



File: Spill Prevention Order MO1701

March 12, 2020

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Dear Sirs:

Re: Feedback from Ministry Staff - Sperling Hansen Associates (SHA) Environmental Monitoring Program (EMP), dated December 31, 2019.

Thank you for the SHA EMP dated December 31, 2019, submitted pursuant to the June 26, 2019, Conditional Approval Letter, condition 11 and for discussing your February 28, 2020, comments regarding the draft EMP feedback letter with ministry staff and SHA on March 5, 2020.

The June 26, 2019 Conditional Approval Letter, condition 11 specifies required content of the EMP and states the EMP must incorporate feedback from ministry staff. Ministry staff have reviewed the EMP and provide the following feedback for inclusion in the EMP requirements:

1. The EMP includes many non-mandatory words and phrases that reduce the certainty of EMP requirements (e.g. should, would, may, may be considered, it is recommended, SHA recommends, proposed, if deemed useful, etc.). For certainty of EMP requirements, the EMP must be revised to change the many non-mandatory words and phrases to mandatory words (i.e. will, must).
2. During closure activities, semi-monthly reporting is required in accordance with the June 29, 2017 Second Amended Spill Prevention Order (SPO) section 1(d) & 4, and the June 26, 2019 Conditional Approval Letter, condition 10. The semi-monthly reporting includes “The environmental monitoring program laboratory reports and tabulated results” and accordingly includes all results and reports that arise from the EMP including monitoring, investigations, mitigation, follow-up and contingency actions including from Section 2.10 Contingency Actions for EMP - Trigger Response Plan.

Following completion of all closure activities, quarterly implementation reports must be submitted in accordance with the SPO section 6: “Implementation reports must include records of inspections, operations and maintenance of the Facility, records of the volumes of Leachate collected, stored and transported, including the name and location of the authorized facility(ies) receiving the Leachate, and environmental monitoring program records interpreted and certified by a Qualified Professional.” Accordingly, the EMP must be revised to reflect post-closure quarterly inspection frequency in Table 1 Reporting Frequency, Section 2.6 Geotechnical Inspection, Section 2.7 Post Closure Inspection, and Section 2.8 Annual (i.e. Quarterly) Report.

3. The EMP must be revised to add a section to address the June 26, 2019 Conditional Approval Letter, condition 11(g) description of field methods, and, 11(h) quality assurance and quality control measures (e.g. blank, duplicates, relative percent difference, etc.) to ensure that all water samples are representative of each monitoring site (e.g. free of contamination from sampling, properly preserved and unbiased). Please review and reference information on the ministry Laboratory Standards & Quality Assurance website including the BC Field Sampling Manual and the BC Environmental Laboratory Manual available at:
<https://www2.gov.bc.ca/gov/content/environment/research-monitoring-reporting/monitoring/laboratory-standards-quality-assurance>
4. Section 2.1 Leachate Monitoring: The EMP must be revised to address the June 26, 2019 Conditional Approval Letter, condition 11(e) regarding increased recording frequency of the leachate storage tanks transducer level data. The EMP must include recording of daily transducer level data, converted to daily leachate volume, and this must be reflected in the EMP including Table 1 and Section 2.1 Leachate Monitoring.

5. Section 2.2 Surface Water Monitoring: The EMP must be revised to include monthly testing for listed field parameters and sampling of SW-1 for physical parameters, anions and nutrients, and metals during closure activities, and for a minimum of 12 consecutive months following the completion of closure activities (post-closure) in accordance with the June 26, 2019 Conditional Approval Letter condition 11(a), and quarterly testing for listed field parameters and sampling for physical parameters, anions and nutrients, and metals, thereafter.
6. Section 2.3 Seepage Blanket Monitoring: Section 2 EMP Table 1 indicates the same sampling frequency for the seepage blanket wells as for the groundwater wells (four times per year). Therefore, in Table 5, Frequency column, delete “if wells dry during summer sampling”.
7. Section 2.4 Groundwater Monitoring: As discussed, the EMP must be revised to include monitoring and sampling of MW-3S for the same parameters and at the same frequency as MW19-01 and MW19-02.
8. Section 2.4.1 Procedure for Hydrocarbon Investigation: The EMP must be revised to address the June 26, 2019 Conditional Approval Letter, condition 11(k) forensic investigations of hydrocarbons to address the following key queries:
 - i. Characterize the product;
 - ii. Determine the source(s);
 - iii. Evaluate the product age and degradation, if any; and
 - iv. Describe mitigations to eliminate the source(s).

The EMP does not currently include regular water sampling or analysis for hydrocarbons but includes Section 2.4.1 Procedure for Hydrocarbon Investigation that indicates if hydrocarbons are detected in groundwater, second (confirmatory) sampling will be initiated before the hydrocarbon detections are evaluated further. However, historical hydrocarbon detections have been highly irregular and therefore they may not be detected in the second sampling.

Accordingly, the EMP must be revised to include sampling and analysis for hydrocarbons (e.g. EPHw10-19, LEPHw, VHw6-10, VPHw, PAHs, etc.) at a minimum two times per year (summer dry period and fall flush) for the groundwater, seepage blanket, and surface water monitoring locations, and during leachate removal prior to treatment for the leachate. The EMP must also be revised to specify that any hydrocarbon detections will be investigated in accordance with the June 26, 2019 Conditional Approval Letter, condition 11(k), and describe the hydrocarbon investigations in a stepwise approach of escalating actions (similar to the approach under Section 2.10 Contingency Actions for EMP - Trigger Response Plan).

9. Section 2.8 Annual Report: The EMP describes that Piper diagrams will be used “if deemed useful by the Qualified Professional”, despite the fact that the use of such diagrams are frequently referenced throughout the EMP for routine water quality evaluations. Accordingly, the non-mandatory phrase(s) must be revised to a mandatory phrase(s) and include a description of how Piper diagrams will be used in the routine evaluations. Additionally, the EMP must describe the key components of the routine water quality evaluations, such benchmarking against the water quality limits, baseline and background data (if available), and interpretations of trend analysis and Piper diagrams.
10. Section 2.9 Adjustments to Monitoring Programs Over Time: As indicated, revisions to the EMP may be necessary over time. To facilitate such revisions, please revise section 2.9 to indicate that the Named Parties may, with supporting rationale certified by a Qualified Professional (QP), request revisions to the EMP, and, in response to the Named Parties’ request, or for other reasons, ministry staff may specify revisions to the EMP and/or a revised EMP.
11. Section 2.10 Contingency Actions for EMP - Trigger Response Plan (TRP):
 - a. The EMP must be revised to address the June 26, 2019 Conditional Approval Letter, condition 11(i) description of water quality benchmarks, limits and triggers, and a summary of linkages between triggers and responses. The EMP must be revised to state that leachate, seepage blanket and groundwater quality data will be compared to Contaminated Sites Regulation Drinking Water (DW) and Aquatic Life (AW) standards, and surface water quality data to BC Approved and Working Water Quality Guidelines for drinking water and freshwater aquatic life, and, integrate the water quality benchmarks and limits into Section 2.10 and the routine reporting (Section 2.8).
 - b. The TRP describes implementation of planned contingency measures in the event that identified environmental conditions (triggers) occur. Under Step Two, the TRP describes confirmatory monitoring to validate “the exceedance”. This needs to be edited to reflect the components of Step One, which states that, in part, “[in the event that] there is a negative trend in water quality detected”. In other words, the trigger for Step Two is an increase in water quality parameter(s), which is not necessarily limited to an exceedance of the applicable water quality limit(s). The trigger must be informed by evaluation of the full dataset, including benchmarking against the water quality limits, baseline and background data (if available), and interpretations of trend analysis and Piper diagrams.
 - c. As discussed, Section 2.10 of the EMP must also be revised to state that the Named Parties will submit separate proposed QP recommendations for additional

monitoring, investigations, mitigation, remediation and actions, that arise from Section 2.10, to the ministry for review and feedback. For example, considering the December 2019 sampling results for MW19-02 that indicated potential leachate influence, the ministry expects to receive separate proposed QP recommendations for temporary increased monitoring frequency of MW19-02.

The June 26, 2019 Conditional Approval Letter, condition 11 specifies required content of the EMP and states the EMP must incorporate feedback from ministry staff. The Minister's letter of October 18, 2019 extended the deadline for completion of construction activities until August 31, 2020, and reiterated the requirement to submit the revised standalone EMP by December 31, 2019, thereby indicating that the revised standalone EMP must be implemented before the completion of construction activities, as well as following closure activities (post-closure). This is also consistent with the EMP that states:

- “A detailed Environmental Monitoring Plan (EMP) for leachate, groundwater, surface water, and landfill gas is outlined in the following section and will be implemented during landfill closure and post closure.” (Section 2 Environmental Monitoring Plan p2), and,
- “Monitoring frequency and range of parameters may be adjusted over time dependent on construction activities...” (Sections 2.1 Leachate Monitoring p6; 2.2 Surface Water Monitoring p7; 2.3 Seepage Blanket Monitoring p9; 2.4 Groundwater Monitoring p10)

Accordingly, an updated EMP, that incorporates the required content and the preceding feedback from ministry staff, is immediately in effect and must be implemented. Also, for certainty of EMP requirements, a revised standalone EMP that incorporates the required content and the preceding feedback from ministry staff, must be submitted within 30 days of the date of this letter.

If you have any questions or concerns, please contact AJ Downie at telephone: (250) 751-3176 or email: AJ.Downie@gov.bc.ca.

Sincerely,

A handwritten signature in black ink, appearing to read 'Tessa Graham', written in a cursive style.

Tessa Graham
Executive Director, Regional Operations Branch