

# Oil Sands Environmental Coalition

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31 October 2016

Alberta Energy Regulator  
Authorizations Review and Coordination Team  
Suite 1000, 250 – 5 Street SW  
Calgary, Alberta  
T2P 0R4  
E-mail: [ARCTeam@aer.ca](mailto:ARCTeam@aer.ca)

**Re: The Canadian Natural Resources Limited Tailings Management Plan for the Horizon Mine OSCA Application No. 1869003**

Dear Authorizations Review and Coordination Team:

I am writing you on behalf of the Oilsands Environmental Coalition (OSEC) regarding the proposed Canadian Natural Resources Limited (CNRL) Tailings Management Plan (TMP) for the Horizon Mine (hereinafter the 'Modified Project'). The proposed modifications relate to tailings management of the existing Horizon Mine (hereinafter the "Existing Project"), which includes the Horizon open pit mine (operating since 2008), central processing facility (including both a bitumen extraction plant and upgrader), and External Tailings Facility (ETF). Pursuant to Section 13 of the Oil Sands Conservation Act (OSCA), this letter is submitted as a Statement of Concern from OSEC regarding the Modified Project.

OSEC is a coalition of Alberta-based environmental organizations with a long-standing interest in environmental issues associated with oilsands development. OSEC is comprised of the Fort McMurray Environmental Association (FMEA) and the Pembina Institute. Members of OSEC have a legal interest in recreational lease lands near the Settlement of Fort McKay, in close proximity (approximately 20 kilometers) upstream from the Modified Project operations. The interest consists of a license to occupy lands on the Muskeg and Athabasca Rivers for recreational purposes, such as camping, boating and fishing. Members of OSEC are concerned that CNRL's Modified Project will adversely impact water quality and quantity, wildlife species and terrestrial values, and recreational opportunities available to OSEC members.

OSEC has longstanding concerns about the growing risks that oilsands tailings pose to the environment. We are concerned about the extent to which the Modified Project meets the stated intent and technical requirements of the recently issued *Lower Athabasca Region – Tailings Management Framework for the Mineable Oilsands* (TMF), which comprises a policy direction intended to "manage fluid tailings volumes during and after mine operation in order to manage and decrease liability and environmental risk resulting from the accumulation of fluid tailings on the landscape."<sup>1</sup> The CNRL Horizon Mine **OSCA Application No. 1869003** claims to comply

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<sup>1</sup> Government of Alberta. 2015. *Lower Athabasca Region Tailings Management Framework for the Mineable Oilsands (LARP TMF)*, p.1.

with the *Tailings Directive 085: Fluid Tailings Management for Oilsands Mining Projects*,<sup>2</sup> which was developed under the *Oilsands Conservation Act* (OSCA) and sets requirements for managing fluid tailings volumes for oilsands mining projects. We have several concerns regarding the sufficiency of this application in meeting the information requirements, fluid tailings management reporting, and surveillance and compliance processes stipulated by the Directive. In this regard, we have prepared a preliminary list of questions and concerns that we would like to bring to the Director's attention.

**1. Identify why you believe you may be directly and adversely affected by a decision of the AER on the application(s)**

All members of OSEC are directly and adversely affected by a decision of the AER on the application(s) cited herein. OSEC has an interest in lands near Fort McKay and in close proximity to the Modified Project. The interest consists of a license to occupy lands on and near the McKay and Athabasca Rivers for recreational purposes, such as hiking, bird watching, camping, swimming and boating. Consequently all employees from Pembina and members of FMEA will be directly affected relative to their potential recreation activities on the recreation-leased lands.<sup>3</sup>

The Modified Project is located in Townships 96 and 97, Ranges 11 and 12, and extends into Townships 96 and 97, Range 13, all west of the 4<sup>th</sup> Meridian. The Modified Project is located about 70 kilometres north of Fort McMurray, Alberta. Given its close proximity to Fort McMurray and Fort Mackay, individual members of FMEA are directly and adversely affected by the Modified Project. As all members of OSEC have an interest in recreational lands near Fort McKay, they will be affected by environmental impacts in this region resulting from the Modified Project.

While emphasizing that it will first and foremost be directly and adversely affected by a decision of the AER on the CNRL application, OSEC contends that it also meets the requirements for participation as a genuine interest intervener, as set out in the recent changes to intervener status procedures under the auspices of the AER's enhanced participation pilot program for Directive 085 Tailings Management Plan (TMP) applications. As such, **Appendix A** has been included to demonstrate OSEC's supplementary eligibility for genuine interest intervener status, in addition to its primary eligibility to participate as directly and adversely affected.

**2. Identify the nature of your objection to the application(s)**

CNRL's application provides updates to the previously approved 2013 TMP and has been prepared for the period from 2016 to 2065 with a higher level of detail presented in relation to activities planned to occur over the next ten years. CNRL is also requesting Commercial Scheme approval for the Mature Fine Tailings Reduction Mine Plan (MFTRMP) through the TMP

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<sup>2</sup> AER. 2016. *Directive 085: Fluid Tailings Management for Oilsands Mining Projects*.

<sup>3</sup> These lands are legally described as:

- a. all those portions of lots 1-4 which lie generally north and east of the left bank of the MacKay River;
- b. portions of sections 25 and 26; Township 94; Range 11; Meridian 4;
- c. LSD 16; section 27; Township 94; Range 11; Meridian 4; and
- d. LSD 1; section 34; Township 94; Range 11; Meridian 4.

application. CNRL received Experimental Scheme **Approval #12403A** for the MFTRMP in December 2015, which extended the expiry date of the approval to June 30, 2017.<sup>4</sup>

Correspondingly, CNRL's TMP proposes the following major changes to the Existing Project: an extension of mine life by five years; changes in mining sequence, dyke construction, and storage of tailings in DDAs; and, a proposed Northeast Pit Extension (DDA5) of approximately 1600ha of the previously approved North Pit, increasing the overall footprint of Horizon Mine by 10%.

OSEC has concerns regarding the Modified Project's proposed fluid tailings profiles, tailings treatment technologies, End Pit Lake design and water management, and lack of adequate contingency plan(s). Moreover, OSEC has concerns regarding AER procedures for ensuring industry-wide best practices in tailings management in alignment with Directive 085 and the TMF.

These concerns are described in more detail below.

### *I. Fluid Tailings Profiles*

OSEC is concerned about CNRL's proposed fluid tailings profiles. The stated objective of the TMF, as indicated in Sections 3.4 and 5.0 is:

Fluid tailings accumulation is minimized by ensuring that fluid tailings are treated and reclaimed progressively during the life of the project and all fluid tailings associated with a project are ready-to-reclaim within 10 years of the end of mine life of the project. The objective will be achieved while balancing environmental, social, and economic needs.

However, CNRL states in Section 7.5.3 of its application that "starting 2033, the growth of FT inventory will be equal to or less than the rate of FT treatment which will allow Canadian Natural to adhere to the approved FT trajectory." Furthermore, CNRL states in Section 3.11.2 that peak FT volumes will be reached at 198 Mm<sup>3</sup> – equivalent to 2.6 years of full production – in 2032. This trajectory, as detailed in Table 7.2-1 and depicted in Figure 7-1, does not anticipate aggressive volume reductions for the next 16 years of operations.

OSEC contends that the peak FT volume date for this fluid tailings profile is unreasonable, and that CNRL should be treating FT at the same rate as FT is being produced much sooner. In Section 5.2.1 of the TMF clear expectations are delineated regarding fluid tailings volume profiles, where it states "it is expected that projects manage an inventory of fluid tailings in the range of the volume that is expected to be produced during 3-10 years of full production." Based on these metrics, CNRL's application does not meet the specified expectations of the TMF.

### *II. Fluid Tailings Treatment Technologies*

OSEC is concerned by CNRL's selections in fluid tailings treatment technologies, in particular the plan's heavy reliance on Non-Segregated Tailings (NST). Despite CNRL's account of having extensively tested of a variety of alternative technologies with an on-site tailings research facility

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<sup>4</sup> CNRL. 2016. *Application for the Approval of Canadian Natural's Tailings Management Plan (TMP): Horizon Oil Sands Processing Plant and Mine (Horizon)*. P. 7.

(APIC), the proposed TMP relies principally on NST – a technology that was selected by the company in 2002. CNRL acknowledges that there is a high degree of uncertainty associated with this technology, and that "a minimum of five annual pond assessments must be completed before an accurate estimate of NST performance can be made" (Section 10.3). Additionally, MFT spiked NST is proposed to treat legacy tailings, and yet it is conceded that "MFT Spiked NST technology is not fully demonstrated" and will also require a minimum of five additional pond assessments (Section 10.3). OSEC contends that this high degree of uncertainty contradicts the TMF requirement that "all plans should be based on the most advanced and demonstrated technologies" (Section 5.2.1). Further, the additional time requirements to demonstrate the performance of NST fundamentally undermines the intent of the TMF to ensure FT inventories on the regional landscape are reduced within 10 years of the implementation of Directive 085.

Moreover, Requirement 10 of Section 4.6 in Directive 085 stipulates that applications "justify that the technologies proposed are the best available for the project." In Section 11.1.1.1 of its TMP, CNRL claims to assume NST performance will be similar to CT. OSEC contends that CT is not considered a viable stand-alone technology, hence the extensive research and development that COSIA is currently undertaking to explore supplementary technologies. Subsequently, a more comprehensive justification of CNRL's choice of NST as its primary technology in treating FT despite these significant limitations in its projected performance is requested. This concern is particularly pertinent given the availability of alternative technologies such as centrifuges, which are more capital and energy intensive but have also been demonstrated to be effective.

Finally, OSEC is concerned by CNRL's statement in Section 4.2.5 that comprehensive tests are currently being executed to "validate the effectiveness of CO<sub>2</sub> injection into NST." More information is requested to clarify why additional research and data collection is still necessary, when CNRL has been using this technological process on a commercial scale since 2009.

### *III. End Pit Lake Design and Water Management*

OSEC is concerned that CNRL intends to compile all residual MFT in two End Pit Lakes at the End of Mine Life in 2055 (Section 4.2.4). Firstly, CNRL has proposed that settling and bioremediation will only commence very close to End of Mine Life. This largely passive approach to capturing fines on a beach and amalgamating what is not captured into End Pit lakes is concerning to OSEC, particularly given the persistent and manifold technical uncertainties associated with using this technology to treat MFT.

Secondly, Requirement 12 of Section 4.6 in D085 states that where water-capped fluid tailings technology is proposed, the application must identify an alternative treatment technology. CNRL does not provide any alternative technologies to its proposed End Pit Lakes. This is particularly concerning given that COSIA's pilot End Pit Lake project will not even commence construction until 2017. The research gaps associated with this technology are correspondingly substantial.

Finally, Section 6.6 of the TMF states that applications that anticipate the return of process-affected water to the environment must include supporting analyses including the evaluation of potential ecosystem and human health risks. There are no such analyses included in CNRL's application. This deficiency is a major concern for OSEC, particularly in light of the major existing provincial policy gap for water release from oilsands operations into the natural environment. OSEC is accordingly concerned about the implications of this planned open water

management system on both the ecology of the Athabasca river and the livelihoods and recreational activities of local stakeholders.

OSEC asserts more broadly that the lack of water return policy remains a critical missing element in addressing tailings management at the industry level. In particular, OSEC is concerned by the absence of any existing guidelines or standards on naphthenic acids. As this issue is unique to the Alberta oilsands industry, it is OSEC's recommendation that the Government of Alberta and the AER prioritize addressing it directly with an inclusive and concentrated policymaking working group prior to approving any Directive 085 applications (or, at minimum, including clear conditions *vis-à-vis* upcoming policy implementation for any approvals granted). Extensive consensus-building and consultation processes will ultimately be imperative to designing and implementing water return regulations for this industry.

#### *IV. Lack of Contingency Plan(s)*

OSEC contends that CNRL's proposed TMP fails to meet Requirement 11 in Section 4.6 of Directive 085, which necessitates that the application describes uncertainties, mitigation measures, and contingency plans for unproven technologies. Despite acknowledging a high degree of uncertainty associated with both NST and End Pit Lake performance, CNRL does not provide any sufficient contingency plan(s). Should the proposed NST and/or MFT spiked NST technologies not perform to expectations, CNRL will have little room to increase treatment volumes because both technologies are tied to production.

Furthermore, OSEC contends that CNRL's lack of suitable contingency plans and/or delineation of potential alternative fluid tailings treatment technologies contradicts the TMF's requirements that applications "will identify contingency plans to manage risk" (Section 5.2.1) and "until it is determined whether or not [a] technology is successful treatment method, plans will be required to consider alternatives" (Section 5.2.2). CNRL's reliance on NST, MFT spiked NST, and End Pit Lake technologies despite the significant associated uncertainties is therefore not acceptable as no tangible alternatives are proposed.

Finally, OSEC contends that Requirement 16 of Section 4.8 in Directive 085 has not been met. This requirement reads as follows:

The fluid tailings management plan must describe uncertainties (nature and magnitude) associated with the environmental effects and mitigation measures during operation, reclamation, and closure stages. If there is a high level of uncertainty, describe

- (a) the nature of the uncertainty and the impact of associated failures;
- (b) mitigation measures or contingency plans for how uncertainties will be addressed; and,
- (c) timelines and milestones for fluid tailings research to address uncertainties.

OSEC asserts that CNRL's application fails to adequately meet all three of these requirements. While a high level of uncertainty is repeatedly acknowledged, the nature of these uncertainties are not specified. OSEC is concerned about the impact of these uncertainties in technological performance impacting CNRL's proposed timelines and milestones for fluid tailings treatment trajectories. This relates to the issue of public liability, as while OSEC recognizes CNRL is

obliged to post funds under the auspices of the 2011 Mine Financial Security Program the extent to which these funds will cover true fluid tailings treatment and reclamation costs is unclear. These concerns are borne in part from major deficiencies in ensuring mine financial security that existed under the previous Alberta Environmental Protection Security Fund. As such, OSEC recommends that CNRL provide a detailed analysis regarding the extent to which the Modified Project's fluid tailings treatment and reclamation costs will be covered under the MSFP through to projected certification dates in the mid-late 20<sup>th</sup> century, as well as financial contingency plans pending failure to meet stated targets.

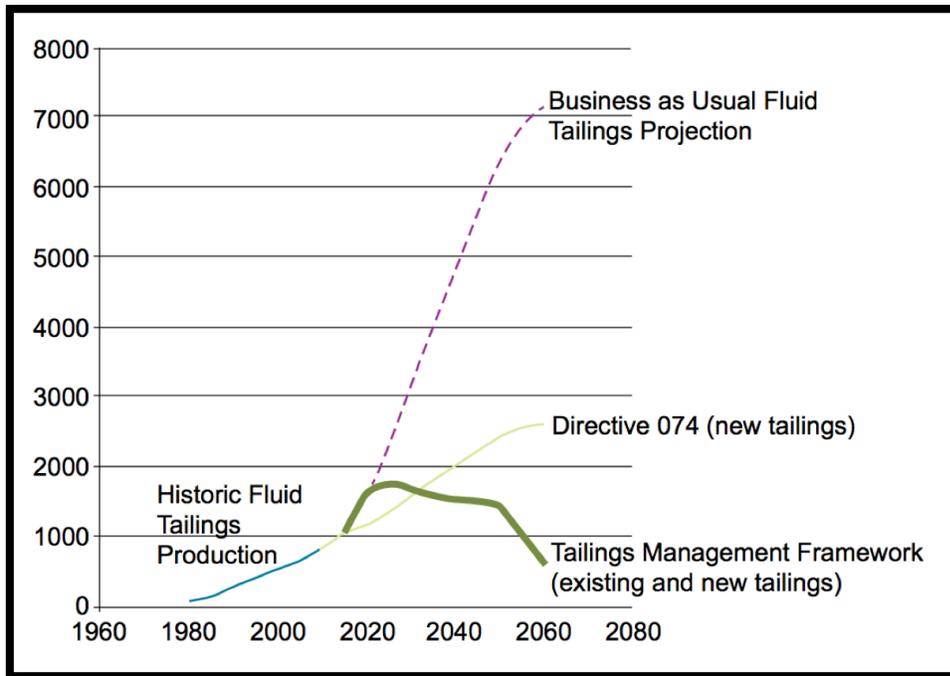
#### *V. Ensuring Best Practices in Tailings Management*

OSEC is interested in ensuring that all companies are using best practices in addressing tailings management and that operators will be held to similar standards. Notably, Pembina is currently conducting an industry-wide analysis of all Directive 085 applications. The preliminary results of this analysis to date has demonstrated that cumulative tailings inventories are not consistent with the expectations presented in the TMF. OSEC correspondingly continues to seek clarification regarding how the AER will consolidate and critically analyze all proponents' trajectories, and delineate which projects are underperforming at the expense of industry-wide expectations.

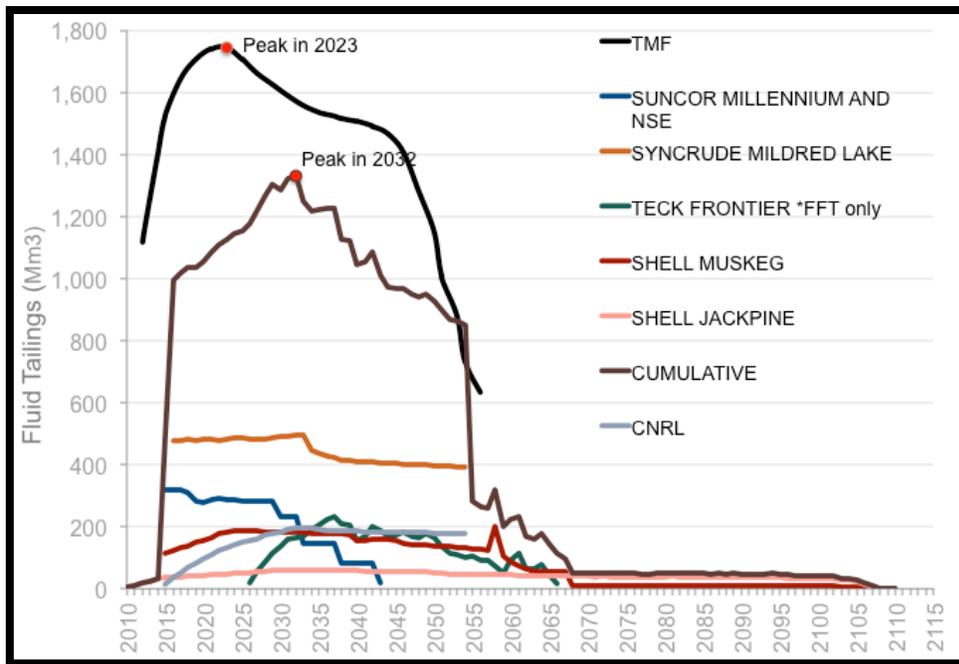
The TMF graphically outlines the expected cumulative trajectory of all fluid tailings on the landscape including a peak date for tailings accumulation, a rate of decline, and the point at which tailings cumulative tailings volumes will actually decline (**Figure 1**). OSEC has amalgamated the projected tailings volumes from all Directive 085 applications submitted to date, and compared it with the aforementioned TMF trajectory (**Figure 2**). This analysis has demonstrated a general trend wherein cumulative tailings volumes are peaking roughly ten years later than the TMF anticipated. This analysis will be expanded to include the projected fluid tailings volumes of all Alberta oilsands mines once the remaining tailings management plans have been submitted for the November 2016 deadline.

OSEC and the AER's ability to determine the adequacy of CNRL's plans are correspondingly dependent on an assessment that the sum of the approved tailings plans are consistent with the TMF's objectives. As such, it is essential for regulators and stakeholders to be able to compare all tailings plans in conjunction to ensure responsible regulatory decisions are made. We thereby strongly recommend that no applications be approved until all proponent plans have been submitted and reviewed.

**Figure 1:** Expected Cumulative Tailings Under the TMF<sup>5</sup>



**Figure 2:** Cumulative Tailings Volumes of All Directive 085 Applications Submitted to Date



(Original Figure)

<sup>5</sup> Government of Alberta. 2015. *Lower Athabasca Region Tailings Management Framework for the Mineable Oilsands (LARP TMF)*, p.18.

### **3. Identify the outcome of the application you advocate**

At this time, OSEC submits that CNRL's TMP application for Directive 085 is incomplete. OSEC correspondingly requests that CNRL provide the aforementioned additional evidence to increase confidence regarding the Modified Projects' compliance with the TMF. In order to fulfill its mandate to ensure safe, efficient and responsible development of Alberta's natural resources, the Alberta Energy Regulator should request additional information from the proponent before proceeding to a hearing. OSEC wishes to work with CNRL and the AER to comprehensively address the deficiencies and impacts outlined above and review the cumulative tailings trajectory expected from approval of this and other applications.

### **4. Identify the location of your land, residence, or activity in relation to the location of the energy resource that is the subject of the proposed application; and your contact information including your name, address in Alberta, telephone number, e-mail address or, if you do not have an email address, your fax number.**

The Pembina Institute and the Fort McMurray Environmental Association have signed an agreement with Fort McKay Metis Local #63. The lands in the agreement are partially adjacent to the McKay River and are legally described as:

- a. all those portions of lots 1-4 which lie generally north and east of the left bank of the MacKay River;
- b. portions of sections 25 and 26; Township 94; Range 11; Meridian 4;
- c. LSD 16; section 27; Township 94; Range 11; Meridian 4; and
- d. LSD 1; section 34; Township 94; Range 11; Meridian 4.

The contract lands are approximately 50 kilometers upstream from the Modified Project. The recreational agreement provides that OSEC members may access the contract lands to recreate (i.e hiking, camping, swimming) providing one week's prior notice is offered to Fort McKay Metis #63.

The Oilsands Environmental Coalition (OSEC) is an unincorporated coalition of Alberta public interest groups and individuals with a long-standing interest in the Athabasca Oilsands area. OSEC was formed to facilitate more efficient participation in the regulatory approvals processes for oilsands applications. Its current members include the Fort McMurray Environmental Association (FMEA) and the Pembina Institute.

Fort McMurray Environmental Association (FMEA)  
260 Grandview Crescent  
Fort McMurray, Alberta  
T9H 4X8  
Attention: Ann Dort-MacLean  
[girlsinc@telus.net](mailto:girlsinc@telus.net)

FMEA consists of residents living in and around Fort McMurray who are concerned about the effects of oilsands development on human health, the ecosystem and the socio-economic quality of life in the municipality of Wood Buffalo. As of 2012, FMEA had 37 members.

The Pembina Institute  
219 19 Street NW  
Calgary, AB  
T2N 2H9

The Pembina Institute is a non-profit environmental research organization founded in Alberta in 1985. One of its objectives is to minimize the environmental impacts associated with fossil fuel development in Alberta. It has monitored the health and environmental implications of oilsands development since the mid-1980's and has been particularly active in the assessment and management of long term, chronic, and cumulative impacts.

*Conclusion*

This Statement of Concern should be considered preliminary rather than final and conclusive. OSEC retains the right, upon further analysis of the project proponent's regulatory filings, to bring new issues to bear in a regulatory setting. OSEC is interested in working with CNRL to attempt to resolve these important issues and we seek a formal ADR process and forum to support this assessment.

Sincerely,



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On behalf of the Oil Sands Environmental Coalition

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## Appendix A

OSEC should be permitted to participate in the process because it is directly and adversely affected by the application, as set out in the preceding Statement of Concern. In the alternative, OSEC should be permitted to participate because it also meets the requirements for participation as a genuine interest intervener, as set out herein.

The following three sub-sections provide an overview of how OSEC meets the requirements of participation as a genuine interest intervener, in addition to being directly and adversely affected.

**1) Provide a concise explanation of how your participation will materially assist the AER in making a decision on the application (e.g., you can provide project-specific, detailed technical information).**

OSEC is a coalition of Alberta-based environmental organizations with a long-standing interest in environmental issues associated with oilsands development. OSEC is comprised of the Fort McMurray Environmental Association (FMEA) and the Pembina Institute.

Since the Public Notice of Application in late September, OSEC has been actively reviewing the proposed CNRL tailings management plan. The Pembina Institute's review of the Modified Project have included both detailed technical analyses of the proposed TMP and comparative analyses from an industry-wide tailings management perspective. The products of both analyses are expected to contribute meaningfully in assisting the AER's decision making process for this application. The preceding Statement of Concern provides an overview of the nature of OSEC's research, analysis, and perspectives on this file.

**2) Provide a concise explanation of how you have a tangible interest in the subject matter of the review (e.g., you participate on committees or are involved in other activities related to oil sands tailings).**

For over 30 years members of OSEC have demonstrated a genuine interest in promoting sustainable development in Northern Alberta, overseeing responsible oilsands exploration and development, and managing the cumulative environmental impacts of oilsands mining.

In particular, the Pembina Institute's experience in researching and reporting on Alberta oilsands tailings includes: five major technical research publications on tailings management from 2008-2013; leadership in designing and facilitating multi-stakeholder initiatives intended to manage cumulative impacts of tailings; participation in numerous government consultation processes, including processes specific to tailings; membership in the AER's 2015-16 Technical Advisory Committee for Tailings Regulatory Management; and participation in the 2016 Water Management Working Group hosted by the Government of Alberta.

**3) Provide a concise explanation of how your participation will not unnecessarily delay the review.**

OSEC has earned a reputation for providing substantive and well-researched perspectives that add value to regulatory processes. Members of OSEC are routinely contacted by media, industry,

and governments both in Canada and abroad for comments and insights that are highly credible, well-researched, and fair.

The principle objective of OSEC for participating in the review of this application is to ensure that concerns are addressed in the most comprehensive and efficient manner possible. Correspondingly, OSEC is currently in bilateral discussions with the AER to promote the adoption of ADR processes and forums at an industry-wide level, in order to prevent unnecessary interferences with the regulator's concurrent review of all D085 applications.