

HISTORICAL REPORT REVIEW & OPINION

City of Courtenay

930 Cliffe Avenue
Courtenay, BC, V9N 2J7

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SITE LOCATION: 100 – 20th Street, Courtenay, BC

1 INTRODUCTION

Active Earth was retained by the City of Courtenay (the “Client”) to conduct a historical report review and provide opinion on environmental conditions of the above-referenced property. The purpose of the review is for due diligence and part of ongoing lease requirements.

2 BACKGROUND AND SCOPE OF WORK

The Site is located in downtown Courtenay, in an estuarine environment directly adjacent to the mouth of the Courtenay River and Comox Harbour. The Site is owned by the City of Courtenay and is currently leased by the Courtenay Airpark Association (CAA) for the purposes of operating the Courtenay Airpark. It is understood that a Baseline Environmental Site Assessment (BESA)¹ was completed in conjunction with the lease commencement in 2021, and a subsequent Recurrent Environmental Investigation (REI)² (as per the ongoing lease obligations) was completed in 2024.

The Active Earth scope included the following:

- Reviewing the initial BESA report and REI report.
- Reviewing documented Site conditions, analytical results and conclusions.
- Providing a second opinion on recommendations and conclusions present in the reports specifically related to sampling results and the seasonality of the sampling event.

3 SUMMARY OF HISTORICAL REPORTS

This section summaries key information outlined within the 2021 Baseline Environmental Site Assessment and the 2024 Recurrent Environmental Investigation, as noted above.

3.1 2021 Baseline Environmental Site Assessment

According to the BESA report, the Site has been operating as an airpark since the 1960s. One area of potential environmental concern (APEC 1), a tank-nest including two fuel pumps and two

¹ November 2021. Lewkowich Engineering Associates Ltd. Baseline Environmental Site Assessment, Courtenay Airpark, 100 20th Street, Courtenay, BC. File No.: F1188-386

² July 3, 2024. Trillium Environmental Ltd. Recurrent Environmental Investigation, Courtenay Airpark, 100 20th Street, Courtenay, BC. Ref. 170-001-01

underground storage tanks (USTs) is present on-Site near the northwestern Site boundaries, adjacent to the marine environment. The USTs were installed by Coast Fuel Contracting Ltd. in 2005 and contain aviation fuel (AV-Gas and Marine Gas). The potential contaminants of concern (PCOCs) associated with the tank-nest, as identified in the report and lease agreement, include benzene, toluene, ethylbenzene, xylenes (BTEX), extractable petroleum hydrocarbons (EPH), light and heavy extractable petroleum hydrocarbons (LEPH and HEPH), volatile petroleum hydrocarbons (VPH) and volatile organic compounds (VOC).

The work was completed to satisfy terms of the lease agreement between the CAA and the City of Courtenay, which included the installation of monitoring wells for future groundwater and soil vapour assessment. The objective was to assess soil, groundwater and soil vapour media for the presence of petroleum hydrocarbon parameters associated with aviation fuel.

As part of the 2021 assessment, five boreholes were advanced to maximum depths of 4.6 metres (m) in the vicinity of the tank-nest. Subsurface soils encountered generally consisted of gravelly sands, underlain by intermittent layers of silty sands and coarse gravels. Four groundwater monitoring wells (MW21-1, MW21-2, MW21-4, and MW21-5) and five soil vapour probes (BH21-1 to BH21-5) were installed within the boreholes. Two monitoring wells (MW-1 and MW-2) were also present within the tank-nest area prior to the CAA leasing the Site in 2021. No information regarding the well installations was provided for review.

Soil and groundwater samples were collected and analyzed for the PCOCs identified. The Site is tidally influenced and the newly installed monitoring wells were noted to contain insufficient water for sample recovery; therefore, only the two pre-existing monitoring wells were sampled.

Soil parameters analyzed were compared against BC Contaminated Sites Regulation (CSR) Urban Park (PL), Low-Density Residential (RL_{LD}) and Commercial (CL) standards established by the BC Ministry of Environment and Parks (ENV) (*formerly the BC Ministry of Environment and Climate Change Strategy*), including:

- Matrix Numerical Soil Standards for the mandatory site-specific factors: human intake of contaminated soil; and toxicity to soil invertebrates and plants;
- Matrix Numerical Soil Standards for the site-specific factors: groundwater flow to surface water used by freshwater aquatic life and drinking water (CSR Schedule 3.1 Part 1); and
- Generic Numerical Soil Standards (CSR Schedule 3.1) to protect human health (Part 2) and ecological health (Part 3).

The soil analytical results indicated that all PCOCs analyzed were less than the most stringent CSR standards applied. Soil was also reported to be less than the laboratory's reported detection limit (RDL). However, according to the analytical results summarized in both Table 1 of that report and the Certificate of Analysis prepared by the laboratory (Bureau Veritas), detectable concentrations of HEPH (BH21-1-2.5-3, BH21-3-1-1.5, BH21-3-1.8-2.25) and phenanthrene (BH21-2-1-1.5, BH21-3-1-1.8, BH21-3-2.25-3, BH21-4-2-3, BH21-5-1-2, BH21-5-2-3) were present. Concentrations of HEPH ranged

between 100 to 170 mg/kg and were less than the most stringent CSR standards (urban park land (PL) and residential low density (RLLD) standards of 1,000 mg/kg, respectively). Concentrations of phenanthrene ranged between 0.1 to 0.031 mg/kg and were less than the CSR PL and RLLD standards (5 mg/kg).

Groundwater parameters analyzed were compared against the CSR drinking water (DW, aquatic life (AW) [freshwater (-f) and marine (-m)] standards. The groundwater analytical results indicated that all PCOCs analyzed were less than the applicable CSR standards. Groundwater concentrations were also predominantly less than the RDL, with the exception of toluene (in both MW-1 and MW-2). The concentrations (0.88 and 1.7 µg/L, respectively) were less than the most stringent CSR standard (AW-f of 5 µg/L).

Soil vapour was not assessed based on field observations and the results of the soil and groundwater analysis.

It was recommended that future groundwater assessment be undertaken during periods of high tide to ensure sufficient volumes of water would be present within the well to facilitate monitoring and sampling activities.

3.2 2024 Recurrent Environmental Investigation

According to the REI report, the tank nest fuel area consists of a two compartment, double-walled fibreglass UST, with maximum capacities of 30,000 litres (L) of AV-Gas and 10,000-L of supreme fuel (MoGas).

The primary objective of the REI was to determine if specific fuel-related PCOCs are present in groundwater at concentrations above the CSR standards. A secondary objective was to review whether it remains true that soil vapour sampling is not warranted based on the new groundwater sampling results.

Groundwater monitoring and sampling was completed on May 28, 2024, and targeted a period of high tide (~4.0m). Static groundwater level measurements were obtained from each monitoring well prior to well purging and sampling activities. Monitoring wells were measured for depth to well bottom and depth to groundwater utilizing a Heron Instruments Inc. water level meter. Groundwater samples were collected from each of the wells using a dedicated polyethylene bailer and placed in laboratory-provided containers/bottles. Following sample collection, the wells were developed/purged dry to improve their utility for future groundwater monitoring events.

Groundwater was encountered in each of the four monitoring wells installed in 2021 (MW21-1, MW21-2, MW21-4 and MW21-5) at depths ranging between 2.3 and 2.6 metres below ground surface (mbgs). Sheens, odours, or light non-aqueous phase liquids (LNAPL) were not observed. Despite sampling during a 4m high tide, the volume of water and rate of recharge was insufficient for proper purging and sample recovery; therefore, groundwater samples were collected without purging the wells. Groundwater analytical results were compared to the CSR AW-F, AW-M and

DW standards. The analytical results indicated that all measured PCOCs were less than the RDL and applicable standards. Groundwater was not monitored or assessed in the two pre-existing monitoring wells (MW-1 and MW-2).

Based on the results, a soil vapour assessment was determined to not be warranted. However, ongoing monitoring/sampling of groundwater was recommended be completed in the fuel area. The report stated that the monitoring wells were installed too shallow to allow for proper purging and sample recovery, except during the highest tides. While the wells could be redrilled and reinstalled deeper, it was recommended that future groundwater monitoring events be completed during a period of higher tide (4.5m or greater).

4 FINDINGS AND CONCLUSIONS

Based on the information reviewed, we provide the following findings and conclusions:

- The work performed in 2021 and 2024 was conducted in general accordance with the lease agreement.
- It is noted that tetraethyl lead (TEL) was not included as a PCOC and therefore was not included as part of analysis outlined within the lease agreement. Tetraethyl lead was banned in 1990 for most fuels used in Canada, with the exception of aviation fuel. As such, TEL is likely present within the fuel products being stored and dispensed on-Site.
- The monitoring wells installed in 2021 were partially developed in 2024 and it is likely that there are still sediments entrained within the wells.
- Groundwater flow direction has not been determined, as the monitoring wells have not been surveyed. However, the groundwater flow direction is expected to be influenced by tidal action based on its location adjacent to the Comox Harbour and Courtenay River estuary.
- There were no detections of the PCOCs in groundwater sampled from the four monitoring wells outside of the tank-nest (MW21-1, MW21-2, MW21-4 and MW21-5) sampled in 2024. However, minor detections of toluene were identified in the two pre-existing monitoring wells (MW-1 and MW-2) during the initial sampling event in 2021 and were not re-assessed.
- Soil vapour has not been assessed to date.

Overall, based on the results of sampling activities to date, there is no indication that the fuel operations have impacted the Site, given that the majority of the PCOC concentrations are less than the RDL in groundwater, even though tide levels were not at their highest.

5 RECOMMENDATIONS

Based on the information reviewed, we provide the following recommendations for consideration in future sampling events:

- Including TEL as a PCOC for APEC 1, and establishing a baseline concentration for TEL. Once a baseline concentration is established, future assessment can be compared against the baseline values.
- Conducting full development of all monitoring wells associated with APEC 1, a minimum of 48-hours prior to the next groundwater sampling activities to remove any sediment entrained within the wells.
- Conducting groundwater monitoring using an interface probe rather than a water level. An interface probe's key advantage over a standard water level meter is its ability to distinguish and measure the thickness of NAPL, such as fuel, in addition to the water level.
- Conducting groundwater sampling using low flow sampling methods rather than with bailers if water levels are limiting factors to reduce the draw down of groundwater during sampling and thereby reducing the potential of sediments being captured within the samples.
- Conducting a level survey of monitoring wells be completed to help facilitate the establishment of a groundwater flow direction during subsequent sampling events.
- Conducting monitoring and sampling of groundwater during high tide events, ideally with a tide of 4.5m or greater to ensure sufficient water volume is available.
- Including the monitoring and sampling of the two pre-existing monitoring wells (MW-1 and MW-2) within the tank nest, as part of future groundwater assessments. Although there are no exceedances of the groundwater standards, minor toluene concentrations were detected within these wells in 2021.
- Continuing to exclude soil vapour assessment until such time as the groundwater analytical data identifies an issue associated with APEC 1.

6 LIMITATIONS

The use of this report by anyone is subject to the following conditions and limitations:

1. This report has been prepared at the request of the client and for the specific use referred to herein. The client may rely on this report. It is not reasonable for any other party to rely on the contents of this report without first obtaining written authorization from the client and Active Earth Engineering Ltd.
2. Liability is expressly denied to any person other than the parties indicated above and those who obtain written consent. Accordingly, Active Earth Engineering Ltd. does not accept responsibility for any damage suffered by any such person as a result of decisions made or actions based on this report. Diligence by all intended users is assumed.
3. This report is believed to provide a reasonable representation of the general environmental condition at the Site. The conclusions made in this report reflect Active Earth Engineering Ltd.'s best judgment in light of the information available at the time of reporting. Should

additional information become available, or Site conditions change, the conclusions and recommendations of this report may be subject to change.

4. Active Earth Engineering Ltd. has agreed to conduct an assessment and prepare this report as requested by the client named in the report for the use specified by the client, which is stated in the report. The client has agreed that the performance of this work and the report format are appropriate for the intended use.
5. Written consent from Active Earth Engineering Ltd. must be obtained before any part of the report can be used for any purpose by anyone other than the client and other intended users identified in the report. Liability to any other party or for any other use is expressly denied regardless of who pays Active Earth Engineering Ltd.'s fee. Written consent and approval of Active Earth Engineering Ltd. must also be obtained before the report (or any part of it) can be altered or conveyed to other parties or the public through prospectus, offering memoranda, advertising, public relations, news, sales or other media.

7 CLOSURE

We trust this provides the information required at this time. If you have any questions, or require additional clarification, please contact the undersigned.

Yours truly,

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