2023-06-03 MBK Baker Lake TSS

GN reference #: 2023-240

Please find the following information as a follow up to the spill report, #2023-240, submitted June 3rd, 2023, by Agnico Eagle Meadowbank division. This detailed report is submitted to the Inspector in compliance with the conditions under the Nunavut Water Board License 2AM-MEA1530, Part H, Item 8c and subsection 38(7) of the fisheries act.

Description

During a regular inspection of the Baker Lake Marshalling Facilities, a turbid flow of water was observed heading into the shore of Baker Lake, creating an apparent plume of total suspended solids (**TSS**) along the shore of the lake. The flows of water appeared to flow through the Agnico Eagle facilities, where heavy equipment was travelling to prepare the area for the upcoming maritime shipping season. The visible plumes in Baker Lake were mostly contained within a few meters from the shoreline, after which the water appeared clear based on visual observations in the field. See figure 1 below for general site layout information and flow path estimate.

Figure 1. Overall Layout - Aerial Picture with the original flow path observed on prior to Agnico Eagle's intervention.

Water samples were taken to analyze for TSS, MDMER parameters as well as for acute lethality to *Daphnia Magna* and *Rainbow Trout*. The lethality samples were collected on June 4th and results indicating an LC50 of >100% for both *Daphnia Magna* and *Rainbow Trout*, indicating the water was nontoxic. The results for TSS samples taken in the lake are presented in Table 1 below. All TSS results following the initial plume were below regulatory limits apart from the sample collected on June 6th. This result is largely due to an influx of rain, the maritime booms were adjusted to account for this influx of water. All MDMER parameters, with the exception of TSS, were found to be below limits outlined in the regulations.

Table 1. TSS Results of Baker Lake Samples

Date	Baker Lake TSS (mg/L)
2023-06-03	426
2023-06-04	3
2023-06-06	49.5
2023-06-07	2
2023-06-11	4.2
2023-06-14	3.5
2023-06-16	23
2023-06-20	2.5

Figure 2. Aerial view of Baker Lake shore after Agnico Eagle's intervention and deployment of turbidity control measures showing the new flow path

Location: 64° 18'20" 95° 57'23". The impacted waterbody is Baker Lake.

Cause

The identified cause for the turbid runoff is the large volume of water reporting through the Marshalling Facilities, from areas where snow removal was not required, through existing control measures. TSS control measures such as Woodchip-log booms and silt fencing have remained downstream in previous areas of concern (exits of culverts, known runoff paths). These control measures are repaired/replaced on an as needed basis by Agnico Eagle and are used to slow the flow of water towards the lake. The water flows through exposed till material, from which sediments are transported towards the lake. Additionally, an ice block was observed diverting water from the existing and modified structures, causing water to flow on top of a laydown pad, increasing the sediment transport upstream of Baker Lake.

Remediation Actions

Agnico Eagle enforced strict snow management practices throughout the winter season. Prior to the 2022-2023 winter season Agnico Eagle determined snow dump locations that would reduce the impact of managed snow melt during the freshet season. These snow dumps were inspected regularly by Agnico Eagle throughout the winter months.

Upon observation of the runoff into the lake, a loader was immediately called to place material along the sides of the road to reduce run off potential by directing water towards the existing culvert, and into multiple control measures. Maritime curtains and additional woodchip-log booms and silt fence were deployed to control the transportation of sediments. Over the next weeks, inspections and monitoring of the sector were performed by Agnico Eagle. During the monitoring, the TSS control measures were monitored, repaired, and added, if needed. Samples of the water quality (total suspended solids) of the lake at the inflow location were taken, as described in Table 1. Additionally, samples were collected and sent for analysis of MDMER parameters & acute toxicity. As part of the Core Receiving Environmental Monitoring Program, water chemistry monitoring will occur in Baker Lake during the summer to evaluate potential lake water quality impact.

Figure 3. Upstream water flow prior to Agnico Eagle's mitigation (2023/06/03)

Figure 4. Upstream water flow after to Agnico Eagle's mitigation (2023/06/03)

Figure 5. Mitigation measures at Baker Lake (2023/06/04)

Figure 6. Contained turbidity & sediments at Baker Lake (2023/06/07)

From Figure 5 and 6, it is possible to see the effectiveness of the barriers to contain the turbidity in a localized area. The area will continue to be closely monitored following each rain events.

Corrective Measures

During the fall of 2022, Agnico Eagle hired an engineering consulting firm to develop a long-term solution to water management challenges encountered at the Baker Lake Marshalling facilities. The design includes a water diversion ditch, which will minimize water inflows onto the pad. Agnico Eagle submitted a 60-day design notice and a modification to the Water License, for which authorization was received on March 24th, 2023, to build a diversion ditch structure. The construction work for the first phase of this infrastructure is scheduled for late August/early September to avoid construction in the high-water flowing season and limit the chance of TSS transportation. The completion of the first phase will provide the most immediate benefit by creating a catchment area of ~46ha and will have the capacity to divert up to 1.9 m^3/s of water upstream of the marshaling facility. Figure 7 below presents the designed infrastructure layout.

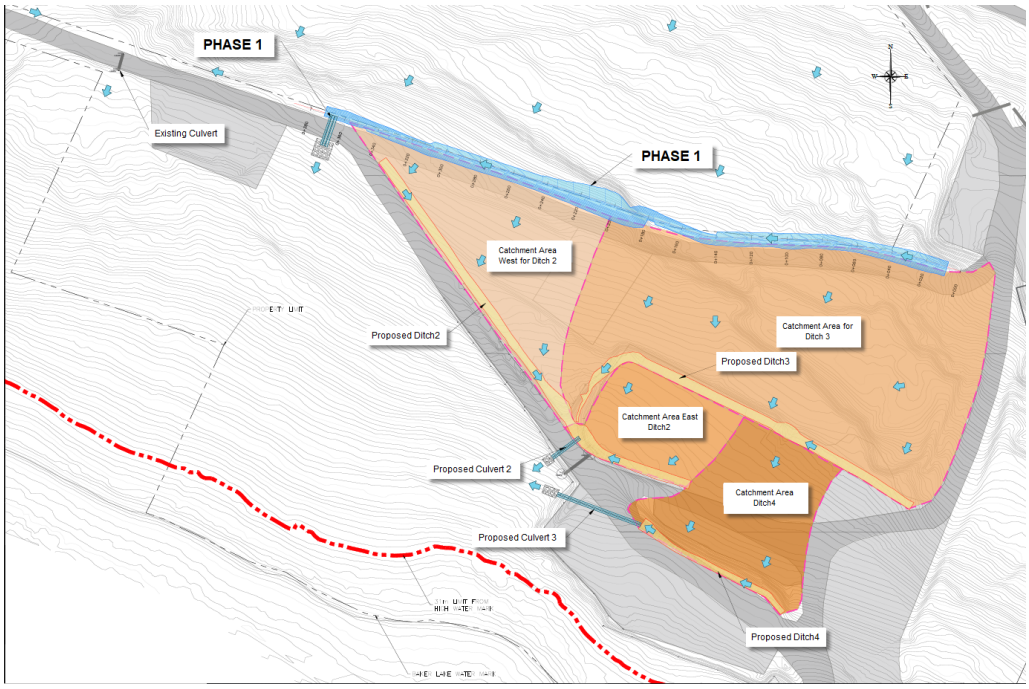

Figure 7. Design stages from the Water Management Improvement at Baker Lake Design Report

Lastly, snow management of the sector will be further evaluated and improved following the selected water management solution.

Closure

We trust that the above details described appropriately the event that occurred at the Baker Lake Marshaling Facilities on June 3rd, 2023 and the remediation activities. Please contact the undersigned should you have any questions.

AGNICO EAGLE

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