Wood Buffalo Environmental Association

Ambient Air Monitoring Station
Site Documentation

Janvier

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WBEA Monitoring Network

Vision

People are empowered to make informed decisions to ensure a safe and healthy environment.

Mission

The Wood Buffalo Environmental Association is a multi-stakeholder, consensus-based organization that leads in state of the art environmental monitoring to enable informed decision-making.

Continuous ambient air quality and meteorological data are collected under the Ambient Air Monitoring (AAM) group in WBEA. The WBEA currently operates 29 permanent continuous monitoring stations, each measuring various air quality parameters. The continuously measured air quality parameters include SO_2, H_2S, TRS, O_3, NO_X, NO, NO_2, NH_3, CO, CO_2, $PM_{2.5}$, THC, NMHC, and CH_4. All sites also measure ambient air temperature, wind speed, wind direction, and relative humidity. Selected sites measure barometric pressure, global radiation, precipitation, surface wetness, vertical wind speed, vertical temperature gradient, and visibility. The ambient air monitoring parameters for each station are summarized in Table 1.0 and 1.1.

The WBEA also maintains and operates five portable monitoring stations. The configuration of these stations differs depending on their task. Three are configured for compliance monitoring and are equipped to measure SO_2, H_2S, NO_X, NO, NO_2, THC, wind speed, wind direction, temperature. One portable is equipped to monitor all these compliance parameters as well as $PM_{2.5}$. The last portable is set up to operate gas chromatography systems and currently has a Sulphur and VOC GC installed to collect speciated data for the Odour Monitoring Program within WBEA.

Since 1998 WBEA has maintained time-integrated sampling for $PM_{2.5}$, PM_{10}, VOC and PAH. The sampling for time-integrated monitoring has evolved with a better understanding of technology, analytical laboratory methods and sample deployment and collection methods. 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 time-integrated parameters for each station are summarized in Table 1.2.

WBEA ID	TYPE	STATION NAME	SO_2	$NO/NO_2/NO_X$	O_3	$PM_{2.5}$	TRS	H_2S	THC	Methane / NMHC	CO	CO_2	NH_3
1	COMMUNITY	BERTHA GANTER-FORT MCKAY	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/ METEORLOGICAL	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	
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			
501	COMPLIANCE	LEISMER	X	X				X	X				
505	COMPLIANCE	SAWBONES BAY	X	X				X	X				
506	COMPLIANCE	JACKFISH 1	X	X			X						
508	COMPLIANCE	KIRBY NORTH	X	X				X	X				

Table 1.0 - Pollutant Parameters monitored in the WBEA network

WBEA ID	TYPE	STATION NAME	Temperature	RH	BP	Wind Speed	Wind Direction	Vertical Wind Speed	Solar Radiation	Precipitation	Leaf Wetness
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/ METEORLOGICAL	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				
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				
501	COMPLIANCE	LEISMER	X	X		X	X				
505	COMPLIANCE	SAWBONES BAY	X	X		X	X				
506	COMPLIANCE	JACKFISH 1	X	X		X	X				
508	COMPLIANCE	KIRBY NORTH	X	X		X	X				

Table 1.1 – Meteorological Parameters monitored in the WBEA network

WBEA ID	TYPE	STATION NAME	VOC	$PM_{2.5}$ Mass, Metals and Ions	PM2.5 Mass, ECOC	PM_{10} Mass, Metals and Ions	PAH	PRECIP
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	
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	
30	COMPLIANCE	ELLS RIVER	X			X		

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

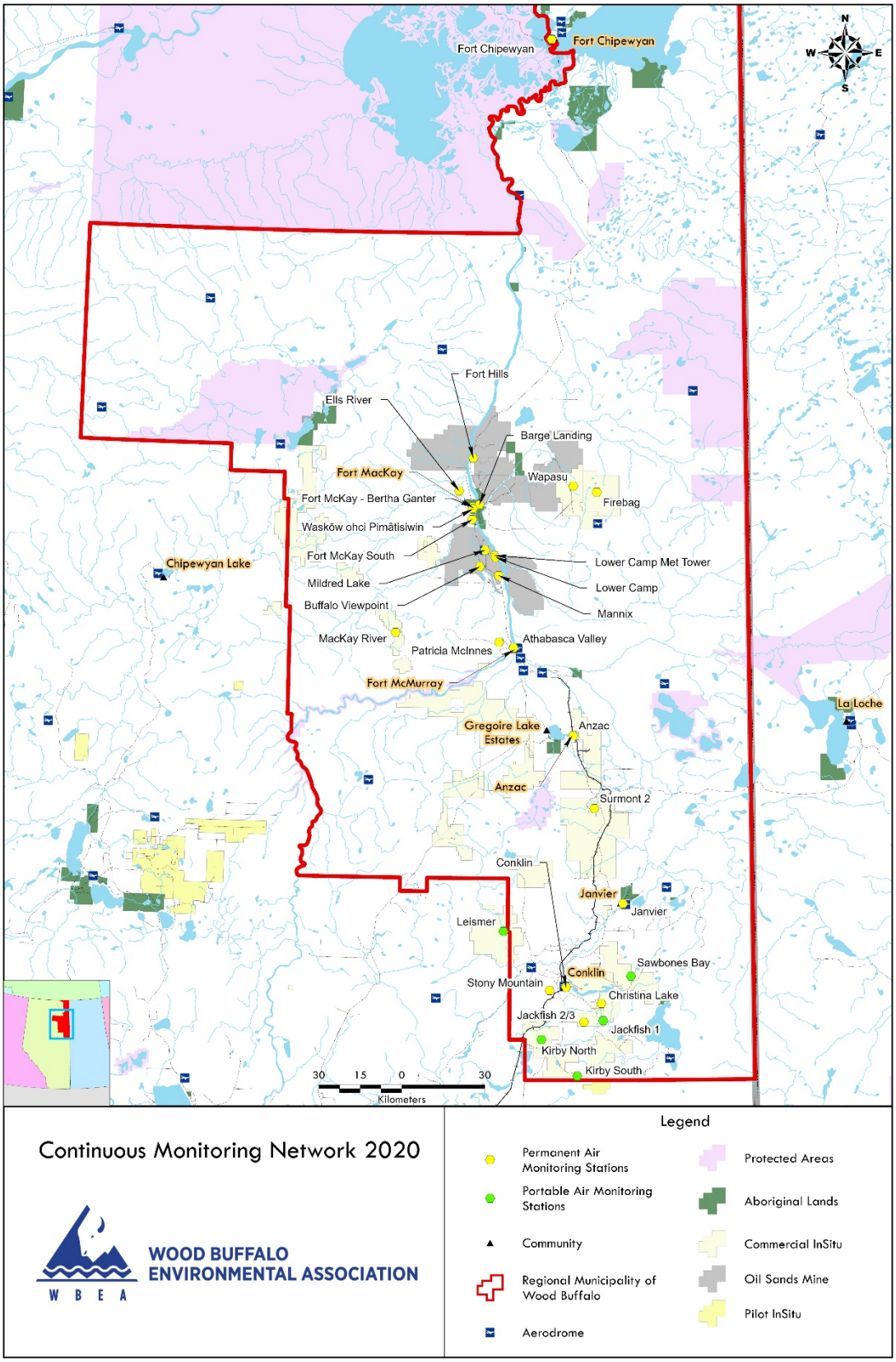

Figure 1.0 – WBEA Network Monitoring Sites

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
Latitude	55.903242
Longitude	-110.749744
UTM East	515647
UTM North	6195323
Nearest community	Janvier
Community population	104

Owner/Operator/Approval Holder

Operating Agency	Wood Buffalo Environmental Association
Name of Approval Holder	NA
Approval number	NA
Contact Name	NA
Address	NA
Phone number	NA
Email address	NA

Site Description

Land use by sector	0 – 90 degrees	Trees
	91 – 180 degrees	Main road
	181 – 270 degrees	Main road
	271 – 360 degrees	Trees and House
Site elevation (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)
Sample manifold	Type	All glass
	Inlet height above roof	1 metre

Meteorological Sensors	Type	Cup and vane
	Height above ground	10 m
	Distance from station	0

Site Influences

Localized Sources (within 20 metres of station)

Type	Distance (m)	Description
Vehicles	25 m East	Main road
Residence	20 m West	Housing area

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

Analytical Equipment

Parameter	Owner	Make	Model	Serial Number	Date Installed
Sulfur Dioxide	WBEA	Thermo Instruments	43i	1152430006	2016
Total reduced Sulphur	WBEA	Thermo Instruments	43iTLE	1152430006	2018
Oxides of Nitrogen	WBEA	Teledyne/API	T200	722	2017
Non-methane	WBEA	Thermo	55i	1172750023	2018
Temperature/RH	WBEA	Vaisala	HMP155	G4330042	2018-12-27
Wind speed	WBEA	Met One	010C-1	U11126	2016
Wind direction	WBEA	Met One	020C-1	U11346	2016
Ozone	AEP	Thermo Instruments	49i	1227254861	2016
Volatile organic compounds	WBEA	Tisch	TE-123	1019	2018
PM 2.5	WBEA	Teledyne/ API	T640	325	2018
Particulate Sampler	WBEA	Thermo Instruments	2000i	2000I2 0388 1308	2019
Particulate Sampler	WBEA	Thermo Instruments	2000i	2000I2 04891408	2019
PAH Sampler	WBEA	Tisch	TE-PUFPLUSBL	1001099	2019

Support Equipment

Name	Description	Make	Model	Serial Number
Datalogger	Datalogger	Campbell Scientific	CR3000	2586
Zero air generator	Zero Air Generator	Teledyne/API	701	138
HVAC	Heating and air conditioning system. Wall mount unit	BARD	1 ton	314P143189505-02
Shelter / Building	Air monitoring portable	ITB	10x20	ITB-15-16494
Gas Dilution Calibrator	Mass flow controlled gas dilution	Teledyne/API	T700	2657
Hydrogen Generator	H2 supply for NMHC	Parker Hannifin	14950646	16HMD0142
TRS converter	Thermal oxidizer	CD Nova	CDN-101	565

Figure 2.0 – Area Topographic map showing AMS 22

Obstacle	Distance from the station (m)	Height of the Obstacle (m)
1 Tree	34	9
2 Tree	45	17
3 Group of trees	77	15

Figure 3.0 – Plan view sketch for AMS 22 site

Figure 4.0 – Aerial photo showing AMS 22

Site photos

The following photos show the environment surrounding the monitoring station.

Figure 5.0 – Environ Looking North

Figure 5.1 – Environ Looking East

Figure 5.2 – Environ looking South

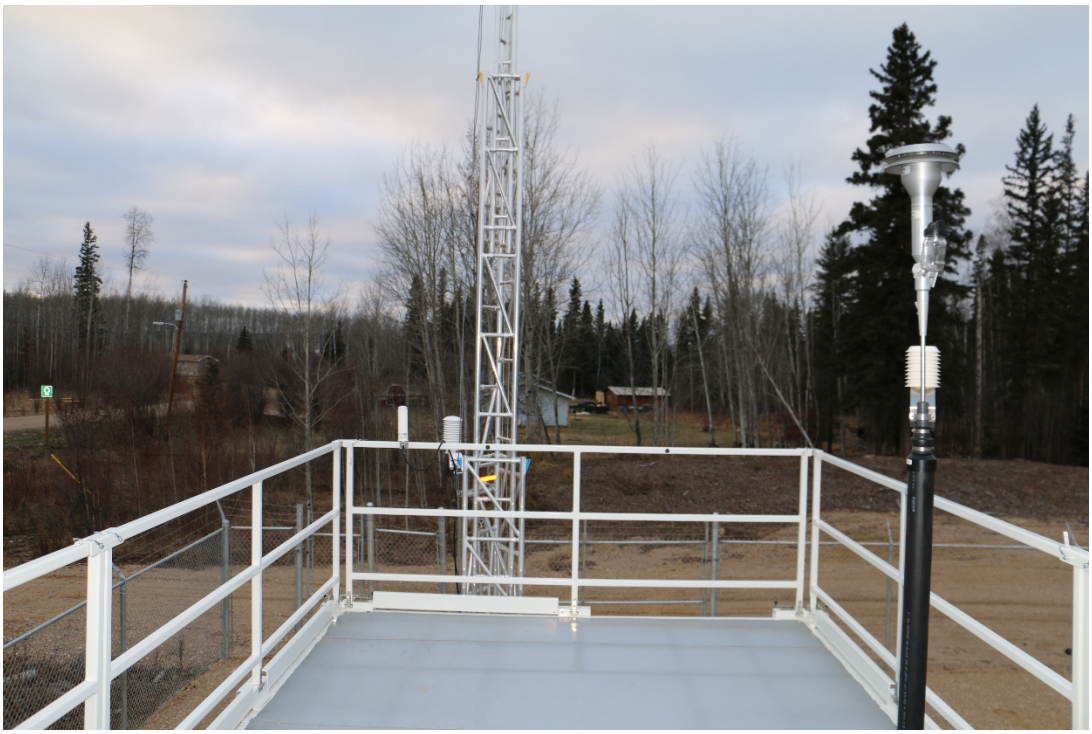

Figure 5.3 – Environ Looking West

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 front and back of instrument rack

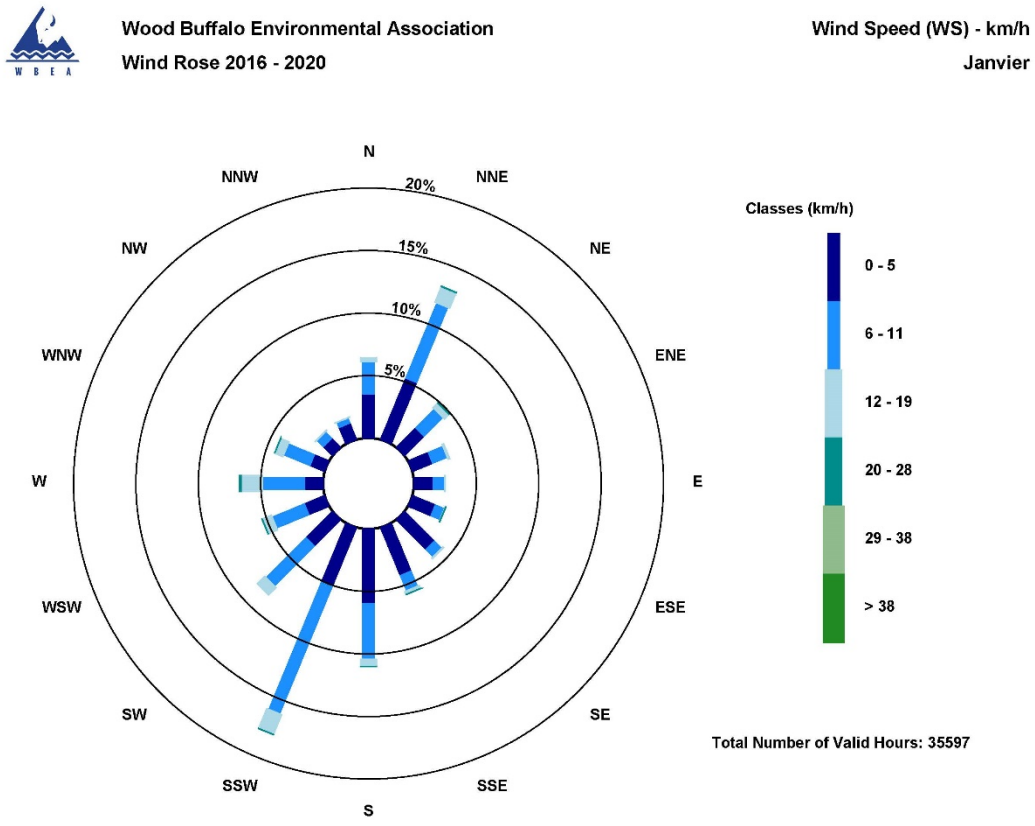

Figure 7.0 – Windrose (Five Year)