

Appendix 15

Meadowbank and Whale Tail 2021 Geotechnical Inspection Implementation Plan

MEADOWBANK - 2021 - Annual Geotechnical Recommendation Implementation Plan

INFRASTRUCTURE	PRIORITY LEVEL	RECOMMENDATION	ACTION PLAN / FOLLOW UP	STATUS	PLANNED COMPLETION DATE	COMPLETION DATE
Baker Lake Fuel Farm	2	A hole in the exposed geomembrane (300 mm diameter hole) was observed at Baker Lake on the south southwestern corner of Tank 3 at the top of the slope. The hole in the geomembrane should be repaired to ensure a good performance of the retention basin. It is also recommended to cover the exposed area with geotextile and fill material to re-establish the liner protection.	Update (2020): the hole has been repaired, the liner must be covered. Update (2021): the geomembrane was damaged again at the same location. Will be repaired and covered with geotextile and granular material.	Ongoing	Summer 2022	-
	3	Cover the exposed liner on northern side of Tank 5	Update (2020): Only northeastern corner of Tank 4 still has exposed liner to be covered. Update (2021): Still exposed geomembrane on the south side of Tanks 1 to 4, and in the northeastern corner of Tank 4. Will be covered	Ongoing	Summer 2022	-
	3	Expose one small area of liner where animal burrows are present to verify that the animals don't damage the liner. Once this verification is done, no more investigation will be required even though new burrows appear.	Update (2021). Outstanding recommendation from 2020. Will be done in 2022	Not started	Summer 2022	-
	2	Repair hole in liner at the southwestern corner of the containment cell of the Jet A fuel tanks.	Update (2021). Outstanding recommendation from 2020. Will be done in 2022	Not started	Summer 2022	-
	2	A fuel leak was reported by AEM in 2020 from one of the old fuel tanks. The geomembrane could be damaged by fuel contact under the granular cover. The geomembrane should be exposed for visual inspection in the leak area, repaired if needed, and covered again.	An investigation of the geomembrane condition in the leak area will be completed to assess its condition. When the liner team is onsite they will assist in a visual inspection of the liner.	Not started	Summer 2022	-
Stormwater Dike	4	Assess whether the design criteria will still be met with different final tailings elevations on both sides of the dike (possible impact on seepage low and freezeback). Can be done by EoR but must be reviewed by designer.	Will be addressed in the update of the Engineering of the landform of the South Cell	Ongoing	Summer 2023	-
Saddle Dam 4	3	A section of pipe with a metal connector and a metal rod are present on the liner and should be removed to avoid damaging the liner.	The situation with the piping with a metal connector and a metal rod on the liner will be investigated in the spring and a remediation plan will be made.	Not started	Summer 2022	-
	2	Tension cracks in the fine filter (2+300 to 3+150) on the upstream slope and sloughing must be repaired to restore filter system. Channeling at the toe of the slope is contributing to the erosion: start capping as soon as possible as part of closure plan.	Remediation work completed prior to resuming of tailings deposition in NC	Completed	Summer 2021	Summer 2021

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North Cell Internal Structure	3	In 2020 linear erosion features were observed at several locations in the upstream surface, where the fine filter has started to wash out from the crest to the toe of the upstream toe. It is still the case in 2021 in the repaired fine filter. Lengthening the pipes toward the center of the cell could help reduce the water flow on the filter and its erosion. Alternatively, a liner could be used to protect the filter at the discharge location.	The washing of the fine filter was mostly due to poor operational practice (i.e. discharging water at the top of the crest). The eroded area will be monitored at freshet and repaired if degradation is observed. Good operational practice will be reviewed with the field crew to ensure the discharge pipe is lengthened or that water is discharged on a liner in the upstream face of the structure.	Closed	-	-
Central Dike	3	Clean up debris on the liner: granular material (0+750) and cable at (0+900).	The material was cleaned up	Completed	Summer 2021	Summer 2021
	3	Water is being discharged from a small height at high velocity directly on the LLDPE liner at around Sta. 0+950. The liner should be protected with a sacrificial liner to avoid erosion by the water flow.	It is not planned to discharge water at that location in the future. If discharge has to be done a sacrificial liner will be installed at freshet	Closed	-	-
Bay Goose Dike	4	The dike crest deformation observed immediately after placement of the thermal cap several year ago do not ease the visual inspection as it is hard to visually observed movement on an unequal surface. It is recommended to fill up the past deformation in a way to produce a flat surface. A flat surface would ease the visual observation. The filling work should be completed in summertime to avoid inclusion of snow in the backfill material that will thaw at summertime and generate additional deformation.	Historical deformation will be filled up at freshet to ease visual inspection	Not started	Summer 2022	-
East Dike	3	Following the unusual seepage event in winter 2021: Improve the seepage monitoring by measuring the flow rate and turbidity at each seepage collection station. The flow rate measurement method must be improved for accuracy.	The flowmeter configuration was modified and is giving stable data.	Completed	-	Fall 2021
	4	Install additional thermistors to cover the South Channel area along the centreline and at a distance from the downstream toe. The two thermistors string located at both abutments are not functioning anymore. As The dike is still in operation for several years and that The abutment is subject to develop and aggregate ice lenses, it is recommended to replace those string of thermistors in order monitor The thermal regime until post-closure phase of The mine.	The current instrumentation coverage at East Dike will be reviewed with the designer and the EOR to ensure an optimal coverage of the East Dike situation. This assessment will include looking at instruments requiring repair or at installing new instruments. If additional instruments need to be installed following this assessment they will be installed in the summer of 2022.	Ongoing	Summer 2022	-

Priority Level Descriptions

P-1: A high priority or actual structure safety issues considered immediately dangerous to life, health, or the environment, or a significant risk of regulatory enforcement.

P-2: If not corrected could likely result in structure safety issues leading to injury, environmental impact, or significant regulatory enforcement; or, a repetitive deficiency that demonstrates a systematic breakdown of procedures.

P-3: Single occurrences of deficiencies or non-conformance that alone would not be expected to result in structure safety issues.

P-4: Best Management Practice – further improvements are necessary to meet industry best practices or reduce potential risks.

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Saline Ditch	3	Clear obstructed culvert at the outlet of the ditch towards AP5 quarry.	Material that have partially filled the outlet will be removed with an excavator.	Completed	Summer 2021	Summer 2021
	3	Blocks and debris are present in the ditch close to the south culvert (ditch outlet) and should be cleared to avoid water flowing out of the ditch.	The blocks and debris was cleared out from the ditch.	Completed	Summer 2021	Summer 2021
	2	The ditch is being backfilled all along the road by mud and gravel from the road, pushed into the ditch by snow removal operation and surface grading. The ditch depth has been significantly reduced. The ditch should be cleared every year of this extra material to maintain its hydraulic capacity.	The extra material in the ditch was cleared out.	Completed	Summer 2021	Summer 2021
Whale Tail Dike	3	Several piezometers show unexplained trends, which mechanisms need to be investigated to rule out the development of adverse conditions: - PZ 0+260 P3A and B exhibit a pressure rise between September and November 2021 (+0.3 m). Mechanism to be investigated. - PZ0+360 P1C exhibits a unique high-pressure trend that seems to be seasonal. Mechanism to be investigated.	The unexplained trends PZ 0+260 P3A and B and PZ0+360 P1C exhibit will be investigated to determine the mechanism responsible.	Not started	Summer 2022	-
	3	Monitoring of the pumping flow within the pit is not considered an accurate indicator of the seepage due to the several water incomes from the surface and other income from the pit wall. It is recommended to monitor the southern pit wall water income and evaluate if it is possible to install a flow monitoring point capturing the water income for the south wall at least relatively visually.	The evolution of the seepage is not only inferred from pit pumping. There is a seepage collection trench at the toe of the dike with a V-Notch installed. Also a drainhole was drilled in the fall of 2021 and water inflow from that point was measured. In winter time the only water input to the Whale Tail attenuation pond and Whale Tail Pit is the dike seepage and this can be measured from the pump flowmeter accurately.	Closed	-	-
IVR Dike	3	Raise piping present in the lower part of the emergency spillway to free the spillway outlet. The raise must be done in a way that will not leave any obstruction in the spillway (e.g. concrete blocks outside of the spillway outlet and a horizontal support in between)	The piping will be lifted to ensure that it does not obstruct the spillway outlet	Not started	Summer 2022	-

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