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Wood Buffalo Environmental Association

# ANNUAL REPORT – VOLUME 3

## 2024 SITE DOCUMENTS

March 2025

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





## Table of Contents

### *Site Documentation*

<b>Station Site Documents</b> .....	3
AMS 01 – Bertha Ganter – Fort McKay .....	3
AMS 02 – Mildred Lake .....	30
AMS 03 – Lower Camp (Meteorology) .....	55
AMS 04 – Buffalo Viewpoint .....	81
AMS 05 – Mannix .....	107
AMS 06 – Patricia McInnes .....	135
AMS 07 – Athabasca Valley .....	161
AMS 08 – Fort Chipewyan .....	187
AMS 09 – Barge Landing .....	214
AMS 11 – Lower Camp (Air Quality) .....	240
AMS 13 – Fort McKay South .....	264
AMS 14 – Anzac .....	288
AMS 17 - Wapasu .....	313
AMS 18 – Stony Mountain .....	338
AMS 19 – Firebag .....	364
AMS 20 – MacKay River .....	388
AMS 21 – Conklin .....	413
AMS 22 – Janvier .....	439
AMS 23 – Fort Hills .....	465
AMS 25 – Waskōw ohci Pimâtisiwin .....	490
AMS 26 – Christina Lake.....	516
AMS 27 – Jackfish 2/3 .....	541
AMS 29 – Surmont 2 .....	565
AMS 30 – Ells River .....	591
AMS 31 – Monday Creek .....	616
AMS 501 – Leismer .....	640
AMS 505 – Sawbones Bay .....	662
AMS 506 – Jackfish 1.....	684
AMS 507 – Kirby South.....	708
AMS 508 – Kirby North .....	732
AMS 511 – Blackgold .....	757
AMS 512 – Hangingstone Expansion .....	775





Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

Bertha Ganter – Fort McKay

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LAST UPDATED: FEBRUARY-21-2025



# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	13
Site photos .....	18
Station Photos.....	23



## Tables and Figures

Table 1.0 - Pollutant Parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area Topographic map showing AMS 01 .....	14
Figure 3.0 – Aerial photo showing AMS 01.....	15
Figure 4.0 – Plan view sketch for AMS 01 site .....	16
Figure 5.0 – Elevation view image for AMS 01 site.....	17
Figure 6.0 – Environment looking North.....	18
Figure 6.1 – Environment looking East .....	19
Figure 6.2 – Environment looking South.....	20
Figure 6.3 – Environment looking West.....	21
Figure 6.4 – Meteorological Tower .....	22
Figure 7.0 – Photo showing the inlet and sample manifold .....	23
Figure 7.1 – Curb shot of the monitoring station .....	24
Figure 7.2 –Photo of the front and the back of the instrument rack .....	26
Figure 8.0 – Windrose (Five Year) .....	27



## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

### Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.



In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.



Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include; sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant Parameters monitored in the WBEA network



Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network



Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP
					ECOC			
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X	
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X	
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X	
9	ATTRIBUTION	BARGE LANDING	X					
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X			X		
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X	
17	COMPLIANCE	WAPASU			X			X
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X
21	COMMUNITY	CONKLIN	X	X		X	X	
22	COMMUNITY	JANVIER	X	X		X	X	
23	COMPLIANCE	FORT HILLS	X			X		
30	COMPLIANCE	ELLS RIVER	X			X		

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network





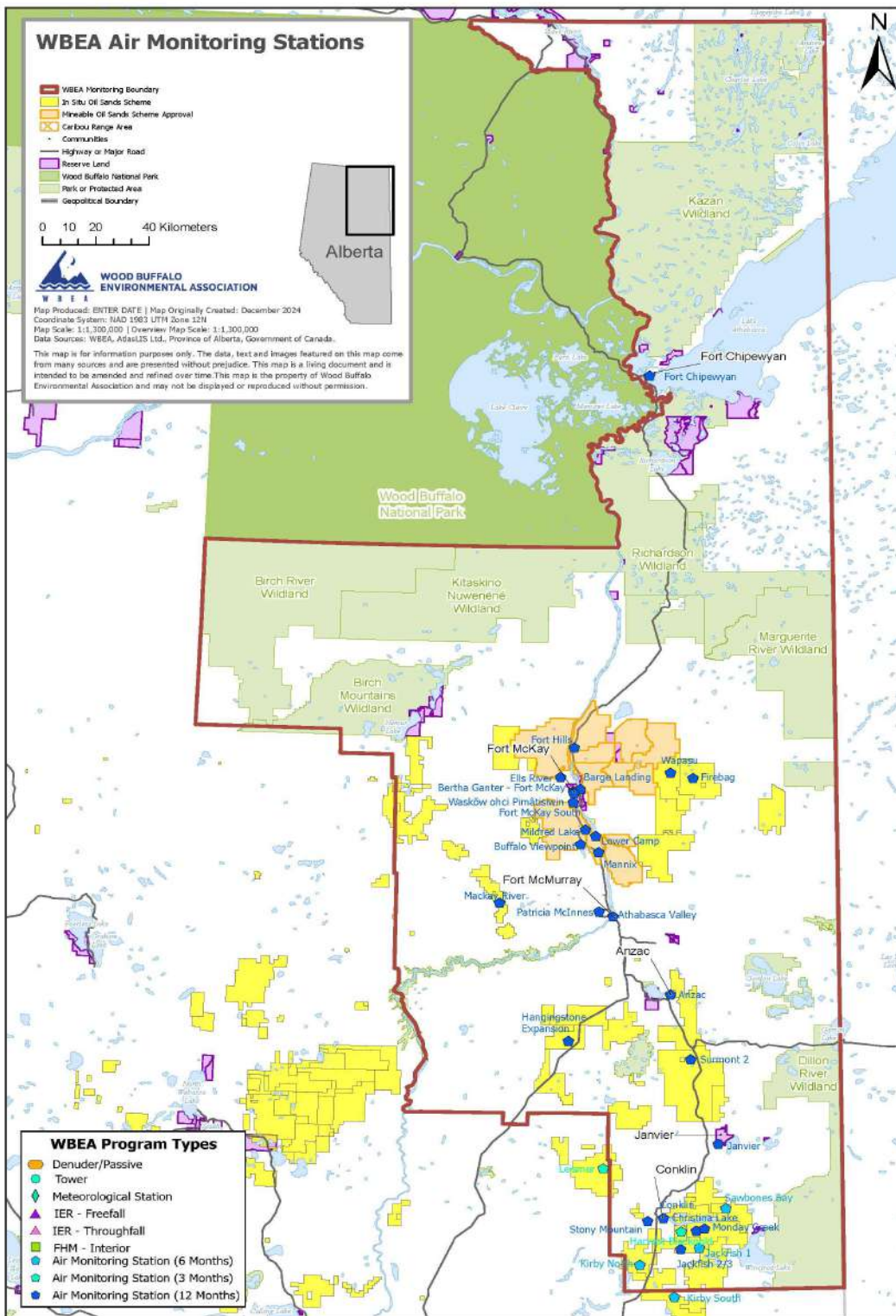


Figure 1.0 – WBEA Network Monitoring Sites



## General Site Information

### Station

Station ID	AMS 01
Station name	Fort McKay – Bertha Ganter
Date station established	October 1997

### Location

Station street address	NA
Legal land description	13-25-094-11 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	57°11'21.94"North
Longitude	111°38'26.10"West
UTM East	461284
UTM North	6338654
Nearest community	Fort McKay
Community population	757
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	NA
Approval number	NA
Contact Name	Wood Buffalo Environmental Association
Address	Unit 3 – 805 Memorial Drive, Fort McMurray, AB
Phone number	780-799-4420
Email address	info@wbea.org

### Site Description

Land use by sector	0 – 90 degrees	Forest and Residential
	91 – 180 degrees	Residential and Water services
	181 – 270 degrees	Forest and Residential
	271 – 360 degrees	Forest and Residential
Site elevation (m) (above sea level)	270m	
Angle of elevation to nearby buildings	Greatest angle	N/A
	Building direction	None
Airflow restrictions	North	No
	East	No
	South	No



	West	No
Distance to nearest trees (m)	North	0m
	East	10m
	West	20m
	South	0m
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	10 m
	Distance from station (m)	Attached to north side of the station

## Site Influences

### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Snow dump	100	Occasionally heavy truck and graders parked in the area.

### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Gravel road	Low	50	Access road
Gravel road	Medium	200	Access road – Range road 110A

### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
CNRL Albian Sands	Oil Sands Plant	340,000 bpd	10	North East
Syncrude Canada Ltd.	Oil Sands Plant	350,000 bpd	10	South East



## Station Equipment

Equipment Owner: WBEA

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO <sub>2</sub>	Thermo Environmental	43i	JC1501301448	2015
H <sub>2</sub> S	Thermo Environmental	43iqTL	1200326167	2021
TRS	Thermo Environmental	43i-TLE	1218153461	2012
NO <sub>2</sub>	Teledyne/API	T200	7117	2024
O <sub>3</sub>	Teledyne/API	T400	1107	2017
NH <sub>3</sub>	Teledyne/API	T201	808	2023
NMHC	Thermo Environmental	55i	1180320040	2022
CO	Teledyne/API	T300	3520	2019
CO <sub>2</sub>	Teledyne/API	T360	442	2022
PM <sub>2.5</sub>	Teledyne/API	T640	322	2018
BC	Magee Scientific	AE33	AE33-SO3-00299	2018
EC/OC	Thermo Environmental	2000i	2000i 20222 1205	2018
PM <sub>2.5</sub> A	Thermo Environmental	2000i	2000i 20390 1308	2021
PM <sub>10</sub> A	Thermo Environmental	2000i	2000i 20457 1405	2018
PM <sub>10</sub> B	Thermo Environmental	2000i	2000i 20484 1408	2018
PM <sub>2.5</sub> B	Thermo Environmental	2000i	2000i 20487 1408	2018
PAH	Tisch	TE-1000	1001056	2015
PC	Yankee Environmental	TPC-3000	164	2018
PC	N-CON	ADS 00-120	60141	2018
VOC	Tisch	TE123	1028	2018

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
WS	Met One	010C-1	P10041	Class 3	2015
WD	Met One	020C-1	R14655	Class 3	2022
AT/RH	Vaisala	HMP155	NA	Class 3	2015
AT/RH	Vaisala	HMP155	N0810526	Class 3	2022
GR	Eppley Radiometer	8-48	38279	NA	2015
PC	OTT	Pluvio 2	363525	Class 3	2019
LW	Campbells Scientific	LWS-L50	22121-30	NA	2023



## Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	9036
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	3565
Zero air generator	Zero Air Generator	Teledyne/API	701	4766
Shelter / Building	Air monitoring portable	ITB	10 x 20 skid	IBT-16-17048
HVAC	Heating and air conditioning system. Wall mount unit	BARD	2 ton	NA
Deck	Deck for sampling equipment	10 x 20	NA	NA
Deck	Deck for sampling equipment	15 x 30	NA	NA
Datalogger	Logger for Pluvio	Campbell Scientific	CR310	5016
Datalogger	Logger for camera and AE33	Campbell Scientific	CR1000	23051
N2 generator	N2 generator for the CO/CO2	Peak Scientific	NG5000A	722090034
NH3 Converter	External converter for the NH3 analyzer	Teledyne/API	T501	484
Thermal Oxidizer	TRS converter	CD Nova	CDN-101	470
H2S Converter	External converter for the H2S analyzer	Global Analyzer Systems	G150	2022-221
10m Tower	10m Tower	Aluma	T135	NA



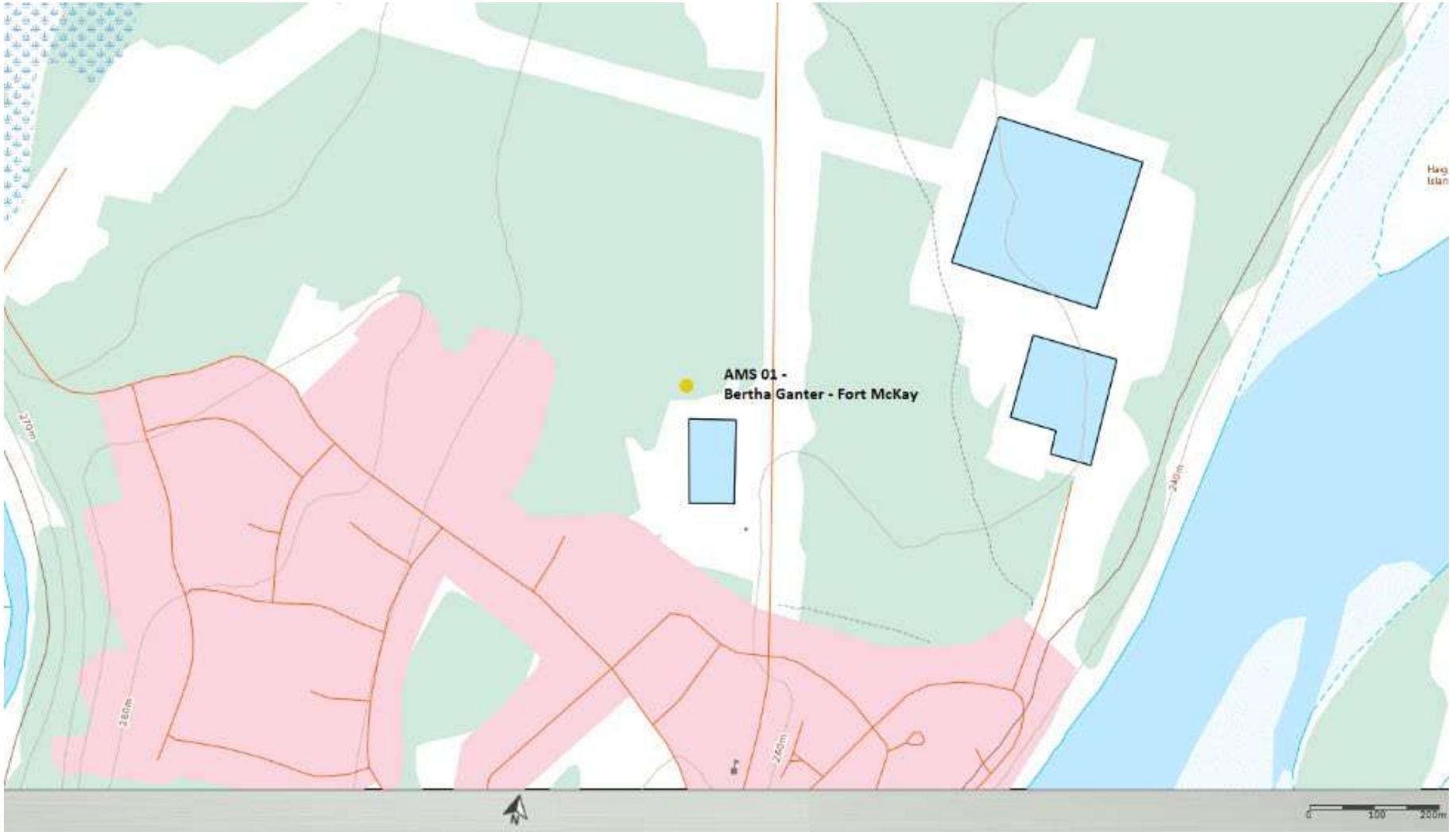


Figure 2.0 – Area Topographic map showing AMS 01





Figure 3.0 – Aerial photo showing AMS 01





Figure 4.0 – Plan view sketch for AMS 01 site



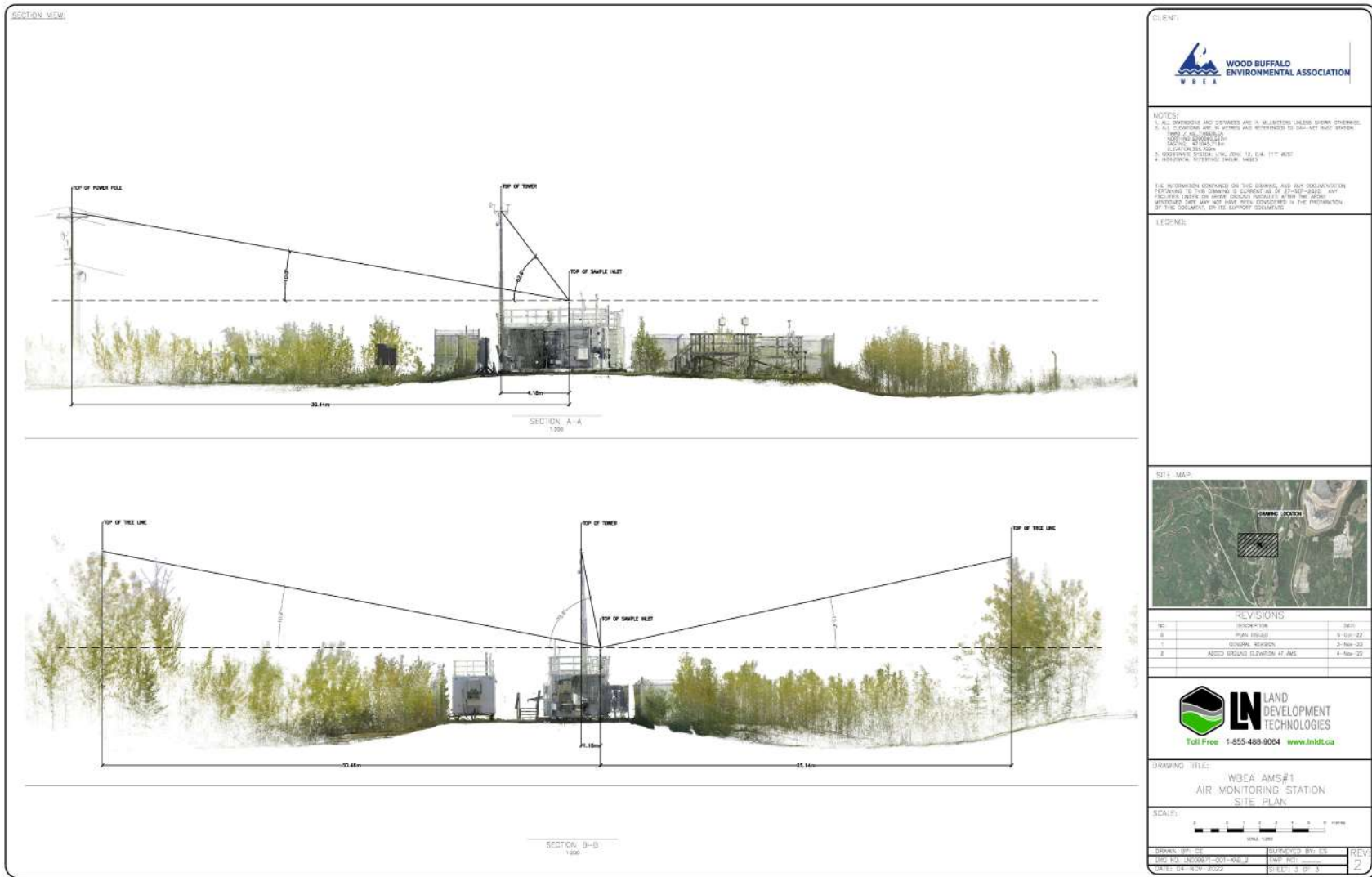


Figure 5.0 – Elevation view image for AMS 01 site

## Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North



Figure 6.1 – Environment looking East





Figure 6.2 – Environment looking South



Figure 6.3 – Environment looking West





Figure 6.4 – Meteorological Tower

## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold



Figure 7.1 – Curb shot of the monitoring station









Figure 7.2 –Photo of the front and the back of the instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

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

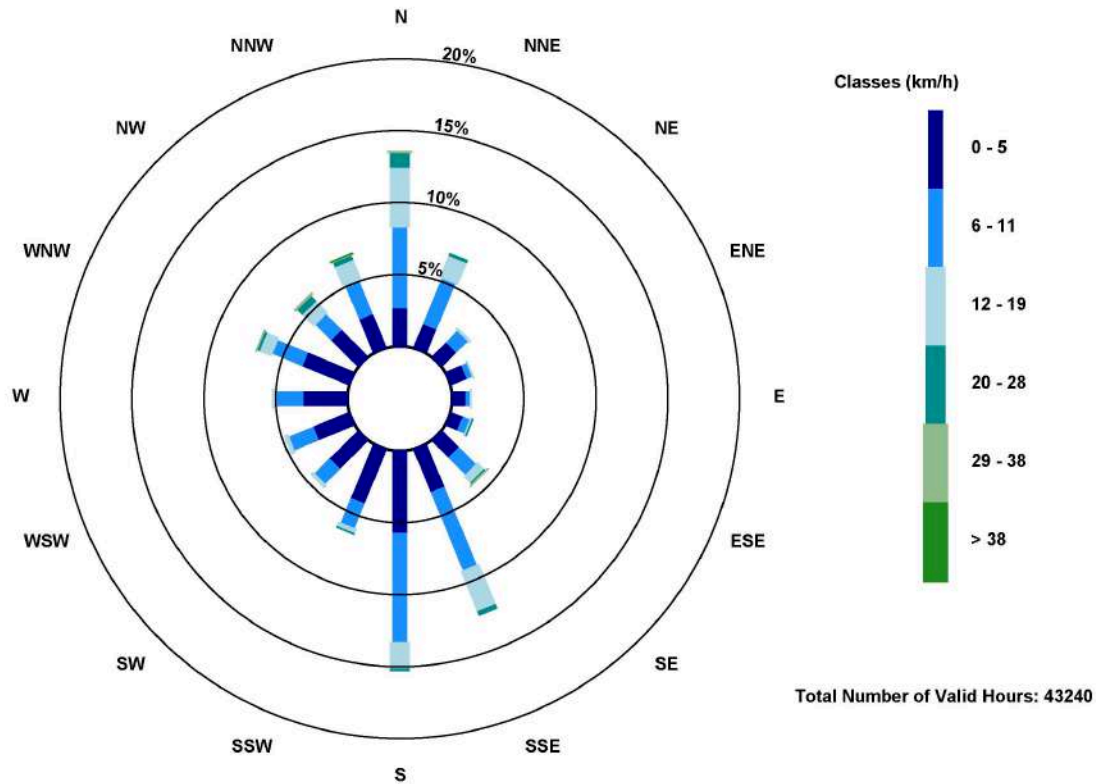


Figure 8.0 – Windrose (Five Year)



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station**  
**Site Documentation**

Mildred Lake

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# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	17
Station Photos.....	22

## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 02.....	13
Figure 3.0 – Aerial image showing AMS 02.....	14
Figure 4.0 – Plan view image for AMS 02 site.....	15
Figure 5.0 – Elevation view image for AMS 02 site.....	16
Figure 6.0 – Environment looking North.....	17
Figure 6.1 – Environment looking East .....	18
Figure 6.2 – Environment looking South.....	19
Figure 6.3 – Environment looking West.....	20
Figure 6.4 – Meteorological Tower .....	21
Figure 7.0 – Photo showing the inlet and sample manifold .....	22
Figure 7.1 – Curb shot of the monitoring station .....	23
Figure 7.2 –Photo of the front and the back of instrument rack.....	24
Figure 8.0 – Windrose (five year).....	25

## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

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### Time Integrated Sampling

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In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

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WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network

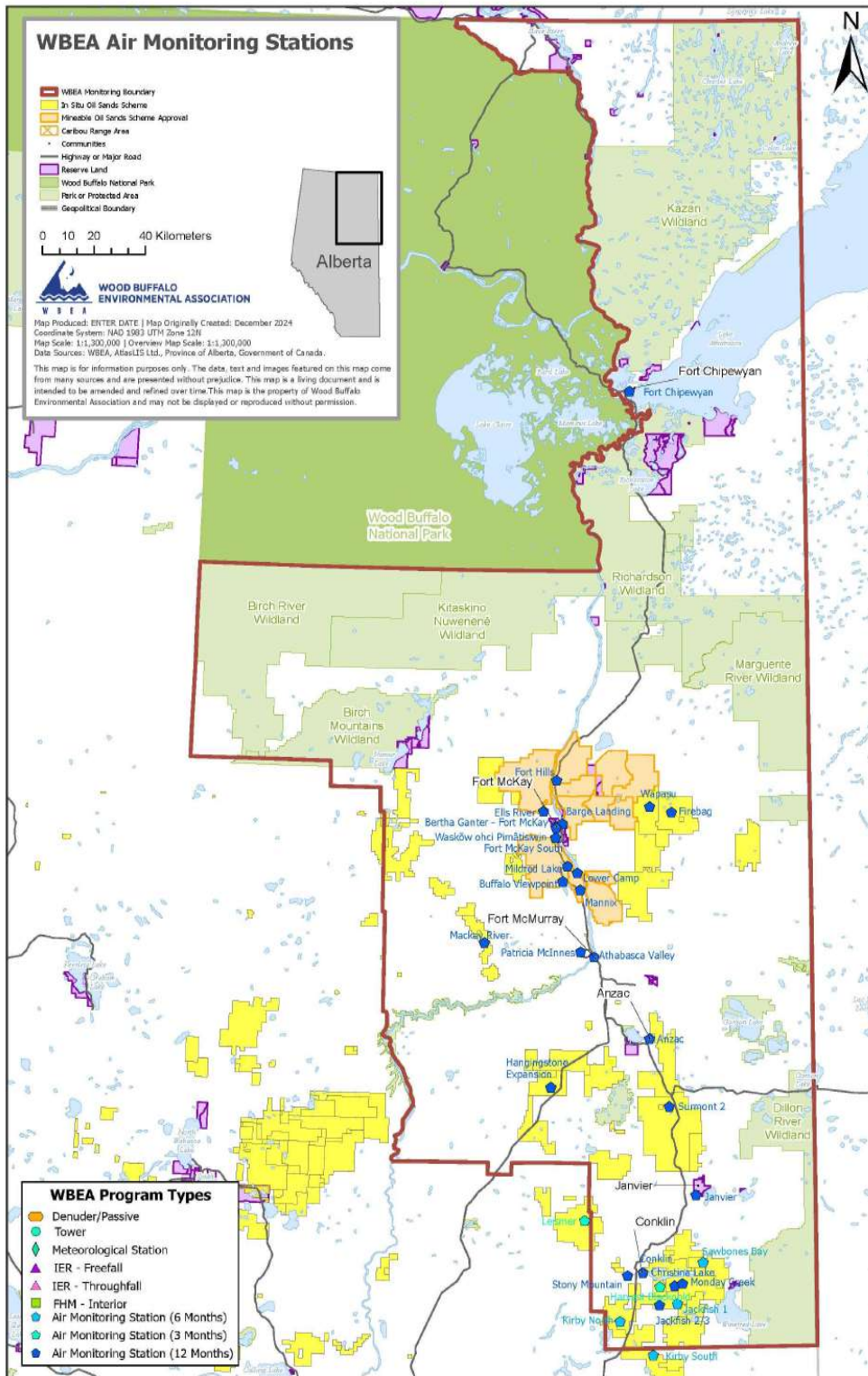


Figure 1.0 – WBEA Network Monitoring Sites

## General Site Information

### Station

Station ID	AMS 02
Station name	Mildred Lake
Date station established	June 1, 1979

### Location

Station street address	Located at the south end of the Syncrude airstrip, 400m west of HWY 63
Legal land description	8-08-093-10 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	57.050006
Longitude	-111.564147
UTM East	465775
UTM North	6323094
Nearest community	Fort Mackay
Community population	757
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Syncrude Canada Limited
Approval number	026-02-00
Contact Name	Brooke Bennett
Address	Bag 4009, MD 4160, Fort McMurray, Alberta, T9H 3L1
Phone number	780-790-5692
Email address	brobennett@suncor.com

### Site Description

Land use by sector	0 – 90 degrees	Airstrip
	91 – 180 degrees	Airstrip
	181 – 270 degrees	Forest
	271 – 360 degrees	Road
Site elevation (m) (above sea level)	314	
Angle of elevation to nearby buildings	Greatest angle	28 degrees
	Building direction	North
Airflow restrictions	North	Building
	East	None

	South	Trees
	West	Trees
Distance to nearest trees (m)	North	165 metre
	East	172 metre
	West	23 metre
	South	32 metre
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	10
	Distance from station (m)	Attached

## Site Influences

### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Airstrip	20	Syncrude Airstrip
Trailer	15	Toilet facilities

### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Access Road	Low	50	Paved secondary road for industrial access frequented by pick-up trucks, heavy equipment, and tractor trailers
Highway 63	Medium	300	Provincial highway frequented by tractor trailers, heavy equipment and light vehicles

### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Syncrude	Oil Sands Plant	350,000	5	West
Suncor	Oil Sands Plant	194,000	20	South East

## Station Equipment

Equipment Owner: Syncrude Canada Ltd.

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO2	Thermo Environmental	43i	JC1404901075	2015
H2S	Thermo Environmental	43iQTLE	12333331546	2024
NMHC	Thermo Environmental	55i	12227620776	2025

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	N2910507	Class 3	2019
WS	Met One	010C-1	E5130	Class 4	2018
WD	Met One	020C-1	B1462	Class 4	2018

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	8790
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	1185
Zero air generator	Zero Air Generator	Teledyne/API	701	4891
Shelter / Building	Air monitoring portable	C&V	8 x 16 trailer	S3381408
Mitsubishi Electric Mr Slim	Heating and air conditioning system. Wall mount unit	R410A	MUY-GE15NA	30025603T
H2S converter	Converter	Global Analyzer Systems	G150	2023-267





Figure 2.0 – Area topographic map showing AMS 02



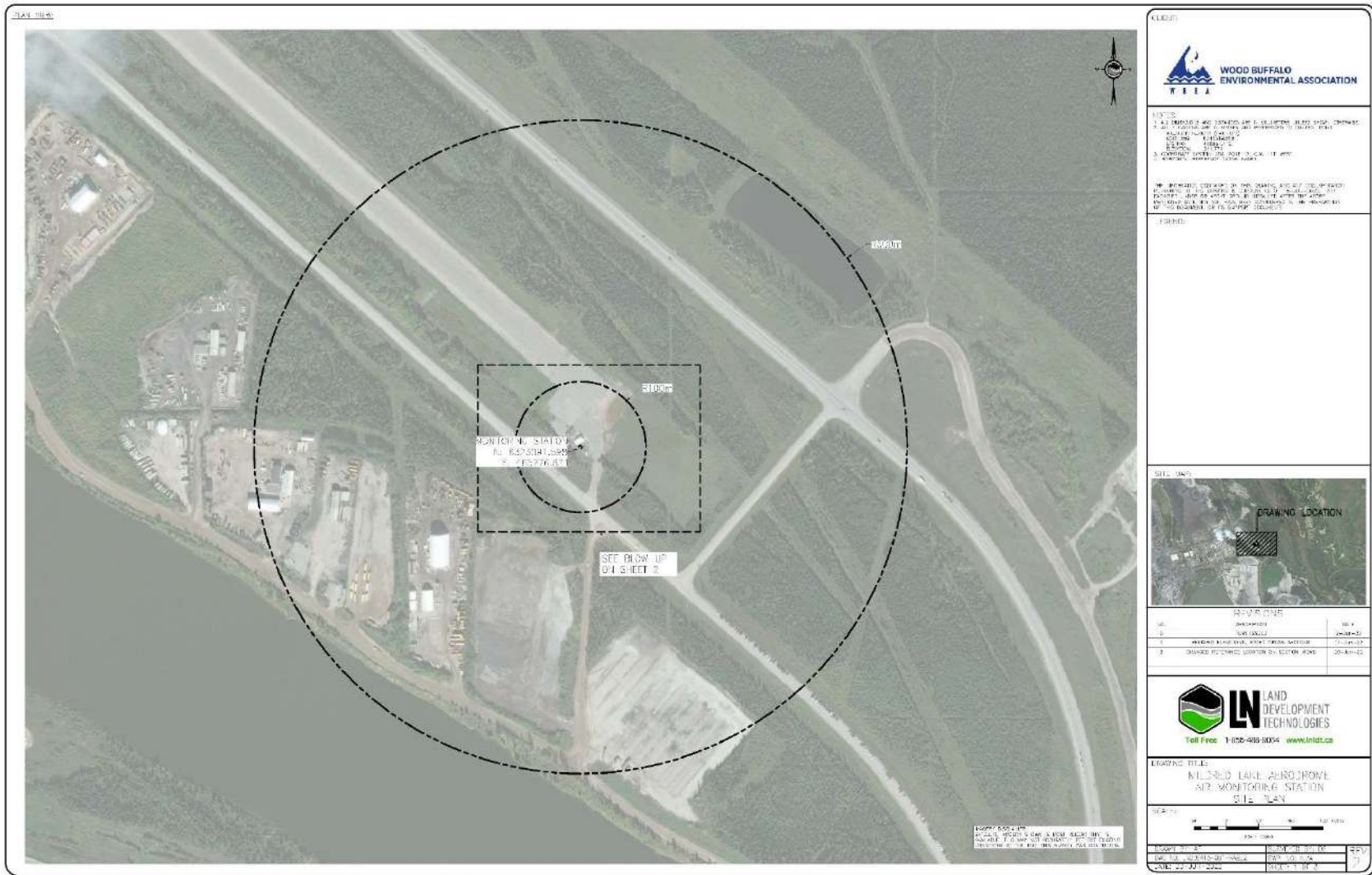


Figure 3.0 – Aerial image showing AMS 02



Figure 4.0 – Plan view image for AMS 02 site



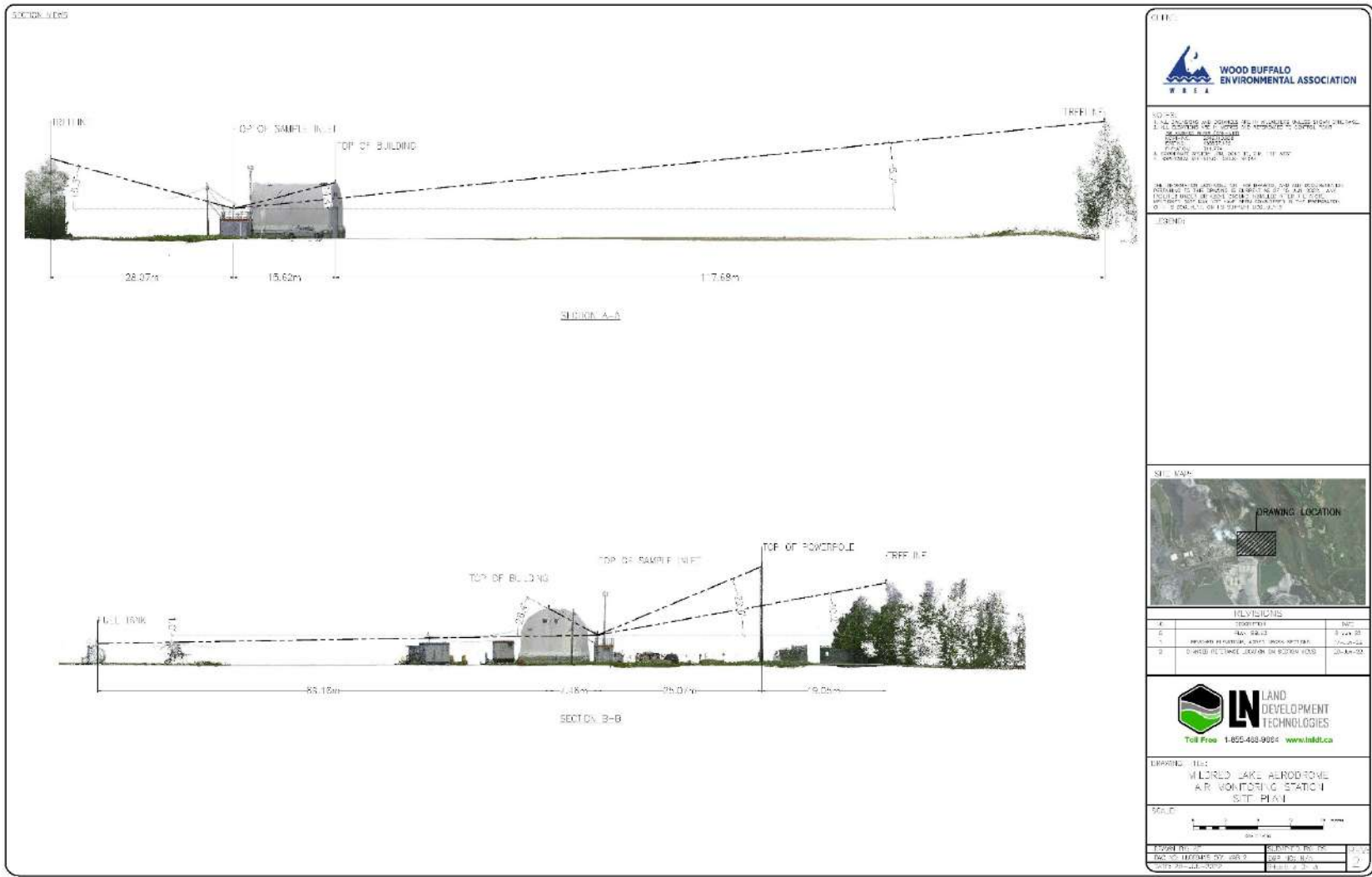


Figure 5.0 – Elevation view image for AMS 02 site

Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North



Figure 6.1 – Environment looking East





Figure 6.2 – Environment looking South



Figure 6.3 – Environment looking West





Figure 6.4 – Meteorological Tower



## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold



Figure 7.1 – Curb shot of the monitoring station



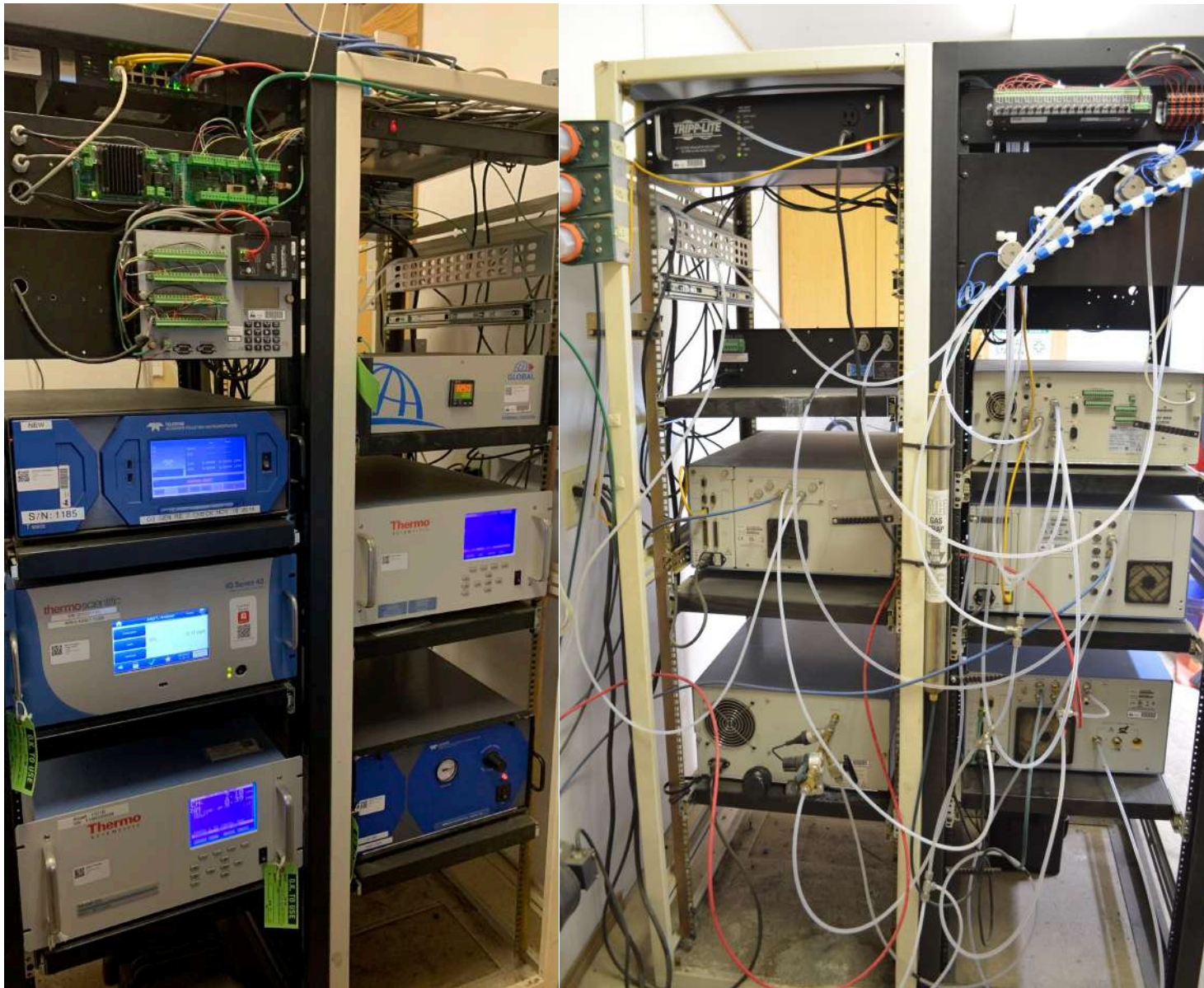


Figure 7.2 –Photo of the front and the back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

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

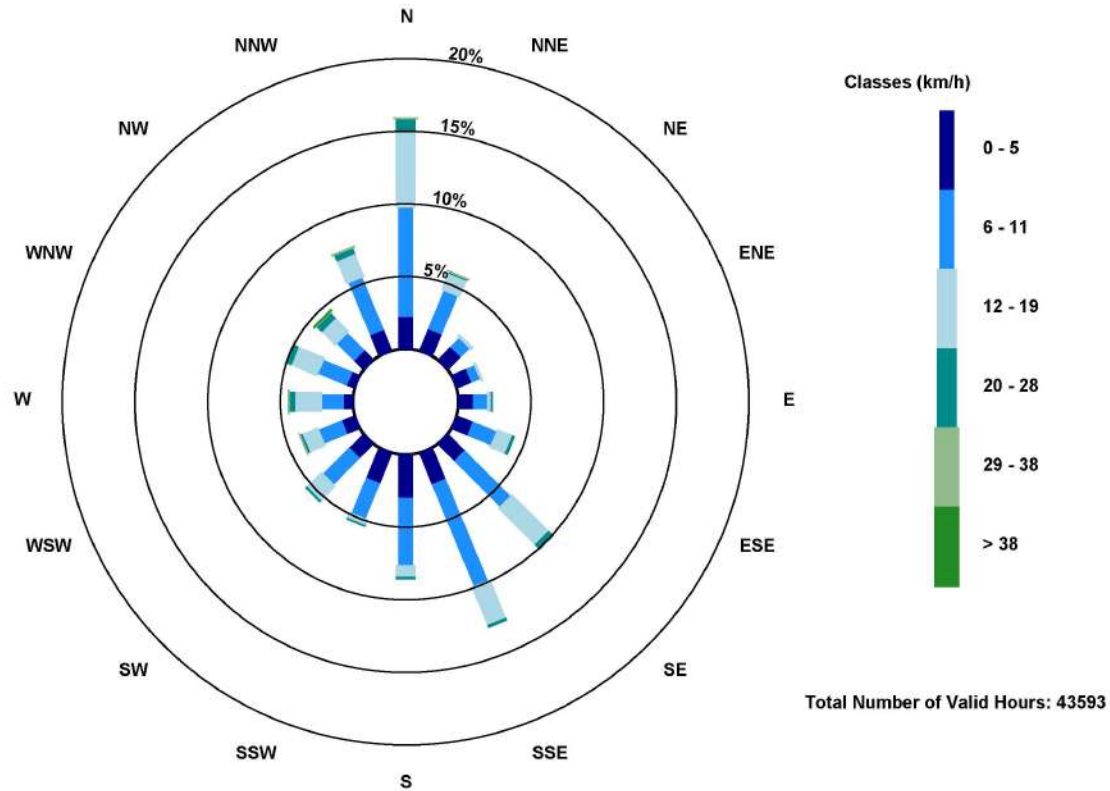


Figure 8.0 – Windrose (five year)



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station**  
**Site Documentation**

# Lower Camp Meteorological Tower

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LAST UPDATED: FEBRUARY 24, 2025



# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description .....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	17
Station Photos.....	22



## Tables and Figures

Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 03.....	13
Figure 3.0 – Aerial photo showing AMS 03.....	14
Figure 4.0 – Plan view image for AMS 03 site.....	15
Figure 5.0 – Elevation view image for AMS 03 site.....	16
Figure 6.0 – Environment looking North.....	17
Figure 6.1 – Environment looking East .....	18
Figure 6.2 – Environment looking South.....	19
Figure 6.3 – Environment looking West.....	20
Figure 6.4 – Meteorological Tower.....	21
Figure 7.1 – Curb shot of the monitoring station .....	22
Figure 8.0 – Windrose – 20 Metre Level (2020-2025) .....	23
Figure 8.1 – Windrose – 45 Metre Level (2020-2025) .....	24
Figure 8.2 – Windrose – 100 Metre Level (2020-2025) .....	25
Figure 8.3 – Windrose – 163 Metre Level (2020-2025) .....	26

## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

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WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network



Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network

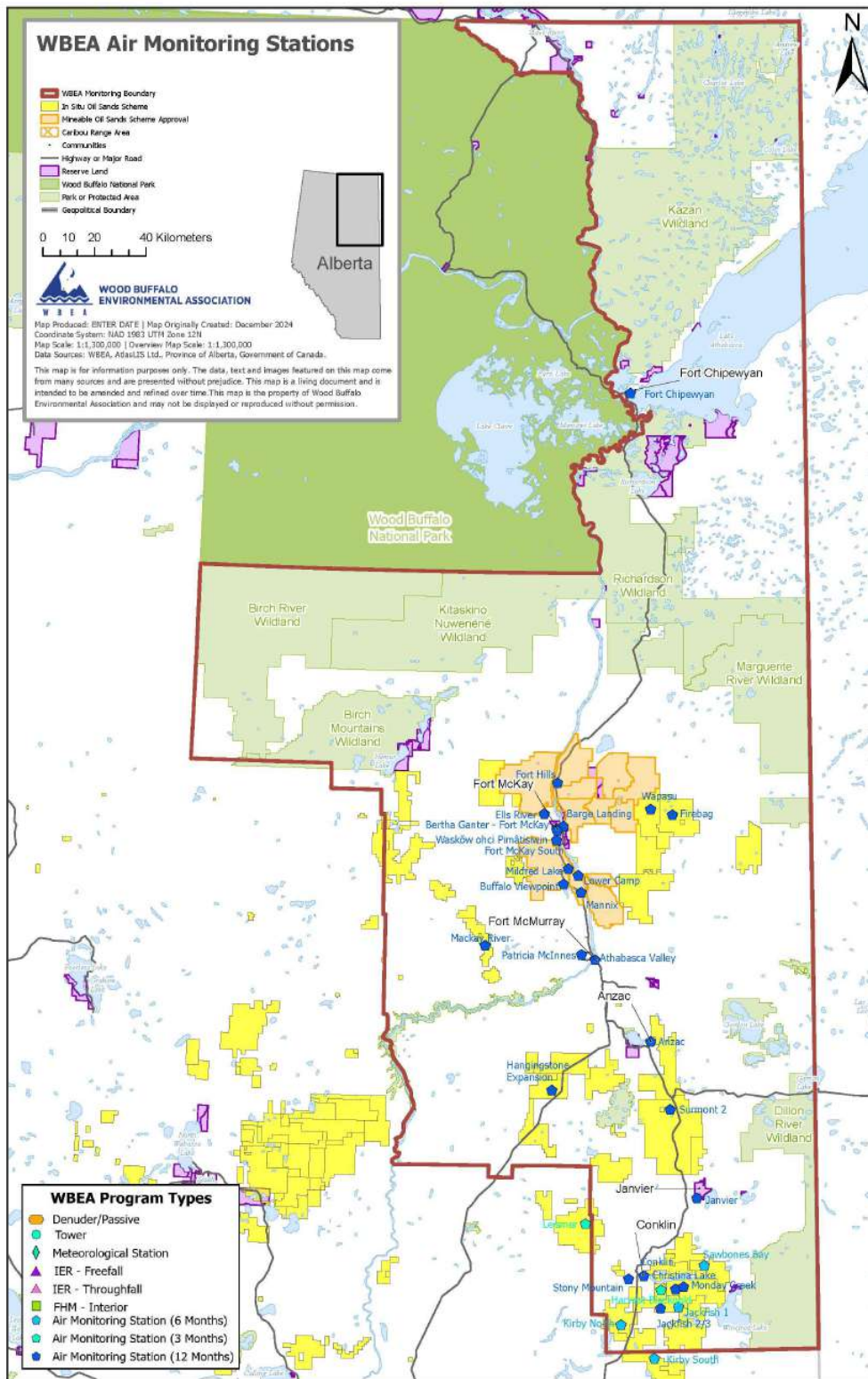


Figure 1.0 – WBEA Network Monitoring Sites

## General Site Information

### Station

Station ID	AMS 03
Station name	Lower Camp Meteorological Tower
Date station established	Original site 1975, new tower erected in 2022

### Location

Station street address	Located by the Athabasca River Valley at about 115 meters NW of the Syncrude pump house
Legal land description	4-02-093-10 W4
Airshed Zone	WBEA
Latitude	57.0321738
Longitude	-111.506355
UTM East	469266.90
UTM North	6321111.10
Nearest community	Fort McMurray
Community population	66,573
Census Year	2016

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Syncrude Canada Ltd.
Approval number	026-02-00
Contact Name	Brooke Bennett
Address	Bag 4009, MD 4160, Fort McMurray, Alberta, T9H 3L1
Phone number	780-790-5692
Email address	Bennett.Brooke@syncrude.com

### Site Description

Land use by sector	0 – 90 degrees	Athabasca River and forest
	91 – 180 degrees	Athabasca River and forest
	181 – 270 degrees	Suncor Base Plant
	271 – 360 degrees	Syncrude plant and operations
Site elevation (m) (above sea level)	239 metres	
Angle of elevation to nearby buildings	Greatest angle	0
	Building direction	N/A
Airflow restrictions	North	No
	East	No

	South	No
	West	No
Distance to nearest trees (m)	North	100
	East	100
	West	NA
	South	NA
Sample manifold	Type	N/A
	Inlet height above roof	N/A
Meteorological Sensors	Type	Ultrasonic
	Height above ground (m)	20, 45, 100, 163 metres
	Distance from station (m)	Mounted on tower

## Site Influences

### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Laydown	79.21m W	Equipment Laydown
Water Pond	136.8m SW	Reservoir
Athabasca River	33.8m E	River
Solar Farm	220m NW	Solar Farm
Pumping Station	114m SE	Syncrude Water Pump Station

### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Gravel road	Low	20	Road access to lay down and pumping station

### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Suncor Energy	Oil refinery		2	South West
Syncrude	Oil refinery/open mining		3	West
Suncor Energy	Open mining operations		4	South East



## Station Equipment

Equipment Owner: WBEA

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
20 Metre WS/WD	RM Young	81000	003492	3	2022
45 Metre WS/WD	RM Young	81000	00544	3	2022
100 Metre WS/WD	RM Young	81000	00584	3	2022
163 Metre WS/WD	RM Young	81000	004000	3	2022
20 Metre AT/RH	Vaisala	HMP155	N5230182	3	2022
45 Metre AT/RH	Vaisala	HMP155	N/A	3	2022
100 Metre AT/RH	Vaisala	HMP155	J3310032	3	2022
167 Metre AT/RH	Vaisala	HMP155	F5010005	3	2022

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	5728

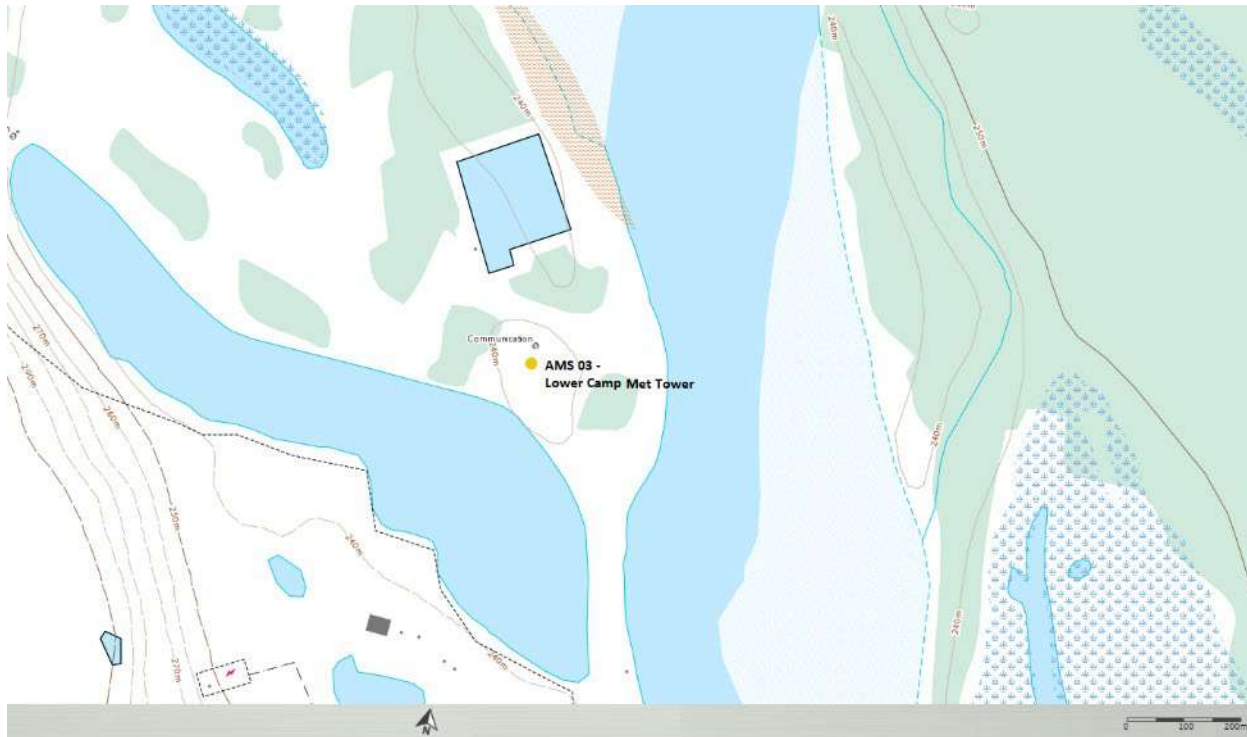


Figure 2.0 – Area topographic map showing AMS 03



Figure 3.0 – Aerial photo showing AMS 03

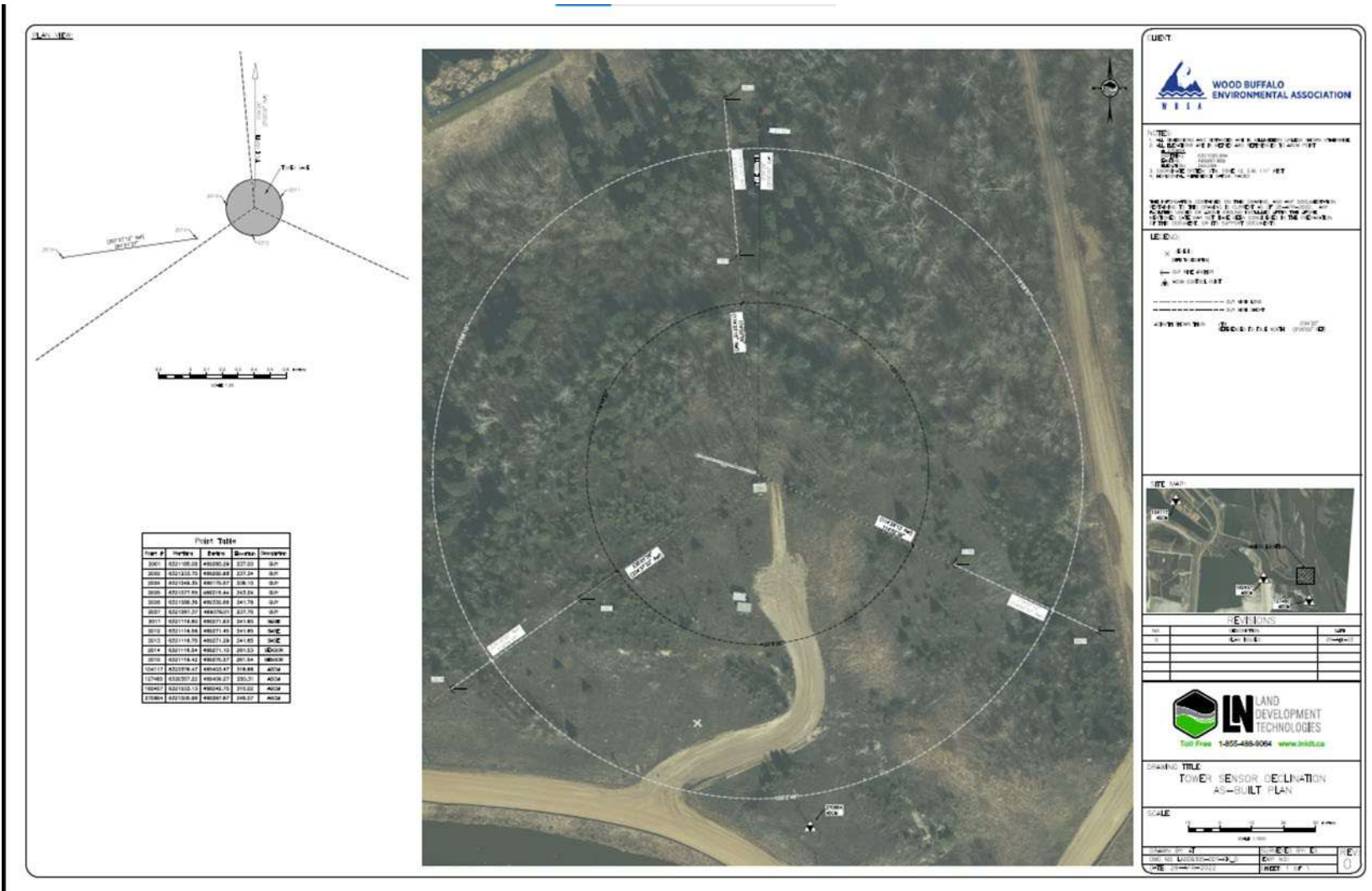


Figure 4.0 – Plan view image for AMS 03 site

The elevation image is currently not available.  
Figure 5.0 – Elevation view image for AMS 03 site



## Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North



Figure 6.1 – Environment looking East





Figure 6.2 – Environment looking South



Figure 6.3 – Environment looking West





Figure 6.4 – Meteorological Tower



## Station Photos

The following photos show the monitoring station.



Figure 7.1 – Curb shot of the monitoring station



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

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

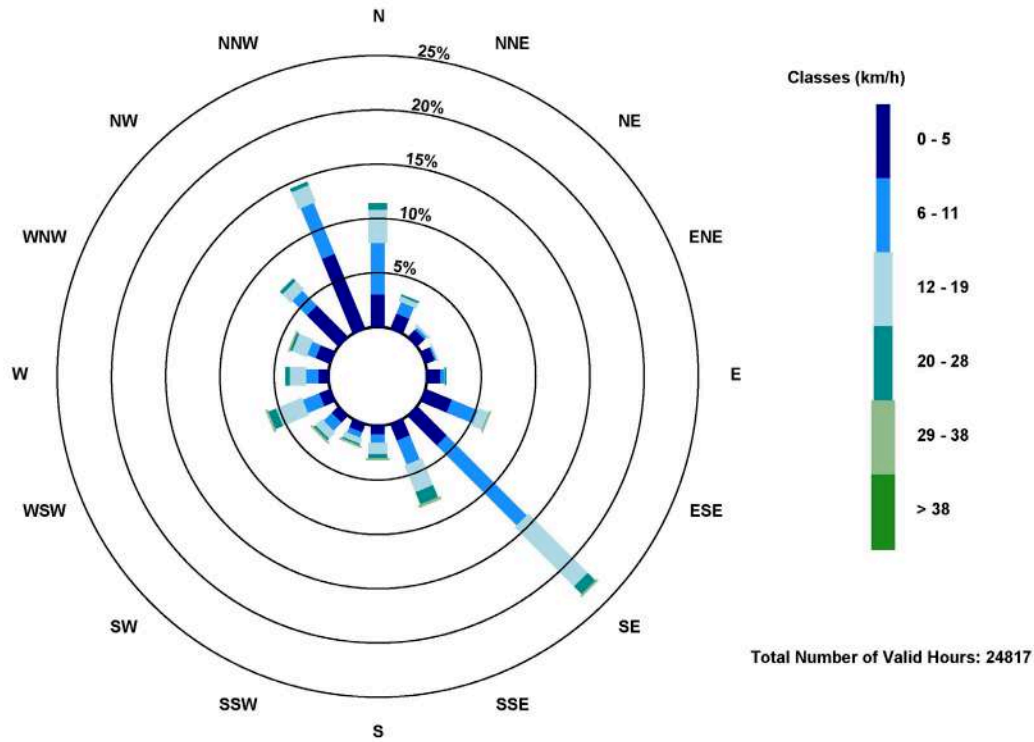


Figure 8.0 – Windrose – 20 Metre Level (2020-2025)



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

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

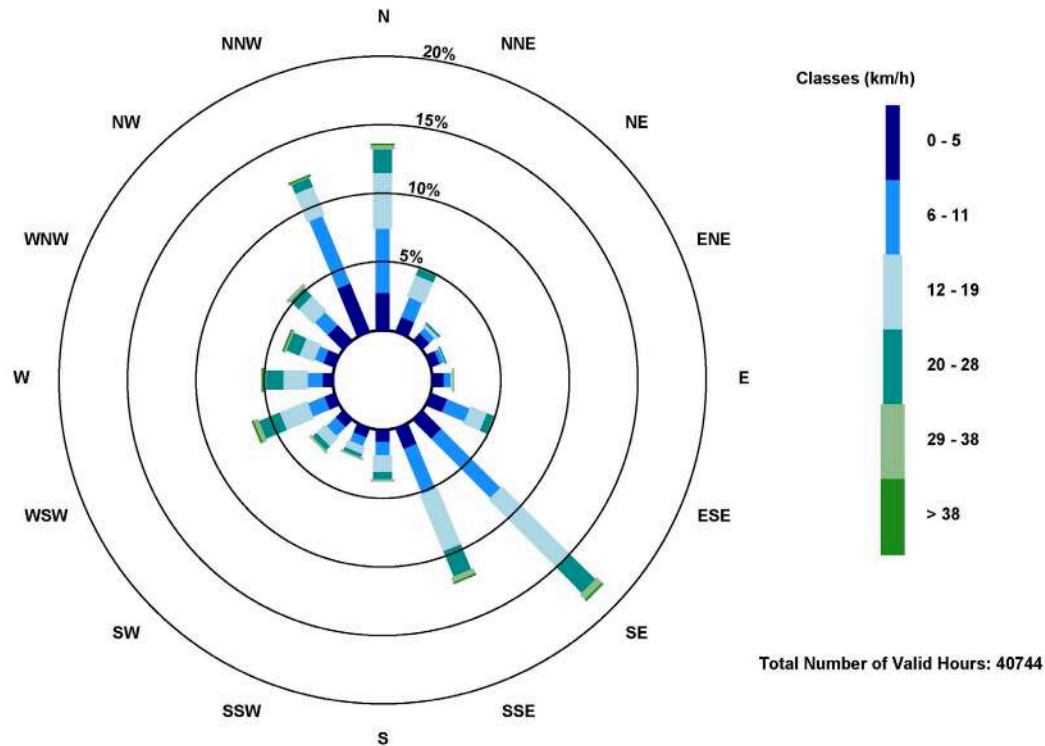


Figure 8.1 – Windrose – 45 Metre Level (2020-2025)



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

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

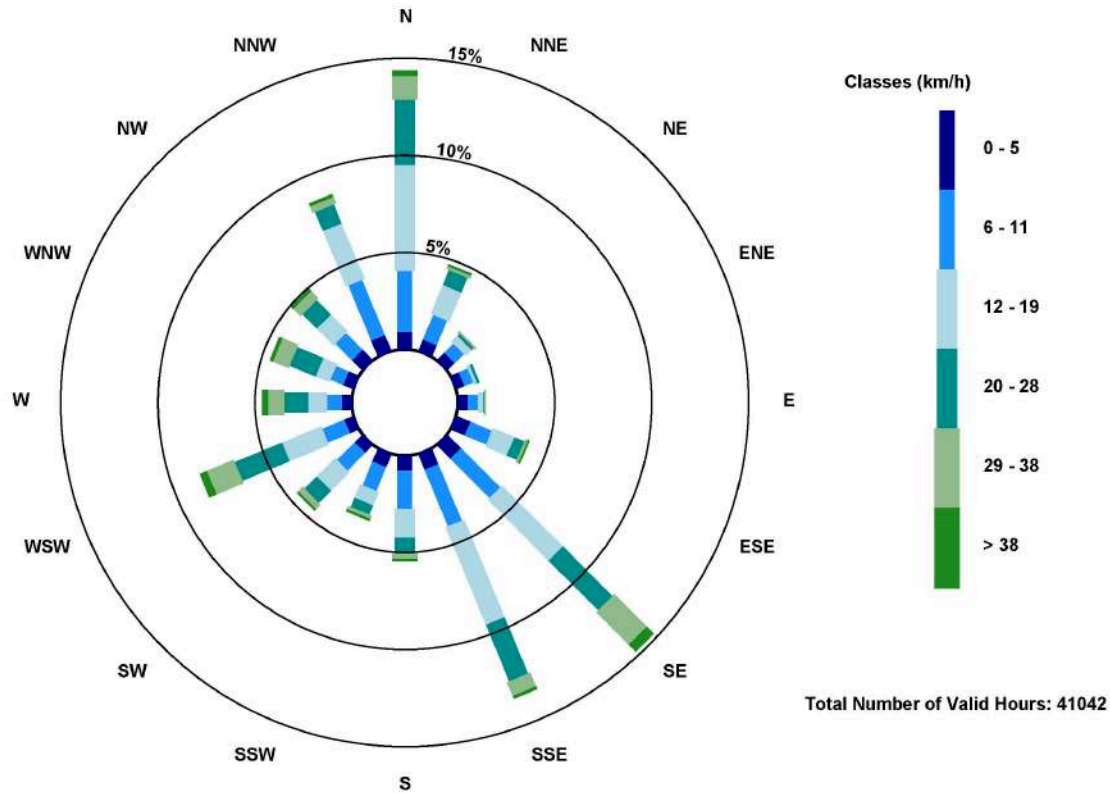


Figure 8.2 – Windrose – 100 Metre Level (2020-2025)





Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

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

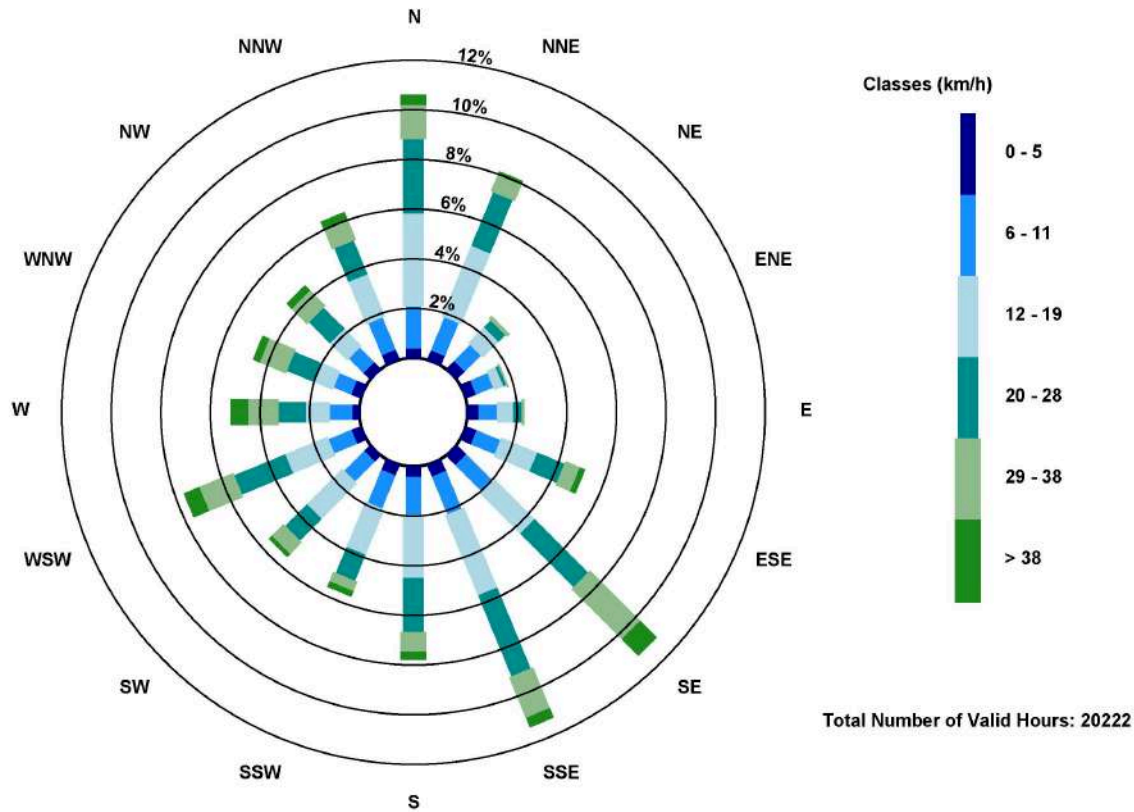


Figure 8.3 – Windrose – 163 Metre Level (2020-2025)



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

# Buffalo Viewpoint

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LAST UPDATED: FEBRUARY 26, 2025



# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Station Photos.....	22

## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 04.....	13
Figure 3.0 – Aerial image showing AMS 04.....	14
Figure 4.0 – Plan view image for AMS 04 site.....	15
Figure 5.0 – Elevation view image for AMS 04 site.....	16
Figure 6.0 – Environment looking North.....	17
Figure 6.1 – Environment looking East .....	18
Figure 6.2 – Environment looking South.....	19
Figure 6.3 – Environment looking West.....	20
Figure 6.4 – Meteorological Tower .....	21
Figure 7.0 – Photo showing the inlet and sample manifold .....	22
Figure 7.1 – Curb shot of the monitoring station .....	23
Figure 7.2 –Photo of the front and the back of instrument rack.....	25
Figure 8.0 – Windrose (Five Year) .....	26



## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

### Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.

In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.

Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include; sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	Compliance	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network



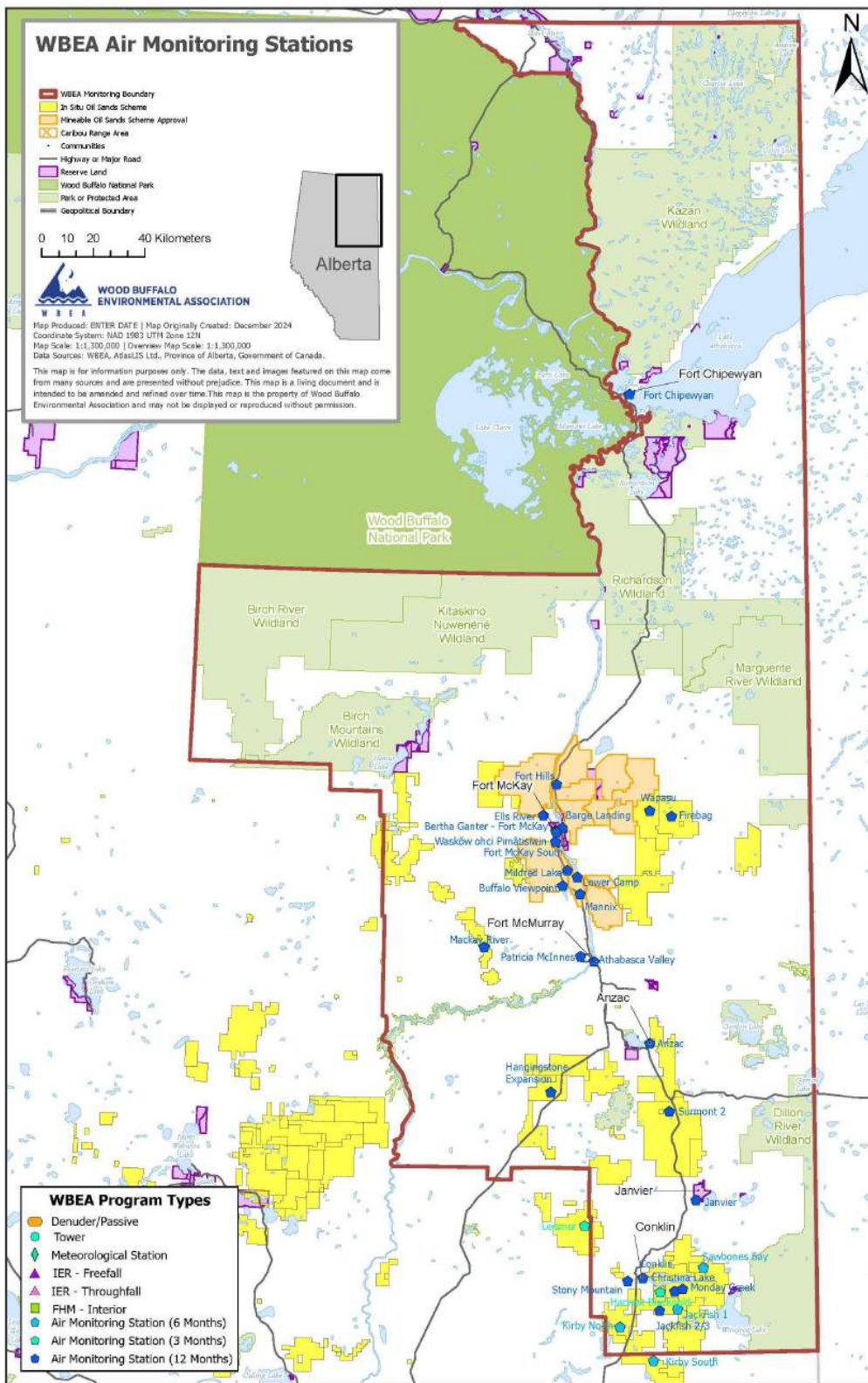


Figure 1.0 – WBEA Network Monitoring Sites

## General Site Information

### Station

Station ID	AMS 04
Station name	Buffalo Viewpoint
Date station established	1979

### Location

Station street address	NA
Legal land description	9-19-092-10 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	56.996243
Longitude	-111.594202
UTM East	463900
UTM North	6317125
Nearest community	Fort McKay
Community population	742
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Synchrude Canada Ltd
Approval number	026-02-00
Contact Name	Brooke Bennett
Address	Bag 4009, MD 4160, Fort McMurray, Alberta, T9H 3L1
Phone number	780-790-5692
Email address	brobennett@suncor.com

### Site Description

Land use by sector	0 – 90 degrees	Oil Sands Plant
	91 – 180 degrees	Forest
	181 – 270 degrees	Forest
	271 – 360 degrees	Oil Sands Plant
Site elevation (m) (above sea level)	315 metres	
Angle of elevation to nearby buildings	Greatest angle	0
	Building direction	NA
Airflow restrictions	North	None
	East	None
	South	None

	West	None
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Distance to nearest trees (m)	North	20 metres
	East	50 metres
	West	76 metres
	South	50 metres
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	10 m
	Distance from station (m)	Attached to North end of Monitoring Shelter

### Site Influences

#### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
None		

#### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Dirt	Very Low	2m North	Access Road to AMS 4
Dirt	Medium	147m North	Road used to Access North American/Syncrude Site
Highway	Medium	758m East	Paved Highway used by the public

#### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Syncrude	Oilsands Plant	350,000	5.12	North
Suncor	Oilsands Plant	194,000	7.8	SouthEast
Syncrude	Buffalo Farm		0.32	NorthWest
Syncrude	Tailings Pond		0.8	NorthEast

## Station Equipment

Equipment Owner:

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO2	Thermo Scientific	43i	JC1327200932	2017
H2S	Thermo Scientific	43i-LTE	108841400	2023
NO2	Teledyne	T200	721	2017
NMHC	Thermo Scientific	55i	1426262594	2022
O3	Teledyne	T400	2961	2017
PM2.5	Teledyne	T640	321	2019

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	G4340043	Class 3	2017
WS	Met One	010C-1	Y3176	Class 4	2017
WD	Met One	020C-1	U11346	Class 4	2017
PWD	Vaisala	PWD-22	H5030007		2017

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	2635
Datalogger	Datalogger	Campbell Scientific	CR1000	10414
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	3808
Zero air generator	Zero Air Generator	Teledyne/API	T701H	362
Shelter / Building	Air monitoring portable	National Trailer	8 x 16 trailer	NA
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	
Tower	10m Tower	Aluma Tower Company	T-135	AT62235-10-R11
H2S Converter	Thermal Oxidizer	Global Analyzer System	G150	2022-200

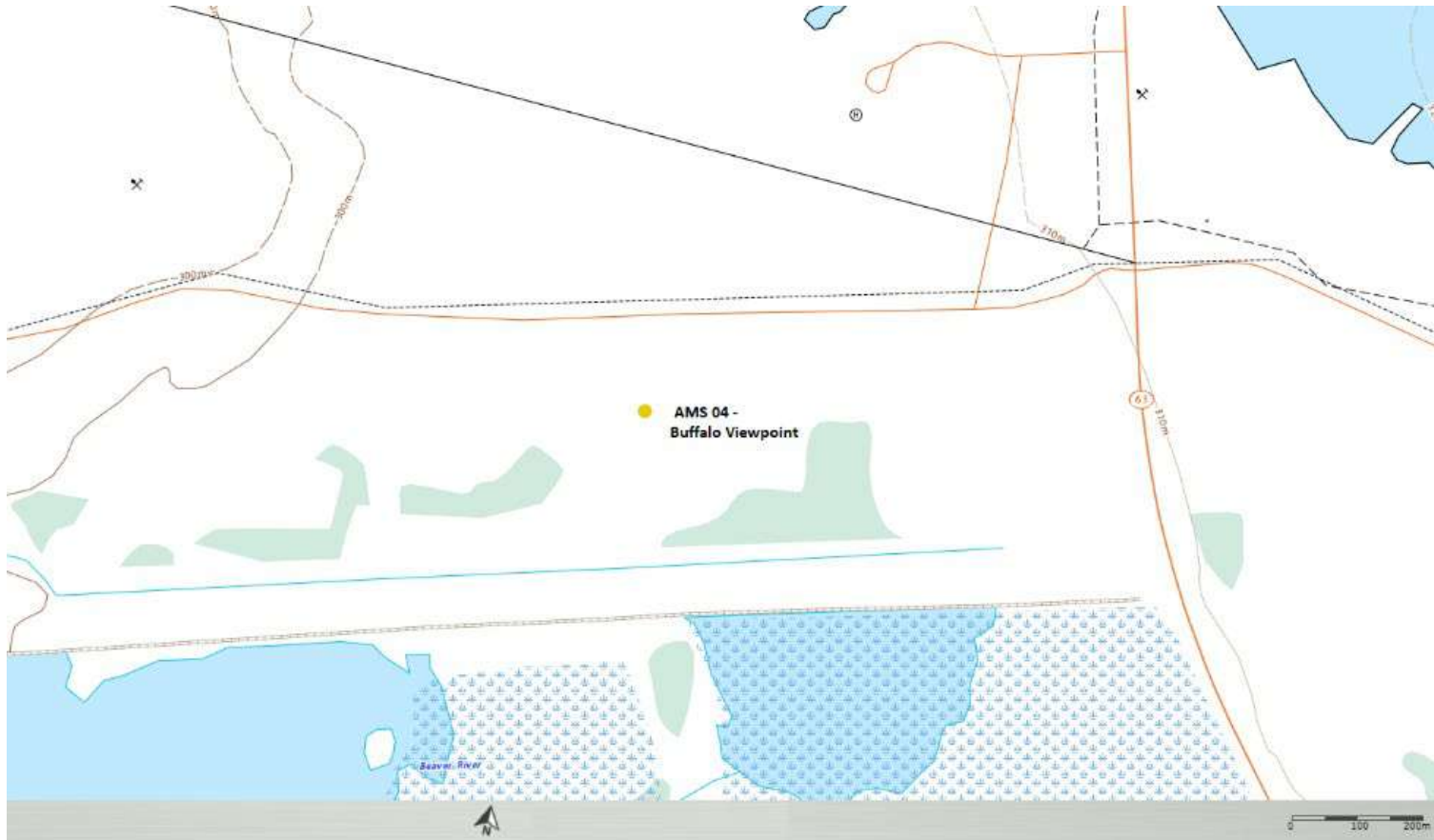


Figure 2.0 – Area topographic map showing AMS 04



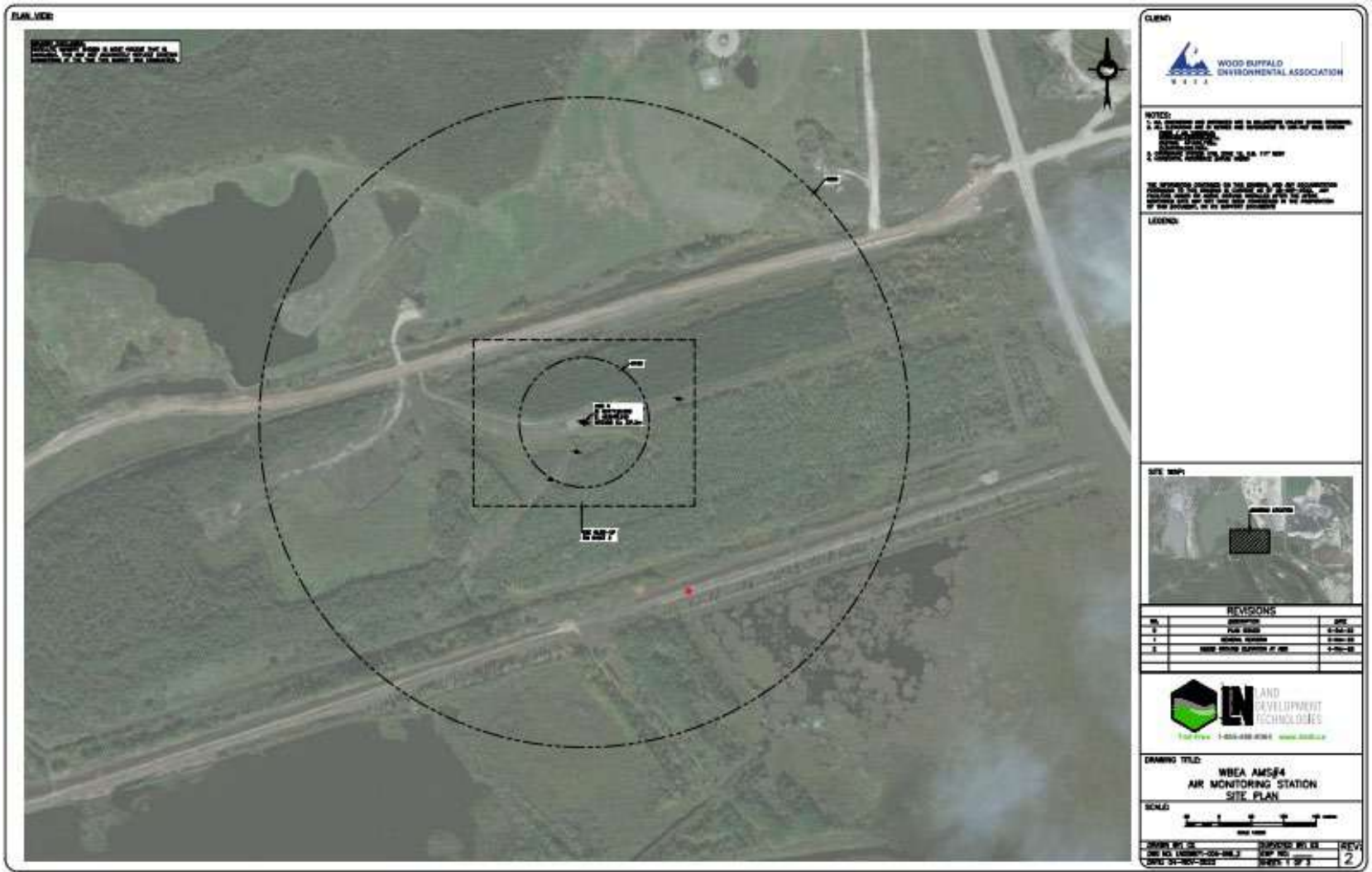


Figure 3.0 – Aerial image showing AMS 04



Figure 4.0 – Plan view image for AMS 04 site



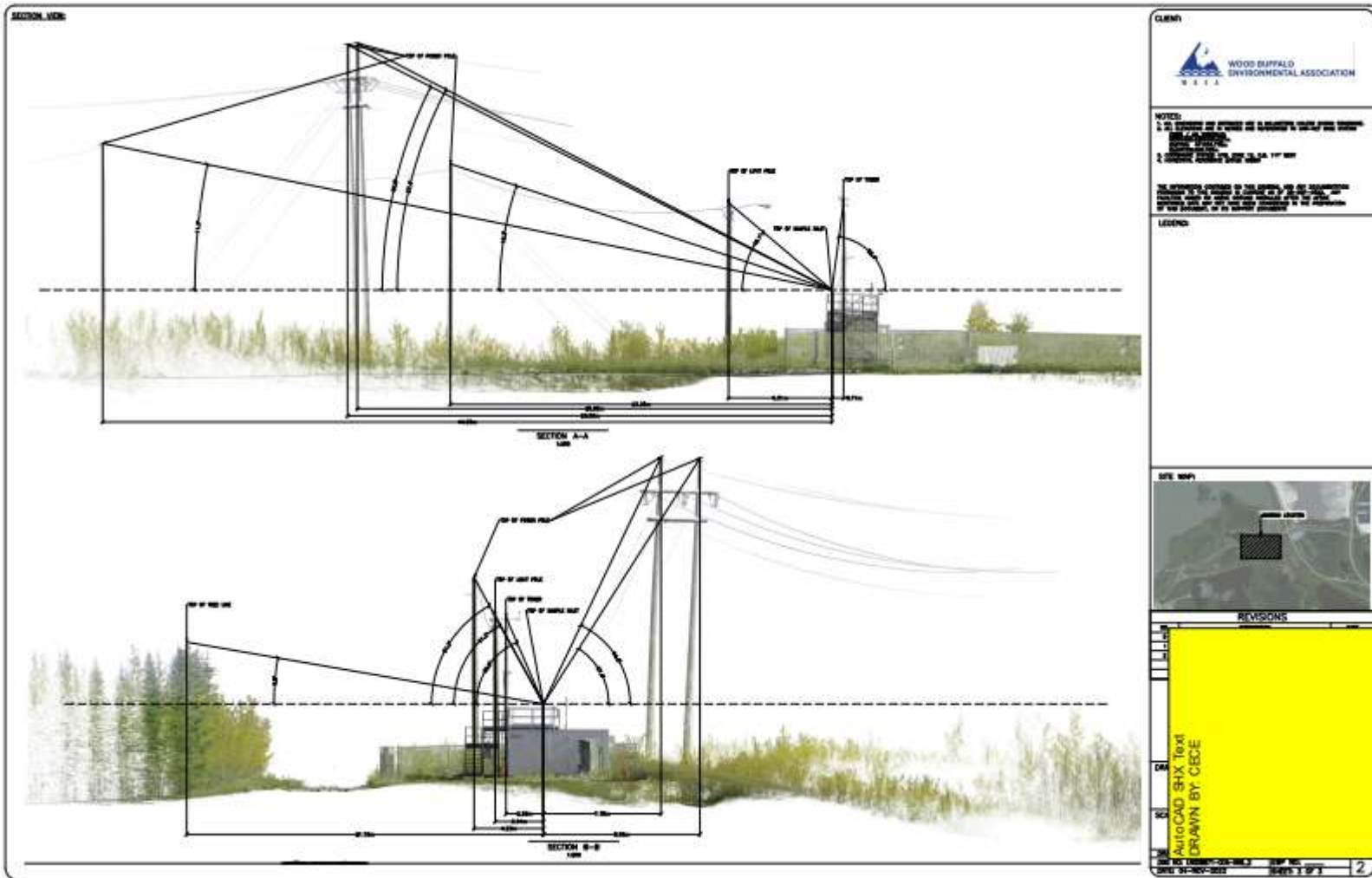


Figure 5.0 – Elevation view image for AMS 04 site

Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North





Figure 6.1 – Environment looking East





Figure 6.2 – Environment looking South



Figure 6.3 – Environment looking West



Figure 6.4 – Meteorological Tower



## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold





Figure 7.1 – Curb shot of the monitoring station





Figure 7.2 –Photo of the front and the back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

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

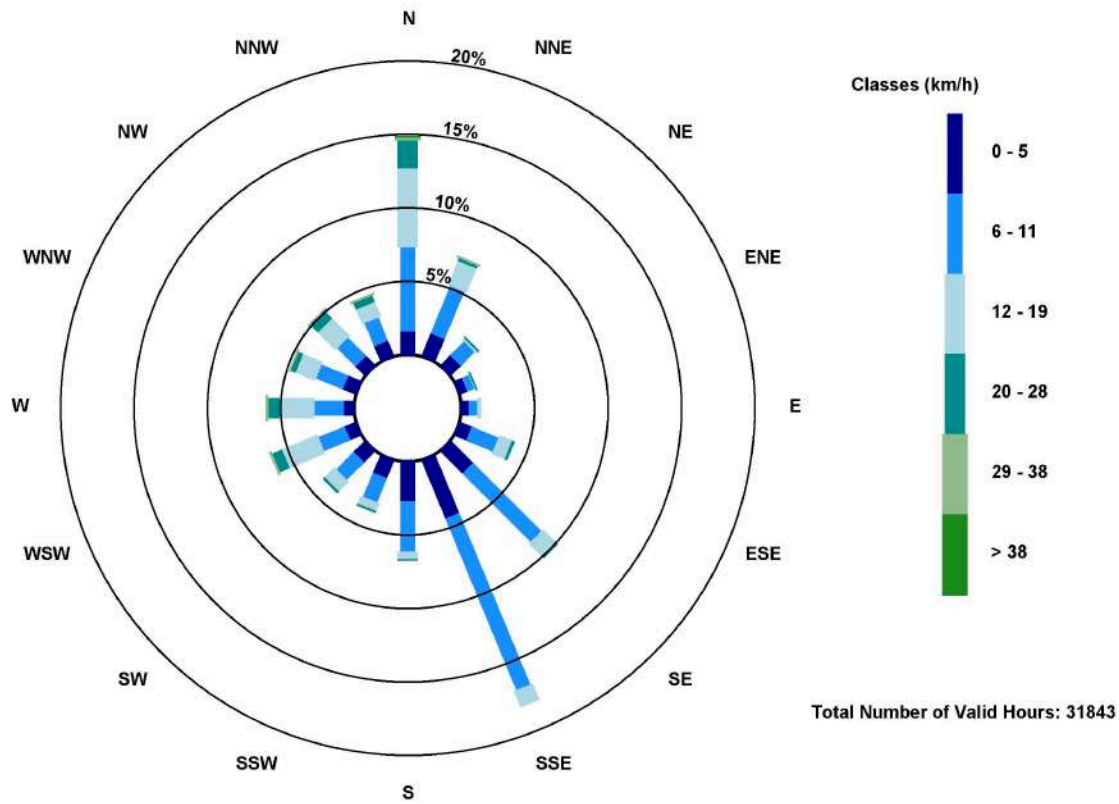


Figure 8.0 – Windrose (Five Year)





Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

Mannix

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LAST UPDATED: FEBRUARY-28-2025



# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Empower all stakeholders and rights holders with environmental data to make informed decisions. ...	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description .....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Station Photos.....	22

## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 05.....	13
Figure 3.0 – Aerial photo showing AMS 05.....	14
Figure 4.0 – Plan view sketch for AMS 05 site .....	15
Figure 5.0 – Environment looking North.....	17
Figure 5.1 – Environment looking East .....	18
Figure 5.2 – Environment looking South.....	19
Figure 5.3 – Environment looking West.....	20
Figure 5.4 – Meteorological Tower.....	21
Figure 6.0 – Photo showing the inlet and sample manifold .....	22
Figure 6.1 – Curb shot of the monitoring station .....	23
Figure 6.2 –Photo of the front and the back of instrument rack.....	24
Figure 7.0 – Windrose (All Levels).....	25

## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient (VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

### Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.



In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.

Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include; sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	Compliance	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network



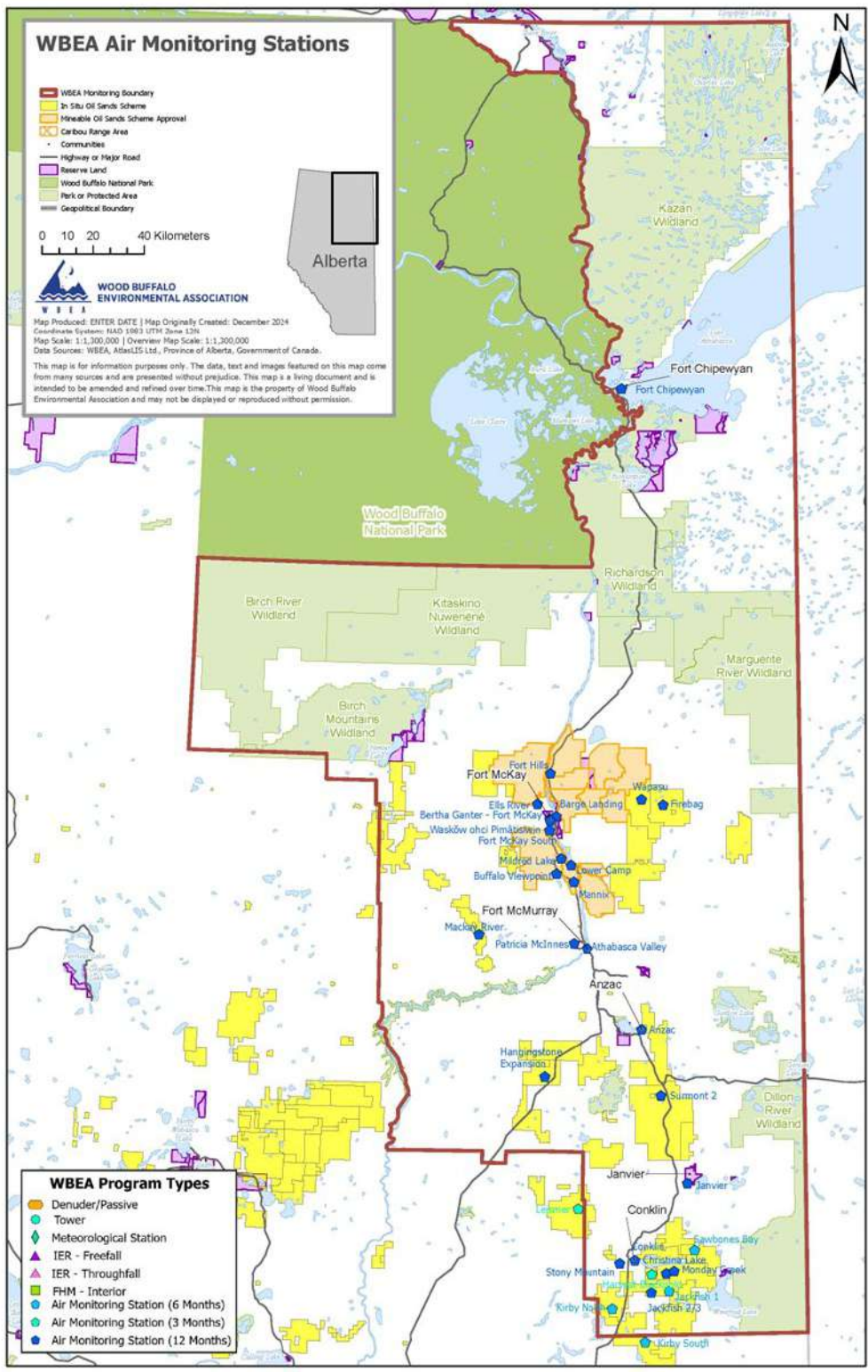


Figure 1.0 – WBEA Network Monitoring Sites

## General Site Information

### Station

Station ID	AMS 05
Station name	Mannix
Date station established	1975

### Location

Station street address	On the west side of Range Road 101, approximately 700 meters south of the Base Plant Road intersection
Legal land description	
Airshed Zone	Wood Buffalo Environmental Association
Latitude	56.967964
Longitude	-111.482100
UTM East	470688
UTM North	6313923
Nearest community	Fort McMurray
Community population	76006
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Suncor Energy Inc.
Approval number	094-03-00
Contact Name	Nelia Heydenreich
Address	Base Plant Rd, Wood Buffalo, AB
Phone number	780-788-8504
Email address	nheydenreich@suncor.com

### Site Description

Land use by sector	0 – 90 degrees	Gravel parking lot, Suncor base plant road.
	91 – 180 degrees	Gravel parking lot, Suncor base plant road.
	181 – 270 degrees	Wooded area.
	271 – 360 degrees	150m met tower, electronics stations.
Site elevation (m) (above sea level)	332	
Angle of elevation to nearby buildings	Greatest angle	N/A
	Building direction	N/A

Airflow restrictions	North	No
	East	No
	South	Trees
	West	Trees
Distance to nearest trees (m)	North	N/A
	East	N/A
	West	45
	South	55
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	20,45,75, and 90
	Distance from station (m)	10

## Site Influences

### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
None	N/A	N/A

### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Range road 101 (Asphalt)	Medium	100	Paved road frequented by heavy equipment, tractor trailers, and pickup trucks.
Highway 63	High	400	Provincial highway frequented by all types of traffic.

### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Suncor Base Plant	Oil Sands Plant	194,000 bbls/d	< 5	North
Enbridge	Storage tank complex	NA	0.2	East

## Station Equipment

Equipment Owner:

## Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO2	Thermo	43i	1008841399	2012
H2S	Thermo	43IQTL	1200326169	2023
H2S	Global Analyzer Systems	G150	3033-225	2023
NMHC	Thermo	55i	1193585649	2024

## Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH-2m	Vaisala	HMP155	NA	4	2025
AT/RH-20m	Vaisala	HMP155	G4340067	4	2025
AT/RH-45m	Vaisala	HMP155	NA	4	2025
AT/RH-75m	Vaisala	HMP155	SS3550310	4	2025
AT/RH-90m	Vaisala	HMP155	NA	4	2025
WS-WD-VWS-20m	UVW Ultrasonic	81000	4000	4	2025
WS-WD-VWS-20m	UVW Ultrasonic	81000	3960	4	2025
WS-WD-VWS-20m	UVW Ultrasonic	81000	3998	4	2025
WS-WD-VWS-20m	UVW Ultrasonic	81000	3999	4	2025

## Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	2580
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	621
Zero air generator	Zero Air Generator	Teledyne/API	701	5613
HVAC	Heating and air conditioning system	BARD	W12A2-A05EPXXXJ	330C132993376-01
Shelter / Building	Air monitoring shelter	C&V	8 x 16 wood	SAA81407





Figure 2.0 – Area topographic map showing AMS 05

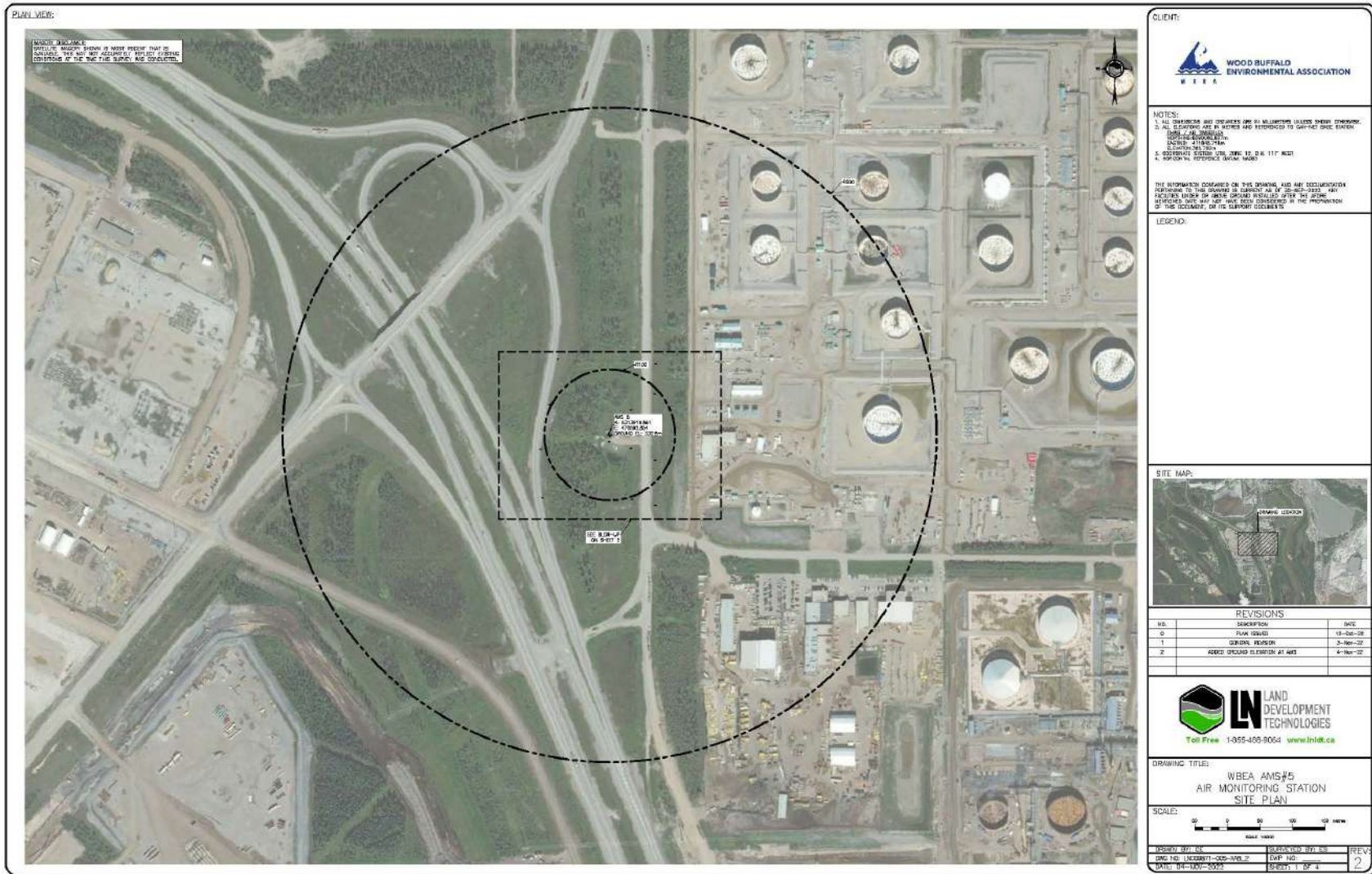


Figure 3.0 – Aerial photo showing AMS 05





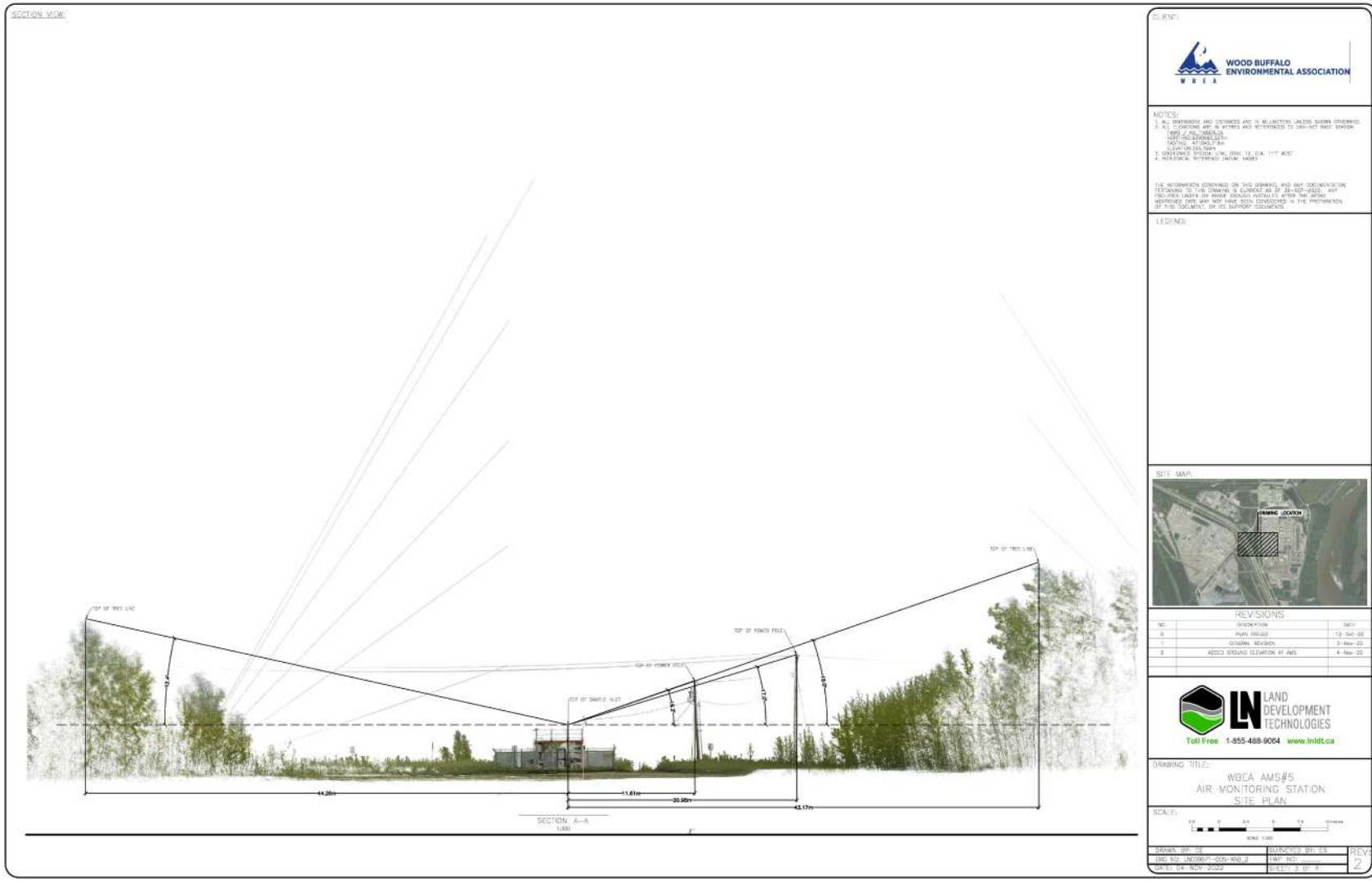


Figure 5.0 – Elevation view sketch for AMS 05 site



Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North



Figure 6.1 – Environment looking East



Figure 6.2 – Environment looking South





Figure 6.3 – Environment looking West





Figure 6.4 – Meteorological Tower

## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold



Figure 7.1 – Curb shot of the monitoring station





Figure 7.2 –Photo of the front and the back of instrument rack





Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 20m (WS20) - km/h  
Mannix

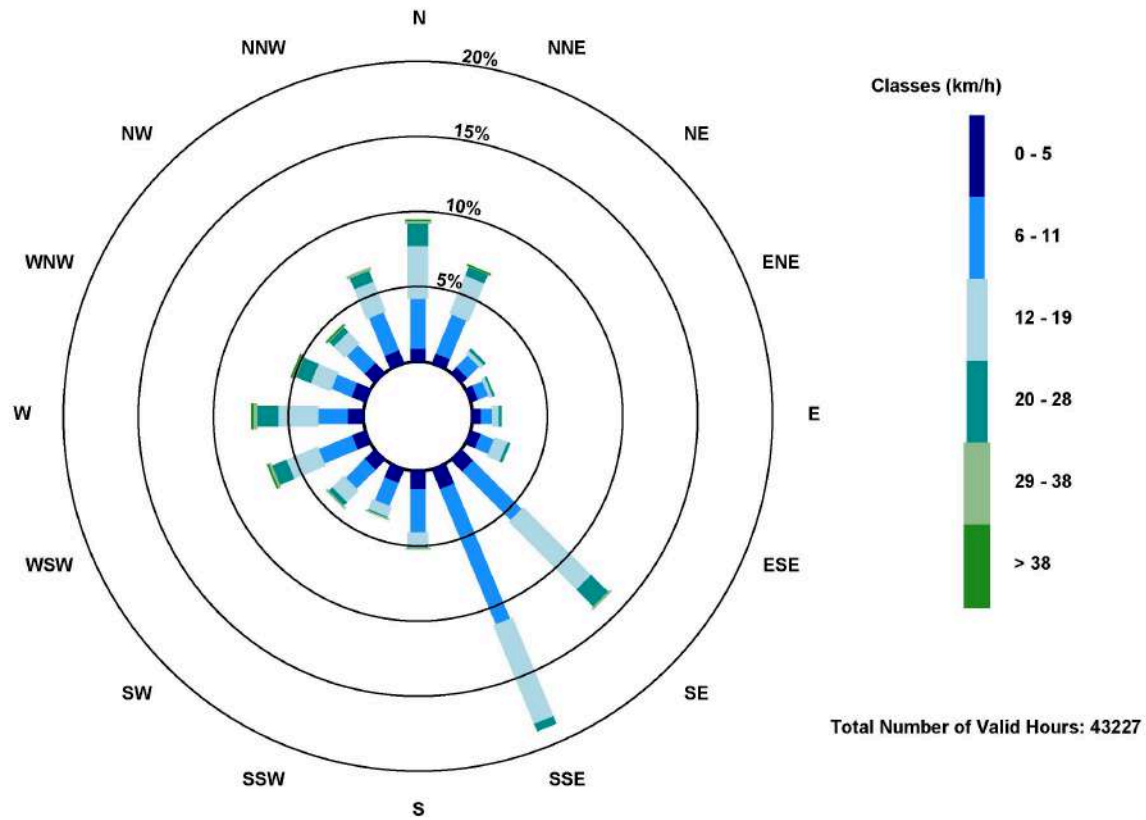


Figure 8.0 – Windrose 20 metres (2020-2025)



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 45m (WS45) - km/h  
Mannix

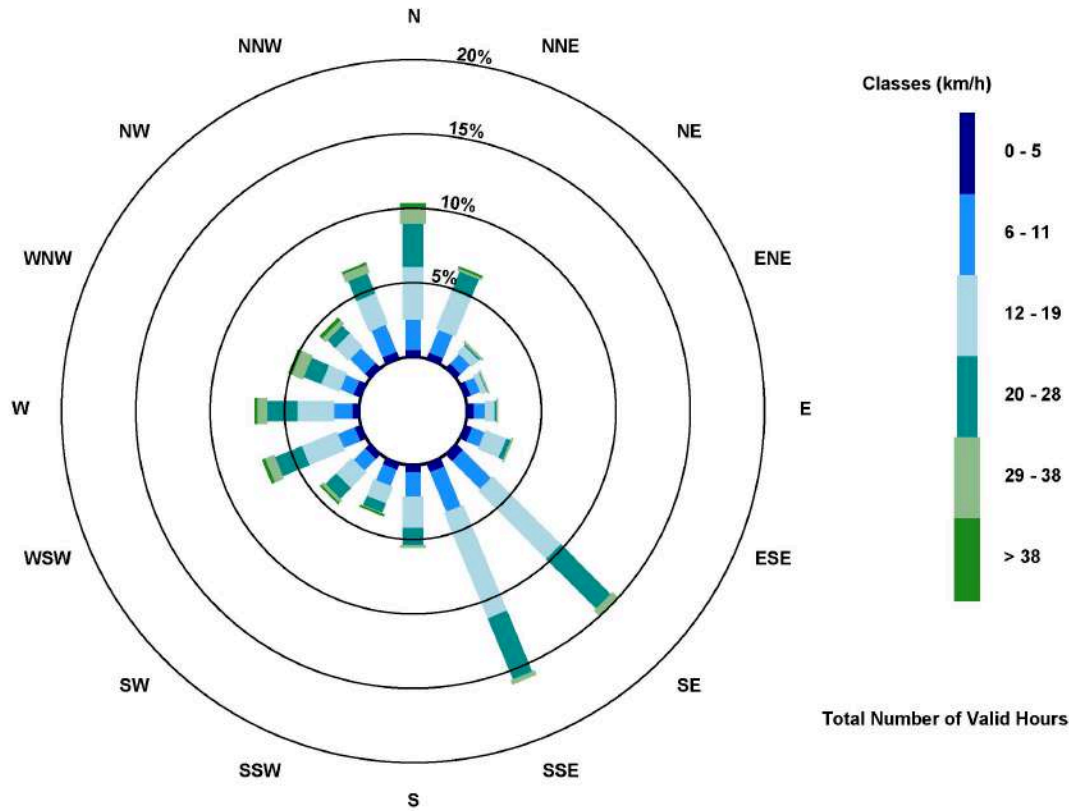


Figure 8.1 – Windrose 45 metres (2020-2025)



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 75m (WS75) - km/h  
Mannix

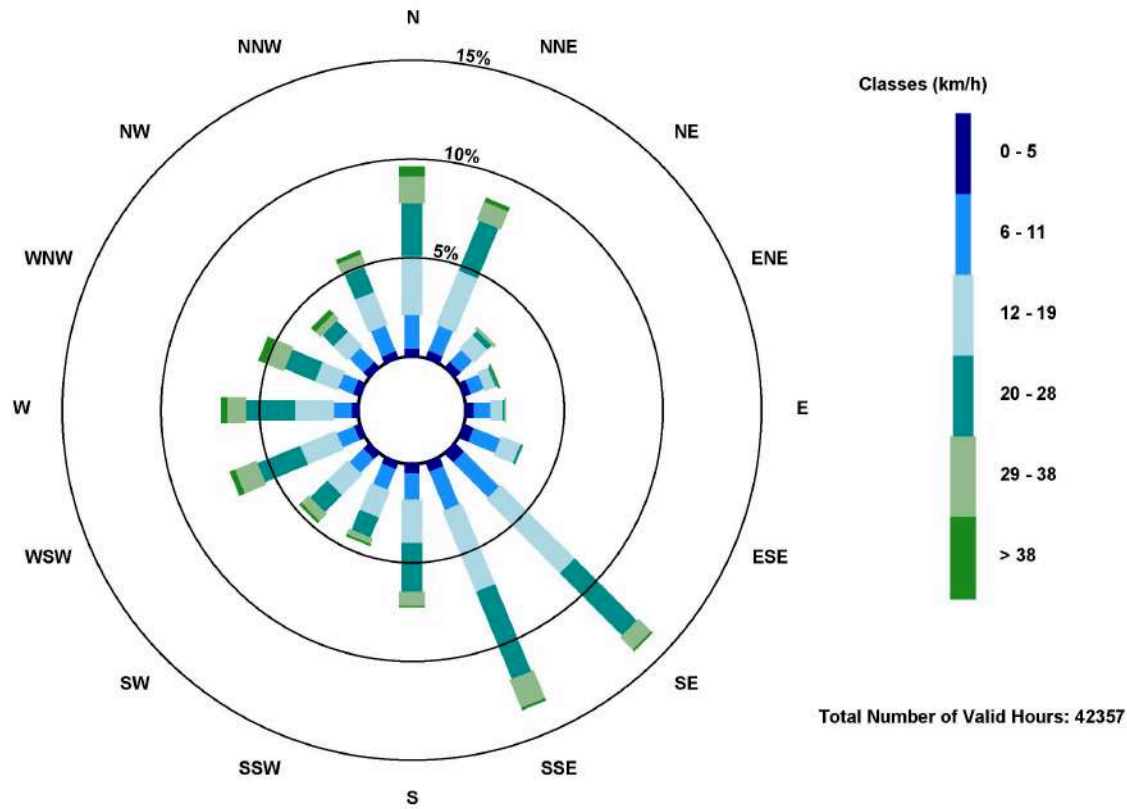


Figure 8.2 – Windrose 75 metres (2020-2025)



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 90m (WS90) - km/h  
Mannix

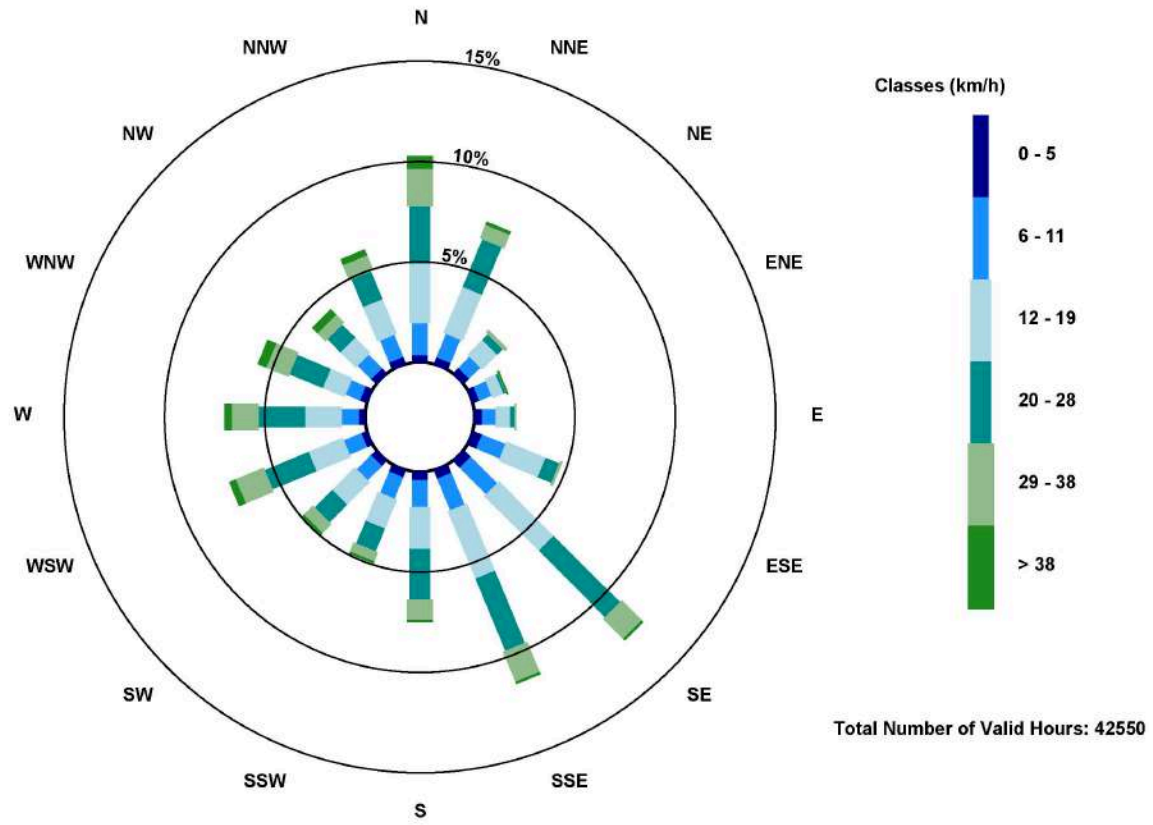


Figure 8.3 – Windrose 90 metres (2020-2025)





Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

Patricia McInnes

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LAST UPDATED: FEBURARY 28, 2025



# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description .....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	17
Station Photos.....	22

## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 06.....	13
Figure 3.0 – Aerial image showing AMS 06.....	14
Figure 4.0 – Plan view image for AMS 06 site.....	15
Figure 5.0 – Elevation view image for AMS 06 site.....	16
Figure 6.0 – Environment looking North.....	17
Figure 6.1 – Environment looking East .....	18
Figure 6.2 – Environment looking South.....	19
Figure 6.3 – Environment looking West.....	20
Figure 6.4 – Meteorological Tower .....	21
Figure 7.0 – Photo showing the sample manifold .....	22
Figure 7.1 – Curb shot of the monitoring station .....	23
Figure 7.2 –Photo of the front and the back of instrument rack.....	25
Figure 8.0 – Windrose (Five Year) .....	26

## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

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The time-integrated parameters for each station are summarized in Table 1.2.

Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include; sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	Compliance	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network



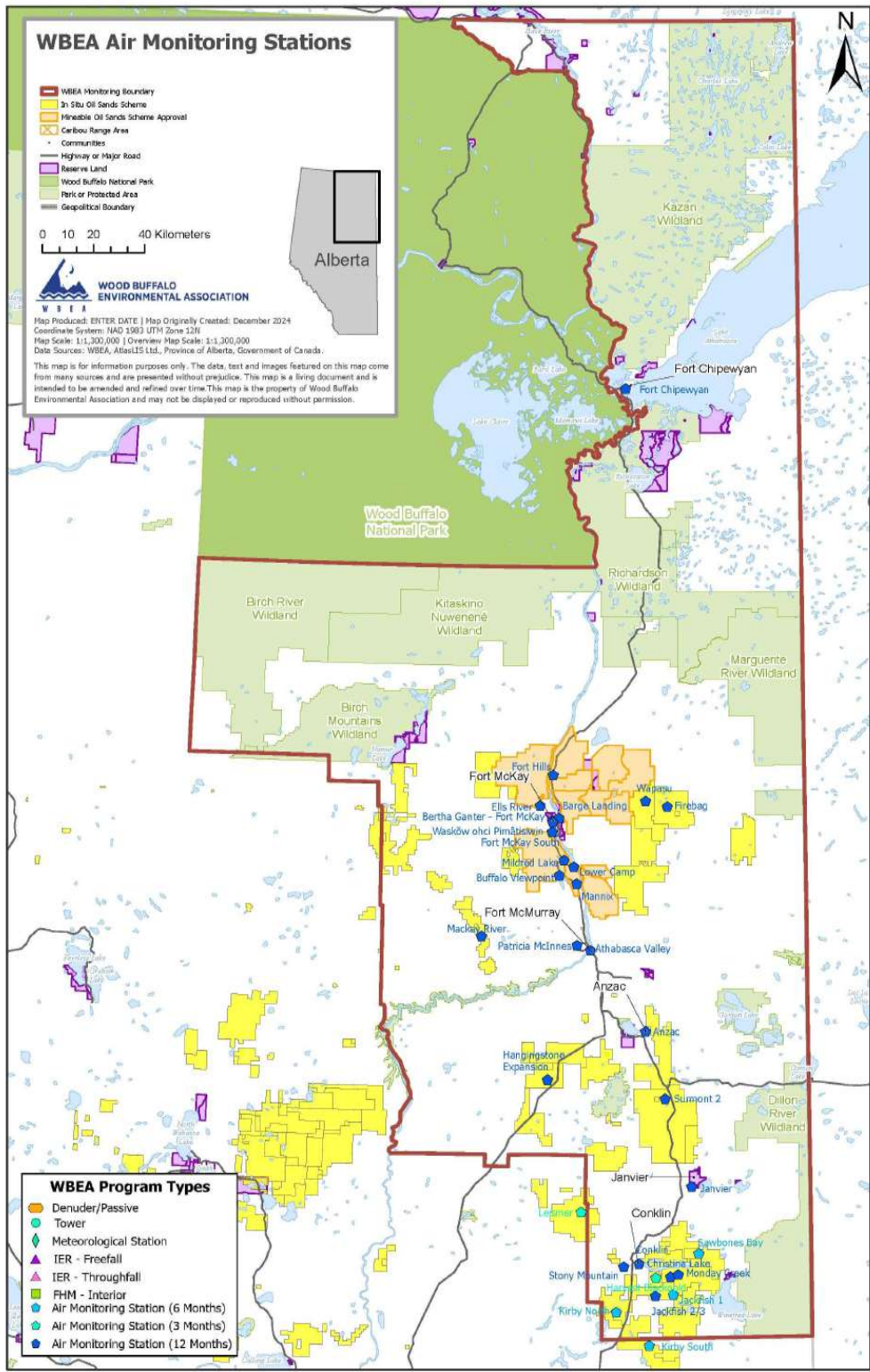


Figure 1.0 – WBEA Network Monitoring Sites

## General Site Information

### Station

Station ID	AMS 06
Station name	Patricia McInnes
Date station established	1998

### Location

Station street address	Carteret Street, Fort McMurray
Legal land description	10-26-089-10 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	56.7514047942
Longitude	-111.476657824
UTM East	470851
UTM North	6289815
Nearest community	Located in Fort McMurray
Community population	76000
Census Year	2023

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Wood Buffalo Environmental Association
Approval number	N/A
Contact Name	Wood Buffalo Environmental Association
Address	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Phone number	780-799-4420
Email address	info@wbea.org

### Site Description

Land use by sector	0 – 90 degrees	Residential
	91 – 180 degrees	Residential
	181 – 270 degrees	Sports Grounds
	271 – 360 degrees	Sports Grounds
Site elevation (m) (above sea level)	362 M	
Angle of elevation to nearby buildings	Greatest angle	0
	Building direction	N/A
Airflow restrictions	North	N/A
	East	N/A
	South	N/A

	West	N/A
Distance to nearest trees (m)	North	N/A
	East	N/A
	West	28 metre
	South	8 metre
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	10
	Distance from station (m)	0

## Site Influences

### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Recreational Complex	About 20-50 meters, North to North West of the Station	Maintenance of sports fields and recreational complex, possible PM and NOx Sources
Residential Subdivision	S and SW of the station	Wood burning in household stoves and backyard firepits

### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Residential Road	High	30	Paved road

### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Fort McMurray Water Treatment Plant	Water treatment plant	N/A	4	SE
Eveready	Asphalt production	N/A	4	N
Suncor / Syncrude	Oil Sands Production	N/A	15	N

## Station Equipment

Equipment Owner: WBEA

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO <sub>2</sub>	Thermo Scientific	43i	1160290013	2020
TRS	Teledyne/API	43i-TLE	1218153358	2019
CH <sub>4</sub> /NMHC	Ametek	Mocon	1220DR0671	2025
NO <sub>2</sub>	Thermo Scientific	42i	1172750022	2016
NH <sub>3</sub>	Teledyne/API	T 201	808	2020
O <sub>3</sub>	Thermo Scientific	49i	1300156234	2022
PM <sub>2.5</sub>	Teledyne/API	T640	871	2020
PM <sub>2.5</sub> A	Thermo Scientific	2000i	2000I203861308	2018
PM <sub>2.5</sub> B	Thermo Scientific	2000i	2000I204851408	2018
PM <sub>10</sub> A	Thermo Scientific	2000i	2000I202151205	2018
PM <sub>10</sub> B	Thermo Scientific	2000i	2000IW20205251411	2018
PAH	Tisch	TE-1004BL	1001099	2016
VOC	Tisch	TE-123	1021	2016

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	N3840525	Class 3	2020
WS	Met One	010C-1	B10015	Class 3	2021
WD	Met One	020C-1	E4854	Class 3	2016

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	10957
Zero air generator	Zero Air Generator	Teledyne/API	701	261
HVAC	Heating and air conditioning system. Wall mount unit	BARD	2 ton	314H183561152-02
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	09 14786
Gas Dilution Calibrator	Mass flow controlled gas dilution	Teledyne/API	T700	3566
Thermal Oxidizer	TRS Converter	Global	G150	2022-195
Thermal Oxidizer	NH <sub>3</sub> Converter	API	T501	484
Tower	Aluma Tower	Aluma	T135	N/A





Figure 2.0 – Area topographic map showing AMS 06

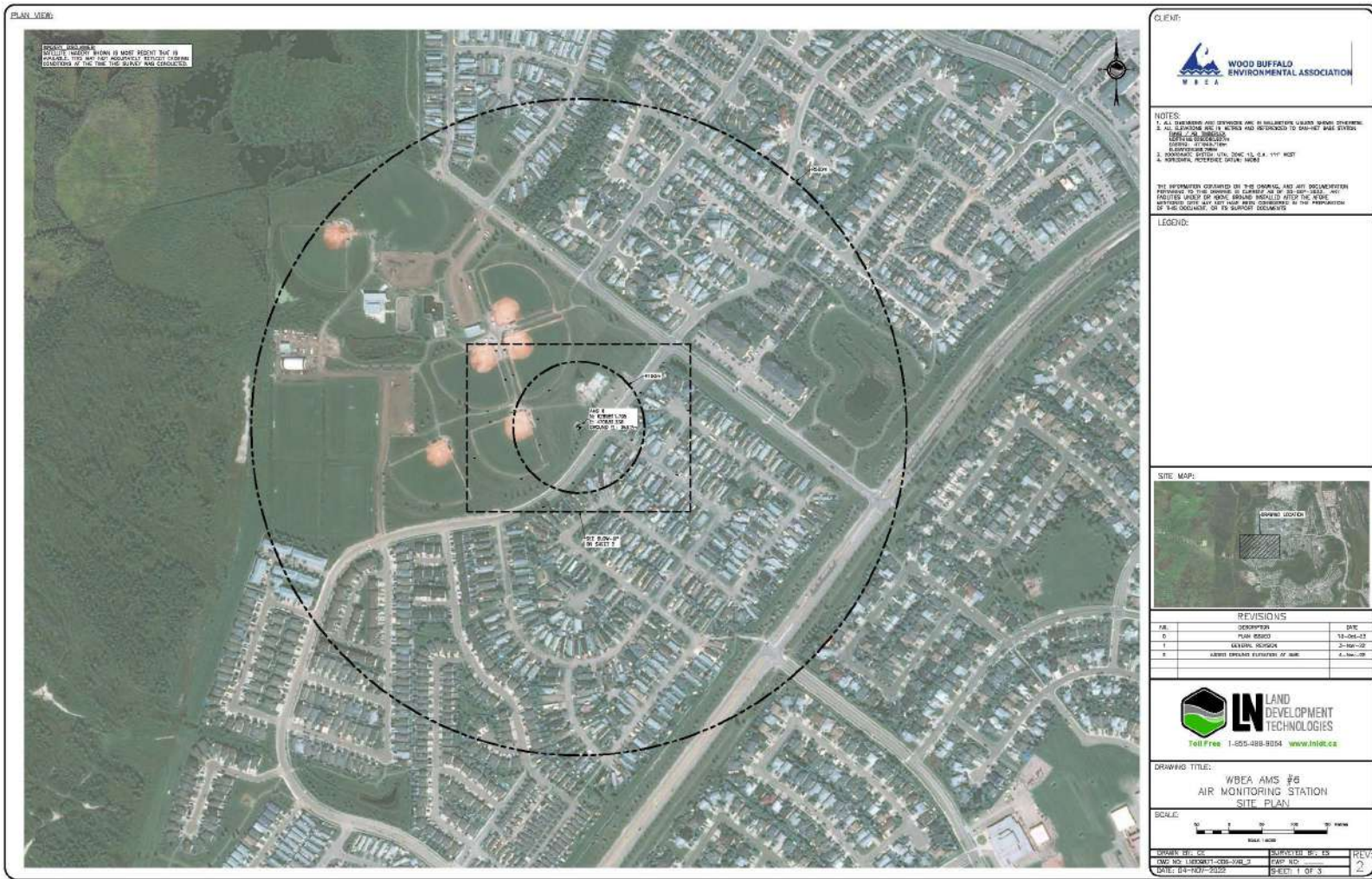


Figure 3.0 – Aerial image showing AMS 06



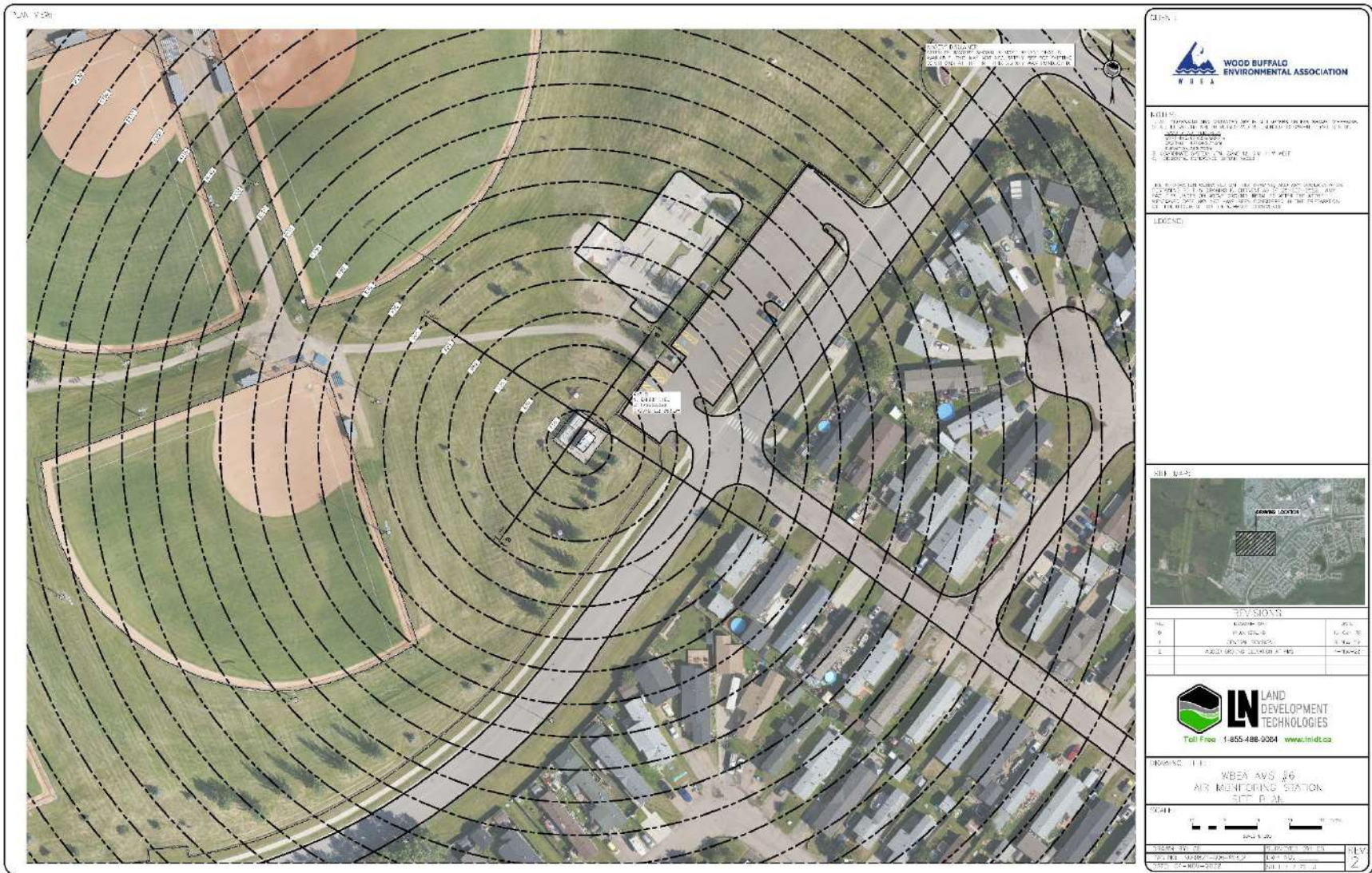


Figure 4.0 – Plan view image for AMS 06 site





Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North



Figure 6.1 – Environment looking East





Figure 6.2 – Environment looking South



Figure 6.3 – Environment looking West





Figure 6.4 – Meteorological Tower

## Station Photos

The following photos show the monitoring station and instrumentation.

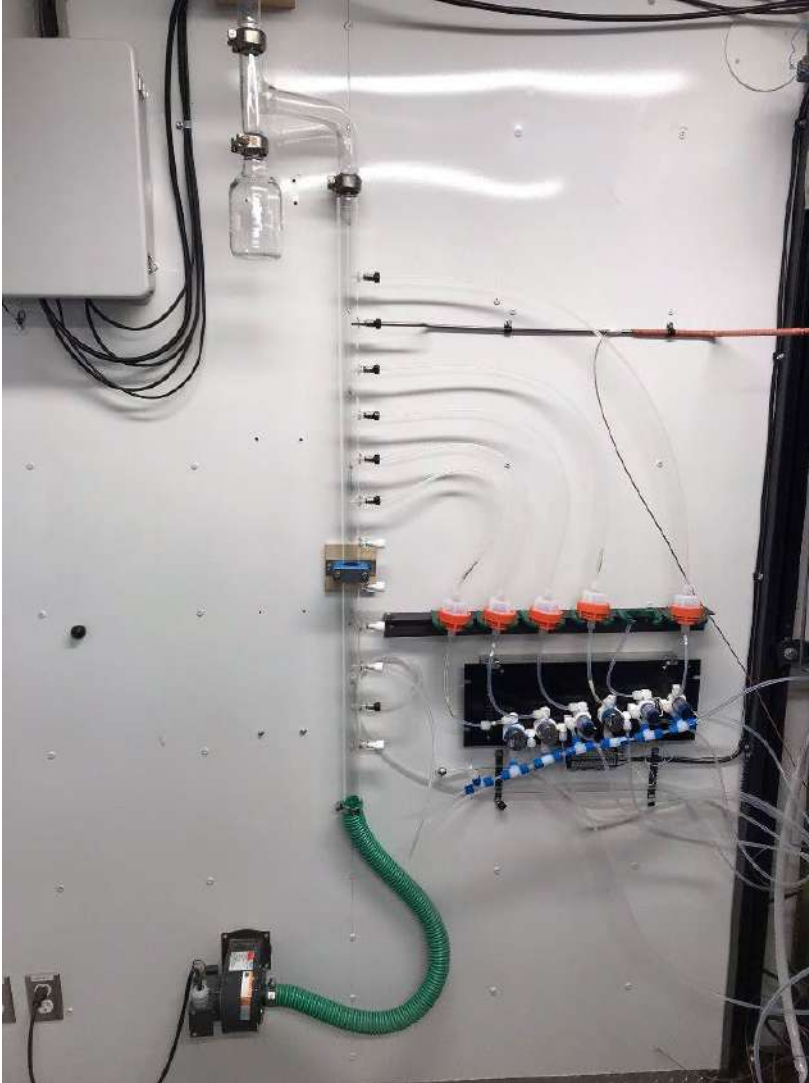


Figure 7.0 – Photo showing the sample manifold



Figure 7.1 – Curb shot of the monitoring station









Figure 7.2 –Photo of the front and the back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Patricia McInnes

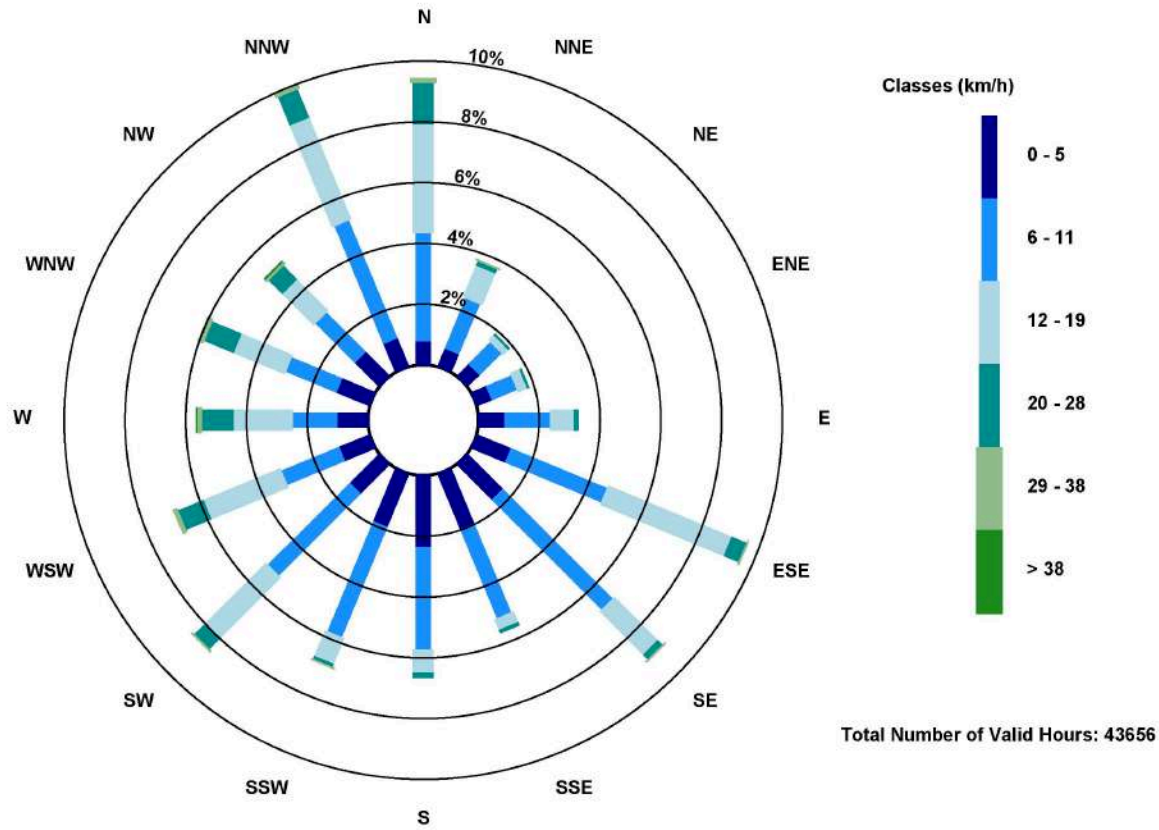


Figure 8.0 – Windrose (Five Year)



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

Athabasca Valley

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LAST UPDATED: FEBRUARY 12, 2025



# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description .....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Station Photos.....	22



## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 07.....	13
Figure 3.0 – Aerial image showing AMS 07.....	14
Figure 4.0 – Plan view image for AMS 07 site.....	15
Figure 5.0 – Elevation view image for AMS 07 site.....	16
Figure 6.0 – Environment looking North.....	17
Figure 6.1 – Environment looking East .....	18
Figure 6.2 – Environment looking South.....	19
Figure 6.3 – Environment looking West.....	20
Figure 6.4 – Meteorological Tower .....	22
Figure 7.0 – Photo showing the inlet and sample manifold .....	22
Figure 7.1 – Curb shot of the monitoring station .....	23
Figure 7.2 –Photo of the front and the back of instrument rack.....	25
Figure 8.0 – Windrose (Five Year) .....	26

## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

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WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	Compliance	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network



Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network

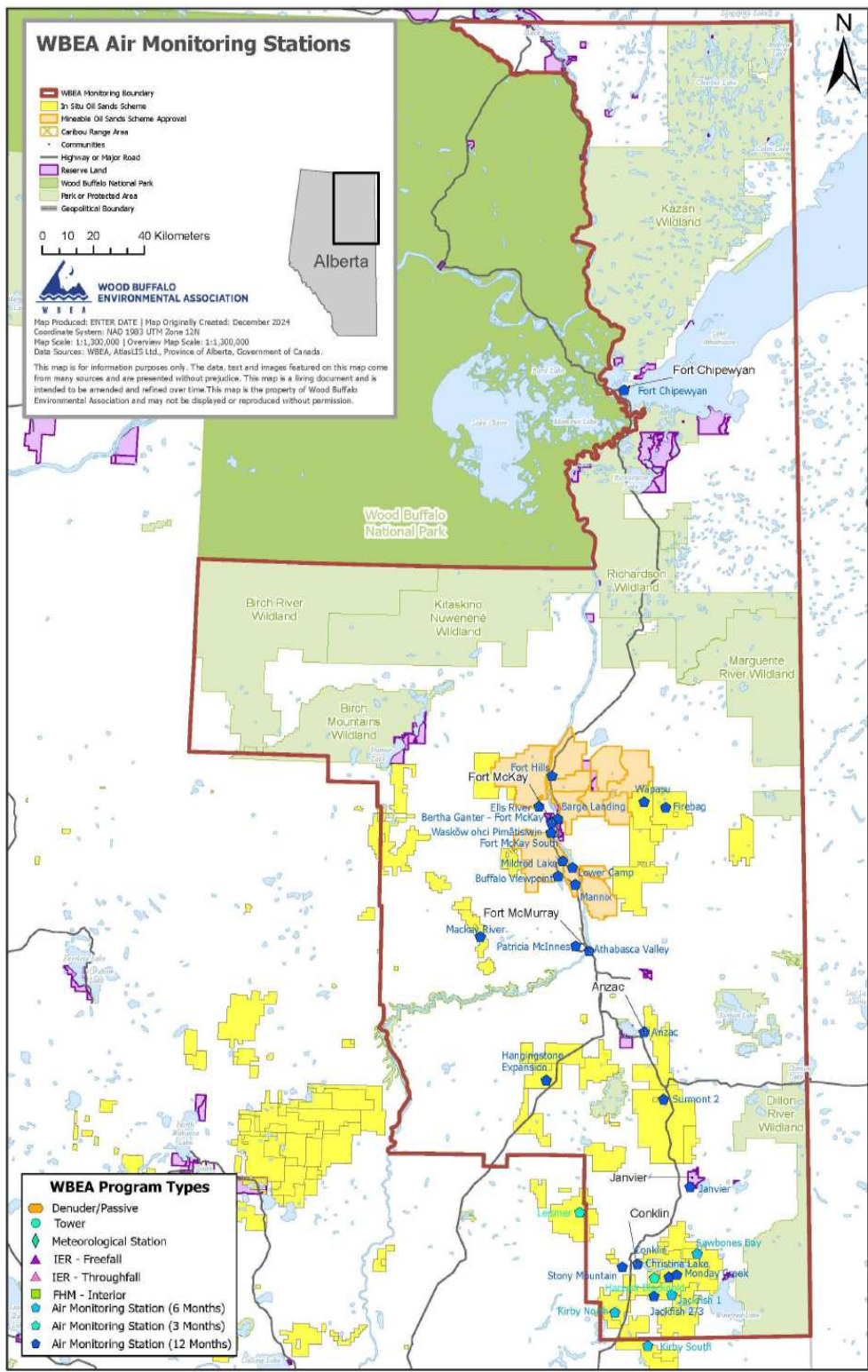


Figure 1.0 – WBEA Network Monitoring Sites

## General Site Information

### Station

Station ID	AMS 07
Station name	Athabasca Valley
Date station established	1977

### Location

Station street address	Located on MacDonald Drive, Near the Athabasca river and McDonald Island
Legal land description	9-20-089-09 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	56°44'00.21"N
Longitude	111°23'25.80"W
UTM East	476105.865
UTM North	6287773.834
Nearest community	Fort McMurray
Community population	75,186
Census Year	2023

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	N/A
Approval number	N/A
Contact Name	Wood Buffalo Environmental Association
Address	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Phone number	780-799-4420
Email address	info@wbea.org

### Site Description

Land use by sector	0 – 90 degrees	Residential
	91 – 180 degrees	Residential
	181 – 270 degrees	Residential
	271 – 360 degrees	River
Site elevation (m) (above sea level)	497 m	
Angle of elevation to nearby buildings	Greatest angle	3
	Building direction	West
Airflow restrictions	North	None
	East	None



	South	None
	West	House
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	10 m
	Distance from station (m)	Attached to North end of monitoring station

## Site Influences

### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Wood Smoke	10m	Wood Stove from shelter(due West)

### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Asphalt road	Medium	15	Access road to MacDonald Island
Highway	High	300	Hwy 63
Asphalt Road	Medium	330	City street

### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Fort McMurray Water treatment Plant	Water treatment Plant		1.22	SW
McDonald Island Park	Recreational Center		0.265	NE
Eveready	Asphalt Plant		3.71	NW
Fort McMurray Wastewater Treatment Plant	Waste Water Treatment Plant		3.84	NW
Diversified	Main Bus Depo		4.48	NW
Suncor	Oil Sands Plant	194,000	26.81	N
Suncor	Tailings Pond		15.81	N
LaFarge	Concrete Plant		3.06	NW
Inland	Concrete Plant		3.32	NW
Burnco	Concrete Plant		4.24	NW

## Station Equipment

Equipment Owner: AEPA and WBEA

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO2	Thermo Scientific	43i-LTE	1507864683	2020
TRS	Thermo Scientific	43i-LTE	1180540018	2019
TRS conv	CD-Nova	CDN-101	551	2019
NO2	Thermo Scientific	42i	1160120024	2021
NMHC	Thermo Scientific	55i	1331259520	2025
O3	Thermo Scientific	49i	1152220023	2019
CO	Thermo Scientific	48i-LTE	1408761381	2016
PM2.5	Teledyne	T640	645	2024
PM10	Thermo Scientific	2000i	2000i 0361 1305	2016
PM10	Thermo Scientific	2000i	2000iW206921702	2021
PM2.5	Thermo Scientific	2000i	2000i2 0370 1306	2018
PM2.5	Thermo Scientific	2000i	2000i2 0433 1312	2019
PAH	Tisch Environmental	TE-PIF+BL	1001057	2016
VOC	Global Analyzer Systems	G23MTS-2CH	2021-101	2023
VOC	Global Analyzer Systems	G23MTS-2CH	2021-102	2023

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	G0840069	3	2020
WD	Met One	020C-1	G3212	3	2021
WS	Met One	010C-1	D13602	3	2023
BP	Young	61302V-10	BPA4395	3	2016

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	8205
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	3805
Zero air generator	Zero Air Generator	Teledyne/API	T701H	198
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	N/A
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	



Figure 2.0 – Area topographic map showing AMS 07

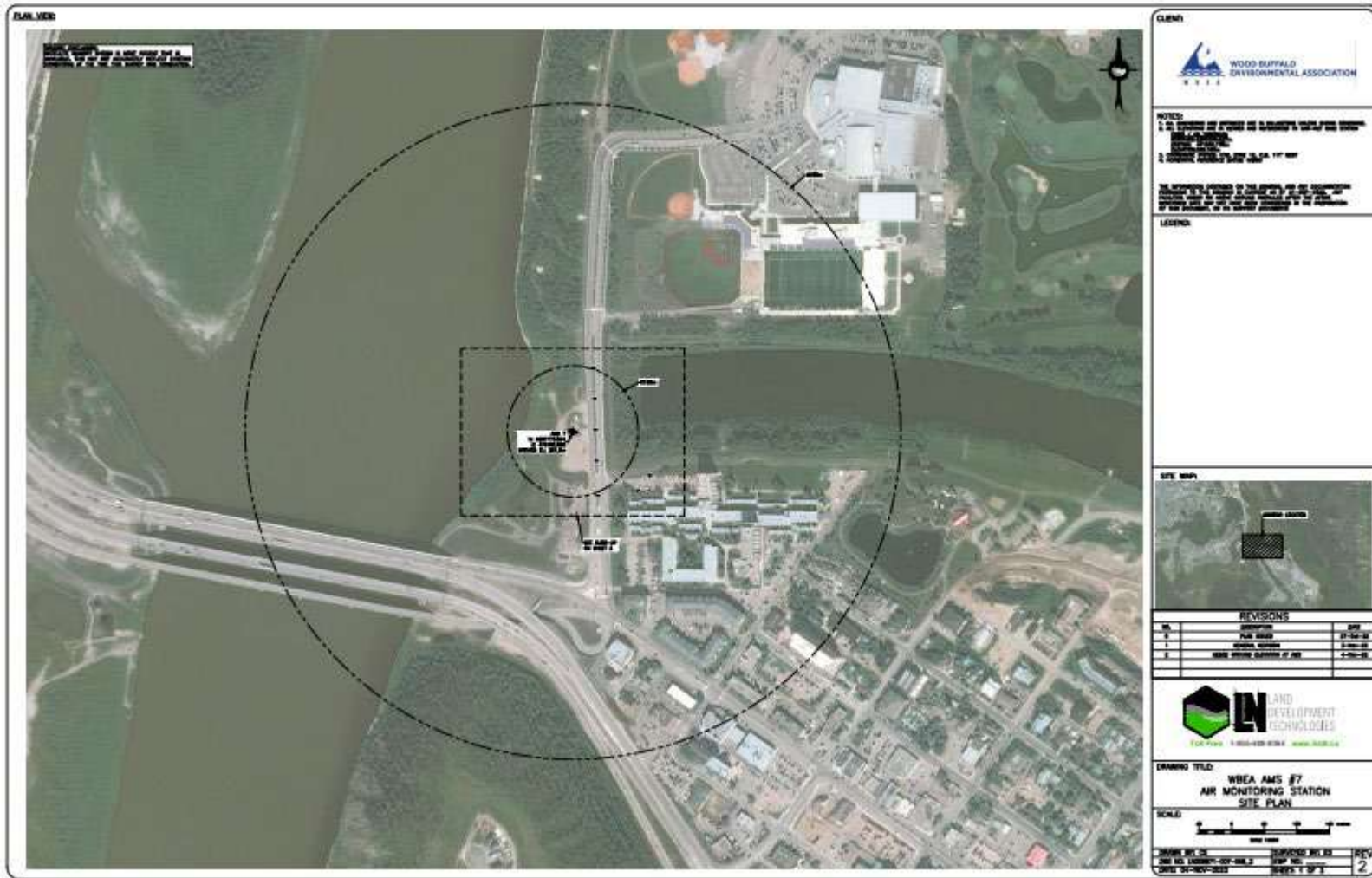


Figure 3.0 – Aerial image showing AMS 07





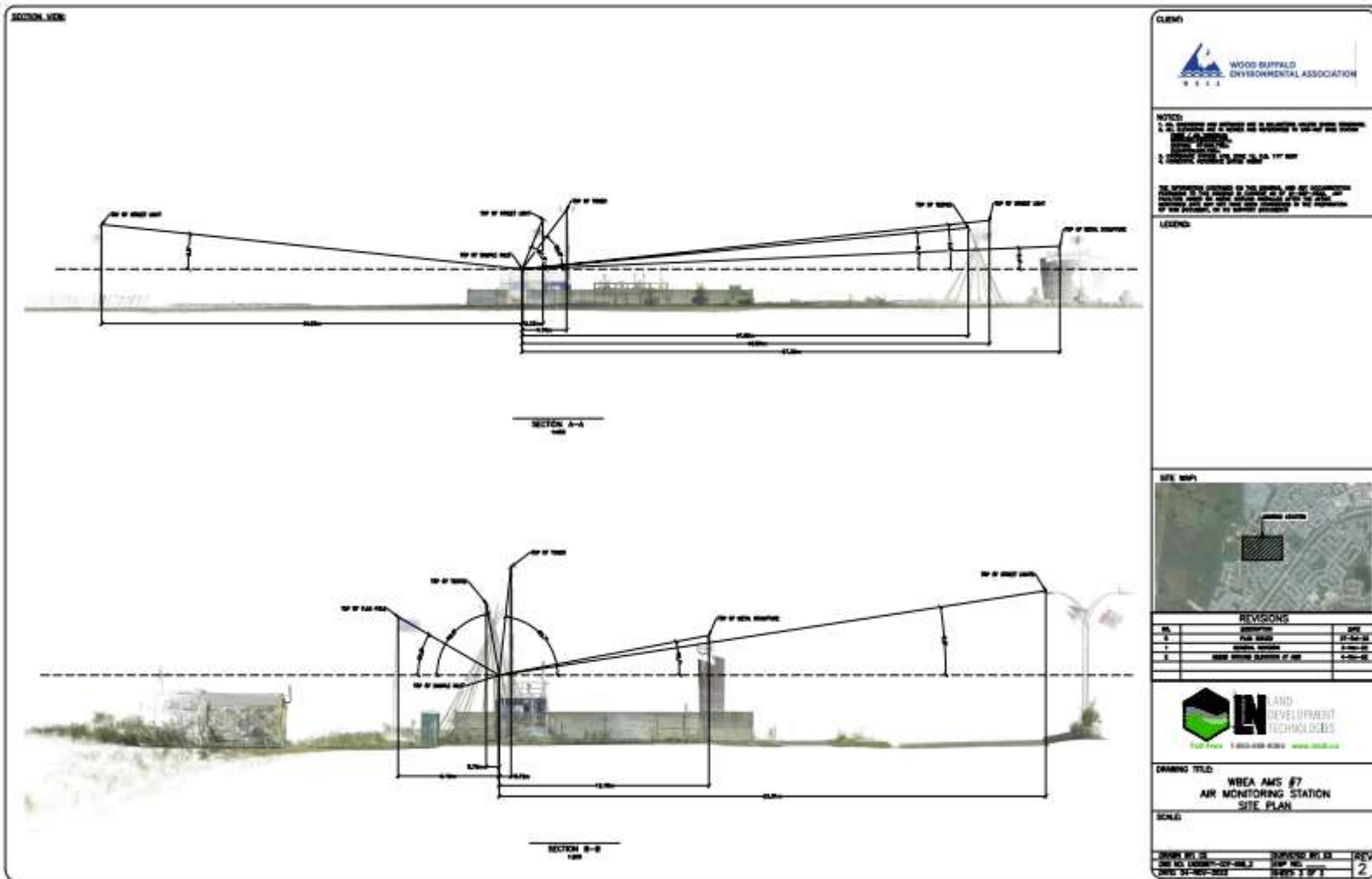


Figure 5.0 – Elevation view image for AMS 07 site

Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North





Figure 6.1 – Environment looking East





Figure 6.2 – Environment looking South



Figure 6.3 – Environment looking West



Figure 6.4 – Meteorological Tower

### Station Photos

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold





Figure 7.1 – Curb shot of the monitoring station





Figure 7.2 –Photo of the front and the back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Athabasca Valley

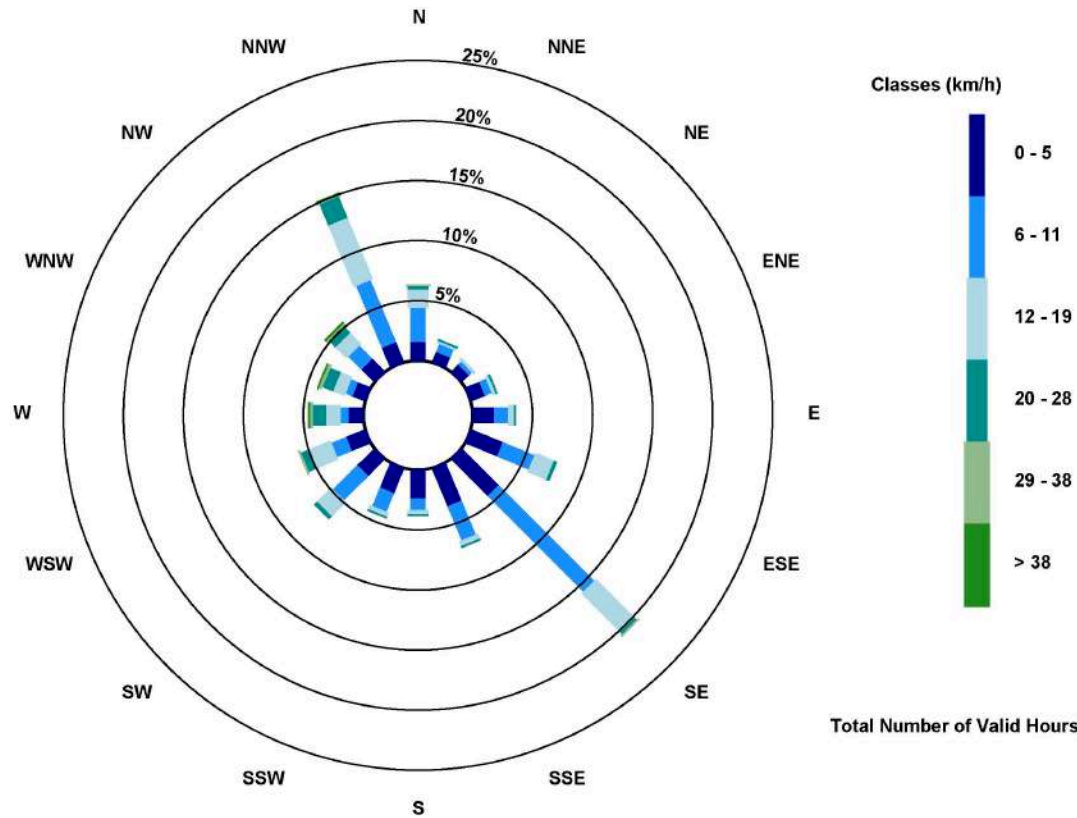


Figure 8.0 – Windrose (Five Year)





Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

Fort Chipewyan

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LAST UPDATED: FEBRUARY 21, 2025



# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Empower all stakeholders and rights holders with environmental data to make informed decisions. ...	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description .....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	18
Station Photos.....	23

## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 08.....	14
Figure 3.0 – Aerial photo showing AMS 08.....	15
Figure 4.0 – Plan view sketch for AMS 08 site .....	16
Figure 5.0 – Elevation view image for AMS 06 site.....	17
Figure 6.0 – Environment looking North.....	18
Figure 6.1 – Environment looking East .....	19
Figure 6.2 – Environment looking South.....	20
Figure 6.3 – Environment looking West.....	21
Figure 6.4 – Meteorological Tower .....	22
Figure 7.0 – Photo showing the inlet and sample manifold .....	23
Figure 7.1 – Curb shot of the monitoring station .....	24
Figure 7.2 –Photo of the front and the back of instrument rack.....	26
Figure 8.0 – Windrose (Five Year) .....	27

## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient (VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

### Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.



In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.

Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include; sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

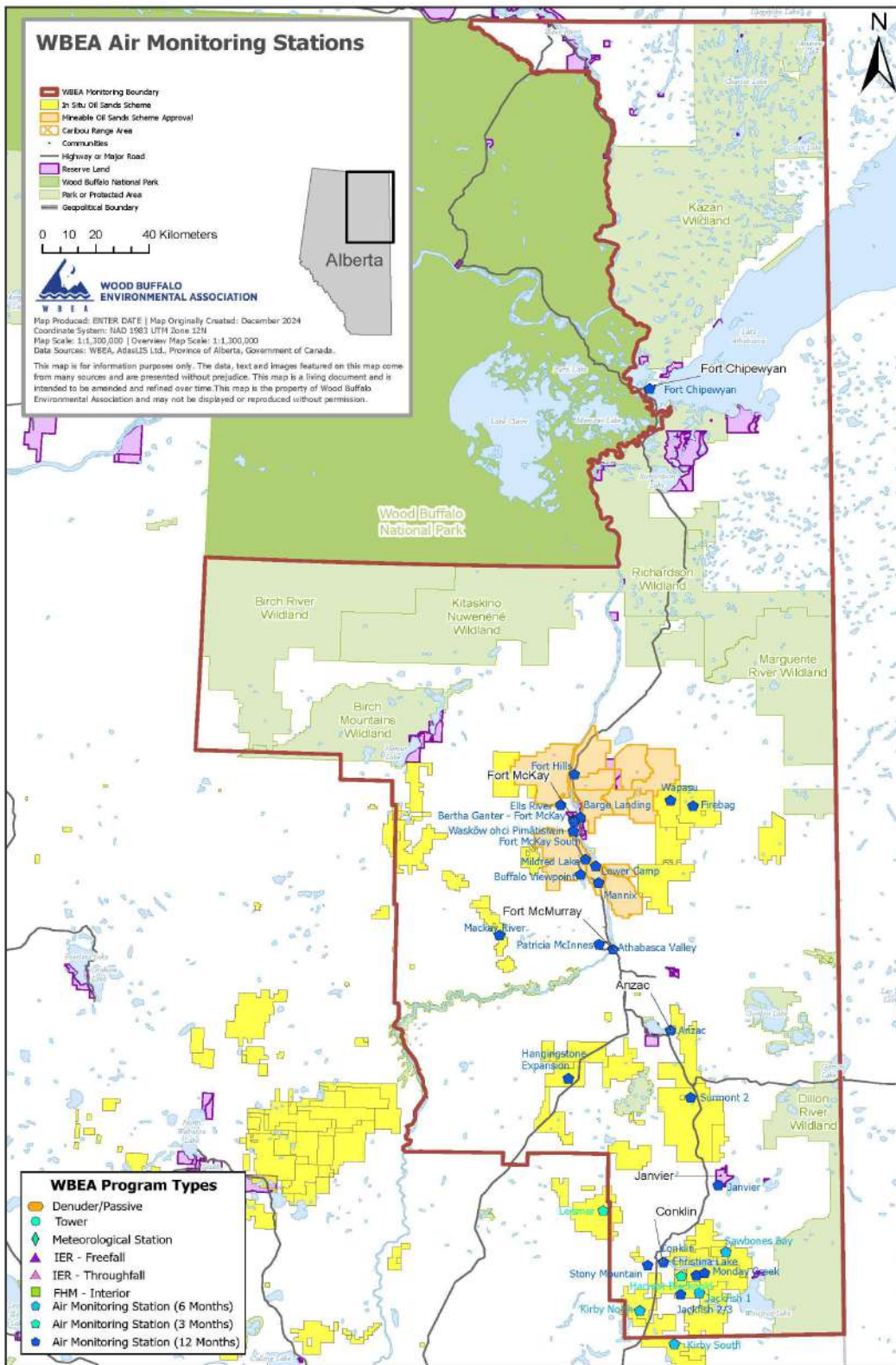
Table 1.1 – Meteorological Parameters monitored in the WBEA network

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network





## General Site Information

### Station

Station ID	AMS 08
Station name	Fort Chipewyan
Date station established	1998

### Location

Station street address	Fort Chipewyan
Legal land description	6-07-112-07 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	58.709285
Longitude	-111.175014
UTM East	489860
UTM North	6507695
Nearest community	Located in Fort Chipewyan
Community population	798
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Community Station
Approval number	026-02-00
Contact Name	Wood Buffalo Environmental Association
Address	Unit 3 – 805 Memorial Drive, Fort McMurray, AB
Phone number	780-799-4420
Email address	info@wbea.org

### Site Description

Land use by sector	0 – 90 degrees	Residential
	91 – 180 degrees	Residential, Lake
	181 – 270 degrees	Residential, Lake
	271 – 360 degrees	Residential
Site elevation (m) (above sea level)	221 m	
Angle of elevation to nearby buildings	Greatest angle	0
	Building direction	NA
Airflow restrictions	North	No
	East	No
	South	No

	West	No
Distance to nearest trees (m)	North	50m
	East	NA
	West	NA
	South	NA
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	10
	Distance from station (m)	0

### Site Influences

#### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
House	About 20 m South	Local residential house. Wood burning

#### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Driveway	Low	10	Dirt road, residential use
Local roads	Low	100	Paved road, very low volume

#### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Suncor/Syncrude	Oil Sands Production	NA	160	South

## Station Equipment

Equipment Owner:

## Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO <sub>2</sub>	Thermo Environmental	43i-TLE	1136451241	Dec 2014
CO	Teledyne API	T300	3505	Feb 2019
CO <sub>2</sub>	Teledyne API	T360	289	Jan 2020
NO <sub>2</sub>	Thermo Environmental	42i	1426262592	Feb 2022
O <sub>3</sub>	Thermo Environmental	49i	1152220026	Jul 2021
TRS	Thermo Environmental	43iq-TLE	1203169744	Feb 2022
PM <sub>2.5</sub>	Teledyne API	T640	216	Sep 2018
VOC	Tisch	TE-123	1029	2023
PM10	Thermo Scientific	2000i	2000IW-20929-2106	2023
PM10	Thermo Scientific	2000i	2000IW-20933-2106	2023
PM2.5	Thermo Scientific	2000i	2000IW-20932-2106	2023
PM2.5	Thermo Scientific	2000i	2000IW-20934-2106	2023
PAH	Tisch	TE-PUF+BL	100111	2023

## Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
PC	OTT	Pluvio 2 – 400	358347	2	March 2023
AT/RH	Vaisala	HMP155	N0810528	5	March 2014
WS	Met One	010C-1	P22394	2	March 2014
WD	Met One	020C-1	E4853	2	March 2014
LW	Campbell Scientific	LWS-L	NA	NA	March 2014
GR	NA	8-48	38243	1	March 2014

## Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	11039
Datalogger	Datalogger	Campbell Scientific	CR310	2237
Zero air generator	Zero Air Generator	Teledyne/API	701	260
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	314B132990230-02
Shelter / Building	Air monitoring portable	ITB	10 x 20 trailer	13 15920
Gas Dilution Calibrator	Mass flow-controlled gas dilution	Teledyne/API	T700	23252



Hydrogen Generator	Hydrogen Generator	Peak Scientific	100cc	720121160
Nitrogen Generator	Nitrogen Generator	Peak Scientific	NG5000A	771048318

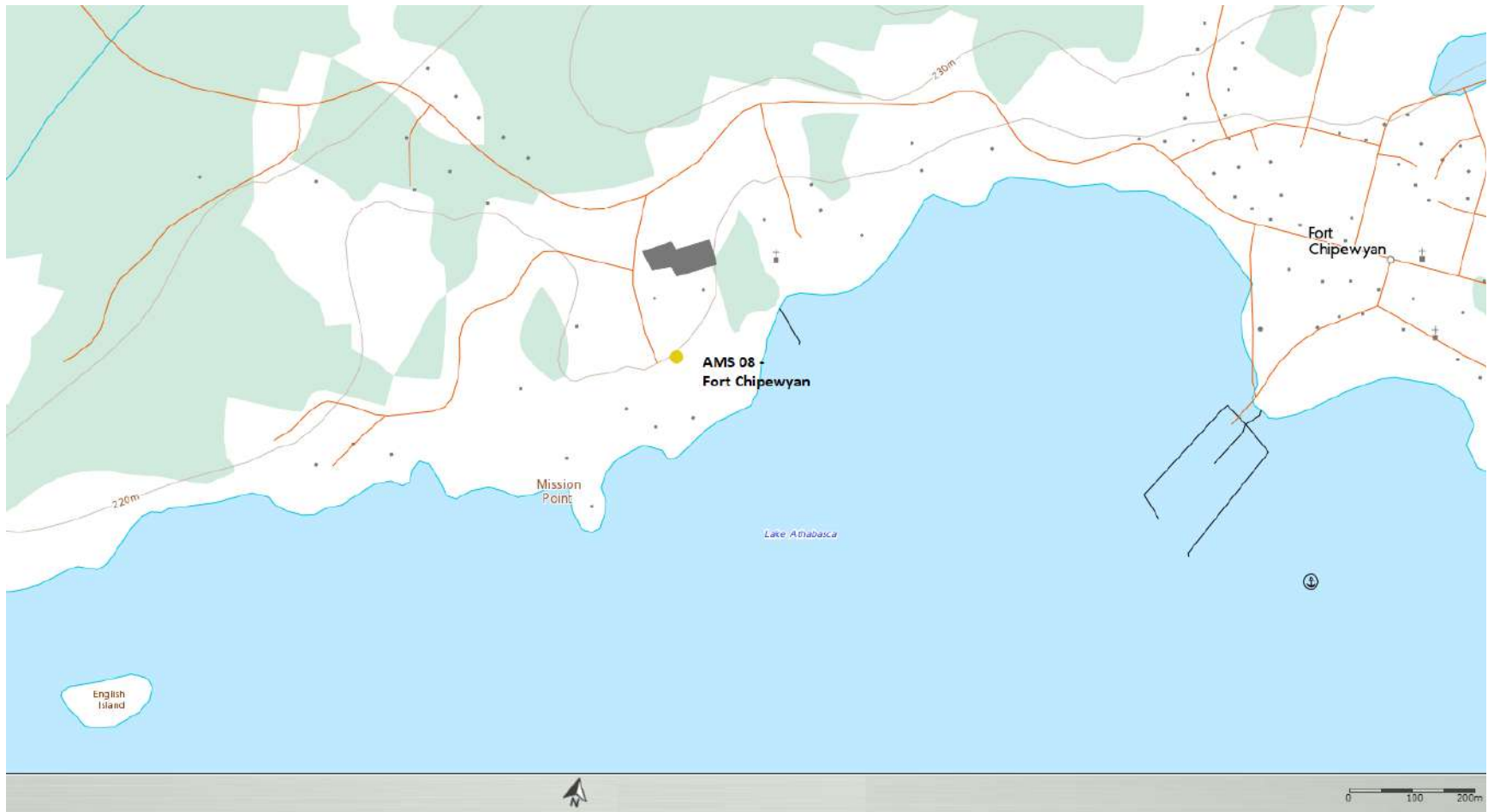


Figure 2.0 – Area topographic map showing AMS 08



Figure 3.0 – Aerial photo showing AMS 08

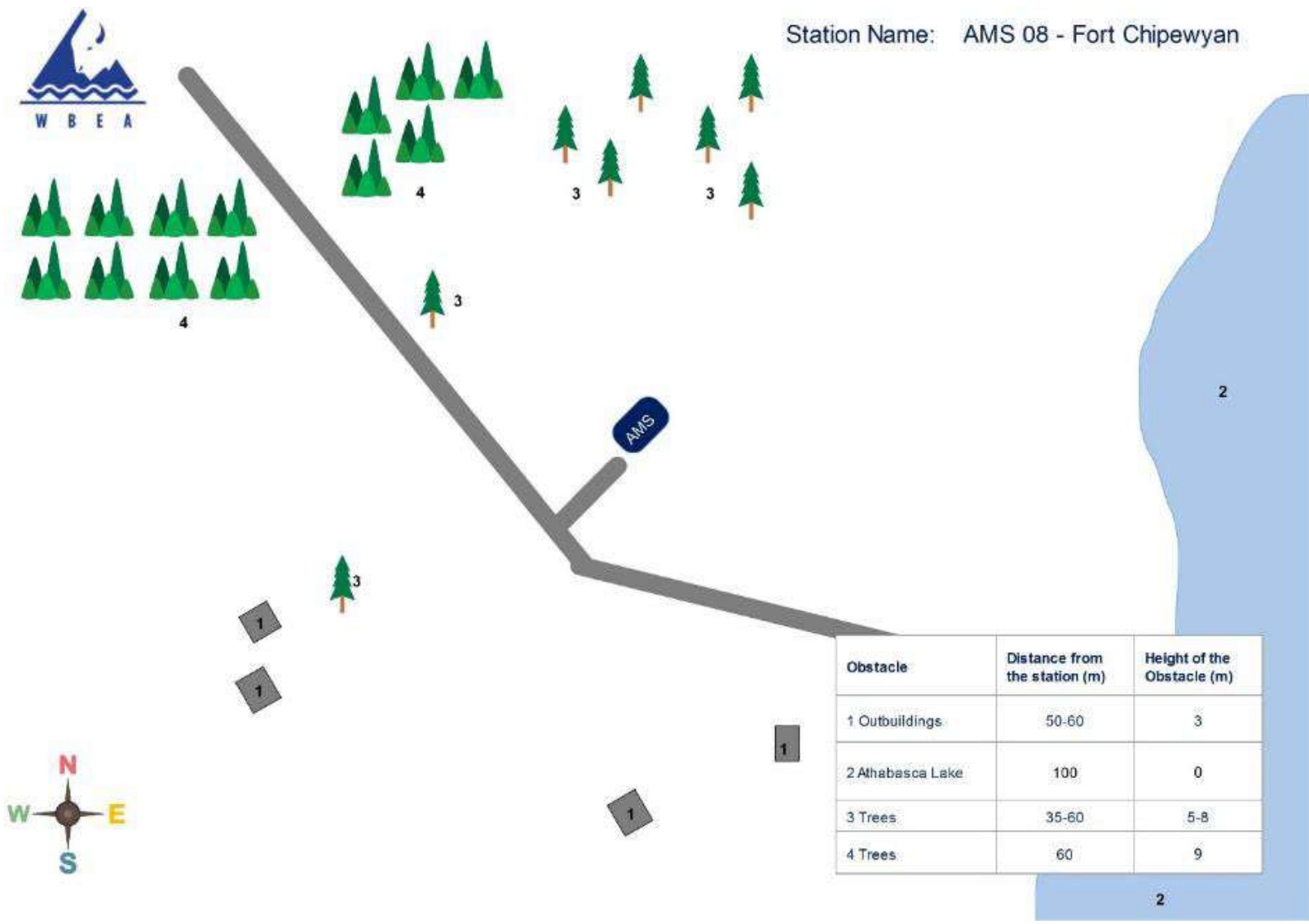


Figure 4.0 – Plan view sketch for AMS 08 site



Figure 5.0 – Elevation view image for AMS 08 site

Not available at this time.

Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North



Figure 6.1 – Environment looking East



Figure 6.2 – Environment looking South





Figure 6.3 – Environment looking West



Figure 6.4 – Meteorological Tower

## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold



Figure 7.1 – Curb shot of the monitoring station





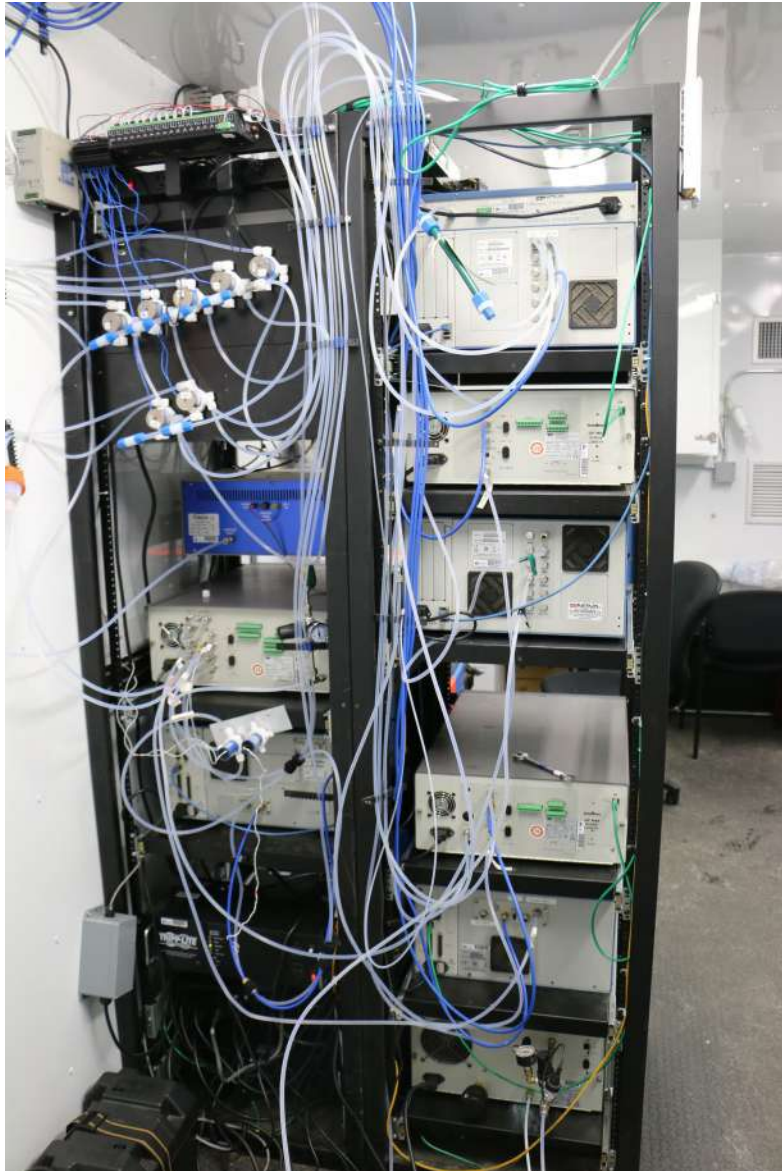


Figure 7.2 –Photo of the front and the back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Fort Chipewyan

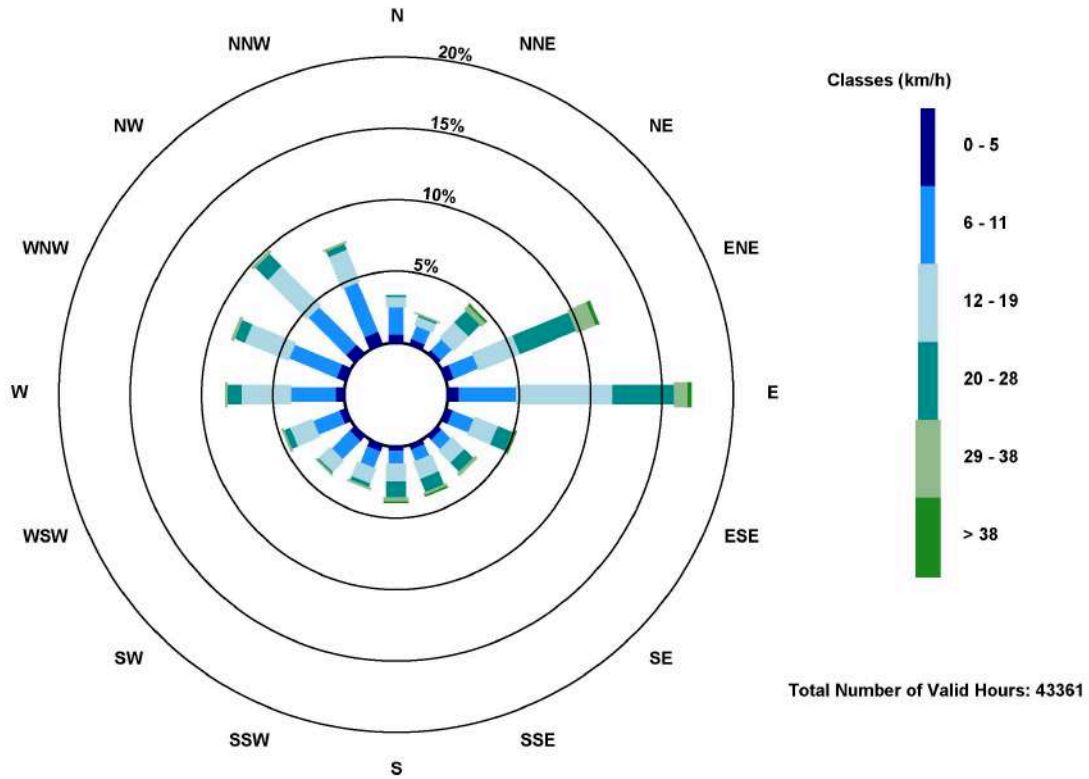


Figure 8.0 – Windrose (Five Year)



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

## Barge Landing

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LAST UPDATED: FEBRUARY-28-2025





# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	18
Station Photos.....	23

## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 09.....	13
Figure 3.0 – Aerial photo showing AMS 09.....	14
Figure 4.0 – Plan view sketch for AMS 09 site .....	15
Figure 5.1 – Elevation view image for AMS 09 site, section A-A .....	16
Figure 5.2 – Elevation view image for AMS 09 site, section B-B.....	17
Figure 6.0 – Environment looking North.....	18
Figure 6.1 – Environment looking East .....	19
Figure 6.2 – Environment looking South.....	20
Figure 6.3 – Environment looking West.....	21
Figure 6.4 – Meteorological Tower.....	22
Figure 7.0 – Photo showing the inlet and sample manifold .....	23
Figure 7.1 – Curb shot of the monitoring station .....	24
Figure 7.2 –Photo of the front and the back of instrument rack.....	25
Figure 8.0 – Windrose (Five Year) .....	26

## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

### Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.

In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.



Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include; sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X	X	X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	X
18	BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network

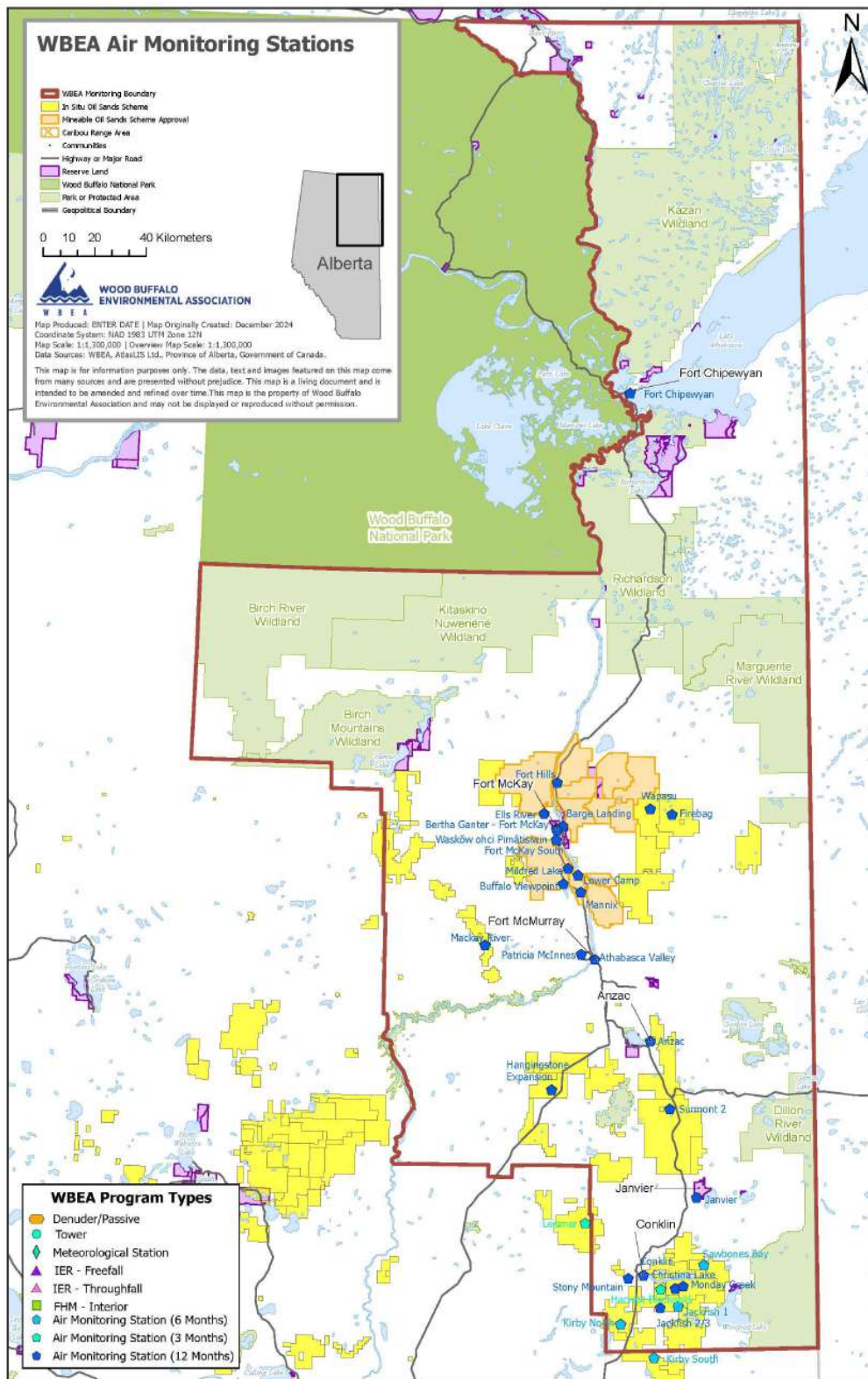


Figure 1.0 – WBEA Network Monitoring Sites



## General Site Information

### Station

Station ID	AMS 09
Station name	Barge Landing
Date station established	2000

### Location

Station street address	Northeast of the Barge Landing Road, approximately 460 meters northwest of the Highway 63 intersection
Legal land description	7-31-094-10 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	57.198178
Longitude	-111.59946327
UTM East	463778
UTM North	6339606
Nearest community	Fort McKay
Community population	757
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Canadian Natural Upgrading Limited
Approval number	20809-02-00
Contact Name	Tina Ding
Address	Albian Sands, P.O. Box 5670
Phone number	780-713-4454
Email address	Tina.Ding@cnrl.com

### Site Description

Land use by sector	0 – 90 degrees	Wooded area
	91 – 180 degrees	Wooded area
	181 – 270 degrees	Wooded area
	271 – 360 degrees	Wooded area
Site elevation (m) (above sea level)	282 m	
Angle of elevation to nearby buildings	Greatest angle	N/A
	Building direction	N/A
Airflow restrictions	North	Trees
	East	Trees

	South	Trees
	West	Trees
Distance to nearest trees (m)	North	10 m
	East	10 m
	West	10 m
	South	10 m
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	20 m
	Distance from station (m)	2 m

### Site Influences

#### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
N/A	N/A	N/A

#### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Barge Landing Road	Very low	70	Well maintained dirt access road frequented by pickup trucks and heavy equipment
Highway 63	Medium	400	Provincial highway frequented by tractor trailers and pickup trucks.

#### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
CNRL Albian	Oil Sands Plant	340,000	10	NE
CNRL Horizon	Oil Sands Plant	100,000	20	NW

## Station Equipment

Equipment Owner: Canadian Natural Upgrading Limited

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO <sub>2</sub>	Thermo Environmental	43i	1118148498	2018
H <sub>2</sub> S	Thermo Environmental	43i-TLE	1331259320	N/A
NO <sub>2</sub>	Thermo Environmental	42i	1426262593	2018
NMHC	Thermo Environmental	55i	1180320038	2024
PM 2.5	Teledyne	T640	844	2023
VOC	Global Analyzers Systems Ltd.	G170	2023-236	2023

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	P3640808	3	2023
WS	Met One	010C-1	B4129	4	2023
WD	Met One	020C-1	D14061	4	2023
Barometric Pressure	WBEA	61302V-10	BPA4394	N/A	2018

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	1850
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	3812
Zero air generator	Zero Air Generator	Teledyne/API	701	4888
TRS Converter	Thermal Oxidizer	CD Nova	CDN-101	519
Shelter / Building	Air monitoring portable	ITB	10 x 20	ITB0814464

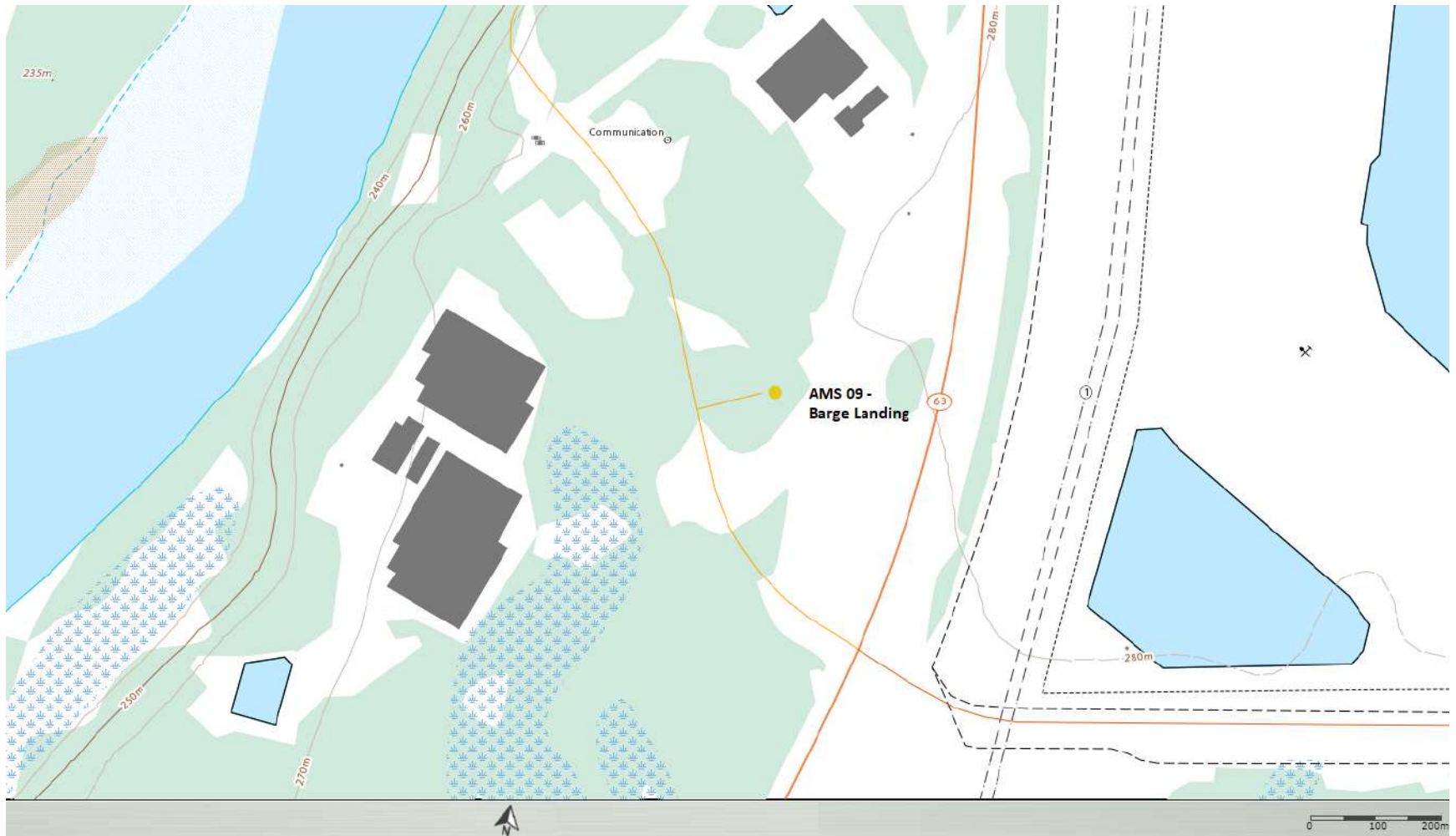


Figure 2.0 – Area topographic map showing AMS 09



Figure 3.0 – Aerial photo showing AMS 09



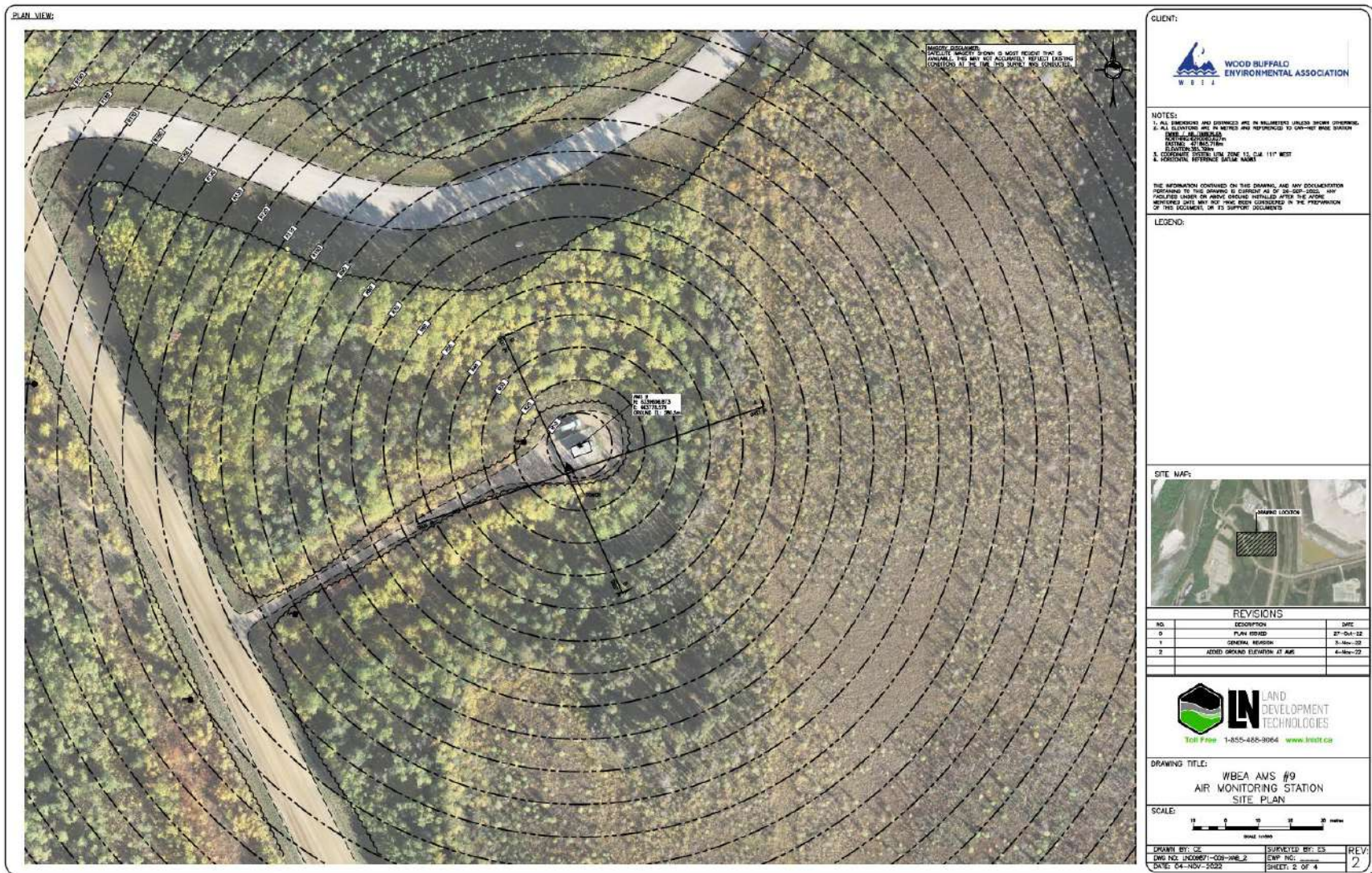
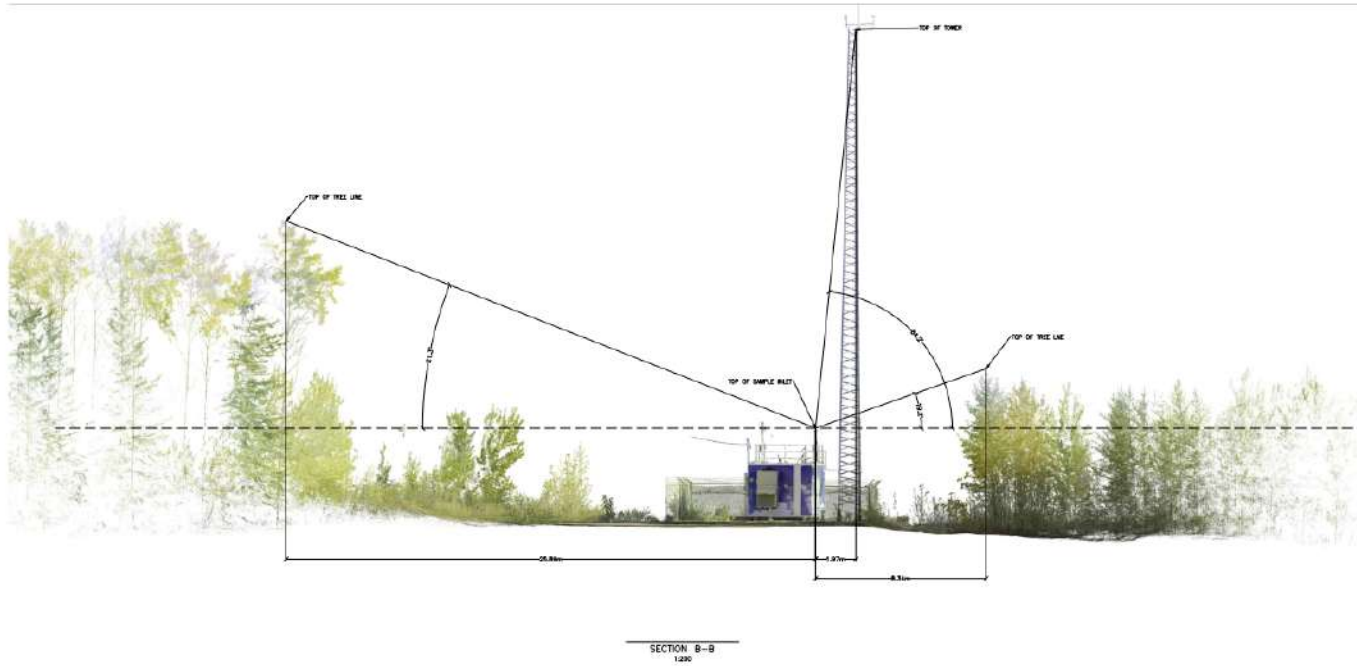


Figure 4.0 – Plan view sketch for AMS 09 site






SECTION VIEW



CLIENT:



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION


NOTES:

1. ALL DIMENSIONS AND DISTANCES ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.
2. ALL ELEVATIONS ARE IN METERS AND REFERENCED TO CANADIAN DATUM.
3. COORDINATE SYSTEM: UTM, ZONE 18, UTM 11° WEST
4. HORIZONTAL REFERENCE DATUM: NAD83

THE INFORMATION CONTAINED ON THIS DRAWING AND ANY DOCUMENTATION PERTAINING TO THIS DRAWING IS LIMITED TO THE PROJECT AND NOT FACILITIES UNDER CONSTRUCTION UNLESS SPECIFICALLY NOTED OTHERWISE. THIS INFORMATION HAS BEEN OBTAINED FROM THE INFORMATION OF THIS DOCUMENT, OR ITS SUPPORT DOCUMENTS.

LEGEND:

SITE MAP:



REVISIONS

NO.	DESCRIPTION	DATE
0	PLAN REVISED	27-Oct-22
1	GENERAL REVISION	3-Nov-22
2	ADDED GROUND ELEVATION AT AMS	4-Nov-22

LAND DEVELOPMENT TECHNOLOGIES

Tool Free 1-855-488-6264 [www.lndt.ca](http://www.lndt.ca)

DRAWING TITLE:

WBEA AMS #9  
AIR MONITORING STATION  
SITE PLAN

SCALE:

DRAWN BY: DE	SURVEYED BY: ES	REV
DWG NO: 19007-000-001	DWGP NO:	2
DATE: 04-10-2022	SHEET: 4 OF 4	

Figure 5.2 – Elevation view image for AMS 09 site, section B-B

## Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North





Figure 6.1 – Environment looking East





Figure 6.2 – Environment looking South





Figure 6.3 – Environment looking West



Figure 6.4 – Meteorological Tower

## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold





Figure 7.1 – Curb shot of the monitoring station



Figure 7.2 –Photo of the front and the back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 20m (WS20) - km/h  
Barge Landing

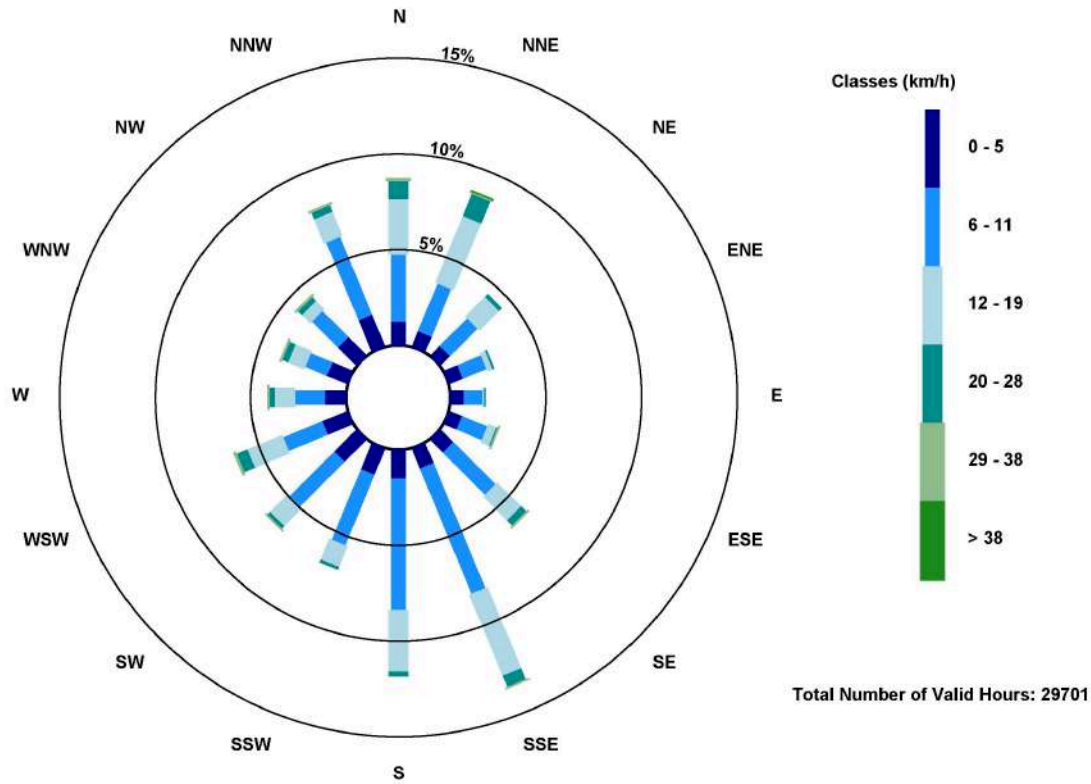


Figure 8.0 – Windrose (Five Year)



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

## Lower Camp

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LAST UPDATED: FEBRUARY 28, 2025





# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	17
Station Photos.....	21

## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 11.....	13
Figure 3.0 – Aerial image showing AMS 11.....	14
Figure 4.0 – Plan view image for AMS 11 site.....	15
Figure 5.0 – Elevation view image for AMS 11 site.....	16
Figure 6.0 – Environment looking North.....	17
Figure 6.1 – Environment looking East .....	18
Figure 6.2 – Environment looking South.....	19
Figure 6.3 – Environment looking West.....	20
Figure 6.4 – Meteorological Tower .....	21
Figure 7.0 – Photo showing the inlet and sample manifold .....	21
Figure 7.1 – Curb shot of the monitoring station .....	22
Figure 7.2 –Photo of the front and the back of instrument rack.....	23
Figure 8.0 – Windrose (five year).....	24

## WBEA Monitoring Network

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### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

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Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.

In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015,

the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012, at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.



Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number, and the air quality parameters measured by continuous methods at each site. Parameters measured include Sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced Sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	Compliance	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network.

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological parameters monitored in the WBEA network.

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated parameters monitored in the WBEA network.

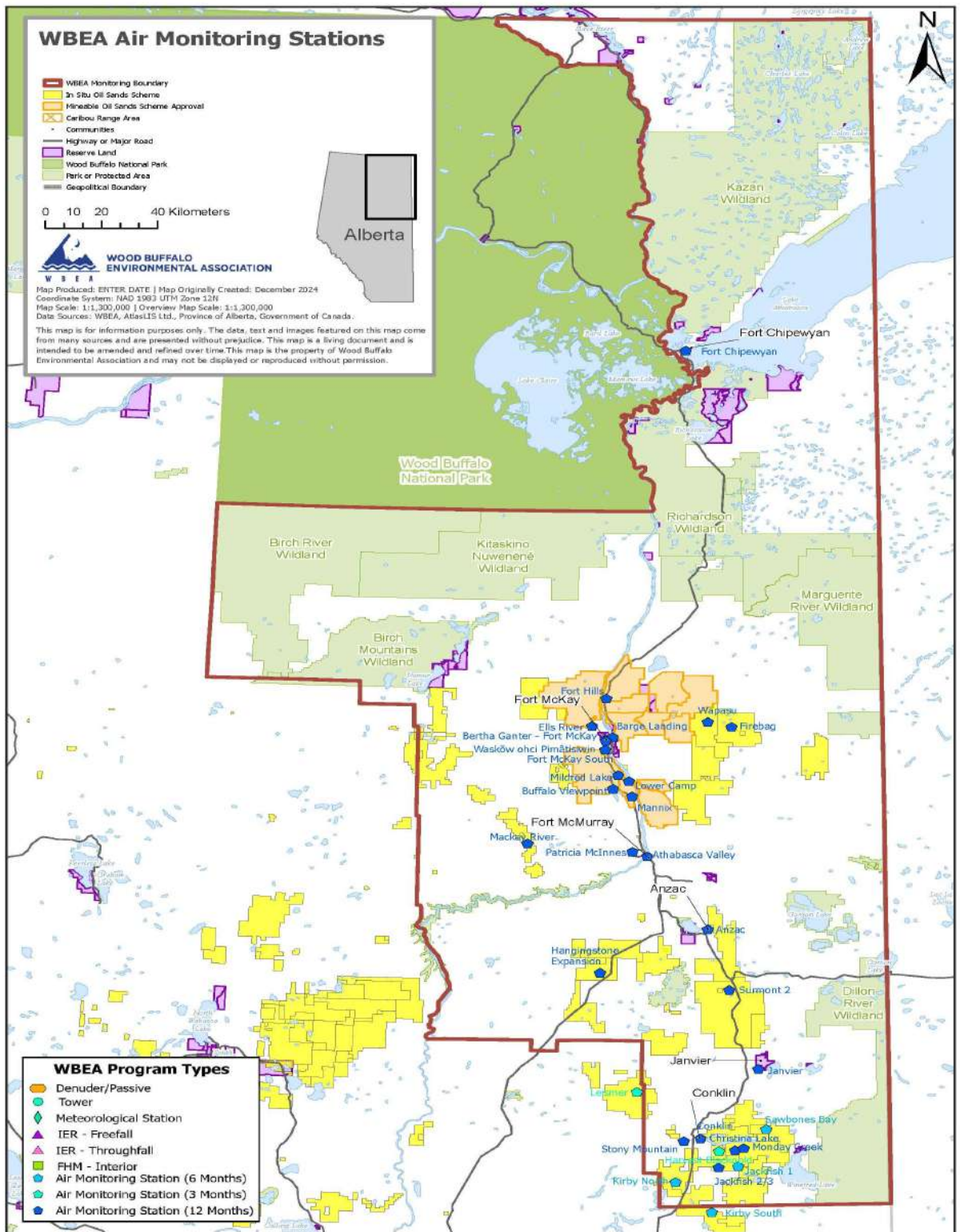


Figure 1.0 – WBEA network monitoring sites.



## General Site Information

### Station

Station ID	AMS 11
Station name	Lower Camp
Date station established	1975

### Location

Station street address	Located by the Athabasca River Valley at about 115 meters south of the Syncrude pump house
Legal land description	11-35-092-10 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	57.0267916667
Longitude	-111.500819444
UTM East	469597.806
UTM North	6320474.662
Nearest community	Fort McMurray
Community population	75186
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Suncor Energy Inc.
Approval number	094-03-00
Contact Name	Nelia Heydenreich
Address	Base Plant Rd, Wood Buffalo, AB
Phone number	780-788-8504
Email address	nheydenreich@suncor.com

### Site Description

Land use by sector	0 – 90 degrees	Syncrude open mining operations
	91 – 180 degrees	Athabasca River
	181 – 270 degrees	Athabasca River
	271 – 360 degrees	Syncrude open mining operations
Site elevation (m) (above sea level)	238 <u>meters</u>	
Angle of elevation to nearby buildings	Greatest angle	0
	Building direction	North
Airflow restrictions	North	Pump House
	East	None

	South	None
	West	None
Distance to nearest trees (m)	North	42
	East	12
	West	12
	South	20
Sample manifold	Type	All glass
	Inlet height above roof	1 meter
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	10
	Distance from station (m)	attached

### Site Influences

#### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Laydown	79.21	Equipment Laydown
Water Pond	136.8	Reservoir
Athabasca River	33.8	River
Pumping Station	114	Syncrude Water Pump Station

#### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Gravel road	Low	20	Road access to lay down and pumping station

#### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Suncor Energy	Oil refinery	330,000 bbl/day	2	South
Syncrude	Oil refinery/open mining	225,000 bbl/day	3	West
Suncor Energy	Open mining operations	NA	4	East

## Station Equipment

Equipment Owner: Suncor

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO <sub>2</sub>	Thermo Scientific	43i	100841398	2015
H <sub>2</sub> S	Thermo Scientific	43iq	1203169745	2015
NMHC	Thermo Scientific	55i	1505164381	2019
PWD	Vaisala	PWD22	H5030008	2013

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	G0840086	4	2022
WS	Met One	010C-1	N11710	4	2017
WD	Met One	020C-1	N12035	4	2022
BP	Vaisala	CS106	T2210938	4	2022
PWD	Vaisala	PWD22	H5030008	4	2015

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	2403
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	3807
Zero air generator	Zero Air Generator	Teledyne/API	701	196
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	11447



Figure 2.0 – Area topographic map showing AMS 11.





Figure 3.0 – Aerial image showing AMS 11.

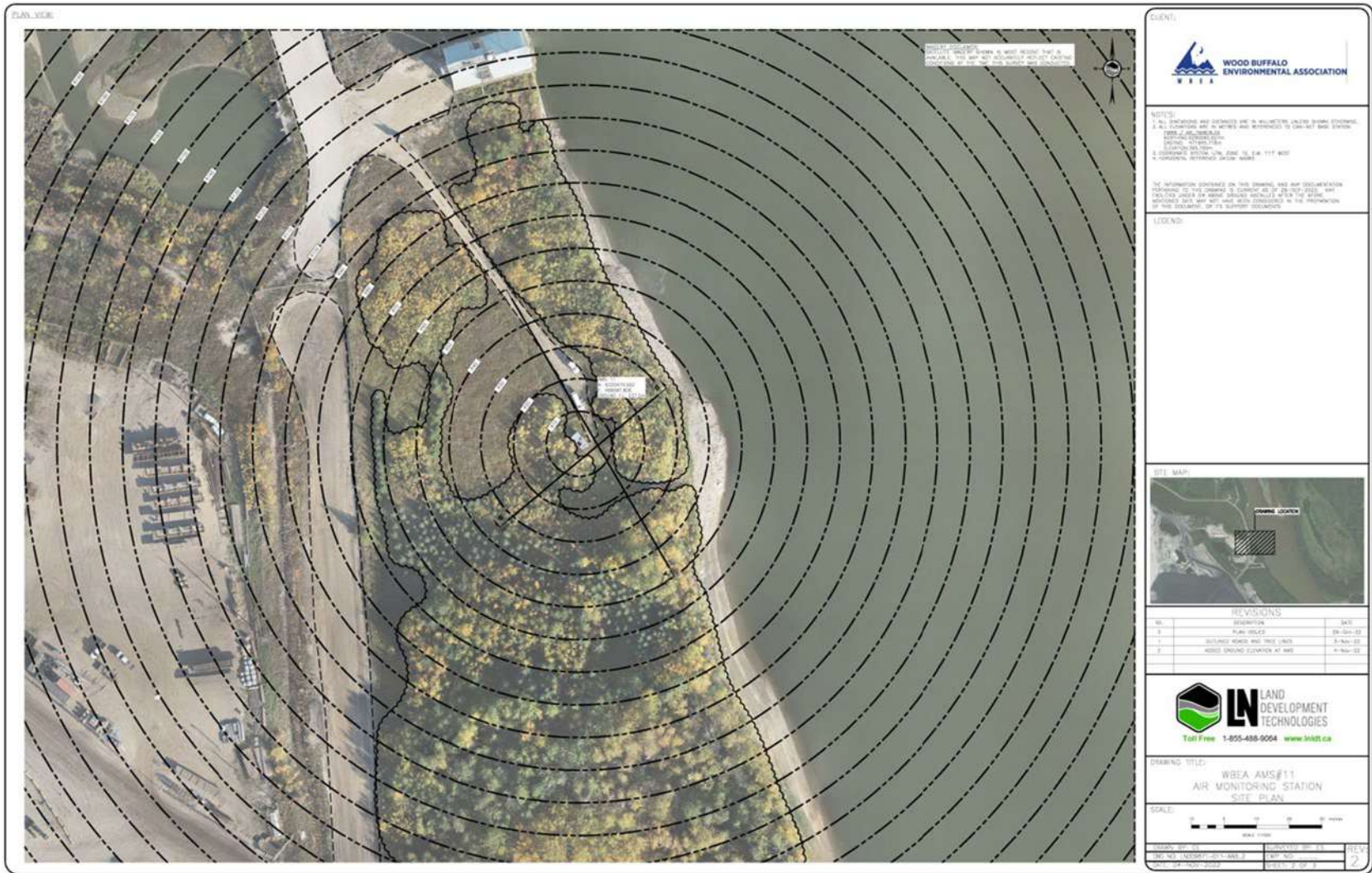


Figure 4.0 – Plan view image for AMS 11 site.



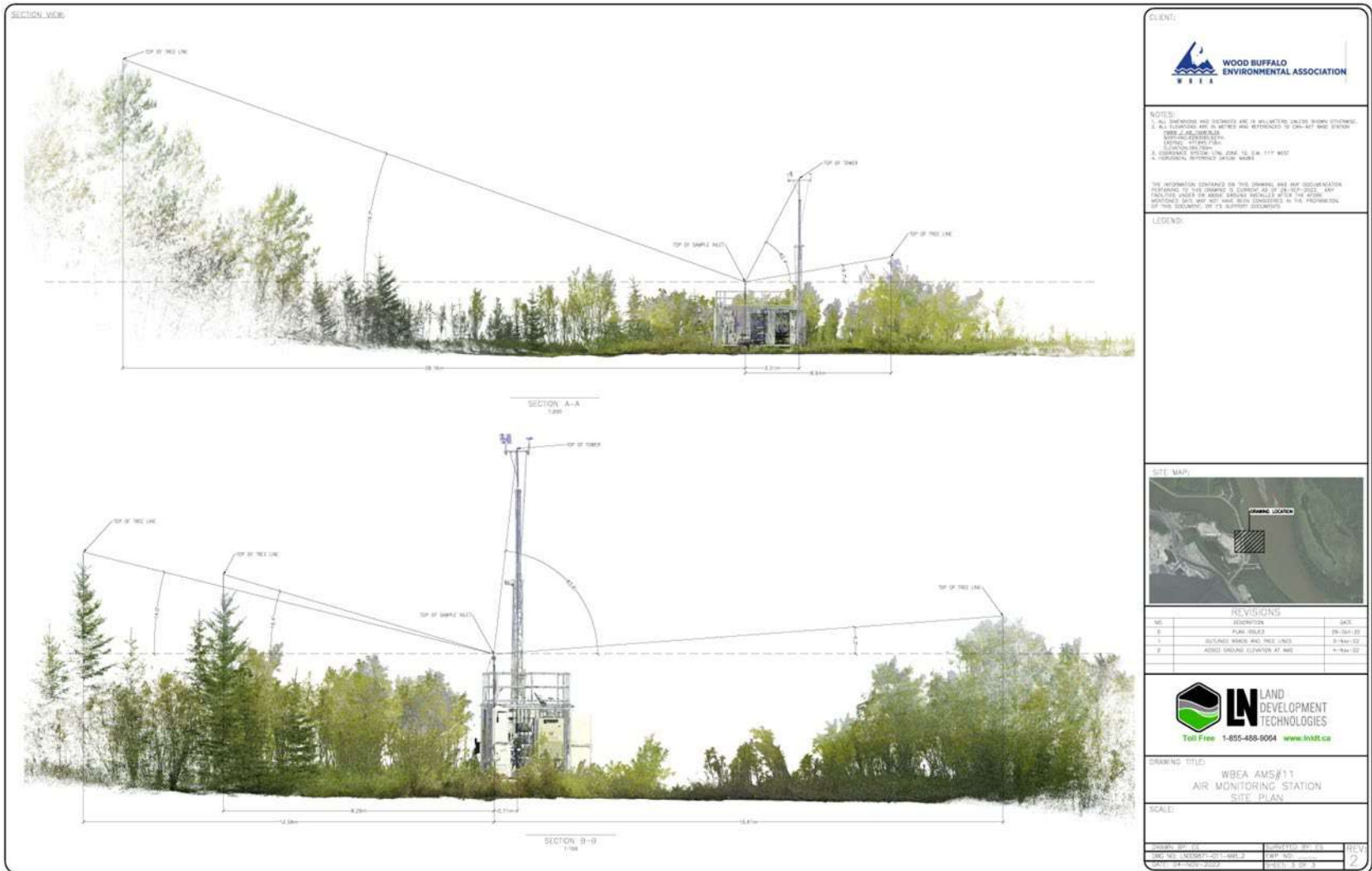


Figure 5.0 – Elevation view image for AMS 11 site.

Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North.





Figure 6.1 – Environment looking East.





Figure 6.2 – Environment looking South.





Figure 6.3 – Environment looking West.

This photo is currently not available  
Figure 6.4 – Meteorological Tower

### Station Photos

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold.





Figure 7.1 – Curb shot of the monitoring station.





Figure 7.2 –Photo of the front and the back of instrument rack.



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Lower Camp

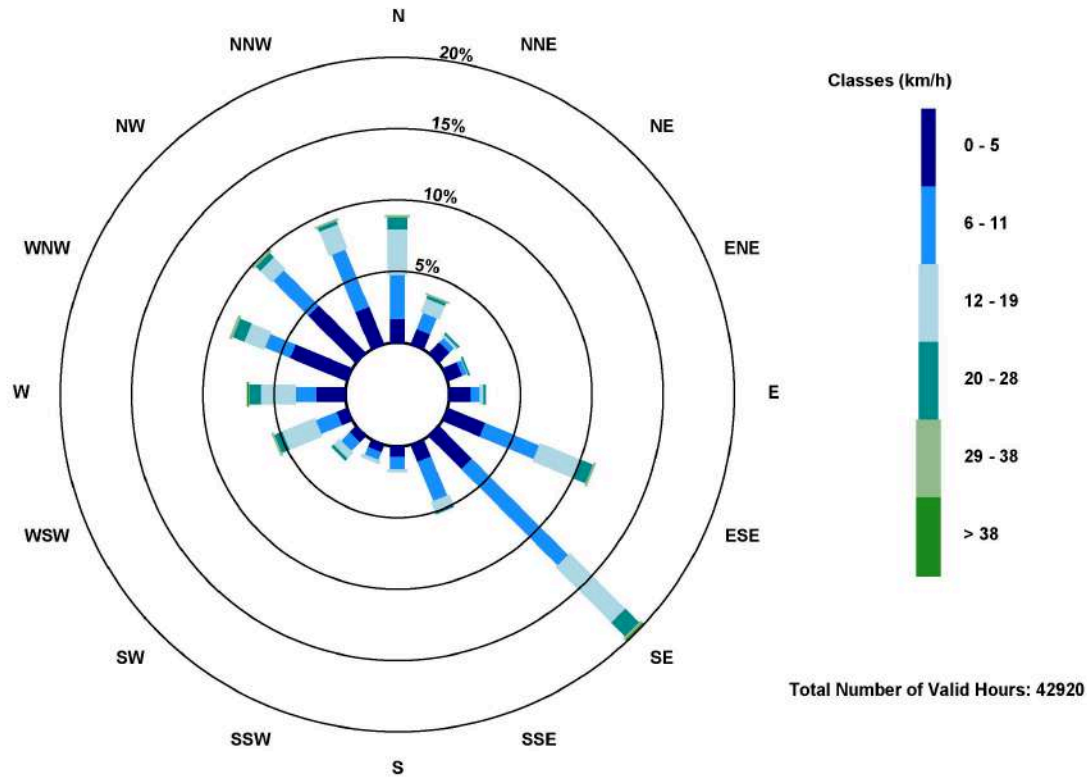


Figure 8.0 – Windrose (five years).

Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station**  
**Site Documentation**

Fort McKay South

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LAST UPDATED: FEBRUARY-28-2025





# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	13
Analytical Equipment .....	13
Meteorological Equipment .....	13
Support Equipment.....	13
Site photos .....	18
Station Photos.....	21



## Tables and Figures

Table 1.0 - Pollutant Parameters monitored in the WBEA network.....	6	
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7	
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8	
Figure 1.0 – WBEA Network Monitoring Sites .....	9	
Figure 2.0 – Area Topographic map showing AMS 13 .....	14	
Figure 3.0 – Aerial image showing AMS 13.....	15	
Figure 4.0 – Plan view image for AMS 13 – Fort McKay South.....	16	
Figure 5.0 – Elevation image for AMS 13 – Fort McKay South .....	17	
Figure 6.0 – Environment looking North	Figure 6.1 – Environment looking East .....	18
Figure 6.2 – Environment looking South	Figure 6.3 – Environment looking West .....	19
Figure 6.4 – Meteorological Tower .....	20	
Figure 7.0 – Photo showing the inlet and sample manifold. ....	21	
Figure 7.1 – Curb shot of the monitoring station. ....	22	
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The time-integrated parameters for each station are summarized in Table 1.2.





Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include hydrogen sulphide (H<sub>2</sub>S), total reduced sulphur (TRS), sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), total hydrocarbons (THC), methane (CH<sub>4</sub>), non-methane hydrocarbons (NMHC), ammonia (NH<sub>3</sub>), carbon monoxide (CO), and carbon dioxide (CO<sub>2</sub>). Sites are categorized as industrial or community, based on the setting in which they are located.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACK FISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACK FISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant Parameters monitored in the WBEA network



Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network



Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), and precipitation samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X	X	X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ ATTRIBUTION	FORTMCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	X
18	BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORTHILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network



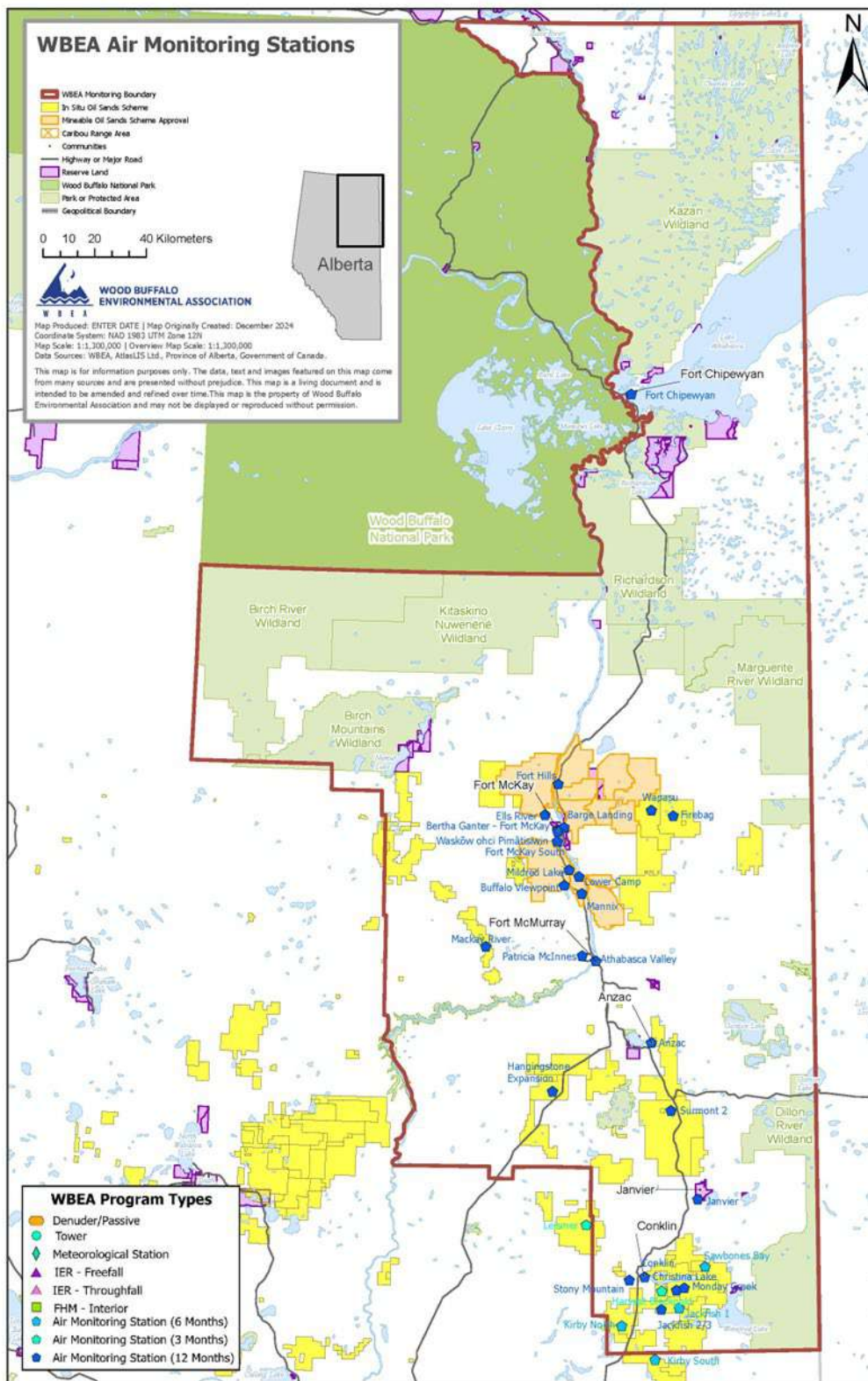


Figure 1.0 – WBEA Network Monitoring Sites





## General Site Information

### Station

Station ID	AMS 13
Station name	Fort McKay South
Date station established	2002

### Location

Station street address	None
Legal land description	4-13-094-11 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	57.149175
Longitude	-111.642344
UTM East	461136
UTM North	6334175
Nearest community	Fort McKay
Community population	757
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Syncrude Canada Ltd
Approval number	026-02-00
Contact Name	Brooke Bennett
Address	Bag 4009, MD 4160, Fort McMurray, Alberta, T9H 3L1
Phone number	780-790-5692
Email address	Bennett.brooke@syncrude.com

### Site Description

Land use by sector	0 – 90 degrees	Forest
	91 – 180 degrees	Forest
	181 – 270 degrees	Forest
	271 – 360 degrees	Forest
Site elevation (m) (above sea level)	268 m	
Angle of elevation to nearby buildings	Greatest angle	None
	Building direction	None
Airflow restrictions	North	None
	East	None
	South	None



	West	None
Distance to nearest trees (m)	North	150
	East	108
	West	56
	South	150
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	10 m
	Distance from station (m)	0 m

## Site Influences

### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description

## Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Asphalt	High	326	Main Road to Fort McKay and CNRL Horizon
Dirt	Low	99	Road to AMS 13
Dirt	Very Low	10	Access Road to AMS 13

## Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
CNRL Horizon	OilSands Plant	250,000	21.9	N
Syncrude	Tailings pond	350,000	6.2	SW
Syncrude	OilSands Plant		12.3	S
Fort McKay Enterprises Ltd.	Laydown Yard		1	SE
Bouchier Group	LayDown Yard		1	SE
BME Ltd.	Laydown Yard		1	SE



Wood Buffalo Water Treatment Plant	Water Treatment Plant		4.9	N
CNRL Albian	Tailings pond		9.2	NE
CNRL Albian	Oilsands Plant	255,000	14.1	NE

## Station Equipment

Equipment Owner: Syncrude Canada Ltd.

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO2	Teledyne/API	T100	599	2016
TRS	Thermo Scientific	43i-TLE	1180540017	2016
NO2	Thermo Scientific	42iQ	12300522720	2025
THC	Thermo Scientific	55i	1181490018	2024
O3	Teledyne/API	T400	3871	2021
PM 2.5	Teledyne/API	T640	1335	2023
PM 10	Thermo Scientific	2000i	20001203861408	2016
PM 10	Thermo Scientific	2000i	20001203861408	2016
VOC	Tisch	TE123	1023	2016
TRS converter	Thermo Scientific	CDN-101	521	2016

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	G430047	Class 3	2016
WS	Met One	010C-1	N10022	Class 4	2022
WD	Met One	020C-1	W16101	Class 4	2021

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	11038
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	2248
Zero air generator	Zero Air Generator	Teledyne/API	701	1117
Shelter / Building	Air monitoring portable	C&V	8 x 16 trailer	5201657
HVAC	Heating and air conditioning system. Wall mount unit	Intherem	E2EB-010HB	E2E011101302





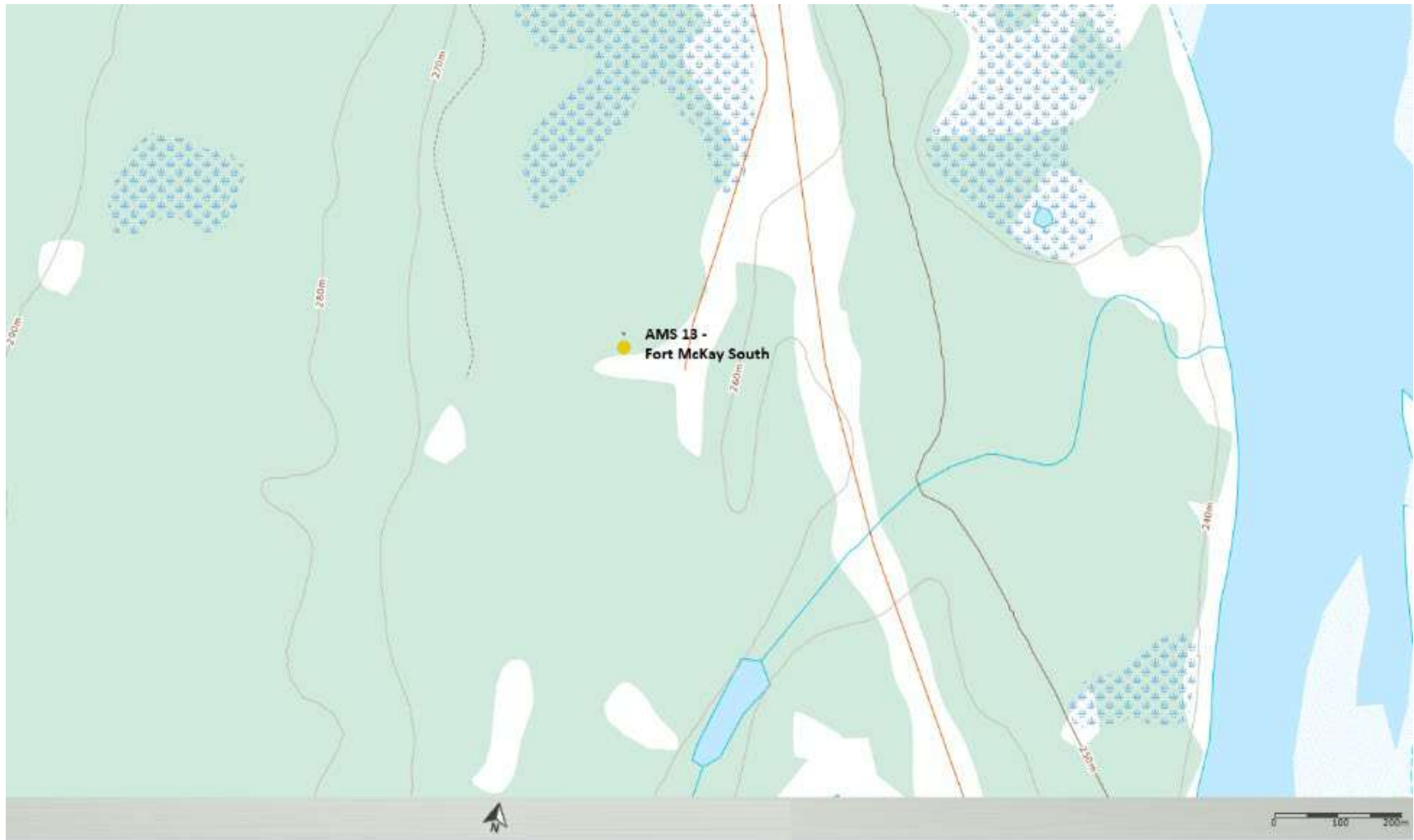


Figure 2.0 – Area Topographic map showing AMS 13



Figure 3.0 – Aerial image showing AMS 13





Figure 4.0 – Plan view image for AMS 13 – Fort McKay South

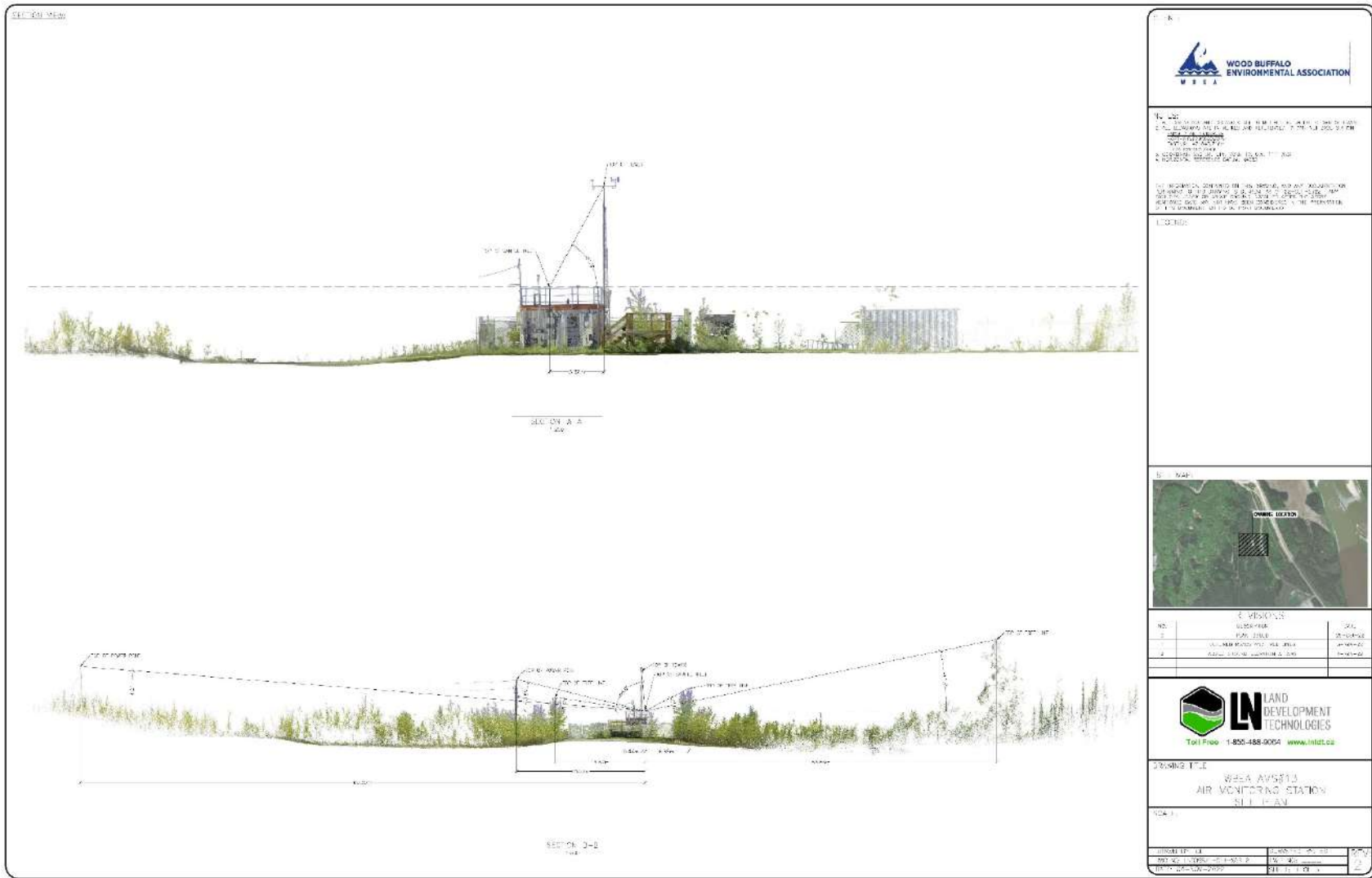


Figure 5.0 – Elevation image for AMS 13 – Fort McKay South



Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North



Figure 6.1 – Environment looking East



Figure 6.2 – Environment looking South



Figure 6.3 – Environment looking West



Figure 6.4 – Meteorological Tower



## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold.





Figure 7.1 – Curb shot of the monitoring station.



Figure 7.2 –Photo of the front and the back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

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

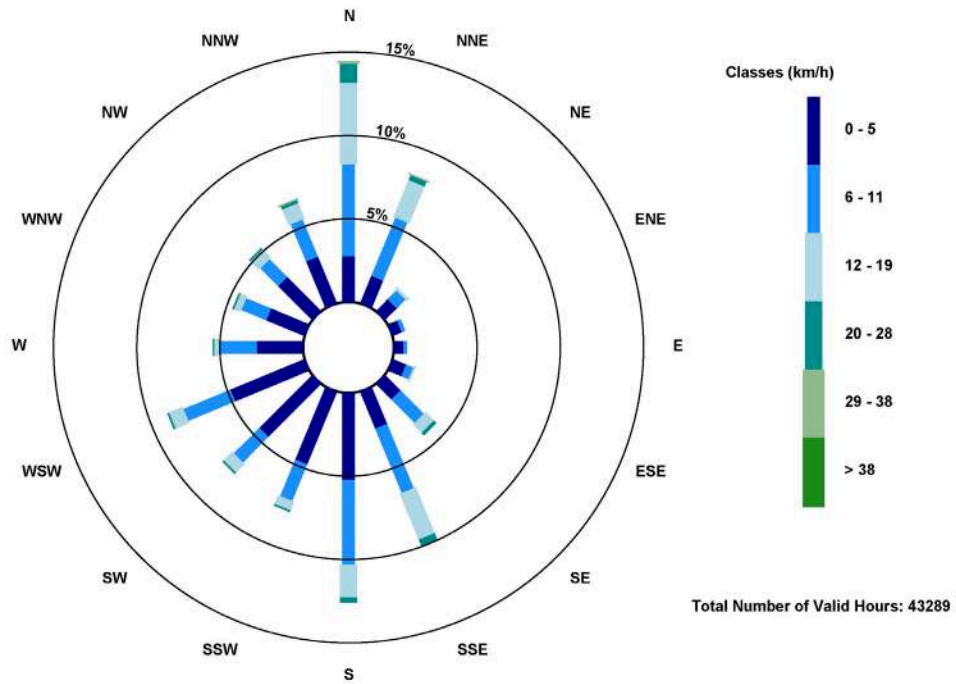


Figure 8.0 – Windrose (2020-2025)



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

Anzac

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LAST UPDATED: FEBRUARY 28, 2025





# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Station Photos.....	22

## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 14.....	13
Figure 3.0 – Aerial image showing AMS 14.....	14
Figure 4.0 – Plan view image for AMS 14 site.....	15
Figure 5.0 – Elevation view image for AMS 14 site.....	16
Figure 6.0 – Environment looking North.....	17
Figure 6.1 – Environment looking East .....	18
Figure 6.2 – Environment looking South.....	19
Figure 6.3 – Environment looking West.....	20
Figure 6.4 – Meteorological Tower .....	21
Figure 7.0 – Photo showing the inlet and sample manifold .....	22
Figure 7.1 – Curb shot of the monitoring station .....	23
Figure 7.2 –Photo of the front and the back of instrument rack.....	24
Figure 8.0 – Windrose (Five Year) .....	25

## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometers, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Oduor Monitoring Program within WBEA.

### Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.

In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012, at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites: Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dust fall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.



Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number, and the air quality parameters measured by continuous methods at each site. Parameters measured include Sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced Sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	Compliance	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network.

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network.

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dust fall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network.

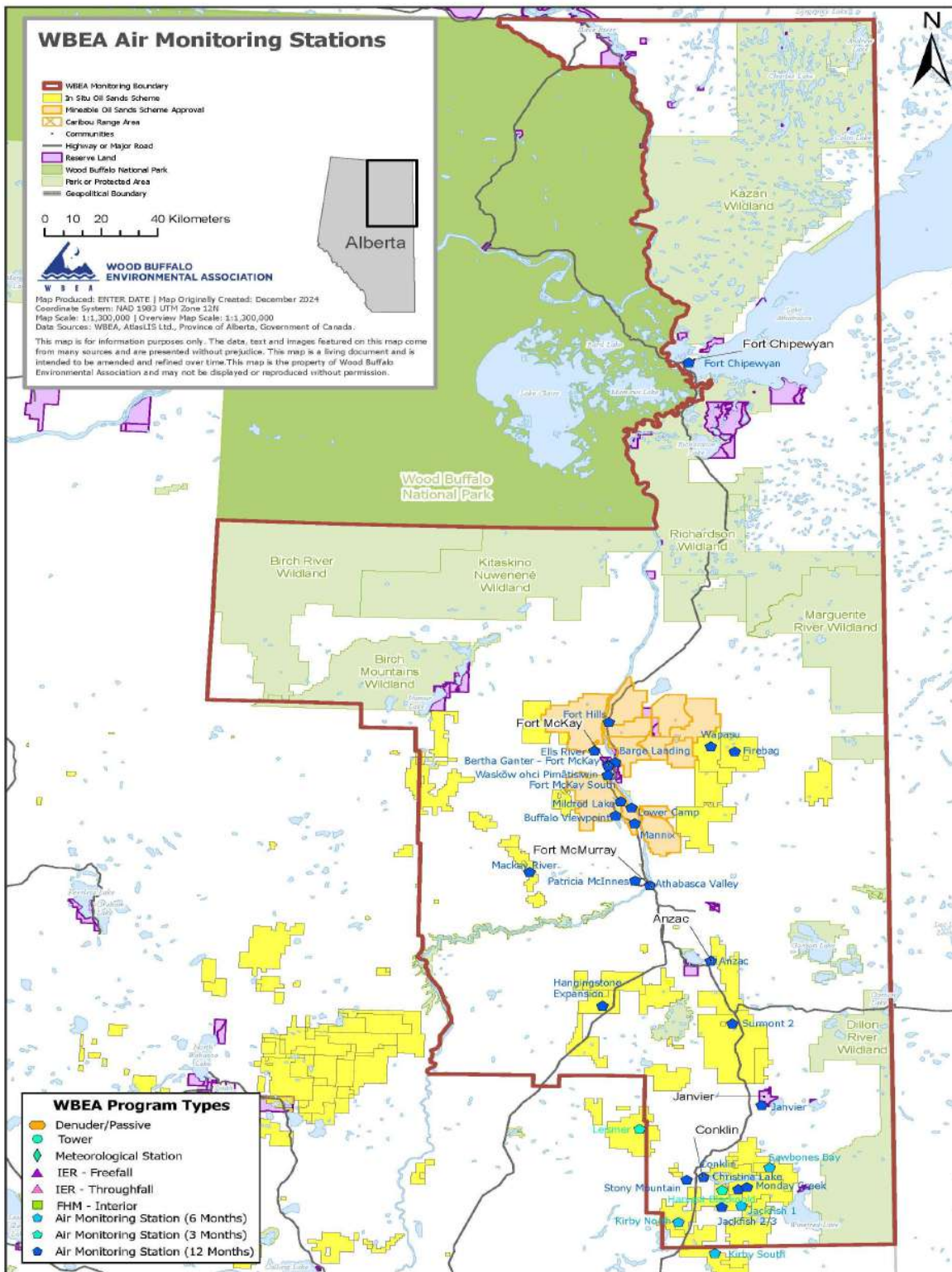


Figure 1.0 – WBEA Network Monitoring Sites.



## General Site Information

### Station

Station ID	AMS 14
Station name	Anzac
Date station established	January 1, 2006

### Location

Station street address	Stony Mountain Road
Legal land description	16-09-086-07 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	56.4489083333
Longitude	-111.037975
UTM East	497659
UTM North	6256044
Nearest community	Anzac
Community population	506
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	CNOOC International
Approval number	137467-01-00; 236394-00-00
Contact Name	Nandakumar Rajendran
Address	Suite 2300, 500 Centre St. SE, Calgary, AB, T2G 1A6
Phone number	780-742-6873
Email address	Nandakumar.Rajendran@intl.cnooltd.com

### Site Description

Land use by sector	0 – 90 degrees	Trees
	91 – 180 degrees	Trees
	181 – 270 degrees	House
	271 – 360 degrees	Trailer
Site elevation (m) (above sea level)	497 m	
Angle of elevation to nearby buildings	Greatest angle	18
	Building direction	West
Airflow restrictions	North	None
	East	None
	South	None

	West	House
Sample manifold	Type	All glass
	Inlet height above roof	1 meter
Distance to nearest trees (m)	North	39 metre
	East	30 metre
	West	NA
	South	NA
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	20 m
	Distance from station (m)	3 m

## Site Influences

### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Trailer	18 m	Communication shack
House	14 m	House W of station

### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Pavement	Low	62 m	Main road of Anzac
Access road	Low	16 m	Access road to the station
Railway	Low	70 m	

### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Nexen Long Lake	SAGD	70,000 bbl/day	4.38	SW

## Station Equipment

Equipment Owner: WBEA

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO2	Thermo Scientific	43i	710321322	2023-07-07
TRS	Thermo Scientific	43i-LTE	1218153582	2022
NO2	Thermo Scientific	42i	1152430008	2022
NMHC	Thermo Scientific	55i	1331259521	2025-01-06
O3	Thermo Scientific	49i	1426262595	2024-01-04
PM2.5	Teledyne	T640	825	2022
PM10	Thermo Scientific	2000i	2000i 294821408	2016
PM10	Thermo Scientific	2000i	2000i 204581405	2016
PM2.5	Thermo Scientific	2000i	2000i 203871308	2016
PM2.5	Thermo Scientific	2000i	2000iW205911510	2016
PAH	Tisch Environmental	TE-PIF+BL	1001055	2016
VOC	Tisch Environmental	TE-123	1024	2022

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	N5050071	2	2024-11-04
WS	Met One	010C-1	U11126	3	2024-04-09
WD	Met One	020C-1	C21020	3	2024-04-09
Leaf Wetness	Decagon Devices	LWS-L	N/A		2022

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	2582
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	3060
Zero air generator	Zero Air Generator	Teledyne/API	T701H	357
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	ITB 21 18397
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	

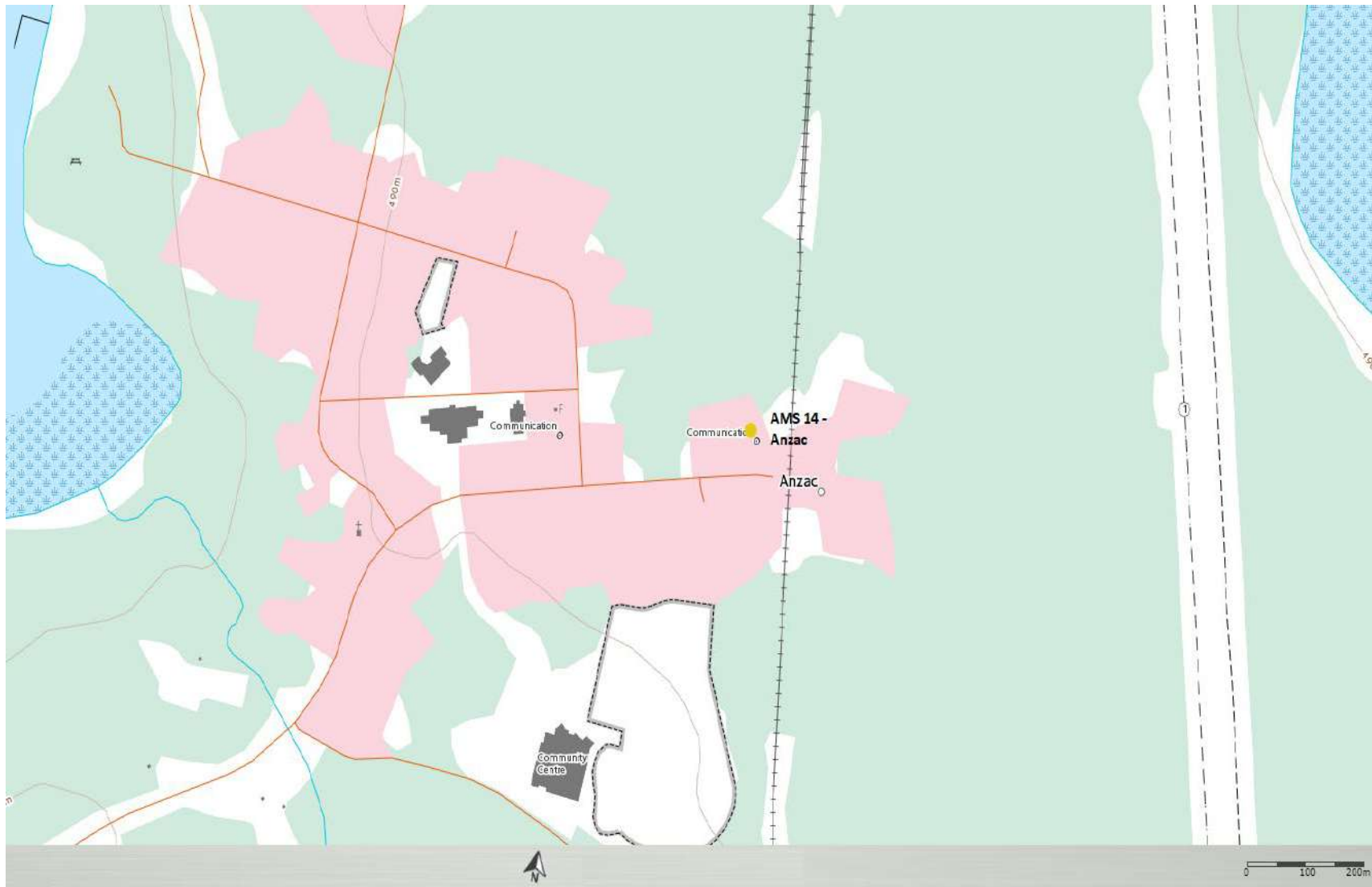


Figure 2.0 – Area topographic map showing AMS 14.





Figure 3.0 – Aerial image showing AMS 14.



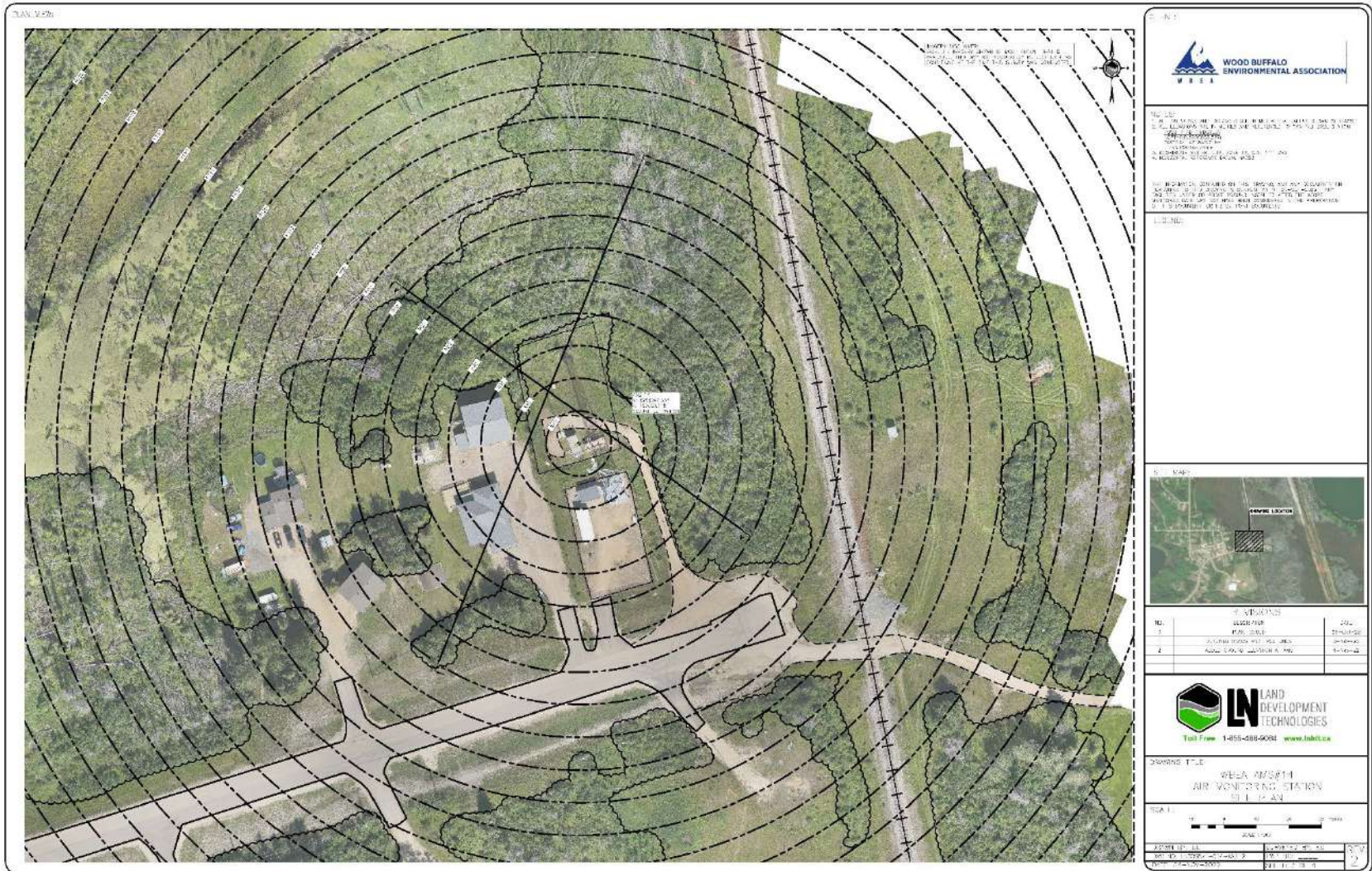


Figure 4.0 – Plan view image for AMS 14 site.





Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North.





Figure 6.1 – Environment looking East.





Figure 6.2 – Environment looking South.





Figure 6.3 – Environment looking West.



Figure 6.4 – Meteorological Tower.



## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold.



Figure 7.1 – Curb shot of the monitoring station.





Figure 7.2 –Photo of the front and the back of instrument rack.



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 20m (WS20) - km/h  
Anzac

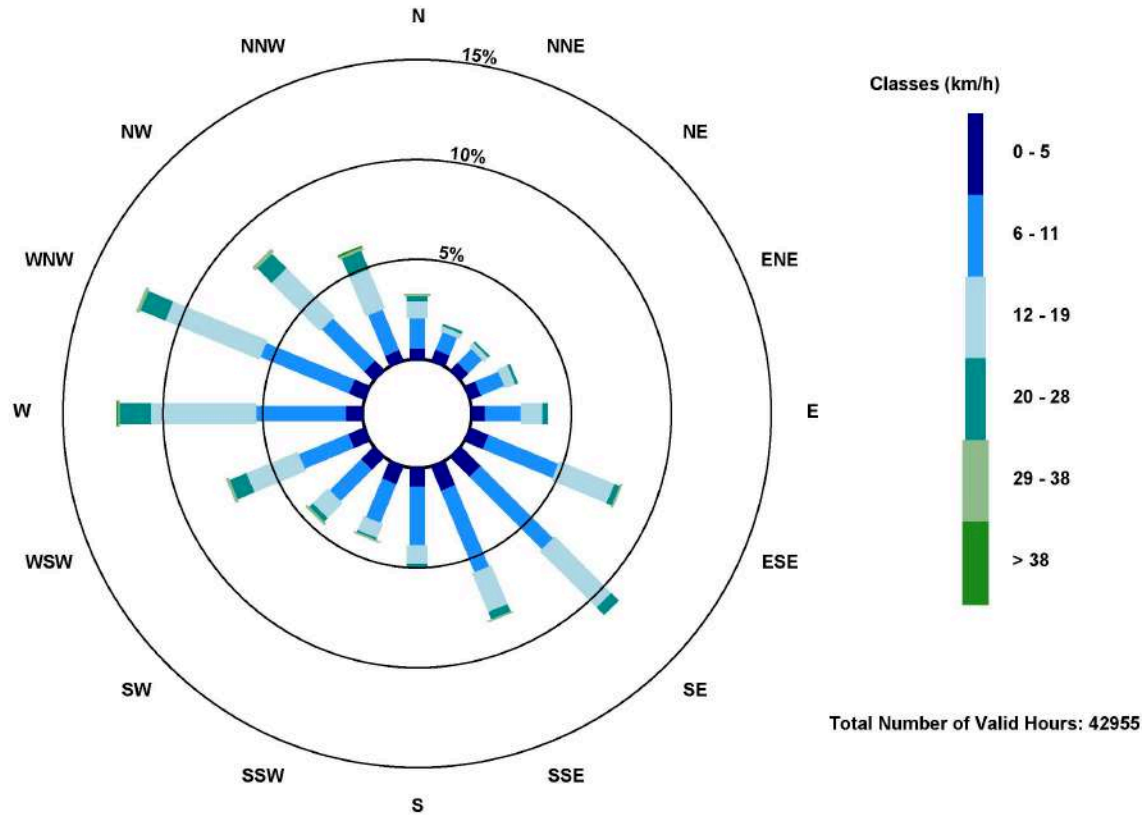


Figure 8.0 Windrose (Five Year).





Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

Wapasu

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LAST UPDATED: FEBRUARY 12, 2025



# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Empower all stakeholders and rights holders with environmental data to make informed decisions. ...	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description .....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Station Photos.....	22

## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 17.....	13
Figure 3.0 – Aerial photo showing AMS 17 .....	14
Figure 4.0 – Plan view sketch for AMS 17 site .....	15
Figure 5.0 – Environment looking North.....	17
Figure 5.1 – Environment looking East .....	18
Figure 5.2 – Environment looking South.....	19
Figure 5.3 – Environment looking West.....	20
Figure 5.4 – Meteorological Tower.....	21
Figure 6.0 – Photo showing the inlet and sample manifold .....	22
Figure 6.1 – Curb shot of the monitoring station .....	23
Figure 6.2 –Photo of the front and the back of instrument rack.....	24
Figure 7.0 – Windrose(Five Year) .....	25

## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient (VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

### Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.



In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.

Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include; sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	Compliance	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network



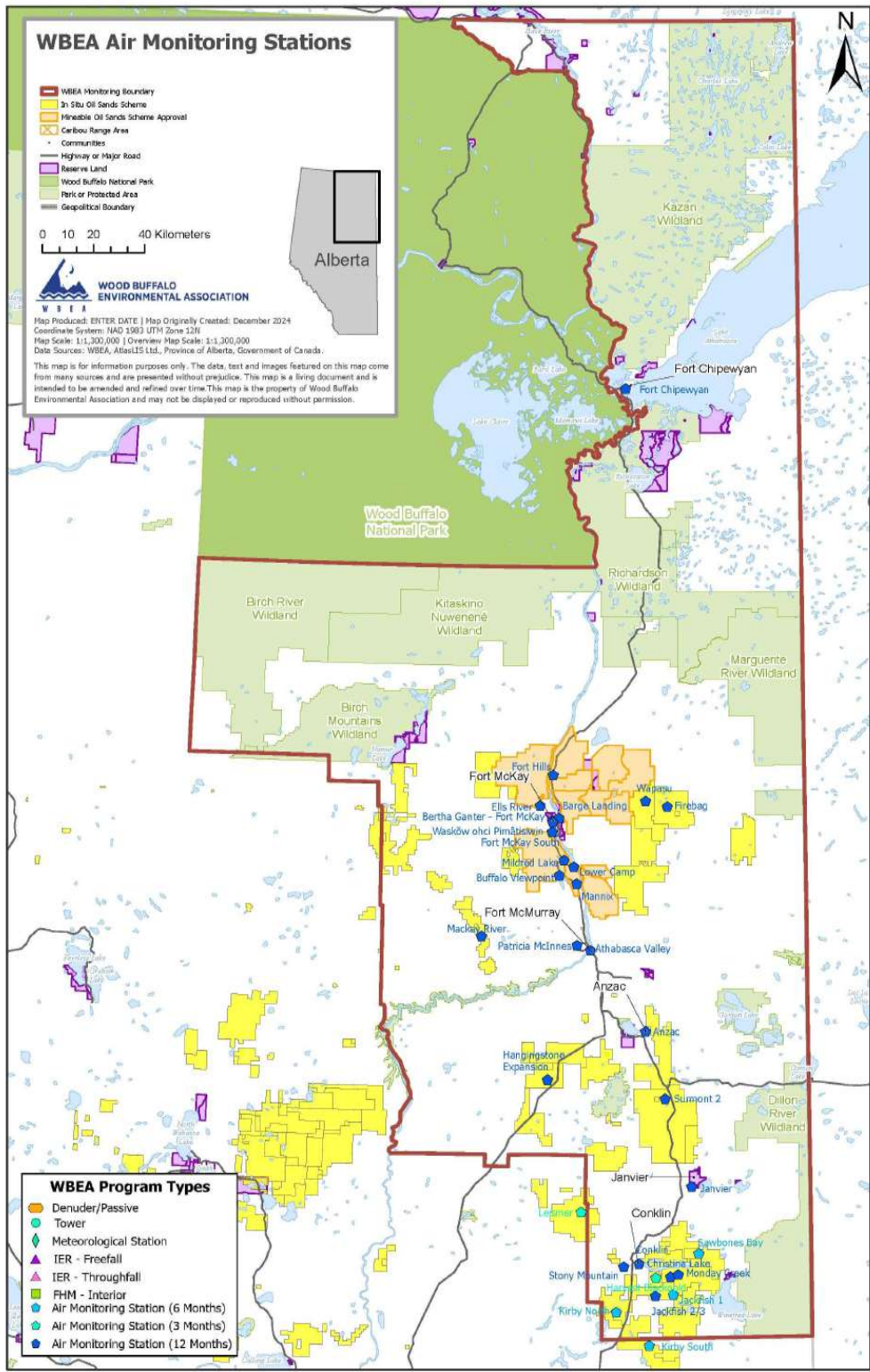


Figure 1.0 – WBEA Network Monitoring Sites

## General Site Information

### Station

Station ID	AMS 17
Station name	Wapasu
Date station established	November, 2013

### Location

Station street address	Located northeast of Husky Sunrise.
Legal land description	9-22-095-07 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	57.25913818
Longitude	-111.0385386
UTM East	497672
UTM North	6346240
Nearest community	Fort Mackay
Community population	757
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Cenovus
Approval number	206355-01-00
Contact Name	Rene Morales
Address	N/A
Phone number	403-816-6144
Email address	Rene.morales@cenovus.com

### Site Description

Land use by sector	0 – 90 degrees	Decommissioned well pad
	91 – 180 degrees	Wooded area
	181 – 270 degrees	Wooded area
	271 – 360 degrees	Site access road
Site elevation (m) (above sea level)	491	
Angle of elevation to nearby buildings	Greatest angle	N/A
	Building direction	N/A
Airflow restrictions	North	No
	East	No
	South	No

	West	No
Distance to nearest trees (m)	North	45 m
	East	45 m
	West	80 m
	South	45 m
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	10 m
	Distance from station (m)	0 m

### Site Influences

#### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
N/A	N/A	N/A

#### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Access road	Low	5	Gravel access road used by pickup trucks.
Canterra Main Road	High	1500	Heavily trafficked gravel road frequented by heavy equipment, tractor trailers, and pickup trucks.

#### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Suncor Firebag	Oilsands Operation	157,500	10	SE
Cenovus Sunrise	Oilsands Operation	346,000	2	SW

## Station Equipment

Equipment Owner:

## Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO <sub>2</sub>	Thermo Environmental	43i	1218153459	March 2016
H <sub>2</sub> S	Thermo Environmental	450i	1218453583	March 2016
NO <sub>2</sub>	Thermo Environmental	42iQ	12300522720	June 6, 2023
THC	Thermo Environmental	51i	1218153352	March 2016
O <sub>3</sub>	Teledyne/API	T400	7045	July 2024
PM <sub>2.5</sub>	Teledyne/API	T640	1183	March 2016
ECOC	Thermo Environmental	2000i	20001204511404	March 2016
PC	N-CON	00-120-2	60198	March 2016

## Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	G4330041	3	September 2021
WS	Met One	010C-1	N14664	3	May 2018
WD	Met One	020C-1	P19942	3	May 2018
PC	OTT	Pluvio 2	31209514	3	March 2016

## Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	2663
Datalogger	Datalogger	Campbell Scientific	CR310	6009
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	2449
Zero air generator	Zero Air Generator	Teledyne/API	701H	1238
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	ITB12-15686
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	NA



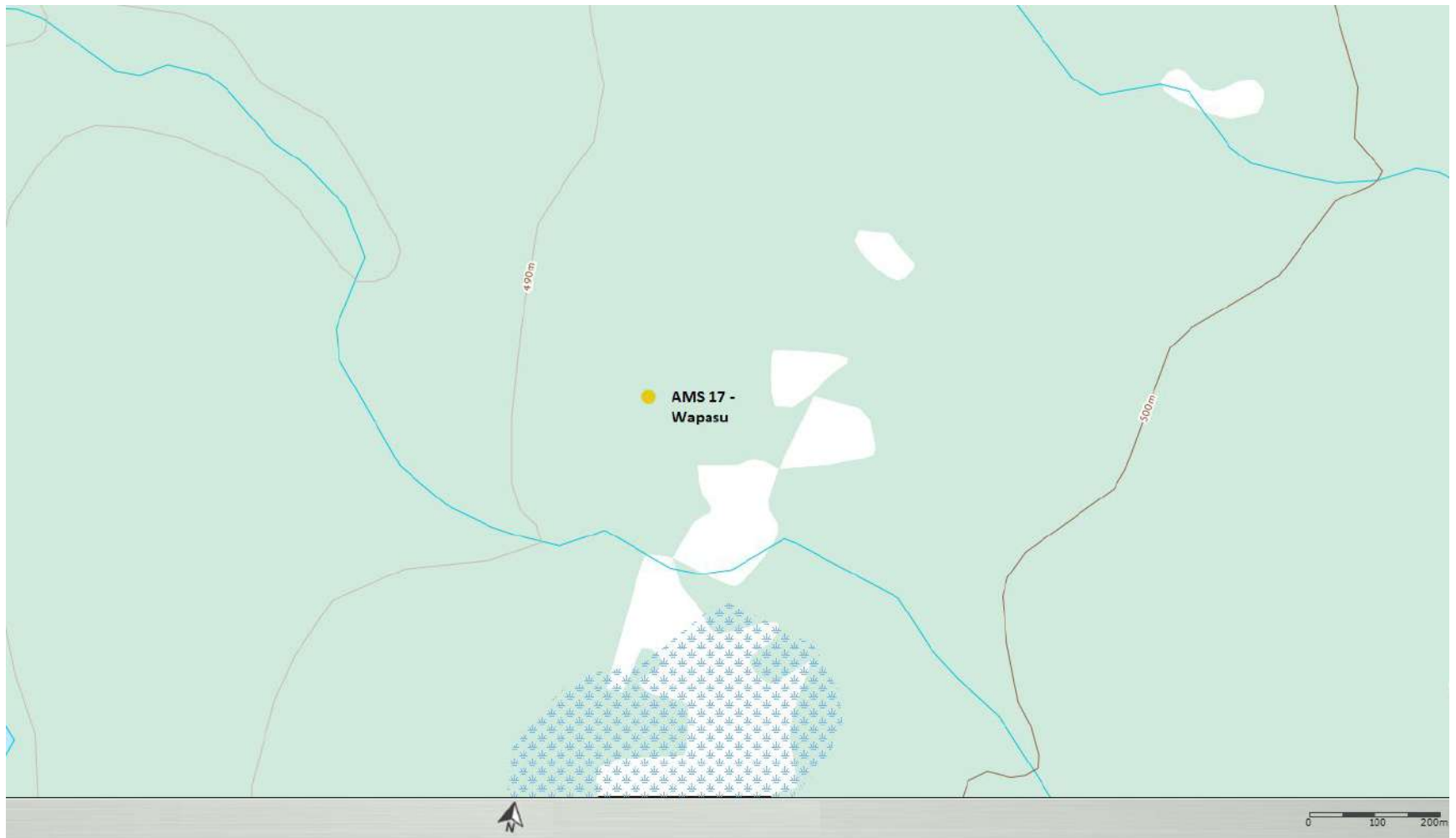


Figure 2.0 – Area topographic map showing AMS 17

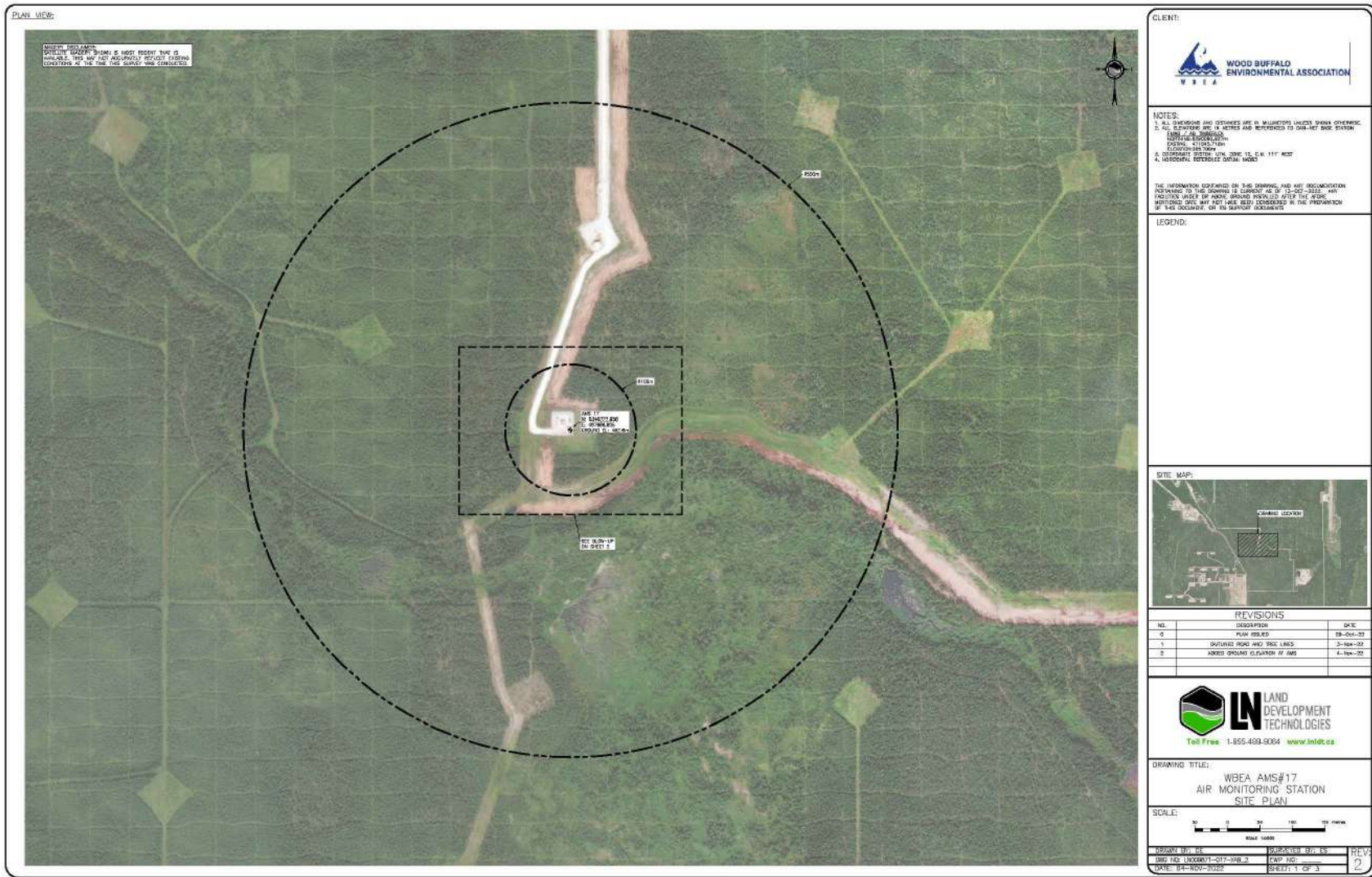


Figure 3.0 – Aerial photo showing AMS 17





Figure 4.0 – Plan view sketch for AMS 17 site

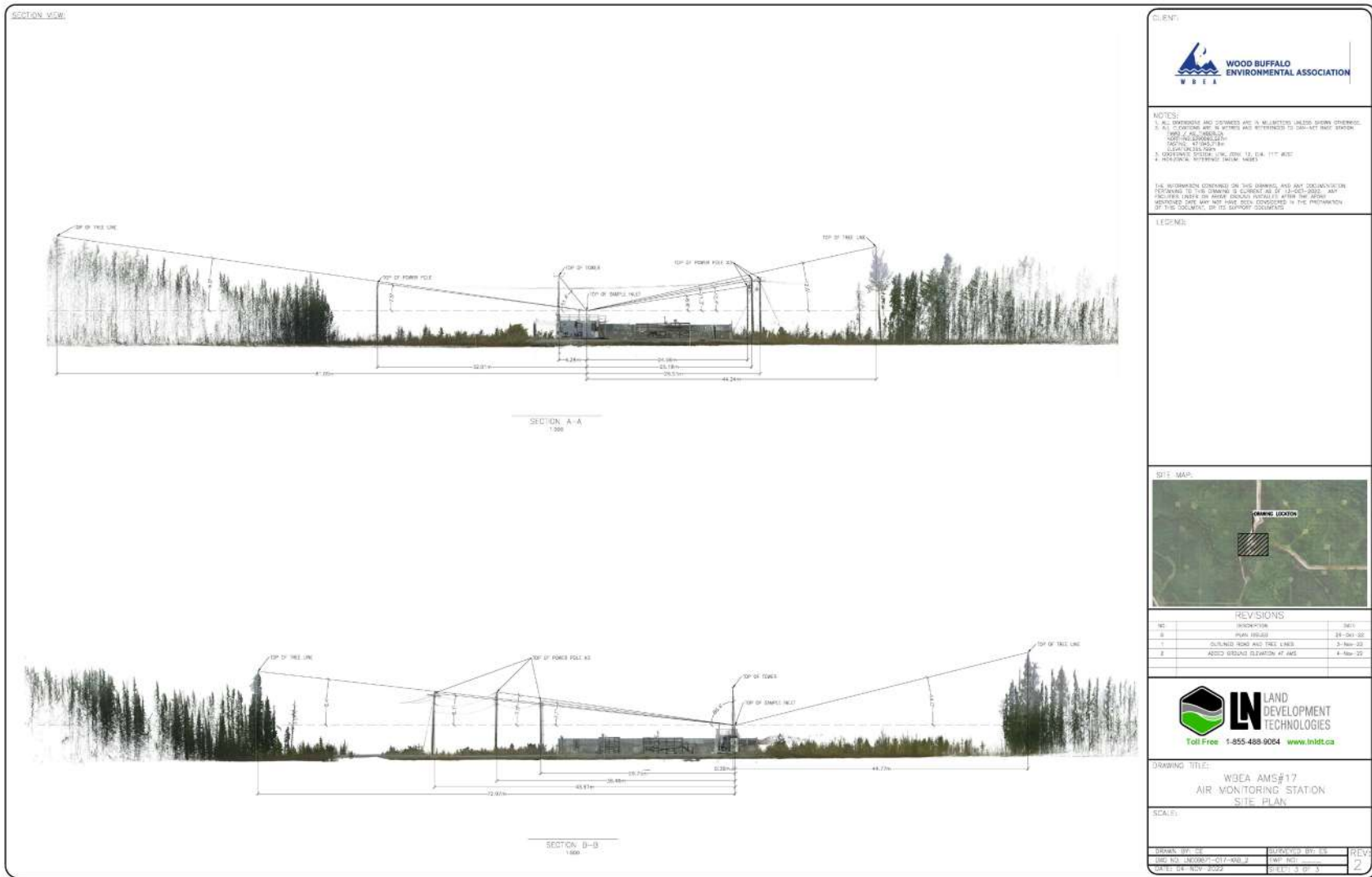


Figure 5.0 – Elevation view sketch for AMS 17 site



Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North



Figure 6.1 – Environment looking East





Figure 6.2 – Environment looking South



Figure 6.3 – Environment looking West





Figure 6.4 – Meteorological Tower

## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold



Figure 7.1 – Curb shot of the monitoring station



Figure 7.2 –Photo of the front and the back of instrument rack





Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Wapasu

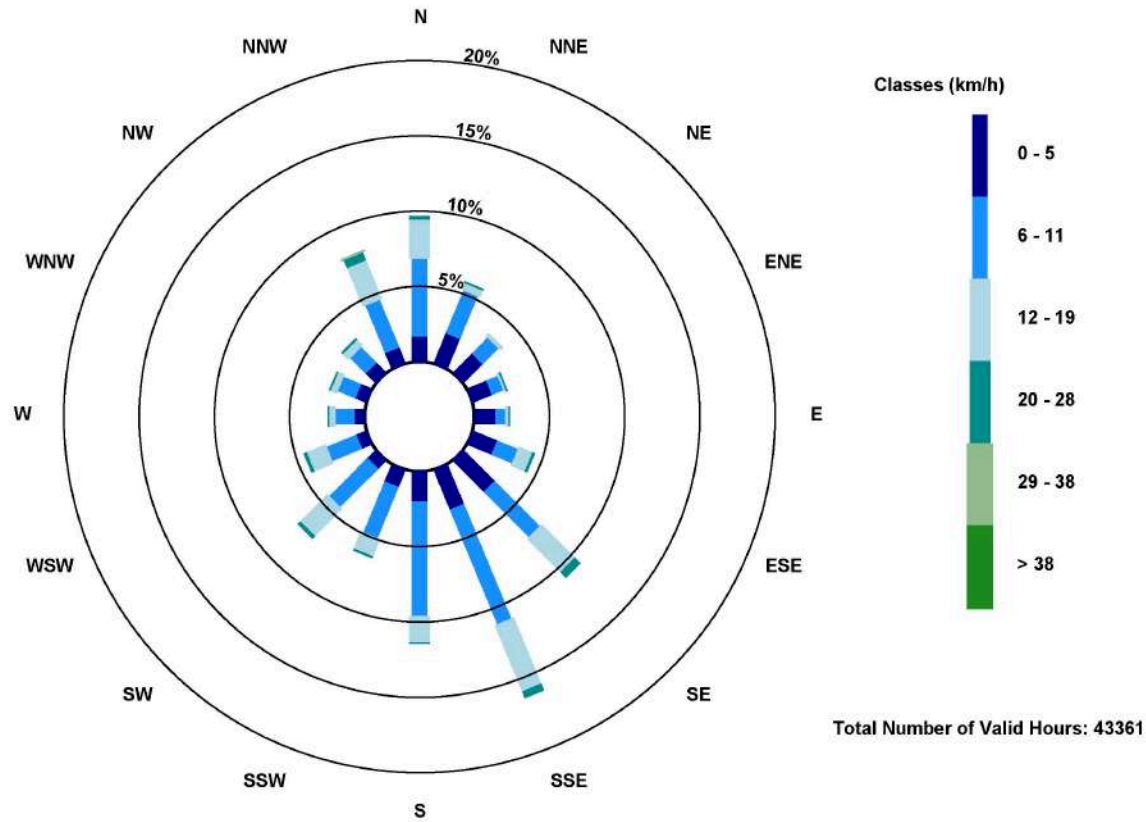


Figure 8.0 – Windrose (Five Year)



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

Stony Mountain

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LAST UPDATED: FEBRUARY 12, 2025



# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	17
Station Photos.....	22

## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 18.....	13
Figure 3.0 – Aerial photo showing AMS 18.....	14
Figure 4.0 – Plan view sketch for AMS 18 site .....	15
Figure 5.0 – Elevation view sketch for AMS 18 site .....	16
Figure 6.0 – Environment looking North.....	17
Figure 6.1 – Environment looking East .....	18
Figure 6.2 – Environment looking South.....	19
Figure 6.3 – Environment looking West.....	20
Figure 6.4 – Meteorological Tower .....	21
Figure 7.0 – Photo showing the inlet and sample manifold .....	22
Figure 7.1 – Curb shot of the monitoring station .....	23
Figure 7.2 –Photo of the front and the back of instrument rack.....	25
Figure 8.0 – Windrose (Five Year) .....	26



## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

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Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include; sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	Compliance	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network



Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network

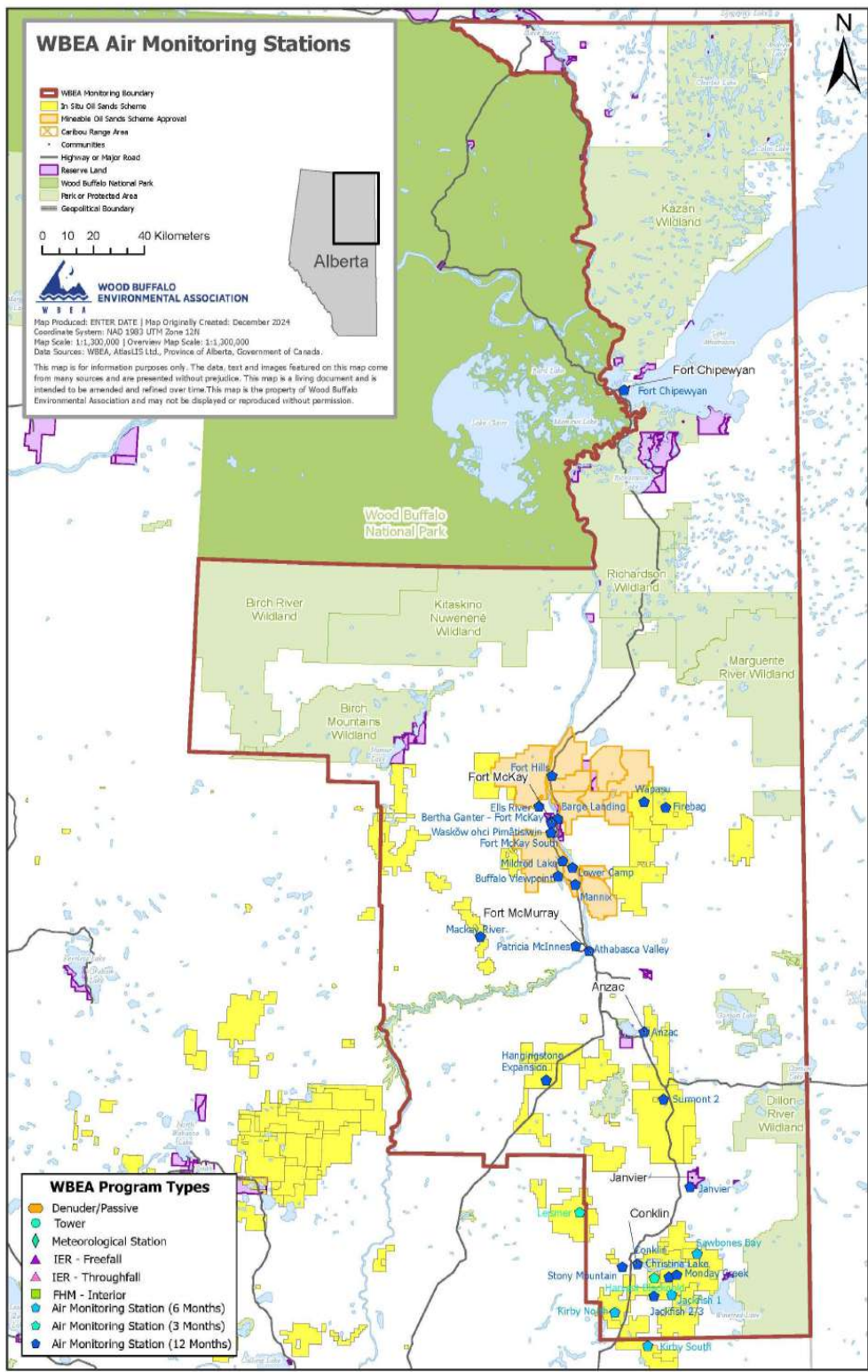


Figure 1.0 – WBEA Network Monitoring Sites

## General Site Information

### Station

Station ID	AMS 18
Station name	Stony Mountain
Date station established	June 2015

### Location

Station street address	NA
Legal land description	1-33-076-08 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	55.621487
Longitude	-111.172798
UTM East	489118
UTM North	6163967
Nearest community	Conklin
Community population	229
Census Year	2018

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	NA
Approval number	NA
Contact Name	Wood Buffalo Environmental Association
Address	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta, T9K 0K4
Phone number	780-799-4420
Email address	info@wbea.org

### Site Description

Land use by sector	0 – 90 degrees	Forestry
	91 – 180 degrees	Forestry
	181 – 270 degrees	Forestry
	271 – 360 degrees	Fire tower, Forestry
Site elevation (m) (above sea level)	673	
Angle of elevation to nearby buildings	Greatest angle	0
	Building direction	NA
Airflow restrictions	North	None
	East	None
	South	None

	West	None
Distance to nearest trees (m)	North	35 metres
	East	5 metres
	West	25 metres
	South	25 metres
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	20
	Distance from station (m)	2

### Site Influences

#### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Fire watch tower	100 m NW of Station	Fire lookout tower, operated by the province of Alberta
Communication Tower	30 m E of Station	Cell tower

#### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Access road	Low	10	Dirt/sand road

#### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Cenovus	SAGD	376,000	18.1	SE
CNRL	SAGD	105,000	14.9	SE



## Station Equipment

Equipment Owner:

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO <sub>2</sub>	Thermo Environmental	43i	JC1501301453	2015
TRS	Thermo Environmental	43i – TLE	1218153359	2021
NO <sub>2</sub>	Thermo Environmental	42i	1035	2023
NMHC	Thermo Environmental	55i	1193585647	2024-01-31
O <sub>3</sub>	Teledyne API	T400	825	2019
CO	Teledyne API	T300	3504	2021
CO <sub>2</sub>	Teledyne API	T360	489	2023-09-29
PM <sub>2.5</sub>	Teledyne API	T640	324	2024
BC	Magee Scientific	AE-33	327	2022
PC	N-CON Systems	00-120-2	60140	2018
EC/OC	Thermo Environmental	2000i-A-N	2000IW 20691 1702	2018

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	G0840106	3	2018
WS	Met One	010C-1	A1406	4	2023-08-25
WD	Met One	020C-1	NA	4	2023-10-02
PC	OTT	OTT Pluvio-2	363526	3	2016
LW	Decagon Devices	LWS-L	NA	N/A	2022
GR	Epply	8-48 Solar Rad	38007	N/A	2021

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	9630
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	2658
Nitrogen Generator	N2 Generator	PEAK Scientific		
Zero air generator	Zero Air Generator	Teledyne/API	701	360
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	ITB-14-16019
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	12345

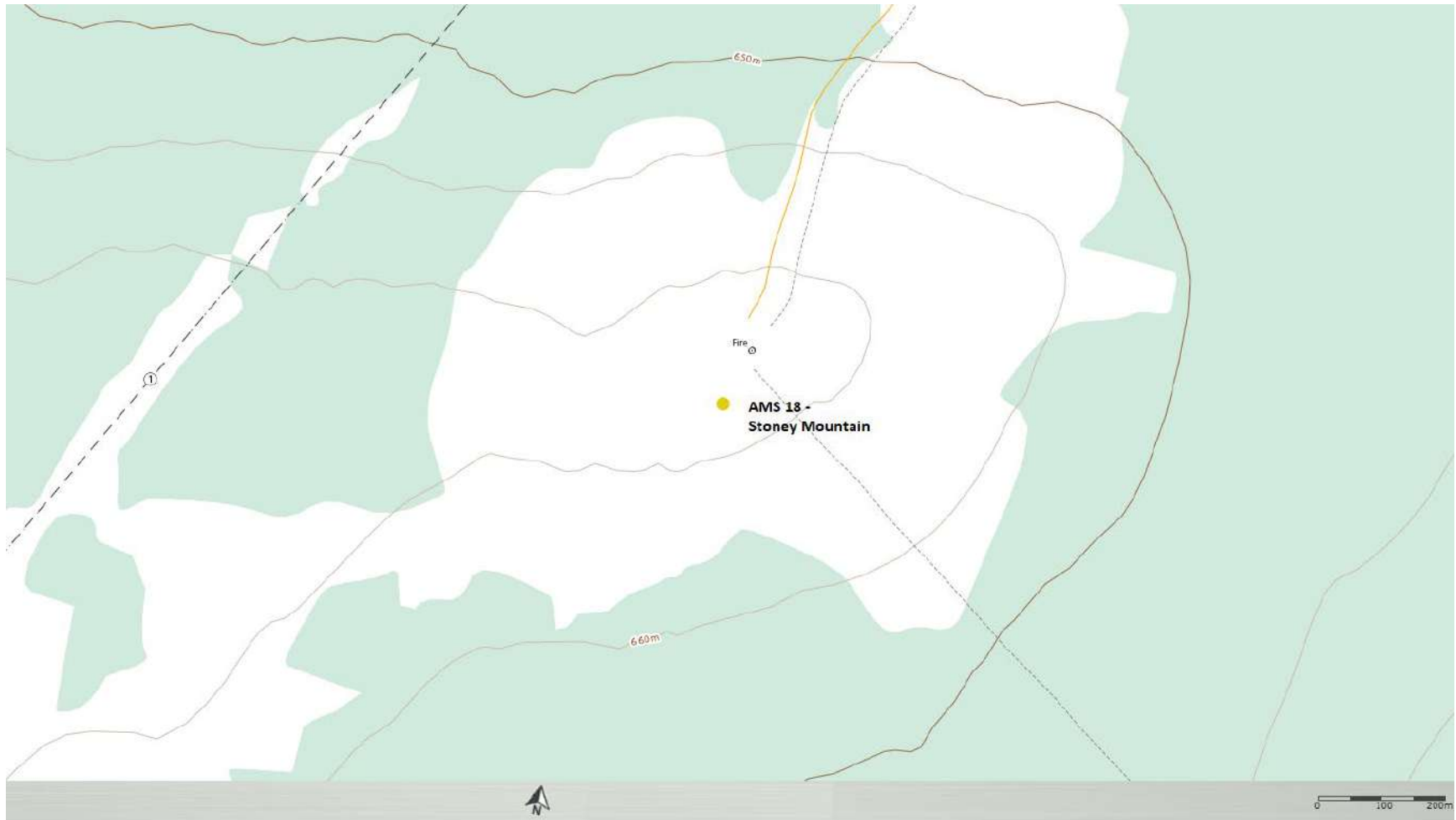


Figure 2.0 – Area topographic map showing AMS 18



Figure 3.0 – Aerial photo showing AMS 18



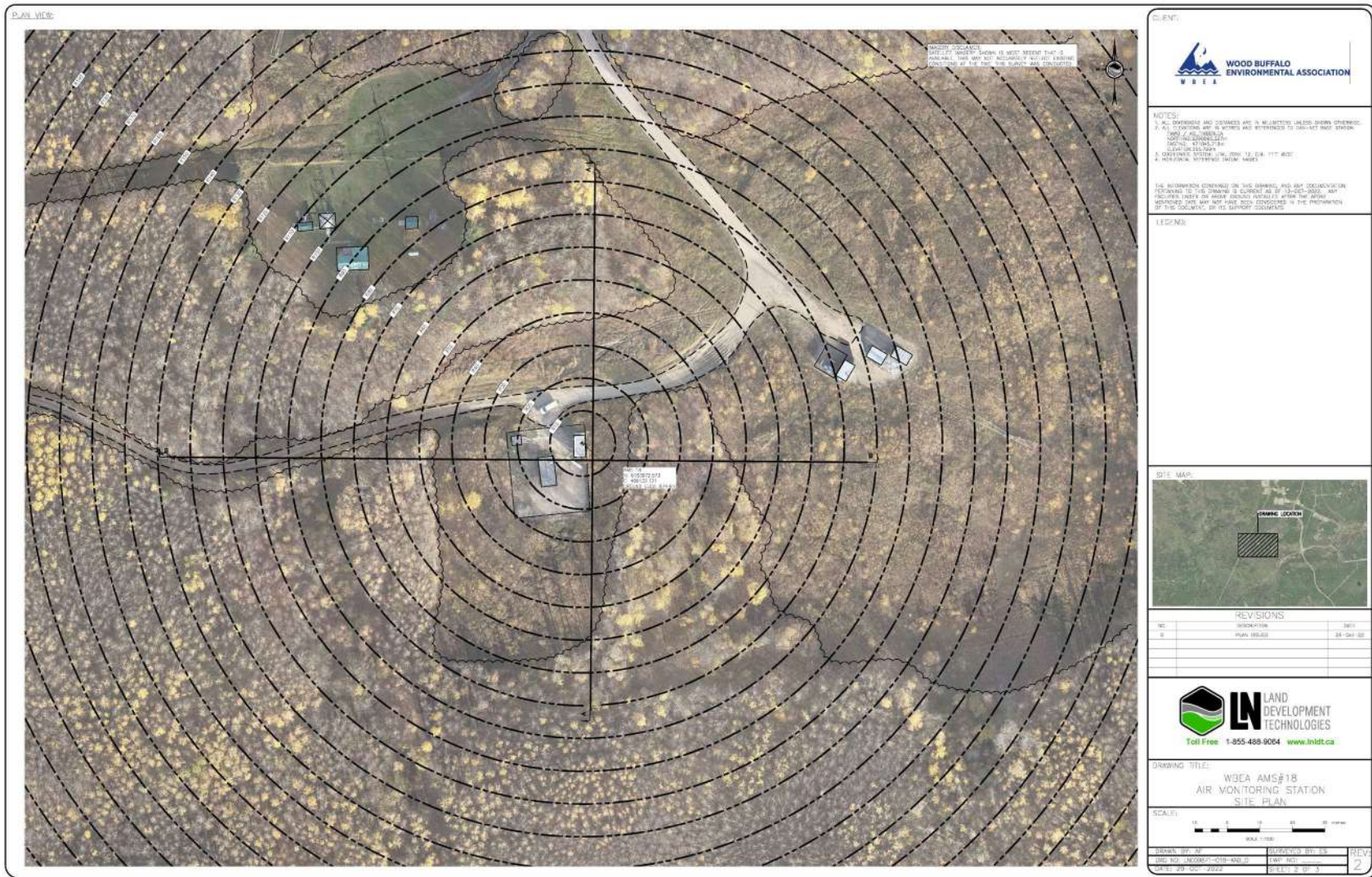


Figure 4.0 – Plan view sketch for AMS 18 site



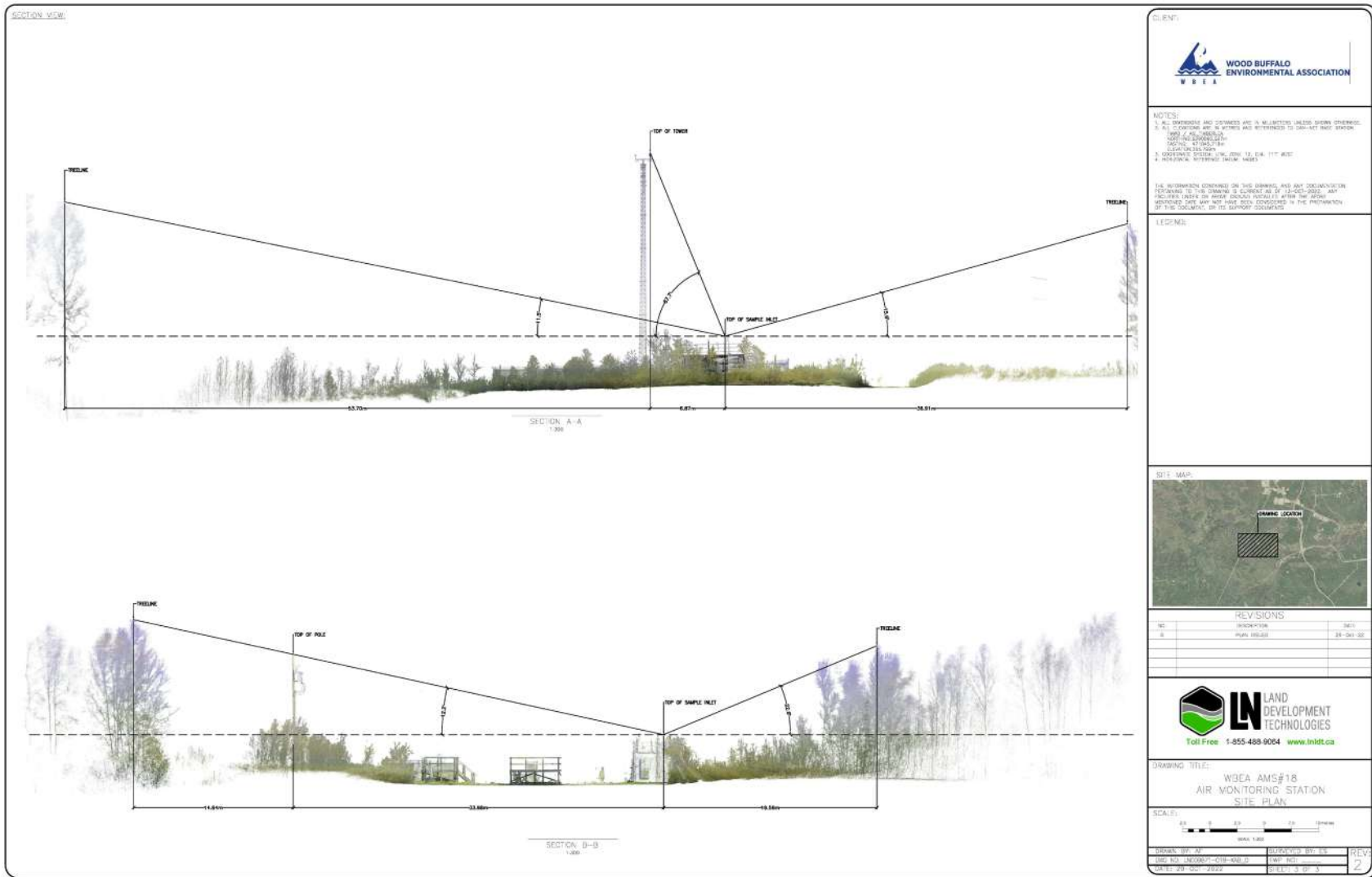


Figure 5.0 – Elevation view sketch for AMS 18 site

Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North





Figure 6.1 – Environment looking East



Figure 6.2 – Environment looking South





Figure 6.3 – Environment looking West



Figure 6.4 – Meteorological Tower

## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold





Figure 7.1 – Curb shot of the monitoring station







Figure 7.2 –Photo of the front and the back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 20m (WS20) - km/h  
Stony Mountain

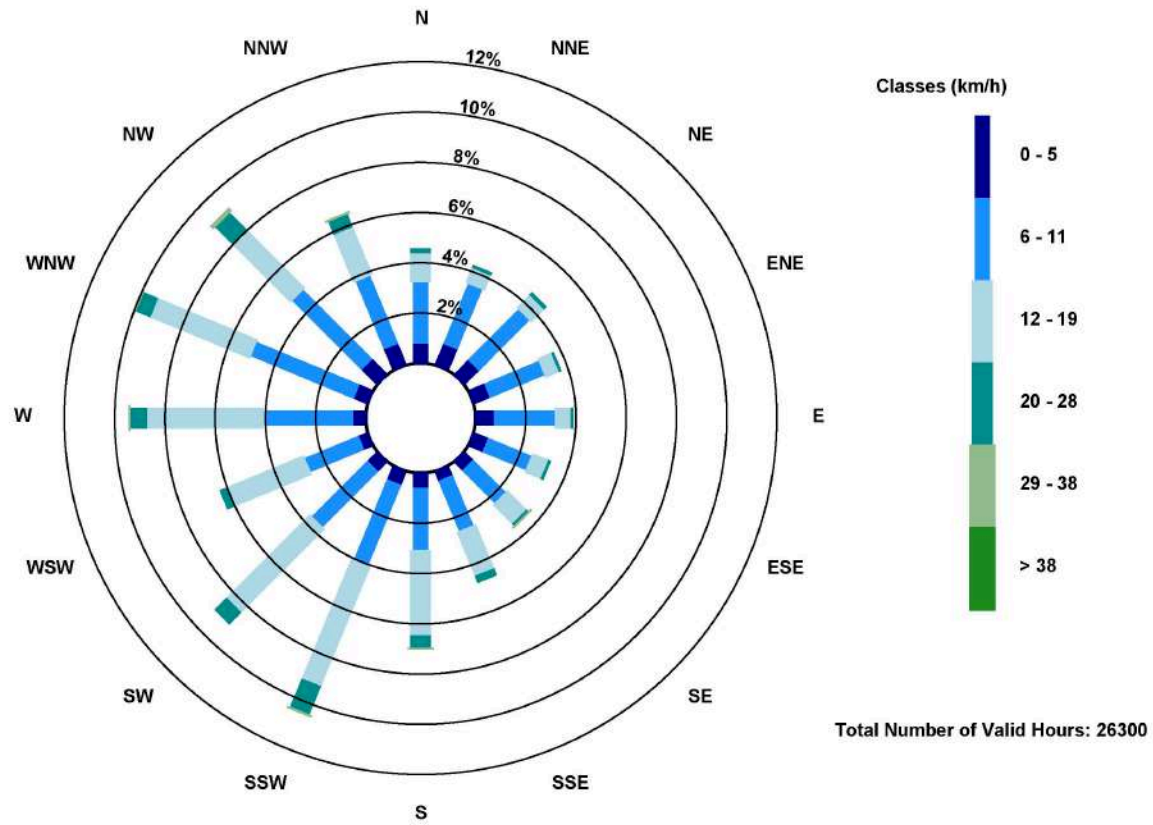


Figure 8.0 – Windrose (Five Year)



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

# Firebag

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LAST UPDATED: 02-28-2025





# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	16
Station Photos.....	21

## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 19.....	13
Figure 3.0 – Plan view sketch for AMS 19 – Firebag .....	14
Figure 4.0 – Aerial photo showing AMS 19 - Firebag.....	15
Figure 5.0 – Environment looking North.....	16
Figure 5.1 – Environment looking East .....	17
Figure 5.2 – Environment looking South.....	18
Figure 5.3 – Environment looking West.....	19
Figure 5.4 – Meteorological Tower.....	20
Figure 6.0 – Photo showing the inlet and sample manifold .....	21
Figure 6.1 – Curb shot of the monitoring station .....	22
Figure 7.0 – Windrose (Five Year) .....	24

## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

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WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network

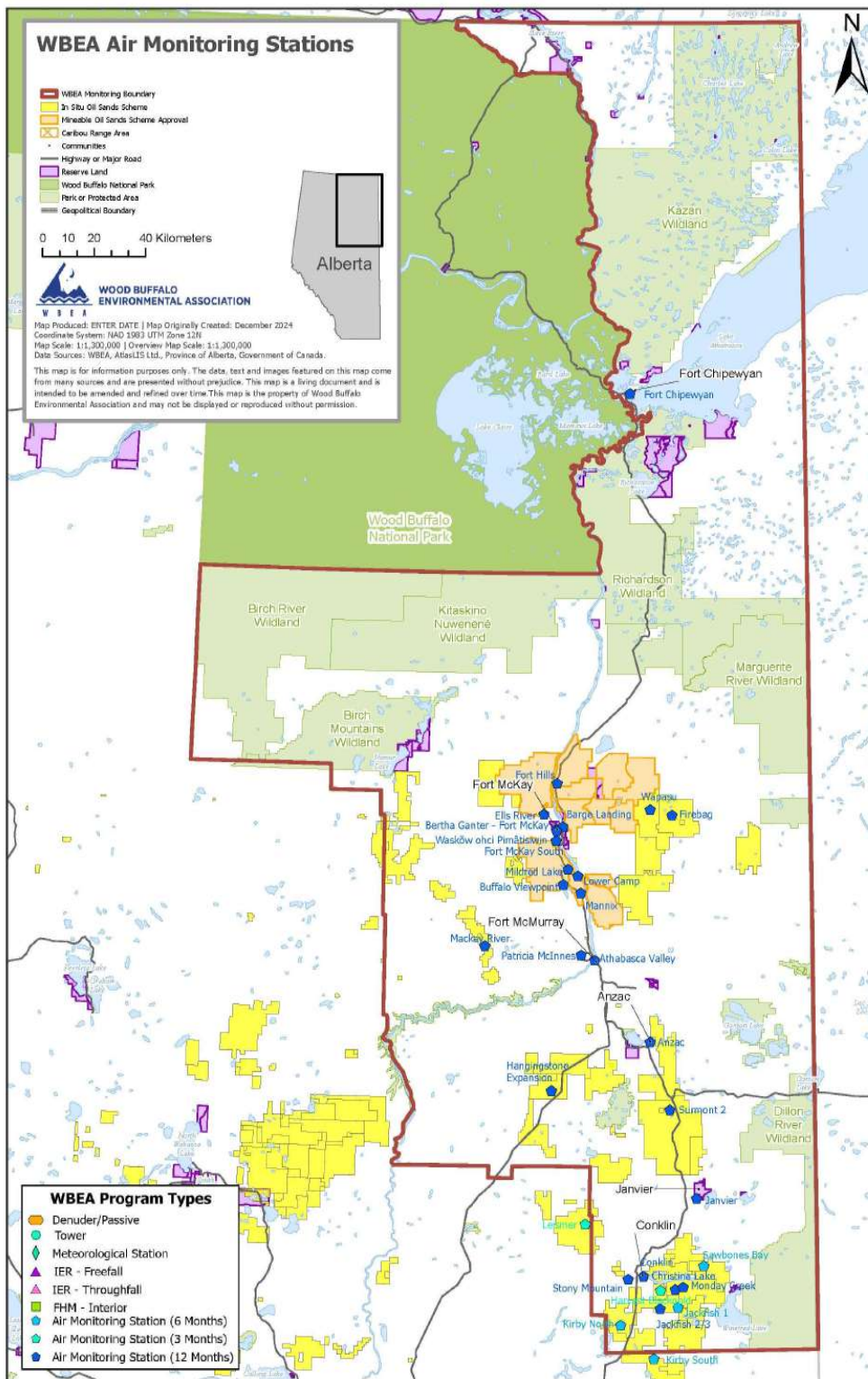


Figure 1.0 – WBEA Network Monitoring Sites



## General Site Information

### Station

Station ID	AMS 19
Station name	Firebag
Date station established	2014

### Location

Station street address	Firebag Camp
Legal land description	5-15-095-06 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	57.2395250989
Longitude	-110.897990073
UTM East	506157
UTM North	6344054
Nearest community	Fort McKay
Community population	757
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Suncor
Approval number	80105-01-00
Contact Name	Dustin Wells
Address	Suncor Energy, Fort McMurray
Phone number	780-799-6835
Email address	<a href="mailto:dewells@suncor.com">dewells@suncor.com</a>

### Site Description

Land use by sector	0 – 90 degrees	Oil sands development
	91 – 180 degrees	Oil sands development
	181 – 270 degrees	Oil sands development
	271 – 360 degrees	Oil sands development
Site elevation (m) (above sea level)		
Angle of elevation to nearby buildings	Greatest angle	0
	Building direction	NA
Airflow restrictions	North	No
	East	No
	South	No

	West	No
Distance to nearest trees (m)	North	40
	East	NA
	West	50
	South	NA
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	10 m
	Distance from station (m)	0 m

### Site Influences

#### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Suncor Firebag	0	Oil sands development
Firebag Camp	20	Camp housing, cafeteria, heating system

#### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Local Camp roads	Low	20	Camp traffic

#### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Suncor Firebag	Oilsands	NA	0	NA
Husky	Oilsands	NA	10	WNW

## Station Equipment

Equipment Owner: Suncor Energy Ltd.

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO <sub>2</sub>	Thermo Environmental	43i	1410661308	2016
H <sub>2</sub> S	Thermo Environmental	43i-TLE	1151680032	2023
NO <sub>2</sub>	Thermo Environmental	42i	1410661309	2016
THC	Thermo Environmental	51i	1336160089	2016

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	H5110027	3	2023
WS	Met One	010C-1	W15276	1	2021
WD	Met One	020C-1	P22885	1	2024

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	6466
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	201
Zero air generator	Zero Air Generator	Teledyne/API	701	1118
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	ITB14-16269
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	NA
Tower	10m Tower	Aluma Tower	T-135	AT213028-Y-3
H <sub>2</sub> S converter	H <sub>2</sub> S converter	Global Analyzer Systems	G150	2022-222

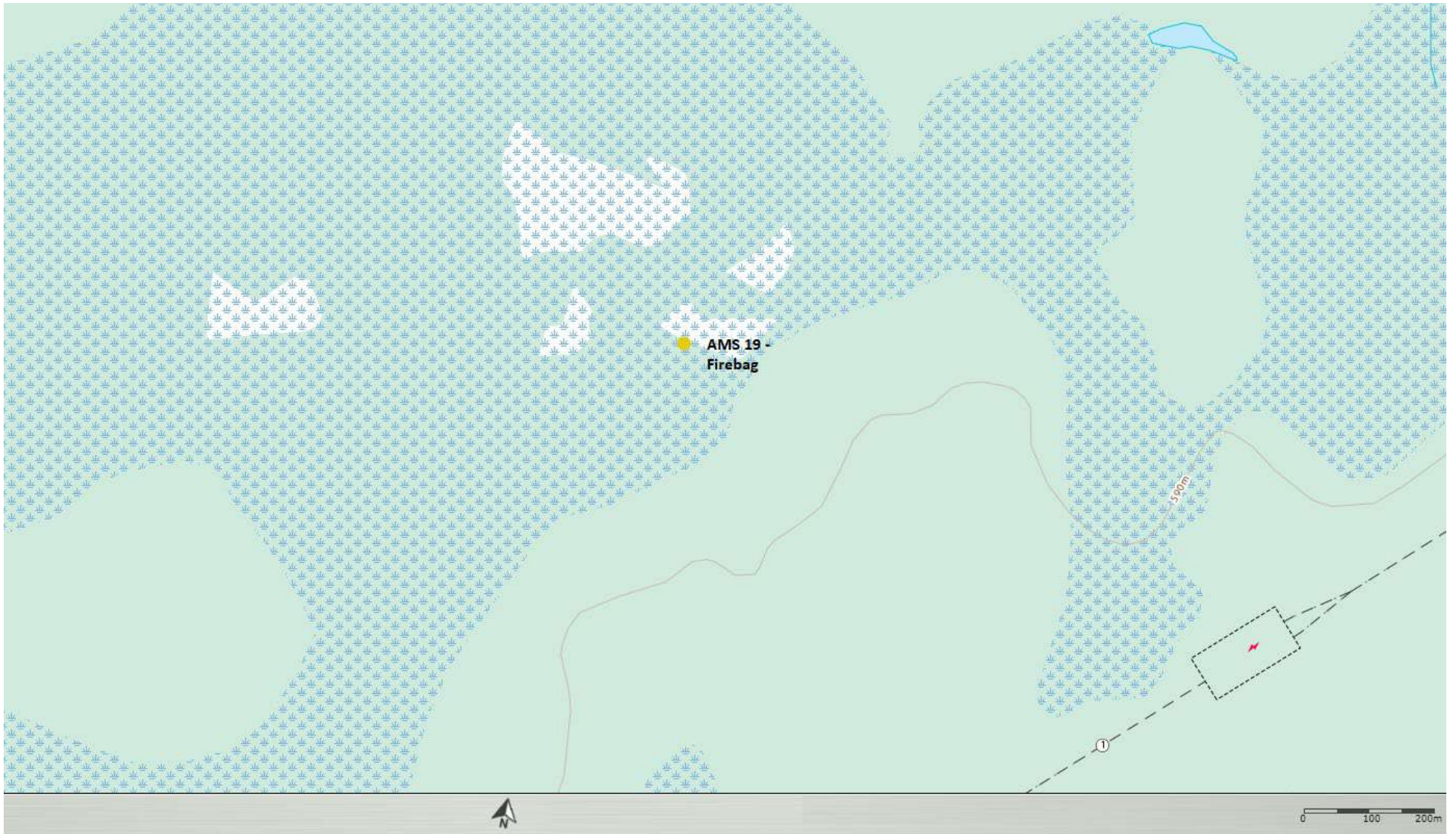


Figure 2.0 – Area topographic map showing AMS 19





Station Name: AMS 19 - Firebag

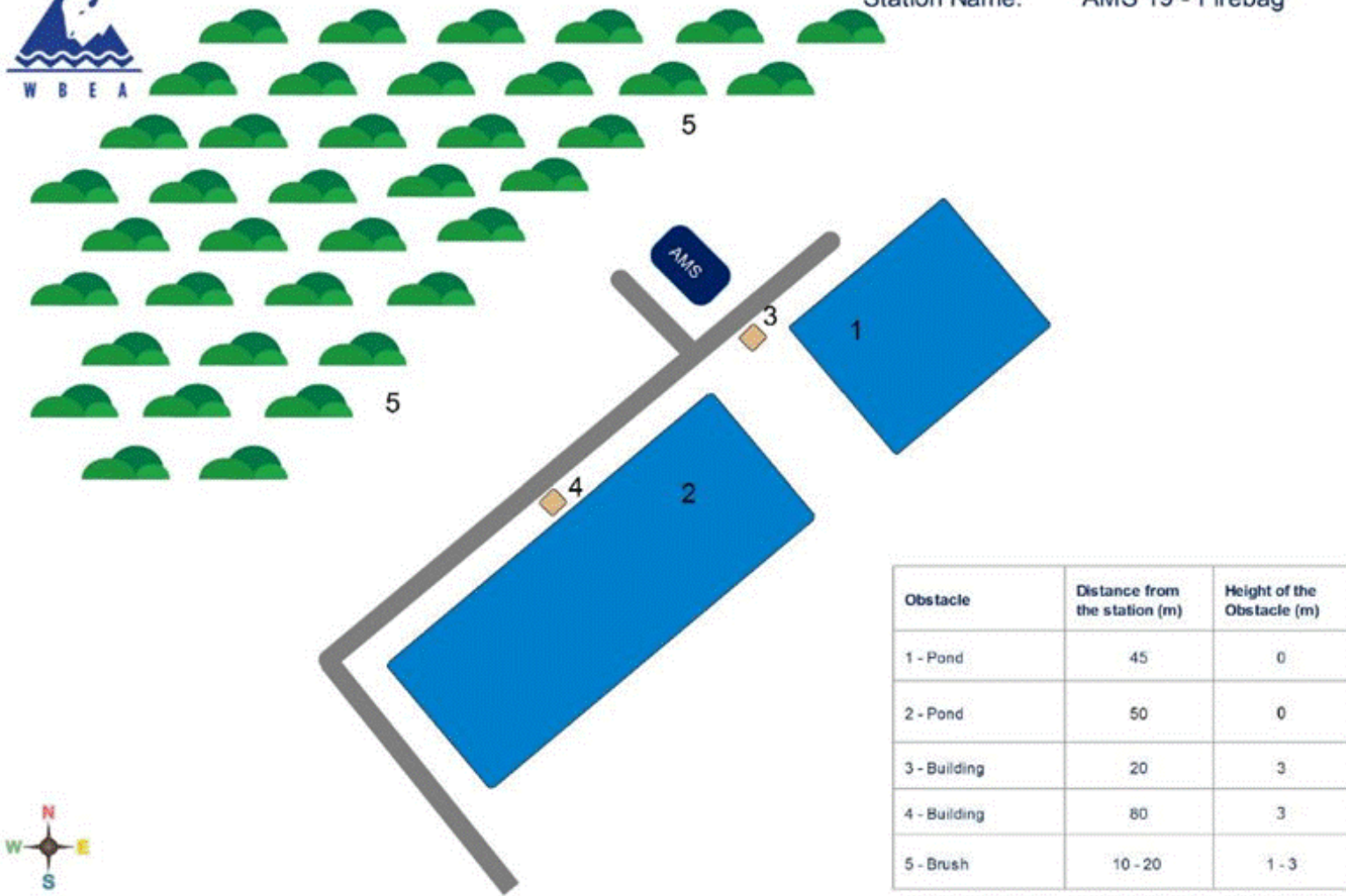


Figure 3.0 – Plan view sketch for AMS 19 – Firebag



Figure 4.0 – Aerial photo showing AMS 19 - Firebag

Site photos

The following photos show the environment surrounding the monitoring station.



Figure 5.0 – Environment looking North





Figure 5.1 – Environment looking East





Figure 5.2 – Environment looking South



Figure 5.3 – Environment looking West



Figure 5.4 – Meteorological Tower

## Station Photos

The following photos show the monitoring station and instrumentation.

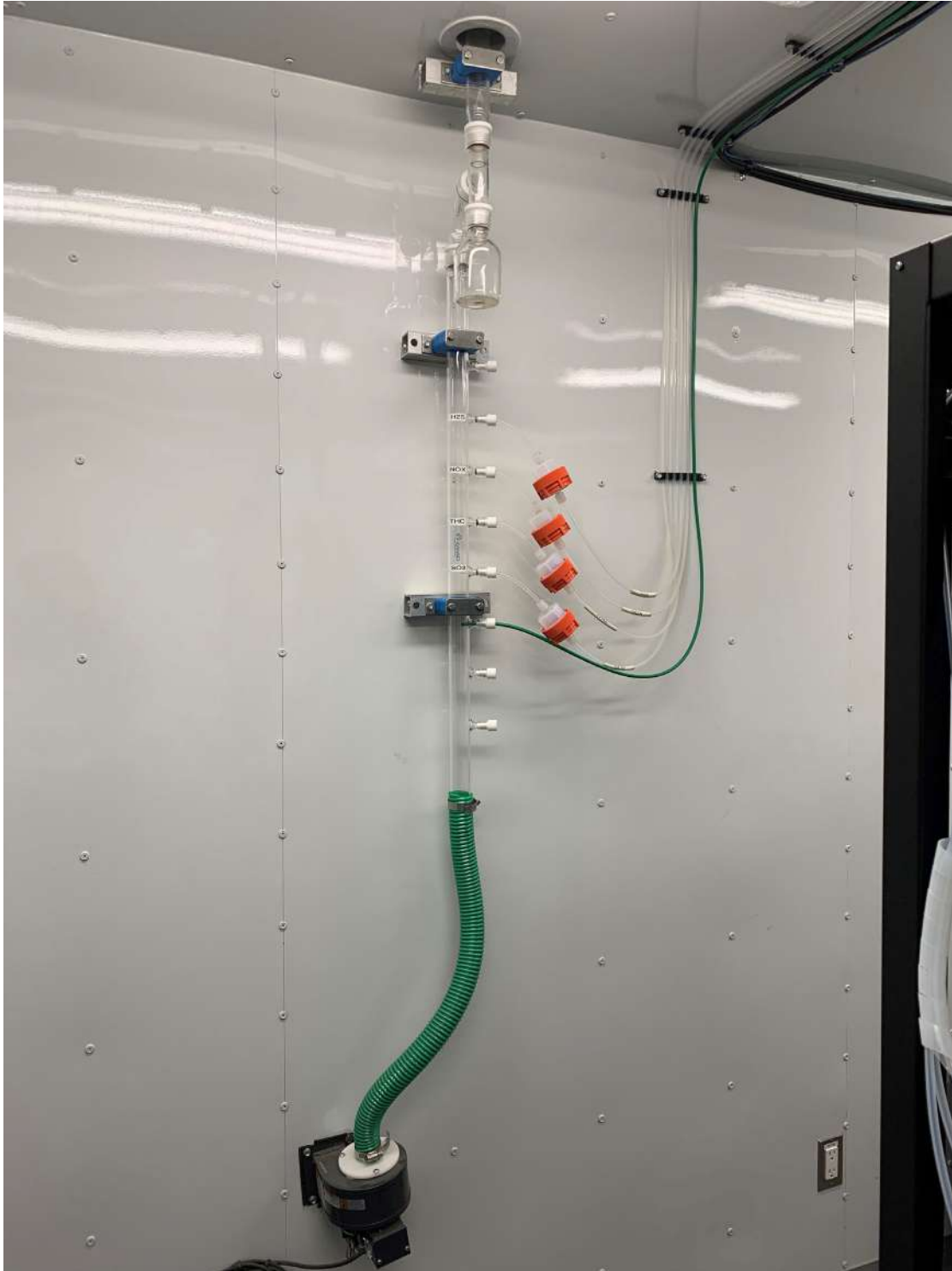


Figure 6.0 – Photo showing the inlet and sample manifold





Figure 6.1 – Curb shot of the monitoring station



Figure 6.2 –Photo of the front and the back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Firebag

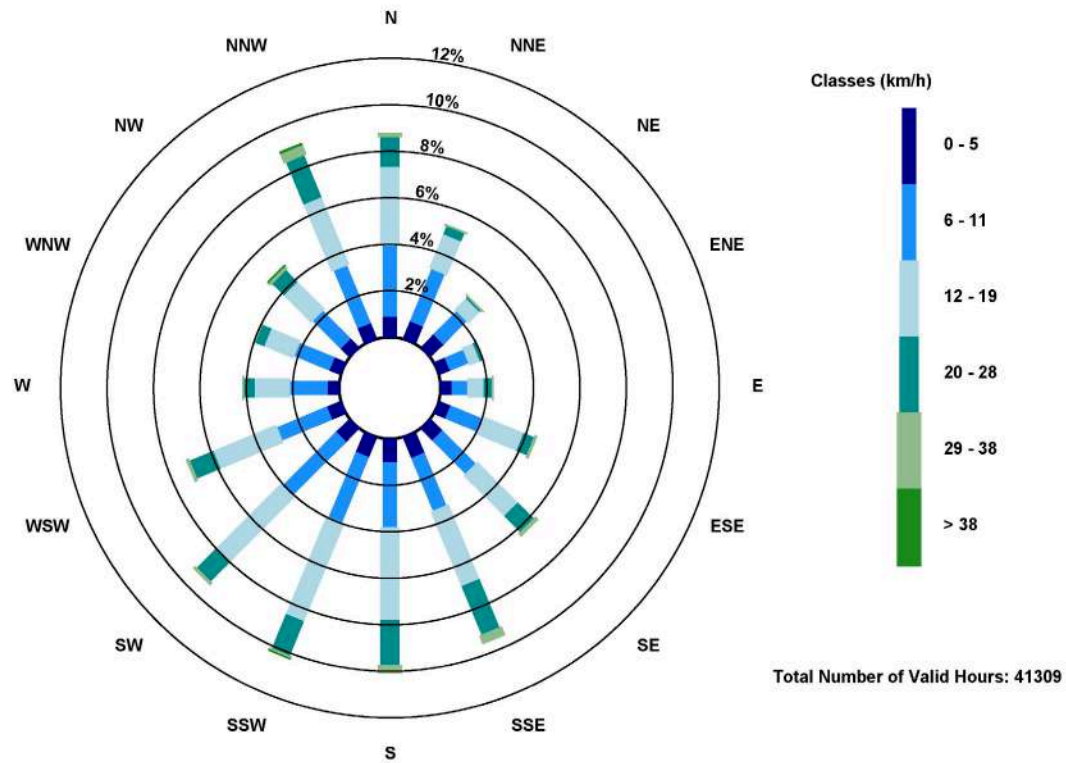


Figure 7.0 – Windrose (Five Year)



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

Mackay River

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LAST UPDATED: FEBRUARY 19, 2024





# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	17
Station Photos.....	22

## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 20.....	13
Figure 3.0 – Aerial image showing AMS 20.....	14
Figure 4.0 – Plan view image for AMS 20 site.....	15
Figure 5.0 – Elevation view image for AMS 20 site.....	16
Figure 6.0 – Environment looking North.....	17
Figure 6.1 – Environment looking East .....	18
Figure 6.2 – Environment looking South.....	19
Figure 6.3 – Environment looking West.....	20
Figure 6.4 – Meteorological Tower .....	21
Figure 7.0 – Photo showing the inlet and sample manifold .....	22
Figure 7.1 – Curb shot of the monitoring station .....	23
Figure 7.2 –Photo of the front and the back of instrument rack.....	24
Figure 8.0 – Windrose (Five Year) .....	25

## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

### Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.

In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.



Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include; sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	Compliance	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network

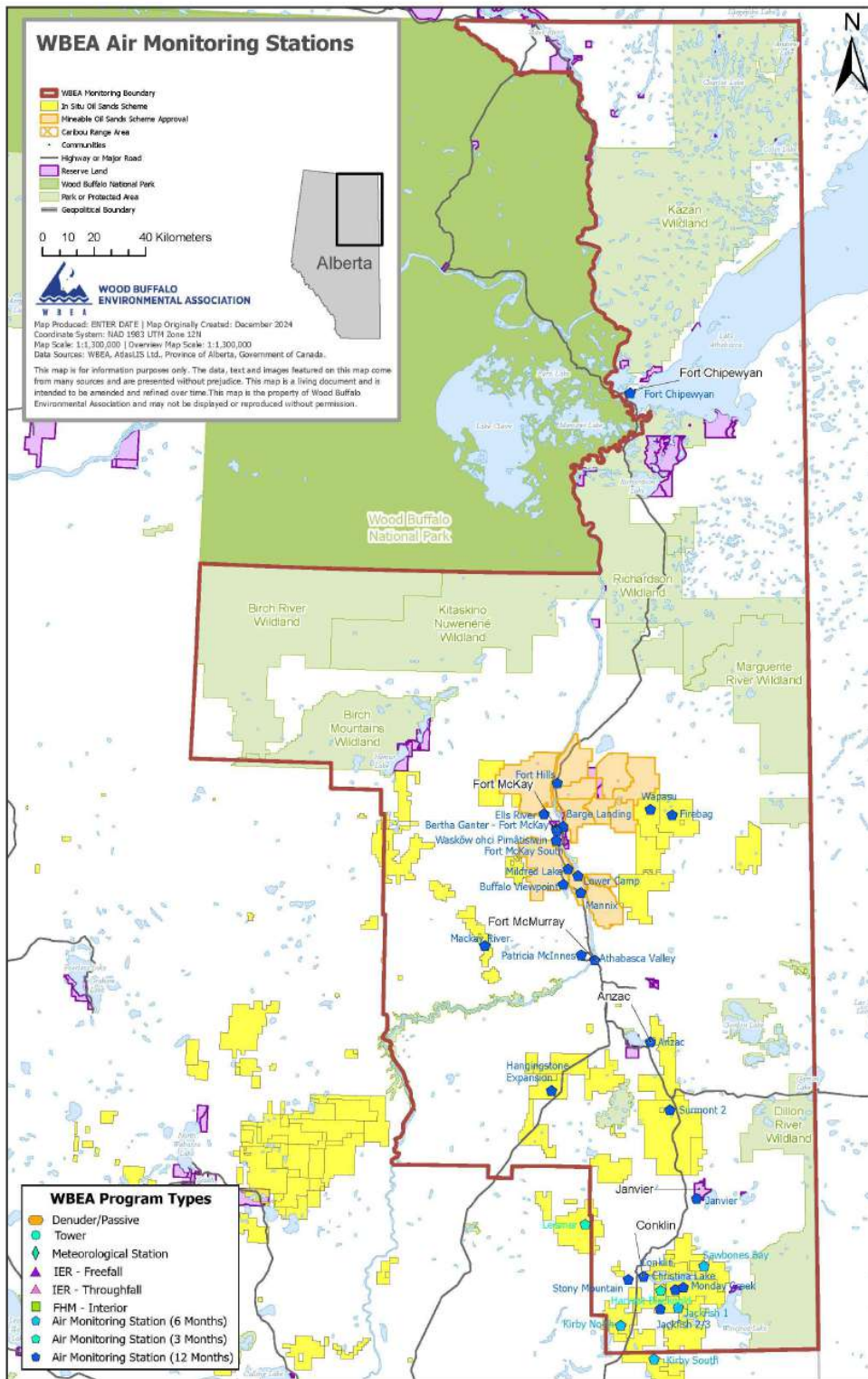


Figure 1.0 – WBEA Network Monitoring Sites



## General Site Information

### Station

Station ID	AMS 20
Station name	Mackay River
Date station established	January 7, 2016

### Location

Station street address	NA
Legal land description	10-01-090-14 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	56.7797279768
Longitude	-112.0890203
UTM East	433456
UTM North	6293396
Nearest community	Fort McMurray
Community population	75186
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	PetroChina Canada Ltd.
Approval number	254465-00-00
Contact Name	Matt Going
Address	NA
Phone number	780-446-0779
Email address	environment@petrochinacanada.com

### Site Description

Land use by sector	0 – 90 degrees	Forest and SAGD project
	91 – 180 degrees	Forest
	181 – 270 degrees	Forest
	271 – 360 degrees	Forest and SAGD project
Site elevation (m) (above sea level)	498	
Angle of elevation to nearby buildings	Greatest angle	0 degree
	Building direction	None
Airflow restrictions	North	None
	East	None
	South	None

	West	Yes
Distance to nearest trees (m)	North	45 metres
	East	55 metres
	West	30 metres
	South	78 metres
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	10
	Distance from station (m)	Attached to the North end of the station

### Site Influences

#### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
NA		

#### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Gravel Road	Low	30	Access Road

#### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
PetroChina Canada Ltd.	Oil and Gas industry	35000 b/day	1.2	Northwest

## Station Equipment

Equipment Owner:

## Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO2	Thermo Scientific	43i	1501301450	March 31, 2016
H2S	Thermo Scientific	43i-LTE	1236656117	October 25, 2023
NO2	Thermo Scientific	42i	1505164379	November 29, 2018
THC	Thermo Scientific	51i	1501663727	March 31, 2016

## Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	F5010002	3	September 26, 2018
WS	Met One	010C-1	Y18363	3	June 25, 2020
WD	Met One	020C-1	N9937	3	March 31, 2016
PC	OTT	OTT-Pluvio2	363524	3	May 2016

## Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	9627
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	5706
Zero air generator	Zero Air Generator	Teledyne/API	701	4522
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	ITB-15-16552
Meteorological Tower	Telescoping 10 metre tower	Aluma Tower Co.	T-135	AT-215036-AA-5-2
Datalogger	Datalogger	Campbell Scientific	CR310	6239
H2S Converter	Thermal Oxidizer	Global Analyzer Systems	G150	2022-226

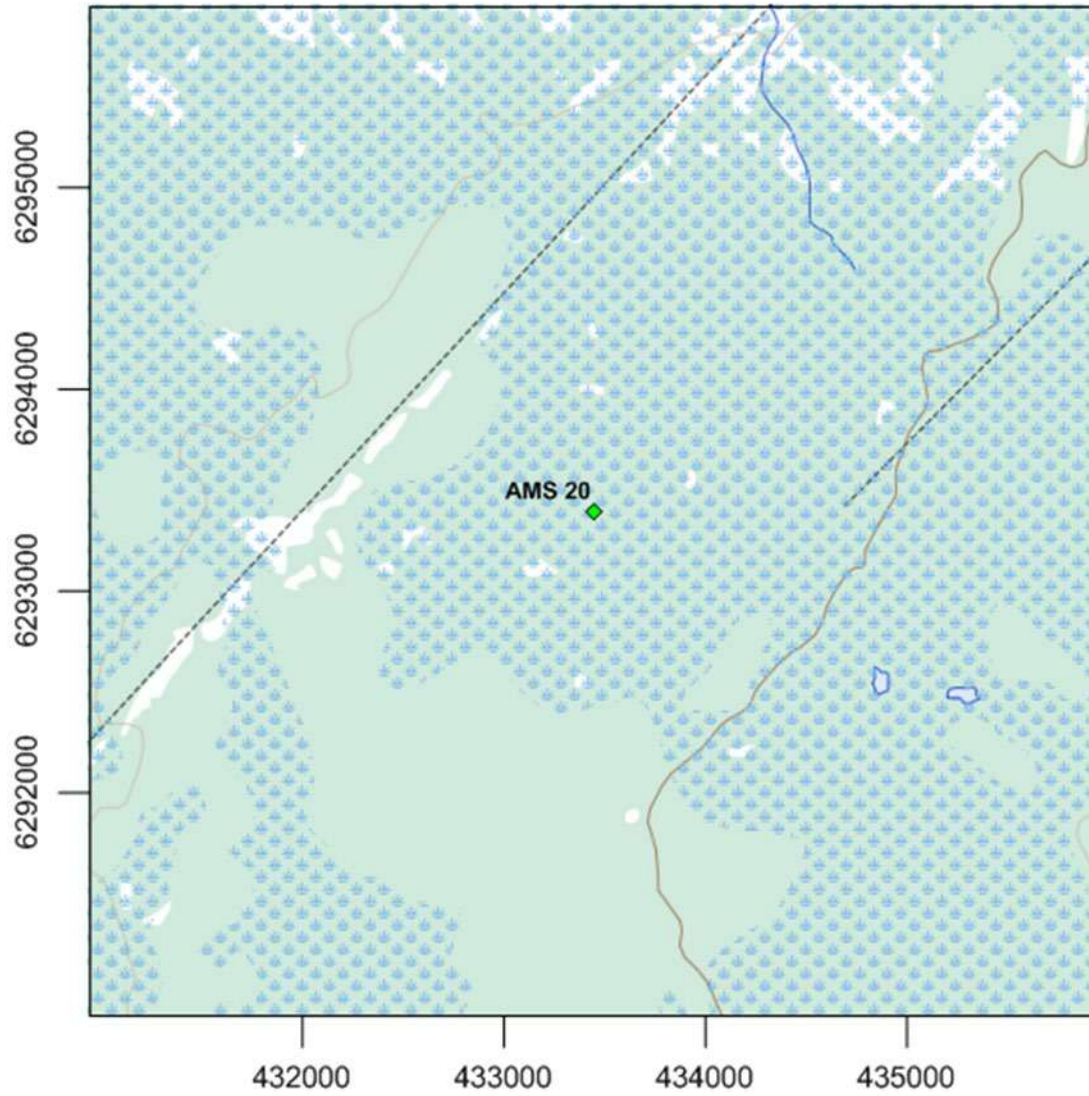


Figure 2.0 – Area topographic map showing AMS 20



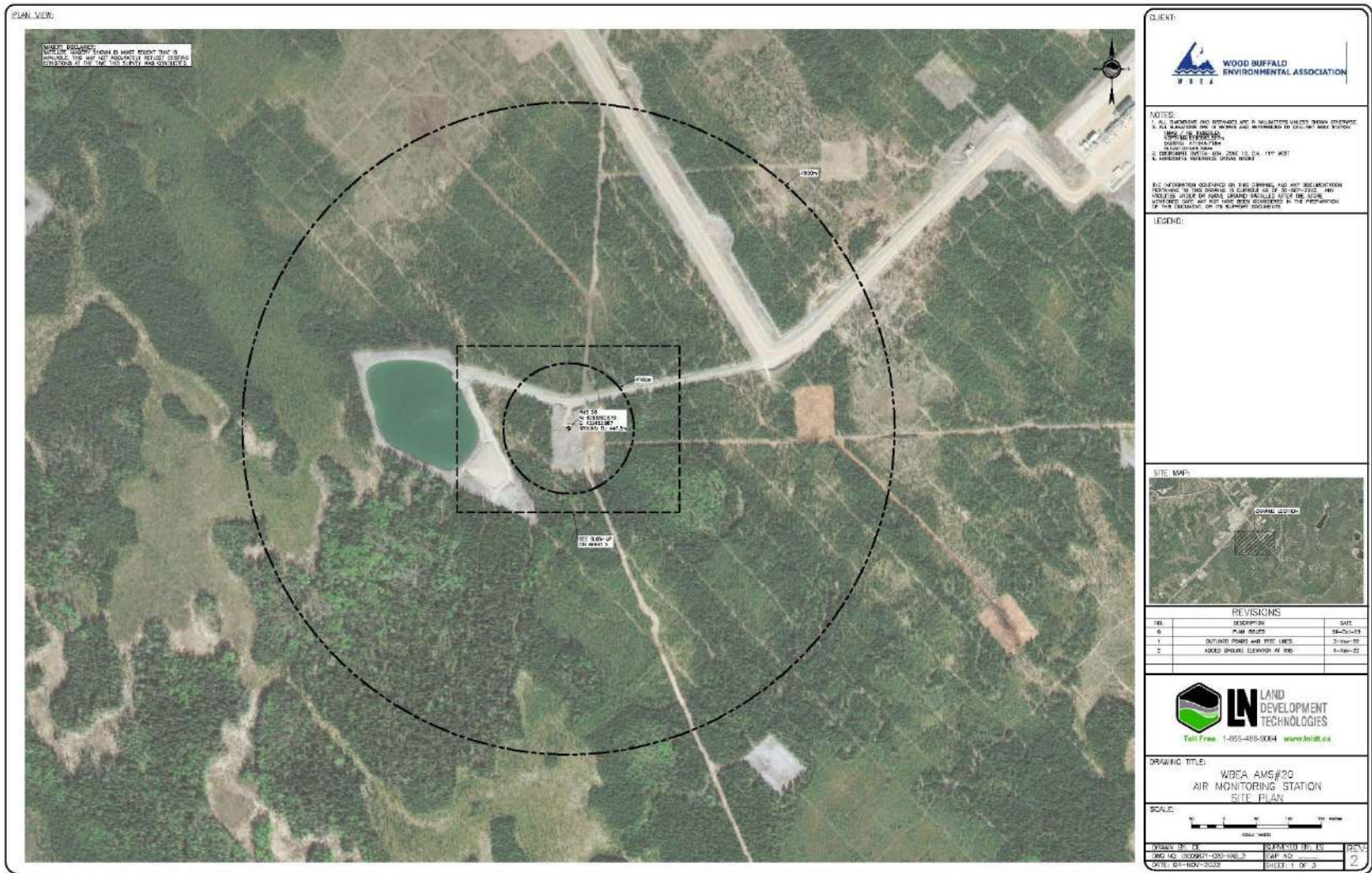


Figure 3.0 – Aerial image showing AMS 20



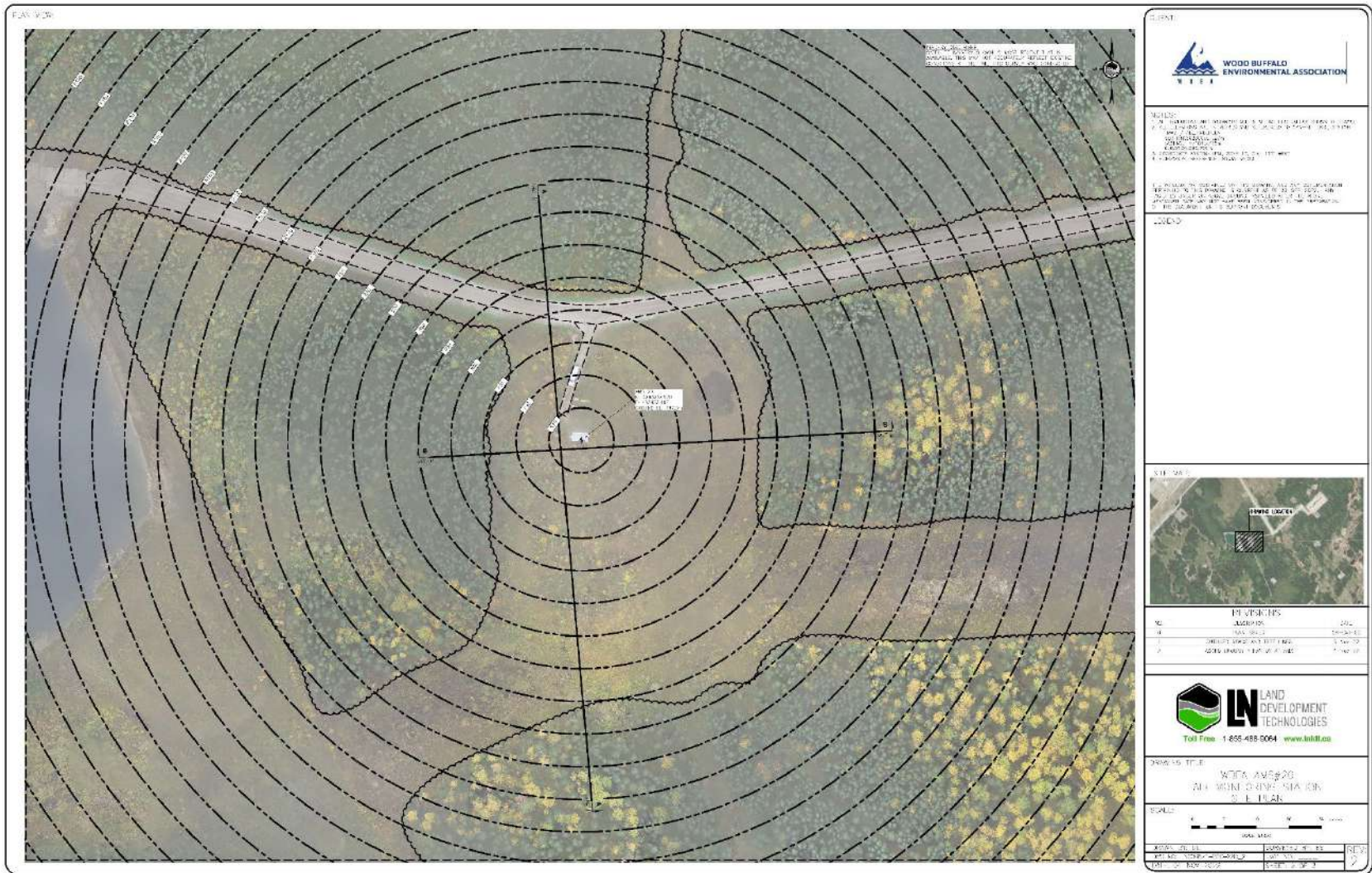


Figure 4.0 – Plan view image for AMS 20 site

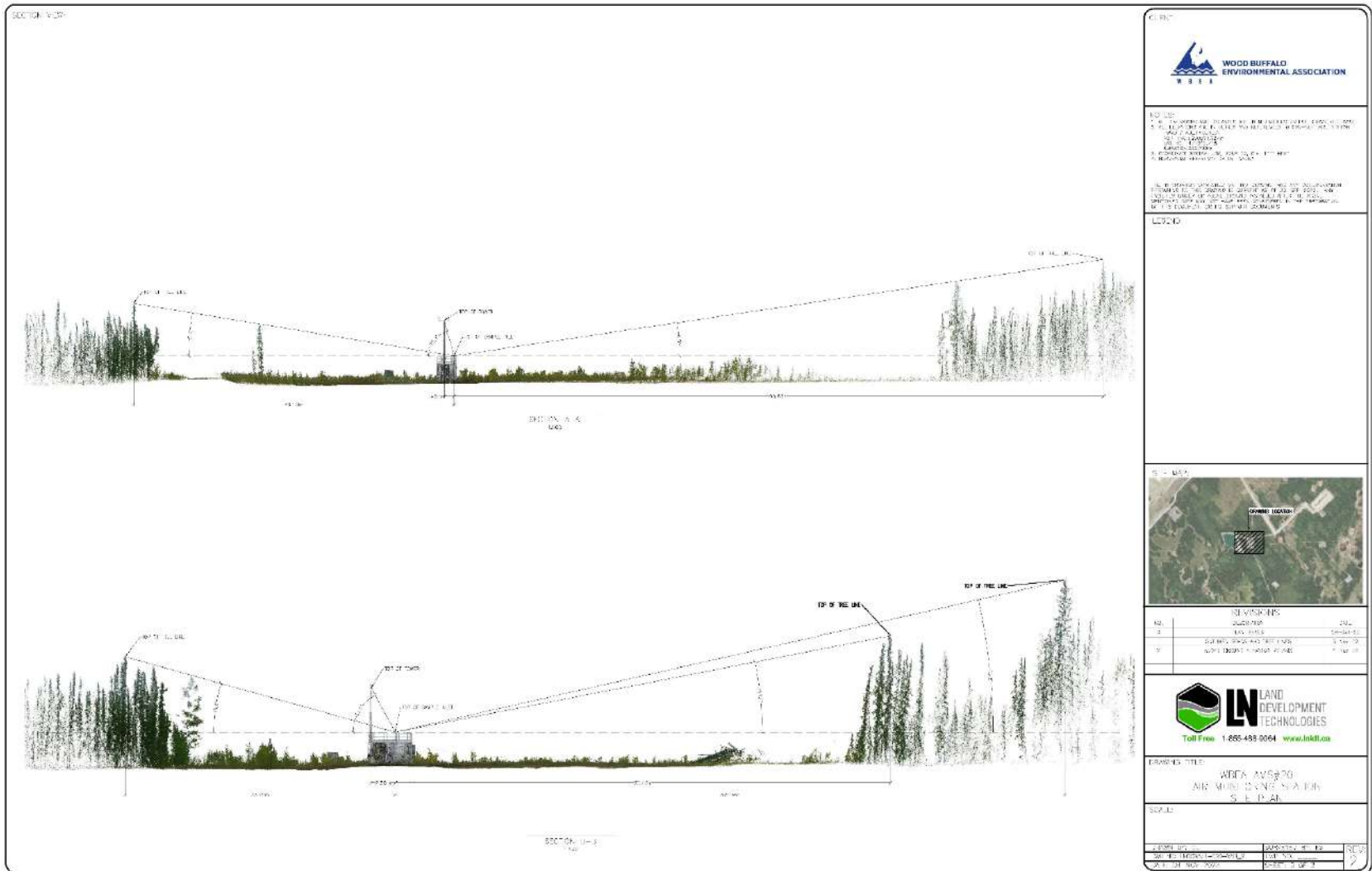


Figure 5.0 – Elevation view image for AMS 20 site



Site photos

The following photos show the environment surrounding the monitoring station.

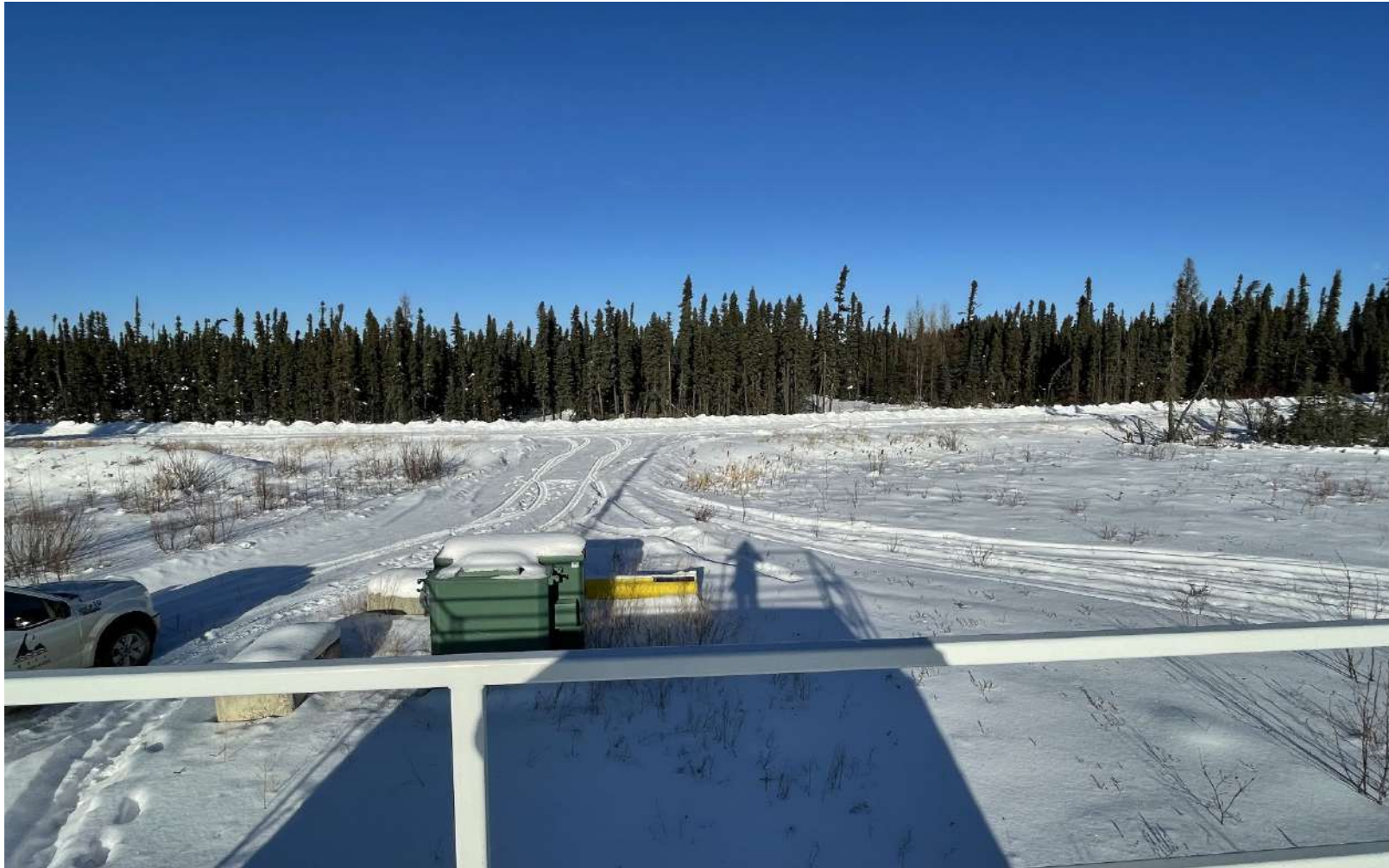


Figure 6.0 – Environment looking North





Figure 6.1 – Environment looking East



Figure 6.2 – Environment looking South





Figure 6.3 – Environment looking West



Figure 6.4 – Meteorological Tower



## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold



Figure 7.1 – Curb shot of the monitoring station





Figure 7.2 –Photo of the front and the back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Mackay River

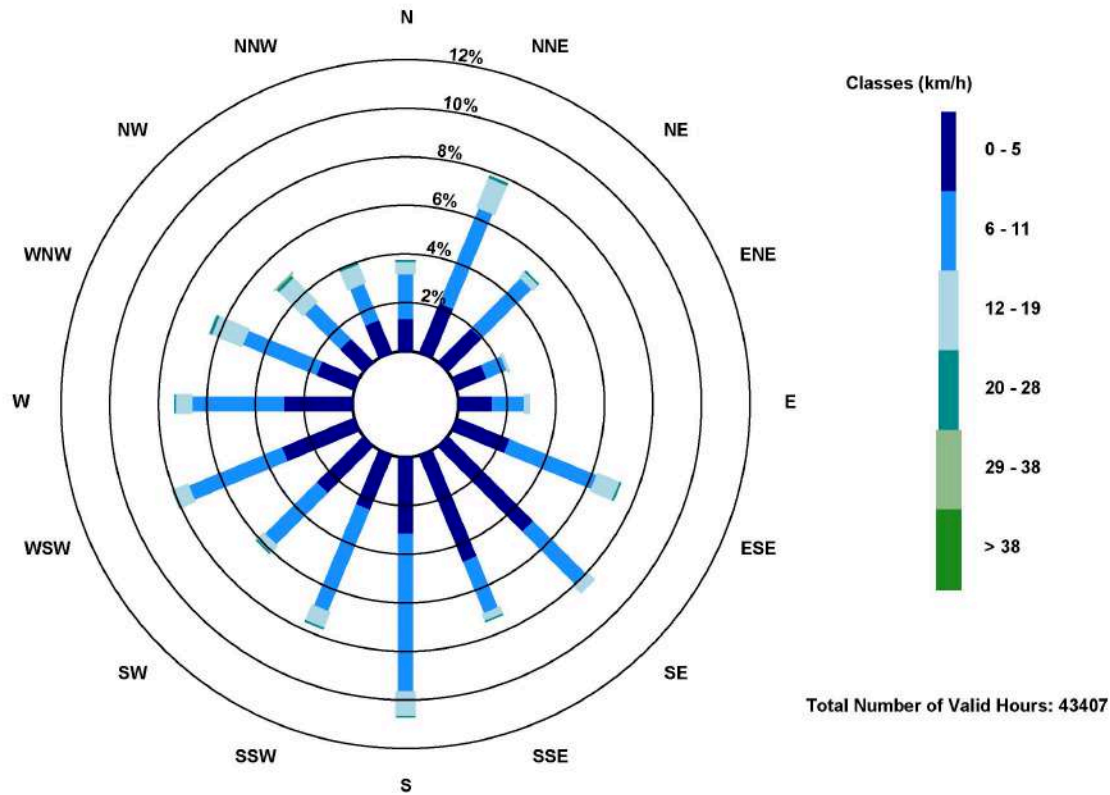


Figure 8.0 – Windrose (Five Year)





Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station**  
**Site Documentation**

Conklin

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LAST UPDATED: FEBRUARY 28, 2025



# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description .....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	17
Station Photos.....	22



## Tables and Figures

Table 1.0 - Pollutant Parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network. ....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network. ....	8
Figure 1.0 – WBEA Network Monitoring SitesGeneral Site Information .....	9
Figure 2.0 – Area Topographic map showing AMS 21 .....	13
Figure 3.0 – Plan view sketch for AMS 21 site .....	14
Figure 4.0 – Aerial photo showing AMS 21.....	15
Figure 6.0 – Environment Looking North.....	17
Figure 6.1 – Environment Looking East.....	18
Figure 6.2 – Environment looking South.....	19
Figure 6.3 – Environment Looking West.....	20
Figure 6.4 – Meteorological Tower.....	21
Figure 7.0 – Photo showing the inlet and sample manifold. ....	22
Figure 7.1 – Curb shot of the monitoring station. ....	23
Figure 7.2 –Photo of front and back of instrument rack .....	25
Figure 8.0 – Windrose (Five Year) .....	26



## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

### Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.





In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.



Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include hydrogen sulphide (H<sub>2</sub>S), total reduced sulphur (TRS), sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), total hydrocarbons (THC), methane (CH<sub>4</sub>), non-methane hydrocarbons (NMHC), ammonia (NH<sub>3</sub>), carbon monoxide (CO), and carbon dioxide (CO<sub>2</sub>). Sites are categorized as industrial or community, based on the setting in which they are located.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant Parameters monitored in the WBEA network



Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature, relative humidity, wind speed, wind direction, vertical wind speed, solar radiation, precipitation, and leaf wetness.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network.



Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), and precipitation samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP
					ECOC			
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X	
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X	
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X	
9	ATTRIBUTION	BARGE LANDING	X					
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X			X		
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X	
17	COMPLIANCE	WAPASU			X			X
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X
21	COMMUNITY	CONKLIN	X	X		X	X	
22	COMMUNITY	JANVIER	X	X		X	X	
23	COMPLIANCE	FORT HILLS	X			X		
30	COMPLIANCE	ELLS RIVER	X			X		

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network.







### Station

Station ID	AMS 21
Station name	Conklin
Date station established	April 01, 2016

### Location

Station street address	Father Mercredis Trail
Legal land description	15-31-076-07 W4
Latitude	55.632330
Longitude	-111.078877
UTM East	495034
UTM North	6165163
Elevation	559.9
Nearest community	Conklin
Community population	185
Census Year	2016

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Name of Approval Holder	NA
Approval number	NA
Contact Name	Wood Buffalo Environmental Association
Address	Unit 3 – 805 Memorial Drive, Fort McMurray, AB
Phone number	780-799-4420
Email address	info@wbea.org

### Site Description

Land use by sector	0 – 90 degrees	Forest and Residential
	91 – 180 degrees	Forest and Residential
	181 – 270 degrees	Forest and Residential
	271 – 360 degrees	Forest and Residential
Site elevation (above sea level)	562	
Angle of elevation to nearby buildings	Greatest angle	0 degree
	Building direction	South – CRDAC office
Airflow restrictions	North	Trees
	East	None
	South	None
	West	Conklin Rec center, about 2 km west



Distance to nearest trees (m)	North	20
	East	20
	West	20
	South	N/A
Sample manifold	East	N/A
	West	28 metre
Meteorological Sensors	South	8 metre
	Height above ground	10 m
	Distance from station	Attached to north site of the station

## Site Influences

### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Wetlands	20	Peat bog / Marshes – Variety of reeds and grasses.
Admin building	20	Conklin Resource Development Advisory Committee Office
Shipping Container	20	SEA-CAN
Free-Standing Structure	20	Gazebo – made of wood.
Watercraft	20	Speed Boat

### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Gravel	Medium	50	Father Mercredis Trail – Access Road
Paved	Medium	200	Northland Drive

### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Meg Energy	Oil and Gas	210,000 bpd	25	NE
Cenovus Energy	Oil and Gas	50, 000 bpd	14	SE



## Station Equipment

Equipment Owner: WBEA

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO2	Thermo Environmental	43i	1428701363	2016
TRS	Thermo Environmental	43i-QTL	12228021058	2024
TRS	CD Nova	CDN-101	565	2024
NO2	Thermo Environmental	42i	1501663731	2016
NMHC	Thermo Environmental	55i	1193585649	2023
O3	Thermo Environmental	49i	1501663734	2024
PM2.5	Teledyne/API	T640	326	2022
PM2.5	Thermo Environmental	2000i	2000iW208842002	2020
PM2.5	Thermo Environmental	2000i	2000iW208822002	2020
PM10	Thermo Environmental	2000i	2000iW208812022	2020
PM10	Thermo Environmental	2000i	2000iW208832002	2020
VOC	Tisch Environmental	TE-123	1019	2020

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	S3550333	3	2016
WD	Met One	010C-1	P22886	2	2020
WS	Met One	020C-1	J4337	2	2016

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	9628
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	5252
Zero air generator	Zero Air Generator	Teledyne/API	T701H	953
Shelter / Building	Air monitoring portable	ITB	10x20 trailer	ITB-14-16423
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	NA
Tower	10 Tower	Aluma	T-135	AT-215036-AA-5-3
Deck	Wooden Deck	NA	10x20	NA





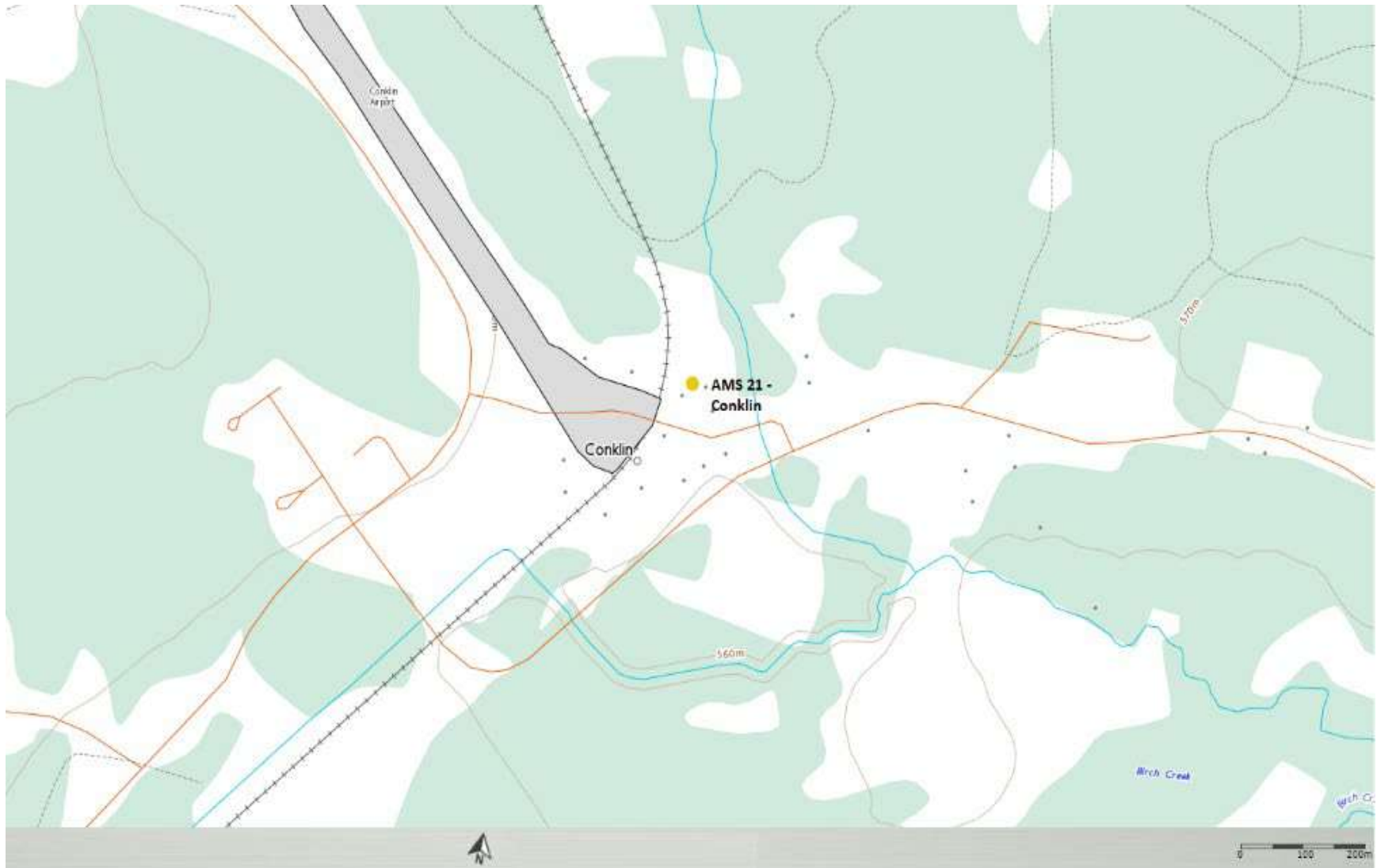


Figure 2.0 – Area Topographic map showing AMS 21



Figure 3.0 – Plan view sketch for AMS 21 site



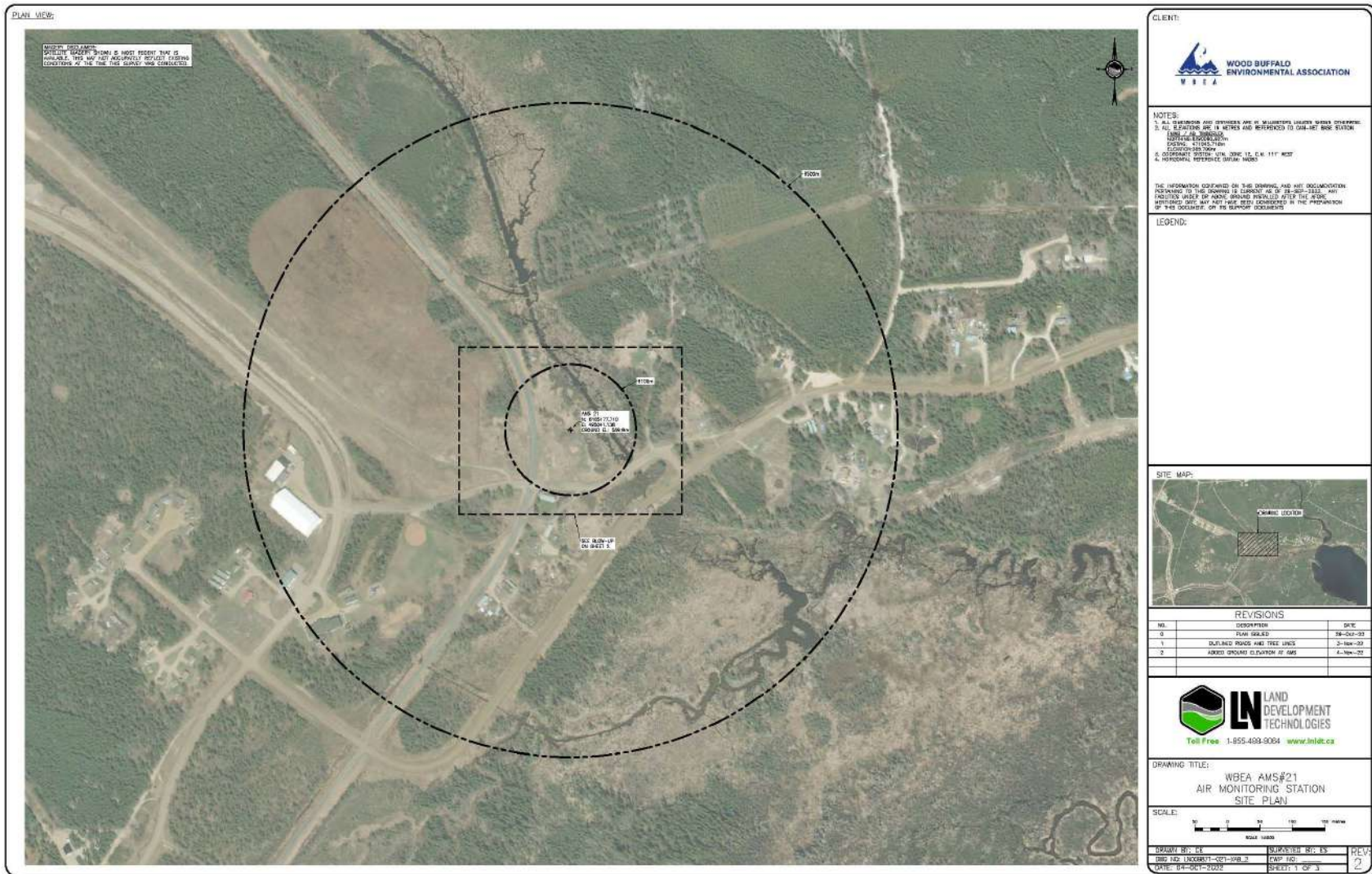


Figure 4.0 – Aerial photo showing AMS 21



Figure 5.0 – Cross Section Elevation Drawing of AMS 21



## Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment Looking North



Figure 6.1 – Environment Looking East





Figure 6.2 – Environment looking South



Figure 6.3 – Environment Looking West





Figure 6.4 – Meteorological Tower

## Station Photos

The following photos show the monitoring station and instrumentation.



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Figure 7.1 – Curb shot of the monitoring station.









Figure 7.2 –Photo of front and back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Conklin

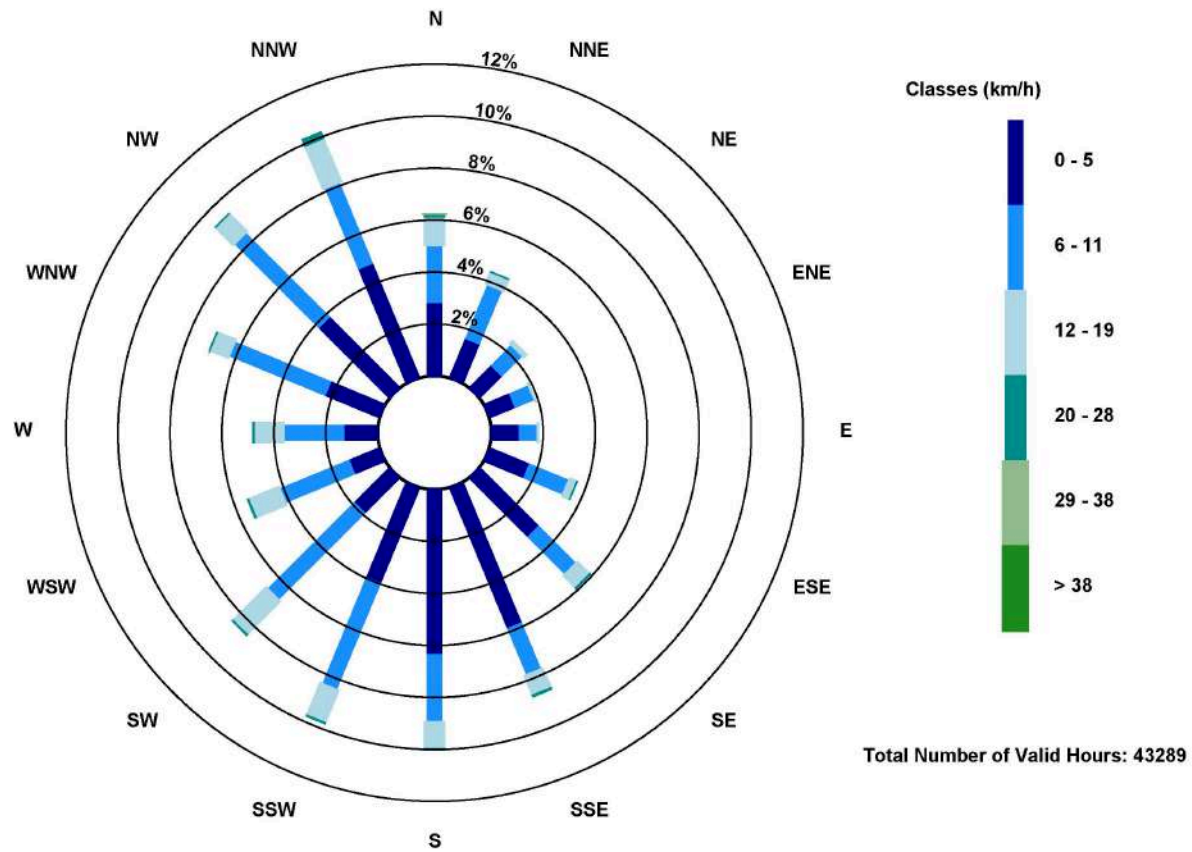


Figure 8.0 – Windrose (Five Year)



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

Janvier

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LAST UPDATED: FEBRUARY 21, 2025



# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	17
Station Photos.....	22



## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 22.....	13
Figure 3.0 – Aerial photo showing AMS 22.....	14
Figure 4.0 – Plan view sketch for AMS 22 site .....	15
Figure 5.0 – Elevation view image for AMS 22 site.....	16
Figure 6.0 – Environment looking North.....	17
Figure 6.1 – Environment looking East .....	18
Figure 6.2 – Environment looking South.....	19
Figure 6.3 – Environment looking West.....	20
Figure 6.4 – Meteorological Tower .....	21
Figure 7.0 – Photo showing the inlet and sample manifold .....	22
Figure 7.1 – Curb shot of the monitoring station .....	23
Figure 7.2 –Photo of the front and the back of instrument rack.....	25
Figure 8.0 – Windrose (five year).....	26

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In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.

Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include; sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network



Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network

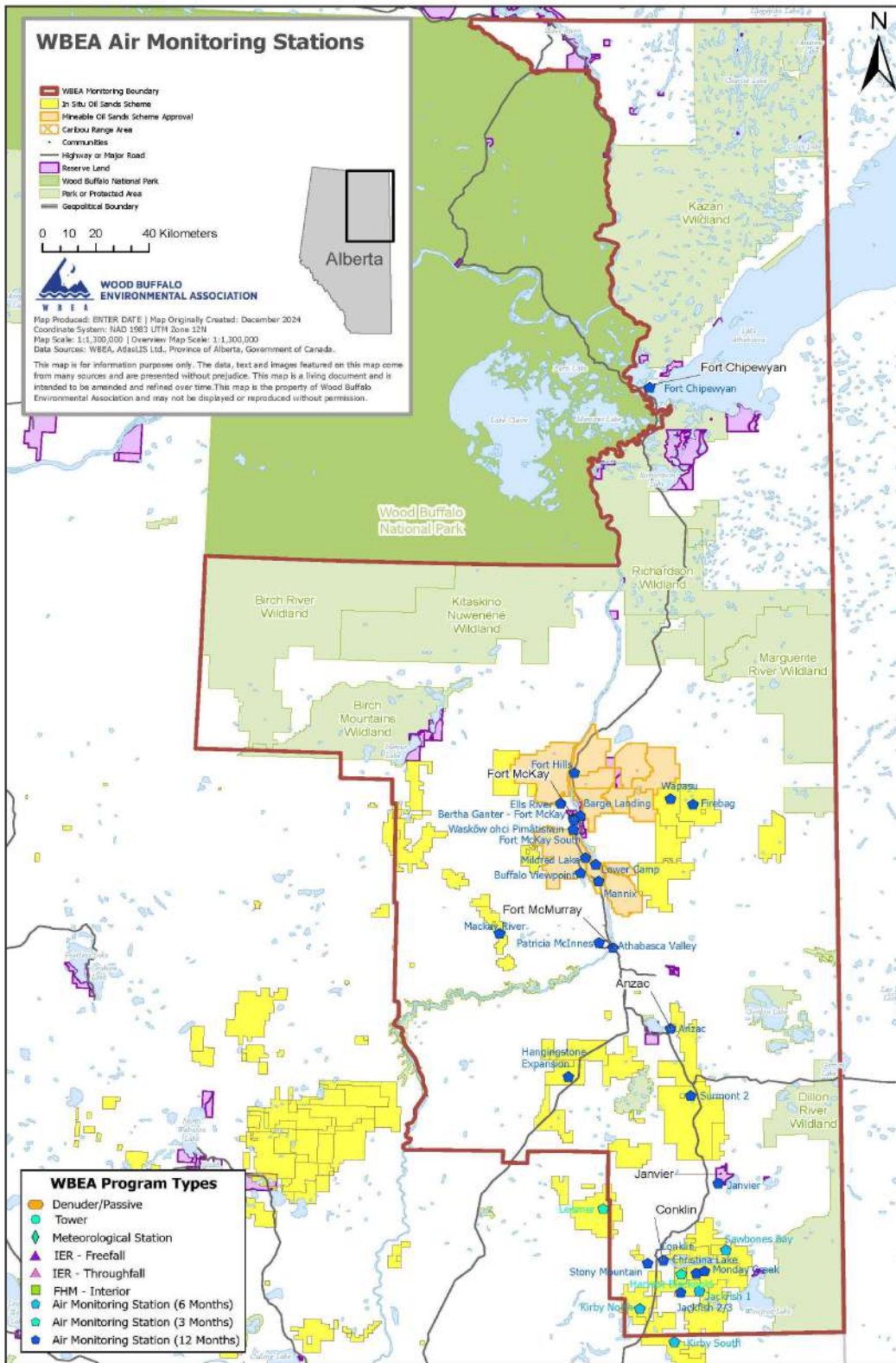


Figure 1.0 – WBEA Network Monitoring Sites

## General Site Information

### Station

Station ID	AMS 22
Station name	Janvier
Date station established	October 2016

### Location

Station street address	Block 4; Lot 135 - Adjacent to Nokohoo Road between Teed Ave and Lapouse Ave.
Legal land description	6-05-80-05-W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	55.903286
Longitude	-110.749758
UTM East	515646
UTM North	6195344
Nearest community	Janvier
Community population	437
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Wood Buffalo Environmental Association
Approval number	NA
Contact Name	Wood Buffalo Environmental Association
Address	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Phone number	780-799-4420
Email address	info@wbea.org

### Site Description

Land use by sector	0 – 90 degrees	Residential
	91 – 180 degrees	Residential
	181 – 270 degrees	Residential
	271 – 360 degrees	Residential
Site elevation (m) (above sea level)	471	
Angle of elevation to nearby buildings	Greatest angle	10°
	Building direction	SE
Airflow restrictions	North	None
	East	None



	South	None
	West	Trees (45 m from station, 17 m high)
Distance to nearest trees (m)	North	80 m from station, 17 m high
	East	80 m from station, 15 m high
	West	45 m from station, 17 m high
	South	None
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	20 m
	Distance from station (m)	2 m

### Site Influences

#### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Vehicles	20 m West	Gravel road

#### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Main access road	low	25 m	Paved

#### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
ConocoPhillips	SAGD	140 MBOED	33.38	NW
Tervita	Landfill	Unknown	11 kms	NW

## Station Equipment

Equipment Owner:

## Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO <sub>2</sub>	Thermo Scientific	43i	1152430006	2016
TRS	Thermo Scientific	43i-TLE	1151680031	2021
NO <sub>2</sub>	Teledyne/API	T200	833	2022
NMHC	Thermo Scientific	55i	1317958219	2024
O <sub>3</sub>	Teledyne/API	T400	7046	2023
PM <sub>2.5</sub>	Teledyne/API	T640	325	2018
PM <sub>2.5</sub> A	Thermo Scientific	2000i	2000i 20388 1308	2019
PM <sub>2.5</sub> B	Thermo Scientific	2000i	2000i 20489 1408	2019
PM <sub>10</sub> A	Thermo Scientific	2000i	2000i 20523 1411	2020
PM <sub>10</sub> B	Thermo Scientific	2000i	2000i 20383 1308	2020
PAH	Tisch	TE-PUFPLUSBL	1001108	2021
VOC	Tisch	TE-123	1018	2021

## Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	G4330042	Class 3	2018
WS	Met One	010C-1	D16121	Class 3	2021
WD	Met One	020C-1	D14528	Class 3	2021
WD 10m	Met One	020C-1	D14054	Class 3	2023
WS 10m	Met One	010C-1	NA	Class 3	2023

## Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	2586
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	3806
Zero air generator	Zero Air Generator	Teledyne/API	T701	691
TRS converter	Thermal oxidizer	CD Nova	CDN-101	587
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	ITB-15-16494
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	314P143189505-02
Deck	10x20	NA	NA	NA

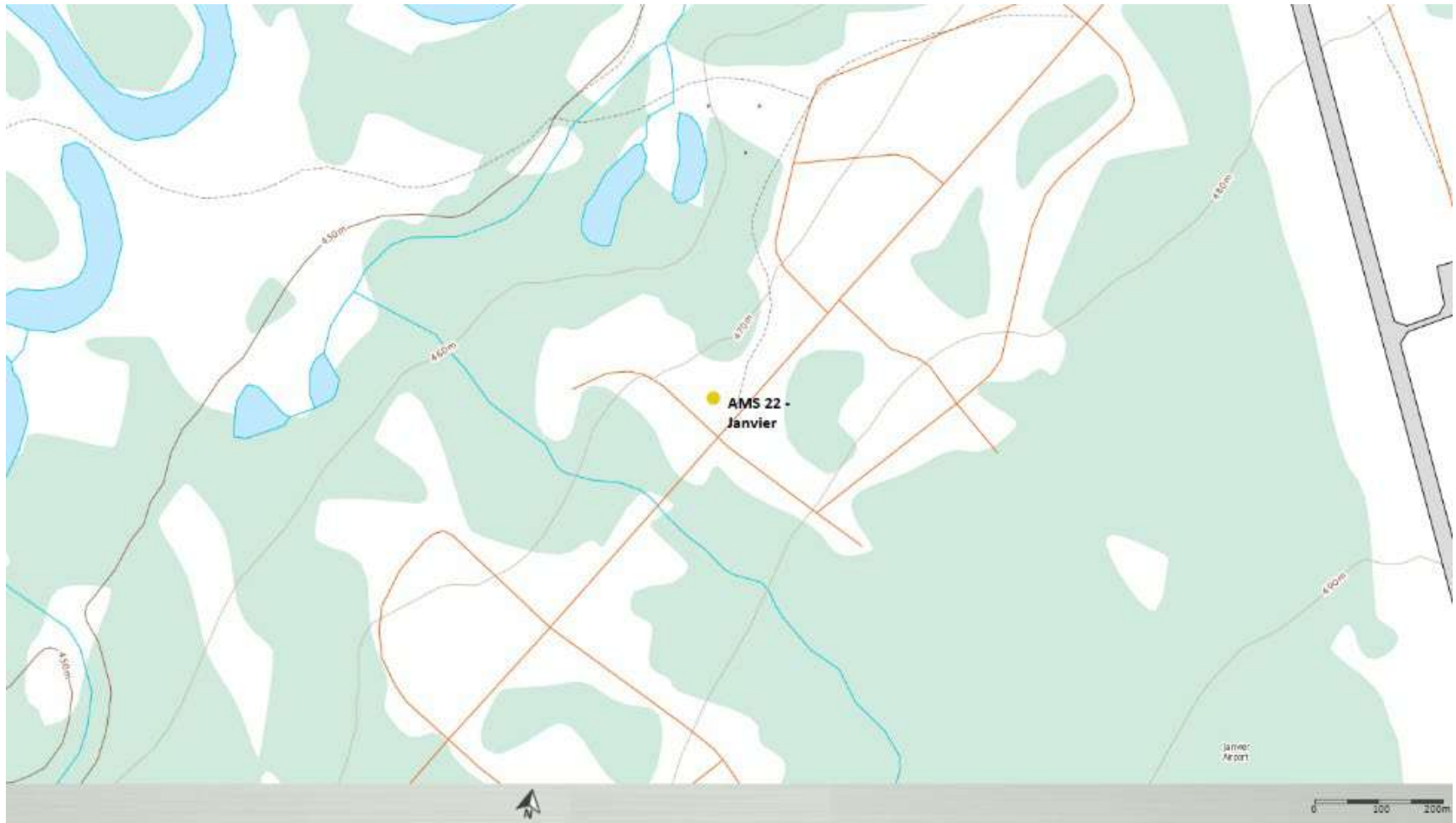


Figure 2.0 – Area topographic map showing AMS 22



Figure 3.0 – Aerial photo showing AMS 22



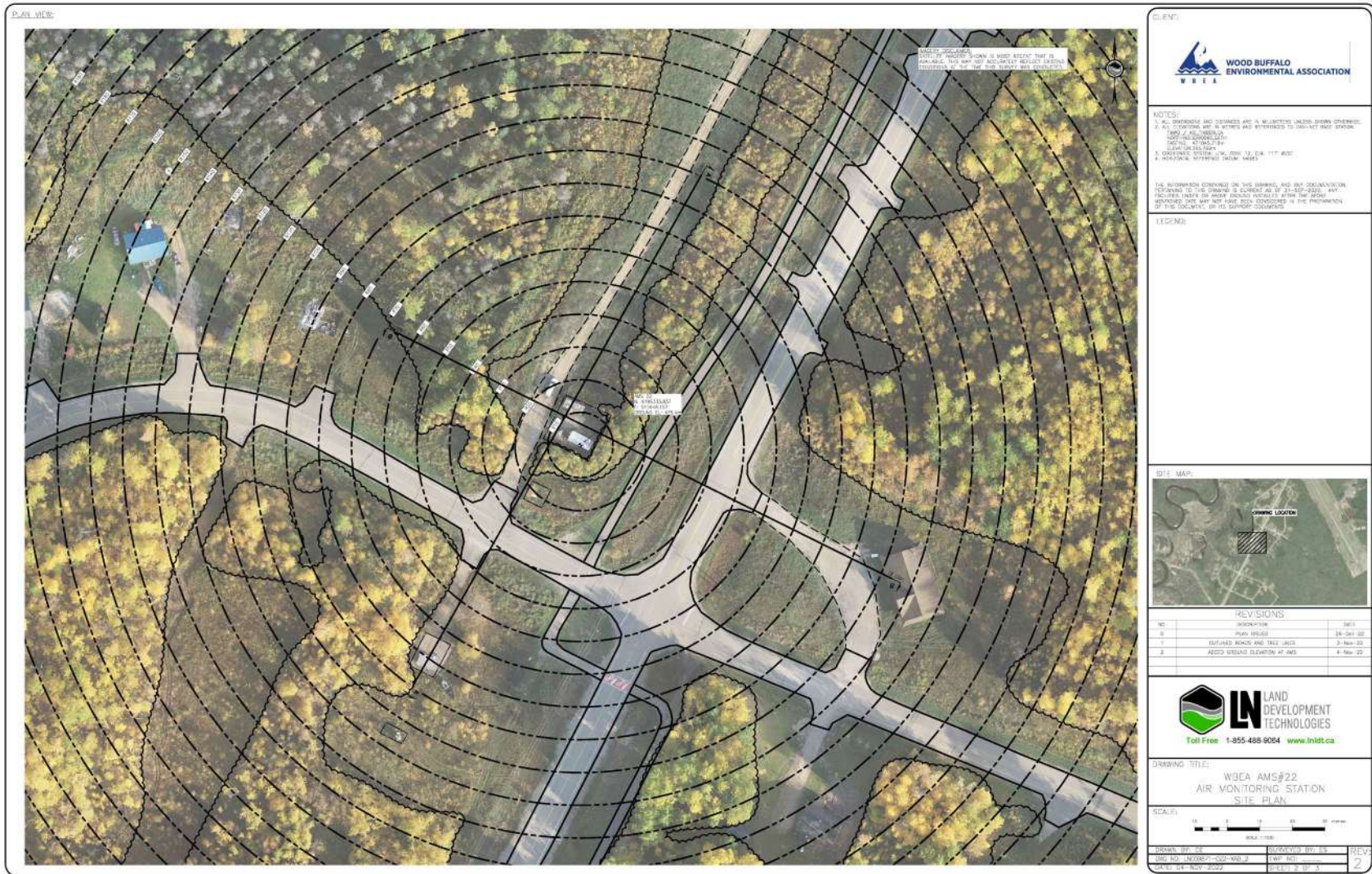


Figure 4.0 – Plan view sketch for AMS 22 site

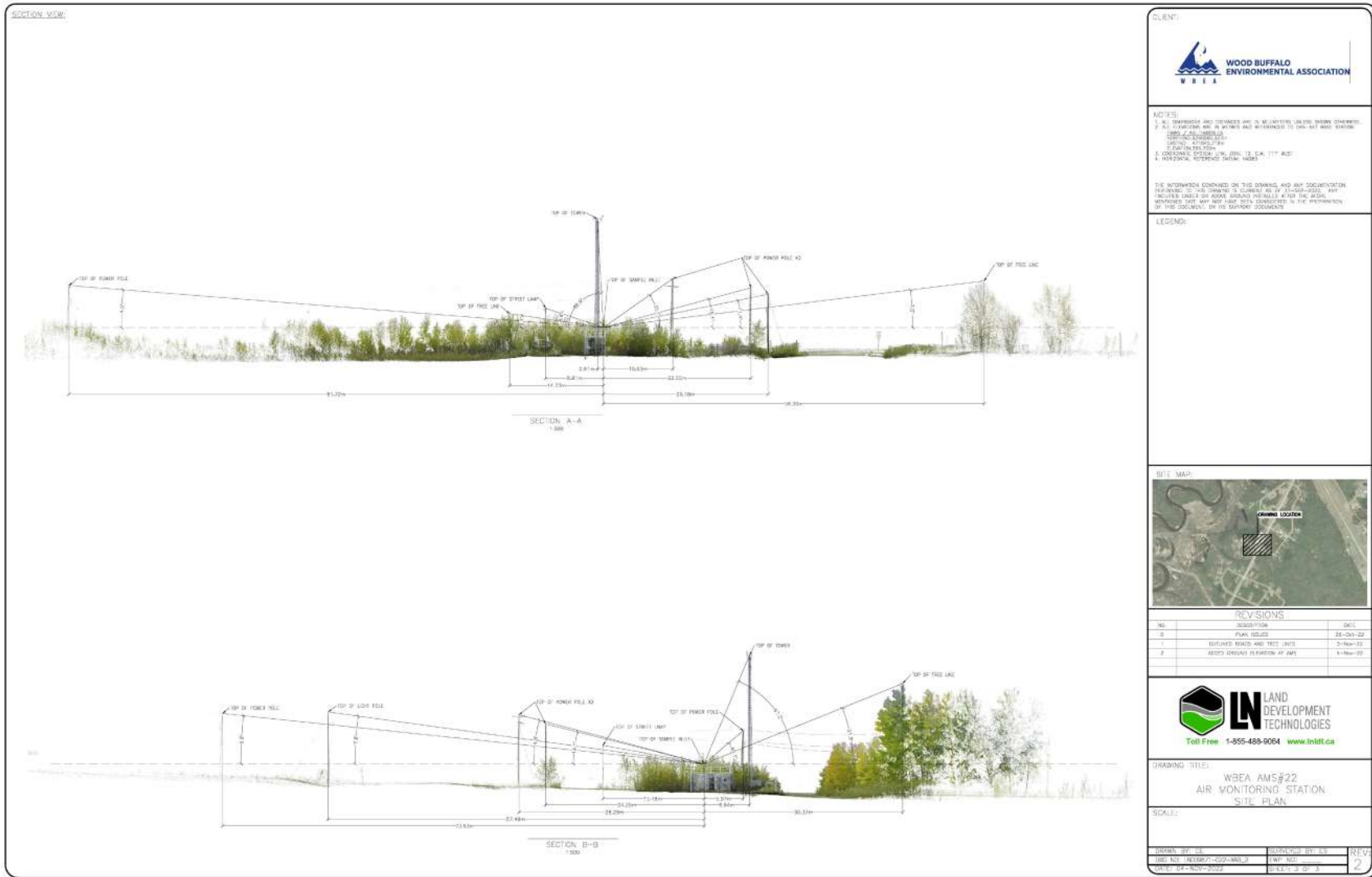


Figure 5.0 – Elevation view image for AMS 22 site



## Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North



Figure 6.1 – Environment looking East





Figure 6.2 – Environment looking South





Figure 6.3 – Environment looking West



Figure 6.4 – Meteorological Tower

## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold





Figure 7.1 – Curb shot of the monitoring station





Figure 7.2 –Photo of the front and the back of instrument rack





Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 20m (WS20) - km/h  
Janvier

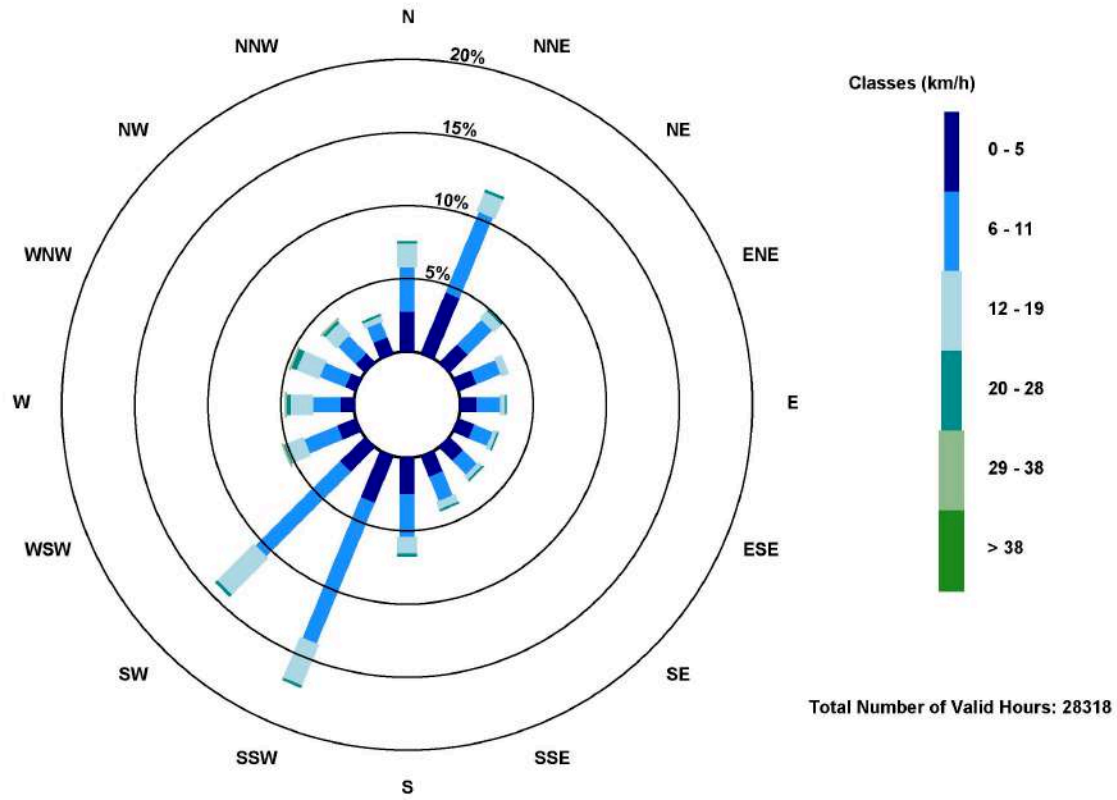


Figure 8.0 – Windrose (five year)





Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

Fort Hills

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LAST UPDATED: FEBURARY-19-2025



# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Station Photos.....	21

## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 23.....	13
Figure 3.0 – Aerial photo showing AMS 23.....	14
Figure 4.0 – Plan view sketch for AMS 23 site .....	15
Figure 5.0 – Environment looking North.....	16
Figure 5.1 – Environment looking East .....	17
Figure 5.2 – Environment looking South.....	18
Figure 5.3 – Environment looking West.....	19
Figure 5.4 – Meteorological Tower.....	20
Figure 6.0 – Photo showing the inlet and sample manifold .....	21
Figure 6.1 – Curb shot of the monitoring station .....	22
Figure 6.2 –Photo of the front and the back of instrument rack.....	23
Figure 6.3 –Photo of the T640 PM monitor and inlet.....	24
Figure 7.0 – Windrose(Five Year) .....	25

## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

### Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.



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WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network



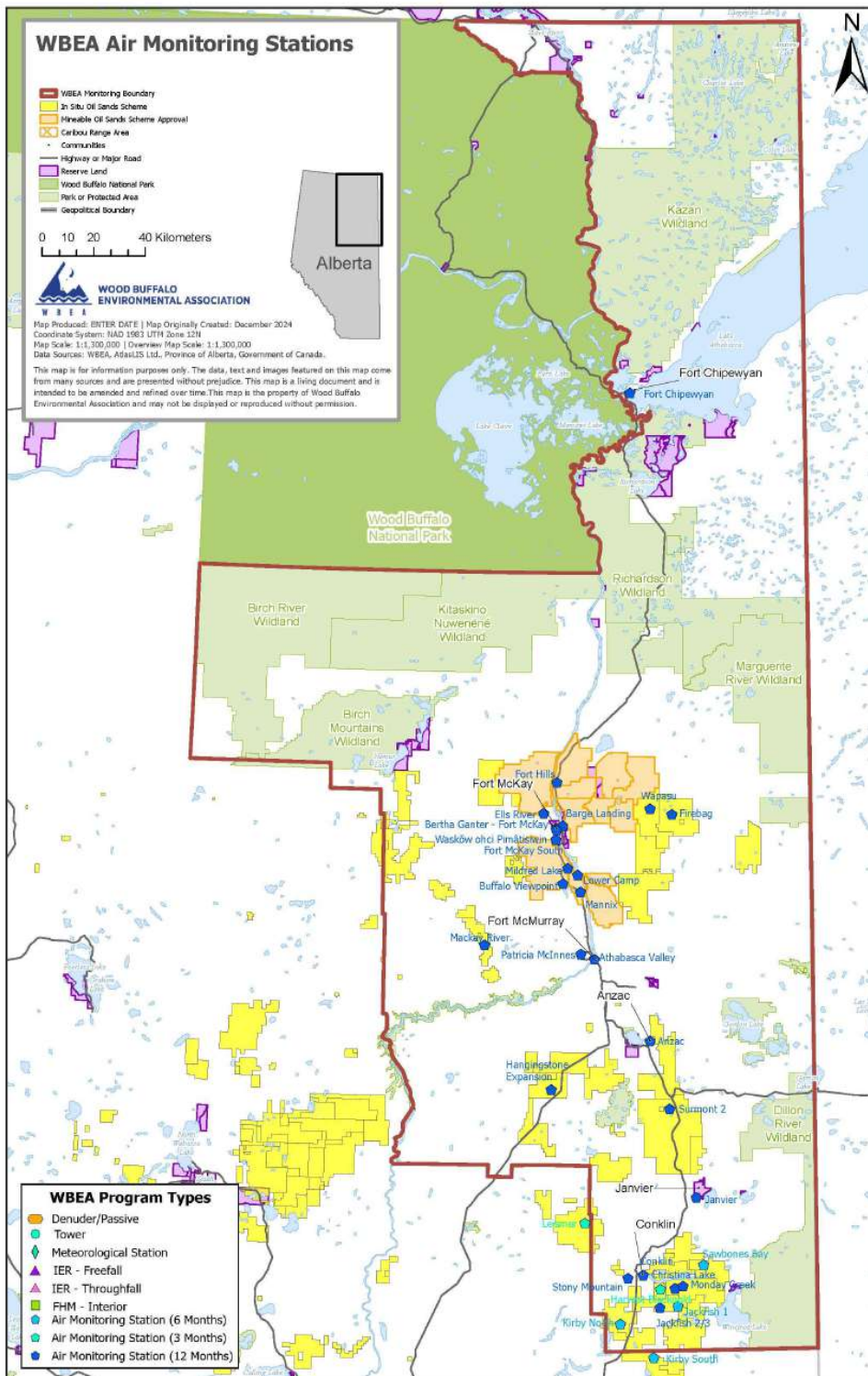


Figure 1.0 – WBEA Network Monitoring Sites

## General Site Information

### Station

Station ID	AMS 23
Station name	Fort Hills
Date station established	March 2017

### Location

Station street address	Located North of the Southwest Raw Water Pond
Legal land description	15-24-096-11 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	57.3489012253
Longitude	-111.639688536
UTM East	461505
UTM North	6356406
Nearest community	Fort McKay
Community population	757
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Fort Hills Energy Corporation
Approval number	151469-01-00
Contact Name	Ade Adeniji
Address	P.O. Box 4001 Fort McMurray, Alberta, T9H 3E3
Phone number	780-743-6840
Email address	slepoudre@suncor.com

### Site Description

Land use by sector	0 – 90 degrees	Water treatment building
	91 – 180 degrees	Raw Water Pond
	181 – 270 degrees	Raw Water Pond
	271 – 360 degrees	Access road, drilling lay down yard
Site elevation (m) (above sea level)	283m	
Angle of elevation to nearby buildings	Greatest angle	20°
	Building direction	West
Airflow restrictions	North	N/A
	East	N/A
	South	N/A

	West	N/A
Distance to nearest trees (m)	North	N/A
	East	N/A
	West	N/A
	South	N/A
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	10m
	Distance from station (m)	0m

## Site Influences

### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Raw water pond	20m	Storage pond for raw process water
Trailer Laydown	20m	Storage for Trailers

### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Gravel Road	Low	100	Mine access road used by pickup trucks and heavy equipment

### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Fort Hills	Oil Sands Plant	194,000	0	N/A
CNRL Horizon	Oil Sands Plant	100,000	10	South West
CNRL Albion	Oil Sands Plant	340,000	15	South

## Station Equipment

Equipment Owner: Suncor Energy Ltd.

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO <sub>2</sub>	Thermo Scientific	43i	1160290012	2021
TRS	Thermo Scientific	43i-TLE	1300156232	2021
NO <sub>2</sub>	Thermo Scientific	42i	1152430007	2021
NMHC	Thermo Scientific	55i	1170050130	2024
PM	Teledyne API	T640	1546	2021
PM <sub>10</sub> A	Thermo Scientific	2000i-A-N	2000I2-0382-308	2021
PM <sub>10</sub> B	Thermo Scientific	2000i-A-N	2000IW 20930 2108	2021
VOC	Global Analyzer Systems	G170	2023-234	2023

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	T2950501	Class 3	2021
WS	Met One	010C-1	B17268	Class 3	2021
WD	Met One	020C-1	B14267	Class 3	2021

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	7882
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	451
Zero air generator	Zero Air Generator	Teledyne/API	T701	5611
Shelter / Building	Air monitoring portable	ITB	8 x 14 trailer	2C9CSC2G7M1044018
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	12345
TRS Converter	Thermal Oxidizer	CD Nova	CDN-101	594
H2Generator	Hydrogen Generator	Parker Hannifin	63-0100	14950646





Figure 2.0 – Area topographic map showing AMS 23



Figure 3.0 – Aerial photo showing AMS 23



Station Name: AMS 23 - Fort Hills

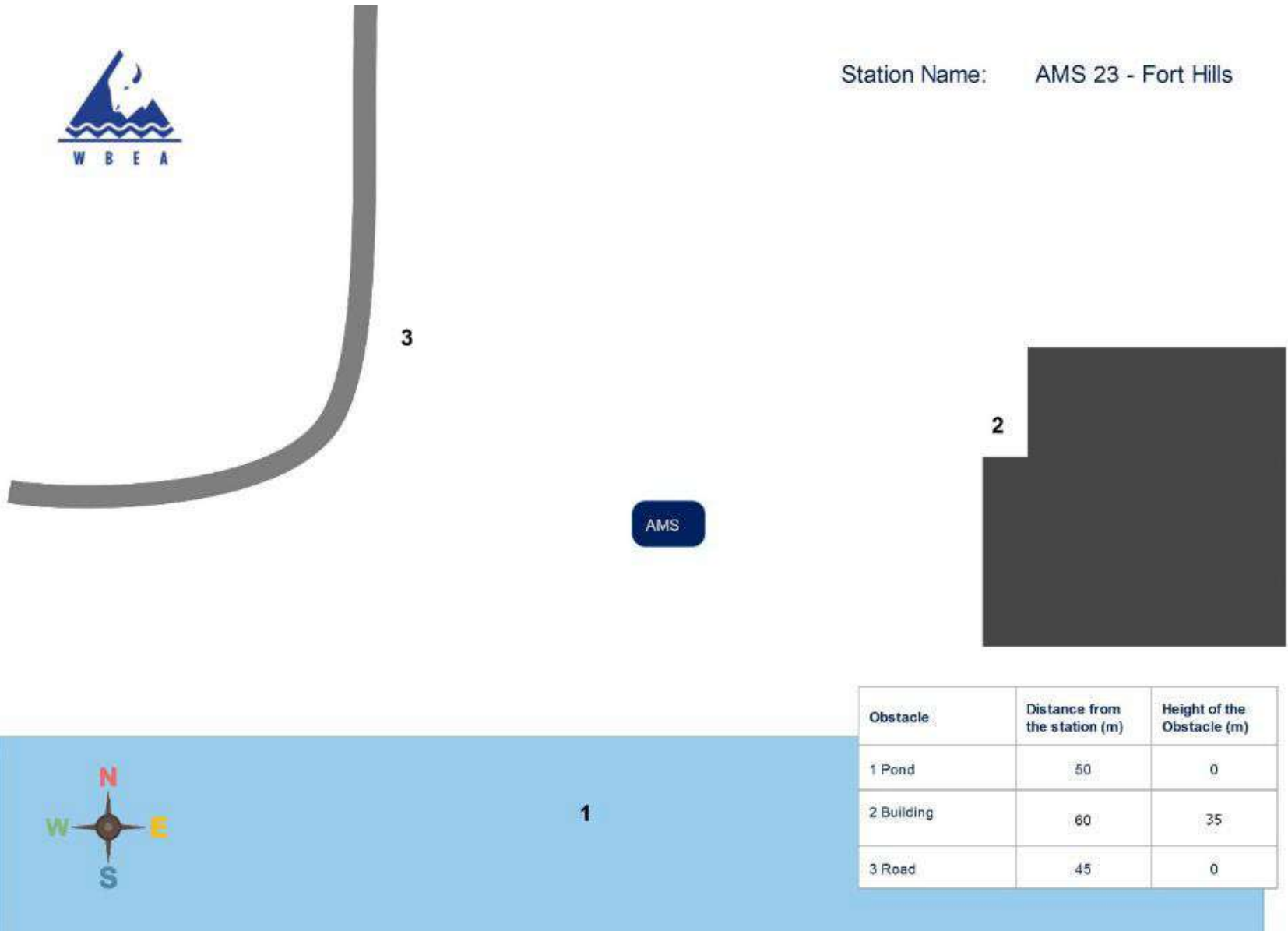


Figure 4.0 – Plan view sketch for AMS 23 site



Site photos

The following photos show the environment surrounding the monitoring station.



Figure 5.0 – Environment looking North





Figure 5.1 – Environment looking East



Figure 5.2 – Environment looking South





Figure 5.3 – Environment looking West



Figure 5.4 – Meteorological Tower



## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 6.0 – Photo showing the inlet and sample manifold

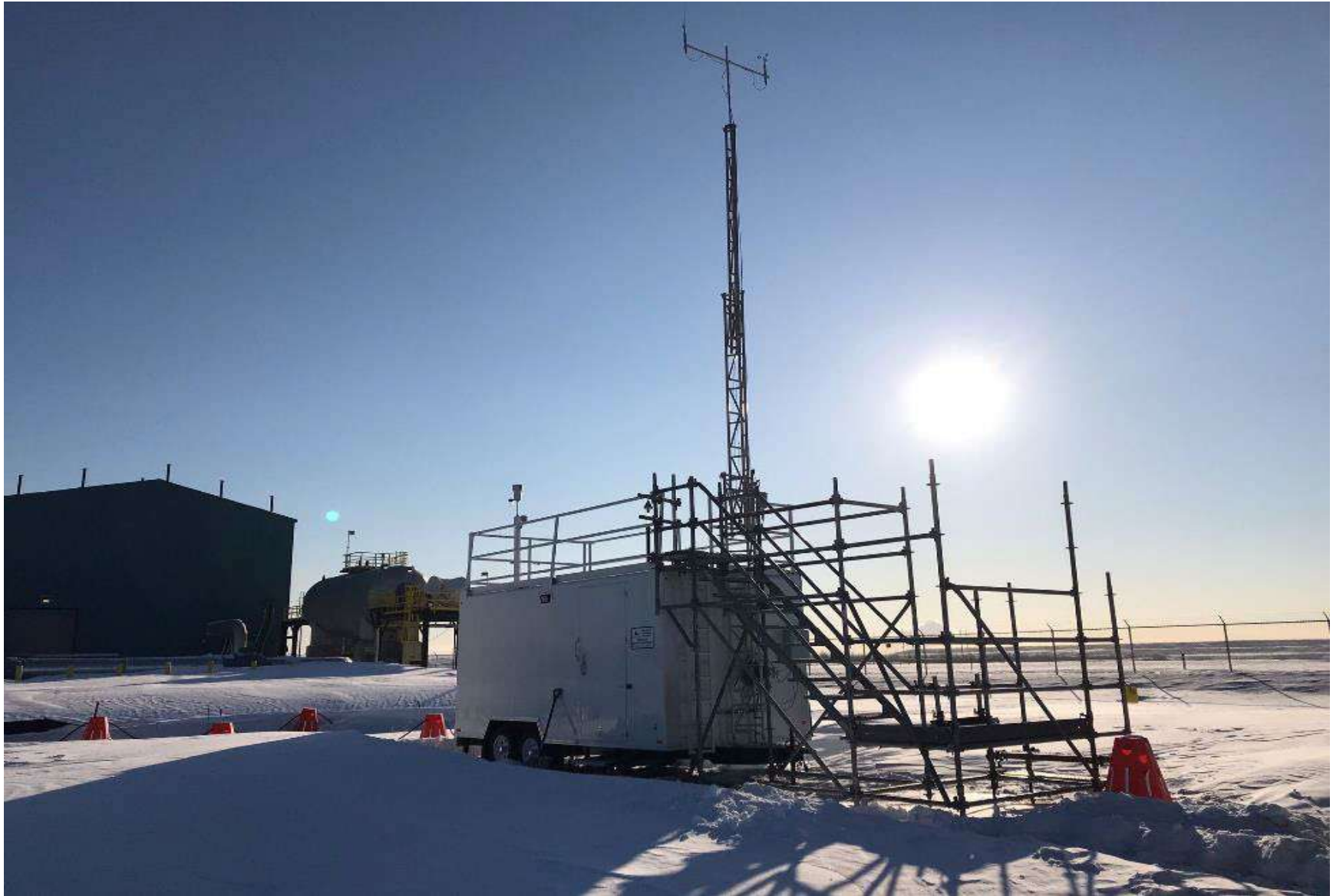


Figure 6.1 – Curb shot of the monitoring station





Figure 6.2 –Photo of the front and the back of instrument rack





Figure 6.3 –Photo of the T640 PM monitor and inlet





Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Fort Hills

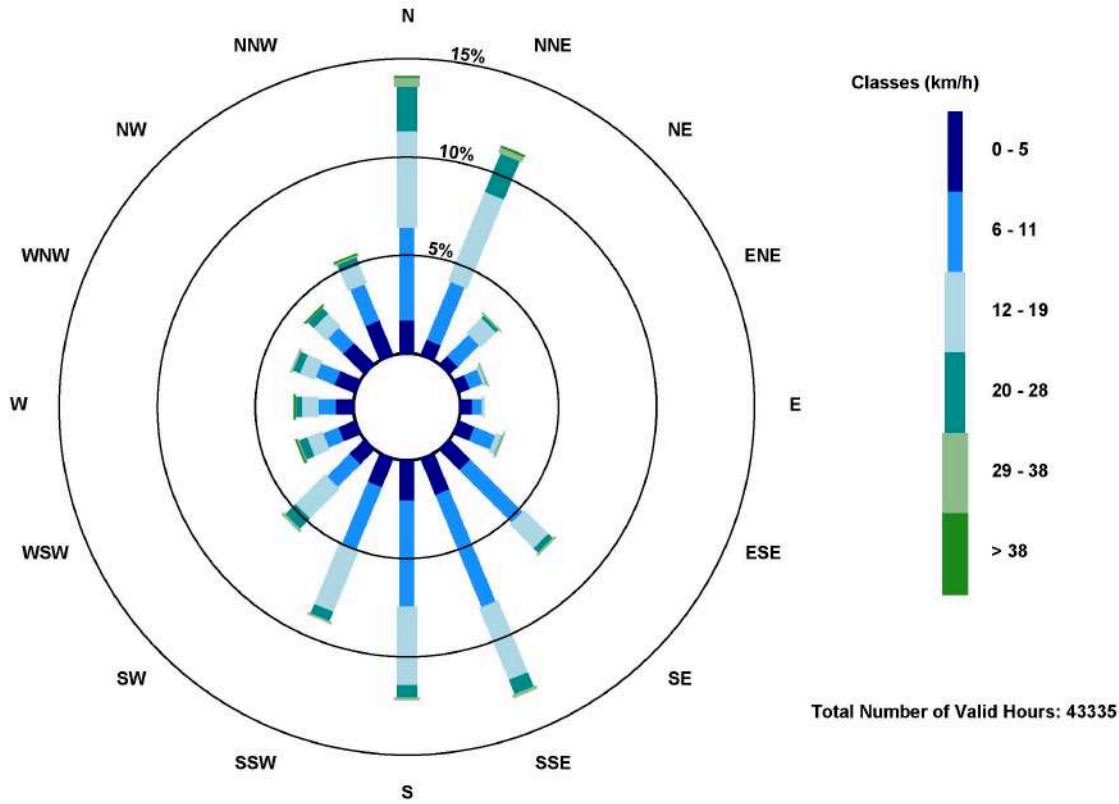


Figure 7.0 – Windrose(Five Year)



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

Waskōw ohci Pimâtisiwin

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LAST UPDATED: FEB-19-2025



# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Station Photos.....	22

## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 25.....	13
Figure 3.0 – Aerial image showing AMS 25.....	14
Figure 4.0 – Plan view image for AMS 25 site.....	15
Figure 5.0 – Elevation view image for AMS 25 site.....	16
Figure 6.0 – Environment looking North.....	18
Figure 6.1 – Environment looking East .....	18
Figure 6.2 – Environment looking South.....	19
Figure 6.3 – Environment looking West.....	20
Figure 6.4 – Meteorological Tower .....	21
Figure 7.0 – Photo showing the inlet and sample manifold .....	22
Figure 7.1 – Curb shot of the monitoring station .....	23
Figure 7.2 –Photo of the front of instrument rack .....	24
Figure 7.3 –Photos of TSI Particle Counter .....	25
Figure 8.0 – Windrose (Five Year) .....	26



## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

### Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.

In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.

Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include; sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network



Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network

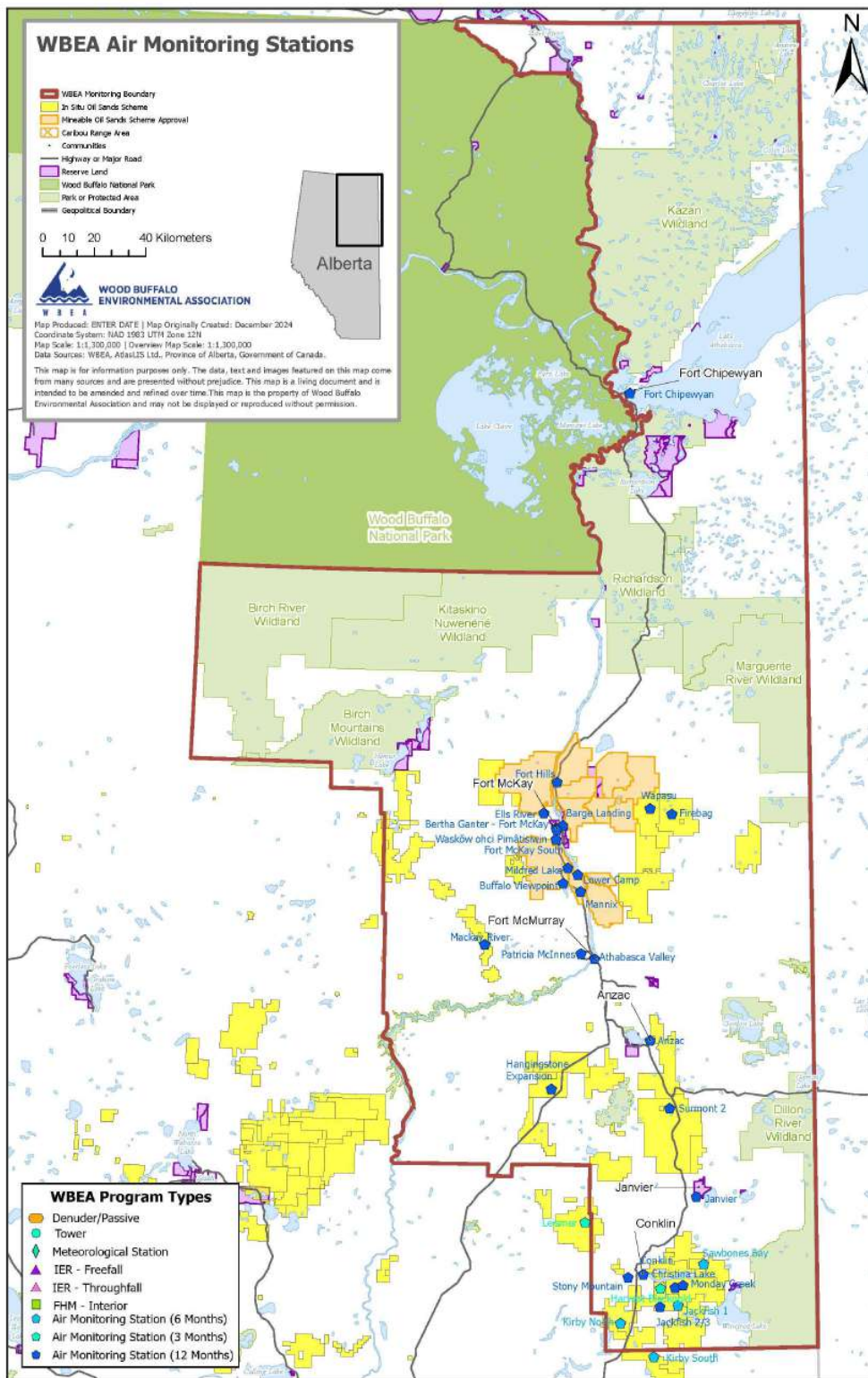


Figure 1.0 – WBEA Network Monitoring Sites

## General Site Information

### Station

Station ID	AMS 25
Station name	Waskōw ohci Pimâtisiwin
Date station established	July 2017

### Location

Station street address	Environment and Climate Change Canada Oski Otin compound
Legal land description	5-25-94-11 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	57.183624
Longitude	-111.639488
UTM East	461350
UTM North	6337994
Nearest community	Fort Mackay
Community population	742
Census Year	2016

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	N/A
Approval number	N/A
Contact Name	Wood Buffalo Environmental Association
Address	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Phone number	780-799-4420
Email address	info@wbea.org

### Site Description

Land use by sector	0 – 90 degrees	Wooded Area
	91 – 180 degrees	Wooded Area
	181 – 270 degrees	Oski-otin Compound
	271 – 360 degrees	Oski-otin Compound, gravel access road
Site elevation (m) (above sea level)	261.6 m	
Angle of elevation to nearby buildings	Greatest angle	N/A
	Building direction	N/A
Airflow restrictions	North	None
	East	None

	South	None
	West	House
Distance to nearest trees (m)	North	60
	East	20
	West	40
	South	20
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	10 m
	Distance from station (m)	0 m

## Site Influences

### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Residential Subdivision	W and N of the station	Wood burning in household stoves and backyard firepits

### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Main roadway	Low	30	Main roadway used by residential vehicles

### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
CNRL Albion	Oil Sands Plant	340,000	10	Northeast
Syncrude	Oil Sands Plant	350,000	15	South
CNRL Horizon	Oil Sands Plant	100,000	20	Northwest



## Station Equipment

Equipment Owner: WBEA

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO2	Thermo Scientific	43i	1118148497	2017
H2S	Thermo Scientific	43i-LTE	1170050146	2019
H2S	Global Analyzer Systems	G150	2022-219	2023
TSI	TSI Inc	332100	71025249	2021

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	P3640812	2	2023
WS	Met One	010C-1	Y18364	3	2023
WD	Met One	020C-1	U11345	3	2023

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	2632
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	747
Zero air generator	Zero Air Generator	Teledyne/API	M701	4765
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	ITB-15-16517
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	

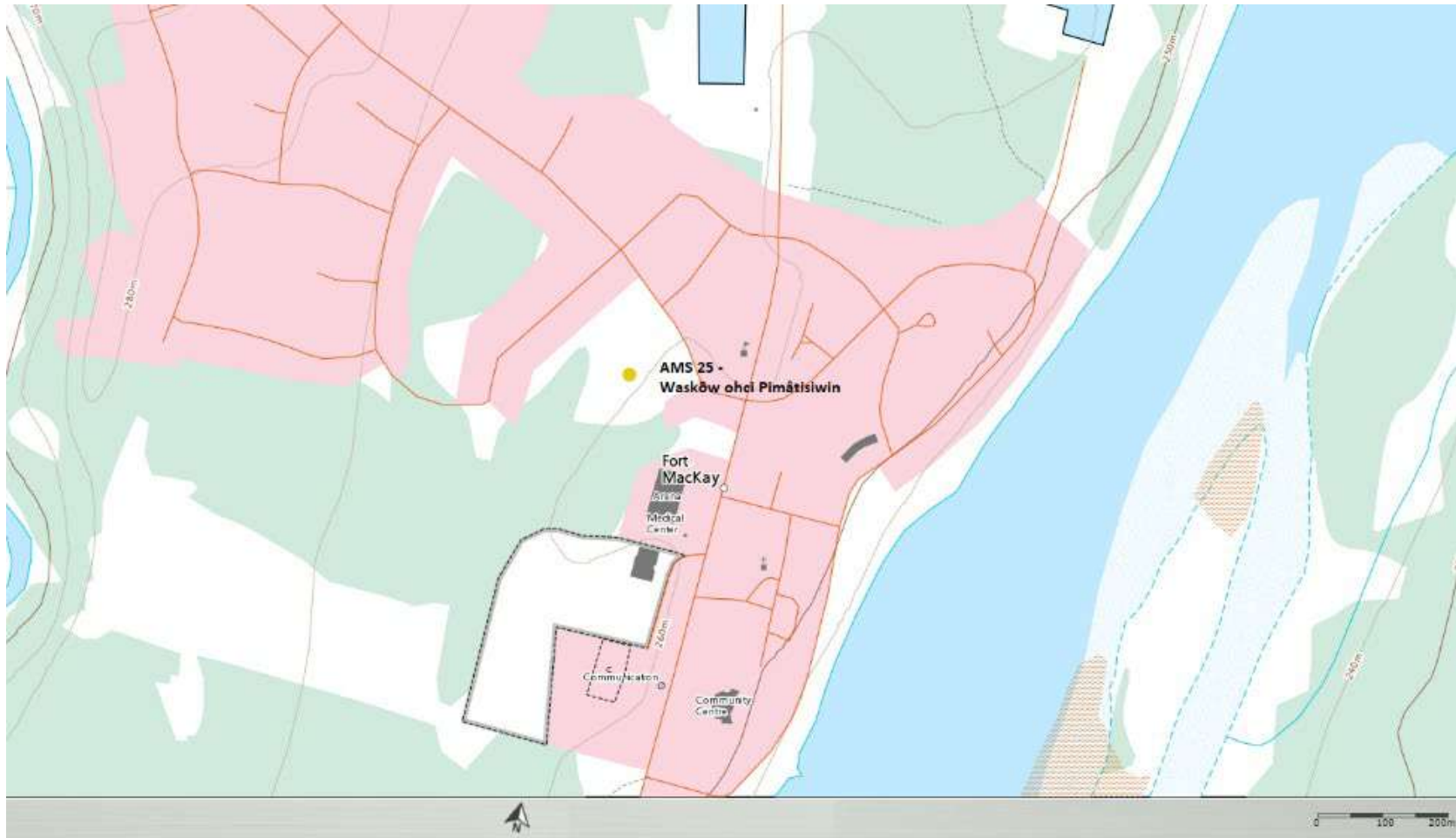


Figure 2.0 – Area topographic map showing AMS 25



Figure 3.0 – Aerial image showing AMS 25







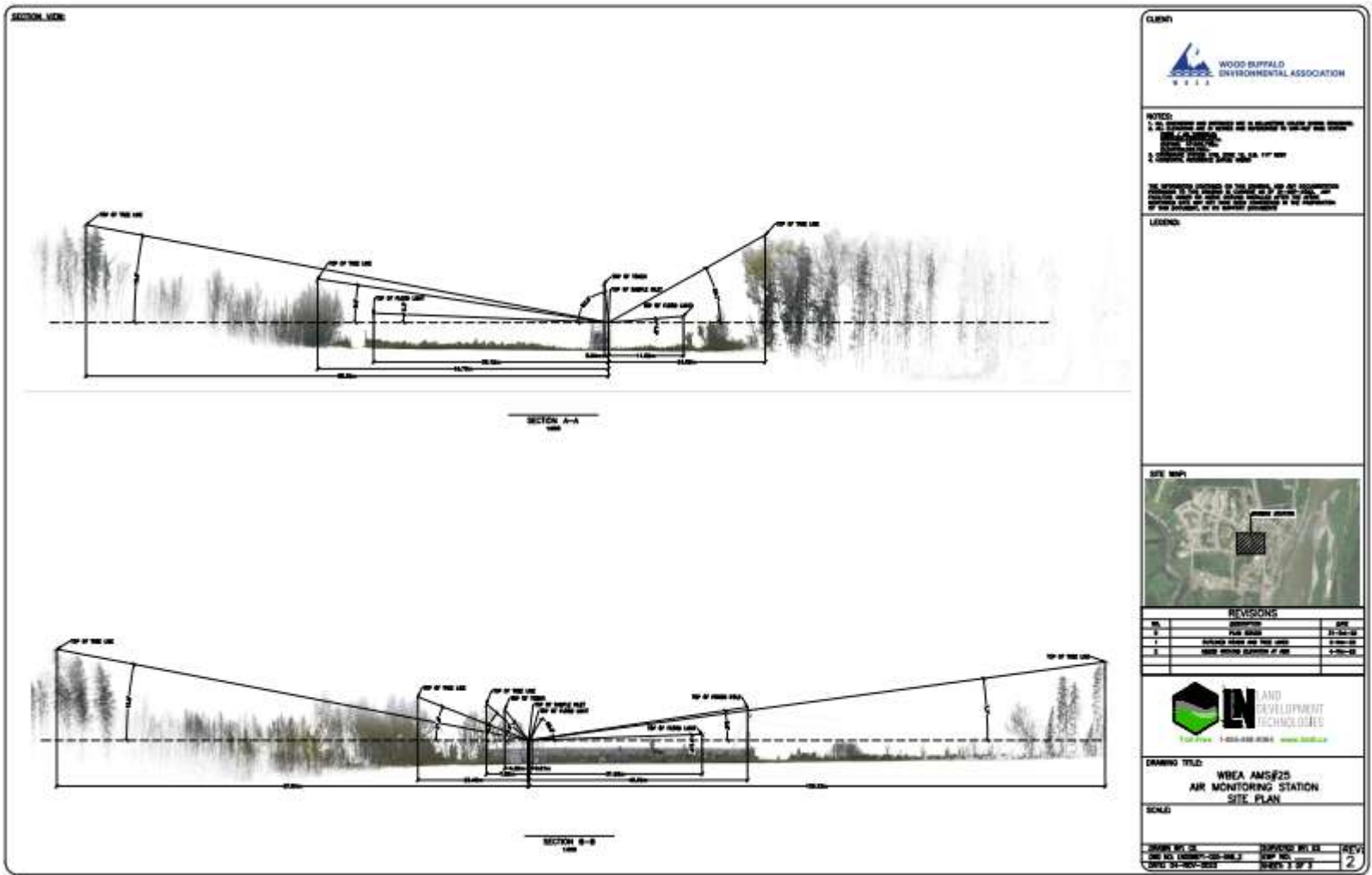


Figure 5.0 – Elevation view image for AMS 25 site

Site photos

The following photos show the environment surrounding the monitoring station.





Figure 6.0 – Environment looking North



Figure 6.1 – Environment looking East



Figure 6.2 – Environment looking South





Figure 6.3 – Environment looking West



Figure 6.4 – Meteorological Tower

## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold





Figure 7.1 – Curb shot of the monitoring station





Figure 7.2 –Photo of the front of instrument rack



Figure 7.3 –Photos of TSI Particle Counter



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Waskow ohci Pimatisiwin

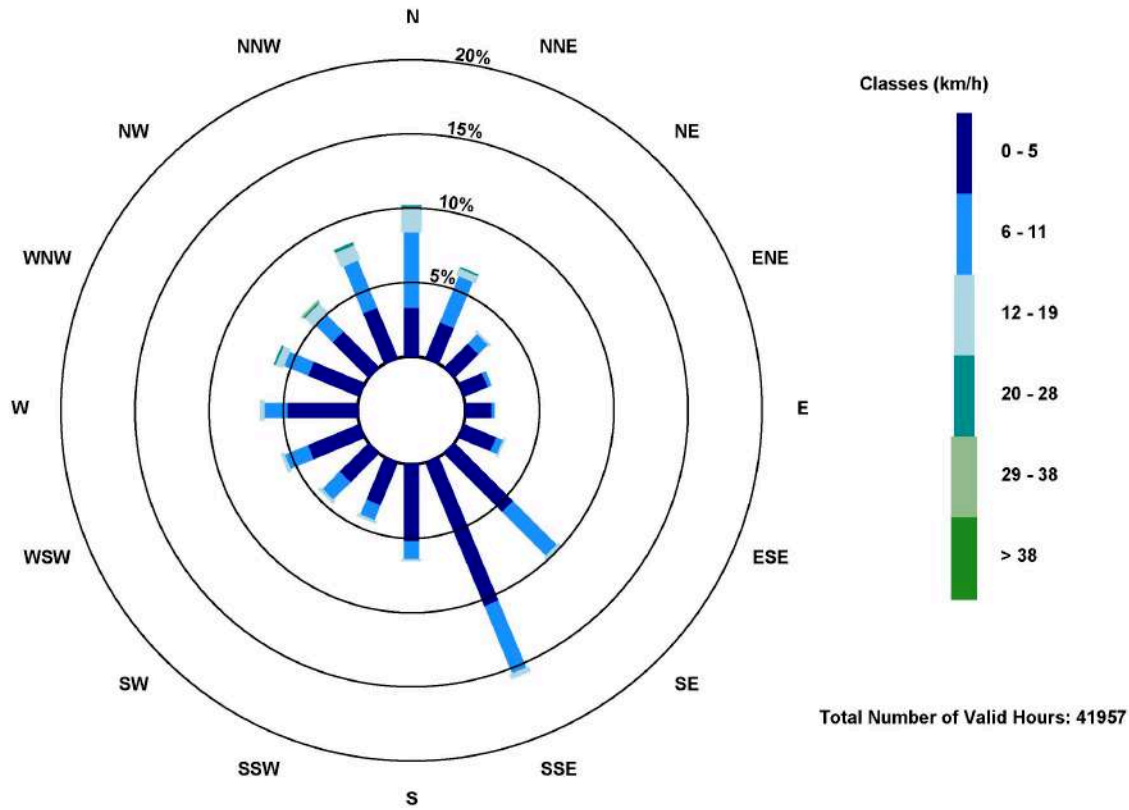


Figure 8.0 – Windrose (Five-Year)



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station**  
**Site Documentation**

Christina Lake

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LAST UPDATED: FEBRUARY 28, 2025





# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources .....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	17
Station Photos.....	22

## Tables and Figures

Table 1.1 – Meteorological parameters monitored in the WBEA network.....	7
Table 1.2 – Time-Integrated parameters monitored in the WBEA network. ....	8
Figure 1.0 – WBEA network monitoring sites.....	9
Figure 2.0 – Area topographic map showing AMS 26.....	13
Figure 3.0 – Plan view image for AMS 26 site.....	14
Figure 4.0 – Aerial photo showing AMS 26.....	15
Figure 5.0 – Elevation view image for AMS 26. ....	16
Figure 6.0 – Environment looking North.....	17
Figure 6.1 – Environment looking East. ....	18
Figure 6.2 – Environment looking South.....	19
Figure 6.3 – Environment looking West.....	20
Figure 6.4 – Meteorological tower. ....	21
Figure 7.0 – Photo showing the inlet and sample manifold. ....	22
Figure 7.1 – Curb shot of the monitoring station. ....	23
Figure 7.2 –Photo of front and back of instrument rack. ....	24
Figure 8.0 – Windrose (Five Year). ....	25

## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

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### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

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Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

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Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.

In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.



Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number, and the air quality parameters measured by continuous methods at each site. Parameters measured include hydrogen sulphide (H<sub>2</sub>S), total reduced sulphur (TRS), sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), total hydrocarbons (THC), methane (CH<sub>4</sub>), non-methane hydrocarbons (NMHC), ammonia (NH<sub>3</sub>), carbon monoxide (CO), and carbon dioxide (CO<sub>2</sub>). Sites are categorized as industrial or community, based on the setting in which they are located.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network.



Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature, relative humidity, wind speed, wind direction, vertical wind speed, solar radiation, precipitation, and leaf wetness.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological parameters monitored in the WBEA network.



Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), and precipitation samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP
					ECOC			
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X	
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X	
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X	
9	ATTRIBUTION	BARGE LANDING	X					
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X			X		
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X	
17	COMPLIANCE	WAPASU			X			X
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X
21	COMMUNITY	CONKLIN	X	X		X	X	
22	COMMUNITY	JANVIER	X	X		X	X	
23	COMPLIANCE	FORT HILLS	X			X		
30	COMPLIANCE	ELLS RIVER	X			X		

Table 1.2 – Time-Integrated parameters monitored in the WBEA network.

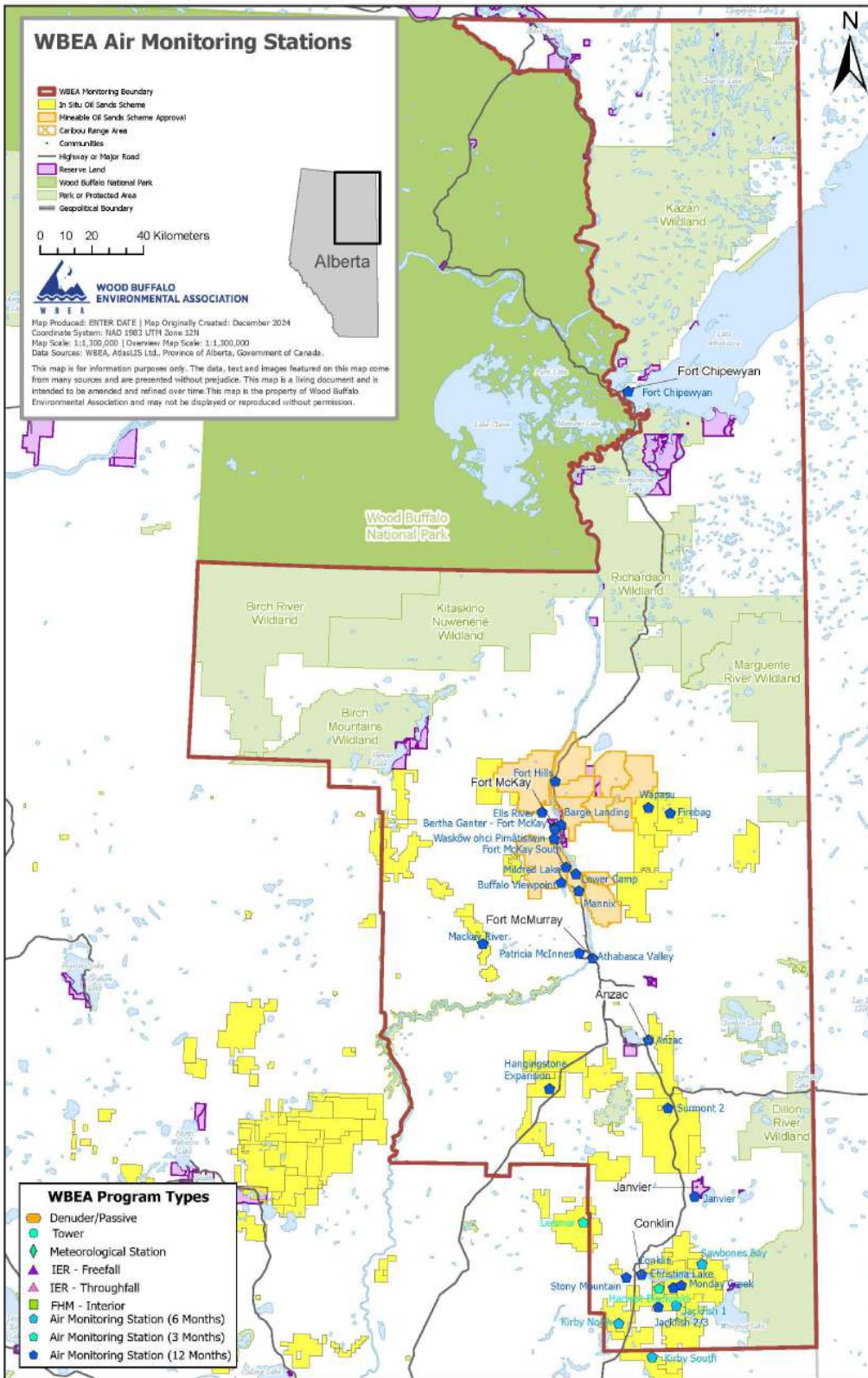


Figure 1.0 – WBEA network monitoring sites



## General Site Information

### Station

Station ID	AMS 26
Station name	Christina Lake
Date station established	May 30, 2018

### Location

Station street address	Located close to a non-operational well-pad 3-16 at Cenovus SAGD site
Legal land description	3-16-76-6 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	55.579153
Longitude	-110.876009
UTM East	507817
UTM North	6159249
Nearest community	Conklin
Community population	178

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Cenovus Energy Inc.
Approval number	48522-01-00
Contact Name	Sean Nichols
Address	500 Centre Street SE Calgary, AB T2P 0M5
Phone number	780-608-7176
Email address	Sean.nichols@cenovus.com

### Site Description

Land use by sector	0 – 90 degrees	SAGD Operations
	91 – 180 degrees	SAGD Operations
	181 – 270 degrees	SAGD Operations
	271 – 360 degrees	SAGD Operations
Site elevation (Above sea level)	569.6m	
Angle of elevation to nearby building	Greatest angle	N/A
	Building direction	N/A
Airflow restrictions	North	No
	East	No
	South	No

	West	No
Distance to nearest trees (m)	North	NA
	East	NA
	West	NA
	South	NA
Sample manifold	Type	All glass
	Inlet height above roof	1 meter
Meteorological Sensors	Type	Cup and vane
	Height above ground	10
	Distance from station	0

## Site Influences

### Localized Sources

Type	Distance (m)	Description
Well-pad	100	Non-operational well pad. Capped.
Holding tanks	50m to the West	Tanker fluids (unidentified)

### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Dirt/gravel	Medium	20	Used by site workers

### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (m)	Compass direction from site
Cenovus Christina Lake	SAGD Facility		300	NW

## Station Equipment

Equipment Owner: WBEA

### Analytical Equipment

Parameter	Owner	Make	Model	Serial Number	Date Installed
SO2	Cenovus	Thermo Instruments	43I	1152430005	Feb. 02, 2024
H2S	Cenovus	Thermo Instruments	43iQTL	12333331547	May 30, 2018
NO2	Cenovus	Thermo Instruments	42I	1173480006	May 30, 2018

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	G4330034	4	May 30, 2018
WS	Met One	010C-1	P22395	2	May 30, 2018
WD	Met One	020C-1	N13744	2	May 30, 2018

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	7881
Zero air generator	Zero Air Generator	Teledyne/API	701	832
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	NA
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	NA
Gas Dilution Calibrator	Mass flow controlled gas dilution	Teledyne/API	T700	5258
Tower	10 Meter crank up	Aluma	T-135	217224002

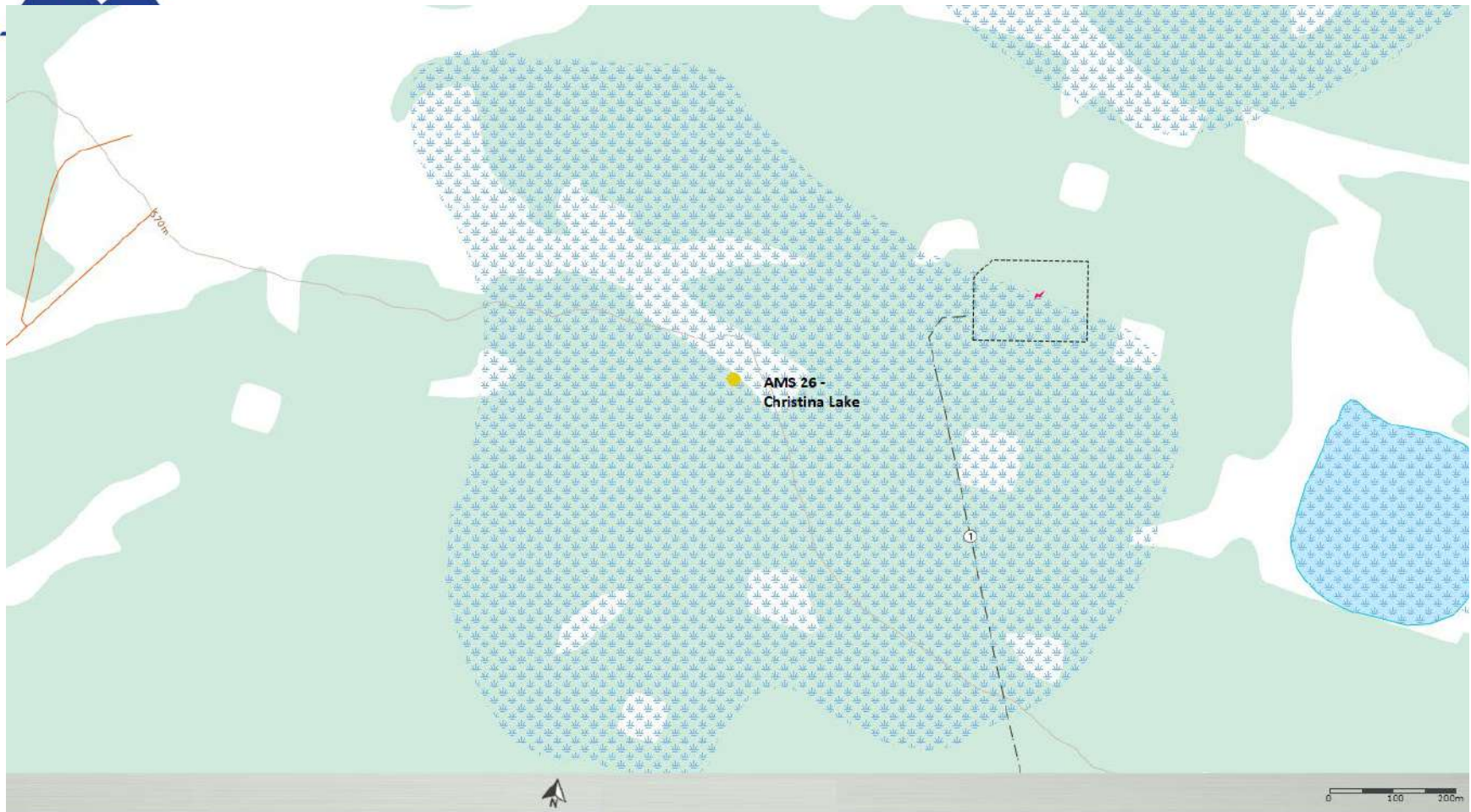


Figure 2.0 – Area topographic map showing AMS 26.



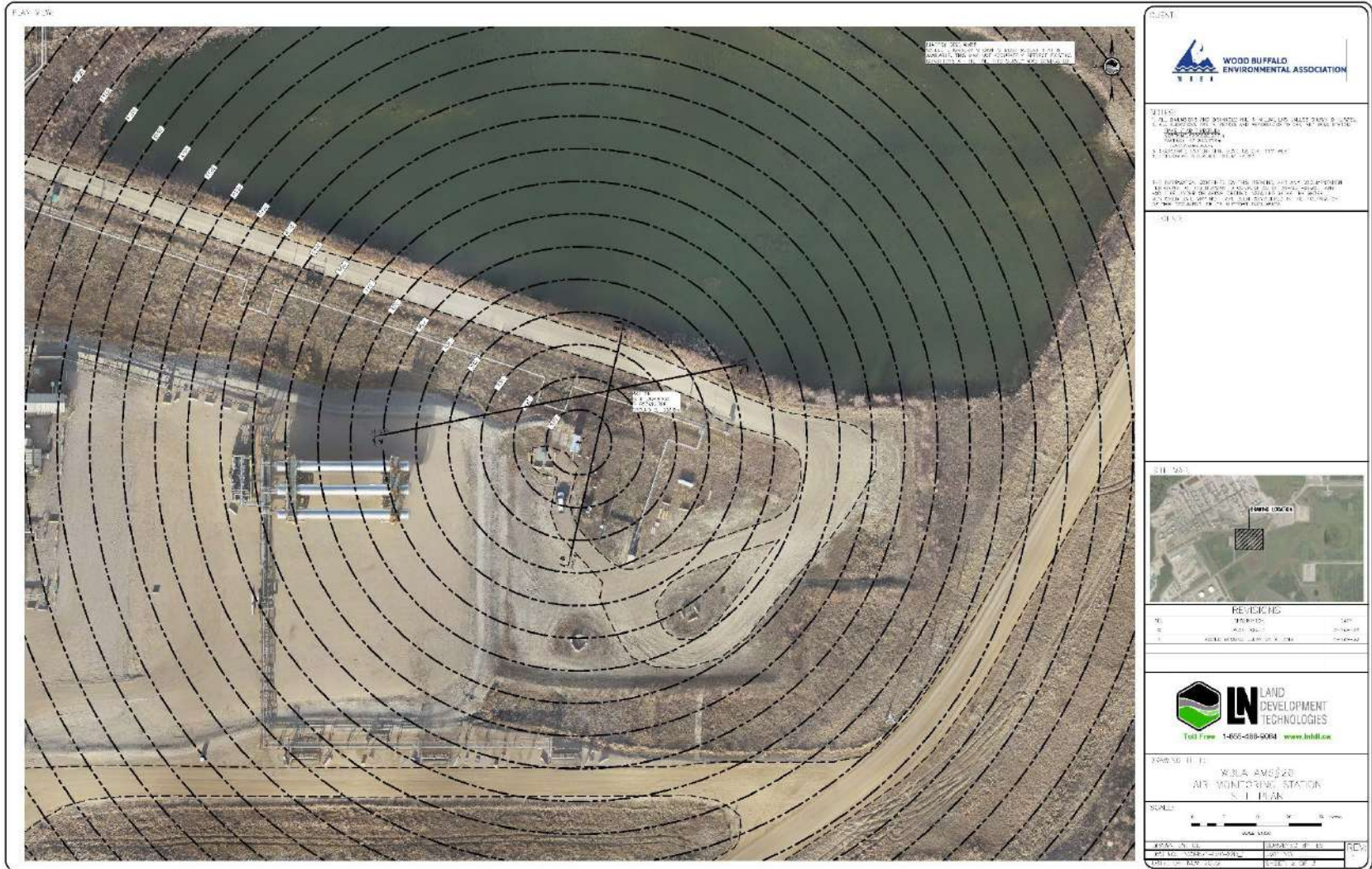


Figure 3.0 – Plan view image for AMS 26 site.











The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North.





Figure 6.1 – Environment looking East.







Figure 6.2 – Environment looking South.





Figure 6.3 – Environment looking West.



Figure 6.4 – Meteorological tower.





The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold.



Figure 7.1 – Curb shot of the monitoring station.





Figure 7.2 –Photo of front and back of instrument rack.



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

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

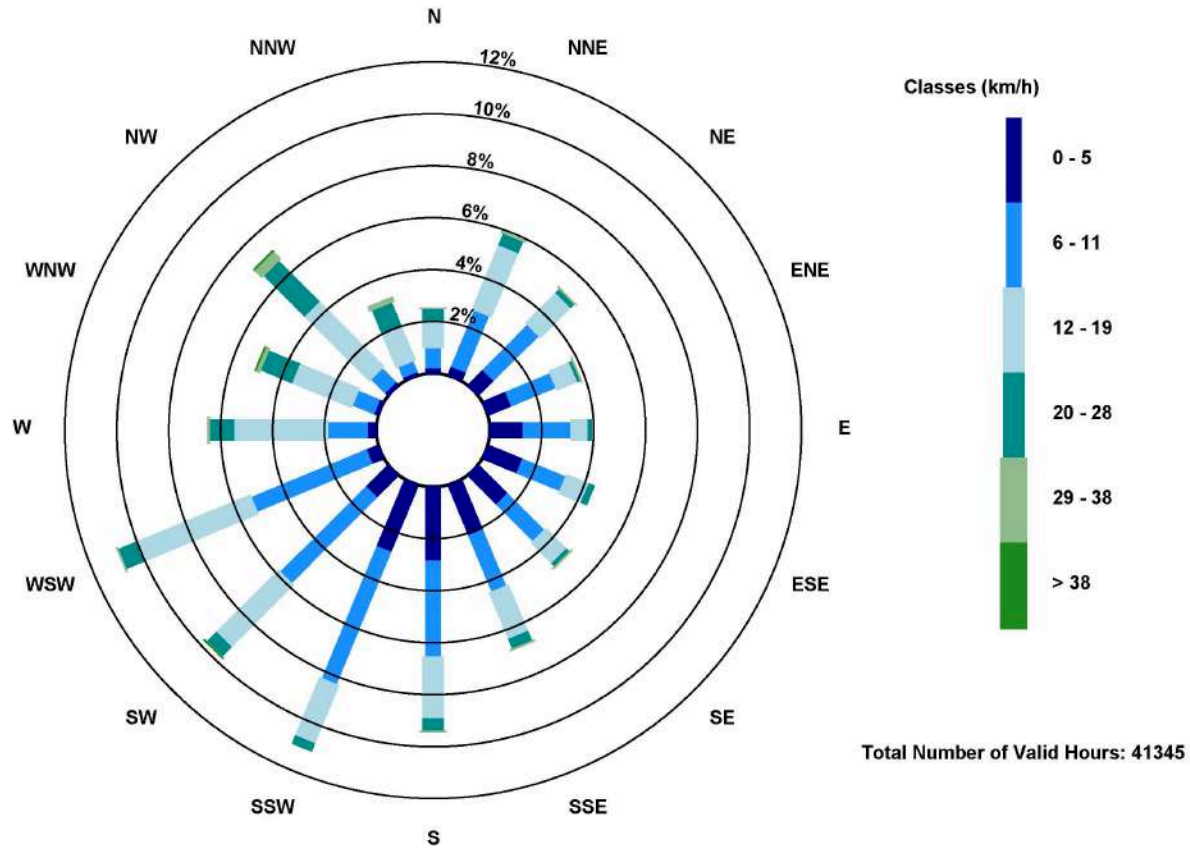


Figure 8.0 – Windrose (Five Year).



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station**  
**Site Documentation**

Jackfish 2/3

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LAST UPDATED: FEBRUARY 28, 2025



# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description .....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	16
Station Photos.....	21



## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1 – WBEA Network Monitoring Sites .....	9
Figure 2 – Aerial photo showing AMS 27.....	13
Figure 3 – Plan view sketch for AMS 27.....	14
Figure 4 - Cross sectional Elevation Drawing of AMS 27.....	15
Figure 5 – Environment looking North.....	16
Figure 6 - Environment looking East.....	17
Figure 7 – Environment looking South.....	18
Figure 8 – Environment looking West.....	19
Figure 9 – Meteorological Tower.....	20
Figure 10 – Photo showing the inlet and sample manifold. ....	221
Figure 11 - Curb shot of the monitoring station.....	22
Figure 12 –Photo of the front and the back of instrument rack.....	23
Figure 13 – Windrose (five years). ....	24



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WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	Compliance	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network



Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network



Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network





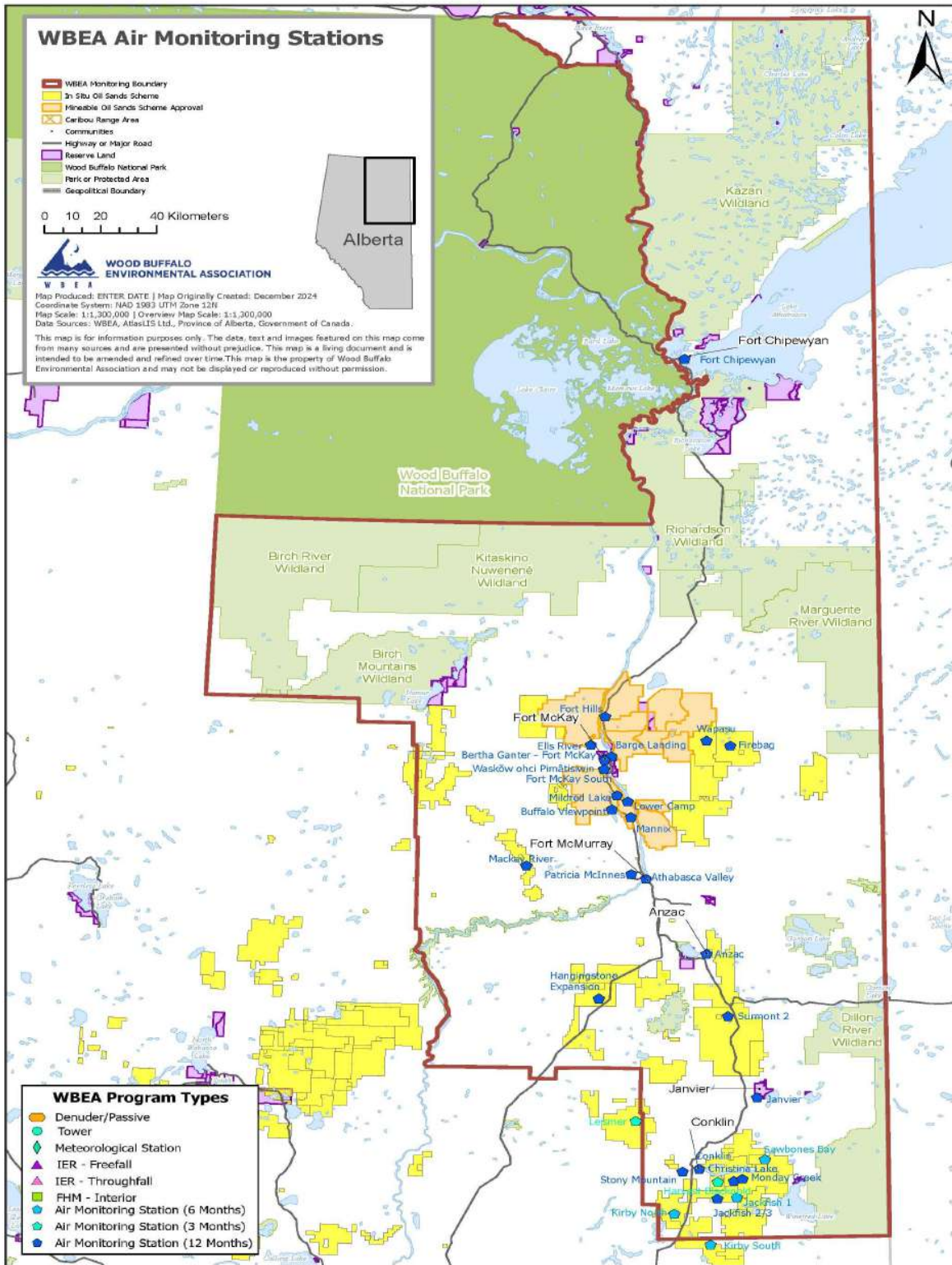


Figure 1.0 – WBEA Network Monitoring Sites



## General Site Information

### Station

Station ID	AMS 27
Station name	Jackfish 2/3
Date station established	Sep 15, 2018

### Location

Station street address	Located southeast of CNRL Jackfish Lodge, left side of the road right after CNRL Energy Plant
Legal land description	15-23-75-7-W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	55.51870937
Longitude	-110.9759839
UTM East	501516
UTM North	6152516
Elevation	679
Nearest community	Conklin
Community population	154
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3-805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Canadian Natural Resources Limited
Approval number	224816-00-00
Contact Name	Shawn Milligan
Address	2100, 855 - 2 Street S.W. Calgary, AB T2P 4J8
Phone number	403-896-3109
Email address	shawn.milligan@cnrl.com

### Site Description

Land use by sector	0 – 90 degrees	SAGD Operations
	91 – 180 degrees	SAGD Operations
	181 – 270 degrees	SAGD Operations
	271 – 360 degrees	SAGD Operations
Site elevation (m) (above sea level)	670 m	
Angle of elevation to nearby buildings	Greatest angle	23 degrees
	Building direction	South
Airflow restrictions	North	None



	East	None
	South	None
	West	None
Distance to nearest trees (m)	North	40
	East	45
	West	45
	South	45
Sample manifold	Type	All glass
	Inlet height above roof	1 meter
Wind Sensors	Type	Cup and vane
	Height above ground (m)	10 m
	Distance from station (m)	0 m

### Site Influences

#### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
None	n/a	n/a

#### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Dirt/Gravel	Medium	100	Used by site workers

#### Major Point Sources

Facility Name	Source Type	Distance from site (km)	Compass direction from site
Devon Energy	SAGD Plant	1	Northwest
Devon Energy	SAGD Plant	2	East



## Station Equipment

Equipment Owner: Canadian Natural Resources Ltd.

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Instrument Installed	WBEA Data Start Date
SO <sub>2</sub>	Thermo Scientific	43iQ-ANN	12124313138	2022	2018
H <sub>2</sub> S	Thermo Scientific	43iQTLE	12228021055	2018	2018
NO/NO <sub>x</sub> /NO <sub>2</sub>	Thermo Scientific	T200	1218153357	2018	2018

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Sensor Installed	WBEA Data Start Date
AT/RH	Vaisala	HMP155	N2910505	Class 3	2018	2018
WS	Met One	010C-1	X16480	Class 4	2018	2018
WD	Met One	020C-1	X16496	Class 4	2018	2018

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	12310
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	3811
Zero air generator	Zero Air Generator	Teledyne/API	701	268
Thermal Oxidizer	H <sub>2</sub> S Converter	Global	G150	2022-195
Shelter / Building	Air monitoring portable	ITB	ITB-18-17684	17684-1
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	NA





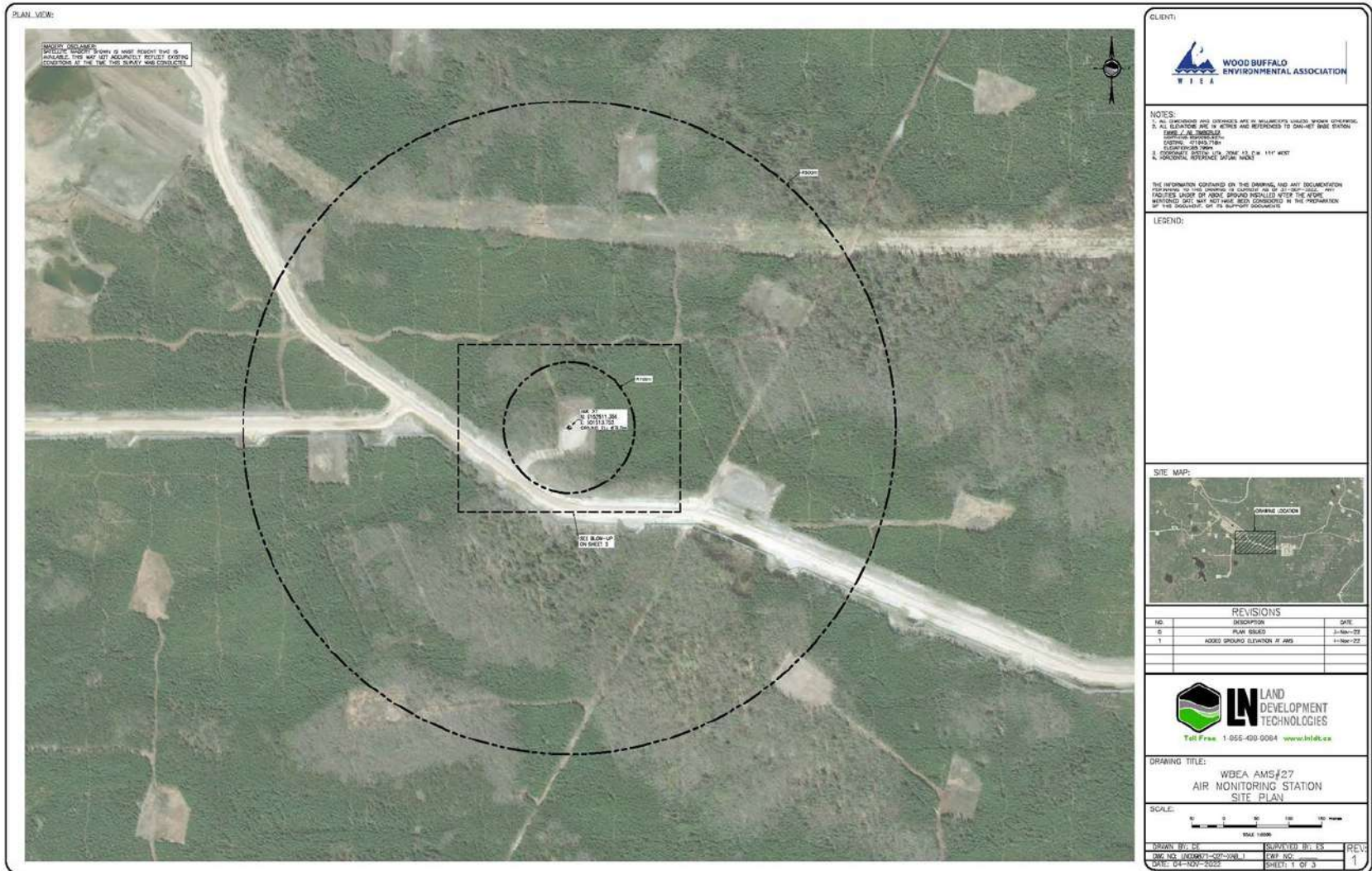


Figure 2 – Aerial photo showing AMS 27.



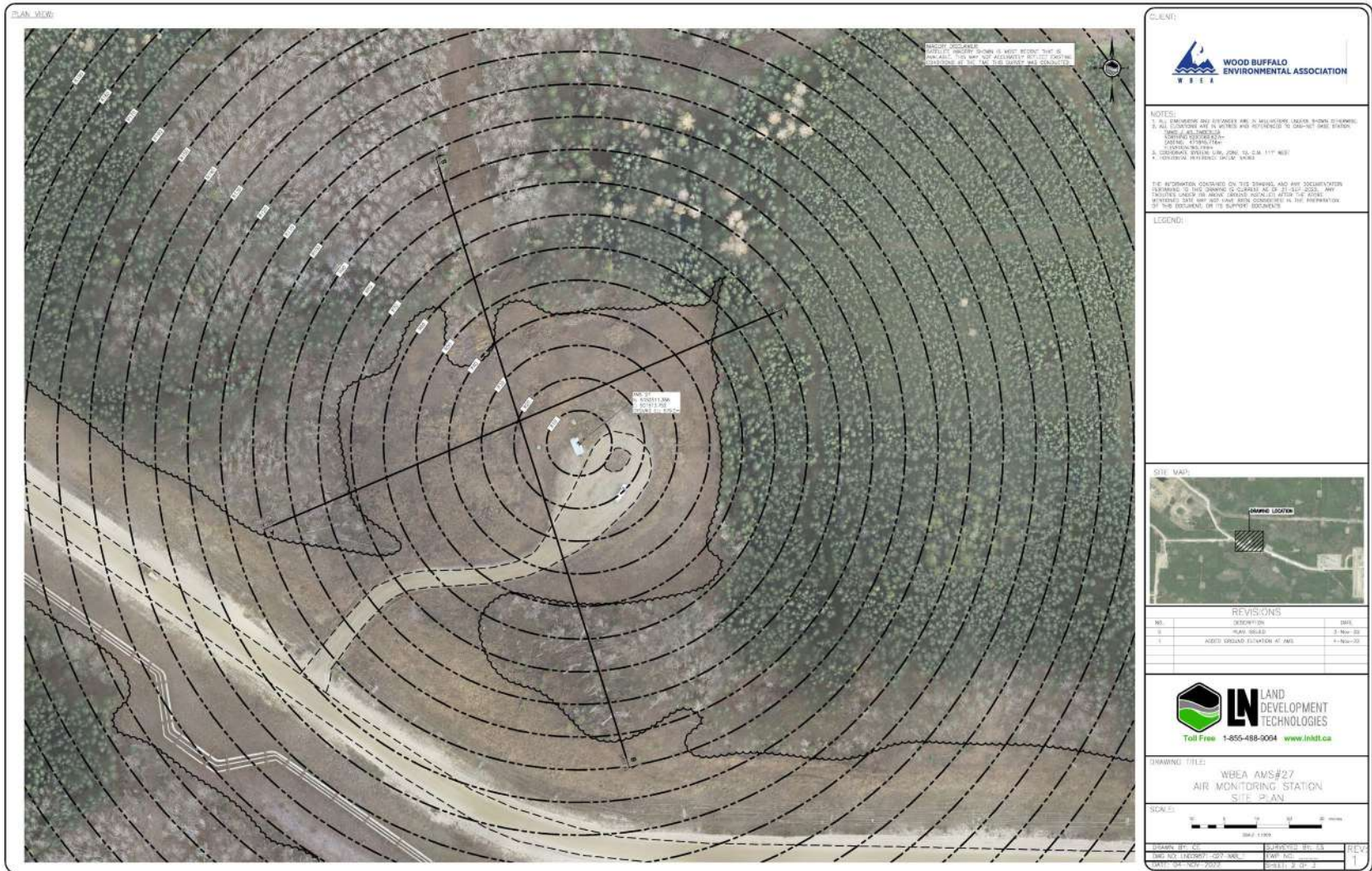
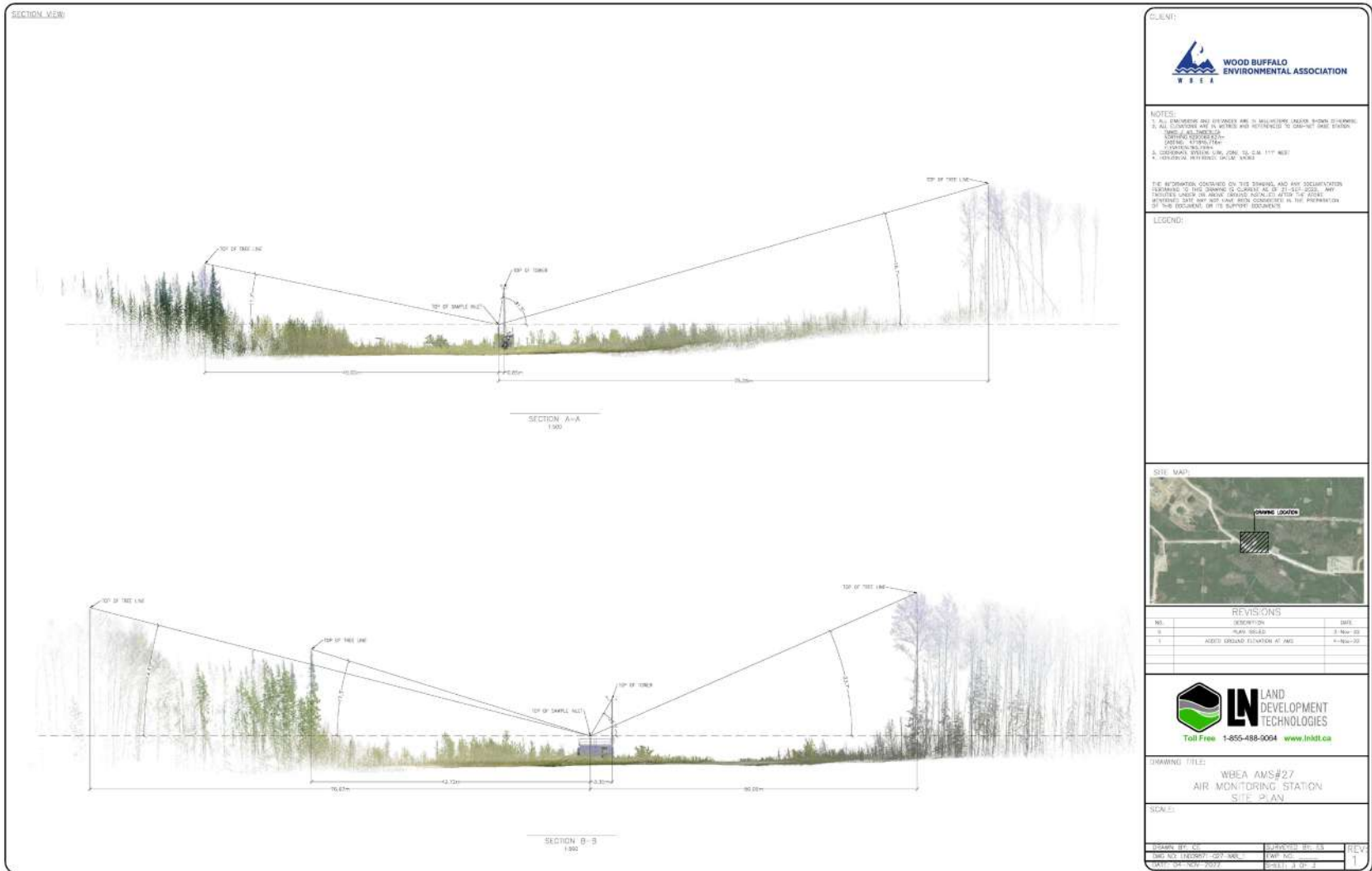


Figure 3 – Plan view sketch for AMS 27.



CLIENT:

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION  
WBEA

NOTES:

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS SHOWN OTHERWISE.
2. ALL DIMENSIONS ARE IN METERS AND REFERENCED TO CANADIAN MEAN SEA LEVEL.
3. DATE: 11/11/2022
4. PROJECT NO: 2022-001
5. DRAWING BY: J. J. J.
6. CHECKED BY: J. J. J.
7. APPROVED BY: J. J. J.

THE INFORMATION CONTAINED ON THIS SHEET AND ANY DOCUMENTS REFERENCED TO THIS DRAWING IS CLASSIFIED AS "AS-BUILT". ANY CHANGES MADE TO THIS DRAWING SHALL BE INDICATED BY A REVISION TABLE AND SHALL HAVE BEEN COMPLETED IN THE PREPARATION OF THIS DOCUMENT OR ITS SUPPLEMENT DOCUMENTS.

LEGEND:

SITE MAP:

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDED GROUND ELEVATION AT AMS	11/11/22

LAND DEVELOPMENT TECHNOLOGIES  
Total Free 1-855-488-9004 www.lndt.ca

DRAWING TITLE: WBEA AMS#27 AIR MONITORING STATION SITE PLAN

SCALE:

DRAWN BY: JJ	CHECKED BY: JJ	REV.
DATE: 11/11/2022	DATE: 11/11/2022	1

Figure 4 – Cross-Sectional Elevation Drawing of AMS 27.



Site photos

The following photos show the environment surrounding the monitoring station.



Figure 5 – Environment looking North.





Figure 6 – Environment looking East.



Figure 7 – Environment looking South.





Figure 8 – Environment looking West.



Figure 9 – Meteorological Tower.





## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 10 – Photo showing the inlet and sample manifold.





Figure 11 – Curb shot of the monitoring station.





Figure 12 –Photo of the front and the back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Jackfish 2/3

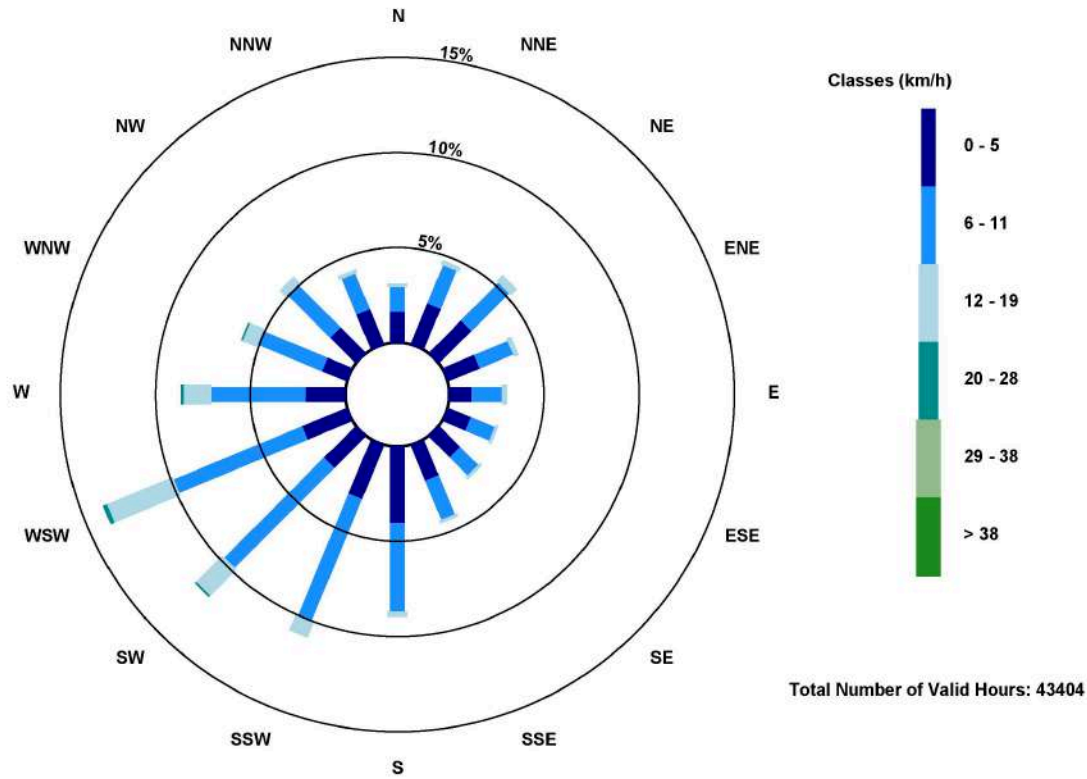


Figure 13 – Windrose (five years).





Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

## Surmont 2

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LAST UPDATED: 02-28-2025



# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	17
Station Photos.....	22

## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 29.....	13
Figure 3.0 – Aerial photo showing AMS 29.....	14
Figure 4.0 – Plan view sketch for AMS 29 site .....	15
Figure 5.0 – Elevation view image for AMS 29 site.....	16
Figure 6.0 – Environment looking North.....	17
Figure 6.1 – Environment looking East .....	18
Figure 6.2 – Environment looking South.....	19
Figure 6.3 – Environment looking West.....	20
Figure 6.4 – Meteorological Tower .....	21
Figure 7.0 – Photo showing the inlet and sample manifold .....	22
Figure 7.1 – Curb shot of the monitoring station .....	23
Figure 7.2 –Photo of the front and the back of instrument rack.....	24
Figure 7.3 –Photo of the T640 Analyzer.....	25
Figure 8.0 – Windrose (2019 – 2024).....	26

## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

### Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.



In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.

Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include; sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network



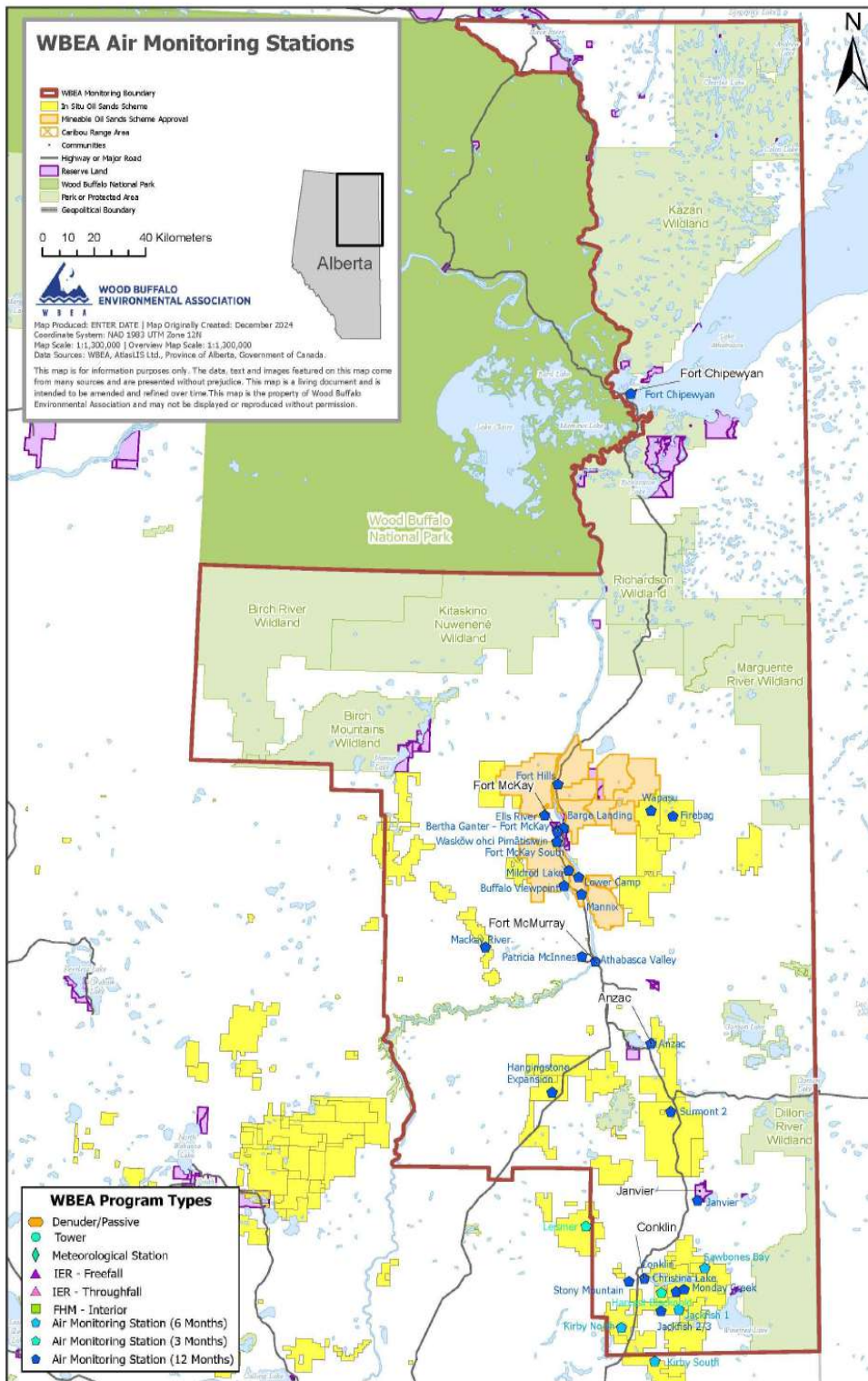


Figure 1.0 – WBEA Network Monitoring Sites

## General Site Information

### Station

Station ID	AMS 29
Station name	Surmont 2
Date station established	2019

### Location

Station street address	NA
Legal land description	10-20-83-6-W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	56.2124224862
Longitude	-110.914925019
UTM East	505285
UTM North	6229755
Nearest community	Anzac
Community population	555
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	ConocoPhillips Canada Resources Corp.
Approval number	48263-01-00
Contact Name	Chad Seigel
Address	401 9 Ave SW, Calgary, Alberta, T2P 3C5
Phone number	780-215-0498
Email address	<a href="mailto:chad.c.seigel@conocophillips.com">chad.c.seigel@conocophillips.com</a>

### Site Description

Land use by sector	0 – 90 degrees	Trees
	91 – 180 degrees	Trees/shed/potable water access point
	181 – 270 degrees	Trees
	271 – 360 degrees	Trees/ laydown yard
Site elevation (m) (above sea level)	550	
Angle of elevation to nearby buildings	Greatest angle	0
	Building direction	NA
Airflow restrictions	North	None
	East	None

	South	None
	West	None
Distance to nearest trees (m)	North	60 m
	East	50 m
	West	100 m
	South	55 m
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	10 m
	Distance from station (m)	0

### Site Influences

#### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Vehicles	20 m NW	Moving vehicles around station

#### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Dirt/gravel road	low	20	Used by site personnel for accessing various sections around plant.

#### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
ConocoPhillips	SAGD	140 MBOED	0.36 km	NW

## Station Equipment

Equipment Owner:

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO <sub>2</sub>	Thermo Environmental	43i	1170050150	2016
H <sub>2</sub> S	Thermo Environmental	43iQTL	1200326170	2023
NO <sub>2</sub>	Thermo Environmental	42i	1170050148	2016
THC	Thermo Environmental	51i	1170050149	2021
PM <sub>2.5</sub>	Teledyne/API	T640	323	2024

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	R2710618	3	2023
WS	Met One	010C-1	P10039	2	2019
WD	Met One	020C-1	U11347	2	2024

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	9037
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	5472
Zero air generator	Zero Air Generator	Teledyne/API	701	4428
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	ITB-17-17154
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	NA
Tower	10m Tower	Aluma	T-135	AT21403Z32
H <sub>2</sub> S converter	H <sub>2</sub> S Converter	Global Analyzer Systems	G150	2022-220





Figure 2.0 – Area topographic map showing AMS 29



Figure 3.0 – Aerial photo showing AMS 29



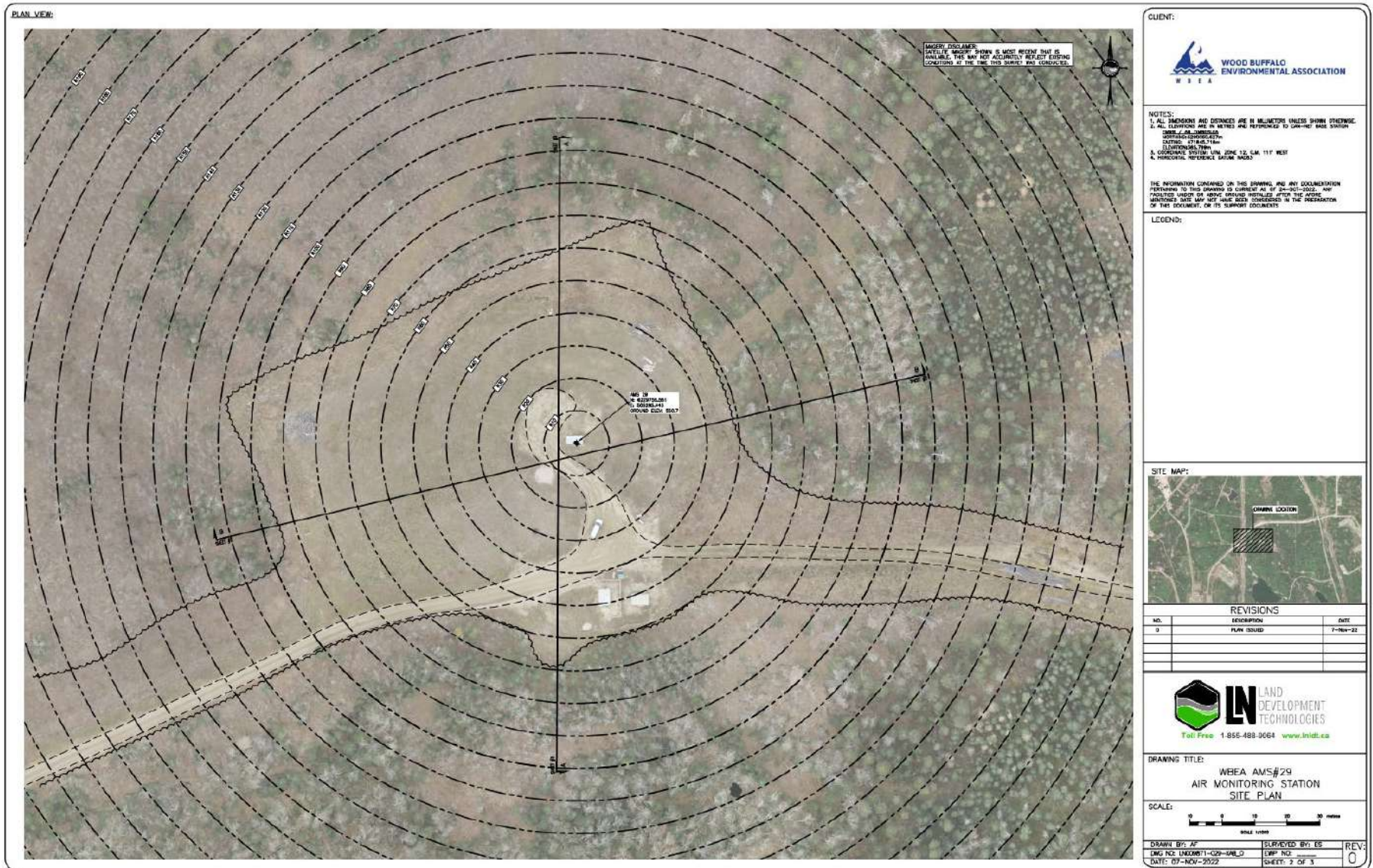


Figure 4.0 – Plan view sketch for AMS 29 site

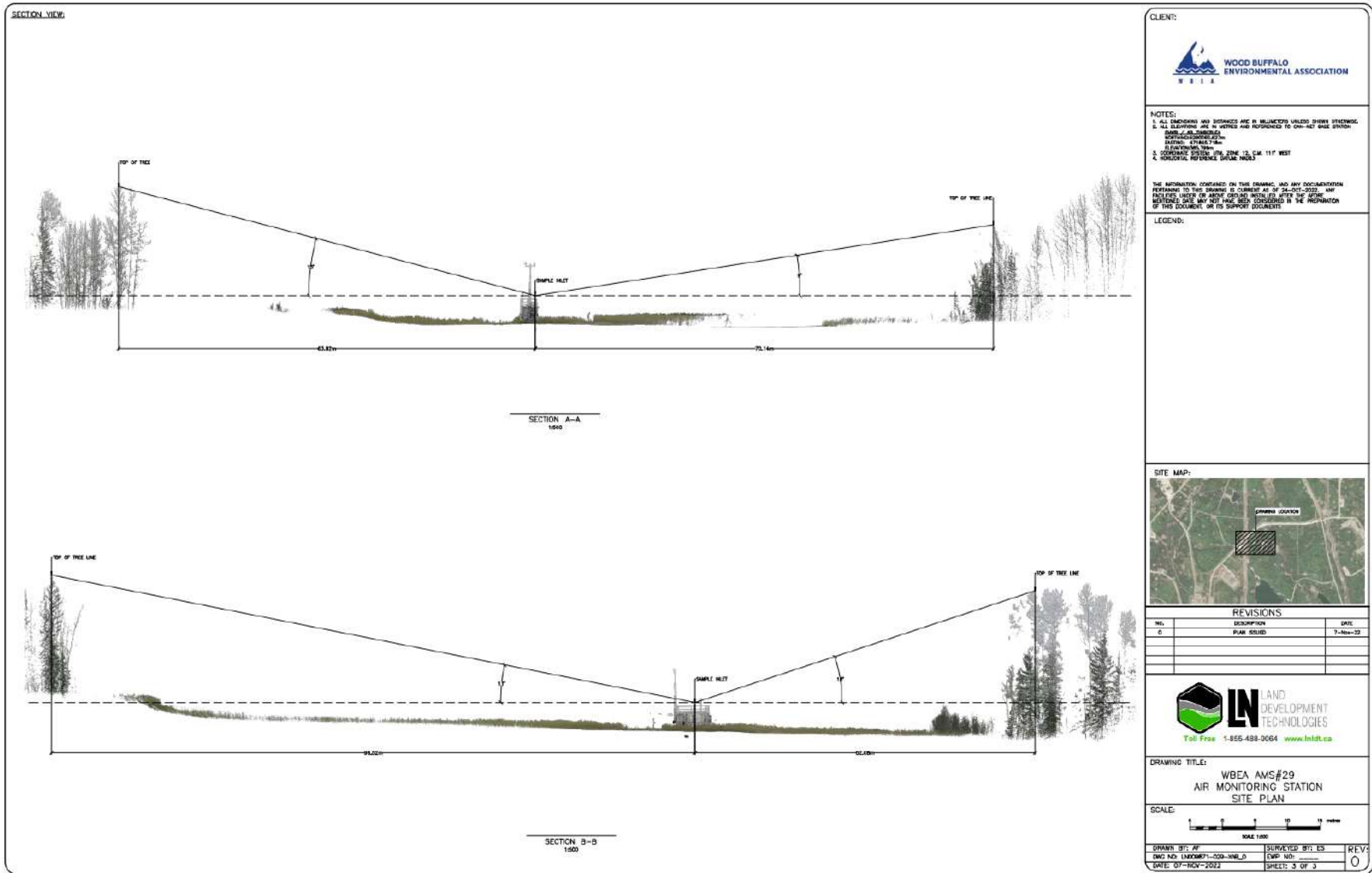


Figure 5.0 – Elevation view image for AMS 29 site



## Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North





Figure 6.1 – Environment looking East





Figure 6.2 – Environment looking South





Figure 6.3 – Environment looking West





Figure 6.4 – Meteorological Tower

## Station Photos

The following photos show the monitoring station and instrumentation.

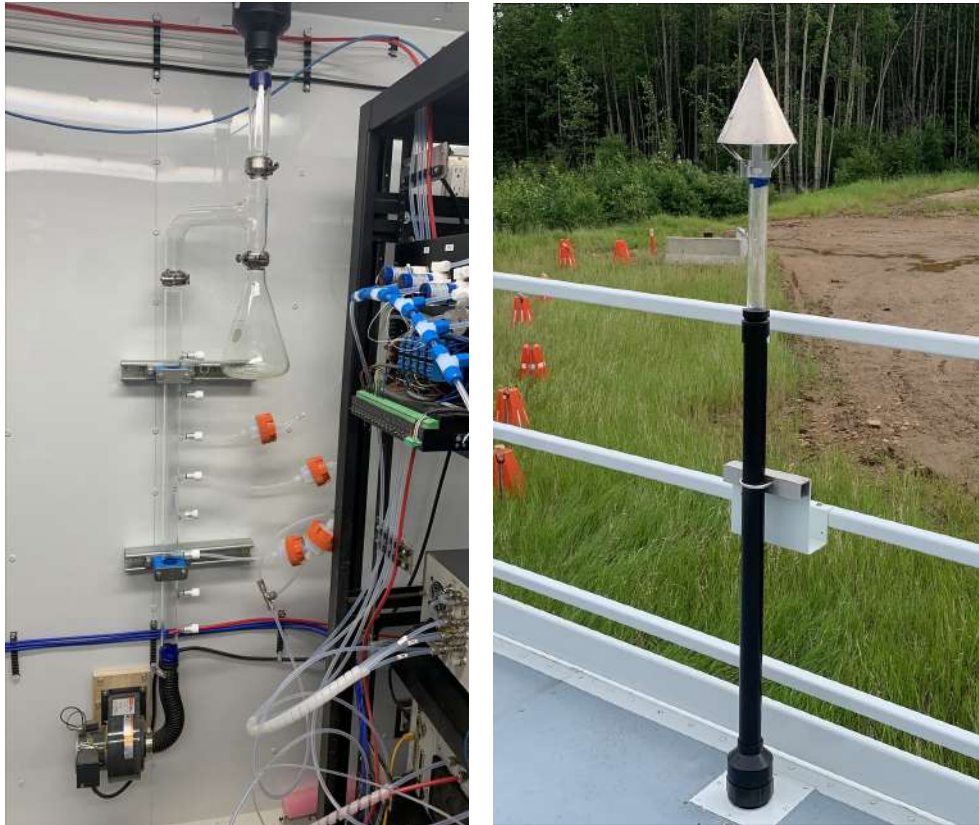


Figure 7.0 – Photo showing the inlet and sample manifold





Figure 7.1 – Curb shot of the monitoring station



Figure 7.2 –Photo of the front and the back of instrument rack





Figure 7.3 –Photo of the T640 Analyzer



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Surmont 2

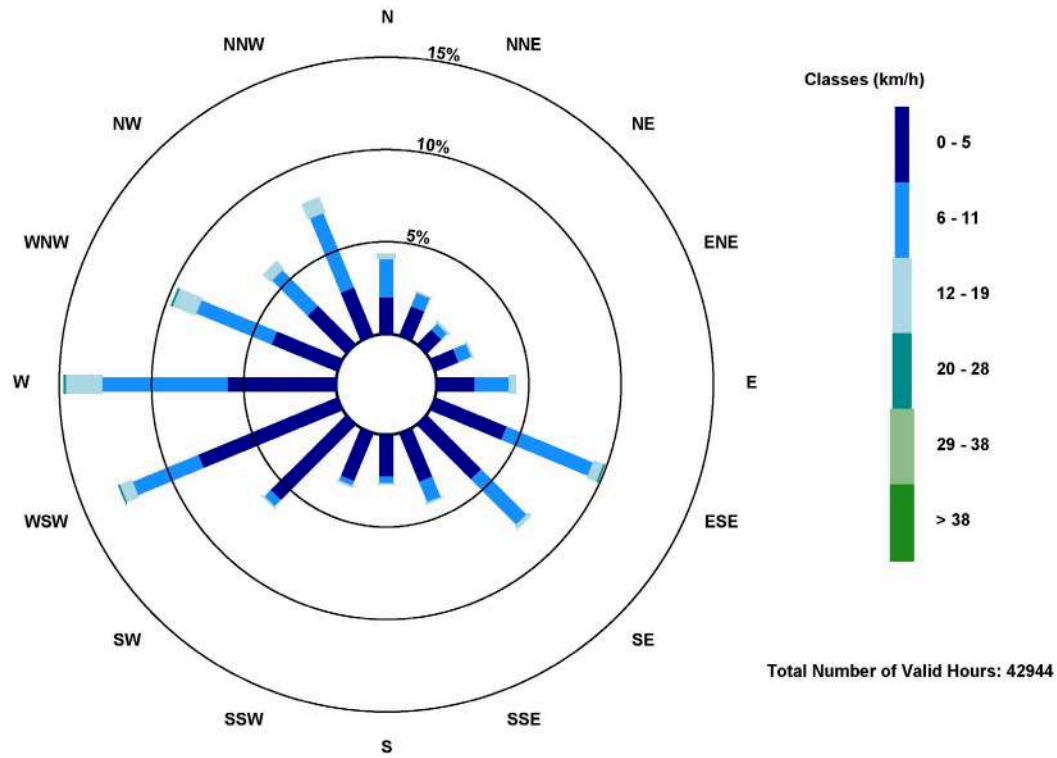


Figure 8.0 – Windrose (2020 – 2025)



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station**  
**Site Documentation**

Ells River

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LAST UPDATED: FEBRUARY 28, 2025



# Table of Contents

WBEA Monitoring Network .....	4
Mission .....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling .....	4
General Site Information .....	10
Station .....	10
Location .....	10
Owner/Operator/Approval Holder .....	10
Site Description .....	10
Site Influences .....	11
Localized Sources (within 20 metres of station) .....	11
Roadway Influences .....	11
Major Point Sources .....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment .....	12
Site photos .....	17
Station Photos .....	22





## Tables and Figures

Table 1.0 - Pollutant Parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area Topographic map showing AMS 30 .....	13
Figure 4.0 – Aerial photo showing AMS 30.....	15
Figure 6.0 – Environ Looking North .....	17
Figure 6.1 – Environ Looking East .....	18
Figure 6.2 – Environ looking South. ....	19
Figure 6.3 – Environ Looking West .....	20
Figure 6.4 – Meteorological Tower.....	21
Figure 7.0 – Photo showing the inlet and sample manifold .....	22
Figure 7.1 – Curb shot of the monitoring station .....	23
Figure 7.2 –Photo of front and back of instrument rack .....	24
Figure 8.0 – Windrose (Five Year) .....	25



## WBEA Monitoring Network

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient (VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

### Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.

In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated



parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.



Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include hydrogen sulphide (H<sub>2</sub>S), total reduced sulphur (TRS), sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), total hydrocarbons (THC), methane (CH<sub>4</sub>), non-methane hydrocarbons (NMHC), ammonia (NH<sub>3</sub>), carbon monoxide (CO), and carbon dioxide (CO<sub>2</sub>). Sites are categorized as industrial or community, based on the setting in which they are located.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant Parameters monitored in the WBEA network





Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature, relative humidity, wind speed, wind direction, vertical wind speed, solar radiation, precipitation, and leaf wetness.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network



Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), and precipitation samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network.



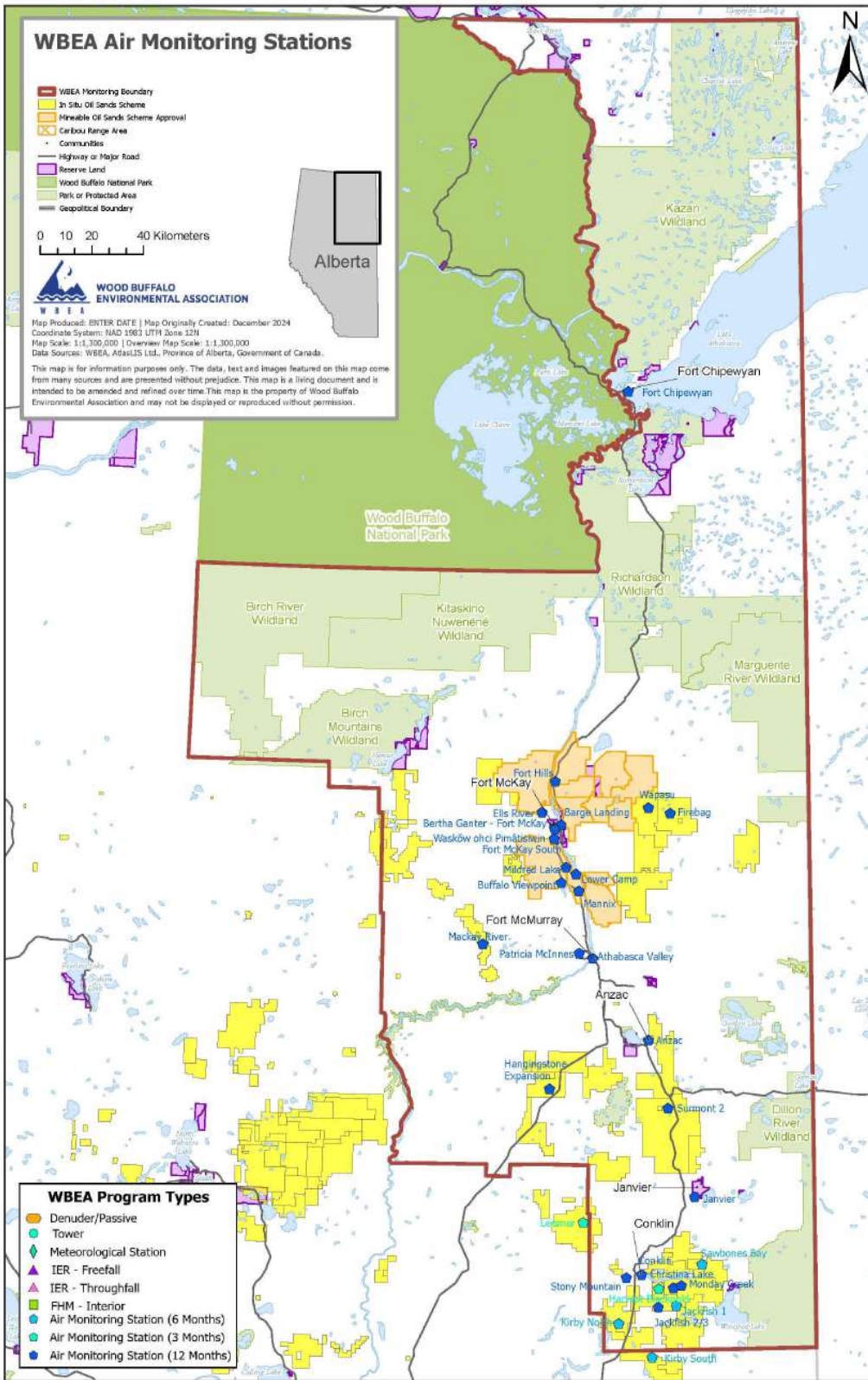


Figure 1.0 – WBEA Network Monitoring Sites

## General Site Information

### Station

Station ID	AMS 30
Station name	Ells River
Date station established	2020

### Location

Station street address	Located at about 300 m northwest of the Total Joslyn Camp.
Legal land description	12-04-096-11 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	57.241180
Longitude	-111.722081
Ground Elevation	299.9
UTM East	456420
UTM North	6344464
Nearest community	Fort Mackay
Community population	757
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Name of Approval Holder	Canadian Natural Resources Ltd.
Approval number	149968-01-00
Contact Name	Malathi Velmurugan
Address	2100, 855 – 2 Street SW Calgary, AB T2P 4J8
Phone number	(780) 714-4436
Email address	<a href="mailto:Malathi.Velmurugan@cnrl.com">Malathi.Velmurugan@cnrl.com</a>

### Site Description

Land use by sector	0 – 90 degrees	Pond
	91 – 180 degrees	Forest / Highway
	181 – 270 degrees	Forest
	271 – 360 degrees	Forest
Site elevation (above sea level)	304 metres	
Angle of elevation to nearby buildings	Greatest angle	12 degrees
	Building direction	East
Airflow restrictions	North	No
	East	No
	South	No
	West	No





Distance to nearest trees (m)	North	NA
	East	NA
	West	65 metres
	South	90 metres
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground	10 metres
	Distance from station	7 metres

## Site Influences

### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Fuel storage	40 metres to the West	Diesel fuel storage and backup generator for cell tower operation

### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Paved road	Very low	50 M West	Old horizon highway
Paved road	Low	250 M East	Horizon highway
Gravel road	Very low	100 M East	Gravel road around the pond

### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
CNRL Horizon Oil Sands	Oil plant		10km	North
CNRL Horizon	Open mining		7km	North



## Station Equipment

Equipment Owner: WBEA

### Analytical Equipment

Parameter	Make	Model	Serial Number	Year Installed
SO <sub>2</sub>	Thermo Scientific	43i	1008841397	2021
TRS	Thermo Scientific	43i-TLE	1410661331	2021
NO <sub>2</sub>	Thermo Scientific	42i	710321429	2021
THC	Thermo Scientific	55i	1152430011	2023
PM <sub>2.5</sub>	Teledyne/API	T640	875	2021
PM <sub>10</sub> A	Thermo Environmental	2000i	2000I2 204961409	2021
PM <sub>10</sub> B	Thermo Environmental	2000i	2000IW 206011510	2021
TSP	Thermo Environmental	2000i	2000IW 209632110	2023
VOC	Tisch Environmental	Te-123	1030	2021

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Year Installed
AT/RH	Vaisala	HMP155	F5010003	3	2021
WS	Met One	010C-1	A3111	5	2021
WD	Met One	020C-1	J2732	5	2021

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	11040
TRS Converter	Converter	CD Nova	CDN- 101	562
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	3061
Zero air generator	Zero Air Generator	Teledyne/API	T701H	358
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	2N9MF73895
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	NA



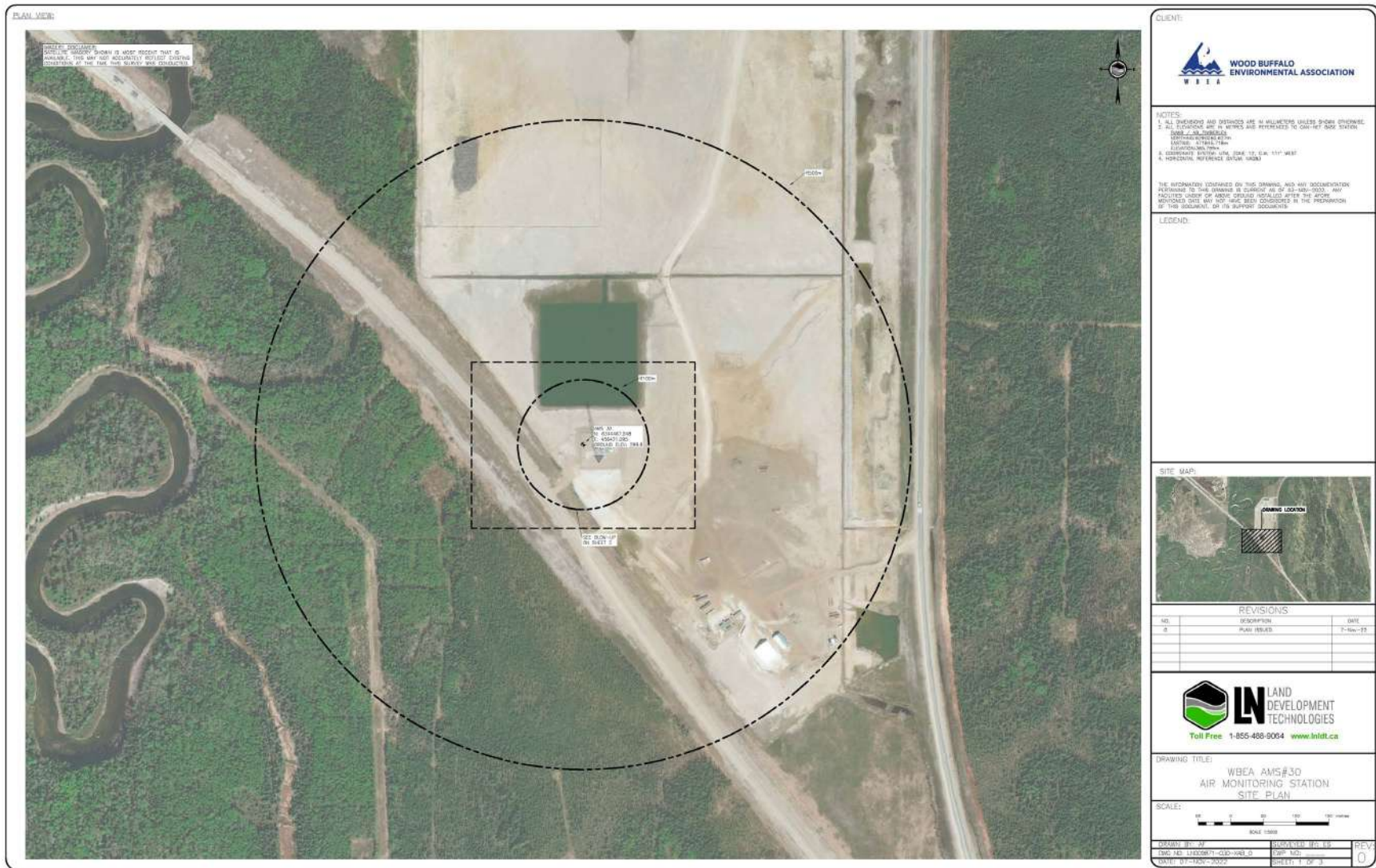
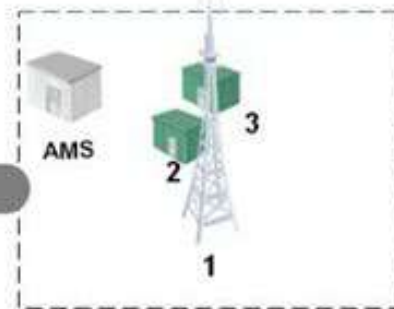


Figure 2.0 – Area Topographic map showing AMS 30



Station Name: AMS 30 Ells River



Obstacle	Distance from the station (m)	Height of the Obstacle (m)
1 Tower	27	100
2 Tower Compound 1	14	3
3 Tower Compound 2	26	5
4 Pond	25	0

Figure 3.0 – Plan view sketch for AMS 30 site



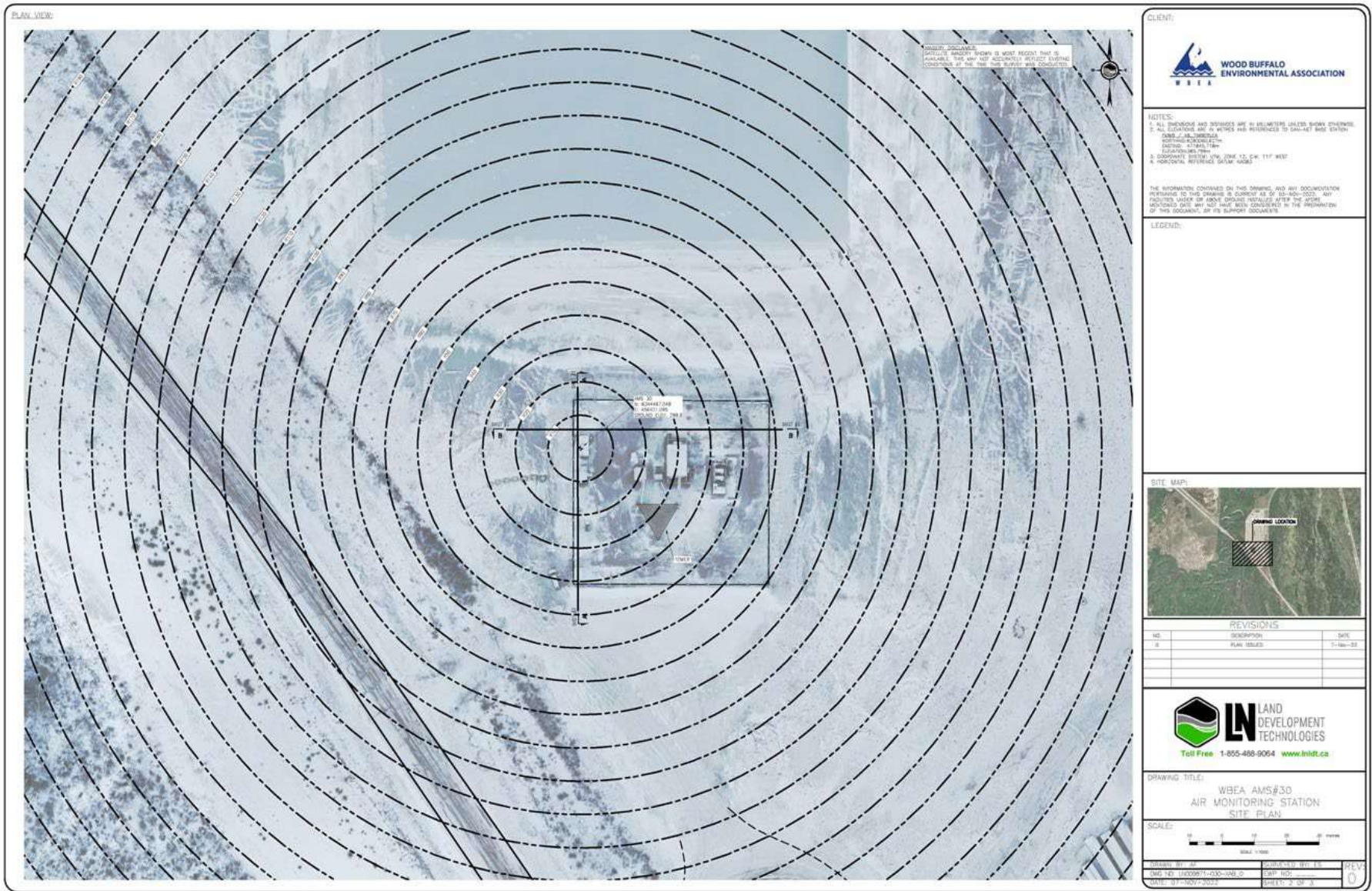


Figure 4.0 – Aerial photo showing AMS 30



Figure 5.0 – Cross-Sectional Elevation Drawing of AMS 30



Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environ Looking North



Figure 6.1 – Environ Looking East





Figure 6.2 – Environ looking South.





Figure 6.3 – Environ Looking West



Figure 6.4 – Meteorological Tower



## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold





Figure 7.1 – Curb shot of the monitoring station





Figure 7.2 –Photo of front and back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Ells River

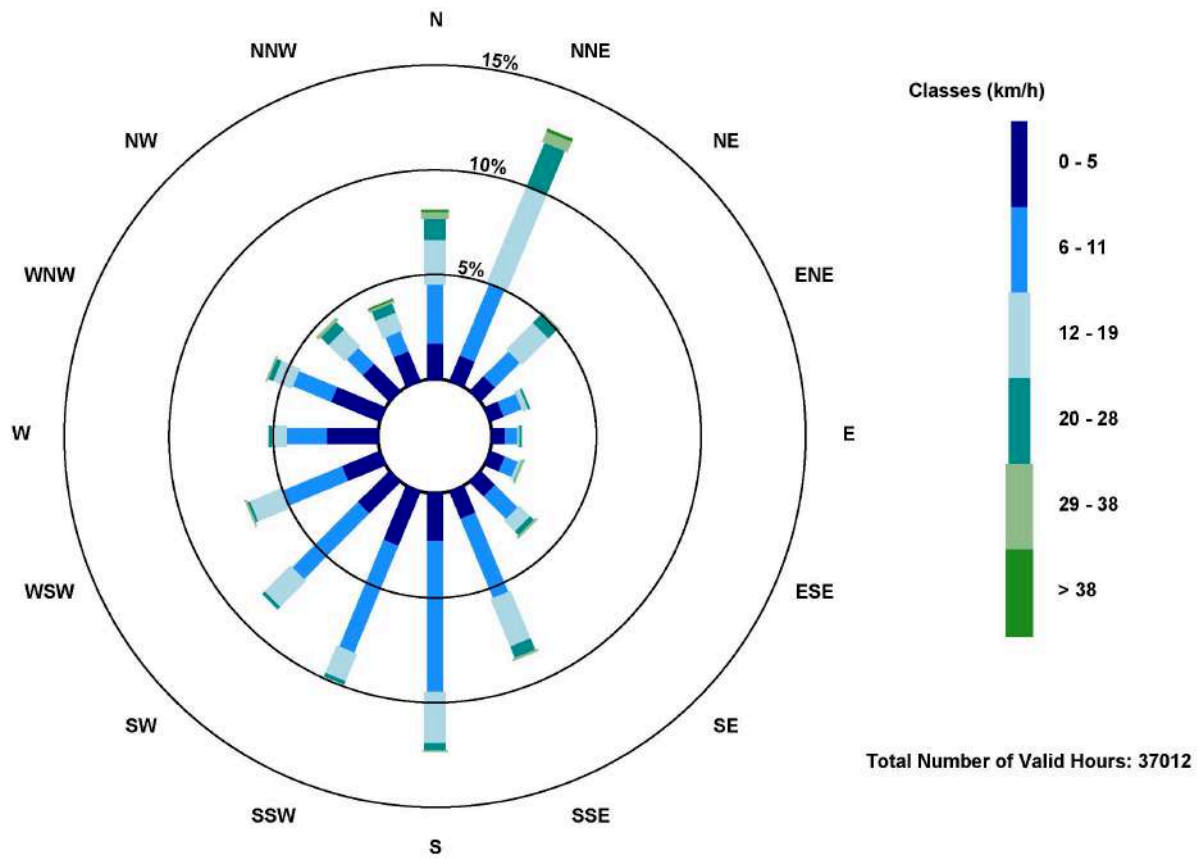


Figure 8.0 – Windrose (Five Year)



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station**  
**Site Documentation**

Monday Creek

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LAST UPDATED: FEBRUARY 28, 2025







## Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description .....	11
Site Influences.....	11
Localized Sources .....	11
Roadway Influences .....	11
Major Point Sources.....	12
Analytical Equipment.....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	16
Station Photos.....	21





## Tables and Figures

Table 1.1 – Meteorological parameters monitored in the WBEA network.....	7
Table 1.2 – Time-Integrated parameters monitored in the WBEA network. ....	8
Figure 1.0 – WBEA network monitoring sites.....	9
Figure 2.0 – Area topographic map showing AMS 33.....	13
Figure 3.0 – Plan view image for AMS 33 site.....	14
Figure 4.0 – Aerial photo showing AMS 33.....	15
Figure 5.0 – Elevation view image for AMS 33. ....	<b>Error! Bookmark not defined.</b>
Figure 6.0 – Environment looking North.....	16
Figure 6.1 – Environment looking East. ....	17
Figure 6.2 – Environment looking South.....	18
Figure 6.3 – Environment looking West.....	19
Figure 6.4 – Meteorological tower. ....	20
Figure 7.0 – Photo showing the inlet and sample manifold. ....	21
Figure 7.1 – Curb shot of the monitoring station. ....	22
Figure 7.2 –Photo of front and back of instrument rack. ....	23
Figure 8.0 – Windrose (Five Year). ....	24





## WBEA Monitoring Network

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Empower all stakeholders and rights holders with environmental data to make informed decisions.

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In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

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In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.







Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number, and the air quality parameters measured by continuous methods at each site. Parameters measured include hydrogen sulphide (H<sub>2</sub>S), total reduced sulphur (TRS), sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), total hydrocarbons (THC), methane (CH<sub>4</sub>), non-methane hydrocarbons (NMHC), ammonia (NH<sub>3</sub>), carbon monoxide (CO), and carbon dioxide (CO<sub>2</sub>). Sites are categorized as industrial or community, based on the setting in which they are located.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network.





Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature, relative humidity, wind speed, wind direction, vertical wind speed, solar radiation, precipitation, and leaf wetness.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological parameters monitored in the WBEA network.





Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5  $\mu\text{m}$  aerodynamic diameter ( $\text{PM}_{2.5}$ ) and associated metals and ions, particulate matter less than 10  $\mu\text{m}$  aerodynamic diameter ( $\text{PM}_{10}$ ) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), and precipitation samples.

WBEA ID	TYPE	STATION NAME	VOC	$\text{PM}_{2.5}$	$\text{PM}_{2.5}$	$\text{PM}_{10}$	PAH	PRECIP
					ECOC			
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X	
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X	
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X	
9	ATTRIBUTION	BARGE LANDING	X					
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X			X		
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X	
17	COMPLIANCE	WAPASU			X			X
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X
21	COMMUNITY	CONKLIN	X	X		X	X	
22	COMMUNITY	JANVIER	X	X		X	X	
23	COMPLIANCE	FORT HILLS	X			X		
30	COMPLIANCE	ELLS RIVER	X			X		

Table 1.2 – Time-Integrated parameters monitored in the WBEA network.



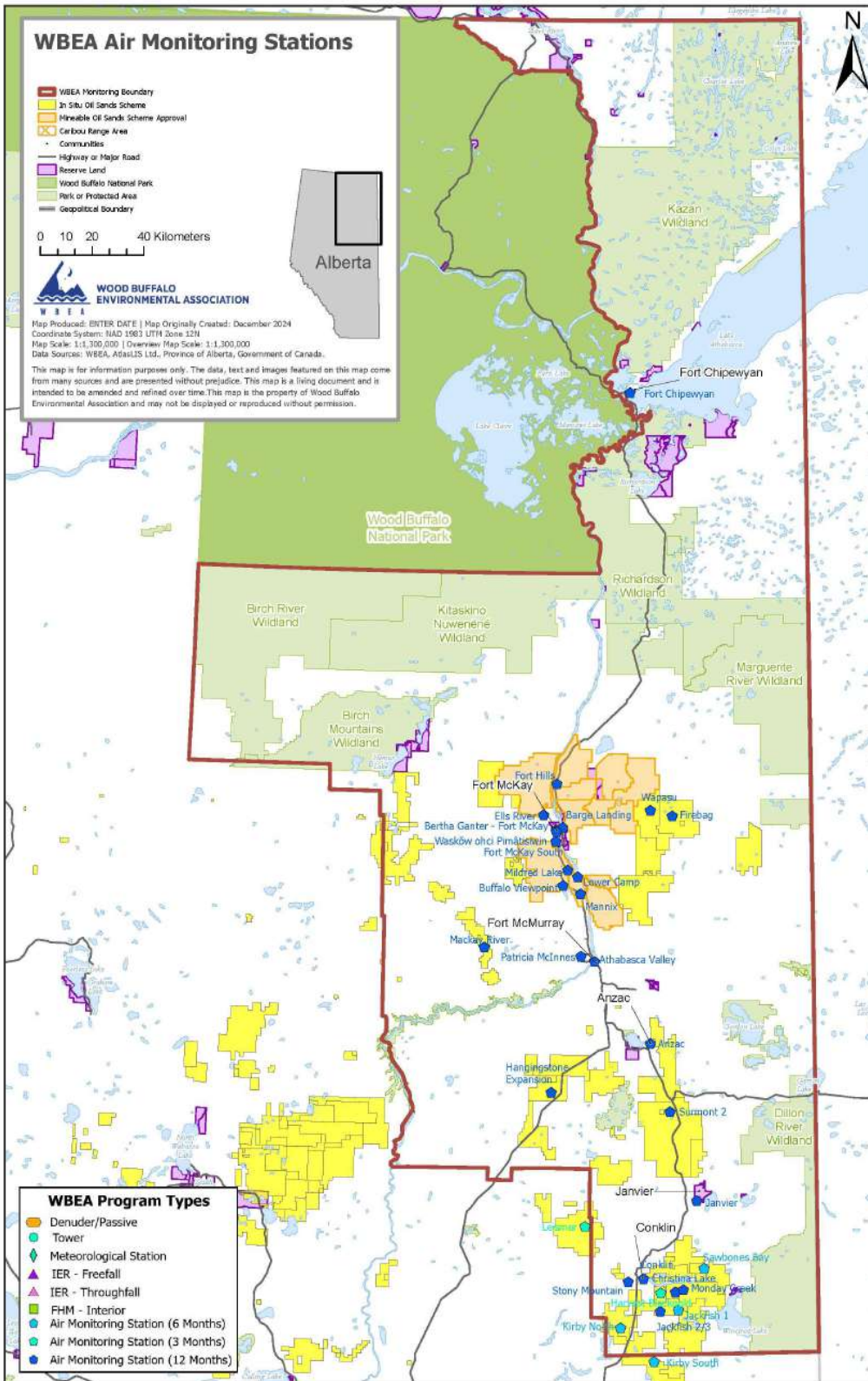


Figure 1.0 – WBEA network monitoring sites







W B E A

## General Site Information

### Station

Station ID	AMS 33
Station name	Monday Creek
Date station established	November 7, 2024

### Location

Station street address	Located close to a non-operational well-pad L04 at Cenovus SAGD site
Legal land description	3-16-76-6 W4
Latitude	55.593883
Longitude	-110.834154
UTM East	507816.87
UTM North	6159249.07
Nearest community	Conklin
Community population	178

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Name of Approval Holder	Cenovus Energy Inc.
Approval number	48522-01-00
Contact Name	Sean Nichols
Address	500 Centre Street SE Calgary, AB T2P 0M5
Phone number	780-608-7176
Email address	Sean.nichols@cenvous.com





W B E A

Site Description

Land use by sector	0 – 90 degrees	SAGD Operations
	91 – 180 degrees	SAGD Operations
	181 – 270 degrees	SAGD Operations
	271 – 360 degrees	SAGD Operations
Site elevation (Above sea level)	569.6m	
Angle of elevation to nearby building	Greatest angle	N/A
	Building direction	N/A
Airflow restrictions	North	N/A
	East	N/A
	South	N/A
	West	N/A
Distance to nearest trees (m)	North	N/A
	East	N/A
	West	N/A
	South	70
Sample manifold	Type	All glass
	Inlet height above roof	1 meter
Meteorological Sensors	Type	Cup and vane
	Height above ground	10
	Distance from station	7

Site Influences

Localized Sources

Type	Distance (m)	Description
Well-pad	100	Two well-pads to the West and East of station.

Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Dirt/gravel	Medium	20	Used by site workers



Facility Name	Source Type	Production Capacity	Distance from site (m)	Compass direction from site
Cenovus Christina Lake	SAGD Facility		2700	SW

### Analytical Equipment

Parameter	Owner	Make	Model	Serial Number	Date Installed
SO2	Cenovus	Thermo Instruments	43I	1152430005	2024
H2S	Cenovus	Thermo Instruments	43iQTL	12333331547	2024
NO2	Cenovus	Thermo Instruments	42I	1182340006	2025

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	G4330034	4	2024
WS	Met One	010C-1	P22395	2	2024
WD	Met One	020C-1	N13744	2	2024

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	7881
Zero air generator	Zero Air Generator	Teledyne/API	701	832
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	NA
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	NA
Gas Dilution Calibrator	Mass flow controlled gas dilution	Teledyne/API	T700	3253
Tower	10 Meter crank up	Aluma	T-135	217224002



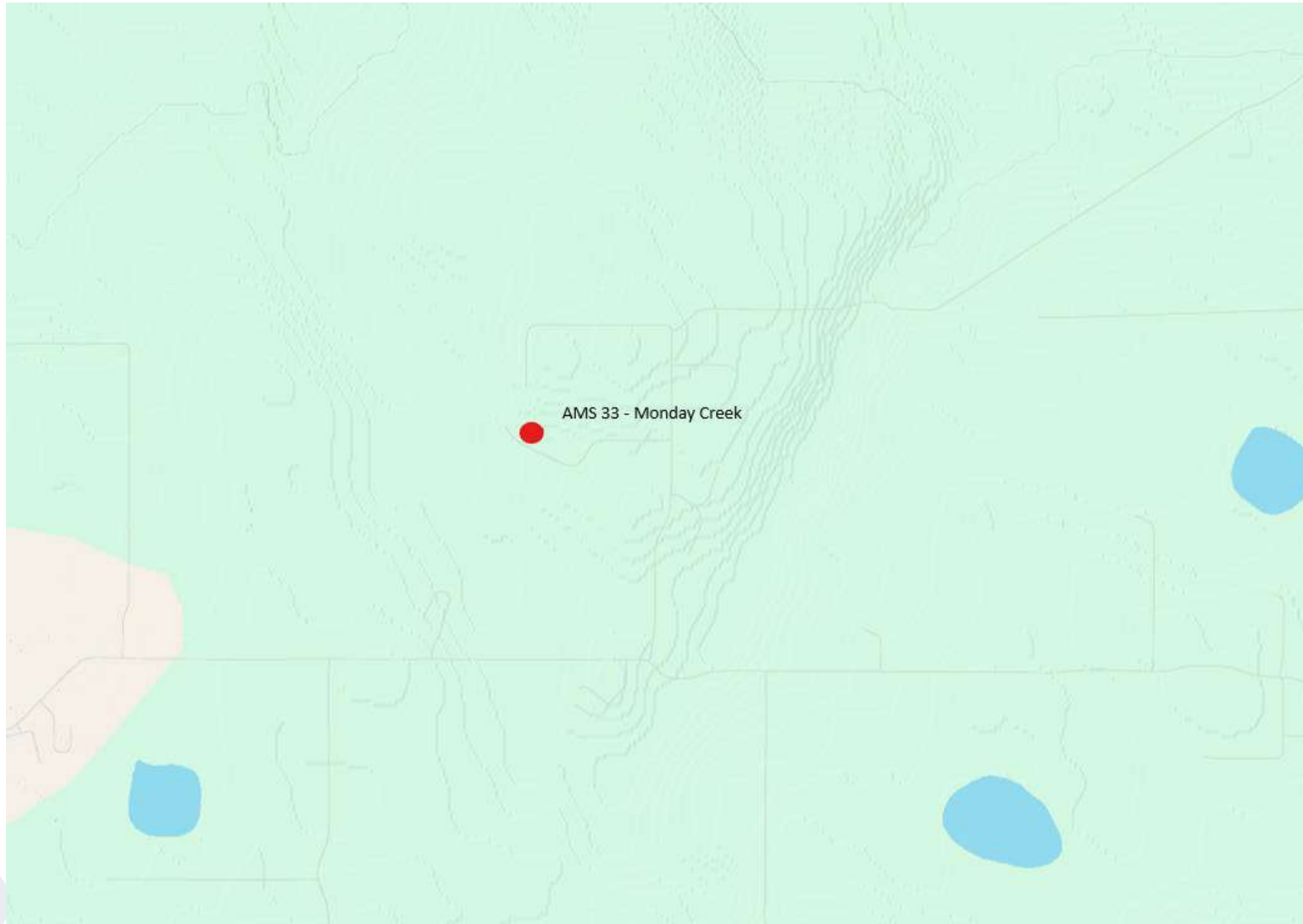


Figure 2.0 – Area topographic map showing AMS 33.



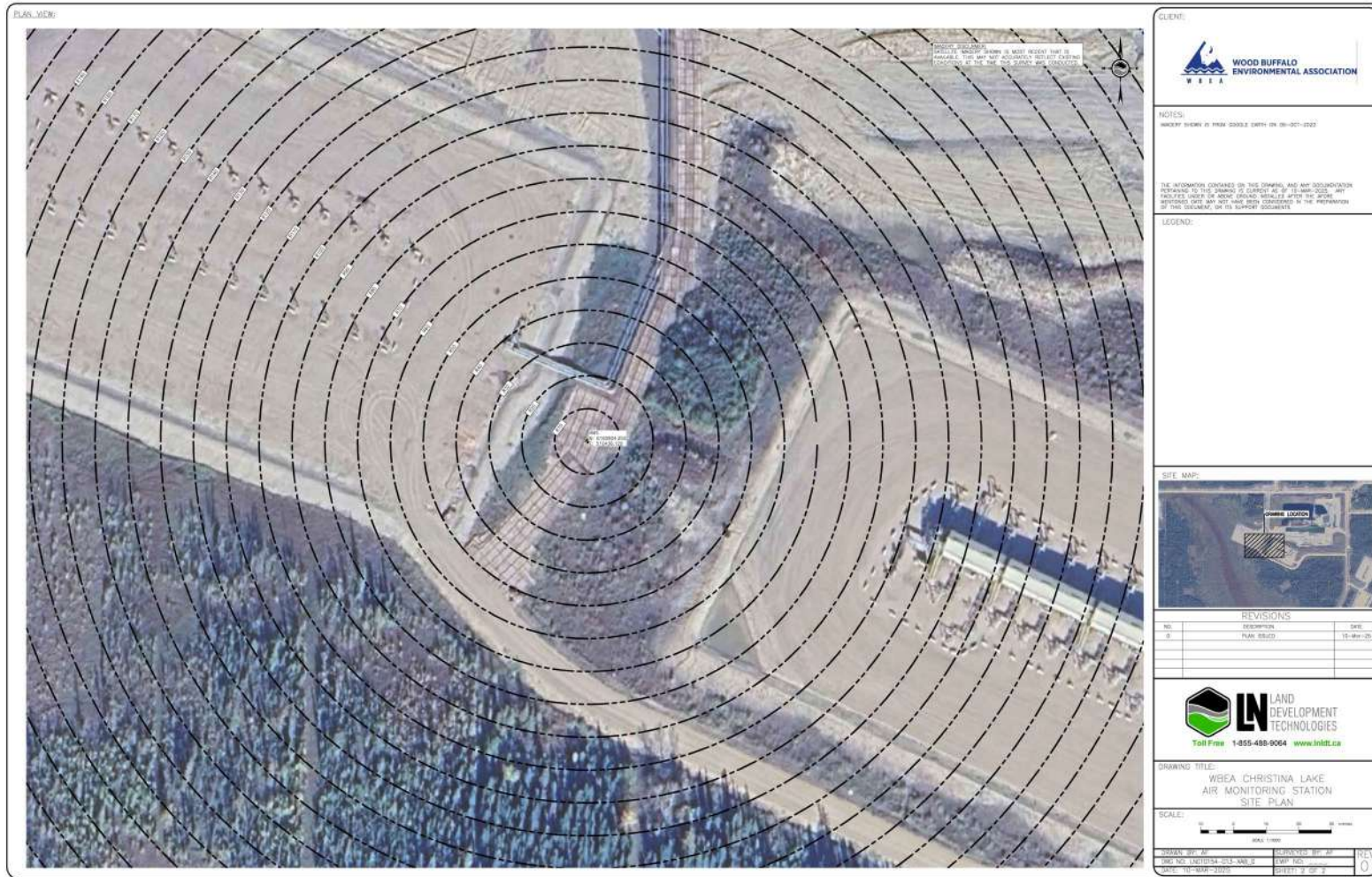


Figure 3.0 – Plan view image for AMS 33 site.



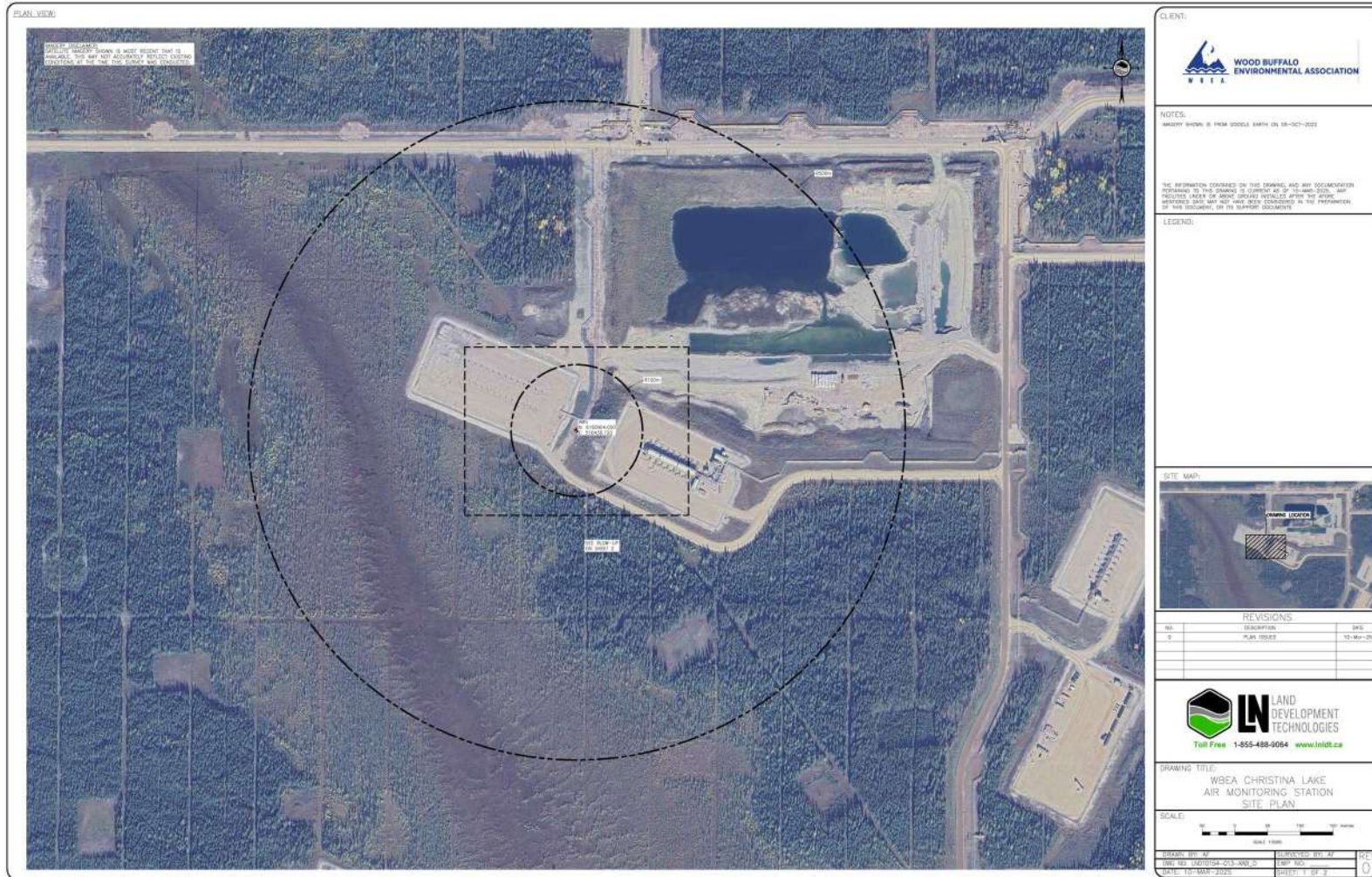


Figure 4.0 – Aerial photo showing AMS 33.



Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North.





Figure 6.1 – Environment looking East.





Figure 6.2 – Environment looking South.



Figure 6.3 – Environment looking West.





Figure 6.4 – Meteorological tower.

The following photos show the monitoring station and instrumentation.



Figure 7.0 – Photo showing the inlet and sample manifold.





Figure 7.1 – Curb shot of the monitoring station.



Figure 7.2 –Photo of front and back of instrument rack.



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Monday Creek

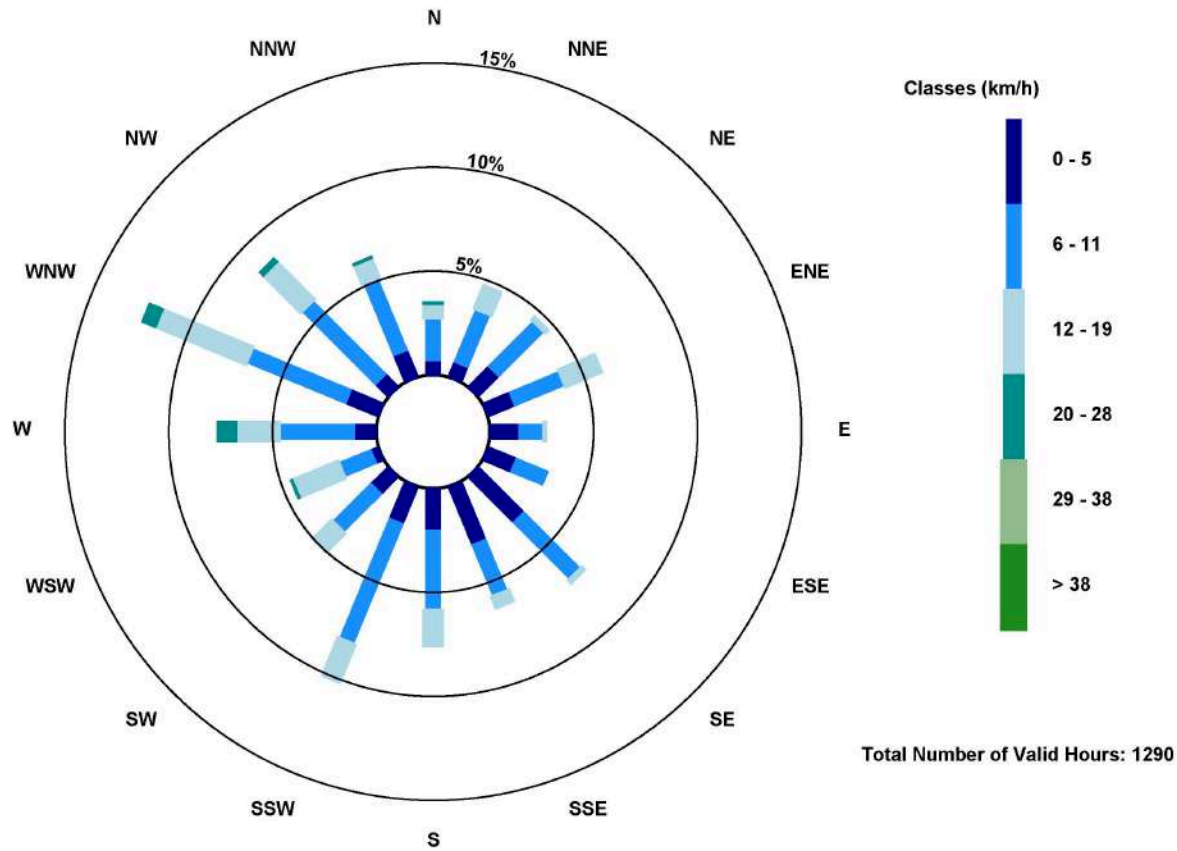


Figure 8.0 – Windrose (Five Year).

Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station**  
**Site Documentation**

Leismer

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**LAST UPDATED: FEBRUARY-28-2025**





# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	16
Station Photos.....	19



## Tables and Figures

Table 1.0 - Pollutant Parameters monitored in the WBEA network.....	6	
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7	
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8	
Figure 1.0 – WBEA Network Monitoring Sites .....	9	
Figure 2.0 – Area Topographic map showing AMS 501 .....	13	
Figure 3.0 – Aerial photo showing AMS 501.....	14	
Figure 4.0 – Plan view sketch for AMS 501 - Leismer .....	15	
Figure 5.0 – Environment looking North	Figure 5.1 – Environment looking East .....	16
Figure 5.2 – Environment looking South	Figure 5.3 – Environment looking West .....	17
Figure 5.4 – Meteorological Tower.....	18	
Figure 6.0 – Photo showing the inlet and sample manifold .....	19	
Figure 6.1 – Curb shot of the monitoring station .....	20	
Figure 6.2 –Photo of the front and the back of instrument rack.....	21	
Figure 7.0 – Windrose (2020-2025) .....	22	



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1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACK FISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACK FISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant Parameters monitored in the WBEA network



Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network



Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), and precipitation samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X	X	X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ ATTRIBUTION	FORTMCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	X
18	BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORTHILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network



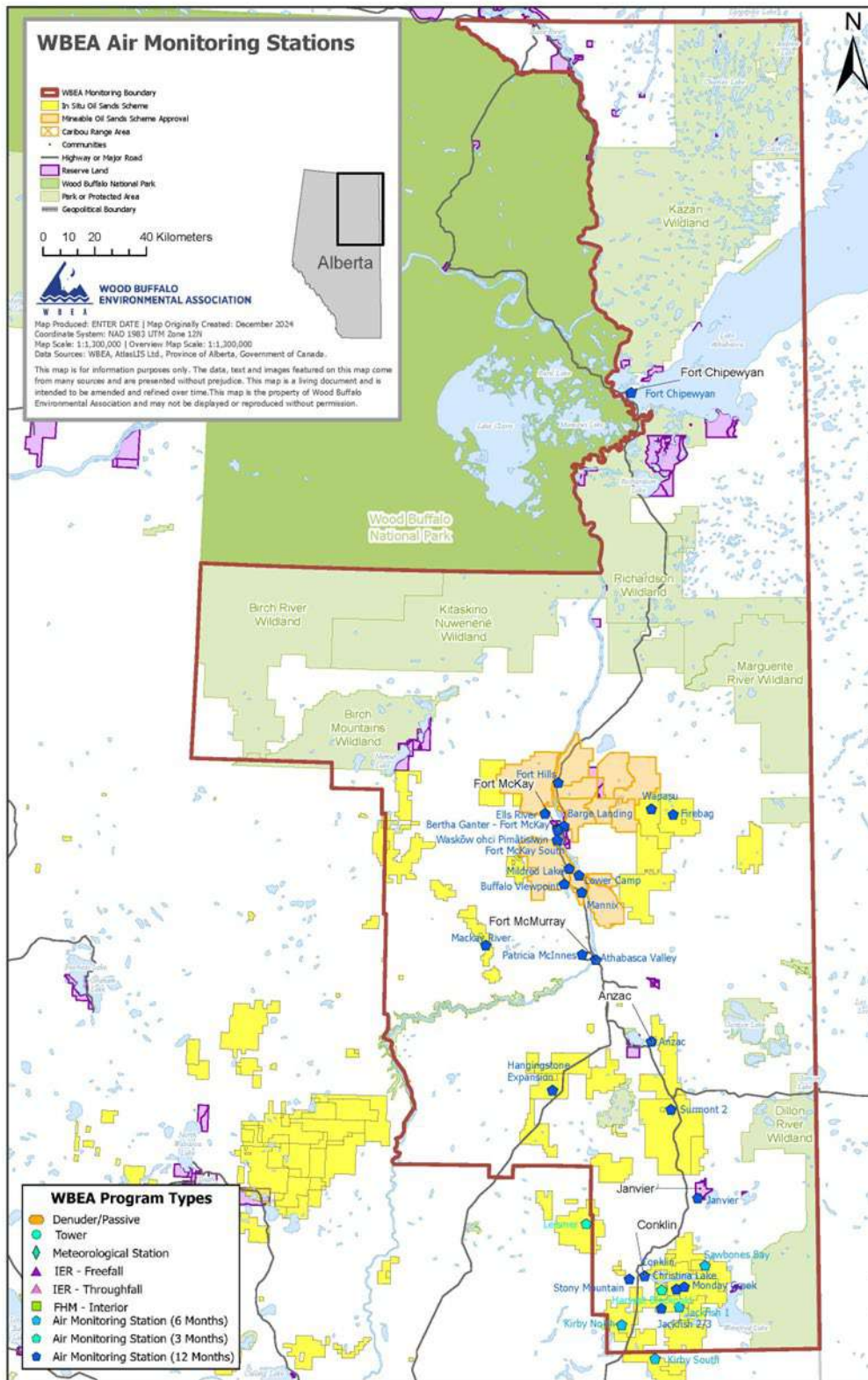


Figure 1.0 – WBEA Network Monitoring Sites





## General Site Information

### Station

Station ID	AMS 501
Station name	Leismer
Date station established	June 2013

### Location

Station street address	Located at the main gate of the Athabasca Oil Corporation SAGD plant.
Legal land description	4-01-079-10 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	55.81294255
Longitude	-111.44054535
UTM East	472392
UTM North	6185349
Nearest community	Conklin
Community population	154
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Athabasca Oil Corporation
Approval number	289664-00-00; 241311-00-00
Contact Name	Troy Halsall
Address	NA
Phone number	403-803-0859
Email address	thalsall@atha.com

### Site Description

Land use by sector	0 – 90 degrees	Gate/Main Road
	91 – 180 degrees	Road/Trees
	181 – 270 degrees	Trees
	271 – 360 degrees	Trees/laydown yard
Site elevation (m) (above sea level)	668 m	
Angle of elevation to nearby buildings	Greatest angle	0
	Building direction	NA
Airflow restrictions	North	None
	East	None



	South	None
	West	None
Distance to nearest trees (m)	North	150
	East	150
	West	35
	South	35
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	10 m
	Distance from station (m)	0 m

### Site Influences

#### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
SAGD operations	100 m	Athabasca Oil SAGD operations

#### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Roadway	Medium	15 m	Main road access into SAGD plant

#### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Atha Oil corp.	SAGD	37,500 – 40,000 boe/d	100 m	West



## Station Equipment

Equipment Owner: Athabasca Oil Corporation

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO2	Thermo Scientific	43i	1160290011	2018
H2S	Thermo Scientific	43i-TLE	1180540020	2023
NO2	Thermo Scientific	42i	1218153356	2018

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	N2910504	Class 3	2021
WS	Met One	010C-1	Y8362	Class 4	2023
WD	Met One	020C-1	R14654	Class 4	2023

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	9035
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	2659
Zero air generator	Zero Air Generator	Teledyne/API	701	4427
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	ITB1315940
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	NA





Figure 2.0 – Area Topographic map showing AMS 501





Figure 3.0 – Aerial photo showing AMS 501



Station Name: AMS 501 - Leismer

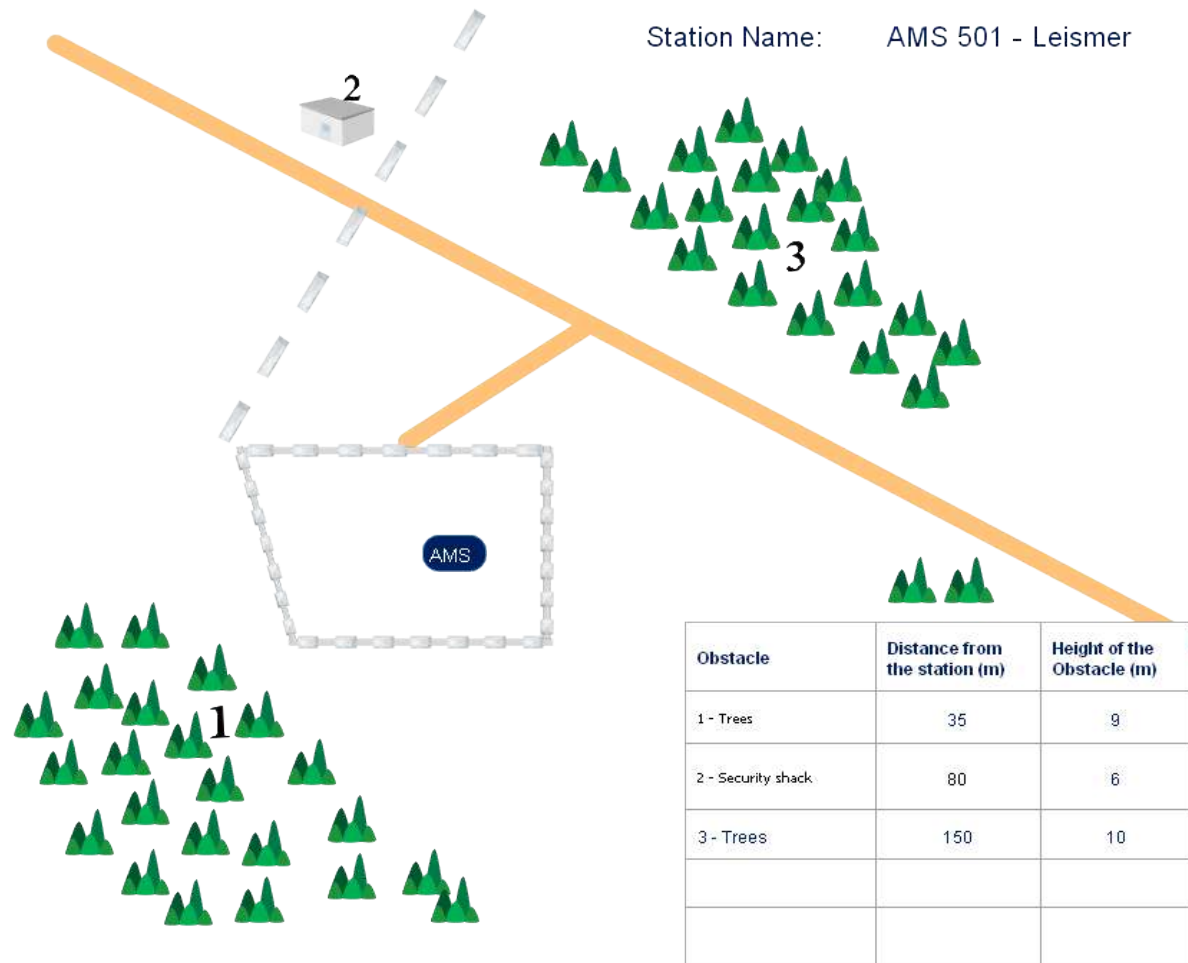


Figure 4.0 – Plan view sketch for AMS 501 - Leismer

Site photos

The following photos show the environment surrounding the monitoring station.



Figure 5.0 – Environment looking North



Figure 5.1 – Environment looking East



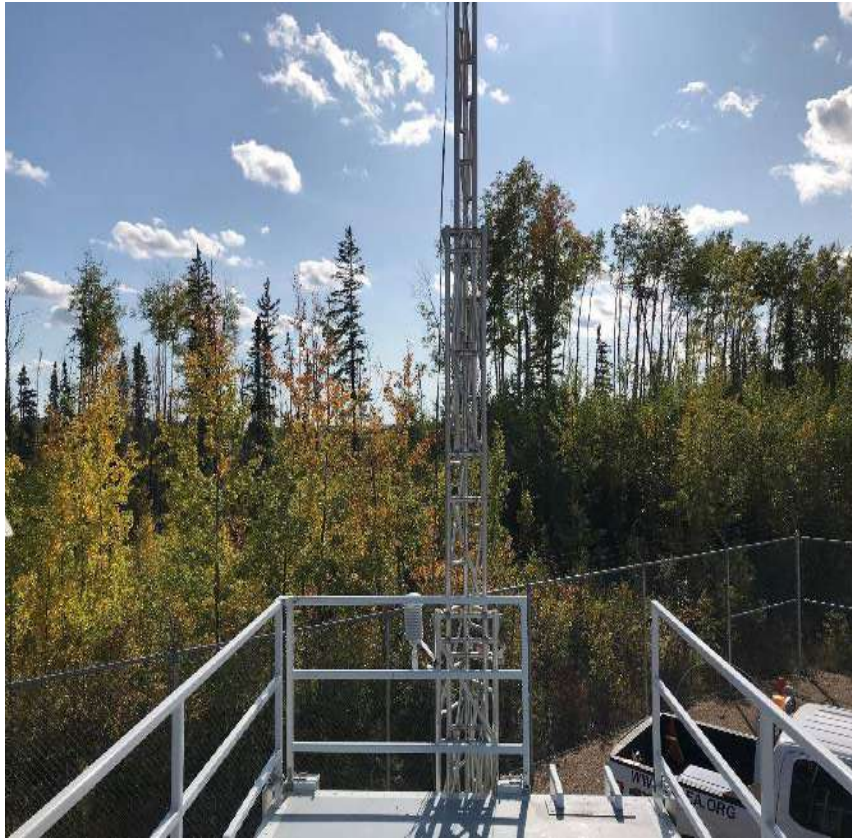


Figure 5.2 – Environment looking South



Figure 5.3 – Environment looking West





Figure 5.4 – Meteorological Tower

## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 6.0 – Photo showing the inlet and sample manifold



Figure 6.1 – Curb shot of the monitoring station





Figure 6.2 –Photo of the front and the back of instrument rack





Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Leismer

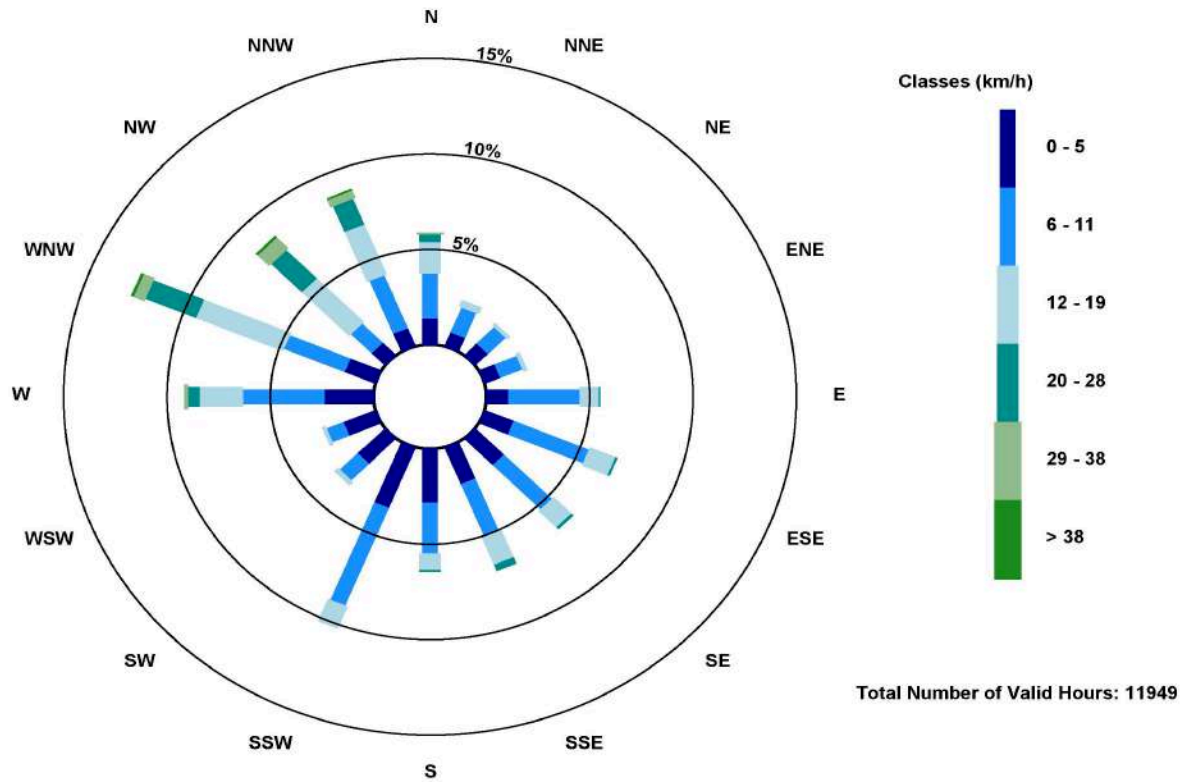


Figure 7.0 – Windrose (2020-2025)

Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station**  
**Site Documentation**

Sawbones Bay

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**LAST UPDATED: FEBRUARY-28-2025**



# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	16
Station Photos.....	19



## Tables and Figures

Table 1.0 - Pollutant Parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network. ....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network. ....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area Topographic map showing AMS 505 .....	13
Figure 3.0 – Aerial image showing AMS 505.....	14
Figure 4.0 – Plan view sketch for AMS 505 – Sawbones Bay.....	15
Figure 5.0 – Environment looking North.      Figure 5.1 – Environment looking East. ....	16
Figure 5.2 – Environment looking South.      Figure 5.3 – Environment looking West. ....	17
Figure 5.4 – Meteorological Tower.....	18
Figure 6.0 – Photo showing the inlet and sample manifold. ....	19
Figure 6.1 – Curb shot of the monitoring station. ....	20
Figure 6.2 –Photo of the front and the back of instrument rack.....	21
Figure 7.0 – Windrose (2020-2025) .....	22





## WBEA Monitoring Network

### Vision

People are empowered to make informed decisions to ensure a safe and healthy environment.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometers, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient (VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Oduor Monitoring Program within WBEA.

### Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.

In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes.



In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012, at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dust fall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2



Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include hydrogen sulphide (H<sub>2</sub>S), total reduced Sulphur (TRS), Sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), total hydrocarbons (THC), methane (CH<sub>4</sub>), non-methane hydrocarbons (NMHC), ammonia (NH<sub>3</sub>), carbon monoxide (CO), and carbon dioxide (CO<sub>2</sub>). Sites are categorized as industrial or community, based on the setting in which they are located.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACK FISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACK FISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant Parameters monitored in the WBEA network



Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAYSOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network.





Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), and precipitation samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X	X	X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ ATTRIBUTION	FORTMCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	X
18	BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORTHILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network.



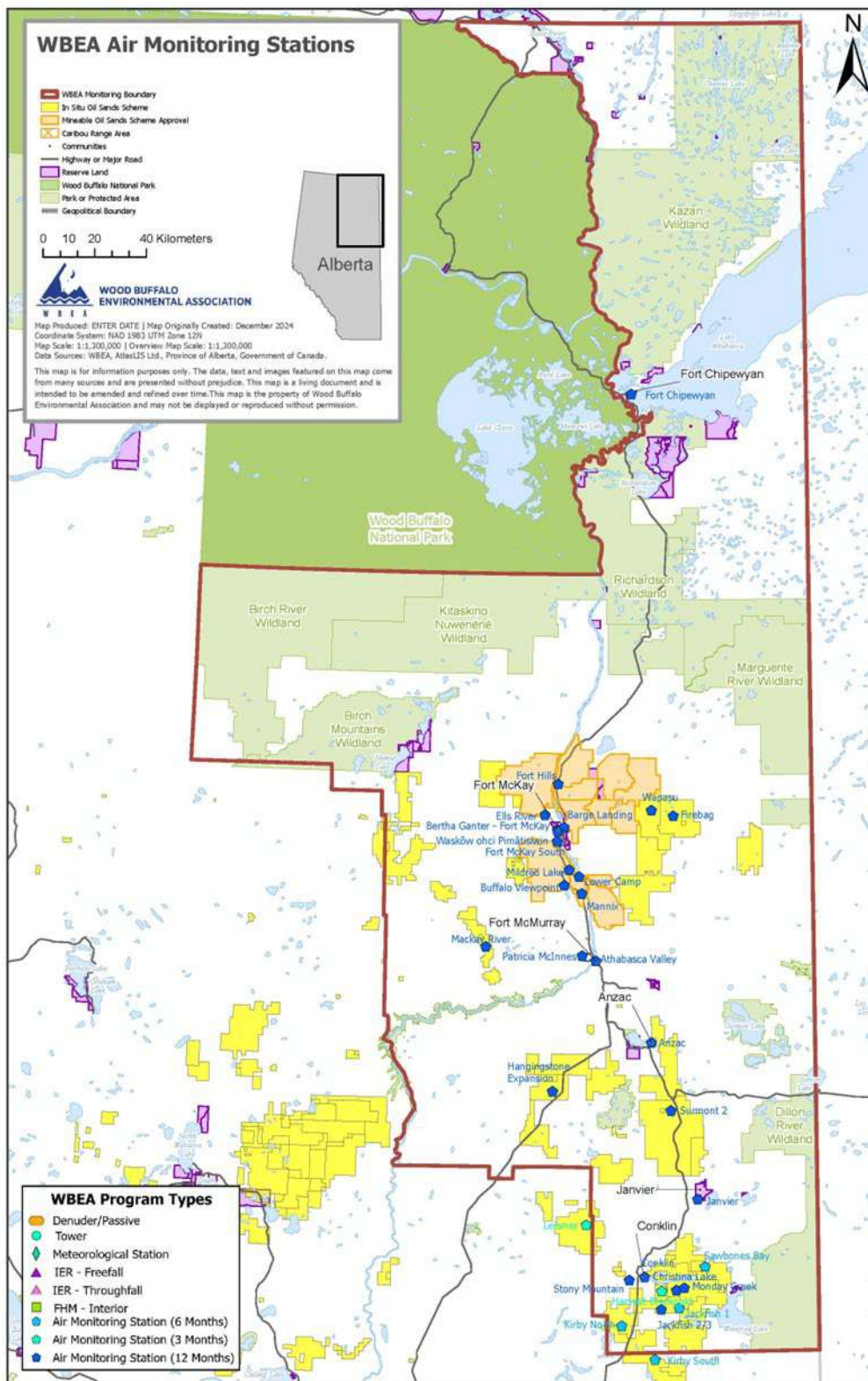


Figure 1.0 – WBEA Network Monitoring Sites



## General Site Information

### Station

Station ID	AMS 505
Station name	Sawbones Bay
Date station established	June 23, 2021

### Location

Station street address	Station located in laydown yard at Christina Lake facility
Legal land description	1-16-77-5 W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	55.667847
Longitude	-110.705711
UTM East	518511
UTM North	6169152
Nearest community	Conklin
Community population	229
Census Year	2018

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	MEG Energy Corp.
Approval number	00216466-01-00
Contact Name	Bryan Wilson
Address	NA
Phone number	403-629-0853
Email address	Bryan.wilson@megenergy.com

### Site Description

Land use by sector	0 – 90 degrees	Forest
	91 – 180 degrees	Forest
	181 – 270 degrees	SAGD operations
	271 – 360 degrees	Forest
Site elevation (m) (above sea level)	471 m	
Angle of elevation to nearby buildings	Greatest angle	0
	Building direction	None
Airflow restrictions	North	None
	East	None
	South	None



	West	None
Distance to nearest trees (m)	North	190
	East	75
	West	NA
	South	15
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	10 m
	Distance from station (m)	0 m

### Site Influences

#### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
SAGD Operations	500m W	MEG Energy operations
Laydown yard	100m S	Heavy equipment

#### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Roadway	Low	100	Gravel access road
Roadway	Low	500	Gravel access road

#### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
MEG Christina Lake	SAGD operations	100,000 barrels per day	500m	West





## Station Equipment

Equipment Owner: MEG Energy

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO2	Thermo Scientific	43i	710321323	2021
H2S	Thermo Scientific	43i-QTL	12113311965	2023
NO2	Teledyne/API	42iQ	12227620777	2023

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	N2910504	Class 3	2021
WS	Met One	010C-1	CA 03845	Class 4	2023
WD	Met One	020C-1	B4693	Class 4	2023

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	6894
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	5112
Zero air generator	Zero Air Generator	Teledyne/API	701	690
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	ITB1315940
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	NA





Figure 2.0 – Area Topographic map showing AMS 505



Figure 3.0 – Aerial image showing AMS 505



Station Name: AMS 505 - Sawbones Bay

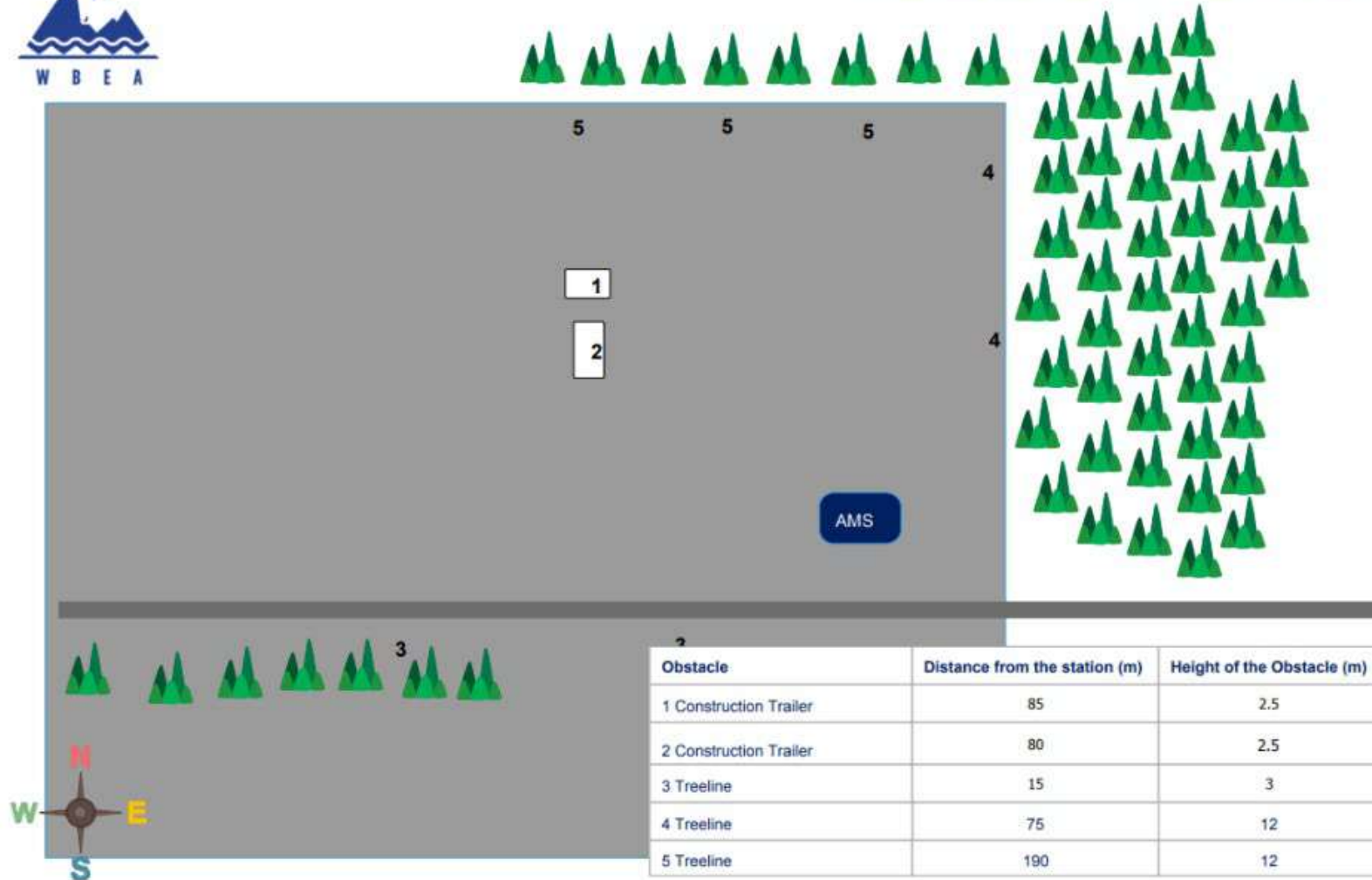


Figure 4.0 – Plan view sketch for AMS 505 – Sawbones Bay



Site photos

The following photos show the environment surrounding the monitoring station.

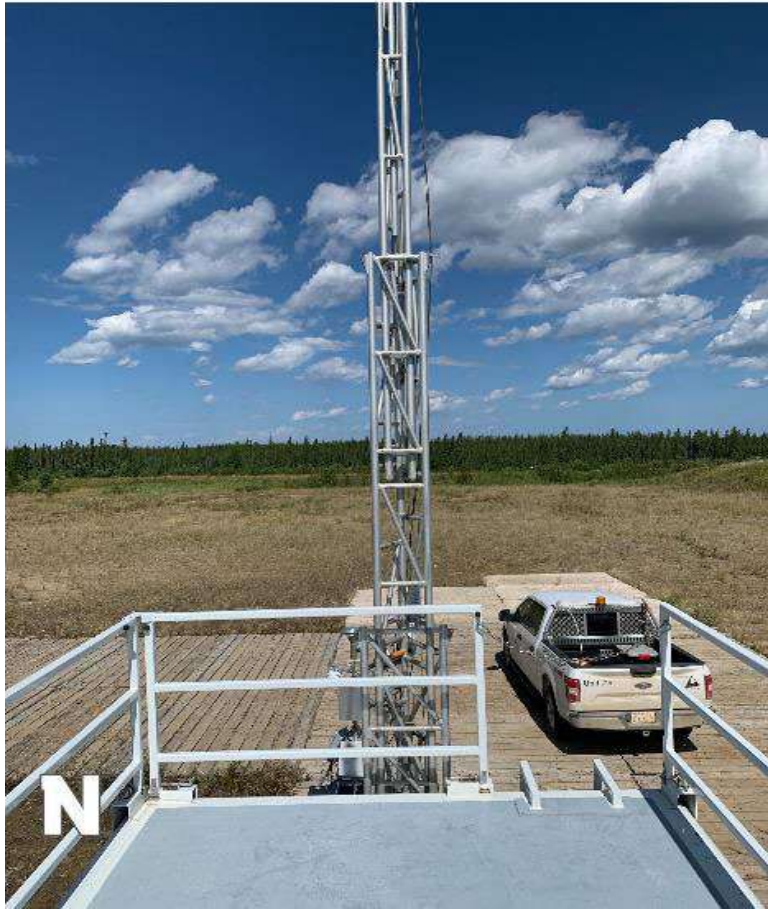


Figure 5.0 – Environment looking North.



Figure 5.1 – Environment looking East.





Figure 5.2 – Environment looking South.



Figure 5.3 – Environment looking West.



Figure 5.4 – Meteorological Tower



## Station Photos

The following photos show the monitoring station and instrumentation.

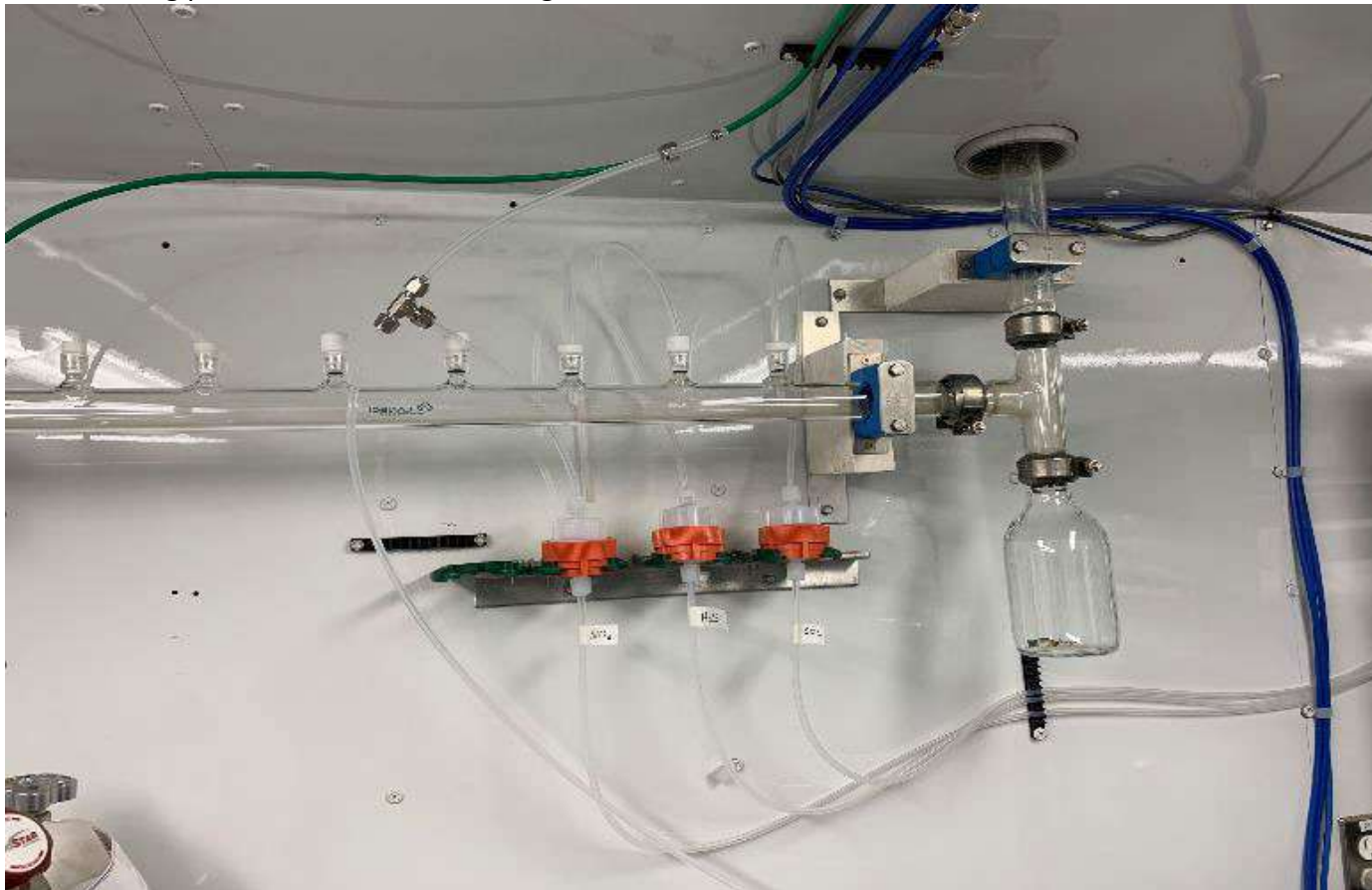


Figure 6.0 – Photo showing the inlet and sample manifold.





Figure 6.1 – Curb shot of the monitoring station.





Figure 6.2 –Photo of the front and the back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Sawbones Bay

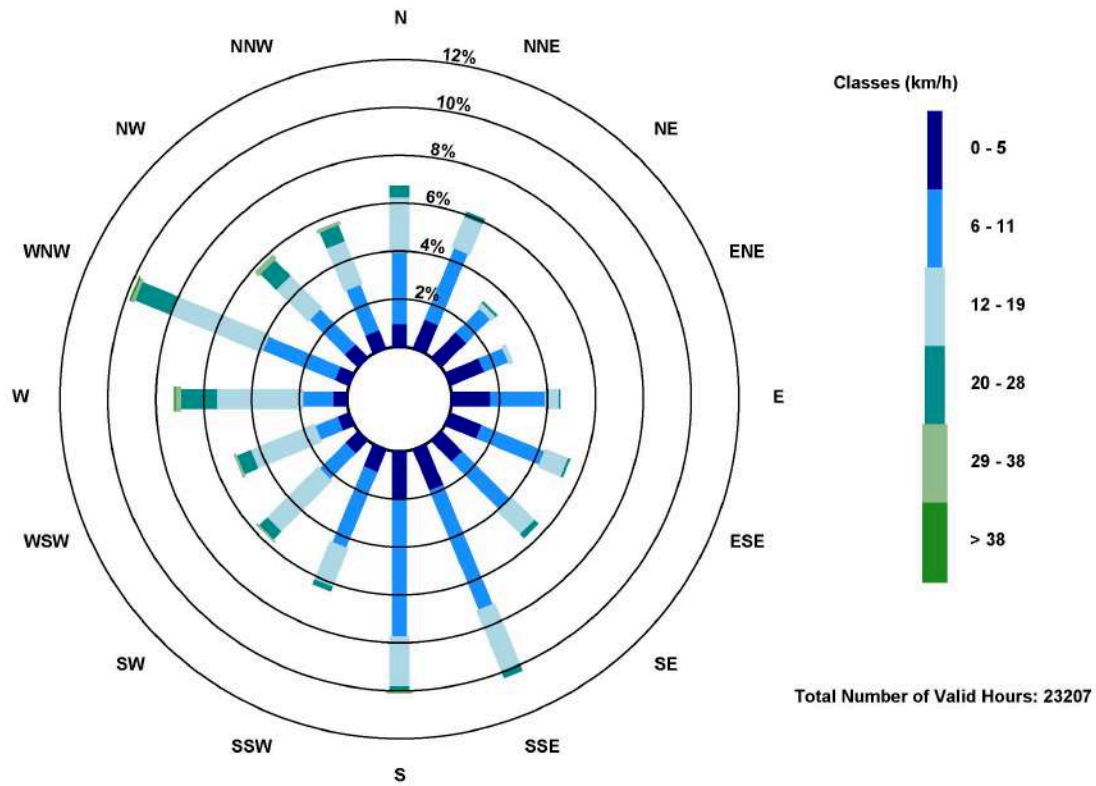


Figure 7.0 – Windrose (2020-2025)



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

# Jackfish 1

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LAST UPDATED: FEBRUARY 28, 2025





# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	16
Station Photos.....	21

## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Figure 1 – Area topographic map showing AMS 506.....	13
Figure 2 – Aerial image showing AMS 506.....	14
Figure 3 – Plan view image for AMS 506 site.....	15
Figure 5 – Environment looking North.....	16
Figure 6 – Environment looking East .....	17
Figure 7 – Environment looking South.....	18
Figure 8 – Environment looking West.....	19
Figure 9 – Meteorological Tower .....	20
Figure 10 – Photo showing the inlet and sample manifold .....	21
Figure 11 – Curb shot of the monitoring station .....	22
Figure 12 –Photo of the front and the back of instrument rack.....	23
Figure 13 – Windrose (2020-2025) .....	24

## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

### Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.

In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.



Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include; sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACK FISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACK FISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAYSOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network.

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), and precipitation samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X	X	X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ ATTRIBUTION	FORTMCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	X
18	BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORTHILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network.

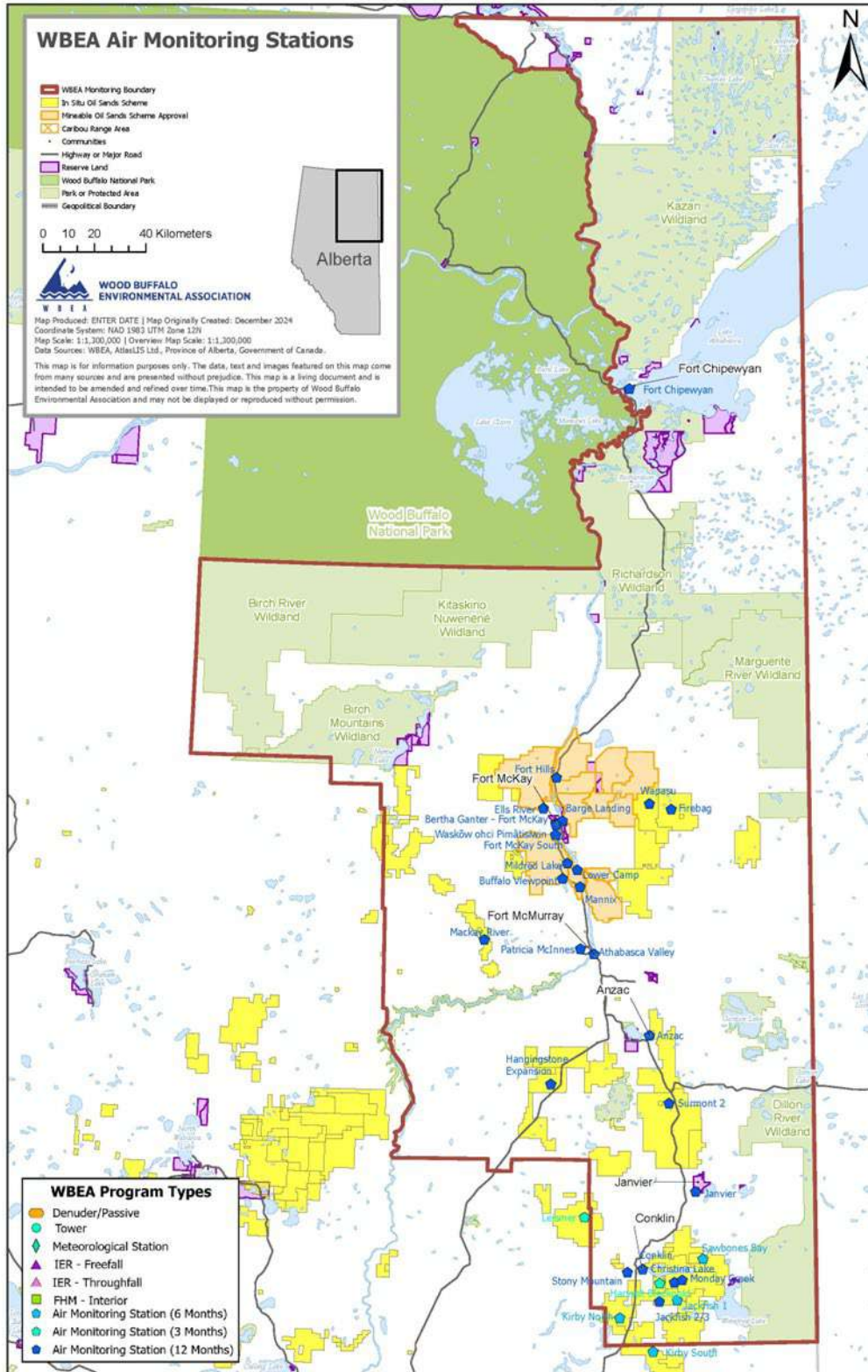


Figure 1.0 – WBEA Network Monitoring Sites



## General Site Information

### Station

Station ID	AMS 506
Station name	Jackfish 1
Date station established	Aug 16, 2018

### Location

Station street address	Located SE of Jackfish 1 SAGD operation
Legal land description	8-28-75-6-W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	55.523807
Longitude	-110.865308
UTM East	508503
UTM North	6153091
Nearest community	Conklin
Community population	154
Census Year	2016

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3-805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Canadian Natural Resources Limited
Approval number	224816-01-00
Contact Name	Shawn Milligan
Address	2100, 855 - 2 Street SW Calgary, Alberta, Canada T2P 4J8
Phone number	403 896-3109
Email address	shawn.milligan@cnrl.com

### Site Description

Land use by sector	0 – 90 degrees	SAGD Operations
	91 – 180 degrees	SAGD Operations
	181 – 270 degrees	SAGD Operations
	271 – 360 degrees	SAGD Operations
Site elevation (m) (above sea level)	620	
Angle of elevation to nearby buildings	Greatest angle	0
	Building direction	NA
Airflow restrictions	North	Trees
	East	Trees

	South	Trees
	West	Trees
Distance to nearest trees (m)	North	100 metres
	East	75 metres
	West	40 metres
	South	35 metres
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Wind Sensors	Type	Cup and vane
	Height above ground (m)	10
	Distance from station (m)	attached

### Site Influences

#### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
none	n/a	n/a

#### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Dirt/gravel	Low	20	Used by site workers

#### Major Point Sources

Facility Name	Source Type	Distance from site (km)	Compass direction from site
CNRL – Jackfish 1	SAGD Plant	0.5	NW

## Station Equipment

Equipment Owner: WBEA

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Instrument Installed	WBEA Data Start Date
SO <sub>2</sub>	Thermo Environmental	43i	1160290011	2022	September, 2018
H <sub>2</sub> S	Thermo Environmental	43iQ	1180540020	2023	September, 2018
NO/NO <sub>x</sub> /NO <sub>2</sub>	Thermo Environmental	42iQ	1218153356	2025	January, 2025

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Sensor Installed	WBEA Data Start Date
AT/RH	Vaisala	HMP155	K1720033	Class 3	2022	September, 2018
WS	Met One	010C-1	Y18362	Class 3	2022	September, 2018
WD	Met One	020C-1	R14654	Class 3	2022	September, 2018

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	9035
Zero air generator	Zero Air Generator	Teledyne/API	701	4427
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	ITB1315940
Gas Dilution Calibrator	Mass flow controlled gas dilution	Teledyne/API	T700	3252
Tower	10 Metre crank up	Aluma	T-135	AT213029-Y-3-1
H <sub>2</sub> S converter	H <sub>2</sub> S converter	Global Analyzer Systems	G150	2022-218



Figure 1 – Area topographic map showing AMS 506





Figure 2 – Aerial image showing AMS 506

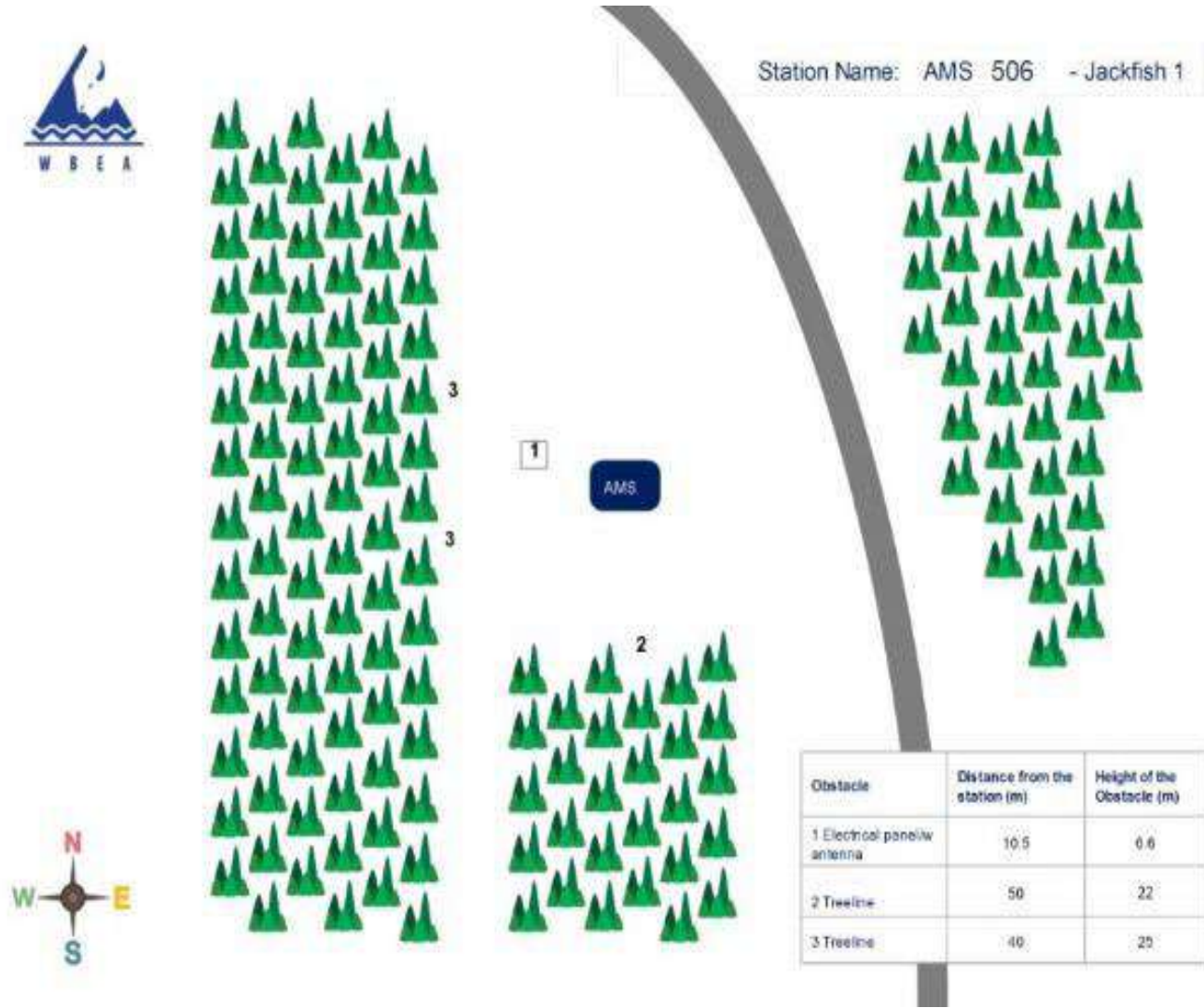


Figure 3 – Plan view image for AMS 506 site

## Site photos

The following photos show the environment surrounding the monitoring station.



Figure 5 – Environment looking North





Figure 6 – Environment looking East



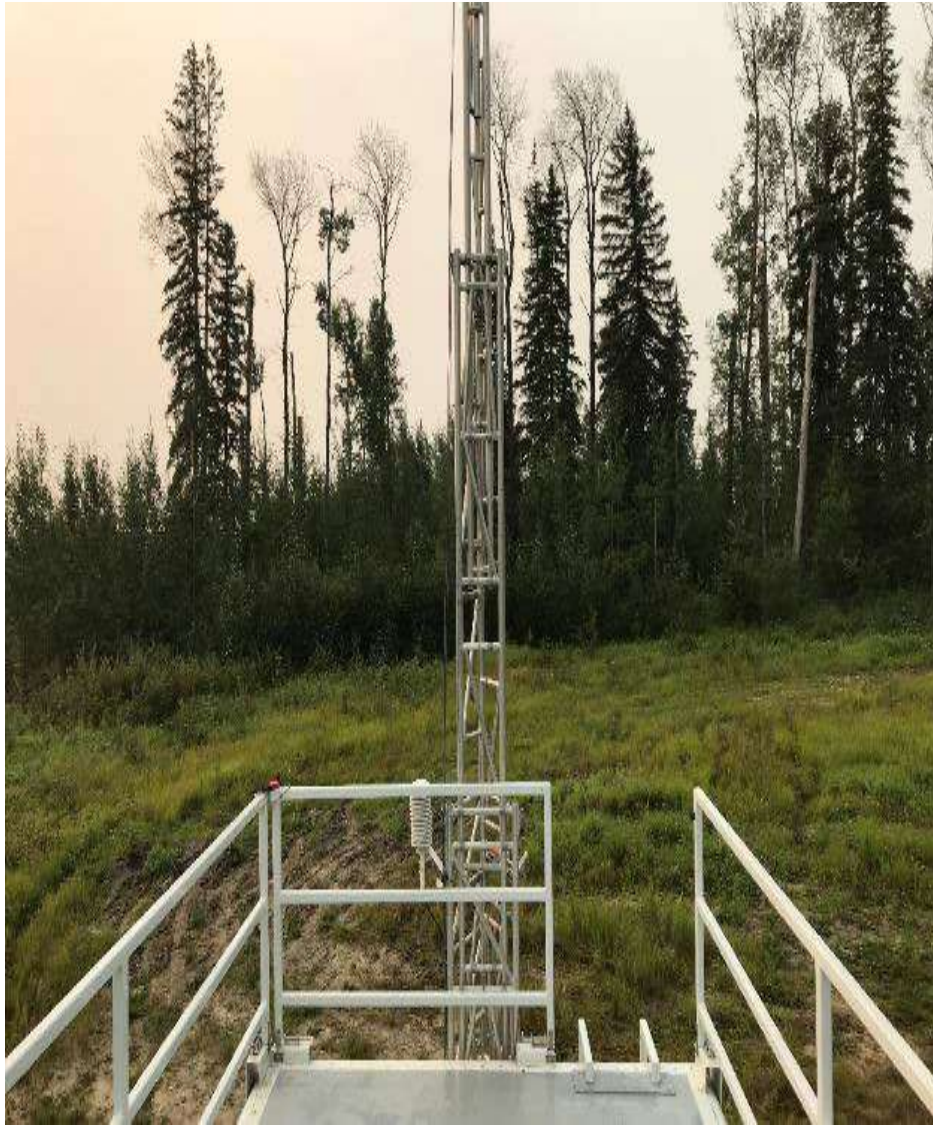


Figure 7 – Environment looking South



Figure 8 – Environment looking West





Figure 9 – Meteorological Tower

## Station Photos

The following photos show the monitoring station and instrumentation.



Figure 10 – Photo showing the inlet and sample manifold





Figure 11 – Curb shot of the monitoring station



Figure 12 –Photo of the front and the back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Jackfish 1

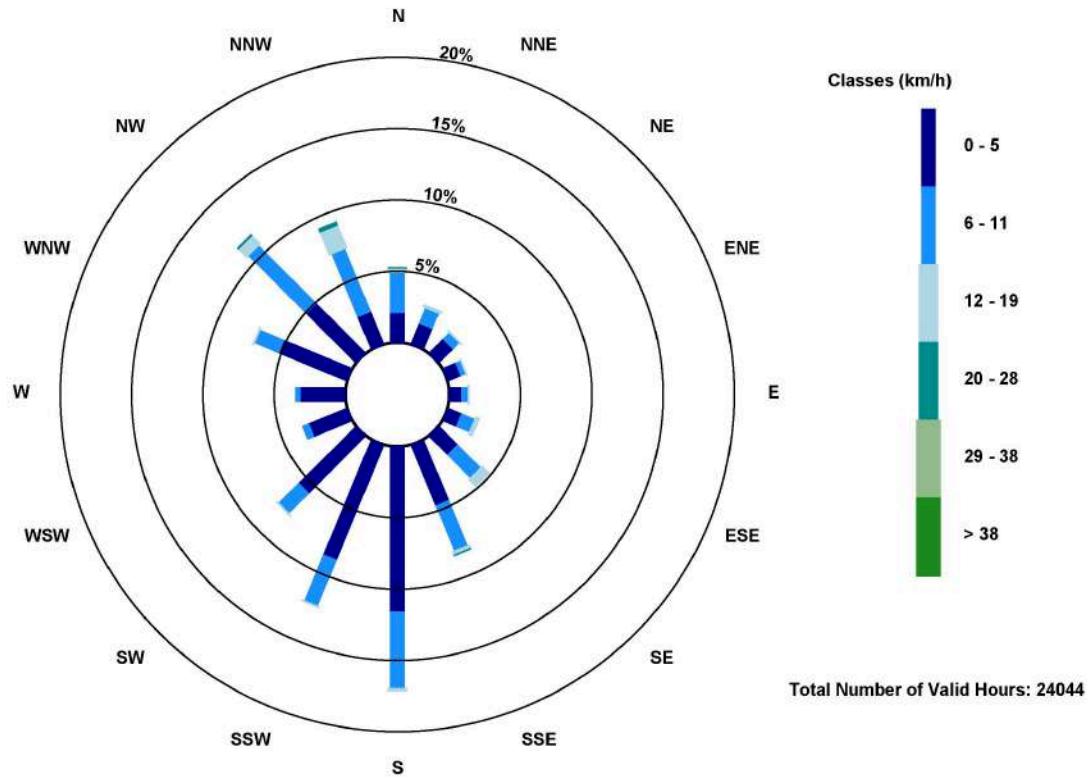


Figure 13 – Windrose (2020-2025)

Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station**  
**Site Documentation**

Kirby South

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**LAST UPDATED: FEBRUARY 28, 2025**





# Table of Contents

WBEA Monitoring Network.....	4
Vision.....	4
Mission.....	4
The Region.....	4
The Network.....	4
Time Integrated Sampling.....	4
<b>General Site Information .....</b>	<b>10</b>
Station.....	10
Location.....	10
Owner/Operator/Approval Holder.....	10
Site Description.....	10
<b>Site Influences.....</b>	<b>11</b>
Localized Sources (within 20 metres of station).....	11
Roadway Influences.....	11
Major Point Sources.....	11
<b>Station Equipment .....</b>	<b>12</b>
Analytical Equipment.....	12
Meteorological Equipment.....	12
Support Equipment.....	12
<b>Site photos .....</b>	<b>16</b>
<b>Station Photos.....</b>	<b>21</b>



## Tables and Figures

Table 1.0 Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network.....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network.....	8
Figure 1 - WBEA Network Monitoring Sites.....	9
Figure 2 – Area Topographic map showing AMS 507 .....	13
Figure 3 - Aerial Photo Showing AMS 507.....	14
Figure 4 - Plan view sketch for AMS 507 site.....	15
Figure 5 – Environment looking North.....	166
Figure 6 – Environment looking East .....	177
Figure 7 – Environment looking South.....	188
Figure 8 – Environment looking West.....	199
Figure 9 – Meteorological Tower .....	20
Figure 10 – Photo showing the inlet and sample manifold .....	21
Figure 11 – Curb shot of the monitoring station .....	22
Figure 12 –Photo of the front and the back of instrument rack.....	23
Figure 13 – Windrose (Five Year) .....	24



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The time-integrated parameters for each station are summarized in Table 1.2.





Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include; sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network



Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network



Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network



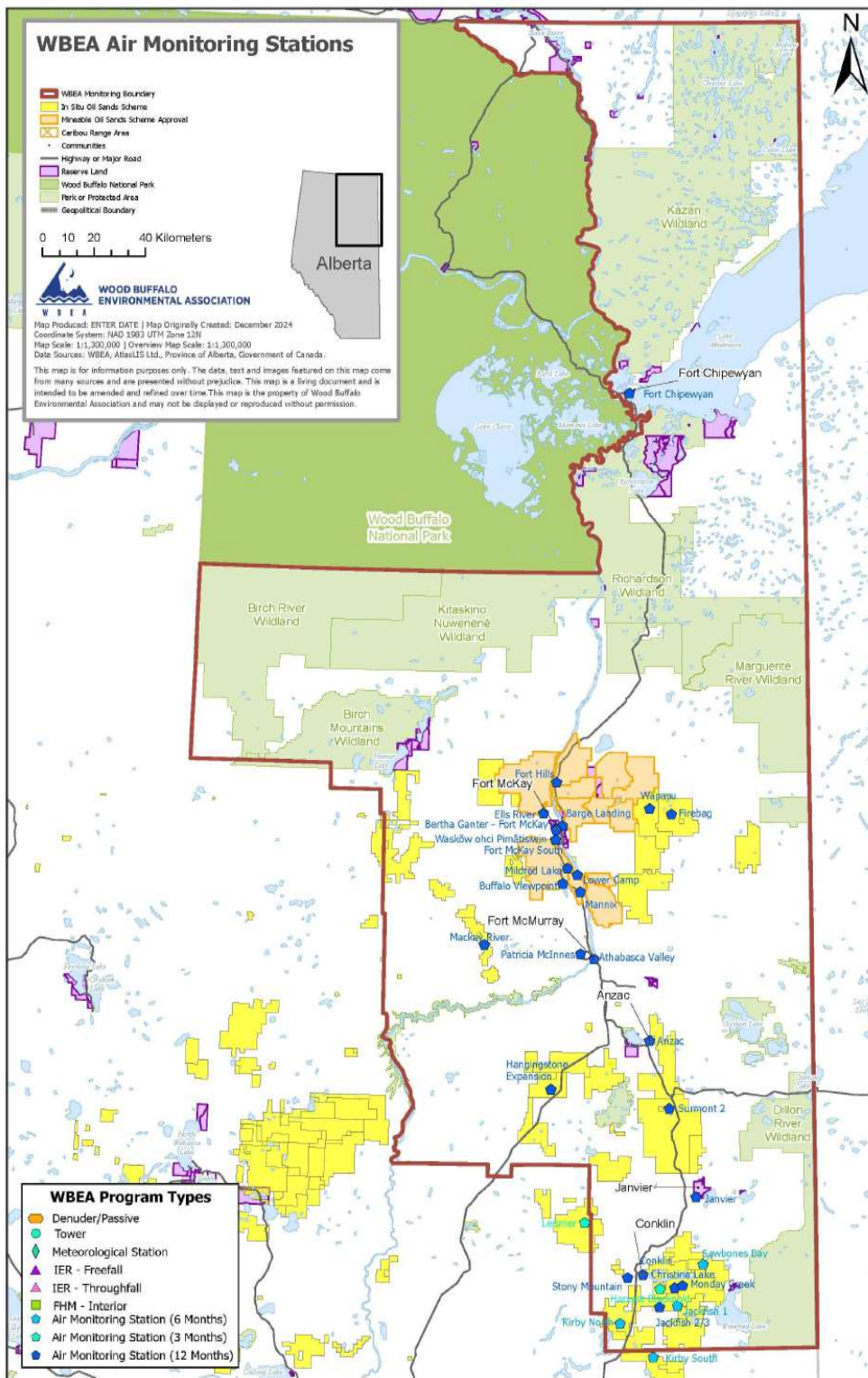


Figure 1.0 – WBEA Network Monitoring Sites





## General Site Information

### Station

Station ID	AMS 507
Station name	Kirby South
Date station established	July 1, 2021

### Location

Station street address	G-Pad
Legal land description	15-21-73-7-W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	55.3437334
Longitude	-111.0139229
UTM East	499117.19
UTM North	6133043.08
Nearest community	Conklin
Community population	229
Census Year	2018

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Canadian Natural Resources Ltd.
Approval number	20809-02-00
Contact Name	Shawn Milligan
Address	2100, 855 – 2 st SW. Calgary, AB T2P 4J8
Phone number	403-896-3109
Email address	shawn.milligan@cnrl.com

### Site Description

Land use by sector	0 – 90 degrees	SAGD Operation
	91 – 180 degrees	SAGD Operation
	181 – 270 degrees	SAGD Operation
	271 – 360 degrees	SAGD Operation
Site elevation	730m	



(above sea level)		
Angle of elevation to nearby buildings	Greatest angle	N/A
	Building direction	N/A
Airflow restrictions	North	N/A
	East	N/A
	South	N/A
	West	N/A
Distance to nearest trees (m)	North	250
	East	100
	West	N/A
	South	100
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Wind Sensors	Type	Cup and vane
	Height above ground	10 metres
	Distance from station	0 metre

## Site Influences

### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
SAGD Operation	25	SAGD Oil Pad

### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Site Roadway	Low	200m	Roadway used by the site workers

### Major Point Sources

Facility Name	Source Type	Distance from site (km)	Compass direction from site
Kirby South	SAGD Plant	0.5	SW



## Station Equipment

Equipment Owner: WBEA

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Instrument Installed	WBEA Data Start Date
SO <sub>2</sub>	Thermo Scientific	43iQ	1182340007	2021	January, 2019
H <sub>2</sub> S	Thermo Scientific	43i-LTE	1150840012	2023	January, 2019
NO/NO <sub>x</sub> /NO <sub>2</sub>	Thermo Scientific	42iQ	118234006	2021	January, 2019
THC	Thermo Scientific	51i	1182340005	2021	January, 2019

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Sensor Installed	WBEA Date Start Date
AT/RH	Vaisala	HMP155	G0840083	4	2021	January, 2019
WS	Met One	010C-1	X16479	3	2021	January, 2019
WD	Met One	020C-1	X16495	3	2021	January, 2019

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	2372
Zero air generator	Zero Air Generator	Teledyne/API	701H	880
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	-
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	17451-1
Gas Dilution Calibrator	Mass flow controlled gas dilution	Teledyne/API	T700	3804
H <sub>2</sub> S Converter	H <sub>2</sub> S converter	Global Analyzer Systems	G150	NA





Figure 2 – Area Topographic map showing AMS 507







Figure 3 – Aerial photo showing AMS 507



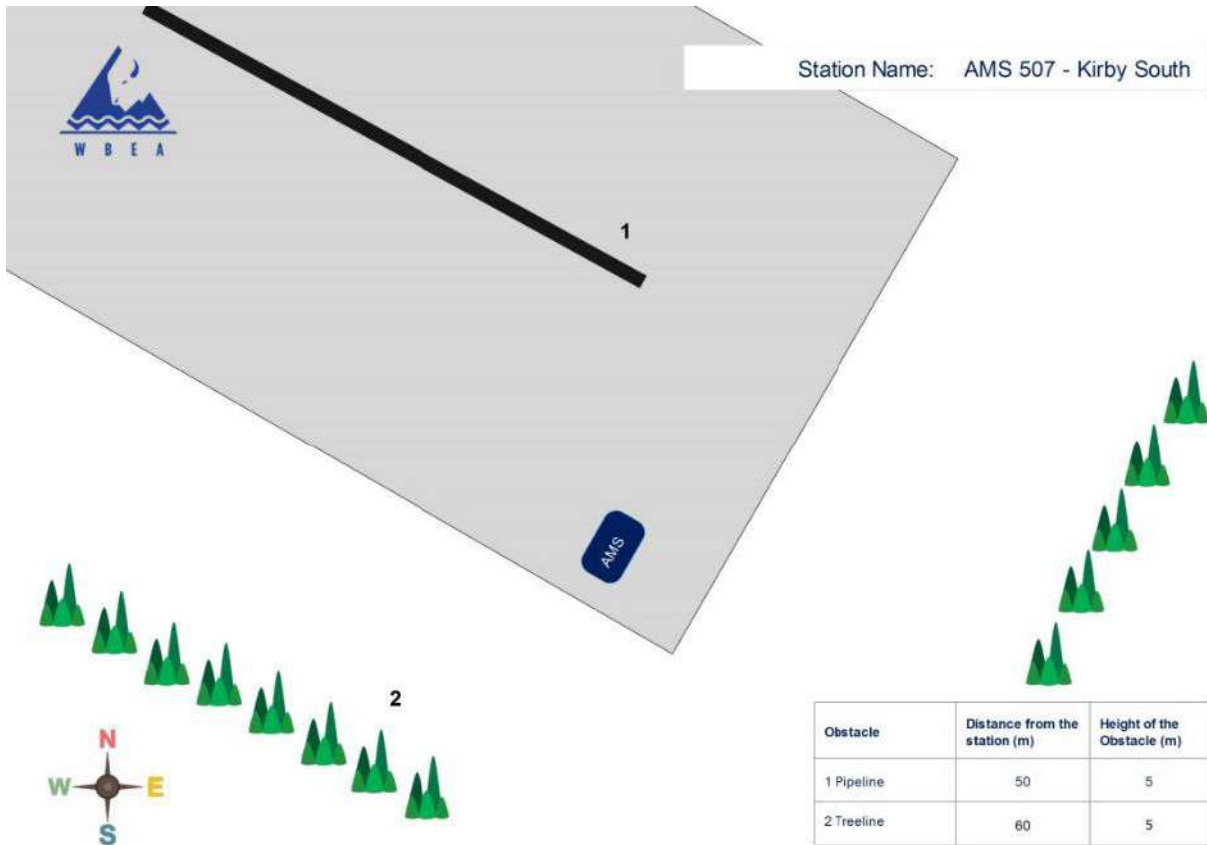


Figure 4 – Plan view sketch for AMS 507 site



## Site photos

The following photos show the environment surrounding the monitoring station.

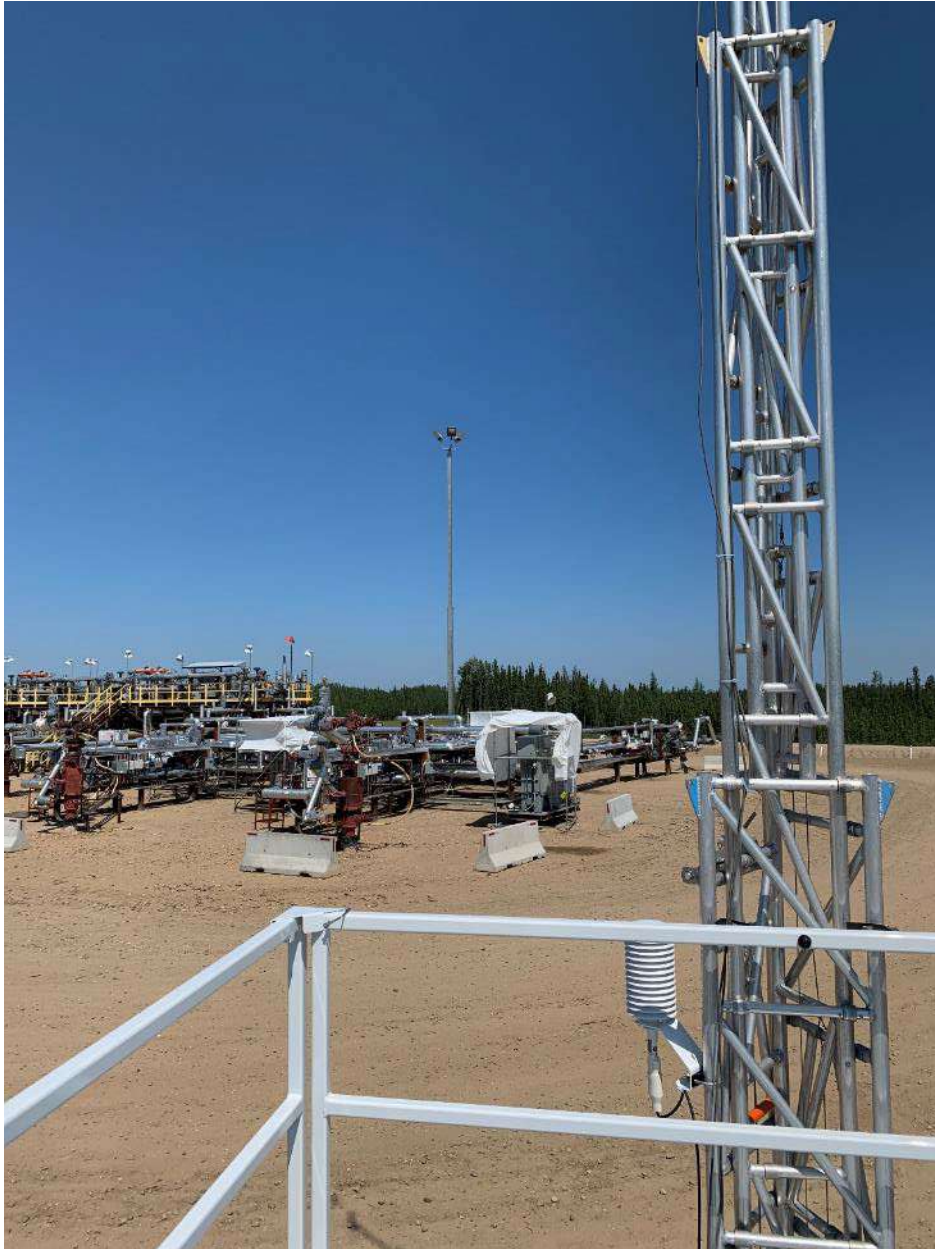


Figure 5 – Environment looking North







Figure 6 – Environment looking East







Figure 7 – Environment looking South



Figure 8 – Environment looking West



Figure 9 – Meteorological Tower

## Station Photos

The following photos show the monitoring station and instrumentation.

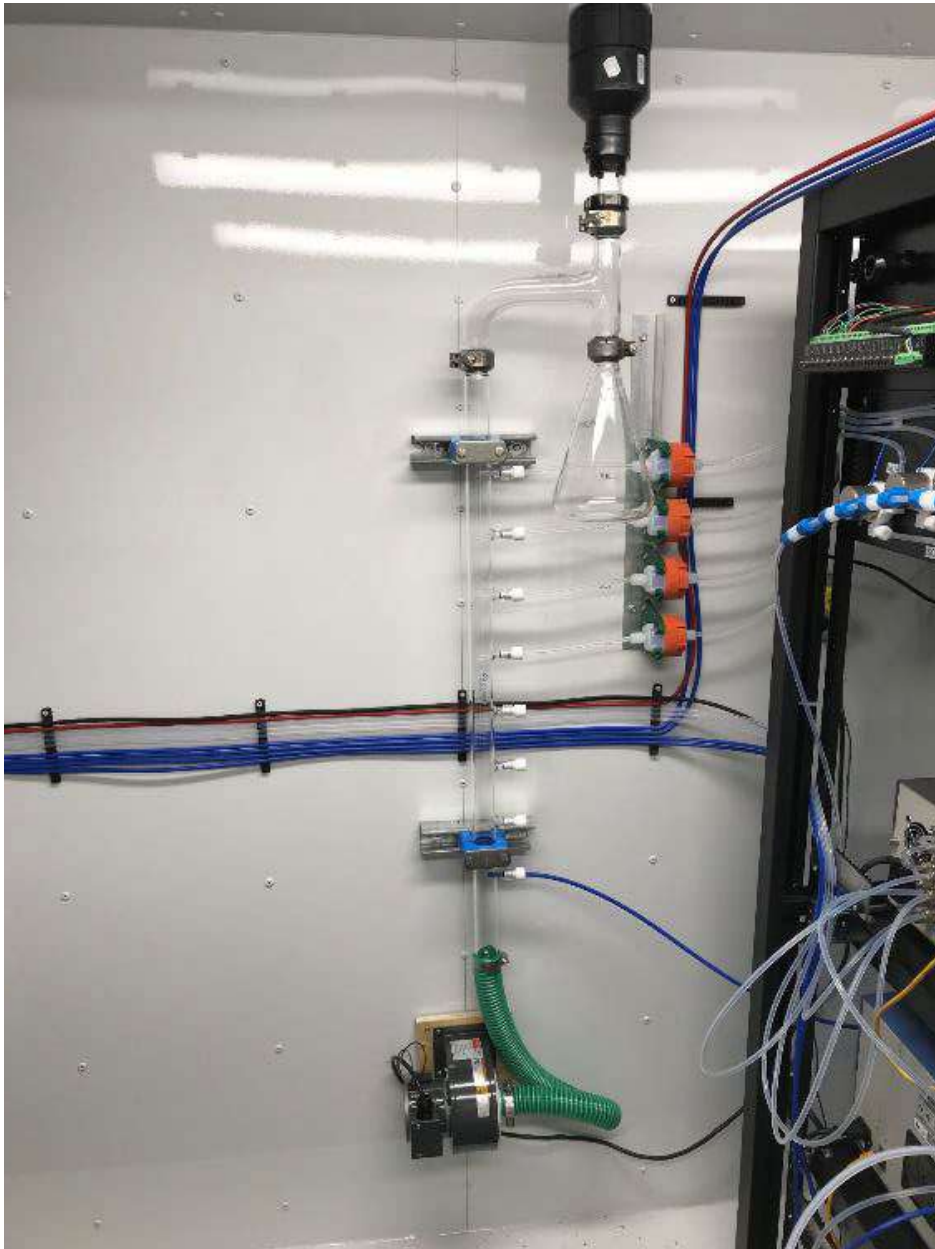


Figure 10 – Photo showing the inlet and sample manifold





Figure 11 – Curb shot of the monitoring station



Figure 12 –Photo of the front and the back of instrument rack



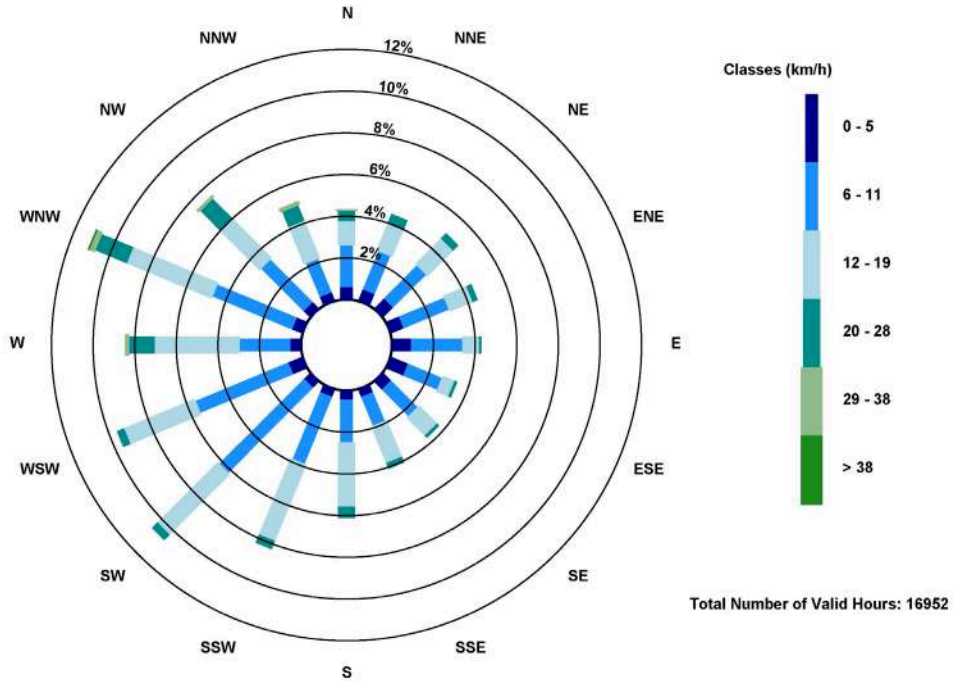


Figure 13 – Windrose (Five Year)





Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

Kirby North

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LAST UPDATED: FEBRUARY 28, 2025





# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	17
Station Photos.....	22

## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 508.....	13
Figure 3.0 – Aerial photo showing AMS 508.....	14
Figure 4.0 – Plan view sketch for AMS 508 site .....	15
Figure 5.0 – Elevation view image for AMS 508 site.....	16
Figure 6.0 – Environment looking North.....	17
Figure 6.1 – Environment looking East .....	18
Figure 6.2 – Environment looking South.....	19
Figure 6.3 – Environment looking West.....	20
Figure 6.4 – Meteorological Tower .....	21
Figure 7.0 – Photo showing the inlet and sample manifold .....	22
Figure 7.1 – Curb shot of the monitoring station .....	23
Figure 7.2 –Photo of the front and the back of instrument rack.....	24
Figure 8.0 – Windrose (2020 - 2025) .....	25

## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

### Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.

In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.



Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include; sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network

Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network

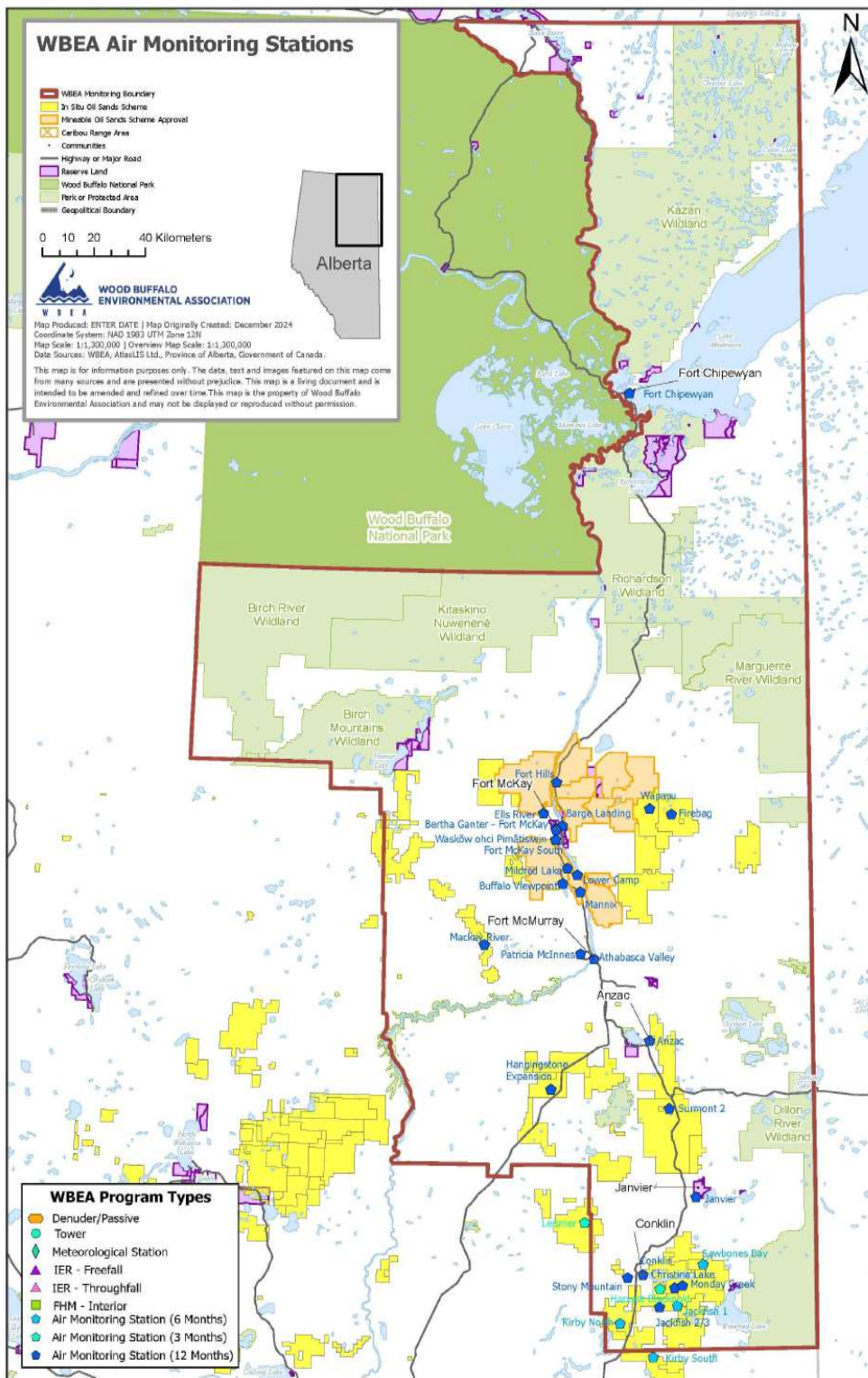


Figure 1.0 – WBEA Network Monitoring Sites



## General Site Information

### Station

Station ID	AMS 508
Station name	Kirby North
Date station established	2022

### Location

Station street address	Industrial Pad 04-05 lease
Legal land description	8-28-75-6-W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	55.461647
Longitude	-111.218823
UTM East	486163
UTM North	6146187
Nearest community	Conklin
Community population	178
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3-805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Canadian Natural Resources Ltd.
Approval number	149968-01-00
Contact Name	Shawn Milligan
Address	2100, 855 – 2 Street S.W. Calgary, AB
Phone number	(403) 896-3109
Email address	shawn.milligan@cnrl.com

### Site Description

Land use by sector	0 – 90 degrees	Wellpad
	91 – 180 degrees	Forest
	181 – 270 degrees	SAGD Land / Forest
	271 – 360 degrees	SAGD Plant
Site elevation (m) (above sea level)	700 metres	
Angle of elevation to nearby buildings	Greatest angle	None
	Building direction	None
Airflow restrictions	North	None

	East	None
	South	None
	West	None
Distance to nearest trees (m)	North	N/A
	East	N/A
	West	40 metres
	South	40 metres
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Wind Sensors	Type	Cup and vane
	Height above ground (m)	10m
	Distance from station (m)	Tower is attached to the shelter

### Site Influences

#### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
SAGD Pad	50	Station is located on the SE side of the pad

#### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Gravel Road	Medium	150	Road used to access the SAGD plant

#### Major Point Sources

Facility Name	Source Type	Distance from site (km)	Compass direction from site
CNRL - Kirby North	SAGD Plant	0.5	W

## Station Equipment

Equipment Owner: WBEA

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Instrument Installed	WBEA Data Start Date
SO <sub>2</sub>	Thermo Environmental	43-iQ	1182340007	2019	May, 2019
H <sub>2</sub> S	Thermo Environmental	43i-TLE	1150840012	2022	May, 2019
NO/NO <sub>x</sub> /NO <sub>2</sub>	Teledyne/API	42-i	1118148496	2024	May, 2019
THC	Thermo Environmental	51i	1182340005	2019	May, 2019

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Sensor Installed	WBEA Data Start Date
AT/RH	Vaisala	HMP155	J5140010	3	2024	May, 2019
WS	Met One	010C-1	X16479	3	2019	May, 2019
WD	Met One	020C-1	D13601	3	2024	May, 2019

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	2372
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	5240
Zero air generator	Zero Air Generator	Teledyne/API	701H	880
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	17541-1
Tower	10 metre crank up	Aluma	T-135	218148.00.7
H <sub>2</sub> S converter	H <sub>2</sub> S converter	Global	G-150	2022-197

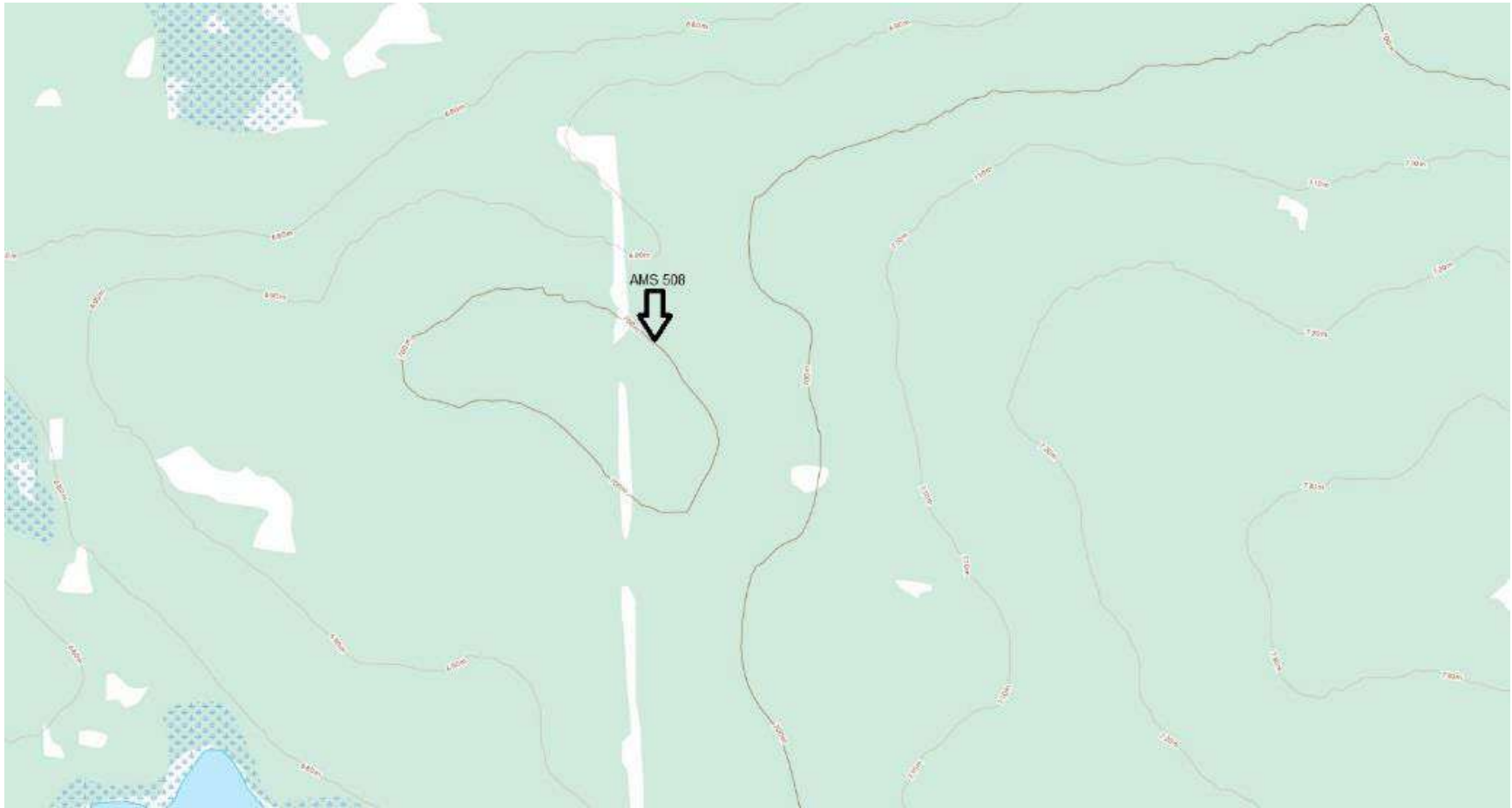


Figure 2.0 – Area topographic map showing AMS 508



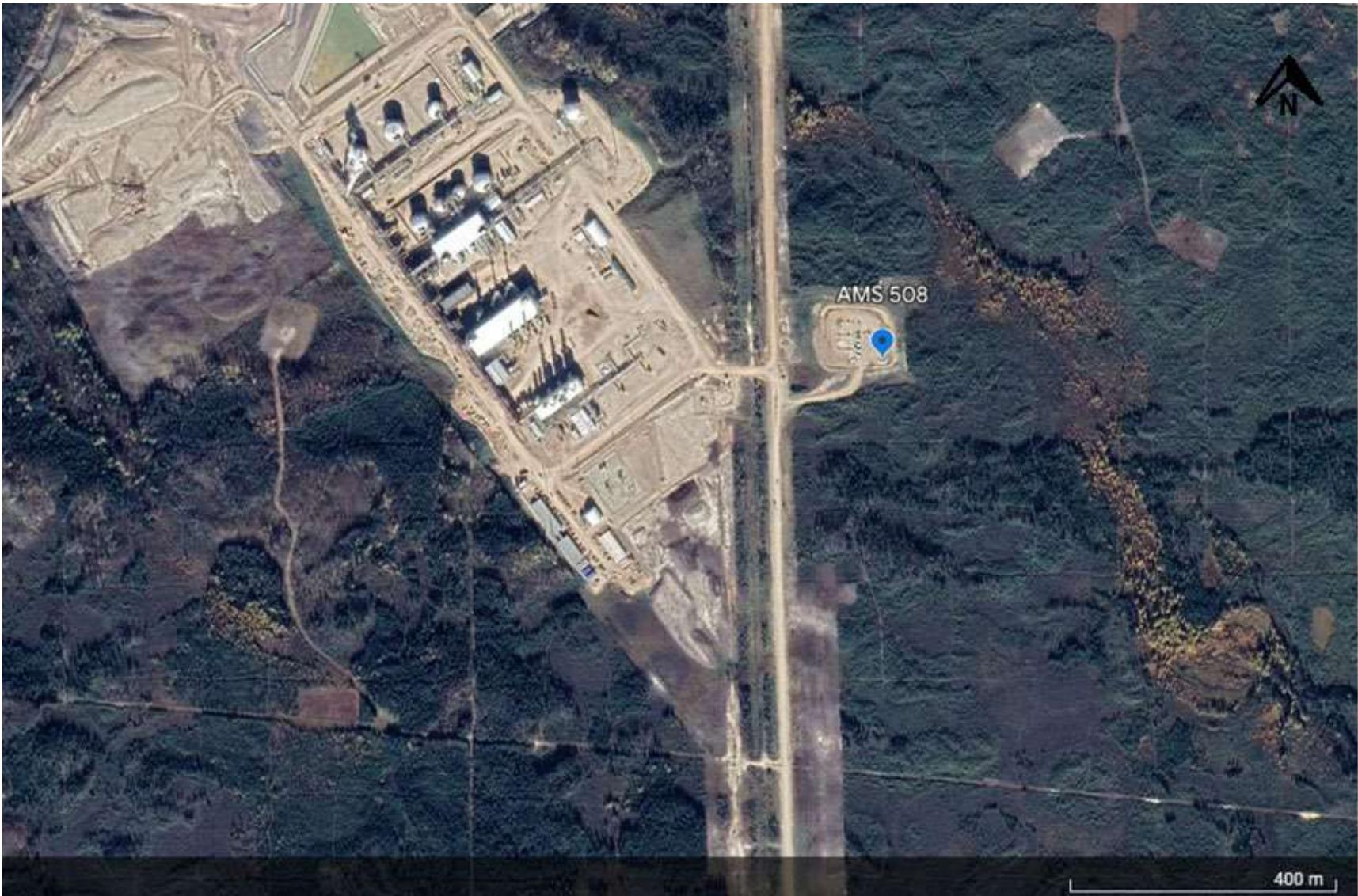


Figure 3.0 – Aerial photo showing AMS 508



Station Name: AMS 508 - Kirby North

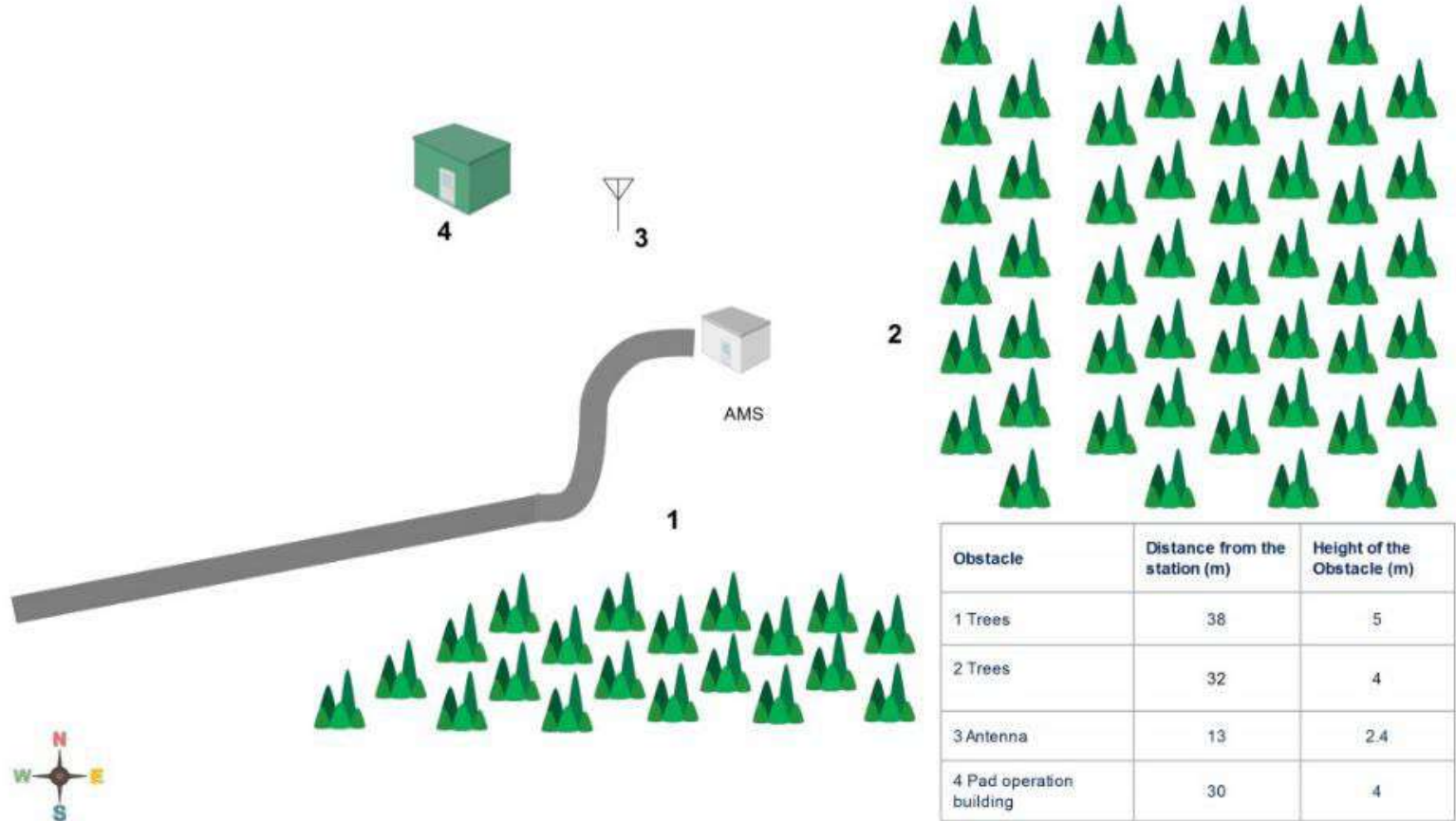


Figure 4.0 – Plan view sketch for AMS 508 site

Figure 5.0 – Elevation view image for AMS 508 site

Not available at this time.



Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North





Figure 6.1 – Environment looking East





Figure 6.2 – Environment looking South



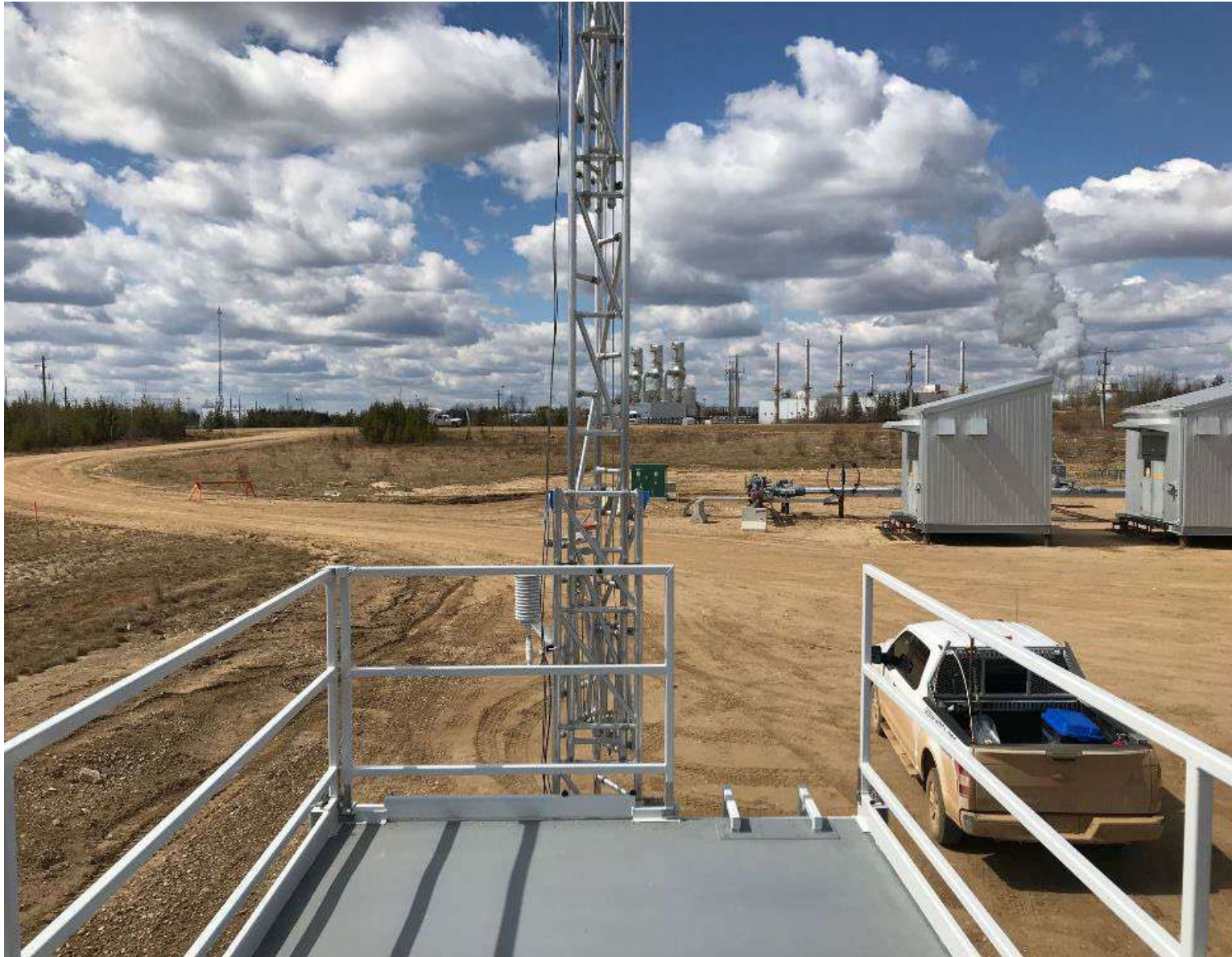


Figure 6.3 – Environment looking West





Figure 6.4 – Meteorological Tower



## Station Photos

The following photos show the monitoring station and instrumentation.

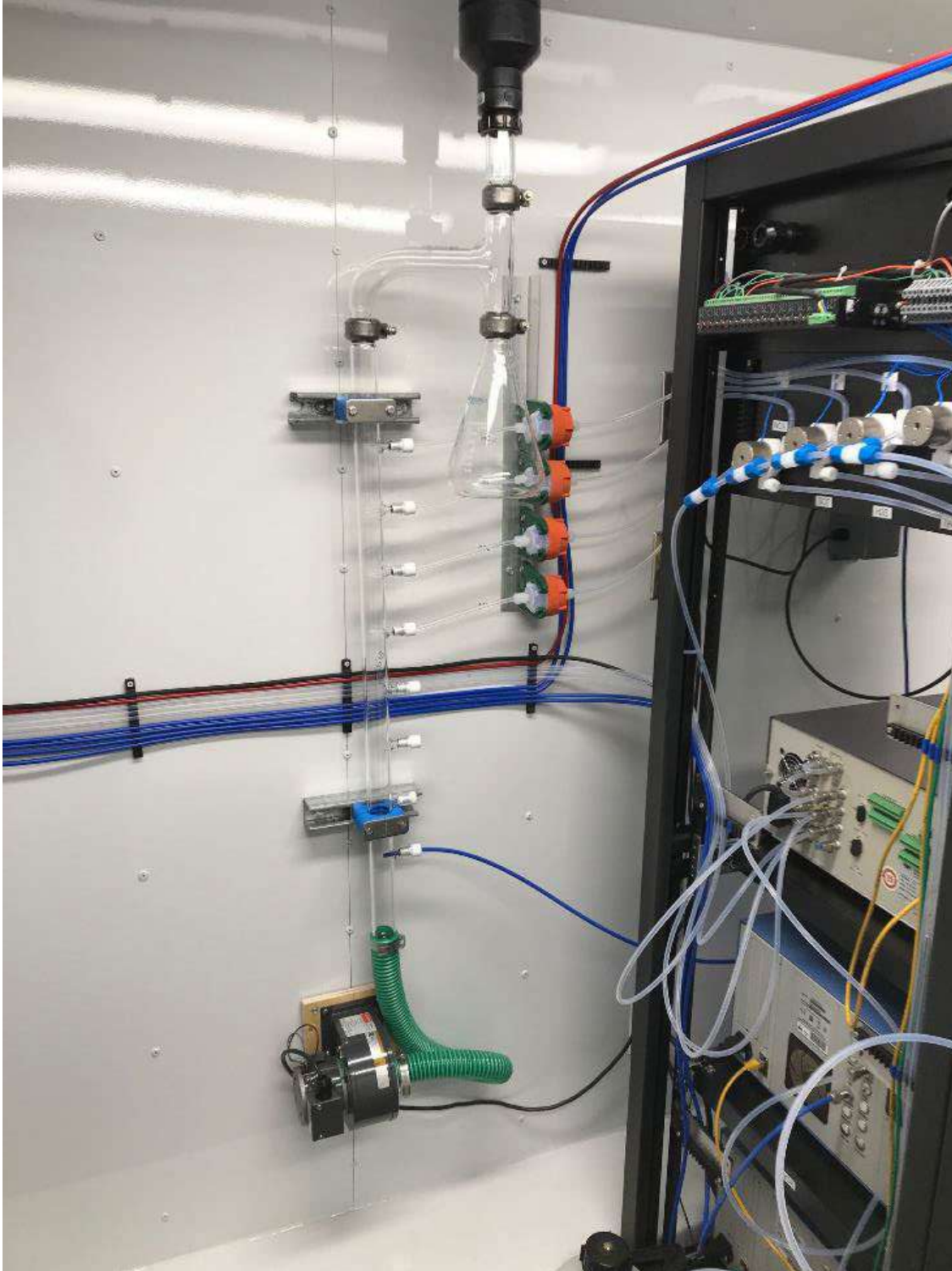


Figure 7.0 – Photo showing the inlet and sample manifold



Figure 7.1 – Curb shot of the monitoring station





Figure 7.2 –Photo of the front and the back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Kirby North

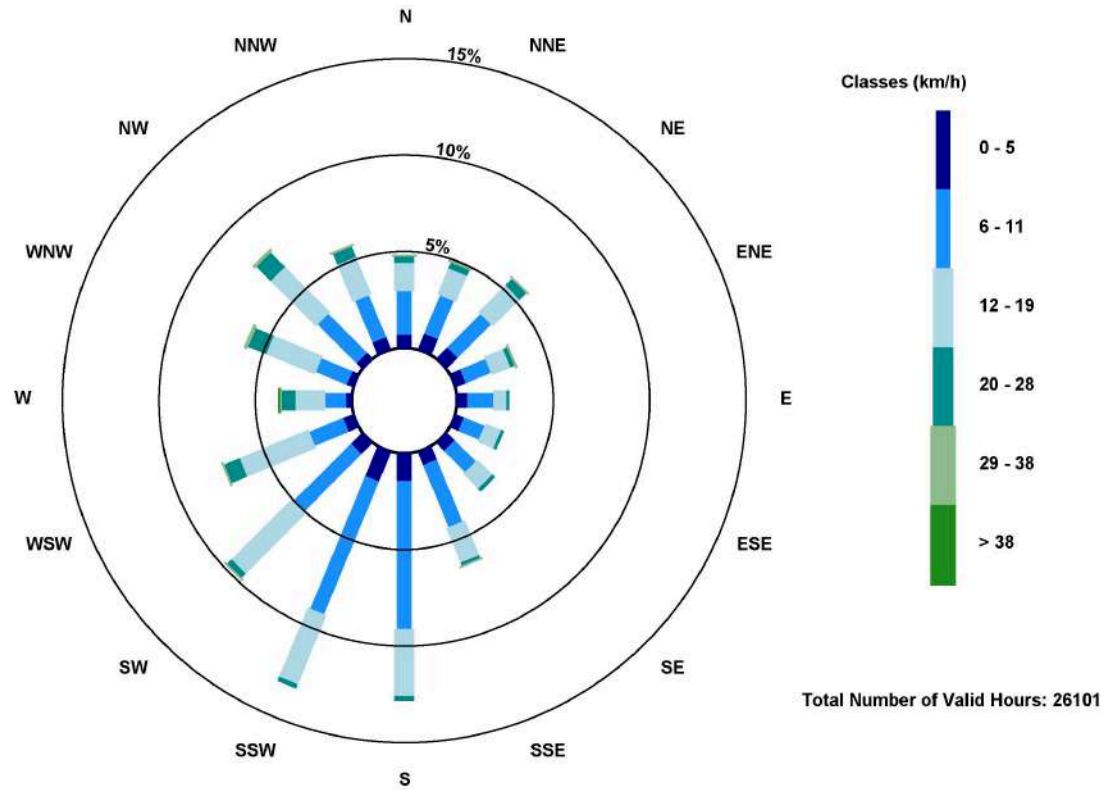


Figure 8.0 – Windrose (2020 - 2025)





Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

# BlackGold

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LAST UPDATED: MARCH 28, 2024



## Table of Contents

General Site Information .....	4
Station .....	4
Location.....	4
Owner/Operator/Approval Holder .....	4
Site Description .....	4
Site Influences .....	5
Localized Sources (within 20 metres of station) .....	5
Roadway Influences .....	5
Major Point Sources.....	5
Station Equipment .....	6
Analytical Equipment .....	6
Meteorolgical Equipment .....	6
Support Equipment.....	6
Site photos .....	10
Station Photos.....	15

## Tables and Figures

Figure 1 – Area topographic map showing AMS 511.....	7
Figure 2 – Aerial photo showing AMS 511.....	8
Figure 3 – Plan view sketch for AMS 507 – Blackgold site .....	9
Figure 4 – Environment looking North.....	10
Figure 5 – Environment looking East .....	11
Figure 6 – Environment looking South.....	12
Figure 7 – Environment looking West.....	13
Figure 8 – Meteorological Tower .....	14
Figure 9 – Photo showing the inlet and sample manifold .....	15
Figure 10 – Curb shot of the monitoring station .....	16
Figure 11 –Photo of the front and the back of instrument rack.....	17
Figure 12 – Windrose (five year).....	18

## General Site Information

Revision Date: March 28, 2024

### Station

Station ID	AMS 511
Station name	BlackGold
Date station established	Oct 1, 2023

### Location

Station street address	n/a
Legal land description	07-14-76-07, W4M
Airshed Zone	Wood Buffalo Environmental Association
Latitude	55.582983
Longitude	110.973061
UTM East	501691
UTM North	6159684
Nearest community	Conklin
Community population	229
Census Year	2018

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3-805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Harvest Operations Corp.
Approval number	246984-01
Contact Name	Eric Deegan
Address	1500, 700 2 <sup>nd</sup> Street S.W. Calgary, AB T2P 2W1
Phone number	403-387-1203
Email address	Eric.deegan@harvestenergy.ca

### Site Description

Land use by sector	0 – 90 degrees	Lay-down yard/Access Road/Muskeg
	91 – 180 degrees	Lay-down yard/Muskeg
	181 – 270 degrees	Lay-down yard/SAGD Facility
	271 – 360 degrees	Lay-down yard/Access Road/Camp Facility
Site elevation (m) (above sea level)	600	
Angle of elevation to nearby buildings	Greatest angle	0
	Building direction	South
Airflow restrictions	North	N/A



	East	N/A
	South	N/A
	West	N/A
Distance to nearest trees (m)	North	85
	East	110
	West	110
	South	165
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Wind Sensors	Type	Cup and vane
	Height above ground (m)	10
	Distance from station (m)	0

### Site Influences

#### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
None	n/a	n/a

#### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Access Road	Low	160	Roadway used by the site workers

#### Major Point Sources

Facility Name	Source Type	Distance from site (km)	Compass direction from site
BlackGold	SAGD	0.5	W

## Station Equipment

Equipment Owner: WBEA

### Analytical Equipment

Parameter	Make	Model	Serial Number	Date Instrument Installed	WBEA Data Start Date
SO <sub>2</sub>	Thermo Environmental	43i	1160290014	October, 2023	October, 2023
H <sub>2</sub> S	Teledyne/API	T101	197	October, 2023	October, 2023
NO/NO <sub>x</sub> /NO <sub>2</sub>	Teledyne/API	T200	7029	October, 2023	October, 2023
THC	Thermo Environmental	51i	1317958295	October, 2023	October, 2023

### Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Instrument Installed	WBEA Data Start Date
AT/RH	Vaisala	HMP155	H5110025	4	October, 2023	October, 2023
WS	Met One	010C-1	B10017	4	October, 2023	October, 2023
WD	Met One	020C-1	D13603	4	October, 2023	October, 2023

### Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	2575
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	2445
Zero air generator	Zero Air Generator	Teledyne/API	701	138
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	ITB-13-16018
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	N/A



Figure 1 – Area topographic map showing AMS 511





Figure 2 – Aerial photo showing AMS 511





Figure 3 – Plan view sketch for AMS 507 – Blackgold site



Site photos

The following photos show the environment surrounding the monitoring station.



Figure 4 – Environment looking North



Figure 5 – Environment looking East





Figure 6 – Environment looking South





Figure 7 – Environment looking West



Figure 8 – Meteorological Tower



## Station Photos

The following photos show the monitoring station and instrumentation.

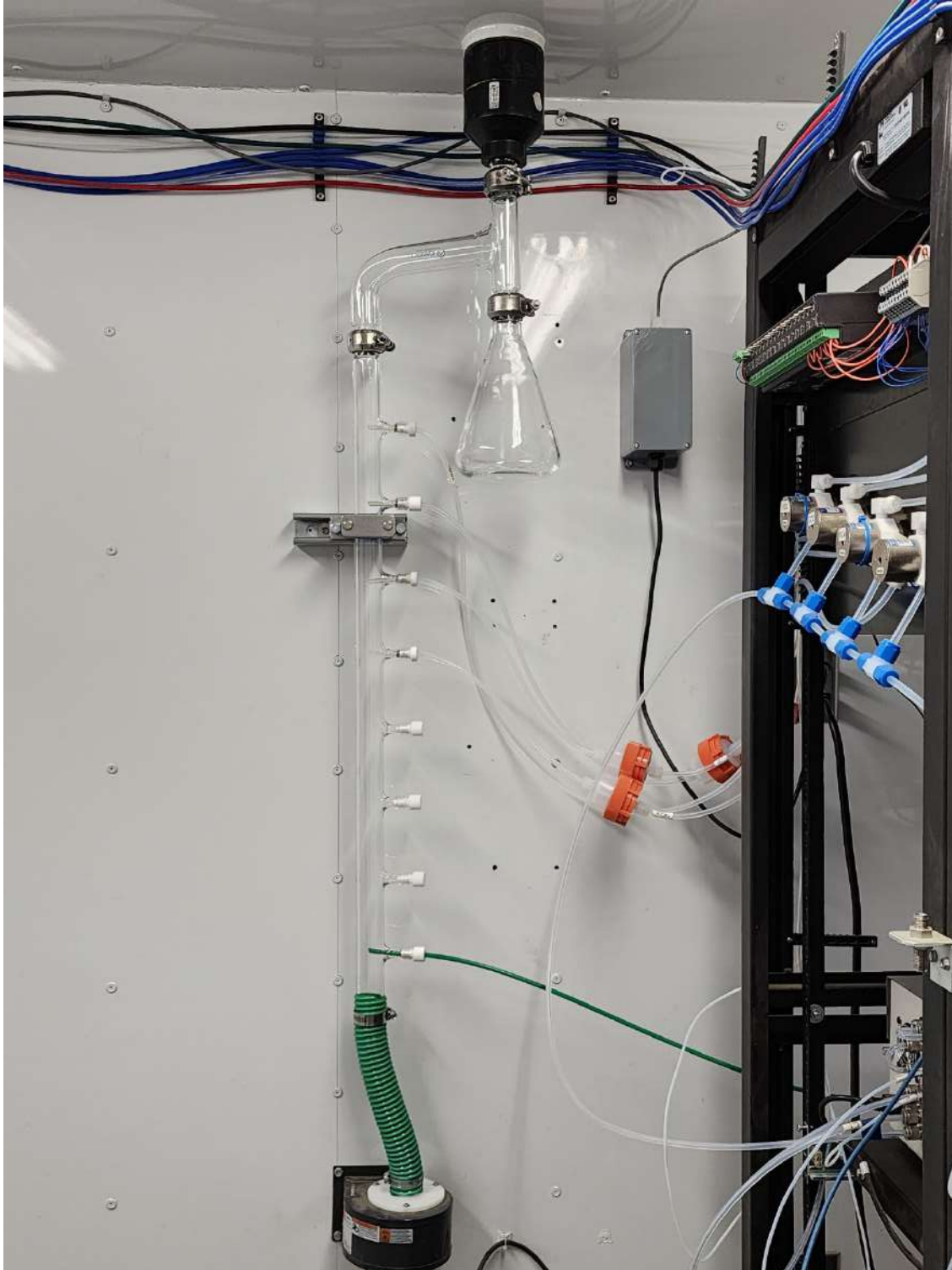


Figure 9 – Photo showing the inlet and sample manifold



Figure 10 – Curb shot of the monitoring station





Figure 11 –Photo of the front and the back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2019 - 2024

Wind Speed (WS) - km/h  
Blackgold

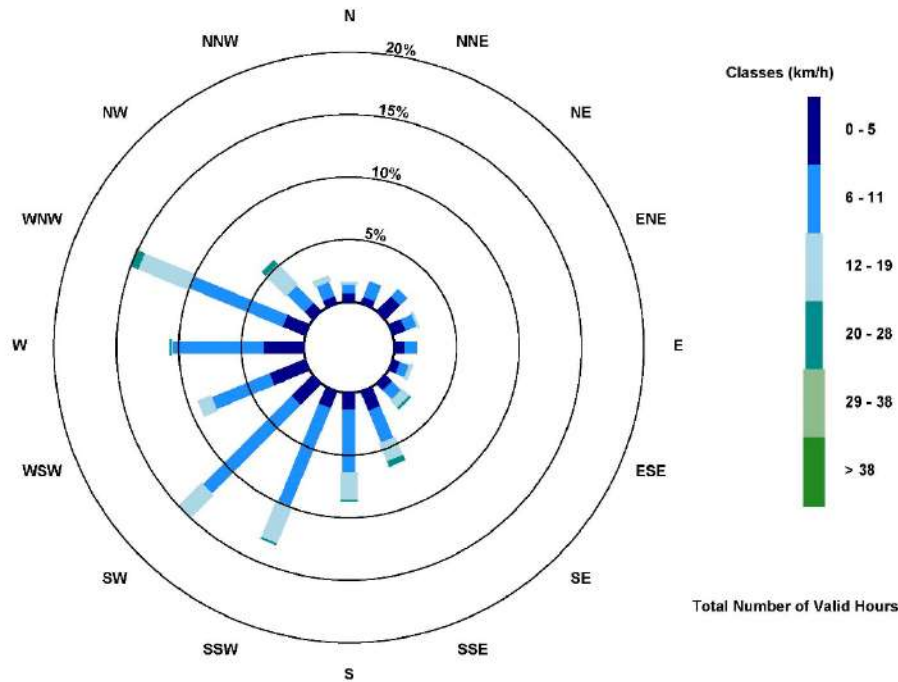


Figure 12 – Windrose (2019-2024)



Wood Buffalo Environmental Association  
**Ambient Air Monitoring Station  
Site Documentation**

Hangingsstone Expansion

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LAST UPDATED: FEBRUARY 25, 2025



# Table of Contents

WBEA Monitoring Network .....	4
Vision.....	4
Mission.....	4
The Region .....	4
The Network .....	4
Time Integrated Sampling.....	4
General Site Information .....	10
Station .....	10
Location.....	10
Owner/Operator/Approval Holder .....	10
Site Description.....	10
Site Influences.....	11
Localized Sources (within 20 metres of station).....	11
Roadway Influences .....	11
Major Point Sources.....	11
Station Equipment .....	12
Analytical Equipment .....	12
Meteorological Equipment .....	12
Support Equipment.....	12
Site photos .....	17
Station Photos.....	22



## Tables and Figures

Table 1.0 - Pollutant parameters monitored in the WBEA network.....	6
Table 1.1 – Meteorological Parameters monitored in the WBEA network .....	7
Table 1.2 – Time-Integrated Parameters monitored in the WBEA network .....	8
Figure 1.0 – WBEA Network Monitoring Sites .....	9
Figure 2.0 – Area topographic map showing AMS 512.....	13
Figure 3.0 – Aerial photo showing AMS 512.....	14
Figure 4.0 – Plan view sketch for AMS 512 site .....	15
Figure 5.0 – Elevation view image for AMS 512 site.....	16
Figure 6.0 – Environment looking North.....	17
Figure 6.1 – Environment looking East .....	18
Figure 6.2 – Environment looking South.....	19
Figure 6.3 – Environment looking West.....	20
Figure 6.4 – Meteorological Tower .....	21
Figure 7.0 – Photo showing the inlet and sample manifold .....	22
Figure 7.1 – Curb shot of the monitoring station .....	23
Figure 7.2 –Photo of the front and the back of instrument rack.....	24
Figure 8.0 – Windrose (five year).....	25

## WBEA Monitoring Network

### Vision

Empower all stakeholders and rights holders with environmental data to make informed decisions.

### Mission

A multi-stakeholder, consensus-based organization providing world-class environmental monitoring and reporting.

### The Region

From north-central Alberta to the borders of Saskatchewan and the Northwest Territories, the Regional Municipality of Wood Buffalo ([www.woodbuffalo.ab.ca](http://www.woodbuffalo.ab.ca)) covers 68,454 square kilometres, making it the second largest municipality in Canada. It was established in 1995 through an amalgamation of the City of Fort McMurray and Improvement District No. 143. The Athabasca Oil Sands Region (AOSR) is within the municipality, and includes both traditional bitumen mining operations and in situ oil production. The region also encompasses the communities of Fort McMurray, Fort Chipewyan, Fort McKay, Anzac, Janvier, and Conklin.

### The Network

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 28 permanent continuous monitoring locations, each measuring various air quality parameters. The continuously measured air quality parameters include Sulphur Dioxide (SO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Total Reduced Sulphur (TRS), Ozone (O<sub>3</sub>), Total Oxides of Nitrogen (NO<sub>x</sub>), Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Ammonia (NH<sub>3</sub>), Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), Particulate Matter less than 2.5µm (PM<sub>2.5</sub>), Total Suspended Particulates (TSP), Total Hydrocarbon (THC), Methane and Non-Methane Hydrocarbons (NMHC). All sites also measure ambient air temperature (AT), wind speed (WS), wind direction (WD), and relative humidity (RH). Selected sites measure barometric pressure (BP), global radiation (GR), precipitation (PC), leaf wetness (LW), vertical wind speed (VWS), vertical temperature gradient VTG) and Present Weather Detector (PWD). The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates six portable monitoring stations. Five of these stations are used for compliance monitoring at sites that require less than 12 months per year. One portable is set up for gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

### Time Integrated Sampling

Since 1998 WBEA has maintained time-integrated sampling for PM<sub>2.5</sub>, PM<sub>10</sub>, VOC and PAH at permanent monitoring sites. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods.

In 2012, the WBEA moved to Hivol PUF sampling for PAH compounds from the previous low volume method. This was done to achieve a lower detection limit for the target analytes. In 2015, the WBEA moved to duplicate sampling for the PM<sub>10</sub> and PM<sub>2.5</sub> time integrated parameters for 2 reasons; (1) to have duplicate mass measurements for QA purposes, (2) to have separate filters for subsequent metals and ion analysis. Elemental and Organic Carbon (ECOC) sampling began on August 7, 2012 at the Bertha Ganter site. ECOC was added and the Wapasu and Stony Mountain sites on May 1, 2018. All time-integrated samples in the WBEA ambient air monitoring network are collected on the National Air Pollution Surveillance (NAPS) schedule every 6 days for a 24-hour period.

The WBEA also collects precipitation samples for chemistry analysis through the National Atmospheric Deposition Program (NADP) at three sites; Bertha Ganter, Wapasu and Stony Mountain. These samples are collected every Tuesday at 12:00.

In 2022, the WBEA added a dustfall sampling network to better understand the larger size settleable particulate in the region. These sites are currently located at the community sites and are collected on a monthly frequency.

The time-integrated parameters for each station are summarized in Table 1.2.

Table 1.0 provides a listing of stations with their names and corresponding WBEA identification number and the air quality parameters measured by continuous methods at each site. Parameters measured include; sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), particulate matter less than 2.5µm (PM<sub>2.5</sub>), total reduced sulphur (TRS), hydrogen sulphide (H<sub>2</sub>S), total hydrocarbons (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	SO <sub>2</sub>	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>2.5</sub>	TRS	H <sub>2</sub> S	THC	NMHC	CO	CO <sub>2</sub>	NH <sub>3</sub>
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X	X	X	X	X
2	COMPLIANCE	MILDRED LAKE	X					X	X	X			
3	METEOROLOGICAL	LOWER CAMP MET TOWER											
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X	X	X		X	X	X			
5	COMPLIANCE/METEOROLOGICAL	MANNIX	X					X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X	X	X	X		X	X			X
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X		X	X	X		
8	COMMUNITY/COMPLIANCE	FORT CHIPEWYAN	X	X	X	X	X				X	X	
9	ATTRIBUTION	BARGE LANDING	X	X		X	X		X	X			
11	COMPLIANCE	LOWER CAMP	X					X	X	X			
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X	X	X	X	X		X	X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X	X	X	X		X	X			
17	COMPLIANCE	WAPASU	X	X	X	X		X	X				
18	BACKGROUND	STONY MOUNTAIN	X	X	X	X	X		X	X	X	X	
19	COMPLIANCE	FIREBAG	X	X				X	X				
20	COMPLIANCE	MACKAY RIVER	X	X				X	X				
21	COMMUNITY	CONKLIN	X	X	X	X	X		X	X			
22	COMMUNITY	JANVIER	X	X	X	X	X		X	X			
23	COMPLIANCE	FORT HILLS	X	X		X	X		X	X			
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X					X					
26	COMPLIANCE	CHRISTINA LAKE	X	X				X					
27	COMPLIANCE	JACKFISH 2/3	X	X				X					
29	COMPLIANCE	SURMONT 2	X	X		X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X	X			
33	COMPLIANCE	MONDAY CREEK	X	X				X					
501	COMPLIANCE	LEISMER	X	X				X					
505	COMPLIANCE	SAWBONES BAY	X	X				X					
506	COMPLIANCE	JACKFISH 1	X	X				X					
507	COMPLIANCE	KIRBY SOUTH	X	X				X	X				
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				
511	COMPLIANCE	BLACKGOLD	X	X				X	X				
512	COMPLIANCE	HANGINGSTONE EXPANSION	X	X				X					

Table 1.0 - Pollutant parameters monitored in the WBEA network



Table 1.1 provides a listing of stations and meteorological parameters measured by continuous methods. Parameters measured include ambient temperature (AT), relative humidity (RH), barometric pressure (BP), wind speed (WS), wind direction (WD), vertical wind speed (VWS), global radiation (GR), total precipitation (PC), and leaf wetness (LW). Sites are categorized by their station type based on the monitoring objectives for the site.

WBEA ID	TYPE	STATION NAME	AT	RH	BP	WS	WD	VWS	GR	PC	LW
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X		X	X		X	X	X
2	COMPLIANCE	MILDRED LAKE	X	X		X	X				
3	METEOROLOGICAL	LOWER CAMP MET TOWER	X	X		X	X	X			
4	COMPLIANCE	BUFFALO VIEWPOINT	X	X		X	X				
5	COMPLIANCE/ METEOROLOGICAL	MANNIX	X	X		X	X	X			
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X				
7	COMMUNITY	ATHABASCA VALLEY	X	X	X	X	X				
8	COMMUNITY/ COMPLIANCE	FORT CHIPEWYAN	X	X		X	X		X		X
9	ATTRIBUTION	BARGE LANDING	X	X	X	X	X				
11	COMPLIANCE	LOWER CAMP	X	X	X	X	X				
13	COMPLIANCE/ ATTRIBUTION	FORT MCKAY SOUTH	X	X		X	X				
14	COMPLIANCE/ COMMUNITY	ANZAC	X	X		X	X				X
17	COMPLIANCE	WAPASU	X	X		X	X			X	
18	BACKGROUND	STONY MOUNTAIN	X	X		X	X		X	X	X
19	COMPLIANCE	FIREBAG	X	X		X	X				
20	COMPLIANCE	MACKAY RIVER	X	X		X	X			X	
21	COMMUNITY	CONKLIN	X	X		X	X				
22	COMMUNITY	JANVIER	X	X		X	X				
23	COMPLIANCE	FORT HILLS	X	X		X	X				
25	EMERGENCY RESPONSE	WASKOW OHCI PIMATISIWIN	X	X		X	X				
26	COMPLIANCE	CHRISTINA LAKE	X	X		X	X				
27	COMPLIANCE	JACKFISH 2/3	X	X		X	X				
29	COMPLIANCE	SURMONT 2	X	X		X	X				
30	COMPLIANCE	ELLS RIVER	X	X		X	X		X		
33	COMPLIANCE	MONDAY CREEK	X	X		X	X				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
507	COMPLIANCE	KIRBY SOUTH	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				
511	COMPLIANCE	BLACKGOLD	X	X		X	X				
512	COMPLIANCE	HANGINSTONE EXPANSION	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network

Table 1.2 provides a listing of stations and air quality parameters measured by time integrated methods. Parameters measured include volatile organic compounds (VOC), particulate matter less than 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>) and associated metals and ions, particulate matter less than 10 µm aerodynamic diameter (PM<sub>10</sub>) and associated metals and ions, polycyclic aromatic hydrocarbons (PAH), precipitation chemistry (PRECIP), and dustfall (DUSTFALL) samples.

WBEA ID	TYPE	STATION NAME	VOC	PM <sub>2.5</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PAH	PRECIP	DUSTFALL
					ECOC				
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	X	X	X	X	X	X	X
6	COMMUNITY	PATRICIA MCINNES	X	X		X	X		X
7	COMMUNITY	ATHABASCA VALLEY	X	X		X	X		X
8	COMPLIANCE/COMMUNITY	FORT CHIPEWYAN	X	X		X	X		
9	ATTRIBUTION	BARGE LANDING	X						
13	COMPLIANCE/ATTRIBUTION	FORT MCKAY SOUTH	X			X			
14	COMPLIANCE/COMMUNITY	ANZAC	X	X		X	X		X
17	COMPLIANCE	WAPASU			X			X	
18	ENHANCED DEPOSITION/ BACKGROUND	STONY MOUNTAIN			X			X	
21	COMMUNITY	CONKLIN	X	X		X	X		X
22	COMMUNITY	JANVIER	X	X		X	X		X
23	COMPLIANCE	FORT HILLS	X			X			
30	COMPLIANCE	ELLS RIVER	X			X			

Table 1.2 – Time-Integrated Parameters monitored in the WBEA network

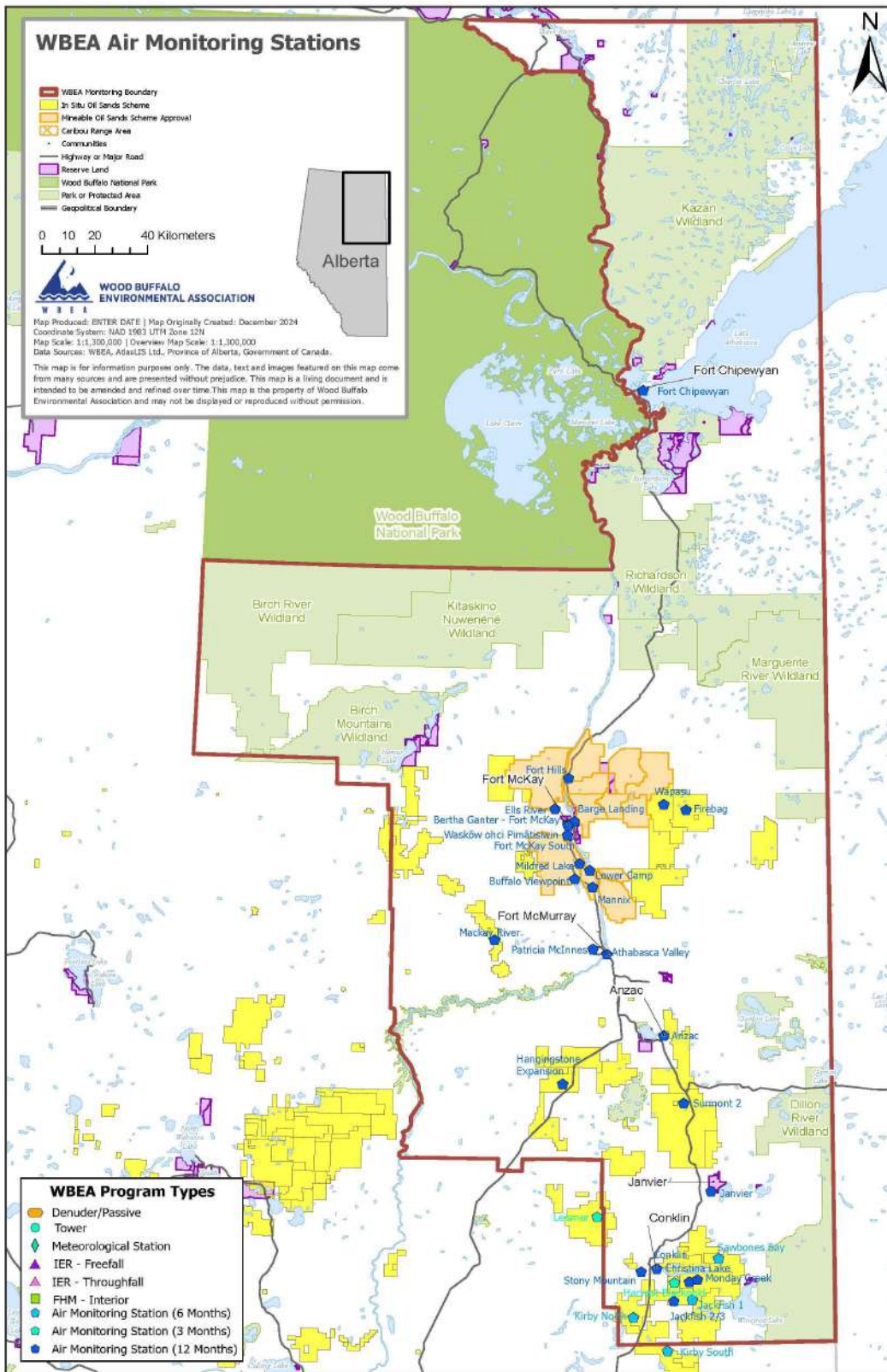


Figure 1.0 – WBEA Network Monitoring Sites

## General Site Information

### Station

Station ID	AMS 512
Station name	Hangingstone Expansion
Date station established	July 1, 2024

### Location

Station street address	NA
Legal land description	12-13-84-11-W4
Airshed Zone	Wood Buffalo Environmental Association
Latitude	56.283250
Longitude	-111.608580
UTM East	462323
UTM North	6237772
Nearest community	Fort McMurray
Community population	68,002
Census Year	2021

### Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Address of Operating Agency	Unit 3, 805 Memorial Drive, Fort McMurray, Alberta T9K 0K4
Name of Approval Holder	Greenfire Resources
Approval number	153105-01-00
Contact Name	Salim Jagirdhar
Address	NA
Phone number	403-671-3079
Email address	sjagirdhar@greenfireres.com

### Site Description

Land use by sector	0 – 90 degrees	Lay-down yard/Muskeg
	91 – 180 degrees	Muskeg/Access Road
	181 – 270 degrees	SAGD plant
	271 – 360 degrees	Lay-down yard/Access Road/Muskeg
Site elevation (m) (above sea level)		
Angle of elevation to nearby buildings	Greatest angle	N/A
	Building direction	N/A
Airflow restrictions	North	N/A
	East	N/A
	South	N/A



	West	N/A
Distance to nearest trees (m)	North	100m
	East	50m
	West	50m
	South	40m
Sample manifold	Type	All glass
	Inlet height above roof	1 metre
Meteorological Sensors	Type	Cup and vane
	Height above ground (m)	10
	Distance from station (m)	0

### Site Influences

#### Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Lay down	20m	Lay down for equipment and rig mats

#### Roadway Influences

Type	Traffic Volume	Distance (m)	Description
Access Road	Low	20m	Roadway used by site workers
Main Access Road	High	100m	Main Road to go to Site

#### Major Point Sources

Facility Name	Source Type	Production Capacity	Distance from site (km)	Compass direction from site
Green fire Expansion	SAGD		0.7	SW
Green fire Demo Plant	SAGD		4.8	NW

## Station Equipment

Equipment Owner:

## Analytical Equipment

Parameter	Make	Model	Serial Number	Date Installed
SO2	Thermo Environmental	43i	1173410001	June 2024
H2S	Thermo Environmental	34iTLE	1336160090	June 2024
NO2	Teledyne/API	T200	7029	June 2024
H2S	Global Converter	G150	11638	June 2024

## Meteorological Equipment

Parameter	Make	Model	Serial Number	WMO Site Class	Date Installed
AT/RH	Vaisala	HMP155	H5110025	4	June 2024
WS	Met One	010C-1	B10017	4	June 2024
WD	Met One	020C-1	D13603	4	June 2024

## Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	2575
Gas Dilution Calibrator	Dynamic dilution calibrator	Teledyne/API	T700	2445
Zero air generator	Zero Air Generator	Teledyne/API	701	138
Shelter / Building	Air monitoring portable	ITB	8 x 16 trailer	ITB-13-16018
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	N/A

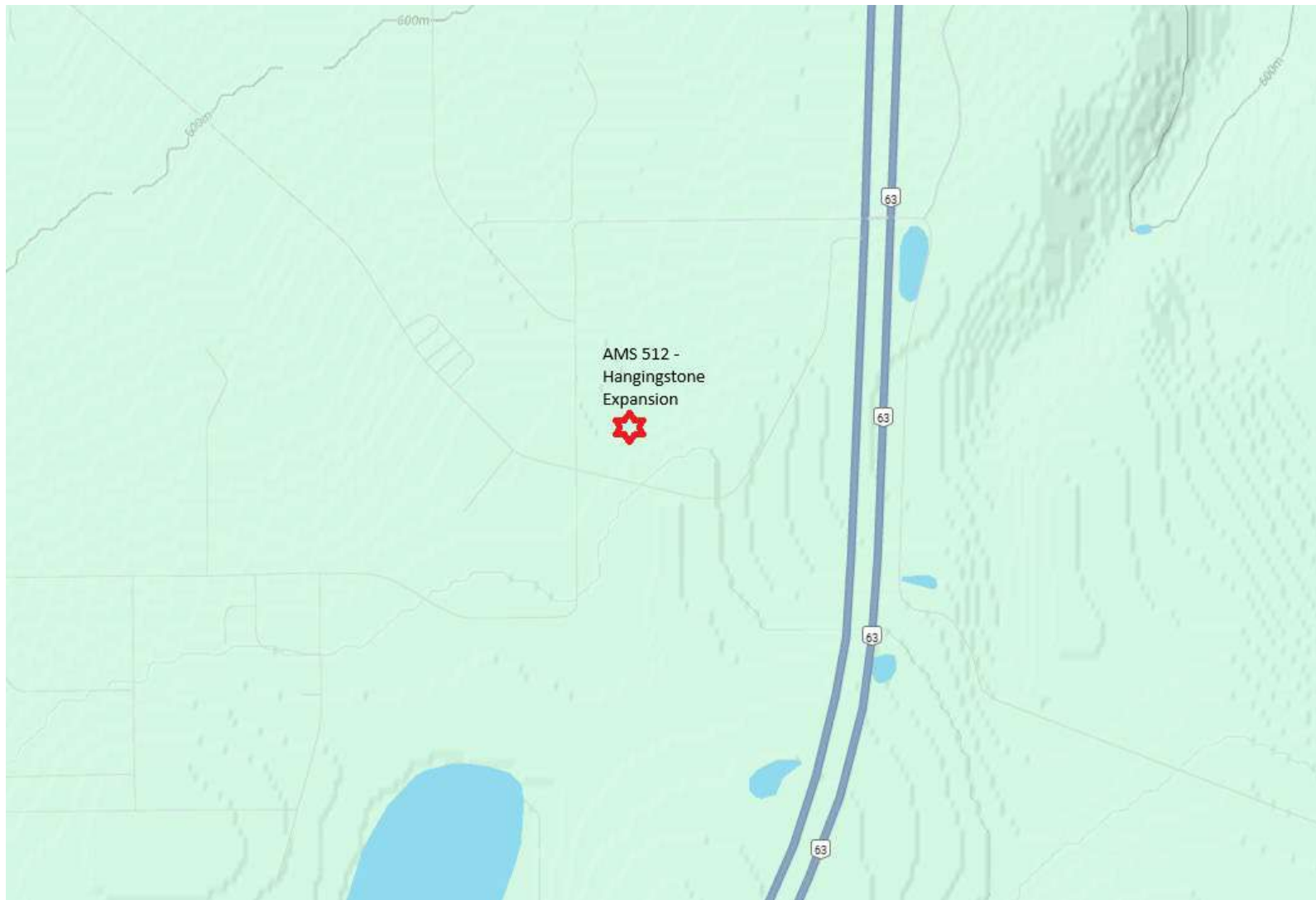


Figure 2.0 – Area topographic map showing AMS 512

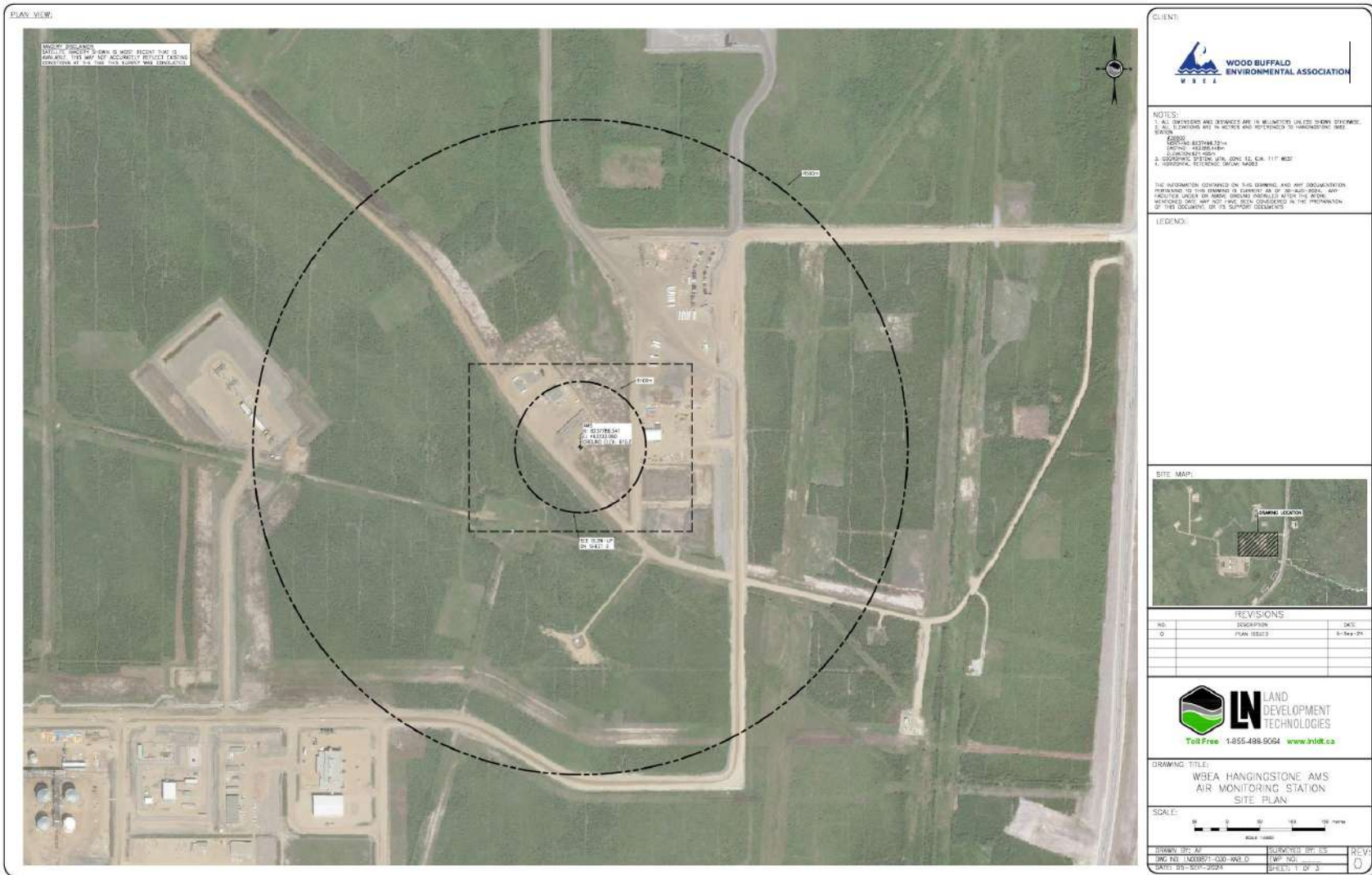


Figure 3.0 – Aerial photo showing AMS 512





Figure 5.0 – Elevation view image for AMS 512 site



## Site photos

The following photos show the environment surrounding the monitoring station.



Figure 6.0 – Environment looking North





Figure 6.1 – Environment looking East





Figure 6.2 – Environment looking South



Figure 6.3 – Environment looking West



Figure 6.4 – Meteorological Tower



## Station Photos

The following photos show the monitoring station and instrumentation.

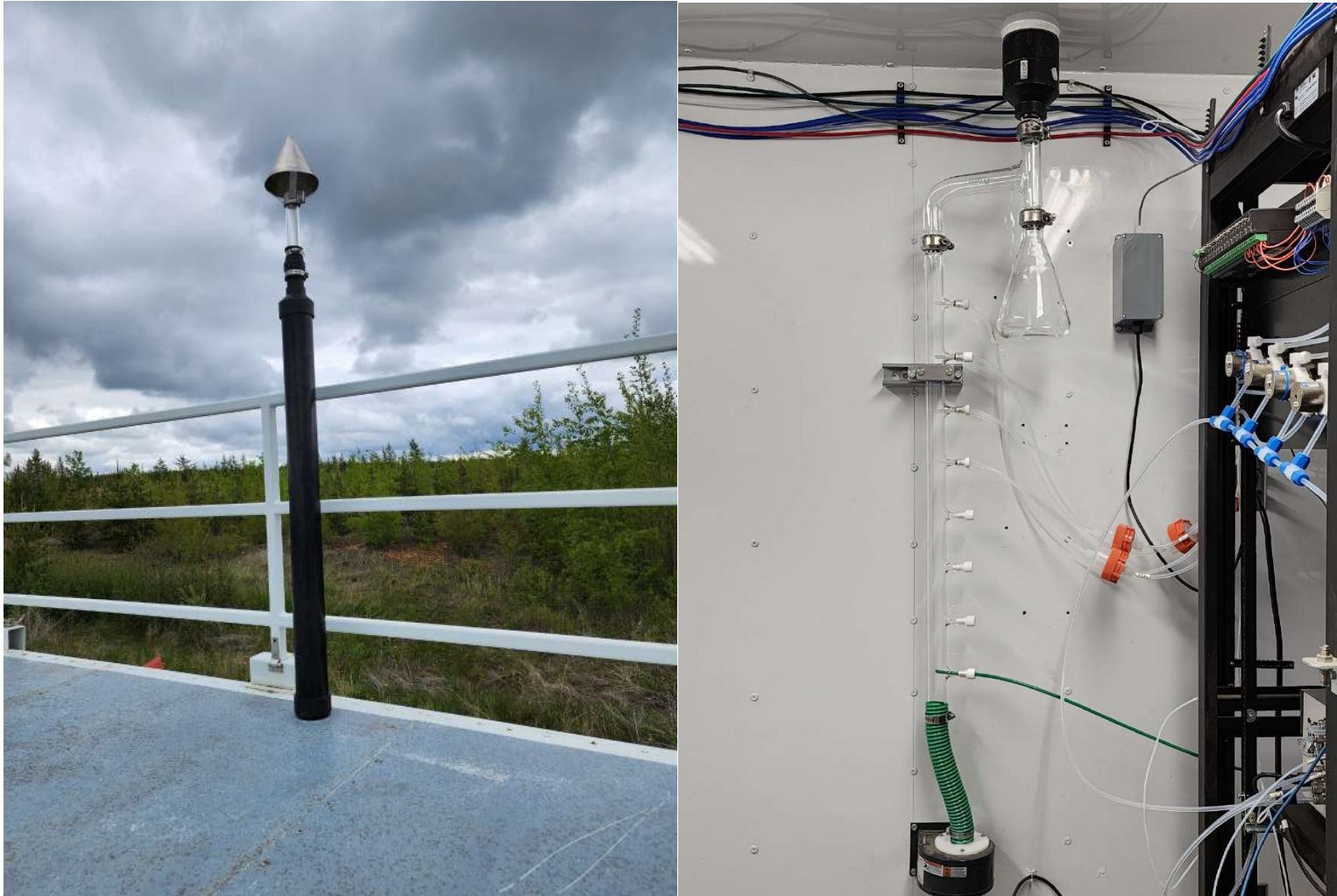


Figure 7.0 – Photo showing the inlet and sample manifold





Figure 7.1 – Curb shot of the monitoring station



Figure 7.2 –Photo of the front and the back of instrument rack



Wood Buffalo Environmental Association  
Wind Rose 2020 - 2025

Wind Speed 10m (WS10) - km/h  
Hangingstone Expansion

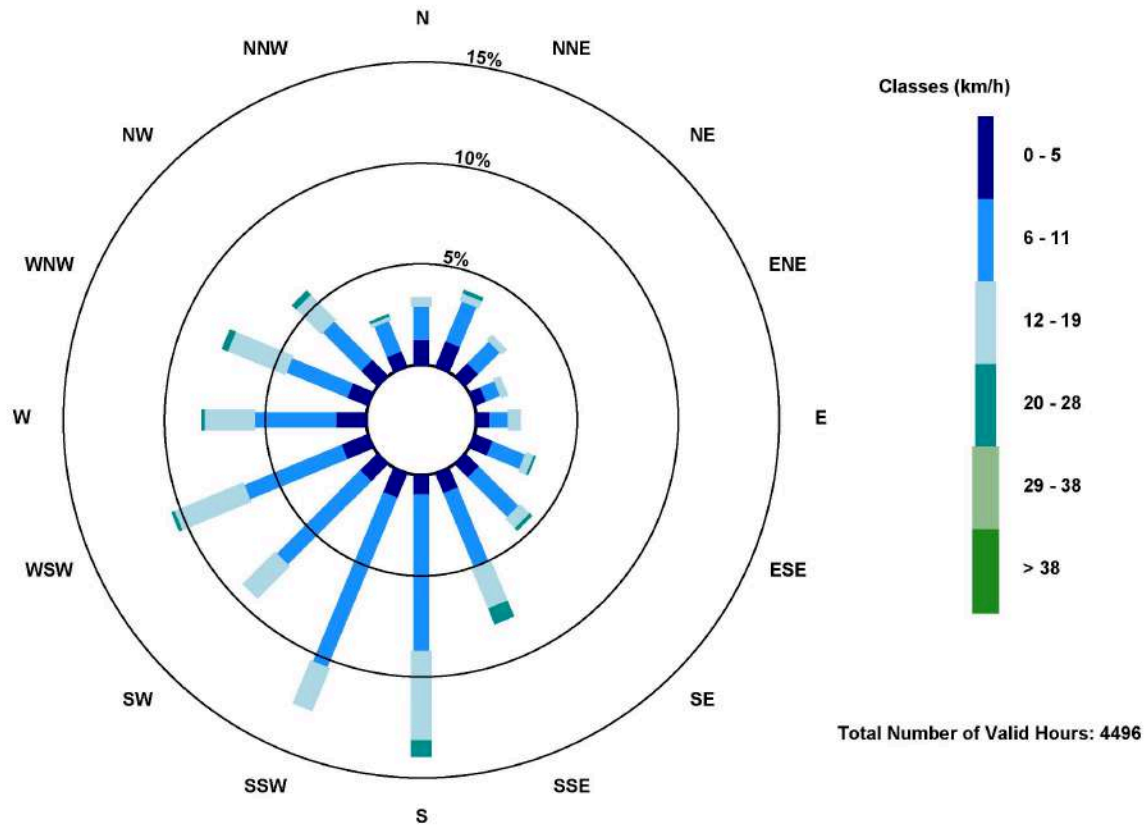


Figure 8.0 – Windrose (2020-2025)



# End of Report - Volume 3