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Jason Heisler, Manager EH&S, Regulatory Approvals, Oil Sands
Suncor Energy Inc.
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Decision on Application Nos. 1857270, 1857274, and 075-94

Dear Mr. Heisler:

The Alberta Energy Regulator (AER) has completed its review of the subject applications. The AER finds that the applications do not satisfy the requirements of the *Lower Athabasca Region: Tailings Management Framework for the Mineable Athabasca Oil Sands (TMF)*, or *Directive 085: Fluid Tailings Management for Oil Sands Mining Projects (Directive 085)*, and the applications are therefore denied.

As per *Directive 085*, the AER is notifying Suncor of the denial and provides the reasons for its decision below.

Background

On April 14, 2016, Suncor filed

- Application No. 1857270, the *Millennium Operational Amendment (MOA)*, to amend Suncor's Approval No. 8535 pursuant to sections 10 and 13 of the *Oil Sands Conservation Act (OSCA)*; and Application No. 075-94 to amend Suncor's Approval No. 94-02-00 pursuant to sections 66 and 70 of the *Environmental Protection and Enhancement Act (EPEA)*. The *MOA* application, with supporting environmental information, describes the construction, operation, and reclamation and closure modifications to Suncor's mine, tailings, dedicated disposal areas, and reclamation and closure plans.
- Application No. 1857274, the *Suncor Base Plant Application for the Draft Tailings Directive*, pursuant to section 13 of *OSCA* and in accordance with the requirements of *Directive 085*. The *Suncor Base Plant Application for the Draft Tailings Directive* describes Suncor's tailings management plan (TMP) for new and legacy fluid tailings associated with the Suncor base plant.

On September 20, 2016, Suncor submitted supplemental information, followed by an addendum on December 23, 2016.

Issues

1. Water-capping

In its TMP Suncor proposed to treat about 75 percent of its fluid tailings in a new dedicated disposal area (DDA3) using in-line flocculation followed by water-capping. *Directive 085* (pages 14, 15, 18, and 19) requires the TMP to describe the risks, benefits, and trade-offs associated with tailings treatment technologies; and to describe the environmental risks and how they will be managed during operation, reclamation, and closure.

- Suncor stated that the primary risk associated with DDA3 was the extended timeline to develop a sustainable lake due to prolonged release of bitumen, ultra-fines, and other material from the treated fluid tailings. Suncor did not identify other risks. Suncor proposed to mitigate the extended timeline by improving the treatment stage to decrease the mobility of the bitumen, ultra-fines, and other material. Suncor did not provide a mitigation plan or identify the triggers to initiate mitigation.
- Suncor indicated that significant work has been done on water-capping technology, citing Syncrude's Base Mine Lake (BML) Demonstration as an example. Suncor did not identify how the BML results addressed the primary risk associated with DDA3, or how the results would mitigate that risk.
- Suncor proposed a 15 year water-capping demonstration to support risk mitigation. Suncor did not provide details about the proposed demonstration in its TMP.
- Suncor did not provide adequate information to describe uncertainties associated with the environmental effects and mitigations measures during operation, reclamation, and closure stages.
- Suncor provided high-level information on the benefits and trade-offs of its technologies, but water-capping was not included in the comparison.

From the information Suncor provided, the AER cannot assess the risks, benefits, and trade-offs to conclude that the water-capping technology will result in an aquatic ecosystem in the time predicted.

2. Terrestrial alternative to water-capping

Water-capping is an unproven technology and policy direction on water-capping and pit lakes is under development by the Government of Alberta. The *TMF* (page 23) requires TMPs to consider alternatives where unproven technology is proposed. In addition, where water-capped fluid tailings technology is used

to generate the fluid tailings profile, *Directive 085* (pages 15 and 30) requires the TMP to include an alternative technology option, including timeframes for implementation.

- As an alternative to water-capping, Suncor proposed to cap its tailings with solid material (e.g., tailings sand), and create an in-pit terrestrial landform. The decision for capping the tailings with solid material, as opposed to water, would be made in 2039, 6 years after the end of mine life.
- Suncor did not provide adequate information on how the in-pit terrestrial landform would be constructed.
- The *TMF* (page 44) and *Directive 085* (pages 14 and 15) seek to manage and decrease risk by encouraging timely reclamation. The timelines associated with reclamation of the terrestrial option are 150 years or more, and require active management for the duration. This is delayed by Suncor's 2039 decision milestone and is significantly longer than the 30 year timeline associated with the proposed use of water-capping technology.

Inadequate information has been provided to assure the AER that the terrestrial option will achieve the closure outcomes, including a deposition plan, a dewatering plan, an assessment of the impacts to the water capping technology, ready-to-reclaim (RTR) criteria, or that the terrestrial option's reclamation timeline could be reduced by other strategies and trade-offs.

3. RTR performance criteria

The *TMF* (page 45) and *Directive 085* (pages 15, 16, 17, 26 and 27) require RTR criteria to track the performance of the treated fluid tailings during the operational stage of the deposit; and to ensure that the deposit can be reclaimed as predicted, and in the time predicted, as per the life-of-mine closure plan. Tailings deposits with higher uncertainty or more complexity may require more criteria. RTR criteria must address a deposit's physical properties (subobjective 1) and environmental effects (subobjective 2).

Fluid tailings profiles are dependent on RTR criteria. Treated tailings that meet RTR criteria enables progressive reclamation, which results in reduced liability.

- Suncor did not provide adequate evidence that its proposed RTR criteria would ensure that its treated tailings deposits could be reclaimed as predicted, and in the time predicted.
- Suncor did not provide RTR criteria for subobjective 2 that addresses the effects the deposits may have on the surrounding environment or on the ability to reclaim.

4. Other

The *TMF* and *Directive 085* seek to manage and decrease risk, uncertainty and liability, and enhance progressive reclamation. The AER notes Suncor did not provide adequate information as follows.

- Plans to reduce uncertainties with
 - o the deposits, the types of mitigation proposed and associated challenges for their implementation, or the triggers for initiating their implementation; and
 - o the duration to operate pollution prevention and mitigation measures and the consideration of this duration in the environmental risk and trade-offs assessment.
- Evidence to demonstrate assurance of progressive reclamation of tailings ponds as shown in the progressive reclamation status maps.

Conclusion

The AER acknowledges Suncor is committed to responsible development of the oil sands resource including a balanced approach to the management of fluid tailings. This denial is without prejudice to any applications that Suncor may submit. As per *Directive 085*, Suncor must submit a new, complete fluid tailings management plan application and any additional amendment applications required to support changes to the approved project.

Regards,



Cal Hill, Executive Vice President
Strategy & Regulatory Division
Alberta Energy Regulator

cc: Tristan Goodman, Alberta Energy Regulator
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