2	0.6	1.1	1.6	2.6	3.3	2.7	-2.5	3.3																						
7-Feb	2.7	2.5	2.5	3.3	2.7	2.1	1.6	1.3	0.7	-0.3	0.0	1.0	1.7	2.5	3.0	2.9	1.7	0.0	-1.3	-2.3	-3.2	-4.1	-5.0	-5.9	0.4	3.3																						
8-Feb	-5.6	-6.0	-6.8	-7.6	-8.2	-8.8	-9.7	-10.5	-10.3	-8.3	-5.6	-3.2	-1.6	-0.3	0.7	1.3	-0.2	-2.6	-3.7	-4.5	-5.0	-5.5	-5.5	-5.4	-5.1	1.3																						
9-Feb	-4.4	-3.8	-4.3	-5.4	-6.3	-7.3	-7.6	-7.3	-6.6	-4.8	-2.7	-0.3	1.7	2.6	2.4	2.4	1.3	-0.1	-0.7	-0.9	-0.7	-0.6	-0.7	-0.8	-2.3	2.6																						
10-Feb	-0.7	-0.9	-0.9	-1.0	-1.2	-1.5	-1.8	-2.2	-2.3	-1.5	-0.8	-0.7	1.2	2.2	3.4	1.5	0.9	-0.7	-1.0	-1.4	-1.4	-1.0	-0.4	0.2	-0.5	3.4																						
11-Feb	0.3	0.4	0.4	0.3	0.2	-1.1	-2.5	-2.6	-2.8	-1.6	-0.5	0.7	1.6	2.7	2.8	1.8	0.3	0.4	0.4	0.8	0.5	-0.4	-1.1	-1.4	0.0	2.8																						
12-Feb	-1.8	-2.3	-2.7	-3.3	-4.2	-4.9	-5.0	-4.7	-4.6	-3.7	-2.3	-0.7	0.8	1.9	2.2	1.9	1.7	1.3	0.7	0.4	0.8	0.7	0.2	-0.1	-1.2	2.2																						
13-Feb	0.3	1.6	1.9	1.4	2.0	1.7	1.0	0.5	DF	0.7	-0.5	-0.4	-0.1	-2.6	-5.6	-8.0	-8.5	-9.4	-10.1	-10.8	-12.0	-13.1	-14.1	-14.6	-4.3	2.0																						
14-Feb	-15.5	-16.3	-17.1	-18.1	-19.1	-20.3	-21.2	-21.8	-20.9	-19.2	-17.5	-16.7	-15.6	-14.4	-12.9	-12.4	-12.1	-12.3	-13.5	-14.1	-14.4	-16.0	-17.0	-17.3	-16.5	-12.1																						
15-Feb	-17.8	-18.1	-18.3	-18.6	-18.8	-18.9	-19.1	-19.6	-19.6	-17.9	-17.2	-15.8	-14.4	-13.1	-12.5	-12.2	-13.5	-15.8	-17.8	-17.6	-16.9	-16.8	-16.2	-15.5	-16.8	-12.2																						
16-Feb	-14.9	-14.8	-14.7	-14.1	-13.5	-12.7	-11.8	-11.1	-10.9	-8.7	-6.8	-5.5	-3.9	-2.1	-0.3	0.7	0.7	0.2	0.1	-0.1	0.2	-0.6	-2.6	-4.6	-6.3	0.7																						
17-Feb	-6.0	-6.2	-6.6	-7.6	-8.2	-8.6	-9.6	-9.6	-9.3	-9.2	-8.8	-8.4	-7.8	-7.6	-7.5	-7.0	-7.2	-7.9	-9.1	-11.4	-12.2	-13.2	-14.6	-15.9	-9.1	-6.0																						
18-Feb	-16.6	-17.6	-18.7	-19.2	-19.1	-19.2	-19.3	-19.5	-20.0	-20.2	-19.8	-19.1	-18.6	-17.9	-17.4	-17.4	-17.9	-20.3	-21.9	-22.7	-23.2	-23.2	-23.4	-23.2	-19.8	-16.6																						
19-Feb	-22.7	-24.0	-24.3	-23.6	-23.2	-22.5	-20.8	-20.3	-19.5	-18.1	-16.6	-14.8	-13.4	-12.7	-12.0	-11.6	-12.2	-13.4	-14.4	-14.9	-15.2	-15.9	-16.7	-17.6	-17.5	-11.6																						
20-Feb	-18.1	-18.1	-18.3	-17.8	-17.9	-17.9	-18.1	-18.2	-18.1	-17.2	-16.2	-15.4	-15.0	-14.7	-14.6	-14.8	-15.3	-16.1	-16.7	-17.2	-17.9	-18.7	-19.3	-20.2	-17.2	-14.6																						
21-Feb	-21.9	-24.0	-24.4	-24.3	-25.8	-27.2	-28.5	-28.7	-28.1	-26.3	-25.4	-24.1	-22.6	-21.4	-20.4	-20.3	-20.9	-23.4	-25.9	-26.9	-28.5	-29.6	-30.2	-31.3	-25.4	-20.3																						
22-Feb	-31.6	-32.5	-32.5	-32.4	-32.9	-32.1	-33.6	-33.5	-32.3	-26.4	-25.8	-23.9	-21.9	-20.3	-18.8	-18.1	-18.6	-21.1	-22.8	-23.8	-24.2	-24.9	-24.5	-25.0	-26.4	-18.1																						
23-Feb	-25.2	-25.3	-26.2	-25.9	-26.0	-26.7	-27.2	-27.3	-26.2	-22.8	-20.3	-17.7	-16.8	-16.0	-15.5	-15.4	-15.5	-18.3	-20.8	-21.7	-22.7	-23.2	-22.6	-23.2	-22.0	-15.4																						
24-Feb	-23.8	-24.5	-25.6	-26.2	-26.5	-26.7	-27.2	-27.4	-27.0	-23.7	-21.8	-20.7	-19.0	-18.3	-17.7	-18.1	-18.9	-20.2	-21.4	-22.5	-23.8	-23.8	-23.8	-23.8	-23.0	-17.7																						
25-Feb	-23.9	-24.2	-24.2	-23.1	-21.0	-20.1	-18.8	-17.7	-16.4	-14.7	-13.2	-11.2	-9.4	-8.4	-7.0	-6.6	-6.4	-7.4	-8.4	-9.3	-9.7	-10.0	-10.4	-11.6	-13.9	-6.4																						
26-Feb	-12.2	-13.2	-13.6	-13.7	-13.8	-13.5	-13.1	-12.5	-11.5	-10.2	-9.8	-9.5	-8.9	-8.0	-7.2	-6.6	-7.2	-8.1	-8.5	-8.7	-8.9	-9.3	-9.8	-10.2	-10.3	-6.6																						
27-Feb	-10.6	-11.9	-11.8	-12.2	-12.6	-12.8	-12.8	-12.7	-11.8	-9.7	-9.9	-9.4	-9.1	-9.2	-9.3	-9.1	-9.6	-10.4	-11.7	-12.2	-12.3	-12.6	-12.9	-13.4	-11.3	-9.1																						
28-Feb	-13.8	-14.4	-15.1	-15.8	-16.7	-17.3	-17.7	-17.9	-17.8	-17.2	-16.4	-15.6	-15.0	-14.0	-12.6	-12.1	-12.6	-14.0	-15.5	-15.6	-15.4	-16.0	-16.3	-16.8	-15.5	-12.1																						
																								-12.8	-13.2	-13.5	-13.8	-14.0	-14.2	-14.6	-14.6	-14.8	-12.9	-11.7	-10.4	-9.2	-8.3	-7.7	-7.8	-8.5	-9.7	-10.7	-11.2	-11.5	-11.9	-12.2	-12.9	Diurnal Average
																								2.7	2.5	2.5	3.3	2.7	2.1	1.6	1.3	0.7	0.7	1.5	3.7	4.4	4.7	4.2	3.3	2.6	2.0	1.3	1.1	1.6	2.6	3.3	2.7	Diurnal Maximum

DF - DAS Failure



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

**Ambient Temperature (AT) - C**  
**Jackfish 2/3 - February 2023**





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

**Ambient Temperature (AT) - C**  
**Jackfish 2/3 - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	144	21.49	21.49
-20 - 0	435	64.93	86.42
0 - 10	91	13.58	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 670

Total Number of Hours: 672



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

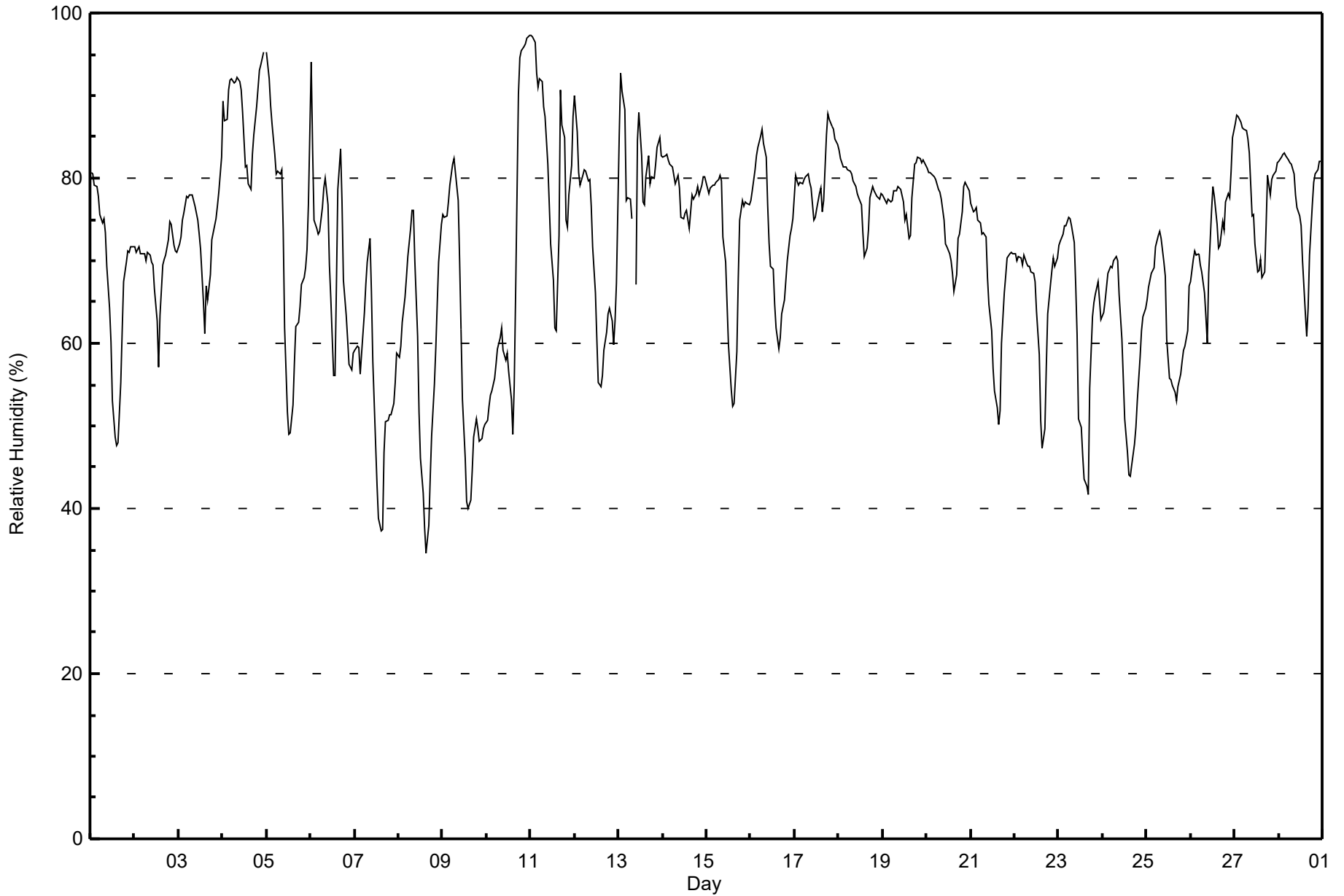
**Relative Humidity (RH) - %**  
**Jackfish 2/3 - February 2023**

Maximum Value: 97.3 % on Feb 11 00:00		Maximum Daily Average: 88.4 % on Feb 4		Hours in Service: 672																																												
Minimum Value: 34.6 % on Feb 8 16:00		Minimum Daily Average: 54.7 % on Feb 7		Hours of Data: 670																																												
Maximum Diurnal Average: 77.3 % at hour 7		Minimum Diurnal Average: 59.3 % at hour 15		Hours of Missing Data: 2																																												
Monthly Average: 71.46 %		Percentiles: P <sub>1</sub> = 40.6 P <sub>10</sub> = 53.6 Q <sub>1</sub> = 64.3 Median = 73.4 Q <sub>3</sub> = 79.6 P <sub>90</sub> = 84.7 P <sub>99</sub> = 95.6		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-Feb	80.6	80.6	79.1	78.9	77.8	75.5	74.6	75.0	73.4	69.3	64.2	60.1	53.1	48.6	47.6	48.0	55.2	61.5	67.4	69.9	71.2	71.1	71.7	71.7	67.8	80.6																						
2-Feb	71.6	71.0	71.6	70.9	70.9	70.9	70.1	71.0	70.7	69.9	69.5	66.6	62.7	57.2	63.4	69.5	70.2	70.7	72.5	74.8	74.4	71.9	71.1	71.0	69.8	74.8																						
3-Feb	72.1	72.9	74.9	75.7	77.9	77.6	78.0	78.0	77.4	76.5	74.9	73.3	71.4	65.1	61.2	67.0	65.2	68.4	72.5	73.4	75.0	76.7	78.4	82.6	73.6	82.6																						
4-Feb	89.4	86.9	87.1	90.7	91.8	92.1	91.5	91.6	92.2	91.7	90.6	88.0	81.3	81.5	79.3	78.6	82.8	85.3	88.6	90.9	93.0	93.7	95.2	DF	88.4	95.2																						
5-Feb	95.3	92.0	88.8	86.6	82.9	80.5	80.8	80.6	81.1	73.7	61.9	51.7	49.0	49.2	52.6	57.7	62.1	62.6	64.4	67.1	68.0	69.1	71.4	76.8	71.1	95.3																						
6-Feb	94.1	83.5	75.0	73.9	73.3	73.6	76.4	78.8	80.0	76.7	69.5	65.3	56.0	56.1	66.9	78.7	83.6	77.2	67.7	63.4	60.5	57.4	56.7	58.8	71.0	94.1																						
7-Feb	59.1	59.7	59.5	56.2	58.8	63.7	67.2	69.9	72.7	66.2	57.7	47.8	42.9	38.8	37.3	37.5	46.8	50.4	50.6	51.3	51.4	52.6	55.3	58.7	54.7	72.7																						
8-Feb	58.4	59.7	62.6	65.7	68.0	70.6	73.9	76.1	76.0	70.1	60.8	51.7	46.1	41.9	37.6	34.6	38.0	43.8	48.8	55.0	59.4	64.8	69.9	74.4	58.7	76.1																						
9-Feb	75.6	75.2	75.4	77.1	79.2	81.7	82.3	80.7	77.3	70.0	61.6	53.2	46.1	40.8	40.1	41.1	44.5	48.6	50.9	49.7	48.1	48.5	49.7	50.2	60.3	82.3																						
10-Feb	50.7	52.4	53.7	54.2	55.8	57.5	59.3	60.7	61.8	59.2	57.9	58.8	56.7	53.2	49.0	55.0	66.2	90.1	94.6	95.5	95.9	96.2	96.9	97.3	67.9	97.3																						
11-Feb	97.3	97.1	96.4	92.7	91.0	92.0	91.7	88.6	87.5	81.7	77.0	72.1	67.7	61.8	61.5	73.0	90.7	86.5	84.9	74.9	74.1	78.0	81.4	87.4	82.8	97.3																						
12-Feb	90.0	85.6	80.8	79.1	80.4	80.9	80.8	79.7	79.8	76.6	71.6	66.2	60.6	55.3	54.8	56.1	59.1	61.4	63.5	64.3	62.6	59.8	62.8	67.2	70.0	90.0																						
13-Feb	85.2	92.7	90.5	88.3	77.3	77.7	77.4	75.1	DF	67.2	84.5	87.9	82.7	77.2	76.7	80.2	82.8	79.3	80.1	80.0	81.7	83.7	84.9	82.7	81.5	92.7																						
14-Feb	82.6	82.7	82.8	82.2	81.6	81.3	80.4	79.2	80.3	78.9	75.2	75.1	75.8	76.0	73.9	75.9	77.9	77.4	78.1	78.9	78.0	79.2	80.2	80.1	78.9	82.8																						
15-Feb	78.8	78.2	78.8	79.1	79.2	79.6	79.9	80.3	79.7	72.9	69.9	64.8	59.9	54.4	52.4	52.8	59.0	67.9	75.0	77.2	76.7	77.1	76.9	76.8	72.0	80.3																						
16-Feb	77.3	78.5	81.0	82.7	83.7	85.1	85.9	84.2	82.5	76.7	72.2	69.3	69.0	64.7	61.9	59.3	60.6	63.6	65.3	67.7	70.0	73.0	74.0	75.1	73.5	85.9																						
17-Feb	80.3	79.6	79.2	79.5	79.3	79.8	80.2	80.5	79.5	78.8	74.9	75.2	76.3	78.1	78.8	76.0	77.4	85.2	87.8	87.1	86.3	85.9	84.7	84.0	80.6	87.8																						
18-Feb	83.3	82.5	81.4	81.3	81.3	81.0	80.9	80.6	79.7	78.9	78.2	77.7	76.8	73.4	70.5	71.6	73.7	77.7	79.0	78.4	78.2	77.7	77.5	78.1	78.3	83.3																						
19-Feb	78.0	77.2	77.0	77.4	77.2	77.3	78.5	78.5	79.0	78.8	78.7	77.1	74.9	75.6	72.7	73.1	77.6	81.7	81.8	82.6	82.5	81.8	82.1	81.8	78.5	82.6																						
20-Feb	81.2	80.7	80.7	80.4	80.2	79.8	78.7	78.3	77.5	74.9	72.1	71.8	70.8	70.0	68.5	66.2	68.4	72.6	73.1	76.0	79.0	79.5	78.7	78.5	75.7	81.2																						
21-Feb	77.0	76.0	76.1	76.4	75.0	74.5	73.2	73.4	72.9	67.9	64.8	61.5	56.9	54.3	52.2	50.2	51.9	60.1	66.1	68.1	70.3	70.9	70.9	70.9	67.1	77.0																						
22-Feb	70.9	70.0	70.5	70.4	69.6	70.8	69.6	69.3	69.3	68.7	68.4	67.5	63.8	58.6	50.7	47.3	49.6	57.2	63.6	67.2	68.7	70.4	69.3	70.4	65.5	70.9																						
23-Feb	71.9	72.3	73.2	74.2	74.3	75.3	75.1	74.3	72.2	67.1	61.0	50.9	49.8	46.5	43.6	42.7	41.8	54.6	63.3	65.0	66.0	67.4	65.2	62.9	62.9	75.3																						
24-Feb	63.7	65.0	66.7	68.4	69.3	69.1	70.1	70.6	70.1	65.9	60.4	55.8	50.8	46.8	44.1	43.9	45.3	47.7	49.8	53.1	58.2	61.6	63.2	64.3	59.3	70.6																						
25-Feb	65.3	66.8	68.4	68.9	69.1	71.8	73.1	73.5	72.7	69.9	68.1	60.6	55.8	55.6	55.0	54.0	53.1	54.7	56.3	57.8	59.2	59.7	61.6	67.0	63.2	73.5																						
26-Feb	67.5	70.1	71.2	70.7	70.9	69.4	68.6	66.1	63.1	60.0	68.5	76.0	79.0	77.8	74.5	71.5	71.9	74.8	73.7	77.1	78.1	77.6	80.8	85.0	72.7	85.0																						
27-Feb	86.5	87.6	87.5	86.7	86.2	85.9	85.7	84.7	83.0	75.5	75.6	72.0	68.7	68.8	70.2	67.9	68.6	74.3	80.4	78.0	79.9	80.4	80.8	81.8	79.0	87.6																						
28-Feb	82.1	82.5	82.9	83.1	82.7	82.2	81.9	81.8	80.6	78.0	76.4	75.5	74.2	70.0	63.8	60.9	64.2	70.7	76.8	79.5	80.4	81.1	82.0	82.0	77.3	83.1																						
																								77.3	77.1	76.9	76.8	76.6	77.0	77.3	77.2	76.7	72.9	70.2	66.9	63.5	60.6	59.3	60.4	63.9	68.1	70.6	71.6	72.4	73.1	74.1	74.7	Diurnal Average
																								97.3	97.1	96.4	92.7	91.8	92.1	91.7	91.6	92.2	91.7	90.6	88.0	82.7	81.5	79.3	80.2	90.7	90.1	94.6	95.5	95.9	96.2	96.9	97.3	Diurnal Maximum
DF - DAS Failure																																																



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

**Relative Humidity (RH) - %**  
**Jackfish 2/3 - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %  
Jackfish 2/3 - February 2023**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	6	0.90	0.90
40 - 60	116	17.31	18.21
60 - 80	390	58.21	76.42
80 - 100	158	23.58	100.00

Total Number of Valid Hours: 670

Total Number of Hours: 672



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Jackfish 2/3 - February 2023

Maximum Speed: 19 km/h on Feb 7 04:00	Maximum Daily Speed Average: 12.7 km/h on Feb 7	Hours in Service: 672
Minimum Speed Value: 1 km/h on Feb 23 08:00	Minimum Daily Speed Average: 0.4 km/h on Feb 23	Hours of Data: 669
Maximum Diurnal Speed Average: 5.0 km/h at hour 12	Minimum Diurnal Speed Average: 2.7 km/h at hour 18	Hours of Missing Data: 3
Monthly Average Velocity: 3.8 km/h 246.3 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 3 Q <sub>1</sub> = 5 Median = 7 Q <sub>3</sub> = 10 P <sub>90</sub> = 13 P <sub>99</sub> = 17	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-Feb	WNW5	NW5	NW6	NNW5	NNW7	N8	N6	NNW6	NNW8	NNW9	NNW9	NNW8	NNW8	NNW8	NNW7	NNW7	NNW5	NNW2	SSW1	SW1	WSW2	SW3	WSW3	WSW3	NNW4.7	NNW9
2-Feb	WSW4	SSW4	SSW5	SSW5	SSW7	SSW7	S6	S7	S8	S8	S8	S9	S9	S9	S10	S10	SSE11	S10	S9	S9	SSW12	SSW14	SSW12	SSW12	S8.2	SSW14
3-Feb	SSW13	SW15	SSW15	SW16	SW18	SW17	SW16	SW17	SW17	SW16	SW17	WSW17	WSW15	W10	NW6	NW5	SW7	WSW5	WSW4	SW4	SW4	WSW3	NNE1	ENE3	SW9.8	SW18
4-Feb	SSE2	ENE3	ENE3	E3	ESE4	SE3	SSE4	SE4	ENE4	ESE2	NNE3	NE2	NW1	NNE2	ENE3	NNE2	E3	E1	SSW4	SSW6	SSW7	SSW6	SSW5	DF	SE1.4	SSW7
5-Feb	SSW9	SW10	SSW8	SSW6	SSW7	SSW8	SSW9	SSW10	SSW9	SSW9	SSW9	SSW9	SSW10	SSW10	SSW9	SSW7	SW9	WSW11	WSW12	WSW12	WSW11	WSW13	W11	W12	SW9.0	WSW13
6-Feb	WNW11	NW15	WNW14	WNW13	WNW11	WNW9	W11	W11	W8	WSW10	W11	WSW12	W11	WSW13	WSW13	SW10	SW8	SW10	SW11	SW12	SW12	WSW14	WSW14	WSW14	W10.4	NW15
7-Feb	WSW13	WSW12	WSW14	WSW19	W18	WSW18	WSW16	WSW17	WNW13	WNW13	WNW10	W13	W15	W17	W16	W16	WSW16	WSW11	WSW9	WSW9	WSW8	W7	WSW6	SW8	W12.7	WSW19
8-Feb	WSW8	WSW8	W6	WSW7	WSW7	WSW8	WSW7	WSW10	WSW9	WSW9	WSW8	W7	W8	WNW8	W9	W6	WSW6	WSW8	SW8	SW8	SW8	SW9	SSW9	SW10	WSW7.4	WSW10
9-Feb	SW9	SW9	SW9	SW8	SW8	SSW8	SW8	SW9	SW10	WSW11	WSW11	SW11	SW10	WSW12	SW7	SSW6	S6	S6	SSW8	SSW9	SW11	SW10	SW10	SW10	SW8.8	WSW12
10-Feb	SW9	SW9	SW9	SW8	SSW7	SSW6	S5	S5	SSW7	SSE1	E3	SW6	SSW1	W2	W7	W8	WNW7	NW5	WNW7	WNW6	W5	W6	W7	W7	WSW4.5	SW9
11-Feb	W8	W8	WSW11	W10	W8	WSW8	WSW9	WSW11	WSW12	WSW13	WSW14	WSW14	WSW16	WSW15	WSW14	W17	WSW14	WSW12	WSW11	W14	WNW14	WNW12	W10	W13	W11.8	W17
12-Feb	WSW13	WSW12	W12	WSW12	WSW13	WSW11	WSW12	WSW10	WSW11	WSW11	WSW12	WSW13	WSW12	WSW11	WSW9	SW8	SW8	SW8	SSW7	S7	S8	S9	SSW10	SSW10	WSW9.6	WSW13
13-Feb	SW13	SW14	SW13	SW10	WSW15	WSW17	WSW17	WSW18	DF	WSW19	W16	W14	WNW12	NW11	NNW11	NNW12	N9	N11	N10	N10	NNW8	NNW6	NNW6	NNW6	W8.4	WSW19
14-Feb	NNW6	NW5	NNW5	N4	NNE4	NNE3	NE2	ESE2	E3	ENE2	SW2	SW4	M	SW6	WSW7	WSW6	W5	NNW5	NNW6	NNW5	NW5	NNE6	NE4	NE5	NNW2.2	WSW7
15-Feb	NE6	NE5	NE3	ENE4	ENE3	NE3	ENE3	NE3	ENE2	E1	NE5	SE2	E1	S2	WSW5	WSW6	SW5	SW4	S4	S5	S6	S6	S7	SSW8	SSE1.2	SSW8
16-Feb	SSW7	S8	S8	S9	S9	S9	S9	SSW10	SSW11	SSW14	SSW15	SSW14	SSW13	SW13	SW13	WSW15	WSW15	WSW13	WSW12	W8	WNW9	NW8	NW7	NW7	SW8.5	WSW15
17-Feb	NW5	NNW6	NNW7	NNW6	NNW6	NW7	NNE4	NW4	WSW5	WSW7	WSW9	WSW9	W7	W7	WSW8	W7	W6	WNW4	NNE5	NE7	NE7	NE6	ENE5	NNE6	NW3.3	WSW9
18-Feb	NNE6	NNE7	NNE5	NE8	NE7	NE8	NE7	NE6	NNE6	NNE6	NNE6	NNE5	NE6	NNE6	NNE5	NNE5	NE4	ENE2	ESE2	SE2	SSE2	SE3	SSE3	S5	NE4.0	NE8
19-Feb	SSE7	S7	S7	SSE7	SSE7	SSE6	SSE7	SSE6	SSE6	SE6	SE6	ESE5	E5	E6	E6	NE5	NNE5	NNE5	NNE4	NNE4	N4	NNE5	NNE4	N4	ESE2.8	SSE7
20-Feb	NNW4	NNW4	NNW3	NNW4	NW4	NW4	NW5	NW5	NW5	WNW4	W5	W7	WNW7	W7	WNW8	NW5	NNW5	N4	NNW3	NNE4	NE5	NNE3	NNE6	NE6	NW3.8	WNW8
21-Feb	NNE6	N3	N2	NNW5	NW3	W2	WSW1	NW3	NW4	NNW7	N8	NNW8	NNW7	NNW8	NNW7	NW7	NW6	NNW7	N6	N5	NNE4	N5	NNE5	NNE3	NNW4.7	NNW8
22-Feb	NNE3	NNE2	NNW2	SW2	NNW2	W2	WSW4	WSW4	WSW2	NNE4	NE7	NNE5	NNE5	NE6	NNE4	NNE6	NE6	NE5	NE4	NE3	NNE4	NE4	ENE4	NE4	NNE2.7	NE7
23-Feb	NE4	NE5	NE4	ENE4	ENE3	ENE3	NE3	S1	N1	WNW1	S3	SW2	WNW3	NE2	N4	NE5	NE2	ESE1	S2	SSW3	S3	S3	SW6	SW8	E0.4	SW8
24-Feb	SW8	SSW7	SSW8	SSW8	SSW8	SSW8	SSW9	SSW8	SSW8	SSW9	SSW13	SSW13	S12	S13	SSW13	SSW13	S10	S9	SSW11	SSW11	SSW14	SSW15	SSW14	SSW14	SSW10.6	SSW15
25-Feb	SW14	SW14	SW14	WSW15	WSW16	SW16	WSW16	WSW15	WSW13	WSW10	WSW10	WSW11	WSW10	WSW9	WSW10	WSW8	SSW5	SW8	SSW6	SSW5	SSW6	S6	S6	S6	WSW10.0	WSW16
26-Feb	SSE7	SSE7	SSE7	SSE6	SSE6	SE6	SE6	SE7	ESE5	E5	ENE6	ENE7	ENE9	ENE11	ENE12	ENE11	NE9	ENE8	E7	E6	ESE5	ESE4	ESE3	ENE2	E5.3	ENE12
27-Feb	NNE3	N3	N3	NW4	NW4	NW5	NW6	NW7	WNW7	NW7	NW7	WNW7	WNW7	NW6	WNW8	NW7	WNW8	WNW5	NW5	NW4	NNW3	NNW3	NNW3	N3	NW5.0	WNW8
28-Feb	N4	NNE5	NE5	NE5	NE5	NE4	NNE3	NNE4	NNE4	NNE5	NNE6	ENE7	NE6	NNE5	NE6	ENE6	NE5	ENE5	ENE4	E4	E5	ESE4	SSE4	SSE6	NE3.9	ENE7

WSW3.7WSW3.8WSW3.9WSW3.7WSW3.9WSW4.1 SW4.4WSW5.0WSW4.1WSW4.5WSW4.3WSW5.0WSW4.7 W4.2 W4.3 W3.9WSW3.2WSW2.7WSW2.8WSW2.7WSW3.0WSW3.0WSW3.1 SW3.3 SW14 NW15 SSW15WSW19 W18WSW18WSW17WSW18 SW17WSW19 SW17WSW17WSW16 W17 W16 W17WSW16WSW13WSW12 W14 SSW14 SSW15 SSW14 SSW14	Diurnal Average
	Diurnal Maximum

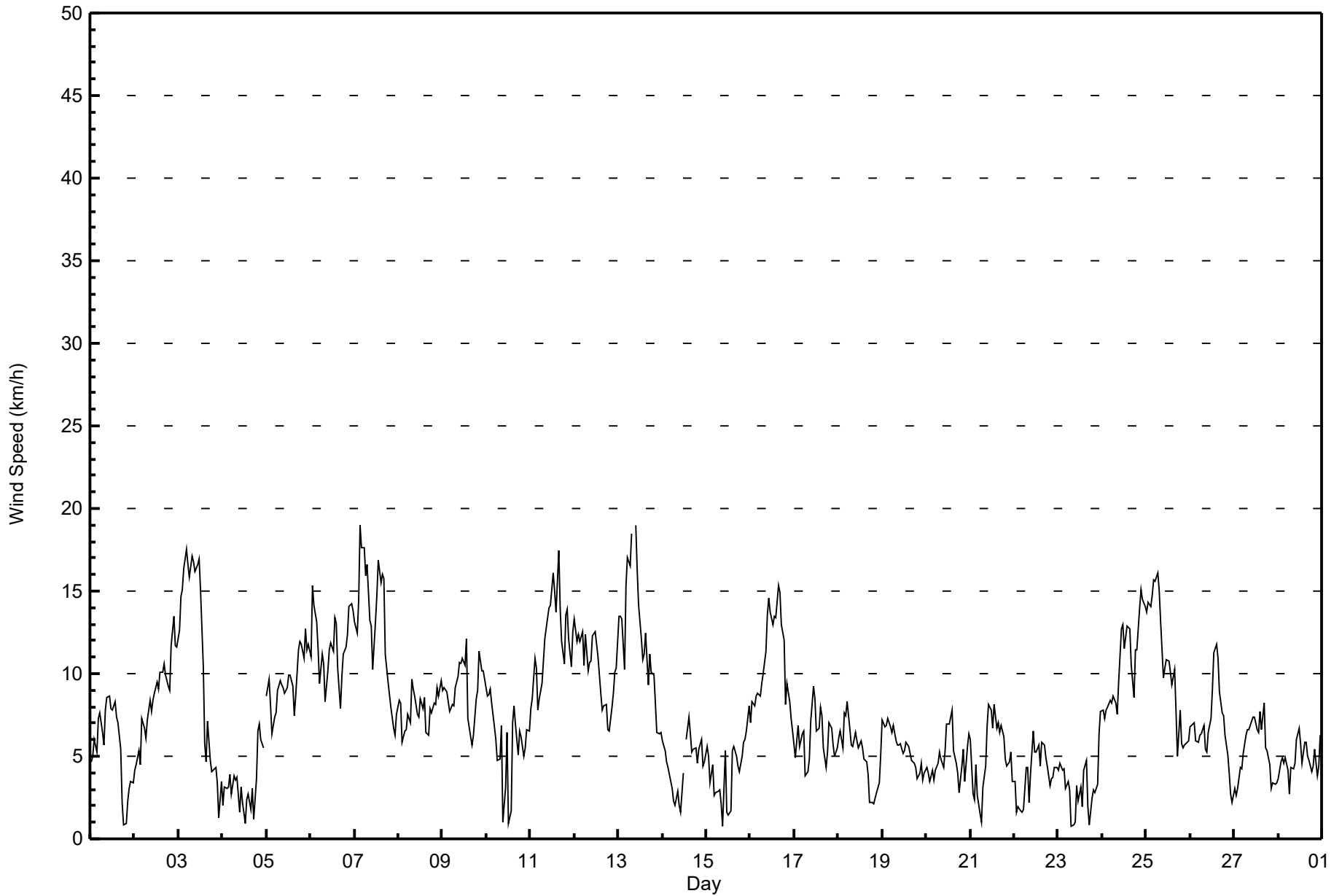
M - Maintenance DF - DAS Failure  
 All monthly, daily, and diurnal averages have been calculated using vector methods





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

**Wind Speed (WS) - km/h**  
**Jackfish 2/3 - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Jackfish 2/3 - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	228	34.08	34.08
6 - 11	327	48.88	82.96
12 - 19	114	17.04	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: 669

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Jackfish 2/3 - February 2023**

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	38	29	20	10	11	5	6	11	10	10	13	6	6	22	18	228
6 - 11	7	12	17	8	4	0	5	14	31	45	48	47	30	16	15	28	327
12 - 19	0	0	0	1	0	0	0	0	2	18	21	51	12	7	1	1	114
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>	20	50	46	29	14	11	10	20	44	73	79	111	48	29	38	47	669

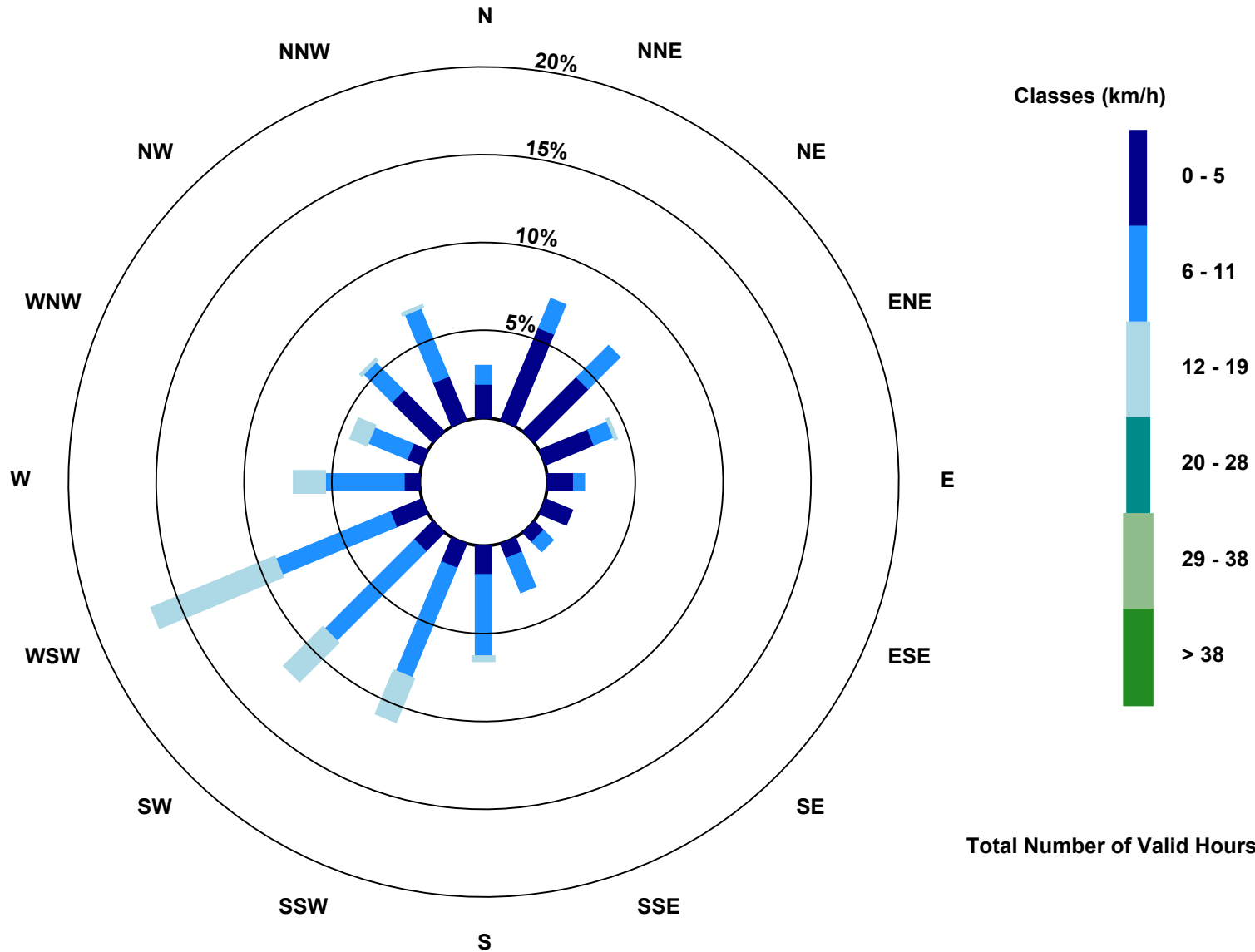
Total Number of Valid Hours: 669

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Jackfish 2/3





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

**Wind Speed (WS) - km/h**  
**Jackfish 2/3 - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 6 km/h on Feb 6 03:00 Minimum Value: 0 km/h on Feb 23 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> = 5																	Hours in Service: 672 Hours of Data: 669 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-Feb	2	2	2	2	3	3	3	2	4	4	4	3	3	4	3	3	2	2	1	1	1	1	1	1	1	4															
2-Feb	1	1	2	1	2	2	2	2	3	3	3	3	4	4	4	4	4	4	3	3	5	5	5	4	5																
3-Feb	4	4	4	4	4	4	4	4	4	4	3	4	3	4	2	2	2	2	1	1	1	1	1	1	4																
4-Feb	1	1	1	1	1	1	1	2	1	1	2	1	1	1	2	1	1	1	1	2	2	2	1	1	2																
5-Feb	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	2	2	2	2	2	3	2	3	3	DF																
6-Feb	5	6	6	5	4	3	3	3	3	2	3	3	4	4	4	3	2	3	3	3	3	4	4	3	6																
7-Feb	4	3	4	5	5	5	4	5	5	5	4	4	4	6	6	5	5	3	2	2	1	2	2	2	6																
8-Feb	1	2	2	2	1	1	2	2	2	2	2	2	3	3	3	2	2	2	2	2	2	2	2	2	3																
9-Feb	2	2	2	2	2	2	2	2	2	2	3	3	3	4	3	2	2	2	3	3	3	3	2	2	4																
10-Feb	2	2	2	2	2	2	2	2	1	2	1	4	1	2	3	2	2	2	2	2	2	2	2	2	4																
11-Feb	3	2	3	3	3	2	2	2	3	3	4	4	5	4	4	5	3	4	4	5	6	5	4	3	6																
12-Feb	3	3	3	2	2	2	3	3	2	2	3	3	3	3	2	3	2	2	2	3	3	3	3	3	3																
13-Feb	5	5	4	3	4	5	4	5	DF	5	5	4	5	5	5	5	4	5	5	4	3	2	2	2	5																
14-Feb	2	2	2	2	1	1	1	1	1	1	1	1	2	M	2	2	2	2	2	2	2	2	1	1	2																
15-Feb	2	2	1	2	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	2	2	2	2																
16-Feb	2	2	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	3	3	3	4	3	4	3	4																
17-Feb	2	3	3	2	3	3	2	2	2	2	2	3	2	2	2	3	2	2	3	2	2	2	2	1	3																
18-Feb	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	0	0	1	1	1	2																
19-Feb	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	1	2	1	1	2																
20-Feb	1	1	1	2	1	2	2	2	2	2	2	3	2	3	3	2	2	2	1	2	2	1	2	2	3																
21-Feb	3	1	1	2	1	1	1	1	2	3	3	3	3	3	3	3	3	3	3	2	2	2	2	1	3																
22-Feb	1	1	1	1	1	2	1	0	1	2	2	2	3	2	2	2	2	1	1	1	1	1	1	1	3																
23-Feb	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	0	0	1	0	2	2	2																
24-Feb	2	2	2	2	2	2	2	2	2	4	4	4	4	4	5	4	4	3	4	4	4	5	4	4	5																
25-Feb	4	3	3	3	3	3	4	3	3	3	3	4	3	3	3	3	2	1	3	1	2	2	2	2	4																
26-Feb	2	2	2	2	2	2	3	3	2	2	2	2	3	4	4	4	3	3	2	2	2	1	1	1	4																
27-Feb	1	1	1	2	1	2	3	3	3	3	3	3	3	3	3	3	4	2	2	2	1	1	1	1	4																
28-Feb	1	2	1	1	1	1	1	1	1	2	2	2	3	2	2	2	2	1	1	1	1	1	2	2	3																
																	5	6	6	5	5	5	4	5	5	5	5	4	5	6	6	5	5	5	5	5	6	5	5	4	
Diurnal Maximum																																									
M - Maintenance      DF - DAS Failure																																									



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

**Wind Direction (WD) - deg**  
**Jackfish 2/3 - February 2023**

Direction of Maximum Speed: 257 deg on Feb 7 04:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 259.8 deg on Feb 7	Hours of Data: 669
Direction of Minimum Speed: 183 deg on Feb 23 08:00	Hours of Missing Data: 3
Direction of Minimum Daily Speed Average: 0.4 deg on Feb 23	Percent Operational Time: 99.6
Monthly Average Direction: 246.3 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-Feb	289	310	322	335	346	353	355	328	339	341	345	342	335	338	330	344	340	327	198	222	238	231	242	241	329.9
2-Feb	242	203	199	194	197	194	187	189	183	177	177	178	178	171	174	172	167	176	185	191	205	207	210	211	189.2
3-Feb	213	216	213	215	214	218	215	219	221	226	234	242	246	271	315	309	232	248	242	218	231	241	18	71	228.2
4-Feb	161	67	71	86	121	145	148	132	58	103	17	53	322	27	66	21	79	86	201	204	204	211	206	DF	136.0
5-Feb	213	222	213	197	209	207	210	208	210	211	219	224	219	214	225	217	230	239	242	247	252	256	267	270	228.4
6-Feb	296	310	302	296	291	288	266	267	275	256	265	258	265	256	253	235	215	214	216	226	230	243	253	246	260.4
7-Feb	248	243	247	257	261	256	254	257	288	287	282	268	262	268	264	259	254	253	254	254	255	279	248	231	259.8
8-Feb	252	241	264	258	257	256	255	246	252	258	253	262	273	283	276	272	247	238	224	223	218	218	213	217	247.2
9-Feb	215	228	234	229	220	207	217	225	230	239	238	234	232	239	218	195	188	191	198	208	222	223	216	219	221.6
10-Feb	226	226	221	214	204	199	188	177	202	163	99	228	200	262	273	265	286	308	290	284	278	267	265	274	241.5
11-Feb	273	260	254	266	278	251	243	247	243	252	253	253	254	256	253	259	251	250	246	272	286	289	274	262	259.0
12-Feb	252	248	260	251	253	239	250	257	247	239	247	251	255	254	246	236	218	216	205	182	188	190	205	211	237.6
13-Feb	228	223	228	229	248	250	255	255	DF	258	260	262	283	326	331	345	356	349	349	352	348	346	342	342	280.7
14-Feb	341	325	343	8	17	19	46	119	79	72	230	235	M	222	244	258	266	328	344	338	317	21	42	54	332.4
15-Feb	53	53	41	58	64	54	77	37	71	100	41	144	91	189	248	254	234	214	190	184	178	181	187	192	155.7
16-Feb	193	191	177	185	180	185	189	195	198	209	208	207	205	221	231	240	240	239	252	263	301	315	320	320	222.0
17-Feb	321	328	340	346	327	318	14	308	253	251	242	243	263	265	253	260	273	286	17	35	42	45	59	32	307.4
18-Feb	28	30	28	37	43	44	48	35	21	31	23	30	35	22	15	24	50	78	117	138	161	133	164	170	42.6
19-Feb	166	169	171	168	158	160	162	159	150	146	127	110	80	79	96	36	29	19	17	15	9	21	21	11	116.2
20-Feb	340	332	328	327	308	304	310	311	308	303	276	266	285	278	294	321	344	2	344	26	46	30	22	35	323.3
21-Feb	32	8	350	346	323	275	239	313	314	337	350	341	331	345	344	323	322	345	4	356	18	9	15	12	346.1
22-Feb	21	16	346	232	342	259	238	240	257	24	55	27	21	39	22	13	35	35	42	45	33	48	61	52	26.8
23-Feb	56	54	36	59	66	61	45	183	2	294	187	225	288	36	352	40	40	120	182	197	187	181	216	227	85.7
24-Feb	226	210	201	208	207	204	204	202	198	200	205	192	187	189	193	197	187	191	193	199	201	205	212	212	200.6
25-Feb	217	223	229	231	240	234	241	248	246	254	255	245	242	239	246	233	224	206	217	207	197	197	186	174	231.5
26-Feb	164	161	166	161	147	139	145	144	114	95	76	74	63	72	73	59	54	63	89	80	113	122	111	70	100.2
27-Feb	15	1	354	324	311	309	305	307	301	311	306	298	289	305	299	304	300	303	307	316	336	339	346	359	312.2
28-Feb	353	20	38	46	54	45	24	18	15	26	31	59	42	31	34	57	46	77	75	88	81	106	147	159	52.4
	243.7	242.9	245.0	243.8	242.7	237.5	234.2	239.0	242.0	249.9	251.4	247.1	256.6	262.1	264.7	267.0	254.3	250.9	238.3	238.8	238.7	238.9	236.4	235.2	

Diurnal Average

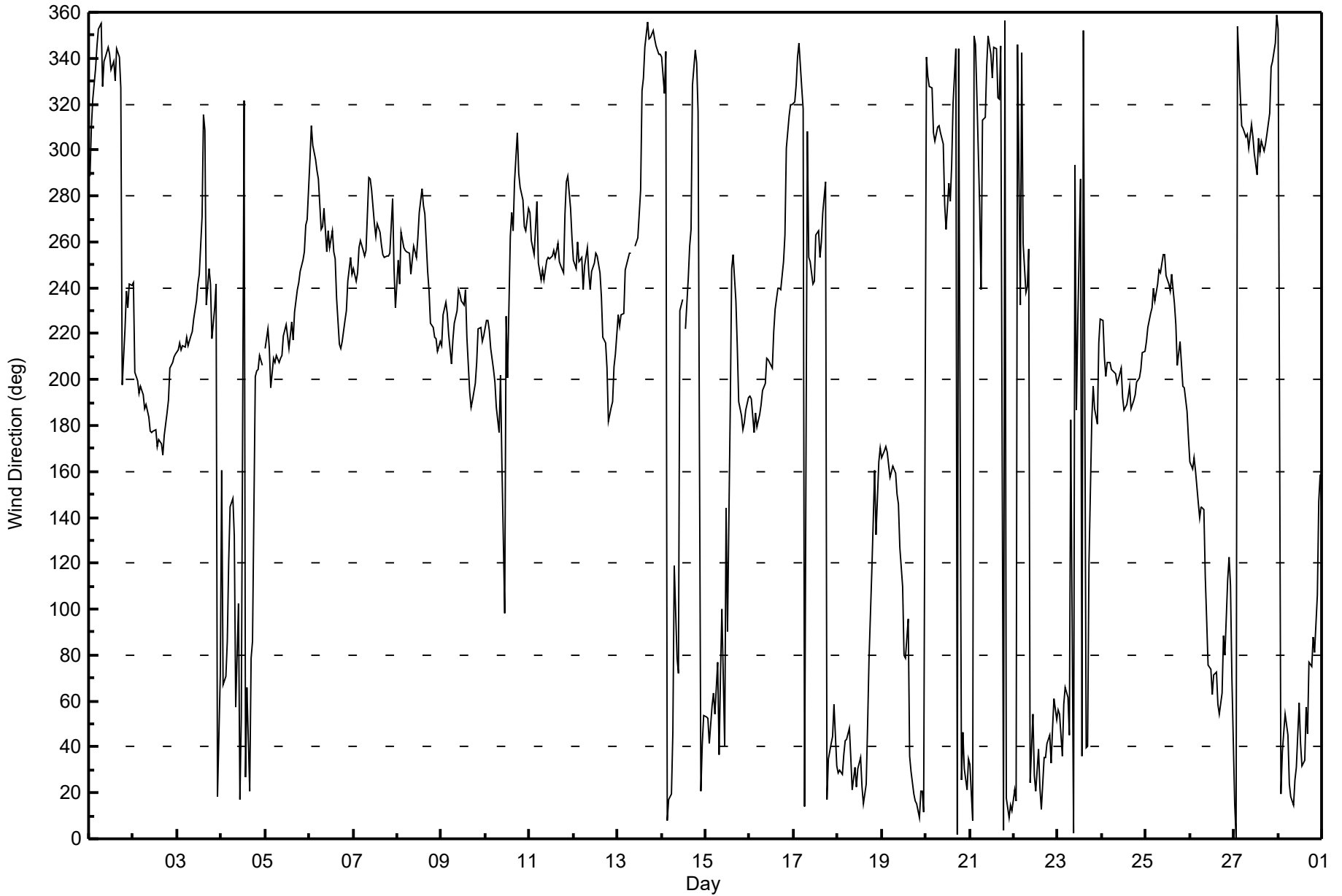
M - Maintenance      DF - DAS Failure

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



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

**Wind Direction (WD) - deg**  
**Jackfish 2/3 - February 2023**





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

**Wind Direction (WD) - deg**  
**Jackfish 2/3 - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 103 deg on Feb 10 10:00 Minimum Value: 6 deg on Feb 23 22:00 Percentiles: P <sub>1</sub> = 12 P <sub>10</sub> = 16 Q <sub>1</sub> = 19 Median = 28 Q <sub>3</sub> = 39 P <sub>90</sub> = 46 P <sub>99</sub> = 91																		Hours in Service: 672 Hours of Data: 669 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-Feb	30	37	39	38	39	42	43	44	42	41	46	50	51	47	45	38	43	77	92	66	22	12	13	14	92
2-Feb	15	16	14	11	12	18	20	21	22	29	30	34	37	41	38	38	39	46	37	34	31	27	28	29	46
3-Feb	23	22	20	18	18	18	18	18	16	17	16	15	17	30	45	42	22	18	26	13	21	21	76	31	76
4-Feb	42	28	26	33	31	40	39	48	34	73	36	70	85	63	55	46	33	73	24	21	19	22	20	DF	85
5-Feb	18	19	21	19	20	19	15	13	13	16	18	20	24	23	20	21	19	16	14	16	14	17	21	25	25
6-Feb	42	37	35	33	31	30	20	25	27	13	23	21	29	23	21	24	22	26	23	21	21	20	19	17	42
7-Feb	17	19	17	17	19	16	16	19	35	33	35	27	23	27	29	22	16	15	13	12	12	23	27	18	35
8-Feb	14	17	15	17	15	12	14	13	13	17	20	25	31	35	31	32	22	16	18	18	17	18	18	19	35
9-Feb	18	19	17	20	19	18	18	19	18	17	18	22	25	23	30	36	34	34	28	24	20	19	18	19	36
10-Feb	19	19	16	16	18	18	57	31	15	103	46	28	92	83	43	23	33	36	36	32	35	25	22	35	103
11-Feb	31	19	17	26	37	16	15	16	17	16	16	18	18	19	19	20	18	17	18	33	35	33	30	16	37
12-Feb	15	15	16	14	13	15	16	14	14	16	16	17	21	21	24	22	24	23	28	30	31	28	25	23	31
13-Feb	21	25	23	27	17	18	16	16	DF	19	18	21	39	45	45	42	45	41	38	43	39	33	30	42	45
14-Feb	34	40	40	44	39	38	36	37	21	80	70	33	M	27	25	30	36	50	43	47	44	42	25	21	80
15-Feb	22	24	32	27	33	30	25	40	55	93	35	79	94	91	47	32	21	16	15	18	18	20	20	19	94
16-Feb	22	25	26	26	25	29	28	22	21	21	21	22	24	21	19	18	17	19	20	29	41	42	50	44	50
17-Feb	40	50	39	44	44	43	47	53	28	28	22	25	34	32	24	29	39	42	45	23	23	22	23	20	53
18-Feb	22	20	21	19	23	21	25	32	38	34	42	45	41	51	53	41	25	35	28	30	21	24	19	17	53
19-Feb	19	18	19	22	31	32	30	33	36	40	40	47	43	39	40	37	32	30	33	33	36	31	34	34	47
20-Feb	34	40	33	37	44	37	43	42	44	43	43	40	40	40	37	46	52	41	40	36	26	36	40	35	52
21-Feb	28	25	44	37	59	85	96	53	44	44	40	41	50	42	52	43	39	42	39	36	28	34	37	28	96
22-Feb	28	49	44	28	62	62	11	8	52	58	25	45	56	55	54	41	31	22	20	15	17	18	16	11	62
23-Feb	15	23	14	14	17	14	13	67	53	62	53	78	85	93	62	44	74	82	22	13	36	6	17	15	93
24-Feb	14	19	17	16	18	18	20	21	23	26	27	32	32	31	33	29	31	31	30	27	23	22	21	20	33
25-Feb	19	19	17	16	15	15	15	15	16	25	28	28	26	25	25	22	26	24	22	19	23	23	26	23	28
26-Feb	24	25	25	36	33	37	37	39	37	38	31	31	28	26	27	29	27	29	26	30	35	44	44	39	44
27-Feb	23	38	36	35	41	43	38	42	42	46	43	42	43	43	37	46	41	42	41	38	43	48	44	36	48
28-Feb	39	34	32	22	23	25	32	30	31	41	38	33	51	55	47	42	34	27	19	17	20	21	35	28	55
Diurnal Maximum																									
M - Maintenance      DF - DAS Failure																									





## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS29 SURMONT 2 FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT2 (AMS29)  
FEBRUARY 2023

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	639	33	33	100	21.5	0	7.1	0
H2S (ppb) Average	638	34	34	100	1.1	0	0.5	0
THC(ppm) Average	639	33	33	100	3.4	-	2.4	-
NO2 (ppb) Average	635	34	37	99.55	28.4	0	11.1	-
NO (ppb) Average	635	34	37	99.55	8.3	-	2.8	-
NOX (ppb) Average	635	34	37	99.55	31.4	-	13.5	-
PM2.5 (ug/m3) Average	670	2	2	100	13.9	0	8.8	0
Temperature 2 m (C) Average	672	0	0	100	5.2	-	1.1	-
Relative Humidity (%) Average	672	0	0	100	98.1	-	90.7	-
Wind Speed 10 m (km/h) Average	664	0	8	98.81	19	-	11	-
Wind Direction 10 m (deg) Average	664	0	8	98.81	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT 2 (AMS29)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	639	1.19	2.3	-	0	0	0.2	0.4	0.9	3.2	21.5
H2S (ppb) Average	638	0.14	0.1	-	0	0	0	0.1	0.2	0.3	1.1
THC (ppm) Average	639	2.29	0.1	-	2.1	2.2	2.2	2.3	2.3	2.4	3.4
NO2 (ppb) Average	635	3.9	4.1	-	0.3	0.6	1.1	2.5	5	9.3	28.4
NO (ppb) Average	635	0.46	1.1	-	0	0	0	0.1	0.3	1.3	8.3
NOX (ppb) Average	635	4.35	4.6	-	0.3	0.7	1.2	2.7	5.8	10.3	31.4
PM2.5 (ug/m3) Average	670	2.89	2.2	-	0.4	0.8	1.4	2.4	3.6	5.4	13.9
Temperature 2 m (C) Average	672	-13.06	10.3	-	-35.8	-27.4	-20.5	-13.4	-3.6	0.8	5.2
Relative Humidity (%) Average	672	73.04	12.2	-	39.7	55.2	66.2	74.5	80.7	89.1	98.1
Wind Speed 10 m (km/h) Average	664	5.5	4	-	0	2	3	5	8	11	19
Wind Direction 10 m (deg) Average	664	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT 2 (AMS29)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2	17 Feb 2023 12:00	17 Feb 2023 14:00	3	Maintenance - station calibrator replaced
Wind Speed, Wind Direction	17 Feb 2023 13:00	17 Feb 2023 14:00	2	Maintenance - station operator activities
Wind Speed, Wind Direction	23 Feb 2023 01:00	23 Feb 2023 04:00	4	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	23 Feb 2023 08:00	23 Feb 2023 08:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	28 Feb 2023 07:00	28 Feb 2023 07:00	1	Flat line in sensor output signal - Sensor frozen



# Wood Buffalo Environmental Association

## Summary of Hour Averages

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

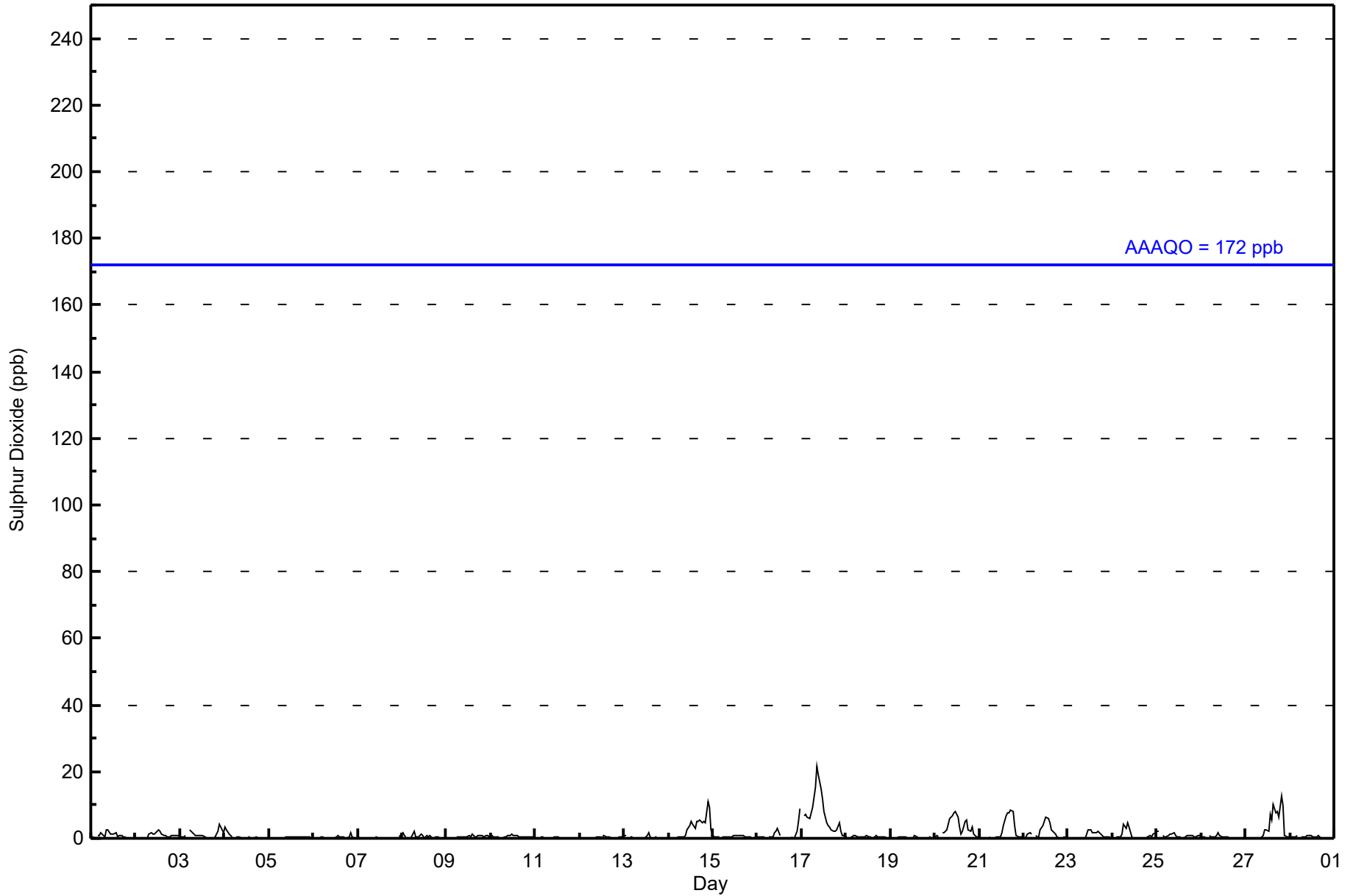
## Surmont 2 - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														672																													
Maximum Value: 21.5 ppb on Feb 17 09:00				Maximum Daily Average: 7.1 ppb on Feb 17		Hours of Data:														639																													
Minimum Value: 0.0 ppb on Feb 4 20:00				Minimum Daily Average: 0.1 ppb on Feb 11		Hours of Missing Data:														33																													
Maximum Diurnal Average: 1.7 ppb at hour 12				Minimum Diurnal Average: 0.6 ppb at hour 1		Hours of Calibration:														33																													
Monthly Average: 1.19 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> = 0.9 P <sub>90</sub> = 3.2 P <sub>99</sub> = 10.8		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-Feb	0.3	0.4	Z	1.0	1.0	1.5	0.9	0.3	2.5	2.4	1.4	1.4	1.3	1.5	0.6	0.7	0.9	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.8	2.5																							
2-Feb	0.1	0.0	0.1	Z	0.1	0.0	0.0	1.3	1.6	1.5	1.2	1.9	2.6	2.0	1.3	0.8	1.0	0.6	0.5	0.7	0.8	0.9	1.0	0.7	0.9	2.6																							
3-Feb	0.4	0.3	0.4	0.7	Z	2.6	2.3	1.1	1.0	0.8	0.7	0.8	0.8	0.4	0.1	0.1	0.0	0.1	0.2	0.5	2.1	4.4	3.2	1.6	1.1	4.4																							
4-Feb	3.2	2.4	1.5	0.6	0.5	Z	0.4	0.2	0.3	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.5	3.2																							
5-Feb	Z	0.2	0.2	0.2	0.0	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.5	0.5	0.2	0.3	0.3	0.4	0.5	0.4	0.6	0.6	0.0	0.3	0.6																							
6-Feb	0.0	Z	0.0	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.9	0.6	0.2	0.3	0.2	0.1	0.5	1.9	0.3	0.2	0.2	0.3	1.9																							
7-Feb	0.2	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	0.1	0.9																							
8-Feb	1.6	0.9	0.4	Z	0.1	0.3	2.0	0.6	0.4	0.5	1.2	0.8	0.2	0.7	0.2	0.7	0.0	0.0	0.2	0.4	0.2	0.1	0.0	0.0	0.5	2.0																							
9-Feb	0.0	0.0	0.0	0.0	Z	0.2	0.2	0.4	0.4	0.5	0.6	0.3	1.0	0.2	1.2	0.4	0.3	0.8	0.8	0.7	0.6	0.7	0.7	0.6	0.5	1.2																							
10-Feb	0.8	0.4	0.4	0.2	0.4	Z	0.2	0.4	0.4	0.7	1.0	1.1	1.0	0.8	0.7	0.5	0.4	0.5	0.3	0.2	0.5	0.5	0.5	0.4	0.5	1.1																							
11-Feb	Z	0.1	0.1	0.2	0.4	0.1	0.0	0.0	0.0	0.1	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.4																							
12-Feb	0.1	Z	0.2	0.1	0.0	0.0	0.2	0.1	0.2	0.3	0.3	0.4	0.2	0.7	0.2	0.5	0.2	0.2	0.1	0.1	0.1	0.3	0.3	0.3	0.2	0.7																							
13-Feb	0.9	0.8	Z	0.3	0.3	0.1	0.2	0.1	0.1	0.2	0.2	0.2	1.0	1.5	0.4	0.1	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.3	1.5																							
14-Feb	0.0	0.0	0.0	Z	0.1	0.5	0.3	0.3	0.4	0.9	2.5	3.9	5.1	4.3	3.0	5.1	5.1	5.4	4.7	5.2	4.8	11.2	9.3	2.6	3.3	11.2																							
15-Feb	0.6	0.5	0.3	0.5	Z	0.4	0.3	0.5	0.3	0.4	0.5	0.9	0.8	0.9	1.0	0.6	0.7	0.4	0.4	0.3	0.3	0.1	0.1	0.3	0.5	1.0																							
16-Feb	0.5	0.5	0.2	0.3	0.3	Z	0.4	0.5	0.5	1.6	2.3	2.9	0.8	C	C	C	C	C	0.3	0.1	0.1	2.2	5.1	8.9	1.5	8.9																							
17-Feb	Z	6.9	7.1	6.3	5.7	7.6	9.2	15.4	21.5	19.2	14.7	11.8	8.0	4.9	3.9	3.2	2.6	2.3	2.2	2.7	4.7	2.3	0.9	0.6	7.1	21.5																							
18-Feb	0.5	Z	0.5	0.4	0.7	0.8	0.4	0.3	0.3	0.3	0.6	0.7	0.6	0.4	0.1	0.3	0.8	0.4	0.6	0.4	0.3	0.3	0.1	0.0	0.4	0.8																							
19-Feb	0.0	0.1	Z	0.2	0.2	0.3	0.3	0.5	0.3	0.2	0.1	0.1	0.1	0.8	0.3	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.8																							
20-Feb	0.6	0.9	0.6	Z	1.6	1.6	2.5	4.2	5.8	6.9	7.5	8.2	6.3	3.6	1.4	2.1	5.0	5.5	2.7	2.1	3.2	1.2	0.4	0.3	3.2	8.2																							
21-Feb	0.3	0.2	0.2	0.2	Z	0.3	0.2	0.1	0.2	0.3	0.3	0.4	1.9	4.0	6.8	7.8	7.7	8.6	8.3	3.8	1.0	0.4	0.3	0.2	2.3	8.6																							
22-Feb	0.2	0.2	1.2	1.6	1.3	Z	1.0	0.4	0.5	2.7	3.9	4.9	6.4	6.0	4.5	2.5	1.6	1.3	0.5	0.2	0.1	0.1	0.2	0.2	1.8	6.4																							
23-Feb	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	1.5	2.6	2.7	1.8	1.8	1.9	2.0	1.5	0.9	0.5	0.3	0.4	0.3	0.2	0.8	2.7																							
24-Feb	0.1	Z	0.3	0.4	0.3	1.2	4.3	3.2	4.9	3.5	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.5	1.0	0.4	1.1	1.6	1.0	4.9																							
25-Feb	2.0	2.2	Z	0.7	0.6	0.5	0.8	1.4	1.3	1.5	1.0	0.5	0.2	0.1	0.2	0.3	0.7	0.8	0.8	0.8	0.6	0.6	1.1	0.8	0.8	2.2																							
26-Feb	0.4	0.3	0.4	Z	0.7	0.6	0.5	0.6	0.8	1.6	0.9	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.4	1.6																							
27-Feb	0.1	0.0	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.7	2.5	2.4	2.1	7.1	5.7	10.1	7.8	8.1	6.2	12.6	9.7	0.9	0.4	0.3	3.4	12.6																							
28-Feb	0.3	0.2	0.2	0.5	0.8	Z	0.4	0.3	0.3	0.7	0.9	0.8	0.5	0.6	0.6	0.7	0.5	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.4	0.9																							
																								0.6	0.7	0.6	0.6	0.7	0.8	1.0	1.2	1.6	1.7	1.7	1.7	1.6	1.7	1.3	1.5	1.4	1.4	1.1	1.2	1.2	1.0	1.0	0.8	Diurnal Average	
																								3.2	6.9	7.1	6.3	5.7	7.6	9.2	15.4	21.5	19.2	14.7	11.8	8.0	7.1	6.8	10.1	7.8	8.6	8.3	12.6	9.7	11.2	9.3	8.9	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**  
**Surmont 2 - February 2023**





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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Surmont 2 - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	632	98.90	98.90
11 - 20	6	0.94	99.84
21 - 60	1	0.16	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: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Surmont 2 - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	39	34	14	8	18	23	57	25	18	11	12	79	94	67	42	84	625
11 - 20	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	2	6
21 - 60	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
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>	40	37	14	8	18	24	57	25	18	11	12	79	94	67	42	86	632

Total Number of Valid Hours: 632

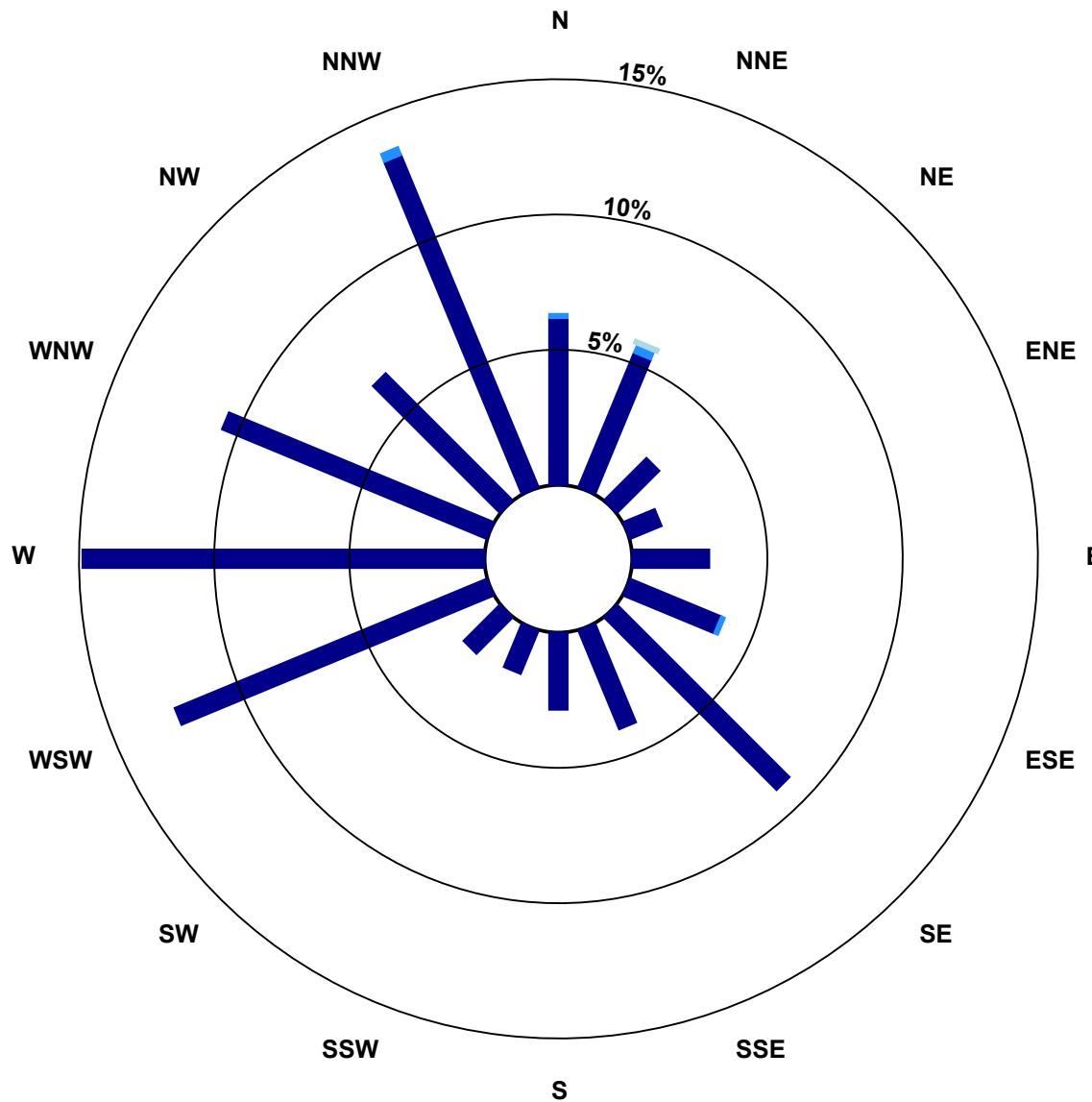
Total Number of Hours: 672



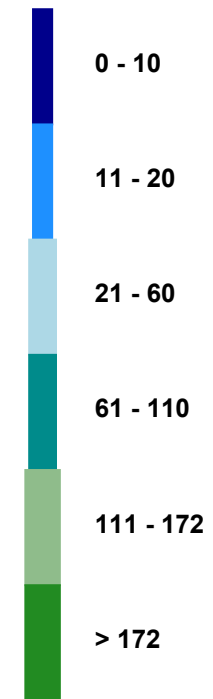


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

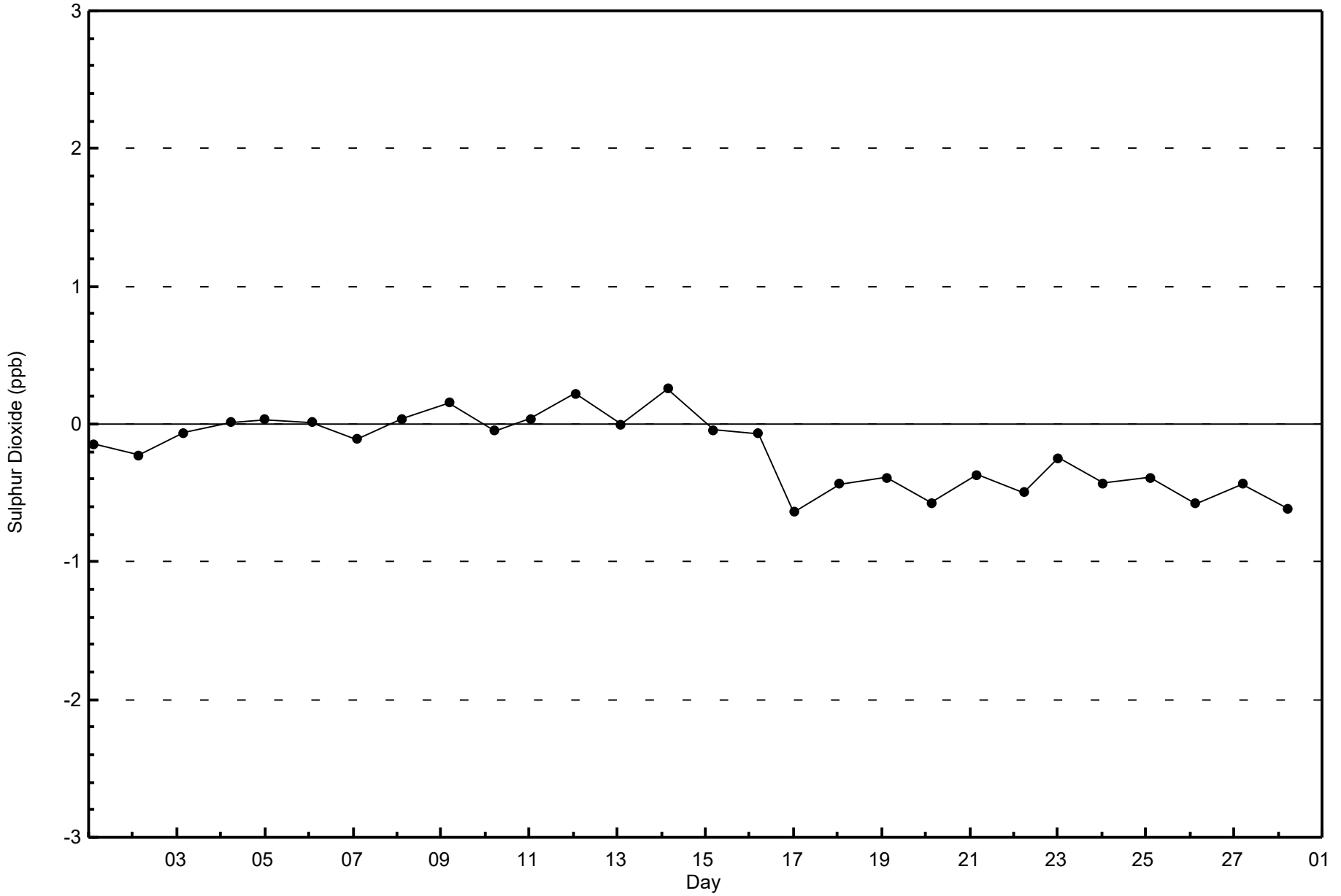
Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Surmont 2

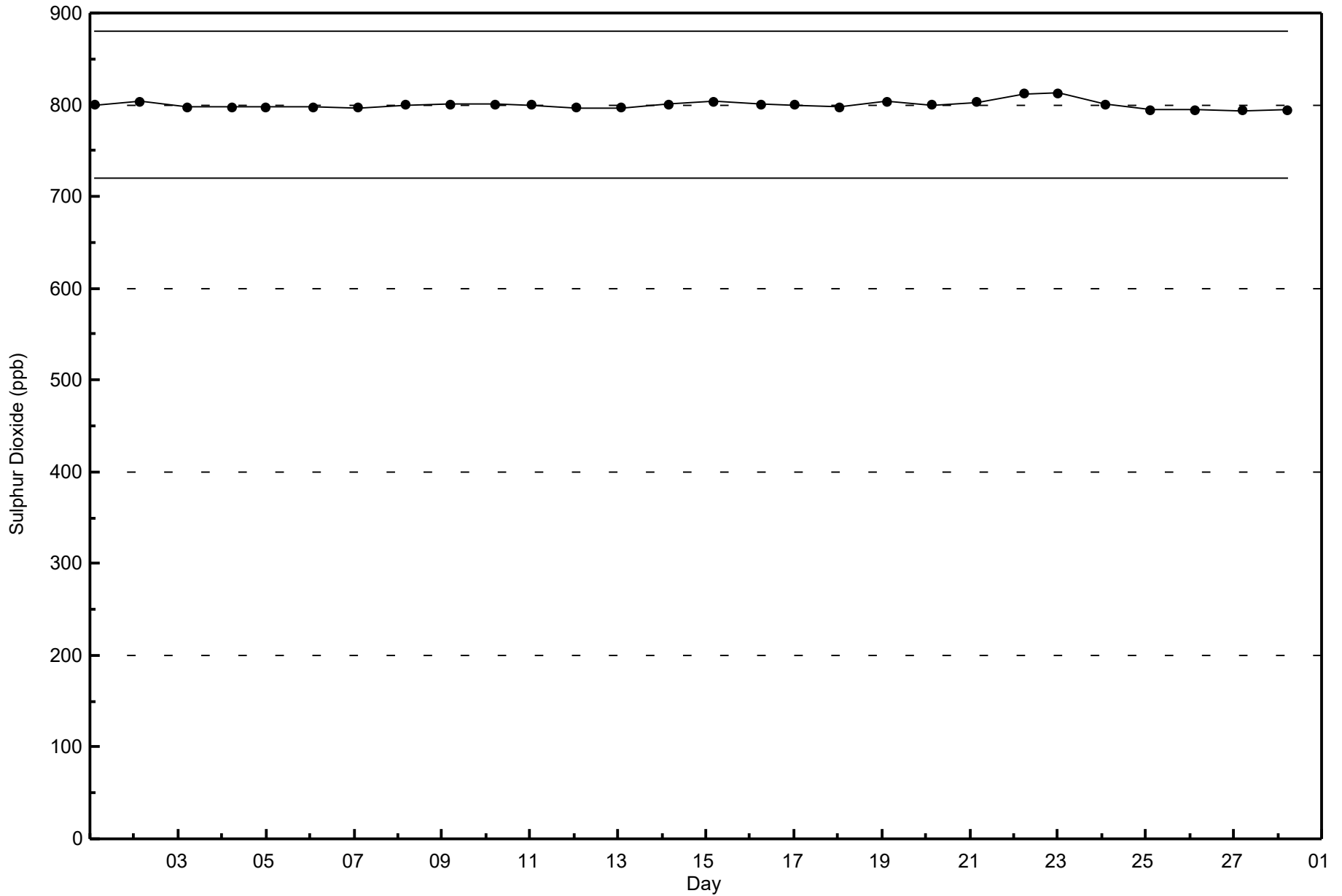


Classes (ppb)



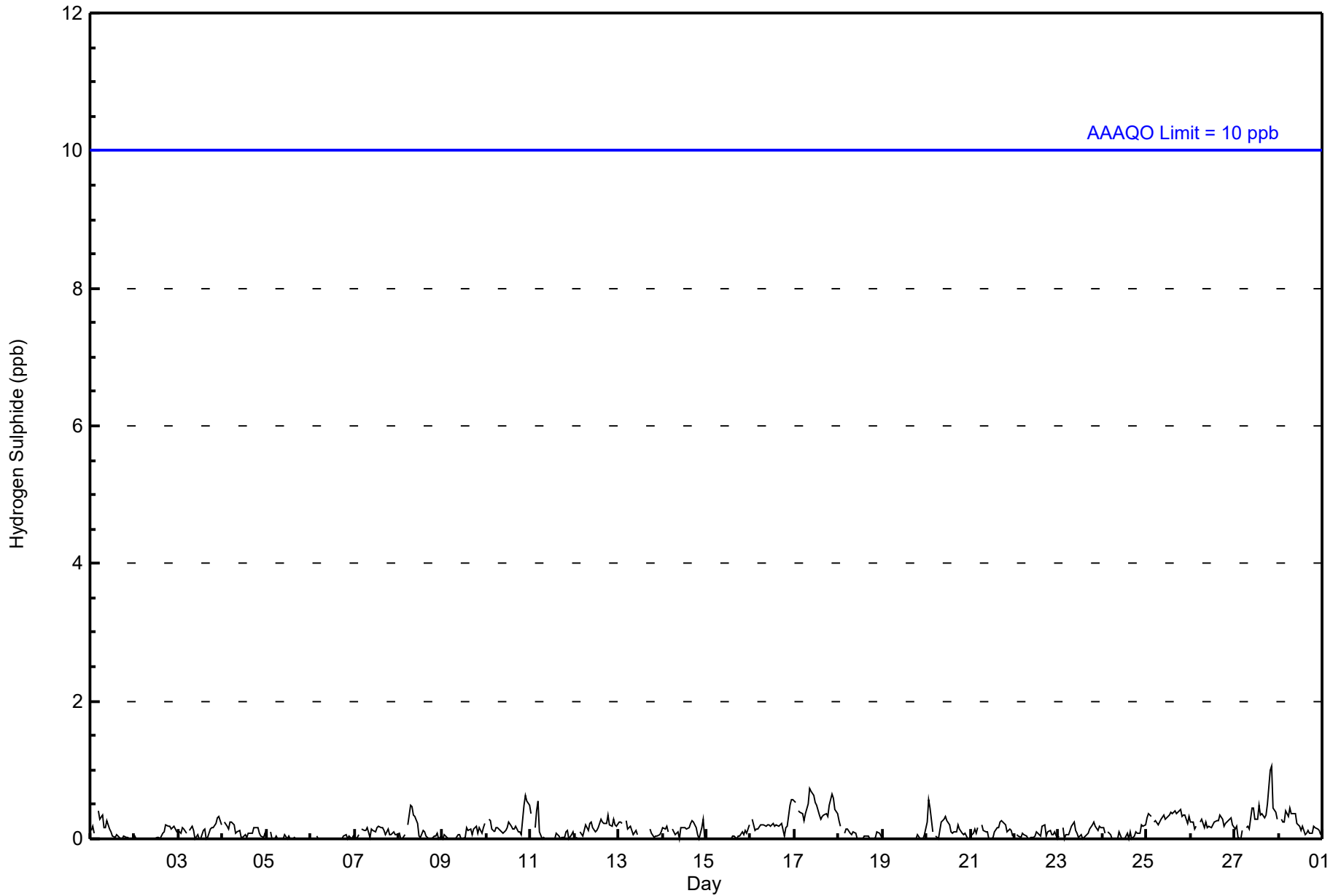
Total Number of Valid Hours: 632







Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																		
Maximum Value: 1.1 ppb on Feb 27 21:00		Maximum Daily Average: 0.5 ppb on Feb 17				Hours of Data:		638																		
Minimum Value: 0.0 ppb on Feb 1 17:00		Minimum Daily Average: 0.0 ppb on Feb 19				Hours of Missing Data:		34																		
Maximum Diurnal Average: 0.2 ppb at hour 22		Minimum Diurnal Average: 0.1 ppb at hour 12				Hours of Calibration:		34																		
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 = 0.1 Q <sub>3</sub> = 0.2 P <sub>90</sub> = 0.3 P <sub>99</sub> = 0.6				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-Feb	0.1	0.2	0.1	Z	0.4	0.3	0.3	0.2	0.2	0.3	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	0.4
2-Feb	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	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2
3-Feb	0.1	0.1	0.2	0.1	0.1	Z	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.3
4-Feb	Z	0.2	0.2	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.1	0.1	0.3
5-Feb	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	0.0	0.0	0.1
6-Feb	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	0.0	0.0	0.1
7-Feb	0.0	0.0	0.1	Z	0.2	0.1	0.1	0.2	0.0	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	0.2
8-Feb	0.1	0.0	0.0	0.1	Z	0.2	0.5	0.5	0.4	0.3	0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.5
9-Feb	0.0	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.2
10-Feb	Z	0.3	0.3	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.5	0.6	0.5	0.5	0.2	0.6
11-Feb	0.4	Z	0.2	0.4	0.5	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	0.0	0.1	0.1	0.1	0.5
12-Feb	0.0	0.0	Z	0.1	0.0	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.3
13-Feb	0.2	0.2	0.2	Z	0.3	0.1	0.2	0.1	0.1	0.1	0.1	C	C	C	C	C	C	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.3	
14-Feb	0.2	0.1	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.2	0.1	0.0	0.2	0.3	0.0	0.1	0.3
15-Feb	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	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.0	0.2
16-Feb	Z	0.3	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	0.2	0.2	0.0	0.2	0.2	0.5	0.6	0.6	0.2	0.6
17-Feb	0.5	Z	0.4	0.4	0.4	0.3	0.4	0.5	0.7	0.7	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.4	0.3	0.5	0.7	0.6	0.4	0.4	0.5	0.7
18-Feb	0.3	0.2	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	0.1	0.3
19-Feb	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	0.1	0.0	0.0	0.0	0.1	0.0	0.1
20-Feb	0.2	0.6	0.4	0.1	Z	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.2	0.6
21-Feb	0.0	0.1	0.1	0.1	0.2	Z	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.3
22-Feb	Z	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2
23-Feb	0.0	Z	0.2	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2
24-Feb	0.2	0.1	Z	0.1	0.1	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	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2
25-Feb	0.3	0.4	0.3	Z	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	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	0.4
26-Feb	0.2	0.2	0.1	0.2	Z	0.2	0.3	0.2	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	0.2	0.2	0.3
27-Feb	0.1	0.2	0.0	0.0	0.1	Z	0.2	0.2	0.1	0.4	0.5	0.3	0.3	0.5	0.4	0.4	0.3	0.3	0.5	1.0	1.1	0.4	0.4	0.3	0.3	1.1
28-Feb	Z	0.3	0.2	0.2	0.4	0.3	0.4	0.4	0.4	0.4	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.4
0.1 0.2 0.1 0.1 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 0.1 0.2 0.2 0.2 0.2 0.1 0.1 0.1 0.1																								Diurnal Average		
0.5 0.6 0.4 0.4 0.5 0.3 0.5 0.5 0.7 0.7 0.6 0.5 0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.5 1.0 1.1 0.6 0.6 0.6 0.6 0.6																								Diurnal Maximum		
Z - zerospan C - Calibration																										
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  
Surmont 2 - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	638	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: 638

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Surmont 2 - February 2023**

<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	43	37	14	8	17	25	60	24	18	11	11	83	96	66	41	77	631
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>	43	37	14	8	17	25	60	24	18	11	11	83	96	66	41	77	631

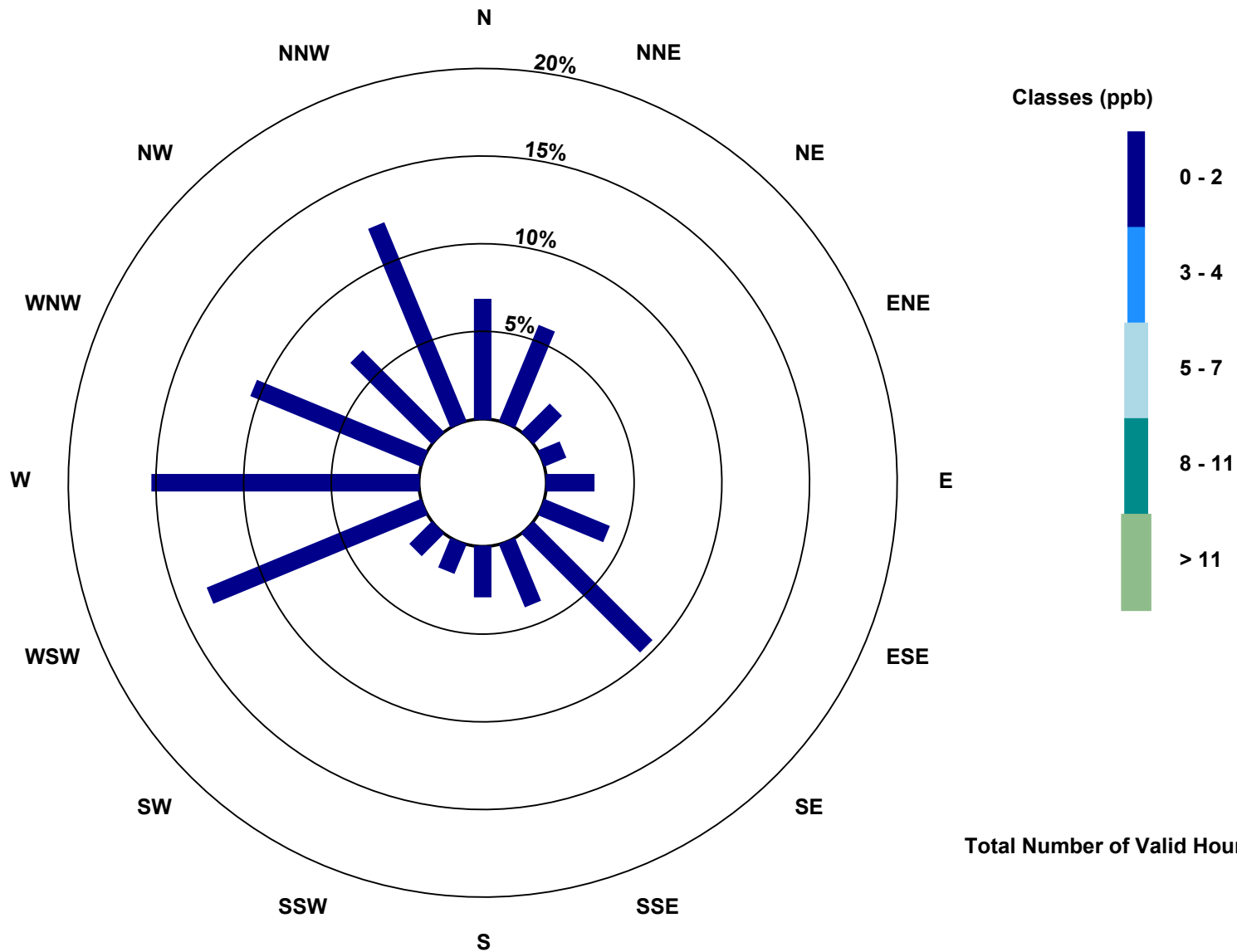
Total Number of Valid Hours: 631

Total Number of Hours: 672



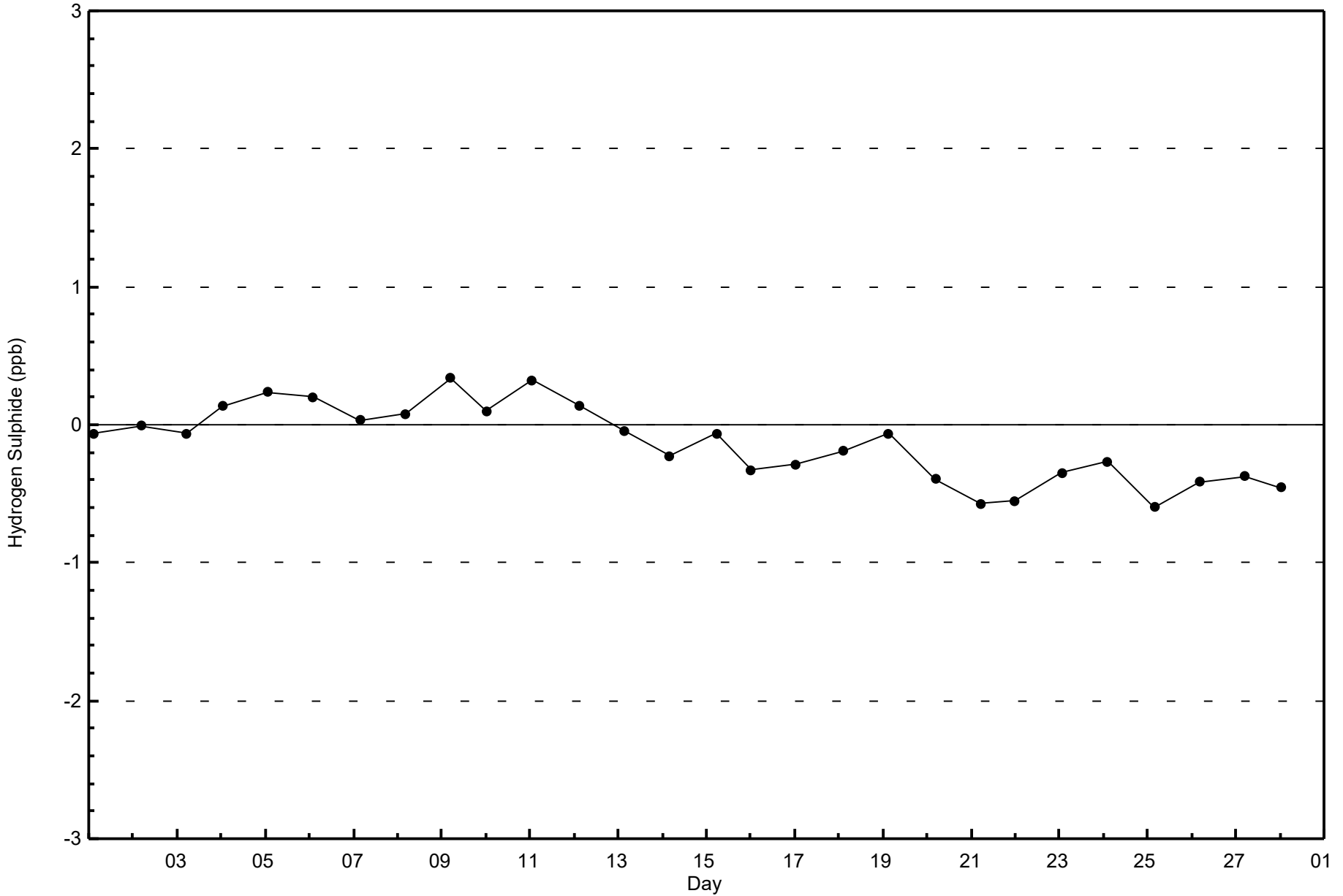
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

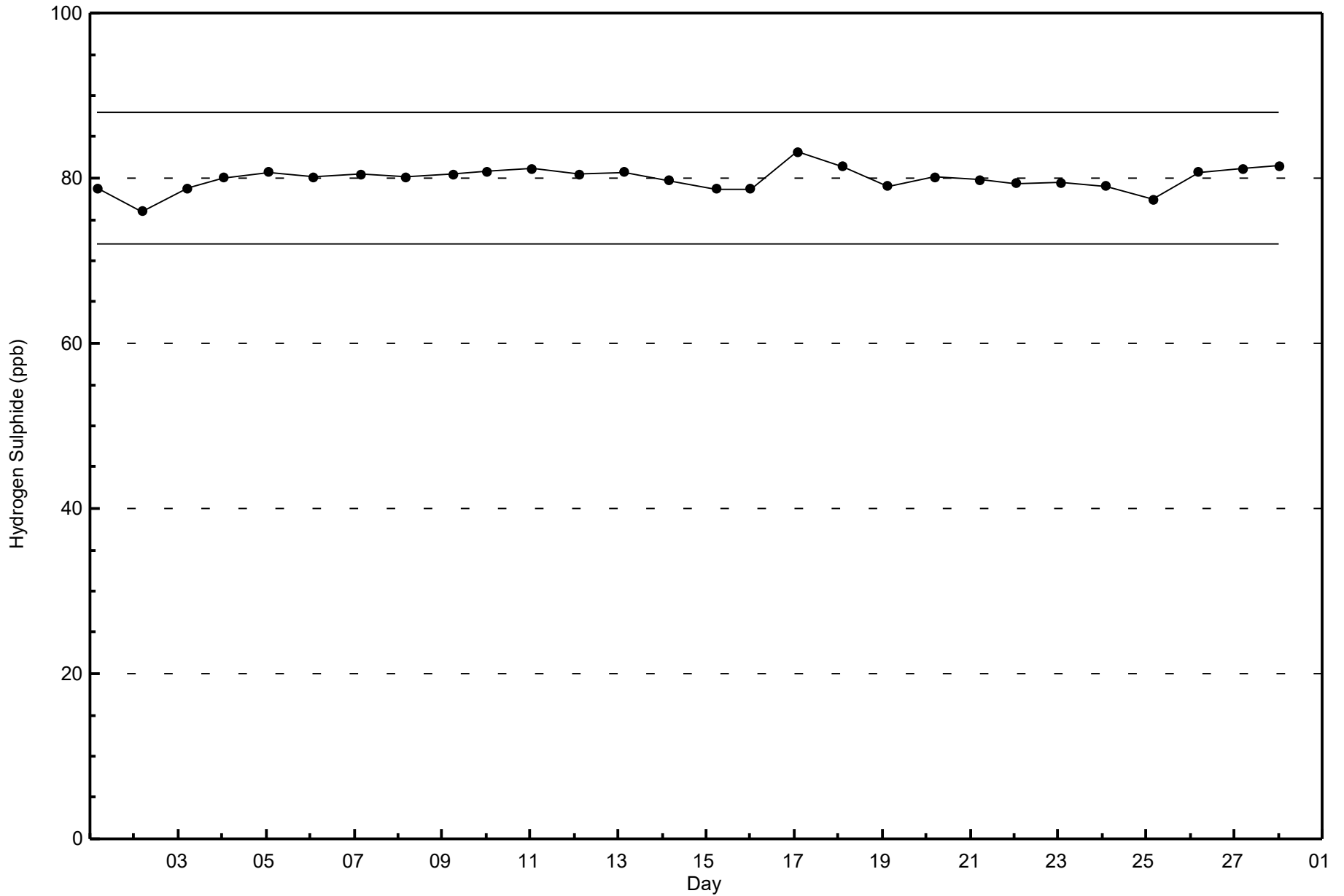
Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Surmont 2



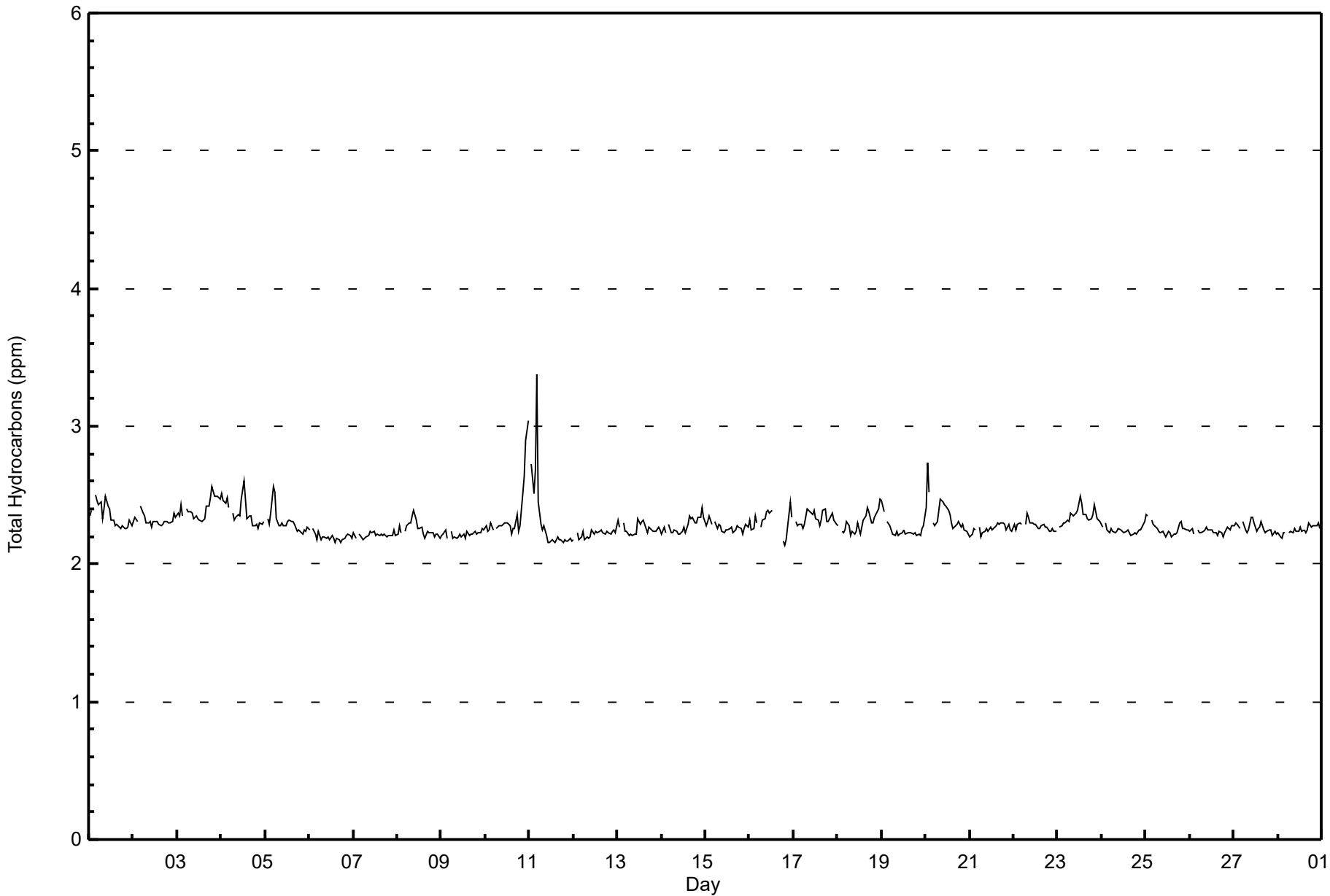
Total Number of Valid Hours: 631













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

**Total Hydrocarbons (THC) - ppm**  
**Surmont 2 - February 2023**

<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	638	99.84	99.84
3.1 - 10.0	1	0.16	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 639

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Surmont 2 - February 2023**

<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	40	37	14	8	18	24	57	25	18	11	12	79	93	67	42	86	631
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>	40	37	14	8	18	24	57	25	18	11	12	79	94	67	42	86	632

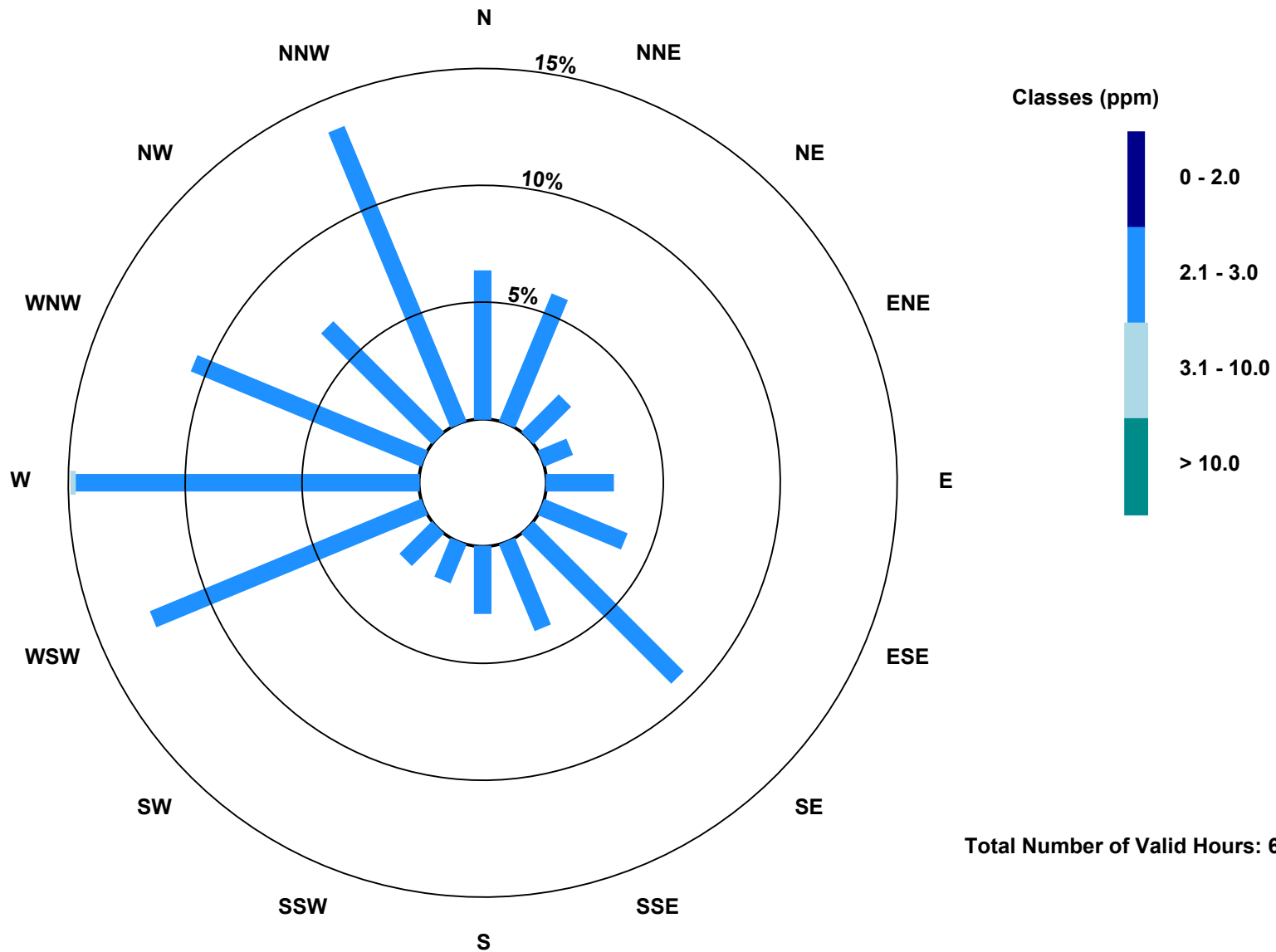
Total Number of Valid Hours: 632

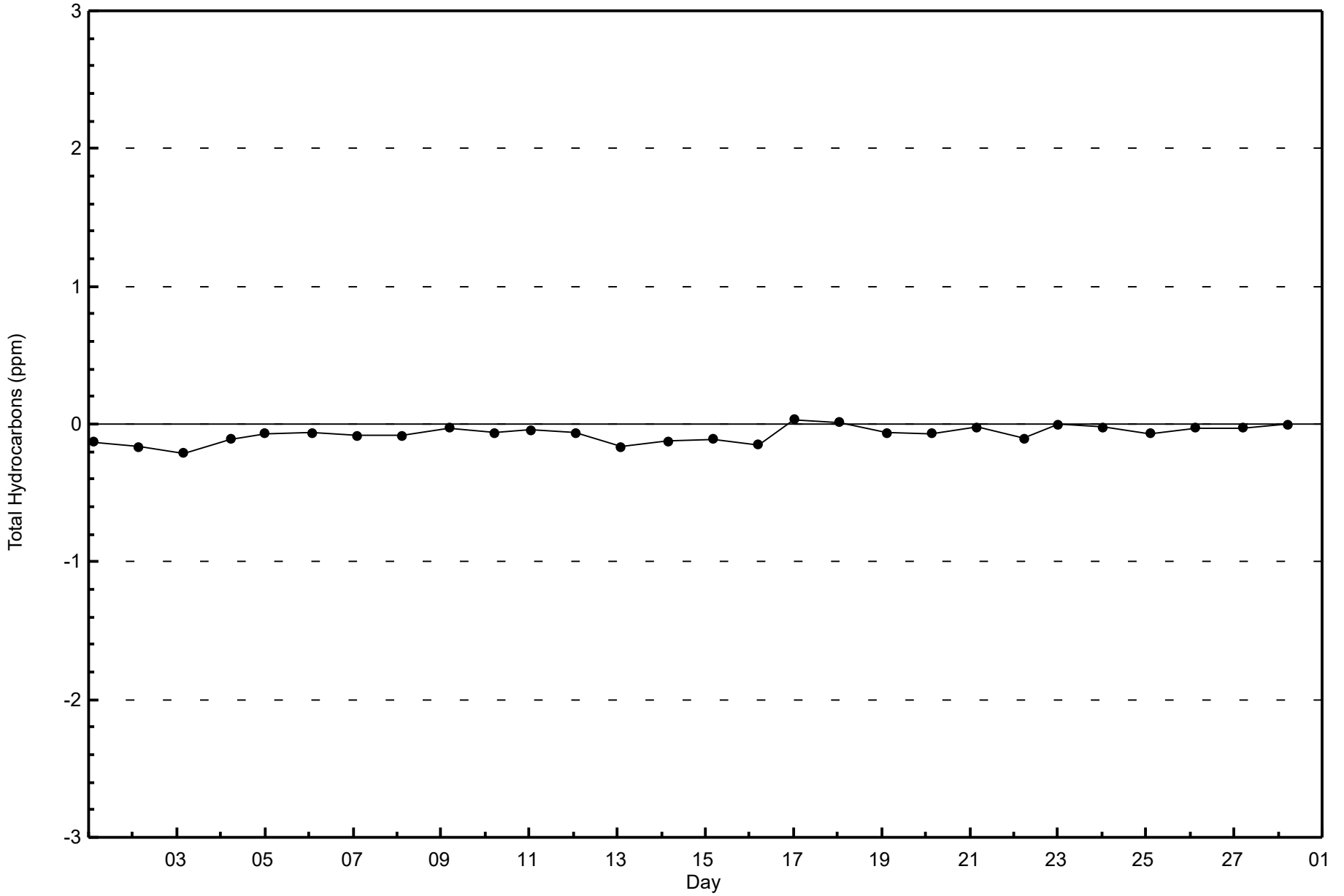
Total Number of Hours: 672



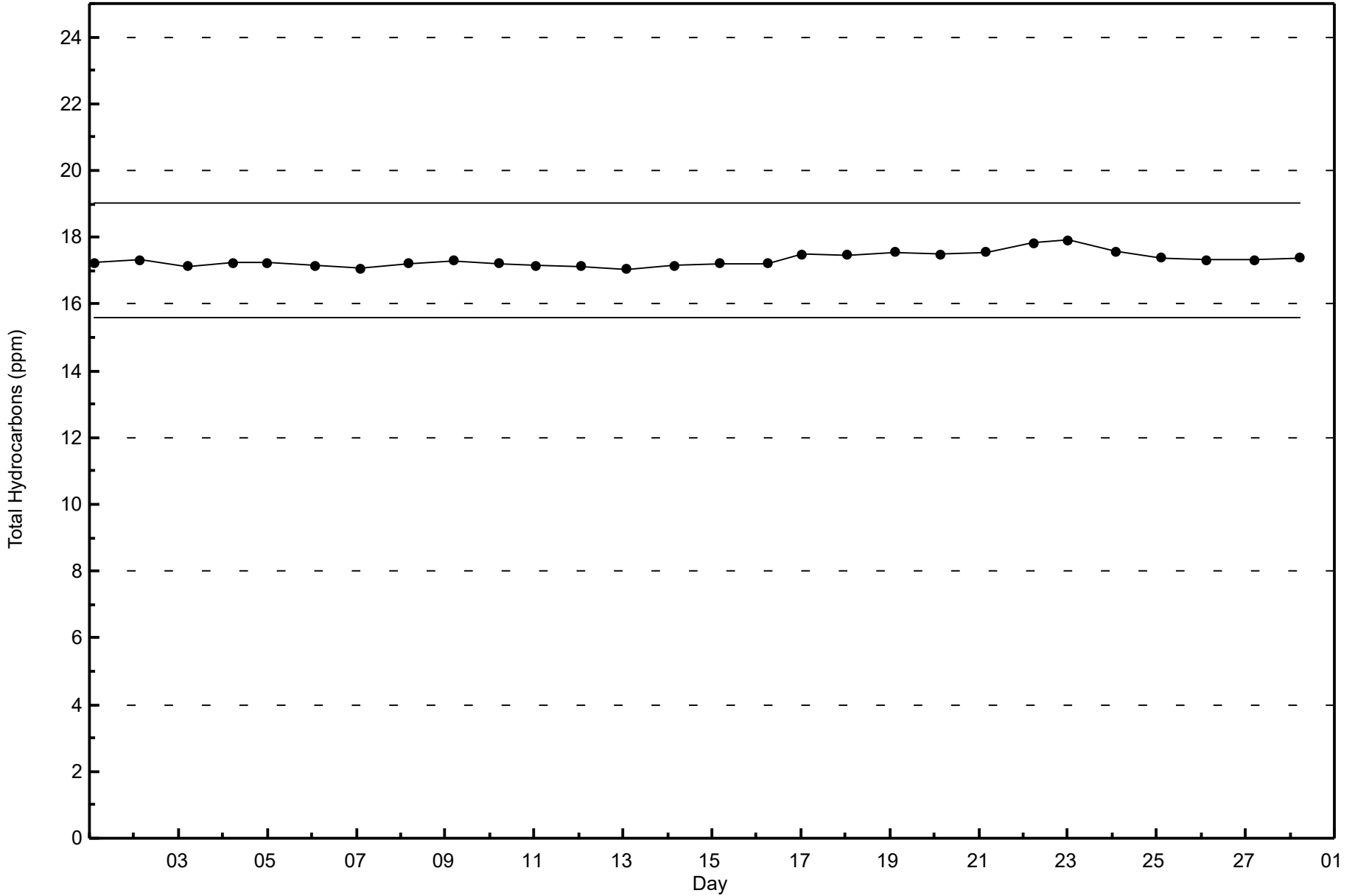
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Hydrocarbons (THC) - ppm  
Surmont 2











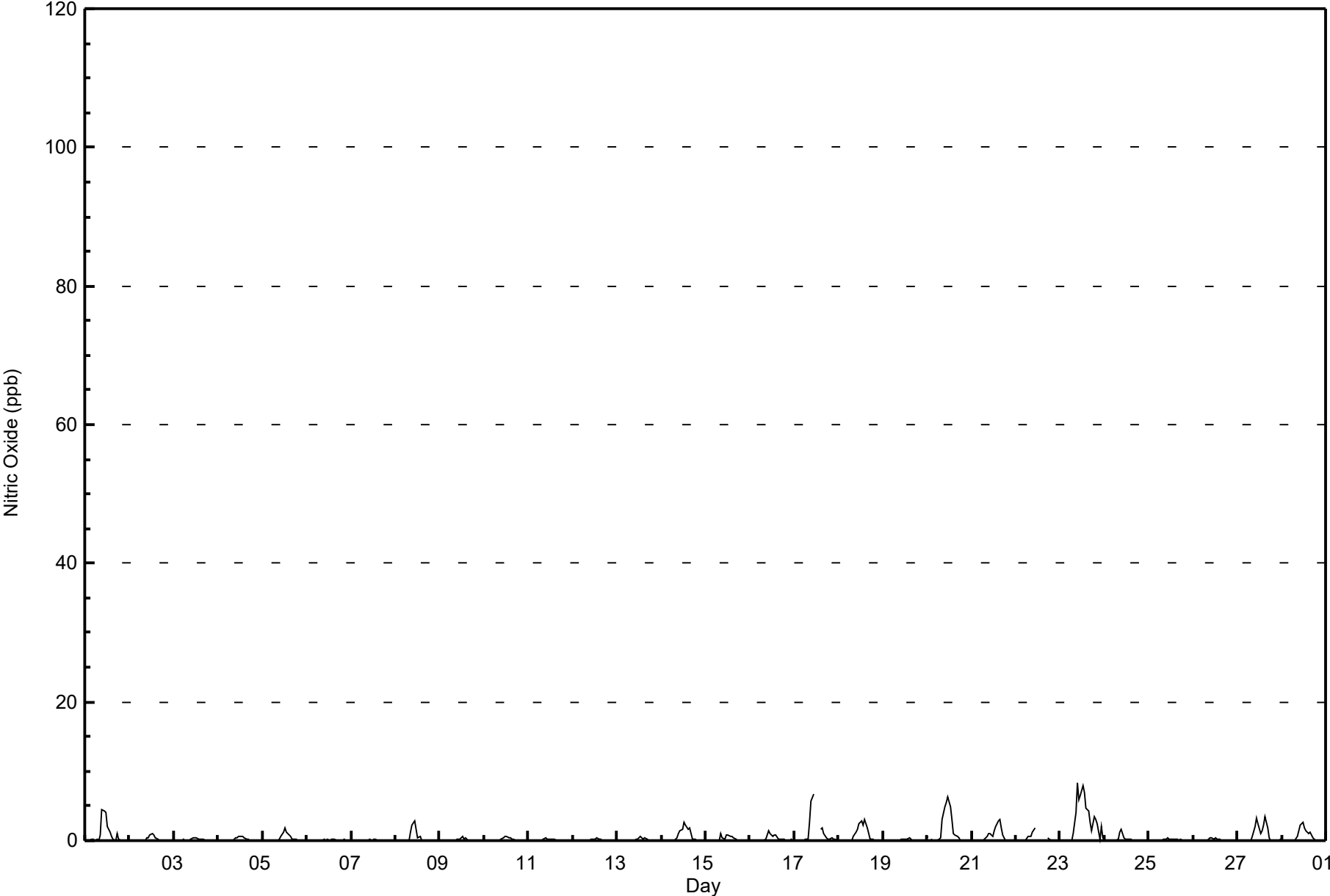
Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Surmont 2 - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 672														672							
Maximum Value: 8.3 ppb on Feb 23 10:00		Maximum Daily Average: 2.8 ppb on Feb 23		Hours of Data: 635														635									
Minimum Value: 0.0 ppb on Feb 4 08:00		Minimum Daily Average: 0.1 ppb on Feb 19		Hours of Missing Data: 37														37									
Maximum Diurnal Average: 1.5 ppb at hour 11		Minimum Diurnal Average: 0.0 ppb at hour 5		Hours of Calibration: 34														34									
Monthly Average: 0.46 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> = 1.3 P <sub>99</sub> = 5.8		Percent Operational Time: 99.6														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-Feb	Z	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.9	4.4	4.2	4.0	2.0	1.2	0.6	0.1	0.1	1.0	0.2	0.0	0.0	0.0	0.0	0.0	0.9	4.4	
2-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.5	0.7	0.9	0.8	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	
3-Feb	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
4-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.3	0.3	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	0.2	0.7	
5-Feb	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.3	0.6	1.2	1.9	1.3	0.8	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.9	
6-Feb	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
7-Feb	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	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	
8-Feb	0.0	Z	0.0	0.1	0.0	0.0	0.1	0.1	1.1	2.2	2.8	1.7	0.3	0.5	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.8	
9-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.6	0.2	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	
10-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.3	0.5	0.6	0.5	0.5	0.3	0.2	0.2	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.6	
11-Feb	0.0	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.2	0.3	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	0.1	0.3	
12-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
13-Feb	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.5	0.4	0.3	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.5	
14-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.0	1.4	1.7	2.6	2.2	1.6	1.8	1.0	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.6	2.6	
15-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.9	0.3	0.3	0.8	0.8	0.7	0.5	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	
16-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.7	1.4	1.1	0.7	0.9	0.8	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.4	
17-Feb	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.3	2.6	5.6	6.8	M	M	M	1.7	1.9	1.1	0.4	0.1	0.2	0.3	0.2	0.1	0.0	1.1	6.8	
18-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.6	1.2	1.7	2.4	2.9	2.3	3.0	1.8	1.0	0.3	0.2	0.0	0.0	0.1	0.1	0.0	0.8	3.0	
19-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
20-Feb	0.6	Z	0.1	0.0	0.0	0.0	0.1	0.3	3.1	4.9	5.4	6.3	4.8	3.1	1.0	0.8	0.6	0.3	0.1	0.1	0.0	0.0	0.0	0.0	1.4	6.3	
21-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.5	1.0	1.1	0.7	1.3	2.0	2.9	3.1	1.8	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.7	3.1	
22-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.5	0.6	0.7	1.2	1.8	C	C	C	C	C	C	0.5	0.2	0.0	0.0	0.0	0.0	0.0	--	1.8	
23-Feb	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.9	4.0	8.3	5.9	6.4	8.0	6.9	4.8	4.2	2.7	1.3	3.5	3.0	2.4	0.1	2.1	0.3	2.8	8.3	
24-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	1.2	1.7	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	1.7	
25-Feb	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
26-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
27-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.5	2.1	3.2	2.4	1.0	1.5	2.3	3.4	1.8	0.5	0.1	0.0	0.1	0.0	0.0	0.1	0.8	3.4	
28-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.5	1.3	2.2	2.5	1.7	1.5	1.1	1.3	0.8	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.6	2.5	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan                      C - Calibration                      M - Maintenance																											





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

**Nitric Oxide (NO) - ppb**  
**Surmont 2 - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	635	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: 635

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Surmont 2 - February 2023**

<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	42	32	13	8	18	25	58	25	18	10	10	83	93	69	42	83	629
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>	42	32	13	8	18	25	58	25	18	10	10	83	93	69	42	83	629

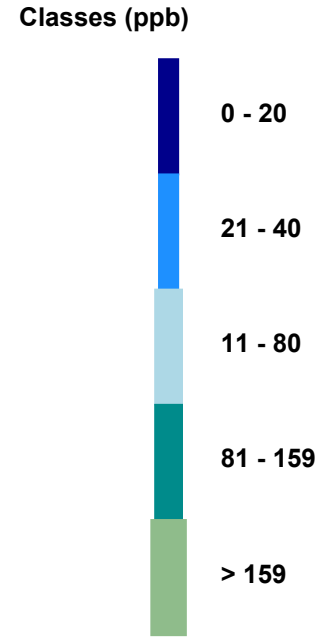
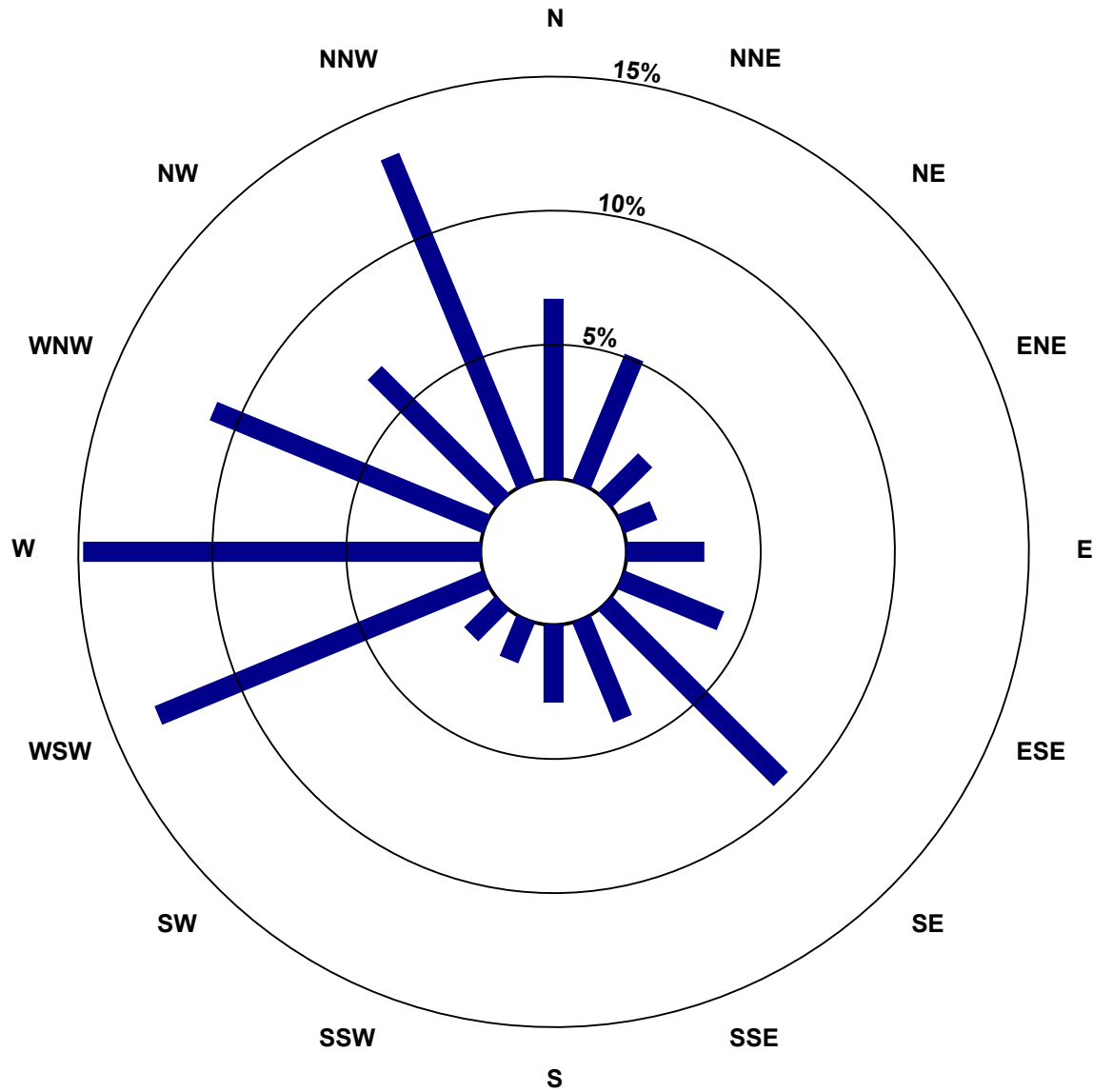
Total Number of Valid Hours: 629

Total Number of Hours: 672

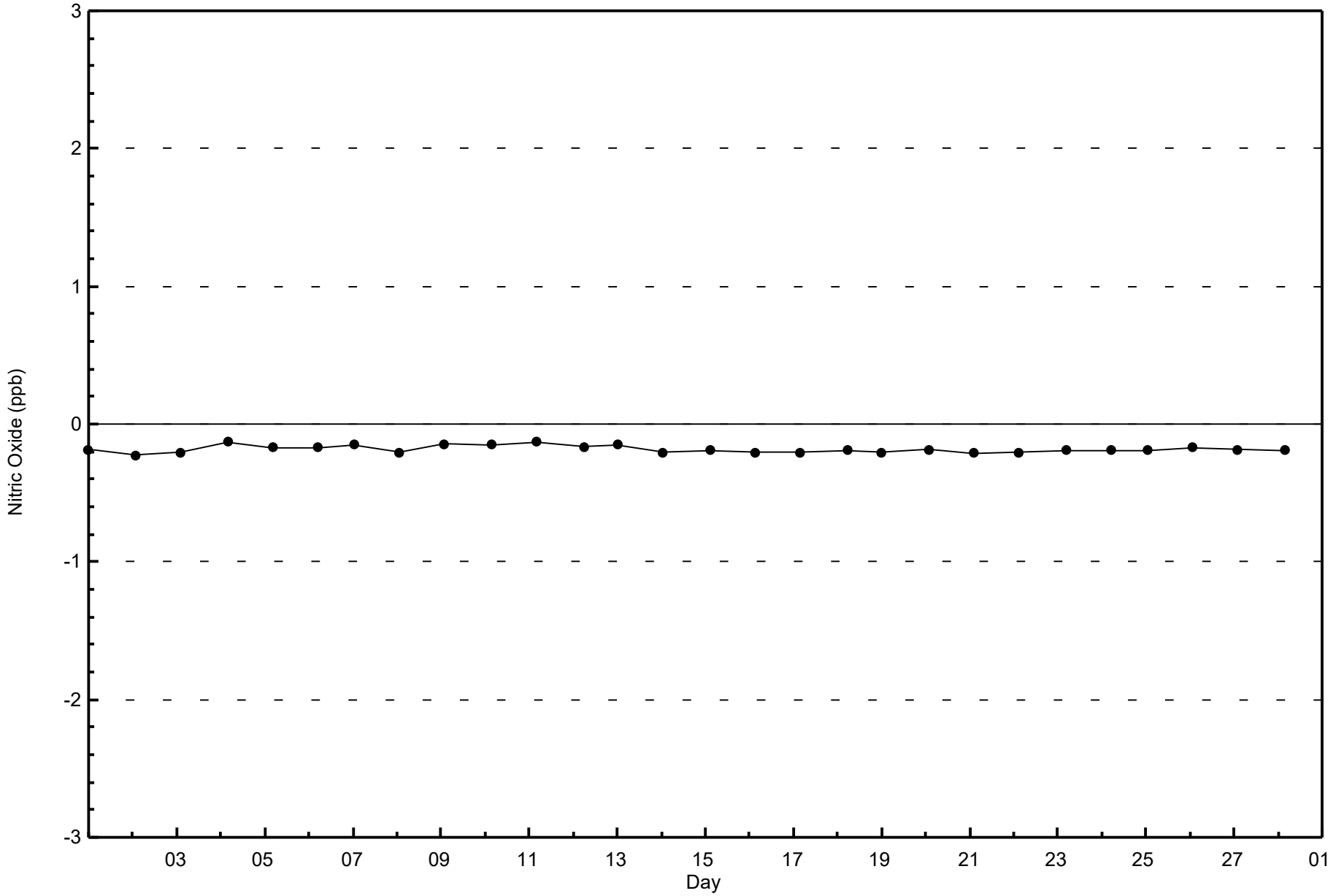


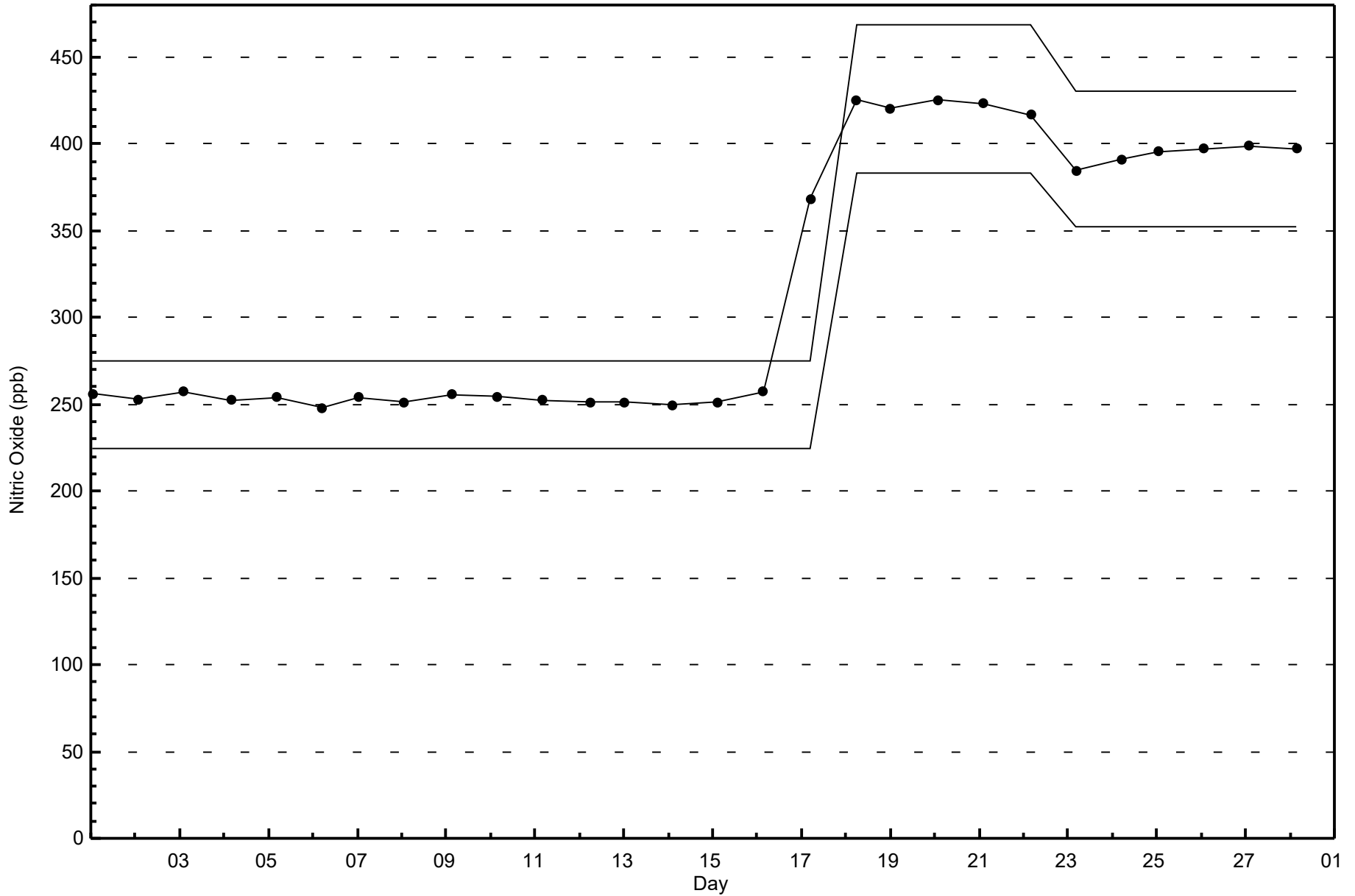
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitric Oxide (NO) - ppb  
Surmont 2



Total Number of Valid Hours: 629









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

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Surmont 2 - February 2023**

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 28.4 ppb on Feb 23 20:00	Maximum Daily Average: 11.1 ppb on Feb 17		Hours of Data:	635
Minimum Value: 0.3 ppb on Feb 6 07:00	Minimum Daily Average: 0.6 ppb on Feb 7		Hours of Missing Data:	37
Maximum Diurnal Average: 5.5 ppb at hour 22	Minimum Diurnal Average: 2.5 ppb at hour 14		Hours of Calibration:	34
Monthly Average: 3.90 ppb	Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.6 Q <sub>1</sub> = 1.1 Median = 2.5 Q <sub>3</sub> = 5.0 P <sub>90</sub> = 9.3 P <sub>99</sub> = 20.0		Percent Operational Time:	99.6

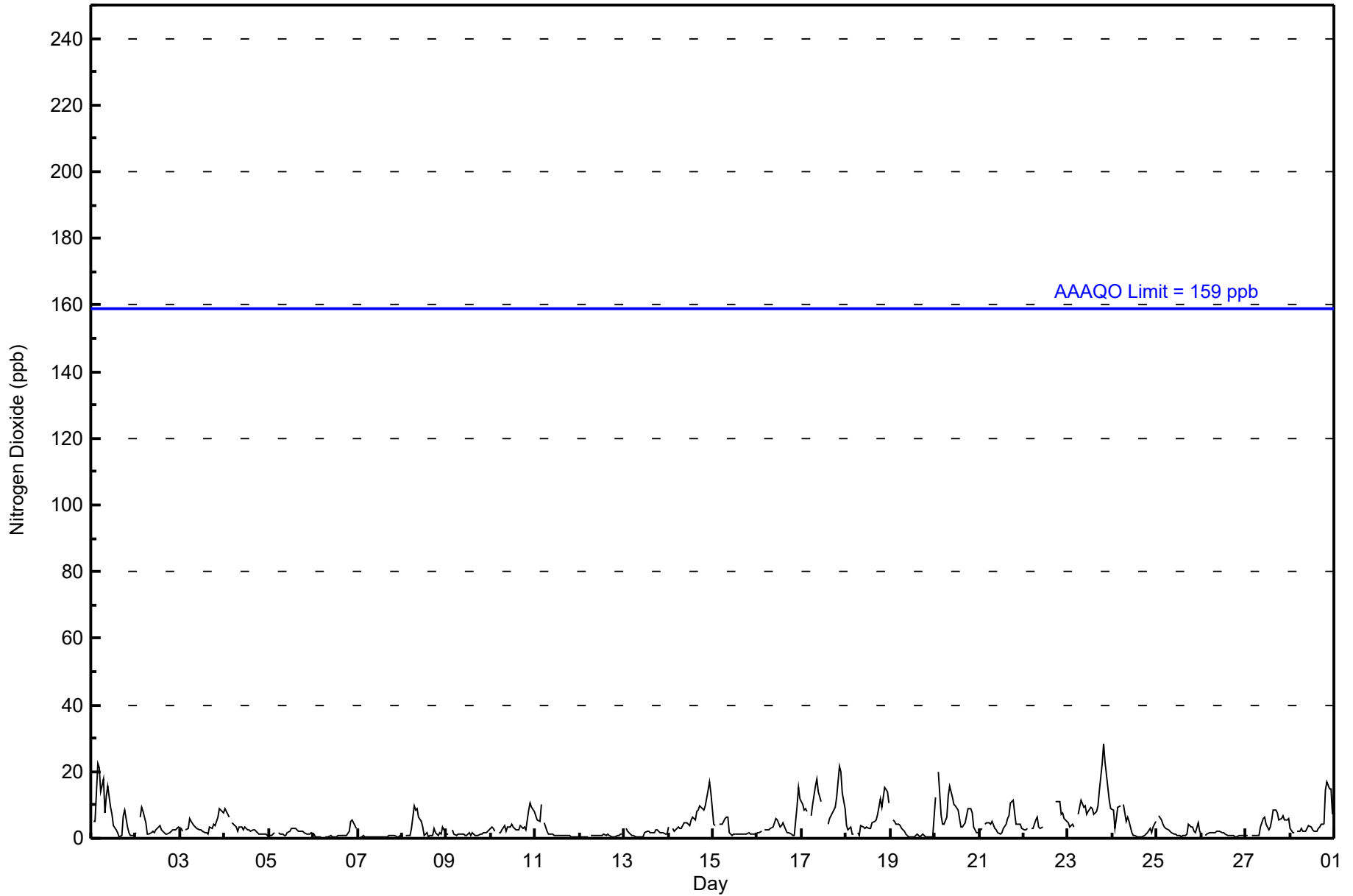
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Feb	Z	5.0	5.2	22.6	21.0	13.9	17.6	7.8	12.5	15.6	9.2	7.1	3.8	2.5	1.7	0.6	1.0	6.6	8.3	3.6	1.5	1.0	0.8	1.0	7.4	22.6																							
2-Feb	1.7	Z	6.2	9.3	8.2	4.7	1.3	1.2	1.5	2.0	1.7	2.7	3.4	3.8	2.4	1.6	1.3	1.2	1.5	2.2	2.6	2.7	3.0	3.2	3.0	9.3																							
3-Feb	3.0	2.2	Z	2.7	2.9	6.0	5.0	3.7	3.6	3.0	2.6	2.5	2.0	1.6	1.6	1.4	3.3	2.8	4.1	3.8	6.2	8.9	8.5	7.5	3.9	8.9																							
4-Feb	8.8	8.0	6.2	Z	4.6	4.4	3.3	2.2	3.2	3.3	2.5	3.2	2.7	2.5	2.0	2.4	2.6	2.2	1.3	1.1	1.2	1.2	1.1	1.0	3.1	8.8																							
5-Feb	0.9	0.9	1.1	1.5	Z	1.8	1.3	1.1	1.0	1.0	1.6	2.0	3.1	2.9	2.8	2.6	2.3	2.3	2.0	1.5	1.2	1.1	1.1	1.6	1.7	3.1																							
6-Feb	1.1	0.5	0.4	0.4	0.4	Z	0.3	0.4	0.6	0.8	0.4	0.5	0.3	0.7	1.0	1.0	1.0	0.7	0.7	2.0	4.9	5.4	3.8	2.8	1.3	5.4																							
7-Feb	Z	0.5	0.6	0.7	0.6	0.6	0.5	0.4	0.4	0.3	0.6	0.4	0.6	0.5	0.4	0.4	0.4	0.7	0.9	0.8	0.7	0.5	0.5	0.7	0.6	0.9																							
8-Feb	0.9	Z	0.7	0.8	0.9	3.0	9.6	8.4	9.1	6.2	5.0	3.2	1.0	1.6	0.5	0.7	0.7	3.0	1.8	1.0	1.5	1.4	3.3	1.9	2.9	9.6																							
9-Feb	1.2	1.2	Z	2.4	1.3	1.0	1.1	1.2	1.1	1.1	1.0	1.0	1.5	0.8	1.9	0.7	0.7	1.0	1.3	1.4	1.5	1.9	2.3	2.6	1.4	2.6																							
10-Feb	3.4	3.1	2.3	Z	1.7	1.9	2.5	3.7	2.2	3.3	3.6	4.3	3.3	2.7	2.5	2.6	3.8	3.1	3.5	2.4	8.3	10.6	9.3	8.0	4.0	10.6																							
11-Feb	6.6	5.4	5.2	10.1	Z	4.5	2.0	1.4	1.2	1.3	0.8	0.8	0.8	0.7	0.8	0.9	0.8	1.0	0.7	0.6	0.5	0.5	0.5	0.4	2.1	10.1																							
12-Feb	0.4	0.6	0.6	0.6	0.6	Z	0.7	0.7	0.8	0.7	0.7	0.7	0.7	1.1	1.0	1.4	0.8	0.6	0.6	0.6	0.8	1.0	1.1	1.1	0.8	1.4																							
13-Feb	Z	2.9	2.3	1.3	0.8	0.7	0.6	0.5	0.5	0.5	0.6	1.5	2.0	2.3	1.6	1.8	1.9	2.4	2.5	1.7	1.7	1.9	1.2	1.4	1.5	2.9																							
14-Feb	3.5	Z	3.1	2.1	2.4	3.3	3.1	3.0	4.6	4.6	4.6	3.9	5.5	6.2	5.7	7.9	8.6	9.6	9.1	8.3	9.7	14.2	16.9	13.7	6.7	16.9																							
15-Feb	4.3	3.7	Z	4.1	4.2	4.4	5.8	6.2	6.2	1.7	0.8	1.3	1.4	1.3	1.2	1.2	1.2	1.3	1.4	1.6	1.4	1.2	1.2	1.2	2.5	6.2																							
16-Feb	1.5	1.9	2.1	Z	2.5	2.7	2.7	2.8	3.2	4.7	5.9	5.5	3.6	3.7	4.5	2.4	1.6	1.8	1.4	0.8	0.7	9.6	15.2	12.0	4.0	15.2																							
17-Feb	10.3	8.4	8.7	8.1	Z	6.9	10.3	15.7	17.8	14.1	11.1	M	M	M	4.4	5.8	6.8	8.6	9.4	12.3	21.5	20.1	13.5	9.1	11.1	21.5																							
18-Feb	3.9	2.7	3.3	1.2	1.4	Z	1.7	1.0	3.7	3.5	3.0	3.2	3.0	2.9	4.8	5.0	5.7	7.3	12.0	9.4	12.1	15.1	13.9	10.7	5.7	15.1																							
19-Feb	Z	5.5	5.0	4.3	4.1	4.0	2.8	2.0	1.3	0.7	0.6	0.6	0.6	0.6	1.3	0.7	0.5	1.2	0.9	0.5	0.3	0.3	0.6	0.6	1.7	5.5																							
20-Feb	12.1	Z	19.9	6.7	4.3	4.2	6.2	12.5	15.7	12.1	10.3	9.7	8.6	6.1	3.2	3.3	4.6	6.8	9.1	8.8	7.8	3.3	1.8	1.7	7.8	19.9																							
21-Feb	2.1	3.1	Z	4.3	4.5	4.5	4.3	5.0	2.8	2.4	1.8	1.2	1.9	2.8	4.3	5.9	6.9	10.7	11.4	7.5	4.4	4.2	4.1	2.9	4.5	11.4																							
22-Feb	2.6	2.7	2.9	Z	3.0	3.0	5.7	6.4	3.3	3.0	3.3	C	C	C	C	C	C	10.9	11.0	11.2	7.1	7.5	6.0	5.0	--	11.2																							
23-Feb	4.6	3.5	4.1	3.6	Z	7.3	9.3	11.5	9.5	9.7	7.4	8.0	9.5	8.9	7.3	8.2	9.8	14.2	22.6	28.4	23.0	15.2	11.4	8.7	10.7	28.4																							
24-Feb	8.4	2.9	6.0	9.3	9.6	Z	10.0	4.9	6.3	5.1	1.5	0.7	0.7	0.6	0.6	0.6	0.6	0.9	1.2	1.5	2.9	1.8	3.6	5.0	3.7	10.0																							
25-Feb	Z	6.9	5.3	4.2	3.6	3.1	2.6	2.1	1.9	1.4	1.1	0.9	0.7	0.6	0.7	0.8	1.2	4.1	3.5	3.6	2.2	1.8	4.7	2.3	2.6	6.9																							
26-Feb	1.4	Z	1.0	1.3	1.6	1.7	1.6	1.8	2.0	2.3	2.0	1.5	1.5	1.2	1.0	0.8	0.9	0.8	0.6	0.6	0.7	0.8	0.7	0.8	1.2	2.3																							
27-Feb	0.8	0.8	Z	0.9	0.9	0.9	0.7	1.0	3.3	6.1	6.4	4.4	2.4	3.6	5.7	8.5	8.5	7.5	5.7	5.9	6.6	5.3	5.4	5.9	4.2	8.5																							
28-Feb	3.0	1.7	1.5	Z	2.0	2.3	3.0	2.0	2.0	3.0	3.8	3.4	2.5	2.1	2.0	2.8	3.5	4.1	4.4	14.3	17.1	15.0	14.9	7.1	5.1	17.1																							
																								3.8	3.2	4.1	4.5	3.6	3.8	4.1	4.0	4.3	4.1	3.4	2.9	2.6	2.5	2.7	3.0	4.2	4.7	4.9	5.4	5.5	5.4	4.3	Diurnal Average		
																								12.1	8.4	19.9	22.6	21.0	13.9	17.6	15.7	17.8	15.6	11.1	9.7	9.5	8.9	7.3	8.5	9.8	14.2	22.6	28.4	23.0	20.1	16.9	13.7	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**  
**Surmont 2 - February 2023**





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

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Surmont 2 - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	629	99.06	99.06
21 - 40	6	0.94	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: 635

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Surmont 2 - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	42	32	13	8	18	25	58	25	18	10	10	80	93	69	41	81	623
21 - 40	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	2	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>	42	32	13	8	18	25	58	25	18	10	10	83	93	69	42	83	629

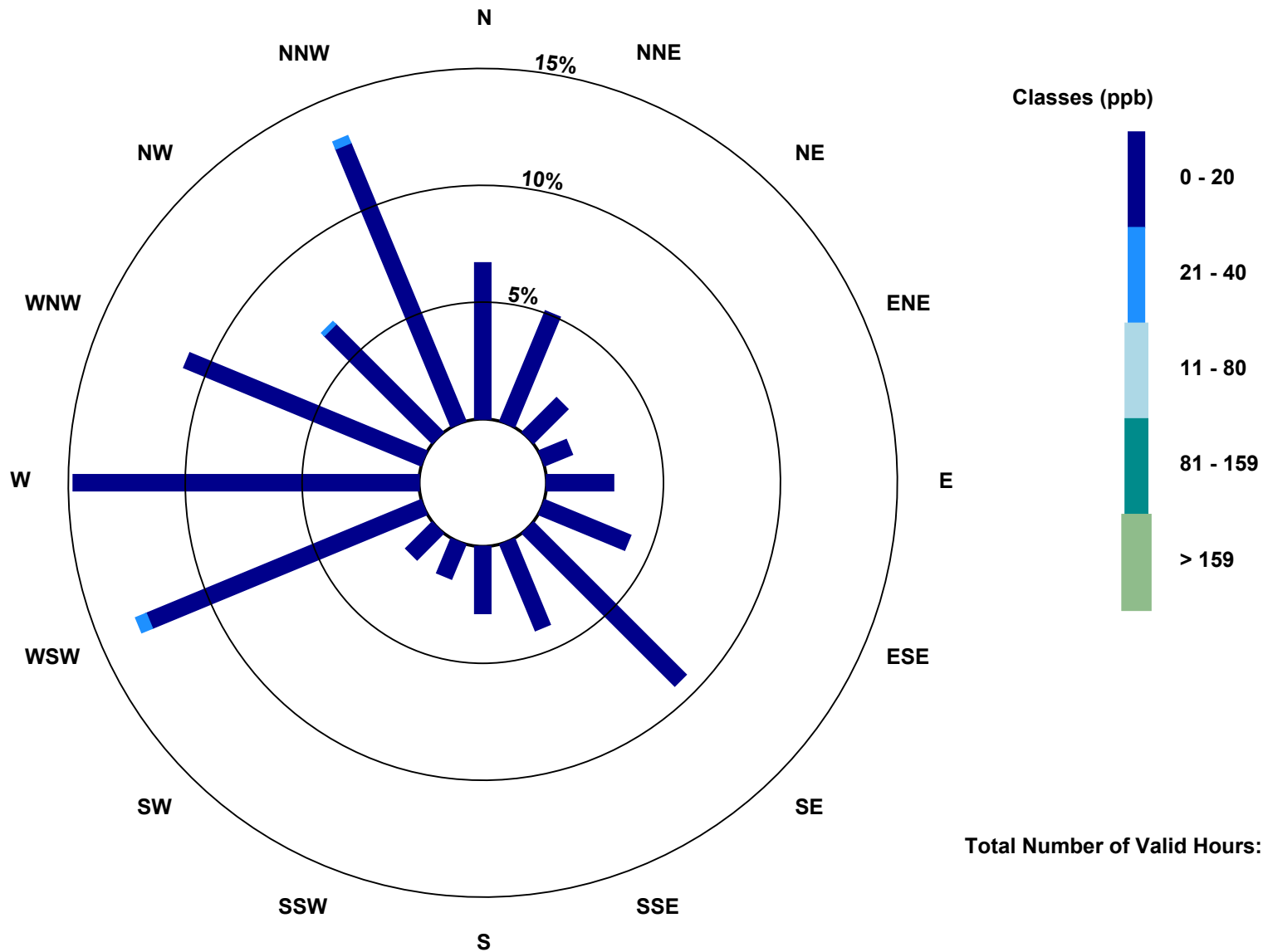
Total Number of Valid Hours: 629

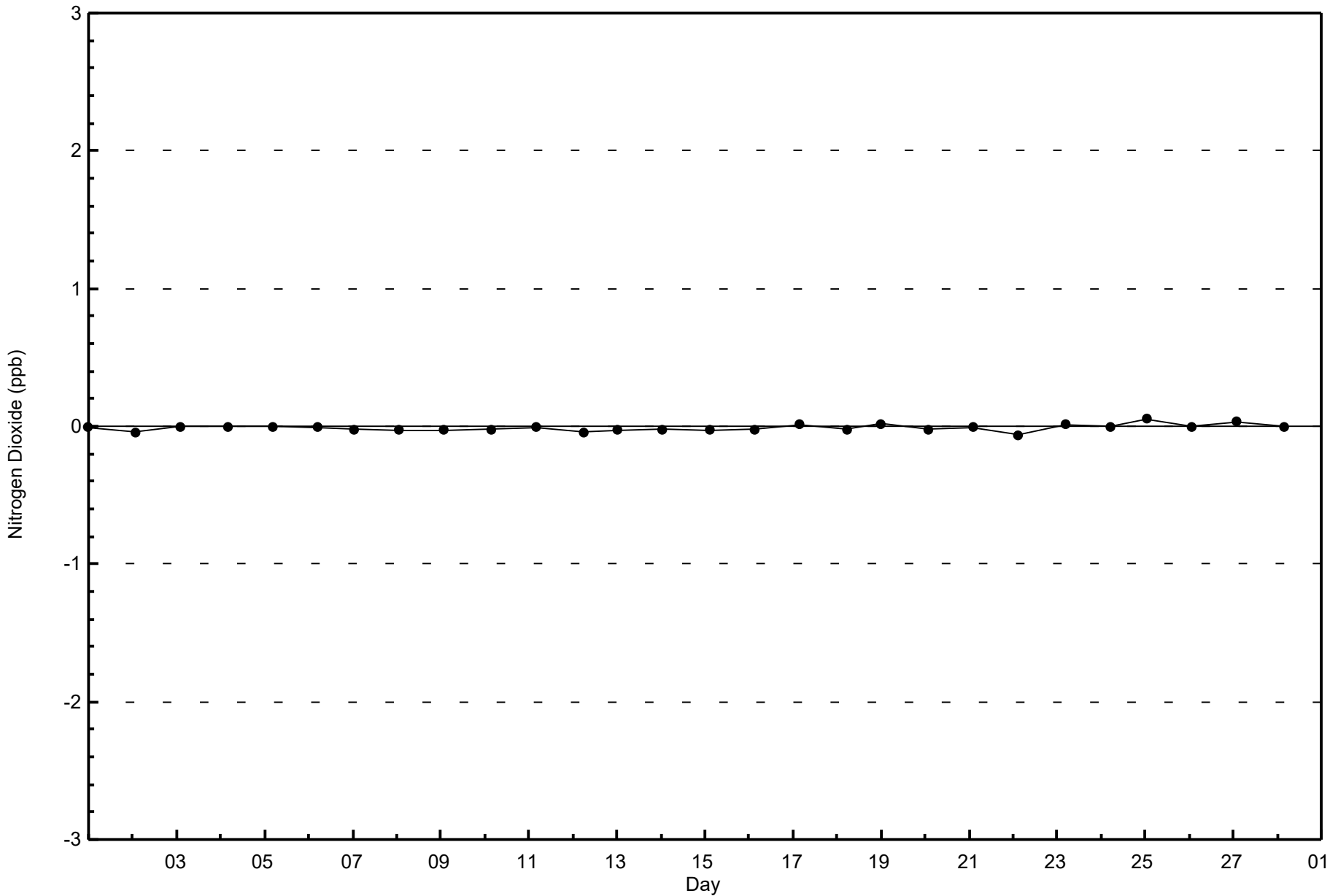
Total Number of Hours: 672

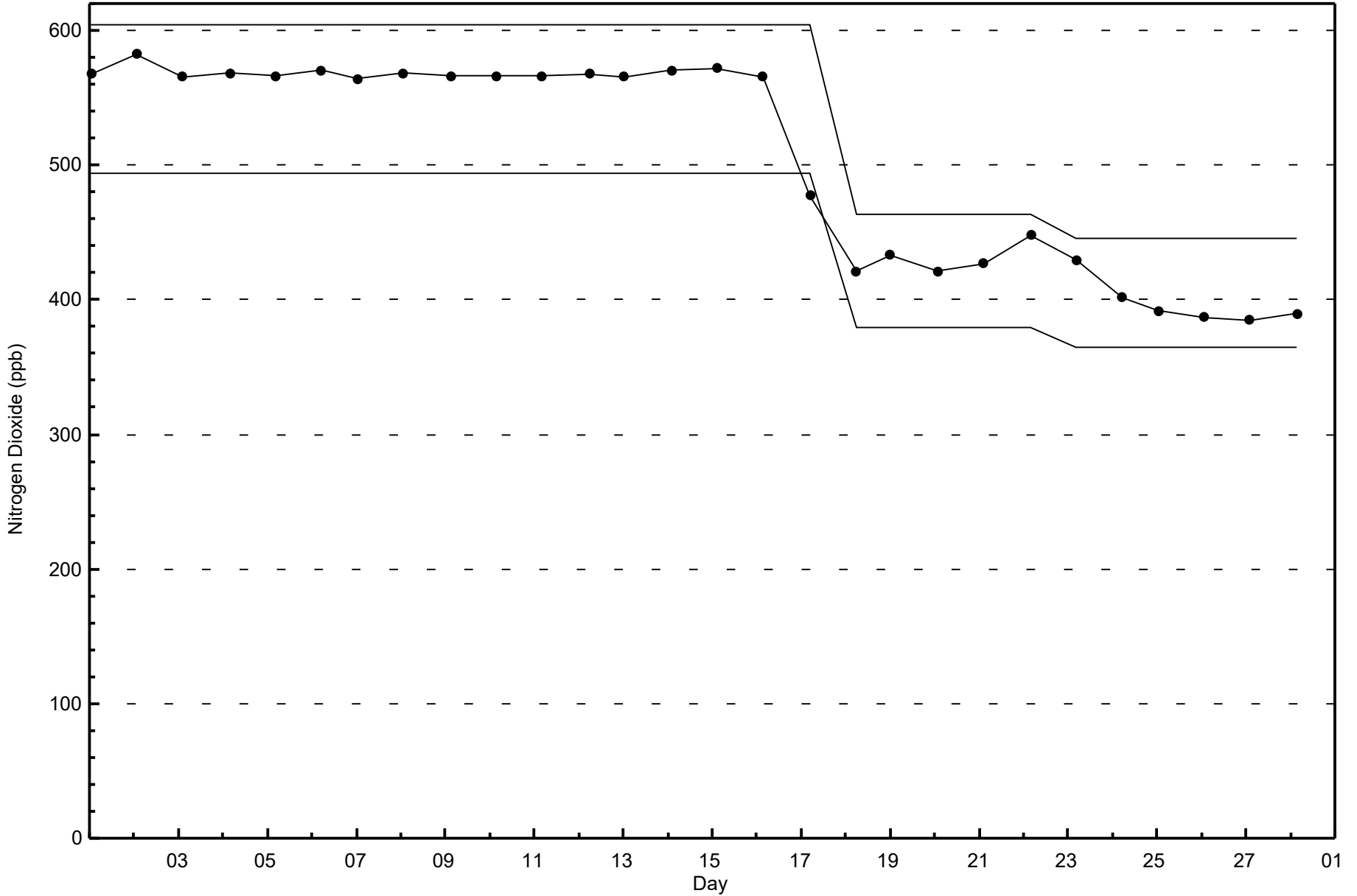


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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 - February 2023

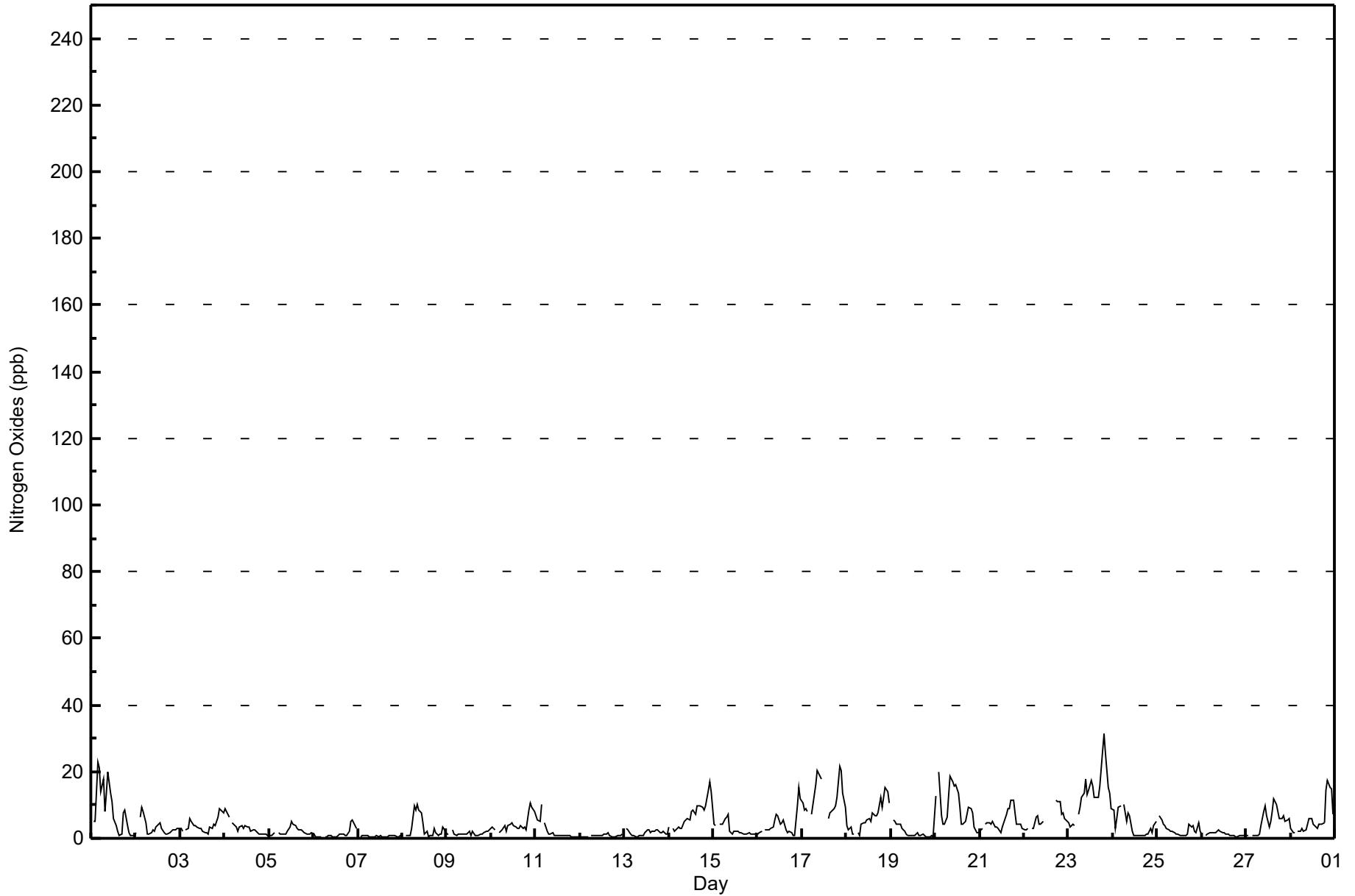
Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 672																				
Maximum Value: 31.4 ppb on Feb 23 20:00		Maximum Daily Average: 13.5 ppb on Feb 23		Hours of Data: 635																						
Minimum Value: 0.3 ppb on Feb 6 07:00		Minimum Daily Average: 0.6 ppb on Feb 7		Hours of Missing Data: 37																						
Maximum Diurnal Average: 5.5 ppb at hour 22		Minimum Diurnal Average: 3.2 ppb at hour 2		Hours of Calibration: 34																						
Monthly Average: 4.35 ppb		Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.7 Q <sub>1</sub> = 1.2 Median = 2.7 Q <sub>3</sub> = 5.8 P <sub>90</sub> = 10.3 P <sub>99</sub> = 20.4		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-Feb	Z	5.0	5.2	22.8	21.1	14.0	17.7	7.9	13.4	20.0	13.4	11.1	5.8	3.7	2.3	0.7	1.1	7.6	8.5	3.6	1.5	1.0	0.8	1.0	8.2	22.8
2-Feb	1.7	Z	6.2	9.3	8.2	4.7	1.3	1.2	1.6	2.4	2.2	3.4	4.3	4.6	2.8	1.8	1.4	1.2	1.5	2.2	2.6	2.7	3.0	3.2	3.2	9.3
3-Feb	3.0	2.2	Z	2.7	2.9	6.1	5.1	3.7	3.7	3.2	3.0	2.9	2.3	1.8	1.5	3.4	2.9	4.1	3.8	6.2	8.9	8.5	7.5	4.0	8.9	
4-Feb	8.8	8.0	6.2	Z	4.6	4.4	3.3	2.2	3.3	3.6	2.8	3.8	3.3	3.2	2.3	2.6	2.7	2.2	1.3	1.1	1.2	1.1	1.0	3.2	8.8	
5-Feb	0.9	0.9	1.1	1.5	Z	1.8	1.3	1.1	1.1	1.3	2.2	3.2	5.0	4.2	3.6	3.1	2.6	2.4	2.1	1.6	1.3	1.2	1.2	2.0	5.0	
6-Feb	1.2	0.5	0.4	0.4	0.4	Z	0.3	0.4	0.7	0.9	0.5	0.6	0.4	0.8	1.2	1.1	1.1	0.7	0.7	2.1	5.0	5.5	3.9	2.9	1.4	5.5
7-Feb	Z	0.6	0.7	0.8	0.7	0.7	0.6	0.5	0.5	0.4	0.7	0.5	0.8	0.6	0.5	0.4	0.5	0.7	1.0	0.8	0.7	0.5	0.5	0.7	0.6	1.0
8-Feb	0.9	Z	0.7	0.9	0.9	3.0	9.7	8.5	10.2	8.4	7.8	4.9	1.3	2.1	0.6	0.8	0.7	3.0	1.8	1.0	1.5	1.4	3.3	1.9	3.3	10.2
9-Feb	1.2	1.2	Z	2.4	1.3	1.0	1.1	1.2	1.1	1.3	1.2	1.3	2.1	1.0	2.3	0.8	0.7	1.0	1.3	1.4	1.5	1.9	2.3	2.6	1.4	2.6
10-Feb	3.4	3.1	2.3	Z	1.7	1.9	2.6	3.8	2.3	3.6	4.1	4.9	3.8	3.2	2.8	2.8	4.0	3.1	3.6	2.4	8.4	10.7	9.4	8.1	4.2	10.7
11-Feb	6.6	5.4	5.2	10.2	Z	4.5	2.0	1.4	1.4	1.6	1.0	1.0	1.0	0.8	0.9	1.0	0.9	1.0	0.8	0.6	0.5	0.5	0.5	0.4	2.1	10.2
12-Feb	0.4	0.6	0.6	0.6	0.6	Z	0.7	0.7	0.8	0.8	0.9	0.8	0.9	1.4	1.2	1.6	0.8	0.6	0.6	0.6	0.8	1.0	1.1	1.1	0.8	1.6
13-Feb	Z	3.0	2.4	1.4	0.9	0.7	0.6	0.6	0.6	0.6	0.7	1.8	2.5	2.7	1.9	2.2	2.1	2.5	2.6	1.7	1.7	1.9	1.2	1.4	1.6	3.0
14-Feb	3.5	Z	3.1	2.1	2.4	3.3	3.1	3.0	4.9	5.6	6.0	5.6	8.1	8.4	7.3	9.7	9.6	9.8	9.2	8.4	9.7	14.3	17.0	13.8	7.3	17.0
15-Feb	4.3	3.7	Z	4.1	4.2	4.4	5.8	6.3	7.1	2.0	1.1	2.1	2.2	2.0	1.7	1.5	1.4	1.3	1.4	1.6	1.4	1.2	1.2	1.2	2.8	7.1
16-Feb	1.5	1.9	2.1	Z	2.5	2.7	2.7	2.8	3.4	5.4	7.3	6.6	4.3	4.6	5.3	2.7	1.8	2.0	1.5	0.9	0.8	9.7	15.3	12.1	4.3	15.3
17-Feb	10.4	8.5	8.8	8.2	Z	7.0	10.4	16.0	20.4	19.7	17.9	M	M	M	6.1	7.7	7.9	9.0	9.5	12.5	21.8	20.3	13.6	9.1	12.2	21.8
18-Feb	3.9	2.7	3.3	1.2	1.4	Z	1.7	1.0	4.3	4.7	4.7	5.6	5.9	5.2	7.8	6.8	6.7	7.6	12.2	9.4	12.1	15.2	14.0	10.7	6.4	15.2
19-Feb	Z	5.5	5.0	4.3	4.1	4.0	2.8	2.0	1.4	0.8	0.7	0.7	0.8	0.8	1.7	0.8	0.6	1.2	0.9	0.5	0.3	0.3	0.6	0.6	1.8	5.5
20-Feb	12.7	Z	20.0	6.7	4.3	4.2	6.3	12.8	18.8	17.0	15.7	16.0	13.4	9.2	4.2	4.1	5.2	7.1	9.2	8.9	7.8	3.3	1.8	1.7	9.1	20.0
21-Feb	2.1	3.1	Z	4.3	4.5	4.5	4.4	5.1	3.3	3.4	2.9	1.9	3.2	4.8	7.2	9.0	8.7	11.5	11.5	7.5	4.4	4.2	4.1	2.9	5.2	11.5
22-Feb	2.6	2.7	2.9	Z	3.0	3.0	6.2	7.0	4.0	4.2	5.1	C	C	C	C	C	C	11.4	11.2	11.2	7.1	7.5	6.0	5.0	--	11.4
23-Feb	4.6	3.5	4.1	3.6	Z	7.3	9.3	12.4	13.5	18.0	13.3	14.4	17.5	15.8	12.1	12.4	12.5	15.5	26.1	31.4	25.4	15.3	13.5	9.0	13.5	31.4
24-Feb	8.4	2.9	6.0	9.3	9.6	Z	10.1	5.0	7.5	6.8	2.0	0.8	0.8	0.7	0.7	0.7	0.7	0.9	1.2	1.5	3.0	1.8	3.6	5.0	3.9	10.1
25-Feb	Z	7.0	5.3	4.2	3.6	3.1	2.6	2.2	2.1	1.7	1.4	1.2	0.9	0.7	0.8	0.9	1.3	4.2	3.5	3.6	2.2	1.8	4.7	2.3	2.7	7.0
26-Feb	1.4	Z	1.0	1.3	1.6	1.7	1.6	1.8	2.1	2.6	2.3	1.8	1.8	1.4	1.1	0.9	1.0	0.8	0.6	0.6	0.7	0.8	0.7	0.8	1.3	2.6
27-Feb	0.8	0.8	Z	0.9	0.9	0.9	0.7	1.1	3.8	8.2	9.6	6.8	3.4	5.1	8.0	11.9	10.3	8.0	5.8	5.9	6.7	5.3	5.4	6.0	5.1	11.9
28-Feb	3.0	1.7	1.5	Z	2.0	2.3	3.0	2.1	2.5	4.3	6.0	5.9	4.2	3.6	3.1	4.1	4.3	4.4	4.5	14.4	17.2	15.1	15.0	7.1	5.7	17.2
3.8 3.2 4.1 4.5 3.7 3.8 4.2 4.1 5.0 5.4 4.9 4.2 3.8 3.6 3.4 3.5 3.5 4.4 4.9 5.0 5.5 5.5 5.5 4.3																								Diurnal Average		
12.7 8.5 20.0 22.8 21.1 14.0 17.7 16.0 20.4 20.0 17.9 16.0 17.5 15.8 12.1 12.4 12.5 15.5 26.1 31.4 25.4 20.3 17.0 13.8																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										





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

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Surmont 2 - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Surmont 2 - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
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41 - 80	0	0.00	100.00
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> 159	0	0.00	100.00

Total Number of Valid Hours: 635

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Surmont 2 - February 2023**

<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	42	32	13	8	18	25	58	25	18	10	10	80	93	69	41	81	623
21 - 40	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	2	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>	42	32	13	8	18	25	58	25	18	10	10	83	93	69	42	83	629

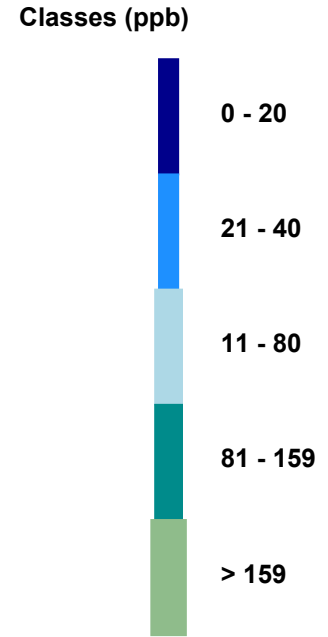
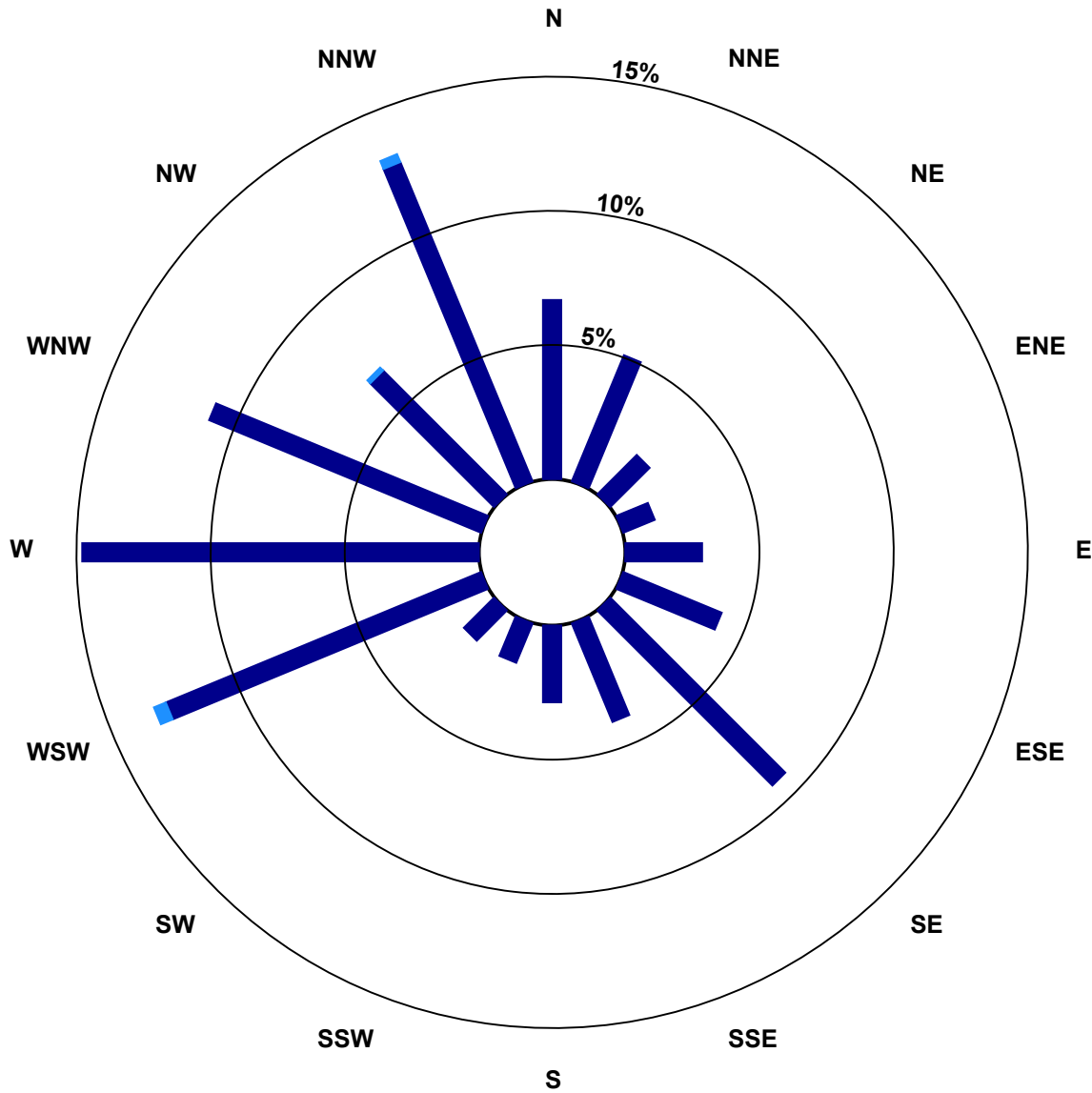
Total Number of Valid Hours: 629

Total Number of Hours: 672

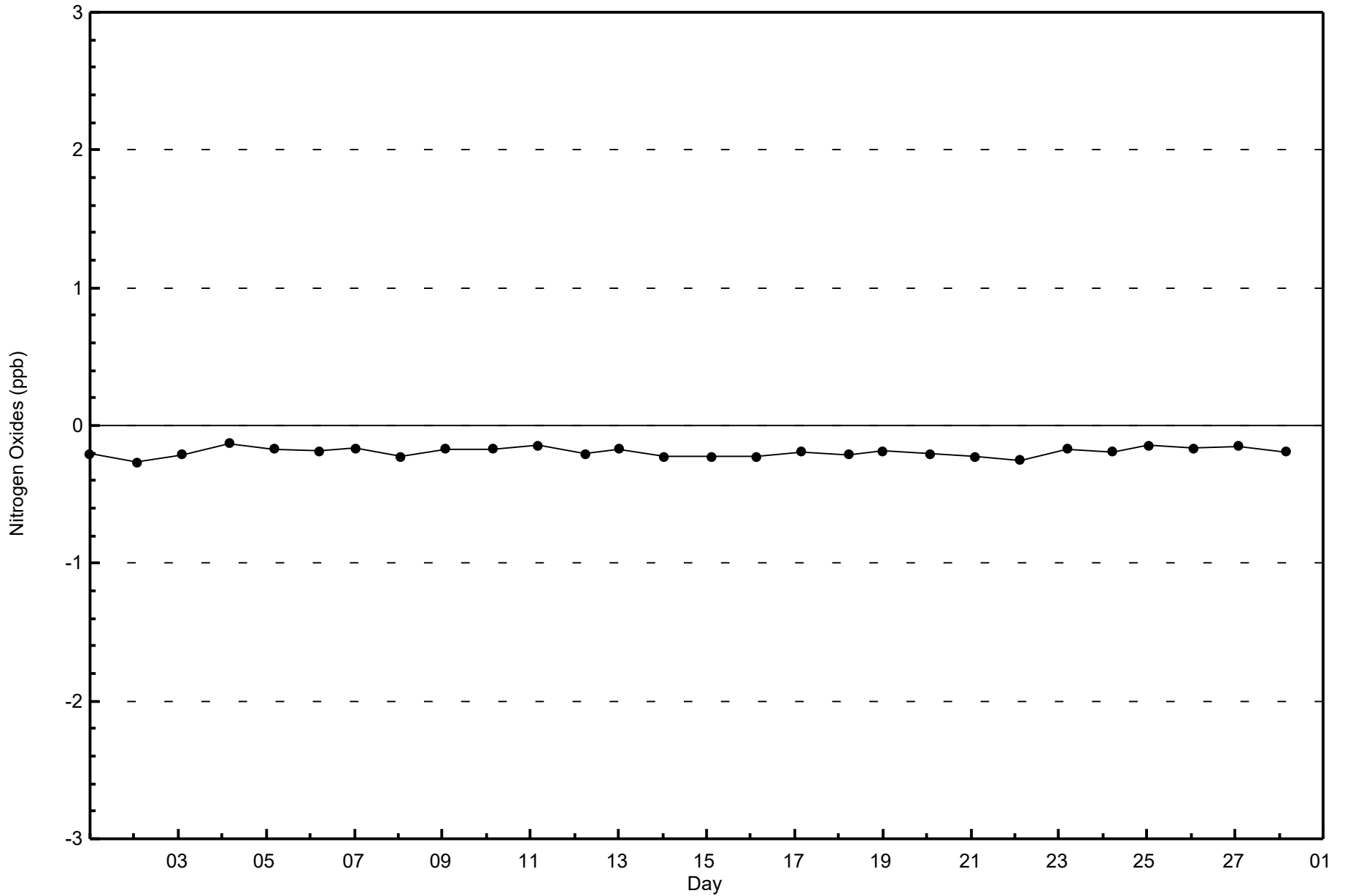


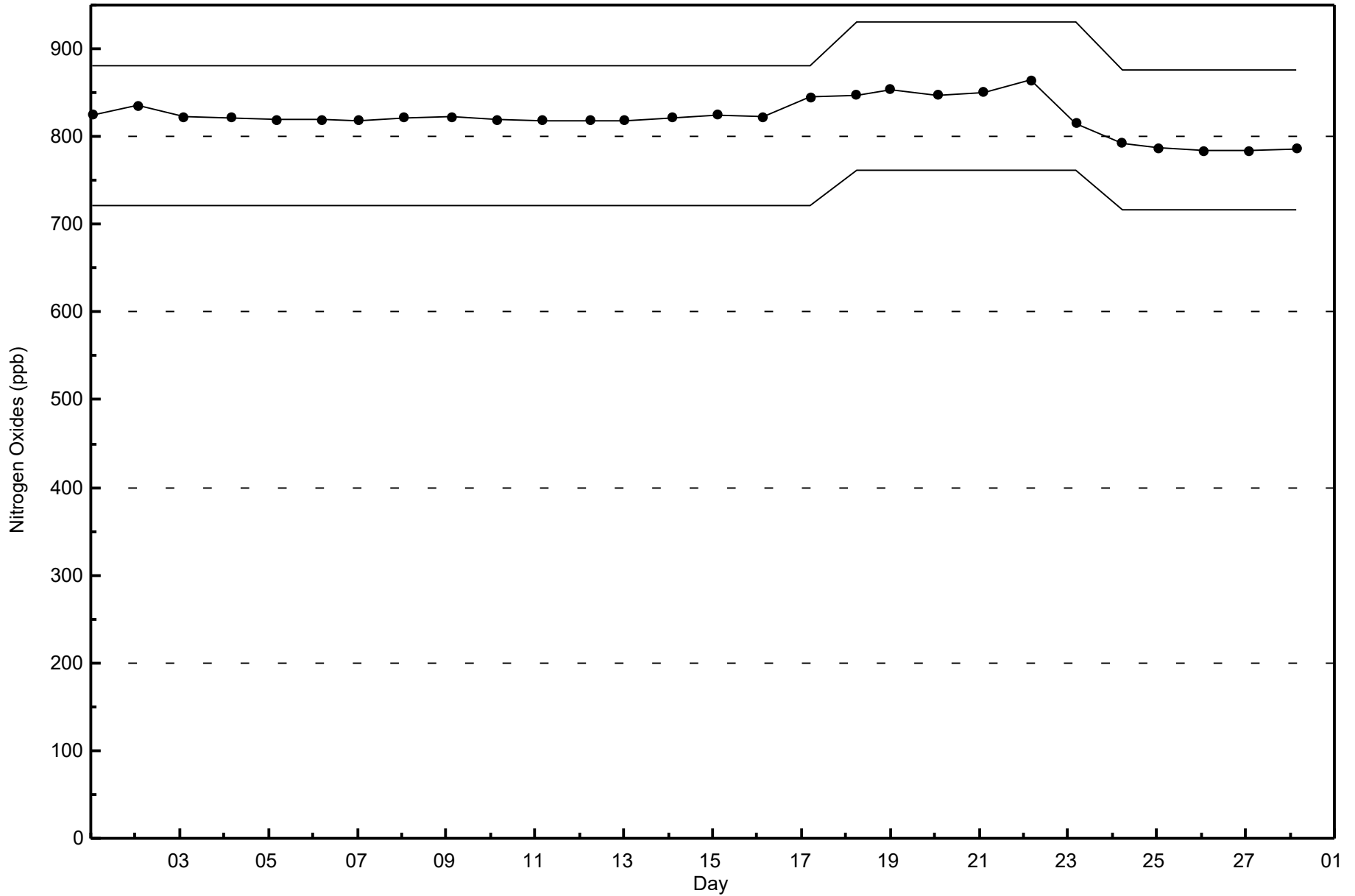
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Surmont 2



Total Number of Valid Hours: 629







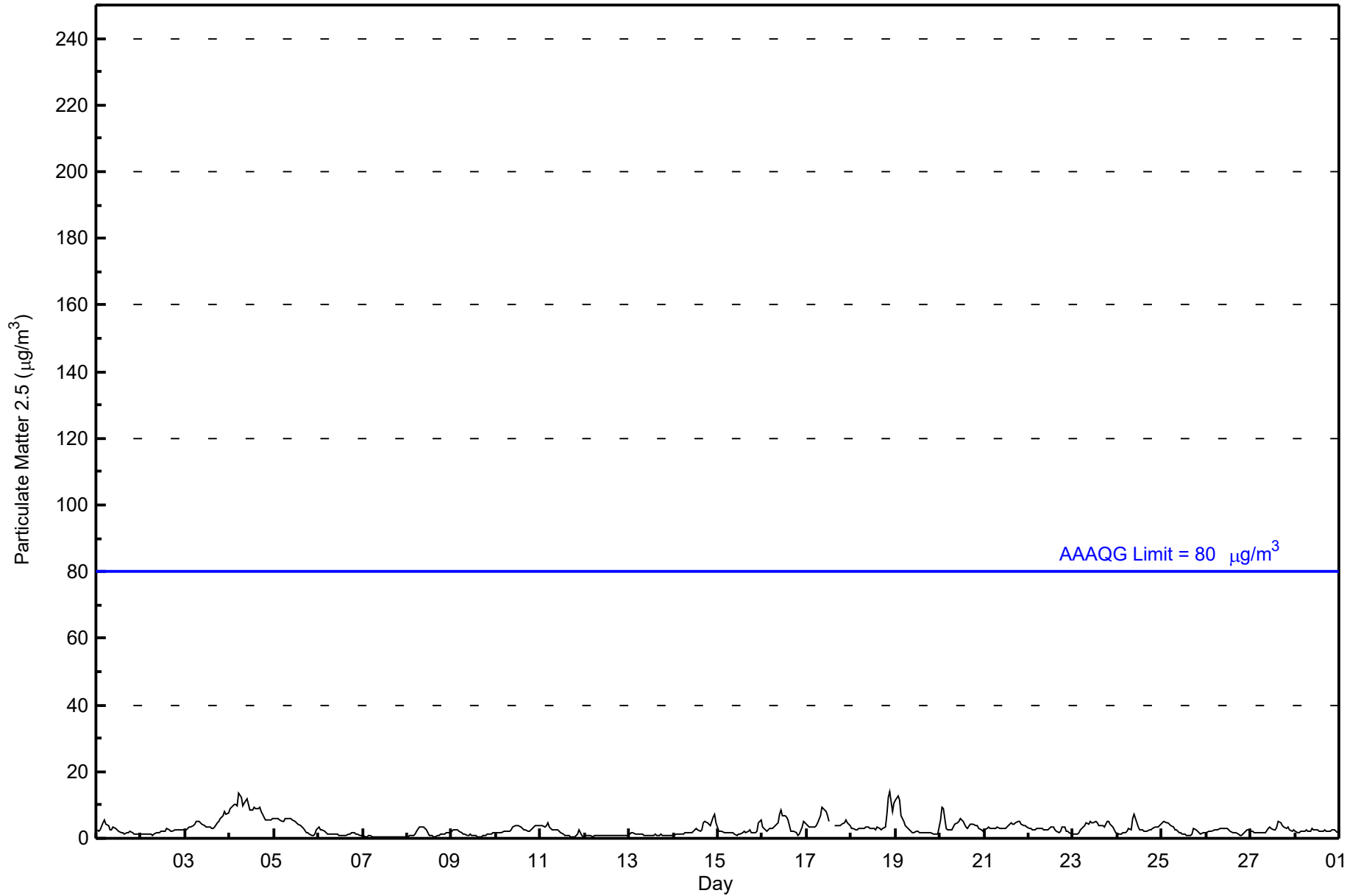
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Surmont 2 - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														672																													
Maximum Value: 13.9 µg/m <sup>3</sup> on Feb 18 22:00		Maximum Daily Average: 8.8 µg/m <sup>3</sup> on Feb 4														Hours of Data:		670																															
Minimum Value: 0.4 µg/m <sup>3</sup> on Feb 7 16:00		Minimum Daily Average: 0.5 µg/m <sup>3</sup> on Feb 7														Hours of Missing Data:		2																															
Maximum Diurnal Average: 3.5 µg/m <sup>3</sup> at hour 10		Minimum Diurnal Average: 2.4 µg/m <sup>3</sup> at hour 16														Hours of Calibration:		2																															
Monthly Average: 2.89 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.8 Q <sub>1</sub> = 1.4 Median = 2.4 Q <sub>3</sub> = 3.6 P <sub>90</sub> = 5.4 P <sub>99</sub> = 11.3														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-Feb	2.5	2.2	2.5	4.8	5.6	4.0	3.9	2.3	2.6	3.5	2.9	2.7	2.3	1.8	1.5	1.4	1.6	1.7	2.1	1.8	1.3	1.3	1.2	1.3	2.4	5.6																							
2-Feb	1.3	1.4	1.3	1.4	1.3	1.2	1.0	1.4	1.6	1.5	1.7	2.0	2.3	2.3	2.8	2.6	2.1	2.2	2.5	2.5	2.5	2.4	2.4	2.5	1.9	2.8																							
3-Feb	2.7	3.0	3.3	3.6	3.7	4.2	5.0	5.2	4.8	4.3	3.8	3.5	3.4	3.2	2.8	3.1	3.6	4.8	5.3	5.7	6.9	7.9	7.4	7.5	4.5	7.9																							
4-Feb	8.7	9.3	10.1	10.1	9.8	13.5	12.3	9.9	10.6	11.9	10.1	8.6	8.4	9.1	8.9	8.9	9.3	8.0	6.2	5.4	5.4	5.6	5.5	5.8	8.8	13.5																							
5-Feb	5.7	5.9	5.8	5.5	5.2	5.3	5.9	5.9	5.9	5.9	5.7	5.1	4.6	4.1	3.6	3.3	3.0	1.7	1.7	1.3	1.0	1.0	1.1	2.5	4.0	5.9																							
6-Feb	3.2	2.7	2.4	2.1	1.8	1.3	1.2	1.4	1.2	1.3	1.1	1.0	0.8	0.9	0.9	0.9	1.2	1.4	1.5	1.6	1.5	1.3	1.0	0.9	1.4	3.2																							
7-Feb	0.7	0.5	0.6	0.9	0.9	0.6	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.9																							
8-Feb	0.5	0.6	0.7	0.7	1.4	2.1	3.5	3.3	3.2	3.2	2.7	1.7	0.8	0.9	0.5	0.5	0.7	0.9	1.1	1.2	1.5	1.6	1.7	1.8	1.5	3.5																							
9-Feb	2.3	2.5	2.6	2.5	2.0	1.5	1.2	1.1	1.0	1.0	1.1	1.0	0.9	0.7	0.5	0.6	0.6	0.7	1.0	1.2	1.2	1.3	1.6	1.7	1.3	2.6																							
10-Feb	1.7	1.9	1.8	1.9	2.0	2.0	2.1	2.3	2.7	3.5	3.9	4.0	3.7	3.3	2.8	2.4	2.5	2.3	2.3	2.4	3.5	3.7	3.8	4.0	2.8	4.0																							
11-Feb	3.8	3.7	3.5	3.9	4.6	3.3	2.7	2.7	2.6	2.5	2.1	1.6	1.3	1.0	0.7	0.7	0.5	0.5	0.6	0.7	1.1	2.4	0.9	0.6	2.0	4.6																							
12-Feb	0.7	0.8	0.7	0.7	0.6	0.7	0.7	0.7	0.8	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	1.0	1.0	0.7	1.0																							
13-Feb	1.3	1.6	1.5	1.2	1.3	1.4	1.4	1.3	1.0	0.8	0.7	0.9	0.8	1.1	1.1	1.0	1.0	1.2	0.9	0.8	0.7	0.8	0.7	0.8	1.0	1.6																							
14-Feb	1.0	1.1	1.2	1.2	1.2	1.4	1.6	1.7	1.7	1.5	1.9	2.4	3.0	2.5	2.1	2.6	4.5	5.0	4.6	4.0	4.0	6.2	7.0	4.6	2.8	7.0																							
15-Feb	2.0	2.2	2.1	1.9	1.7	1.5	1.7	1.6	1.7	1.2	1.0	1.2	1.2	1.6	2.3	1.8	2.2	2.5	1.6	1.8	1.7	2.3	4.7	5.5	2.0	5.5																							
16-Feb	3.4	2.8	2.2	2.4	2.9	2.9	3.2	3.7	4.6	7.3	8.3	6.9	6.9	6.5	5.4	2.1	2.0	2.3	1.7	0.8	1.1	3.4	5.2	4.7	3.9	8.3																							
17-Feb	4.0	3.4	3.5	3.6	3.6	3.6	4.5	6.6	9.2	9.0	8.1	6.8	5.0	C	C	3.9	3.8	3.8	3.8	4.1	4.8	5.3	4.5	3.9	4.9	9.2																							
18-Feb	3.0	2.8	2.7	2.7	2.8	3.1	3.0	3.0	3.4	3.2	3.1	3.1	3.2	2.6	3.2	3.0	2.6	2.8	3.2	7.2	12.1	13.9	7.9	10.6	4.5	13.9																							
19-Feb	11.3	12.9	11.4	6.7	4.9	3.9	3.2	2.4	2.3	1.9	1.9	1.9	2.0	1.8	1.8	1.8	1.7	1.7	1.7	1.6	1.3	1.2	1.3	1.2	3.5	12.9																							
20-Feb	5.4	9.2	9.0	2.9	2.4	2.3	2.5	3.6	4.4	4.7	5.1	6.0	5.3	4.2	3.2	3.2	4.2	4.3	4.0	3.7	3.6	3.0	2.4	2.1	4.2	9.2																							
21-Feb	2.6	3.0	3.3	3.1	2.9	2.9	3.0	3.3	3.1	3.2	3.1	2.9	3.3	3.7	4.6	4.4	4.1	4.5	4.9	5.1	4.0	3.8	3.8	3.3	3.6	5.1																							
22-Feb	2.9	2.8	2.7	2.6	2.8	3.0	2.8	3.0	2.5	2.4	2.5	2.9	3.3	3.2	2.6	1.9	1.7	2.1	3.4	3.6	2.2	2.0	1.6	1.4	2.6	3.6																							
23-Feb	1.4	1.4	1.4	1.9	2.5	3.2	4.0	4.5	4.3	5.2	4.6	4.9	5.2	4.7	3.9	4.0	3.7	3.5	5.3	5.0	4.2	3.4	2.4	1.7	3.6	5.3																							
24-Feb	1.4	1.1	1.2	1.5	1.8	2.2	2.8	2.4	6.0	7.1	4.8	3.4	2.7	2.4	2.0	1.9	2.1	2.6	2.7	3.1	3.3	3.4	3.6	4.1	2.9	7.1																							
25-Feb	4.7	4.9	4.8	4.5	4.2	3.9	3.2	2.7	2.3	1.9	1.5	1.4	1.2	0.9	0.9	0.9	1.2	3.1	2.4	2.2	1.6	1.4	1.6	1.8	2.5	4.9																							
26-Feb	1.7	1.9	2.2	2.2	2.5	2.7	2.6	2.9	3.0	3.0	3.1	3.1	2.7	2.1	1.6	1.5	1.5	1.3	1.0	1.1	1.6	2.1	2.6	2.4	2.2	3.1																							
27-Feb	2.2	2.0	1.9	1.8	1.7	1.7	1.6	1.6	1.9	3.0	3.2	3.1	2.5	2.7	3.4	5.2	4.6	4.0	3.5	3.0	3.2	2.3	2.2	2.4	2.7	5.2																							
28-Feb	2.2	1.8	1.8	2.0	1.9	1.9	2.5	2.1	2.0	2.8	2.7	2.5	2.4	2.3	2.1	2.1	2.3	2.1	2.0	2.3	2.6	2.4	2.3	1.9	2.2	2.8																							
																								3.0	3.2	3.1	2.9	2.9	2.9	3.0	3.0	3.2	3.5	3.3	3.1	2.9	2.6	2.5	2.4	2.5	2.6	2.6	2.7	2.8	3.1	2.9	2.9	Diurnal Average	
																								11.3	12.9	11.4	10.1	9.8	13.5	12.3	9.9	10.6	11.9	10.1	8.6	8.4	9.1	8.9	8.9	9.3	8.0	6.2	7.2	12.1	13.9	7.9	10.6	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>) -  $\mu\text{g}/\text{m}^3$**   
**Surmont 2 - February 2023**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	607	90.60	90.60
6 - 15	63	9.40	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: 670

Total Number of Hours: 672



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

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Surmont 2 - February 2023**

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	40	26	12	6	15	19	51	23	17	9	9	79	99	70	40	85	600
6 - 15	3	10	2	2	3	6	10	2	2	2	3	8	1	1	4	4	63
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>	43	36	14	8	18	25	61	25	19	11	12	87	100	71	44	89	663

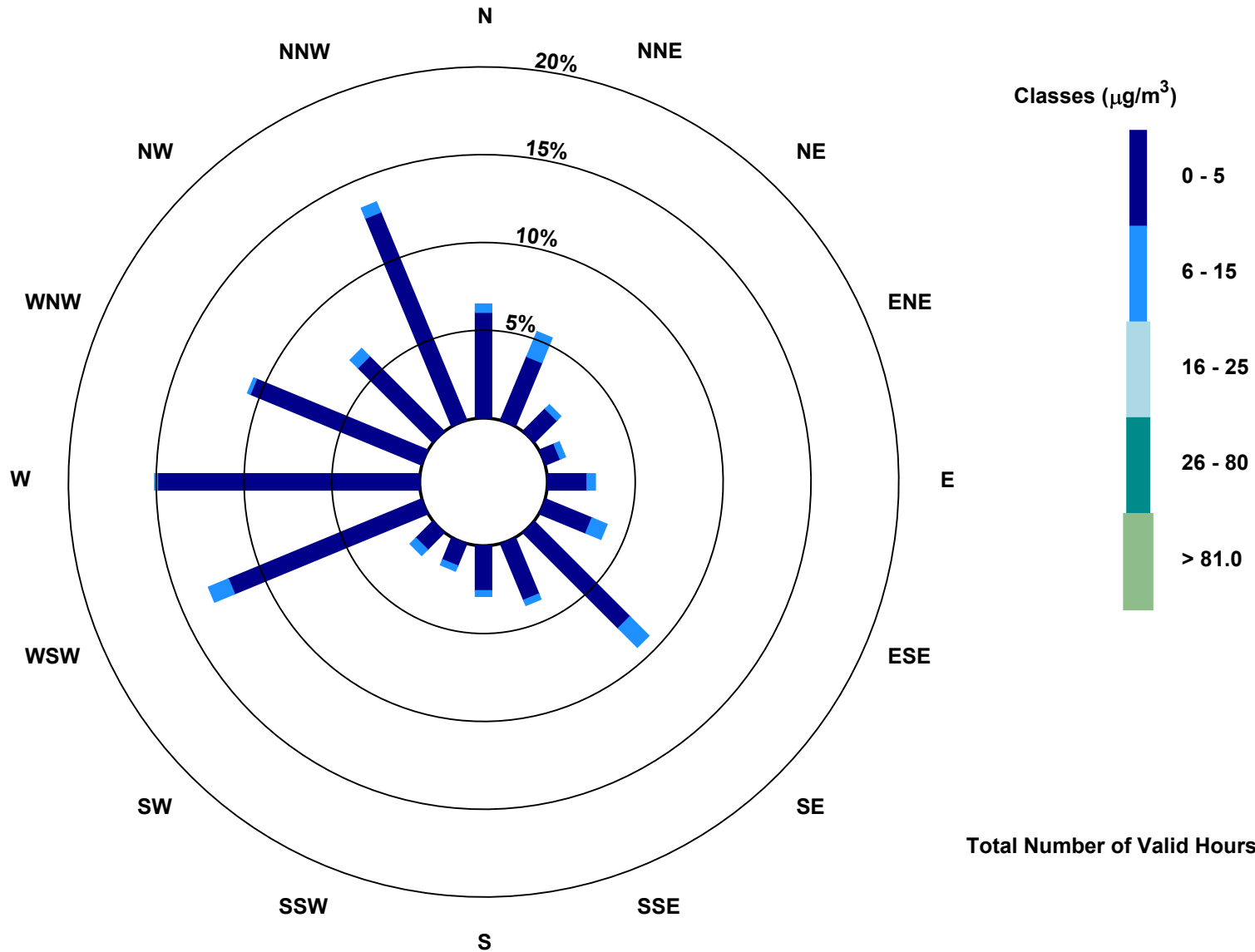
Total Number of Valid Hours: 663

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$   
Surmont 2

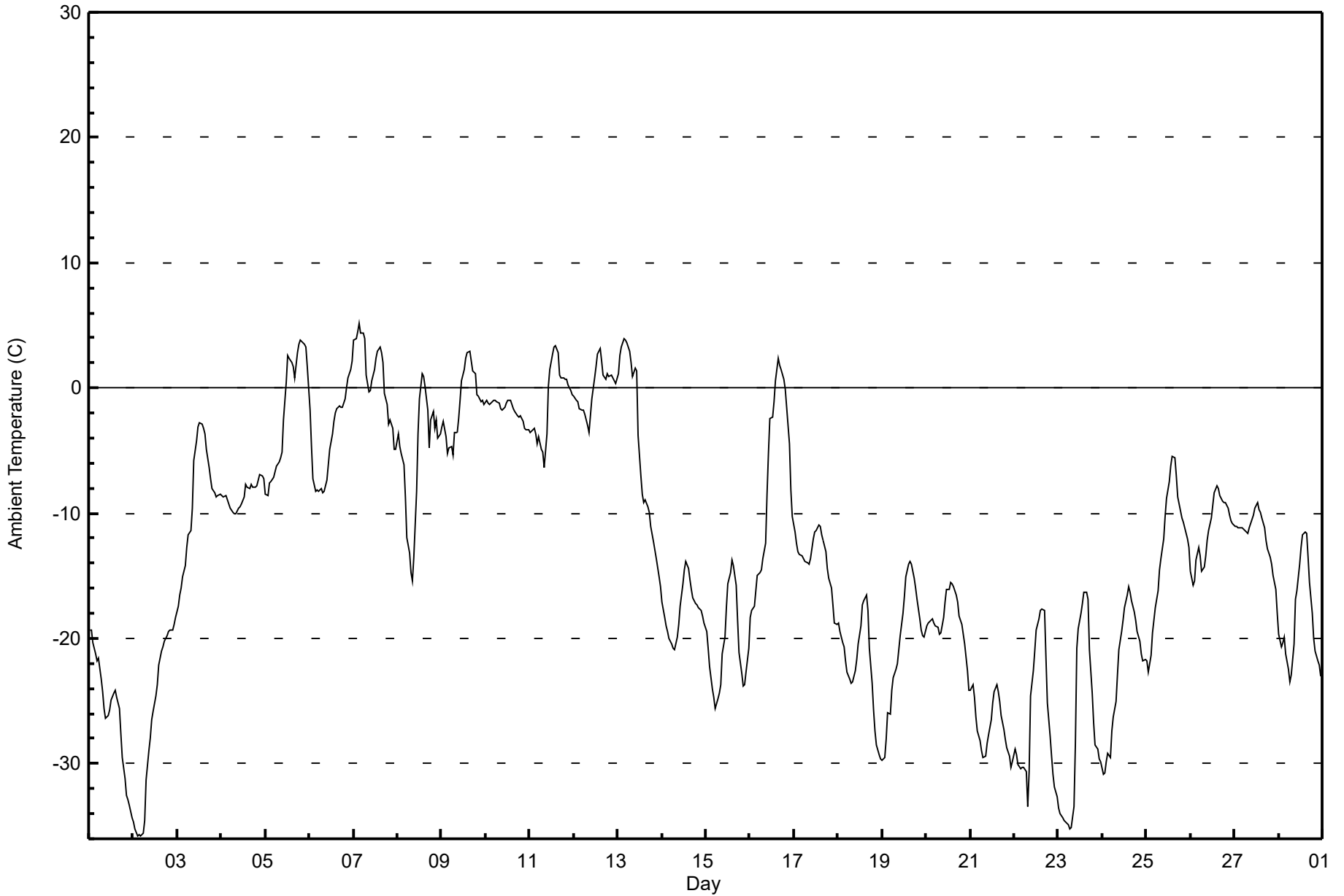




**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Ambient Temperature (AT) - C**  
**Surmont 2 - February 2023**

Maximum Value: 5.2 C on Feb 7 04:00		Maximum Daily Average: 1.1 C on Feb 7		Hours in Service: 672																						
Minimum Value: -35.8 C on Feb 2 05:00		Minimum Daily Average: -27.1 C on Feb 23		Hours of Data: 672																						
Maximum Diurnal Average: -8.9 C at hour 15		Minimum Diurnal Average: -15.7 C at hour 8		Hours of Missing Data: 0																						
Monthly Average: -13.06 C		Percentiles: P <sub>1</sub> = -34.9 P <sub>10</sub> = -27.4 Q <sub>1</sub> = -20.5 Median = -13.4 Q <sub>3</sub> = -3.6 P <sub>90</sub> = 0.8 P <sub>99</sub> = 3.9		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-Feb	-19.3	-19.4	-20.4	-21.2	-21.8	-21.6	-23.2	-24.3	-25.5	-26.4	-26.2	-25.7	-24.9	-24.4	-24.1	-24.7	-25.5	-27.6	-29.5	-31.2	-32.5	-32.9	-33.3	-34.3	-25.8	-19.3
2-Feb	-34.7	-35.2	-35.7	-35.7	-35.8	-35.6	-34.5	-31.3	-29.0	-27.9	-26.5	-25.8	-24.6	-23.7	-22.1	-21.0	-20.7	-20.3	-19.7	-19.4	-19.3	-19.4	-18.9	-18.3	-26.5	-18.3
3-Feb	-17.4	-16.6	-16.0	-15.0	-14.1	-12.7	-11.7	-11.4	-9.6	-5.8	-4.3	-3.1	-2.8	-2.9	-3.2	-3.7	-4.9	-6.4	-7.3	-8.1	-8.4	-8.7	-8.6	-8.5	-8.8	-2.8
4-Feb	-8.6	-8.7	-8.6	-8.9	-9.3	-9.6	-9.9	-10.1	-10.1	-9.6	-9.5	-9.3	-8.7	-7.7	-7.9	-8.1	-7.7	-7.9	-7.9	-7.8	-7.4	-6.9	-7.0	-7.2	-8.5	-6.9
5-Feb	-8.5	-8.6	-7.6	-7.5	-7.1	-6.7	-6.2	-5.9	-5.6	-5.1	-2.6	0.5	2.6	2.4	2.0	1.7	0.8	2.8	3.4	3.8	3.6	3.5	3.3	1.7	-1.6	3.8
6-Feb	-1.8	-4.7	-7.2	-8.2	-8.2	-8.2	-8.0	-8.3	-8.3	-7.4	-6.1	-5.0	-3.7	-2.6	-2.0	-1.6	-1.4	-1.5	-1.5	-0.9	0.1	0.8	1.5	2.2	-3.8	2.2
7-Feb	3.8	4.0	4.5	5.2	4.4	4.3	3.9	1.1	-0.3	-0.2	0.6	1.5	2.4	3.0	3.2	2.8	2.0	-0.4	-1.3	-2.9	-2.5	-3.2	-4.9	-4.9	1.1	5.2
8-Feb	-3.6	-4.6	-5.2	-6.1	-8.7	-12.0	-13.2	-14.8	-15.4	-13.5	-8.2	-3.7	-0.9	1.1	0.9	0.1	-1.8	-4.8	-2.6	-1.9	-3.2	-2.6	-4.0	-3.6	-5.5	1.1
9-Feb	-3.1	-2.7	-3.9	-5.3	-4.8	-4.7	-5.4	-3.6	-3.6	-2.4	-1.0	0.6	1.5	2.4	2.9	2.9	2.1	1.4	1.1	-0.5	-0.6	-1.1	-0.9	-1.4	-1.3	2.9
10-Feb	-1.0	-1.2	-1.3	-1.2	-1.0	-1.0	-1.1	-1.2	-1.7	-1.8	-1.5	-1.2	-0.9	-1.0	-1.3	-1.7	-1.9	-2.2	-2.3	-2.3	-2.7	-3.2	-3.4	-3.4	-1.7	-0.9
11-Feb	-3.6	-3.5	-3.2	-3.7	-4.4	-3.9	-4.9	-5.1	-6.4	-3.6	0.2	1.5	2.7	3.2	3.4	2.8	1.1	0.8	0.8	0.7	0.7	0.2	-0.2	-0.6	-1.0	3.4
12-Feb	-0.7	-1.0	-1.1	-1.7	-1.8	-1.8	-2.1	-3.0	-3.5	-2.2	-0.9	0.8	1.7	2.7	3.1	2.2	1.0	0.7	1.2	1.0	1.0	0.8	0.6	0.3	-0.1	3.1
13-Feb	1.1	2.6	3.3	3.9	3.8	3.6	3.0	2.0	0.9	1.6	1.3	-3.8	-7.0	-8.5	-9.1	-9.0	-9.5	-9.9	-11.1	-12.3	-13.0	-13.7	-15.1	-15.9	-4.6	3.9
14-Feb	-17.1	-18.3	-19.0	-19.5	-20.0	-20.4	-20.8	-20.9	-19.9	-18.9	-17.4	-15.6	-14.5	-13.8	-14.4	-15.3	-16.0	-16.8	-17.2	-17.4	-17.5	-17.8	-18.2	-18.8	-17.7	-13.8
15-Feb	-19.4	-20.8	-22.2	-24.0	-24.7	-25.6	-24.9	-24.4	-23.7	-21.3	-19.9	-17.6	-15.7	-14.8	-13.7	-14.1	-15.8	-18.6	-21.2	-22.8	-23.8	-23.7	-22.7	-20.8	-20.7	-13.7
16-Feb	-18.3	-17.8	-17.4	-16.2	-15.0	-14.7	-14.5	-13.7	-12.4	-8.5	-5.2	-2.5	-2.4	-1.1	0.6	2.3	1.8	1.5	0.7	-0.1	-1.5	-4.5	-8.1	-10.3	-7.4	2.3
17-Feb	-11.6	-12.4	-13.0	-13.3	-13.4	-13.6	-13.8	-14.0	-14.1	-13.6	-12.1	-11.4	-11.3	-11.0	-11.0	-11.8	-12.2	-13.1	-14.4	-15.1	-16.0	-17.3	-18.8	-18.8	-13.6	-11.0
18-Feb	-18.7	-19.4	-20.3	-20.7	-21.8	-22.7	-23.3	-23.6	-23.4	-22.6	-21.7	-20.5	-18.9	-17.3	-17.0	-16.6	-17.8	-20.8	-23.6	-25.7	-27.4	-28.5	-29.3	-29.7	-22.1	-16.6
19-Feb	-29.7	-29.5	-28.1	-25.9	-26.0	-24.2	-23.1	-22.4	-22.0	-20.9	-19.8	-17.9	-16.7	-15.0	-14.1	-13.8	-14.1	-15.2	-15.9	-16.8	-18.4	-19.4	-19.8	-19.9	-20.4	-13.8
20-Feb	-19.0	-18.7	-18.6	-18.4	-18.8	-18.9	-19.1	-19.6	-19.6	-18.3	-17.2	-16.1	-16.1	-15.5	-15.6	-15.9	-16.6	-17.1	-18.3	-18.9	-19.7	-20.4	-22.6	-24.1	-18.5	-15.5
21-Feb	-24.1	-23.7	-24.7	-26.3	-27.4	-28.1	-28.9	-29.5	-29.4	-28.4	-27.8	-26.5	-25.1	-24.2	-23.7	-24.3	-25.0	-26.2	-27.3	-28.1	-28.7	-29.4	-30.3	-29.9	-27.0	-23.7
22-Feb	-28.9	-29.3	-30.0	-30.4	-30.3	-30.3	-30.6	-33.5	-30.7	-24.6	-22.6	-21.1	-19.4	-18.4	-17.8	-17.6	-17.8	-21.6	-25.2	-27.8	-29.4	-30.8	-31.8	-32.7	-26.4	-17.6
23-Feb	-33.5	-34.0	-34.3	-34.5	-34.6	-34.9	-35.2	-35.1	-33.4	-28.4	-20.8	-19.2	-18.0	-17.3	-16.3	-16.3	-16.9	-20.9	-24.4	-26.7	-28.5	-28.8	-29.6	-29.9	-27.1	-16.3
24-Feb	-30.9	-30.7	-29.9	-29.2	-29.5	-27.3	-26.3	-25.0	-22.9	-20.9	-19.5	-18.6	-17.5	-16.6	-15.9	-16.3	-16.9	-17.9	-18.6	-19.4	-20.2	-21.2	-21.8	-21.6	-22.3	-15.9
25-Feb	-21.8	-22.7	-21.4	-19.6	-18.6	-17.5	-16.2	-14.5	-13.6	-12.0	-10.3	-8.9	-7.4	-6.2	-5.5	-5.5	-7.0	-8.7	-9.9	-10.4	-10.8	-11.2	-12.0	-12.8	-12.7	-5.5
26-Feb	-14.7	-15.7	-15.4	-13.7	-12.7	-13.4	-14.6	-14.2	-13.4	-12.2	-11.4	-10.4	-9.4	-8.4	-7.8	-8.0	-8.6	-9.0	-9.2	-9.2	-9.6	-10.2	-10.6	-10.8	-11.4	-7.8
27-Feb	-11.0	-11.1	-11.1	-11.2	-11.2	-11.3	-11.5	-11.6	-11.2	-10.5	-10.1	-9.6	-9.2	-9.7	-10.0	-10.4	-11.2	-12.1	-12.8	-13.5	-14.1	-15.0	-16.1	-18.0	-11.8	-9.2
28-Feb	-19.7	-20.7	-20.3	-19.9	-21.3	-22.5	-23.4	-22.9	-20.4	-16.9	-16.2	-14.0	-12.7	-11.7	-11.5	-11.7	-13.5	-15.6	-17.9	-20.0	-21.0	-21.8	-22.1	-23.0	-18.4	-11.5
	-14.8	-15.2	-15.3	-15.3	-15.5	-15.5	-15.7	-15.3	-13.7	-12.0	-10.8	-9.9	-9.2	-8.9	-9.0	-9.8	-11.0	-11.9	-12.6	-13.2	-13.8	-14.5	-14.8		Diurnal Average	
	3.8	4.0	4.5	5.2	4.4	4.3	3.9	2.0	0.9	1.6	1.3	1.5	2.7	3.2	3.4	2.9	2.1	2.8	3.4	3.8	3.6	3.5	3.3	2.2		Diurnal Maximum





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

**Ambient Temperature (AT) - C**  
**Surmont 2 - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	177	26.34	26.34
-20 - 0	411	61.16	87.50
0 - 10	84	12.50	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



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

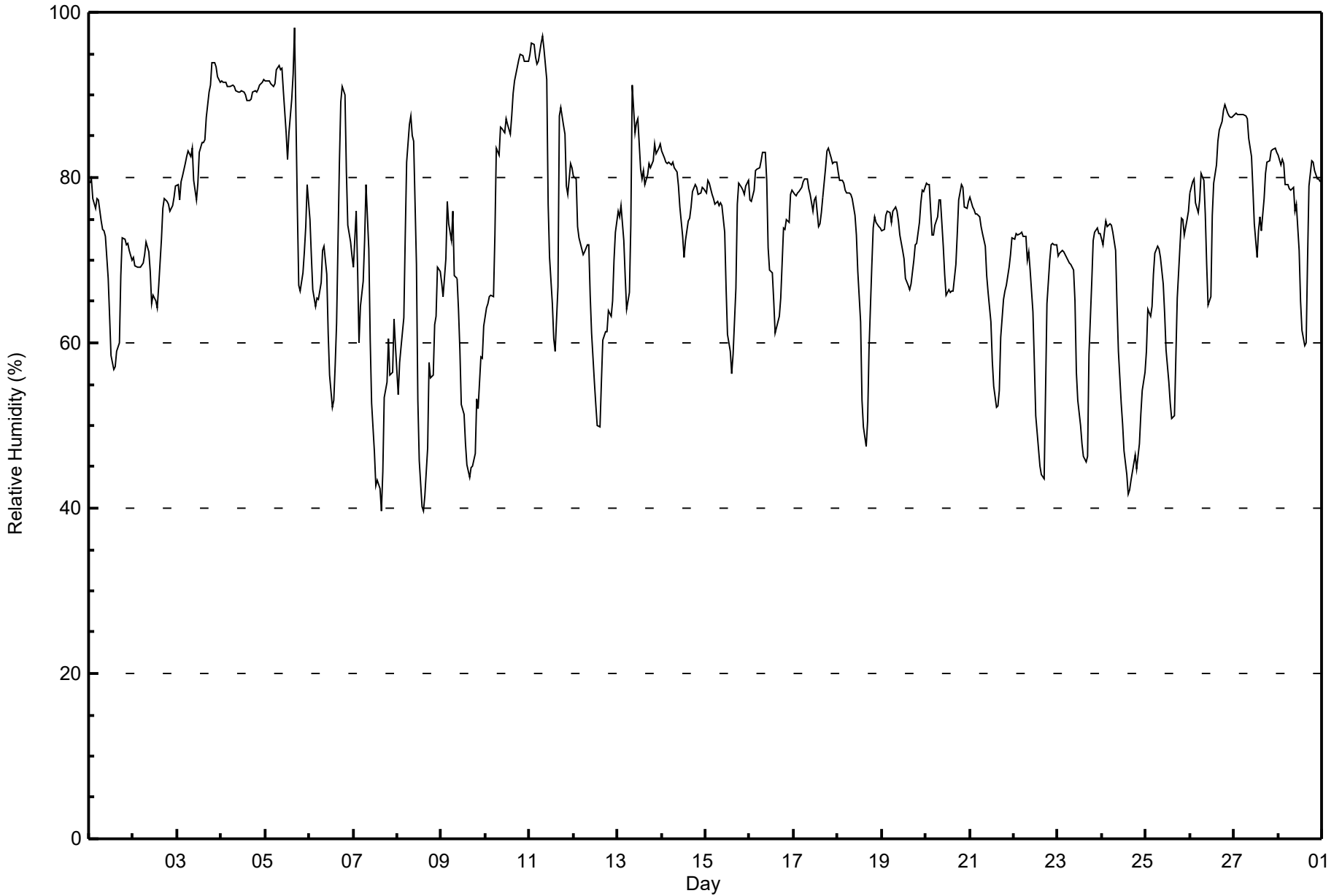
**Relative Humidity (RH) - %**  
**Surmont 2 - February 2023**

Maximum Value: 98.1 % on Feb 5 17:00      Maximum Daily Average: 90.7 % on Feb 4																						Hours in Service:	672			
Minimum Value: 39.7 % on Feb 8 15:00      Minimum Daily Average: 57.4 % on Feb 24																						Hours of Data:	672			
Maximum Diurnal Average: 78.5 % at hour 8      Minimum Diurnal Average: 62.5 % at hour 15																						Hours of Missing Data:	0			
Monthly Average: 73.04 %      Percentiles: P <sub>1</sub> = 42.6 P <sub>10</sub> = 55.2 Q <sub>1</sub> = 66.2 Median = 74.5 Q <sub>3</sub> = 80.7 P <sub>90</sub> = 89.1 P <sub>99</sub> = 94.9																						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-Feb	79.3	79.8	77.5	76.3	77.4	77.2	74.8	73.7	73.5	72.9	67.8	63.1	58.5	56.8	57.0	59.0	60.1	68.2	72.8	72.6	71.8	72.0	71.2	70.0	70.1	79.8
2-Feb	70.3	69.3	69.1	69.2	69.2	69.7	70.7	72.2	71.1	68.6	64.8	65.7	65.1	64.3	66.7	72.5	76.3	77.5	77.2	76.7	76.0	76.5	77.5	79.0	71.5	79.0
3-Feb	79.2	77.2	79.5	80.2	81.7	82.6	83.2	82.6	83.5	79.7	77.3	79.3	83.1	84.3	84.3	84.6	87.3	90.3	91.2	93.9	94.0	93.3	92.3	91.6	84.8	94.0
4-Feb	91.7	91.6	91.6	91.0	91.0	91.1	91.2	91.0	90.4	90.4	90.5	90.4	90.1	89.4	89.3	89.4	90.4	90.5	90.4	90.8	91.2	91.6	91.9	91.9	90.7	91.9
5-Feb	91.7	91.7	91.8	91.4	91.0	91.4	93.1	93.5	93.1	93.2	90.4	85.4	82.2	85.4	89.5	92.6	98.1	76.3	66.9	66.3	68.5	71.0	74.2	79.1	85.3	98.1
6-Feb	74.9	70.5	66.4	64.4	65.5	65.3	67.3	71.2	71.6	68.3	61.1	56.2	52.2	53.1	57.3	62.5	81.6	89.2	91.1	89.9	80.7	74.2	72.2	70.5	69.9	91.1
7-Feb	69.2	75.9	69.0	60.0	64.5	67.4	72.4	79.2	71.4	60.4	52.7	46.8	42.7	43.5	42.3	39.7	44.4	53.5	55.2	60.6	56.1	56.5	62.8	59.6	58.6	79.2
8-Feb	53.8	57.6	59.6	63.1	72.9	81.8	86.4	87.4	85.1	84.3	69.5	53.1	45.7	40.2	39.7	41.5	47.3	57.7	55.8	56.1	62.2	63.2	69.1	68.6	62.6	87.4
9-Feb	67.3	65.7	70.2	77.0	74.5	72.4	76.0	68.2	67.8	64.1	59.1	52.6	51.4	47.8	45.3	43.8	44.9	45.1	46.7	53.3	52.0	58.4	58.1	62.1	59.3	77.0
10-Feb	64.3	64.7	65.6	65.8	65.5	73.1	83.6	82.7	86.1	86.0	85.5	87.0	86.5	85.3	87.5	90.2	91.8	93.3	94.3	95.0	94.8	94.0	94.0	94.2	83.8	95.0
11-Feb	94.9	96.3	96.1	94.6	93.7	94.1	96.2	97.1	95.6	91.9	76.8	70.3	64.8	60.5	59.0	66.7	87.5	88.5	86.3	85.2	79.0	78.0	81.7	81.2	84.0	97.1
12-Feb	80.1	79.8	74.0	72.6	71.4	70.7	70.9	71.9	71.9	65.8	61.2	55.2	52.5	50.1	49.9	55.3	60.4	61.3	61.4	64.0	63.3	65.1	69.9	73.3	65.5	80.1
13-Feb	75.9	75.3	76.6	72.3	68.0	64.1	66.0	74.3	91.2	85.4	86.5	87.2	81.0	79.9	80.8	79.1	80.3	81.7	81.2	82.1	84.0	82.9	83.5	84.0	79.3	91.2
14-Feb	83.2	82.4	81.9	81.7	81.9	81.6	81.8	81.2	80.6	79.0	76.5	72.9	70.4	72.4	74.8	75.2	76.4	78.3	79.1	78.8	78.0	78.1	78.8	78.6	78.5	83.2
15-Feb	78.1	79.6	79.4	78.0	77.4	76.9	77.2	76.5	77.0	76.6	73.3	66.7	61.0	58.9	56.3	58.6	66.7	76.8	79.3	78.9	78.4	78.0	78.9	79.7	73.7	79.7
16-Feb	77.3	77.1	78.4	80.8	81.1	81.1	82.0	83.0	83.1	79.7	71.6	68.8	68.5	65.1	61.2	62.6	63.2	65.5	73.8	73.7	75.0	74.6	77.9	78.5	74.3	83.1
17-Feb	77.9	77.8	78.1	78.3	78.8	79.4	79.9	79.8	78.6	77.9	76.0	77.3	77.6	74.0	74.4	75.8	77.6	81.2	83.2	83.5	82.4	81.7	81.9	81.9	79.0	83.5
18-Feb	80.7	79.7	79.7	79.2	78.4	78.1	78.2	78.0	77.5	75.4	73.0	68.6	62.5	53.1	49.8	47.5	50.5	59.2	69.3	73.9	75.2	74.6	74.1	73.8	70.4	80.7
19-Feb	73.5	73.8	75.3	75.9	75.7	74.5	76.0	76.5	76.0	74.7	73.1	71.2	70.2	67.7	66.9	66.4	67.1	70.0	71.9	72.0	74.6	76.9	78.5	78.2	73.2	78.5
20-Feb	79.3	79.1	79.1	73.1	73.0	74.3	75.3	77.2	77.2	71.7	68.3	65.8	66.4	66.1	66.3	66.2	69.5	73.2	77.3	79.2	78.8	76.5	76.3	77.2	73.6	79.3
21-Feb	77.5	76.4	76.1	75.6	75.5	75.2	74.1	73.2	71.7	68.1	66.2	62.5	57.8	54.8	52.2	52.5	54.3	60.7	65.2	66.2	67.0	69.1	70.7	72.7	67.3	77.5
22-Feb	72.5	73.2	73.1	73.2	73.4	72.8	72.8	69.9	71.0	68.8	63.7	57.7	51.2	47.2	45.0	44.1	43.6	54.1	64.7	70.0	71.9	72.0	71.9	71.9	64.6	73.4
23-Feb	70.5	70.8	71.1	71.0	70.6	70.1	69.6	69.6	68.9	65.1	56.4	53.1	50.0	47.8	46.2	45.6	46.2	58.6	67.5	72.4	73.5	73.9	73.1	73.2	63.9	73.9
24-Feb	71.9	73.4	74.7	74.1	74.4	74.2	73.4	71.2	64.6	58.9	52.7	50.1	46.9	44.1	41.7	42.2	43.3	45.4	46.5	44.8	47.7	51.3	54.2	56.5	57.4	74.7
25-Feb	59.0	64.0	63.3	64.5	68.4	70.8	71.7	71.3	70.3	67.2	63.5	59.1	55.3	52.7	50.9	51.2	58.4	65.3	71.9	75.0	74.9	73.1	75.0	75.9	65.5	75.9
26-Feb	78.2	79.5	79.8	76.9	75.8	77.3	80.6	79.7	75.6	69.5	64.6	65.7	75.4	79.3	81.5	84.5	85.7	86.8	88.1	88.9	87.8	87.4	87.2	87.3	80.1	88.9
27-Feb	87.7	87.8	87.7	87.6	87.6	87.6	87.4	87.2	84.8	82.5	78.6	74.4	70.4	73.5	75.3	73.6	77.4	80.5	81.9	82.1	83.3	83.3	83.6	83.1	82.0	87.8
28-Feb	82.7	81.5	82.2	81.7	79.2	79.1	78.7	78.5	78.7	76.0	76.9	71.2	65.0	61.6	59.7	60.0	69.9	79.1	82.1	81.8	80.8	79.8	79.8	79.5	76.1	82.7
																						Diurnal Average				
																						Diurnal Maximum				



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

**Relative Humidity (RH) - %**  
**Surmont 2 - February 2023**







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

**Relative Humidity (RH) - %**  
**Surmont 2 - February 2023**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	2	0.30	0.30
40 - 60	102	15.18	15.48
60 - 80	392	58.33	73.81
80 - 100	176	26.19	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



Maximum Speed: 19 km/h on Feb 6 01:00	Maximum Daily Speed Average: 10.9 km/h on Feb 7	Hours in Service: 672
Minimum Speed Value: 0 km/h on Feb 11 02:00	Minimum Daily Speed Average: 1.0 km/h on Feb 16	Hours of Data: 664
Maximum Diurnal Speed Average: 3.4 km/h at hour 4	Minimum Diurnal Speed Average: 1.4 km/h at hour 18	Hours of Missing Data: 8
Monthly Average Velocity: 2.2 km/h 298.3 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 2 Q <sub>1</sub> = 3 Median = 5 Q <sub>3</sub> = 8 P <sub>90</sub> = 11 P <sub>99</sub> = 15	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-Feb	NNW3	N5	N6	NNW5	NW3	N5	N8	NNW8	NNW10	NNW9	N10	NNW9	NNW10	NNW10	NNW9	NNW8	NW4	W3	W2	WSW2	WSW1	WSW1	WSW3	W2	NNW5.1	N10
2-Feb	WSW2	WSW2	WSW2	WSW2	WSW1	WSW2	SW2	S4	SE5	SE6	SE8	SE9	SE9	SE10	SE12	SE10	ESE11	SE10	SE12	SE10	SE10	SE9	SE8	SE7	SE5.9	SE12
3-Feb	SE7	SSE7	SE5	SE6	S5	S6	SSE7	SE6	SSE1	W11WNW10	WNW9WNW11	WNW9	NW9	NW8	NNE4	NNE5	NNE4	NNE3	NNE4	NNE2	ESE1	ENE3	ENE3	W1.1	W11	
4-Feb	E2	SE2	ESE3	NNW1	NW1	N3	NNE2	E2	ESE1	NE2	N3	NNE3	E2	ENE2	NNE4	NE2	SE4	SE5	SE5	SE6	SE5	ESE4	SE5	E1.9	SE6	
5-Feb	SE2	WNW2	SE1	NNW2	SSW1	SSE1	SE5	SE3	SSE1	W1	SSW1	E1	SSE3	SSE3	SSW3	S1	WSW2	WSW9	W9	W10	W9	W10WNW11	NW13	W2.6	NW13	
6-Feb	WNW19WNW18WNW16	NW13WNW14WNW14WNW12WNW11	WNW9	NW8	NW8	NW6	WNW7	W2	SSE2	SSE4	S5	SE4	SE4	S5	WSW5	WSW6	WSW6	WSW5	WNW6.4	WNW19						
7-Feb	W8	W9	W10	W16	W15	W14WNW15WNW14WNW15WNW16	W14	W13	W18	W16	W13WNW12	W10	W7	W6	W4	WNW5	WNW5	WNW3	W7	W10.9	W18					
8-Feb	W7	W6	W7	W7	WNW3	NNW1	WNW2	W1	W2	WSW2	ESE4	WSW1	WNW3	NNW1	WNW8	W5	W4	WSW2	W8	W8	W6	WSW9	WSW6	W8	W4.1	WSW9
9-Feb	W8	W9	W7	WSW3	W5	W5	W4	WNW9	W9	W8	W8	WSW8	WSW9WSW11	WSW5	SSW4	S5	SSE5	SE5	ESE1	S3	SSE1	SSE2	WNW1	WSW4.3	WSW11	
10-Feb	WSW0	SE2	W1	S1	SW2	WSW1	NW1	N2	ENE2	ESE5	ESE4	ESE6	E4	ENE4	E4	NNE3	N3	NNW3	NW2	NNW2	NNE3	NNE2	ENE1	W0	ENE1.1	ESE6
11-Feb	WSW0	NNW0	NW1	N2	W1	WNW2	W1	WSW1	SW1	W4	W12	W9	W8	W9	W10WSW10	W9	W11	W11WNW13WNW15WNW13WNW11	W12	W6.7	WNW15					
12-Feb	W12	W9	W11	W12	W14	W13	W11	W12	NW6	WNW6	W7	WNW7	W6	W6	WSW6	WSW3	S2	SSE3	SSE4	SE5	SE6	SE7	SE6	ESE4	WSW4.8	W14
13-Feb	SE6	SW6WSW13WSW14	W13	W15	W14WNW10WNW11	W11WNW10	NNW13	NNW14	NNW13	NNW13	NNW14	N14	NNW14	NNW11	NNW10	NNW10	NNW9	NNW8	NNW9	NNW8.5	W15					
14-Feb	N9	NNW7	NNW7	NNW6	NNW6	NNW5	NW4	WNW3	NW4	NW4	NNW3	E1	SE4	E3	NNE6	N4	NNE5	N5	NW4	NNW4	NNW4	NNW5	N4	NNW3.9	N9	
15-Feb	N3	WNW2	W2	WSW2	W1	W2	WSW2	W1	W1	SSE3	SE4	SE5	ESE6	ESE6	SSE5	SE5	SE4	WSW2	WSW2	WSW3	WSW3	WSW3	W3	WSW1	S1.1	ESE6
16-Feb	SSE4	SE6	SE4	SE4	SSE5	SE6	SE7	SSE7	SSE6	SSW5	S6	S5	SSE5	ESE5	SE3WNW11WNW11WNW11WNW13	NW12	NW11	N11	N9	N9	W1.0	WNW13				
17-Feb	N8	NNW7	NNW6	N6	NNW4	NNW4	NNW4	NE2	NNE3	N1	ESE3	NNE1	M	M	NNE4	NNE5	NNE4	NNE4	NNW4	NNW4	NNW4	NNW5	NW4	NNW4	N3.7	N8
18-Feb	NNW5	NNW4	NNW3	N5	N5	N4	N4	N5	NNW5	N5	N5	NNE5	NNW6	N5	N5	NE5	NE4	NW2	W4	WSW3	WSW2	WSW3	WSW3	WSW3	NNW3.2	NNW6
19-Feb	WSW3	WSW3	WSW2	SW2	S2	SE4	ESE5	ESE5	SE6	SE6	SE7	SE8	SE7	ESE5	ESE5	E5	ENE4	NE3	NE3	E3	NW2	WNW2	W2	WNW1	SE2.3	SE8
20-Feb	NW3	NW3	NW4	NW6	NW6	NNW4	NW4	NW3	NNW2	NNE1	NNE3	NNE5	NNE6	N5	NNE7	N6	NNE5	NNW3	WNW2	WNW2	N4	NNE4	NNW3	W3	NNW3.1	NNE7
21-Feb	NW4	NNW6	NNW7	NNW8	NNW6	NNW7	NNW7	NNW7	NNW9	NNW9	NNW10	N11	NNW9	N10	N11	NNW11	N11	NNW7	NNW6	NNW7	NNW6	NW5	NNW4	NNW5	NNW7.4	NNW11
22-Feb	NW5	WNW4	WNW3	W3	WNW3	W4	W4	W3	W4	NNW5	N7	NNW6	NNE6	NE7	NNE5	NNE5	NNE4	WNW3	WSW3	WSW3	WSW2	WSW2	WSW1	WSW1	NNW2.7	NE7
23-Feb	UO	UO	UO	UO	WSW1	WSW1	W1	UO	WSW1	W1	NE3	NE5	NE4	NNE6	NNE5	N5	N4	WNW2	WSW4	WSW2	WSW3	WSW4	WSW3	WSW3	NNW1.2	NNE6
24-Feb	WSW2	WSW2	WSW2	WSW2	WSW2	SW2	SSW1	SSW3	SW5	SW6	SSE8	S10	S9	SSE10	SSE10	SSW9	S8	SSE9	S9	S10	SSW7	SSW7	S5	SSW6	S5.5	S10
25-Feb	SW6	SW4	WSW6	WNW6	W9	W9	WNW9WNW10	WNW8	WNW7	WSW6	WNW9	W9	WNW9	W8	WSW8	W4	W2	WSW1	WSW1	WSW2	WSW3	WSW3	WSW1	SW2	W5.6	WNW10
26-Feb	WSW3	WSW2	W1	SE4	SE4	SE4	SW1	SE3	SE4	SE5	ESE5	ESE6	ESE6	E7	E7	E6	ENE6	E5	E4	E3	E6	E4	ENE3	N1	ESE3.3	E7
27-Feb	NW1	NW2	NW2	NW2	NW3	NW3	NW3	NW3	NW2	N5	N7	NNW7	NNW7	N8	N8	NNW7	NNW7	NNW6	NNW5	NNW5	NNW5	NNW5	NW4	NW3	NNW4.5	N8
28-Feb	WNW2	WNW2	WNW3	WNW4	W2	W1	UO	WNW1	NE1	NNW4	NW5	NE2	NE2	NE3	NNE4	N2	ESE2	WNW0	WSW1	WSW2	WSW2	WSW2	WSW3	WSW3	NNW1.3	NW5

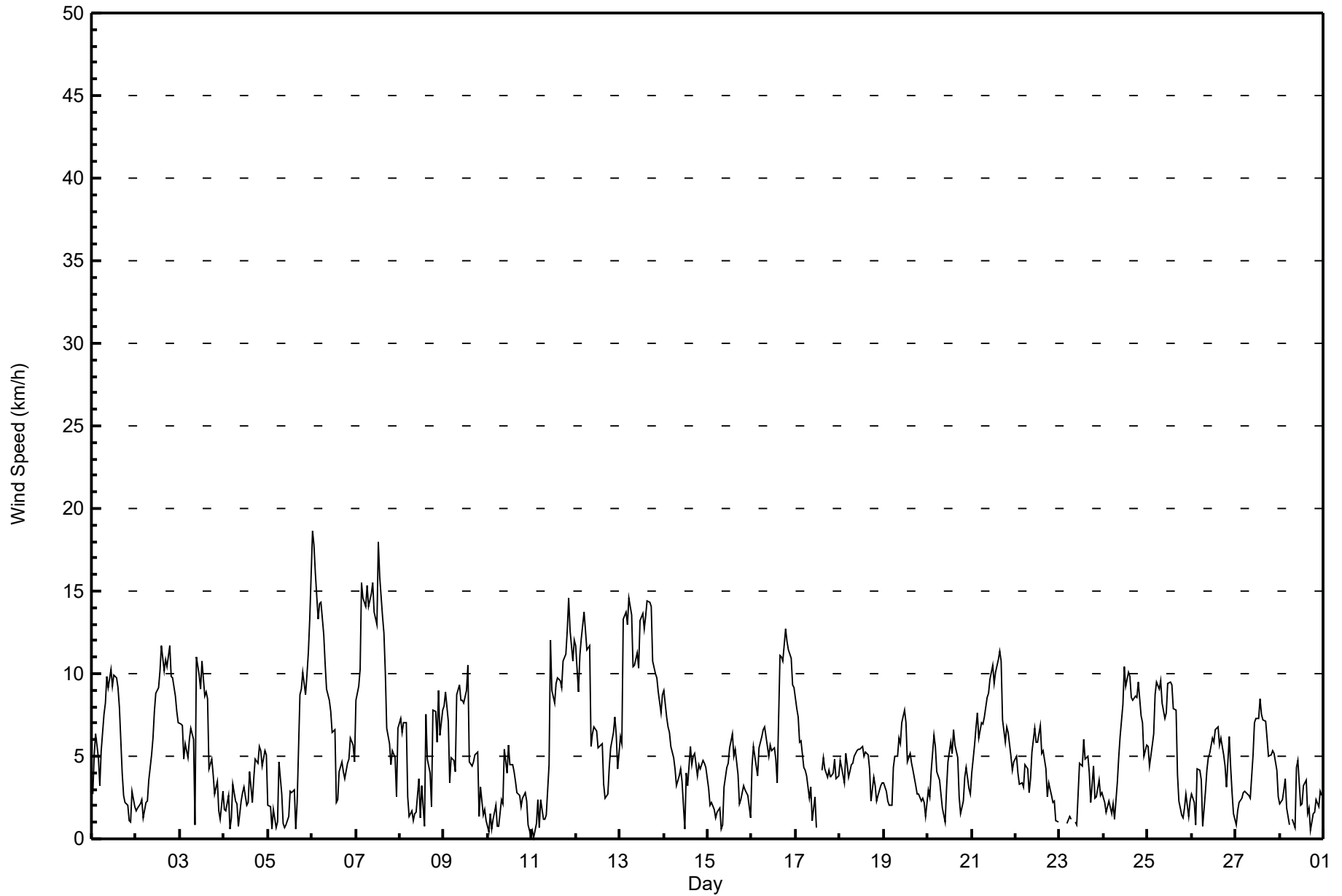
WNW2.7WNW2.9WNW3.4WNW3.4WNW3.3WNW3.0WNW2.9WNW2.4WNW2.3WNW2.8	NW2.3	NW1.8	NW1.9	NNW1.9	NNW1.9	NNW2.4	NNW1.4	NW1.4	W1.8	W1.9	NNW1.9	NNW2.0	NNW1.7	NNW2.2	Diurnal Average			
WNW19WNW18WNW16	W16	W15	W15WNW15WNW14WNW15WNW16	W14	NNW13	W18	W16	NNW13	NNW14	NNW14	NNW14	NNW14	WNW13	WNW13	WNW15	NNW13	Diurnal Maximum	

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 (WS) - km/h**  
**Surmont 2 - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Surmont 2 - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	397	59.79	59.79
6 - 11	220	33.13	92.92
12 - 19	47	7.08	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: 664

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Surmont 2 - February 2023**

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	27	32	13	7	14	18	32	17	12	7	9	73	38	29	32	37	397
6 - 11	16	5	1	1	4	7	27	8	7	4	3	12	44	27	9	45	220
12 - 19	0	0	0	0	0	0	2	0	0	0	0	2	18	15	3	7	47
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>	43	37	14	8	18	25	61	25	19	11	12	87	100	71	44	89	664

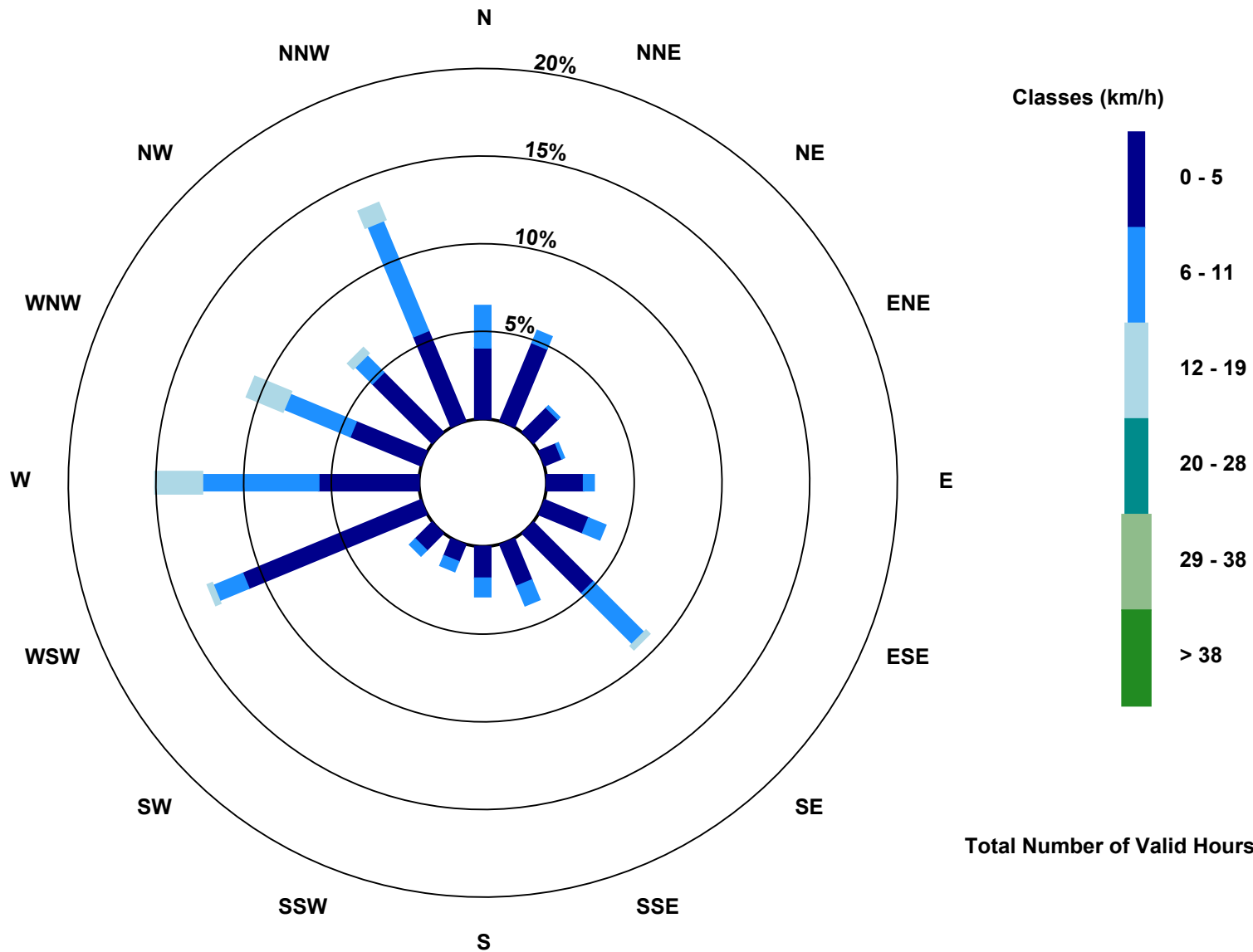
Total Number of Valid Hours: 664

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Surmont 2



Total Number of Valid Hours: 664



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

**Wind Speed (WS) - km/h**  
**Surmont 2 - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Feb 7 13:00 Minimum Value: 1 km/h on Feb 4 03:00 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: 672 Hours of Data: 664 Hours of Missing Data: 8 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-Feb	2	3	2	3	1	3	3	4	4	4	4	4	4	4	3	2	1	1	1	1	2	2	1	4	
2-Feb	1	1	1	2	1	1	1	2	2	2	2	3	3	4	4	3	3	3	4	4	3	3	2	2	
3-Feb	3	3	2	2	2	3	3	2	2	5	3	3	4	3	3	3	2	2	1	1	2	1	1	5	
4-Feb	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	2	2	1	1	2	
5-Feb	2	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	3	3	3	2	3	5	5	5	
6-Feb	6	6	6	5	5	5	4	3	3	3	3	3	2	2	1	2	1	2	2	3	2	2	2	6	
7-Feb	4	4	4	5	5	5	5	6	6	6	5	4	7	5	4	4	4	2	2	1	2	2	2	7	
8-Feb	2	2	1	1	2	1	1	1	1	1	1	2	2	2	3	2	2	1	3	3	2	3	2	3	
9-Feb	3	3	3	1	2	2	3	3	3	3	3	3	4	4	2	2	2	2	2	1	2	1	1	4	
10-Feb	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	
11-Feb	1	1	1	1	1	2	1	1	1	4	4	3	3	3	4	5	3	4	4	4	5	5	4	4	
12-Feb	4	3	4	4	4	4	4	3	2	3	2	2	2	2	2	2	1	1	2	2	2	2	2	4	
13-Feb	2	4	5	5	5	5	5	5	3	4	4	5	6	6	6	6	6	6	5	4	4	4	3	6	
14-Feb	3	3	3	2	2	2	2	1	1	2	1	1	2	2	2	2	2	2	1	2	2	2	1	3	
15-Feb	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	2	
16-Feb	2	2	1	1	2	2	2	2	2	3	3	3	2	2	2	4	4	4	4	5	5	4	3	5	
17-Feb	3	3	3	2	2	2	1	1	1	1	1	1	M	M	2	2	2	2	2	1	2	2	1	3	
18-Feb	2	2	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	1	2	
19-Feb	2	1	1	1	1	2	1	1	2	2	2	2	2	2	2	2	1	1	1	2	1	1	1	2	
20-Feb	1	1	3	3	2	2	1	1	1	1	1	2	2	2	3	2	2	1	1	2	2	2	1	3	
21-Feb	1	2	3	3	2	3	3	3	3	4	4	4	4	4	4	5	4	3	2	2	2	2	1	5	
22-Feb	2	1	1	1	1	2	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	2	
23-Feb	UO	UO	UO	UO	1	1	1	UO	1	1	2	2	2	2	2	2	1	1	1	2	1	1	1	2	
24-Feb	1	1	1	1	1	2	1	2	3	3	4	5	4	4	4	4	4	4	4	4	3	3	2	5	
25-Feb	3	3	3	3	3	3	3	3	3	2	3	3	4	3	3	3	3	1	1	1	1	1	1	4	
26-Feb	1	1	1	2	2	2	1	1	1	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	
27-Feb	1	1	1	1	1	1	1	1	1	2	2	3	3	3	3	3	3	2	2	2	2	2	2	3	
28-Feb	1	1	1	1	2	1	UO	1	1	2	1	2	2	2	2	2	2	1	1	1	2	1	1	2	
																	Diurnal Maximum								
M - Maintenance                      UO - Unstable Operation																									



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

**Wind Direction (WD) - deg**  
**Surmont 2 - February 2023**

Direction of Maximum Speed: 302 deg on Feb 6 01:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 280.2 deg on Feb 7	Hours of Data: 664
Direction of Minimum Speed: 341 deg on Feb 11 02:00	Hours of Missing Data: 8
Direction of Minimum Daily Speed Average: 1.0 deg on Feb 16	Percent Operational Time: 98.8
Monthly Average Direction: 298.3 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-Feb	339	7	359	340	323	359	353	346	346	346	350	348	345	341	343	335	318	276	264	257	249	252	256	260	339.3
2-Feb	257	253	240	246	245	239	225	176	135	124	124	132	135	140	134	126	122	125	137	137	139	139	132	128	138.1
3-Feb	141	160	140	133	178	173	150	131	158	269	283	292	293	302	310	313	16	12	31	28	24	16	108	60	281.1
4-Feb	97	143	120	348	311	6	13	100	106	34	5	21	89	61	18	36	143	132	126	132	125	116	132	142	98.9
5-Feb	144	292	127	337	198	164	146	134	153	271	211	101	164	161	198	173	252	258	270	272	276	280	295	312	266.7
6-Feb	302	299	300	308	301	301	303	294	303	312	314	310	290	266	153	156	174	129	129	188	241	249	242	257	290.9
7-Feb	272	275	272	277	281	279	284	301	289	293	280	272	275	274	278	293	278	260	275	268	293	283	294	261	280.2
8-Feb	278	278	269	271	291	327	298	276	266	239	105	247	303	341	300	280	264	251	268	265	272	258	253	263	271.7
9-Feb	268	263	260	242	259	259	280	292	279	280	268	254	253	254	237	196	169	161	129	123	188	150	162	301	251.5
10-Feb	255	135	275	189	235	242	315	354	76	120	112	112	89	70	95	17	350	336	318	343	17	12	75	265	64.4
11-Feb	251	341	321	6	277	297	270	248	233	270	271	276	271	274	263	258	266	270	281	287	297	300	283	269	277.9
12-Feb	268	276	266	263	267	267	269	270	307	294	275	284	260	260	247	242	173	163	163	138	138	130	126	123	255.1
13-Feb	144	235	257	258	261	261	276	282	282	280	293	348	345	346	339	347	349	346	338	341	346	343	343	345	312.9
14-Feb	350	346	343	341	338	341	323	303	307	313	344	88	138	100	15	10	27	359	326	329	336	343	342	356	346.7
15-Feb	9	287	266	249	272	259	253	273	263	159	133	126	106	106	147	132	129	258	247	248	250	255	259	248	177.3
16-Feb	147	136	133	127	157	143	134	147	162	196	189	175	148	104	134	284	283	294	297	310	323	349	360	353	267.8
17-Feb	349	348	335	352	342	340	330	34	31	359	103	13	M	M	33	13	21	25	348	345	340	346	325	331	355.0
18-Feb	346	347	338	353	350	355	3	0	345	7	351	13	338	358	11	41	39	319	264	251	251	248	248	249	345.2
19-Feb	248	247	242	235	170	124	116	123	135	143	134	136	135	108	114	86	70	48	44	79	323	286	278	289	126.3
20-Feb	305	307	306	325	323	333	314	315	344	13	26	29	18	2	33	3	32	330	293	299	11	12	295	273	346.3
21-Feb	311	331	339	341	347	342	340	339	340	346	340	350	337	349	356	348	350	343	341	333	338	324	295	302	340.1
22-Feb	307	301	298	280	294	278	276	270	276	331	349	339	20	34	23	16	25	301	255	257	254	251	250	258	320.5
23-Feb	UO	UO	UO	UO	257	256	259	UO	253	262	39	39	38	27	27	3	10	289	255	243	245	246	246	246	331.5
24-Feb	244	257	249	251	249	216	198	196	220	226	164	179	186	159	165	192	173	166	182	191	197	201	173	201	188.0
25-Feb	230	232	258	299	277	276	286	300	303	289	292	285	270	288	266	257	266	260	258	251	242	242	258	233	275.5
26-Feb	254	243	264	135	140	130	228	142	138	125	115	122	115	95	86	83	70	86	92	85	93	98	70	353	106.3
27-Feb	316	318	310	320	312	311	314	305	307	351	356	347	347	355	352	341	344	339	328	330	336	330	321	306	336.4
28-Feb	288	294	300	287	260	272	UO	283	35	335	323	42	42	36	14	356	113	287	253	250	246	246	246	246	306.6
	288.3	287.8	286.4	293.1	282.9	285.6	291.1	294.7	297.6	297.8	307.3	319.6	307.7	339.2	341.8	329.9	347.6	306.4	279.5	280.4	297.1	294.1	282.9	286.1	

Diurnal Average

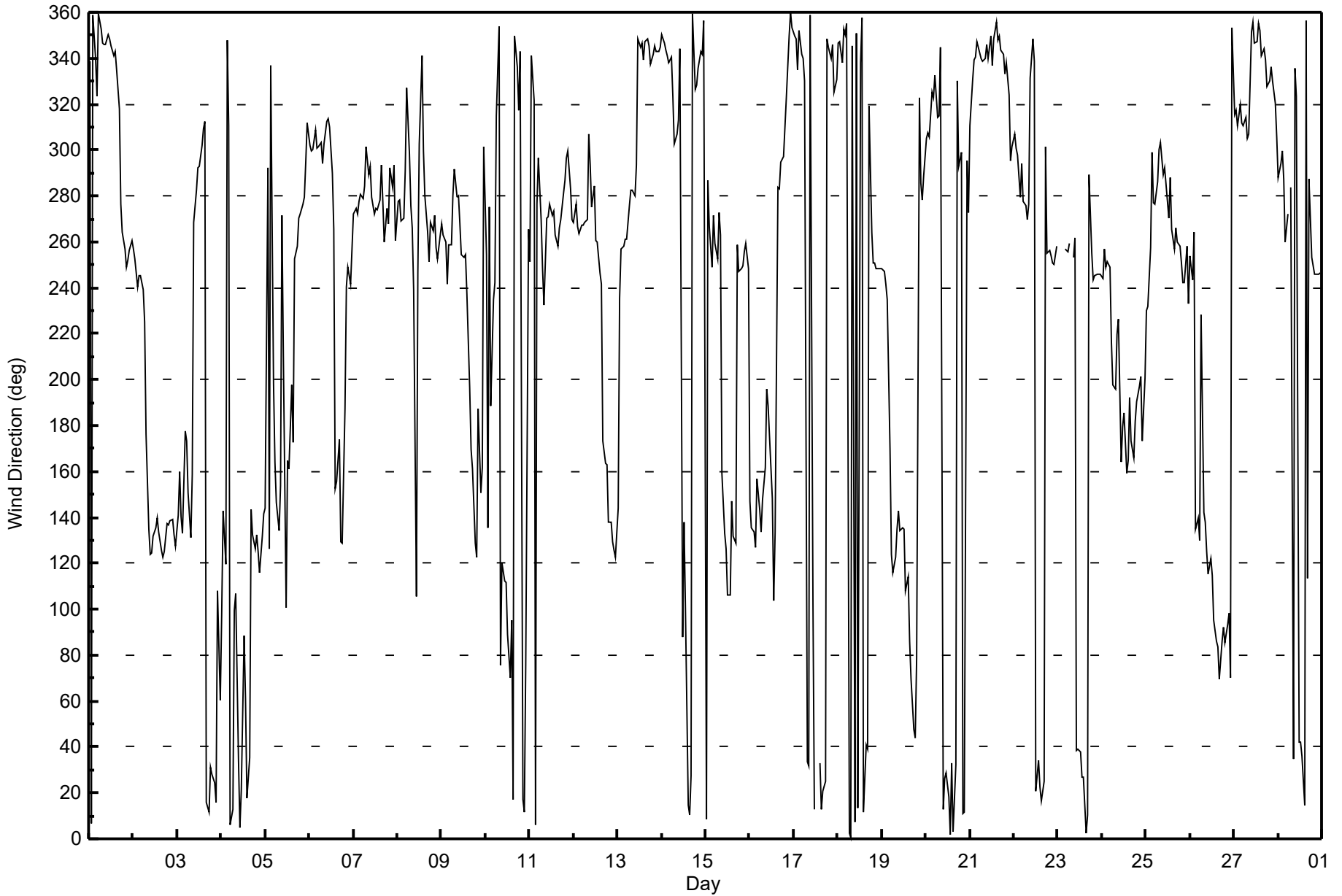
M - Maintenance      UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods





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

**Wind Direction (WD) - deg**  
**Surmont 2 - February 2023**





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

**Wind Direction (WD) - deg**  
**Surmont 2 - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 110 deg on Feb 14 12:00 Minimum Value: 9 deg on Feb 28 21:00 Percentiles: P <sub>1</sub> = 11 P <sub>10</sub> = 23 Q <sub>1</sub> = 29 Median = 35 Q <sub>3</sub> = 47 P <sub>90</sub> = 66 P <sub>99</sub> = 98																			Hours in Service: 672 Hours of Data: 664 Hours of Missing Data: 8 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-Feb	42	37	32	38	31	45	34	37	33	36	35	36	34	37	36	38	35	19	14	45	45	45	16	49	49
2-Feb	66	15	41	38	17	36	50	61	47	40	31	36	37	39	36	28	25	31	36	44	41	45	41	31	66
3-Feb	49	55	50	48	52	57	49	35	105	28	26	27	29	35	34	34	55	37	47	76	39	81	85	34	105
4-Feb	73	89	45	78	51	33	49	52	92	67	32	42	77	77	45	72	43	36	40	41	41	42	24	30	92
5-Feb	69	32	95	32	73	97	29	73	87	66	74	80	57	54	45	96	28	20	23	25	22	22	31	34	97
6-Feb	32	29	31	35	31	30	30	29	30	38	40	46	36	81	80	54	57	49	58	70	44	32	34	34	81
7-Feb	40	29	32	28	28	27	29	32	29	30	28	26	28	28	26	30	25	20	25	23	28	46	51	17	51
8-Feb	23	21	19	19	45	22	31	42	42	42	35	84	56	105	33	29	19	34	27	22	25	18	25	24	105
9-Feb	26	21	26	37	39	49	65	31	28	28	27	27	32	31	57	52	59	59	48	100	60	86	83	53	100
10-Feb	100	74	78	70	28	48	52	41	79	31	57	27	41	42	38	45	33	22	24	36	53	35	98	62	100
11-Feb	67	94	35	42	83	59	69	46	33	51	24	29	31	34	34	34	27	27	28	28	30	32	29	25	94
12-Feb	25	27	24	23	24	24	25	25	39	39	22	33	33	34	44	47	69	74	60	50	49	45	41	71	74
13-Feb	55	74	33	30	28	29	30	28	26	26	33	38	34	38	38	33	33	34	36	32	35	35	37	29	74
14-Feb	31	31	38	31	34	29	32	30	29	33	45	110	46	64	31	44	35	29	35	37	38	34	32	30	110
15-Feb	50	28	18	26	21	41	23	35	61	51	39	44	35	39	44	30	32	15	18	19	15	19	21	48	61
16-Feb	49	46	53	60	49	46	38	44	34	51	65	64	40	50	81	33	29	27	30	34	37	36	32	34	81
17-Feb	35	31	37	36	35	31	29	59	38	89	72	96	M	M	54	41	45	47	40	40	27	26	24	28	96
18-Feb	27	30	29	28	38	39	39	33	30	32	31	43	37	58	47	47	56	40	14	14	12	11	12	11	58
19-Feb	11	18	28	35	75	42	33	33	35	39	34	34	39	61	33	46	43	45	61	67	31	18	9	29	75
20-Feb	24	29	33	38	36	32	32	25	53	89	60	38	44	40	39	34	45	38	25	29	61	41	32	15	89
21-Feb	30	33	32	32	36	35	34	41	38	39	41	34	39	37	31	34	33	31	34	33	30	35	25	28	41
22-Feb	30	27	23	24	20	26	24	20	26	37	39	44	47	36	47	44	39	37	24	24	15	18	35	40	47
23-Feb	UO	UO	UO	UO	39	12	24	UO	32	35	84	51	73	39	58	36	44	39	14	15	12	12	11	13	84
24-Feb	11	33	24	16	27	88	106	61	71	64	55	57	55	52	53	54	59	52	53	55	61	50	59	55	106
25-Feb	63	61	64	54	26	27	29	30	31	31	40	31	30	31	29	32	21	30	21	18	30	36	32	29	64
26-Feb	19	40	90	54	53	61	83	66	44	36	37	28	31	30	32	39	35	37	31	63	31	43	63	55	90
27-Feb	26	23	21	28	24	30	30	25	32	28	31	38	38	28	29	34	34	34	36	30	31	33	32	39	39
28-Feb	31	18	27	28	52	38	UO	78	88	38	34	82	87	79	60	88	82	81	34	32	9	34	11	10	88
																			Diurnal Maximum						
																			100 94 95 78 83 97 106 78 105 89 84 110 87 105 81 96 82 81 61 100 61 86 98 71						
M - Maintenance																			UO - Unstable Operation						



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

### **AMS30 ELLS RIVER FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)  
 FEBRUARY 2023

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	639	31	33	99.7	14.8	0	2.9	0
TRS (ppb) Average	633	33	39	99.11	2.2	0	1	0
THC (ppm) Average	544	33	128	85.86	5.7	-	3.2	-
NMHC (ppm) Average	544	33	128	85.86	0.833	-	0.291	-
CH4 (ppm) Average	544	33	128	85.86	5.2	-	2.9	-
NO2 (ppb) Average	632	33	40	98.96	41	0	23.6	-
NO (ppb) Average	632	33	40	98.96	128.3	-	39.3	-
NOX (ppb) Average	632	33	40	98.96	169.3	-	62.9	-
PM2.5 (ug/m3) Average	670	0	2	99.7	14.5	0	9.5	0
Temperature 2 m (C) Average	672	0	0	100	3.6	-	-2.1	-
Relative Humidity (%) Average	672	0	0	100	93.8	-	89.6	-
Wind Speed 10 m (km/h) Average	662	0	10	98.51	41	-	19	-
Wind Direction 10 m (deg) Average	662	0	10	98.51	-	-	-	-
Global Solar Radiation (W/m2) Average	672	0	0	100	515.5	-	128.1	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)  
FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	639	0.66	1.6	-	0	0	0	0.2	0.5	1.3	14.8
TRS (ppb) Average	633	0.61	0.3	-	0.4	0.4	0.5	0.5	0.6	0.9	2.2
THC (ppm) Average	544	2.25	0.5	-	2	2	2	2.1	2.2	2.5	5.7
NMHC(ppm) Average	544	0.029	0.088	-	0	0	0	0	0	0.1	0.833
CH4(ppm) Average	544	2.22	0.4	-	2	2	2	2.1	2.2	2.4	5.2
NO2 (ppb) Average	632	12.58	9.5	-	0.2	1.2	4.2	11.2	19	26.7	41
NO (ppb) Average	632	5.89	13.6	-	0	0	0.1	0.5	5.2	15.4	128.3
NOX (ppb) Average	632	18.47	20.7	-	0.3	1.3	5.2	13.2	23.5	39.2	169.3
PM2.5 (ug/m3) Average	670	4.24	2.7	-	0.3	1.5	2.4	3.6	5.3	7.6	14.5
Temperature 2 m (C) Average	672	-16.8	9.5	-	-38.8	-31	-23.2	-16.3	-9.6	-5.5	3.6
Relative Humidity (%) Average	672	71.8	10.9	-	40.9	57	65.9	71.8	79.8	85.6	93.8
Wind Speed 10 m (km/h) Average	662	7.9	6	-	0	2	3	7	11	16	41
Wind Direction 10 m (deg) Average	662	291.8	-	-	-	-	-	-	-	-	-
Global Solar Radiation (W/m2) Average	672	64.14	112.1	-	0	0	0	0.2	92.6	241.4	515.5

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)  
FEBRUARY 2023

OPERATIONAL NOTES

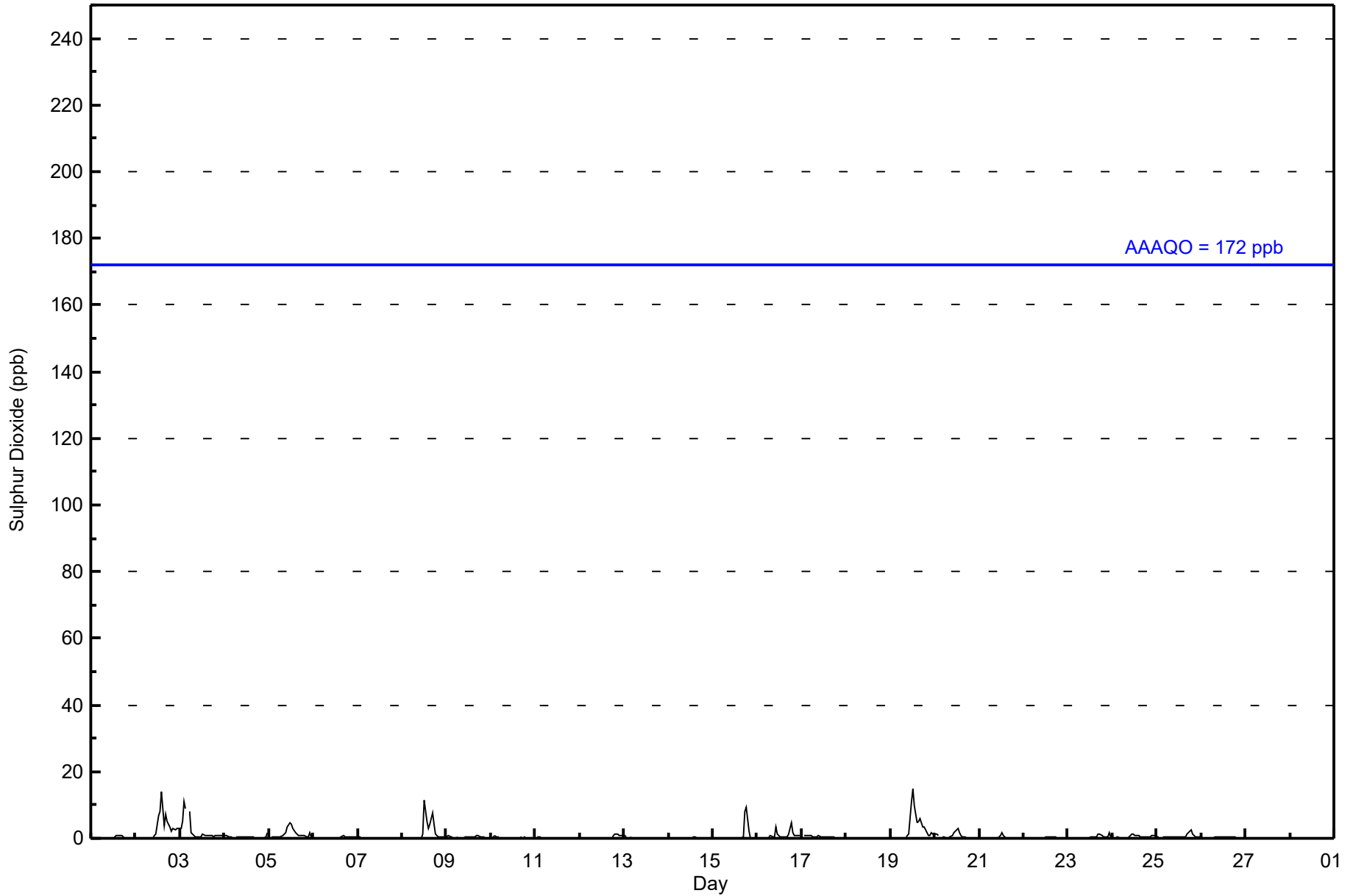
Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2,TRS, NO2, PM2.5	10 Feb 2023 16:00	10 Feb 2023 16:00	1	Station power failure
THC/NMHC/CH4	10 Feb 2023 16:00	10 Feb 2023 17:00	2	Station power failure
TRS, THC/NMHC/CH4, NO2	15 Feb 2023 11:00	15 Feb 2023 12:00	2	Maintenance - sample manifold cleaned
SO2,TRS,THC,NO2,PM2.5	14 Feb 2023 11:00	14 Feb 2023 14:00	4	Maintenance - WBEA internal audit
THC/NMHC/CH4	08 Feb 2023 05:00	09 Feb 2023 04:00	24	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	09 Feb 2023 06:00	10 Feb 2023 05:00	24	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	10 Feb 2023 07:00	10 Feb 2023 10:00	4	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	10 Feb 2023 22:00	11 Feb 2023 00:00	3	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	11 Feb 2023 02:00	11 Feb 2023 10:00	9	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	11 Feb 2023 11:00	12 Feb 2023 12:00	26	Maintenance - replaced analyzer
Wind Speed, Wind Direction	15 Feb 2023 12:00	15 Feb 2023 13:00	2	Maintenance - tower brought down
Wind Speed, Wind Direction	19 Feb 2023 05:00	19 Feb 2023 06:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	23 Feb 2023 07:00	23 Feb 2023 08:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	23 Feb 2023 20:00	23 Feb 2023 21:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	26 Feb 2023 00:00	26 Feb 2023 01:00	2	Flat line in sensor output signal - Sensor frozen





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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Ells River - February 2023**







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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Ells River - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	634	99.22	99.22
11 - 20	5	0.78	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: 639

Total Number of Hours: 672



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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Ells River - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	42	126	41	26	12	7	13	30	68	75	22	40	41	35	31	17	626
11 - 20	0	1	1	0	0	0	0	0	3	0	0	0	0	0	0	0	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>	42	127	42	26	12	7	13	30	71	75	22	40	41	35	31	17	631

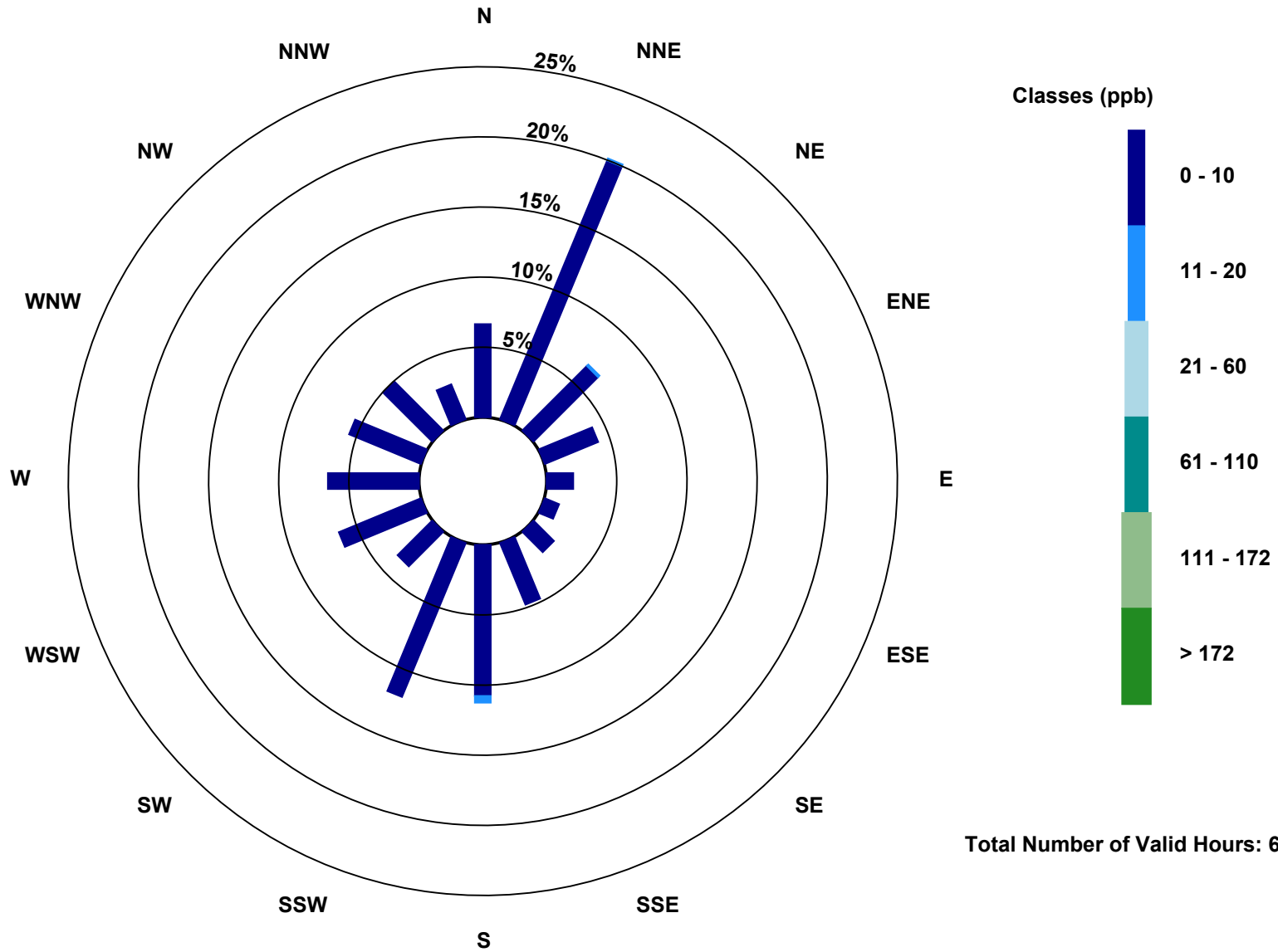
Total Number of Valid Hours: 631

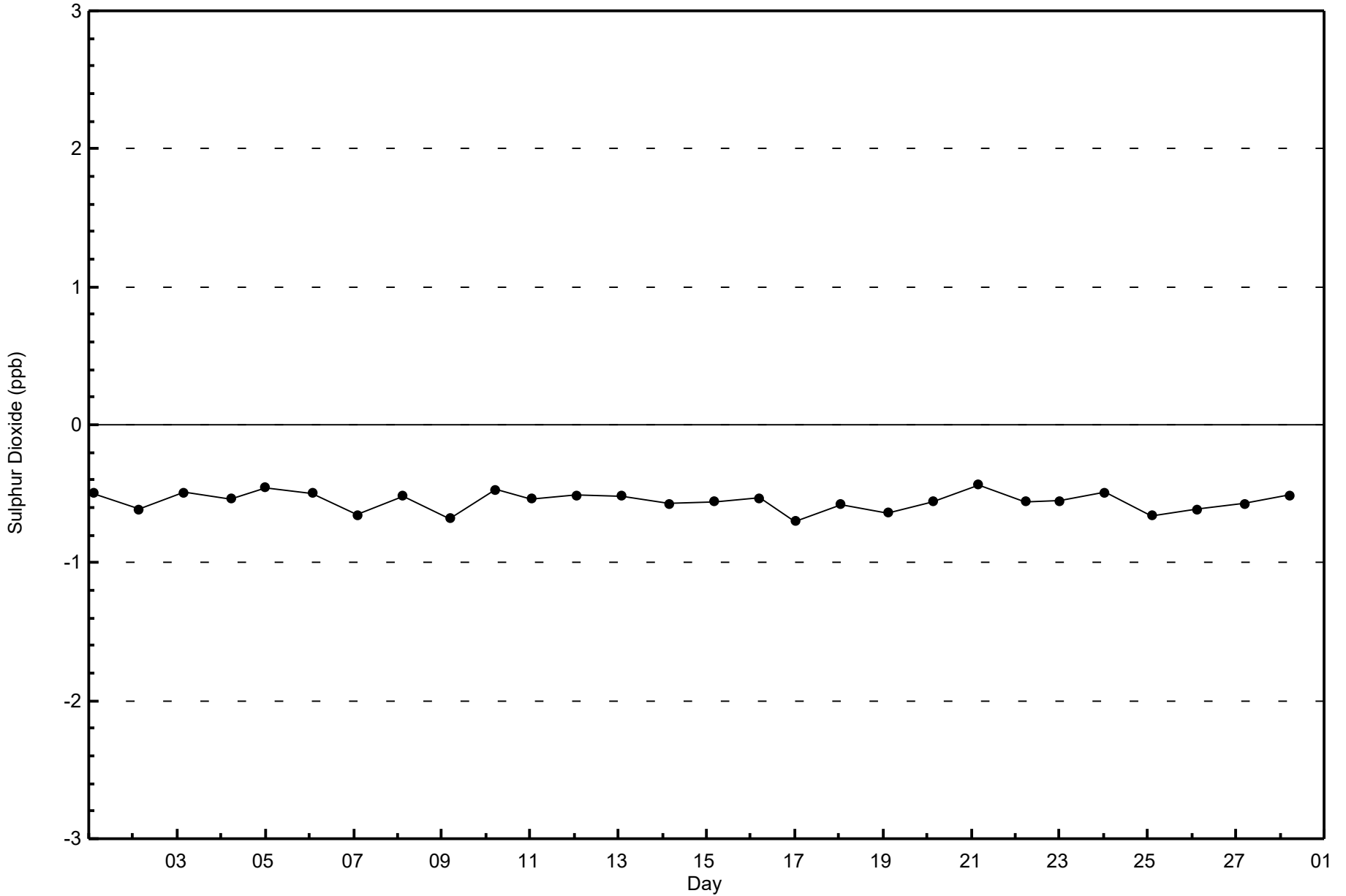
Total Number of Hours: 672

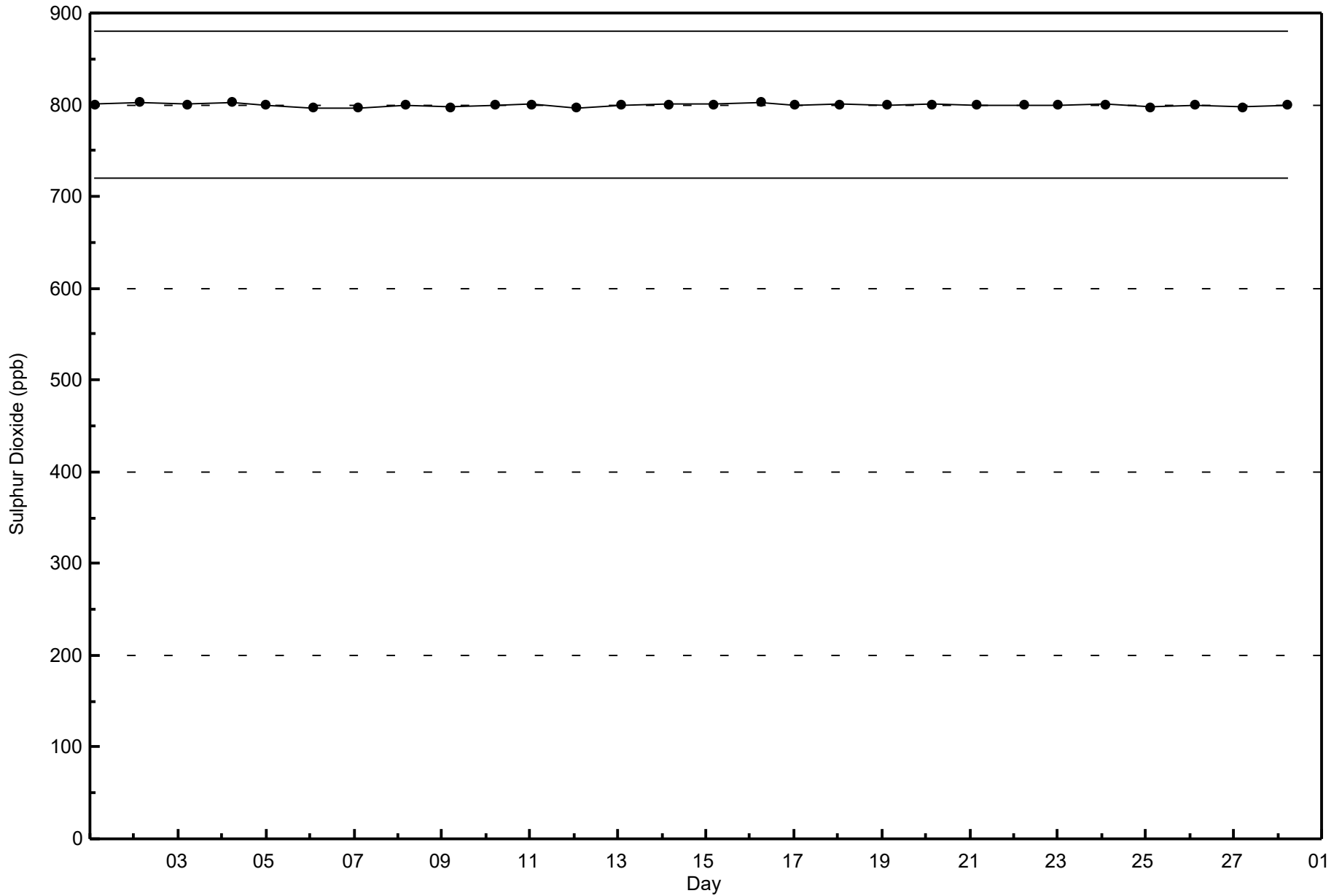


**Wood Buffalo Environmental Association**  
**Wind Rose Feb 2023**

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

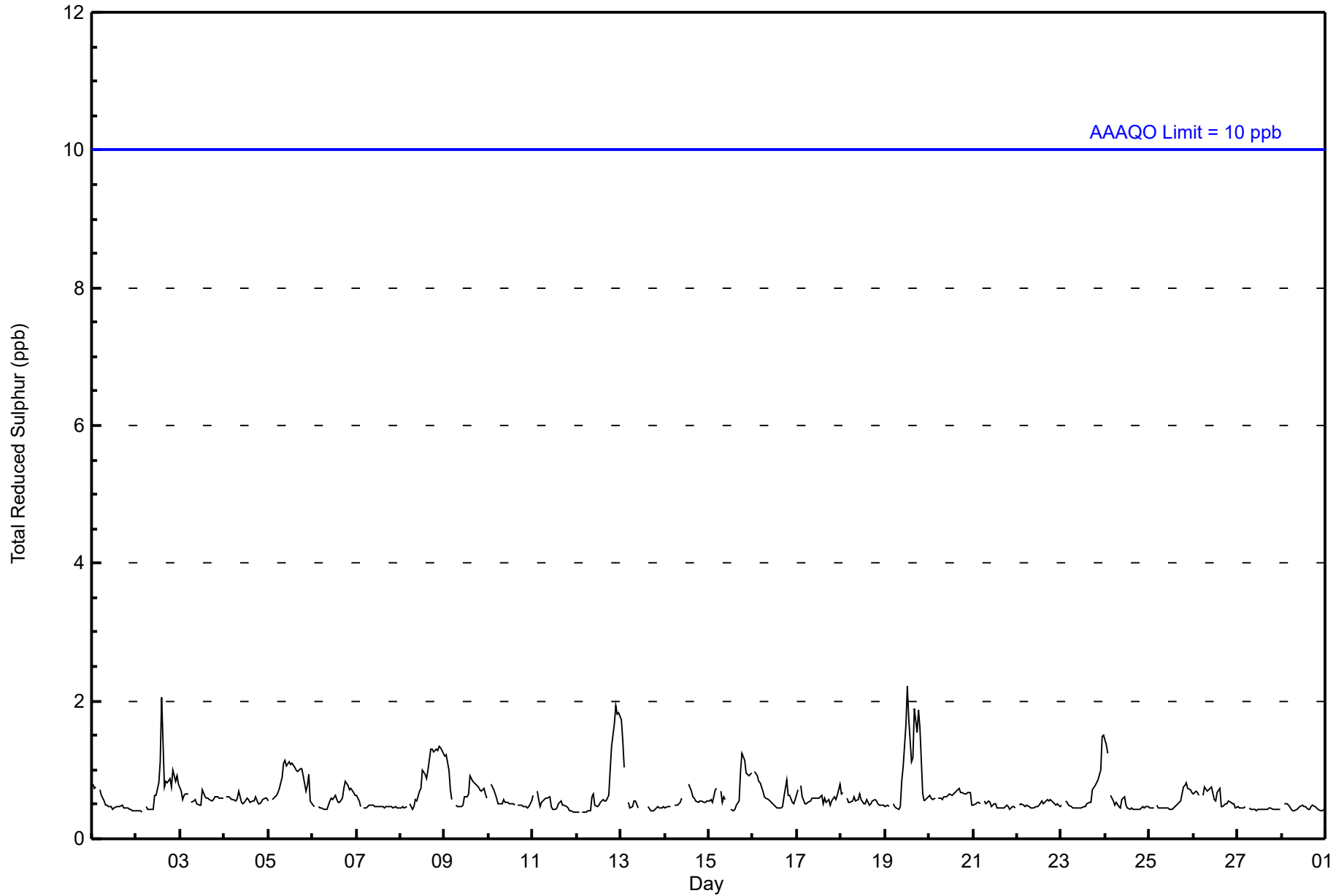








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 672														Daily Average		Daily Maximum					
Maximum Value: 2.2 ppb on Feb 19 13:00		Maximum Daily Average: 1.0 ppb on Feb 19		Hours of Data: 633																							
Minimum Value: 0.4 ppb on Feb 12 00:00		Minimum Daily Average: 0.4 ppb on Feb 27		Hours of Missing Data: 39																							
Maximum Diurnal Average: 0.7 ppb at hour 19		Minimum Diurnal Average: 0.5 ppb at hour 6		Hours of Calibration: 33																							
Monthly Average: 0.61 ppb		Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 0.4 Q <sub>1</sub> = 0.5 Median = 0.5 Q <sub>3</sub> = 0.6 P <sub>90</sub> = 0.9 P <sub>99</sub> = 1.8		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-Feb	0.8	0.7	0.8	Z	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.8	
2-Feb	0.4	0.4	0.4	0.4	Z	0.5	0.4	0.4	0.4	0.4	0.6	0.6	0.8	1.1	2.1	0.7	0.8	0.8	0.9	0.8	1.0	0.8	0.9	0.8	0.7	2.1	
3-Feb	0.7	0.6	0.6	0.6	0.6	Z	0.5	0.6	0.6	0.5	0.5	0.5	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	
4-Feb	Z	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.7	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	
5-Feb	0.5	Z	0.6	0.6	0.6	0.7	0.7	0.9	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	0.9	0.7	0.8	0.9	0.6	0.9	1.1	
6-Feb	0.5	0.5	Z	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.7	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.8	
7-Feb	0.6	0.6	0.5	Z	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	
8-Feb	0.4	0.5	0.4	0.5	Z	0.5	0.4	0.5	0.6	0.6	0.7	0.7	1.0	0.9	0.9	1.0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	0.9	1.3	
9-Feb	1.2	1.2	1.0	0.7	0.6	Z	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.7	1.2	
10-Feb	Z	0.8	0.8	0.7	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	PF	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.6	0.5	0.8	
11-Feb	0.6	Z	0.7	0.6	0.5	0.5	0.6	0.6	0.6	0.6	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	0.5	0.7	
12-Feb	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	1.0	1.3	1.7	1.9	1.8	1.8	0.8	1.9	
13-Feb	1.7	1.4	1.0	Z	0.5	0.5	0.5	0.6	0.5	0.5	C	C	C	C	C	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	1.7	
14-Feb	0.5	0.5	0.5	0.5	Z	0.5	0.5	0.5	0.5	0.6	M	M	M	0.8	0.7	0.6	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.6	0.5	0.8	
15-Feb	0.5	0.6	0.5	0.7	0.7	Z	0.7	0.5	0.6	0.6	M	M	0.4	0.4	0.4	0.5	0.6	1.0	1.2	1.1	1.0	0.9	0.9	1.0	0.7	1.2	
16-Feb	Z	1.0	0.9	0.8	0.8	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.6	0.8	0.6	0.6	0.5	0.5	0.6	0.6	1.0	
17-Feb	0.7	Z	0.8	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.6	0.5	0.5	0.6	0.6	0.6	0.8	0.6	0.8	
18-Feb	0.7	0.7	Z	0.6	0.5	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.7	
19-Feb	0.5	0.5	0.5	Z	0.5	0.5	0.5	0.4	0.5	0.8	1.0	1.7	2.2	1.7	1.1	1.2	1.9	1.5	1.9	1.6	0.6	0.6	0.6	0.6	1.0	2.2	
20-Feb	0.6	0.6	0.6	0.6	Z	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.5	0.6	0.7	
21-Feb	0.5	0.5	0.5	0.5	0.5	Z	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.6	
22-Feb	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	
23-Feb	0.5	Z	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.7	0.8	0.8	0.8	1.0	1.5	1.5	0.6	1.5		
24-Feb	1.4	1.2	Z	0.6	0.6	0.5	0.5	0.4	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	1.4	
25-Feb	0.5	0.5	0.4	Z	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.8		
26-Feb	0.6	0.7	0.7	0.6	Z	0.6	0.7	0.7	0.7	0.7	0.8	0.6	0.5	0.7	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.8	
27-Feb	0.5	0.4	0.5	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	0.4	0.5	
28-Feb	Z	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	
																								Diurnal Average		Diurnal Maximum	
																								0.7		1.8	
																								1.7		1.8	
Z - zerospan      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**

**Total Reduced Sulphur (TRS) - ppb**  
**Ells River - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	633	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: 633

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb  
Ells River - February 2023**

<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	127	41	25	11	7	12	30	69	76	22	36	44	37	31	17	624
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	127	41	25	11	7	12	30	69	76	22	36	44	37	31	17	624

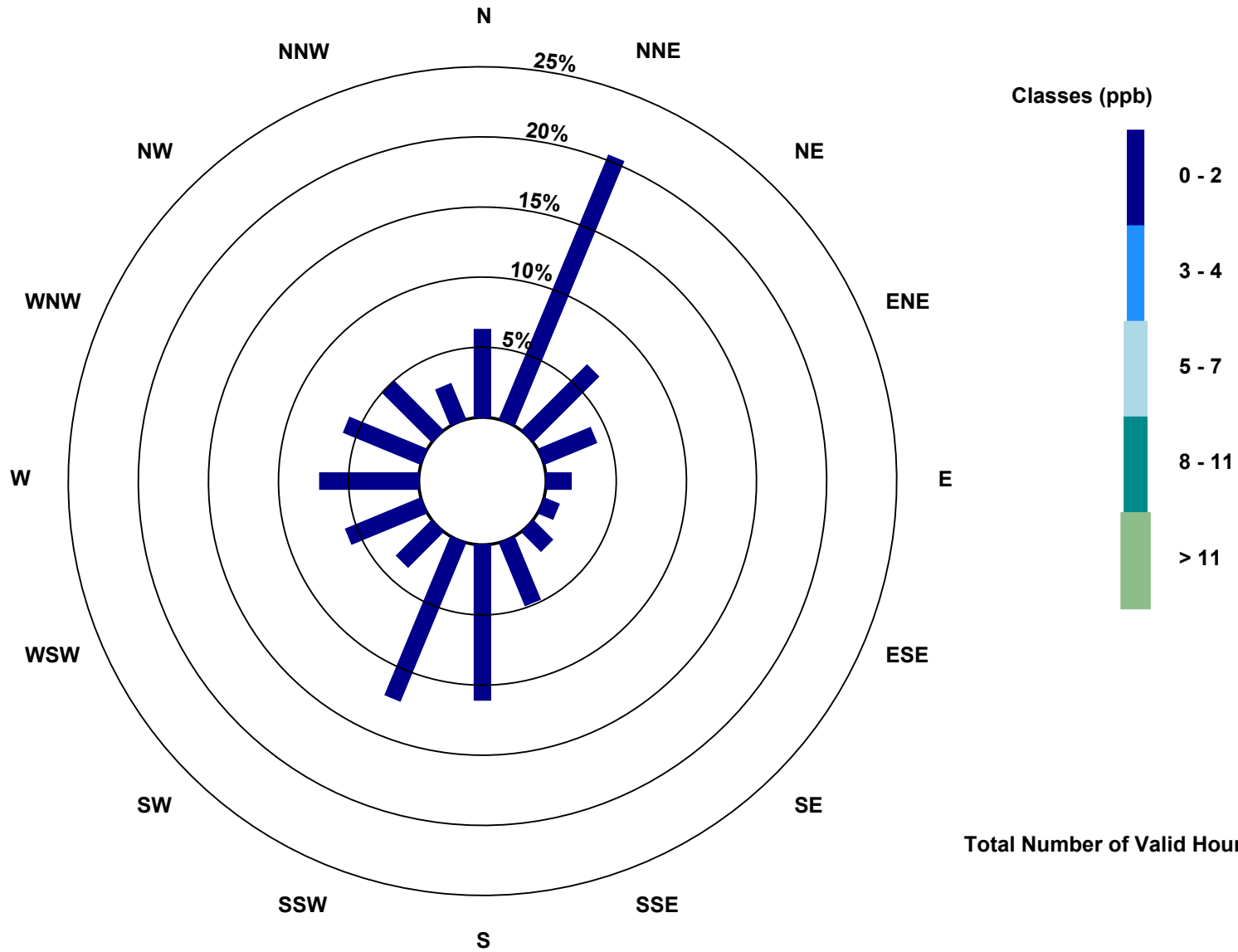
Total Number of Valid Hours: 624

Total Number of Hours: 672

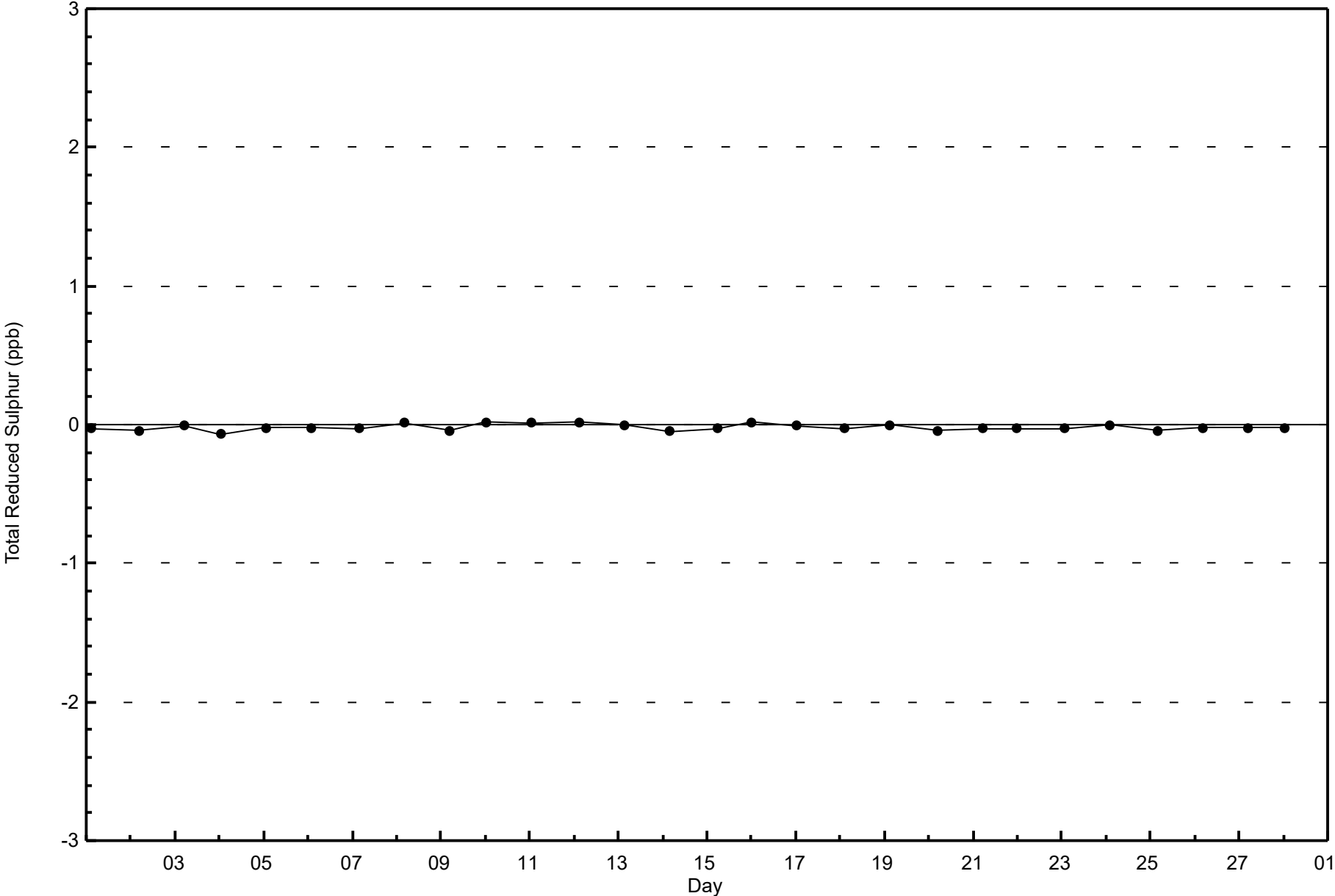


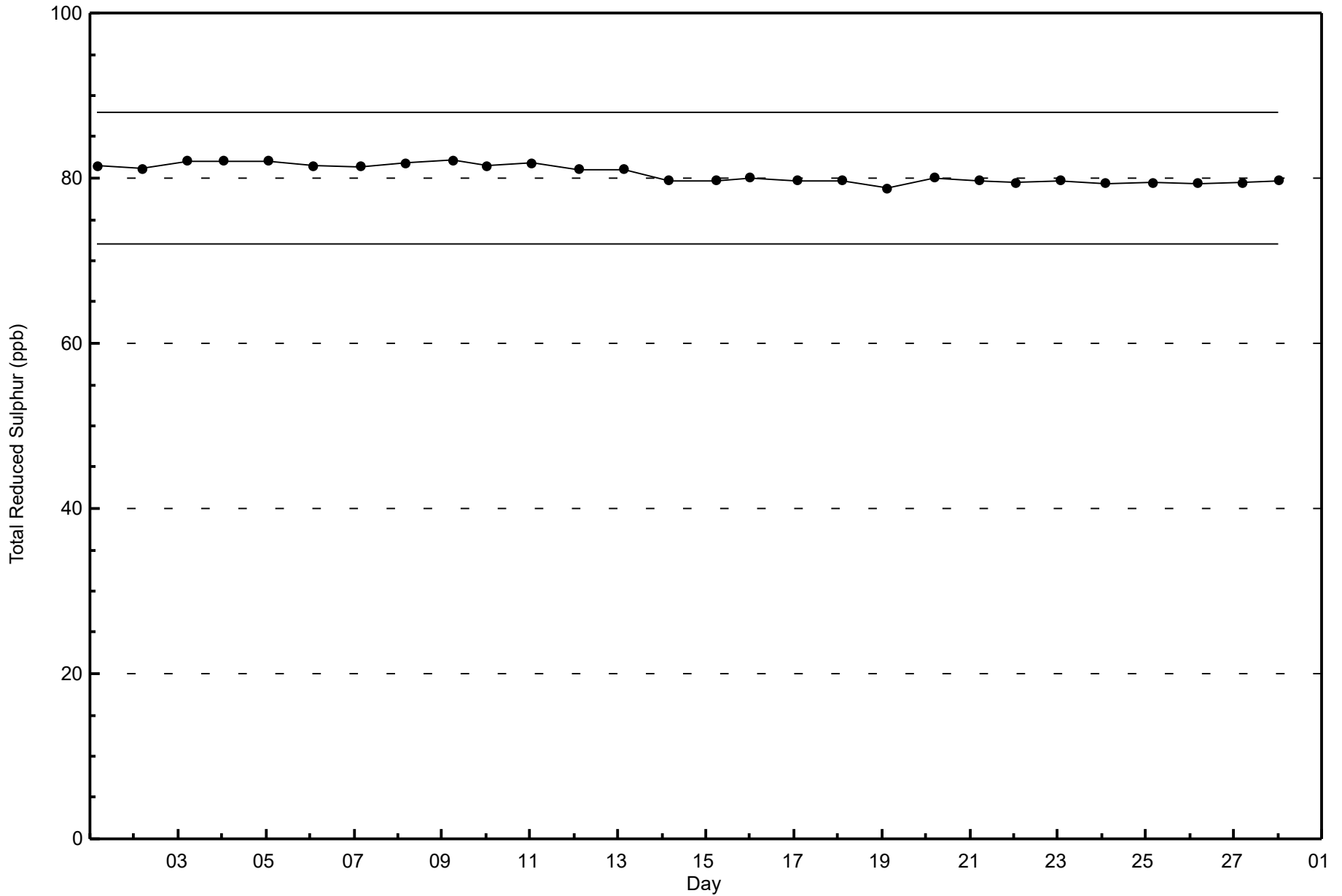
**Wood Buffalo Environmental Association**  
**Wind Rose Feb 2023**

**Total Reduced Sulphur (TRS) - ppb**  
**Ells River**



**Total Number of Valid Hours: 624**





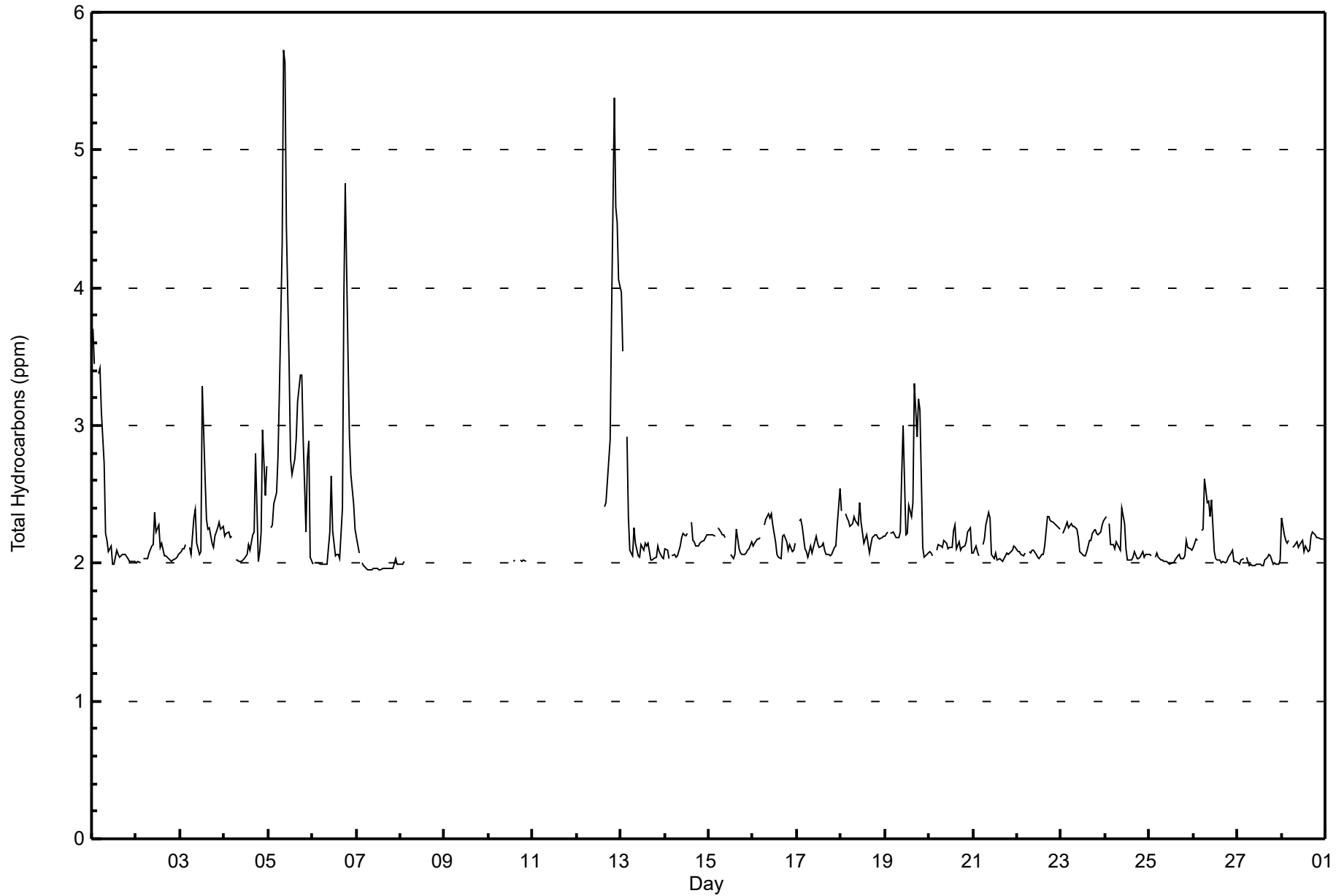


Maximum Value: 5.7 ppm on Feb 5 09:00		Maximum Daily Average: 3.2 ppm on Feb 5		Hours in Service: 672																						
Minimum Value: 2.0 ppm on Feb 7 07:00		Minimum Daily Average: 2.0 ppm on Feb 7		Hours of Data: 544																						
Maximum Diurnal Average: 2.3 ppm at hour 10		Minimum Diurnal Average: 2.1 ppm at hour 15		Hours of Missing Data: 128																						
Monthly Average: 2.25 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> = 2.5 P <sub>99</sub> = 4.5		Hours of Calibration: 33																						
				Percent Operational Time: 85.9																						
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-Feb	3.7	3.4	Z	3.4	3.4	3.1	2.7	2.2	2.2	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.4	3.7
2-Feb	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.4	2.2	2.3	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.4
3-Feb	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.3	2.4	2.1	2.1	3.3	2.6	2.3	2.2	2.3	2.1	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.3	3.3
4-Feb	2.2	2.2	2.2	2.2	2.2	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.8	2.0	2.1	2.2	3.0	2.5	2.7	2.2	3.0	3.0
5-Feb	Z	2.3	2.3	2.4	2.5	2.8	3.2	4.3	5.7	5.6	4.5	3.4	2.8	2.6	2.8	2.9	3.2	3.4	3.4	2.9	2.2	2.8	2.9	2.0	3.2	5.7
6-Feb	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.6	2.2	2.1	2.1	2.1	2.0	2.4	3.9	4.8	3.5	2.9	2.6	2.4	2.2	2.4	4.8
7-Feb	2.2	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	2.0	2.2
8-Feb	2.0	2.0	2.0	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2.0
9-Feb	UO	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
10-Feb	UO	UO	UO	UO	UO	Z	UO	UO	UO	UO	C	C	C	2.0	2.0	PF	PF	2.0	2.0	2.0	2.0	UO	UO	UO	2.0	
11-Feb	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--
12-Feb	M	M	M	M	M	M	M	M	M	M	M	M	C	C	C	2.4	2.4	2.7	2.9	3.8	5.4	4.6	4.5	4.1	--	5.4
13-Feb	4.0	3.5	Z	2.9	2.3	2.1	2.1	2.3	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.3	4.0
14-Feb	2.1	2.1	2.0	Z	2.1	2.1	2.0	2.1	2.1	2.2	2.2	2.2	2.2	M	2.3	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3
15-Feb	2.2	2.2	2.2	2.2	Z	2.3	2.2	2.2	2.2	2.2	M	M	2.1	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
16-Feb	2.1	2.1	2.2	2.2	2.2	Z	2.3	2.3	2.4	2.3	2.4	2.3	2.2	2.1	2.0	2.0	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.4
17-Feb	Z	2.3	2.3	2.3	2.1	2.1	2.0	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	2.3	2.5	2.2	2.5
18-Feb	2.4	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4
19-Feb	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.6	3.0	2.2	2.2	2.4	2.3	2.4	3.3	2.9	3.2	3.1	2.1	2.0	2.1	2.1	2.4	3.3
20-Feb	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	2.2	2.3	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.3	2.1	2.1	2.3
21-Feb	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.3	2.4	2.3	2.1	2.0	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	2.4
22-Feb	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3
23-Feb	Z	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	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	2.3	2.3	2.2	2.3
24-Feb	2.3	Z	2.3	2.1	2.1	2.1	2.2	2.1	2.1	2.4	2.3	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.4
25-Feb	2.1	2.1	Z	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.2	2.1	2.1	2.1	2.0	2.2
26-Feb	2.1	2.2	2.2	Z	2.2	2.2	2.6	2.4	2.5	2.3	2.5	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.2	2.6
27-Feb	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	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1
28-Feb	2.3	2.2	2.2	2.1	2.2	Z	2.1	2.1	2.2	2.1	2.1	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	2.2	2.3
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan			C - Calibration				M - Maintenance				UO - Unstable Operation				PF - Power Failure											



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

**Total Hydrocarbons (THC) - ppm**  
**Ells River - February 2023**





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

**Total Hydrocarbons (THC) - ppm**  
**Ells River - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	142	26.10	26.10
2.1 - 3.0	374	68.75	94.85
3.1 - 10.0	28	5.15	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 544

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Ells River - February 2023**

<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	2	53	11	2	0	1	1	6	12	13	6	17	10	2	5	1	142
2.1 - 3.0	33	57	28	23	11	3	11	14	42	42	11	15	20	27	16	12	365
3.1 - 10.0	4	0	0	0	0	0	0	1	4	1	0	3	2	2	8	3	28
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	39	110	39	25	11	4	12	21	58	56	17	35	32	31	29	16	535

Total Number of Valid Hours: 535

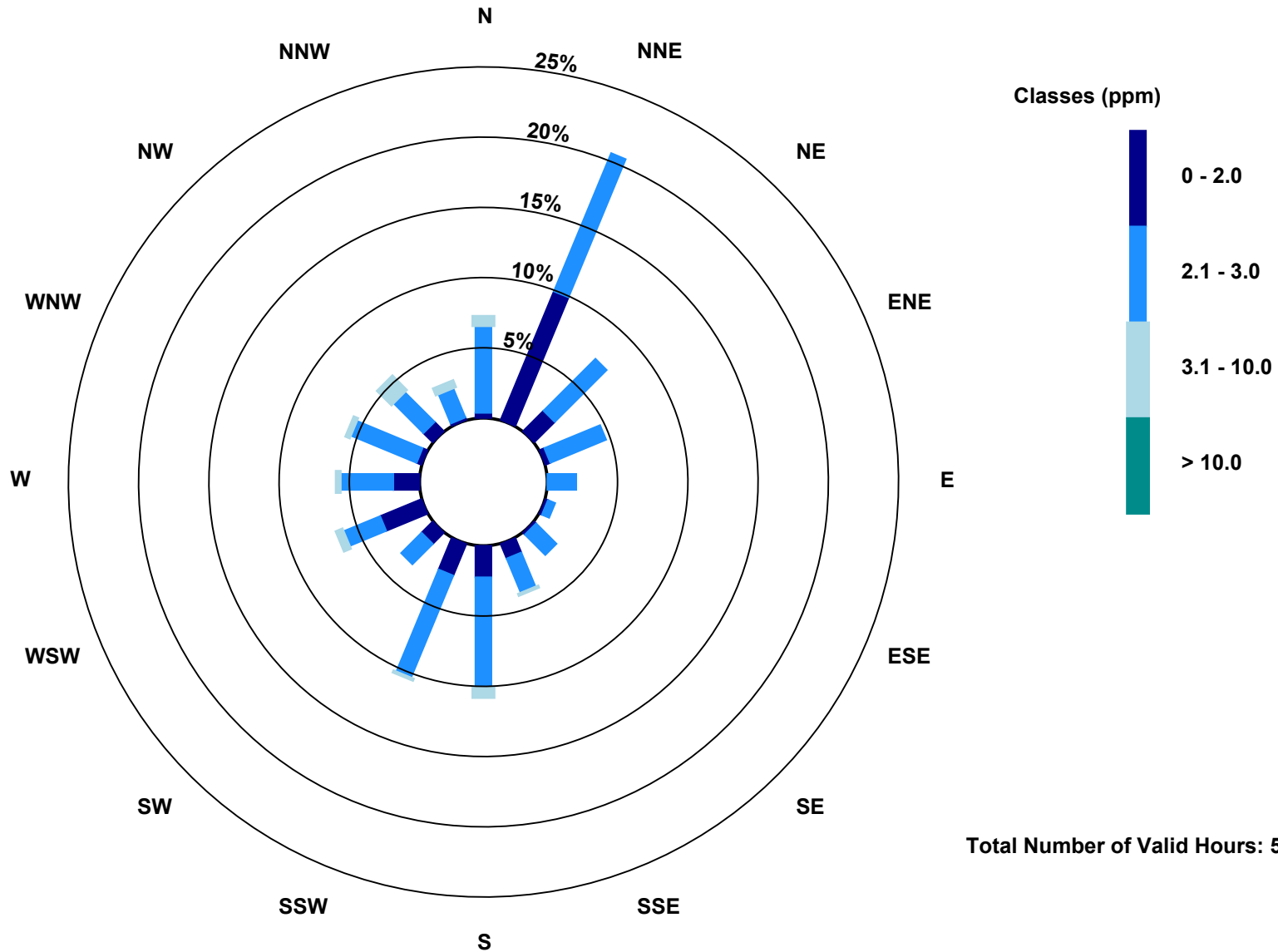
Total Number of Hours: 672



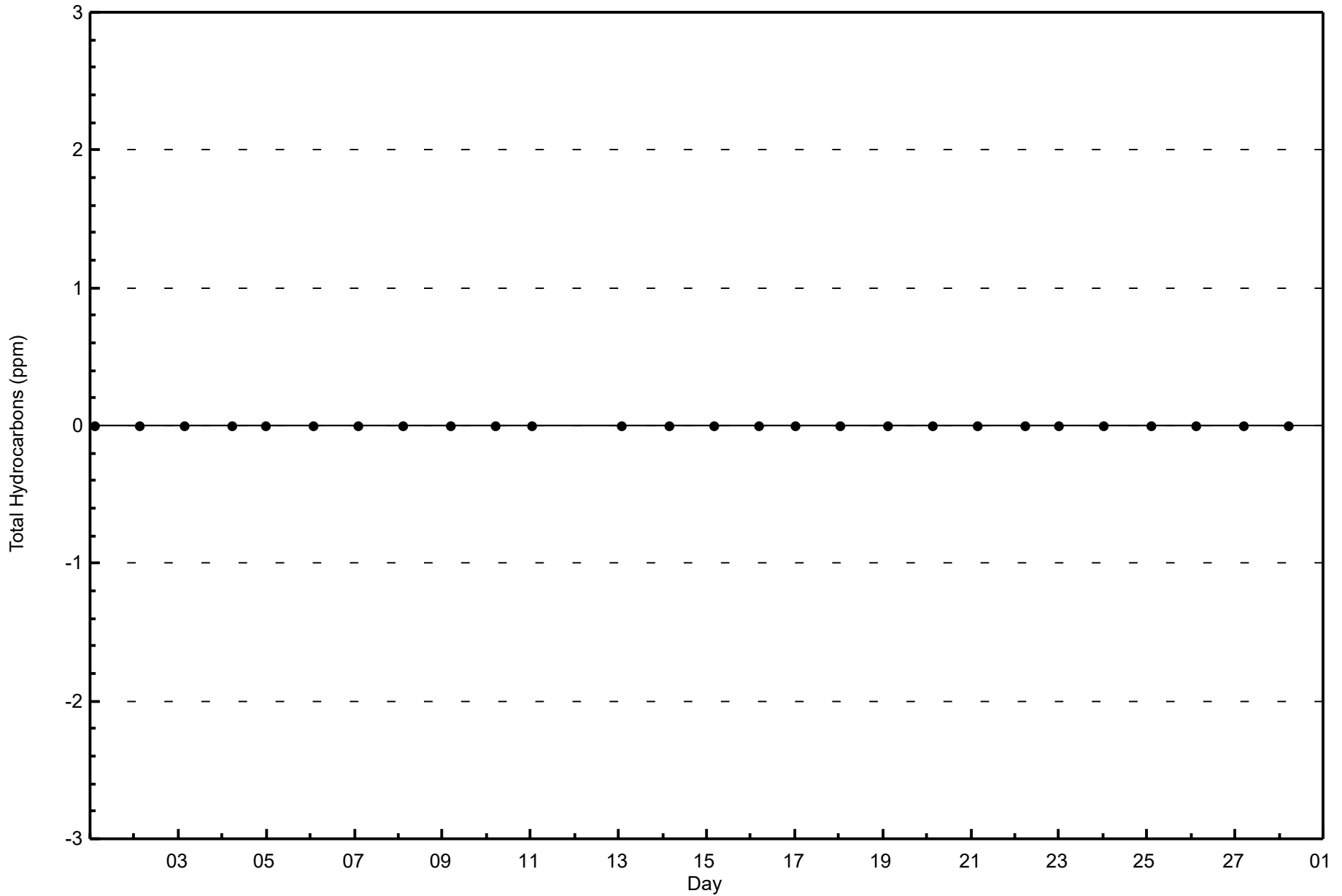


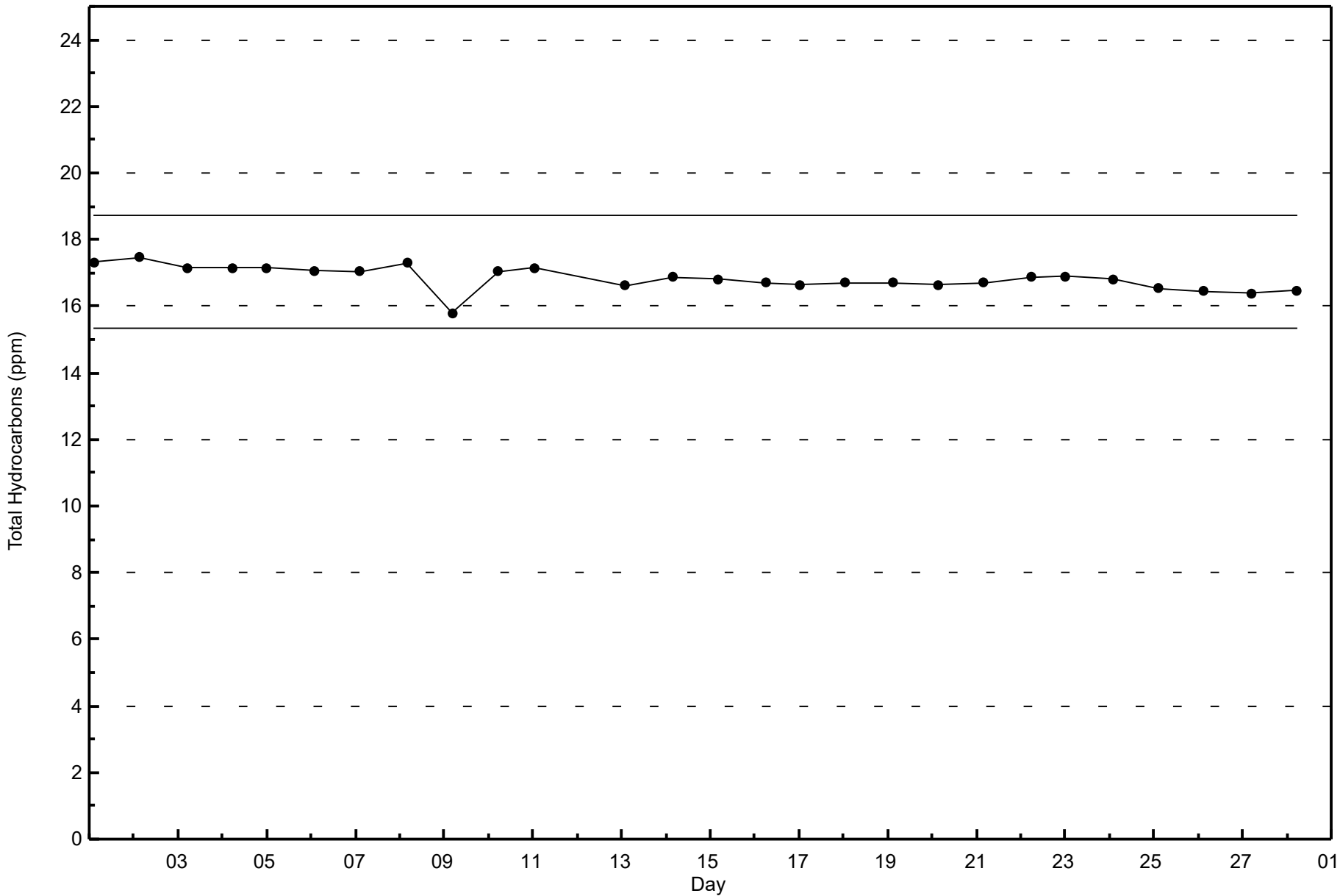
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Hydrocarbons (THC) - ppm  
Ells River



Total Number of Valid Hours: 535



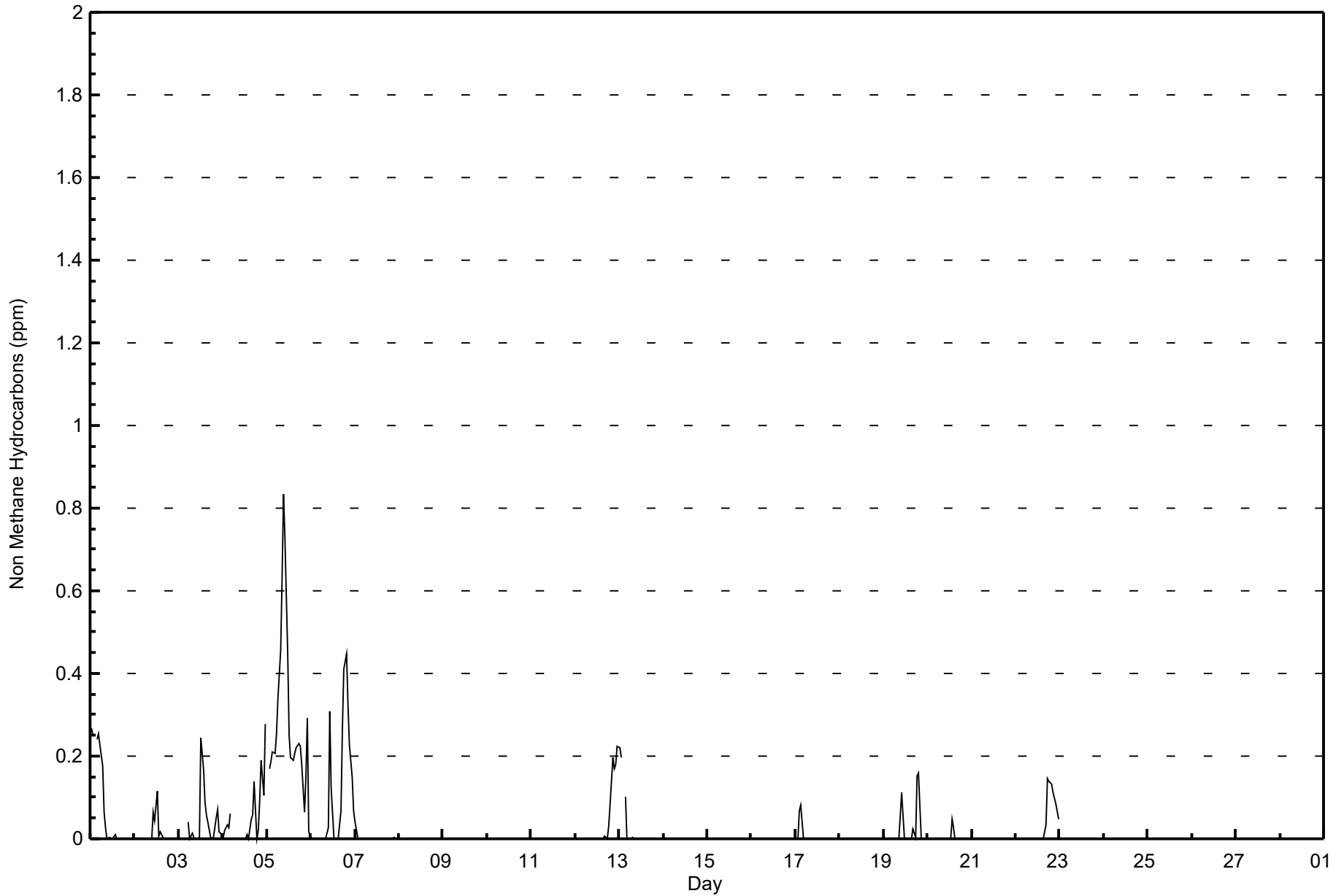




Summary of Hour Averages

Ells River - February 2023

Maximum Value: 0.833 ppm on Feb 5 10:00																				Maximum Daily Average: 0.291 ppm on Feb 5					Hours in Service: 672	
Minimum Value: 0.000 ppm on Feb 1 12:00																				Minimum Daily Average: 0.000 ppm on Feb 14					Hours of Data: 544	
Maximum Diurnal Average: 0.055 ppm at hour 11																				Minimum Diurnal Average: 0.013 ppm at hour 16					Hours of Missing Data: 128	
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: 33	
																									Percent Operational Time: 85.9	
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-Feb	0.266	0.252	Z	0.240	0.254	0.227	0.175	0.065	0.027	0.001	0.002	0.000	0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.066	0.266
2-Feb	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.063	0.045	0.116	0.008	0.017	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.116
3-Feb	0.000	0.000	0.000	0.000	Z	0.041	0.000	0.013	0.003	0.000	0.000	0.003	0.244	0.167	0.088	0.059	0.040	0.003	0.000	0.004	0.050	0.071	0.017	0.011	0.035	0.244
4-Feb	0.002	0.020	0.033	0.026	0.062	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.001	0.048	0.059	0.138	0.000	0.019	0.090	0.190	0.106	0.278	0.047	0.278
5-Feb	Z	0.169	0.187	0.209	0.205	0.255	0.338	0.456	0.634	0.833	0.728	0.447	0.251	0.198	0.191	0.206	0.220	0.231	0.223	0.179	0.064	0.154	0.292	0.018	0.291	0.833
6-Feb	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.310	0.123	0.000	0.000	0.000	0.000	0.069	0.264	0.410	0.446	0.325	0.226	0.148	0.068	0.105	0.446
7-Feb	0.040	0.003	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	0.002	0.000	0.000	0.002	0.040
8-Feb	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	--	0.000
9-Feb	UO	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--
10-Feb	UO	UO	UO	UO	UO	Z	UO	UO	UO	UO	C	C	C	0.000	0.000	PF	PF	0.000	0.000	0.000	0.000	UO	UO	UO	--	0.000
11-Feb	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
12-Feb	M	M	M	M	M	M	M	M	M	M	M	M	C	C	C	0.000	0.008	0.000	0.031	0.083	0.196	0.171	0.181	0.223	--	0.223
13-Feb	0.222	0.198	Z	0.102	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	0.023	0.222
14-Feb	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	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
15-Feb	0.000	0.000	0.000	0.000	Z	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	0.001	0.000	0.001
16-Feb	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
17-Feb	Z	0.000	0.068	0.082	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.082
18-Feb	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
19-Feb	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.054	0.113	0.000	0.000	0.000	0.000	0.000	0.025	0.004	0.152	0.161	0.000	0.000	0.000	0.022	0.161
20-Feb	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	0.048	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.048
21-Feb	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
22-Feb	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	0.034	0.146	0.138	0.131	0.111	0.100	0.085	0.046	0.034	0.146
23-Feb	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
24-Feb	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
25-Feb	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
26-Feb	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
27-Feb	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
28-Feb	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
																								Diurnal Average		
																								Diurnal Maximum		
0.025 0.031 0.015 0.035 0.027 0.028 0.022 0.023 0.029 0.040 0.055 0.028 0.027 0.019 0.013 0.013 0.019 0.031 0.038 0.041 0.033 0.038 0.035 0.027																										
0.266 0.252 0.187 0.240 0.254 0.255 0.338 0.456 0.634 0.833 0.728 0.447 0.251 0.198 0.191 0.206 0.220 0.264 0.410 0.446 0.325 0.226 0.292 0.278																										
Z - zerospan			C - Calibration				M - Maintenance				UO - Unstable Operation				PF - Power Failure											





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm  
Ells River - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 0.005	444	81.62	81.62
0.006 - 0.05	28	5.15	86.76
0.06 - 0.1	27	4.96	91.73
> 0.1	45	8.27	100.00

Total Number of Valid Hours: 544

Total Number of Hours: 672



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

**Non Methane Hydrocarbons (NMHC) - ppm**  
**Ells River - February 2023**

<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	26	99	37	21	5	2	11	18	44	51	15	31	25	25	17	8	435
0.006 - 0.05	4	7	1	4	2	0	0	0	5	1	0	1	0	1	2	0	28
0.06 - 0.1	3	3	1	0	3	2	0	0	2	1	2	0	4	3	0	3	27
> 0.1	6	1	0	0	1	0	1	3	7	3	0	3	3	2	10	5	45
<b>Totals</b>	39	110	39	25	11	4	12	21	58	56	17	35	32	31	29	16	535

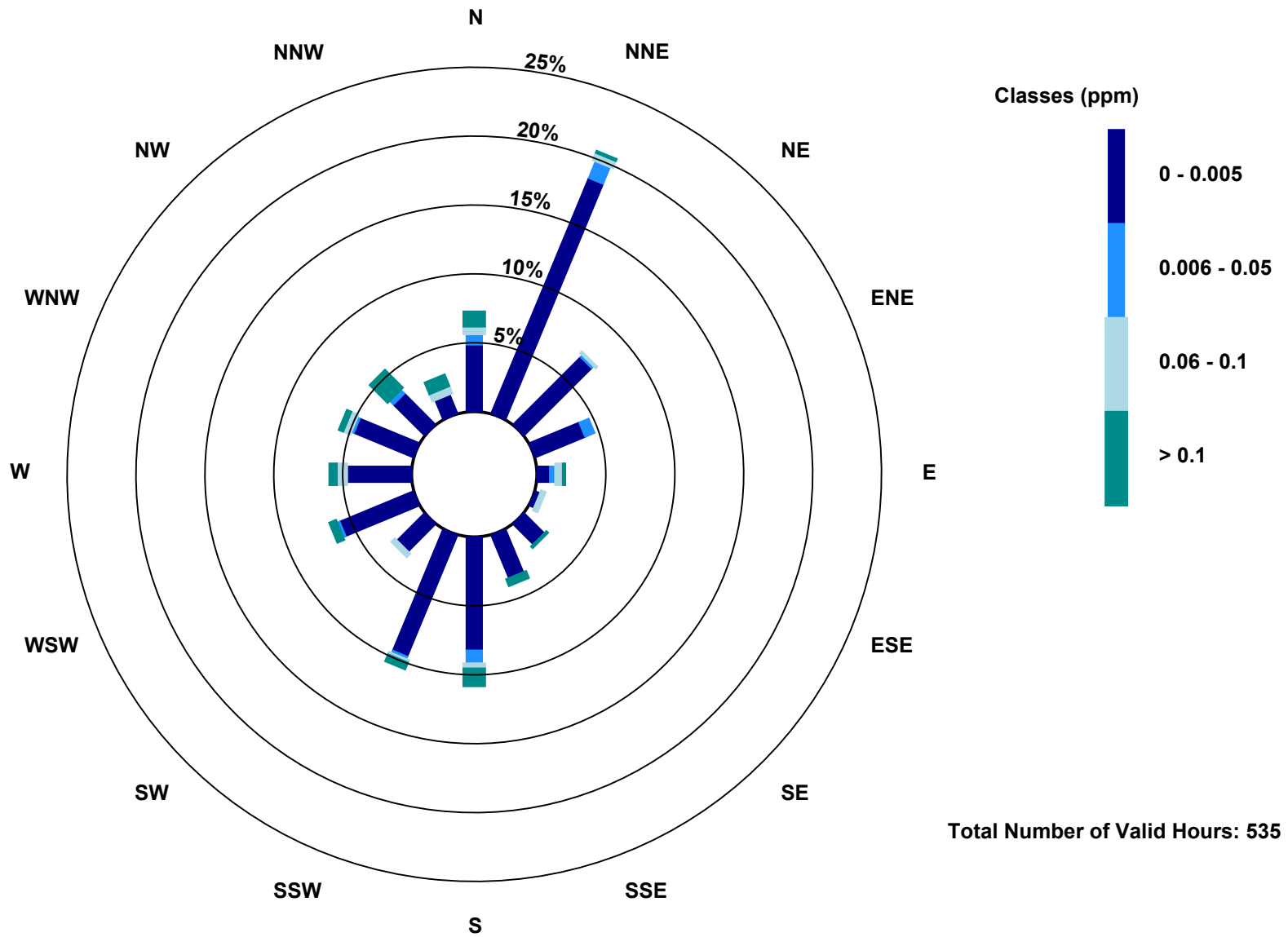
Total Number of Valid Hours: 535

Total Number of Hours: 672

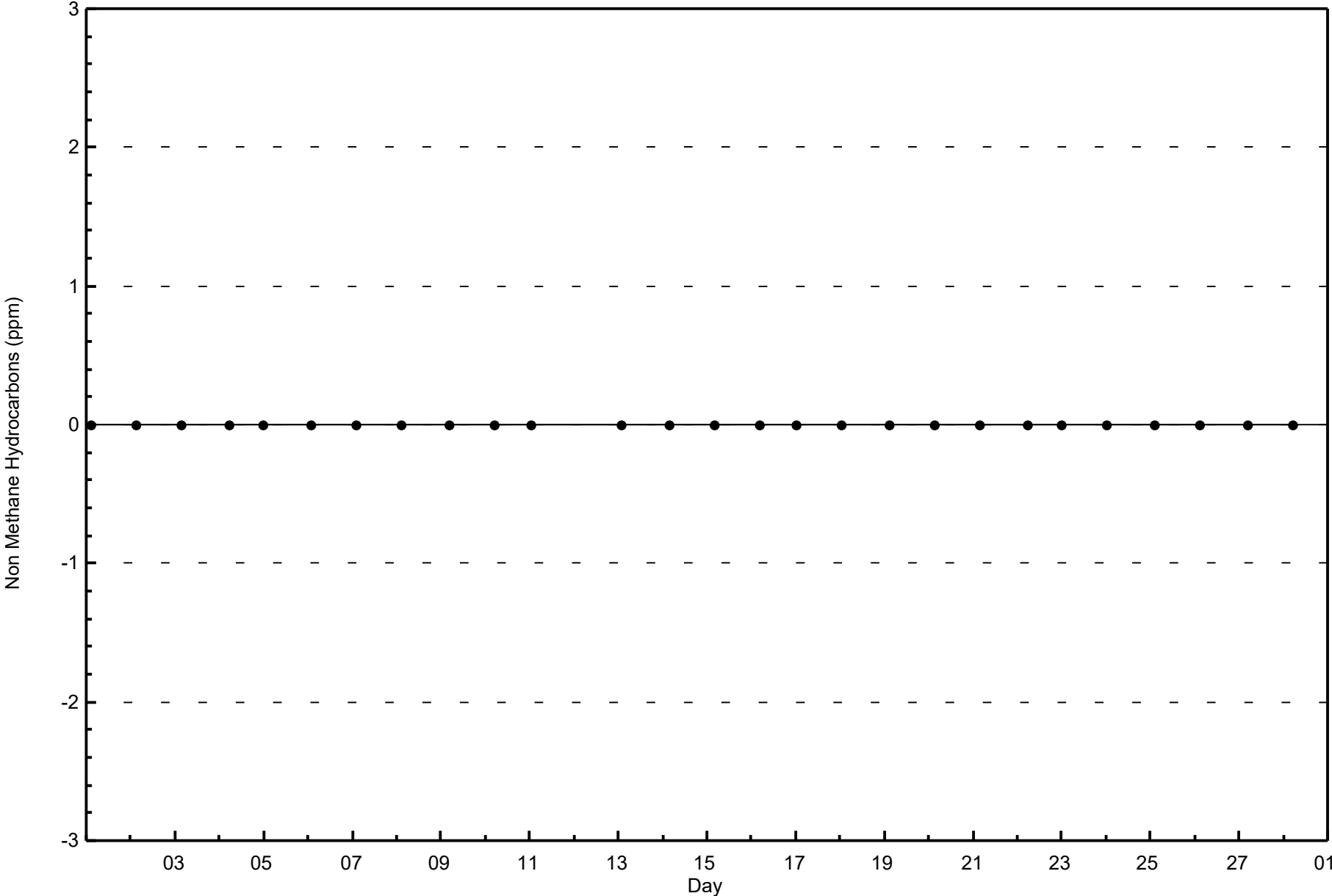


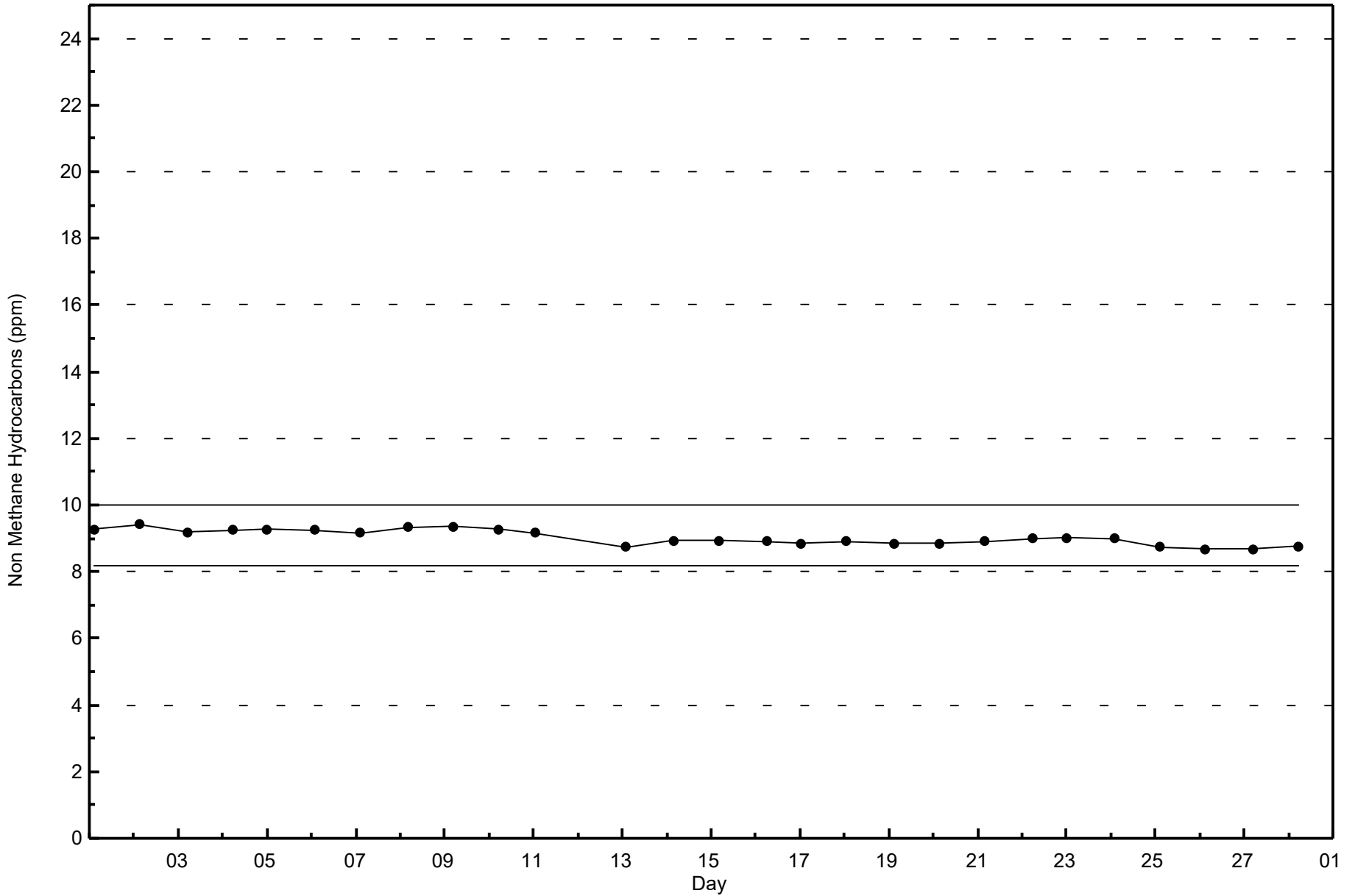
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Non Methane Hydrocarbons (NMHC) - ppm  
Ells River











Wood Buffalo Environmental Association

Summary of Hour Averages

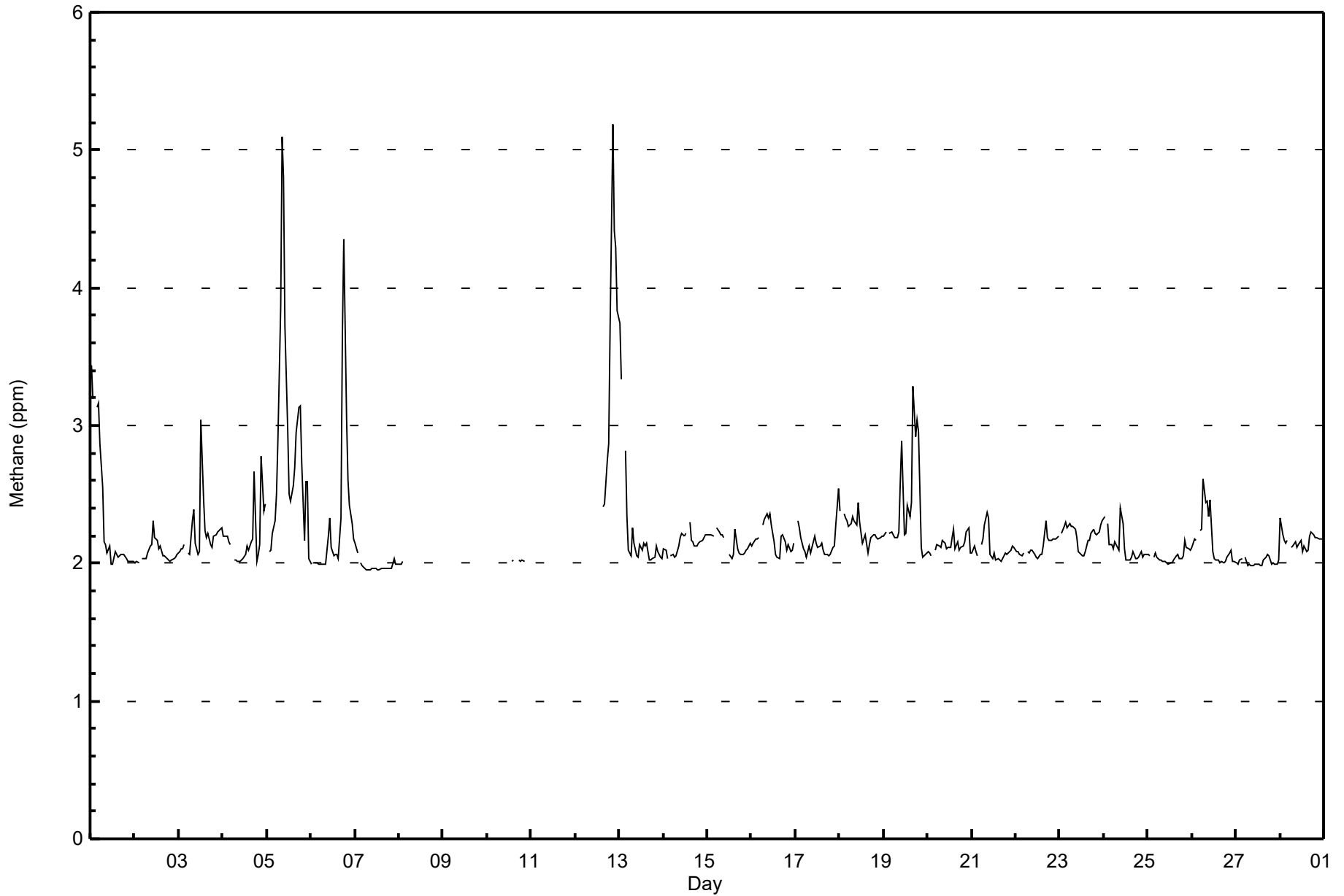
Methane (CH<sub>4</sub>) - ppm  
Ells River - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																		
Maximum Value: 5.2 ppm on Feb 12 21:00		Maximum Daily Average: 2.9 ppm on Feb 5		Hours of Data:		544		Hours of Missing Data: 128																		
Minimum Value: 2.0 ppm on Feb 7 07:00		Minimum Daily Average: 2.0 ppm on Feb 7		Hours of Calibration:		33		Percent Operational Time: 85.9																		
Maximum Diurnal Average: 2.3 ppm at hour 9		Minimum Diurnal Average: 2.1 ppm at hour 14		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> = 4.1																						
Monthly Average: 2.22 ppm																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Feb	3.4	3.2	Z	3.1	3.2	2.9	2.6	2.2	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.3	3.4
2-Feb	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.1	2.3	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3
3-Feb	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.3	2.4	2.1	2.1	3.0	2.5	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.2	3.0
4-Feb	2.2	2.2	2.2	2.2	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.7	2.0	2.1	2.1	2.8	2.4	2.4	2.2	2.8
5-Feb	Z	2.1	2.1	2.2	2.3	2.5	2.9	3.9	5.1	4.8	3.7	3.0	2.5	2.4	2.6	2.7	3.0	3.1	3.1	2.7	2.2	2.6	2.6	2.0	2.9	5.1
6-Feb	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.3	2.1	2.1	2.1	2.1	2.0	2.3	3.7	4.4	3.1	2.6	2.4	2.3	2.2	2.3	4.4
7-Feb	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	2.0	2.1
8-Feb	2.0	2.0	2.0	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	2.0
9-Feb	UO	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--
10-Feb	UO	UO	UO	UO	UO	Z	UO	UO	UO	UO	UO	C	C	C	2.0	2.0	PF	PF	2.0	2.0	2.0	2.0	UO	UO	--	2.0
11-Feb	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
12-Feb	M	M	M	M	M	M	M	M	M	M	M	M	C	C	C	2.4	2.4	2.7	2.9	3.7	5.2	4.4	4.3	3.8	--	5.2
13-Feb	3.7	3.3	Z	2.8	2.3	2.1	2.1	2.3	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.3	3.7
14-Feb	2.1	2.1	2.0	Z	2.1	2.1	2.0	2.1	2.1	2.2	2.2	2.2	2.2	M	2.3	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.3
15-Feb	2.2	2.2	2.2	2.2	Z	2.3	2.2	2.2	2.2	2.2	M	M	2.1	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
16-Feb	2.1	2.1	2.2	2.2	2.2	Z	2.3	2.3	2.4	2.3	2.4	2.3	2.2	2.1	2.0	2.0	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.4
17-Feb	Z	2.3	2.3	2.2	2.1	2.1	2.0	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	2.3	2.5	2.1	2.5
18-Feb	2.4	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4
19-Feb	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.9	2.2	2.2	2.4	2.3	2.4	3.3	2.9	3.0	3.0	2.1	2.0	2.1	2.1	2.4	3.3
20-Feb	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	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.3	2.1	2.1	2.3
21-Feb	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.3	2.4	2.3	2.1	2.0	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	2.4
22-Feb	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
23-Feb	Z	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	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	2.3	2.3	2.2	2.3
24-Feb	2.3	Z	2.3	2.1	2.1	2.1	2.2	2.1	2.1	2.4	2.3	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.4
25-Feb	2.1	2.1	Z	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.2	2.1	2.1	2.1	2.0	2.2
26-Feb	2.1	2.2	2.2	Z	2.2	2.2	2.6	2.4	2.5	2.3	2.5	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.2	2.6
27-Feb	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	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1
28-Feb	2.3	2.2	2.2	2.1	2.2	Z	2.1	2.1	2.2	2.1	2.1	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	2.2	2.3
		2.3	2.2	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.2	Diurnal Average
		3.7	3.3	2.4	3.1	3.2	2.9	2.9	3.9	5.1	4.8	3.7	3.0	3.0	2.5	2.6	2.7	3.3	3.7	4.4	3.7	5.2	4.4	4.3	3.8	Diurnal Maximum
Z - zerspan		C - Calibration					M - Maintenance					UO - Unstable Operation					PF - Power Failure									



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

**Methane (CH<sub>4</sub>) - ppm**  
**Ells River - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Ells River - February 2023**

<b>Concentration Ranges (ppm)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2.0	143	26.29	26.29
2.1 - 3.0	380	69.85	96.14
3.1 - 10.0	21	3.86	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 544

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Methane (CH<sub>4</sub>) - ppm  
Ells River - February 2023**

<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	2	53	11	2	0	1	1	7	12	13	6	17	10	2	5	1	143
2.1 - 3.0	36	57	28	23	11	3	11	13	44	42	11	15	20	27	18	12	371
3.1 - 10.0	1	0	0	0	0	0	0	1	2	1	0	3	2	2	6	3	21
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	39	110	39	25	11	4	12	21	58	56	17	35	32	31	29	16	535

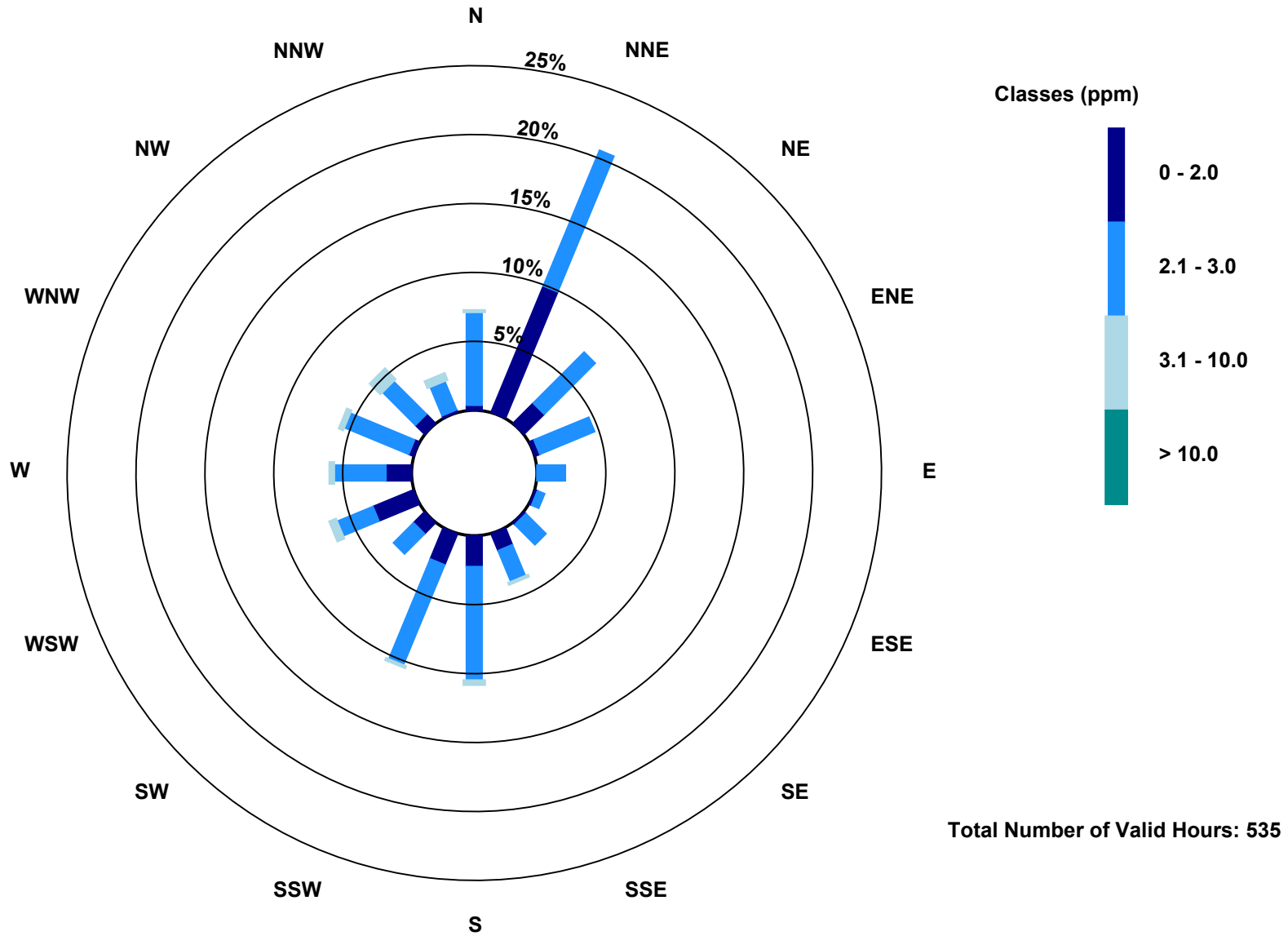
Total Number of Valid Hours: 535

Total Number of Hours: 672

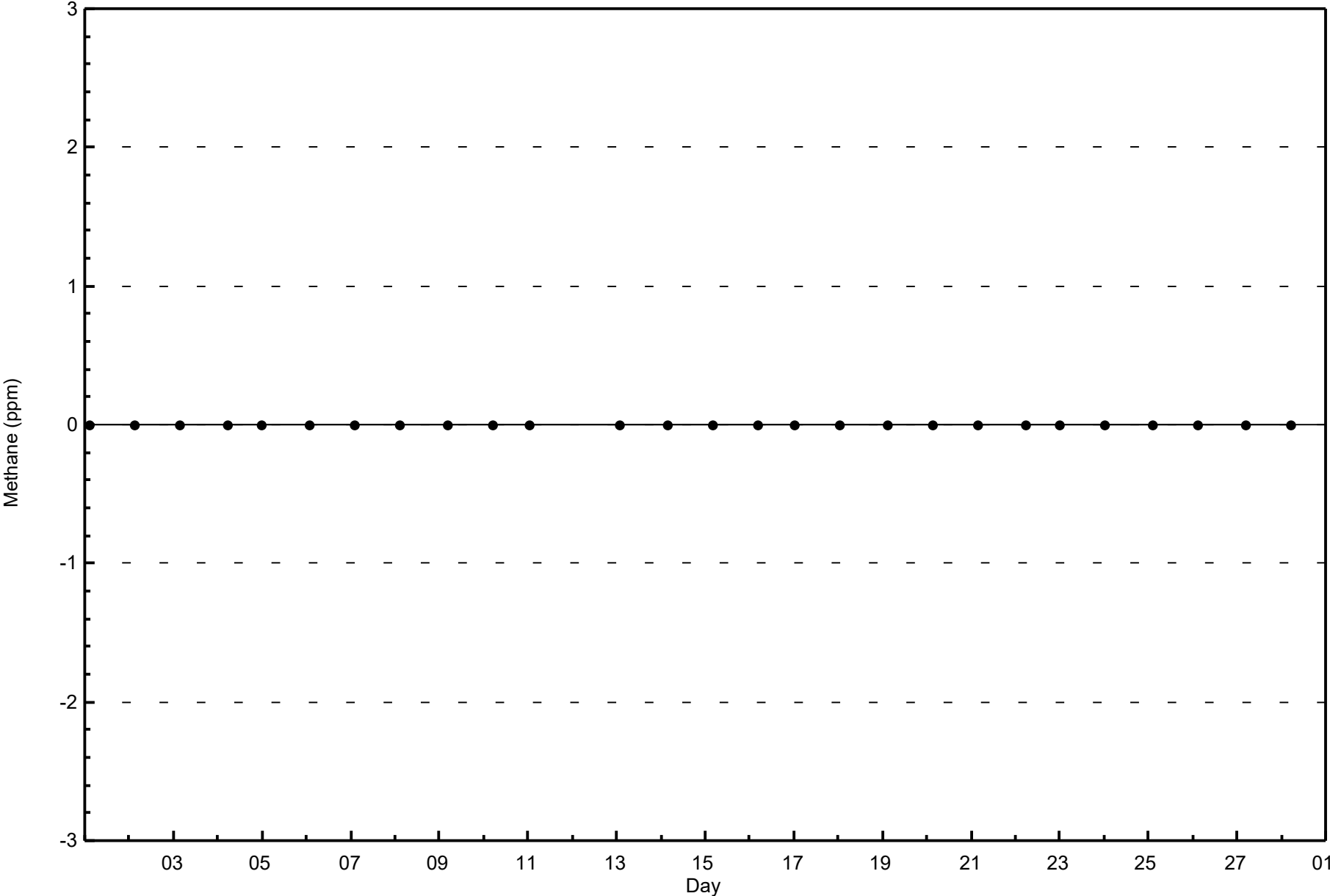


**Wood Buffalo Environmental Association**  
**Wind Rose Feb 2023**

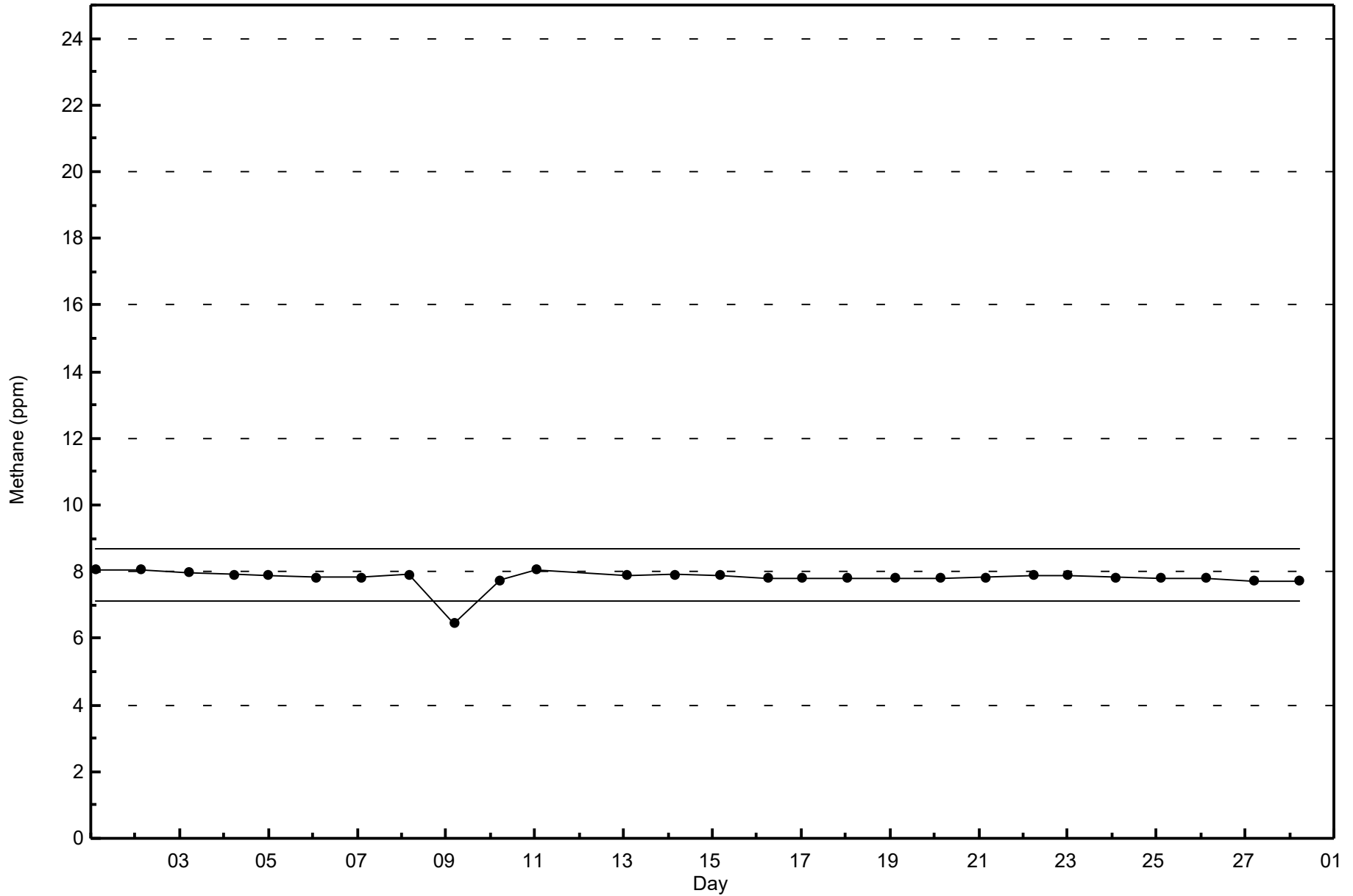
**Methane (CH<sub>4</sub>) - ppm**  
**Ells River**



**Total Number of Valid Hours: 535**







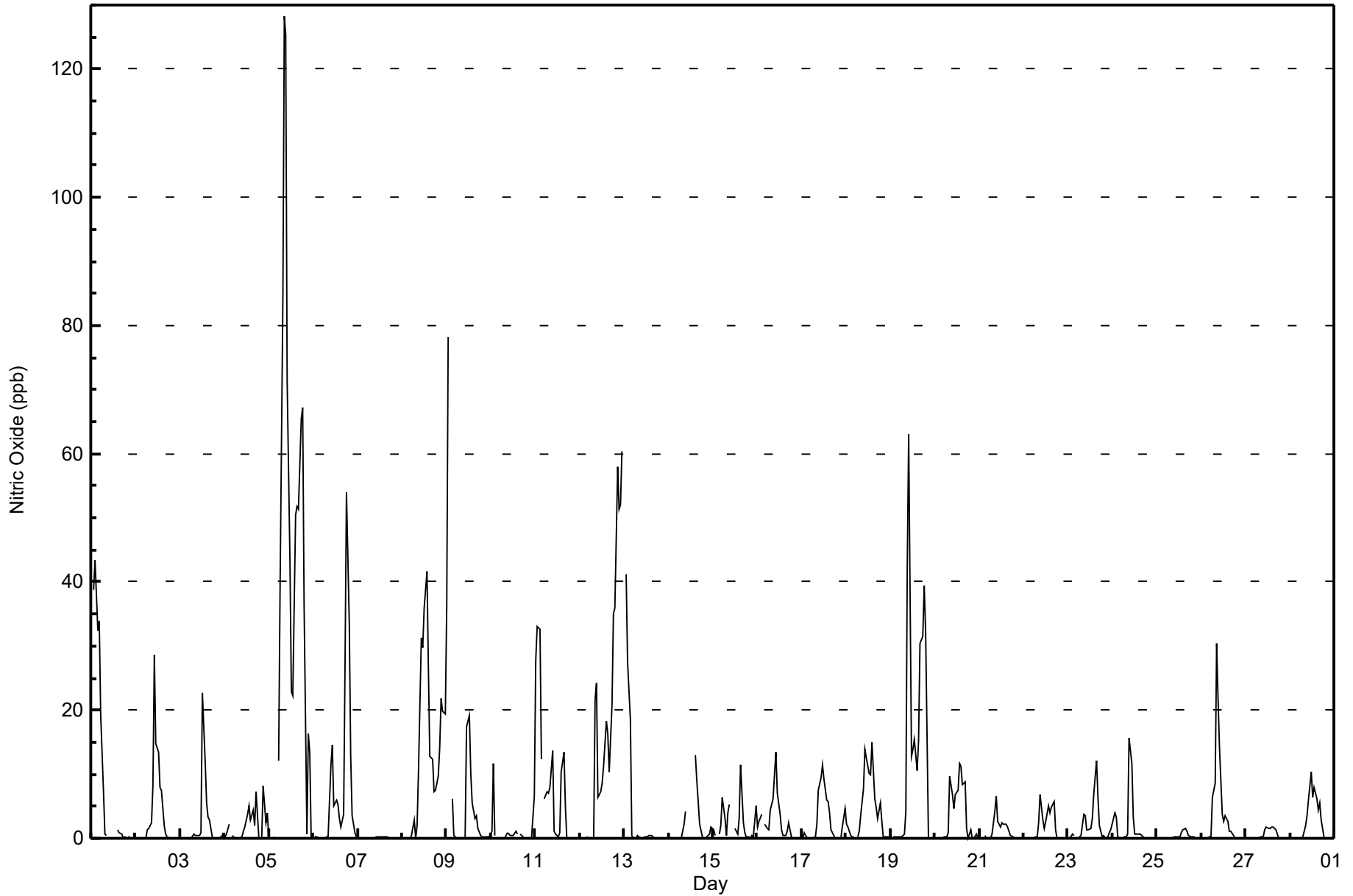


Maximum Value: 128.3 ppb on Feb 5 09:00																				Maximum Daily Average: 39.3 ppb on Feb 5					Hours in Service: 672				
Minimum Value: 0.0 ppb on Feb 1 18:00																				Minimum Daily Average: 0.1 ppb on Feb 7					Hours of Data: 632				
Maximum Diurnal Average: 12.5 ppb at hour 10																				Minimum Diurnal Average: 1.7 ppb at hour 5					Hours of Missing Data: 40				
Monthly Average: 5.89 ppb																				Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.0 Q <sub>1</sub> = 0.1 Median = 0.5 Q <sub>3</sub> = 5.2 P <sub>90</sub> = 15.4 P <sub>99</sub> = 64.7					Hours of Calibration: 33				
																									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-Feb	Z	38.7	43.3	32.3	33.9	19.4	7.2	0.7	0.5	C	C	C	C	C	1.4	1.0	0.6	0.0	0.3	0.1	0.3	0.1	0.0	0.0	10.0	43.3			
2-Feb	0.0	Z	0.0	0.0	0.0	0.0	1.4	1.4	2.3	8.3	28.7	14.8	13.5	7.9	7.5	1.9	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	3.9	28.7			
3-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.7	0.5	0.5	0.4	0.8	22.6	11.8	5.6	3.4	2.8	0.3	0.0	0.0	0.1	0.0	0.2	0.6	2.2	22.6			
4-Feb	0.3	0.7	2.1	Z	0.4	0.2	0.1	0.0	0.1	0.3	1.1	1.7	3.7	5.2	2.9	4.3	2.0	7.3	0.0	0.0	0.1	8.1	2.4	3.9	2.0	8.1			
5-Feb	0.0	0.0	0.0	0.2	Z	12.2	39.1	84.4	128.3	125.3	71.6	43.1	22.9	22.3	50.4	51.8	51.4	65.4	67.3	36.6	0.8	16.3	13.5	0.1	39.3	128.3			
6-Feb	0.1	0.1	0.1	0.1	0.1	Z	0.0	0.2	0.2	11.5	14.6	5.1	6.1	5.2	3.2	1.7	3.8	27.4	54.0	33.5	12.8	3.5	0.9	0.1	8.0	54.0			
7-Feb	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	0.0	0.0	0.1	0.1			
8-Feb	0.0	Z	0.0	0.0	0.0	0.4	2.8	0.0	1.9	10.5	31.3	29.7	35.9	41.7	26.5	12.9	12.3	7.3	7.4	9.8	14.2	21.8	19.9	19.5	13.3	41.7			
9-Feb	36.6	78.2	Z	6.2	0.5	0.0	0.0	0.0	0.0	0.0	0.1	17.5	19.1	10.2	5.5	3.0	3.5	1.4	0.5	0.2	0.3	0.3	0.2	0.2	8.0	78.2			
10-Feb	1.1	11.8	0.4	Z	0.1	0.1	0.1	0.1	0.4	0.8	0.5	0.4	0.5	1.0	0.8	PF	0.8	0.1	0.0	0.0	0.0	0.0	0.1	6.7	1.2	11.8			
11-Feb	27.9	33.0	32.5	12.4	Z	6.2	7.2	7.0	7.9	13.8	1.0	0.6	0.1	0.8	10.3	13.4	4.7	0.1	0.1	0.1	0.1	0.1	0.1	0.1	7.8	33.0			
12-Feb	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	21.7	24.2	6.5	7.2	8.7	11.3	18.3	16.3	10.3	20.8	35.1	36.0	57.9	51.4	52.1	60.5	19.1	60.5			
13-Feb	Z	41.2	27.5	18.5	0.4	0.0	0.0	0.4	0.2	0.0	0.0	0.1	0.2	0.5	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	41.2			
14-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	2.1	4.1	4.1	M	M	M	M	13.0	9.0	5.7	2.1	0.1	0.1	0.1	0.5	0.6	1.8	2.1	13.0		
15-Feb	1.4	0.5	Z	0.6	2.0	6.4	3.0	0.5	4.1	5.4	M	M	M	1.5	0.6	3.0	11.5	2.5	0.9	0.3	0.1	0.1	0.4	0.3	5.2	2.4	11.5		
16-Feb	1.7	2.6	3.7	Z	2.1	1.5	1.3	4.4	6.3	9.9	13.5	7.1	3.8	1.2	0.5	0.4	1.1	2.4	0.3	0.1	0.1	0.1	0.1	0.0	2.8	13.5			
17-Feb	0.1	0.8	0.3	0.1	Z	0.1	0.0	0.3	2.1	7.4	9.4	11.5	9.2	5.9	5.6	3.9	1.2	0.3	0.1	0.1	0.1	0.0	1.8	4.7	2.8	11.5			
18-Feb	2.3	1.8	0.5	0.2	0.1	Z	0.3	1.0	3.6	7.7	13.9	12.6	10.1	10.0	15.0	6.1	4.7	3.0	5.5	2.6	0.3	0.2	0.2	0.1	4.4	15.0			
19-Feb	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.6	4.2	42.5	63.1	12.9	13.9	15.4	10.7	15.1	30.4	31.5	39.4	32.3	0.1	0.0	0.0	0.0	13.6	63.1			
20-Feb	0.1	Z	0.0	0.1	0.1	0.1	0.2	1.0	9.6	6.9	4.5	6.9	7.5	11.6	11.3	8.5	8.7	1.6	0.0	1.2	0.0	0.0	0.7	0.0	3.5	11.6			
21-Feb	0.0	0.0	Z	0.3	0.0	0.1	0.0	0.6	4.2	6.6	2.6	1.7	2.5	2.3	2.2	1.8	1.0	0.5	0.1	0.1	0.0	0.0	0.1	0.0	1.2	6.6			
22-Feb	0.0	0.0	0.0	Z	0.1	0.1	0.3	0.3	2.5	6.8	2.8	1.5	2.6	5.1	4.0	4.9	5.8	1.2	0.1	0.0	0.0	0.0	0.0	0.0	1.7	6.8			
23-Feb	0.0	0.0	0.6	0.4	Z	0.1	0.1	0.5	3.7	3.5	1.3	1.3	1.6	3.0	6.9	12.0	6.5	1.9	0.1	0.3	0.1	0.3	0.8	1.3	2.0	12.0			
24-Feb	3.1	3.9	3.3	0.3	0.1	Z	0.1	0.2	0.7	15.6	11.6	3.3	0.6	0.6	0.6	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	15.6			
25-Feb	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	0.9	1.4	1.6	1.2	0.3	0.2	0.2	0.2	0.0	0.0	0.0	0.3	1.6			
26-Feb	0.0	Z	0.1	0.1	0.1	0.1	6.5	8.6	30.4	21.9	14.3	3.7	2.5	3.6	2.8	1.2	1.2	0.4	0.1	0.1	0.1	0.1	0.1	0.0	4.3	30.4			
27-Feb	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.2	0.2	1.3	1.8	1.4	1.6	1.7	1.8	1.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.8			
28-Feb	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.3	1.9	3.5	6.0	10.3	6.3	8.0	6.2	4.4	5.6	3.0	0.2	0.0	0.0	0.1	0.1	0.2	2.4	10.3			
																								Diurnal Average					
																								Diurnal Maximum					
3.3 9.3 5.0 3.1 1.7 2.0 2.5 4.1 8.6 12.5 12.0 7.8 7.6 7.2 7.8 7.2 6.1 6.4 7.5 5.5 3.1 3.7 3.4 3.8																													
36.6 78.2 43.3 32.3 33.9 19.4 39.1 84.4 128.3 125.3 71.6 43.1 35.9 41.7 50.4 51.8 51.4 65.4 67.3 36.6 57.9 51.4 52.1 60.5																													
Z - zerospan			C - Calibration			M - Maintenance			PF - Power Failure																				



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

**Nitric Oxide (NO) - ppb**  
**Ells River - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Ells River - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	579	91.61	91.61
21 - 40	32	5.06	96.68
41 - 80	18	2.85	99.53
81 - 159	3	0.47	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 632

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Ells River - February 2023**

<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	34	123	41	26	10	6	12	24	58	72	22	36	41	31	22	12	570
21 - 40	7	3	1	0	0	1	0	2	5	3	0	3	1	2	2	2	32
11 - 80	0	0	0	0	0	0	0	3	6	1	0	0	1	2	5	0	18
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	3
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	41	126	42	26	10	7	12	29	69	76	22	39	44	35	30	15	623

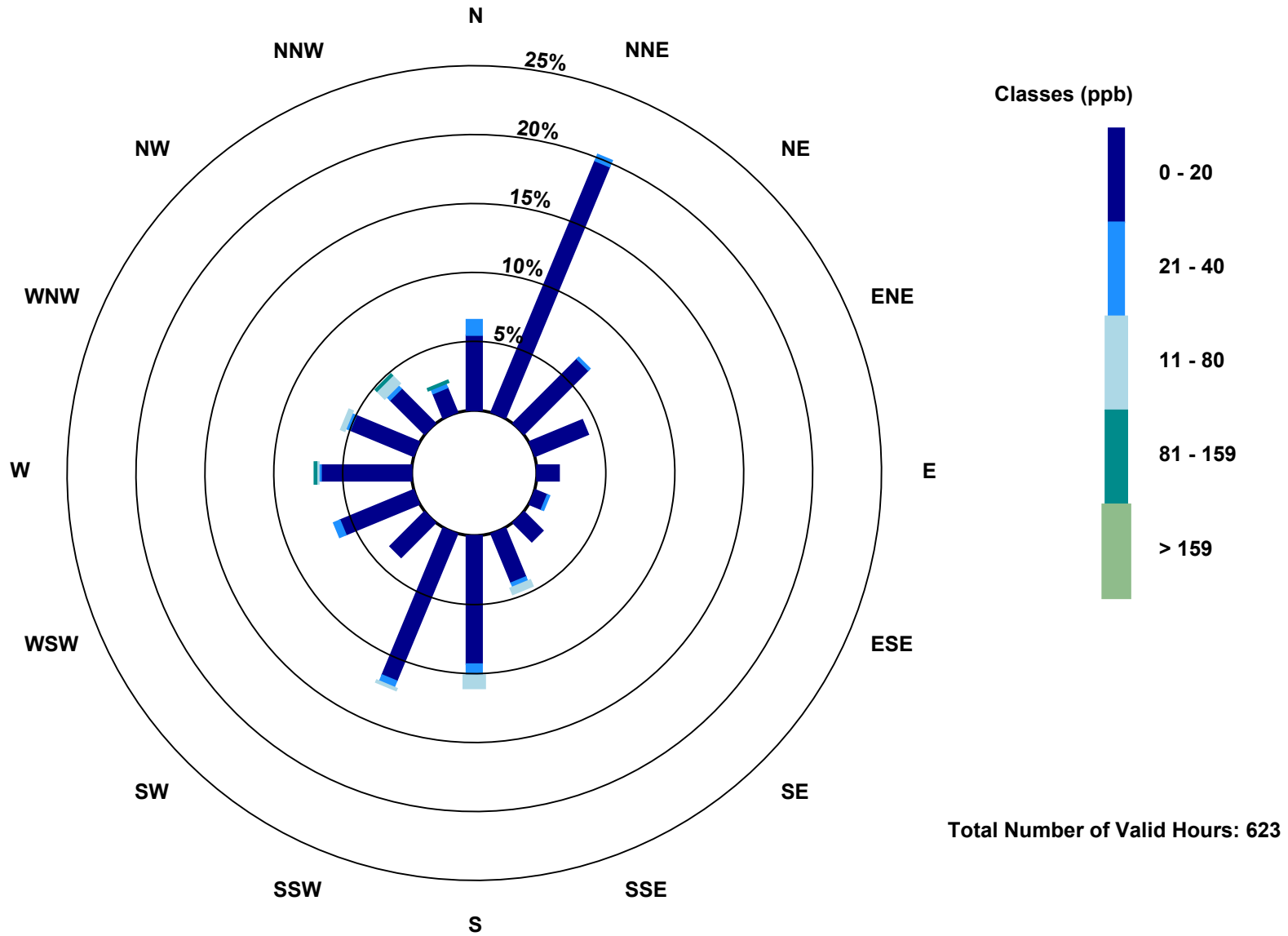
Total Number of Valid Hours: 623

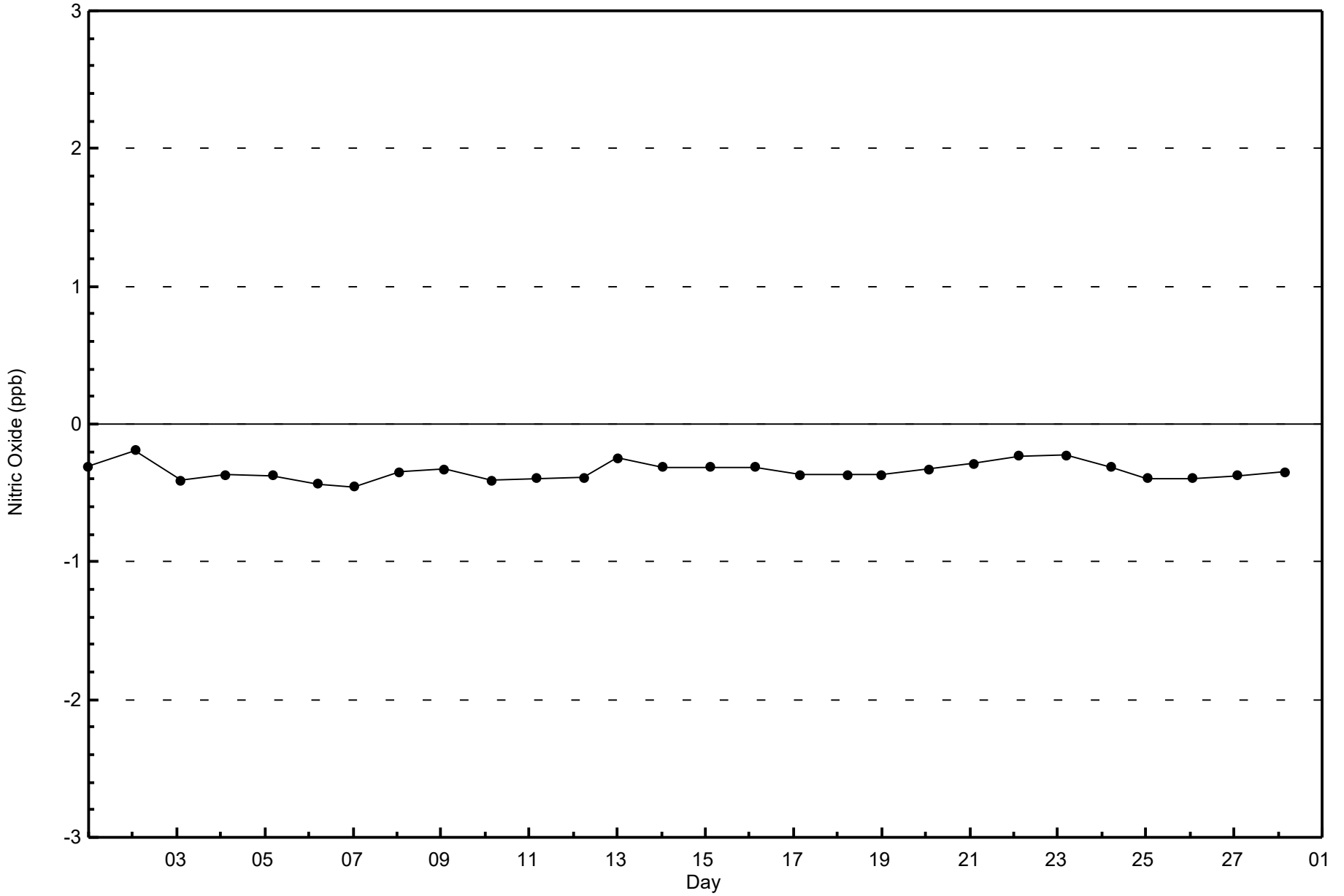
Total Number of Hours: 672

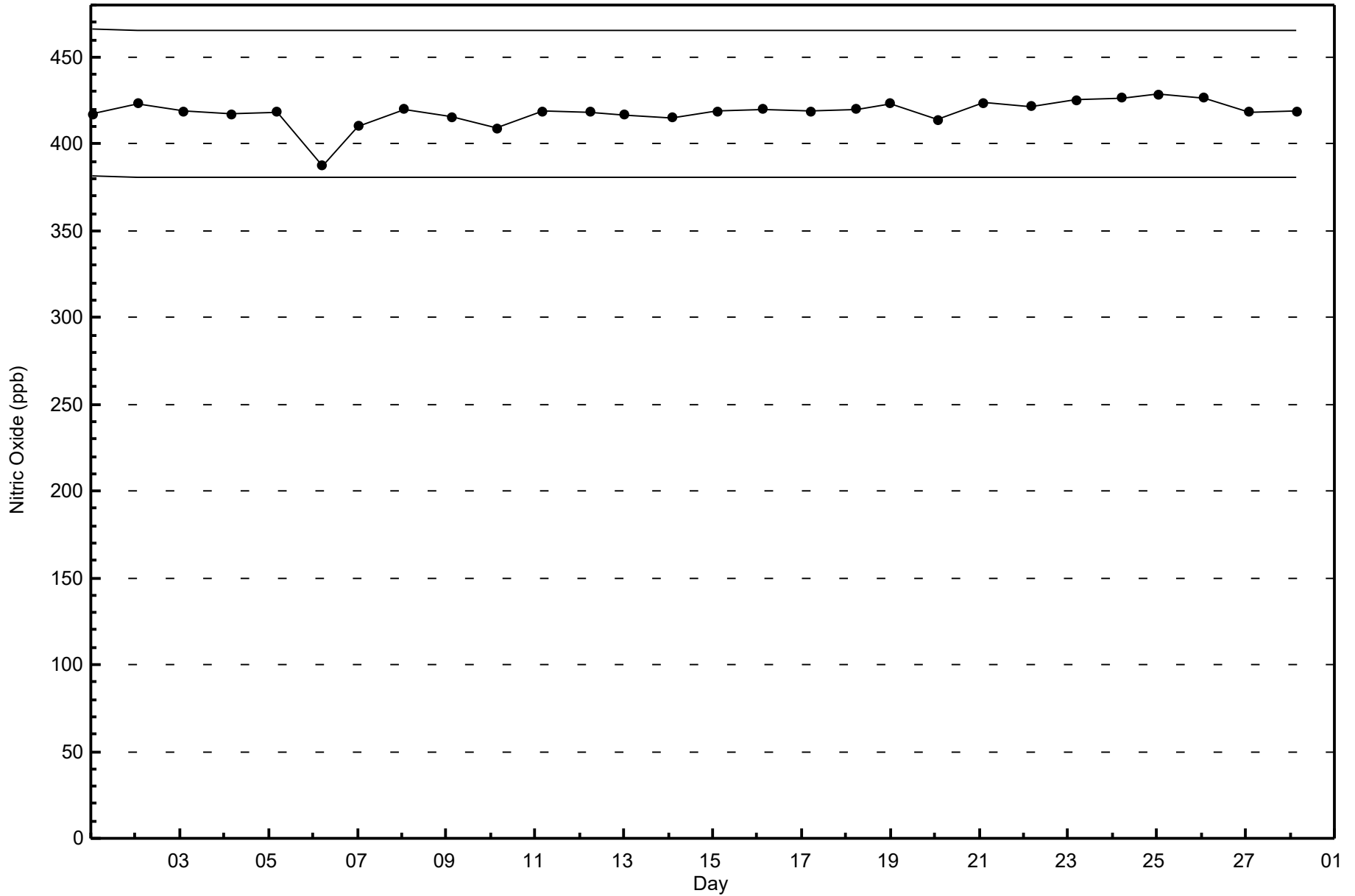


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitric Oxide (NO) - ppb  
Ells River











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

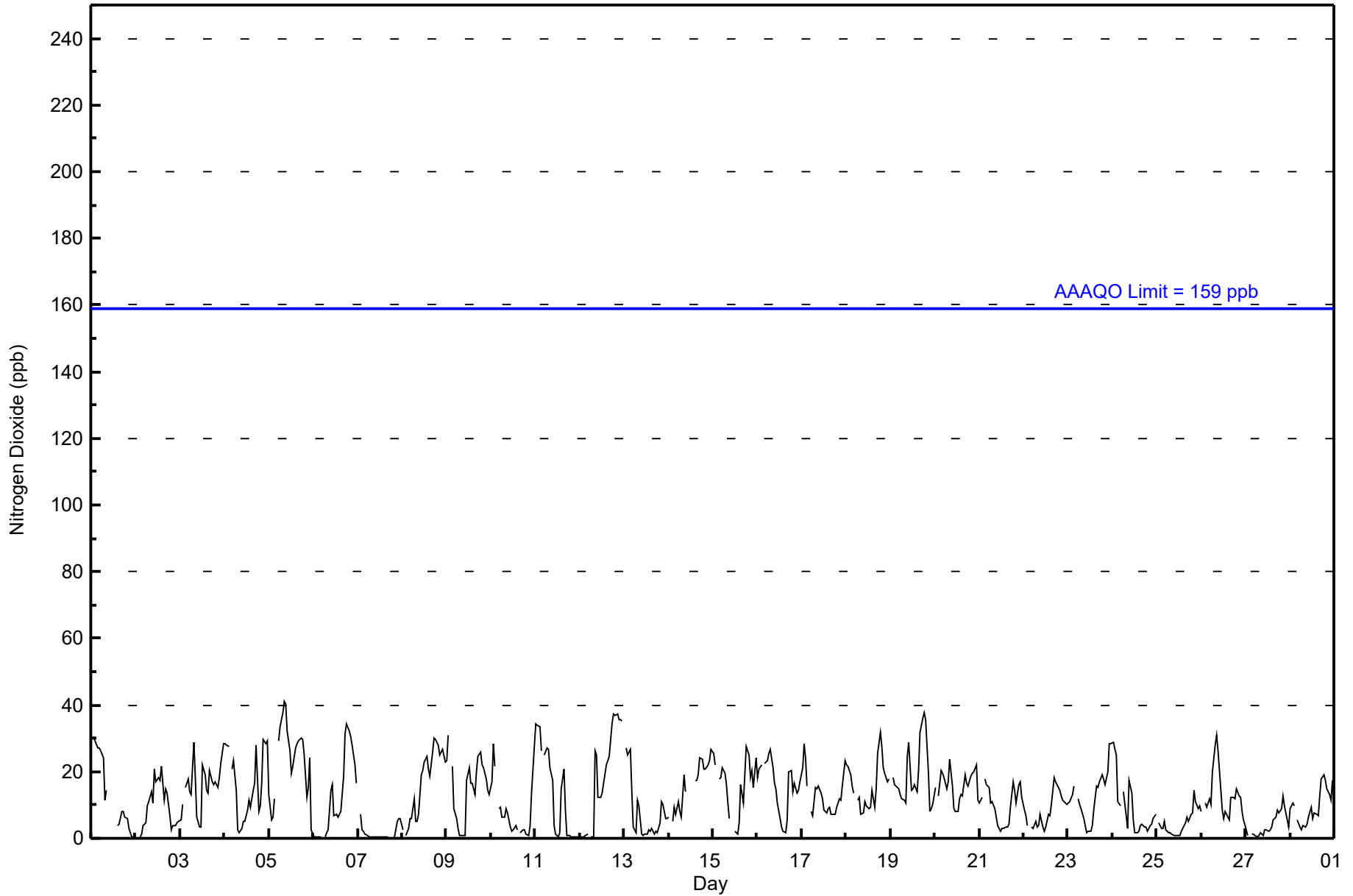
**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Ells River - February 2023**

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	672					
Maximum Value: 41.0 ppb on Feb 5 09:00		Maximum Daily Average: 23.6 ppb on Feb 5																	Hours of Data:	632							
Minimum Value: 0.2 ppb on Feb 7 18:00		Minimum Daily Average: 1.5 ppb on Feb 7																	Hours of Missing Data:	40							
Maximum Diurnal Average: 16.8 ppb at hour 2		Minimum Diurnal Average: 8.1 ppb at hour 12																	Hours of Calibration:	33							
Monthly Average: 12.58 ppb		Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 1.2 Q <sub>1</sub> = 4.2 Median = 11.2 Q <sub>3</sub> = 19.0 P <sub>90</sub> = 26.7 P <sub>99</sub> = 36.8																	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-Feb	Z	30.6	29.4	27.0	27.0	26.2	24.0	11.3	14.2	C	C	C	C	C	3.7	4.4	7.9	7.9	6.4	5.9	2.8	1.7	0.6	0.3	12.9	30.6	
2-Feb	0.3	Z	0.3	1.3	3.7	4.5	9.9	11.2	14.1	10.4	20.9	17.1	18.4	17.2	21.8	11.6	14.8	13.5	6.8	2.7	3.9	3.9	4.5	5.2	9.5	21.8	
3-Feb	5.7	10.3	Z	15.1	17.6	13.8	13.0	28.7	18.3	6.5	3.2	3.4	22.1	19.0	14.2	13.5	20.2	16.9	16.0	16.9	15.1	18.4	22.5	28.5	15.6	28.7	
4-Feb	28.2	27.9	27.5	Z	20.6	23.3	14.2	2.4	1.9	3.0	4.9	5.1	8.3	11.4	9.2	14.6	16.4	28.0	8.1	9.8	16.4	29.7	28.2	29.2	16.0	29.7	
5-Feb	13.2	5.7	6.3	11.9	Z	29.1	33.3	37.9	41.0	40.3	32.4	26.4	19.5	21.4	27.2	28.5	29.3	30.2	29.8	25.3	12.4	15.2	24.1	2.5	23.6	41.0	
6-Feb	0.5	0.5	0.4	0.4	0.3	Z	0.5	1.6	2.5	14.5	16.1	6.6	7.1	6.5	7.0	7.9	18.5	31.4	34.3	32.4	30.4	27.9	21.9	16.5	12.4	34.3	
7-Feb	Z	7.0	2.6	2.1	1.2	0.7	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	5.2	6.0	5.8	1.5	7.0	
8-Feb	2.4	Z	1.0	2.8	5.9	5.8	12.0	5.2	5.2	7.3	19.1	20.4	22.9	24.7	20.8	18.6	25.9	30.2	29.6	27.9	25.0	26.0	26.6	22.7	16.9	30.2	
9-Feb	23.4	31.0	Z	21.5	8.8	5.9	3.0	0.9	0.7	0.8	0.8	17.2	21.1	16.5	16.7	13.1	20.0	24.6	25.7	22.2	21.3	17.7	14.3	13.0	14.8	31.0	
10-Feb	17.0	28.5	21.7	Z	8.7	9.3	6.4	6.3	8.7	7.7	3.4	2.3	2.6	3.7	2.7	PF	1.6	2.7	2.4	1.2	1.0	4.0	13.6	27.5	8.3	28.5	
11-Feb	34.2	34.1	33.3	26.2	Z	25.1	27.1	26.5	21.3	17.2	3.7	1.2	0.6	1.7	14.9	20.6	8.6	0.9	0.8	0.6	0.4	0.3	0.3	0.3	13.0	34.2	
12-Feb	0.3	0.3	0.3	1.0	1.1	Z	0.5	0.4	26.3	25.2	12.3	12.3	13.6	16.4	21.9	23.2	24.7	34.3	37.3	37.0	37.2	35.8	35.4	35.2	18.8	37.3	
13-Feb	Z	27.1	25.1	26.8	14.0	3.2	1.5	11.3	9.6	1.3	0.8	1.4	1.4	2.7	2.1	3.0	1.2	2.0	1.5	4.6	11.0	10.2	5.9	6.0	7.6	27.1	
14-Feb	6.4	Z	4.9	9.2	7.3	11.1	8.1	6.4	19.1	13.8	M	M	M	M	17.2	17.3	18.9	24.2	23.9	20.9	20.7	22.1	23.1	26.7	15.9	26.7	
15-Feb	25.4	22.2	Z	17.9	18.3	21.1	19.5	16.1	10.6	6.1	M	M	M	2.1	1.2	4.5	16.2	10.7	19.1	27.4	25.2	18.3	20.5	15.2	24.1	16.3	27.4
16-Feb	18.3	20.6	22.2	Z	22.4	23.4	25.6	26.6	21.2	16.7	15.0	10.6	6.1	3.2	2.0	1.9	5.3	19.8	20.2	13.8	16.4	13.4	14.5	16.9	15.5	26.6	
17-Feb	21.0	28.2	24.1	15.8	Z	8.1	6.9	15.3	14.8	15.8	13.7	12.0	8.6	7.8	8.9	9.2	7.2	7.0	7.4	9.5	11.7	11.5	15.7	23.1	13.2	28.2	
18-Feb	22.0	21.7	19.1	15.7	13.6	Z	11.3	12.1	7.4	7.8	11.0	9.9	9.0	9.2	14.3	9.5	14.9	25.5	31.9	27.6	21.2	19.7	17.1	18.0	16.1	31.9	
19-Feb	Z	18.3	16.3	15.8	15.0	13.3	11.9	11.4	10.5	24.4	28.8	14.6	14.7	16.2	14.1	20.5	31.8	36.2	37.7	35.4	19.6	7.9	8.9	10.2	18.8	37.7	
20-Feb	15.2	Z	12.6	20.2	19.7	18.4	14.7	17.1	23.6	15.8	8.8	8.2	8.1	11.9	13.1	12.9	19.2	16.4	15.7	18.5	19.5	20.0	22.2	11.4	15.8	23.6	
21-Feb	10.8	12.1	Z	17.6	15.9	15.4	10.7	11.2	8.8	6.3	3.7	2.2	2.9	3.0	3.3	3.5	4.2	9.3	16.9	14.2	10.6	16.1	17.0	12.4	9.9	17.6	
22-Feb	8.6	6.6	3.8	Z	3.5	2.9	4.9	3.4	3.7	7.1	3.2	2.1	3.6	7.3	6.7	10.3	18.3	17.1	16.3	14.5	12.6	11.5	11.0	10.2	8.2	18.3	
23-Feb	10.5	11.0	13.0	15.7	Z	11.8	10.1	8.9	6.1	3.8	1.7	2.0	2.0	3.8	8.3	15.7	15.3	17.1	18.9	17.9	16.0	20.1	28.5	28.5	12.5	28.5	
24-Feb	28.7	26.9	25.2	11.2	9.6	Z	14.0	6.7	3.1	17.2	13.4	5.3	1.8	1.8	2.2	3.9	4.2	3.2	3.4	2.2	3.9	4.4	6.1	7.0	8.9	28.7	
25-Feb	Z	4.7	3.0	3.0	4.9	2.7	1.7	1.6	1.3	1.0	0.8	0.7	0.7	2.0	3.1	4.6	6.2	5.1	7.0	7.7	14.3	11.0	8.8	9.6	4.6	14.3	
26-Feb	8.0	Z	10.8	9.5	11.9	10.3	20.1	28.1	31.1	26.3	20.4	8.6	6.0	8.0	6.3	5.5	12.2	12.3	11.9	14.8	12.9	12.1	7.9	5.7	13.1	31.1	
27-Feb	2.7	1.0	Z	1.2	1.1	0.8	0.5	0.9	1.5	0.7	2.5	2.6	2.2	2.5	3.2	5.3	6.2	8.5	7.5	9.0	12.6	9.7	5.6	3.2	4.0	12.6	
28-Feb	8.8	10.5	9.9	Z	5.3	3.5	2.4	3.7	3.2	4.2	6.2	9.4	6.1	7.7	7.0	6.7	12.5	17.9	19.0	17.3	14.8	13.2	11.4	17.4	9.5	19.0	
		13.5	16.8	13.6	12.6	10.7	12.1	11.0	11.2	11.8	11.2	9.9	8.1	8.2	8.7	9.9	11.2	13.4	16.5	16.6	15.5	14.4	14.6	14.9	14.9	Diurnal Average	
		34.2	34.1	33.3	27.0	27.0	29.1	33.3	37.9	41.0	40.3	32.4	26.4	22.9	24.7	27.2	28.5	31.8	36.2	37.7	37.0	37.2	35.8	35.4	35.2	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**  
**Ells River - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Ells River - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	496	78.48	78.48
21 - 40	135	21.36	99.84
41 - 80	1	0.16	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 632

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Ells River - February 2023**

<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	27	113	39	21	8	4	10	22	51	57	16	34	35	24	18	8	487
21 - 40	14	13	3	5	2	3	2	7	18	19	6	5	9	11	12	6	135
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
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	126	42	26	10	7	12	29	69	76	22	39	44	35	30	15	623

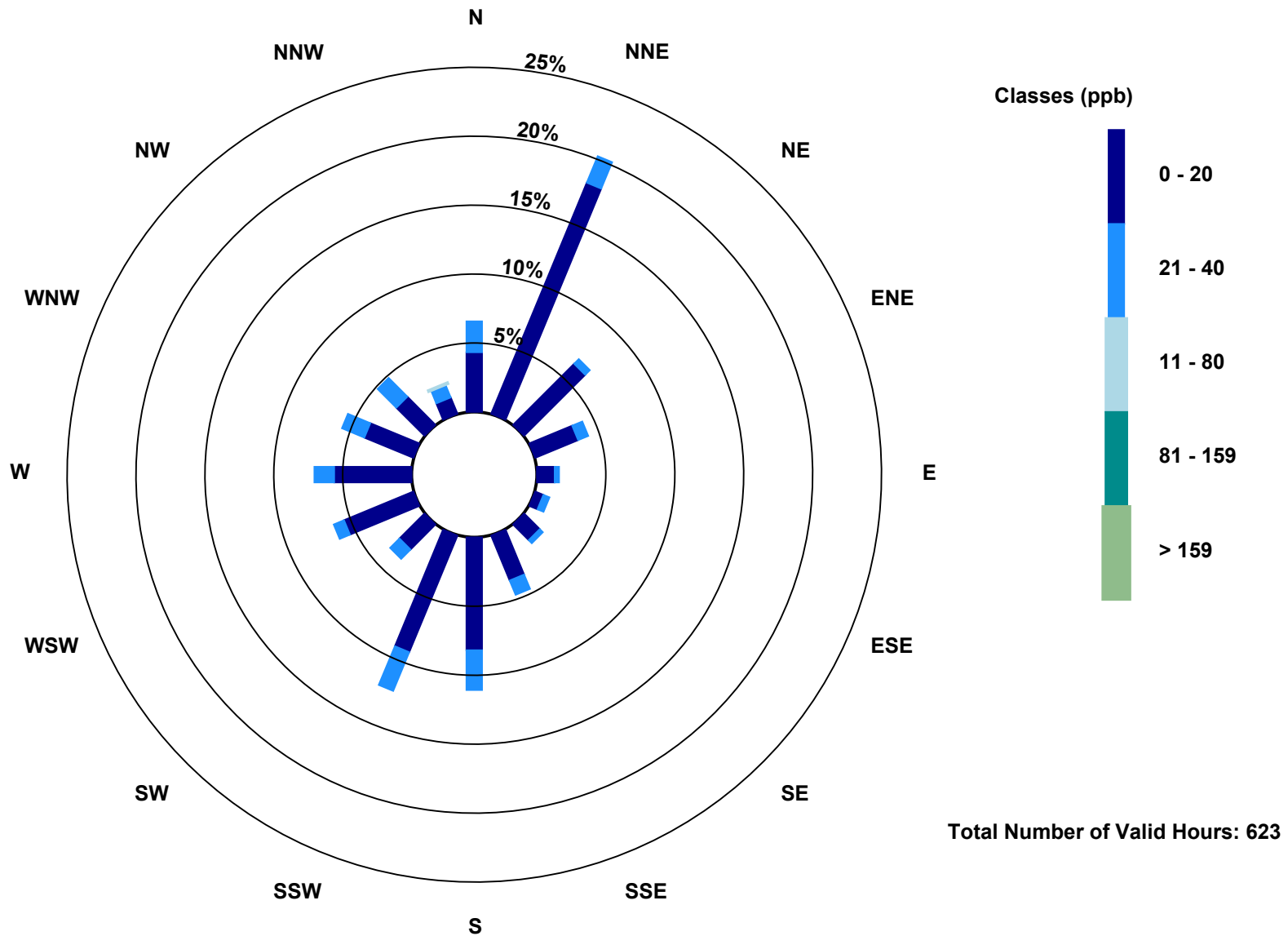
Total Number of Valid Hours: 623

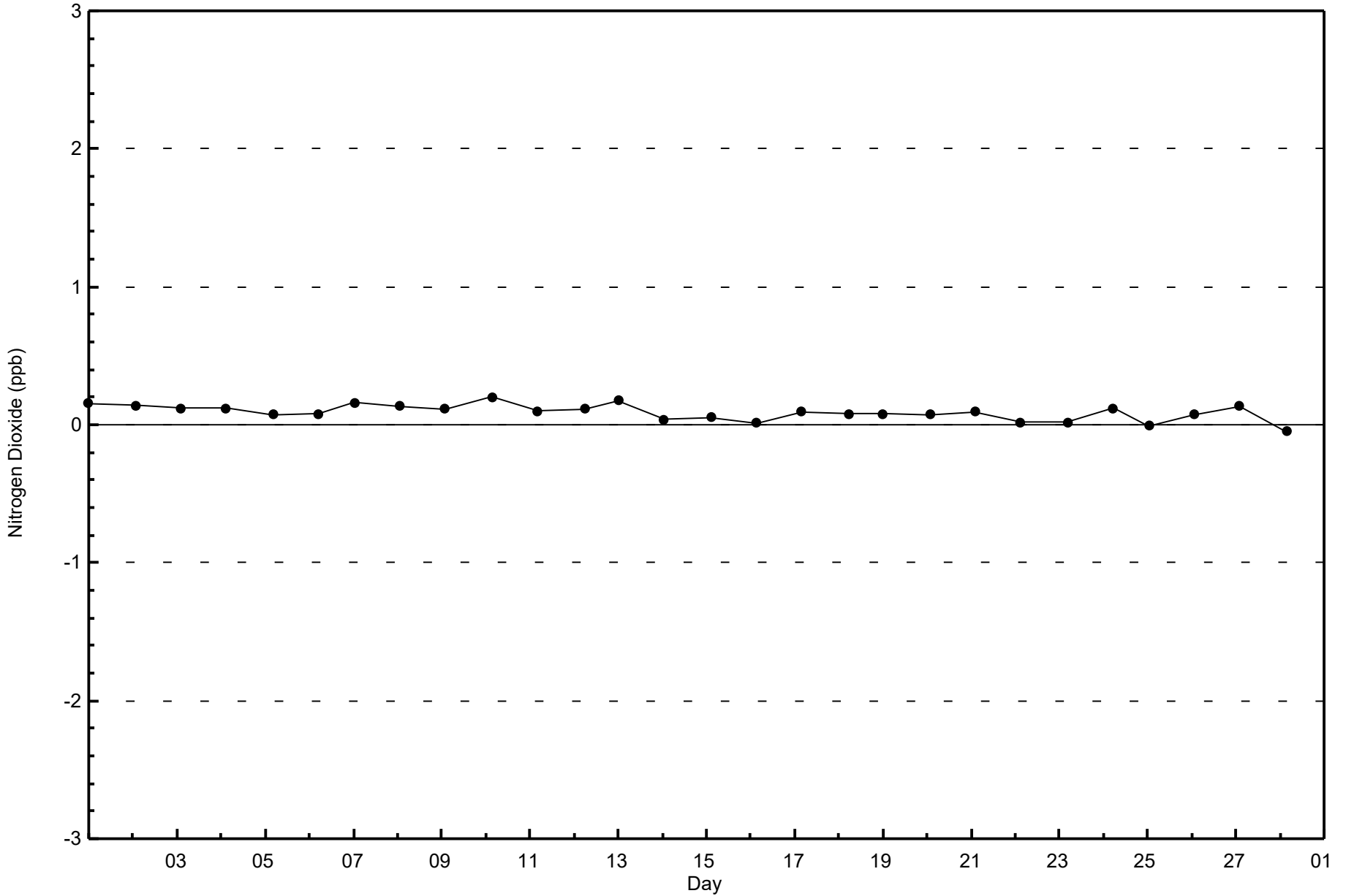
Total Number of Hours: 672

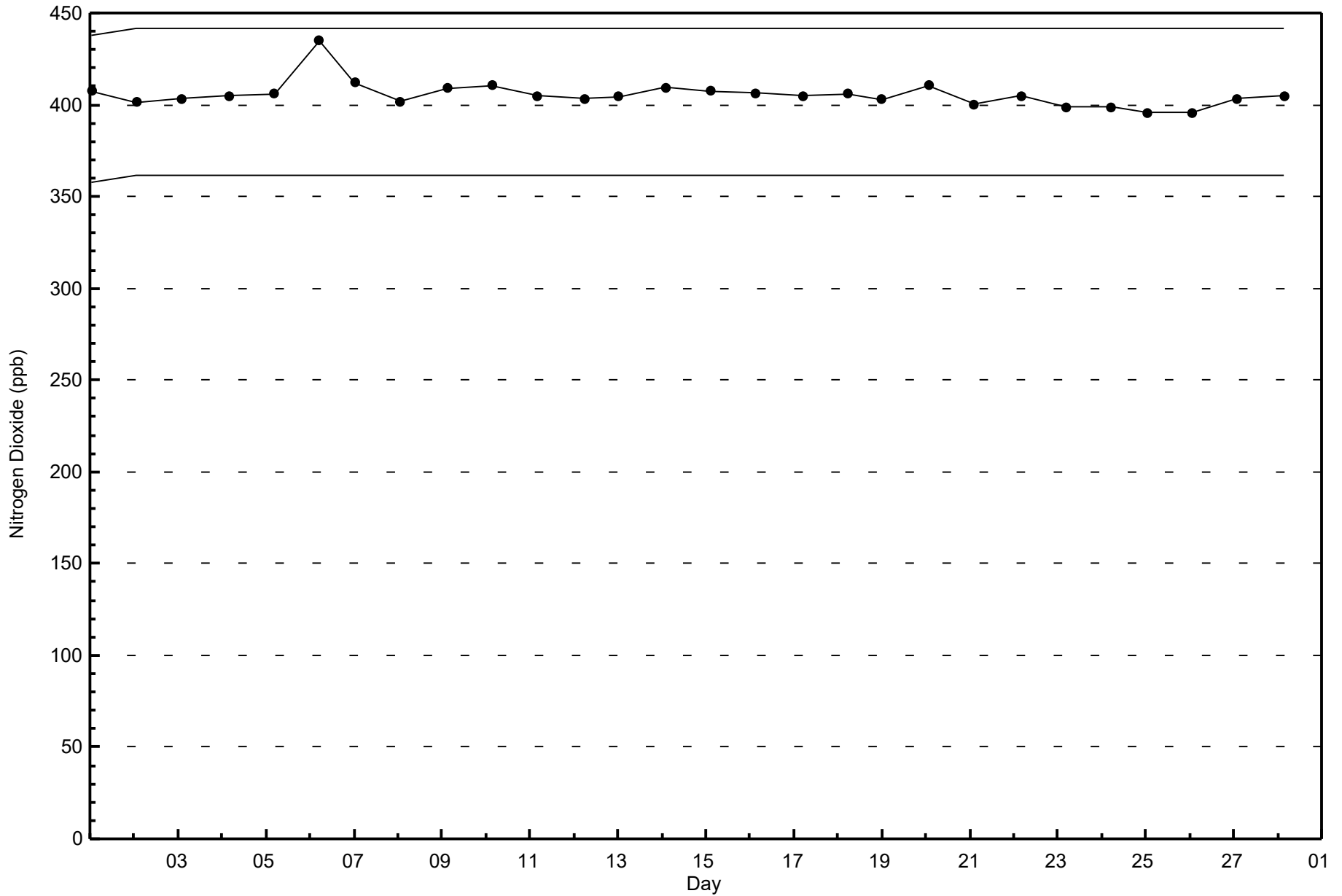


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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







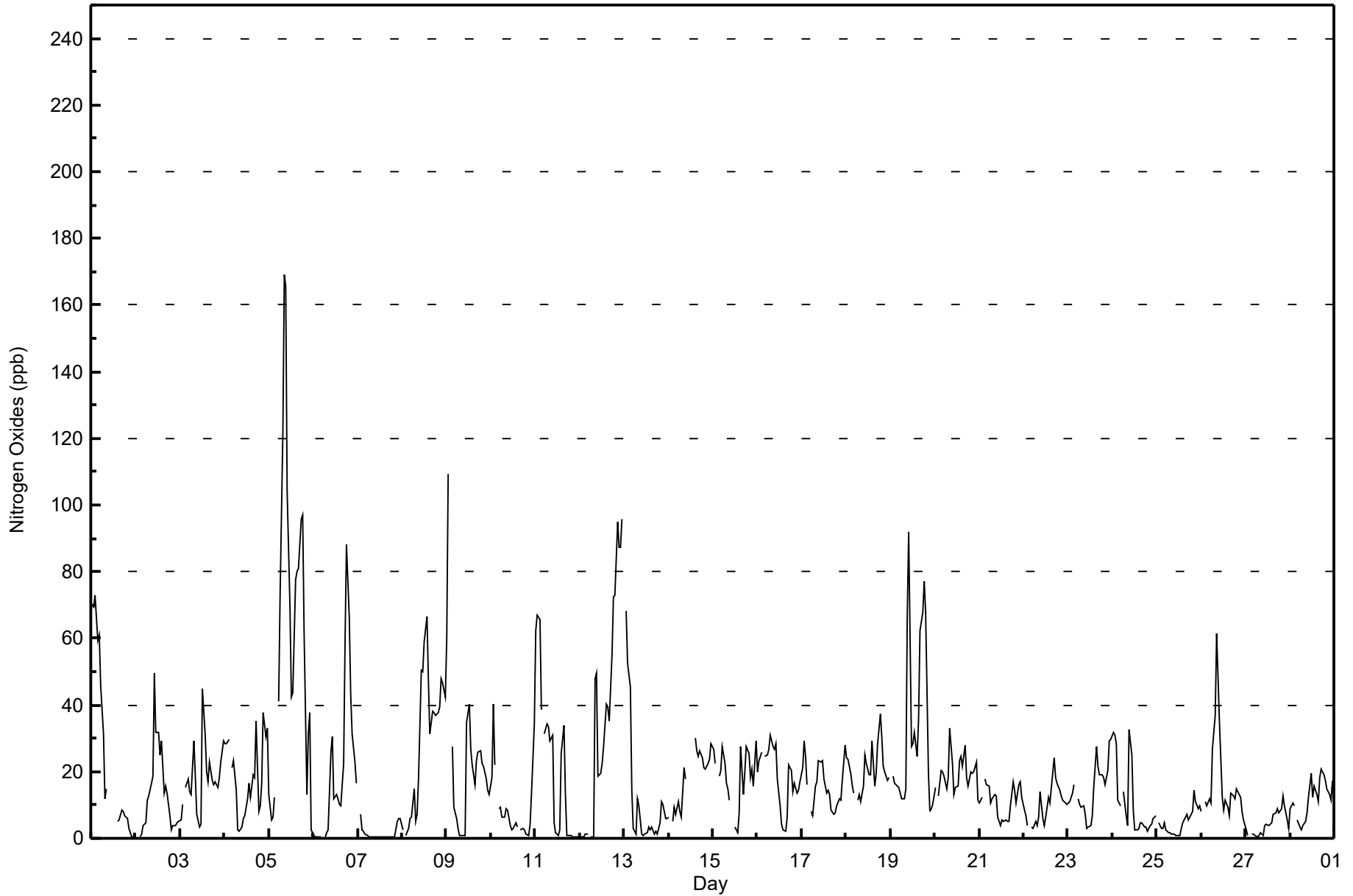


**Wood Buffalo Environmental Association**  
**Summary of Hour Averages**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Ells River - February 2023**

Maximum Value: 169.3 ppb on Feb 5 09:00      Maximum Daily Average: 62.9 ppb on Feb 5																						Hours in Service: 672 Hours of Data: 632					
Minimum Value: 0.3 ppb on Feb 2 01:00      Minimum Daily Average: 1.6 ppb on Feb 7																						Hours of Missing Data: 40 Hours of Calibration: 33					
Maximum Diurnal Average: 26.1 ppb at hour 2      Minimum Diurnal Average: 12.4 ppb at hour 5																						Percent Operational Time: 99.0					
Monthly Average: 18.47 ppb      Percentiles: P <sub>1</sub> = 0.4 P <sub>10</sub> = 1.3 Q <sub>1</sub> = 5.2 Median = 13.2 Q <sub>3</sub> = 23.5 P <sub>90</sub> = 39.2 P <sub>99</sub> = 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-Feb	Z	69.3	72.7	59.3	60.9	45.6	31.2	12.0	14.7	C	C	C	C	C	5.1	5.4	8.5	7.9	6.7	6.0	3.1	1.8	0.6	0.3	22.8	72.7	
2-Feb	0.3	Z	0.3	1.3	3.7	4.5	11.3	12.6	16.4	18.7	49.6	31.9	31.9	25.1	29.3	13.5	15.5	13.6	6.8	2.7	3.9	3.9	4.5	5.2	13.3	49.6	
3-Feb	5.7	10.3	Z	15.1	17.6	13.8	13.0	29.4	18.8	7.0	3.6	4.2	44.7	30.8	19.8	16.9	23.0	17.2	16.0	16.9	15.2	18.4	22.7	29.1	17.8	44.7	
4-Feb	28.5	28.6	29.6	Z	21.0	23.5	14.3	2.4	2.0	3.3	6.0	6.8	12.0	16.6	12.1	18.9	18.4	35.3	8.1	9.8	16.5	37.8	30.6	33.1	18.1	37.8	
5-Feb	13.2	5.7	6.3	12.1	Z	41.3	72.4	122.3	169.3	165.6	104.0	69.5	42.4	43.7	77.6	80.3	80.7	95.6	97.1	61.9	13.2	31.5	37.6	2.6	62.9	169.3	
6-Feb	0.6	0.6	0.5	0.5	0.4	Z	0.5	1.8	2.7	26.0	30.7	11.7	13.2	11.7	10.2	9.6	22.3	58.8	88.3	65.9	43.2	31.4	22.8	16.6	20.4	88.3	
7-Feb	Z	7.1	2.7	2.2	1.3	0.8	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	5.3	6.0	5.8	1.6	7.1	
8-Feb	2.4	Z	1.0	2.8	5.9	6.2	14.8	5.2	7.1	17.8	50.4	50.1	58.8	66.4	47.3	31.5	38.2	37.5	37.0	37.7	39.2	47.8	46.5	42.2	30.2	66.4	
9-Feb	60.0	109.2	Z	27.7	9.3	5.9	3.0	0.9	0.7	0.8	0.9	34.7	40.2	26.7	22.2	16.1	23.5	26.0	26.2	22.4	21.6	18.0	14.5	13.2	22.8	109.2	
10-Feb	18.1	40.3	22.1	Z	8.8	9.4	6.5	6.4	9.1	8.5	3.9	2.7	3.1	4.7	3.5	PF	2.4	2.8	2.4	1.2	1.0	4.0	13.7	34.2	9.5	40.3	
11-Feb	62.1	67.1	65.8	38.6	Z	31.3	34.3	33.5	29.2	31.0	4.7	1.8	0.7	2.5	25.2	34.0	13.3	1.0	0.9	0.7	0.5	0.4	0.4	0.4	20.8	67.1	
12-Feb	0.4	0.4	0.4	1.1	1.2	Z	0.6	0.5	48.0	49.4	18.8	19.5	22.3	27.7	40.2	39.5	35.0	55.1	72.4	73.0	95.1	87.2	87.5	95.7	37.9	95.7	
13-Feb	Z	68.3	52.6	45.3	14.4	3.2	1.5	11.7	9.8	1.3	0.8	1.5	1.6	3.2	2.4	3.5	1.2	2.0	1.5	4.6	11.0	10.2	5.9	6.0	11.5	68.3	
14-Feb	6.4	Z	4.9	9.2	7.3	11.1	8.1	6.4	21.2	17.9	M	M	M	M	30.2	26.3	24.6	26.3	24.0	21.0	20.8	22.6	23.7	28.5	17.9	30.2	
15-Feb	26.8	22.7	Z	18.5	20.3	27.5	22.5	16.6	14.7	11.5	M	M	M	3.6	1.8	7.5	27.7	13.2	20.0	27.7	25.3	18.4	20.9	15.5	29.3	18.7	29.3
16-Feb	20.0	23.2	25.9	Z	24.5	24.9	26.9	31.0	27.5	26.6	28.5	17.7	9.9	4.4	2.5	2.3	6.4	22.2	20.5	13.9	16.5	13.5	14.6	16.9	18.3	31.0	
17-Feb	21.1	29.0	24.4	15.9	Z	8.2	6.9	15.6	16.9	23.2	23.1	23.5	17.8	13.7	14.5	13.1	8.4	7.3	7.5	9.6	11.8	11.5	17.5	27.8	16.0	29.0	
18-Feb	24.3	23.5	19.6	15.9	13.7	Z	11.6	13.1	11.0	15.5	24.9	22.5	19.1	19.2	29.3	15.6	19.6	28.5	37.4	30.2	21.5	19.9	17.3	18.1	20.5	37.4	
19-Feb	Z	18.5	16.5	16.0	15.2	13.5	12.0	12.0	14.7	66.9	91.9	27.5	28.6	31.6	24.8	35.6	62.2	67.7	77.1	67.7	19.7	7.9	8.9	10.2	32.5	91.9	
20-Feb	15.3	Z	12.6	20.3	19.8	18.5	14.9	18.1	33.2	22.7	13.3	15.1	15.6	23.5	24.4	21.4	27.9	18.0	15.7	19.7	19.5	20.0	22.9	11.4	19.3	33.2	
21-Feb	10.8	12.1	Z	17.9	15.9	15.5	10.7	11.8	13.0	12.9	6.3	3.9	5.4	5.3	5.5	5.3	5.2	9.8	17.0	14.3	10.6	16.1	17.1	12.4	11.1	17.9	
22-Feb	8.6	6.6	3.8	Z	3.6	3.0	5.2	3.7	6.2	13.9	6.0	3.6	6.2	12.4	10.7	15.2	24.1	18.3	16.4	14.5	12.6	11.5	11.0	10.2	9.9	24.1	
23-Feb	10.5	11.0	13.6	16.1	Z	11.9	10.2	9.4	9.8	7.3	3.0	3.3	3.6	6.8	15.2	27.7	21.8	19.0	19.0	18.2	16.1	20.4	29.3	29.8	14.5	29.8	
24-Feb	31.8	30.8	28.5	11.5	9.7	Z	14.1	6.9	3.8	32.8	25.0	8.6	2.4	2.4	2.8	4.6	4.6	3.2	3.4	2.2	3.9	4.4	6.1	7.0	10.9	32.8	
25-Feb	Z	4.7	3.0	3.0	4.9	2.7	1.7	1.6	1.4	1.2	1.0	0.9	0.8	2.9	4.5	6.2	7.4	5.4	7.2	7.9	14.5	11.0	8.8	9.6	4.9	14.5	
26-Feb	8.0	Z	10.9	9.6	12.0	10.4	26.6	36.7	61.5	48.2	34.7	12.3	8.5	11.6	9.1	6.7	13.4	12.7	12.0	14.9	13.0	12.2	8.0	5.7	17.3	61.5	
27-Feb	2.7	1.0	Z	1.3	1.1	0.8	0.5	0.9	1.7	0.9	3.8	4.4	3.6	4.1	4.9	7.1	7.5	9.1	7.5	9.0	12.6	9.7	5.6	3.2	4.5	12.6	
28-Feb	8.8	10.5	9.9	Z	5.3	3.6	2.4	4.0	5.1	7.7	12.2	19.7	12.4	15.7	13.2	11.1	18.1	20.9	19.2	17.3	14.8	13.3	11.5	17.6	11.9	20.9	
16.8   26.1   18.6   15.7   12.4   14.0   13.5   15.2   20.4   23.7   21.9   15.9   15.7   15.9   17.7   18.4   19.5   22.9   24.1   21.0   17.5   18.3   18.3   18.6																						Diurnal Average					
62.1   109.2   72.7   59.3   60.9   45.6   72.4   122.3   169.3   165.6   104.0   69.5   58.8   66.4   77.6   80.3   80.7   95.6   97.1   73.0   95.1   87.2   87.5   95.7																						Diurnal Maximum					
Z - zerspan      C - Calibration      M - Maintenance      PF - Power Failure																											







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Ells River - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	442	69.94	69.94
21 - 40	131	20.73	90.66
41 - 80	45	7.12	97.78
81 - 159	11	1.74	99.53
> 159	2	0.32	99.84

Total Number of Valid Hours: 632

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Ells River - February 2023**

<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	105	35	10	7	4	10	17	40	53	16	34	34	24	18	7	433
21 - 40	14	18	6	16	3	2	2	7	18	17	5	2	6	7	3	5	131
11 - 80	8	3	1	0	0	1	0	4	7	5	1	3	3	3	4	2	45
81 - 159	0	0	0	0	0	0	0	1	3	1	0	0	0	1	5	0	11
> 159	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2
<b>Totals</b>	41	126	42	26	10	7	12	29	68	76	22	39	44	35	30	15	622

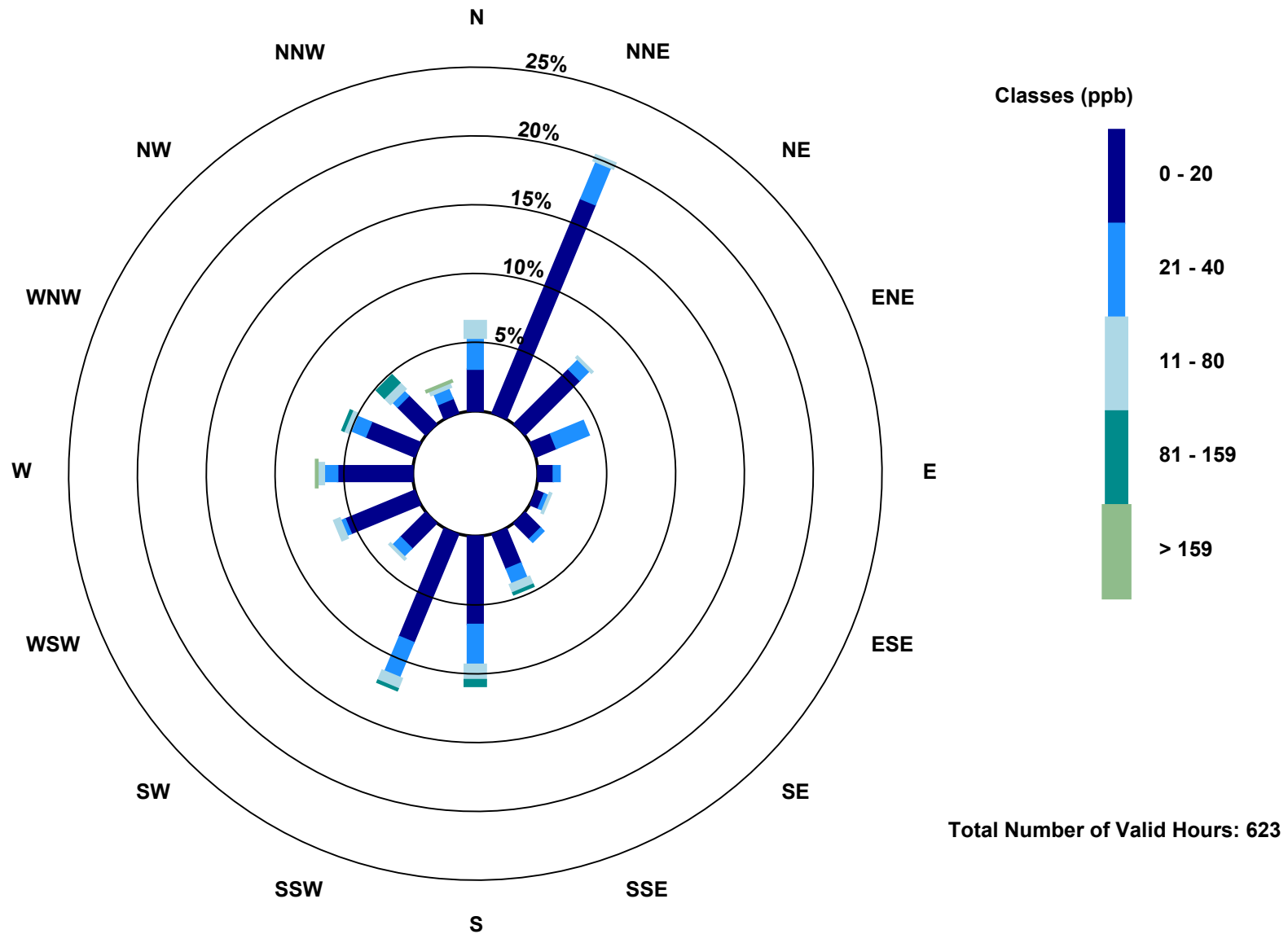
Total Number of Valid Hours: 623

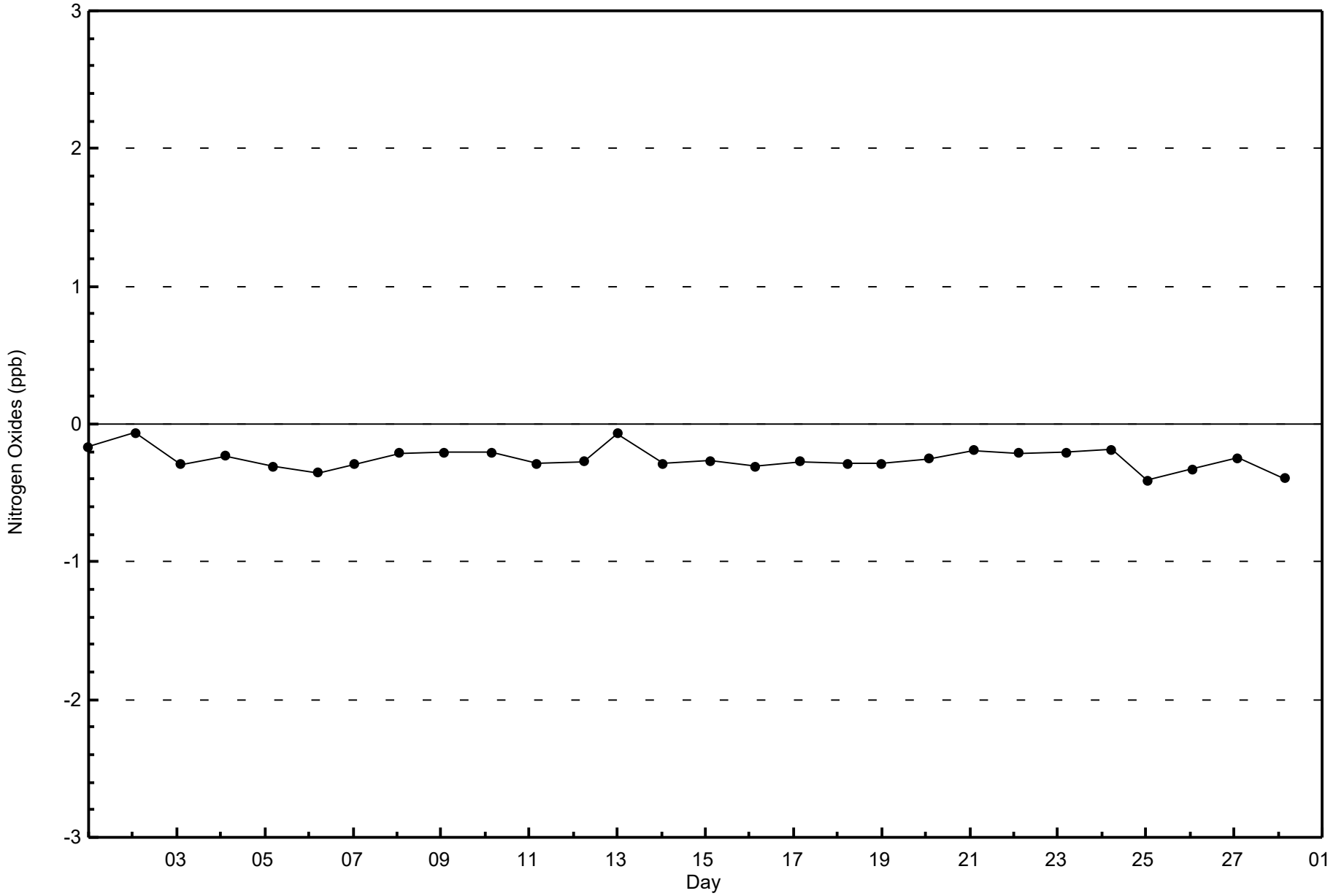
Total Number of Hours: 672

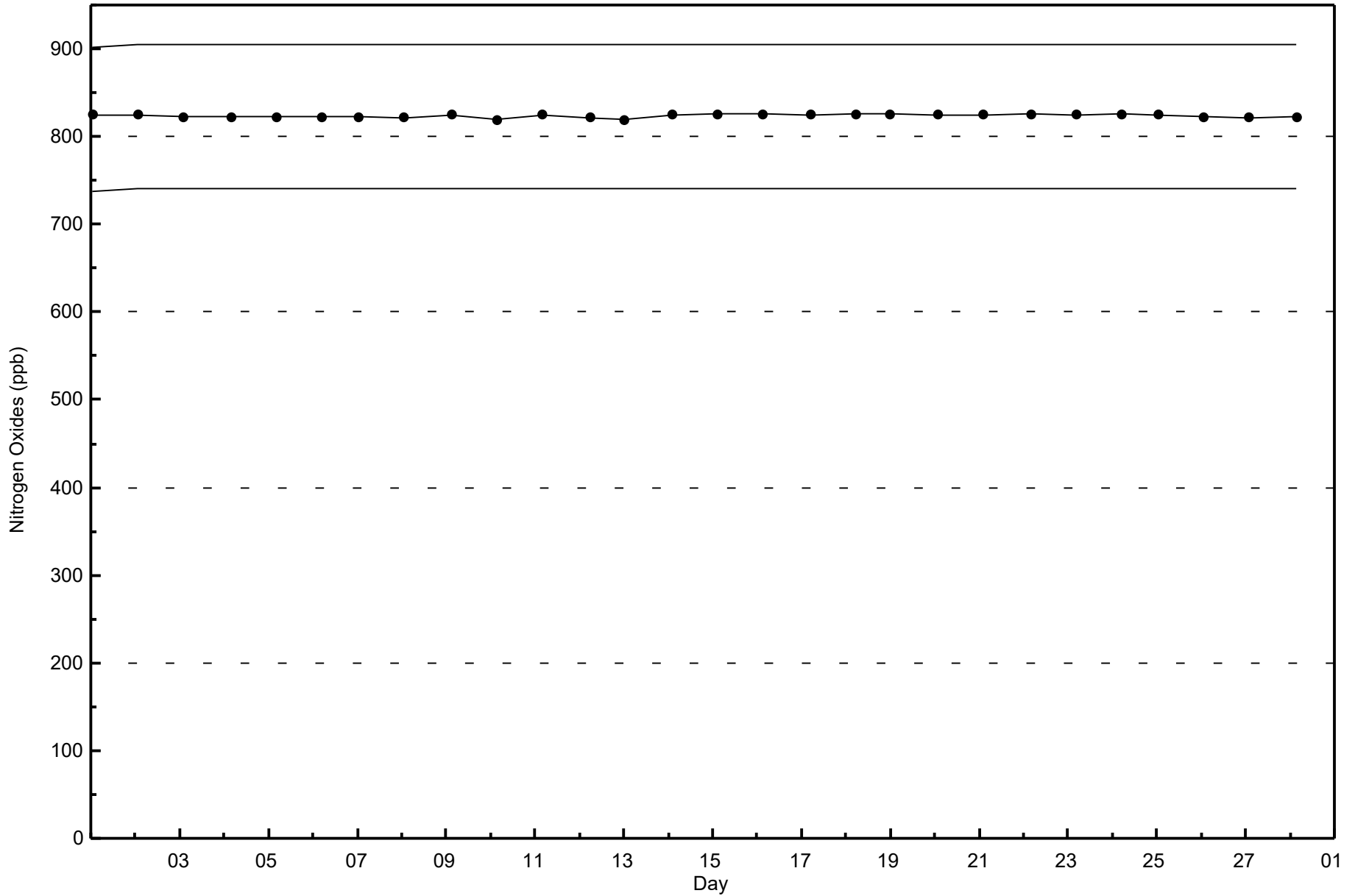


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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









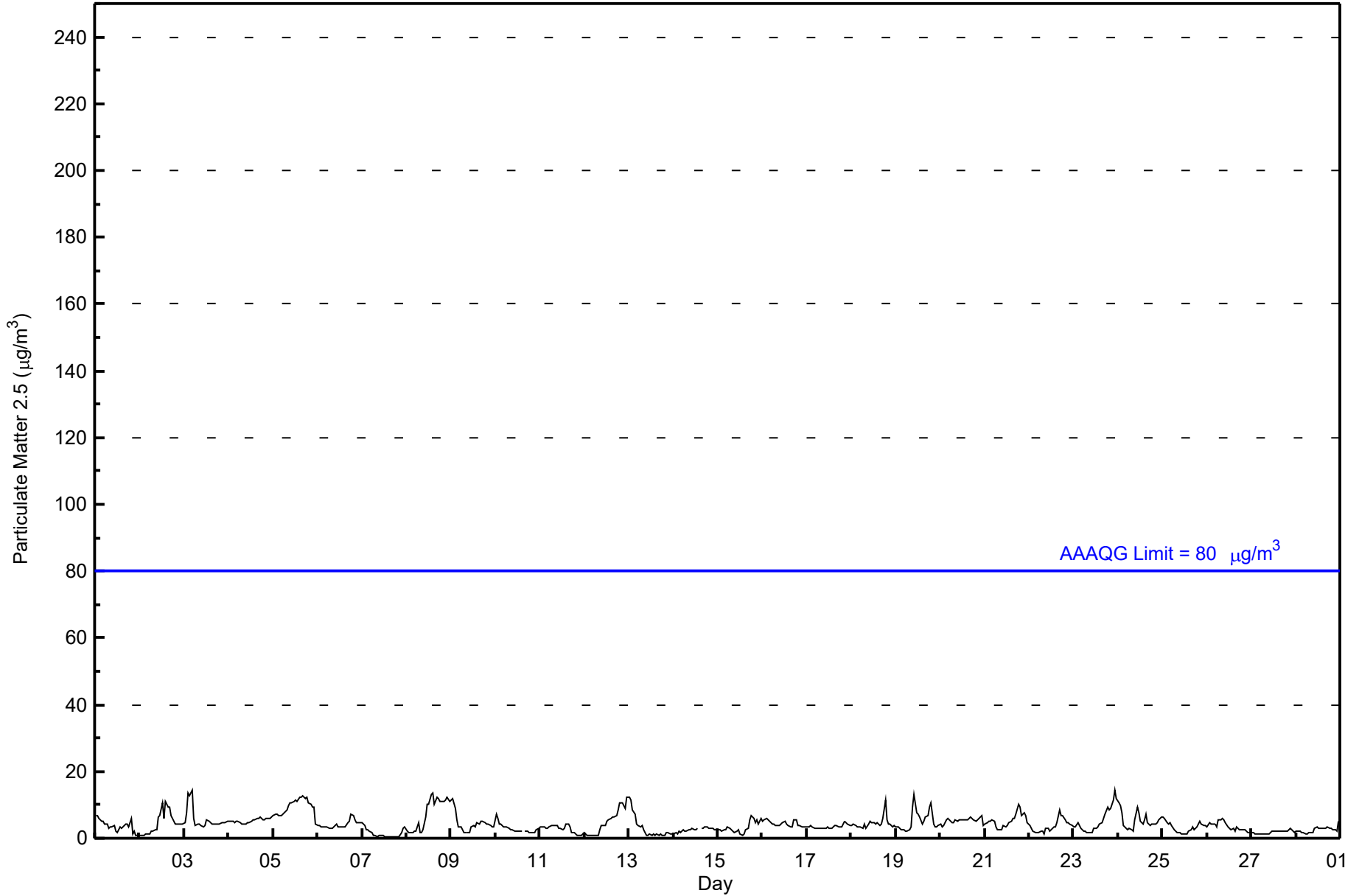
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Ells River - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														672							
Maximum Value: 14.5 µg/m <sup>3</sup> on Feb 23 23:00		Maximum Daily Average: 9.5 µg/m <sup>3</sup> on Feb 5		Hours of Data:														670									
Minimum Value: 0.3 µg/m <sup>3</sup> on Feb 7 18:00		Minimum Daily Average: 1.4 µg/m <sup>3</sup> on Feb 7		Hours of Missing Data:														2									
Maximum Diurnal Average: 5.5 µg/m <sup>3</sup> at hour 19		Minimum Diurnal Average: 3.0 µg/m <sup>3</sup> at hour 8		Hours of Calibration:														0									
Monthly Average: 4.24 µg/m <sup>3</sup>		Percentiles: P <sub>1</sub> = 0.5 P <sub>10</sub> = 1.5 Q <sub>1</sub> = 2.4 Median = 3.6 Q <sub>3</sub> = 5.3 P <sub>90</sub> = 7.6 P <sub>99</sub> = 12.7		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-Feb	6.9	6.7	5.9	5.1	4.9	4.3	4.0	2.8	3.6	3.5	3.7	2.2	1.6	3.2	3.1	3.4	4.2	4.0	3.4	6.0	1.5	1.9	1.0	1.0	3.7	6.9	
2-Feb	1.0	1.0	1.0	1.1	1.3	1.3	2.1	2.0	2.5	2.7	6.4	6.7	10.4	6.0	11.0	9.1	9.5	6.7	4.9	4.2	4.2	4.0	4.2	4.4	4.5	11.0	
3-Feb	4.6	7.7	13.7	12.7	14.4	5.7	3.9	4.4	4.4	3.9	3.6	3.7	5.7	5.3	4.7	4.4	4.3	4.2	4.3	4.4	4.7	4.8	4.8	5.1	5.8	14.4	
4-Feb	5.1	5.2	5.3	4.9	5.0	4.9	4.5	4.3	4.3	4.2	4.5	4.6	4.9	5.3	5.5	6.0	6.1	6.4	5.6	5.4	5.8	6.1	6.1	6.5	5.3	6.5	
5-Feb	6.9	7.0	7.0	6.7	6.8	7.3	7.6	8.6	9.6	10.6	10.7	10.8	11.2	11.0	12.3	12.2	12.7	12.1	12.3	10.7	10.3	9.4	9.3	4.3	9.5	12.7	
6-Feb	3.8	3.7	3.6	3.4	3.2	3.2	3.1	2.9	2.8	3.7	4.1	3.2	3.3	3.3	3.2	3.4	4.7	5.3	7.0	6.7	5.5	4.8	4.5	4.7	4.1	7.0	
7-Feb	4.7	3.6	2.6	2.5	2.3	1.6	0.9	0.7	0.6	0.6	0.7	0.7	0.6	0.5	0.4	0.4	0.4	0.3	0.4	0.3	0.4	1.9	2.9	3.2	1.4	4.7	
8-Feb	2.1	1.8	1.7	1.7	2.2	2.1	4.8	1.8	1.5	2.7	6.5	10.3	10.0	13.3	13.4	10.1	12.1	12.0	10.9	10.9	11.0	11.6	12.3	11.1	7.4	13.4	
9-Feb	11.6	12.1	8.9	5.4	3.5	3.2	2.6	1.7	1.5	1.6	1.9	3.3	3.7	3.4	4.7	4.2	5.1	4.9	4.8	4.3	4.2	3.7	3.2	3.3	4.4	12.1	
10-Feb	7.4	6.0	4.4	4.1	3.4	3.5	3.3	3.0	2.5	2.5	2.1	2.0	2.2	2.2	2.2	PF	1.9	1.9	1.8	1.8	1.7	1.8	2.4	3.0	2.9	7.4	
11-Feb	3.3	3.4	3.4	3.1	2.8	3.3	3.8	4.0	4.0	4.0	2.8	2.9	2.7	2.8	4.2	4.4	3.2	1.9	1.6	1.2	0.8	0.8	0.8	1.4	2.8	4.4	
12-Feb	1.6	1.0	0.8	0.8	0.8	0.7	0.7	0.8	2.7	3.7	3.8	4.0	5.0	5.3	5.9	6.4	6.6	6.9	8.5	10.5	10.5	9.6	8.9	12.2	4.9	12.2	
13-Feb	12.3	11.3	8.4	7.2	4.2	3.9	3.5	3.8	2.4	1.0	0.9	1.4	0.9	1.1	1.0	1.2	0.8	1.1	0.7	1.1	1.7	1.7	1.4	1.2	3.1	12.3	
14-Feb	1.4	1.5	1.4	1.9	1.6	2.4	2.0	2.0	2.3	2.6	2.8	2.5	2.7	2.9	M	2.9	3.1	3.2	3.2	2.9	2.9	3.0	2.6	2.7	2.5	3.2	
15-Feb	2.5	2.4	2.1	2.4	2.6	3.2	2.9	2.5	2.2	1.8	2.0	2.3	1.2	1.0	1.2	2.5	2.5	2.8	5.3	6.7	6.0	4.9	5.6	4.3	6.0	3.2	6.7
16-Feb	5.2	5.5	5.8	5.5	5.0	4.2	4.1	4.0	3.7	3.9	4.4	4.7	5.2	4.3	3.6	3.3	3.2	5.6	5.6	4.0	4.0	3.6	3.5	3.4	4.4	5.8	
17-Feb	3.4	3.6	3.9	3.4	3.1	2.9	2.8	3.1	3.0	2.9	2.8	3.3	3.1	3.1	3.4	3.7	3.7	3.5	3.4	3.5	5.1	4.5	4.1	3.9	3.5	5.1	
18-Feb	3.9	4.3	3.9	3.6	3.3	3.2	3.2	4.1	3.0	4.1	5.0	4.7	4.5	4.2	4.6	3.9	4.3	5.8	11.5	5.4	4.3	4.3	3.6	3.6	4.4	11.5	
19-Feb	3.6	3.5	3.1	2.6	2.6	2.3	2.2	2.4	3.3	9.2	13.2	7.5	7.1	6.2	4.3	5.1	6.5	6.6	9.5	10.7	4.3	3.4	3.6	3.6	5.3	13.2	
20-Feb	4.1	3.6	3.8	5.7	5.9	5.4	4.6	4.8	5.6	5.2	5.4	5.4	5.3	5.4	5.6	5.5	6.2	6.0	5.6	5.1	5.5	5.9	6.7	3.9	5.3	6.7	
21-Feb	4.4	4.8	4.9	5.3	5.6	5.1	3.5	2.6	2.5	2.7	3.8	3.5	3.9	4.5	5.2	5.8	6.0	7.1	10.0	9.4	6.9	7.7	6.9	4.8	5.3	10.0	
22-Feb	3.8	2.9	2.2	1.6	1.9	1.7	2.2	2.0	1.4	3.0	3.1	2.2	2.4	3.6	3.5	4.9	8.6	6.7	6.7	5.7	4.8	4.5	4.2	3.8	3.6	8.6	
23-Feb	3.4	3.4	4.5	3.8	3.0	2.3	2.0	1.7	1.7	1.6	1.8	2.9	3.2	3.5	4.1	4.8	5.8	7.1	9.1	8.5	8.9	11.4	14.5	11.8	5.2	14.5	
24-Feb	10.7	9.7	7.5	3.8	3.0	2.3	3.1	2.5	2.3	5.5	9.4	7.6	5.0	4.4	5.5	7.2	4.6	4.0	4.3	4.1	4.4	4.9	5.7	6.5	5.3	10.7	
25-Feb	6.6	5.9	4.8	4.3	4.5	3.6	2.3	2.0	1.8	1.6	1.4	1.2	1.1	1.3	2.2	2.6	3.2	2.6	3.3	4.1	5.0	4.4	3.9	3.8	3.2	6.6	
26-Feb	3.4	4.8	4.4	4.0	4.4	3.6	5.3	5.6	6.0	5.4	4.5	3.5	3.0	2.7	2.8	2.3	3.2	2.7	2.5	2.6	2.7	2.1	1.8	1.6	3.5	6.0	
27-Feb	1.6	1.6	1.4	1.3	1.3	1.4	1.4	1.3	1.4	1.5	1.8	2.1	2.1	2.2	2.1	2.2	2.2	2.1	2.1	2.2	2.4	2.8	2.0	1.7	1.8	2.8	
28-Feb	2.1	2.2	2.3	1.8	1.5	1.3	1.2	1.5	1.5	1.9	3.1	3.5	3.1	3.2	3.1	2.9	3.2	3.3	3.1	3.0	2.6	2.4	2.2	4.9	2.5	4.9	
																								Diurnal Average			
																								Diurnal Maximum			
4.7 4.6 4.4 3.9 3.7 3.2 3.1 3.0 3.0 3.5 4.1 4.0 4.1 4.1 4.5 4.6 4.9 5.0 5.5 5.2 4.7 4.7 4.7 4.6																											
12.3 12.1 13.7 12.7 14.4 7.3 7.6 8.6 9.6 10.6 13.2 10.8 11.2 13.3 13.4 12.2 12.7 12.1 12.3 10.9 11.0 11.6 14.5 12.2																											
M - Maintenance		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>) -  $\mu\text{g}/\text{m}^3$**   
**Ells River - February 2023**

<b>Concentration Ranges (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	523	78.06	78.06
6 - 15	147	21.94	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: 670

Total Number of Hours: 672



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

**Particulate Matter 2.5 (PM<sub>2.5</sub>) -  $\mu\text{g}/\text{m}^3$**   
**Ells River - February 2023**

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	31	119	34	23	12	6	11	19	45	62	19	37	36	30	20	11	515
6 - 15	11	14	8	5	0	1	2	11	29	18	5	3	9	9	14	6	145
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>	42	133	42	28	12	7	13	30	74	80	24	40	45	39	34	17	660

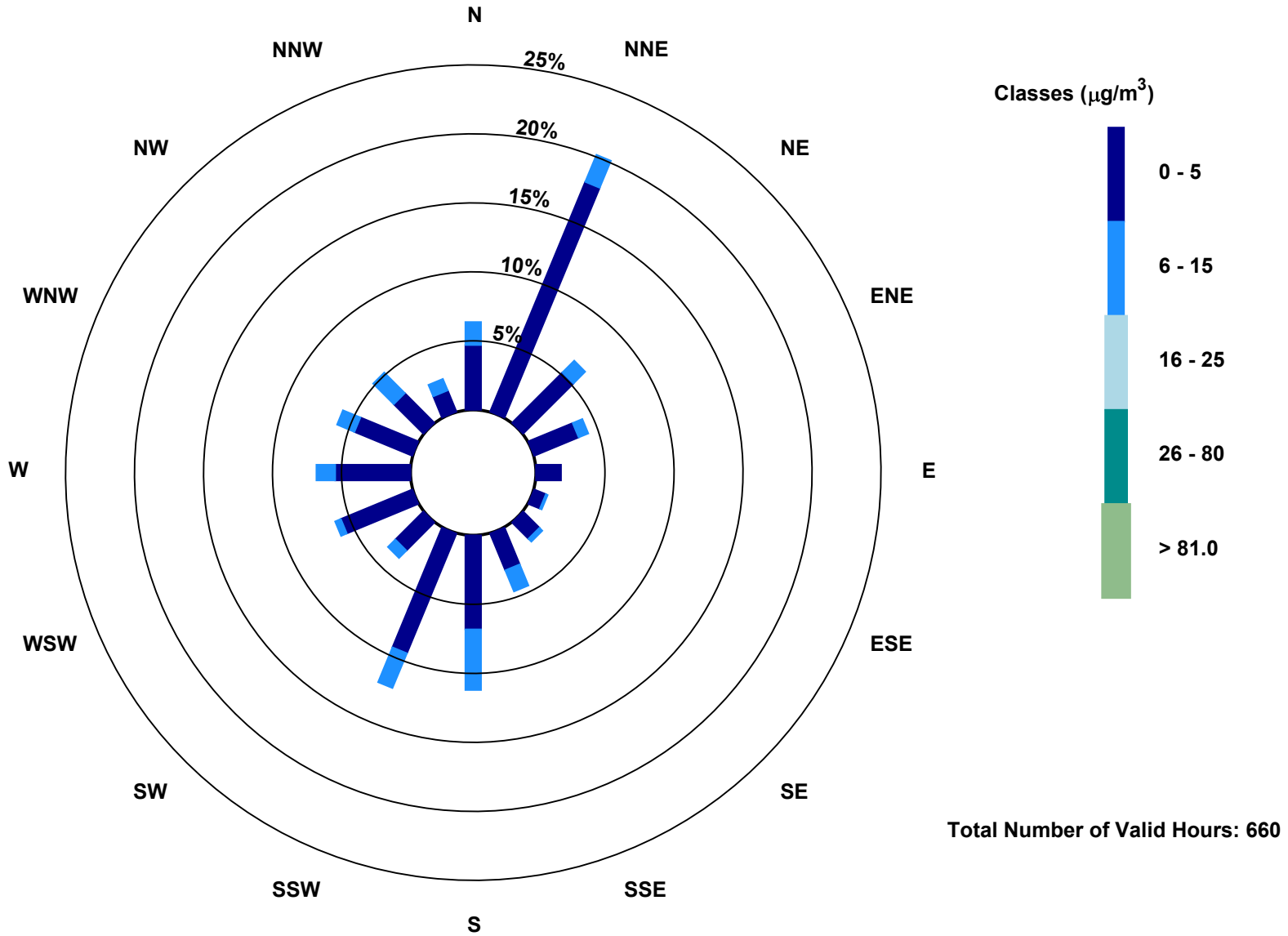
Total Number of Valid Hours: 660

Total Number of Hours: 672



**Wood Buffalo Environmental Association**  
**Wind Rose Feb 2023**

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





**Wood Buffalo Environmental Association**

**Summary of Hour Averages**

**Ambient Temperature (AT) - C**

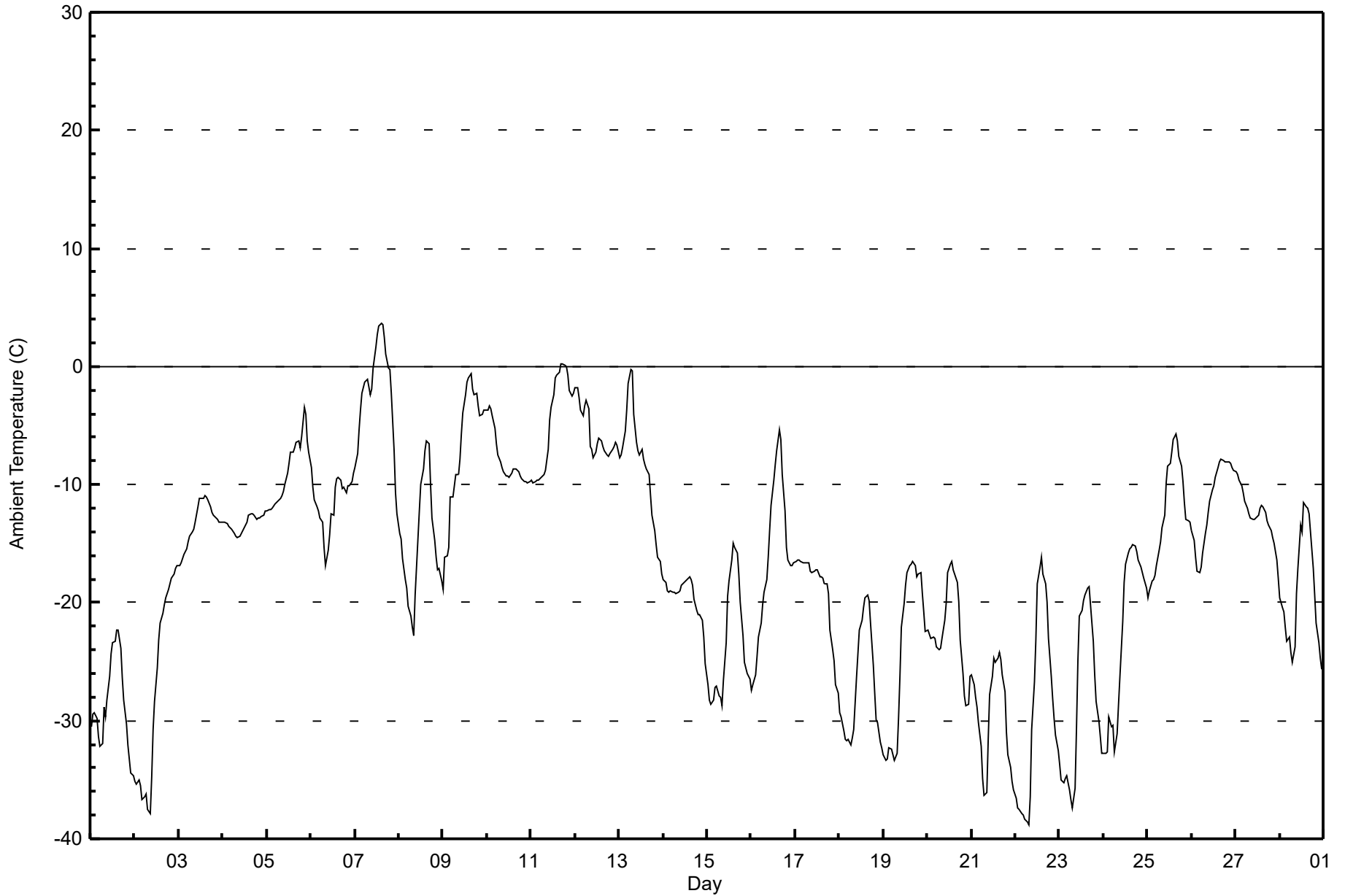
**Ells River - February 2023**

Maximum Value: 3.6 C on Feb 7 15:00		Maximum Daily Average: -2.1 C on Feb 7		Hours in Service: 672																						
Minimum Value: -38.8 C on Feb 22 08:00		Minimum Daily Average: -29.6 C on Feb 21		Hours of Data: 672																						
Maximum Diurnal Average: -12.0 C at hour 16		Minimum Diurnal Average: -19.9 C at hour 7		Hours of Missing Data: 0																						
Monthly Average: -16.80 C		Percentiles: P <sub>1</sub> = -37.5 P <sub>10</sub> = -31.0 Q <sub>1</sub> = -23.2 Median = -16.3 Q <sub>3</sub> = -9.6 P <sub>90</sub> = -5.5 P <sub>99</sub> = 0.5		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-Feb	-30.5	-29.4	-29.4	-29.8	-31.3	-32.2	-31.9	-28.9	-29.7	-28.2	-26.3	-24.4	-23.3	-23.3	-22.3	-22.3	-23.8	-26.4	-28.2	-30.3	-32.1	-33.3	-34.4	-34.6	-28.6	-22.3
2-Feb	-35.1	-35.4	-35.0	-35.5	-36.7	-36.4	-36.2	-37.5	-37.9	-34.8	-30.8	-28.3	-25.5	-23.1	-21.8	-20.9	-20.2	-19.6	-18.9	-18.4	-17.9	-17.5	-17.1	-16.8	-27.4	-16.8
3-Feb	-16.9	-16.7	-16.2	-15.9	-15.4	-14.8	-14.4	-14.0	-13.8	-13.1	-11.9	-11.2	-11.2	-11.1	-10.9	-11.1	-11.3	-11.9	-12.3	-12.6	-12.8	-13.0	-13.2	-13.2	-13.3	-10.9
4-Feb	-13.1	-13.2	-13.3	-13.5	-13.6	-13.8	-14.1	-14.4	-14.4	-14.4	-14.2	-14.0	-13.4	-13.2	-12.6	-12.5	-12.4	-12.6	-12.9	-12.9	-12.8	-12.7	-12.6	-12.3	-13.3	-12.3
5-Feb	-12.2	-12.1	-12.2	-12.0	-11.6	-11.6	-11.4	-11.1	-11.0	-10.6	-10.2	-9.0	-8.2	-7.2	-7.2	-6.9	-6.5	-6.3	-6.9	-5.9	-3.4	-4.0	-6.3	-7.3	-8.8	-3.4
6-Feb	-8.6	-10.2	-11.3	-11.9	-12.2	-12.9	-13.2	-15.3	-16.9	-15.6	-14.2	-12.4	-12.5	-10.2	-9.6	-9.4	-9.6	-10.4	-10.2	-10.7	-10.0	-10.1	-9.8	-9.0	-11.5	-8.6
7-Feb	-8.5	-7.4	-5.4	-3.7	-2.3	-1.4	-1.2	-1.1	-2.3	-1.9	-0.1	1.6	2.7	3.5	3.6	3.5	2.5	1.1	-0.2	-0.3	-2.2	-7.1	-10.6	-12.5	-2.1	3.6
8-Feb	-14.2	-14.6	-16.3	-18.1	-18.8	-20.3	-21.1	-22.1	-22.8	-19.3	-14.6	-12.3	-10.0	-8.6	-7.1	-6.3	-6.5	-9.9	-12.8	-14.7	-16.2	-17.2	-17.1	-18.2	-15.0	-6.3
9-Feb	-18.9	-16.2	-16.0	-15.3	-11.0	-11.0	-10.1	-9.1	-9.1	-7.9	-5.7	-4.0	-2.4	-1.3	-0.9	-0.7	-1.9	-2.4	-2.3	-3.3	-4.2	-4.1	-3.7	-3.7	-6.9	-0.7
10-Feb	-3.7	-3.4	-3.5	-4.1	-5.2	-6.5	-7.5	-8.1	-8.6	-8.9	-9.2	-9.3	-9.4	-9.1	-8.7	-8.7	-8.7	-8.9	-9.2	-9.5	-9.7	-9.8	-9.8	-9.7	-7.9	-3.4
11-Feb	-9.6	-9.9	-9.8	-9.6	-9.7	-9.5	-9.3	-9.2	-8.8	-7.0	-4.5	-3.4	-2.3	-1.0	-0.7	-0.5	0.2	0.2	0.1	-0.1	-0.7	-2.1	-2.5	-2.3	-4.7	0.2
12-Feb	-1.8	-1.8	-2.6	-3.7	-4.1	-3.3	-2.9	-3.6	-6.8	-7.0	-7.8	-7.2	-6.5	-6.1	-6.3	-6.8	-7.1	-7.5	-7.7	-7.4	-7.0	-6.8	-6.4	-6.7	-5.6	-1.8
13-Feb	-7.8	-7.5	-6.8	-5.5	-3.7	-1.4	-0.3	-0.4	-4.1	-6.4	-7.1	-7.5	-7.0	-7.8	-8.3	-8.7	-9.1	-10.9	-12.6	-13.9	-15.1	-16.2	-16.5	-17.6	-8.4	-0.3
14-Feb	-18.0	-18.2	-19.0	-19.2	-19.0	-19.1	-19.1	-19.3	-19.2	-19.0	-18.6	-18.3	-18.2	-18.0	-17.8	-18.1	-18.5	-19.7	-20.7	-21.0	-21.0	-21.4	-22.9	-25.1	-19.5	-17.8
15-Feb	-27.0	-28.3	-28.6	-28.2	-27.2	-27.1	-27.9	-28.1	-28.8	-26.6	-23.4	-19.4	-18.2	-16.4	-14.9	-15.4	-15.8	-17.5	-19.9	-22.8	-25.1	-25.5	-26.0	-26.4	-23.5	-14.9
16-Feb	-27.4	-26.9	-26.1	-24.6	-22.9	-21.7	-20.2	-19.1	-18.0	-16.1	-13.9	-11.7	-9.7	-8.3	-7.1	-5.4	-6.2	-9.2	-12.2	-15.3	-16.4	-16.9	-16.9	-16.7	-16.2	-5.4
17-Feb	-16.5	-16.4	-16.4	-16.5	-16.6	-16.6	-16.6	-16.7	-17.3	-17.4	-17.4	-17.3	-17.2	-17.8	-17.8	-18.0	-18.4	-18.4	-19.3	-22.3	-24.0	-24.9	-26.9	-27.6	-18.9	-16.4
18-Feb	-29.3	-29.7	-30.9	-31.6	-31.6	-31.6	-32.0	-31.4	-30.7	-26.4	-24.3	-22.3	-21.5	-20.5	-19.5	-19.4	-19.8	-21.8	-25.3	-27.6	-29.9	-30.2	-31.8	-32.3	-27.1	-19.4
19-Feb	-32.9	-33.3	-33.2	-32.3	-32.4	-32.9	-33.4	-32.8	-29.8	-26.3	-22.1	-20.1	-18.5	-17.5	-16.9	-16.8	-16.5	-16.9	-17.9	-17.6	-17.4	-19.2	-20.7	-22.4	-24.2	-16.5
20-Feb	-22.3	-22.7	-23.0	-22.9	-23.0	-23.7	-24.0	-23.9	-23.1	-21.5	-20.1	-17.4	-16.8	-16.6	-17.2	-17.6	-18.3	-19.9	-23.1	-26.0	-27.9	-28.7	-28.7	-26.2	-22.3	-16.6
21-Feb	-26.1	-26.9	-28.0	-28.9	-30.2	-32.1	-34.9	-36.4	-36.0	-31.5	-27.8	-26.3	-24.7	-25.0	-24.7	-24.2	-24.8	-26.2	-27.5	-31.0	-32.9	-33.9	-35.1	-35.9	-29.6	-24.2
22-Feb	-36.6	-37.4	-37.5	-37.9	-38.0	-38.3	-38.5	-38.8	-36.5	-30.8	-26.8	-23.1	-18.4	-17.0	-16.1	-17.6	-18.5	-19.9	-23.1	-26.3	-28.1	-29.8	-31.2	-32.5	-29.1	-16.1
23-Feb	-33.7	-35.0	-35.2	-34.9	-34.6	-35.9	-36.7	-37.4	-35.7	-30.6	-25.0	-21.1	-20.7	-19.9	-19.3	-18.7	-18.7	-20.1	-23.3	-26.2	-28.4	-30.0	-31.3	-32.7	-28.5	-18.7
24-Feb	-32.7	-32.8	-32.7	-29.7	-30.5	-30.4	-32.6	-31.0	-28.6	-26.2	-21.7	-18.3	-16.8	-15.8	-15.4	-15.3	-15.1	-15.2	-15.6	-16.4	-17.0	-17.4	-18.0	-18.8	-22.7	-15.1
25-Feb	-19.5	-19.0	-18.2	-18.0	-17.7	-16.9	-15.5	-14.8	-13.7	-12.6	-9.9	-8.5	-8.2	-7.2	-6.1	-5.8	-6.4	-7.6	-8.4	-9.8	-11.5	-12.9	-13.0	-13.2	-12.3	-5.8
26-Feb	-13.9	-14.7	-16.2	-17.3	-17.4	-17.0	-15.9	-14.1	-13.4	-12.4	-11.4	-10.5	-10.1	-9.4	-8.5	-8.1	-7.8	-7.9	-8.0	-8.1	-8.1	-8.2	-8.5	-8.7	-11.5	-7.8
27-Feb	-8.9	-9.2	-9.6	-10.1	-10.7	-11.3	-12.0	-12.4	-12.9	-13.0	-13.0	-12.9	-12.6	-12.0	-11.8	-11.9	-12.4	-13.1	-13.5	-13.9	-14.5	-15.0	-16.4	-17.9	-12.5	-8.9
28-Feb	-19.5	-20.4	-20.8	-22.1	-23.3	-22.9	-24.2	-25.0	-23.7	-19.2	-17.1	-13.5	-14.1	-11.5	-11.9	-12.0	-12.5	-14.1	-17.1	-19.4	-21.7	-23.4	-24.7	-25.7	-19.2	-11.5
	-19.5	-19.6	-19.8	-19.7	-19.7	-19.7	-19.9	-19.9	-19.8	-18.0	-16.0	-14.4	-13.4	-12.6	-12.1	-12.0	-12.3	-13.3	-14.6	-15.8	-16.7	-17.6	-18.3	-18.8		Diurnal Average
	-1.8	-1.8	-2.6	-3.7	-2.3	-1.4	-0.3	-0.4	-2.3	-1.9	-0.1	1.6	2.7	3.5	3.6	3.5	2.5	1.1	0.1	-0.1	-0.7	-2.1	-2.5	-2.3		Diurnal Maximum



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

**Ambient Temperature (AT) - C**  
**Ells River - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Ells River - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	216	32.14	32.14
-20 - 0	446	66.37	98.51
0 - 10	10	1.49	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



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

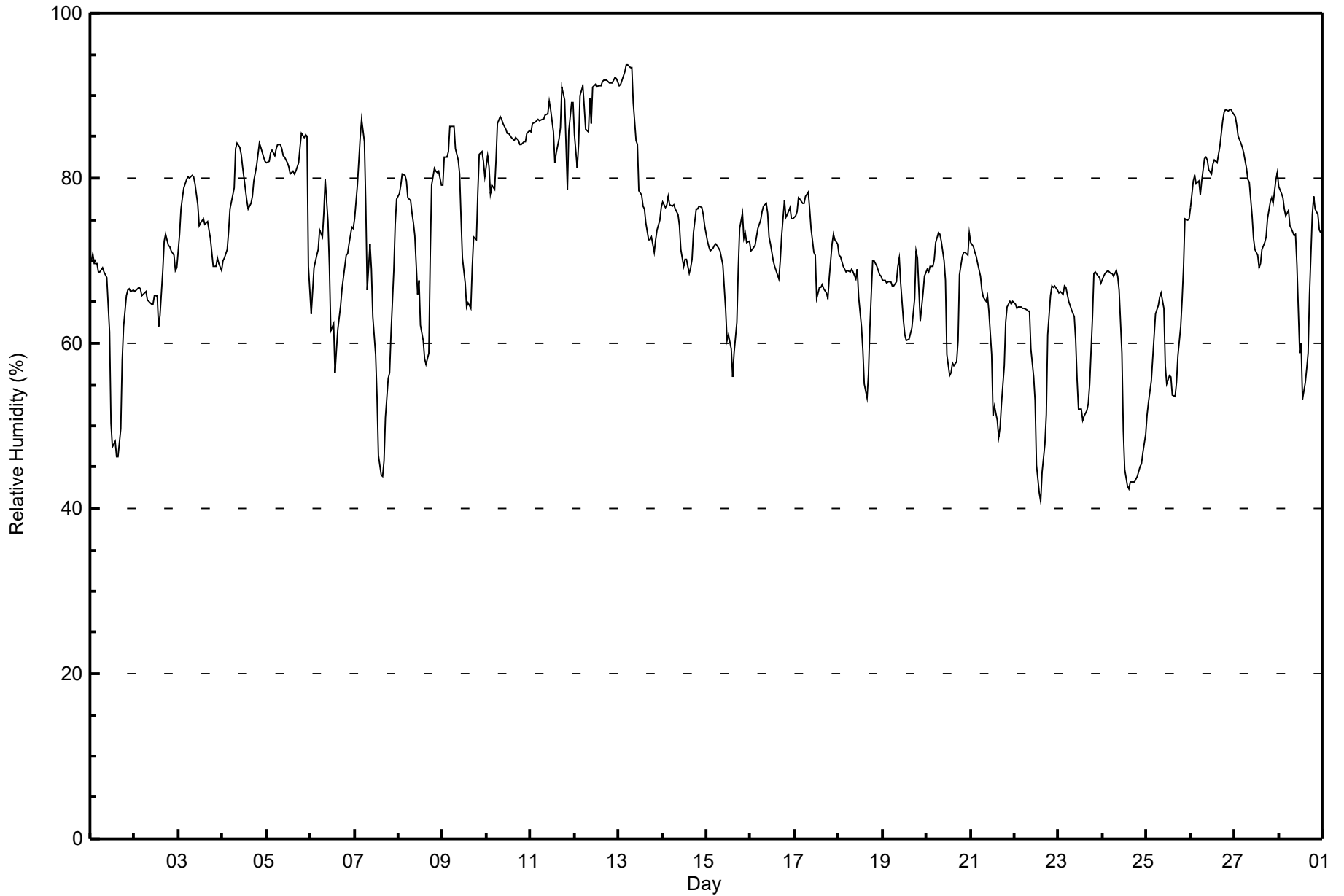
**Relative Humidity (RH) - %**  
**Ells River - February 2023**

Maximum Value: 93.8 % on Feb 13 05:00      Maximum Daily Average: 89.6 % on Feb 12																						Hours in Service: 672 Hours of Data: 672																										
Minimum Value: 40.9 % on Feb 22 15:00      Minimum Daily Average: 55.2 % on Feb 24 Maximum Diurnal Average: 75.9 % at hour 6      Minimum Diurnal Average: 63.6 % at hour 15 Monthly Average: 71.80 %      Percentiles: P <sub>1</sub> = 43.4 P <sub>10</sub> = 57.0 Q <sub>1</sub> = 65.9 Median = 71.8 Q <sub>3</sub> = 79.8 P <sub>90</sub> = 85.6 P <sub>99</sub> = 91.9																						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-Feb	69.9	70.8	69.7	69.7	68.6	68.6	69.2	68.6	68.4	67.9	61.4	50.3	47.5	48.1	46.2	46.3	49.6	57.9	62.0	65.7	66.5	66.7	66.3	66.4	62.2	70.8																						
2-Feb	66.2	66.5	66.7	66.6	65.7	66.1	66.3	65.2	64.8	64.7	64.7	65.8	65.7	62.0	63.5	68.8	72.4	73.2	71.8	71.6	71.2	70.8	68.9	69.2	67.4	73.2																						
3-Feb	73.2	76.3	77.7	78.8	79.8	80.1	80.0	80.3	80.2	79.3	76.7	74.3	74.6	75.1	74.5	74.7	74.7	72.7	70.9	69.3	69.3	70.3	69.7	68.9	75.1	80.3																						
4-Feb	70.0	70.3	71.4	73.5	76.3	77.1	78.8	83.5	84.3	83.8	82.8	81.4	78.6	77.2	76.2	77.0	77.8	79.6	81.5	82.9	84.3	83.8	82.6	82.0	79.0	84.3																						
5-Feb	81.9	82.0	83.0	83.3	82.8	83.6	84.1	84.0	83.6	82.8	82.6	81.9	81.4	80.6	80.8	80.5	80.9	81.9	83.7	85.4	85.0	85.2	85.1	69.2	82.3	85.4																						
6-Feb	63.5	66.3	69.2	70.7	71.4	73.6	72.8	75.8	79.8	74.7	69.3	61.5	62.4	56.4	59.1	61.7	64.5	66.6	67.9	70.7	70.8	72.1	74.1	73.9	68.7	79.8																						
7-Feb	75.1	79.1	82.0	85.0	87.1	84.4	76.6	66.5	72.0	69.0	63.3	58.7	53.6	46.5	44.1	43.9	45.8	51.0	55.8	56.5	61.1	68.8	74.3	77.5	65.7	87.1																						
8-Feb	78.1	79.2	80.5	80.4	79.6	77.7	77.3	75.8	74.6	73.1	65.9	67.5	62.2	60.3	58.1	57.4	58.8	70.4	79.2	81.3	80.9	80.6	80.9	79.2	73.3	81.3																						
9-Feb	79.1	82.5	82.5	83.3	86.2	86.3	86.2	83.6	82.1	80.5	75.3	70.4	67.2	64.4	64.9	64.3	69.2	72.9	72.6	78.3	82.9	83.2	82.0	80.2	77.5	86.3																						
10-Feb	82.7	81.3	78.1	79.1	78.7	82.2	86.5	87.5	87.2	86.7	86.0	85.5	85.4	84.9	84.7	84.6	85.0	84.6	84.1	84.1	84.3	84.4	85.3	85.8	84.1	87.5																						
11-Feb	85.6	86.7	86.8	86.9	87.1	87.0	87.1	87.2	87.7	87.9	89.3	88.3	85.6	81.9	83.1	84.8	86.1	91.1	89.6	84.0	78.6	85.8	89.1	89.2	86.5	91.1																						
12-Feb	85.2	81.2	84.2	90.0	91.2	88.7	85.9	85.6	89.7	86.5	90.9	91.3	91.1	91.1	91.2	91.7	91.8	91.9	91.6	91.6	91.8	92.2	92.0	89.6	92.2	92.2																						
13-Feb	91.1	91.3	91.8	92.9	93.8	93.7	93.4	93.4	89.2	84.5	84.0	78.5	77.9	76.7	76.3	74.6	72.5	72.9	71.0	72.6	73.8	75.0	76.4	82.1	93.8	93.8																						
14-Feb	77.1	76.5	76.8	77.8	76.8	76.6	76.8	76.3	75.6	74.2	71.3	69.4	70.2	70.1	68.6	69.2	70.1	73.4	76.3	76.7	76.5	75.7	74.2	74.3	74.3	77.8																						
15-Feb	72.4	71.7	71.2	71.5	71.8	72.0	71.5	71.2	70.3	69.4	64.1	60.4	61.0	59.3	55.9	58.8	62.5	69.0	74.0	75.8	72.6	73.4	72.2	72.4	68.5	75.8																						
16-Feb	71.2	71.3	71.9	72.8	73.9	74.9	75.9	76.6	76.9	75.7	72.9	72.1	70.0	69.3	68.9	67.8	70.0	73.0	77.2	75.3	75.6	76.4	75.1	75.0	73.3	77.2																						
17-Feb	75.5	75.9	77.7	77.4	76.9	76.9	77.8	78.3	76.2	73.9	71.0	70.7	65.5	66.7	66.8	67.2	66.7	66.2	65.4	68.0	72.0	73.2	72.5	72.0	72.1	78.3																						
18-Feb	70.6	70.5	69.3	69.0	68.7	68.9	68.6	69.0	68.6	67.9	68.9	65.6	62.0	59.2	55.1	53.4	56.2	61.8	70.1	70.0	69.7	69.4	68.2	68.1	66.2	70.6																						
19-Feb	67.6	67.5	67.3	67.5	67.4	67.0	67.0	67.4	69.3	70.3	67.3	62.7	61.1	60.4	60.6	61.2	61.9	65.4	71.1	70.4	62.6	64.5	66.0	68.1	65.9	71.1																						
20-Feb	69.0	68.6	69.2	69.3	70.2	72.2	73.4	73.2	72.4	70.0	67.6	58.6	56.1	56.4	57.6	57.3	57.9	60.3	68.4	70.5	71.1	71.1	70.7	73.4	66.9	73.4																						
21-Feb	72.3	71.6	70.9	70.6	69.6	68.1	66.5	65.6	65.1	65.8	63.9	58.7	51.2	52.4	50.6	48.6	49.9	52.8	57.2	62.6	64.4	65.1	64.8	65.1	62.2	72.3																						
22-Feb	64.8	64.2	64.5	64.4	64.3	64.2	64.1	63.9	63.9	59.3	55.9	53.0	45.2	41.8	40.9	44.5	47.7	51.4	61.0	65.7	67.0	66.7	67.0	66.5	58.8	67.0																						
23-Feb	66.1	66.2	65.9	67.0	66.9	65.1	64.5	64.1	63.2	60.4	55.6	52.0	52.0	50.7	51.2	51.9	52.7	55.1	63.3	68.5	68.6	68.1	68.0	67.3	61.4	68.6																						
24-Feb	68.2	68.5	68.7	68.9	68.5	68.5	68.2	68.9	68.1	66.5	58.8	49.5	44.7	42.7	42.3	43.3	43.1	43.1	43.5	43.9	45.1	45.3	46.8	48.9	55.2	68.9																						
25-Feb	51.4	52.8	55.4	58.2	60.9	63.5	64.6	65.7	66.1	64.2	57.3	55.0	56.2	55.9	53.8	53.6	55.3	58.5	62.0	65.3	69.1	75.0	74.9	75.0	61.2	75.0																						
26-Feb	76.5	79.7	80.4	79.3	79.7	77.9	79.6	82.3	82.6	82.2	81.0	80.6	81.7	82.2	81.9	82.8	84.0	87.0	87.9	88.3	88.2	88.3	88.3	88.0	82.9	88.3																						
27-Feb	87.5	86.4	85.2	84.3	83.8	83.1	81.2	79.8	79.5	75.5	72.7	71.3	70.6	69.2	69.6	71.3	72.3	73.0	75.1	77.1	77.6	76.9	79.8	80.6	77.6	87.5																						
28-Feb	78.9	78.2	77.5	76.3	75.4	76.1	74.3	74.0	73.0	73.2	69.5	58.8	60.0	53.2	55.2	57.0	58.8	65.8	75.6	77.8	76.2	75.5	73.7	73.5	70.3	78.9																						
																								74.0	74.4	74.8	75.5	75.8	75.9	75.7	75.5	73.9	71.1	67.6	65.7	64.1	63.6	64.2	65.6	68.7	71.8	73.1	73.4	74.4	74.6	74.2	Diurnal Average	
																								91.1	91.3	91.8	92.9	93.8	93.7	93.4	89.7	87.9	90.9	91.3	91.1	91.1	91.2	91.7	91.8	91.9	91.6	91.6	91.8	92.2	92.0	Diurnal Maximum		



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

**Relative Humidity (RH) - %**  
**Ells River - February 2023**







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

**Relative Humidity (RH) - %**  
**Ells River - February 2023**

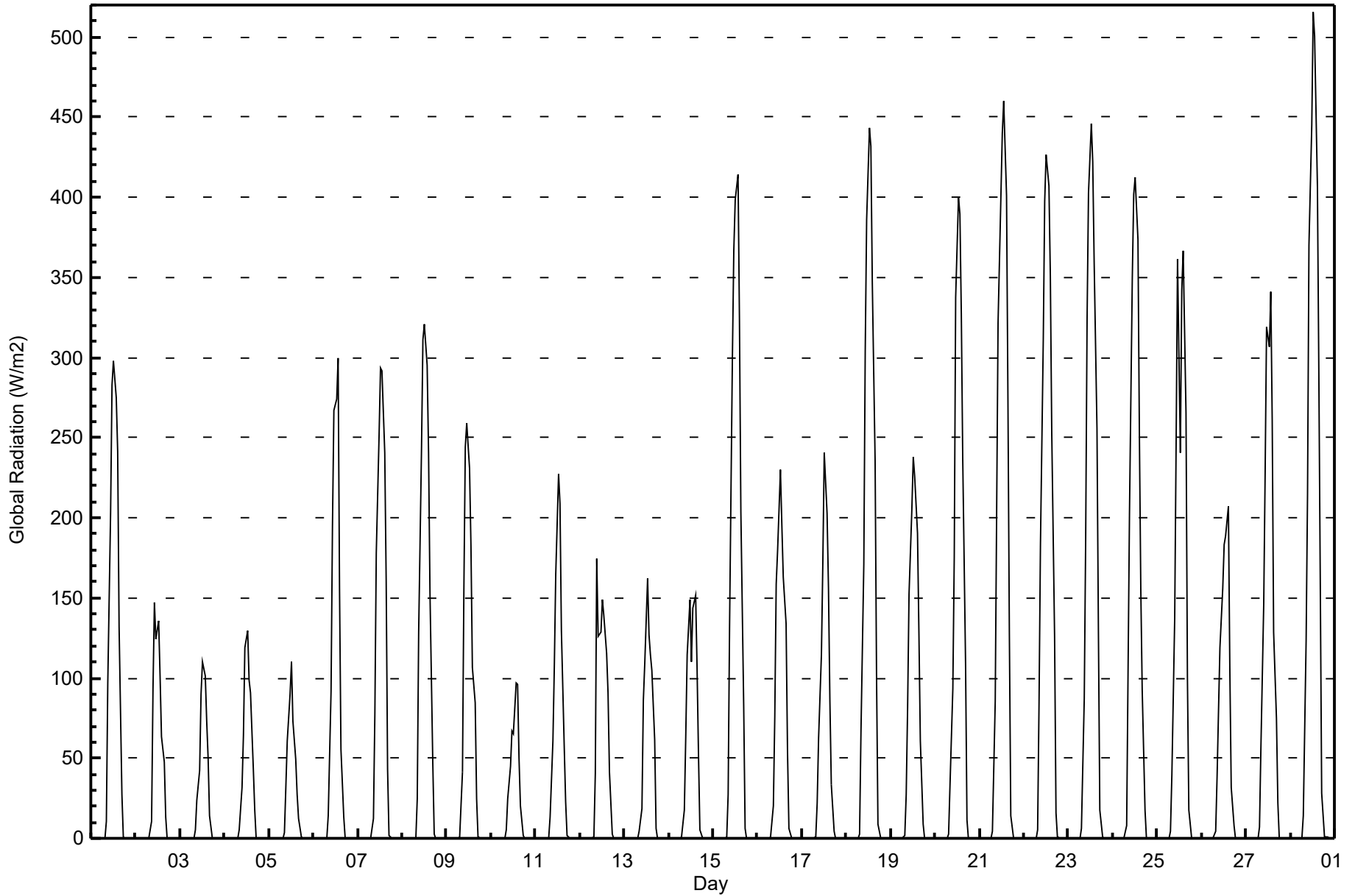
<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	91	13.54	13.54
60 - 80	415	61.76	75.30
80 - 100	166	24.70	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



Maximum Value: 515.5 W/m2 on Feb 28 13:00      Maximum Daily Average: 128.1 W/m2 on Feb 28																							Hours in Service:	672		
Minimum Value: 0.0 W/m2 on Feb 1 01:00      Minimum Daily Average: 19.1 W/m2 on Feb 5																							Hours of Data:	672		
Maximum Diurnal Average: 269.2 W/m2 at hour 13      Minimum Diurnal Average: 0.0 W/m2 at hour 2																							Hours of Missing Data:	0		
Monthly Average: 64.14 W/m2      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> = 92.6 P <sub>90</sub> = 241.4 P <sub>99</sub> = 434.0																							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-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.5	96.6	203.5	282.9	297.9	274.8	241.5	132.5	27.1	0.7	0.2	0.1	0.1	0.1	0.1	0.1	65.4	297.9
2-Feb	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	10.8	93.7	146.9	124.5	135.7	101.8	63.9	47.3	13.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.8	146.9
3-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	23.5	42.5	89.7	110.3	101.7	73.2	50.1	14.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	21.3	110.3
4-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	31.3	64.5	119.3	129.2	98.5	90.8	43.1	17.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	25.0	129.2
5-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	32.2	60.7	89.5	110.1	72.7	49.0	27.0	12.4	0.8	0.0	0.0	0.0	0.1	0.0	0.0	19.1	110.1
6-Feb	0.0	0.1	0.1	0.0	0.1	0.2	0.0	0.2	14.3	91.4	194.9	266.9	273.8	299.7	155.4	55.6	13.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	56.9	299.7
7-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	11.9	77.6	178.1	252.4	293.4	291.7	240.8	161.3	43.2	2.1	0.1	0.0	0.1	0.0	0.0	0.0	64.7	293.4
8-Feb	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.4	24.4	128.5	242.8	311.0	321.0	295.2	241.0	153.6	46.8	2.6	0.2	0.1	0.1	0.0	0.0	0.0	73.7	321.0
9-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	41.4	156.4	243.8	258.9	230.9	182.2	106.3	84.3	24.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	55.4	258.9
10-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	25.0	44.8	66.7	65.7	97.0	96.3	50.2	19.9	2.2	0.0	0.0	0.0	0.0	0.0	0.0	19.7	97.0
11-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.8	60.9	107.3	164.5	227.3	208.8	129.8	57.4	22.8	2.1	0.0	0.0	0.0	0.2	0.1	0.0	41.4	227.3
12-Feb	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.9	40.2	174.3	125.7	128.4	149.2	139.5	115.1	90.5	41.3	2.3	0.0	0.0	0.0	0.0	0.0	0.0	42.0	174.3
13-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	18.7	86.8	109.3	161.9	126.9	114.5	105.0	62.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	33.1	161.9
14-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	17.9	63.0	114.6	148.7	110.0	143.8	151.7	106.6	52.5	5.5	0.0	0.0	0.0	0.0	0.3	0.2	38.1	151.7
15-Feb	0.2	0.0	0.0	0.0	0.0	0.1	0.0	1.3	27.6	132.3	299.5	367.0	398.2	413.8	323.0	203.7	82.4	6.5	0.3	0.4	0.0	0.0	0.0	0.0	94.0	413.8
16-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	20.6	75.8	158.5	179.6	230.0	195.5	163.1	133.7	54.5	6.3	0.0	0.0	0.0	0.0	0.0	0.0	50.8	230.0
17-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	22.3	62.2	114.3	171.4	240.2	202.5	156.3	85.2	33.7	4.7	0.0	0.0	0.0	0.1	0.0	0.0	45.6	240.2
18-Feb	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.8	67.2	171.4	304.5	386.0	443.3	431.5	347.5	235.4	101.9	9.1	0.2	0.2	0.1	0.3	0.1	0.0	104.2	443.3
19-Feb	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.7	27.0	81.8	152.7	205.0	237.6	225.3	190.2	127.8	60.4	9.0	0.0	0.0	0.0	0.0	0.0	0.0	54.9	237.6
20-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	33.6	93.2	175.0	337.3	400.1	389.9	327.4	237.2	109.7	11.4	0.3	0.1	0.0	0.0	0.0	0.0	88.2	400.1
21-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.2	4.3	85.9	203.5	321.4	400.3	440.0	460.4	401.1	272.4	127.8	14.4	0.4	0.4	0.2	0.2	0.3	0.2	113.9	460.4
22-Feb	0.2	0.1	0.0	0.1	0.0	0.1	0.0	5.5	84.3	183.4	310.9	397.1	427.0	407.3	351.0	252.6	125.8	15.9	0.5	0.3	0.2	0.3	0.2	0.2	106.8	427.0
23-Feb	0.2	0.0	0.0	0.0	0.1	0.2	0.2	6.1	87.2	186.5	324.3	403.0	446.2	422.1	359.5	256.0	131.7	17.4	0.6	0.4	0.3	0.2	0.2	0.2	110.1	446.2
24-Feb	0.0	0.0	0.0	0.0	0.0	0.1	0.0	8.1	104.6	202.3	350.3	401.6	412.1	373.4	252.6	155.9	92.4	17.8	0.1	0.0	0.0	0.0	0.0	0.1	98.8	412.1
25-Feb	0.1	0.0	0.0	0.0	0.0	0.0	0.0	4.3	39.2	137.7	245.7	361.1	240.7	341.8	366.4	265.5	100.8	18.0	0.4	0.1	0.0	0.0	0.0	0.0	88.4	366.4
26-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	38.4	79.5	119.2	156.3	183.2	188.7	207.0	106.8	31.8	7.9	0.0	0.0	0.0	0.0	0.0	0.0	46.8	207.0
27-Feb	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	56.0	146.7	228.7	319.0	306.3	340.8	261.2	128.5	74.7	21.8	0.4	0.0	0.0	0.0	0.0	0.2	78.8	340.8
28-Feb	0.1	0.0	0.0	0.2	0.0	0.0	0.2	14.4	123.6	215.0	370.3	445.0	515.5	501.0	406.6	290.1	161.4	28.3	1.2	0.5	0.5	0.4	0.4	0.4	128.1	515.5
																							Diurnal Average			
																							Diurnal Maximum			





# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Wind Speed (WS) - km/h

## Ells River - February 2023

Maximum Speed: 41 km/h on Feb 13 12:00	Maximum Daily Speed Average: 14.7 km/h on Feb 13	Hours in Service: 672
Minimum Speed Value: 0 km/h on Feb 5 02:00	Minimum Daily Speed Average: 0.8 km/h on Feb 22	Hours of Data: 662
Maximum Diurnal Speed Average: 3.7 km/h at hour 16	Minimum Diurnal Speed Average: 0.8 km/h at hour 2	Hours of Missing Data: 10
Monthly Average Velocity: 1.0 km/h 14.9 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 2 Q <sub>1</sub> = 3 Median = 7 Q <sub>3</sub> = 11 P <sub>90</sub> = 16 P <sub>99</sub> = 24	Percent Operational Time: 98.5

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-Feb	WNW5	WSW1	WNW3	WSW1	WNW4	NW5	NNW6	NNW8	NNE5	WNW2	WNW6	NW10	NW11	N9	ENE4	ENE5	ENE3	NNW6	WNW5	WNW3	W3	W2	SW2	SW3	NW3.3	NW11
2-Feb	SSW4	S6	SSW7	SSW6	SSW6	SSW7	S7	SSW5	SSW4	S3	S6	S6	S7	S10	S13	SSE16	SSE16	SSE14	SSE21	SSE22	S20	S20	S19	SSE18	S10.6	SSE22
3-Feb	S17	S13	S14	S13	S12	S12	SSW10	SSW7	SSW7	SSW8	SSE2	N4	N8	NNE9	NE10	NNE9	ENE10	ENE10	ENE8	E7	E6	E5	E5	N4	SE3.6	S17
4-Feb	NE4	NNE6	N7	NNE10	NNE9	NNE10	NNE11	NNE14	NNE12	NNE13	NNE12	NNE11	NNE9	NNE9	NNE5	NE4	N4	N6	NNE9	NNE8	N6	NNW6	NNW5	NW3	NNE7.9	NNE14
5-Feb	NW3	SE0	S3	NW1	NW1	N4	N3	NW4	NNW2	W3	S6	S4	SSE9	S9	SSE11	S10	S10	S8	SSW9	SSW7	W8	NNW10	N16	WNW14	SW2.1	N16
6-Feb	W12	W11	WSW9	WSW9	WSW10	WSW9	W7	S4	N3	N3	E8	E5	SE7	SE4	E3	E3	N5	N6	NW3	WSW4	W3	SSW6	SW6	SSW7	WSW2.6	W12
7-Feb	S8	SSW9	SW11	WSW14	WSW13	WSW11	W10	WSW10	SSW9	SW12	WSW12	WSW12	WSW13	W18	W18	W16	W14	WSW11	WSW11	W10	NW5	NNE14	NNE17	NNE13	W8.2	W18
8-Feb	NNE10	NNE6	NW3	W2	SSW4	SW2	S0	W2	NNW3	WSW3	W1	S11	S10	SSE10	SSE10	SSE9	SSE5	WNW2	WNW3	W1	SW1	SSW3	SSW6	SSW5	S2.3	S11
9-Feb	SSW8	S11	S11	S10	SSW10	S10	SSW9	SW13	SW12	SSW11	SSW12	S10	S11	S13	S13	S6	ENE2	NE4	ESE1	W1	W2	NW3	W2	SSW4	SSW6.8	S13
10-Feb	NE2	NNE12	NNE13	NNE16	NNE18	NNE18	NNE14	NNE15	NNE15	NNE16	NNE16	NNE18	NNE16	NNE17	NNE17	NNE18	NNE15	NNE15	NNE16	NNE12	NNE11	NNE8	NE5	ENE4	NNE13.5	NNE18
11-Feb	NE2	N2	ESE3	SSE6	SSE7	SSE4	SE2	ESE1	SSW5	SSW7	SSW10	SSW12	SSW13	SSW11	S9	SSW3	WSW9	WSW10	W7	WNW9	W7	SSW8	SW9	WSW11	SW5.2	SSW13
12-Feb	W15	W13	SW9	SSE6	S7	SSW7	WSW9	NW6	NNW8	N7	NNE9	N6	NNE2	NNE2	NNE4	NNE6	NNE7	NNE7	N4	NNW4	NW2	SSE1	NW4	NW3	NW2.3	W15
13-Feb	NNW2	W2	S9	SW5	SW8	WSW12	WSW11	NNW12	NNE25	NNE20	NNE24	N41	NNE35	N36	NNE32	NNE30	NNE23	NNE24	NNE13	NE13	NE13	NE17	NNE22	NNE16	NNE14.7	N41
14-Feb	NE16	NE14	NNE8	NNE5	NNE8	NNE7	NNE8	NNE7	ENE6	NE5	ENE5	E6	ENE5	E6	NE6	ENE9	ENE8	ENE3	WNW1	WNW3	NNW1	S1	W1	S1	NE5.0	NE16
15-Feb	S1	SSW4	SSW4	SW2	SSW2	SSW5	S3	SSW4	SSW2	NW3	M	M	SE3	SE5	SSE7	S8	SSE8	S5	S3	WSW2	SW1	WNW3	SW1	S2.9	S8	
16-Feb	W1	NNW2	SSW2	SW1	W1	W3	SW3	WSW2	SSW5	SSW5	SSW8	SSW11	SSW11	SSW13	SW11	SW6	NNE11	NNE16	NNE20	NNE18	NNE12	NNE9	NNE6	NE3	NNW0.8	NNE20
17-Feb	ENE3	ENE4	E3	ESE3	SE2	SE3	ESE2	NE6	ENE10	ENE9	NE10	NE10	NE11	NE12	NE12	NE14	NE15	NE13	NE13	NE10	NNE8	NNW5	NW6	NW5	NE6.7	NE15
18-Feb	NW6	WNW4	WNW3	WNW3	NW3	WNW4	WNW3	W1	W2	NNW3	N6	N7	NNE8	NNE6	NNE5	ENE8	E7	ENE3	N3	WNW3	W3	SW0	WNW3	WSW2	NNW2.4	NNE8
19-Feb	SW2	S2	SW2	WSW1	UO	UO	WNW3	WNW1	WSW3	NW1	WNW4	NE3	NNE3	N5	N6	N6	NW6	WNW4	NW7	N7	NNE12	NNE14	N12	NNE10	N3.8	NNE14
20-Feb	N7	NNE7	NNE5	NNE2	S2	SSE5	S4	SSE4	SE4	SSE7	SE5	NE2	E6	ENE9	ENE13	ENE10	ENE8	NE4	NW2	W4	WNW5	NW4	N4	NNE10	ENE2.7	ENE13
21-Feb	NNE13	NNE10	NNE4	NNE7	NNE6	NNE3	W2	W2	WSW2	WSW1	NNE6	N5	NNE5	NNE12	NE15	NE11	NE14	NE8	NE2	W3	W3	SSW2	SSW4	SSW4	NNE4.2	NE15
22-Feb	S5	S4	SSW6	SSW3	S3	S4	S5	SSW4	S4	SE2	NE2	NE3	NNW2	N3	NNE3	ENE8	ENE6	ESE2	W1	W2	W2	WNW2	WNW2	WSW2	S0.8	ENE8
23-Feb	NW3	NW5	NW5	N6	NNW3	W3	UO	UO	SW1	WSW1	NNE1	N2	NE4	ESE8	SE8	SSE11	S9	SSE7	WNW1	UO	UO	W1	SSW6	SSW5	S1.1	SSE11
24-Feb	SSW9	SSW8	S10	S13	S12	S11	S10	S12	S9	S9	SSW14	S21	S21	SSW21	SSW20	S20	S21	SSW18	SSW16	S18	S15	S14	SSW12	SSW10	S14.4	S21
25-Feb	SSW10	SSW10	SSW10	SSW9	SSW7	SSW6	SW7	SSW5	WSW9	WSW11	W11	WSW10	SSW10	S13	SSE13	SSE13	SE12	SSE9	SSE7	S7	SSW4	NNW2	WSW2	UO	SSW7.0	S13
26-Feb	UO	NE1	WNW2	WNW3	NW3	NW2	N4	NNE7	NNE7	NNE7	NNE7	NNE10	NNE12	NNE14	NNE18	NNE18	NNE17	NNE17	NNE17	NNE14	NE13	NNE11	NNE14	NNE15	NNE9.7	NNE18
27-Feb	NNE17	NNE19	NNE19	NNE18	NNE17	NNE16	NNE17	NNE14	NNE14	NNE18	NNE20	NE19	NE16	NE13	NE17	NE18	NE17	NE13	NNE11	NNE13	NNE10	NNE11	NNE8	NW5	NNE14.7	NNE20
28-Feb	WNW5	NW6	WNW3	W4	WNW6	WNW4	WNW4	W2	WNW4	NW3	N6	N3	N5	N4	N4	N4	N5	N4	W1	SSW3	W1	WSW1	SSW2	S3	NW2.6	N6

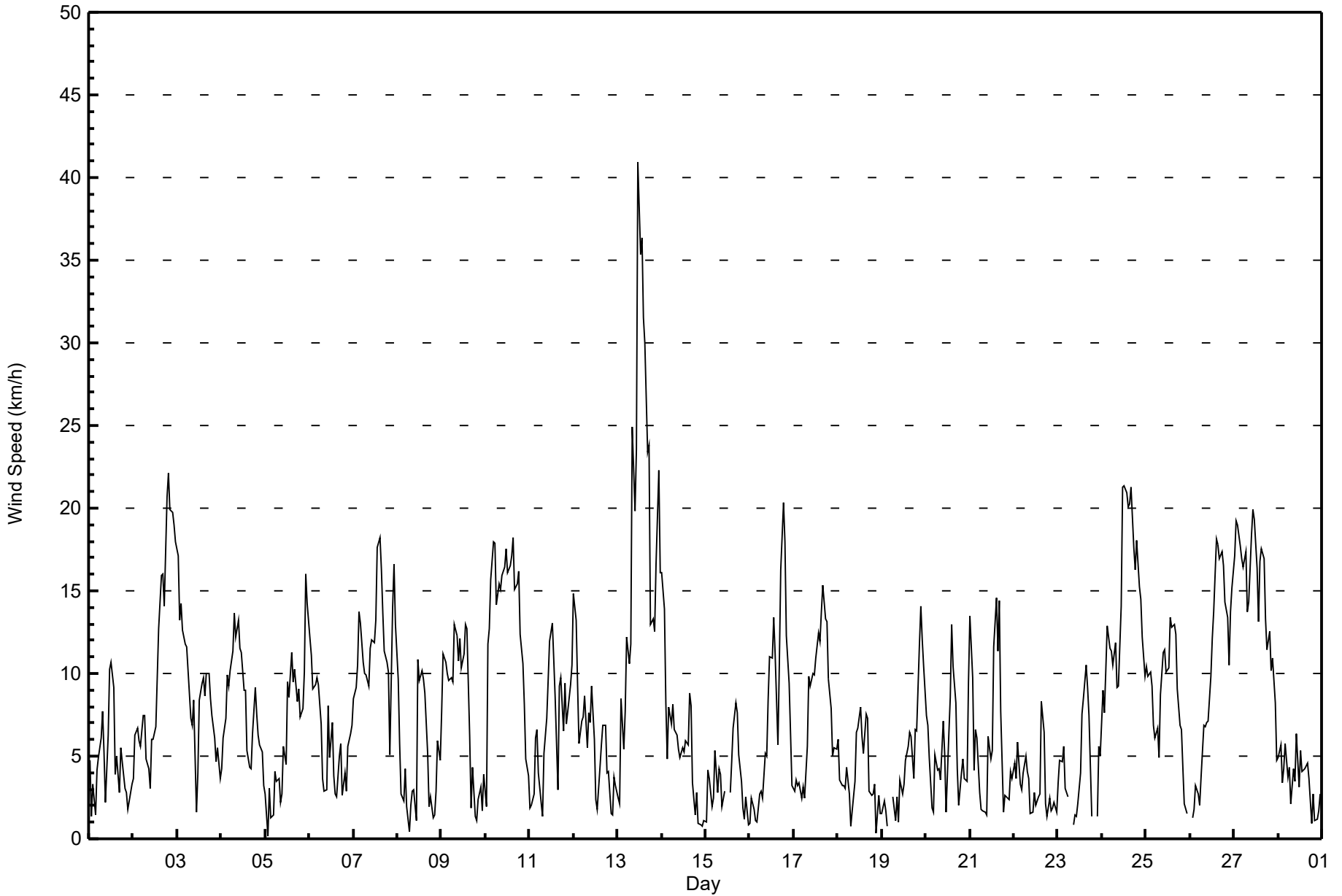
NW1.0	NNW0.8	SW1.5	SW1.0	SW1.3	WSW1.6	W1.6	NW1.3	N1.1	N1.0	N2.0	NNE2.1	NNE1.8	NE2.1	ENE2.9	ENE3.7	ENE3.7	NE3.2	NNE1.8	N1.3	N1.7	NNE1.8	N1.8	NW1.0	Diurnal Average
S17	NNE19	NNE19	NNE18	NNE18	NNE18	NNE17	NNE15	NNE25	NNE20	NNE24	N41	NNE35	N36	NNE32	NNE30	NNE23	NNE24	SSE21	SSE22	S20	S20	NNE22	SSE18	Diurnal 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 (WS) - km/h**  
**Ells River - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Ells River - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	277	41.84	41.84
6 - 11	232	35.05	76.89
12 - 19	130	19.64	96.53
20 - 28	18	2.72	99.24
29 - 38	4	0.60	99.85
> 38	1	0.15	100.00

Total Number of Valid Hours: 662

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Ells River - February 2023**

<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	24	15	16	12	5	6	10	6	20	31	13	17	31	35	26	10	277
6 - 11	14	50	8	15	7	1	2	16	31	39	8	17	7	3	8	6	232
12 - 19	2	58	19	1	0	0	1	6	17	8	3	6	7	1	0	1	130
20 - 28	0	8	0	0	0	0	0	2	6	2	0	0	0	0	0	0	18
29 - 38	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
> 38	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<b>Totals</b>	42	134	43	28	12	7	13	30	74	80	24	40	45	39	34	17	662

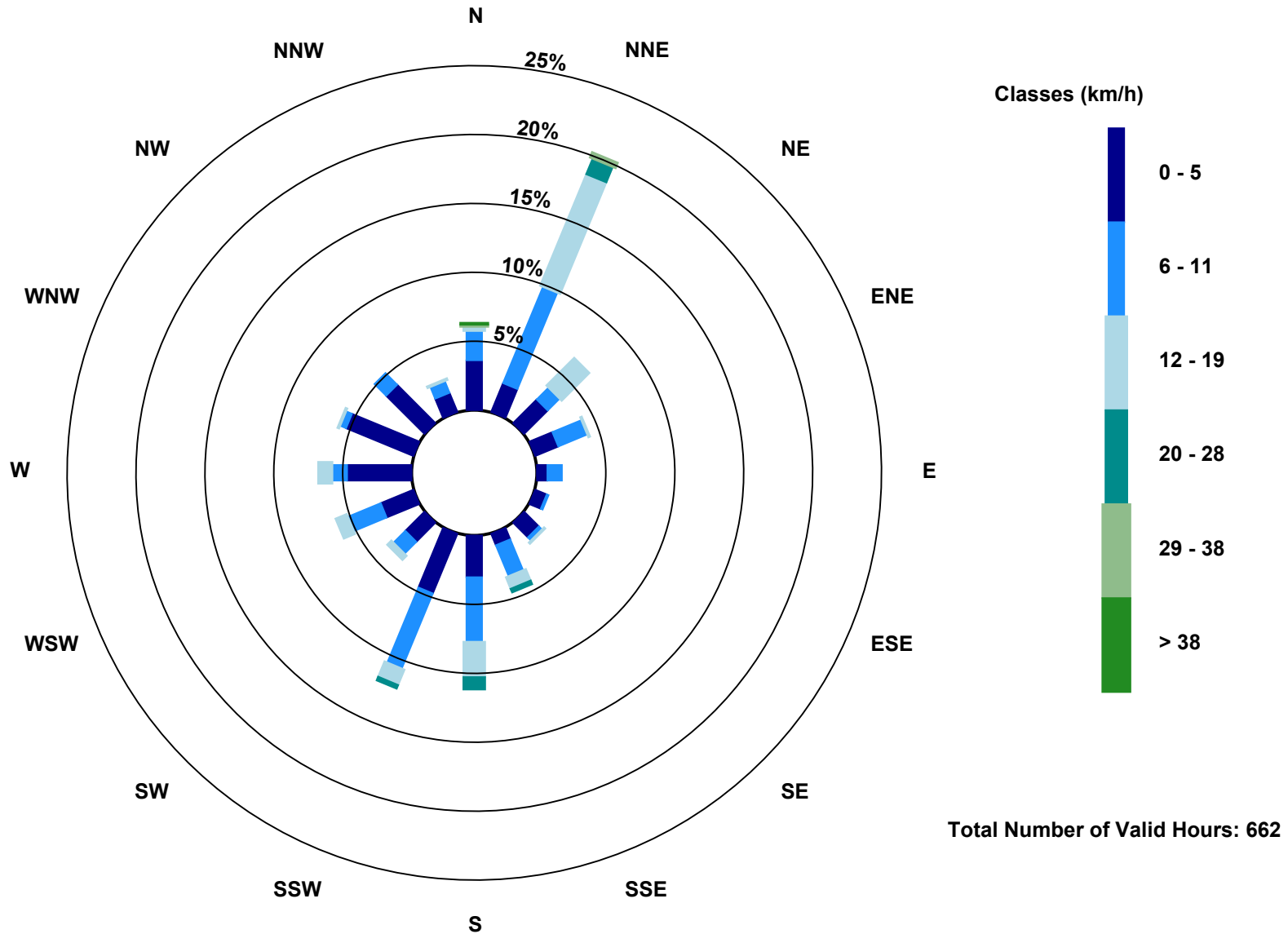
Total Number of Valid Hours: 662

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Ells River







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

**Wind Speed (WS) - km/h**  
**Ells River - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Feb 13 12:00 Minimum Value: 0 km/h on Feb 21 20:00 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: 672 Hours of Data: 662 Hours of Missing Data: 10 Hours of Calibration: 0 Percent Operational Time: 98.5								
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-Feb	2	1	1	2	2	1	3	2	2	1	2	3	3	4	2	1	1	2	1	1	1	1	1	1	4
2-Feb	1	1	1	1	2	1	1	2	1	1	1	2	2	2	4	3	3	3	4	4	4	4	4	3	4
3-Feb	4	2	2	2	2	2	3	2	2	3	2	2	2	1	2	1	1	2	2	2	1	1	1	4	
4-Feb	1	2	1	1	1	1	1	2	2	2	2	3	1	1	2	1	1	1	1	2	2	1	1	3	
5-Feb	1	1	0	1	1	2	1	1	1	2	1	2	2	2	3	3	2	1	1	2	2	6	3	6	
6-Feb	3	3	2	2	2	2	2	3	2	1	2	2	2	2	2	2	3	1	1	2	1	1	1	3	
7-Feb	2	2	3	4	4	4	4	3	3	2	4	4	4	5	5	5	4	3	3	3	2	5	2	5	
8-Feb	1	1	1	1	1	2	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	2	1	2	
9-Feb	3	2	1	1	2	1	2	3	3	2	3	2	2	2	3	2	1	1	1	1	1	1	2	3	
10-Feb	3	2	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	3	
11-Feb	1	1	1	1	1	1	1	1	2	2	2	3	3	2	2	2	4	3	2	4	5	1	2	5	
12-Feb	4	4	2	1	1	2	2	2	2	3	2	1	1	2	1	1	1	2	1	1	1	1	1	4	
13-Feb	1	1	2	3	2	3	3	5	5	3	6	7	6	6	5	5	3	5	2	2	2	3	4	7	
14-Feb	3	3	4	1	1	2	1	1	1	1	1	2	1	2	1	1	2	1	1	1	1	1	1	4	
15-Feb	1	1	2	1	1	1	1	1	1	1	1	M	M	2	2	2	2	1	1	1	1	1	1	2	
16-Feb	1	1	1	1	1	1	2	2	1	2	2	2	3	3	3	2	5	4	3	3	1	1	2	5	
17-Feb	2	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2	
18-Feb	1	1	1	2	1	1	1	1	1	1	1	1	2	2	2	2	1	2	2	1	1	1	2	2	
19-Feb	1	1	1	1	UO	UO	1	1	3	1	2	1	1	1	1	1	1	1	1	3	2	2	1	3	
20-Feb	2	2	2	1	1	2	1	1	1	2	2	2	2	2	3	2	2	2	1	1	1	1	1	3	
21-Feb	2	4	2	1	2	1	1	1	1	1	3	2	3	3	3	4	2	3	1	0	1	2	2	4	
22-Feb	2	2	2	2	1	1	2	1	1	1	1	1	1	1	1	2	2	2	1	1	1	2	2	2	
23-Feb	3	1	1	1	1	1	UO	UO	1	1	1	1	1	2	3	2	1	2	1	UO	UO	1	2	3	
24-Feb	2	2	1	1	2	1	1	1	2	2	3	6	4	5	5	5	4	4	4	3	3	2	2	6	
25-Feb	2	2	3	2	2	2	4	2	2	3	2	3	3	3	3	2	2	1	1	1	2	1	1	4	
26-Feb	UO	1	2	1	1	1	1	1	1	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	
27-Feb	2	2	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	3	2	2	2	2	1	3	
28-Feb	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2	
																	Diurnal Maximum								
M - Maintenance																	UO - Unstable Operation								



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

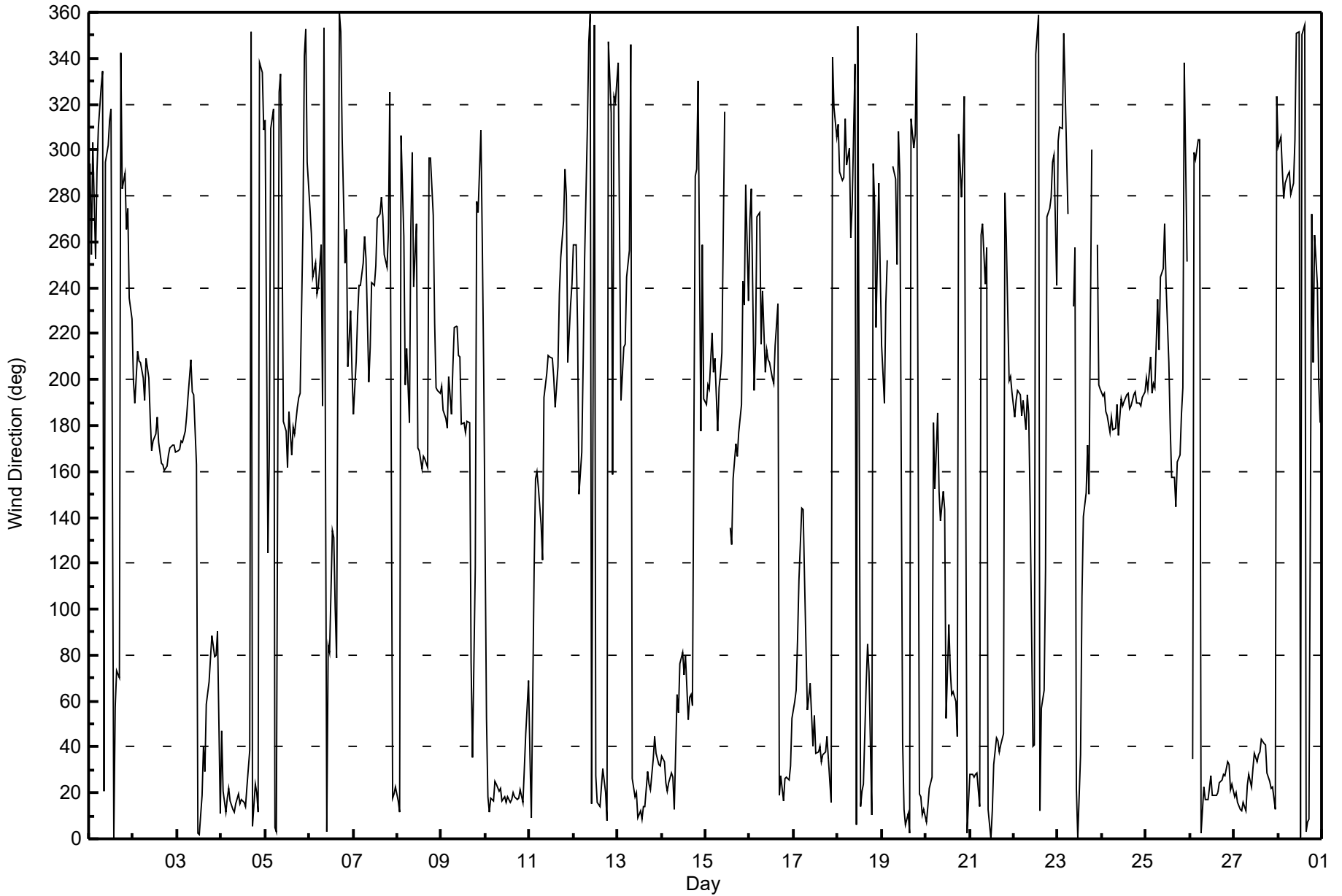
**Wind Direction (WD) - deg**  
**Ells River - February 2023**

Direction of Maximum Speed: 9 deg on Feb 13 12:00																				Hours in Service: 672					
Direction of Maximum Daily Speed Average: 15.7 deg on Feb 13																				Hours of Data: 662					
Direction of Minimum Speed: 124 deg on Feb 5 02:00										Direction of Minimum Daily Speed Average: 0.8 deg on Feb 22										Hours of Missing Data: 10					
Monthly Average Direction: 14.9 deg																				Percent Operational Time: 98.5					
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-Feb	294	254	303	252	291	310	328	335	21	295	302	313	318	0	57	73	70	342	283	290	265	274	236	227	320.0
2-Feb	199	190	212	208	207	201	191	209	200	183	169	174	176	184	173	164	163	160	162	167	170	171	171	168	175.1
3-Feb	169	170	173	173	177	185	193	209	195	193	163	2	2	19	40	30	59	68	78	88	79	80	91	11	133.2
4-Feb	47	21	11	18	22	16	13	12	15	20	15	17	16	14	23	39	352	6	24	20	11	338	334	309	13.9
5-Feb	313	124	170	309	318	5	3	325	333	272	182	177	161	186	167	179	176	188	192	194	266	341	353	295	221.5
6-Feb	274	264	244	251	237	240	259	189	353	3	84	81	134	131	101	79	360	352	305	251	265	206	230	204	244.9
7-Feb	185	208	228	241	241	251	263	253	199	214	242	241	249	271	272	280	271	254	249	264	325	18	19	23	259.0
8-Feb	16	12	306	263	198	214	181	266	299	241	268	170	169	161	167	166	161	297	296	271	224	197	195	194	188.3
9-Feb	197	186	183	179	202	185	206	223	223	211	210	181	181	177	182	182	77	35	119	278	273	309	259	204	196.0
10-Feb	53	18	12	18	17	25	24	21	22	17	18	16	18	16	17	20	18	17	18	21	16	31	46	69	19.9
11-Feb	37	9	118	157	160	153	137	121	192	202	210	210	209	201	188	205	237	253	269	292	280	207	232	241	216.5
12-Feb	259	259	222	150	169	208	252	310	347	360	15	355	27	16	14	23	31	20	8	347	316	159	323	321	314.0
13-Feb	338	261	191	214	216	245	256	346	26	18	20	9	12	8	14	14	30	24	22	35	44	37	32	32	15.7
14-Feb	36	34	24	21	24	28	27	13	63	55	76	81	71	80	52	61	63	58	289	292	330	178	259	191	43.1
15-Feb	189	198	196	220	203	209	178	196	203	212	317	M	M	135	128	157	172	166	177	189	243	233	285	234	186.9
16-Feb	270	283	196	215	271	273	215	239	203	213	208	207	201	198	215	233	19	27	17	26	27	25	32	52	346.4
17-Feb	60	65	86	113	144	144	113	56	62	67	40	54	37	38	40	34	37	38	44	35	16	341	318	306	41.9
18-Feb	311	290	286	288	314	294	301	262	277	337	6	354	14	21	24	68	85	73	11	294	277	223	285	247	347.1
19-Feb	215	189	233	252	UO	UO	293	287	250	308	289	42	13	6	11	3	314	301	307	351	20	18	11	13	353.2
20-Feb	7	14	22	27	181	153	186	151	139	151	144	53	93	74	63	64	60	45	307	280	295	324	2	16	59.1
21-Feb	28	28	27	28	29	14	263	268	241	257	13	0	12	32	44	43	38	41	46	281	261	199	201	194	27.3
22-Feb	184	191	195	193	184	191	178	193	185	145	40	41	342	359	12	57	64	117	271	275	279	295	298	241	172.9
23-Feb	304	310	309	351	327	272	UO	UO	232	258	22	1	37	106	140	151	172	150	300	UO	UO	259	198	196	172.3
24-Feb	193	194	186	184	177	184	178	179	189	176	192	188	190	193	194	188	189	194	195	189	190	188	192	194	188.8
25-Feb	201	196	210	194	198	196	235	213	245	248	268	242	208	179	158	158	145	164	167	185	196	338	251	UO	198.9
26-Feb	UO	35	299	296	304	305	2	23	17	17	17	27	19	19	19	20	24	26	28	27	34	32	21	24	20.8
27-Feb	18	20	16	13	12	16	12	23	28	22	30	37	34	36	38	44	41	41	29	25	22	23	13	323	25.2
28-Feb	301	306	291	279	286	289	291	281	285	304	351	352	1	350	354	3	7	9	272	207	263	242	198	181	314.4
307.0 297.3 227.2 227.8 231.3 237.2 268.9 314.3 3.9 351.9 5.6 14.4 30.9 46.3 61.5 60.9 57.9 40.0 20.8 2.3 358.0 18.2 358.7 322.0																									
Diurnal Average																									
M - Maintenance UO - Unstable Operation																									
All monthly, daily, and diurnal averages have been calculated using vector methods																									



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

**Wind Direction (WD) - deg**  
**Ells River - February 2023**





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

**Wind Direction (WD) - deg**  
**Ells River - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 108 deg on Feb 19 10:00	Hours in Service: 672 Hours of Data: 662 Hours of Missing Data: 10 Hours of Calibration: 0 Percent Operational Time: 98.5
Minimum Value: 4 deg on Feb 24 06:00	
Percentiles: P <sub>1</sub> = 5 P <sub>10</sub> = 7 Q <sub>1</sub> = 11 Median = 17 Q <sub>3</sub> = 29 P <sub>90</sub> = 52 P <sub>99</sub> = 82	

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-Feb	31	58	34	68	16	17	25	26	23	45	18	25	21	30	58	23	38	20	15	48	27	50	38	25	68
2-Feb	13	9	8	7	14	13	16	21	13	22	17	17	21	16	13	11	10	9	10	11	11	10	11	10	22
3-Feb	10	9	10	9	10	10	14	17	17	21	69	27	12	9	17	12	13	14	13	14	18	22	24	29	69
4-Feb	11	15	9	5	7	7	8	7	7	7	9	8	13	11	30	23	18	16	6	9	18	18	26	24	30
5-Feb	31	101	27	60	46	30	27	36	42	65	17	27	16	18	18	13	11	13	10	23	26	49	21	22	101
6-Feb	18	19	18	17	17	16	19	64	49	21	14	34	16	47	50	46	47	11	24	32	35	12	16	11	64
7-Feb	14	20	20	19	18	20	23	25	12	16	19	22	24	21	21	20	20	19	20	23	39	34	8	6	39
8-Feb	6	17	25	53	19	69	82	18	19	30	90	11	16	14	14	11	29	38	18	49	32	53	11	18	90
9-Feb	8	6	6	6	22	9	8	11	14	13	13	15	14	12	10	13	61	22	78	64	32	26	64	34	78
10-Feb	62	8	8	7	7	6	6	6	7	6	6	6	7	7	7	6	6	7	7	8	12	9	16	31	62
11-Feb	73	41	50	9	10	18	38	67	15	21	14	17	15	17	15	67	30	22	18	22	43	12	17	17	73
12-Feb	18	19	21	20	21	19	18	33	13	13	13	11	57	83	22	13	10	14	11	18	82	71	36	43	83
13-Feb	48	67	12	46	26	19	18	46	8	9	8	13	11	12	10	10	9	7	9	7	10	6	8	7	67
14-Feb	8	8	10	18	6	10	10	11	12	24	19	29	18	26	28	16	16	29	60	14	75	92	64	57	92
15-Feb	60	12	52	42	16	8	29	18	15	19	29	M	M	71	45	24	14	7	13	12	62	74	17	48	74
16-Feb	49	12	56	59	61	28	41	61	16	27	16	13	18	15	16	29	43	7	6	7	8	12	8	18	61
17-Feb	14	13	22	19	33	26	49	17	11	15	17	17	11	9	12	9	9	8	10	5	9	14	13	13	49
18-Feb	9	14	16	24	33	19	49	57	30	15	9	9	16	30	29	19	14	34	38	22	23	81	24	57	81
19-Feb	50	27	36	65	UO	UO	42	30	58	108	59	64	25	17	15	17	13	21	7	31	6	5	6	4	108
20-Feb	14	15	17	25	78	14	36	21	29	21	24	83	26	20	14	15	13	26	35	13	12	31	24	11	83
21-Feb	6	11	26	7	16	53	36	32	38	33	20	16	25	19	12	18	11	11	33	32	27	36	28	9	53
22-Feb	20	16	9	36	22	16	24	13	17	47	52	30	43	70	41	11	12	63	46	20	37	69	53	56	70
23-Feb	58	16	18	13	31	39	UO	UO	67	55	55	55	39	23	16	22	13	11	60	UO	UO	25	12	7	67
24-Feb	6	14	7	6	5	4	5	6	9	11	14	14	15	15	14	14	12	13	13	12	12	11	10	10	15
25-Feb	11	13	17	14	14	29	62	38	17	19	15	29	33	21	14	13	8	8	13	11	67	55	58	UO	67
26-Feb	UO	66	48	13	14	36	23	7	11	6	8	4	5	5	5	5	6	5	5	6	8	10	6	4	66
27-Feb	6	6	8	8	8	7	7	9	6	7	7	9	8	14	11	8	11	7	11	7	11	8	6	23	23
28-Feb	15	9	12	10	9	15	13	49	15	26	8	13	11	13	15	9	11	12	52	37	41	48	33	36	52
Diurnal Maximum																									
73	101	56	68	78	69	82	67	67	108	90	83	57	83	58	67	61	63	78	64	82	92	64	57		

M - Maintenance UO - Unstable Operation



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

**AMS506**  
**JACKFISH 1**  
**FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 1 (AMS506)  
 FEBRUARY 2023

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	637	32	35	99.55	34.7	0	6.4	0
H2S (ppb) Average	578	34	94	91.07	0.7	0	0.2	0
NO2 (ppb) Average	635	33	37	99.4	15	0	5.8	-
NO (ppb) Average	635	33	37	99.4	11	-	1.6	-
NOX (ppb) Average	635	33	37	99.4	21.7	-	7.1	-
Temperature 2 m (C) Average	672	0	0	100	5.6	-	0.8	-
Relative Humidity (%) Average	672	0	0	100	97.3	-	89	-
Wind Speed 10 m (km/h) Average	662	0	10	98.51	20	-	11	-
Wind Direction 10 m (deg) Average	662	0	10	98.51	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 1 (AMS506)  
 FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile							
					Min	P10	Q1	Median	Q3	P90	Max	
SO2 (ppb) Average	637	1.69	3.5	-	0	0.1	0.3	0.7	1.5	3.5	34.7	
H2S (ppb) Average	578	0.13	0.1	-	0	0	0.1	0.1	0.2	0.2	0.7	
NO2 (ppb) Average	635	3.47	2.4	-	0.3	1.1	1.7	2.9	4.7	6.5	15	
NO (ppb) Average	635	0.82	1.3	-	0	0	0	0.2	1.1	2.5	11	
NOX (ppb) Average	635	4.29	3.4	-	0.4	1.2	2	3.4	5.4	8.3	21.7	
Temperature 2 m (C) Average	672	-11.56	9.6	-	-33.3	-24.7	-18.6	-11.7	-2.4	0.7	5.6	
Relative Humidity (%) Average	672	72.22	11.9	-	38.8	54.6	65	73.8	80.5	85.4	97.3	
Wind Speed 10 m (km/h) Average	662	5.8	3	-	0	2	4	5	7	10	20	
Wind Direction 10 m (deg) Average	662	-	-	-	-	-	-	-	-	-	-	

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 1 (AMS506)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	08 Feb 2023 13:00	08 Feb 2023 15:00	3	Maintenance - WBEA internal audit
H2S, NO2	08 Feb 2023 11:00	08 Feb 2023 14:00	4	Maintenance - WBEA internal audit
H2S	13 Feb 2023 11:00	13 Feb 2023 15:00	5	Maintenance - Sox scrubber hydrated
H2S	21 Feb 2023 11:00	21 Feb 2023 12:00	2	Maintenance - verify daily QA response
H2S	22 Feb 2023 11:00	22 Feb 2023 13:00	3	Maintenance - Sox scrubber hydrated
H2S	22 Feb 2023 14:00	24 Feb 2023 10:00	45	Analyzer Failure - inconsistent response
H2S	24 Feb 2023 11:00	24 Feb 2023 11:00	1	Maintenance - analyzer replaced
Wind Speed, Wind Direction	06 Feb 2023 02:00	06 Feb 2023 11:00	10	Flat line in sensor output signal - Sensor frozen





# Wood Buffalo Environmental Association

## Summary of Hour Averages

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

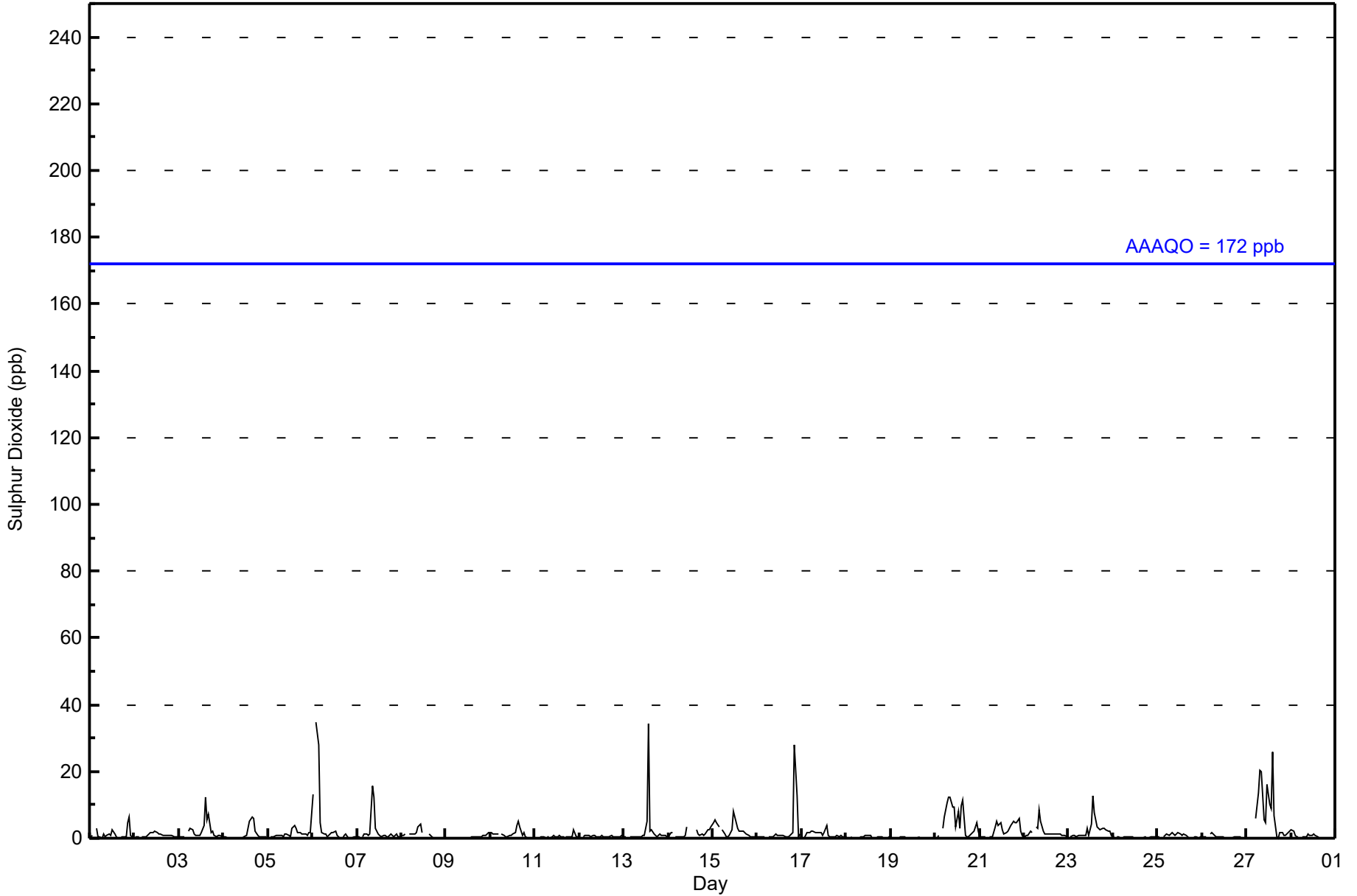
## Jackfish 1 - February 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																																								
Maximum Value: 34.7 ppb on Feb 6 03:00		Maximum Daily Average: 6.4 ppb on Feb 27		Minimum Value: 0.0 ppb on Feb 19 04:00		Minimum Daily Average: 0.1 ppb on Feb 19		Hours of Data: 637																																								
Maximum Diurnal Average: 3.4 ppb at hour 14		Minimum Diurnal Average: 0.7 ppb at hour 24		Hours of Missing Data: 35		Hours of Calibration: 32		Percent Operational Time: 99.6																																								
Monthly Average: 1.69 ppb		Percentiles: P <sub>1</sub> = 0.0 P <sub>10</sub> = 0.1 Q <sub>1</sub> = 0.3 Median = 0.7 Q <sub>3</sub> = 1.5 P <sub>90</sub> = 3.5 P <sub>99</sub> = 18.4																																														
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-Feb	0.4	0.9	Z	2.8	0.4	0.4	0.1	1.2	0.3	1.1	1.4	1.0	2.4	1.1	0.4	0.2	0.2	0.4	0.6	0.6	4.6	6.5	0.9	0.2	1.2	6.5																						
2-Feb	0.2	0.3	0.3	Z	0.3	0.4	0.5	1.0	1.8	1.7	1.7	2.0	1.6	1.2	1.1	1.0	0.9	0.7	0.9	0.9	0.8	0.6	0.6	0.5	0.9	2.0																						
3-Feb	0.5	0.5	0.5	0.5	Z	2.1	3.0	2.5	1.3	0.9	0.8	0.8	1.7	3.6	12.5	5.7	7.1	1.7	2.2	0.7	0.5	0.7	0.8	0.5	2.2	12.5																						
4-Feb	0.4	0.3	0.2	0.1	0.1	Z	0.1	0.2	0.1	0.1	0.1	0.3	1.0	2.9	4.9	6.5	5.9	2.2	1.0	0.5	0.5	0.4	0.2	0.2	1.2	6.5																						
5-Feb	Z	0.3	0.2	0.4	1.0	1.0	0.9	0.8	0.6	1.2	1.3	0.9	0.5	2.9	3.7	2.8	1.6	1.5	1.4	1.1	1.2	0.9	1.5	1.6	1.3	3.7																						
6-Feb	13.2	Z	34.7	28.0	4.7	1.7	1.3	1.3	0.6	1.3	1.5	1.8	1.9	0.9	0.3	0.0	0.0	0.7	1.2	0.2	0.1	0.2	0.5	0.3	4.2	34.7																						
7-Feb	0.4	0.4	Z	0.4	1.2	1.1	0.7	1.1	15.6	12.4	2.9	1.1	0.7	0.6	0.6	0.7	0.6	0.3	1.1	0.9	0.5	1.2	0.5	0.3	2.0	15.6																						
8-Feb	1.0	0.8	1.1	Z	1.1	1.3	1.2	1.5	1.6	3.5	4.1	1.9	M	M	M	1.3	0.6	0.2	0.1	0.2	0.2	0.2	0.2	0.2	1.1	4.1																						
9-Feb	0.2	0.2	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.4	0.5	0.3	0.3	0.3	0.3	0.7	0.8	1.1	1.5	0.4	1.5																						
10-Feb	1.8	1.4	1.4	1.4	1.3	Z	1.2	0.7	0.5	0.6	0.8	0.8	1.5	1.7	3.7	5.0	3.3	0.9	1.6	0.3	0.2	0.2	0.1	0.1	1.3	5.0																						
11-Feb	Z	0.1	0.1	0.4	0.4	0.3	0.1	0.2	0.2	0.4	0.7	0.6	0.5	0.7	0.5	0.4	0.1	0.3	0.2	0.5	0.4	2.4	0.4	0.5	0.4	2.4																						
12-Feb	0.5	Z	0.6	0.9	0.9	0.9	0.6	0.9	1.0	0.6	0.4	0.6	0.8	0.4	0.3	0.3	0.3	0.8	0.4	0.3	0.2	0.4	0.4	0.7	0.6	1.0																						
13-Feb	0.5	0.3	Z	0.4	0.3	0.2	0.3	0.4	0.4	0.5	0.7	0.7	5.0	34.3	2.0	2.5	1.1	0.9	0.6	1.4	0.9	0.8	0.9	0.5	2.4	34.3																						
14-Feb	0.5	1.8	1.5	Z	0.5	0.3	0.3	0.3	0.5	0.8	3.5	C	C	C	C	2.4	1.3	1.0	1.2	0.7	1.4	2.4	2.6	3.3	1.4	3.5																						
15-Feb	4.5	5.4	4.6	3.4	Z	2.6	1.3	0.6	0.5	0.8	2.6	8.0	6.3	2.8	2.0	2.1	2.2	1.6	1.4	0.9	0.5	0.3	0.3	0.4	2.4	8.0																						
16-Feb	0.3	0.3	0.3	0.3	0.4	Z	0.5	0.6	0.6	0.8	1.1	0.8	0.7	0.7	0.7	0.5	0.4	0.2	1.3	1.9	28.1	12.7	0.5	1.1	2.4	28.1																						
17-Feb	Z	0.2	0.7	1.6	1.6	2.0	2.0	1.7	1.8	1.7	1.9	0.7	1.7	3.6	0.9	0.2	0.5	0.6	0.6	0.6	0.5	0.7	0.6	0.5	1.2	3.6																						
18-Feb	0.5	Z	0.4	0.2	0.1	0.1	0.1	0.2	0.3	0.4	0.7	0.7	0.6	0.7	0.1	0.1	0.1	0.3	0.3	0.2	0.1	0.1	0.2	0.2	0.3	0.7																						
19-Feb	0.2	0.1	Z	0.0	0.1	0.4	0.6	0.4	0.2	0.1	0.2	0.1	0.1	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6																						
20-Feb	0.0	0.2	0.8	Z	2.8	6.4	10.6	12.4	12.4	9.4	9.2	3.3	8.1	3.1	9.8	11.3	1.0	0.5	0.4	1.3	1.6	1.9	4.7	2.1	4.9	12.4																						
21-Feb	0.5	0.3	0.3	0.6	Z	0.6	0.3	0.3	3.3	5.2	3.7	4.8	2.7	1.4	1.7	1.9	2.8	3.7	5.1	4.9	4.6	5.9	2.3	0.7	2.5	5.9																						
22-Feb	0.3	0.7	1.0	2.1	1.9	Z	3.2	2.8	8.5	5.0	2.1	1.3	1.3	1.5	1.2	1.4	1.3	1.1	1.1	1.2	1.0	0.9	0.7	0.6	1.8	8.5																						
23-Feb	Z	0.5	0.7	0.9	0.6	0.8	1.0	0.8	0.7	0.7	2.8	0.9	4.4	12.9	7.8	3.5	2.9	2.7	2.9	3.1	2.5	2.2	2.2	0.9	2.5	12.9																						
24-Feb	0.5	Z	0.2	0.3	0.2	0.2	0.5	0.5	0.3	0.6	0.3	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.5	0.6	0.2	0.3	0.6																						
25-Feb	0.3	0.3	Z	0.3	0.9	1.4	1.0	1.4	1.6	1.0	1.2	1.6	1.3	0.8	1.1	0.8	0.3	0.1	0.1	0.1	0.3	0.3	0.2	0.3	0.7	1.6																						
26-Feb	0.3	0.4	0.4	Z	1.4	1.8	1.1	0.4	0.4	0.3	0.4	0.3	0.2	0.1	0.2	0.2	0.1	0.3	0.4	0.3	0.2	0.2	0.1	0.1	0.4	1.8																						
27-Feb	0.1	0.1	0.0	0.1	Z	5.7	13.5	20.5	19.8	5.7	4.7	15.9	10.3	9.1	25.9	7.0	0.4	0.2	1.7	1.7	1.0	0.8	1.8	2.1	6.4	25.9																						
28-Feb	2.6	2.1	0.7	0.4	0.6	Z	0.5	0.5	0.5	1.1	0.8	0.8	1.4	0.9	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.6																						
																								1.2	0.7	2.2	2.0	1.0	1.4	1.7	2.0	2.7	2.1	1.8	1.9	2.2	3.4	3.2	2.1	1.3	0.8	1.0	0.9	1.9	1.6	0.9	0.7	Diurnal Average
																								13.2	5.4	34.7	28.0	4.7	6.4	13.5	20.5	19.8	12.4	9.2	15.9	10.3	34.3	25.9	11.3	7.1	3.7	5.1	4.9	28.1	12.7	4.7	3.3	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  
Jackfish 1 - February 2023





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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Jackfish 1 - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	618	97.02	97.02
11 - 20	13	2.04	99.06
21 - 60	6	0.94	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: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Jackfish 1 - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	46	27	22	14	14	18	20	25	89	84	55	26	26	44	32	69	611
11 - 20	0	1	0	0	0	0	0	0	0	0	0	0	0	2	10	0	13
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	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>	46	28	22	14	14	18	20	25	89	84	55	26	26	46	46	69	628

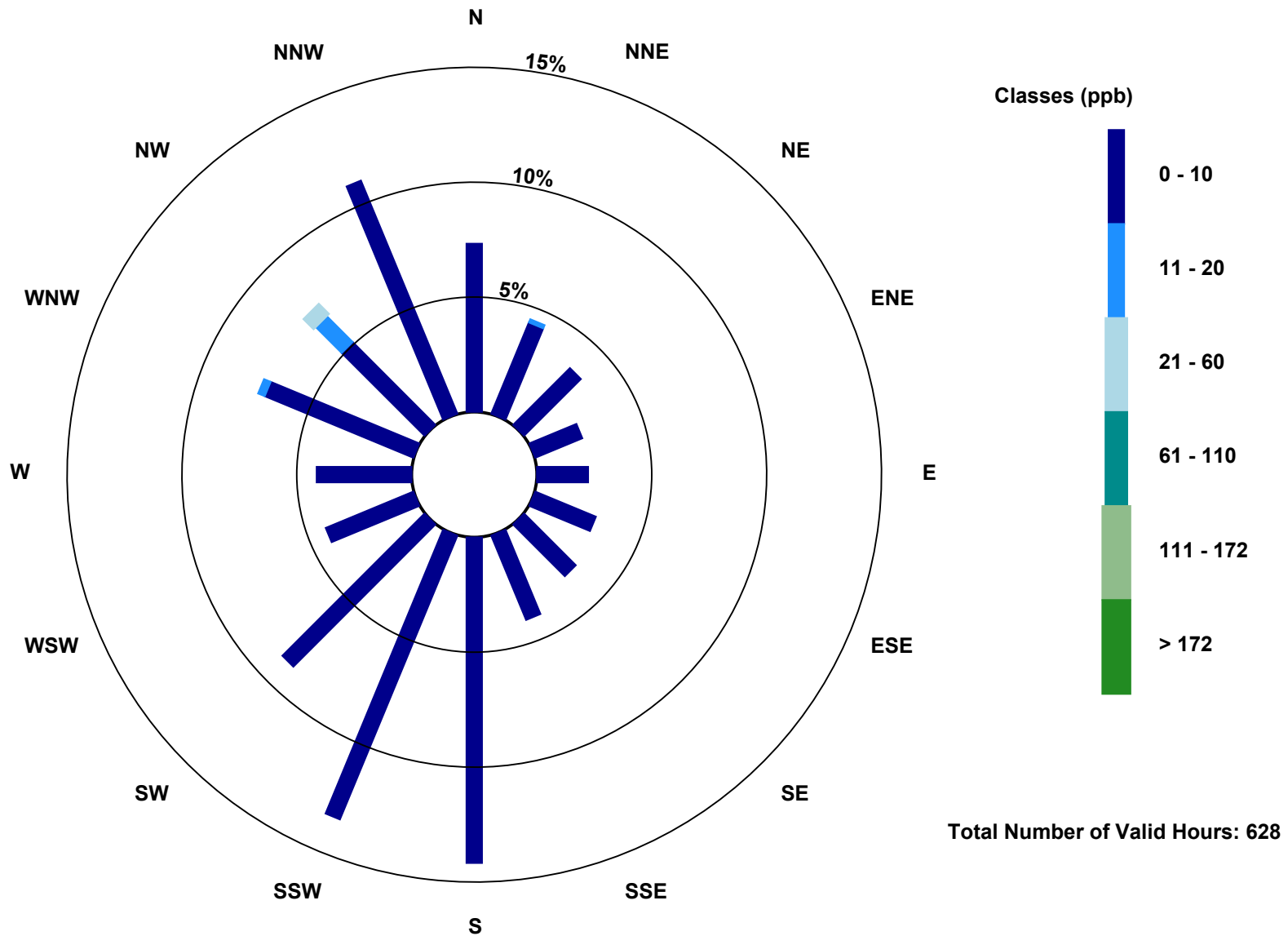
Total Number of Valid Hours: 628

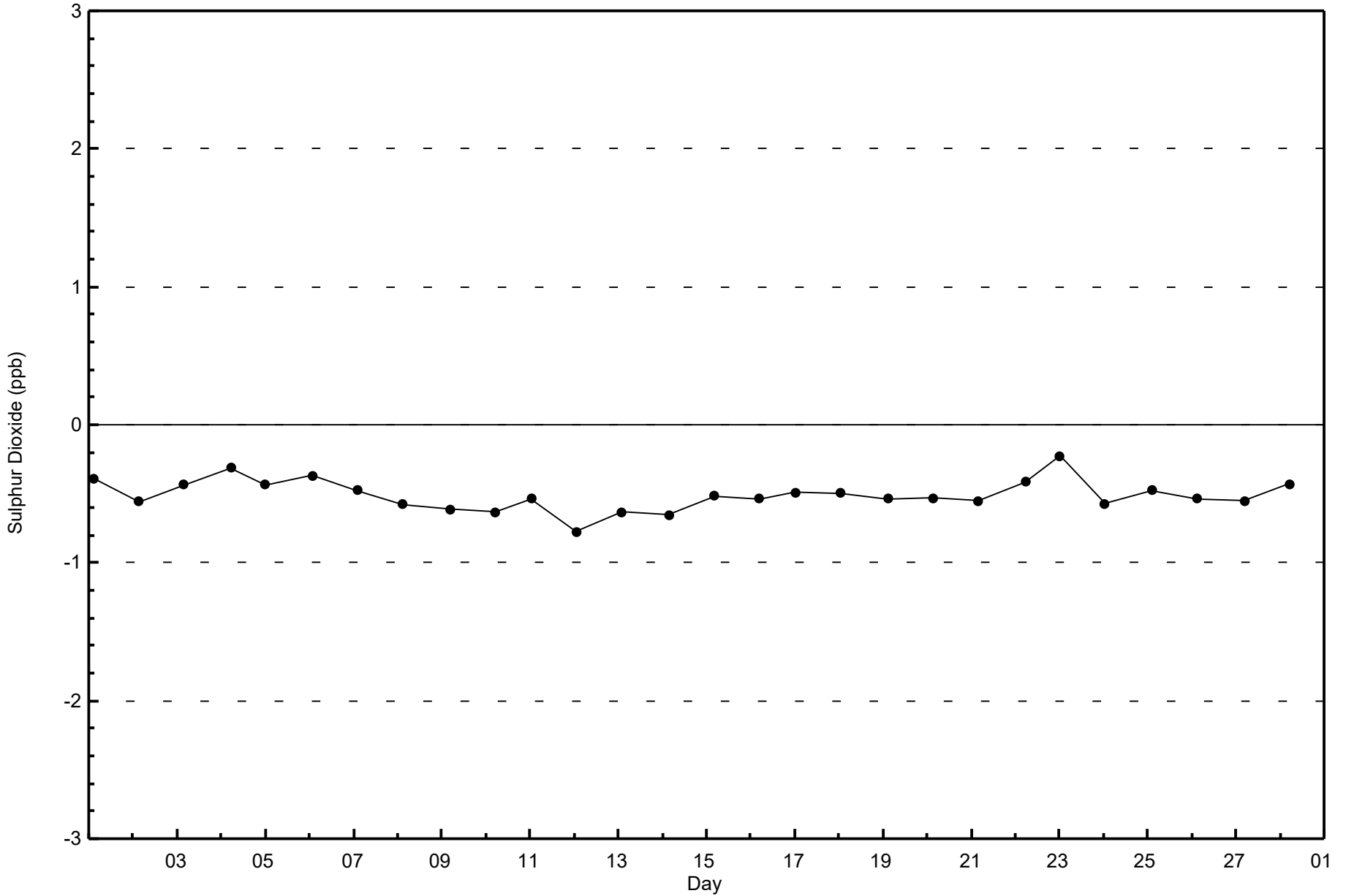
Total Number of Hours: 672

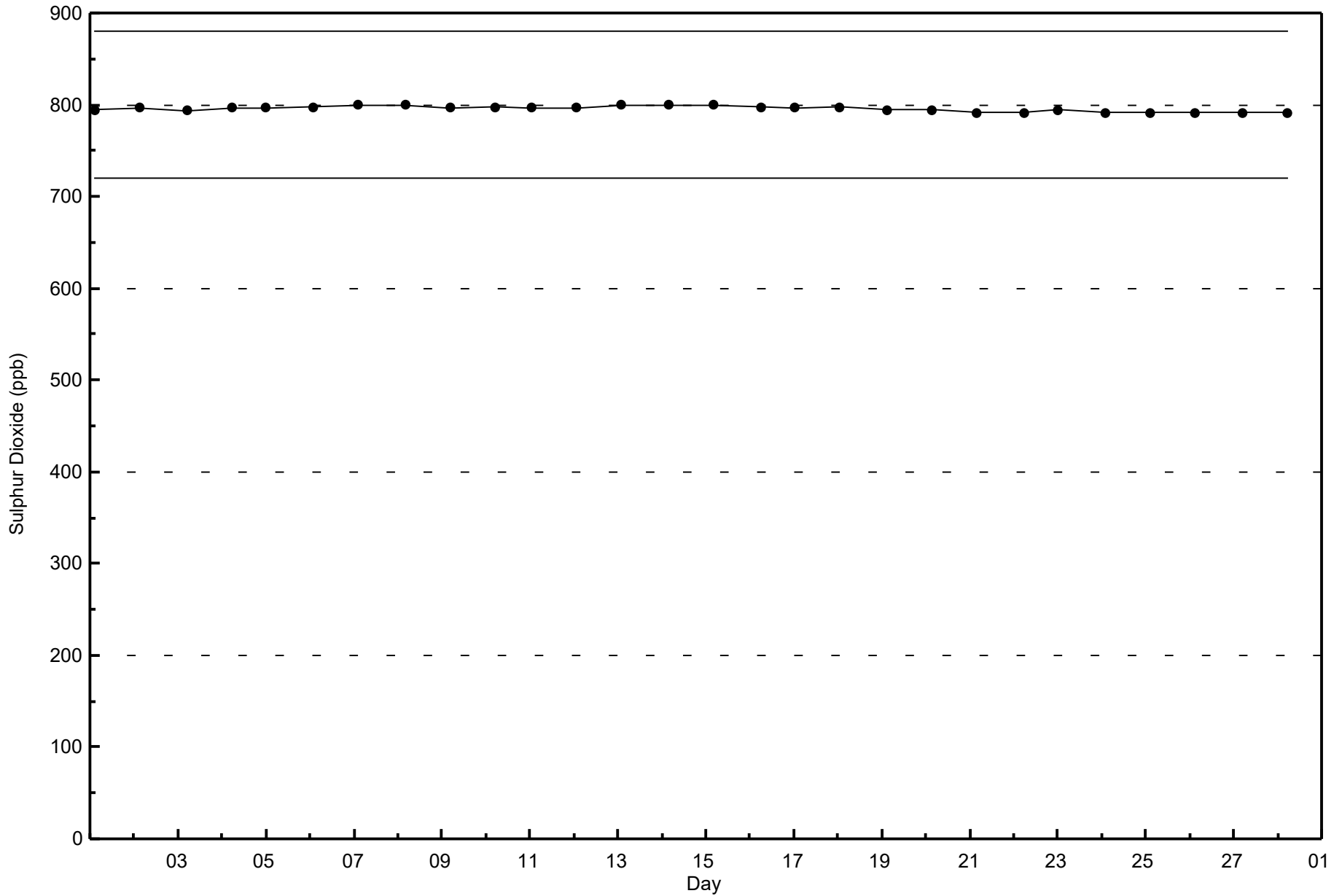


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Jackfish 1









Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H2S) - ppb

Jackfish 1 - February 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	672
Maximum Value: 0.7 ppb on Feb 22 10:00	Maximum Daily Average: 0.2 ppb on Feb 10		Hours of Data:	578
Minimum Value: 0.0 ppb on Feb 1 18:00	Minimum Daily Average: 0.1 ppb on Feb 11		Hours of Missing Data:	94
Maximum Diurnal Average: 0.2 ppb at hour 8	Minimum Diurnal Average: 0.1 ppb at hour 24		Hours of Calibration:	34
Monthly Average: 0.13 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> = 0.2 P <sub>99</sub> = 0.4		Percent Operational Time:	91.1

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-Feb	0.1	0.1	0.1	Z	0.2	0.1	0.0	0.1	0.1	0.2	C	C	C	C	C	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3																							
2-Feb	0.1	0.1	0.0	0.1	Z	0.2	0.1	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3																					
3-Feb	0.1	0.1	0.1	0.1	0.1	Z	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.3																						
4-Feb	Z	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	0.3	0.2	0.2	0.1	0.3	0.3	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.3																						
5-Feb	0.1	Z	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	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	0.1	0.3																						
6-Feb	0.2	0.3	Z	0.4	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	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.4																						
7-Feb	0.1	0.1	0.0	Z	0.2	0.1	0.1	0.1	0.2	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	0.2																						
8-Feb	0.1	0.1	0.1	0.1	Z	0.3	0.2	0.2	0.1	0.1	M	M	M	M	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	0.3																						
9-Feb	0.1	0.1	0.0	0.1	0.1	Z	0.3	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.3	0.3	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4																						
10-Feb	Z	0.4	0.3	0.3	0.3	0.3	0.2	0.4	0.5	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5																						
11-Feb	0.1	Z	0.3	0.2	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	0.0	0.0	0.0	0.0	0.0	0.0	0.3																						
12-Feb	0.0	0.0	Z	0.2	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	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
13-Feb	0.1	0.0	0.0	Z	0.3	0.2	0.2	0.1	0.1	0.1	M	M	M	M	M	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3																						
14-Feb	0.0	0.2	0.3	0.1	Z	0.3	0.2	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3																						
15-Feb	0.2	0.3	0.2	0.2	0.2	Z	0.3	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	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.3																						
16-Feb	Z	0.3	0.2	0.2	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	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3																						
17-Feb	0.2	Z	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3																						
18-Feb	0.2	0.3	Z	0.3	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3																						
19-Feb	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2																						
20-Feb	0.1	0.0	0.1	0.1	Z	0.5	0.4	0.4	0.4	0.3	0.2	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	0.2	0.1	0.1	0.5																						
21-Feb	0.1	0.2	0.1	0.1	0.1	Z	0.3	0.5	0.4	0.3	M	M	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.5																						
22-Feb	Z	0.3	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.7	M	M	M	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	0.7																						
23-Feb	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	AF	--																						
24-Feb	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	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	--																						
25-Feb	0.0	0.0	0.0	Z	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	0.1	0.1	0.1	0.1	0.1																						
26-Feb	0.1	0.1	0.1	0.1	Z	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
27-Feb	0.1	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3																						
28-Feb	Z	0.2	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
																								0.1	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	0.1	0.1	0.1	0.1	0.1	0.1	Diurnal Average
																								0.2	0.4	0.3	0.4	0.3	0.5	0.4	0.5	0.5	0.7	0.2	0.3	0.3	0.2	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	Diurnal Maximum

Z - zerospan      C - Calibration      M - Maintenance      AF - Analyzer Failure

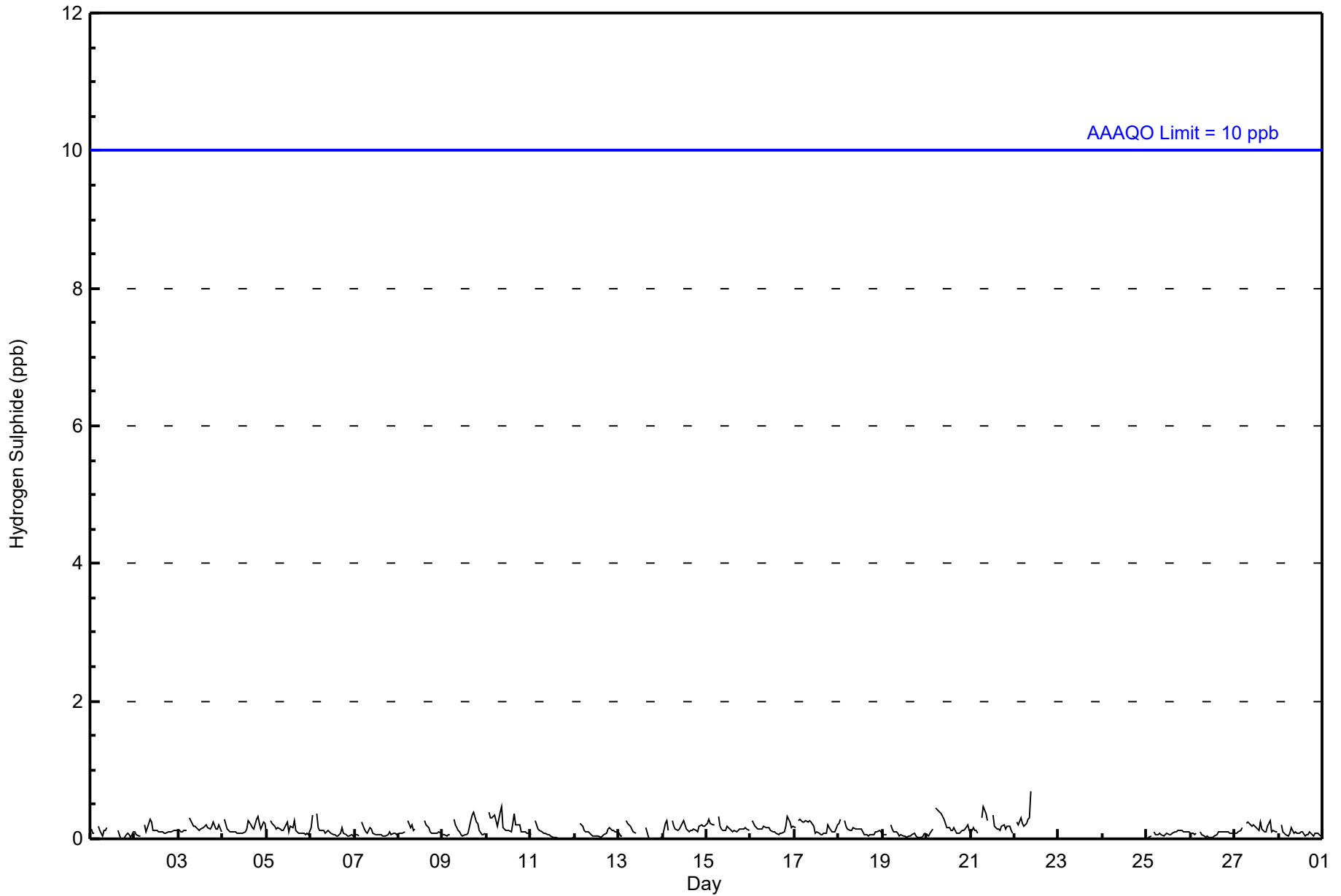
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb    24-hr 3 ppb





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

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Jackfish 1 - February 2023**





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

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Jackfish 1 - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	578	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: 578

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Jackfish 1 - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	33	25	20	14	13	16	20	24	83	78	54	24	20	42	41	62	569
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>	33	25	20	14	13	16	20	24	83	78	54	24	20	42	41	62	569

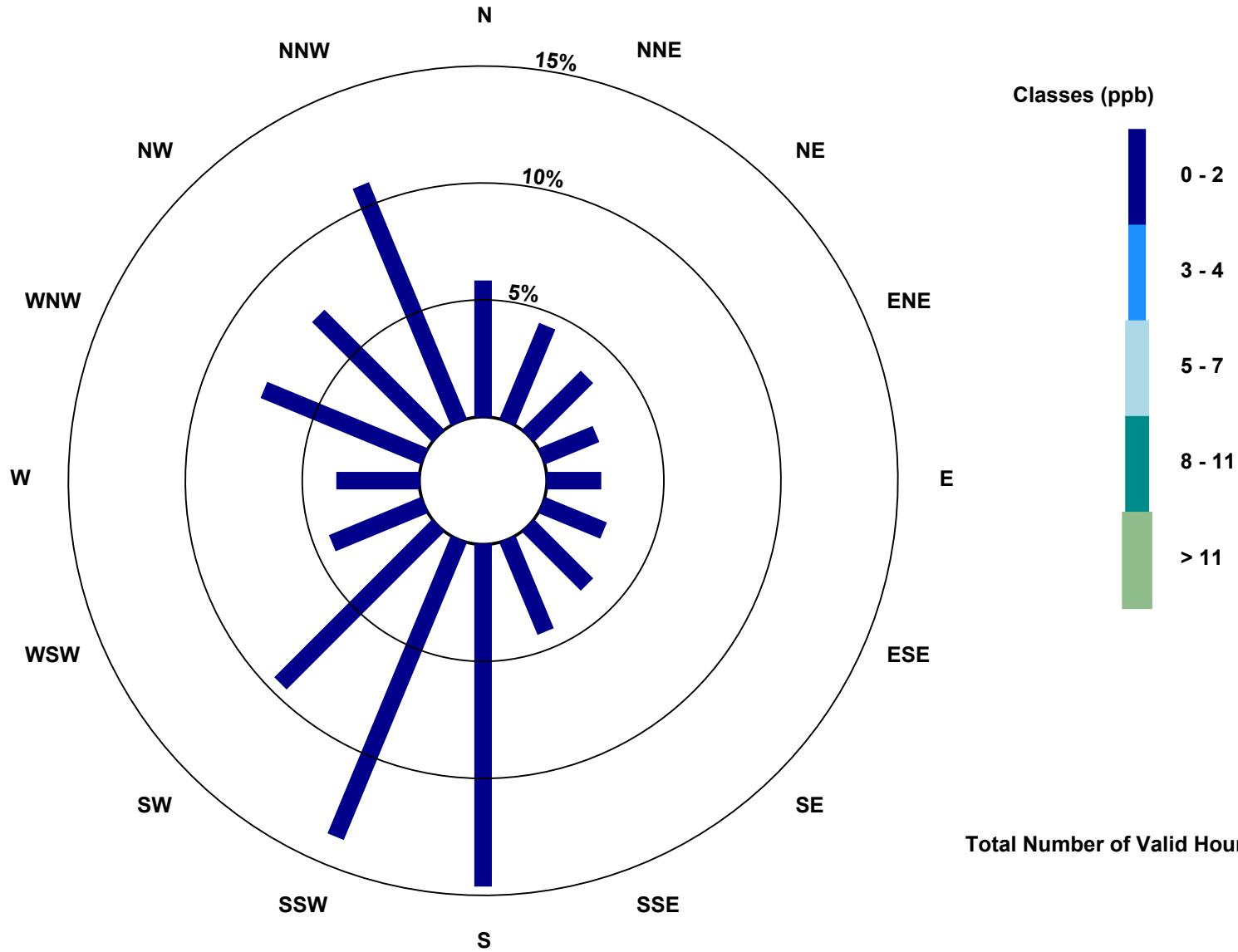
Total Number of Valid Hours: 569

Total Number of Hours: 672

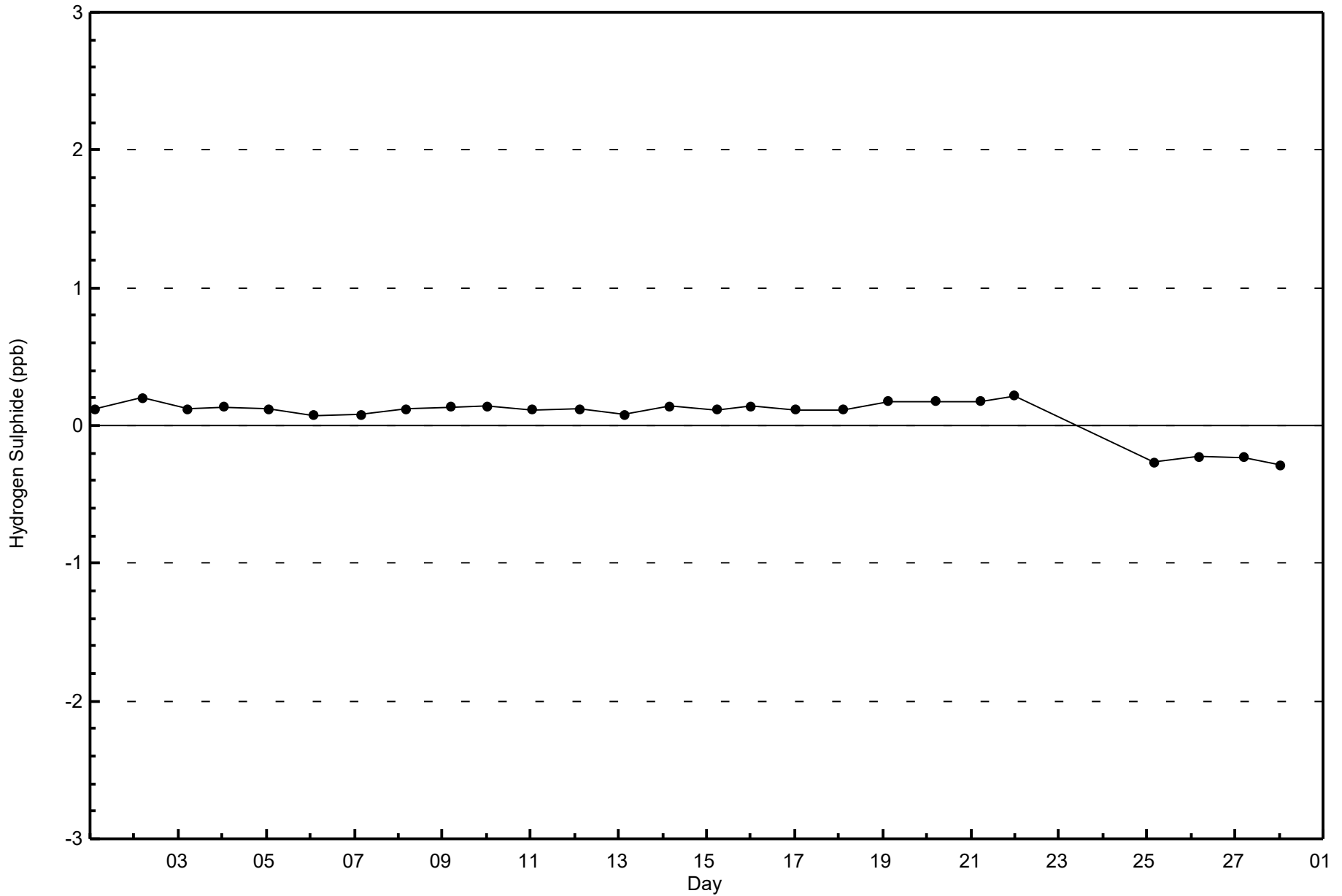


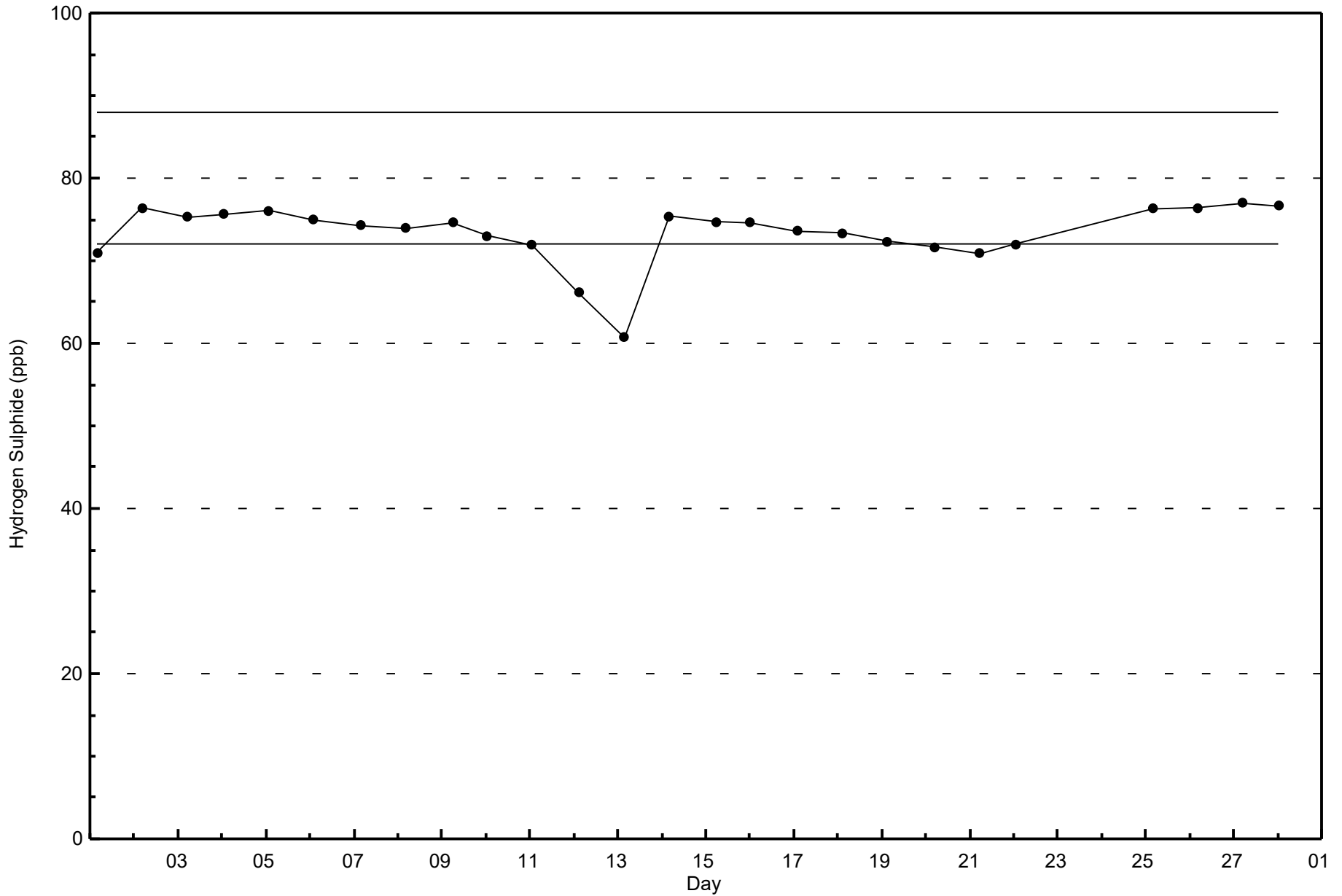
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Jackfish 1



Total Number of Valid Hours: 569







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

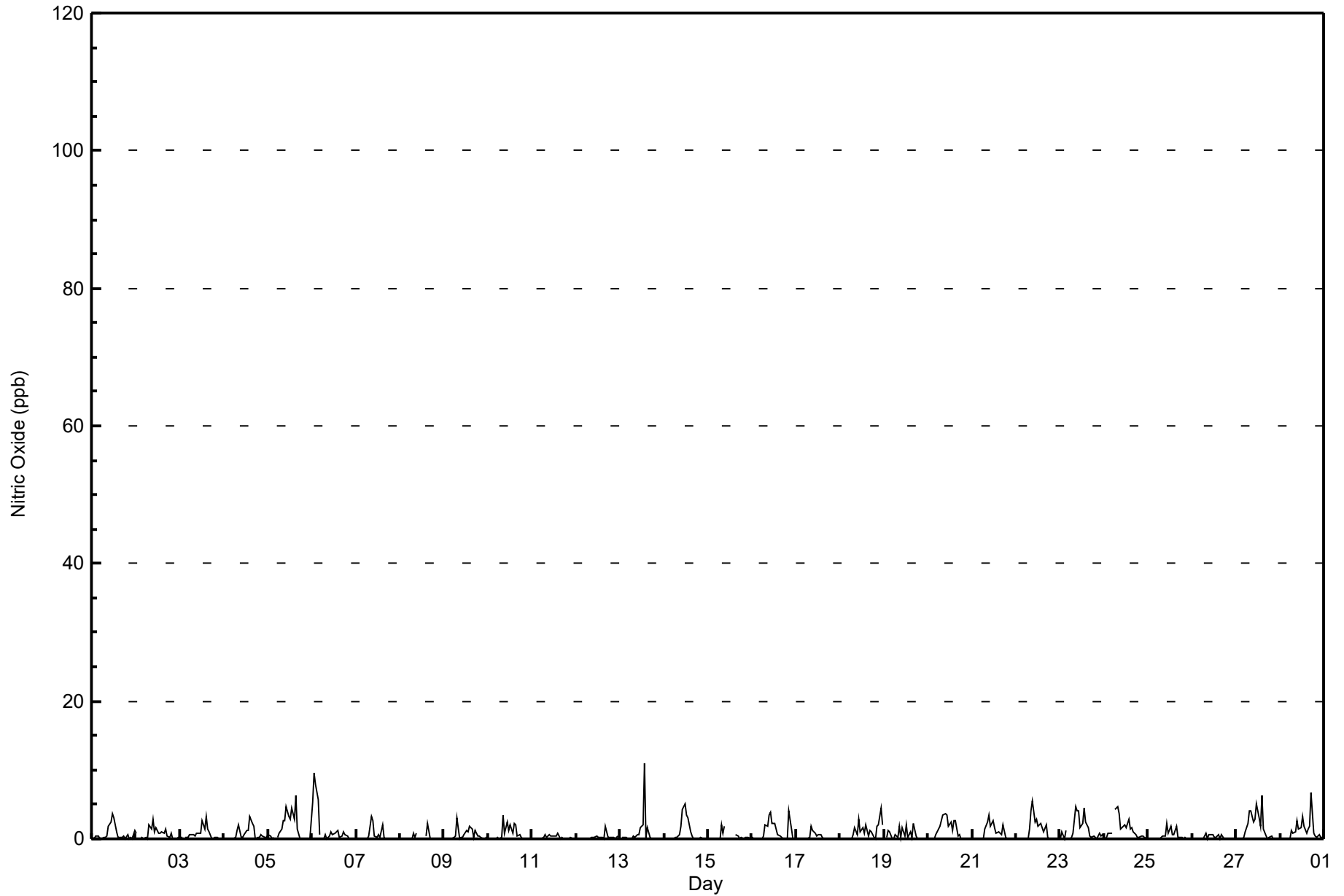
Jackfish 1 - February 2023

Maximum Value: 11.0 ppb on Feb 13 14:00																				Maximum Daily Average: 1.6 ppb on Feb 6					Hours in Service: 672	
Minimum Value: 0.0 ppb on Feb 1 05:00																				Minimum Daily Average: 0.2 ppb on Feb 11					Hours of Data: 635	
Maximum Diurnal Average: 1.9 ppb at hour 11																				Minimum Diurnal Average: 0.1 ppb at hour 5					Hours of Missing Data: 37	
Monthly Average: 0.82 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> = 1.1 P <sub>90</sub> = 2.5 P <sub>99</sub> = 5.7					Hours of Calibration: 33	
																									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-Feb	Z	0.1	0.5	0.3	0.0	0.0	0.2	0.3	0.4	1.8	2.5	3.8	3.0	1.1	0.2	0.1	0.1	0.3	0.0	0.7	0.1	0.1	0.0	1.1	0.7	3.8
2-Feb	0.9	Z	0.0	0.2	0.0	0.2	0.1	2.0	1.5	2.8	1.0	1.6	0.8	0.9	1.0	0.9	1.4	0.4	0.2	0.9	0.0	0.1	0.1	0.2	0.7	2.8
3-Feb	0.1	0.2	Z	0.2	0.2	0.6	0.6	0.6	0.5	0.8	0.9	0.7	2.6	1.4	3.2	1.4	1.0	0.0	0.1	0.3	0.2	0.1	0.0	0.0	0.7	3.2
4-Feb	0.0	0.1	0.0	Z	0.0	0.0	0.1	1.2	2.1	0.2	0.3	0.6	1.2	1.1	3.2	2.2	1.9	0.0	0.2	0.3	0.5	0.4	0.2	0.2	0.7	3.2
5-Feb	0.6	0.3	0.0	0.2	Z	0.3	0.9	1.3	2.6	2.6	4.6	3.2	2.8	4.5	2.8	6.2	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	6.2
6-Feb	5.3	9.6	8.0	5.8	0.6	Z	0.0	0.5	0.1	0.4	1.0	0.6	0.8	1.0	1.3	0.2	0.3	1.1	0.5	0.4	0.0	0.0	0.0	0.0	1.6	9.6
7-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.5	3.3	2.6	0.5	0.3	0.7	0.2	2.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.3
8-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.8	0.2	0.9	M	M	M	M	0.4	2.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.3
9-Feb	0.0	0.0	Z	0.0	0.0	0.2	0.3	3.0	0.1	0.2	0.2	0.7	1.2	0.9	1.7	1.4	0.2	1.3	0.3	0.5	0.2	0.1	0.1	0.1	0.6	3.0
10-Feb	0.0	0.1	0.1	Z	0.0	0.1	0.1	0.3	3.5	0.8	2.5	1.2	2.1	0.9	2.2	2.1	0.4	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.7	3.5
11-Feb	0.0	0.0	0.0	0.0	Z	0.0	0.2	0.6	0.3	0.5	0.5	0.3	0.4	0.4	0.9	0.1	0.1	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.2	0.9
12-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.2	0.2	0.3	0.4	0.2	0.2	0.2	0.1	1.9	0.3	0.2	0.1	0.1	0.1	0.2	0.4	0.2	1.9
13-Feb	Z	0.1	0.2	0.2	0.0	0.0	0.0	0.3	0.1	0.5	0.5	1.6	1.9	11.0	0.3	1.6	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.8	11.0
14-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.2	0.6	1.9	4.2	5.1	3.4	3.0	1.0	0.5	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.9	5.1
15-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.1	2.0	0.9	1.9	C	C	C	C	C	0.6	0.4	0.0	0.3	0.0	0.2	0.1	0.3	0.0	0.4	2.0
16-Feb	0.1	0.0	0.0	Z	0.0	0.1	0.3	2.1	1.9	3.4	4.0	2.2	2.1	1.5	0.7	0.3	0.2	0.0	0.0	0.0	4.1	1.5	0.0	0.1	1.1	4.1
17-Feb	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.1	1.8	1.2	0.8	0.4	0.5	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.8
18-Feb	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.7	1.6	0.7	2.8	1.1	1.7	0.9	2.0	0.5	1.3	1.1	0.3	0.0	1.8	2.0	4.4	1.9	1.1	4.4
19-Feb	Z	0.1	1.1	0.9	0.1	0.0	0.7	0.2	1.9	0.2	1.7	0.4	2.0	0.3	1.1	0.2	2.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.3
20-Feb	0.0	Z	0.0	0.0	0.7	1.0	1.9	2.7	3.6	3.6	3.5	1.9	2.5	1.3	2.6	2.7	0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	1.3	3.6
21-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.1	1.4	2.5	3.4	1.9	2.7	1.7	0.8	1.0	0.9	0.6	2.0	0.1	0.0	0.0	0.0	0.0	0.0	0.8	3.4
22-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.1	1.5	4.0	5.5	2.5	2.8	1.8	2.2	1.6	1.0	2.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.1	5.5
23-Feb	0.1	1.0	0.0	1.2	Z	0.1	0.3	0.8	4.7	4.0	4.0	1.5	2.3	4.6	2.5	1.6	0.4	0.1	0.3	0.1	0.0	0.7	0.4	0.5	1.4	4.7
24-Feb	0.0	0.3	0.7	0.7	0.8	Z	4.2	4.7	3.6	1.5	1.8	1.9	1.7	2.9	1.4	1.6	1.1	0.7	0.2	0.3	0.4	0.3	0.2	0.1	1.4	4.7
25-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5	2.2	0.9	1.8	0.5	0.7	1.8	0.2	0.2	0.3	0.0	0.2	0.1	0.1	0.1	0.4	2.2
26-Feb	0.1	Z	0.0	0.0	0.0	0.0	0.9	0.1	0.6	0.7	0.7	0.1	0.3	0.6	0.0	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9
27-Feb	0.0	0.0	Z	0.0	0.1	1.0	2.2	4.2	4.0	2.4	2.8	5.2	3.1	1.9	6.3	1.5	0.4	0.0	0.2	0.4	0.0	0.0	0.0	0.0	1.6	6.3
28-Feb	0.0	0.0	0.0	Z	0.0	0.0	1.3	0.8	1.0	2.7	1.4	1.7	3.2	1.8	0.9	1.4	1.8	6.8	0.8	0.4	0.1	0.6	0.1	0.1	1.2	6.8
																								Diurnal Average		
																								Diurnal Maximum		
0.3 0.5 0.5 0.4 0.1 0.1 0.5 1.2 1.7 1.7 1.9 1.7 1.8 1.8 1.5 1.2 0.8 0.6 0.2 0.2 0.3 0.2 0.2 0.2																										
5.3 9.6 8.0 5.8 0.8 1.0 4.2 4.7 4.7 5.5 4.6 5.2 3.4 11.0 6.3 6.2 2.3 6.8 0.8 0.9 4.1 2.0 4.4 1.9																										
Z - zerospan                      C - Calibration                      M - Maintenance																										



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

**Nitric Oxide (NO) - ppb**  
**Jackfish 1 - February 2023**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Jackfish 1 - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	635	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: 635

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Jackfish 1 - February 2023**

<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	46	26	21	13	15	17	21	23	87	89	55	26	25	45	46	71	626
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>	46	26	21	13	15	17	21	23	87	89	55	26	25	45	46	71	626

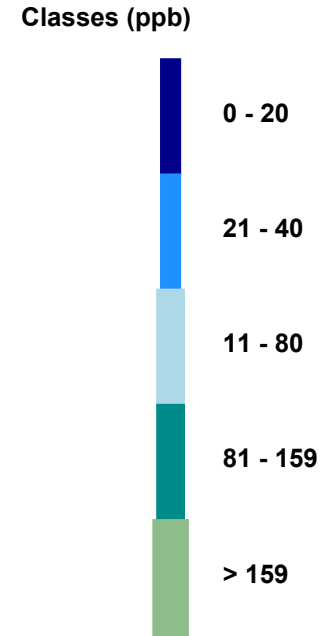
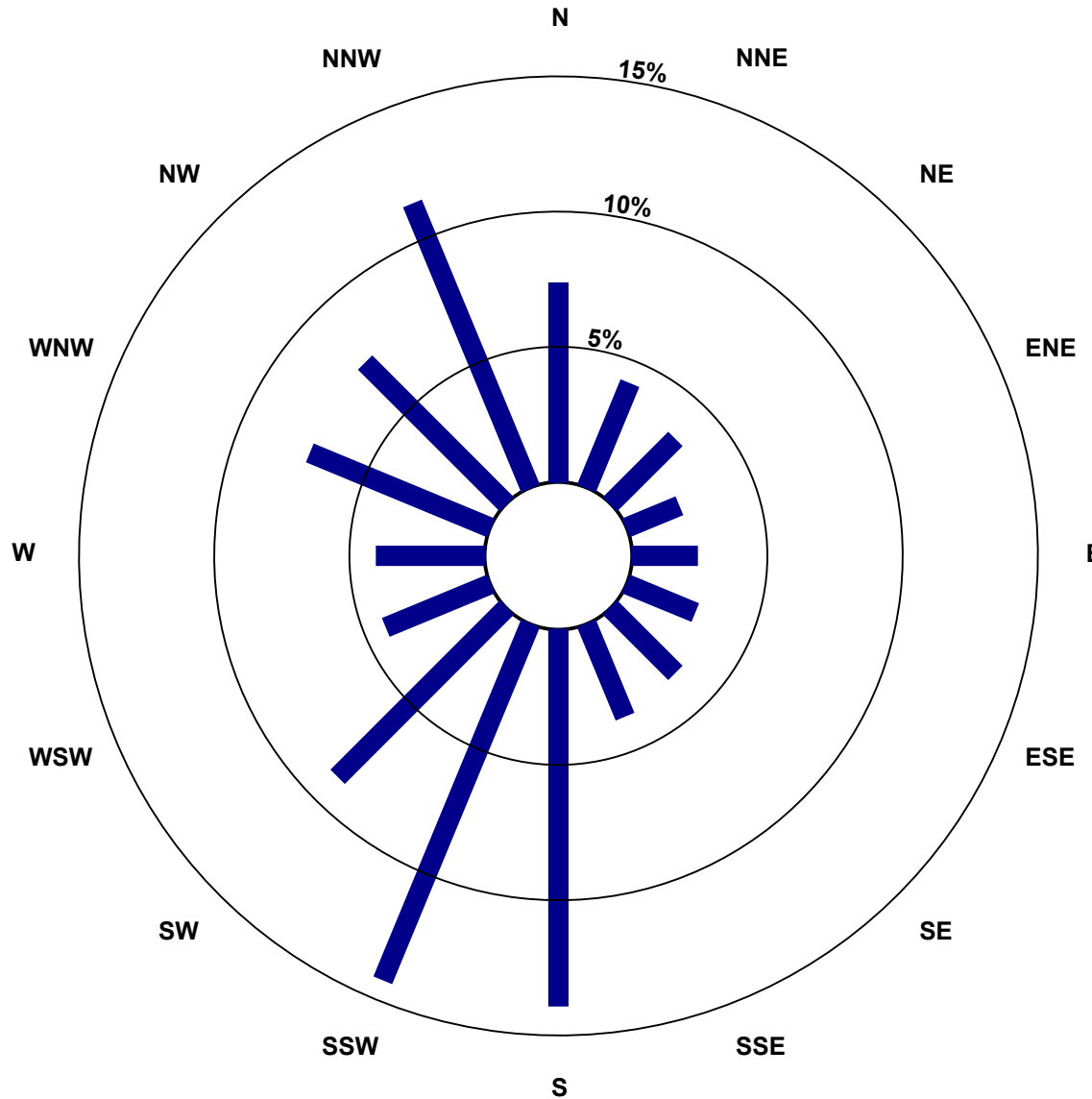
Total Number of Valid Hours: 626

Total Number of Hours: 672

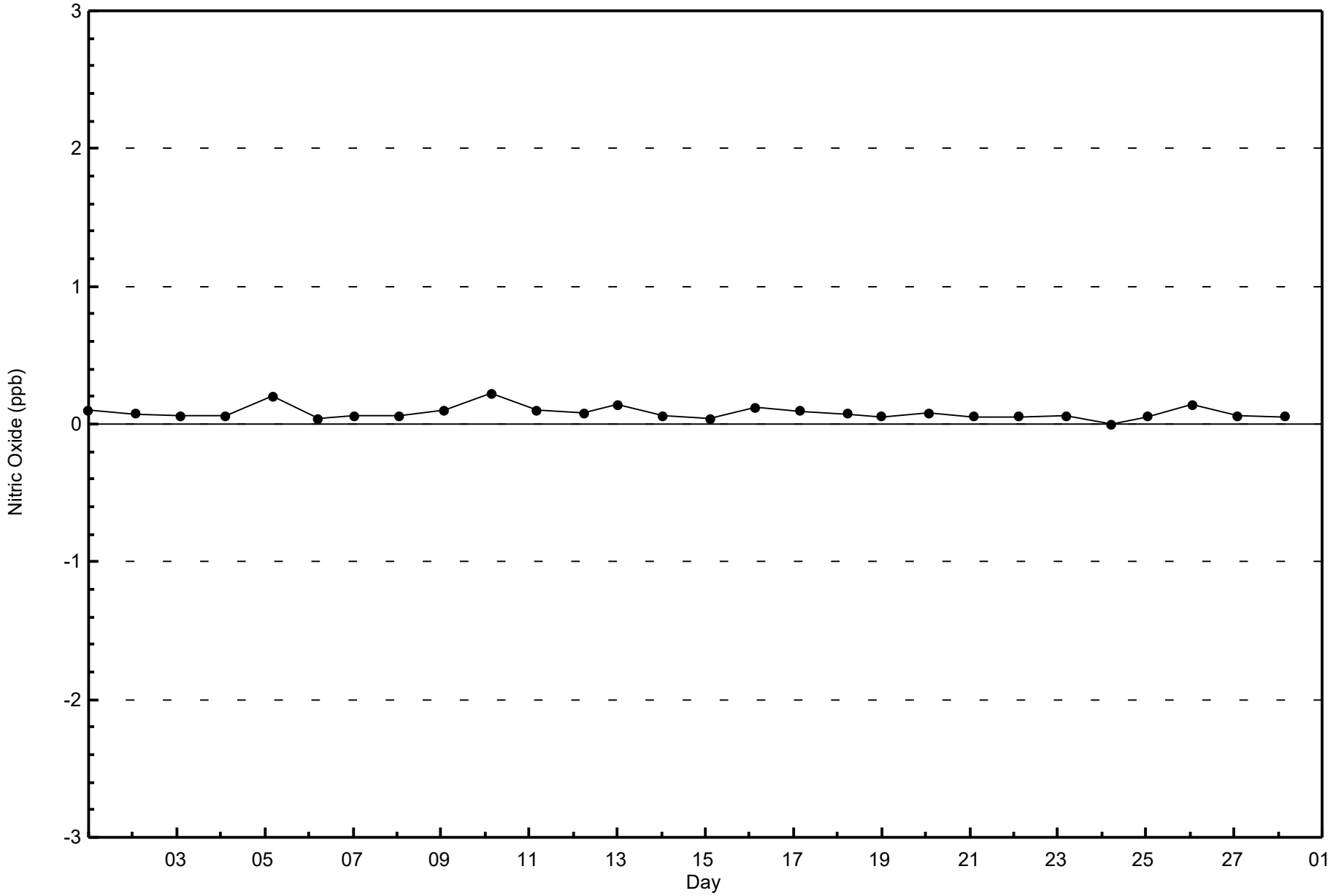


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitric Oxide (NO) - ppb  
Jackfish 1



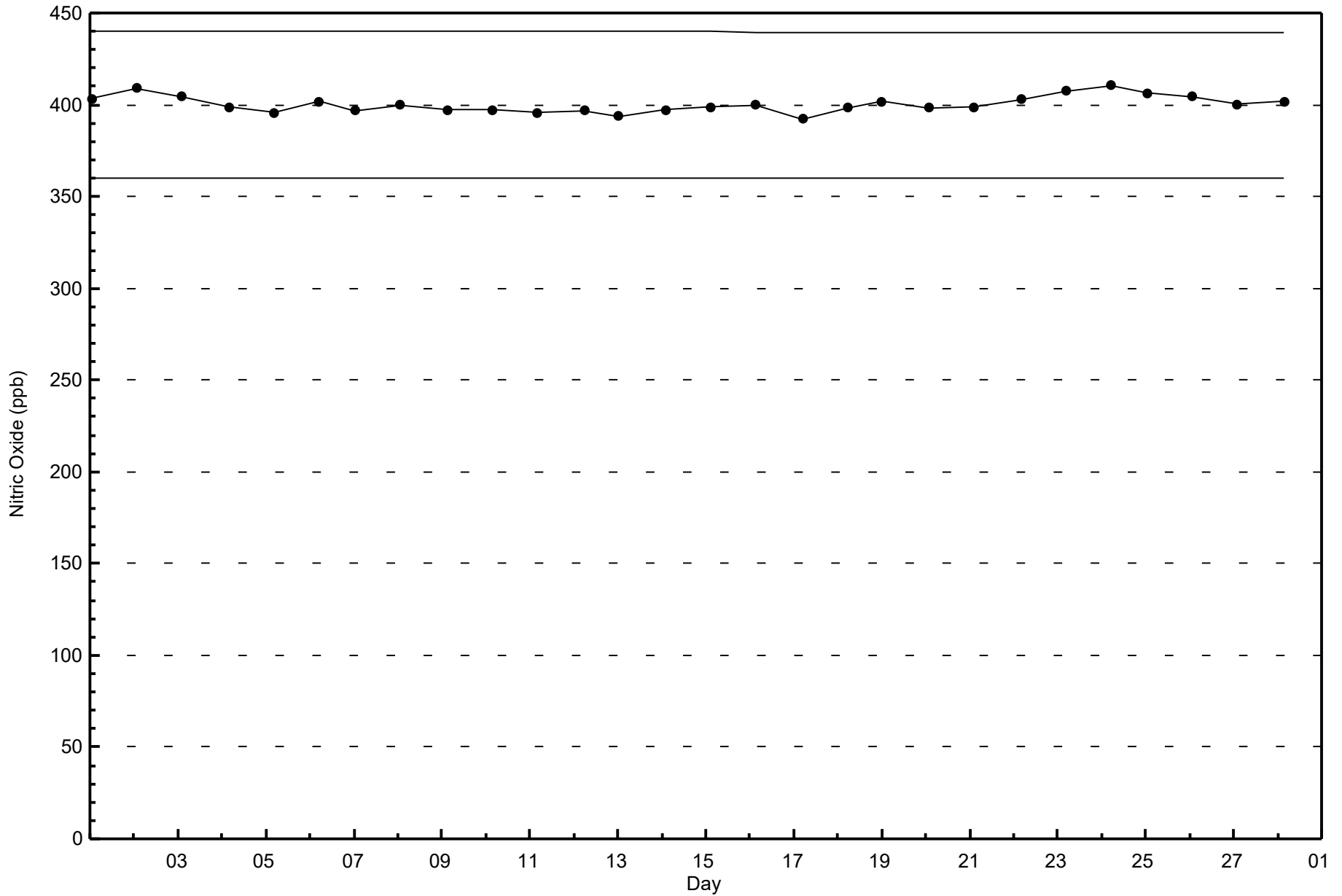
Total Number of Valid Hours: 626





Wood Buffalo Environmental Association  
Span Responses

Nitric Oxide (NO) - ppb  
Jackfish 1 - February 2023





# Wood Buffalo Environmental Association

## Summary of Hour Averages

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

## Jackfish 1 - February 2023

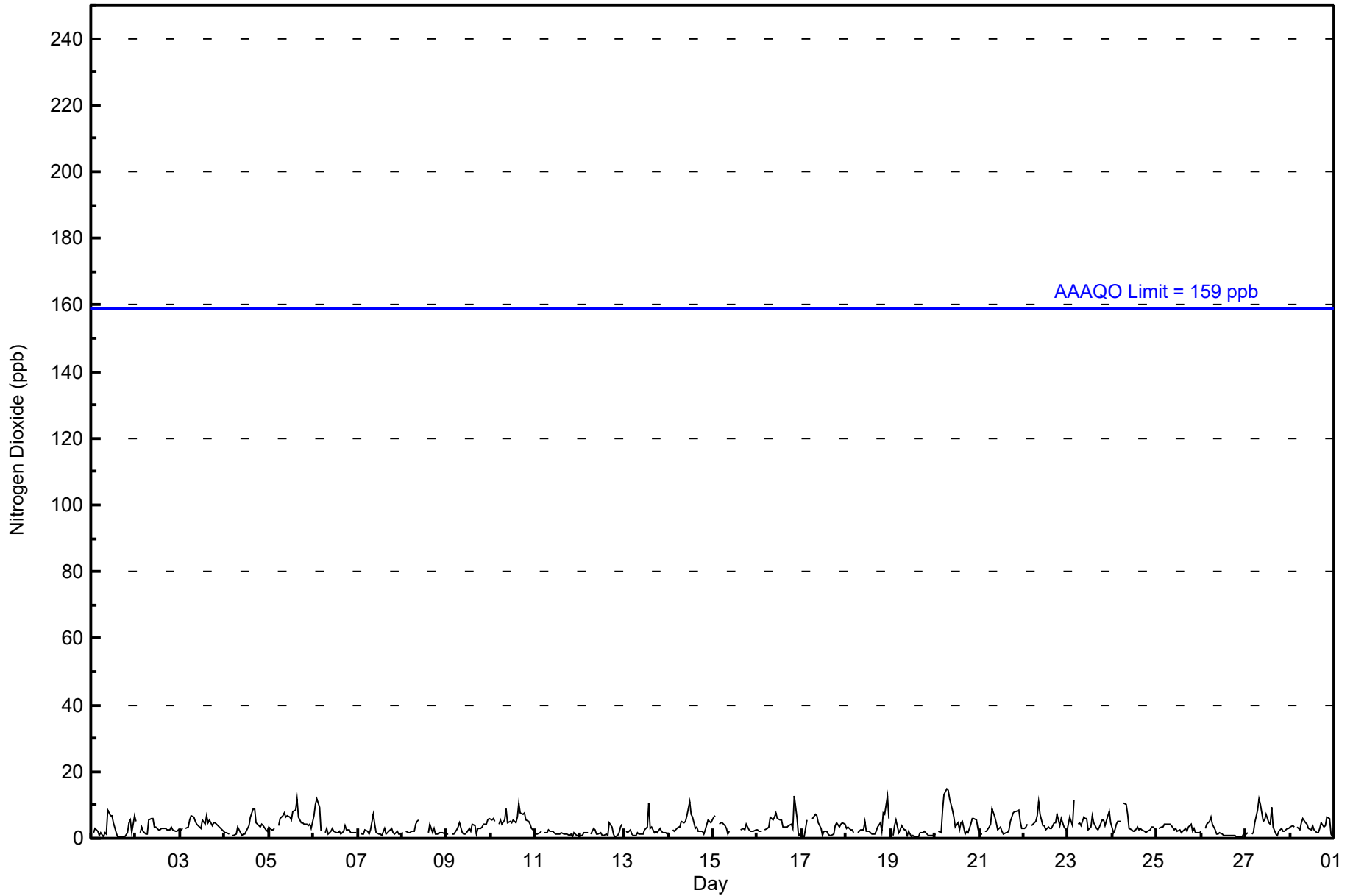
Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		672																		
Maximum Value: 15.0 ppb on Feb 20 07:00		Maximum Daily Average: 5.8 ppb on Feb 20		Minimum Value: 0.3 ppb on Feb 19 14:00		Minimum Daily Average: 1.4 ppb on Feb 11		Hours of Data: 635																		
Maximum Diurnal Average: 5.2 ppb at hour 8		Minimum Diurnal Average: 2.7 ppb at hour 24		Monthly Average: 3.47 ppb		Percentiles: P <sub>1</sub> = 0.5 P <sub>10</sub> = 1.1 Q <sub>1</sub> = 1.7 Median = 2.9 Q <sub>3</sub> = 4.7 P <sub>90</sub> = 6.5 P <sub>99</sub> = 11.9		Hours of Missing Data: 37																		
								Hours of Calibration: 33																		
								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-Feb	Z	1.9	3.0	2.2	0.7	1.5	0.6	1.5	1.1	8.6	6.7	6.7	4.7	1.6	0.4	0.5	0.6	0.5	0.5	1.9	4.5	5.7	1.7	6.8	2.8	8.6
2-Feb	5.2	Z	1.9	3.2	2.1	1.4	1.1	5.6	6.1	5.9	3.3	3.4	2.6	2.7	3.1	3.1	2.9	2.4	2.6	3.3	2.7	2.1	2.3	2.5	3.1	6.1
3-Feb	2.6	3.0	Z	3.0	3.2	5.6	6.7	6.3	5.1	4.3	3.5	3.1	5.6	4.2	6.6	4.6	5.7	4.0	4.5	4.7	3.9	3.2	3.1	2.3	4.3	6.7
4-Feb	1.7	1.7	1.1	Z	1.0	0.9	1.3	3.5	2.5	0.9	1.1	1.3	2.9	3.7	6.4	8.8	8.9	4.8	3.8	3.4	4.1	4.0	2.7	2.1	3.2	8.9
5-Feb	3.5	2.6	2.4	3.0	Z	3.9	5.9	6.6	7.7	6.2	6.7	6.2	5.5	8.0	8.5	11.9	6.3	4.8	4.8	4.4	4.3	3.8	4.3	2.9	5.4	11.9
6-Feb	6.6	10.2	11.7	9.2	2.0	Z	1.8	2.8	1.1	2.3	2.8	2.0	1.9	1.9	2.2	1.3	2.1	3.8	2.6	2.6	1.6	1.7	1.9	1.5	3.4	11.7
7-Feb	Z	1.6	1.3	1.2	2.5	2.0	1.3	2.6	7.2	4.4	1.7	1.2	1.4	0.9	2.9	1.2	1.5	2.0	3.1	1.6	1.2	2.1	1.3	1.2	2.1	7.2
8-Feb	1.8	Z	2.1	1.6	1.9	2.0	2.0	4.1	4.9	5.4	M	M	M	M	1.6	4.3	1.6	3.0	1.2	1.3	1.5	1.5	1.5	1.3	2.3	5.4
9-Feb	1.2	1.4	Z	1.4	1.2	2.5	3.2	4.6	1.6	1.3	1.3	1.5	2.9	2.3	4.2	3.8	1.4	3.1	2.9	3.2	4.4	4.2	5.6	5.9	2.8	5.9
10-Feb	5.3	5.9	4.9	Z	4.2	5.6	4.2	5.5	9.0	4.7	5.1	4.7	5.5	4.7	6.4	10.6	7.6	7.2	7.6	5.3	5.1	4.1	3.1	2.2	5.6	10.6
11-Feb	1.2	1.3	1.5	2.3	Z	1.7	1.7	2.4	2.3	2.2	1.7	1.2	1.1	1.3	1.6	1.3	1.4	1.1	0.8	1.2	0.5	1.7	0.7	1.0	1.4	2.4
12-Feb	1.0	0.8	1.5	1.9	1.9	Z	1.3	2.8	2.7	1.3	1.4	1.5	0.9	0.9	1.3	0.9	4.7	3.5	1.2	0.6	0.8	1.9	3.2	4.3	1.8	4.7
13-Feb	Z	2.3	1.9	2.4	1.2	0.8	0.9	1.8	1.2	1.4	1.4	2.5	3.3	10.7	3.1	3.3	1.8	2.1	1.9	2.9	2.0	1.7	1.8	1.2	2.3	10.7
14-Feb	1.7	Z	2.7	2.1	2.4	3.3	3.6	5.2	4.8	5.2	6.9	11.0	7.0	6.3	2.9	3.2	2.1	2.1	2.2	1.4	2.6	5.4	4.9	4.5	4.1	11.0
15-Feb	6.3	6.6	Z	4.4	4.6	4.8	3.7	2.8	1.3	2.3	C	C	C	C	C	2.4	3.1	2.5	4.3	2.7	2.1	2.0	2.3	2.5	3.4	6.6
16-Feb	2.5	2.1	2.2	Z	2.5	2.8	3.5	6.4	5.5	6.5	7.8	6.0	5.7	5.4	3.5	3.4	3.6	3.8	4.4	2.9	12.9	6.1	0.7	1.1	4.4	12.9
17-Feb	1.0	0.4	3.0	5.6	Z	6.1	5.8	7.0	6.8	4.7	2.8	1.0	2.2	2.0	1.4	0.7	0.9	1.3	4.0	4.5	3.3	4.2	4.7	4.1	3.4	7.0
18-Feb	3.1	3.3	2.5	2.4	1.7	Z	1.6	2.1	2.5	2.4	5.0	2.0	2.1	1.5	1.4	1.1	2.0	3.6	4.7	2.0	7.5	7.4	12.8	5.8	3.5	12.8
19-Feb	Z	1.0	3.7	5.6	1.9	2.7	3.7	2.6	2.5	0.9	2.0	0.5	1.0	0.3	0.6	0.5	1.9	1.7	2.1	1.5	0.9	0.7	0.8	1.0	1.7	5.6
20-Feb	1.4	Z	2.2	1.7	8.6	13.3	15.0	14.3	11.9	8.3	6.3	3.6	4.5	2.7	4.7	4.9	1.2	2.1	1.8	4.2	6.0	6.0	5.6	3.1	5.8	15.0
21-Feb	1.2	1.1	Z	2.1	2.0	3.2	4.1	8.7	6.3	4.7	2.7	3.2	2.1	1.2	1.5	1.5	2.5	5.0	7.5	8.1	8.1	8.4	4.9	3.1	4.1	8.7
22-Feb	3.0	3.5	4.2	Z	3.7	4.4	5.1	6.9	10.9	7.1	4.0	3.9	2.7	3.3	3.1	3.0	4.6	4.5	7.4	4.0	5.9	4.6	3.3	2.2	4.6	10.9
23-Feb	4.2	6.5	4.0	11.6	Z	4.4	4.8	3.7	6.3	6.1	6.0	2.6	3.3	6.9	4.8	3.0	2.6	3.3	5.7	5.7	4.0	6.6	7.9	4.6	5.2	11.6
24-Feb	1.6	2.7	4.4	5.1	5.1	Z	10.7	10.3	7.4	2.8	2.5	2.3	2.2	3.2	2.5	3.1	2.6	2.1	1.6	2.0	2.6	3.3	3.2	2.7	3.7	10.7
25-Feb	Z	3.1	3.2	3.5	4.3	4.3	4.2	4.4	4.0	2.6	3.0	2.2	2.5	1.8	2.2	3.0	2.0	3.6	4.2	2.0	2.9	1.9	1.8	1.9	3.0	4.4
26-Feb	2.1	Z	2.8	4.4	5.1	6.3	4.4	2.6	1.3	1.4	1.7	1.4	0.9	0.8	0.8	0.7	0.7	0.9	0.7	0.5	0.6	0.5	0.5	1.1	1.8	6.3
27-Feb	1.2	1.7	Z	1.4	1.7	4.8	8.3	11.9	10.3	4.9	5.5	7.0	4.8	4.3	9.2	3.4	1.4	0.9	2.2	2.8	2.1	2.1	2.8	2.9	4.2	11.9
28-Feb	3.3	3.8	3.5	Z	3.3	2.6	4.8	5.8	4.8	4.2	2.9	2.7	3.7	2.6	1.6	1.6	3.0	4.7	3.4	3.7	6.5	5.8	1.2	0.5	3.5	6.5
																								Diurnal Average		
																								Diurnal Maximum		
																								2.7 3.0 3.1 3.5 2.9 3.8 4.1 5.2 5.0 4.0 3.7 3.3 3.2 3.3 3.3 3.3 2.9 3.0 3.3 3.0 3.7 3.7 3.2 2.7		
																								6.6 10.2 11.7 11.6 8.6 13.3 15.0 14.3 11.9 8.6 7.8 11.0 7.0 10.7 9.2 11.9 8.9 7.2 7.6 8.1 12.9 8.4 12.8 6.8		

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 - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Jackfish 1 - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	635	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: 635

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Jackfish 1 - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	46	26	21	13	15	17	21	23	87	89	55	26	25	45	46	71	626
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>	46	26	21	13	15	17	21	23	87	89	55	26	25	45	46	71	626

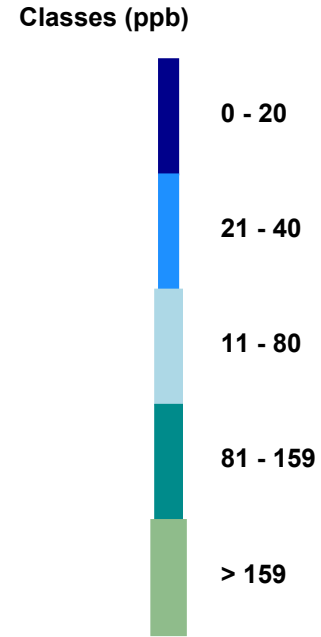
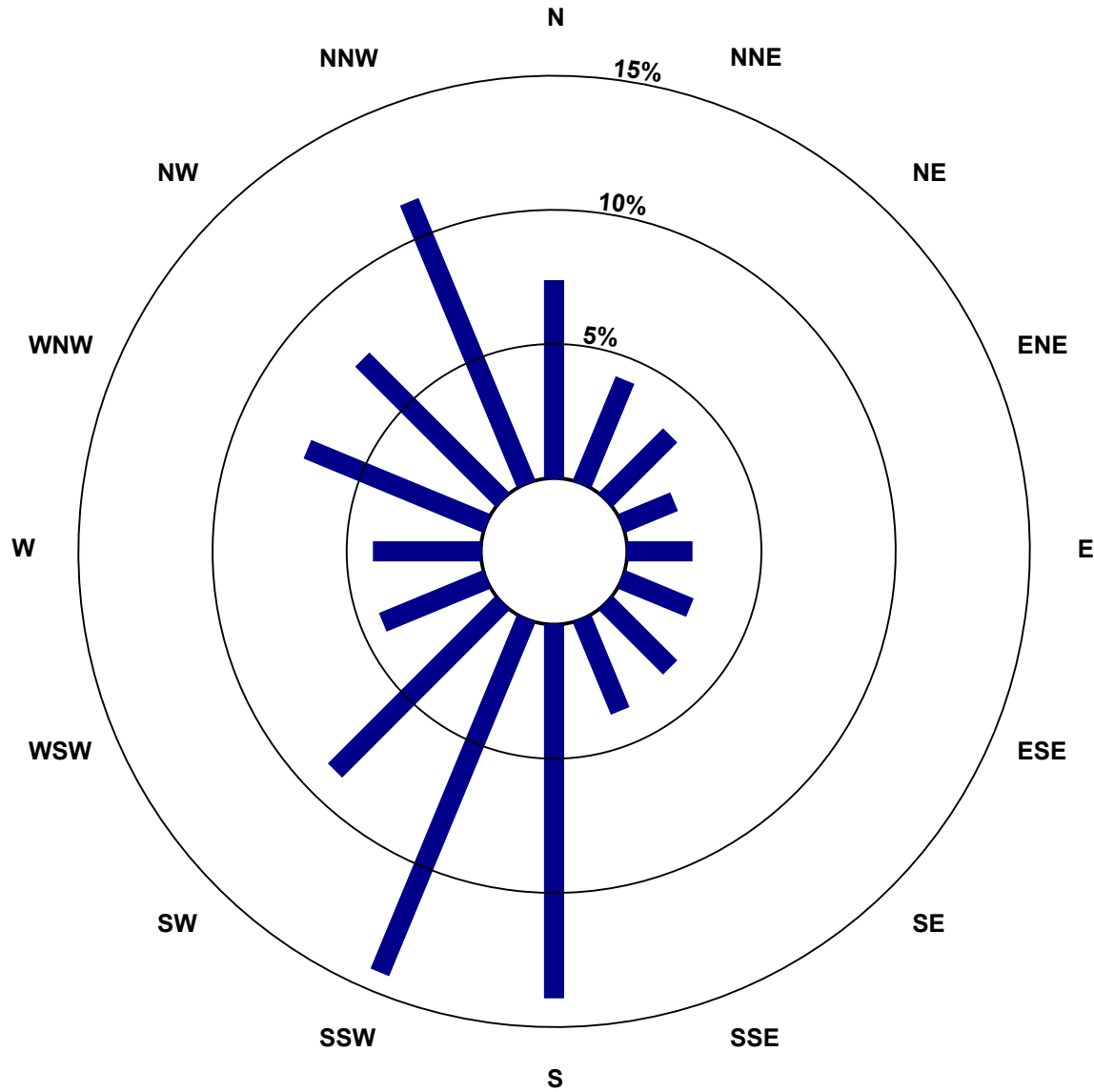
Total Number of Valid Hours: 626

Total Number of Hours: 672

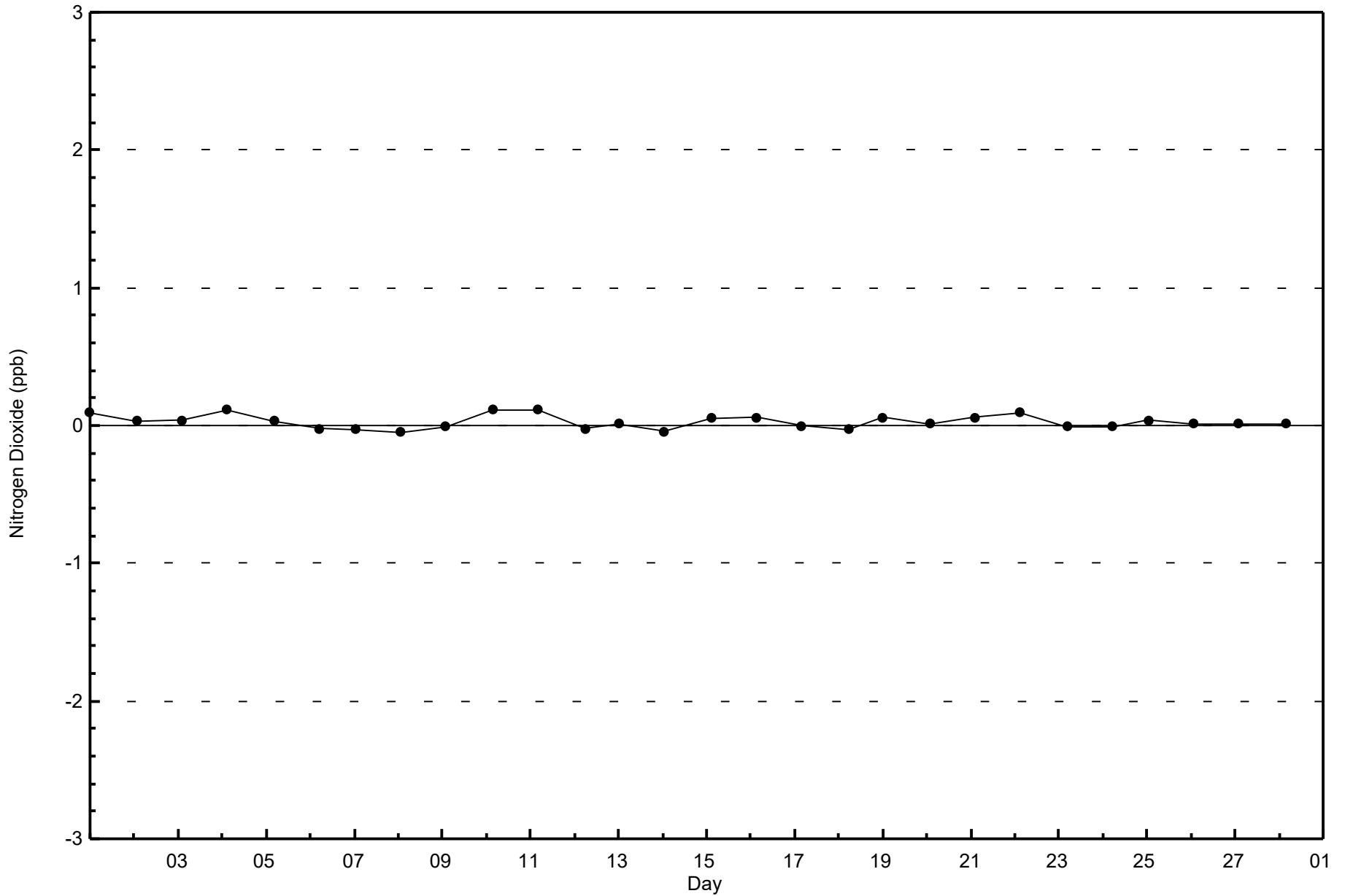


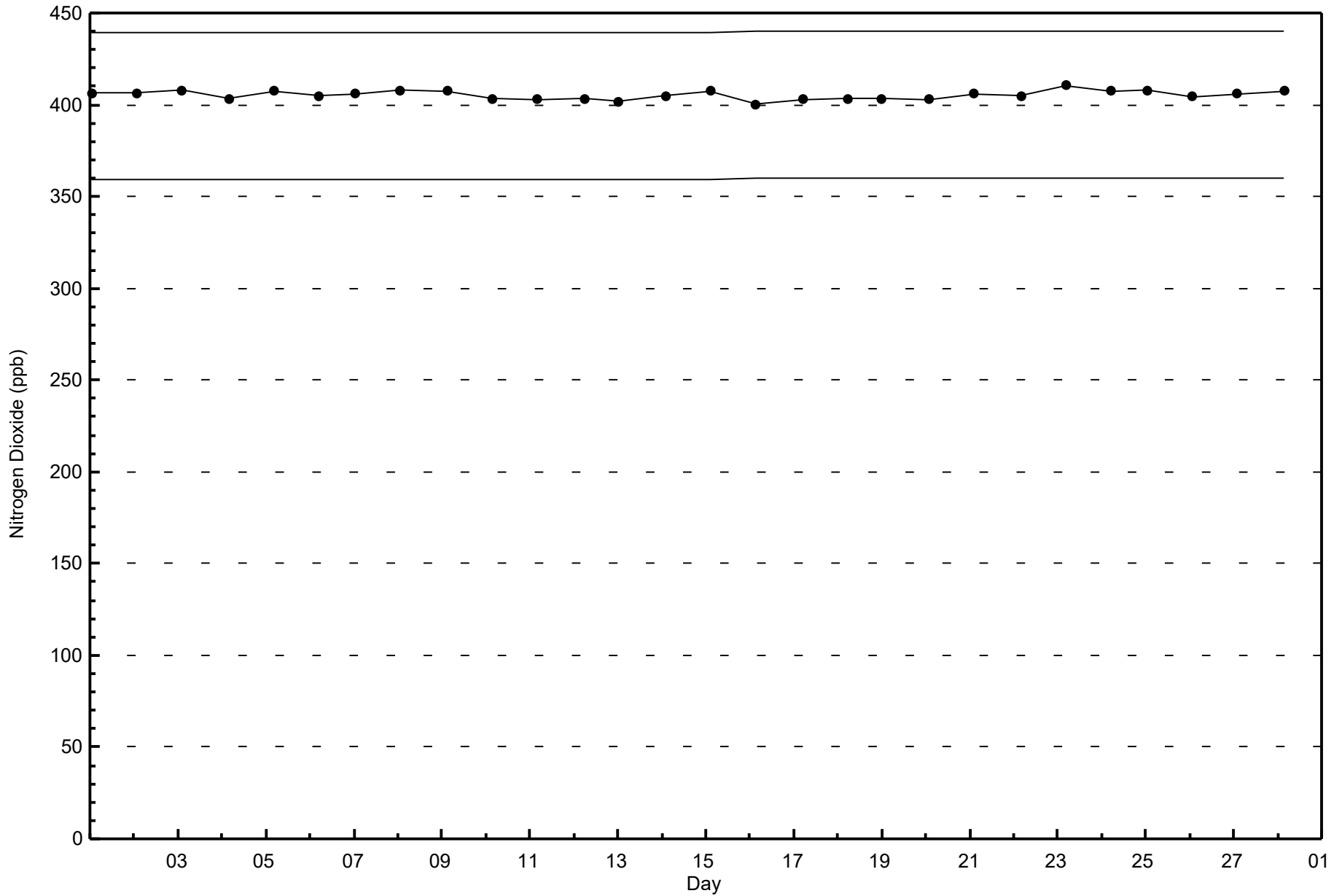
**Wood Buffalo Environmental Association**  
**Wind Rose Feb 2023**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Jackfish 1**



**Total Number of Valid Hours: 626**







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

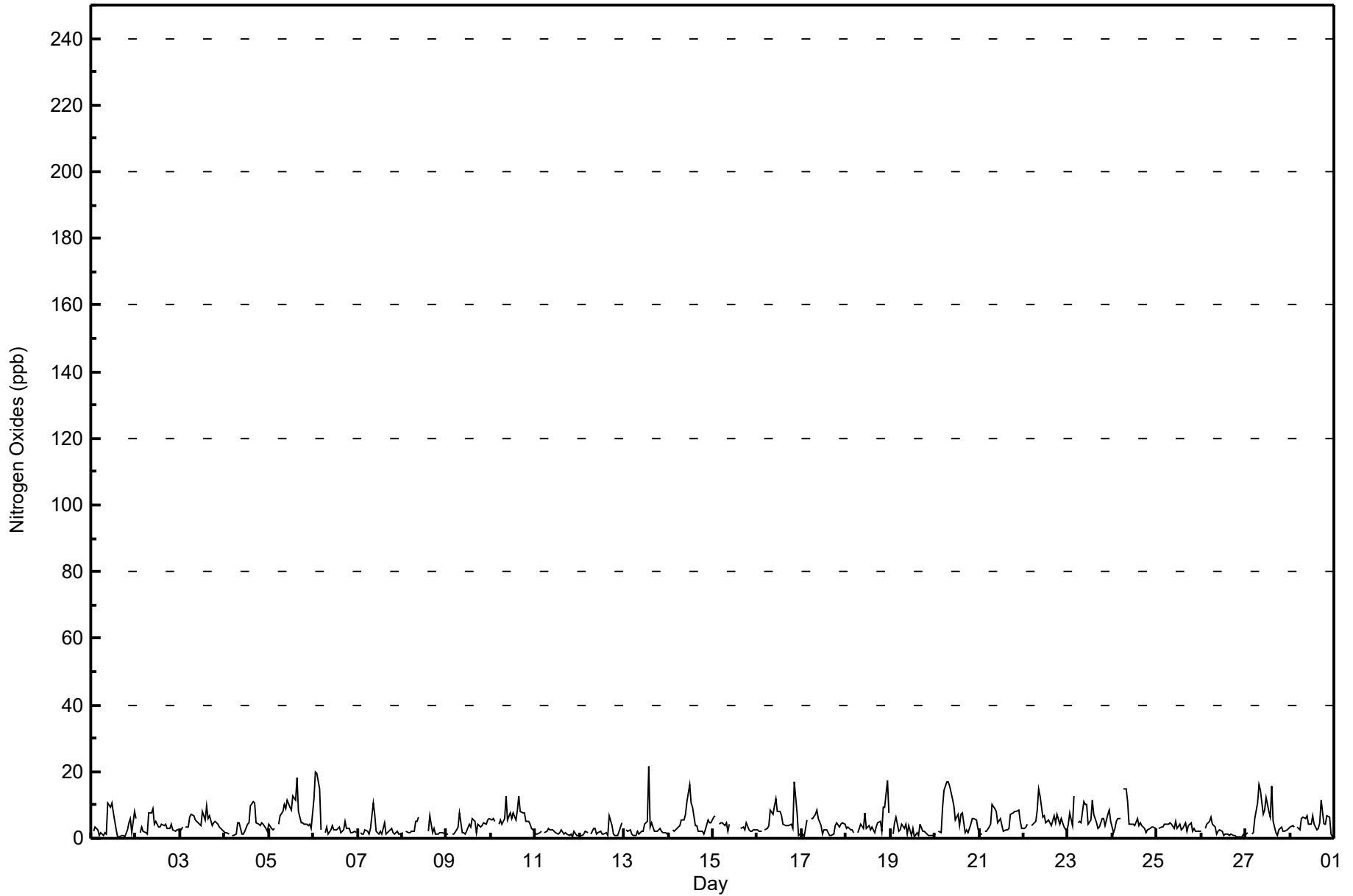
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Jackfish 1 - February 2023**

Maximum Value: 21.7 ppb on Feb 13 14:00																				Maximum Daily Average: 7.1 ppb on Feb 20					Hours in Service: 672		
Minimum Value: 0.4 ppb on Feb 17 02:00										Minimum Daily Average: 1.6 ppb on Feb 11					Hours of Data: 635												
Maximum Diurnal Average: 6.7 ppb at hour 9										Minimum Diurnal Average: 2.9 ppb at hour 24					Hours of Missing Data: 37												
Monthly Average: 4.29 ppb										Percentiles: P <sub>1</sub> = 0.6 P <sub>10</sub> = 1.2 Q <sub>1</sub> = 2.0 Median = 3.4 Q <sub>3</sub> = 5.4 P <sub>90</sub> = 8.3 P <sub>99</sub> = 16.9					Hours of Calibration: 33												
																				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-Feb	Z	2.0	3.5	2.5	0.7	1.5	0.8	1.8	1.5	10.4	9.2	10.5	7.7	2.7	0.6	0.6	0.7	0.8	0.5	2.6	4.6	5.8	1.7	7.9	3.5	10.5	
2-Feb	6.1	Z	1.9	3.4	2.1	1.6	1.2	7.6	7.6	8.7	4.3	5.0	3.4	3.6	4.1	4.0	4.3	2.8	2.8	4.2	2.7	2.2	2.4	2.7	3.9	8.7	
3-Feb	2.7	3.2	Z	3.2	3.4	6.2	7.3	6.9	5.6	5.1	4.4	3.8	8.2	5.6	9.8	6.0	6.7	4.0	4.6	5.0	4.1	3.3	3.1	2.3	5.0	9.8	
4-Feb	1.7	1.8	1.1	Z	1.0	0.9	1.4	4.7	4.6	1.1	1.4	1.9	4.1	4.8	9.6	11.0	10.8	4.8	4.0	3.7	4.6	4.4	2.9	2.3	3.9	11.0	
5-Feb	4.1	2.9	2.4	3.2	Z	4.2	6.8	7.9	10.3	8.8	11.3	9.4	8.3	12.5	11.3	18.1	7.8	4.8	4.8	4.4	4.3	3.8	4.3	2.9	6.9	18.1	
6-Feb	11.9	19.8	19.7	15.0	2.6	Z	1.8	3.3	1.2	2.7	3.8	2.6	2.7	2.9	3.5	1.5	2.4	4.9	3.1	3.0	1.6	1.7	1.9	1.5	5.0	19.8	
7-Feb	Z	1.6	1.3	1.2	2.5	2.0	1.4	3.1	10.5	7.0	2.2	1.5	2.1	1.1	4.9	1.3	1.6	2.0	3.1	1.6	1.2	2.1	1.3	1.2	2.5	10.5	
8-Feb	1.8	Z	2.1	1.6	1.9	2.0	2.0	4.9	5.1	6.3	M	M	M	M	2.0	6.6	1.7	3.1	1.2	1.3	1.5	1.5	1.5	1.3	2.6	6.6	
9-Feb	1.2	1.4	Z	1.4	1.2	2.7	3.5	7.6	1.7	1.5	1.5	2.2	4.1	3.2	5.9	5.2	1.6	4.4	3.2	3.7	4.6	4.3	5.7	6.0	3.4	7.6	
10-Feb	5.3	6.0	5.0	Z	4.2	5.7	4.3	5.8	12.5	5.5	7.6	5.9	7.6	5.6	8.6	12.7	8.0	7.8	7.8	5.3	5.1	4.1	3.1	2.2	6.3	12.7	
11-Feb	1.2	1.3	1.5	2.3	Z	1.7	1.9	3.0	2.6	2.7	2.2	1.5	1.5	1.7	2.5	1.4	1.5	1.1	0.8	1.2	0.5	2.0	0.7	1.0	1.6	3.0	
12-Feb	1.0	0.8	1.5	1.9	1.9	Z	1.3	2.8	2.9	1.5	1.7	1.9	1.1	1.1	1.5	1.0	6.6	3.8	1.4	0.7	0.9	2.0	3.4	4.7	2.1	6.6	
13-Feb	Z	2.4	2.1	2.6	1.2	0.8	0.9	2.1	1.3	1.9	1.9	4.1	5.2	21.7	3.4	4.9	1.9	2.2	2.0	2.9	2.0	1.7	1.8	1.2	3.2	21.7	
14-Feb	1.7	Z	2.7	2.1	2.4	3.3	3.8	5.4	5.4	7.1	11.1	16.1	10.4	9.3	3.9	3.7	2.2	2.1	2.2	1.4	2.7	5.4	4.9	4.5	4.9	16.1	
15-Feb	6.3	6.6	Z	4.4	4.6	4.8	3.8	4.8	2.2	4.2	C	C	C	C	C	3.0	3.5	2.5	4.6	2.7	2.3	2.1	2.6	2.5	3.8	6.6	
16-Feb	2.6	2.1	2.2	Z	2.5	2.9	3.8	8.5	7.4	9.9	11.8	8.2	7.8	6.9	4.2	3.7	3.8	3.8	4.4	2.9	17.0	7.6	0.7	1.2	5.5	17.0	
17-Feb	1.1	0.4	3.0	5.6	Z	6.1	5.8	7.1	8.6	5.9	3.6	1.4	2.7	2.6	1.6	0.7	0.9	1.3	4.0	4.5	3.3	4.2	4.7	4.1	3.6	8.6	
18-Feb	3.1	3.3	2.5	2.4	1.7	Z	1.7	2.8	4.1	3.1	7.8	3.1	3.8	2.4	3.4	1.6	3.3	4.7	5.0	2.0	9.3	9.4	17.2	7.7	4.6	17.2	
19-Feb	Z	1.1	4.8	6.5	2.0	2.7	4.4	2.8	4.4	1.1	3.7	0.9	3.0	0.6	1.7	0.7	4.2	2.1	2.1	1.5	0.9	0.7	0.8	1.0	2.3	6.5	
20-Feb	1.4	Z	2.2	1.7	9.3	14.3	16.9	17.0	15.5	11.9	9.8	5.5	7.0	4.0	7.3	7.6	1.7	2.7	1.8	4.2	6.0	6.0	5.6	3.1	7.1	17.0	
21-Feb	1.2	1.1	Z	2.1	2.0	3.2	4.2	10.1	8.8	8.1	4.6	5.9	3.8	2.0	2.5	2.4	3.1	7.0	7.6	8.1	8.1	8.4	4.9	3.1	4.9	10.1	
22-Feb	3.0	3.5	4.2	Z	3.7	4.4	5.2	8.4	14.9	12.6	6.5	6.7	4.5	5.5	4.7	4.0	6.7	4.7	7.4	4.0	5.9	4.6	3.3	2.2	5.7	14.9	
23-Feb	4.3	7.5	4.0	12.8	Z	4.5	5.1	4.5	11.0	10.1	10.0	4.1	5.6	11.5	7.3	4.6	3.0	3.4	6.0	5.8	4.0	7.3	8.3	5.1	6.5	12.8	
24-Feb	1.6	3.0	5.1	5.8	5.9	Z	14.9	15.0	11.0	4.3	4.3	4.2	3.9	6.1	3.9	4.7	3.7	2.8	1.8	2.3	3.0	3.6	3.4	2.8	5.1	15.0	
25-Feb	Z	3.1	3.2	3.5	4.3	4.3	4.2	4.5	4.3	3.1	5.2	3.1	4.3	2.3	2.9	4.8	2.2	3.8	4.5	2.0	3.1	2.0	1.9	2.0	3.4	5.2	
26-Feb	2.2	Z	2.8	4.4	5.1	6.3	4.4	3.5	1.4	2.0	2.4	2.1	1.0	1.1	1.4	0.7	1.4	1.0	0.7	0.5	0.6	0.5	0.5	1.1	2.1	6.3	
27-Feb	1.2	1.7	Z	1.4	1.8	5.8	10.5	16.1	14.3	7.3	8.3	12.2	7.9	6.2	15.5	4.9	1.8	0.9	2.4	3.2	2.1	2.1	2.8	2.9	5.8	16.1	
28-Feb	3.3	3.8	3.5	Z	3.3	2.6	6.1	6.6	5.8	6.9	4.3	4.4	6.9	4.4	2.5	3.0	4.8	11.5	4.2	4.1	6.6	6.4	1.3	0.6	4.6	11.5	
																								Diurnal Average			
																								Diurnal Maximum			
																								3.1 11.9 3.5 19.8 3.6 19.7 4.0 15.0 3.0 9.3 3.9 14.3 4.6 16.9 6.4 17.0 6.7 15.5 5.7 11.8 5.6 16.1 4.9 10.4 4.9 21.7 4.8 15.5 4.4 18.1 3.6 10.8 3.6 11.5 3.5 7.8 3.2 8.1 4.0 17.0 3.9 9.4 3.4 17.2 2.9 7.9			
Z - zerospan			C - Calibration			M - Maintenance																					



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

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Jackfish 1 - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Jackfish 1 - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	634	99.84	99.84
21 - 40	1	0.16	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: 635

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Jackfish 1 - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	46	26	21	13	15	17	21	23	87	89	55	26	25	45	45	71	625
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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>	46	26	21	13	15	17	21	23	87	89	55	26	25	45	46	71	626

Total Number of Valid Hours: 626

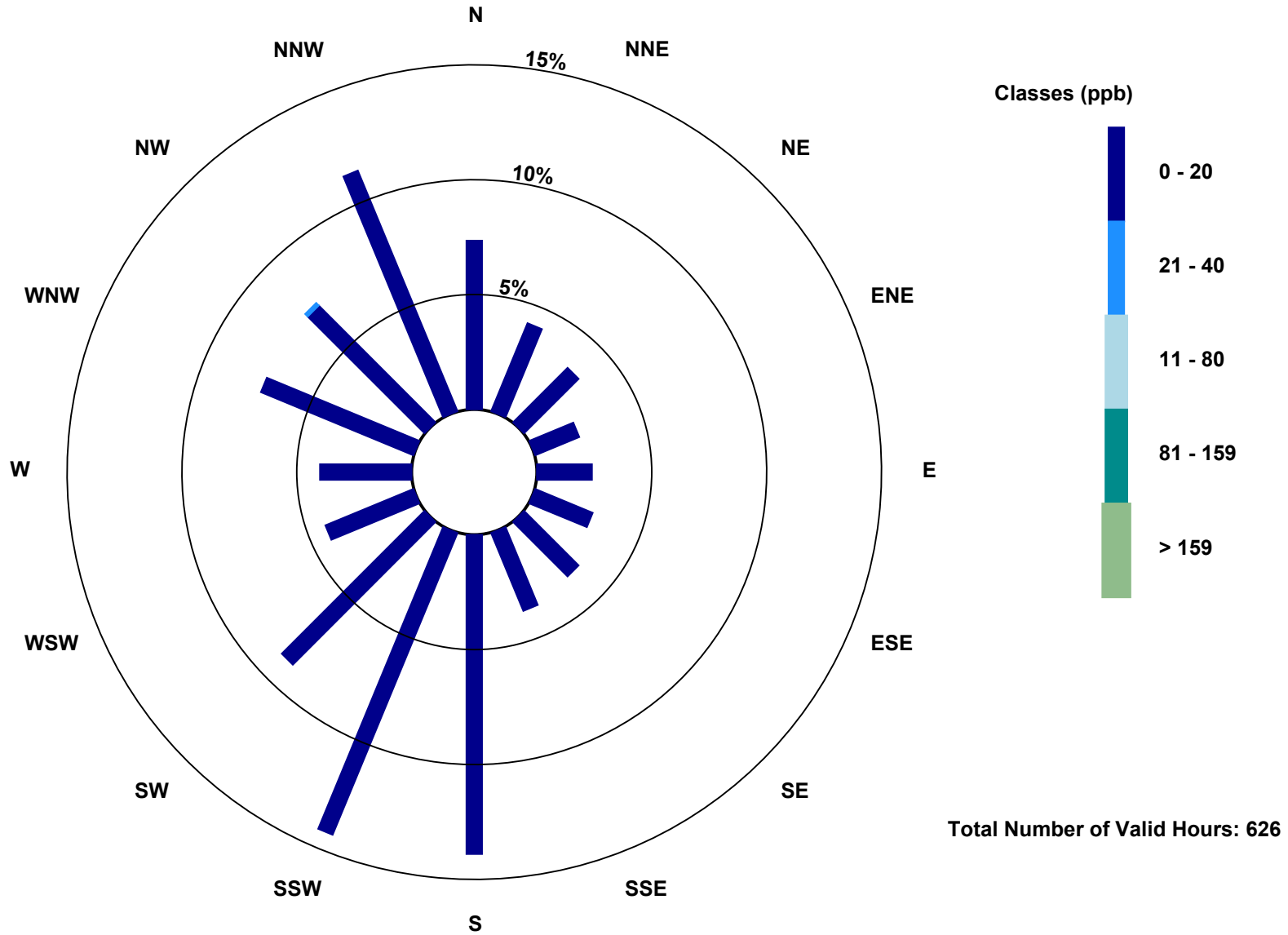
Total Number of Hours: 672

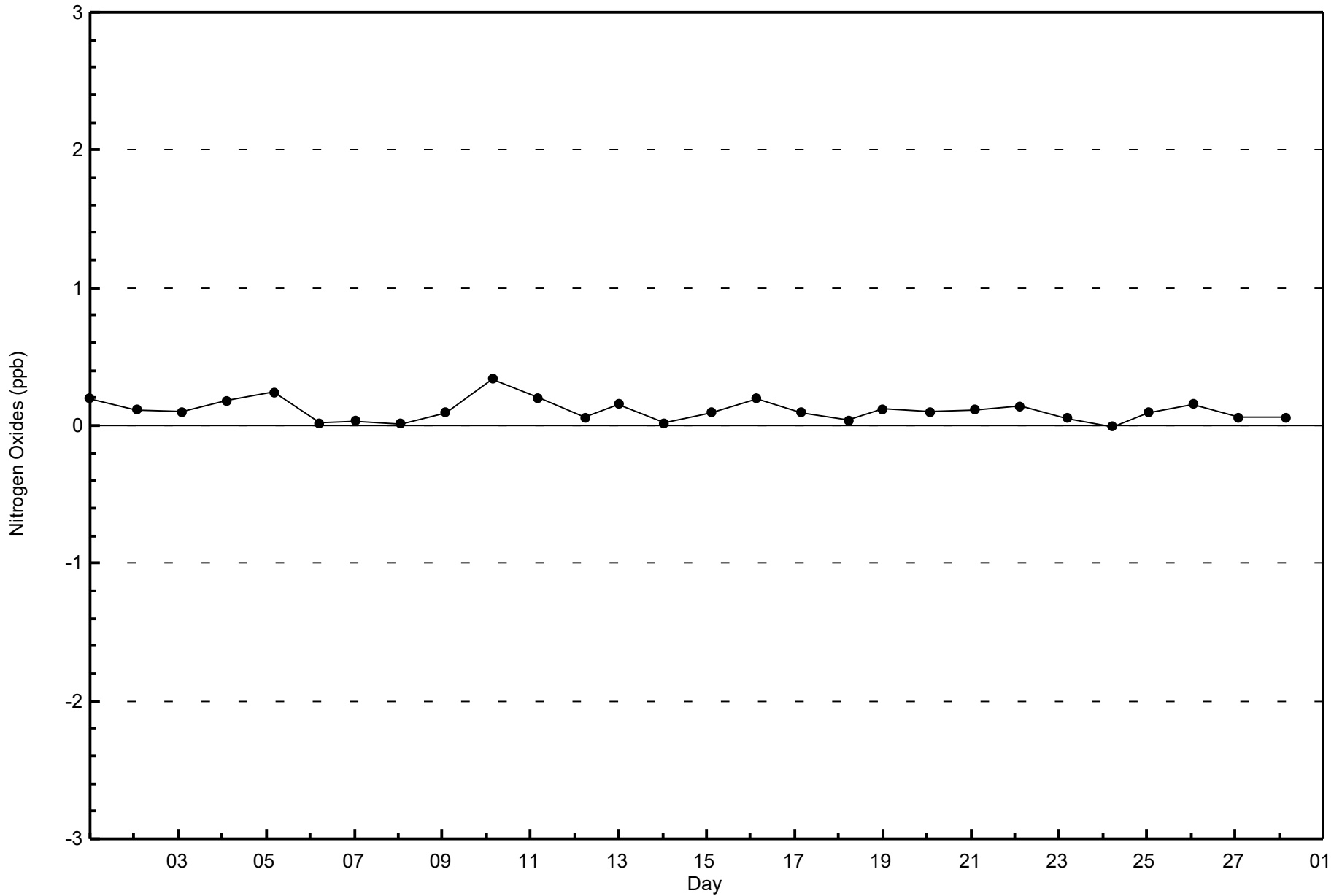


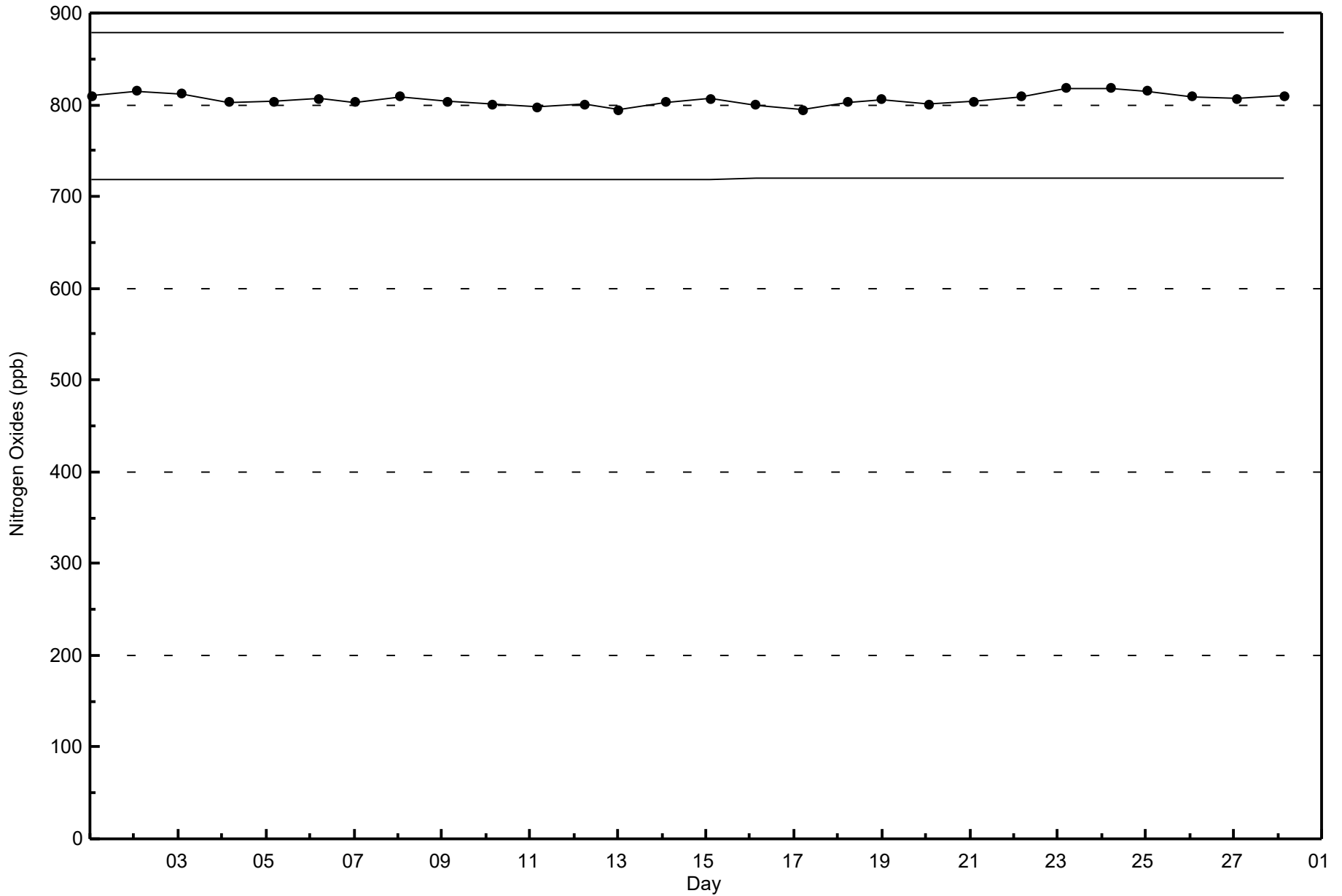


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Jackfish 1









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

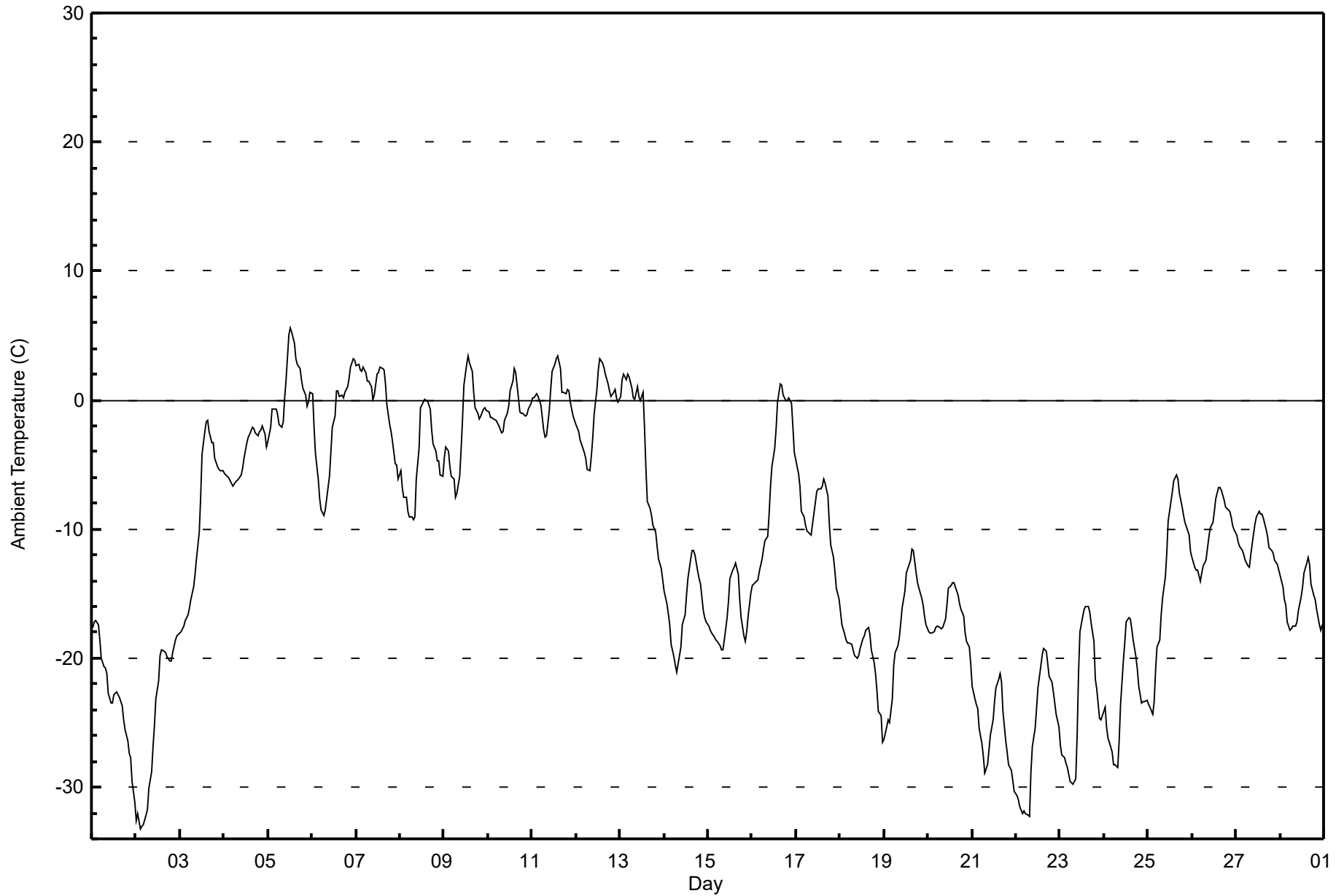
**Ambient Temperature (AT) - C**  
**Jackfish 1 - February 2023**

Maximum Value: 5.6 C on Feb 5 13:00      Maximum Daily Average: 0.8 C on Feb 5																						Hours in Service: 672 Hours of Data: 672				
Minimum Value: -33.3 C on Feb 2 03:00      Minimum Daily Average: -25.8 C on Feb 22 Maximum Diurnal Average: -7.8 C at hour 15      Minimum Diurnal Average: -14.5 C at hour 7 Monthly Average: -11.56 C      Percentiles: $P_1 = -32.1$ $P_{10} = -24.7$ $Q_1 = -18.6$ Median = -11.7 $Q_3 = -2.4$ $P_{90} = 0.7$ $P_{99} = 3.2$																						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-Feb	-17.7	-17.2	-17.1	-17.4	-18.6	-20.0	-20.7	-20.7	-21.2	-22.7	-23.5	-23.4	-22.9	-22.6	-22.9	-23.1	-23.7	-24.7	-25.6	-26.4	-27.4	-27.7	-29.6	-31.2	-22.8	-17.1
2-Feb	-32.6	-32.1	-33.3	-33.0	-32.9	-32.2	-31.7	-30.1	-28.8	-26.8	-25.2	-23.2	-21.7	-19.8	-19.3	-19.4	-19.6	-19.9	-20.2	-20.2	-19.6	-18.6	-18.3	-18.2	-24.9	-18.2
3-Feb	-18.0	-17.7	-17.5	-17.1	-16.7	-16.1	-15.4	-14.5	-13.5	-12.3	-10.3	-7.5	-4.2	-2.5	-1.7	-1.6	-2.4	-3.3	-3.3	-4.5	-5.1	-5.4	-5.4	-5.5	-9.2	-1.6
4-Feb	-5.7	-5.8	-6.0	-6.2	-6.4	-6.6	-6.3	-6.2	-6.1	-5.8	-5.2	-4.5	-3.3	-2.9	-2.6	-2.1	-2.2	-2.6	-2.8	-2.4	-2.4	-2.0	-2.6	-3.7	-4.3	-2.0
5-Feb	-3.2	-2.1	-0.8	-0.8	-0.7	-1.1	-1.9	-2.1	-1.7	0.1	1.6	5.1	5.6	5.3	4.4	3.2	2.8	2.5	1.6	0.9	0.4	-0.5	-0.2	0.6	0.8	5.6
6-Feb	0.5	-2.1	-4.2	-6.1	-7.6	-8.5	-8.9	-8.6	-7.6	-5.9	-4.1	-2.1	-1.2	0.7	0.7	0.3	0.4	0.2	0.6	1.1	1.7	2.6	3.2	3.1	-2.2	3.2
7-Feb	2.7	2.8	2.3	2.3	2.5	2.1	1.5	1.5	1.0	0.1	0.4	2.0	2.2	2.5	2.5	2.3	1.3	-0.4	-1.9	-2.4	-3.2	-4.9	-5.1	-6.2	0.3	2.8
8-Feb	-5.5	-6.8	-7.5	-7.6	-8.6	-9.1	-9.0	-9.3	-9.1	-6.1	-3.7	-0.5	-0.4	0.1	0.0	-0.1	-0.7	-2.3	-3.4	-4.0	-4.7	-4.7	-5.8	-5.9	-4.8	0.1
9-Feb	-4.5	-3.6	-4.0	-5.2	-5.9	-6.2	-7.5	-7.2	-5.9	-3.8	-1.6	1.2	2.7	3.4	2.8	2.3	0.6	-0.5	-1.0	-1.5	-1.2	-0.7	-0.6	-0.8	-2.0	3.4
10-Feb	-0.9	-1.3	-1.3	-1.5	-1.6	-1.8	-2.0	-2.5	-2.4	-1.6	-1.0	-0.4	0.7	1.5	2.5	2.1	1.2	-0.9	-1.0	-1.0	-1.2	-1.1	-0.7	-0.3	-0.7	2.5
11-Feb	0.1	0.2	0.4	0.2	0.0	-0.4	-2.3	-2.9	-2.8	-0.8	0.8	2.2	2.7	3.2	3.4	2.4	0.6	0.6	0.5	0.8	0.7	-0.2	-1.2	-1.6	0.3	3.4
12-Feb	-1.9	-2.5	-3.1	-3.4	-4.0	-4.5	-5.4	-5.5	-4.4	-3.0	-1.2	0.8	2.4	3.2	2.9	2.6	2.0	1.3	0.7	0.3	0.6	0.8	0.2	-0.1	-0.9	3.2
13-Feb	0.2	1.6	2.0	1.6	2.0	1.7	0.9	0.2	0.1	1.1	0.3	0.0	0.6	-2.1	-5.3	-7.9	-8.4	-8.9	-9.7	-10.3	-11.3	-12.3	-13.0	-13.9	-3.8	2.0
14-Feb	-14.8	-15.7	-16.5	-17.4	-18.9	-19.9	-20.5	-21.1	-19.7	-19.1	-17.5	-16.6	-15.1	-13.8	-12.3	-11.6	-11.7	-12.0	-13.3	-13.8	-14.3	-16.3	-16.8	-17.2	-16.1	-11.6
15-Feb	-17.5	-17.8	-18.1	-18.4	-18.6	-18.7	-19.0	-19.4	-19.4	-18.6	-16.9	-15.5	-13.8	-13.1	-13.0	-12.6	-13.5	-15.5	-16.8	-18.2	-18.7	-18.0	-16.7	-14.9	-16.8	-12.6
16-Feb	-14.4	-14.2	-14.1	-13.9	-13.3	-12.3	-11.6	-10.9	-10.5	-8.9	-6.7	-5.2	-3.8	-2.2	-0.1	1.2	1.1	0.4	0.0	-0.1	0.1	-0.3	-2.2	-4.0	-6.1	1.2
17-Feb	-5.1	-5.7	-6.7	-8.6	-9.0	-9.7	-10.1	-10.4	-10.4	-9.6	-8.0	-7.1	-6.9	-6.8	-6.7	-6.2	-6.5	-7.5	-9.6	-11.3	-12.2	-13.2	-14.6	-15.5	-9.1	-5.1
18-Feb	-16.5	-17.4	-18.2	-18.6	-18.8	-18.8	-18.9	-19.3	-19.8	-20.0	-19.8	-19.2	-18.4	-18.3	-17.8	-17.6	-18.1	-19.4	-20.3	-21.2	-22.5	-24.2	-24.5	-26.5	-19.8	-16.5
19-Feb	-26.3	-25.4	-24.8	-25.0	-23.2	-20.5	-19.5	-19.0	-18.3	-17.3	-16.1	-14.8	-13.3	-13.1	-12.4	-11.5	-11.6	-13.4	-14.1	-14.6	-15.4	-15.9	-16.7	-17.4	-17.5	-11.5
20-Feb	-17.9	-18.0	-18.1	-17.9	-17.6	-17.5	-17.6	-17.8	-17.6	-17.0	-15.9	-14.6	-14.4	-14.2	-14.1	-14.4	-15.1	-15.7	-16.2	-16.8	-18.0	-18.7	-19.1	-20.5	-16.9	-14.1
21-Feb	-22.2	-23.1	-23.6	-23.9	-25.5	-26.7	-27.6	-28.9	-28.2	-27.2	-26.0	-24.8	-23.4	-22.2	-21.7	-21.2	-21.9	-24.2	-26.4	-27.3	-28.2	-28.7	-29.5	-30.3	-25.5	-21.2
22-Feb	-30.6	-31.0	-31.5	-32.0	-31.8	-32.0	-32.1	-32.3	-28.8	-26.9	-25.4	-23.9	-22.2	-20.7	-19.8	-19.2	-19.5	-20.4	-21.4	-21.8	-22.6	-23.5	-24.3	-25.3	-25.8	-19.2
23-Feb	-26.7	-27.5	-27.7	-28.2	-28.4	-29.6	-29.7	-29.8	-29.4	-26.0	-21.1	-17.9	-16.7	-16.2	-16.0	-15.9	-16.4	-17.3	-18.8	-21.6	-22.4	-24.7	-24.8	-24.5	-23.2	-15.9
24-Feb	-23.8	-25.3	-26.1	-26.5	-27.3	-28.2	-28.2	-28.4	-26.4	-23.6	-20.3	-18.8	-17.1	-16.8	-17.0	-17.7	-18.6	-19.9	-20.9	-22.2	-23.5	-23.4	-23.3	-23.3	-22.8	-16.8
25-Feb	-23.6	-23.8	-24.4	-23.3	-21.0	-19.1	-18.6	-16.7	-15.3	-13.7	-11.9	-9.4	-7.9	-7.1	-6.2	-5.8	-6.1	-7.2	-8.3	-8.9	-9.5	-9.9	-10.4	-11.7	-13.3	-5.8
26-Feb	-12.2	-13.0	-13.2	-13.1	-14.0	-13.4	-12.8	-12.4	-11.6	-10.6	-9.9	-9.4	-8.6	-7.7	-6.8	-6.8	-7.0	-7.7	-8.3	-8.4	-8.7	-9.1	-9.7	-10.1	-10.2	-6.8
27-Feb	-10.4	-11.0	-11.3	-11.6	-12.0	-12.4	-12.9	-13.0	-12.0	-10.4	-9.6	-9.1	-8.7	-8.8	-8.9	-9.2	-10.0	-10.5	-11.5	-11.7	-11.9	-12.4	-12.8	-13.2	-11.1	-8.7
28-Feb	-13.6	-14.5	-15.4	-15.9	-17.2	-17.8	-17.7	-17.5	-17.5	-17.1	-16.3	-15.2	-14.5	-13.3	-12.6	-12.1	-12.8	-14.3	-15.1	-15.5	-16.2	-17.4	-17.8	-17.4	-15.6	-12.1
																								Diurnal Average		
																								Diurnal Maximum		



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

**Ambient Temperature (AT) - C**  
**Jackfish 1 - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Jackfish 1 - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	133	19.79	19.79
-20 - 0	442	65.77	85.57
0 - 10	97	14.43	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



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

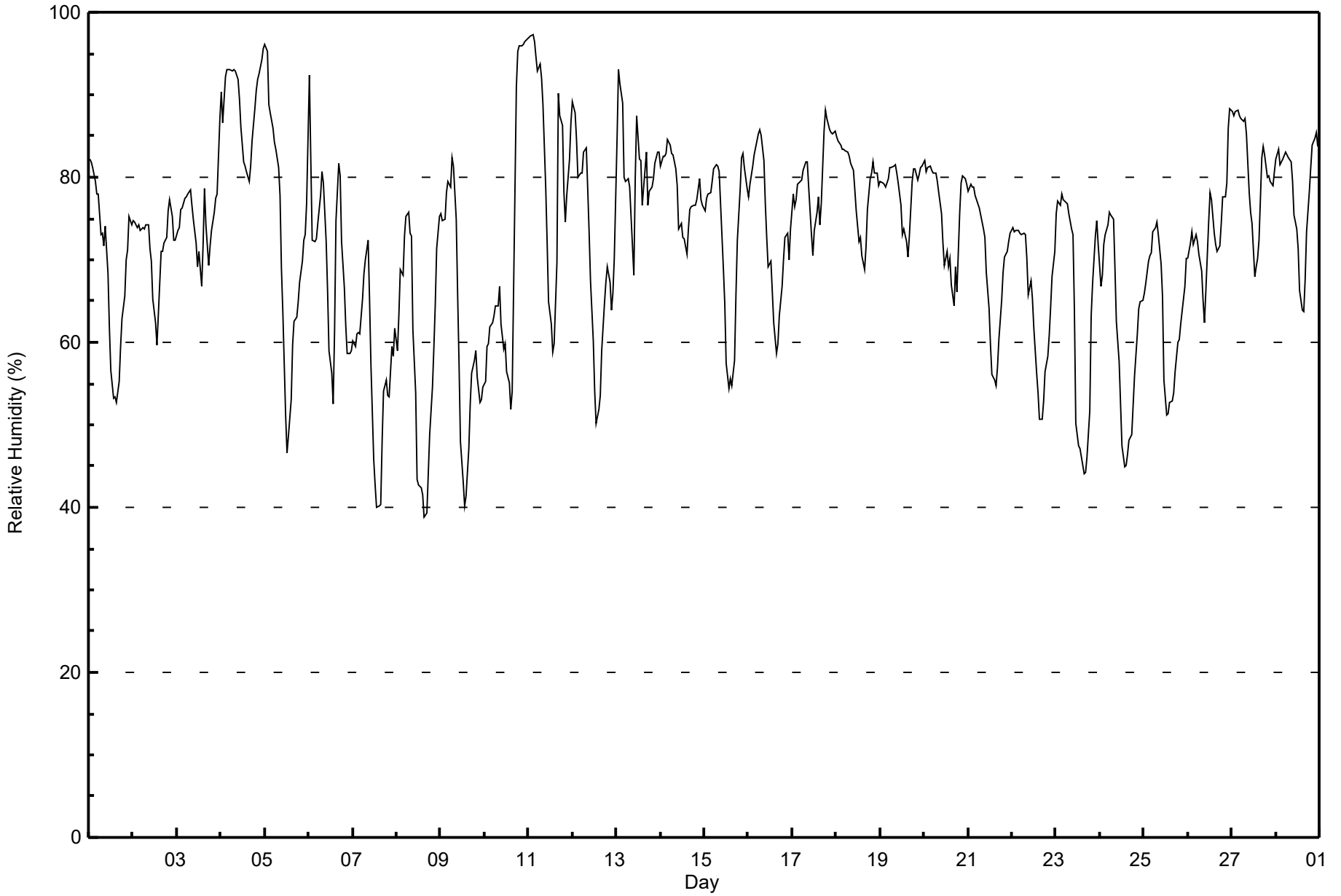
**Relative Humidity (RH) - %**  
**Jackfish 1 - February 2023**

Maximum Value: 97.3 % on Feb 11 03:00      Maximum Daily Average: 89.0 % on Feb 4																						Hours in Service: 672 Hours of Data: 672				
Minimum Value: 38.8 % on Feb 8 16:00      Minimum Daily Average: 56.4 % on Feb 7 Maximum Diurnal Average: 79.2 % at hour 7      Minimum Diurnal Average: 60.1 % at hour 14 Monthly Average: 72.22 %      Percentiles: P <sub>1</sub> = 41.5 P <sub>10</sub> = 54.6 Q <sub>1</sub> = 65.0 Median = 73.8 Q <sub>3</sub> = 80.5 P <sub>90</sub> = 85.4 P <sub>99</sub> = 96.1																						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-Feb	82.3	81.9	81.2	79.5	77.9	78.0	73.0	73.2	71.8	74.1	68.4	61.7	56.7	53.2	53.3	52.7	55.3	59.4	62.9	65.6	70.0	71.1	75.2	74.2	68.9	82.3
2-Feb	74.8	74.6	73.8	74.2	73.6	73.8	73.8	74.2	74.2	71.3	69.9	65.2	62.3	59.6	63.4	70.9	71.0	72.0	72.6	75.9	77.2	75.2	72.5	72.4	71.6	77.2
3-Feb	73.6	73.9	76.2	76.3	77.5	77.6	78.0	78.5	76.6	74.9	72.0	69.2	71.0	66.9	71.9	78.6	74.3	69.3	71.7	73.5	75.8	77.5	78.0	87.1	75.0	87.1
4-Feb	90.4	86.6	92.2	93.1	93.0	93.1	92.9	93.0	92.9	91.9	89.4	86.1	81.9	81.4	80.6	79.6	81.3	84.4	88.3	90.5	91.8	92.6	94.3	95.6	89.0	95.6
5-Feb	96.1	95.3	88.8	87.8	86.0	84.3	83.3	81.2	77.8	68.9	63.7	51.2	46.6	48.7	53.1	59.7	62.5	63.0	64.9	67.3	69.8	72.4	73.1	76.8	71.8	96.1
6-Feb	92.4	82.2	72.4	72.2	72.6	74.4	77.7	80.6	79.3	72.2	66.3	59.0	56.2	52.6	61.4	74.8	81.7	80.2	72.2	66.6	62.0	58.6	58.7	58.9	70.2	92.4
7-Feb	60.1	59.5	61.0	61.2	61.0	65.2	68.2	70.1	72.4	65.2	57.4	45.7	42.7	40.1	40.2	40.3	47.9	54.1	55.5	53.5	53.4	59.5	58.3	61.8	56.4	72.4
8-Feb	58.9	63.4	68.8	68.1	72.9	75.2	75.8	73.3	72.8	61.5	53.9	43.3	42.8	42.4	41.6	38.8	39.3	44.0	48.8	54.6	59.3	64.5	71.3	75.2	58.8	75.8
9-Feb	75.5	74.8	74.9	78.1	79.5	78.9	82.4	81.4	74.9	65.7	57.4	48.0	43.1	40.2	41.3	47.1	52.5	56.3	57.8	59.0	55.7	52.6	53.0	54.6	61.9	82.4
10-Feb	55.2	59.5	59.8	61.9	62.4	63.2	64.5	64.3	66.8	62.2	59.2	59.8	56.4	55.1	51.8	54.1	66.2	91.0	95.3	95.9	96.0	96.2	96.4	96.8	70.4	96.8
11-Feb	97.0	97.2	97.3	96.4	94.5	92.9	93.8	92.0	88.8	78.6	72.0	65.0	62.3	58.9	59.9	69.7	90.3	87.4	86.4	78.2	74.6	77.9	82.2	86.6	82.5	97.3
12-Feb	89.2	87.7	84.6	80.1	80.4	80.5	83.1	83.6	78.6	73.4	67.5	60.2	54.0	50.3	51.9	53.6	59.0	64.8	67.3	69.1	67.3	64.0	65.9	70.2	70.3	89.2
13-Feb	84.7	93.0	91.4	89.0	79.9	79.6	79.8	78.8	75.2	68.2	80.0	87.5	82.2	82.1	76.7	78.9	83.0	76.5	78.3	78.8	79.9	81.7	83.0	83.0	81.3	93.0
14-Feb	81.4	82.5	82.5	82.9	84.5	83.8	82.8	82.7	81.0	79.1	73.8	74.4	72.6	72.5	70.7	73.8	76.0	76.4	76.7	76.6	77.3	79.8	77.3	76.6	78.2	84.5
15-Feb	76.0	77.5	78.0	78.2	79.5	81.0	81.6	81.4	80.6	76.7	69.0	64.8	57.5	54.4	55.6	54.8	57.8	65.7	72.3	78.4	82.4	82.8	81.1	78.6	72.7	82.8
16-Feb	77.7	79.1	81.4	82.8	83.6	85.2	85.8	85.0	82.0	76.8	72.6	69.1	69.7	66.1	62.3	58.6	59.9	63.3	66.7	70.1	72.7	73.3	69.9	73.8	73.6	85.8
17-Feb	78.0	76.5	77.3	79.1	79.4	79.7	80.9	81.9	81.9	78.9	73.1	70.4	73.5	75.7	77.6	74.2	76.8	85.6	88.1	87.1	85.8	85.3	85.3	85.6	79.9	88.1
18-Feb	84.9	84.4	83.9	83.5	83.5	83.2	83.1	82.6	81.7	80.8	78.5	75.8	72.1	72.7	70.5	68.7	71.5	76.1	79.9	80.5	81.8	80.5	80.5	78.9	79.1	84.9
19-Feb	79.4	79.3	79.1	78.8	79.9	81.2	81.2	81.4	81.5	80.5	79.4	76.6	73.0	73.8	72.3	70.4	72.9	79.5	81.0	81.0	79.6	80.4	81.2	81.3	78.5	81.5
20-Feb	82.1	80.8	81.2	81.3	80.8	80.5	80.5	79.5	78.2	75.5	72.1	69.3	71.0	69.1	70.2	66.9	64.4	69.1	66.1	75.8	79.3	80.1	79.8	79.2	75.5	82.1
21-Feb	78.2	79.1	78.9	78.7	77.8	76.8	76.3	75.3	73.8	72.7	68.5	64.0	59.6	56.0	55.4	54.8	56.9	60.3	65.1	68.6	70.3	71.0	72.1	73.2	69.3	79.1
22-Feb	73.8	73.5	73.6	73.6	73.2	73.1	73.2	73.0	70.2	65.8	67.5	65.3	61.7	56.2	53.9	50.7	50.7	52.9	56.5	58.3	60.9	64.2	68.0	71.0	65.0	73.8
23-Feb	75.6	77.2	76.6	78.0	77.4	77.0	76.8	75.5	73.8	73.1	64.0	50.2	47.4	47.0	46.2	44.1	44.2	46.1	51.7	63.2	67.1	72.9	74.8	71.9	64.7	78.0
24-Feb	66.9	68.1	71.8	73.1	74.2	75.8	75.4	75.0	69.1	62.5	57.6	52.6	47.5	44.8	45.2	46.4	48.2	48.8	52.3	55.9	61.0	64.1	64.9	65.0	61.1	75.8
25-Feb	65.9	67.1	69.9	70.5	70.8	73.3	74.0	74.6	73.0	69.5	65.5	55.4	51.2	51.4	52.7	52.8	54.0	56.4	60.0	60.3	62.2	63.8	66.8	70.2	63.8	74.6
26-Feb	70.2	72.1	73.4	71.9	73.1	72.2	70.7	68.6	65.1	62.3	66.3	74.6	78.2	77.3	73.2	71.9	70.9	71.7	74.5	77.7	77.7	79.3	86.0	88.3	73.6	88.3
27-Feb	88.0	87.4	87.9	88.2	87.4	87.1	86.8	87.1	85.2	78.1	75.7	74.3	68.0	69.2	70.2	72.3	82.4	83.8	82.8	80.1	80.1	79.5	79.1	80.7	80.9	88.2
28-Feb	82.2	83.4	81.6	81.9	82.2	83.0	82.8	82.4	81.9	79.5	75.5	73.8	71.4	66.3	63.9	63.7	67.6	73.4	78.3	81.2	83.9	84.8	85.4	83.7	78.1	85.4
78.2 78.5 78.6 78.6 78.5 78.9 79.2 78.9 77.2 72.9 69.1 64.7 61.9 60.1 60.3 61.5 64.9 68.3 70.5 72.3 73.4 74.5 75.5 76.8																								Diurnal Average		
97.0 97.2 97.3 96.4 94.5 93.1 93.8 93.0 92.9 91.9 89.4 87.5 82.2 82.1 80.6 79.6 90.3 91.0 95.3 95.9 96.0 96.2 96.4 96.8																								Diurnal Maximum		



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

**Relative Humidity (RH) - %**  
**Jackfish 1 - February 2023**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %  
Jackfish 1 - February 2023**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	2	0.30	0.30
40 - 60	116	17.26	17.56
60 - 80	376	55.95	73.51
80 - 100	178	26.49	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



# Wood Buffalo Environmental Association

## Summary of Hour Averages

# Wind Speed (WS) - km/h

## Jackfish 1 - February 2023

Maximum Speed: 20 km/h on Feb 13 16:00	Maximum Daily Speed Average: 9.1 km/h on Feb 1	Hours in Service: 672
Minimum Speed Value: 0 km/h on Feb 23 10:00	Minimum Daily Speed Average: 0.6 km/h on Feb 23	Hours of Data: 662
Maximum Diurnal Speed Average: 2.5 km/h at hour 16	Minimum Diurnal Speed Average: 1.0 km/h at hour 20	Hours of Missing Data: 10
Monthly Average Velocity: 1.4 km/h 260.2 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 2 Q <sub>1</sub> = 4 Median = 5 Q <sub>3</sub> = 7 P <sub>90</sub> = 10 P <sub>99</sub> = 15	Percent Operational Time: 98.5

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-Feb	WNW2	WNW4	NW5	NNW9	NNW12	NNW13	NNW15	NNW11	NNW16	NNW10	NNW14	NNW12	NW11	NNW13	NNW14	NNW13	NNW13	NNW12	NNW10	NNW8	W3	WSW2	SW2	WSW2	NNW9.1	NNW16
2-Feb	SSW3	SSW3	S4	S6	S6	S8	S7	S9	S7	S8	S7	S7	S9	SSE10	SSE10	SSE11	SSE12	SSE10	S10	S7	S8	S9	S9	S8	S7.7	SSE12
3-Feb	S8	SSW9	S9	SSW9	SSW9	SSW8	SSW7	SSW7	SSW8	SSW8	SW8	SW7	W4	NW5	NW9	NW10	WSW4	SW2	SW1	SSW3	S2	WSW2	ENE1	ENE4	SW4.0	NW10
4-Feb	SSE2	E3	ESE3	ESE3	SE5	SE4	SE3	SE4	E3	SE4	NE1	SSE1	N2	ESE1	W1	E3	SE2	S3	S5	S6	S4	S6	S6	SSW2.4	S6	
5-Feb	SSW5	SSW5	SSW6	S7	S7	S7	S5	SSW6	SSW6	SSW7	SSW6	S4	SSW6	SSW7	SSW4	SSW5	SSW5	SW6	SW6	SW5	SW4	SW4	W4	WNW6	SSW5.1	S7
6-Feb	NW8	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	WNW5	NW4	W4	WSW6	SSW5	SSW4	S7	SSW8	SSW7	SSW8	SSW8	WSW5	SW6	---	NW8
7-Feb	SW5	SW6	SW7	W5	WNW7	WNW6	W6	WNW7	NW10	WNW9	WNW7	WNW5	WNW6	WNW7	WNW6	W5	W5	WSW3	SW2	SW3	SW4	W2	SSW3	SSW4	W4.6	WNW10
8-Feb	SW4	SW4	SW1	SSW2	SSW0	SW2	WSW2	SW4	WSW3	W3	W3	WNW2	WNW3	WNW3	WNW3	W2	SW2	SW5	SW6	SW6	SW7	SSW6	SSW6	SSW5	SW3.1	SW7
9-Feb	SSW5	SSW6	SW6	SW6	SSW6	SSW5	SSW5	SSW6	SSW6	SSW7	SW8	SSW7	SSW7	SSW7	SSW5	S5	S5	S6	S6	S7	S6	SSW5	SSW5	SSW4	SSW5.8	SW8
10-Feb	SSE3	S4	S3	S3	S3	S4	SSE4	SSE3	S4	SSE2	SE4	S3	SE1	SE2	N5	NNW3	NW5	NNW7	WNW3	WNW3	WNW2	WNW1	WNW1	WNW1	SSW0.9	NNW7
11-Feb	WNW3	W1	WSW3	WNW4	WNW4	W3	SSW5	SSW5	SW5	SSW5	SW5	WSW6	W7	W7	WSW5	W6	WSW6	SW5	SW4	WNW5	WNW9	WNW8	NW5	NW4	W4.2	WNW9
12-Feb	WSW4	SW5	WSW4	SW3	WSW3	SW4	SSW6	SW4	SW5	SW8	SW6	SW6	WSW5	WSW4	SSW5	SSW4	SSW5	S6	S7	S6	S8	S11	S11	S9	SSW5.3	S11
13-Feb	SSW9	SSW9	SSW9	SSW7	SW7	SW8	SW7	WSW6	WSW7	WSW8	WNW6	WNW5	WNW7	NW15	NNW19	NNW20	NNW16	NNW16	NNW20	NNW18	NNW14	NNW14	NNW11	NNW13	NW7.4	NNW20
14-Feb	NNW12	NW9	NNW11	NNW10	N6	N4	NNE3	SE2	NE1	ENE2	N0	SSE2	S3	SSW4	SW4	WNW3	WNW2	NNW10	NNW10	NNW11	NNW9	NNE7	NNE4	NE3	NNW4.0	NNW12
15-Feb	NE4	ENE4	ENE4	ENE4	E1	E2	ESE3	ESE4	E2	E3	NNE4	NNW3	SSE3	SSE4	SSE3	NNE1	ENE3	SSE3	S3	S4	S5	S5	S7	S6	SE1.9	S7
16-Feb	S6	S7	S8	S8	S9	S9	S10	S10	S10	S8	SSW7	SSW8	SSW9	SSW9	SSW7	SW8	WSW7	SW5	NW4	WNW5	NW7	NW13	NNW13	NW10	SW4.9	NW13
17-Feb	NNW11	NNW14	N10	N6	NNE5	NNE5	ENE2	ESE3	ESE3	E2	NW3	W3	WNW3	WNW3	WNW3	WNW3	NW4	NW4	N6	NNE6	NE6	NE5	NE3	N5	N3.6	NNW14
18-Feb	N4	N5	N5	NNE5	NE5	NE5	NNE6	NNE5	N6	N6	N6	NNE7	N6	NNW6	N6	NNE6	NE3	E1	ESE2	SE2	S4	S3	S4	SSW4	NNE3.1	NNE7
19-Feb	S6	S6	S5	S3	S5	SSE6	SSE8	SSE7	SSE7	SSE8	SE8	SE8	E6	ESE7	SE7	NNE5	N5	N6	N5	NE4	NNE4	N4	N5	N3	SE2.5	SE8
20-Feb	NNW6	NNW9	NNW7	NNW7	NW7	NW6	NW5	NW7	NW6	NW5	NW4	WNW4	NW4	WNW5	NW6	NW8	NNW9	N6	NNW7	NNE6	ENE5	NNE4	NNE6	NE7	NNW5.3	NNW9
21-Feb	NE5	N3	NNW6	NNW9	NNW7	NW4	NW7	NNW5	NW8	NNW10	NNW12	NNW10	NNW10	NNW11	NNW10	NNW10	NNW13	N9	N8	N5	NNE6	NNW9	N8	NNW5	NNW7.5	NNW13
22-Feb	NNW4	NW4	NW5	WNW2	WNW2	W2	W2	W2	NW1	NNW3	N6	N5	N6	N5	NNW5	N7	NNE5	N4	N3	NNE2	NE3	NE2	N2	NW2	NNW3.0	N7
23-Feb	WNW1	WNW2	NNW3	W1	W2	WSW1	W1	W2	WNW1	ESE0	E1	SE3	N4	NNE4	N5	N5	NE2	ESE2	S2	SSW1	SW2	SSW2	SW2	SW4	NW0.6	N5
24-Feb	SW4	SSW5	S6	SSW4	SSW4	S6	S6	SSW6	SSW5	SSW6	S9	S10	S8	SSW10	SSW9	S9	S9	SSW9	S9	S9	SSW8	SSW8	SSW7	SSW8	SSW7.2	SSW10
25-Feb	SSW8	SW7	SW7	SW7	SW5	SW6	SW6	WNW5	WNW5	WNW5	W4	WSW5	WSW5	W3	SW4	SSW3	SSW4	SSW4	SSW4	SSW4	S5	S6	S5	S4	SW4.1	SSW8
26-Feb	S6	SSE7	SSE7	SSE7	SE5	SSE7	SE7	SE7	ESE6	ESE7	ESE6	ESE7	E10	ESE11	E12	ENE10	ENE9	ESE9	ESE9	E7	SE5	SE4	E2	ENE2	ESE6.0	E12
27-Feb	ENE3	N2	N4	NNW9	NNW8	NW6	NW7	NW7	NW6	NW11	NW10	NW8	NW8	NW6	NW8	NW9	NNW11	NNW10	NW7	NNW10	NNW7	N5	NNW6	NNW5	NW6.9	NW11
28-Feb	N5	NNE5	NE5	NE4	NE4	NE2	N2	N3	NNE5	NNE5	N5	NNE5	NE4	NE5	N4	NNE4	ENE4	SE3	NE2	SSE3	SE3	S4	S4	S4	NE2.4	NNE5

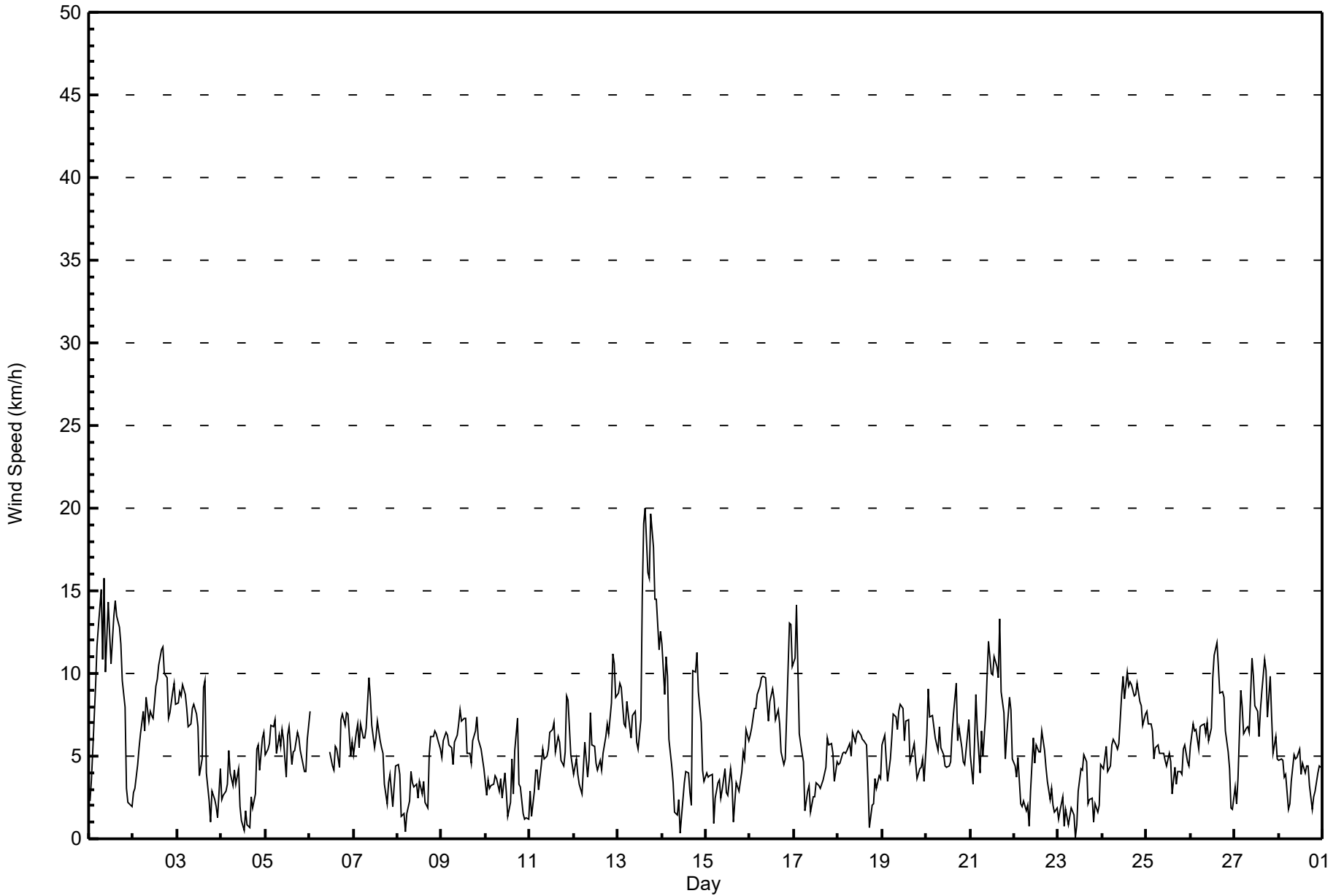
WSW1.6WSW1.9WSW1.6WSW1.3WSW1.3 SW1.8 SW1.9 SW2.0WSW1.7WSW1.5 W1.7 W1.7 W1.7WNW1.7WNW2.2 NW2.5 NW1.6WNW1.2 W1.3 W1.0 SW1.4WSW1.4WSW1.3WSW1.3 NNW12 NNW14 NNW11 NNW10 NNW12 NNW13 NNW15 NNW11 NNW16 NW11 NNW14 NNW12 NNW11 NNW15 NNW19 NNW20 NNW16 NNW16 NNW20 NNW18 NNW14 NNW14 NNW13 NNW13	Diurnal Average Diurnal Maximum
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UO - Unstable Operation  
All monthly, daily, and diurnal averages have been calculated using vector methods



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

**Wind Speed (WS) - km/h**  
**Jackfish 1 - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Jackfish 1 - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	349	52.72	52.72
6 - 11	284	42.90	95.62
12 - 19	27	4.08	99.70
20 - 28	2	0.30	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 662

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Jackfish 1 - February 2023**

<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	31	20	21	12	11	10	16	13	32	42	34	19	23	37	18	10	349
6 - 11	16	8	2	2	3	8	5	13	61	50	25	7	4	14	27	39	284
12 - 19	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	23	27
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	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>	47	28	23	14	15	18	21	27	93	92	59	26	27	51	47	74	662

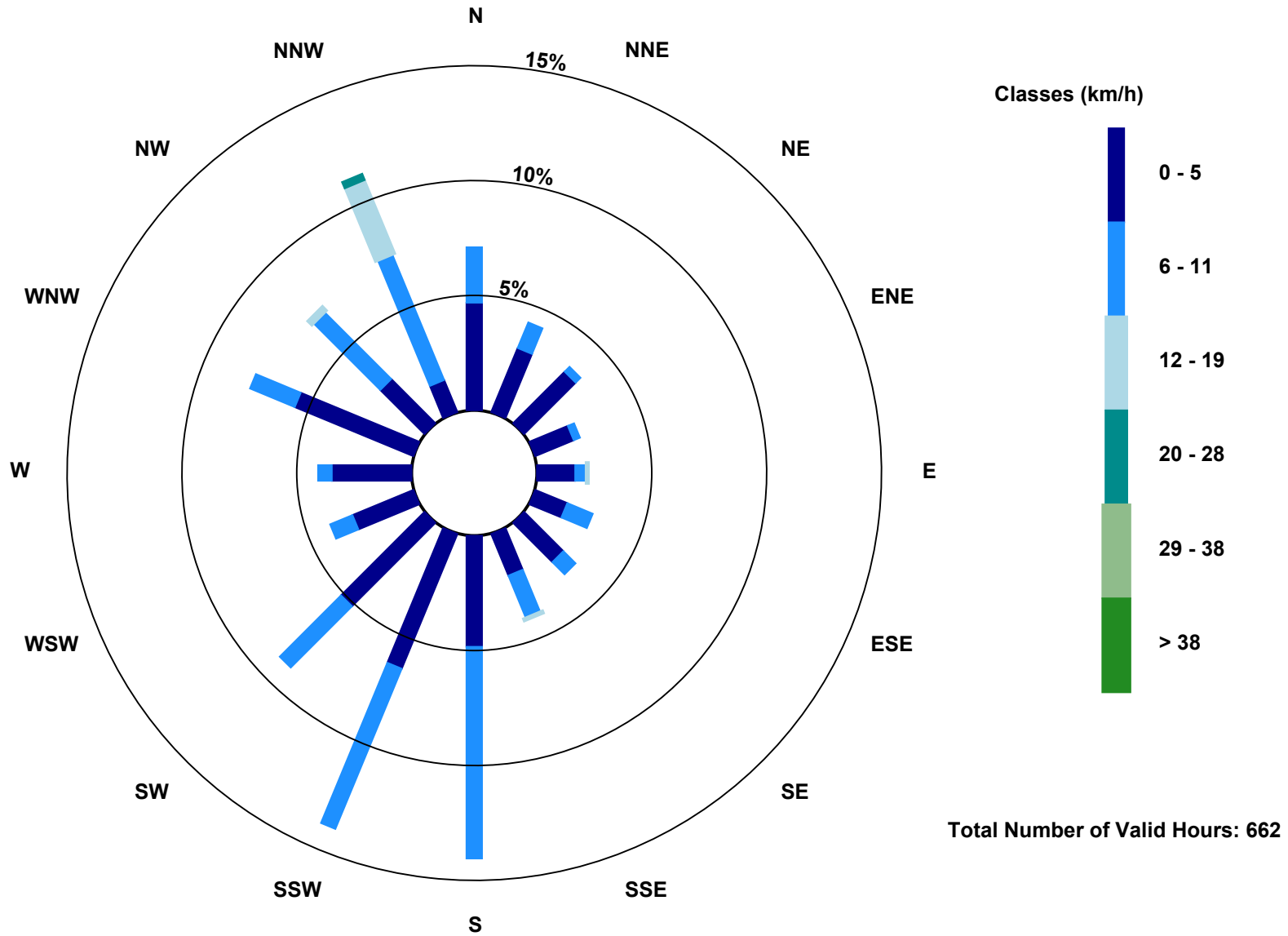
Total Number of Valid Hours: 662

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Jackfish 1





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

**Wind Speed (WS) - km/h**  
**Jackfish 1 - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 5 km/h on Feb 13 14:00														Hours in Service: 672 Hours of Data: 662 Hours of Missing Data: 10 Hours of Calibration: 0 Percent Operational Time: 98.5											
Minimum Value: 0 km/h on Feb 15 20:00																									
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																									
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-Feb	1	1	2	4	4	4	3	3	4	3	4	3	3	3	4	4	3	3	1	1	1	1	1	1	4
2-Feb	2	1	1	1	1	1	2	2	2	3	3	2	3	3	3	4	4	4	4	2	2	3	3	3	4
3-Feb	3	3	3	3	3	3	3	2	3	3	3	2	2	2	3	3	2	1	1	1	1	1	1	2	3
4-Feb	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2
5-Feb	1	2	2	2	2	2	2	2	2	2	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2
6-Feb	4	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2	2	2	3	2	2	2	2	2	3	3	2	3	4
7-Feb	2	3	3	3	3	3	3	3	4	3	2	2	3	4	3	3	3	2	1	1	1	1	1	1	4
8-Feb	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	2	2	2	2	1	1	2
9-Feb	1	2	2	2	2	2	1	3	2	2	3	3	3	3	2	2	1	2	2	2	2	2	2	2	3
10-Feb	1	1	1	1	1	1	2	1	1	2	1	2	1	1	2	2	4	2	1	1	1	1	1	1	4
11-Feb	1	1	2	2	2	2	1	2	2	2	2	3	3	3	3	3	3	2	2	3	3	3	2	2	3
12-Feb	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3
13-Feb	3	4	4	2	3	3	3	3	4	4	4	3	3	5	5	5	4	5	4	4	3	3	2	2	5
14-Feb	3	2	3	2	2	1	1	1	1	1	1	1	1	1	2	1	1	3	3	2	3	3	1	1	3
15-Feb	2	1	2	1	1	1	1	1	1	1	1	2	1	2	2	2	1	1	0	0	1	1	2	2	2
16-Feb	2	2	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	2	2	2	5	4	3	5
17-Feb	3	3	4	2	2	1	1	1	1	1	1	2	1	1	1	1	1	2	2	2	2	2	1	1	4
18-Feb	1	1	1	2	2	2	2	2	2	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2
19-Feb	1	1	1	1	1	1	2	2	2	2	2	3	2	2	2	2	2	2	1	1	1	1	1	1	3
20-Feb	2	2	1	2	2	1	1	2	2	2	2	2	1	1	2	2	3	2	2	2	2	2	2	3	3
21-Feb	2	1	2	2	2	2	2	2	1	3	2	2	2	3	3	3	3	3	3	1	2	2	2	1	3
22-Feb	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	2
23-Feb	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1	2	2	2	1	2
24-Feb	1	1	1	1	1	1	1	1	2	2	3	4	3	4	3	3	4	3	3	3	3	3	3	4	4
25-Feb	3	3	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	3
26-Feb	1	1	1	1	1	1	2	1	2	2	2	2	3	4	4	4	3	3	3	2	2	2	1	1	4
27-Feb	1	1	1	2	3	1	1	1	1	3	3	2	3	2	2	3	2	2	2	3	2	1	1	1	3
28-Feb	1	1	2	2	2	1	1	1	2	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2
	4	4	4	4	4	4	3	3	4	4	4	4	3	5	5	5	4	5	4	4	3	5	4	4	
Diurnal Maximum																									
UO - Unstable Operation																									



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

**Wind Direction (WD) - deg**  
**Jackfish 1 - February 2023**

Direction of Maximum Speed: 336 deg on Feb 13 16:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 329.8 deg on Feb 1	Hours of Data: 662
Direction of Minimum Speed: 107 deg on Feb 23 10:00	Direction of Minimum Daily Speed Average: 0.6 deg on Feb 23
Direction of Minimum Speed: 107 deg on Feb 23 10:00	Hours of Missing Data: 10
Monthly Average Direction: 260.2 deg	Percent Operational Time: 98.5

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-Feb	301	303	309	327	342	340	335	327	330	341	331	331	323	332	333	335	334	336	336	338	275	252	234	238	329.8
2-Feb	212	210	188	190	190	188	185	187	180	178	172	172	169	164	167	163	164	168	175	176	178	185	188	189	177.7
3-Feb	191	198	191	194	194	200	196	200	206	207	216	216	270	310	318	325	241	226	223	198	191	249	61	64	215.4
4-Feb	152	94	105	114	137	144	127	131	94	140	34	52	152	352	123	261	96	140	177	185	188	191	184	187	148.4
5-Feb	195	196	198	186	191	187	189	196	202	195	194	169	195	193	195	196	211	217	219	216	220	225	278	299	203.6
6-Feb	304	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	296	306	272	246	213	195	189	197	200	205	212	239	220	--
7-Feb	234	218	218	265	298	290	263	292	304	303	301	302	293	297	286	266	259	237	232	221	221	265	201	206	269.8
8-Feb	228	219	234	208	201	228	250	225	242	267	270	290	284	302	282	278	216	217	215	218	219	203	194	196	230.1
9-Feb	197	204	222	217	212	208	201	209	213	211	215	212	205	205	196	180	178	182	179	182	191	200	198	195	201.3
10-Feb	160	182	180	175	177	182	163	164	181	147	145	188	125	133	352	339	317	330	302	288	285	284	294	294	211.1
11-Feb	296	281	243	298	290	270	212	209	216	206	227	254	261	263	242	268	238	229	219	296	301	302	304	307	260.8
12-Feb	252	233	238	228	241	231	212	217	219	219	222	230	242	244	211	208	194	190	185	181	183	184	188	190	208.1
13-Feb	200	203	203	201	215	217	229	242	249	256	292	292	298	324	328	336	339	341	334	333	333	334	336	337	307.9
14-Feb	331	318	333	339	0	352	15	146	50	70	360	162	191	192	230	301	283	336	339	335	342	16	17	44	339.7
15-Feb	47	68	62	71	90	80	113	102	86	101	17	346	159	150	158	31	76	162	180	181	184	183	186	181	127.2
16-Feb	183	181	180	181	183	184	184	190	189	191	195	197	195	199	208	227	245	232	308	297	307	326	331	324	216.9
17-Feb	331	331	349	4	12	26	69	107	109	97	306	261	300	298	293	298	304	326	5	33	44	41	45	10	354.0
18-Feb	0	6	8	28	40	42	30	24	8	351	2	16	6	347	5	21	53	95	111	141	189	178	191	197	18.8
19-Feb	184	187	191	190	176	160	159	157	156	148	144	138	98	102	129	25	11	357	350	42	25	8	354	356	129.0
20-Feb	341	339	341	335	321	315	310	313	312	316	312	301	304	303	314	313	340	354	344	32	61	19	15	47	336.2
21-Feb	36	2	339	339	339	326	325	328	321	334	337	333	335	339	345	336	338	4	3	7	12	348	354	344	343.2
22-Feb	341	322	326	283	282	263	275	271	313	348	4	349	355	4	342	9	12	4	3	26	42	34	359	313	348.4
23-Feb	286	291	327	264	278	250	273	271	294	107	98	129	359	19	5	8	51	119	186	203	217	201	223	231	311.1
24-Feb	235	212	191	199	194	186	190	192	193	192	187	186	184	194	195	189	189	196	189	188	192	196	203	205	193.5
25-Feb	207	223	221	223	229	234	226	296	296	298	295	265	256	250	272	234	211	202	201	193	189	185	179	178	229.5
26-Feb	170	166	168	162	146	153	146	141	122	122	106	102	94	105	93	71	76	105	116	99	141	137	90	72	118.5
27-Feb	58	9	351	339	328	308	307	309	309	323	320	310	315	306	310	319	335	335	316	331	340	349	345	344	326.1
28-Feb	6	16	39	48	39	55	360	2	12	25	5	24	41	55	360	28	58	131	51	150	138	182	173	174	41.5
254.2	240.8	244.6	253.7	247.5	223.8	221.0	222.4	248.4	244.1	277.6	262.5	274.1	283.8	298.1	312.2	312.1	285.4	276.9	262.2	235.1	250.2	251.0	245.4		
Diurnal Average																									

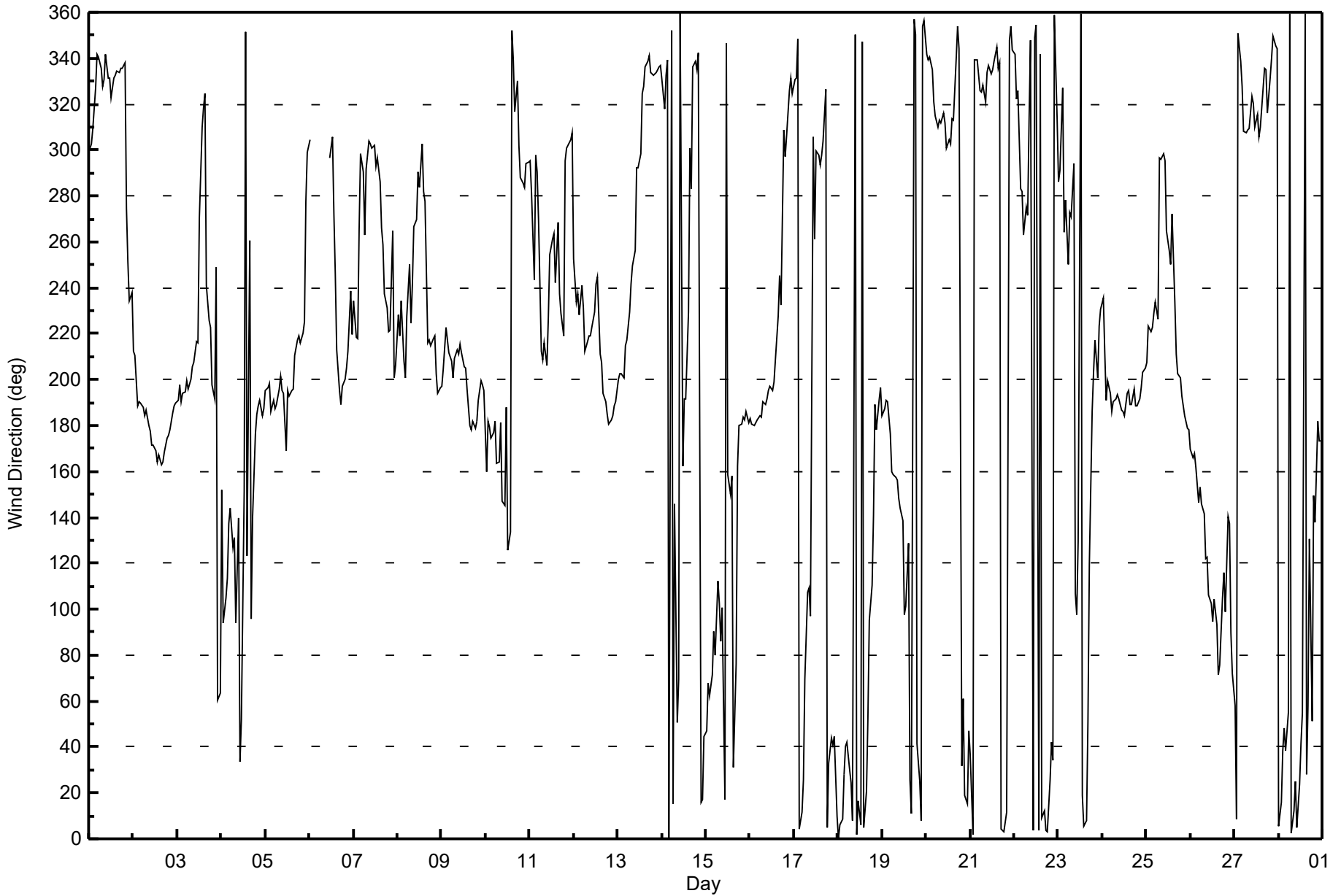
UO - Unstable Operation  
 All monthly, daily, and diurnal averages have been calculated using vector methods





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

**Wind Direction (WD) - deg**  
**Jackfish 1 - February 2023**





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

**Wind Direction (WD) - deg**  
**Jackfish 1 - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 107 deg on Feb 14 11:00 Minimum Value: 7 deg on Feb 15 20:00 Percentiles: P <sub>1</sub> = 9 P <sub>10</sub> = 13 Q <sub>1</sub> = 19 Median = 27 Q <sub>3</sub> = 41 P <sub>90</sub> = 65 P <sub>99</sub> = 88																			Hours in Service: 672 Hours of Data: 662 Hours of Missing Data: 10 Hours of Calibration: 0 Percent Operational Time: 98.5						
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-Feb	43	35	14	19	20	18	13	15	12	18	13	15	15	16	14	13	11	11	8	11	30	40	16	19	43
2-Feb	26	26	10	10	11	10	10	15	18	22	20	21	19	19	20	19	19	20	23	22	22	24	24	26	26
3-Feb	24	24	27	23	26	28	33	31	34	40	33	30	78	44	20	15	45	76	88	39	72	69	74	40	88
4-Feb	48	34	29	27	12	13	21	27	32	20	64	78	93	66	72	87	27	49	17	17	22	26	16	19	93
5-Feb	21	24	28	16	17	19	26	21	22	27	30	46	28	26	32	18	20	24	27	43	37	59	78	45	78
6-Feb	29	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	60	67	69	59	42	31	23	26	28	29	40	69	56	69
7-Feb	72	49	51	86	76	80	76	76	32	24	36	56	66	65	75	79	67	80	88	33	27	57	30	17	88
8-Feb	23	27	63	63	87	76	45	27	29	42	53	56	56	81	68	77	39	21	19	20	20	26	18	20	87
9-Feb	23	28	28	21	20	29	31	30	29	31	24	29	31	29	26	20	12	13	17	16	26	29	23	29	31
10-Feb	35	17	22	19	12	27	23	15	18	59	27	79	72	73	41	40	42	13	23	34	30	32	21	29	79
11-Feb	43	78	72	63	52	62	23	22	50	37	55	61	65	65	69	76	64	59	51	70	38	24	57	71	78
12-Feb	89	46	61	73	86	39	22	27	26	22	35	51	64	51	40	28	25	19	15	15	19	17	20	20	89
13-Feb	28	29	27	28	45	48	56	72	61	68	76	67	58	20	14	15	17	19	13	13	13	12	12	11	76
14-Feb	12	13	12	11	21	18	25	27	48	79	107	53	47	36	51	55	43	16	15	13	31	25	33	31	107
15-Feb	25	31	34	28	89	27	36	23	66	41	42	80	65	48	78	92	44	18	10	7	8	8	12	21	92
16-Feb	22	16	19	21	22	21	23	24	23	27	35	31	28	31	41	54	61	72	76	38	16	17	14	14	76
17-Feb	14	14	26	24	25	22	56	31	28	60	79	90	49	45	55	43	33	26	23	26	27	28	23	23	90
18-Feb	22	17	21	27	30	27	28	32	29	25	28	32	31	29	31	26	29	59	25	23	11	16	10	9	59
19-Feb	10	9	11	11	13	13	13	15	16	16	17	23	34	29	25	40	32	24	22	26	30	30	24	26	40
20-Feb	14	11	9	17	19	15	15	16	18	18	34	48	32	36	20	20	17	20	15	32	29	31	25	25	48
21-Feb	24	20	10	12	16	35	12	19	12	15	14	17	19	20	20	20	14	25	22	20	18	15	20	15	35
22-Feb	11	32	9	29	27	19	35	23	66	27	30	50	32	44	32	28	30	19	20	24	30	17	31	35	66
23-Feb	36	38	15	21	27	29	27	16	30	99	79	48	51	57	42	42	52	28	10	46	70	84	22	26	99
24-Feb	19	22	15	17	14	11	13	15	20	25	27	26	27	26	26	23	24	23	21	22	27	31	33	38	38
25-Feb	34	51	35	32	43	43	46	60	47	37	51	60	68	61	77	63	80	19	18	21	18	16	16	12	80
26-Feb	11	9	9	12	16	14	13	12	16	22	28	26	29	28	30	28	28	26	22	25	18	19	26	30	30
27-Feb	31	34	21	12	17	12	13	11	12	16	16	17	20	26	17	19	14	14	14	17	14	17	15	19	34
28-Feb	25	24	26	30	32	36	45	24	30	36	35	41	64	54	62	61	43	40	43	11	29	12	10	11	64
89 78 72 86 89 80 76 76 66 99 107 90 93 81 78 92 80 80 88 70 72 84 78 71																									
Diurnal Maximum																									
UO - Unstable Operation																									



## WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY  
MONITORING PROGRAM  
MONTHLY REPORT

**AMS508  
KIRBY NORTH  
FEBRUARY 2023**

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

March 31, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY NORTH (AMS 508)  
 FEBRUARY 2023

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	637	35	35	100	12.8	0	3.1	0
H2S (ppb) Average	577	40	95	91.82	0.8	0	0.3	0
THC (ppm) Average	633	32	39	98.96	3.2	-	2.6	-
NO2 (ppb) Average	637	35	35	100	18.4	0	6.2	-
NO (ppb) Average	637	35	35	100	5.5	-	1	-
NOX (ppb) Average	637	35	35	100	18.9	-	6.8	-
Temperature 2 m (C) Average	672	0	0	100	3.8	-	-0.2	-
Relative Humidity (%) Average	672	0	0	100	97.7	-	88.6	-
Wind Speed 10 m (km/h) Average	663	0	9	98.66	23	-	17	-
Wind Direction 10 m (deg) Average	663	0	9	98.66	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY NORTH (AMS508)  
FEBRUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	637	0.99	1.6	-	0	0	0.2	0.4	1.2	2.6	12.8
H2S (ppb) Average	577	0.12	0.1	-	0	0.1	0.1	0.1	0.1	0.2	0.8
THC (ppm) Average	633	2.41	0.1	-	2.2	2.3	2.3	2.4	2.4	2.5	3.2
NO2 (ppb) Average	637	2.68	2.3	-	0	0.7	1.2	2.1	3.6	5.1	18.4
NO (ppb) Average	637	0.4	0.6	-	0	0	0	0.2	0.5	1.1	5.5
NOX (ppb) Average	637	3.09	2.6	-	0.1	0.8	1.4	2.4	4.1	5.7	18.9
Temperature 2 m (C) Average	672	-11.96	9.3	-	-36.8	-25.1	-18.8	-11.9	-3	0.3	3.8
Relative Humidity (%) Average	672	72.21	12.4	-	34.7	55.1	64.5	73.7	80.4	86.7	97.7
Wind Speed 10 m (km/h) Average	663	10.6	4	-	1	5	8	10	13	17	23
Wind Direction 10 m (deg) Average	663	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY NORTH (AMS508)  
FEBRUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S	13 Feb 2023 05:00	14 Feb 2023 04:00	24	Unstable Operation - inconsistent response
H2S	14 Feb 2023 06:00	14 Feb 2023 13:00	8	Unstable Operation - inconsistent response
H2S	14 Feb 2023 14:00	15 Feb 2023 12:00	23	Maintenance - hydrate SO2 scrubber beads
THC	02 Feb 2023 09:00	02 Feb 2023 15:00	7	Maintenance - multi-point verification check
Wind Speed, Wind Direction	02 Feb 2023 10:00	02 Feb 2023 15:00	6	Maintenance - station operator activities
Wind Speed, Wind Direction	14 Feb 2023 08:00	14 Feb 2023 10:00	3	Flat line in sensor output signal - Sensor frozen



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

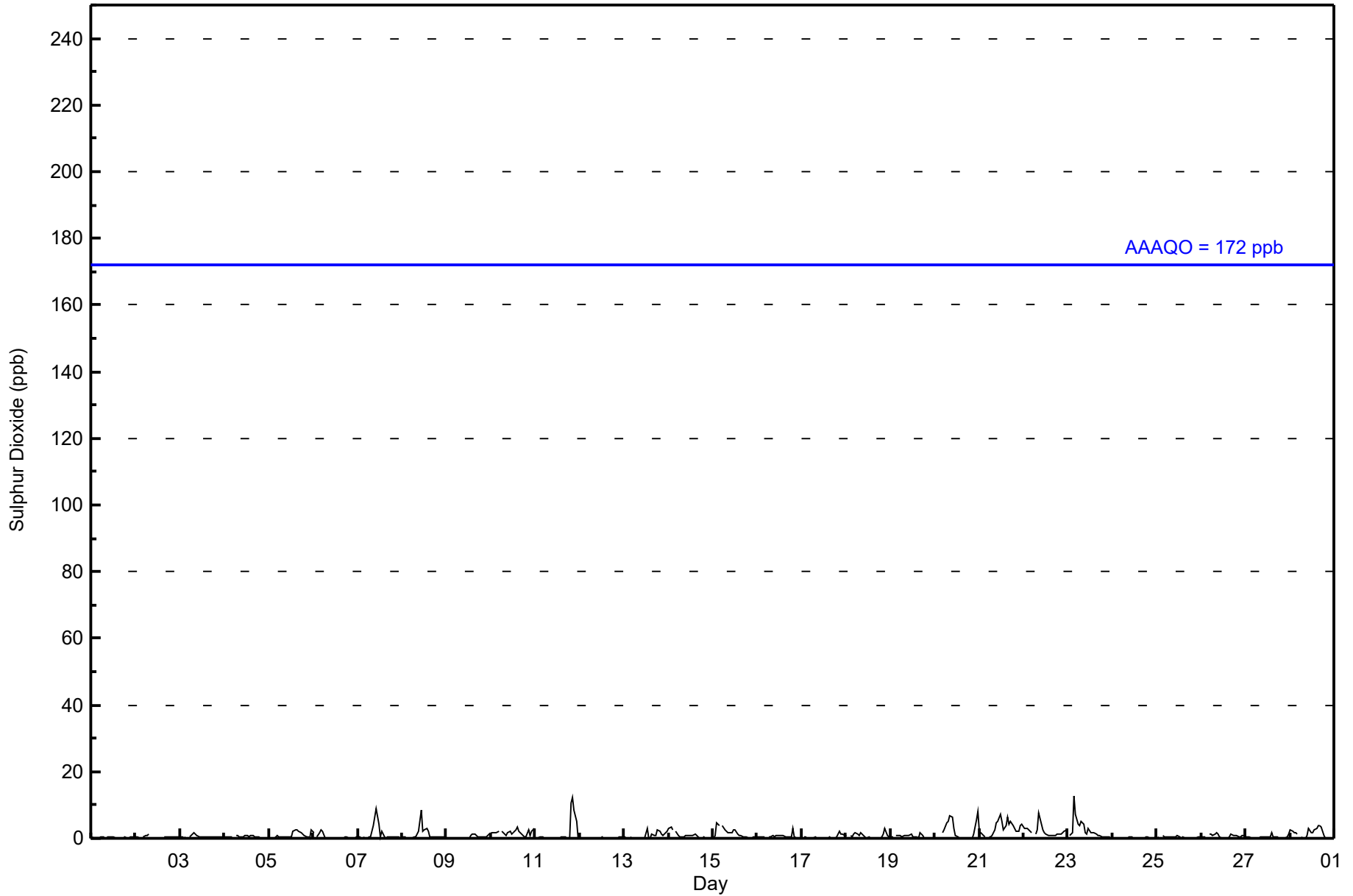
**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Kirby North - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0		Hours in Service: 672																								
Maximum Value: 12.8 ppb on Feb 23 04:00		Maximum Daily Average: 3.1 ppb on Feb 21																								
Minimum Value: 0.0 ppb on Feb 5 23:00		Minimum Daily Average: 0.1 ppb on Feb 12																								
Maximum Diurnal Average: 1.5 ppb at hour 11		Minimum Diurnal Average: 0.6 ppb at hour 19																								
Monthly Average: 0.99 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> = 1.2 P <sub>90</sub> = 2.6 P <sub>99</sub> = 7.9																								
		Hours of Data: 637																								
		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-Feb	0.2	0.1	Z	0.1	0.2	0.3	0.2	0.1	0.0	0.2	0.3	0.4	0.2	0.1	0.2	0.1	0.0	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.4
2-Feb	0.2	0.2	0.1	Z	0.4	0.7	0.9	1.5	C	C	C	C	C	C	C	0.5	0.2	0.4	0.3	0.4	0.6	0.5	0.5	0.4	--	1.5
3-Feb	0.3	0.3	0.1	0.2	Z	0.6	0.8	1.5	1.2	0.7	0.6	0.6	0.5	0.5	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	1.5
4-Feb	0.4	0.4	0.3	0.5	0.5	Z	0.7	0.7	0.5	0.5	0.5	0.7	0.8	0.6	0.6	0.9	0.4	0.3	0.2	0.2	0.2	0.2	0.0	0.1	0.4	0.9
5-Feb	Z	0.1	0.1	0.2	0.9	0.6	0.4	0.3	0.3	0.2	0.4	0.3	0.5	2.0	2.3	2.5	2.1	1.5	1.4	1.0	0.6	0.3	0.0	2.7	0.9	2.7
6-Feb	1.5	Z	0.4	1.8	2.5	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.4	2.5
7-Feb	0.2	0.2	Z	0.2	0.2	0.1	0.3	0.2	3.9	6.6	9.0	4.2	0.3	2.1	0.5	0.2	0.3	0.4	0.5	0.3	0.3	0.6	0.3	0.2	1.3	9.0
8-Feb	0.4	0.2	0.3	Z	0.2	0.1	0.2	0.4	1.3	2.2	8.3	2.1	2.7	2.9	2.3	0.4	0.3	0.3	0.4	0.3	0.3	0.2	0.3	0.3	1.1	8.3
9-Feb	0.1	0.1	0.2	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.2	1.1	0.7	0.5	0.4	0.3	0.4	0.6	0.8	1.4	0.4	1.4
10-Feb	1.6	1.7	1.5	1.7	2.0	Z	2.1	1.1	0.7	1.8	2.0	1.3	1.5	2.6	3.2	2.2	1.6	0.9	0.4	0.3	2.7	1.0	2.0	2.9	1.7	3.2
11-Feb	Z	0.2	0.6	0.5	0.2	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.1	0.1	10.4	12.3	8.6	5.2	0.2	1.7	12.3
12-Feb	0.2	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	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.5	0.1	0.5
13-Feb	0.5	0.2	Z	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	2.9	0.0	0.1	1.2	0.9	0.8	2.6	2.2	1.3	1.0	1.6	2.0	0.8	2.9
14-Feb	2.9	3.3	2.7	Z	2.1	0.9	0.5	0.6	0.4	0.9	0.9	0.8	0.9	1.0	1.4	0.7	0.5	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.9	3.3
15-Feb	0.0	1.1	4.8	3.7	Z	3.9	2.6	2.1	1.8	1.7	1.6	2.7	2.3	1.1	0.9	0.7	0.5	0.5	0.4	0.2	0.2	0.2	0.3	0.3	1.5	4.8
16-Feb	0.4	0.2	0.3	0.3	0.4	Z	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.9	0.8	0.6	0.5	0.3	0.3	3.2	0.3	0.2	0.2	0.1	0.6	3.2
17-Feb	Z	0.3	0.2	0.2	0.1	0.1	0.0	0.3	0.1	0.1	0.1	0.0	0.0	0.2	0.0	0.6	0.0	0.0	0.0	0.4	2.2	1.5	1.3	0.9	0.4	2.2
18-Feb	0.7	Z	0.7	0.4	1.1	1.9	1.3	1.0	1.8	0.8	0.3	0.2	0.4	0.0	0.0	0.2	0.2	0.2	0.2	0.6	1.2	3.1	0.8	0.6	0.8	3.1
19-Feb	0.4	0.4	Z	0.7	0.8	0.6	0.6	0.9	0.8	0.7	0.6	1.3	0.6	0.4	0.2	0.2	1.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.8
20-Feb	0.0	0.0	0.1	Z	1.5	2.5	4.6	5.2	6.6	6.2	2.8	0.8	0.6	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	1.2	5.4	8.1	2.0	8.1
21-Feb	2.0	1.2	0.6	0.4	Z	0.6	0.5	1.0	2.5	4.5	5.1	7.3	4.9	2.6	3.6	6.2	4.3	5.2	3.7	2.8	2.2	1.9	3.7	4.1	3.1	7.3
22-Feb	2.8	2.9	2.9	2.1	1.5	Z	1.4	2.7	7.4	5.9	2.4	1.7	1.3	1.1	1.0	0.9	0.7	0.8	1.3	1.5	1.4	1.8	2.0	2.7	2.2	7.4
23-Feb	Z	0.9	1.7	12.8	7.3	4.4	3.9	4.9	4.0	1.7	1.1	2.8	1.5	1.7	1.7	1.4	0.8	0.7	0.5	0.5	0.5	0.3	0.3	0.2	2.4	12.8
24-Feb	0.2	Z	0.1	0.1	0.0	0.0	0.1	0.2	0.1	0.2	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.2	0.3	0.2	0.3
25-Feb	0.2	0.4	Z	0.8	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.7	0.3	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.3	0.3	0.8
26-Feb	0.4	0.3	0.3	Z	1.3	1.3	0.8	1.4	1.7	1.1	0.6	0.2	0.1	0.1	0.1	0.2	1.4	0.9	0.7	0.7	0.4	0.5	1.0	0.6	0.7	1.7
27-Feb	0.3	0.3	0.2	0.2	Z	0.1	0.2	0.2	0.5	0.6	0.5	0.6	0.6	0.5	1.6	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.5	1.5	0.4	1.6
28-Feb	2.6	2.1	1.8	1.5	1.2	Z	0.3	0.2	0.1	1.0	3.1	1.7	1.5	2.4	3.2	3.7	3.9	3.4	0.9	0.1	0.1	0.0	0.2	0.1	1.5	3.9
																								Diurnal Average		
																								Diurnal Maximum		
																								0.8 0.7 0.9 1.2 1.1 0.9 0.8 1.0 1.4 1.4 1.5 1.2 0.9 0.9 1.0 0.9 0.8 0.7 0.6 0.9 1.0 0.9 1.0 1.1		
																								2.9 3.3 4.8 12.8 7.3 4.4 4.6 5.2 7.4 6.6 9.0 7.3 4.9 2.9 3.6 6.2 4.3 5.2 3.7 10.4 12.3 8.6 5.4 8.1		
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 - February 2023**







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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Kirby North - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 10	635	99.69	99.69
11 - 20	2	0.31	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: 637

Total Number of Hours: 672



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

**Sulphur Dioxide (SO<sub>2</sub>) - ppb**  
**Kirby North - February 2023**

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	37	50	30	12	13	7	23	87	118	55	49	13	29	30	52	632
11 - 20	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	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>	27	37	50	31	12	13	7	23	87	118	55	49	13	30	30	52	634

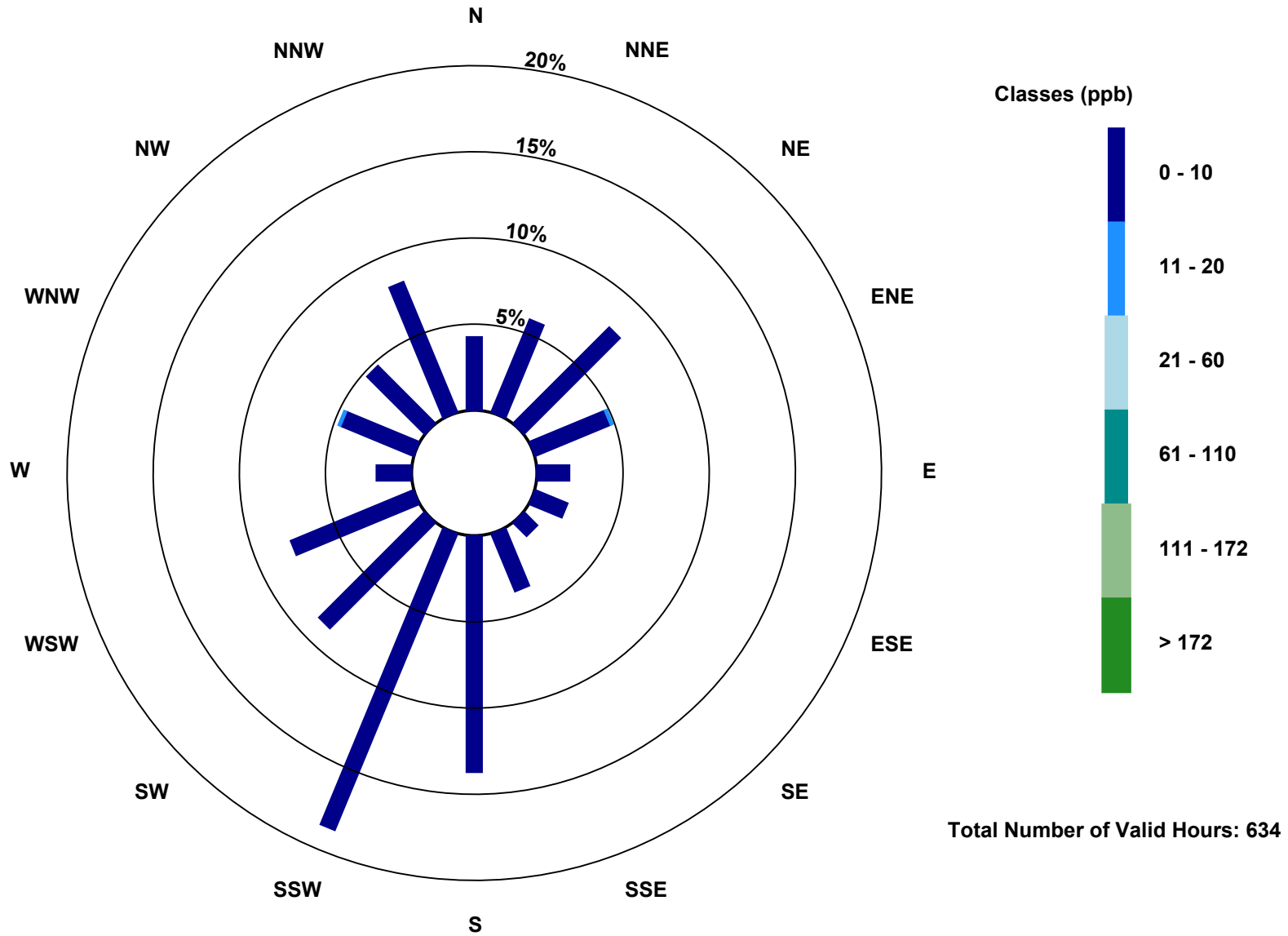
Total Number of Valid Hours: 634

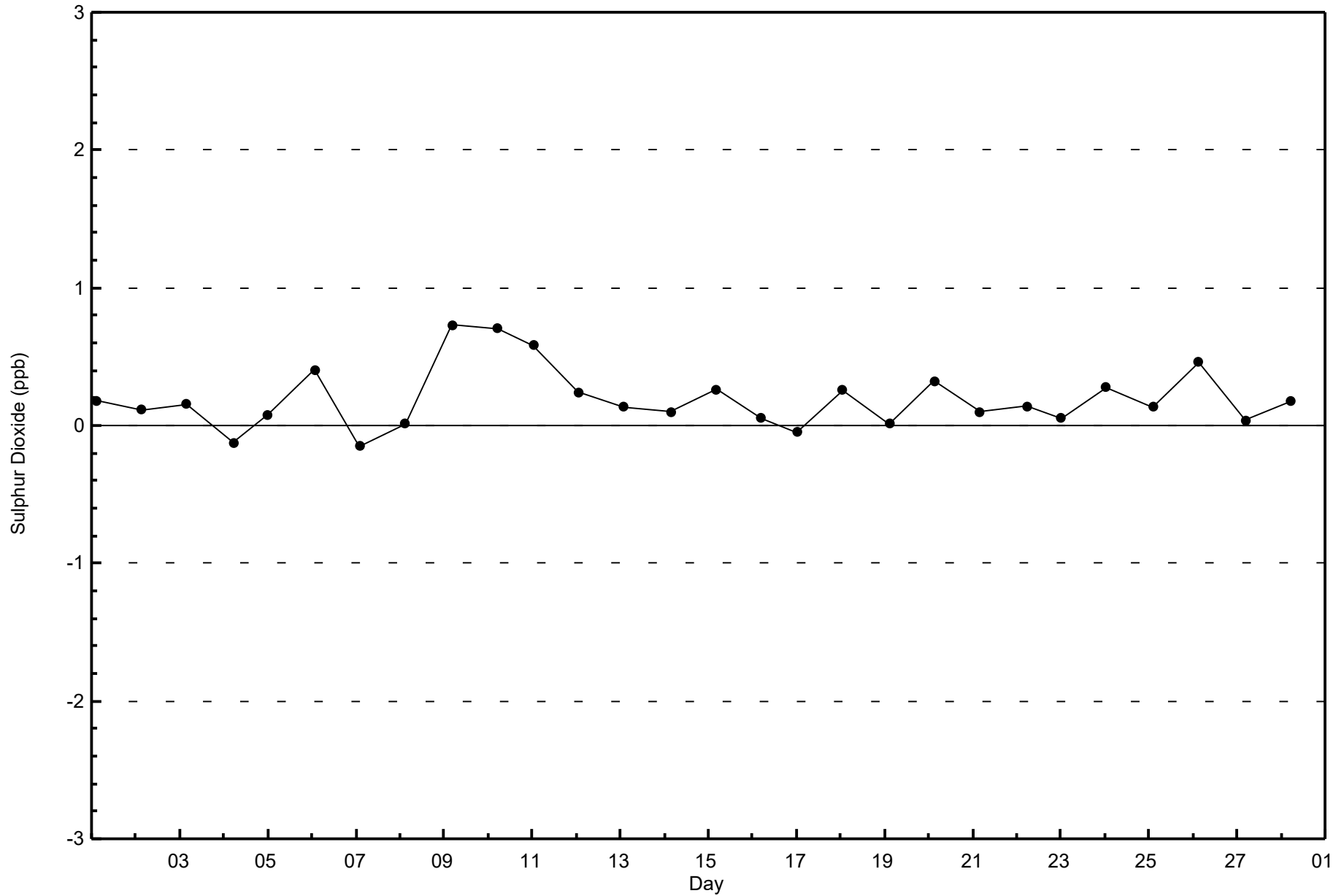
Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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

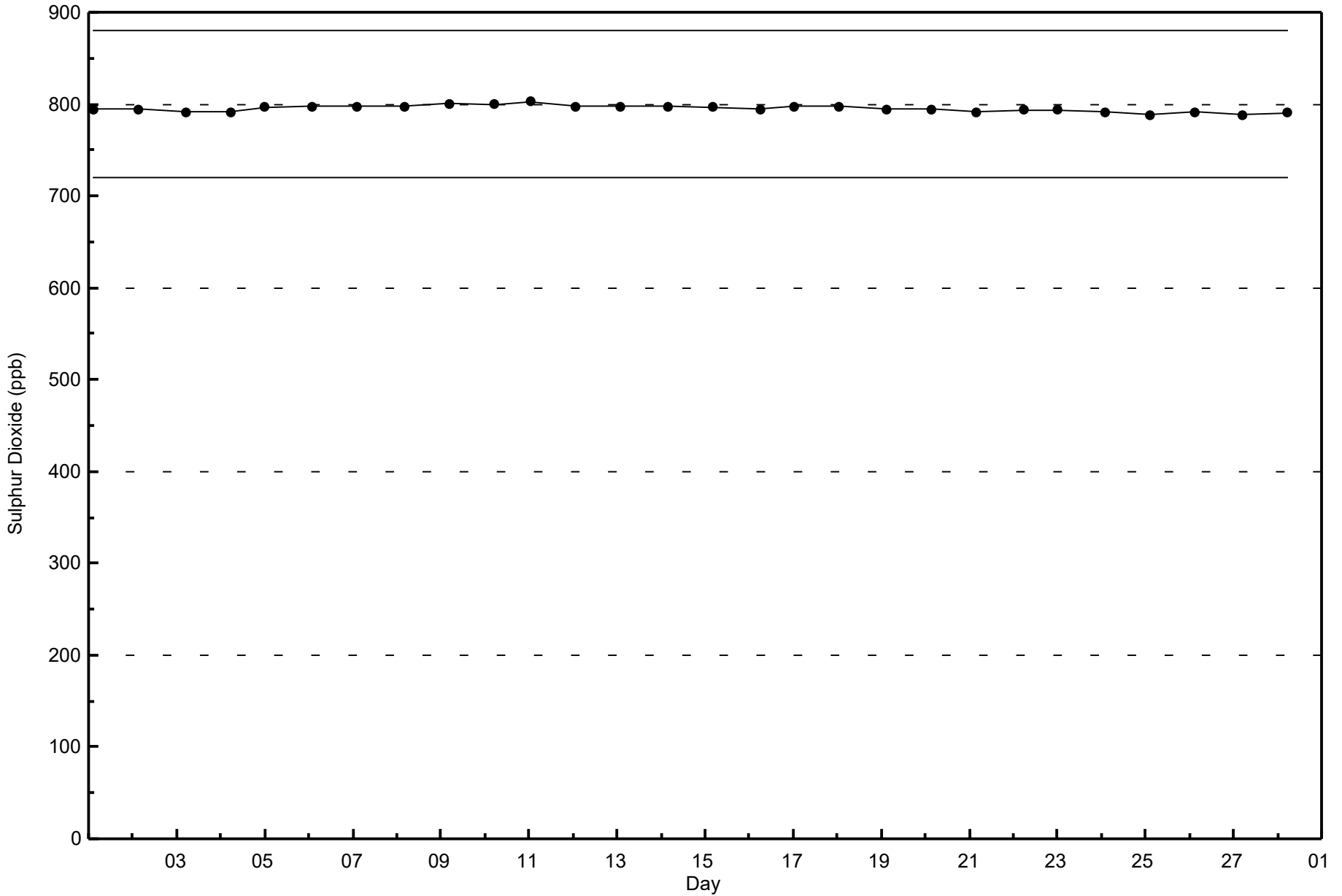




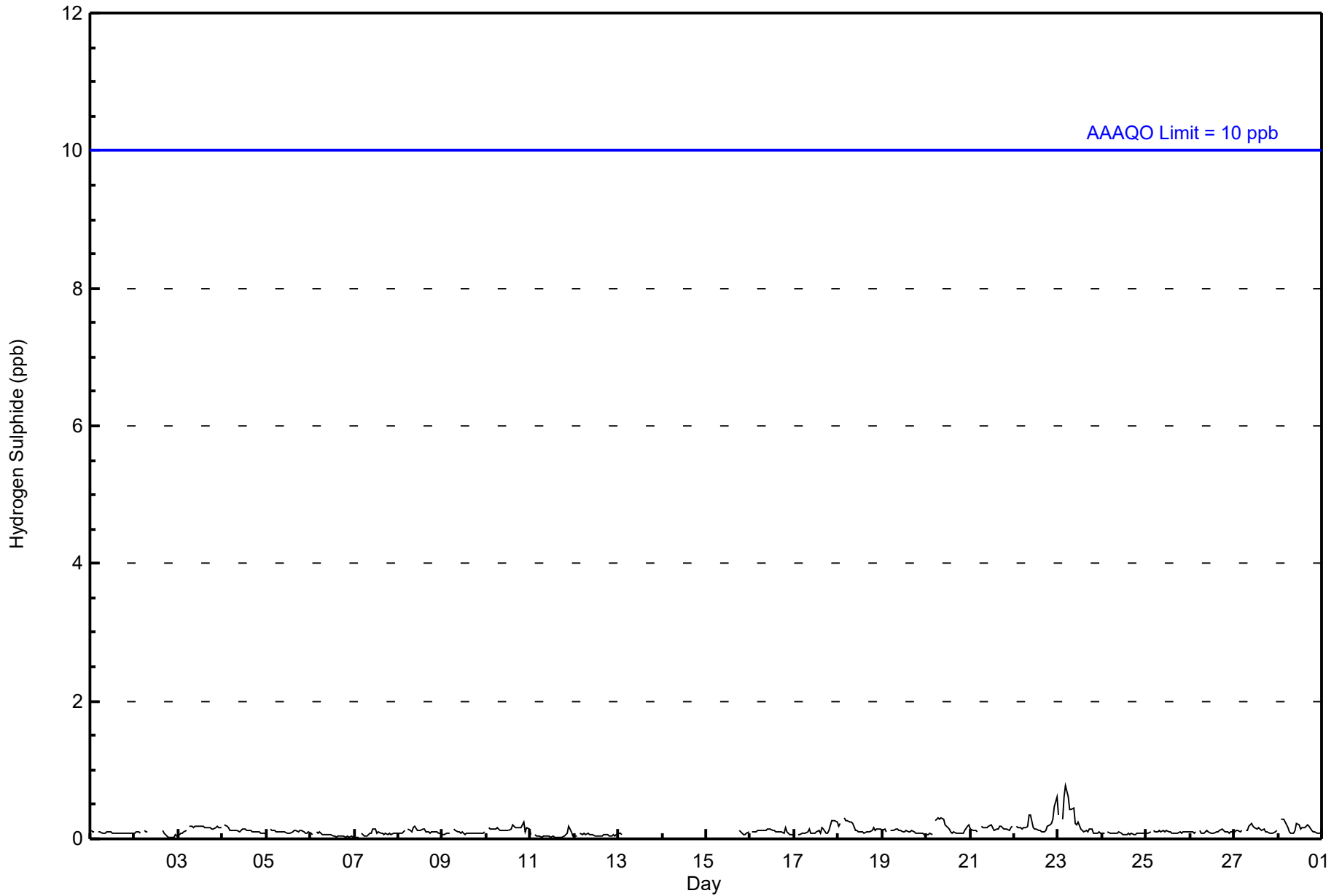


Wood Buffalo Environmental Association  
Span Responses

Sulphur Dioxide (SO<sub>2</sub>) - ppb  
Kirby North - February 2023









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

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb**  
**Kirby North - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 2	577	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: 577

Total Number of Hours: 672





**Wood Buffalo Environmental Association  
Frequency Distribution**

**Hydrogen Sulphide (H<sub>2</sub>S) - ppb  
Kirby North - February 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	19	33	49	27	12	10	7	24	85	113	47	42	13	27	30	39	577
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>	19	33	49	27	12	10	7	24	85	113	47	42	13	27	30	39	577

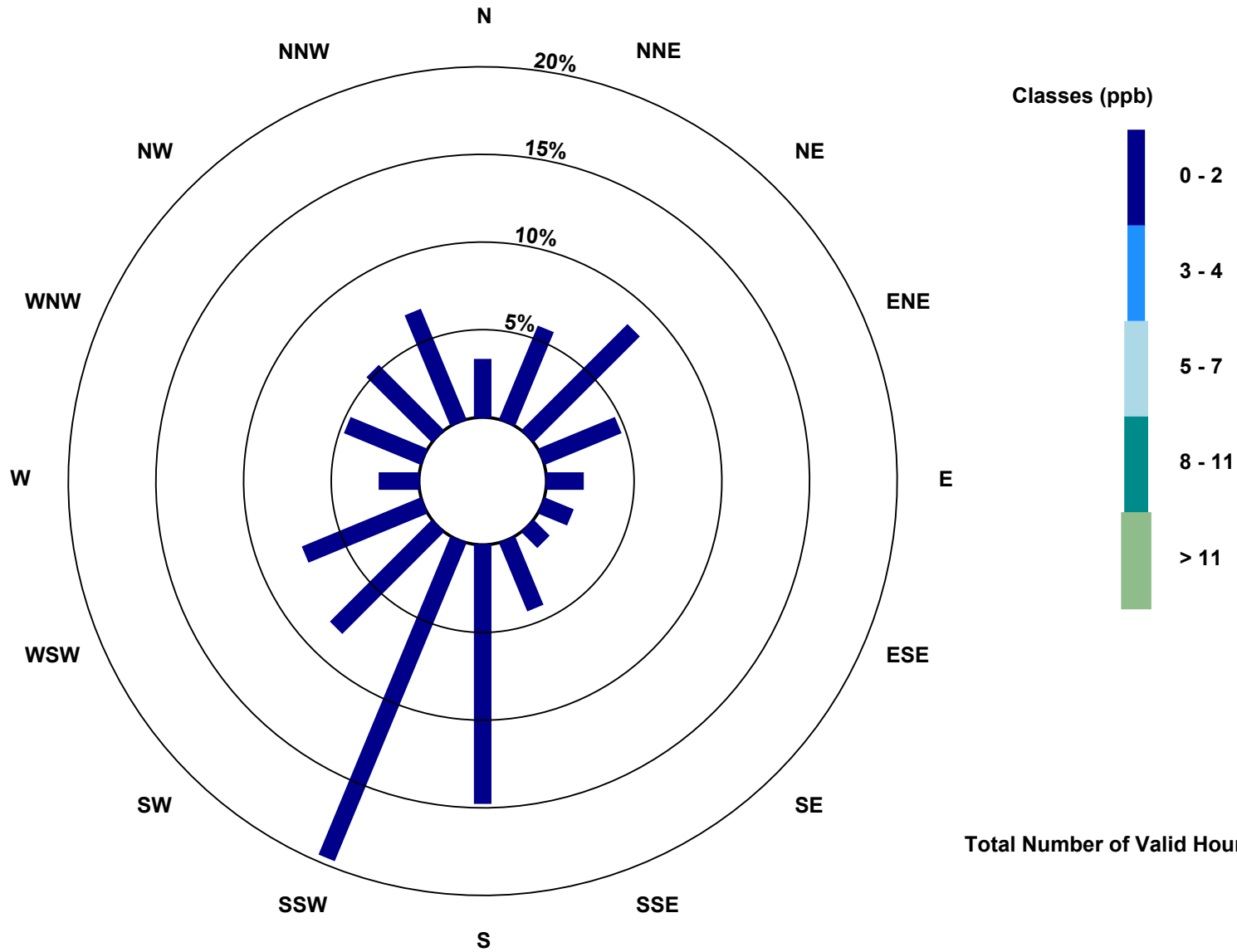
Total Number of Valid Hours: 577

Total Number of Hours: 672

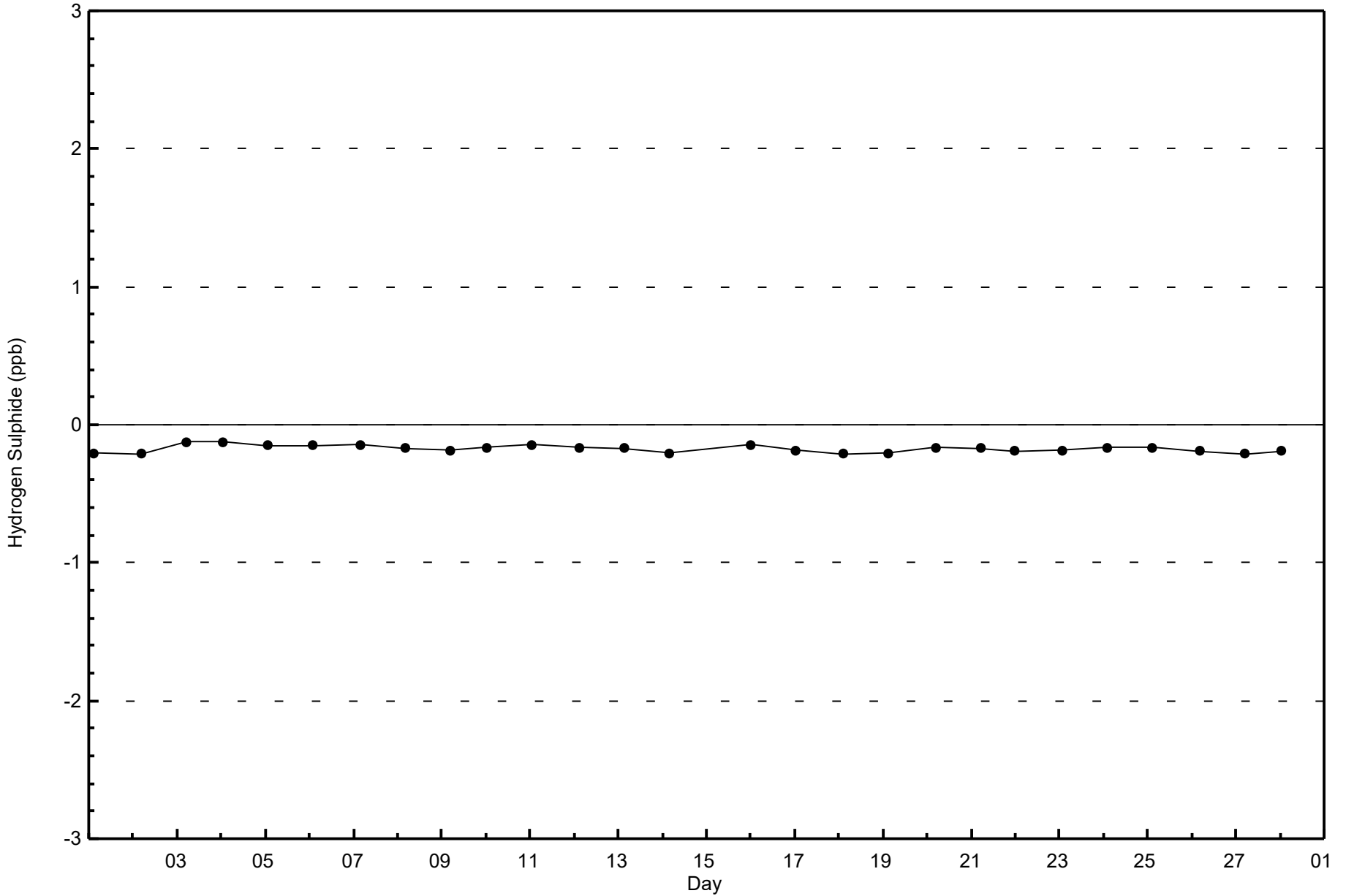


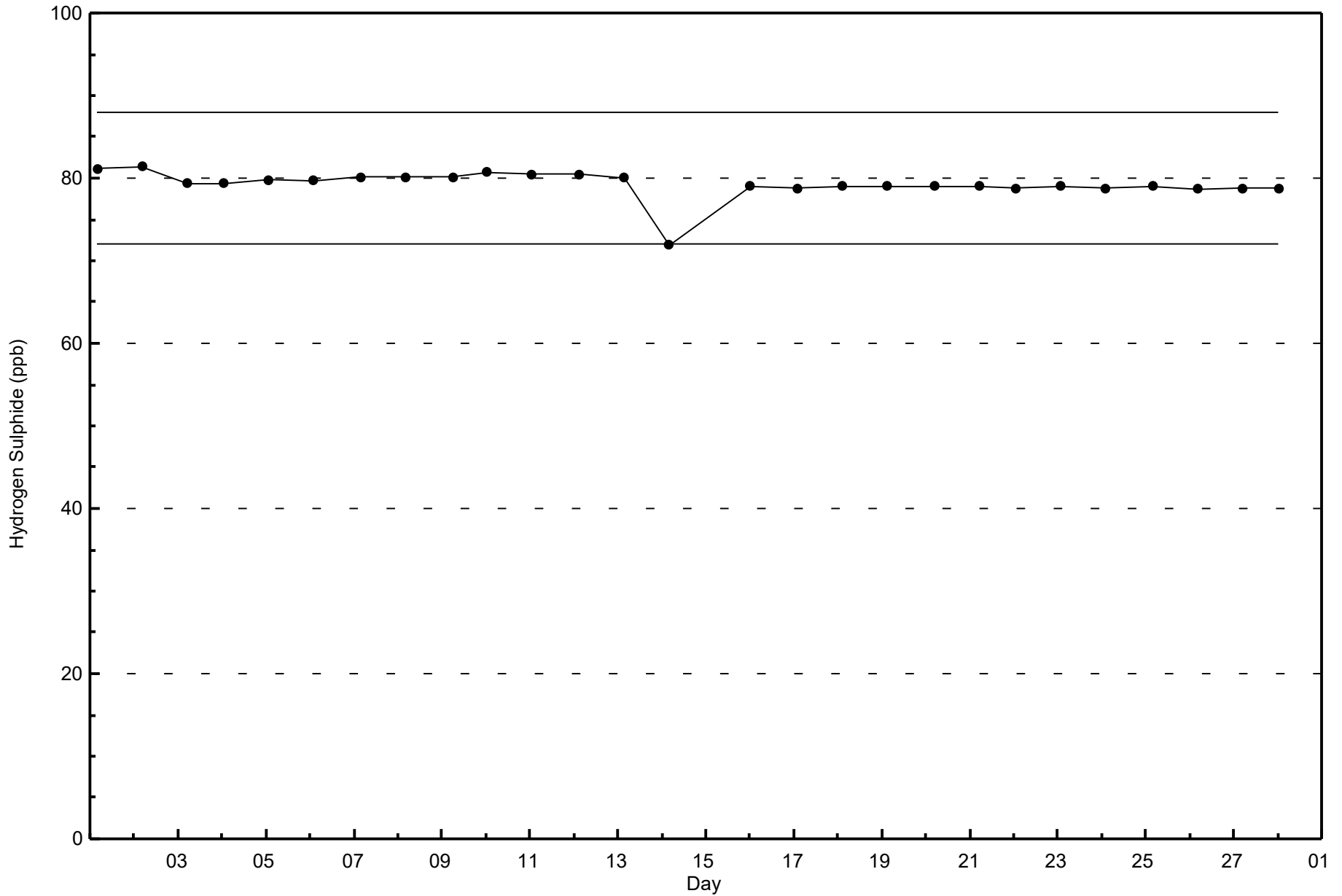
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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



Total Number of Valid Hours: 577



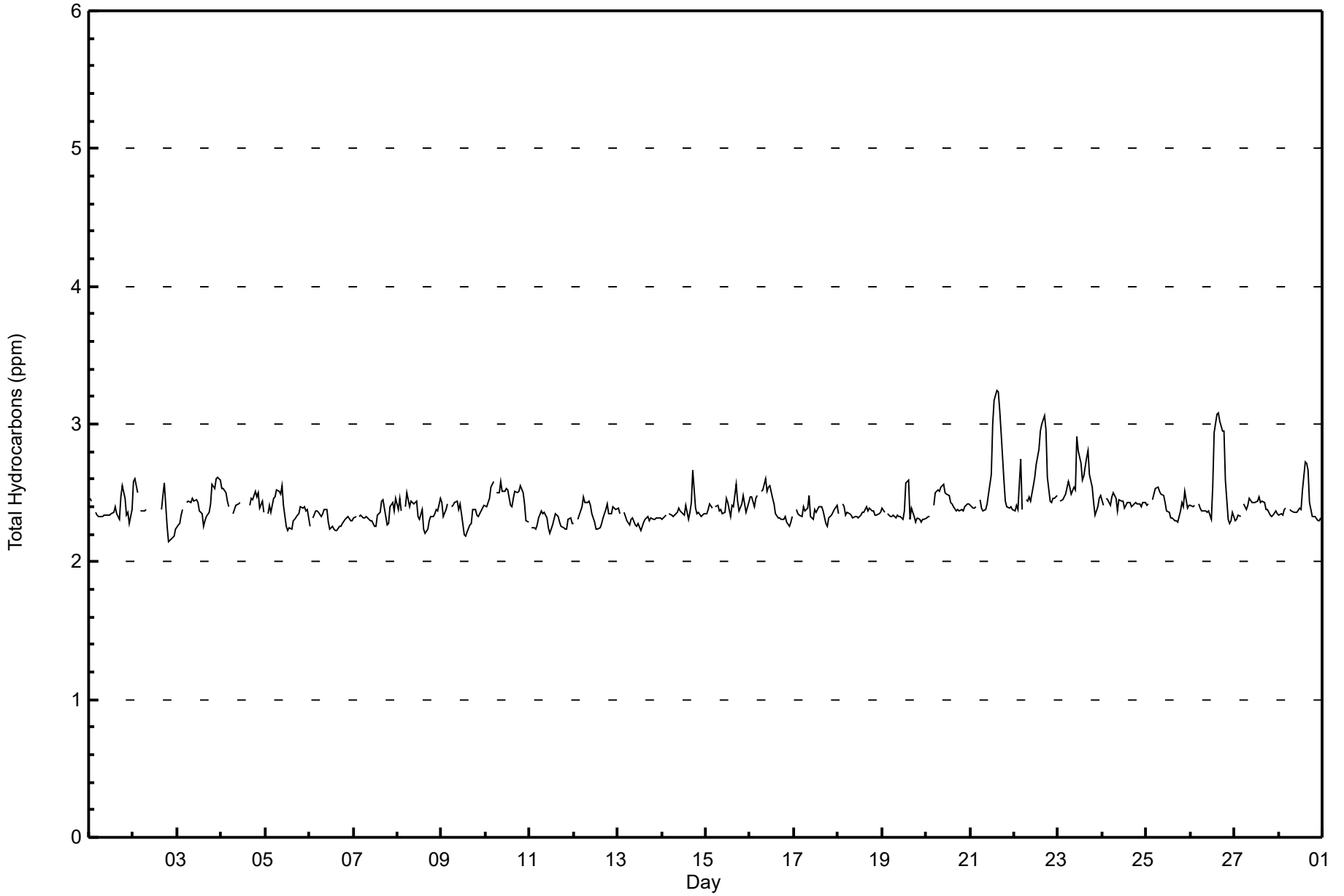






**Wood Buffalo Environmental Association**  
**Hourly Averages**

**Total Hydrocarbons (THC) - ppm**  
**Kirby North - February 2023**





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

**Total Hydrocarbons (THC) - ppm**  
**Kirby North - February 2023**

<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	626	98.89	98.89
3.1 - 10.0	7	1.11	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 633

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm  
Kirby North - February 2023**

<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	36	48	29	11	13	7	23	87	118	55	49	13	30	30	49	623
3.1 - 10.0	2	1	0	2	0	0	0	0	0	0	0	0	0	0	0	2	7
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	27	37	48	31	11	13	7	23	87	118	55	49	13	30	30	51	630

Total Number of Valid Hours: 630

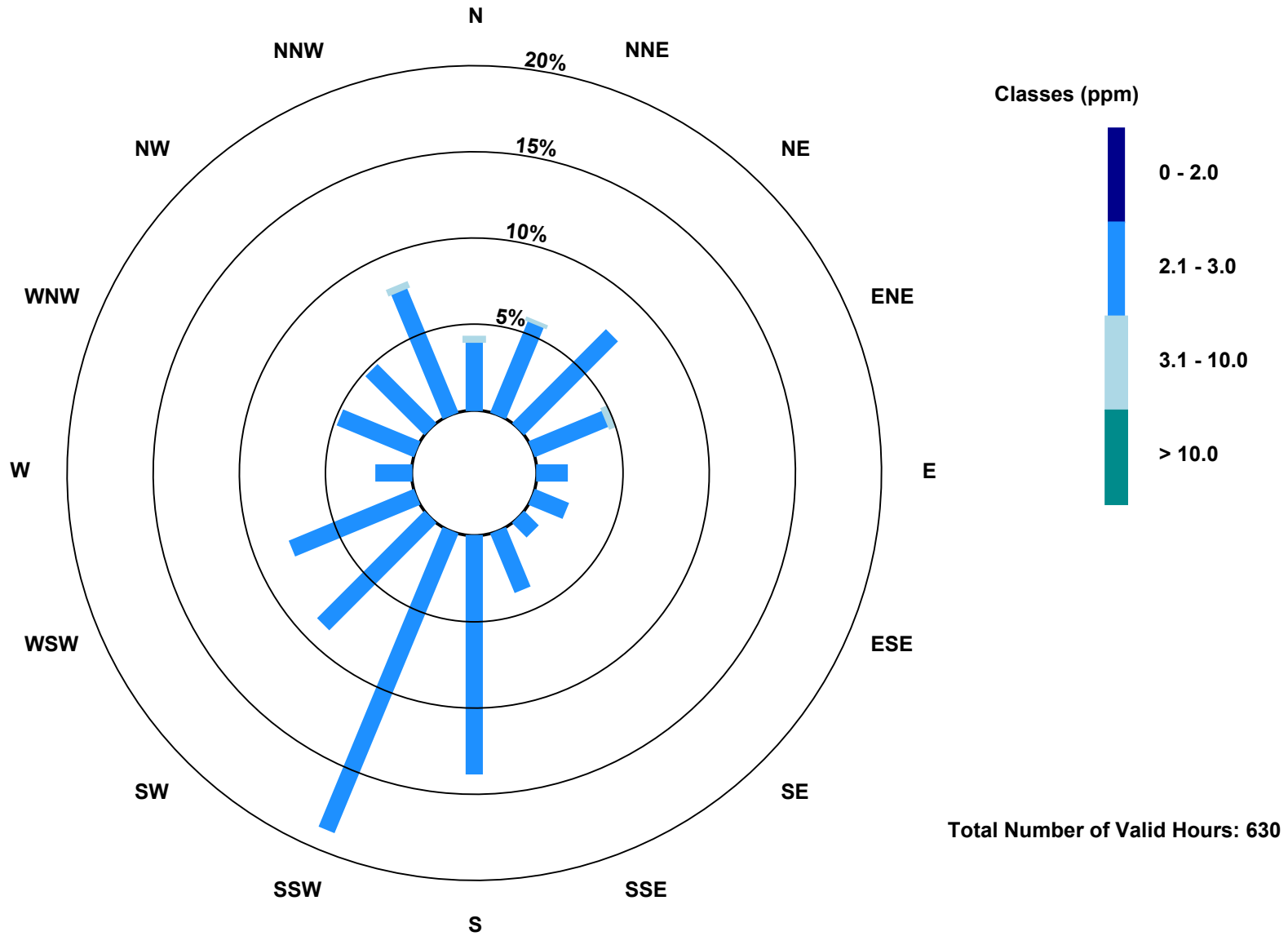
Total Number of Hours: 672

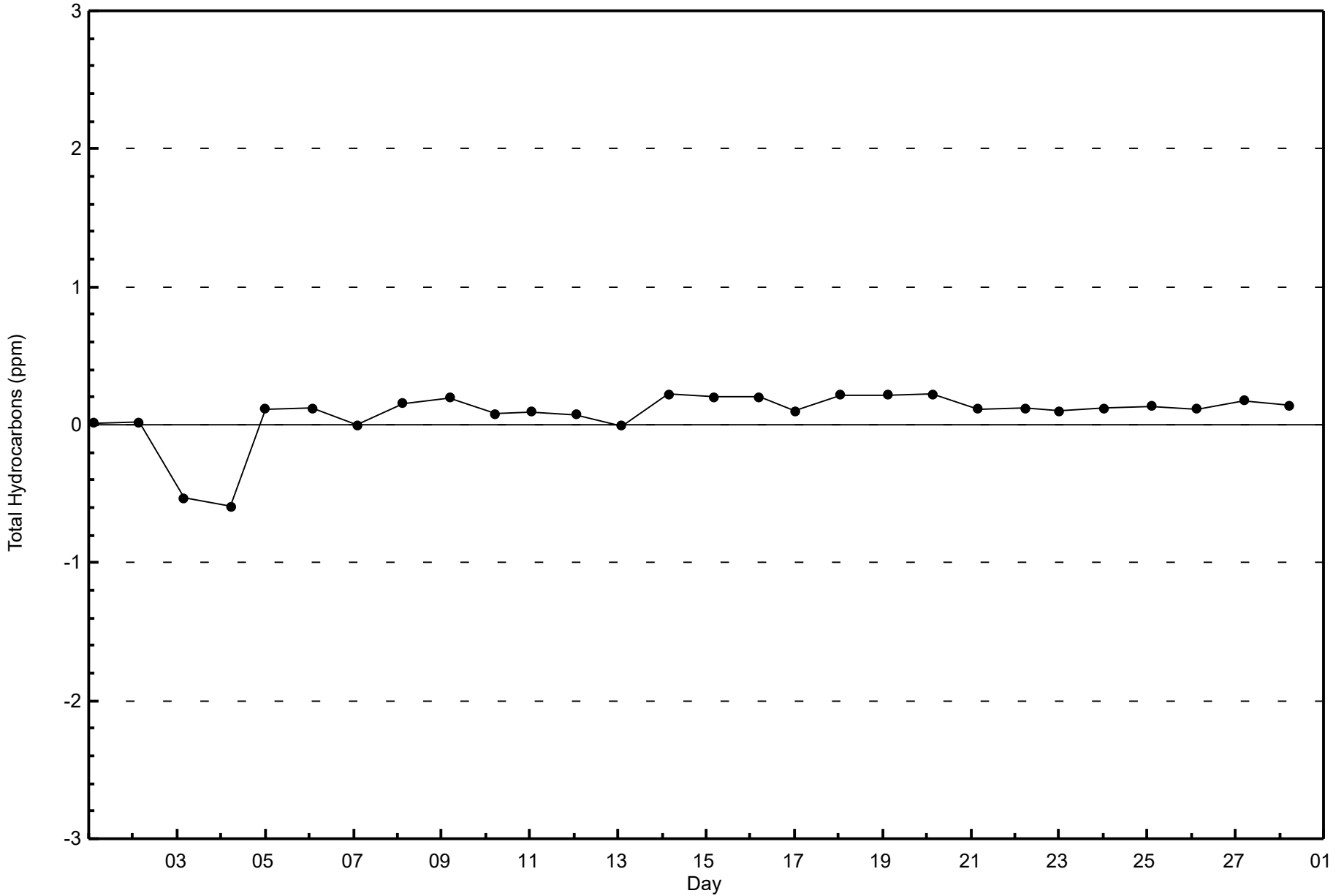


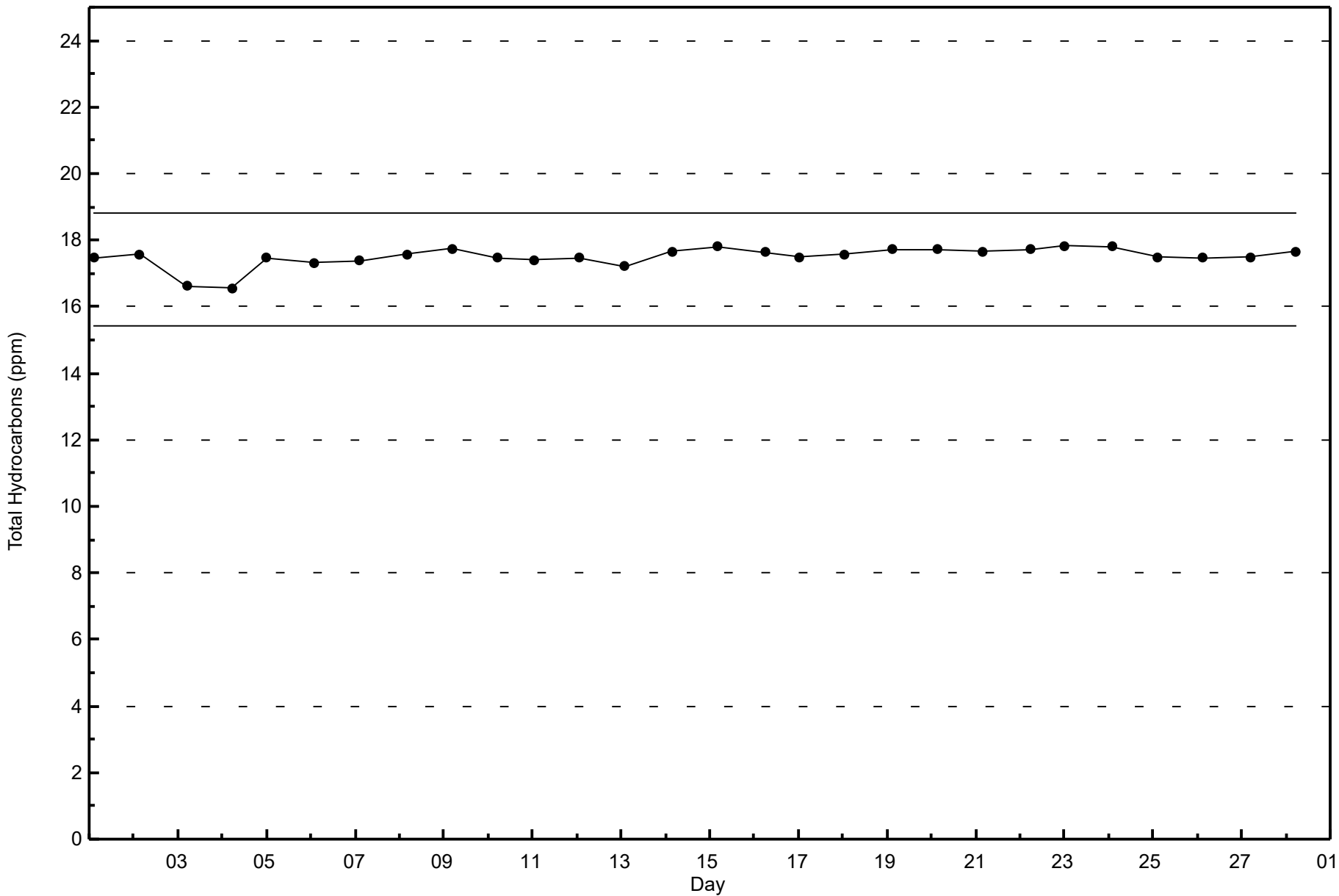


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Total Hydrocarbons (THC) - ppm  
Kirby North







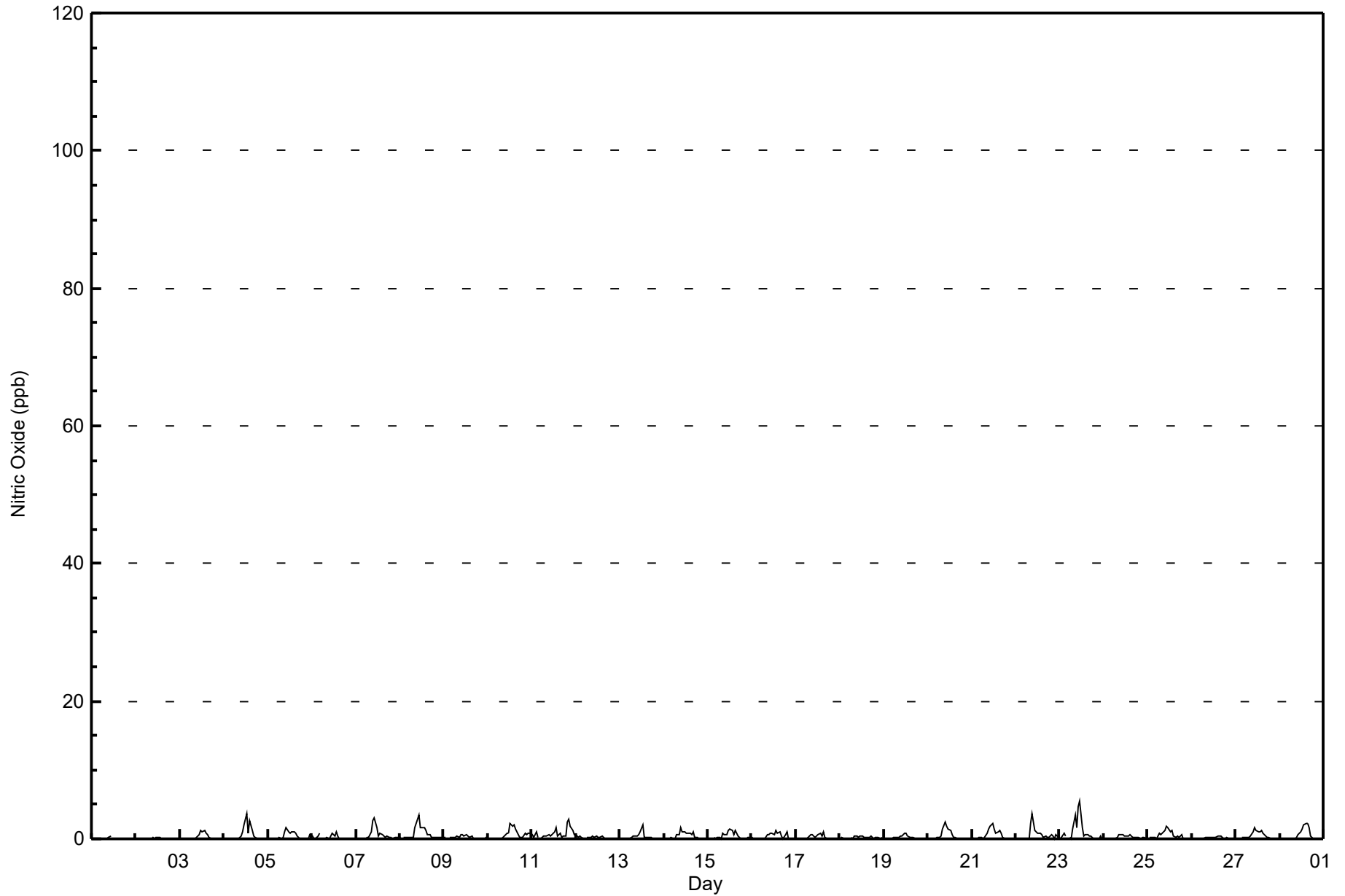


Maximum Value: 5.5 ppb on Feb 23 12:00		Maximum Daily Average: 1.0 ppb on Feb 23		Hours in Service: 672																							
Minimum Value: 0.0 ppb on Feb 1 03:00		Minimum Daily Average: 0.0 ppb on Feb 2		Hours of Data: 637																							
Maximum Diurnal Average: 1.1 ppb at hour 12		Minimum Diurnal Average: 0.1 ppb at hour 2		Hours of Missing Data: 35																							
Monthly Average: 0.40 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> = 1.1 P <sub>99</sub> = 3.0		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-Feb	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.4	C	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.1	0.0	--	0.4	
2-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	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	0.3
3-Feb	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	1.2	0.9	1.2	0.8	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.2	
4-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.4	1.0	2.0	3.7	0.8	2.6	1.3	0.5	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.6	3.7	
5-Feb	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.2	1.1	1.6	1.0	0.9	1.1	1.0	0.8	0.4	0.1	0.0	0.0	0.0	0.0	0.5	0.4	1.6		
6-Feb	0.3	0.0	0.1	0.5	0.7	Z	0.0	0.0	0.3	0.0	0.3	0.8	0.3	1.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0		
7-Feb	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.3	1.0	2.7	3.0	1.5	0.4	0.8	0.6	0.4	0.2	0.3	0.1	0.1	0.0	0.3	0.2	0.2	0.6	3.0	
8-Feb	0.2	Z	0.2	0.3	0.2	0.2	0.2	0.2	1.7	2.2	3.4	1.5	1.7	1.6	1.3	0.6	0.7	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.8	3.4	
9-Feb	0.2	0.3	Z	0.2	0.2	0.1	0.3	0.4	0.3	0.7	0.6	0.5	0.6	0.4	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.7		
10-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.4	0.8	0.9	2.1	1.9	2.0	1.5	1.1	0.3	0.2	0.2	0.9	0.6	0.8	0.8	0.6	2.1	
11-Feb	0.6	0.2	1.0	0.2	Z	0.1	0.4	0.4	0.3	0.7	0.4	0.5	1.0	1.5	0.5	0.7	0.2	0.4	0.4	2.4	2.8	1.9	1.1	0.6	0.8	2.8	
12-Feb	0.6	0.3	0.3	0.3	0.1	Z	0.2	0.2	0.2	0.4	0.2	0.3	0.2	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6		
13-Feb	Z	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.4	0.5	0.5	1.1	2.0	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.3	2.0		
14-Feb	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.5	0.6	1.6	1.0	1.1	0.7	0.8	0.8	0.5	1.0	0.3	0.1	0.1	0.1	0.0	0.1	0.1	0.4	1.6	
15-Feb	0.0	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.7	0.6	0.7	1.3	1.5	1.3	0.7	1.2	0.4	0.2	0.0	0.0	0.1	0.1	0.2	0.1	0.4	1.5	
16-Feb	0.1	0.1	0.0	Z	0.1	0.0	0.0	0.0	0.6	0.6	0.9	0.8	0.6	1.2	0.8	1.0	0.4	0.1	0.6	0.9	0.1	0.0	0.1	0.0	0.4	1.2	
17-Feb	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.3	0.6	0.6	0.3	0.3	0.5	0.7	0.4	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9		
18-Feb	0.1	0.1	0.0	0.0	0.0	Z	0.2	0.0	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.4	
19-Feb	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.5	0.4	0.8	0.8	0.5	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	
20-Feb	0.0	Z	0.0	0.0	0.0	0.2	0.1	0.4	1.3	2.4	1.9	1.4	1.1	0.5	0.2	0.3	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.4	2.4	
21-Feb	0.1	0.1	Z	0.1	0.1	0.2	0.1	0.3	0.8	1.3	1.8	2.2	1.5	0.7	1.0	1.1	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.5	2.2		
22-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	2.3	3.7	1.2	0.9	0.9	0.7	0.6	0.3	0.3	0.1	0.1	0.6	0.5	0.0	0.5	0.2	0.6	3.7	
23-Feb	0.1	0.1	0.7	0.4	Z	0.1	0.1	1.5	3.5	1.5	4.6	5.5	1.5	0.5	0.5	0.6	0.4	0.3	0.0	0.0	0.0	0.1	0.3	0.0	1.0	5.5	
24-Feb	0.1	0.0	0.0	0.1	0.0	Z	0.0	0.1	0.7	0.6	0.6	0.4	0.4	0.4	0.7	0.3	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.7	
25-Feb	Z	0.2	0.2	0.2	0.3	0.1	0.7	0.5	0.9	1.2	1.9	1.6	1.1	1.2	0.5	0.2	0.4	0.3	0.6	0.1	0.0	0.1	0.0	0.0	0.5	1.9	
26-Feb	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.4	0.4	0.3	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.4	
27-Feb	0.1	0.1	Z	0.1	0.3	0.2	0.2	0.3	0.4	1.0	1.7	1.1	0.9	1.0	1.2	0.8	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.4	1.7	
28-Feb	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.3	0.6	1.0	1.4	1.9	2.3	2.2	1.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.5	2.3	
																								Diurnal Average			
																								Diurnal Maximum			
0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.2 0.6 0.9 1.1 1.1 1.0 0.8 0.8 0.6 0.4 0.2 0.1 0.2 0.2 0.1 0.1 0.1 0.1 0.1 0.8																											
0.6 0.3 1.0 0.5 0.7 0.2 0.7 1.5 3.5 3.7 4.6 5.5 3.7 1.9 2.6 2.2 1.6 0.4 0.6 2.4 2.8 1.9 1.1 0.8																											
Z - zerospan C - Calibration																											



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

**Nitric Oxide (NO) - ppb**  
**Kirby North - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb  
Kirby North - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	637	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: 637

Total Number of Hours: 672



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

**Nitric Oxide (NO) - ppb**  
**Kirby North - February 2023**

<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	26	38	48	31	12	13	7	24	89	115	55	52	12	29	33	44	628
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>	26	38	48	31	12	13	7	24	89	115	55	52	12	29	33	44	628

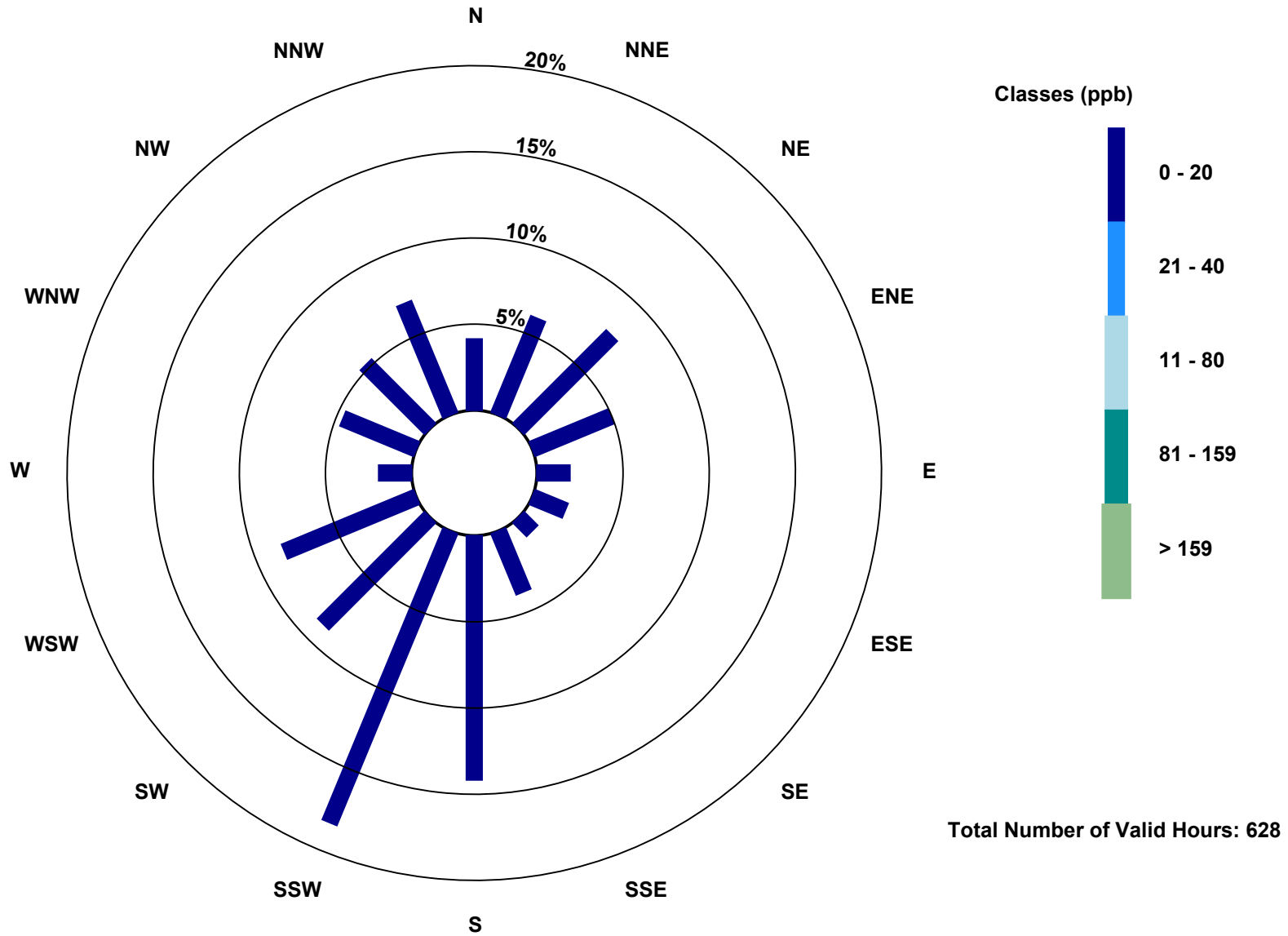
Total Number of Valid Hours: 628

Total Number of Hours: 672



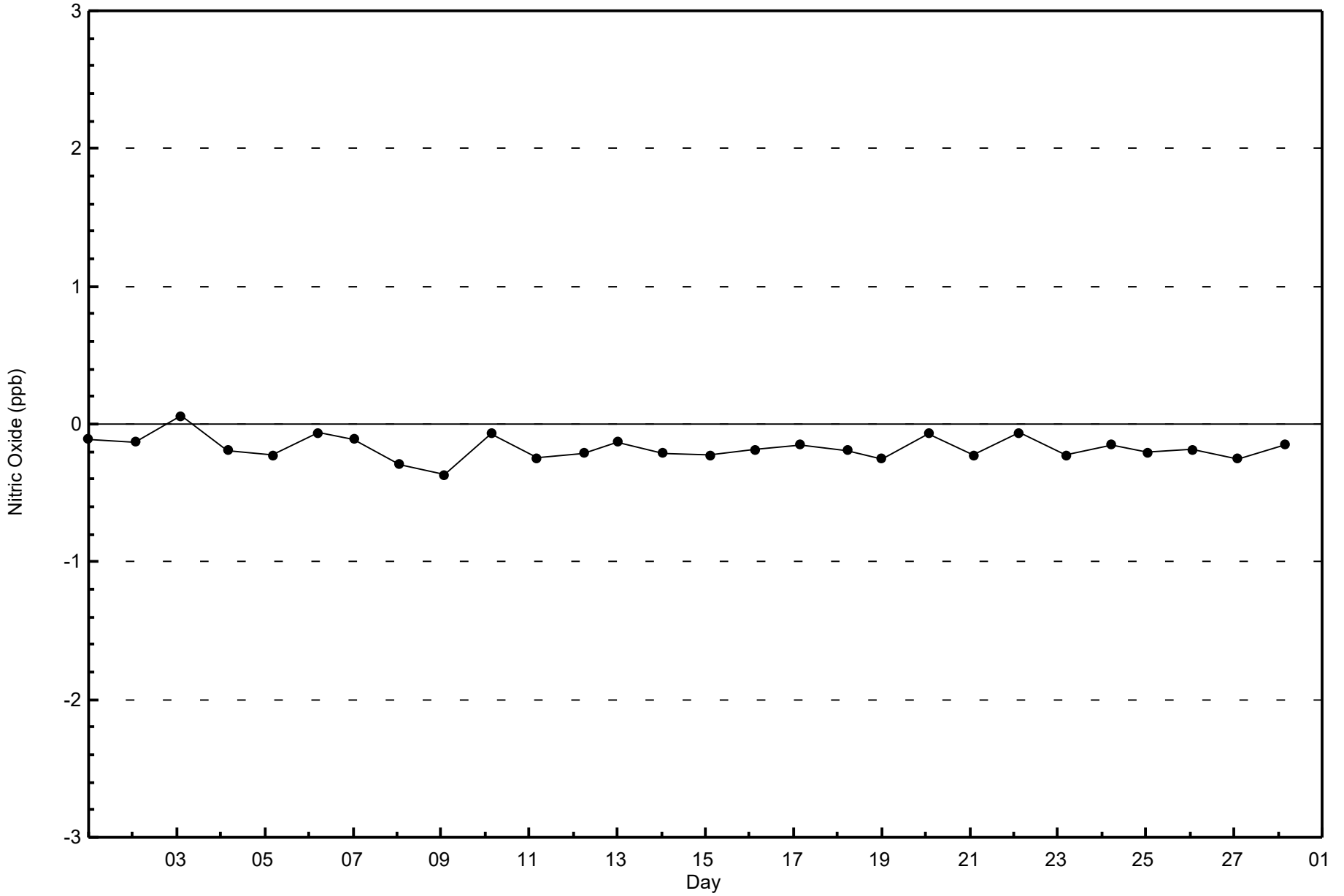
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

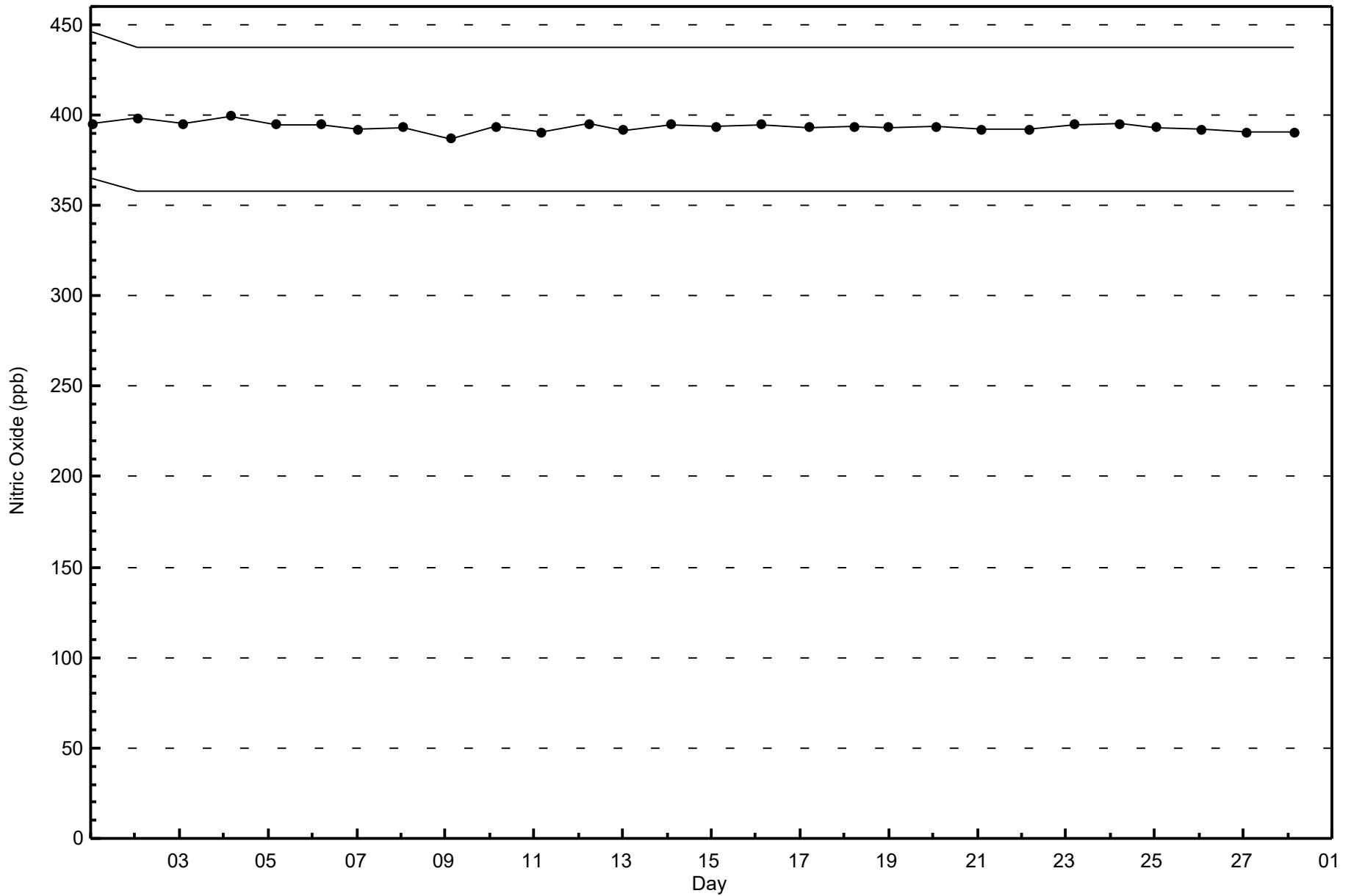
Nitric Oxide (NO) - ppb  
Kirby North



Total Number of Valid Hours: 628









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

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb**  
**Kirby North - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 672
Maximum Value: 18.4 ppb on Feb 22 23:00	Maximum Daily Average: 6.2 ppb on Feb 22
Minimum Value: 0.0 ppb on Feb 14 23:00	Hours of Data: 637
Maximum Diurnal Average: 3.7 ppb at hour 9	Hours of Missing Data: 35
Monthly Average: 2.68 ppb	Hours of Calibration: 35
Minimum Daily Average: 1.3 ppb on Feb 6	Percent Operational Time: 100.0
Minimum Diurnal Average: 1.9 ppb at hour 14	
Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 0.7 Q <sub>1</sub> = 1.2 Median = 2.1 Q <sub>3</sub> = 3.6 P <sub>90</sub> = 5.1 P <sub>99</sub> = 13.1	

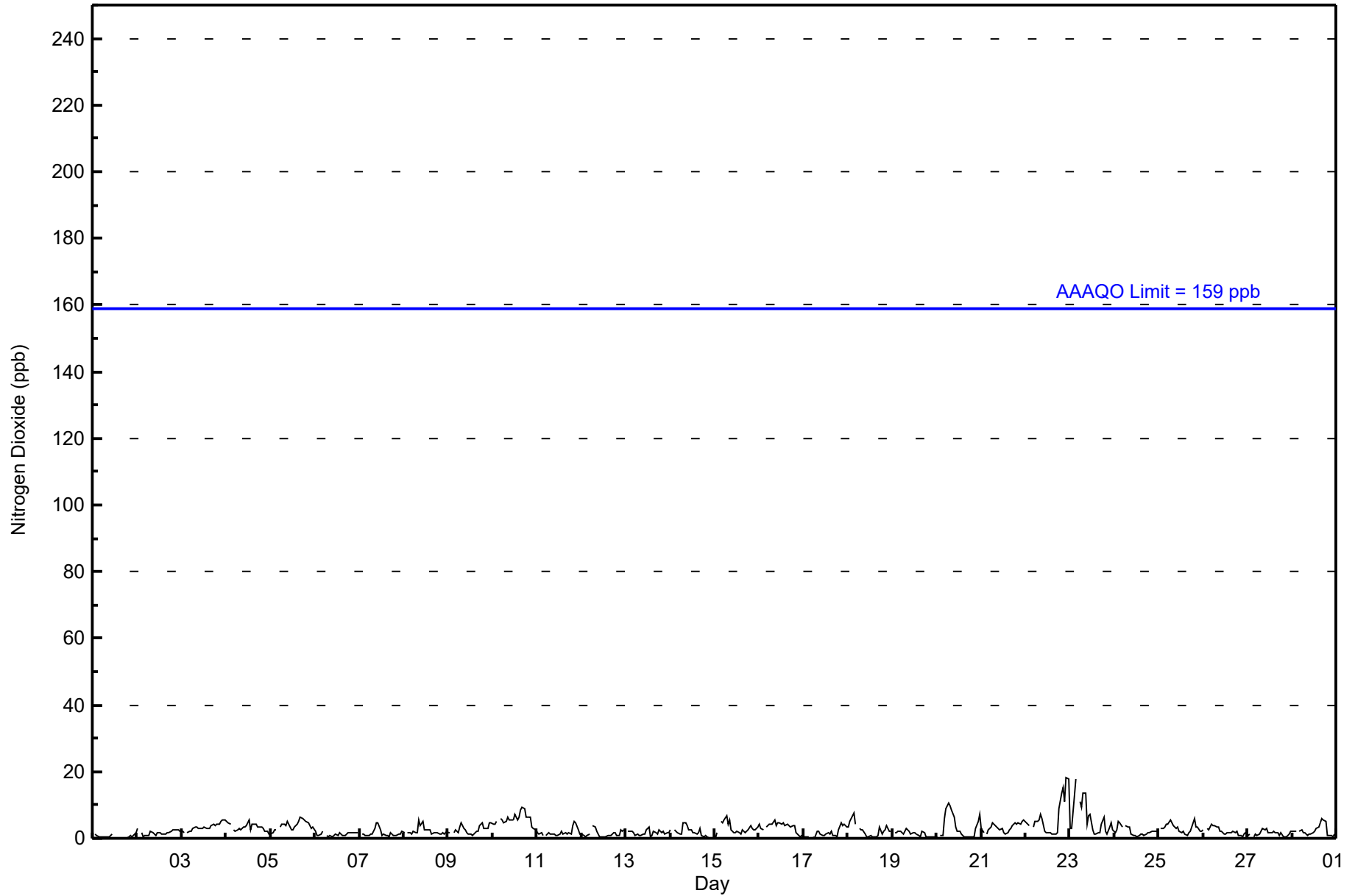
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Feb	Z	1.2	0.7	0.6	0.3	0.4	0.4	0.3	0.3	0.4	1.1	C	C	C	C	C	C	C	0.2	0.4	0.7	0.3	0.9	1.7	--	1.7
2-Feb	2.9	Z	1.6	0.6	0.7	0.9	0.9	2.0	1.5	1.1	1.0	1.5	1.5	1.3	1.3	1.3	1.5	1.8	2.3	2.5	2.6	2.5	2.4	2.0	1.6	2.9
3-Feb	2.0	1.9	Z	1.9	2.1	2.2	2.8	3.6	3.4	3.1	2.9	3.1	3.3	3.0	3.0	3.1	3.8	4.1	4.0	4.1	4.2	4.9	5.5	5.5	3.4	5.5
4-Feb	5.0	4.6	4.2	Z	2.5	2.2	2.7	2.8	2.6	3.3	3.6	3.8	5.3	2.5	4.1	4.3	4.1	3.2	3.3	3.2	3.1	2.1	2.2	1.3	3.3	5.3
5-Feb	1.3	1.6	2.5	2.5	Z	3.4	4.1	4.2	3.9	5.2	4.3	2.7	2.6	3.5	4.4	5.1	6.3	5.9	5.6	5.1	4.6	3.9	2.9	3.2	3.9	6.3
6-Feb	2.1	1.0	0.7	1.4	2.1	Z	0.8	0.5	1.0	0.6	0.9	1.3	0.8	1.8	1.1	0.7	0.9	1.2	1.7	1.8	1.9	1.7	1.6	1.7	1.3	2.1
7-Feb	Z	1.4	1.2	1.0	0.8	0.8	1.4	1.1	3.1	4.7	4.6	2.4	0.7	1.1	0.8	0.9	0.6	1.6	0.8	0.7	0.9	1.2	1.2	2.0	1.5	4.7
8-Feb	1.6	Z	1.8	1.8	1.2	2.0	1.7	1.5	5.6	3.9	5.2	2.6	2.5	2.7	2.4	1.2	1.8	1.9	1.6	1.2	1.4	1.6	1.4	2.0	2.2	5.6
9-Feb	1.7	1.5	Z	1.7	2.5	1.8	3.2	4.6	3.0	2.4	1.6	1.1	1.2	0.9	1.2	2.1	2.2	3.7	4.6	3.0	3.1	2.8	4.5	4.5	2.6	4.6
10-Feb	4.2	4.4	4.9	Z	5.8	5.4	4.8	4.9	6.5	5.3	5.4	5.3	7.0	5.3	6.3	8.5	9.2	9.1	6.2	6.2	6.2	3.6	2.9	2.6	5.7	9.2
11-Feb	1.6	1.2	1.5	0.8	Z	1.0	1.6	1.4	1.2	1.2	0.8	1.0	1.4	2.1	1.1	1.6	1.1	1.6	1.4	3.9	5.1	4.7	2.7	1.3	1.8	5.1
12-Feb	1.2	0.7	0.6	0.9	1.2	Z	4.0	3.3	2.3	1.3	0.6	0.6	0.6	0.5	0.9	0.8	1.0	1.5	1.8	0.7	0.9	2.4	2.3	2.7	1.4	4.0
13-Feb	Z	2.0	2.2	2.2	1.5	0.9	1.3	0.9	1.0	1.2	1.3	2.4	3.6	0.4	0.8	2.1	1.7	1.3	2.4	1.9	2.0	1.4	1.5	1.9	1.6	3.6
14-Feb	2.4	Z	2.4	2.2	1.9	1.1	1.2	4.5	4.6	3.8	2.6	2.7	1.5	1.5	1.4	1.6	2.8	0.7	0.6	0.8	0.5	0.1	0.0	0.0	1.8	4.6
15-Feb	0.1	1.7	Z	5.1	4.7	5.4	6.7	4.4	5.3	2.5	1.7	1.8	2.1	1.8	1.3	2.5	1.9	2.3	2.4	3.9	2.8	2.5	2.4	3.3	3.0	6.7
16-Feb	4.4	3.0	2.5	Z	3.5	4.1	4.4	4.2	5.3	4.0	4.5	4.7	4.3	4.5	4.0	4.3	3.9	3.5	3.8	3.7	1.5	0.8	0.5	0.7	3.5	5.3
17-Feb	0.5	0.4	0.4	0.3	Z	0.4	0.2	2.0	2.0	1.2	0.7	0.7	1.2	1.6	1.1	2.2	0.9	0.9	0.3	2.6	4.6	3.9	4.2	3.6	1.6	4.6
18-Feb	3.2	5.0	6.8	7.5	4.3	Z	2.9	2.4	2.5	1.4	0.6	0.6	0.7	0.3	0.3	0.4	0.9	3.3	1.4	2.1	2.6	3.8	2.0	2.2	2.5	7.5
19-Feb	Z	1.7	1.6	2.0	2.2	1.6	1.3	2.8	2.6	2.2	1.3	1.7	1.7	1.2	0.7	0.5	2.0	1.8	0.5	0.4	0.4	0.4	0.5	0.3	1.4	2.8
20-Feb	0.4	Z	1.0	1.0	6.1	9.1	10.7	9.6	8.3	6.2	3.5	2.1	2.0	1.1	0.7	0.6	0.4	0.6	0.6	0.4	0.6	3.1	5.2	7.1	3.5	10.7
21-Feb	2.9	1.7	Z	1.2	2.7	3.4	4.5	4.3	3.5	2.8	2.5	2.8	1.9	1.3	1.6	2.6	3.0	3.9	4.6	4.4	4.7	4.1	5.2	5.5	3.3	5.5
22-Feb	4.5	4.3	4.0	Z	3.6	5.2	5.0	5.5	7.2	5.9	2.3	1.7	1.5	1.5	1.4	1.1	1.3	1.7	8.9	13.6	15.2	11.1	18.4	17.7	6.2	18.4
23-Feb	3.0	3.1	12.5	17.6	Z	11.2	9.2	13.5	13.5	4.1	6.7	7.0	2.6	1.2	1.2	1.8	1.7	4.4	6.3	2.2	1.4	3.4	4.7	2.5	5.9	17.6
24-Feb	1.6	2.4	5.0	4.7	3.2	Z	3.9	3.6	3.3	1.3	1.0	0.9	0.6	0.8	1.2	1.1	0.9	1.2	1.5	1.7	2.3	2.3	2.3	2.2	2.1	5.0
25-Feb	Z	2.8	3.0	3.6	4.2	4.2	5.3	4.6	3.9	3.1	3.2	2.3	1.9	2.2	1.4	0.9	1.6	2.2	4.8	5.8	3.4	3.3	2.2	2.2	3.1	5.8
26-Feb	2.7	Z	2.8	2.7	4.1	3.9	3.7	3.2	3.3	2.3	2.1	1.1	1.1	1.5	1.6	1.5	2.3	1.6	2.1	0.7	0.7	0.5	1.1	1.6	2.1	4.1
27-Feb	1.0	1.2	Z	0.6	1.4	0.9	1.1	2.3	3.0	2.5	2.8	1.8	1.5	1.5	2.1	1.9	1.6	0.9	1.8	0.4	0.4	0.5	1.4	2.2	1.5	3.0
28-Feb	2.3	2.1	2.0	Z	2.0	2.4	1.8	1.7	1.0	1.3	1.4	1.6	2.0	2.9	3.6	4.8	6.1	5.4	4.9	0.9	0.9	0.7	0.6	1.1	2.3	6.1
	2.3	2.2	2.9	2.8	2.7	3.1	3.3	3.6	3.7	2.8	2.5	2.3	2.1	1.9	1.9	2.2	2.4	2.6	2.9	2.8	2.8	2.6	3.0	3.0		Diurnal Average
	5.0	5.0	12.5	17.6	6.1	11.2	10.7	13.5	13.5	6.2	6.7	7.0	7.0	5.3	6.3	8.5	9.2	9.1	8.9	13.6	15.2	11.1	18.4	17.7		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 - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Kirby North - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	637	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: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Dioxide (NO<sub>2</sub>) - ppb  
Kirby North - February 2023**

<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	26	38	48	31	12	13	7	24	89	115	55	52	12	29	33	44	628
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>	26	38	48	31	12	13	7	24	89	115	55	52	12	29	33	44	628

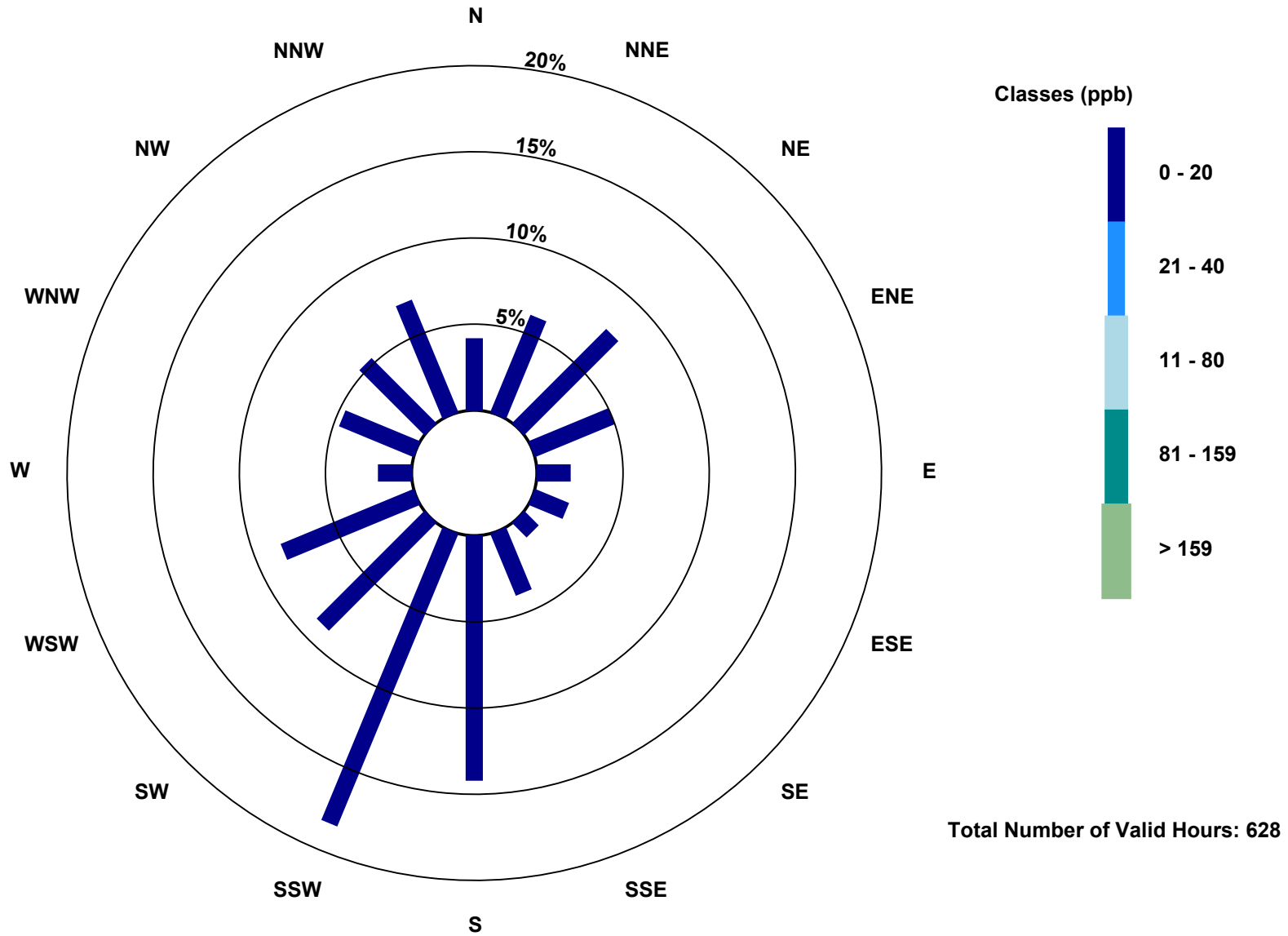
Total Number of Valid Hours: 628

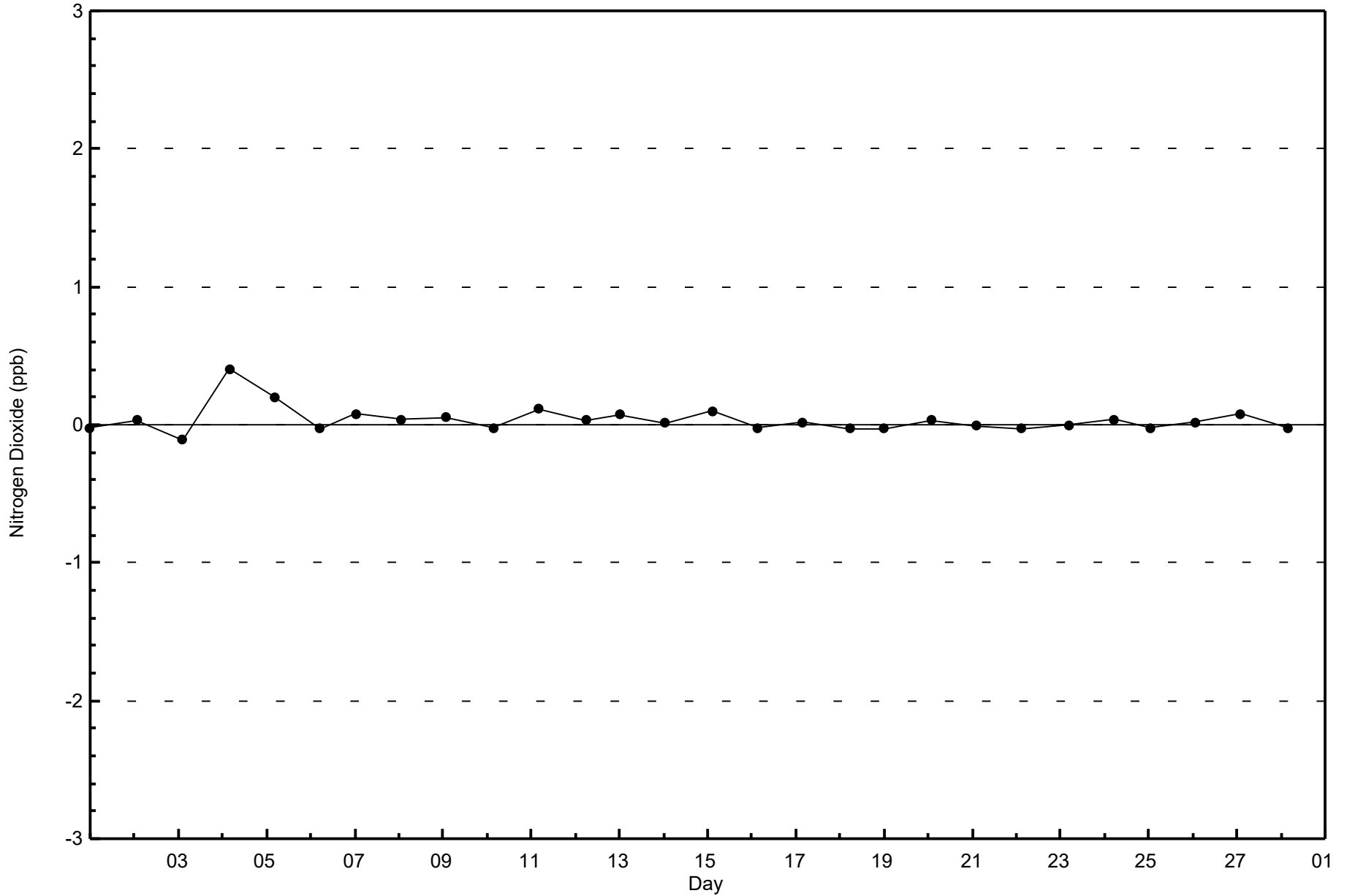
Total Number of Hours: 672



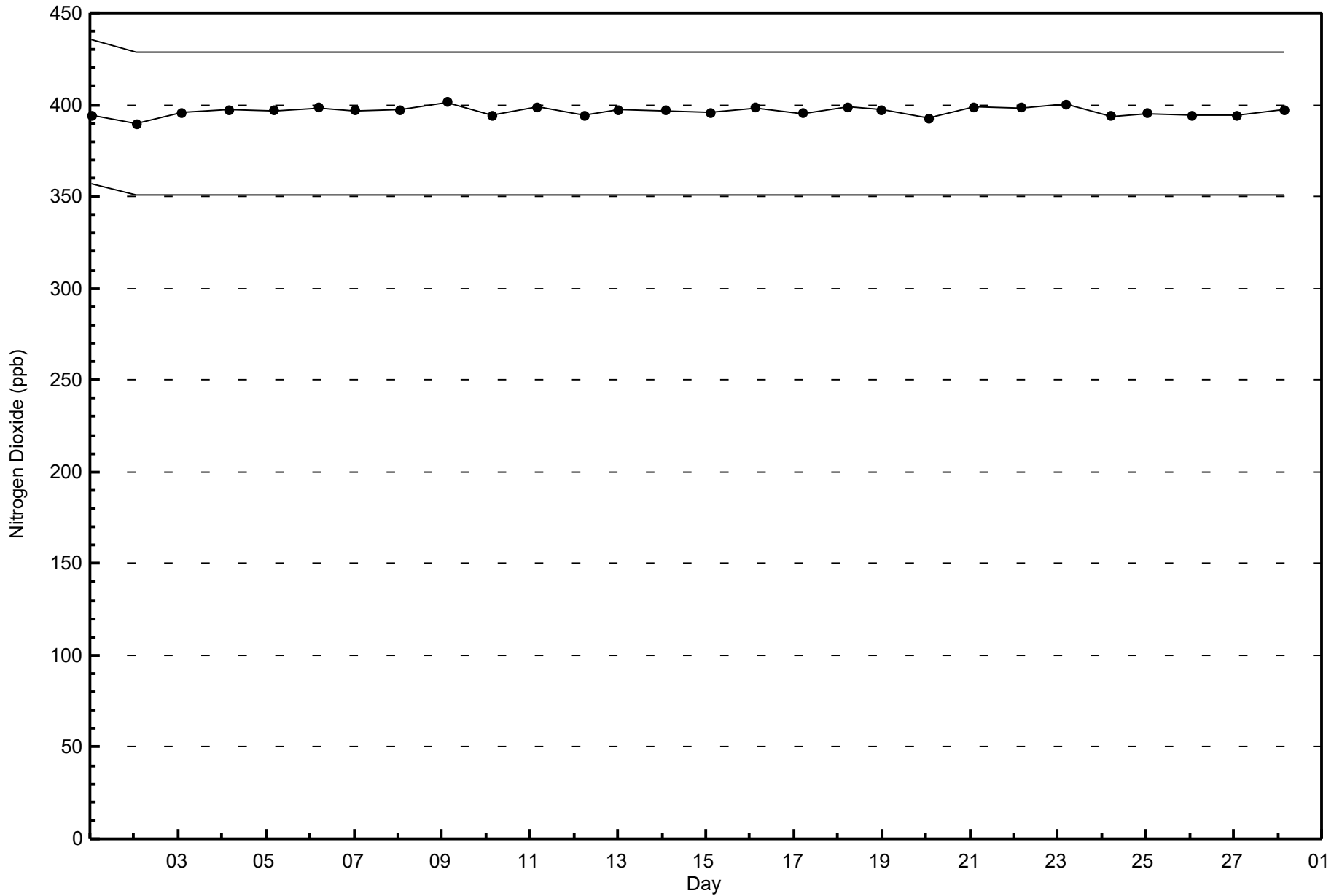
Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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











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

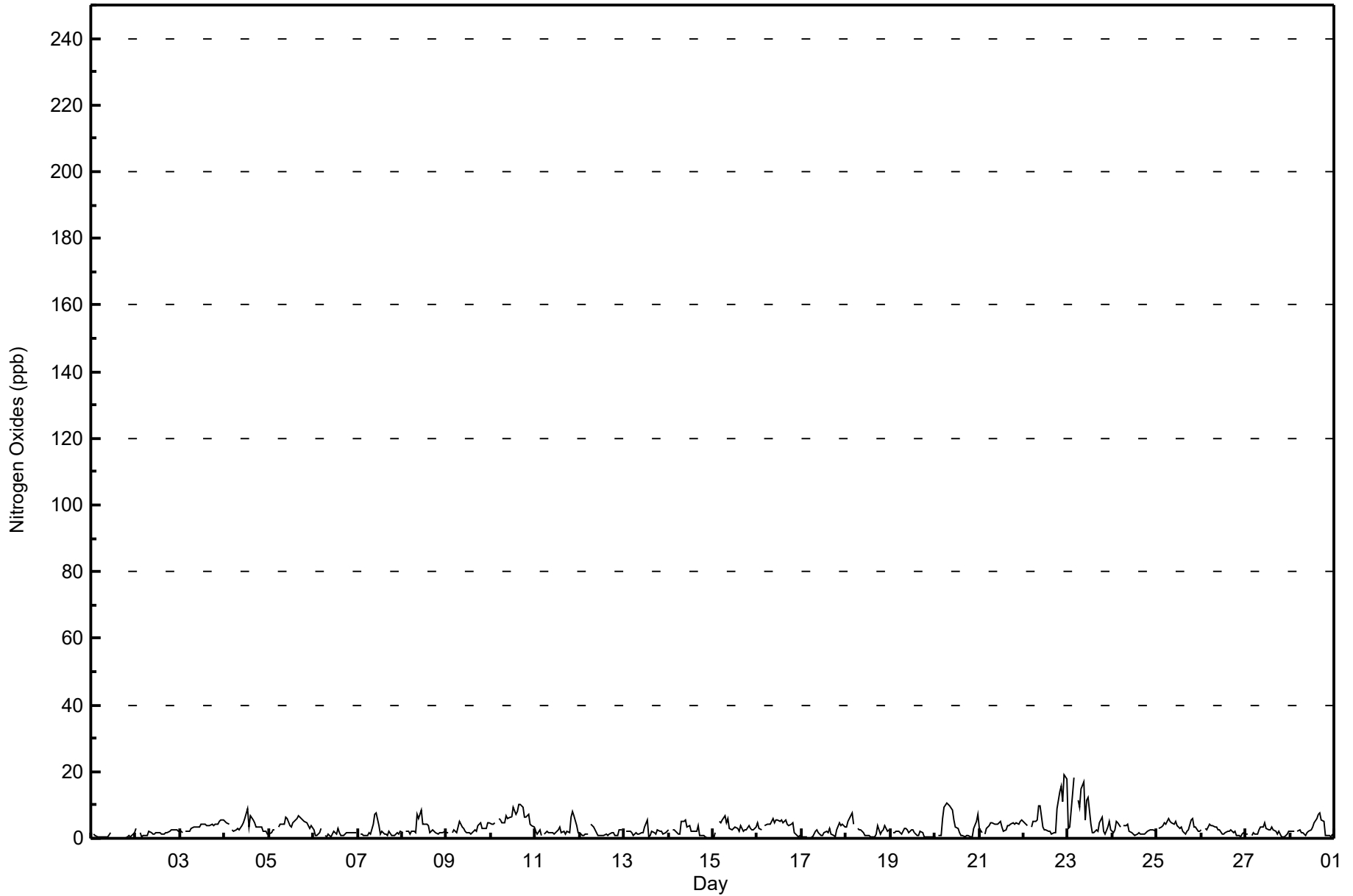
**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Kirby North - February 2023**

Maximum Value: 18.9 ppb on Feb 22 23:00																				Maximum Daily Average: 6.8 ppb on Feb 23					Hours in Service: 672	
Minimum Value: 0.1 ppb on Feb 15 01:00										Minimum Daily Average: 1.5 ppb on Feb 6										Hours of Data: 637						
Maximum Diurnal Average: 4.4 ppb at hour 9										Minimum Diurnal Average: 2.3 ppb at hour 2										Hours of Missing Data: 35						
Monthly Average: 3.09 ppb										Percentiles: P <sub>1</sub> = 0.3 P <sub>10</sub> = 0.8 Q <sub>1</sub> = 1.4 Median = 2.4 Q <sub>3</sub> = 4.1 P <sub>90</sub> = 5.7 P <sub>99</sub> = 13.8										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-Feb	Z	1.2	0.7	0.6	0.3	0.5	0.4	0.3	0.4	0.6	1.5	C	C	C	C	C	C	0.2	0.4	0.7	0.3	1.0	1.7	--	1.7	
2-Feb	2.9	Z	1.6	0.6	0.7	0.9	0.9	2.0	1.5	1.2	1.1	1.8	1.7	1.5	1.4	1.3	1.5	1.8	2.3	2.5	2.6	2.5	2.4	2.0	1.7	2.9
3-Feb	2.0	1.9	Z	1.9	2.1	2.2	2.8	3.6	3.4	3.4	3.5	4.3	4.2	4.2	3.8	3.7	3.9	4.1	4.0	4.1	4.2	4.9	5.5	5.5	3.6	5.5
4-Feb	5.0	4.6	4.2	Z	2.5	2.2	2.7	2.8	2.6	3.7	4.6	5.8	9.0	3.3	6.7	5.6	4.6	3.3	3.2	3.2	3.2	2.1	2.2	1.4	3.9	9.0
5-Feb	1.3	1.6	2.5	2.5	Z	3.4	4.2	4.3	4.1	6.3	5.9	3.7	3.5	4.6	5.4	5.9	6.7	6.0	5.6	5.1	4.6	3.9	2.9	3.7	4.2	6.7
6-Feb	2.4	1.0	0.8	1.9	2.8	Z	0.8	0.5	1.3	0.6	1.2	2.1	1.1	2.8	1.5	0.7	0.9	1.2	1.7	1.8	1.9	1.7	1.6	1.7	1.5	2.8
7-Feb	Z	1.4	1.2	1.0	0.8	0.8	1.6	1.4	4.1	7.4	7.6	3.9	1.1	1.9	1.4	1.3	0.8	1.9	0.9	0.8	0.9	1.5	1.4	2.2	2.0	7.6
8-Feb	1.8	Z	2.0	2.1	1.4	2.2	1.9	1.7	7.3	6.1	8.6	4.1	4.2	4.3	3.7	1.8	2.5	2.2	1.8	1.3	1.6	1.8	1.6	2.2	3.0	8.6
9-Feb	1.9	1.8	Z	1.9	2.7	1.9	3.5	5.0	3.3	3.1	2.2	1.6	1.8	1.3	1.5	2.5	2.3	3.7	4.6	3.0	3.1	2.8	4.5	4.6	2.8	5.0
10-Feb	4.2	4.4	4.9	Z	5.8	5.4	4.8	4.9	6.7	5.7	6.2	6.2	9.1	7.2	8.3	10.0	10.3	9.4	6.4	6.4	7.1	4.2	3.7	3.4	6.3	10.3
11-Feb	2.2	1.4	2.5	1.0	Z	1.1	2.0	1.8	1.5	1.9	1.2	1.5	2.4	3.6	1.6	2.3	1.3	2.0	1.8	6.3	7.9	6.6	3.8	1.9	2.6	7.9
12-Feb	1.8	1.0	0.9	1.2	1.3	Z	4.2	3.5	2.5	1.7	0.8	0.9	0.8	0.7	1.2	1.0	1.1	1.5	1.8	0.7	0.9	2.4	2.3	2.7	1.6	4.2
13-Feb	Z	2.0	2.2	2.2	1.5	1.0	1.6	1.2	1.4	1.7	1.8	3.5	5.6	0.5	1.0	2.3	1.9	1.4	2.4	1.9	2.0	1.4	1.6	1.9	1.9	5.6
14-Feb	2.5	Z	2.5	2.3	2.0	1.2	1.2	5.0	5.2	5.4	3.6	3.8	2.2	2.3	2.2	2.1	3.8	1.0	0.7	0.9	0.6	0.1	0.1	0.1	2.2	5.4
15-Feb	0.1	1.8	Z	5.2	4.8	5.5	6.9	4.5	6.0	3.1	2.4	3.1	3.6	3.1	2.0	3.7	2.3	2.5	2.4	3.9	2.9	2.6	2.6	3.4	3.4	6.9
16-Feb	4.5	3.1	2.5	Z	3.6	4.1	4.4	4.2	5.9	4.6	5.4	5.5	4.9	5.7	4.8	5.3	4.3	3.6	4.4	4.6	1.6	0.8	0.6	0.7	3.9	5.9
17-Feb	0.5	0.4	0.4	0.3	Z	0.4	0.2	2.3	2.6	1.8	1.0	1.0	1.7	2.3	1.5	3.1	1.1	0.9	0.3	2.6	4.6	3.9	4.2	3.6	1.8	4.6
18-Feb	3.3	5.1	6.8	7.5	4.3	Z	3.1	2.4	2.8	1.8	0.9	0.9	1.0	0.5	0.5	0.6	1.1	3.6	1.4	2.2	2.7	3.9	2.1	2.4	2.6	7.5
19-Feb	Z	1.7	1.6	2.1	2.3	1.7	1.4	2.9	2.9	2.7	1.7	2.5	2.5	1.7	0.9	0.6	2.2	1.9	0.5	0.4	0.4	0.4	0.5	0.3	1.6	2.9
20-Feb	0.4	Z	1.0	1.0	6.1	9.3	10.8	10.0	9.6	8.6	5.4	3.5	3.1	1.6	0.9	0.9	0.5	0.6	0.7	0.5	0.6	3.1	5.3	7.2	3.9	10.8
21-Feb	3.0	1.8	Z	1.3	2.8	3.6	4.6	4.6	4.3	4.1	4.3	5.0	3.4	2.0	2.6	3.7	3.7	4.1	4.6	4.4	4.7	4.1	5.2	5.5	3.8	5.5
22-Feb	4.5	4.3	4.0	Z	3.6	5.2	5.0	5.6	9.5	9.6	3.5	2.6	2.4	2.2	2.0	1.4	1.6	1.8	9.0	14.2	15.7	11.1	18.9	17.9	6.8	18.9
23-Feb	3.1	3.2	13.2	18.0	Z	11.3	9.3	15.0	17.0	5.6	11.3	12.5	4.1	1.7	1.7	2.4	2.1	4.7	6.3	2.2	1.4	3.5	5.0	2.5	6.8	18.0
24-Feb	1.7	2.4	5.0	4.8	3.2	Z	3.9	3.7	4.0	1.9	1.6	1.3	1.0	1.2	1.9	1.4	1.1	1.3	1.7	1.9	2.4	2.4	2.4	2.3	2.4	5.0
25-Feb	Z	3.0	3.2	3.8	4.5	4.3	6.0	5.1	4.8	4.3	5.1	3.9	3.0	3.4	1.9	1.1	2.0	2.5	5.4	5.9	3.4	3.4	2.2	2.2	3.7	6.0
26-Feb	2.7	Z	2.8	2.7	4.1	3.9	3.7	3.3	3.5	2.6	2.4	1.3	1.3	1.7	2.0	1.9	2.6	1.7	2.1	0.8	0.8	0.6	1.2	1.6	2.2	4.1
27-Feb	1.1	1.3	Z	0.7	1.7	1.1	1.3	2.6	3.4	3.5	4.5	2.9	2.4	2.5	3.3	2.7	2.0	1.2	2.0	0.5	0.5	0.5	1.4	2.2	2.0	4.5
28-Feb	2.3	2.1	2.0	Z	2.0	2.4	1.8	1.7	1.0	1.6	2.0	2.6	3.4	4.8	5.9	7.0	7.7	5.7	5.0	0.9	0.9	0.7	0.6	1.1	2.8	7.7
2.4 2.3 3.0 2.9 2.8 3.1 3.4 3.8 4.4 3.7 3.6 3.4 3.1 2.7 2.6 2.8 2.8 2.8 3.0 3.0 3.0 2.8 3.1 3.1																								Diurnal Average		
5.0 5.1 13.2 18.0 6.1 11.3 10.8 15.0 17.0 9.6 11.3 12.5 9.1 7.2 8.3 10.0 10.3 9.4 9.0 14.2 15.7 11.1 18.9 17.9																								Diurnal Maximum		
Z - zerospan C - Calibration																										



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

**Nitrogen Oxides (NO<sub>x</sub>) - ppb**  
**Kirby North - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Kirby North - February 2023**

<b>Concentration Ranges (ppb)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	637	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: 637

Total Number of Hours: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Nitrogen Oxides (NO<sub>x</sub>) - ppb  
Kirby North - February 2023**

<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	26	38	48	31	12	13	7	24	89	115	55	52	12	29	33	44	628
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>	26	38	48	31	12	13	7	24	89	115	55	52	12	29	33	44	628

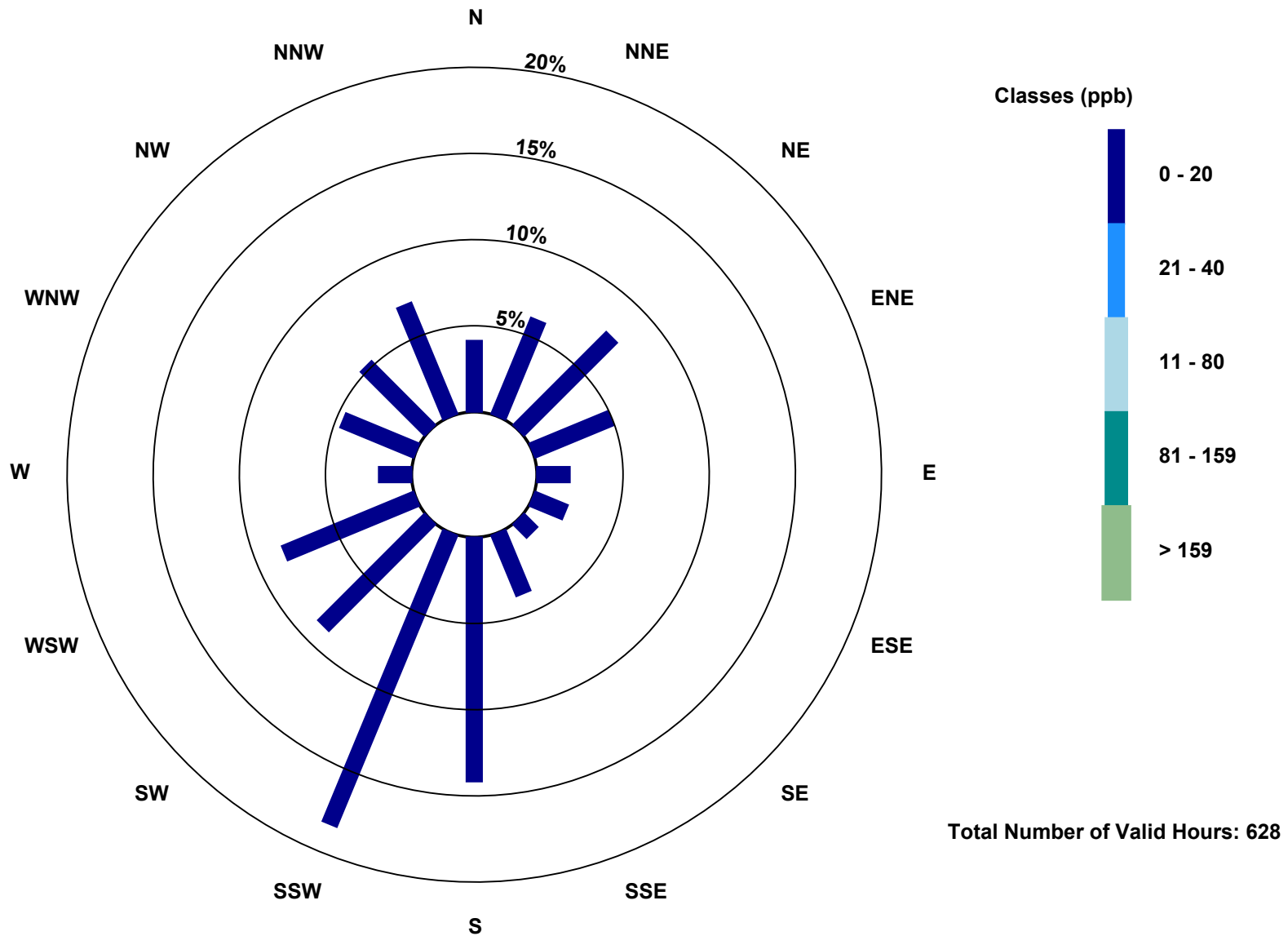
Total Number of Valid Hours: 628

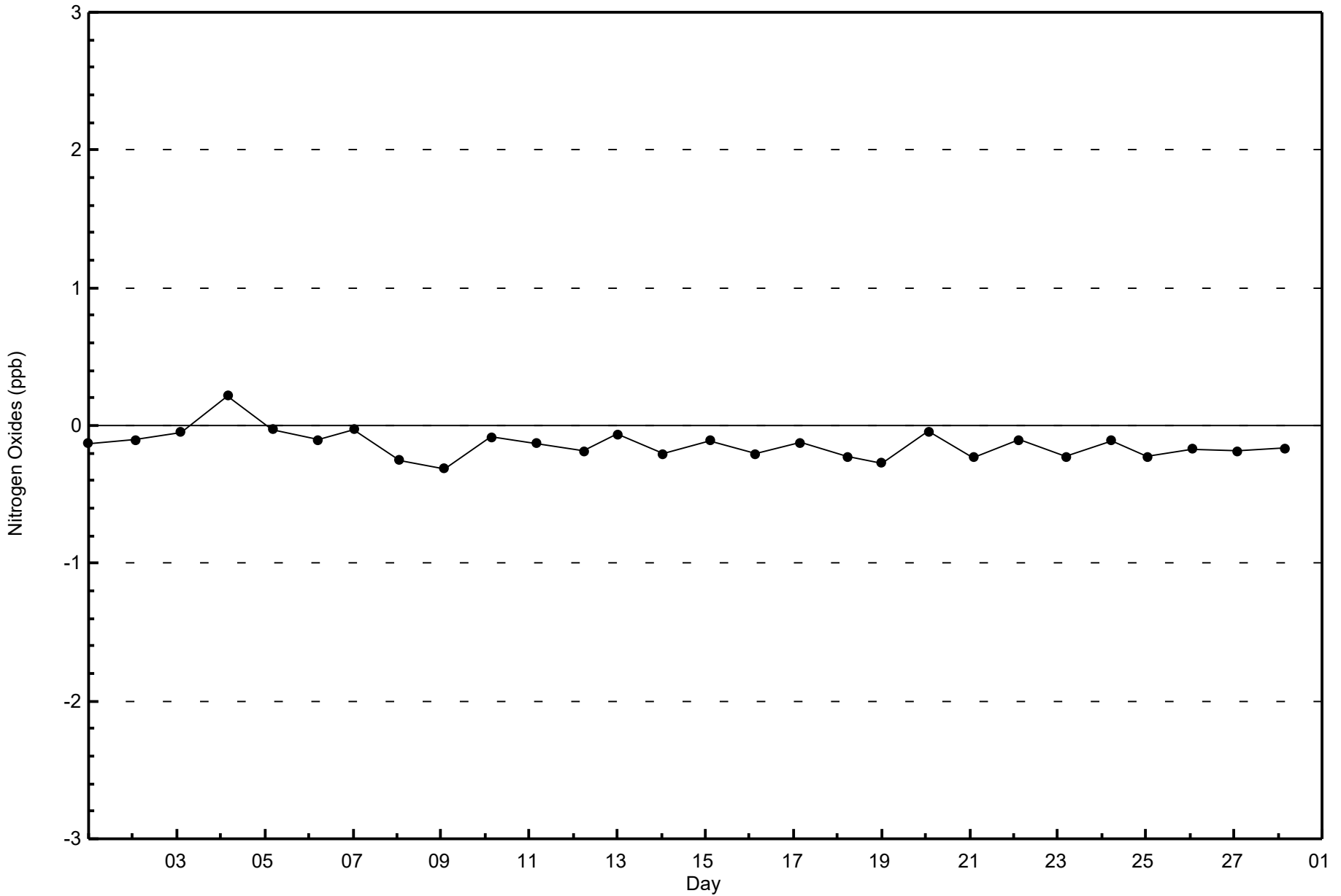
Total Number of Hours: 672

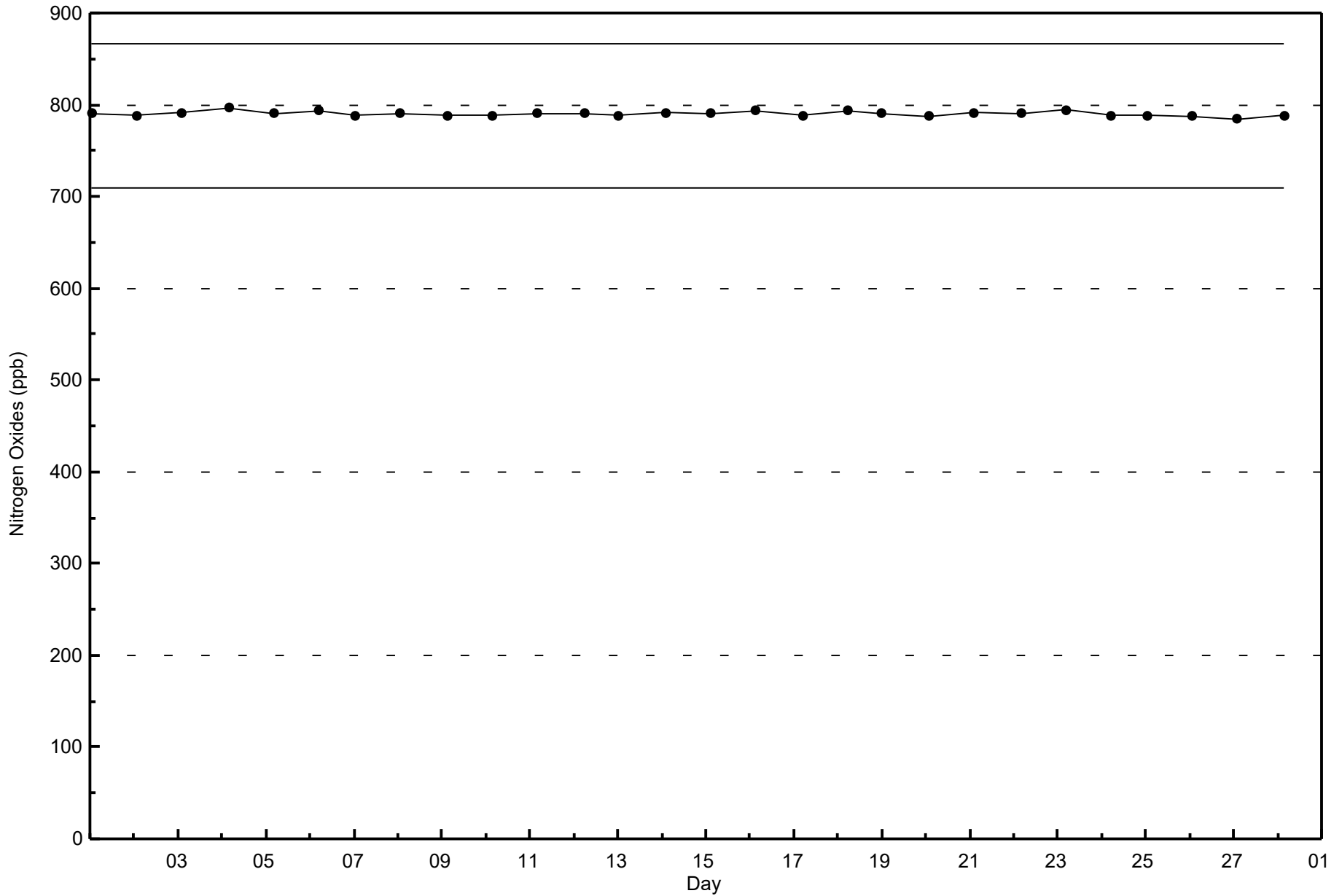


Wood Buffalo Environmental Association  
Wind Rose Feb 2023

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











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

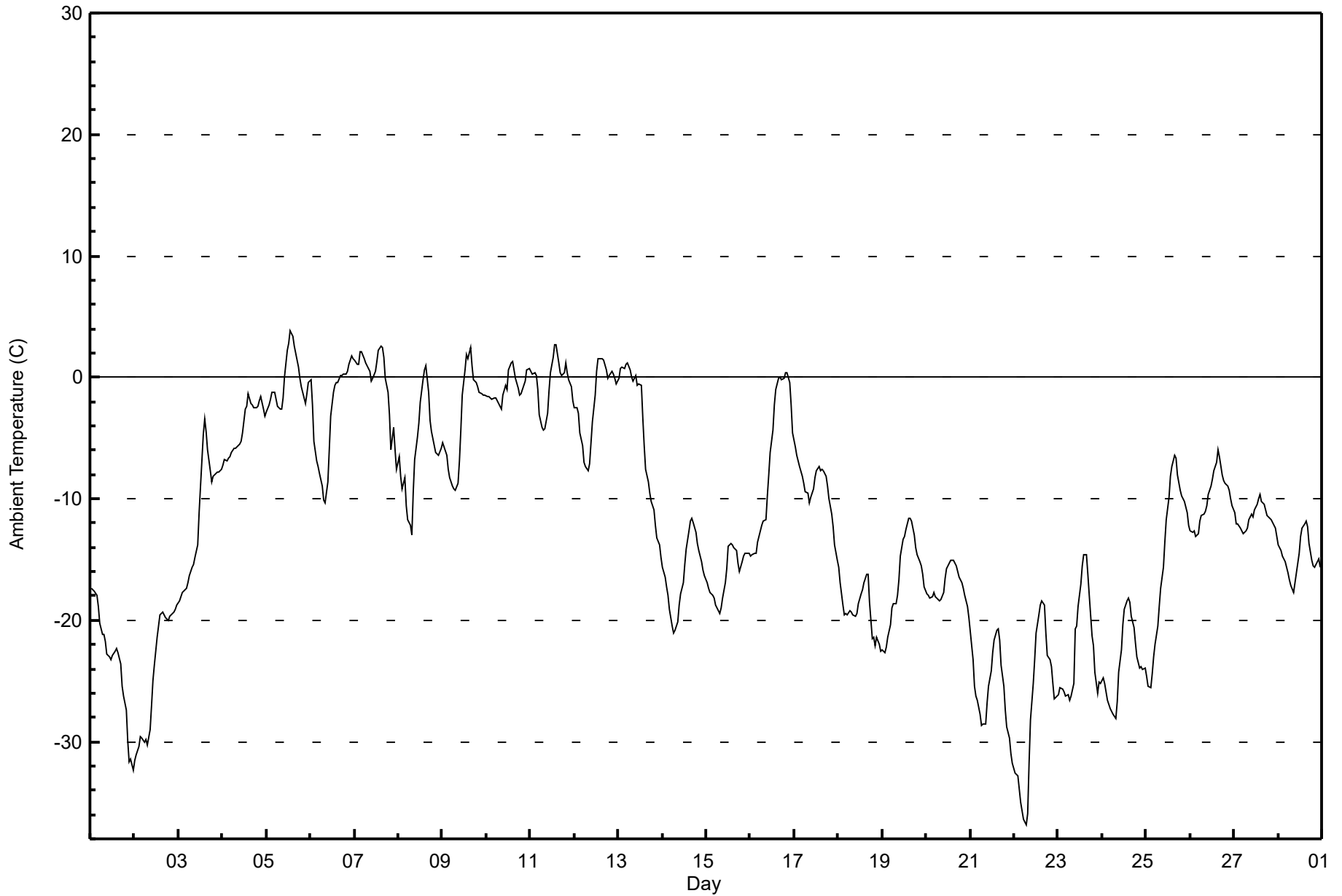
**Ambient Temperature (AT) - C**  
**Kirby North - February 2023**

Maximum Value: 3.8 C on Feb 5 14:00		Maximum Daily Average: -0.2 C on Feb 7		Hours in Service: 672																							
Minimum Value: -36.8 C on Feb 22 07:00		Minimum Daily Average: -27.2 C on Feb 22		Hours of Data: 672																							
Maximum Diurnal Average: -8.1 C at hour 15		Minimum Diurnal Average: -14.9 C at hour 8		Hours of Missing Data: 0																							
Monthly Average: -11.96 C		Percentiles: P <sub>1</sub> = -32.6 P <sub>10</sub> = -25.1 Q <sub>1</sub> = -18.8 Median = -11.9 Q <sub>3</sub> = -3.0 P <sub>90</sub> = 0.3 P <sub>99</sub> = 2.5		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-Feb	-17.4	-17.5	-17.6	-17.9	-18.9	-20.3	-21.2	-21.2	-21.7	-22.8	-23.0	-23.2	-22.9	-22.6	-22.4	-22.7	-23.6	-25.4	-26.2	-27.4	-29.9	-31.6	-31.5	-32.4	-23.4	-17.4	
2-Feb	-31.6	-31.1	-30.3	-29.6	-29.8	-30.1	-29.8	-30.2	-29.0	-27.0	-25.0	-23.7	-21.4	-20.5	-19.5	-19.3	-19.6	-19.8	-20.0	-19.7	-19.6	-19.3	-19.1	-18.7	-24.3	-18.7	
3-Feb	-18.4	-18.1	-17.7	-17.5	-17.3	-16.9	-16.3	-15.7	-15.4	-14.8	-13.8	-11.2	-8.9	-4.7	-3.4	-4.4	-5.9	-7.7	-8.6	-8.2	-7.9	-7.8	-7.9	-7.5	-11.5	-3.4	
4-Feb	-7.3	-6.8	-6.9	-6.6	-6.5	-6.2	-5.8	-5.8	-5.8	-5.6	-5.2	-4.5	-2.6	-2.4	-1.4	-2.2	-2.2	-2.5	-2.5	-2.4	-1.9	-1.6	-2.6	-3.2	-4.2	-1.4	
5-Feb	-2.8	-2.3	-1.9	-1.2	-1.2	-1.8	-2.4	-2.6	-2.6	-1.7	0.1	2.2	2.8	3.8	3.4	2.6	2.0	0.9	0.0	-0.8	-1.7	-2.1	-1.3	-0.5	-0.4	3.8	
6-Feb	-0.2	-2.3	-5.2	-6.9	-7.4	-7.9	-9.0	-10.1	-10.3	-8.6	-5.9	-3.2	-1.2	-0.6	-0.5	-0.4	0.1	0.1	0.2	0.3	0.5	1.0	1.7	1.5	-3.1	1.7	
7-Feb	1.4	1.0	1.1	2.1	2.1	1.5	1.2	0.9	0.5	-0.4	0.0	0.5	1.3	2.2	2.6	2.4	1.7	-0.1	-1.2	-3.1	-5.9	-4.1	-5.9	-7.6	-0.2	2.6	
8-Feb	-6.5	-8.1	-9.2	-8.3	-10.6	-11.7	-12.2	-13.0	-9.5	-6.7	-4.9	-3.7	-2.1	-0.2	0.6	0.9	-1.3	-3.5	-4.5	-5.7	-6.2	-6.3	-6.4	-5.9	-6.0	0.9	
9-Feb	-5.3	-5.7	-6.4	-7.6	-8.3	-9.0	-9.2	-9.3	-8.7	-6.8	-4.3	-1.5	0.6	1.9	1.6	2.4	1.0	-0.2	-0.4	-0.8	-1.2	-1.3	-1.5	-1.4	-3.4	2.4	
10-Feb	-1.5	-1.6	-1.7	-1.8	-1.7	-1.7	-1.9	-2.3	-2.6	-1.5	-0.6	-1.0	0.6	1.1	1.2	0.6	-0.1	-0.9	-1.4	-1.4	-0.7	-0.3	0.6	0.7	-0.8	1.2	
11-Feb	0.5	0.3	0.4	0.1	-1.0	-3.1	-4.1	-4.4	-4.2	-3.0	-1.1	0.4	1.7	2.7	2.6	1.2	0.4	0.2	0.4	1.2	0.4	-0.2	-0.8	-1.9	-0.5	2.7	
12-Feb	-2.5	-2.5	-3.0	-4.6	-5.6	-7.0	-7.3	-7.7	-7.2	-5.4	-3.7	-1.4	0.5	1.6	1.6	1.6	1.4	0.7	-0.1	0.2	0.5	0.3	-0.1	-0.5	-2.1	1.6	
13-Feb	-0.1	0.8	0.9	0.7	1.0	1.2	0.6	0.1	-0.3	0.1	-0.7	-0.5	-0.6	-3.3	-5.7	-7.6	-8.6	-9.5	-10.3	-11.0	-12.2	-13.2	-13.8	-14.8	-4.5	1.2	
14-Feb	-15.6	-16.5	-17.2	-18.0	-19.1	-20.5	-21.0	-20.9	-20.2	-18.8	-17.8	-16.9	-15.4	-14.1	-12.7	-11.8	-11.6	-12.0	-12.8	-13.7	-14.3	-15.2	-15.8	-16.3	-16.2	-11.6	
15-Feb	-16.9	-17.4	-17.7	-17.9	-18.2	-18.8	-19.2	-19.5	-19.0	-18.1	-16.9	-15.7	-13.9	-13.7	-13.8	-14.0	-14.3	-15.3	-16.0	-15.2	-14.7	-14.5	-14.5	-14.5	-16.2	-13.7	
16-Feb	-14.7	-14.6	-14.5	-14.5	-13.5	-12.7	-12.2	-11.9	-11.7	-9.8	-8.0	-6.2	-4.4	-2.3	-1.0	-0.1	0.0	-0.2	-0.1	0.4	0.4	-0.4	-2.2	-4.5	-6.6	0.4	
17-Feb	-5.8	-6.4	-6.8	-7.4	-8.1	-8.7	-9.4	-9.6	-10.3	-9.8	-9.2	-8.3	-7.7	-7.4	-7.7	-7.5	-7.7	-8.1	-9.0	-10.0	-11.2	-12.3	-13.8	-15.0	-9.1	-5.8	
18-Feb	-15.7	-16.9	-18.8	-19.6	-19.5	-19.5	-19.2	-19.4	-19.6	-19.7	-19.5	-18.7	-17.8	-17.5	-16.9	-16.2	-16.2	-18.5	-21.5	-21.4	-22.2	-21.4	-22.0	-22.6	-19.2	-15.7	
19-Feb	-22.4	-22.6	-22.3	-21.4	-20.4	-19.0	-18.6	-18.6	-17.9	-16.6	-14.7	-13.3	-13.1	-12.5	-11.6	-11.6	-11.8	-13.0	-14.1	-14.6	-15.2	-15.5	-16.2	-17.3	-16.4	-11.6	
20-Feb	-17.8	-17.9	-18.2	-18.0	-17.7	-18.0	-18.3	-18.5	-18.3	-17.7	-16.6	-15.8	-15.3	-15.0	-15.0	-15.1	-15.5	-15.9	-16.5	-16.9	-17.4	-18.0	-18.9	-19.7	-17.2	-15.0	
21-Feb	-21.0	-23.2	-25.4	-26.3	-26.6	-27.8	-28.7	-28.6	-28.5	-26.8	-25.4	-24.1	-22.7	-21.6	-20.9	-20.7	-21.6	-23.7	-25.5	-27.4	-28.8	-29.8	-31.0	-31.8	-25.7	-20.7	
22-Feb	-32.6	-32.7	-32.8	-35.0	-35.7	-36.4	-36.8	-36.0	-31.8	-28.2	-25.2	-23.2	-21.1	-19.6	-18.7	-18.5	-18.7	-21.0	-22.9	-23.3	-23.9	-25.2	-26.5	-26.3	-27.2	-18.5	
23-Feb	-26.1	-25.5	-25.6	-25.9	-26.3	-26.1	-26.6	-26.3	-25.3	-20.7	-20.5	-18.8	-17.0	-15.6	-14.6	-14.6	-16.2	-17.9	-21.3	-22.1	-24.2	-26.0	-25.1	-25.3	-22.2	-14.6	
24-Feb	-24.8	-25.2	-25.9	-26.6	-27.3	-27.5	-27.8	-28.1	-26.7	-24.3	-22.4	-20.4	-19.1	-18.4	-18.2	-18.5	-19.7	-20.6	-21.9	-23.1	-24.0	-23.9	-24.1	-24.0	-23.4	-18.2	
25-Feb	-24.7	-25.4	-25.5	-24.4	-23.0	-22.0	-20.5	-18.9	-17.4	-15.7	-13.6	-11.7	-9.8	-8.1	-7.3	-6.4	-6.7	-8.0	-9.3	-9.8	-10.0	-10.2	-11.1	-12.2	-14.7	-6.4	
26-Feb	-12.7	-12.8	-12.7	-13.1	-12.8	-11.8	-11.4	-11.2	-11.0	-10.5	-9.7	-9.0	-8.3	-7.7	-7.1	-5.9	-6.6	-6.6	-8.0	-8.5	-8.7	-9.0	-9.3	-10.0	-10.6	-9.9	-5.9
27-Feb	-11.2	-12.1	-12.1	-12.4	-12.7	-12.9	-12.6	-12.4	-11.8	-11.2	-11.5	-10.9	-10.5	-10.0	-9.6	-10.2	-10.5	-11.0	-11.4	-11.6	-11.7	-11.9	-12.5	-13.1	-11.6	-9.6	
28-Feb	-13.8	-14.3	-14.7	-14.9	-15.2	-16.0	-16.7	-17.1	-17.7	-17.0	-16.1	-14.5	-13.1	-12.4	-12.1	-11.8	-12.3	-13.6	-15.1	-15.6	-15.6	-15.2	-14.9	-15.6	-14.8	-11.8	
	-13.1	-13.5	-13.8	-14.1	-14.3	-14.7	-14.9	-14.9	-14.4	-13.2	-12.0	-10.7	-9.3	-8.5	-8.1	-8.1	-8.7	-9.8	-10.7	-11.1	-11.7	-12.0	-12.4	-12.9		Diurnal Average	
	1.4	1.0	1.1	2.1	2.1	1.5	1.2	0.9	0.5	0.1	0.1	2.2	2.8	3.8	3.4	2.6	2.0	0.9	0.4	1.2	0.5	1.0	1.7	1.5		Diurnal Maximum	



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

**Ambient Temperature (AT) - C**  
**Kirby North - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C  
Kirby North - February 2023**

<b>Concentration Ranges (C)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
-50 - -20	136	20.24	20.24
-20 - 0	458	68.15	88.39
0 - 10	78	11.61	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



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

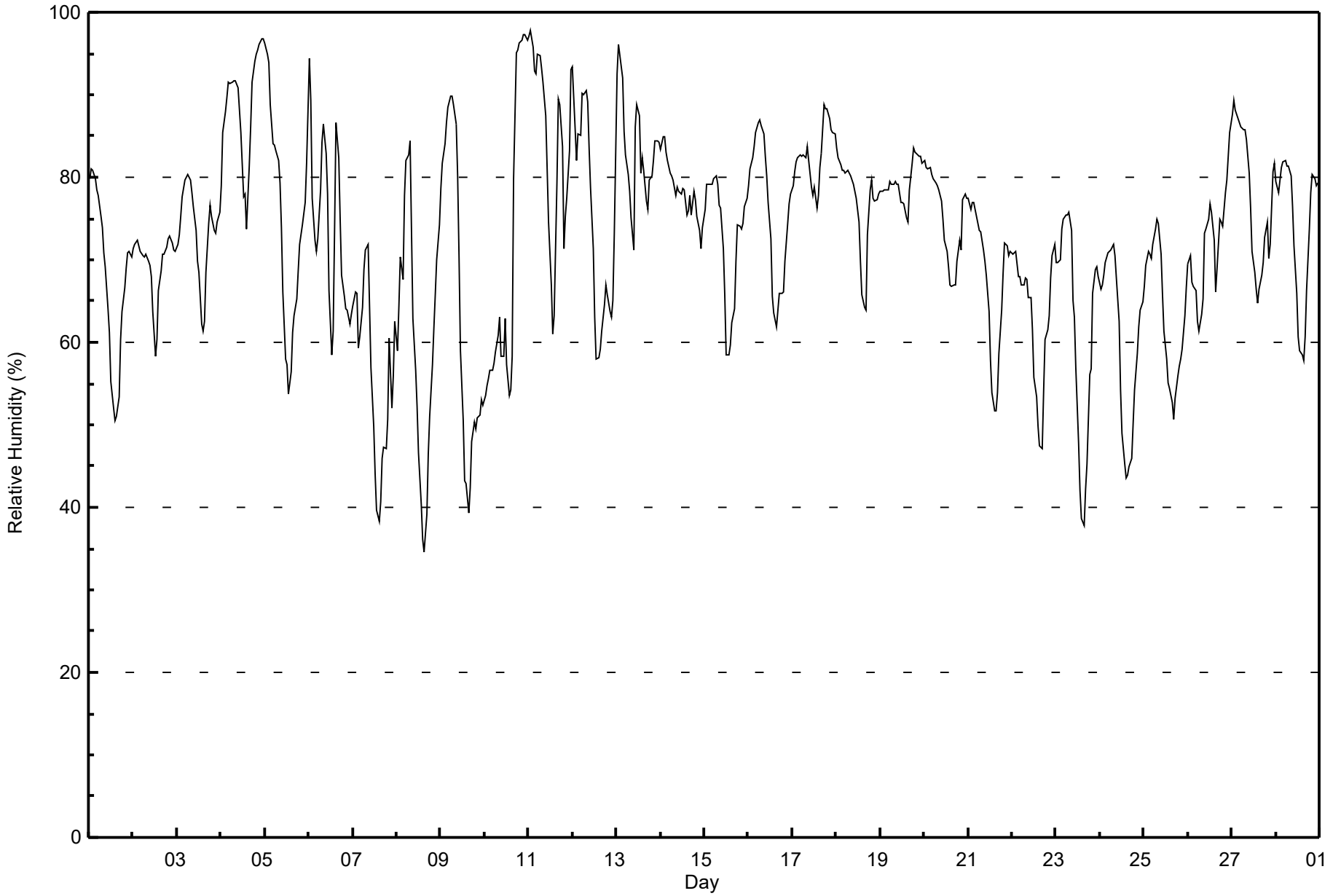
**Relative Humidity (RH) - %**  
**Kirby North - February 2023**

Maximum Value: 97.7 % on Feb 11 02:00      Maximum Daily Average: 88.6 % on Feb 4																						Hours in Service: 672 Hours of Data: 672				
Minimum Value: 34.7 % on Feb 8 16:00      Minimum Daily Average: 56.2 % on Feb 7 Maximum Diurnal Average: 78.9 % at hour 8      Minimum Diurnal Average: 59.8 % at hour 15 Monthly Average: 72.21 %      Percentiles: P <sub>1</sub> = 39.6 P <sub>10</sub> = 55.1 Q <sub>1</sub> = 64.5 Median = 73.7 Q <sub>3</sub> = 80.4 P <sub>90</sub> = 86.7 P <sub>99</sub> = 96.6																						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-Feb	79.9	81.0	80.9	79.9	78.5	77.7	75.3	73.9	70.9	69.2	64.1	61.1	55.3	52.0	50.5	51.1	53.5	60.4	63.7	66.5	69.0	70.8	71.1	70.3	67.8	81.0
2-Feb	71.3	71.8	72.5	71.8	71.1	70.6	70.3	70.6	69.8	69.4	67.9	63.7	58.3	60.3	66.2	68.6	70.7	70.7	71.5	72.6	72.8	72.0	71.1	71.1	69.4	72.8
3-Feb	71.9	73.0	75.3	77.7	79.7	80.0	80.4	79.7	78.2	76.5	73.5	69.8	68.4	62.2	61.3	62.5	68.4	74.3	76.6	75.2	73.6	73.1	74.6	75.7	73.4	80.4
4-Feb	79.0	85.4	88.0	89.7	91.5	91.4	91.5	91.8	91.6	90.8	88.2	85.5	77.6	78.0	73.7	81.4	86.1	91.5	94.0	94.9	95.5	96.2	96.8	96.7	88.6	96.8
5-Feb	96.2	95.0	93.9	88.8	84.1	83.9	83.2	82.1	79.4	73.9	66.1	57.9	57.2	53.8	56.4	61.3	63.1	65.2	68.7	71.8	74.2	75.6	77.0	81.7	74.6	96.2
6-Feb	94.5	89.3	77.4	72.3	71.0	72.6	78.4	84.2	86.4	82.9	77.9	66.2	58.5	61.3	73.5	86.6	82.4	75.0	68.2	65.5	64.0	63.9	62.3	63.5	74.1	94.5
7-Feb	64.4	66.1	65.9	59.2	60.7	64.3	68.8	71.2	71.9	64.3	56.9	49.8	44.1	39.7	38.4	40.6	46.0	47.3	47.1	50.7	60.5	52.1	56.0	62.5	56.2	71.9
8-Feb	59.0	64.5	70.4	67.6	77.7	82.1	82.8	84.5	73.5	62.9	56.6	52.2	46.6	40.4	36.1	34.7	39.1	46.4	51.0	57.3	61.6	65.8	70.0	74.3	60.7	84.5
9-Feb	78.7	81.8	84.0	86.7	88.5	89.8	89.9	88.8	86.4	80.2	70.3	59.1	50.5	43.2	42.9	39.3	42.4	48.0	50.3	49.6	50.9	51.1	53.1	52.4	64.9	89.9
10-Feb	53.6	54.7	55.7	56.6	56.6	57.5	58.8	60.9	63.1	58.4	58.3	62.9	57.3	53.6	54.3	58.2	79.8	95.1	95.4	96.2	96.6	97.3	97.2	96.6	69.8	97.3
11-Feb	97.1	97.7	95.8	92.9	92.6	94.9	94.8	93.3	91.6	87.4	81.0	74.5	67.0	61.1	63.2	79.3	89.4	88.8	83.7	71.4	75.2	77.4	83.2	93.0	84.4	97.7
12-Feb	93.5	86.0	82.1	85.3	85.1	90.2	90.0	90.6	89.2	83.5	78.9	71.3	63.0	58.0	58.2	59.2	61.3	64.5	67.0	65.7	63.7	63.1	65.2	73.0	74.5	93.5
13-Feb	92.5	96.1	94.7	92.0	85.7	82.7	80.3	78.3	75.1	71.2	86.1	88.8	87.4	80.5	82.4	80.9	77.1	76.1	79.6	80.2	82.0	84.4	84.4	84.2	83.4	96.1
14-Feb	83.5	84.9	84.9	83.0	82.1	80.4	80.1	79.6	77.8	78.3	77.9	78.6	78.4	75.4	76.0	77.7	75.5	78.4	77.2	75.2	73.6	71.4	73.8	78.4	78.4	84.9
15-Feb	76.2	79.2	79.2	79.1	79.2	79.8	80.1	79.1	76.7	76.3	71.4	65.8	58.4	58.4	59.7	62.3	64.0	69.8	74.2	74.1	73.7	74.4	76.4	77.4	72.7	80.1
16-Feb	79.0	81.0	82.4	83.8	85.4	86.6	87.0	86.2	85.3	82.5	80.2	77.0	72.6	65.6	63.6	61.8	63.9	65.9	65.9	66.1	69.9	74.3	76.7	77.9	75.8	87.0
17-Feb	79.0	80.6	81.9	82.4	82.8	82.5	82.8	82.4	83.8	82.1	78.9	77.7	78.8	76.3	77.8	81.2	83.0	88.8	88.3	88.3	87.1	85.8	85.4	85.2	82.6	88.8
18-Feb	83.6	82.3	81.6	80.9	80.9	80.5	80.8	80.6	80.1	79.2	78.4	77.5	74.5	69.8	65.8	64.2	64.0	73.0	78.4	79.6	77.5	77.1	77.4	77.9	76.9	83.6
19-Feb	78.2	78.3	78.5	78.5	78.5	79.5	79.2	79.2	79.4	79.2	79.1	77.0	77.0	76.8	75.1	74.6	78.5	81.7	83.5	83.1	82.7	82.6	82.5	81.8	79.3	83.5
20-Feb	82.1	81.1	81.0	81.2	80.4	79.9	79.4	79.0	78.4	77.1	74.9	72.3	71.0	69.1	66.9	66.8	66.9	66.9	69.9	72.3	71.1	77.3	77.9	77.4	75.0	82.1
21-Feb	77.5	76.2	77.0	77.0	76.0	74.3	73.6	73.4	71.1	69.8	68.1	63.6	57.7	53.8	51.8	51.7	53.9	58.7	63.9	68.3	72.0	71.6	70.5	71.1	67.6	77.5
22-Feb	70.7	70.8	71.0	68.0	68.0	67.0	66.9	67.7	67.6	65.4	65.3	61.5	55.8	53.4	49.8	47.5	47.1	54.0	60.3	61.5	63.2	67.8	70.6	71.9	63.0	71.9
23-Feb	69.7	69.6	70.0	73.8	74.8	75.5	75.7	73.6	65.0	63.0	56.9	47.8	42.0	38.6	37.7	42.2	45.3	56.2	56.8	65.9	68.9	69.1	68.0	61.7	75.7	
24-Feb	66.4	66.9	68.1	69.6	70.9	71.0	71.3	71.9	70.4	67.8	62.5	54.3	49.0	45.2	43.5	43.9	44.9	45.9	50.2	54.2	58.7	61.8	63.9	64.9	59.9	71.9
25-Feb	66.8	69.4	71.0	70.7	70.2	71.8	73.7	74.9	74.4	70.7	65.8	61.3	57.9	55.0	54.4	52.7	50.8	53.3	56.0	57.0	57.9	59.1	63.2	66.6	63.5	74.9
26-Feb	69.5	70.5	67.3	66.7	66.3	62.6	61.4	63.5	65.2	73.3	73.7	75.0	76.7	75.8	72.4	66.0	68.9	74.9	74.6	74.1	78.1	79.7	82.5	85.4	71.8	85.4
27-Feb	87.7	89.3	88.2	87.2	86.7	86.2	85.7	85.8	84.6	80.5	76.2	70.9	68.5	66.4	64.8	66.4	68.1	69.7	72.7	74.5	70.1	71.9	80.8	81.8	77.7	89.3
28-Feb	79.5	78.1	79.6	81.2	81.8	82.1	81.4	81.4	80.2	76.4	71.7	65.9	60.7	59.0	58.5	57.9	60.6	66.3	73.7	78.1	80.3	79.9	79.0	79.4	73.9	82.1
77.9 78.6 78.5 78.0 78.1 78.5 78.7 78.9 77.7 74.8 71.9 67.8 63.4 60.3 59.8 61.2 64.1 67.6 70.1 70.8 72.3 73.2 74.6 76.3																								Diurnal Average		
97.1 97.7 95.8 92.9 92.6 94.9 94.8 93.3 91.6 90.8 88.2 88.8 87.4 80.5 82.4 86.6 89.4 95.1 95.4 96.2 96.6 97.3 97.2 96.7																								Diurnal Maximum		



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

**Relative Humidity (RH) - %**  
**Kirby North - February 2023**





**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %  
Kirby North - February 2023**

<b>Concentration Ranges (%)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 20	0	0.00	0.00
20 - 40	8	1.19	1.19
40 - 60	103	15.33	16.52
60 - 80	381	56.70	73.21
80 - 100	180	26.79	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 672



Maximum Speed: 23 km/h on Feb 13 16:00	Maximum Daily Speed Average: 14.5 km/h on Feb 7	Hours in Service: 672
Minimum Speed Value: 1 km/h on Feb 23 19:00	Minimum Daily Speed Average: 1.6 km/h on Feb 23	Hours of Data: 663
Maximum Diurnal Speed Average: 5.5 km/h at hour 14	Minimum Diurnal Speed Average: 1.8 km/h at hour 21	Hours of Missing Data: 9
Monthly Average Velocity: 3.4 km/h 233.3 deg	Percentiles: P <sub>1</sub> = 1 P <sub>10</sub> = 5 Q <sub>1</sub> = 8 Median = 10 Q <sub>3</sub> = 13 P <sub>90</sub> = 17 P <sub>99</sub> = 22	Percent Operational Time: 98.7

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-Feb	WNW9	NW7	NW8	NNW9	NNW12	N15	N15	NNW13	NNW16	NNW14	NNW13	NNW14	NNW14	NNW15	NNW15	NNW15	NNW11	NNW9	NNW6	NNW6	NW2	N3	SSW1	S5	NNW9.6	NNW16
2-Feb	S6	S7	SSE7	S8	S9	S10	S10	S11	S13	M	M	M	M	M	M	SSE18	SSE17	S17	S17	S16	SSW18	S17	SSW15	SSW15	S12.7	SSE18
3-Feb	SSW13	SSW17	SSW17	SSW19	SSW20	SSW20	SSW20	SSW21	SSW18	SSW19	SSW19	SSW16	SW14	SW11	SW9	SW12	SSW7	S6	S8	S7	S6	S4	S5	S5	SSW12.9	SSW21
4-Feb	S4	ENE2	ENE1	E3	ESE3	SSE6	ESE5	SSE7	ESE2	E2	NE6	NE4	NE2	NNW3	E1	SW6	SSW5	S5	S6	S8	S8	S9	S9	SSW10	SSE3.0	SSW10
5-Feb	S10	S10	S9	E3	S10	S12	S12	S12	S10	S11	SSW11	SSW10	SSW11	SSW13	SSW12	SSW11	SSW11	SSW12	SSW12	SSW13	SSW12	SSW14	SSW14	SSW10.8	SSW14	
6-Feb	WNW19	NW23	WNW23	WNW18	WNW18	W12	SW12	SW11	SW11	SW11	SW13	WSW14	WSW15	WSW16	SW15	SSW11	SSW11	SSW13	SSW12	SSW12	SSW13	SW14	SW15	SW14	WSW11.5	WNW23
7-Feb	SSW12	SSW13	SW15	WSW19	WSW21	WSW18	WSW18	WSW20	WNW22	WNW21	W17	WSW18	WSW20	WSW22	WSW22	WSW22	WSW19	WSW13	WSW13	SW9	S4	WNW8	SSW7	S4	WSW14.5	WSW22
8-Feb	SW7	SSW8	SSW6	WSW6	SSW6	SW6	SSW7	SW3	W10	W12	WNW13	WSW12	WSW10	WNW11	W12	WSW12	SW10	SSW8	SSW8	SSW9	S9	S10	S10	SSW10	SW7.4	WNW13
9-Feb	S11	S11	SSW10	SSW11	SSW11	SSW10	SSW10	SSW10	S10	SSW10	S9	SSW9	SSW12	SW12	SSW8	S10	S9	S11	S12	SSW13	SSW11	SSW12	SSW11	SSW11	SSW10.5	SSW13
10-Feb	SSW10	SSW8	S7	S7	S10	S8	SSE10	S6	S6	S9	SE1	SSW8	S6	SW8	WSW12	WSW9	WNW8	NW10	WNW10	WNW9	WNW9	WSW6	W11	W12	SW5.7	W12
11-Feb	WSW12	SW11	WSW15	WSW15	SW11	SSW9	SSW11	SSW11	SSW11	SW13	SW13	SW15	WSW19	WSW19	WSW18	WSW23	WSW17	SW11	WSW13	W22	WNW22	WNW18	W14	SW11	WSW13.7	WSW23
12-Feb	SW13	WSW16	WSW14	SW11	SSW10	SSW9	SSW10	SSW9	SSW8	SSW10	SSW12	SW12	SW12	SW11	SW11	SSW11	SSW9	S8	S9	S11	S13	S11	SSW14	SSW12	SSW10.5	WSW16
13-Feb	SSW16	SSW14	SSW15	SSW13	SW16	WSW19	WSW19	WSW21	WSW21	WSW19	WSW11	WSW14	WNW19	NW22	NNW21	N23	N22	N22	N19	N20	N16	N13	NNW12	N11	WNW9.3	N23
14-Feb	NNW10	NNW8	N8	NNE9	NNE8	NNE6	NE6	UO	UO	UO	SSW2	SW5	SW6	SSW7	SW9	WSW10	WNW10	NW14	NNW13	NNW13	NNW13	N12	NNW13	NNW10	NNW6.1	NW14
15-Feb	NNW7	NE4	ENE4	ENE2	E4	ENE4	S3	ENE3	ESE4	ESE6	ESE4	SSW4	SSW5	SW8	SW7	SW6	S3	SSE4	S5	S6	S7	S9	SSW10	SSW11	S3.0	SSW11
16-Feb	S12	S12	S12	S13	S12	S12	S14	S14	S16	SSW16	S15	SSW13	SSW16	SSW18	SW18	SW15	SW14	SW13	WSW15	W15	NW15	NNW15	NNW12	NNW13	SW9.9	SSW18
17-Feb	NNW12	NNW10	NNW9	NNW10	NNW9	NNW12	NW9	WNW7	W5	SW9	WSW11	WSW9	W7	WNW9	NW11	WNW9	WNW9	NNW6	NNW6	NNE9	NE10	NE10	NE9	NE9	NNW5.8	NNW12
18-Feb	NE13	NE14	NE12	NE10	NE10	NE10	NE12	NE12	NE14	NE12	NE12	NE9	NE9	NNE10	NNE9	NE8	ENE6	ENE5	E6	ESE5	ESE6	ESE6	SE7	SSE8	NE7.9	NE14
19-Feb	SSE9	SSE8	SSE9	S11	S11	S11	SSE9	SSE10	SSE10	SSE10	SE8	E7	ENE10	ENE11	E8	NE7	NE10	NE11	NNE9	NE9	NNE10	NNE9	NNE9	NNE10	ESE4.7	S11
20-Feb	NNE8	N7	NNW6	NNW5	NNW8	NW8	NW7	NW9	NW8	NW11	NW10	NW12	WNW12	NW13	NW13	NW11	NNW10	N7	NNE6	NNE8	NNE9	NE7	NE11	NE12	NNW7.4	NW13
21-Feb	NE10	NE8	NE5	NNE5	N7	NNW6	NNW7	N10	N10	N12	N14	N12	N11	NNW11	NNW13	N13	N13	N15	N14	NNE9	NNE8	NNE9	NNE9	NNE10	N9.5	N15
22-Feb	NNE10	NE6	NNE5	N3	NW1	S4	NNW1	NNW3	NW2	NNW2	NNE9	NNE10	NNE7	NNE6	NNE7	NNE11	NNE11	NE8	ENE10	ENE11	ENE9	NE7	NE8	ENE7	NE5.7	ENE11
23-Feb	ENE9	ENE11	ENE10	ENE9	NE5	ENE4	ENE5	NE5	NE4	SE2	WSW3	W5	WNW5	N4	NNE4	NW3	SW6	WNW3	SSW1	NNW2	SSE1	SSE4	S6	S8	ENE1.6	ENE11
24-Feb	S8	S9	S8	S9	S9	S9	S10	S9	SSW10	SSW13	SSW15	SSW18	SSW18	SSW17	SSW17	SSW16	SSW15	SSW16	SSW18	SSW17	SSW19	SSW17	SSW18	SSW13.8	SSW19	
25-Feb	SSW16	SSW14	SSW14	SW15	SSW12	SSW13	SW12	SW14	SW14	SSW11	WSW14	WSW15	WSW18	SSW11	WSW11	SW12	SW12	SW10	SSW7	SSW7	S7	S8	S8	S8	SSW11.0	SSW16
26-Feb	SSE10	SSE9	SSE9	SSE11	SSE10	SSE13	SSE10	SE9	ESE8	ESE8	E9	E11	ENE14	ENE16	ENE17	ENE17	ENE16	NE13	ENE12	E10	ESE7	SE6	E4	NE3	ESE8.3	ENE17
27-Feb	NNE5	N6	NNW7	NNW8	NW8	NW9	NW11	NW11	NW13	NW13	WNW16	NW15	WNW15	WNW16	WNW16	WNW17	NW16	NW12	NW11	NNW10	NNW10	N8	NE5	NE8	NW10.0	WNW17
28-Feb	NE9	NE9	NE7	NE7	NE7	NE9	NE6	NNE7	NNE7	NNE7	NNE8	NE8	ENE7	ENE9	NE10	ENE8	ENE8	NE9	E7	E7	ESE8	ESE8	SE8	SSE8	ENE6.6	NE10

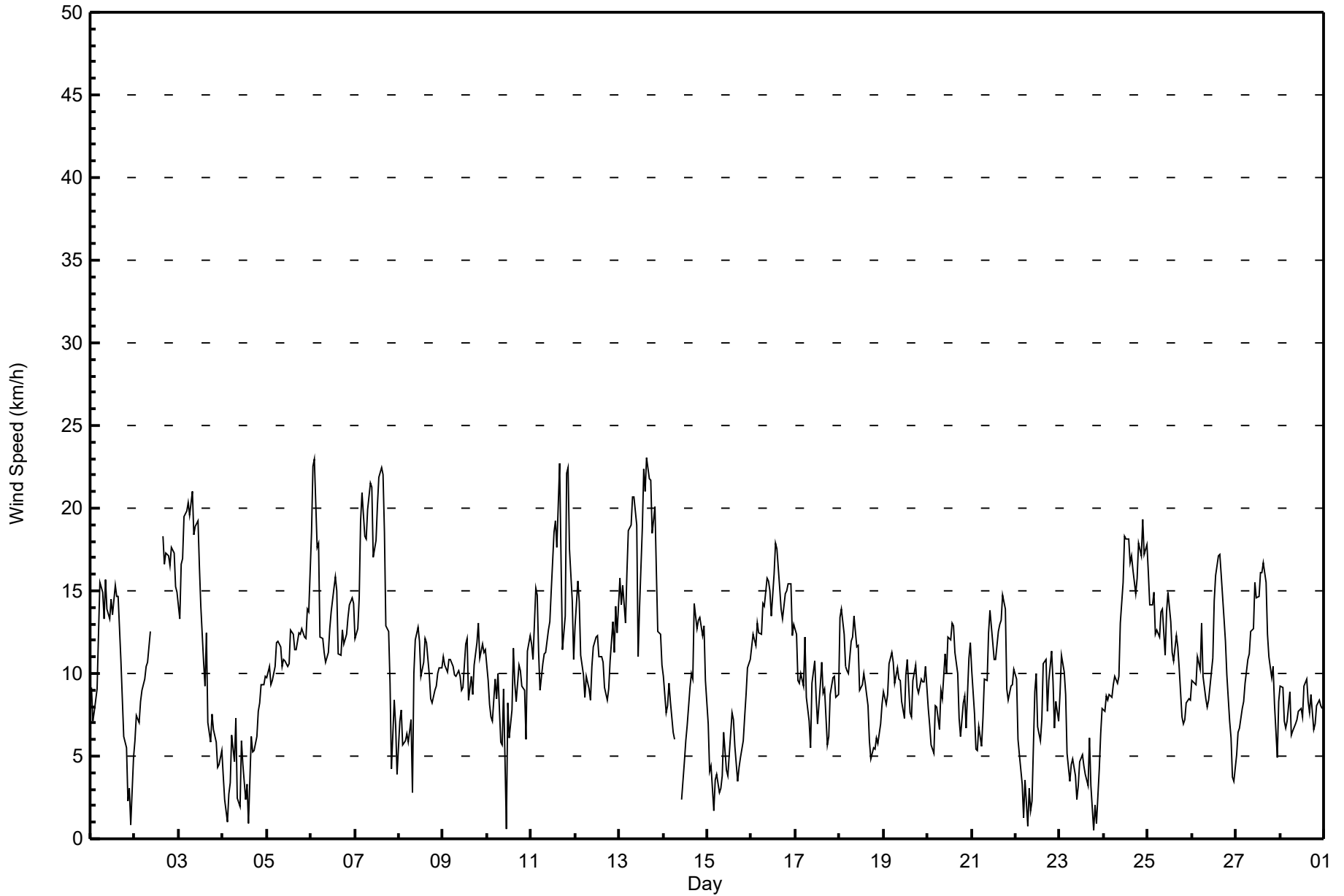
SW2.7	SSW2.6	SW3.1	SW3.5	SW3.7	SSW4.2	SSW4.3	SW4.6	SW4.2	SW4.5	WSW4.0	WSW5.0	WSW5.3	W5.5	W5.2	WSW4.8	WSW3.2	WSW2.0	SW2.3	SW2.0	SW1.8	SW2.1	SSW2.9	SSW3.0	Diurnal Average	
WNW19	NW23	WNW23	SSW19	WSW21	SSW20	SSW20	SSW21	WNW22	WNW21	SSW19	SSW18	WSW20	NW22	WSW22	N23	N22	N22	N19	W22	WNW22	SSW19	SSW17	SSW18	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 (WS) - km/h**  
**Kirby North - February 2023**







**Wood Buffalo Environmental Association  
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h  
Kirby North - February 2023**

<b>Wind Speed Ranges (km/h)</b>	<b>Number of Hours</b>	<b>%</b>	<b>Cumulative %</b>
0 - 5	76	11.46	11.46
6 - 11	342	51.58	63.05
12 - 19	220	33.18	96.23
20 - 28	25	3.77	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: 672



**Wood Buffalo Environmental Association  
Frequency Distribution**

**Wind Speed (WS) - km/h  
Kirby North - February 2023**

<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	2	5	9	10	5	5	2	3	12	6	2	1	2	2	4	6	76
6 - 11	10	33	33	16	8	8	5	20	63	52	28	9	3	12	17	25	342
12 - 19	12	0	10	6	0	0	0	3	19	60	26	33	7	12	10	22	220
20 - 28	4	0	0	0	0	0	0	0	0	4	0	9	1	4	2	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>	28	38	52	32	13	13	7	26	94	122	56	52	13	30	33	54	663

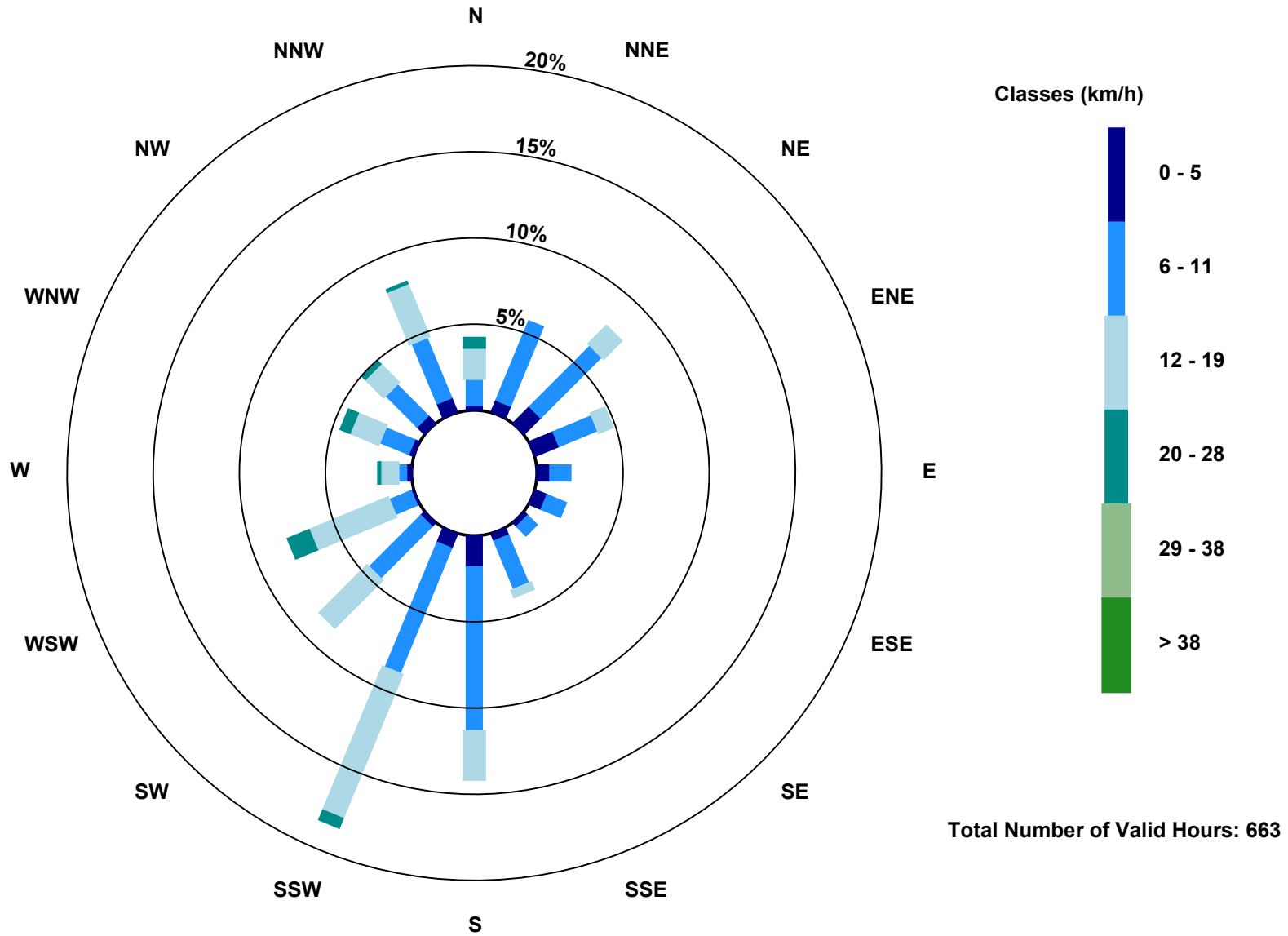
Total Number of Valid Hours: 663

Total Number of Hours: 672



Wood Buffalo Environmental Association  
Wind Rose Feb 2023

Wind Speed (WS) - km/h  
Kirby North





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

**Wind Speed (WS) - km/h**  
**Kirby North - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Feb 11 20:00 Minimum Value: 1 km/h on Feb 27 00:00 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: 672 Hours of Data: 663 Hours of Missing Data: 9 Hours of Calibration: 0 Percent Operational Time: 98.7							
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-Feb	3	2	2	3	4	4	5	5	4	4	4	4	4	4	4	4	3	2	1	2	1	1	1	1	5
2-Feb	1	1	1	2	2	2	2	2	3	M	M	M	M	M	M	6	5	5	5	5	6	5	5	5	6
3-Feb	4	5	5	5	5	5	5	5	4	4	5	4	3	2	3	3	4	2	2	2	2	2	1	2	5
4-Feb	2	2	1	1	2	2	1	1	2	2	3	2	2	1	2	2	2	2	2	2	2	2	2	2	3
5-Feb	2	2	2	2	2	2	2	2	2	2	2	3	3	4	3	3	3	2	2	2	2	3	3	3	4
6-Feb	6	6	6	4	4	3	2	2	2	2	3	3	3	4	3	3	3	3	3	3	3	3	3	3	6
7-Feb	2	2	4	3	4	3	3	4	6	5	4	4	4	5	5	5	4	3	2	2	3	4	2	2	6
8-Feb	1	1	2	2	2	1	1	3	3	3	3	3	3	3	3	3	2	1	1	2	1	2	2	2	3
9-Feb	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	2	3	3	3	3	3	3	3	3
10-Feb	2	2	2	2	2	2	2	3	3	2	3	3	2	3	2	3	3	3	3	2	3	4	3	3	4
11-Feb	3	2	3	3	2	2	2	2	2	3	3	4	4	5	4	6	4	3	3	8	6	4	3	2	8
12-Feb	3	3	3	3	3	2	2	2	2	2	2	3	3	2	2	3	2	2	2	3	3	3	4	3	4
13-Feb	4	4	4	3	4	4	4	4	5	4	7	6	5	5	6	6	5	5	5	6	4	3	3	2	7
14-Feb	2	2	1	2	2	1	1	UO	UO	UO	1	1	1	2	2	2	3	4	4	4	3	3	3	2	4
15-Feb	2	2	3	2	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	2	2	3	3	3
16-Feb	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	3	3	3	3	3	4	5	3	4	5
17-Feb	3	2	3	3	3	3	2	2	3	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	3
18-Feb	3	3	2	2	2	2	2	3	3	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	3
19-Feb	2	2	2	3	3	3	3	2	2	3	3	2	2	2	3	2	2	2	2	2	2	2	2	2	3
20-Feb	2	1	1	1	2	2	2	2	2	3	3	3	3	3	3	3	3	2	1	2	2	2	3	3	3
21-Feb	3	2	1	1	1	1	1	1	2	3	3	3	3	3	3	3	3	3	3	2	1	2	2	2	3
22-Feb	1	2	1	1	1	2	1	2	2	2	3	2	2	3	2	3	2	2	1	1	1	1	2	1	3
23-Feb	1	1	2	1	1	1	1	1	1	2	1	1	2	2	2	2	2	2	1	2	1	3	2	1	3
24-Feb	1	1	1	2	2	2	2	2	3	4	5	5	5	5	5	5	4	5	5	5	5	5	4	4	5
25-Feb	4	3	3	3	3	3	2	3	3	2	3	3	3	3	3	3	3	2	2	2	2	2	2	2	4
26-Feb	2	2	2	3	3	3	3	2	2	2	3	3	3	4	4	4	3	2	3	3	2	2	1	1	4
27-Feb	2	1	1	2	2	2	2	3	3	3	3	3	3	4	4	4	4	4	3	3	3	3	2	1	4
28-Feb	2	2	2	1	1	2	1	2	1	1	2	2	2	3	3	2	2	1	2	1	2	2	2	2	3
																		Diurnal Maximum							
M - Maintenance																		UO - Unstable Operation							



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

**Wind Direction (WD) - deg**  
**Kirby North - February 2023**

Direction of Maximum Speed: 349 deg on Feb 13 16:00	Hours in Service: 672
Direction of Maximum Daily Speed Average: 248.3 deg on Feb 7	Hours of Data: 663
Direction of Minimum Speed: 203 deg on Feb 23 19:00	Direction of Minimum Daily Speed Average: 1.6 deg on Feb 23
Direction of Minimum Daily Speed Average: 1.6 deg on Feb 23	Hours of Missing Data: 9
Monthly Average Direction: 233.3 deg	Percent Operational Time: 98.7

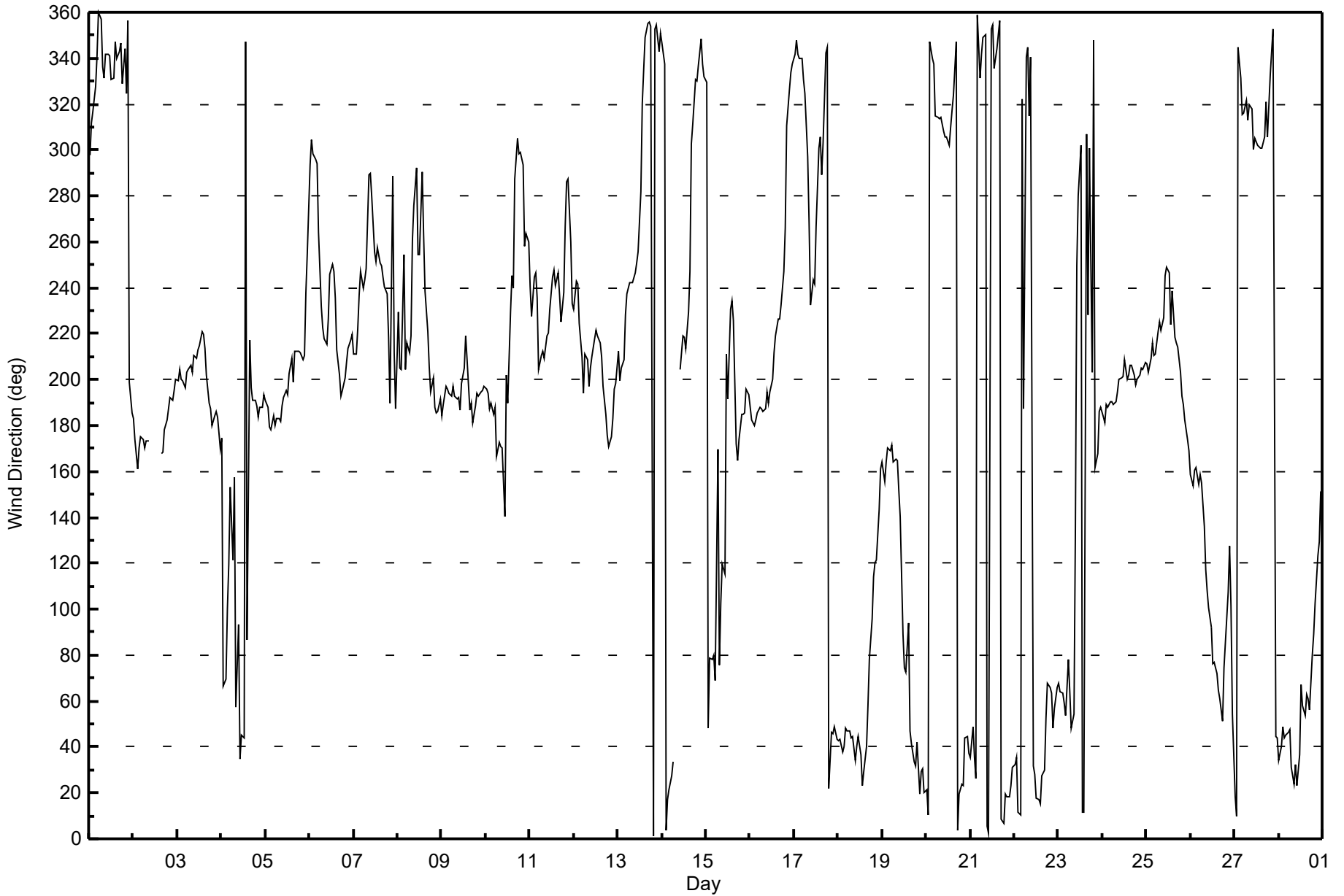
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Feb	298	312	317	328	341	360	357	336	332	342	341	341	331	331	347	340	343	347	329	344	325	356	199	185	337.2
2-Feb	183	174	161	170	175	174	170	173	173	M	M	M	M	M	M	168	168	178	182	187	192	191	195	200	180.2
3-Feb	199	204	200	200	197	203	204	206	203	211	210	213	215	221	220	214	202	189	187	180	185	186	184	169	203.4
4-Feb	174	66	69	100	120	153	121	158	58	93	35	45	44	347	87	217	197	191	191	189	184	188	188	193	166.3
5-Feb	191	188	180	178	184	180	183	183	182	189	192	195	193	203	209	199	212	212	212	212	209	211	238	255	200.7
6-Feb	294	305	299	296	294	264	232	222	218	215	226	246	250	247	235	213	202	193	195	201	208	214	217	220	243.3
7-Feb	211	211	222	237	247	240	244	248	289	290	279	256	251	257	251	250	245	240	237	219	190	288	211	187	248.3
8-Feb	229	205	205	254	204	216	212	219	260	276	292	254	254	290	263	239	221	205	195	201	188	185	186	192	230.1
9-Feb	184	189	197	196	194	193	197	193	191	192	187	198	205	219	209	187	190	181	189	194	193	195	195	197	194.5
10-Feb	196	194	187	190	185	188	167	173	171	170	140	202	190	229	245	240	288	305	299	299	294	258	263	260	228.3
11-Feb	240	227	245	246	236	204	211	212	209	219	220	230	245	248	241	246	237	225	238	267	286	288	260	233	242.2
12-Feb	230	243	241	225	210	194	211	209	197	205	210	218	222	219	216	210	197	185	176	171	175	183	196	198	207.5
13-Feb	213	200	205	209	228	237	242	242	242	246	251	256	282	320	335	349	355	356	354	1	353	355	343	351	291.0
14-Feb	347	337	4	17	21	28	34	UO	UO	UO	205	219	218	213	229	247	302	311	331	330	337	349	338	332	327.6
15-Feb	329	48	78	78	80	69	170	75	102	120	116	211	192	231	234	226	172	165	174	185	185	185	196	193	175.8
16-Feb	188	183	180	183	186	188	188	186	187	195	190	195	200	212	219	226	227	232	247	266	311	327	334	338	215.6
17-Feb	341	348	342	340	340	331	325	297	268	233	243	241	267	301	306	289	303	342	344	22	46	46	49	43	327.1
18-Feb	43	43	38	41	48	47	47	44	45	34	40	44	37	23	29	40	58	78	96	114	120	121	143	161	52.6
19-Feb	164	156	164	170	169	172	164	165	165	152	140	89	74	73	94	47	42	34	32	42	20	29	31	20	102.0
20-Feb	21	11	347	340	337	315	314	314	314	308	306	305	302	310	317	324	347	3	19	24	23	44	44	37	340.0
21-Feb	36	49	35	27	359	332	341	349	350	5	3	353	355	336	344	350	357	8	7	20	18	18	23	31	4.6
22-Feb	32	36	12	10	322	187	340	345	315	340	32	28	18	17	15	28	30	52	68	66	64	48	56	66	37.5
23-Feb	68	64	64	59	53	78	64	48	54	136	250	280	302	11	12	307	228	301	203	348	161	168	186	188	60.2
24-Feb	184	181	189	188	191	190	189	191	195	200	201	201	209	200	202	206	206	202	198	200	202	205	205	208	199.6
25-Feb	207	203	209	216	211	211	221	225	222	227	245	249	247	224	239	218	216	214	203	193	189	183	174	169	216.2
26-Feb	159	154	160	162	154	158	155	136	117	108	100	92	76	77	72	65	61	51	75	85	107	127	101	55	103.4
27-Feb	18	10	345	331	315	316	321	313	320	318	300	305	302	302	301	301	306	321	306	332	343	353	45	44	319.6
28-Feb	34	40	49	44	45	46	48	31	24	32	23	37	67	58	53	63	61	56	80	89	102	123	129	151	59.7
221.3 207.4 219.4 220.6 220.0 211.5 212.1 219.1 227.7 233.1 244.9 245.5 250.4 265.4 265.6 252.5 255.2 254.3 230.0 228.6 227.7 216.8 209.4 206.8																									
Diurnal Average																									

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



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

**Wind Direction (WD) - deg**  
**Kirby North - February 2023**





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

**Wind Direction (WD) - deg**  
**Kirby North - February 2023**

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 672
Maximum Value: 99 deg on Feb 10 11:00	Hours of Data: 663
Minimum Value: 4 deg on Feb 21 03:00	Hours of Missing Data: 9
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> = 26 P <sub>99</sub> = 65	Hours of Calibration: 0
	Percent Operational Time: 98.7

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-Feb	16	18	17	15	18	18	16	17	15	18	18	18	21	19	19	18	16	14	13	21	24	19	84	16	84
2-Feb	12	10	16	15	12	15	16	17	18	M	M	M	M	M	M	19	19	20	19	20	21	21	24	22	24
3-Feb	22	19	20	19	19	17	20	16	16	17	16	16	15	15	16	14	38	15	15	16	17	24	20	23	38
4-Feb	34	36	27	19	24	18	27	13	43	65	25	31	59	32	88	33	40	26	19	18	16	17	16	16	88
5-Feb	15	16	15	15	14	14	14	15	15	17	17	18	20	20	16	18	16	14	14	15	14	15	15	18	20
6-Feb	31	18	16	16	15	26	12	13	11	13	15	12	14	13	14	18	18	19	18	17	16	14	14	13	31
7-Feb	15	14	15	12	12	12	12	12	20	15	16	14	13	13	12	13	12	11	10	16	57	27	22	35	57
8-Feb	17	13	25	40	17	21	13	44	22	16	15	19	19	20	22	15	15	13	12	13	12	12	13	13	44
9-Feb	15	14	16	12	13	12	13	13	14	15	16	20	19	19	25	21	19	18	19	17	17	17	18	18	25
10-Feb	20	20	20	17	14	18	12	28	18	13	99	32	28	24	14	12	36	14	15	15	21	49	17	19	99
11-Feb	13	12	12	12	13	14	13	13	13	15	15	15	14	13	12	13	13	15	13	18	15	15	20	13	20
12-Feb	14	10	11	15	25	15	14	13	15	15	14	14	15	17	16	17	19	18	17	16	19	21	19	19	25
13-Feb	16	21	18	19	13	13	11	12	12	14	13	13	28	17	19	19	19	18	18	18	18	16	16	15	28
14-Feb	16	18	14	13	10	8	8	UO	UO	UO	31	19	17	20	16	14	28	16	21	17	16	18	18	16	31
15-Feb	14	43	33	40	24	40	31	45	36	18	32	48	36	30	26	22	16	9	10	14	16	19	19	18	48
16-Feb	16	16	18	16	16	18	17	16	16	17	17	18	19	16	14	13	13	14	11	20	15	18	15	16	20
17-Feb	16	19	16	16	17	16	16	17	31	17	15	20	31	25	15	23	12	22	16	21	11	11	14	9	31
18-Feb	11	11	9	10	12	11	11	11	12	15	13	19	20	17	17	18	20	14	5	16	9	11	11	11	20
19-Feb	13	15	17	17	16	19	18	16	19	19	26	22	17	15	23	26	15	11	11	16	14	10	10	13	26
20-Feb	11	11	12	18	14	17	20	16	16	15	18	14	16	17	18	16	19	21	12	13	16	13	13	12	21
21-Feb	13	13	4	6	20	12	10	13	17	16	18	19	24	21	24	20	20	15	15	8	8	8	9	7	24
22-Feb	6	18	11	15	61	22	73	30	36	59	19	19	35	49	34	20	13	12	8	7	9	10	7	10	73
23-Feb	9	7	7	9	12	21	13	10	23	45	44	25	32	56	62	72	38	48	64	45	69	34	18	11	72
24-Feb	11	11	13	12	14	14	15	15	19	20	21	19	22	22	20	19	19	20	20	19	17	16	15	15	22
25-Feb	16	15	14	15	15	15	16	13	13	14	13	16	14	19	17	16	14	14	17	16	19	18	14	16	19
26-Feb	16	17	16	16	17	16	19	19	18	18	19	20	18	16	15	15	14	11	16	16	23	19	18	22	23
27-Feb	11	12	15	12	15	15	15	15	17	18	15	16	16	17	16	15	18	19	16	18	16	21	17	13	21
28-Feb	13	12	13	11	14	12	12	10	10	16	18	31	37	30	21	20	16	10	15	12	18	13	16	15	37
	34	43	33	40	61	40	73	45	43	65	99	48	59	56	88	72	40	48	64	45	69	49	84	35	

Diurnal Maximum

M - Maintenance UO - Unstable Operation

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**ELECTRONIC TRANSFER SYSTEM  
AIRDATA  
SUBMISSION REPORT**

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March 31, 2023  
9:36:41 AM  
Request # 4534551

**Submitted by:** EN6138  
**Submission Date:** Mar 31, 2023 9:29:44 AM

File Type

Calibration Report

File Name

CAL-WBEA-202302.pdf

**Total Number of Files: 1**

\*\*\* End of Report \*\*\*



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**ELECTRONIC TRANSFER SYSTEM  
AIRDATA  
SUBMISSION REPORT**

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March 31, 2023  
9:08:09 AM  
Request # 4534523

**Submitted by:** EN6138  
**Submission Date:** Mar 31, 2023 9:07:42 AM

File Type

Ambient Data

File Name

AMB-WBEA-202302-V00.xml

**Total Number of Files: 1**

\*\*\* End of Report \*\*\*

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**ELECTRONIC TRANSFER SYSTEM  
AIRDATA  
SUBMISSION REPORT**

March 31, 2023  
11:29:45 AM  
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