Performance Verification Plan Suncor Management Area 3035 Airport Road, Kamloops, BC

Suncor Energy Products Partnership

SLR Project No: 204.02996.00056 April 2022





Performance Verification Plan SUNCOR MANAGEMENT AREA 3035 AIRPORT ROAD KAMLOOPS, BC Suncor Management Area (ENV Site ID: 23367)

SLR Project No: 204.02996.00056

Prepared by SLR CONSULTING (CANADA) LTD. 8 WEST ST. PAUL STREET KAMLOOPS, BC V2C 1E1

for

SUNCOR ENERGY PRODUCTS PARTNERSHIP PO BOX 100, 1155 GLENAYRE DRIVE PORT MOODY, BC V3H 3E1

12 April 2022

The Association of Professional Engineers and Geoscientists of the Province of British Columbia Permit to Practice #1001562

Prepared by:

Reviewed by:

Michelle Anderson, M.E.T., R.P.Bio., CSAP Senior Risk Assessor

Erin Robson, M.Eng, P.Eng., CSAP Senior Hydrogeologist

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1.0 INTRODUCTION

SLR Consulting (Canada) Ltd. (SLR) on behalf of Suncor Energy Products Partnership (Suncor) has prepared this Performance Verification Plan (PVP) in support of an application for a Certificate of Compliance (CofC) for a portion of the Kamloops Airport Authority Society property, referred to as the Suncor Management Area (MA) and Site ID 23367, adjacent to the Suncor Kamloops Distribution Terminal (Site ID 3087).

This PVP presents the risk controls that were identified in the Human Health and Ecological Risk Assessment (HHERA) for the MA that require ongoing actions and/or records keeping to verify that the assumptions of the risk assessment and risk-based Certificate of Compliance (CofC) for the MA remain valid. This PVP was prepared in accordance with BC Ministry of Environment & Climate Change Strategy (ENV) guidance on the ENV webpage.

2.0 BACKGROUND

The MA is at the northeast corner of Kamloops Airport property in a currently vacant/undeveloped area adjacent to the operating Suncor Kamloops Distribution Terminal at 2955 Tranquille Road, Kamloops, BC (Suncor property). The Suncor property was originally used as a petroleum fuel refinery from 1952 to 1983 and has since been used as a Petro-Canada/Suncor gasoline and diesel distribution terminal to distribute fuel using truck and rail car loading facilities. Petroleum hydrocarbons from the Suncor property migrated into the MA through movement of groundwater when seasonal groundwater flow was to the south.

The Kamloops Airport intends to redevelop the northeast portion of their property including lands within the MA. Potential future development scenarios include commercial and industrial slab-on-grade construction. The HHERA concluded that under present and future site use there will be an incomplete exposure pathway between site soil and groundwater concentrations exceeding CSR numerical standards and human and ecological receptors (SLR, 2022a). In addition, the Stage 1 Preliminary Site Investigation and Detailed Site Investigation (SLR, 2022b) concluded that attenuated vapour concentrations meet CSR numerical standards. The measured vapour concentrations have a direct correlation to groundwater concentrations and are therefore dependent on groundwater petroleum hydrocarbon concentration stability. Plume stability is also a general ENV requirement for risk-based CofCs.

With respect to plume stability, SLR completed a light non-aqueous phase liquid (LNAPL) mobility and dissolved phase stability assessment for the MA and the southernmost portion of the Suncor property in June 2020 (SLR, 2020c). The assessment concluded that the dissolved petroleum hydrocarbon plume is stable and residual LNAPL is not mobile. In-situ remediation via vapour extraction within the MA was conducted historically between circa 1987 and 2010. Additional in-situ LNAPL removal and vapour extraction systems have been in operation at the Suncor property since 2014. The timeframes for which the plume stability (2000 - 2019) and LNAPL mobility (2011 - 2019) assessments were conducted included the timeframe during which the in-situ groundwater remediation and vapour extraction systems at the Suncor property have been in operation. Suncor plans to continue operation of these systems under an existing Waste Discharge Permit (#10712) which requires reports to be prepared and submitted to ENV annually to document remediation progress and monitor the size and extent of the plume. The Waste Discharge Permit is included in Appendix A.



3.0 REQUIRED RISK CONTROLS

The following risk controls were identified in the report titled Human Health and Ecological Risk Assessment, Suncor Management Area, 3035 Airport Road, Kamloops, BC (SLR, 2022a) and are recommended for inclusion as conditions on the CofC for the MA:

- Suncor Management Area groundwater must not be used as a drinking water source.
- Groundwater monitoring must continue according to the terms and conditions of the Waste Discharge Permit #10712. Post-remedial plume stability at the MA must be verified following remediation system shut down.

4.0 **REMEDIATION TYPE**

The MA is considered to be a Type 2 site. Both institutional and engineering risk controls are necessary to confirm that CSR risk-based standards are met in the future, and failure of risk controls will not likely result in immediate risk or exposure of humans to contaminants at levels exceeding risk-based standards.

5.0 RATIONALE FOR RISK CONTROLS

MA groundwater must not be used as potable water given it contains multiple substances with concentrations exceeding CSR Schedule 3.2 standards for drinking water. The use of MA groundwater as potable water was determined to be an incomplete exposure pathway in the HHERA based on the lack of active water wells on the MA or immediate surrounding lands, future MA development likely connecting to City of Kamloops municipal water supply, a risk control prohibiting the use of MA impacted water as drinking water being added to the CofC (to protect MA receptors), and assumed groundwater contaminant plume stability (to protect further downgradient off-site properties and receptors).

With respect to the latter topic of groundwater contaminant plume stability, the HHERA report relied upon the 2020 LNAPL mobility and dissolved phase stability assessment as confirmation of a stable to decreasing plume in order to define the boundaries of the MA. However, an in-situ vapour extraction system and an LNAPL skimmer are currently operating for approximately eight months per year at the adjacent Suncor property. The plume stability assessment findings are linked to these operating remedial systems. Further, the Detailed Site Investigation conclusions that site vapour (indoor and outdoor air) meets CSR Schedule 3.3 standards for commercial use are also linked to the operation of these systems. The required risk controls will provide confirmation that additional contamination of the MA from the Suncor property is not occurring, that site groundwater exceeding DW standards does not migrate beyond the MA boundary, and that the site continues to meet numeric standards for vapour.

6.0 RISK CONTROLS PERFORMANCE VERIFICATION

No performance verification actions or records keeping are necessary with respect to the risk control prohibiting the use of MA groundwater as potable water.

Performance verification and records keeping is already required for operation of the Suncor remedial systems, as part of ENV Waste Discharge Permit #10712, this includes:

• Groundwater monitoring programs completed twice per year at approximately six month intervals to monitor the status of the dissolved phase hydrocarbon plume in groundwater. Samples must be collected from 24 specific monitoring well locations identified in the permit.

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- Free product thickness in each monitoring well must also be measured and recorded.
- Data must be interpreted and submitted to ENV annually. The report must also include information regarding the location and size of any contaminant plumes.

These activities, record keeping, and reporting should continue in relation to this PVP for the MA while the Suncor remedial systems are operational.

In order to verify post-remedial plume stability following remediation system shut down, the following additional verification records are also necessary:

• Update the 2020 LNAPL mobility and dissolved phase stability assessment as confirmation of a stable to decreasing plume within the MA.

7.0 STATEMENT OF LIMITATIONS

This report has been prepared and the work referred to in this report has been undertaken by SLR Consulting (Canada) Ltd. (SLR) for Suncor Energy Products Partnership, hereafter referred to as the "Client". It is intended for the sole and exclusive use of the Client. Other than by the Client and as set out herein, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted unless payment for the work has been made in full and express written permission has been obtained from SLR.

This report has been prepared for specific application to this site and site conditions existing at the time work for the report was completed. Any conclusions or recommendations made in this report reflect SLR's professional opinion based on limited investigations including: visual observation of the site, surface and subsurface investigation at discrete locations and depths, and laboratory analysis of specific chemical parameters. The results cannot be extended to previous or future site conditions, portions of the site that were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters and materials that were not addressed. Substances other than those addressed by the investigation may exist within the site; and substances addressed by the investigation may exist in areas of the site not investigated in concentrations that differ from those reported. SLR does not warranty information from third party sources used in the development of investigations and subsequent reporting.

Nothing in this report is intended to constitute or provide a legal opinion. SLR expresses no warranty to the accuracy of laboratory methodologies and analytical results. SLR makes no representation as to the requirements of compliance with environmental laws, rules, regulations or policies established by federal, provincial or local government bodies. Revisions to the regulatory standards referred to in this report may be expected over time. As a result, modifications to the findings, conclusions and recommendations in this report may be necessary.

The Client may submit this report to the BC Ministry of Environment & Climate Change Strategy and/or related BC environmental regulatory authorities or persons for review and comment purposes.

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8.0 REFERENCES

- SLR Consulting (Canada) Ltd. (SLR). 2022a. Human Health and Ecological Risk Assessment, Suncor Management Area, 3035 Airport Road, Kamloops, BC. SLR Consulting (Canada) Ltd. (SLR), April 2022.
- SLR. 2022b. Stage 1 Preliminary Site Investigation and Detailed Site Investigation, 3035 Airport Road, Kamloops, BC. Suncor Management Area (ENV Site ID 23367). Prepared by SLR for Suncor. SLR Project #204.02996.00056. April 2022.
- SLR. 2020c. LNAPL Mobility and Dissolved Petroleum Hydrocarbon Stability Assessment, 3035 Airport Road, Kamloops, BC. Prepared by SLR for Suncor. SLR Project #204.02996.00004. August, 2020.

APPENDIX A WASTE DISCHARGE PERMIT #10712

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MINISTRY OF ENVIRONMENT

PERMIT

10712

Under the Provisions of the Environmental Management Act

SUNCOR ENERGY PRODUCTS INC. doing business as SUNCOR ENERGY PRODUCTS PARTNERSHIP

c/o AHBL Corporate Services 2700-700 West Georgia Street Vancouver, BC V7Y 1B8

is authorized to discharge effluent to ground and contaminants to the air from remediation systems located at the Suncor Distribution Terminal Facility, 2955 Tranquille Road in Kamloops, British Columbia, subject to the terms and conditions listed below. Contravention of any of these conditions is a violation of the *Environmental Management Act* and may lead to prosecution.

This permit supersedes and amends all previous versions of Permit 10712 issued under Part 2, Section 14 of the *Environmental Management Act*.

1. AUTHORIZED DISCHARGES

- 1.1 This section applies to the discharge of effluent from a **REINJECTION SYSTEM**. The site reference number for this discharge is E219058.
 - 1.1.1 The average rate of discharge is 0.5 cubic metres per minute.
 - 1.1.2 The maximum rate of discharge is 1 cubic metre per minute.
 - 1.1.4 The authorized discharge period is continuous.

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1.1.5 The characteristics of the discharge must be equivalent to or better than:

Parameter	Limit/units
Benzene	5 ug/L
Toluene	24 ug/L
Ethylbenzene	2.4 ug/L
Xylene	300 ug/L
EPHw10-19	5000 ug/L
VHw6-10	15000 ug/L
Dissolved Lead	10 ug/L

- 1.1.6 The authorized works are pumps, aeration tank, blowers, settling tank, filter, infiltration trench, pipes and related appurtenances approximately located as shown on Site Plan A.
- 1.1.7 The authorized works must be complete and in operation while discharging.
- 1.1.8 The location of the facilities from which the discharge originates and the point of discharge is Lot 1, District Lot 250, Kamloops Division Yale District, Plan 6260 (PID 004-768-086) and Amended Lot 3 (DF26571B), District Lots 250 and 251, Kamloops Division Yale District, Plan 6260 except Plans 11189 and 37545 (PID 004-768-175).
- 1.2 This section applies to the discharge of air from a VAPOUR EXTRACTION SYSTEM. The site reference number for this discharge is E219059.
 - 1.2.1 The maximum rate of discharge is 30 cubic metres per minute.
 - 1.2.2 The authorized discharge period is continuous.

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1.2.3 The characteristics of the discharge must be equivalent to or better than:

Parameter	Limit/units
Benzene	32 mg/m3 (0.5 kg/d)
Toluene	188 mg/m3
Ethylbenzene	434 mg/m3
Total Xylenes	434 mg/m3
Total BTEX	5 kg/d
Total Volatile Organic Compounds	7 kg/d

- 1.2.4 The authorized works are boreholes, vacuum pumps, fan units, thermal oxider, vent pipes and related appurtenances approximately located as shown on Site Plan B.
- 1.2.5 The authorized works must be complete and in operation while discharging.
- 1.2.6 The location of the facilities from which the discharge originates and the point of discharge is the same as Section 1.1.8 above.

2. GENERAL REQUIREMENTS

2.1 Future Upgrading of Works

The Director may require repair, alteration, removal, improvement or addition to works or construction of new or existing works, and submission of plans and specification for works specified in this authorization.

2.2 Maintenance of Works and Emergency Procedures

The authorized works must be inspected regularly and maintained in good working order. In the event of an emergency or condition beyond the control of the permittee which prevents effective operation of the authorized works or leads to an unauthorized discharge, the permittee must take appropriate remedial action and notify the Director immediately. The Director may reduce or suspend operations to protect the environment until the authorized works has been restored, and/or corrective steps taken to prevent unauthorized discharges.

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2.3 **Bypasses**

Any bypass of the authorized works is prohibited unless the approval of the Director is obtained and confirmed in writing.

2.4 Process Modifications

The Director must be notified prior to implementing changes to any process that may adversely affect the quality and/or quantity of the discharge. Despite notification under this section, permitted levels must not be exceeded.

2.5 Infiltration Trench

The infiltration trench, part of the reinjection system, must be operated such that:

- (a) there is no overflow from the infiltration trench to the surrounding environment and
- (b) surface drainage is diverted away from the infiltration trench.

3. MONITORING AND REPORTING REQUIREMENTS

3.1 Flow Measurement

Provide and maintain suitable flow measuring devices for the discharges authorized in Sections 1.1 and 1.2 of this amended Permit and record twice per year at approximately 6 month intervals the effluent and air volumes discharged over a 24-hour period.

3.2 Groundwater Monitoring

A groundwater monitoring program must be completed twice per year at approximately six month intervals to monitor the status of the dissolved phase hydrocarbon plume in groundwater. Samples must collected from the following monitoring wells: BH7, BH8, BH27, BH28, BH32, BH44, BH46, BH111, BH 114, BH120, BH122, BH124, BH125, BH127, BH135 through BH137, BH139 through BH144 and G1.

If at any time analytical results from any of the above-referenced wells should exceed the applicable standards for the site, additional boreholes may be

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required to delineate the plume.

The free product thickness in each monitoring well must be measured and recorded.

3.3 Treatment System Monitoring and Sampling

Suitable sampling facilities must be installed and samples of the effluent and vapour discharges authorized by Sections 1.1 and 1.2 must be obtained twice per year at approximately six month intervals. Proper care must be taken in sampling, storing and transporting the samples to adequately control temperature and avoid contamination, breakage, etc.

3.4 Analysis

3.4.1 Obtain analysis of the samples from the groundwater monitoring program for the following:

Benzene, Ethylbenzene, Toluene, Xylenes, Volatile Petroleum Hydrocarbons, Extractable Petroleum Hydrocarbons

3.4.2 Obtain analysis of the samples of treated groundwater from the reinjection system for the following:

Benzene, Ethylbenzene, Toluene, Xylenes, Volatile Hydrocarbons, Extractable Petroleum Hydrocarbons, Dissolved Lead

3.4.3 Obtain analysis of the samples of treated vapour from the vapour extraction system for the following:

Benzene, Ethylbenzene, Toluene, Total Xylenes, Total BTEX, Total Volatile Organic Compounds

3.5 Sampling Procedures

Sampling is to be carried out in accordance with the procedures described in the "British Columbia Field Sampling Manual for Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples, 2003 Edition (Permittee)", or most recent edition, or by suitable alternative procedures as authorized by the Director.

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A copy of the above manual may be purchased from the Queen's Printer Publications Centre, P. O. Box 9452, Stn. Prov. Gov't. Victoria, British Columbia, V8W 9V7 (1-800-663-6105 or 250-387-6409) or via the internet at www.crownpub.bc.ca. A copy of the manual is also available for review at all Environmental Protection offices.

3.6 Analytical Procedures

Analyses are to be carried out in accordance with procedures described in the "British Columbia Laboratory Manual (2009 Permittee Edition)", or the most recent edition, or by suitable alternative procedures as authorized by the Director.

A copy of the above manual may be purchased from the Queen's Printer Publications Centre, P. O. Box 9452, Stn. Prov. Gov't. Victoria, British Columbia, V8W 9V7 (1-800-663-6105 or 250-387-6409) or via the internet at www.crownpub.bc.ca. A copy of the manual is also available for review at all Environmental Protection offices.

3.7 **Quality Assurance**

The Permittee must obtain from the analytical laboratory (ies) their precision, accuracy and blank data for each sample set submitted as well as an evaluation of the data acceptability, based on the criteria set by the laboratory.

One duplicate sample for every ten samples collected must be prepared and submitted for analysis for each parameter sampled for each monitoring period.

The analytical laboratory(ies) must be registered in accordance with CALA (Canadian Association for Laboratory Accreditation) unless otherwise instructed by the Director.

3.8 **Reporting**

Maintain all data of analysis and flow measurements, new works information, and the quality assurance/ quality control data. Submit data and information suitably tabulated, graphically represented and interpreted to the Director annually. The report for the preceding calendar year must be submitted on or before March 31. The report must also include information regarding the location and size of any contaminant plumes.

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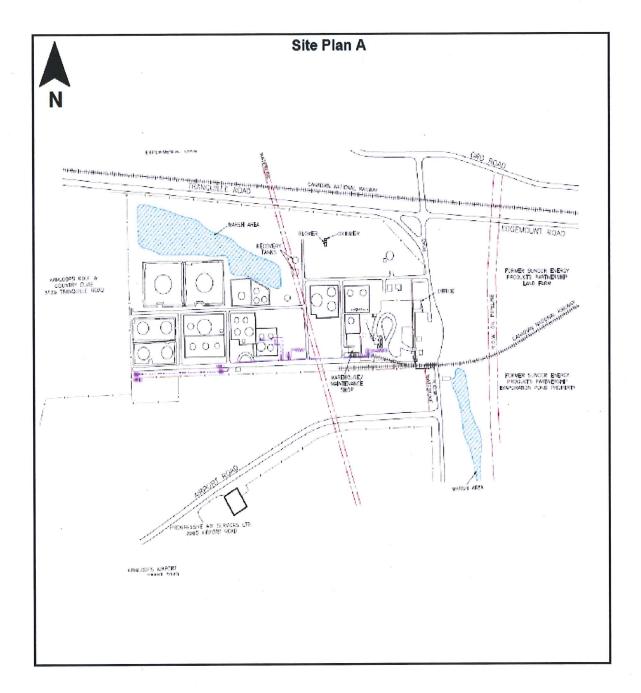
3.9 Closure Plan

An updated closure plan for the remediation systems must be prepared and submitted for approval by the Director of Waste Management within 90 days of issuance of this amended Permit.

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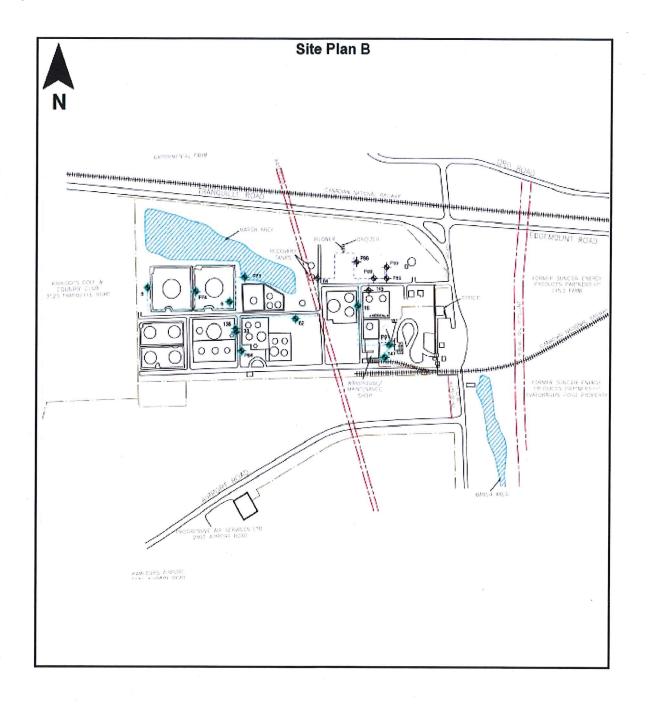
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