



# Sahtu Land and Water Board Staff Information Report

<b>Division:</b> Waters Program	<b>Report No.</b> 1
<b>Date Prepared:</b> July 23, 2020	<b>File:</b> S17L8-003
<b>Meeting Date:</b> July 27, 2020	

**Subject:** Public review completed 2019 Annual Water Licence Report  
**Project:** Transport Canada's On-Site Land Treatment Facility (Landfarm) Project for the treatment of Hydrocarbon contaminated soils; located near Norman Wells Airport, NT. (**Norman Wells Airside Landfarm Project**).

## 1. Purpose/Report Summary

The purpose of this report is to present to the Sahtu Land and Water Board for information on the public review completed **2019 Annual Report for the Water Licence (S17L8-003) held by Transport Canada, for its Norman Wells Airside Landfarm Project.**

Although formal Board approval is not required under the Licence, the Board must be satisfied that the Licensee has met the Licence requirements.

## 2. Background

In general, Annual Reports for water licences (also permits) are expected to be submitted by March 31, every year, reporting about the previous calendar year's project activities. Transport Canada (Licensee) is expected to submit Annual Reports by March 31, every year, as per the Licence (S18L3-003) Part B, Condition 11 and Schedule 1, Condition 1.

The annual water licence report of S17L8-003 was reviewed, as given in the timetable below.

### 2.1 Public Review Timeline for the Annual Report

Licence	Report Received Date	Report Distributed (ORS)	Distribution List	Review Comments Due Date	Proponent Response Due Date	Public Review Outcome
<b>S17L8-003</b>	Mar 31_20	Apr 28_20	Tulita Dist. (SLWB)	May 19_19	Jun 9_20	See section 3.4

(Recorded in Review Comment Table: Attachment 2).

### 3. Discussion

#### 3.1 Overview - S17L8-003 – Water Licence of Transport Canada - Prairie and Northern Region

The Licence S17L8-003 entitles the Transport Canada - Prairie and Northern Region (Licensee), to use Water and dispose of Waste for operation and maintenance, monitoring, and closure of the hydrocarbon contaminated soil Land Treatment Facility (Landfarm) located at the Norman Wells Airport property.

The Type B Licence (S17L8-003) and the associated Type A permit (S17X-004) were obtained to continue the operations of an existing land treatment unit (commissioned at the airport property in 2003) and also to close the operations after the treated Landfarm soil meets GNWT and CCME remediation criteria.

The Norman Wells Airport Landfarm Project consists of the following activities:

- 1) Installation of three (3) groundwater monitoring wells (named MW1, MW2 and MW3) required to replace existing monitoring wells that are damaged due to frost-jacking/heaving;
- 2) Treatment of ~2500 m<sup>3</sup> of hydrocarbon contaminated soils, monitoring and decommissioning of the Landfarm;
- 3) Characterization of ~500 m<sup>3</sup> of the soil that is located immediately above and beneath the Landfarm liner that may require off-site disposal during decommissioning; and
- 4) Discharge of ~400m<sup>3</sup> of standing water that has accumulated within the lined Landfarm plus any additional waters retained following freshet.

#### 3.2 Summary and Review of 2019 Annual Water Licence Report (S17L8-003)

The 2019 Annual Water Licence Report (Attachment 1) provides information on (annual reporting requirements as per the License Part B, Condition 11 and Schedule 1, Condition 1 are bolded and italicized):

- a) ***Updates or revisions to the Engagement Plan referred to in Part B:***  
No revisions or updates were made on the plan past its approval date.
- b) ***Updates or revisions to the Waste Management Plan referred to in Part E:***
- c) No revisions or updates were made on the plan past its approval date.
- d) ***Updates or revisions to the Operations and Maintenance Manual referred to in Part E:***
- e) No revisions or updates were made on the plan past its approval date.

- f) **Details and results of the Water Quality Management Plan, referred to in Part E, including, but not limited to: monitoring location (GPS coordinates); inspection results, depths, frequency of monitoring events, flow direction, chemical parameters tested, and data analysis.**

Section 5.4 of the Annual Report discusses the Water Quality Management Program. Groundwater data from four monitoring wells- MW1, MW1-D, MW2 and MW3.

<b>Monitoring Wells (also, SNP stations)</b>	<b>Description</b>	<b>Sampling Frequency and Sampling Parameters</b>
MW1 (2017-2a)	Upgradient monitoring well - at northwestern edge outside perimeter of the Landfarm	<b>Sampling frequency:</b> Following spring freshet and prior to freeze-up  <b>Sampling Parameters:</b>
MW1-D (2019-1a)	New upgradient well adjacent to MW1 established in Jan 2019	-ICP-MS Metal Scan (Total) -Field parameters
MW2 (2017-2b)	Downgradient monitoring well- at southwestern edge outside perimeter of the Landfarm	-Total Petroleum Hydrocarbons (F1, F2, F3, F4 CCME <sup>1</sup> Fractions)
MW3 (2017-2c)	Downgradient monitoring well- at southern edge outside perimeter of the Landfarm	-Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) -Chemical Oxygen Demand (COD) -Extractable Petroleum Hydrocarbons (EPH) -Perfluorooctane Sulfonate (PFOS) -Total Suspended Solids (TSS) -pH

**Table:** Descriptions and sampling parameters for the groundwater monitoring wells under the Norman Wells Airside Landfarm Project. References: S17L8-003 Licence conditions, Annex A, Part C; and Table 2 of the 2019 Annual Water Licence Report.

The groundwater samples were analyzed as per the water quality tests and criteria as laid out in Part E of the Licence. The results showed three action levels of groundwater management.

(Following is an excerpt from the Annual Report)

“The three action levels for groundwater management are as follows:

<sup>1</sup> CCME- Canadian Council of Ministers of the Environment; F1, F2, F3, F4 [CCME Fractions](#): Canada wide standard for petroleum hydrocarbons (PHC) in soil

- **Meets Applicable Groundwater Quality Criteria** – Groundwater quality meets the applicable criteria which suggests that groundwater quality has not been impacted by the HSTF<sup>2</sup> – NO FURTHER ACTION REQUIRED
- **Exceeds Applicable Groundwater Quality Criteria but Concentrations are Less Than the Upgradient Groundwater Monitoring Well (MW1)** – Groundwater quality does not meet the applicable groundwater criteria but concentrations are less than or equal to those found in the upgradient monitoring well MW1 which suggests that groundwater quality has not been impacted by the HSTF – No Further Action Required
- **Exceeds Applicable Groundwater Quality Criteria but Concentrations are Greater Than the Upgradient Groundwater Monitoring Well (MW1)** – Groundwater quality does not meet the applicable groundwater criteria and concentrations are greater than those found in the upgradient monitoring well MW1 which suggests that groundwater quality has been impacted by the HSTF – Resample And Further Investigate Groundwater Quality If Criteria Continue To Be Exceeded.

As detailed in the SNP Sampling Report above, groundwater samples collected in August and October, 2019 were found to exceed the applicable criteria for certain metals however concentrations in the upgradient well, MW1 were greater than concentrations found in the downgradient wells, MW2 and MW3. This suggests groundwater quality has not been impacted by the HSTF and no further action is required.”

g) ***Reporting of Action Levels exceedances and actions taken during the year as identified in the Water Quality Management Plan:***

A summary of the Water Quality Management Program Reporting Action Levels was given in Table 5 of the Annual Report. The licensee reported that the groundwater exceeds applicable groundwater quality criteria, but concentrations are less than the upgradient groundwater monitoring well (MW1).

h) ***Monthly and annual quantities in cubic metres of all effluent discharged from the Landfarm;***

A total annual 50m<sup>3</sup> effluent discharged (one time) to the environment via an approved discharge pad outside of the east edge of the HSTF<sup>2</sup> berm ( Table 3 of the Annual Report).

i) ***Volume and analytical results of soil, including soil chemistry and soil particle size, removed from the Landfarm, the locations of the receiving sites, and the land use activity occurring at each receiving site location.***

A total of 187 megabags of soil and two (2) roll-off bins containing the HSTF<sup>2</sup> liner were mobilized for disposal in Alberta prior to the closure of the winter road in March 2019. The remaining 17 megabags were moved by KBL Environmental to their facility in Norman Wells for storage and eventual shipment by barge for disposal.

On March 16, 2019, BluMetric personnel performed a quality assurance/quality control (QA/QC) site inspection of the soil disposal activities at the site. Site activities observed during

<sup>2</sup> HSTF- Hydrocarbon Soils Treatment Facility

the inspection included the loading of soil bags onto trucks for demobilization via the winter road. Water and Soil Chemistry Results (2019) are given in Appendix A and photos from site inspection recorded in Appendix B of the Annual Report.

Soil sample collected from the drilling of MW1-D well was characterized for soil disposal purposes. Analytical results for these samples are provided in Table 9 of the Annual Report.

***j) A description of how the contaminated soil was managed during the previous calendar year, including relevant operational details and methods and dates of soil tilling***

The retention pond soil that had been removed during the sub-liner assessment in October 2018 was approved for use as re-grading material in March 2019 and was returned to the HSTF area as part of the soil shipping activities (Section 3.1.2 of the Annual Report).

***k) A summary of Construction, Modifications and/or maintenance activities at the Landfarm referred to in Parts F and G***

The new monitoring well (labelled MW1-D) was constructed and installed by Clean Harbors/Gully Enterprises personnel under the direction of BluMetric on January 30, 2019. (Section 3.1.1 of the Annual Report).

***l) Contravention reports, if applicable***

No contravention reports were issued in 2019 (Section 5.5 of Annual Report).

***k) A Surveillance Network Program (SNP) Report as required under the Surveillance Network Program in accordance with reporting requirements in Part A, condition 2 of Annex A of this Licence;***

Tables 6 and 7 of the Annual Report present the analytical results for the samples collected from SNP Stations 2017-2a (MW1), 2019-1a (MW1-D), 2017-2b (MW2) and 2017-2c (MW3) during the year 2019.

***l) A sampling and analysis plan for the forthcoming year (2020)***

SNP stations 2017-2a (MW1), 2b (MW2) and 2c (MW3) will be monitored followed the conditions outlined in Annex A- Surveillance Network Program. Water licence will be amended to include the sampling of newly installed MW1-D as part of the SNP to provide additional upgradient data from the Landfarm (Section 6 of the Annual Report).

***m) Record of inspections of the Landfarm***

Photos taken during the site inspection are presented in Appendix B of the Annual Report.

**n) Updates or revisions to the Spill Contingency Plan referred to in Part H**

No revisions or updates were made on the plan past its approval date.

**o) A list of spills or Unauthorized Discharges**

No spills or unauthorized discharges occurred in 2019 (Section 5.5 of Annual Report).

**p) Updates or revisions to the Closure and Reclamation Plan referred to in Part I**

Final Closure and Reclamation Plan v1.0 submitted in March 2019 and approved in April 2019 (mentioned in Table 1 of the Annual Report).

**q) Details of any Reclamation including progressive Reclamation undertaken**

Forty-nine mega bags of soil were approved for use on the project site (by SLWB in 2018). The soil was evenly spread on site and roughly graded. Further grading work will be required in 2020 to complete the reclamation of the site.

**and**

**r) Any other details on Waste disposal requested by the as Board by November 1 of the year being reported: NA.**

Results from soil testing met the soil quality criteria as per Water Licence and CCME. Results of the groundwater samples collected from MW2 and MW3 (downgradient wells; test wells) were below the FIGWQGs<sup>3</sup> for all parameters, except for several metal parameters. The metal parameters with exceedances in water quality criteria include Aluminum, Iron, Uranium, Copper, Cadmium and Lead (ref: tables 6b, 7b and 8b of the Annual Report). For parameters that exceeded the FIGWQGs, the action level of “no further action required” was determined by comparing the test results to the upgradient well MW1, which recorded higher water quality values for the same parameters.

### **3.3 Comments on 2019 Annual Report (S17L8-003)**

The 2019 Annual Water Licence (S17L8-003) Report is compliant with the reporting requirements of the Licence.

Both soil and water quality results met the quality criteria given in Part E of the Licence, except several metal parameters from groundwater testing (Total Aluminum, Iron, Uranium, Copper, Cadmium and Lead). The exceedances were not considered for further action as they were attributed to the background water quality data observed from the reference well MW1 (second action level: no further action required). The new upgradient well MW1-D had most of the parameters within CCME guideline values except Aluminium and Iron. If the exceedances observed for the metal parameters in test wells MW2 and MW3 are compared to the reference MW1-D, the action level will change to

<sup>3</sup> FIGWQGs - Federal Interim Groundwater Quality Guidelines

third action level “resample and investigate further.” MW1-D has much lower levels of elements of concern, compared to MW1; most parameters fall below FIGWQG values. Hence, MW1-D will serve as a better reference to draw conclusions and set action levels.

One of the comments from public review (SRRB) regarding the one-time discharge of stored contaminated sump water (50m<sup>3</sup> as noted in Table 3 of Annual Report) from the project to the receiving environment was previously addressed SLWB Staff and GNWT-ENR officers. Surface runoff water was collected and stored due to exceedances in water quality criteria for four parameters viz— total Aluminum, Iron, Arsenic and Manganese. Former two parameters did not exceed background water quality data from MW1, but, the last two parameters did exceed both CCME guideline values and reference values (MW1). Initially, SLWB staff disagreed with the idea of discharging the sump-water on the receiving environment as it had elevated Arsenic (0.1 micrograms/L above CCME guidelines and Licence criterion; elevated in comparison with reference site sample too) and Manganese (a newly recognized CCME element of concern; the data point with the highest value was 23 times higher than the Licence criterion; elevated in comparison with reference site sample too). The licensee sent another memorandum with their justifications to release the sump-water on the land. This time the request was circulated for feedback from technical experts of GNWT- ENR, and they suggested that a one-time discharge can be allowed. A consensus decision was made on the basis that the one-time discharge of sump-water on the land will not cause significant negative impacts on the following basis: a) contaminants from this one-time discharge may be retained in soil structure and may not reach Valued Ecological Components in significant concentrations and b) aerobic conditions (referring to land surface) may allow compounds of Arsenic to be in a less toxic form. A one-time discharge (which will not set any precedents for such discharges in the future) was approved by the GNWT-ENR Water Resource Officer<sup>4</sup>.

### **3.4 Summary of Public Review of 2019 Annual Report (S17L8-003)**

The Annual Report was distributed for public review and received comments from GNWT- Department of Environment and Natural Resources (GNWT-ENR) and Sahtu Renewable Resources Board (SRRB). GNWT- Department of Environment and Natural Resources (GNWT-ENR) provided a formal letter for their response (Attachment 2).

ENR recommended the licensee to provide a rationale to explain the elevated TSS and COD concentrations monitored in January 2019. The licensee responded that the elevated TSS and COD results for the January 2019 sampling event are likely a result of the sampling time (sampling shortly after the drilling/well construction and sampling method during Jan 2019 (acceptable response).

SRRB submitted eight comments during the public review. SRRB discussed/recommended about having MW1-D as a better reference for groundwater quality analysis (ID 1,6), improving groundwater sampling analysis (ID 4, 7), improved reporting on QA/QC procedures (ID 5) and asked the licensee to provide rationale on the on-time discharge of contaminated sump-water (ID 3).

<sup>4</sup> [S17L8-003 – Inspector approval to discharge sump water – Mar 13, 2019](#)

The proponent accepted most of the soil/groundwater analysis improvements, and all their responses were found reasonable/acceptable. The public review process, comments and recommendations are recorded in the review comment table (attachment 2).

#### **4. Conclusion and Recommendation**

It was found that the Licensee has met the requirements of the Licence through the 2019 Annual Report submission.

Board staff recommend the Board to issue a Letter of Direction to the Licensee, advising to follow the reviewer recommendations and to use the upgradient well MW1-D as the reference well to draw conclusions and determine action levels based on the same. (Draft Letter of Direction attached – Attachment 3).

#### **5. Attachments**

- 5.1 [2019 Annual Water Licence Report \(S17L8-003\)](#) (Hyperlink only);
- 5.2 Review Comment Table and Attached ENR Letter - 2019 Annual Report (S17L8-003);
- 5.3 Draft Letter of Direction.

Respectfully submitted,



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