

## Work Plan Application

Project Information	
<b>Project Title:</b>	Ni ho ghe di - Athabasca Chipewyan First Nation Community Based Monitoring
<b>Lead Applicant, Organization, or Community:</b>	Athabasca Chipewyan First Nation - Dene Lands and Resource Management
<b>Work Plan Identifier Number:</b> If this is an on-going project please fill the identifier number for 24/25 fiscal by adjusting the last four digits: <b>Example:</b> D-1-2425 would become D-1- <b>2425</b>	B-CM-8-2425
<b>Project Region(s):</b>	Athabasca
<b>Project Start Year:</b> First year funding under the OSM program was received for this project (if applicable)	2022
<b>Project End Year:</b> Last year funding under the OSM program is requested <b>Example: 2024</b>	2025
<b>Total 2024/25 Project Budget:</b> From all sources for the 2024/25 fiscal year	\$433,000.00
<b>Requested OSM Program Funding:</b> For the 2024/25 fiscal year	\$415,000.00
<b>Project Type:</b>	Community Based Monitoring
<b>Project Theme:</b>	Surface Water
<b>Anticipated Total Duration of Projects (Core and Focused Study (3 years))</b>	Year 3
<b>Current Year (choose one):</b>	Focused Study -Select One-
	Core Monitoring Year 3 of 3

**Contact Information**

<b>Lead Applicant/ Principal Investigator:</b> Every work plan application requires one lead applicant. This lead is accountable for the entire work plan and all deliverables.	Lisa Tsessaze
<b>Job Title:</b>	Executive Director
<b>Organization:</b>	Athabasca Chipewyan First Nation - Dene Lands and Resource Management
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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**.

The Athabasca Chipewyan First Nation - Community Based Monitoring program seeks to answer community concerns about potential impacts from oil sands development, provide local employment opportunities, support cultural transmissions, and provide answers about the state of our traditional territory. Our community members are concerned about the changes they are seeing on the land including decreasing water quantity and declining water quality in the Peace-Athabasca Delta (PAD). Data collected by the CBM will be used to inform the extent of changes to our traditional resources and the extent change is attributable to industrial development in the region.

The CBM Program operates in a manner that:

- develops and tracks Indigenous Knowledge indicators pertaining to ACFN rights, culture, and community well-being;
- conducts Western Scientific monitoring of valued ecosystem components (water quality, water quantity, fish health);
- helps community members safely navigate ACFN territory by tracking and marking river channels and hazards, and by measuring changing winter ice and snow conditions;
- creates educational opportunities for youth and Elders to come together who in turn inform monitoring from an Indigenous perspective;
- supports collaborative research with other CBM initiatives, federal and provincial programs, and academia.
- shares information with a broad range of stakeholders, through annual technical reports, plain language summaries and quarterly community newsletters which update on ACFN-CBM activities

## 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 Athabasca Chipewyan First Nation's Community Based Monitoring program began in 2010, sampling water quality and water quantity. The CBM program is one of the important ways that ACFN is caring for our lands. Environmental Guardians go out twice weekly year around to collect data that is used by ACFN to take action on issues threatening the health of our lands and water. The program creates meaningful, local employment for our members. It also creates opportunities for Elders and youth to spend time on the land together, which ensures that the future generations will continue to uphold our responsibility to watch over the land.

We work closely and often in partnership with the Mikisew Cree First Nation and with the Fort Chipewyan Metis Nation and with Parks Canada.

The CBM program has grown enormously since it began under direction from Chief and Council, and as directed by the Elders, and with vision from Lisa Tsessaze at the DLRM, the program has expanded and professionalized. Today the program has a full time Director of Rights and Lands who directs a full time Program Manager in Fort Chipewyan with 2 Environmental Guardians.

Key drivers for the ACFN are to better understand the water quality and quantity and health of wild foods that members consume. Elders have noted and intimately described negative changes to the health of the Peace Athabasca Delta and have founded a Community Based Monitoring program to assist in the rigorous collection of both science and Indigenous Knowledge Indicators to track these changes and identify stressors.

Our CBM program is designed following the EEM Framework. Where sufficient data exists we create monitoring triggers, both regionally and site specific. These triggers act as our baseline to understand if conditions in the environment are changing and if these changes are driven by oil sands development. The community hopes to use culturally relevant management triggers to address a deteriorating environment through management responses or remediation/restoration. If environmental conditions are not declining, the community has an evidence-based decision making framework to re prioritize monitoring efforts to other areas.

The mandate of the ACFN program aligns well with that of OSM in that it seeks to understand if and how changes are occurring in the traditional homelands and waters of the ACFN, to understand the contributions of oil sands operations to these changes and to place these changes in the context of cumulative effects, most notably the synergistic effects of hydro regulation and climate change. They do this using Indigenous Indicators alongside western science. The program will be able to plan research, align monitoring protocols for select mediums, implement further monitoring mediums, and subsequently evaluate the program. Data gathered through the ACFN CBM program will complement the Real-Time Water Quality focused study, for the purposes of integration with the core OSM surface water quality Technical Advisory Committee.

This work builds on a decade of steady capacity and growth. The community based monitoring program has office and storage space at the Youth-Elder lodge. A network of backcountry cabins have also been built to

support expanding research. The CBM program also owns 3 skidoos and sleighs, along with a skidoo trailer, and their own work boat along with other sample equipment described below:

The team also owns a complete suite of modern scientific sampling devices including a water chemistry sampler, sediment grab sampler, coring equipment (to study contaminants in aged lake cores, and wildlife health dissection gear).

#### Custom Phone App

The ACFN has co-designed and built Geokeeper, which is a phone app that is used as a custom field collection tool, and trip tracker. The CBM crew uses the app to collect and record data on water quality and quantity. The app can also be used by community members to track navigational hazards when out traveling by boat. The Geokeeper app can be downloaded from the Google Play store and the Apple store.

With final updates to Geokeeper completed in 2022, the Geokeeper is part of ACFN's strategy to modernize data collection, protection and access. Data visualization platforms are completed and live, so that members can have access to all CBM data.

## 2.0 Objectives of the Work Plan

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

The ACFN-CBM program objectives are to:

1. Undertake core CBM monitoring activities (water quality, water quantity, fish health and winter parameters) to answer community concerns about the state of the Peace-Athabasca Delta and Richardson Backcountry using western science and Indigenous Knowledge;
2. Increase engagement of youth and elders in monitoring in a culturally-meaningful way including land-based monitoring camps and an Elders group;
3. Advance data management and reporting strategies to support knowledge mobilization in the community including integration of ACFN data platforms with Data Analytics TAC (Kisters);
4. Strengthen connections and integrate with other Indigenous CBM programs in the oil sands region to support knowledge sharing and State of Environment reporting.

### 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:

- |  |   |   |                                   |
|--|---|---|-----------------------------------|
| <input type="checkbox"/> Air                 | <input type="checkbox"/> Groundwater                            | <input checked="" type="checkbox"/> Surface Water | <input type="checkbox"/> Wetlands |
| <input type="checkbox"/> Terrestrial Biology | <input type="checkbox"/> Data Management Analytics & Prediction | <input checked="" type="checkbox"/> 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.

Community Based Monitoring

### Themes

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

- |                                      |   |   |                                  |
|--------------------------------------|---|---|----------------------------------|
| <input type="checkbox"/> Air         | <input type="checkbox"/> Groundwater              | <input checked="" type="checkbox"/> Surface Water | <input type="checkbox"/> Wetland |
| <input type="checkbox"/> Terrestrial | <input checked="" type="checkbox"/> 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

Cross Cutting

#### 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?

The ACFN-CBM monitoring program is designed to answer whether there are changes in 1) water quality; 2) biological health of Lake Whitefish (a culturally important species and wild food source) and Walleye; 3) water quantity and flows; and 4) changes to winter parameters (oil sands influence on ice and snow including IK indicators).

##### 1) Water Quality

The community of Fort Chipewyan is concerned about the quality of their source water and treated drinking water. Concerns are due to first hand observations of declines in quality and quantity of the Athabasca River and negative changes in the Peace Athabasca Delta.

Elders and land users have noted Indigenous Knowledge Indicators (IK Indicators) such as more algae, foamy scum, dirtier water, scum on rim of the tea pots and boats, as well as a stronger smell to the water (MCFN, 2009). ACFN CBM program water quality data, and Parks Canada data (Glozier et al., 2009), show an increase in nutrient levels in the Peace Athabasca Delta over the last 15-30 years. At 5 of the 9 CBM sampling sites recorded, phosphorus levels were above the government guideline of 0.05mg/L (ACFN, 2012). Phosphorus is the main contributor to algae blooms and resultant decreases in water quality. More recent analysis of CBM water quality data from 2014-2021 continues to see increases in nutrients. Therefore western science nutrient data indicates that the PAD is becoming more eutrophic, which is consistent with IK interview findings and IK Indicator monitoring.

Chemical contamination of the Athabasca River from oil sands development and upstream land use change is also a community concern. PAD. Priority pollutants of concern (identified by the US EPA Clean Water Act) that have seen increases in CBM data since 2014 include Arsenic, Copper, Mercury, Nickel and Zinc, with Zinc consistently having values over Federal guidelines.

Methyl mercury levels increases exponentially with proximity to the upgraders (Kirk et al., 2012). Methyl mercury bioaccumulates in the food chain, and can affect wild food, especially fish that community members consume. In fact, health advisories for mercury levels exist for the Athabasca River and recommend that adults refrain from eating large predatory fish more than once per week and that children and women of child-bearing age not eat these fish at all (Jardine, 2003, in McLachlan, 2012). ACFN examines low level mercury and methyl mercury to assist with better cumulative effects understanding of mercury, as well as to assist in understanding health risks associated with consumption of wildfoods. Gull and tern eggs (Hebert) have been shown to have elevated mercury levels, high enough to warrant a human health advisory.

Polycyclic Aromatic Hydrocarbons (PAHs) are found at CBM monitoring sites throughout the PAD and increasing at levels above which industry claims is due to the natural erosion of bitumen (Kelly et al. 2009). Fish from the Athabasca River, collected in 2011-2012 demonstrate that the larger 5 ring PAHs (associated with bitumen upgrading) are more concentrated in fish bile from sites closer to oil sands operations. The concentrations of 5 ring PAHs measured in fish bile decrease from the upper to the lower sampling sites on the river system. This suggests that oil sands generated pollution is entering the water and reaching the aquatic food web, (Jones, 2012).

ACFN has examined PAH levels in water and now fish. Findings were as follows:

- All PAH levels fall under currently accepted Canadian Water Quality Guidelines;
- Sites in the Athabasca River are influenced by liquid fossil fuel combustion; most likely a result of the combustion of fossil fuels for the upgrading of bitumen. Values in the PAD are near zero (Indeno(1,2,3-c, d)pyrene was not detected at every site, as a result, yielding “0” ratio values for most of the PAD sites;
- Levels of PAHs in the PAD are lower than those found throughout the Athabasca River (with the exception at the Mouth of the Athabasca River site);
- At every site (apart from Sandy Point), PAH levels are driven by human influence/factors; and,
- Sites in the Athabasca River, at the mouth of the Athabasca River and the Quatres Fourches sites are influenced by petroleum derived PAHs, while the other sites are mostly influenced by the combustion of wood (most likely a reflection of forest fire activity and/or residential wood burning).

Baselines from recent CBM monitoring for many contaminants of concern and chemistry parameters have been established. Corresponding indigenous relevant thresholds or limits of change have been identified.

All water quality baselines are on the following online data platform:

[https://acfn.shinyapps.io/water\\_quality/](https://acfn.shinyapps.io/water_quality/)

These baselines also have embedded with our efforts at including and communicating the Lower Athabasca Surface Water and Sediment Quality Criteria for Protection of Indigenous

Users report co-developed by ACFN - accessed here:

[https://thompsonaquatic.ca/reports/WQCIU/wqciu\\_report.pdf](https://thompsonaquatic.ca/reports/WQCIU/wqciu_report.pdf)

## 2) Whitefish health

Whitefish health parameters have been collected at sites throughout the PAD since 2018. CBM baselines and thresholds/limits of change have been established for 2 sites so far (Lake Claire and Athabasca River at Jackfish Creek), with an additional 3 sites under development. In earlier studies, C3DBT was a significant predictor of Hg in muscle tissue.

## 3) Water quantity

In 2011, the Athabasca Chipewyan First Nation (ACFN) and Mikisew Cree First Nation (MCFN) began water-depth monitoring as part of their wider Community- Based Monitoring (CBM) program, to address gaps in the provincial and federal governments' quantitative assessment of the status of water resources within their Territories.

Years of declining water levels precipitated action to create the program. The Government of Alberta and upstream industry displayed a prolonged lack of interest and initiative in quantifying depth changes and their potential linkage to changes in the Athabasca River and Peace River hydrographs. The AXF aspect of the CBM program was specifically designed to quantify the temporal and spatial extent to which access is being lost to ACFN and MCFN Territories and to determine whether there are identifiable thresholds in relation to this loss.

The first five-year report (Carver & Maclean, 2016) provided an analysis of CBM field data from 2011-2015. That reporting assesses and describes water quantity correlations among the CBM data available to 2015 and confirms the validity of the concept of an Aboriginal Extreme Flow (AXF) threshold and its preliminary value of 400 m<sup>3</sup>/s, based on reference to upstream hydrometric data taken at Water Survey of Canada 07DA001 (near Fort McMurray). That report provides an overview of Peace-Athabasca Delta (PAD) waterways and related Traditional travel requirements. Based on data from that period, the sites along Lake Athabasca were the least correlated with Athabasca River discharge while the sites within and adjacent to Athabasca River were the most, suggesting a collection of controls on water depth varying spatially. Those earlier findings dispute the management approach enacted by the Government of Alberta in its Surface Water Quantity Management Framework (SWQMF) of the Lower Athabasca Regional Plan (LARP), which provides no benefit to Indigenous navigability



while acknowledging the need to do so. Interim review of subsequent data carried out in support of submissions regarding the proposed Frontier Mine (Carver, 2018) suggested that the threshold may more appropriately be set at 500 m<sup>3</sup>/s, again based on the 07DA001 reference.

ACFN has now co-reported (with Mikisew Cree) on a second major analysis of the program's water-depth data sets and emphasizes data from 2016-2020 at a dozen or so sites describing water-depth variation within and around the PAD where ACFN and MCFN Territories are centered.

Whereas the first period involved low water levels and periods of highly restricted access, the second period was associated with low water levels at the beginning, giving way to higher water levels and generally increased water availability later in the period, thus lacking the sustained periods of restricted access. The overall goal of the monitoring has always been to better understand how navigational access varies under different levels of water availability. However, in this second period the emphasis shifts to seeking a tighter connection between water depth and the hydrometric data by reducing the variability and by better understanding its sources. This is accomplished through more detailed measurements, use of alternative hydrometric reference data, establishment of reference sites (to secure long-term site reliability), and revision of site locations to increase the overall benefit of the available monitoring effort. Early efforts to explore the role of Peace River are also included.

Athabasca River and Lake Athabasca are both found to directly determine navigation depth, depending on the site. Sites in the Southern Area closely follow the discharge of Athabasca River. Based largely on these sites, the Aboriginal Extreme Flow (AXF) is determined to be 482 m<sup>3</sup>/s, using Water Survey of Canada 07DA001 as the reference hydrometric data set. This value rises to 512 m<sup>3</sup>/s when the Embarras (07DD001) monitoring station is used, 180 km downstream of 07DA001.

Our findings from the CBM program may be useful in a variety of applications.

Navigation support can be developed from the site-specific results and real-time hydrometric monitoring provided by Water Survey of Canada. Such an "expert system" could be used to improve travel efficiencies for ACFN and MCFN land users, particularly when water depth approaches thresholds for access. In some locations, wind forecasts could be used to improve projections. Such a tool can be used to backcast lost navigation opportunities. BC and Alberta can also use the outcomes to reduce the magnitude of impacts that their incremental and ongoing project approvals (flow regulation and oilsands water withdrawals) have on Indigenous navigation.

Navigation assumptions contained in Alberta's LARP remain in error, resulting in avoidable losses in Territorial access. To address this, MCFN and ACFN recommend that Alberta Environment and Protected Areas (formerly Alberta Environment and Parks) reconfigure the SWQMF's Aboriginal Navigation Index (ANI) and the associated SWQMF thresholds for management intervention so as to provide meaningful protection of Traditional-use during periods of low water. This includes the following:

- revise the datum for the index to reflect an AXF of 500 m<sup>3</sup>/s (not the 300-m<sup>3</sup>/s discharge arbitrarily used in the SWQMF),
- use a freeboard requirement of 122 cm depth (not the 100-cm depth arbitrarily used in the SWQMF), and
- apply a compatible and more sensitive ANI threshold of change (i.e., use a value less than the 10% change in mean seasonal indicator that is currently in place).

#### 4) Winter Parameters

10 seasons of ice and snow measurements and IK winter indicators have been collected by CBM. These

have been used to establish metrics of specific relevance to the community: ice travel duration and maximum ice thickness. Baselines for these metrics and culturally appropriate thresholds/limits of change have been established.

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?)

The CBM Programs have monitored water quality in the PAD since 2014. We looked at whether there were changes over time and difference between areas of the PAD. Many water quality parameters are measured, here we focused on the US EPA priority pollutants of concern.

- In the flood year of 2020, 9 metals were higher compared to previous years with Arsenic, Cadmium, Mercury and Nickel significant increases. Higher flows often results in higher metals and nutrients in water bodies, which we observed in the data.
- After the flood, by 2021, most contaminant levels had dropped again except for Magnesium and methyl-Mercury.
- Some USEPA priority pollutants, although mostly below guidelines, show increasing trends over the period 2014-2021 including Arsenic, Mercury and Nickel which are of concern to environmental and human health. Nutrients also show increasing trends which lead to concerns of eutrophication in the PAD.

Dividing the water quality sites into 3 zones: Lower Athabasca River (LAR), Athabasca River Delta (ARD) and Peace River Delta (PRD) we looked at whether there are differences between the zones.

- Contaminant levels drop when entering the ARD from the LAR and are further reduced on entering the PRD.
- Likely due to a combination of dilution due to more water volume and settling into sediments as water slows and spreads out into channels.
- Patterns are consistent across all US EPA pollutants of concern.

Whitefish health monitoring indicates that populations are mostly stable, but there is a significant increase in fish tissue Mercury at the Athabasca River at Jackfish Creek site.

Winter parameter monitoring has seen decreases in regional maximum ice thickness and ice travel duration. This leads to reduce safe winter travel which has implications for exercising traditional rights and for bringing supplies to a fly-in community.

Efforts are needed to use our data in conjunction with the rest of the OSM water quality findings to better understand the source of increases in methyl mercury and other heavy metals.

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

As mentioned above there were statistically significant trends in several metals and nutrients that were associated with higher than average flows. Significant gaps exist in the pathways of these, especially methyl mercury. Methyl mercury increases is likely the result of increased mobilization from the oil sands producing area with the increased flow in the Athabasca River, but likely also cumulatively impacted by increased flushing of inland basins in the PAD. Examining mercury across water quality, benthics and wildlife is required. Capacity to look across programs - water quality - wetlands - fish- wildlife - air and deposition is beyond our capabilities and likely requires engagement with the Data and Analytics team and use of Kisters platform and sophistication. Increases in methyl mercury, arsenic and chloride in 2022-23 may be related to ongoing seeps and spills from the Kearsy site (Imperial).

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

Changes to water quality, water quantity, and fish health are of great concern to our community. Our

Elders report a decrease in water quality that are a health concern and dropping water levels that impact safe navigation. The ACFN-CBM monitoring program seeks to better understand these changes that are a concern to our community.

Yes. Water was mentioned above in #2 referring to key community question about changes to water quality.

For fish health:

Data on fish health, fish tissue contaminants and Indigenous Knowledge have been collected at Fish Camps since 2018. We looked at changes over time and also differences between sites (Lake Athabasca, Lake Claire, Jackfish Creek and Peace River).

- Data from 2018-2021 show us there bigger differences in fish condition between sites than between years.
- Mercury tissue content relative to body weight in all samples well below the 500 ng/g Health Canada consumption guideline in whitefish. However significant increases in mercury were seen over 3 years in Jackfish Creek females.
- PAHs are detected in fish tissue at all areas of the PAD, though below guidelines and consumption risk levels.
- Even though 2020 was a flood year and some water quality contaminants of concern were elevated, this wasn't seen in the fish tissue results.
- Indigenous members express concern that oil sands relevant contaminants are present in fish caught in even the most remote part of the PAD.

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

ACFN collects data on a custom app based application known as Geokeeper. All water quality data is available as a .csv file. All data is to be made available for the OSM program data management system.

The ACFN has already joined with the Gordon Foundation to put CBM water quality data onto Mackenzie DataStream platform. The Mackenzie DataStream is an initiative to have free, water quality data available to the communities across the Mackenzie watershed to better understand how the changes they are experiencing compare across the region.

Morgan Voyageur has presented and participated at two regional database and data management workshops in Yellowknife, hosted by Tides Canada. This has helped to centre ACFN as a leader in regional CBM in data management.

However OSM in general lacks a process for integrating Indigenous collected data. We are stuck on 'closed by default'. ACFN supports the AEPA and ICBMAC methods to provide a deeper list of categories for IK classification. ACFN would like it's data to be included on the Kisters platform and for CBM findings to be used in the consideration of overall OS development impacts.

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

Yes:

- CBM specific SOPs have been developed for water quality lab collections.
- CBM has adopted fish monitoring SOPs used by ECCC and AEP, and furthermore have an Indigenous Knowledge Index, that could be useful in the development of the broader CBM for OSM.
- ACFN-CBM Guardian staff have been trained in SOPs for use of the YSI DSS Proplus meter, and the WTW Multi 3410 Turbidity meter. They also follow protocols for collection of water quality lab samples, as well as in the deployment fo PMDs, as per coordination with the GNWT's CBM program.
- Standardized data QA/QC processes have been formalized and reviewed by expert third party, and

available to share.

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

Integration with other OSM projects is occurring in the following ways:

ACFN closely collaborates with the Mikisew Cree First Nation Community Based Monitoring program through shared methods, protocols and data.

We are actively involved in the Oil Sands Monitoring program as a key partner in the ICBMAC and in the overall ICBM program design. We seek to work with other monitoring initiatives that are taking place on our traditional territory. In particular, we have started to integrate with Fort Chipewyan Métis Association, Smith's Landing First Nation, Cold Lake First Nations and Chipewyan Prairie Dene First Nation.

ACFN also collaborates with the Mikisew Cree FN and Wetlands TAC on expanding benthic invertebrate monitoring at specific basins as identified by the ACFN through participation in the IRMP. We consider this strong integration, as the integration is driven by the ACFN, at sites identified by the ACFN, and using methods as defined by the ECCC team. Furthermore ECCC will training CBM members. ACFN brings their own capacity in the way of staff dollars, while ECCC brings the SOPs, and field and lab costs.

ACFN leads the Air Monitoring in Fort Chipewyan and partners with MCFN on this separate workplan.

ACFN is working in coordination with Philippe Thomas (ECCC) on a biological health study of aquatic furbearers.

ACFN (in partnership with MCFN and FCMA) is integrated with Mark McMaster, Erin Ussery (ECCC) and Keegan Hicks and Kristin Hynes (AEPA) whitefish work in the Delta and co-wrote the SOPs and training materials. This collaboration and integration is ongoing with joint field work at PAD whitefish camps and laboratory analysis undertaken by Mark McMaster and Keegan Hicks/ Kristin Hynes. All data is shared, this year continued effort will be undertaken to examine indigenous indicators of fish health.

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?

The monitoring is designed as Environmental Effects Monitoring. Triggers have been established for 7 PAD sites for water chemistry and select contaminants. Ongoing monitoring is therefore assessing changes spatially and temporally against these monitoring triggers. Because Elders have described changes to historic water quality, a focus on nutrient enrichment is a priority, as is contaminants associated with the operation of the Oil Sands. Nutrients such as phosphorus and contaminants such as Arsenic, Cadmium, Silver, and Mercury have regularly exceeded water quality guidelines.

Under the surface water conceptual model, this workplan addresses the following:

Pressure:

Spills, Weather, and habitat

Stressors:

Nutrients, Inorganic and organic substances, pH and hydrology (pinch points)

Pathways:

Fluvial transport

Responses:

Water quality and fish as well as traditional use

Of the Programmatic conceptual model this workplan will also address:

Valued Components such as Traditional resources and cultural practices and access to land.

How will this work advance understanding transition towards adaptive monitoring?

Our water quality work has positioned us to work this year under the Integrated Monitoring and Research Plan with Park Canada, ECCC and AEP to better align long term monitoring locations, parameters, SOPs, data management, lab use, reporting needs etc. Too much uncoordinated water quality work is being conducted that does not lead to any effective decision making on oil sands impacts. ACFN has established EEM triggers for all of our water chemistry and lab parameters. We intend to move towards sondes in some areas to improve understanding, and will drop some sites in favour of coordination among ECCC and AEPA. Improvements in this alignment will assist in better unpacking cumulative effects. Improved coordination from Glozier and Cooke in terms of sites selection , SOP sharing, data templates, laboratory coordination, data sharing, QA/QC techniques, and reporting (including SOE reporting) urgently needed to support our adaptive monitoring.

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. Relevant to water quality and quantity and fish health as well as foundational to the ICBMAC IK Index concepts.

### 3.3.6 Cross-Cutting Across Theme Areas

#### 3.3.6.1 Sub Themes

Other: (Describe in space below)

If "Other" was selected from the drop down list above please describe below:

Highlighting here that true CBM work does not only focus on one area, (wetlands, air, water etc.,) and has a more holistic and cultural context difficult to articulate in this workplan structure.

#### 3.3.6.2 Cross-Cutting - Key Questions:

Explain how your cross-cutting biological monitoring program addresses the key questions below.

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

Yes, however exploring avenues to use IK and IK generated data. Therefore Elders inclusion and IK Index and IK Indicators used, but not shared.

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

Yes, however SOPs use IK and IK generated data and do not always follow western science practices. exploring the concepts here that Elders and IK have their own validating protocols, and include aspects of NiHoGheDi whereby SOP/protocols are tied to cultural protocols and responsibilities. Therefore Elders inclusion and IK Index and IK Indicators essential to program success.

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

Elders inclusion in the program and their input on holistic/cross-cutting impacts used to strengthen all aspects of the program. Meeting with Elders, having Elders do some of the work, Elders co-running our monitoring camps means the integration happens.

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?

Elders inclusion and IK Index and IK Indicators assessment and braided approach to assessing significance of findings (science and IK) key to making this work and be Indigenous-led.

How will this work advance understanding transition towards adaptive monitoring?

Our Knowledge Forum will provide a braided platform for debate on project design, sample site selection, timing, and results. Elders inclusion and IK Index and IK Indicators assessment and braided approach to assessing significance of findings (science and IK) key to making this work and be Indigenous-led.

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, however actually IK data and findings are not shared. Elders inclusion and IK Index and IK Indicators used to guide the process.



## 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.

Data collected through the ACFN-CBM program informs how our Nation engages with the province on policy development. We have used our data to call for stronger regulatory compliance. The monitoring that we have done on water quantity, along with the development and validation of the Aboriginal Extreme Flow has been used to challenge the Surface Water Quantity Management Framework under the Lower Athabasca Regional Plan (LARP). OSM lacks a mechanism to apply findings to policy. We will continue to use our data to inform management, policy, and regulatory compliance. Additionally the program collects data on water quality, fish health, ice and winter parameters which have been used to develop community relevant management triggers. No mechanism yet exists to protect Sec 35 rights. Even when substantial evidence (science and Indigenous Knowledge combined) collected through the OSM program, demonstrates that Alberta policy is in error, there is no formal mechanism to change the policy, even when it impacts a Sec 35 right.

## 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

Further to the point above, the waters of the Peace-Athabasca Delta are central to Dene people's culture, well-being, spirituality, and economies. The CBM program is heavily focused on monitoring surface water quality, quantity, and fish health because water is such an important resource for their community.

Athabasca Chipewyan First Nation leads this project and involves Elders and land users in all stages, including program design, data collection, and analysis. We are strongly aligned with the Mikisew Cree First Nation CBM program.

Dene Elders, Knowledge Holders, and elected leadership have been actively involved in guiding the CBM program since its inception. Their involvement is integral to ensuring that the program is grounded in ACFN Dene stewardship values, provides information to support decision-making, and answers to community priorities. These in turn, coupled with the development of monitoring triggers for sampled parameters, will assist the Nation in establishment of management triggers or section 35 triggers, to ensure protection of treaty and aboriginal rights.

A primary objective of this project is to engage Elders, land users and youth in all aspects, therefore capacity building and training are central to the project. Youth have the opportunity to learn from Elders, land-users, and CBM Guardians at on-the-land camps which facilitate knowledge transmission. The CBM supports community capacity development through providing employment opportunities, and by

empowering community members to be active stewards of our traditional territory.

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?

We have an Elders Council that guides our CBM work.

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.

We share all water quality data with Mackenzie Datastream and on our ACFN knowledge hub. This allows raw data and interpretation of the data to be available to other Nations.

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.

The IK Index work for fish is interpreted alongside the fish health indices. At this time the raw IK data from fish camps is only used internally, but the composite IK index is shared publicly.

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

The CBM is managed, staffed and operated by ACFN members and through their Dene Lands and Resource Management. They have an established Elders Council that guides this work. The Executive director, director and program manager are all Dene members, guided by their Chief and Council.

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

All SOPs have been co-created with the community. The fish camp IK index work is an example of an integrated approach. Each fish sampled is considered through an Indigenous lens and a Western science lens. Often scientists and Elders are at the same sample tables to share and discuss observations, ensure samples are taken to address specific concerns and to ensure there is overlap between knowledge holders from both knowledge systems.

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

The CBM directly employs CBM staff and supports the operations to answer community questions about environmental changes observed. ACFN members see CBM jobs as meaningful land-based work that directly supports cultural knowledge exchange between generations. The CBM supports Elders, youth and the schools and builds community by allowing staff to work with the other Nations (MCFN and FCMN) as well as Parks Canada, ECCC, Alberta and RMWB. The work plan capacity leads to empowerment in the community and support for long-term environmental management.

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?

We do this is 4 ways:  
Reporting (technical and through our data visualization platform)  
Presentations to the community (annually); participation in an annual forum (Feb)  
Engagement with the Elders Council  
Annual calendars

## 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.

Our CBM program is designed following the EEM Framework. For all of our data (water quality, water quantity, ice thickness, fish health etc.) we QA/QC data and then where sufficient data exists we create monitoring triggers, both regionally and site specific. These triggers act as our baseline to understand if conditions in the environment are changing and if these changes are driven by oil sands development. Given the strongly linked cumulative effects of hydroelectric development and climate change with the potential oil sands impacts, study design as other ICBMs come on line is critical for our regional understanding.

Furthermore ACFN has Indigenous Knowledge indicators that we also rank as an index and can assess under an EEM framework.

Data collected through the ACFN-CBM program informs how our Nation engages with the province on policy development. We have used our data to call for stronger regulatory compliance. The monitoring that we have done on water quantity, along with the development and validation of the Aboriginal Extreme Flow has been used to challenge the Water Quantity Management Framework under the Lower Athabasca Regional Plan (LARP). We will continue to use our data to inform management, policy, and regulatory compliance.

The Whitefish camp was designed to collect three - five years of baseline data (modelled after the OSM core fish monitoring program). Past sites were chosen as areas of high traditional use, and this year (Sept 2024) will be the 7th year of collections. Because our baseline understanding of Whitefish is now complete we are transitioning into Walleye sampling. This builds off of 2 previous years of genetics work, and mercury and ageing work on walleye to assist in study design. We hope to sample from all relevant walleye populations harvested by members, and use an appropriate sample design (power analysis) based on those findings. We continue to sample Lake Whitefish in order to better understand the contaminant difference is populations that use the oil sands operating area for spawning versus Lake Athabasca. We only have 2022-23 data so far and require at least two more years of data. ACFN continues working with Mikisew and with Mark McMaster and Keegan Hicks and Kristin Hynes to assess our baseline data for whitefish and create decision triggers for the PAD. Past study design involves 20 male and 20 females (based off year one collections) and is of sufficient power to detect levels of change we have determined significant enough to trigger changes in monitoring frequency and focus.

ACFN will examine whitefish for the next two years because we need the data for our genetics work on populations, and will also serve to determine how big a change would represent a departure from what we would expect the situation to be for fish health, contaminants, abundance, movement (From McMaster).

1. Abundance. If the dryfish makers, through the index agree that fish numbers decline alongside a CPUE decline. Power for CPUE is low, and therefore designed essentially to catch large changes in fish abundance. CPUE was not calculated in year one pilot, and therefore no trigger currently exists. Essentially any change of 25% outside of the 3-year CPUE mean will trigger the management trigger.

2. The health condition factors and indices (age/ size, sex ration, GSI, LSI, demonstrates a 25% change or mean +/- 2SD after three yrs. For changes to condition factor (K-value) this is based on a 10% change.

3. If the contaminant trend (total Hg or pre-selected PACs) exceeds 25% or mean +/- 2SD (whichever is

smaller) - established after three years of monitoring.

4. Any IK index factors decline by 25% or mean +/- 2SD over a three year sampling period.

Monitoring triggers have been established for 7 sites in the PAD from water chemistry, based on EEM approaches in partnership with University of Calgary. Current monitoring therefore is assessing the state of water quality against our 8 year understanding of the natural variation.

## 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.

For the whitefish camp in the PAD we are primarily looking for stressors from the Athabasca Oil Sands. Two populations of Lake Whitefish use the PAD. One spawns in the Athabasca river, near the McMurray formation and active oil sands operations, and the other population is a resident; - spawning in Lake Athabasca or Lake Claire. We do not yet know these population interactions with the Peace River. This project design assesses change in fish health indicators within sites, between sites, and between years within two areas with assistance from Mark McMaster and team. Similar methods are used across teams. If effects are documented and not understood, we will then use focused studies to investigate the causes of the observed changes.

The water quality methodology will also add to the transect nature of the OSM core water program, getting better cumulative effects data to answer to gaps in the spatial understanding of the PAD in particular. This will also provide baseline data for areas that may be impacted by future oil sands mine development. Work on the Peace River is important to gain a better regional understanding of the various water inputs to the PAD.

## 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.

The ACFN-CBM program collects data using Standard Operating Procedures and best practices. Staff are well-trained in data collection methods to ensure the quality of data. Data undergoes a rigorous QA/QC procedure. All lab analyses are done by an accredited lab, and we work with consultants to synthesize the data to ensure it is credible.

We are committed to disseminating monitoring data through the OSM program.

Communicating results back to our community members in accessible language is a priority to us. We produce a number of different communication products to share information back to our community members each year ( a wall calendar, summary documents of technical reports - annual report and fish camp report). We also attend the Elders Council meetings to share results back to our Elders in person. We envision a larger monitoring forum (shared with other Nations) this coming February and beyond as an annual event.

## 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.

This work plan builds on over 12 years of CBM experience. ACFN has demonstrated leadership in development of OSM Operational Framework Agreement and has been engaged in the JOSM/AEMERA/ Oil Sands Monitoring project for 11 years. ACFN has established relationships with Environment and Climate Change Canada, Government of Alberta, Parks Canada, and University of Alberta. We hope to strengthen these relationships and work towards stronger monitoring integration with these organizations through this work plan

ACFN has coordinated with AEP, ECCC, and other Indigenous groups in a variety of ways include sharing of methods, coordination of analysis, and ensuring that sampling methods are compatible between data sources to ensure efficiencies.

The ACFN-CBM program is highly coordinated with the Mikisew Cree First Nation CBM program. We share methods, protocols, and data. MCFN & ACFN lab analyses are done in coordination to support efficiencies.

We have also started to integrate with Fort Chipewyan Métis Nation.

- ACFN is working in coordination with Philippe Thomas (ECCC) on a biological health study of aquatic furbearers. CBM crew and Land Users participate in sample collections.

- ACFN is continuing a partnership with Keegan Hicks (AEP) and Mark McMaster (ECCC) through the “OSM Monitoring Fish Health and Community” program to study the health of Lake Whitefish through an annual Whitefish Camp. Lab analyses are done in coordination with AEPA and ECCC.

The ACFN Community Based Monitoring Program is highly participatory. Community members are hired as CBM Guardians; Elders and Land Users are engaged in program design as well in the gathering and interpretation of Indigenous knowledge; youth are involved in CBM on the land camps; and accessible reporting is done to share information with ACFN members.

## 10.0 Work Plan Approach/Methods

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

- Environmental effects monitoring of water quality, water quantity, fish health and winter parameters using western science and Indigenous Knowledge.
- Integrate MCFN-CBM with other oil sand monitoring and research being undertaken in the Peace-Athabasca Delta.
- Integrate data platforms created by the ACFN with Data Analytics TAC (Kisters)
- Increase community engagement in monitoring initiatives through the Elders Council and land-based monitoring camps.

### Phase 1- Sample collection and Indigenous Knowledge observations from CBM Guardians

- Undertake water quality, water quantity, and snow and ice monitoring, using Indigenous Knowledge and western science;
- Involve community members in sample collection to engage interest and develop capacity;
- Conduct analysis of data;
- Initiate knowledge-sharing with other CBM programs around data collection and Indigenous Knowledge gathering.
- Continue EEM trigger development for all indicators

### Phase 2 - Community Engagement

- Support youth in Fort Chipewyan to connect to land through engagement opportunities organized with the school, the Keyano College-based monitoring program in Fort Chipewyan, and youth-Elder events;
- Support the involvement of Elders in all aspects of the CBM program;
- Increase community engagement
- Complete community focused data visualization platforms

### Phase 3 - Reporting and Information Sharing

- Report back to the community using a variety of different media, including in-person events, social media, and various print documents;
- Assess effective methods for communicating CBM information to community members;
- Explore integrated reporting opportunities with other regional CBM programs and Oil Sands Monitoring initiatives;
- Continued use and development of custom 'GeoKeeper' database, and link with Mackenzie Datastream.
- Integrate CBM data with Data Analytics TAC and Kister's program - includes use and ownership agreement development

Describe how changes in environmental Condition will be assessed

- Changes in environmental condition will be assessed by land-users and Elders, based on observations from being on the land and place-based knowledge passed down through generations.
- Trend analyses will be undertaken for water quality, water quantity, fish health and winter parameters CBM data collected over the past ten years. Current year data will be assessed against current and existing EEM triggers and community relevant management thresholds.
- In consultation with other scientists, ACFN-CBM program is identifying appropriate fish health end points that can be used to assess the health status of fish species that are of cultural importance to our community.

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

- ACFN uses the 'Aboriginal Extreme Flow' policy as a threshold for low water flows in the Peace Athabasca



Delta. The AXF represents the threshold at which safe navigation by the boat is impeded in the Delta.

- ACFN uses the CCME Canadian Water Quality Guidelines for the Protection of Aquatic Life to assess the condition of water quality. ACFN also employs water quality criteria for Indigenous uses (WQCIU), developed for the community, as a culturally appropriate means to report results to the community.
- ACFN has developed triggers for whitefish health one site (Athabasca River at Jackfish Creek), with another site under development (Old Fort) to assess the health and status of whitefish and other species of cultural importance to the community.
- ACFN will also be testing a new Sec 35 management trigger or benchmark related to their 10 years of ice thickness monitoring. Here we are testing the use of an ice thickness duration (ITD) metric to describe how safe winter travel conditions are impacted by oil sands withdrawals, and in an attempt to distinguish these particular impacts from the cumulative picture of hydro and climate change.

(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

The ACFN and MCFN CBM programs collect complimentary data and share sampling methods:

#### Water Quality

- The ACFN CBM program samples water chemistry and Indigenous Knowledge indicators weekly during the open water season at 7 sites. At each site information is collected on water temperature, conductivity, dissolved oxygen, pH, salinity, turbidity and secchi depth, along with Indigenous indicators of water health. Additionally, weather descriptions are logged and a geographical position is taken. All data is collected on a custom app based database system containing internal quality control features. Monitoring staff employ a YSI Pro Plus meter, and a Analite NEP 160 Turbidity meter or a WTW Multi 3410 Turbidity meter. The Mikisew Cree collects complimentary data at an additional 7 sites in the PAD. In addition, quarterly grab samples are taken at sites and sent to certified labs for analysis for a suite of contaminants.

#### Water Quantity

ACFN Guardians measure depth at nine sites. At each site, ten depth readings are evenly distributed across each cross-section of a channel. This method accounts for variability of the bed and provides options for analysis of regional correlations.

#### Snow & Ice

Samples are taken at seven different sites. Snow depth, ice thickness, Indigenous Knowledge indicators of ice quality and water chemistry are monitored at each site. Data is used to track changing conditions related to climate change and development and also provide valuable information to the community about winter travel safety.

#### Fish

Sampling methods allow for rigorous sampling, while also allowing fish to be used for dryfish making (a cultural food source). 100 yards of 4.5 inch mesh nets are set at each site. Fish are processed initially with fork length (mm), and weight (g) being measured. The sampled fish is then scaled, gutted, and prepared for dryfish. A tissue sample is retained from the anterior part of fish for metals, Hg and PACs (100g). The fish are then processed and additional metrics taken: gonad weight (g), liver weight (g), sex and sexual maturity. Otoliths are removed for age sampling and the liver is stored for sampling.

#### Indigenous Knowledge Indicators

Indigenous knowledge has informed the design of ACFN CBM program, and is woven into all aspects of its implementation. The ACFN CBM program goals and site selection were established after extensive consultations and interviews with ACFN Elders. Elders guide training and are continuously part of monitoring, training and evaluation of the program. Observation of Indigenous Knowledge indicators will be undertaken by CBM Guardians as well as the Elders who will participate in tracking and sharing their observations and understanding of what is seen on the land. Validation and analysis of indigenous

knowledge observations will take place at seasonal cultural gatherings, where observations will be compiled, interpreted and orally analyzed, as per traditional practices.

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

Western Science Indicators - Routine, pH, Conductivity, Alkalinity, All Anions, Total Nitrate (NO<sub>2</sub>) + Nitrate (NO<sub>3</sub>), All Cations, Hardness, Nitrogen: Total, Dissolved, Turbidity, TSS, TDS, Ammonia, Phosphorus: Total, Dissolved, Ortho, Carbon: Total and Dissolved, Metals (Al, As, Ba, Be, Cd, Cr, Cu, Cn, Fe, Pb, Li, Mn, Hg speciated, Mo, Ni, Se, Ag, U, V, Zn). PACs and naphthenics added this coming season.

Channel depth is currently used as a measure of water quantity - Ice thickness, Snow depth

Whitefish/walleye indicators - condition factor, GSI, LSI, age, mercury and other contaminants, suite of PAHs. Genetics.

Indigenous knowledge Indicators - The CBM program tracks changes to the PAD using Indigenous Knowledge indicators identified by ACFN Elders. Indigenous Knowledge indicators are monitored weekly and evaluated alongside scientific monitoring results to look for synergies. These indicators are the signs that community members look for to recognize the well-being of the Delta. This co-production of knowledge allows us to fill out the story explaining changes to the PAD more fully and to explain changes back to community members in a culturally appropriate format.



## 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.

The ACFN-CBM Knowledge Transfer Plan includes the dissemination of results to technical audiences as well as our community members.

### Technical Audiences:

An Annual Progress Report will be written which includes a technical summary of findings from both Western Science and Indigenous Knowledge components of the project. A plain language summary will also be developed to share with ACFN leadership. A Fish Camp Technical Report will share results from the Whitefish Sampling Camp.

### Community Members:

Four Quarterly Community Newsletters will be developed, which provide updates on the program, stories from the field, and plain language summary of data analysis from the monitoring season. A Fish Camp plain language summary report, appropriate for community members, will be shared with results from the Whitefish Sampling Camp.

A joint MCFN-ACFN CBM wall calendar will be produced that shares information from the CBM program, and provides an opportunity for community members to track their observations of changes on the land.

Elders meetings will be held to gather observations and disseminate scientific findings back to them. We envision an annual knowledge forum which will bring together scientists, Elders and youth in Fort Chipewyan to discuss findings and significance and required changes to program design.

## 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

Bruce Maclean - Principal, Maclean Environmental Consulting

Bruce supports the ACFN-CBM program in program design & implementation, data analysis, reporting.

Taiga Environmental Laboratory - Taiga Environmental Laboratory is a full-service analytical laboratory that performs a wide range of organic and inorganic chemical analyses on surface water. It is accredited by the Canadian Association for Laboratory Accreditation (CALA) to ISO/IEC 17025 standards and accreditation is limited to the tests named on the scope of testing.

Flett Research Ltd. Performs total mercury and methyl-mercury analysis for the CBM programs. Flett Research is accredited by the Canadian Association for Laboratory Accreditation (CALA). Accreditation recognizes technical competence for a defined scope, operation of a laboratory quality management system and compliance with International Standard ISO 17025.

\*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? \*

Yes

13.2 Type of Quantitative Data Variables:

Discrete

13.3 Frequency of Collection:

Monthly

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 30, 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?

Yes

**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
ACFN_WaterQuality	<a href="https://acfn.shinyapps.io/water_quality/">https://acfn.shinyapps.io/water_quality/</a>	.csv	Open by Default
ACFN_WaterQuantity	ACFN Internal Database	.csv and .kml	Protected by Default
ACFN_IKIndicators	ACFN Internal Database	.csv	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
Technical Report	Q4	Technical analysis of CBM results
OSM Program Annual Progress Report (required)	Q4	OSM Program Annual Progress Report
Peer-reviewed Journal Publication	Q4	Water quality publication
Stakeholder or Community Presentation	Q4	Presentation to community on results

## 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.

ACFN has a strong CBM team with a proven track record of quality data collection. The Guardians are skilled professionals with a mix of on-the-land experience and formal monitoring training. They possess all required safety certifications. The Guardian team is supported by strong administration and leadership support. There are no anticipated personnel or expertise gaps.

The program is managed by the ACFN-Dene Lands and Resource Management, who receives direction from Chief and Council.

1. Lisa Tssessaze - Director of ACFN Dene Lands and Resource Management

Role: Oversees CBM Program. She holds a degree in Environmental Sciences from the University of Alberta and has been working for the DLRM since 2004.

2. Lori Cyprien - Rights and Lands Manager, ACFN Dene Lands and Resource Management. She holds a diploma in Renewable Resources from NAIT, a degree in Natural Resource Science from Thompson Rivers University, and a MSc in Environment and Management from Royal Roads University. Managing the Rights and Lands team, Lori oversees ACFN's Reserve Lands, Traditional Lands, Community-Based Monitoring (CBM) Program, Guardian Program and various research programs.

3. Morgan Voyageur - CBM Program Manager. Morgan began in 2018 as the full time CBM Co-ordinator, after 5 years as the lead field Environmental Guardian, and is now based out of the Youth-Elders Lodge. Morgan is responsible for conducting all sampling and field collections, coordination of Elder and youth engagement, as well as data quality control and special projects.

4. Sabian Voyageur - CBM technician . Multiple years of practical field based monitoring including muskrat survey, Whitefish camps and routine water quantity and quality work.

## 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
Hicks, Keegan	Coordinate Aquatics lab/ samples	0

#### 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
McMaster, Mark	Assist coordinate fish sampling	0

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)	0	\$0.00
<b>Operations and Maintenance</b>		
<b>Consumable materials and supplies</b>		
<b>Conferences and meetings travel</b>		
<b>Project-related travel</b>		
<b>Engagement</b>		
<b>Reporting</b>		
<b>Overhead</b>		
Total All Grants (Calculated from Table 16.4 below)		\$400,000.00
Total All Contracts (Calculated from Table 16.5 below)		\$0.00
Sub-Total (Calculated)		\$400,000.00
<b>Capital*</b>		\$15,000.00
<b>AEPA TOTAL</b> (Calculated)		\$415,000.00

\* 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)	0	\$0.00
<b>Operations and Maintenance</b>		
Consumable materials and supplies		
Conferences and meetings travel		
Project-related travel		
Engagement		
Reporting		
Overhead		
ECCC TOTAL (Calculated)		\$0.00

\* 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	Lisa Tsessaze- Executive Director, ACFN Dene Lands and Resource Management
GRANT RECIPIENT - ONLY: Organization	Athabasca Chipewyan First Nation - Dene Lands and Resource Management
Category	Total Funding Requested from OSM
Salaries and Benefits FTE	\$205,000.00
<b>Operations and Maintenance</b>	
Consumable materials and supplies	\$60,000.00
Conferences and meetings travel	\$3,000.00
Project-related travel	\$34,000.00
Engagement	\$28,000.00
Reporting	\$30,000.00
Overhead	\$40,000.00
GRANT TOTAL (Calculated)	\$400,000.00



**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	
Salaries and Benefits	Total Funding Requested from OSM
<b>Operations and Maintenance</b>	
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	\$0.00
<b>Operations and Maintenance</b>	
Consumable materials and supplies Sums totals for AEPA and ECCC ONLY	\$0.00
Conferences and meetings travel Sums totals for AEPA and ECCC ONLY	\$0.00
Project-related travel Sums totals for AEPA and ECCC ONLY	\$0.00
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	\$0.00
Total All Grants (from table 16.2.1 above) <b>Sums totals for AEPA Tables ONLY</b>	\$400,000.00
Total All Contracts (from table 16.2.1 above) <b>Sums totals for AEPA Tables ONLY</b>	\$0.00
SUB-TOTAL (Calculated)	\$400,000.00
Capital* <b>Sums total for AEPA</b>	\$15,000.00
<b>GRAND PROJECT TOTAL</b>	<b>\$415,000.00</b>

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.

This is a continuing project, that received funding last year. In previous years including the last one, 2021-22, ACFN met all project deliverables and was on budget for spending, even through disruptions due to Covid-19. We successfully trained staff virtually, hosting multiple engagement sessions via zoom with Elders and Land Users. The ACFN-CBM was able to successfully carry out sampling, and collect samples for external researchers who were unable to travel to the areas due to COVID-19 travel restrictions.

Strict safety measures are in place with the ACFN-CBM staff, including contingency plans that allow sampling to continue in the event that a staff member is unable to work due to illness or stricter lock down measures. The CBM program has consistent staff and long standing relationships with consultants and labs that we work with that have a proven track record of delivering analyses on time.

We do not anticipate any changes between last year and this year which would cause us to over- or under-spend this year.

**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)
ACFN Management time	Lisa Tsessaze - Executive Direc	\$18,000.00
<b>TOTAL</b>		<b>\$18,000.00</b>

**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**

Lisa Tsessaze

**Title/Organization**

Lisa Tsessaze - Executive Director ACFN - DLRM

**Signature**

Lisa Tsessaze  Digitally signed by Lisa Tsessaze  
Date: 2023.10.27 14:08:19 -06'00'

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

**Title/Organization**

**Signature**

Lisa Tsessaze  Digitally signed by Lisa Tsessaze  
Date: 2023.10.27 14:08:48 -06'00'

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

**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:**

**Lisa Tsessaze**

 Digitally signed by Lisa Tsessaze  
Date: 2023.10.27 14:09:34 -06'00'

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Signature