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File: 448-080.14

Chevron Canada Limited  
1200 – 1050 West Pender Street  
Vancouver, BC V6E 3T4

**Attn: Kristi Thornhill, Site Remediation Specialist**

Dear Ms. Thornhill,

**Re: Performance Verification Plan for Certificate of Compliance at the Off-Site Management Area (OMA-3), located at 2504 37<sup>th</sup> Street, Vernon, BC**

Hemmera Envirochem Inc. (Hemmera) has prepared this Performance Verification Plan (PVP) in support of an application for a Certificate of Compliance (CofC) for the property located at the Off-Site Management Area (OMA-3), 2504 37th Street, Vernon, BC. The PVP presents the principle risk management measures that apply at OMA-3 so that risk-based standards are and continue to be met, and the actions that must be taken so that these risk controls are implemented and maintained. This PVP was prepared in accordance with BC Ministry of Environment (MOE) *Procedure 12: Procedures for Preparing and Issuing Contaminated Site Legal Instruments*, effective February 1, 2014 (BC MOE 2014a) and BC MOE Administrative Guidance on Contaminated Sites #14: *Performance Verification Plans, Contingency Plans, and Operations and Maintenance Plans, Version 1.0*, dated February 2014 (BC MOE 2014b).

A detailed human health and ecological risk assessment (DHHERA) was conducted for OMA-3 in September 2015 (Hemmera 2015a). The DHHERA relied on the Stage 1 and 2 Preliminary Site Investigation, Detailed Site Investigation, and Confirmation of Remediation report (Hemmera 2015b).

## **1.0 RISK CONTROL TYPE**

Based on the risk management measures for OMA-3 (i.e., the use of institutional controls to mitigate/eliminate risks at OMA-3 and lack of imminent risks in the event that controls were either not implemented or were implemented but were rendered ineffective), the Type applicable at OMA-3 is considered to be **Type 2**.

Under a **Type 2** scenario, the BC MOE (2014a; 2014b) indicates that a PVP is required, while an operations and maintenance plan may be required.

## **2.0 REQUIRED RISK CONTROLS**

The principle risk controls, presented in Schedule B of the CofC, are as follows:

- a) Groundwater must not be used for domestic purposes (i.e. drinking water).
- b) Subsurface capped soils (i.e., > 3 m bgs) with contamination must not be exposed or redistributed as shallower soils under future site development scenarios. If such soils are retained on OMA-3, these soils must remain capped by a minimum of 3 m of uncontaminated soils or by a permanent barrier (such as pavement or concrete).

## **3.0 REQUIRED ACTIONS TO IMPLEMENT THE REQUIRE RISK CONTROLS**

A PVP is required to maintain the principle risk management measures upon which the DHHERA is based. This includes the maintenance of up-to-date records of performance verification actions and results for the Site being maintained. If requested by the Director, these records must be provided to the BC MOE. As well, if requested by the Director, a signed statement on whether conditions set out in Schedule B of the CofC are being met must be provided.

Performance verification actions required for OMA-3 include the following:

- a) The site owner / operator must ensure that groundwater is not used as a source of drinking water.
  - The applicant of the instrument must communicate to the site owner / operator that groundwater wells must not be installed at OMA-3 and used as drinking water. The applicant of the instrument must keep written records of such communications to verify that this risk control has been conveyed.
  - The site owner must keep written records that document drinking water accessibility to verify that this risk control is maintained.
- b) The site owner / operator must ensure that deep contaminated soils must remain capped by a minimum of 3 m of uncontaminated soils or by a permanent barrier. The site owner / operator must ensure that deep soils greater than 3 m are not redistributed as shallower soils.
  - The applicant of the instrument must communicate to the site owner / operator of this requirement and keep written records of such communications to verify that this risk control has been conveyed.
  - The site owner must inform persons involved in sub-surface activities at OMA-3 of this requirement and keep written records of such communications to verify that this risk control is maintained.
  - The site owner must keep written records of soil management (such as records of soil movement) to verify that deeper contaminated soils are not redistributed as shallower soils during sub-surface activities.

## 4.0 SUMMARY OF RATIONALE FOR SELECTING REQUIRED PVP ELEMENTS

***Groundwater must not be used for domestic purposes (i.e. drinking water).***

Contaminated groundwater remains at depths greater than 3 m below ground surface, at concentrations greater than human health drinking water standards. The DHHERA concluded that drinking water wells are unlikely to be installed at OMA-3 in the future given that the current on-site buildings are connected to the municipal water system. Documentation verifying drinking water accessibility and communication record keeping are considered to be a suitable risk management measures. Decommissioning of the existing monitoring wells would further mitigate this as a possibility.

***Subsurface capped soils (i.e., > 3 m bgs) with contamination must not be exposed or redistributed as shallower soils under future site development scenarios. If such soils are retained on OMA-3, these soils must remain capped by a minimum of 3 m of uncontaminated soils or by a permanent barrier (such as pavement or concrete). A soil management plan prepared by a qualified professional must be in place for OMA-3.***

Contaminated soils remain at depths greater than 3 m below ground surface, at concentrations greater than applicable human health and ecological protection standards for residential / urban parkland and commercial land use. The DHHERA assumed that the existing capping layer of clean soils and pavement would remain over top of this soil contamination in the future to limit inadvertent exposures to people, wildlife, soil invertebrates, and plants. In the event that contaminated soils are unearthed, implementation of soil management practices would minimize potential human and ecological exposures to site contaminants. Communication record keeping and written records of soil management are considered suitable risk management measures. Buildings present on OMA-3 and asphalt layer present on the existing laneways would further act as a barrier and mitigate this as a possibility.

## 5.0 CLOSURE

We have appreciated the opportunity of working with you on this project and trust that this report is satisfactory to your requirements. Please feel free to contact the undersigned regarding any questions or further information that you may require.

Report prepared by:  
**Hemmera Envirochem Inc.**

Report peer reviewed by:  
**Hemmera Envirochem Inc.**

**ORIGINAL SIGNED  
AND STAMPED**

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*This document represents an electronic version of the original hard copy document, sealed, signed and dated by Adam J. Radlowski, M.Sc., R.P.Bio. and Diane Zorn, P.Eng., CSAP and retained on file. The content of the electronically transmitted document can be confirmed by referring to the original hard copy and file. This document is provided in electronic format for convenience only. Hemmera Envirochem Inc. shall not be liable in any way for errors or omissions in any electronic version of its report document.*

## **6.0 STATEMENT OF LIMITATIONS**

This report was prepared by Hemmera Envirochem Inc. (“Hemmera”), based on previous investigations reports, for the sole benefit and exclusive use of the Chevron Canada Limited (Client). For the purpose of the work product herein, Hemmera extends reliance on the report to the BC Ministry of the Environment (MOE), provided that the MOE is bound to the same terms and conditions as the Client. The material in it reflects Hemmera’s best judgment in light of the information available to it at the time of preparing this report. Any use that a third party makes of this report, or any reliance on or decision made based on it, is the responsibility of such third parties. Hemmera accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

Hemmera has performed the work as described above and made the findings and conclusions set out in this report in a manner consistent with the level of care and skill normally exercised by members of the environmental science profession practicing under similar conditions at the time the work was performed.

This report represents a reasonable review of the information available to Hemmera within the established scope, work schedule and budgetary constraints. It is possible that the levels of contamination or hazardous materials may vary across OMA-3, and hence currently unrecognised contamination or potentially hazardous materials may exist at OMA-3. No warranty, expressed or implied, is given concerning the presence or level of contamination on OMA-3, except as specifically noted in this report. The conclusions and recommendations contained in this report are based upon applicable legislation existing at the time the report was drafted. Any changes in the legislation may alter the conclusions and/or recommendations contained in the report. Regulatory implications discussed in this report were based on the applicable legislation existing at the time this report was written.

In preparing this report, Hemmera has relied in good faith on information provided by others as noted in this report, and has assumed that the information provided by those individuals is both factual and accurate. Hemmera accepts no responsibility for any deficiency, mis-statement or inaccuracy in this report resulting from the information provided by those individuals.

The liability of Hemmera to Chevron Canada Limited shall be limited to injury or loss caused by the negligent acts of Hemmera. The total aggregate liability of Hemmera related to this agreement shall not exceed the lesser of the actual damages incurred, or the total fee of Hemmera for services rendered on this project.

## **7.0 REFERENCES**

BC MOE 2014a. BC Ministry of Environment (BC MOE) Procedure 12: Procedures for Preparing and Issuing Contaminated Site Legal Instruments dated January 14, 2014. Effective February 1, 2014.

BC MOE 2014b. BC MOE Administrative Guidance 14 on Contaminated Sites: Performance Verification Plans, Contingency Plans, and Operations and Maintenance Plans, Version 1.0 dated February 2014.

BC MOE (2010). BC Ministry of Environment. CSR Technical Guidance 4 Vapour Investigation and Remediation, Version 1, September 2010.

Hemmera (2015a). Stage 1 and 2 Preliminary Site Investigation, Detailed Site Investigation, and Confirmation of Remediation Chevron Former Bulk Plant VCN0839, 2503 37<sup>th</sup> Street, Vernon, BC and Affected Properties, dated July 2015.

Hemmera (2015b). Detailed Human Health and Ecological Risk Assessment Chevron Former Bulk Plant VCN0839, 2503 37<sup>th</sup> Street, and Affected Properties, Vernon, BC. Dated September 2015.