

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>* Decision Pool B: Workplan approved with contingency * Approved at \$183,200 with contingency</p> <p>* The project lead and key project members are to meet with the Oil Sands Monitoring Program leadership as coordinated by the OSM Secretariat to discuss this project and to rationalize budget items</p> <p>* It is a requirement of funding that key members of the project team participate in a Groundwater Integration Workshop to be informed by the Oil Sands Monitoring Secretariat.</p> <p>* The Draft Monitoring Plan is to be presented to the Oil Sands Monitoring Program leadership as coordinated by the OSM Secretariat by December 31, 2018</p> <p>*Funding expectations: 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>
19/01/2018		OSM - Focus Study	
Program Category *	Status *	Dept. ID	
Watershed Sciences (Surface Water and Groundwater)	New Project		
Project Leadership / Contact Information			
Project Title *	Key Words (max 10) *		
A Monitoring, Evaluation and Reporting Plan for Groundwater in Alberta's Athabasca Oil Sands Area	planning, groundwater, network design, quality assurance, water quality, water resources		
Surname *	Given Name *	Title *	
McClain	Cynthia	Dr.	
Organization *	Department	Division	
Alberta Provincial	AEP	EMSD	
Branch *	Section/Unit (if applicable)	Phone *	
Science	Watershed	5872262551	
Email *	Mailing Address	City	
cynthia.mcclain@gov.ab.ca	3115 -12 Street NE	Calgary	
Postal Code	EMSD Executive Owner (if Applicable)		
T2E 7J2	Monique Dube		
Project Information			
Project Objective(s) (Bullet Form) *	<ol style="list-style-type: none"> 1. Review of international best-practices/approaches for regional-scale groundwater monitoring 2. Scientific evaluation of existing groundwater monitoring and research programs in the region 3. Identification of key issues and stressors on water quantity and quality related to oil sands development activities 4. Development and publication of a 5-year groundwater monitoring plan focused on testable scientific questions that is adaptive and flexible, such that the data needs related to on-going and emerging issues are fulfilled, and regularly re-assessed to address scientific questions/hypotheses that have arisen 5. Development of a plan for implementing the new monitoring design (e.g., site selection, land-use agreements, expansion, database and website) 		
Plain Language Overview (100 words) *	<p>Alberta Environment and Parks has no published long-term ambient groundwater monitoring plans for the Athabasca Oil Sands Area. Although approximately 10,000 water wells exist in the region, AEP currently monitors less than 200 for "ambient" groundwater quantity or quality, and conducts little data evaluation and reporting. AEP's wells are often clustered, historically sampled infrequently or sampled using inconsistent procedures. Thus, AEP's current monitoring may not capture the variability and trends in ambient conditions regional aquifers in relation to oil sands development activities. This multi-year project includes development of a comprehensive 5-year Monitoring, Evaluation and Reporting (MER) plan for Alberta's oil sands area focusing on key scientific questions that will enhance the understanding of Alberta's environment and inform decision-making in the management of Alberta's groundwater resources. In tandem, standard operating procedures and well maintenance plans are being developed (separate work plans) to ensure monitoring is performed in a scientifically credible, consistent and transparent manner, and that the status of the aging well infrastructure is assessed. Implementation of the MER plan in years 2+ would otherwise not be possible.</p>		
Project Duration *	Project Original Start Date *	Estimated Completion Date *	
Multi-Year	1/4/2018	31/03/2020	
Specify Objectives This Project Will Address in 2018/2019. *	<ol style="list-style-type: none"> We aim to at least partially address the following objectives in 2018/2019: 1. Review of international best-practices/approaches for regional-scale groundwater monitoring 2. Scientific evaluation of existing groundwater monitoring and research programs in the region 3. Identification of key issues and stressors on water quantity and quality related to oil sands development activities 4. Development and publication of a 5-year groundwater monitoring plan focused on testable scientific questions that is adaptive and flexible, such that the data needs related to on-going and emerging issues are fulfilled, and regularly re-assessed to address scientific questions/hypotheses that have arisen 5. Development of a plan for implementing the new monitoring design (e.g., site selection, land-use agreements, expansion, database and website) 		
Specify Objectives This Project Will Address Beyond 2018/19 (if multi-year). *	<ol style="list-style-type: none"> 4. Development and publication of a 5-year groundwater monitoring plan focused on testable scientific questions that is adaptive and flexible, such that the data needs related to on-going and emerging issues are fulfilled, and regularly re-assessed to address scientific questions/hypotheses that have arisen 5. Development of a plan for implementing the new monitoring design (e.g., site selection, land-use agreements, expansion, database and website) 		

<p>List Key Questions/Hypotheses Related to Each Objective Stated Above. *</p>	<p>Objective 1</p> <ul style="list-style-type: none"> • What approaches are being used internationally to design regional-scale groundwater monitoring programs relevant to boreal forest biomes and groundwater flow systems of Alberta's oil sands region? <p>Objective 2</p> <ul style="list-style-type: none"> • Do existing regional groundwater monitoring programs have statistical power to detect change, are the data generated available and suitable for secondary use? • What is the quality of EMSD's historical groundwater datasets? <p>Objective 3</p> <ul style="list-style-type: none"> • What is the current state-of-science related to groundwater and groundwater monitoring in the region? • What are the key groundwater issues and priority areas? • How do these issues relate to those identified by lotic, lentic, wetlands MER plans? <p>Objective 4</p> <ul style="list-style-type: none"> • What are the key scientific questions (testable hypotheses) our monitoring program aims to address? • Can AEP's groundwater monitoring program be designed to cost-effectively address key issues (e.g., scientific questions about anthropogenic stressors, climate variability) and also guide decision makers, planning and policy? • What monitoring approach/design will be used (e.g., spatially representative, risk-based, stressor-receptor, community based monitoring, incorporating indigenous knowledge)? Considers information need 30. • What are the spatial and temporal boundaries (consider information needs 2, 3, 4, 24)? • What are the data elements (e.g., parameters, metadata), and requirements for planned statistical methods (significance levels, acceptable uncertainty, sample size requirements) • What is the QA/QC plan for groundwater quality and quantity monitoring? • What monitoring methods and frequency are appropriate? How can modern technologies (e.g., continuous water quality) be incorporated? • What is the role of modelling and geostatistics? • What, where, and how is it best to monitor changes in groundwater over space and time such that trends can be detected and origins of change can be attributed? 		
	<ul style="list-style-type: none"> • Where are there opportunities for alignment with other GoA groundwater monitoring/science programs (e.g., lotic/lentic QA/QC methods and parameter lists, wetland inventories, spring inventories, Provincial Groundwater Inventory Program, Alberta Health's Domestic Well Water Quality Program)? • What existing information/data (e.g., geologic frameworks, non-EMSD groundwater data, groundwater models, land use maps, river baseflow) can be utilized to help design this program? How can this information be accessed in a sustainable way and analyzed? • How can the program be designed to adapt to new research findings and emerging issues? • What are the implications for implementing new Standard Operating Procedures? <p>Objective 5</p> <ul style="list-style-type: none"> • How can AEP's existing infrastructure (wells, Near-Real-Time stations) be used/improved to maintain the quality of long-term datasets on regional groundwater conditions such that temporal trends can be assessed (addressing information need 21)? What are the implications for the well maintenance program? • Based on the new design, what change/gaps are there in the groundwater program lifecycle, and how can these be addressed? • What are the requirements of a data management system to support EMSDs groundwater program (including data and metadata standards, public availability/web portal)? 		
<p>Main Assumptions, Constraints, Dependencies. *</p>	<ul style="list-style-type: none"> -Project completion is dependent on 2 new OSM hires, without this support only objectives 1-3 may be addressed and phases 1-2 may be completed in FY 2018/2019 -If similar MER plan development is taking place for the Provincial Program, efforts should be aligned. -This project is dependent on Standard Operating Procedures and a Well Maintenance Plan being developed in parallel. -Implementation of the MER Plan is not possible without having SOPs in place to ensure monitoring is conducted in a reproducible and scientifically credible way, and a proper inventory of the current maintenance status of our own wells to determine whether they can continue to be included in our monitoring network, and how much it would cost to test the wells to ensure they remain connected to the aquifers they are intended to monitor. -The early phases of the MER do not explicitly include engagement with First Nations and incorporation of Indigenous Knowledge. However, the intent is to include this engagement /incorporation of knowledge in subsequent years. -As ~10,000 water wells exist in the region, evaluation of the current state and trends in regional groundwater will likely require more robust data compilation and analysis. Much of this data is not readily accessible (e.g., in PDFs in ERKS), or has yet to be QA/QC-ed by EMSD scientists (e.g., data in AWWID, BWWT, AHS) thus efforts to digitize historical data, support electronic data submission/sharing, and the development of comprehensive groundwater databases for Alberta will be key to the long term success of EMSD's groundwater program. -Planning for expansion of monitoring will likely require more robust data compilation and analysis, including 3D geologic models of the subsurface, and robust regional scale groundwater models, likely through collaboration with AGS, establishment of data sharing with other organizations, and hiring expertise in groundwater modelling -Existing data management systems cannot accommodate the current monitoring data being collected, and will certainly require updating to accommodate the new program -While this work plan stipulates and budgets for multiple meetings with stakeholders, including First Nations, further guidance from EMSD and OSM Directors and Executives is desired to determine whether this is appropriate, what the format and deliverables would be. Thus, no associated deliverables are listed in this work plan. -This work assumes that a total of 20% of an FTE (spread between ~3 different roles) from AEP Corporate Services would be available to contribute to this project 		
<p>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.</p> <p><input checked="" type="checkbox"/> Federal Government <input checked="" type="checkbox"/> Another AEP Division <input checked="" type="checkbox"/> Another GoA Department <input checked="" type="checkbox"/> University/Academic Institution</p>	<table border="1"> <tr> <td data-bbox="430 1780 727 1877"> <p>Knowledge System *</p> <p>Classical Science</p> </td> <td data-bbox="727 1780 1133 1877"> <p>Location (select all that apply) *</p> <p><input checked="" type="checkbox"/> Office or Laboratory <input checked="" type="checkbox"/> Sub-regional <input type="checkbox"/> Transboundary (provincial/territorial) <input type="checkbox"/> Lower Peace Region</p> </td> </tr> </table>	<p>Knowledge System *</p> <p>Classical Science</p>	<p>Location (select all that apply) *</p> <p><input checked="" type="checkbox"/> Office or Laboratory <input checked="" type="checkbox"/> Sub-regional <input type="checkbox"/> Transboundary (provincial/territorial) <input type="checkbox"/> Lower Peace Region</p>
<p>Knowledge System *</p> <p>Classical Science</p>	<p>Location (select all that apply) *</p> <p><input checked="" type="checkbox"/> Office or Laboratory <input checked="" type="checkbox"/> Sub-regional <input type="checkbox"/> Transboundary (provincial/territorial) <input type="checkbox"/> Lower Peace Region</p>		

<input type="checkbox"/> Solely delivered by GoA <input type="checkbox"/> Citizen Science <input checked="" type="checkbox"/> Indigenous Community or Organization <input checked="" type="checkbox"/> ENGO <input type="checkbox"/> Other		<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
AEP ONLY: Strategic Alignment to EMSD Outcomes		
AEP ONLY: Strategic Alignment to EMSD Science Plan, select 1-2 areas that apply (if Applicable) Sustainability of Water Resources for Human Use Climate Variability and Change		
AEP ONLY: Strategic Alignment to AEP Departmental Outcomes		
AEP ONLY: Environmental and Ecosystem Health and Integrity Water (Surface and Ground)	AEP ONLY: Sustainable Economic Diversity Yes	AEP ONLY: Social Well-Being No
AEP ONLY: Protected Public Health and Safety from Environmental Yes		
AEP ONLY: IMAG/IMSC Information Needs, Please Specify Which Need(s) is Being Addressed. File location M:\EMSD\Common\Portfolio Mgmt System Shared Docs	2, 3, 4, 7, 21, 24, 30	
AEP ONLY: How This Project Will Address Each Strategic Theme Selected Above.	The MER plan aims to assess the health and integrity of groundwater in the Athabasca Oil Sands Area and its suitability for various uses including drinking water (protection of public health), supply for ecosystems and to inform whether groundwater resources can be relied on to support sustainable economic diversity.	
Project Methodology		
List the Key Project Phases and Provide Bullets for Each Major Task Under Each Project Phase. *	Review groundwater monitoring approaches and Alberta programs - Conduct literature review, which may include meeting with experts - Evaluate when there were changes in instrumentation, methods, detection limits, labs, and how this may impact the suitability of the data for trend analysis Identify key groundwater issues and scientific questions - Literature review - Identify the state-of-science, and evidence to support development of key scientific questions focused on priority issues (may include meeting with experts) - Catalogue list of issues and prioritize Develop and write MER plan - Identify key scientific questions and develop testable hypotheses - Identify whether questions/hypotheses overlap with goals of regional planning and policy, and other monitoring programs (may include meeting with GoA experts) - Discuss what, where and how to monitor (may include meeting with groundwater monitoring and design experts) - Design and write an adaptable monitoring program which may include (a) a field-based monitoring plan with design and rationale for site selection, list of SOPs to be developed, expansion plan, (b) consideration of groundwater dependent ecosystems, (c) a plan for data evaluation and reporting, (d) a QA/QC plan. - Write criteria for well inclusion in monitoring network based on new program design - Evaluate database of well infrastructure and maintenance status (to be compiled in 2018/2019+ as a part of the groundwater monitoring and well maintenance programs) versus inclusion criteria - Identify existing information that can be used address key scientific questions, and begin to plan for obtaining data access and analysis, this may include pursuing data sharing with other organizations - Internal and external review of MER plan, revision, and publication Plan for program implementation - Update groundwater program lifecycle process maps to reflect new program, identify gaps, and plan to address them (may include change management training) - Identify requirements for a data management system to support the groundwater program (may include meeting with experts), and plan for implementation - Compile database/geodatabase of relevant data and information to support program implementation - Plan/schedule monitoring program expansion, including land use agreements	
Describe How Changes in Environmental Condition Will Be Assessed. *	TBD. The MER plan aims to identify the best approaches to assess change in environmental condition of groundwater with space and time.	
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". *	Water quality guidelines may be used to assess changes, the MER plan may outline approach to developing other benchmarks for comparison. If Groundwater Management Frameworks become finalized (with benchmarks) those may also be used.	

<p>Provide a Brief Description of the Methods By Project Phase. *</p>	<p>Review groundwater monitoring approaches and programs - Literature review and possibly meetings with experts - Tables will be compiled summarizing when major changes in data collection took place (e.g., instrumentation, methods, detection limits, and labs) Identify key groundwater issues and scientific questions - Literature review, writing - Consider holding one-on-one meetings, webinar series, and/or workshop with experts from Government, Academia, and other stakeholders Develop and write MER plan - Writing, meetings, revision Plan for program implementation - Working with EMSD's data management/governance team to update process maps, and plan to address gaps - Meetings and write-up about recommendations for data management, compilation - Database, geodatabase and mapping work - Investigation of budget/HR needs and schedule for expansion (e.g., drilling new wells)</p>
<p>List the Key Indicators Measured. *</p>	<p>N/A</p>
<p>Describe Sample Handling Procedures, if Not Applicable, State N/A. *</p>	<p>N/A</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>QA/QC plan to be developed as a part of the MER plan.</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.*</p>	<p>TBD based on scope of external stakeholder engagement to address objectives 1, 3, 4 and 5</p>
Components Delivered by Others	
<p>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>	<p>No phases will be fully delivered by external parties, assuming sufficient HR are available within EMSD. External parties may be engaged to participate in multiple phases addressing objectives 1, 3, 4 and 5.</p>
<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. *</p>	<p>No phases will be fully delivered by grant or contract, assuming sufficient HR are available within EMSD.</p>
Monitoring Site Locations and Coordinates (for all sites, please add them to the Monitoring Site Location tab - a separate excel sheet)	
<p>Attach Map of Locations. Distinguish Indicators by Station if Necessary. Distinguish Sampling Frequency by Station if Necessary.</p>	<p>N/A</p>
Project Schedule	
<p>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.</p>	<p>N/A</p>
<p>FOR OIL SANDS MONITORING PROJECTS ONLY: Have You Coordinated With Other Project Leads On Field Logistics? If So, Please Specify. *</p>	<p>N/A</p>
Other	

Additional Details.	This project will build off of 2017/2018 project GW-MD-3-1718, and will complement Greg Bickerton's 2018/2019 project on field and modelling methods to investigate surface water-groundwater interaction in the Oil Sands Area.	
Will Capacity Building and Training be a Component of the Project and If So, Explain How. If Not, State N/A. *	Yes. New scientific, project management, facilitation, and change management capacity will likely be built.	
Environmental Impact and Considerations.	N/A	
Data Management and Digital Assets		
Will Data be Produced as a Result Of This Project? *	Type of Quantitative Data Variables	Frequency Of Collection
No	Choose one	Choose one
Data Collection Period: Start Date - End Date	Timeline For Upload Period: Start Date - End Date	
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 data with TK will be produced.	
Platform/Location of Data Storage.	Data that will be used (not produced) as a part of this project are stored in Excel, Access, WDS, WISKI, PDFs etc.	
Project Deliverables		
Proposed 2018-19 Deliverable Type (for each deliverable outline document, presentation, meeting, etc.)		
<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"/> 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	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.
<input checked="" type="checkbox"/> EMSD Strategic & Operational Publication	<input checked="" type="checkbox"/> Other Documents	
Q1 - Deliverable, Comments	Q1 - Deliverable, Comments	
Q2 - Deliverable, Comments	Q2 - Deliverable, Comments	
Q3 - Deliverable, Comments	Q3 - Deliverable, Comments	
Q4 - Deliverable, Comments	Q4 - Deliverable, Comments	
MER Plan for Groundwater in the Athabasca Oil Sands Area of Canada- Draft	Annual Progress Report	
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

Review of groundwater issues and monitoring in the Athabasca Oil Sands Area of Alberta, Canada- manuscript submission		
Q3 - Deliverable, Comments	Q3 - Deliverable, Comments	Q3 - Deliverable, Comments
Q4 - Deliverable, Comments	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 checked="" 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.
Review of groundwater issues and monitoring in the Athabasca Oil Sands Area of Alberta, Canada		
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.
MER Plan for Groundwater in the Athabasca Oil Sands Area of Canada		
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.
<input checked="" type="checkbox"/> EMSD Strategic & Operational Publication	<input checked="" type="checkbox"/> Other Documents	
Q1 - Deliverable, Comments	Q1 - Deliverable, Comments	

Q2 - Deliverable, Comments	Q2 - Deliverable, Comments
	FACT SHEET: Review of groundwater issues and monitoring in Alberta
Q3 - Deliverable, Comments	Q3 - Deliverable, Comments
Q4 - Deliverable, Comments	Q4 - Deliverable, Comments
MER Plan for Groundwater in the Athabasca Oil Sands Area of Canada	Fact Sheet: MER Plan for Groundwater in the Athabasca Oil Sands Area of Canada; Annual Progress Report

All Completed Products if a multi-year project,
specify all completed products to date (consistent format for the fields below). Add rows as required.

Journal Paper

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)

Technical Report

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)

Book Chapter

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)

Conference Proceeding

Required Format: Author, Year, Title of Paper, Editors, Title of Proceedings, Name of Conference Location of Conference, Publisher Location, Name of Publisher,

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.)


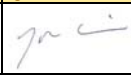
- 1)
- 2)
- 3)
- 4)
- 5)

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)		
2)		
3)		
4)		
5)		
Conference Presentation		
Required Format: Presenter, Date, Location, Title, Platform or Poster, Conference Name		
1)		
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
Dr. Cynthia McClain- Hydrogeologist	AEP	PI, lead phases 1 and 2, contribute to writing
Geospatial Analyst	AEP	Generate geodatabase and maps to support data evaluation and publications
Dr. John Orwin- Watershed Sci Director	AEP	Expert scientific advice on MER planning
New OSM Hydrogeologist (100% FTE)	AEP	Write MER Plan, lead engagement
New OSM Hydrogeologist (22% FTE)	AEP	Support MER planning, plan for implementation
AEP ONLY: Additional Human Resources Required from EMSD		
Name & Role	Branch - Section	Estimated time (% of annual FTE)
Dr. Cynthia McClain- Hydrogeologist	AEP	40
Financial Details and Budget Request		
Source of Funding Requested Year 1 - 2018/19		
	AEP ONLY: EMSD	OSM
Salaries and Benefits - AEP Chargeback		48000
Salaries and Benefits - New OSM Staff		0
Operations and Maintenance		
Consumable materials and supplies		400
Conferences and meetings travel		
Field work travel		
Project-related travel		17000
Engagement		72800
Reporting		
External Contracts - Organization/Vendor/Suppliers		45000
Overhead		
Grants		
Capital		
Total budget request for the year	0	183200

Total budget approved		
Source of Funding Requested Year 2 - 2019/20		
	AEP ONLY: EMSD	OSM
Salaries and Benefits - AEP Chargeback		48000
Salaries and Benefits - New OSM Staff		TBD
Operations and Maintenance		
Consumable materials and supplies		400
Conferences and meetings travel		8000
Field work travel		
Project-related travel		17000
Engagement		72800
Reporting		4000
External Contracts -		
Organization/Vendor/Suppliers		45000
Overhead		
Grants		0
Capital		
Total budget request for the year	0	195200
Total budget approved		
Source of Funding Requested Year 3 - 2020/21		
	AEP ONLY: EMSD	OSM
Salaries and Benefits - AEP Chargeback		
Salaries and Benefits - New OSM Staff		TBD
Operations and Maintenance		
Consumable materials and supplies		
Conferences and meetings travel		
Field work travel		
Project-related travel		
Engagement		
Reporting		
External Contracts -		
Overhead		
Grants		
Capital		
Total budget request for the year	0	0
Total budget approved		
Source of Funding Requested Year 4 - 2021/22		
	AEP ONLY: EMSD	OSM
Salaries and Benefits - AEP Chargeback		
Salaries and Benefits - New OSM Staff		TBD
Operations and Maintenance		
Consumable materials and supplies		
Conferences and meetings travel		
Field work travel		
Project-related travel		
Engagement		
Reporting		
External Contracts -		
Overhead		
Grants		
Capital		
Total budget request for the year	0	0
Total budget approved		
Budget Request for the Entire Project	0	378,400
Project Approval(s)		
Proposal Submitted by		
Surname	Given Name	Organization
McClain	Cynthia	AEP
Signature	Date	
	12/2/2018	
Proposal for OSM Reviewed by		
EMSD Executive Director	Signature	Date
John Orwin for Bill Donahue		12/2/2018
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
OSM / EMSD Project Has Not Been Approved		
Project Status	Date Notified	Date Required
The project is conditionally approved. The following conditions are required before approval is granted.		
List the Condition(s)		
Condition(s) Addressed / Approval Granted		
Choose one		
OSM / EMSD Approval Post Removal of Condition(s)		
Name & Title	Signature	Date