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January 4, 2021 VIA EMAIL
File: SR 2962440

ALAN HAMILTON
SUNCOR ENERGY PRODUCTS PARTNERSHIP
300 106TH ST PO BOX 10550 STN P
THUNDER BAY ON P7B 6T9
ahamilton@suncor.com

Dear ALAN HAMILTON,

Re: Application for a Variance from Clauses 3.2.1.4. & 8.2.6 of the Liquid Fuels Handling Code, Technical Standards & Safety Act R.S.O. 2000 for 300 106TH ST MISSION ISLAND THUNDER BAY

You have requested two variances on behalf of Suncor for the bulk plant on Mission Island:

1. To build the proposed new tank (TK-01) in the same location as the previous TK-01, which was located 25 metres from the Mission River; and

2. Not to submit an environmental assessment following the removal of tanks TK-01, TK-03, and TK-04.

The Liquid Fuels Handling Code (LFHC) 2017 requires that aboveground tanks be located at least 30 m from a waterway and that when an aboveground tank system that is larger than 5,000 L is removed, that an assessment report that delineates the full extent of any petroleum product that has escaped from the tank system, be submitted to TSSA.

The reasons for the variance request are:

1. The new tank, TK-01, is located at the same location as the previous TK-01 to maximize the utilization of the existing infrastructure. This in turn minimizes the disturbances caused by construction to the site (which is an active and operating facility).

- The foundation for the previous TK-01 can be built up to accommodate the new larger size tank without constructing new. (This greatly reduces the extent of earth work and excavation, which is a major consideration since the tank is located within an existing active and operating tank farm.)
- Facility/Equipment sizing (i.e. pipes, pumps) will remain as is. Existing piping and pumps can be re-used without modifications.
- Inlet and outlet piping are existing and can be re-connected and re-used for the new tank.
- Associated steel support structures (for piping, cables/cable tray) are existing and can be re-used.

2. The new TK-01 is located within an engineered containment dike that continues to be in use following the removal of the aboveground storage tanks (TK-01, TK-03, and TK-04). Soil sample collections will involve excavation which will compromise the integrity of the tank farm. To maintain the integrity of the dike, Suncor would prefer not to submit an environmental report.

   Please be advised that your variance application dated November 17, 2020, has been approved because of the following equivalent safety:

1. Distance from the River:
   - TK-1 will have a bottom leak detection system (i.e. a drainpipe will run from under the tank floor to a leak detection well).

   - The tank will be located within a clay dike that has a permeability of 5×10^{-9} cm/s (which exceeds the 10^{-6} cm/s permeability requirement of the LFHC) and has an available containment capacity (27ML) that is more than 1.5 times the LFHC required containment capacity (16ML).

   - In addition to the clay dike, TK-1 will have an additional liner (Enviro liner 6040 by Layfield) on the underside of the tank which will provide tertiary containment.

   - In addition to the independent overfill protection device specified by the LFHC, the new TK-01 will have an additional continuous automatic level monitoring system which provides real-time level readings in the tank and informs Operations of any abnormalities.

   - Suncor has adopted the disciplined approach of API Std. 2350 for Overfill Protection for Storage Tanks in Petroleum Facilities. Suncor's Corporate practice for overfill prevention in Distribution Terminals is highly conservative and involves multiple layers of alarms/warnings and manual/automated corrective actions before reaching the overfill condition.

   - The proposed Tank TK-1 will exceed the design requirements of API 650:

     - Suncor specified higher quality steel plates (fully killed and fine grain practice).
     - Tank bottom and shell plates were specified with greater thickness than required by API.
     - Shell vertical joints are seamless, full penetration welds which result in stronger welds and overall better structural integrity.
     - Welding electrodes specified by Suncor on bottom joints provide stronger welds and higher resistance to corrosion and environmental factors.
     - Suncor specified higher corrosion allowance on all internal shell, bottom and wetted structural components.
     - Suncor specified design specific gravity of the liquid stored shall be minimum 1.0 (equivalent to water), and the design liquid level higher than the API requirement. This translates to a more robust tank structure than a typical API tank.

- The tank side sampling system is equipped with self-closing valves with spring return handles (deadman valve). This feature ensures no escape of tank contents during sampling operations.

- Leak detection program - Terminal Operations perform monthly visual monitoring of the surface of the groundwater in each of the leak detection groundwater monitoring wells, within the tank farm, for the presence of floating, free-phase hydrocarbon or sheen. In addition, there is semi-annual groundwater monitoring and annual groundwater sampling by a certified environmental consultant. Both programs are intended to provide early warning/indication of a potential breach. These programs allow Suncor to take corrective action to remove/eliminate the concern in advance of a potential failure.

- MECP has no objection to locating the proposed TK-01 25 m from the river.

2. No Environmental Report

i. Semi-Annual Monitoring and Annual Sampling Program

There is an environmental groundwater monitoring and management program for the Thunder Bay Terminal. This program involves semi-annual groundwater monitoring and annual groundwater sampling by a certified environmental consultant, which includes headspace vapour concentration readings, water level measurement and determination of liquid-phase petroleum hydrocarbon detection.

As part of the Thunder Bay Terminal environmental groundwater monitoring and management program, there are numerous groundwater monitoring wells located within the Terminal property. Suncor has identified three (3) monitoring wells that are relevant to this Variance application.

- One (1) monitoring well (BH7) is located between TK-01 and TK-02, inside the tank farm.
- One (1) monitoring well (BH5) is located south-east of TK-04, outside the tank farm, along the shoreline.
- One (1) monitoring well (BH6) is located south-east of TK-01, outside the tank farm, along the shoreline.

The 2020 Groundwater Sampling Report prepared by TERRAPEX Environmental, dated October 30, 2020, shows that the benzene, toluene, ethylbenzene and xylene (BTEX) and petroleum hydrocarbon (PHC) fractions F1-F4 levels fall within the Ministry of the Environment, Conservation and Parks (MECP) Table 9 Site Condition. There are no impacts in the groundwater samples collected from the monitoring wells.

Suncor has a current contaminant management plan (CMP) that is reviewed by MECP. MECP will provide any comments/recommendations to Suncor.

ii. Leak Detection Program

A leak detection program is in place at the Thunder Bay Terminal where Terminal Operations perform monthly visual survey / monitoring of the surface of the groundwater in each of the leak detection groundwater monitoring wells, within the tank farm, for the presence of floating, free-phase hydrocarbon or sheen, using a dedicated clear bailer. In

addition, Terminal Operations also conduct visual inspection of the monitoring wells to assess their condition and potential need for repairs/upgrades.

iii. Tank Floor Condition of Demolished Tanks

TK-01, 03, 04 were emptied, cleaned, and removed from service permanently on the following dates:

- TK-01: out of service since September 13, 2005
- TK-03: out of service since September 28, 2019
- TK-04: out of service since September 28, 2006

The tanks were never returned to service from the above dates and were demolished in October 2019.

TK-01, 03, 04 all had internal epoxy coating applied on the tank floor, which provided additional corrosion protection.

The final API 653 out-of-service inspection report for each tank detailed the floor condition of each tank. It was evident from the inspection reports that no tank contents had escaped TK-01, 03 and 04, as the floor, shell, and welds were all intact. Despite the age of the tanks, no through-holes developed from internal and/or external corrosion factors.

In addition to the inspection records of the tanks, there were no reported leaks or spills from TK-01, 03 and 04 known to Suncor.

Please be advised that this variance will not take effect until 15 days from the date of posting the decision on the environmental registry. This decision of the Director is subject to a right of appeal, under the Environmental Bill of Rights, if such an appeal is filed within 15 days from date of posting. In the event an appeal is filed, this decision of the director may be subsequently stayed, disallowed or significantly altered. Notice of an appeal will be placed on the Environmental Bill of Rights registry.

This variance is allowed under the authority of subsection 36.(3)(c) of the *Technical Standards and Safety Act, 2000*, (the "Act") and subject to such conditions as may be specified herein, being that:

- Suncor shall continue the semi-annual monitoring (headspace vapour readings, depth to groundwater, presence or absence of liquid petroleum hydrocarbon) and annual sampling of the three monitoring wells BH5, BH6 and BH7 for the laboratory analysis of BTEX and PHC F1-F4.

- The CMP reports are to be submitted to MECP as per the current CMP in place for the site.

- Non-conformity with the conditions specified shall thereby cause the allowed variance to become null and void;

- The applicant accepts full responsibility for any and all damages resulting from the use of the thing to which the variance applies. The applicant further accepts full responsibility

for any impacts to the health and safety of any person in consequence of the allowance of the variance or of non-conformity with the conditions specified. The Technical Standards and Safety Authority accepts no responsibility for any such damages or impacts;

- In the event of any claims against the Technical Standards and Safety Authority arising from allowance of the variance or non-conformity with the conditions specified, the applicant agrees to indemnify the Technical Standards and Safety Authority and agrees to hold it harmless from such claims and attendant costs;

- The variance process is subject to public access under the TSSA Access and Privacy Code (available upon request). The fact that a variance has been granted, and information about any public conditions, such as a requirement to post a sign, may be released on request. Subject to law and the TSSA Access and Privacy Code, proprietary information will not be subject to release;

- The applicant shall pay the fee associated with the review of the variance; and

- A copy of the variance letter shall always be kept readily available and permanently legible in the vicinity of the appliance/equipment.

This variance only relates to the Act and regulations made thereunder and does not exempt you from compliance with other applicable regulatory requirements. The installation will be inspected as part of the modification inspection under SR 2937800 to ensure compliance with the terms of the variance. Please contact Gary Burke at 807.631.2706 to arrange for the inspection.

Should you have any questions or require further assistance, please contact Ann-Marie Barker at 416.734.3354, or by e-mail at abarker@tssa.org. When contacting TSSA regarding this file, please refer to the Service Request number provided above.

Yours truly,

Zenon Fraczkowski, P.Eng.
Manager, Fuels Engineering
Delegated Authority under section 36(3) (c) of TSS Act

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