

# 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 A: Workplan approved.</b></p> <p><b>* Approved at \$240,250</b></p> <p>* It is a requirement of funding that key members of the project team participate in a Water Monitoring Integration Workshop to be informed by the Oil Sands Monitoring Secretariat.</p> <p>* This project will inform how the basin approach can facilitate integration across monitoring components</p> <p>* Recommendations from this project are required that inform how the basin approach can facilitate integration across monitoring components and also identify opportunities to implement this approach within the OSM program including insights gained during the Water Monitoring Integration Workshop</p> <p>*Funding expectations: as a minimum an annual progress report is required by February 28, 2019. All publications or products resulting from this work requires acknowledgement of funding from the Oil Sands Monitoring Program and are to be provided to the Oil Sands Monitoring Secretariat for tracking and any programmatic communications purposes. Work funded through the Oil Sands Program will be available for public dissemination.</p>
15/01/2018	W-MD-7-1819	OSM - Focus Study	
Program Category *	Status *	Dept. ID	
Environmental Data, Analytics, Prediction	Existing Project		
Project Leadership / Contact information			
Project Title *	Key Words (max 10) *		
Representative Sub-basin Studies – Ells and Steepbank Rivers (REPs)	Cumulative effects, ecological endpoints, metals, sediment, invertebrate, periphyton, watershed monitoring, primary production, environmental disturbance gradient, integrated monitoring		
Surname *	Given Name *	Title *	
Wrona	Fred	Adjunct Professor (Principal Investigator)	
Organization *	Department	Division	
Other			
Branch *	Section/Unit (if applicable)	Phone *	
University of Calgary, Dept. Biological Sciences		4032204234	
Email *	Mailing Address	City	
Frederickjohn.wrona@ucalgary.ca	University of Calgary 2500 University Drive NW	Calgary	
Postal Code	EMSD Executive Owner (if Applicable)		
T2N 1N4	Monique Dube		
Project Information			
Project Objective(s) (Bullet Form) *	<ul style="list-style-type: none"> <li>To assess concentrations of algal chlorophyll-a and stone dwelling organisms using a variety of sampling methods along a gradient of catchment landuse disturbance in a tributary of the Lower Athabasca River</li> <li>To assess multi-year trends in metal and polyaromatic hydrocarbon (PAH) concentrations and food web dynamics in the Ells and Steepbank Rivers</li> <li>To conduct a cumulative effects assessment and inter-comparison of environmental stressors in the Steepbank and Ells River watersheds</li> <li>To assess and predict causal linkages of landuse changes on hydrology and ecology of rivers in the Athabasca Watershed region</li> </ul>		
Plain Language Overview (100 words) *	This study builds upon data obtained from the Joint Oil Sands Monitoring Representative Sub-basin studies (JOSM REPs) (2012 – 2015) project, involving a comparison of two representative sub-basins (Ells and Steepbank Rivers). This study will process and complete the analysis of archived samples of periphyton, invertebrates and sediments from the two sub-basins. It will provide additional information to quantify and discriminate the relative importance of natural fluvial geomorphological processes and trophic food web structure in producing observed trends in hydrocarbon and metal concentrations. It will also examine existing protocols for assessing benthic primary production in tributaries of the Lower Athabasca River.		
Project Duration *	Project Original Start Date *	Estimated Completion Date *	
Multi-Year	1-Apr-17	December 31, 2020	
Specify Objectives This Project Will Address in 2018/2019. *	<ul style="list-style-type: none"> <li>To assess concentrations of algal chlorophyll-a and densities of stone dwelling organisms using a variety of sampling methods along a gradient of catchment landuse disturbance in a tributary of the Lower Athabasca River</li> <li>To assess multi-year trends in metal and polyaromatic hydrocarbon (PAH) concentrations and food web dynamics in the Ells and Steepbank Rivers</li> </ul>		
Specify Objectives This Project Will Address Beyond 2018/19 (if multi-year). *	<ul style="list-style-type: none"> <li>This is a multiyear project and will end in 2020.</li> <li>To conduct a cumulative effects assessment and inter-comparison of environmental stressors in the Steepbank and Ells River watersheds</li> <li>To assess and predict causal linkages of landuse changes on hydrology and ecology of rivers in the Athabasca Watershed region</li> </ul>		
List Key Questions/Hypotheses Related to Each Objective Stated Above. *	H1) The sampling program design and related analytical methodologies are not adequate in making the necessary linkages (cause-effect relationships) between abiotic stressors and corresponding changes in the structure and function of watersheds; H2) Sub-basins within the Lower Athabasca Region differ in environmental conditions and are not comparable due to differences in geomorphology and background conditions		
Main Assumptions, Constraints, Dependencies. *	The Ells and Steepbank River sampling sites were selected along a pre-determined environmental disturbance gradient. Therefore, it was an <i>a priori</i> assumption that observed results would follow the pre-selected disturbance categories within the gradient design - the assumption is being explicitly tested. The Ells and Steepbank river basins have been selected to be Representative Experimental Basins (REPs) for the purpose of conducting integrated, multidisciplinary monitoring and focused studies to better ascertain cause-effects relationships and cumulative environmental effects across multiple media (air, water, lands).		
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 checked="" type="checkbox"/> Federal Government <input checked="" 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 checked="" 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 checked="" type="checkbox"/> Upper Athabasca Region	
AEP ONLY: Strategic Alignment to EMSD Outcomes			
AEP ONLY: Strategic Alignment to EMSD Science Plan, select 1-2 areas that apply (if Applicable)			
Ecosystems and Predicting Change			
Legislated/Policy Requirement			
AEP ONLY: Strategic Alignment to AEP Departmental Outcomes			
AEP ONLY: Environmental and Ecosystem Health and Integrity	AEP ONLY: Sustainable Economic Diversity	AEP ONLY: Social Well-Being	
Water (Surface and Ground)	Choose one	Choose one	
AEP ONLY: Protected Public Health and Safety from Environmental			
Choose one			

<p><b>AEP ONLY:</b> IMAG/IMSC Information Needs, Please Specify Which Need(s) is Being Addressed. File location M:\EMSD\Common\Portfolio Mgmt System Shared Docs</p>	<p>Improved methods to assess changes in accumulated state and cumulative effects of multiple stressors in the Lower Athabasca region.</p>
<p><b>AEP ONLY:</b> How This Project Will Address Each Strategic Theme Selected Above.</p>	<p>New data, integrated assessment procedures will be delivered.</p>
<p><b>Project Methodology</b></p>	
<p>List the Key Project Phases and Provide Bullets for Each Major Task Under Each Project Phase. *</p>	<p>1) Data Collection Phase (2012 - 2014)  <ul style="list-style-type: none"> <li>Field work was completed in 2014</li> </ul> 2) Data Analysis Phase (2012 - 2015; 2017 - 2020)  <ul style="list-style-type: none"> <li>Laboratory analysis and QA/QC of data</li> </ul> 3) Writing Phase (2017 - 2020)  <ul style="list-style-type: none"> <li>Publication/report writing of data</li> </ul> </p>
<p>Describe How Changes in Environmental Condition Will Be Assessed. *</p>	<p>The two sub-basins being assessed (Steeptank and Ells Rivers) in the Lower Athabasca River differ in non-point source geochemical inputs as a result of landuse disturbance from oil sands (OS) operations. However, both flow through a geological region containing natural hydrocarbon deposits, resulting in challenges discerning the direct and indirect effects on their respective aquatic ecosystems. To assess environmental condition, metal and polycyclic aromatic hydrocarbon (PAH) concentrations, algal and nutrient concentrations, and invertebrate community structure will be examined in the two sub-basins using an environmental disturbance gradient sampling design; with sites 1) outside of OS geological deposit and development, 2) inside OS geological deposit, with no to limited development, and 3) inside OS geological deposit and within development area. The gradient design was to develop a more comprehensive understanding of the responses of chemical/biological/ecological endpoints to catchment/landscape/development-related processes.</p>
<p>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". *</p>	<p>Water quality and aquatic biological data will be assessed against triggers/thresholds set for the Lower Athabasca region by AEP and CCME.</p>
<p>Provide a Brief Description of the Methods By Project Phase. *</p>	<p>1) Data Collection Phase (2012 - 2014)  <ul style="list-style-type: none"> <li>Fine sediments - were collected from scour pads within artificial substrates which were deployed at each site in both rivers for one-month periods in 2012 and 2013</li> <li>Depositional sediments - were collected using a stainless steel scoop at each site during each sampling period in 2012 and 2013</li> <li>Stone samples - were collected in different sizes from the Ells River in 2013 to be processed for periphyton and surface area</li> <li>Periphyton scrapings - were collected from five random rocks at each site during each sampling period in 2012 and 2013</li> <li>Nutrient diffusing substrates - were deployed for one-month periods at each site for both rivers in 2012 and 2013</li> <li>Benthic macroinvertebrates - were collected using a kick net (2012, 2013, 2014) and artificial substrates (2012, 2013) at each site in both rivers</li> </ul> 2) Data Analysis Phase (2012 - 2015; 2017 - 2020)  <ul style="list-style-type: none"> <li>Fine sediments - samples were freeze-dried and each site was analyzed for metal and polycyclic aromatic hydrocarbon (PAH) concentrations (Project Year 1 - 2017/2018)</li> <li>Depositional sediments - samples will be freeze-dried and each site will be analyzed for metal and PAH concentrations (Project Year 2/3 - 2018/2019, 2019/2020)</li> <li>Stone samples - periphyton was removed from stones and analyzed for chlorophyll-a and ash-free dry mass concentrations and stone surface area (Project Year 1 &amp; 2 - 2017/2018, 2018/2019)</li> <li>Periphyton scrapings - were analyzed for chlorophyll-a and ash-free dry mass concentrations at each site as well as surface area calculated and analyzed for isotopes and algal taxonomy (Project Year 1 - 2017/2018)</li> <li>Nutrient diffusing substrates - were analyzed for chlorophyll-a and ash-free dry mass concentrations at each site (Project Year 1 - 2017/2018)</li> <li>Benthic macroinvertebrates - will be analyzed for mercury concentration and isotope signatures (Project Year 2 - 2018/2019) from kick net samples and were analyzed for taxonomy from artificial substrates (Project Year 1 - 2017/2018)</li> </ul> 3) Writing Phase (2017 - 2020)  <ul style="list-style-type: none"> <li>Several publications are going to be written from the data collected from this multi-year project:</li> </ul> 1) &amp; 2) Multi-year trends in metal and polycyclic aromatic hydrocarbon (PAH) concentrations and food web dynamics in the Ells and Steeptank Rivers (initial manuscript Project Year 1 (2017/2018), 2nd manuscript in Project Year 2 (2018/2019))  3) Concentrations of algal chlorophyll-a along a gradient of catchment landuse disturbance in a tributary of the Lower Athabasca River: A comparison of methods (Project Year 2 - 2018/2019)  4) Alberta River ecosystems biomonitoring plans: The need for developing support tools for Stone-Dwelling organisms and Chlorophyll analysis (Project Year 2 - 2018/2019)  5) SDest: A complete R package tool for the estimation of Stone-Dwelling organisms, Chlorophyll concentrations and evaluate their evolution in time (Project Year 2 - 2018/2019)  6) Cumulative effects assessment and inter-comparison of environmental stressors in the Steeptank and Ells River watersheds (Project Year 2/3 - 2018/2019, 2019/2020)  7) Synthesis Papers: Assessing and predicting causal linkages of landuse changes on hydrology and ecology of rivers in the Athabasca Watershed region (Project Year 2/3 - 2018/2019, 2019/2020)</p>
<p>List the Key Indicators Measured. *</p>	<p>Fine sediments - metal and PAH concentrations  Depositional sediments - metal and PAH concentrations  Stone samples - periphyton chlorophyll-a and ash-free dry mass concentrations; stone surface area  Periphyton biomass &amp; taxonomy - chlorophyll-a and ash-free dry mass concentrations; community structure and isotope signatures  Nutrient diffusing substrates - nutrient limitations in chlorophyll-a and ash-free dry mass  Benthic macroinvertebrates - community composition, isotope signatures, mercury concentration</p>
<p>Describe Sample Handling Procedures, If Not Applicable, State N/A. *</p>	<p>Fine sediments - scour pads containing fine sediments were stored frozen at -20 degrees Celsius until sediments were rinsed from scour pads and freeze-dried immediately for sample analysis  Depositional sediments - were stored frozen at -20 degrees Celsius before being freeze-dried for sample analysis  Stone samples - were stored frozen until periphyton was removed with a scalpel and surface area was measured; periphyton was stored in 90% ethanol before analysis  Periphyton - were stored in 95% ethanol in a -20 degree Celsius freezer before analysis; periphyton for algal taxonomy was stored in Lugols solution  Nutrient diffusing substrates - were stored frozen at -20 degrees Celsius until analysis  Benthic macroinvertebrates - kick net samples were stored frozen at -20 degrees Celsius until analysis; artificial substrate samples were stored in 95% ethanol before analysis</p>
<p>List SOPs that Will Be Used, If Not Applicable, State N/A. *</p>	<p>N/A</p>
<p>Describe the QA/QC Plan, If Not Applicable, State N/A. *</p>	<p>All data entered will be reviewed by the Scientific Program Manager before data analysis begins.</p>
<p>Describe the QA/QC Plan, If Not Applicable, State N/A. *</p>	<p></p>

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><b>Data Analysis Phase:</b></p> <ul style="list-style-type: none"> <li>Fine sediments - metal concentrations were processed at the National Laboratory of Environmental Testing (NLET; Ian Droppo (ECCC)); mercury concentrations were processed at the Canada Centre for Inland Water (CCIW; Jane Kirk (ECCC)); PAHs were processed at AXYS Analytical Laboratories Ltd (Project Year 1 - 2017/2018)</li> <li>Depositional sediments - metal concentrations will be processed at NLET (Ian Droppo (ECCC)); mercury concentrations will be processed at CCIW (Jane Kirk (ECCC)); PAHs will be processed at AXYS Analytical Laboratories Ltd (Project Year 2 - 2018/2019)</li> <li>Periphyton scrapings - isotopes were processed at the Isotope Science Laboratory at the University of Calgary (UofC); algal taxonomy was processed at MB Laboratories Ltd (Project Year 1 - 2017/2018)</li> <li>Benthic macroinvertebrates - mercury concentrations will be processed at CCIW (Jane Kirk (ECCC)) (Project Year 2 - 2018/2019); isotopes will be processed at the Isotope Science Laboratory - UofC (Project Year 2 - 2018/2019); taxonomy was processed at Jack Zloty Ltd (Project Year 1 - 2017/2018)</li> </ul> <p><b>Writing Phase:</b></p> <ul style="list-style-type: none"> <li>Scientific contributors from ECCC, AEP and other academic institutions will be involved in the writing of a special issue of synthesis papers connecting previously collected ecological and biogeochemical data in the EIs and Steepbank River sub-basins as an inter-comparison and to support the implementation of an integrated cumulative effects assessment approach (Project Year 2/3 - 2018/2019; 2019/2020)</li> </ul>	
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. *	<p>These components have been or will be delivered by <b>Contract only</b> for External Lab Analysis and fees for these contracts have been budgeted in the work plan.</p> <ul style="list-style-type: none"> <li>Fine sediments - samples processed for metal concentrations at NLET, mercury concentrations at CCIW, and PAHs at AXYS Analytical Ltd (Project Year 1 - 2017/2018)</li> <li>Depositional sediments - samples processed for metal concentrations at NLET, mercury concentrations at CCIW, and PAHs at AXYS Analytical Ltd (Project Year 2 - 2018/2019)</li> <li>Periphyton scrapings - samples processed for isotopes at UofC Isotope Lab; samples processed for algal taxonomy at MB Laboratories Ltd (Project Year 1 - 2017/2018)</li> <li>Benthic macroinvertebrates - samples processed for mercury concentration at CCIW (Project Year 2 - 2018/2019); samples processed for isotopes at the Isotope Science Laboratory - UofC (Project Year 2 - 2018/2019); samples processed for taxonomy at Jack Zloty Ltd (Project Year 1 - 2017/2018)</li> </ul>	
<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.	Sampling occurred monthly at each site from March - October, 2012 - 2014	
<b>Project Schedule</b>		
FOR OIL SANDS MONITORING PROJECTS ONLY: 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.	Sampling already occurred monthly at each site from March - October, 2012 - 2014	
FOR OIL SANDS MONITORING PROJECTS ONLY: Have You Coordinated With Other Project Leads On Field Logistics? If So, Please Specify. *	Sample collection already occurred from 2012-2014	
<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. *	N/A	
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	Other	Monthly
Data Collection Period: Start Date - End Date	Timeline For Upload Period: Start Date - End Date	
March 2012 - October 2014	September 1, 2020 - December 31, 2020	
Is There a Data Sharing Agreement? (Yes or No).	No	
Will the Data Include Traditional Knowledge as Defined by and Provided by an Indigenous Representative, Community or Organization (Yes / No).	No	
Platform/Location of Data Storage.	External harddrive/Aquatic Ecology Lab - University of Calgary	
<b>Project Deliverables</b>		
<b>Proposed 2018-19 Deliverable Type (for each deliverable outline document, presentation, meeting, etc.)</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

<p><b>Title:</b> "Concentrations of algal chlorophyll-a along a gradient of catchment landuse disturbance in a tributary of the Lower Athabasca River: A comparison of methods"</p> <p><b>Description:</b> A comparison of the efficacy and efficiency of existing protocols for conventional periphyton sampling, artificial substrates, and stone sampling across two years along an environmental disturbance gradient in the Ellis River. Datasets from this paper will be made available.</p>		
Q2 - Deliverable, Comments	Q2 - Deliverable, Comments	Q2 - Deliverable, Comments
<p><b>Title:</b> "Alberta River ecosystems biomonitoring plans: The need for developing support tools for Stone-Dwelling organisms and Chlorophyll analysis"</p> <p><b>Description:</b> A critical review of the biomonitoring plans that have been implemented in Albertan Riverine ecosystems until present, sampling protocols, analysis and driven conclusions with the aim of evaluating their strength and understanding the need for developing standardized tools for increasing their value as decision making tools.</p>		
Q3 - Deliverable, Comments	Q3 - Deliverable, Comments	Q3 - Deliverable, Comments
<p><b>Title:</b> "SDest: A complete R package tool for the estimation of Stone-Dwelling organisms, Chlorophyll concentrations and evaluate their evolution in time"</p> <p><b>Description:</b> This paper consists of the very complete and user friendly R package program developed to be used in the biomonitoring programs. The program includes the estimation of Stone-Dwelling organisms, Chlorophyll concentration and the tools for analysing their natural cycles and evolution in time. Datasets and R package program from this paper will be made available.</p>		
Q4 - Deliverable, Comments	Q4 - Deliverable, Comments	Q4 - Deliverable, Comments
<p><b>Title:</b> "Multi-year trends in metal and polyaromatic hydrocarbon (PAH) concentrations and food web dynamics in the Ellis and Steepbank Rivers"</p> <p><b>Description:</b> Second publication on longitudinal patterns of metal (including total and methyl mercury) and polyaromatic hydrocarbon (PAH) concentrations in sediments, surface water and invertebrates in the Ellis and Steepbank Rivers. Also the assessment of algal and invertebrate community structure and nutrient dynamics along the environmental disturbance gradient. Datasets from this paper will be made available.</p>		
<input type="checkbox"/> Conference Presentation(s)	<input type="checkbox"/> Stakeholder Presentation	<input type="checkbox"/> Key Engagement/Participation Meeting *
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.
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.
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.
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.
Proposed Deliverables After 2018/2019 for the project funds received in 2018/2019		
<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

<b>Q3 - Deliverable, Comments</b> Title: "Cumulative effects assessment and inter-comparison of environmental stressors in the Steepbank and Ellis River watersheds" Description: Multiple environmental stressors will be assessed within and between the Steepbank and Ellis River watersheds to achieve an improved understanding of the cumulative effects of both natural and anthropogenic disturbances in tributaries of the Lower Athabasca River. Datasets from this paper will be made available.	<b>Q3 - Deliverable, Comments</b>	<b>Q3 - Deliverable, Comments</b>
<b>Q4 - Deliverable, Comments</b> Title: "Assessing and predicting causal linkages of landuse changes on hydrology and ecology of rivers in the Athabasca Watershed region" Description: A special issue of synthesis papers connecting previously collected ecological and biogeochemical data in the Ellis and Steepbank River sub-basins to support the implementation of an integrated cumulative effects assessment approach. Datasets from this paper will be made available.	<b>Q4 - Deliverable, Comments</b>	<b>Q4 - Deliverable, Comments</b>
<input type="checkbox"/> <b>Conference Presentation(s)</b>	<input type="checkbox"/> <b>Stakeholder Presentation</b>	<input type="checkbox"/> <b>Key Engagement/Participation Meeting *</b>
<b>Q1 - Deliverable, Comments</b> Choose one	<b>Q1 - Deliverable, Comments</b> Choose one	<b>Q1 - Deliverable, Comments</b> Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants.
<b>Q2 - Deliverable, Comments</b> Choose one	<b>Q2 - Deliverable, Comments</b> Choose one	<b>Q2 - Deliverable, Comments</b> Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants.
<b>Q3 - Deliverable, Comments</b> Choose one	<b>Q3 - Deliverable, Comments</b> Choose one	<b>Q3 - Deliverable, Comments</b> Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants.
<b>Q4 - Deliverable, Comments</b> Choose one	<b>Q4 - Deliverable, Comments</b> Choose one	<b>Q4 - Deliverable, Comments</b> Name of Meeting, Year, Location, Dates, Participant Groups and Number of Participants.
<b>All Completed Products</b> <span style="float: right;">if a multi-year project, specify all completed products</span>		
to date (consistent format for the fields below). Add rows as required.		
<b>Journal Paper</b>		
Required Format: Author (follow APA citation format), Year, Title, Journal, Volume, Page Numbers, Open or Closed and Document Location		
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>		
Required Format: Author, Year, Title, Publisher Location, Name of Publisher, Publisher, Document Location		
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>		
Required Format: Author, Year, Title of Paper, Editors, Title of Book, Page Numbers, Location of Publisher, Name of Publisher, Document Location		
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>		
Required Format: Author, Year, Title of Paper, Editors, Title of Proceedings, Name of Conference Location of Conference, Publisher Location, Name of Publisher, Document Location		
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)

**Public Dissemination Document**

Required Format: Author, Year, Title, Journal / Report, Volume, Publisher, Page Number, Number of Pages, Document Location

- 1)
- 2)
- 3)
- 4)
- 5)

**AEP ONLY: EMSD Strategic and Operational Publication**

Required Format: Author, Year, Title, Publisher Location, Name of Publisher, Publisher, Document Location

- 1)
- 2)
- 3)
- 4)
- 5)

**Other Documents**

Detailed Information of Other Documents

- 1) Suzanne, C. L. 2015. Effects of Natural and Anthropogenic Non-Point Source Disturbances on the Structure and Function of Tributary Ecosystems in the Athabasca Oil Sands Region. MSc Thesis, Department of Geography, University of Victoria.
- 2)
- 3)
- 4)
- 5)

**Conference Presentation**

Required Format: Presenter, Date, Location, Title, Platform or Poster, Conference Name

- 1) Christina Suzanne, November 6-10, 2016, Orlando, Florida, USA, Longitudinal Patterns of Metal Concentrations in Fine Sediments, Surface Water and Aquatic Invertebrates in Tributaries of the Lower Athabasca River, Poster, SETAC North America 37th Annual Meeting
- 2)
- 3)
- 4)
- 5)

**Stakeholder Presentation**

Required Format: Presenter, Date, Location, Title, Platform or Poster, Name of Meeting

- 1)
- 2)
- 3)
- 4)
- 5)

**Key Engagement/Participation Meeting**

Required Format: Meeting Host, Date, Location

- 1)
- 2)
- 3)
- 4)
- 5)

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

Name & Role	Organization	Responsibilities
Frederick Wrona (Project Leader)	University of Calgary; Alberta Environment and Parks	Scientific oversight for entire project. Provides advice on data analysis and how the publications produced from this study will be organized and structured.
Christina Suzanne (Scientific Program Manager)	University of Calgary	Hire and train technical assistants to do laboratory sample processing, data analysis and report writing. Also contributes to data analyses and related publications produced from this study.
Scientific Contributors	Environment and Climate Change Canada; Alberta Environment and Parks; Other academic Principle Investigators	Active and historical principle investigators involved in the REPs program. Contributing data, analyses and writing appropriate scientific evaluations and publications.
Professional and Technical Assistants	University of Calgary; Alberta Environment and Parks; Environment and Climate Change Canada	Process all archived samples in the laboratory, data analysis and contribute to the publications produced from this study. Aiding in the production of technical reports and publications (eg. Literature reviews, data integration etc.)
Monique Dube (Scientific Contributor)	EMSD-IEAP Branch	Review draft manuscripts and provide direction and advice when needed. Ensure integration with other integrated analytical assessments on environmental condition under the OSM program.

**AEP ONLY: Additional Human Resources Required**

Name & Role	Branch - Section	Estimated time (% of annual FTE)

**Financial Details and Budget Request**

	Source of Funding Requested Year 1 - 2018/19	
	AEP ONLY: EMSD	OSM
Salaries and Benefits - AEP Chargeback		0
Salaries and Benefits - New OSM Staff		
Salaries and Benefits - non AEP		124000

Operations and Maintenance		0
Consumable materials and supplies		13500
Conferences and meetings travel		0
Field work travel		0
Project-related travel		12000
Engagement		0
Reporting		3000
External Contracts - Organization/Vendor/Suppliers		39700
Overhead		48050
Capital		
<b>Total budget request for the year</b>	0	240250
<b>Total budget approved</b>		
Grant to U of Calgary		240 250

Source of Funding Requested Year 2 - 2019/20		
	AEP ONLY: EMSD	OSM
Salaries and Benefits - AEP Chargeback		75000
Salaries and Benefits - New OSM Staff		
Salaries and Benefits - non AEP		
Operations and Maintenance		
Consumable materials and supplies		
Conferences and meetings travel		
Field work travel		
Project-related travel		8000
Engagement		
Reporting		5000
External Contracts - Organization/Vendor/Suppliers		
Overhead		22000
Grants		
Capital		
<b>Total budget request for the year</b>	0	110000
<b>Total budget approved</b>		

Source of Funding Requested Year 3 - 2020/21		
	AEP ONLY: EMSD	OSM
Salaries and Benefits		
Operations and Maintenance		
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>		

Source of Funding Requested Year 4 - 2021/22		
	AEP ONLY: EMSD	OSM
Salaries and Benefits		
Operations and Maintenance		
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	350,250

Project Approval(s)		
Proposal Submitted by		
Surname	Given Name	Organization
Wirona	Fred	University of Calgary; Alberta Environment and Parks
Signature	Date	
	15/01/2018	
Proposal for OSM Reviewed by		
EMSD Executive Director	Signature	Date
Monique Dube		
AEP Administrator/Coordinator - Review	Signature	Date
ECCC Administrator/Coordinator - Review	Signature	Date
OSM Project Approved by		
AEP Co-Lead for OSM	Signature	Date
ECCC Co-Lead for OSM	Signature	Date
AEP ONLY: Proposal for EMSD Reviewed by		
EMSD Director	Signature	Date
AEP ONLY: EMSD Project Approved by		
EMSD Executive Director	Signature	Date

EMSD Chief Scientist	Signature	Date
<b>OSM / EMSD Project Has Not Been Approved</b>		
<b>Project Status</b>	<b>Date Notified</b>	<b>Date Required</b>
The project is conditionally approved. The following conditions are required before approval is granted.		
<b>List the Condition(s)</b>		
<b>Condition(s) Addressed / Approval Granted</b>		
Choose one		
<b>OSM / EMSD Approval Post Removal of Condition(s)</b>		
<b>Name &amp; Title</b>	<b>Signature</b>	<b>Date</b>



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

Site Identifier *	Location Name *
Site 1 Ells River downstream	EL1
Site 2 Ells River mid-downstream	EL2
Site 3 Ells River mid-upstream	EL3
Site 4 Ells River upstream	EL4
Site 5 Steepbank River downstream	ST1
Site 6 Steepbank River mid-downstream	ST2
Site 7 Steepbank River mid-upstream	ST3
Site 8 Steepbank River upstream	ST4
Site 9	

rows if required)

Long/Lat \*

57°16.826' N,111°42.284' W

57°14.676' N,111°44.193' W

57°13.665' N,111°57.536' W

57°9.083' N,112°10.205' W

57°01.338' N,111°28.618' W

56°59.919' N,111°24.201' W

56°58.773' N,111°17.914' W

56°52.144' N,111°08.606' W