



**REPORT**

**Westbay Monitoring Well System M20-3071  
Groundwater Quality  
Meliadine Extension  
*Factual Report***

Submitted to:

**Agnico Eagle Mines Limited**  
Colleen Prather and Michel Groleau

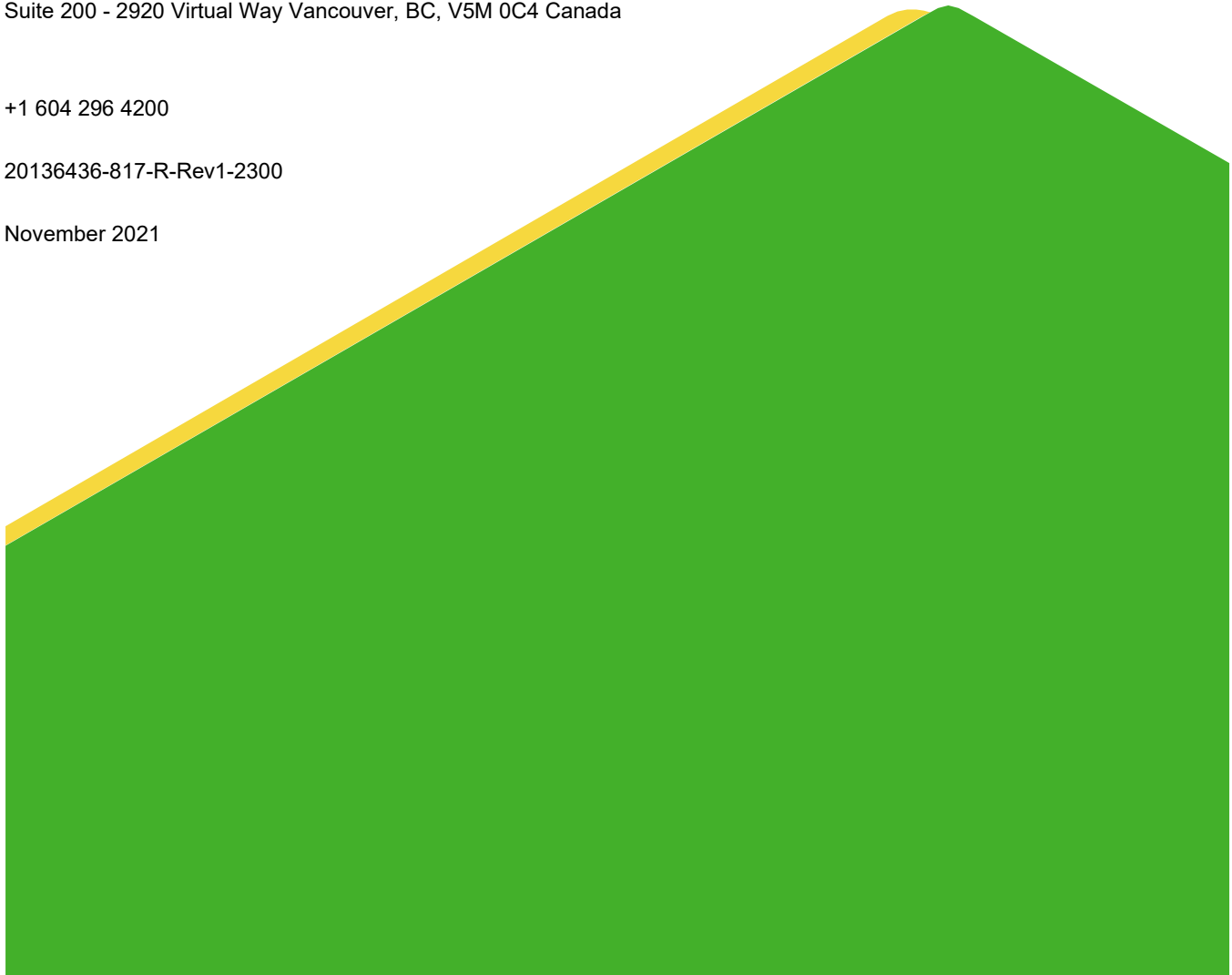
Submitted by:

**Golder Associates Ltd.**  
Suite 200 - 2920 Virtual Way Vancouver, BC, V5M 0C4 Canada

+1 604 296 4200

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## 1.0 INTRODUCTION

Agnico-Eagle Mines Limited (Agnico Eagle) retained Golder Associates Ltd. (Golder) through Nuqsana Golder to install and develop a multi-level well (Westbay system monitoring well M20-3071) near the proposed Discovery Underground to support the assessment of future underground water quality that would be intercepted during mining of the proposed Meliadine Extension. This report summarizes the well development, water sampling and groundwater quality analytical results obtained from Westbay well M20-3071 during the fall of 2020. Well installation was documented in a separate report, which is included in APPENDIX A for reference.

## 2.0 METHODOLOGY

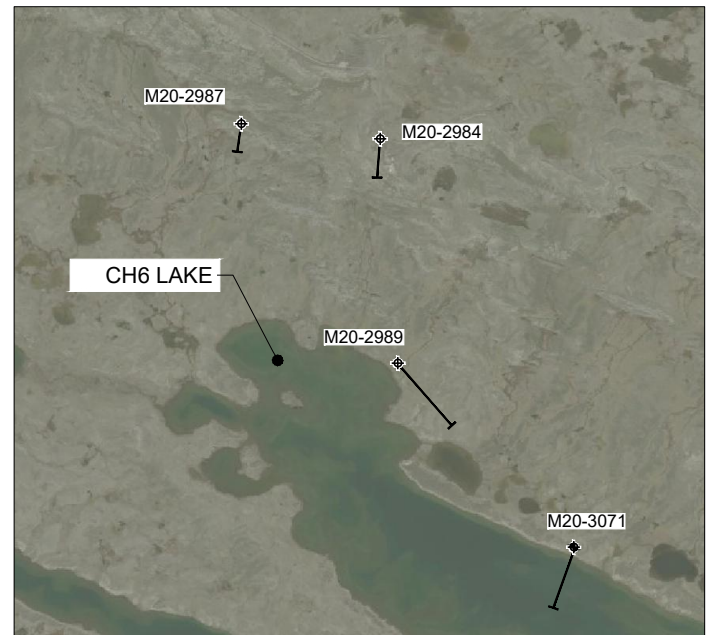
### 2.1 Background

The Westbay system installed in monitoring well M20-3071 is a multi-level groundwater sampling system designed for long-term groundwater monitoring and data acquisition. It is designed for collecting subsurface groundwater data at multiple discrete positions within a single well. M20-3071 was installed in September 2020 to a depth of 606 metres below ground surface at an average collar inclination of 67.7 degrees. M20-3071 is located approximately 65 metres east of Lake CH6, which is interpreted to have underlying open talik. Data collected from M20-3071 will be used to evaluate groundwater quality within the open talik and at the depth of the Discovery underground, along with data collected at the Tiriganiaq Underground and at the previously installed Westbay System (MW11-1257; Golder 2013) installed to the northwest of Tiriganiaq Underground (northeast of Lake B5). M20-3071 will also be used to measure the vertical hydraulic gradient below Lake CH6 and assess if the lake is a source of groundwater recharge or discharge. The approximate locations of Westbay wells M11-1257 and M20-3071 are shown in Figure 1.

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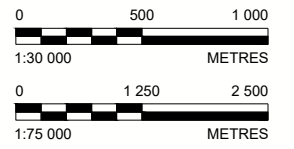
**LEGEND**

- BOREHOLE WITH THERMISTOR INSTALLATION
- BOREHOLE WITH WESTBAY WELL INSTALLATION

Borehole ID	
Golder	Agnico Eagle
DISCO-CONV-016	M20-2984
DISCO-CONV-019	M20-2987
DISCO-CONV-021-V2	M20-2989

**REFERENCE(S)**

- COORDINATE SYSTEM: UTM NAD 83, ZONE 15.
- AERIAL IMAGE : GOOGLE EARTH, 2020



CLIENT		
CONSULTANT	YYYY-MM-DD	2021-11-05
	DESIGNED	IA
	PREPARED	XM
	REVIEWED	DH
	APPROVED	VJB



PROJECT  
AGNICO EAGLE MINES LIMITED  
MELIADINE EXTENSION  
NUNAVUT

TITLE  
**GROUNDWATER MONITORING LOCATIONS**

PROJECT NO.	PHASE	REV.	FIGURE
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Sampling intervals in the Westbay well were selected to isolate discrete zones of unfrozen bedrock and, if encountered, zones of higher hydraulic conductivity observed during drilling. A total of 14 ports are present along the length of the borehole. Five of these ports target intervals to be used for sampling and/or pressure monitoring (Ports 2, 4, 6, 8 and 10), and 9 ports were installed to facilitate the installation process (i.e., relieve excess pressure generated during the packer inflation process and/or to allow the injection of propylene glycol mixture into the annulus of the borehole within the extent of the permafrost zone to prevent freezing of the well). A detailed schematic of the Westbay well installed in borehole M20-3071 is presented in APPENDIX A and the port intervals are presented in Table 1.

**Table 1: Monitoring Ports installed in Westbay Well M20-3071**

Port	Interval Length (mah)				Interval Length (mbgs)			
	Port Position within Interval	Interval Top	Interval Bottom	Length	Port Position within Interval	Interval Top	Interval Bottom	Length
14	46.0	45.8	145.5	99.7	44.2	44.0	139.0	95.0
13	146.6	146.4	246.1	99.7	144.0	139.9	233.6	93.7
12	247.3	247.0	255.3	8.3	234.7	234.4	242.1	7.7
11	256.4	256.2	288.8	32.6	243.2	243.0	273.3	30.3
10	290.0	289.7	308.7	19.0	274.4	274.1	291.7	17.6
9	309.8	309.6	328.5	18.9	292.7	292.5	310.0	17.4
8	329.7	329.4	346.9	17.5	311.1	310.8	326.9	16.1
7	348.0	347.8	407.8	60.0	327.9	327.7	382.5	54.8
6	409.0	408.7	420.1	11.4	383.6	383.4	393.7	10.4
5	421.2	421.0	468.9	47.9	394.7	394.5	437.9	43.3
4	470.0	469.8	490.3	20.5	438.9	438.7	457.1	18.4
3	491.4	491.2	572.6	81.4	458.1	457.9	530.6	72.7
2	573.7	573.5	586.4	12.9	531.6	531.4	542.8	11.4
1	587.5	587.3	606.0	18.7	543.8	543.6	560.2	16.6

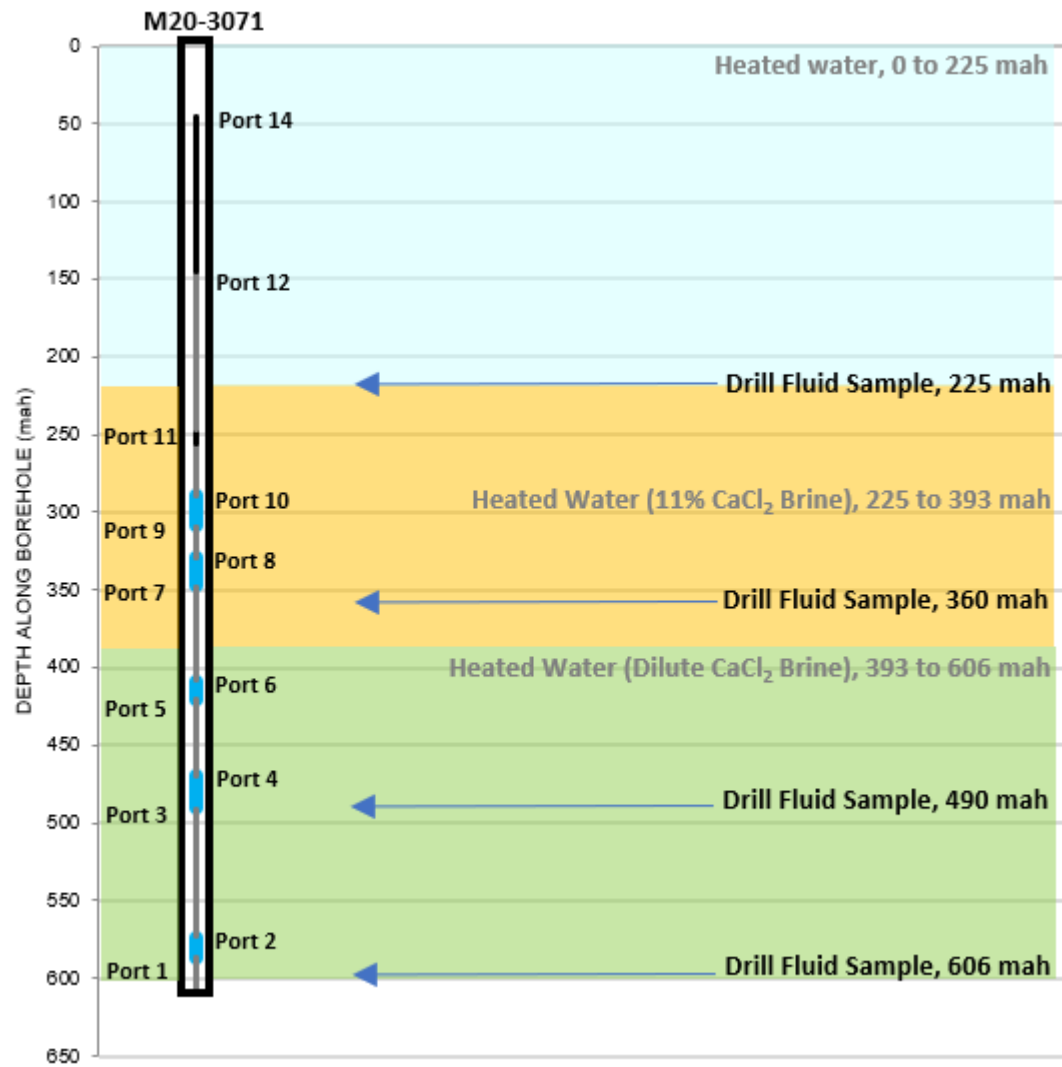
**Notes:**


m = metres; mah = metres along the hole; mbgs = metres below ground surface

Depths along hole were provided by Westbay Instruments completion report and are based on packer seal position.

Depths below ground surface were calculated from provided depths along hole and gyroscopic survey data.

Development of select sample ports is required to remove, to the extent possible the fluid introduced during drilling. From 225 mah the drilling fluid was tagged with a fluorescein tracer with average concentration of 795 parts per billion (ppb). The tracer was added to allow future differentiation of the amount of drill fluid present in water collected from the Westbay well ports. The drilling fluid for M20-3071 was composed of Lake CH6 water to which was tagged with calcium chloride salt ( $\text{CaCl}_2$ ) between 225 mah and 393 mah (11% calcium chloride brine). At the end of drilling, salt water (11% calcium chloride brine) was introduced into the borehole to displace the fresh water and prevent freezing during packer testing and subsequent Westbay system well installation. A schematic illustrating the composition of the drill fluid used during the drilling of M20-3071 is shown in Figure 2, including the depths where samples of the drill fluid were collected for chemical analysis (refer to Section 2.3 for more details).



Notes:  
 = Port targeted for sampling zone interval  
mah = metres depth along borehole  
CaCl<sub>2</sub> = calcium chloride

CLIENT



CONSULTANT



YYYY-MM-DD 2021-11-04

PREPARED DH

DESIGN -

REVIEW JL

APPROVED VJB

PROJECT

AGNICO EAGLE MINES LIMITED  
MELIADINE EXTENSION  
NUNAVUT

TITLE

**SCHEMATIC OF WESTBAY WELL M20-3071 SHOWING DRILL FLUID COMPOSITION DURING DRILLING**

PROJECT No. 20136436-817 2300

Rev.

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## 2.2 Well Development

Following installation, well development was initiated to develop and remove drill fluid introduced into the borehole during drilling from Ports 4 and 8. Port 8 was selected for development, as water samples collected at this depth will support assessment of transition water quality between Lake CH6 and the deeper regional groundwater flow system. Additional transitional water quality data was collected in 2009 from borehole GT09-19 below Lake B7 (northwest of Tiriganiaq) at a depth of approximately 105 m (Golder 2009; refer to Figure 1). Port 4 was selected for development, as water samples collected at this depth will support assessment of water quality to be intercepted at the Discovery underground mine (i.e., it is at a similar elevation) and it will support the overall interpretation of regional water quality below the permafrost at similar depths. Additional regional water quality data is available from interval five of a previously installed Westbay System to the northwest of the Tiriganiaq underground (Golder 2013, M11-1257, refer to Figure 1).

Well development and groundwater sampling were carried out by Golder personnel from 8 September 2020 to 28 September 2020. On 28 September 2020 development and sampling was stopped due to the winter shut down of the work area near the proposed Discovery underground. Development and groundwater sampling were performed using the Westbay Mosdax sampler manufactured and supplied by Westbay Instruments (refer to APPENDIX B for the instrument calibration record). The Mosdax sampler collects 1 Litre of groundwater per sampling instrument descent and retrieval into the well.

During development and water sample collection at Ports 4 and 8, field chemical parameters (electrical conductivity, total dissolved solids (TDS), salinity, fluorescein content and temperature) were measured to track the progress of development and estimate the percentage of drilling fluid remaining. Field parameters were also periodically measured at other sample ports not actively being developed to monitor changes in fluorescein concentrations with time and evaluate whether natural flushing was occurring. Fluorescein content was measured using the AquaFluor handheld fluorometer manufactured by Turner Designs. Temperature, TDS and electrical conductivity were measured with a Pro30 Conductivity, Salinity instrument manufactured by YSI or a Hanna Marine Salinity Tester (HI 98319). Field pH could not be measured due to malfunction of the pH probe sensors on both units.

Table 2 presents a summary of the field development record. As indicated, development focused on Ports 4 and 8; however limited water was collected from other ports to measure field parameters present at the ports at the completion of drilling and/or collect samples for isotope analysis (Section 2.3 and 2.4 for more details). Included in Table 2 is a summary of the standing water volume within each sampling interval and an estimate of the volume of water that would likely need to be removed before the formation groundwater quality could be estimated with reasonable accuracy. In general, a fluorescein concentration target of approximately 5 to 10% (40 to 80 ppb) of initial drill fluid concentration (795 ppb) was targeted for terminating development. Other factors contribute to the evaluation of terminating development including the stabilization of the fluorescein concentration during development, and the variability of the drill fluid chemistry. A lower development target (<5%) may be applicable when the chemistry of the drill fluid content is variable during the drilling program. The estimated required extraction volume for Ports 4 and 8 presented in Table 2 is based on the observed trends during development of the well and based on the historical volumes that were removed from development of interval five at M11-1257 (6.6 port interval water volumes). Interval 5 at M11-1257 is completed within similarly low permeability bedrock as Ports 4 and 8 of M20-3071 and was therefore considered a reasonable indicator of potential development requirements at M20-3071.

**Table 2: Borehole M20-3071 Westbay System Port Development Record**

Port	Interval (mah)		Interval Length (mah)	Interval Volume (L)	Estimated Required Development Volume (b) (L)	Total Volume Extracted (L)	Initial Field Parameters <sup>(d)</sup>		Final Field Parameters <sup>(e)</sup>	
	To	From					F	EC	F	EC
10	289.7	308.7	19	103	-	3	782.5	146.5	713.8	88.0
9	309.6	328.5	18.9	103	-	3	793.0	147.0	234.7	53.4
8	329.4	346.9	17.5	95	627 - 980 <sup>(c)</sup>	272	809.0	146.5	234.5	83.7
7	347.8	407.8	60	326	-	2	786.8	140.4	434.1	103.5
6	408.7	420.1	11.4	62	-	2	747.4	146.6	748.4	151.5
5	421	468.9	47.9	260	-	1	699.0	137.1	-	-
4	469.8	490.3	20.5	111	400 <sup>(c)</sup> - 735	220	820.2 <sup>(f)</sup>	145.1	421.5	92.7
3	491.2	572.6	81.4	442	-	2	237.2	73.0	276.5	75.6
2	573.5	586.4	12.9	70	-	2	743.5	158.0	542.4	117.3
1	587.3	606	18.7	102	-	1	755.3	140.4	-	-

**Notes:**

mah = metres along hole; L = litres; - not applicable; F = fluorescein concentration (ppb); EC = electrical conductivity (mS/cm);

- (a) Interval volume is the estimated volume in the annulus between the PVC pipe and the borehole wall. The volume per metre in the annulus is approximately 5.43 L/m based on the known dimensions of Schedule 80 1-1/2" PVC (inner diameter = 38 mm; outer diameter = 48 mm) and HQ outer hole diameter is 96 mm.
- (b) The required extraction volume is estimated based on 6.6 well volumes that were extracted to obtain a representative groundwater sample for M11-1257 Interval 5 in 2011 for all sample ports, except as noted.
- (c) Estimated volume forecasted from the 2020 development progress (trends of fluorescein concentrations with time) for Ports 4 and 8
- (d) Date of initial field parameters: 7 September 2020 (Port 8), 8 September 2020 (Ports 2, 4, 6, 9 and 10), 24 September 2020 (Ports 1, 3 and 5)
- (e) Date of final field measured parameters: 21 September 2020 (Port 8), 24 September 2020 (Port 2), 25 September 2020 (Ports 6 and 7) and 28 September 2020 (Ports 3, 4 and 9)
- (f) Maximum fluorescein concentration (820.2 ppb) measured after extracting 6 L, which was greater than the initial 1 L sample recovered (809.3 ppb) at the start of development.

## 2.3 Drill Fluid Sample Analysis

To estimate formation groundwater quality, the influence of drill fluid chemistry must be removed from the collected port water sample (herein referred to as the raw water sample), which is a mixture of formation groundwater and drill fluid introduced during borehole drilling. The proportion of drill fluid in the raw water sample is estimated based on the fluorescein concentration in the sample and fluorescein concentration in the drilling fluid. The drill fluid chemistry was estimated using analytical results of collected drill fluid samples.

Table 3 presents a summary of the drill fluid sample collection and Table 4 presents a summary the analytical groups samples were analysed for. For two of the six samples collected, the samples were also analysed for isotopes (oxygen 18 and deuterium) to help differentiate between drill fluid and formation groundwater isotopic signatures.

**Table 3: Drilling Fluid Sample Details from Borehole M20-3071**

Sample Identification	Sample Collection Date	Sample Description
Westbay-A-225	17-Aug-20	Drilling fluid (brine) sample collected during drilling with the borehole depth at approximately 225 mah
Westbay-A-360	21-Aug-20	Drilling fluid (brine) sample collected during drilling with the borehole depth at approximately 360 mah
Westbay-A-490	25-Aug-20	Drilling fluid (fresh water) sample collected during drilling with the borehole depth at approximately 490 mah
Westbay-A-490-Dup	25-Aug-20	Drilling fluid (fresh water) duplicate sample collected during drilling with the borehole depth at approximately 490 mah for QA/QC purposes
Westbay-A-606	27-Aug-20	Fluid (fresh water) sample collected during drilling with borehole depth at approximately 606 mah.
Westbay-A-606-BR	27-Aug-20	Fluid (brine) sample collected at end of drilling activities with the borehole depth at approximately 606 mah. Brine was used to flush hole to prevent freezing of the drilling fluid during packer testing and Westbay well installation.

**Notes:** mah = metres along hole

**Table 4: Summary of M20-3071 Drill Fluid Analytical Parameters**

Analytical Parameters
<ul style="list-style-type: none"> <li>■ Alkalinity (total, bicarbonate, hydroxide and phenolphthalein as CaCO<sub>3</sub>), bicarbonate, carbonate, conductivity, dissolved organic carbon (DOC), hardness<sup>(c)</sup> (total and dissolved), hydroxide, pH, salinity, total dissolved solids (TDS), total organic carbon (TOC), total suspended solids (TSS) and turbidity</li> <li>■ Anions and nutrients including ammonia, bromide, chloride, fluoride, total kjeldahl nitrogen (TKN), nitrate, nitrite, orthophosphate, total phosphorus, silicate, and sulphate</li> <li>■ Cyanides, including free, strong acid dissociable and weak acid dissociable</li> <li>■ Metals (total<sup>(a)</sup> and dissolved<sup>(b)</sup>), including aluminium, antimony, barium, beryllium, bismuth, boron, cadmium, calcium, cesium, chromium, cobalt, copper, iron, ferrous iron (dissolved only), lead, lithium, magnesium, manganese, mercury, molybdenum, nickel, phosphorus, potassium, rubidium, selenium, silicon, silver, sodium, strontium, sulfur, tellurium, thallium, thorium, tin, titanium, tungsten, uranium, vanadium, zinc and zirconium</li> <li>■ Petroleum hydrocarbons and volatile organic compounds (VOCs), including benzene, ethylbenzene, methyl-tert-butyl-ether (MTBE), styrene, toluene, m+p-xylene, o-xylene, and total xylenes</li> <li>■ Oil and grease</li> <li>■ Radium 226</li> </ul>
<ul style="list-style-type: none"> <li>■ Extractable petroleum hydrocarbons (EPH) C10-C19, C19-C32, light EPH (LEPHw) and heavy (HEPHw)</li> </ul>
<ul style="list-style-type: none"> <li>■ Isotopes*: oxygen and hydrogen (oxygen 18 and deuterium)</li> </ul>

**Notes:**

\* Isotopes were only analyzed for the two drill fluid samples collected after the completion of 225 and 360 metres along hole of coring

(a) Total constituent, unfiltered

(b) Dissolved constituents, field filtered to 0.45 microns

(c) Hardness calculated from sum of calcium and magnesium

The salinity content of the drilling fluid was relatively consistent from 225 mah to 393 mah as a known content of calcium chloride brine was added to the drilling fluid (Section 2.1). Below 393 mah, the salinity is less certain as the calcium chloride additive was discontinued, and there was a progressive freshening of the drill fluid as the additive was flushed out of the drill fluid. There is also some natural uncertainty associated with the fluorescein content of the drilling fluid introduced into the rock formation as field measurements of the drilling fluid varied somewhat around the average concentration of 795 ppb  $\pm$  142 ppb (APPENDIX A).

## 2.4 Westbay Well Groundwater Sample Collection

Groundwater samples were collected from Ports 4 and 8 and analysed for alkalinity, major ions, dissolved and total metals, cyanides, petroleum hydrocarbons, oil and grease, radium-226, sulphate reducing bacteria and stable isotopes of water (oxygen 18 and deuterium), as summarized on Table 5 and Table 6. Ports 3 and 9 were sampled for the stable isotopes of water to further assess the presence or absence of drill fluid at these locations as the final fluorescein content in water collected from the Ports had dropped significantly relative to the first measurements collected at the Ports following drilling. Unlike Ports 4 and 8, Ports 3 and 9 were not actively developed; only natural flushing by groundwater flow past the ports had occurred prior to sampling.

**Table 5: Summary of Analytical Parameters for M20-3071 Port Sampling**

Analysis Group	Analytical Parameters
1	<ul style="list-style-type: none"> <li>■ Alkalinity (total, bicarbonate, hydroxide and phenolphthalein as CaCO<sub>3</sub>), biological oxygen demand (BOD), chemical oxygen demand (COD), bicarbonate, carbonate, conductivity, dissolved organic carbon (DOC), hardness (total and dissolved), hydroxide, pH, salinity, total dissolved solids (TDS), total organic carbon (TOC), total suspended solids (TSS) and turbidity</li> <li>■ Anions and nutrients including ammonia, bromide, chloride, fluoride, total kjeldahl nitrogen (TKN), nitrate, nitrite, orthophosphate, total phosphorus, silicate, and sulphate</li> <li>■ Cyanides, including free, strong acid dissociable and weak acid dissociable</li> <li>■ Metals (total<sup>(a)</sup> and dissolved<sup>(b)</sup>), including aluminium, antimony, barium, beryllium, bismuth, boron, cadmium, calcium, cesium, chromium, cobalt, copper, iron, ferrous iron (dissolved only), lead, lithium, magnesium, manganese, mercury, molybdenum, nickel, phosphorus, potassium, rubidium, selenium, silicon, silver, sodium, strontium, sulfur, tellurium, thallium, thorium, tin, titanium, tungsten, uranium, vanadium, zinc and zirconium</li> <li>■ Petroleum hydrocarbons and volatile organic compounds (VOCs), including benzene, ethylbenzene, methyl-tert-butyl-ether (MTBE), styrene, toluene, m+p-xylene, o-xylene, and total xylenes</li> <li>■ Oil and grease</li> <li>■ Radium 226</li> </ul>
2	<ul style="list-style-type: none"> <li>■ Ferrous iron (dissolved)<sup>(b)</sup></li> <li>■ Petroleum hydrocarbons F1 (C6-C10), F2 (C10-C16), F3 (C16-C34), F4 (C35-C50), F1-BTEX</li> <li>■ Sulphate reducing bacteria</li> </ul>
3	<ul style="list-style-type: none"> <li>■ Isotopes: oxygen and hydrogen (oxygen 18 and deuterium)</li> </ul>

**Notes:**

(a) Total constituent, unfiltered

(b) Dissolved constituents, field filtered to 0.45 microns

(c) Hardness calculated from sum of calcium and magnesium

**Table 6: Summary of Raw Water Samples from Ports 3, 4, 8 and 9**

Port	Development Volume (L) <sup>(a)</sup>	Sample Date	Estimated Drill Fluid Content (%)	Analysis Group <sup>(b)</sup>	Comment
4	34	19 September 2020	91	1, 2 and 3	(c)
4	178	25 September 2020	56	1, 2 and 3	
4	220	27 to 28 September 2020	51 to 52	1, 2 and 3	Duplicate samples were submitted <sup>(d)</sup>
8	267	20 September 2020	29 to 31	1, 2 and 3	Duplicate samples were submitted <sup>(d)</sup>
3	No Active Development	28 September 2020	35	3	
9	No Active Development	28 September 2020	30	3	

**Notes:**

L = Litres, % = percentage of drill fluid content remaining in raw water sample collected from Westbay well sample port

(a) Development volume after sampling (between 10 and 14 L of sample volume required for Ports 4 and 8).

(b) Complete list of analysis group parameters is included in Table 5.

(c) Sample was collected in duplicate and one sample was submitted to the lab for analysis, while the other was kept on-site as a backup

(d) Sample was collected in triplicate, where two samples were submitted to the lab for analysis and the third was kept on-site as a backup

Samples were collected in single, duplicate, or triplicate set(s) and submitted to the analytical laboratory for analysis. Where duplicate or triplicate sets were collected (generally the final sample), the extra set of samples were kept on site as backup and disposed of upon confirmation of receipt of the samples by the analytical laboratory. An equipment blank was also collected on 19 September 2020 for quality assurance/quality control (QA/QC) purposes.

Groundwater samples were filtered in the field, as required for the analysis, and collected in laboratory-supplied bottles which were packed and shipped to the analytical laboratory ALS Environmental in Vancouver, British Columbia for analysis. From their Vancouver office, ALS subsequently sent the samples for radioactive ions analysis to their Fort Collins, Colorado locations. ALS subcontracted the analysis of isotopes to Isobrine Solutions located in Edmonton, Alberta.

## 2.5 Evaluation of Formation Water Quality

To assess formation groundwater quality, well development is used to remove and/or minimize the amount of drill fluid present in collected raw water samples. The fluorescein concentration in the raw water sample is then used in combination with the concentration of fluorescein in the drill fluid and the drill fluid chemistry to correct the raw water sample for residual drill water influence. The estimated quantity of drilling fluid in the raw water sample is then mathematically removed from the analytical results, according to the concentration and proportion of drilling fluid (fluorescein concentration) in the raw water sample (as summarized below).

The following steps summarize the calculations made to estimate formation groundwater quality from field measurements of fluorescein concentrations and laboratory analytical results of the raw water samples and drill fluid samples.

- 1) **Estimation of the drill fluid chemistry introduced during drilling and well completion.** The borehole drilling process introduced fresh and saline drilling fluids into the rock formation. The drilling fluid consisted of heated low TDS lake water to which was added a concentrated brine between 225 mah and 393 mah. Below 393 mah the drilling fluid progressively freshened as the concentrated brine flushed out of the drill fluid. Brine was again at the end of drilling to displace the fresh water and prevent freezing during packer testing and subsequent Westbay well installation.

Port 8 – The drill fluid composition was calculated based on the average chemistry of the two drill fluid samples collected while drilling the interval of 225 and 360 mah.

Port 4 – The drill fluid composition for Port 4 was calculated as the average chemistry of the drill fluid sample and its duplicate collected when the borehole was at a depth of 490 mah.

Ports 3 and 9 – The drill fluid composition for these ports were not calculated as part of this investigation as these intervals were only sampled for stable isotopes and not for the full suite of chemical constituents. Therefore, the drill fluid chemistry did not need to be removed from the raw water sample.

- 2) **Calculation of the proportion of drill fluid in collected raw water sample.** This was estimated based on the amount of residual fluorescein measured in the raw water sample collected compared to the initial fluorescein content measured at each Port (assumed to be representative of the fluorescein content of the drill fluid delivered to the interval) and the average fluorescein content measured in the drill fluid at the time the borehole drilling (i.e., Port 8 only). The fluorescein content of the drill fluid assumed for each port is based on the following:

Port 8 – Calculated range based on the average measured fluorescein content of the drilling fluid samples between 225 and 360 mah (758 ppb) based on the available drill fluid (brine) chemistries, and the initial fluorescein content measured in the port interval at the start of development (809 ppb). Because fluorescein concentrations and drill fluid chemistry varied during drilling and Westbay well installation, a range of resultant groundwater concentrations were estimated from the correction process reflective of the uncertainty in the drill fluid quantity and quality in each raw water sample from Port 8.

Port 4 – Estimated based on the fluorescein content measured in the port interval prior to the start of development (820 ppb), and the average fluorescein content during the drilling of the port interval (470 to 490 mah; 803 ppb). Port 3 – The fluorescein content of the drilling fluid introduced to Port 3 was assumed to be the average fluorescein content measured during the drilling program (i.e., 795 ppb). Fluorescein content in the interval was not measured until after significant development had occurred in adjacent ports, and therefore only the average fluorescein concentration was available to support the proportion estimate.

Port 9 – The fluorescein content of the drilling fluid introduced to Port 9 was assumed to be the initial fluorescein content measured in the port interval at the start of development (796 ppb).

- 3) **Removal of drilling fluid chemistry from the raw water sample analytical results.** The concentration of constituents from the drilling fluid are removed from the reported analytical results for each chemical constituent per the below equation 1.

$$(1) \quad \text{Groundwater Quality}_{\text{corrected}} = \frac{\text{Lab Result} - \text{Proportion of Drill Fluid} \times \text{Drill Fluid Chemistry}}{\text{Proportion of Formation Water in Raw Water Sample}}$$

## 2.6 Stable Isotope Analysis

Groundwater near M20-3071 is saline, consistent with the findings at the previously installed Westbay well (M11-1257) and observations at the Tiriganiaq underground development. Dissolved salts in water can change oxygen and hydrogen partitioning between water and other phases (vapour, minerals) due to the hydration of ions upon dissolution of salts in water. Saline groundwater oxygen (equation 2) and hydrogen (equation 3) isotope results have been corrected for the “salt effect” for the drilling fluids and the water samples collected from Ports 4 and 8 given the following equations developed by Sofer & Gat (1972) and Sofer & Gat (1975), respectively:

$$(2) \quad \frac{\delta_o - \delta_m}{\delta_m + 1000} \times 10^3 = 1.11M_{Mg} + 0.47M_{Ca} - 0.16M_K$$

$$(3) \quad \frac{\delta_o - \delta_m}{\delta_m + 1000} \times 10^3 = 6.1M_{Mg} + 5.1M_{Ca} + 2.4M_K + 0.4M_{Na}$$

Where:

$\delta_o$  = delta value on the concentration scale;

$\delta_m$  = measured activity delta of the salt solution; and,

$M_i$  = molality of the dissolved salt component ‘i’ of the raw water quality result.

Isotope results for Ports 3 and 9 could not be corrected for salinity as geochemical parameters (i.e., calcium, magnesium, sodium and potassium) were not sampled as part of the 2020 groundwater monitoring program. Sampling of Ports 3 and 9 were never planned as part of the field program and the collection of isotope samples was add-on based on field observations. Insufficient time was available for the collection of the full analytic suite given the pending closure of the site for winter conditions and the priority of focusing development on Ports 4 and 8 (full sample collection can take between six and twelve hours to complete). Salinity corrected isotope calculations are provided in APPENDIX E. As discussed in Section 3.2.3 the salinity correction would not be expected to be significant for these two samples.

## 3.0 RESULTS AND DISCUSSION

### 3.1 Drill Fluid Chemistry

The results of the drill fluid chemical analyses are presented in Table C-1 of APPENDIX C. Laboratory analytical reports are included in APPENDIX D. Drill fluid sample results presented in Table C-1 are for drill fluid samples collected at various stages of the drilling program as described in Section 2.1. Based on the results of the available drill fluid chemistries, the salinity of the drill fluid varied throughout the drilling program (i.e., TDS ranged between 136,000 mg/L and 185,000 mg/L during the use of 11% calcium chloride brine between 225 and 360 mah and to displace fresh water upon completion of the borehole at 606 mah to prevent freezing of the liquids in the borehole during packer testing and subsequent Westbay well installation). Below 393 mah, the salinity is less certain as the calcium chloride additive was discontinued, and there was a progressive freshening of the drill fluid as the additive was flushed out of the drill fluid (TDS ranged between 40,400 mg/L and 40,900 mg/L during drilling at 490 mah and 559 mg/sL at the end of the borehole at 606 mah). There is also some natural uncertainty associated with the fluorescein content of the drilling fluid introduced into the rock formation as field measurements of the drilling fluid varied somewhat around the average concentration of 795 ppb ± 142 ppb (Golder 2021, APPENDIX A).

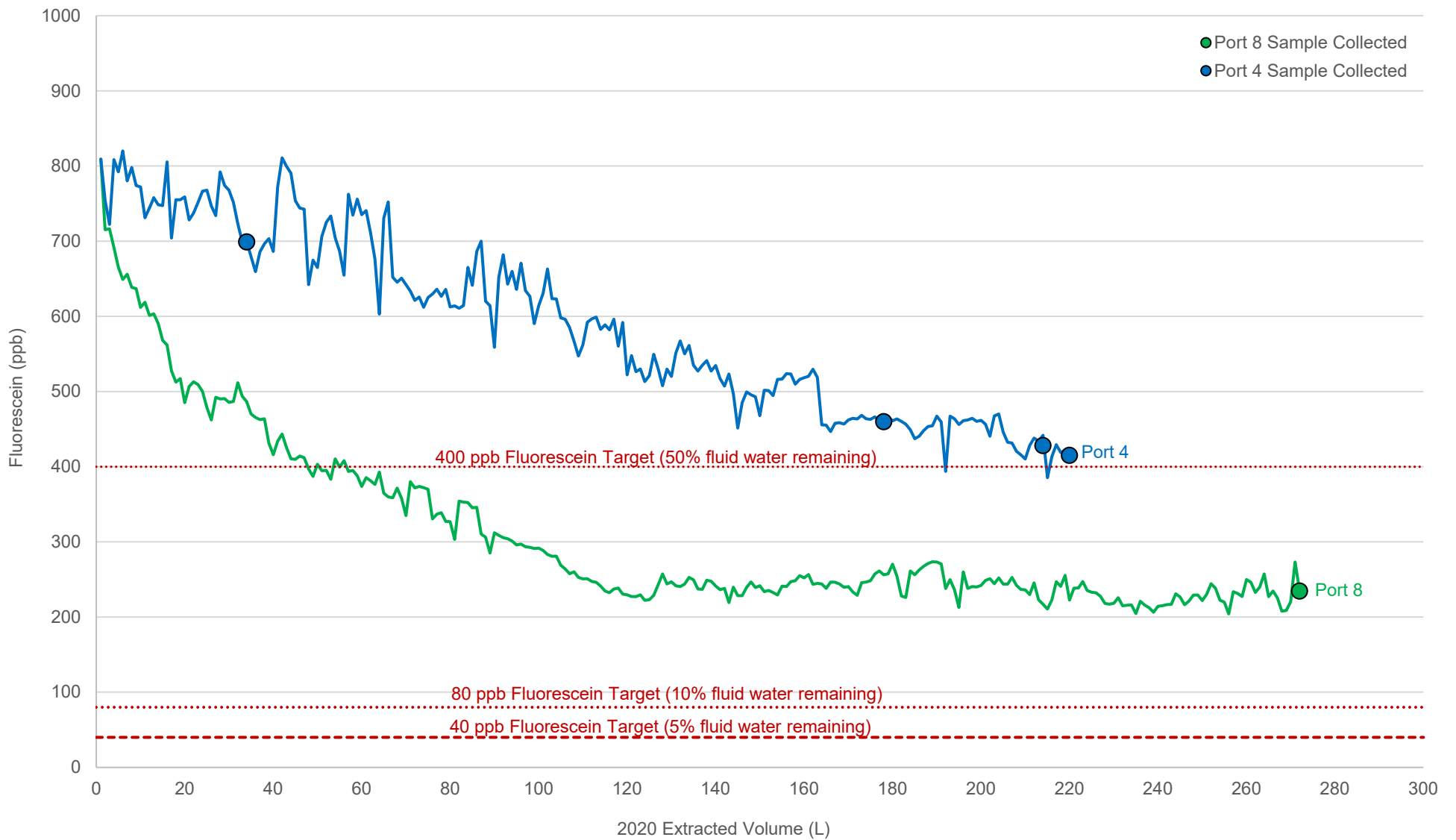
## 3.2 Groundwater Quality

The results of the groundwater quality analyses are presented in Table 7 and Tables C-1 through C-3 of APPENDIX C. Laboratory analytical reports are included in APPENDIX D. Sample results presented in Table C-1 of APPENDIX C include Port 4 samples collected at various stages of well development. Termination of well development was targeted for a drilling fluid content of less than 5 to 10%, however this target was not achieved because of the winter shut down of the work area near the Westbay well and proposed Discovery underground.

Fluorescein concentrations measured in water removed from Ports 4 and 8 of M20-3071 during development are illustrated in Figure 3. Table 6, Table 7 and Tables C-1 and C-2 of APPENDIX C summarize the average fluorescein concentrations recorded at the time of sampling. The fluorescein concentration values in these tables are averages from the subsamples collected to obtain the required volume of water for analysis of the full suite of chemical constituents (as outlined in ). Figure 3 illustrates that the fluorescein content in Port 8 was starting to stabilize at the time the sample was collected on 20 September 2020 whereas concentrations of fluorescein in Port 4 were still declining during each of the three separate sampling events on 19 September, 25 September and 27-28 September 2020.

Ports 3 and 9 were sampled for stable isotopes of water without prior development. Port 3 and 9 samples were collected to track evolution of groundwater quality with natural flushing that may have occurred between completion of the Westbay well installation on 7 September 2020 and the end of the development program on 28 September 2020. As shown in Table 2, the final fluorescein content measured in Ports 3 and 9 at the end of the field program decreased from the initial fluorescein content in Port 9 (796 ppb) and the average fluorescein content of the drill fluid (795 ppb) delivered to Port 3 to less than 300 ppb.





Note:  
<sup>1</sup> 2020 Development target based on average fluorescein concentration of drilling fluid (795 ppb).

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 MELIADINE EXTENSION  
 NUNAVUT

TITLE

**2020 M20-3071 PORTS 4 AND 8 DEVELOPMENT RECORD**

PROJECT No.  
**20136436-817 2300**

Rev.

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### 3.2.1 Port 8 Groundwater Quality

Table 7 presents a summary of the estimated groundwater quality at Port 8 of M20-3071 for key salinity parameters, using the correction procedure outlined in Section 2.5. The correction procedure was applied for each parameter that was above the method detection limit. Also included in Table 7 for comparison is a summary of the estimated groundwater quality at the previously installed Westbay well northwest of Tiriganiaq (M11-1257 Interval 5 since it is completed at a similar depth to Port 8 and was sufficiently developed). Detailed water quality results are provided in Table C-2 in APPENDIX C.

**Table 7: Key Groundwater Quality Parameters at M20-3071 Port 8 and M11-1257 Interval 5, Corrected to Remove Drilling Fluid Content**

Parameter	Drilling Fluid (Average 225 and 360 mah) <sup>(a)</sup>	Port 8 Corrected Water Quality Results M20-3071		Interval 5 Corrected Water Quality Results M11-1257
		Sample 1 (Average)	Duplicate of Sample 1 (Average)	Average 2011 & 2012 Samples <sup>(b)</sup>
Sample Interval (mbgs)	-	310.8 to 326.9		460.3 to 448.5
Fluorescein Concentration in Drill Fluid (ppb)	-	758 to 809 <sup>(a)</sup>		581
Fluorescein Concentration in Water Sample (ppb)	-	237		54 to 65
Estimated Proportion of Drilling Fluid in Sample	100%	29 to 31%		9 to 11%
Estimated Proportion of Formation Groundwater in Sample	0%	69 to 71%		89 to 91%
<b>General Chemistry Water Quality Tests</b>				
Measured Total Dissolved Solids (mg/L)	149,500	24,558	33,308	66,122
Calculated Total Dissolved Solids <sup>(c)</sup> (mg/L)	124,304	25,842	30,846	56,772
Chloride (mg/L)	74,500	14,518	20,399	32,510
Sulphate (mg/L)	<30	1,086	1,222	3,551
<b>Dissolved Metals</b>				
Dissolved Calcium (mg/L)	43,850	392	-	1,080
Dissolved Magnesium (mg/L)	19	1,232	1,156	2,240
Dissolved Potassium (mg/L)	2,240	-	-	345
Dissolved Sodium (mg/L)	1,370	8,614	8,069	16,982
Dissolved Strontium (mg/L)	2,260	-	-	64
<b>Sodium Ratios</b>				
Sodium: Chloride	0.02	0.59	0.40	0.52
Sodium: Sulphate	8.3	7.9	6.6	4.8
Sodium: Magnesium	72.0	7.0	7.0	7.6

**Notes:**

“-“ indicates a low estimated concentration (calculations returned a negative value)

(a) Average fluorescein concentration in 225 and 360 mah drill fluid samples (758 ppb) and initial fluorescein content measured in the port interval prior to development (809 ppb).

(b) Average groundwater quality estimated from samples collected by Golder in 2011 and Agnico Eagle in 2012 (Golder 2013).

(c) Total dissolved solids calculated from sum of laboratory results of major ions chloride, sulphate, calcium, magnesium, potassium, sodium and strontium.

As presented in Table 7, the chemical signature of the groundwater measured at Port 8 of M20-3071 (based on the ratios of sodium to chloride, sulphate and magnesium) is approaching that observed at Interval 5 of M11-1257 in comparison to the drill fluid. The estimated formation groundwater quality from Port 8 has a sodium chloride signature similar to regional chemistry measured at M11-1257 though slightly more diluted (concentrations of major ions measured in Port 8 are on average two times lower than those measured at M11-1257).

The concentration of metals in groundwater collected from Port 8 is low and/or below the analytical detection limits, except for radium-226, which ranged between 3.2 and 3.6 Bq/L. Based on drill fluid samples, the Radium-226 may be associated with the brined drill fluid and not the formation groundwater. Additional development will be required to confirm the source of Radium.

Although time constraints did not allow for sufficient development to achieve the targeted drill fluid content (5 to 10%), the groundwater sample collected from Port 8 (29-31% drill fluid remaining) is considered adequately representative of formation water based on its chemical signature and similarly in sodium ratios to MW11-1257 Interval 5.

### 3.2.2 Port 4 Groundwater Quality

At end of the available development time, the fluorescein content of the raw water sample collected from Port 4 remained high (51 to 52%; see Table 6), which indicates water near the port still contains a high proportion of drilling fluid. Preliminary corrections of water quality results were attempted which resulted in negative concentrations of many key groundwater constituents (i.e., calcium, potassium and strontium), which indicated unreliability in the data correction for the drill fluid content remaining. Relative to Port 8 there is higher uncertainty in the corrections due the higher drill fluid content, and due to the variability in drilling fluid chemistry (discontinuation of the brine additive below 393 depth).

Port 4 was determined to not be sufficiently developed to provide reliably accurate groundwater quality data because too much of the drill fluid remained in the sample collected and that the drilling fluid during drilling of this interval had a variable salinity (refer to APPENDIX C Table C-1, laboratory measured TDS ranged between 40,400 mg/L for the drill fluid (fresh) sample collected during drilling at approximately 490 mah and 185,000 mg/L for the drill fluid (brine) used to prevent the borehole from freezing prior to the packer testing and Westbay well installation). Preliminary calculations of Port 4 samples were attempted which resulted in negative concentrations of major ions and metals, which indicated a high degree of unreliability in the data.

The corrected raw (laboratory) water quality results based on the proportion of drill fluid remaining are not included in the report due to inherent inaccuracies in the extrapolation of the drilling fluid chemistry and thus, groundwater constituents at this time. Notwithstanding this, the chemical signature of the groundwater (based on sodium ratios to chloride, sulphate and magnesium) indicates a trend toward a similar signature to that of the groundwater at Interval 5 of M11-1257 as the development progressed. Further development of this interval, combined with natural flushing, is recommended.

Traces of toluene and m+o-xylene were observed in the samples collected from Port 4, are likely associated with drilling (i.e., introduced from products associated with the drilling equipment).

### 3.2.3 Isotope Results

Results for the stable isotopes of water, Oxygen ( $\delta^{18}\text{O}$ ) and hydrogen ( $\delta^2\text{H}$ ), from Port 3, 4, 8, 9 of M20-3071 and the drilling fluids are illustrated in Figures 4 and 5 and summarized in Tables C-1, C-2 and C-3 of APPENDIX C.

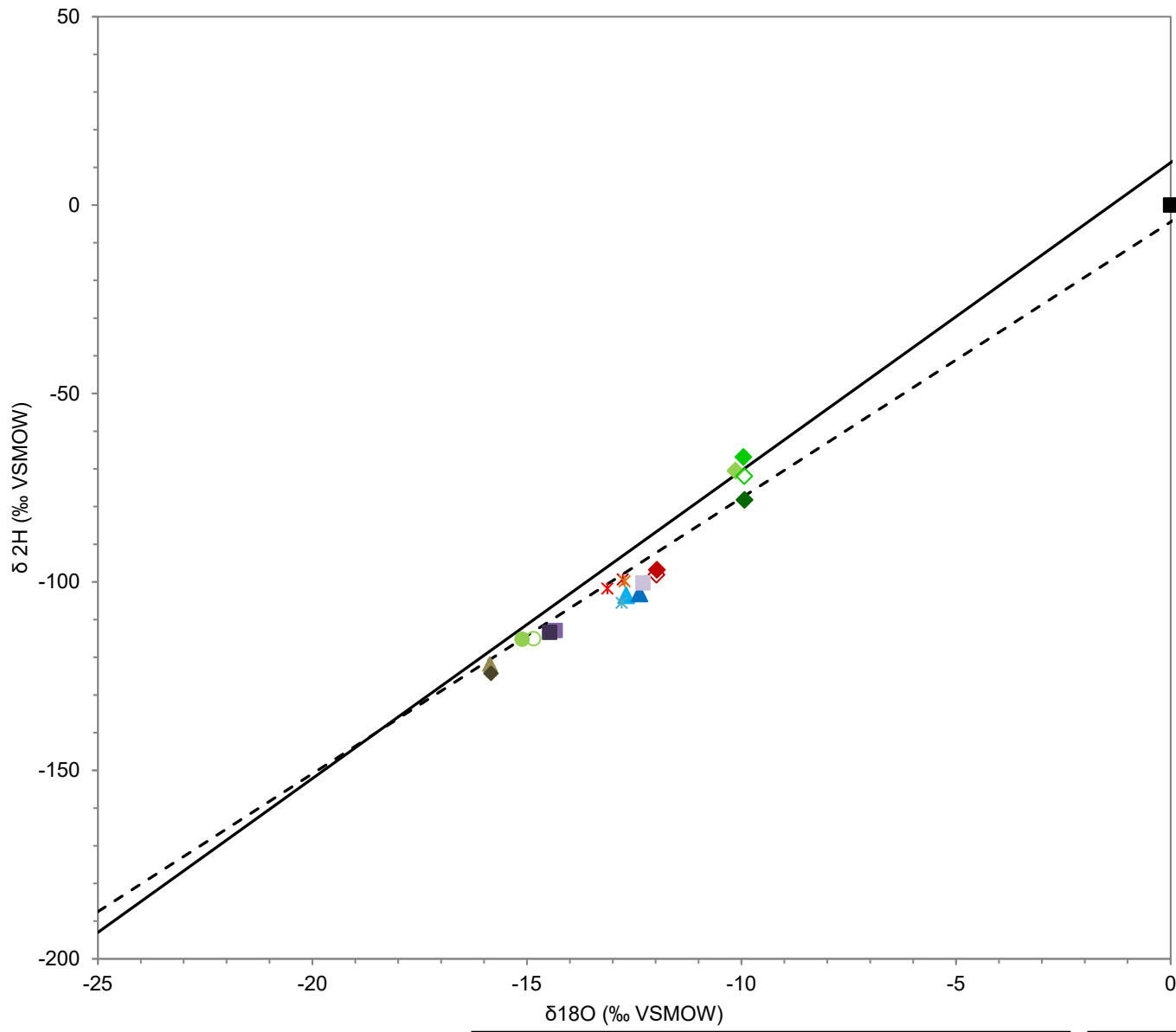
Saline groundwater oxygen and hydrogen isotope have been corrected for the “salt effect” for the drilling fluids and the water samples collected from Ports 4 and 8, as outlined in Section 2.6. The salt effect correction results in an enrichment of oxygen and hydrogen isotopes as salinity increases. The salt effect correction resulted in an enrichment in isotopes as follows:

- Port 8 - up to 1.3 relative percent difference (RPD) oxygen and 1.8 RPD for hydrogen (lowest salinity groundwater) after correction.
- Port 4 - up to 3.6% RPD for oxygen and 5.5% RPD for hydrogen after correction. Port 4 initial sample has a higher salinity compared to final sample collected.
- Drilling fluid with  $\text{CaCl}_2$  brine - up to 4.2% RPD for oxygen and up to 6.5 RPD for hydrogen after correction.

Ports 3 and 9 were sampled for the stable isotopes of water to further assess the presence or absence of drill fluid at these locations as the final fluorescein content in water collected from the Ports had dropped significantly relative to the first measurements collected at the Ports following drilling. Unlike Ports 4 and 8, Ports 3 and 9 were not actively developed; only natural flushing by groundwater flow past the ports had occurred prior to sampling. Isotope results for M20-3071 Ports 3 and 9 could not be corrected for salinity as geochemical parameters (i.e., calcium, magnesium, sodium and potassium) were not sampled during the 2020 groundwater monitoring program. The isotope enrichment for Ports 3 and 9 associated with the salinity correction would not be significant as salinity parameters (i.e., conductivity, TDS and salinity) measured in the field at the time of sampling were lower in Ports 3 and 9 compared to Ports 4 and 8 (refer to Table C-1 in APPENDIX C).

Isotopic results for  $\delta^{18}\text{O}$  and  $\delta^2\text{H}$  for Ports 4 and 8, as well as Ports 3, 9 and the drilling are shown in detail on Figure 4, where the results of Ports 4 and 8 have been corrected for salinity. The isotopic results are also shown on Figure 5, which provides more context for the interpretation of groundwater isotopic results by comparing them to other groundwaters from shield rock under permafrost conditions. Results of the  $\delta^{18}\text{O}$  and  $\delta^2\text{H}$  analysis, after correction for the drilling water component, indicate that groundwater at M20-3071 has the following attributes:

- is significantly more depleted relative to the isotopic signature of groundwater at Interval 5 of M11-1257 (Figure 4)
- plots on or just below the global meteoric water line
- plots on or just below the local meteoric water line for Lupin Mine area
- are more enriched than the estimated average annual isotopic composition of precipitation (approximate  $\delta^{18}\text{O}$  of -18 to -19 ‰ based on the interception point of the local evaporation line with the local meteoric water line (e.g., Edwards et al., 2004) and on the map of  $\delta^{18}\text{O}$  distribution in precipitation summarized in Rozanski et al. 1993)
- does not follow a consistent trend with depth (based on calculated final isotopic compositions, which may be revised as samples with less drilling fluid are acquired), M20-3071 raw water samples from Port 3 (35% drill fluid remaining) and Port 9 (30% drill fluid remaining) are more depleted relative to the isotopic signature of Port 8 (29-31% drill fluid remaining)



- Global Meteoric Water Line
- - - Local Meteoric Water Line
- Sea Water
- ◆ M11-1257 Interval 2A (19-Jun-12)
- ◇ M11-1257 Interval 2A (19-Jun-12) Duplicate
- ◆ M11-1257 Interval 5 (6-Oct-11)
- ◆ M11-1257 Interval 5 (13-Oct-11)
- ◇ M11-1257 Interval 5 (13-Oct-11) Duplicate
- ◆ M11-1257 Interval 5 (25-Jun-12)
- ▲ Lake B5
- ▲ Lake B6
- ✕ M20-3071 Drill Fluid-Brine (225 mah)
- ✕ M20-3071 Drill Fluid-Brine (360 mah)
- ✕ M20-3071 Drill Fluid (606 mah)
- ✕ M20-3071 Drill Fluid-Brine Flush (606 mah)
- M20-3071 Port 4 (19-Sep-20)
- M20-3071 Port 4 (25-Sep-20)
- M20-3071 Port 4 (28-Sep-20)
- M20-3071 Port 8 (20-Sep-20)
- M20-3071 Port 8 (20-Sep-20) Duplicate
- ▲ M20-3071 Port 3 (28-Sep-20)
- ◆ M20-3071 Port 9 (28-Sep-20)

Notes:  
<sup>1</sup> VSMOW - Vienna Standard Mean Ocean Water;  
<sup>2</sup> Saline groundwater oxygen and hydrogen isotope results were corrected for the 'salt effect' using Sofer & Gat (1972, 1975), with the exception of Port 3 and Port 9;  
<sup>3</sup> Global Meteoric Water Line (Rozanski et al., 1993);  
<sup>4</sup> Local Meteoric Water Line for Lupin (Gibson, 1996);  
<sup>5</sup> DUP – Quality Control Duplicate;  
<sup>6</sup> Lake B5 and B6 are located near M11-1257;  
<sup>7</sup> mah – metres along hole

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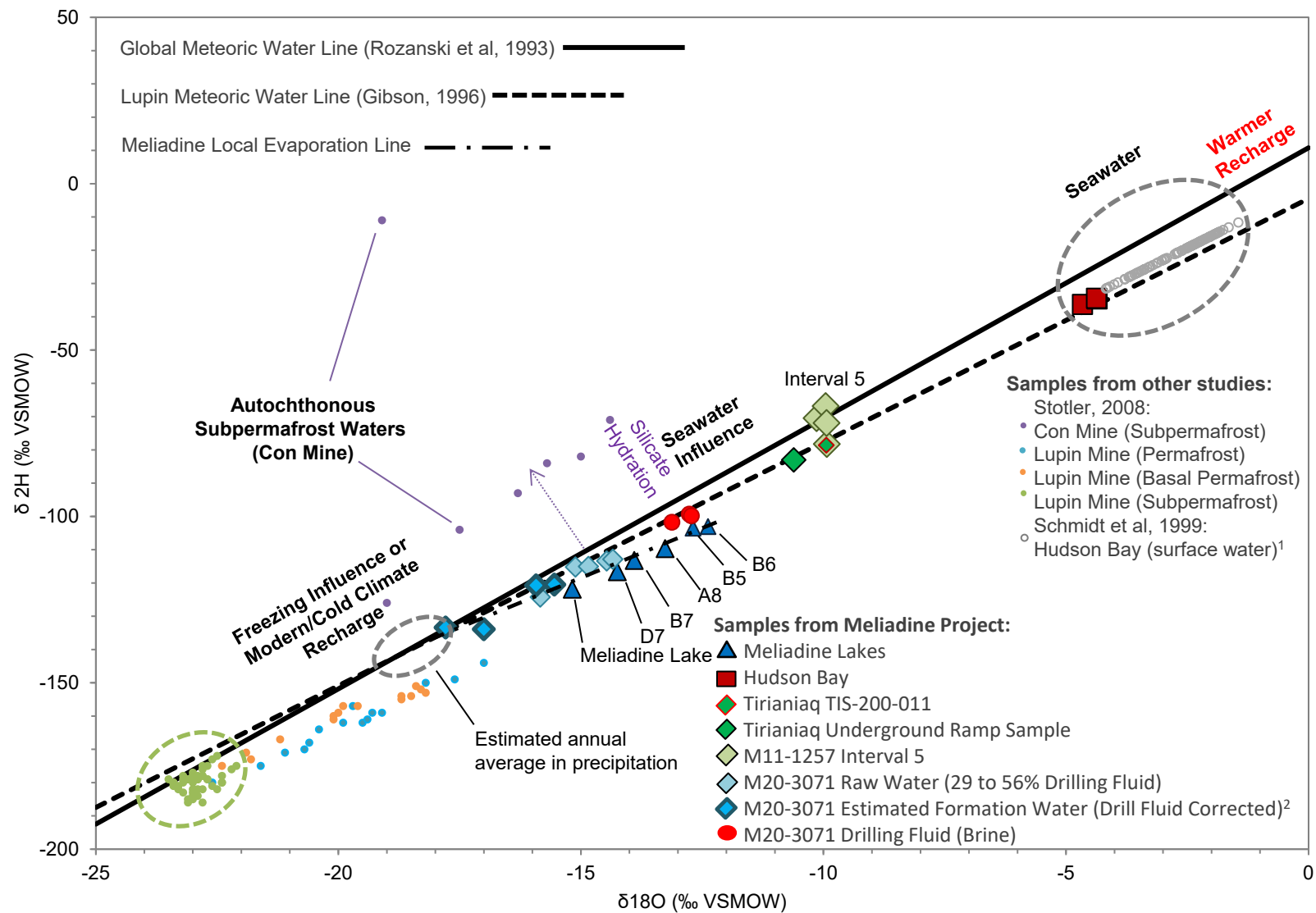
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**GOLDER**  
 MEMBER OF WSP

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PREPARED	DH
DESIGN	-
REVIEW	JL
APPROVED	VJB

PROJECT  
**AGNICO EAGLE MINES LIMITED**  
**MELIADINE EXTENSION**  
**NUNAVUT**  
 TITLE  
**ISOTOPIC COMPOSITION OF MELIADINE WATER SAMPLES**

PROJECT No. **20136436-817 2300** Rev. **1** **4**

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Notes:

<sup>1</sup> δ2H not measured in Schmidt (1999) samples from Hudson Bay; values plotted assume the δ2H vs δ18O relationship in samples from Atlantic Ocean from that study;

<sup>2</sup> Estimated Formation Water (Drilling Fluid Corrected) shown for Ports 3, 8 and 9;

<sup>3</sup> Annual average precipitation estimated as the point at which local evaporation line intersects the LMWL (Edwards et al. 2004);

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PREPARED DH

DESIGN -

REVIEW JL

APPROVED VJB

PROJECT

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MELIADINE EXTENSION  
NUNAVUT

TITLE

**WATER ISOTOPES – RECHARGE ORIGIN DEUTERIUM  
VERSUS OXYGEN-18 COMPOSITION OF WATER**

PROJECT No.  
**20136436-817 2300**

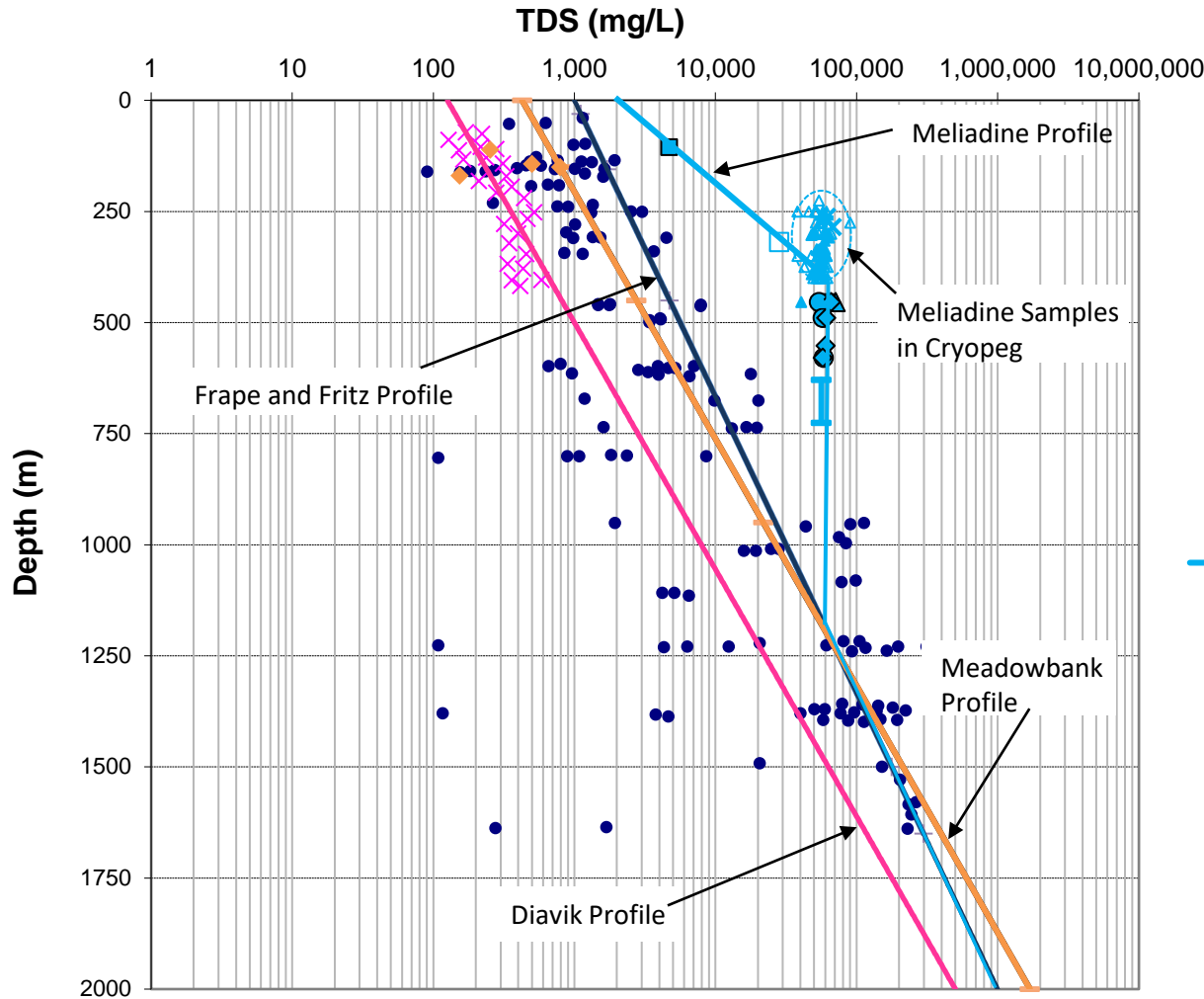
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The isotopic signatures from Ports 4 and 8 of M20-3071 which is enriched compared to modern climate or cold climate recharge, along with the geochemical results showing similar ionic ratios to groundwater collected from Interval 5 of M11-1157, suggest some component of seawater influence. This corroborates with the salinity of groundwater being dominantly sodium chloride; of seawater overprinting onto a typical Canadian Shield brine (typically dominated by calcium carbonate) as explained in Golder (2016). The depletion of the  $\delta^{18}\text{O}/\delta^2\text{H}$  isotopic signature at M20-3071 compared to that of M11-1257 Interval 5 suggests a greater influence of modern ( $\delta^{18}\text{O}$  -18 to -19 ‰) or cold climate ( $\delta^{18}\text{O} < 20$  ‰) recharge or freezing processes (Figure 5). Freezing causes the heavy isotopes to preferentially be incorporated into the ice, initially enriching the ice and causing depletion in the residual water. As freezing continues and the amount of residual water decreasing, both the ice and the residual water will be depleted relative to the original solution. This corroborates with the samples being collected from a talik; thawed ground surrounded by frozen ground, as opposed to the deeper regional aquifer below the permafrost. The relatively depleted isotopic signature of Ports 3 and 9 compared to Ports 4 and 8 supports that flushing has occurred at these ports.

### 3.3 Groundwater Salinity Profile

Figure 6 presents the interpreted TDS profile with depth from sites in the Canadian Shield and that of the Meliadine groundwater. The Meliadine data set incorporates data from Port 8 of M20-3071, as well as historical data collected from the Tiriganiaq underground, GT09-19 located below Lake B7, and Westbay well M11-1257 to the northwest of the Tiriganiaq underground. Samples collected at the Tiriganiaq Underground are from the partially frozen cryopeg and may be elevated in TDS relative to unfrozen bedrock at similar elevation below lakes due the preference freezing of fresher in the cryopeg.

Data from sites in the Canadian Shield are included for reference and comparison and is typically used to project the local TDS profile at depth. The Frape and Fritz dataset (1987) was developed based on chemical analyses of deep saline water collected by various investigators from several sites in the Canadian Shield. The Diavik dataset is based on site-specific data from Diavik, supplemented by information from the Lupin Mine site located about 200 km north of Diavik (Blowes and Logsdon 1997; Kuchling et al. 2000). The Diavik mine is located about 300 km northeast of Yellowknife. The Meadowbank dataset (Golder 2004) was developed based on site-specific data from Meadowbank Mine site supplemented by the data sources discussed above (Frape and Fritz 1987; Blowes and Logsdon 1997). The Meadowbank Mine is located approximately 300 km west of Hudson Bay and 70 km north of Baker Lake, or approximately 250 northwest of the Meliadine site. Of note is that the Meadowbank and Diavik datasets reflect shallow talik groundwater which differs from deep talik water and deeper sub permafrost groundwater. The hydraulic connection with an overlying freshwater lake results in lower salinity at equivalent depths than has been previously observed below full permafrost at the Meliadine Mine.



- Multiple Sites (Frape and Fritz 1987)
- ✕ Diavik (Kuchling et al. 2000)
- ◆ Meadowbank Data (Cumberland 2005)
- Meliadine 2009 and 2011 - Westbay and Talik Sample
- ▲ M11-1157 - 2012 Sample
- M11-1157 - 2013 Sample
- ◆ M11-1157 - 2014 Sample
- Meliadine 2015 - Underground Program
- ✕ Meliadine 2015 Ramp Sample 1
- ✕ Meliadine 2015 Ramp Sample 2
- ✕ Meliadine 2015 Ramp Sample 3
- ▲ Meliadine 2016 and 2017 - DDH Holes Tiriganiaq
- M20-3071 - 2020 Sample
- ▲ Meliadine 2020 - DDH Holes Tiriganiaq

Notes:  
<sup>1</sup> TDS result plotted as midpoint of sample interval depth where applicable;  
<sup>2</sup> Meliadine 2020 sample collected from M20-3071 Port 8.

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PROJECT

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TITLE

**GROUNDWATER SALINITY PROFILE WITH DEPTH**

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## 4.0 QUALITY ASSURANCE/QUALITY CONTROL

Duplicate field samples and a field equipment blank were submitted to the analytical laboratory as part of the quality assurance/quality control (QA/QC) protocol. The duplicate samples included a drill fluid sample collected at 490 mah and the final samples Port 8 and Port 4. Separate from the field submitted duplicates, the analytical laboratory performs equipment blanks and duplicate analyses as an internal QA/QC verification by the laboratory.

Analytical repeatability was tested by assessing the similarity between duplicate pairs of results. For each duplicate pairs of analysis where both results were higher than 5 times the method detection limit (MDL), the RPD was calculated as follows (equation 5):

$$(5) \quad RPD = \frac{\text{absolute [difference (concentration of a given parameter)]}}{\text{[average (concentration of a given parameter)]}} \times 100$$

Per USEPA recommended methods (USEPA 1994), an RPD of 20% or less was considered acceptable. Where one or both results of the duplicate pair were less than 5 times the MDL, a margin of +/- MDL was considered acceptable.

Table C-4 in APPENDIX C presents the RPD or +/- MDL value calculated from the duplicate pairs of results. Approximately 59% of the duplicate pairs of analyses had one or both analytical results below the method detection limit and consequently could not be assessed for repeatability. Where analytical results were above method detection limits in both samples, QA/QC results were within acceptable tolerance limits (RPD or +/- MDL) except for duplicate concentrations of COD (chemical oxygen demand), total suspended solids (TSS), salinity and laboratory measured electrical conductivity in Port 8 and duplicate concentrations of TSS in Port 4. The reason for the deviations in concentrations of these parameters may be attributed to the presence of trace sediments in the sample and/or the exceedance of the hold times due to sample shipping times and delayed laboratory analysis (Port 8 sample VA20B6509-008).

The results of the analysis of the equipment blank (VA20B6509-006) submitted to ALS indicate all parameters were below laboratory method detection limits except for total and/or dissolved calcium, strontium, zinc, total cesium, total phosphorus and orthophosphate which are present in trace amounts in the blanks.

The concentrations of these parameters in the equipment blank were consistently lower (within the same order of magnitude or lower by many orders of magnitude than the groundwater samples. The presence of cesium, strontium and zinc in the equipment blank may be the result of minor leaching from either the stainless steel Westbay sample bottles or laboratory equipment. Detectable concentrations of calcium, orthophosphate and total phosphorus in the equipment blank may be attributed to the presence of drilling fluids in the Westbay well over the course of the development program as drill fluids consistently had higher (several orders of magnitude) concentrations of these parameters, except for the non-brine drill sample (VA20B4662-001) collected at the end of the drilling program. Based on the results of the corrected groundwater quality from Port 8, the low concentrations (total and dissolved) of calcium, strontium, zinc, total cesium, total phosphorus and orthophosphate reported in the equipment blank are not interpreted to have affected the calculated quality of formation groundwater.

The results of the calculated and laboratory measured values were within reasonable range limits for all samples, except for drilling fluid samples containing 11% calcium chloride brine collected during the drilling between the depth of 225 and 360 mah and the initial raw water sample collected from Port 4 on 19 September 2020 (VA20B6509-005). The TDS and consequently electrical conductivity results (Table C-1 in APPENDIX C) exceeded the calibration range for these samples. The laboratory reported TDS results for the drilling fluid and Port 4 are still deemed useful as the TDS calculated values were typically within 2 to 29% the laboratory measured TDS values and generally lower due to the incomplete list of TDS constituents analyzed as part of the parameter suite.

The results of the 2020 groundwater monitoring program indicate the samples collected from Port 8 are representative of formation groundwater quality (within +/- 5 to 10%) based on the lower fluorescein content measured in the samples and sodium ratio trends of major anions trending towards water quality obtained from Interval 5 of Westbay well M11-1257 (fully developed). Based on the elevated concentrations of fluorescein content in Port 4, the samples collected during the 2020 groundwater monitoring program do not offer an accurate representation of formation groundwater quality. Low accuracy at Port 4 also stems from the variability of the drill fluid composition that must be used to calculate formation groundwater salinity and freezing point depression. The effect of this will decrease, and calculation accuracy should improve, as the proportion of drilling fluid in the formation decreases with further development and/or natural flushing.

## 5.0 CONCLUSIONS

This report documents the development and sampling to date of the new Westbay groundwater monitoring well M20-3071. Two of the five sampling ports were partially developed with reasonable representative groundwater samples collected from Port 8. Development time was constrained in 2020 by the onset of winter and the shutdown of mine site operations in the area of the well.

Port 8 formation water quality data serves to support the assessment of water salinity between lake CH6 and the deeper regional groundwater flow system, and as such provides an important transition water quality sample between the shallow surface water of low salinity and the deeper regional groundwater of high salinity (below the regional permafrost). Although the drill fluid remaining is higher than targeted (approximately 30%), there is reasonable confidence in the accuracy of the groundwater salinity evaluated from the sample that was collected at Port 8 (319 metres below ground surface) because of the consistent fluorescein and salinity of the drill fluid used during drilling at that interval depth. The estimated formation groundwater quality from Port 8 has a sodium chloride signature similar to regional chemistry measured at M11-1257 Interval 5 (approximately 450 to 460 metres below ground surface) though slightly more diluted (concentrations of major ions measured in Port 8 are on average two times lower than those measured at M11-1257 Interval 5). This relative dilution is consistent with the previously interpreted TDS profile for the site that shows increasing TDS with depth over these sampling intervals (Golder 2013, 2016).

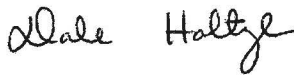
Formation groundwater quality at Port 4 could not be assessed because it still contains a large proportion of drilling fluids (more than 50% residual drill fluid remaining). The interval requires further development and removal of drilling fluids from the formation to provide better resolution of groundwater quality. Notwithstanding this, the chemical signature of the groundwater (based on major ion ratios) indicates a trend toward a similar salinity signature to that of the groundwater at Interval 5 of M11-1257 as the development progressed at Port 4.

Fluorescein concentrations at Ports 3 (35% residual drill fluid remaining) and Port 9 (30% residual drill fluid remaining) lowered more than would be expected given they were not actively developed and hydraulic testing in the surrounding bedrock indicated the rock permeability is low ( $10^{-9}$  to  $10^{-11}$  m/s; refer to APPENDIX A, Figure 4, Golder 2021). It is possible that flushing has been induced from adjacent port development.

## 6.0 CLOSURE

The reader is referred to the Study Limitations, which follows the text and forms an integral part of this report. We trust the above meets your present requirements. If you have any questions or require additional information, please contact the undersigned.

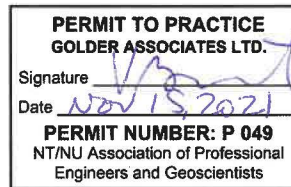
**Golder Associates Ltd.**



Dale Holtze, M.Sc.  
*Environmental Specialist*

  
Valerie Bertrand, M.A.Sc., P.Geo.  
*Senior Geochemist / Associate*

Jennifer Levenick, M.Sc., P.Eng.  
*Associate, Senior Hydrogeologist*



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[https://golderassociates.sharepoint.com/sites/120710/project\\_files/6\\_deliverables/issued/20136436-817-r-rev1 - westbay gw quality/20136436-817-r-rev1-2300-meliadine westbay gw quality 15nov\\_21.docx](https://golderassociates.sharepoint.com/sites/120710/project_files/6_deliverables/issued/20136436-817-r-rev1_-_westbay_gw_quality/20136436-817-r-rev1-2300-meliadine_westbay_gw_quality_15nov_21.docx)

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**APPENDIX A**

**Installation of Westbay Monitoring  
Well System M20-3071 (Golder 2021)**



## REPORT

# Installation of Westbay Monitoring Well System M20-3071 Meliadine Extension

## *Factual Report*

Submitted to:

**Agnico Eagle Mines Limited**

Colleen Prather and Michel Groleau

Submitted by:

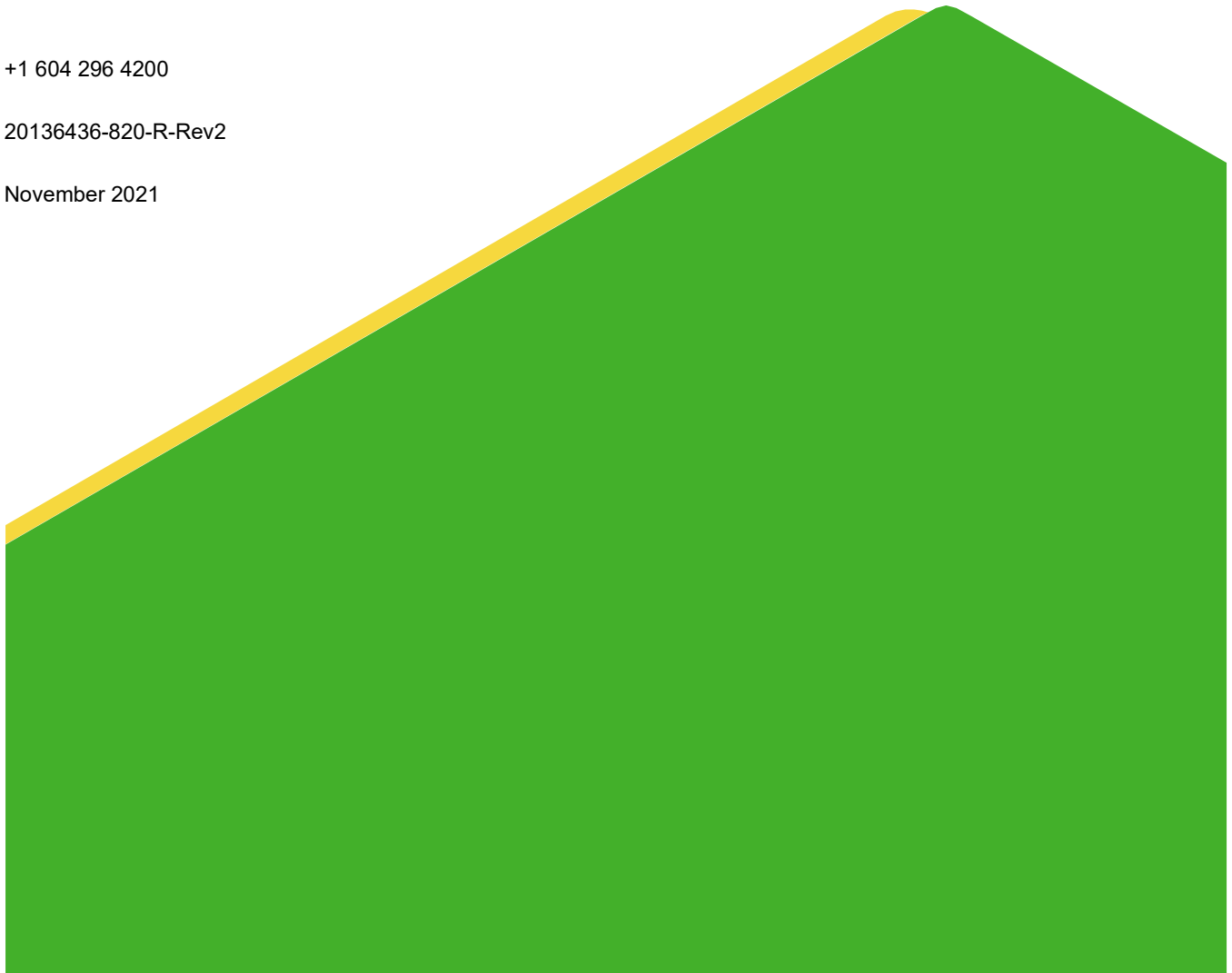
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+1 604 296 4200

20136436-820-R-Rev2

November 2021





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Drilling, Circulation, Displacement, and Monitoring Well M20-3071 Westbay System Fluid Summary Tables

**APPENDIX B**

Photographs of M20-3071 Core

**APPENDIX C**

M20-3071 Drill Hole Report prepared by Agnico Eagle Mines Limited

**APPENDIX D**

FracMan HydroBench® Analysis Reports

**APPENDIX E**

Completion Report, Westbay System Monitoring Well: M30-3071, Agnico Eagle Mines Ltd. (Westbay Instruments a Division of Nova Metrix Ground Monitoring (Canada) Limited)

## 1.0 INTRODUCTION

The following report provides a summary and interpretation of the hydrogeological data collected during the 2020 installation of the Westbay groundwater monitoring well system M20-3071 (Westbay well) for the evaluation of groundwater conditions at the Discovery deposit carried out in support of the Agnico Eagle Mines Limited (Agnico Eagle) proposed Meliadine Extension. This report accompanies the Westbay Monitoring Well System M20-3071 Groundwater Quality report (Golder 2021).

The M20-3071 drilling program commenced on 12 August 2020 and was under the direction of Agnico Eagle personnel for the first 225 metres of drilling. The 2020 Westbay well drilling and installation program included the following activities as summarized in Table 1 and described in more detail in subsequent sections of the report.

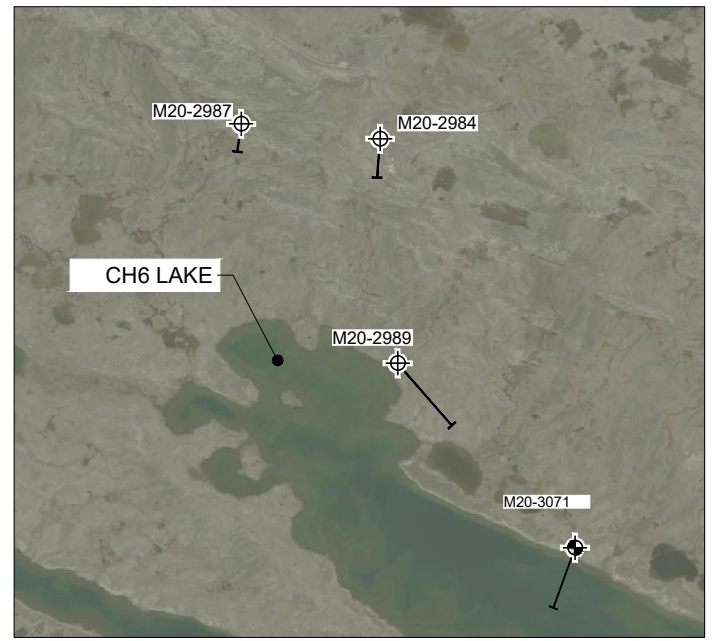
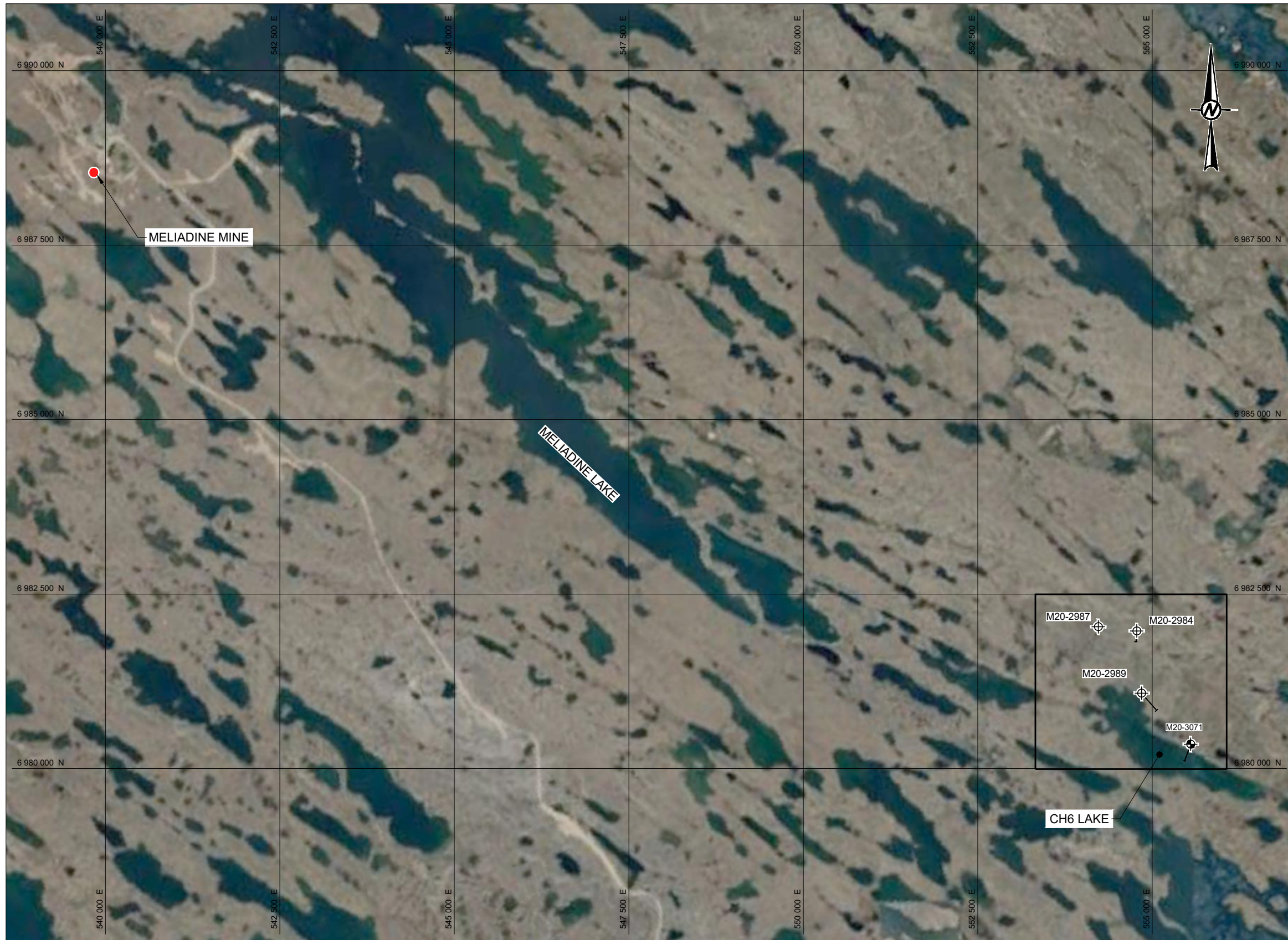
**Table 1: M20-3071 Drilling and Westbay Well Installation Program Schedule**

Task Description	Start Date	Date of Completion
<ul style="list-style-type: none"> <li>■ Geotechnical and oriented core logging support, 225 to 606 metres along the borehole</li> <li>■ Field monitoring of selected parameters in the drilling fluids, and sample collection</li> </ul>	17-Aug-20	27-Aug-20
<ul style="list-style-type: none"> <li>■ Hydrogeologic testing using pneumatic packers</li> </ul>	17-Aug-20	28-Aug-20
<ul style="list-style-type: none"> <li>■ Borehole flushed with hot water or brine to prevent freezing</li> <li>■ Field monitoring of selected parameters</li> </ul>	28-Aug-30	31-Aug-20
<ul style="list-style-type: none"> <li>■ Installation of the Westbay well</li> </ul>	29-Aug-20	7-Sep-20
<ul style="list-style-type: none"> <li>■ Hydraulic response testing of the Westbay well isolated intervals</li> </ul>	20-Sep-20	23-Sep-20

## 2.0 DRILLING PROGRAM



The drilling program for Westbay well M20-3071 was undertaken in August 2020 by Forage Orbit Garant (Orbit Garant). The borehole M20-3071 was drilled in 96 mm (HQ size) diameter to a depth of about 560 metres below ground surface (606 metres along hole) at an average inclination of -67.7 degrees, and average azimuth of 199.7 degrees. A 101.6 mm diameter (HWT size) surface casing was advanced to approximately 250 mah through overburden and weathered rock into competent bedrock to prevent caving of the unconsolidated materials into the borehole. A site plan with borehole location is shown on Figure 1. Detailed information on the borehole, including collar coordinates, ground surface elevation, borehole survey data (provided by Agnico Eagle), and end depth is presented in Table 2.

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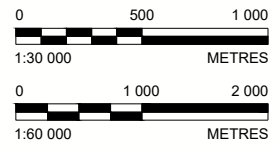
**LEGEND**

-  BOREHOLE WITH THERMISTOR INSTALLATION
-  BOREHOLE WITH WESTBAY WELL INSTALLATION

Borehole ID	
Golder	Agnico Eagle
DISCO-CONV-016	M20-2984
DISCO-CONV-019	M20-2987
DISCO-CONV-021-V2	M20-2989

**REFERENCE(S)**

- COORDINATE SYSTEM: UTM NAD 83, ZONE 15.
- AERIAL IMAGE : GOOGLE EARTH, 2020



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CONSULTANT



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DESIGNED	RG
PREPARED	DH
REVIEWED	DH
APPROVED	MD

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MELIADINE EXTENSION  
NUNAVUT

TITLE

**M20-3071 WESTBAY WELL LOCATION**

PROJECT NO.	PHASE	REV.	FIGURE
20136436-820	2300	2	1

25 mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSIB

**Table 2: M20-3071 Borehole Details**

Borehole ID	Northing [m] <sup>(a)</sup>	Easting [m] <sup>(a)</sup>	Ground Surface Elevation [masl] <sup>(b)</sup>	Borehole Length [mah] <sup>(c)</sup>	Average Borehole Azimuth [°]	Average Borehole Inclination [°]
M20-3071	6980349	555551	66.9	606	199.7	67.7

**Notes:** m = metres; masl = metres above sea level; mah = metres along hole; ° = degrees

(a) = collar coordinates are referenced to UTM coordinate system – NAD83; Zone 15

(b) = metres above sea level

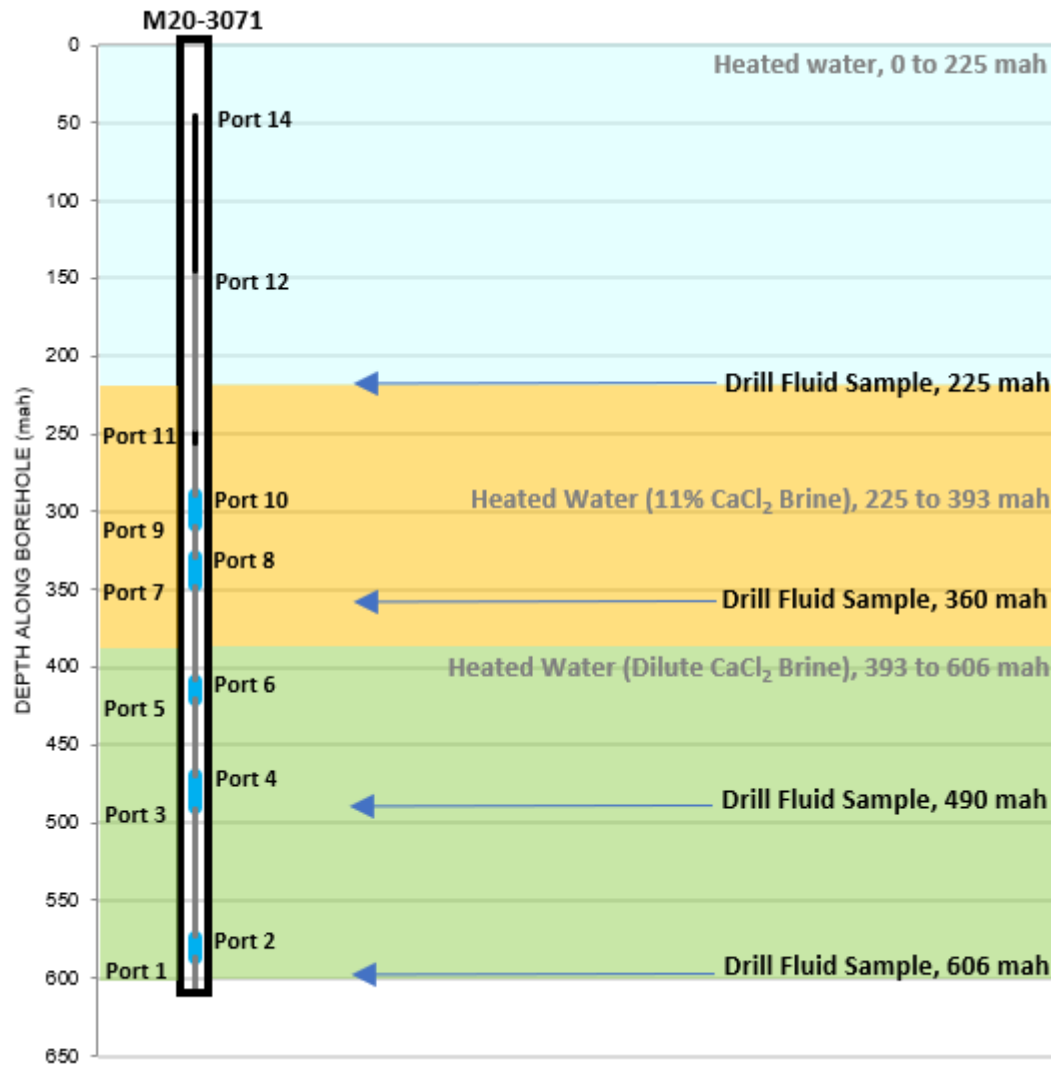
(c) = metres along hole, relative to ground surface

The upper 225 meters of drilling was carried out with heated water sourced from Lake CH6, which has electrical conductivity of 42  $\mu\text{S/cm}$  to 193  $\mu\text{S/cm}$ . At 225 m depth along hole (mah), a calcium chloride salt ( $\text{CaCl}_2$ ) was added to the water creating a 11% calcium chloride brine to prevent the drilling fluid from freezing, and to provide a secondary tracer for future separation of drill fluid / formation water during sampling. At the request of Agnico Eagle the use of calcium chloride brine was discontinued at 393 mah for financial and environmental reasons. Orbit Garant was unable to recycle/recirculate the brine fluid as originally planned, which resulted in a higher rate of consumption of calcium chloride and brine drilling fluid being discharged to the ground surface. These changes introduced an uncertainty in understanding the concentration of calcium chloride in the drilling fluid introduced to the borehole below 393 mah, as the drilling fluid salinity varied until the brine was completely replaced by heated lake water. A schematic illustrating the composition of the drill fluid used during the drilling of M20-3071 is shown in Figure 2, including the depths where samples of the drill fluid were collected for chemical analysis. At the end of drilling and prior to well installation, 11% calcium chloride brine was added to prevent freezing during packer testing and subsequent Westbay well installation. Chemical analysis of the drill fluid sample collected at 490 mah indicates that residual calcium chloride brine remained in the drilling fluid.

In addition to calcium chloride a fluorescein tracer with average concentration of 795 parts per billion (ppb) was added to the drilling fluid at 225 mah. The tracer was added to aid with well development prior to sampling to monitor concentration of drilling fluid in water collected from the Westbay well ports.

The fluorescein concentration and the general water parameters (pH, temperature, specific gravity, and electrical conductivity) were collected and recorded throughout the drilling and installation of the Westbay well. Fluorescein concentration was measured with an AquaFluor handheld fluorometer manufactured by Turner Designs. Temperature, pH, and electrical conductivity values were measured with a Hanna Combo tester (HI 98129). Field conductivity measurements were collected from diluted samples (up to 100 times dilution) for drill fluid comprised of brine or a mixture of freshwater and brine due to limitations of the field instrument available at the time of the drilling program (Hanna Combo tester has a measurement range between 0 and 3,999  $\mu\text{S/cm}$ ). The dilution of the samples introduced a degree of uncertainty for the corrected electrical conductivity readings recorded. A Pro30 Conductivity instrument manufactured by YSI with a range 0 to 200,000  $\mu\text{S/cm}$  was used to measure the conductivity water samples during the well development as documented in the Westbay Monitoring Well System M20-3071 Groundwater Quality report (Golder 2021).

A summary of drilling fluid measurements is provided in Appendix A. The variability in the electrical conductivity and fluorescein concentration measured in the drilling fluid during drilling may be related to the problems with recirculation of the drilling fluid in the supply tank due to limitations of the equipment used by Orbit Garant. A summary of the drilling fluid samples collected during drilling of the borehole is presented in Table 3. The samples were submitted to the analytical laboratory ALS Environmental in Vancouver, British Columbia for analysis of key chemical parameters. The results of the analytical testing completed on the drilling fluid samples are documented in the Westbay Monitoring Well System M20-3071 Groundwater Quality report (Golder 2021).



Notes:

- = Port targeted for sampling zone interval
- mah = metres depth along borehole
- CaCl<sub>2</sub> = calcium chloride

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PREPARED DH

DESIGN -

REVIEW JL

APPROVED MD

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MELIADINE EXTENSION  
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**SCHEMATIC OF M20-3071 WESTBAY WELL DRILL FLUID COMPOSITION**

PROJECT No. 20136436-820 2300

Rev. 2

Figure 2

**Table 3: Drilling Fluid Sample Details Borehole M20-3071**

Sample Identification	Sample Collection Date	Sample Description
Westbay-A-225	17-Aug-20	Drilling fluid (brine) sample collected during drilling with the borehole depth at approximately 225 mah
Westbay-A-360	21-Aug-20	Drilling fluid (brine) sample collected during drilling with the borehole dept at approximately 360 mah
Westbay-A-490	25-Aug-20	Drilling fluid (fresh water) sample collected during drilling with the borehole depth at approximately 490 mah
Westbay-A-490-Dup	25-Aug-20	Drilling fluid (fresh water) duplicate sample collected during drilling with the borehole depth at approximately 490 mah for QA/QC purposes
Westbay-A-606	27-Aug-20	Fluid (fresh water) sample collected during drilling with borehole depth at approximately 606 mah.
Westbay-A-606-BR	27-Aug-20	Fluid (brine) sample collected at end of drilling activities with the borehole depth at approximately 606 mah. Brine was used to flush the hole to prevent freezing of the drilling fluid during packer testing and Westbay well installation.

**Notes:** mah = metres along hole

Following drilling, a gyroscopic borehole survey was completed prior to the start of the Westbay well installation activities to map the orientation of the borehole. A summary of the averaged downhole orientation data for borehole M20-3071 is presented in Table 4.

**Table 4: Results of Borehole M20-3071 Deviation Survey**

Depth Interval [mah]	Azimuth [ $^{\circ}$ ] <sup>(a,b)</sup>	Inclination [ $^{\circ}$ ] <sup>(a,c)</sup>
0 to 60	197.4	73.5
60 to 120	198.1	72.1
120 to 180	199.2	70.7
180 to 240	200.1	69.5
240 to 300	200.7	68.0
300 to 360	200.2	66.7
360 to 420	201.5	65.5
420 to 480	200.4	64.4
480 to 540	200.6	63.3
540 to 590	200.1	62.5

**Notes:**  $^{\circ}$  = degrees; mah = metres along hole

(a) The average azimuth and inclination for borehole M20-3071 were calculated from gyroscopic survey data provided by Agnico Eagle

(b) The azimuth measurements are with respect to true north. All angles are in degrees.

(c) Inclination is the angle below the horizontal, i.e., -90 degrees = a vertical hole.

The core recovered from borehole M20-3071 was photographed and reviewed by Golder to assist in selection of intervals for hydrogeological testing and placement of Westbay packers. Photographs of the M20-3071 core are included in Appendix B. The geological core logging was carried out by Agnico Eagle personnel. Based on the information provided by Agnico Eagle the lithology of the borehole consists of sedimentary rock (greywacke) from 2.3 to 593 mah, with inter-bedded oxide iron formations from 15.9 to 22.5 mah and 593 mah to the end of the borehole at 606 mah (refer to Appendix C).



### 3.0 HYDROGEOLOGICAL TESTING IN OPEN BOREHOLE

Hydrogeological testing in borehole M20-3071 was completed between 17 and 20 August 2020 using a pneumatic packer tool in a wireline single packer configuration. Single-well pressure response tests were carried out to obtain information of local-scale aquifer parameters such as transmissivity and hydraulic conductivity, and hydraulic heads at selected depths along the borehole. Hydrogeological testing was conducted between 180 m and 606 mah, with the uppermost interval potentially partially within permafrost (Agnico Eagle 2014). The borehole was projected to extend below the footprint of Lake CH6 at 250 mah, and if open talik is present below Lake CH6, bedrock below 250 mah would therefore be outside of the permafrost. Information on tested intervals and number of tests conducted is presented in Table 5.

**Table 5: Summary of Hydrogeological Testing**

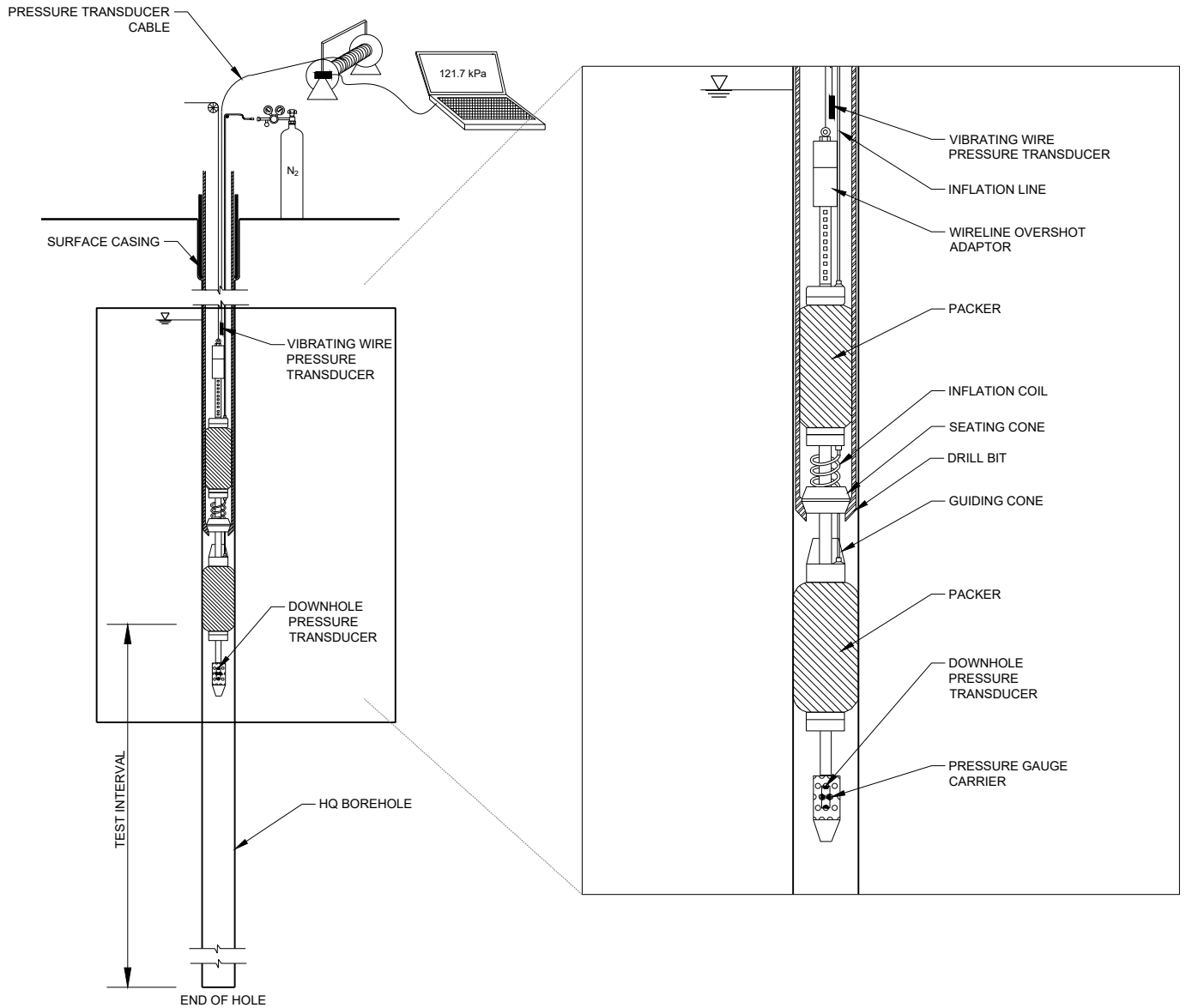
Borehole ID	Interval Tested [mah]	Number of Tests Conducted	Date Started	Date Ended
M20-3071	180.4 to 345	4	17 August 2020	21 August 2020
	345.4 to 606	4	22 August 2020	27 August 2020

**Notes:** mah = metres along hole

### 3.1 Testing Approach

The testing equipment used for the hydrogeological in situ testing during drilling included a pneumatic single packer tool in a wireline configuration provided by Golder. Single-packer wireline tool consists of two RST Instruments packers connected with a seating cone designed to stop in the drill bit so that one packer stays inside the core barrel and one extends into the open borehole below the bit. With the packers inflated this set up allows a direct connection from surface through the NQ drill string to the test interval below the packer. To perform a test, the drill string was pulled up to expose a section of the borehole selected for testing, and the tool was lowered on a wireline through the drill string into the borehole. When the packers were seated in the selected test position, they were inflated with nitrogen gas isolating the section of the borehole between the lower packer and the bottom of the borehole at that time. After the test was completed, the packers were deflated and removed from the borehole. A schematic of the single-packer wireline tool is shown in Figure 3.

Pressure response data during each test were collected by two pressure transducers, an In-Situ Level TROLL 700 memory gauge and an RST Instruments Vibrating Wire (VW) piezometer connected to a datalogger. The Level TROLL memory gauge was placed in a carrier attached to the bottom of the packer tool and programmed to a sample frequency of two to five seconds to allow collection of data within the test interval. The RST Instruments VW piezometer was lowered below the water level inside the drill rods and programmed to the same frequency. In test intervals where the depth to the water level exceeded the length of the pressure transducer cable, the RST Instruments sensor was not used. Data from the Level TROLL gauge were used for the test analysis. The RST Instruments VW piezometer readings were used to monitor the progress during each test sequence in real time and serve as a secondary source of data in case of Level TROLL malfunction.



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**SCHEMATIC ONLY**

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DESIGNED RG

PREPARED DH

REVIEWED DH

APPROVED MD

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 AGNICO EAGLE MINES LIMITED  
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TITLE  
**SINGLE PACKER WIRELINE DOWNHOLE ASSEMBLY  
 SCHEMATIC**

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 20136436-820

PHASE  
 2300

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 2

FIGURE  
**3**

## 3.2 Testing Methodology

The following testing methodology was used for the hydrogeological testing during drilling of the borehole M20-3071:

- pressure static recovery (PSR) sequence
- slug withdrawal (SW) or slug injection (SI) sequence
- constant rate injection (RI) sequence

The procedures and the order of the individual test sequences were adjusted for each test. Based on the actual conditions encountered in the individual test intervals, some of the sequences listed above were not carried out.

Detailed description of the individual test sequences is provided below:

### Pressure Static Recovery

The PSR sequence was carried out to allow the aquifer within the isolated interval to reach static conditions after packer inflation. The duration of this sequence varied from approximately 30 to 60 minutes. This time was determined by reaching the pre-test static conditions or collecting sufficient data to extrapolate the static water level corresponding to the test interval.

### Slug Injection Test / Slug Withdrawal Test

After the PSR sequence, a SI or SW test was carried out. The test sequence consisted of adding or removing an instantaneous slug of water into/from the test rods. After the slug displacement, the water level inside the test rods was monitored until it recovered to the pre-test level. If the water fully recovered within a 30-minute period, the slug test was followed by a constant RI test sequence. If full recovery was not reached within 30 minutes, the slug recovery monitoring continued for another 15 to 30 minutes until sufficient data was collected to extrapolate the recovery to pre-test levels.

### Constant Rate Injection

A constant RI test consists of injecting water into the test interval at a constant rate for a minimum of 30 minutes. A surface water injection assembly including a pump, flow control valves, flowmeter, pressure transducer, and a header that connects the water injection assembly to the top of the test rods is required to perform a constant rate injection test. In addition to the data collected by the downhole memory gauge in the test interval, flow rate and injection pressure are recorded during the test with the surface monitoring equipment.

A summary of the flow rates and injection pressures used during each test are included in Appendix D.

## 3.3 Test Results

The test analyses were carried out with FracMan HydroBench® (Version 7.00), a Golder internally developed software package designed to analyze different types of hydrogeological tests. HydroBench® is a pressure transient interpretation package using the methodology of the Bourdet Derivative (e.g., Gringarten 2008), coupled with a library of analytical reservoir models. Further information on the HydroBench® software including a summary of the software is included in Appendix D.

A summary of the initial transmissivity and hydraulic conductivity values calculated for the tested intervals is presented in Table 6. The hydraulic conductivity values were calculated by dividing the transmissivity value by the length of the corresponding test interval. The table shows the test sequences carried out in each interval such as

PSR, SI and SW. For each test interval, the test sequence with the most reliable pressure response data was selected for analysis.

**Table 6: Summary of Hydrogeological Test Results in Open Borehole**

Test Number	Test Interval			Test Sequences		Transmissivity	Hydraulic Conductivity
	Top [mah]	Bottom [mah]	Length [mah]	Conducted	Analysed <sup>(a)</sup>	[m <sup>2</sup> /s]	[m/s]
1	180.4	225	44.6	PSR, SI	SI	$5 \times 10^{-8}$	$1 \times 10^{-9}$
2	222.1	264	41.9	PSR, SI	SI	$3 \times 10^{-9}$	$<1 \times 10^{-10}$
3	260	303	42	PSR, SI	SI	$3 \times 10^{-7}$	$6 \times 10^{-9}$
4	300	345	45	PSR, SW, RI	RI	(b)	(b)
5	345.4	384	38.6	PSR, SI	SI	$<2 \times 10^{-10}$	$<1 \times 10^{-10}$
6	432.2	480	47.8	PSR, SI	SI	$6 \times 10^{-10}$	$<1 \times 10^{-10}$
7	381	480	99	PSR, SI	SI	$1 \times 10^{-9}$	$<1 \times 10^{-10}$
8	477	606	129	PSR, SI	SI	$7 \times 10^{-9}$	$<1 \times 10^{-10}$

**Notes:** PSR = Pressure Static Recovery, SI = Slug Injection, SW = Slug Withdrawal, RI = Constant Rate Injection

(a) Most reliable test sequence selected for analysis

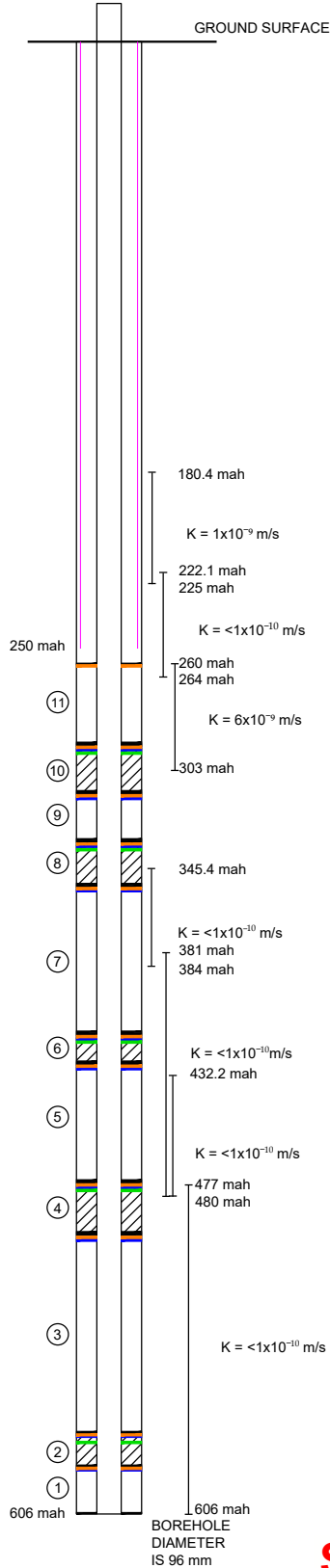
(b) Results not reliable due to packer bypass observed during test

The hydraulic conductivity values derived from the single-well pressure response tests completed in borehole M20-3071 vary from less than  $1 \times 10^{-10}$  m/s to  $6 \times 10^{-9}$  m/s indicating very low hydraulic conductivity. The test results in relation to the corresponding test interval depths are presented in Figure 4 except test 4. Results of test 4 ( $5 \times 10^{-8}$  m/s) carried out between 300 mah and 345 mah are not considered representative of natural formation response because a packer bypass was observed during the test.

The hydraulic conductivity value of  $6 \times 10^{-9}$  m/s calculated for the test interval 3 between 260 mah and 303 mah may be influenced by a zone of enhanced permeability, as indicated by the low rock quality designation and higher fracture frequency reported between 293 and 303 mah (refer to Appendix B – Figure B-9) and Appendix C. Agnico Eagle also recorded moderate fault structure at 299 mah.

Detailed analytical test reports are presented in Appendix D. These reports are computer generated protocols and some values in these documents may differ from values discussed within the text section of this document.

BOREHOLE M20-3071



WESTBAY SYSTEM INTERVAL DETAILS							
PORT NO.	ZONE NO.	INTERVAL DEPTH ALONG HOLE			INTERVAL VERTICAL DEPTH		
		MONITORING PORT	FROM	TO	MONITORING PORT	FROM	TO
		(mah)	(mah)	(mah)	(mbgs)	(mbgs)	(mbgs)
11	QA6	256.4	256.2	288.8	243.2	243	273.3
10	5	290	289.7	308.7	274.4	274.1	291.7
9	QA5	309.8	309.6	328.5	292.7	292.5	310
8	4	329.7	329.4	346.9	311.1	310.8	326.9
7	QA4	348	347.8	407.8	327.9	327.7	382.5
6	3	409	408.7	420.1	383.6	383.4	393.7
5	QA3	421.2	421	468.9	394.7	394.5	437.9
4	2	470	469.8	490.3	438.9	438.7	457.1
3	QA2	491.4	491.2	572.6	458.1	457.9	530.6
2	1	573.7	573.5	586.4	531.6	531.4	542.8
1	QA1	587.5	587.3	606	543.8	543.6	560.2

**LEGEND**

- PACKER
- ▨ SAMPLE INTERVAL
- STEEL CASING
- ① PORT
- MAGNETIC COLLAR (MC)
- MONITORING PORT (MP)
- PUMPING PORT (PP)
- K HYDRAULIC CONDUCTIVITY (m/s)
- mah METRES ALONG BOREHOLE RELATIVE TO GROUND SURFACE
- mbgs METRES BELOW GROUND SURFACE
- m/s METRES PER SECOND

**NOTES**

1. ALL UNITS ARE IN METRES UNLESS OTHERWISE NOTED.
2. PERMAFROST ASSUMED 250 m ALONG HOLE ALIGNMENT.
3. DRILL RODS TO 250 m ALONG HOLE.
4. BOREHOLE LOCATED IN UTM ZONE 15 NAD 83 AT N 6980349.0, E 555550.8, ELEVATION 66.85 m.
5. BOREHOLE INCLINATION VARIES FROM 74.3° AT COLLAR TO 62.2° AT THE END OF THE SURVEYED HOLE (590 mah).
6. DEPTHS FOR TOP AND BOTTOM INTERVAL BASED ON PACKER SEAL POSITION.
7. ZONE NO. REFERENCED AS PER TABLE 4 M20-3071 AS-BUILT PACKER AND PORT SUMMARY PREPARED BY WESTBAY INSTRUMENTS (REFER TO APPENDIX E).
8. NOT ALL MONITORING PORTS INSTALLED ARE SHOWN FOR SIMPLICITY PURPOSES.

NOT TO SCALE  
SCHEMATIC ONLY

CLIENT



CONSULTANT

YYYY-MM-DD 2021-11-05

DESIGNED RG

PREPARED DH

REVIEWED DH

APPROVED MD

PROJECT

**AGNICO EAGLE MINES LIMITED  
MELIADINE EXTENSION  
NUNAVUT**

TITLE

**M20-3071 WESTBAY WELL INSTALLATION DETAILS**

PROJECT NO. 20136436-820

PHASE 2300

REV. 2

FIGURE 4

## 4.0 WESTBAY WELL

All of the materials and components of the Westbay multi-level monitoring well required for installation in borehole M20-3071 were prepared at the well site between 29 August and 7 September 2020. The time required to complete the installation was longer than planned due to inclement weather between 1 and 3 September 2020 that delayed mobilization of drill equipment until 4 September 2020. The preparation included visual inspection, counting, and numbering each PVC pipe, packer, measurement port, pumping port, magnetic collar, and other materials according to the order of the installation as specified in the well design. The joints (well casing and couplings) were tested on the surface for potential leak as part of quality control and quality assurance.

Once the well installation materials were ready, the core barrel was removed from the drill string, and the drill rods equipped with a shoe bit were lowered back into the hole to depth of 350 mah. As mentioned in section 2.0, a calcium chloride brine (11%) with fluorescein tracer was used to displace the fresh water in the portion of the borehole within permafrost to prevent freezing. Upon completion of the freshwater displacement the drill string was pulled up to about 250 mah and permanently secured in place to protect the instrumentation through permafrost.

The individual well components were assembled at the surface according to the design and lowered into the borehole through the drill rods. As the PVC pipe was lowered into the hole, it was filled with a 4:1 mixture of lake water and propylene glycol for the first 306 metres of the well installation followed by a 2:1 mixture of lake water and propylene glycol in the upper 300 metres of the well to overcome buoyancy of the system and to prevent freezing of fluids within the pipe.

Once the complete Westbay well was in place, the twelve deepest packers were inflated with a 4:1 mixture of diluted propylene glycol. A 2:1 mixture of diluted propylene glycol was used to inflate the upper two support packers for added protection against freezing.

The Westbay well multi-port interval depths are provided in Table 7 and a schematic of the installation details are presented in Figure 4. All sampling intervals were installed in unfrozen bedrock within the talik of CH6 Lake.

**Table 7: M20-3071 Westbay Monitoring Well System Intervals**

Port			Interval Depth Along Borehole <sup>(a)</sup>			Interval Depth Vertical <sup>(b)</sup>		
No.	Depth [mah]	Depth [mbgs]	From [mah]	To [mah]	Length [m]	From [mbgs]	To [mbgs]	Length [m]
14	46.0	45.8	145.5	99.7	44.2	44.0	139.0	95.0
13	146.6	146.4	246.1	99.7	144.0	139.9	233.6	93.7
12	247.3	247.0	255.3	8.3	234.7	234.4	242.1	7.7
11	256.4	243.2	256.2	288.8	32.6	243.0	273.3	30.3
10	290.0	274.4	289.7	308.7	19.0	274.1	291.7	17.6
9	309.8	292.7	309.6	328.5	18.9	292.5	310.0	17.4
8	329.7	311.1	329.4	346.9	17.5	310.8	326.9	16.1
7	348.0	327.9	347.8	407.8	60.0	327.7	382.5	54.8
6	409.0	383.6	408.7	420.1	11.4	383.4	393.7	10.4
5	421.2	394.7	421.0	468.9	47.9	394.5	437.9	43.3
4	470.0	438.9	469.8	490.3	20.5	438.7	457.1	18.4
3	491.4	458.1	491.2	572.6	81.4	457.9	530.6	72.7
2	573.7	531.6	573.5	586.4	12.9	531.4	542.8	11.4
1	587.5	543.8	587.3	606.0	18.7	543.6	560.2	16.6

**Notes:** m = metres; mah = metres along the hole, relative to ground surface; mbgs = metres below ground surface

(a) Depth values were provided in Westbay Instruments completion Report and are based on packer seal position.

(b) Depth values were inferred from the gyroscopic survey data corresponding to the appropriate interval.

A pressure measurement and sampling port was installed in each isolated interval to measure the corresponding hydraulic heads and to allow for the collection of groundwater samples. A total of 14 ports were installed along the length of the borehole with five of these ports targeting sampling zone intervals (Ports 2, 4, 6, 8, and 10), and nine to facilitate the installation process. Pressure measurement ports were also installed below the first two packers to relieve excess pressure generated during the packer inflation process. These ports were opened during the inflation of the packers to allow proper inflation and prevent any potential damage to the well from excess pressure. Pumping ports were also placed at the base and halfway through the permafrost zone to allow injection of a 2:1 mixture of lake water and propylene glycol into the annulus of the borehole within the extent of the permafrost zone to prevent freezing of the well. A comprehensive record of well installation (from Westbay Instruments Division of Nova Metrix Ground Monitoring Canada limited) including as-built casing summary, field data calculation sheet, and packer pre-inflation and post-inflation profiles, is included in Appendix E.

## 4.1 Hydrogeological Testing in Westbay Well

### 4.1.1 Testing Methodology

Single-well pressure response tests were carried out in five isolated intervals using the measurement ports of the Westbay well by Golder personnel between 20 and 23 September 2020. The data collected from these tests was used to obtain information on the hydraulic conductivity of each interval. The hydrogeological testing was conducted using the Mosdax sampler probe and the sampling bottles.

To perform a test, the sample bottles were attached to the Mosdax sampler probe and lowered inside the Westbay well. Once the Mosdax probe reached the level of the sample port, the pressure inside the casing was recorded. The probe was connected to the sample zone via the measurement port and the formation pressure was recorded as the sample bottles were being filled until the pressure was similar to the formation pressure prior to opening the sample valve. The total volume removed was 1 litre. The probe was disconnected from the monitoring port and then the sample probe and sample bottles were removed from the Westbay well.

### 4.1.2 Test Results

The test analyses were carried out with FracMan HydroBench® (Version 7.00), a Golder internally developed software package designed to analyze different types of hydrogeological tests. A summary of the transmissivity and hydraulic conductivity values calculated for the zones tested are presented in Table 8.

**Table 8: Hydrogeological Test Results from M20-3071 Westbay Monitoring Well System**

Test ID	Test Interval			Transmissivity (T)	Hydraulic Conductivity (K)
	From (mah)	To (mah)	Length (m)	(m <sup>2</sup> /s)	(m/s)
Port 11	256.2	288.8	32.6	2 x 10 <sup>-8</sup>	5 x 10 <sup>-10</sup>
Port 10	289.7	308.7	19.0	7 x 10 <sup>-8</sup>	4 x 10 <sup>-9</sup>
Port 9	309.6	328.5	18.9	7 x 10 <sup>-9</sup>	4 x 10 <sup>-10</sup>
Port 8	329.4	346.9	17.5	6 x 10 <sup>-8(a)</sup>	3 x 10 <sup>-9(a)</sup>
Port 7	347.8	407.8	60.0	1 x 10 <sup>-9(b)</sup>	<1 x 10 <sup>-10(b)</sup>

**Notes:** m = metres; mah = metres along the hole; m<sup>2</sup>/s = square metres per second; m/s = metres per second

(a) Low to moderate confidence in result due to uncertain magnitude of pressure change during the test

(b) Low to moderate confidence in the result due to small magnitude of pressure change during the test

The hydraulic conductivity values derived from the single-well pressure response tests completed in the Westbay well vary from less than 1 x 10<sup>-10</sup> m/s to 4 x 10<sup>-9</sup> m/s. These values indicate very low hydraulic conductivity and are in the same range as the results of the hydrogeological tests completed in the open borehole.

The hydraulic conductivity values of 4 x 10<sup>-10</sup> m/s and 3 x 10<sup>-9</sup> m/s calculated for Port 9 and Port 8 between 310 mah and 347 mah support the decision to exclude the results of open borehole test 4 (5 x 10<sup>-8</sup> m/s) which straddled the same borehole interval due to the packer bypass.

Detailed test analytical reports are presented in Appendix D. These reports are computer generated protocols, and some values in these documents might differ from values discussed within the text section of this document.



## 4.2 Westbay Well Development Methods

The individual Westbay well intervals need to be developed to remove water introduced during the drilling and well installation, so that a representative sample of the formation can be obtained. Development consists of removing water from each interval until the fluorescein concentration indicates that most of the collected water is formation water. Typically, the well is considered to be sufficiently developed when fluorescein concentration is less than 5 to 10% of the initial fluorescein concentration in the drilling water. There are generally two methods to develop the Westbay ports under permafrost conditions:

- Air-lifting method if the hydraulic conductivity at the port is sufficiently high.
- Dedicated sampler tool if the hydraulic conductivity of the port is too low (tripping up and down the sample tool one litre at a time).

Based on the results of the hydrogeological testing completed in the Westbay well installed in borehole M20-3071, airlifting methods for development are not recommended for the sample ports.

## 5.0 SUMMARY

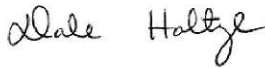
The following provides a summary of the activities carried out as part of the hydrogeological data collected during the 2020 installation of the M20-3071 Westbay well for the evaluation of groundwater conditions at the Discovery deposit carried out in support of the Agnico Eagle proposed Meliadine Extension.

- Geotechnical and core logging support in borehole M20-3071 from 225 to 606 metres along the borehole, field monitoring of selected parameters in the drilling fluids, and sample collection.
- Eight single-well pressure responses tests using a single packer wireline system were carried out in borehole M20-3071.
- Documentation of Westbay multi-level monitoring well system installation in borehole M20-3071.
- Five single-well pressure response tests were carried out in five isolated intervals using the measurement ports of Westbay well M20-3071.
- The hydraulic conductivity of the rock at M20-3071 is very low. The results of the hydraulic conductivity completed within the Westbay well are in the same range as the results of the hydrogeological tests completed in the open borehole.
- A zone of enhanced permeability may exist between 293 and 303 mah based on the low rock quality designation and higher frequency reported within this interval.

## 6.0 CLOSURE

The reader is referred to the Study Limitations, which follows the text and forms an integral part of this report. We trust the above meets your present requirements. If you have any questions or require additional information, please contact the undersigned.

### **Golder Associates Ltd.**



Dale Holtze, M.Sc.  
*Environmental Specialist*



Michal Dobr, RNDr., P.Geol.  
*Principal, Senior Hydrogeologist*

DH/MD/sg

[https://golderassociates.sharepoint.com/sites/120710/project\\_files/6\\_deliverables/working/20136436-820-r-rev2\\_-\\_westbay\\_installation/20136436-820-r-rev1-westbayinstallation-mel\\_expansion.docx](https://golderassociates.sharepoint.com/sites/120710/project_files/6_deliverables/working/20136436-820-r-rev2_-_westbay_installation/20136436-820-r-rev1-westbayinstallation-mel_expansion.docx)

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## 7.0 REFERENCES

Agnico Eagle Ltd. (Agnico Eagle) 2014a. Volume 7.0 Freshwater Environmental, Final Environmental Impact Statement (FEIS) – Meliadine Gold Project. Report Number Doc 314-1314280007 Ver. 0. April 2014.

Golder Associates Ltd. 2021. Westbay Monitoring Well System M20-3071 Groundwater Quality Meliadine Extension, Factual Report. Prepared for Agnico Eagle Mines Limited. Report Number Doc 20136436-817-R-Rev1. November 2021.

## 8.0 STUDY LIMITATIONS

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**APPENDIX A**

**Drilling, Circulation, Displacement, and Monitoring Well  
M20-3071 Westbay System Fluid Summary Tables**



Collected from Decantation Tank 1 (Post Run)												
Date/Time	Start of Run (mah)	End of Run (mah)	Fluorescein	Temperature	Fluid Weight		pH	Conductivity				Notes / Comments
			ppb	degrees Celsius	SG	kg/m <sup>3</sup>	-	Dilution Factor	Temperature	Diluted Conductivity	Corrected Conductivity	
									degrees Celsius	uS/cm-	µS/cm	
23-Aug-20 07:56	411	414	1064	27	NA	NA	7.52	0	26.1	920	920	FI not well mixed in tank yet
23-Aug-20 08:22	-	-	1108	NA	NA	NA	NA	NA	NA	NA	NA	FI not well mixed in tank, not mixing top down well
23-Aug-20 09:19	414	417	890.6	26.9	1.01	1010	7.07	0	26.9	673	673	Reasonably well mixed
23-Aug-20 09:47	-	-	655.4	NA	NA	NA	NA	NA	NA	NA	NA	Add 23% more F - 20mL
23-Aug-20 10:24	417	420	657.4	22.7	1.01	1010	7.62	0	22.7	315	315	Add 23% more F - 20mL
23-Aug-20 11:19	420	423	801.4	23.6	1.01	1010	7.67	0	23.6	230	230	
23-Aug-20 11:51	-	-	628.9	NA	NA	NA	NA	NA	NA	NA	NA	Added 20 mL of F after readings
23-Aug-20 12:33	423	426	622.8	33.3	1.01	1010	7.81	1	33.3	345	345	Added 20 mL of F after readings
23-Aug-20 12:50	-	-	559.3	NA	NA	NA	NA	0	NA	NA	NA	Added 30mL of F after readings
23-Aug-20 13:15	426	429	886.4	22.5	1.01	1010	7.82	0	22.5	309	309	
23-Aug-20 13:50	-	-	916	NA	NA	NA	NA	NA	NA	NA	NA	
23-Aug-20 14:20	429	432	521.7	26.7	1.01	1010	7.91	0	26.7	224	224	Added 35mL of F after readings
23-Aug-20 15:14	-	-	850.1	NA	NA	NA	NA	NA	NA	NA	NA	
23-Aug-20 15:50	-	-	618.9	NA	NA	NA	NA	NA	NA	NA	NA	Added 20 mL of F after readings
23-Aug-20 16:42	-	-	569.5	NA	NA	NA	NA	NA	NA	NA	NA	Added 30mL of F after readings
23-Aug-20 16:58	432	435	890.9	27.3	1.00	1000	7.67	0	27.3	186	186	
23-Aug-20 17:26	-	-	809.1	NA	NA	NA	NA	NA	NA	NA	NA	
23-Aug-20 08:00	435	438	858	28.9	1.00	1000	7.63	0	28.9	224	224	
23-Aug-20 09:30	438	441	844.1	30	1.00	1000	8.03	0	30	1,255	1,255	Weird cond., but calibrated probe
23-Aug-20 11:00	441	444	811.9	29.9	1.00	1000	9.11	0	29.9	1,390	1,390	
23-Aug-20 00:00	444	447	990.1	32.2	1.02	1020	8.92	10	15.4	1,780	17,800	Driller added 2 bags of salt in tank to save hole from freezing
23-Aug-20 00:45	447	450	951.9	23	1.01	1010	8.88	10	13.4	883	8,830	
23-Aug-20 01:50	450	453	859.6	33.5	1.01	1010	8.65	10	14	450	4,500	
23-Aug-20 02:45	453	456	741.8	32.2	1.01	1010	9.05	10	13.5	620	6,200	
23-Aug-20 04:25	456	459	873.6	30.6	1.01	1010	8.09	0	30.6	645	645	No more salt in solution
23-Aug-20 05:12	459	462	811	40.1	1.00	1000	8.01	0	40.1	626	626	
24-Aug-20 06:10	462	465	928.9	10.6	1.01	1010	7.57	0	10.6	1,556	1,556	
24-Aug-20 07:37	-	-	745.3	43	1.01	1010	8.02	0	43	753	753	
24-Aug-20 08:05	465	468	728.6	39.1	1.01	1010	7.90	0	39.1	716	716	
24-Aug-20 09:40	468	471	856.7	23.1	1.05	1050	10.07	100	13	1,229	122,900	Switched to brine for packer testing, to displace fresh water.
24-Aug-20 11:05	471	474	860.8	23	1.06	1060	10.72	100	12.6	1,760	176,000	Difficulty mixing this tank, some pumps are broken, large amount of salt sitting on the bottom of the tank - need to clean out and mix better in the future
24-Aug-20 12:10	474	477	890.6	26.7	1.10	1100	10.40	100	13.6	2,157	215,700	Into well mixed tank now
24-Aug-20 13:20	477	480	874.4	22.5	1.11	1110	10.57	100	14.4	1,698	169,800	Packer test, 430 to 480 and 380 to 480 m
24-Aug-20 03:50	480	483	858.5	39	1.01	1010	8.96	10	12.3	1,229	12,290	Back to normal hot water, but might have some salty leftovers from packer testing, Driller says he hit a water vein, but core looks super tight,
25-Aug-20 00:00	483	486	NA	NA	NA	NA	NA	NA	NA	NA	NA	Missed measurement during shift change
25-Aug-20 13:10	486	489	778	27.7	1.03	1030	9.31	10	17.2	3,089	30,890	490 m collect drill water sample and dup
25-Aug-20 14:20	489	492	598.5	41.1	1.03	1030	9.36	20	17.6	3,314	66,280	
25-Aug-20 15:15	492	495	710.4	32.2	1.00	1000	8.89	10	17.7	1,633	16,330	
25-Aug-20 16:20	495	498	579.4	33.7	1.01	1010	8.86	10	17.7	1,419	14,190	some mud in sample may have interfered with F measurement
25-Aug-20 17:35	498	501	670.7	41.4	1.01	1010	8.41	10	18.4	643	6,430	some mud in sample may have interfered with F measurement, as temperature decreases, F appears to increase
25-Aug-20 19:15	501	504	640.3	26.3	1.01	1010	8.74	10	16.2	1,445	14,450	
25-Aug-20 20:21	504	507	682.8	44.5	1.01	1010	8.51	0	24.6	3,530	3,530	
25-Aug-20 22:30	507	510	789.4	32.3	1.01	1010	8.40	0	31.5	1,338	1,338	
25-Aug-20 23:50	510	513	782	29.8	1.01	1010	8.62	0	29.7	1,411	1,411	
25-Aug-20 00:43	513	516	815.5	24.7	1.01	1010	8.45	0	25.5	1,433	1,433	
25-Aug-20 01:51	516	519	875.3	27.6	1.01	1010	8.32	0	27.4	1,416	1,416	
25-Aug-20 03:12	519	522	883.5	28.4	1.01	1010	8.44	0	27.9	1,445	1,445	
25-Aug-20 04:01	522	525	849.9	32.3	1.01	1010	8.25	0	32.4	671	671	Conductivity could be low due to poor mixing in tank
25-Aug-20 05:02	525	528	848.2	25.3	1.02	1020	8.07	0	25.3	564	564	
25-Aug-20 06:08	528	531	799.4	24.1	1.01	1010	8.26	0	24.1	353	353	
26-Aug-20 07:14	531	534	902.8	34.1	1.01	1010	8.68	0	34.1	252	252	
26-Aug-20 08:05	534	537	1056	30.8	1.01	1010	7.78	0	30.8	314	314	Driller started using water with very low F when mixing drill fluid due to miscommunication
26-Aug-20 09:20	537	540	971.5	30.1	1.01	1010	7.88	0	30.1	432	432	Mud in drill fluid
26-Aug-20 10:40	540	543	910.5	29.8	1.01	1010	7.89	0	29.8	254	254	
26-Aug-20 12:15	543	546	750.2	28.8	1.01	1010	8.00	0	28.8	236	236	
26-Aug-20 13:40	546	549	672.1	29.1	1.01	1010	8.60	0	29.1	259	259	
26-Aug-20 14:50	549	552	664.5	28.9	1.00	1000	8.33	0	28.9	328	328	
26-Aug-20 16:30	552	555	816.8	41.4	1.01	1010	8.66	0	41.4	279	279	
26-Aug-20 18:03	555	558	692.4	38.5	1.01	1010	7.68	0	38.5	189	189	
26-Aug-20 19:55	558	561	680.3	30.9	1.01	1010	8.56	0	30.7	263	263	
26-Aug-20 21:29	561	564	638.6	25.5	1.01	1010	8.72	0	25.9	259	259	
26-Aug-20 23:07	564	567	841.5	27.6	1.01	1010	8.07	0	25.5	211	211	Another "water vein"
26-Aug-20 00:04	567	570	925.8	29.6	1.01	1010	7.66	0	27.6	448	448	Got Sump water values : 892 of F; 1.01 of SG; 7.55 of pH; 1203 of cond; 19 degree
26-Aug-20 01:00	570	573	839.7	27.5	1.01	1010	8.15	0	29.3	388	388	
26-Aug-20 01:58	573	576	816.5	25.8	1.01	1010	7.82	0	27.5	400	400	
26-Aug-20 03:03	576	579	834.7	28.1	1.01	1010	7.54	0	25.8	662	662	
26-Aug-20 04:50	579	582	977.5	27.5	1.01	1010	7.36	0	28.1	987	987	First of new tank
26-Aug-20 07:35	582	585	836	31.9	1.01	1010	7.25	0	27.5	925	925	

Collected from Decantation Tank 1 (Post Run)												
Date/Time	Start of Run (mah)	End of Run (mah)	Fluorescein	Temperature	Fluid Weight		pH	Conductivity				Notes / Comments
			ppb	degrees Celsius	SG	kg/m <sup>3</sup>	-	Dilution Factor	Temperature	Diluted Conductivity	Corrected Conductivity	
									degrees Celsius	uS/cm-	µS/cm	
27-Aug-20 08:00	585	588	851.4	27.2	1.01	1010	7.29	0	27.2	760	760	
27-Aug-20 09:30	588	591	863.1	33.1	1.01	1010	7.19	0	33.1	890	890	Last of second tank
27-Aug-20 11:00	591	594	877.8	28.2	1.01	1010	7.22	0	28.2	409	409	
27-Aug-20 11:30	594	597	931.3	29.8	1.01	1010	7.38	0	29.8	898	898	
27-Aug-20 12:25	597	600	989.7	32.2	NA	NA	7.23	0	32.2	756	756	
27-Aug-20 13:30	600	603	996.4	21.6	NA	NA	7.37	0	21.6	734	734	Added water to dilute high F concentration in tank
27-Aug-20 14:00	603	606	892.4	20.2	NA	NA	7.32	0	20.2	485	485	
27-Aug-20 23:23	606	606	840.1	23.1	1.10	1100	9.93	0	10.5	2,679	2,679	Brine before packer test of end of hole
28-Aug-20 01:15	606	606	765.14	24.7	1.12	1120	9.65	0	10.34	2,347	2,347	Brine to keep the hole from freezing
29-Aug-20 22:32	350	350	740.3	25.5	1.01	1010	7.31	0	25.5	2,050	2,050	Hot water running to keep hole from freezing before installation
29-Aug-20 00:46	350	350	717.4	31	1.02	1020	7.92	0	31	6,070	6,070	Second tank of hot water. High conductivity reading related to previous use of salt in the tank.
29-Aug-20 02:00	350	350	855.4	16.3	1.11	1110	10.57	10	11.9	19.07	190,700	Brine added before install
30-Aug-20 03:00	350	350	908.1	13.2	1.11	1110	10.54	10	12.9	16.13	161,300	Brine recycled
31-Aug-20 04:10	0	250	18.25	10.5	1.01	1010	8.85	0	10.5	54.20	54,200	2:1 Water:glycol solution flushed through the annulus between HQ and Westbay tubing for the upper 250 m
31-Aug-20	0	250	862.4	5.9	1.11	1110	10.43	0	5.9	84,249	84,249	Water being flushed out of HQ-Westbay tubing annulus after 1 drum (215L) of 2:1 water:glycol Solution
31-Aug-20	0	250	NA	8.1	1.11	1110	10.61	0	8.1	91,160	91,160	Water being flushed out of HQ-Westbay tubing annulus after 2.5 drum (520L) of 2:1 water:glycol Solution
31-Aug-20	0	250	NA	8.3	1.10	1100	10.45	0	8.3	22,300	22,300	Water being flushed out of HQ-Westbay tubing annulus after 3 drum2 (645L) of 2:1 water:glycol Solution
31-Aug-20	0	250	150.6	8.6	NA	NA	7.60	0	8.6	7,245	7,245	Water being flushed out of HQ-Westbay tubing annulus after 3,5 drum (750L) of 2:1 water:glycol Solution

**Notes:**

Drillers had difficulty circulating drill fluid in tank, especially during day shift. There is some uncertainty associated with the composition (fluorescein and calcium chloride brine) of the drill fluid introduced into the formation during drilling.

Drill fluid sample diluted for conductivity reading. There is some uncertainty associated with conductivity reading for all diluted conductivity measurements.

mah = metres along borehole

F = fluorescein

ppb = parts per billion

kg/m<sup>3</sup> = kilogram per cubic metre

uS/cm = microSiemen per centimetre

NA = Not Available. No data collected

L - Litre

mL = millilitre



**APPENDIX B**

**Photographs of M20-3071 Core**

Note: Photographs of M30-3071 core are unavailable for the following intervals:

- 262.41 metres to 273.54 metres;
- 296.27 metres to 307.52 metres; and,
- 336.35 metres to 342.15 metres.

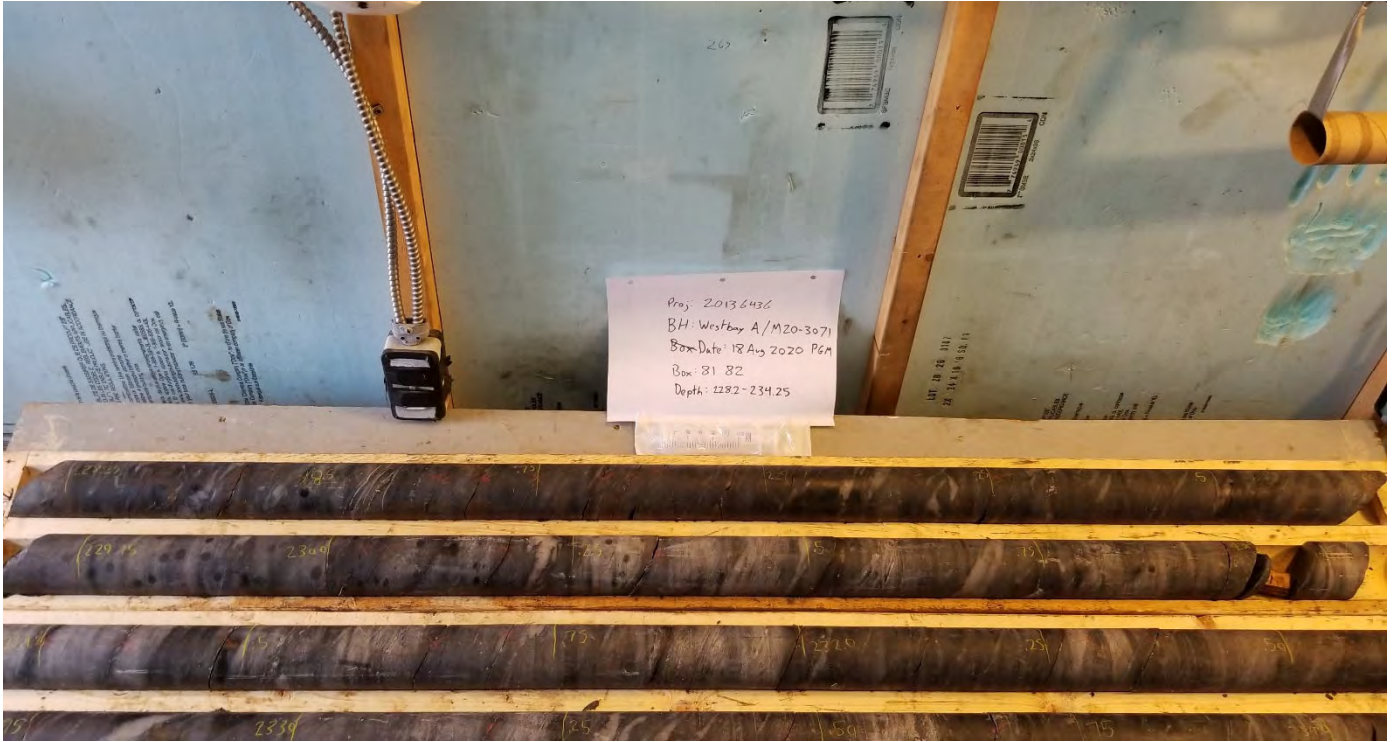
## 222.40 M TO 228.20 M (WET)



# M20-3071

Boxes 81-82

## 228.20 M TO 234.25 M (DRY)



## 228.20 M TO 234.25 M (WET)



# M20-3071

Boxes 83-84

## 234.25 M TO 239.86 M (DRY)



## 234.25 M TO 239.86 M (WET)



# M20-3071

Boxes 85-86

239.86 M TO 245.59 M (DRY)



239.86 M TO 245.59 M (WET)



# M20-3071

Boxes 87-88

## 245.59 M TO 251.16 M (DRY)



## 245.59 M TO 251.16 M (WET)



# M20-3071

Boxes 89-92

## 251.15 M TO 256.85 M (WET)



## 256.85 M TO 262.41 M (WET)





# M20-3071

Boxes 97-98

273.54 M TO 279.04 M (DRY)



273.54 M TO 279.04 M (WET)



# M20-3071

Boxes 99-100

279.04 M TO 284.77 M (DRY)



279.04 M TO 284.77 M (WET)



# M20-3071

Boxes 101-104

284.77 M TO 290.62 M (WET)



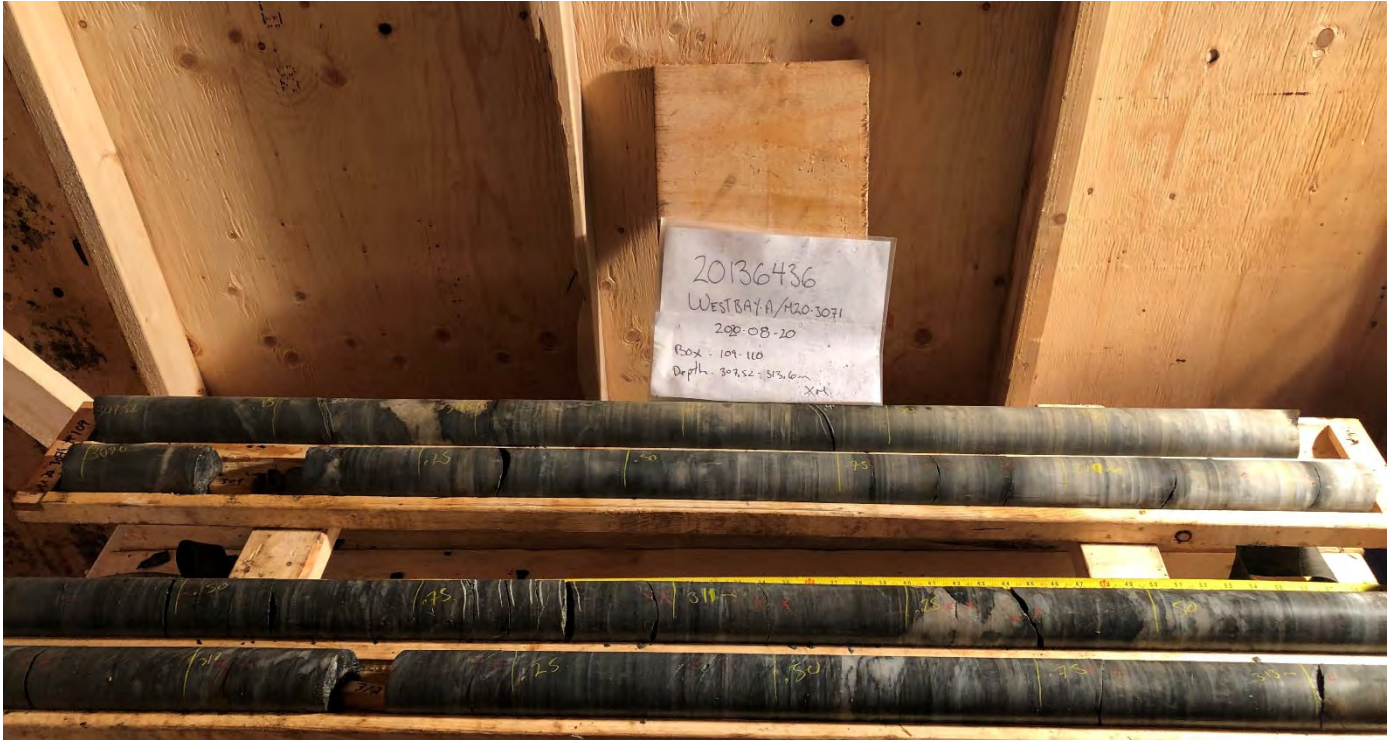
290.62 M TO 296.27 M (WET)



# M20-3071

Boxes 109-110

307.52 M TO 313.16 M (DRY)



307.52 M TO 313.60 M (WET)



# M20-3071

Boxes 111-114

## 313.16 M TO 318.87 M (WET)



## 318.87 M TO 324.83 (WET)



# M20-3071

Boxes 115-118

324.83 M TO 330.64 M (WET)



330.64 M TO 336.35 M (WET)



# M20-3071

Boxes 121-122

342.15 M TO 347.90 M (DRY)



342.15 M TO 347.90 M (WET)



347.90 M TO 353.39 M (WET)





# M20-3071

Boxes 125-126

## 353.39 M TO 359.19 M (DRY)



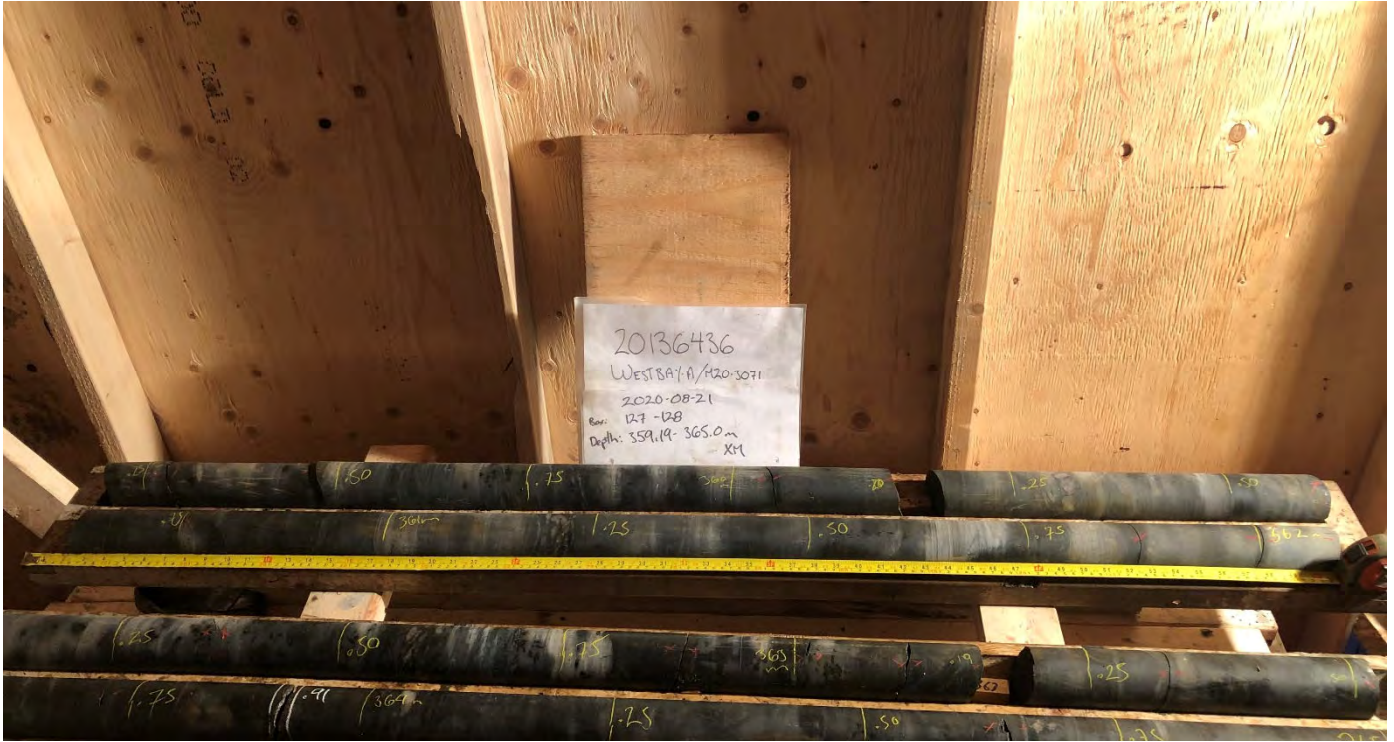
## 353.39 M TO 359.19 M (WET)



# M20-3071

Boxes 127-128

## 359.19 M TO 365.00 M (DRY)



## 359.19 M TO 365.00 M (WET)



# M20-3071

Boxes 129-130

365.00 M TO 370.73 M (DRY)



365.00 M TO 370.73 M (WET)



## 370.73 M TO 376.57 M (WET)



# M20-3071

Boxes 133-134

## 376.57 M TO 382.24 M (DRY)



## 376.57 M TO 382.24 M (WET)



# M20-3071

Boxes 135-137

## 382.24 M TO 385.44 M (DRY)



## 382.24 M TO 385.44 M (WET)



# M20-3071

Boxes 137-140

## 385.44 M TO 388.80 M (DRY)



## 385.44 M TO 388.80 M (WET)



# M20-3071

Boxes 141-143

388.80 M TO 392.00 M (DRY)



388.80 M TO 392.00 M (WET)





# M20-3071

Boxes 144-145

## 392.00 M TO 395.84 M (DRY)



## 392.00 M TO 395.84 M (WET)



# M20-3071

Boxes 146-147

395.84 M TO 401.58 M (DRY)



395.84 M TO 401.58 M (WET)



# M20-3071

Boxes 148-149

## 401.58 M TO 407.48 M (DRY)



## 401.58 M TO 407.48 M (WET)



# M20-3071

Boxes 150-151

## 407.48 M TO 413.24 M (DRY)



## 407.48 M TO 413.24 M (WET)



413.24 M TO 418.95 M (DRY)



# M20-3071

Boxes 154-155

## 418.95 M TO 424.61 M (DRY)



## 418.95 M TO 424.61 M (WET)



# M20-3071

Boxes 156-157

424.61 M TO 430.25 M (DRY)



424.61 M TO 430.25 M (WET)



# M20-3071

Boxes 158-159

## 430.25 M TO 436.05 M (DRY)



## 430.25 M TO 436.05 M (WET)





# M20-3071

Boxes 160-161

436.05 M TO 441.82 M (DRY)



436.05 M TO 441.82 M (WET)



# M20-3071

Boxes 162-163

## 441.82 M TO 447.50 M (DRY)



## 441.82 M TO 447.50 M (WET)



# M20-3071

Boxes 164-165

447.50 M TO 453.23 M (DRY)



447.50 M TO 453.23 M (WET)



# M20-3071

Boxes 166-167

## 453.23 M TO 459.15 M (DRY)



## 453.23 M TO 459.15 M (WET)



# M20-3071

Boxes 168-169

459.15 M TO 465.00 M (DRY)



459.15 M TO 465.00 M (WET)



# M20-3071

Boxes 170-171

465.00 M TO 470.71 M (DRY)



465.00 M TO 470.71 M (WET)



# M20-3071

Boxes 172-173

## 470.71 M TO 476.45 M (DRY)



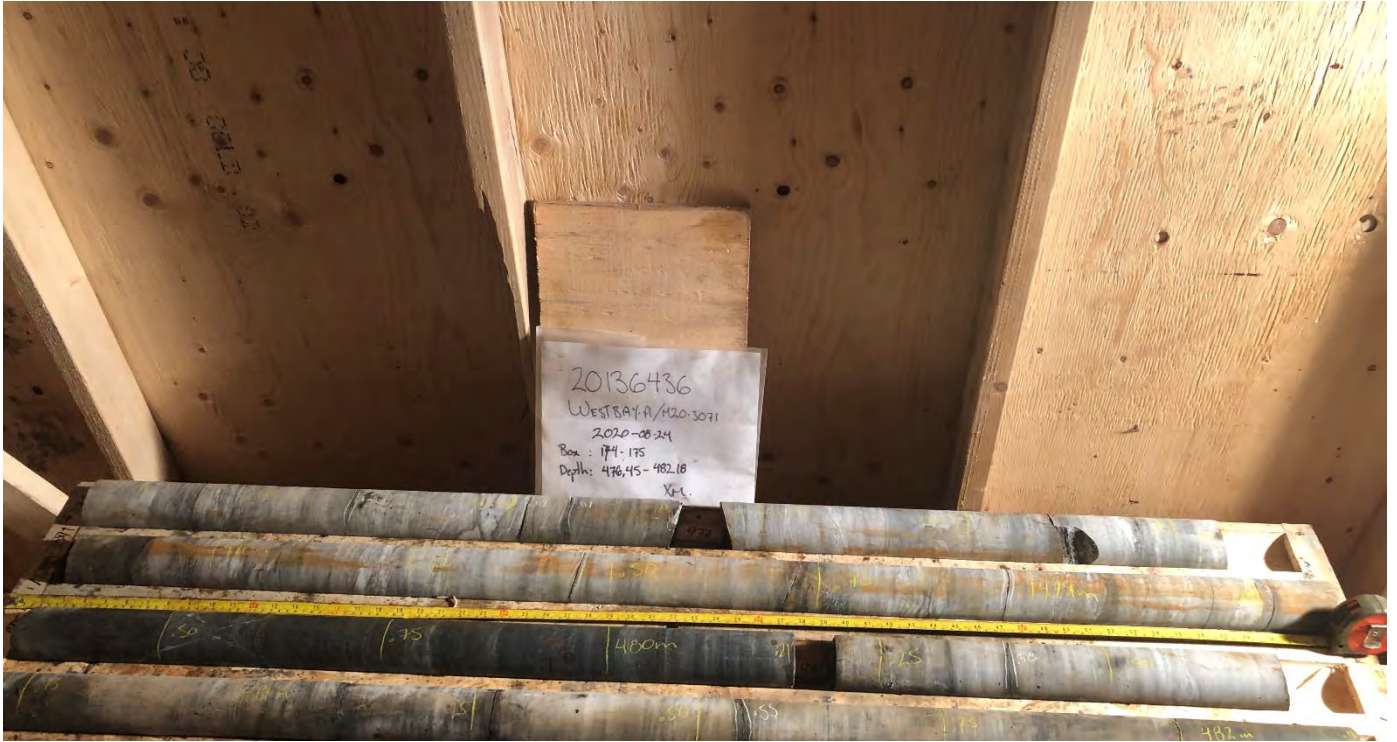
## 470.71 M TO 476.45 M (WET)



# M20-3071

Boxes 174-175

476.45 M TO 482.18 M (DRY)



476.45 M TO 482.18 M (WET)





# M20-3071

Boxes 176-177

## 482.18 M TO 487.94 M (DRY)



## 482.18 M TO 487.94 M (WET)



# M20-3071

Boxes 178-179

487.94 M TO 493.65 M (DRY)



487.94 M TO 493.65 M (WET)



# M20-3071

Boxes 180-181

493.65 M TO 499.35 M (DRY)



493.65 M TO 499.35 M (WET)



# M20-3071

Boxes 182-183

499.35 M TO 505.01 M (DRY)



499.35 M TO 505.01 M (WET)



# M20-3071

Boxes 184-185

## 505.01 M TO 510.75 M (DRY)



## 505.01 M TO 510.75 M (WET)



# M20-3071

Boxes 186-187

## 510.75 M TO 516.48 M (DRY)



## 510.75 M TO 516.48 M (WET)



# M20-3071

Boxes 188-189

## 516.48 M TO 522.13 M (DRY)



## 516.48 M TO 522.13 M (WET)



# M20-3071

Boxes 190-191

## 522.13 M TO 528.02 M (DRY)



## 522.13 M TO 528.02 M (WET)





# M20-3071

Boxes 193-194

528.02 M TO 533.84 M (DRY)



528.02 M TO 533.84 M (WET)



# M20-3071

Boxes 194-195

533.84 M TO 539.63 M (DRY)



533.84 M TO 539.63 (WET)



# M20-3071

Boxes 196-197

539.63 M TO 545.35 M (DRY)



539.63 M TO 545.35 M (WET)



# M20-3071

Boxes 198-199

**545.35 M TO 550.98 M (DRY)**



**545.35 M TO 550.98 M (WET)**



# M20-3071

Boxes 200-201

550.98 M TO 556.23 M (DRY)



550.98 M TO 556.23 M (WET)



# M20-3071

Boxes 202-203

556.73 M TO 562.07 M (DRY)



556.23 M TO 562.07 M (WET)



# M20-3071

Boxes 204-205

562.07 M TO 568.33 M (DRY)



562.57 M TO 568.33 M (WET)



# M20-3071

Boxes 206-207

568.33 M TO 574.14 M (DRY)



568.33 M TO 574.14 M (WET)





# M20-3071

Boxes 208-209

574.14 M TO 579.89 M (DRY)



574.14 M TO 579.89 M (WET)



# M20-3071

Boxes 210 - 211

579.89 M TO 585.52 M (DRY)



579.89 M TO 585.52 M (WET)



# M20-3071

Boxes 212-213

585.52 M TO 591.35 M (DRY)



20136436  
WESTBATA/M20-3071  
2020-08-27  
Box: 212-213  
Depth: 585.52-591.35 m  
CM

585.52 M TO 591.35 M (WET)



20136436  
WESTBATA/M20-3071  
2020-08-27  
Box: 212-213  
Depth: 585.52-591.35 m  
CM

# M20-3071

Boxes 214-215

591.35 M TO 597.15 M (DRY)



591.35 M TO 597.15 M (WET)



# M20-3071

Boxes 216-217

597.15 M TO 603.00 M (DRY)



597.15 M TO 603.00 M (WET)



## 603.00 M TO 606.00 M (DRY)



## 603.00 M TO 606.00 M (WET)



**APPENDIX C**

**M20-3071 Drill Hole Report prepared by  
Agnico Eagle Mines Limited**



<b>Hole number:</b>	<b>M20-3071</b>	<b>Project name:</b>	<b>DISCOVERY</b>
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<b>Historic hole number:</b>		<b>Collar survey:</b>	Y	<b>From:</b>	0.0	<b>Coordinates:</b>	Primary
<b>System:</b>	METRIC	<b>Verified:</b>		<b>To:</b>	606.0	<b>Grid:</b>	UTM83-Z15:
<b>Target:</b>	DISCOVERY	<b>Gas:</b>	N	<b>Depth:</b>	606.0	<b>North:</b>	6,980,348.53
<b>No. Claim:</b>		<b>Multishot survey:</b>	Y	<b>Location:</b>	Surface	<b>East:</b>	555,550.78
<b>Year:</b>	2 020	<b>Is making water:</b>	N	<b>Core storage:</b>	Discovery Camp	<b>Elevation:</b>	10,067.11
<b>Date started:</b>	2020-08-12	<b>Object in hole:</b>	Y	<b>Contractor:</b>	Forage Orbit Garant	<b>Collar dip:</b>	-74.30
<b>Date logged:</b>	2020-08-12	<b>Pulse EM survey:</b>	N	<b>Logged by:</b>	Dominic Fleming, geo	<b>Collar azimuth:</b>	196.46
<b>Date completed:</b>	2020-08-27	<b>Plugged:</b>	N	<b>Signature:</b>	_____		
<b>Core size:</b>	HQ	<b>Cemented:</b>	Y				
<b>Hole type:</b>	DDH	<b>Branch:</b>	N				
<b>Casing:</b>	Instruments in	<b>Reserve:</b>					
<b>Logging status:</b>	Geological Logging						
<b>Rig number:</b>	0035						

<b>Additional sizes and types:</b>	<b>2nd Size:</b>	<b>2nd Type:</b>	<b>2nd Depth:</b>	<b>3rd Size:</b>	<b>3rd Type:</b>
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**Comment:** Target Westbay-A, Geotechnical hole for water sampling.

**Survey data**

<u>Depth</u>	<u>Azimuth dec.</u>	<u>Dip dec.</u>	<u>Type</u>	<u>Flag</u>	<u>Comments</u>	<u>Depth</u>	<u>Azimuth dec.</u>	<u>Dip dec.</u>	<u>Type</u>	<u>Flag</u>	<u>Comments</u>
0.0	196.46	-74.30	S	O	Survey data.	0.0	197.87	-74.28	GS		
30.0	196.00	-73.46	GS	O		45.0	267.20	-73.30	EZ	D	
60.0	198.31	-72.75	GS	O		90.0	197.78	-72.13	GS	O	
105.0	192.50	-71.80	EZ	D		120.0	198.24	-71.33	GS	O	
150.0	199.85	-70.65	GS	O		156.0	203.30	-70.20	EZ	D	
180.0	199.49	-70.05	GS	O		207.0	200.30	-69.40	EZ		
210.0	200.04	-69.53	GS	O		240.0	200.77	-68.89	GS	O	
254.0	204.20	-68.40	EZ	D		270.0	200.69	-67.96	GS	O	
300.0	200.76	-67.28	GS	O		330.0	198.34	-66.78	GS	O	
354.0	203.40	-66.10	EZ			360.0	201.51	-66.14	GS	O	
390.0	202.58	-65.47	GS	O		420.0	200.40	-64.96	GS	O	





Hole number: M20-3071

Survey data

Depth	Azimuth dec.	Dip dec.	Type	Flag	Comments
450.0	204.80	-64.40	EZ		
480.0	200.66	-63.81	GS	O	
510.0	200.85	-63.26	GS	O	
552.0	186.50	-72.50	EZ		
570.0	200.24	-62.49	GS	O	
600.0	145.90	-72.40	EZ		

Depth	Azimuth dec.	Dip dec.	Type	Flag	Comments
450.0	200.18	-64.48	GS	O	
501.0	218.40	-63.20	EZ		
540.0	200.35	-62.87	GS	O	
558.0	186.50	-73.00	EZ		
590.0	199.72	-62.17	GS	O	

Sample dispatch	Lab package	Sample list*
MELEXPL20-050	Meliadine2	CAMLD279242 - CAMLD279325 CAMLD279409 - CAMLD279415
MELEXPL20-052	Meliadine2	CAMLD262501 - CAMLD262575
MELEXPL20-053	Meliadine2	CAMLD262576 - CAMLD262650
MELEXPL20-054	Meliadine2	CAMLD262651 - CAMLD262720

\*The sample list may content samples from other holes

Sample number	Standard
CAMLD262506	ML-AE-18-2
CAMLD262517	BLANK-ML
CAMLD262544	ML-AE-18-4
CAMLD262550	BLANK-DI
CAMLD262568	BLANK-DI
CAMLD262571	ML-AE-18-9
CAMLD262589	BLANK-DI
CAMLD262594	ML-AE-18-2
CAMLD262615	BLANK-DI
CAMLD262623	ML-AE-18-4
CAMLD262639	BLANK-DI
CAMLD262641	ML-AE-18-9
CAMLD262670	BLANK-DI
CAMLD262673	ML-AE-18-4
CAMLD262693	BLANK-DI
CAMLD262697	ML-AE-18-2
CAMLD262714	BLANK-DI
CAMLD262717	ML-AE-18-9
CAMLD279246	BLANK-DI
CAMLD279251	BLANK-DI
CAMLD279254	BLANK-DI
CAMLD279270	ML-AE-18-4



DRILL HOLE REPORT

MELIADINE

Hole number: M20-3071

Sample number	Standard
CAMLD279289	ML-AE-18-2
CAMLD279325	ML-AE-18-2

Major: From: 0.0 To: 2.3 CS, TUBAGE  
 Overburden  
**STRUCTURE**  
 TYPE/INTENSITY/CORE\_ORIENT/ALPHA/BETA/GAMMA/COMMENTS  
 0.00, 2.30, FOL, MOD, 55.00, -, -, -, -

Major: From: 2.3 To: 15.9 Ksc-wa, Chloritic Siltstone and Greywacke  
**ALTERATION**  
 TYPE/STYLE/INTENSITY/COLOR/GRAIN\_SIZE/FACIES/COMMENTS  
 2.30, 15.90, BTI+, PEN, STRONG, -, -, -, -  
**STRUCTURE**  
 TYPE/INTENSITY/CORE\_ORIENT/ALPHA/BETA/GAMMA/COMMENTS  
 2.30, 15.90, FOL, MOD, 55.00, -, -, -, -  
 9.00, 9.20, OJN, -, -, -, -, -, -  
 13.40, 13.50, OJN, -, -, -, -, -, -

Sample	From	To	Length	Au_g/t	Masse_Kg	Sg_Kgm3
CAMLD279242	12.9	14.4	1.5			
CAMLD279243	14.4	15.9	1.5			



Hole number: M20-3071

Major: From: 15.9 To: 22.5 Ksc-lj, Ksc-wa with cm-dm Chert-Magnetite Iron formation

Fine grained medium gray chloritized sediment with 60% pluridcm bands of chert chlorite iron formation absent of magnetite; CL-GN alteration; white to pink garnets locally; hard to distinguish between Chert beds or Qz veins a some places; 1-2% heaps of ASP; 2-3% Py; 2-3% PO; 2 VG at different locations

MINOR INTERVAL

17.80 - 19.70: Ksc-waFine grained dark gray greenish chloritized sediment

MINOR INTERVAL

20.20 - 20.50: Ksc-waFine grained dark gray greenish chloritized sediment

MINOR INTERVAL

22.00 - 22.40: Kmgminor graphitic interval with strong Po

MINERALIZATION

TYPE/STYLE/PCT/COLOR/GRAIN\_SIZE/COMMENTS

- 15.90, 17.80, POT, IRM, 2.00, -, FGR, -
15.90, 17.80, PYR, IRM, 4.00, -, FGR, -
17.10, 17.20, VG, SPO, .01, -, FGR, 1 grain
17.10, 17.30, APY, MSS, 4.00, -, CGR, -
19.70, 20.00, APY, MSS, 3.00, -, CGR, -
19.70, 22.50, POT, IRM, 3.00, -, FGR, -
19.70, 22.50, PYR, IRM, 2.00, -, FGR, -
20.50, 22.50, APY, DIS, 1.00, -, MGR, -
22.30, 22.40, VG, SPO, .01, -, FGR, 1 grain

ALTERATION

TYPE/STYLE/INTENSITY/COLOR/GRAIN\_SIZE/FACIES/COMMENTS

- 15.90, 17.80, CHL+, BAN, STRONG, -, -, -, -
15.90, 17.80, GRU+, PAT, STRONG, -, -, -, -
19.70, 20.20, CHL+, BAN, MOD, -, -, -, -
19.70, 20.20, GRU+, PAT, STRONG, -, -, -, -
20.50, 22.50, CHL+, BAN, STRONG, -, -, -, -
20.50, 22.50, GRU+, PAT, STRONG, -, -, -, -

STRUCTURE

TYPE/INTENSITY/CORE\_ORIENT/ALPHA/BETA/GAMMA/COMMENTS

- 15.90, 22.50, FOL, MOD, 55.00, -, -, -, -
15.90, 16.00, CZN, -, 60.00, -, -, -, -
17.80, 17.90, CZN, -, 60.00, -, -, -, -
19.70, 19.80, CZN, -, 55.00, -, -, -, -
20.20, 20.30, CZN, -, 60.00, -, -, -, -
20.50, 20.60, CZN, -, 55.00, -, -, -, -
21.10, 21.20, FLD, MOD, -, -, -, -, -

VEIN

VEIN/VEIN\_PCT/ANGLE/ALPHA/BETA/GAMMA/COLOR/TRUE\_WIDTH/TEXTURE/MNZ/MNZ\_PCT/COMMENTS

Table with columns: Sample, From, To, Length, Au\_g/t, Masse\_Kg, Sg\_Kgm3. Rows include sample IDs like CAMLD279244 and their corresponding depth and length data.



## DRILL HOLE REPORT

MELIADINE

Hole number: M20-3071

15.90, 17.80, QTZ, 10.00, -, -, -, -, -, FLP, -, -, -  
19.70, 22.50, QTZ, 3.00, -, -, -, -, -, FLP, -, -, -



**Hole number: M20-3071**

**Major: From: 22.5 To: 593.4 Ksc-wa, Chloritic Siltstone and Greywacke**

Fine to medium grained medium gray chloritized sediment; a couple of faults showing gouge

MINOR INTERVAL

108.10 - 108.20: aUa

MINOR INTERVAL

414.70 - 415.10: NljWeak Nlj section, chert, Po

MINOR INTERVAL

469.70 - 473.00: Mg

MINOR INTERVAL

482.00 - 485.20: Mg

MINERALIZATION

TYPE/STYLE/PCT/COLOR/GRAIN\_SIZE/COMMENTS

- 36.70, 36.80, APY, DIS, .50, -, FGR, -
- 36.70, 36.80, PYR, INT, 2.00, -, FGR, -
- 40.20, 40.30, APY, DIS, .50, -, FGR, -
- 45.90, 46.10, APY, VEN, 20.00, -, FGR, -
- 85.00, 86.70, PYR, DIS, .50, -, FGR, -
- 86.70, 87.00, POT, INT, 3.00, -, FGR, -
- 94.40, 95.00, POT, DIS, 1.00, -, FGR, -
- 118.70, 118.80, PYR, DIS, 1.00, -, FGR, -
- 120.90, 121.00, PYR, IRM, 7.00, -, FGR, -
- 181.80, 182.00, PYR, DIS, 1.00, -, FGR, -
- 184.30, 185.50, PYR, DIS, 1.00, -, FGR, -
- 207.10, 207.20, POT, INT, 10.00, -, FGR, -
- 207.60, 208.10, APY, DIS, 5.00, -, FGR, -
- 207.60, 208.40, PYR, IRM, 3.00, -, FGR, -
- 207.60, 208.50, POT, IRM, 3.00, -, FGR, -
- 209.60, 209.80, POT, DIS, 1.00, -, FGR, -
- 211.20, 211.30, POT, IRM, 15.00, -, FGR, -
- 213.30, 213.90, APY, DIS, 2.00, -, FGR, -
- 216.20, 217.20, POT, DIS, 1.00, -, FGR, -
- 220.50, 220.70, POT, INT, 4.00, -, FGR, -
- 221.40, 221.50, PYR, INT, 2.00, -, FGR, -
- 223.30, 223.80, PYR, DIS, 3.00, -, FGR, -
- 224.00, 224.10, POT, DIS, 2.00, -, FGR, -
- 225.20, 225.30, PYR, DIS, 2.00, -, FGR, -
- 228.30, 228.40, PYR, INT, 2.00, -, FGR, -
- 232.20, 232.30, PYR, INT, 2.00, -, FGR, -
- 260.80, 261.70, PYR, DIS, 4.00, -, MGR, -
- 261.70, 271.00, PYR, DIS, 2.00, -, MGR, -
- 276.00, 281.00, PYR, DIS, 2.00, -, MGR, -
- 286.50, 289.80, PYR, EUH, 2.00, -, MGR, -
- 289.80, 290.00, PYR, DIS, 5.00, -, FGR, -

<u>Sample</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Au_g/t</u>	<u>Masse_Kg</u>	<u>Sg_Kgm3</u>
CAMLD279255	22.5	24.0	1.5			
CAMLD279256	24.0	25.5	1.5			
CAMLD279257	35.1	36.6	1.5			
CAMLD279258	36.6	38.1	1.5			
CAMLD279260	38.1	39.6	1.5			
CAMLD279261	39.6	41.1	1.5			
CAMLD279262	41.1	42.6	1.5			
CAMLD279263	42.6	44.1	1.5			
CAMLD279264	44.1	45.6	1.5			
CAMLD279265	45.6	46.1	0.5			
CAMLD279266	46.1	47.6	1.5			
CAMLD279268	47.6	49.1	1.5			
CAMLD279269	49.1	50.6	1.5			
CAMLD279271	50.6	52.1	1.5			
CAMLD279272	52.1	53.6	1.5			
CAMLD279273	70.4	71.9	1.5			
CAMLD279274	71.9	73.4	1.5			
CAMLD279276	73.4	74.9	1.5			
CAMLD279277	74.9	76.4	1.5			
CAMLD279278	76.4	77.9	1.5			
CAMLD279280	77.9	79.4	1.5			
CAMLD279281	79.4	80.9	1.5			
CAMLD279282	80.9	82.4	1.5			
CAMLD279283	82.4	83.9	1.5			
CAMLD279284	83.9	85.4	1.5			
CAMLD279285	85.4	86.9	1.5			
CAMLD279287	86.9	88.4	1.5			
CAMLD279288	88.4	89.9	1.5			
CAMLD279290	108.0	109.5	1.5			
CAMLD279291	109.5	111.0	1.5			
CAMLD279292	111.0	112.5	1.5			
CAMLD279293	112.5	114.0	1.5			
CAMLD279294	114.0	115.5	1.5			
CAMLD279295	115.5	117.0	1.5			
CAMLD279296	117.0	118.5	1.5			



**Hole number: M20-3071**

341.00, 342.70, POT, MSS, 2.00, -, FGR, -  
379.20, 379.30, POT, MSS, 5.00, -, FGR, -  
414.70, 415.20, POT, RPL, 5.00, -, FGR, -  
415.30, 421.00, POT, DIS, 2.00, -, FGR, -  
427.80, 428.70, PYR, DIS, 2.00, -, FGR, -  
432.40, 432.60, PYR, DIS, 5.00, -, FGR, -  
434.20, 435.00, PYR, DIS, 3.00, -, FGR, -  
457.30, 457.40, POT, MSS, 5.00, -, FGR, -  
514.90, 515.00, POT, MSS, 5.00, -, FGR, -  
589.50, 589.60, PYR, MSS, 3.00, -, FGR, -

**ALTERATION**  
TYPE/STYLE/INTENSITY/COLOR/GRAIN\_SIZE/FACIES/COMMENTS

120.70, 121.00, SIC+, PEN, STRONG, -, -, -, -  
122.20, 123.00, SIC+, PEN, STRONG, -, -, -, -  
165.00, 180.00, BTI+, PEN, WEAK, -, -, -, -  
180.00, 238.00, BTI+, PEN, STRONG, -, -, -, -  
202.50, 225.00, BTI+, BAN, STRONG, -, -, -, -  
204.00, 204.70, AMP+, PEN, STRONG, -, -, -, -  
225.00, 318.00, BTI+, DIS, WEAK, -, -, -, -  
233.10, 234.30, AMP+, PEN, MOD, -, -, -, -  
234.10, 234.30, SIC+, PEN, STRONG, -, -, -, -  
238.00, 255.20, SER+, HAL, STRONG, -, -, -, -  
299.00, 299.30, SER+, HAL, STRONG, -, -, -, -  
317.60, 318.20, SER+, HAL, MOD, -, -, -, -  
318.00, 340.00, BTI+, DIS, WEAK, -, -, -, -  
324.50, 332.00, SER+, HAL, WEAK, -, -, -, -  
340.00, 348.00, BTI+, BAN, MOD, -, -, -, -  
344.00, 358.00, BTI+, DIS, STRONG, -, -, -, -  
348.20, 365.00, BTI+, PHB, STRONG, -, -, -, -  
379.10, 379.30, CHL+, BAN, STRONG, -, -, -, -  
399.00, 417.00, BTI+, PEN, WEAK, -, -, -, -  
417.00, 432.00, CHL+, PAT, WEAK, -, -, -, -  
423.00, 435.00, SER+, HAL, MOD, -, -, -, -  
433.30, 436.30, CHL+, PEN, STRONG, -, -, -, -  
437.00, 441.00, SER+, HAL, MOD, -, -, -, -  
437.00, 460.50, BTI+, PHB, WEAK, -, -, -, -  
441.00, 450.30, CHL+, HAL, MOD, -, -, -, -  
451.00, 458.00, CHL+, HAL, MOD, -, -, -, -  
471.00, 473.00, CHL+, PEN, MOD, -, -, -, -  
482.00, 485.30, CHL+, PEN, MOD, -, -, -, -  
484.90, 494.00, CHL+, HAL, MOD, -, -, -, -  
485.30, 540.00, BTI+, PEN, WEAK, -, -, -, -

<u>Sample</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Au_g/t</u>	<u>Masse_Kg</u>	<u>Sg_Kgm3</u>
CAMLD279297	118.5	120.0	1.5			
CAMLD279298	120.0	121.5	1.5			
CAMLD279299	121.5	123.0	1.5			
CAMLD279300	180.0	181.5	1.5			
CAMLD279301	181.5	183.0	1.5			
CAMLD279302	183.0	184.5	1.5			
CAMLD279303	184.5	186.0	1.5			
CAMLD279304	186.0	187.5	1.5			
CAMLD279305	187.5	189.0	1.5			
CAMLD279306	189.0	190.5	1.5			
CAMLD279307	190.5	192.0	1.5			
CAMLD279308	192.0	192.5	0.5			
CAMLD279309	192.5	193.7	1.2			
CAMLD279310	205.5	207.0	1.5			
CAMLD279311	207.0	208.5	1.5			
CAMLD279312	208.5	210.0	1.5			
CAMLD279313	210.0	211.5	1.5			
CAMLD279314	211.5	213.0	1.5			
CAMLD279315	213.0	214.0	1.0			
CAMLD279317	214.0	215.5	1.5			
CAMLD279318	215.5	217.0	1.5			
CAMLD279319	217.0	218.5	1.5			
CAMLD279320	218.5	220.0	1.5			
CAMLD279321	220.0	221.5	1.5			
CAMLD279323	221.5	223.0	1.5			
CAMLD279324	223.0	224.5	1.5			
CAMLD279409	224.5	226.0	1.5			
CAMLD279410	226.0	227.5	1.5			
CAMLD279411	227.5	229.0	1.5			
CAMLD279412	229.0	230.5	1.5			
CAMLD279413	230.5	232.0	1.5			
CAMLD279414	232.0	233.5	1.5			
CAMLD279415	233.5	235.0	1.5			
CAMLD262501	241.5	243.0	1.5			
CAMLD262502	243.0	244.5	1.5			



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510.00, 550.00, CHL+, HAL, MOD, -, -, -, -  
544.50, 593.40, BTI+, PHB, STRONG, -, -, -, -  
550.00, 566.00, SER+, HAL, MOD, -, -, -, -  
575.80, 576.00, SIC+, PEN, STRONG, -, -, -, -  
577.30, 577.50, CHL+, PHB, STRONG, -, -, -, -

STRUCTURE  
TYPE/INTENSITY/CORE\_ORIENT/ALPHA/BETA/GAMMA/COMMENTS

22.50, 201.00, FOL, MOD, 55.00, -, -, -, -  
22.50, 22.60, CZN, -, 60.00, -, -, -, -  
24.00, 25.30, FRA, WEAK, -, -, -, -  
25.50, 25.80, JST, -, -, -, -, -  
27.30, 28.00, OJN, -, -, -, -, -  
30.00, 31.00, OJN, -, -, -, -, -  
31.90, 32.40, BRF, STRONG, -, -, -, -, -  
32.40, 32.50, FGO, STRONG, -, -, -, -, -  
32.50, 33.00, FRA, STRONG, -, -, -, -, -  
36.60, 36.70, BRC, -, -, -, -, -  
39.00, 39.10, OJN, -, -, -, -, -  
44.70, 45.00, BRC, MOD, -, -, -, -, -  
45.60, 45.70, BRC, MOD, -, -, -, -, -  
45.60, 45.70, BRC, -, -, -, -, -  
55.80, 55.90, BRC, WEAK, -, -, -, -, -  
55.90, 56.90, FZN, STRONG, -, -, -, -, -  
57.00, 59.00, FRA, WEAK, -, -, -, -, -  
58.50, 59.00, OJN, -, -, -, -, -  
65.30, 65.40, OJN, -, -, -, -, -  
66.00, 66.60, FRA, MOD, -, -, -, -, -  
68.50, 69.20, FRA, WEAK, -, -, -, -, -  
73.20, 73.50, OJN, -, -, -, -, -  
74.00, 79.00, FRA, WEAK, -, -, -, -, -  
75.50, 76.80, OJN, -, -, -, -, -  
79.50, 79.90, OJN, -, -, -, -, -  
83.80, 83.90, OJN, -, -, -, -, -  
83.90, 85.60, FZN, MOD, -, -, -, -, -  
85.60, 85.70, FGO, STRONG, -, -, -, -, -  
85.70, 86.70, FRA, WEAK, -, -, -, -, -  
86.00, 86.20, OJN, -, -, -, -, -  
87.40, 87.60, OJN, -, -, -, -, -  
96.40, 96.60, OJN, -, -, -, -, -  
102.10, 102.30, OJN, -, -, -, -, -  
108.00, 108.10, CZN, STRONG, 60.00, -, -, -, -  
108.10, 108.20, CZN, STRONG, 75.00, -, -, -, -

Sample	From	To	Length	Au_g/t	Masse_Kg	Sg_Kgm3
CAMLD262503	244.5	246.0	1.5			
CAMLD262504	246.0	247.5	1.5			
CAMLD262505	247.5	249.0	1.5			
CAMLD262507	249.0	250.5	1.5			
CAMLD262508	250.5	252.0	1.5			
CAMLD262509	252.0	253.5	1.5			
CAMLD262510	253.5	255.0	1.5			
CAMLD262511	255.0	256.5	1.5			
CAMLD262512	256.5	258.0	1.5			
CAMLD262514	258.0	259.5	1.5			
CAMLD262515	259.5	261.0	1.5			
CAMLD262516	261.0	262.5	1.5			
CAMLD262518	262.5	264.0	1.5			
CAMLD262519	264.0	265.5	1.5			
CAMLD262520	298.5	300.0	1.5			
CAMLD262521	300.0	301.5	1.5			
CAMLD262522	301.5	303.0	1.5			
CAMLD262523	303.0	304.5	1.5			
CAMLD262525	304.5	306.0	1.5			
CAMLD262526	306.0	307.5	1.5			
CAMLD262527	307.5	309.0	1.5			
CAMLD262528	309.0	310.5	1.5			
CAMLD262529	310.5	312.0	1.5			
CAMLD262531	312.0	313.5	1.5			
CAMLD262532	313.5	315.0	1.5			
CAMLD262533	315.0	316.5	1.5			
CAMLD262534	316.5	318.0	1.5			
CAMLD262536	318.0	319.5	1.5			
CAMLD262537	319.5	321.0	1.5			
CAMLD262538	337.5	339.0	1.5			
CAMLD262539	339.0	340.5	1.5			
CAMLD262540	340.5	342.0	1.5			
CAMLD262541	342.0	343.5	1.5			
CAMLD262542	343.5	345.0	1.5			
CAMLD262543	345.0	346.5	1.5			



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126.60, 127.00, OJN, -, -, -, -, -  
 133.50, 133.70, OJN, -, -, -, -, -  
 134.00, 134.20, OJN, -, -, -, -, -  
 137.70, 138.50, FRA, MOD, -, -, -, -, -  
 146.00, 146.20, OJN, -, -, -, -, -  
 201.00, 393.00, FOL, MOD, 60.00, -, -, -, -  
 259.80, 259.90, FGO, STRONG, -, -, -, -, -  
 260.20, 260.30, FGO, STRONG, -, -, -, -, -  
 269.60, 269.80, OJN, STRONG, -, -, -, -, -  
 293.00, 293.20, OJN, -, -, -, -, -  
 299.30, 299.40, FAL, MOD, -, -, -, -, -  
 303.20, 303.40, OJN, -, -, -, -, -  
 334.60, 334.70, FGO, STRONG, -, -, -, -, -  
 393.00, 593.40, FOL, MOD, 70.00, -, -, -, -  
 469.70, 469.80, CZN, STRONG, 70.00, -, -, -, -, -  
 473.00, 473.10, CZN, STRONG, 70.00, -, -, -, -, -  
 482.00, 482.10, CZN, STRONG, 80.00, -, -, -, -, -  
 485.20, 485.30, CZN, STRONG, 70.00, -, -, -, -, -  
 489.20, 489.30, TFL, STRONG, -, -, -, -, -

**VEIN**  
 VEIN/VEIN\_PCT/ANGLE/ALPHA/BETA/GAMMA/COLOR/TRUE\_WIDTH/TEXTURE/MNZ/MNZ\_PCT/COMMENTS

22.50, 23.00, QTZ, 3.00, -, -, -, -, -, FLP, -, -, -  
 36.70, 41.30, QtzCbt, 5.00, -, -, -, -, -, FLP, -, -, -  
 43.70, 44.40, QtzCbt, 10.00, -, -, -, -, -, IRR, -, -, -  
 45.90, 46.10, QtzTur, 30.00, -, -, -, -, -, OBL, -, -, -  
 47.00, 49.30, QtzTur, 20.00, -, -, -, -, -, FLP, -, -, to oblique  
 50.30, 51.10, QtzCbt, 7.00, -, -, -, -, -, FLP, -, -, -  
 71.90, 74.00, QTZ, 15.00, -, -, -, -, -, IRR, -, -, to // foliation, boudinage  
 75.10, 77.00, QTZ, 7.00, -, -, -, -, -, IRR, -, -, -  
 78.90, 80.30, QTZ, 10.00, -, -, -, -, -, IRR, -, -, -  
 85.00, 86.70, QTZ, 5.00, -, -, -, -, -, FLP, PYR, -, -  
 86.70, 87.00, QtzTur, 25.00, -, -, -, -, -, BRC, POT, -, -  
 94.40, 95.00, QTZ, 20.00, -, -, -, -, -, FLP, POT, -, -  
 100.50, 101.30, QtzCbt, 10.00, -, -, -, -, -, FLP, -, -, -  
 102.80, 103.00, QtzCbt, 30.00, -, -, -, -, -, FLP, POT, .10, -  
 108.20, 108.40, QTZ, 25.00, -, -, -, -, -, IRR, POT, .50, -  
 109.40, 111.90, QTZ, 5.00, -, -, -, -, -, DSC, -, -, -  
 114.20, 117.40, QtzCbt, 5.00, -, -, -, -, -, FLP, POT, .10, -  
 118.70, 119.00, QTZ, 25.00, -, -, -, -, -, FLP, PYR, .10, -  
 120.80, 123.20, QTZ, 7.00, -, -, -, -, -, FLP, PYR, .10, -  
 167.00, 176.70, QtzCbt, 4.00, -, -, -, -, -, FLP, PYR, .10, -  
 178.80, 179.10, QTZ, 40.00, -, -, -, -, -, FLP, -, -, -

Sample	From	To	Length	Au_g/t	Masse_Kg	Sg_Kgm3
CAMLD262545	346.5	348.0	1.5			
CAMLD262546	348.0	349.5	1.5			
CAMLD262547	349.5	350.4	0.9			
CAMLD262548	393.5	395.0	1.5			
CAMLD262549	395.0	396.5	1.5			
CAMLD262551	396.5	398.0	1.5			
CAMLD262552	398.0	399.5	1.5			
CAMLD262553	399.5	401.0	1.5			
CAMLD262554	401.0	402.5	1.5			
CAMLD262556	402.5	404.0	1.5			
CAMLD262557	404.0	405.0	1.0			
CAMLD262558	405.0	406.5	1.5			
CAMLD262560	406.5	408.0	1.5			
CAMLD262561	408.0	409.5	1.5			
CAMLD262562	409.5	411.0	1.5			
CAMLD262563	411.0	412.5	1.5			
CAMLD262564	412.5	414.0	1.5			
CAMLD262565	414.0	415.5	1.5			
CAMLD262566	415.5	417.0	1.5			
CAMLD262567	417.0	418.5	1.5			
CAMLD262569	418.5	420.0	1.5			
CAMLD262570	420.0	421.5	1.5			
CAMLD262572	421.5	423.0	1.5			
CAMLD262573	423.0	424.5	1.5			
CAMLD262574	424.5	426.0	1.5			
CAMLD262575	426.0	427.5	1.5			
CAMLD262576	427.5	429.0	1.5			
CAMLD262577	429.0	430.5	1.5			
CAMLD262578	430.5	432.0	1.5			
CAMLD262579	432.0	433.5	1.5			
CAMLD262581	433.5	435.0	1.5			
CAMLD262582	435.0	436.5	1.5			
CAMLD262583	436.5	438.0	1.5			
CAMLD262584	438.0	439.5	1.5			
CAMLD262585	439.5	441.0	1.5			





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181.70, 192.20, QTZ, 7.00, -, -, -, -, -, FLP, PYR, .10, to oblique and x-cutting  
 207.60, 219.20, QTZ, 10.00, -, -, -, -, -, IRR, -, -, -  
 219.70, 233.50, QTZ, 15.00, -, -, -, -, -, IRR, POT, .10, -  
 237.00, 244.20, QTZ, 5.00, -, -, -, -, -, IRR, -, -, -  
 245.80, 247.50, QTZ, 30.00, -, -, -, -, -, IRR, -, -, -  
 253.00, 256.50, QTZ, 15.00, -, -, -, -, -, IRR, -, -, -  
 260.90, 263.20, QTZ, 10.00, -, -, -, -, -, FLP, PYR, 1.00, and irregular  
 268.40, 271.50, QTZ, 15.00, -, -, -, -, -, FLP, PYR, .10, and irregular  
 278.90, 281.20, QTZ, 7.00, -, -, -, -, -, FLP, PYR, .10, and irregular  
 284.20, 285.60, QTZ, 10.00, -, -, -, -, -, FLP, -, -, and irregular  
 289.80, 290.10, QTZ, 25.00, -, -, -, -, -, FLP, PYR, 1.00, and irregular  
 303.30, 307.20, QTZ, 15.00, -, -, -, -, -, FLP, -, -, and irregular  
 307.50, 315.50, QTZ, 10.00, -, -, -, -, -, FLP, -, -, and irregular  
 317.50, 318.20, QTZ, 60.00, -, -, -, -, -, FLP, -, -, -  
 320.90, 334.30, QTZ, 5.00, -, -, -, -, -, FLP, -, -, and irregular  
 338.90, 348.20, QTZ, 15.00, -, -, -, -, -, FLP, -, -, and irregular  
 353.40, 364.10, QTZ, 3.00, -, -, -, -, -, FLP, -, -, and irregular  
 369.20, 372.20, QTZ, 5.00, -, -, -, -, -, FLP, -, -, and irregular  
 376.80, 381.00, QTZ, 3.00, -, -, -, -, -, FLP, -, -, and irregular  
 385.80, 389.30, QTZ, 4.00, -, -, -, -, -, FLP, -, -, and irregular  
 391.30, 391.70, QTZ, 25.00, -, -, -, -, -, FLP, -, -, -  
 394.30, 403.00, QTZ, 7.00, -, -, -, -, -, FLP, -, -, and irregular  
 411.80, 416.70, QTZ, 5.00, -, -, -, -, -, FLP, PYR, .10, and irregular  
 421.90, 426.00, QTZ, 7.00, -, -, -, -, -, FLP, -, -, and irregular  
 426.50, 435.60, QTZ, 7.00, -, -, -, -, -, FLP, -, -, and irregular  
 438.40, 450.30, QTZ, 10.00, -, -, -, -, -, FLP, -, -, and irregular  
 452.30, 457.50, QTZ, 15.00, -, -, -, -, -, FLP, -, -, and irregular  
 462.20, 464.30, QTZ, 5.00, -, -, -, -, -, FLP, -, -, and irregular  
 466.20, 469.50, QTZ, 7.00, -, -, -, -, -, FLP, -, -, and irregular  
 472.20, 473.70, QTZ, 20.00, -, -, -, -, -, FLP, -, -, and irregular  
 475.20, 479.30, QTZ, 7.00, -, -, -, -, -, FLP, -, -, and irregular  
 486.00, 494.00, QTZ, 10.00, -, -, -, -, -, FLP, -, -, and irregular  
 495.00, 498.00, QtzTur, 15.00, -, -, -, -, -, FLP, -, -, and irregular  
 499.20, 503.00, QtzTur, 10.00, -, -, -, -, -, FLP, -, -, and irregular  
 503.30, 505.80, QtzAnk, 10.00, -, -, -, -, -, FLP, -, -, and irregular  
 506.10, 506.20, QtzTur, 80.00, -, -, -, -, -, FLP, POT, 3.00, -  
 508.00, 512.50, QTZ, 3.00, -, -, -, -, -, FLP, -, -, and irregular  
 512.50, 518.60, QTZ, 20.00, -, -, -, -, -, IRR, -, -, -  
 520.70, 534.60, QTZ, 15.00, -, -, -, -, -, FLP, -, -, and irregular  
 536.80, 544.70, QTZ, 10.00, -, -, -, -, -, FLP, -, -, and irregular  
 549.70, 575.80, QTZ, 5.00, -, -, -, -, -, FLP, -, -, and irregular  
 575.80, 577.10, QTZ, 30.00, -, -, -, -, -, IRR, -, -, -  
 579.00, 591.50, QTZ, 7.00, -, -, -, -, -, IRR, -, -, and // foliation

Sample	From	To	Length	Au_g/t	Masse_Kg	Sg_Kgm3
CAMLD262587	441.0	442.5	1.5			
CAMLD262588	442.5	444.0	1.5			
CAMLD262590	444.0	445.5	1.5			
CAMLD262591	445.5	447.0	1.5			
CAMLD262592	447.0	448.5	1.5			
CAMLD262593	448.5	450.0	1.5			
CAMLD262595	450.0	451.5	1.5			
CAMLD262596	451.5	453.0	1.5			
CAMLD262597	453.0	454.5	1.5			
CAMLD262598	454.5	456.0	1.5			
CAMLD262599	456.0	457.5	1.5			
CAMLD262600	457.5	459.0	1.5			
CAMLD262601	459.0	460.5	1.5			
CAMLD262602	460.5	462.0	1.5			
CAMLD262603	462.0	463.5	1.5			
CAMLD262604	463.5	465.0	1.5			
CAMLD262606	465.0	466.5	1.5			
CAMLD262607	466.5	468.0	1.5			
CAMLD262608	468.0	469.5	1.5			
CAMLD262609	469.5	471.0	1.5			
CAMLD262610	471.0	472.5	1.5			
CAMLD262611	472.5	474.0	1.5			
CAMLD262613	474.0	475.5	1.5			
CAMLD262614	475.5	477.0	1.5			
CAMLD262616	477.0	478.5	1.5			
CAMLD262617	478.5	480.0	1.5			
CAMLD262618	480.0	481.5	1.5			
CAMLD262619	481.5	483.0	1.5			
CAMLD262620	483.0	484.0	1.0			
CAMLD262621	484.0	485.3	1.3			
CAMLD262622	485.3	486.0	0.7			
CAMLD262624	486.0	487.5	1.5			
CAMLD262625	487.5	489.0	1.5			
CAMLD262626	489.0	490.5	1.5			
CAMLD262627	490.5	492.0	1.5			

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MINERAL

TYPE/STYLE/PCT/MNL\_COLOR/GRAIN\_SIZE/COMMENTS  
 574.80, 577.10, GRT, PHB, 5.00, -, MGR, -

Sample	From	To	Length	Au_g/t	Masse_Kg	Sg_Kgm3
CAMLD262629	492.0	493.5	1.5			
CAMLD262630	493.5	495.0	1.5			
CAMLD262631	495.0	496.5	1.5			
CAMLD262632	496.5	498.0	1.5			
CAMLD262633	498.0	499.5	1.5			
CAMLD262634	499.5	501.0	1.5			
CAMLD262635	501.0	502.5	1.5			
CAMLD262636	502.5	504.0	1.5			
CAMLD262638	504.0	505.5	1.5			
CAMLD262640	505.5	507.0	1.5			
CAMLD262642	507.0	508.5	1.5			
CAMLD262643	508.5	510.0	1.5			
CAMLD262644	510.0	511.5	1.5			
CAMLD262645	511.5	513.0	1.5			
CAMLD262646	513.0	514.5	1.5			
CAMLD262647	514.5	516.0	1.5			
CAMLD262648	516.0	517.5	1.5			
CAMLD262649	517.5	519.0	1.5			
CAMLD262650	519.0	520.5	1.5			
CAMLD262651	520.5	522.0	1.5			
CAMLD262652	522.0	523.5	1.5			
CAMLD262653	523.5	525.0	1.5			
CAMLD262654	525.0	526.5	1.5			
CAMLD262655	526.5	528.0	1.5			
CAMLD262656	528.0	529.5	1.5			
CAMLD262657	529.5	531.0	1.5			
CAMLD262658	531.0	532.5	1.5			
CAMLD262659	532.5	534.0	1.5			
CAMLD262661	534.0	535.5	1.5			
CAMLD262662	535.5	537.0	1.5			
CAMLD262663	537.0	538.5	1.5			
CAMLD262664	538.5	540.0	1.5			
CAMLD262666	540.0	541.5	1.5			
CAMLD262667	541.5	543.0	1.5			
CAMLD262668	543.0	544.5	1.5			

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<u>Sample</u>	<u>From</u>	<u>To</u>	<u>Length</u>	<u>Au_g/t</u>	<u>Masse_Kg</u>	<u>Sg_Kgm3</u>
CAMLD262669	544.5	546.0	1.5			
CAMLD262671	546.0	547.5	1.5			
CAMLD262672	547.5	549.0	1.5			
CAMLD262674	549.0	550.5	1.5			
CAMLD262675	550.5	552.0	1.5			
CAMLD262676	552.0	553.5	1.5			
CAMLD262677	553.5	555.0	1.5			
CAMLD262678	555.0	556.5	1.5			
CAMLD262679	556.5	558.0	1.5			
CAMLD262681	558.0	559.5	1.5			
CAMLD262682	559.5	561.0	1.5			
CAMLD262683	561.0	562.5	1.5			
CAMLD262684	562.5	564.0	1.5			
CAMLD262686	564.0	565.5	1.5			
CAMLD262687	565.5	567.0	1.5			
CAMLD262688	567.0	568.5	1.5			
CAMLD262689	568.5	570.0	1.5			
CAMLD262690	570.0	571.5	1.5			
CAMLD262691	571.5	573.0	1.5			
CAMLD262692	573.0	574.5	1.5			
CAMLD262694	574.5	576.0	1.5			
CAMLD262695	576.0	577.5	1.5			
CAMLD262696	577.5	579.0	1.5			
CAMLD262698	579.0	580.5	1.5			
CAMLD262699	580.5	582.0	1.5			
CAMLD262700	582.0	583.5	1.5			
CAMLD262701	583.5	585.0	1.5			
CAMLD262702	585.0	586.5	1.5			
CAMLD262703	586.5	588.0	1.5			
CAMLD262704	588.0	589.5	1.5			
CAMLD262705	589.5	591.0	1.5			
CAMLD262706	591.0	592.5	1.5			
CAMLD262708	592.5	593.4	0.9			



Hole number: M20-3071

Major: From: 593.4 To: 606.0 Ksc-lj, Ksc-wa with cm-dm Chert-Magnetite Iron formation

Unit is strongly chloritized. Moderate magnetism throughout. Have also a local gabbroic look.

MINERALIZATION

TYPE/STYLE/PCT/COLOR/GRAIN\_SIZE/COMMENTS

595.50, 598.00, POT, DIS, 2.00, -, FGR, -

ALTERATION

TYPE/STYLE/INTENSITY/COLOR/GRAIN\_SIZE/FACIES/COMMENTS

593.40, 594.70, BTI+, BAN, STRONG, -, -, -, -

593.40, 606.00, CHL+, PHB, STRONG, -, -, -, -

594.70, 606.00, BTI+, PHB, MOD, -, -, -, -

STRUCTURE

TYPE/INTENSITY/CORE\_ORIENT/ALPHA/BETA/GAMMA/COMMENTS

593.40, 606.00, FOL, MOD, 70.00, -, -, -, -

VEIN

VEIN/VEIN\_PCT/ANGLE/ALPHA/BETA/GAMMA/COLOR/TRUE\_WIDTH/TEXTURE/MNZ/MNZ\_PCT/COMMENTS

593.40, 606.00, QtzCbt, 3.00, -, -, -, -, -, FLP, -, -, to irregular

Sample	From	To	Length	Au_g/t	Masse_Kg	Sg_Kgm3
CAMLD262709	593.4	594.5	1.1			
CAMLD262710	594.5	596.0	1.5			
CAMLD262711	596.0	597.5	1.5			
CAMLD262713	597.5	599.0	1.5			
CAMLD262715	599.0	600.5	1.5			
CAMLD262716	600.5	602.0	1.5			
CAMLD262718	602.0	603.5	1.5			
CAMLD262719	603.5	605.0	1.5			
CAMLD262720	605.0	606.0	1.0			

RQD

From	To	Quality (%)	Recov.(%)	C.A.	Break	Disking	Comment
2.5	6.0	33.00	100.00			N	
6.0	9.0	73.00	100.00			N	
9.0	12.0	94.00	100.00			N	
12.0	15.0	73.00	100.00			N	
15.0	18.0	80.00	100.00			N	
18.0	21.0	70.00	100.00			N	
21.0	24.0	77.00	100.00			N	
24.0	27.0	57.00	100.00			N	
27.0	30.0	94.00	100.00			N	
30.0	33.0	47.00	100.00			N	
33.0	36.0	25.00	100.00			N	
36.0	39.0	40.00	98.00			N	
39.0	42.0	77.00	100.00			N	
42.0	45.0	66.00	100.00			N	



Hole number: M20-3071

**RQD**

<u>From</u>	<u>To</u>	<u>Quality (%)</u>	<u>Recov.(%)</u>	<u>C.A.</u>	<u>Break</u>	<u>Disking</u>	<u>Comment</u>
45.0	48.0	67.00	100.00			N	
48.0	51.0	60.00	100.00			N	
51.0	54.0	54.00	100.00			N	
54.0	57.0	23.00	100.00			N	
57.0	60.0	40.00	100.00			N	
60.0	63.0	50.00	100.00			N	
63.0	66.0	33.00	100.00			N	
66.0	69.0	60.00	100.00			N	
69.0	72.0	57.00	100.00			N	
72.0	75.0	60.00	100.00			N	
75.0	78.0	50.00	100.00			N	
78.0	81.0	63.00	100.00			N	
81.0	84.0	47.00	100.00			N	
84.0	87.0	37.00	100.00			N	
87.0	90.0	77.00	100.00			N	
90.0	93.0	70.00	100.00			N	
93.0	96.0	70.00	100.00			N	
96.0	99.0	70.00	100.00			N	
99.0	102.0	70.00	100.00			N	
102.0	105.0	77.00	100.00			N	
105.0	108.0	54.00	100.00			N	
108.0	111.0	77.00	100.00			N	
111.0	114.0	70.00	100.00			N	
114.0	117.0	77.00	100.00			N	
117.0	120.0	80.00	100.00			N	
120.0	123.0	87.00	100.00			N	
123.0	126.0	77.00	100.00			N	
126.0	129.0	87.00	100.00			N	



Hole number: **M20-3071**

**RQD**

<u>From</u>	<u>To</u>	<u>Quality (%)</u>	<u>Recov.(%)</u>	<u>C.A.</u>	<u>Break</u>	<u>Disking</u>	<u>Comment</u>
129.0	132.0	87.00	100.00			N	
132.0	135.0	94.00	100.00			N	
135.0	138.0	90.00	100.00			N	
138.0	141.0	83.00	100.00			N	
141.0	144.0	67.00	100.00			N	
144.0	147.0	64.00	100.00			N	
147.0	150.0	90.00	100.00			N	
150.0	153.0	77.00	100.00			N	
153.0	156.0	73.00	100.00			N	
156.0	159.0	87.00	100.00			N	
159.0	162.0	87.00	100.00			N	
162.0	165.0	83.00	100.00			N	
165.0	168.0	77.00	100.00			N	
168.0	171.0	87.00	100.00			N	
171.0	174.0	83.00	100.00			N	
174.0	177.0	94.00	100.00			N	
177.0	180.0	80.00	100.00			N	
180.0	183.0	97.00	100.00			N	
183.0	186.0	87.00	100.00			N	
186.0	189.0	94.00	100.00			N	
189.0	192.0	77.00	100.00			N	
192.0	195.0	94.00	100.00			N	
195.0	198.0	67.00	100.00			N	
198.0	201.0	83.00	100.00			N	
201.0	204.0	87.00	100.00			N	
204.0	207.0	97.00	100.00			N	
207.0	210.0	87.00	100.00			N	
210.0	213.0	87.00	100.00			N	



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**RQD**

<u>From</u>	<u>To</u>	<u>Quality (%)</u>	<u>Recov.(%)</u>	<u>C.A.</u>	<u>Break</u>	<u>Disking</u>	<u>Comment</u>
213.0	216.0	90.00	100.00			N	
216.0	219.0	90.00	100.00			N	
219.0	222.0	77.00	100.00			N	
222.0	225.0	77.00	100.00			N	
225.0	228.0	70.00	100.00			N	
228.0	231.0	77.00	100.00			N	
231.0	234.0	73.00	100.00			N	
234.0	237.0	97.00	100.00			N	
237.0	240.0	90.00	100.00			N	
240.0	243.0	97.00	100.00			N	
243.0	246.0	87.00	100.00			N	
246.0	249.0	83.00	100.00			N	
249.0	252.0	70.00	100.00			N	
252.0	255.0	94.00	100.00			N	
255.0	258.0	83.00	100.00			N	
258.0	261.0	67.00	100.00			N	
261.0	264.0	94.00	100.00			N	
264.0	267.0	90.00	100.00			N	
267.0	270.0	83.00	100.00			N	
270.0	273.0	94.00	100.00			N	
273.0	276.0	90.00	100.00			N	
276.0	279.0	97.00	100.00			N	
279.0	282.0	97.00	100.00			N	
282.0	285.0	90.00	100.00			N	
285.0	288.0	94.00	100.00			N	
288.0	291.0	94.00	100.00			N	
291.0	294.0	73.00	100.00			N	
294.0	297.0	80.00	100.00			N	



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**RQD**

<u>From</u>	<u>To</u>	<u>Quality (%)</u>	<u>Recov.(%)</u>	<u>C.A.</u>	<u>Break</u>	<u>Disking</u>	<u>Comment</u>
297.0	300.0	77.00	100.00			N	
300.0	303.0	80.00	100.00			N	
303.0	306.0	73.00	100.00			N	
306.0	309.0	83.00	100.00			N	
309.0	312.0	73.00	100.00			N	
312.0	315.0	80.00	100.00			N	
315.0	318.0	87.00	100.00			N	
318.0	321.0	73.00	100.00			N	
321.0	324.0	83.00	100.00			N	
324.0	327.0	70.00	100.00			N	
327.0	330.0	67.00	100.00			N	
330.0	333.0	27.00	100.00			N	
333.0	336.0	30.00	100.00			N	
336.0	339.0	53.00	100.00			N	
339.0	342.0	77.00	100.00			N	
342.0	345.0	94.00	100.00			N	
345.0	348.0	87.00	100.00			N	
348.0	351.0	67.00	100.00			N	
351.0	354.0	77.00	100.00			N	
354.0	357.0	90.00	98.00			N	
357.0	360.0	90.00	100.00			N	
360.0	363.0	94.00	100.00			N	
363.0	366.0	97.00	100.00			N	
366.0	369.0	90.00	100.00			N	
369.0	372.0	90.00	100.00			N	
372.0	375.0	97.00	100.00			N	
375.0	378.0	100.00	100.00			N	
378.0	381.0	97.00	100.00			N	





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**RQD**

<u>From</u>	<u>To</u>	<u>Quality (%)</u>	<u>Recov.(%)</u>	<u>C.A.</u>	<u>Break</u>	<u>Disking</u>	<u>Comment</u>
381.0	384.0	90.00	100.00			N	
384.0	387.0	83.00	100.00			N	
387.0	390.0	97.00	100.00			N	
390.0	393.0	100.00	100.00			N	
393.0	396.0	90.00	100.00			N	
396.0	399.0	94.00	100.00			N	
399.0	402.0	90.00	100.00			N	
402.0	405.0	87.00	100.00			N	
405.0	408.0	94.00	100.00			N	
408.0	411.0	97.00	100.00			N	
411.0	414.0	97.00	100.00			N	
414.0	417.0	97.00	100.00			N	
417.0	420.0	90.00	100.00			N	
420.0	423.0	94.00	100.00			N	
423.0	426.0	100.00	100.00			N	
426.0	429.0	94.00	100.00			N	
429.0	432.0	94.00	100.00			N	
432.0	435.0	94.00	100.00			N	
435.0	438.0	94.00	100.00			N	
438.0	441.0	94.00	100.00			N	
441.0	444.0	83.00	100.00			N	
444.0	447.0	83.00	100.00			N	
447.0	450.0	83.00	100.00			N	
450.0	453.0	87.00	100.00			N	
453.0	456.0	64.00	100.00			N	
456.0	459.0	83.00	100.00			N	
459.0	462.0	83.00	100.00			N	
462.0	465.0	89.00	100.00			N	



Hole number: M20-3071

**RQD**

<u>From</u>	<u>To</u>	<u>Quality (%)</u>	<u>Recov.(%)</u>	<u>C.A.</u>	<u>Break</u>	<u>Disking</u>	<u>Comment</u>
465.0	468.0	94.00	100.00			N	
468.0	471.0	87.00	100.00			N	
471.0	474.0	100.00	100.00			N	
474.0	477.0	97.00	100.00			N	
477.0	480.0	90.00	100.00			N	
480.0	483.0	90.00	100.00			N	
483.0	486.0	90.00	100.00			N	
486.0	489.0	94.00	100.00			N	
489.0	492.0	83.00	100.00			N	
492.0	495.0	83.00	100.00			N	
495.0	498.0	100.00	100.00			N	
498.0	501.0	100.00	100.00			N	
501.0	504.0	94.00	100.00			N	
504.0	507.0	87.00	100.00			N	
507.0	510.0	83.00	100.00			N	
510.0	513.0	94.00	100.00			N	
513.0	516.0	94.00	100.00			N	
516.0	519.0	94.00	100.00			N	
519.0	522.0	83.00	100.00			N	
522.0	525.0	100.00	100.00			N	
525.0	528.0	83.00	100.00			N	
528.0	531.0	97.00	100.00			N	
531.0	534.0	87.00	100.00			N	
534.0	537.0	90.00	100.00			N	
537.0	540.0	87.00	100.00			N	
540.0	543.0	90.00	100.00			N	
543.0	546.0	94.00	100.00			N	
546.0	549.0	87.00	100.00			N	



Hole number: M20-3071

**RQD**

<u>From</u>	<u>To</u>	<u>Quality (%)</u>	<u>Recov.(%)</u>	<u>C.A.</u>	<u>Break</u>	<u>Disking</u>	<u>Comment</u>
549.0	552.0	87.00	100.00			N	
552.0	555.0	90.00	100.00			N	
555.0	558.0	97.00	100.00			N	
558.0	561.0	100.00	100.00			N	
561.0	564.0	100.00	100.00			N	
564.0	567.0	94.00	100.00			N	
567.0	570.0	97.00	100.00			N	
570.0	573.0	90.00	100.00			N	
573.0	576.0	97.00	100.00			N	
576.0	579.0	87.00	100.00			N	
579.0	582.0	94.00	100.00			N	
582.0	585.0	97.00	100.00			N	
585.0	588.0	97.00	100.00			N	
588.0	591.0	97.00	100.00			N	
591.0	594.0	97.00	100.00			N	
594.0	597.0	97.00	100.00			N	
597.0	600.0	90.00	100.00			N	
600.0	603.0	97.00	100.00			N	
603.0	606.0	94.00	100.00			N	

**APPENDIX D**

# FracMan HydroBench<sup>®</sup> Analysis Reports

**Note:** These reports are computer generated protocols, and some values might differ from values discussed within the text section of this document.

## HydroBench® Overview

HydroBench® is a software package developed by Golder to analyse different types of hydrogeological tests using the most current methodologies. HydroBench allows for the analysis of constant rate, variable rate, constant head, pulse, and slug tests. Multi-step superposition is available (e.g., a recovery phase following a variable rate period). In addition, the software includes the deconvolution approach to analyse slug and pulse test data. Both homogeneous and composite flow models may be used to interpret the data and the flow geometry may also be matched to infer the local connectivity of a fracture network. HydroBench also includes the derivative of pressure (rate of pressure change) with respect to the common logarithm of time that has shown to significantly improve the diagnostic and quantitative analysis of slug tests and constant-rate pumping tests. Transmissivity normalised plots are included in the software package and allow comparing different phases of a hydrogeological test by normalising the pressure response.

## Validation Process

The software HydroBench was validated by using a standardised methodology in multiple steps. The individual steps of the validation process are described in detail below.

- Two commercial software packages capable to conduct forward simulations and to analyse hydrogeological tests were selected for the validation process. Each of these software packages is well respected within the industry and reviewed in detail in various publications (see references below). The software packages selected for the validation are listed below:
- *Interpret 2006* by Paradigm Ltd. Interpret is mainly used in the petroleum industry to conduct pressure transient analysis for well tests. The software Interpret is verified in detail. *E.g.*, in *NTB 95-02 (1995)*, *NTB 93-08 (1993)*, and *NTB 93-05 (1993)*.
- *nSIGHTS nPre/32* Version 2.50D Beta. nSIGHTS was developed by the Sandia National Laboratories and has been fully verified following Sandia National Laboratories Nuclear Waste Management Program Procedure NP 19-1, "Software Requirements," Rev. 4 to meet NQA-2 requirements (ASME, 1990). A description of the nSIGHTS governing equations can be found in *Pickens et al. (1987)*, which discusses the well-test analysis code GTFM (Graph Theoretic Field Model), the DOS-based precursor to nSIGHTS.
- Certain parameter sets consisting of borehole, fluid, and aquifer parameters at different scales with respect to create a distinct pressure transient simulation were chosen and entered into one of the software packages described above.
- A forward simulation was conducted by using these parameters with one of the software packages. This forward simulation created a distinct dataset of a certain hydrogeological test. The data output is pressure vs. time.
- The pressure vs. time dataset was then loaded into HydroBench.
- The parameters discussed above were entered into HydroBench and a simulation (without regression) with these parameters was conducted within HydroBench.
- Both datasets were then compared in various figures. All figures are color coded equally:
  - Blue squares: pressure response dataset, created by a forward simulation.
  - Pink solid lines: simulation conducted by HydroBench.

## HYDROBENCH REPORT

Project                    Agnico Eagle Mines Limited  
Site                        Meliadine Expansion  
Source Well                M20-3071  
Test Name                 Test 1  
Test Date/Time            17.08.20, 10:00  
Interval                    top: 180.40 m    bottom: 225.00 m

### Basic Data

Test Interval	44.60 m		
Porosity	0.10		
Well Radius	0.048 m	Tubing Radius	0.039 m
Inclination	22.0 deg		
Test Volume	322.825 l		
Well Type	Source		

### Fluid Properties

Viscosity	0.001 Pa*s
Density	1000.0 kg/m <sup>3</sup>
Compressibility	2.0e-09 1/Pa

### Sequence Definition

Name	Category	t(o) [hrs]	P(o) [kPa]	P(i) [kPa]	Rate [l/min]	C [m <sup>3</sup> /Pa]
INF	Variable Pressure	0.00000	1816.25			5.3e-07
PSR	Recovery	0.60139	1864.20			5.3e-07
SI-Init	dP-Event	1.21833	1863.49	-73.5 *		5.3e-07
SI	Slug	1.25944	1936.97	1863.5		5.3e-07
DEF	Variable Pressure	2.20028	1932.57			5.3e-07

### Analysis Results

#### Analysis "SI"

Static Pressure: 1863.06 kPa

Shell Parameters:

Name	Transmissivity [m <sup>2</sup> /s]	Storativity [-]	Radius [m]	Flow Dimension [-]
Shell 1	5.1e-08	8.7e-05	--	2.0

Sequence Parameters:

Name	Wellbore Storage [m <sup>3</sup> /Pa]	Skin [-]
INF	5.3e-07	0.0
PSR	5.3e-07	0.0
SI-Init	5.3e-07	0.0
SI	5.3e-07	0.0
DEF	5.3e-07	0.0

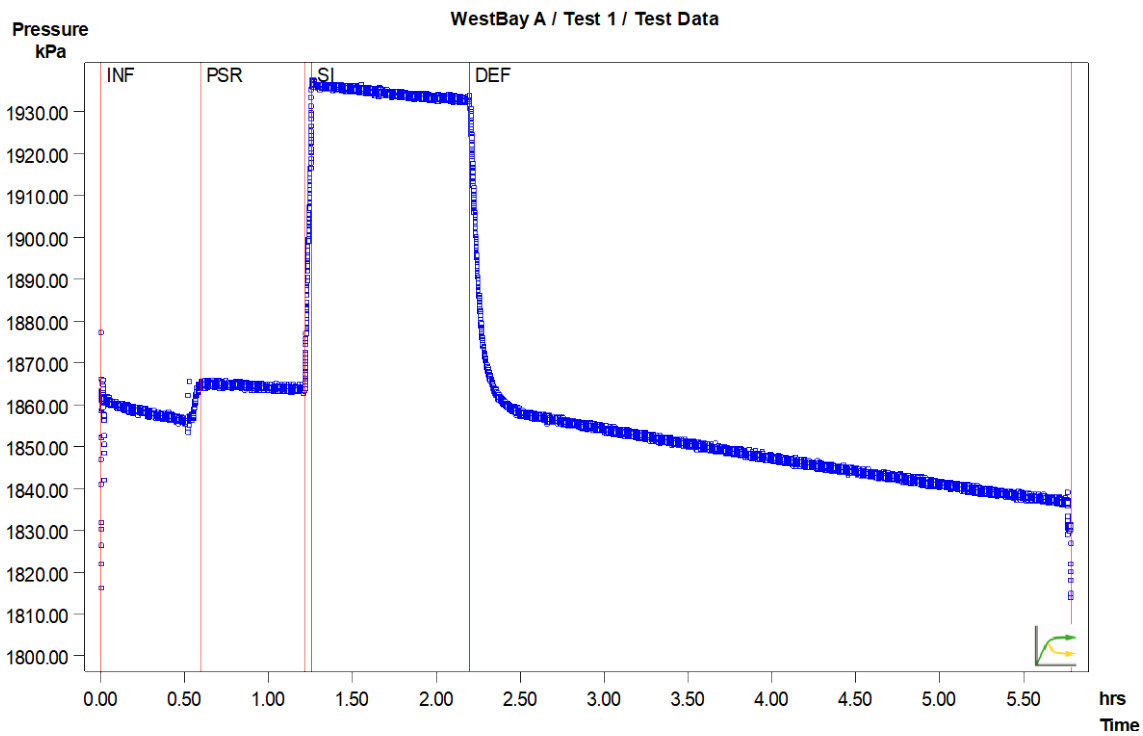


Figure 1: Pressure Response and Sequence Definition

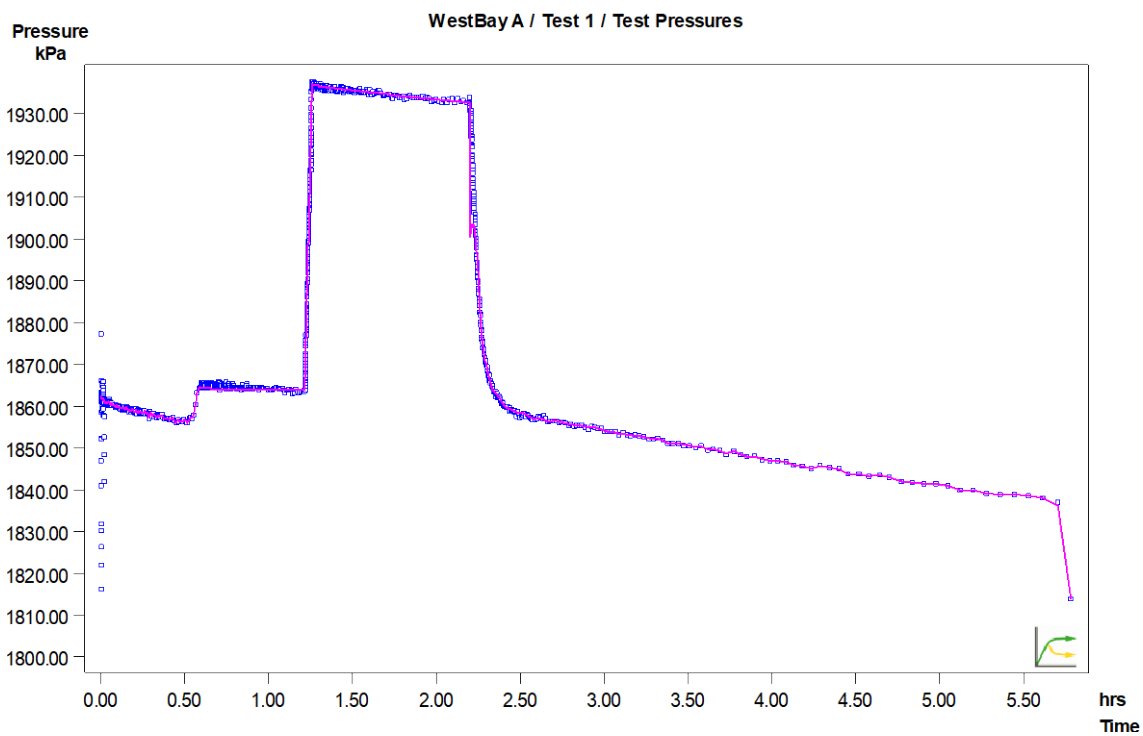


Figure 2: Pressure Response (Blue) and Simulation (Pink) Cartesian Plot

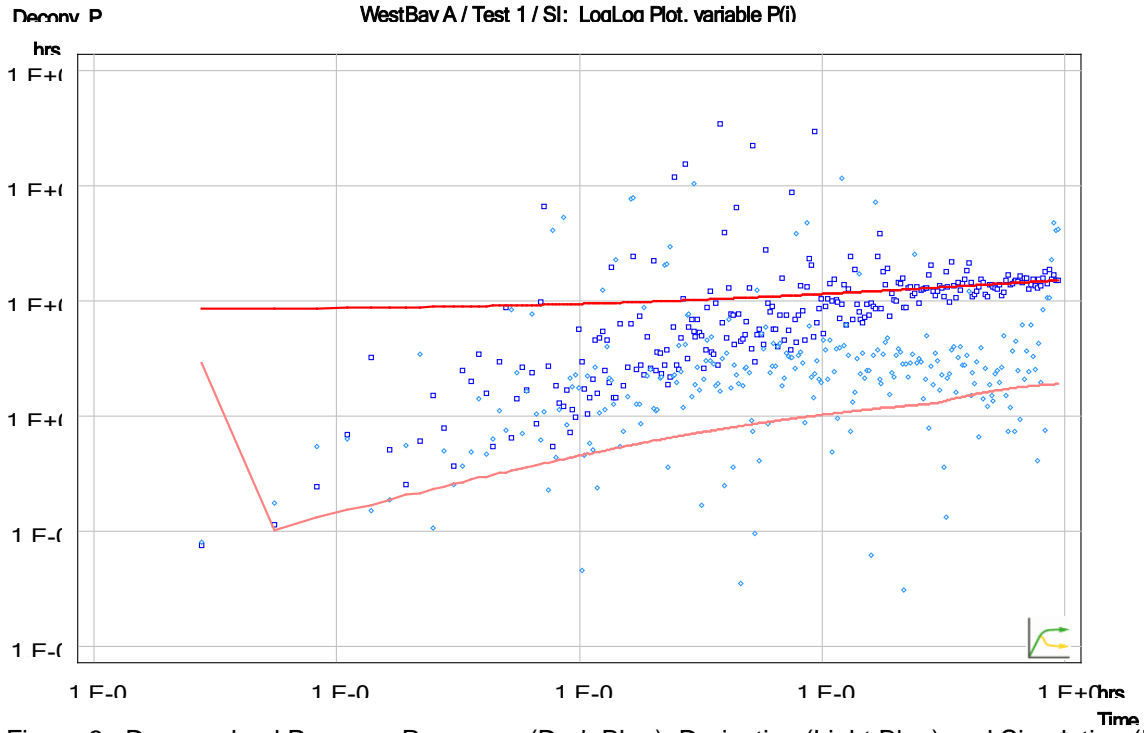


Figure 3: Deconvolved Pressure Response (Dark Blue), Derivative (Light Blue) and Simulation (Red): Log-Log Diagnostic Plot, SI Sequence



## HYDROBENCH REPORT

Project                    Agnico Eagle Mines Limited  
Site                        Expansion Project  
Source Well               M20-3071  
Test Name                Test 2  
Test Date/Time         18.08.20, 03:12  
Interval                 top: 222.12 m    bottom: 264.00 m

### Basic Data

Test Interval	41.88 m		
Porosity	0.10		
Well Radius	0.048 m	Tubing Radius	0.039 m
Inclination	22.0 deg		
Test Volume	303.137 l		
Well Type	Source		

### Fluid Properties

Viscosity	0.001 Pa*s
Density	1000.0 kg/m <sup>3</sup>
Compressibility	2.0e-09 1/Pa

### Sequence Definition

Name	Category	t(o) [hrs]	P(o) [kPa]	P(i) [kPa]	Rate [l/min]	C [m <sup>3</sup> /Pa]
INF	Variable Pressure	0.00000	2252.43			5.3e-07
PSR	Recovery	0.53861	2332.47			5.3e-07
SI-Init	dP-Event	3.02167	2331.76	-96.0 *		5.3e-07
SI	Slug	3.04694	2427.75	2331.8		5.3e-07
DEF	Variable Pressure	4.17611	2427.49			5.3e-07

### Analysis Results

#### Analysis "SI"

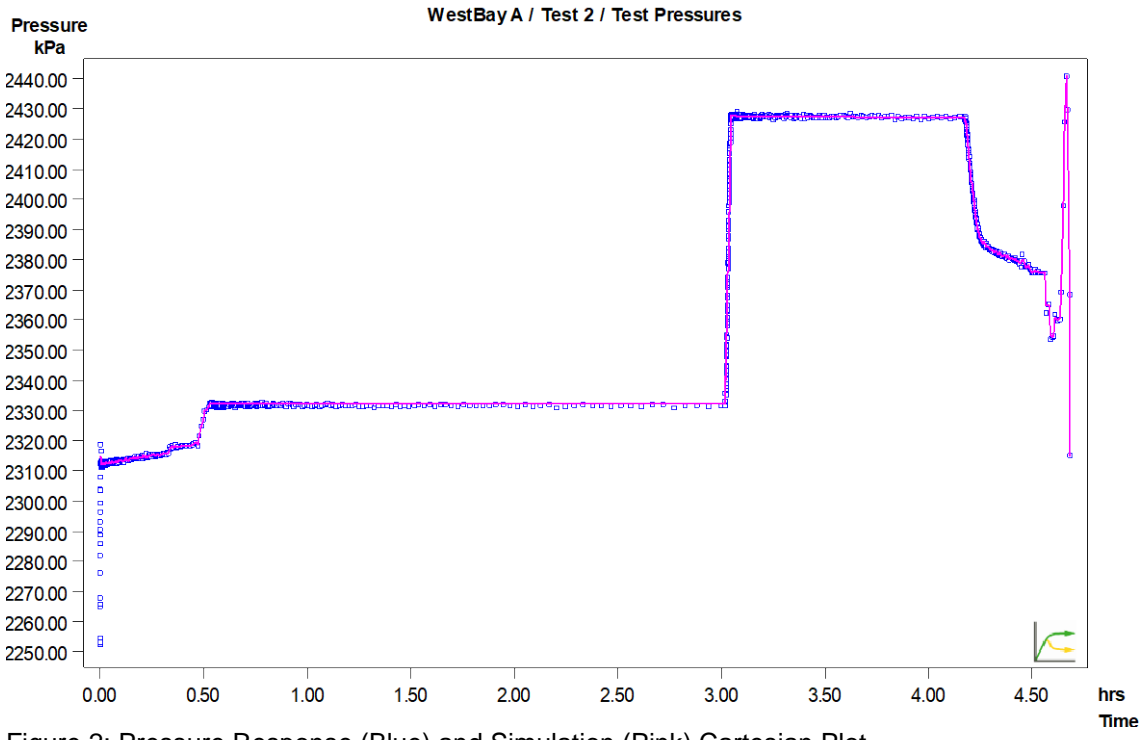
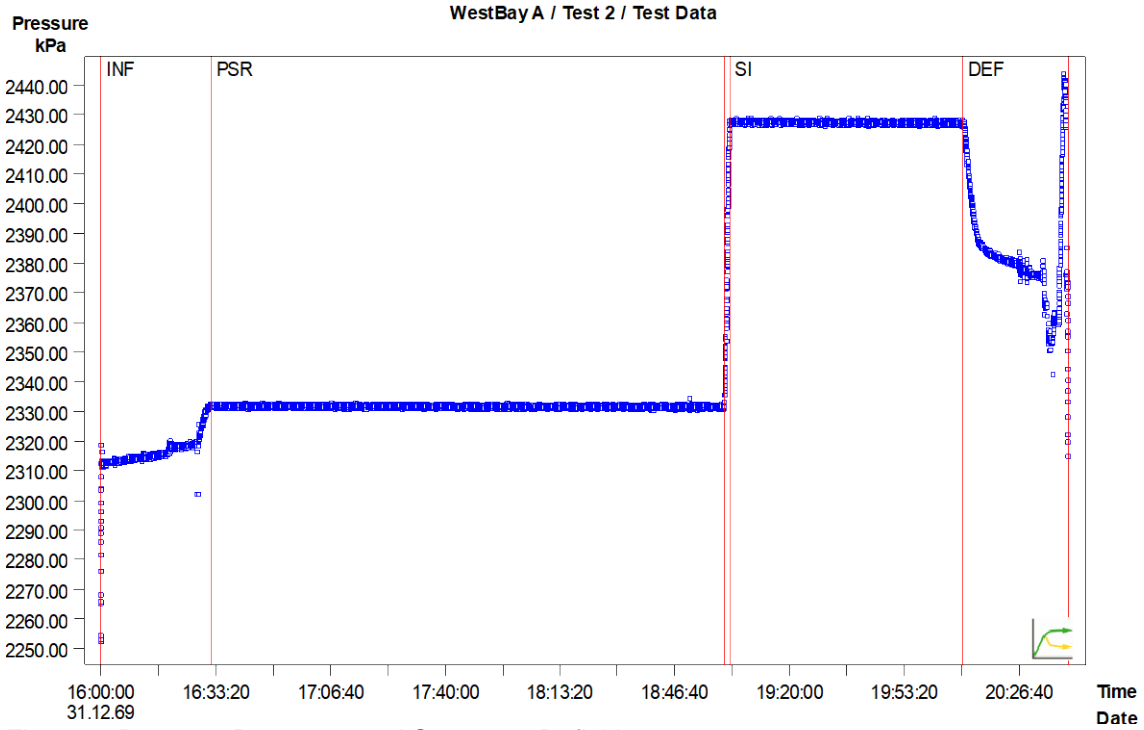
Static Pressure: 2331.09 kPa

Shell Parameters:

Name	Transmissivity [m <sup>2</sup> /s]	Storativity [-]	Radius [m]	Flow Dimension [-]
Shell 1	3.0e-09	8.2e-05	--	2.0

Sequence Parameters:

Name	Wellbore Storage [m <sup>3</sup> /Pa]	Skin [-]
INF	5.3e-07	0.0
PSR	5.3e-07	0.0
SI-Init	5.3e-07	0.0
SI	5.3e-07	0.0
DEF	5.3e-07	0.0



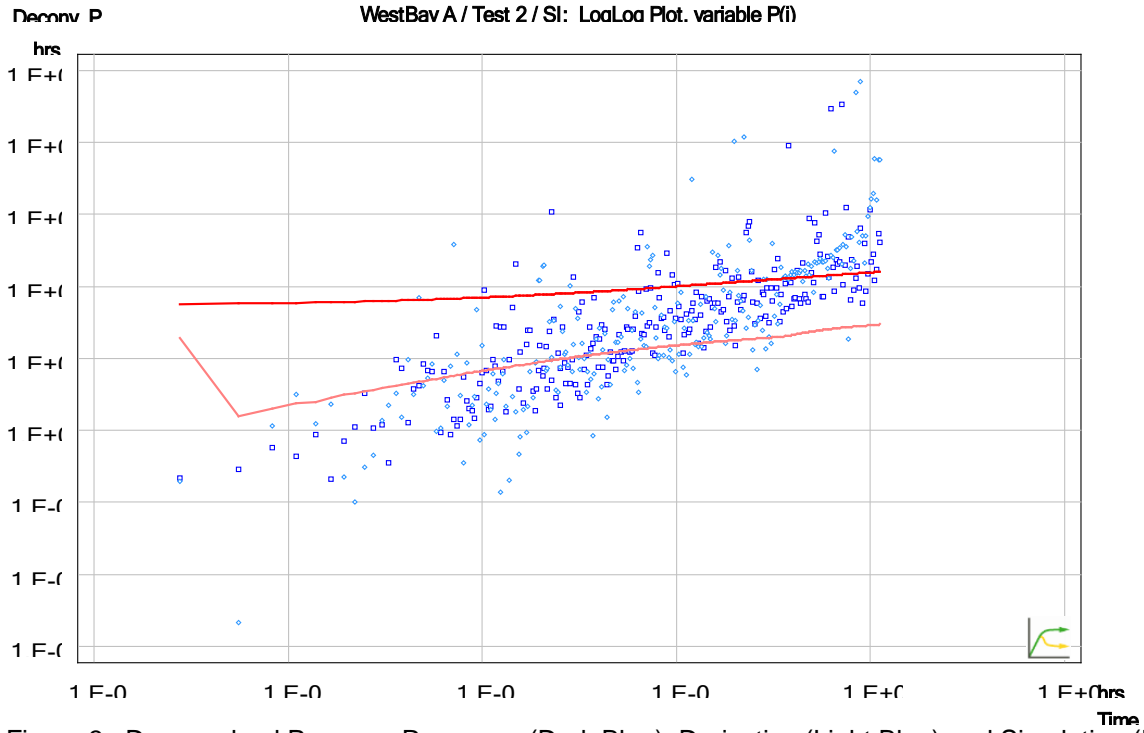


Figure 3: Deconvolved Pressure Response (Dark Blue), Derivative (Light Blue) and Simulation (Red): Log-Log Diagnostic Plot, SI Sequence

## HYDROBENCH REPORT

Project                    Agnico Eagle Mines Limited  
Site                        Expansion Project  
Source Well                M20-3071  
Test Name                 Test 3  
Test Date/Time            20.08.20, 05:17:34  
Interval                    top: 261.00 m    bottom: 303.00 m

### Basic Data

Test Interval	42.00 m		
Porosity	0.10		
Well Radius	0.048 m	Tubing Radius	0.039 m
Inclination	22.0 deg		
Test Volume	304.006 l		
Well Type	Source		

### Fluid Properties

Viscosity	0.001 Pa*s
Density	1000.0 kg/m <sup>3</sup>
Compressibility	2.0e-09 1/Pa

### Sequence Definition

Name	Category	t(o) [hrs]	P(o) [kPa]	P(i) [kPa]	Rate [l/min]	C [m <sup>3</sup> /Pa]
INF	Variable Pressure	0.00000	2632.42			5.3e-07
PSR	Recovery	2.67861	2763.49			5.3e-07
SI-Init	dP-Event	3.80194	2734.37	-88.3 *		5.3e-07
SI	Slug	3.82750	2822.65	2734.4		5.3e-07
DEF	Variable Pressure	4.93833	2788.29			5.3e-07

### Analysis Results

#### Analysis "SI"

Static Pressure: 2690.75 kPa

#### Shell Parameters:

Name	Transmissivity [m <sup>2</sup> /s]	Storativity [-]	Radius [m]	Flow Dimension [-]
Shell 1	2.6e-07	8.2e-05	--	2.0

#### Sequence Parameters:

Name	Wellbore Storage [m <sup>3</sup> /Pa]	Skin [-]
INF	5.3e-07	0.0
PSR	5.3e-07	0.0
SI-Init	5.3e-07	0.0
SI	5.3e-07	0.0
DEF	5.3e-07	0.0

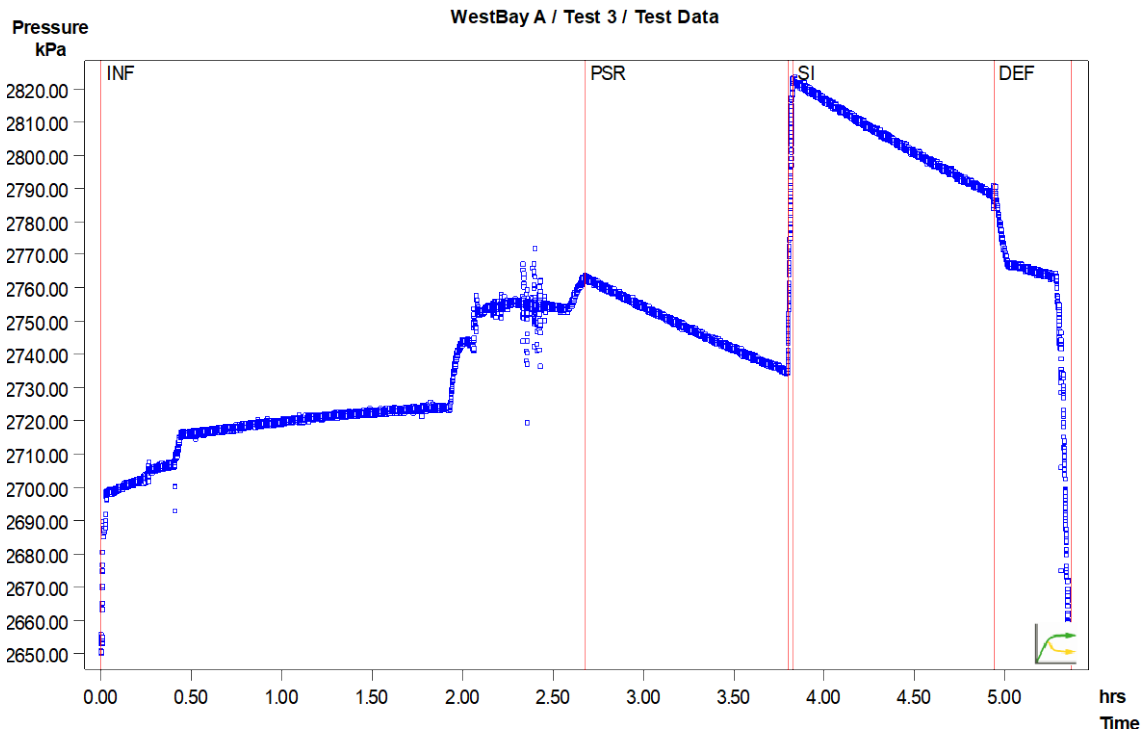


Figure 1: Pressure Response and Sequence Definition

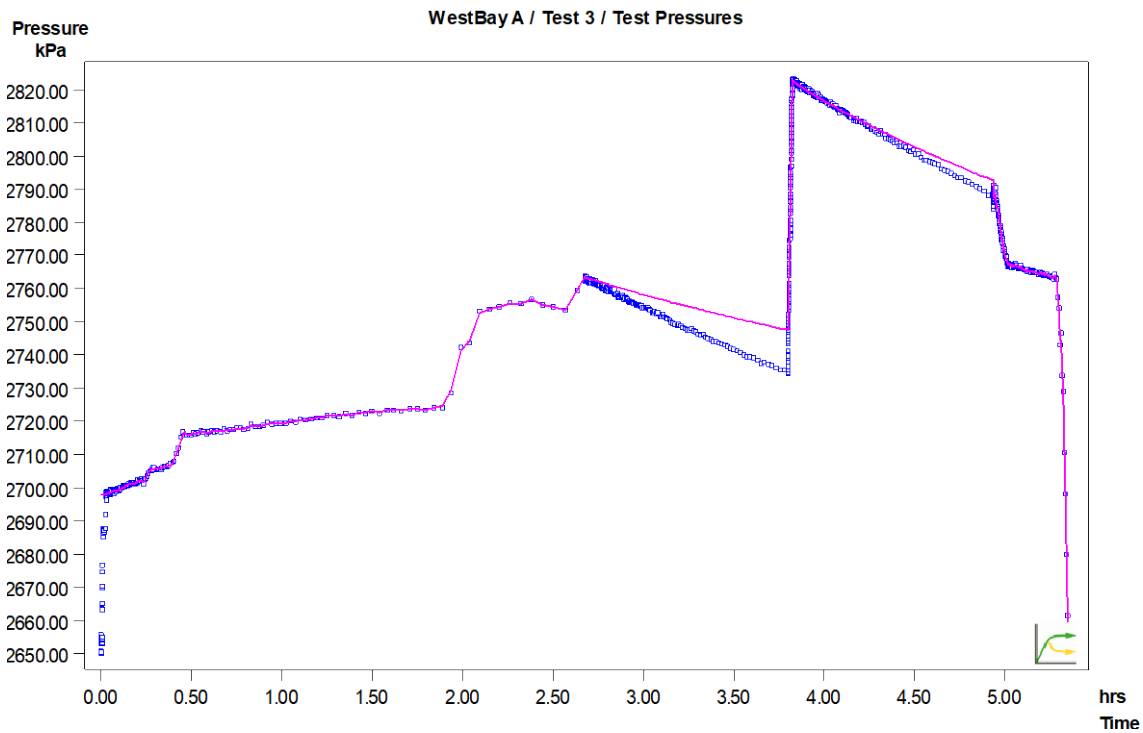


Figure 2: Pressure Response (Blue) and Simulation (Pink) Cartesian Plot

Deconv P

WestBav A / Test 3 / SI: LogLoa Plot. variable P(i)

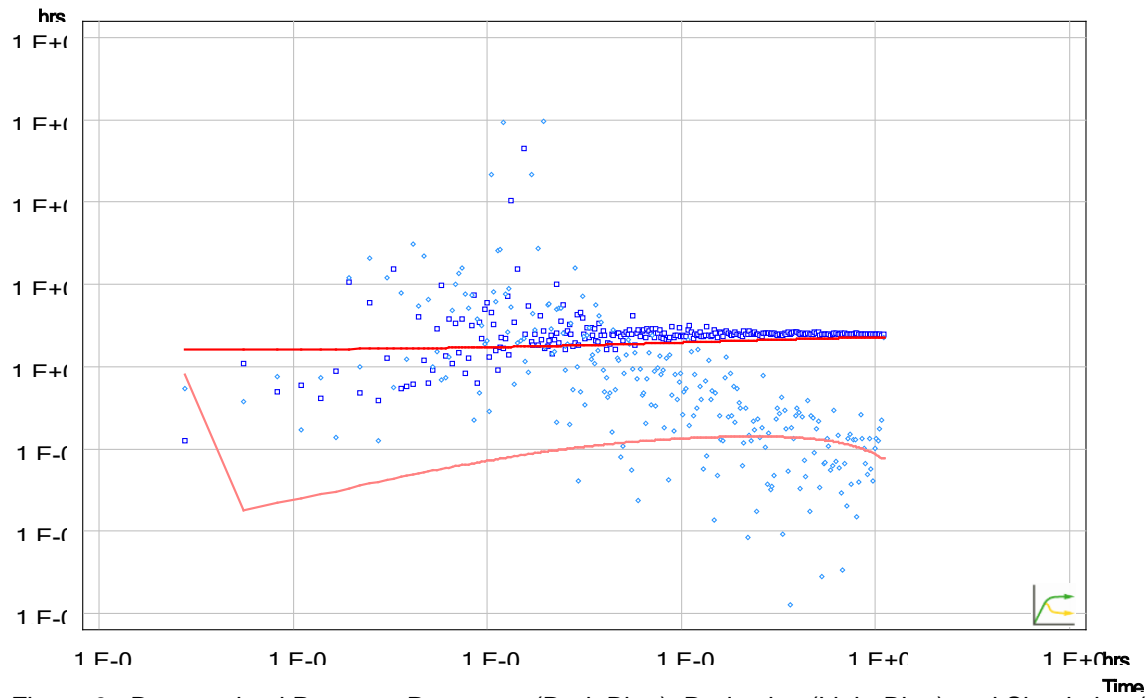


Figure 3: Deconvolved Pressure Response (Dark Blue), Derivative (Light Blue) and Simulation (Red): Log-Log Diagnostic Plot, SI Sequence

## HYDROBENCH REPORT

Project                    Agnico Eagle Mines Limited  
Site                        Expansion Project  
Source Well              M20-3071  
Test Name                Test 4  
Test Date/Time         21.08.20, 09:19:15  
Interval                  top: 300.00 m    bottom: 345.00 m

### Basic Data

Test Interval	45.00 m		
Porosity	0.10		
Well Radius	0.048 m	Tubing Radius	0.039 m
Inclination	22.0 deg		
Test Volume	325.720 l		
Well Type	Source		

### Fluid Properties

Viscosity	0.001 Pa*s
Density	1000.0 kg/m <sup>3</sup>
Compressibility	2.0e-09 1/Pa

### Sequence Definition

Name	Category	t(o) [hrs]	P(o) [kPa]	P(i) [kPa]	Rate [l/min]	C [m <sup>3</sup> /Pa]
INF	Variable Pressure	0.00000	3064.43			5.3e-07
PSr	Recovery	0.35000	3147.98			5.3e-07
COM	Variable Pressure	0.57778	3145.98			5.3e-07
SW-Init	dP-Event	1.78056	3148.91	31.4 *		5.3e-07
SW	Slug	1.82222	3117.55	3148.9		5.3e-07
RI1	Variable Pressure	2.76806	3128.88			5.3e-07
RI2	Constant Rate	2.90139	3184.18		-2.20e+00	5.3e-07
RIR	Recovery	3.25972	3212.56			5.3e-07
DEF	Variable Pressure	3.91944	3170.28			5.3e-07

## Analysis Results

### Analysis "RI(final)"

Static Pressure: 3155.56 kPa

Shell Parameters:

Name	Transmissivity [m <sup>2</sup> /s]	Storativity [-]	Radius [m]	Flow Dimension [-]
Shell 1	2.2e-06	8.8e-05	--	2.0

Sequence Parameters:

Name	Wellbore Storage [m <sup>3</sup> /Pa]	Skin [-]
INF	5.3e-07	-2.2
PSr	5.3e-07	-2.2
COM	5.3e-07	-2.2
SW-Init	5.3e-07	-2.2
SW	5.3e-07	-2.2
RI1	5.3e-07	-2.2
RI2	5.3e-07	-2.2
RIR	5.3e-07	-2.2
DEF	5.3e-07	-2.2

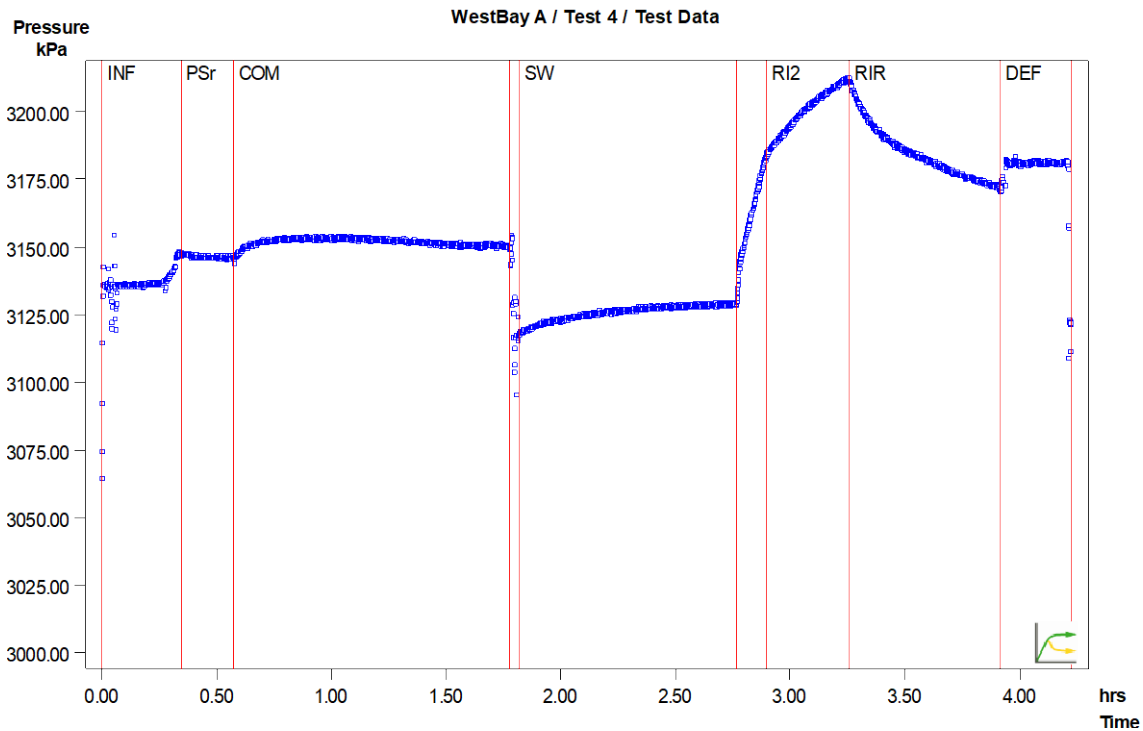


Figure 1: Pressure Response and Sequence Definition



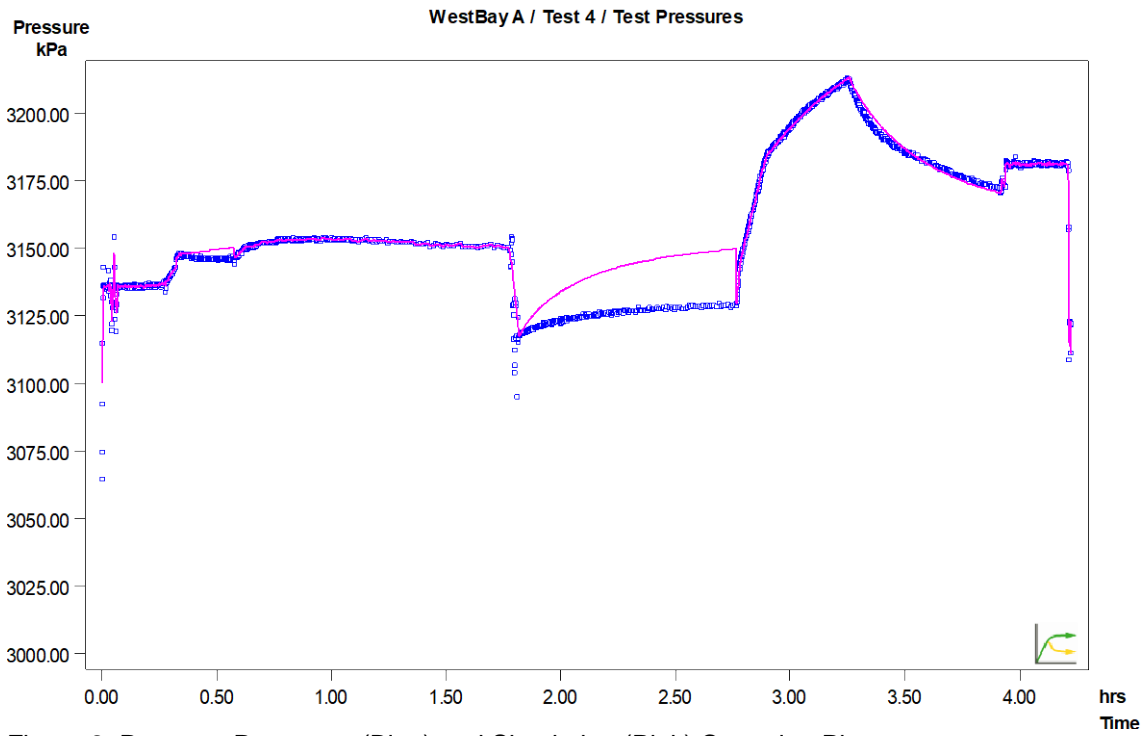


Figure 2: Pressure Response (Blue) and Simulation (Pink) Cartesian Plot

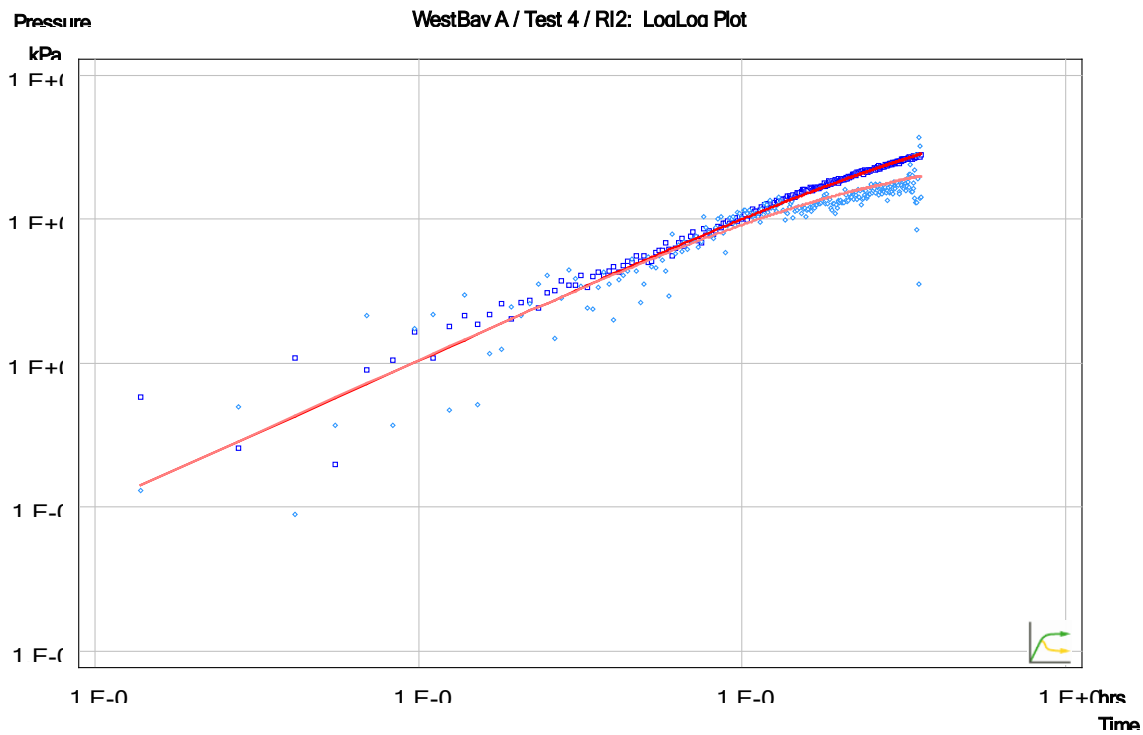


Figure 3: Deconvolved Pressure Response (Dark Blue), Derivative (Light Blue) and Simulation (Red): Log-Log Diagnostic Plot, RI2 Sequence

## HYDROBENCH REPORT

Project Agnico Eagle Mines Limited  
Site Meliadine Expansion  
Source Well M20-3071  
Test Name Test 5  
Test Date/Time 22.08.20, 07:45  
Interval top: 345.40 m bottom: 384.00 m

### Basic Data

Test Interval	38.60 m		
Porosity	0.10		
Well Radius	0.048 m	Tubing Radius	0.039 m
Inclination	22.0 deg		
Test Volume	279.396 l		
Well Type	Source		

### Fluid Properties

Viscosity	0.001 Pa*s
Density	1000.0 kg/m <sup>3</sup>
Compressibility	2.0e-09 1/Pa

### Sequence Definition

Name	Category	t(o) [hrs]	P(o) [kPa]	P(i) [kPa]	Rate [l/min]	C [m <sup>3</sup> /Pa]
INF	Variable Pressure	0.00000	3255.49			5.3e-07
PSR	Recovery	0.41639	3352.28			5.3e-07
SI1-Init	dP-Event	1.36722	3354.05	-112.1 *		5.3e-07
SI1	Slug	1.40306	3466.15	3354.1		5.3e-07
SI2-Init	dP-Event	2.47306	3466.76	-25.8 *		5.3e-07
SI2	Slug	2.48194	3492.60	3466.8		5.3e-07
DEF	Variable Pressure	2.53111	3492.68			5.3e-07

### Analysis Results

#### Analysis "SI1(Final)"

Static Pressure: 3353.40 kPa

Shell Parameters:

Name	Transmissivity [m <sup>2</sup> /s]	Storativity [-]	Radius [m]	Flow Dimension [-]
Shell 1	2.0e-10	7.6e-05	--	2.0

Sequence Parameters:

Name	Wellbore Storage [m <sup>3</sup> /Pa]	Skin [-]
INF	5.3e-07	0.0
PSR	5.3e-07	0.0
SI1-Init	5.3e-07	0.0
SI1	5.3e-07	0.0
SI2-Init	5.3e-07	0.0
SI2	5.3e-07	0.0
DEF	5.3e-07	0.0

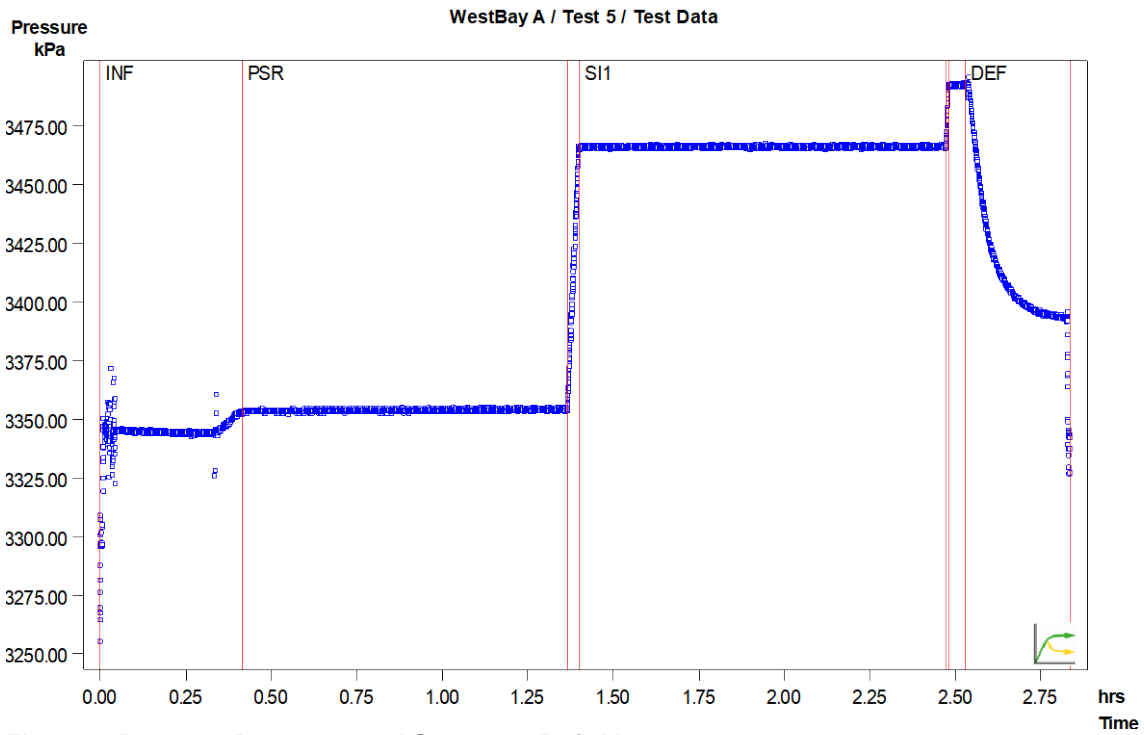


Figure 1: Pressure Response and Sequence Definition

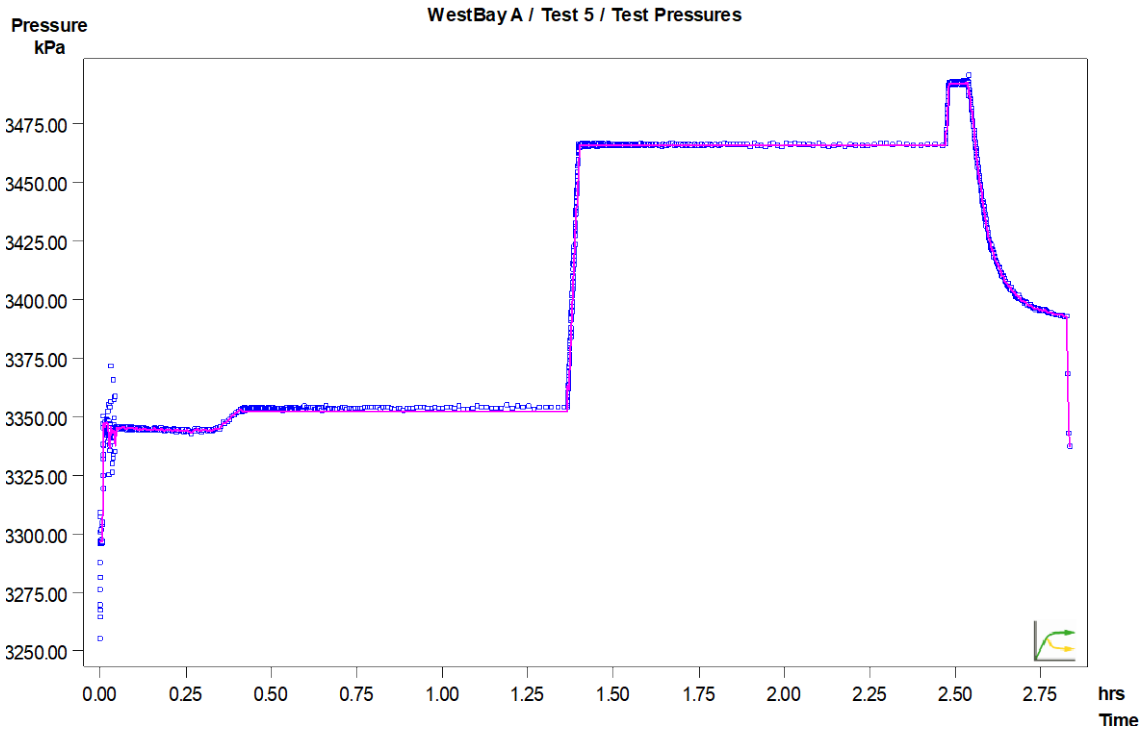


Figure 2: Pressure Response (Blue) and Simulation (Pink) Cartesian Plot

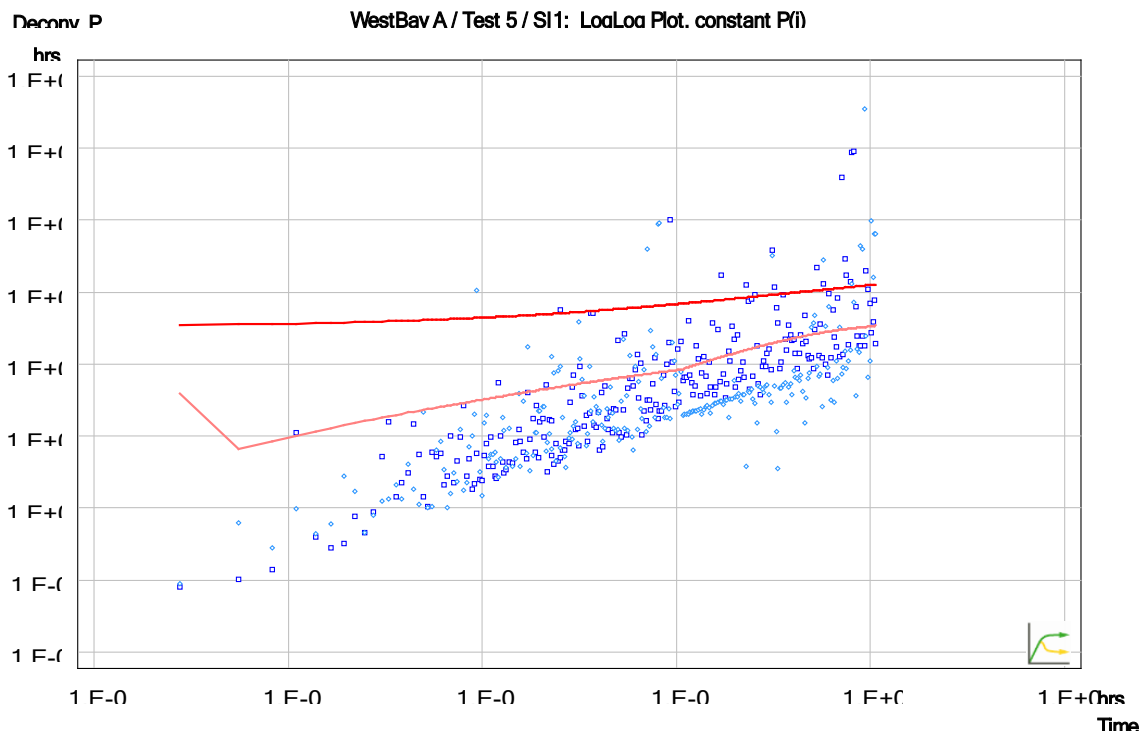


Figure 3: Deconvolved Pressure Response (Dark Blue), Derivative (Light Blue) and Simulation (Red): Log-Log Diagnostic Plot, SI Sequence

## HYDROBENCH REPORT

Project                    Agnico Eagle Mines Limited  
Site                        Expansion Project  
Source Well                M20-3071  
Test Name                 Test 6  
Test Date/Time            24.08.20, 14:00  
Interval                    top: 432.20 m    bottom: 480.00 m

### Basic Data

Test Interval	47.80 m		
Porosity	0.10		
Well Radius	0.048 m	Tubing Radius	0.039 m
Inclination	22.0 deg		
Test Volume	345.987 l		
Well Type	Source		

### Fluid Properties

Viscosity	0.001 Pa*s
Density	1000.0 kg/m <sup>3</sup>
Compressibility	2.0e-09 1/Pa

### Sequence Definition

Name	Category	t(o) [hrs]	P(o) [kPa]	P(i) [kPa]	Rate [l/min]	C [m <sup>3</sup> /Pa]
INF	Variable Pressure	0.00000	4289.92			5.3e-07
PSR	Recovery	0.47472	4369.51			5.3e-07
SI-Init	dP-Event	1.07611	4369.86	-102.9 *		5.3e-07
SI	Slug	1.12389	4472.80	4369.9		5.3e-07
DEF	Variable Pressure	2.19306	4472.02			5.3e-07

### Analysis Results

#### Analysis "SI"

Static Pressure: 4369.78 kPa

Shell Parameters:

Name	Transmissivity [m <sup>2</sup> /s]	Storativity [-]	Radius [m]	Flow Dimension [-]
Shell 1	6.0e-10	9.4e-05	--	2.0

Sequence Parameters:

Name	Wellbore Storage [m <sup>3</sup> /Pa]	Skin [-]
INF	5.3e-07	0.0
PSR	5.3e-07	0.0
SI-Init	5.3e-07	0.0
SI	5.3e-07	0.0
DEF	5.3e-07	0.0

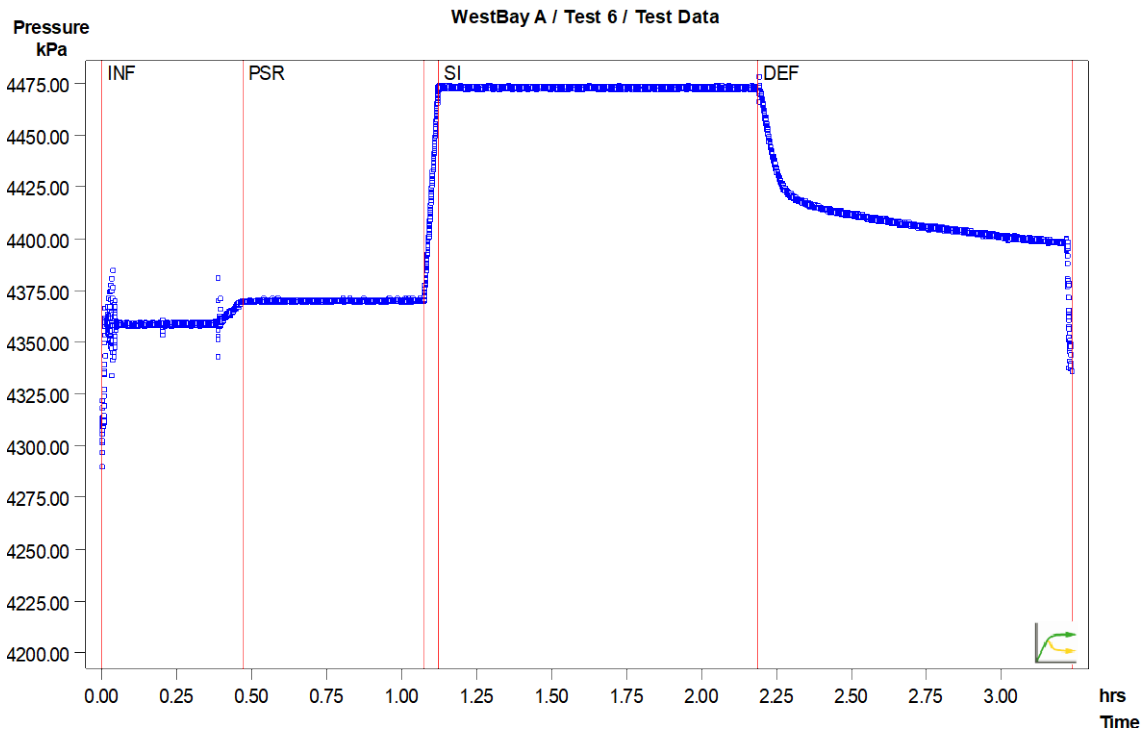


Figure 1: Pressure Response and Sequence Definition

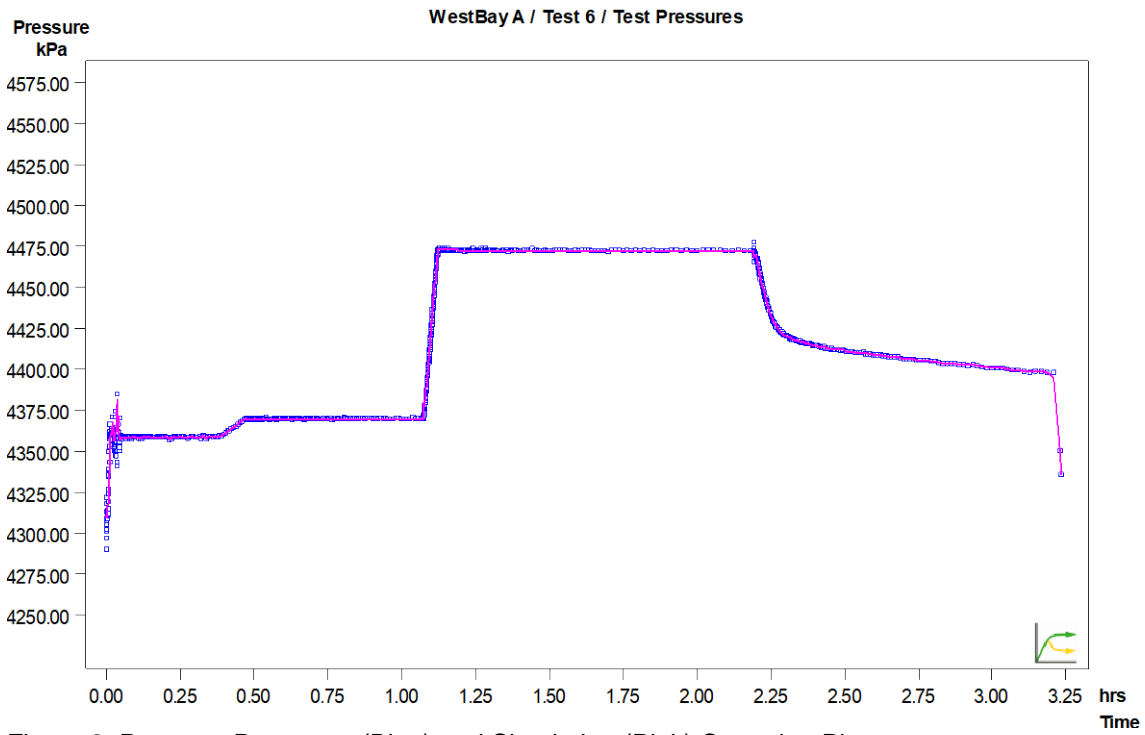


Figure 2: Pressure Response (Blue) and Simulation (Pink) Cartesian Plot

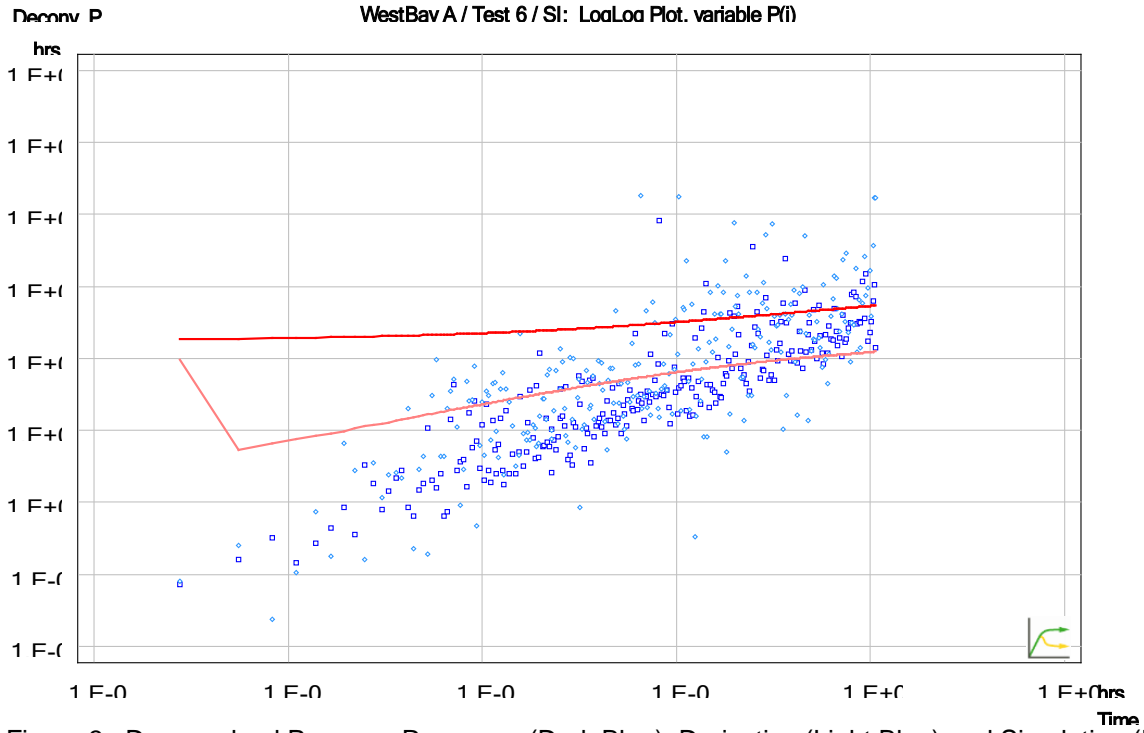


Figure 3: Deconvolved Pressure Response (Dark Blue), Derivative (Light Blue) and Simulation (Red): Log-Log Diagnostic Plot, SI Sequence

## HYDROBENCH REPORT

Project                    Agnico Eagle Mines Limited  
Site                        Meliadine Expansion  
Source Well               M20-3071  
Test Name                Test 7  
Test Date/Time         24.08.20, 20:00  
Interval                 top: 380.99 m    bottom: 480.00 m

### Basic Data

Test Interval	99.01 m		
Porosity	0.10		
Well Radius	0.048 m	Tubing Radius	0.039 m
Inclination	22.0 deg		
Test Volume	716.657 l		
Well Type	Source		

### Fluid Properties

Viscosity	0.001 Pa*s
Density	1000.0 kg/m <sup>3</sup>
Compressibility	2.0e-09 1/Pa

### Sequence Definition

Name	Category	t(o) [hrs]	P(o) [kPa]	P(i) [kPa]	Rate [l/min]	C [m <sup>3</sup> /Pa]
INF	Variable Pressure	0.00000	3311.61			5.3e-07
PSR	Recovery	1.66639	3368.08			5.3e-07
SI-Init	dP-Event	2.35972	3367.46	-56.2 *		5.3e-07
SI	Slug	2.37972	3423.69	3367.5		5.3e-07
DEF	Variable Pressure	3.44750	3423.69			5.3e-07

### Analysis Results

#### Analysis "SI"

Static Pressure: 3367.40 kPa

Shell Parameters:

Name	Transmissivity [m <sup>2</sup> /s]	Storativity [-]	Radius [m]	Flow Dimension [-]
Shell 1	1.1e-09	1.9e-04	--	2.0



Sequence Parameters:

Name	Wellbore Storage [m <sup>3</sup> /Pa]	Skin [-]
INF	5.3e-07	0.0
PSR	5.3e-07	0.0
SI-Init	5.3e-07	0.0
SI	5.3e-07	0.0
DEF	5.3e-07	0.0

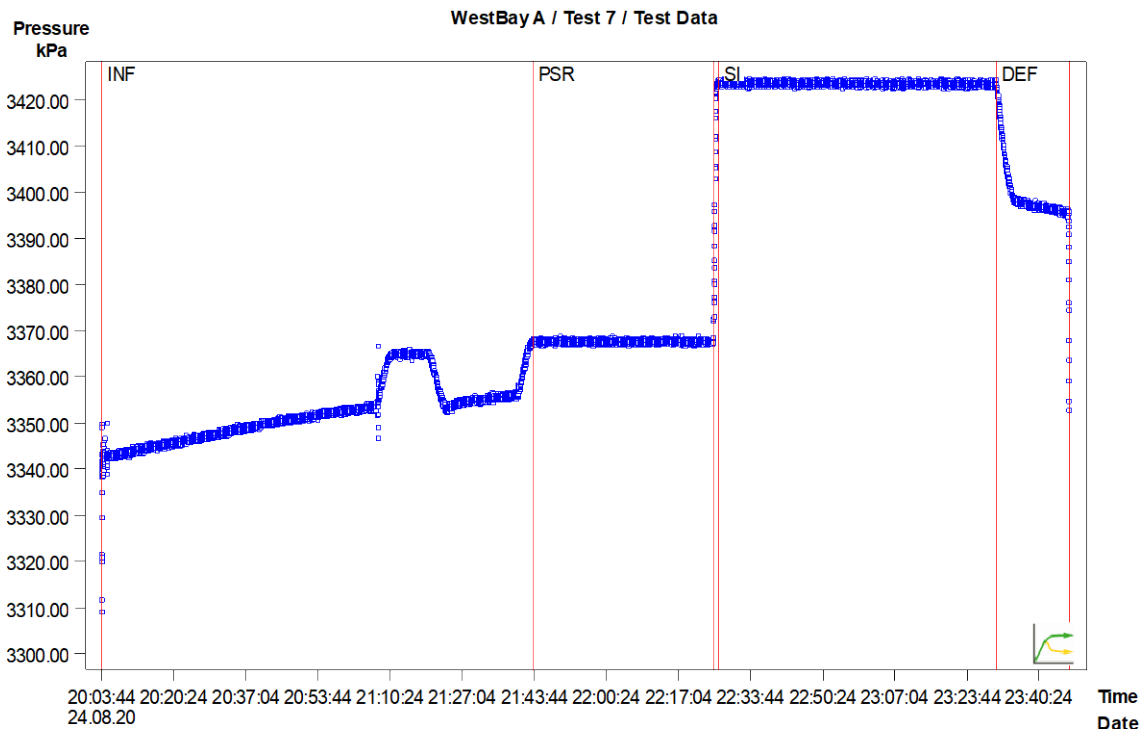


Figure 1: Pressure Response and Sequence Definition

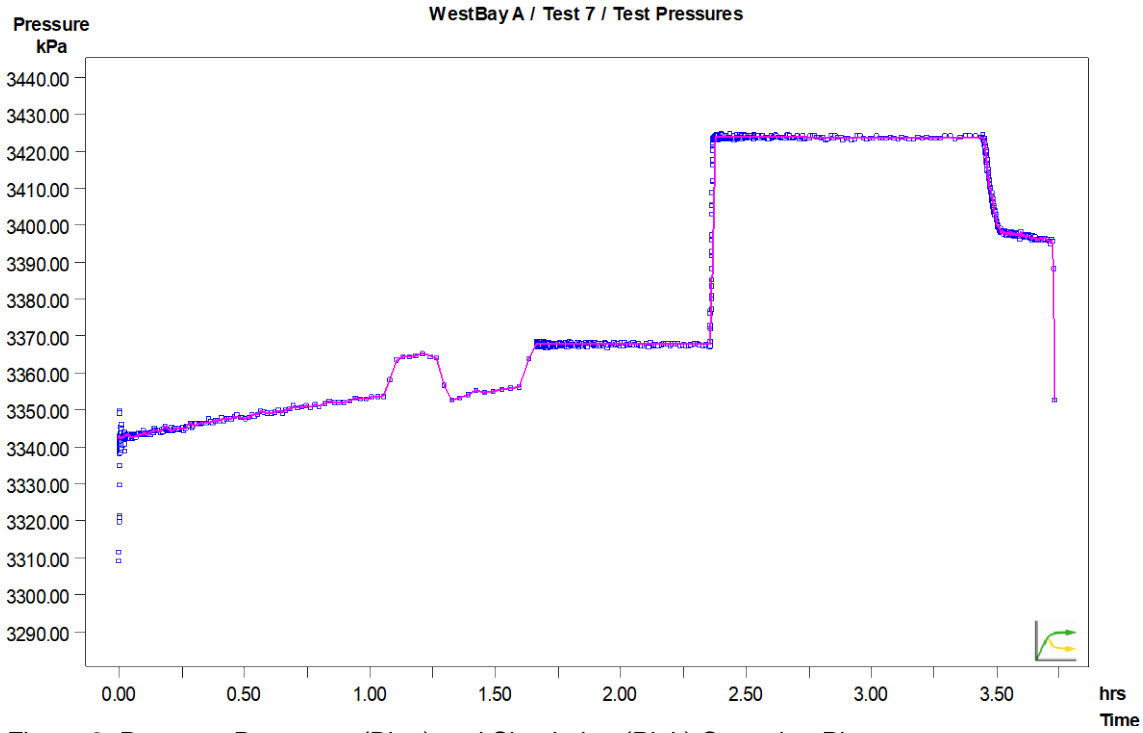


Figure 2: Pressure Response (Blue) and Simulation (Pink) Cartesian Plot

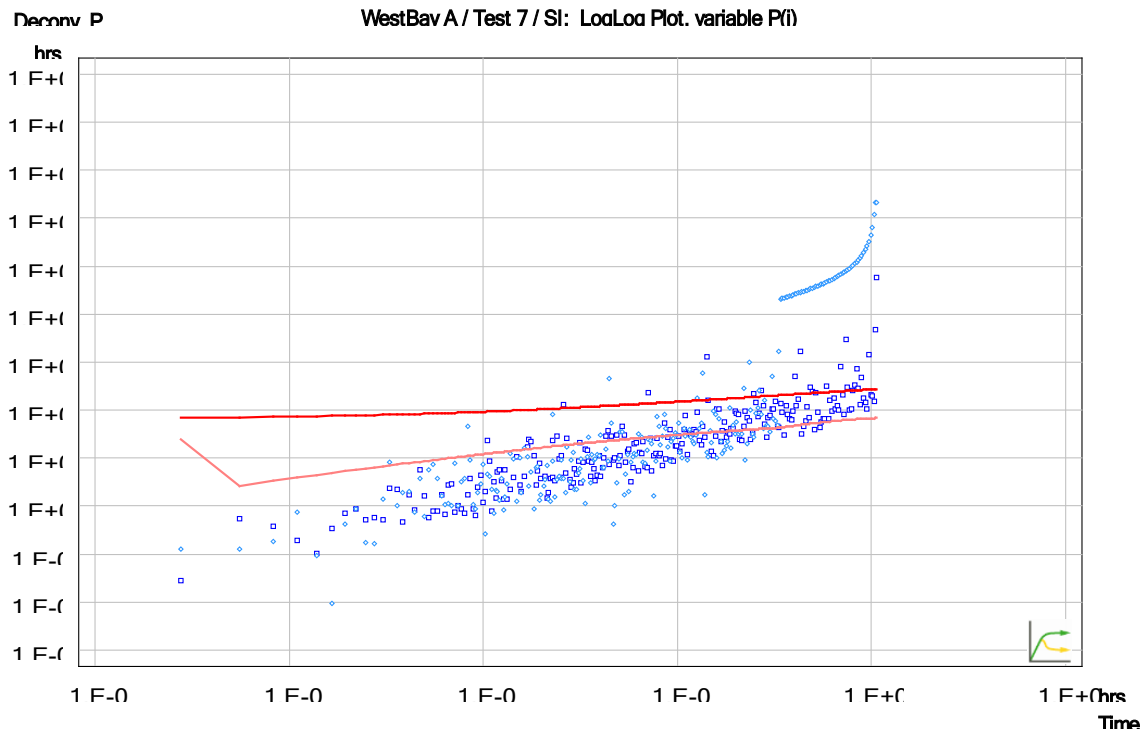


Figure 3: Deconvolved Pressure Response (Dark Blue), Derivative (Light Blue) and Simulation (Red): Log-Log Diagnostic Plot, SI Sequence

## HYDROBENCH REPORT

Project Agnico Eagle Mines Limited  
Site Meliadien Expansion  
Source Well M20-3071  
Test Name Test 8  
Test Date/Time 28.08.20, 03:27:46  
Interval top: 476.99 m bottom: 606.00 m

### Basic Data

Test Interval	129.01 m		
Porosity	0.10		
Well Radius	0.048 m	Tubing Radius	0.039 m
Inclination	22.0 deg		
Test Volume	933.804 l		
Well Type	Source		

### Fluid Properties

Viscosity	0.001 Pa*s
Density	1000.0 kg/m <sup>3</sup>
Compressibility	2.0e-09 1/Pa

### Sequence Definition

Name	Category	t(o) [hrs]	P(o) [kPa]	P(i) [kPa]	Rate [l/min]	C [m <sup>3</sup> /Pa]
INF	Variable Pressure	0.00000	4622.11			5.3e-07
PSR	Recovery	0.42861	4761.29			5.3e-07
SI-Init	dP-Event	2.20750	4758.97	-119.0 *		5.3e-07
SI	Slug	2.24056	4877.97	4759.0		5.3e-07
DEF	Variable Pressure	3.88556	4875.56			5.3e-07

### Analysis Results

#### Analysis "SI(Final)"

Static Pressure: 4758.28 kPa

Shell Parameters:

Name	Transmissivity [m <sup>2</sup> /s]	Storativity [-]	Radius [m]	Flow Dimension [-]
Shell 1	7.2e-09	2.5e-04	--	2.0

Sequence Parameters:

Name	Wellbore Storage [m <sup>3</sup> /Pa]	Skin [-]
INF	5.3e-07	0.0
PSR	5.3e-07	0.0
SI-Init	5.3e-07	0.0
SI	5.3e-07	0.0
DEF	5.3e-07	0.0

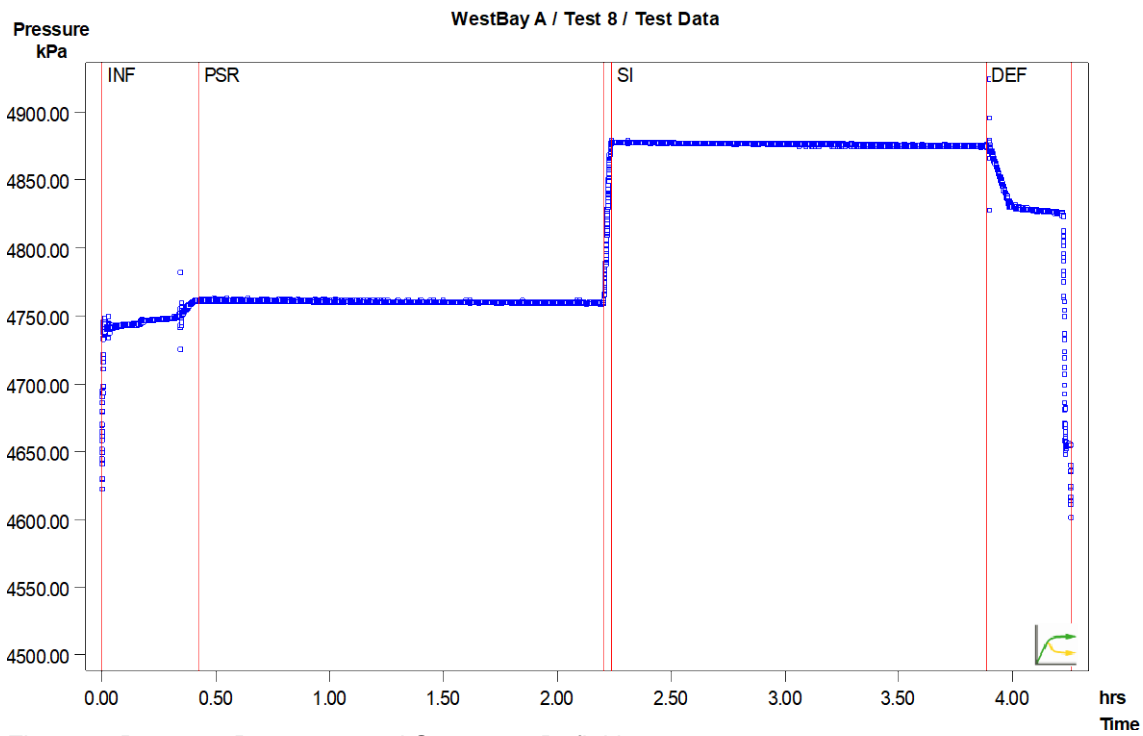


Figure 1: Pressure Response and Sequence Definition

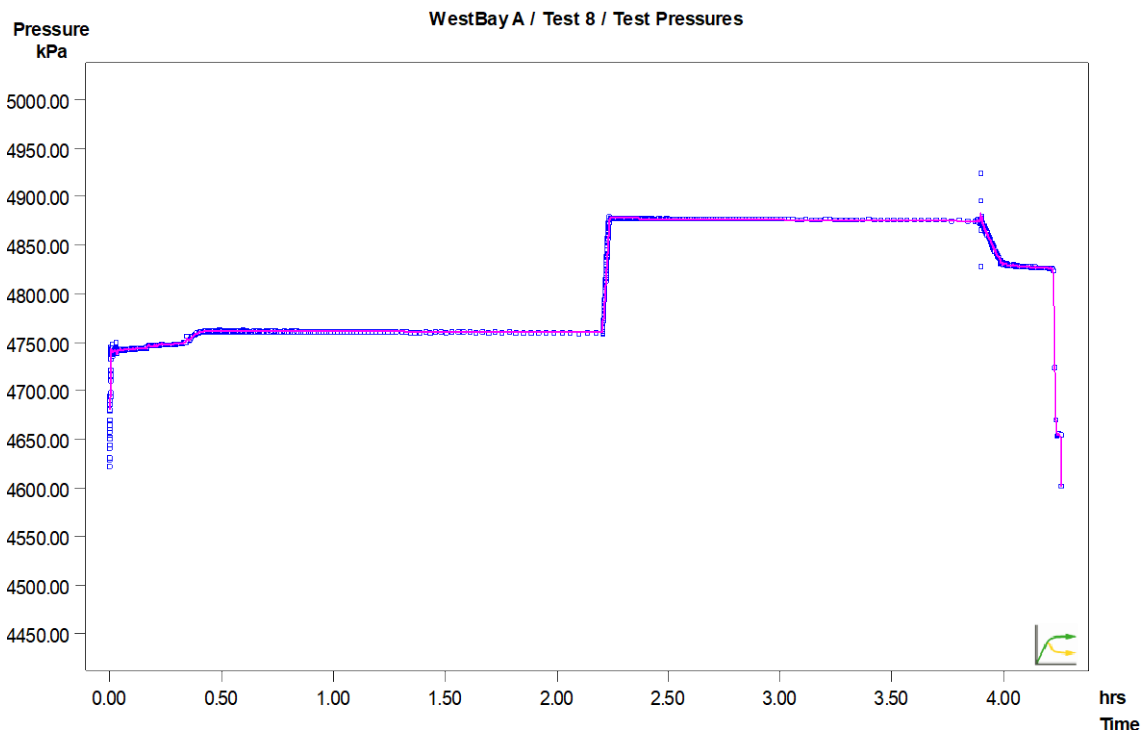


Figure 2: Pressure Response (Blue) and Simulation (Pink) Cartesian Plot

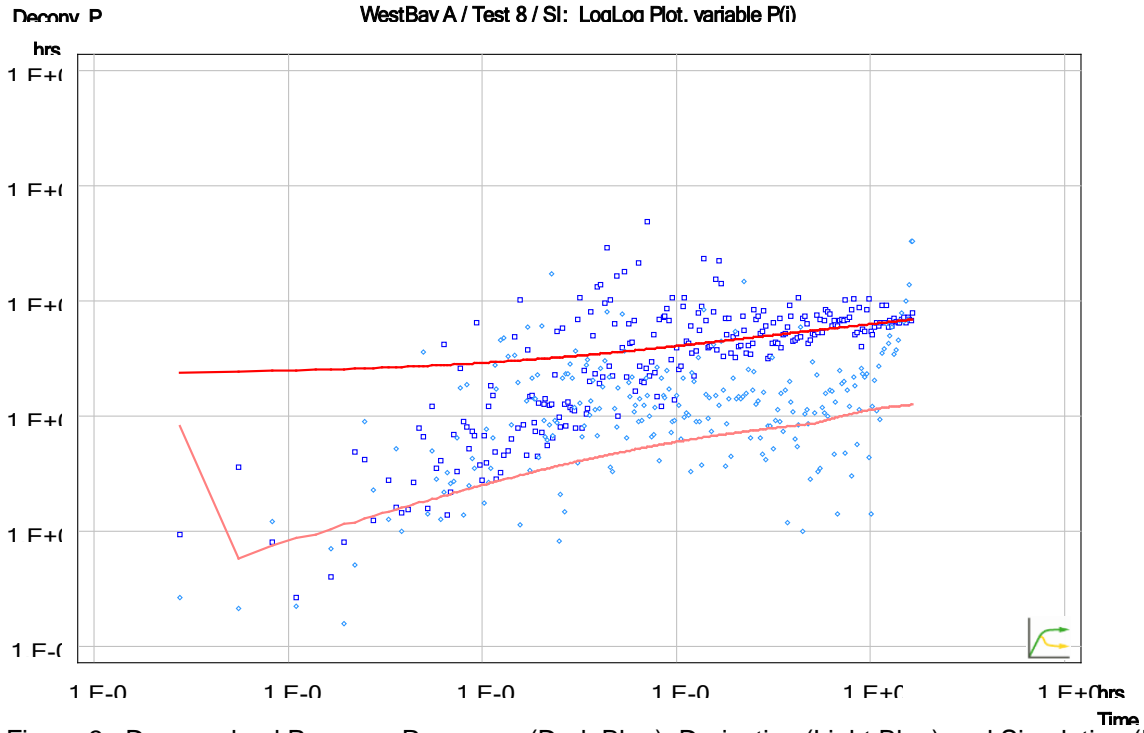


Figure 3: Deconvolved Pressure Response (Dark Blue), Derivative (Light Blue) and Simulation (Red): Log-Log Diagnostic Plot, SI Sequence

## HYDROBENCH REPORT

Project Agnico Eagle Mines Limited  
Site Meliadine Expansion  
Source Well M20-3071  
Test Name Port 11  
Test Date/Time 23.09.20, 01:16:00  
Interval top: 256.20 m bottom: 288.80 m

### Basic Data

Test Interval	32.60 m		
Porosity	0.10		
Well Radius	0.048 m	Tubing Radius	
Inclination	22.0 deg		
Test Volume	235.966 l		
Well Type	Source		

### Fluid Properties

Viscosity	0.001 Pa*s
Density	1000.0 kg/m <sup>3</sup>
Compressibility	2.0e-09 1/Pa

### Sequence Definition

Name	Category	t(o) [hrs]	P(o) [kPa]	P(i) [kPa]	Rate [l/min]	C [m <sup>3</sup> /Pa]
Com1	Variable Pressure	0.00000	2493.70			4.6e-10
PSR	Recovery	0.00417	2493.28			4.6e-10
SW-Init	dP-Event	0.07500	2493.70	20.4 *		4.6e-10
SW	Slug	0.10833	2473.29	2493.7		4.6e-10

### Analysis Results

#### Analysis "SW"

Static Pressure: 2493.36 kPa

Shell Parameters:

Name	Transmissivity [m <sup>2</sup> /s]	Storativity [-]	Radius [m]	Flow Dimension [-]
Shell 1	1.7e-08	6.3e-05	--	2.0

Sequence Parameters:

Name	Wellbore Storage [m <sup>3</sup> /Pa]	Skin [-]
Com1	4.6e-10	0.0
PSR	4.6e-10	0.0
SW-Init	4.6e-10	0.0
SW	4.6e-10	0.0

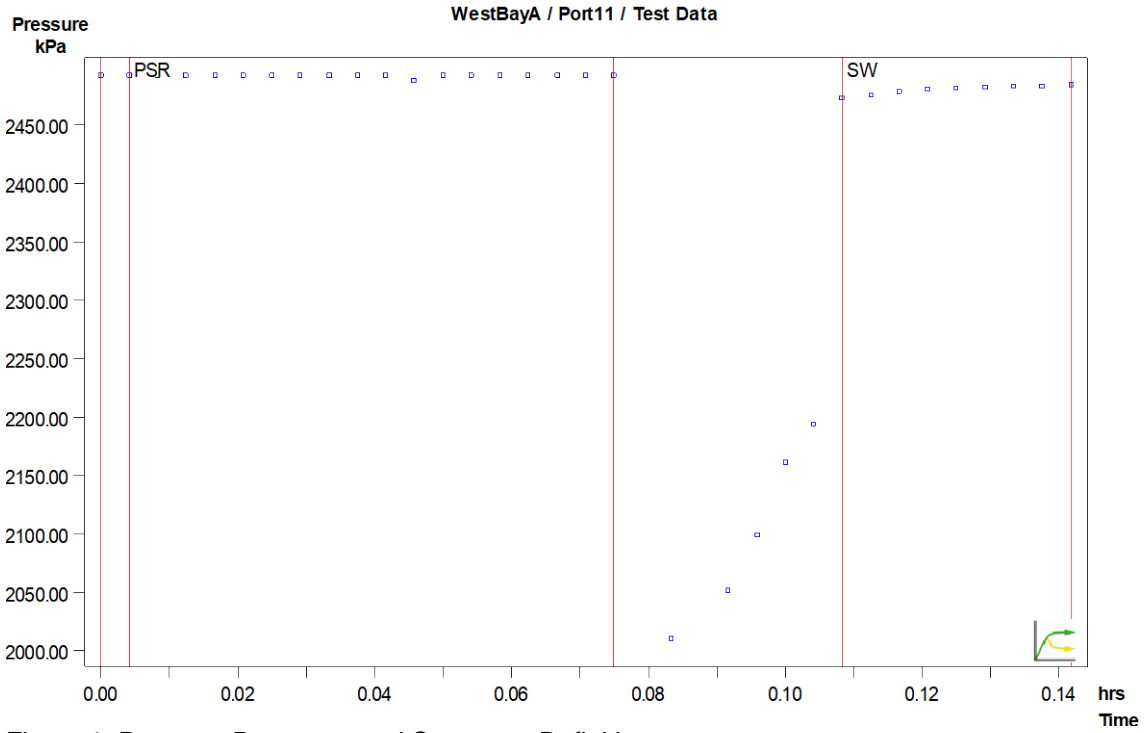


Figure 1: Pressure Response and Sequence Definition

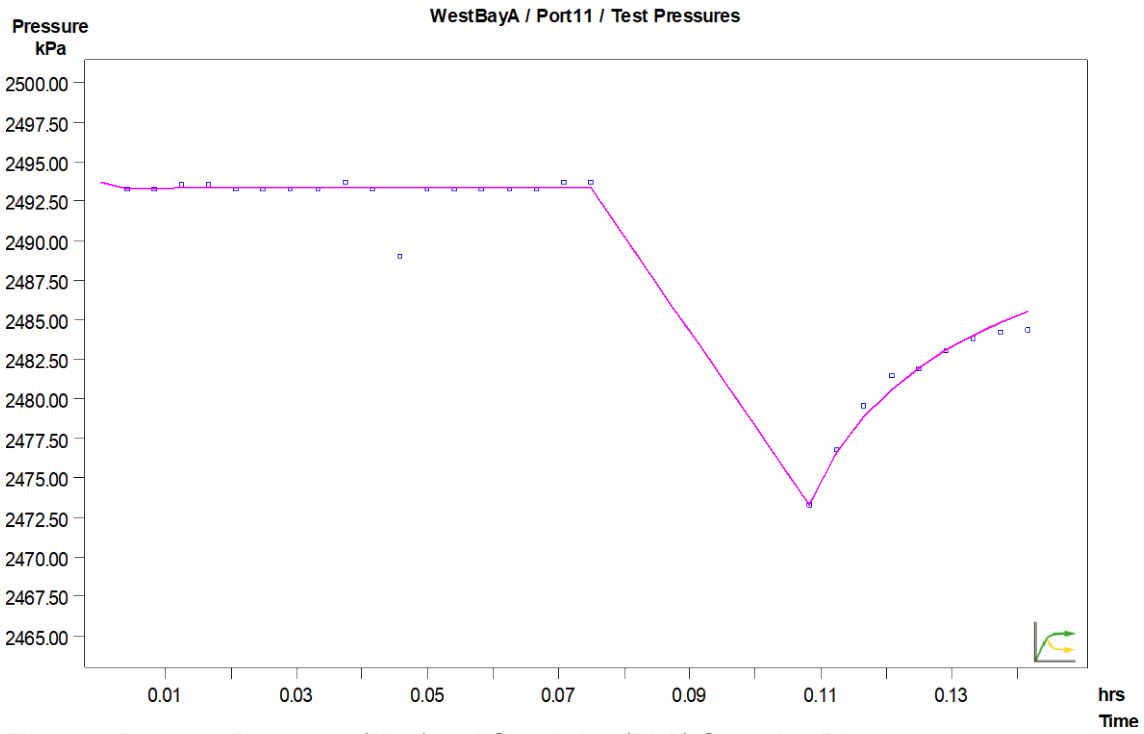


Figure 2: Pressure Response (Blue) and Simulation (Pink) Cartesian Plot

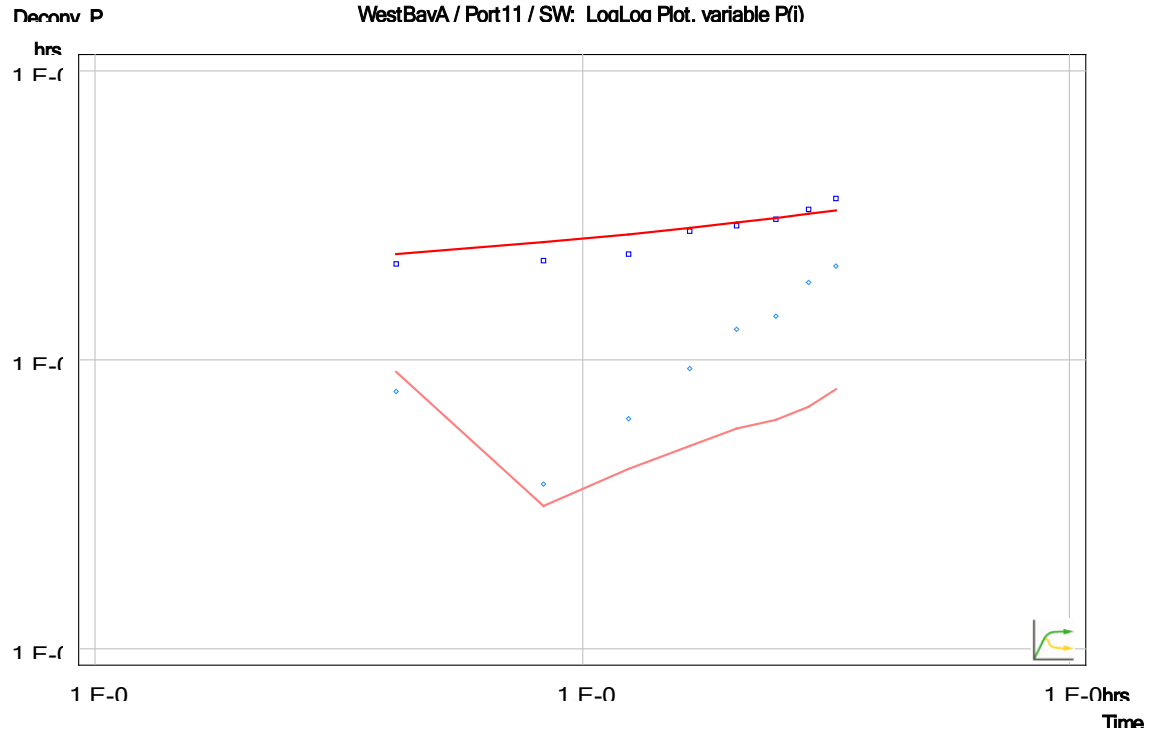


Figure 3: Deconvolved Pressure Response (Dark Blue), Derivative (Light Blue) and Simulation (Red): Log-Log Diagnostic Plot, SW Sequence



## HYDROBENCH REPORT

Project Agnico Eagle Mines Limited  
Site Meliadine Expansion  
Source Well M20-3071  
Test Name Port 10  
Test Date/Time 22.09.20, 01:49:00  
Interval top: 289.70 m bottom: 308.70 m

### Basic Data

Test Interval	19.00 m		
Porosity	0.10		
Well Radius	0.048 m	Tubing Radius	
Inclination	22.0 deg		
Test Volume	137.526 l		
Well Type	Source		

### Fluid Properties

Viscosity	0.001 Pa*s
Density	1000.0 kg/m <sup>3</sup>
Compressibility	2.0e-09 1/Pa

### Sequence Definition

Name	Category	t(o) [hrs]	P(o) [kPa]	P(i) [kPa]	Rate [l/min]	C [m <sup>3</sup> /Pa]
COM1	Variable Pressure	0.00000	2797.41			2.9e-10
PSR	Recovery	0.00417	2797.07			2.9e-10
SW-Init	dP-Event	0.07917	2797.34	156.8 *		2.9e-10
SW	Slug	0.08333	2640.55	2797.3		2.9e-10

### Analysis Results

#### Analysis "SW(Final)"

Static Pressure: 2797.33 kPa

Shell Parameters:

Name	Transmissivity [m <sup>2</sup> /s]	Storativity [-]	Radius [m]	Flow Dimension [-]
Shell 1	7.1e-08	3.9e-05	--	2.0

Sequence Parameters:

Name	Wellbore Storage [m <sup>3</sup> /Pa]	Skin [-]
COM1	2.9e-10	0.0
PSR	2.9e-10	0.0
SW-Init	2.9e-10	0.0
SW	2.9e-10	0.0

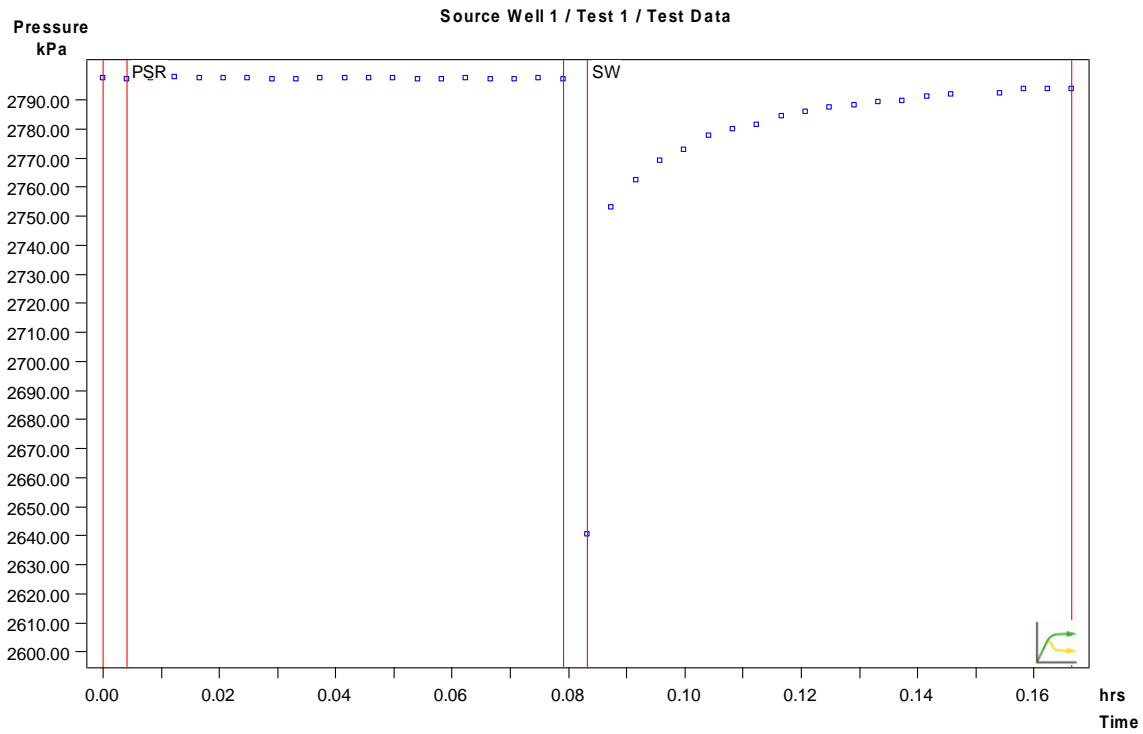


Figure 1: Pressure Response and Sequence Definition

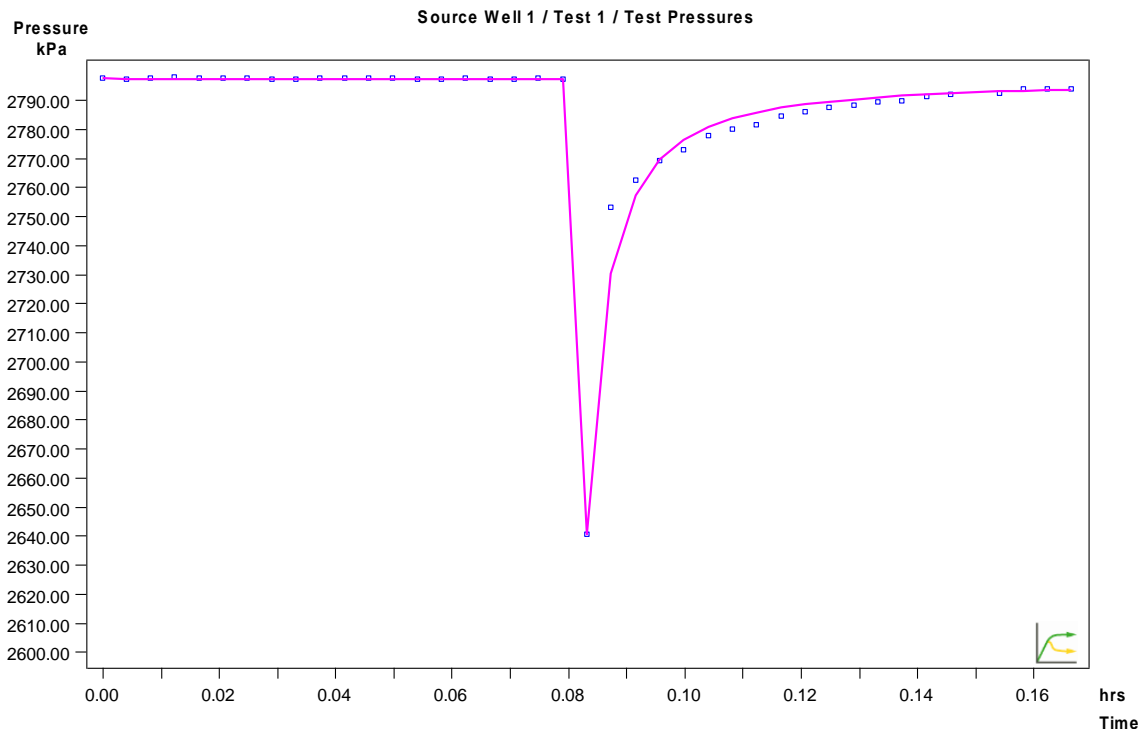


Figure 2: Pressure Response (Blue) and Simulation (Pink) Cartesian Plot

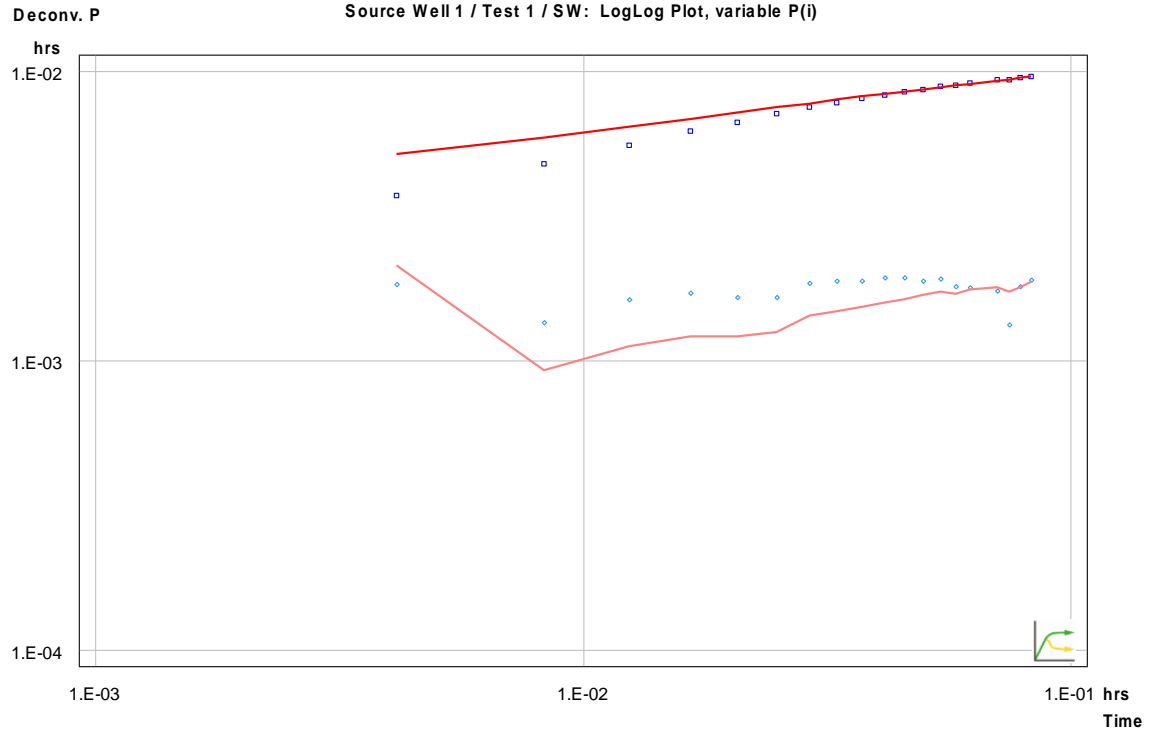


Figure 3: Deconvolved Pressure Response (Dark Blue), Derivative (Light Blue) and Simulation (Red): Log-Log Diagnostic Plot, SW Sequence

## HYDROBENCH REPORT

Project                    Agnico Eagle Mines Limited  
Site                        Meliadine Expansion  
Source Well                M20-3071  
Test Name                 Port 9  
Test Date/Time            22.09.20, 21:54:00  
Interval                    top: 309.60 m    bottom: 328.50 m

### Basic Data

Test Interval	18.90 m		
Porosity	0.10		
Well Radius	0.048 m	Tubing Radius	
Inclination	22.0 deg		
Test Volume	136.803 l		
Well Type	Source		

### Fluid Properties

Viscosity	0.001 Pa*s
Density	1000.0 kg/m <sup>3</sup>
Compressibility	2.0e-09 1/Pa

### Sequence Definition

Name	Category	t(o) [hrs]	P(o) [kPa]	P(i) [kPa]	Rate [l/min]	C [m <sup>3</sup> /Pa]
COM1	Variable Pressure	0.00000	2711.43			2.6e-10
PSR	Recovery	0.08750	2984.46			2.6e-10
SW_Init	dP-Event	0.17500	2983.91	991.9 *		2.6e-10
SW	Slug	0.20000	1991.96	2983.9		2.6e-10

### Analysis Results

#### Analysis "SW"

Static Pressure: 2984.47 kPa

Shell Parameters:

Name	Transmissivity [m <sup>2</sup> /s]	Storativity [-]	Radius [m]	Flow Dimension [-]
Shell 1	7.4e-09	3.5e-05	--	2.0

Sequence Parameters:

Name	Wellbore Storage [m <sup>3</sup> /Pa]	Skin [-]
COM1	2.6e-10	0.0
PSR	2.6e-10	0.0
SW_Init	2.6e-10	0.0
SW	2.6e-10	0.0

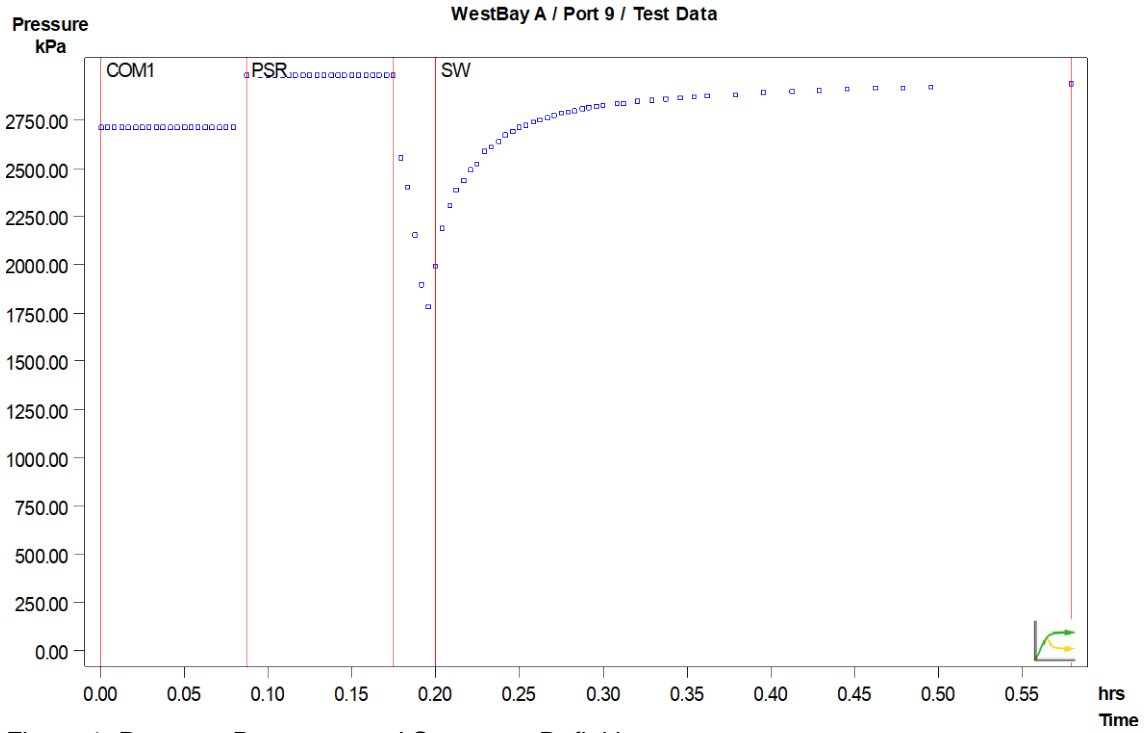


Figure 1: Pressure Response and Sequence Definition

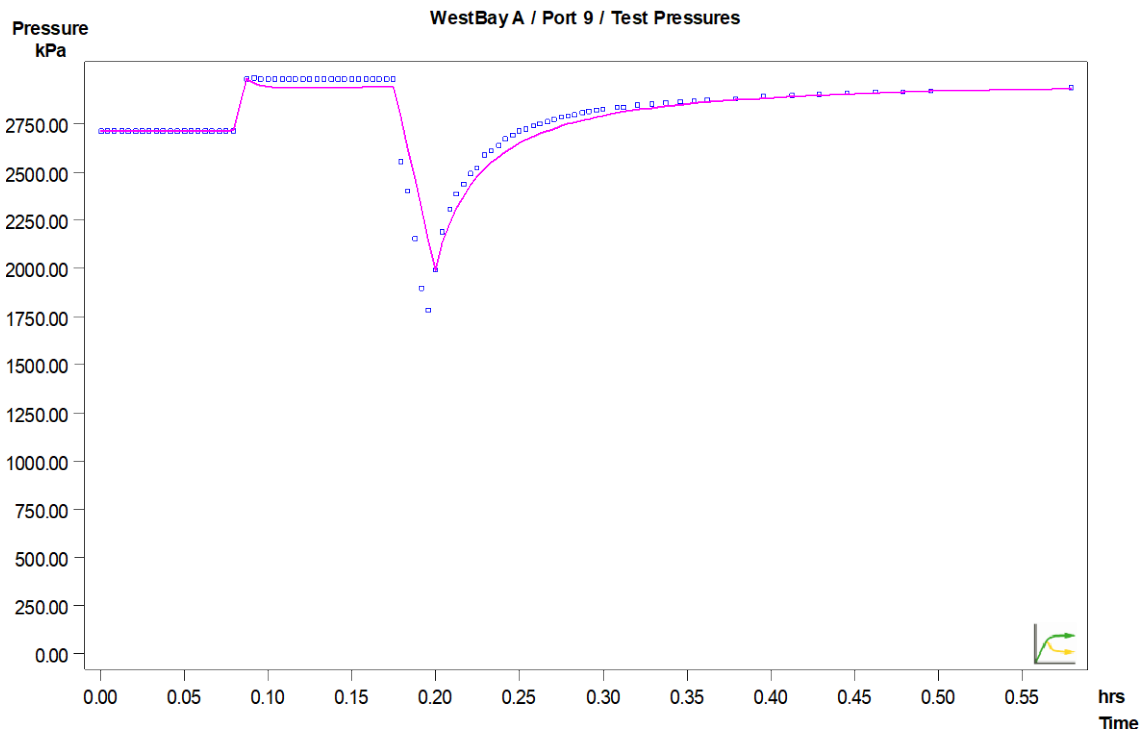


Figure 2: Pressure Response (Blue) and Simulation (Pink) Cartesian Plot

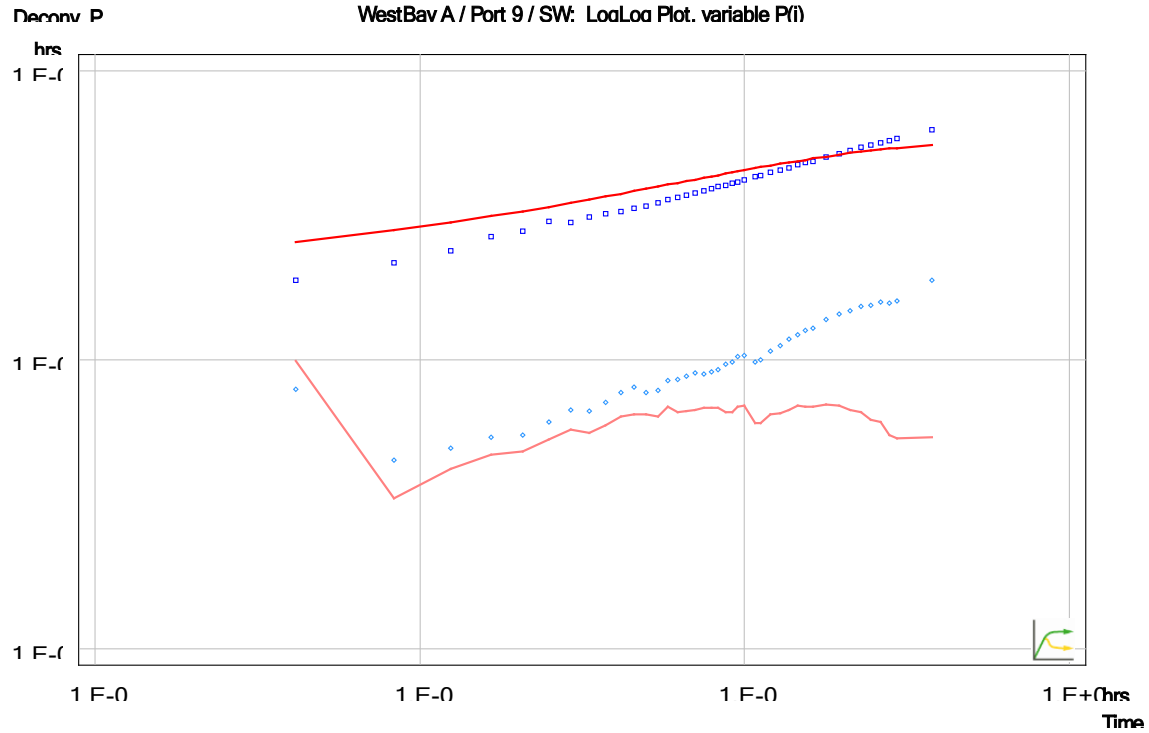


Figure 3: Deconvolved Pressure Response (Dark Blue), Derivative (Light Blue) and Simulation (Red): Log-Log Diagnostic Plot, SW Sequence

## HYDROBENCH REPORT

Project                    Agnico Eagle Mines Limited  
Site                        Meliadine Expansion  
Source Well                M20-3071  
Test Name                 Port 8  
Test Date/Time            21.09.20, 02:20:00  
Interval                    top: 329.40 m    bottom: 346.90 m

### Basic Data

Test Interval	17.50 m		
Porosity	0.10		
Well Radius	0.048 m	Tubing Radius	0.017 m
Inclination	22.0 deg		
Test Volume	126.669 l		
Well Type	Source		

### Fluid Properties

Viscosity	0.001 Pa*s
Density	1000.0 kg/m <sup>3</sup>
Compressibility	2.0e-09 1/Pa

### Sequence Definition

Name	Category	t(o) [hrs]	P(o) [kPa]	P(i) [kPa]	Rate [l/min]	C [m <sup>3</sup> /Pa]
COM1	Variable Pressure	0.00000	2961.57			2.5e-10
PSR	Recovery	0.08333	3175.59			2.5e-10
SI-init	dP-Event	0.16250	3170.62	1601.2 *		2.5e-10
SW	Slug	0.17917	1569.45	3170.6		2.5e-10

### Analysis Results

#### Analysis "SW"

Static Pressure: 3170.33 kPa

Shell Parameters:

Name	Transmissivity [m <sup>2</sup> /s]	Storativity [-]	Radius [m]	Flow Dimension [-]
Shell 1	5.5e-08	3.4e-05	--	2.0

Sequence Parameters:

Name	Wellbore Storage [m <sup>3</sup> /Pa]	Skin [-]
COM1	2.5e-10	0.0
PSR	2.5e-10	0.0
SI-init	2.5e-10	0.0
SW	2.5e-10	0.0

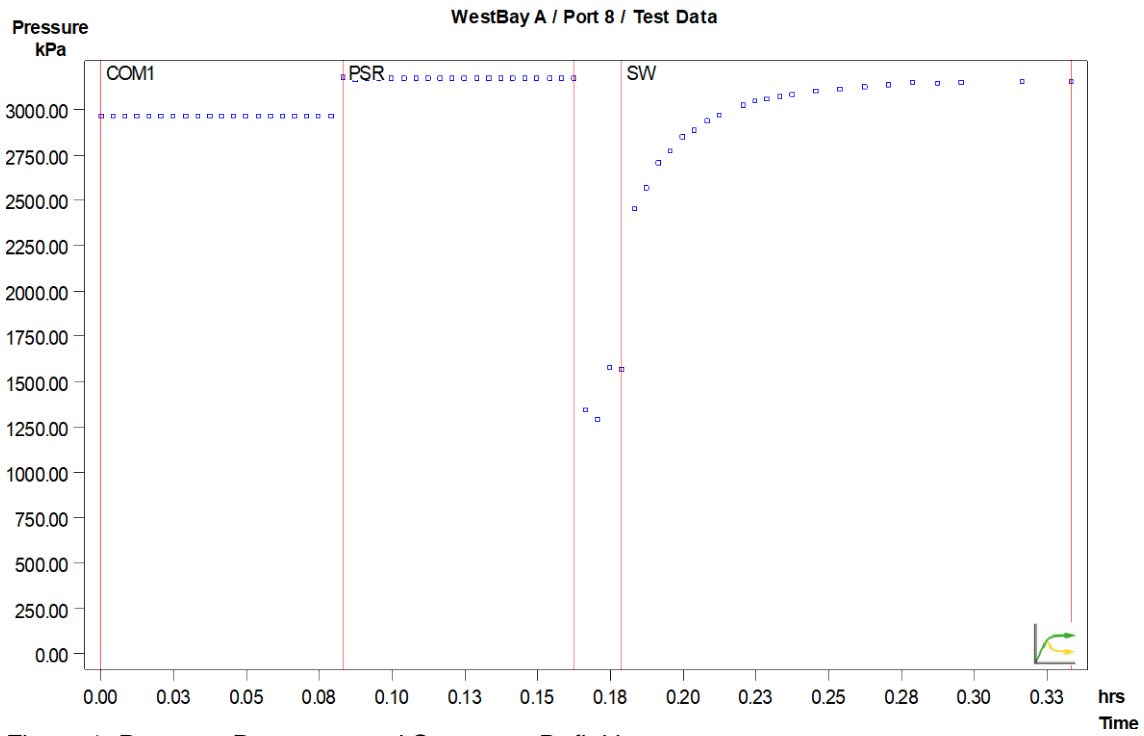


Figure 1: Pressure Response and Sequence Definition

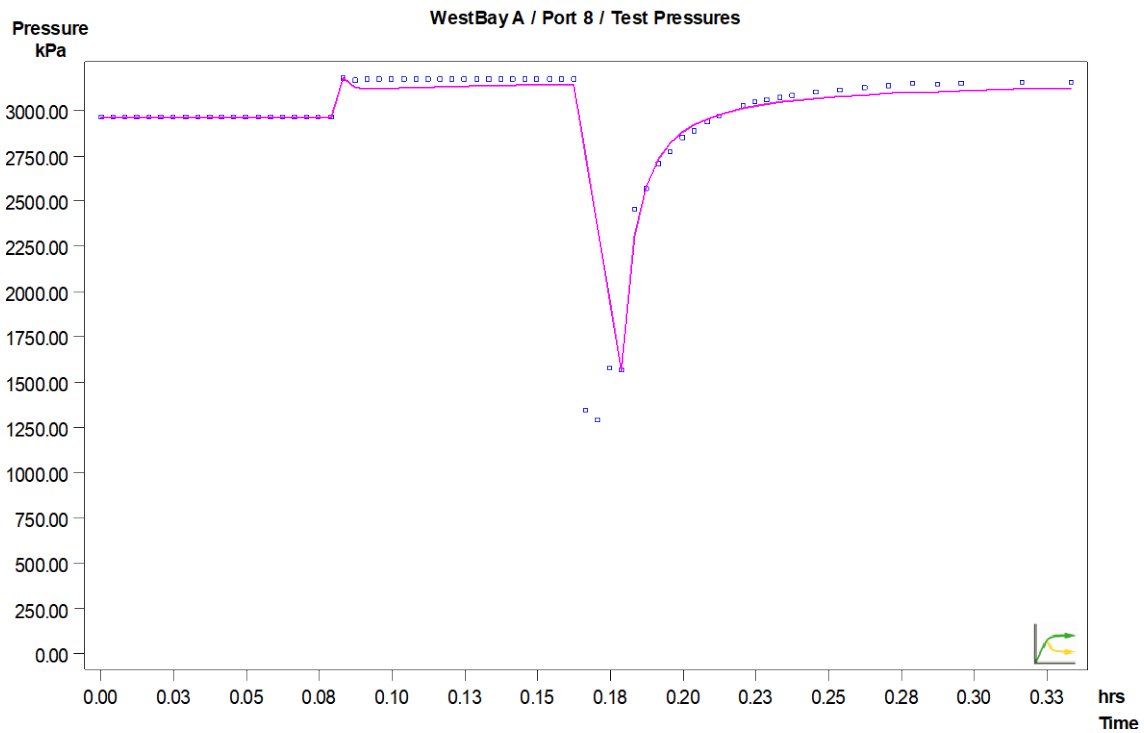


Figure 2: Pressure Response (Blue) and Simulation (Pink) Cartesian Plot



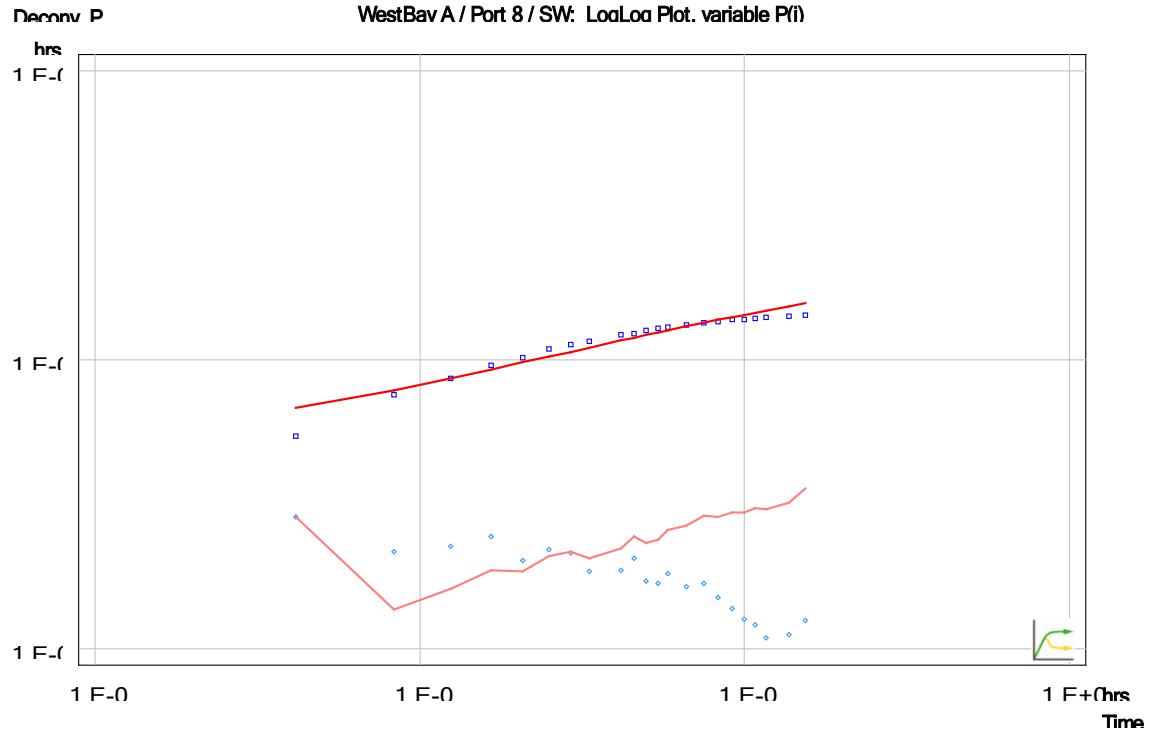


Figure 3: Deconvolved Pressure Response (Dark Blue), Derivative (Light Blue) and Simulation (Red): Log-Log Diagnostic Plot, SW Sequence

## HYDROBENCH REPORT

Project                    Agnico Eagle Mines Limited  
Site                        Meliadine Expansion  
Source Well              M20-3071  
Test Name                Port 7  
Test Date/Time         21.09.20, 12:52:00  
Interval                 top: 350.00 m    bottom: 408.00 m

### Basic Data

Test Interval	58.00 m		
Porosity	0.10		
Well Radius	0.048 m	Tubing Radius	0.017 m
Inclination	22.0 deg		
Test Volume	419.817 l		
Well Type	Source		

### Fluid Properties

Viscosity	0.001 Pa*s
Density	1000.0 kg/m <sup>3</sup>
Compressibility	2.0e-09 1/Pa

### Sequence Definition

Name	Category	t(o) [hrs]	P(o) [kPa]	P(i) [kPa]	Rate [l/min]	C [m <sup>3</sup> /Pa]
COM1	Variable Pressure	0.00000	3133.94			8.4e-10
PSR	Recovery	0.08333	2884.08			8.4e-10
SW_init	dP-Event	0.17083	2886.49	847.8 *		8.4e-10
SW	Slug	0.20833	2038.71	2886.5		8.4e-10

### Analysis Results

#### Analysis "SW(Final)"

Static Pressure: 2894.38 kPa

Shell Parameters:

Name	Transmissivity [m <sup>2</sup> /s]	Storativity [-]	Radius [m]	Flow Dimension [-]
Shell 1	9.8e-10	1.1e-04	--	2.0

Sequence Parameters:

Name	Wellbore Storage [m <sup>3</sup> /Pa]	Skin [-]
COM1	8.4e-10	0.0
PSR	8.4e-10	0.0
SW_init	8.4e-10	0.0
SW	8.4e-10	0.0

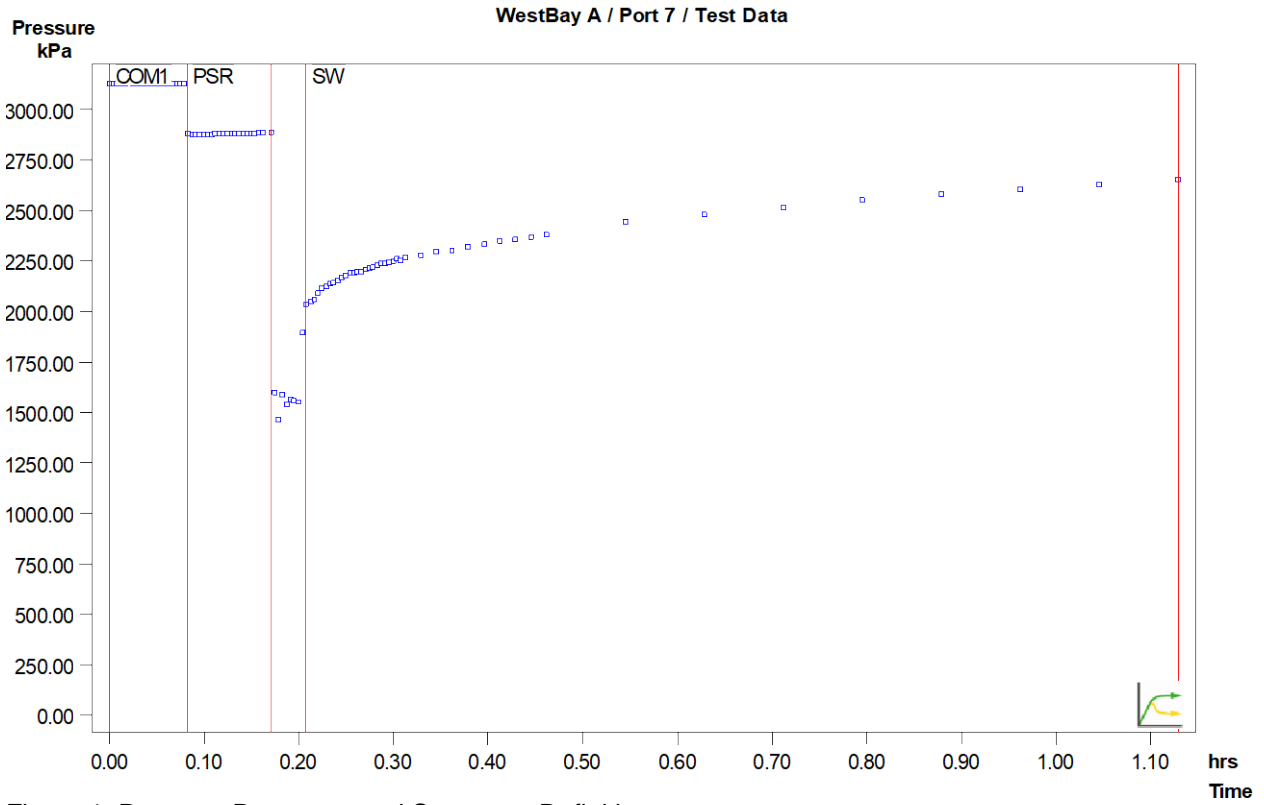


Figure 1: Pressure Response and Sequence Definition

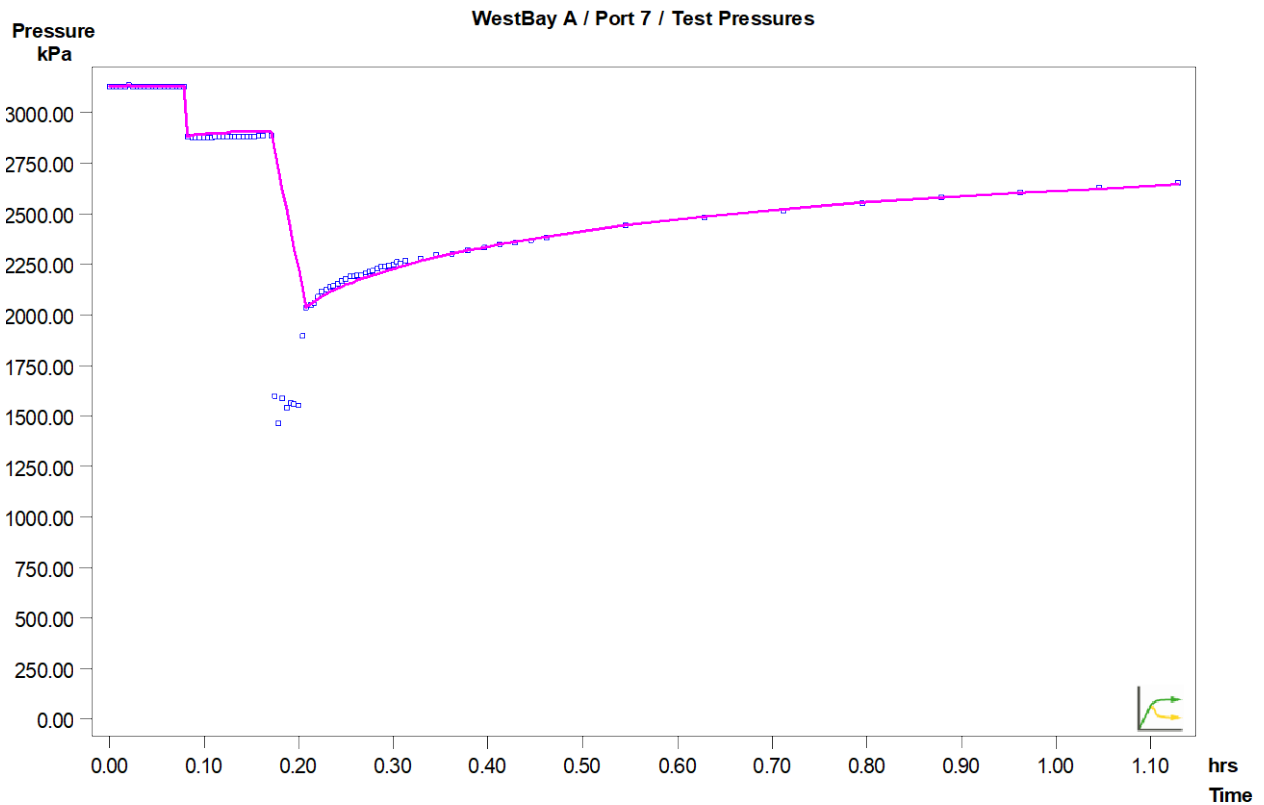


Figure 2: Pressure Response (Blue) and Simulation (Pink) Cartesian Plot

Deconv P

WestBav A / Port 7 / SW: Log-Log Plot. variable P(i)

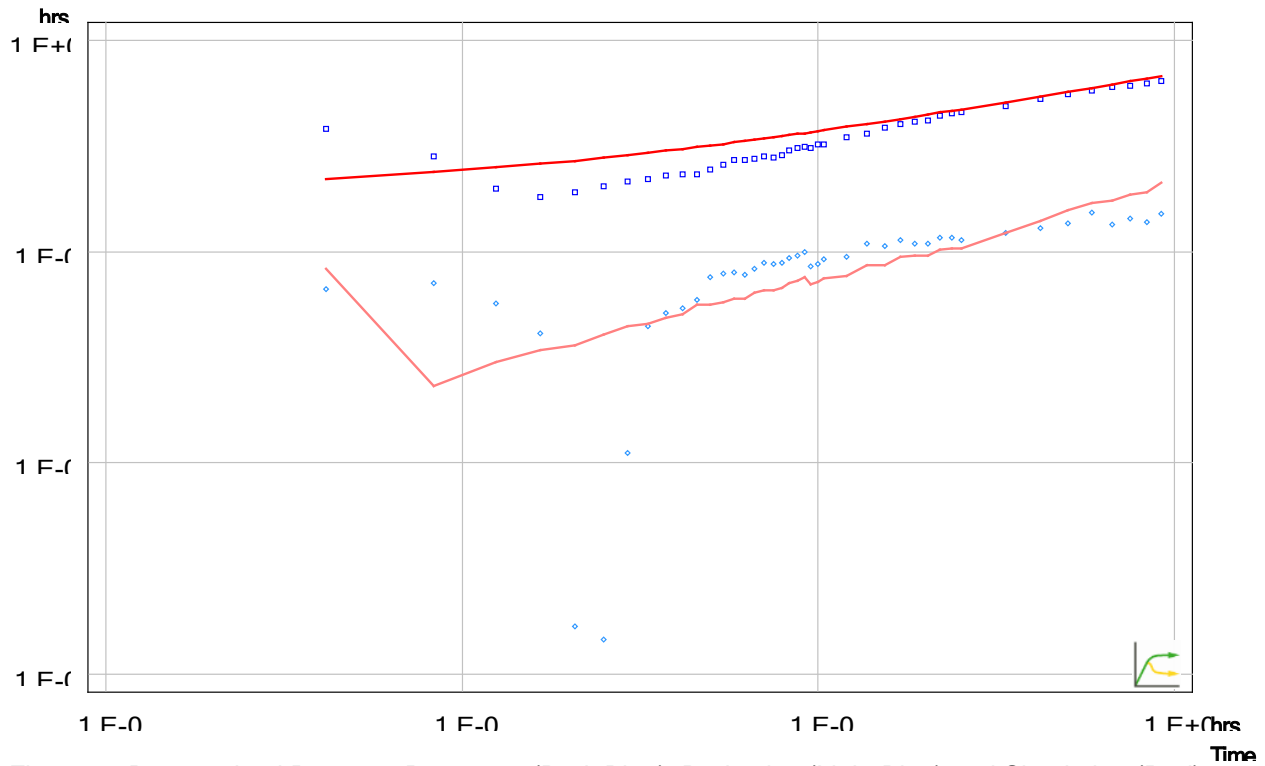


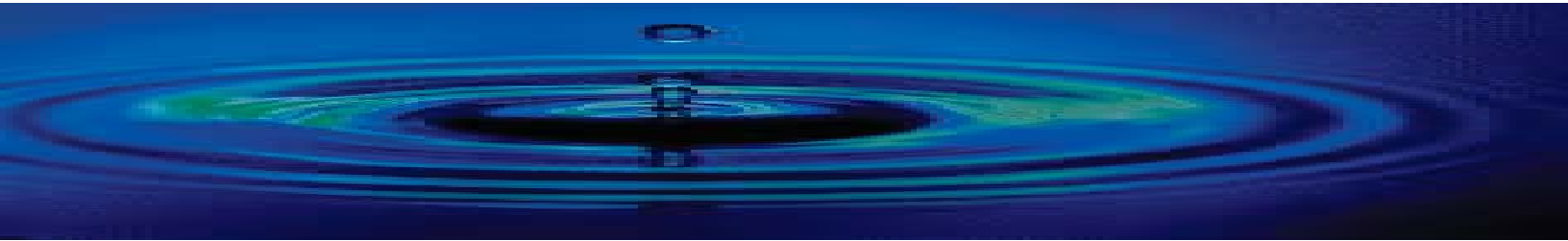
Figure 3: Deconvolved Pressure Response (Dark Blue), Derivative (Light Blue) and Simulation (Red): Log-Log Diagnostic Plot, SW Sequence

**APPENDIX E**

Completion Report, Westbay System Monitoring Well:  
M30-3071, Agnico Eagle Mines Ltd.  
(Westbay Instruments a Division of Nova Metrix  
Ground Monitoring (Canada) Limited)

# Completion Report

Well Name: M20-3071



September 30, 2020

# Completion Report

Well Name: M20-3071

Project Number: WB913

Prepared for:

Agnico-Eagle Mines Ltd.

Prepared by:

Westbay Instruments  
A Division of Nova Metrix Ground Monitoring (Canada) Limited.  
8610 Glenlyon Parkway  
Suite134  
Burnaby, BC  
V5J 0B6

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## APPENDICES

- APPENDIX: Monitoring Well: M20-3071



# 1. Introduction

This report and the attached Appendix document the technical services carried out by Westbay Instruments (Westbay) under Agnico-Eagle Mines Ltd. (Agnico-Eagle) P.O. OL-950327 dated August 13, 2020. A Westbay System completion was installed in borehole M20-3071 at the Meliadine mine site, Nunavut, Canada.

Westbay technical services representatives Mr. Mark Lessard and Mr. Tony Kim were on site for installation of the Westbay System from August 25 to September 9, 2020. Golder Associates (Golder) representative Mr. François Laniel was on-site to supervise the work.

This report documents the installation tasks and related QA checks.

## 2. Pre-Installation Activities

The borehole was drilled by Orbit Garant Drilling Inc. under contract to Agnico-Eagle using a diamond core rotary method at a nominal 96-mm diameter (HQ-size). The borehole inclination was set to a nominal plunge angle of 75 degrees below horizontal.

The depth of permafrost was estimated to be about 250 meters. A salt brine mixture (CaCl) was used as a drilling fluid and to keep the borehole from freezing. An HWT casing (~7 meters deep) was installed in the borehole as permanent surface casing. Hydrogeological tests were carried out in the borehole by Golder to obtain a continuous hydraulic conductivity profile of the borehole below the permafrost. Core logging was completed by Agnico-Eagle with some assistance by Golder.

The borehole was prepared prior to lowering the Westbay casing as follows:

- The borehole was flushed with a clean warm water.
- HQ rods with a smooth ID shoe were lowered to about 350 meters and circulated with a brine mixture (11 % CaCl). The brine circulation continued as the HQ rods were raised.
- The HQ rods were set to about 250 meters ( estimated permafrost depth) as a permanent casing.
- The HQ rods were welded to a HWT casing which rested on the surface casing

(Note: all depths are with distances along the borehole with respect to ground surface. There has been no correction for borehole plunge angle. Monitoring well reference elevations were not available at the time of installation ).

## 3. Installation

Westbay Instruments technical services representatives Mr. Mark Lessard and Mr. Tony Kim were on site to install the Westbay System in M20-3071 as indicated below in Table 1.

(Note: Monitoring well reference elevation was not available at the time of writing).

**Table 1: Summary of Westbay System Installation**

Well Name.	Field Installation Dates	Total Depth (m)	MP38 Tubing Length (m)	No. Monitoring Zones
M20-3071	August 30 – September 7, 2020	606	606	5

The Westbay System in M20-3071 was installed according to the procedure described below.

### 3.1 Preparation of Westbay System Design

Target packer depths for the borehole were provided to Westbay by Mr. Adrian Kowalchuk of Golder. A well design was created based on these depths. The well design was used to prepare a Westbay Completion Log, which specifies the location of the Westbay System components in the well. This log was reviewed and approved in the field by Mr. Charles Moliere and Mr. François Laniel of Golder prior to installation of the Westbay System. The Westbay Completion Log as approved was used as an installation guide in the field. A field copy of the log is in the Appendix.

A measurement port coupling was included in each primary monitoring zone to provide the capability to measure fluid pressures and collect fluid samples. Measurement port couplings were also included in QA zones to provide QA testing capabilities and to permit operation of squeeze relief venting capabilities of the Westbay Model No. 6055 vented inflation tool. A Model 0206 hydraulic pumping port coupling was also included in each primary monitoring zone to provide purging and hydraulic conductivity testing capabilities. A pumping port was also placed above the two packers located directly above the expected base of permafrost. This pumping port was placed as part of a plan to introduce a glycol/water mixture into the annulus in the permafrost zone. Mr. Adrian Kowalchuk requested that optional synthetic (PET) filters were to be installed over the measurement port couplings.

A summary of the installed Westbay System components are shown on Table 2 below and in the Summary Completion Log Legend in the Appendix.

**Table 2: Summary of Installed Westbay System Components**

Well Name	Packers (0238)	Measurement Ports (0205)	Pumping Ports (0206)
M20-3071	14	14	6

### 3.2 Layout of Westbay System Tubing Components

Prior to the installation, the Westbay System components were set out at the borehole according to the sequence indicated on the Westbay Completion Log. Each casing length was numbered beginning with the lowermost as an aid to confirming the proper sequence of components. The appropriate Westbay System couplings were attached to each casing section. Magnetic location collars were attached 0.6 meter below the top of the measurement port couplings in the bottom 10 packers and one near the surface. Locations of key components are listed in Tables 4 and 5 in the Appendix.

Since the borehole is inclined at 75 degrees from horizontal, an abrasion protector is used to protect the packers and pumping ports from damage during deployment inside the guide tube. The abrasion protectors are clamped to the outside of the Westbay tubing at specified positions. There are 2 abrasion protectors per packer, 1 abrasion protector per pumping port, and 2 abrasion protectors for the bottom section of Westbay tubing. In addition, a special tapered end plug is attached to the bottom of the Westbay tubing.

Each component was visually inspected. Serial numbers for each packer, pumping port and measurement port coupling were recorded on the Westbay Completion Log. The component layout was confirmed with the log before the components were lowered into the borehole.

### 3.3 Lowering of Westbay System Components

The Westbay System components were lowered into the borehole by hand. The assembled joints were tested at an internal pressure of 150 psi as they were lowered into the borehole (HQ rods). A record of each component is noted by check marks on the Westbay Completion Log. A propylene glycol/water mixture was added to the Westbay System when necessary to counter buoyancy effects while components were lowered into the borehole. A 4:1 propylene glycol/water mixture was added into the bottom half of the Westbay System (300 to 606m), and a 2:1 propylene glycol/water mixture was added into the top half of the Westbay System (300m and higher). The mixtures were provided by Orbit and Golder.

### 3.4 Hydraulic Integrity Testing

After the Westbay System string was lowered into the borehole, the fluid (propylene glycol mixture) level inside the Westbay System completion was monitored to confirm hydraulic integrity of the completion. The hydraulic integrity test measurements are shown in Table 3 below. The test results successfully confirmed that the Westbay components were water tight.

**Table 3: Hydraulic Integrity Test**

Well Name	August 31, 2020	Fluid Levels		
		Time	Inside Tubing	Outside Tubing
M20-3071		02:15	65.026 m	Near surface
		02:25	65.022 m	
		02:35	65.021 m	
		02:45	65.021 m	
		02:55	65.021 m	

### 3.5 Positioning of Westbay System Completion

After the Westbay System components were lowered into the well, the Westbay System was positioned as illustrated on the Westbay Completion Log. The Westbay System was supported in this position while packer inflation was carried out. The positioning of the Westbay System components is based on the "nominal" lengths of Westbay System components. The positioning calculations do not include allowances for borehole temperature or deviation effects.

The attached figure titled "MOSDAX Transducer Position" provides information to correlate the position of MOSDAX transducer sensor to the reference position at the top of the measurement port. The attached figure titled "Dimensions of Packer Seals and Monitoring Zones" outlines the calculations used to

determine the packer depths and zone length. The Summary Completion Log, which shows the final “as-built” locations of the components in the well, is included in the Appendix.

### 3.6 Pre-inflation Profile

A pre-inflation pressure profile was carried out at the well prior to inflating the packers to confirm the proper position and operation of measurement ports and magnetic collars. The ports operated properly and were positioned correctly in the well. A plot of the Pre-inflation Piezometric levels in all zones is shown on Figure 3 in the Appendix. The data are presented as equivalent depth to water assuming a fresh water fluid density. There has been no correction for the density of fluids in the annulus outside of the Westbay completion.

### 3.7 Inflation of Westbay System Packers

The packers were inflated in a specific sequence as part of a plan to introduce and control an antifreeze solution in the well annulus through the permafrost zone:

- Two packers positioned immediately above the expected base of permafrost were inflated.
- The pumping port above the upper inflated packer was opened.
- A 2:1 mixture of water and propylene glycol supplied by Orbit and Golder was pumped inside the Westbay casing, out the pumping port and into the well annulus. Pumping continued until a return flow of the mixture was observed from the well annulus at ground level, indicating that the well annulus was full of the antifreeze mixture.
- The pumping port port was closed.
- The remaining Westbay packers in the well were inflated beginning with the deepest.

The deepest 12 Westbay packers (below the permafrost depth) were inflated using a 4:1 propylene glycol/water mixture. The upper two support packers in the HQ rods were inflated with a 2:1 mixture for improved protection against freezing.. The Westbay Model No. 6055 vented inflation tool was used for packer inflation. All the packers appear to have inflated normally. The data for inflation of each packer are provided on the Westbay Packer Inflation Records included in the appendix.

## 4. Fluid Pressure Measurements

After packer inflation was completed, fluid pressures were measured at each measurement port. At that time, the in-situ formation pressures may not have recovered from the pre-installation activities and potential groundwater pressure increases in monitoring zones that may result from packer inflation. This latter effect may be more likely to occur in monitoring zones located in low-permeability geological formations. Longer term monitoring may be required to establish representative fluid pressures.

A plot of the Post-Inflation Piezometric levels in all zones in the well is shown on Figure 4 and a plot of the primary zones only on Figure 5 in the Appendix. The data were examined to confirm proper operation of the measurement ports and as a check on the presence of annulus seals between monitoring zones. The calculation sheets for all pressure profiles of the Westbay System are also enclosed in the Appendix.

The data are presented as equivalent depth to water assuming a fresh water fluid density. There has been no correction for the density of fluids in the annulus outside of the Westbay completion.

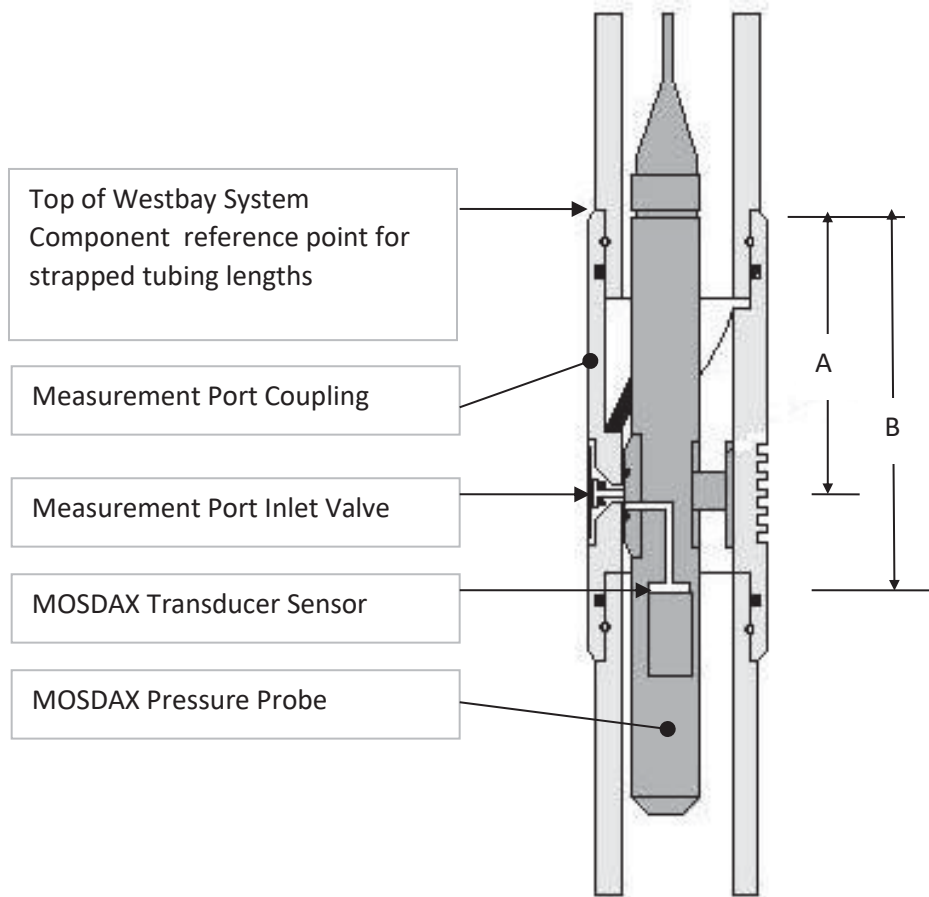
## 5. Westbay Operator Training

Training was provided to Mr. Charles Moliere and Mr. François Laniel of Golder and Ms. Anne-Laurence Paquet of Agnico Eagle. The training covered the following areas:

- Operation and maintenance of Model 2532 Sampler Probe and MAGI controller in pressure profiling, sample collection.
- Cable reheading, maintenance, and system troubleshooting.

Ms. Paquet was not available for the cable reheading training exercises, however the cable reheading procedure was covered step by step with the training pictorial booklet.

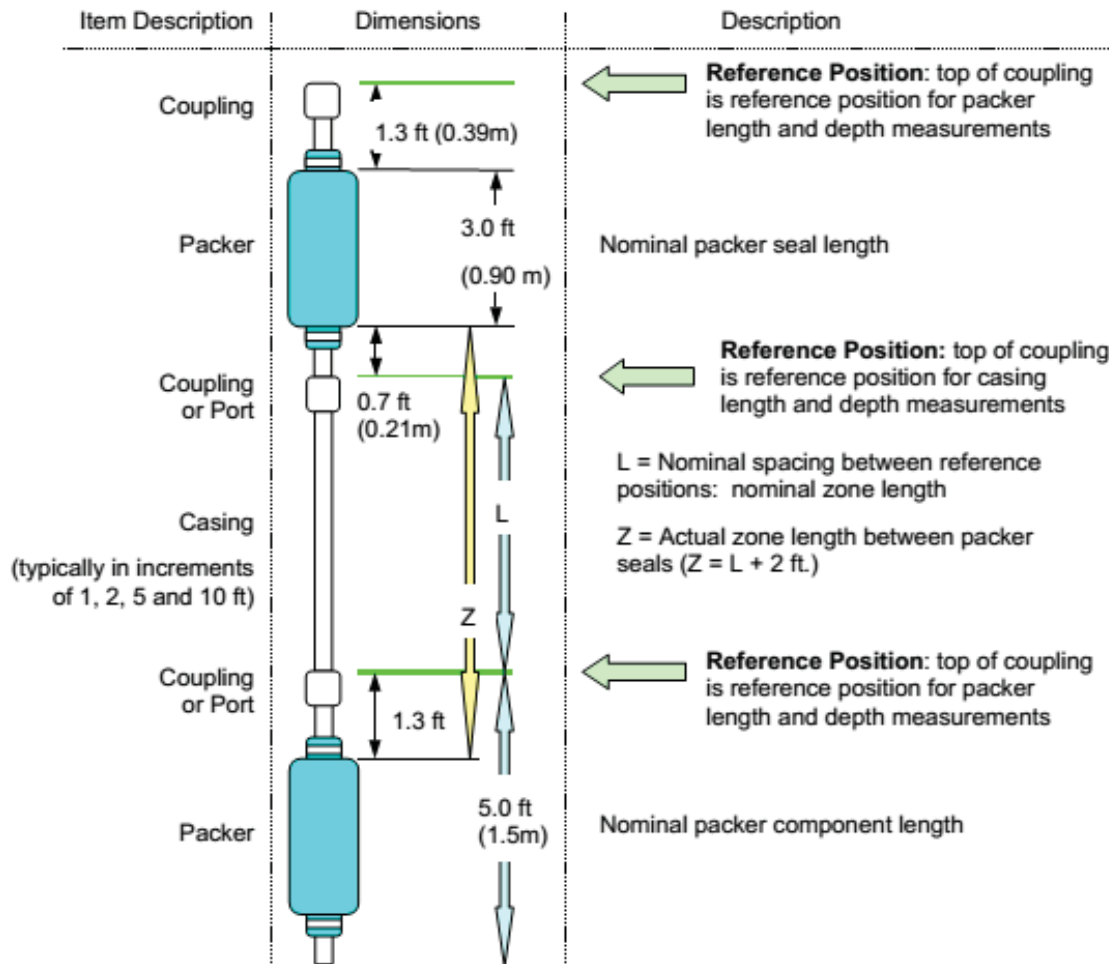
Figure 1:  
**MOSDAX Transducer Position**  
 In an Westbay System Measurement Port Coupling



System	Measurement Port	A	B
Plastic MP38	0205	0.37 ft. (114.3 mm)	0.54 ft. (165.1 mm)

Figure 2:

## Dimensions of Packer Seals and Monitoring Zones Westbay MP38 System 0238 Packers



**Discussion Points:**

- o The top of a coupling (Regular Coupling, Measurement Port or Pumping Port) is the reference point for describing nominal depths and nominal lengths. Actual positions of packer seals and zone lengths are determined with respect to the appropriate reference positions.
- o **Packer Position Example:** A packer with a nominal depth of 50 ft (15.2m), will have a nominal packer seal position of 51.3 to 54.3 ft. (15.59 to 16.49m)
- o **Zone Length Example:** A zone whose upper packer is at 50 ft (15.2m) and bottom packer is at 70 ft (21.3m) will have a nominal zone length of 15 ft (4.6m) and an actual zone length (between packer seals) of 15.0+1.3+0.7 = 17.0ft. (4.6 + 0.39 + 0.2 = 5.19m)
- o Information on the position of Measurement Port Valve and MOSDAX Transducer sensor, used for detailed calculation of piezometric level measurements, are described separately.

## **APPENDIX: MONITORING WELL: M20-3071**

As-Built Packer and Port Summary (Table 4)	- 1 page
As-Built Tubing Summary (Table 5)	- 5 pages
Summary Completion Log	- 5 pages
Pre-Inflation Piezometric Pressure/ Levels	
Field Data and Calculation Sheet (August 31)	- 1 page
Figure 3, Pre-Inflation Profile	- 1 page
Post- Inflation Piezometric Pressure/Levels	
Field Data and Calculation Sheet (September 7)	- 1 page
Figure 4, Post-Inflation Profile	- 1 page
Figure 5, Post-Inflation Profile – Zones only	- 1 page
Westbay Completion Log (field copy)	- 13 pages
Westbay System Packer Inflation Records	- 14 pages



**TABLE 4**  
**M20-3071 As-Built Packer and Port Summary**

<b>Zone No.</b>	<b>Measurement Port Depth (m)</b>	<b>Pumping Port Depth (m)</b>	<b>Magnetic Collar Depth (m)</b>	<b>Top of Zone (m)</b>	<b>Bottom of Zone (m)</b>
QA1	587.5		588.1	587.3	606.0
Zone 1	573.7	576.8	574.3	573.5	586.4
QA2	491.4		492.0	491.2	572.6
Zone 2	470.0	473.1	470.6	469.8	490.3
QA3	421.2		421.8	421.0	468.9
Zone 3	409.0	412.0	409.6	408.7	420.1
QA4	348.0		348.6	347.8	407.8
Zone 4	329.7	332.7	330.3	329.4	346.9
QA5	309.8		310.4	309.6	328.5
Zone 5	290.0	293.0	290.6	289.7	308.7
QA6	256.4			256.2	288.8
QA7	247.3	245.7		247.0	255.3
QA8	146.6			146.4	246.1
QA9	46.0			45.8	145.5

- Note 1: All depth measurements in meters below ground surface.
- Note 2: All depth measurements use 'Nominal' casing lengths.
- Note 3: Not corrected for borehole angle, deviation or borehole temperature effects.
- Note 4: All Westbay Port depth measurements to upper edge of coupling item.
- Note 5: Depths for top and bottom of zone based on packer seal position.

Item No.	Component Part Number	Component S/N	Coupling P/N	Component Discription	Coupling S/N	Accessory P/N	Accessory Depth (m)	Depth (m) *
219	0203							-1.6
218	020102		0202					-1.5
217	020101		0202					-0.9
216	020101		0202					-0.6
215	020102		0202					-0.3
214	020105		0202					0.3
213	020110		0202			0216		1.9
212	020110		0202					4.9
211	020110		0202					7.9
210	020110		0202					11.0
209	020110		0202					14.0
208	020110		0202					17.1
207	020110		0202					20.1
206	020110		0202					23.2
205	020110		0202					26.2
204	020110		0202					29.3
203	020110		0202					32.3
202	020110		0202					35.4
201	020110		0202					38.4
200	020110		0202					41.5
199	0238	19821	0202	Packer				44.5
198	020110		0205	Measurement Port	9717			46.0
197	020105		0202					49.1
196	020110		0202					50.6
195	020110		0202					53.7
194	020110		0202					56.7
193	020110		0202					59.8
192	020110		0202					62.8
191	020110		0202					65.9
190	020110		0202					68.9
189	020110		0202					72.0
188	020110		0202					75.0
187	020110		0202					78.0
186	020110		0202					81.1
185	020110		0202					84.1
184	020110		0202					87.2
183	020110		0202					90.2
182	020110		0202					93.3
181	020110		0202					96.3
180	020110		0202					99.4
179	020110		0202					102.4
178	020110		0202					105.5
177	020110		0202					108.5
176	020110		0202					111.6
175	020110		0202					114.6
174	020110		0202					117.7
173	020110		0202					120.7
172	020110		0202					123.8
171	020110		0202					126.8
170	020110		0202					129.9

Item No.	Component Part Number	Component S/N	Coupling P/N	Component Discription	Coupling S/N	Accessory P/N	Accessory Depth (m)	Depth (m) *
169	020110		0202					132.9
168	020110		0202					136.0
167	020110		0202					139.0
166	020110		0202					142.1
165	0238	19822	0202	Packer				145.1
164	020110		0205	Measurement Port	9716			146.6
163	020105		0202					149.7
162	020110		0202					151.2
161	020110		0202					154.2
160	020110		0202					157.3
159	020110		0202					160.3
158	020110		0202					163.4
157	020110		0202					166.4
156	020110		0202					169.5
155	020110		0202					172.5
154	020110		0202					175.6
153	020110		0202					178.6
152	020110		0202					181.7
151	020110		0202					184.7
150	020110		0202					187.8
149	020110		0202					190.8
148	020110		0202					193.9
147	020110		0202					196.9
146	020110		0202					200.0
145	020110		0202					203.0
144	020110		0202					206.1
143	020110		0202					209.1
142	020110		0202					212.2
141	020110		0202					215.2
140	020110		0202					218.3
139	020110		0202					221.3
138	020110		0202					224.3
137	020110		0202					227.4
136	020110		0202					230.4
135	020110		0202					233.5
134	020110		0202					236.5
133	020110		0202					239.6
132	020110		0202					242.6
131	0238	19845	0206	Packer/Pumping Port	544			245.7
130	020110		0205	Measurement Port	9712			247.3
129	020105		0202					250.3
128	020110		0202					251.9
127	0238	19846	0202	Packer				254.9
126	020110		0205	Measurement Port	9715			256.4
125	020105		0202					259.5
124	020110		0202					261.0
123	020110		0202					264.0
122	020110		0202					267.1
121	020110		0202					270.1
120	020110		0202					273.2

Item No.	Component Part Number	Component S/N	Coupling P/N	Component Discription	Coupling S/N	Accessory P/N	Accessory Depth (m)	Depth (m) *
119	020110		0202					276.2
118	020110		0202					279.3
117	020110		0202					282.3
116	020110		0202					285.4
115	0238	19820	0202	Packer				288.4
114	020110		0205	Measurement Port	9709	0216		290.0
113	020110		0206	Pumping Port	545			293.0
112	020105		0202					296.1
111	020110		0202					297.6
110	020105		0202					300.7
109	020110		0202					302.2
108	020110		0202					305.3
107	0238	19844	0202	Packer				308.3
106	020110		0205	Measurement Port	9714	0216		309.8
105	020105		0202					312.9
104	020110		0202					314.4
103	020105		0202					317.5
102	020110		0202					319.0
101	020110		0202					322.0
100	020110		0202					325.1
99	0238	19843	0202	Packer				328.1
98	020110		0205	Measurement Port	9710	0216		329.7
97	020110		0206	Pumping Port	543			332.7
96	020105		0202					335.8
95	020110		0202					337.3
94	020110		0202					340.4
93	020110		0202					343.4
92	0238	19842	0202	Packer				346.5
91	020110		0205	Measurement Port	9706	0216		348.0
90	020105		0202					351.1
89	020110		0202					352.6
88	020110		0202					355.6
87	020110		0202					358.7
86	020110		0202					361.7
85	020110		0202					364.8
84	020110		0202					367.8
83	020110		0202					370.9
82	020110		0202					373.9
81	020110		0202					377.0
80	020110		0202					380.0
79	020110		0202					383.1
78	020110		0202					386.1
77	020110		0202					389.2
76	020110		0202					392.2
75	020110		0202					395.3
74	020110		0202					398.3
73	020110		0202					401.4
72	020110		0202					404.4
71	0238	19841	0202	Packer				407.4
70	020110		0205	Measurement Port	9707	0216		409.0

Item No.	Component Part Number	Component S/N	Coupling P/N	Component Discription	Coupling S/N	Accessory P/N	Accessory Depth (m)	Depth (m) *
69	020110		0206	Pumping Port	542			412.0
68	020105		0202					415.1
67	020110		0202					416.7
66	0238	19840	0202	Packer				419.7
65	020110		0205	Measurement Port	9713	0216		421.2
64	020105		0202					424.3
63	020110		0202					425.8
62	020110		0202					428.9
61	020110		0202					431.9
60	020110		0202					435.0
59	020110		0202					438.0
58	020110		0202					441.1
57	020110		0202					444.1
56	020110		0202					447.1
55	020110		0202					450.2
54	020110		0202					453.2
53	020110		0202					456.3
52	020110		0202					459.3
51	020110		0202					462.4
50	020110		0202					465.4
49	0238	19839	0202	Packer				468.5
48	020110		0205	Measurement Port	9705	0216		470.0
47	020110		0206	Pumping Port	541			473.1
46	020105		0202					476.2
45	020110		0202					477.7
44	020110		0202					480.7
43	020110		0202					483.8
42	020110		0202					486.8
41	0238	19838	0202	Packer				489.9
40	020110		0205	Measurement Port	9704	0216		491.4
39	020105		0202					494.5
38	020110		0202					496.0
37	020110		0202					499.0
36	020110		0202					502.1
35	020110		0202					505.1
34	020110		0202					508.2
33	020110		0202					511.2
32	020110		0202					514.3
31	020110		0202					517.3
30	020110		0202					520.4
29	020110		0202					523.4
28	020110		0202					526.5
27	020110		0202					529.5
26	020110		0202					532.6
25	020110		0202					535.6
24	020110		0202					538.7
23	020110		0202					541.7
22	020110		0202					544.8
21	020110		0202					547.8
20	020110		0202					550.8

Item No.	Component Part Number	Component S/N	Coupling P/N	Component Discription	Coupling S/N	Accessory P/N	Accessory Depth (m)	Depth (m) *
19	020110		0202					553.9
18	020110		0202					556.9
17	020110		0202					560.0
16	020110		0202					563.0
15	020110		0202					566.1
14	020110		0202					569.1
13	0238	19837	0202	Packer				572.2
12	020110		0205	Measurement Port	9711	0216		573.7
11	020110		0206	Pumping Port	540			576.8
10	020110		0202					579.9
9	020110		0202					582.9
8	0238	19836	0202	Packer				586.0
7	020110		0205	Measurement Port	9708	0216		587.5
6	020105		0202					590.5
5	020110		0202					592.1
4	020110		0202					595.1
3	020110		0202					598.2
2	020105		0202					601.2
1	020110		0202					602.7
0	0203							605.8

Depths are with respect to ground surface.

\* Component positions are referenced to the top of the subject Westbay System coupling.

\* Packer positions are referenced to the top Westbay System coupling on the packer.

Monitoring zone dimensions are determined as described on the attached "Dimensions of Packer Seals and Monitoring Zones".

The position of a MOSDAX Transducer in a Measurement Port is illustrated in the attached "MOSDAX Transducer Position".

This information may be used in calculating piezometric levels.

\* Component positions are not adjusted for borehole angle.

# Summary Completion Log

Company: Agnico Eagle/Golder  
Well: M20-3071  
Site: Discovery  
Project:

Job No: WB913  
Author: TK/ML

## Well Information

Reference Datum: Ground Surface  
Elevation of Datum: 0.00 m.  
MP Casing Top: 0.00 m.  
MP Casing Length: 606.00 m.

Borehole Depth: 606.02 m.  
Borehole Inclination: 70 deg from horizontal  
Borehole Diameter: 98.00 mm

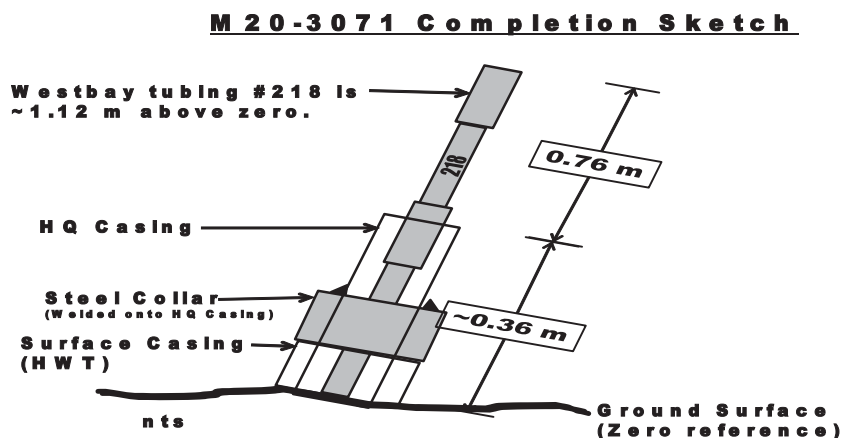
Well Description:  
MP38  
Other References:

## File Information

File Name: M203071F.WWD  
Report Date: Wed Sep 30 08:24:07 2020

File Date: Sep 30 08:21:01 2020

## Sketch of Wellhead Completion



















# Legend

**(Qty) MP Components**  
(Library - WD Library 04/29/15)

**Geology**

**Backfill/Casing**

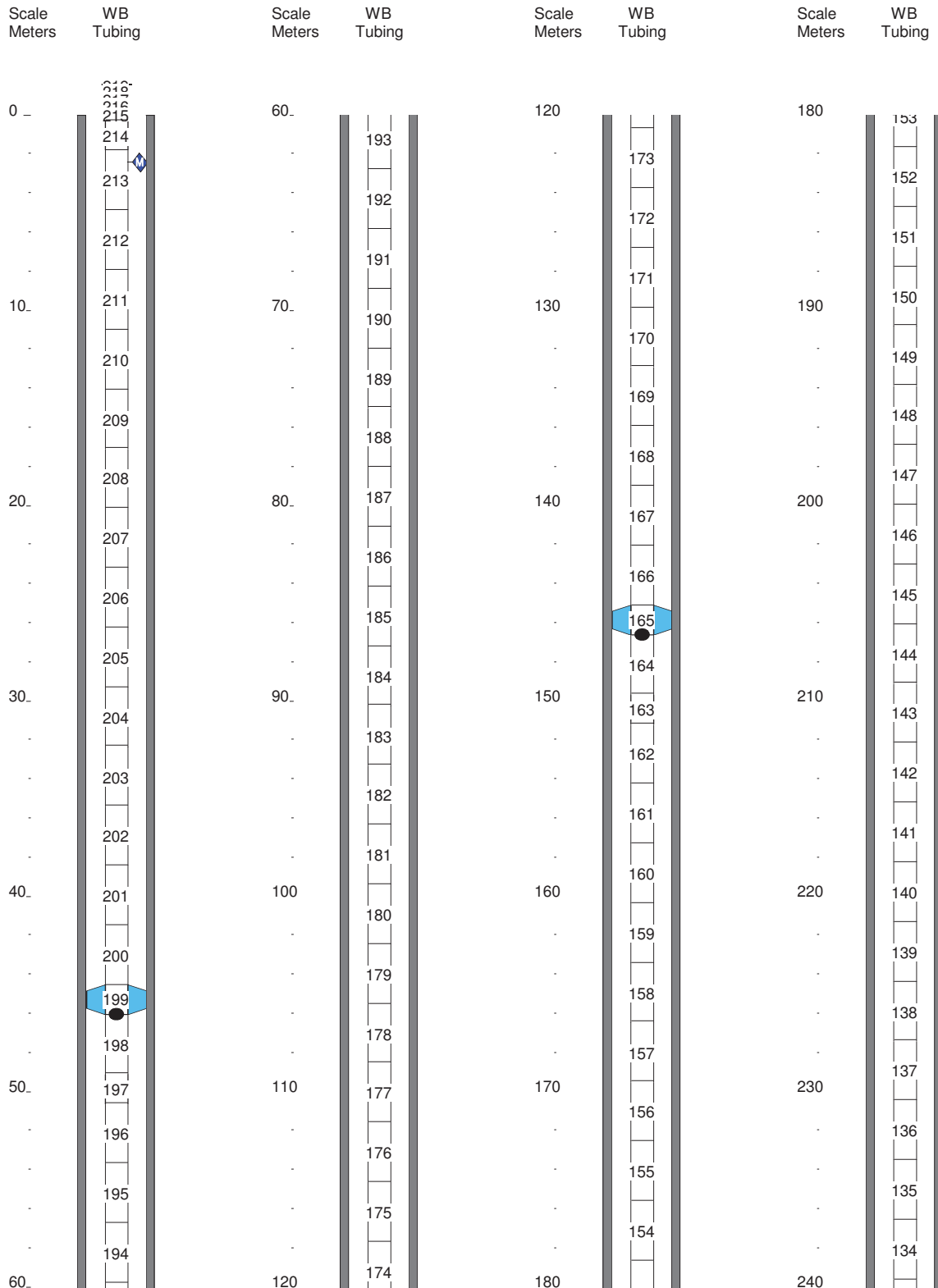
-  (1) 0203 - MP38 End Cap
-   (2) 020102 - MP38 Casing 3 (2F/0.6M)
-   (2) 020101 - MP38 Casing 4 (1F/0.3M)
-   (17) 020105 - MP38 Casing 2 (5F/1.5M)
-   (183) 020110 - MP38 Casing 1 (10F/3M)
-  (14) 0238 - MP38 Packer - 74mm  
(5F/1.5M)
-  (199) 0202 - MP38 Regular Coupling
-  (14) 0205 - MP38 Measurement Port
-  (6) 0206 - MP38 Hydraulic Pumping Port
-  (11) 0216 - Magnetic Location Collar
-  (1) 020305 - Tapered End Plug
-  (35) 025002C2 - Abrasion Protector





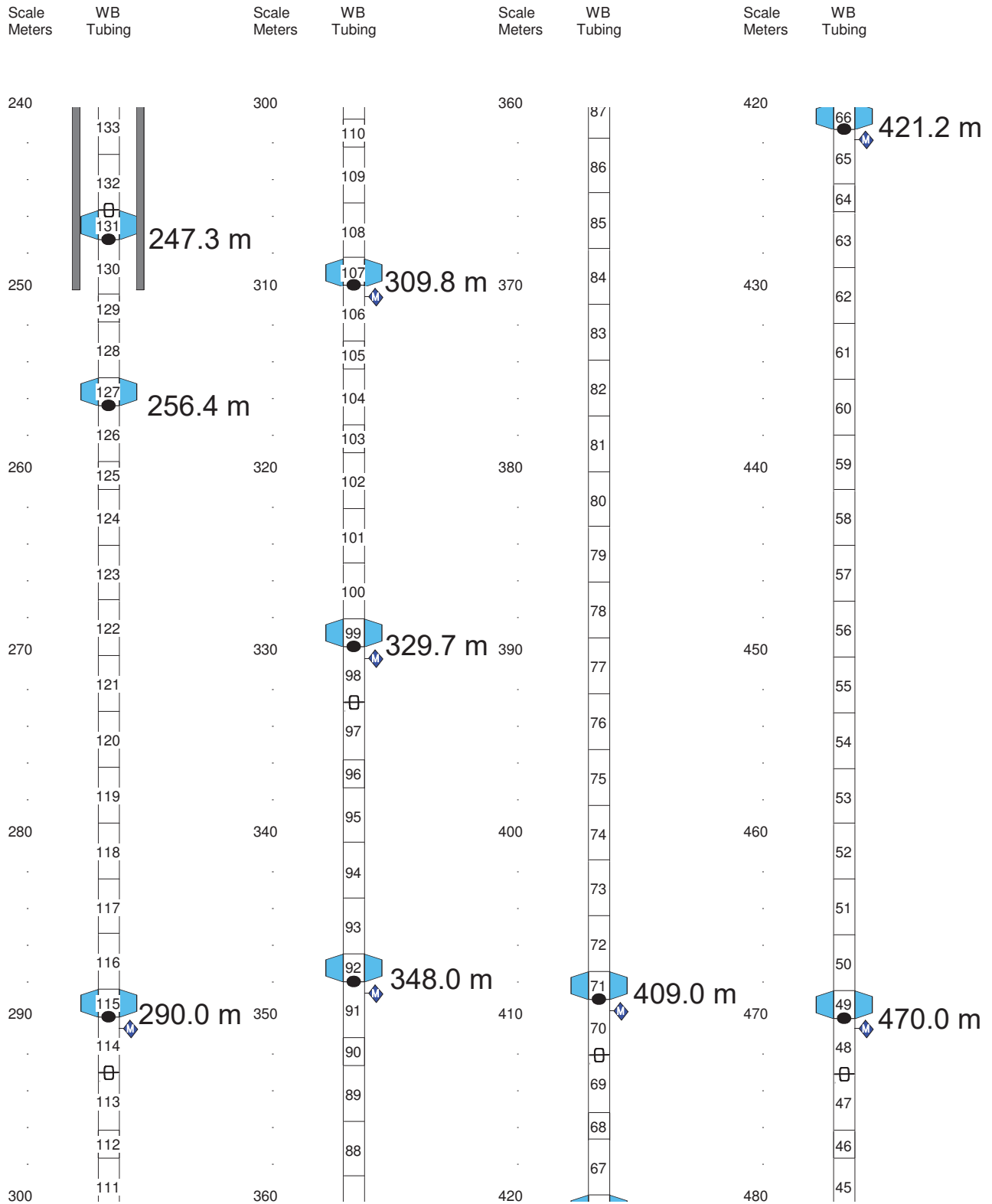
# Summary Completion Log Agnico Eagle/Golder

Job No: WB913  
Well: M20-3071



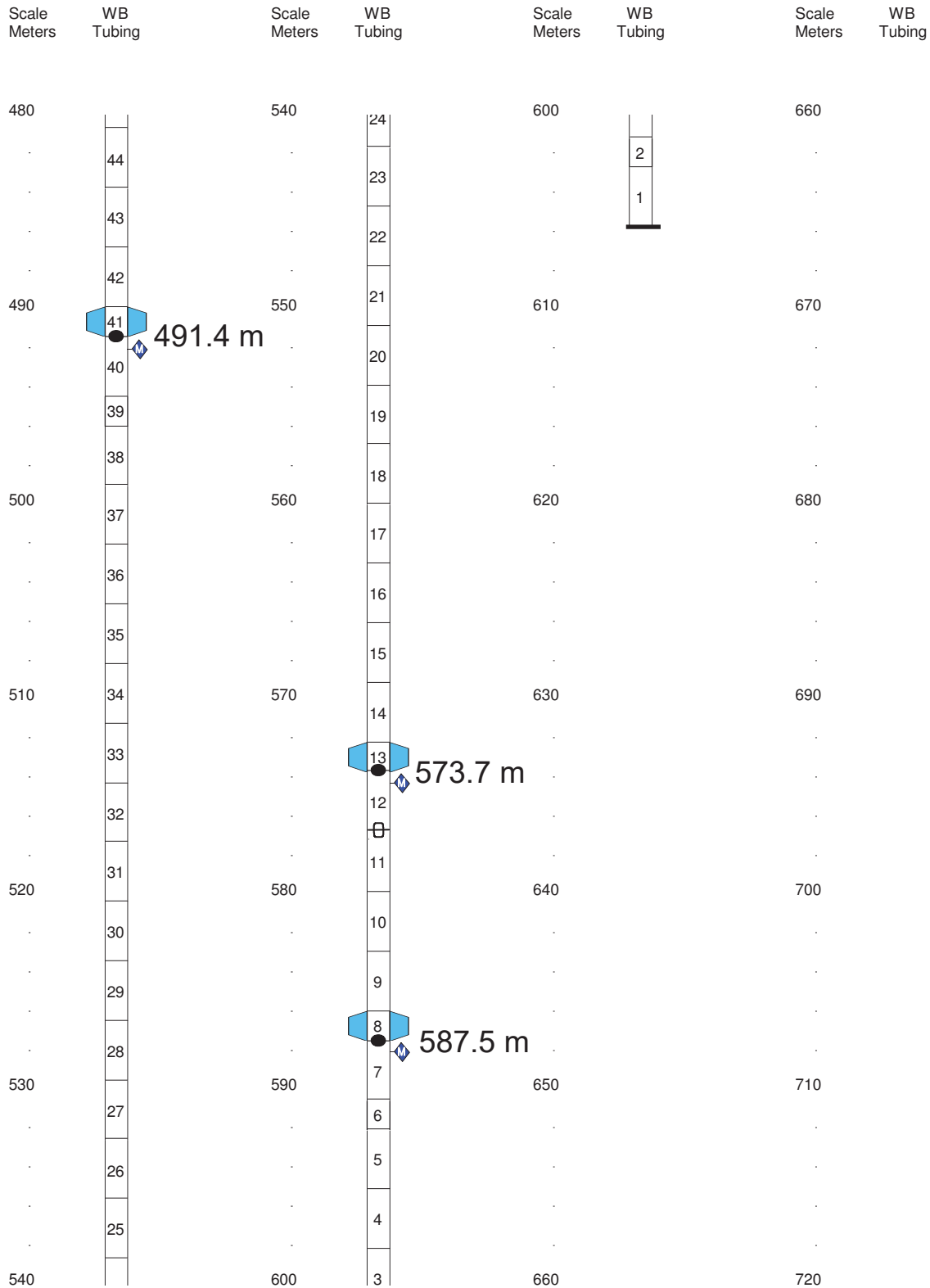
# Summary Completion Log Agnico Eagle/Golder

Job No: WB913  
Well: M20-3071



# Summary Completion Log Agnico Eagle/Golder

Job No: WB913  
Well: M20-3071





# Westbay Piezometric Pressures/Levels

Field Data and Calculation Sheet

Well No.: M 20 - 3071  
 Datum: GL  
 Elev. G.S.: \_\_\_\_\_  
 Height of Westbay above G.S.: \_\_\_\_\_  
 Elev. top of Westbay Casing: \_\_\_\_\_  
 Reference Elevation: \_\_\_\_\_  
 Borehole angle: 75°

Probe Type: EM6/Sampler  
 Serial No.: EM6 1764  
 Probe Range: 2K  
 Westbay Casing Type: MP308  
 Sampler Valve Position: A closed

Date: Aug 31 / 2020  
 Client: AEM  
 Job No.: 10413  
 Location: Discovery  
 Weather: Night / Dark / Windy  
 Operator: TK / ML

Note: "Port position" in angled boreholes refer to position along drillhole. True depth (Dp) needs to be calculated using borehole angle and deviation data to calculate zone piezometric level (Dz).

Ambient Reading (P<sub>atm</sub>) (pressure, temperature, time)

Start: Pressure 14.24      Finish: 14.40  
 Temp 10.36                      3.06  
 Time 00:26 AM                      02:00

P<sub>atm</sub> 14.24 psi

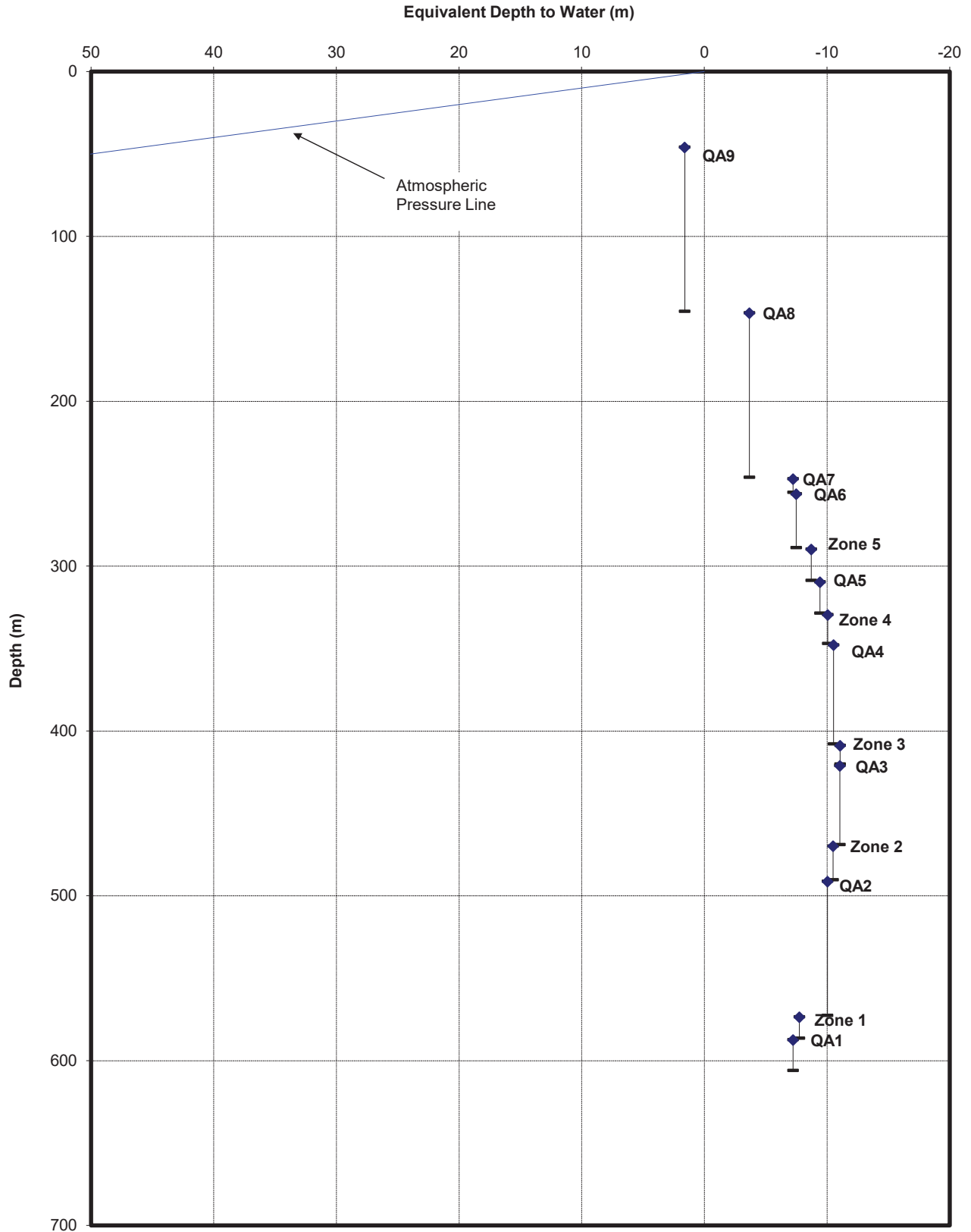
Port No.	Port Position From Log (m)	Port Position From Cable (m)	True Port Depth "Dp" (m)	Fluid Pressure Readings				Pressure Head Outside Port (m) H = (P2 - Patm) / w	Piez. Level Outside Port (m) Dz = Dp - H	Comments	
				Inside Casing (P1)	Outside Casing (P2)	Time H:M:S	Probe Temp. (°C)				Inside Casing (P1)
1	587.49	587.8		716.48	859.94	00:54	7.45	718.46	594.73	-7.24	18 rd.
2	573.70	574.1		700.74	841.06	00:57	7.60	700.74	581.45	-7.74	18 rd.
3	491.41	491.8	492.3	594.42	727.32	01:06	6.84	594.36	501.46	-10.05	18 rd.
4	470.00	471.1		566.41	697.52	01:11	6.55	566.48	480.51	-10.50	18 rd.
5	421.23	422.5		502.56	628.95	01:15	6.11	502.57	432.29	-11.06	18 rd.
6	408.97	410.04		486.33	611.54	01:17	6.02	486.31	420.04	-11.07	18 rd.
7	348.01	349.8		405.14	528.11	01:22	5.19	405.18	358.65	-10.55	18 rd.
8	329.65	331.5		380.43	497.32	01:26	4.75	380.47	339.72	-10.07	18 rd.
9	309.84	311.8		353.69	468.24	01:29	4.51	353.73	319.27	-9.42	18 rd.
10	289.95	292.0		326.80	438.94	01:32	4.26	326.83	298.66	-8.71	18 rd.
11	256.42	258.6		281.23	389.52	01:38	3.70	281.23	263.90	-7.49	18 rd.
12	247.28	249.5		268.88	376.15	01:41	3.59	268.84	254.51	-7.23	18 rd.
13	146.62	149.6		130.14	227.95	01:47	2.93	130.22	150.29	-3.67	18 rd.
14	46.04	49.3		14.47	77.44	01:54	2.92	14.47	44.44	-1.6	18 rd.

Notes: w = 1.422psi / m of H<sub>2</sub>O      Dz = piezometric level in zone      Patm = atmospheric pressure      H = pressure head of water in zone      Dp = true depth of measurement port

DTW WB ~ 63 / 64 m      585.2. Peep with rd. = 588.2.

**Piezometric Profile**  
**Monitoring Well: M20-3071**

Profile Date: August 31, 2020  
Comments: Pre-Inflation Profile



Client: Agnico Eagle  
Site: Discovery  
Datum: Ground Surface

**Figure 3**

Plot By: TK Date: Sept 30/20  
Checked By: DL Date: Sept 30/20  
Westbay Project: WB913



**Westbay**  
Instruments

# Westbay Piezometric Pressures/Levels

Field Data and Calculation Sheet

Well No.: M20-3071  
 Datum: GL  
 Elev. G.S.: \_\_\_\_\_  
 Height of Westbay above G.S.: \_\_\_\_\_  
 Elev. top of Westbay casing: \_\_\_\_\_  
 Reference Elevation: \_\_\_\_\_  
 Borehole angle: 75°

Probe Type: o/c sampler  
 Serial No.: ZMS1764  
 Probe Range: 2k  
 Westbay Casing Type: MP38  
 Sampler Valve Position: closed

Date: Sept 7 2020  
 Client: AEM  
 Job No.: LR113  
 Location: Discovery Helicon Mine  
 Weather: Sun  
 Operator: DE/KL

Ambient Reading (P<sub>amb</sub>) (pressure, temperature, time)  
 Start: Pressure 14.50 Finish: 14.73  
 Temp 9.34  
 Time 14:07  
 P<sub>amb</sub> 14.50 psi

Note: "Port position" in angled boreholes refer to position along drillhole. True depth (Dp) needs to be calculated using borehole angle and deviation data to calculate zone piezometric level (Dz).

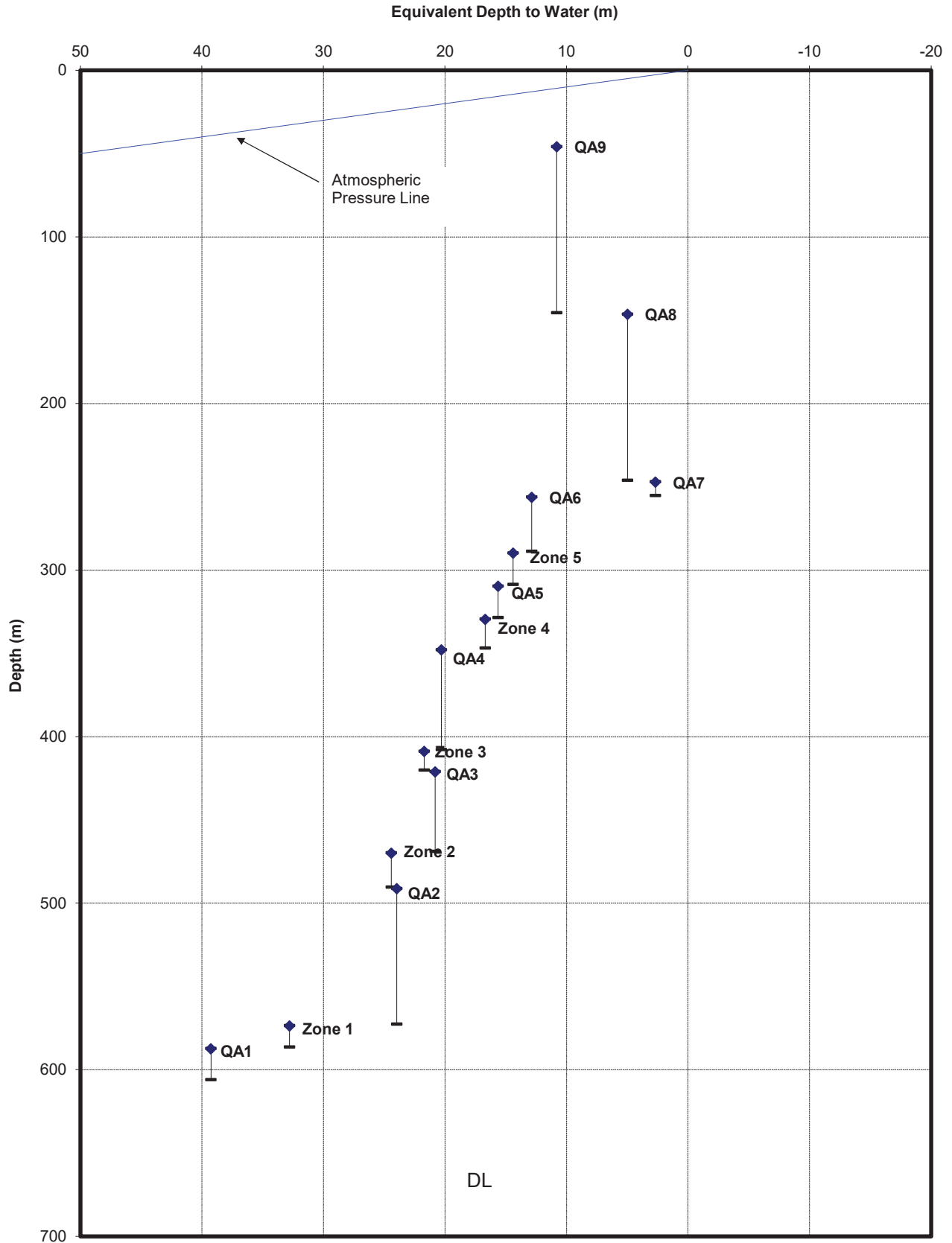
Port No.	Port Position From Log (m)	Port Position From Cable (m)	True Port Depth "Dp" (m)	Fluid Pressure Readings				Piez. Level Outside Port (m)	Comments	
				Inside Casing (P1)	Outside Casing (P2)	Time H:M:S	Probe Temp. (°C)			Inside Casing (P1)
1	507.49	585.7		791.05	794.18	14:28	6.90	791.08	39.24	17 rots
2	513.70	571.9		772.82	783.76	14:33	7.34	772.86	32.76	18 rots
3	491.41	490.2		664.47	679.29	14:41	6.56	664.47	23.96	17 rots
4	490.00	469.0		636.05	648.20	14:45	6.26	636.06	24.41	18 rots
5	421.23	420.5		570.98	583.98	14:50	5.66	570.96	20.81	18 rots
6	408.97	404.4		554.46	565.27	14:55	5.30	554.49	21.71	18 rots
7	348.01	349.8		492.24	480.60	15:04	4.55	492.26	20.29	18 rots
8	329.65	321.5		447.36	459.63	15:08	4.27	447.34	16.68	17 rots
9	309.84	309.7		420.30	432.96	15:12	3.99	420.34	15.62	18 rots
10	289.45	290.0		393.15	406.44	15:16	3.71	393.13	14.38	18 rots
11	256.42	256.7		347.44	360.93	15:22	3.11	347.39	12.85	17 rots
12	247.28	247.6		334.79	362.41	15:25	2.99	334.82	2.67	17 rots
13	146.62	147.6		196.93	216.00	15:32	1.90	195.91	4.97	17 rots
14	46.04	47.6		55.45	64.71	15:38	0.24	55.42	10.70	17 rots

Notes: w = 1.422psi / m of H<sub>2</sub>O  
 Dz = piezometric level in zone  
 Pamb = atmospheric pressure  
 H = pressure head of water in zone  
 Dp = true depth of measurement port

BTW WB (by probe) ~ 18.7m

**Piezometric Profile**  
**Monitoring Well: M20-3071**

Profile Date: September 7, 2020  
 Comments: Post-Inflation Profile



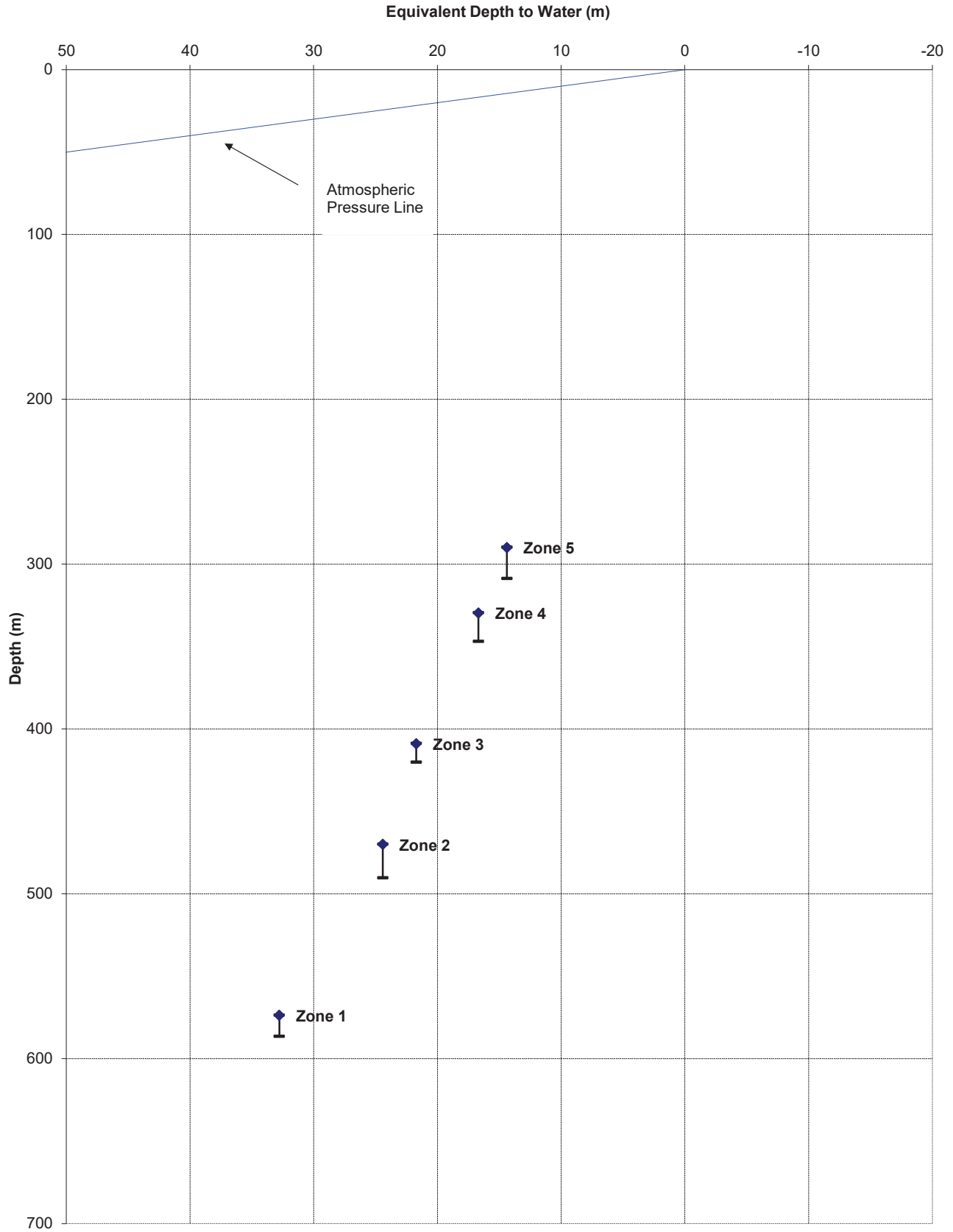
Client: Agnico Eagle  
 Site: Discovery  
 Datum: Ground Surface

**Figure 4**

Plot By: TK Date: Sept 30/20  
 Checked By: DL Date: Sept 30/20  
 Westbay Project: WB913

**Piezometric Profile**  
**Monitoring Well: M20-3071**

Profile Date: September 7, 2020  
Comments: Post-Inflation Profile  
Monitoring zones only



Client: Agnico Eagle  
Site: Discovery  
Datum: Ground Surface

**Figure 5**

Plot By: TK Date: Sept 30/20  
Checked By: \_\_\_ Date: \_\_\_  
Westbay Project: WB913



# Westbay Completion Log

Company: Agnico Eagle/Golder  
Well: M20-3071  
Site: Discovery  
Project:

Job No: WB913  
Author: TK/ML

## Well Information

Reference Datum: Ground Surface  
Elevation of Datum: 0.00 m.  
MP Casing Top: 0.00 m.  
MP Casing Length: ~~605.83 m.~~

606.0 m *TK*

Borehole Depth: ~~604.78 m.~~ 606.02 m *CH*  
Borehole Inclination: 75 Deg *CH*  
Borehole Diameter: 98.00 mm

Well Description:  
MP38  
Other References:

## File Information

File Name: M20\_3071.WWD  
Report Date: Sat Aug 29 07:15:30 2020

File Date: Aug 29 09:14:17 2020

## Comments






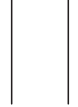







Filter rocks to be used on measurement ports - *CH*  
Zero reference is ground surface - *CH*  
Bottom of HQ rod at 249.92 m below ground surface. *CH*  
Westbay tubing to be installed in open borehole below 250 m -

## Log Information

Borehole condition confirmed.  
MP well design & preparation.  
MP well design checked.  
MP well and borehole approved to install.

(method) Rods Date: Aug 28/20  
By: *TK* Date: Aug 29/20  
By: *CH* Date: Aug 29/20  
By: *[Signature]* Date: Aug 30/20

## Legend

<b>(Qty) MP Components</b> (Library - WD Library 04/29/15)		<b>Geology</b>	<b>Backfill/Casing</b>
	(1) 0203 - MP38 End Cap		 Mild Steel
	(2) 020102 - MP38 Casing 3 (2F/0.6M)		
	(2) 020101 - MP38 Casing 4 (1F/0.3M)		
	(17) 020105 - MP38 Casing 2 (5F/1.5M)		
	(183) 020110 - MP38 Casing 1 (10F/3M)		
	(14) 0238 - MP38 Packer - 74mm (5F/1.5M)		
	(199) 0202 - MP38 Regular Coupling		
	(14) 0205 - MP38 Measurement Port		
	(6) 0206 - MP38 Hydraulic Pumping Port		
	(11) 0216 - Magnetic Location Collar		
	(1) 020305 - Tapered End Plug		
	(35) 025002C2 - Abrasion Protector		

# Westbay Completion Log Agnico Eagle/Golder

Job No: WB913  
Well: M20-3071

Scale Meters	WB Tubing	QA Tested OK	WB Tubing Description	Serial Numbers
0	215	<input type="checkbox"/>	020102 - MP38 Casing 3 (2F/0.6M)	<i>22:20 pm finished downing #214 at the well head.</i>
	214	<input checked="" type="checkbox"/>	020105 - MP38 Casing 2 (5F/1.5M)	
	213	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	212	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	<i>#212 add water ~20 l.</i>
10	211	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	210	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	209	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	208	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
20	207	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	<i>#207 add water ~20 l.</i>
	206	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	205	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
30	204	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	203	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	202	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
40	201	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	<i>#201 add water ~20 l.</i>
	200	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	199	<input checked="" type="checkbox"/>	0238 - MP38 Packer - 74mm (5F/1.5M)	<i>19821</i>
	198	<input checked="" type="checkbox"/>	0205 - MP38 Measurement Port	<i>MP 9217</i>
50	197	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	196	<input checked="" type="checkbox"/>	020105 - MP38 Casing 2 (5F/1.5M)	
	195	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	<i>#195 Add water ~20 l.</i>
	194	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	

# Westbay Completion Log Agnico Eagle/Golder

Job No: WB913  
Well: M20-3071

Scale Meters	WB Tubing	QA Tested OK	WB Tubing Description	Serial Numbers
60	193	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	192	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	191	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
70	190	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	189	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	# 189 add water
	188	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
80	187	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	186	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	185	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	# 185 add water roll
	184	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
90	183	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	182	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	181	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
100	180	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	179	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	# 179 add water roll
	178	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
110	177	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	176	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	175	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
120	174	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	

# Westbay Completion Log Agnico Eagle/Golder

Job No: WB913  
Well: M20-3071

Scale Meters	WB Tubing	QA Tested OK	WB Tubing Description	Serial Numbers
120	173	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	# 173 add water sol.
	172	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	171	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
130	170	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	169	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	168	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
140	167	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	# 167 add water sol.
	166	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	165	<input checked="" type="checkbox"/>	0238 - MP38 Packer - 74mm (5F/1.5M) 0205 - MP38 Measurement Port	10822 MD 9716
	164	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
150	163	<input checked="" type="checkbox"/>	020105 - MP38 Casing 2 (5F/1.5M)	
	162	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	161	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	# 161 add add water sol.
	160	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
160	159	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	18-49 Resins
	158	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	# 158 at well 18-20PM crew change.
	157	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
170	156	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	155	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	# 155 Add water sol.
	154	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
180				

# Westbay Completion Log Agnico Eagle/Golder

Job No: WB913  
Well: M20-3071

Scale Meters	WB Tubing	QA Tested OK	WB Tubing Description	Serial Numbers
180	153	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	152	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	151	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
190	150	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	#150 add water roll.
	149	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	148	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
200	147	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	146	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	#146 Add water roll.
	145	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
210	144	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	143	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	142	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	141	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
220	140	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	#140 Add water roll.
	139	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	138	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
230	137	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	136	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	135	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
5m. -	134	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	#134 Add water roll.
240		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	

# Westbay Completion Log Agnico Eagle/Golder

Job No: WB913  
Well: M20-3071

Scale Meters	WB Tubing	QA Tested OK	WB Tubing Description	Serial Numbers
240		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	PP 544
		<input checked="" type="checkbox"/>	0206 - MP38 Hydraulic Pumping Port	19845
		<input checked="" type="checkbox"/>	0238 - MP38 Packer - 74mm (5F/1.5M)	MP 9712
		<input checked="" type="checkbox"/>	0205 - MP38 Measurement Port	
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	# 120 adding water 2-20 l.
250		<input checked="" type="checkbox"/>	020105 - MP38 Casing 2 (5F/1.5M)	
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
		<input checked="" type="checkbox"/>	0238 - MP38 Packer - 74mm (5F/1.5M)	19846
		<input checked="" type="checkbox"/>	0205 - MP38 Measurement Port	MP 9715
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
260		<input checked="" type="checkbox"/>	020105 - MP38 Casing 2 (5F/1.5M)	
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
270		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	# 121 Adding water 2-1 mixing 2-20 l.
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
280		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	19820
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	# 115 Adding water MP <del>9709</del> 9709 2-20 l.
290		<input checked="" type="checkbox"/>	0238 - MP38 Packer - 74mm (5F/1.5M)	PP 545/last of 1-4 mix time
		<input checked="" type="checkbox"/>	0205 - MP38 Measurement Port	2-1 mix will be added.
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
		<input checked="" type="checkbox"/>	0206 - MP38 Hydraulic Pumping Port	
		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
		<input checked="" type="checkbox"/>	020105 - MP38 Casing 2 (5F/1.5M)	
300		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	

# Westbay Completion Log Agnico Eagle/Golder

Job No: WB913  
Well: M20-3071

Scale Meters	WB Tubing	QA Tested OK	WB Tubing Description	Serial Numbers
300	110	<input checked="" type="checkbox"/>	020105 - MP38 Casing 2 (5F/1.5M)	#110 DTW WB
	109	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	3m Top of 110
	108	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
310	107	<input checked="" type="checkbox"/>	0238 - MP38 Packer - 74mm (5F/1.5M)	#106 Adding water
	106	<input checked="" type="checkbox"/>	0205 - MP38 Measurement Port	19844
	105	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	MP 9714
	104	<input checked="" type="checkbox"/>	020105 - MP38 Casing 2 (5F/1.5M)	
	103	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
320	102	<input checked="" type="checkbox"/>	020105 - MP38 Casing 2 (5F/1.5M)	
	101	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	#101 Adding water
	100	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	2202
330	99	<input checked="" type="checkbox"/>	0238 - MP38 Packer - 74mm (5F/1.5M)	19843
	98	<input checked="" type="checkbox"/>	0205 - MP38 Measurement Port	MP 9710
	97	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	PP 543
	96	<input checked="" type="checkbox"/>	0206 - MP38 Hydraulic Pumping Port	
	95	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
340	94	<input checked="" type="checkbox"/>	020105 - MP38 Casing 2 (5F/1.5M)	
	93	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	#93 Adding water
	92	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	2202
350	91	<input checked="" type="checkbox"/>	0238 - MP38 Packer - 74mm (5F/1.5M)	19842
	90	<input checked="" type="checkbox"/>	0205 - MP38 Measurement Port	MP 9706
	89	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	88	<input checked="" type="checkbox"/>	020105 - MP38 Casing 2 (5F/1.5M)	
360		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	



# Westbay Completion Log Agnico Eagle/Golder

Job No: WB913  
Well: M20-3071

Scale Meters	WB Tubing	QA Tested OK	WB Tubing Description	Serial Numbers
360	87	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	86	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	85	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
370	84	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	83	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	#83 Adding water vol.
	82	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
380	81	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	80	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	79	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	#79 Adding water vol.
	78	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
390	77	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	1311 testing.
	76	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	#75 at well head.
	75	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	Break. 12-45 pm
400	74	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	73	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	72	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
410	71	<input checked="" type="checkbox"/>	0238 - MP38 Packer - 74mm (5F/1.5M)	#71 Adding water vol.
	70	<input checked="" type="checkbox"/>	0205 - MP38 Measurement Port	19841
	69	<input checked="" type="checkbox"/>	0206 - MP38 Hydraulic Pumping Port	MP 9707
	68	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	PP 542
	67	<input checked="" type="checkbox"/>	020105 - MP38 Casing 2 (5F/1.5M)	
420		<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	

# Westbay Completion Log Agnico Eagle/Golder

Job No: WB913  
Well: M20-3071

Scale Meters	WB Tubing	QA Tested OK	WB Tubing Description	Serial Numbers
420	66	<input checked="" type="checkbox"/>	0238 - MP38 Packer - 74mm (5F/1.5M)	19840
	65	<input checked="" type="checkbox"/>	0205 - MP38 Measurement Port	MP 973
	64	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	#63 Adding water 220L
	63	<input checked="" type="checkbox"/>	020105 - MP38 Casing 2 (5F/1.5M)	
	62	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
430	61	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	60	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
3rd - 440	59	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	58	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	57	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	#56 Adding water 220L
	56	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
450	55	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	54	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	53	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
460	52	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	51	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	#51 Adding water 220L
	50	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
470	49	<input checked="" type="checkbox"/>	0238 - MP38 Packer - 74mm (5F/1.5M)	19839
	48	<input checked="" type="checkbox"/>	0205 - MP38 Measurement Port	MP 9705
	47	<input checked="" type="checkbox"/>	0206 - MP38 Hydraulic Pumping Port	PP 541
	46	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	45	<input checked="" type="checkbox"/>	020105 - MP38 Casing 2 (5F/1.5M)	
480	45	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	

# Westbay Completion Log Agnico Eagle/Golder

Job No: WB913  
Well: M20-3071

Scale Meters	WB Tubing	QA Tested OK	WB Tubing Description	Serial Numbers
480	44	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	43	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	42	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	#43 Add water ~20 l 20 l
490	41	<input checked="" type="checkbox"/>	0238 - MP38 Packer - 74mm (5F/1.5M) 0205 - MP38 Measurement Port	WB is full
	40	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	19838 MP 9704
	39	<input checked="" type="checkbox"/>	020105 - MP38 Casing 2 (5F/1.5M)	
	38	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
500	37	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	#37 Add water ~30 l
	36	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	35	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
510	34	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	33	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	32	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	31	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	#31 Add water ~20 l
520	30	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	29	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	28	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
530	27	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	
	26	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	#26 Add water ~20 l
	25	<input checked="" type="checkbox"/>	020110 - MP38 Casing 1 (10F/3M)	

# Westbay Completion Log Agnico Eagle/Golder

Job No: WB913  
Well: M20-3071

Scale Meters	WB Tubing	QA Tested OK	WB Tubing Description	Serial Numbers
540	24	✓	020110 - MP38 Casing 1 (10F/3M)	
	23	✓✓✓	020110 - MP38 Casing 1 (10F/3M)	
	22	✓✓✓	020110 - MP38 Casing 1 (10F/3M)	
	21	✓	020110 - MP38 Casing 1 (10F/3M)	#21 Add water ~ 20L
550	20	✓✓✓	020110 - MP38 Casing 1 (10F/3M)	
	19	✓	020110 - MP38 Casing 1 (10F/3M)	
	18	✓✓✓	020110 - MP38 Casing 1 (10F/3M)	
560	17	✓	020110 - MP38 Casing 1 (10F/3M)	#17 Add water ~ 20L
	16	✓✓✓	020110 - MP38 Casing 1 (10F/3M)	~ 4 And 7W WB
	15	✓	020110 - MP38 Casing 1 (10F/3M)	
570	14	✓✓✓	020110 - MP38 Casing 1 (10F/3M)	
	13	✓✓✓	0238 - MP38 Packer - 74mm (5F/1.5M) 0205 - MP38 Measurement Port	#13 Add water ~ 20L 19837 MP 9771 PP 540
	12	✓	020110 - MP38 Casing 1 (10F/3M)	
	11	✓✓✓	0206 - MP38 Hydraulic Pumping Port	
580	10	✓	020110 - MP38 Casing 1 (10F/3M)	#10 Add water ~ 15L 8-40am
	9	✓✓✓	020110 - MP38 Casing 1 (10F/3M)	
	8	✓✓✓	0238 - MP38 Packer - 74mm (5F/1.5M) 0205 - MP38 Measurement Port	19836 MP 9708
590	7	✓	020110 - MP38 Casing 1 (10F/3M)	
	6	✓✓✓	020105 - MP38 Casing 2 (5F/1.5M)	
	5	✓	020110 - MP38 Casing 1 (10F/3M)	
	4	✓✓✓	020110 - MP38 Casing 1 (10F/3M)	
600	3	✓	020110 - MP38 Casing 1 (10F/3M)	

Westbay Completion Log  
Agnico Eagle/Golder

Job No: WB913  
Well: M20-3071

Scale Meters	WB Tubing	QA Tested OK	WB Tubing Description	Serial Numbers
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600

2
1

<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

020105 - MP38 Casing 2 (5F/1.5M)

020110 - MP38 Casing 1 (10F/3M)

0203 - MP38 End Cap

*tapped end cap with RC*

610

DTW - 13-44 m Top of casing

8:10am Aug 30 start lowering  
421 Antiferrous mixture

620

630

Hydraulic Integrity Test

Aug 31, 2020

2:15am @ 65.026 m

2:25am @ 65.022 m

2:35am @ 65.021 m

2:45am @ 65.021 m

2:55am @ 65.021 m

Westbay Casing  
is water tight.  
mud L

640

650

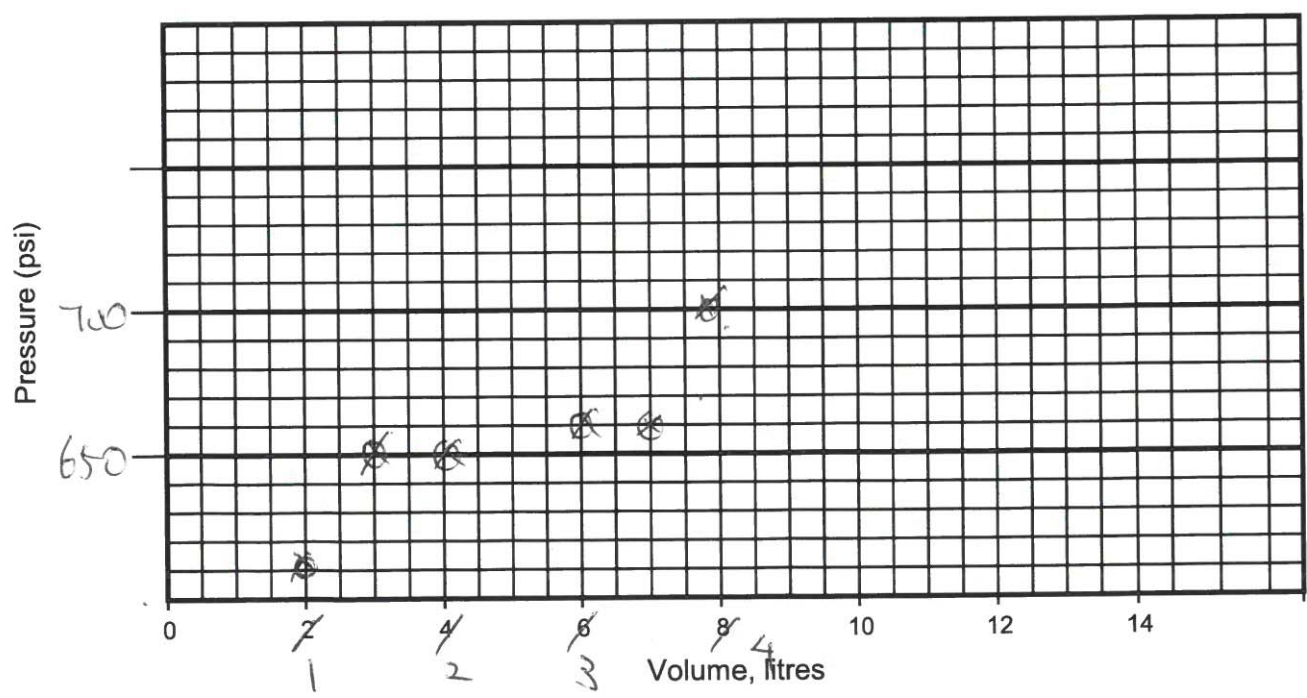
660



# Westbay Packer Inflation Record

Project: Agnic Esalt Eagle Project No.: WR 913 Well No.: M20-3071  
 Location: Nelidiam Mine / Discovery Completed by: TR/ML Date Inflated: Sept 6 120  
 Packer No. Rubber #1, Comp 8, SN 19A30 Depth (ft/m): 585.97 Inflation Tool No.: T1W3994  
 Packer Valve Pressure, P<sub>V</sub>: 145 psi Final Line Pressure, P<sub>L</sub>: 700 psi Tool Pressure, P<sub>T</sub>: 400 psi  
 Borehole Water Level: ~ (ft/m) = ∅ psi (P<sub>w</sub>)  
 Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>w</sub> - P<sub>V</sub> - P<sub>T</sub> = 155 psi

Volume, litres	0.5	1.0	1.5	1.75	2.0	2.5	2.75	3.0	3.25	3.5
Pressure, psi	600	610	650	650	650	660	660	660	660	660
Volume, litres	3.7	3.75	3.85	3.5						
Pressure, psi	670	680	700	∅						



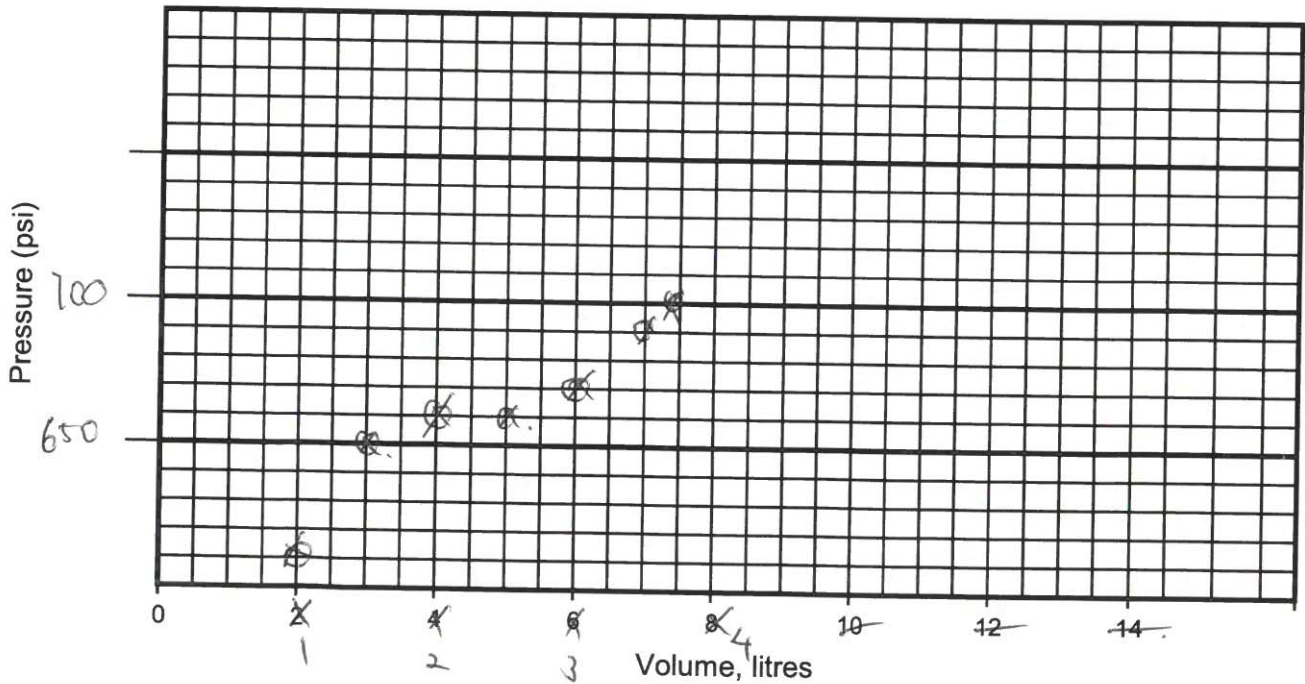
Comments: \_\_\_\_\_ Time - 14 = 12.



# Westbay Packer Inflation Record

Project: Agnico Eagle Project No.: WR 9B Well No.: M20-3071  
 Location: McLachline Mine / Discovery Completed by: TR/M Date Inflated: Sept 6/20  
 Packer No. #2, Comp B, SN 19837 Depth (ft/m): 572.16 Inflation Tool No.: TW3994  
 Packer Valve Pressure, P<sub>V</sub>: 150 psi Final Line Pressure, P<sub>L</sub>: 700 psi Tool Pressure, P<sub>T</sub>: 400 psi  
 Borehole Water Level: ~ (ft/m) = ∅ psi (P<sub>W</sub>)  
 Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>W</sub> - P<sub>V</sub> - P<sub>T</sub> = 150 psi

Volume, litres	0.5	1.0	1.5	2.0	2.5	3.0	3.25	3.5	3.75	3.85
Pressure, psi	500	610	650	660	660	670	670	690	690	700
Volume, litres	3.5									
Pressure, psi	∅									



Comments: \_\_\_\_\_

Time - 14:43

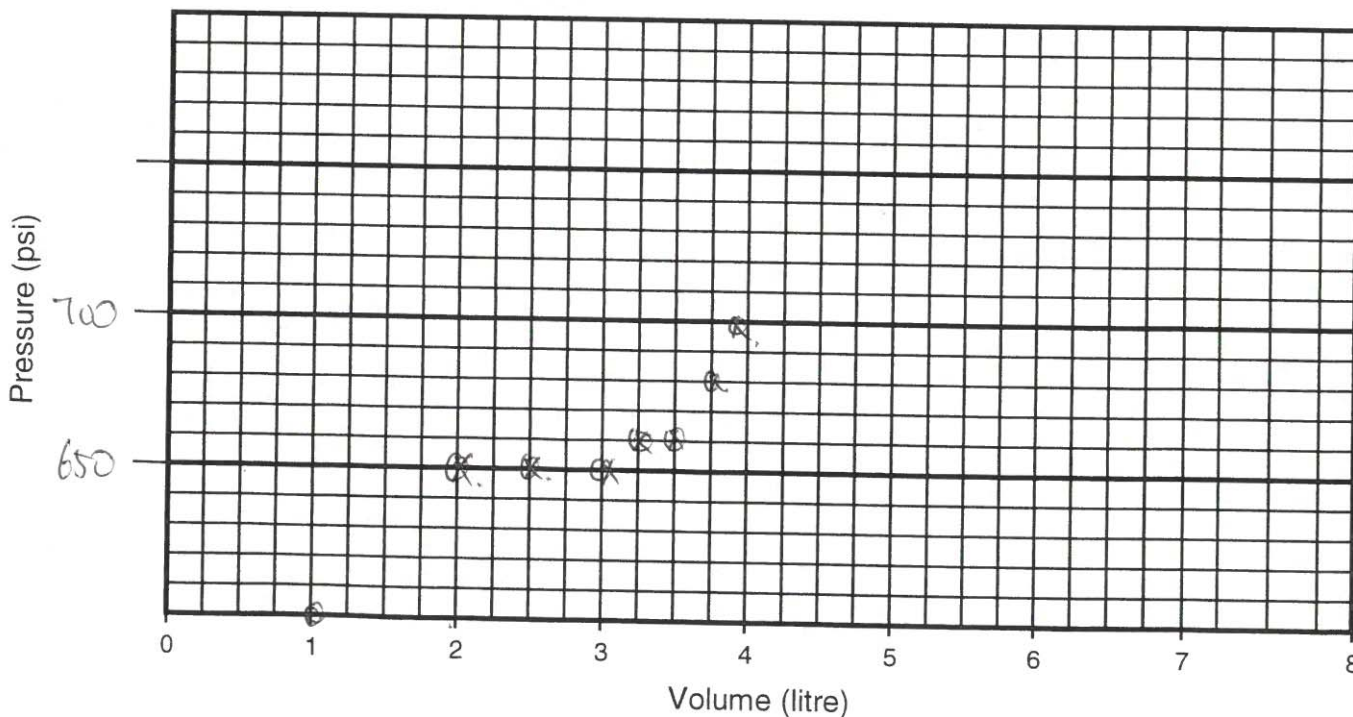


# Westbay Packer Inflation Record

Project: Agric Eagle Project No.: WS 713 Well No.: M20-3071  
 Location: Meladime Mine / Discovery Completed by: TK/ML Date Inflated: Sept 6 / 20  
 Packer No. #3, comp 41, SH 1903B Depth (ft @m): 489.89 Inflation Tool No.: TW 3994  
 Packer Valve Pressure, P<sub>V</sub>: 135 psi Final Line Pressure, P<sub>L</sub>: 700 psi Tool Pressure, P<sub>T</sub>: 400 psi  
 Borehole Water Level: 26 (ft @) =      psi (P<sub>w</sub>)

Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>w</sub> - P<sub>V</sub> - P<sub>T</sub> = 165 psi

Volume, litres	0.5	1.0	1.5	2.0	2.5	<del>2.75</del> 3.0	3.0	3.25	3.5	3.75
Pressure, psi	560	600	640	650	650	650	650	660	660	660
Volume, litres	3.85	3.6								
Pressure, psi	700	∅								



Comments: \_\_\_\_\_ Time - 15=36

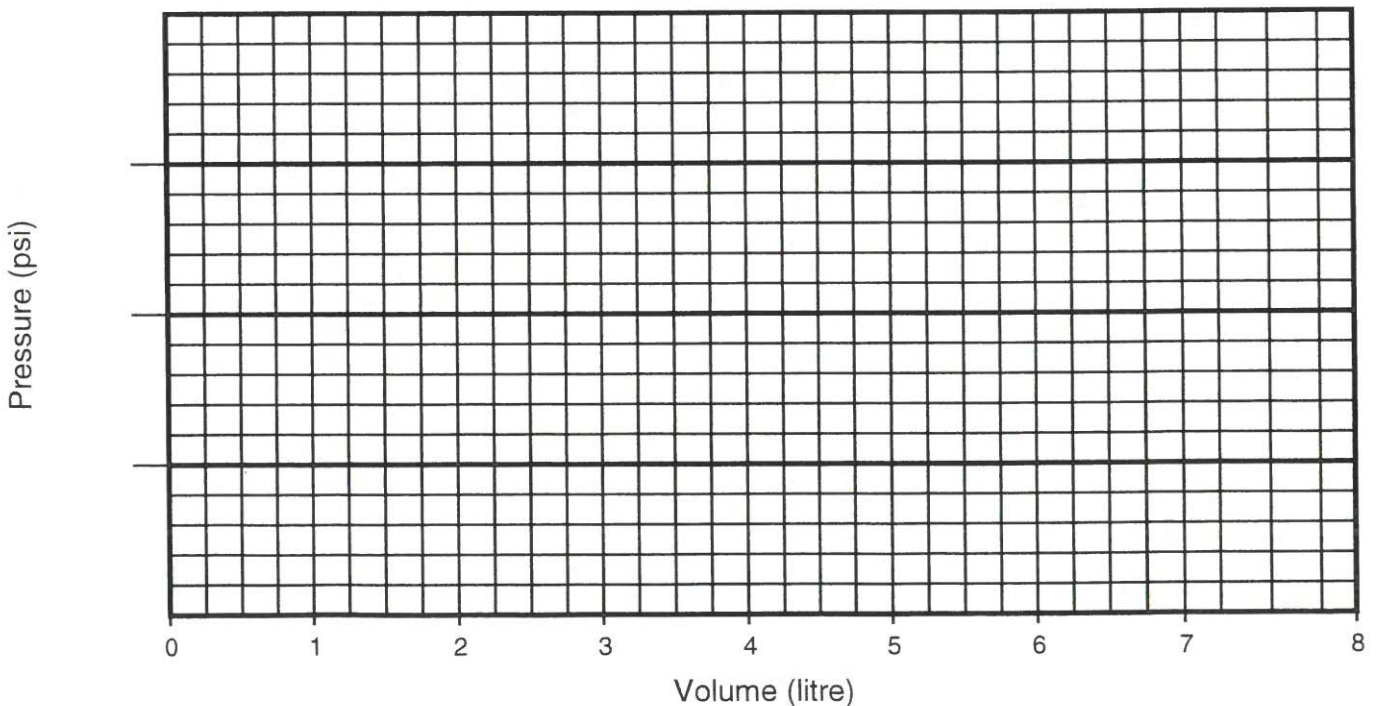




# Westbay Packer Inflation Record

Project: Agnico Eagle Project No.: WB913 Well No.: M20-3071  
 Location: Hebractine Mine / Discovery Completed by: TK/ML Date Inflated: Sept 6 20  
 Packer No. #4, Comp 4A, SN 19839 Depth (ft/m): 466.48 Inflation Tool No.: T103114  
 Packer Valve Pressure, P<sub>V</sub>: 150 psi Final Line Pressure, P<sub>L</sub>: 700 psi Tool Pressure, P<sub>T</sub>: 400 psi  
 Borehole Water Level: \_\_\_\_\_ (ft/m) = \_\_\_\_\_ psi (P<sub>W</sub>)  
 Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>W</sub> - P<sub>V</sub> - P<sub>T</sub> = 150 psi

Volume, litres	0.5	1.0	1.5	2.0	2.5	2.75	3.0	3.25	3.5	3.75
Pressure, psi	600	610	650	650	650	650	650	650	670	680
Volume, litres	3.8	3.4								
Pressure, psi	700	∅								



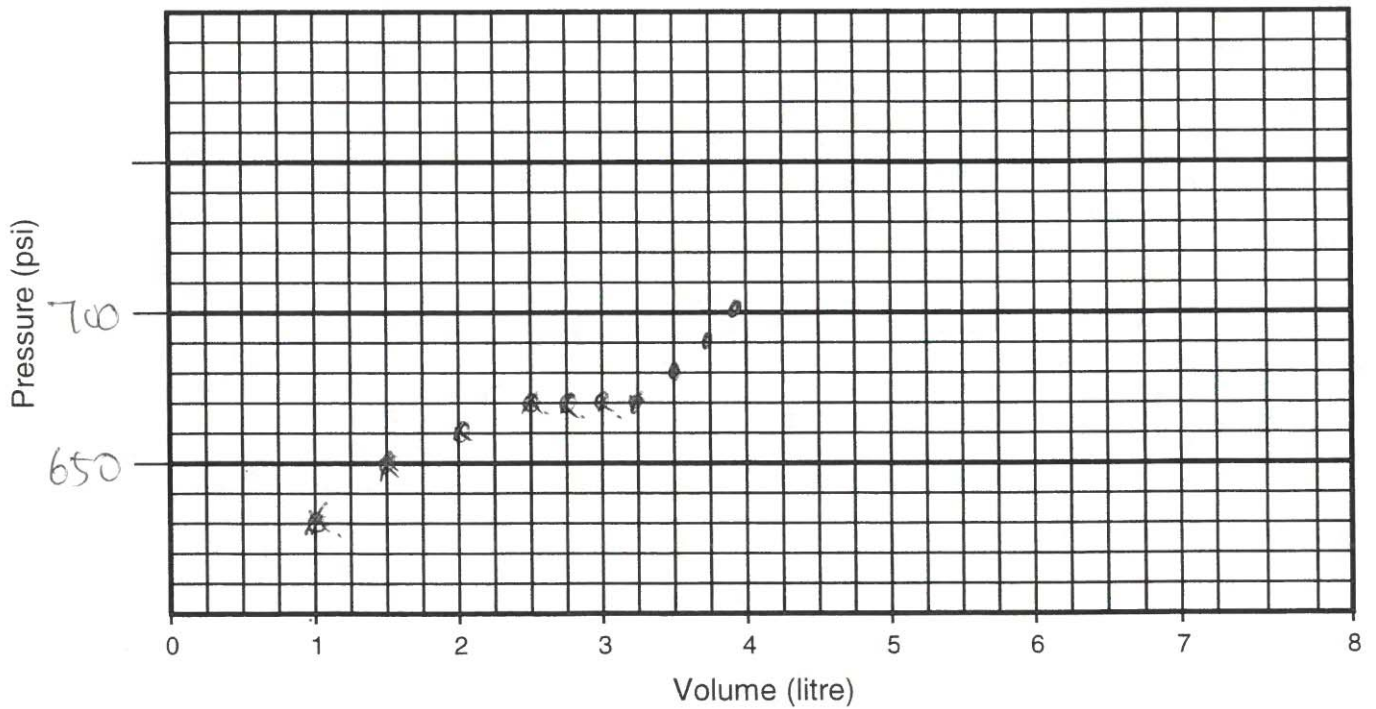
Comments: \_\_\_\_\_ Time - 16-21



# Westbay Packer Inflation Record

Project: Agnico Eagle Project No.: WB913 Well No.: M20.3071  
 Location: Meltradine Mine / Discovery Completed by: TB/ML Date Inflated: Sep-6/20  
 Packer No. #5, comp 66, SN 19840 Depth (ft/m): 419.71 Inflation Tool No.: TW 3994  
 Packer Valve Pressure, P<sub>V</sub>: 145 psi Final Line Pressure, P<sub>L</sub>: 700 psi Tool Pressure, P<sub>T</sub>: 400 psi  
 Borehole Water Level:      (ft/m) =      psi (P<sub>w</sub>)  
 Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>w</sub> - P<sub>V</sub> - P<sub>T</sub> = 155 psi

Volume, litres	0.5	1.0	1.5	2.0	2.5	2.75	3.0	3.25	3.5	3.75
Pressure, psi	590	630	650	660	670	670	670	670	680	690
Volume, litres	3.85	3.5								
Pressure, psi	700	∅								



Comments: \_\_\_\_\_ Time - 17:00

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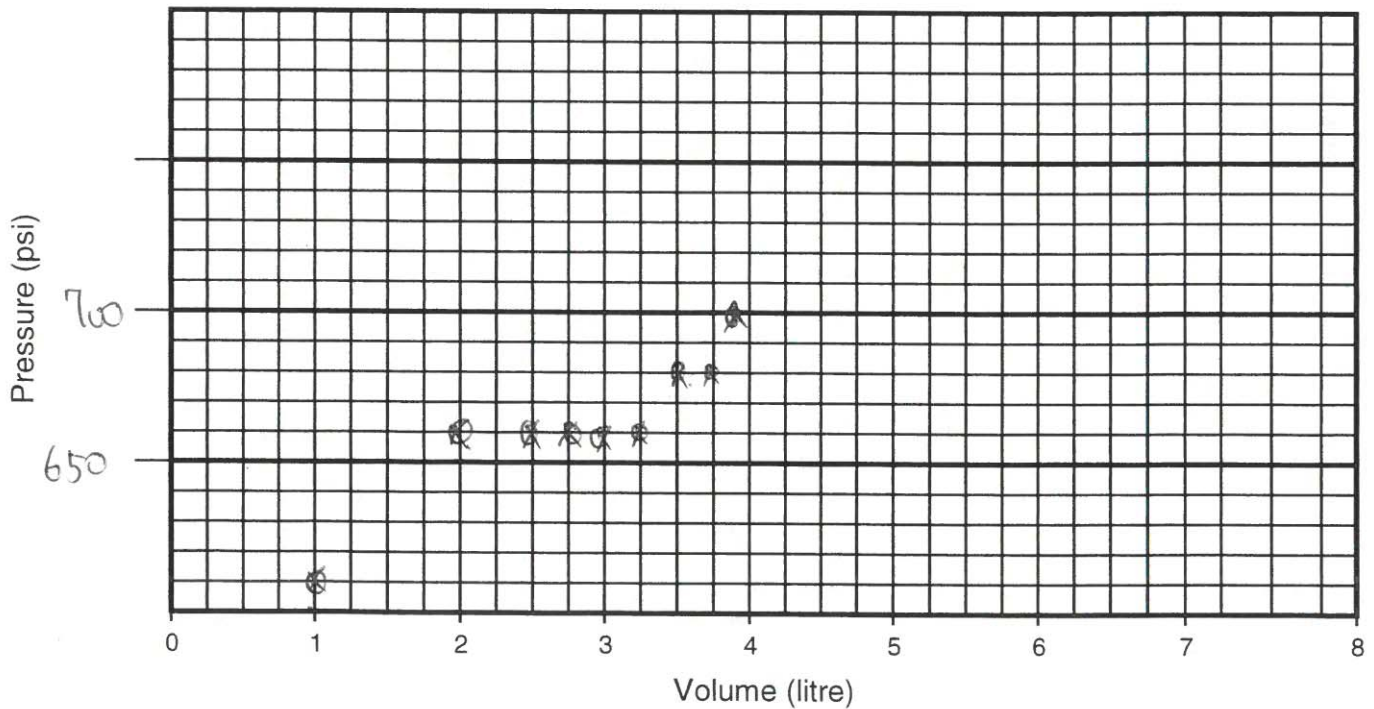


# Westbay Packer Inflation Record

Project: Agnic Eagle Mine Project No.: WB913 Well No.: M20-3071  
 Location: Melradine Mine / Discovery Completed by: TH ML Date Inflated: Sept 6 / 20  
 Packer No.: H-comp III, SN 19841 Depth (ft/m): 407.44 Inflation Tool No.: T103994  
 Packer Valve Pressure, P<sub>V</sub>: 165 psi Final Line Pressure, P<sub>L</sub>: 700 psi Tool Pressure, P<sub>T</sub>: 400 psi  
 Borehole Water Level:      (ft/m) =      psi (P<sub>W</sub>)

Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>W</sub> - P<sub>V</sub> - P<sub>T</sub> = 135 psi

Volume, litres	0.5	1.0	1.5	2.0	2.5	3.0	3.25	3.5	3.75
Pressure, psi	580	610	650	660	660	660	660	680	680
Volume, litres	3.85	3.5							
Pressure, psi	700	∅							



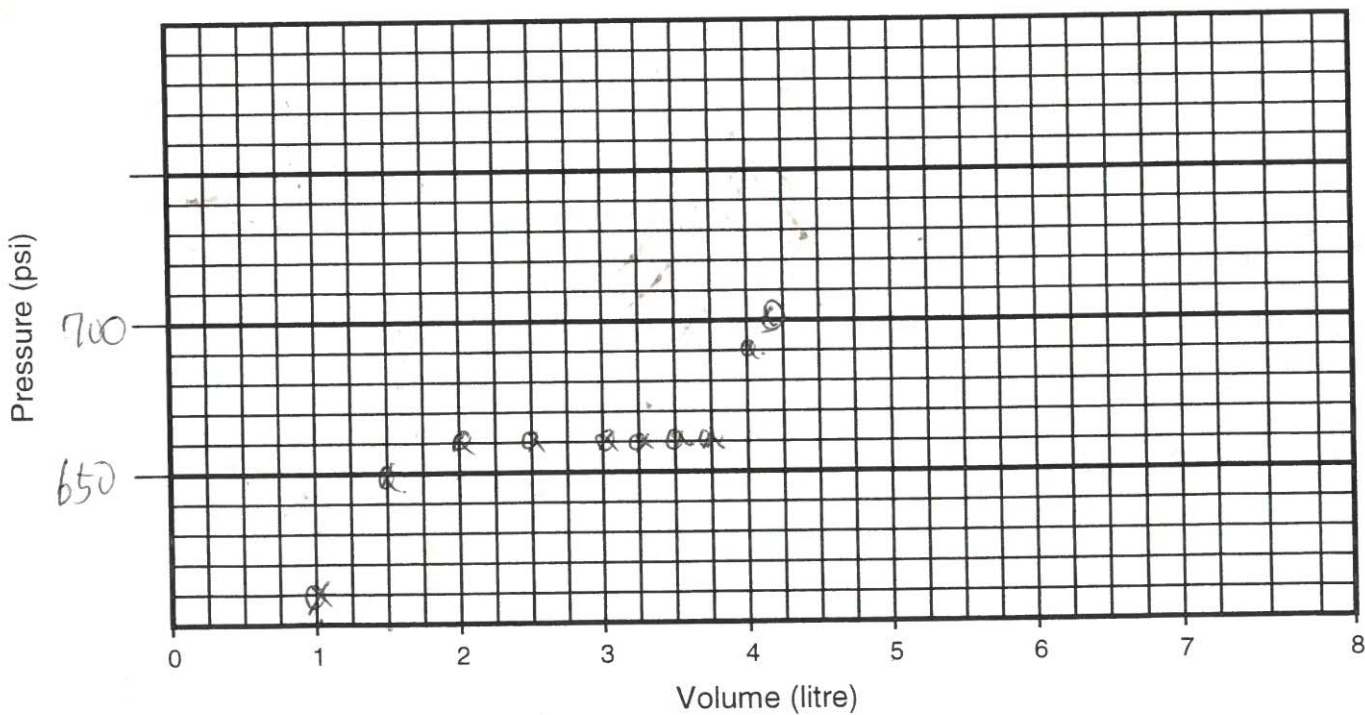
Comments: \_\_\_\_\_ Time - 17 = 35



# Westbay Packer Inflation Record

Project: Agnic Eagle Mine Project No.: WB913 Well No.: M20-3071  
 Location: Melradine Mine / Discovery Completed by: TK/ml Date Inflated: Sept 6/20  
 Packer No. #7 comp 92 SN# 19842 Depth (ft/Ⓜ): 346.49 Inflation Tool No.: TIW3994  
 Packer Valve Pressure, P<sub>V</sub>: 145 psi Final Line Pressure, P<sub>L</sub>: 700 psi Tool Pressure, P<sub>T</sub>: 1100 psi  
 Borehole Water Level: — (ft/Ⓜ) = — psi (P<sub>w</sub>)  
 Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>w</sub> - P<sub>V</sub> - P<sub>T</sub> = 155 psi

Volume, litres	0.5	1.0	1.5	2.0	2.5	2.75	3.0	3.25	3.5	3.75
Pressure, psi	580	610	650	660	660	660	660	660	660	660
Volume, litres	3.85	4.0	4.1	3.7						
Pressure, psi	660	690	700	∅						



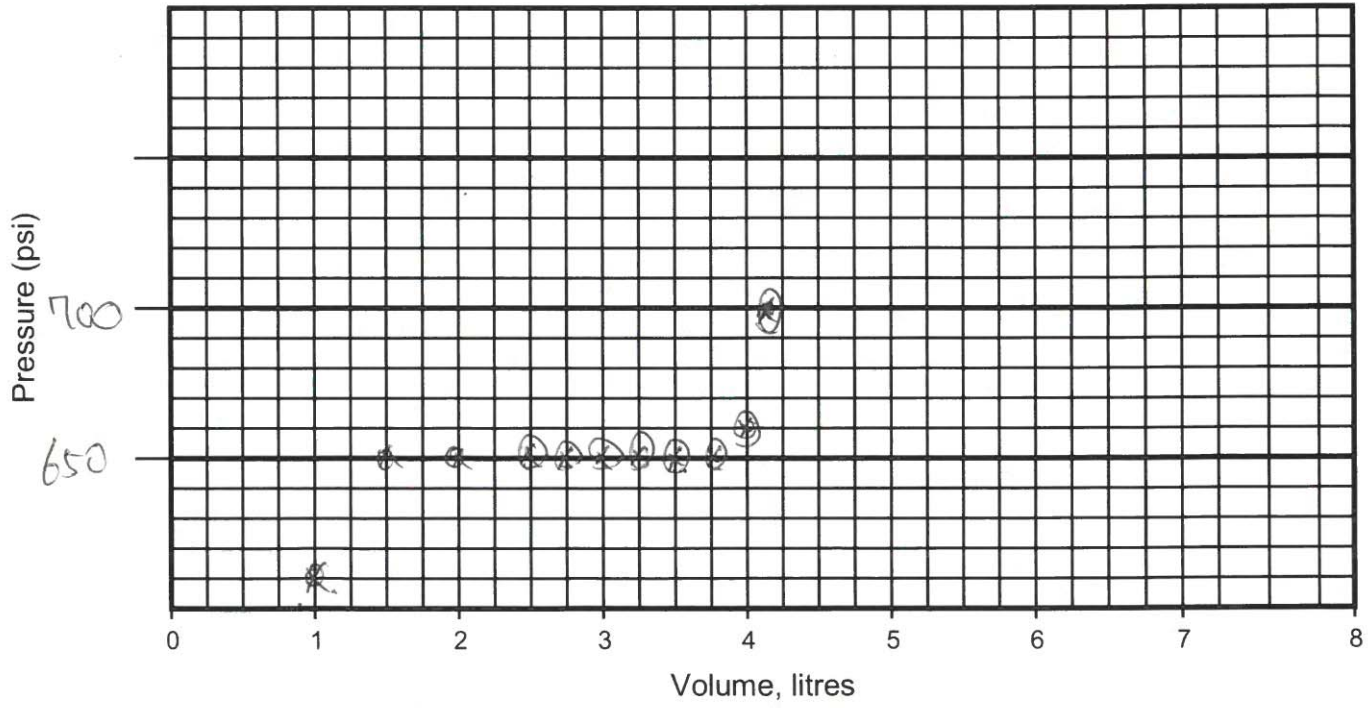
Comments: \_\_\_\_\_ Time - 18:14



# Westbay Packer Inflation Record

Project: Aantic Eagle Mine Project No.: WB 913 Well No.: M20-3071  
 Location: Melradine Mine / Discovery Completed by: TK/ML Date Inflated: Sept 7 / 20  
 Packer No. #8, Comp 99, SN 19843 Depth (ft/m): 328-12 Inflation Tool No.: TW 3924  
 Packer Valve Pressure, P<sub>V</sub>: 145 psi Final Line Pressure, P<sub>L</sub>: 700 psi Tool Pressure, P<sub>T</sub>: 400 psi  
 Borehole Water Level:      (ft/m) =      psi (P<sub>W</sub>)  
 Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>W</sub> - P<sub>V</sub> - P<sub>T</sub> = 150 psi

Volume, litres	0.5	1.0	1.5	2.0	2.5	2.75	3.0	3.25	3.5	3.75
Pressure, psi	590	610	650	650	650	650	650	650	650	650
Volume, litres	4.0	4.05	3.7							
Pressure, psi	660	700	∅							



Comments: \_\_\_\_\_ Time - 8 = 47.

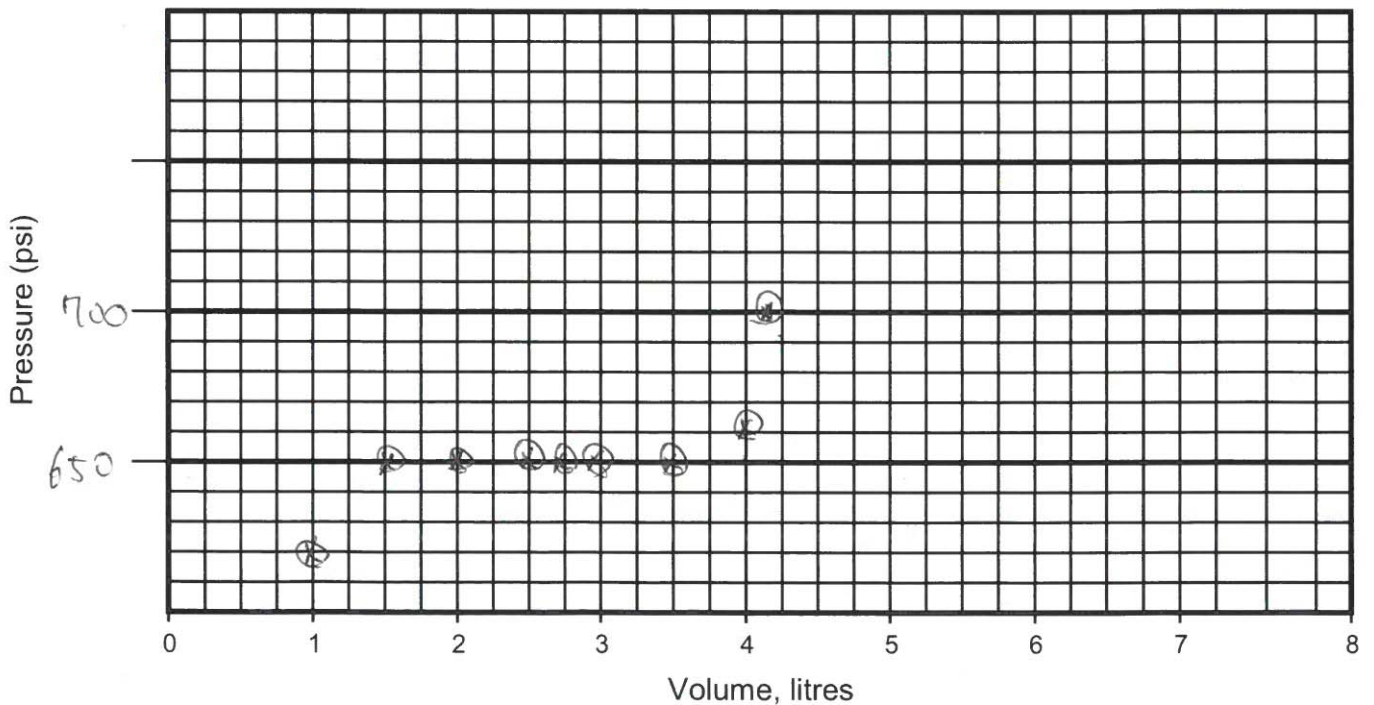


# Westbay Packer Inflation Record

Project: Agnico Eagle Mine Project No.: WB 913 Well No.: M20-3021  
 Location: Meltraine Mine / Discovery Completed by: TK/ML Date Inflated: Sept 7/20  
 Packer No. #9, comp 107 SN# 19894 Depth (ft/m): 308.31 Inflation Tool No.: TIW 3994  
 Packer Valve Pressure, P<sub>v</sub>: 140 psi Final Line Pressure, P<sub>L</sub>: 700 psi Tool Pressure, P<sub>T</sub>: 400 psi  
 Borehole Water Level: — (ft/m) = — psi (P<sub>w</sub>)

Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>w</sub> - P<sub>v</sub> - P<sub>T</sub> = 160 psi

Volume, litres	0.5	1.0	1.5	2.0	2.5	2.75	3.0	3.25	3.5	3.75
Pressure, psi	580	620	650	650	650	650	650	650	650	650
Volume, litres	4.0	4.1	3.7							
Pressure, psi	660	700	φ							



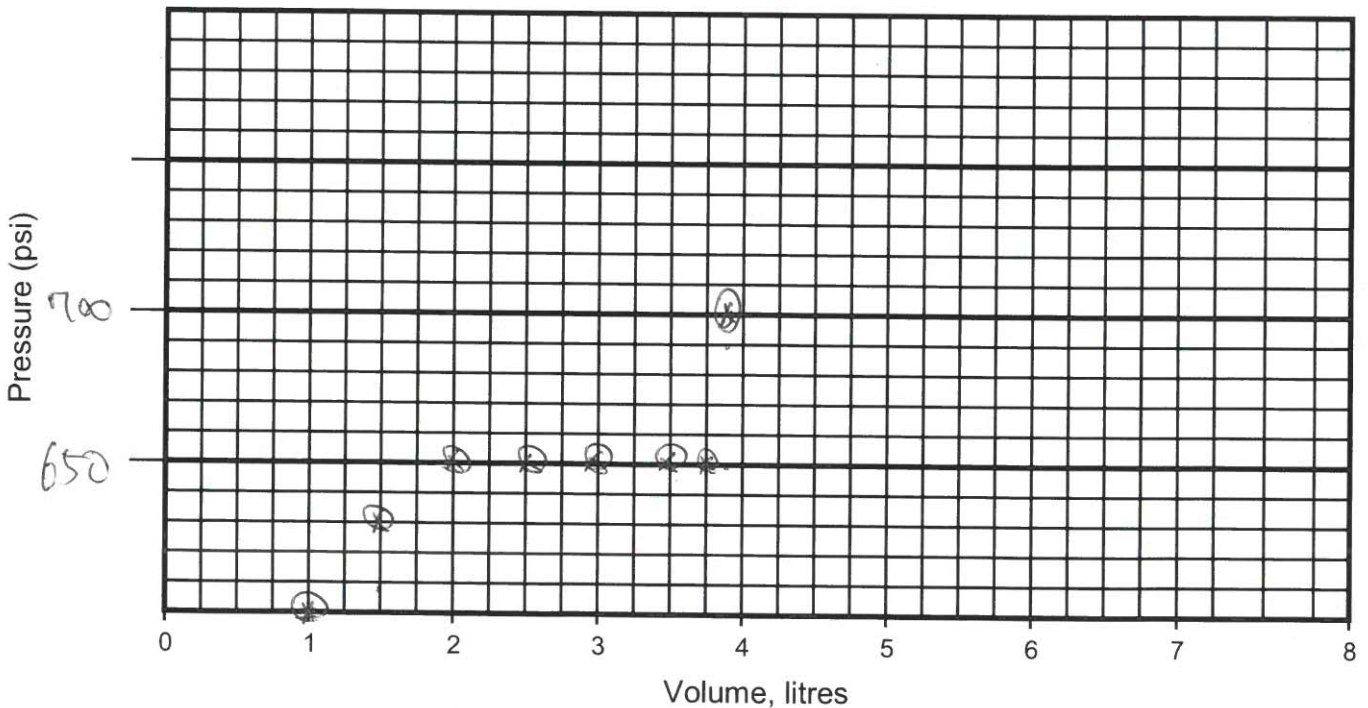
Comments: \_\_\_\_\_ Time - 9:17



# Westbay Packer Inflation Record

Project: Agnico Eagle Mine Project No.: WR 913 Well No.: M70-3071  
 Location: Meliadine Mine / Discovery Completed by: TW/ML Date Inflated: Sept 7 / 20  
 Packer No. #10, Camp #115, S14 19820 Depth (ft (m)): 288.42 Inflation Tool No.: TW3994  
 Packer Valve Pressure, P<sub>V</sub>: 150 psi Final Line Pressure, P<sub>L</sub>: 700 psi Tool Pressure, P<sub>T</sub>: 400 psi  
 Borehole Water Level:      (ft / 6) =      psi (P<sub>W</sub>)  
 Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>W</sub> - P<sub>V</sub> - P<sub>T</sub> = 150 psi

Volume, litres	0.5	1.0	1.5	2.0	2.5	2.75	3.0	3.25	3.5	3.75
Pressure, psi	560	600	630	650	650	650	650	650	650	650
Volume, litres	3.85	3.5								
Pressure, psi	700	∅								



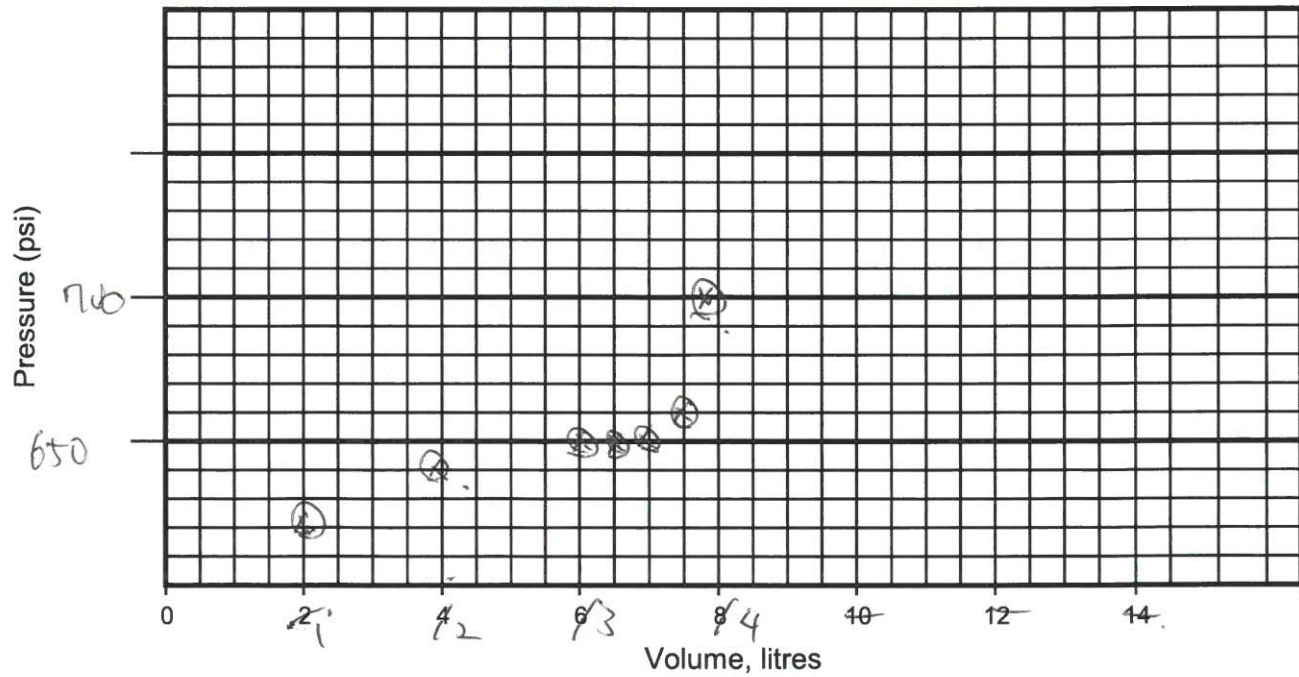
Comments: \_\_\_\_\_ Time - 9:51



# Westbay Packer Inflation Record

Project: Agnico Eagle Mine Project No.: WB913 Well No.: M20-3071  
 Location: Helradine Mine / Discovery Completed by: TU/ML Date Inflated: Aug 31/20  
 Packer No. #11 SN 14845, Comp 127 Depth (ft/m): 254.9 Inflation Tool No.: TW3994  
 Packer Valve Pressure, P<sub>V</sub>: 145 psi Final Line Pressure, P<sub>L</sub>: 700 psi Tool Pressure, P<sub>T</sub>: 400 psi  
 Borehole Water Level: — (ft/⊙) = — psi (P<sub>W</sub>)  
 Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>W</sub> - P<sub>V</sub> - P<sub>T</sub> = 155 psi

Volume, litres	0.5	1.0	1.5	2.0	2.5	2.75	3.0	3.25	3.5	3.75
Pressure, psi	570	620	640	640	650	650	650	650	650	660
Volume, litres	3.8	3.9	3.6							
Pressure, psi	670	700	∅							



Comments: \_\_\_\_\_ Time - 3:43 AM

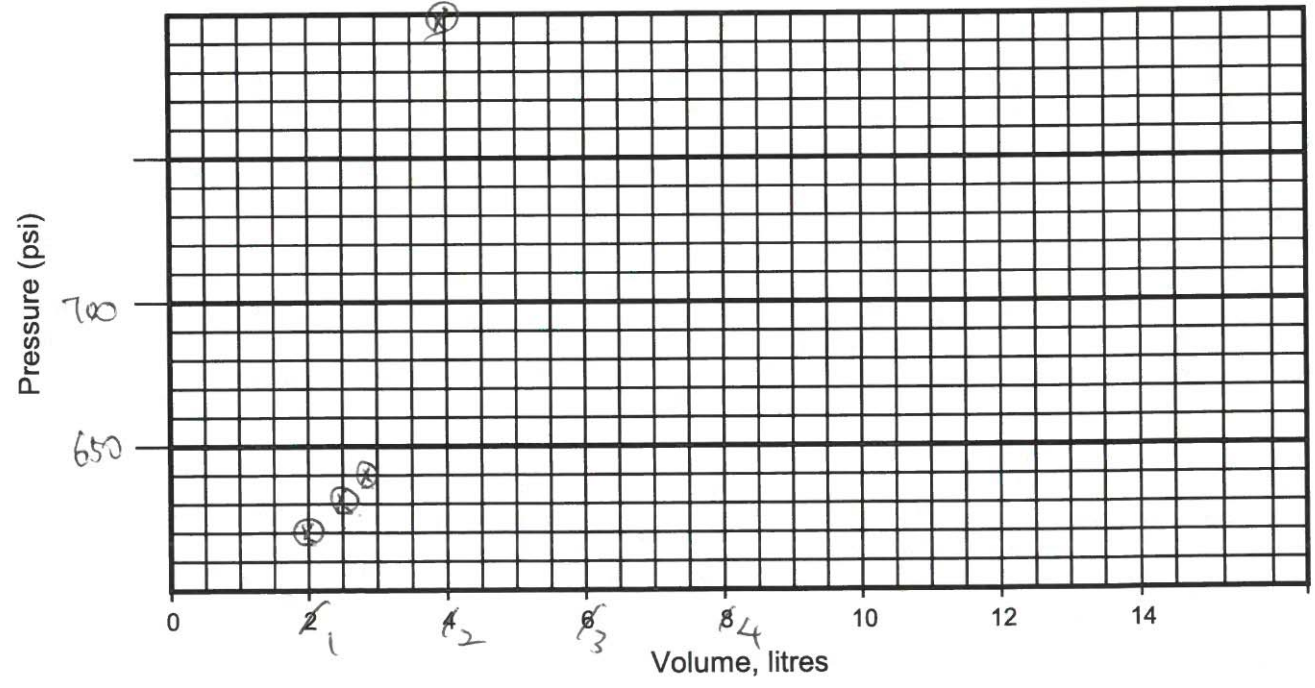




# Westbay Packer Inflation Record

Project: Agnico Eagle Mine Project No.: WB913 Well No.: M20-3071  
 Location: Meltrachne Mine / Discovery Completed by: Tk/ML Date Inflated: Aug 31 / 20  
 Packer No. #12, SN 14845 Comp 131 Depth (ft/m): 245.68 Inflation Tool No.: 4  
 Packer Valve Pressure, P<sub>V</sub>: 155 psi Final Line Pressure, P<sub>L</sub>: 800 psi Tool Pressure, P<sub>T</sub>: 400 psi  
 Borehole Water Level: \_\_\_\_\_ (ft/m) = \_\_\_\_\_ psi (P<sub>w</sub>)  
 Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>w</sub> - P<sub>V</sub> - P<sub>T</sub> = 245 psi

Volume, litres	0.5	1.0	1.25	1.4	1.5	1.2				
Pressure, psi	570	620	630	640	800	Ø				
Volume, litres										
Pressure, psi										



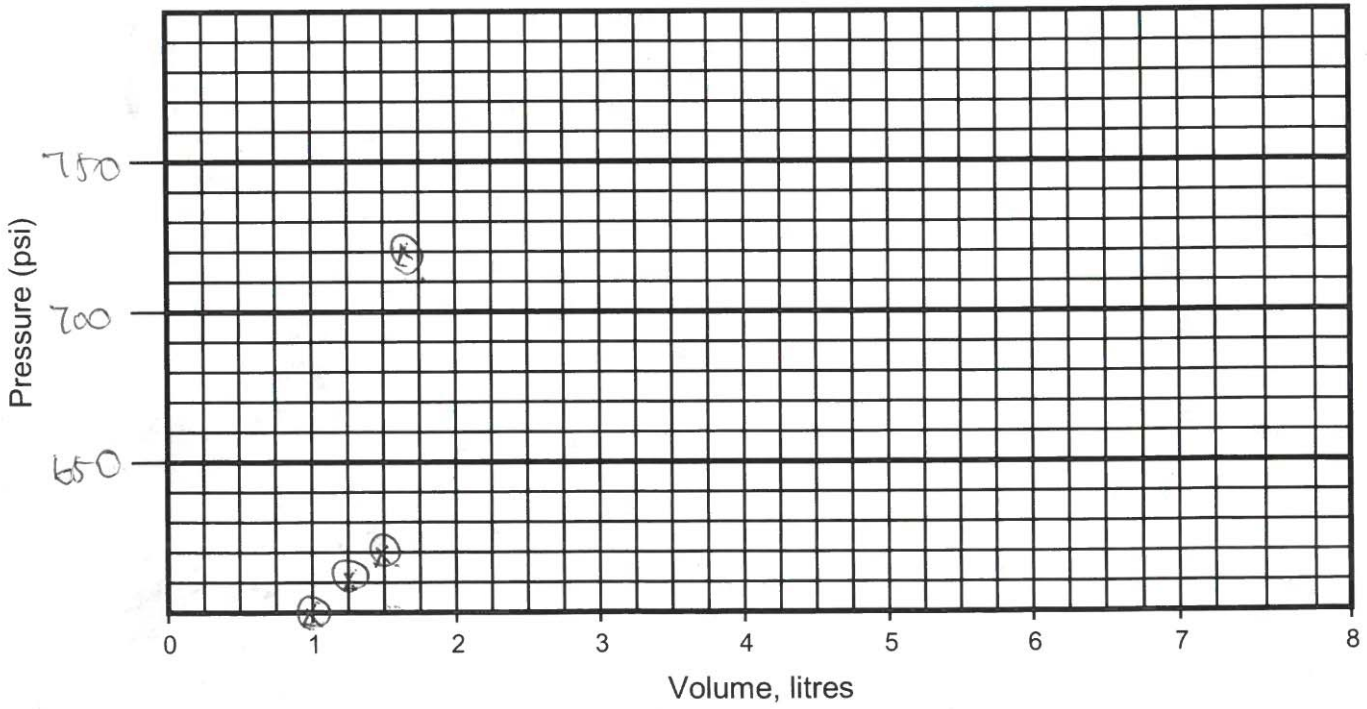
Comments: In HQ. Rod Time - 04:00 AM  
start from 3l at ~~TK~~ TK mark



# Westbay Packer Inflation Record

Project: Agnico Eagle Mine Project No.: WB913 Well No.: M20-3071  
 Location: Melchior Mine / Discovery Completed by: Tk/ML Date Inflated: Sept 7/20  
 Packer No. 13, comp 165 SN#19822 Depth (ft @): 145.10 Inflation Tool No.: TIW3994  
 Packer Valve Pressure, P<sub>V</sub>: 140 psi Final Line Pressure, P<sub>L</sub>: 750 psi Tool Pressure, P<sub>T</sub>: 400 psi  
 Borehole Water Level: — (ft @) = — psi (P<sub>w</sub>) 54  
 Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>w</sub> - P<sub>V</sub> - P<sub>T</sub> = 210 psi

Volume, litres	0.5	0.75	1.0	1.25	1.35	1.5	1.6	1.25		
Pressure, psi	560	580	600	610	610	620	750	∅		
Volume, litres										
Pressure, psi										



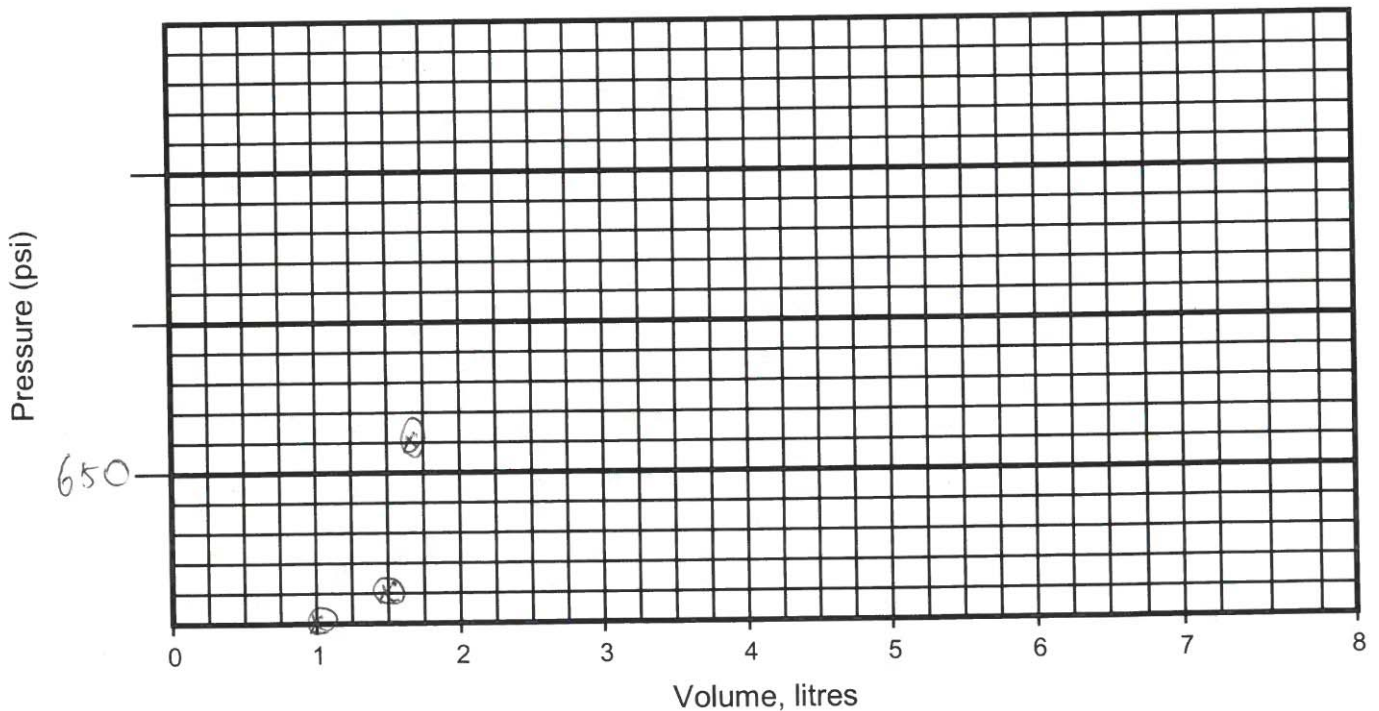
Comments: In HQ Rod Time - 11:46 am  
start at 4L,



# Westbay Packer Inflation Record

Project: Agnico Eagle Mine Project No.: WB913 Well No.: M 70-3071  
 Location: Melina Mine / Discovery Completed by: TK/ML Date Inflated: Sept 7/20  
 Packer No. 14, comp 199 SN#19821 Depth (ft / @): 44.52 Inflation Tool No.: TFW 3994  
 Packer Valve Pressure, P<sub>V</sub>: 140 psi Final Line Pressure, P<sub>L</sub>: 660 psi Tool Pressure, P<sub>T</sub>: 800 psi  
 Borehole Water Level: --- (ft / @) = --- psi (P<sub>W</sub>) 5.6  
 Calculated Packer Element Pressure, P<sub>E</sub> = P<sub>L</sub> + P<sub>W</sub> - P<sub>V</sub> - P<sub>T</sub> = 120 psi

Volume, litres	0.5	0.75	1.0	1.25	1.4	1.5	1.6	1.25		
Pressure, psi	550	570	600	600	600	610	660	∅		
Volume, litres										
Pressure, psi										



Comments: In the Rod Time - 12:05 pm





**[golder.com](http://golder.com)**

**APPENDIX B**

**Westbay Instruments Mosdax Sampler  
Calibration Reports**

# MOSDAX Calibration Report 1: EMS - 1764 Module 323

Full Scale: 2000 (psia)

File: E:\DATA\CAL\0-2020\2000\30JAN2-1\01764

Pressure Reference: Paroscientific Model 42K-101 S/N 59937

Range: 2K PSI

Date of last reference to traceable standard: Oct 9 2019

EMS - 1764 Feb 03 10:45:00 2020 Range 1 Temp 3.5° C			EMS - 1764 Feb 01 10:42:38 2020 Range 2 Temp 10.3° C			EMS - 1764 Feb 01 05:31:44 2020 Range 3 Temp 20.1° C		
Ref Pres (psia)	Error (psia)	(% FS)	Ref Pres (psia)	Error (psia)	(% FS)	Ref Pres (psia)	Error (psia)	(% FS)
14.868	0.096	0.005	14.781	0.226	0.011	14.596	0.225	0.011
191.493	-0.223	-0.011	193.775	-0.066	-0.003	192.305	-0.095	-0.005
391.006	-0.336	-0.017	392.640	-0.184	-0.009	391.786	-0.212	-0.011
590.165	-0.326	-0.016	592.950	-0.162	-0.008	589.811	-0.164	-0.008
787.912	-0.196	-0.010	790.116	-0.038	-0.002	787.800	-0.082	-0.004
991.538	-0.133	-0.007	986.148	0.060	0.003	987.067	0.022	0.001
1185.080	-0.063	-0.003	1184.405	0.147	0.007	1184.282	0.056	0.003
1383.103	-0.073	-0.004	1389.367	0.169	0.008	1382.746	0.171	0.009
1588.738	-0.026	-0.001	1581.444	0.194	0.010	1580.834	0.156	0.008
1788.180	-0.227	-0.011	1781.409	0.057	0.003	1780.426	0.044	0.002
1986.418	-0.416	-0.021	1987.230	-0.140	-0.007	1988.412	-0.147	-0.007
1816.045	-0.131	-0.007	1815.603	-0.014	-0.001	1813.901	0.035	0.002
1612.942	-0.038	-0.002	1613.700	0.277	0.014	1617.823	0.180	0.009
1403.152	0.084	0.004	1419.203	0.236	0.012	1406.772	0.177	0.009
1196.859	0.012	0.001	1216.619	0.267	0.013	1206.443	0.144	0.007
1019.380	0.026	0.001	1009.360	0.134	0.007	1009.176	0.124	0.006
807.792	-0.139	-0.007	807.546	-0.005	0.000	819.172	0.013	0.001
606.963	-0.267	-0.013	606.726	-0.083	-0.004	606.403	-0.102	-0.005
407.003	-0.215	-0.011	406.710	-0.079	-0.004	406.484	-0.183	-0.009
205.895	-0.128	-0.006	206.253	-0.015	-0.001	205.793	-0.087	-0.004
14.895	0.121	0.006	14.839	0.226	0.011	14.622	0.250	0.013
EMS - 1764 Feb 01 00:35:22 2020 Range 4 Temp 30.0° C			EMS - 1764 Jan 31 19:30:07 2020 Range 5 Temp 39.8° C					
Ref Pres (psia)	Error (psia)	(% FS)	Ref Pres (psia)	Error (psia)	(% FS)			
14.619	0.157	0.008	14.637	0.182	0.009			
192.457	-0.135	-0.007	194.057	-0.086	-0.004			
391.864	-0.276	-0.014	391.756	-0.214	-0.011			
590.361	-0.257	-0.013	589.098	-0.174	-0.009			
791.130	-0.119	-0.006	788.721	-0.096	-0.005			
986.456	-0.043	-0.002	992.715	-0.027	-0.001			
1186.055	-0.052	-0.003	1184.627	-0.025	-0.001			
1389.731	-0.004	0.000	1390.374	0.067	0.003			
1582.483	-0.011	-0.001	1583.219	0.066	0.003			
1783.121	-0.112	-0.006	1785.176	-0.004	0.000			
1989.472	-0.250	-0.012	1991.019	-0.144	-0.007			
1813.998	-0.105	-0.005	1817.094	0.040	0.002			
1606.876	0.058	0.003	1618.041	0.138	0.007			
1407.509	0.058	0.003	1419.969	0.200	0.010			
1207.752	0.043	0.002	1217.745	0.090	0.005			
1010.127	0.064	0.003	1012.652	0.105	0.005			
807.569	-0.043	-0.002	807.659	-0.136	-0.007			
606.787	-0.136	-0.007	606.654	-0.166	-0.008			
406.409	-0.134	-0.007	406.303	-0.116	-0.006			
205.769	-0.056	-0.003	206.024	-0.128	-0.006			
14.617	0.155	0.008	14.653	0.198	0.010			

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# MOSDAX Calibration Report 2: EMS - 1764 Module 323

Full Scale: 2000 (psia)

File E:\DATA\CAL\0-2020\2000\30JAN2-1\01764

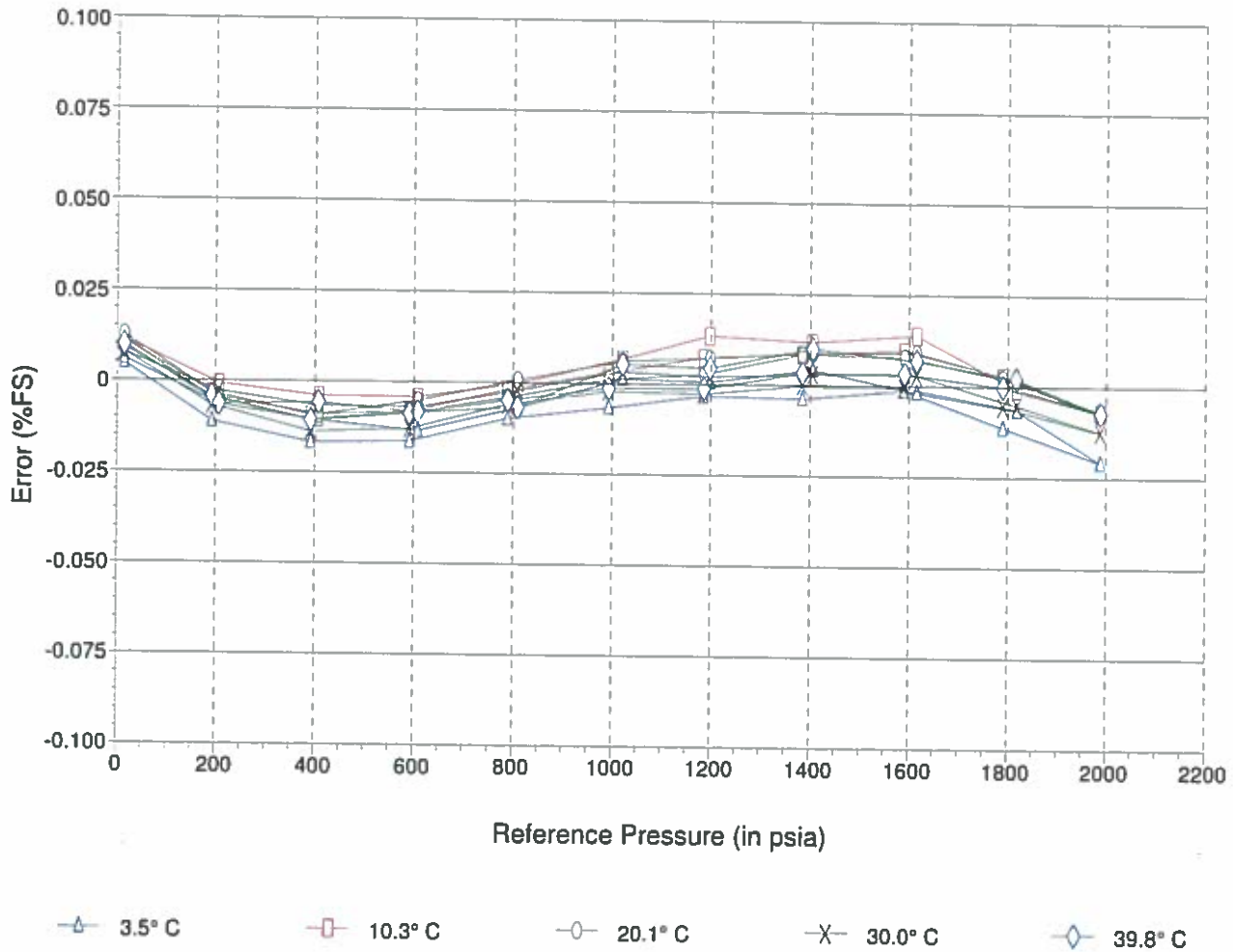
Pressure Reference: Paroscientific Model 42K-101 S/N 59937

Range: 2K PSI

Date of last reference to traceable standard: Oct 9 2019

## Plot of Error vs. Reference Pressure

EMS - 1764 Module 323



Comments

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# MOSDAX Calibration Report 1: EMS - 2652 Module 3008

Full Scale: 2000 (psia)

File: E:\DATA\CAL\0-2020200030JULY-1102652

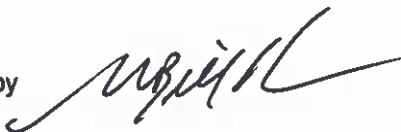
Pressure Reference: Paroscientific Model 42K-101 S/N 59937

Range: 2K PSI

Date of last reference to traceable standard: Oct 9 2019

EMS - 2652 Jul 30 04:57:07 2020 Range 1 Temp 3.1° C			EMS - 2652 Jul 30 00:19:36 2020 Range 2 Temp 10.2° C			EMS - 2652 Jul 29 19:44:31 2020 Range 3 Temp 20.0° C		
Ref Pres (psia)	Error (psia)	(% FS)	Ref Pres (psia)	Error (psia)	(% FS)	Ref Pres (psia)	Error (psia)	(% FS)
14.717	-0.236	-0.012	14.704	-0.057	-0.003	14.682	-0.072	-0.004
194.682	-0.045	-0.002	193.597	-0.021	-0.001	193.991	-0.003	0.000
393.193	0.039	0.002	393.192	0.127	0.006	393.283	0.139	0.007
593.290	-0.029	-0.001	593.535	0.142	0.007	593.145	0.096	0.005
792.622	0.002	0.000	792.075	0.129	0.006	792.881	0.057	0.003
991.799	-0.063	-0.003	990.394	0.092	0.005	992.105	0.065	0.003
1190.052	-0.164	-0.008	1190.555	0.045	0.002	1191.144	-0.032	-0.002
1389.975	-0.190	-0.010	1390.260	0.022	0.001	1390.376	-0.061	-0.003
1589.405	-0.164	-0.008	1589.193	0.116	0.006	1589.796	0.067	0.003
1789.287	-0.062	-0.003	1789.426	0.207	0.010	1789.404	0.155	0.008
1989.481	0.074	0.004	1988.138	0.379	0.019	1989.327	0.357	0.018
1814.982	0.004	0.000	1816.435	0.319	0.016	1817.764	0.220	0.011
1607.013	-0.032	-0.002	1616.462	0.242	0.012	1619.446	0.164	0.008
1406.780	-0.086	-0.004	1408.660	0.156	0.008	1408.961	0.090	0.004
1218.374	-0.044	-0.002	1206.413	0.129	0.006	1208.434	0.114	0.006
1010.297	0.061	0.003	1010.064	0.247	0.012	1018.377	0.276	0.014
807.964	0.082	0.004	808.214	0.270	0.013	806.649	0.221	0.011
606.635	0.088	0.004	606.523	0.224	0.011	606.731	0.213	0.011
406.364	0.118	0.006	406.582	0.190	0.009	406.443	0.194	0.010
206.021	0.099	0.005	205.718	0.159	0.008	206.420	0.138	0.007
14.731	-0.109	-0.005	14.717	-0.101	-0.005	14.696	-0.001	0.000
EMS - 2652 Jul 29 15:06:43 2020 Range 4 Temp 29.8° C			EMS - 2652 Jul 29 10:29:08 2020 Range 5 Temp 39.6° C					
Ref Pres (psia)	Error (psia)	(% FS)	Ref Pres (psia)	Error (psia)	(% FS)			
14.687	-0.123	-0.006	14.695	-0.084	-0.004			
193.327	-0.030	-0.001	192.891	-0.027	-0.001			
389.580	0.064	0.003	393.278	0.052	0.003			
593.345	0.005	0.000	593.152	0.017	0.001			
786.601	-0.008	0.000	792.520	0.089	0.004			
991.330	-0.060	-0.003	991.957	0.055	0.003			
1191.195	-0.247	-0.012	1190.974	-0.162	-0.008			
1390.532	-0.217	-0.011	1389.899	-0.081	-0.004			
1589.961	-0.105	-0.005	1588.889	-0.108	-0.005			
1782.148	-0.046	-0.002	1789.239	0.107	0.005			
1989.317	0.117	0.006	1989.238	0.229	0.011			
1818.447	-0.030	-0.002	1817.397	0.058	0.003			
1606.278	-0.018	-0.001	1607.058	0.027	0.001			
1410.065	-0.035	-0.002	1406.045	0.051	0.003			
1218.546	-0.016	-0.001	1208.259	0.043	0.002			
1010.485	0.146	0.007	1007.348	0.108	0.005			
807.979	0.163	0.008	808.010	0.149	0.007			
606.685	0.160	0.008	606.719	0.164	0.008			
406.349	0.135	0.007	406.583	0.023	0.001			
206.494	0.117	0.006	205.803	-0.031	-0.002			
14.697	0.001	0.000	14.707	-0.128	-0.006			

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# MOSDAX Calibration Report 2: EMS - 2652 Module 3008

Full Scale: 2000 (psia)

File: E:\DATA\CAL\0-2020\2000\30JULY-1\02652

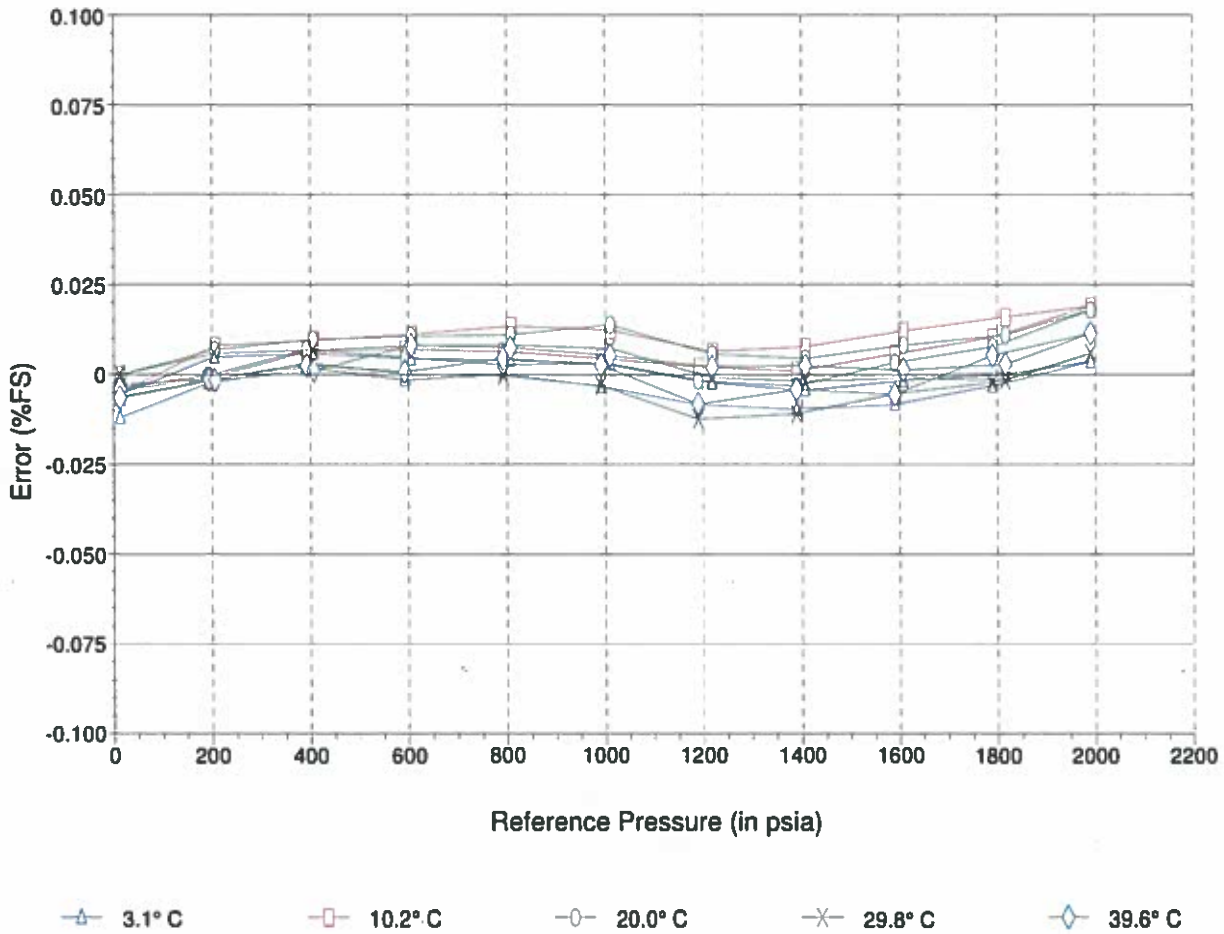
Pressure Reference: Paroscientific Model 42K-101 S/N 59937

Range: 2K PSI

Date of last reference to traceable standard: Oct 9 2019

## Plot of Error vs. Reference Pressure

EMS - 2652 Module 3008



Comments

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**APPENDIX C**

**Water Quality Result Tables**

Table C-1 - Laboratory Results for Raw Water Quality Results from Westbay Well M20-3071  
Meliadine Extension Agnico Eagle Mines Limited

Sample Source	Drilling Fluid						Port 9	Port 8		Port 4						Port 3					
Client Sample ID	Westbay-A-225	West bay-A-360	Westbay-A-490	Westbay-A-490-Dup	Westbay-A-606	Westbay-A-606-BR	Westbay-A-Port 9-1	Westbay-A-Port 8-0.29	Westbay-A-Port 8-29%DUP-1	Westbay-A-Port 4-1	Westbay-A-Port 4-1	Westbay-A-Port 4-2	Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 4-2	Westbay-A-Port 3-1					
Date Sampled	17-Aug-2020	21-Aug-2020	25-Aug-2020	25-Aug-2020	27-Aug-2020	27-Aug-2020	28-Sep-20	20-Sep-2020	20-Sep-2020	19-Sep-2020	25-Sep-2020	27-Sep-2020	27-Sep-2020	28-Sep-2020	28-Sep-2020	28-Sep-2020					
ALS Sample ID	VA20B3721-001, VA20B6509-001	VA20B4004-001, VAB6509-002	VA20B4663-001	VA20B4663-002	VA20B4662-001, V20B6509-003	VA20B4662-002, VA20B6509-004	VA20B7020-006	VA20B6509-007, L25081847	VA20B6509-008, L25081848	VA20B6509-005, L25081845	VA20B7020-001	VA20B7020-003	VA20B7020-004	VA20B7020-007	VA20B7020-008	VA20B7020-005					
Sample Interval	surface						292.5 to 310	310.8 to 326.9		438.7 to 457.1						491.2 to 572.6					
Drilling Fluid Dye Concentration	mbgs						783	758 to 809		820						795					
Sample Dye Concentration	ppb						752	812	710	710	867	840	235	746	460	428	428	415	415	277	
Proportion of Drilling Fluid in Samples	%						100%	100%	100%	100%	100%	100%	30%	29 to 31%	91%	56%	52%	52%	51%	51%	35%
Proportion of Formation Groundwater in Samples	%						0%	0%	0%	0%	0%	0%	70%	69 to 71%	9%	44%	48%	48%	49%	49%	65%
<b>Field Parameters</b>																					
conductivity	uS/cm	*	*	*	*	394	*	53400	78410	78410	125490	93593	93938	93938	91517	91517	75600				
pH	-	9.96	9.11	8.89	8.89	7.29	9.93	*	*	*	*	*	*	*	*	*	*				
TDS	mg/L	-	-	-	-	-	-	34800	50960	50960	81500	60771	61100	59383	59383	49100					
salinity	ppt	-	-	-	-	-	-	35.1	53.3	53.3	114.5	66.2	66.9	66.9	64.7	64.7	52				
<b>Laboratory Measured Parameters</b>																					
electrical conductivity	uS/cm	142000	115000	48600	48400	661	132000	-	52300	81000	81800	96100	95100	95000	-	-	-				
alkalinity, total (as CaCO3)	mg/L	1040	992	367	365	55.5	1120	-	247	251	857	448	446	439	-	-	-				
hardness (as CaCO3), dissolved	mg/L	120000	99200	30200	30800	90.3	120000	-	37000	35300	98100	60700	-	-	-	-	-				
hardness (as CaCO3), from total Ca/Mg	mg/L	107000	116000	31700	31700	92.7	118000	-	-	68500	-	61500	-	-	-	-	-				
pH	-	9.2	9.76	9.27	9.28	7.18	10.2	-	8.99	9.01	10.2	9.2	9.22	9.24	-	-	-				
solids, total dissolved [TDS]	mg/L	163000	136000	40400	40900	559	185000	-	62400	68500	130000	89000	77000	63100	-	-	-				
solids, total suspended [TSS]	mg/L	4810	28.7	741	643	17.2	2480	-	163	11	6.9	3.8	16.5	205	-	-	-				
turbidity	NTU	665	28.6	56.9	58	50.8	29.8	-	10.9	11.8	19.4	14	12.8	12.1	-	-	-				
alkalinity, phenolphthalein (as CaCO3)	mg/L	140	97.4	100	100	<2.0	206	-	44.4	-	91.5	74.4	78.4	80.1	-	-	-				
alkalinity, hydroxide (as CaCO3)	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	<1.0	<2.0	<2.0	<2.0	<2.0	-	-	-				
alkalinity, carbonate (as CaCO3)	mg/L	279	195	200	200	<2.0	413	-	88.8	139	183	149	157	160	-	-	-				
alkalinity, bicarbonate (as CaCO3)	mg/L	757	798	167	165	55.5	712	-	158	112	674	300	290	278	-	-	-				
bicarbonate	mg/L	924	973	203	202	67.7	869	-	193	137	823	365	353	340	-	-	-				
salinity	psu	112	97.2	34.9	34.8	<1.0	113	-	38.6	53.4	64.5	67	66.2	66.1	-	-	-				
carbonate	mg/L	168	117	120	120	<2.0	248	-	53.3	83.3	110	89.3	94.1	96.1	-	-	-				
hydroxide	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	<1.0	<2.0	<2.0	<2.0	<2.0	-	-	-				
<b>Anions and Nutrients</b>																					
kjeldahl nitrogen, total [TKN]	mg/L	52.6	66.2	40.6	45.1	12.2	5.32	-	1.46	1.54	5.07	2.4	-	-	-	2.35	2.35				
ammonia, total (as N)	mg/L	15.4	3.47	1.9	1.92	1.28	2.65	-	1.12	1.09	1.84	1.01	-	-	-	0.952	0.952				
bromide	mg/L	259	279	115	117	0.193	353	-	127	144	298	205	188	200	-	-	-				
chloride	mg/L	71200	77900	21600	22200	180	90300	-	32700	36800	77700	51700	47300	50200	-	-	-				
fluoride	mg/L	<2.0	<2.0	<2.0	<2.0	0.034	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	-	-				
nitrate (as N)	mg/L	6.38	3.2	1.05	1.02	0.208	6.37	-	1.3	1.48	5.2	3.2	2.78	2.96	-	-	-				
nitrite (as N)	mg/L	<1.00	<0.100	<0.100	<0.100	0.0018	<0.100	-	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	-	-	-				
phosphate, ortho-, dissolved (as P)	mg/L	<0.0500	0.0174	0.0148	0.0152	0.0029	0.0685	-	0.0032	0.0032	0.0118	0.0471	0.0825	0.0778	-	-	-				
phosphorus, total	mg/L	<0.100	0.0423	<0.170	<0.160	0.0096	0.0761	-	0.0343	0.0317	0.0338	<0.200	-	-	-	0.0158	0.0158				
silicate (as SiO2)	mg/L	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	-	5.18	5.4	<25.0	<5.00	<5.00	<5.00	-	-	-				
sulfate (as SO4)	mg/L	<300	<30.0	<30.0	<30.0	5.47	41.5	-	766	861	80.7	375	403	427	-	-	-				
<b>Cyanides</b>																					
cyanide, free	mg/L	<0.200	<0.0200	<0.0100	<0.0100	<0.0400	<0.0400	-	<0.0200	<0.0200	<0.0200	<0.0500	<0.0050	<0.0200	-	-	-				
cyanide, strong acid dissociable (total)	mg/L	<0.200	<0.0200	<0.0100	<0.0100	<0.0400	<0.0400	-	<0.0200	<0.0200	<0.0200	<0.0100	<0.0050	<0.0200	-	-	-				
cyanide, weak acid dissociable	mg/L	<0.200	<0.0200	<0.0100	<0.0100	<0.0400	<0.0400	-	<0.0200	<0.0200	<0.0200	<0.0100	<0.0050	<0.0200	-	-	-				
<b>Organic / Inorganic Carbon</b>																					
carbon, dissolved organic [DOC]	mg/L	165	219	170	200	13	32.6	-	216	218	2780	8880	6270	6570	-	-	-				
carbon, total organic [TOC]	mg/L	233	222	211	216	86.7	30.6	-	212	212	3040	9860	8860	8000	-	7760	-				

Table C-1 - Laboratory Results for Raw Water Quality Results from Westbay Well M20-3071  
Meliadine Extension Agnico Eagle Mines Limited

Sample Source	Drilling Fluid						Port 9	Port 8			Port 4					Port 3	
Client Sample ID	Westbay-A-225	West bay-A-360	Westbay-A-490	Westbay-A-490-Dup	Westbay A-606	Westbay A-606-BR	Westbay-A-Port 9-1	Westbay-A-Port 8-0-29	Westbay-A-Port 8-29%DUP-1	Westbay-A-Port 4-1	Westbay-A-Port 4-1	Westbay-A-Port 4-2	Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 4-2	Westbay-A-Port 3-1	
Date Sampled	17-Aug-2020	21-Aug-2020	25-Aug-2020	25-Aug-2020	27-Aug-2020	27-Aug-2020	28-Sep-20	20-Sep-2020	20-Sep-2020	19-Sep-2020	25-Sep-2020	27-Sep-2020	27-Sep-2020	28-Sep-2020	28-Sep-2020	28-Sep-2020	
ALS Sample ID	VA20B3721-001, VA20B6509-001	VA20B4004-001, VAB6509-002	VA20B4663-001	VA20B4663-002	VA20B4662-001, V20B6509-003	VA20B4662-002, VA20B6509-004	VA20B7020-006	VA20B6509-007, L25081847	VA20B6509-008, L25081848	VA20B6509-005, L25081845	VA20B7020-001	VA20B7020-003	VA20B7020-004	VA20B7020-007	VA20B7020-008	VA20B7020-005	
Sample Interval	surface						292.5 to 310	310.8 to 326.9			438.7 to 457.1					491.2 to 572.6	
Drilling Fluid Dye Concentration	mbgs						783	758 to 809			820					795	
Sample Dye Concentration	ppb						752	812			710					710	
Proportion of Drilling Fluid in Samples	%						100%	100%			100%					100%	
Proportion of Formation Groundwater in Samples	%						0%	0%			0%					0%	
Dissolved Metals																	
aluminum, dissolved	mg/L	<0.500	<0.500	<0.100	<0.100	0.004	<0.500	-	<0.100	<0.100	<0.500	<0.200	-	-	<0.200	<0.200	-
antimony, dissolved	mg/L	<0.0500	<0.0500	<0.0100	<0.0100	<0.00010	<0.0500	-	<0.0100	<0.0100	<0.0500	<0.0200	-	-	<0.0200	<0.0200	-
arsenic, dissolved	mg/L	<0.0500	<0.0500	<0.0100	<0.0100	0.00065	<0.0500	-	<0.0100	<0.0100	<0.0500	<0.0200	-	-	<0.0200	<0.0200	-
barium, dissolved	mg/L	13.4	11.4	3.04	2.96	0.0187	12.2	-	3.22	2.94	11.6	5.56	-	-	5.13	5.27	-
beryllium, dissolved	mg/L	<0.0500	<0.0500	<0.0100	<0.0100	<0.000100	<0.0500	-	<0.00200	<0.00200	<0.0100	<0.0200	-	-	<0.00400	<0.00400	-
bismuth, dissolved	mg/L	<0.0250	<0.0250	<0.00500	<0.00500	<0.000050	<0.0250	-	<0.00500	<0.00500	<0.0250	<0.0100	-	-	<0.0100	<0.0100	-
boron, dissolved	mg/L	175	132	41	40	0.015	159	-	37	34.6	118	72.1	-	-	70.2	69.3	-
cadmium, dissolved	mg/L	<0.00250	<0.00250	<0.000500	<0.000500	0.000139	<0.00250	-	<0.000500	<0.000500	<0.00250	<0.00100	-	-	<0.00100	<0.00100	-
calcium, dissolved	mg/L	48000	39700	12100	12300	32.8	48200	-	13400	12800	39200	23800	-	-	22700	22000	-
cesium, dissolved	mg/L	4.21	3.63	1	1.02	0.000152	3.9	-	0.919	0.913	3.26	1.56	-	-	1.56	1.58	-
chromium, dissolved	mg/L	<0.0500	<0.0500	<0.0100	<0.0100	<0.00010	<0.0500	-	<0.0500	<0.0500	<0.250	<0.0200	-	-	<0.100	<0.100	-
cobalt, dissolved	mg/L	<0.0500	<0.0500	<0.0100	<0.0100	0.00021	<0.0500	-	<0.0100	<0.0100	<0.0500	<0.0200	-	-	<0.0200	<0.0200	-
copper, dissolved	mg/L	<0.100	<0.100	<0.0200	<0.0200	0.00213	<0.100	-	<0.0200	<0.0200	<0.100	<0.0400	-	-	<0.0400	<0.0400	-
iron, dissolved	mg/L	<5.00	<5.00	2.94	2.83	1.04	<5.00	-	<1.00	<1.00	<5.00	<2.00	-	-	<2.00	<2.00	-
iron, ferrous [Fe II], dissolved	mg/L	-	-	-	-	0.338	0.247	-	0.024	0.039	0.096	0.02	-	-	0.054	0.022	-
lead, dissolved	mg/L	<0.0250	<0.0250	<0.00500	<0.00500	0.000054	<0.0250	-	<0.00500	<0.00500	<0.0250	<0.0100	-	-	<0.0100	<0.0100	-
lithium, dissolved	mg/L	177	156	42.9	42.6	0.0686	169	-	39.8	37	135	75.4	-	-	70	70.7	-
magnesium, dissolved	mg/L	13.9	24.7	3.61	3.68	2.05	10.7	-	865	812	32.8	309	-	-	340	344	-
manganese, dissolved	mg/L	<0.0500	<0.0500	0.0393	0.0381	0.0343	<0.0500	-	0.657	0.626	<0.0500	<0.0200	-	-	<0.0200	<0.0200	-
mercury, dissolved	mg/L	<0.0000250	<0.0000500	<0.0000050	<0.0000050	<0.0000050	<0.0000250	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	-	-	<0.0000050	<0.0000050	-
molybdenum, dissolved	mg/L	0.057	0.0297	0.0104	0.0112	0.000134	0.0274	-	0.0196	0.021	0.0732	0.0401	-	-	0.0364	0.0378	-
nickel, dissolved	mg/L	<0.250	<0.250	<0.0500	<0.0500	0.00286	<0.250	-	<0.0500	<0.0500	<0.250	<0.100	-	-	<0.100	<0.100	-
phosphorus, dissolved	mg/L	<25.0	<25.0	<5.00	<5.00	<0.050	<25.0	-	<5.00	<5.00	<25.0	<10.0	-	-	<10.0	<10.0	-
potassium, dissolved	mg/L	2420	2060	563	561	3.62	2240	-	607	571	1920	1080	-	-	1020	1030	-
rubidium, dissolved	mg/L	9.48	7.92	2.2	2.11	0.00254	8.65	-	2.34	2.23	7.78	3.68	-	-	3.47	3.5	-
selenium, dissolved	mg/L	<0.0250	<0.0250	<0.00500	<0.00500	0.000079	<0.0250	-	<0.00500	<0.00500	<0.0250	0.0186	-	-	<0.0100	0.0145	-
silicon, dissolved	mg/L	<25.0	<25.0	<5.00	<5.00	0.221	<25.0	-	<5.00	<5.00	<25.0	<10.0	-	-	<10.0	<10.0	-
silver, dissolved	mg/L	<0.00500	<0.00500	<0.00100	<0.00100	<0.000010	<0.00500	-	<0.00100	<0.00100	<0.00500	<0.00200	-	-	<0.00200	<0.00200	-
sodium, dissolved	mg/L	1490	1250	381	376	95.2	1430	-	6420	6040	1550	2950	-	-	3190	3260	-
strontium, dissolved	mg/L	2440	2080	553	564	0.294	2220	-	642	655	2060	1070	-	-	1060	1080	-
sulfur, dissolved	mg/L	<250	<250	<50.0	<50.0	1.94	<250	-	270	261	<250	<100	-	-	<100	109	-
tellurium, dissolved	mg/L	0.191	0.133	0.0396	0.0457	<0.00020	0.196	-	0.038	0.0438	0.131	0.0577	-	-	0.075	0.0631	-
thallium, dissolved	mg/L	0.311	0.275	0.0744	0.0757	0.000073	0.288	-	0.0532	0.0532	0.198	0.1	-	-	0.0945	0.0992	-
thorium, dissolved	mg/L	<0.0500	<0.0500	<0.0100	<0.0100	<0.00010	<0.0500	-	<0.0100	<0.0100	<0.0500	<0.0200	-	-	<0.0200	<0.0200	-
tin, dissolved	mg/L	<0.0500	<0.0500	<0.0100	<0.0100	<0.00010	<0.0500	-	<0.0100	<0.0100	<0.0500	<0.0200	-	-	<0.0200	<0.0200	-
titanium, dissolved	mg/L	<0.150	<0.150	<0.0300	<0.0300	<0.00030	<0.150	-	<0.0300	<0.0300	<0.150	<0.0600	-	-	<0.0600	<0.0600	-
tungsten, dissolved	mg/L	<0.0500	<0.0500	<0.0100	<0.0100	<0.00010	<0.0500	-	0.0112	0.0109	<0.0500	<0.0200	-	-	<0.0200	<0.0200	-
uranium, dissolved	mg/L	<0.00500	<0.00500	<0.00100	<0.00100	<0.000024	<0.00500	-	0.00262	0.00259	<0.00500	<0.00200	-	-	<0.00200	<0.00200	-
vanadium, dissolved	mg/L	<0.250	<0.250	<0.0500	<0.0500	<0.00050	<0.250	-	<0.0500	<0.0500	<0.250	<0.100	-	-	<0.100	<0.100	-
zinc, dissolved	mg/L	3.13	<0.500	<0.100	<0.100	0.0097	<0.500	-	<0.100	<0.100	<0.500	<0.200	-	-	<0.200	0.531	-
zirconium, dissolved	mg/L	<0.100	<0.100	<0.0200	<0.0200	<0.00020	<0.100	-	<0.0300	<0.0300	<0.150	<0.0400	-	-	<0.0600	<0.0600	-



Table C-1 - Laboratory Results for Raw Water Quality Results from Westbay Well M20-3071  
Meliadine Extension Agnico Eagle Mines Limited

Sample Source	Drilling Fluid						Port 9	Port 8			Port 4						Port 3
Client Sample ID	Westbay-A-225	West bay-A-360	Westbay-A-490	Westbay-A-490-Dup	Westbay A-606	Westbay A-606-BR	Westbay-A-Port 9-1	Westbay-A-Port 8-0-29	Westbay-A-Port 8-29%DUP-1	Westbay-A-Port 4-1	Westbay-A-Port 4-1	Westbay-A-Port 4-2	Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 4-2	Westbay-A-Port 3-1	
Date Sampled	17-Aug-2020	21-Aug-2020	25-Aug-2020	25-Aug-2020	27-Aug-2020	27-Aug-2020	28-Sep-20	20-Sep-2020	20-Sep-2020	19-Sep-2020	25-Sep-2020	27-Sep-2020	27-Sep-2020	28-Sep-2020	28-Sep-2020	28-Sep-2020	
ALS Sample ID	VA20B3721-001, VA20B6509-001	VA20B4004-001, VAB6509-002	VA20B4663-001	VA20B4663-002	VA20B4662-001, V20B6509-003	VA20B4662-002, VA20B6509-004	VA20B7020-006	VA20B6509-007, LZ5081847	VA20B6509-008, LZ5081848	VA20B6509-005, LZ5081845	VA20B7020-001	VA20B7020-003	VA20B7020-004	VA20B7020-007	VA20B7020-008	VA20B7020-005	
Sample Interval	surface						292.5 to 310	310.8 to 326.9			438.7 to 457.1						491.2 to 572.6
Drilling Fluid Dye Concentration	mbgs						783	758 to 809			820						795
Sample Dye Concentration	ppb						752	812			710						710
Proportion of Drilling Fluid in Samples	%						100%	100%			100%						100%
Proportion of Formation Groundwater in Samples	%						0%	0%			0%						0%
Volatile Organic Compounds [BTEXS+MTBE]																	
benzene	μg/L	<0.50	<0.50	<0.50	<0.50	1.19	<0.50	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	
ethylbenzene	μg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	
methyl-tert-butyl ether [MTBE]	μg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	
styrene	μg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	
toluene	μg/L	3.14	2.36	1.55	1.36	1.12	0.7	-	<0.50	<0.50	0.67	0.74	0.60	0.85	-	-	
xylene, m+p-	μg/L	<0.50	0.78	0.64	0.52	<0.50	0.93	-	<0.50	<0.50	0.71	<0.50	<0.50	0.68	-	-	
xylene, o-	μg/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.52	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	
xylenes, total	μg/L	<0.75	0.78	<0.75	<0.75	<0.75	1.44	-	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	-	-	
Hydrocarbons																	
F1 (C6-C10)	μg/L	-	-	-	-	-	-	-	<100	<100	<100	<100	<100	<100	-	-	
F2 (C10-C16)	μg/L	-	-	-	-	-	-	-	<100	<100	<100	<100	<100	<100	-	-	
F3 (C16-C34)	μg/L	-	-	-	-	-	-	-	<250	<250	<250	<250	<250	<250	-	-	
F4 (C34-C50)	μg/L	-	-	-	-	-	-	-	<250	<250	<250	<250	<250	<250	-	-	
F1-BTEX	μg/L	-	-	-	-	-	-	-	<100	<100	<100	<100	<100	<100	-	-	
TEH (C10-C50)	μg/L	-	-	-	-	-	-	-	<400	<400	<400	<400	<400	<400	-	-	
TEH (C16-C50)	μg/L	-	-	-	-	-	-	-	<400	<400	<400	<400	<400	<400	-	-	
EPH (C10-C19)	μg/L	208000	<250	<250	<250	880	<250	-	-	-	-	-	-	-	-	-	
EPH (C19-C32)	μg/L	9450	<250	<250	<250	<250	<250	-	-	-	-	-	-	-	-	-	
LEPHw	μg/L	208000	<250	<250	<250	880	<250	-	-	-	-	-	-	-	-	-	
HEPHw	μg/L	9450	<250	<250	<250	<250	<250	-	-	-	-	-	-	-	-	-	
Polycyclic Aromatic Hydrocarbons																	
acenaphthene	μg/L	<0.421	<0.010	<0.010	<0.010	<0.020	<0.020	-	-	-	-	-	-	-	-	-	
acenaphthylene	μg/L	<4.00	<0.010	<0.010	<0.010	<0.060	0.045	-	-	-	-	-	-	-	-	-	
acridine	μg/L	<0.421	<0.010	<0.010	<0.010	0.072	0.026	-	-	-	-	-	-	-	-	-	
anthracene	μg/L	<0.421	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-	-	-	-	-	-	-	
benz(a)anthracene	μg/L	<0.421	<0.010	<0.020	<0.020	<0.020	<0.010	-	-	-	-	-	-	-	-	-	
benzo(a)pyrene	μg/L	<0.421	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	-	-	-	-	-	-	-	-	
benzo(b+j)fluoranthene	μg/L	0.531	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-	-	-	-	-	-	-	
benzo(b+j+k)fluoranthene	μg/L	<0.595	<0.015	<0.015	<0.015	<0.015	<0.015	-	-	-	-	-	-	-	-	-	
benzo(g,h,i)perylene	μg/L	<0.421	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-	-	-	-	-	-	-	
benzo(k)fluoranthene	μg/L	<0.421	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-	-	-	-	-	-	-	
chrysene	μg/L	0.612	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-	-	-	-	-	-	-	
dibenz(a,h)anthracene	μg/L	<0.421	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	-	-	-	-	-	-	-	-	
fluoranthene	μg/L	0.519	<0.010	<0.010	<0.010	0.021	0.023	-	-	-	-	-	-	-	-	-	
fluorene	μg/L	<0.421	0.018	<0.010	<0.010	0.035	0.044	-	-	-	-	-	-	-	-	-	
indeno(1,2,3-c,d)pyrene	μg/L	<0.421	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-	-	-	-	-	-	-	
methylnaphthalene, 1-	μg/L	<7.00	0.018	0.048	0.045	0.202	0.117	-	-	-	-	-	-	-	-	-	
methylnaphthalene, 2-	μg/L	<0.421	0.026	0.06	0.058	0.106	0.098	-	-	-	-	-	-	-	-	-	
naphthalene	μg/L	<0.800	0.083	0.073	0.074	0.766	0.449	-	-	-	-	-	-	-	-	-	
phenanthrene	μg/L	<0.500	0.052	<0.020	<0.020	0.094	0.113	-	-	-	-	-	-	-	-	-	
pyrene	μg/L	<0.421	0.015	0.022	0.021	0.058	0.052	-	-	-	-	-	-	-	-	-	
quinoline	μg/L	<0.060	<0.050	<0.050	<0.050	<0.800	<0.200	-	-	-	-	-	-	-	-	-	

Table C-1 - Laboratory Results for Raw Water Quality Results from Westbay Well M20-3071  
Meliadine Extension Agnico Eagle Mines Limited

Sample Source	Drilling Fluid						Port 9	Port 8			Port 4						Port 3
Client Sample ID	Westbay-A-225	West bay-A-360	Westbay-A-490	Westbay-A-490-Dup	Westbay A-606	Westbay A-606-BR	Westbay-A-Port 9-1	Westbay-A-Port 8-0.29	Westbay-A-Port 8-29%DUP-1	Westbay-A-Port 4-1	Westbay-A-Port 4-1	Westbay-A-Port 4-2	Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 4-2	Westbay-A-Port 3-1	
Date Sampled	17-Aug-2020	21-Aug-2020	25-Aug-2020	25-Aug-2020	27-Aug-2020	27-Aug-2020	28-Sep-20	20-Sep-2020	20-Sep-2020	19-Sep-2020	25-Sep-2020	27-Sep-2020	27-Sep-2020	28-Sep-2020	28-Sep-2020	28-Sep-2020	
ALS Sample ID	VA20B3721-001, VA20B6509-001	VA20B4004-001, VAB6509-002	VA20B4663-001	VA20B4663-002	VA20B4662-001, V20B6509-003	VA20B4662-002, VA20B6509-004	VA20B7020-006	VA20B6509-007, L25081847	VA20B6509-008, L25081848	VA20B6509-005, L25081845	VA20B7020-001	VA20B7020-003	VA20B7020-004	VA20B7020-007	VA20B7020-008	VA20B7020-005	
Sample Interval	surface						292.5 to 310	310.8 to 326.9			438.7 to 457.1						491.2 to 572.6
Drilling Fluid Dye Concentration	mbgs						783	310.8 to 326.9			438.7 to 457.1						491.2 to 572.6
Sample Dye Concentration	ppb						783	758 to 809			820						795
Proportion of Drilling Fluid in Samples	%						752	235			746						277
Proportion of Formation Groundwater in Samples	%						100%	29 to 31%			91%						35%
Proportion of Formation Groundwater in Samples	%						0%	69 to 71%			9%						65%
<b>Volatile Organic Compounds</b>																	
bromodichloromethane	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
bromoform	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
carbon tetrachloride	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
chlorobenzene	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
chloroethane	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
chloroform	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
chloromethane	µg/L	<79	<53	<3.60	<3.20	<0.50	<110	-	-	-	-	-	-	-	-	-	
dibromochloromethane	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
dichlorobenzene, 1,2-	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
dichlorobenzene, 1,3-	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
dichlorobenzene, 1,4-	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
dichloroethane, 1,1-	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
dichloroethane, 1,2-	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
dichloroethylene, 1,1-	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
dichloroethylene, cis-1,2-	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
dichloroethylene, trans-1,2-	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
dichloromethane	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
dichloropropane, 1,2-	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
dichloropropylene, cis+trans-1,3-	µg/L	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	-	-	-	-	-	-	-	-	-	
dichloropropylene, cis-1,3-	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
dichloropropylene, trans-1,3-	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
tetrachloroethane, 1,1,1,2-	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
tetrachloroethane, 1,1,2,2-	µg/L	<0.40	<0.20	<0.20	<0.20	<0.20	<0.20	-	-	-	-	-	-	-	-	-	
tetrachloroethylene	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
trichloroethane, 1,1,1-	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
trichloroethane, 1,1,2-	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
trichloroethylene	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
trichlorofluoromethane	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	-	-	-	-	-	-	-	-	
vinyl chloride	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	-	-	-	-	-	-	-	-	-	
<b>Bacteriological Tests</b>																	
bacteria, sulfate reducing	CFU/1mL	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	-	-	
<b>Stable Isotopes</b>																	
delta-oxygen-18	‰ VSMOW	-13.32	-13.58	-	-	-12.79	-13.28	-15.84	-15.31	-15.03	-	-14.63	-	-	-	-14.74	-15.87
delta-hydrogen-2	‰ VSMOW	-106.0	-107.3	-	-	-105.5	-106.5	-124.2	-117.3	-117.0	-	-116.2	-	-	-	-116.5	-121.8
<b>QA/QC</b>																	
Field Conductivity vs Lab Conductivity	-	-	-	-	-	0.6	-	-	1.5	1.0	1.5	1.0	1.0	1.0	-	-	
Calculated TDS (lab)	mg/L	127485	124889	35989	36826	406	146316	-	56353	59501	126767	90982	54610	57839	-	-	
Lab measured vs Calculated TDS	%	78%	92%	89%	90%	73%	79%	-	90%	-	98%	102%	71%	92%	-	-	
Lab measured TDS vs Lab Conductivity	-	1.1	1.2	0.8	0.8	0.8	1.4	-	1.2	-	1.6	0.9	0.8	0.7	-	-	

**Notes:**

Average field measured parameters reported for Ports 4 and 8

- parameter was not analyzed

\* parameter could not be accurately measured in field due to equipment malfunction or limitations  
underline parameter exceeds laboratory calibration range



**Appendix C**  
**Table C-2 - Corrected Water Quality Results for Westbay Well M20-3071 Port 8**  
**Meladine Extension Agnico Eagle Mines Limited**

Location		Drilling Fluid (Average 225 and 360 mah)	Raw Results Port 8			Corrected Results Port 8				
Client Sample ID			Westbay-A-Port 8- 0.29	Westbay-A-Port 8- 29%DUP-1	Westbay-A-Port 8-0.29	Westbay-A-Port 8-0.29	Westbay-A-Port 8- 29%DUP-1	Westbay-A-Port 8- 29%DUP-1	Westbay-A-Port 8- 29%DUP-1	
Date Sampled			20-Sep-2020	20-Sep-2020	20-Sep-2020	20-Sep-2020	20-Sep-2020	20-Sep-2020	20-Sep-2020	
Golder ID			-	-	Sample 1	Sample 1 average	Sample 1 Duplicate	Sample 1 duplicate average		
ALS Sample ID		VA20B6509-007	VA20B6509-008	VA20B6509-007	Average VA20B6509-007	VA20B6509-008	Average VA20B6509-008			
Sample Interval	mbgs	-	310.8 to 326.9	310.8 to 329.9	310.8 to 329.9	310.8 to 329.9	310.8 to 329.9	310.8 to 329.9		
Drilling Fluid Dye Concentration	ppb	-	758 to 809	758 to 809	758 to 809	758 to 809	758 to 809	758 to 809		
Sample Dye Concentration	ppb	-	237	237	237	237	237	237		
Proportion of Drilling Fluid in Samples	%	100%	29 to 31%	31% to 29%	29% to 31%	31% to 29%	29% to 31%	29% to 31%		
Proportion of Formation Groundwater in Samples	%	0%	69 to 71%	69%	71%	69 to 71%	69%	71%		
electrical conductivity	µS/cm	128500	52300	81000	17660	20728	19194	59407	61319	60363
alkalinity, total (as CaCO3)	mg/L	1016	247	251						
hardness (as CaCO3), dissolved	mg/L	109600	37000	35300	3996	6919	5458	1523	4515	3019
pH	-	9.48	8.99	9.01	8.77	8.79	8.78	8.80	8.82	8.81
Lab Measured TDS	mg/L	149500	62400	68500	22805	26311	24558	31678	34939	33308
Calculated TDS (Cl, SO4, Ca, Mg, Na, K, Sr)	mg/L	124304	55400	58539	24406	26637	25842	29835	31135	30846
solids, total suspended [TSS]	mg/L	2419	163	11						
turbidity	NTU	346.8	10.9	11.8						
alkalinity, phenolphthalein (as CaCO3)	mg/L	118.7	44.4	-	10.6	13.6	12.1	-	-	-
alkalinity, hydroxide (as CaCO3)	mg/L	<2.0	<2.0	<1.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0
alkalinity, carbonate (as CaCO3)	mg/L	237	88.8	139	21	27	24	94	98	96
alkalinity, bicarbonate (as CaCO3)	mg/L	777.5	158	112						
bicarbonate	mg/L	948.5	193	137						
salinity	psu	104.6	38.6	53.4	8.6	11.3	9.9	30	32	31
carbonate	mg/L	142.5	53.3	83.3	12.7	16.3	14.5	56.4	58.8	57.6
hydroxide	mg/L	<2.0	<2.0	<1.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0
<b>Anions and Nutrients</b>										
Kjeldahl nitrogen, total [TKN]	mg/L	59.4	1.46	1.54						
ammonia, total (as N)	mg/L	9.435	1.12	1.09						
bromide	mg/L	269	127	144	62	68	65	87	92	90
chloride	mg/L	74550	32700	36800	13675	15360	14518	19639	21159	20399
fluoride	mg/L	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
nitrate (as N)	mg/L	4.79	1.3	1.48					0.11	0.05
nitrite (as N)	mg/L	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
phosphate, ortho-, dissolved (as P)	mg/L	0.0337	0.0032	0.0032						
phosphorus, total	mg/L	0.0423	0.0343	0.0317	0.0307	0.0310	0.0308	0.0269	0.0273	0.0271
silicate (as SiO2)	mg/L	<25.0	5.18	5.4	5.18	5.18	5.18	5.4	5.4	5.4
sulphate (as SO4)	mg/L	15	766	861	766	766	766	861	861	861
<b>Cyanides</b>										
cyanide, free	mg/L	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200
cyanide, strong acid dissociable (total)	mg/L	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200
cyanide, weak acid dissociable	mg/L	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200
<b>Organic / Inorganic Carbon</b>										
carbon, dissolved organic [DOC]	mg/L	192	216	218	227	226	226	230	229	229
carbon, total organic [TOC]	mg/L	228	212	212	205	206	205	205	206	205
<b>Dissolved Metals</b>										
aluminum, dissolved	mg/L	<0.500	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
antimony, dissolved	mg/L	<0.0500	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
arsenic, dissolved	mg/L	<0.0500	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
barium, dissolved	mg/L	12.4	3.22	2.94						
beryllium, dissolved	mg/L	<0.0500	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
bismuth, dissolved	mg/L	<0.0250	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
boron, dissolved	mg/L	153.5	37	34.6						
cadmium, dissolved	mg/L	<0.00250	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
calcium, dissolved	mg/L	43850	13400	12800		783	783			

Appendix C  
 Table C-2 - Corrected Water Quality Results for Westbay Well M20-3071 Port 8  
 Meliadine Extension Agnico Eagle Mines Limited

Location		Drilling Fluid (Average 225 and 360 mah)	Raw Results Port 8				Corrected Results Port 8			
Client Sample ID			Westbay-A-Port 8- 0.29	Westbay-A-Port 8- 29%DUP-1	Westbay-A-Port 8-0.29	Westbay-A-Port 8-0.29	Westbay-A-Port 8- 29%DUP-1	Westbay-A-Port 8- 29%DUP-1		
Date Sampled			20-Sep-2020	20-Sep-2020	20-Sep-2020	20-Sep-2020	20-Sep-2020	20-Sep-2020		
Golder ID			-	-	Sample 1	Sample 1 average	Sample 1 Duplicate	Sample 1 duplicate average		
ALS Sample ID			VA20B6509-007	VA20B6509-008	VA20B6509-007	Average VA20B6509-007	VA20B6509-008	Average VA20B6509- 008		
Sample Interval	mbgs	-	310.8 to 326.9	310.8 to 329.9	310.8 to 329.9	310.8 to 329.9	310.8 to 329.9			
Drilling Fluid Dye Concentration	ppb	-	758 to 809	758 to 809	758 to 809	758 to 809	758 to 809			
Sample Dye Concentration	ppb	-	237	237	237	237	237			
Proportion of Drilling Fluid in Samples	%	100%	29 to 31%	31% to 29%	29% to 31%	31% to 29%	29% to 31%			
Proportion of Formation Groundwater in Samples	%	0%	69 to 71%	69%	71%	69 to 71%	69%			
cesium, dissolved	mg/L	3.92	0.919	0.913						
chromium, dissolved	mg/L	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500			
cobalt, dissolved	mg/L	<0.0500	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100			
copper, dissolved	mg/L	<0.100	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200			
iron, dissolved	mg/L	<5.00	<1.00	<1.00	<1.00	<1.00	<1.00			
iron, ferrous [Fe II], dissolved	mg/L	-	0.024	0.039	0.024	0.024	0.039			
lead, dissolved	mg/L	<0.0250	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500			
lithium, dissolved	mg/L	166.5	39.8	37						
magnesium, dissolved	mg/L	19.3	865	812	1249	1215	1232			
manganese, dissolved	mg/L	<0.0500	0.657	0.626	0.657	0.657	0.657			
mercury, dissolved	mg/L	<0.0000500	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050			
molybdenum, dissolved	mg/L	0.043	0.0196	0.021	0.009	0.010	0.009			
nickel, dissolved	mg/L	<0.250	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500			
phosphorus, dissolved	mg/L	<25.0	<5.00	<5.00	<5.00	<5.00	<5.00			
potassium, dissolved	mg/L	2240	607	571						
rubidium, dissolved	mg/L	8.7	2.34	2.23						
selenium, dissolved	mg/L	<0.0250	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500			
silicon, dissolved	mg/L	<25.0	<5.00	<5.00	<5.00	<5.00	<5.00			
silver, dissolved	mg/L	<0.00500	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100			
sodium, dissolved	mg/L	1370	6420	6040	8716	8512	8614			
strontium, dissolved	mg/L	2260	642	655						
sulfur, dissolved	mg/L	<250	270	261	270	270	270			
tellurium, dissolved	mg/L	0.162	0.038	0.0438						
thallium, dissolved	mg/L	0.293	0.0532	0.0532						
thorium, dissolved	mg/L	<0.0500	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100			
tin, dissolved	mg/L	<0.0500	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100			
titanium, dissolved	mg/L	<0.150	<0.0300	<0.0300	<0.0300	<0.0300	<0.0300			
tungsten, dissolved	mg/L	<0.0500	0.0112	0.0109	0.0112	0.0112	0.0112			
uranium, dissolved	mg/L	<0.00500	0.00262	0.00259	0.00262	0.00262	0.00262			
vanadium, dissolved	mg/L	<0.250	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500			
zinc, dissolved	mg/L	1.815	<0.100	<0.100	<0.100	<0.100	<0.100			
zirconium, dissolved	mg/L	<0.100	<0.0300	<0.0300	<0.0300	<0.0300	<0.0300			
<b>Aggregate Organics</b>										
biochemical oxygen demand [BOD]	mg/L	165	537	621	706	691	699	828	810	819
chemical oxygen demand [COD]	mg/L	9310	2180	3770				1252	1475	1363
oil & grease (gravimetric)	mg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
<b>Radiological Parameters</b>										
radium-226	Bq/L	5.4	3.9	4.1	3.2	3.3	3.3	3.5	3.6	3.6
<b>Stable Isotopes</b>										
delta-oxygen-18	‰ VSMOW	-13.45	-15.31	-15.03	-21.90	-21.29	-21.60	-21.52	-20.91	-21.21
delta-hydrogen-2	‰ VSMOW	-106.64	-117.3	-117.0	-161.1	-156.9	-159.0	-160.8	-156.7	-158.7

**Notes:**

Shaded result indicates a low estimated concentration (calculations returned a negative value)

underline parameter exceeds laboratory calibration range

- parameter was not analyzed

Isotopes results were corrected for salinity and proportion of drill fluid remaining

**Table C-3 - Salinity Corrected Water Isotope Results for Westbay Well M20-3071  
Meliadine Extension Agnico Eagle Mines Limited**

Sample	Laboratory Result (‰ VSMOW)		Salinity corrected (‰ VSMOW)		Proportion drill water	Proportion formation water	Drill Fluid Corrected (‰ VSMOW)	
	d2H	d18O	d2H	d18O			d18O	d2H
225-BR Drilling Fluid	-106.00	-13.32	-99.29	-12.77			--	--
360-BR Drilling Fluid	-107.28	-13.58	-101.73	-13.13			--	--
606 Drilling Fluid	-105.51	-12.79	--	--			--	--
606-BR BH Flush	-106.51	-13.28	-99.79	-12.72			--	--
Port 8-29% (20-Sep-20)	-117.30	-15.31	-115.20	-15.11	0.29	0.71	-15.93	-120.70
Port 8-29% (20-Sep-20)	-117.30	-15.31	-115.20	-15.11	0.31	0.69	-16.01	-121.25
Port 8-29% (20-Sep-20) - DUP	-117.04	-15.03	-115.04	-14.85	0.29	0.71	-15.55	-120.48
Port 8-29% (20-Sep-20) - DUP	-117.04	-15.03	-115.04	-14.85	0.31	0.69	-15.62	-121.02
Port 4-95% (19-Sep-20)	-105.73	-12.74	-100.24	-12.30	0.95	0.05	--	--
Port 4-56% (25-Sep-20)	-116.24	-14.63	-112.86	-14.34	0.56	0.44	-16.95	-128.93
Port 3-35% (28-Sep-20)	-121.76	-15.87	--	--	0.35	0.65	-17.79	-133.35
Port 9-30% (28-Sep-20)	-124.23	-15.84	--	--	0.30	0.70	-17.00	-133.87
Port 4-51% (28-Sep-20)	-116.49	-14.74	-113.35	-14.47	0.51	0.49	-16.73	-127.00

**Notes:**

-- Not applicable

Ports 8 and 9 data corrected for drill fluid using 360-BR Drilling Fluid salinity corrected isotope results.

Ports 3 and 4 data corrected for drill fluid using Port-4-95% salinity corrected isotope results.

Port 4 was not sufficiently developed to provide reliably accurate drill fluid corrected isotopic compositions (not shown on Figure 5).

Table C-4 - QA/QC of Laboratory Water Quality Results for Westbay Well M20-3071  
Meliadine Extension Agnico Eagle Mines Limited

Location		Drilling Fluid Collected upon completion of 490 m along borehole				
Sample ID	Westbay-A-490		Westbay-A-490-Dup		RPD	
Date	25-Aug-2020		25-Aug-2020			
ALS Sample ID	VA20B4663-001		VA20B4663-002			
Parameters	Units	MDL	5 x MDL			
<b>Physical Tests</b>						
electrical conductivity	µS/cm	2	10	48600	48400	0.4%
alkalinity, total (as CaCO3)	mg/L	2	10	367	365	0.5%
hardness (as CaCO3), dissolved	mg/L	5	25	30200	30800	2%
hardness (as CaCO3), from total Ca/Mg	mg/L	5-10	25 - 50	31700	31700	<MDL
pH	-	0	0.5	9.27	9.28	0%
solids, total dissolved [TDS]	mg/L	80	400	40400	40900	1%
solids, total suspended [TSS]	mg/L	5	25	741	643	14%
turbidity	NTU	0.1	0.5	56.9	58	2%
alkalinity, phenolphthalein (as CaCO3)	mg/L	2	10	100	100	0%
alkalinity, hydroxide (as CaCO3)	mg/L	2	10	<2.0	<2.0	--
alkalinity, carbonate (as CaCO3)	mg/L	2	10	200	200	0%
alkalinity, bicarbonate (as CaCO3)	mg/L	2	10	167	165	1.2%
bicarbonate	mg/L	2	10	203	202	0.5%
salinity	psu	1	5	34.9	34.8	0.3%
carbonate	mg/L	2	10	120	120	0%
hydroxide	mg/L	2	10	<2.0	<2.0	--
<b>Anions and Nutrients</b>						
Kjeldahl nitrogen, total [TKN]	mg/L	1.00	5.00	40.6	45.1	11%
ammonia, total (as N)	mg/L	0.100	0.50	1.9	1.92	1%
bromide	mg/L	5.00	25.00	115	117	2%
chloride	mg/L	50.0	250.00	21600	22200	3%
fluoride	mg/L	2.00	10.00	<2.00	<2.00	--
nitrate (as N)	mg/L	0.500	2.50	1.05	1.02	<MDL
nitrite (as N)	mg/L	0.100	0.50	<0.100	<0.100	--
phosphate, ortho-, dissolved (as P)	mg/L	0.0010	0.01	0.0148	0.0152	3%
phosphorus, total	mg/L	0.160 - 0.170	0.800 - 0.805	<0.170	<0.160	--
silicate (as SiO2)	mg/L	25.0	125.0	<25.0	<25.0	--
sulfate (as SO4)	mg/L	30.0	150.0	<30.0	<30.0	--
<b>Cyanides</b>						
cyanide, free	mg/L	0.0100	0.0500	<0.0100	<0.0100	--
cyanide, strong acid dissociable (total)	mg/L	0.0100	0.0500	<0.0100	<0.0100	--
cyanide, weak acid dissociable	mg/L	0.0100	0.0500	<0.0100	<0.0100	--
<b>Organic / Inorganic Carbon</b>						
carbon, dissolved organic [DOC]	mg/L	5.00	25.00	170	200	16%
carbon, total organic [TOC]	mg/L	5.00	25.00	211	216	2%
<b>Total Metals</b>						
aluminum, total	mg/L	0.3 - 0.6	1.5	<0.600	<0.300	--
antimony, total	mg/L	0.0100 - 0.0200	0.0500 - 0.1000	<0.0200	<0.0100	--
arsenic, total	mg/L	0.0100 - 0.0200	0.0500 - 0.1000	<0.0200	<0.0100	--
barium, total	mg/L	0.0100 - 0.0200	0.0500 - 0.1000	3.27	3.21	2%
beryllium, total	mg/L	0.0100 - 0.0200	0.0500 - 0.1000	<0.0200	<0.0100	--
bismuth, total	mg/L	0.00500 - 0.0100	0.02500 - 0.0500	<0.0100	<0.00500	--
boron, total	mg/L	1.00 - 2.00	5.00 - 10.00	44.1	41.5	6%
cadmium, total	mg/L	0.000500 - 0.00100	0.002500 - 0.00500	<0.00100	<0.000500	--
calcium, total	mg/L	5.00 - 10.0	25.00 - 50.00	12700	12700	0%
cesium, total	mg/L	0.0100 - 0.00200	0.0500 - 0.01000	1.04	1.17	12%
chromium, total	mg/L	0.0100 - 0.0200	0.0500 - 0.1000	<0.0200	<0.0100	--
cobalt, total	mg/L	0.0100 - 0.0200	0.0500 - 0.1000	<0.0200	<0.0100	--
copper, total	mg/L	0.0500 - 0.100	0.2500 - 0.500	<0.100	<0.0500	--
iron, total	mg/L	1.00 - 2.00	5.00 - 10.00	5.84	5.8	1%
lead, total	mg/L	0.00500 - 0.0100	0.02500 - 0.0500	<0.0100	<0.00500	--
lithium, total	mg/L	0.100 - 0.200	0.500 - 1.000	47	47.3	1%
magnesium, total	mg/L	0.0500 - 0.100	0.2500 - 0.500	4.2	5.01	18%
manganese, total	mg/L	0.0100 - 0.0200	0.0500 - 0.1000	0.0724	0.083	14%
mercury, total	mg/L	0.0000050	0.0000025	<0.0000050	<0.0000050	--
molybdenum, total	mg/L	0.00500 - 0.0100	0.025000 - 0.05000	0.0102	0.0123	19%
nickel, total	mg/L	0.0500 - 0.100	0.2500 - 0.500	<0.100	<0.0500	--
phosphorus, total	mg/L	5.00 - 10.0	25.00 - 50.00	<10.0	<5.00	--
potassium, total	mg/L	5.00 - 10.0	25.00 - 50.00	598	636	6%
rubidium, total	mg/L	0.0200 - 0.0400	0.1000 - 0.2000	2.28	2.42	6%
selenium, total	mg/L	0.00500 - 0.0100	0.02500 - 0.0500	<0.0100	<0.00500	--
silicon, total	mg/L	10.0 - 20.0	-150.00	<20.0	<10.0	--
silver, total	mg/L	0.00100 - 0.00200	0.00500 - 0.01000	<0.00200	<0.00100	--
sodium, total	mg/L	5.00 - 10.0	25.00 - 50.00	415	428	3%
strontium, total	mg/L	0.0200 - 0.0400	0.1000 - 0.2000	591	689	15%
sulfur, total	mg/L	50.0 - 100	250.0 - 500.00	<100	<50.0	--
tellurium, total	mg/L	0.0200 - 0.0400	0.1000 - 0.2000	0.0562	0.0472	17%
thallium, total	mg/L	0.00100 - 0.00200	0.00500 - 0.01000	0.0806	0.08	1%
thorium, total	mg/L	0.0100 - 0.0200	0.0500 - 0.1000	<0.0200	<0.0100	--
tin, total	mg/L	0.0100 - 0.0200	0.0500 - 0.1000	<0.0200	<0.0100	--
titanium, total	mg/L	0.0300 - 0.0600	0.1500 - 0.3000	<0.0600	<0.0300	--
tungsten, total	mg/L	0.0100 - 0.0200	0.0500 - 0.1000	<0.0200	<0.0100	--
uranium, total	mg/L	0.00100 - 0.00200	0.00500 - 0.01000	<0.00200	<0.00100	--
vanadium, total	mg/L	0.0500 - 0.100	0.2500 - 0.500	<0.100	<0.0500	--
zinc, total	mg/L	0.300 - 0.600	1.500 - 3.000	<0.600	<0.300	--
zirconium, total	mg/L	0.0200 - 0.0400	0.1000 - 0.2000	<0.0400	<0.0200	--

Table C-4 - QA/QC of Laboratory Water Quality Results for Westbay Well M20-3071  
Meliadine Extension Agnico Eagle Mines Limited

Location				Drilling Fluid Collected upon completion of 490 m along borehole			
Sample ID				Westbay-A-490		Westbay-A-490-Dup	RPD
Date				25-Aug-2020		25-Aug-2020	
ALS Sample ID				VA20B4663-001		VA20B4663-002	
Parameters	Units	MDL	5 x MDL				
<b>Dissolved Metals</b>							
aluminum, dissolved	mg/L	0.100	0.500	<0.100	<0.100	--	
antimony, dissolved	mg/L	0.0100	0.0500	<0.0100	<0.0100	--	
arsenic, dissolved	mg/L	0.0100	0.0500	<0.0100	<0.0100	--	
barium, dissolved	mg/L	0.0100	0.0500	3.04	2.96	3%	
beryllium, dissolved	mg/L	0.0100	0.0500	<0.0100	<0.0100	--	
bismuth, dissolved	mg/L	0.00500	0.02500	<0.00500	<0.00500	--	
boron, dissolved	mg/L	1.00	5.00	41	40	2%	
cadmium, dissolved	mg/L	0.000500	0.002500	<0.000500	<0.000500	--	
calcium, dissolved	mg/L	5.00	25.00	12100	12300	2%	
cesium, dissolved	mg/L	0.00100	0.00500	1	1.02	2%	
chromium, dissolved	mg/L	0.01	0.05	<0.0100	<0.0100	--	
cobalt, dissolved	mg/L	0.01	0.05	<0.0100	<0.0100	--	
copper, dissolved	mg/L	0.02	0.1	<0.0200	<0.0200	--	
iron, dissolved	mg/L	1	5	2.94	2.83	<MDL	
lead, dissolved	mg/L	0.005	0.025	<0.00500	<0.00500	--	
lithium, dissolved	mg/L	0.1	0.5	42.9	42.6	1%	
magnesium, dissolved	mg/L	0.5	2.5	3.61	3.68	2%	
manganese, dissolved	mg/L	0.01	0.05	0.0393	0.0381	<MDL	
mercury, dissolved	mg/L	0.0000050	0.000025	<0.0000050	<0.0000050	--	
molybdenum, dissolved	mg/L	0.005	0.025	0.0104	0.0112	<MDL	
nickel, dissolved	mg/L	0.05	0.25	<0.0500	<0.0500	--	
phosphorus, dissolved	mg/L	5	25	<5.00	<5.00	--	
potassium, dissolved	mg/L	5	25	563	561	0%	
rubidium, dissolved	mg/L	0.02	0.1	2.2	2.11	4%	
selenium, dissolved	mg/L	0.005	0.025	<0.00500	<0.00500	--	
silicon, dissolved	mg/L	5	25	<5.00	<5.00	--	
silver, dissolved	mg/L	0.001	0.005	<0.00100	<0.00100	--	
sodium, dissolved	mg/L	5	25	381	376	1%	
strontium, dissolved	mg/L	0.02	0.1	553	564	2%	
sulfur, dissolved	mg/L	50	250	<50.0	<50.0	--	
tellurium, dissolved	mg/L	0.02	0.1	0.0396	0.0457	<MDL	
thallium, dissolved	mg/L	0.001	0.005	0.0744	0.0757	2%	
thorium, dissolved	mg/L	0.01	0.05	<0.0100	<0.0100	--	
tin, dissolved	mg/L	0.01	0.05	<0.0100	<0.0100	--	
titanium, dissolved	mg/L	0.03	0.15	<0.0300	<0.0300	--	
tungsten, dissolved	mg/L	0.01	0.05	<0.0100	<0.0100	--	
uranium, dissolved	mg/L	0.001	0.005	<0.00100	<0.00100	--	
vanadium, dissolved	mg/L	0.05	0.25	<0.0500	<0.0500	--	
zinc, dissolved	mg/L	0.1	0.5	<0.100	<0.100	--	
zirconium, dissolved	mg/L	0.02	0.1	<0.0200	<0.0200	--	
<b>Aggregate Organics</b>							
biochemical oxygen demand [BOD]	mg/L	6.0	30.0	<6.0	<6.0	--	
chemical oxygen demand [COD]	mg/L	20	100.00	2240	2270	1%	
oil & grease (gravimetric)	mg/L	5.0	25	<5.0	<5.0	--	
<b>Volatile Organic Compounds</b>							
chlorobenzene	µg/L	0.50	2.5	<0.50	<0.50	--	
chloromethane	µg/L	0.50	2.50	3.5	3.18	10%	
dichlorobenzene, 1,2-	µg/L	0.50	2.5	<0.50	<0.50	--	
dichlorobenzene, 1,3-	µg/L	0.50	2.50	<0.50	<0.50	--	
dichlorobenzene, 1,4-	µg/L	0.50	2.5	<0.50	<0.50	--	
dichloropropane, 1,2-	µg/L	0.50	2.50	<0.50	<0.50	--	
dichloropropylene, cis+trans-1,3-	µg/L	0.75	3.75	<0.75	<0.75	--	
dichloropropylene, cis-1,3-	µg/L	0.50	2.50	<0.50	<0.50	--	
tetrachloroethane, 1,1,1,2-	µg/L	0.50	2.5	<0.50	<0.50	--	
tetrachloroethane, 1,1,2,2-	µg/L	0.20	1.00	<0.20	<0.20	--	
trichloroethane, 1,1,2-	µg/L	0.50	2.5	<0.50	<0.50	--	
trichlorofluoromethane	µg/L	0.50	2.50	<0.50	<0.50	--	
<b>Volatile Organic Compounds [BTEXS+MTBE]</b>							
benzene	µg/L	0.50	2.5	<0.50	<0.50	--	
ethylbenzene	µg/L	0.50	2.50	<0.50	<0.50	--	
methyl-tert-butyl ether [MTBE]	µg/L	0.50	2.5	<0.50	<0.50	--	
styrene	µg/L	0.50	2.50	<0.50	<0.50	--	
toluene	µg/L	0.40	2	1.55	1.36	<MDL	
xylene, m+p-	µg/L	0.50	2.50	0.64	0.52	<MDL	
xylene, o-	µg/L	0.50	2.5	<0.50	<0.50	--	
xylenes, total	µg/L	0.75	3.75	<0.75	<0.75	--	
<b>Volatile Organic Compounds [Drycleaning]</b>							
carbon tetrachloride	µg/L	0.50	2.5	<0.50	<0.50	--	
chloroethane	µg/L	0.50	2.50	<0.50	<0.50	--	
dichloroethane, 1,1-	µg/L	0.50	2.5	<0.50	<0.50	--	
dichloroethane, 1,2-	µg/L	0.50	2.50	<0.50	<0.50	--	
dichloroethylene, 1,1-	µg/L	0.50	2.5	<0.50	<0.50	--	
dichloroethylene, cis-1,2-	µg/L	0.50	2.50	<0.50	<0.50	--	
dichloroethylene, trans-1,2-	µg/L	0.50	2.5	<0.50	<0.50	--	
dichloromethane	µg/L	0.50	2.50	<0.50	<0.50	--	
dichloropropylene, trans-1,3-	µg/L	0.50	2.5	<0.50	<0.50	--	
tetrachloroethylene	µg/L	0.50	2.50	<0.50	<0.50	--	
trichloroethane, 1,1,1-	µg/L	0.50	2.5	<0.50	<0.50	--	
trichloroethylene	µg/L	0.50	2.50	<0.50	<0.50	--	
vinyl chloride	µg/L	0.40	2	<0.40	<0.40	--	

Table C-4 - QA/QC of Laboratory Water Quality Results for Westbay Well M20-3071  
Meliadine Extension Agnico Eagle Mines Limited

Location				Drilling Fluid Collected upon completion of 490 m along borehole		
Sample ID				Westbay-A-490		RPD
Date				25-Aug-2020		
ALS Sample ID				VA20B4663-001		
Parameters				VA20B4663-002		
	Units	MDL	5 x MDL			
<b>Hydrocarbons</b>						
EPH (C10-C19)	µg/L	250	1250	<250	<250	--
EPH (C19-C32)	µg/L	250	1250	<250	<250	--
LEPHw	µg/L	250	1250	<250	<250	--
HEPHw	µg/L	250	1250	<250	<250	--
<b>Polycyclic Aromatic Hydrocarbons</b>						
acenaphthene	µg/L	0.010	0.050	<0.010	<0.010	--
acenaphthylene	µg/L	0.010	0.050	<0.010	<0.010	--
acridine	µg/L	0.010	0.050	<0.010	<0.010	--
anthracene	µg/L	0.010	0.050	<0.010	<0.010	--
benz(a)anthracene	µg/L	0.020	0.100	<0.020	<0.020	--
benzo(a)pyrene	µg/L	0.0050	0.025	<0.0050	<0.0050	--
benzo(b+j)fluoranthene	µg/L	0.010	0.050	<0.010	<0.010	--
benzo(b+k)fluoranthene	µg/L	0.015	0.075	<0.015	<0.015	--
benzo(g,h,i)perylene	µg/L	0.010	0.050	<0.010	<0.010	--
benzo(k)fluoranthene	µg/L	0.010	0.050	<0.010	<0.010	--
chrysene	µg/L	0.010	0.050	<0.010	<0.010	--
dibenz(a,h)anthracene	µg/L	0.0050	0.025	<0.0050	<0.0050	--
fluoranthene	µg/L	0.010	0.050	<0.010	<0.010	--
fluorene	µg/L	0.010	0.050	<0.010	<0.010	--
indeno(1,2,3-c,d)pyrene	µg/L	0.010	0.050	<0.010	<0.010	--
methylnaphthalene, 1-	µg/L	0.010	0.050	0.048	0.045	<MDL
methylnaphthalene, 2-	µg/L	0.010	0.050	0.06	0.058	3%
naphthalene	µg/L	0.050	0.250	0.073	0.074	<MDL
phenanthrene	µg/L	0.020	0.100	<0.020	<0.020	--
pyrene	µg/L	0.010	0.050	0.022	0.021	<MDL
quinoline	µg/L	0.050	0.250	<0.050	<0.050	--
<b>Volatile Organic Compounds [THMs]</b>						
bromodichloromethane	µg/L	0.50	2.5	<0.50	<0.50	--
bromoform	µg/L	0.50	2.50	<0.50	<0.50	--
chloroform	µg/L	0.50	2.5	<0.50	<0.50	--
dibromochloromethane	µg/L	0.50	2.50	<0.50	<0.50	--
<b>Radiological Parameters</b>						
radium-226	Bq/L	0.085	0.425	1.8	2	11%

Location			Equipment Blank-1		Port 8				
Client Sample ID					Westbay-A-Port 8-0.29		Westbay-A-Port 8-29%DUP-1		
Date Sampled			19-Sep-2020		20-Sep-2020		20-Sep-2020		
ALS Sample ID			VA20B6509-006		VA20B6509-007		VA20B6509-008		
Parameters	Units	MDL		MDL	5 x MDL				RPD
<b>Physical Tests</b>									
electrical conductivity	µS/cm	2	<2.0	2	10	52300		81000	43%
alkalinity, total (as CaCO3)	mg/L	2	<2.0	2	10	247		251	2%
hardness (as CaCO3), dissolved	mg/L	0.6	<0.60	5	25	37000		35300	5%
solids, total dissolved [TDS]	mg/L	10	<10	200	1000	62400		68500	9%
solids, total suspended [TSS]	mg/L	3	<3.0	3	15	163		11	>MDL
turbidity	NTU	0.1	<0.10	0.1	0.5	10.9		11.8	8%
alkalinity, phenolphthalein (as CaCO3)	mg/L	2	<2.0	2	10	44.4		--	--
pH	-	0.1	6.05	0.1	0.5	8.99		9.01	0%
alkalinity, hydroxide (as CaCO3)	mg/L	2	<2.0	2	10	<2.0		<1.0	--
alkalinity, carbonate (as CaCO3)	mg/L	2	<2.0	2	10	88.8		83.3	6%
alkalinity, bicarbonate (as CaCO3)	mg/L	2	<2.0	2	10	158		137	14%
salinity	psu	1	<1.0	1	5	38.6		53.4	32%
<b>Anions and Nutrients</b>									
Kjeldahl nitrogen, total [TKN]	mg/L	0.05	<0.050	1	5	1.46		1.54	<MDL
ammonia, total (as N)	mg/L	0.005	<0.0050	0.05	0.25	1.12		1.09	3%
bromide	mg/L	0.05	<0.050	5.00	25	127		144	13%
chloride	mg/L	0.5	<0.50	50	250	32700		36800	12%
fluoride	mg/L	0.02	<0.020	2.00	10	<2.00		<2.00	--
nitrate (as N)	mg/L	0.005	<0.0050	0.5	2.5	1.3		1.48	<MDL
nitrite (as N)	mg/L	0.001	<0.0010	0.1	0.5	<0.100		<0.100	--
phosphate, ortho- dissolved (as P)	mg/L	0.001	<0.0013	0.001	0.005	0.0032		0.0032	<MDL
phosphorus, total	mg/L	0.002	<0.0049	0.01	0.05	0.0343		0.0317	<MDL
silicate (as SiO2)	mg/L	0.5	<0.50	5.00	25	5.18		5.4	<MDL
sulfate (as SO4)	mg/L	0.3	<0.30	30	150	766		861	12%
<b>Cyanides</b>									
cyanide, free	mg/L	0.005	<0.0050	0.02	0.1	<0.0200		<0.0200	--
cyanide, strong acid dissociable (total)	mg/L	0.005	<0.0050	0.02	0.1	<0.0200		<0.0200	--
cyanide, weak acid dissociable	mg/L	0.005	<0.0050	0.02	0.1	<0.0200		<0.0200	--
<b>Organic / Inorganic Carbon</b>									
carbon, dissolved organic [DOC]	mg/L	0.5	<0.50	5.00	25.00	216		218	1%
carbon, total organic [TOC]	mg/L	0.5	<0.50	5.00	25.00	212		212	0%
<b>Total Metals</b>									
aluminum, total	mg/L	0.003	<0.0030	0.600	3.000	<0.600		<0.600	--
antimony, total	mg/L	0.0001	<0.00010	0.0200	0.100	<0.0200		<0.0200	--
arsenic, total	mg/L	0.0001	<0.00010	0.0200	0.100	<0.0200		<0.0200	--
barium, total	mg/L	0.0001	<0.00010	0.0200	0.100	3.06		2.97	3%
beryllium, total	mg/L	0.00002	<0.000020	0.00400	0.020	<0.00400		<0.00400	--
bismuth, total	mg/L	0.00005	<0.000050	0.0100	0.050	<0.0100		<0.0100	--
boron, total	mg/L	0.01	<0.010	2.00	10.000	40.4		39.5	2%
cadmium, total	mg/L	0.000005	<0.0000050	0.00100	0.005	<0.00100		<0.00100	--
calcium, total	mg/L	0.05	0.297	10.0	50.000	14900		14400	3%
cesium, total	mg/L	0.00001	0.000021	0.00200	0.010	0.886		0.855	4%
chromium, total	mg/L	0.0005	<0.00050	0.100	0.500	<0.100		<0.100	--
cobalt, total	mg/L	0.0001	<0.00010	0.0200	0.100	<0.0200		<0.0200	--
copper, total	mg/L	0.0005	<0.00050	0.100	0.500	<0.100		<0.100	--
iron, total	mg/L	0.01	<0.010	2.00	10.000	<2.00		<2.00	--
lead, total	mg/L	0.00005	<0.000050	0.0100	0.050	<0.0100		<0.0100	--
lithium, total	mg/L	0.001	<0.0010	0.200	1.000	40.2		39.9	1%
magnesium, total	mg/L	0.005	<0.0050	1.00	5.000	899		850	6%
manganese, total	mg/L	0.0001	<0.00010	0.0200	0.100	0.696		0.65	7%
mercury, total	mg/L	0.000005	<0.0000050	0.000005	0.000005	<0.0000050		<0.0000050	--
molybdenum, total	mg/L	0.00005	<0.000050	0.0100	0.050	0.0176		0.0186	<MDL
nickel, total	mg/L	0.0005	<0.00050	0.100	0.500	<0.100		<0.100	--
phosphorus, total	mg/L	0.05	<0.050	10.0	50.000	<10.0		<10.0	--
potassium, total	mg/L	0.05	<0.050	10.0	50.000	646		610	6%
rubidium, total	mg/L	0.0002	<0.00020	0.0400	0.200	2.34		2.2	6%
selenium, total	mg/L	0.00005	<0.000050	0.0100	0.050	<0.0100		<0.0100	--
silicon, total	mg/L	0.1	<0.10	20.0	100.000	<20.0		<20.0	--
silver, total	mg/L	0.00001	<0.000010	0.00200	0.010	<0.00200		<0.00200	--
sodium, total	mg/L	0.05	<0.050	10.0	50.000	6760		6400	5%
strontium, total	mg/L	0.0002	0.0127	100	500.000	655		631	4%
sulfur, total	mg/L	0.5	<0.50	100	500.000	233		196	<MDL
tellurium, total	mg/L	0.0002	<0.00020	0.0400	0.200	0.0707		0.0756	<MDL
thallium, total	mg/L	0.00001	<0.000010	0.00200	0.010	0.0562		0.0536	5%
thorium, total	mg/L	0.0001	<0.00010	0.0200	0.100	<0.0200		<0.0200	--
tin, total	mg/L	0.0001	<0.00010	0.0200	0.100	<0.0200		<0.0200	--
titanium, total	mg/L	0.0003	<0.00030	0.0600	0.300	<0.0600		<0.0600	--
tungsten, total	mg/L	0.0001	<0.00010	0.0200	0.100	<0.0200		<0.0200	--
uranium, total	mg/L	0.00001	<0.000010	0.00200	0.010	0.00295		0.00274	<MDL
vanadium, total	mg/L	0.0005	<0.00050	0.100	0.500	<0.100		<0.100	--
zinc, total	mg/L	0.003	<0.0030	0.600	3.000	<0.600		<0.600	--
zirconium, total	mg/L	0.0002	<0.00020	0.0400	0.200	<0.0400		<0.0400	--

Table C-4 - QA/QC of Laboratory Water Quality Results for Westbay Well M20-3071  
Meliadine Extension Agnico Eagle Mines Limited

Location			Equipment Blank-1		Port 8				
Client Sample ID			19-Sep-2020		Westbay-A-Port 8-0.29		Westbay-A-Port 8-29%DUP-1		RPD
Date Sampled			VA20B6509-006		20-Sep-2020		20-Sep-2020		
ALS Sample ID					VA20B6509-007		VA20B6509-008		
Parameters	Units	MDL	MDL	5 x MDL					
<b>Dissolved Metals</b>									
aluminum, dissolved	mg/L	0.001	<0.0010	0.100	0.500	<0.100	<0.100	--	
antimony, dissolved	mg/L	0.0001	<0.00010	0.0100	0.050	<0.0100	<0.0100	--	
arsenic, dissolved	mg/L	0.0001	<0.00010	0.0100	0.050	<0.0100	<0.0100	--	
barium, dissolved	mg/L	0.0001	<0.00010	0.0100	0.050	3.22	2.94	9%	
beryllium, dissolved	mg/L	0.00002	<0.000020	0.002	0.010	<0.00200	<0.00200	--	
bismuth, dissolved	mg/L	0.00005	<0.000050	0.005	0.025	<0.00500	<0.00500	--	
boron, dissolved	mg/L	0.01	<0.010	1.00	5.000	37	34.6	7%	
cadmium, dissolved	mg/L	0.000005	<0.0000050	0.0005	0.003	<0.000500	<0.000500	--	
calcium, dissolved	mg/L	0.05	0.111	5.00	25.000	13400	12800	5%	
cesium, dissolved	mg/L	0.00001	<0.000010	0.001	0.005	0.919	0.913	1%	
chromium, dissolved	mg/L	0.0005	<0.00050	0.0500	0.250	<0.0500	<0.0500	--	
cobalt, dissolved	mg/L	0.0001	<0.00010	0.0100	0.050	<0.0100	<0.0100	--	
copper, dissolved	mg/L	0.0002	<0.00020	0.0200	0.100	<0.0200	<0.0200	--	
iron, dissolved	mg/L	0.01	<0.010	1.00	5.000	<1.00	<1.00	--	
lead, dissolved	mg/L	0.00005	<0.000050	0.005	0.025	<0.00500	<0.00500	--	
lithium, dissolved	mg/L	0.001	<0.0010	0.100	0.500	39.8	37	7%	
magnesium, dissolved	mg/L	0.005	<0.0050	0.500	2.500	865	812	6%	
manganese, dissolved	mg/L	0.0001	<0.00010	0.0100	0.050	0.657	0.626	5%	
mercury, dissolved	mg/L	0.000005	<0.0000050	0.000005	0.000	<0.0000050	<0.0000050	--	
molybdenum, dissolved	mg/L	0.00005	<0.000050	0.005	0.025	0.0196	0.021	<MDL	
nickel, dissolved	mg/L	0.0005	<0.00050	0.0500	0.250	<0.0500	<0.0500	--	
phosphorus, dissolved	mg/L	0.05	<0.050	5.00	25.000	<5.00	<5.00	--	
potassium, dissolved	mg/L	0.05	<0.050	5.00	25.000	607	571	6%	
rubidium, dissolved	mg/L	0.0002	<0.00020	0.0200	0.100	2.34	2.23	5%	
selenium, dissolved	mg/L	0.00005	<0.000050	0.00500	0.025	<0.00500	<0.00500	--	
silicon, dissolved	mg/L	0.05	<0.050	5.00	25.000	<5.00	<5.00	--	
silver, dissolved	mg/L	0.00001	<0.000010	0.00100	0.005	<0.00100	<0.00100	--	
sodium, dissolved	mg/L	0.05	<0.050	5.00	25.000	6420	6040	6%	
strontium, dissolved	mg/L	0.0002	0.00461	0.0200	0.100	642	655	2%	
sulfur, dissolved	mg/L	0.5	<0.50	50	250.000	270	261	3%	
tellurium, dissolved	mg/L	0.0002	<0.00020	0.0200	0.100	0.038	0.0438	<MDL	
thallium, dissolved	mg/L	0.00001	<0.000010	0.00100	0.005	0.0532	0.0532	0%	
thorium, dissolved	mg/L	0.0001	<0.00010	0.0100	0.050	<0.0100	<0.0100	--	
tin, dissolved	mg/L	0.0001	<0.00010	0.0100	0.050	<0.0100	<0.0100	--	
titanium, dissolved	mg/L	0.0003	<0.00030	0.0300	0.150	<0.0300	<0.0300	--	
tungsten, dissolved	mg/L	0.0001	<0.00010	0.0100	0.050	0.0112	0.0109	<MDL	
uranium, dissolved	mg/L	0.00001	<0.000010	0.00100	0.005	0.00262	0.00259	<MDL	
vanadium, dissolved	mg/L	0.0005	<0.00050	0.0500	0.250	<0.0500	<0.0500	--	
zinc, dissolved	mg/L	0.001	0.0016	0.100	0.500	<0.100	<0.100	--	
zirconium, dissolved	mg/L	0.0003	<0.00030	0.0300	0.150	<0.0300	<0.0300	--	
<b>Speciated Metals</b>									
iron, ferrous [Fe II], dissolved	mg/L	0.02	<0.020	0.0200	0.1000	0.024	0.039	<MDL	
<b>Aggregate Organics</b>									
biochemical oxygen demand [BOD]	mg/L	2	<2.0	200	1000	537	621	<MDL	
chemical oxygen demand [COD]	mg/L	20	<20	20.0	100	2180	3770	53%	
oil & grease (gravimetric)	mg/L	5	<5.0	5.00	25	<5.0	<5.0	--	
<b>Volatile Organic Compounds [BTEXS+MTBE]</b>									
benzene	µg/L	0.5	<0.50	0.50	2.50	<0.50	<0.50	--	
ethylbenzene	µg/L	0.5	<0.50	0.50	2.50	<0.50	<0.50	--	
methyl-tert-butyl ether [MTBE]	µg/L	0.5	<0.50	0.50	2.50	<0.50	<0.50	--	
styrene	µg/L	0.5	<0.50	0.50	2.50	<0.50	<0.50	--	
toluene	µg/L	0.5	<0.50	0.50	2.50	<0.50	<0.50	--	
xylene, m+p-	µg/L	0.5	<0.50	0.50	2.50	<0.50	<0.50	--	
xylene, o-	µg/L	0.5	<0.50	0.50	2.50	<0.50	<0.50	--	
xylenes, total	µg/L	0.75	<0.75	0.75	3.75	<0.75	<0.75	--	
<b>Hydrocarbons</b>									
F1 (C6-C10)	µg/L	100	<100	100	500	<100	<100	--	
F2 (C10-C16)	µg/L	100	<100	100	500	<100	<100	--	
F3 (C16-C34)	µg/L	250	<250	250	1250	<250	<250	--	
F4 (C34-C50)	µg/L	250	<250	250	1250	<250	<250	--	
F1-BTEX	µg/L	100	<100	100	500	<100	<100	--	
TEH (C10-C50)	µg/L	400	<400	400	2000	<400	<400	--	
TEH (C16-C50)	µg/L	400	<400	400	2000	<400	<400	--	
<b>Radiological Parameters</b>									
radium-226	Bq/L	0.28	<0.0085	0.28	1.4	3.9	4.1	5%	
<b>Stable Isotopes</b>									
delta-oxygen-18	‰ VSMOW	-	-12.62	-	-	15.31	15.03	--	
delta-hydrogen-2	‰ VSMOW	-	-89.5	-	-	117.3	117.0	--	



Table C-4 - QA/QC of Laboratory Water Quality Results for Westbay Well M20-3071  
Melidaine Extension Agnico Eagle Mines Limited

Location				Port 4		
Client Sample ID				Westbay-A-Port 4-2	Westbay-A-Port 4-2-DUP-1	RPD
Date Sampled				27-Sep-2020	27-Sep-2020	
ALS Sample ID				VA20B7020-003	VA20B7020-004	
Parameters	Units	MDL	5 x MDL			
<b>Physical Tests</b>						
electrical conductivity	µS/cm	2.0	10	95100	95000	0%
alkalinity, total (as CaCO <sub>3</sub> )	mg/L	2.0	10	446	439	2%
pH	-	0.10	0.5	9.22	9.24	0%
solids, total dissolved [TDS]	mg/L	200	1000	77000	63100	20%
solids, total suspended [TSS]	mg/L	3.0	15	16.5	205	170%
turbidity	NTU	0.10	0.5	12.8	12.1	6%
alkalinity, phenolphthalein (as CaCO <sub>3</sub> )	mg/L	2.0	10	78.4	80.1	2%
alkalinity, hydroxide (as CaCO <sub>3</sub> )	mg/L	2.0	10	<2.0	<2.0	--
alkalinity, carbonate (as CaCO <sub>3</sub> )	mg/L	2.0	10	157	160	2%
alkalinity, bicarbonate (as CaCO <sub>3</sub> )	mg/L	2.0	10	290	278	4%
salinity	psu	1.0	5	66.2	66.1	0%
<b>Anions and Nutrients</b>						
bromide	mg/L	5	25	188	200	6%
chloride	mg/L	50.00	250	47300	50200	6%
fluoride	mg/L	2	10	<2.00	<2.00	--
nitrate (as N)	mg/L	0.50	2.5	2.78	2.96	6%
nitrite (as N)	mg/L	0.1	0.5	<0.100	<0.100	--
phosphate, ortho-, dissolved (as P)	mg/L	0.01	0.05	0.0825	0.0778	6%
silicate (as SiO <sub>2</sub> )	mg/L	5.00	25	<5.00	<5.00	--
sulfate (as SO <sub>4</sub> )	mg/L	30	150	403	427	6%
<b>Cyanides</b>						
cyanide, free	mg/L	0.0050 - 0.0200	0.0250 - 0.1000	<0.0050	<0.0200	--
cyanide, strong acid dissociable (total)	mg/L	0.0050 - 0.0200	0.0250 - 0.1000	<0.0050	<0.0200	--
cyanide, weak acid dissociable	mg/L	0.0050 - 0.0200	0.0250 - 0.1000	<0.0050	<0.0200	--
<b>Organic / Inorganic Carbon</b>						
carbon, dissolved organic [DOC]	mg/L	250	1250	6270	6570	5%
carbon, total organic [TOC]	mg/L	250	1250	8860	8000	10%
<b>Bacteriological Tests</b>						
bacteria, sulfate reducing	CFU/1 mL	1	5	<1	<1	--
<b>Aggregate Organics</b>						
biochemical oxygen demand [BOD]	mg/L	6000	30000	>13000	11800	--
oil & grease (gravimetric)	mg/L	5.0	25	<5.0	<5.0	--
<b>Volatile Organic Compounds [BTEXS+MTBE]</b>						
benzene	µg/L	0.50	2.5	<0.50	<0.50	--
ethylbenzene	µg/L	0.50	2.5	<0.50	<0.50	--
methyl-tert-butyl ether [MTBE]	µg/L	0.50	2.5	<0.50	<0.50	--
styrene	µg/L	0.50	2.5	<0.50	<0.50	--
toluene	µg/L	0.50	2.5	0.6	0.85	<MDL
xylene, m+p-	µg/L	0.50	2.5	<0.50	0.68	--
xylene, o-	µg/L	0.50	2.5	<0.50	<0.50	--
xylenes, total	µg/L	0.75	3.75	<0.75	<0.75	--
<b>Hydrocarbons</b>						
F1 (C6-C10)	µg/L	100	500	<100	<100	--
F2 (C10-C16)	µg/L	100	500	<100	<100	--
F3 (C16-C34)	µg/L	250	1250	<250	<250	--
F4 (C34-C50)	µg/L	250	1250	<250	<250	--
F1-BTEX	µg/L	100	500	<100	<100	--
TEH (C10-C50)	µg/L	400	2000	<400	<400	--
TEH (C16-C50)	µg/L	400	2000	<400	<400	--
<b>Radiological Parameters</b>						
radium-226	Bq/L	0.16	0.8	8.2	9.6	16%

Table C-4 - QA/QC of Laboratory Water Quality Results for Westbay Well M20-3071  
Meliadine Extension Agnico Eagle Mines Limited

Location				Port 4		
Client Sample ID				Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 4-2	RPD
Date Sampled				28-Sep-2020	28-Sep-2020	
ALS Sample ID				VA20B7020-007	VA20B7020-008	
Parameters	Units	MDL	5 x MDL			
<b>Total Metals</b>						
aluminum, total	mg/L	0.600	3.000	<0.600	<0.600	--
antimony, total	mg/L	0.0200	0.100	<0.0200	<0.0200	--
arsenic, total	mg/L	0.0200	0.100	<0.0200	<0.0200	--
barium, total	mg/L	0.0200	0.100	5.36	5.48	2%
beryllium, total	mg/L	0.00400	0.020	<0.00400	<0.00400	--
bismuth, total	mg/L	0.0100	0.050	<0.0100	<0.0100	--
boron, total	mg/L	2.00	10.000	71.4	72.9	2%
cadmium, total	mg/L	0.00100	0.005	<0.00100	<0.00100	--
calcium, total	mg/L	10.0	50.000	22900	23500	3%
cesium, total	mg/L	0.00200	0.010	1.62	1.69	4%
chromium, total	mg/L	0.100	0.500	<0.100	<0.100	--
cobalt, total	mg/L	0.0200	0.100	<0.0200	<0.0200	--
copper, total	mg/L	0.100	0.500	<0.100	<0.100	--
iron, total	mg/L	2.00	10.000	<2.00	<2.00	--
lead, total	mg/L	0.0100	0.050	<0.0100	<0.0100	--
lithium, total	mg/L	0.200	1.000	66.4	71.3	7%
magnesium, total	mg/L	1.00	5.000	374	381	2%
manganese, total	mg/L	0.0200	0.100	0.229	0.239	4%
mercury, total	mg/L	0.000005	0.000025	<0.0000050	<0.0000050	--
molybdenum, total	mg/L	0.0100	0.050	0.038	0.0407	<MDL
nickel, total	mg/L	0.100	0.500	<0.100	<0.100	--
phosphorus, total	mg/L	10.0	50.000	<10.0	<10.0	--
potassium, total	mg/L	10.0	50.000	1010	1030	2%
rubidium, total	mg/L	0.0400	0.200	3.6	3.7	3%
selenium, total	mg/L	0.0100	0.050	0.0368	0.0369	<MDL
silicon, total	mg/L	20.0	100.000	<20.0	<20.0	--
silver, total	mg/L	0.00200	0.010	<0.00200	<0.00200	--
sodium, total	mg/L	10.0	50.000	3360	3460	3%
strontium, total	mg/L	0.0400	0.200	1090	1100	1%
sulfur, total	mg/L	100	500.000	138	131	<MDL
tellurium, total	mg/L	0.0400	0.200	0.064	0.0704	<MDL
thallium, total	mg/L	0.00200	0.010	0.0973	0.103	6%
thorium, total	mg/L	0.0200	0.100	<0.0200	<0.0200	--
tin, total	mg/L	0.0200	0.100	<0.0200	<0.0200	--
titanium, total	mg/L	0.0600	0.300	<0.0600	<0.0600	--
tungsten, total	mg/L	0.0200	0.100	<0.0200	<0.0200	--
uranium, total	mg/L	0.00200	0.010	<0.00200	<0.00200	--
vanadium, total	mg/L	0.100	0.500	<0.100	<0.100	--
zinc, total	mg/L	0.600	3.000	<0.600	<0.600	--
zirconium, total	mg/L	0.0400	0.200	<0.0400	<0.0400	--
<b>Dissolved Metals</b>						
aluminum, dissolved	mg/L	0.0010	0.005	<0.200	<0.200	--
antimony, dissolved	mg/L	0.00010	0.001	<0.0200	<0.0200	--
arsenic, dissolved	mg/L	0.00010	0.001	<0.0200	<0.0200	--
barium, dissolved	mg/L	0.00010	0.001	5.13	5.27	3%
beryllium, dissolved	mg/L	0.000100	0.001	<0.00400	<0.00400	--
bismuth, dissolved	mg/L	0.000050	0.000	<0.0100	<0.0100	--
boron, dissolved	mg/L	0.010	0.050	70.2	69.3	1%
cadmium, dissolved	mg/L	0.0000050	0.000	<0.00100	<0.00100	--
calcium, dissolved	mg/L	0.050	0.250	22700	22000	3%
cesium, dissolved	mg/L	0.000010	0.000	1.56	1.58	1%
chromium, dissolved	mg/L	0.00010	0.001	<0.100	<0.100	--
cobalt, dissolved	mg/L	0.00010	0.001	<0.0200	<0.0200	--
copper, dissolved	mg/L	0.00020	0.001	<0.0400	<0.0400	--
iron, dissolved	mg/L	0.010	0.050	<2.00	<2.00	--
lead, dissolved	mg/L	0.000050	0.000	<0.0100	<0.0100	--
lithium, dissolved	mg/L	0.0010	0.005	70	70.7	1%
magnesium, dissolved	mg/L	0.0050	0.025	340	344	1%
manganese, dissolved	mg/L	0.00010	0.001	<0.0200	<0.0200	--
mercury, dissolved	mg/L	0.0000050	0.000	<0.0000050	<0.0000050	--
molybdenum, dissolved	mg/L	0.000050	0.000	0.0364	0.0378	4%
nickel, dissolved	mg/L	0.00050	0.003	<0.100	<0.100	--
phosphorus, dissolved	mg/L	0.050	0.250	<10.0	<10.0	--
potassium, dissolved	mg/L	0.050	0.250	1020	1030	1%
rubidium, dissolved	mg/L	0.00020	0.001	3.47	3.5	1%
selenium, dissolved	mg/L	0.000050	0.000	<0.0100	0.0145	--
silicon, dissolved	mg/L	0.050	0.250	<10.0	<10.0	--
silver, dissolved	mg/L	0.000010	0.000	<0.00200	<0.00200	--
sodium, dissolved	mg/L	0.050	0.250	3190	3260	2%
strontium, dissolved	mg/L	0.00020	0.001	1060	1080	2%
sulfur, dissolved	mg/L	0.50	2.500	<100	109	--
tellurium, dissolved	mg/L	0.00020	0.001	0.075	0.0631	17%
thallium, dissolved	mg/L	0.000010	0.000	0.0945	0.0992	5%
thorium, dissolved	mg/L	0.00010	0.001	<0.0200	<0.0200	--
tin, dissolved	mg/L	0.00010	0.001	<0.0200	<0.0200	--
titanium, dissolved	mg/L	0.00030	0.002	<0.0600	<0.0600	--
tungsten, dissolved	mg/L	0.00010	0.001	<0.0200	<0.0200	--
uranium, dissolved	mg/L	0.000010	0.000	<0.00200	<0.00200	--
vanadium, dissolved	mg/L	0.00050	0.003	<0.100	<0.100	--
zinc, dissolved	mg/L	0.0010	0.005	<0.200	0.531	--
zirconium, dissolved	mg/L	0.00020	0.001	<0.0600	<0.0600	--
<b>Speciated Metals</b>						
Iron, ferrous [Fe II], dissolved	mg/L	0.020	0.1	0.054	0.022	<MDL

**Notes:**  
 Concentrations are mg/L unless otherwise noted  
 MDL = Method Detection Limit  
 RPD = Relative Percent Difference  
 RPD value exceeds 20%  
 - parameter was not analyzed  
 -- not calculated (one or both result below MDL)

**APPENDIX D**

**2020 Laboratory Certificates of Analysis**

## APPENDIX D-I

## Drilling Fluid

Laboratory Report No. VA20B3721 – August 17, 2020

Laboratory Report No. VA20B4004 – August 21, 2020

Laboratory Report No. VA20B4663 – August 25, 2020

Laboratory Report No. VA20B4662 – August 27, 2020

Sample Identification	Sample Collection Date	Sample Description	Laboratory Report No.
Westbay-A-225	17-Aug-20	Drilling fluid (brine) sample collected during drilling with the borehole depth at approximately 225 mah	VA20B3721
Westbay-A-360	21-Aug-20	Drilling fluid (brine) sample collected during drilling with the borehole depth at approximately 360 mah	VA20B4004
Westbay-A-490	25-Aug-20	Drilling fluid (fresh water) sample collected during drilling with the borehole depth at approximately 490 mah	VA20B4663
Westbay-A-490-Dup	25-Aug-20	Drilling fluid (fresh water) duplicate sample collected during drilling with the borehole depth at approximately 490 mah for QA/QC purposes	
Westbay-A-606	27-Aug-20	Fluid (fresh water) sample collected during drilling with borehole depth at approximately 606 mah.	VA20B4662
Westbay-A-606-BR	27-Aug-20	Fluid (brine) sample collected at end of drilling activities with the borehole at approximately 606 mah. Brine was used to flush the hole to prevent freezing of the drilling fluid during packer testing and Westbay well installation.	



Nov 10, 2021

Golder Associates Ltd  
1931 Robertson Rd.  
Ottawa, Ontario,  
K2H 5B7

Dear Adrian Kowalchuk,

**Re: ALS Corrective Action Report (CAR)# 20699: False Positive Results for Chloromethane in Samples Containing Elevated Chloride for Golder Project 20136436-2300-2304**

ALS recently discovered an issue with chloromethane results reported for samples containing extremely high levels of chloride. Only samples containing more than approximately 5,000 mg/L chloride were impacted by this issue.

For selected seawater samples and other sample matrices containing very high levels of chloride, a false positive chloromethane result was reported due to a reaction of the chloride in the sample with methanol, which is a reagent in the method. This reaction was previously unknown but has now been characterized and addressed.

During the data review conducted for this issue, a second error was discovered for 2 of the identified samples (VA20B3721-1 and VA20B4004-1). For these 2 samples, the sample preparation volumes were entered incorrectly which led to final results being incorrect by a factor of 5.

There were 5 Golder samples in 4 different files affected by the above two issues. Please refer to the table below for a summary of the affected results, showing the original and corrected results:

ALS Sample ID	Client Sample ID	Originally Reported Chloromethane Result	Revised Chloromethane Result	Originally Reported Toluene Result	Revised Toluene Result
VA20B3721 -1	Westbay-A-225 Aug 17, 2020	15.7 ug/L	<79 ug/L*	0.63 ug/L	3.14 ug/L*
VA20B4004 -1	Westbay-A-360 Aug 21, 2020	10.6 ug/L	<53 ug/L*	0.47 ug/L	2.36 mg/L*
VA20B4662 -2	Westbay-A-606- BR Aug 27, 2020	107 ug/L	<110 ug/L	NA	NA
VA20B4663 -1	Westbay-A-490 Aug 25, 2020	3.50 ug/L	<3.60 ug/L	NA	NA
VA20B4663 -2	Westbay-A-490 Dup Aug 25, 2020	3.18 ug/L	<3.20 ug/L	NA	NA



ALS Sample ID	Client Sample ID	Originally Reported m,p-xylene Result	Revised m,p-xylene Result	Originally Reported total xylenes Result	Revised total xylenes Result
VA20B4004 -1	Westbay-A-360 Aug 21, 2020	<0.50 ug/L	0.78 ug/L*	<0.50 ug/L	0.78 ug/L*

We have implemented several corrective actions to address these errors and to prevent recurrence, as follows:

1. All incorrect results have been identified, flagged, and corrected, and affected reports have been re-issued.
2. The reported detection limits for chloromethane in all ALS Canada Volatile Organic Compound (VOC) test methods have been increased to ensure that false positives for chloromethane do not occur, at least up to the 50% of the chloride concentration found in seawaters (i.e. 10,000 mg/L chloride). ALS Vancouver's new routine DL for chloromethane will be 5 ug/L.
3. ALS Canada is incorporating an automated check in our computer system to internally flag any chloromethane positive results in samples with levels of chloride that exceed 25% of the level found in seawater (i.e. 5,000 mg/L chloride).
4. The ALS Canada National SOP (Standard Operating Procedure) for VOC analysis in water has been updated to include information on this potential false positive, including the steps and procedures for how to address it. This information has also been shared with all other ALS labs across Canada that conduct VOC analysis.
5. The ALS Vancouver Trace Organics sample preparation team has been notified of the issue regarding the sample preparation data entry errors for these files. All staff understand the direct impact of prep volumes on final data results.

ALS sincerely apologizes for the inconvenience that this issue has caused Golder and their client. We recognize and understand the implications of these types of errors and take this issue very seriously.

If you would like more details regarding our corrective actions, or if you have suggestions for further ALS improvements, please do not hesitate to contact either of the undersigned.

Sincerely,

Katherine B. Thomas, B.Sc.  
Operations Manager, Vancouver

Mark Hugdahl, B.Sc.  
Technical Director, Canada

## CERTIFICATE OF ANALYSIS

**Work Order** : **VA20B3721**  
**Amendment** : **2**  
**Client** : **Agnico-Eagle Mines Limited**  
**Contact** : Etienne Parent  
**Address** : # 400 - 543 Granville Street  
                   Vancouver BC Canada V6C 1X8  
**Telephone** : ----  
**Project** : 20136436-2300-2304  
**PO** : ----  
**C-O-C number** : ----  
**Sampler** : Xavier Montano  
**Site** : Meliadine - Westbay A  
**Quote number** : VA20-AEML100-001 (Q72802)  
**No. of samples received** : 1  
**No. of samples analysed** : 1

**Page** : 1 of 11  
  
**Laboratory** : Vancouver - Environmental  
**Account Manager** : Heather McKenzie  
**Address** : 8081 Lougheed Highway  
                   Burnaby BC Canada V5A 1W9  
**Telephone** : +1 604 253 4188  
**Date Samples Received** : 24-Aug-2020 12:00  
**Date Analysis Commenced** : 27-Aug-2020  
**Issue Date** : 03-Sep-2021 15:34

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
- Surrogate Control Limits

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>
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Brieanna Allen	Production/Validation Manager	Organics, Burnaby, British Columbia
Bruna Botti	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Jacky Chou	Team Leader - Organics	Organics, Burnaby, British Columbia
Janice Pearson	Account Manager Assistant	Internal Subcontracting, Fort Collins, Colorado
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Monica Ko	Lab Assistant	Metals, Burnaby, British Columbia
Muneeb Alam	Analyst	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Shaneel Dayal	Analyst	Metals, Burnaby, British Columbia







## 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.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances  
 LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
Bq/L	Becquerels per litre
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units
psu	practical salinity units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

## Workorder Comments

Amendment (03/09/2021): This report has been amended following changes to the analytical data reported. The quality system is being utilised to resolve this issue. The specific data affected is chloromethane and toluene for sample VA20B3721-1.

## Sample Comments

<i>Sample</i>	<i>Client Id</i>	<i>Comment</i>
VA20B3721-001	Westbay-A-225	Water sample for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.

## Qualifiers

<i>Qualifier</i>	<i>Description</i>
------------------	--------------------



*DLA*                      *Detection Limit adjusted for required dilution.*

*DLCI*                    *Detection Limit Raised: Chromatographic interference due to co-elution.*

*DLDS*                   *Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*

*DLM*                    *Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*

*DLQ*                    *Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.*

---



## Analytical Results

Sub-Matrix: Drilling Fluid

Client sample ID

Westbay-A-225

(Matrix: Water)

					Client sampling date / time	17-Aug-2020 14:00	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA20B3721-001	-----	-----	-----	-----	
					Result	----	----	----	----	
<b>Physical Tests</b>										
conductivity	----	E100	2.0	µS/cm	142000	----	----	----	----	
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	107000	----	----	----	----	
pH	----	E108	0.10	pH units	9.20	----	----	----	----	
salinity	----	EC100S	1.0	psu	112	----	----	----	----	
solids, total dissolved [TDS]	----	E162	10	mg/L	163000	----	----	----	----	
solids, total suspended [TSS]	----	E160-H	3.0	mg/L	4810	----	----	----	----	
turbidity	----	E121	0.10	NTU	665	----	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	1040	----	----	----	----	
alkalinity, phenolphthalein (as CaCO3)	----	E290	2.0	mg/L	140	----	----	----	----	
alkalinity, hydroxide (as CaCO3)	----	E290	2.0	mg/L	<2.0	----	----	----	----	
alkalinity, carbonate (as CaCO3)	----	E290	2.0	mg/L	279	----	----	----	----	
alkalinity, bicarbonate (as CaCO3)	----	E290	2.0	mg/L	757	----	----	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	2.0	mg/L	924	----	----	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	2.0	mg/L	168	----	----	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	2.0	mg/L	<2.0	----	----	----	----	
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	120000	----	----	----	----	
<b>Anions and Nutrients</b>										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	15.4	----	----	----	----	
bromide	24959-67-9	E235.Br-L	0.050	mg/L	259	----	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	71200	----	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	<20.0 <sup>DLDS</sup>	----	----	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	52.6	----	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	6.38	----	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<1.00 <sup>DLDS</sup>	----	----	----	----	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0500 <sup>DLM</sup>	----	----	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.100 <sup>DLM</sup>	----	----	----	----	
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	<25.0 <sup>DLM</sup>	----	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<300 <sup>DLDS</sup>	----	----	----	----	
<b>Cyanides</b>										
cyanide, free	----	E339	0.0050	mg/L	<0.200 <sup>DLM</sup>	----	----	----	----	



## Analytical Results

Sub-Matrix: Drilling Fluid

Client sample ID

Westbay-A-225

(Matrix: Water)

Client sampling date / time

17-Aug-2020  
14:00

Analyte	CAS Number	Method	LOR	Unit	VA20B3721-001				
					Result	---	---	---	---
<b>Cyanides</b>									
cyanide, strong acid dissociable (total)	---	E333	0.0050	mg/L	<0.200 <sup>DLM</sup>	---	---	---	---
cyanide, weak acid dissociable	---	E336	0.0050	mg/L	<0.200 <sup>DLM</sup>	---	---	---	---
<b>Organic / Inorganic Carbon</b>									
carbon, dissolved organic [DOC]	---	E358-L	0.50	mg/L	165	---	---	---	---
carbon, total organic [TOC]	---	E355-L	0.50	mg/L	233	---	---	---	---
<b>Total Metals</b>									
aluminum, total	7429-90-5	E420	0.0030	mg/L	<1.50 <sup>DLA</sup>	---	---	---	---
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---
arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---
barium, total	7440-39-3	E420	0.00010	mg/L	12.0	---	---	---	---
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.0250 <sup>DLA</sup>	---	---	---	---
boron, total	7440-42-8	E420	0.010	mg/L	144	---	---	---	---
cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.00250 <sup>DLA</sup>	---	---	---	---
calcium, total	7440-70-2	E420	0.050	mg/L	42700	---	---	---	---
cesium, total	7440-46-2	E420	0.000010	mg/L	3.82	---	---	---	---
chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---
copper, total	7440-50-8	E420	0.00050	mg/L	<0.250 <sup>DLA</sup>	---	---	---	---
iron, total	7439-89-6	E420	0.010	mg/L	<5.00 <sup>DLA</sup>	---	---	---	---
lead, total	7439-92-1	E420	0.000050	mg/L	<0.0250 <sup>DLA</sup>	---	---	---	---
lithium, total	7439-93-2	E420	0.0010	mg/L	150	---	---	---	---
magnesium, total	7439-95-4	E420	0.0050	mg/L	12.7	---	---	---	---
manganese, total	7439-96-5	E420	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.000250 <sup>DLM</sup>	---	---	---	---
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.0539	---	---	---	---
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.250 <sup>DLA</sup>	---	---	---	---
phosphorus, total	7723-14-0	E420	0.050	mg/L	<25.0 <sup>DLA</sup>	---	---	---	---
potassium, total	7440-09-7	E420	0.050	mg/L	2110	---	---	---	---
rubidium, total	7440-17-7	E420	0.00020	mg/L	7.95	---	---	---	---
selenium, total	7782-49-2	E420	0.000050	mg/L	<0.0250 <sup>DLA</sup>	---	---	---	---



## Analytical Results

Sub-Matrix: Drilling Fluid

Client sample ID

Westbay-A-225

(Matrix: Water)

Client sampling date / time

17-Aug-2020  
14:00

Analyte	CAS Number	Method	LOR	Unit	VA20B3721-001	Result				
<b>Total Metals</b>										
silicon, total	7440-21-3	E420	0.10	mg/L	<50.0 <sup>DLA</sup>	---	---	---	---	---
silver, total	7440-22-4	E420	0.000010	mg/L	<0.00500 <sup>DLA</sup>	---	---	---	---	---
sodium, total	17341-25-2	E420	0.050	mg/L	1440	---	---	---	---	---
strontium, total	7440-24-6	E420	0.00020	mg/L	2160	---	---	---	---	---
sulfur, total	7704-34-9	E420	0.50	mg/L	<250 <sup>DLA</sup>	---	---	---	---	---
tellurium, total	13494-80-9	E420	0.00020	mg/L	0.166	---	---	---	---	---
thallium, total	7440-28-0	E420	0.000010	mg/L	0.285	---	---	---	---	---
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---	---
tin, total	7440-31-5	E420	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---	---
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.150 <sup>DLA</sup>	---	---	---	---	---
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---	---
uranium, total	7440-61-1	E420	0.000010	mg/L	<0.00500 <sup>DLA</sup>	---	---	---	---	---
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.250 <sup>DLA</sup>	---	---	---	---	---
zinc, total	7440-66-6	E420	0.0030	mg/L	2.58	---	---	---	---	---
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.100 <sup>DLA</sup>	---	---	---	---	---
<b>Dissolved Metals</b>										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.500 <sup>DLA</sup>	---	---	---	---	---
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---	---
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---	---
barium, dissolved	7440-39-3	E421	0.00010	mg/L	13.4	---	---	---	---	---
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---	---
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.0250 <sup>DLA</sup>	---	---	---	---	---
boron, dissolved	7440-42-8	E421	0.010	mg/L	175	---	---	---	---	---
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.00250 <sup>DLA</sup>	---	---	---	---	---
calcium, dissolved	7440-70-2	E421	0.050	mg/L	48000	---	---	---	---	---
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	4.21	---	---	---	---	---
chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---	---
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---	---
copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.100 <sup>DLA</sup>	---	---	---	---	---
iron, dissolved	7439-89-6	E421	0.010	mg/L	<5.00 <sup>DLA</sup>	---	---	---	---	---
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.0250 <sup>DLA</sup>	---	---	---	---	---



## Analytical Results

Sub-Matrix: Drilling Fluid

Client sample ID

Westbay-A-225

(Matrix: Water)

Client sampling date / time

17-Aug-2020  
14:00

Analyte	CAS Number	Method	LOR	Unit	VA20B3721-001	Result	Result	Result	Result
<b>Dissolved Metals</b>									
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	177	---	---	---	---
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	13.9	---	---	---	---
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000250 <sup>DLM</sup>	---	---	---	---
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0570	---	---	---	---
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.250 <sup>DLA</sup>	---	---	---	---
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<25.0 <sup>DLA</sup>	---	---	---	---
potassium, dissolved	7440-09-7	E421	0.050	mg/L	2420	---	---	---	---
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	9.48	---	---	---	---
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.0250 <sup>DLA</sup>	---	---	---	---
silicon, dissolved	7440-21-3	E421	0.050	mg/L	<25.0 <sup>DLA</sup>	---	---	---	---
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.00500 <sup>DLA</sup>	---	---	---	---
sodium, dissolved	17341-25-2	E421	0.050	mg/L	1490	---	---	---	---
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	2440	---	---	---	---
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<250 <sup>DLA</sup>	---	---	---	---
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	0.191	---	---	---	---
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.311	---	---	---	---
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.150 <sup>DLA</sup>	---	---	---	---
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	<0.00500 <sup>DLA</sup>	---	---	---	---
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.250 <sup>DLA</sup>	---	---	---	---
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	3.13	---	---	---	---
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.100 <sup>DLA</sup>	---	---	---	---
dissolved mercury filtration location	---	EP509	-	-	Laboratory	---	---	---	---
dissolved metals filtration location	---	EP421	-	-	Laboratory	---	---	---	---
<b>Aggregate Organics</b>									
biochemical oxygen demand [BOD]	---	E550	2.0	mg/L	321	---	---	---	---
chemical oxygen demand [COD]	---	E559	20	mg/L	11600	---	---	---	---
oil & grease (gravimetric)	---	E567	5.0	mg/L	688	---	---	---	---



## Analytical Results

Sub-Matrix: Drilling Fluid

Client sample ID

Westbay-A-225

(Matrix: Water)

Client sampling date / time

17-Aug-2020  
14:00

Analyte	CAS Number	Method	LOR	Unit	VA20B3721-001	Result				
<b>Volatile Organic Compounds</b>										
chlorobenzene	108-90-7	E611C	0.50	µg/L	<0.50	---	---	---	---	---
chloromethane	74-87-3	E611C	0.50	µg/L	<79.0 <sup>DLM</sup>	---	---	---	---	---
dichlorobenzene, 1,2-	95-50-1	E611C	0.50	µg/L	<0.50	---	---	---	---	---
dichlorobenzene, 1,3-	541-73-1	E611C	0.50	µg/L	<0.50	---	---	---	---	---
dichlorobenzene, 1,4-	106-46-7	E611C	0.50	µg/L	<0.50	---	---	---	---	---
dichloropropane, 1,2-	78-87-5	E611C	0.50	µg/L	<0.50	---	---	---	---	---
dichloropropylene, cis+trans-1,3-	542-75-6	E611C	0.75	µg/L	<0.75	---	---	---	---	---
dichloropropylene, cis-1,3-	10061-01-5	E611C	0.50	µg/L	<0.50	---	---	---	---	---
tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.50	µg/L	<0.50	---	---	---	---	---
tetrachloroethane, 1,1,2,2-	79-34-5	E611C	0.20	µg/L	<0.40 <sup>DLCI</sup>	---	---	---	---	---
trichloroethane, 1,1,2-	79-00-5	E611C	0.50	µg/L	<0.50	---	---	---	---	---
trichlorofluoromethane	75-69-4	E611C	0.50	µg/L	<0.50	---	---	---	---	---
<b>Volatile Organic Compounds [BTEXS+MTBE]</b>										
benzene	71-43-2	E611C	0.50	µg/L	<0.50	---	---	---	---	---
ethylbenzene	100-41-4	E611C	0.50	µg/L	<0.50	---	---	---	---	---
methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.50	µg/L	<0.50	---	---	---	---	---
styrene	100-42-5	E611C	0.50	µg/L	<0.50	---	---	---	---	---
toluene	108-88-3	E611C	0.40	µg/L	3.14	---	---	---	---	---
xylene, m+p-	179601-23-1	E611C	0.50	µg/L	<0.50	---	---	---	---	---
xylene, o-	95-47-6	E611C	0.50	µg/L	<0.50	---	---	---	---	---
xylenes, total	1330-20-7	E611C	0.75	µg/L	<0.75	---	---	---	---	---
<b>Volatile Organic Compounds [Drycleaning]</b>										
carbon tetrachloride	56-23-5	E611C	0.50	µg/L	<0.50	---	---	---	---	---
chloroethane	75-00-3	E611C	0.50	µg/L	<0.50	---	---	---	---	---
dichloroethane, 1,1-	75-34-3	E611C	0.50	µg/L	<0.50	---	---	---	---	---
dichloroethane, 1,2-	107-06-2	E611C	0.50	µg/L	<0.50	---	---	---	---	---
dichloroethylene, 1,1-	75-35-4	E611C	0.50	µg/L	<0.50	---	---	---	---	---
dichloroethylene, cis-1,2-	156-59-2	E611C	0.50	µg/L	<0.50	---	---	---	---	---
dichloroethylene, trans-1,2-	156-60-5	E611C	0.50	µg/L	<0.50	---	---	---	---	---
dichloromethane	75-09-2	E611C	0.50	µg/L	<0.50	---	---	---	---	---
dichloropropylene, trans-1,3-	10061-02-6	E611C	0.50	µg/L	<0.50	---	---	---	---	---



## Analytical Results

Sub-Matrix: Drilling Fluid

Client sample ID

Westbay-A-225

(Matrix: Water)

Client sampling date / time

17-Aug-2020  
14:00

Analyte	CAS Number	Method	LOR	Unit	VA20B3721-001	-----	-----	-----	-----
					Result	---	---	---	---
<b>Volatile Organic Compounds [Drycleaning]</b>									
tetrachloroethylene	127-18-4	E611C	0.50	µg/L	<0.50	---	---	---	---
trichloroethane, 1,1,1-	71-55-6	E611C	0.50	µg/L	<0.50	---	---	---	---
trichloroethylene	79-01-6	E611C	0.50	µg/L	<0.50	---	---	---	---
vinyl chloride	75-01-4	E611C	0.40	µg/L	<0.40	---	---	---	---
<b>Volatile Organic Compounds [THMs]</b>									
bromodichloromethane	75-27-4	E611C	0.50	µg/L	<0.50	---	---	---	---
bromoform	75-25-2	E611C	0.50	µg/L	<0.50	---	---	---	---
chloroform	67-66-3	E611C	0.50	µg/L	<0.50	---	---	---	---
dibromochloromethane	124-48-1	E611C	0.50	µg/L	<0.50	---	---	---	---
<b>Volatile Organic Compounds Surrogates</b>									
bromofluorobenzene, 4-	460-00-4	E611C	0.50	%	80.4	---	---	---	---
difluorobenzene, 1,4-	540-36-3	E611C	0.50	%	103	---	---	---	---
<b>Hydrocarbons</b>									
EPH (C10-C19)	---	E601A	250	µg/L	208000	---	---	---	---
EPH (C19-C32)	---	E601A	250	µg/L	9450	---	---	---	---
HEPHw	---	EC600A	250	µg/L	9450	---	---	---	---
LEPHw	---	EC600A	250	µg/L	208000	---	---	---	---
<b>Hydrocarbons Surrogates</b>									
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	50	%	109	---	---	---	---
<b>Polycyclic Aromatic Hydrocarbons</b>									
acenaphthene	83-32-9	E641A	0.010	µg/L	<0.421 <sup>DLCI</sup>	---	---	---	---
acenaphthylene	208-96-8	E641A	0.010	µg/L	<4.00 <sup>DLCI</sup>	---	---	---	---
acridine	260-94-6	E641A	0.010	µg/L	<0.421 <sup>DLCI</sup>	---	---	---	---
anthracene	120-12-7	E641A	0.010	µg/L	<0.421 <sup>DLCI</sup>	---	---	---	---
benz(a)anthracene	56-55-3	E641A	0.010	µg/L	<0.421 <sup>DLCI</sup>	---	---	---	---
benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	<0.421 <sup>DLCI</sup>	---	---	---	---
benzo(b+j)fluoranthene	---	E641A	0.010	µg/L	0.531	---	---	---	---
benzo(b+j+k)fluoranthene	---	E641A	0.015	µg/L	<0.595	---	---	---	---
benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	<0.421 <sup>DLCI</sup>	---	---	---	---
benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	<0.421 <sup>DLCI</sup>	---	---	---	---
chrysene	218-01-9	E641A	0.010	µg/L	0.612	---	---	---	---





## Analytical Results

Sub-Matrix: Drilling Fluid

Client sample ID

Westbay-A-225

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(Matrix: Water)

Client sampling date / time

17-Aug-2020  
14:00

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Analyte	CAS Number	Method	LOR	Unit	VA20B3721-001	-----	-----	-----	-----
					Result	---	---	---	---
<b>Polycyclic Aromatic Hydrocarbons</b>									
dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	<0.421 <sup>DLCI</sup>	----	----	----	----
fluoranthene	206-44-0	E641A	0.010	µg/L	0.519	----	----	----	----
fluorene	86-73-7	E641A	0.010	µg/L	<0.421 <sup>DLCI</sup>	----	----	----	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	<0.421 <sup>DLCI</sup>	----	----	----	----
methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	<7.00 <sup>DLCI</sup>	----	----	----	----
methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	<0.421 <sup>DLCI</sup>	----	----	----	----
naphthalene	91-20-3	E641A	0.050	µg/L	<0.800 <sup>DLCI</sup>	----	----	----	----
phenanthrene	85-01-8	E641A	0.020	µg/L	<0.500 <sup>DLCI</sup>	----	----	----	----
pyrene	129-00-0	E641A	0.010	µg/L	<0.421 <sup>DLCI</sup>	----	----	----	----
quinoline	6027-02-7	E641A	0.050	µg/L	<0.060 <sup>DLCI</sup>	----	----	----	----
<b>Polycyclic Aromatic Hydrocarbons Surrogates</b>									
acridine-d9	34749-75-2	E641A	0.010	µg/L	1.32	----	----	----	----
chrysene-d12	1719-03-5	E641A	0.010	%	97.8	----	----	----	----
naphthalene-d8	1146-65-2	E641A	0.010	%	109	----	----	----	----
phenanthrene-d10	1517-22-2	E641A	0.010	%	115	----	----	----	----
<b>Radiological Parameters</b>									
radium-226	13982-63-3	RA226-MMER	0.35	Bq/L	9.2	----	----	----	----

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

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA20B3721	Page	: 1 of 15
Amendment	: 2		
Client	: Agnico-Eagle Mines Limited	Laboratory	: Vancouver - Environmental
Contact	: Etienne Parent	Account Manager	: Heather McKenzie
Address	: # 400 - 543 Granville Street Vancouver BC Canada V6C 1X8	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: 20136436-2300-2304	Date Samples Received	: 24-Aug-2020 12:00
PO	: ----	Issue Date	: 03-Sep-2021 15:34
C-O-C number	: ----		
Sampler	: Xavier Montano		
Site	: Meliadine - Westbay A		
Quote number	: VA20-AEML100-001 (Q72802)		
No. of samples received	: 1		
No. of samples analysed	: 1		

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 Services number is a unique identifier assigned to discrete substances.

**DQO:** Data Quality Objective.

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

**RPD:** Relative Percent Difference.

## Summary of Outliers

### Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- 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)

- Analysis Holding Time Outliers exist - please see following pages for full details.

### Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



## 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		
<b>Aggregate Organics : Biochemical Oxygen Demand - 5 day</b>											
<b>HDPE [BOD HT 3d]</b> Westbay-A-225	E550	17-Aug-2020	----	----	----		27-Aug-2020	3 days	10 days	*	EHTR
<b>Aggregate Organics : Chemical Oxygen Demand by Colourimetry</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-225	E559	17-Aug-2020	----	----	----		31-Aug-2020	28 days	14 days	✓	
<b>Aggregate Organics : Oil &amp; Grease by Gravimetry</b>											
<b>Amber glass (hydrochloric acid)</b> Westbay-A-225	E567	17-Aug-2020	30-Aug-2020	28 days	13 days	✓	30-Aug-2020	40 days	0 days	✓	
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-225	E298	17-Aug-2020	27-Aug-2020	----	----		01-Sep-2020	28 days	15 days	✓	
<b>Anions and Nutrients : Bromide in Water by IC (Low Level)</b>											
<b>HDPE</b> Westbay-A-225	E235.Br-L	17-Aug-2020	----	----	----		27-Aug-2020	28 days	10 days	✓	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
<b>HDPE</b> Westbay-A-225	E235.Cl	17-Aug-2020	----	----	----		27-Aug-2020	28 days	10 days	✓	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)</b>											
<b>HDPE</b> Westbay-A-225	E378-U	17-Aug-2020	----	----	----		28-Aug-2020	3 days	11 days	*	EHTR



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		
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
HDPE Westbay-A-225	E235.F	17-Aug-2020	----	----	----		27-Aug-2020	28 days	10 days	✓	
<b>Anions and Nutrients : Nitrate in Water by IC (Low Level)</b>											
HDPE Westbay-A-225	E235.NO3-L	17-Aug-2020	----	----	----		27-Aug-2020	3 days	10 days	* EHTR	
<b>Anions and Nutrients : Nitrite in Water by IC (Low Level)</b>											
HDPE Westbay-A-225	E235.NO2-L	17-Aug-2020	----	----	----		27-Aug-2020	3 days	10 days	* EHTR	
<b>Anions and Nutrients : Reactive Silica by Colourimetry</b>											
HDPE Westbay-A-225	E392	17-Aug-2020	----	----	----		31-Aug-2020	28 days	14 days	✓	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE Westbay-A-225	E235.SO4	17-Aug-2020	----	----	----		27-Aug-2020	28 days	10 days	✓	
<b>Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)</b>											
Amber glass total (sulfuric acid) Westbay-A-225	E318	17-Aug-2020	27-Aug-2020	----	----		28-Aug-2020	28 days	11 days	✓	
<b>Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)</b>											
Amber glass total (sulfuric acid) Westbay-A-225	E372-U	17-Aug-2020	27-Aug-2020	----	----		28-Aug-2020	28 days	10 days	✓	
<b>Cyanides : Free Cyanide by CFA</b>											
UV inhibited HDPE - total (sodium hydroxide) Westbay-A-225	E339	17-Aug-2020	----	----	----		31-Aug-2020	14 days	14 days	✓	
<b>Cyanides : Total Cyanide by CFA</b>											
UV inhibited HDPE - total (sodium hydroxide) Westbay-A-225	E333	17-Aug-2020	----	----	----		31-Aug-2020	14 days	14 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		
<b>Cyanides : WAD Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-225	E336	17-Aug-2020	----	----	----		31-Aug-2020	14 days	14 days	✓	
<b>Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)</b>											
<b>HDPE dissolved (nitric acid)</b> Westbay-A-225	E421.Cr-L	17-Aug-2020	27-Aug-2020	----	----		28-Aug-2020	180 days	11 days	✓	
<b>Dissolved Metals : Dissolved Mercury in Water by CVAAS</b>											
<b>Glass vial dissolved (hydrochloric acid)</b> Westbay-A-225	E509	17-Aug-2020	28-Aug-2020	----	----		28-Aug-2020	28 days	11 days	✓	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
<b>HDPE dissolved (nitric acid)</b> Westbay-A-225	E421	17-Aug-2020	27-Aug-2020	----	----		28-Aug-2020	180 days	11 days	✓	
<b>Hydrocarbons : BC PHC - EPH by GC-FID</b>											
<b>Amber glass/Teflon lined cap (sodium bisulfate)</b> Westbay-A-225	E601A	17-Aug-2020	29-Aug-2020	14 days	12 days	✓	31-Aug-2020	40 days	2 days	✓	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
<b>Amber glass dissolved (sulfuric acid)</b> Westbay-A-225	E358-L	17-Aug-2020	28-Aug-2020	----	----		28-Aug-2020	28 days	11 days	✓	
<b>Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-225	E355-L	17-Aug-2020	27-Aug-2020	----	----		28-Aug-2020	28 days	10 days	✓	
<b>Physical Tests : Alkalinity Species by Titration</b>											
<b>HDPE</b> Westbay-A-225	E290	17-Aug-2020	----	----	----		27-Aug-2020	14 days	10 days	✓	
<b>Physical Tests : Conductivity in Water</b>											
<b>HDPE</b> Westbay-A-225	E100	17-Aug-2020	----	----	----		27-Aug-2020	28 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		
<b>Physical Tests : pH by Meter</b>											
HDPE Westbay-A-225	E108	17-Aug-2020	----	----	----		27-Aug-2020	0.25 hrs	248 hrs	*	EHTR-FM
<b>Physical Tests : TDS by Gravimetry</b>											
HDPE Westbay-A-225	E162	17-Aug-2020	----	----	----		27-Aug-2020	7 days	10 days	*	EHTL
<b>Physical Tests : TSS by Gravimetry</b>											
HDPE Westbay-A-225	E160-H	17-Aug-2020	----	----	----		27-Aug-2020	7 days	10 days	*	EHTL
<b>Physical Tests : Turbidity by Nephelometry</b>											
HDPE Westbay-A-225	E121	17-Aug-2020	----	----	----		27-Aug-2020	3 days	10 days	*	EHTR
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS</b>											
Amber glass/Teflon lined cap (sodium bisulfate) Westbay-A-225	E641A	17-Aug-2020	29-Aug-2020	14 days	12 days	✓	30-Aug-2020	40 days	1 days	✓	
<b>Radiological Parameters : Radium-226 by Radon Emanation</b>											
HDPE total (nitric acid) Westbay-A-225	RA226-MMER	17-Aug-2020	----	----	----		15-Sep-2020	180 days	29 days	✓	
<b>Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)</b>											
HDPE - total (lab preserved) Westbay-A-225	E420.Cr-L	17-Aug-2020	----	----	----		29-Aug-2020	180 days	12 days	✓	
<b>Total Metals : Total Mercury in Water by CVAAS</b>											
HDPE - total (lab preserved) Westbay-A-225	E508	17-Aug-2020	----	----	----		02-Sep-2020	----	16 days		
<b>Total Metals : Total Metals in Water by CRC ICPMS</b>											
HDPE - total (lab preserved) Westbay-A-225	E420	17-Aug-2020	----	----	----		29-Aug-2020	180 days	12 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	
<b>Volatile Organic Compounds : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay-A-225	E611C	17-Aug-2020	27-Aug-2020	----	----		28-Aug-2020	----	----	
<b>Volatile Organic Compounds [BTEXS+MTBE] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay-A-225	E611C	17-Aug-2020	27-Aug-2020	----	----		28-Aug-2020	14 days	11 days	✓
<b>Volatile Organic Compounds [Drycleaning] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay-A-225	E611C	17-Aug-2020	27-Aug-2020	----	----		28-Aug-2020	----	----	
<b>Volatile Organic Compounds [THMs] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay-A-225	E611C	17-Aug-2020	27-Aug-2020	----	----		28-Aug-2020	----	----	

**Legend & Qualifier Definitions**

- EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
- EHTR: Exceeded ALS recommended hold time prior to sample receipt.
- EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
- 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 (%)		Evaluation
			QC	Regular	Actual	Expected	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity Species by Titration	E290	78259	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	78267	1	6	16.6	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	78118	1	5	20.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	78145	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	79273	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	78143	1	20	5.0	5.0	✓
Conductivity in Water	E100	78261	1	18	5.5	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	78216	1	13	7.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	78350	1	4	25.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	78215	1	15	6.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	78311	1	7	14.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	78325	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	78144	1	20	5.0	5.0	✓
Free Cyanide by CFA	E339	79205	1	3	33.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	78146	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	78147	1	20	5.0	5.0	✓
pH by Meter	E108	78258	1	18	5.5	5.0	✓
Reactive Silica by Colourimetry	E392	79460	1	1	100.0	5.0	✓
Sulfate in Water by IC	E235.SO4	78148	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	78001	1	20	5.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	78081	1	5	20.0	5.0	✓
Total Cyanide by CFA	E333	79203	1	13	7.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	78263	1	7	14.2	5.0	✓
Total Mercury in Water by CVAAS	E508	80122	1	7	14.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	78080	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	78264	1	9	11.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	78266	1	7	14.2	5.0	✓
TSS by Gravimetry	E160-H	78067	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	78057	1	20	5.0	5.0	✓
VOCs (BC List) by Headspace GC-MS	E611C	78076	1	7	14.2	5.0	✓
WAD Cyanide by CFA	E336	79204	1	5	20.0	5.0	✓
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity Species by Titration	E290	78259	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	78267	1	6	16.6	5.0	✓
BC PHC - EPH by GC-FID	E601A	78961	1	6	16.6	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	78118	1	5	20.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	78145	1	20	5.0	5.0	✓





Matrix: **Water**

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
<b>Analytical Methods</b>							
<b>Laboratory Control Samples (LCS) - Continued</b>							
Chemical Oxygen Demand by Colourimetry	E559	79273	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	78143	1	20	5.0	5.0	✓
Conductivity in Water	E100	78261	1	18	5.5	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	78216	1	13	7.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	78350	1	4	25.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	78215	1	15	6.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	78311	1	7	14.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	78325	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	78144	1	20	5.0	5.0	✓
Free Cyanide by CFA	E339	79205	1	3	33.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	78146	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	78147	1	20	5.0	5.0	✓
Oil & Grease by Gravimetry	E567	79081	1	4	25.0	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	78962	1	4	25.0	5.0	✓
pH by Meter	E108	78258	1	18	5.5	5.0	✓
Reactive Silica by Colourimetry	E392	79460	1	1	100.0	5.0	✓
Sulfate in Water by IC	E235.SO4	78148	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	78001	1	20	5.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	78081	1	5	20.0	5.0	✓
Total Cyanide by CFA	E333	79203	1	13	7.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	78263	1	7	14.2	5.0	✓
Total Mercury in Water by CVAAS	E508	80122	1	7	14.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	78080	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	78264	1	9	11.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	78266	1	7	14.2	5.0	✓
TSS by Gravimetry	E160-H	78067	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	78057	1	20	5.0	5.0	✓
VOCs (BC List) by Headspace GC-MS	E611C	78076	1	7	14.2	5.0	✓
WAD Cyanide by CFA	E336	79204	1	5	20.0	5.0	✓
<b>Method Blanks (MB)</b>							
Alkalinity Species by Titration	E290	78259	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	78267	1	6	16.6	5.0	✓
BC PHC - EPH by GC-FID	E601A	78961	1	6	16.6	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	78118	1	5	20.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	78145	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	79273	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	78143	1	20	5.0	5.0	✓
Conductivity in Water	E100	78261	1	18	5.5	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	78216	1	13	7.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	78350	1	4	25.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	78215	1	15	6.6	5.0	✓



Matrix: **Water**

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	78311	1	7	14.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	78325	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	78144	1	20	5.0	5.0	✓
Free Cyanide by CFA	E339	79205	1	3	33.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	78146	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	78147	1	20	5.0	5.0	✓
Oil & Grease by Gravimetry	E567	79081	1	4	25.0	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	78962	1	4	25.0	5.0	✓
Reactive Silica by Colourimetry	E392	79460	1	1	100.0	5.0	✓
Sulfate in Water by IC	E235.SO4	78148	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	78001	1	20	5.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	78081	1	5	20.0	5.0	✓
Total Cyanide by CFA	E333	79203	1	13	7.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	78263	1	7	14.2	5.0	✓
Total Mercury in Water by CVAAS	E508	80122	1	7	14.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	78080	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	78264	1	9	11.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	78266	1	7	14.2	5.0	✓
TSS by Gravimetry	E160-H	78067	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	78057	1	20	5.0	5.0	✓
VOCs (BC List) by Headspace GC-MS	E611C	78076	1	7	14.2	5.0	✓
WAD Cyanide by CFA	E336	79204	1	5	20.0	5.0	✓
<b>Matrix Spikes (MS)</b>							
Ammonia by Fluorescence	E298	78267	1	6	16.6	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	78145	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	79273	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	78143	1	20	5.0	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	78216	1	13	7.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	78350	1	4	25.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	78215	1	15	6.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	78311	1	7	14.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	78325	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	78144	1	20	5.0	5.0	✓
Free Cyanide by CFA	E339	79205	1	3	33.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	78146	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	78147	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	79460	1	1	100.0	5.0	✓
Sulfate in Water by IC	E235.SO4	78148	1	20	5.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	78081	1	5	20.0	5.0	✓
Total Cyanide by CFA	E333	79203	1	13	7.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	78263	1	7	14.2	5.0	✓



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
<i>Analytical Methods</i>							
<b>Matrix Spikes (MS) - Continued</b>							
Total Mercury in Water by CVAAS	E508	80122	1	7	14.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	78080	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	78264	1	9	11.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	78266	1	7	14.2	5.0	✓
VOCs (BC List) by Headspace GC-MS	E611C	78076	1	7	14.2	5.0	✓
WAD Cyanide by CFA	E336	79204	1	5	20.0	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
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Vancouver - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TSS by Gravimetry	E160-H Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Vancouver - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC (Low Level)	E235.Br-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Sulfate in Water by IC	E235.SO4  Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290  Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298  Vancouver - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318  Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.
Total Cyanide by CFA	E333  Vancouver - Environmental	Water	ISO 14403 (mod)	Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.
WAD Cyanide by CFA	E336  Vancouver - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.
Free Cyanide by CFA	E339  Vancouver - Environmental	Water	ASTM D7237 (mod)	Free cyanide is determined by in-line gas diffusion at pH 6 with final determination by colourimetric analysis.
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L  Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L  Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U Vancouver - Environmental	Water	APHA 4500-P E (mod)	Dissolved Orthophosphate is determined colourimetrically on a water sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Total Metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L Vancouver - Environmental	Water	APHA 3030 B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Biochemical Oxygen Demand - 5 day	E550 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter.  Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry	E559	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
	Vancouver - Environmental			
Oil & Grease by Gravimetry	E567 Vancouver - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane and the extract is evaporated to dryness. The residue is then weighed to determine Oil and Grease.
BC PHC - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Extractable Petroleum Hydrocarbons (EPH) are analyzed by GC-FID.
VOCs (BC List) by Headspace GC-MS	E611C Vancouver - 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.
PAHs by Hexane LVI GC-MS	E641A Vancouver - Environmental	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO <sub>3</sub> ), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO <sub>3</sub> equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO <sub>3</sub> ), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO <sub>3</sub> equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
Salinity in Seawater (calculation)	EC100S Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a seawater sample. Conductivity measurements are temperature-compensated to 25°C. Salinity in Practical Salinity Units is calculated.
LEPH and HEPH: EPH-PAH	EC600A Vancouver - Environmental	Water	BC MOE Lab Manual (LEPH and HEPH) (mod)	Light Extractable Petroleum Hydrocarbons (LEPH) and Heavy Extractable Petroleum Hydrocarbons (HEPH) are calculated as follows: LEPH = Extractable Petroleum Hydrocarbons (EPH10-19) minus Acenaphthene, Acridine, Anthracene, Fluorene, Naphthalene and Phenanthrene; HEPH = Extractable Petroleum Hydrocarbons (EPH19-32) minus Benz(a)anthracene, Benzo(a)pyrene, Fluoranthene, and Pyrene.
Radium-226 by Radon Emanation	RA226-MMER Fort Collins - Environmental - 225 Commerce Drive Fort Collins Colorado United States 80524	Water	EPA 903.1	Radium-226 in sample was analyzed according to the current revision of SOP 783.



Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
Oil & Grease Extraction for Gravimetry	EP567 Vancouver - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane by liquid-liquid extraction.
VOCs Preparation for Headspace Analysis	EP581 Vancouver - 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 Vancouver - 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 : **VA20B3721**

Page : 1 of 24

Amendment : **2**

Client : Agnico-Eagle Mines Limited  
 Contact : Etienne Parent  
 Address : # 400 - 543 Granville Street  
 Vancouver BC Canada V6C 1X8  
 Telephone : ----  
 Project : 20136436-2300-2304  
 PO : ----  
 C-O-C number : ----  
 Sampler : Xavier Montano  
 Site : Meliadine - Westbay A  
 Quote number : VA20-AEML100-001 (Q72802)  
 No. of samples received : 1  
 No. of samples analysed : 1

Laboratory : Vancouver - Environmental  
 Account Manager : Heather McKenzie  
 Address : 8081 Lougheed Highway  
 Burnaby, British Columbia Canada V5A 1W9  
 Telephone : +1 604 253 4188  
 Date Samples Received : 24-Aug-2020 12:00  
 Date Analysis Commenced : 27-Aug-2020  
 Issue Date : 03-Sep-2021 15:34

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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

### 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>
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Brieanna Allen	Production/Validation Manager	Organics, Burnaby, British Columbia
Bruna Botti	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Jacky Chou	Team Leader - Organics	Organics, Burnaby, British Columbia
Janice Pearson	Account Manager Assistant	Internal Subcontracting, Fort Collins, Colorado
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Monica Ko	Lab Assistant	Metals, Burnaby, British Columbia
Muneeb Alam	Analyst	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Shaneel Dayal	Analyst	Metals, Burnaby, British Columbia



## 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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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



### 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
<b>Physical Tests (QC Lot: 78001)</b>											
VA20B3491-004	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	269	280	4.01%	20%	----
<b>Physical Tests (QC Lot: 78057)</b>											
VA20B3712-001	Anonymous	turbidity	----	E121	0.10	NTU	0.23	0.25	0.02	Diff <2x LOR	----
<b>Physical Tests (QC Lot: 78067)</b>											
VA20B3527-026	Anonymous	solids, total suspended [TSS]	----	E160-H	3.0	mg/L	4.4	5.8	1.4	Diff <2x LOR	----
<b>Physical Tests (QC Lot: 78258)</b>											
VA20B3721-001	Westbay-A-225	pH	----	E108	0.10	pH units	9.20	9.20	0.00%	4%	----
<b>Physical Tests (QC Lot: 78259)</b>											
VA20B3721-001	Westbay-A-225	alkalinity, bicarbonate (as CaCO3)	----	E290	2.0	mg/L	757	782	3.27%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	2.0	mg/L	279	269	3.72%	20%	----
		alkalinity, hydroxide (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	2.0	mg/L	140	134	3.72%	20%	----
		alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	1040	1050	1.44%	20%	----
<b>Physical Tests (QC Lot: 78261)</b>											
VA20B3721-001	Westbay-A-225	conductivity	----	E100	2.0	µS/cm	142000	142000	0.141%	10%	----
<b>Anions and Nutrients (QC Lot: 78143)</b>											
VA20B2560-006	Anonymous	chloride	16887-00-6	E235.Cl	2.50	mg/L	<2.50	<2.50	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 78144)</b>											
VA20B2560-006	Anonymous	fluoride	16984-48-8	E235.F	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 78145)</b>											
VA20B2560-006	Anonymous	bromide	24959-67-9	E235.Br-L	0.250	mg/L	<0.250	<0.250	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 78146)</b>											
VA20B2560-006	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	0.146	0.147	0.0010	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 78147)</b>											
VA20B2560-006	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 78148)</b>											
VA20B2560-006	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	490	491	0.229%	20%	----
<b>Anions and Nutrients (QC Lot: 78263)</b>											
VA20B3213-005	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.878	0.812	7.77%	20%	----
<b>Anions and Nutrients (QC Lot: 78266)</b>											
VA20B3213-005	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0057	0.0032	0.0024	Diff <2x LOR	----



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
<b>Anions and Nutrients (QC Lot: 78267)</b>											
VA20B3696-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0088	0.0071	0.0016	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 78325)</b>											
VA20B3213-005	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 79460)</b>											
VA20B3764-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	15.8	15.5	1.96%	20%	----
<b>Cyanides (QC Lot: 79203)</b>											
VA20B3444-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 79204)</b>											
VA20B3609-001	Anonymous	cyanide, weak acid dissociable	----	E336	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 79205)</b>											
VA20B3627-001	Anonymous	cyanide, free	----	E339	2.00	mg/L	38.4	34.0	12.0%	20%	----
<b>Organic / Inorganic Carbon (QC Lot: 78264)</b>											
KS2001517-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	4.20	4.29	0.09	Diff <2x LOR	----
<b>Organic / Inorganic Carbon (QC Lot: 78311)</b>											
VA20B3721-001	Westbay-A-225	carbon, dissolved organic [DOC]	----	E358-L	5.00	mg/L	165	168	1.76%	20%	----
<b>Total Metals (QC Lot: 78080)</b>											
VA20B3539-001	Anonymous	aluminum, total	7429-90-5	E420	0.0060	mg/L	0.490	0.464	5.61%	20%	----
		antimony, total	7440-36-0	E420	0.00020	mg/L	0.0311	0.0312	0.318%	20%	----
		arsenic, total	7440-38-2	E420	0.00020	mg/L	0.00937	0.00928	0.949%	20%	----
		barium, total	7440-39-3	E420	0.00020	mg/L	0.0784	0.0790	0.757%	20%	----
		beryllium, total	7440-41-7	E420	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.020	mg/L	0.069	0.068	0.0004	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000600	mg/L	<0.0000600	<0.0000600	0	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.100	mg/L	241	237	1.80%	20%	----
		cesium, total	7440-46-2	E420	0.000020	mg/L	0.00362	0.00357	1.42%	20%	----
		cobalt, total	7440-48-4	E420	0.00020	mg/L	0.00264	0.00260	1.69%	20%	----
		copper, total	7440-50-8	E420	0.00100	mg/L	0.141	0.137	3.02%	20%	----
		iron, total	7439-89-6	E420	0.020	mg/L	1.01	0.994	1.62%	20%	----
		lead, total	7439-92-1	E420	0.000100	mg/L	0.000217	0.000277	0.00060	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0020	mg/L	0.0975	0.0988	1.39%	20%	----
		magnesium, total	7439-95-4	E420	0.200	mg/L	90.4	89.1	1.40%	20%	----
		manganese, total	7439-96-5	E420	0.00020	mg/L	0.127	0.126	0.878%	20%	----
		molybdenum, total	7439-98-7	E420	0.000100	mg/L	0.140	0.140	0.114%	20%	----
		nickel, total	7440-02-0	E420	0.00100	mg/L	0.0108	0.0107	0.945%	20%	----



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
<b>Total Metals (QC Lot: 78080) - continued</b>											
VA20B3539-001	Anonymous	phosphorus, total	7723-14-0	E420	0.600	mg/L	<0.600	<0.600	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.100	mg/L	14.7	14.4	1.80%	20%	----
		rubidium, total	7440-17-7	E420	0.00040	mg/L	0.0317	0.0314	0.885%	20%	----
		selenium, total	7782-49-2	E420	0.000100	mg/L	0.00590	0.00575	2.54%	20%	----
		silicon, total	7440-21-3	E420	0.20	mg/L	15.4	15.4	0.126%	20%	----
		silver, total	7440-22-4	E420	0.000020	mg/L	0.000042	0.000039	0.000003	Diff <2x LOR	----
		sodium, total	17341-25-2	E420	0.100	mg/L	235	232	1.31%	20%	----
		strontium, total	7440-24-6	E420	0.00040	mg/L	8.86	8.77	0.996%	20%	----
		sulfur, total	7704-34-9	E420	1.00	mg/L	273	278	1.81%	20%	----
		tellurium, total	13494-80-9	E420	0.00040	mg/L	0.00118	0.00117	0.000010	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00020	mg/L	0.00024	0.00025	0.000005	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000020	mg/L	0.00741	0.00759	2.37%	20%	----
		vanadium, total	7440-62-2	E420	0.00100	mg/L	0.00859	0.00841	0.00018	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0060	mg/L	<0.0060	<0.0060	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
<b>Total Metals (QC Lot: 78081)</b>											
VA20B3539-001	Anonymous	chromium, total	7440-47-3	E420.Cr-L	0.00020	mg/L	0.00062	0.00058	0.00004	Diff <2x LOR	----
<b>Total Metals (QC Lot: 80122)</b>											
KS2001546-001	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 78215)</b>											
VA20B3514-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0089	0.0097	0.0008	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00019	0.00018	0.000009	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00153	0.00145	5.38%	20%	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0277	0.0263	5.28%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	0.020	0.020	0.00010	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000150	mg/L	<0.0000150	<0.0000150	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	15.6	16.0	2.75%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000010	<0.000010	0.0000004	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00019	0.00020	0.00001	Diff <2x LOR	----



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
<b>Dissolved Metals (QC Lot: 78215) - continued</b>											
VA20B3514-001	Anonymous	copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00160	0.00148	0.00012	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000052	<0.000050	0.000002	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0051	0.0051	0.00002	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	6.99	7.01	0.254%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.0294	0.0297	1.09%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00777	0.00780	0.366%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00074	0.00074	0.0000009	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	5.11	5.09	0.365%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00289	0.00272	5.79%	20%	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000566	0.000584	3.22%	20%	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	10.1	10.3	2.01%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	0.050	mg/L	281	282	0.535%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0676	0.0666	1.47%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	12.2	12.4	2.15%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000029	0.000027	0.000001	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00353	0.00351	0.463%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00192	0.00200	0.00009	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0539	0.0548	1.66%	20%	----
		zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 78216)</b>											
VA20B3514-001	Anonymous	chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	0.00030	0.00031	0.00002	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 78350)</b>											
VA20B3453-001	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
<b>Aggregate Organics (QC Lot: 78118)</b>											
KS2001521-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	39.6	41.3	4.20%	30%	----
<b>Aggregate Organics (QC Lot: 79273)</b>											
KS2001509-001	Anonymous	chemical oxygen demand [COD]	----	E559	20	mg/L	58	60	2	Diff <2x LOR	----



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
<b>Volatile Organic Compounds (QC Lot: 78076)</b>											
VA20B3721-001	Westbay-A-225	benzene	71-43-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		bromodichloromethane	75-27-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		bromoform	75-25-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		carbon tetrachloride	56-23-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chlorobenzene	108-90-7	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloroethane	75-00-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloroform	67-66-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloromethane	74-87-3	E611C	79.0	µg/L	<79.0	<80.0	1.00	Diff <2x LOR	----
		dibromochloromethane	124-48-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorobenzene, 1,2-	95-50-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorobenzene, 1,3-	541-73-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorobenzene, 1,4-	106-46-7	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethane, 1,1-	75-34-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethane, 1,2-	107-06-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, 1,1-	75-35-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, cis-1,2-	156-59-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, trans-1,2-	156-60-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloromethane	75-09-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloropropane, 1,2-	78-87-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloropropylene, cis-1,3-	10061-01-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloropropylene, trans-1,3-	10061-02-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tetrachloroethane, 1,1,2,2-	79-34-5	E611C	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		tetrachloroethylene	127-18-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611C	0.40	µg/L	3.14	3.47	10.2%	30%	----
		trichloroethane, 1,1,1-	71-55-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichloroethane, 1,1,2-	79-00-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichloroethylene	79-01-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichlorofluoromethane	75-69-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		vinyl chloride	75-01-4	E611C	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611C	0.50	µg/L	<0.50	0.55	0.05	Diff <2x LOR	----
		xylene, o-	95-47-6	E611C	0.50	µg/L	<0.50	<0.50	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
<b>Physical Tests (QCLot: 78001)</b>						
solids, total dissolved [TDS]	---	E162	10	mg/L	<10	---
<b>Physical Tests (QCLot: 78057)</b>						
turbidity	---	E121	0.1	NTU	<0.10	---
<b>Physical Tests (QCLot: 78067)</b>						
solids, total suspended [TSS]	---	E160-H	3	mg/L	<3.0	---
<b>Physical Tests (QCLot: 78259)</b>						
alkalinity, bicarbonate (as CaCO3)	---	E290	1	mg/L	<1.0	---
alkalinity, carbonate (as CaCO3)	---	E290	1	mg/L	<1.0	---
alkalinity, hydroxide (as CaCO3)	---	E290	1	mg/L	<1.0	---
alkalinity, phenolphthalein (as CaCO3)	---	E290	1	mg/L	<1.0	---
alkalinity, total (as CaCO3)	---	E290	1	mg/L	<1.0	---
<b>Physical Tests (QCLot: 78261)</b>						
conductivity	---	E100	1	µS/cm	<1.0	---
<b>Anions and Nutrients (QCLot: 78143)</b>						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	---
<b>Anions and Nutrients (QCLot: 78144)</b>						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	---
<b>Anions and Nutrients (QCLot: 78145)</b>						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	---
<b>Anions and Nutrients (QCLot: 78146)</b>						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	---
<b>Anions and Nutrients (QCLot: 78147)</b>						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	---
<b>Anions and Nutrients (QCLot: 78148)</b>						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	---
<b>Anions and Nutrients (QCLot: 78263)</b>						
Kjeldahl nitrogen, total [TKN]	---	E318	0.05	mg/L	<0.050	---
<b>Anions and Nutrients (QCLot: 78266)</b>						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	---
<b>Anions and Nutrients (QCLot: 78267)</b>						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
<b>Anions and Nutrients (QCLot: 78325)</b>						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	---





Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Anions and Nutrients (QCLot: 79460)</b>						
silicate (as SiO <sub>2</sub> )	7631-86-9	E392	0.5	mg/L	<0.50	---
<b>Cyanides (QCLot: 79203)</b>						
cyanide, strong acid dissociable (total)	---	E333	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 79204)</b>						
cyanide, weak acid dissociable	---	E336	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 79205)</b>						
cyanide, free	---	E339	0.002	mg/L	<0.0020	---
<b>Organic / Inorganic Carbon (QCLot: 78264)</b>						
carbon, total organic [TOC]	---	E355-L	0.5	mg/L	<0.50	---
<b>Organic / Inorganic Carbon (QCLot: 78311)</b>						
carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
<b>Total Metals (QCLot: 78080)</b>						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	---
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	---
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	---
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	---
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	---
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	---
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	---
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	---
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	---
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	---
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	---
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	---
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	---
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	---
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	---
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	---
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	---
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	---
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	---
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	---



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Total Metals (QCLot: 78080) - continued</b>						
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	---
sodium, total	17341-25-2	E420	0.05	mg/L	<0.050	---
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	---
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	---
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	---
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	---
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	---
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	---
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	---
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	---
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	---
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	---
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	---
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	---
<b>Total Metals (QCLot: 78081)</b>						
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	<0.00010	---
<b>Total Metals (QCLot: 80122)</b>						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	---
<b>Dissolved Metals (QCLot: 78215)</b>						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	---
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	---



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Dissolved Metals (QCLot: 78215) - continued</b>						
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
<b>Dissolved Metals (QCLot: 78216)</b>						
chromium, dissolved	7440-47-3	E421.Cr-L	0.0001	mg/L	<0.00010	----
<b>Dissolved Metals (QCLot: 78350)</b>						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
<b>Aggregate Organics (QCLot: 78118)</b>						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
<b>Aggregate Organics (QCLot: 79081)</b>						
oil & grease (gravimetric)	----	E567	5	mg/L	<5.0	----
<b>Aggregate Organics (QCLot: 79273)</b>						
chemical oxygen demand [COD]	----	E559	20	mg/L	<20	----
<b>Volatile Organic Compounds (QCLot: 78076)</b>						
benzene	71-43-2	E611C	0.5	µg/L	<0.50	----
bromodichloromethane	75-27-4	E611C	0.5	µg/L	<0.50	----
bromoform	75-25-2	E611C	0.5	µg/L	<0.50	----
carbon tetrachloride	56-23-5	E611C	0.5	µg/L	<0.50	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Volatile Organic Compounds (QCLot: 78076) - continued</b>						
chlorobenzene	108-90-7	E611C	0.5	µg/L	<0.50	---
chloroethane	75-00-3	E611C	0.5	µg/L	<0.50	---
chloroform	67-66-3	E611C	0.5	µg/L	<0.50	---
chloromethane	74-87-3	E611C	0.5	µg/L	<0.50	---
dibromochloromethane	124-48-1	E611C	0.5	µg/L	<0.50	---
dichlorobenzene, 1,2-	95-50-1	E611C	0.5	µg/L	<0.50	---
dichlorobenzene, 1,3-	541-73-1	E611C	0.5	µg/L	<0.50	---
dichlorobenzene, 1,4-	106-46-7	E611C	0.5	µg/L	<0.50	---
dichloroethane, 1,1-	75-34-3	E611C	0.5	µg/L	<0.50	---
dichloroethane, 1,2-	107-06-2	E611C	0.5	µg/L	<0.50	---
dichloroethylene, 1,1-	75-35-4	E611C	0.5	µg/L	<0.50	---
dichloroethylene, cis-1,2-	156-59-2	E611C	0.5	µg/L	<0.50	---
dichloroethylene, trans-1,2-	156-60-5	E611C	0.5	µg/L	<0.50	---
dichloromethane	75-09-2	E611C	0.5	µg/L	<0.50	---
dichloropropane, 1,2-	78-87-5	E611C	0.5	µg/L	<0.50	---
dichloropropylene, cis-1,3-	10061-01-5	E611C	0.5	µg/L	<0.50	---
dichloropropylene, trans-1,3-	10061-02-6	E611C	0.5	µg/L	<0.50	---
ethylbenzene	100-41-4	E611C	0.5	µg/L	<0.50	---
methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.5	µg/L	<0.50	---
styrene	100-42-5	E611C	0.5	µg/L	<0.50	---
tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.5	µg/L	<0.50	---
tetrachloroethane, 1,1,2,2-	79-34-5	E611C	0.2	µg/L	<0.20	---
tetrachloroethylene	127-18-4	E611C	0.5	µg/L	<0.50	---
toluene	108-88-3	E611C	0.4	µg/L	<0.40	---
trichloroethane, 1,1,1-	71-55-6	E611C	0.5	µg/L	<0.50	---
trichloroethane, 1,1,2-	79-00-5	E611C	0.5	µg/L	<0.50	---
trichloroethylene	79-01-6	E611C	0.5	µg/L	<0.50	---
trichlorofluoromethane	75-69-4	E611C	0.5	µg/L	<0.50	---
vinyl chloride	75-01-4	E611C	0.4	µg/L	<0.40	---
xylene, m+p-	179601-23-1	E611C	0.5	µg/L	<0.50	---
xylene, o-	95-47-6	E611C	0.5	µg/L	<0.50	---
<b>Hydrocarbons (QCLot: 78961)</b>						
EPH (C10-C19)	---	E601A	250	µg/L	<250	---
EPH (C19-C32)	---	E601A	250	µg/L	<250	---
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 78962)</b>						
acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	---



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 78962) - continued</b>						
acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	----
acridine	260-94-6	E641A	0.01	µg/L	<0.010	----
anthracene	120-12-7	E641A	0.01	µg/L	<0.010	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	<0.0050	----
benzo(b+j)fluoranthene	----	E641A	0.01	µg/L	<0.010	----
benzo(b+j+k)fluoranthene	----	E641A	0.015	µg/L	<0.015	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	----
chrysene	218-01-9	E641A	0.01	µg/L	<0.010	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	<0.0050	----
fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	----
fluorene	86-73-7	E641A	0.01	µg/L	<0.010	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	----
naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	----
phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	----
pyrene	129-00-0	E641A	0.01	µg/L	<0.010	----
quinoline	6027-02-7	E641A	0.05	µg/L	<0.050	----
<b>Polycyclic Aromatic Hydrocarbons Surrogates (QCLot: 78962)</b>						
acridine-d9	34749-75-2	E641A	0.01	µg/L	0.748	----



## 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	
<b>Physical Tests (QCLot: 78001)</b>									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	99.7	85.0	115	----
<b>Physical Tests (QCLot: 78057)</b>									
turbidity	----	E121	0.1	NTU	200 NTU	105	85.0	115	----
<b>Physical Tests (QCLot: 78067)</b>									
solids, total suspended [TSS]	----	E160-H	3	mg/L	150 mg/L	98.3	85.0	115	----
<b>Physical Tests (QCLot: 78258)</b>									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
<b>Physical Tests (QCLot: 78259)</b>									
alkalinity, phenolphthalein (as CaCO <sub>3</sub> )	----	E290	1	mg/L	229 mg/L	95.7	75.0	125	----
alkalinity, total (as CaCO <sub>3</sub> )	----	E290	1	mg/L	500 mg/L	101	85.0	115	----
<b>Physical Tests (QCLot: 78261)</b>									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	100	90.0	110	----
<b>Anions and Nutrients (QCLot: 78143)</b>									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
<b>Anions and Nutrients (QCLot: 78144)</b>									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	97.2	90.0	110	----
<b>Anions and Nutrients (QCLot: 78145)</b>									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	99.8	85.0	115	----
<b>Anions and Nutrients (QCLot: 78146)</b>									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
<b>Anions and Nutrients (QCLot: 78147)</b>									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	97.6	90.0	110	----
<b>Anions and Nutrients (QCLot: 78148)</b>									
sulfate (as SO <sub>4</sub> )	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
<b>Anions and Nutrients (QCLot: 78263)</b>									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	101	75.0	125	----
<b>Anions and Nutrients (QCLot: 78266)</b>									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	97.4	80.0	120	----
<b>Anions and Nutrients (QCLot: 78267)</b>									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.12 mg/L	96.9	85.0	115	----
<b>Anions and Nutrients (QCLot: 78325)</b>									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	101	80.0	120	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
<b>Anions and Nutrients (QCLot: 79460)</b>									
silicate (as SiO <sub>2</sub> )	7631-86-9	E392	0.5	mg/L	10 mg/L	99.9	85.0	115	----
<b>Cyanides (QCLot: 79203)</b>									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	95.2	80.0	120	----
<b>Cyanides (QCLot: 79204)</b>									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	101	80.0	120	----
<b>Cyanides (QCLot: 79205)</b>									
cyanide, free	----	E339	0.002	mg/L	0.125 mg/L	93.9	80.0	120	----
<b>Organic / Inorganic Carbon (QCLot: 78264)</b>									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	98.9	80.0	120	----
<b>Organic / Inorganic Carbon (QCLot: 78311)</b>									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	97.6	80.0	120	----
<b>Total Metals (QCLot: 78080)</b>									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	100	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	106	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	97.5	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	108	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	92.4	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	101	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	88.0	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	103	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	98.6	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	103	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	99.2	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	99.6	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	104	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	104	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	90.8	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	99.0	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	96.8	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	97.6	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	112	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	99.6	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	97.6	80.0	120	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
<b>Total Metals (QCLot: 78080) - continued</b>									
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	101	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	98.0	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	103	80.0	120	----
sodium, total	17341-25-2	E420	0.05	mg/L	50 mg/L	105	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	100	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	97.1	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	98.7	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	104	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	103	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	103	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	102	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	102	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	106	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	103	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	103	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	99.1	80.0	120	----
<b>Total Metals (QCLot: 78081)</b>									
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	0.25 mg/L	99.6	80.0	120	----
<b>Total Metals (QCLot: 80122)</b>									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	101	80.0	120	----
<b>Dissolved Metals (QCLot: 78215)</b>									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	98.9	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	98.9	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	105	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	103	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	102	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	105	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	98.6	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	105	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	102	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	105	80.0	120	----





Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Dissolved Metals (QCLot: 78215) - continued</b>									
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	101	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	102	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	103	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	90.8	70.0	130	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	103	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	105	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	105	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	103	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	100	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	106	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	105	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	99.3	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	102	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	100	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	102	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	94.2	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	100	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	100	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	103	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	102	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
<b>Dissolved Metals (QCLot: 78216)</b>									
chromium, dissolved	7440-47-3	E421.Cr-L	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	92.2	80.0	120	----
<b>Aggregate Organics (QCLot: 78118)</b>									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	91.7	85.0	115	----
<b>Aggregate Organics (QCLot: 79081)</b>									
oil & grease (gravimetric)	----	E567	5	mg/L	100 mg/L	99.5	70.0	130	----
<b>Aggregate Organics (QCLot: 79273)</b>									
chemical oxygen demand [COD]	----	E559	20	mg/L	750 mg/L	99.0	85.0	115	----
<b>Volatile Organic Compounds (QCLot: 78076)</b>									
benzene	71-43-2	E611C	0.5	µg/L	100 µg/L	99.1	70.0	130	----
bromodichloromethane	75-27-4	E611C	0.5	µg/L	100 µg/L	110	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
<b>Volatile Organic Compounds (QCLot: 78076) - continued</b>									
bromoform	75-25-2	E611C	0.5	µg/L	100 µg/L	118	70.0	130	----
carbon tetrachloride	56-23-5	E611C	0.5	µg/L	100 µg/L	98.9	70.0	130	----
chlorobenzene	108-90-7	E611C	0.5	µg/L	100 µg/L	102	70.0	130	----
chloroethane	75-00-3	E611C	0.5	µg/L	100 µg/L	74.4	60.0	140	----
chloroform	67-66-3	E611C	0.5	µg/L	100 µg/L	127	70.0	130	----
chloromethane	74-87-3	E611C	0.5	µg/L	100 µg/L	70.1	60.0	140	----
dibromochloromethane	124-48-1	E611C	0.5	µg/L	100 µg/L	95.0	70.0	130	----
dichlorobenzene, 1,2-	95-50-1	E611C	0.5	µg/L	100 µg/L	96.0	70.0	130	----
dichlorobenzene, 1,3-	541-73-1	E611C	0.5	µg/L	100 µg/L	93.0	70.0	130	----
dichlorobenzene, 1,4-	106-46-7	E611C	0.5	µg/L	100 µg/L	96.0	70.0	130	----
dichloroethane, 1,1-	75-34-3	E611C	0.5	µg/L	100 µg/L	97.1	70.0	130	----
dichloroethane, 1,2-	107-06-2	E611C	0.5	µg/L	100 µg/L	109	70.0	130	----
dichloroethylene, 1,1-	75-35-4	E611C	0.5	µg/L	100 µg/L	101	70.0	130	----
dichloroethylene, cis-1,2-	156-59-2	E611C	0.5	µg/L	100 µg/L	99.6	70.0	130	----
dichloroethylene, trans-1,2-	156-60-5	E611C	0.5	µg/L	100 µg/L	101	70.0	130	----
dichloromethane	75-09-2	E611C	0.5	µg/L	100 µg/L	112	70.0	130	----
dichloropropane, 1,2-	78-87-5	E611C	0.5	µg/L	100 µg/L	92.0	70.0	130	----
dichloropropylene, cis-1,3-	10061-01-5	E611C	0.5	µg/L	100 µg/L	74.0	70.0	130	----
dichloropropylene, trans-1,3-	10061-02-6	E611C	0.5	µg/L	100 µg/L	70.5	70.0	130	----
ethylbenzene	100-41-4	E611C	0.5	µg/L	100 µg/L	92.1	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.5	µg/L	100 µg/L	110	70.0	130	----
styrene	100-42-5	E611C	0.5	µg/L	100 µg/L	88.5	70.0	130	----
tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.5	µg/L	100 µg/L	96.2	70.0	130	----
tetrachloroethane, 1,1,2,2-	79-34-5	E611C	0.2	µg/L	100 µg/L	101	70.0	130	----
tetrachloroethylene	127-18-4	E611C	0.5	µg/L	100 µg/L	88.8	70.0	130	----
toluene	108-88-3	E611C	0.4	µg/L	100 µg/L	101	70.0	130	----
trichloroethane, 1,1,1-	71-55-6	E611C	0.5	µg/L	100 µg/L	104	70.0	130	----
trichloroethane, 1,1,2-	79-00-5	E611C	0.5	µg/L	100 µg/L	101	70.0	130	----
trichloroethylene	79-01-6	E611C	0.5	µg/L	100 µg/L	89.2	70.0	130	----
trichlorofluoromethane	75-69-4	E611C	0.5	µg/L	100 µg/L	122	60.0	140	----
vinyl chloride	75-01-4	E611C	0.4	µg/L	100 µg/L	71.1	60.0	140	----
xylene, m+p-	179601-23-1	E611C	0.5	µg/L	200 µg/L	106	70.0	130	----
xylene, o-	95-47-6	E611C	0.5	µg/L	100 µg/L	94.9	70.0	130	----
<b>Hydrocarbons (QCLot: 78961)</b>									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	121	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	119	70.0	130	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 78962)</b>									
acenaphthene	83-32-9	E641A	0.01	µg/L	1 µg/L	119	60.0	130	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	1 µg/L	119	60.0	130	----
acridine	260-94-6	E641A	0.01	µg/L	1 µg/L	107	60.0	130	----
anthracene	120-12-7	E641A	0.01	µg/L	1 µg/L	115	60.0	130	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	1 µg/L	124	60.0	130	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	1 µg/L	127	60.0	130	----
benzo(b+j)fluoranthene	----	E641A	0.01	µg/L	1 µg/L	119	60.0	130	----
benzo(b+j+k)fluoranthene	----	E641A	0.015	µg/L	2 µg/L	115	60.0	130	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	1 µg/L	117	60.0	130	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	1 µg/L	111	60.0	130	----
chrysene	218-01-9	E641A	0.01	µg/L	1 µg/L	122	60.0	130	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	1 µg/L	115	60.0	130	----
fluoranthene	206-44-0	E641A	0.01	µg/L	1 µg/L	115	60.0	130	----
fluorene	86-73-7	E641A	0.01	µg/L	1 µg/L	108	60.0	130	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	1 µg/L	124	60.0	130	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	1 µg/L	123	60.0	130	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	1 µg/L	122	60.0	130	----
naphthalene	91-20-3	E641A	0.05	µg/L	1 µg/L	120	50.0	130	----
phenanthrene	85-01-8	E641A	0.02	µg/L	1 µg/L	112	60.0	130	----
pyrene	129-00-0	E641A	0.01	µg/L	1 µg/L	120	60.0	130	----
quinoline	6027-02-7	E641A	0.05	µg/L	1 µg/L	127	60.0	130	----
<b>Polycyclic Aromatic Hydrocarbons Surrogates (QCLot: 78962)</b>									
acridine-d9	34749-75-2	E641A	0.01	µg/L	0.8421 µg/L	94.2	----	----	----



## 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
<b>Anions and Nutrients (QCLot: 78143)</b>										
VA20B3213-005	Anonymous	chloride	16887-00-6	E235.Cl	487 mg/L	500 mg/L	97.5	75.0	125	----
<b>Anions and Nutrients (QCLot: 78144)</b>										
VA20B3213-005	Anonymous	fluoride	16984-48-8	E235.F	4.85 mg/L	5 mg/L	97.1	75.0	125	----
<b>Anions and Nutrients (QCLot: 78145)</b>										
VA20B3213-005	Anonymous	bromide	24959-67-9	E235.Br-L	2.49 mg/L	2.5 mg/L	99.6	75.0	125	----
<b>Anions and Nutrients (QCLot: 78146)</b>										
VA20B3213-005	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	12.3 mg/L	12.5 mg/L	98.7	75.0	125	----
<b>Anions and Nutrients (QCLot: 78147)</b>										
VA20B3213-005	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	2.35 mg/L	2.5 mg/L	94.2	75.0	125	----
<b>Anions and Nutrients (QCLot: 78148)</b>										
VA20B3213-005	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	488 mg/L	500 mg/L	97.5	75.0	125	----
<b>Anions and Nutrients (QCLot: 78263)</b>										
VA20B3696-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.61 mg/L	2.5 mg/L	104	70.0	130	----
<b>Anions and Nutrients (QCLot: 78266)</b>										
VA20B3696-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0447 mg/L	0.05 mg/L	89.4	70.0	130	----
<b>Anions and Nutrients (QCLot: 78267)</b>										
VA20B3696-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.214 mg/L	0.2 mg/L	107	75.0	125	----
<b>Anions and Nutrients (QCLot: 78325)</b>										
VA20B3712-003	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0336 mg/L	0.03 mg/L	112	70.0	130	----
<b>Anions and Nutrients (QCLot: 79460)</b>										
VA20B3721-001	Westbay-A-225	silicate (as SiO2)	7631-86-9	E392	478 mg/L	500 mg/L	95.5	75.0	125	----
<b>Cyanides (QCLot: 79203)</b>										
VA20B3444-002	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.246 mg/L	0.25 mg/L	98.6	75.0	125	----
<b>Cyanides (QCLot: 79204)</b>										
VA20B3609-002	Anonymous	cyanide, weak acid dissociable	----	E336	0.128 mg/L	0.125 mg/L	102	75.0	125	----
<b>Cyanides (QCLot: 79205)</b>										
VA20B3627-002	Anonymous	cyanide, free	----	E339	126 mg/L	125 mg/L	101	75.0	125	----



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
<b>Organic / Inorganic Carbon (QCLot: 78264)</b>										
KS2001517-003	Anonymous	carbon, total organic [TOC]	----	E355-L	4.74 mg/L	5 mg/L	94.8	70.0	130	----
<b>Organic / Inorganic Carbon (QCLot: 78311)</b>										
WR2000748-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
<b>Total Metals (QCLot: 78080)</b>										
VA20B3567-001	Anonymous	aluminum, total	7429-90-5	E420	0.192 mg/L	0.2 mg/L	96.0	70.0	130	----
		antimony, total	7440-36-0	E420	0.0184 mg/L	0.02 mg/L	92.2	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0187 mg/L	0.02 mg/L	93.4	70.0	130	----
		barium, total	7440-39-3	E420	0.0203 mg/L	0.02 mg/L	102	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0342 mg/L	0.04 mg/L	85.6	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00918 mg/L	0.01 mg/L	91.8	70.0	130	----
		boron, total	7440-42-8	E420	0.080 mg/L	0.1 mg/L	79.6	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00392 mg/L	0.004 mg/L	97.9	70.0	130	----
		calcium, total	7440-70-2	E420	3.26 mg/L	4 mg/L	81.4	70.0	130	----
		cesium, total	7440-46-2	E420	0.00929 mg/L	0.01 mg/L	92.9	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0194 mg/L	0.02 mg/L	97.1	70.0	130	----
		copper, total	7440-50-8	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		iron, total	7439-89-6	E420	1.95 mg/L	2 mg/L	97.4	70.0	130	----
		lead, total	7439-92-1	E420	0.0173 mg/L	0.02 mg/L	86.6	70.0	130	----
		lithium, total	7439-93-2	E420	0.0828 mg/L	0.1 mg/L	82.8	70.0	130	----
		magnesium, total	7439-95-4	E420	0.956 mg/L	1 mg/L	95.6	70.0	130	----
		manganese, total	7439-96-5	E420	0.0196 mg/L	0.02 mg/L	98.1	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0181 mg/L	0.02 mg/L	90.4	70.0	130	----
		nickel, total	7440-02-0	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
		phosphorus, total	7723-14-0	E420	9.91 mg/L	10 mg/L	99.1	70.0	130	----
		potassium, total	7440-09-7	E420	3.78 mg/L	4 mg/L	94.4	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0190 mg/L	0.02 mg/L	95.2	70.0	130	----
		selenium, total	7782-49-2	E420	0.0392 mg/L	0.04 mg/L	97.9	70.0	130	----
		silicon, total	7440-21-3	E420	9.10 mg/L	10 mg/L	91.0	70.0	130	----
		silver, total	7440-22-4	E420	0.00371 mg/L	0.004 mg/L	92.7	70.0	130	----
		sodium, total	17341-25-2	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	0.0174 mg/L	0.02 mg/L	86.9	70.0	130	----
		sulfur, total	7704-34-9	E420	18.7 mg/L	20 mg/L	93.4	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0365 mg/L	0.04 mg/L	91.3	70.0	130	----
		thallium, total	7440-28-0	E420	0.00356 mg/L	0.004 mg/L	89.0	70.0	130	----
		thorium, total	7440-29-1	E420	0.0190 mg/L	0.02 mg/L	94.9	70.0	130	----
		tin, total	7440-31-5	E420	0.0182 mg/L	0.02 mg/L	91.2	70.0	130	----



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
<b>Total Metals (QCLot: 78080) - continued</b>										
VA20B3567-001	Anonymous	titanium, total	7440-32-6	E420	0.0391 mg/L	0.04 mg/L	97.8	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0177 mg/L	0.02 mg/L	88.4	70.0	130	----
		uranium, total	7440-61-1	E420	0.00370 mg/L	0.004 mg/L	92.5	70.0	130	----
		vanadium, total	7440-62-2	E420	0.0976 mg/L	0.1 mg/L	97.6	70.0	130	----
		zinc, total	7440-66-6	E420	0.397 mg/L	0.4 mg/L	99.4	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0370 mg/L	0.04 mg/L	92.6	70.0	130	----
<b>Total Metals (QCLot: 78081)</b>										
VA20B3567-001	Anonymous	chromium, total	7440-47-3	E420.Cr-L	0.0393 mg/L	0.04 mg/L	98.2	70.0	130	----
<b>Total Metals (QCLot: 80122)</b>										
VA20B4077-001	Anonymous	mercury, total	7439-97-6	E508	ND mg/L	0.0001 mg/L	ND	70.0	130	----
<b>Dissolved Metals (QCLot: 78215)</b>										
VA20B3514-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.187 mg/L	0.2 mg/L	93.6	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0194 mg/L	0.02 mg/L	97.2	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00875 mg/L	0.01 mg/L	87.5	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.098 mg/L	0.1 mg/L	98.0	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00385 mg/L	0.004 mg/L	96.2	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00970 mg/L	0.01 mg/L	97.0	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0191 mg/L	0.02 mg/L	95.6	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0179 mg/L	0.02 mg/L	89.4	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.94 mg/L	2 mg/L	97.0	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0186 mg/L	0.02 mg/L	92.8	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0973 mg/L	0.1 mg/L	97.3	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0195 mg/L	0.02 mg/L	97.7	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0373 mg/L	0.04 mg/L	93.3	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	9.84 mg/L	10 mg/L	98.4	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0197 mg/L	0.02 mg/L	98.5	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0438 mg/L	0.04 mg/L	109	70.0	130	----
		silicon, dissolved	7440-21-3	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00378 mg/L	0.004 mg/L	94.6	70.0	130	----



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
<b>Dissolved Metals (QCLot: 78215) - continued</b>										
VA20B3514-002	Anonymous	sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	20.6 mg/L	20 mg/L	103	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0382 mg/L	0.04 mg/L	95.5	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00369 mg/L	0.004 mg/L	92.3	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0199 mg/L	0.02 mg/L	99.3	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0195 mg/L	0.02 mg/L	97.5	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0376 mg/L	0.04 mg/L	94.1	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0190 mg/L	0.02 mg/L	95.0	70.0	130	----
		uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.0982 mg/L	0.1 mg/L	98.2	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.370 mg/L	0.4 mg/L	92.5	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0396 mg/L	0.04 mg/L	99.1	70.0	130	----
<b>Dissolved Metals (QCLot: 78216)</b>										
VA20B3514-002	Anonymous	chromium, dissolved	7440-47-3	E421.Cr-L	0.0386 mg/L	0.04 mg/L	96.4	70.0	130	----
<b>Dissolved Metals (QCLot: 78350)</b>										
VA20B3514-001	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000917 mg/L	0.0001 mg/L	91.7	70.0	130	----
<b>Aggregate Organics (QCLot: 79273)</b>										
KS2001509-002	Anonymous	chemical oxygen demand [COD]	----	E559	506 mg/L	500 mg/L	101	75.0	125	----
<b>Volatile Organic Compounds (QCLot: 78076)</b>										
WR2000748-001	Anonymous	benzene	71-43-2	E611C	99.8 µg/L	100 µg/L	99.8	60.0	140	----
		bromodichloromethane	75-27-4	E611C	115 µg/L	100 µg/L	115	60.0	140	----
		bromoform	75-25-2	E611C	126 µg/L	100 µg/L	126	60.0	140	----
		carbon tetrachloride	56-23-5	E611C	97.1 µg/L	100 µg/L	97.1	60.0	140	----
		chlorobenzene	108-90-7	E611C	103 µg/L	100 µg/L	103	60.0	140	----
		chloroethane	75-00-3	E611C	70.3 µg/L	100 µg/L	70.3	50.0	150	----
		chloroform	67-66-3	E611C	109 µg/L	100 µg/L	109	60.0	140	----
		chloromethane	74-87-3	E611C	60.4 µg/L	100 µg/L	60.4	50.0	150	----
		dibromochloromethane	124-48-1	E611C	101 µg/L	100 µg/L	101	60.0	140	----
		dichlorobenzene, 1,2-	95-50-1	E611C	96.0 µg/L	100 µg/L	96.0	60.0	140	----
		dichlorobenzene, 1,3-	541-73-1	E611C	87.3 µg/L	100 µg/L	87.3	60.0	140	----
		dichlorobenzene, 1,4-	106-46-7	E611C	90.6 µg/L	100 µg/L	90.6	60.0	140	----
		dichloroethane, 1,1-	75-34-3	E611C	99.1 µg/L	100 µg/L	99.1	60.0	140	----
		dichloroethane, 1,2-	107-06-2	E611C	117 µg/L	100 µg/L	117	60.0	140	----
		dichloroethylene, 1,1-	75-35-4	E611C	95.9 µg/L	100 µg/L	95.9	60.0	140	----



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
<b>Volatile Organic Compounds (QCLot: 78076) - continued</b>										
WR2000748-001	Anonymous	dichloroethylene, cis-1,2-	156-59-2	E611C	100 µg/L	100 µg/L	100	60.0	140	----
		dichloroethylene, trans-1,2-	156-60-5	E611C	95.6 µg/L	100 µg/L	95.6	60.0	140	----
		dichloromethane	75-09-2	E611C	115 µg/L	100 µg/L	115	60.0	140	----
		dichloropropane, 1,2-	78-87-5	E611C	95.4 µg/L	100 µg/L	95.4	60.0	140	----
		dichloropropylene, cis-1,3-	10061-01-5	E611C	76.0 µg/L	100 µg/L	76.0	60.0	140	----
		dichloropropylene, trans-1,3-	10061-02-6	E611C	68.1 µg/L	100 µg/L	68.1	60.0	140	----
		ethylbenzene	100-41-4	E611C	90.1 µg/L	100 µg/L	90.1	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	112 µg/L	100 µg/L	112	60.0	140	----
		styrene	100-42-5	E611C	89.4 µg/L	100 µg/L	89.4	60.0	140	----
		tetrachloroethane, 1,1,1,2-	630-20-6	E611C	106 µg/L	100 µg/L	106	60.0	140	----
		tetrachloroethane, 1,1,2,2-	79-34-5	E611C	112 µg/L	100 µg/L	112	60.0	140	----
		tetrachloroethylene	127-18-4	E611C	83.4 µg/L	100 µg/L	83.4	60.0	140	----
		toluene	108-88-3	E611C	99.6 µg/L	100 µg/L	99.6	60.0	140	----
		trichloroethane, 1,1,1-	71-55-6	E611C	103 µg/L	100 µg/L	103	60.0	140	----
		trichloroethane, 1,1,2-	79-00-5	E611C	108 µg/L	100 µg/L	108	60.0	140	----
		trichloroethylene	79-01-6	E611C	86.5 µg/L	100 µg/L	86.5	60.0	140	----
		trichlorofluoromethane	75-69-4	E611C	105 µg/L	100 µg/L	105	50.0	150	----
		vinyl chloride	75-01-4	E611C	62.9 µg/L	100 µg/L	62.9	50.0	150	----
		xylene, m+p-	179601-23-1	E611C	204 µg/L	200 µg/L	102	60.0	140	----
		xylene, o-	95-47-6	E611C	93.5 µg/L	100 µg/L	93.5	60.0	140	----





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# Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



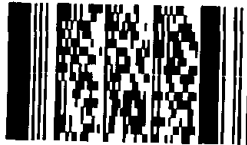
L2493219-COFC

COC Number: 17 -

Page 1 of 1

<b>Report To</b> Contact and company name below will appear on the final report		<b>Report Format / Distribution</b>			<b>Select Service Level Below - Contact your AM to confirm all E&amp;P TATs (surcharges may apply)</b>														
Company: <b>Golder Associates</b>		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply														
Contact: <b>Adrian Kowalchuk</b>		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days)		4 day (P4-20%) <input type="checkbox"/>		EMERGENCY		1 Business day (E - 100%) <input type="checkbox"/>								
Phone: <b>(204) 891-5372</b>		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			3 day (P3-25%) <input type="checkbox"/>		2 day (P2-50%) <input type="checkbox"/>		Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] <input type="checkbox"/>										
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			Date and Time Required for all E&P TATs:						dd-mmm-yy hh:mm								
Street: <b>1931 Robertson Road,</b>		Email 1 or Fax <b>Adrian_Kowalchuk@Golder.com</b>			For tests that can not be performed according to the service level selected, you will be contacted.														
City/Province: <b>Ottawa, Ontario</b>		Email 2 <b>Valerie_Bertrand@Golder.com</b>			<b>Analysis Request</b>														
Postal Code: <b>K2H-5B7</b>		Email 3			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below														
Invoice To: <b>Same as Report To</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		<b>Invoice Distribution</b>			<b>NUMBER OF CONTAINERS</b>											<b>SAMPLES ON HOLD</b>	<b>SUSPECTED HAZARD (see Special Instructions)</b>		
Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX				P				P				P	P			P	
Company: <b>Agnico Eagle, Meliadine Mine, Permitting</b>		Email 1 or Fax <b>Eterne.Parent@AgnicoEagle.com</b>																	
Contact: <b>Etienne Parent</b>		Email 2																	
<b>Project Information</b>		<b>Oil and Gas Required Fields (client use)</b>																	
ALS Account # / Quote #: <b>TBD</b>		AFE/Cost Center:		PO#:															
Job #: <b>20136436-2300-2304</b>		Major/Minor Code:		Routing Code:															
PO / AFE:		Requisitioner:																	
LSD:		Location: <b>Meliadine - Westbay A</b>																	
ALS Lab Work Order # (lab use only):		ALS Contact: <b>Yang Chu</b>		Sampler: <b>Xavier Montano</b>															
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD	Cyanides	General TDS TSS Routine	Dissolved metals and Mercury	Total Metals and mercury	Microbi	Oil & Grease	NUT/COG/COD/TN/NT/PH/3PHEN	NUT/BOC/DK/NT/DT/DP/NNH3	PAH/EPH/LEPH/HEPH	RADIUM 226	VOCS			
	<b>Westbay-A-225</b>	<b>17-Aug-20</b>	<b>2:00</b>	<b>Drill Water</b>	15	R	R	R	R	R	R	R	R	R	R	R			

Environmental Division  
Vancouver  
Work Order Reference  
**VA20B3721**



Telephone : +1 604 253 4188

<b>Drinking Water (DW) Samples (client use)</b>		<b>Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)</b>			<b>SAMPLE CONDITION AS RECEIVED (lab use only)</b>											
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Frozen <input type="checkbox"/>		SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>		Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/>		Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>		Cooling Initiated <input type="checkbox"/>			
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C									
<b>SHIPMENT RELEASE (client use)</b>		<b>INITIAL SHIPMENT RECEPTION (lab use only)</b>			<b>FINAL SHIPMENT RECEPTION (lab use only)</b>											
Released by: <b>Pal mwm</b>	Date: <b>19-Aug-20</b>	Time: <b>5:30</b>	Received by:	Date:	Time:	Received by: <b>JG</b>	Date: <b>24 Aug</b>	Time: <b>12PM</b>								



CERTIFICATE OF ANALYSIS

Work Order : VA20B4004  
Amendment : 2  
Client : Agnico-Eagle Mines Limited  
Contact : Etienne Parent  
Address : # 400 - 543 Granville Street  
Vancouver BC Canada V6C 1X8  
Telephone : ----  
Project : 20136436-2300-2306  
PO : ----  
C-O-C number : 17-766902  
Sampler : ----  
Site : ----  
Quote number : VA20-AEML100-001 (Q72802)  
No. of samples received : 1  
No. of samples analysed : 1

Page : 1 of 11  
Laboratory : Vancouver - Environmental  
Account Manager : Heather McKenzie  
Address : 8081 Lougheed Highway  
Burnaby BC Canada V5A 1W9  
Telephone : +1 604 253 4188  
Date Samples Received : 31-Aug-2020 08:35  
Date Analysis Commenced : 31-Aug-2020  
Issue Date : 03-Sep-2021 16:37

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
- Surrogate Control Limits

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.

Signatories	Position	Laboratory Department
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Angelo Salandanan	Lab Assistant	Metals, Burnaby, British Columbia
Ann Ho	Laboratory Analyst	Metals, Burnaby, British Columbia
Annabelle Prasad	Analyst	Metals, Burnaby, British Columbia
Brieanna Allen	Production/Validation Manager	Organics, Burnaby, British Columbia
Bruna Botti	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Jacky Chou	Team Leader - Organics	Organics, Burnaby, British Columbia
Jeanie Mark	Laboratory Analyst	Organics, Calgary, Alberta
Kaitlyn Gardner	Account Manager Assistant	Internal Subcontracting, Fort Collins, Colorado
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Shaneel Dayal	Analyst	Metals, Burnaby, British Columbia





## 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.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances  
LOR: Limit of Reporting (detection limit).

Unit	Description
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
Bq/L	Becquerels per litre
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units
psu	practical salinity units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

## Workorder Comments

Amendment (03/09/2021): This report has been amended following changes to the analytical data reported. The quality system is being utilised to resolve this issue. The specific data affected includes chloromethane, toluene and xylenes.

**Bacteriological Sample: Exceeded Recommended Holding Time prior to receipt at the lab. Request for "Microbio" Analysis will not proceed: Please promptly contact Account Manager if you would like the sample logged in for bacteriological testing.**

**Analysis Requirements Unclear: General/Total Nutrients/Dissolved Nutrients will be logged in as per Quote. Two amber glass nutrients bottles received but not marked as "Total Nutrients" or "Dissolved Nutrients". Both bottles will be labelled in lab as "Total Nutrients", and a subsample will be taken for Dissolved Nutrients analyses.**

## Sample Comments

Sample	Client Id	Comment
VA20B4004-001	West bay-A-360	Water sample for dissolved mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.



## Qualifiers

<i>Qualifier</i>	<i>Description</i>
<i>DLA</i>	<i>Detection Limit adjusted for required dilution.</i>
<i>DLDS</i>	<i>Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.</i>
<i>DLM</i>	<i>Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).</i>
<i>HTD</i>	<i>Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.</i>



## Analytical Results

Sub-Matrix: Drilling Fluid

Client sample ID

West bay-A-360

(Matrix: Water)

					Client sampling date / time	21-Aug-2020 23:00	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA20B4004-001	-----	-----	-----	-----	-----
					Result	----	----	----	----	----
<b>Physical Tests</b>										
conductivity	----	E100	2.0	µS/cm	115000	----	----	----	----	----
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	116000	----	----	----	----	----
pH	----	E108	0.10	pH units	9.76	----	----	----	----	----
salinity	----	EC100S	1.0	psu	97.2	----	----	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L	136000	----	----	----	----	----
solids, total suspended [TSS]	----	E160-H	3.0	mg/L	28.7	----	----	----	----	----
turbidity	----	E121	0.10	NTU	28.6	----	----	----	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	992	----	----	----	----	----
alkalinity, phenolphthalein (as CaCO3)	----	E290	2.0	mg/L	97.4	----	----	----	----	----
alkalinity, hydroxide (as CaCO3)	----	E290	2.0	mg/L	<2.0	----	----	----	----	----
alkalinity, carbonate (as CaCO3)	----	E290	2.0	mg/L	195	----	----	----	----	----
alkalinity, bicarbonate (as CaCO3)	----	E290	2.0	mg/L	798	----	----	----	----	----
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	2.0	mg/L	973	----	----	----	----	----
alkalinity, carbonate (as CO3)	3812-32-6	E290	2.0	mg/L	117	----	----	----	----	----
alkalinity, hydroxide (as OH)	14280-30-9	E290	2.0	mg/L	<2.0	----	----	----	----	----
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	99200	----	----	----	----	----
<b>Anions and Nutrients</b>										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	3.47	----	----	----	----	----
bromide	24959-67-9	E235.Br-L	0.050	mg/L	279	----	----	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	77900	----	----	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	<2.00 <sup>DLDS</sup>	----	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	66.2	----	----	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	3.20	----	----	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.100 <sup>DLDS</sup>	----	----	----	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0174	----	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0423	----	----	----	----	----
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	<25.0 <sup>DLM</sup>	----	----	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<30.0 <sup>DLDS</sup>	----	----	----	----	----
<b>Cyanides</b>										
cyanide, free	----	E339	0.0050	mg/L	<0.0200 <sup>DLM</sup>	----	----	----	----	----



## Analytical Results

Sub-Matrix: Drilling Fluid

Client sample ID

West bay-A-360

(Matrix: Water)

Client sampling date / time

21-Aug-2020  
23:00

Analyte	CAS Number	Method	LOR	Unit	VA20B4004-001				
					Result	---	---	---	---
<b>Cyanides</b>									
cyanide, strong acid dissociable (total)	---	E333	0.0050	mg/L	<0.0200 <sup>DLM</sup>	---	---	---	---
cyanide, weak acid dissociable	---	E336	0.0050	mg/L	<0.0200 <sup>DLM</sup>	---	---	---	---
<b>Organic / Inorganic Carbon</b>									
carbon, dissolved organic [DOC]	---	E358-L	0.50	mg/L	219	---	---	---	---
carbon, total organic [TOC]	---	E355-L	0.50	mg/L	222	---	---	---	---
<b>Total Metals</b>									
aluminum, total	7429-90-5	E420	0.0030	mg/L	<1.50 <sup>DLA</sup>	---	---	---	---
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---
arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---
barium, total	7440-39-3	E420	0.00010	mg/L	12.6	---	---	---	---
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.0250 <sup>DLA</sup>	---	---	---	---
boron, total	7440-42-8	E420	0.010	mg/L	163	---	---	---	---
cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.00250 <sup>DLA</sup>	---	---	---	---
calcium, total	7440-70-2	E420	0.050	mg/L	46400	---	---	---	---
cesium, total	7440-46-2	E420	0.000010	mg/L	3.80	---	---	---	---
chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---
copper, total	7440-50-8	E420	0.00050	mg/L	<0.250 <sup>DLA</sup>	---	---	---	---
iron, total	7439-89-6	E420	0.010	mg/L	<5.00 <sup>DLA</sup>	---	---	---	---
lead, total	7439-92-1	E420	0.000050	mg/L	<0.0250 <sup>DLA</sup>	---	---	---	---
lithium, total	7439-93-2	E420	0.0010	mg/L	180	---	---	---	---
magnesium, total	7439-95-4	E420	0.0050	mg/L	34.7	---	---	---	---
manganese, total	7439-96-5	E420	0.00010	mg/L	<0.0500 <sup>DLA</sup>	---	---	---	---
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000250 <sup>DLM</sup>	---	---	---	---
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.0320	---	---	---	---
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.250 <sup>DLA</sup>	---	---	---	---
phosphorus, total	7723-14-0	E420	0.050	mg/L	<25.0 <sup>DLA</sup>	---	---	---	---
potassium, total	7440-09-7	E420	0.050	mg/L	2260	---	---	---	---
rubidium, total	7440-17-7	E420	0.00020	mg/L	8.46	---	---	---	---
selenium, total	7782-49-2	E420	0.000050	mg/L	<0.0250 <sup>DLA</sup>	---	---	---	---



## Analytical Results

Sub-Matrix: Drilling Fluid

Client sample ID

West bay-A-360

(Matrix: Water)

Client sampling date / time

21-Aug-2020  
23:00

Analyte	CAS Number	Method	LOR	Unit	VA20B4004-001	-----	-----	-----	-----
					Result	---	---	---	---
<b>Total Metals</b>									
silicon, total	7440-21-3	E420	0.10	mg/L	<50.0 <sup>DLA</sup>	----	----	----	----
silver, total	7440-22-4	E420	0.000010	mg/L	<0.00500 <sup>DLA</sup>	----	----	----	----
sodium, total	17341-25-2	E420	0.050	mg/L	1300	----	----	----	----
strontium, total	7440-24-6	E420	0.00020	mg/L	2140	----	----	----	----
sulfur, total	7704-34-9	E420	0.50	mg/L	<250 <sup>DLA</sup>	----	----	----	----
tellurium, total	13494-80-9	E420	0.00020	mg/L	0.219	----	----	----	----
thallium, total	7440-28-0	E420	0.000010	mg/L	0.274	----	----	----	----
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.0500 <sup>DLA</sup>	----	----	----	----
tin, total	7440-31-5	E420	0.00010	mg/L	<0.0500 <sup>DLA</sup>	----	----	----	----
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.150 <sup>DLA</sup>	----	----	----	----
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.0500 <sup>DLA</sup>	----	----	----	----
uranium, total	7440-61-1	E420	0.000010	mg/L	<0.00500 <sup>DLA</sup>	----	----	----	----
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.250 <sup>DLA</sup>	----	----	----	----
zinc, total	7440-66-6	E420	0.0030	mg/L	<1.50 <sup>DLA</sup>	----	----	----	----
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.100 <sup>DLA</sup>	----	----	----	----
<b>Dissolved Metals</b>									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.500 <sup>DLA</sup>	----	----	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.0500 <sup>DLA</sup>	----	----	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.0500 <sup>DLA</sup>	----	----	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	11.4	----	----	----	----
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.0500 <sup>DLA</sup>	----	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.0250 <sup>DLA</sup>	----	----	----	----
boron, dissolved	7440-42-8	E421	0.010	mg/L	132	----	----	----	----
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.00250 <sup>DLA</sup>	----	----	----	----
calcium, dissolved	7440-70-2	E421	0.050	mg/L	39700	----	----	----	----
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	3.63	----	----	----	----
chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	<0.0500 <sup>DLA</sup>	----	----	----	----
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.0500 <sup>DLA</sup>	----	----	----	----
copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.100 <sup>DLA</sup>	----	----	----	----
iron, dissolved	7439-89-6	E421	0.010	mg/L	<5.00 <sup>DLA</sup>	----	----	----	----
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.0250 <sup>DLA</sup>	----	----	----	----





## Analytical Results

Sub-Matrix: Drilling Fluid

Client sample ID

West bay-A-360

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(Matrix: Water)

Client sampling date / time

21-Aug-2020  
23:00

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Analyte CAS Number Method LOR Unit

VA20B4004-001

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Result

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### Dissolved Metals

lithium, dissolved	7439-93-2	E421	0.0010	mg/L	156	----	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	24.7	----	----	----	----
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	<0.0500 <sup>DLA</sup>	----	----	----	----
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000500 <sup>DLM</sup>	----	----	----	----
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0297	----	----	----	----
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.250 <sup>DLA</sup>	----	----	----	----
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<25.0 <sup>DLA</sup>	----	----	----	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L	2060	----	----	----	----
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	7.92	----	----	----	----
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.0250 <sup>DLA</sup>	----	----	----	----
silicon, dissolved	7440-21-3	E421	0.050	mg/L	<25.0 <sup>DLA</sup>	----	----	----	----
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.00500 <sup>DLA</sup>	----	----	----	----
sodium, dissolved	17341-25-2	E421	0.050	mg/L	1250	----	----	----	----
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	2080	----	----	----	----
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<250 <sup>DLA</sup>	----	----	----	----
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	0.133	----	----	----	----
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.275	----	----	----	----
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.0500 <sup>DLA</sup>	----	----	----	----
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.0500 <sup>DLA</sup>	----	----	----	----
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.150 <sup>DLA</sup>	----	----	----	----
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.0500 <sup>DLA</sup>	----	----	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	<0.00500 <sup>DLA</sup>	----	----	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.250 <sup>DLA</sup>	----	----	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.500 <sup>DLA</sup>	----	----	----	----
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.100 <sup>DLA</sup>	----	----	----	----
dissolved mercury filtration location	----	EP509	-	-	Laboratory	----	----	----	----
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	----

### Aggregate Organics

biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	9.1 <sup>HTD</sup>	----	----	----	----
chemical oxygen demand [COD]	----	E559	20	mg/L	7020	----	----	----	----
oil & grease (gravimetric)	----	E567	5.0	mg/L	<5.0	----	----	----	----



## Analytical Results

Sub-Matrix: Drilling Fluid

Client sample ID

West bay-A-360

(Matrix: Water)

Client sampling date / time

21-Aug-2020  
23:00

Analyte	CAS Number	Method	LOR	Unit	VA20B4004-001				
					Result	---	---	---	---
<b>Volatile Organic Compounds</b>									
chlorobenzene	108-90-7	E611C	0.50	µg/L	<0.50	---	---	---	---
chloromethane	74-87-3	E611C	0.50	µg/L	<53.0 <sup>DLM</sup>	---	---	---	---
dichlorobenzene, 1,2-	95-50-1	E611C	0.50	µg/L	<0.50	---	---	---	---
dichlorobenzene, 1,3-	541-73-1	E611C	0.50	µg/L	<0.50	---	---	---	---
dichlorobenzene, 1,4-	106-46-7	E611C	0.50	µg/L	<0.50	---	---	---	---
dichloropropane, 1,2-	78-87-5	E611C	0.50	µg/L	<0.50	---	---	---	---
dichloropropylene, cis+trans-1,3-	542-75-6	E611C	0.75	µg/L	<0.75	---	---	---	---
dichloropropylene, cis-1,3-	10061-01-5	E611C	0.50	µg/L	<0.50	---	---	---	---
tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.50	µg/L	<0.50	---	---	---	---
tetrachloroethane, 1,1,2,2-	79-34-5	E611C	0.20	µg/L	<0.20	---	---	---	---
trichloroethane, 1,1,2-	79-00-5	E611C	0.50	µg/L	<0.50	---	---	---	---
trichlorofluoromethane	75-69-4	E611C	0.50	µg/L	<0.50	---	---	---	---
<b>Volatile Organic Compounds [BTEXS+MTBE]</b>									
benzene	71-43-2	E611C	0.50	µg/L	<0.50	---	---	---	---
ethylbenzene	100-41-4	E611C	0.50	µg/L	<0.50	---	---	---	---
methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.50	µg/L	<0.50	---	---	---	---
styrene	100-42-5	E611C	0.50	µg/L	<0.50	---	---	---	---
toluene	108-88-3	E611C	0.40	µg/L	2.36	---	---	---	---
xylene, m+p-	179601-23-1	E611C	0.50	µg/L	0.78	---	---	---	---
xylene, o-	95-47-6	E611C	0.50	µg/L	<0.50	---	---	---	---
xylenes, total	1330-20-7	E611C	0.75	µg/L	0.78	---	---	---	---
<b>Volatile Organic Compounds [Drycleaning]</b>									
carbon tetrachloride	56-23-5	E611C	0.50	µg/L	<0.50	---	---	---	---
chloroethane	75-00-3	E611C	0.50	µg/L	<0.50	---	---	---	---
dichloroethane, 1,1-	75-34-3	E611C	0.50	µg/L	<0.50	---	---	---	---
dichloroethane, 1,2-	107-06-2	E611C	0.50	µg/L	<0.50	---	---	---	---
dichloroethylene, 1,1-	75-35-4	E611C	0.50	µg/L	<0.50	---	---	---	---
dichloroethylene, cis-1,2-	156-59-2	E611C	0.50	µg/L	<0.50	---	---	---	---
dichloroethylene, trans-1,2-	156-60-5	E611C	0.50	µg/L	<0.50	---	---	---	---
dichloromethane	75-09-2	E611C	0.50	µg/L	<0.50	---	---	---	---
dichloropropylene, trans-1,3-	10061-02-6	E611C	0.50	µg/L	<0.50	---	---	---	---



## Analytical Results

Sub-Matrix: Drilling Fluid

Client sample ID

West bay-A-360

(Matrix: Water)

Client sampling date / time

21-Aug-2020  
23:00

Analyte	CAS Number	Method	LOR	Unit	VA20B4004-001	-----	-----	-----	-----
					Result	---	---	---	---
<b>Volatile Organic Compounds [Drycleaning]</b>									
tetrachloroethylene	127-18-4	E611C	0.50	µg/L	<0.50	---	---	---	---
trichloroethane, 1,1,1-	71-55-6	E611C	0.50	µg/L	<0.50	---	---	---	---
trichloroethylene	79-01-6	E611C	0.50	µg/L	<0.50	---	---	---	---
vinyl chloride	75-01-4	E611C	0.40	µg/L	<0.40	---	---	---	---
<b>Volatile Organic Compounds [THMs]</b>									
bromodichloromethane	75-27-4	E611C	0.50	µg/L	<0.50	---	---	---	---
bromoform	75-25-2	E611C	0.50	µg/L	<0.50	---	---	---	---
chloroform	67-66-3	E611C	0.50	µg/L	<0.50	---	---	---	---
dibromochloromethane	124-48-1	E611C	0.50	µg/L	<0.50	---	---	---	---
<b>Volatile Organic Compounds Surrogates</b>									
bromofluorobenzene, 4-	460-00-4	E611C	0.50	%	92.8	---	---	---	---
difluorobenzene, 1,4-	540-36-3	E611C	0.50	%	101	---	---	---	---
<b>Hydrocarbons</b>									
EPH (C10-C19)	---	E601A	250	µg/L	<250	---	---	---	---
EPH (C19-C32)	---	E601A	250	µg/L	<250	---	---	---	---
HEPHw	---	EC600A	250	µg/L	<250	---	---	---	---
LEPHw	---	EC600A	250	µg/L	<250	---	---	---	---
<b>Hydrocarbons Surrogates</b>									
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	50	%	85.1	---	---	---	---
<b>Polycyclic Aromatic Hydrocarbons</b>									
acenaphthene	83-32-9	E641A	0.010	µg/L	<0.010	---	---	---	---
acenaphthylene	208-96-8	E641A	0.010	µg/L	<0.010	---	---	---	---
acridine	260-94-6	E641A	0.010	µg/L	<0.010	---	---	---	---
anthracene	120-12-7	E641A	0.010	µg/L	<0.010	---	---	---	---
benz(a)anthracene	56-55-3	E641A	0.010	µg/L	<0.010	---	---	---	---
benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	<0.0050	---	---	---	---
benzo(b+j)fluoranthene	---	E641A	0.010	µg/L	<0.010	---	---	---	---
benzo(b+j+k)fluoranthene	---	E641A	0.015	µg/L	<0.015	---	---	---	---
benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	<0.010	---	---	---	---
benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	<0.010	---	---	---	---
chrysene	218-01-9	E641A	0.010	µg/L	<0.010	---	---	---	---



## Analytical Results

Sub-Matrix: Drilling Fluid

Client sample ID

West bay-A-360

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(Matrix: Water)

Client sampling date / time

21-Aug-2020  
23:00

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Analyte	CAS Number	Method	LOR	Unit	VA20B4004-001	-----	-----	-----	-----
					Result	---	---	---	---
<b>Polycyclic Aromatic Hydrocarbons</b>									
dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	<0.0050	----	----	----	----
fluoranthene	206-44-0	E641A	0.010	µg/L	<0.010	----	----	----	----
fluorene	86-73-7	E641A	0.010	µg/L	0.018	----	----	----	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	<0.010	----	----	----	----
methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	0.018	----	----	----	----
methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	0.026	----	----	----	----
naphthalene	91-20-3	E641A	0.050	µg/L	0.083	----	----	----	----
phenanthrene	85-01-8	E641A	0.020	µg/L	0.052	----	----	----	----
pyrene	129-00-0	E641A	0.010	µg/L	0.015	----	----	----	----
quinoline	6027-02-7	E641A	0.050	µg/L	<0.050	----	----	----	----
<b>Polycyclic Aromatic Hydrocarbons Surrogates</b>									
acridine-d9	34749-75-2	E641A	0.010	µg/L	0.826	----	----	----	----
chrysene-d12	1719-03-5	E641A	0.010	%	76.5	----	----	----	----
naphthalene-d8	1146-65-2	E641A	0.010	%	89.4	----	----	----	----
phenanthrene-d10	1517-22-2	E641A	0.010	%	89.2	----	----	----	----
<b>Radiological Parameters</b>									
radium-226	13982-63-3	RA226-MMER	0.16	Bq/L	1.5	----	----	----	----

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

## QUALITY CONTROL INTERPRETIVE REPORT

<b>Work Order</b>	: <b>VA20B4004</b>	<b>Page</b>	: 1 of 16
<b>Amendment</b>	: 2	<b>Laboratory</b>	: Vancouver - Environmental
<b>Client</b>	: <b>Agnico-Eagle Mines Limited</b>	<b>Account Manager</b>	: Heather McKenzie
<b>Contact</b>	: Etienne Parent	<b>Address</b>	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
<b>Address</b>	: # 400 - 543 Granville Street Vancouver BC Canada V6C 1X8	<b>Telephone</b>	: +1 604 253 4188
<b>Telephone</b>	: ----	<b>Date Samples Received</b>	: 31-Aug-2020 08:35
<b>Project</b>	: 20136436-2300-2306	<b>Issue Date</b>	: 03-Sep-2021 16:37
<b>PO</b>	: ----		
<b>C-O-C number</b>	: 17-766902		
<b>Sampler</b>	: ----		
<b>Site</b>	: ----		
<b>Quote number</b>	: VA20-AEML100-001 (Q72802)		
<b>No. of samples received</b>	: 1		
<b>No. of samples analysed</b>	: 1		

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 Services number is a unique identifier assigned to discrete substances.

**DQO:** Data Quality Objective.

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

**RPD:** Relative Percent Difference.

## Summary of Outliers

### Outliers : Quality Control Samples

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

- Analysis Holding Time Outliers exist - please see following pages for full details.

### 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
<b>Method Blank (MB) Values</b>								
Total Metals	QC-MRG2-8063000 1	----	manganese, total	7439-96-5	E420	0.00053 <sup>B</sup> mg/L	0.0001 mg/L	Blank result exceeds permitted value
Total Metals	QC-MRG2-8063000 1	----	molybdenum, total	7439-98-7	E420	0.000060 <sup>B</sup> mg/L	0.00005 mg/L	Blank result exceeds permitted value

### Result Qualifiers

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.

### Duplicate (DUP) RPDs

Physical Tests	VA20B4004-001	West bay-A-360	alkalinity, phenolphthalein (as CaCO <sub>3</sub> )	----	E290	23.9 % <sup>DUP-H</sup>	20%	Duplicate RPD does not meet the DQO for this test.
Physical Tests	VA20B4004-001	West bay-A-360	alkalinity, carbonate (as CaCO <sub>3</sub> )	----	E290	23.9 % <sup>DUP-H</sup>	No Limit	Duplicate RPD does not meet the DQO for this test.

### Result Qualifiers

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.

### Laboratory Control Sample (LCS) Recoveries

Volatile Organic Compounds	QC-MRG2-7939400 2	----	dichloropropylene, trans-1,3-	10061-02-6	E611C	62.5 % <sup>LCS-ND</sup>	70.0-130%	Recovery less than lower control limit
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### Result Qualifiers

Qualifier	Description
LCS-ND	Lab Control Sample recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.



## 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		
<b>Aggregate Organics : Biochemical Oxygen Demand - 5 day</b>											
<b>HDPE [BOD HT 3d]</b> West bay-A-360	E550	21-Aug-2020	----	----	----		01-Sep-2020	3 days	11 days	*	EHTR
<b>Aggregate Organics : Chemical Oxygen Demand by Colourimetry</b>											
<b>Amber glass total (sulfuric acid)</b> West bay-A-360	E559	21-Aug-2020	----	----	----		03-Sep-2020	28 days	12 days	✓	
<b>Aggregate Organics : Oil &amp; Grease by Gravimetry</b>											
<b>Amber glass (hydrochloric acid)</b> West bay-A-360	E567	21-Aug-2020	02-Sep-2020	28 days	11 days	✓	03-Sep-2020	40 days	1 days	✓	
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
<b>Amber glass total (sulfuric acid)</b> West bay-A-360	E298	21-Aug-2020	03-Sep-2020	----	----		05-Sep-2020	28 days	14 days	✓	
<b>Anions and Nutrients : Bromide in Water by IC (Low Level)</b>											
<b>HDPE</b> West bay-A-360	E235.Br-L	21-Aug-2020	----	----	----		31-Aug-2020	28 days	10 days	✓	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
<b>HDPE</b> West bay-A-360	E235.Cl	21-Aug-2020	----	----	----		31-Aug-2020	28 days	10 days	✓	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)</b>											
<b>HDPE</b> West bay-A-360	E378-U	21-Aug-2020	----	----	----		01-Sep-2020	3 days	10 days	*	EHTR



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	
<b>Anions and Nutrients : Fluoride in Water by IC</b>										
HDPE West bay-A-360	E235.F	21-Aug-2020	----	----	----		31-Aug-2020	28 days	10 days	✓
<b>Anions and Nutrients : Nitrate in Water by IC (Low Level)</b>										
HDPE West bay-A-360	E235.NO3-L	21-Aug-2020	----	----	----		31-Aug-2020	3 days	10 days	* EHTR
<b>Anions and Nutrients : Nitrite in Water by IC (Low Level)</b>										
HDPE West bay-A-360	E235.NO2-L	21-Aug-2020	----	----	----		31-Aug-2020	3 days	10 days	* EHTR
<b>Anions and Nutrients : Reactive Silica by Colourimetry</b>										
HDPE West bay-A-360	E392	21-Aug-2020	----	----	----		03-Sep-2020	28 days	13 days	✓
<b>Anions and Nutrients : Sulfate in Water by IC</b>										
HDPE West bay-A-360	E235.SO4	21-Aug-2020	----	----	----		31-Aug-2020	28 days	10 days	✓
<b>Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)</b>										
Amber glass total (sulfuric acid) West bay-A-360	E318	21-Aug-2020	03-Sep-2020	----	----		04-Sep-2020	28 days	14 days	✓
<b>Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)</b>										
Amber glass total (sulfuric acid) West bay-A-360	E372-U	21-Aug-2020	03-Sep-2020	----	----		04-Sep-2020	28 days	14 days	✓
<b>Cyanides : Free Cyanide by CFA</b>										
UV inhibited HDPE - total (sodium hydroxide) West bay-A-360	E339	21-Aug-2020	----	----	----		04-Sep-2020	14 days	13 days	✓
<b>Cyanides : Total Cyanide by CFA</b>										
UV inhibited HDPE - total (sodium hydroxide) West bay-A-360	E333	21-Aug-2020	----	----	----		04-Sep-2020	14 days	13 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	
<b>Cyanides : WAD Cyanide by CFA</b>										
<b>UV inhibited HDPE - total (sodium hydroxide)</b> West bay-A-360	E336	21-Aug-2020	----	----	----		04-Sep-2020	14 days	13 days	✓
<b>Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)</b>										
<b>HDPE - dissolved (lab preserved)</b> West bay-A-360	E421.Cr-L	21-Aug-2020	02-Sep-2020	----	----		02-Sep-2020	180 days	11 days	✓
<b>Dissolved Metals : Dissolved Mercury in Water by CVAAS</b>										
<b>HDPE - dissolved (lab preserved)</b> West bay-A-360	E509	21-Aug-2020	05-Sep-2020	----	----		05-Sep-2020	----	14 days	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>										
<b>HDPE - dissolved (lab preserved)</b> West bay-A-360	E421	21-Aug-2020	02-Sep-2020	----	----		02-Sep-2020	180 days	11 days	✓
<b>Hydrocarbons : BC PHC - EPH by GC-FID</b>										
<b>Amber glass/Teflon lined cap (sodium bisulfate)</b> West bay-A-360	E601A	21-Aug-2020	03-Sep-2020	14 days	12 days	✓	04-Sep-2020	40 days	1 days	✓
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>										
<b>Amber glass dissolved (lab preserved)</b> West bay-A-360	E358-L	21-Aug-2020	03-Sep-2020	----	----		04-Sep-2020	3 days	14 days	* EHTR
<b>Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)</b>										
<b>Amber glass total (sulfuric acid)</b> West bay-A-360	E355-L	21-Aug-2020	03-Sep-2020	----	----		03-Sep-2020	28 days	13 days	✓
<b>Physical Tests : Alkalinity Species by Titration</b>										
<b>HDPE</b> West bay-A-360	E290	21-Aug-2020	----	----	----		01-Sep-2020	14 days	11 days	✓
<b>Physical Tests : Conductivity in Water</b>										
<b>HDPE</b> West bay-A-360	E100	21-Aug-2020	----	----	----		01-Sep-2020	28 days	11 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	
<b>Physical Tests : pH by Meter</b>										
HDPE West bay-A-360	E108	21-Aug-2020	----	----	----		01-Sep-2020	0.25 hrs	254 hrs	* EHTR-FM
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE West bay-A-360	E162	21-Aug-2020	----	----	----		31-Aug-2020	7 days	10 days	* EHTR
<b>Physical Tests : TSS by Gravimetry</b>										
HDPE West bay-A-360	E160-H	21-Aug-2020	----	----	----		31-Aug-2020	7 days	10 days	* EHTR
<b>Physical Tests : Turbidity by Nephelometry</b>										
HDPE West bay-A-360	E121	21-Aug-2020	----	----	----		31-Aug-2020	3 days	10 days	* EHTR
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS</b>										
Amber glass/Teflon lined cap (sodium bisulfate) West bay-A-360	E641A	21-Aug-2020	03-Sep-2020	14 days	12 days	✓	04-Sep-2020	40 days	1 days	✓
<b>Radiological Parameters : Radium-226 by Radon Emanation</b>										
HDPE (nitric acid) West bay-A-360	RA226-MMER	21-Aug-2020	----	----	----		17-Sep-2020	180 days	27 days	✓
<b>Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)</b>										
HDPE - total (lab preserved) West bay-A-360	E420.Cr-L	21-Aug-2020	----	----	----		03-Sep-2020	180 days	13 days	✓
<b>Total Metals : Total Mercury in Water by CVAAS</b>										
Glass vial - total (lab preserved) West bay-A-360	E508	21-Aug-2020	----	----	----		03-Sep-2020	28 days	13 days	✓
<b>Total Metals : Total Metals in Water by CRC ICPMS</b>										
HDPE - total (lab preserved) West bay-A-360	E420	21-Aug-2020	----	----	----		03-Sep-2020	180 days	13 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	
<b>Volatile Organic Compounds : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> West bay-A-360	E611C	21-Aug-2020	31-Aug-2020	----	----		01-Sep-2020	----	----	
<b>Volatile Organic Compounds [BTEXS+MTBE] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> West bay-A-360	E611C	21-Aug-2020	31-Aug-2020	----	----		01-Sep-2020	14 days	11 days	✓
<b>Volatile Organic Compounds [Drycleaning] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> West bay-A-360	E611C	21-Aug-2020	31-Aug-2020	----	----		01-Sep-2020	----	----	
<b>Volatile Organic Compounds [THMs] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> West bay-A-360	E611C	21-Aug-2020	31-Aug-2020	----	----		01-Sep-2020	----	----	

**Legend & Qualifier Definitions**

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHTR: Exceeded ALS recommended hold time prior to sample receipt.

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 (%)		Evaluation
			QC	Regular	Actual	Expected	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity Species by Titration	E290	79364	1	9	11.1	5.0	✔
Ammonia by Fluorescence	E298	81134	1	20	5.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	82769	2	14	14.2	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	79348	1	5	20.0	5.0	✔
Chemical Oxygen Demand by Colourimetry	E559	81008	1	18	5.5	5.0	✔
Chloride in Water by IC	E235.Cl	79346	1	9	11.1	5.0	✔
Conductivity in Water	E100	79362	1	9	11.1	5.0	✔
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	80000	1	8	12.5	5.0	✔
Dissolved Mercury in Water by CVAAS	E509	82081	1	6	16.6	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	79999	1	16	6.2	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	81135	1	9	11.1	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	79368	1	9	11.1	5.0	✔
Fluoride in Water by IC	E235.F	79347	1	5	20.0	5.0	✔
Free Cyanide by CFA	E339	81561	1	6	16.6	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	79349	1	9	11.1	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	79350	1	9	11.1	5.0	✔
pH by Meter	E108	79363	1	9	11.1	5.0	✔
Reactive Silica by Colourimetry	E392	81411	1	10	10.0	5.0	✔
Sulfate in Water by IC	E235.SO4	79351	1	9	11.1	5.0	✔
TDS by Gravimetry	E162	79424	1	20	5.0	5.0	✔
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	80631	1	4	25.0	5.0	✔
Total Cyanide by CFA	E333	81559	1	19	5.2	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	81132	1	20	5.0	5.0	✔
Total Mercury in Water by CVAAS	E508	81238	1	20	5.0	5.0	✔
Total Metals in Water by CRC ICPMS	E420	80630	1	13	7.6	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	81136	1	20	5.0	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	81133	1	20	5.0	5.0	✔
TSS by Gravimetry	E160-H	79423	1	20	5.0	5.0	✔
Turbidity by Nephelometry	E121	79415	1	18	5.5	5.0	✔
VOCs (BC List) by Headspace GC-MS	E611C	79395	1	11	9.0	5.0	✔
WAD Cyanide by CFA	E336	81560	1	15	6.6	5.0	✔
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity Species by Titration	E290	79364	1	9	11.1	5.0	✔
Ammonia by Fluorescence	E298	81134	1	20	5.0	5.0	✔
BC PHC - EPH by GC-FID	E601A	80894	1	16	6.2	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	82769	1	14	7.1	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	79348	1	5	20.0	5.0	✔



Matrix: **Water**

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
<b>Analytical Methods</b>							
<b>Laboratory Control Samples (LCS) - Continued</b>							
Chemical Oxygen Demand by Colourimetry	E559	81008	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	79346	1	9	11.1	5.0	✓
Conductivity in Water	E100	79362	1	9	11.1	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	80000	1	8	12.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	82081	1	6	16.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	79999	1	16	6.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	81135	1	9	11.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	79368	1	9	11.1	5.0	✓
Fluoride in Water by IC	E235.F	79347	1	5	20.0	5.0	✓
Free Cyanide by CFA	E339	81561	1	6	16.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	79349	1	9	11.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	79350	1	9	11.1	5.0	✓
Oil & Grease by Gravimetry	E567	80191	1	4	25.0	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	80893	1	11	9.0	5.0	✓
pH by Meter	E108	79363	1	9	11.1	5.0	✓
Reactive Silica by Colourimetry	E392	81411	1	10	10.0	5.0	✓
Sulfate in Water by IC	E235.SO4	79351	1	9	11.1	5.0	✓
TDS by Gravimetry	E162	79424	1	20	5.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	80631	1	4	25.0	5.0	✓
Total Cyanide by CFA	E333	81559	1	19	5.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	81132	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	81238	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	80630	1	13	7.6	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	81136	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	81133	1	20	5.0	5.0	✓
TSS by Gravimetry	E160-H	79423	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	79415	1	18	5.5	5.0	✓
VOCs (BC List) by Headspace GC-MS	E611C	79395	1	11	9.0	5.0	✓
WAD Cyanide by CFA	E336	81560	1	15	6.6	5.0	✓
<b>Method Blanks (MB)</b>							
Alkalinity Species by Titration	E290	79364	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	81134	1	20	5.0	5.0	✓
BC PHC - EPH by GC-FID	E601A	80894	1	16	6.2	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	82769	1	14	7.1	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	79348	1	5	20.0	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	81008	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	79346	1	9	11.1	5.0	✓
Conductivity in Water	E100	79362	1	9	11.1	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	80000	1	8	12.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	82081	1	6	16.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	79999	1	16	6.2	5.0	✓



Matrix: **Water**

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	81135	1	9	11.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	79368	1	9	11.1	5.0	✓
Fluoride in Water by IC	E235.F	79347	1	5	20.0	5.0	✓
Free Cyanide by CFA	E339	81561	1	6	16.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	79349	1	9	11.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	79350	1	9	11.1	5.0	✓
Oil & Grease by Gravimetry	E567	80191	1	4	25.0	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	80893	1	11	9.0	5.0	✓
Reactive Silica by Colourimetry	E392	81411	1	10	10.0	5.0	✓
Sulfate in Water by IC	E235.SO4	79351	1	9	11.1	5.0	✓
TDS by Gravimetry	E162	79424	1	20	5.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	80631	1	4	25.0	5.0	✓
Total Cyanide by CFA	E333	81559	1	19	5.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	81132	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	81238	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	80630	2	13	15.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	81136	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	81133	1	20	5.0	5.0	✓
TSS by Gravimetry	E160-H	79423	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	79415	1	18	5.5	5.0	✓
VOCs (BC List) by Headspace GC-MS	E611C	79395	1	11	9.0	5.0	✓
WAD Cyanide by CFA	E336	81560	1	15	6.6	5.0	✓
<b>Matrix Spikes (MS)</b>							
Ammonia by Fluorescence	E298	81134	1	20	5.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	79348	1	5	20.0	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	81008	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	79346	1	9	11.1	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	80000	1	8	12.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	82081	1	6	16.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	79999	2	16	12.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	81135	1	9	11.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	79368	1	9	11.1	5.0	✓
Fluoride in Water by IC	E235.F	79347	1	5	20.0	5.0	✓
Free Cyanide by CFA	E339	81561	1	6	16.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	79349	1	9	11.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	79350	1	9	11.1	5.0	✓
Reactive Silica by Colourimetry	E392	81411	1	10	10.0	5.0	✓
Sulfate in Water by IC	E235.SO4	79351	1	9	11.1	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	80631	1	4	25.0	5.0	✓
Total Cyanide by CFA	E333	81559	1	19	5.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	81132	1	20	5.0	5.0	✓



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
<i>Analytical Methods</i>							
<b>Matrix Spikes (MS) - Continued</b>							
Total Mercury in Water by CVAAS	E508	81238	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	80630	1	13	7.6	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	81136	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	81133	1	20	5.0	5.0	✓
VOCs (BC List) by Headspace GC-MS	E611C	79395	1	11	9.0	5.0	✓
WAD Cyanide by CFA	E336	81560	1	15	6.6	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
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Vancouver - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TSS by Gravimetry	E160-H Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Vancouver - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC (Low Level)	E235.Br-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.





Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Sulfate in Water by IC	E235.S04  Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290  Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298  Vancouver - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318  Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.
Total Cyanide by CFA	E333  Vancouver - Environmental	Water	ISO 14403 (mod)	Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.
WAD Cyanide by CFA	E336  Vancouver - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.
Free Cyanide by CFA	E339  Vancouver - Environmental	Water	ASTM D7237 (mod)	Free cyanide is determined by in-line gas diffusion at pH 6 with final determination by colourimetric analysis.
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L  Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L  Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U Vancouver - Environmental	Water	APHA 4500-P E (mod)	Dissolved Orthophosphate is determined colourimetrically on a water sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Total Metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L Vancouver - Environmental	Water	APHA 3030 B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Biochemical Oxygen Demand - 5 day	E550 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter.  Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry	E559	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
	Vancouver - Environmental			
Oil & Grease by Gravimetry	E567 Calgary - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane and the extract is evaporated to dryness. The residue is then weighed to determine Oil and Grease.
BC PHC - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Extractable Petroleum Hydrocarbons (EPH) are analyzed by GC-FID.
VOCs (BC List) by Headspace GC-MS	E611C Vancouver - 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.
PAHs by Hexane LVI GC-MS	E641A Vancouver - Environmental	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO <sub>3</sub> ), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO <sub>3</sub> equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO <sub>3</sub> ), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO <sub>3</sub> equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
Salinity in Seawater (calculation)	EC100S Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a seawater sample. Conductivity measurements are temperature-compensated to 25°C. Salinity in Practical Salinity Units is calculated.
LEPH and HEPH: EPH-PAH	EC600A Vancouver - Environmental	Water	BC MOE Lab Manual (LEPH and HEPH) (mod)	Light Extractable Petroleum Hydrocarbons (LEPH) and Heavy Extractable Petroleum Hydrocarbons (HEPH) are calculated as follows: LEPH = Extractable Petroleum Hydrocarbons (EPH10-19) minus Acenaphthene, Acridine, Anthracene, Fluorene, Naphthalene and Phenanthrene; HEPH = Extractable Petroleum Hydrocarbons (EPH19-32) minus Benz(a)anthracene, Benzo(a)pyrene, Fluoranthene, and Pyrene.
Radium-226 by Radon Emanation	RA226-MMER Fort Collins - Environmental - 225 Commerce Drive Fort Collins Colorado United States 80524	Water	EPA 903.1	Radium-226 in sample was analyzed according to the current revision of SOP 783.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO <sub>3</sub> .
Dissolved Mercury Water Filtration	EP509 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
Oil & Grease Extraction for Gravimetry	EP567 Calgary - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane by liquid-liquid extraction.
VOCs Preparation for Headspace Analysis	EP581 Vancouver - 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 Vancouver - 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 : **VA20B4004**  
Amendment : **2**

Page : 1 of 26

Client : Agnico-Eagle Mines Limited  
Contact : Etienne Parent  
Address : # 400 - 543 Granville Street  
Vancouver BC Canada V6C 1X8  
Telephone : ----  
Project : 20136436-2300-2306  
PO : ----  
C-O-C number : 17-766902  
Sampler : ----  
Site : ----  
Quote number : VA20-AEML100-001 (Q72802)  
No. of samples received : 1  
No. of samples analysed : 1

Laboratory : Vancouver - Environmental  
Account Manager : Heather McKenzie  
Address : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9  
Telephone : +1 604 253 4188  
Date Samples Received : 31-Aug-2020 08:35  
Date Analysis Commenced : 31-Aug-2020  
Issue Date : 03-Sep-2021 16:37

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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

### 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.

Signatories	Position	Laboratory Department
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Angelo Salandanan	Lab Assistant	Metals, Burnaby, British Columbia
Ann Ho	Laboratory Analyst	Metals, Burnaby, British Columbia
Annabelle Prasad	Analyst	Metals, Burnaby, British Columbia
Brieanna Allen	Production/Validation Manager	Organics, Burnaby, British Columbia
Bruna Botti	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Jacky Chou	Team Leader - Organics	Organics, Burnaby, British Columbia
Jeanie Mark	Laboratory Analyst	Organics, Calgary, Alberta
Kaitlyn Gardner	Account Manager Assistant	Internal Subcontracting, Fort Collins, Colorado
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia

Shaneel Dayal

Analyst

Metals, Burnaby, British Columbia



## 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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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



### 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: <b>Water</b>					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
<b>Physical Tests (QC Lot: 79362)</b>											
VA20B4004-001	West bay-A-360	conductivity	----	E100	2.0	µS/cm	115000	115000	0.0870%	10%	----
<b>Physical Tests (QC Lot: 79363)</b>											
VA20B4004-001	West bay-A-360	pH	----	E108	0.10	pH units	9.76	9.71	0.514%	4%	----
<b>Physical Tests (QC Lot: 79364)</b>											
VA20B4004-001	West bay-A-360	alkalinity, bicarbonate (as CaCO <sub>3</sub> )	----	E290	2.0	mg/L	798	738	7.76%	20%	----
		alkalinity, carbonate (as CaCO <sub>3</sub> )	----	E290	2.0	mg/L	195	248	23.9%	20%	DUP-H
		alkalinity, hydroxide (as CaCO <sub>3</sub> )	----	E290	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO <sub>3</sub> )	----	E290	2.0	mg/L	97.4	124	23.9%	20%	DUP-H
		alkalinity, total (as CaCO <sub>3</sub> )	----	E290	2.0	mg/L	992	986	0.687%	20%	----
<b>Physical Tests (QC Lot: 79415)</b>											
VA20B4002-001	Anonymous	turbidity	----	E121	0.10	NTU	0.94	0.95	0.01	Diff <2x LOR	----
<b>Physical Tests (QC Lot: 79423)</b>											
VA20B3845-004	Anonymous	solids, total suspended [TSS]	----	E160-H	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
<b>Physical Tests (QC Lot: 79424)</b>											
VA20B3690-002	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	599	590	1.60%	20%	----
<b>Anions and Nutrients (QC Lot: 79346)</b>											
VA20B4003-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	0.61	0.61	0.0002	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 79347)</b>											
VA20B4003-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.089	0.104	0.014	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 79348)</b>											
VA20B4003-001	Anonymous	bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 79349)</b>											
VA20B4003-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0073	0.0058	0.0015	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 79350)</b>											
VA20B4003-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 79351)</b>											
VA20B4003-001	Anonymous	sulfate (as SO <sub>4</sub> )	14808-79-8	E235.SO4	0.30	mg/L	<0.30	<0.30	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 79368)</b>											
VA20B4003-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0057	0.0052	0.0004	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 81132)</b>											
VA20B4003-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	1.70	1.59	7.00%	20%	----





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
<b>Anions and Nutrients (QC Lot: 81133)</b>											
VA20B4003-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0822	0.0851	3.45%	20%	----
<b>Anions and Nutrients (QC Lot: 81134)</b>											
VA20B4003-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0666	0.0648	2.79%	20%	----
<b>Anions and Nutrients (QC Lot: 81411)</b>											
VA20B4004-001	West bay-A-360	silicate (as SiO2)	7631-86-9	E392	25.0	mg/L	<25.0	<25.0	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 81559)</b>											
VA20B3842-020	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 81560)</b>											
VA20B3842-020	Anonymous	cyanide, weak acid dissociable	----	E336	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 81561)</b>											
VA20B3842-020	Anonymous	cyanide, free	----	E339	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
<b>Organic / Inorganic Carbon (QC Lot: 81135)</b>											
VA20B4003-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	20.6	21.0	2.14%	20%	----
<b>Organic / Inorganic Carbon (QC Lot: 81136)</b>											
VA20B4003-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	23.3	24.4	4.34%	20%	----
<b>Total Metals (QC Lot: 80630)</b>											
VA20B3861-003	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	2.10	2.12	1.26%	20%	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	0.00010	0.00011	0.000009	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00100	0.00095	0.00005	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0338	0.0328	3.18%	20%	----
		beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000337	0.0000342	0.0000006	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	17.8	17.5	1.52%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	0.000140	0.000144	2.51%	20%	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00134	0.00132	1.22%	20%	----
		copper, total	7440-50-8	E420	0.00050	mg/L	0.00424	0.00422	0.00002	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	2.42	2.53	4.52%	20%	----
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000840	0.000848	0.962%	20%	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	0.0028	0.0027	0.0001	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	4.50	4.47	0.754%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.0649	0.0636	2.08%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000747	0.000704	5.87%	20%	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	0.00486	0.00483	0.00003	Diff <2x LOR	----



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
<b>Total Metals (QC Lot: 80630) - continued</b>											
VA20B3861-003	Anonymous	phosphorus, total	7723-14-0	E420	0.050	mg/L	0.085	0.110	0.025	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	1.19	1.27	6.48%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00297	0.00291	1.99%	20%	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	0.000142	0.000111	0.000031	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	6.60	6.18	6.67%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	0.000014	0.000012	0.000002	Diff <2x LOR	----
		sodium, total	17341-25-2	E420	0.050	mg/L	4.14	4.26	2.86%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.0932	0.0931	0.109%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	3.04	2.88	0.16	Diff <2x LOR	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	0.000017	0.000017	0.0000004	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	0.00031	0.00034	0.00003	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	0.0981	0.0966	1.53%	20%	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000292	0.000348	17.6%	20%	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00506	0.00514	1.65%	20%	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	0.0064	0.0076	0.0012	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00180	mg/L	<0.00180	<0.00180	0	Diff <2x LOR	----
<b>Total Metals (QC Lot: 80631)</b>											
VA20B3861-003	Anonymous	chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	0.00344	0.00335	2.81%	20%	----
<b>Total Metals (QC Lot: 81238)</b>											
VA20B3997-004	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 79999)</b>											
KS2001571-001	Anonymous	aluminum, dissolved	7429-90-5	E421	1.00	mg/L	4.6 µg/L	0.0047	0.0001	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.100	mg/L	0.13 µg/L	0.00013	0.000002	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.100	mg/L	0.62 µg/L	0.00062	0.000010	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.100	mg/L	35.4 µg/L	0.0372	5.06%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.100	mg/L	<0.100 µg/L	<0.000100	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.0500	mg/L	<0.050 µg/L	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	10.0	mg/L	12 µg/L	0.012	0.0001	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.00500	mg/L	0.0144 µg/L	0.0000180	0.0000036	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	50.0	mg/L	84400 µg/L	85.1	0.837%	20%	----
		cesium, dissolved	7440-46-2	E421	0.0100	mg/L	<0.010 µg/L	<0.000010	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.100	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----



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
<b>Dissolved Metals (QC Lot: 79999) - continued</b>											
KS2001571-001	Anonymous	copper, dissolved	7440-50-8	E421	0.200	mg/L	0.61 µg/L	0.00059	0.00002	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	10.0	mg/L	<10 µg/L	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.0500	mg/L	<0.050 µg/L	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	1.00	mg/L	5.7 µg/L	0.0056	0.00008	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	5.00	mg/L	32000 µg/L	32.4	1.09%	20%	----
		manganese, dissolved	7439-96-5	E421	0.100	mg/L	1.82 µg/L	0.00183	0.454%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.0500	mg/L	1.42 µg/L	0.00147	3.84%	20%	----
		nickel, dissolved	7440-02-0	E421	0.500	mg/L	<0.50 µg/L	0.00054	0.00004	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	50.0	mg/L	<50 µg/L	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	50.0	mg/L	3480 µg/L	3.51	0.900%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.200	mg/L	0.89 µg/L	0.00088	0.000009	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.0500	mg/L	4.48 µg/L	0.00484	7.76%	20%	----
		silicon, dissolved	7440-21-3	E421	50.0	mg/L	11300 µg/L	11.5	1.95%	20%	----
		silver, dissolved	7440-22-4	E421	0.0100	mg/L	<0.010 µg/L	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	50.0	mg/L	3450 µg/L	3.44	0.307%	20%	----
		strontium, dissolved	7440-24-6	E421	0.200	mg/L	657 µg/L	0.673	2.47%	20%	----
		sulfur, dissolved	7704-34-9	E421	500	mg/L	21000 µg/L	22.1	5.03%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.200	mg/L	<0.20 µg/L	<0.00020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.0100	mg/L	<0.010 µg/L	<0.000010	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.100	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.100	mg/L	0.32 µg/L	0.00032	0.0000005	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.300	mg/L	<0.30 µg/L	<0.00030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.100	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.0100	mg/L	1.69 µg/L	0.00161	4.37%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.500	mg/L	1.92 µg/L	0.00188	0.00004	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	1.00	mg/L	<1.0 µg/L	0.0010	0.00003	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.200	mg/L	<0.20 µg/L	<0.00020	0	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 80000)</b>											
KS2001571-001	Anonymous	chromium, dissolved	7440-47-3	E421.Cr-L	0.100	mg/L	1.81 µg/L	0.00181	0.105%	20%	----
<b>Dissolved Metals (QC Lot: 82081)</b>											
KS2001604-001	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
<b>Aggregate Organics (QC Lot: 81008)</b>											
VA20B3842-017	Anonymous	chemical oxygen demand [COD]	----	E559	20	mg/L	<20	<20	0	Diff <2x LOR	----
<b>Aggregate Organics (QC Lot: 82769)</b>											
KS2001625-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	20.0	mg/L	107	79.3	29.5%	30%	----



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
<b>Aggregate Organics (QC Lot: 82769) - continued</b>											
KS2001586-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	20.0	mg/L	82.8	80.3	3.06%	30%	----
<b>Volatile Organic Compounds (QC Lot: 79395)</b>											
VA20B3937-001	Anonymous	benzene	71-43-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		bromodichloromethane	75-27-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		bromoform	75-25-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		carbon tetrachloride	56-23-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chlorobenzene	108-90-7	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloroethane	75-00-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloroform	67-66-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloromethane	74-87-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dibromochloromethane	124-48-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorobenzene, 1,2-	95-50-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorobenzene, 1,3-	541-73-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorobenzene, 1,4-	106-46-7	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethane, 1,1-	75-34-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethane, 1,2-	107-06-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, 1,1-	75-35-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, cis-1,2-	156-59-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, trans-1,2-	156-60-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloromethane	75-09-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloropropane, 1,2-	78-87-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloropropylene, cis-1,3-	10061-01-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloropropylene, trans-1,3-	10061-02-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tetrachloroethane, 1,1,2,2-	79-34-5	E611C	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		tetrachloroethylene	127-18-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611C	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		trichloroethane, 1,1,1-	71-55-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichloroethane, 1,1,2-	79-00-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichloroethylene	79-01-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichlorofluoromethane	75-69-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		vinyl chloride	75-01-4	E611C	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----

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 Work Order : VA20B4004 Amendment 2  
 Client : Agnico-Eagle Mines Limited  
 Project : 20136436-2300-2306



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>
<b>Volatile Organic Compounds (QC Lot: 79395) - continued</b>											
VA20B3937-001	Anonymous	xylene, m+p-	179601-23-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----

**Qualifiers**

<i>Qualifier</i>	<i>Description</i>
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.



## 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
<b>Physical Tests (QCLot: 79362)</b>						
conductivity	----	E100	1	µS/cm	<1.0	----
<b>Physical Tests (QCLot: 79364)</b>						
alkalinity, bicarbonate (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, carbonate (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, hydroxide (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, phenolphthalein (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, total (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
<b>Physical Tests (QCLot: 79415)</b>						
turbidity	----	E121	0.1	NTU	<0.10	----
<b>Physical Tests (QCLot: 79423)</b>						
solids, total suspended [TSS]	----	E160-H	3	mg/L	<3.0	----
<b>Physical Tests (QCLot: 79424)</b>						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
<b>Anions and Nutrients (QCLot: 79346)</b>						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
<b>Anions and Nutrients (QCLot: 79347)</b>						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
<b>Anions and Nutrients (QCLot: 79348)</b>						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
<b>Anions and Nutrients (QCLot: 79349)</b>						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
<b>Anions and Nutrients (QCLot: 79350)</b>						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
<b>Anions and Nutrients (QCLot: 79351)</b>						
sulfate (as SO <sub>4</sub> )	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
<b>Anions and Nutrients (QCLot: 79368)</b>						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
<b>Anions and Nutrients (QCLot: 81132)</b>						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
<b>Anions and Nutrients (QCLot: 81133)</b>						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
<b>Anions and Nutrients (QCLot: 81134)</b>						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Anions and Nutrients (QCLot: 81411)</b>						
silicate (as SiO <sub>2</sub> )	7631-86-9	E392	0.5	mg/L	<0.50	---
<b>Cyanides (QCLot: 81559)</b>						
cyanide, strong acid dissociable (total)	---	E333	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 81560)</b>						
cyanide, weak acid dissociable	---	E336	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 81561)</b>						
cyanide, free	---	E339	0.002	mg/L	<0.0020	---
<b>Organic / Inorganic Carbon (QCLot: 81135)</b>						
carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
<b>Organic / Inorganic Carbon (QCLot: 81136)</b>						
carbon, total organic [TOC]	---	E355-L	0.5	mg/L	<0.50	---
<b>Total Metals (QCLot: 80630)</b>						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	---
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	---
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	---
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	---
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	---
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	---
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	---
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	---
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	---
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	---
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	---
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	---
manganese, total	7439-96-5	E420	0.0001	mg/L	# 0.00053	B
molybdenum, total	7439-98-7	E420	0.00005	mg/L	# 0.000060	B
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	---
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	---
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	---
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	---
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	---
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	---



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Total Metals (QCLot: 80630) - continued</b>						
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	---
sodium, total	17341-25-2	E420	0.05	mg/L	<0.050	---
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	---
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	---
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	---
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	---
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	---
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	---
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	---
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	---
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	---
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	---
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	---
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	---
<b>Total Metals (QCLot: 80631)</b>						
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	<0.00010	---
<b>Total Metals (QCLot: 81238)</b>						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	---
<b>Dissolved Metals (QCLot: 79999)</b>						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	---
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	---





Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Dissolved Metals (QCLot: 79999) - continued</b>						
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
<b>Dissolved Metals (QCLot: 80000)</b>						
chromium, dissolved	7440-47-3	E421.Cr-L	0.0001	mg/L	<0.00010	----
<b>Dissolved Metals (QCLot: 82081)</b>						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
<b>Aggregate Organics (QCLot: 80191)</b>						
oil & grease (gravimetric)	----	E567	5	mg/L	<5.0	----
<b>Aggregate Organics (QCLot: 81008)</b>						
chemical oxygen demand [COD]	----	E559	20	mg/L	<20	----
<b>Aggregate Organics (QCLot: 82769)</b>						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
<b>Volatile Organic Compounds (QCLot: 79395)</b>						
benzene	71-43-2	E611C	0.5	µg/L	<0.50	----
bromodichloromethane	75-27-4	E611C	0.5	µg/L	<0.50	----
bromoform	75-25-2	E611C	0.5	µg/L	<0.50	----
carbon tetrachloride	56-23-5	E611C	0.5	µg/L	<0.50	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Volatile Organic Compounds (QCLot: 79395) - continued</b>						
chlorobenzene	108-90-7	E611C	0.5	µg/L	<0.50	---
chloroethane	75-00-3	E611C	0.5	µg/L	<0.50	---
chloroform	67-66-3	E611C	0.5	µg/L	<0.50	---
chloromethane	74-87-3	E611C	0.5	µg/L	<0.50	---
dibromochloromethane	124-48-1	E611C	0.5	µg/L	<0.50	---
dichlorobenzene, 1,2-	95-50-1	E611C	0.5	µg/L	<0.50	---
dichlorobenzene, 1,3-	541-73-1	E611C	0.5	µg/L	<0.50	---
dichlorobenzene, 1,4-	106-46-7	E611C	0.5	µg/L	<0.50	---
dichloroethane, 1,1-	75-34-3	E611C	0.5	µg/L	<0.50	---
dichloroethane, 1,2-	107-06-2	E611C	0.5	µg/L	<0.50	---
dichloroethylene, 1,1-	75-35-4	E611C	0.5	µg/L	<0.50	---
dichloroethylene, cis-1,2-	156-59-2	E611C	0.5	µg/L	<0.50	---
dichloroethylene, trans-1,2-	156-60-5	E611C	0.5	µg/L	<0.50	---
dichloromethane	75-09-2	E611C	0.5	µg/L	<0.50	---
dichloropropane, 1,2-	78-87-5	E611C	0.5	µg/L	<0.50	---
dichloropropylene, cis-1,3-	10061-01-5	E611C	0.5	µg/L	<0.50	---
dichloropropylene, trans-1,3-	10061-02-6	E611C	0.5	µg/L	<0.50	---
ethylbenzene	100-41-4	E611C	0.5	µg/L	<0.50	---
methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.5	µg/L	<0.50	---
styrene	100-42-5	E611C	0.5	µg/L	<0.50	---
tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.5	µg/L	<0.50	---
tetrachloroethane, 1,1,2,2-	79-34-5	E611C	0.2	µg/L	<0.20	---
tetrachloroethylene	127-18-4	E611C	0.5	µg/L	<0.50	---
toluene	108-88-3	E611C	0.4	µg/L	<0.40	---
trichloroethane, 1,1,1-	71-55-6	E611C	0.5	µg/L	<0.50	---
trichloroethane, 1,1,2-	79-00-5	E611C	0.5	µg/L	<0.50	---
trichloroethylene	79-01-6	E611C	0.5	µg/L	<0.50	---
trichlorofluoromethane	75-69-4	E611C	0.5	µg/L	<0.50	---
vinyl chloride	75-01-4	E611C	0.4	µg/L	<0.40	---
xylene, m+p-	179601-23-1	E611C	0.5	µg/L	<0.50	---
xylene, o-	95-47-6	E611C	0.5	µg/L	<0.50	---
<b>Hydrocarbons (QCLot: 80894)</b>						
EPH (C10-C19)	---	E601A	250	µg/L	<250	---
EPH (C19-C32)	---	E601A	250	µg/L	<250	---
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 80893)</b>						
acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	---



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 80893) - continued</b>						
acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	----
acridine	260-94-6	E641A	0.01	µg/L	<0.010	----
anthracene	120-12-7	E641A	0.01	µg/L	<0.010	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	<0.0050	----
benzo(b+j)fluoranthene	----	E641A	0.01	µg/L	<0.010	----
benzo(b+j+k)fluoranthene	----	E641A	0.015	µg/L	<0.015	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	----
chrysene	218-01-9	E641A	0.01	µg/L	<0.010	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	<0.0050	----
fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	----
fluorene	86-73-7	E641A	0.01	µg/L	<0.010	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	----
naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	----
phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	----
pyrene	129-00-0	E641A	0.01	µg/L	<0.010	----
quinoline	6027-02-7	E641A	0.05	µg/L	<0.050	----
<b>Polycyclic Aromatic Hydrocarbons Surrogates (QCLot: 80893)</b>						
acridine-d9	34749-75-2	E641A	0.01	µg/L	0.736	----

**Qualifiers**

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.



## 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: <b>Water</b>					Laboratory Control Sample (LCS) Report				
					Spike Concentration	Recovery (%) LCS	Recovery Limits (%)		Qualifier
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Physical Tests (QCLot: 79362)</b>									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	102	90.0	110	----
<b>Physical Tests (QCLot: 79363)</b>									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
<b>Physical Tests (QCLot: 79364)</b>									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	95.7	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	100	85.0	115	----
<b>Physical Tests (QCLot: 79415)</b>									
turbidity	----	E121	0.1	NTU	200 NTU	105	85.0	115	----
<b>Physical Tests (QCLot: 79423)</b>									
solids, total suspended [TSS]	----	E160-H	3	mg/L	150 mg/L	103	85.0	115	----
<b>Physical Tests (QCLot: 79424)</b>									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	108	85.0	115	----
<b>Anions and Nutrients (QCLot: 79346)</b>									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	97.6	90.0	110	----
<b>Anions and Nutrients (QCLot: 79347)</b>									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	94.5	90.0	110	----
<b>Anions and Nutrients (QCLot: 79348)</b>									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	91.2	85.0	115	----
<b>Anions and Nutrients (QCLot: 79349)</b>									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	97.1	90.0	110	----
<b>Anions and Nutrients (QCLot: 79350)</b>									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	96.7	90.0	110	----
<b>Anions and Nutrients (QCLot: 79351)</b>									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	98.7	90.0	110	----
<b>Anions and Nutrients (QCLot: 79368)</b>									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	96.5	80.0	120	----
<b>Anions and Nutrients (QCLot: 81132)</b>									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	98.1	75.0	125	----
<b>Anions and Nutrients (QCLot: 81133)</b>									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	94.2	80.0	120	----
<b>Anions and Nutrients (QCLot: 81134)</b>									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.12 mg/L	98.2	85.0	115	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Anions and Nutrients (QCLot: 81411)</b>									
silicate (as SiO <sub>2</sub> )	7631-86-9	E392	0.5	mg/L	10 mg/L	96.6	85.0	115	----
<b>Cyanides (QCLot: 81559)</b>									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	93.9	80.0	120	----
<b>Cyanides (QCLot: 81560)</b>									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	95.4	80.0	120	----
<b>Cyanides (QCLot: 81561)</b>									
cyanide, free	----	E339	0.002	mg/L	0.125 mg/L	94.1	80.0	120	----
<b>Organic / Inorganic Carbon (QCLot: 81135)</b>									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
<b>Organic / Inorganic Carbon (QCLot: 81136)</b>									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----
<b>Total Metals (QCLot: 80630)</b>									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	112	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	118	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	109	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	109	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	114	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	107	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	113	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	108	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	109	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	110	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	109	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	110	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	104	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	106	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	116	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	111	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	109	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	111	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	103	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	112	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	110	80.0	120	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
<b>Total Metals (QCLot: 80630) - continued</b>									
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	112	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	112	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	111	80.0	120	----
sodium, total	17341-25-2	E420	0.05	mg/L	50 mg/L	111	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	110	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	102	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	108	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	107	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	99.8	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	108	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	112	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	104	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	106	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	111	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	110	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	106	80.0	120	----
<b>Total Metals (QCLot: 80631)</b>									
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	0.25 mg/L	111	80.0	120	----
<b>Total Metals (QCLot: 81238)</b>									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	94.5	80.0	120	----
<b>Dissolved Metals (QCLot: 79999)</b>									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	106	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	108	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	101	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	101	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	106	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	102	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	104	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	108	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	107	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	99.1	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	99.7	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	99.7	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	101	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	109	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Dissolved Metals (QCLot: 79999) - continued</b>									
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	101	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	104	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	99.8	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	99.8	70.0	130	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	100	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	104	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	102	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	110	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	107	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	103	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	102	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	102	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	104	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	101	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	103	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	102	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	103	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
<b>Dissolved Metals (QCLot: 80000)</b>									
chromium, dissolved	7440-47-3	E421.Cr-L	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	91.2	80.0	120	----
<b>Aggregate Organics (QCLot: 80191)</b>									
oil & grease (gravimetric)	----	E567	5	mg/L	100 mg/L	85.5	70.0	130	----
<b>Aggregate Organics (QCLot: 81008)</b>									
chemical oxygen demand [COD]	----	E559	20	mg/L	750 mg/L	101	85.0	115	----
<b>Aggregate Organics (QCLot: 82769)</b>									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	87.1	85.0	115	----
<b>Volatile Organic Compounds (QCLot: 79395)</b>									
benzene	71-43-2	E611C	0.5	µg/L	100 µg/L	97.3	70.0	130	----
bromodichloromethane	75-27-4	E611C	0.5	µg/L	100 µg/L	92.6	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
<b>Volatile Organic Compounds (QCLot: 79395) - continued</b>									
bromoform	75-25-2	E611C	0.5	µg/L	100 µg/L	88.0	70.0	130	----
carbon tetrachloride	56-23-5	E611C	0.5	µg/L	100 µg/L	85.9	70.0	130	----
chlorobenzene	108-90-7	E611C	0.5	µg/L	100 µg/L	101	70.0	130	----
chloroethane	75-00-3	E611C	0.5	µg/L	100 µg/L	92.3	60.0	140	----
chloroform	67-66-3	E611C	0.5	µg/L	100 µg/L	94.0	70.0	130	----
chloromethane	74-87-3	E611C	0.5	µg/L	100 µg/L	89.0	60.0	140	----
dibromochloromethane	124-48-1	E611C	0.5	µg/L	100 µg/L	92.2	70.0	130	----
dichlorobenzene, 1,2-	95-50-1	E611C	0.5	µg/L	100 µg/L	100	70.0	130	----
dichlorobenzene, 1,3-	541-73-1	E611C	0.5	µg/L	100 µg/L	88.9	70.0	130	----
dichlorobenzene, 1,4-	106-46-7	E611C	0.5	µg/L	100 µg/L	102	70.0	130	----
dichloroethane, 1,1-	75-34-3	E611C	0.5	µg/L	100 µg/L	94.0	70.0	130	----
dichloroethane, 1,2-	107-06-2	E611C	0.5	µg/L	100 µg/L	96.2	70.0	130	----
dichloroethylene, 1,1-	75-35-4	E611C	0.5	µg/L	100 µg/L	91.2	70.0	130	----
dichloroethylene, cis-1,2-	156-59-2	E611C	0.5	µg/L	100 µg/L	97.6	70.0	130	----
dichloroethylene, trans-1,2-	156-60-5	E611C	0.5	µg/L	100 µg/L	95.3	70.0	130	----
dichloromethane	75-09-2	E611C	0.5	µg/L	100 µg/L	96.3	70.0	130	----
dichloropropane, 1,2-	78-87-5	E611C	0.5	µg/L	100 µg/L	96.0	70.0	130	----
dichloropropylene, cis-1,3-	10061-01-5	E611C	0.5	µg/L	100 µg/L	91.1	70.0	130	----
dichloropropylene, trans-1,3-	10061-02-6	E611C	0.5	µg/L	100 µg/L	# 62.5	70.0	130	LCS-ND
ethylbenzene	100-41-4	E611C	0.5	µg/L	100 µg/L	92.9	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.5	µg/L	100 µg/L	105	70.0	130	----
styrene	100-42-5	E611C	0.5	µg/L	100 µg/L	93.2	70.0	130	----
tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.5	µg/L	100 µg/L	90.7	70.0	130	----
tetrachloroethane, 1,1,2,2-	79-34-5	E611C	0.2	µg/L	100 µg/L	104	70.0	130	----
tetrachloroethylene	127-18-4	E611C	0.5	µg/L	100 µg/L	97.2	70.0	130	----
toluene	108-88-3	E611C	0.4	µg/L	100 µg/L	93.9	70.0	130	----
trichloroethane, 1,1,1-	71-55-6	E611C	0.5	µg/L	100 µg/L	81.8	70.0	130	----
trichloroethane, 1,1,2-	79-00-5	E611C	0.5	µg/L	100 µg/L	99.3	70.0	130	----
trichloroethylene	79-01-6	E611C	0.5	µg/L	100 µg/L	99.1	70.0	130	----
trichlorofluoromethane	75-69-4	E611C	0.5	µg/L	100 µg/L	83.0	60.0	140	----
vinyl chloride	75-01-4	E611C	0.4	µg/L	100 µg/L	89.2	60.0	140	----
xylene, m+p-	179601-23-1	E611C	0.5	µg/L	200 µg/L	98.7	70.0	130	----
xylene, o-	95-47-6	E611C	0.5	µg/L	100 µg/L	94.9	70.0	130	----
<b>Hydrocarbons (QCLot: 80894)</b>									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	122	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	123	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
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 80893)</b>									
acenaphthene	83-32-9	E641A	0.01	µg/L	0.5 µg/L	109	60.0	130	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	0.5 µg/L	111	60.0	130	----
acridine	260-94-6	E641A	0.01	µg/L	0.5 µg/L	94.8	60.0	130	----
anthracene	120-12-7	E641A	0.01	µg/L	0.5 µg/L	110	60.0	130	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.5 µg/L	108	60.0	130	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.5 µg/L	117	60.0	130	----
benzo(b+j)fluoranthene	----	E641A	0.01	µg/L	0.5 µg/L	121	60.0	130	----
benzo(b+j+k)fluoranthene	----	E641A	0.015	µg/L	1 µg/L	123	60.0	130	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.5 µg/L	124	60.0	130	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.5 µg/L	124	60.0	130	----
chrysene	218-01-9	E641A	0.01	µg/L	0.5 µg/L	116	60.0	130	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.5 µg/L	118	60.0	130	----
fluoranthene	206-44-0	E641A	0.01	µg/L	0.5 µg/L	112	60.0	130	----
fluorene	86-73-7	E641A	0.01	µg/L	0.5 µg/L	99.6	60.0	130	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.5 µg/L	125	60.0	130	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.5 µg/L	108	60.0	130	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.5 µg/L	102	60.0	130	----
naphthalene	91-20-3	E641A	0.05	µg/L	0.5 µg/L	102	50.0	130	----
phenanthrene	85-01-8	E641A	0.02	µg/L	0.5 µg/L	106	60.0	130	----
pyrene	129-00-0	E641A	0.01	µg/L	0.5 µg/L	115	60.0	130	----
quinoline	6027-02-7	E641A	0.05	µg/L	0.5 µg/L	125	60.0	130	----
<b>Polycyclic Aromatic Hydrocarbons Surrogates (QCLot: 80893)</b>									
acridine-d9	34749-75-2	E641A	0.01	µg/L	0.8421 µg/L	87.4	----	----	----

**Qualifiers**

Qualifier	Description
LCS-ND	Lab Control Sample recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.



### 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 >= 1x 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
<b>Anions and Nutrients (QCLot: 79346)</b>										
VA20B4003-002	Anonymous	chloride	16887-00-6	E235.Cl	102 mg/L	100 mg/L	102	75.0	125	----
<b>Anions and Nutrients (QCLot: 79347)</b>										
VA20B4003-002	Anonymous	fluoride	16984-48-8	E235.F	1.06 mg/L	1 mg/L	106	75.0	125	----
<b>Anions and Nutrients (QCLot: 79348)</b>										
VA20B4003-002	Anonymous	bromide	24959-67-9	E235.Br-L	0.466 mg/L	0.5 mg/L	93.2	75.0	125	----
<b>Anions and Nutrients (QCLot: 79349)</b>										
VA20B4003-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.55 mg/L	2.5 mg/L	102	75.0	125	----
<b>Anions and Nutrients (QCLot: 79350)</b>										
VA20B4003-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.499 mg/L	0.5 mg/L	99.7	75.0	125	----
<b>Anions and Nutrients (QCLot: 79351)</b>										
VA20B4003-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	102 mg/L	100 mg/L	102	75.0	125	----
<b>Anions and Nutrients (QCLot: 79368)</b>										
VA20B4003-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	ND mg/L	0.03 mg/L	ND	70.0	130	----
<b>Anions and Nutrients (QCLot: 81132)</b>										
VA20B4003-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.47 mg/L	2.5 mg/L	98.8	70.0	130	----
<b>Anions and Nutrients (QCLot: 81133)</b>										
VA20B4003-002	Anonymous	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
<b>Anions and Nutrients (QCLot: 81134)</b>										
VA20B4003-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.202 mg/L	0.2 mg/L	101	75.0	125	----
<b>Anions and Nutrients (QCLot: 81411)</b>										
VA20B4303-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	60.5 mg/L	50 mg/L	121	75.0	125	----
<b>Cyanides (QCLot: 81559)</b>										
VA20B3842-021	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.248 mg/L	0.25 mg/L	99.2	75.0	125	----
<b>Cyanides (QCLot: 81560)</b>										
VA20B3842-021	Anonymous	cyanide, weak acid dissociable	----	E336	0.129 mg/L	0.125 mg/L	103	75.0	125	----
<b>Cyanides (QCLot: 81561)</b>										
VA20B3842-021	Anonymous	cyanide, free	----	E339	0.125 mg/L	0.125 mg/L	100	75.0	125	----



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
<b>Organic / Inorganic Carbon (QCLot: 81135)</b>										
VA20B4003-002	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
<b>Organic / Inorganic Carbon (QCLot: 81136)</b>										
VA20B4003-002	Anonymous	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
<b>Total Metals (QCLot: 80630)</b>										
VA20B4004-001	West bay-A-360	aluminum, total	7429-90-5	E420	110 mg/L	100 mg/L	110	70.0	130	----
		antimony, total	7440-36-0	E420	10.6 mg/L	10 mg/L	106	70.0	130	----
		arsenic, total	7440-38-2	E420	10.8 mg/L	10 mg/L	108	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	10 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	21.5 mg/L	20 mg/L	108	70.0	130	----
		bismuth, total	7440-69-9	E420	4.84 mg/L	5 mg/L	96.7	70.0	130	----
		boron, total	7440-42-8	E420	ND mg/L	50 mg/L	ND	70.0	130	----
		cadmium, total	7440-43-9	E420	2.09 mg/L	2 mg/L	105	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	2000 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	5.42 mg/L	5 mg/L	108	70.0	130	----
		cobalt, total	7440-48-4	E420	10.5 mg/L	10 mg/L	105	70.0	130	----
		copper, total	7440-50-8	E420	10.5 mg/L	10 mg/L	105	70.0	130	----
		iron, total	7439-89-6	E420	1040 mg/L	1000 mg/L	104	70.0	130	----
		lead, total	7439-92-1	E420	9.76 mg/L	10 mg/L	97.6	70.0	130	----
		lithium, total	7439-93-2	E420	ND mg/L	50 mg/L	ND	70.0	130	----
		magnesium, total	7439-95-4	E420	525 mg/L	500 mg/L	105	70.0	130	----
		manganese, total	7439-96-5	E420	10.3 mg/L	10 mg/L	103	70.0	130	----
		molybdenum, total	7439-98-7	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, total	7440-02-0	E420	21.1 mg/L	20 mg/L	106	70.0	130	----
		phosphorus, total	7723-14-0	E420	5820 mg/L	5000 mg/L	116	70.0	130	----
		potassium, total	7440-09-7	E420	ND mg/L	2000 mg/L	ND	70.0	130	----
		rubidium, total	7440-17-7	E420	10.9 mg/L	10 mg/L	109	70.0	130	----
		selenium, total	7782-49-2	E420	21.9 mg/L	20 mg/L	110	70.0	130	----
		silicon, total	7440-21-3	E420	4900 mg/L	5000 mg/L	98.1	70.0	130	----
		silver, total	7440-22-4	E420	2.03 mg/L	2 mg/L	101	70.0	130	----
		sodium, total	17341-25-2	E420	ND mg/L	1000 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	10 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	11200 mg/L	10000 mg/L	112	70.0	130	----
		tellurium, total	13494-80-9	E420	19.5 mg/L	20 mg/L	97.5	70.0	130	----
		thallium, total	7440-28-0	E420	1.95 mg/L	2 mg/L	97.5	70.0	130	----
		thorium, total	7440-29-1	E420	10.2 mg/L	10 mg/L	102	70.0	130	----
		tin, total	7440-31-5	E420	10.3 mg/L	10 mg/L	103	70.0	130	----

Page : 24 of 26  
 Work Order : VA20B4004 Amendment 2  
 Client : Agnico-Eagle Mines Limited  
 Project : 20136436-2300-2306



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
<b>Total Metals (QCLot: 80630) - continued</b>										
VA20B4004-001	West bay-A-360	titanium, total	7440-32-6	E420	22.1 mg/L	20 mg/L	111	70.0	130	----
		tungsten, total	7440-33-7	E420	10.0 mg/L	10 mg/L	100	70.0	130	----
		uranium, total	7440-61-1	E420	2.03 mg/L	2 mg/L	101	70.0	130	----
		vanadium, total	7440-62-2	E420	56.2 mg/L	50 mg/L	112	70.0	130	----
		zinc, total	7440-66-6	E420	201 mg/L	200 mg/L	101	70.0	130	----
		zirconium, total	7440-67-7	E420	21.2 mg/L	20 mg/L	106	70.0	130	----
<b>Total Metals (QCLot: 80631)</b>										
VA20B4004-001	West bay-A-360	chromium, total	7440-47-3	E420.Cr-L	22.0 mg/L	20 mg/L	110	70.0	130	----
<b>Total Metals (QCLot: 81238)</b>										
VA20B3997-005	Anonymous	mercury, total	7439-97-6	E508	0.0000962 mg/L	0.0001 mg/L	96.2	70.0	130	----
<b>Dissolved Metals (QCLot: 79999)</b>										
KS2001571-002	Anonymous	boron, dissolved	7440-42-8	E421	0.095 mg/L	0.1 mg/L	95.3	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00328 mg/L	0.004 mg/L	82.1	70.0	130	----
KS2001571-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.324 mg/L	0.4 mg/L	81.0	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0315 mg/L	0.04 mg/L	78.7	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0333 mg/L	0.04 mg/L	83.3	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0569 mg/L	0.08 mg/L	71.2	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.0140 mg/L	0.02 mg/L	70.0	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00594 mg/L	0.008 mg/L	74.2	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	8 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0148 mg/L	0.02 mg/L	74.1	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0306 mg/L	0.04 mg/L	76.6	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0302 mg/L	0.04 mg/L	75.6	70.0	130	----
		iron, dissolved	7439-89-6	E421	3.13 mg/L	4 mg/L	78.2	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0291 mg/L	0.04 mg/L	72.7	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.141 mg/L	0.2 mg/L	70.6	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0316 mg/L	0.04 mg/L	79.0	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0298 mg/L	0.04 mg/L	74.4	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0584 mg/L	0.08 mg/L	73.1	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	16.5 mg/L	20 mg/L	82.4	70.0	130	----
		potassium, dissolved	7440-09-7	E421	6.21 mg/L	8 mg/L	77.6	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0315 mg/L	0.04 mg/L	78.6	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0712 mg/L	0.08 mg/L	89.1	70.0	130	----
		silicon, dissolved	7440-21-3	E421	ND mg/L	10 mg/L	ND	70.0	130	----



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
<b>Dissolved Metals (QCLot: 79999) - continued</b>										
KS2001571-002	Anonymous	sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0613 mg/L	0.08 mg/L	76.6	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00580 mg/L	0.008 mg/L	72.5	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0320 mg/L	0.04 mg/L	80.0	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0300 mg/L	0.04 mg/L	74.9	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0623 mg/L	0.08 mg/L	77.9	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0300 mg/L	0.04 mg/L	75.0	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00593 mg/L	0.008 mg/L	74.2	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.164 mg/L	0.2 mg/L	82.3	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.620 mg/L	0.8 mg/L	77.5	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0632 mg/L	0.08 mg/L	79.0	70.0	130	----
<b>Dissolved Metals (QCLot: 80000)</b>										
KS2001571-002	Anonymous	chromium, dissolved	7440-47-3	E421.Cr-L	0.0641 mg/L	0.08 mg/L	80.1	70.0	130	----
<b>Dissolved Metals (QCLot: 82081)</b>										
VA20B2435-001	Anonymous	mercury, dissolved	7439-97-6	E509	0.0169 mg/L	0.02 mg/L	84.5	70.0	130	----
<b>Aggregate Organics (QCLot: 81008)</b>										
VA20B4087-001	Anonymous	chemical oxygen demand [COD]	----	E559	480 mg/L	500 mg/L	95.9	75.0	125	----
<b>Volatile Organic Compounds (QCLot: 79395)</b>										
VA20B3937-002	Anonymous	benzene	71-43-2	E611C	99.2 µg/L	100 µg/L	99.2	60.0	140	----
		bromodichloromethane	75-27-4	E611C	92.9 µg/L	100 µg/L	92.9	60.0	140	----
		bromoform	75-25-2	E611C	86.7 µg/L	100 µg/L	86.7	60.0	140	----
		carbon tetrachloride	56-23-5	E611C	91.7 µg/L	100 µg/L	91.7	60.0	140	----
		chlorobenzene	108-90-7	E611C	100.0 µg/L	100 µg/L	100.0	60.0	140	----
		chloroethane	75-00-3	E611C	95.8 µg/L	100 µg/L	95.8	50.0	150	----
		chloroform	67-66-3	E611C	96.4 µg/L	100 µg/L	96.4	60.0	140	----
		chloromethane	74-87-3	E611C	86.7 µg/L	100 µg/L	86.7	50.0	150	----
		dibromochloromethane	124-48-1	E611C	90.3 µg/L	100 µg/L	90.3	60.0	140	----
		dichlorobenzene, 1,2-	95-50-1	E611C	101 µg/L	100 µg/L	101	60.0	140	----
		dichlorobenzene, 1,3-	541-73-1	E611C	89.4 µg/L	100 µg/L	89.4	60.0	140	----
		dichlorobenzene, 1,4-	106-46-7	E611C	101 µg/L	100 µg/L	101	60.0	140	----
		dichloroethane, 1,1-	75-34-3	E611C	96.9 µg/L	100 µg/L	96.9	60.0	140	----
		dichloroethane, 1,2-	107-06-2	E611C	93.5 µg/L	100 µg/L	93.5	60.0	140	----
		dichloroethylene, 1,1-	75-35-4	E611C	94.8 µg/L	100 µg/L	94.8	60.0	140	----



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
<b>Volatile Organic Compounds (QCLot: 79395) - continued</b>										
VA20B3937-002	Anonymous	dichloroethylene, cis-1,2-	156-59-2	E611C	98.4 µg/L	100 µg/L	98.4	60.0	140	----
		dichloroethylene, trans-1,2-	156-60-5	E611C	96.6 µg/L	100 µg/L	96.6	60.0	140	----
		dichloromethane	75-09-2	E611C	96.7 µg/L	100 µg/L	96.7	60.0	140	----
		dichloropropane, 1,2-	78-87-5	E611C	95.6 µg/L	100 µg/L	95.6	60.0	140	----
		dichloropropylene, cis-1,3-	10061-01-5	E611C	71.2 µg/L	100 µg/L	71.2	60.0	140	----
		dichloropropylene, trans-1,3-	10061-02-6	E611C	60.4 µg/L	100 µg/L	60.4	60.0	140	----
		ethylbenzene	100-41-4	E611C	94.8 µg/L	100 µg/L	94.8	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	106 µg/L	100 µg/L	106	60.0	140	----
		styrene	100-42-5	E611C	90.2 µg/L	100 µg/L	90.2	60.0	140	----
		tetrachloroethane, 1,1,1,2-	630-20-6	E611C	90.5 µg/L	100 µg/L	90.5	60.0	140	----
		tetrachloroethane, 1,1,2,2-	79-34-5	E611C	101 µg/L	100 µg/L	101	60.0	140	----
		tetrachloroethylene	127-18-4	E611C	100 µg/L	100 µg/L	100	60.0	140	----
		toluene	108-88-3	E611C	109 µg/L	100 µg/L	109	60.0	140	----
		trichloroethane, 1,1,1-	71-55-6	E611C	86.4 µg/L	100 µg/L	86.4	60.0	140	----
		trichloroethane, 1,1,2-	79-00-5	E611C	95.2 µg/L	100 µg/L	95.2	60.0	140	----
		trichloroethylene	79-01-6	E611C	101 µg/L	100 µg/L	101	60.0	140	----
		trichlorofluoromethane	75-69-4	E611C	91.1 µg/L	100 µg/L	91.1	50.0	150	----
		vinyl chloride	75-01-4	E611C	90.0 µg/L	100 µg/L	90.0	50.0	150	----
		xylene, m+p-	179601-23-1	E611C	200 µg/L	200 µg/L	99.9	60.0	140	----
		xylene, o-	95-47-6	E611C	95.2 µg/L	100 µg/L	95.2	60.0	140	----



Chain of Custody (COC) / Analytical Request Form

COC Number: 17-766902

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

Page 1 of 1

www.alsglobal.com

<b>Report To</b> Contact and company name below will appear on the final report.			<b>Report Format / Distribution</b>			<b>Select Service Level Below - Contact your AM to confirm all E&amp;P TATs (surcharges may apply)</b>								
Company: <u>Golder Associates</u>			Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply								
Contact: <u>Adrian Kowalchuk</u>			Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			4 day [P4-20%] <input type="checkbox"/>								
Phone: <u>204-891-5372</u>			<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			1 Business day [E - 100%] <input type="checkbox"/>								
Company address below will appear on the final report			Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			3 day [P3-25%] <input type="checkbox"/>								
Street: <u>1931 Robertson Road</u>			Email 1 or Fax <u>Adrian - Kowalchuk@golder.com</u>			2 day [P2-50%] <input type="checkbox"/>								
City/Province: <u>Ottawa, ON</u>			Email 2 <u>Valerie - Bertrand@golder.com</u>			Date and Time Required for all E&P TATs: <u>dd-mmm-yy hh:mm</u>								
Postal Code: <u>K2H 5B7</u>			Email 3			For tests that can not be performed according to the service level selected, you will be contacted.								
<b>Invoice To</b>			<b>Invoice Distribution</b>			<b>Analysis Request</b>								
Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below								
Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			Email 1 or Fax <u>Etienne Parente@aquicoeng.com</u>			<b>NUMBER OF CONTAINERS</b> <u>Bad</u> <u>Cyanides</u> <u>Gen. TDS, TSS Routine</u> <u>Diss metals &amp; mercury</u> <u>total metals &amp; mercury</u> <u>Microbio</u> <u>Oil &amp; Grease</u> <u>NUT/DOC / CO3/TKN/AMTP</u> <u>NUT/DOC / INH3 / PHEN</u> <u>AWH3</u> <u>PRH/EPH/L EPH/HEPH</u> <u>Radium 226</u> <u>VOCs</u>								
Company: <u>Aquico Eagle Meliadine Min. Corp</u>			Email 2											
Contact: <u>Etienne Parente</u>			Oil and Gas Required Fields (client use)											
Project Information			AFE/Cost Center:											
ALS Account # / Quote #: <u>TBD</u>			PO#											
Job #: <u>2013643C-2305-2306</u>			Major/Minor Code:											
PO / AFE:			Routing Code:											
LSD:			Requisitioner:											
ALS Lab Work Order # (lab use only):			Location: <u>Meliadine - Westbay A</u>											
ALS Contact:			Sampler:											
ALS Sample # (lab use only)		Sample Identification and/or Coordinates (This description will appear on the report)			Date (dd-mmm-yy)		Time (hh:mm)		Sample Type		<b>SAMPLES ON HOLD</b> SUSPECTED HAZARDOUS (see Special Instructions)			
		<u>Westbay-A-360</u>			<u>21-Aug-20</u>		<u>23:00</u>		<u>Drill Water</u>					
<b>Drinking Water (DW) Samples (client use)</b>					<b>Special Instructions / Specify Criteria to add (electro)</b>			<b>SAMPLE CONDITION AS RECEIVED (lab use only)</b>						
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO								Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>						
Are samples for human consumption/use? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO								Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>						
Cooling Initiated <input type="checkbox"/>								INITIAL COOLER TEMPERATURES °C: _____						
FINAL COOLER TEMPERATURES °C: <u>12 C</u>														
<b>SHIPMENT RELEASE (client use)</b>					<b>INITIAL SHIPMENT RECEPTION (lab use only)</b>					<b>FINAL SHIPMENT RECEPTION (lab use only)</b>				
Released by: <u>PJ M</u>					Received by: _____					Received by: <u>VF</u>				
Date: <u>24 Aug 2020</u>					Date: _____					Date: <u>31 Aug 2020</u>				
Time: <u>6:00</u>					Time: _____					Time: _____				

Environmental Division  
 Vancouver  
 Work Order Reference  
**VA20B4004**

Telephone : + 1 604 253 4188



CERTIFICATE OF ANALYSIS

Work Order : VA20B4663  
Amendment : 1  
Client : Golder Associates Ltd.  
Contact : Adrian Kowalchuk  
Address : 1931 Robertson Road  
Ottawa ON Canada K2H 5B7  
Telephone : 613 592 9600  
Project : 20136436-2300-2304  
PO : VA20-AEML 100-001  
C-O-C number : 17-766901  
Sampler : PM  
Site : Meliadine-Westbay A  
Quote number : VA20-AEML100-001 (Q72802)  
No. of samples received : 2  
No. of samples analysed : 2

Page : 1 of 11  
Laboratory : Vancouver - Environmental  
Account Manager : Heather McKenzie  
Address : 8081 Lougheed Highway  
Burnaby BC Canada V5A 1W9  
Telephone : +1 604 253 4188  
Date Samples Received : 08-Sep-2020 08:25  
Date Analysis Commenced : 08-Sep-2020  
Issue Date : 03-Sep-2021 16:57

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
- Surrogate Control Limits

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.

Signatories	Position	Laboratory Department
Annabelle Prasad	Analyst	Metals, Burnaby, British Columbia
Brieanna Allen	Production/Validation Manager	Inorganics, Burnaby, British Columbia
Brieanna Allen	Production/Validation Manager	Organics, Burnaby, British Columbia
Bruna Botti	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Cristina Alexandre	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kaitlyn Gardner	Account Manager Assistant	Internal Subcontracting, Fort Collins, Colorado
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Organics, Burnaby, British Columbia
Shaneel Dayal	Analyst	Metals, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia







## 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.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances  
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
Bq/L	Becquerels per litre
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units
psu	practical salinity units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

## Workorder Comments

Amendment (03/09/2021): This report has been amended following changes to the analytical data reported. The quality system is being utilised to resolve this issue. The specific data affected includes chloromethane.

## Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLA	Detection Limit adjusted for required dilution.
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).



*DLQ*                      *Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.*

*PHA*                      *pH adjusted before analysis.*

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## Analytical Results

Sub-Matrix: Water					Client sample ID	Westbay-A-490	Westbay-A-490 -Dup	----	----	----
(Matrix: Water)					Client sampling date / time	25-Aug-2020 16:00	25-Aug-2020 16:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA20B4663-001 Result	VA20B4663-002 Result	-----	-----	-----	
<b>Physical Tests</b>										
conductivity	----	E100	2.0	µS/cm	48600	48400	----	----	----	
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	31700	31700	----	----	----	
pH	----	E108	0.10	pH units	9.27	9.28	----	----	----	
salinity	----	EC100S	1.0	psu	34.9	34.8	----	----	----	
solids, total dissolved [TDS]	----	E162	10	mg/L	40400	40900	----	----	----	
solids, total suspended [TSS]	----	E160-H	3.0	mg/L	741	643	----	----	----	
turbidity	----	E121	0.10	NTU	56.9	58.0	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	367	365	----	----	----	
alkalinity, phenolphthalein (as CaCO3)	----	E290	2.0	mg/L	100	100	----	----	----	
alkalinity, hydroxide (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	----	----	----	
alkalinity, carbonate (as CaCO3)	----	E290	2.0	mg/L	200	200	----	----	----	
alkalinity, bicarbonate (as CaCO3)	----	E290	2.0	mg/L	167	165	----	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	2.0	mg/L	203	202	----	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	2.0	mg/L	120	120	----	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	2.0	mg/L	<2.0	<2.0	----	----	----	
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	30200	30800	----	----	----	
<b>Anions and Nutrients</b>										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	1.90	1.92	----	----	----	
bromide	24959-67-9	E235.Br-L	0.050	mg/L	115	117	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	21600	22200	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	<2.00 <sup>DLDS</sup>	<2.00 <sup>DLDS</sup>	----	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	40.6	45.1	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	1.05	1.02	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.100 <sup>DLDS</sup>	<0.100 <sup>DLDS</sup>	----	----	----	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0148	0.0152	----	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.170 <sup>DLM</sup>	<0.160 <sup>DLM</sup>	----	----	----	
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	<25.0 <sup>DLM</sup>	<25.0 <sup>DLM</sup>	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<30.0 <sup>DLDS</sup>	<30.0 <sup>DLDS</sup>	----	----	----	
<b>Cyanides</b>										
cyanide, free	----	E339	0.0050	mg/L	<0.0100	<0.0100	----	----	----	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Westbay-A-490	Westbay-A-490 -Dup	----	----	----
Client sampling date / time					25-Aug-2020 16:00	25-Aug-2020 16:00	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA20B4663-001	VA20B4663-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Cyanides</b>										
cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	<0.0100	<0.0100	----	----	----	
cyanide, weak acid dissociable	----	E336	0.0050	mg/L	<0.0100	<0.0100	----	----	----	
<b>Organic / Inorganic Carbon</b>										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	170	200	----	----	----	
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	211	216	----	----	----	
<b>Total Metals</b>										
aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.600 <sup>DLA</sup>	<0.300 <sup>DLA</sup>	----	----	----	
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----	
arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----	
barium, total	7440-39-3	E420	0.00010	mg/L	3.27	3.21	----	----	----	
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.0200 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----	
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.0100 <sup>DLA</sup>	<0.00500 <sup>DLA</sup>	----	----	----	
boron, total	7440-42-8	E420	0.010	mg/L	44.1	41.5	----	----	----	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.00100 <sup>DLA</sup>	<0.000500 <sup>DLA</sup>	----	----	----	
calcium, total	7440-70-2	E420	0.050	mg/L	12700	12700	----	----	----	
cesium, total	7440-46-2	E420	0.000010	mg/L	1.04	1.17	----	----	----	
chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----	
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----	
copper, total	7440-50-8	E420	0.000050	mg/L	<0.100 <sup>DLA</sup>	<0.0500 <sup>DLA</sup>	----	----	----	
iron, total	7439-89-6	E420	0.010	mg/L	5.84	5.80	----	----	----	
lead, total	7439-92-1	E420	0.000050	mg/L	<0.0100 <sup>DLA</sup>	<0.00500 <sup>DLA</sup>	----	----	----	
lithium, total	7439-93-2	E420	0.0010	mg/L	47.0	47.3	----	----	----	
magnesium, total	7439-95-4	E420	0.0050	mg/L	4.20	5.01	----	----	----	
manganese, total	7439-96-5	E420	0.00010	mg/L	0.0724	0.0830	----	----	----	
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.0102	0.0123	----	----	----	
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.100 <sup>DLA</sup>	<0.0500 <sup>DLA</sup>	----	----	----	
phosphorus, total	7723-14-0	E420	0.050	mg/L	<10.0 <sup>DLA</sup>	<5.00 <sup>DLA</sup>	----	----	----	
potassium, total	7440-09-7	E420	0.050	mg/L	598	636	----	----	----	
rubidium, total	7440-17-7	E420	0.00020	mg/L	2.28	2.42	----	----	----	
selenium, total	7782-49-2	E420	0.000050	mg/L	<0.0100 <sup>DLA</sup>	<0.00500 <sup>DLA</sup>	----	----	----	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Westbay-A-490	Westbay-A-490 -Dup	----	----	----
Client sampling date / time					25-Aug-2020 16:00	25-Aug-2020 16:00	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA20B4663-001	VA20B4663-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Total Metals</b>										
silicon, total	7440-21-3	E420	0.10	mg/L	<20.0 <sup>DLA</sup>	<10.0 <sup>DLA</sup>	----	----	----	
silver, total	7440-22-4	E420	0.000010	mg/L	<0.00200 <sup>DLA</sup>	<0.00100 <sup>DLA</sup>	----	----	----	
sodium, total	17341-25-2	E420	0.050	mg/L	415	428	----	----	----	
strontium, total	7440-24-6	E420	0.00020	mg/L	591	689	----	----	----	
sulfur, total	7704-34-9	E420	0.50	mg/L	<100 <sup>DLA</sup>	<50.0 <sup>DLA</sup>	----	----	----	
tellurium, total	13494-80-9	E420	0.00020	mg/L	0.0562	0.0472	----	----	----	
thallium, total	7440-28-0	E420	0.000010	mg/L	0.0806	0.0800	----	----	----	
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----	
tin, total	7440-31-5	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----	
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.0600 <sup>DLA</sup>	<0.0300 <sup>DLA</sup>	----	----	----	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----	
uranium, total	7440-61-1	E420	0.000010	mg/L	<0.00200 <sup>DLA</sup>	<0.00100 <sup>DLA</sup>	----	----	----	
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.100 <sup>DLA</sup>	<0.0500 <sup>DLA</sup>	----	----	----	
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.600 <sup>DLA</sup>	<0.300 <sup>DLA</sup>	----	----	----	
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.0400 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	----	
<b>Dissolved Metals</b>										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.100 <sup>DLA</sup>	<0.100 <sup>DLA</sup>	----	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	3.04	2.96	----	----	----	
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.00500 <sup>DLA</sup>	<0.00500 <sup>DLA</sup>	----	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	41.0	40.0	----	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.000500 <sup>DLA</sup>	<0.000500 <sup>DLA</sup>	----	----	----	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	12100	12300	----	----	----	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	1.00	1.02	----	----	----	
chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	----	
iron, dissolved	7439-89-6	E421	0.010	mg/L	2.94	2.83	----	----	----	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.00500 <sup>DLA</sup>	<0.00500 <sup>DLA</sup>	----	----	----	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Westbay-A-490	Westbay-A-490 -Dup	----	----	----
Client sampling date / time					25-Aug-2020 16:00	25-Aug-2020 16:00	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA20B4663-001	VA20B4663-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Dissolved Metals</b>										
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	42.9	42.6	----	----	----	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	3.61	3.68	----	----	----	
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.0393	0.0381	----	----	----	
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0104	0.0112	----	----	----	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.0500 <sup>DLA</sup>	<0.0500 <sup>DLA</sup>	----	----	----	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<5.00 <sup>DLA</sup>	<5.00 <sup>DLA</sup>	----	----	----	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	563	561	----	----	----	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	2.20	2.11	----	----	----	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.00500 <sup>DLA</sup>	<0.00500 <sup>DLA</sup>	----	----	----	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	<5.00 <sup>DLA</sup>	<5.00 <sup>DLA</sup>	----	----	----	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.00100 <sup>DLA</sup>	<0.00100 <sup>DLA</sup>	----	----	----	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	381	376	----	----	----	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	553	564	----	----	----	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<50.0 <sup>DLA</sup>	<50.0 <sup>DLA</sup>	----	----	----	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	0.0396	0.0457	----	----	----	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.0744	0.0757	----	----	----	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.0300 <sup>DLA</sup>	<0.0300 <sup>DLA</sup>	----	----	----	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	<0.00100 <sup>DLA</sup>	<0.00100 <sup>DLA</sup>	----	----	----	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.0500 <sup>DLA</sup>	<0.0500 <sup>DLA</sup>	----	----	----	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.100 <sup>DLA</sup>	<0.100 <sup>DLA</sup>	----	----	----	
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	----	
dissolved mercury filtration location	----	EP509	-	-	Field	Field	----	----	----	
dissolved metals filtration location	----	EP421	-	-	Field	Field	----	----	----	
<b>Aggregate Organics</b>										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<6.0 <sup>PHA</sup>	<6.0 <sup>PHA</sup>	----	----	----	
chemical oxygen demand [COD]	----	E559	20	mg/L	2240 <sup>DLM</sup>	2270 <sup>DLM</sup>	----	----	----	
oil & grease (gravimetric)	----	E567	5.0	mg/L	<5.0	<5.0	----	----	----	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Westbay-A-490	Westbay-A-490 -Dup	----	----	----
Client sampling date / time					25-Aug-2020 16:00	25-Aug-2020 16:00	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA20B4663-001	VA20B4663-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Volatile Organic Compounds</b>										
chlorobenzene	108-90-7	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
chloromethane	74-87-3	E611C	0.50	µg/L	<3.60 <sup>DLM</sup>	<3.20 <sup>DLM</sup>	----	----	----	
dichlorobenzene, 1,2-	95-50-1	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichlorobenzene, 1,3-	541-73-1	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichlorobenzene, 1,4-	106-46-7	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichloropropane, 1,2-	78-87-5	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichloropropylene, cis+trans-1,3-	542-75-6	E611C	0.75	µg/L	<0.75	<0.75	----	----	----	
dichloropropylene, cis-1,3-	10061-01-5	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
tetrachloroethane, 1,1,1,2,2-	79-34-5	E611C	0.20	µg/L	<0.20	<0.20	----	----	----	
trichloroethane, 1,1,2-	79-00-5	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
trichlorofluoromethane	75-69-4	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
<b>Volatile Organic Compounds [BTEXS+MTBE]</b>										
benzene	71-43-2	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
ethylbenzene	100-41-4	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
styrene	100-42-5	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
toluene	108-88-3	E611C	0.40	µg/L	1.55	1.36	----	----	----	
xylene, m+p-	179601-23-1	E611C	0.50	µg/L	0.64	0.52	----	----	----	
xylene, o-	95-47-6	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
xylenes, total	1330-20-7	E611C	0.75	µg/L	<0.75	<0.75	----	----	----	
<b>Volatile Organic Compounds [Drycleaning]</b>										
carbon tetrachloride	56-23-5	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
chloroethane	75-00-3	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichloroethane, 1,1-	75-34-3	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichloroethane, 1,2-	107-06-2	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichloroethylene, 1,1-	75-35-4	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichloroethylene, cis-1,2-	156-59-2	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichloroethylene, trans-1,2-	156-60-5	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichloromethane	75-09-2	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichloropropylene, trans-1,3-	10061-02-6	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	





## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Westbay-A-490	Westbay-A-490 -Dup	----	----	----
Client sampling date / time					25-Aug-2020 16:00	25-Aug-2020 16:00	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA20B4663-001	VA20B4663-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Volatile Organic Compounds [Drycleaning]</b>										
tetrachloroethylene	127-18-4	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
trichloroethane, 1,1,1-	71-55-6	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
trichloroethylene	79-01-6	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
vinyl chloride	75-01-4	E611C	0.40	µg/L	<0.40	<0.40	----	----	----	
<b>Volatile Organic Compounds [THMs]</b>										
bromodichloromethane	75-27-4	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
bromoform	75-25-2	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
chloroform	67-66-3	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dibromochloromethane	124-48-1	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
<b>Volatile Organic Compounds Surrogates</b>										
bromofluorobenzene, 4-	460-00-4	E611C	0.50	%	95.5	87.7	----	----	----	
difluorobenzene, 1,4-	540-36-3	E611C	0.50	%	97.6	100	----	----	----	
<b>Hydrocarbons</b>										
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	----	----	----	
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	----	----	----	
HEPHw	----	EC600A	250	µg/L	<250	<250	----	----	----	
LEPHw	----	EC600A	250	µg/L	<250	<250	----	----	----	
<b>Hydrocarbons Surrogates</b>										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	50	%	101	91.3	----	----	----	
<b>Polycyclic Aromatic Hydrocarbons</b>										
acenaphthene	83-32-9	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	
acenaphthylene	208-96-8	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	
acridine	260-94-6	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	
anthracene	120-12-7	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	
benz(a)anthracene	56-55-3	E641A	0.010	µg/L	<0.020 <sup>DLO</sup>	<0.020 <sup>DLO</sup>	----	----	----	
benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	<0.0050	<0.0050	----	----	----	
benzo(b+j)fluoranthene	----	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	
benzo(b+j+k)fluoranthene	----	E641A	0.015	µg/L	<0.015	<0.015	----	----	----	
benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	
benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	
chrysene	218-01-9	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Westbay-A-490	Westbay-A-490 -Dup	----	----	----
Client sampling date / time					25-Aug-2020 16:00	25-Aug-2020 16:00	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA20B4663-001	VA20B4663-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Polycyclic Aromatic Hydrocarbons</b>										
dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	<0.0050	<0.0050	----	----	----	
fluoranthene	206-44-0	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	
fluorene	86-73-7	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	
methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	0.048	0.045	----	----	----	
methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	0.060	0.058	----	----	----	
naphthalene	91-20-3	E641A	0.050	µg/L	0.073	0.074	----	----	----	
phenanthrene	85-01-8	E641A	0.020	µg/L	<0.020	<0.020	----	----	----	
pyrene	129-00-0	E641A	0.010	µg/L	0.022	0.021	----	----	----	
quinoline	6027-02-7	E641A	0.050	µg/L	<0.050	<0.050	----	----	----	
<b>Polycyclic Aromatic Hydrocarbons Surrogates</b>										
acridine-d9	34749-75-2	E641A	0.010	µg/L	0.856	0.833	----	----	----	
chrysene-d12	1719-03-5	E641A	0.010	%	115	110	----	----	----	
naphthalene-d8	1146-65-2	E641A	0.010	%	105	98.2	----	----	----	
phenanthrene-d10	1517-22-2	E641A	0.010	%	110	104	----	----	----	
<b>Radiological Parameters</b>										
radium-226	13982-63-3	RA226-MMER	0.082	Bq/L	---	2	----	----	----	
radium-226	13982-63-3	RA226-MMER	0.085	Bq/L	1.8	---	----	----	----	

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

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: <b>VA20B4663</b>	Page	: 1 of 20
Amendment	: 1		
Client	: <b>Golder Associates Ltd.</b>	Laboratory	: Vancouver - Environmental
Contact	: Adrian Kowalchuk	Account Manager	: Heather McKenzie
Address	: 1931 Robertson Road Ottawa ON Canada K2H 5B7	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 204 489 9600	Telephone	: +1 604 253 4188
Project	: 20136436-2300-2304	Date Samples Received	: 08-Sep-2020 08:25
PO	: VA20-AEML 100-001	Issue Date	: 03-Sep-2021 16:58
C-O-C number	: 17-766901		
Sampler	: PM		
Site	: Meliadine-Westbay A		
Quote number	: VA20-AEML100-001 (Q72802)		
No. of samples received	: 2		
No. of samples analysed	: 2		

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 Services number is a unique identifier assigned to discrete substances.

**DQO:** Data Quality Objective.

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

**RPD:** Relative Percent Difference.

## Summary of Outliers

### Outliers : Quality Control Samples

- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Method Blank value 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)

- Analysis Holding Time Outliers exist - please see following pages for full details.

### 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
<b>Method Blank (MB) Values</b>								
Physical Tests	QC-MRG3-8315100 1	----	alkalinity, total (as CaCO3)	----	E290	6.6 mg/L <sup>B</sup>	1.5 mg/L	Blank result exceeds permitted value
Physical Tests	QC-MRG3-8315100 1	----	alkalinity, bicarbonate (as CaCO3)	----	E290	6.6 mg/L <sup>B</sup>	1.5 mg/L	Blank result exceeds permitted value

**Result Qualifiers**

Qualifier	Description
<b>B</b>	<i>Method Blank exceeds ALS DQO. Associated sample results which are &lt; Limit of Reporting or &gt; 5 times blank level are considered reliable.</i>



## 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		
<b>Aggregate Organics : Biochemical Oxygen Demand - 5 day</b>											
<b>HDPE [BOD HT 3d]</b> Westbay-A-490	E550	25-Aug-2020	----	----	----		09-Sep-2020	3 days	15 days	*	EHTR
<b>Aggregate Organics : Biochemical Oxygen Demand - 5 day</b>											
<b>HDPE [BOD HT 3d]</b> Westbay-A-490-Dup	E550	25-Aug-2020	----	----	----		09-Sep-2020	3 days	15 days	*	EHTR
<b>Aggregate Organics : Chemical Oxygen Demand by Colourimetry</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-490	E559	25-Aug-2020	----	----	----		15-Sep-2020	28 days	21 days	✓	
<b>Aggregate Organics : Chemical Oxygen Demand by Colourimetry</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-490-Dup	E559	25-Aug-2020	----	----	----		15-Sep-2020	28 days	21 days	✓	
<b>Aggregate Organics : Oil &amp; Grease by Gravimetry</b>											
<b>Amber glass (hydrochloric acid)</b> Westbay-A-490	E567	25-Aug-2020	09-Sep-2020	28 days	15 days	✓	09-Sep-2020	40 days	0 days	✓	
<b>Aggregate Organics : Oil &amp; Grease by Gravimetry</b>											
<b>Amber glass (hydrochloric acid)</b> Westbay-A-490-Dup	E567	25-Aug-2020	09-Sep-2020	28 days	15 days	✓	09-Sep-2020	40 days	0 days	✓	
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-490	E298	25-Aug-2020	14-Sep-2020	----	----		15-Sep-2020	28 days	21 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		
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-490-Dup	E298	25-Aug-2020	14-Sep-2020	----	----		15-Sep-2020	28 days	21 days	✓	
<b>Anions and Nutrients : Bromide in Water by IC (Low Level)</b>											
<b>HDPE</b> Westbay-A-490	E235.Br-L	25-Aug-2020	----	----	----		09-Sep-2020	28 days	15 days	✓	
<b>Anions and Nutrients : Bromide in Water by IC (Low Level)</b>											
<b>HDPE</b> Westbay-A-490-Dup	E235.Br-L	25-Aug-2020	----	----	----		09-Sep-2020	28 days	15 days	✓	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
<b>HDPE</b> Westbay-A-490	E235.Cl	25-Aug-2020	----	----	----		09-Sep-2020	28 days	15 days	✓	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
<b>HDPE</b> Westbay-A-490-Dup	E235.Cl	25-Aug-2020	----	----	----		09-Sep-2020	28 days	15 days	✓	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)</b>											
<b>HDPE</b> Westbay-A-490	E378-U	25-Aug-2020	----	----	----		09-Sep-2020	3 days	15 days	* EHTR	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)</b>											
<b>HDPE</b> Westbay-A-490-Dup	E378-U	25-Aug-2020	----	----	----		09-Sep-2020	3 days	15 days	* EHTR	
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
<b>HDPE</b> Westbay-A-490	E235.F	25-Aug-2020	----	----	----		09-Sep-2020	28 days	15 days	✓	
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
<b>HDPE</b> Westbay-A-490-Dup	E235.F	25-Aug-2020	----	----	----		09-Sep-2020	28 days	15 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 Rec Actual		Eval	Analysis Date	Holding Times Rec Actual		Eval
<b>Anions and Nutrients : Nitrate in Water by IC (Low Level)</b>										
HDPE Westbay-A-490	E235.NO3-L	25-Aug-2020	----	----	----		09-Sep-2020	3 days	15 days	* EHTR
<b>Anions and Nutrients : Nitrate in Water by IC (Low Level)</b>										
HDPE Westbay-A-490-Dup	E235.NO3-L	25-Aug-2020	----	----	----		09-Sep-2020	3 days	15 days	* EHTR
<b>Anions and Nutrients : Nitrite in Water by IC (Low Level)</b>										
HDPE Westbay-A-490	E235.NO2-L	25-Aug-2020	----	----	----		09-Sep-2020	3 days	15 days	* EHTR
<b>Anions and Nutrients : Nitrite in Water by IC (Low Level)</b>										
HDPE Westbay-A-490-Dup	E235.NO2-L	25-Aug-2020	----	----	----		09-Sep-2020	3 days	15 days	* EHTR
<b>Anions and Nutrients : Reactive Silica by Colourimetry</b>										
HDPE Westbay-A-490	E392	25-Aug-2020	----	----	----		15-Sep-2020	28 days	21 days	✓
<b>Anions and Nutrients : Reactive Silica by Colourimetry</b>										
HDPE Westbay-A-490-Dup	E392	25-Aug-2020	----	----	----		15-Sep-2020	28 days	21 days	✓
<b>Anions and Nutrients : Sulfate in Water by IC</b>										
HDPE Westbay-A-490	E235.SO4	25-Aug-2020	----	----	----		09-Sep-2020	28 days	15 days	✓
<b>Anions and Nutrients : Sulfate in Water by IC</b>										
HDPE Westbay-A-490-Dup	E235.SO4	25-Aug-2020	----	----	----		09-Sep-2020	28 days	15 days	✓
<b>Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)</b>										
<b>Amber glass total (sulfuric acid)</b> Westbay-A-490	E318	25-Aug-2020	14-Sep-2020	----	----		23-Sep-2020	28 days	28 days	* EHTR



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		
<b>Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-490-Dup	E318	25-Aug-2020	14-Sep-2020	----	----		23-Sep-2020	28 days	28 days	*	
<b>Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-490	E372-U	25-Aug-2020	14-Sep-2020	----	----		15-Sep-2020	28 days	20 days	✓	
<b>Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-490-Dup	E372-U	25-Aug-2020	14-Sep-2020	----	----		15-Sep-2020	28 days	20 days	✓	
<b>Cyanides : Free Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-490	E339	25-Aug-2020	----	----	----		09-Sep-2020	14 days	15 days	*	
<b>Cyanides : Free Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-490-Dup	E339	25-Aug-2020	----	----	----		09-Sep-2020	14 days	15 days	*	
<b>Cyanides : Total Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-490	E333	25-Aug-2020	----	----	----		09-Sep-2020	14 days	15 days	*	
<b>Cyanides : Total Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-490-Dup	E333	25-Aug-2020	----	----	----		09-Sep-2020	14 days	15 days	*	
<b>Cyanides : WAD Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-490	E336	25-Aug-2020	----	----	----		09-Sep-2020	14 days	15 days	*	
<b>Cyanides : WAD Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-490-Dup	E336	25-Aug-2020	----	----	----		09-Sep-2020	14 days	15 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		
<b>Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)</b>											
<b>HDPE dissolved (nitric acid)</b> Westbay-A-490	E421.Cr-L	25-Aug-2020	10-Sep-2020	----	----		11-Sep-2020	180 days	16 days	✓	
<b>Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)</b>											
<b>HDPE dissolved (nitric acid)</b> Westbay-A-490-Dup	E421.Cr-L	25-Aug-2020	10-Sep-2020	----	----		11-Sep-2020	180 days	16 days	✓	
<b>Dissolved Metals : Dissolved Mercury in Water by CVAAS</b>											
<b>Glass vial dissolved (hydrochloric acid)</b> Westbay-A-490	E509	25-Aug-2020	14-Sep-2020	----	----		14-Sep-2020	28 days	20 days	✓	
<b>Dissolved Metals : Dissolved Mercury in Water by CVAAS</b>											
<b>Glass vial dissolved (hydrochloric acid)</b> Westbay-A-490-Dup	E509	25-Aug-2020	14-Sep-2020	----	----		14-Sep-2020	28 days	20 days	✓	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
<b>HDPE dissolved (nitric acid)</b> Westbay-A-490	E421	25-Aug-2020	10-Sep-2020	----	----		11-Sep-2020	180 days	16 days	✓	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
<b>HDPE dissolved (nitric acid)</b> Westbay-A-490-Dup	E421	25-Aug-2020	10-Sep-2020	----	----		11-Sep-2020	180 days	16 days	✓	
<b>Hydrocarbons : BC PHC - EPH by GC-FID</b>											
<b>Amber glass/Teflon lined cap (sodium bisulfate)</b> Westbay-A-490	E601A	25-Aug-2020	09-Sep-2020	14 days	15 days	* EHTL	10-Sep-2020	40 days	1 days	✓	
<b>Hydrocarbons : BC PHC - EPH by GC-FID</b>											
<b>Amber glass/Teflon lined cap (sodium bisulfate)</b> Westbay-A-490-Dup	E601A	25-Aug-2020	09-Sep-2020	14 days	15 days	* EHTL	10-Sep-2020	40 days	1 days	✓	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
<b>Amber glass dissolved (sulfuric acid)</b> Westbay-A-490	E358-L	25-Aug-2020	17-Sep-2020	----	----		17-Sep-2020	28 days	23 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		
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
<b>Amber glass dissolved (sulfuric acid)</b> Westbay-A-490-Dup	E358-L	25-Aug-2020	17-Sep-2020	----	----		17-Sep-2020	28 days	23 days	✓	
<b>Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-490	E355-L	25-Aug-2020	14-Sep-2020	----	----		15-Sep-2020	28 days	21 days	✓	
<b>Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-490-Dup	E355-L	25-Aug-2020	14-Sep-2020	----	----		15-Sep-2020	28 days	21 days	✓	
<b>Physical Tests : Alkalinity Species by Titration</b>											
<b>HDPE</b> Westbay-A-490	E290	25-Aug-2020	----	----	----		09-Sep-2020	14 days	15 days	*	
<b>Physical Tests : Alkalinity Species by Titration</b>											
<b>HDPE</b> Westbay-A-490-Dup	E290	25-Aug-2020	----	----	----		09-Sep-2020	14 days	15 days	*	
<b>Physical Tests : Conductivity in Water</b>											
<b>HDPE</b> Westbay-A-490	E100	25-Aug-2020	----	----	----		09-Sep-2020	28 days	15 days	✓	
<b>Physical Tests : Conductivity in Water</b>											
<b>HDPE</b> Westbay-A-490-Dup	E100	25-Aug-2020	----	----	----		09-Sep-2020	28 days	15 days	✓	
<b>Physical Tests : pH by Meter</b>											
<b>HDPE</b> Westbay-A-490	E108	25-Aug-2020	----	----	----		09-Sep-2020	0.25 hrs	352 hrs	* EHTR-FM	
<b>Physical Tests : pH by Meter</b>											
<b>HDPE</b> Westbay-A-490-Dup	E108	25-Aug-2020	----	----	----		09-Sep-2020	0.25 hrs	352 hrs	* EHTR-FM	



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		
<b>Physical Tests : TDS by Gravimetry</b>											
HDPE Westbay-A-490	E162	25-Aug-2020	----	----	----		08-Sep-2020	7 days	14 days	*	EHTR
<b>Physical Tests : TDS by Gravimetry</b>											
HDPE Westbay-A-490-Dup	E162	25-Aug-2020	----	----	----		08-Sep-2020	7 days	14 days	*	EHTR
<b>Physical Tests : TSS by Gravimetry</b>											
HDPE Westbay-A-490	E160-H	25-Aug-2020	----	----	----		09-Sep-2020	7 days	14 days	*	EHTR
<b>Physical Tests : TSS by Gravimetry</b>											
HDPE Westbay-A-490-Dup	E160-H	25-Aug-2020	----	----	----		09-Sep-2020	7 days	14 days	*	EHTR
<b>Physical Tests : Turbidity by Nephelometry</b>											
HDPE Westbay-A-490	E121	25-Aug-2020	----	----	----		09-Sep-2020	3 days	15 days	*	EHTR
<b>Physical Tests : Turbidity by Nephelometry</b>											
HDPE Westbay-A-490-Dup	E121	25-Aug-2020	----	----	----		09-Sep-2020	3 days	15 days	*	EHTR
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS</b>											
Amber glass/Teflon lined cap (sodium bisulfate) Westbay-A-490	E641A	25-Aug-2020	09-Sep-2020	14 days	15 days	*	09-Sep-2020	40 days	1 days	✓	EHTL
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS</b>											
Amber glass/Teflon lined cap (sodium bisulfate) Westbay-A-490-Dup	E641A	25-Aug-2020	09-Sep-2020	14 days	15 days	*	09-Sep-2020	40 days	1 days	✓	EHTL
<b>Radiological Parameters : Radium-226 by Radon Emanation</b>											
HDPE (nitric acid) Westbay-A-490	RA226-MMER	25-Aug-2020	----	----	----		24-Sep-2020	180 days	30 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		
<b>Radiological Parameters : Radium-226 by Radon Emanation</b>											
<b>HDPE (nitric acid)</b> Westbay-A-490-Dup	RA226-MMER	25-Aug-2020	----	----	----		24-Sep-2020	180 days	30 days	✔	
<b>Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)</b>											
<b>HDPE total (nitric acid)</b> Westbay-A-490-Dup	E420.Cr-L	25-Aug-2020	----	----	----		11-Sep-2020	180 days	17 days	✔	
<b>Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)</b>											
<b>HDPE total (nitric acid)</b> Westbay-A-490	E420.Cr-L	25-Aug-2020	----	----	----		14-Sep-2020	180 days	20 days	✔	
<b>Total Metals : Total Mercury in Water by CVAAS</b>											
<b>Glass vial total (hydrochloric acid)</b> Westbay-A-490	E508	25-Aug-2020	----	----	----		13-Sep-2020	28 days	19 days	✔	
<b>Total Metals : Total Mercury in Water by CVAAS</b>											
<b>Glass vial total (hydrochloric acid)</b> Westbay-A-490-Dup	E508	25-Aug-2020	----	----	----		13-Sep-2020	28 days	19 days	✔	
<b>Total Metals : Total Metals in Water by CRC ICPMS</b>											
<b>HDPE total (nitric acid)</b> Westbay-A-490-Dup	E420	25-Aug-2020	----	----	----		11-Sep-2020	180 days	17 days	✔	
<b>Total Metals : Total Metals in Water by CRC ICPMS</b>											
<b>HDPE total (nitric acid)</b> Westbay-A-490	E420	25-Aug-2020	----	----	----		14-Sep-2020	180 days	20 days	✔	
<b>Volatile Organic Compounds : VOCs (BC List) by Headspace GC-MS</b>											
<b>Glass vial (sodium bisulfate)</b> Westbay-A-490	E611C	25-Aug-2020	09-Sep-2020	----	----		09-Sep-2020	----	----		
<b>Volatile Organic Compounds : VOCs (BC List) by Headspace GC-MS</b>											
<b>Glass vial (sodium bisulfate)</b> Westbay-A-490-Dup	E611C	25-Aug-2020	09-Sep-2020	----	----		09-Sep-2020	----	----		



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	
<b>Volatile Organic Compounds [BTEXS+MTBE] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay-A-490	E611C	25-Aug-2020	09-Sep-2020	----	----		09-Sep-2020	14 days	15 days	*
<b>Volatile Organic Compounds [BTEXS+MTBE] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay-A-490-Dup	E611C	25-Aug-2020	09-Sep-2020	----	----		09-Sep-2020	14 days	15 days	*
<b>Volatile Organic Compounds [Drycleaning] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay-A-490	E611C	25-Aug-2020	09-Sep-2020	----	----		09-Sep-2020	----	----	
<b>Volatile Organic Compounds [Drycleaning] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay-A-490-Dup	E611C	25-Aug-2020	09-Sep-2020	----	----		09-Sep-2020	----	----	
<b>Volatile Organic Compounds [THMs] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay-A-490	E611C	25-Aug-2020	09-Sep-2020	----	----		09-Sep-2020	----	----	
<b>Volatile Organic Compounds [THMs] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay-A-490-Dup	E611C	25-Aug-2020	09-Sep-2020	----	----		09-Sep-2020	----	----	

**Legend & Qualifier Definitions**

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended  
 EHTR: Exceeded ALS recommended hold time prior to sample receipt.  
 EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.  
 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 (%)		Evaluation
			QC	Regular	Actual	Expected	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity Species by Titration	E290	83152	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	85676	1	15	6.6	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	83463	1	10	10.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	83156	1	19	5.2	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	85916	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	83154	1	19	5.2	5.0	✓
Conductivity in Water	E100	83151	1	15	6.6	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	84254	1	17	5.8	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	85441	1	4	25.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	84255	1	17	5.8	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	87122	1	9	11.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	83160	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	83155	1	19	5.2	5.0	✓
Free Cyanide by CFA	E339	83512	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	83157	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	83158	1	19	5.2	5.0	✓
pH by Meter	E108	83150	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	86182	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	83159	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	83100	1	5	20.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	84719	2	35	5.7	5.0	✓
Total Cyanide by CFA	E333	83513	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	85677	1	2	50.0	5.0	✓
Total Mercury in Water by CVAAS	E508	85274	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	84718	2	36	5.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	85678	1	2	50.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	85675	1	15	6.6	5.0	✓
TSS by Gravimetry	E160-H	83134	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	83296	1	20	5.0	5.0	✓
VOCs (BC List) by Headspace GC-MS	E611C	83260	1	11	9.0	5.0	✓
WAD Cyanide by CFA	E336	83511	1	4	25.0	5.0	✓
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity Species by Titration	E290	83152	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	85676	1	15	6.6	5.0	✓
BC PHC - EPH by GC-FID	E601A	83213	1	8	12.5	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	83463	1	10	10.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	83156	1	19	5.2	5.0	✓



Matrix: **Water**

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
<b>Analytical Methods</b>							
<b>Laboratory Control Samples (LCS) - Continued</b>							
Chemical Oxygen Demand by Colourimetry	E559	85916	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	83154	1	19	5.2	5.0	✓
Conductivity in Water	E100	83151	1	15	6.6	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	84254	1	17	5.8	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	85441	1	4	25.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	84255	1	17	5.8	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	87122	1	9	11.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	83160	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	83155	1	19	5.2	5.0	✓
Free Cyanide by CFA	E339	83512	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	83157	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	83158	1	19	5.2	5.0	✓
Oil & Grease by Gravimetry	E567	83354	1	5	20.0	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	83214	1	8	12.5	5.0	✓
pH by Meter	E108	83150	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	86182	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	83159	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	83100	1	5	20.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	84719	2	35	5.7	5.0	✓
Total Cyanide by CFA	E333	83513	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	85677	1	2	50.0	5.0	✓
Total Mercury in Water by CVAAS	E508	85274	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	84718	2	36	5.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	85678	1	2	50.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	85675	1	15	6.6	5.0	✓
TSS by Gravimetry	E160-H	83134	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	83296	1	20	5.0	5.0	✓
VOCs (BC List) by Headspace GC-MS	E611C	83260	1	11	9.0	5.0	✓
WAD Cyanide by CFA	E336	83511	1	4	25.0	5.0	✓
<b>Method Blanks (MB)</b>							
Alkalinity Species by Titration	E290	83152	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	85676	1	15	6.6	5.0	✓
BC PHC - EPH by GC-FID	E601A	83213	1	8	12.5	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	83463	1	10	10.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	83156	1	19	5.2	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	85916	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	83154	1	19	5.2	5.0	✓
Conductivity in Water	E100	83151	1	15	6.6	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	84254	1	17	5.8	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	85441	1	4	25.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	84255	1	17	5.8	5.0	✓



Matrix: **Water**

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	87122	1	9	11.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	83160	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	83155	1	19	5.2	5.0	✓
Free Cyanide by CFA	E339	83512	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	83157	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	83158	1	19	5.2	5.0	✓
Oil & Grease by Gravimetry	E567	83354	1	5	20.0	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	83214	1	8	12.5	5.0	✓
Reactive Silica by Colourimetry	E392	86182	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	83159	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	83100	1	5	20.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	84719	2	35	5.7	5.0	✓
Total Cyanide by CFA	E333	83513	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	85677	1	2	50.0	5.0	✓
Total Mercury in Water by CVAAS	E508	85274	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	84718	2	36	5.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	85678	1	2	50.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	85675	1	15	6.6	5.0	✓
TSS by Gravimetry	E160-H	83134	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	83296	1	20	5.0	5.0	✓
VOCs (BC List) by Headspace GC-MS	E611C	83260	1	11	9.0	5.0	✓
WAD Cyanide by CFA	E336	83511	1	4	25.0	5.0	✓
<b>Matrix Spikes (MS)</b>							
Ammonia by Fluorescence	E298	85676	1	15	6.6	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	83156	1	19	5.2	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	85916	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	83154	1	19	5.2	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	84254	1	17	5.8	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	85441	1	4	25.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	84255	1	17	5.8	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	87122	1	9	11.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	83160	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	83155	1	19	5.2	5.0	✓
Free Cyanide by CFA	E339	83512	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	83157	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	83158	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	86182	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	83159	1	19	5.2	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	84719	2	35	5.7	5.0	✓
Total Cyanide by CFA	E333	83513	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	85677	1	2	50.0	5.0	✓





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
<i>Analytical Methods</i>							
<b>Matrix Spikes (MS) - Continued</b>							
Total Mercury in Water by CVAAS	E508	85274	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	84718	2	36	5.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	85678	1	2	50.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	85675	1	15	6.6	5.0	✓
VOCs (BC List) by Headspace GC-MS	E611C	83260	1	11	9.0	5.0	✓
WAD Cyanide by CFA	E336	83511	1	4	25.0	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
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Vancouver - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TSS by Gravimetry	E160-H Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Vancouver - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC (Low Level)	E235.Br-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Sulfate in Water by IC	E235.SO4  Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290  Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298  Vancouver - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318  Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.
Total Cyanide by CFA	E333  Vancouver - Environmental	Water	ISO 14403 (mod)	Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.
WAD Cyanide by CFA	E336  Vancouver - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.
Free Cyanide by CFA	E339  Vancouver - Environmental	Water	ASTM D7237 (mod)	Free cyanide is determined by in-line gas diffusion at pH 6 with final determination by colourimetric analysis.
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L  Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L  Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U Vancouver - Environmental	Water	APHA 4500-P E (mod)	Dissolved Orthophosphate is determined colourimetrically on a water sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Total Metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L Vancouver - Environmental	Water	APHA 3030 B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Biochemical Oxygen Demand - 5 day	E550 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter.  Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry	E559	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
	Vancouver - Environmental			
Oil & Grease by Gravimetry	E567 Vancouver - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane and the extract is evaporated to dryness. The residue is then weighed to determine Oil and Grease.
BC PHC - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Extractable Petroleum Hydrocarbons (EPH) are analyzed by GC-FID.
VOCs (BC List) by Headspace GC-MS	E611C Vancouver - 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.
PAHs by Hexane LVI GC-MS	E641A Vancouver - Environmental	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO <sub>3</sub> ), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO <sub>3</sub> equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO <sub>3</sub> ), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO <sub>3</sub> equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
Salinity in Seawater (calculation)	EC100S Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a seawater sample. Conductivity measurements are temperature-compensated to 25°C. Salinity in Practical Salinity Units is calculated.
LEPH and HEPH: EPH-PAH	EC600A Vancouver - Environmental	Water	BC MOE Lab Manual (LEPH and HEPH) (mod)	Light Extractable Petroleum Hydrocarbons (LEPH) and Heavy Extractable Petroleum Hydrocarbons (HEPH) are calculated as follows: LEPH = Extractable Petroleum Hydrocarbons (EPH10-19) minus Acenaphthene, Acridine, Anthracene, Fluorene, Naphthalene and Phenanthrene; HEPH = Extractable Petroleum Hydrocarbons (EPH19-32) minus Benz(a)anthracene, Benzo(a)pyrene, Fluoranthene, and Pyrene.
Radium-226 by Radon Emanation	RA226-MMER Fort Collins - Environmental - 225 Commerce Drive Fort Collins Colorado United States 80524	Water	EPA 903.1	Radium-226 in sample was analyzed according to the current revision of SOP 783.



Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298  Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318  Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Preparation for Total Organic Carbon by Combustion	EP355  Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358  Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372  Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421  Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509  Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
Oil & Grease Extraction for Gravimetry	EP567  Vancouver - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane by liquid-liquid extraction.
VOCs Preparation for Headspace Analysis	EP581  Vancouver - 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  Vancouver - 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 : VA20B4663
Amendment : 1

Page : 1 of 29

Client : Golder Associates Ltd.
Contact : Adrian Kowalchuk
Address : # 400 - 543 Granville Street
Vancouver BC Canada V6C 1X8
Telephone : 204 489 9600
Project : 20136436-2300-2304
PO : VA20-AEML 100-001
C-O-C number : 17-766901
Sampler : PM
Site : Meliadine-Westbay A
Quote number : VA20-AEML100-001 (Q72802)
No. of samples received : 2
No. of samples analysed : 2

Laboratory : Vancouver - Environmental
Account Manager : Heather McKenzie
Address : 8081 Lougheed Highway
Burnaby, British Columbia Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 08-Sep-2020 08:25
Date Analysis Commenced : 08-Sep-2020
Issue Date : 03-Sep-2021 16:57

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 Percentage Difference (RPD) and Acceptance Limits
Matrix Spike (MS) Report; Recovery and Acceptance Limits
Reference Material (RM) Report; Recovery and Acceptance Limits
Method Blank (MB) Report; Recovery and Acceptance Limits
Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

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.

Table with 3 columns: Signatories, Position, Laboratory Department. Lists names like Annabelle Prasad, Brieanna Allen, Bruna Botti, etc., along with their roles and departments.

Page : 2 of 29  
Work Order : VA20B4663 Amendment 1  
Client : Golder Associates Ltd.  
Project : 20136436-2300-2304

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## **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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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





### 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: <b>Water</b>					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
<b>Physical Tests (QC Lot: 83100)</b>											
VA20B4594-007	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	251	267	6.19%	20%	----
<b>Physical Tests (QC Lot: 83134)</b>											
VA20B4559-002	Anonymous	solids, total suspended [TSS]	----	E160-H	3.0	mg/L	5.1	6.7	1.6	Diff <2x LOR	----
<b>Physical Tests (QC Lot: 83150)</b>											
VA20B4662-001	Anonymous	pH	----	E108	0.10	pH units	7.18	7.18	0.00%	4%	----
<b>Physical Tests (QC Lot: 83151)</b>											
VA20B4662-001	Anonymous	conductivity	----	E100	2.0	µS/cm	661	651	1.52%	10%	----
<b>Physical Tests (QC Lot: 83152)</b>											
VA20B4662-001	Anonymous	alkalinity, bicarbonate (as CaCO3)	----	E290	2.0	mg/L	55.5	53.0	4.61%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	55.5	53.0	4.61%	20%	----
<b>Physical Tests (QC Lot: 83296)</b>											
VA20B4594-006	Anonymous	turbidity	----	E121	0.10	NTU	0.87	0.81	0.05	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 83154)</b>											
VA20B4472-001	Anonymous	chloride	16887-00-6	E235.Cl	5000	mg/L	118000 µg/L	116	2.04%	20%	----
<b>Anions and Nutrients (QC Lot: 83155)</b>											
VA20B4472-001	Anonymous	fluoride	16984-48-8	E235.F	200	mg/L	<200 µg/L	0.203	0.003	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 83156)</b>											
VA20B4472-001	Anonymous	bromide	24959-67-9	E235.Br-L	500	mg/L	<500 µg/L	<0.500	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 83157)</b>											
VA20B4472-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	50.0	mg/L	<50.0 µg/L	<0.0500	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 83158)</b>											
VA20B4472-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	10.0	mg/L	<10.0 µg/L	<0.0100	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 83159)</b>											
VA20B4472-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	3000	mg/L	65500 µg/L	63.4	3.32%	20%	----
<b>Anions and Nutrients (QC Lot: 83160)</b>											
VA20B4630-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0205	0.0211	3.22%	20%	----
<b>Anions and Nutrients (QC Lot: 85675)</b>											
VA20B4656-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0758	0.0780	2.79%	20%	----



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
<b>Anions and Nutrients (QC Lot: 85676)</b>											
VA20B4656-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0208	0.0208	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 85677)</b>											
VA20B4663-001	Westbay-A-490	Kjeldahl nitrogen, total [TKN]	----	E318	1.00	mg/L	40.6	40.7	0.247%	20%	----
<b>Anions and Nutrients (QC Lot: 86182)</b>											
VA20B4610-021	Anonymous	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	0.55	0.52	0.03	Diff <2x LOR	----
<b>Cyanides (QC Lot: 83511)</b>											
VA20B4662-001	Anonymous	cyanide, weak acid dissociable	----	E336	0.0400	mg/L	<0.0400	<0.0400	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 83512)</b>											
VA20B4662-001	Anonymous	cyanide, free	----	E339	0.0400	mg/L	<0.0400	<0.0400	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 83513)</b>											
VA20B4662-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.0400	mg/L	<0.0400	<0.0400	0	Diff <2x LOR	----
<b>Organic / Inorganic Carbon (QC Lot: 85678)</b>											
VA20B4663-001	Westbay-A-490	carbon, total organic [TOC]	----	E355-L	5.00	mg/L	211	219	3.95%	20%	----
<b>Organic / Inorganic Carbon (QC Lot: 87122)</b>											
VA20B4663-001	Westbay-A-490	carbon, dissolved organic [DOC]	----	E358-L	5.00	mg/L	170	178	4.64%	20%	----
<b>Total Metals (QC Lot: 84718)</b>											
VA20B4610-018	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0070	0.0066	0.0004	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00016	0.00015	0.000004	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.00329	0.00314	4.67%	20%	----
		beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	1.27	1.26	1.16%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	0.025	0.024	0.0010	Diff <2x LOR	----
		lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	0.564	0.555	1.59%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.00401	0.00389	2.95%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----



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
<b>Total Metals (QC Lot: 84718) - continued</b>											
VA20B4610-018	Anonymous	phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	0.314	0.304	0.010	Diff <2x LOR	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00047	0.00050	0.00003	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	0.32	0.31	0.01	Diff <2x LOR	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	17341-25-2	E420	0.050	mg/L	0.601	0.597	0.668%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.00818	0.00789	3.62%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000052	0.000052	0.0000004	Diff <2x LOR	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
<b>Total Metals (QC Lot: 84719)</b>											
VA20B4610-018	Anonymous	chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
<b>Total Metals (QC Lot: 85274)</b>											
VA20B4662-001	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
<b>Total Metals (QC Lot: 85453)</b>											
VA20B4656-001	Anonymous	chromium, total	7440-47-3	E420.Cr-L	0.100	mg/L	2.78 µg/L	0.00305	9.27%	20%	----
<b>Total Metals (QC Lot: 85454)</b>											
VA20B4656-001	Anonymous	aluminum, total	7429-90-5	E420	3.00	mg/L	1650 µg/L	1.80	8.54%	20%	----
		antimony, total	7440-36-0	E420	0.100	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.100	mg/L	0.98 µg/L	0.00098	0.000002	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.100	mg/L	29.0 µg/L	0.0305	5.03%	20%	----
		beryllium, total	7440-41-7	E420	0.100	mg/L	<0.100 µg/L	<0.000100	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.0500	mg/L	<0.050 µg/L	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	10.0	mg/L	<10 µg/L	<0.010	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.00500	mg/L	0.0381 µg/L	0.0000354	0.0000028	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	50.0	mg/L	18400 µg/L	19.1	4.19%	20%	----



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
<b>Total Metals (QC Lot: 85454) - continued</b>											
VA20B4656-001	Anonymous	cesium, total	7440-46-2	E420	0.0100	mg/L	0.135 µg/L	0.000152	11.3%	20%	----
		cobalt, total	7440-48-4	E420	0.100	mg/L	1.27 µg/L	0.00130	2.33%	20%	----
		copper, total	7440-50-8	E420	0.500	mg/L	3.96 µg/L	0.00417	0.00021	Diff <2x LOR	----
		iron, total	7439-89-6	E420	10.0	mg/L	2400 µg/L	2.57	6.84%	20%	----
		lead, total	7439-92-1	E420	0.0500	mg/L	0.870 µg/L	0.000922	5.79%	20%	----
		lithium, total	7439-93-2	E420	1.00	mg/L	2.3 µg/L	0.0026	0.0002	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	5.00	mg/L	4460 µg/L	4.58	2.86%	20%	----
		manganese, total	7439-96-5	E420	0.100	mg/L	60.4 µg/L	0.0624	3.20%	20%	----
		molybdenum, total	7439-98-7	E420	0.0500	mg/L	0.563 µg/L	0.000619	9.37%	20%	----
		nickel, total	7440-02-0	E420	0.500	mg/L	4.31 µg/L	0.00451	0.00020	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	50.0	mg/L	83 µg/L	0.082	0.0010	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	50.0	mg/L	939 µg/L	0.963	2.52%	20%	----
		rubidium, total	7440-17-7	E420	0.200	mg/L	2.22 µg/L	0.00238	6.82%	20%	----
		selenium, total	7782-49-2	E420	0.0500	mg/L	0.106 µg/L	0.000118	0.000012	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	100	mg/L	4820 µg/L	5.01	3.82%	20%	----
		silver, total	7440-22-4	E420	0.0100	mg/L	0.010 µg/L	0.000011	0.0000004	Diff <2x LOR	----
		sodium, total	17341-25-2	E420	50.0	mg/L	2260 µg/L	2.24	1.02%	20%	----
		strontium, total	7440-24-6	E420	0.200	mg/L	94.5 µg/L	0.0952	0.718%	20%	----
		sulfur, total	7704-34-9	E420	500	mg/L	2490 µg/L	2.51	0.02	Diff <2x LOR	----
		tellurium, total	13494-80-9	E420	0.200	mg/L	<0.20 µg/L	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.0100	mg/L	0.015 µg/L	0.000014	0.0000003	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.100	mg/L	0.24 µg/L	0.00030	0.00006	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.100	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.300	mg/L	61.8 µg/L	0.0688	10.8%	20%	----
		tungsten, total	7440-33-7	E420	0.100	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.0100	mg/L	0.276 µg/L	0.000286	3.62%	20%	----
		vanadium, total	7440-62-2	E420	0.500	mg/L	4.11 µg/L	0.00433	0.00022	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	3.00	mg/L	6.8 µg/L	0.0068	0.00004	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.200	mg/L	0.35 µg/L	0.00038	0.00003	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 84254)</b>											
VA20B4610-001	Anonymous	chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 84255)</b>											
VA20B4610-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0029	0.0023	0.0006	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----



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
<b>Dissolved Metals (QC Lot: 84255) - continued</b>											
VA20B4610-001	Anonymous	barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.00167	0.00168	0.783%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	1.15	1.17	2.08%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00033	0.00031	0.00002	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	0.646	0.653	1.16%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00025	0.00022	0.00003	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.362	0.373	0.011	Diff <2x LOR	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00050	0.00053	0.00003	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	0.128	0.133	0.004	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	0.050	mg/L	0.535	0.541	1.23%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.00626	0.00633	1.12%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000048	0.000046	0.000002	Diff <2x LOR	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----



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
<b>Dissolved Metals (QC Lot: 85441)</b>											
VA20B4662-001	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
<b>Aggregate Organics (QC Lot: 83463)</b>											
VA20B4711-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	6.0	mg/L	23.6	21.6	8.76%	30%	----
<b>Aggregate Organics (QC Lot: 85916)</b>											
VA20B4662-001	Anonymous	chemical oxygen demand [COD]	----	E559	20	mg/L	147	148	1	Diff <2x LOR	----
<b>Volatile Organic Compounds (QC Lot: 83260)</b>											
VA20B4359-006	Anonymous	benzene	71-43-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		bromodichloromethane	75-27-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		bromoform	75-25-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		carbon tetrachloride	56-23-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chlorobenzene	108-90-7	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloroethane	75-00-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloroform	67-66-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloromethane	74-87-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dibromochloromethane	124-48-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorobenzene, 1,2-	95-50-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorobenzene, 1,3-	541-73-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorobenzene, 1,4-	106-46-7	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethane, 1,1-	75-34-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethane, 1,2-	107-06-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, 1,1-	75-35-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, cis-1,2-	156-59-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, trans-1,2-	156-60-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloromethane	75-09-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloropropane, 1,2-	78-87-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloropropylene, cis-1,3-	10061-01-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloropropylene, trans-1,3-	10061-02-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tetrachloroethane, 1,1,1,2,2-	79-34-5	E611C	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		tetrachloroethylene	127-18-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611C	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		trichloroethane, 1,1,1-	71-55-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----

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 Work Order : VA20B4663 Amendment 1  
 Client : Golder Associates Ltd.  
 Project : 20136436-2300-2304



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>
<b>Volatile Organic Compounds (QC Lot: 83260) - continued</b>											
VA20B4359-006	Anonymous	trichloroethane, 1,1,2-	79-00-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichloroethylene	79-01-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichlorofluoromethane	75-69-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		vinyl chloride	75-01-4	E611C	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611C	0.50	µg/L	<0.50	<0.50	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
<b>Physical Tests (QCLot: 83100)</b>						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
<b>Physical Tests (QCLot: 83134)</b>						
solids, total suspended [TSS]	----	E160-H	3	mg/L	<3.0	----
<b>Physical Tests (QCLot: 83151)</b>						
conductivity	----	E100	1	µS/cm	<1.0	----
<b>Physical Tests (QCLot: 83152)</b>						
alkalinity, bicarbonate (as CaCO <sub>3</sub> )	----	E290	1	mg/L	# 6.6	B
alkalinity, carbonate (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, hydroxide (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, phenolphthalein (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, total (as CaCO <sub>3</sub> )	----	E290	1	mg/L	# 6.6	B
<b>Physical Tests (QCLot: 83296)</b>						
turbidity	----	E121	0.1	NTU	<0.10	----
<b>Anions and Nutrients (QCLot: 83154)</b>						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
<b>Anions and Nutrients (QCLot: 83155)</b>						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
<b>Anions and Nutrients (QCLot: 83156)</b>						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
<b>Anions and Nutrients (QCLot: 83157)</b>						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
<b>Anions and Nutrients (QCLot: 83158)</b>						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
<b>Anions and Nutrients (QCLot: 83159)</b>						
sulfate (as SO <sub>4</sub> )	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
<b>Anions and Nutrients (QCLot: 83160)</b>						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
<b>Anions and Nutrients (QCLot: 85675)</b>						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
<b>Anions and Nutrients (QCLot: 85676)</b>						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
<b>Anions and Nutrients (QCLot: 85677)</b>						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----





Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Anions and Nutrients (QCLot: 86182)</b>						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	---
<b>Cyanides (QCLot: 83511)</b>						
cyanide, weak acid dissociable	---	E336	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 83512)</b>						
cyanide, free	---	E339	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 83513)</b>						
cyanide, strong acid dissociable (total)	---	E333	0.002	mg/L	<0.0020	---
<b>Organic / Inorganic Carbon (QCLot: 85678)</b>						
carbon, total organic [TOC]	---	E355-L	0.5	mg/L	<0.50	---
<b>Organic / Inorganic Carbon (QCLot: 87122)</b>						
carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
<b>Total Metals (QCLot: 84718)</b>						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	---
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	---
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	---
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	---
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	---
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	---
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	---
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	---
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	---
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	---
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	---
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	---
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	---
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	---
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	---
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	---
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	---
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	---
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	---
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	---



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Total Metals (QCLot: 84718) - continued</b>						
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	---
sodium, total	17341-25-2	E420	0.05	mg/L	<0.050	---
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	---
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	---
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	---
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	---
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	---
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	---
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	---
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	---
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	---
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	---
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	---
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	---
<b>Total Metals (QCLot: 84719)</b>						
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	<0.00010	---
<b>Total Metals (QCLot: 85274)</b>						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	---
<b>Total Metals (QCLot: 85453)</b>						
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	<0.00010	---
<b>Total Metals (QCLot: 85454)</b>						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	---
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	---
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	---
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	---
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	---
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	---
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	---
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	---
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	---
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	---
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	---



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Total Metals (QCLot: 85454) - continued</b>						
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	---
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	---
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	---
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	---
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	---
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	---
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	---
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	---
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	---
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	---
sodium, total	17341-25-2	E420	0.05	mg/L	<0.050	---
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	---
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	---
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	---
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	---
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	---
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	---
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	---
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	---
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	---
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	---
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	---
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	---
<b>Dissolved Metals (QCLot: 84254)</b>						
chromium, dissolved	7440-47-3	E421.Cr-L	0.0001	mg/L	<0.00010	---
<b>Dissolved Metals (QCLot: 84255)</b>						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Dissolved Metals (QCLot: 84255) - continued</b>						
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	---
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	---
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	---
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	---
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	---
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	---
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	---
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	---
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	---
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	---
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	---
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	---
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	---
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	---
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	---
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	---
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	---
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	---
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	---
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	---
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	---
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	---
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	---
<b>Dissolved Metals (QCLot: 85441)</b>						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	---
<b>Aggregate Organics (QCLot: 83354)</b>						
oil & grease (gravimetric)	---	E567	5	mg/L	<5.0	---
<b>Aggregate Organics (QCLot: 83463)</b>						
biochemical oxygen demand [BOD]	---	E550	2	mg/L	<2.0	---
<b>Aggregate Organics (QCLot: 85916)</b>						
chemical oxygen demand [COD]	---	E559	20	mg/L	<20	---



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Volatile Organic Compounds (QCLot: 83260)</b>						
benzene	71-43-2	E611C	0.5	µg/L	<0.50	---
bromodichloromethane	75-27-4	E611C	0.5	µg/L	<0.50	---
bromoform	75-25-2	E611C	0.5	µg/L	<0.50	---
carbon tetrachloride	56-23-5	E611C	0.5	µg/L	<0.50	---
chlorobenzene	108-90-7	E611C	0.5	µg/L	<0.50	---
chloroethane	75-00-3	E611C	0.5	µg/L	<0.50	---
chloroform	67-66-3	E611C	0.5	µg/L	<0.50	---
chloromethane	74-87-3	E611C	0.5	µg/L	<0.50	---
dibromochloromethane	124-48-1	E611C	0.5	µg/L	<0.50	---
dichlorobenzene, 1,2-	95-50-1	E611C	0.5	µg/L	<0.50	---
dichlorobenzene, 1,3-	541-73-1	E611C	0.5	µg/L	<0.50	---
dichlorobenzene, 1,4-	106-46-7	E611C	0.5	µg/L	<0.50	---
dichloroethane, 1,1-	75-34-3	E611C	0.5	µg/L	<0.50	---
dichloroethane, 1,2-	107-06-2	E611C	0.5	µg/L	<0.50	---
dichloroethylene, 1,1-	75-35-4	E611C	0.5	µg/L	<0.50	---
dichloroethylene, cis-1,2-	156-59-2	E611C	0.5	µg/L	<0.50	---
dichloroethylene, trans-1,2-	156-60-5	E611C	0.5	µg/L	<0.50	---
dichloromethane	75-09-2	E611C	0.5	µg/L	<0.50	---
dichloropropane, 1,2-	78-87-5	E611C	0.5	µg/L	<0.50	---
dichloropropylene, cis-1,3-	10061-01-5	E611C	0.5	µg/L	<0.50	---
dichloropropylene, trans-1,3-	10061-02-6	E611C	0.5	µg/L	<0.50	---
ethylbenzene	100-41-4	E611C	0.5	µg/L	<0.50	---
methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.5	µg/L	<0.50	---
styrene	100-42-5	E611C	0.5	µg/L	<0.50	---
tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.5	µg/L	<0.50	---
tetrachloroethane, 1,1,2,2-	79-34-5	E611C	0.2	µg/L	<0.20	---
tetrachloroethylene	127-18-4	E611C	0.5	µg/L	<0.50	---
toluene	108-88-3	E611C	0.4	µg/L	<0.40	---
trichloroethane, 1,1,1-	71-55-6	E611C	0.5	µg/L	<0.50	---
trichloroethane, 1,1,2-	79-00-5	E611C	0.5	µg/L	<0.50	---
trichloroethylene	79-01-6	E611C	0.5	µg/L	<0.50	---
trichlorofluoromethane	75-69-4	E611C	0.5	µg/L	<0.50	---
vinyl chloride	75-01-4	E611C	0.4	µg/L	<0.40	---
xylene, m+p-	179601-23-1	E611C	0.5	µg/L	<0.50	---
xylene, o-	95-47-6	E611C	0.5	µg/L	<0.50	---
<b>Hydrocarbons (QCLot: 83213)</b>						



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Hydrocarbons (QCLot: 83213) - continued</b>						
EPH (C10-C19)	---	E601A	250	µg/L	<250	---
EPH (C19-C32)	---	E601A	250	µg/L	<250	---
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 83214)</b>						
acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	---
acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	---
acridine	260-94-6	E641A	0.01	µg/L	<0.010	---
anthracene	120-12-7	E641A	0.01	µg/L	<0.010	---
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	---
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	<0.0050	---
benzo(b+j)fluoranthene	---	E641A	0.01	µg/L	<0.010	---
benzo(b+j+k)fluoranthene	---	E641A	0.015	µg/L	<0.015	---
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	---
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	---
chrysene	218-01-9	E641A	0.01	µg/L	<0.010	---
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	<0.0050	---
fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	---
fluorene	86-73-7	E641A	0.01	µg/L	<0.010	---
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	---
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	---
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	---
naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	---
phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	---
pyrene	129-00-0	E641A	0.01	µg/L	<0.010	---
quinoline	6027-02-7	E641A	0.05	µg/L	<0.050	---
<b>Polycyclic Aromatic Hydrocarbons Surrogates (QCLot: 83214)</b>						
acridine-d9	34749-75-2	E641A	0.01	µg/L	0.793	---

**Qualifiers**

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.



## 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	
<b>Physical Tests (QCLot: 83100)</b>									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	100	85.0	115	----
<b>Physical Tests (QCLot: 83134)</b>									
solids, total suspended [TSS]	----	E160-H	3	mg/L	150 mg/L	106	85.0	115	----
<b>Physical Tests (QCLot: 83150)</b>									
pH	----	E108	----	pH units	7 pH units	99.6	98.0	102	----
<b>Physical Tests (QCLot: 83151)</b>									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	100	90.0	110	----
<b>Physical Tests (QCLot: 83152)</b>									
alkalinity, phenolphthalein (as CaCO <sub>3</sub> )	----	E290	1	mg/L	229 mg/L	112	75.0	125	----
alkalinity, total (as CaCO <sub>3</sub> )	----	E290	1	mg/L	500 mg/L	98.9	85.0	115	----
<b>Physical Tests (QCLot: 83296)</b>									
turbidity	----	E121	0.1	NTU	200 NTU	97.0	85.0	115	----
<b>Anions and Nutrients (QCLot: 83154)</b>									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	104	90.0	110	----
<b>Anions and Nutrients (QCLot: 83155)</b>									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
<b>Anions and Nutrients (QCLot: 83156)</b>									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	100	85.0	115	----
<b>Anions and Nutrients (QCLot: 83157)</b>									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	105	90.0	110	----
<b>Anions and Nutrients (QCLot: 83158)</b>									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	102	90.0	110	----
<b>Anions and Nutrients (QCLot: 83159)</b>									
sulfate (as SO <sub>4</sub> )	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	107	90.0	110	----
<b>Anions and Nutrients (QCLot: 83160)</b>									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	88.8	80.0	120	----
<b>Anions and Nutrients (QCLot: 85675)</b>									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	88.3	80.0	120	----
<b>Anions and Nutrients (QCLot: 85676)</b>									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.12 mg/L	98.5	85.0	115	----
<b>Anions and Nutrients (QCLot: 85677)</b>									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	103	75.0	125	----



Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Anions and Nutrients (QCLot: 86182)</b>									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	96.9	85.0	115	----
<b>Cyanides (QCLot: 83511)</b>									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	97.5	80.0	120	----
<b>Cyanides (QCLot: 83512)</b>									
cyanide, free	----	E339	0.002	mg/L	0.125 mg/L	97.1	80.0	120	----
<b>Cyanides (QCLot: 83513)</b>									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	92.4	80.0	120	----
<b>Organic / Inorganic Carbon (QCLot: 85678)</b>									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	96.6	80.0	120	----
<b>Organic / Inorganic Carbon (QCLot: 87122)</b>									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	100	80.0	120	----
<b>Total Metals (QCLot: 84718)</b>									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	90.2	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	102	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	90.5	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	94.1	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	97.5	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	99.9	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	95.7	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	88.9	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	97.2	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	98.7	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	91.2	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	89.4	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	89.3	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	97.4	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	101	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	89.1	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	90.6	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	95.8	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	90.3	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	86.6	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	90.7	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	92.8	80.0	120	----





Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
<b>Total Metals (QCLot: 84718) - continued</b>									
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	88.9	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	96.7	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	102	80.0	120	----
sodium, total	17341-25-2	E420	0.05	mg/L	50 mg/L	91.8	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	110	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	88.4	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	97.7	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	99.6	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	94.4	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	94.4	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	84.2	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	100	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	99.4	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	90.4	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	92.8	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	98.2	80.0	120	----
<b>Total Metals (QCLot: 84719)</b>									
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	0.25 mg/L	90.9	80.0	120	----
<b>Total Metals (QCLot: 85274)</b>									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	98.1	80.0	120	----
<b>Total Metals (QCLot: 85453)</b>									
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	0.25 mg/L	94.3	80.0	120	----
<b>Total Metals (QCLot: 85454)</b>									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	96.8	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	101	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	92.5	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	97.1	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	98.3	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	103	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	95.7	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	96.7	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	97.0	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	96.3	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	96.0	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	93.2	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	94.4	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	100	80.0	120	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
<b>Total Metals (QCLot: 85454) - continued</b>									
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	96.0	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	94.0	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	92.7	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	95.5	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	94.8	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	96.6	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	95.8	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	96.3	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	95.8	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	95.9	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	97.3	80.0	120	----
sodium, total	17341-25-2	E420	0.05	mg/L	50 mg/L	97.6	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	98.8	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	84.6	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	94.6	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	103	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	94.9	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	97.5	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	89.5	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	98.2	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	98.3	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	96.4	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	98.9	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	93.0	80.0	120	----
<b>Dissolved Metals (QCLot: 84254)</b>									
chromium, dissolved	7440-47-3	E421.Cr-L	0.0001	mg/L	0.25 mg/L	98.3	80.0	120	----
<b>Dissolved Metals (QCLot: 84255)</b>									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	97.7	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	96.8	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	95.3	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	98.7	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	103	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	97.6	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	102	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	98.5	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	102	80.0	120	----



Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Dissolved Metals (QCLot: 84255) - continued</b>									
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	96.6	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	96.0	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	94.5	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	92.8	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	98.0	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	103	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	94.4	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	95.9	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	99.4	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	96.1	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	95.9	70.0	130	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	98.5	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	96.7	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	102	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	104	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	99.8	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	98.2	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	93.3	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	98.6	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	91.0	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	98.3	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	96.5	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	99.8	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	95.1	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	99.2	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	98.4	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	95.8	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	99.3	80.0	120	----
<b>Aggregate Organics (QCLot: 83354)</b>									
oil & grease (gravimetric)	----	E567	5	mg/L	100 mg/L	97.3	70.0	130	----
<b>Aggregate Organics (QCLot: 83463)</b>									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	92.1	85.0	115	----
<b>Aggregate Organics (QCLot: 85916)</b>									
chemical oxygen demand [COD]	----	E559	20	mg/L	750 mg/L	101	85.0	115	----



Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Volatile Organic Compounds (QCLot: 83260)</b>									
benzene	71-43-2	E611C	0.5	µg/L	100 µg/L	102	70.0	130	----
bromodichloromethane	75-27-4	E611C	0.5	µg/L	100 µg/L	102	70.0	130	----
bromoform	75-25-2	E611C	0.5	µg/L	100 µg/L	101	70.0	130	----
carbon tetrachloride	56-23-5	E611C	0.5	µg/L	100 µg/L	94.2	70.0	130	----
chlorobenzene	108-90-7	E611C	0.5	µg/L	100 µg/L	104	70.0	130	----
chloroethane	75-00-3	E611C	0.5	µg/L	100 µg/L	97.5	60.0	140	----
chloroform	67-66-3	E611C	0.5	µg/L	100 µg/L	100	70.0	130	----
chloromethane	74-87-3	E611C	0.5	µg/L	100 µg/L	91.8	60.0	140	----
dibromochloromethane	124-48-1	E611C	0.5	µg/L	100 µg/L	102	70.0	130	----
dichlorobenzene, 1,2-	95-50-1	E611C	0.5	µg/L	100 µg/L	103	70.0	130	----
dichlorobenzene, 1,3-	541-73-1	E611C	0.5	µg/L	100 µg/L	90.3	70.0	130	----
dichlorobenzene, 1,4-	106-46-7	E611C	0.5	µg/L	100 µg/L	104	70.0	130	----
dichloroethane, 1,1-	75-34-3	E611C	0.5	µg/L	100 µg/L	103	70.0	130	----
dichloroethane, 1,2-	107-06-2	E611C	0.5	µg/L	100 µg/L	106	70.0	130	----
dichloroethylene, 1,1-	75-35-4	E611C	0.5	µg/L	100 µg/L	99.5	70.0	130	----
dichloroethylene, cis-1,2-	156-59-2	E611C	0.5	µg/L	100 µg/L	104	70.0	130	----
dichloroethylene, trans-1,2-	156-60-5	E611C	0.5	µg/L	100 µg/L	104	70.0	130	----
dichloromethane	75-09-2	E611C	0.5	µg/L	100 µg/L	103	70.0	130	----
dichloropropane, 1,2-	78-87-5	E611C	0.5	µg/L	100 µg/L	101	70.0	130	----
dichloropropylene, cis-1,3-	10061-01-5	E611C	0.5	µg/L	100 µg/L	109	70.0	130	----
dichloropropylene, trans-1,3-	10061-02-6	E611C	0.5	µg/L	100 µg/L	77.1	70.0	130	----
ethylbenzene	100-41-4	E611C	0.5	µg/L	100 µg/L	95.5	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.5	µg/L	100 µg/L	108	70.0	130	----
styrene	100-42-5	E611C	0.5	µg/L	100 µg/L	95.3	70.0	130	----
tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.5	µg/L	100 µg/L	97.4	70.0	130	----
tetrachloroethane, 1,1,2,2-	79-34-5	E611C	0.2	µg/L	100 µg/L	110	70.0	130	----
tetrachloroethylene	127-18-4	E611C	0.5	µg/L	100 µg/L	98.5	70.0	130	----
toluene	108-88-3	E611C	0.4	µg/L	100 µg/L	97.1	70.0	130	----
trichloroethane, 1,1,1-	71-55-6	E611C	0.5	µg/L	100 µg/L	90.6	70.0	130	----
trichloroethane, 1,1,2-	79-00-5	E611C	0.5	µg/L	100 µg/L	104	70.0	130	----
trichloroethylene	79-01-6	E611C	0.5	µg/L	100 µg/L	101	70.0	130	----
trichlorofluoromethane	75-69-4	E611C	0.5	µg/L	100 µg/L	98.8	60.0	140	----
vinyl chloride	75-01-4	E611C	0.4	µg/L	100 µg/L	92.7	60.0	140	----
xylene, m+p-	179601-23-1	E611C	0.5	µg/L	200 µg/L	101	70.0	130	----
xylene, o-	95-47-6	E611C	0.5	µg/L	100 µg/L	97.2	70.0	130	----
<b>Hydrocarbons (QCLot: 83213)</b>									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	114	70.0	130	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
<b>Hydrocarbons (QCLot: 83213) - continued</b>									
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	106	70.0	130	----
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 83214)</b>									
acenaphthene	83-32-9	E641A	0.01	µg/L	0.5 µg/L	111	60.0	130	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	0.5 µg/L	113	60.0	130	----
acridine	260-94-6	E641A	0.01	µg/L	0.5 µg/L	93.4	60.0	130	----
anthracene	120-12-7	E641A	0.01	µg/L	0.5 µg/L	109	60.0	130	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.5 µg/L	112	60.0	130	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.5 µg/L	118	60.0	130	----
benzo(b+j)fluoranthene	----	E641A	0.01	µg/L	0.5 µg/L	107	60.0	130	----
benzo(b+j+k)fluoranthene	----	E641A	0.015	µg/L	1 µg/L	112	60.0	130	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.5 µg/L	118	60.0	130	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.5 µg/L	118	60.0	130	----
chrysene	218-01-9	E641A	0.01	µg/L	0.5 µg/L	122	60.0	130	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.5 µg/L	120	60.0	130	----
fluoranthene	206-44-0	E641A	0.01	µg/L	0.5 µg/L	114	60.0	130	----
fluorene	86-73-7	E641A	0.01	µg/L	0.5 µg/L	105	60.0	130	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.5 µg/L	112	60.0	130	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.5 µg/L	113	60.0	130	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.5 µg/L	108	60.0	130	----
naphthalene	91-20-3	E641A	0.05	µg/L	0.5 µg/L	104	50.0	130	----
phenanthrene	85-01-8	E641A	0.02	µg/L	0.5 µg/L	106	60.0	130	----
pyrene	129-00-0	E641A	0.01	µg/L	0.5 µg/L	117	60.0	130	----
quinoline	6027-02-7	E641A	0.05	µg/L	0.5 µg/L	127	60.0	130	----
<b>Polycyclic Aromatic Hydrocarbons Surrogates (QCLot: 83214)</b>									
acridine-d9	34749-75-2	E641A	0.01	µg/L	0.8421 µg/L	90.7	----	----	----



## 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 >= 1x 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
<b>Anions and Nutrients (QCLot: 83154)</b>										
VA20B4630-001	Anonymous	chloride	16887-00-6	E235.Cl	516 mg/L	500 mg/L	103	75.0	125	----
<b>Anions and Nutrients (QCLot: 83155)</b>										
VA20B4630-001	Anonymous	fluoride	16984-48-8	E235.F	5.24 mg/L	5 mg/L	105	75.0	125	----
<b>Anions and Nutrients (QCLot: 83156)</b>										
VA20B4630-001	Anonymous	bromide	24959-67-9	E235.Br-L	2.68 mg/L	2.5 mg/L	107	75.0	125	----
<b>Anions and Nutrients (QCLot: 83157)</b>										
VA20B4630-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	13.1 mg/L	12.5 mg/L	105	75.0	125	----
<b>Anions and Nutrients (QCLot: 83158)</b>										
VA20B4630-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	2.40 mg/L	2.5 mg/L	95.9	75.0	125	----
<b>Anions and Nutrients (QCLot: 83159)</b>										
VA20B4630-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	519 mg/L	500 mg/L	104	75.0	125	----
<b>Anions and Nutrients (QCLot: 83160)</b>										
VA20B4630-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0300 mg/L	0.03 mg/L	100	70.0	130	----
<b>Anions and Nutrients (QCLot: 85675)</b>										
VA20B4656-002	Anonymous	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
<b>Anions and Nutrients (QCLot: 85676)</b>										
VA20B4656-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.210 mg/L	0.2 mg/L	105	75.0	125	----
<b>Anions and Nutrients (QCLot: 85677)</b>										
VA20B4663-002	Westbay-A-490-Dup	Kjeldahl nitrogen, total [TKN]	----	E318	45.3 mg/L	2.5 mg/L	90.6	70.0	130	----
<b>Anions and Nutrients (QCLot: 86182)</b>										
VA20B4610-022	Anonymous	silicate (as SiO2)	7631-86-9	E392	11.0 mg/L	10 mg/L	110	75.0	125	----
<b>Cyanides (QCLot: 83511)</b>										
VA20B4662-002	Anonymous	cyanide, weak acid dissociable	----	E336	3.03 mg/L	2.5 mg/L	121	75.0	125	----
<b>Cyanides (QCLot: 83512)</b>										
VA20B4662-002	Anonymous	cyanide, free	----	E339	3.07 mg/L	2.5 mg/L	123	75.0	125	----
<b>Cyanides (QCLot: 83513)</b>										
VA20B4662-002	Anonymous	cyanide, strong acid dissociable (total)	----	E333	4.73 mg/L	5 mg/L	94.7	75.0	125	----



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
<b>Organic / Inorganic Carbon (QCLot: 85678)</b>										
VA20B4663-002	Westbay-A-490-Dup	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
<b>Organic / Inorganic Carbon (QCLot: 87122)</b>										
VA20B4663-002	Westbay-A-490-Dup	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	50 mg/L	ND	70.0	130	----
<b>Total Metals (QCLot: 84718)</b>										
VA20B4610-019	Anonymous	aluminum, total	7429-90-5	E420	0.196 mg/L	0.2 mg/L	97.8	70.0	130	----
		antimony, total	7440-36-0	E420	0.0207 mg/L	0.02 mg/L	104	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0196 mg/L	0.02 mg/L	98.3	70.0	130	----
		barium, total	7440-39-3	E420	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0406 mg/L	0.04 mg/L	102	70.0	130	----
		bismuth, total	7440-69-9	E420	0.0101 mg/L	0.01 mg/L	101	70.0	130	----
		boron, total	7440-42-8	E420	0.095 mg/L	0.1 mg/L	94.9	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00402 mg/L	0.004 mg/L	100	70.0	130	----
		calcium, total	7440-70-2	E420	3.81 mg/L	4 mg/L	95.3	70.0	130	----
		cesium, total	7440-46-2	E420	0.0102 mg/L	0.01 mg/L	102	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		copper, total	7440-50-8	E420	0.0207 mg/L	0.02 mg/L	103	70.0	130	----
		iron, total	7439-89-6	E420	1.98 mg/L	2 mg/L	99.1	70.0	130	----
		lead, total	7439-92-1	E420	0.0197 mg/L	0.02 mg/L	98.4	70.0	130	----
		lithium, total	7439-93-2	E420	0.103 mg/L	0.1 mg/L	103	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	0.0197 mg/L	0.02 mg/L	98.5	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0194 mg/L	0.02 mg/L	96.8	70.0	130	----
		nickel, total	7440-02-0	E420	0.0418 mg/L	0.04 mg/L	104	70.0	130	----
		phosphorus, total	7723-14-0	E420	9.81 mg/L	10 mg/L	98.1	70.0	130	----
		potassium, total	7440-09-7	E420	3.92 mg/L	4 mg/L	97.9	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		selenium, total	7782-49-2	E420	0.0388 mg/L	0.04 mg/L	97.0	70.0	130	----
		silicon, total	7440-21-3	E420	9.32 mg/L	10 mg/L	93.2	70.0	130	----
		silver, total	7440-22-4	E420	0.00414 mg/L	0.004 mg/L	104	70.0	130	----
		sodium, total	17341-25-2	E420	2.03 mg/L	2 mg/L	102	70.0	130	----
		strontium, total	7440-24-6	E420	0.0215 mg/L	0.02 mg/L	108	70.0	130	----
		sulfur, total	7704-34-9	E420	19.5 mg/L	20 mg/L	97.6	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0413 mg/L	0.04 mg/L	103	70.0	130	----
		thallium, total	7440-28-0	E420	0.00391 mg/L	0.004 mg/L	97.7	70.0	130	----
		thorium, total	7440-29-1	E420	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		tin, total	7440-31-5	E420	0.0204 mg/L	0.02 mg/L	102	70.0	130	----



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
<b>Total Metals (QCLot: 84718) - continued</b>										
VA20B4610-019	Anonymous	titanium, total	7440-32-6	E420	0.0385 mg/L	0.04 mg/L	96.2	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0199 mg/L	0.02 mg/L	99.5	70.0	130	----
		uranium, total	7440-61-1	E420	0.00411 mg/L	0.004 mg/L	103	70.0	130	----
		vanadium, total	7440-62-2	E420	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		zinc, total	7440-66-6	E420	0.406 mg/L	0.4 mg/L	101	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0432 mg/L	0.04 mg/L	108	70.0	130	----
<b>Total Metals (QCLot: 84719)</b>										
VA20B4610-019	Anonymous	chromium, total	7440-47-3	E420.Cr-L	0.0408 mg/L	0.04 mg/L	102	70.0	130	----
<b>Total Metals (QCLot: 85274)</b>										
VA20B4662-002	Anonymous	mercury, total	7439-97-6	E508	0.00101 mg/L	0.001 mg/L	101	70.0	130	----
<b>Total Metals (QCLot: 85453)</b>										
VA20B4656-002	Anonymous	chromium, total	7440-47-3	E420.Cr-L	0.0373 mg/L	0.04 mg/L	93.3	70.0	130	----
<b>Total Metals (QCLot: 85454)</b>										
VA20B4656-002	Anonymous	aluminum, total	7429-90-5	E420	ND mg/L	0.2 mg/L	ND	70.0	130	----
		antimony, total	7440-36-0	E420	0.0187 mg/L	0.02 mg/L	93.3	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0183 mg/L	0.02 mg/L	91.4	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0392 mg/L	0.04 mg/L	98.1	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00988 mg/L	0.01 mg/L	98.8	70.0	130	----
		boron, total	7440-42-8	E420	0.094 mg/L	0.1 mg/L	93.5	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00388 mg/L	0.004 mg/L	97.0	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.00946 mg/L	0.01 mg/L	94.6	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0189 mg/L	0.02 mg/L	94.7	70.0	130	----
		copper, total	7440-50-8	E420	0.0189 mg/L	0.02 mg/L	94.7	70.0	130	----
		iron, total	7439-89-6	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		lead, total	7439-92-1	E420	0.0188 mg/L	0.02 mg/L	94.2	70.0	130	----
		lithium, total	7439-93-2	E420	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0184 mg/L	0.02 mg/L	91.9	70.0	130	----
		nickel, total	7440-02-0	E420	0.0378 mg/L	0.04 mg/L	94.6	70.0	130	----
		phosphorus, total	7723-14-0	E420	9.96 mg/L	10 mg/L	99.6	70.0	130	----
		potassium, total	7440-09-7	E420	3.88 mg/L	4 mg/L	97.0	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0189 mg/L	0.02 mg/L	94.7	70.0	130	----





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
<b>Total Metals (QCLot: 85454) - continued</b>										
VA20B4656-002	Anonymous	selenium, total	7782-49-2	E420	0.0377 mg/L	0.04 mg/L	94.2	70.0	130	----
		silicon, total	7440-21-3	E420	9.10 mg/L	10 mg/L	91.0	70.0	130	----
		silver, total	7440-22-4	E420	0.00380 mg/L	0.004 mg/L	95.1	70.0	130	----
		sodium, total	17341-25-2	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	21.0 mg/L	20 mg/L	105	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0369 mg/L	0.04 mg/L	92.2	70.0	130	----
		thallium, total	7440-28-0	E420	0.00376 mg/L	0.004 mg/L	94.1	70.0	130	----
		thorium, total	7440-29-1	E420	0.0205 mg/L	0.02 mg/L	103	70.0	130	----
		tin, total	7440-31-5	E420	0.0191 mg/L	0.02 mg/L	95.5	70.0	130	----
		titanium, total	7440-32-6	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0188 mg/L	0.02 mg/L	94.3	70.0	130	----
		uranium, total	7440-61-1	E420	0.00378 mg/L	0.004 mg/L	94.6	70.0	130	----
		vanadium, total	7440-62-2	E420	0.0967 mg/L	0.1 mg/L	96.7	70.0	130	----
		zinc, total	7440-66-6	E420	0.386 mg/L	0.4 mg/L	96.5	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0380 mg/L	0.04 mg/L	95.1	70.0	130	----
<b>Dissolved Metals (QCLot: 84254)</b>										
VA20B4610-010	Anonymous	chromium, dissolved	7440-47-3	E421.Cr-L	0.0384 mg/L	0.04 mg/L	95.9	70.0	130	----
<b>Dissolved Metals (QCLot: 84255)</b>										
VA20B4610-010	Anonymous	aluminum, dissolved	7429-90-5	E421	0.195 mg/L	0.2 mg/L	97.3	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0193 mg/L	0.02 mg/L	96.7	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0190 mg/L	0.02 mg/L	94.8	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.0197 mg/L	0.02 mg/L	98.5	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0408 mg/L	0.04 mg/L	102	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00976 mg/L	0.01 mg/L	97.6	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.097 mg/L	0.1 mg/L	96.7	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00390 mg/L	0.004 mg/L	97.6	70.0	130	----
		calcium, dissolved	7440-70-2	E421	3.93 mg/L	4 mg/L	98.3	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00953 mg/L	0.01 mg/L	95.3	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0194 mg/L	0.02 mg/L	97.2	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0191 mg/L	0.02 mg/L	95.5	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.85 mg/L	2 mg/L	92.4	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0198 mg/L	0.02 mg/L	98.9	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0993 mg/L	0.1 mg/L	99.3	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0190 mg/L	0.02 mg/L	94.8	70.0	130	----



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
<b>Dissolved Metals (QCLot: 84255) - continued</b>										
VA20B4610-010	Anonymous	molybdenum, dissolved	7439-98-7	E421	0.0197 mg/L	0.02 mg/L	98.5	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0382 mg/L	0.04 mg/L	95.5	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	9.83 mg/L	10 mg/L	98.3	70.0	130	----
		potassium, dissolved	7440-09-7	E421	3.91 mg/L	4 mg/L	97.8	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0400 mg/L	0.04 mg/L	100	70.0	130	----
		silicon, dissolved	7440-21-3	E421	9.12 mg/L	10 mg/L	91.2	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00391 mg/L	0.004 mg/L	97.8	70.0	130	----
		sodium, dissolved	17341-25-2	E421	1.89 mg/L	2 mg/L	94.4	70.0	130	----
		strontium, dissolved	7440-24-6	E421	0.0180 mg/L	0.02 mg/L	89.8	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	19.9 mg/L	20 mg/L	99.4	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0398 mg/L	0.04 mg/L	99.4	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00395 mg/L	0.004 mg/L	98.8	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0193 mg/L	0.02 mg/L	96.5	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0354 mg/L	0.04 mg/L	88.6	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00385 mg/L	0.004 mg/L	96.2	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.0943 mg/L	0.1 mg/L	94.3	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.384 mg/L	0.4 mg/L	96.1	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0388 mg/L	0.04 mg/L	97.1	70.0	130	----
<b>Dissolved Metals (QCLot: 85441)</b>										
VA20B4662-002	Anonymous	mercury, dissolved	7439-97-6	E509	0.000386 mg/L	0.0005 mg/L	77.1	70.0	130	----
<b>Aggregate Organics (QCLot: 85916)</b>										
VA20B4869-001	Anonymous	chemical oxygen demand [COD]	----	E559	426 mg/L	500 mg/L	85.3	75.0	125	----
<b>Volatile Organic Compounds (QCLot: 83260)</b>										
VA20B4359-007	Anonymous	benzene	71-43-2	E611C	101 µg/L	100 µg/L	101	60.0	140	----
		bromodichloromethane	75-27-4	E611C	100 µg/L	100 µg/L	100	60.0	140	----
		bromoform	75-25-2	E611C	100 µg/L	100 µg/L	100	60.0	140	----
		carbon tetrachloride	56-23-5	E611C	96.0 µg/L	100 µg/L	96.0	60.0	140	----
		chlorobenzene	108-90-7	E611C	103 µg/L	100 µg/L	103	60.0	140	----
		chloroethane	75-00-3	E611C	95.6 µg/L	100 µg/L	95.6	50.0	150	----
		chloroform	67-66-3	E611C	99.7 µg/L	100 µg/L	99.7	60.0	140	----
		chloromethane	74-87-3	E611C	85.2 µg/L	100 µg/L	85.2	50.0	150	----
		dibromochloromethane	124-48-1	E611C	99.6 µg/L	100 µg/L	99.6	60.0	140	----
		dichlorobenzene, 1,2-	95-50-1	E611C	104 µg/L	100 µg/L	104	60.0	140	----



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
<b>Volatile Organic Compounds (QCLot: 83260) - continued</b>										
VA20B4359-007	Anonymous	dichlorobenzene, 1,3-	541-73-1	E611C	92.4 µg/L	100 µg/L	92.4	60.0	140	----
		dichlorobenzene, 1,4-	106-46-7	E611C	106 µg/L	100 µg/L	106	60.0	140	----
		dichloroethane, 1,1-	75-34-3	E611C	103 µg/L	100 µg/L	103	60.0	140	----
		dichloroethane, 1,2-	107-06-2	E611C	103 µg/L	100 µg/L	103	60.0	140	----
		dichloroethylene, 1,1-	75-35-4	E611C	98.7 µg/L	100 µg/L	98.7	60.0	140	----
		dichloroethylene, cis-1,2-	156-59-2	E611C	104 µg/L	100 µg/L	104	60.0	140	----
		dichloroethylene, trans-1,2-	156-60-5	E611C	104 µg/L	100 µg/L	104	60.0	140	----
		dichloromethane	75-09-2	E611C	102 µg/L	100 µg/L	102	60.0	140	----
		dichloropropane, 1,2-	78-87-5	E611C	98.9 µg/L	100 µg/L	98.9	60.0	140	----
		dichloropropylene, cis-1,3-	10061-01-5	E611C	86.0 µg/L	100 µg/L	86.0	60.0	140	----
		dichloropropylene, trans-1,3-	10061-02-6	E611C	73.8 µg/L	100 µg/L	73.8	60.0	140	----
		ethylbenzene	100-41-4	E611C	96.4 µg/L	100 µg/L	96.4	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	108 µg/L	100 µg/L	108	60.0	140	----
		styrene	100-42-5	E611C	105 µg/L	100 µg/L	105	60.0	140	----
		tetrachloroethane, 1,1,1,2-	630-20-6	E611C	96.3 µg/L	100 µg/L	96.3	60.0	140	----
		tetrachloroethane, 1,1,2,2-	79-34-5	E611C	106 µg/L	100 µg/L	106	60.0	140	----
		tetrachloroethylene	127-18-4	E611C	99.9 µg/L	100 µg/L	99.9	60.0	140	----
		toluene	108-88-3	E611C	111 µg/L	100 µg/L	111	60.0	140	----
		trichloroethane, 1,1,1-	71-55-6	E611C	91.5 µg/L	100 µg/L	91.5	60.0	140	----
		trichloroethane, 1,1,2-	79-00-5	E611C	99.7 µg/L	100 µg/L	99.7	60.0	140	----
		trichloroethylene	79-01-6	E611C	102 µg/L	100 µg/L	102	60.0	140	----
		trichlorofluoromethane	75-69-4	E611C	99.0 µg/L	100 µg/L	99.0	50.0	150	----
		vinyl chloride	75-01-4	E611C	88.1 µg/L	100 µg/L	88.1	50.0	150	----
		xylene, m+p-	179601-23-1	E611C	204 µg/L	200 µg/L	102	60.0	140	----
		xylene, o-	95-47-6	E611C	96.8 µg/L	100 µg/L	96.8	60.0	140	----

<b>Report To</b> Contact and company name below will appear on the final report		<b>Report Format / Distribution</b>		<b>Select Service Level Below - Contact your AM to confirm all E&amp;P TATs (surcharges may apply)</b>																																																																																																																																																					
Company: <u>Galder Associates</u>		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)		Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply																																																																																																																																																					
Contact: <u>Adrian Kowalchuk</u>		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		4 day [P4-20%] <input type="checkbox"/>		1 Business day [E - 100%] <input type="checkbox"/>																																																																																																																																																			
Phone: <u>204-891-5377</u>		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked		3 day [P3-25%] <input type="checkbox"/>		Same Day, Weekend or Statutory holiday [E2 -200%] (Laboratory opening fees may apply) <input type="checkbox"/>																																																																																																																																																			
Company address below will appear on the final report		Select Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		2 day [P2-50%] <input type="checkbox"/>																																																																																																																																																					
Street: <u>1931 Robertson Rd.</u>		Email 1 or Fax: <u>Adrian_Kowalchuk@Galder.com</u>		Date and Time Required for all E&P TATs: <span style="float: right;">dd-mmm-yy hh:mm</span>																																																																																																																																																					
City/Province: <u>Ottawa, Ontario</u>		Email 2: <u>Valerie_Bertrand@Galder.com</u>		For tests that can not be performed according to the service level selected, you will be contacted.																																																																																																																																																					
Postal Code: <u>K2H 5B7</u>		Email 3:		<b>Analysis Request</b>																																																																																																																																																					
Invoice To: Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		<b>Invoice Distribution</b>		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																																																																																																																																																					
Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="10" style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold;">NUMBER OF CONTAINERS</td> <td>BOD</td> <td>P</td> <td>F/P</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td rowspan="10" style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold;">SAMPLES ON HOLD</td> <td rowspan="10" style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold;">SUSPECTED HAZARD (see Special Instructions)</td> </tr> <tr> <td>Cyanides</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>General TDS, TSS Rating</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Diss metals &amp; Mercury</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total metals &amp; Mercury</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><del>Oil &amp; Grease</del></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>METALS (COBALT/NICKEL/IRON) / COPPER / ZINC / LEAD</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>MUTAGENICITY / PCB / PCP / DDT / DDE / DDD</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>PAH / EPH / LEPAH / MEPAH</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Andium 226</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>VOLs</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>				NUMBER OF CONTAINERS	BOD	P	F/P											SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)	Cyanides													General TDS, TSS Rating													Diss metals & Mercury													Total metals & Mercury													<del>Oil &amp; Grease</del>													METALS (COBALT/NICKEL/IRON) / COPPER / ZINC / LEAD													MUTAGENICITY / PCB / PCP / DDT / DDE / DDD													PAH / EPH / LEPAH / MEPAH													Andium 226													VOLs												
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Company: <u>Agnico Eagle Malindine Mine, Pemungwa</u>		Email 1 or Fax: <u>Etienne Parente@AgnicoEagle.com</u>																																																																																																																																																							
Contact: <u>Etienne Parente</u>		Email 2:																																																																																																																																																							
<b>Project Information</b>		<b>Oil and Gas Required Fields (client use)</b>																																																																																																																																																							
ALS Account # / Quote #:		AFE/Cost Center:		PO#:																																																																																																																																																					
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PO / AFE: <u>VA20-AEML 100-001</u>		Requisitioner:																																																																																																																																																							
LSD:		Location: <u>MELIADINE - WESTRAYA</u>																																																																																																																																																							
ALS Lab Work Order # (lab use only):		ALS Contact: <u>Yang Chu</u>		Sampler: <u>Paul Mackwell</u>																																																																																																																																																					
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type																																																																																																																																																					
	<u>West bay - A - 490</u>	<u>25-Aug-20</u>	<u>4:00 am</u>	<u>Drill Water</u>	<u>15</u>	<u>R</u>	<u>R</u>	<u>R</u>																																																																																																																																																	
	<u>West bay - A - 490 - Dwp</u>	<u>25-Aug-20</u>	<u>4:00 am</u>	<u>Drill Water</u>	<u>15</u>	<u>R</u>	<u>R</u>	<u>R</u>																																																																																																																																																	

Environmental Division  
Vancouver  
Work Order Reference  
**VA20B4663**

Telephone: +1 604 253 4188

<b>Drinking Water (DW) Samples<sup>1</sup> (client use)</b>			<b>Special Instructions / Specify Criteria to (elect)</b>		
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
<b>SHIPMENT RELEASE (client use)</b>			<b>INITIAL SHIPMENT RECEPTION (lab use only)</b>		
Released by: <u>Paul Mackwell</u>	Date: <u>27-Aug-20</u>	Time: <u>6:00</u>	Received by:	Date:	Time:
			<b>FINAL SHIPMENT RECEPTION (lab use only)</b>		
			Received by: <u>RR</u>	Date: <u>9/8/20</u>	Time: <u>8:25 am</u>
			INITIAL COOLER TEMPERATURES °C: <u>18.8°C</u> FINAL COOLER TEMPERATURES °C:		



Friday, September 25, 2020

Amber Springer  
ALS Environmental  
8081 Lougheed Hwy, Suite 100  
Burnaby, BC V5A 1W9

Re: ALS Workorder: 2009248  
Project Name:  
Project Number: VA20B4663

Dear Ms. Springer:

Two water samples were received from ALS Environmental, on 9/11/2020. The samples were scheduled for the following analysis:

Radium-226

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental  
Katie M. O'Brien  
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280



**2009248**

**Radium-226:**

The samples were prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

# ALS -- Fort Collins

## Sample Number(s) Cross-Reference Table

---

**OrderNum:** 2009248

**Client Name:** ALS Environmental

**Client Project Name:**

**Client Project Number:** VA20B4663

**Client PO Number:** VA20B4663

---

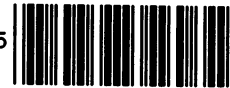
Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
VA20B4663-001	2009248-1		WATER	25-Aug-20	17:00
VA20B4663-002	2009248-2		WATER	25-Aug-20	17:00





**Chain of Custody**  
 Vancouver - Environmental  
 8081 Lougheed Highway  
 Burnaby BC Canada V5A 1W9

4715



Destination Lab: **USA - Fort Collins**

Address: 225 Commerce Drive Fort Collins CO  
 United States 80524

Client: Agnico-Eagle Mines Limited

Work Order Number: **VA20B4663**

Original Receipt Date/Time: 08/09/2020 09:25  
 Instructions Received

**#2009248 #**

Relinquished By

Date/Time

---

Received By *[Signature]*

Date/Time: 8/10/20  
 1550

Receipt Temp: amb

Return as Indicated: Results: Invoice: Electronic Data:

Attention: Heather McKenzie

ALS Sample ID	Client ID	Matrix	Container Type	Test Codes	Method Description	Due Date	Sampling Date and Time	Remarks
VA20B4663-001	Westbay-A-49 0	Water	HDPE (nitric acid)	RA226-MMER	Radium-226 by Radon Emanation	06-10-2020	25/08/2020 17:00	
VA20B4663-002	Westbay-A-49 0-Dup	Water	HDPE (nitric acid)	RA226-MMER	Radium-226 by Radon Emanation	06-10-2020	25/08/2020 17:00	

Account Manager: *Ash Spang*  
 ALSEVDataSublet@ALSGlobal.com (PDF / EXCEL / B2B)  
 ALS Vancouver Phone Number: 604-253-4188



**ALS Environmental - Fort Collins**  
**CONDITION OF SAMPLE UPON RECEIPT FORM**

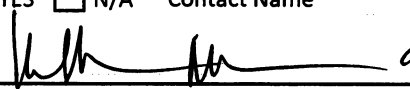
Client Name/ID: **ALS Burnaby** Workorder No: **2009248**  
 Project Manager: **KMO** Initials: **TM** Date: **9/14/20**

1. Are airbills / shipping documents present and/or removable?	<input type="checkbox"/> Drop Off	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
2. Are custody seals on shipping containers intact?	<input checked="" type="checkbox"/> NONE	<input type="checkbox"/> YES	<input type="checkbox"/> NO*
3. Are custody seals on sample containers intact?	<input checked="" type="checkbox"/> NONE	<input type="checkbox"/> YES	<input type="checkbox"/> NO*
4. Is there a COC (chain-of-custody) present?		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
6. Are short-hold samples present?		<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
7. Are all samples within holding times for the requested analyses?		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
8. Were all sample containers received intact? (not broken or leaking)		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
9. Is there sufficient sample for the requested analyses?		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
10. Are samples in proper containers for requested analyses? (form 250, Sample Handling Guidelines)		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
11. Are all aqueous samples preserved correctly, if required?	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
12. Were unpreserved samples pH checked, if required?	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> YES	<input type="checkbox"/> NO
13. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm in diameter?	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> YES	<input type="checkbox"/> NO
14. Were the samples shipped on ice?		<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
15. Were cooler temperatures measured at 0.1 - 6.0°C?	IR gun used*: <input type="checkbox"/> #3 <input type="checkbox"/> #5	<input checked="" type="checkbox"/> Rad Only	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO

Cooler #: **1**  
 Temperature (°C): **amb**  
 # of custody seals on cooler: **0**  
 External mR/hr reading: **11**  
 Background mR/hr reading: **12**      Were external mR/hr readings ≤ two times background and within DOT acceptance criteria? (If no, see Form 008)  N/A  YES  NO

\* Please provide details below for 'NO' responses in gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

All client bottle ID's vs ALS lab ID's double-checked by: **EL**

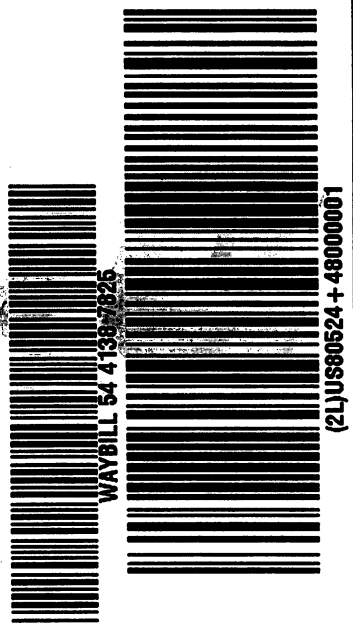
If applicable, was the client contacted?  YES  N/A      Contact Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Project Manager Signature / Date:  **9/14/20**

**EXPRESS WORLDWIDE WPX DHL**  
 2020-09-10 09:08 3.0.1 / '12--1403'  
**From:** ALS ENVIRONMENTAL  
 100 - 8081 LOUGHEED HIGHWAY  
 BC BC BC BC  
 V5A 1W9 BURNABY  
 CANADA  
**Origin:** YVR

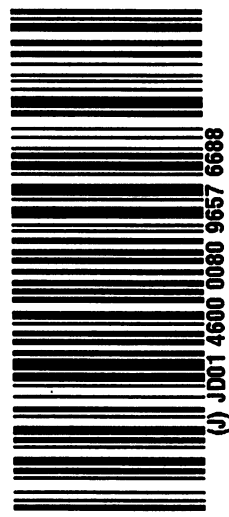
**To:** ALS ENVIRONMENTAL - FORT COLLINS  
 225 COMMERCE DRIVE  
 COLORADO CO CO COLORADO  
 80524 FORT COLLINS  
 UNITED STATES OF AMERICA  
 11-02-20

**US - DEN - DEN**  
 C  
 Per/Shpt Weight: .720.0 LB  
 Pieces: 1/1

**Content Description:**  
 Environmental Water Samples for Research



**Reference:** (2LJUS80524 + 48000001)



**\*WAYBILL DOC\***  
 Not to be attached to package - Hand to Courier  
 2020-09-10 MYDHL  
**Shipper:** ALS Environmental  
 Paul Chandra  
 100 - 8081 Lougheed Highway  
 V5A 1W9 BURNABY BC  
 Canada  
**Contact:** +16042534188

**Receiver:** ALS Environmental - Fort Collins  
 Sample Receiving  
 +18004431511  
 225 Commerce Drive  
 80524 FORT COLLINS Colorado  
 United States of America

**CA-YVR-GTW US-DEN-DEN**  
 Product Details:  
 Features / Services (Service Code)  
 [PI] EXPRESS WORLDWIDE (48) Emergency Situation(CR)  
 Payer Details: Duties Taxes Unpaid(DS)  
 Freight A/C: 977808715  
 Duty A/C: Receiver Will Pay  
 Taxes A/C: Receiver Will Pay  
 Incoterm: DAP

**Shipment Details:**  
 Ref: Custom Val: 8.00 CAD  
 Cust Decl Sht Wgt (UOM) / Dim Wgt (UOM): 20.0 lbs 1  
 Name (in Capital Letters):  
 Signature:  
 Date (DD.MM.YYYY):

**Contents:**  
 Environmental Water Samples for Research



**Waybill 54 4138 7825**  
 License Plates of pieces in shipment  
 JD014600008096576688

Client: ALS Environmental

Date: 25-Sep-20

Project: VA20B4663

Work Order: 2009248

Sample ID: VA20B4663-001

Lab ID: 2009248-1

Legal Location:

Matrix: WATER

Collection Date: 8/25/2020 17:00

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>Radium-226 by Radon Emanation - Method 903.1</b>			<b>SOP 783</b>		Prep Date: <b>9/15/2020</b>	PrepBy: <b>TRW</b>
<b>Ra-226</b>	<b>1.8 (+/- 0.49)</b>	M3	<b>0.085</b>	<b>BQ/l</b>	NA	9/24/2020 12:41
<i>Carr: BARIUM</i>	96.2		40-110	%REC	DL = NA	9/24/2020 12:41

**Client:** ALS Environmental

**Date:** 25-Sep-20

**Project:** VA20B4663

**Work Order:** 2009248

**Sample ID:** VA20B4663-002

**Lab ID:** 2009248-2

**Legal Location:**

**Matrix:** WATER

**Collection Date:** 8/25/2020 17:00

**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>Radium-226 by Radon Emanation - Method 903.1</b>			<b>SOP 783</b>		Prep Date: <b>9/15/2020</b>	PrepBy: <b>TRW</b>
<b>Ra-226</b>	<b>2.0 (+/- 0.52)</b>	M3	<b>0.082</b>	<b>BQ/l</b>	NA	9/24/2020 12:41
<i>Carr: BARIUM</i>	96.1		40-110	%REC	DL = NA	9/24/2020 12:41

**Client:** ALS Environmental  
**Project:** VA20B4663  
**Sample ID:** VA20B4663-002  
**Legal Location:**  
**Collection Date:** 8/25/2020 17:00

**Date:** 25-Sep-20  
**Work Order:** 2009248  
**Lab ID:** 2009248-2  
**Matrix:** WATER  
**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	--------------	-------	-----------------	---------------

**Explanation of Qualifiers**

**Radiochemistry:**

- "Report Limit" is the MDC
- U or ND - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- W - DER is greater than Warning Limit of 1.42
- \* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
- # - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.
- G - Sample density differs by more than 15% of LCS density.
- D - DER is greater than Control Limit
- M - Requested MDC not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS, Matrix Spike Recovery within control limits.
- N - Matrix Spike Recovery outside control limits
- NC - Not Calculated for duplicate results less than 5 times MDC
- B - Analyte concentration greater than MDC.
- B3 - Analyte concentration greater than MDC but less than Requested MDC.

**Inorganics:**

- B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).
- U or ND - Indicates that the compound was analyzed for but not detected.
- E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.
- M - Duplicate injection precision was not met.
- N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.
- Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.
- \* - Duplicate analysis (relative percent difference) not within control limits.
- S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

**Organics:**

- U or ND - Indicates that the compound was analyzed for but not detected.
- B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.
- E - Analyte concentration exceeds the upper level of the calibration range.
- J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).
- A - A tentatively identified compound is a suspected aldol-condensation product.
- X - The analyte was diluted below an accurate quantitation level.
- \* - The spike recovery is equal to or outside the control criteria used.
- + - The relative percent difference (RPD) equals or exceeds the control criteria.
- G - A pattern resembling gasoline was detected in this sample.
- D - A pattern resembling diesel was detected in this sample.
- M - A pattern resembling motor oil was detected in this sample.
- C - A pattern resembling crude oil was detected in this sample.
- 4 - A pattern resembling JP-4 was detected in this sample.
- 5 - A pattern resembling JP-5 was detected in this sample.
- H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.
- L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.
- Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
  - gasoline
  - JP-8
  - diesel
  - mineral spirits
  - motor oil
  - Stoddard solvent
  - bunker C

ALS -- Fort Collins

Date: 9/25/2020 7:40:

Client: ALS Environmental  
 Work Order: 2009248  
 Project: VA20B4663

**QC BATCH REPORT**

Batch ID: **RE200915-1-1** Instrument ID **Alpha Scin** Method: **Radium-226 by Radon Emanation**

LCS		Sample ID: <b>RE200915-1</b>			Units: <b>BQ/I</b>		Analysis Date: <b>9/24/2020 13:15</b>				
Client ID:		Run ID: <b>RE200915-1A</b>			Prep Date: <b>9/15/2020</b>		DF: <b>NA</b>				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.52 (+/- 0.380)	0.0125	1.719		88.5	67-120					P,M3
Carr: BARIUM	16100		16340		98.7	40-110					

LCSD		Sample ID: <b>RE200915-1</b>			Units: <b>BQ/I</b>		Analysis Date: <b>9/24/2020 13:15</b>				
Client ID:		Run ID: <b>RE200915-1A</b>			Prep Date: <b>9/15/2020</b>		DF: <b>NA</b>				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.46 (+/- 0.364)	0.011	1.719		84.7	67-120		1.52	0.1	2.1	P,M3
Carr: BARIUM	15700		16340		96.1	40-110		16100			

MB		Sample ID: <b>RE200915-1</b>			Units: <b>BQ/I</b>		Analysis Date: <b>9/24/2020 13:15</b>				
Client ID:		Run ID: <b>RE200915-1A</b>			Prep Date: <b>9/15/2020</b>		DF: <b>NA</b>				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	0.00097 (+/- 0.0051)	0.0094									U
Carr: BARIUM	16000		16340		98	40-110					

The following samples were analyzed in this batch: 2009248-1      2009248-2



## CERTIFICATE OF ANALYSIS

**Work Order** : **VA20B4662**  
**Amendment** : **1**  
**Client** : **Golder Associates Ltd.**  
**Contact** : Adrian Kowalchuk  
**Address** : 1931 Robertson Road  
 Ottawa ON Canada K2H 5B7  
**Telephone** : 613 592 9600  
**Project** : 20136436-2300-2304  
**PO** : ----  
**C-O-C number** : 17-766900  
**Sampler** : Adrian Kowalchuk  
**Site** : Meliadine-Westbay A  
**Quote number** : VA20-AEML100-001 (Q72802)  
**No. of samples received** : 2  
**No. of samples analysed** : 2

**Page** : 1 of 11  
**Laboratory** : Vancouver - Environmental  
**Account Manager** : Heather McKenzie  
**Address** : 8081 Lougheed Highway  
 Burnaby BC Canada V5A 1W9  
**Telephone** : +1 604 253 4188  
**Date Samples Received** : 08-Sep-2020 08:25  
**Date Analysis Commenced** : 08-Sep-2020  
**Issue Date** : 03-Sep-2021 16:51

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
- Surrogate Control Limits

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>
Annabelle Prasad	Analyst	Metals, Burnaby, British Columbia
Brieanna Allen	Production/Validation Manager	Organics, Burnaby, British Columbia
Bruna Botti	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Cristina Alexandre	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kaitlyn Gardner	Account Manager Assistant	Internal Subcontracting, Fort Collins, Colorado
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Inorganics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Organics, Burnaby, British Columbia
Shaneel Dayal	Analyst	Metals, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia







## 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.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances  
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
Bq/L	Becquerels per litre
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units
psu	practical salinity units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

## Workorder Comments

Amendment (03/09/2021): This report has been amended following changes to the analytical data reported. The quality system is being utilised to resolve this issue. The specific data affected is chloromethane for sample VA20B4662-002.

## Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLA	Detection Limit adjusted for required dilution.
DLCI	Detection Limit Raised: Chromatographic interference due to co-elution.
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).

Page : 4 of 11  
Work Order : VA20B4662 Amendment 1  
Client : Golder Associates Ltd.  
Project : 20136436-2300-2304

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*DLQ*                      *Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.*

*PHA*                      *pH adjusted before analysis.*

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## Analytical Results

Sub-Matrix: Water					Client sample ID	Westbay A-606	Westbay A-606-BR	----	----	----
(Matrix: Water)					Client sampling date / time	27-Aug-2020 07:00	27-Aug-2020 10:30	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA20B4662-001	VA20B4662-002	-----	-----	-----	
					Result	Result	----	----	----	
<b>Sample Preparation</b>										
dissolved Fe2 filtration location	----	EP541	-	-	Field	Field	----	----	----	
<b>Physical Tests</b>										
conductivity	----	E100	2.0	µS/cm	661	132000	----	----	----	
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	92.7	118000	----	----	----	
pH	----	E108	0.10	pH units	7.18	10.2	----	----	----	
salinity	----	EC100S	1.0	psu	<1.0	113	----	----	----	
solids, total dissolved [TDS]	----	E162	10	mg/L	559	185000	----	----	----	
solids, total suspended [TSS]	----	E160-H	3.0	mg/L	17.2	2480	----	----	----	
turbidity	----	E121	0.10	NTU	50.8	29.8	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	55.5	1120	----	----	----	
alkalinity, phenolphthalein (as CaCO3)	----	E290	2.0	mg/L	<2.0	206	----	----	----	
alkalinity, hydroxide (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	----	----	----	
alkalinity, carbonate (as CaCO3)	----	E290	2.0	mg/L	<2.0	413	----	----	----	
alkalinity, bicarbonate (as CaCO3)	----	E290	2.0	mg/L	55.5	712	----	----	----	
alkalinity, bicarbonate (as HCO3)	71-52-3	E290	2.0	mg/L	67.7	869	----	----	----	
alkalinity, carbonate (as CO3)	3812-32-6	E290	2.0	mg/L	<2.0	248	----	----	----	
alkalinity, hydroxide (as OH)	14280-30-9	E290	2.0	mg/L	<2.0	<2.0	----	----	----	
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	90.3	120000	----	----	----	
<b>Anions and Nutrients</b>										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	1.28	2.65	----	----	----	
bromide	24959-67-9	E235.Br-L	0.050	mg/L	0.193	353	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	180	90300	----	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	0.034	<2.00 <sup>DLDS</sup>	----	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	12.2	5.32	----	----	----	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.208	6.37	----	----	----	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0018	<0.100 <sup>DLDS</sup>	----	----	----	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0029	0.0685	----	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0096	0.0761	----	----	----	
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	<25.0 <sup>DLM</sup>	<25.0 <sup>DLM</sup>	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	5.47	41.5	----	----	----	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Westbay A-606	Westbay A-606-BR	----	----	----
Client sampling date / time					27-Aug-2020 07:00	27-Aug-2020 10:30	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA20B4662-001	VA20B4662-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Cyanides</b>										
cyanide, free	----	E339	0.0050	mg/L	<0.0400	<0.0400	----	----	----	
cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	<0.0400	<0.0400	----	----	----	
cyanide, weak acid dissociable	----	E336	0.0050	mg/L	<0.0400	<0.0400	----	----	----	
<b>Organic / Inorganic Carbon</b>										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	13.0	32.6	----	----	----	
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	86.7	30.6	----	----	----	
<b>Total Metals</b>										
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0191	<1.50 <sup>DLA</sup>	----	----	----	
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.0500 <sup>DLA</sup>	----	----	----	
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00090	<0.0500 <sup>DLA</sup>	----	----	----	
barium, total	7440-39-3	E420	0.00010	mg/L	0.0200	13.2	----	----	----	
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.0500 <sup>DLA</sup>	----	----	----	
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.0250 <sup>DLA</sup>	----	----	----	
boron, total	7440-42-8	E420	0.010	mg/L	0.015	164	----	----	----	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000176	<0.00250 <sup>DLA</sup>	----	----	----	
calcium, total	7440-70-2	E420	0.050	mg/L	33.0	47000	----	----	----	
cesium, total	7440-46-2	E420	0.000010	mg/L	0.000123	4.24	----	----	----	
chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	0.00049	<0.0500 <sup>DLA</sup>	----	----	----	
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00027	<0.0500 <sup>DLA</sup>	----	----	----	
copper, total	7440-50-8	E420	0.000050	mg/L	0.00359	<0.250 <sup>DLA</sup>	----	----	----	
iron, total	7439-89-6	E420	0.010	mg/L	1.06	<5.00 <sup>DLA</sup>	----	----	----	
lead, total	7439-92-1	E420	0.000050	mg/L	0.000320	<0.0250 <sup>DLA</sup>	----	----	----	
lithium, total	7439-93-2	E420	0.0010	mg/L	0.0641	166	----	----	----	
magnesium, total	7439-95-4	E420	0.0050	mg/L	2.52	12.4	----	----	----	
manganese, total	7439-96-5	E420	0.00010	mg/L	0.0421	<0.0500 <sup>DLA</sup>	----	----	----	
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000500 <sup>DLM</sup>	----	----	----	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000296	0.0252	----	----	----	
nickel, total	7440-02-0	E420	0.000050	mg/L	0.00364	<0.250 <sup>DLA</sup>	----	----	----	
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<25.0 <sup>DLA</sup>	----	----	----	
potassium, total	7440-09-7	E420	0.050	mg/L	3.92	2400	----	----	----	
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00284	9.09	----	----	----	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Westbay A-606	Westbay A-606-BR	----	----	----
Client sampling date / time					27-Aug-2020 07:00	27-Aug-2020 10:30	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA20B4662-001	VA20B4662-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Total Metals</b>										
selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.0250 <sup>DLA</sup>	----	----	----	
silicon, total	7440-21-3	E420	0.10	mg/L	0.26	<50.0 <sup>DLA</sup>	----	----	----	
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.00500 <sup>DLA</sup>	----	----	----	
sodium, total	17341-25-2	E420	0.050	mg/L	104	1590	----	----	----	
strontium, total	7440-24-6	E420	0.00020	mg/L	0.307	2360	----	----	----	
sulfur, total	7704-34-9	E420	0.50	mg/L	2.61	<250 <sup>DLA</sup>	----	----	----	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	0.227	----	----	----	
thallium, total	7440-28-0	E420	0.000010	mg/L	0.000070	0.303	----	----	----	
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.0500 <sup>DLA</sup>	----	----	----	
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.0500 <sup>DLA</sup>	----	----	----	
titanium, total	7440-32-6	E420	0.00030	mg/L	0.00064	<0.150 <sup>DLA</sup>	----	----	----	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.0500 <sup>DLA</sup>	----	----	----	
uranium, total	7440-61-1	E420	0.000010	mg/L	0.000024	<0.00500 <sup>DLA</sup>	----	----	----	
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.250 <sup>DLA</sup>	----	----	----	
zinc, total	7440-66-6	E420	0.0030	mg/L	0.0255	<1.50 <sup>DLA</sup>	----	----	----	
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.100 <sup>DLA</sup>	----	----	----	
<b>Dissolved Metals</b>										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0040	<0.500 <sup>DLA</sup>	----	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.0500 <sup>DLA</sup>	----	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00065	<0.0500 <sup>DLA</sup>	----	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0187	12.2	----	----	----	
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.0500 <sup>DLA</sup>	----	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.0250 <sup>DLA</sup>	----	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	0.015	159	----	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000139	<0.00250 <sup>DLA</sup>	----	----	----	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	32.8	48200	----	----	----	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000152	3.90	----	----	----	
chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	<0.00010	<0.0500 <sup>DLA</sup>	----	----	----	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00021	<0.0500 <sup>DLA</sup>	----	----	----	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00213	<0.100 <sup>DLA</sup>	----	----	----	
iron, dissolved	7439-89-6	E421	0.010	mg/L	1.04	<5.00 <sup>DLA</sup>	----	----	----	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Westbay A-606	Westbay A-606-BR	----	----	----
Client sampling date / time					27-Aug-2020 07:00	27-Aug-2020 10:30	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA20B4662-001	VA20B4662-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Dissolved Metals</b>										
lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000054	<0.0250 <sup>DLA</sup>	----	----	----	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0686	169	----	----	----	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	2.05	10.7	----	----	----	
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.0343	<0.0500 <sup>DLA</sup>	----	----	----	
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000250 <sup>DLM</sup>	----	----	----	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000134	0.0274	----	----	----	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00286	<0.250 <sup>DLA</sup>	----	----	----	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<25.0 <sup>DLA</sup>	----	----	----	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	3.62	2240	----	----	----	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00254	8.65	----	----	----	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000079	<0.0250 <sup>DLA</sup>	----	----	----	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	0.221	<25.0 <sup>DLA</sup>	----	----	----	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.00500 <sup>DLA</sup>	----	----	----	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	95.2	1430	----	----	----	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.294	2220	----	----	----	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	1.94	<250 <sup>DLA</sup>	----	----	----	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	0.196	----	----	----	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000073	0.288	----	----	----	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.0500 <sup>DLA</sup>	----	----	----	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.0500 <sup>DLA</sup>	----	----	----	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.150 <sup>DLA</sup>	----	----	----	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.0500 <sup>DLA</sup>	----	----	----	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000024	<0.00500 <sup>DLA</sup>	----	----	----	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.250 <sup>DLA</sup>	----	----	----	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0097	<0.500 <sup>DLA</sup>	----	----	----	
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.100 <sup>DLA</sup>	----	----	----	
dissolved mercury filtration location	----	EP509	-	-	Field	Field	----	----	----	
dissolved metals filtration location	----	EP421	-	-	Field	Field	----	----	----	
<b>Speciated Metals</b>										
iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.020	mg/L	0.338	0.247	----	----	----	
<b>Aggregate Organics</b>										



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Westbay A-606	Westbay A-606-BR	----	----	----
Client sampling date / time					27-Aug-2020 07:00	27-Aug-2020 10:30	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA20B4662-001	VA20B4662-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Aggregate Organics</b>										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<6.0 <sup>PHA</sup>	8.2 <sup>PHA</sup>	----	----	----	
chemical oxygen demand [COD]	----	E559	20	mg/L	147	2390 <sup>DLM</sup>	----	----	----	
oil & grease (gravimetric)	----	E567	5.0	mg/L	<5.0	<5.0	----	----	----	
<b>Volatile Organic Compounds</b>										
chlorobenzene	108-90-7	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
chloromethane	74-87-3	E611C	0.50	µg/L	<0.50	<110 <sup>DLM</sup>	----	----	----	
dichlorobenzene, 1,2-	95-50-1	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichlorobenzene, 1,3-	541-73-1	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichlorobenzene, 1,4-	106-46-7	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichloropropane, 1,2-	78-87-5	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichloropropylene, cis+trans-1,3-	542-75-6	E611C	0.75	µg/L	<0.75	<0.75	----	----	----	
dichloropropylene, cis-1,3-	10061-01-5	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
tetrachloroethane, 1,1,2,2-	79-34-5	E611C	0.20	µg/L	<0.20	<0.20	----	----	----	
trichloroethane, 1,1,2-	79-00-5	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
trichlorofluoromethane	75-69-4	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
<b>Volatile Organic Compounds [BTEXS+MTBE]</b>										
benzene	71-43-2	E611C	0.50	µg/L	1.19	<0.50	----	----	----	
ethylbenzene	100-41-4	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
styrene	100-42-5	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
toluene	108-88-3	E611C	0.40	µg/L	1.12	0.70	----	----	----	
xylene, m+p-	179601-23-1	E611C	0.50	µg/L	<0.50	0.93	----	----	----	
xylene, o-	95-47-6	E611C	0.50	µg/L	<0.50	0.52	----	----	----	
xylenes, total	1330-20-7	E611C	0.75	µg/L	<0.75	1.44	----	----	----	
<b>Volatile Organic Compounds [Drycleaning]</b>										
carbon tetrachloride	56-23-5	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
chloroethane	75-00-3	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichloroethane, 1,1-	75-34-3	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichloroethane, 1,2-	107-06-2	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichloroethylene, 1,1-	75-35-4	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	





## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Westbay A-606	Westbay A-606-BR	----	----	----
Client sampling date / time					27-Aug-2020 07:00	27-Aug-2020 10:30	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA20B4662-001	VA20B4662-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Volatile Organic Compounds [Drycleaning]</b>										
dichloroethylene, cis-1,2-	156-59-2	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichloroethylene, trans-1,2-	156-60-5	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichloromethane	75-09-2	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dichloropropylene, trans-1,3-	10061-02-6	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
tetrachloroethylene	127-18-4	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
trichloroethane, 1,1,1-	71-55-6	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
trichloroethylene	79-01-6	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
vinyl chloride	75-01-4	E611C	0.40	µg/L	<0.40	<0.40	----	----	----	
<b>Volatile Organic Compounds [THMs]</b>										
bromodichloromethane	75-27-4	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
bromoform	75-25-2	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
chloroform	67-66-3	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
dibromochloromethane	124-48-1	E611C	0.50	µg/L	<0.50	<0.50	----	----	----	
<b>Volatile Organic Compounds Surrogates</b>										
bromofluorobenzene, 4-	460-00-4	E611C	0.50	%	104	85.1	----	----	----	
difluorobenzene, 1,4-	540-36-3	E611C	0.50	%	99.4	100	----	----	----	
<b>Hydrocarbons</b>										
EPH (C10-C19)	----	E601A	250	µg/L	880	<250	----	----	----	
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	----	----	----	
HEPHw	----	EC600A	250	µg/L	<250	<250	----	----	----	
LEPHw	----	EC600A	250	µg/L	880	<250	----	----	----	
<b>Hydrocarbons Surrogates</b>										
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	50	%	92.7	84.5	----	----	----	
<b>Polycyclic Aromatic Hydrocarbons</b>										
acenaphthene	83-32-9	E641A	0.010	µg/L	<0.020 <sup>DLO</sup>	<0.020 <sup>DLO</sup>	----	----	----	
acenaphthylene	208-96-8	E641A	0.010	µg/L	<0.060 <sup>DLO</sup>	0.045	----	----	----	
acridine	260-94-6	E641A	0.010	µg/L	0.072	0.026	----	----	----	
anthracene	120-12-7	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	
benz(a)anthracene	56-55-3	E641A	0.010	µg/L	<0.020 <sup>DLO</sup>	<0.010	----	----	----	
benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	<0.0050	<0.0050	----	----	----	
benzo(b+j)fluoranthene	----	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Westbay A-606	Westbay A-606-BR	----	----	----
Client sampling date / time					27-Aug-2020 07:00	27-Aug-2020 10:30	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA20B4662-001	VA20B4662-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Polycyclic Aromatic Hydrocarbons</b>										
benzo(b+j+k)fluoranthene	----	E641A	0.015	µg/L	<0.015	<0.015	----	----	----	
benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	
benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	
chrysene	218-01-9	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	
dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	<0.0050	<0.0050	----	----	----	
fluoranthene	206-44-0	E641A	0.010	µg/L	0.021	0.023	----	----	----	
fluorene	86-73-7	E641A	0.010	µg/L	0.035	0.044	----	----	----	
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	
methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	0.202	0.117	----	----	----	
methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	0.106	0.098	----	----	----	
naphthalene	91-20-3	E641A	0.050	µg/L	0.766	0.449	----	----	----	
phenanthrene	85-01-8	E641A	0.020	µg/L	0.094	0.113	----	----	----	
pyrene	129-00-0	E641A	0.010	µg/L	0.058	0.052	----	----	----	
quinoline	6027-02-7	E641A	0.050	µg/L	<0.800 <sup>DLO</sup>	<0.200 <sup>DLO</sup>	----	----	----	
<b>Polycyclic Aromatic Hydrocarbons Surrogates</b>										
acridine-d9	34749-75-2	E641A	0.010	µg/L	0.890	0.924	----	----	----	
chrysene-d12	1719-03-5	E641A	0.010	%	115	94.5	----	----	----	
naphthalene-d8	1146-65-2	E641A	0.010	%	120	97.7	----	----	----	
phenanthrene-d10	1517-22-2	E641A	0.010	%	108	98.1	----	----	----	
<b>Radiological Parameters</b>										
radium-226	13982-63-3	RA226-MMER	0.01	Bq/L	<0.01	----	----	----	----	
radium-226	13982-63-3	RA226-MMER	0.29	Bq/L	----	8.8	----	----	----	

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

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA20B4662	Page	: 1 of 21
Amendment	: 1		
Client	: Golder Associates Ltd.	Laboratory	: Vancouver - Environmental
Contact	: Adrian Kowalchuk	Account Manager	: Heather McKenzie
Address	: 1931 Robertson Road Ottawa ON Canada K2H 5B7	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 204 489 9600	Telephone	: +1 604 253 4188
Project	: 20136436-2300-2304	Date Samples Received	: 08-Sep-2020 08:25
PO	: ----	Issue Date	: 03-Sep-2021 16:51
C-O-C number	: 17-766900		
Sampler	: Adrian Kowalchuk		
Site	: Meliadine-Westbay A		
Quote number	: VA20-AEML100-001 (Q72802)		
No. of samples received	: 2		
No. of samples analysed	: 2		

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 Services number is a unique identifier assigned to discrete substances.

**DQO:** Data Quality Objective.

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

**RPD:** Relative Percent Difference.

## Summary of Outliers

### Outliers : Quality Control Samples

- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Method Blank value 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)

- Analysis Holding Time Outliers exist - please see following pages for full details.

### 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
<b>Method Blank (MB) Values</b>								
Physical Tests	QC-MRG3-8315100 1	----	alkalinity, total (as CaCO3)	----	E290	6.6 mg/L <sup>B</sup>	1.5 mg/L	Blank result exceeds permitted value
Physical Tests	QC-MRG3-8315100 1	----	alkalinity, bicarbonate (as CaCO3)	----	E290	6.6 mg/L <sup>B</sup>	1.5 mg/L	Blank result exceeds permitted value

**Result Qualifiers**

Qualifier	Description
<b>B</b>	<i>Method Blank exceeds ALS DQO. Associated sample results which are &lt; Limit of Reporting or &gt; 5 times blank level are considered reliable.</i>



## 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		
<b>Aggregate Organics : Biochemical Oxygen Demand - 5 day</b>											
<b>HDPE [BOD HT 3d]</b> Westbay A-606	E550	27-Aug-2020	----	----	----		09-Sep-2020	3 days	13 days	*	EHTR
<b>Aggregate Organics : Biochemical Oxygen Demand - 5 day</b>											
<b>HDPE [BOD HT 3d]</b> Westbay A-606-BR	E550	27-Aug-2020	----	----	----		09-Sep-2020	3 days	13 days	*	EHTR
<b>Aggregate Organics : Chemical Oxygen Demand by Colourimetry</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay A-606	E559	27-Aug-2020	----	----	----		15-Sep-2020	28 days	19 days	✓	
<b>Aggregate Organics : Chemical Oxygen Demand by Colourimetry</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay A-606-BR	E559	27-Aug-2020	----	----	----		15-Sep-2020	28 days	19 days	✓	
<b>Aggregate Organics : Oil &amp; Grease by Gravimetry</b>											
<b>Amber glass (hydrochloric acid)</b> Westbay A-606	E567	27-Aug-2020	09-Sep-2020	28 days	13 days	✓	09-Sep-2020	40 days	0 days	✓	
<b>Aggregate Organics : Oil &amp; Grease by Gravimetry</b>											
<b>Amber glass (hydrochloric acid)</b> Westbay A-606-BR	E567	27-Aug-2020	09-Sep-2020	28 days	13 days	✓	09-Sep-2020	40 days	0 days	✓	
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay A-606	E298	27-Aug-2020	14-Sep-2020	----	----		14-Sep-2020	28 days	18 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		
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay A-606-BR	E298	27-Aug-2020	14-Sep-2020	----	----		14-Sep-2020	28 days	18 days	✓	
<b>Anions and Nutrients : Bromide in Water by IC (Low Level)</b>											
<b>HDPE</b> Westbay A-606	E235.Br-L	27-Aug-2020	----	----	----		09-Sep-2020	28 days	13 days	✓	
<b>Anions and Nutrients : Bromide in Water by IC (Low Level)</b>											
<b>HDPE</b> Westbay A-606-BR	E235.Br-L	27-Aug-2020	----	----	----		09-Sep-2020	28 days	13 days	✓	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
<b>HDPE</b> Westbay A-606	E235.Cl	27-Aug-2020	----	----	----		09-Sep-2020	28 days	13 days	✓	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
<b>HDPE</b> Westbay A-606-BR	E235.Cl	27-Aug-2020	----	----	----		09-Sep-2020	28 days	13 days	✓	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)</b>											
<b>HDPE</b> Westbay A-606	E378-U	27-Aug-2020	----	----	----		09-Sep-2020	3 days	13 days	* EHTR	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)</b>											
<b>HDPE</b> Westbay A-606-BR	E378-U	27-Aug-2020	----	----	----		09-Sep-2020	3 days	13 days	* EHTR	
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
<b>HDPE</b> Westbay A-606	E235.F	27-Aug-2020	----	----	----		09-Sep-2020	28 days	13 days	✓	
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
<b>HDPE</b> Westbay A-606-BR	E235.F	27-Aug-2020	----	----	----		09-Sep-2020	28 days	13 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		
<b>Anions and Nutrients : Nitrate in Water by IC (Low Level)</b>											
HDPE Westbay A-606	E235.NO3-L	27-Aug-2020	----	----	----		09-Sep-2020	3 days	13 days	*	EHTR
<b>Anions and Nutrients : Nitrate in Water by IC (Low Level)</b>											
HDPE Westbay A-606-BR	E235.NO3-L	27-Aug-2020	----	----	----		09-Sep-2020	3 days	13 days	*	EHTR
<b>Anions and Nutrients : Nitrite in Water by IC (Low Level)</b>											
HDPE Westbay A-606	E235.NO2-L	27-Aug-2020	----	----	----		09-Sep-2020	3 days	13 days	*	EHTR
<b>Anions and Nutrients : Nitrite in Water by IC (Low Level)</b>											
HDPE Westbay A-606-BR	E235.NO2-L	27-Aug-2020	----	----	----		09-Sep-2020	3 days	13 days	*	EHTR
<b>Anions and Nutrients : Reactive Silica by Colourimetry</b>											
HDPE Westbay A-606	E392	27-Aug-2020	----	----	----		15-Sep-2020	28 days	19 days	✓	
<b>Anions and Nutrients : Reactive Silica by Colourimetry</b>											
HDPE Westbay A-606-BR	E392	27-Aug-2020	----	----	----		15-Sep-2020	28 days	19 days	✓	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE Westbay A-606	E235.SO4	27-Aug-2020	----	----	----		09-Sep-2020	28 days	13 days	✓	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE Westbay A-606-BR	E235.SO4	27-Aug-2020	----	----	----		09-Sep-2020	28 days	13 days	✓	
<b>Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay A-606	E318	27-Aug-2020	14-Sep-2020	----	----		15-Sep-2020	28 days	19 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		
<b>Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay A-606-BR	E318	27-Aug-2020	14-Sep-2020	----	----		15-Sep-2020	28 days	19 days	✔	
<b>Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay A-606	E372-U	27-Aug-2020	14-Sep-2020	----	----		15-Sep-2020	28 days	19 days	✔	
<b>Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay A-606-BR	E372-U	27-Aug-2020	14-Sep-2020	----	----		15-Sep-2020	28 days	19 days	✔	
<b>Cyanides : Free Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay A-606	E339	27-Aug-2020	----	----	----		09-Sep-2020	14 days	13 days	✔	
<b>Cyanides : Free Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay A-606-BR	E339	27-Aug-2020	----	----	----		09-Sep-2020	14 days	13 days	✔	
<b>Cyanides : Total Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay A-606	E333	27-Aug-2020	----	----	----		09-Sep-2020	14 days	13 days	✔	
<b>Cyanides : Total Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay A-606-BR	E333	27-Aug-2020	----	----	----		09-Sep-2020	14 days	13 days	✔	
<b>Cyanides : WAD Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay A-606	E336	27-Aug-2020	----	----	----		09-Sep-2020	14 days	13 days	✔	
<b>Cyanides : WAD Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay A-606-BR	E336	27-Aug-2020	----	----	----		09-Sep-2020	14 days	13 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		
<b>Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)</b>											
<b>HDPE dissolved (nitric acid)</b> Westbay A-606-BR	E421.Cr-L	27-Aug-2020	10-Sep-2020	----	----		11-Sep-2020	180 days	14 days	✔	
<b>Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)</b>											
<b>HDPE dissolved (nitric acid)</b> Westbay A-606	E421.Cr-L	27-Aug-2020	10-Sep-2020	----	----		11-Sep-2020	180 days	15 days	✔	
<b>Dissolved Metals : Dissolved Mercury in Water by CVAAS</b>											
<b>Glass vial dissolved (hydrochloric acid)</b> Westbay A-606	E509	27-Aug-2020	14-Sep-2020	----	----		14-Sep-2020	28 days	18 days	✔	
<b>Dissolved Metals : Dissolved Mercury in Water by CVAAS</b>											
<b>Glass vial dissolved (hydrochloric acid)</b> Westbay A-606-BR	E509	27-Aug-2020	14-Sep-2020	----	----		14-Sep-2020	28 days	18 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
<b>HDPE dissolved (nitric acid)</b> Westbay A-606-BR	E421	27-Aug-2020	10-Sep-2020	----	----		11-Sep-2020	180 days	14 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
<b>HDPE dissolved (nitric acid)</b> Westbay A-606	E421	27-Aug-2020	10-Sep-2020	----	----		11-Sep-2020	180 days	15 days	✔	
<b>Hydrocarbons : BC PHC - EPH by GC-FID</b>											
<b>Amber glass/Teflon lined cap (sodium bisulfate)</b> Westbay A-606	E601A	27-Aug-2020	09-Sep-2020	14 days	13 days	✔	10-Sep-2020	40 days	1 days	✔	
<b>Hydrocarbons : BC PHC - EPH by GC-FID</b>											
<b>Amber glass/Teflon lined cap (sodium bisulfate)</b> Westbay A-606-BR	E601A	27-Aug-2020	09-Sep-2020	14 days	13 days	✔	10-Sep-2020	40 days	1 days	✔	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
<b>Amber glass dissolved (sulfuric acid)</b> Westbay A-606	E358-L	27-Aug-2020	14-Sep-2020	----	----		14-Sep-2020	28 days	18 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		
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
<b>Amber glass dissolved (sulfuric acid)</b> Westbay A-606-BR	E358-L	27-Aug-2020	14-Sep-2020	----	----		14-Sep-2020	28 days	18 days	✓	
<b>Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay A-606	E355-L	27-Aug-2020	14-Sep-2020	----	----		14-Sep-2020	28 days	18 days	✓	
<b>Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay A-606-BR	E355-L	27-Aug-2020	14-Sep-2020	----	----		14-Sep-2020	28 days	18 days	✓	
<b>Physical Tests : Alkalinity Species by Titration</b>											
<b>HDPE</b> Westbay A-606	E290	27-Aug-2020	----	----	----		09-Sep-2020	14 days	13 days	✓	
<b>Physical Tests : Alkalinity Species by Titration</b>											
<b>HDPE</b> Westbay A-606-BR	E290	27-Aug-2020	----	----	----		09-Sep-2020	14 days	13 days	✓	
<b>Physical Tests : Conductivity in Water</b>											
<b>HDPE</b> Westbay A-606	E100	27-Aug-2020	----	----	----		09-Sep-2020	28 days	13 days	✓	
<b>Physical Tests : Conductivity in Water</b>											
<b>HDPE</b> Westbay A-606-BR	E100	27-Aug-2020	----	----	----		09-Sep-2020	28 days	13 days	✓	
<b>Physical Tests : pH by Meter</b>											
<b>HDPE</b> Westbay A-606-BR	E108	27-Aug-2020	----	----	----		09-Sep-2020	0.25 hrs	309 hrs	* EHTR-FM	
<b>Physical Tests : pH by Meter</b>											
<b>HDPE</b> Westbay A-606	E108	27-Aug-2020	----	----	----		09-Sep-2020	0.25 hrs	313 hrs	* EHTR-FM	



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	
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE Westbay A-606	E162	27-Aug-2020	----	----	----		08-Sep-2020	7 days	13 days	* EHTR
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE Westbay A-606-BR	E162	27-Aug-2020	----	----	----		08-Sep-2020	7 days	13 days	* EHTR
<b>Physical Tests : TSS by Gravimetry</b>										
HDPE Westbay A-606	E160-H	27-Aug-2020	----	----	----		09-Sep-2020	7 days	13 days	* EHTR
<b>Physical Tests : TSS by Gravimetry</b>										
HDPE Westbay A-606-BR	E160-H	27-Aug-2020	----	----	----		09-Sep-2020	7 days	13 days	* EHTR
<b>Physical Tests : Turbidity by Nephelometry</b>										
HDPE Westbay A-606	E121	27-Aug-2020	----	----	----		09-Sep-2020	3 days	13 days	* EHTR
<b>Physical Tests : Turbidity by Nephelometry</b>										
HDPE Westbay A-606-BR	E121	27-Aug-2020	----	----	----		09-Sep-2020	3 days	13 days	* EHTR
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS</b>										
Amber glass/Teflon lined cap (sodium bisulfate) Westbay A-606	E641A	27-Aug-2020	09-Sep-2020	14 days	13 days	✓	09-Sep-2020	40 days	0 days	✓
<b>Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS</b>										
Amber glass/Teflon lined cap (sodium bisulfate) Westbay A-606-BR	E641A	27-Aug-2020	09-Sep-2020	14 days	13 days	✓	09-Sep-2020	40 days	0 days	✓
<b>Radiological Parameters : Radium-226 by Radon Emanation</b>										
HDPE (nitric acid) Westbay A-606	RA226-MMER	27-Aug-2020	----	----	----		24-Sep-2020	180 days	28 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	
<b>Radiological Parameters : Radium-226 by Radon Emanation</b>										
<b>HDPE (nitric acid)</b> Westbay A-606-BR	RA226-MMER	27-Aug-2020	----	----	----		24-Sep-2020	180 days	28 days	✓
<b>Speciated Metals : Dissolved Ferrous Iron in Water by Colour</b>										
<b>Opaque HDPE Dissolved (hydrochloric acid)</b> Westbay A-606-BR	E541	27-Aug-2020	02-Oct-2020	----	----		02-Oct-2020	7 days	36 days	* EHTR-FM
<b>Speciated Metals : Dissolved Ferrous Iron in Water by Colour</b>										
<b>Opaque HDPE Dissolved (hydrochloric acid)</b> Westbay A-606	E541	27-Aug-2020	02-Oct-2020	----	----		02-Oct-2020	7 days	37 days	* EHTR-FM
<b>Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)</b>										
<b>HDPE total (nitric acid)</b> Westbay A-606	E420.Cr-L	27-Aug-2020	----	----	----		14-Sep-2020	180 days	19 days	✓
<b>Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)</b>										
<b>HDPE total (nitric acid)</b> Westbay A-606-BR	E420.Cr-L	27-Aug-2020	----	----	----		14-Sep-2020	180 days	19 days	✓
<b>Total Metals : Total Mercury in Water by CVAAS</b>										
<b>Glass vial total (hydrochloric acid)</b> Westbay A-606	E508	27-Aug-2020	----	----	----		13-Sep-2020	28 days	17 days	✓
<b>Total Metals : Total Mercury in Water by CVAAS</b>										
<b>Glass vial total (hydrochloric acid)</b> Westbay A-606-BR	E508	27-Aug-2020	----	----	----		13-Sep-2020	28 days	17 days	✓
<b>Total Metals : Total Metals in Water by CRC ICPMS</b>										
<b>HDPE total (nitric acid)</b> Westbay A-606	E420	27-Aug-2020	----	----	----		14-Sep-2020	180 days	19 days	✓
<b>Total Metals : Total Metals in Water by CRC ICPMS</b>										
<b>HDPE total (nitric acid)</b> Westbay A-606-BR	E420	27-Aug-2020	----	----	----		14-Sep-2020	180 days	19 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	
<b>Volatile Organic Compounds : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay A-606	E611C	27-Aug-2020	09-Sep-2020	----	----		09-Sep-2020	----	----	
<b>Volatile Organic Compounds : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay A-606-BR	E611C	27-Aug-2020	09-Sep-2020	----	----		09-Sep-2020	----	----	
<b>Volatile Organic Compounds [BTEXS+MTBE] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay A-606	E611C	27-Aug-2020	09-Sep-2020	----	----		09-Sep-2020	14 days	13 days	✔
<b>Volatile Organic Compounds [BTEXS+MTBE] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay A-606-BR	E611C	27-Aug-2020	09-Sep-2020	----	----		09-Sep-2020	14 days	13 days	✔
<b>Volatile Organic Compounds [Drycleaning] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay A-606	E611C	27-Aug-2020	09-Sep-2020	----	----		09-Sep-2020	----	----	
<b>Volatile Organic Compounds [Drycleaning] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay A-606-BR	E611C	27-Aug-2020	09-Sep-2020	----	----		09-Sep-2020	----	----	
<b>Volatile Organic Compounds [THMs] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay A-606	E611C	27-Aug-2020	09-Sep-2020	----	----		09-Sep-2020	----	----	
<b>Volatile Organic Compounds [THMs] : VOCs (BC List) by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay A-606-BR	E611C	27-Aug-2020	09-Sep-2020	----	----		09-Sep-2020	----	----	

**Legend & Qualifier Definitions**

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended  
 EHTR: Exceeded ALS recommended hold time prior to sample receipt.  
 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 (%)		Evaluation
			QC	Regular	Actual	Expected	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity Species by Titration	E290	83152	1	18	5.5	5.0	✔
Ammonia by Fluorescence	E298	85388	1	7	14.2	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	83463	1	10	10.0	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	83156	1	19	5.2	5.0	✔
Chemical Oxygen Demand by Colourimetry	E559	85916	1	20	5.0	5.0	✔
Chloride in Water by IC	E235.Cl	83154	1	19	5.2	5.0	✔
Conductivity in Water	E100	83151	1	15	6.6	5.0	✔
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	84254	1	17	5.8	5.0	✔
Dissolved Ferrous Iron in Water by Colour	E541	96342	1	2	50.0	5.0	✔
Dissolved Mercury in Water by CVAAS	E509	85441	1	4	25.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	84255	1	17	5.8	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	85385	1	13	7.6	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	83160	1	19	5.2	5.0	✔
Fluoride in Water by IC	E235.F	83155	1	19	5.2	5.0	✔
Free Cyanide by CFA	E339	83512	1	4	25.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	83157	1	19	5.2	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	83158	1	19	5.2	5.0	✔
pH by Meter	E108	83150	1	19	5.2	5.0	✔
Reactive Silica by Colourimetry	E392	86182	1	14	7.1	5.0	✔
Sulfate in Water by IC	E235.SO4	83159	1	19	5.2	5.0	✔
TDS by Gravimetry	E162	83100	1	5	20.0	5.0	✔
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	85394	1	8	12.5	5.0	✔
Total Cyanide by CFA	E333	83513	1	4	25.0	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	85384	1	3	33.3	5.0	✔
Total Mercury in Water by CVAAS	E508	85274	1	20	5.0	5.0	✔
Total Metals in Water by CRC ICPMS	E420	85395	1	13	7.6	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	85386	1	10	10.0	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	85387	1	3	33.3	5.0	✔
TSS by Gravimetry	E160-H	83134	1	20	5.0	5.0	✔
Turbidity by Nephelometry	E121	83296	1	20	5.0	5.0	✔
VOCs (BC List) by Headspace GC-MS	E611C	83260	1	11	9.0	5.0	✔
WAD Cyanide by CFA	E336	83511	1	4	25.0	5.0	✔
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity Species by Titration	E290	83152	1	18	5.5	5.0	✔
Ammonia by Fluorescence	E298	85388	1	7	14.2	5.0	✔
BC PHC - EPH by GC-FID	E601A	83251	1	2	50.0	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	83463	1	10	10.0	5.0	✔



Matrix: **Water**

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
<b>Analytical Methods</b>							
<b>Laboratory Control Samples (LCS) - Continued</b>							
Bromide in Water by IC (Low Level)	E235.Br-L	83156	1	19	5.2	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	85916	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	83154	1	19	5.2	5.0	✓
Conductivity in Water	E100	83151	1	15	6.6	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	84254	1	17	5.8	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	96342	1	2	50.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	85441	1	4	25.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	84255	1	17	5.8	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	85385	1	13	7.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	83160	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	83155	1	19	5.2	5.0	✓
Free Cyanide by CFA	E339	83512	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	83157	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	83158	1	19	5.2	5.0	✓
Oil & Grease by Gravimetry	E567	83354	1	5	20.0	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	83250	1	20	5.0	5.0	✓
pH by Meter	E108	83150	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	86182	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	83159	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	83100	1	5	20.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	85394	1	8	12.5	5.0	✓
Total Cyanide by CFA	E333	83513	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	85384	1	3	33.3	5.0	✓
Total Mercury in Water by CVAAS	E508	85274	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	85395	1	13	7.6	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	85386	1	10	10.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	85387	1	3	33.3	5.0	✓
TSS by Gravimetry	E160-H	83134	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	83296	1	20	5.0	5.0	✓
VOCs (BC List) by Headspace GC-MS	E611C	83260	1	11	9.0	5.0	✓
WAD Cyanide by CFA	E336	83511	1	4	25.0	5.0	✓
<b>Method Blanks (MB)</b>							
Alkalinity Species by Titration	E290	83152	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	85388	1	7	14.2	5.0	✓
BC PHC - EPH by GC-FID	E601A	83251	1	2	50.0	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	83463	1	10	10.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	83156	1	19	5.2	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	85916	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	83154	1	19	5.2	5.0	✓
Conductivity in Water	E100	83151	1	15	6.6	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	84254	1	17	5.8	5.0	✓



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
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Dissolved Ferrous Iron in Water by Colour	E541	96342	1	2	50.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	85441	1	4	25.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	84255	1	17	5.8	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	85385	1	13	7.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	83160	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	83155	1	19	5.2	5.0	✓
Free Cyanide by CFA	E339	83512	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	83157	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	83158	1	19	5.2	5.0	✓
Oil & Grease by Gravimetry	E567	83354	1	5	20.0	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	83250	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	86182	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	83159	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	83100	1	5	20.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	85394	1	8	12.5	5.0	✓
Total Cyanide by CFA	E333	83513	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	85384	1	3	33.3	5.0	✓
Total Mercury in Water by CVAAS	E508	85274	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	85395	1	13	7.6	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	85386	1	10	10.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	85387	1	3	33.3	5.0	✓
TSS by Gravimetry	E160-H	83134	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	83296	1	20	5.0	5.0	✓
VOCs (BC List) by Headspace GC-MS	E611C	83260	1	11	9.0	5.0	✓
WAD Cyanide by CFA	E336	83511	1	4	25.0	5.0	✓
<b>Matrix Spikes (MS)</b>							
Ammonia by Fluorescence	E298	85388	1	7	14.2	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	83156	1	19	5.2	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	85916	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	83154	1	19	5.2	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	84254	1	17	5.8	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	96342	1	2	50.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	85441	1	4	25.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	84255	1	17	5.8	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	85385	1	13	7.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	83160	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	83155	1	19	5.2	5.0	✓
Free Cyanide by CFA	E339	83512	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	83157	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	83158	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	86182	1	14	7.1	5.0	✓





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
<i>Analytical Methods</i>							
<b>Matrix Spikes (MS) - Continued</b>							
Sulfate in Water by IC	E235.SO4	83159	1	19	5.2	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	85394	1	8	12.5	5.0	✓
Total Cyanide by CFA	E333	83513	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	85384	1	3	33.3	5.0	✓
Total Mercury in Water by CVAAS	E508	85274	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	85395	1	13	7.6	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	85386	1	10	10.0	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	85387	1	3	33.3	5.0	✓
VOCs (BC List) by Headspace GC-MS	E611C	83260	1	11	9.0	5.0	✓
WAD Cyanide by CFA	E336	83511	1	4	25.0	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
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Vancouver - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TSS by Gravimetry	E160-H Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Vancouver - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC (Low Level)	E235.Br-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Sulfate in Water by IC	E235.SO4  Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290  Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298  Vancouver - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318  Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.
Total Cyanide by CFA	E333  Vancouver - Environmental	Water	ISO 14403 (mod)	Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.
WAD Cyanide by CFA	E336  Vancouver - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.
Free Cyanide by CFA	E339  Vancouver - Environmental	Water	ASTM D7237 (mod)	Free cyanide is determined by in-line gas diffusion at pH 6 with final determination by colourimetric analysis.
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L  Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L  Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U Vancouver - Environmental	Water	APHA 4500-P E (mod)	Dissolved Orthophosphate is determined colourimetrically on a water sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Total Metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L Vancouver - Environmental	Water	APHA 3030 B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Dissolved Ferrous Iron in Water by Colour	E541 Vancouver - Environmental	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and Environ. Sci. Technol. 1999, 33, 5, 807-813. The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method. Holding time is 7 days for 0.45um filtration or 6 months if samples have been filtered using 0.1um filters.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Biochemical Oxygen Demand - 5 day	E550  Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter.  Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry	E559  Vancouver - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Oil & Grease by Gravimetry	E567  Vancouver - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane and the extract is evaporated to dryness. The residue is then weighed to determine Oil and Grease.
BC PHC - EPH by GC-FID	E601A  Vancouver - Environmental	Water	BC MOE Lab Manual	Extractable Petroleum Hydrocarbons (EPH) are analyzed by GC-FID.
VOCs (BC List) by Headspace GC-MS	E611C  Vancouver - 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.
PAHs by Hexane LVI GC-MS	E641A  Vancouver - Environmental	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Dissolved Hardness (Calculated)	EC100  Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO <sub>3</sub> ), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO <sub>3</sub> equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Hardness (Calculated) from Total Ca/Mg	EC100A  Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO <sub>3</sub> ), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO <sub>3</sub> equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
Salinity in Seawater (calculation)	EC100S  Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a seawater sample. Conductivity measurements are temperature-compensated to 25°C. Salinity in Practical Salinity Units is calculated.
LEPH and HEPH: EPH-PAH	EC600A  Vancouver - Environmental	Water	BC MOE Lab Manual (LEPH and HEPH) (mod)	Light Extractable Petroleum Hydrocarbons (LEPH) and Heavy Extractable Petroleum Hydrocarbons (HEPH) are calculated as follows: LEPH = Extractable Petroleum Hydrocarbons (EPH10-19) minus Acenaphthene, Acridine, Anthracene, Fluorene, Naphthalene and Phenanthrene; HEPH = Extractable Petroleum Hydrocarbons (EPH19-32) minus Benz(a)anthracene, Benzo(a)pyrene, Fluoranthene, and Pyrene.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Radium-226 by Radon Emanation	RA226-MMER  Fort Collins - Environmental - 225 Commerce Drive Fort Collins Colorado United States 80524	Water	EPA 903.1	Radium-226 in sample was analyzed according to the current revision of SOP 783.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298  Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318  Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Preparation for Total Organic Carbon by Combustion	EP355  Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358  Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372  Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421  Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509  Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
Dissolved Ferrous Iron in Water by Colour	EP541  Vancouver - Environmental	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and "A New Method for the Direct Determination of Dissolved Iron Concentration in Acid Mine Waters" published by James W. Ball et al (1999). The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method.
Oil & Grease Extraction for Gravimetry	EP567  Vancouver - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane by liquid-liquid extraction.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
VOCs Preparation for Headspace Analysis	EP581 Vancouver - 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 Vancouver - 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 : **VA20B4662**

Page : 1 of 25

Amendment : **1**

Client : Golder Associates Ltd.  
 Contact : Adrian Kowalchuk  
 Address : # 400 - 543 Granville Street  
 Vancouver BC Canada V6C 1X8  
 Telephone : 204 489 9600  
 Project : 20136436-2300-2304  
 PO : ----  
 C-O-C number : 17-766900  
 Sampler : Adrian Kowalchuk  
 Site : Meliadine-Westbay A  
 Quote number : VA20-AEML100-001 (Q72802)  
 No. of samples received : 2  
 No. of samples analysed : 2

Laboratory : Vancouver - Environmental  
 Account Manager : Heather McKenzie  
 Address : 8081 Lougheed Highway  
 Burnaby, British Columbia Canada V5A 1W9  
 Telephone : +1 604 253 4188  
 Date Samples Received : 08-Sep-2020 08:25  
 Date Analysis Commenced : 08-Sep-2020  
 Issue Date : 03-Sep-2021 16:51

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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

### 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.

Signatories	Position	Laboratory Department
Annabelle Prasad	Analyst	Metals, Burnaby, British Columbia
Brieanna Allen	Production/Validation Manager	Organics, Burnaby, British Columbia
Bruna Botti	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Cristina Alexandre	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kaitlyn Gardner	Account Manager Assistant	Internal Subcontracting, Fort Collins, Colorado
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Inorganics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Organics, Burnaby, British Columbia
Shaneel Dayal	Analyst	Metals, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia



Page : 2 of 25  
Work Order : VA20B4662 Amendment 1  
Client : Golder Associates Ltd.  
Project : 20136436-2300-2304

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## **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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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



### 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: <b>Water</b>					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
<b>Physical Tests (QC Lot: 83100)</b>											
VA20B4594-007	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	251	267	6.19%	20%	----
<b>Physical Tests (QC Lot: 83134)</b>											
VA20B4559-002	Anonymous	solids, total suspended [TSS]	----	E160-H	3.0	mg/L	5.1	6.7	1.6	Diff <2x LOR	----
<b>Physical Tests (QC Lot: 83150)</b>											
VA20B4662-001	Westbay A-606	pH	----	E108	0.10	pH units	7.18	7.18	0.00%	4%	----
<b>Physical Tests (QC Lot: 83151)</b>											
VA20B4662-001	Westbay A-606	conductivity	----	E100	2.0	µS/cm	661	651	1.52%	10%	----
<b>Physical Tests (QC Lot: 83152)</b>											
VA20B4662-001	Westbay A-606	alkalinity, bicarbonate (as CaCO3)	----	E290	2.0	mg/L	55.5	53.0	4.61%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	55.5	53.0	4.61%	20%	----
<b>Physical Tests (QC Lot: 83296)</b>											
VA20B4594-006	Anonymous	turbidity	----	E121	0.10	NTU	0.87	0.81	0.05	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 83154)</b>											
VA20B4472-001	Anonymous	chloride	16887-00-6	E235.Cl	5000	mg/L	118000 µg/L	116	2.04%	20%	----
<b>Anions and Nutrients (QC Lot: 83155)</b>											
VA20B4472-001	Anonymous	fluoride	16984-48-8	E235.F	200	mg/L	<200 µg/L	0.203	0.003	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 83156)</b>											
VA20B4472-001	Anonymous	bromide	24959-67-9	E235.Br-L	500	mg/L	<500 µg/L	<0.500	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 83157)</b>											
VA20B4472-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	50.0	mg/L	<50.0 µg/L	<0.0500	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 83158)</b>											
VA20B4472-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	10.0	mg/L	<10.0 µg/L	<0.0100	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 83159)</b>											
VA20B4472-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	3000	mg/L	65500 µg/L	63.4	3.32%	20%	----
<b>Anions and Nutrients (QC Lot: 83160)</b>											
VA20B4630-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0205	0.0211	3.22%	20%	----
<b>Anions and Nutrients (QC Lot: 85384)</b>											
VA20B4600-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.160	0.140	0.020	Diff <2x LOR	----



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
<b>Anions and Nutrients (QC Lot: 85387)</b>											
VA20B4600-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0651	0.0638	1.93%	20%	----
<b>Anions and Nutrients (QC Lot: 85388)</b>											
VA20B4600-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	0.0051	0.0001	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 86182)</b>											
VA20B4610-021	Anonymous	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	0.55	0.52	0.03	Diff <2x LOR	----
<b>Cyanides (QC Lot: 83511)</b>											
VA20B4662-001	Westbay A-606	cyanide, weak acid dissociable	----	E336	0.0400	mg/L	<0.0400	<0.0400	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 83512)</b>											
VA20B4662-001	Westbay A-606	cyanide, free	----	E339	0.0400	mg/L	<0.0400	<0.0400	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 83513)</b>											
VA20B4662-001	Westbay A-606	cyanide, strong acid dissociable (total)	----	E333	0.0400	mg/L	<0.0400	<0.0400	0	Diff <2x LOR	----
<b>Organic / Inorganic Carbon (QC Lot: 85385)</b>											
VA20B4600-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	7.09	7.35	3.55%	20%	----
<b>Organic / Inorganic Carbon (QC Lot: 85386)</b>											
VA20B4442-018	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	8.84	9.02	2.11%	20%	----
<b>Total Metals (QC Lot: 85274)</b>											
VA20B4662-001	Westbay A-606	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
<b>Total Metals (QC Lot: 85394)</b>											
VA20B4662-001	Westbay A-606	chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	0.00049	0.00046	0.00002	Diff <2x LOR	----
<b>Total Metals (QC Lot: 85395)</b>											
VA20B4662-001	Westbay A-606	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0191	0.0175	0.0016	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00090	0.00084	0.00005	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0200	0.0201	0.672%	20%	----
		beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	0.015	0.016	0.00008	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000176	0.0000170	0.0000006	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	33.0	33.3	0.958%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	0.000123	0.000117	5.12%	20%	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00027	0.00026	0.00001	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	0.00359	0.00356	0.00003	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	1.06	1.04	1.54%	20%	----
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000320	0.000319	0.000002	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	0.0641	0.0632	1.34%	20%	----



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
<b>Total Metals (QC Lot: 85395) - continued</b>											
VA20B4662-001	Westbay A-606	magnesium, total	7439-95-4	E420	0.0050	mg/L	2.52	2.44	3.39%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.0421	0.0414	1.67%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000296	0.000298	0.000002	Diff <2x LOR	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	0.00364	0.00361	0.00004	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	3.92	3.80	3.04%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00284	0.00283	0.645%	20%	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	0.000058	0.000008	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	0.26	0.27	0.003	Diff <2x LOR	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	17341-25-2	E420	0.050	mg/L	104	104	0.485%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.307	0.302	1.68%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	2.61	2.44	0.17	Diff <2x LOR	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	0.000070	0.000066	0.000004	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	0.00064	0.00065	0.000009	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000024	0.000023	0.0000007	Diff <2x LOR	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	0.0255	0.0253	0.0001	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 84254)</b>											
VA20B4610-001	Anonymous	chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 84255)</b>											
VA20B4610-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0029	0.0023	0.0006	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.00167	0.00168	0.783%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	1.15	1.17	2.08%	20%	----



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
<b>Dissolved Metals (QC Lot: 84255) - continued</b>											
VA20B4610-001	Anonymous	cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00033	0.00031	0.00002	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	0.646	0.653	1.16%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00025	0.00022	0.00003	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.362	0.373	0.011	Diff <2x LOR	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00050	0.00053	0.00003	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	0.128	0.133	0.004	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	0.050	mg/L	0.535	0.541	1.23%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.00626	0.00633	1.12%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000048	0.000046	0.000002	Diff <2x LOR	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 85441)</b>											
VA20B4662-001	Westbay A-606	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
<b>Speciated Metals (QC Lot: 96342)</b>											
VA20B4662-001	Westbay A-606	iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.020	mg/L	0.338	0.338	0.00918%	20%	----
<b>Aggregate Organics (QC Lot: 83463)</b>											
VA20B4711-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	6.0	mg/L	23.6	21.6	8.76%	30%	----



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
<b>Aggregate Organics (QC Lot: 85916)</b>											
VA20B4662-001	Westbay A-606	chemical oxygen demand [COD]	----	E559	20	mg/L	147	148	1	Diff <2x LOR	----
<b>Volatile Organic Compounds (QC Lot: 83260)</b>											
VA20B4359-006	Anonymous	benzene	71-43-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		bromodichloromethane	75-27-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		bromoform	75-25-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		carbon tetrachloride	56-23-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chlorobenzene	108-90-7	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloroethane	75-00-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloroform	67-66-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloromethane	74-87-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dibromochloromethane	124-48-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorobenzene, 1,2-	95-50-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorobenzene, 1,3-	541-73-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichlorobenzene, 1,4-	106-46-7	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethane, 1,1-	75-34-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethane, 1,2-	107-06-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, 1,1-	75-35-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, cis-1,2-	156-59-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloroethylene, trans-1,2-	156-60-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloromethane	75-09-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloropropane, 1,2-	78-87-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloropropylene, cis-1,3-	10061-01-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		dichloropropylene, trans-1,3-	10061-02-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tetrachloroethane, 1,1,2,2-	79-34-5	E611C	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		tetrachloroethylene	127-18-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611C	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		trichloroethane, 1,1,1-	71-55-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichloroethane, 1,1,2-	79-00-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichloroethylene	79-01-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		trichlorofluoromethane	75-69-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		vinyl chloride	75-01-4	E611C	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----

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 Work Order : VA20B4662 Amendment 1  
 Client : Golder Associates Ltd.  
 Project : 20136436-2300-2304



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>
<b>Volatile Organic Compounds (QC Lot: 83260) - continued</b>											
VA20B4359-006	Anonymous	xylene, m+p-	179601-23-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611C	0.50	µg/L	<0.50	<0.50	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
<b>Physical Tests (QCLot: 83100)</b>						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
<b>Physical Tests (QCLot: 83134)</b>						
solids, total suspended [TSS]	----	E160-H	3	mg/L	<3.0	----
<b>Physical Tests (QCLot: 83151)</b>						
conductivity	----	E100	1	µS/cm	<1.0	----
<b>Physical Tests (QCLot: 83152)</b>						
alkalinity, bicarbonate (as CaCO <sub>3</sub> )	----	E290	1	mg/L	# 6.6	B
alkalinity, carbonate (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, hydroxide (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, phenolphthalein (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, total (as CaCO <sub>3</sub> )	----	E290	1	mg/L	# 6.6	B
<b>Physical Tests (QCLot: 83296)</b>						
turbidity	----	E121	0.1	NTU	<0.10	----
<b>Anions and Nutrients (QCLot: 83154)</b>						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
<b>Anions and Nutrients (QCLot: 83155)</b>						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
<b>Anions and Nutrients (QCLot: 83156)</b>						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
<b>Anions and Nutrients (QCLot: 83157)</b>						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
<b>Anions and Nutrients (QCLot: 83158)</b>						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
<b>Anions and Nutrients (QCLot: 83159)</b>						
sulfate (as SO <sub>4</sub> )	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
<b>Anions and Nutrients (QCLot: 83160)</b>						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
<b>Anions and Nutrients (QCLot: 85384)</b>						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
<b>Anions and Nutrients (QCLot: 85387)</b>						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
<b>Anions and Nutrients (QCLot: 85388)</b>						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----





Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Anions and Nutrients (QCLot: 86182)</b>						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	---
<b>Cyanides (QCLot: 83511)</b>						
cyanide, weak acid dissociable	---	E336	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 83512)</b>						
cyanide, free	---	E339	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 83513)</b>						
cyanide, strong acid dissociable (total)	---	E333	0.002	mg/L	<0.0020	---
<b>Organic / Inorganic Carbon (QCLot: 85385)</b>						
carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
<b>Organic / Inorganic Carbon (QCLot: 85386)</b>						
carbon, total organic [TOC]	---	E355-L	0.5	mg/L	<0.50	---
<b>Total Metals (QCLot: 85274)</b>						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	---
<b>Total Metals (QCLot: 85394)</b>						
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	<0.00010	---
<b>Total Metals (QCLot: 85395)</b>						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	---
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	---
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	---
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	---
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	---
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	---
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	---
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	---
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	---
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	---
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	---
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	---
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	---
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	---
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	---
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	---



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Total Metals (QCLot: 85395) - continued</b>						
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	---
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	---
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	---
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	---
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	---
sodium, total	17341-25-2	E420	0.05	mg/L	<0.050	---
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	---
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	---
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	---
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	---
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	---
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	---
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	---
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	---
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	---
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	---
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	---
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	---
<b>Dissolved Metals (QCLot: 84254)</b>						
chromium, dissolved	7440-47-3	E421.Cr-L	0.0001	mg/L	<0.00010	---
<b>Dissolved Metals (QCLot: 84255)</b>						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Dissolved Metals (QCLot: 84255) - continued</b>						
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
<b>Dissolved Metals (QCLot: 85441)</b>						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
<b>Speciated Metals (QCLot: 96342)</b>						
iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	<0.020	----
<b>Aggregate Organics (QCLot: 83354)</b>						
oil & grease (gravimetric)	----	E567	5	mg/L	<5.0	----
<b>Aggregate Organics (QCLot: 83463)</b>						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
<b>Aggregate Organics (QCLot: 85916)</b>						
chemical oxygen demand [COD]	----	E559	20	mg/L	<20	----
<b>Volatile Organic Compounds (QCLot: 83260)</b>						
benzene	71-43-2	E611C	0.5	µg/L	<0.50	----
bromodichloromethane	75-27-4	E611C	0.5	µg/L	<0.50	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Volatile Organic Compounds (QCLot: 83260) - continued</b>						
bromoform	75-25-2	E611C	0.5	µg/L	<0.50	----
carbon tetrachloride	56-23-5	E611C	0.5	µg/L	<0.50	----
chlorobenzene	108-90-7	E611C	0.5	µg/L	<0.50	----
chloroethane	75-00-3	E611C	0.5	µg/L	<0.50	----
chloroform	67-66-3	E611C	0.5	µg/L	<0.50	----
chloromethane	74-87-3	E611C	0.5	µg/L	<0.50	----
dibromochloromethane	124-48-1	E611C	0.5	µg/L	<0.50	----
dichlorobenzene, 1,2-	95-50-1	E611C	0.5	µg/L	<0.50	----
dichlorobenzene, 1,3-	541-73-1	E611C	0.5	µg/L	<0.50	----
dichlorobenzene, 1,4-	106-46-7	E611C	0.5	µg/L	<0.50	----
dichloroethane, 1,1-	75-34-3	E611C	0.5	µg/L	<0.50	----
dichloroethane, 1,2-	107-06-2	E611C	0.5	µg/L	<0.50	----
dichloroethylene, 1,1-	75-35-4	E611C	0.5	µg/L	<0.50	----
dichloroethylene, cis-1,2-	156-59-2	E611C	0.5	µg/L	<0.50	----
dichloroethylene, trans-1,2-	156-60-5	E611C	0.5	µg/L	<0.50	----
dichloromethane	75-09-2	E611C	0.5	µg/L	<0.50	----
dichloropropane, 1,2-	78-87-5	E611C	0.5	µg/L	<0.50	----
dichloropropylene, cis-1,3-	10061-01-5	E611C	0.5	µg/L	<0.50	----
dichloropropylene, trans-1,3-	10061-02-6	E611C	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611C	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.5	µg/L	<0.50	----
styrene	100-42-5	E611C	0.5	µg/L	<0.50	----
tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.5	µg/L	<0.50	----
tetrachloroethane, 1,1,2,2-	79-34-5	E611C	0.2	µg/L	<0.20	----
tetrachloroethylene	127-18-4	E611C	0.5	µg/L	<0.50	----
toluene	108-88-3	E611C	0.4	µg/L	<0.40	----
trichloroethane, 1,1,1-	71-55-6	E611C	0.5	µg/L	<0.50	----
trichloroethane, 1,1,2-	79-00-5	E611C	0.5	µg/L	<0.50	----
trichloroethylene	79-01-6	E611C	0.5	µg/L	<0.50	----
trichlorofluoromethane	75-69-4	E611C	0.5	µg/L	<0.50	----
vinyl chloride	75-01-4	E611C	0.4	µg/L	<0.40	----
xylene, m+p-	179601-23-1	E611C	0.5	µg/L	<0.50	----
xylene, o-	95-47-6	E611C	0.5	µg/L	<0.50	----
<b>Hydrocarbons (QCLot: 83251)</b>						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 83250)</b>						
acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	----
acridine	260-94-6	E641A	0.01	µg/L	<0.010	----
anthracene	120-12-7	E641A	0.01	µg/L	<0.010	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	<0.0050	----
benzo(b+j)fluoranthene	----	E641A	0.01	µg/L	<0.010	----
benzo(b+j+k)fluoranthene	----	E641A	0.015	µg/L	<0.015	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	----
chrysene	218-01-9	E641A	0.01	µg/L	<0.010	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	<0.0050	----
fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	----
fluorene	86-73-7	E641A	0.01	µg/L	<0.010	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	----
naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	----
phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	----
pyrene	129-00-0	E641A	0.01	µg/L	<0.010	----
quinoline	6027-02-7	E641A	0.05	µg/L	<0.050	----
<b>Polycyclic Aromatic Hydrocarbons Surrogates (QCLot: 83250)</b>						
acridine-d9	34749-75-2	E641A	0.01	µg/L	0.817	----

**Qualifiers**

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.



## 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: <b>Water</b>					Laboratory Control Sample (LCS) Report				
					Spike Concentration	Recovery (%)	Recovery Limits (%)		Qualifier
Analyte	CAS Number	Method	LOR	Unit	LCS	Low	High		
<b>Physical Tests (QCLot: 83100)</b>									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	100	85.0	115	----
<b>Physical Tests (QCLot: 83134)</b>									
solids, total suspended [TSS]	----	E160-H	3	mg/L	150 mg/L	106	85.0	115	----
<b>Physical Tests (QCLot: 83150)</b>									
pH	----	E108	----	pH units	7 pH units	99.6	98.0	102	----
<b>Physical Tests (QCLot: 83151)</b>									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	100	90.0	110	----
<b>Physical Tests (QCLot: 83152)</b>									
alkalinity, phenolphthalein (as CaCO <sub>3</sub> )	----	E290	1	mg/L	229 mg/L	112	75.0	125	----
alkalinity, total (as CaCO <sub>3</sub> )	----	E290	1	mg/L	500 mg/L	98.9	85.0	115	----
<b>Physical Tests (QCLot: 83296)</b>									
turbidity	----	E121	0.1	NTU	200 NTU	97.0	85.0	115	----
<b>Anions and Nutrients (QCLot: 83154)</b>									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	104	90.0	110	----
<b>Anions and Nutrients (QCLot: 83155)</b>									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
<b>Anions and Nutrients (QCLot: 83156)</b>									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	100	85.0	115	----
<b>Anions and Nutrients (QCLot: 83157)</b>									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	105	90.0	110	----
<b>Anions and Nutrients (QCLot: 83158)</b>									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	102	90.0	110	----
<b>Anions and Nutrients (QCLot: 83159)</b>									
sulfate (as SO <sub>4</sub> )	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	107	90.0	110	----
<b>Anions and Nutrients (QCLot: 83160)</b>									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	88.8	80.0	120	----
<b>Anions and Nutrients (QCLot: 85384)</b>									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	96.5	75.0	125	----
<b>Anions and Nutrients (QCLot: 85387)</b>									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	95.6	80.0	120	----
<b>Anions and Nutrients (QCLot: 85388)</b>									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.12 mg/L	94.9	85.0	115	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				Qualifier
					Spike Concentration	Recovery (%)	Recovery Limits (%)		
					LCS	Low	High		
<b>Anions and Nutrients (QCLot: 86182)</b>									
silicate (as SiO <sub>2</sub> )	7631-86-9	E392	0.5	mg/L	10 mg/L	96.9	85.0	115	----
<b>Cyanides (QCLot: 83511)</b>									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	97.5	80.0	120	----
<b>Cyanides (QCLot: 83512)</b>									
cyanide, free	----	E339	0.002	mg/L	0.125 mg/L	97.1	80.0	120	----
<b>Cyanides (QCLot: 83513)</b>									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	92.4	80.0	120	----
<b>Organic / Inorganic Carbon (QCLot: 85385)</b>									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	95.9	80.0	120	----
<b>Organic / Inorganic Carbon (QCLot: 85386)</b>									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	97.9	80.0	120	----
<b>Total Metals (QCLot: 85274)</b>									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	98.1	80.0	120	----
<b>Total Metals (QCLot: 85394)</b>									
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	0.25 mg/L	100.0	80.0	120	----
<b>Total Metals (QCLot: 85395)</b>									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	96.9	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	102	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	101	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	98.5	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	100	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	96.3	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	98.6	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	103	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	98.7	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	98.9	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	99.5	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	95.9	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	102	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	96.6	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	103	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	102	80.0	120	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
<b>Total Metals (QCLot: 85395) - continued</b>									
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	98.9	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	117	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	102	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	98.7	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	97.7	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	108	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	100	80.0	120	----
sodium, total	17341-25-2	E420	0.05	mg/L	50 mg/L	106	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	103	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	94.5	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	99.6	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	103	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	97.4	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	98.7	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	103	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	100	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	99.4	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	101	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	100.0	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	101	80.0	120	----
<b>Dissolved Metals (QCLot: 84254)</b>									
chromium, dissolved	7440-47-3	E421.Cr-L	0.0001	mg/L	0.25 mg/L	98.3	80.0	120	----
<b>Dissolved Metals (QCLot: 84255)</b>									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	97.7	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	96.8	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	95.3	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	98.7	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	103	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	97.6	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	102	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	98.5	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	96.6	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	96.0	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	94.5	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	92.8	80.0	120	----





Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Dissolved Metals (QCLot: 84255) - continued</b>									
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	98.0	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	103	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	94.4	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	95.9	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	99.4	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	96.1	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	95.9	70.0	130	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	98.5	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	96.7	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	102	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	104	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	99.8	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	98.2	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	93.3	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	98.6	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	91.0	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	98.3	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	96.5	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	99.8	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	95.1	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	99.2	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	98.4	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	95.8	80.0	120	----
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	99.3	80.0	120	----
<b>Speciated Metals (QCLot: 96342)</b>									
iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	0.5 mg/L	102	80.0	120	----
<b>Aggregate Organics (QCLot: 83354)</b>									
oil & grease (gravimetric)	----	E567	5	mg/L	100 mg/L	97.3	70.0	130	----
<b>Aggregate Organics (QCLot: 83463)</b>									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	92.1	85.0	115	----
<b>Aggregate Organics (QCLot: 85916)</b>									
chemical oxygen demand [COD]	----	E559	20	mg/L	750 mg/L	101	85.0	115	----
<b>Volatile Organic Compounds (QCLot: 83260)</b>									



Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Volatile Organic Compounds (QCLot: 83260) - continued</b>									
benzene	71-43-2	E611C	0.5	µg/L	100 µg/L	102	70.0	130	----
bromodichloromethane	75-27-4	E611C	0.5	µg/L	100 µg/L	102	70.0	130	----
bromoform	75-25-2	E611C	0.5	µg/L	100 µg/L	101	70.0	130	----
carbon tetrachloride	56-23-5	E611C	0.5	µg/L	100 µg/L	94.2	70.0	130	----
chlorobenzene	108-90-7	E611C	0.5	µg/L	100 µg/L	104	70.0	130	----
chloroethane	75-00-3	E611C	0.5	µg/L	100 µg/L	97.5	60.0	140	----
chloroform	67-66-3	E611C	0.5	µg/L	100 µg/L	100	70.0	130	----
chloromethane	74-87-3	E611C	0.5	µg/L	100 µg/L	91.8	60.0	140	----
dibromochloromethane	124-48-1	E611C	0.5	µg/L	100 µg/L	102	70.0	130	----
dichlorobenzene, 1,2-	95-50-1	E611C	0.5	µg/L	100 µg/L	103	70.0	130	----
dichlorobenzene, 1,3-	541-73-1	E611C	0.5	µg/L	100 µg/L	90.3	70.0	130	----
dichlorobenzene, 1,4-	106-46-7	E611C	0.5	µg/L	100 µg/L	104	70.0	130	----
dichloroethane, 1,1-	75-34-3	E611C	0.5	µg/L	100 µg/L	103	70.0	130	----
dichloroethane, 1,2-	107-06-2	E611C	0.5	µg/L	100 µg/L	106	70.0	130	----
dichloroethylene, 1,1-	75-35-4	E611C	0.5	µg/L	100 µg/L	99.5	70.0	130	----
dichloroethylene, cis-1,2-	156-59-2	E611C	0.5	µg/L	100 µg/L	104	70.0	130	----
dichloroethylene, trans-1,2-	156-60-5	E611C	0.5	µg/L	100 µg/L	104	70.0	130	----
dichloromethane	75-09-2	E611C	0.5	µg/L	100 µg/L	103	70.0	130	----
dichloropropane, 1,2-	78-87-5	E611C	0.5	µg/L	100 µg/L	101	70.0	130	----
dichloropropylene, cis-1,3-	10061-01-5	E611C	0.5	µg/L	100 µg/L	109	70.0	130	----
dichloropropylene, trans-1,3-	10061-02-6	E611C	0.5	µg/L	100 µg/L	77.1	70.0	130	----
ethylbenzene	100-41-4	E611C	0.5	µg/L	100 µg/L	95.5	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.5	µg/L	100 µg/L	108	70.0	130	----
styrene	100-42-5	E611C	0.5	µg/L	100 µg/L	95.3	70.0	130	----
tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.5	µg/L	100 µg/L	97.4	70.0	130	----
tetrachloroethane, 1,1,2,2-	79-34-5	E611C	0.2	µg/L	100 µg/L	110	70.0	130	----
tetrachloroethylene	127-18-4	E611C	0.5	µg/L	100 µg/L	98.5	70.0	130	----
toluene	108-88-3	E611C	0.4	µg/L	100 µg/L	97.1	70.0	130	----
trichloroethane, 1,1,1-	71-55-6	E611C	0.5	µg/L	100 µg/L	90.6	70.0	130	----
trichloroethane, 1,1,2-	79-00-5	E611C	0.5	µg/L	100 µg/L	104	70.0	130	----
trichloroethylene	79-01-6	E611C	0.5	µg/L	100 µg/L	101	70.0	130	----
trichlorofluoromethane	75-69-4	E611C	0.5	µg/L	100 µg/L	98.8	60.0	140	----
vinyl chloride	75-01-4	E611C	0.4	µg/L	100 µg/L	92.7	60.0	140	----
xylene, m+p-	179601-23-1	E611C	0.5	µg/L	200 µg/L	101	70.0	130	----
xylene, o-	95-47-6	E611C	0.5	µg/L	100 µg/L	97.2	70.0	130	----
<b>Hydrocarbons (QCLot: 83251)</b>									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	108	70.0	130	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
<b>Hydrocarbons (QCLot: 83251) - continued</b>									
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	103	70.0	130	----
<b>Polycyclic Aromatic Hydrocarbons (QCLot: 83250)</b>									
acenaphthene	83-32-9	E641A	0.01	µg/L	0.5 µg/L	98.0	60.0	130	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	0.5 µg/L	102	60.0	130	----
acridine	260-94-6	E641A	0.01	µg/L	0.5 µg/L	93.8	60.0	130	----
anthracene	120-12-7	E641A	0.01	µg/L	0.5 µg/L	103	60.0	130	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.5 µg/L	104	60.0	130	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.5 µg/L	118	60.0	130	----
benzo(b+j)fluoranthene	----	E641A	0.01	µg/L	0.5 µg/L	101	60.0	130	----
benzo(b+j+k)fluoranthene	----	E641A	0.015	µg/L	1 µg/L	110	60.0	130	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.5 µg/L	109	60.0	130	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.5 µg/L	119	60.0	130	----
chrysene	218-01-9	E641A	0.01	µg/L	0.5 µg/L	111	60.0	130	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.5 µg/L	111	60.0	130	----
fluoranthene	206-44-0	E641A	0.01	µg/L	0.5 µg/L	107	60.0	130	----
fluorene	86-73-7	E641A	0.01	µg/L	0.5 µg/L	92.1	60.0	130	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.5 µg/L	105	60.0	130	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.5 µg/L	97.2	60.0	130	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.5 µg/L	91.3	60.0	130	----
naphthalene	91-20-3	E641A	0.05	µg/L	0.5 µg/L	91.7	50.0	130	----
phenanthrene	85-01-8	E641A	0.02	µg/L	0.5 µg/L	98.1	60.0	130	----
pyrene	129-00-0	E641A	0.01	µg/L	0.5 µg/L	110	60.0	130	----
quinoline	6027-02-7	E641A	0.05	µg/L	0.5 µg/L	116	60.0	130	----
<b>Polycyclic Aromatic Hydrocarbons Surrogates (QCLot: 83250)</b>									
acridine-d9	34749-75-2	E641A	0.01	µg/L	0.8421 µg/L	94.3	----	----	----



### 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 >= 1x 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
<b>Anions and Nutrients (QCLot: 83154)</b>										
VA20B4630-001	Anonymous	chloride	16887-00-6	E235.Cl	516 mg/L	500 mg/L	103	75.0	125	----
<b>Anions and Nutrients (QCLot: 83155)</b>										
VA20B4630-001	Anonymous	fluoride	16984-48-8	E235.F	5.24 mg/L	5 mg/L	105	75.0	125	----
<b>Anions and Nutrients (QCLot: 83156)</b>										
VA20B4630-001	Anonymous	bromide	24959-67-9	E235.Br-L	2.68 mg/L	2.5 mg/L	107	75.0	125	----
<b>Anions and Nutrients (QCLot: 83157)</b>										
VA20B4630-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	13.1 mg/L	12.5 mg/L	105	75.0	125	----
<b>Anions and Nutrients (QCLot: 83158)</b>										
VA20B4630-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	2.40 mg/L	2.5 mg/L	95.9	75.0	125	----
<b>Anions and Nutrients (QCLot: 83159)</b>										
VA20B4630-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	519 mg/L	500 mg/L	104	75.0	125	----
<b>Anions and Nutrients (QCLot: 83160)</b>										
VA20B4630-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0300 mg/L	0.03 mg/L	100	70.0	130	----
<b>Anions and Nutrients (QCLot: 85384)</b>										
VA20B4662-001	Westbay A-606	Kjeldahl nitrogen, total [TKN]	----	E318	124 mg/L	2.5 mg/L	99.0	70.0	130	----
<b>Anions and Nutrients (QCLot: 85387)</b>										
VA20B4662-001	Westbay A-606	phosphorus, total	7723-14-0	E372-U	0.0368 mg/L	0.05 mg/L	73.7	70.0	130	----
<b>Anions and Nutrients (QCLot: 85388)</b>										
VA20B4625-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.191 mg/L	0.2 mg/L	95.6	75.0	125	----
<b>Anions and Nutrients (QCLot: 86182)</b>										
VA20B4610-022	Anonymous	silicate (as SiO2)	7631-86-9	E392	11.0 mg/L	10 mg/L	110	75.0	125	----
<b>Cyanides (QCLot: 83511)</b>										
VA20B4662-002	Westbay A-606-BR	cyanide, weak acid dissociable	----	E336	3.03 mg/L	2.5 mg/L	121	75.0	125	----
<b>Cyanides (QCLot: 83512)</b>										
VA20B4662-002	Westbay A-606-BR	cyanide, free	----	E339	3.07 mg/L	2.5 mg/L	123	75.0	125	----
<b>Cyanides (QCLot: 83513)</b>										
VA20B4662-002	Westbay A-606-BR	cyanide, strong acid dissociable (total)	----	E333	4.73 mg/L	5 mg/L	94.7	75.0	125	----



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
<b>Organic / Inorganic Carbon (QCLot: 85385)</b>										
VA20B4608-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	5.25 mg/L	5 mg/L	105	70.0	130	----
<b>Organic / Inorganic Carbon (QCLot: 85386)</b>										
VA20B4470-003	Anonymous	carbon, total organic [TOC]	----	E355-L	5.08 mg/L	5 mg/L	102	70.0	130	----
<b>Total Metals (QCLot: 85274)</b>										
VA20B4662-002	Westbay A-606-BR	mercury, total	7439-97-6	E508	0.00101 mg/L	0.001 mg/L	101	70.0	130	----
<b>Total Metals (QCLot: 85394)</b>										
VA20B4662-002	Westbay A-606-BR	chromium, total	7440-47-3	E420.Cr-L	19.8 mg/L	20 mg/L	98.9	70.0	130	----
<b>Total Metals (QCLot: 85395)</b>										
VA20B4662-002	Westbay A-606-BR	aluminum, total	7429-90-5	E420	94.3 mg/L	100 mg/L	94.3	70.0	130	----
		antimony, total	7440-36-0	E420	9.86 mg/L	10 mg/L	98.6	70.0	130	----
		arsenic, total	7440-38-2	E420	10.0 mg/L	10 mg/L	100	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	10 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	20.3 mg/L	20 mg/L	101	70.0	130	----
		bismuth, total	7440-69-9	E420	4.80 mg/L	5 mg/L	96.1	70.0	130	----
		boron, total	7440-42-8	E420	ND mg/L	50 mg/L	ND	70.0	130	----
		cadmium, total	7440-43-9	E420	1.96 mg/L	2 mg/L	98.2	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	2000 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	5.03 mg/L	5 mg/L	101	70.0	130	----
		cobalt, total	7440-48-4	E420	9.58 mg/L	10 mg/L	95.8	70.0	130	----
		copper, total	7440-50-8	E420	9.51 mg/L	10 mg/L	95.1	70.0	130	----
		iron, total	7439-89-6	E420	958 mg/L	1000 mg/L	95.8	70.0	130	----
		lead, total	7439-92-1	E420	9.48 mg/L	10 mg/L	94.8	70.0	130	----
		lithium, total	7439-93-2	E420	ND mg/L	50 mg/L	ND	70.0	130	----
		magnesium, total	7439-95-4	E420	484 mg/L	500 mg/L	96.8	70.0	130	----
		manganese, total	7439-96-5	E420	9.97 mg/L	10 mg/L	99.7	70.0	130	----
		molybdenum, total	7439-98-7	E420	9.87 mg/L	10 mg/L	98.7	70.0	130	----
		nickel, total	7440-02-0	E420	19.0 mg/L	20 mg/L	95.1	70.0	130	----
		phosphorus, total	7723-14-0	E420	5340 mg/L	5000 mg/L	107	70.0	130	----
		potassium, total	7440-09-7	E420	ND mg/L	2000 mg/L	ND	70.0	130	----
		rubidium, total	7440-17-7	E420	9.43 mg/L	10 mg/L	94.3	70.0	130	----
		selenium, total	7782-49-2	E420	20.0 mg/L	20 mg/L	100	70.0	130	----
		silicon, total	7440-21-3	E420	4850 mg/L	5000 mg/L	97.1	70.0	130	----
		silver, total	7440-22-4	E420	1.94 mg/L	2 mg/L	97.0	70.0	130	----
		sodium, total	17341-25-2	E420	ND mg/L	1000 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	10 mg/L	ND	70.0	130	----



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
<b>Total Metals (QCLot: 85395) - continued</b>										
VA20B4662-002	Westbay A-606-BR	sulfur, total	7704-34-9	E420	10300 mg/L	10000 mg/L	103	70.0	130	----
		tellurium, total	13494-80-9	E420	19.5 mg/L	20 mg/L	97.7	70.0	130	----
		thallium, total	7440-28-0	E420	1.94 mg/L	2 mg/L	97.0	70.0	130	----
		thorium, total	7440-29-1	E420	10.1 mg/L	10 mg/L	101	70.0	130	----
		tin, total	7440-31-5	E420	9.73 mg/L	10 mg/L	97.3	70.0	130	----
		titanium, total	7440-32-6	E420	19.7 mg/L	20 mg/L	98.3	70.0	130	----
		tungsten, total	7440-33-7	E420	9.85 mg/L	10 mg/L	98.5	70.0	130	----
		uranium, total	7440-61-1	E420	1.96 mg/L	2 mg/L	97.8	70.0	130	----
		vanadium, total	7440-62-2	E420	50.1 mg/L	50 mg/L	100	70.0	130	----
		zinc, total	7440-66-6	E420	194 mg/L	200 mg/L	97.2	70.0	130	----
		zirconium, total	7440-67-7	E420	20.5 mg/L	20 mg/L	102	70.0	130	----
<b>Dissolved Metals (QCLot: 84254)</b>										
VA20B4610-010	Anonymous	chromium, dissolved	7440-47-3	E421.Cr-L	0.0384 mg/L	0.04 mg/L	95.9	70.0	130	----
<b>Dissolved Metals (QCLot: 84255)</b>										
VA20B4610-010	Anonymous	aluminum, dissolved	7429-90-5	E421	0.195 mg/L	0.2 mg/L	97.3	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0193 mg/L	0.02 mg/L	96.7	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0190 mg/L	0.02 mg/L	94.8	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.0197 mg/L	0.02 mg/L	98.5	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0408 mg/L	0.04 mg/L	102	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00976 mg/L	0.01 mg/L	97.6	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.097 mg/L	0.1 mg/L	96.7	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00390 mg/L	0.004 mg/L	97.6	70.0	130	----
		calcium, dissolved	7440-70-2	E421	3.93 mg/L	4 mg/L	98.3	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00953 mg/L	0.01 mg/L	95.3	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0194 mg/L	0.02 mg/L	97.2	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0191 mg/L	0.02 mg/L	95.5	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.85 mg/L	2 mg/L	92.4	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0198 mg/L	0.02 mg/L	98.9	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0993 mg/L	0.1 mg/L	99.3	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0190 mg/L	0.02 mg/L	94.8	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0197 mg/L	0.02 mg/L	98.5	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0382 mg/L	0.04 mg/L	95.5	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	9.83 mg/L	10 mg/L	98.3	70.0	130	----
		potassium, dissolved	7440-09-7	E421	3.91 mg/L	4 mg/L	97.8	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----



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
<b>Dissolved Metals (QCLot: 84255) - continued</b>										
VA20B4610-010	Anonymous	selenium, dissolved	7782-49-2	E421	0.0400 mg/L	0.04 mg/L	100	70.0	130	----
		silicon, dissolved	7440-21-3	E421	9.12 mg/L	10 mg/L	91.2	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00391 mg/L	0.004 mg/L	97.8	70.0	130	----
		sodium, dissolved	17341-25-2	E421	1.89 mg/L	2 mg/L	94.4	70.0	130	----
		strontium, dissolved	7440-24-6	E421	0.0180 mg/L	0.02 mg/L	89.8	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	19.9 mg/L	20 mg/L	99.4	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0398 mg/L	0.04 mg/L	99.4	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00395 mg/L	0.004 mg/L	98.8	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0193 mg/L	0.02 mg/L	96.5	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0354 mg/L	0.04 mg/L	88.6	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00385 mg/L	0.004 mg/L	96.2	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.0943 mg/L	0.1 mg/L	94.3	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.384 mg/L	0.4 mg/L	96.1	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0388 mg/L	0.04 mg/L	97.1	70.0	130	----
<b>Dissolved Metals (QCLot: 85441)</b>										
VA20B4662-002	Westbay A-606-BR	mercury, dissolved	7439-97-6	E509	0.000386 mg/L	0.0005 mg/L	77.1	70.0	130	----
<b>Speciated Metals (QCLot: 96342)</b>										
VA20B4662-002	Westbay A-606-BR	iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.436 mg/L	0.5 mg/L	87.2	70.0	130	----
<b>Aggregate Organics (QCLot: 85916)</b>										
VA20B4869-001	Anonymous	chemical oxygen demand [COD]	----	E559	426 mg/L	500 mg/L	85.3	75.0	125	----
<b>Volatile Organic Compounds (QCLot: 83260)</b>										
VA20B4359-007	Anonymous	benzene	71-43-2	E611C	101 µg/L	100 µg/L	101	60.0	140	----
		bromodichloromethane	75-27-4	E611C	100 µg/L	100 µg/L	100	60.0	140	----
		bromoform	75-25-2	E611C	100 µg/L	100 µg/L	100	60.0	140	----
		carbon tetrachloride	56-23-5	E611C	96.0 µg/L	100 µg/L	96.0	60.0	140	----
		chlorobenzene	108-90-7	E611C	103 µg/L	100 µg/L	103	60.0	140	----
		chloroethane	75-00-3	E611C	95.6 µg/L	100 µg/L	95.6	50.0	150	----
		chloroform	67-66-3	E611C	99.7 µg/L	100 µg/L	99.7	60.0	140	----
		chloromethane	74-87-3	E611C	85.2 µg/L	100 µg/L	85.2	50.0	150	----
		dibromochloromethane	124-48-1	E611C	99.6 µg/L	100 µg/L	99.6	60.0	140	----
		dichlorobenzene, 1,2-	95-50-1	E611C	104 µg/L	100 µg/L	104	60.0	140	----
		dichlorobenzene, 1,3-	541-73-1	E611C	92.4 µg/L	100 µg/L	92.4	60.0	140	----
		dichlorobenzene, 1,4-	106-46-7	E611C	106 µg/L	100 µg/L	106	60.0	140	----



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
<b>Volatile Organic Compounds (QCLot: 83260) - continued</b>										
VA20B4359-007	Anonymous	dichloroethane, 1,1-	75-34-3	E611C	103 µg/L	100 µg/L	103	60.0	140	----
		dichloroethane, 1,2-	107-06-2	E611C	103 µg/L	100 µg/L	103	60.0	140	----
		dichloroethylene, 1,1-	75-35-4	E611C	98.7 µg/L	100 µg/L	98.7	60.0	140	----
		dichloroethylene, cis-1,2-	156-59-2	E611C	104 µg/L	100 µg/L	104	60.0	140	----
		dichloroethylene, trans-1,2-	156-60-5	E611C	104 µg/L	100 µg/L	104	60.0	140	----
		dichloromethane	75-09-2	E611C	102 µg/L	100 µg/L	102	60.0	140	----
		dichloropropane, 1,2-	78-87-5	E611C	98.9 µg/L	100 µg/L	98.9	60.0	140	----
		dichloropropylene, cis-1,3-	10061-01-5	E611C	86.0 µg/L	100 µg/L	86.0	60.0	140	----
		dichloropropylene, trans-1,3-	10061-02-6	E611C	73.8 µg/L	100 µg/L	73.8	60.0	140	----
		ethylbenzene	100-41-4	E611C	96.4 µg/L	100 µg/L	96.4	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	108 µg/L	100 µg/L	108	60.0	140	----
		styrene	100-42-5	E611C	105 µg/L	100 µg/L	105	60.0	140	----
		tetrachloroethane, 1,1,1,2-	630-20-6	E611C	96.3 µg/L	100 µg/L	96.3	60.0	140	----
		tetrachloroethane, 1,1,2,2-	79-34-5	E611C	106 µg/L	100 µg/L	106	60.0	140	----
		tetrachloroethylene	127-18-4	E611C	99.9 µg/L	100 µg/L	99.9	60.0	140	----
		toluene	108-88-3	E611C	111 µg/L	100 µg/L	111	60.0	140	----
		trichloroethane, 1,1,1-	71-55-6	E611C	91.5 µg/L	100 µg/L	91.5	60.0	140	----
		trichloroethane, 1,1,2-	79-00-5	E611C	99.7 µg/L	100 µg/L	99.7	60.0	140	----
		trichloroethylene	79-01-6	E611C	102 µg/L	100 µg/L	102	60.0	140	----
		trichlorofluoromethane	75-69-4	E611C	99.0 µg/L	100 µg/L	99.0	50.0	150	----
		vinyl chloride	75-01-4	E611C	88.1 µg/L	100 µg/L	88.1	50.0	150	----
		xylene, m+p-	179601-23-1	E611C	204 µg/L	200 µg/L	102	60.0	140	----
		xylene, o-	95-47-6	E611C	96.8 µg/L	100 µg/L	96.8	60.0	140	----





Friday, September 25, 2020

Amber Springer  
ALS Environmental  
8081 Lougheed Hwy, Suite 100  
Burnaby, BC V5A 1W9

Re: ALS Workorder: 2009249  
Project Name:  
Project Number: VA20B4662

Dear Ms. Springer:

Two water samples were received from ALS Environmental, on 9/11/2020. The samples were scheduled for the following analysis:

Radium-226

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental  
Katie M. O'Brien  
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280



**2009249**

**Radium-226:**

The samples were prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

# ALS -- Fort Collins

## Sample Number(s) Cross-Reference Table

---

**OrderNum:** 2009249

**Client Name:** ALS Environmental

**Client Project Name:**

**Client Project Number:** VA20B4662

**Client PO Number:** VA20B4662

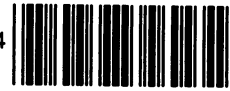
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Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
VA20B4662-001	2009249-1		WATER	27-Aug-20	8:00
VA20B4662-002	2009249-2		WATER	27-Aug-20	11:30



Chain of Custody  
 Vancouver - Environmental  
 8081 Lougheed Highway  
 Burnaby BC Canada V5A 1W9

4714



Destination Lab: **USA - Fort Collins**

Address: 225 Commerce Drive Fort Collins CO  
 United States 80524

Client: Agnico-Eagle Mines Limited

Work Order Number: **VA20B4662**

Original Receipt Date/Time: 08/09/2020 09:25  
 Instructions Received

#2009249 #

Relinquished By

Date/Time

Received By *[Signature]*

Date/Time 8/11/20 1550

Receipt Temp amb

Return as Indicated: Results: Invoice: Electronic Data:

Attention: Heather McKenzie

ALS Sample ID	Client ID	Matrix	Container Type	Test Codes	Method Description	Due Date	Sampling Date and Time	Remarks
VA20B4662-001	Westbay A-606	Water	HDPE (nitric acid)	RA226-MMER	Radium-226 by Radon Emanation	06-10-2020	27/08/2020 08:00	
VA20B4662-002	Westbay A-606-BR	Water	HDPE (nitric acid)	RA226-MMER	Radium-226 by Radon Emanation	06-10-2020	27/08/2020 11:30	

Account Manager: *John Sprague*

ALSEVDataSublet@ALSGlobal.com (PDF / EXCEL / B2B)  
 ALS Vancouver Phone Number: 604-253-4188



**ALS Environmental - Fort Collins**  
**CONDITION OF SAMPLE UPON RECEIPT FORM**

Client Name/ID: **ALS Burnaby** Workorder No: **2009249**  
 Project Manager: **KMO** Initials: **TM** Date: **9/14/20**

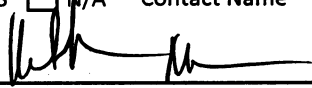
1. Are airbills / shipping documents present and/or removable?	<input type="checkbox"/> Drop Off	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
2. Are custody seals on shipping containers intact?	<input checked="" type="checkbox"/> NONE	<input type="checkbox"/> YES	<input type="checkbox"/> NO*
3. Are custody seals on sample containers intact?	<input checked="" type="checkbox"/> NONE	<input type="checkbox"/> YES	<input type="checkbox"/> NO*
4. Is there a COC (chain-of-custody) present?		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
6. Are short-hold samples present?		<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
7. Are all samples within holding times for the requested analyses?		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
8. Were all sample containers received intact? (not broken or leaking)		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
9. Is there sufficient sample for the requested analyses?		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
10. Are samples in proper containers for requested analyses? (form 250, Sample Handling Guidelines)		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
11. Are all aqueous samples preserved correctly, if required?	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
12. Were unpreserved samples pH checked, if required?	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> YES	<input type="checkbox"/> NO
13. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm in diameter?	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> YES	<input type="checkbox"/> NO
14. Were the samples shipped on ice?		<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
15. Were cooler temperatures measured at 0.1 - 6.0°C?	IR gun used: <input type="checkbox"/> #3 <input type="checkbox"/> #5	<input checked="" type="checkbox"/> Rad Only	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO

Cooler #: **1**  
 Temperature (°C): **amb**  
 # of custody seals on cooler: **0**  
 External mR/hr reading: **11**  
 Background mR/hr reading: **12**

Were external mR/hr readings ≤ two times background and within DOT acceptance criteria? (If no, see Form 008)  N/A  YES  NO

\* Please provide details below for 'NO' responses in gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

All client bottle ID's vs ALS lab ID's double-checked by: **EL**

If applicable, was the client contacted?  YES  N/A Contact Name \_\_\_\_\_ Date: \_\_\_\_\_  
 Project Manager Signature / Date:  **9/14/20**

EXPRESS WORLDWIDE WPX DHL

2020-08-10.DCV8.3.0.1 / '12-1402'

From: ALS ENVIRONMENTAL  
100 - 8081 LOUGHEED HIGHWAY  
BC BC BC BC  
V5A 1W9 BURNABY  
CANADA

Origin: YVR

To: ALS ENVIRONMENTAL - FORT COLLINS  
225 COMMERCE DRIVE  
COLORADO CO CO COLORADO  
80524 FORT COLLINS  
UNITED STATES OF AMERICA

Contact: SAMPLE RECEIVING

11-0-ans

US - DEN - DEN

Day Time

C

Per/Sht Weight  
/20.0 LB

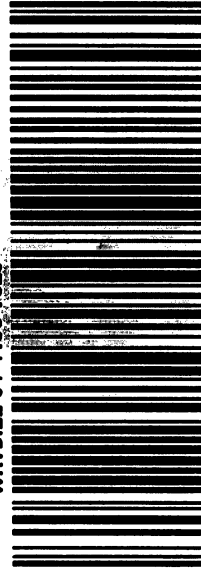
Pieces  
1/1

Content Description

Environmental Water Samples for Research

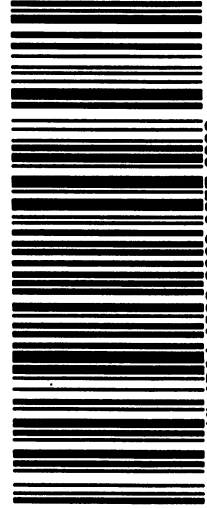


WAYBILL 54 4138 7825



(2L)US80524 + 48000001

Reference



(J) JD01 4600 0080 9657 6688

WPX DHL

\*WAYBILL DOC\*

Not to be attached to package - Hand to Courier  
2020-08-10.MYDHL + /

Shipper: ALS Environmental  
Paul Chandra  
100 - 8081 Lougheed Highway  
V5A 1W9 BURNABY BC  
Canada

Contact: +16042534188

Receiver: ALS Environmental - Fort Collins  
Sample Receiving  
225 Commerce Drive  
80524 FORT COLLINS Colorado  
United States of America

Contact: Sample Receiving  
+18004431511

CA-YVR-GTW US-DEN-DEN

Product Details: Features / Services (Service Code)  
[P] EXPRESS WORLDWIDE (48) Emergency Situation(CR)  
Payer Details: Freight A/C: 977808715 Duties Taxes Unpaid(DS)  
Duty A/C: Receiver Will Pay  
Taxes A/C: Receiver Will Pay  
Incoterm: DAP

Shipment Details

Ref:

Custom Val: 8.00 CAD

Cust Decl Sht Wgt (UOM) / Dim Wgt (UOM):

20.0 lbs

Pieces

1

Name (in Capital Letters)

Signature

Date (DD.MM.YYYY)



WAYBILL 54 4138 7825

License Plates of pieces in shipment  
JD01460008096576688

Contents:  
Environmental Water  
Samples for Research

**Client:** ALS Environmental

**Date:** 25-Sep-20

**Project:** VA20B4662

**Work Order:** 2009249

**Sample ID:** VA20B4662-001

**Lab ID:** 2009249-1

**Legal Location:**

**Matrix:** WATER

**Collection Date:** 8/27/2020 08:00

**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>Radium-226 by Radon Emanation - Method 903.1</b>			<b>SOP 783</b>		Prep Date: <b>9/15/2020</b>	PrepBy: <b>TRW</b>
Ra-226	0.0046 (+/- 0.0062)	U	0.01	BQ/l	NA	9/24/2020 12:41
Carr: <i>BARIUM</i>	92		40-110	%REC	DL = NA	9/24/2020 12:41



Client: ALS Environmental

Date: 25-Sep-20

Project: VA20B4662

Work Order: 2009249

Sample ID: VA20B4662-002

Lab ID: 2009249-2

Legal Location:

Matrix: WATER

Collection Date: 8/27/2020 11:30

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>Radium-226 by Radon Emanation - Method 903.1</b>			<b>SOP 783</b>		Prep Date: <b>9/15/2020</b>	PrepBy: <b>TRW</b>
<b>Ra-226</b>	<b>8.8 (+/- 2.3)</b>	M3	<b>0.29</b>	<b>BQ/l</b>	NA	9/24/2020 12:41
<i>Carr: BARIUM</i>	95.5		40-110	%REC	DL = NA	9/24/2020 12:41

**Client:** ALS Environmental  
**Project:** VA20B4662  
**Sample ID:** VA20B4662-002  
**Legal Location:**  
**Collection Date:** 8/27/2020 11:30

**Date:** 25-Sep-20  
**Work Order:** 2009249  
**Lab ID:** 2009249-2  
**Matrix:** WATER  
**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	--------------	-------	-----------------	---------------

**Explanation of Qualifiers**

**Radiochemistry:**

- "Report Limit" is the MDC
- U or ND - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- W - DER is greater than Warning Limit of 1.42
- \* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
- # - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.
- G - Sample density differs by more than 15% of LCS density.
- D - DER is greater than Control Limit
- M - Requested MDC not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS, Matrix Spike Recovery within control limits.
- N - Matrix Spike Recovery outside control limits
- NC - Not Calculated for duplicate results less than 5 times MDC
- B - Analyte concentration greater than MDC.
- B3 - Analyte concentration greater than MDC but less than Requested MDC.

**Inorganics:**

- B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).
- U or ND - Indicates that the compound was analyzed for but not detected.
- E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.
- M - Duplicate injection precision was not met.
- N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.
- Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.
- \* - Duplicate analysis (relative percent difference) not within control limits.
- S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

**Organics:**

- U or ND - Indicates that the compound was analyzed for but not detected.
- B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.
- E - Analyte concentration exceeds the upper level of the calibration range.
- J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).
- A - A tentatively identified compound is a suspected aldol-condensation product.
- X - The analyte was diluted below an accurate quantitation level.
- \* - The spike recovery is equal to or outside the control criteria used.
- + - The relative percent difference (RPD) equals or exceeds the control criteria.
- G - A pattern resembling gasoline was detected in this sample.
- D - A pattern resembling diesel was detected in this sample.
- M - A pattern resembling motor oil was detected in this sample.
- C - A pattern resembling crude oil was detected in this sample.
- 4 - A pattern resembling JP-4 was detected in this sample.
- 5 - A pattern resembling JP-5 was detected in this sample.
- H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.
- L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.
- Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
  - gasoline
  - JP-8
  - diesel
  - mineral spirits
  - motor oil
  - Stoddard solvent
  - bunker C

ALS -- Fort Collins

Date: 9/25/2020 9:15:

Client: ALS Environmental  
 Work Order: 2009249  
 Project: VA20B4662

**QC BATCH REPORT**

Batch ID: **RE200915-1-1** Instrument ID **Alpha Scin** Method: **Radium-226 by Radon Emanation**

LCS		Sample ID: <b>RE200915-1</b>			Units: <b>BQ/I</b>		Analysis Date: <b>9/24/2020 13:15</b>				
Client ID:		Run ID: <b>RE200915-1A</b>			Prep Date: <b>9/15/2020</b>		DF: <b>NA</b>				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.52 (+/- 0.380)	0.0125	1.719		88.5	67-120					P,M3
Carr: BARIUM	16100		16340		98.7	40-110					

LCSD		Sample ID: <b>RE200915-1</b>			Units: <b>BQ/I</b>		Analysis Date: <b>9/24/2020 13:15</b>				
Client ID:		Run ID: <b>RE200915-1A</b>			Prep Date: <b>9/15/2020</b>		DF: <b>NA</b>				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.46 (+/- 0.364)	0.011	1.719		84.7	67-120		1.52	0.1	2.1	P,M3
Carr: BARIUM	15700		16340		96.1	40-110		16100			

MB		Sample ID: <b>RE200915-1</b>			Units: <b>BQ/I</b>		Analysis Date: <b>9/24/2020 13:15</b>				
Client ID:		Run ID: <b>RE200915-1A</b>			Prep Date: <b>9/15/2020</b>		DF: <b>NA</b>				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	0.00097 (+/- 0.0051)	0.0094									U
Carr: BARIUM	16000		16340		98	40-110					

The following samples were analyzed in this batch: 2009249-1      2009249-2

## APPENDIX D-II

## Ports 3, 4, 8, 9 and Drilling Fluid (isotopes only)

Laboratory Report No. VA20B6509 – various dates

Laboratory Report No. L2508184 – 19 and 20 September 2020

Laboratory Report No. VA20B7020 – 25, 27 and 28 September 2020

Sample Identification	Sample Date	Sample Description	Laboratory Report No.
Westbay-A-225-DUP-1	17-Aug-20	Drilling fluid (brine) sample collected during drilling with the borehole depth at approximately 225 mah	VA20B6509 (isotopes only)
Westbay-A-360-DUP-1	22-Aug-20	Drilling fluid (brine) sample collected during drilling with the borehole depth at approximately 360 mah	
Westbay-A-606-DUP-1	8-Sep-20	Fluid (fresh water) sample collected during drilling with borehole depth at approximately 606 mah.	
Westbay-A-606BR-DUP-1	8-Sep-20	Fluid (brine) sample collected at end of drilling activities with the borehole depth at approximately 606 mah. Brine was used to flush the hole to prevent freezing of the drilling fluid during packer testing and Westbay System installation.	
Westbay-A-Port-4-1	19-Sep-20	Raw water sample collected from Port 4 containing 91% drill fluid	VA20B6509, L2508184-8
Equipment Blank-1	19-Sep-20	Equipment blank for QA/QC purposes	
Westbay-A-Port 8-0.29	20-Sep-20	Raw water sample collected from Port 8 containing 29 to 31% drill fluid	
Westbay-A-Port 8-29%DUP-1	20-Sep-20	Raw water sample collected from Port 8 containing 29 to 31% drill fluid duplicate for QA/QC purposes	
Westbay-A-Port 4-1	25-Sep-20	Raw water sample collected from Port 4 containing 56% drill fluid	VA20B7020
Westbay-A-Port 4-2	27-Sep-20	Raw water sample collected from Port 4 containing 52% drill fluid (incomplete suite of parameters)	
Westbay-A-Port 4-2-DUP-1	27-Sep-20	Raw water sample collected from Port 4 containing 52% drill fluid duplicate for QA/QC purposes (incomplete suite of parameters)	
Westbay-A-Port 4-2-DUP-1	28-Sep-20	Raw water sample collected from Port 4 containing 41% drill fluid (missing parameters)	
Westbay-A-Port 4-2	28-Sep-20	Raw water sample collected from Port 4 containing 41% drill fluid duplicate for QA/QC purposes (missing parameters)	
Westbay-A-Port 3-1	28-Sep-20	Raw water sample collected from Port 3 containing 35% drill fluid	
Westbay-A-Port 9-1	28-Sep-20	Raw water sample collected from Port 9 containing 30% drill fluid	



**Environmental**

## CERTIFICATE OF ANALYSIS

**Work Order** : **VA20B6509**  
**Client** : **Golder Associates Ltd.**  
**Contact** : Adrian Kowalchuk  
**Address** : 1931 Robertson Road  
Ottawa ON Canada K2H 5B7  
**Telephone** : 613 592 9600  
**Project** : 20136436-2300-2304  
**PO** : ----  
**C-O-C number** : 17-2020-19-21  
**Sampler** : Adrian Kowalchuk  
**Site** : Meliadine - Westbay A  
**Quote number** : VA20-AEML100-001 (Q72802)  
**No. of samples received** : 8  
**No. of samples analysed** : 8

**Page** : 1 of 16  
**Laboratory** : Vancouver - Environmental  
**Account Manager** : Heather McKenzie  
**Address** : 8081 Lougheed Highway  
Burnaby BC Canada V5A 1W9  
**Telephone** : +1 604 253 4188  
**Date Samples Received** : 26-Sep-2020 10:50  
**Date Analysis Commenced** : 28-Sep-2020  
**Issue Date** : 04-Nov-2020 11:51

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
- Surrogate Control Limits

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>
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Brieanna Allen	Department Manager - Organics	Organics, Burnaby, British Columbia
Bruna Botti	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Gloria Chan	Lab Analyst	Metals, Burnaby, British Columbia
Jeanie Mark		Organics, Calgary, Alberta
Kaitlyn Gardner	Account Manager Assistant	External Subcontracting, Edmonton, Alberta
Kaitlyn Gardner	Account Manager Assistant	Internal Subcontracting, Fort Collins, Colorado
Kevin Duarte	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics - Water Quality, Burnaby, British Columbia
Monica Ko	Lab Assistant	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Shaneel Dayal	Analyst	Metals, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics - Water Quality, Burnaby, British Columbia





## 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.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances  
 LOR: Limit of Reporting (detection limit).

Unit	Description
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
‰ VSMOW	parts per thousand Vienna Standard Mean Ocean Water
Bq/L	Becquerels per litre
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units
psu	practical salinity units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in reports identified as "Preliminary Report" are considered authorized for use.

## Sample Comments

Sample	Client Id	Comment
VA20B6509-006	Equipment Blank-1	Sample 6: Water sample for total mercury analysis broken in transit and run from HDPE bottle. Results may be biased low.

## Qualifiers

Qualifier	Description
DLA	Detection Limit adjusted for required dilution.
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.



*DLM* Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).

*RRV* Reported result verified by repeat analysis.

*SUR-ND* Surrogate recovery marginally exceeded ALS DQO. Reported non-detect results for associated samples were deemed to be unaffected.

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## Analytical Results

Sub-Matrix: Water					Client sample ID				
(Matrix: Water)					Westbay-A-225 -DUP-1	Westbay-A-360 -DUP-1	Westbay-A-606 -DUP-1	Westbay-A-606 BR-DUP-1	Westbay-A-Port 4-1
Client sampling date / time					17-Aug-2020 02:00	21-Aug-2020 23:00	08-Sep-2020 19:00	08-Sep-2020 22:30	19-Sep-2020
Analyte	CAS Number	Method	LOR	Unit	VA20B6509-001	VA20B6509-002	VA20B6509-003	VA20B6509-004	VA20B6509-005
					Result	Result	Result	Result	Result
<b>Sample Preparation</b>									
dissolved Fe2 filtration location	----	EP541	-	-	----	----	----	----	Field
<b>Physical Tests</b>									
conductivity	----	E100	2.0	µS/cm	----	----	----	----	81800
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	----	----	----	----	98100
salinity	----	EC100S	1.0	psu	----	----	----	----	64.5
solids, total dissolved [TDS]	----	E162	10	mg/L	----	----	----	----	130000
solids, total suspended [TSS]	----	E160-H	3.0	mg/L	----	----	----	----	6.9
turbidity	----	E121	0.10	NTU	----	----	----	----	19.4
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	----	----	----	----	857
pH @ 15°C (WSER)	----	E108A	0.10	pH units	----	----	----	----	10.2
alkalinity, phenolphthalein (as CaCO3)	----	E290	2.0	mg/L	----	----	----	----	91.5
alkalinity, hydroxide (as CaCO3)	----	E290	2.0	mg/L	----	----	----	----	<2.0
alkalinity, carbonate (as CaCO3)	----	E290	2.0	mg/L	----	----	----	----	183
alkalinity, bicarbonate (as CaCO3)	----	E290	2.0	mg/L	----	----	----	----	674
<b>Anions and Nutrients</b>									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	----	----	----	1.84
ammonia, un-ionized (as N), 15C (WSER)	7664-41-7	EC298	0.0010	mg/L	----	----	----	----	1.48
bromide	24959-67-9	E235.Br-L	0.050	mg/L	----	----	----	----	298
chloride	16887-00-6	E235.Cl	0.50	mg/L	----	----	----	----	77700
fluoride	16984-48-8	E235.F	0.020	mg/L	----	----	----	----	<2.00 <sup>DLDS</sup>
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	----	----	----	----	5.07
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	----	----	----	----	5.20
nitrate + nitrite (as N)	----	EC235.N+N	0.0050	mg/L	----	----	----	----	5.22
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	----	----	----	----	<0.100 <sup>DLDS</sup>
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	----	----	----	----	0.0118
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	----	----	----	0.0338
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	----	----	----	----	<25.0 <sup>DLM</sup>
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	----	----	----	----	80.7
<b>Cyanides</b>									
cyanide, free	----	E339	0.0050	mg/L	----	----	----	----	<0.0200 <sup>DLM</sup>



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Westbay-A-225 -DUP-1	Westbay-A-360 -DUP-1	Westbay-A-606 -DUP-1	Westbay-A-606 BR-DUP-1	Westbay-A-Port 4-1
Client sampling date / time					17-Aug-2020 02:00	21-Aug-2020 23:00	08-Sep-2020 19:00	08-Sep-2020 22:30	19-Sep-2020	
Analyte	CAS Number	Method	LOR	Unit	VA20B6509-001	VA20B6509-002	VA20B6509-003	VA20B6509-004	VA20B6509-005	
					Result	Result	Result	Result	Result	
<b>Cyanides</b>										
cyanide, strong acid dissociable (total)	---	E333	0.0050	mg/L	---	---	---	---	<0.0200 <sup>DLM</sup>	
cyanide, weak acid dissociable	---	E336	0.0050	mg/L	---	---	---	---	<0.0200 <sup>DLM</sup>	
<b>Organic / Inorganic Carbon</b>										
carbon, dissolved organic [DOC]	---	E358-L	0.50	mg/L	---	---	---	---	2780	
carbon, total organic [TOC]	---	E355-L	0.50	mg/L	---	---	---	---	3040	
<b>Total Metals</b>										
aluminum, total	7429-90-5	E420	0.0030	mg/L	---	---	---	---	<1.50 <sup>DLA</sup>	
antimony, total	7440-36-0	E420	0.00010	mg/L	---	---	---	---	<0.0500 <sup>DLA</sup>	
arsenic, total	7440-38-2	E420	0.00010	mg/L	---	---	---	---	<0.0500 <sup>DLA</sup>	
barium, total	7440-39-3	E420	0.00010	mg/L	---	---	---	---	10.0	
beryllium, total	7440-41-7	E420	0.000020	mg/L	---	---	---	---	<0.0100 <sup>DLA</sup>	
bismuth, total	7440-69-9	E420	0.000050	mg/L	---	---	---	---	<0.0250 <sup>DLA</sup>	
boron, total	7440-42-8	E420	0.010	mg/L	---	---	---	---	138	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	---	---	---	---	<0.00250 <sup>DLA</sup>	
calcium, total	7440-70-2	E420	0.050	mg/L	---	---	---	---	42500	
cesium, total	7440-46-2	E420	0.000010	mg/L	---	---	---	---	2.98	
chromium, total	7440-47-3	E420	0.00050	mg/L	---	---	---	---	<0.250 <sup>DLA</sup>	
cobalt, total	7440-48-4	E420	0.00010	mg/L	---	---	---	---	<0.0500 <sup>DLA</sup>	
copper, total	7440-50-8	E420	0.00050	mg/L	---	---	---	---	<0.250 <sup>DLA</sup>	
iron, total	7439-89-6	E420	0.010	mg/L	---	---	---	---	<5.00 <sup>DLA</sup>	
lead, total	7439-92-1	E420	0.000050	mg/L	---	---	---	---	<0.0250 <sup>DLA</sup>	
lithium, total	7439-93-2	E420	0.0010	mg/L	---	---	---	---	133	
magnesium, total	7439-95-4	E420	0.0050	mg/L	---	---	---	---	32.7	
manganese, total	7439-96-5	E420	0.00010	mg/L	---	---	---	---	<0.0500 <sup>DLA</sup>	
mercury, total	7439-97-6	E508	0.0000050	mg/L	---	---	---	---	<0.0000050	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	---	---	---	---	0.0704	
nickel, total	7440-02-0	E420	0.00050	mg/L	---	---	---	---	<0.250 <sup>DLA</sup>	
phosphorus, total	7723-14-0	E420	0.050	mg/L	---	---	---	---	<25.0 <sup>DLA</sup>	
potassium, total	7440-09-7	E420	0.050	mg/L	---	---	---	---	1820	
rubidium, total	7440-17-7	E420	0.00020	mg/L	---	---	---	---	7.17	
selenium, total	7782-49-2	E420	0.000050	mg/L	---	---	---	---	<0.0250 <sup>DLA</sup>	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Westbay-A-225 -DUP-1	Westbay-A-360 -DUP-1	Westbay-A-606 -DUP-1	Westbay-A-606 BR-DUP-1	Westbay-A-Port 4-1
Client sampling date / time					17-Aug-2020 02:00	21-Aug-2020 23:00	08-Sep-2020 19:00	08-Sep-2020 22:30	19-Sep-2020	
Analyte	CAS Number	Method	LOR	Unit	VA20B6509-001	VA20B6509-002	VA20B6509-003	VA20B6509-004	VA20B6509-005	
					Result	Result	Result	Result	Result	
<b>Total Metals</b>										
silicon, total	7440-21-3	E420	0.10	mg/L	----	----	----	----	<50.0 <sup>DLA</sup>	
silver, total	7440-22-4	E420	0.000010	mg/L	----	----	----	----	<0.00500 <sup>DLA</sup>	
sodium, total	17341-25-2	E420	0.050	mg/L	----	----	----	----	1460	
strontium, total	7440-24-6	E420	0.00020	mg/L	----	----	----	----	1940	
sulfur, total	7704-34-9	E420	0.50	mg/L	----	----	----	----	<250 <sup>DLA</sup>	
tellurium, total	13494-80-9	E420	0.00020	mg/L	----	----	----	----	0.243	
thallium, total	7440-28-0	E420	0.000010	mg/L	----	----	----	----	0.198	
thorium, total	7440-29-1	E420	0.00010	mg/L	----	----	----	----	<0.0500 <sup>DLA</sup>	
tin, total	7440-31-5	E420	0.00010	mg/L	----	----	----	----	<0.0500 <sup>DLA</sup>	
titanium, total	7440-32-6	E420	0.00030	mg/L	----	----	----	----	<0.150 <sup>DLA</sup>	
tungsten, total	7440-33-7	E420	0.00010	mg/L	----	----	----	----	<0.0500 <sup>DLA</sup>	
uranium, total	7440-61-1	E420	0.000010	mg/L	----	----	----	----	<0.00500 <sup>DLA</sup>	
vanadium, total	7440-62-2	E420	0.00050	mg/L	----	----	----	----	<0.250 <sup>DLA</sup>	
zinc, total	7440-66-6	E420	0.0030	mg/L	----	----	----	----	<1.50 <sup>DLA</sup>	
zirconium, total	7440-67-7	E420	0.00020	mg/L	----	----	----	----	<0.100 <sup>DLA</sup>	
<b>Dissolved Metals</b>										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	----	----	----	----	<0.500 <sup>DLA</sup>	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	----	----	----	----	<0.0500 <sup>DLA</sup>	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	----	----	----	----	<0.0500 <sup>DLA</sup>	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	----	----	----	----	11.6	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	----	----	----	----	<0.0100 <sup>DLA</sup>	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	----	----	----	----	<0.0250 <sup>DLA</sup>	
boron, dissolved	7440-42-8	E421	0.010	mg/L	----	----	----	----	118	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	----	----	----	----	<0.00250 <sup>DLA</sup>	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	----	----	----	----	39200	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	----	----	----	----	3.26	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	----	----	----	----	<0.250 <sup>DLA</sup>	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	----	----	----	----	<0.0500 <sup>DLA</sup>	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	----	----	----	----	<0.100 <sup>DLA</sup>	
iron, dissolved	7439-89-6	E421	0.010	mg/L	----	----	----	----	<5.00 <sup>DLA</sup>	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	----	----	----	----	<0.0250 <sup>DLA</sup>	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Westbay-A-225 -DUP-1	Westbay-A-360 -DUP-1	Westbay-A-606 -DUP-1	Westbay-A-606 BR-DUP-1	Westbay-A-Port 4-1
Client sampling date / time					17-Aug-2020 02:00	21-Aug-2020 23:00	08-Sep-2020 19:00	08-Sep-2020 22:30	19-Sep-2020	
Analyte	CAS Number	Method	LOR	Unit	VA20B6509-001	VA20B6509-002	VA20B6509-003	VA20B6509-004	VA20B6509-005	
					Result	Result	Result	Result	Result	
<b>Dissolved Metals</b>										
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	----	----	----	----	135	
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	----	----	----	----	32.8	
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	----	----	----	----	<0.0500 <sup>DLA</sup>	
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	----	----	----	----	<0.0000050	
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	----	----	----	----	0.0732	
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	----	----	----	----	<0.250 <sup>DLA</sup>	
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	----	----	----	----	<25.0 <sup>DLA</sup>	
potassium, dissolved	7440-09-7	E421	0.050	mg/L	----	----	----	----	1920	
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	----	----	----	----	7.78	
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	----	----	----	----	<0.0250 <sup>DLA</sup>	
silicon, dissolved	7440-21-3	E421	0.050	mg/L	----	----	----	----	<25.0 <sup>DLA</sup>	
silver, dissolved	7440-22-4	E421	0.000010	mg/L	----	----	----	----	<0.00500 <sup>DLA</sup>	
sodium, dissolved	17341-25-2	E421	0.050	mg/L	----	----	----	----	1550	
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	----	----	----	----	2060	
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	----	----	----	----	<250 <sup>DLA</sup>	
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	----	----	----	----	0.131	
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	----	----	----	----	0.198	
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	----	----	----	----	<0.0500 <sup>DLA</sup>	
tin, dissolved	7440-31-5	E421	0.00010	mg/L	----	----	----	----	<0.0500 <sup>DLA</sup>	
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	----	----	----	----	<0.150 <sup>DLA</sup>	
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	----	----	----	----	<0.0500 <sup>DLA</sup>	
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	----	----	----	----	<0.00500 <sup>DLA</sup>	
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	----	----	----	----	<0.250 <sup>DLA</sup>	
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	----	----	----	----	<0.500 <sup>DLA</sup>	
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	----	----	----	----	<0.150 <sup>DLA</sup>	
dissolved mercury filtration location	----	EP509	-	-	----	----	----	----	Field	
dissolved metals filtration location	----	EP421	-	-	----	----	----	----	Field	
<b>Speciated Metals</b>										
iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.020	mg/L	----	----	----	----	0.096	
<b>Aggregate Organics</b>										
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	----	----	----	----	57.2	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Westbay-A-225 -DUP-1	Westbay-A-360 -DUP-1	Westbay-A-606 -DUP-1	Westbay-A-606 BR-DUP-1	Westbay-A-Port 4-1
Client sampling date / time					17-Aug-2020 02:00	21-Aug-2020 23:00	08-Sep-2020 19:00	08-Sep-2020 22:30	19-Sep-2020	
Analyte	CAS Number	Method	LOR	Unit	VA20B6509-001	VA20B6509-002	VA20B6509-003	VA20B6509-004	VA20B6509-005	
					Result	Result	Result	Result	Result	
<b>Aggregate Organics</b>										
chemical oxygen demand [COD]	---	E559	20	mg/L	---	---	---	---	9450 <sup>DLM</sup>	
oil & grease (gravimetric)	---	E567	5.0	mg/L	---	---	---	---	<5.0	
<b>Volatile Organic Compounds [BTEXS+MTBE]</b>										
benzene	71-43-2	E611A	0.50	µg/L	---	---	---	---	<0.50	
ethylbenzene	100-41-4	E611A	0.50	µg/L	---	---	---	---	<0.50	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	---	---	---	---	<0.50	
styrene	100-42-5	E611A	0.50	µg/L	---	---	---	---	<0.50	
toluene	108-88-3	E611A	0.50	µg/L	---	---	---	---	0.67	
xylene, m+p-	179601-23-1	E611A	0.50	µg/L	---	---	---	---	0.71	
xylene, o-	95-47-6	E611A	0.50	µg/L	---	---	---	---	<0.50	
xylenes, total	1330-20-7	E611A	0.75	µg/L	---	---	---	---	<0.75	
<b>Volatile Organic Compounds Surrogates</b>										
bromofluorobenzene, 4-	460-00-4	E611A	0.50	%	---	---	---	---	76.9	
difluorobenzene, 1,4-	540-36-3	E611A	0.50	%	---	---	---	---	97.8	
<b>Hydrocarbons</b>										
F1 (C6-C10)	---	E581.VH+F1	100	µg/L	---	---	---	---	<100	
F1-BTEX	---	EC580	100	µg/L	---	---	---	---	<100	
F2 (C10-C16)	---	E601	100	µg/L	---	---	---	---	<100	
F3 (C16-C34)	---	E601	250	µg/L	---	---	---	---	<250	
F4 (C34-C50)	---	E601	250	µg/L	---	---	---	---	<250	
TEH (C10-C50)	---	E601	400	µg/L	---	---	---	---	<400	
TEH (C16-C50)	---	E601	400	µg/L	---	---	---	---	<400	
<b>Hydrocarbons Surrogates</b>										
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	50	%	---	---	---	---	88.2	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	---	---	---	---	69.9 <sup>SUR-N<sub>D</sub></sup>	
<b>Radiological Parameters</b>										
radium-226	13982-63-3	RA226-MMER	0.28	Bq/L	---	---	---	---	11	
<b>Stable Isotope</b>										
delta-oxygen-18	NA	H2+O18	-	‰ VSMOW	See attached	See attached	See attached	See attached	See attached	
delta-hydrogen-2	NA	H2+O18	-	‰ VSMOW	See attached	See attached	See attached	See attached	See attached	



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

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## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Equipment Blank-1	Westbay-A-Port 8-0.29	Westbay-A-Port 8-29%DUP-1	----	----
Client sampling date / time					19-Sep-2020 02:00	20-Sep-2020 18:00	20-Sep-2020 18:00	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA20B6509-006	VA20B6509-007	VA20B6509-008	-----	-----	
					Result	Result	Result	---	---	
<b>Sample Preparation</b>										
dissolved Fe2 filtration location	----	EP541	-	-	Field	Field	Field	----	----	
<b>Physical Tests</b>										
conductivity	----	E100	2.0	µS/cm	<2.0	52300	81000	----	----	
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	<0.60	37000	35300	----	----	
salinity	----	EC100S	1.0	psu	<1.0	38.6	----	----	----	
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	62400	68500	----	----	
solids, total suspended [TSS]	----	E160-H	3.0	mg/L	<3.0	163	----	----	----	
turbidity	----	E121	0.10	NTU	<0.10	10.9	----	----	----	
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	<2.0	247	----	----	----	
pH @ 15°C (WSER)	----	E108A	0.10	pH units	6.05	8.99	9.01	----	----	
alkalinity, phenolphthalein (as CaCO3)	----	E290	2.0	mg/L	<2.0	44.4	----	----	----	
alkalinity, hydroxide (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	----	----	----	
alkalinity, carbonate (as CaCO3)	----	E290	2.0	mg/L	<2.0	88.8	----	----	----	
alkalinity, bicarbonate (as CaCO3)	----	E290	2.0	mg/L	<2.0	158	----	----	----	
<b>Anions and Nutrients</b>										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	1.12	1.09	----	----	
ammonia, un-ionized (as N), 15C (WSER)	7664-41-7	EC298	0.0010	mg/L	<0.0010	0.236	0.240	----	----	
bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	127	144	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	32700	36800	----	----	
fluoride	16984-48-8	E235.F	0.020	mg/L	<0.020	<2.00 <sup>DLDS</sup>	<2.00 <sup>DLDS</sup>	----	----	
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	<0.050	1.46 <sup>DLM</sup>	1.54 <sup>DLM</sup>	----	----	
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	1.30	1.48	----	----	
nitrate + nitrite (as N)	----	EC235.N+N	0.0050	mg/L	<0.0051	1.31	1.49	----	----	
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.100 <sup>DLDS</sup>	<0.100 <sup>DLDS</sup>	----	----	
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0013 <sup>RRV</sup>	0.0032	0.0032	----	----	
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0049 <sup>RRV</sup>	0.0343	0.0317	----	----	
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	<0.50	5.18	5.40	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<0.30	766	861	----	----	
<b>Cyanides</b>										
cyanide, free	----	E339	0.0050	mg/L	<0.0050	<0.0200 <sup>DLM</sup>	<0.0200 <sup>DLM</sup>	----	----	
cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	<0.0050	<0.0200 <sup>DLM</sup>	<0.0200 <sup>DLM</sup>	----	----	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Equipment Blank-1	Westbay-A-Port 8-0.29	Westbay-A-Port 8-29%DUP-1	----	----
Client sampling date / time					19-Sep-2020 02:00	20-Sep-2020 18:00	20-Sep-2020 18:00	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA20B6509-006	VA20B6509-007	VA20B6509-008	-----	-----	
					Result	Result	Result	----	----	
<b>Cyanides</b>										
cyanide, weak acid dissociable	----	E336	0.0050	mg/L	<0.0050	<0.0200 <sup>DLM</sup>	<0.0200 <sup>DLM</sup>	----	----	
<b>Organic / Inorganic Carbon</b>										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	<0.50	216	218	----	----	
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	212	212	----	----	
<b>Total Metals</b>										
aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	<0.600 <sup>DLA</sup>	<0.600 <sup>DLA</sup>	----	----	
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	
arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.00010	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	
barium, total	7440-39-3	E420	0.00010	mg/L	<0.00010	3.06	2.97	----	----	
beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.00400 <sup>DLA</sup>	<0.00400 <sup>DLA</sup>	----	----	
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	
boron, total	7440-42-8	E420	0.010	mg/L	<0.010	40.4	39.5	----	----	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	<0.00100 <sup>DLA</sup>	<0.00100 <sup>DLA</sup>	----	----	
calcium, total	7440-70-2	E420	0.050	mg/L	0.297 <sup>RRV</sup>	14900	14400	----	----	
cesium, total	7440-46-2	E420	0.000010	mg/L	0.000021 <sup>RRV</sup>	0.886	0.855	----	----	
chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.100 <sup>DLA</sup>	<0.100 <sup>DLA</sup>	----	----	
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	
copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.100 <sup>DLA</sup>	<0.100 <sup>DLA</sup>	----	----	
iron, total	7439-89-6	E420	0.010	mg/L	<0.010	<2.00 <sup>DLA</sup>	<2.00 <sup>DLA</sup>	----	----	
lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	0.0109	<0.0100 <sup>DLA</sup>	----	----	
lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	40.2	39.9	----	----	
magnesium, total	7439-95-4	E420	0.0050	mg/L	<0.0050	899	850	----	----	
manganese, total	7439-96-5	E420	0.00010	mg/L	<0.00010	0.696	0.650	----	----	
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	----	----	
molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	0.0176	0.0186	----	----	
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.100 <sup>DLA</sup>	<0.100 <sup>DLA</sup>	----	----	
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<10.0 <sup>DLA</sup>	<10.0 <sup>DLA</sup>	----	----	
potassium, total	7440-09-7	E420	0.050	mg/L	<0.050	646	610	----	----	
rubidium, total	7440-17-7	E420	0.00020	mg/L	<0.00020	2.34	2.20	----	----	
selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	
silicon, total	7440-21-3	E420	0.10	mg/L	<0.10	<20.0 <sup>DLA</sup>	<20.0 <sup>DLA</sup>	----	----	





## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Equipment Blank-1	Westbay-A-Port 8-0.29	Westbay-A-Port 8-29%DUP-1	----	----
Client sampling date / time					19-Sep-2020 02:00	20-Sep-2020 18:00	20-Sep-2020 18:00	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA20B6509-006	VA20B6509-007	VA20B6509-008	-----	-----	
					Result	Result	Result	---	---	
<b>Total Metals</b>										
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.00200 <sup>DLA</sup>	<0.00200 <sup>DLA</sup>	----	----	
sodium, total	17341-25-2	E420	0.050	mg/L	<0.050	6760	6400	----	----	
strontium, total	7440-24-6	E420	0.00020	mg/L	0.0127 <sup>RRV</sup>	655	631	----	----	
sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	233	196	----	----	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	0.0707	0.0756	----	----	
thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	0.0562	0.0536	----	----	
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	
tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.0600 <sup>DLA</sup>	<0.0600 <sup>DLA</sup>	----	----	
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	
uranium, total	7440-61-1	E420	0.000010	mg/L	<0.000010	0.00295	0.00274	----	----	
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.100 <sup>DLA</sup>	<0.100 <sup>DLA</sup>	----	----	
zinc, total	7440-66-6	E420	0.0030	mg/L	0.0051 <sup>RRV</sup>	<0.600 <sup>DLA</sup>	<0.600 <sup>DLA</sup>	----	----	
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.0400 <sup>DLA</sup>	<0.0400 <sup>DLA</sup>	----	----	
<b>Dissolved Metals</b>										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.0010	<0.100 <sup>DLA</sup>	<0.100 <sup>DLA</sup>	----	----	
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.00010	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	
barium, dissolved	7440-39-3	E421	0.00010	mg/L	<0.00010	3.22	2.94	----	----	
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.00200 <sup>DLA</sup>	<0.00200 <sup>DLA</sup>	----	----	
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.00500 <sup>DLA</sup>	<0.00500 <sup>DLA</sup>	----	----	
boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	37.0	34.6	----	----	
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.000500 <sup>DLA</sup>	<0.000500 <sup>DLA</sup>	----	----	
calcium, dissolved	7440-70-2	E421	0.050	mg/L	0.111 <sup>RRV</sup>	13400	12800	----	----	
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	0.919	0.913	----	----	
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.0500 <sup>DLA</sup>	<0.0500 <sup>DLA</sup>	----	----	
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	
copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.00020	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	
iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<1.00 <sup>DLA</sup>	<1.00 <sup>DLA</sup>	----	----	
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.00500 <sup>DLA</sup>	<0.00500 <sup>DLA</sup>	----	----	
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	39.8	37.0	----	----	



## Analytical Results

Sub-Matrix: Water  
 (Matrix: Water)

Client sample ID

					Equipment Blank-1	Westbay-A-Port 8-0.29	Westbay-A-Port 8-29%DUP-1	----	----
Client sampling date / time					19-Sep-2020 02:00	20-Sep-2020 18:00	20-Sep-2020 18:00	----	----
Analyte	CAS Number	Method	LOR	Unit	VA20B6509-006	VA20B6509-007	VA20B6509-008	-----	-----
					Result	Result	Result	---	---
<b>Dissolved Metals</b>									
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	<0.0050	865	812	----	----
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	<0.00010	0.657	0.626	----	----
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	----	----
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	<0.000050	0.0196	0.0210	----	----
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.0500 <sup>DLA</sup>	<0.0500 <sup>DLA</sup>	----	----
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<5.00 <sup>DLA</sup>	<5.00 <sup>DLA</sup>	----	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L	<0.050	607	571	----	----
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	<0.00020	2.34	2.23	----	----
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	<0.00500 <sup>DLA</sup>	<0.00500 <sup>DLA</sup>	----	----
silicon, dissolved	7440-21-3	E421	0.050	mg/L	<0.050	<5.00 <sup>DLA</sup>	<5.00 <sup>DLA</sup>	----	----
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.00100 <sup>DLA</sup>	<0.00100 <sup>DLA</sup>	----	----
sodium, dissolved	17341-25-2	E421	0.050	mg/L	<0.050	6420	6040	----	----
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.00461 <sup>RRV</sup>	642	655	----	----
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	270	261	----	----
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	0.0380	0.0438	----	----
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	0.0532	0.0532	----	----
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.0300 <sup>DLA</sup>	<0.0300 <sup>DLA</sup>	----	----
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	0.0112	0.0109	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	<0.000010	0.00262	0.00259	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.0500 <sup>DLA</sup>	<0.0500 <sup>DLA</sup>	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0016 <sup>RRV</sup>	<0.100 <sup>DLA</sup>	<0.100 <sup>DLA</sup>	----	----
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.0300 <sup>DLA</sup>	<0.0300 <sup>DLA</sup>	----	----
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	----	----
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	----	----
<b>Speciated Metals</b>									
iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.020	mg/L	<0.020	0.024	0.039	----	----
<b>Aggregate Organics</b>									
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	537	621	----	----
chemical oxygen demand [COD]	----	E559	20	mg/L	<20	2180 <sup>DLM</sup>	3770 <sup>DLM</sup>	----	----



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Equipment Blank-1	Westbay-A-Port 8-0.29	Westbay-A-Port 8-29%DUP-1	----	----
Client sampling date / time					19-Sep-2020 02:00	20-Sep-2020 18:00	20-Sep-2020 18:00	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA20B6509-006	VA20B6509-007	VA20B6509-008	-----	-----	
					Result	Result	Result	---	---	
<b>Aggregate Organics</b>										
oil & grease (gravimetric)	----	E567	5.0	mg/L	<5.0	<5.0	<5.0	----	----	
<b>Volatile Organic Compounds [BTEXS+MTBE]</b>										
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
xylene, m+p-	179601-23-1	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
xylene, o-	95-47-6	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----	
xylenes, total	1330-20-7	E611A	0.75	µg/L	<0.75	<0.75	<0.75	----	----	
<b>Volatile Organic Compounds Surrogates</b>										
bromofluorobenzene, 4-	460-00-4	E611A	0.50	%	80.4	79.6	79.7	----	----	
difluorobenzene, 1,4-	540-36-3	E611A	0.50	%	93.9	97.1	93.2	----	----	
<b>Hydrocarbons</b>										
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	<100	----	----	
F1-BTEX	----	EC580	100	µg/L	<100	<100	<100	----	----	
F2 (C10-C16)	----	E601	100	µg/L	<100	<100	<100	----	----	
F3 (C16-C34)	----	E601	250	µg/L	<250	<250	<250	----	----	
F4 (C34-C50)	----	E601	250	µg/L	<250	<250	<250	----	----	
TEH (C10-C50)	----	E601	400	µg/L	<400	<400	<400	----	----	
TEH (C16-C50)	----	E601	400	µg/L	<400	<400	<400	----	----	
<b>Hydrocarbons Surrogates</b>										
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	50	%	82.7	89.7	93.9	----	----	
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	91.9	94.6	90.8	----	----	
<b>Radiological Parameters</b>										
radium-226	13982-63-3	RA226-MMER	0.0085	Bq/L	<0.0085	----	----	----	----	
radium-226	13982-63-3	RA226-MMER	0.044	Bq/L	----	----	4.1	----	----	
radium-226	13982-63-3	RA226-MMER	0.077	Bq/L	----	3.9	----	----	----	
<b>Stable Isotope</b>										
delta-oxygen-18	NA	H2+O18	-	‰ VSMOW	See attached	See attached	See attached	----	----	



## Analytical Results

Sub-Matrix: <b>Water</b>					<i>Client sample ID</i>	<b>Equipment Blank-1</b>	<b>Westbay-A-Port 8-0.29</b>	<b>Westbay-A-Port 8-29%DUP-1</b>	----	----
(Matrix: <b>Water</b> )										
					<i>Client sampling date / time</i>				----	----
<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<b>VA20B6509-006</b>	<b>VA20B6509-007</b>	<b>VA20B6509-008</b>	-----	-----	
					Result	Result	Result	---	---	
<b>Stable Isotope</b>										
<b>delta-hydrogen-2</b>	NA	H2+O18	-	‰ VSMOW	See attached	See attached	See attached	----	----	

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

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: <b>VA20B6509</b>	Page	: 1 of 28
Client	: <b>Golder Associates Ltd.</b>	Laboratory	: Vancouver - Environmental
Contact	: Adrian Kowalchuk	Account Manager	: Heather McKenzie
Address	: 1931 Robertson Road Ottawa ON Canada K2H 5B7	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 204 489 9600	Telephone	: +1 604 253 4188
Project	: 20136436-2300-2304	Date Samples Received	: 26-Sep-2020 10:50
PO	: ----	Issue Date	: 04-Nov-2020 11:51
C-O-C number	: 17-2020-19-21		
Sampler	: Adrian Kowalchuk		
Site	: Meliadine - Westbay A		
Quote number	: VA20-AEML100-001 (Q72802)		
No. of samples received	: 8		
No. of samples analysed	: 8		

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 Services number is a unique identifier assigned to discrete substances.

**DQO:** Data Quality Objective.

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

**RPD:** Relative Percent Difference.

## Summary of Outliers

### **Outliers : Quality Control Samples**

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

### **Outliers: Reference Material (RM) Samples**

- No Reference Material (RM) Sample outliers occur.

### **Outliers : Analysis Holding Time Compliance (Breaches)**

- Analysis Holding Time Outliers exist - please see following pages for full details.

### **Outliers : Frequency of Quality Control Samples**

- No Quality Control Sample Frequency Outliers occur.

RIGHT SOLUTIONS | RIGHT PARTNER

Page : 3 of 28  
Work Order : VA20B6509  
Client : Golder Associates Ltd.  
Project : 20136436-2300-2304



**Regular Sample Surrogates**

Sub-Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Result	Limits	Comment
<b>Samples Submitted</b>							
Hydrocarbons Surrogates	VA20B6509-005	Westbay-A-Port4-1	dichlorotoluene, 3,4-	97-75-0	69.9 %	70.0-130 %	Recovery less than lower data quality objective



## 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 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 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	
<b>Aggregate Organics : Biochemical Oxygen Demand - 5 day</b>										
<b>HDPE [BOD]</b> Westbay-A-Port8-0.29	E550	20-Sep-2020	----	----	----		28-Sep-2020	3 days	7 days	* EHTR
<b>Aggregate Organics : Biochemical Oxygen Demand - 5 day</b>										
<b>HDPE [BOD]</b> Westbay-A-Port8-29%DUP-1	E550	20-Sep-2020	----	----	----		28-Sep-2020	3 days	7 days	* EHTR
<b>Aggregate Organics : Biochemical Oxygen Demand - 5 day</b>										
<b>HDPE [BOD]</b> Equipment Blank-1	E550	19-Sep-2020	----	----	----		28-Sep-2020	3 days	9 days	* EHTR
<b>Aggregate Organics : Biochemical Oxygen Demand - 5 day</b>										
<b>HDPE [BOD]</b> Westbay-A-Port4-1	E550	19-Sep-2020	----	----	----		28-Sep-2020	3 days	9 days	* EHTR
<b>Aggregate Organics : Chemical Oxygen Demand by Colourimetry</b>										
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port8-0.29	E559	20-Sep-2020	----	----	----		05-Oct-2020	28 days	14 days	✓
<b>Aggregate Organics : Chemical Oxygen Demand by Colourimetry</b>										
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port8-29%DUP-1	E559	20-Sep-2020	----	----	----		05-Oct-2020	28 days	14 days	✓
<b>Aggregate Organics : Chemical Oxygen Demand by Colourimetry</b>										
<b>Amber glass total (sulfuric acid)</b> Equipment Blank-1	E559	19-Sep-2020	----	----	----		05-Oct-2020	28 days	16 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 Rec Actual		Eval	Analysis Date	Holding Times Rec Actual		Eval
<b>Aggregate Organics : Chemical Oxygen Demand by Colourimetry</b>										
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port4-1	E559	19-Sep-2020	----	----	----		05-Oct-2020	28 days	16 days	✓
<b>Aggregate Organics : Oil &amp; Grease by Gravimetry</b>										
<b>Amber glass (hydrochloric acid)</b> Westbay-A-Port8-0.29	E567	20-Sep-2020	01-Oct-2020	28 days	10 days	✓	01-Oct-2020	40 days	0 days	✓
<b>Aggregate Organics : Oil &amp; Grease by Gravimetry</b>										
<b>Amber glass (hydrochloric acid)</b> Westbay-A-Port8-29%DUP-1	E567	20-Sep-2020	01-Oct-2020	28 days	10 days	✓	01-Oct-2020	40 days	0 days	✓
<b>Aggregate Organics : Oil &amp; Grease by Gravimetry</b>										
<b>Amber glass (hydrochloric acid)</b> Equipment Blank-1	E567	19-Sep-2020	01-Oct-2020	28 days	12 days	✓	01-Oct-2020	40 days	0 days	✓
<b>Aggregate Organics : Oil &amp; Grease by Gravimetry</b>										
<b>Amber glass (hydrochloric acid)</b> Westbay-A-Port4-1	E567	19-Sep-2020	01-Oct-2020	28 days	12 days	✓	01-Oct-2020	40 days	0 days	✓
<b>Anions and Nutrients : Ammonia by Fluorescence</b>										
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port8-0.29	E298	20-Sep-2020	----	----	----		06-Oct-2020	28 days	15 days	✓
<b>Anions and Nutrients : Ammonia by Fluorescence</b>										
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port8-29%DUP-1	E298	20-Sep-2020	----	----	----		06-Oct-2020	28 days	15 days	✓
<b>Anions and Nutrients : Ammonia by Fluorescence</b>										
<b>Amber glass total (sulfuric acid)</b> Equipment Blank-1	E298	19-Sep-2020	----	----	----		06-Oct-2020	28 days	17 days	✓
<b>Anions and Nutrients : Ammonia by Fluorescence</b>										
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port4-1	E298	19-Sep-2020	----	----	----		06-Oct-2020	28 days	17 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		
<b>Anions and Nutrients : Bromide in Water by IC (Low Level)</b>											
HDPE Westbay-A-Port8-0.29	E235.Br-L	20-Sep-2020	----	----	----		28-Sep-2020	28 days	8 days	✓	
<b>Anions and Nutrients : Bromide in Water by IC (Low Level)</b>											
HDPE Westbay-A-Port8-29%DUP-1	E235.Br-L	20-Sep-2020	----	----	----		28-Sep-2020	28 days	8 days	✓	
<b>Anions and Nutrients : Bromide in Water by IC (Low Level)</b>											
HDPE Equipment Blank-1	E235.Br-L	19-Sep-2020	----	----	----		28-Sep-2020	28 days	9 days	✓	
<b>Anions and Nutrients : Bromide in Water by IC (Low Level)</b>											
HDPE Westbay-A-Port4-1	E235.Br-L	19-Sep-2020	----	----	----		28-Sep-2020	28 days	9 days	✓	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE Westbay-A-Port8-0.29	E235.Cl	20-Sep-2020	----	----	----		28-Sep-2020	28 days	8 days	✓	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE Westbay-A-Port8-29%DUP-1	E235.Cl	20-Sep-2020	----	----	----		28-Sep-2020	28 days	8 days	✓	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE Equipment Blank-1	E235.Cl	19-Sep-2020	----	----	----		28-Sep-2020	28 days	9 days	✓	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
HDPE Westbay-A-Port4-1	E235.Cl	19-Sep-2020	----	----	----		28-Sep-2020	28 days	9 days	✓	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)</b>											
HDPE Westbay-A-Port8-0.29	E378-U	20-Sep-2020	----	----	----		28-Sep-2020	3 days	8 days	* EHTR	



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	
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)</b>										
HDPE Westbay-A-Port8-29%DUP-1	E378-U	20-Sep-2020	----	----	----		28-Sep-2020	3 days	8 days	* EHTR
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)</b>										
HDPE Equipment Blank-1	E378-U	19-Sep-2020	----	----	----		28-Sep-2020	3 days	9 days	* EHTR
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)</b>										
HDPE Westbay-A-Port4-1	E378-U	19-Sep-2020	----	----	----		28-Sep-2020	3 days	9 days	* EHTR
<b>Anions and Nutrients : Fluoride in Water by IC</b>										
HDPE Westbay-A-Port8-0.29	E235.F	20-Sep-2020	----	----	----		28-Sep-2020	28 days	8 days	✓
<b>Anions and Nutrients : Fluoride in Water by IC</b>										
HDPE Westbay-A-Port8-29%DUP-1	E235.F	20-Sep-2020	----	----	----		28-Sep-2020	28 days	8 days	✓
<b>Anions and Nutrients : Fluoride in Water by IC</b>										
HDPE Equipment Blank-1	E235.F	19-Sep-2020	----	----	----		28-Sep-2020	28 days	9 days	✓
<b>Anions and Nutrients : Fluoride in Water by IC</b>										
HDPE Westbay-A-Port4-1	E235.F	19-Sep-2020	----	----	----		28-Sep-2020	28 days	9 days	✓
<b>Anions and Nutrients : Nitrate in Water by IC (Low Level)</b>										
HDPE Westbay-A-Port8-0.29	E235.NO3-L	20-Sep-2020	----	----	----		28-Sep-2020	3 days	8 days	* EHTR
<b>Anions and Nutrients : Nitrate in Water by IC (Low Level)</b>										
HDPE Westbay-A-Port8-29%DUP-1	E235.NO3-L	20-Sep-2020	----	----	----		28-Sep-2020	3 days	8 days	* EHTR



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		
<b>Anions and Nutrients : Nitrate in Water by IC (Low Level)</b>											
HDPE Equipment Blank-1	E235.NO3-L	19-Sep-2020	----	----	----		28-Sep-2020	3 days	9 days	*	EHTR
<b>Anions and Nutrients : Nitrate in Water by IC (Low Level)</b>											
HDPE Westbay-A-Port4-1	E235.NO3-L	19-Sep-2020	----	----	----		28-Sep-2020	3 days	9 days	*	EHTR
<b>Anions and Nutrients : Nitrite in Water by IC (Low Level)</b>											
HDPE Westbay-A-Port8-0.29	E235.NO2-L	20-Sep-2020	----	----	----		28-Sep-2020	3 days	8 days	*	EHTR
<b>Anions and Nutrients : Nitrite in Water by IC (Low Level)</b>											
HDPE Westbay-A-Port8-29%DUP-1	E235.NO2-L	20-Sep-2020	----	----	----		28-Sep-2020	3 days	8 days	*	EHTR
<b>Anions and Nutrients : Nitrite in Water by IC (Low Level)</b>											
HDPE Equipment Blank-1	E235.NO2-L	19-Sep-2020	----	----	----		28-Sep-2020	3 days	9 days	*	EHTR
<b>Anions and Nutrients : Nitrite in Water by IC (Low Level)</b>											
HDPE Westbay-A-Port4-1	E235.NO2-L	19-Sep-2020	----	----	----		28-Sep-2020	3 days	9 days	*	EHTR
<b>Anions and Nutrients : Reactive Silica by Colourimetry</b>											
HDPE Westbay-A-Port8-0.29	E392	20-Sep-2020	----	----	----		01-Oct-2020	28 days	10 days	✓	
<b>Anions and Nutrients : Reactive Silica by Colourimetry</b>											
HDPE Westbay-A-Port8-29%DUP-1	E392	20-Sep-2020	----	----	----		01-Oct-2020	28 days	10 days	✓	
<b>Anions and Nutrients : Reactive Silica by Colourimetry</b>											
HDPE Equipment Blank-1	E392	19-Sep-2020	----	----	----		01-Oct-2020	28 days	12 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	
<b>Anions and Nutrients : Reactive Silica by Colourimetry</b>										
<b>HDPE</b> Westbay-A-Port4-1	E392	19-Sep-2020	----	----	----		01-Oct-2020	28 days	12 days	✔
<b>Anions and Nutrients : Sulfate in Water by IC</b>										
<b>HDPE</b> Westbay-A-Port8-0.29	E235.SO4	20-Sep-2020	----	----	----		28-Sep-2020	28 days	8 days	✔
<b>Anions and Nutrients : Sulfate in Water by IC</b>										
<b>HDPE</b> Westbay-A-Port8-29%DUP-1	E235.SO4	20-Sep-2020	----	----	----		28-Sep-2020	28 days	8 days	✔
<b>Anions and Nutrients : Sulfate in Water by IC</b>										
<b>HDPE</b> Equipment Blank-1	E235.SO4	19-Sep-2020	----	----	----		28-Sep-2020	28 days	9 days	✔
<b>Anions and Nutrients : Sulfate in Water by IC</b>										
<b>HDPE</b> Westbay-A-Port4-1	E235.SO4	19-Sep-2020	----	----	----		28-Sep-2020	28 days	9 days	✔
<b>Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)</b>										
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port8-0.29	E318	20-Sep-2020	06-Oct-2020	28 days	15 days	✔	07-Oct-2020	12 days	1 days	✔
<b>Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)</b>										
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port8-29%DUP-1	E318	20-Sep-2020	06-Oct-2020	28 days	15 days	✔	07-Oct-2020	12 days	1 days	✔
<b>Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)</b>										
<b>Amber glass total (sulfuric acid)</b> Equipment Blank-1	E318	19-Sep-2020	06-Oct-2020	28 days	16 days	✔	07-Oct-2020	11 days	1 days	✔
<b>Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)</b>										
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port4-1	E318	19-Sep-2020	06-Oct-2020	28 days	17 days	✔	07-Oct-2020	10 days	1 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		
<b>Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port8-0.29	E372-U	20-Sep-2020	06-Oct-2020	28 days	15 days	✔	06-Oct-2020	12 days	0 days	✔	
<b>Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port8-29%DUP-1	E372-U	20-Sep-2020	06-Oct-2020	28 days	15 days	✔	06-Oct-2020	12 days	0 days	✔	
<b>Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)</b>											
<b>Amber glass total (sulfuric acid)</b> Equipment Blank-1	E372-U	19-Sep-2020	06-Oct-2020	28 days	16 days	✔	06-Oct-2020	11 days	0 days	✔	
<b>Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port4-1	E372-U	19-Sep-2020	06-Oct-2020	28 days	17 days	✔	06-Oct-2020	10 days	0 days	✔	
<b>Cyanides : Free Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port8-0.29	E339	20-Sep-2020	----	----	----		02-Oct-2020	14 days	11 days	✔	
<b>Cyanides : Free Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port8-29%DUP-1	E339	20-Sep-2020	----	----	----		02-Oct-2020	14 days	11 days	✔	
<b>Cyanides : Free Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Equipment Blank-1	E339	19-Sep-2020	----	----	----		01-Oct-2020	14 days	12 days	✔	
<b>Cyanides : Free Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port4-1	E339	19-Sep-2020	----	----	----		01-Oct-2020	14 days	12 days	✔	
<b>Cyanides : Total Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port8-0.29	E333	20-Sep-2020	----	----	----		02-Oct-2020	14 days	11 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	
<b>Cyanides : Total Cyanide by CFA</b>										
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port8-29%DUP-1	E333	20-Sep-2020	----	----	----		02-Oct-2020	14 days	11 days	✔
<b>Cyanides : Total Cyanide by CFA</b>										
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Equipment Blank-1	E333	19-Sep-2020	----	----	----		01-Oct-2020	14 days	12 days	✔
<b>Cyanides : Total Cyanide by CFA</b>										
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port4-1	E333	19-Sep-2020	----	----	----		01-Oct-2020	14 days	12 days	✔
<b>Cyanides : WAD Cyanide by CFA</b>										
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port8-0.29	E336	20-Sep-2020	----	----	----		02-Oct-2020	14 days	11 days	✔
<b>Cyanides : WAD Cyanide by CFA</b>										
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port8-29%DUP-1	E336	20-Sep-2020	----	----	----		02-Oct-2020	14 days	11 days	✔
<b>Cyanides : WAD Cyanide by CFA</b>										
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Equipment Blank-1	E336	19-Sep-2020	----	----	----		01-Oct-2020	14 days	12 days	✔
<b>Cyanides : WAD Cyanide by CFA</b>										
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port4-1	E336	19-Sep-2020	----	----	----		01-Oct-2020	14 days	12 days	✔
<b>Dissolved Metals : Dissolved Mercury in Water by CVAAS</b>										
<b>Glass vial dissolved (hydrochloric acid)</b> Westbay-A-Port8-0.29	E509	20-Sep-2020	05-Oct-2020	28 days	14 days	✔	05-Oct-2020	13 days	0 days	✔
<b>Dissolved Metals : Dissolved Mercury in Water by CVAAS</b>										
<b>Glass vial dissolved (hydrochloric acid)</b> Westbay-A-Port8-29%DUP-1	E509	20-Sep-2020	05-Oct-2020	28 days	14 days	✔	05-Oct-2020	13 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		
<b>Dissolved Metals : Dissolved Mercury in Water by CVAAS</b>											
<b>Glass vial dissolved (hydrochloric acid)</b> Equipment Blank-1	E509	19-Sep-2020	05-Oct-2020	28 days	16 days	✔	05-Oct-2020	11 days	0 days	✔	
<b>Dissolved Metals : Dissolved Mercury in Water by CVAAS</b>											
<b>Glass vial dissolved (hydrochloric acid)</b> Westbay-A-Port4-1	E509	19-Sep-2020	05-Oct-2020	28 days	16 days	✔	05-Oct-2020	11 days	0 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
<b>HDPE dissolved (nitric acid)</b> Westbay-A-Port8-0.29	E421	20-Sep-2020	01-Oct-2020	180 days	11 days	✔	02-Oct-2020	168 days	0 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
<b>HDPE dissolved (nitric acid)</b> Westbay-A-Port8-29%DUP-1	E421	20-Sep-2020	01-Oct-2020	180 days	11 days	✔	02-Oct-2020	168 days	0 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
<b>HDPE dissolved (nitric acid)</b> Equipment Blank-1	E421	19-Sep-2020	01-Oct-2020	180 days	12 days	✔	02-Oct-2020	167 days	0 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
<b>HDPE dissolved (nitric acid)</b> Westbay-A-Port4-1	E421	19-Sep-2020	01-Oct-2020	180 days	12 days	✔	02-Oct-2020	167 days	0 days	✔	
<b>Hydrocarbons : CCME PHC - F2-F4 by GC-FID</b>											
<b>Amber glass/Teflon lined cap (sodium bisulfate)</b> Westbay-A-Port8-0.29	E601	20-Sep-2020	02-Oct-2020	14 days	12 days	✔	05-Oct-2020	40 days	2 days	✔	
<b>Hydrocarbons : CCME PHC - F2-F4 by GC-FID</b>											
<b>Amber glass/Teflon lined cap (sodium bisulfate)</b> Westbay-A-Port8-29%DUP-1	E601	20-Sep-2020	02-Oct-2020	14 days	12 days	✔	05-Oct-2020	40 days	2 days	✔	
<b>Hydrocarbons : CCME PHC - F2-F4 by GC-FID</b>											
<b>Amber glass/Teflon lined cap (sodium bisulfate)</b> Equipment Blank-1	E601	19-Sep-2020	02-Oct-2020	14 days	13 days	✔	05-Oct-2020	40 days	2 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		
<b>Hydrocarbons : CCME PHC - F2-F4 by GC-FID</b>											
<b>Amber glass/Teflon lined cap (sodium bisulfate)</b> Westbay-A-Port4-1	E601	19-Sep-2020	02-Oct-2020	14 days	13 days	✔	05-Oct-2020	40 days	2 days	✔	
<b>Hydrocarbons : VH and F1 by Headspace GC-FID</b>											
<b>Glass vial (sodium bisulfate)</b> Westbay-A-Port8-0.29	E581.VH+F1	20-Sep-2020	02-Oct-2020	14 days	11 days	✔	02-Oct-2020	2 days	0 days	✔	
<b>Hydrocarbons : VH and F1 by Headspace GC-FID</b>											
<b>Glass vial (sodium bisulfate)</b> Westbay-A-Port8-29%DUP-1	E581.VH+F1	20-Sep-2020	02-Oct-2020	14 days	11 days	✔	02-Oct-2020	2 days	0 days	✔	
<b>Hydrocarbons : VH and F1 by Headspace GC-FID</b>											
<b>Glass vial (sodium bisulfate)</b> Equipment Blank-1	E581.VH+F1	19-Sep-2020	02-Oct-2020	14 days	13 days	✔	02-Oct-2020	0 days	0 days	✔	
<b>Hydrocarbons : VH and F1 by Headspace GC-FID</b>											
<b>Glass vial (sodium bisulfate)</b> Westbay-A-Port4-1	E581.VH+F1	19-Sep-2020	02-Oct-2020	14 days	13 days	✔	02-Oct-2020	0 days	0 days	✔	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
<b>Amber glass dissolved (sulfuric acid)</b> Westbay-A-Port8-0.29	E358-L	20-Sep-2020	----	----	----		06-Oct-2020	28 days	15 days	✔	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
<b>Amber glass dissolved (sulfuric acid)</b> Westbay-A-Port8-29%DUP-1	E358-L	20-Sep-2020	----	----	----		06-Oct-2020	28 days	15 days	✔	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
<b>Amber glass dissolved (sulfuric acid)</b> Equipment Blank-1	E358-L	19-Sep-2020	----	----	----		06-Oct-2020	28 days	17 days	✔	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>											
<b>Amber glass dissolved (sulfuric acid)</b> Westbay-A-Port4-1	E358-L	19-Sep-2020	----	----	----		06-Oct-2020	28 days	17 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	
<b>Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)</b>										
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port8-0.29	E355-L	20-Sep-2020	----	----	----		06-Oct-2020	28 days	15 days	✓
<b>Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)</b>										
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port8-29%DUP-1	E355-L	20-Sep-2020	----	----	----		06-Oct-2020	28 days	15 days	✓
<b>Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)</b>										
<b>Amber glass total (sulfuric acid)</b> Equipment Blank-1	E355-L	19-Sep-2020	----	----	----		06-Oct-2020	28 days	17 days	✓
<b>Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)</b>										
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port4-1	E355-L	19-Sep-2020	----	----	----		06-Oct-2020	28 days	17 days	✓
<b>Physical Tests : Alkalinity Species by Titration</b>										
<b>HDPE</b> Westbay-A-Port8-0.29	E290	20-Sep-2020	----	----	----		05-Oct-2020	14 days	14 days	✓
<b>Physical Tests : Alkalinity Species by Titration</b>										
<b>HDPE</b> Equipment Blank-1	E290	19-Sep-2020	----	----	----		05-Oct-2020	14 days	16 days	* EHT
<b>Physical Tests : Alkalinity Species by Titration</b>										
<b>HDPE</b> Westbay-A-Port4-1	E290	19-Sep-2020	----	----	----		05-Oct-2020	14 days	16 days	* EHT
<b>Physical Tests : Conductivity in Water</b>										
<b>HDPE</b> Westbay-A-Port8-0.29	E100	20-Sep-2020	----	----	----		05-Oct-2020	28 days	14 days	✓
<b>Physical Tests : Conductivity in Water</b>										
<b>HDPE</b> Equipment Blank-1	E100	19-Sep-2020	----	----	----		05-Oct-2020	28 days	16 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 Rec Actual		Eval	Analysis Date	Holding Times Rec Actual		Eval
<b>Physical Tests : Conductivity in Water</b>										
HDPE Westbay-A-Port4-1	E100	19-Sep-2020	----	----	----		05-Oct-2020	28 days	16 days	✓
<b>Physical Tests : Conductivity in Water</b>										
HDPE Westbay-A-Port8-29%DUP-1	E100	20-Sep-2020	----	----	----		30-Oct-2020	28 days	39 days	* EHT
<b>Physical Tests : pH by Meter at 15C (WSER)</b>										
HDPE Equipment Blank-1	E108A	19-Sep-2020	----	----	----		30-Sep-2020	5 days	11 days	* EHTR
<b>Physical Tests : pH by Meter at 15C (WSER)</b>										
HDPE Westbay-A-Port4-1	E108A	19-Sep-2020	----	----	----		30-Sep-2020	5 days	11 days	* EHTR
<b>Physical Tests : pH by Meter at 15C (WSER)</b>										
HDPE Westbay-A-Port8-0.29	E108A	20-Sep-2020	----	----	----		30-Sep-2020	5 days	9 days	* EHTR
<b>Physical Tests : pH by Meter at 15C (WSER)</b>										
HDPE Westbay-A-Port8-29%DUP-1	E108A	20-Sep-2020	----	----	----		30-Sep-2020	5 days	9 days	* EHTR
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE Westbay-A-Port8-0.29	E162	20-Sep-2020	----	----	----		02-Oct-2020	7 days	11 days	* EHT
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE Equipment Blank-1	E162	19-Sep-2020	----	----	----		02-Oct-2020	7 days	13 days	* EHTR
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE Westbay-A-Port4-1	E162	19-Sep-2020	----	----	----		02-Oct-2020	7 days	13 days	* EHTR



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	
<b>Physical Tests : TDS by Gravimetry</b>										
<b>HDPE</b> Westbay-A-Port8-29%DUP-1	E162	20-Sep-2020	----	----	----		29-Oct-2020	7 days	38 days	* EHT
<b>Physical Tests : TSS by Gravimetry</b>										
<b>HDPE</b> Westbay-A-Port8-0.29	E160-H	20-Sep-2020	----	----	----		02-Oct-2020	7 days	12 days	* EHT
<b>Physical Tests : TSS by Gravimetry</b>										
<b>HDPE</b> Equipment Blank-1	E160-H	19-Sep-2020	----	----	----		02-Oct-2020	7 days	13 days	* EHTR
<b>Physical Tests : TSS by Gravimetry</b>										
<b>HDPE</b> Westbay-A-Port4-1	E160-H	19-Sep-2020	----	----	----		02-Oct-2020	7 days	13 days	* EHTR
<b>Physical Tests : Turbidity by Nephelometry</b>										
<b>HDPE</b> Westbay-A-Port8-0.29	E121	20-Sep-2020	----	----	----		04-Oct-2020	3 days	13 days	* EHTR
<b>Physical Tests : Turbidity by Nephelometry</b>										
<b>HDPE</b> Equipment Blank-1	E121	19-Sep-2020	----	----	----		04-Oct-2020	3 days	15 days	* EHTR
<b>Physical Tests : Turbidity by Nephelometry</b>										
<b>HDPE</b> Westbay-A-Port4-1	E121	19-Sep-2020	----	----	----		04-Oct-2020	3 days	15 days	* EHTR
<b>Radiological Parameters : Radium-226 by Radon Emanation</b>										
<b>HDPE total (nitric acid)</b> Westbay-A-Port8-0.29	RA226-MMER	20-Sep-2020	----	----	----		14-Oct-2020	180 days	23 days	✓
<b>Radiological Parameters : Radium-226 by Radon Emanation</b>										
<b>HDPE total (nitric acid)</b> Westbay-A-Port8-29%DUP-1	RA226-MMER	20-Sep-2020	----	----	----		14-Oct-2020	180 days	23 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		
<b>Radiological Parameters : Radium-226 by Radon Emanation</b>											
<b>HDPE total (nitric acid)</b> Equipment Blank-1	RA226-MMER	19-Sep-2020	----	----	----		14-Oct-2020	180 days	25 days	✓	
<b>Radiological Parameters : Radium-226 by Radon Emanation</b>											
<b>HDPE total (nitric acid)</b> Westbay-A-Port4-1	RA226-MMER	19-Sep-2020	----	----	----		15-Oct-2020	180 days	26 days	✓	
<b>Speciated Metals : Dissolved Ferrous Iron in Water by Colour</b>											
<b>Opaque HDPE Dissolved (hydrochloric acid)</b> Equipment Blank-1	E541	19-Sep-2020	29-Sep-2020	7 days	10 days	* EHTR	29-Sep-2020	-4 days	0 days	* EHTR-FM	
<b>Speciated Metals : Dissolved Ferrous Iron in Water by Colour</b>											
<b>Opaque HDPE Dissolved (hydrochloric acid)</b> Westbay-A-Port4-1	E541	19-Sep-2020	29-Sep-2020	7 days	10 days	* EHTR	29-Sep-2020	-4 days	0 days	* EHTR-FM	
<b>Speciated Metals : Dissolved Ferrous Iron in Water by Colour</b>											
<b>Opaque HDPE Dissolved (hydrochloric acid)</b> Westbay-A-Port8-0.29	E541	20-Sep-2020	29-Sep-2020	7 days	8 days	* EHT	29-Sep-2020	-2 days	0 days	*	
<b>Speciated Metals : Dissolved Ferrous Iron in Water by Colour</b>											
<b>Opaque HDPE Dissolved (hydrochloric acid)</b> Westbay-A-Port8-29%DUP-1	E541	20-Sep-2020	29-Sep-2020	7 days	8 days	* EHT	29-Sep-2020	-2 days	0 days	*	
<b>Stable Isotope : Stable Isotope Analysis in Water (Deuterium and Oxygen 18)</b>											
<b>Original packaging</b> Equipment Blank-1	H2+O18	19-Sep-2020	----	----	----		29-Oct-2020	----	----		
<b>Stable Isotope : Stable Isotope Analysis in Water (Deuterium and Oxygen 18)</b>											
<b>Original packaging</b> Westbay-A-225-DUP-1	H2+O18	17-Aug-2020	----	----	----		29-Oct-2020	----	----		
<b>Stable Isotope : Stable Isotope Analysis in Water (Deuterium and Oxygen 18)</b>											
<b>Original packaging</b> Westbay-A-360-DUP-1	H2+O18	21-Aug-2020	----	----	----		29-Oct-2020	----	----		



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		
<b>Stable Isotope : Stable Isotope Analysis in Water (Deuterium and Oxygen 18)</b>											
<b>Original packaging</b> Westbay-A-606BR-DUP-1	H2+O18	08-Sep-2020	----	----	----		29-Oct-2020	----	----		
<b>Stable Isotope : Stable Isotope Analysis in Water (Deuterium and Oxygen 18)</b>											
<b>Original packaging</b> Westbay-A-606-DUP-1	H2+O18	08-Sep-2020	----	----	----		29-Oct-2020	----	----		
<b>Stable Isotope : Stable Isotope Analysis in Water (Deuterium and Oxygen 18)</b>											
<b>Original packaging</b> Westbay-A-Port4-1	H2+O18	19-Sep-2020	----	----	----		29-Oct-2020	----	----		
<b>Stable Isotope : Stable Isotope Analysis in Water (Deuterium and Oxygen 18)</b>											
<b>Original packaging</b> Westbay-A-Port8-0.29	H2+O18	20-Sep-2020	----	----	----		29-Oct-2020	----	----		
<b>Stable Isotope : Stable Isotope Analysis in Water (Deuterium and Oxygen 18)</b>											
<b>Original packaging</b> Westbay-A-Port8-29%DUP-1	H2+O18	20-Sep-2020	----	----	----		29-Oct-2020	----	----		
<b>Total Metals : Total Mercury in Water by CVAAS</b>											
<b>Glass vial total (hydrochloric acid)</b> Westbay-A-Port8-0.29	E508	20-Sep-2020	----	----	----		05-Oct-2020	28 days	14 days	✔	
<b>Total Metals : Total Mercury in Water by CVAAS</b>											
<b>Glass vial total (hydrochloric acid)</b> Westbay-A-Port8-29%DUP-1	E508	20-Sep-2020	----	----	----		05-Oct-2020	28 days	14 days	✔	
<b>Total Metals : Total Mercury in Water by CVAAS</b>											
<b>Glass vial total (hydrochloric acid)</b> Westbay-A-Port4-1	E508	19-Sep-2020	----	----	----		05-Oct-2020	28 days	16 days	✔	
<b>Total Metals : Total Mercury in Water by CVAAS</b>											
<b>HDPE total (nitric acid)</b> Equipment Blank-1	E508	19-Sep-2020	----	----	----		07-Oct-2020	28 days	18 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	
<b>Total Metals : Total Metals in Water by CRC ICPMS</b>										
<b>HDPE total (nitric acid)</b> Westbay-A-Port8-0.29	E420	20-Sep-2020	----	----	----		03-Oct-2020	180 days	12 days	✔
<b>Total Metals : Total Metals in Water by CRC ICPMS</b>										
<b>HDPE total (nitric acid)</b> Westbay-A-Port8-29%DUP-1	E420	20-Sep-2020	----	----	----		03-Oct-2020	180 days	12 days	✔
<b>Total Metals : Total Metals in Water by CRC ICPMS</b>										
<b>HDPE total (nitric acid)</b> Equipment Blank-1	E420	19-Sep-2020	----	----	----		03-Oct-2020	180 days	14 days	✔
<b>Total Metals : Total Metals in Water by CRC ICPMS</b>										
<b>HDPE total (nitric acid)</b> Westbay-A-Port4-1	E420	19-Sep-2020	----	----	----		03-Oct-2020	180 days	14 days	✔
<b>Volatile Organic Compounds [BTEXS+MTBE] : BTEX by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay-A-Port8-0.29	E611A	20-Sep-2020	02-Oct-2020	14 days	11 days	✔	02-Oct-2020	2 days	0 days	✔
<b>Volatile Organic Compounds [BTEXS+MTBE] : BTEX by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay-A-Port8-29%DUP-1	E611A	20-Sep-2020	02-Oct-2020	14 days	11 days	✔	02-Oct-2020	2 days	0 days	✔
<b>Volatile Organic Compounds [BTEXS+MTBE] : BTEX by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Equipment Blank-1	E611A	19-Sep-2020	02-Oct-2020	14 days	13 days	✔	02-Oct-2020	0 days	0 days	✔
<b>Volatile Organic Compounds [BTEXS+MTBE] : BTEX by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay-A-Port4-1	E611A	19-Sep-2020	02-Oct-2020	14 days	13 days	✔	02-Oct-2020	0 days	0 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 (%)		Evaluation
			QC	Regular	Actual	Expected	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity Species by Titration	E290	96972	1	7	14.2	5.0	✔
Ammonia by Fluorescence	E298	97631	1	16	6.2	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	93386	1	16	6.2	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	93441	1	4	25.0	5.0	✔
BTEX by Headspace GC-MS	E611A	96227	1	18	5.5	5.0	✔
Chemical Oxygen Demand by Colourimetry	E559	97323	3	42	7.1	5.0	✔
Chloride in Water by IC	E235.Cl	93440	1	14	7.1	5.0	✔
Conductivity in Water	E100	96974	2	7	28.5	5.0	✔
Dissolved Ferrous Iron in Water by Colour	E541	94109	1	20	5.0	5.0	✔
Dissolved Mercury in Water by CVAAS	E509	97181	1	20	5.0	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	95658	2	20	10.0	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	97933	1	12	8.3	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	93437	1	14	7.1	5.0	✔
Fluoride in Water by IC	E235.F	93438	1	4	25.0	5.0	✔
Free Cyanide by CFA	E339	95331	2	16	12.5	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	93443	1	19	5.2	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	93442	1	14	7.1	5.0	✔
pH by Meter at 15C (WSER)	E108A	94726	1	14	7.1	5.0	✔
Reactive Silica by Colourimetry	E392	95429	1	17	5.8	5.0	✔
Sulfate in Water by IC	E235.SO4	93439	1	14	7.1	5.0	✔
TDS by Gravimetry	E162	96254	2	40	5.0	5.0	✔
Total Cyanide by CFA	E333	95329	2	33	6.0	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	97629	1	9	11.1	5.0	✔
Total Mercury in Water by CVAAS	E508	97351	2	31	6.4	5.0	✔
Total Metals in Water by CRC ICPMS	E420	93977	1	19	5.2	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	97628	1	9	11.1	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	97630	1	17	5.8	5.0	✔
TSS by Gravimetry	E160-H	96269	1	20	5.0	5.0	✔
Turbidity by Nephelometry	E121	96838	1	20	5.0	5.0	✔
VH and F1 by Headspace GC-FID	E581.VH+F1	96226	1	12	8.3	5.0	✔
WAD Cyanide by CFA	E336	95330	2	23	8.7	5.0	✔
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity Species by Titration	E290	96972	1	7	14.2	5.0	✔
Ammonia by Fluorescence	E298	97631	1	16	6.2	5.0	✔
Biochemical Oxygen Demand - 5 day	E550	93386	1	16	6.2	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	93441	1	4	25.0	5.0	✔
BTEX by Headspace GC-MS	E611A	96227	1	18	5.5	5.0	✔





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
<b>Analytical Methods</b>							
<b>Laboratory Control Samples (LCS) - Continued</b>							
CCME PHC - F2-F4 by GC-FID	E601	96087	1	5	20.0	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	97323	3	42	7.1	5.0	✓
Chloride in Water by IC	E235.Cl	93440	1	14	7.1	5.0	✓
Conductivity in Water	E100	96974	2	7	28.5	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	94109	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	97181	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	95658	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	97933	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	93437	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	93438	1	4	25.0	5.0	✓
Free Cyanide by CFA	E339	95331	2	16	12.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	93443	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	93442	1	14	7.1	5.0	✓
Oil & Grease by Gravimetry	E567	95113	1	12	8.3	5.0	✓
pH by Meter at 15C (WSER)	E108A	94726	1	14	7.1	5.0	✓
Reactive Silica by Colourimetry	E392	95429	1	17	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	93439	1	14	7.1	5.0	✓
TDS by Gravimetry	E162	96254	2	40	5.0	5.0	✓
Total Cyanide by CFA	E333	95329	2	33	6.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	97629	1	9	11.1	5.0	✓
Total Mercury in Water by CVAAS	E508	97351	2	31	6.4	5.0	✓
Total Metals in Water by CRC ICPMS	E420	93977	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	97628	1	9	11.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	97630	1	17	5.8	5.0	✓
TSS by Gravimetry	E160-H	96269	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	96838	1	20	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	96226	1	12	8.3	5.0	✓
WAD Cyanide by CFA	E336	95330	2	23	8.7	5.0	✓
<b>Method Blanks (MB)</b>							
Alkalinity Species by Titration	E290	96972	1	7	14.2	5.0	✓
Ammonia by Fluorescence	E298	97631	1	16	6.2	5.0	✓
Biochemical Oxygen Demand - 5 day	E550	93386	1	16	6.2	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	93441	1	4	25.0	5.0	✓
BTEX by Headspace GC-MS	E611A	96227	1	18	5.5	5.0	✓
CCME PHC - F2-F4 by GC-FID	E601	96087	1	5	20.0	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	97323	3	42	7.1	5.0	✓
Chloride in Water by IC	E235.Cl	93440	1	14	7.1	5.0	✓
Conductivity in Water	E100	96974	2	7	28.5	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	94109	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	97181	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	95658	1	20	5.0	5.0	✓



Matrix: **Water**

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	97933	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	93437	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	93438	1	4	25.0	5.0	✓
Free Cyanide by CFA	E339	95331	2	16	12.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	93443	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	93442	1	14	7.1	5.0	✓
Oil & Grease by Gravimetry	E567	95113	1	12	8.3	5.0	✓
Reactive Silica by Colourimetry	E392	95429	1	17	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	93439	1	14	7.1	5.0	✓
TDS by Gravimetry	E162	96254	2	40	5.0	5.0	✓
Total Cyanide by CFA	E333	95329	2	33	6.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	97629	1	9	11.1	5.0	✓
Total Mercury in Water by CVAAS	E508	97351	2	31	6.4	5.0	✓
Total Metals in Water by CRC ICPMS	E420	93977	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	97628	1	9	11.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	97630	1	17	5.8	5.0	✓
TSS by Gravimetry	E160-H	96269	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	96838	1	20	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	96226	1	12	8.3	5.0	✓
WAD Cyanide by CFA	E336	95330	2	23	8.7	5.0	✓
<b>Matrix Spikes (MS)</b>							
Ammonia by Fluorescence	E298	97631	1	16	6.2	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	93441	1	4	25.0	5.0	✓
BTEX by Headspace GC-MS	E611A	96227	1	18	5.5	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	97323	3	42	7.1	5.0	✓
Chloride in Water by IC	E235.Cl	93440	1	14	7.1	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	94109	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	97181	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	95658	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	97933	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	93437	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	93438	1	4	25.0	5.0	✓
Free Cyanide by CFA	E339	95331	2	16	12.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	93443	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	93442	1	14	7.1	5.0	✓
Reactive Silica by Colourimetry	E392	95429	1	17	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	93439	1	14	7.1	5.0	✓
Total Cyanide by CFA	E333	95329	2	33	6.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	97629	1	9	11.1	5.0	✓
Total Mercury in Water by CVAAS	E508	97351	2	31	6.4	5.0	✓
Total Metals in Water by CRC ICPMS	E420	93977	1	19	5.2	5.0	✓



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
<i>Analytical Methods</i>							
<b>Matrix Spikes (MS) - Continued</b>							
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	97628	1	9	11.1	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	97630	1	17	5.8	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	96226	1	12	8.3	5.0	✓
WAD Cyanide by CFA	E336	95330	2	23	8.7	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
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter at 15C (WSER)	E108A Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at 15 ± 1°C, and is used to calculate Un-ionized Ammonia for the federal Wastewater Systems Effluent Regulation.
Turbidity by Nephelometry	E121 Vancouver - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TSS by Gravimetry	E160-H Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Vancouver - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC (Low Level)	E235.Br-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Sulfate in Water by IC	E235.S04  Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290  Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298  Vancouver - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318  Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.
Total Cyanide by CFA	E333  Vancouver - Environmental	Water	ISO 14403 (mod)	Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.
WAD Cyanide by CFA	E336  Vancouver - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.
Free Cyanide by CFA	E339  Vancouver - Environmental	Water	ASTM D7237 (mod)	Free cyanide is determined by in-line gas diffusion at pH 6 with final determination by colourimetric analysis.
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L  Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L  Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U Vancouver - Environmental	Water	APHA 4500-P E (mod)	Dissolved Orthophosphate is determined colourimetrically on a water sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test.
Total Metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Dissolved Ferrous Iron in Water by Colour	E541 Vancouver - Environmental	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and Environ. Sci. Technol. 1999, 33, 5, 807-813. The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method. Holding time is 7 days for 0.45um filtration or 6 months if samples have been filtered using 0.1um filters.
Biochemical Oxygen Demand - 5 day	E550 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter.  Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry	E559 Vancouver - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Oil & Grease by Gravimetry	E567 Calgary - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane and the extract is evaporated to dryness. The residue is then weighed to determine Oil and Grease.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
VH and F1 by Headspace GC-FID	E581.VH+F1  Vancouver - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and 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.
CCME PHC - F2-F4 by GC-FID	E601  Vancouver - Environmental	Water	CCME PHC in Soil - Tier 1	CCME Fractions 2-4 (F2-F4) are analyzed by GC-FID.
BTEX by Headspace GC-MS	E611A  Vancouver - 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.
Dissolved Hardness (Calculated)	EC100  Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO <sub>3</sub> ), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO <sub>3</sub> equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Salinity in Seawater (calculation)	EC100S  Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a seawater sample. Conductivity measurements are temperature-compensated to 25°C. Salinity in Practical Salinity Units is calculated.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N  Vancouver - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Un-ionized Ammonia at 15°C, WSER	EC298  Vancouver - Environmental	Water	WSER 29June2012	Un-ionized Ammonia at 15C is calculated from test results for Total Ammonia and for pH at 15C, as per the federal Wastewater Systems Effluent Regulation, and is expressed in units of mg/L "as N".
F1-BTEX	EC580  Vancouver - 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).
Stable Isotope Analysis in Water (Deuterium and Oxygen 18)	H2+O18  Isobrine Solutions Inc. - 9330 60 Avenue NW Edmonton Alberta Canada T6E 0C1	Water	see attached	See attached report.
Radium-226 by Radon Emanation	RA226-MMER  Fort Collins - Environmental - 225 Commerce Drive Fort Collins Colorado United States 80524	Water	EPA 903.1	Radium-226 in sample was analyzed according to the current revision of SOP 783.



Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for TKN in water	EP318  Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Digestion for Total Phosphorus in water	EP372  Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421  Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509  Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
Dissolved Ferrous Iron in Water by Colour	EP541  Vancouver - Environmental	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and "A New Method for the Direct Determination of Dissolved Iron Concentration in Acid Mine Waters" published by James W. Ball et al (1999). The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method.
Oil & Grease Extraction for Gravimetry	EP567  Calgary - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane by liquid-liquid extraction.
VOCs Preparation for Headspace Analysis	EP581  Vancouver - 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  Vancouver - 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 : **VA20B6509**

Page : 1 of 23

Client : Golder Associates Ltd.  
 Contact : Adrian Kowalchuk  
 Address : # 400 - 543 Granville Street  
 Vancouver BC Canada V6C 1X8  
 Telephone : 204 489 9600  
 Project : 20136436-2300-2304  
 PO : ----  
 C-O-C number : 17-2020-19-21  
 Sampler : Adrian Kowalchuk  
 Site : Meliadine - Westbay A  
 Quote number : VA20-AEML100-001 (Q72802)  
 No. of samples received : 8  
 No. of samples analysed : 8

Laboratory : Vancouver - Environmental  
 Account Manager : Heather McKenzie  
 Address : 8081 Lougheed Highway  
 Burnaby, British Columbia Canada V5A 1W9  
 Telephone : +1 604 253 4188  
 Date Samples Received : 26-Sep-2020 10:50  
 Date Analysis Commenced : 28-Sep-2020  
 Issue Date : 04-Nov-2020 11:51

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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

### 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>
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Brianna Allen	Department Manager - Organics	Organics, Burnaby, British Columbia
Bruna Botti	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Gloria Chan	Lab Analyst	Metals, Burnaby, British Columbia
Jeanie Mark		Organics, Calgary, Alberta
Kaitlyn Gardner	Account Manager Assistant	External Subcontracting, Edmonton, Alberta
Kaitlyn Gardner	Account Manager Assistant	Internal Subcontracting, Fort Collins, Colorado
Kevin Duarte	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics - Water Quality, Burnaby, British Columbia
Monica Ko	Lab Assistant	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Shaneel Dayal	Analyst	Metals, Burnaby, British Columbia



Page : 3 of 23  
Work Order : VA20B6509  
Client : Golder Associates Ltd.  
Project : 20136436-2300-2304

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## 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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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



### 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
<b>Physical Tests (QC Lot: 110022)</b>											
KS2002300-001	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	486	504	3.74%	20%	----
<b>Physical Tests (QC Lot: 110736)</b>											
VA20B9214-001	Anonymous	conductivity	----	E100	2.0	µS/cm	1070	1060	0.375%	10%	----
<b>Physical Tests (QC Lot: 94726)</b>											
VA20B6282-001	Anonymous	pH @ 15°C (WSER)	----	E108A	0.10	pH units	7.35	7.34	0.136%	4%	----
<b>Physical Tests (QC Lot: 96254)</b>											
VA20B6509-005	Westbay-A-Port4-1	solids, total dissolved [TDS]	----	E162	400	mg/L	130000	132000	1.38%	20%	----
<b>Physical Tests (QC Lot: 96269)</b>											
VA20B6509-005	Westbay-A-Port4-1	solids, total suspended [TSS]	----	E160-H	3.0	mg/L	6.9	6.3	0.6	Diff <2x LOR	----
<b>Physical Tests (QC Lot: 96838)</b>											
KS2001997-001	Anonymous	turbidity	----	E121	0.10	NTU	2.41	2.37	1.68%	15%	----
<b>Physical Tests (QC Lot: 96972)</b>											
VA20B6509-005	Westbay-A-Port4-1	alkalinity, bicarbonate (as CaCO3)	----	E290	2.0	mg/L	674	712	5.44%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	2.0	mg/L	183	184	0.436%	20%	----
		alkalinity, hydroxide (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	2.0	mg/L	91.5	91.9	0.436%	20%	----
		alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	857	896	4.39%	20%	----
<b>Physical Tests (QC Lot: 96974)</b>											
VA20B6509-005	Westbay-A-Port4-1	conductivity	----	E100	2.0	µS/cm	81800	81300	0.613%	10%	----
<b>Anions and Nutrients (QC Lot: 93437)</b>											
VA20B6509-005	Westbay-A-Port4-1	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0118	0.0123	3.88%	20%	----
<b>Anions and Nutrients (QC Lot: 93438)</b>											
VA20B6509-005	Westbay-A-Port4-1	fluoride	16984-48-8	E235.F	2.00	mg/L	<2.00	<2.00	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 93439)</b>											
VA20B6509-005	Westbay-A-Port4-1	sulfate (as SO4)	14808-79-8	E235.SO4	30.0	mg/L	80.7	58.9	21.8	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 93440)</b>											
VA20B6509-005	Westbay-A-Port4-1	chloride	16887-00-6	E235.Cl	50.0	mg/L	77700	70400	9.85%	20%	----
<b>Anions and Nutrients (QC Lot: 93441)</b>											
VA20B6509-005	Westbay-A-Port4-1	bromide	24959-67-9	E235.Br-L	5.00	mg/L	298	276	7.69%	20%	----
<b>Anions and Nutrients (QC Lot: 93442)</b>											
VA20B6509-005	Westbay-A-Port4-1	nitrite (as N)	14797-65-0	E235.NO2-L	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----



Sub-Matrix: <b>Water</b>					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
<b>Anions and Nutrients (QC Lot: 93443)</b>											
VA20B6509-005	Westbay-A-Port4-1	nitrate (as N)	14797-55-8	E235.NO3-L	0.500	mg/L	5.20	4.84	7.12%	20%	----
<b>Anions and Nutrients (QC Lot: 95429)</b>											
VA20B6292-011	Anonymous	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	1.03	1.02	0.007	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 97629)</b>											
VA20B6509-005	Westbay-A-Port4-1	Kjeldahl nitrogen, total [TKN]	----	E318	1.00	mg/L	5.07	5.08	0.014	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 97630)</b>											
VA20B6509-005	Westbay-A-Port4-1	phosphorus, total	7723-14-0	E372-U	0.0100	mg/L	0.0338	0.0320	0.0019	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 97631)</b>											
VA20B6509-005	Westbay-A-Port4-1	ammonia, total (as N)	7664-41-7	E298	0.100	mg/L	1.84	1.85	0.368%	20%	----
<b>Cyanides (QC Lot: 95329)</b>											
VA20B6387-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 95330)</b>											
VA20B6509-005	Westbay-A-Port4-1	cyanide, weak acid dissociable	----	E336	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 95331)</b>											
VA20B6509-005	Westbay-A-Port4-1	cyanide, free	----	E339	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 95892)</b>											
VA20B6325-016	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	0.0729	0.0768	5.24%	20%	----
<b>Cyanides (QC Lot: 95893)</b>											
VA20B6325-016	Anonymous	cyanide, weak acid dissociable	----	E336	0.0050	mg/L	0.0077	0.0076	0.00008	Diff <2x LOR	----
<b>Cyanides (QC Lot: 95894)</b>											
VA20B6509-007	Westbay-A-Port8-0.29	cyanide, free	----	E339	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
<b>Organic / Inorganic Carbon (QC Lot: 97628)</b>											
VA20B6509-005	Westbay-A-Port4-1	carbon, total organic [TOC]	----	E355-L	100	mg/L	3040	2970	2.12%	20%	----
<b>Organic / Inorganic Carbon (QC Lot: 97933)</b>											
VA20B4192-005	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.45	2.26	0.19	Diff <2x LOR	----
<b>Total Metals (QC Lot: 93977)</b>											
VA20B6464-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.436	0.470	7.50%	20%	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.0160	0.0161	0.330%	20%	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0184	0.0191	3.93%	20%	----
		beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	0.374	0.383	2.43%	20%	----
		cadmium, total	7440-43-9	E420	0.0000800	mg/L	<0.0000800	<0.0000800	0	Diff <2x LOR	----



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
<b>Total Metals (QC Lot: 93977) - continued</b>											
VA20B6464-001	Anonymous	calcium, total	7440-70-2	E420	0.050	mg/L	19.8	20.2	1.77%	20%	---
		cesium, total	7440-46-2	E420	0.000010	mg/L	0.000050	0.000050	0.0000007	Diff <2x LOR	---
		chromium, total	7440-47-3	E420	0.000050	mg/L	0.00153	0.00163	0.00010	Diff <2x LOR	---
		cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00041	0.00042	0.000010	Diff <2x LOR	---
		copper, total	7440-50-8	E420	0.000050	mg/L	0.00656	0.00655	0.109%	20%	---
		iron, total	7439-89-6	E420	0.010	mg/L	0.344	0.352	2.37%	20%	---
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000135	0.000140	0.000005	Diff <2x LOR	---
		lithium, total	7439-93-2	E420	0.0010	mg/L	0.0079	0.0079	0.00002	Diff <2x LOR	---
		magnesium, total	7439-95-4	E420	0.0050	mg/L	10.2	10.4	2.95%	20%	---
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.0642	0.0655	2.09%	20%	---
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.308	0.305	0.840%	20%	---
		nickel, total	7440-02-0	E420	0.000050	mg/L	0.00143	0.00151	0.00008	Diff <2x LOR	---
		phosphorus, total	7723-14-0	E420	0.050	mg/L	0.099	0.083	0.016	Diff <2x LOR	---
		potassium, total	7440-09-7	E420	0.050	mg/L	16.5	16.4	0.522%	20%	---
		rubidium, total	7440-17-7	E420	0.000020	mg/L	0.00750	0.00746	0.421%	20%	---
		selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	0.000057	0.000007	Diff <2x LOR	---
		silicon, total	7440-21-3	E420	0.10	mg/L	6.18	6.42	3.81%	20%	---
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	---
		sodium, total	17341-25-2	E420	0.050	mg/L	488	486	0.334%	20%	---
		strontium, total	7440-24-6	E420	0.000020	mg/L	1.00	1.03	2.26%	20%	---
		sulfur, total	7704-34-9	E420	0.50	mg/L	303	304	0.102%	20%	---
		tellurium, total	13494-80-9	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	---
		thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	---
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	---
		tin, total	7440-31-5	E420	0.00010	mg/L	0.00011	0.00012	0.00001	Diff <2x LOR	---
		titanium, total	7440-32-6	E420	0.00030	mg/L	0.0231	0.0248	7.30%	20%	---
		tungsten, total	7440-33-7	E420	0.00010	mg/L	0.00115	0.00117	2.13%	20%	---
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000647	0.000639	1.19%	20%	---
		vanadium, total	7440-62-2	E420	0.000050	mg/L	0.00237	0.00246	0.00009	Diff <2x LOR	---
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	---
		zirconium, total	7440-67-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	---
<b>Total Metals (QC Lot: 97351)</b>											
VA20B6509-005	Westbay-A-Port4-1	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	---
<b>Total Metals (QC Lot: 98407)</b>											
VA20B6509-006	Equipment Blank-1	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	---



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
<b>Dissolved Metals (QC Lot: 95658)</b>											
VA20B6649-001	Anonymous	zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0030	0.0021	0.0009	Diff <2x LOR	----
VA20B6649-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.169	0.163	3.44%	20%	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00322	0.00304	5.84%	20%	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0111	0.0109	1.65%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	5.39	5.46	1.40%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00150	0.00146	2.48%	20%	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00062	0.00029	0.00032	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	5.80	5.74	1.06%	20%	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000059	<0.000050	0.000009	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	1.51	1.48	1.85%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.436	0.430	1.38%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000213	0.000220	0.000006	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.457	0.462	0.005	Diff <2x LOR	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00068	0.00072	0.00004	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	5.79	5.66	2.22%	20%	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	0.050	mg/L	6.67	6.57	1.61%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0388	0.0384	0.939%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000015	0.000017	0.000002	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00030	mg/L	0.00427	0.00409	4.40%	20%	----
		tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----



Sub-Matrix: <b>Water</b>					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
<b>Dissolved Metals (QC Lot: 95658) - continued</b>											
VA20B6649-001	Anonymous	uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000059	0.000062	0.000003	Diff <2x LOR	----
		vanadium, dissolved	7440-62-2	E421	0.000050	mg/L	0.00330	0.00307	0.00023	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.000030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 97181)</b>											
VA20B6509-005	Westbay-A-Port4-1	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
<b>Speciated Metals (QC Lot: 94109)</b>											
VA20B6478-001	Anonymous	iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
<b>Aggregate Organics (QC Lot: 93386)</b>											
KS2001930-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	6.5	7.0	7.70%	30%	----
<b>Aggregate Organics (QC Lot: 97323)</b>											
VA20B6509-006	Equipment Blank-1	chemical oxygen demand [COD]	----	E559	20	mg/L	<20	<20	0	Diff <2x LOR	----
<b>Aggregate Organics (QC Lot: 97398)</b>											
VA20B6857-002	Anonymous	chemical oxygen demand [COD]	----	E559	20	mg/L	<20	<20	0	Diff <2x LOR	----
<b>Aggregate Organics (QC Lot: 97766)</b>											
VA20B6509-007	Westbay-A-Port8-0.29	chemical oxygen demand [COD]	----	E559	20	mg/L	2180	2100	3.72%	20%	----
<b>Volatile Organic Compounds (QC Lot: 96227)</b>											
VA20B6509-005	Westbay-A-Port4-1	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	0.67	0.53	0.14	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.50	µg/L	0.71	0.53	0.18	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
<b>Hydrocarbons (QC Lot: 96226)</b>											
VA20B6509-005	Westbay-A-Port4-1	F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.00%	30%	----





## 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
<b>Physical Tests (QCLot: 110022)</b>						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
<b>Physical Tests (QCLot: 110736)</b>						
conductivity	----	E100	1	µS/cm	<1.0	----
<b>Physical Tests (QCLot: 96254)</b>						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
<b>Physical Tests (QCLot: 96269)</b>						
solids, total suspended [TSS]	----	E160-H	3	mg/L	<3.0	----
<b>Physical Tests (QCLot: 96838)</b>						
turbidity	----	E121	0.1	NTU	<0.10	----
<b>Physical Tests (QCLot: 96972)</b>						
alkalinity, bicarbonate (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, carbonate (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, hydroxide (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, phenolphthalein (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, total (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
<b>Physical Tests (QCLot: 96974)</b>						
conductivity	----	E100	1	µS/cm	<1.0	----
<b>Anions and Nutrients (QCLot: 93437)</b>						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
<b>Anions and Nutrients (QCLot: 93438)</b>						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
<b>Anions and Nutrients (QCLot: 93439)</b>						
sulfate (as SO <sub>4</sub> )	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
<b>Anions and Nutrients (QCLot: 93440)</b>						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
<b>Anions and Nutrients (QCLot: 93441)</b>						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
<b>Anions and Nutrients (QCLot: 93442)</b>						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
<b>Anions and Nutrients (QCLot: 93443)</b>						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
<b>Anions and Nutrients (QCLot: 95429)</b>						
silicate (as SiO <sub>2</sub> )	7631-86-9	E392	0.5	mg/L	<0.50	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Anions and Nutrients (QCLot: 97629)</b>						
Kjeldahl nitrogen, total [TKN]	---	E318	0.05	mg/L	<0.050	---
<b>Anions and Nutrients (QCLot: 97630)</b>						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	---
<b>Anions and Nutrients (QCLot: 97631)</b>						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
<b>Cyanides (QCLot: 95329)</b>						
cyanide, strong acid dissociable (total)	---	E333	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 95330)</b>						
cyanide, weak acid dissociable	---	E336	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 95331)</b>						
cyanide, free	---	E339	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 95892)</b>						
cyanide, strong acid dissociable (total)	---	E333	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 95893)</b>						
cyanide, weak acid dissociable	---	E336	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 95894)</b>						
cyanide, free	---	E339	0.002	mg/L	<0.0020	---
<b>Organic / Inorganic Carbon (QCLot: 97628)</b>						
carbon, total organic [TOC]	---	E355-L	0.5	mg/L	<0.50	---
<b>Organic / Inorganic Carbon (QCLot: 97933)</b>						
carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
<b>Total Metals (QCLot: 93977)</b>						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	---
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	---
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	---
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	---
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	---
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	---
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	---
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	---
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	---
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Total Metals (QCLot: 93977) - continued</b>						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	---
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	---
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	---
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	---
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	---
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	---
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	---
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	---
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	---
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	---
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	---
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	---
sodium, total	17341-25-2	E420	0.05	mg/L	<0.050	---
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	---
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	---
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	---
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	---
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	---
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	---
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	---
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	---
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	---
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	---
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	---
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	---
<b>Total Metals (QCLot: 97351)</b>						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	---
<b>Total Metals (QCLot: 98407)</b>						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	---
<b>Dissolved Metals (QCLot: 95658)</b>						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Dissolved Metals (QCLot: 95658) - continued</b>						
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	---
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	---
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	---
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	---
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	---
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	---
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	---
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	---
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	---
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	---
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	---
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	---
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	---
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	---
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	---
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	---
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	---
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	---
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	---
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	---
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	---
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	---
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	---
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	---
<b>Dissolved Metals (QCLot: 97181)</b>						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	---
<b>Speciated Metals (QCLot: 94109)</b>						



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Speciated Metals (QCLot: 94109) - continued</b>						
iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	<0.020	----
<b>Aggregate Organics (QCLot: 93386)</b>						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
<b>Aggregate Organics (QCLot: 95113)</b>						
oil & grease (gravimetric)	----	E567	5	mg/L	<5.0	----
<b>Aggregate Organics (QCLot: 97323)</b>						
chemical oxygen demand [COD]	----	E559	20	mg/L	<20	----
<b>Aggregate Organics (QCLot: 97398)</b>						
chemical oxygen demand [COD]	----	E559	20	mg/L	<20	----
<b>Aggregate Organics (QCLot: 97766)</b>						
chemical oxygen demand [COD]	----	E559	20	mg/L	<20	----
<b>Volatile Organic Compounds (QCLot: 96227)</b>						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.5	µg/L	<0.50	----
xylene, o-	95-47-6	E611A	0.5	µg/L	<0.50	----
<b>Hydrocarbons (QCLot: 96087)</b>						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
F3 (C16-C34)	----	E601	250	µg/L	<250	----
F4 (C34-C50)	----	E601	250	µg/L	<250	----
<b>Hydrocarbons (QCLot: 96226)</b>						
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----



## 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	
<b>Physical Tests (QCLot: 110022)</b>									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	100	85.0	115	----
<b>Physical Tests (QCLot: 110736)</b>									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	101	90.0	110	----
<b>Physical Tests (QCLot: 94726)</b>									
pH @ 15°C (WSER)	----	E108A	----	pH units	7 pH units	101	98.0	102	----
<b>Physical Tests (QCLot: 96254)</b>									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	102	85.0	115	----
<b>Physical Tests (QCLot: 96269)</b>									
solids, total suspended [TSS]	----	E160-H	3	mg/L	150 mg/L	102	85.0	115	----
<b>Physical Tests (QCLot: 96838)</b>									
turbidity	----	E121	0.1	NTU	200 NTU	100	85.0	115	----
<b>Physical Tests (QCLot: 96972)</b>									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	108	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	99.0	85.0	115	----
<b>Physical Tests (QCLot: 96974)</b>									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	97.5	90.0	110	----
<b>Anions and Nutrients (QCLot: 93437)</b>									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	101	80.0	120	----
<b>Anions and Nutrients (QCLot: 93438)</b>									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	97.9	90.0	110	----
<b>Anions and Nutrients (QCLot: 93439)</b>									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
<b>Anions and Nutrients (QCLot: 93440)</b>									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	98.5	90.0	110	----
<b>Anions and Nutrients (QCLot: 93441)</b>									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	102	85.0	115	----
<b>Anions and Nutrients (QCLot: 93442)</b>									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	97.3	90.0	110	----
<b>Anions and Nutrients (QCLot: 93443)</b>									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	99.4	90.0	110	----
<b>Anions and Nutrients (QCLot: 95429)</b>									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	103	85.0	115	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
<b>Anions and Nutrients (QCLot: 97629)</b>									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	102	75.0	125	----
<b>Anions and Nutrients (QCLot: 97630)</b>									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	96.9	80.0	120	----
<b>Anions and Nutrients (QCLot: 97631)</b>									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.12 mg/L	97.3	85.0	115	----
<b>Cyanides (QCLot: 95329)</b>									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	92.4	80.0	120	----
<b>Cyanides (QCLot: 95330)</b>									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	97.5	80.0	120	----
<b>Cyanides (QCLot: 95331)</b>									
cyanide, free	----	E339	0.002	mg/L	0.125 mg/L	92.3	80.0	120	----
<b>Cyanides (QCLot: 95892)</b>									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	91.6	80.0	120	----
<b>Cyanides (QCLot: 95893)</b>									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	98.9	80.0	120	----
<b>Cyanides (QCLot: 95894)</b>									
cyanide, free	----	E339	0.002	mg/L	0.125 mg/L	94.3	80.0	120	----
<b>Organic / Inorganic Carbon (QCLot: 97628)</b>									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	98.5	80.0	120	----
<b>Organic / Inorganic Carbon (QCLot: 97933)</b>									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	99.0	80.0	120	----
<b>Total Metals (QCLot: 93977)</b>									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	107	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	109	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	102	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	107	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	113	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	111	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	113	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	108	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	99.5	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	107	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	106	80.0	120	----



Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Total Metals (QCLot: 93977) - continued</b>									
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	105	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	103	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	107	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	104	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	104	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	108	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	106	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	111	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	108	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	108	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	112	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	112	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	98.7	80.0	120	----
sodium, total	17341-25-2	E420	0.05	mg/L	50 mg/L	111	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	106	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	90.7	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	114	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	109	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	103	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	103	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	107	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	110	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	108	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	108	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	103	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	98.3	80.0	120	----
<b>Total Metals (QCLot: 97351)</b>									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	98.5	80.0	120	----
<b>Total Metals (QCLot: 98407)</b>									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	99.7	80.0	120	----
<b>Dissolved Metals (QCLot: 94109)</b>									
<b>Dissolved Metals (QCLot: 95658)</b>									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	104	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	105	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	103	80.0	120	----





Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Dissolved Metals (QCLot: 95658) - continued</b>									
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	100	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	97.6	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	86.1	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	104	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	107	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	108	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	104	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	100	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	98.9	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	97.0	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	102	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	109	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	107	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	97.0	70.0	130	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	108	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	100	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	101	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	108	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	106	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	112	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	91.8	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	110	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	96.2	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	91.3	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	102	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	101	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	99.6	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	91.2	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	107	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	104	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	103	80.0	120	----

**Dissolved Metals (QCLot: 97181)**



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Dissolved Metals (QCLot: 97181) - continued</b>									
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	97.7	80.0	120	----
<b>Speciated Metals (QCLot: 94109)</b>									
iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	0.5 mg/L	103	80.0	120	----
<b>Aggregate Organics (QCLot: 93386)</b>									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	86.7	85.0	115	----
<b>Aggregate Organics (QCLot: 95113)</b>									
oil & grease (gravimetric)	----	E567	5	mg/L	100 mg/L	81.0	70.0	130	----
<b>Aggregate Organics (QCLot: 97323)</b>									
chemical oxygen demand [COD]	----	E559	20	mg/L	750 mg/L	99.1	85.0	115	----
<b>Aggregate Organics (QCLot: 97398)</b>									
chemical oxygen demand [COD]	----	E559	20	mg/L	750 mg/L	98.5	85.0	115	----
<b>Aggregate Organics (QCLot: 97766)</b>									
chemical oxygen demand [COD]	----	E559	20	mg/L	750 mg/L	99.0	85.0	115	----
<b>Volatile Organic Compounds (QCLot: 96227)</b>									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	84.8	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	76.9	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	86.7	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	74.0	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	81.4	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.5	µg/L	200 µg/L	82.7	70.0	130	----
xylene, o-	95-47-6	E611A	0.5	µg/L	100 µg/L	77.6	70.0	130	----
<b>Hydrocarbons (QCLot: 96087)</b>									
F2 (C10-C16)	----	E601	100	µg/L	3538 µg/L	115	70.0	130	----
F3 (C16-C34)	----	E601	250	µg/L	7053 µg/L	109	70.0	130	----
F4 (C34-C50)	----	E601	250	µg/L	5051 µg/L	108	70.0	130	----
<b>Hydrocarbons (QCLot: 96226)</b>									
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	82.9	70.0	130	----



## 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
<b>Anions and Nutrients (QCLot: 93437)</b>										
VA20B6509-006	Equipment Blank-1	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0316 mg/L	0.03 mg/L	105	70.0	130	----
<b>Anions and Nutrients (QCLot: 93438)</b>										
VA20B6509-006	Equipment Blank-1	fluoride	16984-48-8	E235.F	1.00 mg/L	1 mg/L	100	75.0	125	----
<b>Anions and Nutrients (QCLot: 93439)</b>										
VA20B6509-006	Equipment Blank-1	sulfate (as SO4)	14808-79-8	E235.SO4	103 mg/L	100 mg/L	103	75.0	125	----
<b>Anions and Nutrients (QCLot: 93440)</b>										
VA20B6509-006	Equipment Blank-1	chloride	16887-00-6	E235.Cl	100 mg/L	100 mg/L	100	75.0	125	----
<b>Anions and Nutrients (QCLot: 93441)</b>										
VA20B6509-006	Equipment Blank-1	bromide	24959-67-9	E235.Br-L	0.515 mg/L	0.5 mg/L	103	75.0	125	----
<b>Anions and Nutrients (QCLot: 93442)</b>										
VA20B6509-006	Equipment Blank-1	nitrite (as N)	14797-65-0	E235.NO2-L	0.497 mg/L	0.5 mg/L	99.4	75.0	125	----
<b>Anions and Nutrients (QCLot: 93443)</b>										
VA20B6509-006	Equipment Blank-1	nitrate (as N)	14797-55-8	E235.NO3-L	2.52 mg/L	2.5 mg/L	101	75.0	125	----
<b>Anions and Nutrients (QCLot: 95429)</b>										
VA20B6292-012	Anonymous	silicate (as SiO2)	7631-86-9	E392	9.86 mg/L	10 mg/L	98.6	75.0	125	----
<b>Anions and Nutrients (QCLot: 97629)</b>										
VA20B6509-006	Equipment Blank-1	Kjeldahl nitrogen, total [TKN]	----	E318	2.59 mg/L	2.5 mg/L	104	70.0	130	----
<b>Anions and Nutrients (QCLot: 97630)</b>										
VA20B6509-006	Equipment Blank-1	phosphorus, total	7723-14-0	E372-U	0.0437 mg/L	0.05 mg/L	87.4	70.0	130	----
<b>Anions and Nutrients (QCLot: 97631)</b>										
VA20B6509-006	Equipment Blank-1	ammonia, total (as N)	7664-41-7	E298	0.207 mg/L	0.2 mg/L	104	75.0	125	----
<b>Cyanides (QCLot: 95329)</b>										
VA20B6387-002	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.238 mg/L	0.25 mg/L	95.3	75.0	125	----
<b>Cyanides (QCLot: 95330)</b>										
VA20B6509-006	Equipment Blank-1	cyanide, weak acid dissociable	----	E336	0.130 mg/L	0.125 mg/L	104	75.0	125	----
<b>Cyanides (QCLot: 95331)</b>										
VA20B6509-006	Equipment Blank-1	cyanide, free	----	E339	0.123 mg/L	0.125 mg/L	98.7	75.0	125	----



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
<b>Cyanides (QCLot: 95892)</b>										
VA20B6509-007	Westbay-A-Port8-0.29	cyanide, strong acid dissociable (total)	----	E333	2.16 mg/L	2.5 mg/L	86.6	75.0	125	----
<b>Cyanides (QCLot: 95893)</b>										
VA20B6509-007	Westbay-A-Port8-0.29	cyanide, weak acid dissociable	----	E336	1.39 mg/L	1.25 mg/L	111	75.0	125	----
<b>Cyanides (QCLot: 95894)</b>										
VA20B6509-008	Westbay-A-Port8-29%DUP-1	cyanide, free	----	E339	1.32 mg/L	1.25 mg/L	105	75.0	125	----
<b>Organic / Inorganic Carbon (QCLot: 97628)</b>										
VA20B6509-006	Equipment Blank-1	carbon, total organic [TOC]	----	E355-L	4.66 mg/L	5 mg/L	93.2	70.0	130	----
<b>Organic / Inorganic Carbon (QCLot: 97933)</b>										
VA20B6387-013	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	4.80 mg/L	5 mg/L	96.1	70.0	130	----
<b>Total Metals (QCLot: 93977)</b>										
VA20B6464-002	Anonymous	aluminum, total	7429-90-5	E420	0.188 mg/L	0.2 mg/L	93.8	70.0	130	----
		antimony, total	7440-36-0	E420	0.0198 mg/L	0.02 mg/L	99.2	70.0	130	----
		arsenic, total	7440-38-2	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		barium, total	7440-39-3	E420	0.0188 mg/L	0.02 mg/L	94.2	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00950 mg/L	0.01 mg/L	95.0	70.0	130	----
		boron, total	7440-42-8	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00417 mg/L	0.004 mg/L	104	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.00914 mg/L	0.01 mg/L	91.4	70.0	130	----
		chromium, total	7440-47-3	E420	0.0411 mg/L	0.04 mg/L	103	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0195 mg/L	0.02 mg/L	97.7	70.0	130	----
		copper, total	7440-50-8	E420	0.0186 mg/L	0.02 mg/L	93.0	70.0	130	----
		iron, total	7439-89-6	E420	1.97 mg/L	2 mg/L	98.6	70.0	130	----
		lead, total	7439-92-1	E420	0.0195 mg/L	0.02 mg/L	97.4	70.0	130	----
		lithium, total	7439-93-2	E420	0.0952 mg/L	0.1 mg/L	95.2	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		nickel, total	7440-02-0	E420	0.0397 mg/L	0.04 mg/L	99.3	70.0	130	----
		phosphorus, total	7723-14-0	E420	9.92 mg/L	10 mg/L	99.2	70.0	130	----
		potassium, total	7440-09-7	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		selenium, total	7782-49-2	E420	0.0438 mg/L	0.04 mg/L	110	70.0	130	----



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
<b>Total Metals (QCLot: 93977) - continued</b>										
VA20B6464-002	Anonymous	silicon, total	7440-21-3	E420	9.57 mg/L	10 mg/L	95.7	70.0	130	----
		silver, total	7440-22-4	E420	0.00356 mg/L	0.004 mg/L	89.0	70.0	130	----
		sodium, total	17341-25-2	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0403 mg/L	0.04 mg/L	101	70.0	130	----
		thallium, total	7440-28-0	E420	0.00376 mg/L	0.004 mg/L	93.9	70.0	130	----
		thorium, total	7440-29-1	E420	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		tin, total	7440-31-5	E420	0.0188 mg/L	0.02 mg/L	94.2	70.0	130	----
		titanium, total	7440-32-6	E420	0.0412 mg/L	0.04 mg/L	103	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		uranium, total	7440-61-1	E420	0.00390 mg/L	0.004 mg/L	97.6	70.0	130	----
		vanadium, total	7440-62-2	E420	0.105 mg/L	0.1 mg/L	105	70.0	130	----
		zinc, total	7440-66-6	E420	0.390 mg/L	0.4 mg/L	97.6	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0385 mg/L	0.04 mg/L	96.3	70.0	130	----
<b>Total Metals (QCLot: 97351)</b>										
VA20B6509-007	Westbay-A-Port8-0.29	mercury, total	7439-97-6	E508	0.0000769 mg/L	0.0001 mg/L	76.9	70.0	130	----
<b>Total Metals (QCLot: 98407)</b>										
VA20B6832-001	Anonymous	mercury, total	7439-97-6	E508	0.0000991 mg/L	0.0001 mg/L	99.1	70.0	130	----
<b>Dissolved Metals (QCLot: 95658)</b>										
VA20B6649-002	Anonymous	aluminum, dissolved	7429-90-5	E421	ND mg/L	0.2 mg/L	ND	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0203 mg/L	0.02 mg/L	101	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.0196 mg/L	0.02 mg/L	97.8	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0404 mg/L	0.04 mg/L	101	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00936 mg/L	0.01 mg/L	93.6	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.088 mg/L	0.1 mg/L	87.6	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00427 mg/L	0.004 mg/L	107	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0102 mg/L	0.01 mg/L	102	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0426 mg/L	0.04 mg/L	106	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0203 mg/L	0.02 mg/L	102	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.95 mg/L	2 mg/L	97.4	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0189 mg/L	0.02 mg/L	94.7	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.100 mg/L	0.1 mg/L	100	70.0	130	----



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
<b>Dissolved Metals (QCLot: 95658) - continued</b>										
VA20B6649-002	Anonymous	magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	10.4 mg/L	10 mg/L	104	70.0	130	----
		potassium, dissolved	7440-09-7	E421	3.98 mg/L	4 mg/L	99.6	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0409 mg/L	0.04 mg/L	102	70.0	130	----
		silicon, dissolved	7440-21-3	E421	9.46 mg/L	10 mg/L	94.6	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00307 mg/L	0.004 mg/L	76.7	70.0	130	----
		sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0411 mg/L	0.04 mg/L	103	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00378 mg/L	0.004 mg/L	94.5	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0191 mg/L	0.02 mg/L	95.4	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0401 mg/L	0.04 mg/L	100	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0192 mg/L	0.02 mg/L	96.1	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00366 mg/L	0.004 mg/L	91.6	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.106 mg/L	0.1 mg/L	106	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.424 mg/L	0.4 mg/L	106	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0382 mg/L	0.04 mg/L	95.6	70.0	130	----
<b>Dissolved Metals (QCLot: 97181)</b>										
VA20B6509-006	Equipment Blank-1	mercury, dissolved	7439-97-6	E509	0.0000983 mg/L	0.0001 mg/L	98.3	70.0	130	----
<b>Speciated Metals (QCLot: 94109)</b>										
VA20B6478-002	Anonymous	iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.510 mg/L	0.5 mg/L	102	70.0	130	----
<b>Aggregate Organics (QCLot: 97323)</b>										
VA20B6689-001	Anonymous	chemical oxygen demand [COD]	----	E559	487 mg/L	500 mg/L	97.4	75.0	125	----
<b>Aggregate Organics (QCLot: 97398)</b>										
VA20B6857-001	Anonymous	chemical oxygen demand [COD]	----	E559	448 mg/L	500 mg/L	89.6	75.0	125	----
<b>Aggregate Organics (QCLot: 97766)</b>										
VA20B6509-008	Westbay-A-Port8-29%DUP-1	chemical oxygen demand [COD]	----	E559	ND mg/L	500 mg/L	ND	75.0	125	----
<b>Volatile Organic Compounds (QCLot: 96227)</b>										
VA20B6509-007	Westbay-A-Port8-0.29	benzene	71-43-2	E611A	85.3 µg/L	100 µg/L	85.3	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>
<b>Volatile Organic Compounds (QCLot: 96227) - continued</b>										
VA20B6509-007	Westbay-A-Port8-0.29	ethylbenzene	100-41-4	E611A	81.2 µg/L	100 µg/L	81.2	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	87.5 µg/L	100 µg/L	87.5	60.0	140	----
		styrene	100-42-5	E611A	78.1 µg/L	100 µg/L	78.1	60.0	140	----
		toluene	108-88-3	E611A	82.9 µg/L	100 µg/L	82.9	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	175 µg/L	200 µg/L	87.4	60.0	140	----
		xylene, o-	95-47-6	E611A	81.6 µg/L	100 µg/L	81.6	60.0	140	----
<b>Hydrocarbons (QCLot: 96226)</b>										
VA20B6509-006	Equipment Blank-1	F1 (C6-C10)	----	E581.VH+F1	5430 µg/L	6310 µg/L	86.1	60.0	140	----



Thursday, October 15, 2020

Heather McKenzie  
ALS Environmental  
8081 Lougheed Hwy, Suite 100  
Burnaby, BC V5A 1W9

Re: ALS Workorder: 2009615  
Project Name:  
Project Number: VA20B6509

Dear Ms. McKenzie:

Four water samples were received from ALS Environmental, on 9/29/2020. The samples were scheduled for the following analysis:

Radium-226

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental  
Katie M. O'Brien  
Project Manager



ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280



**2009615**

**Radium-226:**

The samples were prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

# ALS -- Fort Collins

## Sample Number(s) Cross-Reference Table

---

**OrderNum:** 2009615

**Client Name:** ALS Environmental

**Client Project Name:**

**Client Project Number:** VA20B6509

**Client PO Number:** VA20B6509

---

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
VA20B6509-005	2009615-1		WATER	19-Sep-20	1:00
VA20B6509-006	2009615-2		WATER	19-Sep-20	3:00
VA20B6509-007	2009615-3		WATER	20-Sep-20	19:00
VA20B6509-008	2009615-4		WATER	20-Sep-20	19:00



CHAIN OF CUSTODY

Destination Lab: **USA - Fort Collins**

Address: 225 Commerce Drive Fort Collins CO  
 United States 80524

Client: Agnico-Eagle Mines Limited

Work Order Number: **VA20B6509**

Original Receipt Date/Time: 26/09/2020 11:50  
 Instructions Received

# 2009615 #

Relinquished By

Date/Time

---

Received By  
*el* EMILY LYONS  
 Date/Time  
 SEP 29 2020  
 Receipt Temp

Return as Indicated: Results: Invoice: Electronic Data:

Attention: Heather McKenzie

ALS Sample ID	Client ID	Matrix	Container Type	Test Codes	Method Description	Due Date	Sampling Date and Time	Remarks
1 VA20B6509-005	Westbay-A-Port4-1	Water	HDPE total (nitric acid)	RA226-MMER	Radium-226 by Radon Emanation	05-10-2020	19/09/2020 01:00	
2 VA20B6509-006	Equipment Blank-1	Water	HDPE total (nitric acid)	RA226-MMER	Radium-226 by Radon Emanation	05-10-2020	19/09/2020 03:00	
3 VA20B6509-007	Westbay-A-Port8-0.29	Water	HDPE total (nitric acid)	RA226-MMER	Radium-226 by Radon Emanation	05-10-2020	20/09/2020 19:00	
4 VA20B6509-008	Westbay-A-Port8-29%DUP-1	Water	HDPE total (nitric acid)	RA226-MMER	Radium-226 by Radon Emanation	05-10-2020	20/09/2020 19:00	

Account Manager: *Heather*  
 ALSEV.DataSublet@ALSGlobal.com (PDF / EXCEL/ B2B)  
 ALS Vancouver Phone Number: 604-253-4188  
*McKenzie*



**ALS Environmental - Fort Collins**  
**CONDITION OF SAMPLE UPON RECEIPT FORM**

Client Name/ID:

ALS\_Burnaby

Workorder No:

2009615

Project Manager:

KMO

Initials:

ERL

Date:

09.30.20

1. Are airbills / shipping documents present and/or removable?	<input type="checkbox"/> Drop Off	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
2. Are custody seals on <b>shipping</b> containers intact?	<input checked="" type="checkbox"/> NONE	<input type="checkbox"/> YES	<input type="checkbox"/> NO*
3. Are custody seals on <b>sample</b> containers intact?	<input checked="" type="checkbox"/> NONE	<input type="checkbox"/> YES	<input type="checkbox"/> NO*
4. Is there a COC (chain-of-custody) present?		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
6. Are short-hold samples present?		<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
7. Are all samples within holding times for the requested analyses?		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
8. Were all sample containers received intact? (not broken or leaking)		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
9. Is there sufficient sample for the requested analyses?		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
10. Are samples in proper containers for requested analyses? (form 250, Sample Handling Guidelines)		<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
11. Are all aqueous samples preserved correctly, if required?	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO*
12. Were unpreserved samples pH checked, if required?	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> YES	<input type="checkbox"/> NO
13. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm in diameter?	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> YES	<input type="checkbox"/> NO
14. Were the samples shipped on ice?		<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
15. Were cooler temperatures measured at 0.1 - 6.0°C?	IR gun used: <input type="checkbox"/> #3 <input type="checkbox"/> #5	<input checked="" type="checkbox"/> Rad Only	<input type="checkbox"/> YES <input type="checkbox"/> NO

Cooler #: 1

Temperature (°C): Amb

# of custody seals on cooler: 0

External mR/hr reading: 9

Background mR/hr reading: 9

Were external mR/hr readings ≤ two times background and within DOT acceptance criteria? (If no, see Form 008)

N/A  YES  NO

\* Please provide details below for 'NO' responses in gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

All client bottle ID's vs ALS lab ID's double-checked by: ERL

If applicable, was the client contacted?  YES  NA

Contact Name:

Date:

Project Manager Signature / Date:

*[Signature]* 9/30/2020

**EXPRESS WORLDWIDE WPX** 

2020-09-28 MYDHL+ 1.0 / \*30-0821\*

From : ALS Environmental  
Paul Chandra  
100 - 8081 Lougheed Highway

Origin:

9-8 YVR  
AMB

V5A 1W9 BURNABY BC  
Canada

To : ALS Environmental - Fort Collins  
Sample Receiving  
225 Commerce Drive

Contact:  
Sample Receiving

80524 FORT COLLINS Colorado  
United States of America

**US-DEN-DEN**

Day Time

**C**

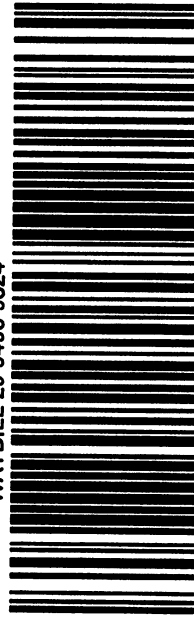
Ref: Sublets

Pcs/Shpt Weight Piece  
25.0/50.0 lbs 2 / 2

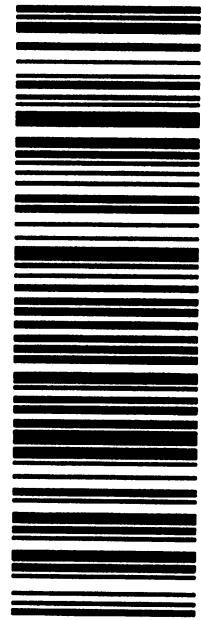


WAYBILL 29 9493 9824

Contents:  
Environmental Water  
Samples for Research



(2L)US80524+48000001



(J) JD01 4600 0081 3511 4287

Client: ALS Environmental

Date: 15-Oct-20

Project: VA20B6509

Work Order: 2009615

Sample ID: VA20B6509-005

Lab ID: 2009615-1

Legal Location:

Matrix: WATER

Collection Date: 9/19/2020 01:00

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>Radium-226 by Radon Emanation - Method 903.1</b>			<b>SOP 783</b>		Prep Date: <b>10/6/2020</b>	PrepBy: <b>TRW</b>
<b>Ra-226</b>	11 (+/- 3.0)	M3	<b>0.28</b>	<b>BQ/l</b>	NA	10/15/2020 12:32
<i>Carr: BARIUM</i>	96		40-110	%REC	DL = NA	10/15/2020 12:32

**Client:** ALS Environmental

**Date:** 15-Oct-20

**Project:** VA20B6509

**Work Order:** 2009615

**Sample ID:** VA20B6509-006

**Lab ID:** 2009615-2

**Legal Location:**

**Matrix:** WATER

**Collection Date:** 9/19/2020 03:00

**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>Radium-226 by Radon Emanation - Method 903.1</b>			<b>SOP 783</b>		Prep Date: <b>10/2/2020</b>	PrepBy: <b>TRW</b>
Ra-226	0.00047 (+/- 0.0045)	U	0.0085	BQ/l	NA	10/14/2020 10:23
Carr: <i>BARIUM</i>	97.3		40-110	%REC	DL = NA	10/14/2020 10:23



Client: ALS Environmental

Date: 15-Oct-20

Project: VA20B6509

Work Order: 2009615

Sample ID: VA20B6509-007

Lab ID: 2009615-3

Legal Location:

Matrix: WATER

Collection Date: 9/20/2020 19:00

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>Radium-226 by Radon Emanation - Method 903.1</b>			<b>SOP 783</b>		Prep Date: <b>10/2/2020</b>	PrepBy: <b>TRW</b>
<b>Ra-226</b>	<b>3.9 (+/- 0.98)</b>	M3	<b>0.077</b>	<b>BQ/l</b>	NA	10/14/2020 10:23
<i>Carr: BARIUM</i>	98.6		40-110	%REC	DL = NA	10/14/2020 10:23

**Client:** ALS Environmental

**Date:** 15-Oct-20

**Project:** VA20B6509

**Work Order:** 2009615

**Sample ID:** VA20B6509-008

**Lab ID:** 2009615-4

**Legal Location:**

**Matrix:** WATER

**Collection Date:** 9/20/2020 19:00

**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>Radium-226 by Radon Emanation - Method 903.1</b>			<b>SOP 783</b>		Prep Date: <b>10/2/2020</b>	PrepBy: <b>TRW</b>
<b>Ra-226</b>	<b>4.1 (+/- 1.0)</b>	M3	<b>0.044</b>	<b>BQ/l</b>	NA	10/14/2020 10:23
<i>Carr: BARIUM</i>	<i>96.9</i>		<i>40-110</i>	<i>%REC</i>	DL = NA	10/14/2020 10:23

**Client:** ALS Environmental  
**Project:** VA20B6509  
**Sample ID:** VA20B6509-008  
**Legal Location:**  
**Collection Date:** 9/20/2020 19:00

**Date:** 15-Oct-20  
**Work Order:** 2009615  
**Lab ID:** 2009615-4  
**Matrix:** WATER  
**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	--------------	-------	-----------------	---------------

**Explanation of Qualifiers**

**Radiochemistry:**

- "Report Limit" is the MDC
- U or ND - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- W - DER is greater than Warning Limit of 1.42
- \* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
- # - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.
- G - Sample density differs by more than 15% of LCS density.
- D - DER is greater than Control Limit
- M - Requested MDC not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS, Matrix Spike Recovery within control limits.
- N - Matrix Spike Recovery outside control limits
- NC - Not Calculated for duplicate results less than 5 times MDC
- B - Analyte concentration greater than MDC.
- B3 - Analyte concentration greater than MDC but less than Requested MDC.

**Inorganics:**

- B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).
- U or ND - Indicates that the compound was analyzed for but not detected.
- E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.
- M - Duplicate injection precision was not met.
- N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.
- Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.
- \* - Duplicate analysis (relative percent difference) not within control limits.
- S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

**Organics:**

- U or ND - Indicates that the compound was analyzed for but not detected.
- B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.
- E - Analyte concentration exceeds the upper level of the calibration range.
- J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).
- A - A tentatively identified compound is a suspected aldol-condensation product.
- X - The analyte was diluted below an accurate quantitation level.
- \* - The spike recovery is equal to or outside the control criteria used.
- + - The relative percent difference (RPD) equals or exceeds the control criteria.
- G - A pattern resembling gasoline was detected in this sample.
- D - A pattern resembling diesel was detected in this sample.
- M - A pattern resembling motor oil was detected in this sample.
- C - A pattern resembling crude oil was detected in this sample.
- 4 - A pattern resembling JP-4 was detected in this sample.
- 5 - A pattern resembling JP-5 was detected in this sample.
- H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.
- L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.
- Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
  - gasoline
  - JP-8
  - diesel
  - mineral spirits
  - motor oil
  - Stoddard solvent
  - bunker C

ALS -- Fort Collins

Date: 10/15/2020 2:50

Client: ALS Environmental  
 Work Order: 2009615  
 Project: VA20B6509

**QC BATCH REPORT**

Batch ID: **RE201002-1-1** Instrument ID **Alpha Scin** Method: **Radium-226 by Radon Emanation**

LCS		Sample ID: <b>RE201002-1</b>			Units: <b>BQ/I</b>		Analysis Date: <b>10/14/2020 11:27</b>				
Client ID:		Run ID: <b>RE201002-1A</b>			Prep Date: <b>10/2/2020</b>		DF: <b>NA</b>				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.74 (+/- 0.433)	0.0102	1.732		100	67-120					P,M3
Carr: BARIUM	15900		16740		94.8	40-110					

LCSD		Sample ID: <b>RE201002-1</b>			Units: <b>BQ/I</b>		Analysis Date: <b>10/14/2020 11:27</b>				
Client ID:		Run ID: <b>RE201002-1A</b>			Prep Date: <b>10/2/2020</b>		DF: <b>NA</b>				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.45 (+/- 0.364)	0.0077	1.732		83.7	67-120		1.74	0.5	2.1	P
Carr: BARIUM	16500		16740		98.6	40-110		15900			

MB		Sample ID: <b>RE201002-1</b>			Units: <b>BQ/I</b>		Analysis Date: <b>10/14/2020 11:27</b>				
Client ID:		Run ID: <b>RE201002-1A</b>			Prep Date: <b>10/2/2020</b>		DF: <b>NA</b>				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	0.0018 (+/- 0.0042)	0.0073									U
Carr: BARIUM	15800		16740		94.3	40-110					

The following samples were analyzed in this batch: 2009615-2      2009615-3      2009615-4

Client: ALS Environmental  
 Work Order: 2009615  
 Project: VA20B6509

# QC BATCH REPORT

Batch ID: RE201006-1-1 Instrument ID Alpha Scin Method: Radium-226 by Radon Emanation

LCS		Sample ID: RE201006-1		Units: BQ/I			Analysis Date: 10/15/2020 13:02				
Client ID:		Run ID: RE201006-1A			Prep Date: 10/6/2020			DF: NA			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.41 (+/- 0.352)	0.0066	1.732		81.3	67-120					P
Carr: BARIUM	15700		15890		98.5	40-110					

LCSD		Sample ID: RE201006-1		Units: BQ/I			Analysis Date: 10/15/2020 13:02				
Client ID:		Run ID: RE201006-1A			Prep Date: 10/6/2020			DF: NA			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.67 (+/- 0.416)	0.00709	1.732		96.2	67-120		1.41	0.5	2.1	P
Carr: BARIUM	15600		15890		98.3	40-110		15700			

MB		Sample ID: RE201006-1		Units: BQ/I			Analysis Date: 10/15/2020 13:02				
Client ID:		Run ID: RE201006-1A			Prep Date: 10/6/2020			DF: NA			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	0.0043 (+/- 0.0045)	0.0068									U
Carr: BARIUM	15600		15890		97.9	40-110					

The following samples were analyzed in this batch:



**Client:** ALS Environmental  
**Report date:** 28-Oct-20  
**Client project ID:** VA20B6509  
**Isobrine File No:** ISOBR-21075



9330 60 Avenue NW  
 Edmonton, AB  
 Canada, T6E 0C1  
 www.isobrine.com  
 780-433-3699

Isobrine ID	Client sample IDs		Collected	Received	$\delta^{18}\text{O}$		$\delta^2\text{H}$	
					‰ VSMOW	$\pm 1\sigma$	‰ VSMOW	$\pm 1\sigma$
IB-21-865	VA20B6509-001	Westbay-A-225-DUP-1	17-Aug-20	30-Sep-20	-13.32	0.30	-106.0	0.83
IB-21-866	VA20B6509-002	Westbay-A-360-DUP-1	22-Aug-20	30-Sep-20	-13.58	0.53	-107.3	0.95
IB-21-867	VA20B6509-003	Westbay-A-606-DUP-1	8-Sep-20	30-Sep-20	-12.79	0.23	-105.5	0.37
IB-21-868	VA20B6509-004	Westbay-A-606BR-DUP-1	8-Sep-20	30-Sep-20	-13.28	0.11	-106.5	0.20
IB-21-869	VA20B6509-005	Westbay-A-Port4-1	19-Sep-20	30-Sep-20	-12.74	0.33	-105.7	0.37
IB-21-870	VA20B6509-006	Equipment Blank-1	19-Sep-20	30-Sep-20	-12.62	0.27	-89.5	1.33
IB-21-871	VA20B6509-007	Westbay-A-Port8-0.29	20-Sep-20	30-Sep-20	-15.31	0.28	-117.3	1.28
IB-21-872	VA20B6509-008	Westbay-A-Port8-29%DUP-1	20-Sep-20	30-Sep-20	-15.03	0.17	-117.0	0.36

Oxygen and hydrogen stable isotope compositions determined on mechanically and chemically cleaned samples using a CRDS (Cavity Ring-down Mass Spectrometer).  
 Standard deviations for  $\delta^{18}\text{O}$  and  $\delta^2\text{H}$  are typically equal to or better than 0.2 ‰ and 2.0 ‰, respectively ( $\pm 1\sigma$ ). However, these samples contained chemicals which impacted the precision.



Golder Associates Ltd. (Winnipeg)  
ATTN: ADRIAN KOWALCHUK  
6925 Century Ave, Suite 100  
Mississauga ON LN57K2

Date Received: 25-SEP-20  
Report Date: 14-OCT-20 07:56 (MT)  
Version: FINAL

Client Phone: 204-489-9600

## Certificate of Analysis

Lab Work Order #: L2508184  
Project P.O. #: NOT SUBMITTED  
Job Reference: 20136436-2300-2304  
C of C Numbers:  
Legal Site Desc:

Comments: ADDITIONAL 25-SEP-20 10:44

Judy Dalmaijer  
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 1329 Niakwa Road East, Unit 12, Winnipeg, MB R2J 3T4 Canada | Phone: +1 204 255 9720 | Fax: +1 204 255 9721  
ALS CANADA LTD Part of the ALS Group An ALS Limited Company



# ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L2508184-5 GROUNDWATER 19-SEP-20  WESTBAY-A- PORT4-100%	L2508184-6 BLANK 19-SEP-20 02:00 EQUIPMENT BLANK 1	L2508184-7 GROUNDWATER 20-SEP-20 18:00 WESTBAY-A- PORT8-29%	L2508184-8 GROUNDWATER 20-SEP-20 18:00 WESTBAY-A- PORT8-29%DUP-1
Grouping	Analyte				
<b>WATER</b>					
<b>Bacteriological Tests</b>	Sulfur Reducing Bacteria	<1 CFU/mL <sup>ESQ</sup>	<1 CFU/mL <sup>ESQ</sup>	<1 CFU/mL <sup>ESQ</sup>	<1 CFU/mL <sup>ESQ</sup>

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

## Reference Information

### Additional Comments for Sample Listed:

Sample Number	Matrix	Report Remarks	Sample Comment
L2508184-5	Water	Note: Parameter exceeded recommended holding time prior analysis.	
L2508184-6	Water	Note: Parameter exceeded recommended holding time prior analysis.	
L2508184-7	Water	Note: Parameter exceeded recommended holding time prior analysis.	
L2508184-8	Water	Note: Parameter exceeded recommended holding time prior analysis.	

### Qualifiers for Individual Samples Listed:

Sample Number	Client Sample ID	Qualifier	Description
L2508184-5	WESTBAY-A-PORT4-100%	PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.
L2508184-6	EQUIPMENT BLANK 1	PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.
L2508184-7	WESTBAY-A-PORT8-29%	PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.
L2508184-8	WESTBAY-A-PORT8-29%DL	PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.

### Qualifiers for Individual Parameters Listed:

Qualifier	Description
ESQ	Estimated Result; semi-quantitative only

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
SRB-BART-WP	Water	Sulfate Reducing Bacteria	BART TEST KIT

#### Sulfate-Reducing Bacteria- SRB

Anaerobic bacteria produce hydrogen sulfide from sulfate. The most prevalent problem is rotten egg smell. Other problems that may persist include, black precipitate, slime and corrosion. The bacteria colonize on surfaces to form bio-films. Therefore, point of sample is critical to ensure proper results.

#### SRB: Analytical Method

A small amount of sample is transferred to a vial (anaerobic chamber) that contains ferrous iron. A color reaction is observed (over 8 days) within the chamber to indicate the presence of Sulfate-Reducing Bacteria. The colour reaction determines the population of Sulfate-Reducing Bacteria. The results are reported as estimated value of Colony Forming Units (CFU/ml).

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

### Chain of Custody Numbers:

#### GLOSSARY OF REPORT TERMS

*Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.*

*mg/kg - milligrams per kilogram based on dry weight of sample.*

*mg/kg wwt - milligrams per kilogram based on wet weight of sample.*

*mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.*

*mg/L - milligrams per litre.*

*< - Less than.*

*D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

**UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.**

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*





**Environmental**

## CERTIFICATE OF ANALYSIS

**Work Order** : **VA20B7020**  
**Client** : **Golder Associates Ltd.**  
**Contact** : Adrian Kowalchuk  
**Address** : 1931 Robertson Road  
Ottawa ON Canada K2H 5B7  
**Telephone** : 613 592 9600  
**Project** : 20136436-2300-2304  
**PO** : ----  
**C-O-C number** : ----  
**Sampler** : M. Bowman  
**Site** : Meliadine - Westbay A  
**Quote number** : VA20-AEML100-001 (Q72802)  
**No. of samples received** : 8  
**No. of samples analysed** : 7

**Page** : 1 of 14  
**Laboratory** : Vancouver - Environmental  
**Account Manager** : Heather McKenzie  
**Address** : 8081 Lougheed Highway  
Burnaby BC Canada V5A 1W9  
**Telephone** : +1 604 253 4188  
**Date Samples Received** : 02-Oct-2020 08:20  
**Date Analysis Commenced** : 02-Oct-2020  
**Issue Date** : 04-Nov-2020 11:35

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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
- Surrogate Control Limits

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>
Brieanna Allen	Department Manager - Organics	Organics, Burnaby, British Columbia
Bruna Botti	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Cynthia Bauer		Organics, Calgary, Alberta
Dee Lee	Analyst	Metals, Burnaby, British Columbia
Gloria Chan	Lab Analyst	Metals, Burnaby, British Columbia
Jeanie Mark		Organics, Calgary, Alberta
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Kaitlyn Gardner	Account Manager Assistant	External Subcontracting, Edmonton, Alberta
Kaitlyn Gardner	Account Manager Assistant	Internal Subcontracting, Fort Collins, Colorado
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics - Water Quality, Burnaby, British Columbia
Monica Ko	Lab Assistant	Metals, Burnaby, British Columbia
Shaneel Dayal	Analyst	Metals, Burnaby, British Columbia
Sunil Palak		Microbiology, Calgary, Alberta
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics - Water Quality, Burnaby, British Columbia



## 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.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances  
 LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
% VSMOW	parts per thousand Vienna Standard Mean Ocean Water
Bq/L	Becquerels per litre
CFU/1mL	colony forming units per 1 mL
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units
psu	practical salinity units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in reports identified as "Preliminary Report" are considered authorized for use.

## Qualifiers

<i>Qualifier</i>	<i>Description</i>
BODP	BOD dilution results differed by more than 30% RPD. Precision of reported BOD result may be less than usual.
DLA	Detection Limit adjusted for required dilution.
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
HTD	Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.



*SUR-ND*                      *Surrogate recovery marginally exceeded ALS DQO. Reported non-detect results for associated samples were deemed to be unaffected.*

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## Analytical Results

Sub-Matrix: Groundwater

Client sample ID

(Matrix: Water)

					Westbay-A-Port 4-1	Westbay-A-Port 4-2	Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 3-1	Westbay-A-Port 9-1
Client sampling date / time					25-Sep-2020	27-Sep-2020	27-Sep-2020	28-Sep-2020	28-Sep-2020
Analyte	CAS Number	Method	LOR	Unit	VA20B7020-001	VA20B7020-003	VA20B7020-004	VA20B7020-005	VA20B7020-006
					Result	Result	Result	Result	Result
<b>Sample Preparation</b>									
dissolved Fe2 filtration location	----	EP541	-	-	Field	----	----	----	----
<b>Physical Tests</b>									
conductivity	----	E100	2.0	µS/cm	96100	95100	95000	----	----
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L	61500	----	----	----	----
pH	----	E108	0.10	pH units	9.20	9.22	9.24	----	----
salinity	----	EC100S	1.0	psu	67.0	66.2	66.1	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L	89000	77000	63100	----	----
solids, total suspended [TSS]	----	E160-H	3.0	mg/L	3.8	16.5	205	----	----
turbidity	----	E121	0.10	NTU	14.0	12.8	12.1	----	----
alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	448	446	439	----	----
alkalinity, phenolphthalein (as CaCO3)	----	E290	2.0	mg/L	74.4	78.4	80.1	----	----
alkalinity, hydroxide (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	<2.0	----	----
alkalinity, carbonate (as CaCO3)	----	E290	2.0	mg/L	149	157	160	----	----
alkalinity, bicarbonate (as CaCO3)	----	E290	2.0	mg/L	300	290	278	----	----
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	60700	----	----	----	----
<b>Anions and Nutrients</b>									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	1.01	----	----	----	----
bromide	24959-67-9	E235.Br-L	0.050	mg/L	205	188	200	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	51700	47300	50200	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	<2.00 <sup>DLDS</sup>	<2.00 <sup>DLDS</sup>	<2.00 <sup>DLDS</sup>	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	2.40	----	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	3.20	2.78	2.96	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.100 <sup>DLDS</sup>	<0.100 <sup>DLDS</sup>	<0.100 <sup>DLDS</sup>	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0471	0.0825	0.0778	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.200 <sup>DLM</sup>	----	----	----	----
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	<5.00 <sup>DLM</sup>	<5.00 <sup>DLM</sup>	<5.00 <sup>DLM</sup>	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	375	403	427	----	----
<b>Cyanides</b>									
cyanide, free	----	E339	0.0050	mg/L	----	----	<0.0200 <sup>DLM</sup>	----	----
cyanide, free	----	E339	0.0050	mg/L	<0.0500 <sup>DLM</sup>	<0.0050	----	----	----
cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	----	----	<0.0200 <sup>DLM</sup>	----	----





## Analytical Results

Sub-Matrix: Groundwater

Client sample ID

					Westbay-A-Port 4-1	Westbay-A-Port 4-2	Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 3-1	Westbay-A-Port 9-1
					25-Sep-2020	27-Sep-2020	27-Sep-2020	28-Sep-2020	28-Sep-2020
Analyte	CAS Number	Method	LOR	Unit	VA20B7020-001	VA20B7020-003	VA20B7020-004	VA20B7020-005	VA20B7020-006
					Result	Result	Result	Result	Result
<b>Cyanides</b>									
cyanide, strong acid dissociable (total)	---	E333	0.0050	mg/L	<0.0100 <sup>DLM</sup>	<0.0050	---	---	---
cyanide, weak acid dissociable	---	E336	0.0050	mg/L	---	---	<0.0200 <sup>DLM</sup>	---	---
cyanide, weak acid dissociable	---	E336	0.0050	mg/L	<0.0100 <sup>DLM</sup>	<0.0050	---	---	---
<b>Organic / Inorganic Carbon</b>									
carbon, dissolved organic [DOC]	---	E358-L	0.50	mg/L	8880 <sup>HTD</sup>	6270 <sup>HTD</sup>	6570 <sup>HTD</sup>	---	---
carbon, total organic [TOC]	---	E355-L	0.50	mg/L	9860	8860	8000	---	---
<b>Bacteriological Tests</b>									
bacteria, sulfate reducing	---	E030.SRB	1	CFU/1mL	<1	<1	<1	---	---
<b>Total Metals</b>									
aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.600 <sup>DLA</sup>	---	---	---	---
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	---	---	---	---
arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	---	---	---	---
barium, total	7440-39-3	E420	0.00010	mg/L	5.84	---	---	---	---
beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.0200 <sup>DLA</sup>	---	---	---	---
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.0100 <sup>DLA</sup>	---	---	---	---
boron, total	7440-42-8	E420	0.010	mg/L	73.2	---	---	---	---
cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.00100 <sup>DLA</sup>	---	---	---	---
calcium, total	7440-70-2	E420	0.050	mg/L	24100	---	---	---	---
cesium, total	7440-46-2	E420	0.000010	mg/L	1.75	---	---	---	---
chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	<0.0200 <sup>DLA</sup>	---	---	---	---
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	---	---	---	---
copper, total	7440-50-8	E420	0.00050	mg/L	<0.100 <sup>DLA</sup>	---	---	---	---
iron, total	7439-89-6	E420	0.010	mg/L	<2.00 <sup>DLA</sup>	---	---	---	---
lead, total	7439-92-1	E420	0.000050	mg/L	<0.0100 <sup>DLA</sup>	---	---	---	---
lithium, total	7439-93-2	E420	0.0010	mg/L	69.2	---	---	---	---
magnesium, total	7439-95-4	E420	0.0050	mg/L	333	---	---	---	---
manganese, total	7439-96-5	E420	0.00010	mg/L	0.212	---	---	---	---
mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	---	---	---	---
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.0434	---	---	---	---
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.100 <sup>DLA</sup>	---	---	---	---
phosphorus, total	7723-14-0	E420	0.050	mg/L	<10.0 <sup>DLA</sup>	---	---	---	---
potassium, total	7440-09-7	E420	0.050	mg/L	1090	---	---	---	---



## Analytical Results

Sub-Matrix: Groundwater

Client sample ID

(Matrix: Water)

					Westbay-A-Port 4-1	Westbay-A-Port 4-2	Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 3-1	Westbay-A-Port 9-1
Client sampling date / time					25-Sep-2020	27-Sep-2020	27-Sep-2020	28-Sep-2020	28-Sep-2020
Analyte	CAS Number	Method	LOR	Unit	VA20B7020-001	VA20B7020-003	VA20B7020-004	VA20B7020-005	VA20B7020-006
					Result	Result	Result	Result	Result
<b>Total Metals</b>									
rubidium, total	7440-17-7	E420	0.00020	mg/L	4.01	----	----	----	----
selenium, total	7782-49-2	E420	0.000050	mg/L	0.0572	----	----	----	----
silicon, total	7440-21-3	E420	0.10	mg/L	<20.0 <sup>DLA</sup>	----	----	----	----
silver, total	7440-22-4	E420	0.000010	mg/L	<0.00200 <sup>DLA</sup>	----	----	----	----
sodium, total	17341-25-2	E420	0.050	mg/L	3120	----	----	----	----
strontium, total	7440-24-6	E420	0.00020	mg/L	1170	----	----	----	----
sulfur, total	7704-34-9	E420	0.50	mg/L	123	----	----	----	----
tellurium, total	13494-80-9	E420	0.00020	mg/L	0.0704	----	----	----	----
thallium, total	7440-28-0	E420	0.000010	mg/L	0.110	----	----	----	----
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	----	----	----	----
tin, total	7440-31-5	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	----	----	----	----
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.0600 <sup>DLA</sup>	----	----	----	----
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	----	----	----	----
uranium, total	7440-61-1	E420	0.000010	mg/L	<0.00200 <sup>DLA</sup>	----	----	----	----
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.100 <sup>DLA</sup>	----	----	----	----
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.600 <sup>DLA</sup>	----	----	----	----
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.0400 <sup>DLA</sup>	----	----	----	----
<b>Dissolved Metals</b>									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.200 <sup>DLA</sup>	----	----	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.0200 <sup>DLA</sup>	----	----	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.0200 <sup>DLA</sup>	----	----	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	5.56	----	----	----	----
beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.0200 <sup>DLA</sup>	----	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.0100 <sup>DLA</sup>	----	----	----	----
boron, dissolved	7440-42-8	E421	0.010	mg/L	72.1	----	----	----	----
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.00100 <sup>DLA</sup>	----	----	----	----
calcium, dissolved	7440-70-2	E421	0.050	mg/L	23800	----	----	----	----
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	1.56	----	----	----	----
chromium, dissolved	7440-47-3	E421.Cr-L	0.00010	mg/L	<0.0200 <sup>DLA</sup>	----	----	----	----
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.0200 <sup>DLA</sup>	----	----	----	----
copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.0400 <sup>DLA</sup>	----	----	----	----
iron, dissolved	7439-89-6	E421	0.010	mg/L	<2.00 <sup>DLA</sup>	----	----	----	----



## Analytical Results

Sub-Matrix: Groundwater

Client sample ID

(Matrix: Water)

					Westbay-A-Port 4-1	Westbay-A-Port 4-2	Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 3-1	Westbay-A-Port 9-1
Client sampling date / time					25-Sep-2020	27-Sep-2020	27-Sep-2020	28-Sep-2020	28-Sep-2020
Analyte	CAS Number	Method	LOR	Unit	VA20B7020-001	VA20B7020-003	VA20B7020-004	VA20B7020-005	VA20B7020-006
					Result	Result	Result	Result	Result
<b>Dissolved Metals</b>									
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.0100 <sup>DLA</sup>	----	----	----	----
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	75.4	----	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	309	----	----	----	----
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	<0.0200 <sup>DLA</sup>	----	----	----	----
mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	----	----	----	----
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0401	----	----	----	----
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.100 <sup>DLA</sup>	----	----	----	----
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<10.0 <sup>DLA</sup>	----	----	----	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L	1080	----	----	----	----
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	3.68	----	----	----	----
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.0186	----	----	----	----
silicon, dissolved	7440-21-3	E421	0.050	mg/L	<10.0 <sup>DLA</sup>	----	----	----	----
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.00200 <sup>DLA</sup>	----	----	----	----
sodium, dissolved	17341-25-2	E421	0.050	mg/L	2950	----	----	----	----
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	1070	----	----	----	----
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<100 <sup>DLA</sup>	----	----	----	----
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	0.0577	----	----	----	----
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.100	----	----	----	----
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.0200 <sup>DLA</sup>	----	----	----	----
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.0200 <sup>DLA</sup>	----	----	----	----
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.0600 <sup>DLA</sup>	----	----	----	----
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.0200 <sup>DLA</sup>	----	----	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	<0.00200 <sup>DLA</sup>	----	----	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.100 <sup>DLA</sup>	----	----	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.200 <sup>DLA</sup>	----	----	----	----
zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.0400 <sup>DLA</sup>	----	----	----	----
dissolved mercury filtration location	----	EP509	-	-	Field	----	----	----	----
dissolved metals filtration location	----	EP421	-	-	Field	----	----	----	----
<b>Speciated Metals</b>									
iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.020	mg/L	0.020	----	----	----	----
<b>Aggregate Organics</b>									
biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	>13000 <sup>HTD</sup>	>13000 <sup>HTD</sup>	11800 <sup>BODP</sup>	----	----



## Analytical Results

Sub-Matrix: Groundwater

Client sample ID

(Matrix: Water)

					Westbay-A-Port 4-1	Westbay-A-Port 4-2	Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 3-1	Westbay-A-Port 9-1
Client sampling date / time					25-Sep-2020	27-Sep-2020	27-Sep-2020	28-Sep-2020	28-Sep-2020
Analyte	CAS Number	Method	LOR	Unit	VA20B7020-001	VA20B7020-003	VA20B7020-004	VA20B7020-005	VA20B7020-006
					Result	Result	Result	Result	Result
<b>Aggregate Organics</b>									
chemical oxygen demand [COD]	---	E559	20	mg/L	23900 <sup>DLM</sup>	----	----	----	----
oil & grease (gravimetric)	---	E567	5.0	mg/L	<5.0	<5.0	<5.0	----	----
<b>Volatile Organic Compounds [BTEXS+MTBE]</b>									
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----
toluene	108-88-3	E611A	0.50	µg/L	0.74	0.60	0.85	----	----
xylene, m+p-	179601-23-1	E611A	0.50	µg/L	<0.50	<0.50	0.68	----	----
xylene, o-	95-47-6	E611A	0.50	µg/L	<0.50	<0.50	<0.50	----	----
xylenes, total	1330-20-7	E611A	0.75	µg/L	<0.75	<0.75	<0.75	----	----
<b>Volatile Organic Compounds Surrogates</b>									
bromofluorobenzene, 4-	460-00-4	E611A	0.50	%	94.8	96.2	91.7	----	----
difluorobenzene, 1,4-	540-36-3	E611A	0.50	%	108	108	98.9	----	----
<b>Hydrocarbons</b>									
F1 (C6-C10)	---	E581.VH+F1	100	µg/L	<100	<100	<100	----	----
F1-BTEX	---	EC580	100	µg/L	----	----	<100	----	----
F1-BTEX	---	EC580	100	µg/L	<100	<100	----	----	----
F2 (C10-C16)	---	E601	100	µg/L	<100	<100	<100	----	----
F3 (C16-C34)	---	E601	250	µg/L	<250	<250	<250	----	----
F4 (C34-C50)	---	E601	250	µg/L	<250	<250	<250	----	----
TEH (C10-C50)	---	E601	400	µg/L	<400	<400	<400	----	----
TEH (C16-C50)	---	E601	400	µg/L	<400	<400	<400	----	----
<b>Hydrocarbons Surrogates</b>									
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	50	%	88.0	75.0	72.6	----	----
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	111	105	59.4 <sup>SUR-N D</sup>	----	----
<b>Radiological Parameters</b>									
radium-226	13982-63-3	RA226-MMER	0.12	Bq/L	----	8.2	----	----	----
radium-226	13982-63-3	RA226-MMER	0.16	Bq/L	8.8	----	----	----	----
radium-226	13982-63-3	RA226-MMER	0.17	Bq/L	----	----	9.6	----	----
<b>Stable Isotope</b>									



## Analytical Results

Sub-Matrix: Groundwater

(Matrix: Water)

					Client sample ID	Westbay-A-Port 4-1	Westbay-A-Port 4-2	Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 3-1	Westbay-A-Port 9-1
					Client sampling date / time	25-Sep-2020	27-Sep-2020	27-Sep-2020	28-Sep-2020	28-Sep-2020
Analyte	CAS Number	Method	LOR	Unit	VA20B7020-001	VA20B7020-003	VA20B7020-004	VA20B7020-005	VA20B7020-006	
					Result	Result	Result	Result	Result	
<b>Stable Isotope</b>										
delta-oxygen-18	NA	H2+O18	-	‰ VSMOW	See attached	----	----	See attached	See attached	
delta-hydrogen-2	NA	H2+O18	-	‰ VSMOW	See attached	----	----	See attached	See attached	

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



## Analytical Results

Sub-Matrix: Groundwater

Client sample ID

					Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 4-2	----	----	----
					28-Sep-2020	28-Sep-2020	---	---	---
Analyte	CAS Number	Method	LOR	Unit	VA20B7020-007	VA20B7020-008	-----	-----	-----
					Result	Result	---	---	---
<b>Sample Preparation</b>									
dissolved Fe2 filtration location	----	EP541	-	-	Field	Field	----	----	----
<b>Anions and Nutrients</b>									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	----	0.952	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	----	2.35	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	----	0.0158	----	----	----
<b>Organic / Inorganic Carbon</b>									
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	----	7760	----	----	----
<b>Total Metals</b>									
aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.600 <sup>DLA</sup>	<0.600 <sup>DLA</sup>	----	----	----
antimony, total	7440-36-0	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	----
arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	----
barium, total	7440-39-3	E420	0.00010	mg/L	5.36	5.48	----	----	----
beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.00400 <sup>DLA</sup>	<0.00400 <sup>DLA</sup>	----	----	----
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----
boron, total	7440-42-8	E420	0.010	mg/L	71.4	72.9	----	----	----
cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.00100 <sup>DLA</sup>	<0.00100 <sup>DLA</sup>	----	----	----
calcium, total	7440-70-2	E420	0.050	mg/L	22900	23500	----	----	----
cesium, total	7440-46-2	E420	0.000010	mg/L	1.62	1.69	----	----	----
chromium, total	7440-47-3	E420	0.00050	mg/L	<0.100 <sup>DLA</sup>	<0.100 <sup>DLA</sup>	----	----	----
cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	----
copper, total	7440-50-8	E420	0.00050	mg/L	<0.100 <sup>DLA</sup>	<0.100 <sup>DLA</sup>	----	----	----
iron, total	7439-89-6	E420	0.010	mg/L	<2.00 <sup>DLA</sup>	<2.00 <sup>DLA</sup>	----	----	----
lead, total	7439-92-1	E420	0.000050	mg/L	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----
lithium, total	7439-93-2	E420	0.0010	mg/L	66.4	71.3	----	----	----
magnesium, total	7439-95-4	E420	0.0050	mg/L	374	381	----	----	----
manganese, total	7439-96-5	E420	0.00010	mg/L	0.229	0.239	----	----	----
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.0380	0.0407	----	----	----
nickel, total	7440-02-0	E420	0.00050	mg/L	<0.100 <sup>DLA</sup>	<0.100 <sup>DLA</sup>	----	----	----
phosphorus, total	7723-14-0	E420	0.050	mg/L	<10.0 <sup>DLA</sup>	<10.0 <sup>DLA</sup>	----	----	----
potassium, total	7440-09-7	E420	0.050	mg/L	1010	1030	----	----	----
rubidium, total	7440-17-7	E420	0.00020	mg/L	3.60	3.70	----	----	----
selenium, total	7782-49-2	E420	0.000050	mg/L	0.0368	0.0369	----	----	----



## Analytical Results

Sub-Matrix: Groundwater

Client sample ID

(Matrix: Water)

					Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 4-2	----	----	----
					28-Sep-2020	28-Sep-2020	---	---	---
Analyte	CAS Number	Method	LOR	Unit	VA20B7020-007	VA20B7020-008	-----	-----	-----
					Result	Result	---	---	---
<b>Total Metals</b>									
silicon, total	7440-21-3	E420	0.10	mg/L	<20.0 <sup>DLA</sup>	<20.0 <sup>DLA</sup>	----	----	----
silver, total	7440-22-4	E420	0.000010	mg/L	<0.00200 <sup>DLA</sup>	<0.00200 <sup>DLA</sup>	----	----	----
sodium, total	17341-25-2	E420	0.050	mg/L	3360	3460	----	----	----
strontium, total	7440-24-6	E420	0.00020	mg/L	1090	1100	----	----	----
sulfur, total	7704-34-9	E420	0.50	mg/L	138	131	----	----	----
tellurium, total	13494-80-9	E420	0.00020	mg/L	0.0640	0.0704	----	----	----
thallium, total	7440-28-0	E420	0.000010	mg/L	0.0973	0.103	----	----	----
thorium, total	7440-29-1	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	----
tin, total	7440-31-5	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	----
titanium, total	7440-32-6	E420	0.00030	mg/L	<0.0600 <sup>DLA</sup>	<0.0600 <sup>DLA</sup>	----	----	----
tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	----
uranium, total	7440-61-1	E420	0.000010	mg/L	<0.00200 <sup>DLA</sup>	<0.00200 <sup>DLA</sup>	----	----	----
vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.100 <sup>DLA</sup>	<0.100 <sup>DLA</sup>	----	----	----
zinc, total	7440-66-6	E420	0.0030	mg/L	<0.600 <sup>DLA</sup>	<0.600 <sup>DLA</sup>	----	----	----
zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.0400 <sup>DLA</sup>	<0.0400 <sup>DLA</sup>	----	----	----
<b>Dissolved Metals</b>									
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.200 <sup>DLA</sup>	<0.200 <sup>DLA</sup>	----	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L	5.13	5.27	----	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.00400 <sup>DLA</sup>	<0.00400 <sup>DLA</sup>	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----
boron, dissolved	7440-42-8	E421	0.010	mg/L	70.2	69.3	----	----	----
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.00100 <sup>DLA</sup>	<0.00100 <sup>DLA</sup>	----	----	----
calcium, dissolved	7440-70-2	E421	0.050	mg/L	22700	22000	----	----	----
cesium, dissolved	7440-46-2	E421	0.000010	mg/L	1.56	1.58	----	----	----
chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.100 <sup>DLA</sup>	<0.100 <sup>DLA</sup>	----	----	----
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	----
copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.0400 <sup>DLA</sup>	<0.0400 <sup>DLA</sup>	----	----	----
iron, dissolved	7439-89-6	E421	0.010	mg/L	<2.00 <sup>DLA</sup>	<2.00 <sup>DLA</sup>	----	----	----
lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.0100 <sup>DLA</sup>	<0.0100 <sup>DLA</sup>	----	----	----
lithium, dissolved	7439-93-2	E421	0.0010	mg/L	70.0	70.7	----	----	----



## Analytical Results

Sub-Matrix: Groundwater

Client sample ID

(Matrix: Water)

					Westbay-A-Port 4-2-DUP-1	Westbay-A-Port 4-2	----	----	----
					28-Sep-2020	28-Sep-2020	---	---	---
Analyte	CAS Number	Method	LOR	Unit	VA20B7020-007	VA20B7020-008	-----	-----	-----
					Result	Result	---	---	---
<b>Dissolved Metals</b>									
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	340	344	----	----	----
manganese, dissolved	7439-96-5	E421	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	----
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0364	0.0378	----	----	----
nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.100 <sup>DLA</sup>	<0.100 <sup>DLA</sup>	----	----	----
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<10.0 <sup>DLA</sup>	<10.0 <sup>DLA</sup>	----	----	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L	1020	1030	----	----	----
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	3.47	3.50	----	----	----
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.0100 <sup>DLA</sup>	0.0145	----	----	----
silicon, dissolved	7440-21-3	E421	0.050	mg/L	<10.0 <sup>DLA</sup>	<10.0 <sup>DLA</sup>	----	----	----
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.00200 <sup>DLA</sup>	<0.00200 <sup>DLA</sup>	----	----	----
sodium, dissolved	17341-25-2	E421	0.050	mg/L	3190	3260	----	----	----
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	1060	1080	----	----	----
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<100 <sup>DLA</sup>	109	----	----	----
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	0.0750	0.0631	----	----	----
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.0945	0.0992	----	----	----
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	----
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	----
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.0600 <sup>DLA</sup>	<0.0600 <sup>DLA</sup>	----	----	----
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.0200 <sup>DLA</sup>	<0.0200 <sup>DLA</sup>	----	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	<0.00200 <sup>DLA</sup>	<0.00200 <sup>DLA</sup>	----	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.100 <sup>DLA</sup>	<0.100 <sup>DLA</sup>	----	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.200 <sup>DLA</sup>	0.531	----	----	----
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.0600 <sup>DLA</sup>	<0.0600 <sup>DLA</sup>	----	----	----
dissolved metals filtration location	----	EP421	-	-	Field	Field	----	----	----
<b>Speciated Metals</b>									
iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.020	mg/L	0.054	0.022	----	----	----
<b>Aggregate Organics</b>									
chemical oxygen demand [COD]	----	E559	20	mg/L	----	17000 <sup>DLM</sup>	----	----	----
<b>Stable Isotope</b>									
delta-oxygen-18	NA	H2+O18	-	‰ VSMOW	----	See attached	----	----	----
delta-hydrogen-2	NA	H2+O18	-	‰ VSMOW	----	See attached	----	----	----





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

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## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: <b>VA20B7020</b>	Page	: 1 of 24
Client	: <b>Golder Associates Ltd.</b>	Laboratory	: Vancouver - Environmental
Contact	: Adrian Kowalchuk	Account Manager	: Heather McKenzie
Address	: 1931 Robertson Road Ottawa ON Canada K2H 5B7	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 204 489 9600	Telephone	: +1 604 253 4188
Project	: 20136436-2300-2304	Date Samples Received	: 02-Oct-2020 08:20
PO	: ----	Issue Date	: 04-Nov-2020 11:35
C-O-C number	: ----		
Sampler	: M. Bowman		
Site	: Meliadine - Westbay A		
Quote number	: VA20-AEML100-001 (Q72802)		
No. of samples received	: 8		
No. of samples analysed	: 7		

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 Services number is a unique identifier assigned to discrete substances.

**DQO:** Data Quality Objective.

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

**RPD:** Relative Percent Difference.

## Summary of Outliers

### **Outliers : Quality Control Samples**

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

### **Outliers: Reference Material (RM) Samples**

- No Reference Material (RM) Sample outliers occur.

### **Outliers : Analysis Holding Time Compliance (Breaches)**

- Analysis Holding Time Outliers exist - please see following pages for full details.

### **Outliers : Frequency of Quality Control Samples**

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.

RIGHT SOLUTIONS | RIGHT PARTNER

Page : 3 of 24  
Work Order : VA20B7020  
Client : Golder Associates Ltd.  
Project : 20136436-2300-2304



**Regular Sample Surrogates**

Sub-Matrix: **Groundwater**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Result	Limits	Comment
<b>Samples Submitted</b>							
Hydrocarbons Surrogates	VA20B7020-004	Westbay-A-Port4-2-DUP-1	dichlorotoluene, 3,4-	97-75-0	59.4 %	70.0-130 %	Recovery less than lower data quality objective



## 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 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 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		
<b>Aggregate Organics : Biochemical Oxygen Demand - 5 day</b>											
<b>HDPE [BOD]</b> Westbay-A-Port4-2	E550	27-Sep-2020	----	----	----		02-Oct-2020	3 days	4 days	*	EHTR
<b>Aggregate Organics : Biochemical Oxygen Demand - 5 day</b>											
<b>HDPE [BOD]</b> Westbay-A-Port4-1	E550	25-Sep-2020	----	----	----		02-Oct-2020	3 days	6 days	*	EHTR
<b>Aggregate Organics : Biochemical Oxygen Demand - 5 day</b>											
<b>HDPE [BOD]</b> Westbay-A-Port4-2-DUP-1	E550	27-Sep-2020	----	----	----		06-Oct-2020	3 days	8 days	*	EHTR
<b>Aggregate Organics : Chemical Oxygen Demand by Colourimetry</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port4-1	E559	25-Sep-2020	----	----	----		08-Oct-2020	28 days	12 days	✓	
<b>Aggregate Organics : Chemical Oxygen Demand by Colourimetry</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port4-2	E559	28-Sep-2020	----	----	----		08-Oct-2020	28 days	9 days	✓	
<b>Aggregate Organics : Oil &amp; Grease by Gravimetry</b>											
<b>Amber glass (hydrochloric acid)</b> Westbay-A-Port4-1	E567	25-Sep-2020	07-Oct-2020	28 days	11 days	✓	07-Oct-2020	40 days	0 days	✓	
<b>Aggregate Organics : Oil &amp; Grease by Gravimetry</b>											
<b>Amber glass (hydrochloric acid)</b> Westbay-A-Port4-2-DUP-1	E567	27-Sep-2020	09-Oct-2020	28 days	11 days	✓	09-Oct-2020	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		
<b>Aggregate Organics : Oil &amp; Grease by Gravimetry</b>											
<b>Amber glass (hydrochloric acid)</b> Westbay-A-Port4-2	E567	27-Sep-2020	07-Oct-2020	28 days	9 days	✔	07-Oct-2020	40 days	0 days	✔	
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port4-1	E298	25-Sep-2020	----	----	----		07-Oct-2020	28 days	12 days	✔	
<b>Anions and Nutrients : Ammonia by Fluorescence</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port4-2	E298	28-Sep-2020	----	----	----		07-Oct-2020	28 days	9 days	✔	
<b>Anions and Nutrients : Bromide in Water by IC (Low Level)</b>											
<b>HDPE</b> Westbay-A-Port4-1	E235.Br-L	25-Sep-2020	----	----	----		06-Oct-2020	28 days	10 days	✔	
<b>Anions and Nutrients : Bromide in Water by IC (Low Level)</b>											
<b>HDPE</b> Westbay-A-Port4-2	E235.Br-L	27-Sep-2020	----	----	----		06-Oct-2020	28 days	8 days	✔	
<b>Anions and Nutrients : Bromide in Water by IC (Low Level)</b>											
<b>HDPE</b> Westbay-A-Port4-2-DUP-1	E235.Br-L	27-Sep-2020	----	----	----		06-Oct-2020	28 days	8 days	✔	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
<b>HDPE</b> Westbay-A-Port4-1	E235.Cl	25-Sep-2020	----	----	----		06-Oct-2020	28 days	10 days	✔	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
<b>HDPE</b> Westbay-A-Port4-2	E235.Cl	27-Sep-2020	----	----	----		06-Oct-2020	28 days	8 days	✔	
<b>Anions and Nutrients : Chloride in Water by IC</b>											
<b>HDPE</b> Westbay-A-Port4-2-DUP-1	E235.Cl	27-Sep-2020	----	----	----		06-Oct-2020	28 days	8 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		
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)</b>											
HDPE Westbay-A-Port4-1	E378-U	25-Sep-2020	----	----	----		06-Oct-2020	3 days	10 days	*	EHTR
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)</b>											
HDPE Westbay-A-Port4-2	E378-U	27-Sep-2020	----	----	----		06-Oct-2020	3 days	8 days	*	EHTR
<b>Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)</b>											
HDPE Westbay-A-Port4-2-DUP-1	E378-U	27-Sep-2020	----	----	----		06-Oct-2020	3 days	8 days	*	EHTR
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
HDPE Westbay-A-Port4-1	E235.F	25-Sep-2020	----	----	----		06-Oct-2020	28 days	10 days	✓	
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
HDPE Westbay-A-Port4-2	E235.F	27-Sep-2020	----	----	----		06-Oct-2020	28 days	8 days	✓	
<b>Anions and Nutrients : Fluoride in Water by IC</b>											
HDPE Westbay-A-Port4-2-DUP-1	E235.F	27-Sep-2020	----	----	----		06-Oct-2020	28 days	8 days	✓	
<b>Anions and Nutrients : Nitrate in Water by IC (Low Level)</b>											
HDPE Westbay-A-Port4-1	E235.NO3-L	25-Sep-2020	----	----	----		06-Oct-2020	3 days	10 days	*	EHTR
<b>Anions and Nutrients : Nitrate in Water by IC (Low Level)</b>											
HDPE Westbay-A-Port4-2	E235.NO3-L	27-Sep-2020	----	----	----		06-Oct-2020	3 days	8 days	*	EHTR
<b>Anions and Nutrients : Nitrate in Water by IC (Low Level)</b>											
HDPE Westbay-A-Port4-2-DUP-1	E235.NO3-L	27-Sep-2020	----	----	----		06-Oct-2020	3 days	8 days	*	EHTR



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		
<b>Anions and Nutrients : Nitrite in Water by IC (Low Level)</b>											
HDPE Westbay-A-Port4-1	E235.NO2-L	25-Sep-2020	----	----	----		06-Oct-2020	3 days	10 days	*	EHTR
<b>Anions and Nutrients : Nitrite in Water by IC (Low Level)</b>											
HDPE Westbay-A-Port4-2	E235.NO2-L	27-Sep-2020	----	----	----		06-Oct-2020	3 days	8 days	*	EHTR
<b>Anions and Nutrients : Nitrite in Water by IC (Low Level)</b>											
HDPE Westbay-A-Port4-2-DUP-1	E235.NO2-L	27-Sep-2020	----	----	----		06-Oct-2020	3 days	8 days	*	EHTR
<b>Anions and Nutrients : Reactive Silica by Colourimetry</b>											
HDPE Westbay-A-Port4-1	E392	25-Sep-2020	----	----	----		05-Oct-2020	28 days	10 days	✓	
<b>Anions and Nutrients : Reactive Silica by Colourimetry</b>											
HDPE Westbay-A-Port4-2	E392	27-Sep-2020	----	----	----		05-Oct-2020	28 days	8 days	✓	
<b>Anions and Nutrients : Reactive Silica by Colourimetry</b>											
HDPE Westbay-A-Port4-2-DUP-1	E392	27-Sep-2020	----	----	----		05-Oct-2020	28 days	8 days	✓	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE Westbay-A-Port4-1	E235.SO4	25-Sep-2020	----	----	----		06-Oct-2020	28 days	10 days	✓	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE Westbay-A-Port4-2	E235.SO4	27-Sep-2020	----	----	----		06-Oct-2020	28 days	8 days	✓	
<b>Anions and Nutrients : Sulfate in Water by IC</b>											
HDPE Westbay-A-Port4-2-DUP-1	E235.SO4	27-Sep-2020	----	----	----		06-Oct-2020	28 days	8 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		
<b>Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port4-1	E318	25-Sep-2020	07-Oct-2020	28 days	11 days	✓	08-Oct-2020	16 days	0 days	✓	
<b>Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port4-2	E318	28-Sep-2020	07-Oct-2020	28 days	8 days	✓	08-Oct-2020	19 days	0 days	✓	
<b>Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port4-1	E372-U	25-Sep-2020	07-Oct-2020	28 days	11 days	✓	08-Oct-2020	16 days	0 days	✓	
<b>Anions and Nutrients : Total Phosphorus by Colourimetry (Ultra Trace)</b>											
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port4-2	E372-U	28-Sep-2020	07-Oct-2020	28 days	8 days	✓	08-Oct-2020	19 days	0 days	✓	
<b>Bacteriological Tests : BART Test for Sulfate Reducing Bacteria (SRB)</b>											
<b>Sterile HDPE (Sodium thiosulphate)</b> Westbay-A-Port4-2	E030.SRB	27-Sep-2020	----	----	----		05-Oct-2020	24 hrs	189 hrs	* EHTR	
<b>Bacteriological Tests : BART Test for Sulfate Reducing Bacteria (SRB)</b>											
<b>Sterile HDPE (Sodium thiosulphate)</b> Westbay-A-Port4-2-DUP-1	E030.SRB	27-Sep-2020	----	----	----		06-Oct-2020	24 hrs	213 hrs	* EHTR	
<b>Bacteriological Tests : BART Test for Sulfate Reducing Bacteria (SRB)</b>											
<b>Sterile HDPE (Sodium thiosulphate)</b> Westbay-A-Port4-1	E030.SRB	25-Sep-2020	----	----	----		05-Oct-2020	24 hrs	237 hrs	* EHTR	
<b>Cyanides : Free Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port4-2-DUP-1	E339	27-Sep-2020	----	----	----		08-Oct-2020	14 days	10 days	✓	
<b>Cyanides : Free Cyanide by CFA</b>											
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port4-2	E339	27-Sep-2020	----	----	----		05-Oct-2020	14 days	7 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	
<b>Cyanides : Free Cyanide by CFA</b>										
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port4-1	E339	25-Sep-2020	----	----	----		05-Oct-2020	14 days	9 days	✔
<b>Cyanides : Total Cyanide by CFA</b>										
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port4-2-DUP-1	E333	27-Sep-2020	----	----	----		08-Oct-2020	14 days	10 days	✔
<b>Cyanides : Total Cyanide by CFA</b>										
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port4-2	E333	27-Sep-2020	----	----	----		05-Oct-2020	14 days	7 days	✔
<b>Cyanides : Total Cyanide by CFA</b>										
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port4-1	E333	25-Sep-2020	----	----	----		05-Oct-2020	14 days	9 days	✔
<b>Cyanides : WAD Cyanide by CFA</b>										
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port4-2-DUP-1	E336	27-Sep-2020	----	----	----		08-Oct-2020	14 days	10 days	✔
<b>Cyanides : WAD Cyanide by CFA</b>										
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port4-2	E336	27-Sep-2020	----	----	----		05-Oct-2020	14 days	7 days	✔
<b>Cyanides : WAD Cyanide by CFA</b>										
<b>UV inhibited HDPE - total (sodium hydroxide)</b> Westbay-A-Port4-1	E336	25-Sep-2020	----	----	----		05-Oct-2020	14 days	9 days	✔
<b>Dissolved Metals : Dissolved Chromium in Water by CRC ICPMS (Low Level)</b>										
<b>HDPE dissolved (nitric acid)</b> Westbay-A-Port4-1	E421.Cr-L	25-Sep-2020	07-Oct-2020	180 days	12 days	✔	08-Oct-2020	167 days	0 days	✔
<b>Dissolved Metals : Dissolved Mercury in Water by CVAAS</b>										
<b>Glass vial dissolved (hydrochloric acid)</b> Westbay-A-Port4-1	E509	25-Sep-2020	07-Oct-2020	28 days	11 days	✔	07-Oct-2020	16 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		
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
<b>HDPE dissolved (nitric acid)</b> Westbay-A-Port4-1	E421	25-Sep-2020	07-Oct-2020	180 days	12 days	✔	08-Oct-2020	167 days	0 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
<b>HDPE dissolved (nitric acid)</b> Westbay-A-Port4-2	E421	28-Sep-2020	07-Oct-2020	180 days	9 days	✔	08-Oct-2020	170 days	0 days	✔	
<b>Dissolved Metals : Dissolved Metals in Water by CRC ICPMS</b>											
<b>HDPE dissolved (nitric acid)</b> Westbay-A-Port4-2-DUP-1	E421	28-Sep-2020	07-Oct-2020	180 days	9 days	✔	08-Oct-2020	170 days	0 days	✔	
<b>Hydrocarbons : CCME PHC - F2-F4 by GC-FID</b>											
<b>Amber glass/Teflon lined cap (sodium bisulfate)</b> Westbay-A-Port4-2	E601	27-Sep-2020	05-Oct-2020	14 days	7 days	✔	07-Oct-2020	40 days	1 days	✔	
<b>Hydrocarbons : CCME PHC - F2-F4 by GC-FID</b>											
<b>Amber glass/Teflon lined cap (sodium bisulfate)</b> Westbay-A-Port4-2-DUP-1	E601	27-Sep-2020	06-Oct-2020	14 days	8 days	✔	06-Oct-2020	40 days	0 days	✔	
<b>Hydrocarbons : CCME PHC - F2-F4 by GC-FID</b>											
<b>Amber glass/Teflon lined cap (sodium bisulfate)</b> Westbay-A-Port4-1	E601	25-Sep-2020	05-Oct-2020	14 days	9 days	✔	07-Oct-2020	40 days	1 days	✔	
<b>Hydrocarbons : VH and F1 by Headspace GC-FID</b>											
<b>Glass vial (sodium bisulfate)</b> Westbay-A-Port4-1	E581.VH+F1	25-Sep-2020	06-Oct-2020	14 days	10 days	✔	06-Oct-2020	3 days	0 days	✔	
<b>Hydrocarbons : VH and F1 by Headspace GC-FID</b>											
<b>Glass vial (sodium bisulfate)</b> Westbay-A-Port4-2-DUP-1	E581.VH+F1	27-Sep-2020	09-Oct-2020	14 days	12 days	✔	10-Oct-2020	1 days	0 days	✔	
<b>Hydrocarbons : VH and F1 by Headspace GC-FID</b>											
<b>Glass vial (sodium bisulfate)</b> Westbay-A-Port4-2	E581.VH+F1	27-Sep-2020	06-Oct-2020	14 days	8 days	✔	06-Oct-2020	5 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	
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>										
<b>Amber glass dissolved (sulfuric acid)</b> Westbay-A-Port4-1	E358-L	25-Sep-2020	----	----	----		07-Oct-2020	28 days	11 days	✓
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>										
<b>Amber glass dissolved (sulfuric acid)</b> Westbay-A-Port4-2	E358-L	27-Sep-2020	----	----	----		07-Oct-2020	28 days	9 days	✓
<b>Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)</b>										
<b>Amber glass dissolved (sulfuric acid)</b> Westbay-A-Port4-2-DUP-1	E358-L	27-Sep-2020	----	----	----		07-Oct-2020	28 days	9 days	✓
<b>Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)</b>										
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port4-1	E355-L	25-Sep-2020	----	----	----		07-Oct-2020	28 days	11 days	✓
<b>Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)</b>										
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port4-2	E355-L	28-Sep-2020	----	----	----		07-Oct-2020	28 days	8 days	✓
<b>Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)</b>										
<b>Amber glass total (sulfuric acid)</b> Westbay-A-Port4-2-DUP-1	E355-L	27-Sep-2020	----	----	----		07-Oct-2020	28 days	9 days	✓
<b>Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)</b>										
<b>Amber glass total (lab preserved)</b> Westbay-A-Port4-2	E355-L	27-Sep-2020	----	----	----		04-Oct-2020	3 days	6 days	* EHTR
<b>Physical Tests : Alkalinity Species by Titration</b>										
<b>HDPE</b> Westbay-A-Port4-1	E290	25-Sep-2020	----	----	----		06-Oct-2020	14 days	10 days	✓
<b>Physical Tests : Alkalinity Species by Titration</b>										
<b>HDPE</b> Westbay-A-Port4-2	E290	27-Sep-2020	----	----	----		06-Oct-2020	14 days	8 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						
<b>Physical Tests : Alkalinity Species by Titration</b>										
HDPE Westbay-A-Port4-2-DUP-1	E290	27-Sep-2020	----	----	----		06-Oct-2020	14 days	8 days	✓
<b>Physical Tests : Conductivity in Water</b>										
HDPE Westbay-A-Port4-1	E100	25-Sep-2020	----	----	----		06-Oct-2020	28 days	10 days	✓
<b>Physical Tests : Conductivity in Water</b>										
HDPE Westbay-A-Port4-2	E100	27-Sep-2020	----	----	----		06-Oct-2020	28 days	8 days	✓
<b>Physical Tests : Conductivity in Water</b>										
HDPE Westbay-A-Port4-2-DUP-1	E100	27-Sep-2020	----	----	----		06-Oct-2020	28 days	8 days	✓
<b>Physical Tests : pH by Meter</b>										
HDPE Westbay-A-Port4-2	E108	27-Sep-2020	----	----	----		06-Oct-2020	0.25 hrs	210 hrs	* EHTR-FM
<b>Physical Tests : pH by Meter</b>										
HDPE Westbay-A-Port4-2-DUP-1	E108	27-Sep-2020	----	----	----		06-Oct-2020	0.25 hrs	210 hrs	* EHTR-FM
<b>Physical Tests : pH by Meter</b>										
HDPE Westbay-A-Port4-1	E108	25-Sep-2020	----	----	----		06-Oct-2020	0.25 hrs	258 hrs	* EHTR-FM
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE Westbay-A-Port4-2	E162	27-Sep-2020	----	----	----		02-Oct-2020	7 days	5 days	✓
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE Westbay-A-Port4-1	E162	25-Sep-2020	----	----	----		02-Oct-2020	7 days	6 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	
<b>Physical Tests : TDS by Gravimetry</b>										
HDPE Westbay-A-Port4-2-DUP-1	E162	27-Sep-2020	----	----	----		05-Oct-2020	7 days	8 days	* EHT
<b>Physical Tests : TSS by Gravimetry</b>										
HDPE Westbay-A-Port4-2	E160-H	27-Sep-2020	----	----	----		02-Oct-2020	7 days	5 days	✓
<b>Physical Tests : TSS by Gravimetry</b>										
HDPE Westbay-A-Port4-1	E160-H	25-Sep-2020	----	----	----		02-Oct-2020	7 days	6 days	✓
<b>Physical Tests : TSS by Gravimetry</b>										
HDPE Westbay-A-Port4-2-DUP-1	E160-H	27-Sep-2020	----	----	----		05-Oct-2020	7 days	8 days	* EHT
<b>Physical Tests : Turbidity by Nephelometry</b>										
HDPE Westbay-A-Port4-2	E121	27-Sep-2020	----	----	----		04-Oct-2020	3 days	6 days	* EHTR
<b>Physical Tests : Turbidity by Nephelometry</b>										
HDPE Westbay-A-Port4-1	E121	25-Sep-2020	----	----	----		04-Oct-2020	3 days	8 days	* EHTR
<b>Physical Tests : Turbidity by Nephelometry</b>										
HDPE Westbay-A-Port4-2-DUP-1	E121	27-Sep-2020	----	----	----		05-Oct-2020	3 days	8 days	* EHTR
<b>Radiological Parameters : Radium-226 by Radon Emanation</b>										
HDPE total (nitric acid) Westbay-A-Port4-2	RA226-MMER	27-Sep-2020	----	----	----		19-Oct-2020	180 days	21 days	✓
<b>Radiological Parameters : Radium-226 by Radon Emanation</b>										
HDPE total (nitric acid) Westbay-A-Port4-2-DUP-1	RA226-MMER	27-Sep-2020	----	----	----		19-Oct-2020	180 days	21 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		
<b>Radiological Parameters : Radium-226 by Radon Emanation</b>											
<b>HDPE total (nitric acid)</b> Westbay-A-Port4-1	RA226-MMER	25-Sep-2020	----	----	----		19-Oct-2020	180 days	23 days	✓	
<b>Speciated Metals : Dissolved Ferrous Iron in Water by Colour</b>											
<b>Opaque HDPE Dissolved (hydrochloric acid)</b> Westbay-A-Port4-2	E541	28-Sep-2020	02-Oct-2020	7 days	4 days	✓	02-Oct-2020	2 days	0 days	✓	
<b>Speciated Metals : Dissolved Ferrous Iron in Water by Colour</b>											
<b>Opaque HDPE Dissolved (hydrochloric acid)</b> Westbay-A-Port4-1	E541	25-Sep-2020	02-Oct-2020	7 days	7 days	✓	02-Oct-2020	-1 days	0 days	✓	
<b>Speciated Metals : Dissolved Ferrous Iron in Water by Colour</b>											
<b>Opaque HDPE Dissolved (hydrochloric acid)</b> Westbay-A-Port4-2-DUP-1	E541	28-Sep-2020	05-Oct-2020	7 days	7 days	✓	05-Oct-2020	-1 days	0 days	✓	
<b>Stable Isotope : Stable Isotope Analysis in Water (Deuterium and Oxygen 18)</b>											
<b>HDPE</b> Westbay-A-Port3-1	H2+O18	28-Sep-2020	----	----	----		03-Nov-2020	----	----		
<b>Stable Isotope : Stable Isotope Analysis in Water (Deuterium and Oxygen 18)</b>											
<b>HDPE</b> Westbay-A-Port4-1	H2+O18	25-Sep-2020	----	----	----		03-Nov-2020	----	----		
<b>Stable Isotope : Stable Isotope Analysis in Water (Deuterium and Oxygen 18)</b>											
<b>HDPE</b> Westbay-A-Port4-2	H2+O18	28-Sep-2020	----	----	----		03-Nov-2020	----	----		
<b>Stable Isotope : Stable Isotope Analysis in Water (Deuterium and Oxygen 18)</b>											
<b>HDPE</b> Westbay-A-Port9-1	H2+O18	28-Sep-2020	----	----	----		03-Nov-2020	----	----		
<b>Total Metals : Total Chromium in Water by CRC ICPMS (Low Level)</b>											
<b>HDPE total (nitric acid)</b> Westbay-A-Port4-1	E420.Cr-L	25-Sep-2020	----	----	----		09-Oct-2020	180 days	14 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	
<b>Total Metals : Total Mercury in Water by CVAAS</b>										
<b>Glass vial total (hydrochloric acid)</b> Westbay-A-Port4-1	E508	25-Sep-2020	----	----	----		06-Oct-2020	28 days	10 days	✓
<b>Total Metals : Total Metals in Water by CRC ICPMS</b>										
<b>HDPE total (nitric acid)</b> Westbay-A-Port4-2	E420	28-Sep-2020	----	----	----		09-Oct-2020	180 days	11 days	✓
<b>Total Metals : Total Metals in Water by CRC ICPMS</b>										
<b>HDPE total (nitric acid)</b> Westbay-A-Port4-2-DUP-1	E420	28-Sep-2020	----	----	----		09-Oct-2020	180 days	11 days	✓
<b>Total Metals : Total Metals in Water by CRC ICPMS</b>										
<b>HDPE total (nitric acid)</b> Westbay-A-Port4-1	E420	25-Sep-2020	----	----	----		09-Oct-2020	180 days	14 days	✓
<b>Volatile Organic Compounds [BTEXS+MTBE] : BTEX by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay-A-Port4-1	E611A	25-Sep-2020	06-Oct-2020	14 days	10 days	✓	06-Oct-2020	3 days	0 days	✓
<b>Volatile Organic Compounds [BTEXS+MTBE] : BTEX by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay-A-Port4-2-DUP-1	E611A	27-Sep-2020	09-Oct-2020	14 days	12 days	✓	10-Oct-2020	1 days	0 days	✓
<b>Volatile Organic Compounds [BTEXS+MTBE] : BTEX by Headspace GC-MS</b>										
<b>Glass vial (sodium bisulfate)</b> Westbay-A-Port4-2	E611A	27-Sep-2020	06-Oct-2020	14 days	8 days	✓	06-Oct-2020	5 days	0 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 (%)		Evaluation
			QC	Regular	Actual	Expected	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Alkalinity Species by Titration	E290	97657	1	10	10.0	5.0	✔
Ammonia by Fluorescence	E298	98634	1	17	5.8	5.0	✔
BART Test for Sulfate Reducing Bacteria (SRB)	E030.SRB	97361	0	3	0.0	3.3	✘
Biochemical Oxygen Demand - 5 day	E550	97873	1	30	3.3	5.0	✘
Bromide in Water by IC (Low Level)	E235.Br-L	97646	1	8	12.5	5.0	✔
BTEX by Headspace GC-MS	E611A	97113	1	17	5.8	5.0	✔
Chemical Oxygen Demand by Colourimetry	E559	99185	1	19	5.2	5.0	✔
Chloride in Water by IC	E235.Cl	97645	1	17	5.8	5.0	✔
Conductivity in Water	E100	97656	1	19	5.2	5.0	✔
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	98878	1	16	6.2	5.0	✔
Dissolved Ferrous Iron in Water by Colour	E541	96103	2	5	40.0	5.0	✔
Dissolved Mercury in Water by CVAAS	E509	98539	1	9	11.1	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	98879	1	19	5.2	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	98631	1	13	7.6	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	97659	1	19	5.2	5.0	✔
Fluoride in Water by IC	E235.F	97644	1	17	5.8	5.0	✔
Free Cyanide by CFA	E339	97377	1	2	50.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	97647	1	8	12.5	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	97648	1	19	5.2	5.0	✔
pH by Meter	E108	97655	1	19	5.2	5.0	✔
Reactive Silica by Colourimetry	E392	97593	1	16	6.2	5.0	✔
Sulfate in Water by IC	E235.SO4	97649	1	17	5.8	5.0	✔
TDS by Gravimetry	E162	96107	3	60	5.0	5.0	✔
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	98484	1	9	11.1	5.0	✔
Total Cyanide by CFA	E333	97375	1	14	7.1	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	98630	1	2	50.0	5.0	✔
Total Mercury in Water by CVAAS	E508	97847	1	20	5.0	5.0	✔
Total Metals in Water by CRC ICPMS	E420	98483	1	15	6.6	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	96927	2	16	12.5	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	98633	1	12	8.3	5.0	✔
TSS by Gravimetry	E160-H	96105	3	60	5.0	5.0	✔
Turbidity by Nephelometry	E121	97043	2	40	5.0	5.0	✔
VH and F1 by Headspace GC-FID	E581.VH+F1	97112	1	8	12.5	5.0	✔
WAD Cyanide by CFA	E336	97376	1	13	7.6	5.0	✔
<b>Laboratory Control Samples (LCS)</b>							
Alkalinity Species by Titration	E290	97657	1	10	10.0	5.0	✔
Ammonia by Fluorescence	E298	98634	1	17	5.8	5.0	✔



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
<b>Analytical Methods</b>							
<b>Laboratory Control Samples (LCS) - Continued</b>							
Biochemical Oxygen Demand - 5 day	E550	97873	2	30	6.6	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	97646	1	8	12.5	5.0	✓
BTEX by Headspace GC-MS	E611A	97113	1	17	5.8	5.0	✓
CCME PHC - F2-F4 by GC-FID	E601	97119	1	6	16.6	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	99185	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	97645	1	17	5.8	5.0	✓
Conductivity in Water	E100	97656	1	19	5.2	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	98878	1	16	6.2	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	96103	2	5	40.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	98539	1	9	11.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	98879	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	98631	1	13	7.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	97659	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	97644	1	17	5.8	5.0	✓
Free Cyanide by CFA	E339	97377	1	2	50.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	97647	1	8	12.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	97648	1	19	5.2	5.0	✓
Oil & Grease by Gravimetry	E567	98435	2	16	12.5	5.0	✓
pH by Meter	E108	97655	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	97593	1	16	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	97649	1	17	5.8	5.0	✓
TDS by Gravimetry	E162	96107	3	60	5.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	98484	1	9	11.1	5.0	✓
Total Cyanide by CFA	E333	97375	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	98630	1	2	50.0	5.0	✓
Total Mercury in Water by CVAAS	E508	97847	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	98483	1	15	6.6	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	96927	2	16	12.5	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	98633	1	12	8.3	5.0	✓
TSS by Gravimetry	E160-H	96105	3	60	5.0	5.0	✓
Turbidity by Nephelometry	E121	97043	2	40	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	97112	1	8	12.5	5.0	✓
WAD Cyanide by CFA	E336	97376	1	13	7.6	5.0	✓
<b>Method Blanks (MB)</b>							
Alkalinity Species by Titration	E290	97657	1	10	10.0	5.0	✓
Ammonia by Fluorescence	E298	98634	1	17	5.8	5.0	✓
BART Test for Sulfate Reducing Bacteria (SRB)	E030.SRB	97361	2	3	66.6	3.3	✓
Biochemical Oxygen Demand - 5 day	E550	97873	2	30	6.6	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	97646	1	8	12.5	5.0	✓
BTEX by Headspace GC-MS	E611A	97113	1	17	5.8	5.0	✓
CCME PHC - F2-F4 by GC-FID	E601	97119	1	6	16.6	5.0	✓



Matrix: **Water**

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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
<b>Analytical Methods</b>							
<b>Method Blanks (MB) - Continued</b>							
Chemical Oxygen Demand by Colourimetry	E559	99185	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	97645	1	17	5.8	5.0	✓
Conductivity in Water	E100	97656	1	19	5.2	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	98878	1	16	6.2	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	96103	2	5	40.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	98539	1	9	11.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	98879	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	98631	1	13	7.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	97659	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	97644	1	17	5.8	5.0	✓
Free Cyanide by CFA	E339	97377	1	2	50.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	97647	1	8	12.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	97648	1	19	5.2	5.0	✓
Oil & Grease by Gravimetry	E567	98435	2	16	12.5	5.0	✓
Reactive Silica by Colourimetry	E392	97593	1	16	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	97649	1	17	5.8	5.0	✓
TDS by Gravimetry	E162	96107	3	60	5.0	5.0	✓
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	98484	1	9	11.1	5.0	✓
Total Cyanide by CFA	E333	97375	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	98630	1	2	50.0	5.0	✓
Total Mercury in Water by CVAAS	E508	97847	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	98483	1	15	6.6	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	96927	2	16	12.5	5.0	✓
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	98633	1	12	8.3	5.0	✓
TSS by Gravimetry	E160-H	96105	3	60	5.0	5.0	✓
Turbidity by Nephelometry	E121	97043	2	40	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	97112	1	8	12.5	5.0	✓
WAD Cyanide by CFA	E336	97376	1	13	7.6	5.0	✓
<b>Matrix Spikes (MS)</b>							
Ammonia by Fluorescence	E298	98634	1	17	5.8	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	97646	1	8	12.5	5.0	✓
BTEX by Headspace GC-MS	E611A	97113	1	17	5.8	5.0	✓
Chemical Oxygen Demand by Colourimetry	E559	99185	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	97645	1	17	5.8	5.0	✓
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L	98878	1	16	6.2	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	96103	2	5	40.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	98539	1	9	11.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	98879	1	19	5.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	98631	1	13	7.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U	97659	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	97644	1	17	5.8	5.0	✓



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
<i>Analytical Methods</i>							
<b>Matrix Spikes (MS) - Continued</b>							
Free Cyanide by CFA	E339	97377	1	2	50.0	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	97647	1	8	12.5	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	97648	1	19	5.2	5.0	✔
Reactive Silica by Colourimetry	E392	97593	1	16	6.2	5.0	✔
Sulfate in Water by IC	E235.SO4	97649	1	17	5.8	5.0	✔
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L	98484	1	9	11.1	5.0	✔
Total Cyanide by CFA	E333	97375	1	14	7.1	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	98630	1	2	50.0	5.0	✔
Total Mercury in Water by CVAAS	E508	97847	1	20	5.0	5.0	✔
Total Metals in Water by CRC ICPMS	E420	98483	1	15	6.6	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	96927	2	16	12.5	5.0	✔
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U	98633	1	12	8.3	5.0	✔
VH and F1 by Headspace GC-FID	E581.VH+F1	100490	1	17	5.8	5.0	✔
WAD Cyanide by CFA	E336	97376	1	13	7.6	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
BART Test for Sulfate Reducing Bacteria (SRB)	E030.SRB Calgary - Environmental	Water	Droyocon Bioconcepts Inc., 2014	Sulfate Reducing Bacteria (SRB) are determined using a Biological Activity Reaction Test (BART). The SRB-BART determined approximate results within 10 days, however operators using the SRB-BART method for the detection of deep-seated SRB infestations associated with wells and distribution systems may find it advantageous to request the test continue for 15 days. By default this test will only run for 10 days.
Conductivity in Water	E100 Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Vancouver - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TSS by Gravimetry	E160-H Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Vancouver - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC (Low Level)	E235.Br-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Nitrite in Water by IC (Low Level)	E235.NO2-L  Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L  Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4  Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290  Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298  Vancouver - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318  Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Total Kjeldahl Nitrogen is determined using block digestion followed by flow-injection analysis with fluorescence detection.
Total Cyanide by CFA	E333  Waterloo - Environmental	Water	ISO 14403 (mod)	Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.
WAD Cyanide by CFA	E336  Waterloo - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.
Free Cyanide by CFA	E339  Vancouver - Environmental	Water	ASTM D7237 (mod)	Free cyanide is determined by in-line gas diffusion at pH 6 with final determination by colourimetric analysis.
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L  Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Organic Carbon by Combustion (Low Level)	E358-L  Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (Ultra Trace)	E372-U  Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	E378-U  Vancouver - Environmental	Water	APHA 4500-P E (mod)	Dissolved Orthophosphate is determined colourimetrically on a water sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392  Vancouver - Environmental	Water	APHA 4500-SiO <sub>2</sub> E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test.
Total Metals in Water by CRC ICPMS	E420  Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Chromium in Water by CRC ICPMS (Low Level)	E420.Cr-L  Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.
Dissolved Metals in Water by CRC ICPMS	E421  Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Chromium in Water by CRC ICPMS (Low Level)	E421.Cr-L  Vancouver - Environmental	Water	APHA 3030 B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS
Total Mercury in Water by CVAAS	E508  Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509  Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Ferrous Iron in Water by Colour	E541 Vancouver - Environmental	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and Environ. Sci. Technol. 1999, 33, 5, 807–813. The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method. Holding time is 7 days for 0.45um filtration or 6 months if samples have been filtered using 0.1um filters.
Biochemical Oxygen Demand - 5 day	E550 Vancouver - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Chemical Oxygen Demand by Colourimetry	E559 Vancouver - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Oil & Grease by Gravimetry	E567 Calgary - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane and the extract is evaporated to dryness. The residue is then weighed to determine Oil and Grease.
VH and F1 by Headspace GC-FID	E581.VH+F1 Vancouver - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and 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.
CCME PHC - F2-F4 by GC-FID	E601 Calgary - Environmental	Water	CCME PHC in Soil - Tier 1	CCME Fractions 2-4 (F2-F4) are analyzed by GC-FID.
BTEX by Headspace GC-MS	E611A Calgary - 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.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
Salinity in Seawater (calculation)	EC100S Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a seawater sample. Conductivity measurements are temperature-compensated to 25°C. Salinity in Practical Salinity Units is calculated.
F1-BTEX	EC580 Calgary - 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).





Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Stable Isotope Analysis in Water (Deuterium and Oxygen 18)	H2+O18  Isobrine Solutions Inc. - 9330 60 Avenue NW Edmonton Alberta Canada T6E 0C1	Water	see attached	See attached report.
Radium-226 by Radon Emanation	RA226-MMER  Fort Collins - Environmental - 225 Commerce Drive Fort Collins Colorado United States 80524	Water	EPA 903.1	Radium-226 in sample was analyzed according to the current revision of SOP 783.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for TKN in water	EP318  Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested using block digestion with Copper Sulfate Digestion Reagent.
Digestion for Total Phosphorus in water	EP372  Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421  Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509  Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
Dissolved Ferrous Iron in Water by Colour	EP541  Vancouver - Environmental	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and "A New Method for the Direct Determination of Dissolved Iron Concentration in Acid Mine Waters" published by James W. Ball et al (1999). The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method.
Oil & Grease Extraction for Gravimetry	EP567  Calgary - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane by liquid-liquid extraction.
VOCs Preparation for Headspace Analysis	EP581  Calgary - 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  Calgary - 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 : **VA20B7020**

Page : 1 of 26

Client : Golder Associates Ltd.  
 Contact : Adrian Kowalchuk  
 Address : # 400 - 543 Granville Street  
 Vancouver BC Canada V6C 1X8  
 Telephone : 204 489 9600  
 Project : 20136436-2300-2304  
 PO : ----  
 C-O-C number : ----  
 Sampler : M. Bowman  
 Site : Meliadine - Westbay A  
 Quote number : VA20-AEML100-001 (Q72802)  
 No. of samples received : 8  
 No. of samples analysed : 7

Laboratory : Vancouver - Environmental  
 Account Manager : Heather McKenzie  
 Address : 8081 Lougheed Highway  
 Burnaby, British Columbia Canada V5A 1W9  
 Telephone : +1 604 253 4188  
 Date Samples Received : 02-Oct-2020 08:20  
 Date Analysis Commenced : 02-Oct-2020  
 Issue Date : 04-Nov-2020 11:36

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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

### 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.

Signatories	Position	Laboratory Department
Brianna Allen	Department Manager - Organics	Organics, Burnaby, British Columbia
Bruna Botti	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Inorganics - Water Quality, Burnaby, British Columbia
Cynthia Bauer		Organics, Calgary, Alberta
Dee Lee	Analyst	Metals, Burnaby, British Columbia
Gloria Chan	Lab Analyst	Metals, Burnaby, British Columbia
Jeanie Mark		Organics, Calgary, Alberta
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Kaitlyn Gardner	Account Manager Assistant	External Subcontracting, Edmonton, Alberta
Kaitlyn Gardner	Account Manager Assistant	Internal Subcontracting, Fort Collins, Colorado
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics - Water Quality, Burnaby, British Columbia
Monica Ko	Lab Assistant	Metals, Burnaby, British Columbia
Shaneel Dayal	Analyst	Metals, Burnaby, British Columbia

Sunil Palak  
Tracy Harley

Supervisor - Water Quality Instrumentation

Microbiology, Calgary, Alberta  
Inorganics - Water Quality, Burnaby, British Columbia

Page : 3 of 26  
Work Order : VA20B7020  
Client : Golder Associates Ltd.  
Project : 20136436-2300-2304

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## **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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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



## 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: <b>Water</b>					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
<b>Physical Tests (QC Lot: 96105)</b>											
VA20B7011-001	Anonymous	solids, total suspended [TSS]	----	E160-H	3.0	mg/L	1090	1080	1.14%	20%	----
<b>Physical Tests (QC Lot: 96107)</b>											
VA20B7011-001	Anonymous	solids, total dissolved [TDS]	----	E162	13	mg/L	162	153	5.70%	20%	----
<b>Physical Tests (QC Lot: 96254)</b>											
VA20B6509-005	Anonymous	solids, total dissolved [TDS]	----	E162	400	mg/L	130000	132000	1.38%	20%	----
<b>Physical Tests (QC Lot: 96269)</b>											
VA20B6509-005	Anonymous	solids, total suspended [TSS]	----	E160-H	3.0	mg/L	6.9	6.3	0.6	Diff <2x LOR	----
<b>Physical Tests (QC Lot: 97043)</b>											
VA20B6737-001	Anonymous	turbidity	----	E121	0.10	NTU	0.22	0.23	0.01	Diff <2x LOR	----
<b>Physical Tests (QC Lot: 97427)</b>											
KS2002011-001	Anonymous	turbidity	----	E121	0.10	NTU	13.0	14.4	10.2%	15%	----
<b>Physical Tests (QC Lot: 97599)</b>											
VA20B6862-010	Anonymous	solids, total suspended [TSS]	----	E160-H	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
<b>Physical Tests (QC Lot: 97603)</b>											
VA20B6881-007	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	1580	1710	8.13%	20%	----
<b>Physical Tests (QC Lot: 97655)</b>											
VA20B7020-003	Westbay-A-Port4-2	pH	----	E108	0.10	pH units	9.22	9.21	0.108%	4%	----
<b>Physical Tests (QC Lot: 97656)</b>											
VA20B7020-003	Westbay-A-Port4-2	conductivity	----	E100	2.0	µS/cm	95100	95200	0.105%	10%	----
<b>Physical Tests (QC Lot: 97657)</b>											
VA20B7020-003	Westbay-A-Port4-2	alkalinity, bicarbonate (as CaCO3)	----	E290	2.0	mg/L	290	281	2.94%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	2.0	mg/L	157	153	2.58%	20%	----
		alkalinity, hydroxide (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	2.0	mg/L	78.4	76.4	2.58%	20%	----
		alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	446	434	2.82%	20%	----
<b>Anions and Nutrients (QC Lot: 97593)</b>											
VA20B7020-001	Westbay-A-Port4-1	silicate (as SiO2)	7631-86-9	E392	5.00	mg/L	<5.00	<5.00	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 97644)</b>											
VA20B4192-005	Anonymous	fluoride	16984-48-8	E235.F	0.400	mg/L	2.08	2.02	0.054	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 97645)</b>											
VA20B4192-005	Anonymous	chloride	16887-00-6	E235.Cl	10.0	mg/L	37.3	36.5	0.73	Diff <2x LOR	----

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 Work Order : VA20B7020  
 Client : Golder Associates Ltd.  
 Project : 20136436-2300-2304



Sub-Matrix: <b>Water</b>					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
<b>Anions and Nutrients (QC Lot: 97646)</b>											
VA20B4192-005	Anonymous	bromide	24959-67-9	E235.Br-L	1.00	mg/L	<1.00	<1.00	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 97647)</b>											
VA20B4192-005	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 97648)</b>											
VA20B4192-005	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 97649)</b>											
VA20B4192-005	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	6.00	mg/L	1360	1330	1.82%	20%	----
<b>Anions and Nutrients (QC Lot: 97659)</b>											
VA20B4192-005	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0011	<0.0010	0.0001	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 98630)</b>											
VA20B7020-001	Westbay-A-Port4-1	Kjeldahl nitrogen, total [TKN]	----	E318	1.00	mg/L	2.40	2.46	0.061	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 98633)</b>											
VA20B6955-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0032	0.0025	0.0007	Diff <2x LOR	----
<b>Anions and Nutrients (QC Lot: 98634)</b>											
VA20B6955-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 97375)</b>											
VA20B7011-011	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 97376)</b>											
VA20B7011-011	Anonymous	cyanide, weak acid dissociable	----	E336	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 97377)</b>											
VA20B7020-001	Westbay-A-Port4-1	cyanide, free	----	E339	0.0500	mg/L	<0.0500	<0.0500	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 99219)</b>											
VA20B7020-004	Westbay-A-Port4-2-DUP-1	cyanide, strong acid dissociable (total)	----	E333	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 99220)</b>											
VA20B7020-004	Westbay-A-Port4-2-DUP-1	cyanide, weak acid dissociable	----	E336	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
<b>Cyanides (QC Lot: 99221)</b>											
VA20B7020-004	Westbay-A-Port4-2-DUP-1	cyanide, free	----	E339	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
<b>Organic / Inorganic Carbon (QC Lot: 96927)</b>											
VA20B7011-031	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	0.73	<0.50	0.23	Diff <2x LOR	----
<b>Organic / Inorganic Carbon (QC Lot: 98631)</b>											
VA20B6955-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.65	1.59	0.06	Diff <2x LOR	----
<b>Organic / Inorganic Carbon (QC Lot: 98632)</b>											
VA20B6955-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.93	1.84	0.10	Diff <2x LOR	----
<b>Total Metals (QC Lot: 97847)</b>											



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
<b>Total Metals (QC Lot: 97847) - continued</b>											
VA20B6978-002	Anonymous	mercury, total	7439-97-6	E508	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
<b>Total Metals (QC Lot: 98483)</b>											
VA20B6858-002	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.194	0.194	0.230%	20%	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	0.00046	0.00046	0.000005	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00410	0.00419	2.27%	20%	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0353	0.0365	3.25%	20%	----
		beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.000050	mg/L	0.0000660	0.0000640	3.10%	20%	----
		calcium, total	7440-70-2	E420	0.050	mg/L	22.9	22.7	1.09%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	0.000642	0.000666	3.50%	20%	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00086	0.00087	0.000008	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	0.00372	0.00388	0.00016	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	0.217	0.218	0.154%	20%	----
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000294	0.000294	0.0000003	Diff <2x LOR	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.100	mg/L	0.750	0.765	0.0147	Diff <2x LOR	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.0753	0.0764	1.43%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000410	0.000431	0.000021	Diff <2x LOR	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	0.00050	0.0000006	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.300	mg/L	<0.300	<0.300	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	0.131	0.135	0.004	Diff <2x LOR	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00030	0.00030	0.0000008	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	0.000229	0.000254	0.000025	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	1.16	1.10	5.34%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	17341-25-2	E420	0.050	mg/L	0.699	0.716	2.38%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.178	0.178	0.219%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	14.0	14.7	4.80%	20%	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----



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
<b>Total Metals (QC Lot: 98483) - continued</b>											
VA20B6858-002	Anonymous	tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000080	0.000081	0.000001	Diff <2x LOR	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	0.0108	0.0097	0.0012	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
<b>Total Metals (QC Lot: 98484)</b>											
VA20B6858-002	Anonymous	chromium, total	7440-47-3	E420.Cr-L	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 98539)</b>											
VA20B7011-019	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 98878)</b>											
VA20B7020-001	Westbay-A-Port4-1	chromium, dissolved	7440-47-3	E421.Cr-L	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
<b>Dissolved Metals (QC Lot: 98879)</b>											
VA20B7020-001	Westbay-A-Port4-1	aluminum, dissolved	7429-90-5	E421	0.200	mg/L	<0.200	<0.200	0	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.0200	mg/L	5.56	5.55	0.319%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	2.00	mg/L	72.1	69.8	3.24%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	10.0	mg/L	23800	22400	6.20%	20%	----
		cesium, dissolved	7440-46-2	E421	0.00200	mg/L	1.56	1.59	1.74%	20%	----
		chromium, dissolved	7440-47-3	E421	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.0400	mg/L	<0.0400	<0.0400	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	2.00	mg/L	<2.00	<2.00	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.200	mg/L	75.4	74.4	1.31%	20%	----
		magnesium, dissolved	7439-95-4	E421	1.00	mg/L	309	310	0.433%	20%	----
		manganese, dissolved	7439-96-5	E421	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.0100	mg/L	0.0401	0.0438	0.00373	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E421	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	10.0	mg/L	<10.0	<10.0	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	10.0	mg/L	1080	1060	2.27%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.0400	mg/L	3.68	3.68	0.221%	20%	----





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
<b>Dissolved Metals (QC Lot: 98879) - continued</b>											
VA20B7020-001	Westbay-A-Port4-1	selenium, dissolved	7782-49-2	E421	0.0100	mg/L	0.0186	0.0180	0.000513	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	10.0	mg/L	<10.0	<10.0	0	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		sodium, dissolved	17341-25-2	E421	10.0	mg/L	2950	3000	1.62%	20%	----
		strontium, dissolved	7440-24-6	E421	0.0400	mg/L	1070	1080	1.26%	20%	----
		sulfur, dissolved	7704-34-9	E421	100	mg/L	<100	<100	0	Diff <2x LOR	----
		tellurium, dissolved	13494-80-9	E421	0.0400	mg/L	0.0577	0.0704	0.0127	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.00200	mg/L	0.100	0.0948	5.87%	20%	----
		thorium, dissolved	7440-29-1	E421	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.0600	mg/L	<0.0600	<0.0600	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.0200	mg/L	<0.0200	<0.0200	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		vanadium, dissolved	7440-62-2	E421	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
zinc, dissolved	7440-66-6	E421	0.200	mg/L	<0.200	<0.200	0	Diff <2x LOR	----		
zirconium, dissolved	7440-67-7	E421	0.0400	mg/L	<0.0400	<0.0400	0	Diff <2x LOR	----		
<b>Speciated Metals (QC Lot: 96103)</b>											
VA20B7020-001	Westbay-A-Port4-1	iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.020	mg/L	0.020	<0.020	0.0005	Diff <2x LOR	----
<b>Speciated Metals (QC Lot: 97514)</b>											
VA20B7020-007	Westbay-A-Port4-2-DUP-1	iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.020	mg/L	0.054	0.040	0.014	Diff <2x LOR	----
<b>Aggregate Organics (QC Lot: 97873)</b>											
VA20B7271-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.00%	30%	----
<b>Aggregate Organics (QC Lot: 99185)</b>											
VA20B6818-001	Anonymous	chemical oxygen demand [COD]	----	E559	20	mg/L	<20	<20	0	Diff <2x LOR	----
<b>Volatile Organic Compounds (QC Lot: 100491)</b>											
VA20B7020-004	Westbay-A-Port4-2-DUP-1	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	0.85	0.79	0.06	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.50	µg/L	0.68	0.50	0.18	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
<b>Volatile Organic Compounds (QC Lot: 97113)</b>											
VA20B6782-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----

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 Client : Golder Associates Ltd.  
 Project : 20136436-2300-2304



Sub-Matrix: <b>Water</b>					<i>Laboratory Duplicate (DUP) Report</i>						
<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>
<b>Volatile Organic Compounds (QC Lot: 97113) - continued</b>											
VA20B6782-001	Anonymous	methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
<b>Hydrocarbons (QC Lot: 100490)</b>											
VA20B7020-004	Westbay-A-Port4-2-DUP-1	F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.00%	30%	----
<b>Hydrocarbons (QC Lot: 97112)</b>											
VA20B6782-001	Anonymous	F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	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
<b>Physical Tests (QCLot: 96105)</b>						
solids, total suspended [TSS]	----	E160-H	3	mg/L	<3.0	----
<b>Physical Tests (QCLot: 96107)</b>						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
<b>Physical Tests (QCLot: 96254)</b>						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
<b>Physical Tests (QCLot: 96269)</b>						
solids, total suspended [TSS]	----	E160-H	3	mg/L	<3.0	----
<b>Physical Tests (QCLot: 97043)</b>						
turbidity	----	E121	0.1	NTU	<0.10	----
<b>Physical Tests (QCLot: 97427)</b>						
turbidity	----	E121	0.1	NTU	<0.10	----
<b>Physical Tests (QCLot: 97599)</b>						
solids, total suspended [TSS]	----	E160-H	3	mg/L	<3.0	----
<b>Physical Tests (QCLot: 97603)</b>						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
<b>Physical Tests (QCLot: 97656)</b>						
conductivity	----	E100	1	µS/cm	1.0	----
<b>Physical Tests (QCLot: 97657)</b>						
alkalinity, bicarbonate (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, carbonate (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, hydroxide (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, phenolphthalein (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
alkalinity, total (as CaCO <sub>3</sub> )	----	E290	1	mg/L	<1.0	----
<b>Anions and Nutrients (QCLot: 97593)</b>						
silicate (as SiO <sub>2</sub> )	7631-86-9	E392	0.5	mg/L	<0.50	----
<b>Anions and Nutrients (QCLot: 97644)</b>						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
<b>Anions and Nutrients (QCLot: 97645)</b>						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
<b>Anions and Nutrients (QCLot: 97646)</b>						
bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
<b>Anions and Nutrients (QCLot: 97647)</b>						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Anions and Nutrients (QCLot: 97648)</b>						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	---
<b>Anions and Nutrients (QCLot: 97649)</b>						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	---
<b>Anions and Nutrients (QCLot: 97659)</b>						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	---
<b>Anions and Nutrients (QCLot: 98630)</b>						
Kjeldahl nitrogen, total [TKN]	---	E318	0.05	mg/L	<0.050	---
<b>Anions and Nutrients (QCLot: 98633)</b>						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	---
<b>Anions and Nutrients (QCLot: 98634)</b>						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
<b>Cyanides (QCLot: 97375)</b>						
cyanide, strong acid dissociable (total)	---	E333	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 97376)</b>						
cyanide, weak acid dissociable	---	E336	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 97377)</b>						
cyanide, free	---	E339	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 99219)</b>						
cyanide, strong acid dissociable (total)	---	E333	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 99220)</b>						
cyanide, weak acid dissociable	---	E336	0.002	mg/L	<0.0020	---
<b>Cyanides (QCLot: 99221)</b>						
cyanide, free	---	E339	0.002	mg/L	<0.0020	---
<b>Organic / Inorganic Carbon (QCLot: 96927)</b>						
carbon, total organic [TOC]	---	E355-L	0.5	mg/L	<0.50	---
<b>Organic / Inorganic Carbon (QCLot: 98631)</b>						
carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
<b>Organic / Inorganic Carbon (QCLot: 98632)</b>						
carbon, total organic [TOC]	---	E355-L	0.5	mg/L	<0.50	---
<b>Bacteriological Tests (QCLot: 97361)</b>						
bacteria, sulfate reducing	---	E030.SRB	1	CFU/1mL	<1	---
<b>Bacteriological Tests (QCLot: 97904)</b>						
bacteria, sulfate reducing	---	E030.SRB	1	CFU/1mL	<1	---
<b>Total Metals (QCLot: 97847)</b>						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	---
<b>Total Metals (QCLot: 98483)</b>						



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Total Metals (QCLot: 98483) - continued</b>						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	---
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	---
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	---
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	---
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	---
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	---
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	---
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	---
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	---
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	---
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	---
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	---
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	---
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	---
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	---
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	---
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	---
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	---
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	---
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	---
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	---
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	---
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	---
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	---
sodium, total	17341-25-2	E420	0.05	mg/L	<0.050	---
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	---
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	---
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	---
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	---
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	---
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	---
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	---
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	---
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Total Metals (QCLot: 98483) - continued</b>						
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	---
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	---
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	---
<b>Total Metals (QCLot: 98484)</b>						
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	<0.00010	---
<b>Dissolved Metals (QCLot: 98539)</b>						
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	---
<b>Dissolved Metals (QCLot: 98878)</b>						
chromium, dissolved	7440-47-3	E421.Cr-L	0.0001	mg/L	<0.00010	---
<b>Dissolved Metals (QCLot: 98879)</b>						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	---
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	---
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	---
barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	---
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	---
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	---
boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	---
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	---
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	---
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	---
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	---
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	---
copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	---
iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	---
lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	---
lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	---
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	---
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	---
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	---
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	---
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	---
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	---
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	---
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	---
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	---
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Dissolved Metals (QCLot: 98879) - continued</b>						
sodium, dissolved	17341-25-2	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
<b>Speciated Metals (QCLot: 96103)</b>						
iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	<0.020	----
<b>Speciated Metals (QCLot: 97514)</b>						
iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	<0.020	----
<b>Aggregate Organics (QCLot: 100316)</b>						
oil & grease (gravimetric)	----	E567	5	mg/L	<5.0	----
<b>Aggregate Organics (QCLot: 97873)</b>						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
<b>Aggregate Organics (QCLot: 98435)</b>						
oil & grease (gravimetric)	----	E567	5	mg/L	<5.0	----
<b>Aggregate Organics (QCLot: 98659)</b>						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
<b>Aggregate Organics (QCLot: 99185)</b>						
chemical oxygen demand [COD]	----	E559	20	mg/L	<20	----
<b>Volatile Organic Compounds (QCLot: 100491)</b>						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.5	µg/L	<0.50	----
xylene, o-	95-47-6	E611A	0.5	µg/L	<0.50	----
<b>Volatile Organic Compounds (QCLot: 97113)</b>						



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Volatile Organic Compounds (QCLot: 97113) - continued</b>						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.5	µg/L	<0.50	----
xylene, o-	95-47-6	E611A	0.5	µg/L	<0.50	----
<b>Hydrocarbons (QCLot: 100490)</b>						
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
<b>Hydrocarbons (QCLot: 97112)</b>						
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
<b>Hydrocarbons (QCLot: 97119)</b>						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
F3 (C16-C34)	----	E601	250	µg/L	<250	----
F4 (C34-C50)	----	E601	250	µg/L	<250	----
<b>Hydrocarbons (QCLot: 97833)</b>						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
F3 (C16-C34)	----	E601	250	µg/L	<250	----
F4 (C34-C50)	----	E601	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				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Physical Tests (QCLot: 96105)</b>									
solids, total suspended [TSS]	---	E160-H	3	mg/L	150 mg/L	92.0	85.0	115	---
<b>Physical Tests (QCLot: 96107)</b>									
solids, total dissolved [TDS]	---	E162	10	mg/L	1000 mg/L	101	85.0	115	---
<b>Physical Tests (QCLot: 96254)</b>									
solids, total dissolved [TDS]	---	E162	10	mg/L	1000 mg/L	102	85.0	115	---
<b>Physical Tests (QCLot: 96269)</b>									
solids, total suspended [TSS]	---	E160-H	3	mg/L	150 mg/L	102	85.0	115	---
<b>Physical Tests (QCLot: 97043)</b>									
turbidity	---	E121	0.1	NTU	200 NTU	104	85.0	115	---
<b>Physical Tests (QCLot: 97427)</b>									
turbidity	---	E121	0.1	NTU	200 NTU	99.5	85.0	115	---
<b>Physical Tests (QCLot: 97599)</b>									
solids, total suspended [TSS]	---	E160-H	3	mg/L	150 mg/L	95.0	85.0	115	---
<b>Physical Tests (QCLot: 97603)</b>									
solids, total dissolved [TDS]	---	E162	10	mg/L	1000 mg/L	98.9	85.0	115	---
<b>Physical Tests (QCLot: 97655)</b>									
pH	---	E108	---	pH units	7 pH units	100	98.0	102	---
<b>Physical Tests (QCLot: 97656)</b>									
conductivity	---	E100	1	µS/cm	146.9 µS/cm	103	90.0	110	---
<b>Physical Tests (QCLot: 97657)</b>									
alkalinity, phenolphthalein (as CaCO3)	---	E290	1	mg/L	229 mg/L	101	75.0	125	---
alkalinity, total (as CaCO3)	---	E290	1	mg/L	500 mg/L	95.7	85.0	115	---
<b>Anions and Nutrients (QCLot: 97593)</b>									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	94.4	85.0	115	---
<b>Anions and Nutrients (QCLot: 97644)</b>									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	---
<b>Anions and Nutrients (QCLot: 97645)</b>									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	103	90.0	110	---
<b>Anions and Nutrients (QCLot: 97646)</b>									
bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	103	85.0	115	---
<b>Anions and Nutrients (QCLot: 97647)</b>									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	104	90.0	110	---



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Anions and Nutrients (QCLot: 97648)</b>									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	106	90.0	110	----
<b>Anions and Nutrients (QCLot: 97649)</b>									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	105	90.0	110	----
<b>Anions and Nutrients (QCLot: 97659)</b>									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	96.0	80.0	120	----
<b>Anions and Nutrients (QCLot: 98630)</b>									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	99.3	75.0	125	----
<b>Anions and Nutrients (QCLot: 98633)</b>									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	88.7	80.0	120	----
<b>Anions and Nutrients (QCLot: 98634)</b>									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.12 mg/L	91.3	85.0	115	----
<b>Cyanides (QCLot: 97375)</b>									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	93.5	80.0	120	----
<b>Cyanides (QCLot: 97376)</b>									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	102	80.0	120	----
<b>Cyanides (QCLot: 97377)</b>									
cyanide, free	----	E339	0.002	mg/L	0.125 mg/L	107	80.0	120	----
<b>Cyanides (QCLot: 99219)</b>									
cyanide, strong acid dissociable (total)	----	E333	0.002	mg/L	0.25 mg/L	93.0	80.0	120	----
<b>Cyanides (QCLot: 99220)</b>									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	98.7	80.0	120	----
<b>Cyanides (QCLot: 99221)</b>									
cyanide, free	----	E339	0.002	mg/L	0.125 mg/L	93.9	80.0	120	----
<b>Organic / Inorganic Carbon (QCLot: 96927)</b>									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	112	80.0	120	----
<b>Organic / Inorganic Carbon (QCLot: 98631)</b>									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	107	80.0	120	----
<b>Organic / Inorganic Carbon (QCLot: 98632)</b>									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	106	80.0	120	----
<b>Total Metals (QCLot: 97847)</b>									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	99.1	80.0	120	----
<b>Total Metals (QCLot: 98483)</b>									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	105	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	106	80.0	120	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
<b>Total Metals (QCLot: 98483) - continued</b>									
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	101	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	96.0	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	102	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	103	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	101	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	100	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	100	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	99.0	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	103	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	103	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	92.0	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	100	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	100	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	101	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	107	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	100	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	101	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	104	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	97.7	80.0	120	----
sodium, total	17341-25-2	E420	0.05	mg/L	50 mg/L	102	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	103	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	96.5	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	105	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	100	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	103	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	94.8	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	103	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	107	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	103	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	102	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	98.5	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Total Metals (QCLot: 98484)</b>									
chromium, total	7440-47-3	E420.Cr-L	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
<b>Dissolved Metals (QCLot: 96103)</b>									
<b>Dissolved Metals (QCLot: 97514)</b>									
<b>Dissolved Metals (QCLot: 98539)</b>									
mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	103	80.0	120	----
<b>Dissolved Metals (QCLot: 98878)</b>									
chromium, dissolved	7440-47-3	E421.Cr-L	0.0001	mg/L	0.25 mg/L	98.8	80.0	120	----
<b>Dissolved Metals (QCLot: 98879)</b>									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	105	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	101	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	105	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	112	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	99.4	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	112	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	101	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	108	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	103	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	103	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	98.8	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	101	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	99.2	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	109	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	98.1	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	104	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	99.6	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	110	70.0	130	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	114	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	106	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	103	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	102	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	105	80.0	120	----
sodium, dissolved	17341-25-2	E421	0.05	mg/L	50 mg/L	107	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	107	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Dissolved Metals (QCLot: 98879) - continued</b>									
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	90.1	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	99.1	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	107	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	107	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	105	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	101	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	105	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	110	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	106	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	105	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
<b>Speciated Metals (QCLot: 96103)</b>									
iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	0.5 mg/L	102	80.0	120	----
<b>Speciated Metals (QCLot: 97514)</b>									
iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	0.5 mg/L	104	80.0	120	----
<b>Aggregate Organics (QCLot: 100316)</b>									
oil & grease (gravimetric)	----	E567	5	mg/L	100 mg/L	79.8	70.0	130	----
<b>Aggregate Organics (QCLot: 97873)</b>									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	88.3	85.0	115	----
<b>Aggregate Organics (QCLot: 98435)</b>									
oil & grease (gravimetric)	----	E567	5	mg/L	100 mg/L	95.0	70.0	130	----
<b>Aggregate Organics (QCLot: 98659)</b>									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	92.8	85.0	115	----
<b>Aggregate Organics (QCLot: 99185)</b>									
chemical oxygen demand [COD]	----	E559	20	mg/L	750 mg/L	99.0	85.0	115	----
<b>Volatile Organic Compounds (QCLot: 100491)</b>									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	89.4	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	102	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	92.2	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	98.1	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	97.6	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.5	µg/L	200 µg/L	95.3	70.0	130	----
xylene, o-	95-47-6	E611A	0.5	µg/L	100 µg/L	96.1	70.0	130	----
<b>Volatile Organic Compounds (QCLot: 97113)</b>									



Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Volatile Organic Compounds (QCLot: 97113) - continued</b>									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	122	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	102	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	116	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	111	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	108	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.5	µg/L	200 µg/L	111	70.0	130	----
xylene, o-	95-47-6	E611A	0.5	µg/L	100 µg/L	111	70.0	130	----
<b>Hydrocarbons (QCLot: 100490)</b>									
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	87.9	70.0	130	----
<b>Hydrocarbons (QCLot: 97112)</b>									
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	100 µg/L	87.7	70.0	130	----
<b>Hydrocarbons (QCLot: 97119)</b>									
F2 (C10-C16)	----	E601	100	µg/L	5371.4 µg/L	95.5	70.0	130	----
F3 (C16-C34)	----	E601	250	µg/L	6243.4 µg/L	99.1	70.0	130	----
F4 (C34-C50)	----	E601	250	µg/L	5679.6 µg/L	101	70.0	130	----
<b>Hydrocarbons (QCLot: 97833)</b>									
F2 (C10-C16)	----	E601	100	µg/L	3538 µg/L	117	70.0	130	----
F3 (C16-C34)	----	E601	250	µg/L	7053 µg/L	108	70.0	130	----
F4 (C34-C50)	----	E601	250	µg/L	5051 µg/L	115	70.0	130	----



## 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 >= 1x 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
<b>Anions and Nutrients (QCLot: 97593)</b>										
VA20B7020-003	Westbay-A-Port4-2	silicate (as SiO2)	7631-86-9	E392	114 mg/L	100 mg/L	114	75.0	125	----
<b>Anions and Nutrients (QCLot: 97644)</b>										
VA20B7194-009	Anonymous	fluoride	16984-48-8	E235.F	1.15 mg/L	1 mg/L	115	75.0	125	----
<b>Anions and Nutrients (QCLot: 97645)</b>										
VA20B7194-009	Anonymous	chloride	16887-00-6	E235.Cl	111 mg/L	100 mg/L	111	75.0	125	----
<b>Anions and Nutrients (QCLot: 97646)</b>										
VA20B7194-009	Anonymous	bromide	24959-67-9	E235.Br-L	0.531 mg/L	0.5 mg/L	106	75.0	125	----
<b>Anions and Nutrients (QCLot: 97647)</b>										
VA20B7194-009	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.78 mg/L	2.5 mg/L	111	75.0	125	----
<b>Anions and Nutrients (QCLot: 97648)</b>										
VA20B7194-009	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.555 mg/L	0.5 mg/L	111	75.0	125	----
<b>Anions and Nutrients (QCLot: 97649)</b>										
VA20B7194-009	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	120 mg/L	100 mg/L	120	75.0	125	----
<b>Anions and Nutrients (QCLot: 97659)</b>										
VA20B7194-009	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0281 mg/L	0.03 mg/L	93.7	70.0	130	----
<b>Anions and Nutrients (QCLot: 98630)</b>										
VA20B7020-008	Westbay-A-Port4-2	Kjeldahl nitrogen, total [TKN]	----	E318	51.3 mg/L	2.5 mg/L	103	70.0	130	----
<b>Anions and Nutrients (QCLot: 98633)</b>										
VA20B6955-002	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0465 mg/L	0.05 mg/L	93.1	70.0	130	----
<b>Anions and Nutrients (QCLot: 98634)</b>										
VA20B6955-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.202 mg/L	0.2 mg/L	101	75.0	125	----
<b>Cyanides (QCLot: 97375)</b>										
VA20B7011-011	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.202 mg/L	0.25 mg/L	80.7	70.0	730	----
<b>Cyanides (QCLot: 97376)</b>										
VA20B7011-011	Anonymous	cyanide, weak acid dissociable	----	E336	0.128 mg/L	0.125 mg/L	102	70.0	130	----
<b>Cyanides (QCLot: 97377)</b>										
VA20B7020-001	Westbay-A-Port4-1	cyanide, free	----	E339	0.129 mg/L	0.125 mg/L	103	70.0	730	----



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
<b>Cyanides (QCLot: 99219)</b>										
VA20B7214-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.244 mg/L	0.25 mg/L	97.5	75.0	125	----
<b>Cyanides (QCLot: 99220)</b>										
VA20B7214-001	Anonymous	cyanide, weak acid dissociable	----	E336	0.129 mg/L	0.125 mg/L	104	75.0	125	----
<b>Organic / Inorganic Carbon (QCLot: 96927)</b>										
VA20B7011-040	Anonymous	carbon, total organic [TOC]	----	E355-L	5.10 mg/L	5 mg/L	102	70.0	130	----
<b>Organic / Inorganic Carbon (QCLot: 98631)</b>										
VA20B6955-002	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	5.23 mg/L	5 mg/L	104	70.0	130	----
<b>Organic / Inorganic Carbon (QCLot: 98632)</b>										
VA20B6955-002	Anonymous	carbon, total organic [TOC]	----	E355-L	4.98 mg/L	5 mg/L	99.5	70.0	130	----
<b>Total Metals (QCLot: 97847)</b>										
VA20B6993-001	Anonymous	mercury, total	7439-97-6	E508	0.0000978 mg/L	0.0001 mg/L	97.8	70.0	130	----
<b>Total Metals (QCLot: 98483)</b>										
VA20B6858-003	Anonymous	aluminum, total	7429-90-5	E420	ND mg/L	0.2 mg/L	ND	70.0	130	----
		antimony, total	7440-36-0	E420	0.0196 mg/L	0.02 mg/L	98.0	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0195 mg/L	0.02 mg/L	97.5	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0391 mg/L	0.04 mg/L	97.7	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00993 mg/L	0.01 mg/L	99.3	70.0	130	----
		boron, total	7440-42-8	E420	0.103 mg/L	0.1 mg/L	103	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00403 mg/L	0.004 mg/L	101	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.00979 mg/L	0.01 mg/L	97.9	70.0	130	----
		chromium, total	7440-47-3	E420	0.0398 mg/L	0.04 mg/L	99.5	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0196 mg/L	0.02 mg/L	98.3	70.0	130	----
		copper, total	7440-50-8	E420	0.0194 mg/L	0.02 mg/L	97.2	70.0	130	----
		iron, total	7439-89-6	E420	1.94 mg/L	2 mg/L	97.0	70.0	130	----
		lead, total	7439-92-1	E420	0.0201 mg/L	0.02 mg/L	101	70.0	130	----
		lithium, total	7439-93-2	E420	0.0934 mg/L	0.1 mg/L	93.4	70.0	130	----
		magnesium, total	7439-95-4	E420	0.924 mg/L	1 mg/L	92.4	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0196 mg/L	0.02 mg/L	98.1	70.0	130	----
		nickel, total	7440-02-0	E420	0.0396 mg/L	0.04 mg/L	99.1	70.0	130	----
		phosphorus, total	7723-14-0	E420	9.74 mg/L	10 mg/L	97.4	70.0	130	----
		potassium, total	7440-09-7	E420	3.80 mg/L	4 mg/L	95.1	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0195 mg/L	0.02 mg/L	97.3	70.0	130	----





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
<b>Total Metals (QCLot: 98483) - continued</b>										
VA20B6858-003	Anonymous	selenium, total	7782-49-2	E420	0.0420 mg/L	0.04 mg/L	105	70.0	130	----
		silicon, total	7440-21-3	E420	9.27 mg/L	10 mg/L	92.7	70.0	130	----
		silver, total	7440-22-4	E420	0.00382 mg/L	0.004 mg/L	95.6	70.0	130	----
		sodium, total	17341-25-2	E420	2.05 mg/L	2 mg/L	102	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	20.8 mg/L	20 mg/L	104	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0403 mg/L	0.04 mg/L	101	70.0	130	----
		thallium, total	7440-28-0	E420	0.00404 mg/L	0.004 mg/L	101	70.0	130	----
		thorium, total	7440-29-1	E420	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		tin, total	7440-31-5	E420	0.0199 mg/L	0.02 mg/L	99.3	70.0	130	----
		titanium, total	7440-32-6	E420	0.0375 mg/L	0.04 mg/L	93.7	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		uranium, total	7440-61-1	E420	0.00415 mg/L	0.004 mg/L	104	70.0	130	----
		vanadium, total	7440-62-2	E420	0.0995 mg/L	0.1 mg/L	99.5	70.0	130	----
		zinc, total	7440-66-6	E420	0.405 mg/L	0.4 mg/L	101	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0396 mg/L	0.04 mg/L	99.0	70.0	130	----
<b>Total Metals (QCLot: 98484)</b>										
VA20B6858-003	Anonymous	chromium, total	7440-47-3	E420.Cr-L	0.0398 mg/L	0.04 mg/L	99.5	70.0	130	----
<b>Dissolved Metals (QCLot: 98539)</b>										
VA20B7011-020	Anonymous	mercury, dissolved	7439-97-6	E509	0.0000998 mg/L	0.0001 mg/L	99.8	70.0	130	----
<b>Dissolved Metals (QCLot: 98878)</b>										
VA20B7406-001	Anonymous	chromium, dissolved	7440-47-3	E421.Cr-L	0.0372 mg/L	0.04 mg/L	92.9	70.0	130	----
<b>Dissolved Metals (QCLot: 98879)</b>										
VA20B7406-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.198 mg/L	0.2 mg/L	98.8	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0409 mg/L	0.04 mg/L	102	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.0102 mg/L	0.01 mg/L	102	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.097 mg/L	0.1 mg/L	97.4	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00404 mg/L	0.004 mg/L	101	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0101 mg/L	0.01 mg/L	101	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0372 mg/L	0.04 mg/L	92.9	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0191 mg/L	0.02 mg/L	95.7	70.0	130	----



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
<b>Dissolved Metals (QCLot: 98879) - continued</b>										
VA20B7406-001	Anonymous	copper, dissolved	7440-50-8	E421	0.0185 mg/L	0.02 mg/L	92.5	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.85 mg/L	2 mg/L	92.7	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0989 mg/L	0.1 mg/L	98.9	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0194 mg/L	0.02 mg/L	97.2	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0385 mg/L	0.04 mg/L	96.3	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	9.52 mg/L	10 mg/L	95.2	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0403 mg/L	0.04 mg/L	101	70.0	130	----
		silicon, dissolved	7440-21-3	E421	9.24 mg/L	10 mg/L	92.4	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00396 mg/L	0.004 mg/L	99.0	70.0	130	----
		sodium, dissolved	17341-25-2	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	23.6 mg/L	20 mg/L	118	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0408 mg/L	0.04 mg/L	102	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00405 mg/L	0.004 mg/L	101	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0216 mg/L	0.02 mg/L	108	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0199 mg/L	0.02 mg/L	99.5	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0393 mg/L	0.04 mg/L	98.3	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00426 mg/L	0.004 mg/L	107	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.100 mg/L	0.1 mg/L	100	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.398 mg/L	0.4 mg/L	99.4	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0416 mg/L	0.04 mg/L	104	70.0	130	----
<b>Speciated Metals (QCLot: 96103)</b>										
VA20B7020-008	Westbay-A-Port4-2	iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.508 mg/L	0.5 mg/L	102	70.0	130	----
<b>Speciated Metals (QCLot: 97514)</b>										
WR2000945-008	Anonymous	iron, ferrous [Fe II], dissolved	15438-31-0	E541	5.35 mg/L	5 mg/L	107	70.0	130	----
<b>Aggregate Organics (QCLot: 99185)</b>										
VA20B6818-002	Anonymous	chemical oxygen demand [COD]	----	E559	473 mg/L	500 mg/L	94.7	75.0	125	----
<b>Volatile Organic Compounds (QCLot: 100491)</b>										
VA20B7020-004	Westbay-A-Port4-2-DUP-1	benzene	71-43-2	E611A	97.3 µg/L	100 µg/L	97.3	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>
<b>Volatile Organic Compounds (QCLot: 100491) - continued</b>										
VA20B7020-004	Westbay-A-Port4-2-DUP-1	ethylbenzene	100-41-4	E611A	117 µg/L	100 µg/L	117	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	97.1 µg/L	100 µg/L	97.1	60.0	140	----
		styrene	100-42-5	E611A	99.4 µg/L	100 µg/L	99.4	60.0	140	----
		toluene	108-88-3	E611A	101 µg/L	100 µg/L	101	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	218 µg/L	200 µg/L	109	60.0	140	----
		xylene, o-	95-47-6	E611A	105 µg/L	100 µg/L	105	60.0	140	----
<b>Volatile Organic Compounds (QCLot: 97113)</b>										
VA20B6782-002	Anonymous	benzene	71-43-2	E611A	114 µg/L	100 µg/L	114	60.0	140	----
		ethylbenzene	100-41-4	E611A	90.5 µg/L	100 µg/L	90.5	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	111 µg/L	100 µg/L	111	60.0	140	----
		styrene	100-42-5	E611A	94.8 µg/L	100 µg/L	94.8	60.0	140	----
		toluene	108-88-3	E611A	99.6 µg/L	100 µg/L	99.6	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	196 µg/L	200 µg/L	97.8	60.0	140	----
		xylene, o-	95-47-6	E611A	99.4 µg/L	100 µg/L	99.4	60.0	140	----
<b>Hydrocarbons (QCLot: 100490)</b>										
VA20B7020-004	Westbay-A-Port4-2-DUP-1	F1 (C6-C10)	----	E581.VH+F1	5610 µg/L	6310 µg/L	88.9	60.0	140	----



Monday, October 26, 2020

Heather McKenzie  
ALS Environmental  
8081 Lougheed Hwy, Suite 100  
Burnaby, BC V5A 1W9

Re: ALS Workorder: 2010132  
Project Name:  
Project Number: VA20B7020

Dear Ms. McKenzie:

Four water samples were received from ALS Environmental, on 10/6/2020. The samples were scheduled for the following analysis:

Radium-226

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental  
Katie M. O'Brien  
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280



**2010132**

**Radium-226:**

The samples were prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

# ALS -- Fort Collins

## Sample Number(s) Cross-Reference Table

---

**OrderNum:** 2010132

**Client Name:** ALS Environmental

**Client Project Name:**

**Client Project Number:** VA20B7020

**Client PO Number:** VA20B7020

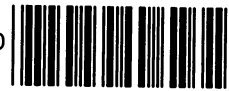
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Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
VA20B7020-001	2010132-1		WATER	25-Sep-20	16:00
VA20B7020-003	2010132-2		WATER	27-Sep-20	16:00
VA20B7020-004	2010132-3		WATER	27-Sep-20	16:00
VA20B7020-002	2010132-4		WATER	25-Sep-20	16:00



Chain of Custody  
 Vancouver - Environmental  
 8081 Lougheed Highway  
 Burnaby BC Canada V5A 1W9

5860



2010132

Destination Lab: **USA - Fort Collins**

Address: 225 Commerce Drive Fort Collins CO  
 United States 80524

Client: Agnico-Eagle Mines Limited

Work Order Number: **VA20B7020**

Original Receipt Date/Time: 02/10/2020 09:20  
 Instructions Received

Relinquished By

Date/Time

Received By *[Signature]*

Date/Time: 10/6/20  
 1340

Receipt Temp: amb

Return as Indicated: Results: Invoice: Electronic Data:

Attention: Heather McKenzie

ALS Sample ID	Client ID	Matrix	Container Type	Test Codes	Method Description	Due Date	Sampling Date and Time	Remarks
VA20B7020-001 1	Westbay-A-Po rt4-1	Water	HDPE total (nitric acid)	RA226-MMER	Radium-226 by Radon Emanation	02-11-2020	25/09/2020 16:00	
VA20B7020-003 2	Westbay-A-Po rt4-2	Water	HDPE total (nitric acid)	RA226-MMER	Radium-226 by Radon Emanation	02-11-2020	27/09/2020 16:00	

3 -004 " dup " " " " " " " " "

4 -002 " HOLD " HOLD " 25/9/2020 1600

Account Manager: *Heather McKenzie*  
 ALSEV.DataSublet@ALSGlobal.com (PDF / EXCEL/ B2B)  
 ALS Vancouver Phone Number: 604-253-4188





EXPRESS WORLDWIDE

WPX

DHL

2020-10-05 DCVS 3.0.1 / '12-1403'

From: ALS ENVIRONMENTAL  
100 - 8081 LOUGHEED HIGHWAY  
BC BC BC BC  
V5A 1W9 BURNABY  
CANADA

Origin:  
YVR

To: ALS ENVIRONMENTAL - FORT COLLINS

Contact:  
SAMPLE RECEIVING

225 COMMERCE DRIVE  
COLORADO CO CO COLORADO  
80524 FORT COLLINS

10-0  
am

UNITED STATES OF AMERICA

US - DEN - DEN

C

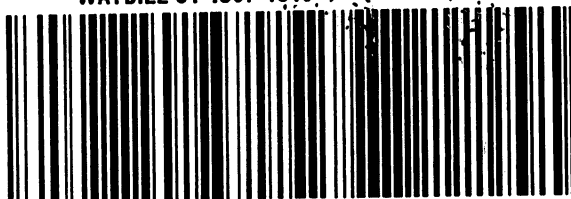
Day Time

Pcs/Sht Weight Piece  
.48.0 LB 1/1

Content Description  
Environmental Water Research

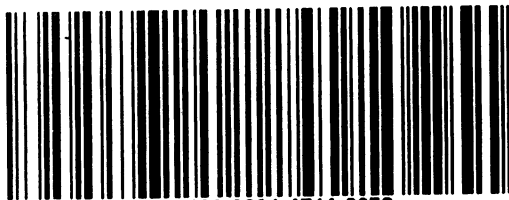


WAYBILL 81 1367 1016



(2L)US80524 + 48000001

Reference



(J) JD01 4600 0081 4714 6253

Client: ALS Environmental

Date: 26-Oct-20

Project: VA20B7020

Work Order: 2010132

Sample ID: VA20B7020-001

Lab ID: 2010132-1

Legal Location:

Matrix: WATER

Collection Date: 9/25/2020 16:00

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>Radium-226 by Radon Emanation - Method 903.1</b>			<b>SOP 783</b>		Prep Date: <b>10/8/2020</b>	PrepBy: <b>TRW</b>
<b>Ra-226</b>	<b>8.8 (+/- 2.2)</b>	M3	<b>0.16</b>	<b>BQ/l</b>	NA	10/19/2020 13:10
<i>Carr: BARIUM</i>	<i>97.8</i>		<i>40-110</i>	<i>%REC</i>	DL = NA	10/19/2020 13:10

**Client:** ALS Environmental

**Date:** 26-Oct-20

**Project:** VA20B7020

**Work Order:** 2010132

**Sample ID:** VA20B7020-003

**Lab ID:** 2010132-2

**Legal Location:**

**Matrix:** WATER

**Collection Date:** 9/27/2020 16:00

**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>Radium-226 by Radon Emanation - Method 903.1</b>			<b>SOP 783</b>		Prep Date: <b>10/8/2020</b>	PrepBy: <b>TRW</b>
<b>Ra-226</b>	<b>8.2 (+/- 2.1)</b>	M3	<b>0.12</b>	<b>BQ/l</b>	NA	10/19/2020 13:10
<i>Carr: BARIUM</i>	<i>99.4</i>		<i>40-110</i>	<i>%REC</i>	DL = NA	10/19/2020 13:10

Client: ALS Environmental

Date: 26-Oct-20

Project: VA20B7020

Work Order: 2010132

Sample ID: VA20B7020-004

Lab ID: 2010132-3

Legal Location:

Matrix: WATER

Collection Date: 9/27/2020 16:00

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>Radium-226 by Radon Emanation - Method 903.1</b>			<b>SOP 783</b>		Prep Date: <b>10/8/2020</b>	PrepBy: <b>TRW</b>
<b>Ra-226</b>	<b>9.6 (+/- 2.4)</b>	Y1,M3	<b>0.17</b>	<b>BQ/l</b>	NA	10/19/2020 13:10
<i>Carr: BARIUM</i>	<i>101</i>	Y1	<i>40-110</i>	<i>%REC</i>	DL = NA	10/19/2020 13:10

**Client:** ALS Environmental  
**Project:** VA20B7020  
**Sample ID:** VA20B7020-002  
**Legal Location:**  
**Collection Date:** 9/25/2020 16:00

**Date:** 26-Oct-20  
**Work Order:** 2010132  
**Lab ID:** 2010132-4  
**Matrix:** WATER  
**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	--------------	-------	-----------------	---------------

**Explanation of Qualifiers**

**Radiochemistry:**

- "Report Limit" is the MDC
- U or ND - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- W - DER is greater than Warning Limit of 1.42
- \* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
- # - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.
- G - Sample density differs by more than 15% of LCS density.
- D - DER is greater than Control Limit
- M - Requested MDC not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS, Matrix Spike Recovery within control limits.
- N - Matrix Spike Recovery outside control limits
- NC - Not Calculated for duplicate results less than 5 times MDC
- B - Analyte concentration greater than MDC.
- B3 - Analyte concentration greater than MDC but less than Requested MDC.

**Inorganics:**

- B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).
- U or ND - Indicates that the compound was analyzed for but not detected.
- E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.
- M - Duplicate injection precision was not met.
- N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.
- Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.
- \* - Duplicate analysis (relative percent difference) not within control limits.
- S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

**Organics:**

- U or ND - Indicates that the compound was analyzed for but not detected.
- B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.
- E - Analyte concentration exceeds the upper level of the calibration range.
- J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).
- A - A tentatively identified compound is a suspected aldol-condensation product.
- X - The analyte was diluted below an accurate quantitation level.
- \* - The spike recovery is equal to or outside the control criteria used.
- + - The relative percent difference (RPD) equals or exceeds the control criteria.
- G - A pattern resembling gasoline was detected in this sample.
- D - A pattern resembling diesel was detected in this sample.
- M - A pattern resembling motor oil was detected in this sample.
- C - A pattern resembling crude oil was detected in this sample.
- 4 - A pattern resembling JP-4 was detected in this sample.
- 5 - A pattern resembling JP-5 was detected in this sample.
- H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.
- L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.
- Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
  - gasoline
  - JP-8
  - diesel
  - mineral spirits
  - motor oil
  - Stoddard solvent
  - bunker C

ALS -- Fort Collins

Date: 10/26/2020 2:06

Client: ALS Environmental  
 Work Order: 2010132  
 Project: VA20B7020

**QC BATCH REPORT**

Batch ID: **RE201008-1-1** Instrument ID **Alpha Scin** Method: **Radium-226 by Radon Emanation**

LCS		Sample ID: <b>RE201008-1</b>			Units: <b>BQ/I</b>		Analysis Date: <b>10/23/2020 12:56</b>				
Client ID:		Run ID: <b>RE201008-1A</b>			Prep Date: <b>10/8/2020</b>		DF: <b>NA</b>				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.97 (+/- 0.495)	0.0235	1.732		114	67-120					P,Y1,M3
Carr: BARIUM	15700		15650		100	40-110					Y1

LCSD		Sample ID: <b>RE201008-1</b>			Units: <b>BQ/I</b>		Analysis Date: <b>10/19/2020 13:41</b>				
Client ID:		Run ID: <b>RE201008-1A</b>			Prep Date: <b>10/8/2020</b>		DF: <b>NA</b>				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.72 (+/- 0.427)	0.00873	1.732		99.1	67-120		1.97	0.4	2.1	P,Y1
Carr: BARIUM	15700		15650		100	40-110		15700			Y1

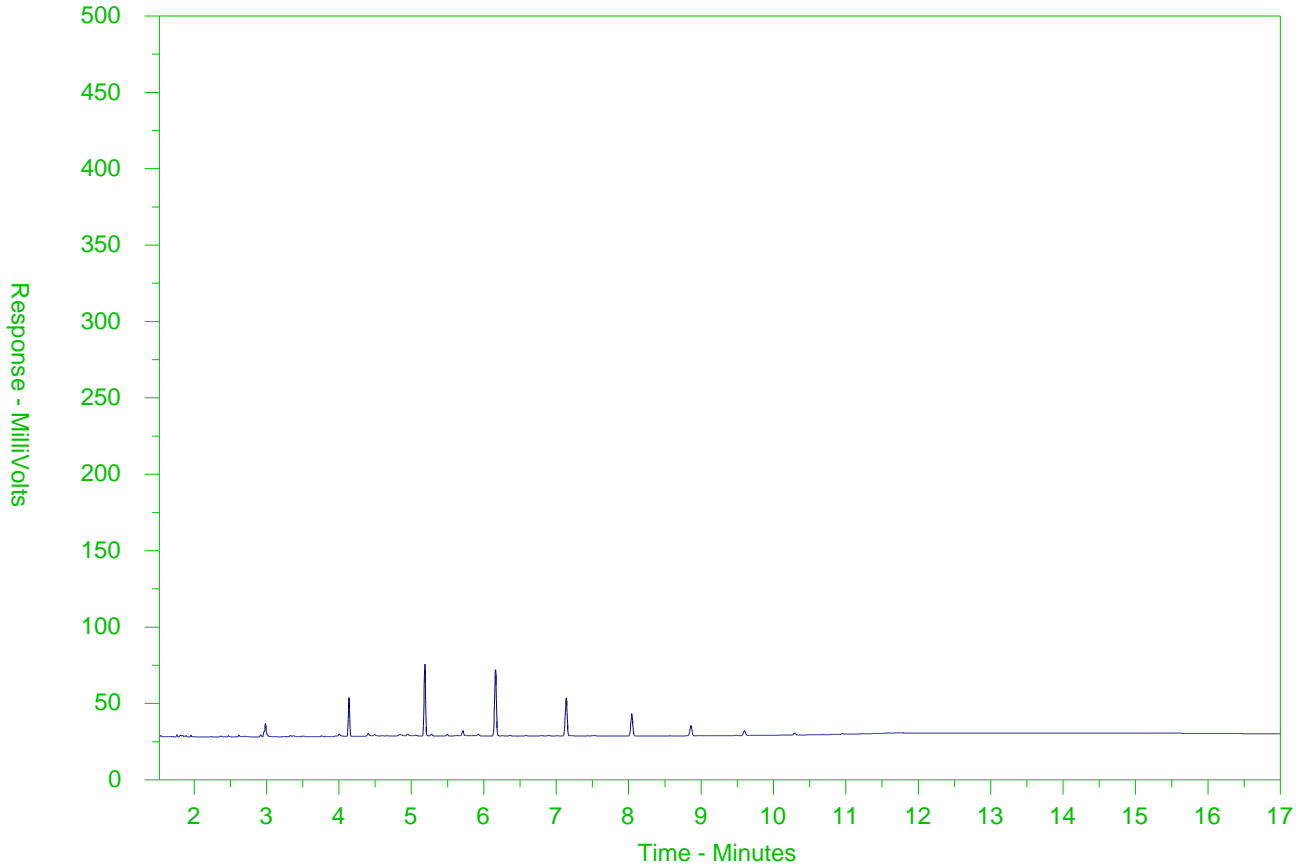
MB		Sample ID: <b>RE201008-1</b>			Units: <b>BQ/I</b>		Analysis Date: <b>10/19/2020 13:10</b>				
Client ID:		Run ID: <b>RE201008-1A</b>			Prep Date: <b>10/8/2020</b>		DF: <b>NA</b>				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	0.00050 (+/- 0.0046)	0.0087									Y1,U
Carr: BARIUM	15800		15650		101	40-110					Y1

The following samples were analyzed in this batch: 2010132-1      2010132-2      2010132-3

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: VA20B7020-001-E601  
 Client Sample ID: Westbay-A-Port4-1



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34	nC50	
174°C	287°C		481°C	575°C	
346°F	549°F		898°F	1067°F	
← Gasoline →			← Motor Oils/ Lube Oils/ Grease →		
← Diesel/ Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

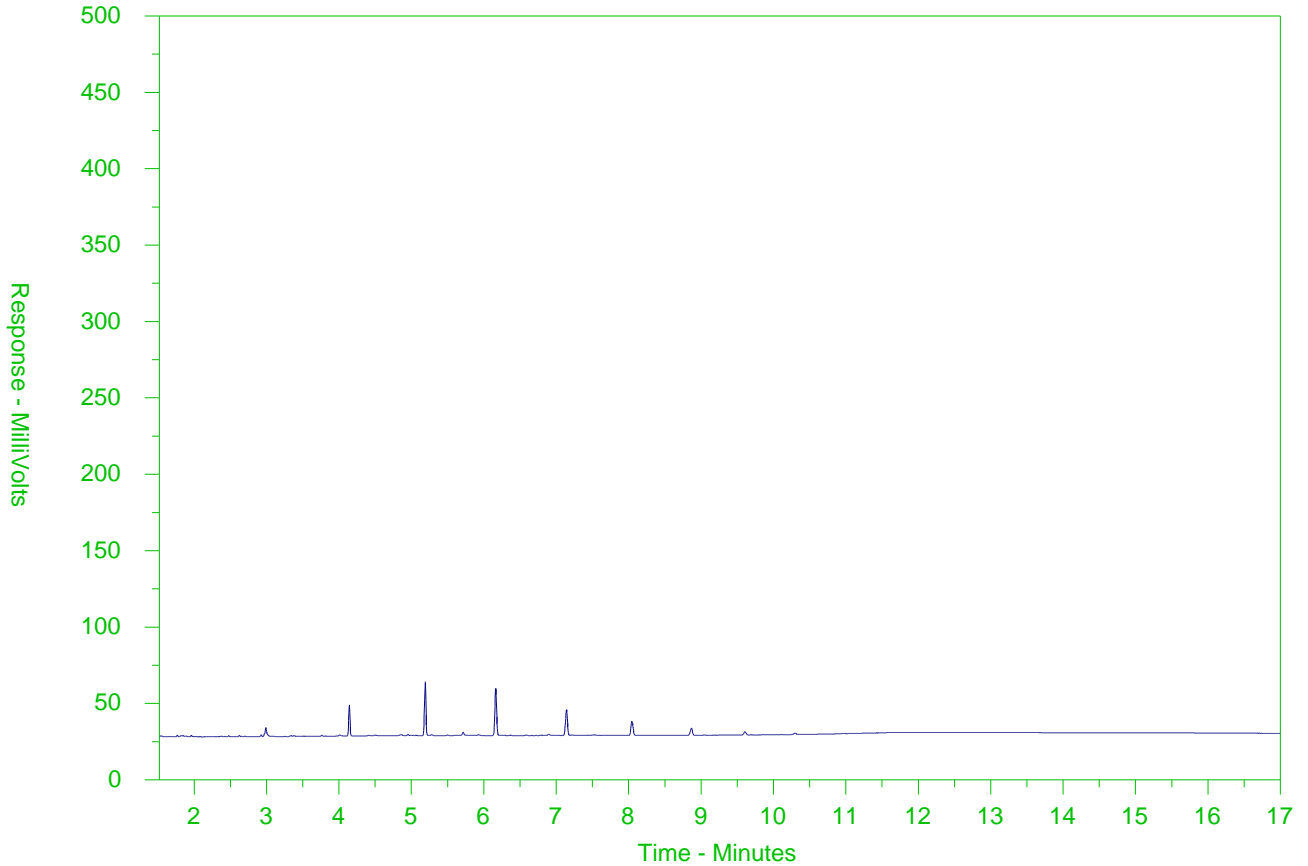
Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at [www.alsglobal.com](http://www.alsglobal.com).



# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: VA20B7020-003-E601  
 Client Sample ID: Westbay-A-Port4-2



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/ Lube Oils/ Grease →		
← Diesel/ Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

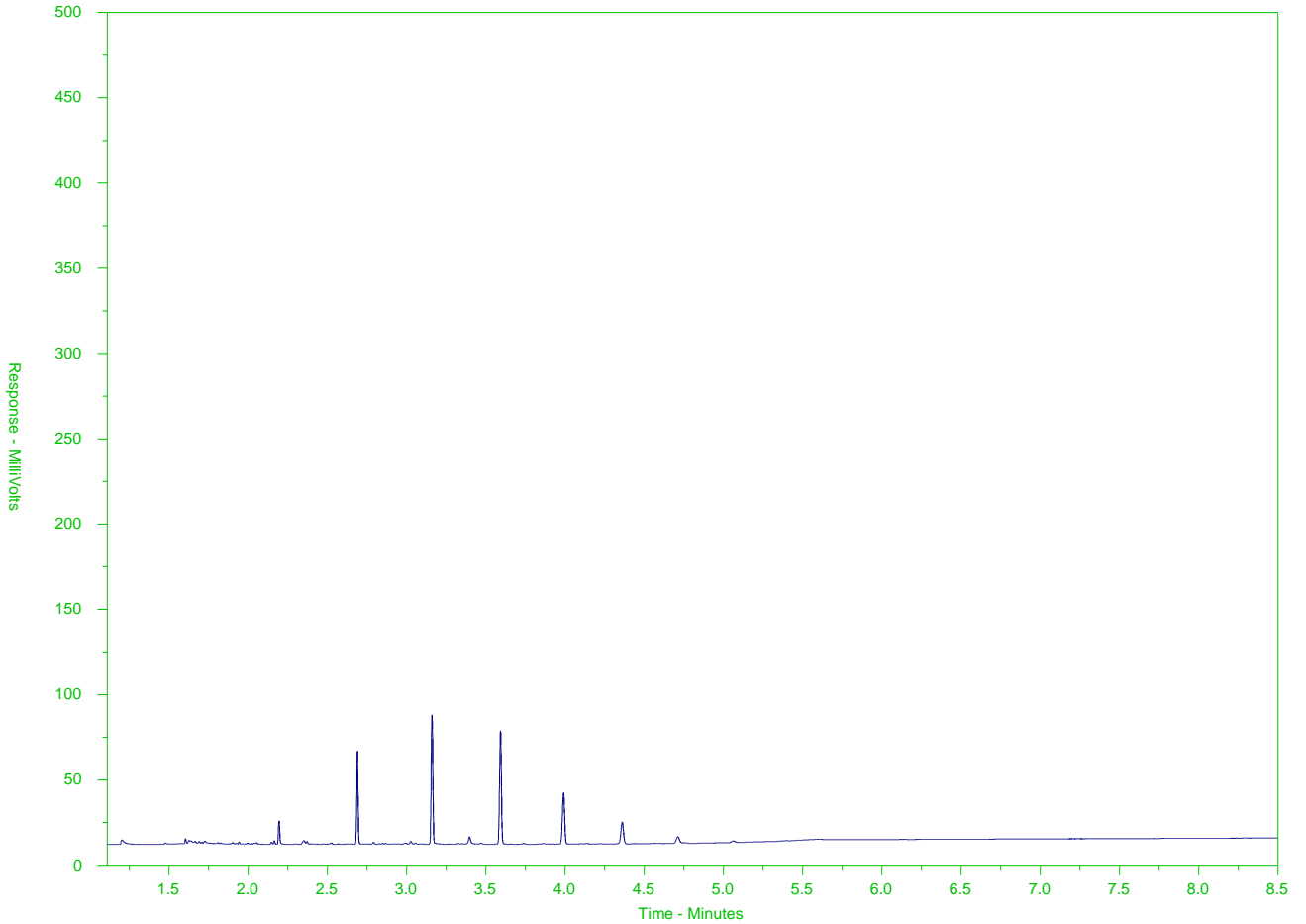
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at [www.alsglobal.com](http://www.alsglobal.com).

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: VA20B7020-004-E601  
 Client Sample ID: Westbay-A-Port4-2-DUP-1



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →		← Motor Oils/ Lube Oils/ Grease →			
← Diesel/ Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at [www.alsglobal.com](http://www.alsglobal.com).



**Client:** ALS Environmental  
**Report date:** 3-Nov-20  
**Client project ID:** VA20B7020  
**Isobrine File No:** ISOBR-21086



9330 60 Avenue NW  
 Edmonton, AB  
 Canada, T6E 0C1  
 www.isobrine.com  
 780-433-3699

Isobrine ID	Client sample IDs		Collected	Received	$\delta^{18}\text{O}$		$\delta^2\text{H}$	
					‰ VSMOW	$\pm 1\sigma$	‰ VSMOW	$\pm 1\sigma$
IB-21-965	VA20B7020-001	Westbay-A-Port4-1	25-Sep-20	6-Oct-20	-14.63	0.06	-116.2	0.47
IB-21-966	VA20B7020-005	Westbay-A-Port3-1	28-Sep-20	6-Oct-20	-15.87	0.09	-121.8	0.18
IB-21-967	VA20B7020-006	Westbay-A-Port9-1	28-Sep-20	6-Oct-20	-15.84	0.04	-124.2	0.24
IB-21-968	VA20B7020-008	Westbay-A-Port4-1	28-Sep-20	6-Oct-20	-14.74	0.02	-116.5	0.09

Oxygen and hydrogen stable isotope compositions determined on mechanically and chemically cleaned samples using a CRDS (Cavity Ring-down Mass Spectrometer).  
 Standard deviations for  $\delta^{18}\text{O}$  and  $\delta^2\text{H}$  are equal to or better than 0.2 ‰ and 2.0 ‰, respectively ( $\pm 1\sigma$ ).

**APPENDIX E**

# Salinity Corrected Isotope Results Calculations

**Appendix E**  
**Salinity Corrected Isotope Result Calculations for Westbay Well M20-3071**  
**Meliadine Extension Agnico Eagle Mines Limited**

Location			M20-3071 Drilling Fluid								
Client Sample ID	Molecular Weight (g/mol)	Unit	Westbay-A-225	Moles (mol)	Molality (mol/kg)	West bay-A-360	Moles (mol)	Molality (mol/kg)	Westbay A-606-BR	Moles (mol)	Molality (mol/kg)
Date Sampled			17-Aug-2020			21-Aug-2020			27-Aug-2020		
ALS Sample ID			VA20B3721-001			VA20B4004-001			VA20B4662-002		
ALS Sample ID (Isotopes)			VA20B6509-001			VA20B6509-002			VA20B6509-004		
Isobrine ID			IB-21-865			IB-21-866			IB-21-868		
calcium, dissolved	40.08	mg/L	48000	1.1976	1.2012	39700	0.9905	0.9935	48200	1.2026	1.2062
magnesium, dissolved	24.31	mg/L	13.9	0.0006	0.0006	24.7	0.0010	0.0010	10.7	0.0004	0.0004
potassium, dissolved	39.1	mg/L	2420	0.0619	0.0621	2060	0.0527	0.0528	2240	0.0573	0.0575
sodium, dissolved	22.99	mg/L	1490	0.0648	0.0650	1250	0.0544	0.0545	1430	0.0622	0.0624
Delta 18O x 1000			-13.32			-13.58			-13.28		
Delta 2H x 1000			-106.00			-107.28			-106.51		
<b>Salinity Corrected delta</b>											
Corrected Delta 18O x 1000 (Sofer & Gat, 1972)		‰ VSMOW	-12.77			-13.13			-12.72		
Corrected Delta 2H x 1000 (Sofer & Gat, 1975)		‰ VSMOW	-99.29			-101.73			-99.79		
Delta 18O Difference		‰ VSMOW	-0.55			-0.45			-0.55		
RPD 18O Difference			4.2%			3.4%			4.2%		
Delta 2H Difference		‰ VSMOW	-6.71			-5.55			-6.72		
RPD 2H Difference			6.5%			5.3%			6.5%		

Location			M20-3071 Port 8								
Client Sample ID	Molecular Weight (g/mol)	Unit	Westbay-A-Port8-0.29	Moles (mol)	Molality (mol/kg)	Westbay-A-Port8-29%DUP-1	Moles (mol)	Molality (mol/kg)			
Date Sampled			20-Sep-2020				20-Sep-2020				
ALS Sample ID			VA20B6509-007			VA20B6509-008			VA20B6509-008		
ALS Sample ID (Isotopes)			VA20B6509-007			VA20B6509-008			VA20B6509-008		
Isobrine ID			IB-21-871			IB-21-872					
calcium, dissolved	40.08	mg/L	13400	0.3343	0.3353	12800	0.3194	0.3203			
magnesium, dissolved	24.31	mg/L	865	0.0356	0.0357	812	0.0334	0.0335			
potassium, dissolved	39.1	mg/L	607	0.0155	0.0156	571	0.0146	0.0146			
sodium, dissolved	22.99	mg/L	6420	0.2793	0.2801	6040	0.2627	0.2635			
Delta 18O x 1000			-15.31			-15.03					
Delta 2H x 1000			-117.30			-117.04					
<b>Salinity Corrected delta</b>											
Corrected Delta 18O x 1000 (Sofer & Gat, 1972)		‰ VSMOW	-15.11			-14.85					
Corrected Delta 2H x 1000 (Sofer & Gat, 1975)		‰ VSMOW	-115.20			-115.04					
Delta 18O Difference		‰ VSMOW	-0.19			-0.18					
RPD 18O Difference			1.3%			1.2%					
Delta 2H Difference		‰ VSMOW	-2.10			-2.00					
RPD 2H Difference			1.8%			1.7%					

Location			M20-3071 Port 4								
Client Sample ID	Molecular Weight (g/mol)	Unit	Westbay-A-Port4-1	Moles (mol)	Molality (mol/kg)	Westbay-A-Port4-1	Moles (mol)	Molality (mol/kg)	Westbay-A-Port4-1	Moles (mol)	Molality (mol/kg)
Date Sampled			19-Sep-2020				25-Sep-2020			28-Sep-20	
ALS Sample ID			VA20B6509-005			VA20B7020-001			VA20B7020-008		
ALS Sample ID (Isotopes)			VA20B6509-005			VA20B7020-001			VA20B7020-008		
Isobrine ID			IB-21-869			IB-21-965					
calcium, dissolved	40.08	mg/L	39200	0.9780	0.9809	23800	0.5938	0.5956	22000	0.5489	0.5505
magnesium, dissolved	24.31	mg/L	32.8	0.0013	0.0014	309	0.0127	0.0127	344	0.0142	0.0142
potassium, dissolved	39.1	mg/L	1920	0.0491	0.0493	1080	0.0276	0.0277	1030	0.0263	0.0264
sodium, dissolved	22.99	mg/L	1550	0.0674	0.0676	2950	0.1283	0.1287	3260	0.1418	0.1422
Delta 18O x 1000			-12.74			-14.63			-14.74		
Delta 2H x 1000			-105.73			-116.24			-116.49		
<b>Salinity Corrected delta</b>											
Corrected Delta 18O x 1000 (Sofer & Gat, 1972)		‰ VSMOW	-12.30			-14.34			-14.47		
Corrected Delta 2H x 1000 (Sofer & Gat, 1975)		‰ VSMOW	-100.24			-112.86			-113.35		
Delta 18O Difference		‰ VSMOW	-0.45			-0.29			-0.27		
RPD 18O Difference			3.6%			2.0%			1.8%		
Delta 2H Difference		‰ VSMOW	-5.49			-3.37			-3.14		
RPD 2H Difference			5.3%			2.9%			2.7%		

**Notes:**

Raw Ca, Mg, K and Na water quality data used for Isotope result correction for salinity  
Density of water at 25oC 0.9970479 kg/L  
Mass = density \* volume 0.9970479 kg  
RPD = relative percent difference



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