5 TAILINGS MANAGEMENT FRAMEWORK

5.1 Introduction

The Tailings Management (TM) Framework represents a significant policy and regulatory tool under the Lower Athabasca Regional Plan (LARP) that aims to manage regional environmental pressures as a result of intense development in the area. The cumulative environmental impact of industrial development in the Lower Athabasca presents unique challenges, and aboriginal peoples of the region have Constitutional rights that are significantly negatively impacted by these cumulative impacts. For Fort McKay, the proximity of tailings ponds to the community poses significant challenges. The management of tailings impoundments is an important issue that directly impacts Fort McKay's traditional rights and the safety of the community therefore we submit this position paper to outline our expectations for a meaningful Tailings Management Framework that protects the community of Fort McKay and the Constitutional rights of our members.

The recent tailings discharges from the Mount Polley mine in British Columbia and the October discharge of tailings from the Obed Coal Mine upstream from Fort McKay have confirmed that all tailings impoundments provide a significant risk to downstream residents and water users. As such it's imperative that Fort McKay have a more active role in ensuring that tailings impoundments are constructed, operated and closed in a safe and responsible fashion. The community of Fort McKay and the land on which members conduct traditional activities will be the most at risk to be directly impacted by any release or catastrophic failure of an impoundment.

5.1.1 Draft Tailings Management Framework (TMF) Components

The need for such a management framework stems from the large volumes of mine tailings that have already accumulated from mine operations. Tailings are the residual material, including sand, water, clay and residual bitumen left after most of it has been extracted from the oil sands. The sands can be readily separated from the remaining tailings and are easily settled out, leaving Fluid Fine Tailings (FFT) containing suspended clay particles which are much more difficult to deal with. In the past and currently, these fluid fine tailings have been deposited into large impoundments, which pose a risk of spills, discharge to groundwater, and require continual withdrawal of makeup water from the Athabasca River. The residual bitumen rises to the surface and is toxic to any waterfowl that land on these ponds. Over time, the clay suspended in the FFT will settle to produce mature fine tailings (MFT), which are about 30% solids. The ERCB (now AER) Directive 074 was developed to arrest the buildup of these fluid fine tailings on the landscape and to begin treating them, by separating the solids and recycling tailings water through the processing plant. Although companies have made considerable progress in treating their FFT, the Directive has generally not been met.

As increasing development will likely increase the amount of tailings and amount of landscape impacted by them, the Government of Alberta has developed a Tailings Management Framework to mitigate the risks associated with accumulated tailings waste. In particular, the TMF has been designed to protect the Government of Alberta from the financial risks associated with tailings accumulation and abandonment. The TMF outlines requirements for companies to maintain tailings accumulation below a plan individually designed for each mine, and requires increased security payment into the Mine Financial Security System.

The TMF provides separate management direction for fluid tailings produced after January 1, 2015 and for legacy fluid tailings existing before that time. The Framework provides the following additional elements to the existing management system:

1. Triggers and a limit on the volume of fluid fine tailings accumulation for each oil sands mine for each year and over the life of the mine. These limits and volumes will be based on plans submitted by each company and approved by ESRD that set out a profile of tailings volumes.
2. A trigger on the deviation of fluid fine tailings volumes from each company's approved tailings profile.
3. A requirement to have all fluid tailings in a ready-to-reclaim state within 10 years of end of mine life, with active treatment completed earlier, no later than 5 years within the 10 year period to allow treated tailings to reach the strength requirements to allow reclamation.
4. A management response when triggers and limits are exceeded.
5. A requirement to address legacy tailings.

Although the Framework focuses regulation at the level of individual mines, the Framework also will monitor regional performance metrics to determine whether or not the desired outcomes are being achieved and that the inventory of fluid fine tailings is being reduced.

Finally, the term fluid tailings used in the Framework is misleading as all tailings are usually deposited in a fluid form. The term fluid fine tailings (FFT) should be used as it is more descriptive as it differentiates them from fluid sand tailings or fluid whole tailings (sand and fines).

5.2 Framework Analysis

The following comments are provided based on the proposed "Tailings Management Framework for Mineable Athabasca Oil Sands" set out in the June 26, 2014 draft as well as the Power Point presentation and conference call of August 6, 2014.

Fort McKay's concerns include:

1. Defining risk and the narrow mandate of Tailings Management Framework,
2. Allowing additional Fluid Fine tailings accumulation,
3. Too much flexibility as tailings management plans are proposed by each company,
4. Management considerations,
5. Technical considerations.

5.2.1 Defining Risk and the Narrow Mandate of the TMF

One of the key principles stated in the TMF is the intent to manage and decrease risk. This is a laudable objective but the framework will likely not accomplish this. While Fort McKay agrees that mitigating the financial risk of tailings accumulation is important, we believe that Alberta has not been diligent in its definition of risk. There are a number of other risks associated with tailings accumulation: the risks to local communities in tailings failure, tailings-associated air quality issues, and loss of traditional territory (including culturally important muskeg areas) that are critical to Fort McKay. Increased tailings accumulations have the potential to impair Constitutional rights by reducing lands available for the pursuit of rights, impacting travel on the land, and impacting the wildlife and fish which support the pursuit of rights. In addition, the siting of tailings ponds has the potential to impact the community's right to enjoyment of reserve lands, as odours and dust

associated with tailings treatment are reaching the community. Thus, if this policy document is to provide a comprehensive tailings management framework then risks must be thought of more holistically. In particular, Alberta must consider the risks to local communities in the case of impoundment failure, the impacts to wildlife that support the pursuit of Constitutional rights, the loss of access to culturally important lands, and the impacts to landscapes that are culturally important, such as muskeg. This could be achieved, in part, by eliminating the continual buildup of Fluid Fine Tailings, developing tools for mitigating the risk of a failure of tailings impoundment, and establishing tools for emergency response, oversight and stakeholder engagement in impoundment siting decisions.

The TMF's major regulatory tool is the requirement that facilities pay into the Mine Financial Security System in order to mitigate the risk of the operator abandoning the facility. However, this tool is unlikely to achieve its objective. A payment into the Mine Financial Security System is usually not required until near the end of the mine's life. Also, these payments are unlikely to be sufficient to cover the full cost of tailings impoundment failure. There needs to be additional security that equals the cost of tailings treatment, and reflects more accurately all risks, rather than the proportional amounts set under the Mine Financial Security Policy. It is clear that in designing this tool, Alberta has not fully considered the spectrum of risks associated with tailings accumulation on the landscape; this remains the greatest shortfall of the proposed framework.

5.2.2 Tailings Accumulation

Fort McKay's position is that any new company should not be allowed to generate any Fluid Fine Tailings. However, we recognize that there will always be some produced even if the technology for thickening tailings greatly improves. Nevertheless, immediate and full treatment of FFT is what industry should strive for. In contrast, the TMF allows companies to develop their own compliance pace and not to continually strive for the existing requirements of the Tailings Directive 074.

The TMF does not require companies to estimate the outstanding liability for treatment of fluid fine tailings during mine life or to require that the full cost of tailings non-treatment be secured under the Mine Financial Security System. Current security requirements only partially cover the cost of treating existing tailings. Therefore, more stringent financial security requirements should be required for companies that do not comply and exceed their triggers amounting to the full cost of treating existing tailings, which would be over and above the regular security requirements which are only a partial cost.

Not only is the amount of security required likely to be insufficient, but because oil sands companies commonly defer many of the major decisions regarding tailings until shortly before closure, there is the potential for troubling loopholes to arise. Depending on the price of oil, mine closure could occur at any time when the extraction and recovery of bitumen exceeds the cost of the product. In that event, there might be insufficient funds available to pay the cost of reclamation. Now that the requirement of treating tailings will also be deferred to the final ten years of mine life, this will add greatly to the final cost of reclamation. Furthermore, because this system pushes the final treatment of a proportion of tailings to the end of mine life this might encourage companies to propose an extended mine life, rather than addressing tailings management.

Companies will have 10 years following the cessation of mining to have tailings ready for reclamation. The mechanical deposition of fine tailings will likely need to be completed earlier to allow time to for tailings consolidation and to meet the strength requirements that will allow a sand and soil capping. Companies will likely want to cover the fines deposited in a dedicated disposal

area (DDA) with a layer of sands as a way to compress the final lifts of fines to achieve the required strength. Presumably, this will be allowed as part of the mechanical deposition process. However, five years will not be enough time to allow MFT to develop and treat that final batch of tailings. Therefore, encouraging companies to only address tailings at the end of mine life will limit the technology that can be used.

Finally, there are a number of other issues surrounding the accumulation of tailings:

- For new mines, the Framework allows fluid fine tailings to increase for five years. The reasoning for this is unclear. Alberta should clarify if it is intended to encourage operators to place these fine tailings into an impoundment then treat the mature fine tailings (MFT).
- New mines, even with dry tailings produced directly from the plant, will undoubtedly produce a small quantity of off-spec material and will need to have some time to treat this material. However, it should not be assumed that there will be a five year production period where fluid fine tailings will be allowed to build up.
- For existing mines, the stockpile of fluid fine tailings should not be permitted to increase after January 1, 2015.
- The Total Volume Limit for tailings accumulation is set at 40% above the end of mine life threshold which is the volume equivalent to two years of tailings production. While setting a limit where punitive action will occur has value, this limit is too high. In combination with the provision that companies will develop their own plans, the limit will provide an incentive for companies to develop very permissive tailings plans. In contrast, under Directive 074, only 50% of tailings, and those that are captured in the sand fraction, are allowed to be deposited in a DDA (and those fines that are captured within the sand fraction). Nevertheless, setting such a limit where significant punitive action will occur has value.
- The Lower Total Volume Trigger is not really necessary. Data should be tracked to ensure that the EML limit is not exceeded.
- The end of mine life threshold should in fact be the compliance point (or limit) instead of the upper volume limit proposed.

5.2.3 Defining the Tailings Management Plan for Each Operator

A key principle of the TMF is to allow flexibility and adaptation. While we appreciate that as tailings management technologies improve, the program might need to adapt, and that individual operators have different needs, in practice the flexibility afforded to companies is too high. The TMF allows companies to determine their own plan and schedule with limited guidance from Alberta. Because each company will be allowed to propose its own program, without more firm requirements, it will be difficult to treat all operations equally. Also, it creates an incentive for operators to set their End of Mine Life Tailings Accumulation Limit as high as possible. Better guidance needs to be provided on what this level should be; in particular, there should be little to no build-up of FFT on any mine.

5.2.4 Management Considerations

The relationship between the TMF and the existing Tailings Directive 074 is unclear. Under Directive 074, all companies are currently required to capture 50% on their fines in a DDA and meet strength requirements of 5kPa after one year, and be ready to reclaim after five years following the last deposition. In fact the total amount of tailings captured might be higher than

50%, as fines tied up in sands must also be captured. While an ambitious directive, no operator has been able to meet these requirements. On March 13, 2015 the AER suspended Directive 074 requirements. This was done despite the assurance that the TMF would build on existing regulations and directives. It is somewhat worrying that the directive was suspended before the AER has determined how the TMF will be used to regulate oil sands tailings. This leaves the management of tailings in limbo.

A further policy principle set out in the Framework is to encourage shared responsibility. It is unclear how this can be achieved. Presumably the regional metrics will be used to encourage sector-wide management of tailings. The bulk of the responsibility for tailings management should rest solely with the company that produces it, and individual performance metrics should be used for compliance and enforcement by Alberta. Regional performance metrics must also be provided by government and will be primarily aimed at seeing whether the Framework is working and whether or not Government is on the right track, however, how this relates back to managing activity by individual operators is unclear. Therefore the TMF needs more development of the regional metrics and how Alberta intends to encourage shared responsibility, and a more thorough investigation of methods for regional management of tailings.

One of the policy principles that the Framework seeks to achieve is transparency. Fort McKay strongly supports this principle and recommends that all matters relating to tailings management be readily available. Each company must provide annual reporting, with these reports sent to Fort McKay and publicly available, and non-compliance and the government's response publicly available. As part of encouraging transparency, operators should be required to involve stakeholders in siting tailings impoundments, and in monitoring impoundment safety.

5.2.5 Technical Considerations

There are technical considerations that require more thought. For example, the technology for treating tailings in a timely fashion is not yet in place and this will be a challenge for all mines as well as regulators, as it was for Directive 074. Fort McKay believes and hopes that a cost effective technology for thickening tailings as they are discharged from the processing plant for placement in a Dedicated Disposal Area (DDA) will eventually be available. However, until this is the case Alberta might have to take a stronger role in technology discovery, or limiting mining activities until such time as the technology is available.

A possible method for final deposition of tailings is to deposit them under water. Fort McKay has always opposed the use of flooded pits over submerged tailings. It is unclear whether the TMF allows for this sort of tailings treatment, and how these volumes will be included in tailings accumulation profiles is not clear. Both submission of tailings and other forms of disposal in DDAs often requires more disturbance of the landscape. Thin lift drying at mine sites can require additional land disturbance. Care must be taken to ensure that the solution to tailings management do not in turn result in further environmental damage.

5.3 Proposed Changes

The June 26, 2014 draft TMF is entitled "Tailings Management Framework for Mineable Athabasca Oil Sands," but only provides a framework for the mitigating the financial risk of fluid fine tailing abandonment. For it to be a true Tailings Management Framework it must be expanded to address their location, design standards, stability monitoring, oversight responsibilities, risk of failure, run-

out analysis, financial assurance, emergency response plans, communication, management and monitoring of effluent, air emissions and groundwater, and reclamation.

It is recognized that some of what we would like to see incorporated into a comprehensive tailings management framework is already contained in existing legislation, policy and operational policy elsewhere. Nevertheless, it is important to set out these matters into one management framework in order to ensure that requirements and standards are clear to industry first nations and government. This is especially important now that the Mount Polley tailings disaster is on the minds of First Nations and the public.

The following issues must be addressed in a comprehensive Tailings Management Framework:

5.3.1 Siting External and In-pit Tailings Impoundments

Criteria should be provided for the siting of external tailings impoundments on the landscape. At present, it appears that the main criteria for the location of these impoundments are that they do not cover areas of recoverable bitumen, and that they are near a source of dyke construction material. Of greater importance to Fort McKay is that these facilities do not cover areas of important traditional use values, do not cover or impinge on major watercourses and are not located close to the community. While restoration and reclamation is planned, it's important to note that the landscape will be transformed into upland boreal forest, a land type that does not have the same cultural importance. The permanent alteration of lands due to tailings ponds poses a major impact to Fort McKay's ability to pursue their Constitutional rights.

Freshwater resources in the area are extremely culturally important. Therefore siting should consider specifying a suitable buffer between the edge of the impoundment and a major watercourse. The buffer should consider the possibility of future expansion of the impoundment, and sufficient room between the impoundment and the watercourse to monitor and collect any groundwater seepage.

On a wider and more regional perspective, the Government of Alberta must take the initiative to require companies to look at ways of avoiding the construction of additional external tailings impoundments by possibly utilizing pits from an adjacent operation. Alberta should consider the development of a regional Tailings Management Framework as an opportunity to employ creative solutions to tailings accumulation. As there might be liability issues with having companies share tailings sites, Alberta would need to play a role in identifying responsible parties, identify a third party to manage waste, or might need to accept some portion of the liability itself.

5.3.2 Design, Size and Construction Standards

Current tailings impoundment design standards likely follow the Canadian Dam Safety Guidelines, 2007 (2013 Edition). However, the assignation of an impoundment design to CDSG risk classification must be clearly discussed and agreed upon between the proponent and Fort McKay. The CDSG classification system takes into account possible environmental and safety risks associated with a failure, and assigns design standards according to the level of risk. For example, dams built upstream of heavily populated areas are classified as high risk. An effective Tailings Management Framework should develop a framework by which dam classification in traditional territories takes into account traditional use values, and the risk to local communities and reserve

lands. General principles of tailings impoundment construction should include limits to the size of external tailings impoundments, and construction standards.

While not posing as great a risk as external tailings impoundments, in-pit tailing disposal poses a number of potential issues. Most will require dyke construction to contain the tailings and will require most of the standards, supervision and monitoring required for external impoundments. Undoubtedly, the risk of catastrophic failure will be much lower than external above ground impoundments the concerns related to contamination, air and water emissions and discharges remain and will require constant surveillance.

5.3.3 Construction Supervision

The risks associated with the potential for tailings failure, either through leakage of breach, require that construction to be supervised by an independent geotechnical consultant. This should include the submission of an "as-built" report signed by the geotechnical consultant to confirm that the impoundment has been constructed in accordance with the design, and apply to include initial construction as well as subsequent raises to the impoundment.

5.3.4 Preparing a Construction, Operation, Maintenance and Surveillance Manual

Ongoing maintenance of tailings structures is essential. As with emergency response plans, these should include documentation for staff that sets out the conditions for safe operation, maintenance and surveillance, which are updated on a regular basis. As the mine progresses to closure, the manual will need to be modified to outline the responsibilities for maintenance and ongoing surveillance.

5.3.5 Tailings Dam Oversight Including Responsibilities of Companies, Consultants, Expert Review Panels and Government

Fort McKay needs to be assured that the proper oversight by companies, consultants, expert review committees and government is in place for all impoundments and roles and responsibilities need to be clearly established as part of AER's regulatory oversight.

5.3.6 Consequence of Failure Category and Inundation Analysis

All dams must be assessed for their consequence of failure category, and constructed and operated to the appropriate design standards. Because Fort McKay's community and land will be directly affected by any failure, Fort McKay believes that the consequence for failure will be very high to high for all tailings impoundments constructed in the oil sands and, therefore, all dams should have an inundation analysis as well as an emergency response plan.

5.3.7 Financial Assurance to Provide Funding to Pay for Clean-up

At present, Alberta's Financial Management System assumes that a mine will progress in a systematic and planned fashion until closure and that full financial security will only be in place near the end of this mine life. There is no current requirement for additional security. As evidenced by the Mount Polley breach, the costs of mitigation and clean up can be substantial and impose a

large financial burden on both the operator and the province, and problems can arise long before mine closure. Therefore, the provision of additional security, likely in the form of insurance, needs to be mandated by government, and the amount of insurance coverage must consider the risk and consequence of any major tailings breach.

5.4 Emergency Preparedness Plan

As for sour gas facilities, the risk of harm in the case of tailings failure is high. Recent leaks at the Suncor facility (March 2013 and March 2011) and the Obed Mine tailings release (October 2013) showed that there is no coordinated response for notification of downstream communities who use the Athabasca for traditional activities. This is a serious oversight. Emergency preparedness plans (EPP) for all external, and possibly some in-pit, tailings impoundments, must be prepared, continually updated and made available to Fort McKay as part of the annual reporting requirements. The EPP should be implemented if any of the following occurs:

- Failure or suspected failure of the dam
- Unauthorized discharge from an impoundment
- Slumping, sliding, cracking or bulging of the dam
- Sinkholes in the tailings beach or dam
- Breakage of tailings pipelines
- Extreme flooding

Should one of these events occur, the plan must indicate who needs to be notified. This will include notification of internal company personnel, government, as well as First Nations. The list of contacts must be available and updated frequently to ensure that the list is current.

5.4.1 Management and Monitoring of Effluent Including Air Emissions, Direct Discharge of Effluent and Groundwater Contamination

The framework must set out the monitoring requirements for all tailings impoundments and this data must be made available to Fort McKay on a timely basis. The community of Fort McKay remains concerned about possible tailings breaches as well as ongoing contamination of surface and groundwater, and odours arising from tailings.

5.4.2 Tailings Impoundments Reclamation

The majority of tailings impoundments are and have been constructed on peat accumulating wetlands and their planned reclamation will generally be to upland ecosystems. This represents a continual loss of these wetlands which are an important cultural feature on the boreal landscape. Fort McKay would like to see more attention given to restoring peat accumulating wetland ecosystems on the landscape following mine closure.

5.4.3 Effectively Engaging Fort McKay

Because Fort McKay bears a large part of the risk for any tailings failure we must be a full partner in the development of this framework and the ongoing approval, inspection and monitoring of these facilities. Furthermore, the development of a comprehensive tailings management framework

requires more substantive input from downstream communities who are at considerable risk for tailings failure or abandonment. Effective engagement must include:

- Opportunities to review proposed new regulations arising from the TMF
- Opportunities to review all tailings proposals
- Opportunities to be appraised of research into new treatment technologies
- At the request of Fort McKay, provision of an independent geotechnical consultant to review tailings pond design and operation on Fort McKay's behalf
- Opportunity to review all reports submitted to government including, annual geotechnical reports, monitoring reports and data
- Inspection reports prepared by government, consultants to be submitted directly to Fort McKay
- Immediate notification of any potential emergency

5.5 References

Canadian Dam Safety Guidelines, 2007 (2013 Edition)

Directive 074: Tailings Performance Criteria and Requirements for Oil Sands Mining Schemes. Energy Resources Conservation Board (now Alberta Energy Regulator), February 3, 2009.

Draft Tailings Management Framework for the Mineable Athabasca Oil Sands. June 26, 2014.

Lower Athabasca Regional Plan, 2012-2022. Alberta Government, 2012.