

# 2018-19 Work Plan Template

All fields with an \* are mandatory

Project Description Summary			Co-Chair Decision (March 8, 2018)
Date *	Project/Work Plan Identifier (if applicable)	Program Type and Strategic Alignment *	<p><b>*Decision Pool C: Activity paused; new project paused.</b></p> <p>* Activity paused pending outcomes of the Deposition Monitoring Integration Workshop</p> <p>* It is a requirement that key members of the project team participate in a Deposition Monitoring Integration Workshop to be informed by the Oil Sands Monitoring Secretariat.</p> <p>*Funding in 2018/19 is dependent upon the findings of the Deposition Monitoring Integration Review and Workshop.</p>
10/01/2018	N/A	OSM - Focus Study	
Program Category *	Status *	Dept. ID	
Air/Atmosphere/Climate	New Project	1104 - 03418	
<b>Project Leadership / Contact information</b>			
Project Title *	Key Words (max 10) *		
Assessing the impact of nutrient and alkaline dust emissions on jack pine forests in the AOSR	Alkalization, base cations, chemical endpoint, ecosystem impacts, Jack pine forest health,		
Surname *	Given Name *	Title *	
Akililu	Yayne-abebe	Atmospheric Scientist	
Organization *	Department	Division	
Alberta Provincial	Alberta Environment and Parks	Environmental Monitoring and Science	
Branch *	Section/Unit (if applicable)	Phone *	
Science	Airshed Sciences	7802297204	
Email *	Mailing Address	City	
<a href="mailto:Yayne.Akililu@gov.ab.ca">Yayne.Akililu@gov.ab.ca</a>	10th Floor, 9888 Jasper Ave NW	Edmonton	
Postal Code	EMSD Executive Owner (If Applicable)		
T5J 5C6	Bill Donahue		
<b>Project Information</b>			
Project Objective(s) (Bullet Form) *	<ul style="list-style-type: none"> <li>Select analogues of high and low impacted ecological survey sites,</li> <li>Conduct detailed plant physiology, soil chemistry and soil water chemistry measurements and laboratory experiments that will be used to investigate causal relationship between atmospheric deposition and ecological effects, and</li> <li>Using information obtained from detailed field measurements and laboratory experiments, parameterize a soil biogeochemical model to investigate the response of forest ecosystems in the oil sands to atmospheric deposition of base cations in the region.</li> </ul>		
Plain Language Overview (100 words) *	<p>Previous oil sands focused studies (for example A-PD-4-1718) have illustrated notable atmospheric deposition of base cations in the oil sands region. Deposition integration work conducted under the oil sands project (A-PD-6-1718) has also determined that base cation measurement and base cation deposition effects are limited in the oil sands region. Analysis of monitoring data collected as part of the forest health monitoring program (Macdonald, 2015) have identified a correlation between change in biodiversity and base cation deposition within forests near open pit mining activities showing measurable changes. However the more detailed monitoring needed to determine a causal relationship between base cation deposition, soil process and ecological impact and extend it to the forest further from emissions sites have not been done. Using both field surveys and laboratory experiments this study plans to establish biological/chemical endpoints at which ecosystem effects from atmospheric base cation deposition may be observed. Lastly a soil biogeochemical model will be used understand the long term effects of atmospheric base cation deposition on to ecosystems in the oil sands region; this is especially important for areas that are currently not exhibiting measurable effects. This model has previously been used for acid deposition investigation. The findings from the field surveys and laboratory experiments will be used to parameterize the model for the purpose of investigating alkalization and eutrophication.</p>		
Project Duration *	Project Original Start Date *	Estimated Completion Date *	
Multi-Year	01/04/2019	30/03/2022	
Specify Objectives This Project Will Address in 2018/2019. *	<ul style="list-style-type: none"> <li>Select analogues of high and low impacted ecological survey sites</li> </ul>		
Specify Objectives This Project Will Address Beyond 2018/19 (if multi-year). *	<ul style="list-style-type: none"> <li>Conduct detailed plant physiology, soil chemistry and soil water chemistry measurements and laboratory experiments that will be used to investigate causal relationship between atmospheric deposition and ecological effects, and</li> <li>Using information obtained from detailed field measurements and laboratory experiments parameterize a soil biogeochemical model to investigate the response of forest ecosystems in the oil sands to atmospheric deposition of base cations in the region.</li> </ul>		
List Key Questions/Hypotheses Related to Each Objective Stated Above. *	Soils in jack pine forests of the Athabasca Oil Sands Region are impacted by atmospheric deposition of base cations, these impacts on soils can be linked to measurable ecosystem effect(s).		

Main Assumptions, Constraints, Dependencies. *	It is assumed that there are measurable ecological differences between the impacted and remote sites that result from BC and/or nutrient (N and S) deposition. Another assumption is that appropriate indicator species (identified from the literature review) are also representative of vegetation across the AOSR. Sufficient time (up to 6 months) will be available to obtain graduate students and post-docs. It is also assumed that scientists and students will be granted survey site access for the duration of the study.	
Partner Categories (select all that apply) * A partner is an individual, group, agency, community etc. that is an active participant in the project and in achieving the project deliverables.	Knowledge System *	Location (select all that apply) *
<input type="checkbox"/> Federal Government <input type="checkbox"/> Another AEP Division <input type="checkbox"/> Another GoA Department <input checked="" type="checkbox"/> University/Academic Institution <input type="checkbox"/> Solely delivered by GoA <input type="checkbox"/> Citizen Science <input type="checkbox"/> Indigenous Community or Organization <input type="checkbox"/> ENGO <input type="checkbox"/> Other	Classical Science	<input type="checkbox"/> Office or Laboratory <input type="checkbox"/> Sub-regional <input type="checkbox"/> Transboundary (provincial/territorial) <input type="checkbox"/> Lower Peace Region <input type="checkbox"/> Upper Peace Region <input type="checkbox"/> North Saskatchewan Region <input type="checkbox"/> Red Deer Region <input checked="" type="checkbox"/> Lower Athabasca Region <input type="checkbox"/> Upper Athabasca Region
<b>AEP ONLY: Strategic Alignment to EMSD Outcomes</b>		
AEP ONLY: Strategic Alignment to EMSD Science Plan, select 1-2 areas that apply (if Applicable)		
Ecosystems and Predicting Change		
Human Relationship with the Environment		
<b>AEP ONLY: Strategic Alignment to AEP Departmental Outcomes</b>		
AEP ONLY: Environmental and Ecosystem Health and Integrity	AEP ONLY: Sustainable Economic Diversity	AEP ONLY: Social Well-Being
Biodiversity	Choose one	Choose one
AEP ONLY: Protected Public Health and Safety from Environmental		
No		
AEP ONLY: IMAG/IMSC Information Needs, Please Specify Which Need(s) is Being Addressed. File location M:\EMSD\Common\Portfolio Mgmt System Shared Docs	Info Need #12 (Ecosystem Services), Info Need #30: (Environmental Health Risk in Alberta) and Info Need #37: Long-Term Soil Acidification Monitoring Program: Effects of base cation deposition on soils in Jack Pine forests at near and far distances from oil sands facilities will be assessed.	
AEP ONLY: How This Project Will Address Each Strategic Theme Selected Above.	Environmental and Ecosystem Health and Integrity: This project directly addresses the relationship between the chemistry of atmospheric deposition and the ecosystem response, specifically the potential impact of atmospheric base cation deposition.	
<b>Project Methodology</b>		
List the Key Project Phases and Provide Bullets for Each Major Task Under Each Project Phase. *	Phase I: Site selection, establish access to site (if needed), obtain student, Phase II: Conduct field survey at impacted and less impacted site(s), Phase III: Conduct Laboratory experiments, Phase IV: Use data from Phase II and III to establish chemical and biological endpoints, Phase V: Parameterize and run biogeochemical soil model to determine long term effects of base cation deposition onto forest ecosystems in the oil sands region, and Phase VI: Peer review publication(s)	
Describe How Changes in Environmental Condition Will Be Assessed. *	Atmospheric deposition will be measured using existing on site ion exchange resins (IER) to understand atmospheric deposition onto impacted and further downwind forest sites. Soil, composition, chemistry and soil water chemistry at impacted and further downwind sites will be examined to understand the impact of atmospheric deposition on soil processes. Tree health and ground vegetation assessment as well as vegetation samples (jack pine bark, foliage, lichen and vascular plant) and laboratory analysis will be used to link atmospheric deposition to soil processes and in effect to impact on vegetation health and composition at sample sites.	
Are There Benchmarks (e.g., objectives, tiers, triggers, limits, reference conditions, thresholds, etc.) Being Used to Assess Changes in Environmental Condition? If So, Please Describe, If Not, State "NONE". *	Soil chemistry and biological endpoints established using field surveys and laboratory analysis will be used in a model to determine long term effects of atmospheric base cation, nutrient nitrogen and sulphur deposition. Tree health assessments will be conducted using the Ecological Monitoring and Assessment Network (EMAN) protocol (Environment and Climate Change Canada 2004), Simpson's and Shannon-Weiner diversity indices will be used to assess differences in plant communities.	

Provide a Brief Description of the Methods By Project Phase. *	<p>Phase I and II: Tree health assessments will be conducted using the Ecological Monitoring and Assessment Network (EMAN) protocol (Environment and Climate Change Canada 2004), Simpson's and Shannon-Weiner diversity indices will be used to assess differences in plant communities soil samples will be collected from three different soil pits/site at three depths (0 – 10 cm, 15 – 25 cm, and 40 - 50cm), five samples of the forest floor (LFH) within each of the 3 plots /site will be collected. All soil samples will be air dried and sieved through a 2mm mesh before being analyzed. Mineral soil and forest floor samples will be analyzed to determine organic matter content, pH, exchangeable base cation saturation and cation exchange capacity (CEC). Within each plot, tree bark samples, biomass samples as well as foliage from selected mature trees will be collected. Vegetation samples are air dried and ground using electric grinders and chemical analysis was conducted using the pulverized sample. Chemical analysis include analysis for Ca, Mg, K, and Na and selected trace metals (e.g. Fe, Al, Mn) using a Perkin Elmer Inductively Ion Coupled Optical Emission Spectrometer and Carbon and N concentrations on an Elementar Macro CNS analyzer.</p> <p>Phase III and IV: laboratory studies will be conducted using select plant species (partly informed by field survey) which will be treated with vary in nutrient level (simulating the spectrum of observed soil conditions in the field)</p> <p>Phase V: Long term effect analysis using newly parametrized MAGIC model.</p>
List the Key Indicators Measured. *	Tree health (EMAN protocol), biodiversity diversity index, organic matter content, pH, exchangeable base cation saturation and cation exchange capacity, Ca, Mg, K, Na, C, Organic carbon, N and selected trace metals (e.g. Fe, Al, Mn)
Describe Sample Handling Procedures, if Not Applicable, State N/A. *	Sample handling will follow similar protocol to recent published work in the same area of study
List SOPs that Will Be Used, if Not Applicable, State N/A. *	N/A
Describe the QA/QC Plan, if Not Applicable, State N/A. *	Data QA/QC will follow similar protocol to recent published work in the same area of study
Describe How Indigenous Communities are Involved in the Project Design, Data Collection, and Analysis (Knowledge Co-creation) and How is their Consent Sought. If Not Applicable, State N/A. *	N/A
<b>Components Delivered by Others</b>	
List by Project or Project Phase Each Component That Will Be Delivered by An External Party (including analytical laboratories) and Name the Party. State None if Not Required. *	<p>Phase I-IV: Conducted in collaboration with Professor Shaun Watmough and a MSc student,</p> <p>Phase III: Laboratory analysis will be conducted at a University of Trent Laboratory,</p> <p>Phase V: Conducted in collaboration with Professor Shaun Watmough and a Post Doctoral Fellow,</p> <p>Phase VI: Peer-reviewed publications will be prepared in collaboration with Prof. Watmough and MSc students and/or Post Doctoral Fellow.</p>
Will These Components be Delivered Under Grant or Contract or Both? Please Describe and Name the Associate Work Plan/Grant/Contract for These Services if Not Included Within This Work Plan. *	This work will be delivered under a grant. This is a new project and thus there is no previous associated grant for these services. If approved a Grant Business Case will be developed for the Grant Selection Committee.
<b>Monitoring Site Locations and Coordinates (for all sites, please add them to the Monitoring Site Location tab - a separate excel sheet)</b>	
Attach Map of Locations. Distinguish Indicators by Station if Necessary. Distinguish Sampling Frequency by Station if Necessary.	Two monitoring sites have been tentatively identified these will be refined as part of Phase I Near source site ( 57° 03'N; 111°36' W) and downwind site reference site (57°07' N; 111° 26' W)
<b>Project Schedule</b>	
<b>FOR OIL SANDS MONITORING PROJECTS ONLY:</b> A coordinated field monitoring schedule for the OSM Program is required. Please complete the attached document named "OSM Program Field Monitoring Schedule" in addition to this work plan. Fill as much as you can recognizing that scheduling changes will occur and the scheduling document will be updated regularly. Please note the scheduling document will be shared with stakeholders.	

<b>FOR OIL SANDS MONITORING PROJECTS ONLY:</b> Have You Coordinated With Other Project Leads On Field Logistics? If So, Please Specify. *		If the project is approved, Phase II of the project will be coordinated with other field studies (wet lands, forest health or water sampling)	
<b>Other</b>			
Additional Details.			
Will Capacity Building and Training be a Component of the Project and If So, Explain How. If Not, State N/A.*		This project will can provide an opportunity for an atmospheric scientist within EMSD (Dr. Aklilu) to be part of a supervisory committee of MSc students as an Adjunct Professor at Trent University. The students will be directly supervised by Dr S. Watmough. Dr. Watmough is an expert in atmospheric-ecological interaction and soil/ecological effects and has worked and published in the oil sands area; collaboration with him will greatly increase the scientific capacity within EMSD and provide useful partnership with academia.	
Environmental Impact and Considerations.			
<b>Data Management and Digital Assets</b>			
Will Data be Produced as a Result Of This Project? *	Type of Quantitative Data Variables	Frequency Of Collection	
Yes	Discrete	Other	
Data Collection Period: Start Date - End Date	Timeline For Upload Period: Start Date - End Date		
June-Sept 2019	12/1/2021		
Is There a Data Sharing Agreement? (Yes or No).			
Will the Data Include Traditional Knowledge as Defined by and Provided by an Indigenous Representative, Community or Organization (Yes / No).			
Platform/Location of Data Storage.			
<b>Project Deliverables</b>			
<b>Proposed 2018-19 Deliverable Type (for each deliverable outline document, presentation, meeting, etc.)</b>			
<input type="checkbox"/> Peer-reviewed Journal Publication	<input type="checkbox"/> Peer-reviewed Conference Proceeding	<input type="checkbox"/> Non-peer reviewed Conference Proceeding	
Q1 - Deliverable, Comments	Q1 - Deliverable, Comments	Q1 - Deliverable, Comments	
Q2 - Deliverable, Comments	Q2 - Deliverable, Comments	Q2 - Deliverable, Comments	
Q3 - Deliverable, Comments	Q3 - Deliverable, Comments	Q3 - Deliverable, Comments	
Q4 - Deliverable, Comments	Q4 - Deliverable, Comments	Q4 - Deliverable, Comments	

<input type="checkbox"/> <b>Technical Report</b>	<input type="checkbox"/> <b>Book Chapter</b>	<input type="checkbox"/> <b>Public Dissemination Document</b>
Q1 - Deliverable, Comments	Q1 - Deliverable, Comments	Q1 - Deliverable, Comments
Q2 - Deliverable, Comments	Q2 - Deliverable, Comments	Q2 - Deliverable, Comments
Q3 - Deliverable, Comments	Q3 - Deliverable, Comments	Q3 - Deliverable, Comments
Q4 - Deliverable, Comments	Q4 - Deliverable, Comments	Q4 - Deliverable, Comments
<input type="checkbox"/> <b>Conference Presentation(s)</b>	<input type="checkbox"/> <b>Stakeholder Presentation</b>	<input checked="" type="checkbox"/> <b>Key Engagement/Participation Meeting *</b>
Q1 - Deliverable, Comments	Q1 - Deliverable, Comments	Q1 - Deliverable, Comments
Choose one	Choose one	Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants. Project initiation meeting, 2019, Edmonton, Professor Watmough, Yayne Aklilu (2 people)
Q2 - Deliverable, Comments	Q2 - Deliverable, Comments	Q2 - Deliverable, Comments
Choose one	Choose one	Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants. Project mid term meeting, 2019, Edmonton, Professor Watmough, Yayne Aklilu, M.Sc. Students and Post Doctoral Fellow (4 plus)
Q3 - Deliverable, Comments	Q3 - Deliverable, Comments	Q3 - Deliverable, Comments
Choose one	Choose one	Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants. Status update meeting , 2019, teleconference, Professor Watmough, Yayne Aklilu, M.Sc. Students and Post Doctoral Fellow (4 plus)
Q4 - Deliverable, Comments	Q4 - Deliverable, Comments	Q4 - Deliverable, Comments
Choose one	Choose one	Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants. Year end planning meeting , 2019, teleconference, Professor Watmough, Yayne Aklilu, M.Sc. Students and Post Doctoral Fellow (4 plus)
<input type="checkbox"/> <b>EMSD Strategic &amp; Operational Publication</b>	<input type="checkbox"/> <b>Other Documents</b>	
Q1 - Deliverable, Comments	Q1 - Deliverable, Comments	
Q2 - Deliverable, Comments	Q2 - Deliverable, Comments	

Q3 - Deliverable, Comments	Q3 - Deliverable, Comments	
Q4 - Deliverable, Comments	Q4 - Deliverable, Comments	
<b>Proposed Deliverables After 2018/2019 for the project funds received in 2018/2019</b>		
<input checked="" type="checkbox"/> Peer-reviewed Journal Publication	<input type="checkbox"/> Peer-reviewed Conference Proceeding	<input type="checkbox"/> Non-peer reviewed Conference Proceeding
Q1 - Deliverable, Comments	Q1 - Deliverable, Comments	Q1 - Deliverable, Comments
Q2 - Deliverable, Comments	Q2 - Deliverable, Comments	Q2 - Deliverable, Comments
Q3 - Deliverable, Comments	Q3 - Deliverable, Comments	Q3 - Deliverable, Comments
Q4 - Deliverable, Comments Publication(s) on field survey, laboratory experiments and modelling results. Title and co authors to be determined	Q4 - Deliverable, Comments	Q4 - Deliverable, Comments
<input type="checkbox"/> Technical Report	<input type="checkbox"/> Book Chapter	<input type="checkbox"/> Public Dissemination Document
Q1 - Deliverable, Comments	Q1 - Deliverable, Comments	Q1 - Deliverable, Comments
Q2 - Deliverable, Comments	Q2 - Deliverable, Comments	Q2 - Deliverable, Comments
Q3 - Deliverable, Comments	Q3 - Deliverable, Comments	Q3 - Deliverable, Comments
Q4 - Deliverable, Comments	Q4 - Deliverable, Comments	Q4 - Deliverable, Comments
<input type="checkbox"/> Conference Presentation(s)	<input type="checkbox"/> Stakeholder Presentation	<input type="checkbox"/> Key Engagement/Participation Meeting *
Q1 - Deliverable, Comments Choose one	Q1 - Deliverable, Comments Choose one	Q1 - Deliverable, Comments Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants.

<b>Q2 - Deliverable, Comments</b>	<b>Q2 - Deliverable, Comments</b>	<b>Q2 - Deliverable, Comments</b>
Choose one	Choose one	Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants.
<b>Q3 - Deliverable, Comments</b>	<b>Q3 - Deliverable, Comments</b>	<b>Q3 - Deliverable, Comments</b>
Choose one	Choose one	Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants.
<b>Q4 - Deliverable, Comments</b>	<b>Q4 - Deliverable, Comments</b>	<b>Q4 - Deliverable, Comments</b>
Choose one	Choose one	Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants.
<input type="checkbox"/> <b>EMSD Strategic &amp; Operational Publication</b>	<input type="checkbox"/> <b>Other Documents</b>	
<b>Q1 - Deliverable, Comments</b>	<b>Q1 - Deliverable, Comments</b>	
<b>Q2 - Deliverable, Comments</b>	<b>Q2 - Deliverable, Comments</b>	
<b>Q3 - Deliverable, Comments</b>	<b>Q3 - Deliverable, Comments</b>	
<b>Q4 - Deliverable, Comments</b>	<b>Q4 - Deliverable, Comments</b>	
<b>All Completed Products</b>		if a multi-
year project, specify all completed products to date (consistent format for the fields below). Add rows as required.		
<b>Journal Paper</b>		
<b>Required Format: Author (follow APA citation format), Year, Title, Journal, Volume, Page Numbers, Open or Closed and Document Location</b>		
Example: Jacoby, W. G. (1994). Public Attitudes Toward Government Spending. American Journal of Political Science, 38(2), 336-361.		
Fearon, J. D., & Laitin, D. D. (2003). Ethnicity, Insurgency, and Civil War. American Political Science Review, 97(01), 75. doi: 10.1017/S0003055403000534		
1)		
2)		
3)		
4)		
5)		
<b>Technical Report</b>		
<b>Required Format: Author, Year, Title, Publisher Location, Name of Publisher, Publisher, Document Location</b>		
Example: Author, F.M. (Publication Year). Title of Report (Report No. XXX). Publisher City, State: Publisher		
1)		

2)
3)
4)
5)
<b>Book Chapter</b>
<b>Required Format: Author, Year, Title of Paper, Editors, Title of Book, Page Numbers, Location of Publisher, Name of Publisher, Document Location</b>
Example: Hemingway, E. (1999). The Killers. In J. Updike & K. Kenison (Eds.), The Best American Short Stories of the Century (pp.78-80). Boston, MA: Houghton Mifflin)
1)
2)
3)
4)
5)
<b>Conference Proceeding</b>
<b>Required Format: Author, Year, Title of Paper, Editors, Title of Proceedings, Name of Conference Location of Conference, Publisher Location, Name of</b>
Example: Author of Paper, A., & Author of Paper, B. (Year, Month date). Title of Paper. In A. Editor, B. Editor, & C. Editor. Title of Published Proceedings Paper Presented at Title of Conference: Subtitle of Conference, Location (inclusive page numbers). Place of Publication: Publisher.)
1)
2)
3)
4)
5)
<b>Public Dissemination Document</b>
<b>Required Format: Author, Year, Title, Journal / Report, Volume, Publisher, Page Number, Number of Pages, Document Location</b>
1)
2)
3)
4)
5)
<b>AEP ONLY: EMSD Strategic and Operational Publication</b>
<b>Required Format: Author, Year, Title, Publisher Location, Name of Publisher, Publisher, Document Location</b>
1)
2)
3)
4)
5)
<b>Other Documents</b>
<b>Detailed Information of Other Documents</b>
1)
2)
3)
4)
5)
<b>Conference Presentation</b>
<b>Required Format: Presenter, Date, Location, Title, Platform or Poster, Conference Name</b>
1)
2)
3)
4)
5)
<b>Stakeholder Presentation</b>
<b>Required Format: Presenter, Date, Location, Title, Platform or Poster, Name of Meeting</b>
1)
2)



3)
4)
5)
<b>Key Engagement/Participation Meeting</b>
<b>Required Format: Meeting Host, Date, Location</b>
1)
2)
3)
4)
5)

**Human Resources / Staffing Plan (roles and responsibilities)**

Name & Role	Organization	Responsibilities
Yayne Aklilu (0.10 FTE)	AEP	Co-lead
Prof. Shaun Watmough	Trent University	Co-lead
MSc Students (two)	Trent University	Conduct field work and laboratory analyses, data analyses, write MSc thesis/paper
Post Doctoral Fellow	Trent University	Parameterize, test and run soil biogeochemistry model, data analyses and write paper

**AEP ONLY: Additional Human Resources Required from EMSD**

Name & Role	Branch - Section	Estimated time (% of annual FTE)	Estimated Salary Range
Yayne Aklilu	Science	10	\$130,000 - \$150,000 (including 25% to cover bene
			Choose one
			Choose one
			Choose one
			Choose one
			Choose one
			Choose one
			Choose one
			Choose one

**Financial Details and Budget Request**

**Source of Funding Requested Year 1 - 2018/19**

	AEP ONLY: EMSD	OSM
Salaries and Benefits - AEP Chargeback		10500
Salaries and Benefits - New OSM Staff		TBD
Operations and Maintenance		
Consumable materials and supplies		
Conferences and meetings travel		
Field work travel		
Project-related travel		2000
Engagement		
Reporting		
External Contracts - Organization/Vendor/Suppliers		98020
Overhead		
Grants		
Capital		
<b>Total budget request for the year</b>	<b>0</b>	<b>110520</b>
<b>Total budget approved</b>		

See budget breakdown

**Source of Funding Requested Year 2 - 2019/20**

	AEP ONLY: EMSD	OSM
Salaries and Benefits - AEP Chargeback		15000
Salaries and Benefits - New OSM Staff		TBD
Operations and Maintenance		
Consumable materials and supplies		
Conferences and meetings travel		
Field work travel		
Project-related travel		2000
Engagement		
Reporting		
External Contracts - Organization/Vendor/Suppliers		86050
Overhead		
Grants		
Capital		
<b>Total budget request for the year</b>	<b>0</b>	<b>103050</b>
<b>Total budget approved</b>		

See budget breakdown

**Source of Funding Requested Year 3 - 2020/21**

	AEP ONLY: EMSD	OSM
Salaries and Benefits - AEP Chargeback		16304
Salaries and Benefits - New OSM Staff		TBD
Operations and Maintenance		

Consumable materials and supplies		
Conferences and meetings travel		
Field work travel		
Project-related travel		2000
Engagement		
Reporting		
External Contracts - Organization/Vendor/Suppliers		44200
Overhead		
Grants		
Capital		
<b>Total budget request for the year</b>	0	62504
<b>Total budget approved</b>		
<b>Source of Funding Requested Year 4 - 2021/22</b>		
AEP ONLY: EMSD		
Salaries and Benefits - AEP Chargeback		OSM
Salaries and Benefits - New OSM Staff		TBD
Operations and Maintenance		TBD
Consumable materials and supplies		
Conferences and meetings travel		
Field work travel		
Project-related travel		
Engagement		
Reporting		
External Contracts - Organization/Vendor/Suppliers		
Overhead		
Grants		
Capital		
<b>Total budget request for the year</b>	0	0
<b>Total budget approved</b>		
<b>Budget Request for the Entire Project</b>	0	276,074
<b>Project Approval(s)</b>		
<b>Proposal Submitted by</b>		
Surname	Given Name	Organization
Myrick	Bob	AEP
Signature	Date	
	12/2/2018	
X	<b>Proposal for OSM Reviewed by</b>	
Bob Myrick Director, Airshed Sciences	Signature	Date
AEP Administrator/Coordinator - Review	X	Date
	for Bill Donahue Executive Director, Science	
ECCC Administrator/Coordinator - Review	Signature	Date
<b>OSM Project Approved by</b>		
AEP Co-Lead for OSM	Signature	Date
Fred Wrona		
ECCC Co-Lead for OSM	Signature	Date
<b>AEP ONLY: Proposal for EMSD Reviewed by</b>		
EMSD Director	Signature	Date
<b>AEP ONLY: EMSD Project Approved by</b>		
EMSD Executive Director	Signature	Date
EMSD Chief Scientist	Signature	Date
<b>OSM / EMSD Project Has Not Been Approved</b>		
Project Status	Date Notified	Date Required
The project is conditionally approved. The following conditions are required before approval is granted.		

See contract budget breakdown

List the Condition(s)

Condition(s) Addressed / Approval Granted  
Choose one

**OSM / EMSD Approval Post Removal of Condition(s)**

Name & Title

Signature

Date

**Add All Monitoring Site Locations and Coordinates (insert more rows if required)**

Site Identifier *	Location Name *	Long/Lat *
Site 1		
Near Source	Near source site	57° 03'N; 111°36' W
Site 2		
Downwind	Downwind site	57°07' N; 111° 26' W
Site 3		
Site 4		
Site 5		
Site 6		
Site 7		
Site 8		
Site 9		
Site 10		
Site 11		
Site 12		
Site 13		
Site 14		
Site 15		

Budget requirements	Year 1 (2018- 2019)		Year 2 (2019- 2020)		Year 3 (2020- 2021)	
	Cash	In-kind	Cash	In-kind	Cash	In-kind
1) Salaries and benefits						
a) Principal Investigator (Shaun Watmough) – 0.15 FTE		\$30,000		\$30,000		\$30,000
b) MSc Students- 2 FTE	\$36,000		\$36,000			
b) Post-doctoral Fellow					\$40,000	
2) Operations and maintenance						
a) Lab Analyses	\$27,000		\$16,000			
b) Field Work	\$14,300		\$13,750			
3) Consumable Materials and supplies						
a) Materials	\$17,720		\$14,300		\$1,200	
4) Travel						
a) Conference and Field Travel	\$3,000		\$6,000		\$3,000	
<b>Grand Total</b>	<b>\$98,020</b>	<b>\$30,000</b>	<b>\$86,050</b>	<b>\$30,000</b>	<b>\$44,200</b>	<b>\$30,000</b>