

5- YEAR LONG-TERM MONITORING OR OPERATIONAL ACTIVITY WORK PLAN

Changes to this Work Plan are only accepted via an Approved Addendum.

General Information	
Monitoring Category: <i>(From OSM long-term plan; choose from drop-down menu)</i>	Atmospheric Monitoring
Strategic Monitoring Objective: <i>(From OSM long-term plan; choose from drop-down menu)</i>	Objective: Detect and report concentration levels and trends of atmospheric substances that are likely to cause adverse human and/or environmental health effects.
Work Plan Unique Identifier:	A-LTM-S-1-1718
Monitoring Activity Title:	Atmospheric Pollutant Active Monitoring Network
Geographic Location <i>(choose from drop-down menu, if Project Location is in more than one area choose from second drop-down)</i>	Athabasca Oil Sands Region
Monitoring Site(s) Coordinates <i>(latitude and longitude)</i>	See Appendix I
Monitoring Organization and Responsible Manager:	Wood Buffalo Environmental Association, Lakeland Industry and Community Association, and Peace River Area Monitoring Program Bob Myrick
Date Monitoring initiated:	2012
Specific Monitoring Objective: <i>(State the monitoring objective addressed through this monitoring)</i>	The primary monitoring objectives for the long-term active air monitoring network in the oil sands region are: <ol style="list-style-type: none"> (1) Provide ambient data which will allow the assessment of current state and trends of the ambient air quality. (2) Provide ambient air information for community monitoring needs including: (i) information for human health risk assessments; and (ii) measuring representative ambient concentrations in populated areas. (3) Provide ambient information to assist in understanding the impact of multiple sources on the quality of air.

<p>Deliverables (Annual):</p> <p><i>What Data Reports will be produced and when?</i></p>	<ol style="list-style-type: none">(1) Data from continuous monitoring is made available in near real-time on AEP's web site at www.airquality.alberta.ca and on Airshed web sites at www.wbea.org (Wood Buffalo region data), www.lica.ca (Cold Lake region data) and at a future web site for Peace River region data. Currently continuous data from the Peace River region is emailed to AEP air staff daily. Real time data from the Peace River region is available on the Northern Sunrise County website at www.northernsunrisecounty.net.(2) Quality controlled continuous data is provided to the Alberta Airdata warehouse within two months of data collection (www.airdata.alberta.ca). Quality controlled data for the air monitoring stations operated by the Wood Buffalo Environmental Association (WBEA) are also available at www.wbea.org.(3) Quality controlled semi-continuous data will available from WBEA's and LICA's website. A copy of any semi-continuous data from the Peace region will be sent to AEP when laboratory analyses are completed.(4) Annual data reports are provided to AEP by March 31st for the previous year of data collection. This is a regulatory obligation required by industry approvals.(5) WBEA, LICA and PRAMP also produce annual data reports that are publicly available.
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Monitoring Plan Summary: *Please summarize the monitoring including relevant information such as background, objectives, monitoring area, methods/monitoring design, assumptions, outcomes, and references. These should align with the information provided in Appendix 1: Annual Monitoring Schedule.*

Background

The Active Ambient Air Monitoring Program includes long-term continuous and semi-continuous (time integrated) monitoring in and around the Athabasca, Cold Lake and Peace River oil sands deposits. Active monitoring in the Athabasca, Cold Lake and Peace River regions is undertaken by the Wood Buffalo Environmental Association, the Lakeland Industry and Community Association, and the Peace River Area Monitoring Program Committee, respectively. The suite of parameters monitored at each station is based on the monitoring needs/objectives for the area. These objectives should be reviewed on a regular basis. A detailed list of parameters monitored at each active monitoring station is listed in Appendix I.

Continuous air monitoring provides one hour average concentrations for a number of criteria air contaminants including carbon monoxide (CO), ammonia (NH₃), oxides of nitrogen (NO, NO₂, NO_x), ozone (O₃), particulate matter (PM_{2.5}), sulphur dioxide (SO₂), and hydrocarbons (THC, CH₄/NMHC, CH₄). These pollutants are produced by various sources and contribute to smog, acidic precipitation, eutrophication and odour events. Hydrocarbons and ammonia are also important in the consideration of odour events. In order to determine if emission management actions are effective for an area, concentrations of criteria air contaminants are compared to the Canadian Ambient Air Quality Standards, Alberta Ambient Air Quality Objectives and the Land Use Framework's Air Quality Management Framework Triggers and Limits.

In addition to criteria air contaminants, hydrogen sulphide (H₂S) and total reduced sulphur (TRS) are monitored at some active monitoring sites. These sulphur compounds are often associated with odour events. All active monitoring sites also measure temperature, wind speed and wind direction. Some stations monitor additional meteorological parameters (Appendix I). These parameters help identify potential sources and/or atmospheric conditions associated with measured concentrations.

The semi-continuous integrated samples include gaseous and particulate samples collected for analysis of volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and particulate matter mass and composition. These samples are often integrated over a 24 hour period (i.e. the sample period is 24 hours). While continuous monitoring of THC, CH₄/NMHC, and CH₄ can provide general information on hydrocarbon concentrations in an area, speciated VOCs and PAHs can provide a wealth of information on the type and quantity of individual compounds. Individual VOCs and PAHs can have differing physical and chemical properties, toxicities and sources. Concentrations of VOCs and PAHs can inform on potential sources, increase knowledge on precursor availability and contribution from atmospheric transformation. Similarly particulate matter composition may be used to better understand the origin of the measured particulate mass concentration in an area. Particulate matter may be directly emitted or produced by atmospheric processes/reactions. Knowledge of composition is vital to assessing and improving the management of particulate matter concentration especially in regions with various potential sources. Currently analysis for VOCs, PAHs and particulate matter composition are conducted by more than one laboratory. In the future, AEP will need to assure that the data received from all laboratories is comparable.

At some active monitoring sites, weekly samples of precipitation are collected and analyzed for ions. The data from these sites are used to determine acidifying precipitation. In the future, AEP will need to add dry deposition monitoring at some of these sites. This will allow the determination of both dry and wet acidifying deposition at selected sites. Modelling studies have shown that in Alberta dry deposition contribution is notable.

Figure 1 shows the active air monitoring stations that are funded by the oil sands monitoring program. There are additional active air monitoring in the oil sands region conducted by industry and is not funded through the oil sands monitoring program.

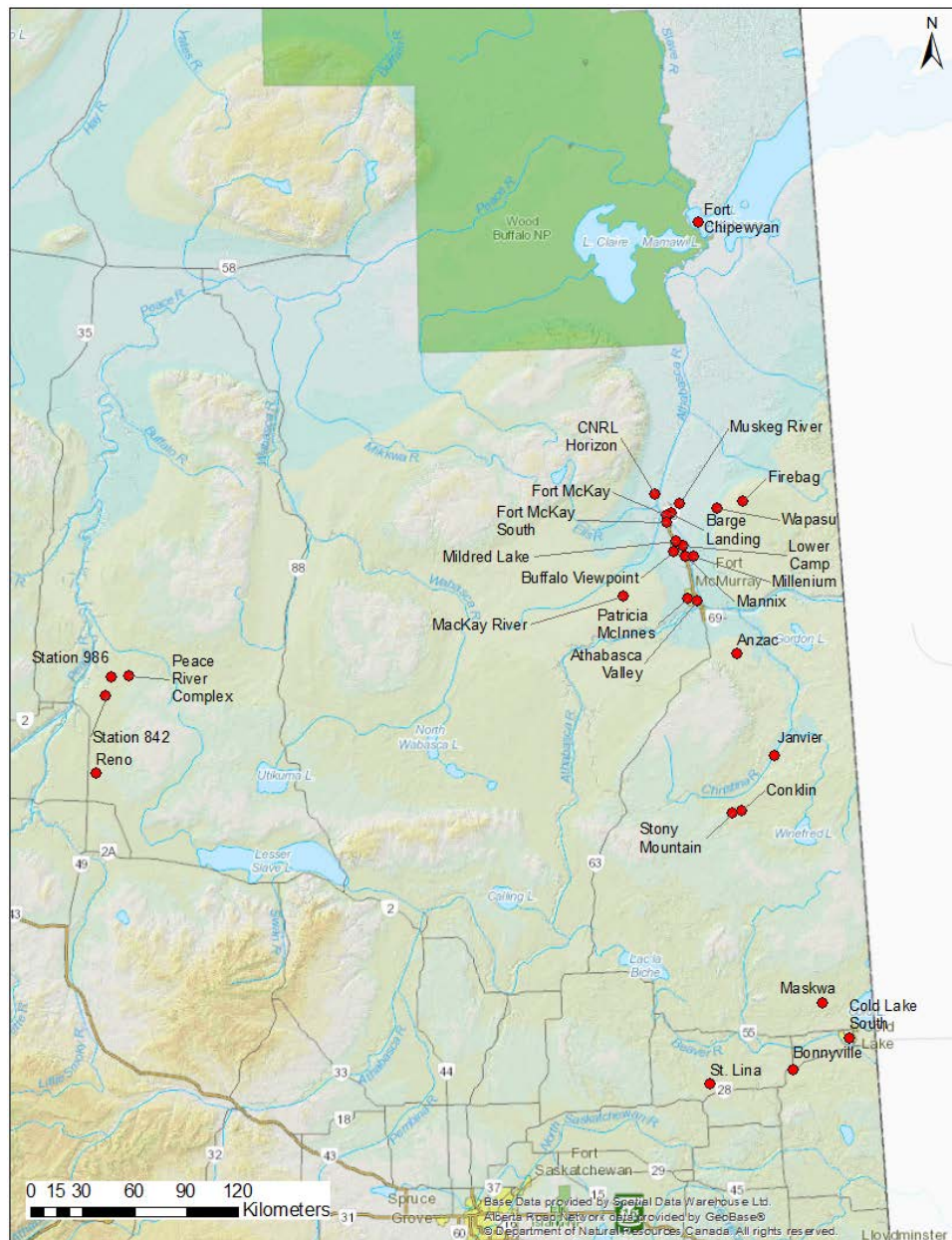


Figure 1 Long-term active ambient air quality monitoring network in the Athabasca, Cold Lake and Peace River oil sands region. There are 5 portable active ambient air quality monitoring stations operated in the Athabasca oil sands region that are not indicated on this map.

Monitoring Objectives

Primary Objectives:

1. Provide ambient data which will allow the assessment of:

- Current state of air quality,
 - Trends in measured concentration, and
 - Identifying hot-spots and emerging issues.
2. Provide representative ambient concentrations in populated areas to inform:
 - Information for human health risk assessments, and
 - The Air Quality Health Index (AQHI).
 3. Provide ambient concentration to assist in understanding the impact of multiple sources on the quality of air in the Oil Sands region. Including ability to distinguish between oil sands specific sources of emissions from other natural and anthropogenic sources

Secondary Objective:

4. Provide ambient data needed to support validation of air quality modeling and remote sensing that are conducted in the oil sands region.

Monitoring Area

The areal extent of the active air monitoring program includes the Regional Municipality of Wood Buffalo, the Cold Lake Oil Sands Deposit and the Peace River Oil Sands Deposit. The extent of the monitoring is concentrated within close proximity of each oil sands deposit and monitoring gaps may exist in the areas between each oil sands deposit and also upwind and downwind of the oil sands deposits.

Methods/Monitoring Design

The methods used to monitor air quality continuously within the three oil sands deposits are consistent with the requirements of the Air Monitoring Directive (Alberta Environment and Parks, 2016). The instrumentation is standard and is used across the country in routine air monitoring. The monitoring protocols are well documented and available to the public (see Appendix I).

The monitoring methods used to measure particulate matter, volatile organic compounds and polycyclic aromatic hydrocarbons using semi-continuous or time-integrated techniques also must follow the requirements of the Air Monitoring Directive. However, there are inconsistencies between monitoring methods, monitoring protocols and laboratory analysis methods that may need to be addressed, documented and harmonized throughout the oil sands monitoring region.

Assumptions

A high priority recommendation that resulted from the 2015 network assessment (Sonoma Technology Inc. 2015) is to “Assess redundancies in the densely clustered areas of monitoring using a combination of correlation analysis and/or removal bias with the area served and emissions served information for the continuous measurement network data for SO₂, NO₂, H₂S, THC, and TRS (especially along the Athabasca River Valley and Conklin).” A focused study was initiated in 2016-17 aimed at optimizing the existing long-term active air monitoring network (see Activity A1-3-1-16-17 from the 2016-17 Oil Sands Work Plan) initially concentrating on the Athabasca oil sands region. The results of this study will be used to develop recommendations for optimizing the air monitoring network including identifying specific redundancies and gaps in the network.

The five-year budget indicated in this project plan reflects efficiencies in operation of the current monitoring network and does not take into account changes to the network that may result from the network optimization.

The future long-term active air monitoring programs are expected to change notionally as follows:

- The number of air monitoring stations in the Athabasca oil sands will be reduced and superstations (more intensive monitoring) may be established at fewer locations.
- The use of portable monitoring may be implemented to meet specific regulatory requirements.
- Additional of monitoring needed to address the recommendations of the Alberta Health/AER recurrent complaint response recommendations.
- A modest increase of monitoring in the Peace River oil sands region if the industry continues to expand in this region. Also a station in the Town of Peace River may be needed.
- A modest increase of monitoring in the Cold Lake oil sands region if the industry continues to expand.
- All of the above assumptions are subject to a scientific assessment prior to making a recommendation.
- It is assumed that most long-term ambient air monitoring will still be contracted to airsheds.

The above changes, if implemented, should result in cost saving over the next five years. The budget does indicate increases from Years 3 to 5 based on inflation.

Outcomes

- (1) The appropriate ambient air quality data will be available to assess air quality relative to specific objectives or standards such as:
 - Alberta's Ambient Air Quality Objectives or other thresholds (e.g. WHO)
 - limits and triggers in defined by regional plans
 - national standards (Canadian Ambient Air Quality Standards)
- (2) The public will be informed on the status of air quality using measures such as the Air Quality Health Index
- (3) Long-term air quality trends will be reported
- (4) The appropriate long-term air quality data set will be available for human and environmental health assessments

References

Alberta Energy Regulator. 2014. Report of Recommendations on Odours and Emissions in the Peace River Area. AER Response. April 15, 2014.

Alberta Environment and Parks. 2016. <http://aep.alberta.ca/air/legislation/air-monitoring-directive/>.

Dann and Edgerton. 2011. Review of the WBEA Air Monitoring Network. Prepared For Wood Buffalo Environmental Association, #100 – 330 Thickwood Blvd., Fort McMurray, Alberta T9K 1Y1. Prepared by Tom Dann, Ottawa, ON, Canada and Eric Edgerton, Cary, NC, USA. December 20, 2011.

PRAMP. 2015. Terms of Reference Peace River Area Monitoring Program (PRAMP). Approved 28 May 2015.

RWDI Air Inc. 2008. Review of the LICA Ambient Air Quality Monitoring Network. Submitted to: Michael Bisaga Airshed Program Manager, Lakeland Industry and Community Association. February 29, 2008.

Sonoma Technology Inc. 2015. Assessment of Ambient Air Monitoring in the Oil Sands Area of Alberta. Final report prepared for the Alberta Environmental Monitoring, Evaluation, and Reporting Agency. Edmonton, Alberta. June 2015.

Appendix 1 – Annual Monitoring Schedule

(Please provide detailed information on the specifics of your monitoring schedule including – **locations, schedule, methods, SOPs, QA/QC data release, references**)

<u>Sampling Locations/Sites</u>	<u>Sampling Schedule (timing/frequency)</u>	<u>Compounds to be Analyzed</u>	<u>SOPs to be Consulted (hyperlinks accepted)</u>	<u>QA/QC Complete & Date Data to be Released</u>
Fort McKay - Bertha Ganter (AMS 1)	Continuous	SO ₂ , TRS, ozone, NO _x , NO, NO ₂ , NH ₃ , PM _{2.5} , THC, NMHC, CH ₄ , wind speed, wind direction, temperature, relative humidity, radiation, surface wetness, precipitation amount.	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Mildred Lake (AMS 2)	Continuous	SO ₂ , H ₂ S, THC, wind speed and wind direction, temperature, relative humidity.	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Lower Camp Met tower(AMS 3)	Continuous	Wind speed, wind direction, vertical wind speed, temperate all measured at 20, 45, 100 and 167 meters	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Buffalo Viewpoint (AMS 4)	Continuous	SO ₂ , H ₂ S, THC, Wind speed, wind direction, temperature and relative humidity.	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Mannix (AMS 5)	Continuous	SO ₂ , H ₂ S, THC, wind speed, wind direction, vertical wind speed, temperature, relative humidity	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Patricia McInnes (AMS 6)	Continuous	SO ₂ , TRS, ozone, NO _x , NO, NO ₂ , NH ₃ , PM _{2.5} , THC, NMHC, CH ₄ , wind speed, wind direction, temperature and relative humidity, precipitation	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Athabasca Valley (AMS 7)	Continuous	SO ₂ , TRS, ozone, NO _x NO, NO ₂ , CO, PM _{2.5} THC, NMHC, CH ₄ , wind speed, wind direction, temperature, relative	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.

		humidity and barometric pressure.		
Fort Chipewayn (AMS 8)	Continuous	SO ₂ , ozone, NO _x NO, NO ₂ , PM _{2.5} , wind speed, wind direction, temperature, relative humidity, radiation, surface wetness and precipitation amount.	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Barge Landing (AMS 9)	Continuous	TRS, THC, wind speed, wind direction, temperature, relative humidity, barometric pressure.	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Lower Camp B (AMS 11)	Continuous	SO ₂ , H ₂ S, THC, wind speed, wind directions, temperature, relative humidity	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Fort McKay South (AMS 13)	Continuous	SO ₂ , TRS, ozone, NO _x NO, NO ₂ , PM _{2.5} , THC, wind speed, wind direction, temperature, relative humidity.	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Anzac (AMS 14)	Continuous	SO ₂ , TRS, Ozone, NO _x , NO, NO ₂ , PM _{2.5} , THC, NMHC, Methane, Wind direction, Wind speed, Temperature, Relative Humidity, Radiation, Surface wetness, precipitation amount.	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
CNRL-Horizon (AMS 15)	Continuous	SO ₂ , TRS, NO _x NO, NO ₂ , PM _{2.5} , THC, wind speed, wind direction, temperature, relative humidity, radiation, precipitation amount.	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Shell Muskeg River (AMS 16)	Continuous	SO ₂ , NO _x NO, NO ₂ , PM _{2.5} , THC, wind speed, wind direction, temperature, relative humidity, barometric pressure.	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Wapasu Creek (AMS 17)	Continuous	SO ₂ , H ₂ S, ozone, NO _x NO, NO ₂ , PM _{2.5} , THC, wind speed, wind direction, temperature, relative humidity, precipitation	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.

		amount.		
Brion MacKay River (AMS 20)	Continuous	SO ₂ , H ₂ S, THC, NO, NO ₂ , NO _x , wind direction, wind speed, relative humidity, temperature and precipitation amount.	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Conklin (AMS 21)	Continuous	SO ₂ , TRS, ozone, NO _x , NO, NO ₂ , ozone, PM _{2.5} , THC, NMHC, CH ₄ , wind speed, wind direction, temperature, relative humidity.	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Suncor Firebag (AMS 19)	Continuous	SO ₂ , H ₂ S, NO _x , NO, NO ₂ , THC, wind speed, wind direction, temperature, relative humidity	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Stony Mountain (AMS 18)	Continuous	SO ₂ , NO _x , NO, NO ₂ , ozone, THC, NMHC, CH ₄ , wind speed, wind direction, temperature, relative humidity, radiation	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Janvier (AMS 22)	Continuous	SO ₂ , NO _x , NO, NO ₂ , ozone, THC, NMHC, CH ₄ , wind speed, wind direction, temperature, relative humidity,	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Portable AMS Hemp Station	Continuous	SO ₂ , NO _x , NO, NO ₂ , THC, TRS, , wind speed, wind direction, temperature, relative humidity	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Portable AMS Niska	Continuous	SO ₂ , NO _x , NO, NO ₂ , H ₂ S, wind speed, wind direction, temperature, relative humidity	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Portable AMS Mahihkan	Continuous	SO ₂ , NO _x , NO, NO ₂ , TRS, PM _{2.5} , wind speed, wind direction, temperature, relative humidity	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.
Portable AMS Northern Lights	Continuous	SO ₂ , NO _x , NO, NO ₂ , H ₂ S, THC, wind speed, wind direction, temperature, relative humidity	http://wbea.org/air/standard-operating-procedures	Within 2 months from data collection.

Bonnyville	Continuous	SO ₂ , H ₂ S, NO _x , NO, NO ₂ , ozone, PM _{2.5} THC, NMHC, CH ₄ , wind speed, wind direction, temperature.	Lakeland Industry and Community association SOP 001-008 http://environmentalmonitoring.alberta.ca/resources/standards-and-protocols/	Within 2 months from data collection.
Maskwa	Continuous	SO ₂ , H ₂ S, NO _x NO, NO ₂ , THC, wind speed, wind direction, temperature, barometric pressure and precipitation amount.	Lakeland Industry and Community association SOP 001-008 http://environmentalmonitoring.alberta.ca/resources/standards-and-protocols/	Within 2 months from data collection.
St. Lina	Continuous	SO ₂ , H ₂ S, ozone, NO _x , NO, NO ₂ , PM _{2.5} , THC, wind speed, wind direction, temperature and precipitation amount.	Lakeland Industry and Community association SOP 001-008 http://environmentalmonitoring.alberta.ca/resources/standards-and-protocols/	Within 2 months from data collection.
Cold Lake South	Continuous	SO ₂ , TRS, ozone, NO _x , NO, NO ₂ , PM _{2.5} THC, wind speed, wind direction, temperature, relative humidity.	Lakeland Industry and Community association SOP 001-008 http://environmentalmonitoring.alberta.ca/resources/standards-and-protocols/	Within 2 months from data collection.
Reno	Continuous	SO ₂ , TRS, THC, CH ₄ , NMHC, wind speed, wind direction, temperature and barometric pressure and relative humidity	No formal SOPs	Within 2 months from data collection as of Oct 1, 2016
Station 842	Continuous	SO ₂ , TRS, THC, CH ₄ , NMHC, wind speed, wind direction, temperature and barometric pressure and relative humidity	No formal SOPs	Within 2 months from data collection as of Oct 1, 2016
Station 986	Continuous	SO ₂ , TRS, THC, CH ₄ , NMHC, wind speed, wind direction, temperature and barometric pressure and relative humidity	No formal SOPs	Within 2 months from data collection as of Oct 1, 2016
Peace River Complex	Continuous	SO ₂ , TRS, wind speed, wind direction, temperature.	No formal SOPs	Within 2 months from data collection as of Oct 1, 2016
Fort McKay – Bertha Ganter (AMS 1)	Semi continuous: 24 hour integrated once every six days	VOCs (65), PAHs (23), PM metals (45), ions (10)	http://wbea.org/air/standard-operating-procedures	To be completed

Fort McKay South (AMS 13)	Semi continuous: 24 hour integrated once every six days	VOCs (65)	http://wbea.org/air/standard-operating-procedures	To be completed
Patricia McInnes (AMS 6)	Semi continuous: 24 hour integrated once every six days	VOCs (65), PAHs (23), PM metals (45), ions (10)	http://wbea.org/air/standard-operating-procedures	To be completed
Athabasca Valley (AMS 7)	Semi continuous: 24 hour integrated once every six days	VOCs, PAHs, PM metals, ions	http://wbea.org/air/standard-operating-procedures	To be completed
Barge Landing (AMS 9)	Semi continuous: 24 hour integrated once every six days	VOCs (65)	http://wbea.org/air/standard-operating-procedures	To be completed
Anzac (AMS 14)	Semi continuous: 24 hour integrated once every six days	VOCs (65), PAHs (23), PM metals (45), ions (10)	http://wbea.org/air/standard-operating-procedures	To be completed
CNRL – Horizon (AMS 15)	Semi continuous: 24 hour integrated once every six days	VOCs (65)	http://wbea.org/air/standard-operating-procedures	To be completed
Cold Lake South	Semi continuous: 24 hour integrated once every six days	VOCs (101) and PAHs (27)	To be completed	To be completed
Bonnyville	Semi continuous: 24 hour integrated once every six days	VOCs (101) and PAHs (27)	To be completed	To be completed
Station 986	Semi continuous: event triggered	VOCs	To be completed	To be completed
Station 842	Semi continuous: event triggered	VOCs	To be completed	To be completed
Reno	Semi continuous: event triggered	VOCs	To be completed	To be completed
Fort McKay – Bertha Ganter (AMS 1)	7 day precipitation sample	Cations and anions	http://wbea.org/air/standard-operating-procedures	AEP receives results from laboratory when analysis are completed (one month after sample)

				collection)
Patricia McInnes (AMS 6)	7 day precipitation sample	Cations and anions	http://wbea.org/air/standard-operating-procedures	AEP receives results from laboratory when analysis are completed (one month after sample collection)
Cold Lake South	7 day precipitation sample	Cations and anions	To be completed	AEP receives results from laboratory when analysis are completed (one month after sample collection)

Appendix 2 – Detailed Multi-Year Financial Breakdown: if changes are to be made then an Addendum must be Complete and Approved.

(Complete the following detailed financial breakdown; add or delete categories as required)

Budget requirements	Year 1 (2017- 2018)		Year 2 (2018- 2019)		Year 3 (2019- 2020)		Year 4 (2020- 2021)		Year 5 (2021- 2022)	
	OSM Funding	External Funding	OSM Funding	External Funding	OSM Funding	External Funding	OSM Funding	External Funding	OSM Funding	External Funding
1) Salaries and benefits										
a) Appendix 3 – Totals	\$55,000 (AEP)		\$55,000 (AEP)		\$35,000 (AEP)		\$25,000 (AEP)		\$25,000 (AEP)	
2) Operations and Maintenance										
a) Vehicles and Transportation										
b) Helicopter										
c) Lab analysis										
d) Data management										
e) Field work										
3) Consumable Materials and supplies										
a) Calibration gases and equipment parts										
4) Travel										
a) Conferences and meetings (identify conference/mee										

ting)										
b) Field work – travel										
c) Project-related travel										
5) External Contracts										
a) WBEA – See Appendix 5	\$8,324,376-WBEA		\$8,013,183-WBEA		\$8,413,841-WBEA		\$8,834,534-WBEA		\$9,276,261-WBEA	
b) LICA – See Appendix 6,	\$932,921-LICA		\$990,000-LICA		\$1,100,000-LICA		\$1,050,000-LICA		\$1,100,000-LICA	
c) PRAMP – See Appendix 7.	\$837,620-PRAMP		\$820,512-PRAMP		\$861,538-PRAMP		\$1,111,538-PRAMP		\$1,011,538-PRAMP	
Grand Total	\$10,149,917	\$0	9,878,695	\$0	\$10,410,379	\$0	\$11,021,072	\$0	\$11,412,799	\$0

Appendix 3 – Staffing Plan

(Complete the following detailed staffing plan; add or delete categories as required)

Responsible Role	Year 1 – Budget Allocation		Year 2 – Budget Allocation		Year 3 – Budget Allocation		Year 4 – Budget Allocation		Year 5 – Budget Allocation	
	OSM Funding (AEP Only)	External Funding	OSM Funding	External Funding	OSM Funding	External Funding	OSM Funding	External Funding	OSM Funding	External Funding
Science Expertise	0.50 FTE (\$50,000)		0.50 FTE (\$50,000)		0.30 FTE (\$20,000)		0.20 FTE (\$20,000)		0.20 FTE (\$20,000)	
Technical/Field Staff										
Administrative and Program Coordination	0.05 FTE (\$5,000)		0.05 FTE (\$5,000)		0.05 FTE (\$5,000)		0.05 FTE (\$5,000)		0.05 FTE (\$5,000)	
Grand Total <i>(inserted into Appendix 2)</i>	0.55 FTE (\$55,000)		0.55 FTE (\$55,000)		0.35 FTE (\$35,000)		0.25 FTE (\$25,000)		0.25 FTE (\$25,000)	

Appendix 4 – Detailed Budget for External Contractor (WBEA)

Budget requirements	Description	Year 1 (2017-2018)
		OSM Funding
1) Salaries and benefits		
a) Technical and Field Staff	17 Full time Technical and 1 Summer Student	\$2,424,678
b) Administrative and Program Coordination	Portion of 7 Administration staff and 2 contracts	\$1,008,775
c) Science Expertise	Science and Technical consultation	\$25,000
2) Operations and Maintenance		
a) Vehicles and Transportation	Leased vehicles, repairs, insurance, gas	\$235,264
b) Helicopter		
c) Lab analysis	Lab analysis of semi-continuous parameters and shipping	\$900,000
d) Data management	Data reporting, QAQC validation, Data Translation, Software License, IT infrastructure and support services, website reporting, rss feeds AQHI, emergency response, data backups, data security, data hosting and publications	\$333,463
e) Station and Site Maintenance	Station infrastructure and site access repairs	\$200,000
f) Data Telemetry and cell phone costs	Station modems, data plans, cell phone and satellite phone plans, emergency response data feeds	\$110,000
g) Station and Facilities Expenses	Station Insurance, Tower Lease, Land Agreements, Utilities, Office Equipment Lease and expenses	\$319,377
h) Building Leases and Occupancy Costs	Taiganova bays lease and occupancy costs	\$843,778
i) Quality Assurance	Data Audits, Documentation Management, QAP, Site Documentation - AMD)	\$115,000
j) Safety	Site Access training, PPE, general safety training, Certificate of Recognition (COR), Health and Safety Policies	\$71,368
k) Shipping	General shipping fees, brokerage fees, freight charges	\$20,000
l) Emergent Items	Unplanned emergency items that needs to be resolved within fiscal year. Requires special resolution and approval to be spent.	\$128,838
3) Consumable Materials and supplies		

a) Support Gases	Reference standards, calibration gases, support gases	\$160,000
b) Materials and Consumables	Critical parts, spare parts, pump rebuild kits, pumps, scrubbing materials, tubing, inlet filters, tools, sample lines, electrical wires, etc.	\$225,000
4) Travel		
a) Field work – travel	Fort Chipewyan - air travel, accommodation and vehicle rental, per diems	\$18,000
b) Program work - travel	AEP/ECCC - Air related travel	\$95,787
c) Conferences, training and meetings	Staff Development, Presentations, Air -specific workshops, conferences	\$102,736
5) External Contracts		
a) External Professional Fees	External Contract fees for Technical Specialists, Software Licence, Alarm Monitoring, Data Analysis Level 3 QA, University Research contracts for post graduate work	\$475,000
b) Stakeholder Honorariums	Honorariums for Indigenous and ENGO involvement	\$47,894
c) Financial Audit and Legal	Perform financial audits and legal reviews of contracts and human resource matters	\$45,472
6) Capital Expense		
a) Capital - Spare Parts	Critical and Spare parts over \$1000 in value	\$75,000
b) Capital - Equipment	Equipment Replacement and new Inventory	\$280,000
c) Capital - Support Equipment	Computers, modems, data loggers, IT related	\$45,000
d) Capital - Office Equipment	Office Equipment - Program related	\$18,947
Grand Total		\$8,324,376



Appendix 5 – Detailed Budget for External Contractor (LICA)

Year 1 (2017- 2018)	
Activity	Cost
Lab Analysis	
PAH/VOC Program (120 routine samples + 60 triggered samples)	\$135,000
Partisol Program (183 routine samples)	\$9,125
Data Management	
Continuous Program report preparation, data uploads	\$16,600
Integrated Program report preparation data uploads	\$2,600
Data System Licensing	\$6,695
Quality System Maintenance and Auditing	\$5,803
Data and Reporting Specialist	\$49,100
Field Work	
Continuous Program (monthly calibrations, site visits)	\$200,000
PAH/VOC Integrated Program sample collection and deployment	\$78,000
Partisol Program sample collection and deployment	\$37,800
Consumable Materials and Supplies	
Utilities and Rent	\$18,550
Snow Removal	\$7,500
Preventative Maintenance HVAC	\$12,000
Preventative Maintenance AQM Equipment	\$28,000
Sample Shipping to AITF	\$3,000
Capital Replacement	
THC St. Lina	\$27,000
H2S Maskwa	\$23,000
SO2 Maskwa	\$20,000
Administration Costs	
Program Management, Salary, Expenses, Payroll	\$196,022
Meeting Costs, Food, Stipend	\$17,822
Insurance	\$13,177
Utilities	\$4,017
Maintenance, Rent, Taxes	\$14,864
Office Supplies, Xerox, Postage, Capital Purchases	\$7,246
Total	\$932,921

Appendix 6 – Detailed Budget for External Contractor (PRAMP)

Budget Category	2017-18
Monitoring Costs	
Continuous Trailer Operations/Maintenance - Station 986	\$108,100
Trailer Power - Station 986	\$2,500
Signage - Station 986	\$260
Continuous Trailer Operations/Maintenance - Station 842	\$108,100
Trailer Power - Station 842	\$2,500
Signage - Station 842	\$260
Continuous Trailer Operations/Maintenance - PRC	\$108,100
Trailer Power - PRC	\$4,000
Signage - PRC	\$260
Continuous Trailer Operations/Maintenance- Reno	\$108,100
Trailer Power - Reno	\$5,000
Signage - Reno	\$260
Triggered VOC Canisters (Assumes 6 canisters per year)	\$24,000
Data Validation and Tech Reporting (Monthly Reports, Data Hosting, Data to AEP Warehouse)	\$75,000
Subtotal Monitoring Costs	\$546,440
Administrative/Functional Costs	
Executive Director (contract fees + travel costs)	\$75,000
Technical Program Manager (contract fees + travel costs)	\$105,000
Financial Accounting & Treasurer	\$30,000
Legal Services	\$5,000
Audit	\$6,500
Insurance	\$3,000
Office Management (teleconference fees, occasional meeting room rental, mail services)	\$5,000
Bank Fees	\$500
Website Maintenance (to provide real-time data)	\$5,000
Subtotal Administrative/Functional Costs	\$235,000
Capital Costs	
Equipment Replacement or New Inventory (to be purchased by AEP)	\$56,180
Subtotal Capital Costs	\$56,180
Subtotal Monitoring and Administration (Ambient Air Quality Surveillance)	\$837,620

Appendix 7 - Approvals

Project Submitted by:		
Name:		
Organization:	Signature:	Date:
Project Approved by:		
Dr. Monique Dubé (AEP)		Dr. Kevin Cash (ECCC)
Signature 		Signature 
Date		Date