Work Plan Application

Project Information	
Project Title:	Surface Water Quantity Monitoring - Water Levels and Flows
Lead Applicant, Organization, or Community:	Environment and Climate Change Canada
Work Plan Identifier Number: If this is an on-going project please fill the identifier number for 24/25 fiscal by adjusting the last four digits: **Example:** D-1-2425 would become D-1-**2425**	W-LTM-S-1-2425
Project Region(s):	Oil Sands Region
Project Start Year: First year funding under the OSM program was received for this project (if applicable)	Since Inception of OSM
Project End Year: Last year funding under the OSM program is requested **Example: 2024**	Ongoing - Core Monitoring
Total 2024/25 Project Budget: From all sources for the 2024/25 fiscal year	
Requested OSM Program Funding: For the 2024/25 fiscal year	1,973,635.00
Project Type:	Long Term Monitoring
Project Theme:	Surface Water
Anticipated Total Duration of Projects (Core and Focused Study (3 years))	Year 5
Current Year (choose one):	Focused Study -Select One-
	Core Monitoring Year 1 of 3

Contact Information

Lead Applicant/ Principal Investigator: Every work plan application requires one lead applicant. This lead is accountable for the entire work plan and all deliverables.	Malcolm Conly
Job Title:	
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Project Summary

In the space below, please provide a summary of the proposed project that includes a brief overview of the project drivers and objectives, the proposed approach/methodology, project deliverables, and how the project will deliver to the OSM Program objectives. The summary should be written in plain language and **should not exceed 300 words**.

As noted in the approved Statement of Work (SoW), the surface water quantity monitoring activities will not substantially change from previous years. Water levels and flows will continue to be monitored at key nodes throughout the lower Athabasca River system. A hydroacoustic suspended sediment monitoring station will be maintained in order to develop the ratings necessary for the longer-term goal of continuous suspended sediment monitoring on the river. It includes the operation of hydrology climate station network (7 stations) in addition to four snow surveys in oil sands region. Climate data are required for predictive modeling (i.e. hydrology, water quality, air quality, etc.) and interpretation of air quality/air depositions and hydrology long-term core monitoring programs.

1.0 Merits of the Work Plan

All work plans under the OSM Program must serve the mandate of the program by determining (1) if changes in indicators are occurring in the oil sands region and (2) if the changes are caused by oil sands development activities and (3) the contribution in the context of cumulative effects. In the space below please provide information on the following:

- Describe the key drivers for the project identifying linkages to Adaptive Monitoring framework particularly as it relates to surveillance, confirmation and limits of change (as per OC approved Key Questions).
- Explain the knowledge gap as it relates to the Adaptive Monitoring that is being addressed along with the context and scope of the problem as well as the Source - Pathway - Receptor Conceptual Models .
- Describe how the project meets the mandate of the OSM Program or areas of limited knowledge is the work being designed to answer with consideration for the TAC specific Scope of Work Document (attached) and the Key Questions (attached)?
- Discuss results of previous monitoring/studies/development and what has been achieved to date. Please identify potential linkages to relevant sections of the State of Environment Report.

The establishment of long-term hydrologic/hydrometric & climate data record in the region supports:
- hydrological characterization of watersheds (LAR) including understanding of natural variability and assessment of hydrological changes in the basin including status, trends and patterns of fresh water supplies in the region.
- development of total loading for water and sediment quality, rather than only concentrations of select pollutants.
- the interpretation of data collected for freshwater aquatic ecosystem including lentic, lotic and wetlands (i.e. water quality, air quality & dispersion, sediment quality, benthic invertebrate community, and fish health & population) by placing in context current hydrological conditions relative to historical mean or extreme conditions;
- establishing baseline conditions within the measured period of record, to better understand the impacts of anthropogenic activities and climate change on the hydrology of region.
- climate data and changing conditions in the region will provide important information as drivers (or co-variants) for other environmental changes
- predictive modeling by providing critical hydro-meteorological boundary conditions and input data for model development, calibration and verification that further form the basis of environmental impact assessments and operational water management plans.
- other groups in assessing navigational challenges in Athabasca River and Peace-Athabasca Delta;
- other groups in evaluating and establishing Environmental Base Flows (EBF) for protection of aquatic ecosystem.
- public reporting of annual hydrological conditions in the context of inter-annual variability

With support from OSM funding in past, the following studies have recently been completed:
(a) Paleo-hydrology – to understand the natural variability versus anthropogenic forcing of hydrological Changes in the Athabasca River Basin.
(b) Assessment of variabilities and changes in the hydro-climatological conditions of Alberta Oil Sands Region using a set of climate indicators
(c) Hydrological characterization and assessment of climate change impacts in the Athabasca River basin - these result also contributed to SOE reporting.

2.0 Objectives of the Work Plan

List in point form the objectives of the 2024/25 work plan below

The following are the specific objectives for an enhanced climate, hydrologic & hydrometric monitoring in the oil sands region of Alberta:
- Ongoing operation and maintenance of Water Survey of Canada (WSC) hydrometric network.
- Continue to secure land disposition authorizations and complete legal land surveys as required under Alberta Public Lands Act to ensure compliance.
- Undertake operation and maintenance of Climate Monitoring stations (AEP)
- Conduct snow surveys at four locations within the oil sands region (AEP)
- Conduct suspended sediment monitoring on the Athabasca River below Fort McMurray.
- Implement hydro-accoustic techniques for continuous monitoring of sediment utilizing standard operating procedures and techniques employed by the USGS.

- Produce annual reporting of hydrological conditions at OSM operated hydrometric stations.

Note:

- Completion of Land Disposition Authorizations under PLA continues to be dependent on availability of Provincial Authorities to process applications – the processing has been slow.

3.0 Scope

Evaluation of Scope Criteria (Information Box Only- No action required)

Your workplan will be evaluated against the criteria below. A successful workplan would:

- Be in scope of the OSM Program (e.g., regional boundaries, specific to oil sands development, within boundaries of the Oil Sands Environmental Monitoring Program Regulation)
- consider the TAC-specific Scope of Work document and the key questions
- integrate western science with Indigenous Community-Based Monitoring)
- address the Adaptive Monitoring particularly as it relates to surveillance, confirmation and limits of change as per approved Key Questions.
- have an experimental design that addresses the Pressure/Stressor, Pathway/Exposure, Response continuum
- produce data/knowledge aligned with OSM Program requirements and is working with Service Alberta
- uses Standard Operating Procedures/ Best Management Practices/ Standard Methods including for Indigenous Community-Based Monitoring

3.1 Theme

Please select the theme(s) your monitoring work plan relates to:

- [ ] Air
- [ ] Groundwater
- [x] Surface Water
- [ ] Wetlands
- [ ] Terrestrial Biology
- [ ] Data Management Analytics & Prediction
- [ ] Cross Cutting

3.2 Core Monitoring, Focused Study or Community Based Monitoring

Please select from the dropdown menu below if the monitoring in the work plan is “core monitoring” and/or a “focused study”. Core monitoring are long term monitoring programs that have been in operation for at least 3 years, have been previously designated by the OSM program as core, and will continue to operate into the future. Focused studies are short term projects 1-2 years that address a specific emerging issue.

Long Term Monitoring

Themes

Please select the theme from the options below. Select all that apply.

- [ ] Air
- [ ] Groundwater
- [x] Surface Water
- [ ] Wetland
- [ ] Terrestrial
- [ ] Cross-Cutting

3.3.1 Surface Water Theme

Please select from the dropdown menus below the sub-theme(s) your monitoring work plan relates to and address the Key Questions:

3.3.1 Surface Water Theme:

3.3.1.1 Sub Themes

Quantity

3.3.1.2 Surface Water Key Questions:

Explain how your surface water monitoring program addresses the key questions below.

Has baseline been established? Have thresholds or limits of change been identified?

Yes a baseline has been established within the period of record. LARP Surface Water Quantity Management Framework is the current Threshold for the LAR.

Are changes occurring in water quality, biological health (e.g., benthos, fish) and/or water quantity/flows relative to baseline? If yes, is there evidence that the observed change is attributable to oil sands development? (Describe source-pathway-receptor and/or conceptual models and what is the contribution in the context of cumulative effects?)

Yes there have observed changes relative to baseline. Stream-flow trends in the past 60 years have demonstrated a declining pattern and recent data illustrate that there has been an increase in the open-season stream-flow since 2015. These changes have not, at this time, been linked directly to Oil Sands development. These findings are regional in nature and more effort is required to understand the impacts of climate change, anthropogenic activities and the potential of compounding influences.

Are there unanticipated results in the data? If yes, is there need for investigation of cause studies?

No, it was anticipated that regional climatological drivers would have a dominant influence on the hydrology of the lower Athabasca River. Moreover, similar patterns of declining flows have been identified in other watersheds. These findings are regional in nature and more effort is required to understand the impacts of climate change, anthropogenic activities and the potential of compounding influences. Until further work has been completed to understand the various regionally-based drivers influencing flow patterns there is currently little benefit in undertaking an Investigation of Cause

Are changes in water quality and/or water quantity and/or biological health informing Indigenous key questions and concerns?

Indigenous communities can access the data, which is publicly available via ECCC's Water Office and it is understood that it is used to inform navigational needs.

Are data produced following OSM Program requirements and provided into the OSM Program data management system?

All hydrometric data are produced following National Standards for data collection and dissementation as established by Water Survey of Canada and are in accordance with processes followed by the World Meteorological Organization (WMO). All data collected and managed by Water Survey of Canada are publicly available and being ingested into OSM's Kister (WISKI) system.

Do methodologies use relevant Standard Operating Procedures/ Best Management Practices/ Standard Methods?

Yes - Water Survey of Canada (as well as the Meteorological Service of Canada) is ISO Certified. All program delivery follows National Standard Operating Procedures. Water Survey of Canada also has a rigid Quality Management System (QMS) and undergoes internal and external audits of its program and processes. All hydrometric data collection platforms have been established with satellite telemetry allowing for near-real time accessibility to water levels and flows (for stations where rating relationships are well established).

How does the monitoring identify integration amongst projects, themes or with communities?

All hydrometric, sediment and climate data collected is publicly available. Many OSM projects access the near real-time data for planning field logistics to ensure safety and scientific integrity of their program. Historic data is made accessible via Water Office allowing for integrated use and for the interpretation of results. All hydrometric & sediment data collected under this work plan supports predictive model

development by providing critical model inputs as well as for calibration and validation of the model outputs.

With consideration for adaptive monitoring, where does the proposed monitoring fit on the conceptual model for the theme area relative to the conceptual model for the OSM Program?

This proposed monitoring sits dominantly in the the 'Pathways' component of the OSM Conceptual Model, although it is significantly influenced by a myriad of Stressors and Pressures.

How will this work advance understanding transition towards adaptive monitoring?

The period of record currently available for the hydrometric operations is sufficient (generally needing ~ 5-10 years of data) to undertake an evaluation of the value/importance of each station in the context of the broader network of stations. One approach that could be applied is based in 'Information Theory', where the amount of shared, or reproducible information, is assessed between the stations in a defined network. The analysis can be varied both spatially, based on different network definitions, and temporally, based on different periods of record or seasonal considerations. This approach allows the amount of new information content derived from any given station to be assessed relative to the investment in operations to maintain that station. This type of Information Theory approach has been utilized in several studies of hydrometric monitoring network assessment and optimization and may be useful to inform adaptive monitoring efforts in the OSM region.

Is the work plan contributing to Programmatic State of Environment Reporting? If yes, please identify potential linkages to relevant sections of the State of Environment Report.

Yes - State of Aquatics - Surface Water Quantity: Streamflow and Water Levels

4.0 Mitigation

Evaluation of Mitigation Criteria (Information Box Only- No action required)
Your workplan will be evaluated against the criteria below. A successful workplan would potentially inform:

- efficacy of an existing regulation or policy
- an EPEA approval condition
- a regional framework (i.e., LARP)
- an emerging issue

Explain how your monitoring program informs management, policy and regulatory compliance. As relevant consider adaptive monitoring and the approved Key Questions in your response.

This monitoring program supports the implementation of Lower Athabasca Regional Plan and associated management framework e.g. LAR Surface Water Quantity Management Framework and LAR Surface Water Quality Management Framework. Further, water level and flow data collected under this program are being used to confirm regulatory compliance with water licenses issued under the Water Act (to industry, municipalities, etc.). Many of the mines are obligated to provide estimates of annual runoff into local tributaries, for which they use data from WSC stations to support their reporting. In addition, some mines are required to compare changes in loadings within the rivers, which requires flow data, as compared to the previous five years (e.g., Muskeg River, Athabasca River). Hydrometric data collected on the Athabasca River is also used to establish and support application of limits and triggers within the context of environmental management in the region.

5.0 Indigenous Issues

Evaluation of Indigenous Issues Criteria (Information Box Only- No action required)
Your workplan will be evaluated against the criteria below. A successful workplan would potentially:

- Investigate Indigenous communities key questions and concerns
- Includes culturally relevant receptor(s) and indicator(s)
- Include or be driven by Indigenous communities (participatory or collaborative)
- Develop capacity in Indigenous communities
- Include a Council Resolution or Letter of Support from one or more Indigenous communities
- Describe how ethics protocols and best practices regarding involvement of Indigenous peoples will be adhered to
- Provide information on how Indigenous Knowledge will be collected, interpreted, validated, and used in a way that meets community Indigenous Knowledge protocols

Explain how your monitoring activities are inclusive and respond to Indigenous key questions and concerns and inform the ability to understand impacts on concerns and inform Section 35 Rights

All hydrometric stations operated in the Oil Sands region, as well as in the Peace-Athabasca Delta (note: PAD hydrometric stations are not funded under the OSM program) have satellite telemetry to provide near real-time access to water level and flow data. Data is available to support local logistics for researchers and others traveling on the waterways. Near real-time availability of water levels may be coupled with local and Indigenous knowledge to provide insight on transportation/navigation and accessibility.

Does this project include an Integrated Community Based Monitoring Component?

No

If YES, please complete the ICBM Abbreviated Work Plan Forms and submit using the link below

ICBM WORK PLAN SUBMISSION LINK

5.1 Alignment with Interim Ethical Guidelines for ICBM in the OSM Program

Are there any community specific protocols that will be followed?

Does the work plan involve methods for Indigenous participants to share information or knowledge (e.g. interview, focus group, survey/structured interview), or any other Indigenous participation? If yes, describe how risks and harms will be assessed, and the consent process that will be used.

Do the activities include any other collecting/sharing, interpreting, or applying Indigenous knowledge? Please describe how these activities will be conducted in alignment with the Interim Ethical Guidelines, and any community-based protocols and/or guidelines that may also apply.

Indicate how Indigenous communities / Indigenous knowledge holders will be involved to ensure appropriate analysis, interpretation and application of data and knowledge.

How are Indigenous communities involved in identifying or confirming the appropriateness of approach, methods, and/or indicators?

How does this work plan directly benefit Indigenous communities? How does it support building capacity in Indigenous communities?

How is the information from this work plan going to be reported back to Indigenous communities in a way that is accessible, transparent and easy to understand?

6.0 Measuring Change

Evaluation of Measuring Change Criteria (Information Box Only- No action required)

Your workplan will be evaluated against the criteria below. A successful workplan would potentially:

- assess changes in environmental conditions compared to baseline (e.g., validation of EIA predictions)
- report uncertainty in estimates and monitoring is of sufficient power to detect change due to oil sands development on reasonable temporal or spatial scales
- include indicators along the spectrum of response (e.g., individual, population, community)
- focus on areas of highest risk (where change is detected, where change is greater than expected, where development is expected to expand collection of baseline).
- measure change along a stressor gradient or a stressor/reference comparison

Explain how your monitoring identifies environmental changes and how can be assessed against a baseline condition. As relevant, consider adaptive monitoring, the TAC specific Scope of Work document and the Key Questions in your response.

Changes in environmental conditions (for example, stream flows, water levels, precipitation, temperature etc.) could be assessed relative to baseline (reference) and other established triggers and limits. For example, triggers and limits identified in Surface Water Quantity Management Framework of LARP will be used to assess the deviation from the intended outcome for the water quantity of Lower Athabasca River. As part of the current workplan, efforts will be undertaken to investigate the potential of a future integrated modeling effort that would apply hydrometric data and water quantity scenario modeling to investigate the impacts of water quantity associated with various performance (Limits of Change) indicators developed by other components of the Surface water TAC (e.g. benthos, fishers etc.). Results from the integrative modeling efforts would help to inform gaps and potential redundancies in surface water monitoring.

7.0 Accounting for Scale

Evaluation of Accounting for Scale Criteria (Information Box Only- No action required)

Your workplan will be evaluated against the criteria below. A successful workplan would potentially be:

- appropriate to the key question and indicator of interest
- relevant to sub-regional and regional questions
- relevant to organism, population and/or community levels of biological organization
- where modelled results are validated with monitored data
- where monitoring informs on environmental processes that occur at a regional scale. e.g. Characterizing individual sources to gain a regional estimate of acid deposition and understand signal from individual contributing sources.

Explain how your monitoring tracks regional and sub-regional state of the environment, including cumulative effects. As relevant, consider adaptive monitoring, the TAC specific Scope of Work document and the Key Questions in your response.

There are discernible hydrological patterns that are observed in the cold-regions hydrological regime of the Lower Athabasca basin, but there is also a high level of variability within and between years. In addition, there is variability in runoff regimes between the main stem of the Athabasca River (regional scale) and the tributaries (sub-regional or sub-watershed scale) to the Athabasca River. The hydrometric monitoring network is designed to accommodate the various scale differences in the watersheds (regional to sub-regional), which allows for comparing and contrasting regional hydrological influences from sub-regional influences on the hydrologic responses in the Oil Sands region. Hydrologic data provides the fundamental basis for cumulative effects assessments in the region. The OSM hydrometric monitoring is now maturing to a stage where an analysis could be undertaken to provide an assessment of the value and/or potential redundancies within the network of stations currently operated.

Although water quantity monitoring is a central pathway component in the OSM Programatic Conceptual Model, it influences other key areas identified in the conceptual model i.e., ecosystem response (diversity, distribution) and valued components (ecosystem structure & function). As performance indicators (or Limits of Change) are developed for some of the response components within the Conceptual model, which have measurable relationships with the hydrodynamic characteristics of the the river systems, integrative models can be investigated that will help to evaluate the potential cumulative effects and help better align future monitoring of key ecosystem response variables.

8.0 Transparency

Evaluation of Transparency Criteria (Information Box Only- No action required)
Your workplan will be evaluated against the criteria below. A successful workplan would potentially include:

- a plan for dissemination of monitoring data, including appropriate timing, format, and aligns with OSM program data management plan
- demonstrated transparency in past performance
- identified an annual progress report as a deliverable
- reporting of monitoring results occurs at timing and format that is appropriate for recipient audience.

Explain how your monitoring generates data and reporting that is accessible, credible and useful. As relevant, consider adaptive monitoring, the TAC specific Scope of Work document and the Key Questions in your response.

Hydrometric/sediment data are made available through ECCC, Water Survey of Canada's Water Office and can be downloaded in CSV format - http://wateroffice.ec.gc.ca/
- Completed new or updated metadata &/or monitoring site records including station metadata can be found at: https://www.ec.gc.ca/rhc-wsc/default.asp?lang=En&n=894E91BE-1
- Climate monitoring data is available through the RAMP website (historical data upto 31 March 2017) and through AEP WISKI (since 1 April 2017).
- Work is underway with Service Alberta to develop climate and hydrology data tree where all the data will also be accessible via the OSM data portal/system. {This needs to be validated}
- An annual report is prepared each year to document hydrologic conditions relative to baseline/historic reference conditions, and is provided to the OSM Secretariat for distribution/publication as an Oil Sands Monitoring Technical Document.

9.0 Efficiency

Evaluation of Efficiency Criteria (Information Box Only- No action required)
Your workplan will be evaluated against the criteria below. A successful workplan would include:

- appropriately addressed a risk-informed allocation of resources
- identified the role and justification for each staff member on the proposed work plan
- identified in-kind and leveraged resources (e.g., resources and approaches are appropriately shared with other OSM projects where possible)
- established partnerships (value-added) and demonstrated examples of coordinated efficiencies (e.g., field, analytical)
- identified co-location of monitoring effort
- demonstrated monitoring activities and information collected are not duplicative
- considered sampling/measurement/methods compatibility to other data sources (e.g., AER)

Explain how your monitoring is integrated with other OSM projects and incorporates community-based participation and/or engagement in proposed monitoring activities. As relevant, consider adaptive monitoring, the TAC specific Scope of Work document and the Key Questions in your response.

The design of the rationalized hydrometric network for the oil sands region takes into account the overall scientific needs of the Oil Sands Monitoring program, regulatory needs of industry and stakeholder interests in monitoring water balances within the Oil Sands Region. The design also takes into account the most cost-effective approach for meeting the multitude of user needs. Many of the hydrometric stations are optimized and co-located with other aquatic monitoring sites e.g., water quality, sediment quality, benthic invertebrates etc.

10.0 Work Plan Approach/Methods

List the Key Project Phases and Provide Bullets for Each Major Task under Each Project Phase

Phase 1: Station Management
Task 1a: Life Cycle Management of hydrometric infrastructure & equipment (ongoing requirement for station management and maintaining data integrity)
Task 1b: Life Cycle Management of climate station infrastructure & equipment (on going requirement for station management and maintaining data integrity)

Phase 2: Land disposition authorization under Alberta's Public Lands Act (PLA)
Task 2a: Development and submission of land disposition applications for all the hydrometric stations under OSM program (on-going from previous years)
Task 2b: Undertake Cadastral surveys for each permanent monitoring stations as required by law under the Alberta PLA.

Phase 3: Hydrometric Monitoring and Data Management
Task 3a: Data collection (monitoring) including monthly manual measurements and maintenance/ calibration of discharge rating curves.
Task 3b: Additional winter flow measurements (minimum 2) taken at hydrometric station: Athabasca River below Fort McMurray (07DA001) to to improve uncertainty of flows under ice and facilitate the implementation of LAR Surface Water Quantity Management Framework.
Task 3c: Data management (annual requirement)
Task 3d: Preparation of monitoring metadata (annual requirement)
Task 3e: Datum updates to CGVD2013
Task 3f: QA/QC of 2023-24 data and approvals

Phase 4: Climate Monitoring and Data Management (AEP)
Task4a: Data Collection – 2 snow survey's complete in late winter (Jan – March).
Task 4b: Data management of climate data (annual requirement)
Task4c: Preparation of metadata associated with climate/snow monitoring network
Task4d: QA/QC of 2023-24 data and approvals

Phase 5: Sediment Monitoring
Task 5a: Data Collection on one site on the main-stem Athabasca River
Task 5b: Operation and maintenance of insitu-continuous sediment monitoring via hydro-accoustics
Task 5c: Sediment Data management (annual requirement)
Task 5d: Preparation of sediment monitoring metadata (annual requirement)
Task 5e: Sediment data QA/QC and data approvals

Phase 6: Dissemination of Knowledge
Task 6a: Upload of approved hydrometric data to public site (i.e., Water Office)
Task 6b: Upload of approved sediment data to public site (i.e., Water Office)
Task 6c: Preparation of annual technical report summarizing current hydrologic year in context of historic baseline

Describe how changes in environmental Condition will be assessed

Changes in flows monitored by the hydrometric network can be evaluated against historical baseline for temporal variability. In addition the network will allow for assessments in longitudinal water balances. The established long-term hydro-climatic data (river flows and water levels; lake levels and climate data including snow surveys) in Lower Athabasca River watershed can be used to characterize natural variability and to assess hydrological changes in the watershed including the status, trends and patterns of fresh

water supplies in the region.
As longterm baseline conditions are established they will be used to understand the impacts of anthropogenic activities (e.g. land use/land cover changes and climate changes) on the hydrology of region. Moreover, these baseline conditions help support integrated interpretation of other components (e.g., fishe, benthos, etc) where relationships with water levels and flows have been developed.

Are there Benchmarks Being Used to Assess Changes in Environmental Condition? If So, Please Describe, If Not, State "NONE"

Given the spatial and temporal variability of hydrological conditions in the region, specific benchmarks are typically not applicable. Currently there are no specific benchmarks, but the following can be used as guidance in addressing key questions such as; What is the historical, current and projected-future spatial and temporal variability of water flow and sediment transport into and through the Lower Athabasca River and from tributaries? With long-term hydrological data sets, evaluations can be undertaken to assess trends in hydrological conditions, which can provide insights that assist in separating natural variability from aspects of anthropogenic activities (e.g. consumptive water use and land disturbances within a watershed) and other pressures like climate change.

However, for water resources management purposes there are ‘triggers’ and ‘limits’ established to support management decisions such as noted in the Surface Water Quantity Management Framework in the Lower Athabasca Regional Plan.

(e.g., objectives, tiers, triggers, limits, reference conditions, thresholds, etc.)

Provide a Brief Description of the Western Science or Community-Based Monitoring Indigenous Community-Based Monitoring Methods by Project Phase

Phase 1: Station Management
- Annual inspections of equipment and site to ensure sustainable operations and site safety.

Phase 2: Land disposition authorization under PLA - Preparation and submission of land disposition applications for all the hydrometric stations under OSM program as per Public Lands Act requirement. Followed by legal land surveys for lands occupied by hydrometric infrastructure as required under the PLA.

Phase 3, 4 & 5: Hydrometric, Climate and Sediment Monitoring and Data Management
- Ensuring all OH&S training are up to date for all the monitoring/field staff, including, as necessary, modified SOPS used to manage risks associated with weather, wildfires and other public health risks.
- Collection of climate, hydrometric and sediment data as per applicable SOPs.
- Hydrometric and sediment data will be finalized as per WSC QA/QC standards and procedures.
- Climate and Snow Survey data will follow protocols in place by AEP
- Hydrometric and sediment data will be managed in WSC's data management system.
- Climate and Snow survey data will be managed by AEP
- Final data will be available through WSC/AEP.

Phase 6: Dissemination of Knowledge
- all approved data for hydrometric and sediment will be uploaded and made publically available via ECCC’s Water Office as per national protocols for Water Survey of Canada.
- a technical paper will be prepared on the annual data collected and put in context of historic data and submitted for approval via OSM Secratariate procedures.

List the Key Indicators Measured, If Not Applicable, State N/A

Water levels, river flows and sediment fluxes in Athabasca River and its tributaries
Temperature, Precipitation, Relative Humidity, Windspeed & Direction, Solar Radiation and Snow Depth for Climate Stations

11.0 Knowledge Translation

In the space below, please provide the following:

- Describe the plan for knowledge transfer and distribution of learnings from the project. This could include workshops, publications, best practice documentation, marketing plan, etc.
- Demonstrate that the knowledge transfer plan is appropriate for the intended end-users.

Evaluation/synthesis of annual data in context of available historical data including:
- Plain language annual summary of hydrological conditions based on Hydrometric data.
Integrative modeling outputs will be shared via maps at different flow scenarios (e.g., web based story maps).

12.0 External Partners

List by project or project phase each component that will be delivered by an external party (including analytical laboratories) and name the party. Describe and name the associate work plan/grant/contract for these services. * state none if not required

None

*To ensure complete work plan proposal submission, all grants and contracts listed in this section should also be captured in Grants & Contracts.

13.0 Data Sharing and Data Management

For 2024-25 the following approach will be taken by the OSM Program related to data sharing.

For all work plans of a **western science** nature funded under the OSM Program, data sharing is a condition of funding and must align with the principle of **"Open by Default"**. In this case, all data is to be shared with the OSM Program as directed by the OSM Program Data Management work plan.

For all work plans involving **Indigenous Knowledge** as defined below and funded under the OSM Program, data sharing is a condition of funding and the Indigenous Knowledge components of the work plan must align with the principle of **"Protected by Default".** In this case, all data as defined as Indigenous Knowledge, are to be retained by the Indigenous community to which the Indigenous Knowledge is held.

Indigenous Knowledge is defined as:

*"*The knowledge held by First Nations, Inuit and Métis peoples, the Aboriginal peoples of Canada. Traditional knowledge is specific to place, usually transmitted orally, and rooted in the experience of multiple generations. It is determined by an Aboriginal community's land, environment, region, culture and language. Traditional knowledge is usually described by Aboriginal peoples as holistic, involving body, mind, feelings and spirit. Knowledge may be expressed in symbols, arts, ceremonial and everyday practices, narratives and, especially, in relationships. The word tradition is not necessarily synonymous with old. Traditional knowledge is held collectively by all members of a community, although some members may have particular responsibility for its transmission. It includes preserved knowledge created by, and received from, past generations and innovations and new knowledge transmitted to subsequent generations. In international or scholarly discourse, the terms traditional knowledge and Indigenous knowledge are sometimes used interchangeably.*"*

This definition was taken from the Canadian Government's Tri-council Policy Statement for Ethical Research involving Humans (Chapter 9, pg. 113) and is an interim definition specific to the Oil Sands Monitoring Program.

13.1 Has there, or will there be, a Data Sharing agreement established through this Project? *

No

13.2 Type of Quantitative Data Variables**:**

Both

13.3 Frequency of Collection:

Real Time

13.4 Estimated Data Collection Start Date:

Apr 1, 2024

13.5 Estimated Data Collection End Date:

Mar 31, 2025

13.6 Estimated Timeline For Upload Start Date:

Apr 1, 2024

13.7 Estimated Timeline For Upload End Date:

Mar 31, 2025

13.8 Will the data include traditional knowledge as defined by and provided by an Indigenous representative, Community or Organization?

No

Table 13.9 Please describe below the Location of Data and Data Type:

Add a Data Source by clicking on the add row on the bottom right side of table

Name of Dataset	Location of Dataset (E.g.:Path, Website, Database, etc.)	Data File Formats (E.g.: csv, txt, API, accdb, xlsx, etc.)	Security Classification
Hydrometric and Sediment Data	http:// wateroffice.ec.gc.ca	csv format	Open by Default
Climate	AEP Wiski	csv format	Protected by Default

14.0 2024/25 Deliverables

Add an additional deliverable by clicking on the add row on the bottom right side of table

Type of Deliverable	Delivery Date	Description
OSM Program Annual Progress Report (required)	Q2	Annual plain language report of previous years's hydrological conditions for the lower Athabasca River
Other (Describe in Description Section)	Q4	Publically available approved hydrometric data that are consistent with National Standards

15.0 Project Team & Partners

In the space below please provide information on the following:

- Describe key members of the project team, including roles, responsibilities and expertise relevant to the proposed project.
- Describe the competency of this team to complete the project.
- Identify any personnel or expertise gaps for successful completion of the project relative to the OSM Program mandate and discuss how these gaps will be addressed.
- Describe the project management approach and the management structure.

Malcolm Conly
Deputy Director, National Hydrological Services – Water Survey of Canada
Principal Investigator/Project Owner
with support from:
Megan Garner
Shelley Morris

Water Survey of Canada – Alberta District (ECCC Lead: Shelley Morris)
- Program operations is integrated with the broader hydrometric operations for Alberta
- Specific investment from Oil Sands ensures a staff of four Hydrometric Technologists are available to operate, manage and compute data from the Oil Sands Hydrometric Network. Each Technologist is responsible for a specific set of stations to operate and maintain
- A Hydrometric Supervisor responsible for managing the overall network operation in the oil sands region, establishing priority for station operation, life cycle management and undertakes approvals of and QA/QC for all station operations with the support of their team of technologist.
- Further supported (30%) by WSC Head for Alberta Northern Hydrometric Operations, who ensures provincial and national consistency of operation of the hydrometric network. They provide oversight on all safety aspects of program delivery within the oil sands as well as within the overall operations in Northern Alberta.
- Data Technologist (50%) provides support for upload and dissemination of hydrometric data while also providing a point of contact for users as a client interface for data inquiries. Also directly supports requirements for managing radio telemetry licensing and management of station metadata and data uploads onto national archive. Also supports the requirements and applications of land disposition under Alberta's Provincial Lands Act (PLA)

Reporting and Sediment Monitoring (ECCC Lead: Megan Garner)
- Water Resources Engineer (100%) provides engineering over-site towards engineered infrastructure installed and used as part of operation, directly supports the analysis and interpretation of annual hydrological conditions reporting, and leads on efforts for sediment monitoring including the implementation of continuous monitoring using hydroaccoustic technology.

Alberta Environment and Parks:
1. Climate Field Technologist – provides technical support for program and responsible for field operations supporting Climate Network and Snow Surveys

16.0 Project Human Resources & Financing

Section 16.1 Human Resource Estimates

Building off of the competencies listed in the previous section, please complete the table below. Add additional rows as necessary. This table must include **ALL staff involved** in the project, their role and the % of that staff's time allocated to this work plan. The AEPA calculated amount is based on an estimate of $120,000/year for FTEs. This number cannot be changed. The OSM program recognizes that this is an estimate.

Table 16.1.1 AEPA

Add an additional AEPA Staff member by clicking on the add row below the table. The total FTE (Full Time Equivalent) is Auto Summed (in Table 16.2.1) and converted to a dollar amount.

Name (Last, First)	Role	%Time Allocated to Project
Climate Technologist	Provide supporrt for operation of AEPA Climate Network and Snow survey sites	30

Table 16.1.2 ECCC

Add an additional ECCC Staff member by clicking on the add row below the table. The total FTE (Full Time Equivalent) is Auto Summed (in Table 16.2.2) and converted to a dollar amount.

Name (Last, First)	Role	%Time Allocated to Project
Water Resources Engineer	Provides engineering oversite towards engineered infrastructure installed and used as part of operation, directly supports the analysis and interpretation of annual hydrological conditions reporting, leads on efforts for sediment monitoring including the assessment of continuous monitoring using hydro-acoustic technology.	100
Expert Technologist	Provides support to Engineering for the planning, analysis,field work, and documentation associated with implementation of the sediment monitoring program.	30
Head of Operations - North	Ensures provincial and national consistency of operation of the hydrometric network. They provide oversight on all safety aspects of program delivery within the oil sands as well as within the overall operations within Northern Alberta.	30
Data Technologist	Provide data quality assurance and control oversight. Support applications for Land Dispositions and management of metadata. Also provides direct support to clients on data inquires	30
Hydrometric Supervisor	Responsible for managing the overall network operation I the oil sands region, establishing priority for station operation, life cycle management and undertakes approvals of and QA/QC for all station operations with the support of their team of technologist.	100
Hydrometric Technologist x 4	Operate, manage and compute data from a sub set of the Oil Sands Hydrometric Network - requires four full time technologists	400

The tables below are the financial tables for Alberta Environment & Protected Areas (AEPA) and Environment & Climate Change Canada. All work plans under the OSM Program require either a government lead or a government coordinator.

Section 16.2 Financing

The OSM Program recognizes that many of these submissions are a result of joint effort and monitoring initiatives. A detailed "PROJECT FINANCE BREAKDOWN" must be provided using the Project Finance Breakdown Template provided, accessible here. Please note that completion of this Project Finance Breakdown Template is mandatory and must be submitted along with each workplan.

PROJECT FINANCE BREAKDOWN TEMPLATE

Table 16.2.1 Funding Requested BY ALBERTA ENVIRONMENT & PROTECTED AREAS

Organization - Alberta Environment & Protected Areas ONLY	Total % time allocated to project for AEPA staff	Total Funding Requested from OSM
Salaries and Benefits (Calculated from Table 16.1.1 above)	30	$36,000.00
Operations and Maintenance		
Consumable materials and supplies		$1,500.00
Conferences and meetings travel		
Project-related travel		$45,500.00
Engagement		
Reporting		
Overhead		
Total All Grants (Calculated from Table 16.4 below)		$0.00
Total All Contracts (Calculated from Table 16.5 below)		$0.00
Sub-Total (Calculated)		$83,000.00
Capital*		
AEPA TOTAL (Calculated)		$83,000.00

* The Government of Alberta Financial Policies (*Policy # A600*) requires that all **capital asset** purchases comply with governmental and departmental legislation, policies, procedures, directives and guidelines. **Capital assets** (*Financial Policy # A100*, Government of Alberta, January 2014) are tangible assets that: have economic life greater than one year; are acquired, constructed, or developed for use on a continuing basis; are not held for sale in ordinary course of operations; are recorded and tracked centrally; have a cost greater than $5,000.
Some **examples of capital asset equipment include:** laboratory equipment, appliances, boats, motors, field equipment, ATV's/snowmobiles, stationary equipment (pier/sign/weather), fire/safety equipment, pumps/tanks, heavy equipment, irrigation systems, furniture, trailers, vehicles, etc. (*Financial Policy # A100*, Government of Alberta, January 2014).

Table 16.2.2 Funding Requested BY ENVIRONMENT & CLIMATE CHANGE CANADA

Organization - Environment & Climate Change Canada ONLY	Total % time allocated to project for ECCC staff	Total Funding Requested from OSM
Salaries and Benefits FTE (Please manually provide the number in the space below)	690	$1,124,093.00
Operations and Maintenance		
Consumable materials and supplies		$182,000.00
Conferences and meetings travel		
Project-related travel		$457,900.00
Engagement		
Reporting		
Overhead		$126,642.00
ECCC TOTAL (Calculated)		$1,890,635.00

* ECCC cannot request capital under the OSM program. Any capital requirements to support long-term monitoring under the OSM program should be procured by Alberta and captured in that budget table.

Table 16.3

Complete ONE table per Grant recipient.

Add a Recipient by clicking on add table below the table. The total of all Grants is Auto Summed in Table 16.2.1

GRANT RECIPIENT - ONLY: Name	
GRANT RECIPIENT - ONLY: Organization	
Category	Total Funding Requested from OSM
Salaries and Benefits FTE	
Operations and Maintenance	
Consumable materials and supplies	
Conferences and meetings travel	
Project-related travel	
Engagement	
Reporting	
Overhead	
GRANT TOTAL (Calculated)	$0.00

Table 16.4

Complete ONE table per Contract recipient.

Add a Recipient by clicking on add row below the table.. This section is only to be completed should the applicant intend to contract components or stages of the project out to external organizations. The total of all Contracts is Auto Summed in Table 16.2.1

CONTRACT RECIPIENT - ONLY: Name	
CONTRACT RECIPIENT - ONLY: Organization	
Category	Total Funding Requested from OSM
Salaries and Benefits	
Operations and Maintenance	
Consumable materials and supplies	
Conferences and meetings travel	
Project-related travel	
Engagement	
Reporting	
Overhead	
CONTRACT TOTAL (Calculated)	$0.00

Table 16.5 GRAND TOTAL Project Funding Requested from OSM Program

The table below is auto calculated, please do not try to manually manipulate these contents.

Category	Total Funding Requested from OSM
Salaries and Benefits Sums totals for salaries and benefits from AEPA and ECCC ONLY	$1,160,093.00
Operations and Maintenance	
Consumable materials and supplies Sums totals for AEPA and ECCC ONLY	$183,500.00
Conferences and meetings travel Sums totals for AEPA and ECCC ONLY	$0.00
Project-related travel Sums totals for AEPA and ECCC ONLY	$503,400.00
Engagement Sums totals for AEPA and ECCC ONLY	$0.00
Reporting Sums totals for AEPA and ECCC ONLY	$0.00
Overhead Sums totals for AEPA and ECCC ONLY	$126,642.00
Total All Grants (from table 16.2.1 above) **Sums totals for AEPA Tables ONLY**	$0.00
Total All Contracts (from table 16.2.1 above) **Sums totals for AEPA Tables ONLY**	$0.00
SUB-TOTAL (Calculated)	$1,973,635.00
Capital* **Sums total for AEPA**	
GRAND PROJECT TOTAL	$1,973,635.00

Some **examples of capital asset equipment include:** laboratory equipment, appliances, boats, motors, field equipment, ATV's/snowmobiles, stationary equipment (pier/sign/weather), fire/safety equipment, pumps/tanks, heavy equipment, irrigation systems, furniture, trailers, vehicles, etc. (*Financial Policy # A100*, Government of Alberta, January 2014).

17.0 FINANCIAL MANAGEMENT

The OSM Program reserves the right to reallocate project funding during the current fiscal year on the basis of project performance and financial overspend or underspend.

☑ Please check this box to acknowledge you have read and understand

In the space below please describe the following:

- Discuss how potential cost overruns and cost underruns will be managed.
- If this is a continuing project from last year, identify if this project was overspent or underspent in the previous year and explain why.
- Describe what risks and/or barriers may affect this project.

18.0 Alternate Sources of Project Financing - In-Kind Contributions

Table 18.1 In-Kind Contributions

Add an In Kind Contribution by clicking on the table and then clicking on the add row on the bottom right side of table.

Description	Source	Equivalent Amount ($CAD)
	TOTAL	$0.00

19.0 Consent & Declaration of Completion

Should your application be successful, The OSM Program reserves the right to publish this work plan application. Please check the box below to acknowledge you have read and understand:

☑ I acknowledge and understand.

Lead Applicant Name

Malcolm Conly

Title/Organization

Deputy Director, National Hydrological Service, Environment and Climate Change Canada

Signature

Government Lead / Government Coordinator Name (if different from lead applicant)

Title/Organization

Signature

Please save your form and refer to the instructions page for submission link.

Program Office Use Only

Governance Review & Decision Process

this phase follows submission and triggers the Governance Review

TAC Review (Date):

ICBMAC Review (Date):

SIKIC Review (Date):

OC Review (Date):

Final Recommendations:
Decision Pool:

Notes:

Post Decision: Submission Work Plan Revisions Follow-up Process

This phase will only be implemented if the final recommendation requires revisions and follow-up from governance

ICBMAC Review (Date):

SIKIC Review (Date):

OC Review (Date):

Comments:
Decision Pool:

Notes & Additional Actions for Successful Work Plan Implementation:

Signature