

**RESIDENTIAL PROPERTIES
245 - 267 ROCHESTER STREET, 27 & 29
BALSAM STREET
OTTAWA, ONTARIO
K1R 7M9**

**Phase II
Environmental Site Assessment**

PREPARED FOR:

Carl Madigan
3N Group Holdings Inc.
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Rubicon Job Number • R63048.10

Report Date • October 14, 2022



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Rubicon Environmental (2008) Inc.

October 14, 2022

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**Phase II – Environmental Site Assessment
Residential Properties
245 - 267 Rochester Street, 27 & 29 Balsam Street, Ottawa,
Ontario, K1R 7M9**

Dear Client,

Please find enclosed the results for the above-mentioned investigation conducted on your behalf.

Please feel free to contact me at 519-924-0003 if you require any additional information.

Sincerely,

RUBICON ENVIRONMENTAL (2008) INC.

Paul Rew, P. Eng., QP

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1.0 EXECUTIVE SUMMARY

Rubicon Environmental (2008) Inc. (Rubicon) was retained by Mr. Carl Madigan on behalf of 3N Group Holdings Inc. to undertake a Phase II Environmental Site Assessment (ESA) at the vacant former residential and commercial properties located at 245, 247, 249, 261, 263, 265, 267 Rochester Street, 27 & 29 Balsam Street, Ottawa, Ontario. (Hereby referred to as the 'RSC property').

The environmental assessment was completed to ascertain and fully explore surficial and subsurface groundwater conditions in the vicinity of the APECs identified in the Phase One. No soil was identified on site at the time of this investigation. The investigation was completed in accordance with O. Reg 153/04 (as amended 2011, 2019). The current investigation was conducted for the purpose of filing a record of site condition with the MECP (Ministry of the Environment Conservation and Parks) in order to determine if the groundwater on site is suitable for Residential Land Use.

The subject property was assessed using the Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition from the Ministry of Environment Conservation and Parks (MECP) document "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*" (April 15, 2011), referred to as MECP Table 7 Site Condition Standards. Based on Rubicon's evaluation, three (3) Areas of Potential Environmental Concern was identified on the subject property. The APEC's identified on site included the following:

APEC #1 is due to the historic use of dry-cleaning equipment from 1920 to 1926 and 1965 to 1982. APEC #1 is considered to encompass the southwest corner of the subject property, where the buildings of 263 & 267 Rochester Street were located.

APEC #2 is due to the historical oil corporation that existed at 263 Rochester Street. APEC #2 is considered to encompass the area where the building of 263 Rochester Street was located.

The three (3) contaminants of potential concern (COPC) were identified at the Site with respect to the three (3) areas of potential environmental concern: Petroleum Hydrocarbons (PHC F₁-F₄), Benzene, Toluene, Ethylbenzene and Xylenes (BTEX), Volatile Organic Compounds (VOC's), identified on the RSC property. These contaminants of potential concern were identified using the Method Groups as outlined in the, Protocol for in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, March 9, 2004, amended as of July 1, 2011.

The Phase II ESA drilling investigation was conducted on Feb 7th and April 22nd, 2022. In total, two (2) boreholes were advanced on-site to a maximum depth 5.11m below grade level (mbgl), to ascertain the surficial and subsurface soil conditions, in the vicinity of the APECS identified in the previous Phase One ESA. The soil samples collected while drilling were examined using both visual and olfactory senses. Field-testing was also conducted using an RKI Eagle calibrated against hexane gas. Two (2) boreholes were advanced as monitoring wells but were unable to be sampled as no soil was encountered; the ground consisted of limestone. A total of eight (8) verification groundwater samples, one (1) duplicate sample and one (1) trip blank were submitted for laboratory analysis.

On October 3, 2022, with the use of a Solinst 101 Water Level Meter - P7 Probe with PVDF flat tape, all eight (8) groundwater monitoring wells onsite (EX-MW1, EX-MW2, EX-MW4, EX-MW5, EX-MW6, EX-MW7, MW3 & MW5) were measured and sampled. Samples were analyzed for pH, VOCs and PHC F₁-F₄. The analytical results were compared to Table 7 O. Reg.511/09 criteria for residential land use, Shallow Soils in a Non-Potable Ground Water Condition, with coarse textured soil. The groundwater sample analytical results from each well showed that the parameters tested for, met the applicable MECP criteria.

Based on the findings of the Phase II ESA, the subject property meets the applicable Table 7 Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition for Residential Land use, Non – Potable Groundwater Condition, Coarse Textured Soil from the Ministry of Environment (MECP) document “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act” (April 15, 2011), referred to as MECP Table 7 Site Condition Standards. As a result of the findings of the Phase II ESA, it is the opinion of Rubicon Environmental (2008) Inc. that there are no known environmental conditions within the areas investigated on the subject property to warrant further environmental investigation at this time.

2.0 GENERAL

Rubicon Environmental (2008) Inc. (Rubicon) was retained by Mr. Carl Madigan on behalf of 3N Group Holdings Inc. to undertake a Phase II Environmental Site Assessment (ESA) at the residential properties located at 245 – 267 Rochester Street, 27 & 29 Balsam Street, Ottawa, Ontario. (hereby referred to as the 'RSC property').

The environmental assessment was completed to ascertain and fully explore surficial and subsurface soil and groundwater conditions in the vicinity of the APECs identified in the Phase One. The investigation was completed with in accordance with O. Reg 153/04 (as amended 2011, 2019). The current investigation was conducted for the purpose of filing a record of site condition with the MECP (Ministry of the Environment Conservation and Parks) in order to determine if the soils and groundwater on site are suitable for Residential Land Use.

The subject property was assessed using the Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition from the Ministry of Environment Conservation and Parks (MECP) document "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*" (April 15, 2011), referred to as MECP Table 7 Site Condition Standards.

3.0 SCOPE OF WORK

The scope of work completed was to ascertain and fully explore surficial and subsurface soil and groundwater conditions on the subject property. The Phase II Environmental Site Assessment consisted of:

- Reviewing any reports or pertinent materials made available to Rubicon Environmental (2008) Inc. in order to ascertain all available information pertaining to the subject property;
- Advancing two (2) boreholes to a maximum depth of 5.11 mbgl on the subject property, to ascertain the current subsurface soil and groundwater conditions on site;
- Submitting, representative soil samples from each of the boreholes advanced, to a CALA member laboratory for analysis of VOCs, PAHS, METALS, BTEX and, PHC F₁-F₄;
- If obtainable, submitting representative groundwater samples from monitoring wells to a CALA member laboratory for analysis of VOCs and, PHC F₁-F₄;
- Comparing the results of the laboratory chemical analysis to the applicable MECP Regulations for the site;
- Preparing the findings and recommendations of this investigation in an engineering report in accordance to O.Reg 153/04;

4.0 BACKGROUND INFORMATION

At the time of this investigation, the Phase I property is currently developed for residential land use, with no current site buildings and four (4) basement foundations left over from demolition. Based on the information gathered during this investigation the subject property was used for residential purposes since its initial development in 1855. From the city directory search, it was determined that most of the properties operated as commercial from the mid-1990s to early 2000s. It appears that the subject property switched back to residential use in 2011. The proposed development includes either a nine-storey apartment building or twenty-three townhouses.

The subject property is located on the northeast corner of the intersection between Balsam Street and Rochester Street in Ottawa/ ON. The total the area of the RSC site encompasses approximately 2,000.0 m². Refer to Figure 1 for the site location and Figure 2 for the Current Site Plan.

Former Environmental site assessment reports

Three (3) previous environmental site assessments were reviewed from the subject property, titled as:

1. *Phase II – Environmental Site Assessment 247-267 Rochester Street and 27 Balsam Street Ottawa, Ontario*. Dated March, 2011. Completed by Paterson Group Inc.
2. *Supplementary Assessment of Soil Vapour Rochester Street Right of Way, Ottawa Ontario K1R 7N1*. Dated July 28, 2019. Completed by Malroz Engineering Inc.
3. *Air Quality Assessment Residential Properties 246, 250 & 254 Rochester Street, Ottawa Ontario K1R 7N1*. Dated July 28, 2021. Completed by Rubicon Environmental (2008) Inc.

PREVIOUS INVESTIGATIONS

Rubicon reviewed three (3) previous environmental investigations completed on the subject property.

The following is a summary of their findings / conclusions:

1. *Phase II – Environmental Site Assessment 247-267 Rochester Street and 27 Balsam Street Ottawa, Ontario. Dated March, 2011. Completed by Paterson Group Inc.*
 - A Phase II Environmental Site Assessment was conducted at the properties located at 245, 247, 249, 261, 263-267 Rochester Street and 27 Balsam Street, Ottawa Ontario. The purpose of the investigation was to assess potential VOC contamination from a former dry cleaners located at 267 Rochester Street. The Phase II Investigation was conducted over the period of September 2009 to November 2010, which consisted of ten (10) boreholes, instrumented with groundwater monitoring wells on the subject site.
 - The groundwater levels were measured on November 2, 2009 and were found to be present at depths ranging from 1.5 and 2.8 m below the existing grade, with the exception of BH6, which was cored 10.6 m into the bedrock and had a groundwater level approximately 9.0 m below surface grade. Groundwater levels were resampled on November 1, 2010 and were found to be present at depths ranging from 3.3 to 4.9 m below surface grade.

- Patterson Group collected a total of fourteen (14) groundwater samples obtained from the ten (10) monitoring wells and were submitted for testing of volatile organic compounds (VOCs). The analytical test results identified the presence of a number of VOC parameters from boreholes BH1, BH3, BH8 & BH9 that exceed the MOE Table 1 Standards. The final groundwater samples from BH1, BH3, BH8 and BH9 displayed exceedances for one or more VOC concentrations comparing to MOE Table 1 Standards. The rest of the groundwater samples taken from the other boreholes do not indicate any presence of VOC concentrations in excess of the MOE Table 1 Standards, with the exception of BH2 with an exceedance for Chloroform. Patterson Group states that “Chloroform was detected in most of the initial groundwater samples and is expected to be present as a result of the use of city water used as core water during the drilling program. The observed concentrations of chloroform were less than that which are typically found in municipal tap water.”
- Patterson Group concluded that the site had been impacted by former on-site dry-cleaning operations. The VOC impacted groundwater appears to rely in the southwest area of the subject property. Tetrachloroethylene (PCE) and trichloroethylene (TCE) were the identified contaminants of concern. The former dry cleaning operation at 267 Rochester Street is suspected to be the source of contamination.
- Patterson Group recommends “that a remediation program be conducted on the subject property to clean up the VOC contaminated groundwater.

2. *Supplementary Assessment of Soil Vapour Rochester Street Right of Way, Ottawa, Ontario. Dated December 16, 2019. Completed by Malroz Engineering Inc.*

- Malroz Engineering was retained by the City of Ottawa in order to conduct a soil vapour assessment within the Rochester Street right of way (ROW), between the intersection of Balsam Street and Willow Street in Ottawa, Ontario.
- Malroz Engineering states that an inferred chlorinated solvent contaminant plume along the Rochester Street ROW was identified in a letter dated May 12, 2015. The source of the contamination appears to be the historic dry-cleaning operations. Data suggests that a groundwater contaminant plume comprising of toluene, tetrachloroethylene (PCE), trichloroethylene (TCE), dichloroethylene (DCE), vinyl chloride, and chloroform has migrated into the Rochester and Balsam Street ROWs.
- Malroz conducted a preliminary soil vapour assessment in May 2018 which is considered to be Event #1. Four (4) soil vapour probes (SVPs) were installed along the Rochester Street ROW and soil vapour samples were collected from each probe. Results from the probes indicated measurable concentrations of toluene, chloroform, methylene chloride, PCE and TCE. However, reported concentrations of these contaminants were below calculated maximum acceptable vapour intrusion target levels (VITLs) for residential property use. Considering the variability of soil vapour data, additional sampling was recommended to confirm the results from the preliminary soil vapour assessment.”
- Malroz completed two additional soil vapour sampling events at the subject site, once in April 2019, and once in July 2019. Results from April 2019 “indicated that measurable concentrations of PCE were reported at each of the SVPs and were below VITLs. However, concentrations of PCE at SVP102 were only slightly below (3-12 µg/m³) the corresponding VITL.” Results from July 2019 “indicated that concentrations of PCE at SVP102 and SVP103 exceeded the VITL. Measurable concentrations of PCE were also reported at SVP101 and SVP104, however, the

measured concentrations met the VITL. Given the exceedances of VITLs at SVP102 and SVP103 during July 2019, an additional sampling event was recommended in the fall of 2019 to confirm the results and to further assess seasonal and temporal variability.”

- Malroz recommended the following: that sub-slab vapour probes be installed in select buildings adjacent to the subject site, indoor air samples be taken within select residential buildings adjacent to the subject site, and that the groundwater impacts should be laterally and vertically delineated to evaluate the extent, magnitude and stability of the plume.
3. *Air Quality Assessment Residential Properties 246, 250 & 254 Rochester Street, Ottawa, Ontario*. Dated July 28, 2021. Completed by Rubicon Environmental (2008) Inc.
- Rubicon Environmental (2008) Inc. was retained by Mr. Carl Madigan to undertake an Air Quality Assessment at the properties located at 246, 250 & 254 Rochester Street, Ottawa Ontario. The air quality monitoring consisted of an initial meeting with the building management, an air sampling program to establish base line data with respect to Total Volatile Organic Compounds (TVOCs), as well as a provision of a summary report to document the findings.
 - The purpose of the air sampling program was to document the levels of basic air quality parameters in the site building at the time and place of the testing, as well as to assess the presence of elevated soil vapour concentrations and contaminants of concern by sampling the existing soil vapour probes present along Rochester Street.
 - The Air Sampling Program was conducted on June 21, 2021. In total, eight (8) air canister samples were taken in a four (4) hour sampling period in order to ascertain the air quality parameters, presence of elevated soil vapour concentrations and contaminants of concern in the study area. Three (3) samples were taken inside the residential properties located at 246, 250 and 254 Rochester Street, one (1) sample was taken from outside, and four (4) additional samples were taken from the existing vapour probes on the Rochester ROW.
 - Eight (8) verification air samples were collected and analysed for permanent gases and VOCs. The subject property was assessed using the List of Ambient Air Quality Criteria (AAQCs) from Ontario’s Ambient Air Quality Criteria set by the Ministry of Environment, Conservation and Parks. The analytical results for all of the samples submitted were below the applicable site standard, apart for several exceedances for chloroform. Rubicon also compared the results to a study done on Canada’s air quality as well as multiple other air quality documents, which indicates that the levels of Chloroform are regular indoor air quality concentrations. None of the potential contaminants of concern which included; toluene, tetrachloroethylene (PCE), trichloroethylene (TCE) dichloroethylene (DCE), vinyl chloride, and chloroform were present at concentrations greater than the typical site condition standards.
 - Based on the findings in the Air Quality Assessment, Rubicon states that the subject meets the applicable list of Ambient Air Quality Criteria (AAQCs) from Ontario’s Ambient Air Quality Criteria set by the Ministry of the Environment, Conservation and Parks. It is the opinion of Rubicon that there are no known environmental conditions within the areas investigated on the subject property to warrant further environmental investigation at this time.

Rubicon's Evaluation of the Background Information

Based on Rubicon's evaluation and interpretation of the background information obtained on the subject property, one (1) potential contaminating activity identified in the previous report was the former dry-cleaning operation at 267 Rochester Street as it is suspected to be the source of contamination. This PCA is considered an APEC on the subject property. From the Air Quality Assessment conducted by Rubicon, all on-site verification air samples were confirmed to have met the applicable criteria as of 2021. Due diligent groundwater sampling is recommended for comparison to current O.Reg 511/09 residential land use standards, as no soil was identified on the site.

5.0 SITE CONDITION STANDARDS

The criteria for conducting this investigation were defined in MOE O. Regulation 511/09. The analytical results obtained from laboratory testing were compared to Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition with coarse textured soil – Residential Property Use. The following rationale was used to determine the applicable site restoration criteria for use at this site:

Site Sensitivity: Section 41: Site condition standards, environmentally sensitive areas of the regulation, does not apply to the Phase Two property for the following conditions; (a) the property is not, (i) within an area of natural significance, (ii) includes or is adjacent to an area of natural significance or part of such an area, or (iii) includes land that is within 30 metres of an area of natural significance or part of such an area; (b) the soil at the property does not have a pH value as follows: (i) for surface soil, less than 5 or greater than 9, (ii) for sub-surface soil, less than 5 or greater than 11; The average pH value was found to be; **Surficial:** No soil present **Subsurface:** No soil present Section 43.1: Site condition standards, shallow soil property or water body of the regulation does apply to the Phase Two property for one of the following conditions; (a) the property is a shallow soil property; or (b) the property does include all or part of a water body or is adjacent to a water body or includes land that is within 30 metres of a water body. O. Reg. 511/09, s. 21.

The RSC Property is not considered environmentally sensitive.

Land Use: The site is currently developed for residential land use. Due to the plan for residential redevelopment of the property, the residential standards shall be applied to determine the sites' suitability for the filing of Record of Site Condition.

Groundwater Use: The RSC property and all other properties have municipal drinking water available as there were no well records identified for water supply use in the study area. Ottawa receives treated water from the Ottawa River.

Depth and Soil Texture Criteria Selection: A Grain size analysis could not be conducted as no soil was encountered during the excavation.

Based on the above information and assumptions, the comparative criteria for this site corresponded to residential land use with coarse textured soil using the Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition (Table 7, O. Regulation 511/09).

5.1 Geology and Physiography

The site is located in a physiographic region known as the Limestone Plain (Physiography of Southern Ontario, Chapman and Putnam, 1984).

Map 2544 "Bedrock Geology of Ontario, Southern Sheet", indicates bedrock in the Ottawa area to be within a region of limestone, dolostone, arkose and sandstone of the Middle Ordovician, Ottawa Gp.; Simcoe Gp.; Shadow lake Fm.

Map 2556 "Quaternary Geology of Ontario, Southern Sheet" indicates that the Ottawa area consists of Bedrock: undifferentiated igneous and metamorphic rock, exposed at surface or covered by a discontinuous, thin layer of drift.

5.2 Groundwater and Surface Water

There are no bodies of water located within 30 m of the RSC Property. The nearest body of water is located approximately 1.03 km northwest, named the Ottawa River.

No areas of natural significance and any well head protection areas or other designation identified by the municipality in its official plan for the protection of groundwater were identified in the study area.

The RSC property and neighbouring properties are serviced with municipal drinking water as there were no well records identified for water supply use in the study area. Ottawa receives treated water from the Ottawa River.

5.3 Other Services

At the time of the Phase One Environmental Site Assessment and Phase Two Environmental Site Assessment being completed on the RSC property, no buildings existed on-site, four (4) basement foundations were present. Hydro, Natural Gas, and Communication is available belowground to the subject property. Municipal sanitary and storm sewer systems are available to service the site. The presence of subsurface utilities within the study area does not represent a human health or ecological risk as no contaminants of concern were identified in soil or groundwater greater than the applicable MECP criteria.

6.0 PHASE II ENVIRONMENTAL SITE ASSESSMENT

6.1.1 General Investigation Method

Based on Rubicon's evaluation and interpretation, a judgemental sampling approach was implemented based on the potentially contaminating activities and areas of environmental concern identified on the subject property completed from the Phase One ESA investigation completed by Rubicon. The Phase II ESA investigation was conducted with reference to O. Reg. 153/04, as amended by O. Reg. 511/09.

The RSC Property was assessed using the Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition from the Ministry of Environment Conservation and Parks (MECP) document "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*" (April 15, 2011), referred to as MECP Table 7 Site Condition Standards.

6.1.2 Drilling and Soil Sampling Equipment

Rubicon Environmental (2008) Inc. completed the borehole drilling program at the Phase II property on February 7th and April 22nd, 2022. A combination of solid stem augers and 76 cm long, 5 cm diameter split spoon samplers were utilized.

6.1.3 Quality Assurance and Quality Control

No deviation from the sampling and analysis plan was necessary.

Locates: It should be noted that the sampling plan was developed with a cautionary approach towards the location of underground utilities onsite and private services including retail petroleum equipment. All public and private locates were obtained by Rubicon prior to the initiation of the drilling program.

Sampling and Analysis Plan: Each sample selected for analysis were placed in the laboratory provided containers/vials/jars and labelled according to the borehole/monitoring well location and/or split spoon sample ID, as per the proposed investigation and analysis plan.

Bottling of Samples: All field screening soil samples were collected with the use of dedicated nitrile gloves and were placed in 1 litre dedicated sterile bags as part of the field sampling procedure. All representative soil samples selected for laboratory analysis were placed in dedicated sterile sample jars / vials with the use of dedicated sampling syringes, all provided in advance by the laboratory, and placed in ice packed coolers at a temperature of approximately 3-10 degrees Celsius.

Field Screening: The headspace vapour concentrations of each sample were tested for petroleum vapour concentrations using an RKI Eagle 2 dual gas portable monitor calibrated against hexane. This system is designed to measure organic vapour concentrations and has a detection range of 0 ppm to 1000 ppm and 1% - 100% LEL. The RKI Eagle was bump calibrated using hexane gas February 7th and April 22nd, 2022. As part of the field screening method, all soils encountered were also examined for olfactory and visual indicators of impairment such as petroleum odours and staining. No deviations from standard operating procedures relating to the proposed field-screening methods were necessary.

Decontamination: All equipment that came into contact with subsurface conditions (split spoon samplers) during the drilling program was thoroughly cleansed with 'Alconox' powder mixed with water between each sampling interval to prevent possible cross contamination.

6.1.4 Installation Groundwater Monitoring Wells

Number of Wells Installed: 2

Date of installation: February 7th and 22nd, 2022

The groundwater monitoring wells on the subject property were developed on February 7 and April 22, 2022, using 2.00", Schedule 40 PVC pipe with slotted screen in the suspected region of the suspected groundwater table. Silica sand was positioned around the screen with a bentonite seal located above the filter pack to grade to prevent surface water from entering the monitoring well. All screened intervals did not exceed 5.11 m in depth. Refer to table 2 for monitoring well construction and Appendix 3 for Borehole Logs.

6.1.5 Soil Sampling – Submitted for Analyses

Soil samples were unable to be taken as no soil was present; the ground consisted of exposed bedrock.

6.1.6 Groundwater Sampling –Submitted for Analyses

On October 3, 2022 with the use of a Solinst 101 Water Level Meter - P7 Probe with PVDF flat tape, for all eight (8) groundwater monitoring wells (EX-MW1, EX-MW2, EX-MW4, EX-MW5, EX-MW6, EX-MW7, MW3 & MW5) were sampled and submitted for the following: VOCs and PHCs (F₁-F₄). Each groundwater monitoring well had <5 ppm headspace readings.

Refer to Table 3 for a summary of the groundwater levels and observations.

Refer to Figure 5 for the location of the groundwater monitoring wells as part of the Phase II investigation.

6.1.7 Groundwater Flow Direction

Groundwater flow direction was calculated using groundwater contour lines utilizing the groundwater measurements from October 2022. Groundwater calculation resulted in the south west direction. Refer to Figure 6 for the groundwater flow direction drawing.

7.0 LABORATORY ANALYSIS

ALS Environmental, Mississauga Ontario, conducted the Chemical analysis. ALS Environmental is a member of the Canadian Association for Laboratory Accreditation Inc. (CALA) and meets the requirements of Section 47 of O. Reg. 153/04 certifying that the analytical laboratory be accredited in accordance with the International Standard ISO/IEC 17025 and with standards developed by the Standards Council of Canada. Refer to the attached certificate of analysis. Appendix 2 contains all laboratory Certificates of Analysis.

7.1 Soil Chemical Analysis

Soil samples were unable to be taken as no soil was present; the ground consisted of exposed bedrock. The location of the boreholes are presented in Figure 5 – Site Investigation and Appendix 2 - Borehole Logs.

7.2 Groundwater Chemical Analysis

The location of groundwater sampling points is presented in Figure 5 – Site Investigation.

The subject property was assessed using the Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition, for residential land use, coarse textured soil from the Ministry of Environment (MECP) document “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*” (April 15, 2011), referred to as MECP Table 7 SCS.

The laboratory analytical results for all the soil samples analyzed showed that each of the locations and depths of samples submitted were below the applicable site conditions standards. None of the potential contaminants of concerns which included: VOCs and Petroleum Hydrocarbons (PHC F₁-F₄) were present at concentrations greater than the applicable site condition standard.

Refer to Tables 6 and 7.

8.0 CONCLUSIONS

Rubicon Environmental (2008) Inc. (Rubicon) was retained by Mr. Carl Madigan on behalf of 3N Group Holdings Inc. to undertake a Phase II Environmental Site Assessment (ESA) at the vacant former residential and commercial properties located at 245, 247, 249, 261, 263, 265, 267 Rochester Street, 27 & 29 Balsam Street, Ottawa, Ontario. (hereby referred to as the 'RSC property').

The environmental assessment was completed to ascertain and fully explore surficial and subsurface groundwater conditions in the vicinity of the APECs identified in the Phase One. No soil was identified on site at the time of this investigation. The investigation was in accordance with in O. Reg 153/04 (as amended 2011, 2019). The current investigation was conducted for the purpose of filing a record of site condition with the MECP (Ministry of the Environment Conservation and Parks) in order to determine if the groundwater on site is suitable for Residential Land Use.

The subject property was assessed using the Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition from the Ministry of Environment Conservation and Parks (MECP) document "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" (April 15, 2011), referred to as MECP Table 7 Site Condition Standards. Based on Rubicon's evaluation, three (3) Areas of Potential Environmental Concern was identified on the subject property. The APEC's identified on site included the following:

APEC #1 is due to the historic use of dry-cleaning equipment from 1920 to 1926 and 1965 to 1982. APEC #1 is considered to encompass the southwest corner of the subject property, where the buildings of 263 & 267 Rochester Street were located.

APEC #2 is due to the historical oil corporation that existed at 263 Rochester Street. APEC #2 is considered to encompass the area where the building of 263 Rochester Street was located.

The three (3) contaminants of potential concern (COPC) were identified at the Site with respect to the three (3) areas of potential environmental concern: Petroleum Hydrocarbons (PHC F₁-F₄), Benzene, Toluene, Ethylbenzene and Xylenes (BTEX), Volatile Organic Compounds (VOC's), identified on the RSC property. These contaminants of potential concern were identified using the Method Groups as outlined in the, Protocol for in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, March 9, 2004, amended as of July 1, 2011.

The Phase II ESA drilling investigation was conducted on Feb 7th and April 22nd, 2022. In total, two (2) boreholes were advanced on-site to a maximum depth 5.11m below grade level (mbgl), to ascertain the surficial and subsurface soil conditions, in the vicinity of the APECS identified in the previous Phase One ESA. The soil samples collected while drilling were examined using both visual and olfactory senses. Field-testing was also conducted using an RKI Eagle calibrated against hexane gas. Two (2) boreholes were advanced as monitoring wells but were unable to be sampled as no soil was encountered; the ground consisted of limestone. A total of eight (8) verification groundwater samples, one (1) duplicate sample and one (1) trip blank were submitted for laboratory analysis.

On October 3, 2022, with the use of a Solinst 101 Water Level Meter - P7 Probe with PVDF flat tape, all eight (8) groundwater monitoring wells onsite (EX-MW1, EX-MW2, EX-MW4, EX-MW5, EX-MW6, EX-MW7, MW3 & MW5) were measured and sampled. Samples were analyzed for pH, VOCs and PHC F₁-F₄. The analytical results were compared to Table 7 O. Reg.511/09 criteria for residential land use, Shallow Soils in a Non-Potable Ground Water Condition, with coarse textured soil. The groundwater sample analytical results from each well showed that the parameters tested for, met the applicable MECP criteria.

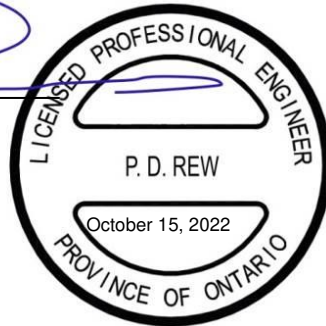
Based on the findings of the Phase II ESA, the subject property meets the applicable Table 7 Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition for Residential Land use, Non – Potable Groundwater Condition, Coarse Textured Soil from the Ministry of Environment (MECP) document “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act” (April 15, 2011), referred to as MECP Table 7 Site Condition Standards. As a result of the findings of the Phase II ESA, it is the opinion of Rubicon Environmental (2008) Inc. that there are no known environmental conditions within the areas investigated on the subject property to warrant further environmental investigation at this time.

Respectfully submitted,

RUBICON ENVIRONMENTAL (2008) INC.



Paul D. Rew, P.Eng. QP



9.0 REFERENCES

Google Maps URL: <http://maps.google.ca/maps>

Ministry of Northern Development and Mines “*Bedrock Geology of Ontario, Southern Sheet, Map 2544*”

Ontario Geological Survey, “*Quaternary Geology of Ontario. 1991. Map 2556*”

Ontario Ministry of the Environment, Ontario Regulation 153/04, as amended by Ontario Regulation 511/09.

Topographic Map referenced from Natural Resources Canada:

<http://www.atlas.nrcan.gc.ca/site/english/toporama/index.html>

Phase II – Environmental Site Assessment 247-267 Rochester Street and 27 Balsam Street Ottawa, Ontario. Dated March, 2011. Completed by Paterson Group Inc.

Supplementary Assessment of Soil Vapour Rochester Street Right of Way, Ottawa Ontario K1R 7N1. Dated July 28, 2019. Completed by Malroz Engineering Inc.

Air Quality Assessment Residential Properties 246, 250 & 254 Rochester Street, Ottawa Ontario K1R 7N1. Dated July 28, 2021. Completed by Rubicon Environmental (2008) Inc.

10.0 LIMITATIONS

1. This assessment was conducted in accordance with generally accepted engineering standards. It is possible that materials other than those described in this report are present at the site. The client acknowledges that no assessment can necessarily identify the existence of all contaminants, potential contaminants, or environmental conditions;
2. This report was prepared for the sole and exclusive use of Mr. Carl Madigan on behalf of 3N Group Holdings Inc., Rubicon Environmental (2008) Inc. accepts no responsibility or liability for any loss, damage, expense, fine or any other claim of any nature or type, including any liability or potential liability arising from its own negligence, for any use of this report or reliance on it, in whole or in part, by anyone other than Mr. Carl Madigan on behalf of 3N Group Holdings Inc.;
3. There is no representation, warranty or condition, express or implied, by Rubicon Environmental (2008) Inc. or its officers, directors, employees or agents that this assessment has identified all contaminants, potential contaminants or environmental conditions at the site or that the site is free from contamination, potential contaminants or environmental conditions other than those noted in this report;
4. This assessment has been completed from information and documentation described in this report as well as the results of limited chemical analysis of soil samples collected from accessible locations on the date(s) specified. We have assumed that any such information and documentation is accurate and complete. We can accept no responsibility or liability for any errors, deficiencies or inaccuracies in this report arising from errors or omissions in the information and documentation provided by others;
5. This assessment was based on information and the results of investigation(s) obtained on the date(s) specified. Rubicon Environmental (2008) Inc. accepts no responsibility or liability for any changes or potential changes in the condition of the site subsequent to the date of our investigation(s);
6. The conditions between sampling locations have been inferred, to the best of our ability, based on the conditions observed at sampling locations. Conditions between and beyond sampling locations may vary. This assessment pertains, only, to the site specifically described in this report and not to any adjacent or other property;
7. This assessment does not include, nor is it intended to include, any opinion regarding the suitability of any structure on the site for any particular function, the integrity of the on-site buildings or the geotechnical conditions on the site, with the exception of how they may identify with environmental concerns. Inspections of buildings do not include compliance with building, gas, electrical or boiler codes, or any other federal, provincial or municipal codes not associated with environmental concerns. Should concerns regarding any parameters other than environmental concerns arise as a result of our investigation(s), they should be addressed by appropriately qualified professionals; and,
8. This report is not to be reproduced or released to any other party, in whole or in part, without the express written consent of Rubicon Environmental (2008) Inc.

FIGURES



R63048	NAME	DATE
DRAWN BY:	NP	October 2022
CHECKED BY:	PDR	October 2022
27, 29 Balsam Street, & 245 - 267 Rochester Street, Ottawa, ON		

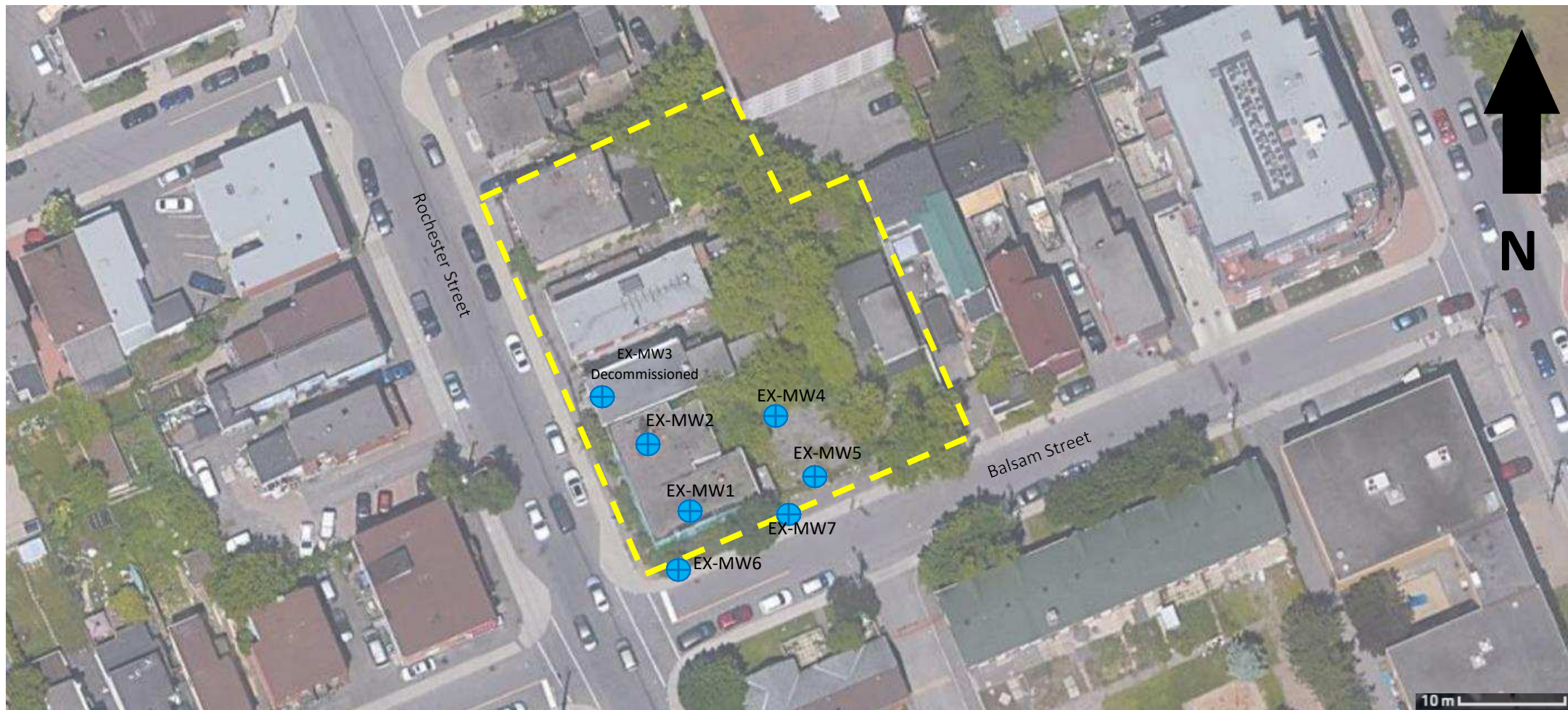


Figure 1:
Site
Location

Legend

- RSC Phase One and Phase Two
- Subject Property
- RSC Phase One and Phase Two
- Study Area







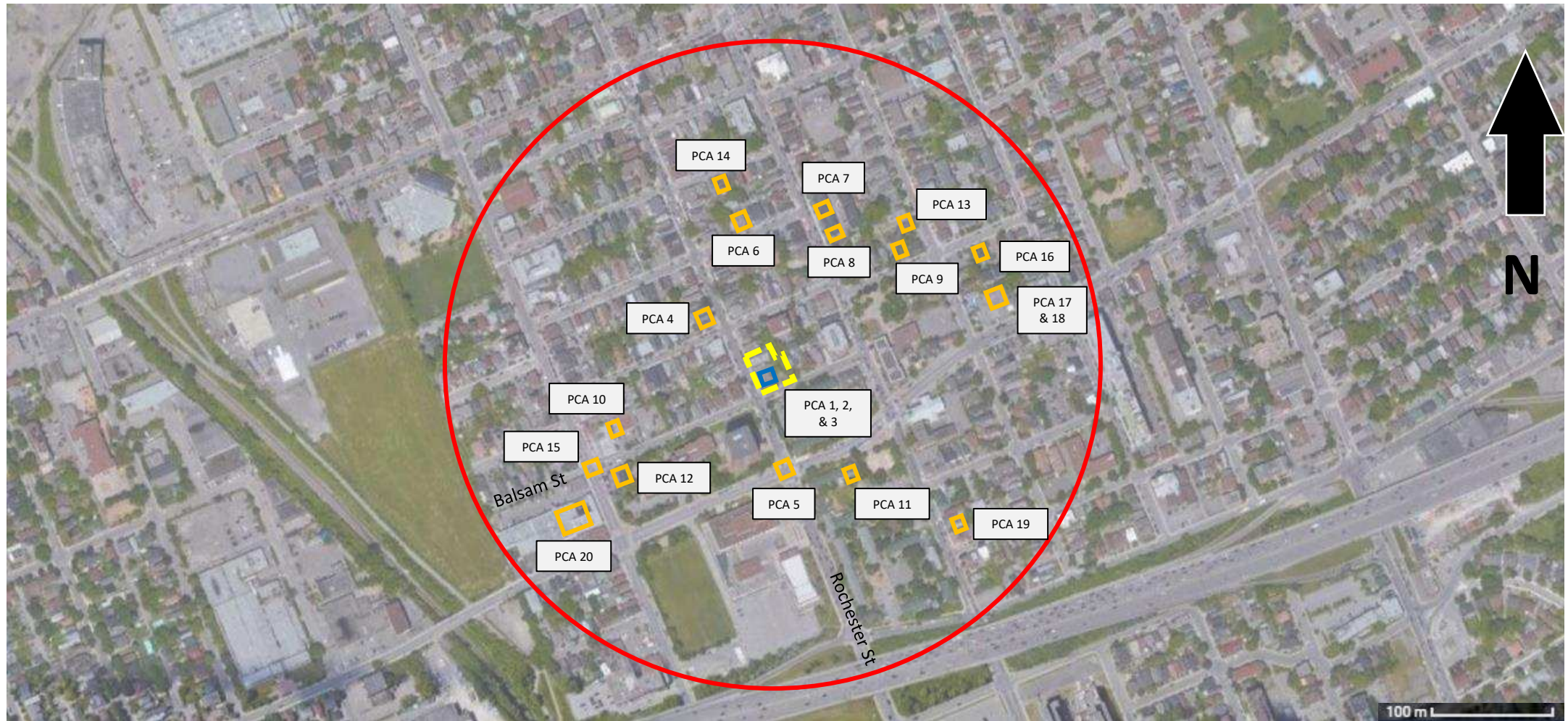
R63048	NAME	DATE
DRAWN BY:	NP	October 2022
CHECKED BY:	PDR	October 2022
27, 29 Balsam Street, & 245 - 267 Rochester Street, Ottawa / ON		



Figure 2:
Site Plan

Legend

- RSC Phase One, Phase Two Subject Property 
- Monitoring wells 







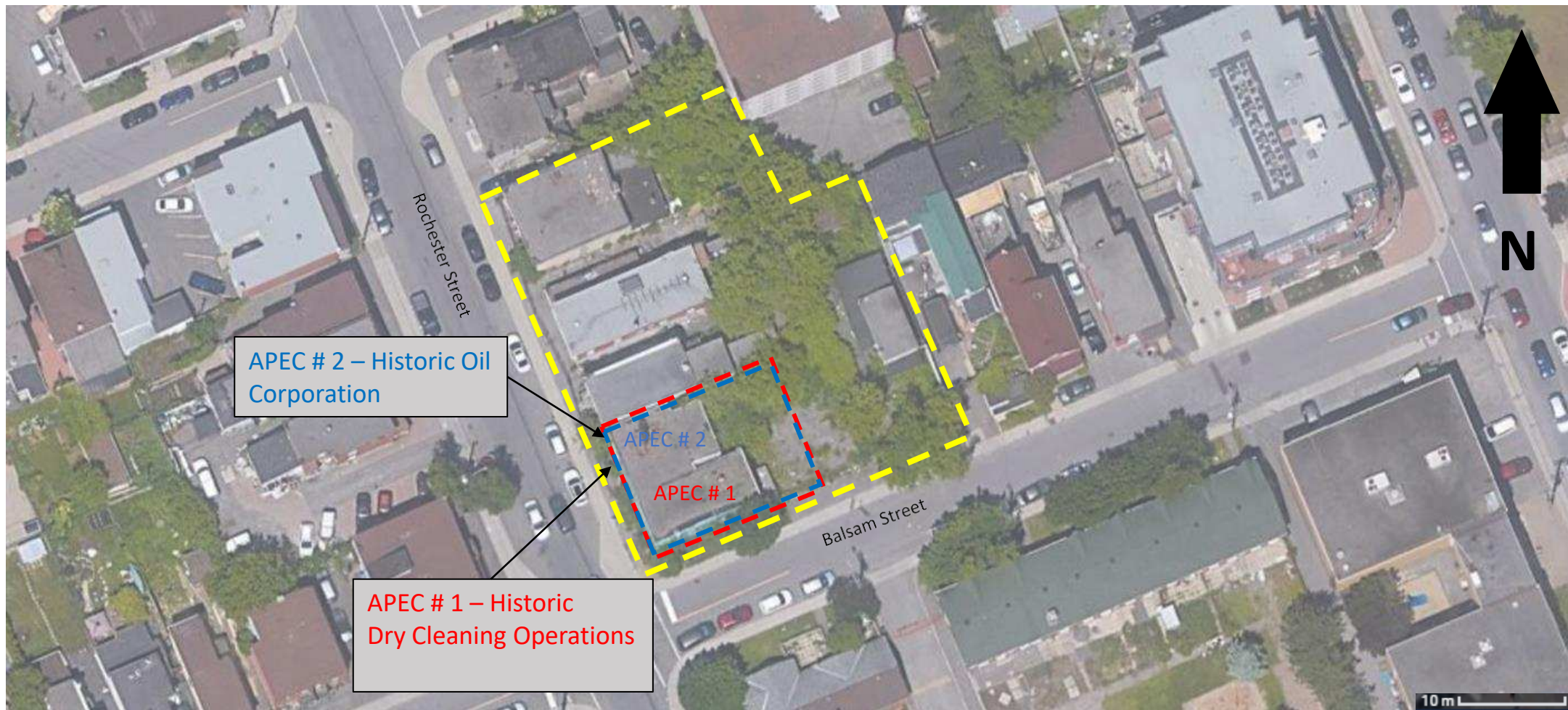
R63048	NAME	DATE
DRAWN BY:	NP	October 2022
CHECKED BY:	PDR	October 2022
27, 29 Balsam Street, & 245 - 267 Rochester Street, Ottawa, ON		



Figure 3:
PCAs - Study
Area

Legend

- RSC Phase One, Phase Two Subject Property 
- RSC Phase One, Phase Two Study Area 
- Contributing PCAs 
- Non-Contributing PCAs 



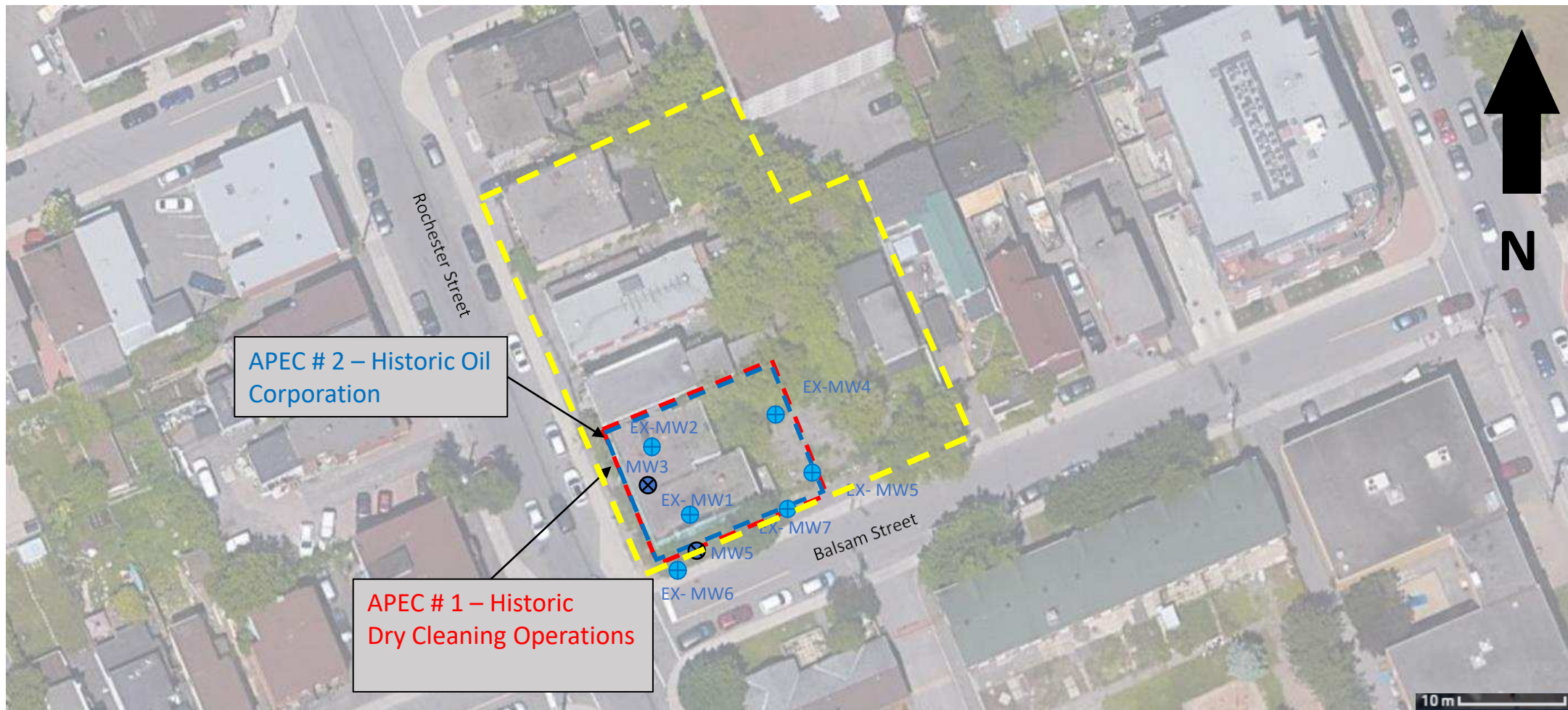
R63048	NAME	DATE
DRAWN BY:	AA	October 2022
CHECKED BY:	PDR	October 2022
27, 29 Balsam Street, & 245 - 267 Rochester Street, Ottawa / ON		



Figure 4:
APECs

Legend
RSC Phase One, Phase Two
Subject Property






R63048	NAME	DATE
DRAWN BY:	AA	October 2022
CHECKED BY:	PDR	October 2022
27, 29 Balsam Street, & 245 - 267 Rochester Street, Ottawa / ON		



Figure 5:
Site
Investigation

Legend
RSC Phase One, Phase Two Subject Property 






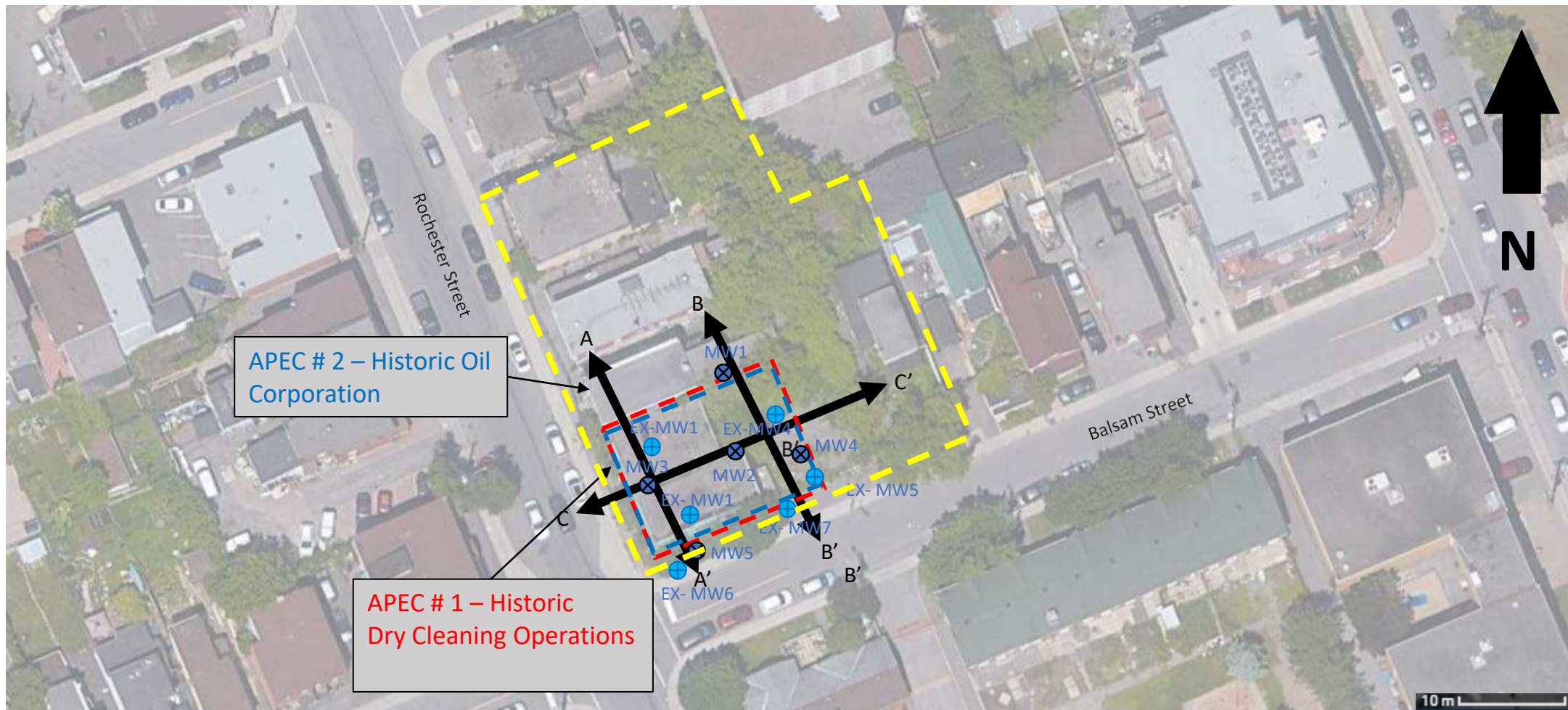
R63048	NAME	DATE
DRAWN BY:	JG	October 2022
CHECKED BY:	PDR	October 2022
27, 29 Balsam Street, & 245 - 267 Rochester Street, Ottawa / ON		



Figure 6:
Groundwater Flow
Direction

Legend

- RSC Phase One, Phase Two Subject Property 
- Groundwater Contour 
- Groundwater Flow Direction 



R63048	NAME	DATE
DRAWN BY:	AA	October 2022
CHECKED BY:	PDR	October 2022
27, 29 Balsam Street, & 247 - 267 Rochester Street, Ottawa / ON		

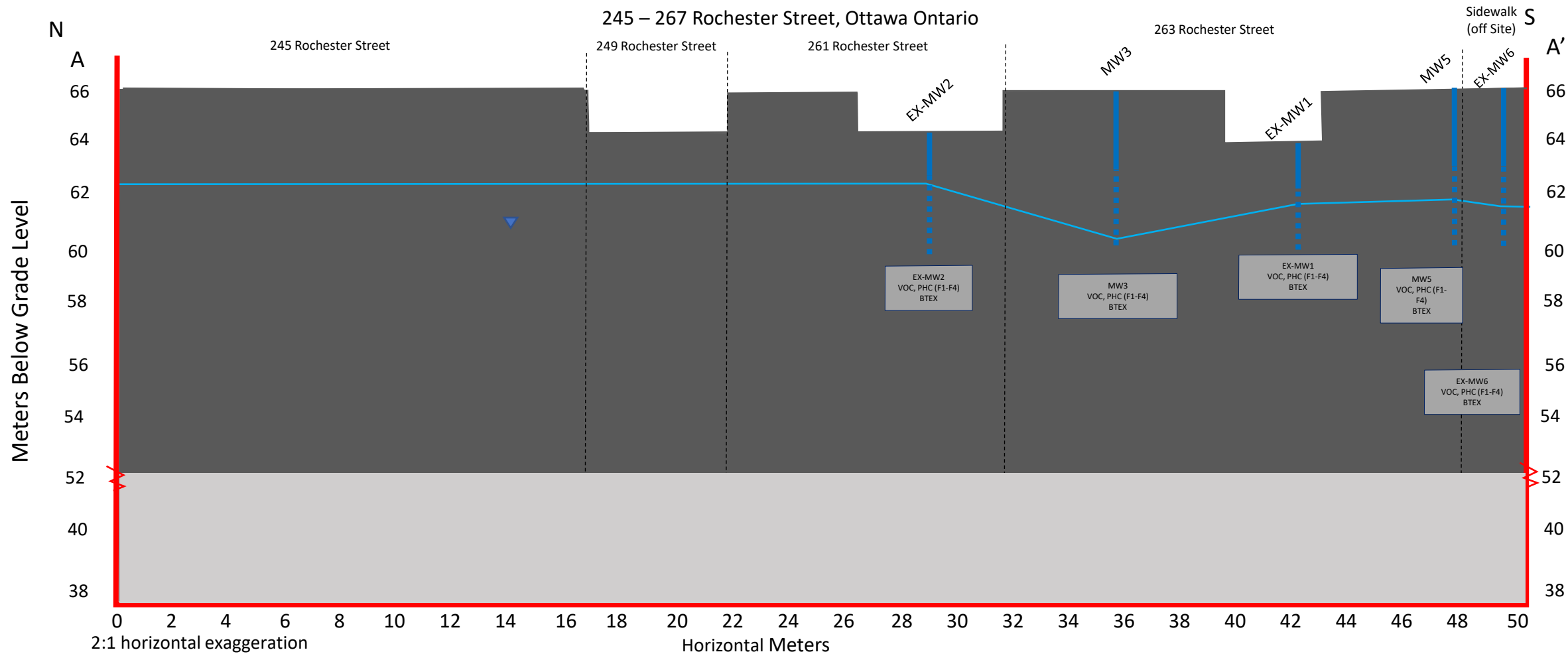


Figure 7:
Cross Section
Layout
A – A'
B – B'
C – C'

Legend
RSC Phase One, Phase Two Subject Property



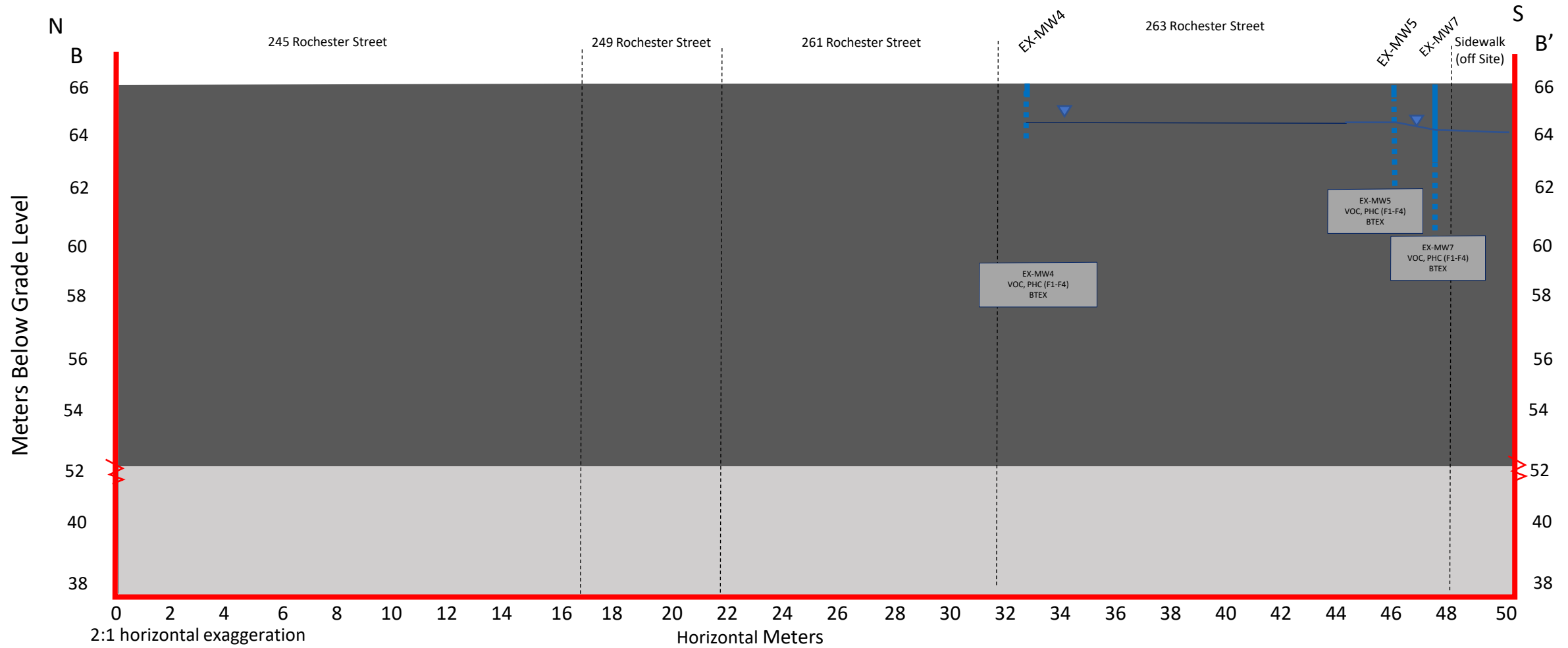
RSC Phase One and Phase Two Subject Property Cross Section



R63048	NAME	DATE	 Rubicon Environmental (2008) Inc.	Figure 8: Cross Section A-A'	Legend: Limestone  Water Table  Bedrock  Borehole  Borehole/ Monitoring well)  Casing  Screen  Asphalt 
DRAWN BY:	JG	October 2022			
CHECKED BY:	PDR	October 2022			
27, 29 Balsam Street, & 245 - 267 Rochester Street, Ottawa / ON					

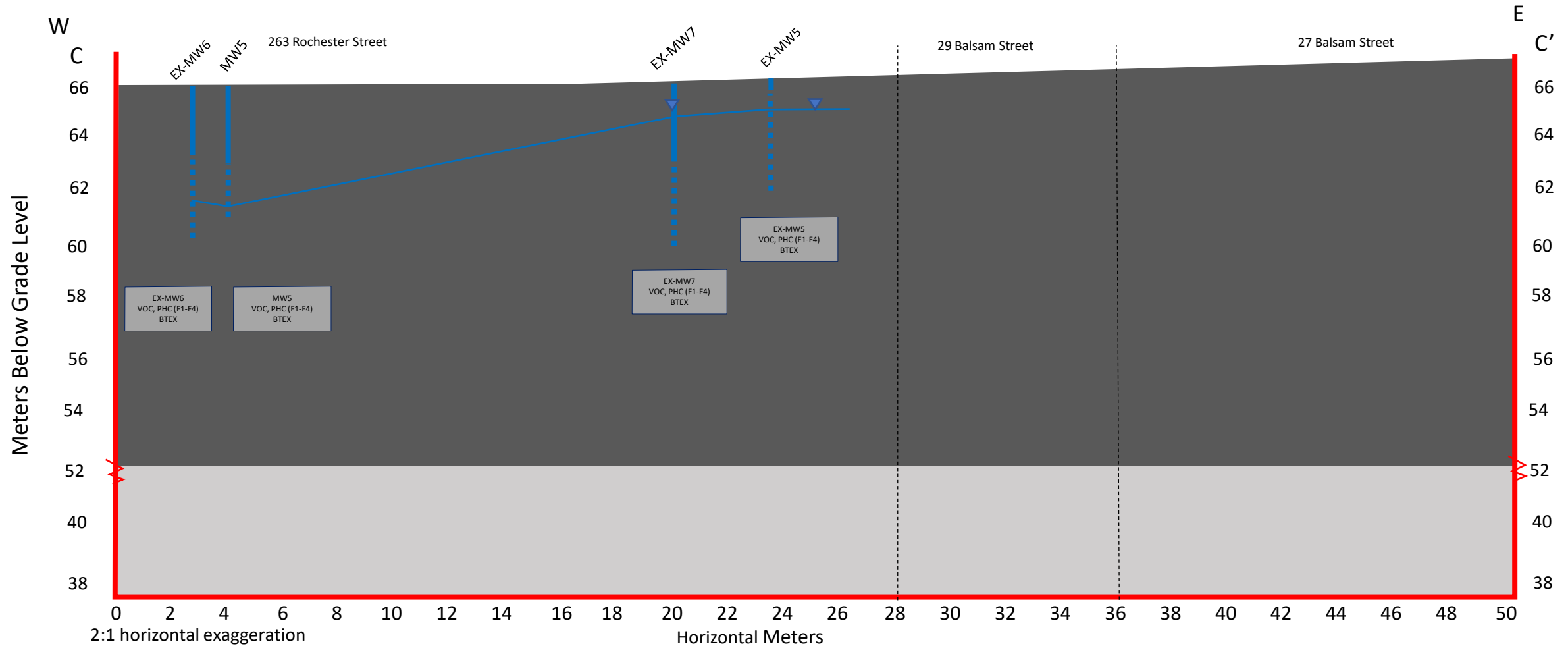
RSC Phase One and Phase Two Subject Property Cross Section

245 – 267 Rochester Street, Ottawa Ontario



R63048	NAME	DATE	 Rubicon Environmental (2008) Inc.	Figure 9: Cross Section B-B'	Legend: Limestone  Water Table  Bedrock  Borehole  Borehole/ Monitoring well)  Casing  Screen  Asphalt 
DRAWN BY:	JG	October 2022			
CHECKED BY:	PDR	October 2022			
27, 29 Balsam Street, & 245 - 267 Rochester Street, Ottawa / ON					

RSC Phase One and Phase Two Subject Property Cross Section 245 – 267 Rochester Street / 27 Balsam Street, Ottawa Ontario



R63048	NAME	DATE	 Rubicon Environmental (2008) Inc.	Figure 10: Cross Section C-C'	Legend: Limestone  Water Table  Bedrock  Borehole  Borehole/ Monitoring well)  Casing  Screen  Asphalt 
DRAWN BY:	JG	October 2022			
CHECKED BY:	PDR	October 2022			
27, 29 Balsam Street, & 245 - 267 Rochester Street, Ottawa / ON					

TABLES

TABLE 1: SOIL AND GROUNDWATER FIELD SAMPLING OBSERVATIONS AND ANALYSIS PLAN

BOREHOLE ID (Max Depth)	SOIL SAMPLE ID	SOIL SAMPLE DEPTH (Mbgf)	RATIONALE/COMMENTS
MW3 (5.00)	N/A	N/A	<ul style="list-style-type: none"> Located within APEC 1 & APEC 2 Soil sample unable to be retrieved due to the ground consisting of bedrock.
MW5 (5.11)	N/A	N/A	<ul style="list-style-type: none"> Located within APEC 1 Soil sample unable to be retrieved due to the ground consisting of bedrock.
Trip Blank	-	-	<ul style="list-style-type: none"> Trip Blank submitted with Soil Laboratory Submission
Groundwater			
Monitoring well	GW Sampling ID	Depth (m)	Comments
EX-MW1 (64.31)	EX-MW1	3.73	<ul style="list-style-type: none"> Located within APEC 1 & APEC 2 No significant well vapour readings using field instruments (< 5 ppm) Groundwater sample analyzed for PHCs & VOCs Duplicate submitted
EX-MW2 (64.63)	EX-MW2	4.52	<ul style="list-style-type: none"> Located within APEC 1 & APEC 2 No significant well vapour readings using field instruments (< 5 ppm) Groundwater sample analyzed for PHCs & VOCs
EX-MW4 (66.8)	EX-MW4	6.29	<ul style="list-style-type: none"> Located within APEC 1 & APEC 2 No significant well vapour readings using field instruments (< 5 ppm) Groundwater sample analyzed for PHCs & VOCs
EX-MW5 (66.82)	EX-MW5	4.33	<ul style="list-style-type: none"> Located within APEC 1 & APEC 2 No significant well vapour readings using field instruments (< 5 ppm) Groundwater sample analyzed for PHCs & VOCs
EX-MW6 (66.35)	EX-MW6	5.81	<ul style="list-style-type: none"> Located within APEC 1 No significant well vapour readings using field instruments (< 5 ppm) Groundwater sample analyzed for PHCs & VOCs
EX-MW7 (66.63)	EX-MW7	5.97	<ul style="list-style-type: none"> Located within APEC 1 & APEC 2 No significant well vapour readings using field instruments (< 5 ppm) Groundwater sample analyzed for PHCs & VOCs
MW3 (66.28)	MW3	6.00	<ul style="list-style-type: none"> Located within APEC 1 & APEC 2 No significant well vapour readings using field instruments (< 5 ppm) Groundwater sample analyzed for PHCs & VOCs
MW5 (66.39)	MW5	5.98	<ul style="list-style-type: none"> Located on the south perimeter line of the subject property, northeast of EX-MW1 No significant well vapour readings using field instruments (< 5 ppm) Groundwater sample analyzed for PHCs & VOCs
Trip Blank	-	-	<ul style="list-style-type: none"> Trip Blank submitted with Groundwater Laboratory Submission

*Refer to Appendix 3 - Borehole Logs

TABLE 2: SUMMARY OF GROUNDWATER LEVELS AND OBSERVATIONS

Monitoring Well ID (Surface Elevation m.a.s.l.)	Well Construction	Screen Elevation (*suspected)	Depth to water table (mbgl)	Water table elevation ¹
EX-MW1 (64.31)	Suspected Screen: 3.00 m Total: 3.73 m	63.58 – 60.58* Masl	1.98 – October 2022	62.23 – January 2022
EX-MW2 (64.63)	Suspected Screen: 3.00 m Total: 4.52 m	63.11 – 60.11* Masl	1.50 – October 2022	63.13 – October 2022
EX-MW4 (66.48)	Suspected Screen: 3.00 m Total: 6.29 m	63.19 – 60.19* Masl	1.33 – October 2022	65.47 – October 2022
EX-MW5 (66.82)	Suspected Screen: 3.00 m Total: 4.33 m	65.49 – 62.49* Masl	1.70 – October 2022	65.12 – October 2022
EX-MW6 (66.35)	Suspected Screen: 3.00 m Total: 5.81 m	63.54 – 60.54* Masl	4.37 – October 2022	61.98 – October 2022
EX-MW7 (66.76)	Suspected Screen: 3.00 m Total: 5.97 m	63.79 – 60.79* Masl	2.14 – October 2022	64.49 – October 2022
MW3 (66.28)	Riser: 2.00 m Screen: 3.00 m Total: 5.00 m	66.28 – 63.28 Masl	2.25 – October 2022	64.03 – October 2022
MW5 (66.39)	Riser: 2.00 m Screen: 3.11 m Total: 5.11 m	66.39 – 63.41 masl	4.22 – October 2022	62.17 – October 2022

TABLE 3: GROUNDWATER CHEMICAL ANALYSIS – VOC/BTEX/PHC (F₁-F₄)/pH

Parameter	2011 MECP Table 7 Residential Coarse	EX-MW1	EX-MW1 DUPE	EX-MW2	EX-MW4	EX-MW5	EX-MW6	EX-MW7	MW3	MW5	TRIP BLANK
Date of Collection		Oct 3, 2022	Oct 3, 2022	Oct 3, 2022	Oct 3, 2022	Oct 3, 2022	Oct 3, 2022	Oct 3, 2022	Oct 3, 2022	Oct 3, 2022	Oct 3, 2022
Date Reported		Oct 14, 2022	Oct 14, 2022	Oct 14, 2022	Oct 14, 2022	Oct 14, 2022	Oct 14, 2022	Oct 14, 2022	Oct 14, 2022	Oct 14, 2022	Oct 14, 2022
Sampling Depth (mbgl)		-	-	-	-	-	-	-	-	-	-
Analytical report reference number		WT2217618	WT2217618	WT2217618	WT2217618	WT2217618	WT2217618	WT2217618	WT2217618	WT2217618	WT2217618
Acetone	10000(U)	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Benzene	0.5(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	67000(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromoform	5(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromomethane	0.89(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon tetrachloride	0.2(U)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	140(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane	2(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroform	65000(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dibromoethane	0.2(U)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	150(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	7600(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	0.5(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	3500(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethane	11(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	0.5(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethylene	0.5(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	1.6(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-Dichloroethylene	1.6(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene Chloride	26(U)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	0.58(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichloropropene (cis & trans)	0.5(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethyl Benzene		<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
n-Hexane		<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methyl Ethyl Ketone	54(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	5(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
MTBE	21000(U)	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Styrene	5200(U)	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
1,1,1,2-Tetrachloroethane	15(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	43(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethylene	1.1(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	0.5(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	0.5(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	320(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	23(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	0.5(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Vinyl chloride	0.5(U)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Xylenes (Total)	72	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
F1 (C6 – C10)	420	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
F2 (C10 – C16)	150	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
F3 (C16 – C34)	500	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250
F4 (C34 – C50)	500	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250

All values in ug/g – ppm – parts per million MDL – method detection limit. D- Duplicate Sample *MOE O. Reg. – Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition, Residential property use, and coarse textured soil criteria applied.

Orange – MDL exceeds applicable SCS

Red – Measured Conc. exceeds applicable SCS

APPENDIX 1 PHOTOGRAPHS



Image 1 – Monitoring Well 4, facing west (later decommissioned)



Image 2 – Monitoring Well 1, facing east (later decommissioned)



Image 3 – Monitoring Well 2, facing west



Image 3 - EXMW2 within the basement foundation



Image 4 – MW3 stick southwest of the subject property



Image 5 – EX-MW1 within basement foundation southwest of the subject property



Image 6 – EX-MW5 south of the subject property



Image 7 – EX-MW7 southwest on the property bounds



Image 8 – EX-MW6 offsite monitoring well



Image 9 – MW5 on the subject property

APPENDIX 2 LABORATORY CERTIFICATES OF ANALYSIS



CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order : WT2217618
Client : Rubicon Environmental Inc.
Contact : Paul Rew
Address : 60 Toronto St
Flesherton ON Canada N0C 1E0
Telephone : 519 924 0003
Project : R63048
PO : ----
C-O-C number : 20-1005665
Sampler : CLIENT
Site : ----
Quote number : SOA
No. of samples received : 10
No. of samples analysed : 10

Page : 1 of 8
Laboratory : Waterloo - Environmental
Account Manager : Gayle Braun
Address : 60 Northland Road, Unit 1
Waterloo, Ontario Canada N2V 2B8
Telephone : +1 519 886 6910
Date Samples Received : 12-Oct-2022 15:28
Date Analysis Commenced : 12-Oct-2022
Issue Date : 14-Oct-2022 14:05

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Organics, Waterloo, Ontario
Sarah Birch	Team Leader - Volatiles	Organics, Waterloo, Ontario



No Breaches Found

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	No Unit
µg/L	micrograms per litre

>: greater than.

<: less than.

Red shading is applied where the result is greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.

For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.



Analytical Results Evaluation

Matrix: Water			Client sample ID	EXMW1	EXMW1-DUPE	EXMW2	EXMW4	EXMW5	EXMW6	EXMW7
			Sampling date/time	03-Oct-2022	03-Oct-2022	03-Oct-2022	03-Oct-2022	03-Oct-2022	03-Oct-2022	03-Oct-2022
			Sub-Matrix	Water	Water	Water	Water	Water	Water	Water
Analyte	CAS Number	Unit	WT2217618-001	WT2217618-002	WT2217618-003	WT2217618-004	WT2217618-005	WT2217618-006	WT2217618-007	
Volatile Organic Compounds										
styrene	100-42-5	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
tetrachloroethane, 1,1,1,2-	630-20-6	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
tetrachloroethane, 1,1,2,2-	79-34-5	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
tetrachloroethylene	127-18-4	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
toluene	108-88-3	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trichloroethane, 1,1,1-	71-55-6	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trichloroethane, 1,1,2-	79-00-5	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trichloroethylene	79-01-6	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trichlorofluoromethane	75-69-4	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
vinyl chloride	75-01-4	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
xylene, m+p-	179601-23-1	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
xylene, o-	95-47-6	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
xylenes, total	1330-20-7	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
BTEX, total	---	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydrocarbons										
F1 (C6-C10)	----	µg/L	<25	<25	<25	<25	<25	<25	<25	<25
F2 (C10-C16)	----	µg/L	<100	<100	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	----	µg/L	<250	<250	<250	<250	<250	<250	<250	<250
F4 (C34-C50)	----	µg/L	<250	<250	<250	<250	<250	<250	<250	<250
F1-BTEX	----	µg/L	<25	<25	<25	<25	<25	<25	<25	<25
hydrocarbons, total (C6-C50)	----	µg/L	<370	<370	<370	<370	<370	<370	<370	<370
chromatogram to baseline at nC50	n/a	-	YES	YES	YES	YES	YES	YES	YES	YES
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	%	98.7	96.9	101	90.9	96.8	96.5	94.6	94.6
dichlorotoluene, 3,4-	97-75-0	%	88.2	99.0	100	96.3	93.0	94.0	94.3	94.3
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	%	94.9	95.8	95.6	95.7	95.3	94.7	95.0	95.0
difluorobenzene, 1,4-	540-36-3	%	100	99.9	99.8	99.8	99.7	99.7	99.8	99.8



Analytical Results Evaluation

Matrix: Water			Client sample ID	MW3	MW5	TRIP BLANK	----	----	----	----
			Sampling date/time	03-Oct-2022	03-Oct-2022	03-Oct-2022	----	----	----	----
			Sub-Matrix	Water	Water	Water	----	----	----	----
Analyte	CAS Number	Unit	WT2217618-008	WT2217618-009	WT2217618-010	-----	-----	-----	-----	-----
Volatile Organic Compounds										
Acetone	67-64-1	µg/L	<20	<20	<20	----	----	----	----	----
benzene	71-43-2	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
bromodichloromethane	75-27-4	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
bromoform	75-25-2	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
bromomethane	74-83-9	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
carbon tetrachloride	56-23-5	µg/L	<0.20	<0.20	<0.20	----	----	----	----	----
chlorobenzene	108-90-7	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
chloroform	67-66-3	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
dibromochloromethane	124-48-1	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
dibromoethane, 1,2-	106-93-4	µg/L	<0.20	<0.20	<0.20	----	----	----	----	----
dichlorobenzene, 1,2-	95-50-1	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
dichlorobenzene, 1,3-	541-73-1	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
dichlorobenzene, 1,4-	106-46-7	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
dichlorodifluoromethane	75-71-8	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
dichloroethane, 1,1-	75-34-3	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
dichloroethane, 1,2-	107-06-2	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
dichloroethylene, 1,1-	75-35-4	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
dichloroethylene, cis-1,2-	156-59-2	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
dichloroethylene, trans-1,2-	156-60-5	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
dichloromethane	75-09-2	µg/L	<1.0	<1.0	<1.0	----	----	----	----	----
dichloropropane, 1,2-	78-87-5	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
dichloropropylene, cis+trans-1,3-	542-75-6	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
dichloropropylene, cis-1,3-	10061-01-5	µg/L	<0.30	<0.30	<0.30	----	----	----	----	----
dichloropropylene, trans-1,3-	10061-02-6	µg/L	<0.30	<0.30	<0.30	----	----	----	----	----
ethylbenzene	100-41-4	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
hexane, n-	110-54-3	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
methyl ethyl ketone [MEK]	78-93-3	µg/L	<20	<20	<20	----	----	----	----	----
methyl isobutyl ketone [MIBK]	108-10-1	µg/L	<20	<20	<20	----	----	----	----	----
methyl-tert-butyl ether [MTBE]	1634-04-4	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
styrene	100-42-5	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----



Analytical Results Evaluation

Matrix: Water			Client sample ID	MW3	MW5	TRIP BLANK	----	----	----	----
			Sampling date/time	03-Oct-2022	03-Oct-2022	03-Oct-2022	----	----	----	----
			Sub-Matrix	Water	Water	Water	----	----	----	----
Analyte	CAS Number	Unit	WT2217618-008	WT2217618-009	WT2217618-010	-----	-----	-----	-----	-----
Volatile Organic Compounds										
tetrachloroethane, 1,1,1,2-	630-20-6	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
tetrachloroethane, 1,1,2,2-	79-34-5	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
tetrachloroethylene	127-18-4	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
toluene	108-88-3	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
trichloroethane, 1,1,1-	71-55-6	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
trichloroethane, 1,1,2-	79-00-5	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
trichloroethylene	79-01-6	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
trichlorofluoromethane	75-69-4	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
vinyl chloride	75-01-4	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
xylene, m+p-	179601-23-1	µg/L	<0.40	<0.40	<0.40	----	----	----	----	----
xylene, o-	95-47-6	µg/L	<0.30	<0.30	<0.30	----	----	----	----	----
xylenes, total	1330-20-7	µg/L	<0.50	<0.50	<0.50	----	----	----	----	----
BTEX, total	----	µg/L	<1.0	<1.0	<1.0	----	----	----	----	----
Hydrocarbons										
F1 (C6-C10)	----	µg/L	<25	<25	----	----	----	----	----	----
F2 (C10-C16)	----	µg/L	<100	<100	----	----	----	----	----	----
F3 (C16-C34)	----	µg/L	<250	<250	----	----	----	----	----	----
F4 (C34-C50)	----	µg/L	<250	<250	----	----	----	----	----	----
F1-BTEX	----	µg/L	<25	<25	----	----	----	----	----	----
hydrocarbons, total (C6-C50)	----	µg/L	<370	<370	----	----	----	----	----	----
chromatogram to baseline at nC50	n/a	-	YES	YES	----	----	----	----	----	----
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	%	87.6	93.0	----	----	----	----	----	----
dichlorotoluene, 3,4-	97-75-0	%	73.1	84.1	----	----	----	----	----	----
Volatile Organic Compounds Surrogates										
bromofluorobenzene, 4-	460-00-4	%	98.3	94.6	95.3	----	----	----	----	----
difluorobenzene, 1,4-	540-36-3	%	99.7	99.5	99.7	----	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.



Summary of Guideline Limits

Analyte	CAS Number	Unit	ON153/04 T7-NPGW-C-AI I	ON153/04 T7-NPGW-F-AII					
Volatile Organic Compounds									
Acetone	67-64-1	µg/L	100000 µg/L	100000 µg/L					
benzene	71-43-2	µg/L	0.5 µg/L	0.5 µg/L					
bromodichloromethane	75-27-4	µg/L	67000 µg/L	67000 µg/L					
bromoform	75-25-2	µg/L	5 µg/L	5 µg/L					
bromomethane	74-83-9	µg/L	0.89 µg/L	0.89 µg/L					
BTEX, total	----	µg/L							
carbon tetrachloride	56-23-5	µg/L	0.2 µg/L	0.2 µg/L					
chlorobenzene	108-90-7	µg/L	140 µg/L	140 µg/L					
chloroform	67-66-3	µg/L	2 µg/L	2 µg/L					
dibromochloromethane	124-48-1	µg/L	65000 µg/L	65000 µg/L					
dibromoethane, 1,2-	106-93-4	µg/L	0.2 µg/L	0.2 µg/L					
dichlorobenzene, 1,2-	95-50-1	µg/L	150 µg/L	150 µg/L					
dichlorobenzene, 1,3-	541-73-1	µg/L	7600 µg/L	7600 µg/L					
dichlorobenzene, 1,4-	106-46-7	µg/L	0.5 µg/L	0.5 µg/L					
dichlorodifluoromethane	75-71-8	µg/L	3500 µg/L	3500 µg/L					
dichloroethane, 1,1-	75-34-3	µg/L	11 µg/L	11 µg/L					
dichloroethane, 1,2-	107-06-2	µg/L	0.5 µg/L	0.5 µg/L					
dichloroethylene, 1,1-	75-35-4	µg/L	0.5 µg/L	0.5 µg/L					
dichloroethylene, cis-1,2-	156-59-2	µg/L	1.6 µg/L	1.6 µg/L					
dichloroethylene, trans-1,2-	156-60-5	µg/L	1.6 µg/L	1.6 µg/L					
dichloromethane	75-09-2	µg/L	26 µg/L	26 µg/L					
dichloropropane, 1,2-	78-87-5	µg/L	0.58 µg/L	0.58 µg/L					
dichloropropylene, cis+trans-1,3-	542-75-6	µg/L	0.5 µg/L	0.5 µg/L					
dichloropropylene, cis-1,3-	10061-01-5	µg/L							
dichloropropylene, trans-1,3-	10061-02-6	µg/L							
ethylbenzene	100-41-4	µg/L	54 µg/L	54 µg/L					
hexane, n-	110-54-3	µg/L	5 µg/L	5 µg/L					
methyl ethyl ketone [MEK]	78-93-3	µg/L	21000 µg/L	21000 µg/L					
methyl isobutyl ketone [MIBK]	108-10-1	µg/L	5200 µg/L	5200 µg/L					
methyl-tert-butyl ether [MTBE]	1634-04-4	µg/L	15 µg/L	15 µg/L					
styrene	100-42-5	µg/L	43 µg/L	43 µg/L					
tetrachloroethane, 1,1,1,2-	630-20-6	µg/L	1.1 µg/L	1.1 µg/L					
tetrachloroethane, 1,1,2,2-	79-34-5	µg/L	0.5 µg/L	0.5 µg/L					
tetrachloroethylene	127-18-4	µg/L	0.5 µg/L	0.5 µg/L					
toluene	108-88-3	µg/L	320 µg/L	320 µg/L					
trichloroethane, 1,1,1-	71-55-6	µg/L	23 µg/L	23 µg/L					



Analyte	CAS Number	Unit	ON153/04 T7-NPGW-C-All	ON153/04 T7-NPGW-F-All					
Volatile Organic Compounds - Continued									
trichloroethane, 1,1,2-	79-00-5	µg/L	0.5 µg/L	0.5 µg/L					
trichloroethylene	79-01-6	µg/L	0.5 µg/L	0.5 µg/L					
trichlorofluoromethane	75-69-4	µg/L	2000 µg/L	2000 µg/L					
vinyl chloride	75-01-4	µg/L	0.5 µg/L	0.5 µg/L					
xylene, m+p-	179601-23-1	µg/L							
xylene, o-	95-47-6	µg/L							
xylene, total	1330-20-7	µg/L	72 µg/L	72 µg/L					
Hydrocarbons									
chromatogram to baseline at nC50	n/a	-							
F1 (C6-C10)	----	µg/L	420 µg/L	420 µg/L					
F1-BTEX	----	µg/L	420 µg/L	420 µg/L					
F2 (C10-C16)	----	µg/L	150 µg/L	150 µg/L					
F3 (C16-C34)	----	µg/L	500 µg/L	500 µg/L					
F4 (C34-C50)	----	µg/L	500 µg/L	500 µg/L					
hydrocarbons, total (C6-C50)	----	µg/L							

Please refer to the General Comments section for an explanation of any qualifiers detected.

Key:

ON153/04

T7-NPGW-C-All

T7-NPGW-F-All

Ontario Regulation 153/04 - April 15, 2011 Standards (JUL, 2011)

153 T7-Non-Potable Ground Water-All Types of Property Use - Coarse

153 T7-Non-Potable Ground Water-All Types of Property Uses (Fine)

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: WT2217618	Page	: 1 of 9
Client	: Rubicon Environmental Inc.	Laboratory	: Waterloo - Environmental
Contact	: Paul Rew	Account Manager	: Gayle Braun
Address	: 60 Toronto St Flesherton ON Canada N0C 1E0	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: 519 924 0003	Telephone	: +1 519 886 6910
Project	: R63048	Date Samples Received	: 12-Oct-2022 15:28
PO	: ----	Issue Date	: 14-Oct-2022 14:05
C-O-C number	: 20-1005665		
Sampler	: CLIENT		
Site	: ----		
Quote number	: SOA		
No. of samples received	: 10		
No. of samples analysed	: 10		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- Matrix Spike outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Volatile Organic Compounds	QC-693114-002	----	Acetone	67-64-1	E611D	150 % LCS-H	70.0-130%	Recovery greater than upper control limit
Volatile Organic Compounds	QC-693114-002	----	methyl ethyl ketone [MEK]	78-93-3	E611D	148 % LCS-H	70.0-130%	Recovery greater than upper control limit
Volatile Organic Compounds	QC-693114-002	----	methyl isobutyl ketone [MIBK]	108-10-1	E611D	140 % MES	70.0-130%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).

Matrix Spike (MS) Recoveries								
Volatile Organic Compounds	Anonymous	Anonymous	methyl ethyl ketone [MEK]	78-93-3	E611D	145 % MES	60.0-140%	Recovery greater than upper data quality objective

Result Qualifiers

Qualifier	Description
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)											
Glass vial (sodium bisulfate) EXMW1	E581.F1-L	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✓	
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)											
Glass vial (sodium bisulfate) EXMW1-DUPE	E581.F1-L	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✓	
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)											
Glass vial (sodium bisulfate) EXMW2	E581.F1-L	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✓	
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)											
Glass vial (sodium bisulfate) EXMW4	E581.F1-L	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✓	
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)											
Glass vial (sodium bisulfate) EXMW5	E581.F1-L	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✓	
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)											
Glass vial (sodium bisulfate) EXMW6	E581.F1-L	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✓	
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)											
Glass vial (sodium bisulfate) EXMW7	E581.F1-L	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✓	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)											
Glass vial (sodium bisulfate) MW3	E581.F1-L	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✓	
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)											
Glass vial (sodium bisulfate) MW5	E581.F1-L	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✓	
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) EXMW1	E601.SG	03-Oct-2022	13-Oct-2022	14 days	10 days	✓	13-Oct-2022	40 days	0 days	✓	
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) EXMW1-DUPE	E601.SG	03-Oct-2022	13-Oct-2022	14 days	10 days	✓	13-Oct-2022	40 days	0 days	✓	
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) EXMW2	E601.SG	03-Oct-2022	13-Oct-2022	14 days	10 days	✓	13-Oct-2022	40 days	0 days	✓	
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) EXMW4	E601.SG	03-Oct-2022	13-Oct-2022	14 days	10 days	✓	13-Oct-2022	40 days	0 days	✓	
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) EXMW5	E601.SG	03-Oct-2022	13-Oct-2022	14 days	10 days	✓	13-Oct-2022	40 days	0 days	✓	
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) EXMW6	E601.SG	03-Oct-2022	13-Oct-2022	14 days	10 days	✓	13-Oct-2022	40 days	0 days	✓	
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) EXMW7	E601.SG	03-Oct-2022	13-Oct-2022	14 days	10 days	✓	13-Oct-2022	40 days	0 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) MW3	E601.SG	03-Oct-2022	13-Oct-2022	14 days	10 days	✔	13-Oct-2022	40 days	0 days	✔	
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID											
Amber glass/Teflon lined cap (sodium bisulfate) MW5	E601.SG	03-Oct-2022	13-Oct-2022	14 days	10 days	✔	13-Oct-2022	40 days	0 days	✔	
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS											
Glass vial (sodium bisulfate) EXMW1	E611D	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✔	
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS											
Glass vial (sodium bisulfate) EXMW1-DUPE	E611D	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✔	
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS											
Glass vial (sodium bisulfate) EXMW2	E611D	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✔	
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS											
Glass vial (sodium bisulfate) EXMW4	E611D	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✔	
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS											
Glass vial (sodium bisulfate) EXMW5	E611D	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✔	
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS											
Glass vial (sodium bisulfate) EXMW6	E611D	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✔	
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS											
Glass vial (sodium bisulfate) EXMW7	E611D	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW3	E611D	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass vial (sodium bisulfate) MW5	E611D	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass vial (sodium bisulfate) TRIP BLANK	E611D	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	14 days	10 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Duplicates (DUP)							
CCME PHC - F1 by Headspace GC-FID (Low Level)	E581.F1-L	693117	1	18	5.5	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	693114	2	20	10.0	5.0	✓
Laboratory Control Samples (LCS)							
CCME PHC - F1 by Headspace GC-FID (Low Level)	E581.F1-L	693117	1	18	5.5	5.0	✓
Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID	E601.SG	693420	1	16	6.2	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	693114	1	20	5.0	5.0	✓
Method Blanks (MB)							
CCME PHC - F1 by Headspace GC-FID (Low Level)	E581.F1-L	693117	1	18	5.5	5.0	✓
Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID	E601.SG	693420	1	16	6.2	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	693114	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
CCME PHC - F1 by Headspace GC-FID (Low Level)	E581.F1-L	693117	1	18	5.5	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	693114	1	20	5.0	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
CCME PHC - F1 by Headspace GC-FID (Low Level)	E581.F1-L Waterloo - Environmental	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID	E601.SG Waterloo - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are subjected to in-situ silica gel treatment prior to analysis by GC-FID for CCME hydrocarbon fractions (F2-F4).
VOCs (Eastern Canada List) by Headspace GC-MS	E611D Waterloo - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
F1-BTEX	EC580 Waterloo - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
SUM F1 to F4 where F2-F4 is SG treated	EC581SG Waterloo - Environmental	Water	CCME PHC in Soil - Tier 1	Hydrocarbons, total (C6-C50) is the sum of CCME Fraction F1(C6-C10), F2(C10-C16), F3(C16-C34), and F4(C34-C50), where F2-F4 have been treated with silica gel. F4G-sg is not used within this calculation due to overlap with other fractions.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
VOCs Preparation for Headspace Analysis	EP581 Waterloo - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Waterloo - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.



QUALITY CONTROL REPORT

Work Order : **WT2217618**
Client : Rubicon Environmental Inc.
Contact : Paul Rew
Address : 60 Toronto St
Flesherton ON Canada N0C 1E0
Telephone : 519 924 0003
Project : R63048
PO : ----
C-O-C number : 20-1005665
Sampler : CLIENT
Site : ----
Quote number : SOA
No. of samples received : 10
No. of samples analysed : 10

Page : 1 of 10
Laboratory : Waterloo - Environmental
Account Manager : Gayle Braun
Address : 60 Northland Road, Unit 1
Waterloo, Ontario Canada N2V 2B8
Telephone : +1 519 886 6910
Date Samples Received : 12-Oct-2022 15:28
Date Analysis Commenced : 12-Oct-2022
Issue Date : 14-Oct-2022 14:05

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Waterloo Organics, Waterloo, Ontario
Sarah Birch	Team Leader - Volatiles	Waterloo Organics, Waterloo, Ontario

Page : 2 of 10
Work Order : WT2217618
Client : Rubicon Environmental Inc.
Project : R63048



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Volatile Organic Compounds (QC Lot: 693114)											
TY2202625-001	Anonymous	Acetone	67-64-1	E611D	20	µg/L	24	25	0.7	Diff <2x LOR	----
TY2202625-001	Anonymous	benzene	71-43-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		bromodichloromethane	75-27-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		bromoform	75-25-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		bromomethane	74-83-9	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		carbon tetrachloride	56-23-5	E611D	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		chlorobenzene	108-90-7	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloroform	67-66-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dibromochloromethane	124-48-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dibromoethane, 1,2-	106-93-4	E611D	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		dichlorobenzene, 1,2-	95-50-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorobenzene, 1,3-	541-73-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorobenzene, 1,4-	106-46-7	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorodifluoromethane	75-71-8	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethane, 1,1-	75-34-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethane, 1,2-	107-06-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, 1,1-	75-35-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, cis-1,2-	156-59-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, trans-1,2-	156-60-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloromethane	75-09-2	E611D	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		dichloropropane, 1,2-	78-87-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloropropylene, cis-1,3-	10061-01-5	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
		dichloropropylene, trans-1,3-	10061-02-6	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		hexane, n-	110-54-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	<20	<20	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tetrachloroethylene	127-18-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----



Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD(%) or Difference</i>	<i>Duplicate Limits</i>	<i>Qualifier</i>
Volatile Organic Compounds (QC Lot: 693114) - continued											
TY2202625-001	Anonymous	toluene	108-88-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichloroethane, 1,1,1-	71-55-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichloroethane, 1,1,2-	79-00-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichloroethylene	79-01-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichlorofluoromethane	75-69-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		vinyl chloride	75-01-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611D	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 693117)											
TY2202625-001	Anonymous	F1 (C6-C10)	----	E581.F1-L	25	µg/L	<25	<25	0	Diff <2x LOR	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 693114)						
Acetone	67-64-1	E611D	20	µg/L	<20	----
benzene	71-43-2	E611D	0.5	µg/L	<0.50	----
bromodichloromethane	75-27-4	E611D	0.5	µg/L	<0.50	----
bromoform	75-25-2	E611D	0.5	µg/L	<0.50	----
bromomethane	74-83-9	E611D	0.5	µg/L	<0.50	----
carbon tetrachloride	56-23-5	E611D	0.2	µg/L	<0.20	----
chlorobenzene	108-90-7	E611D	0.5	µg/L	<0.50	----
chloroform	67-66-3	E611D	0.5	µg/L	<0.50	----
dibromochloromethane	124-48-1	E611D	0.5	µg/L	<0.50	----
dibromoethane, 1,2-	106-93-4	E611D	0.2	µg/L	<0.20	----
dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	<0.50	----
dichlorobenzene, 1,3-	541-73-1	E611D	0.5	µg/L	<0.50	----
dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	<0.50	----
dichlorodifluoromethane	75-71-8	E611D	0.5	µg/L	<0.50	----
dichloroethane, 1,1-	75-34-3	E611D	0.5	µg/L	<0.50	----
dichloroethane, 1,2-	107-06-2	E611D	0.5	µg/L	<0.50	----
dichloroethylene, 1,1-	75-35-4	E611D	0.5	µg/L	<0.50	----
dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	<0.50	----
dichloroethylene, trans-1,2-	156-60-5	E611D	0.5	µg/L	<0.50	----
dichloromethane	75-09-2	E611D	1	µg/L	<1.0	----
dichloropropane, 1,2-	78-87-5	E611D	0.5	µg/L	<0.50	----
dichloropropylene, cis-1,3-	10061-01-5	E611D	0.3	µg/L	<0.30	----
dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	<0.30	----
ethylbenzene	100-41-4	E611D	0.5	µg/L	<0.50	----
hexane, n-	110-54-3	E611D	0.5	µg/L	<0.50	----
methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	----
methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	<20	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	<0.50	----
styrene	100-42-5	E611D	0.5	µg/L	<0.50	----
tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.5	µg/L	<0.50	----
tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	<0.50	----
tetrachloroethylene	127-18-4	E611D	0.5	µg/L	<0.50	----
toluene	108-88-3	E611D	0.5	µg/L	<0.50	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 693114) - continued						
trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	<0.50	----
trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	<0.50	----
trichloroethylene	79-01-6	E611D	0.5	µg/L	<0.50	----
trichlorofluoromethane	75-69-4	E611D	0.5	µg/L	<0.50	----
vinyl chloride	75-01-4	E611D	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611D	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611D	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 693117)						
F1 (C6-C10)	----	E581.F1-L	25	µg/L	<25	----
Hydrocarbons (QCLot: 693420)						
F2 (C10-C16)	----	E601.SG	100	µg/L	<100	----
F3 (C16-C34)	----	E601.SG	250	µg/L	<250	----
F4 (C34-C50)	----	E601.SG	250	µg/L	<250	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Volatile Organic Compounds (QCLot: 693114)									
Acetone	67-64-1	E611D	20	µg/L	100 µg/L	# 150	70.0	130	LCS-H
benzene	71-43-2	E611D	0.5	µg/L	100 µg/L	104	70.0	130	----
bromodichloromethane	75-27-4	E611D	0.5	µg/L	100 µg/L	117	70.0	130	----
bromoform	75-25-2	E611D	0.5	µg/L	100 µg/L	114	70.0	130	----
bromomethane	74-83-9	E611D	0.5	µg/L	100 µg/L	113	60.0	140	----
carbon tetrachloride	56-23-5	E611D	0.2	µg/L	100 µg/L	98.1	70.0	130	----
chlorobenzene	108-90-7	E611D	0.5	µg/L	100 µg/L	98.5	70.0	130	----
chloroform	67-66-3	E611D	0.5	µg/L	100 µg/L	105	70.0	130	----
dibromochloromethane	124-48-1	E611D	0.5	µg/L	100 µg/L	114	70.0	130	----
dibromoethane, 1,2-	106-93-4	E611D	0.2	µg/L	100 µg/L	118	70.0	130	----
dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	100 µg/L	102	70.0	130	----
dichlorobenzene, 1,3-	541-73-1	E611D	0.5	µg/L	100 µg/L	94.0	70.0	130	----
dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	100 µg/L	95.8	70.0	130	----
dichlorodifluoromethane	75-71-8	E611D	0.5	µg/L	100 µg/L	124	60.0	140	----
dichloroethane, 1,1-	75-34-3	E611D	0.5	µg/L	100 µg/L	109	70.0	130	----
dichloroethane, 1,2-	107-06-2	E611D	0.5	µg/L	100 µg/L	119	70.0	130	----
dichloroethylene, 1,1-	75-35-4	E611D	0.5	µg/L	100 µg/L	95.4	70.0	130	----
dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	100 µg/L	105	70.0	130	----
dichloroethylene, trans-1,2-	156-60-5	E611D	0.5	µg/L	100 µg/L	99.0	70.0	130	----
dichloromethane	75-09-2	E611D	1	µg/L	100 µg/L	111	70.0	130	----
dichloropropane, 1,2-	78-87-5	E611D	0.5	µg/L	100 µg/L	109	70.0	130	----
dichloropropylene, cis-1,3-	10061-01-5	E611D	0.3	µg/L	100 µg/L	116	70.0	130	----
dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	100 µg/L	119	70.0	130	----
ethylbenzene	100-41-4	E611D	0.5	µg/L	100 µg/L	93.8	70.0	130	----
hexane, n-	110-54-3	E611D	0.5	µg/L	100 µg/L	93.2	70.0	130	----
methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	100 µg/L	# 148	70.0	130	LCS-H
methyl isobutyl ketone [MIBK]	108-10-1	E611D	20	µg/L	100 µg/L	# 140	70.0	130	MES
methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	0.5	µg/L	100 µg/L	102	70.0	130	----
styrene	100-42-5	E611D	0.5	µg/L	100 µg/L	103	70.0	130	----
tetrachloroethane, 1,1,1,2-	630-20-6	E611D	0.5	µg/L	100 µg/L	101	70.0	130	----
tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	100 µg/L	122	70.0	130	----
tetrachloroethylene	127-18-4	E611D	0.5	µg/L	100 µg/L	92.5	70.0	130	----
toluene	108-88-3	E611D	0.5	µg/L	100 µg/L	96.7	70.0	130	----
trichloroethane, 1,1,1-	71-55-6	E611D	0.5	µg/L	100 µg/L	97.1	70.0	130	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 693114) - continued									
trichloroethane, 1,1,2-	79-00-5	E611D	0.5	µg/L	100 µg/L	116	70.0	130	----
trichloroethylene	79-01-6	E611D	0.5	µg/L	100 µg/L	97.2	70.0	130	----
trichlorofluoromethane	75-69-4	E611D	0.5	µg/L	100 µg/L	96.6	60.0	140	----
vinyl chloride	75-01-4	E611D	0.5	µg/L	100 µg/L	94.9	60.0	140	----
xylene, m+p-	179601-23-1	E611D	0.4	µg/L	200 µg/L	93.8	70.0	130	----
xylene, o-	95-47-6	E611D	0.3	µg/L	100 µg/L	96.4	70.0	130	----
Hydrocarbons (QCLot: 693117)									
F1 (C6-C10)	----	E581.F1-L	25	µg/L	2000 µg/L	97.7	80.0	120	----
Hydrocarbons (QCLot: 693420)									
F2 (C10-C16)	----	E601.SG	100	µg/L	4382.38 µg/L	111	70.0	130	----
F3 (C16-C34)	----	E601.SG	250	µg/L	5331.82 µg/L	116	70.0	130	----
F4 (C34-C50)	----	E601.SG	250	µg/L	4620.98 µg/L	113	70.0	130	----

Qualifiers

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level $\geq 1 \times$ spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 693114)										
TY2202625-001	Anonymous	benzene	71-43-2	E611D	102 µg/L	100 µg/L	102	60.0	140	----
		bromodichloromethane	75-27-4	E611D	114 µg/L	100 µg/L	114	60.0	140	----
		bromoform	75-25-2	E611D	110 µg/L	100 µg/L	110	60.0	140	----
		bromomethane	74-83-9	E611D	104 µg/L	100 µg/L	104	60.0	140	----
		carbon tetrachloride	56-23-5	E611D	95.3 µg/L	100 µg/L	95.3	60.0	140	----
		chlorobenzene	108-90-7	E611D	96.3 µg/L	100 µg/L	96.3	60.0	140	----
		chloroform	67-66-3	E611D	102 µg/L	100 µg/L	102	60.0	140	----
		dibromochloromethane	124-48-1	E611D	111 µg/L	100 µg/L	111	60.0	140	----
		dibromoethane, 1,2-	106-93-4	E611D	114 µg/L	100 µg/L	114	60.0	140	----
		dichlorobenzene, 1,2-	95-50-1	E611D	100 µg/L	100 µg/L	100	60.0	140	----
		dichlorobenzene, 1,3-	541-73-1	E611D	93.4 µg/L	100 µg/L	93.4	60.0	140	----
		dichlorobenzene, 1,4-	106-46-7	E611D	95.1 µg/L	100 µg/L	95.1	60.0	140	----
		dichlorodifluoromethane	75-71-8	E611D	98.2 µg/L	100 µg/L	98.2	60.0	140	----
		dichloroethane, 1,1-	75-34-3	E611D	106 µg/L	100 µg/L	106	60.0	140	----
		dichloroethane, 1,2-	107-06-2	E611D	116 µg/L	100 µg/L	116	60.0	140	----
		dichloroethylene, 1,1-	75-35-4	E611D	91.0 µg/L	100 µg/L	91.0	60.0	140	----
		dichloroethylene, cis-1,2-	156-59-2	E611D	102 µg/L	100 µg/L	102	60.0	140	----
		dichloroethylene, trans-1,2-	156-60-5	E611D	96.6 µg/L	100 µg/L	96.6	60.0	140	----
		dichloromethane	75-09-2	E611D	108 µg/L	100 µg/L	108	60.0	140	----
		dichloropropane, 1,2-	78-87-5	E611D	107 µg/L	100 µg/L	107	60.0	140	----
		dichloropropylene, cis-1,3-	10061-01-5	E611D	110 µg/L	100 µg/L	110	60.0	140	----
		dichloropropylene, trans-1,3-	10061-02-6	E611D	110 µg/L	100 µg/L	110	60.0	140	----
		ethylbenzene	100-41-4	E611D	91.7 µg/L	100 µg/L	91.7	60.0	140	----
		hexane, n-	110-54-3	E611D	88.7 µg/L	100 µg/L	88.7	60.0	140	----
		methyl ethyl ketone [MEK]	78-93-3	E611D	145 µg/L	100 µg/L	145	60.0	140	MES
		methyl isobutyl ketone [MIBK]	108-10-1	E611D	136 µg/L	100 µg/L	136	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611D	99.9 µg/L	100 µg/L	99.9	60.0	140	----
		styrene	100-42-5	E611D	100 µg/L	100 µg/L	100	60.0	140	----
		tetrachloroethane, 1,1,1,2-	630-20-6	E611D	98.3 µg/L	100 µg/L	98.3	60.0	140	----
		tetrachloroethane, 1,1,2,2-	79-34-5	E611D	117 µg/L	100 µg/L	117	60.0	140	----
		tetrachloroethylene	127-18-4	E611D	90.2 µg/L	100 µg/L	90.2	60.0	140	----
		toluene	108-88-3	E611D	94.2 µg/L	100 µg/L	94.2	60.0	140	----
		trichloroethane, 1,1,1-	71-55-6	E611D	94.0 µg/L	100 µg/L	94.0	60.0	140	----



Sub-Matrix: **Water**

					<i>Matrix Spike (MS) Report</i>					
					<i>Spike</i>		<i>Recovery (%)</i>	<i>Recovery Limits (%)</i>		
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>Concentration</i>	<i>Target</i>	<i>MS</i>	<i>Low</i>	<i>High</i>	<i>Qualifier</i>
Volatile Organic Compounds (QCLot: 693114) - continued										
TY2202625-001	Anonymous	trichloroethane, 1,1,2-	79-00-5	E611D	112 µg/L	100 µg/L	112	60.0	140	----
		trichloroethylene	79-01-6	E611D	95.4 µg/L	100 µg/L	95.4	60.0	140	----
		trichlorofluoromethane	75-69-4	E611D	91.2 µg/L	100 µg/L	91.2	60.0	140	----
		vinyl chloride	75-01-4	E611D	87.3 µg/L	100 µg/L	87.3	60.0	140	----
		xylene, m+p-	179601-23-1	E611D	184 µg/L	200 µg/L	91.8	60.0	140	----
		xylene, o-	95-47-6	E611D	94.2 µg/L	100 µg/L	94.2	60.0	140	----
Hydrocarbons (QCLot: 693117)										
TY2202625-001	Anonymous	F1 (C6-C10)	----	E581.F1-L	2110 µg/L	2000 µg/L	106	60.0	140	----

Qualifiers

<i>Qualifier</i>	<i>Description</i>
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).



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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 1005665

Page of

Report To: Rubicon Environmental (2008) Inc.

Company: 549-942-7358

Contact: 723361 Side Road 250

City/Province: Melina, ON

Postal Code: L9V 2N9

Invoice To: Same as Report To

Company: Copy of Invoice with Report

Project Information

ALS Account # / Quote #: P63048

Job #: P63048

PO / AFE:

LSD:

ALS Lab Work Order # (ALS use only):

Sample Identification and/or Coordinates (This description will appear on the report)

EXMMW1

EXMMW1A-Dupe

EXMMW2

EXMMW4

EXMMW5

EXMMW6

EXMMW7

MW3

MW5

Trip Blank

Reports / Recipients

Select Report Format: PDF, EXCEL, EDD (DIGITAL)

Merge COC/CI Reports with COA

Select Distribution: EMAIL, MAIL, FAX

Email 1 or Fax: 549-942-7358

Email 2

Email 3

Select Invoice Distribution: EMAIL, MAIL, FAX

Email 1 or Fax: 549-942-7358

Email 2

Oil and Gas Required Fields (client use)

AFE/Cost Center:

Major/Minor Code:

Requisitioner:

Location:

ALS Contact: Google

Date: 03-OCT-12

Time: 10:30 AM

Sample Type: Water

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Turnaround Time (TAT) Requested

Routine [R] if received by 3pm M-F - no surcharges apply

4 day [P4] if received by 3pm M-F - 20% rush surcharge apply

3 day [P3] if received by 3pm M-F - 25% rush surcharge apply

2 day [P2] if received by 3pm M-F - 50% rush surcharge apply

1 day [P1] if received by 3pm M-F - 100% rush surcharge apply

Same day [E] if received by 10am M-S - 200% rush surcharge apply

Date and Time Required for all EAP TATs:

Indicate Filtered (F), Preserved (P) or Filtered

Analysis

VOC

PH (CFI-FW)

PH

PH

PH

PH

PH

PH

PH

PH

Environmental Division

Waterloo

Work Order Reference

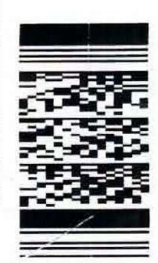
WT2217618

Telephone: +1 519 886 6910

SAMPLES ON HOLD

EXTENDED STORAGE

SUSPECTED HAZARD



Drinking Water (DW) Samples (client use)

Are samples taken from a Regulated DW System?

Are samples for human consumption/ use?

Released by:

SHIPMENT RELEASE (client use)

Time: 5:30 PM

ALS 2002 FORM

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY

YELLOW - CLIENT COPY

MA WU-163 / MM-285 / QR-328

APPENDIX 3 BOREHOLE LOGS



LOG OF MW3

PROJECT NUMBER R63048.10
PROJECT NAME PII RSC
CLIENT 3N Group Holdings Inc.
ADDRESS 27, 29 Balsam Street, & 245 - 267 Rochester Street, Ottawa, ON
DRILLING DATE February 7, 2022
DRILL RIG Acker AD II Truck Mount Rig
DRILLING METHOD Hollow Stem Auger, Split Sp
TOTAL DEPTH 5.00 m
DIAMETER 2.5 inch spoon, 5 inch auger
SURFACE ELEVATION CENTROID
LOGGED BY AA
CHECKED BY Paul Rew

COMPLETION **CASING** uPVC **SCREEN** uPVC Factory Slotted

COMMENTS

Depth (m)	PID	Samples	Sample Type	Analysis	Water	Well Installation	Material Description	Graphic Log	Moisture	Additional Observations	Depth
0.2		SS1	Soil				- Topsoil				0.2
0.4	<5 ppm						- Weathered Limestone				0.4
0.6											0.6
0.8		SS2	Soil								0.8
1.0											1.0
1.2											1.2
1.4	<5 ppm										1.4
1.6		SS3	Soil								1.6
1.8											1.8
2.0											2.0
2.2	<5 ppm										2.2
2.4		SS4	Soil				- Limestone				2.4
2.6											2.6
2.8											2.8
3.0		SS5	Soil								3.0
3.2	<5 ppm										3.2
3.4											3.4
3.6											3.6
3.8		SS6	Soil								3.8
4.0	<5 ppm										4.0
4.2											4.2
4.4											4.4
4.6		SS7									4.6
4.8	<5 ppm										4.8
5.0					▽		Total depth 5.00 m				5.0
5.2											5.2

Disclaimer This bore log is intended for environmental not geotechnical purposes.



LOG OF MW5

PROJECT NUMBER R63048.10		DRILL RIG Acker AD II Truck Mount Rig		SURFACE ELEVATION CENTROID	
PROJECT NAME PII RSC		DRILLING METHOD Hollow Stem Auger, Split Sp		LOGGED BY AA	
CLIENT 3N Group Holdings Inc.		TOTAL DEPTH 5.11 m		CHECKED BY Paul Rew	
ADDRESS 27, 29 Balsam Street, & 245 - 267 Rochester Street, Ottawa, ON		DIAMETER 2.5 inch spoon, 5 inch auger			
DRILLING DATE April 22, 2022					

COMPLETION	CASING uPVC	SCREEN uPVC Factory Slotted
-------------------	--------------------	------------------------------------

COMMENTS

Depth (m)	PID	Samples	Sample Type	Analysis	Water	Well Installation	Material Description	Graphic Log	Moisture	Additional Observations	Depth
0.2		SS1	Soil				- Topsoil				0.2
0.4	<5 ppm						- Weathered Limestone				0.4
0.6											0.6
0.8		SS2	Soil								0.8
1.0											1.0
1.2											1.2
1.4	<5 ppm										1.4
1.6		SS3	Soil								1.6
1.8											1.8
2.0											2.0
2.2	<5 ppm										2.2
2.4		SS4	Soil				- Limestone				2.4
2.6											2.6
2.8											2.8
3.0											3.0
3.2	<5 ppm	SS5	Soil								3.2
3.4											3.4
3.6											3.6
3.8		SS6	Soil								3.8
4.0	<5 ppm										4.0
4.2											4.2
4.4											4.4
4.6		SS7	Soil								4.6
4.8	<5 ppm										4.8
5.0					▽						5.0
5.2							Total depth 5.11 m				5.2

Disclaimer This bore log is intended for environmental not geotechnical purposes.