



# REPORT

# R. Radloff & Associates

# District of Wells Lead Assessment





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# 1 INTRODUCTION

# 1.1 Background and Scope

Lead can be present in drinking water as result of leaching from distribution and plumbing system components, particularly in corrosive waters. The DOW is undertaking sampling of the District-owned and public buildings to determine the risk of corrosion. Although corrosion will affect the leaching of several contaminants, the primary focus is sampling for lead.

The Guidelines on Evaluating and Mitigating Lead in Drinking Water Supplies, Schools, Daycares and Other Buildings (British Columbia Health Protection Branch, April 2019) (referred to in the following document as the Guidelines) recommends using the two-tiered approach for assessing corrosion risks. The scope of this project is as follows:

- Review the distribution system drawings for lead services lines in the community.
- Perform lead sampling as an indicator of corrosion, following the protocol for Tier 1 and Tier 2 sampling, including investigating plumbing and fixtures for potential sources of lead.

DOW's primary consultant, R. Radloff & Associates Inc. (Radloff), retained Associated Engineering (AE) to prepare a sampling plan, and analyze the data. This document provides an analysis of the results of the Corrosion Sampling Plan.

# 1.2 Sampling Plan

The Sampling Plan was developed using the *Guidelines* and the project Terms of Reference provided by the DOW. The *Guidelines* note that, for the evaluation of corrosion risk, the two-tier protocol, outlined in Health Canada's *Guidance on Controlling Corrosion in Drinking Water Distribution Systems* (Health Canada, June 2009) should be used.

Sampling was performed as outlined briefly in the following sections. More detail is provided regarding the sampling plan in two sampling plan documents (Sampling Plan for Tier 1, AE, March 2021 and Tier 2 Sampling Plan, AE, April 2021). These sampling plans are included in **Appendix A**.

The primary indicator of corrosion is lead as its presence is most likely to result in adverse health effects (Health Canada, 2009).

#### 1.2.1 Residential Sites

Tier 1 sampling for residential sites was as follows:

- Stagnate water for 6 hours.
- Collect 1 L sample.
- If more than 10% of the samples have lead levels greater than 15 μg/L, proceed to Tier 2.

Tier 2 sampling for residential sites was as follows:

- Stagnate water for 6 hours.
- Collect 4 consecutive 1 L samples.
- Collect a 1 L fully-flushed sample (defined as running the water until there is a noticeable temperature drop).

#### 1.2.2 Non-Residential Sites

Tier 1 sampling for non-residential sites was as follows:

- Stagnate water for 8 hours.
- Collect a 250 mL first draw sample.
- Note that the *Guidelines* state that after the first sample, and additional sample should be taken, but the volume is not defined. It is recommended to take a 1 L sample.
- If lead concentration exceeds 5  $\mu$ g/L at any of the locations, further investigation and remedial action is required.

Tier 2 sampling for non-residential sites was as follows:

- Stagnate water for 8 hours.
- Flush tap for 30 seconds.
- Collect 250 mL sample.
- Collect a 250 mL fully-flushed sample (defined as running the water until there is a noticeable temperature drop).

#### 1.2.3 Multi-Family Locations (Apartments)

The *Guidelines* do not specify a method for sampling multi-family residences (i.e., locations where there are multiple services from one connection to the network). Therefore, it was proposed to follow the non-residential sampling program protocol.

Sampling involved stagnating the water for 8 hours, taking at 250 mL sample, then running the tap for 30 s, then taking another 250 mL sample. An additional 250 mL fully-flushed sample (defined as running the water until there is a noticeable temperature drop) was also taken.

#### 1.2.4 Water Treatment Plant Sampling

To understand any background lead in the water, the water treatment plant (WTP) was sampled at three locations: the raw water sample tap, the filtered water sample tap immediately after the filters, and the treated water sample tap.

Sampling involved shutting down the plant for 8 hours, then taking a sample at each of the locations. In addition, consecutive 1 L samples were taken until the volume equivalent to the WTP piping (approximately 11 L) was sampled. A fully flushed sample was also taken at the WTP treated water sample tap.

# 1.2.5 Additional Sampling

One hydrant was selected at a dead end in the system to represent high water age. Sampling involved fully flushing the hydrant (clear hydrant lead and hydrant body, 5 minutes at full hydrant flow), then taking a sample.

The reservoir was also sampled for further insight into the lead content in the distribution system.

# 1.3 Sampling Locations

The following locations were sampled for lead as an indicator of corrosion:

#### **Residential Sites**

- Lebeck House
- Hayley's House
- Mayor's House
- RCMP House (Southside)
- RCMP House (Northside)

#### **Non-Residential Sites**

- School (Staff Washroom Sink, Student Washroom Sink, Basement Bathroom Sink, Daycare Bathroom Sink)
- School Portable Service Line
- Highways Building (Kitchen Sink)
- Fire Hall (Bathroom Sink)
- Municipal Hall (Kitchen Sink)
- Community Hall (Kitchen Sink)
- BC Ambulance Station (BCAS) (Hose Bib)
- RCMP Detachment

## **Multi-Family Locations**

- Community Relations Office, Residential Apartment
- Hubs Motel
- BGM Camp
- BGM Apartments

### Other

- Water Treatment Plant (the raw water sample tap, the filtered water sample tap immediately after the filters, and the treated water sample tap)
- Reservoir
- Hydrant

The sampling locations are shown in the Figure 1-1.



Figure 1-1 Sampling Locations

# 2 EXTERNAL INFORMATION REVIEW

## 2.1 Review of the Distribution Network

As part of the scope of work, the available water distribution system drawings were assessed for possible sources of lead from piping materials. This review was performed by Radloff.

Radloff's review of the available water system drawings indicate that the water system is comprised of both polyvinyl chloride (PVC) and ductile iron (DI) piping. The drawings also indicate that valving and fixtures are comprised of DI and epoxy coated DI fittings. Water services appear to be comprised of copper and brass piping with similar fittings.

# 2.2 External Sampling Results<sup>1</sup>

In addition to the sampling that was performed as part of this project, two sampling events were performed in January and February 2021, by DOW personnel. The results are shown in the following tables. The samples were not collected in accordance with the Tier 1 sampling *Guidelines*. The Certificates of Analysis for all samples are shown in **Appendix D**.

It is unknown how the samples from January 6, 2021 were taken. However, all samples with the exception of the raw water well exceeded the MAC. (Refer to Table 2-1.)

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<sup>&</sup>lt;sup>1</sup> Not collected as per Guidelines.

Table 2-1
Additional Lead Sampling Data Results (January 6, 2021)

Location	Lead Concentration (μg/L)
Wells School #1	10.9
Wells School #2	250
DOW Office	13.0
Fire Hall	11.7
DOW Hall	8.40
Raw Water Supply Well	0.371

Table 2-2 shows data from February 2021. The reported stagnation time was 24 hours, and the reported flushing time was 3 minutes. While this sampling did not follow the Tier 1 assessment, the results provide additional insight into the lead levels present. In particular, the flushed samples provide data, regarding the lead levels in the water within the distribution system. The numbers in red exceed the MAC.

Table 2-2
Additional Lead Sampling Data Results 2021

Location (Sample Date)	Lead Concentration (μg/L) (after 24 hr stagnation)	Lead Concentration (μg/L) (after 3 min flushing)
RCMP Station (12-02-2021)	10.6	1.14
District Office (16-02-2021)	18.8	0.395
EMCON (Road Maintenance Building) (12-02-2021)	3.45	0.062
Fire Hall (12-02-2021)	n/a	6.38
Hall Bar (Municipal Hall Kitchen Tap) (12-02-2021)	0.418	1.36
Portables (Waterline to the former modular school office) (12-02-2021)	36.1	4.29
School Staff Kitchen (16-02-2021)	2.68	0.052
WTP Post Filter (location not specified) (12-02-2021)	21.5	4.26

In addition to the above samples, one resident within the DOW took samples and provided their results. The sample was stagnated overnight, then the pre-flush sample was taken. The tap was flushed for 15 minutes, then another sample was taken. The data is shown in Table 2-3 and is above the MAC of 5  $\mu$ g/L prior to flushing, but below the MAC after flushing. Note that this residence was also sampled as part of the Tier 1 and Tier 2 sampling protocol (summarized in section 3.1).

The results are similar such that the initial sample exceeded the MAC and flushing improved the results. The higher initial lead concentration shown in **Table 2-3** may be due to a longer stagnation time.

Table 2-3
Residential Sampling Results (performed by Residents)

Location	Lead Concentration (μg/L)	Lead Concentration (μg/L)	Comments
(Sample Date)	Pre-flushing	After 15-min Flushing	
Lebeck Residence (21-02-2021)	18.4	0.118	House on newly constructed waterline

# 3 SAMPLING RESULTS

Tier 1 sampling was performed on March 4, 2021 and Tier 2 sampling was performed on April 27, 2021. The following sections outline the results and combine both Tier 1 and Tier 2 results. Photos from all Tier 1 sampling locations are shown in **Appendix B**. While the sample collector did not note any obvious sources of lead appurtenances at the sampling locations, not all of the building plumbing was visible.

The Certificates of Analysis for all samples are shown in Appendix C.

## 3.1 Residential Sampling Results

The results from the residential sampling (both Tier 1 and Tier 2) are shown in **Table 3-1**. Data that exceeds the Guidelines for Canadian Drinking Water Quality (GCDWQ) Maximum Acceptable Concentration (MAC) of 5  $\mu$ g/L (0.005 mg/L) are shown in red.

Table 3-1 Residential Sampling Results (After 6 hours of Stagnation, results shown in  $\mu g/L$ )

Building	Sample Location	1 L	2 L	3 L	4 L	Fully Flushed
Lebeck House	Hose Bib	7.33	0.696	0.586	0.326	0.086
Hayley's House	Kitchen Sink	0.487	0.07	0.058	0.075	0.19
Mayor's House	Hose Bib	2.35	0.483	0.263	1.08	0.519
RCMP (Southside) April 2021 (Refer to Note)	Laundry Room Sink	59.7	14.9	2.43	2.9	1.04
RCMP (Northside)	Kitchen Sink	0.126	0.257	0.076	<0.050	0.084

Based on the results from Table 3-1, two locations showed lead concentrations above the MAC of 5  $\mu$ g/L: the Lebeck House and the RCMP (Southside) house. At the Lebeck House, the 1<sup>st</sup> litre that was sampled from the tap had a high concentration of lead, yet subsequent samples did not. At the RCMP (Southside), the 1<sup>st</sup> and 2<sup>nd</sup> litres that were sampled had high concentrations of lead, yet subsequent samples did not. This indicates that the lead concern originates from the plumbing around the tap in these residences.

The fully flushed samples in all cases were below the MAC, indicating that the distribution system infrastructure is not the source of lead.

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Note: In March 2021, two samples were taken from the RCMP (Southside) home. Two 250 mL samples were taken after 6 hours of stagnation. The concentration of the initial sample and the following sample were 9.86 and 731  $\mu$ g/L, respectively. The 250 mL samples are not consistent with the *Guidelines*. Therefore, re-sampling was performed in April 2021 following the protocol outlined in the *Guidelines*. The results from both sampling events show the same conclusion: lead is present around the tap at the RCMP (Southside) laundry room sink.

# 3.2 Non-Residential Sampling Results

The results from the non-residential sampling are shown in **Table 3-2**. For locations where the Tier 1 sample lead result was above the MAC, Tier 2 sampling was performed. If Tier 1 sampling lead results were below the MAC, Tier 2 sampling was not performed. Data that exceeds the GCDWQ MAC are shown in red.

Table 3-2 Non-residential Sampling Results (After 8 hours of Stagnation)

Building	Sample Location	Tier 1 (250 mL)	Tier 2 (250 mL)	Fully Flushed (250 mL)
School	Staff Washroom Sink	5.83	1.02	0.859
School	Student Washroom Sink	8.2	1.3	1.28
School	Basement Bathroom Sink	1.32		
School	Daycare Bathroom Sink	0.903		
School	Portable Service Line	200	Unable to sample, CC inaccessible	
Highways	Kitchen Sink	2.01		
Fire Hall	Bathroom Sink	65.9	0.988	1.97
Municipal Hall	Kitchen Sink	7.73	0.241	0.197
Community Hall	Kitchen Sink	3.66		
BC Ambulance Station	Hose Bib	24.7	1.66	0.664
RCMP Detachment	Kitchen Sink	0.672		

Six locations were revisited for Tier 2 sampling, although only five were able to be sampled (see School Portable Service Line comment). Some Tier 1 samples were above the MAC, however, following a 30 second flush (Tier 2 requirement), the lead concentration was below the MAC for the same samples, indicating that flushing a service can reduce lead exposure. This also indicates that the lead concern originates from the plumbing within the building.

**Note:** If the School Portable Service Line is to be used, Tier 2 sampling should be performed to gather a thorough understanding of the lead concern at that location.

# 3.3 Multi-Family Sampling Results

Multi-Family locations were measured similarly to the non-residential locations. Of the four locations sampled, only one location had Tier 1 lead results above the MAC: The Hubs Motel. Following a 30 second flush, the water at the Hubs Motel was below the MAC, as was the fully flushed sample, indicating that the lead concern originates from the plumbing within the building for the Hubs Motel. (Refer to Table 3-3.)

**Note:** The Tier 2 results are shown for the other three locations as both Tier 1 and Tier 2 sampling was performed at the same time for the Multi-Family locations.

Table 3-3 Multi-Family Sampling Results

Building	Sample Location	Tier 1 (250 mL)	Tier 2 (250 mL)	Fully Flushed (250 mL)
Community Relations Office	Bathroom Sink	0.695	0.062	0.062
Hubs Motel	Office Hose Bib	5.93	1.08	2.27
BGM Camp	First Washroom	0.31	<0.050	<0.050
BGM Apartment	#204 Kitchen Sink	0.789	0.15	0.054

# 3.4 Water Treatment Plant Sampling Results

To determine if the source of lead is the from the WTP, more extensive sampling was performed at the WTP. This included sampling at the raw water sample tap and the treated water sample tap for lead, total metals, alkalinity, pH, hardness, and Dissolved Inorganic Carbonates (DIC), also referred to as Dissolved Organic Carbon. DIC is an estimate of the total amount of inorganic carbon in water in the form of CO<sub>2</sub>, H<sub>2</sub>CO<sub>3</sub>-, CO<sub>3</sub><sup>2</sup>-, and HCO<sup>3</sup>-. DIC is considered as the parameter more closely related to corrosion than alkalinity because it directly measures the available carbonate species in the water that can react with lead and copper to form passivating scales (EPA, 2016). DIC and pH can be used to determine which potential corrosion control measures are best suited for lead management. Based on the DIC levels and the pH of the water leaving the WTP, the water is considered corrosive, and could cause lead to release into the water system if it is present (i.e., if lead pipes or lead-containing fixtures are present).

The results of the testing at the WTP are shown in Table 3-4.

Table 3-4
Water Treatment Plant Sampling Results

Sample Location	Lead (μg/L) (Initial 250 mL sample)	Lead (μg/L) (Subsequent 250 mL sample)	pН	Alkalinity (mg/L CaCO <sub>3</sub> )	DIC (mg/L of C)
Raw Water Sample Tap	0.086	1.55	7.97	147	32.4
Treated Water Sample Tap	17	11.5	8.00	155	37.9

Additional sampling was performed to understand why the treated water sample tap showed high levels of lead. There are two sampling ports after the filter: one treated water sampling port, which is sampled at the sink at the WTP, and another, which is immediately after the filter. These two sampling taps are shown in **Figure 3-1**. Previously, only the treated water sampling port was sampled.

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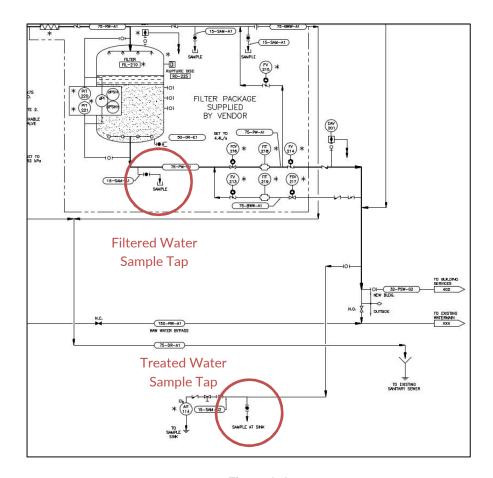


Figure 3-1
Process and Instrumentation Diagram Showing Filtered Water Sample Tap and Treated Water Sample Tap

Additional sampling involved shutting down the plant for 8 hours, then sampling a volume equivalent to the WTP piping (approximately 12 L) in 1-L increments. This method is called profile sampling and provides a snapshot of the piping. A fully flushed sample was also taken at the WTP treated water sample tap.

The results are shown in the Figure 3-2, for the treated water sample tap.

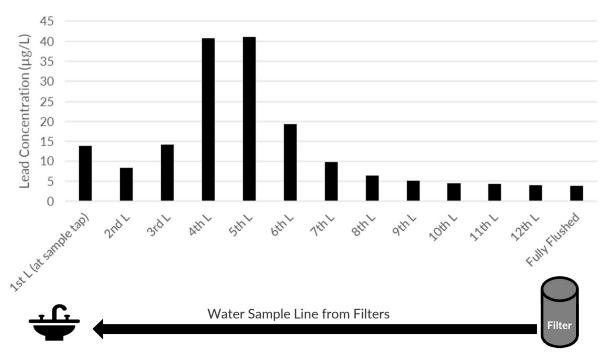


Figure 3-2
Treated Water Sample Tap Profile Sampling Results

In addition, the filter sample tap was also sampled and had a concentration of 18.9 ug/L, after 8 hours of stagnation.

Based on the WTP results, it appears that the piping around the sampling taps may be the source of lead and not the treatment process itself. As the samples represented water near the filter, their lead concentration dropped.

# 3.5 Additional Sampling Results

Two locations within the distribution system were tested for lead: the reservoir and one hydrant at a dead end to represent high water age in the distribution system. A grab sample was taken at the reservoir. The hydrant was fully flushed for 5 minutes at full hydrant flow, then a sample was collected. The results are shown in **Table 3-5**. Both the reservoir and the hydrant were below the MAC, indicating that neither the distribution system, nor the WTP, are a source of lead.

Table 3-5
Additional Sampling Results

Location	Lead Concentration
Reservoir	0.138 μg/L
Hydrant	3.47 μg/L

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# 3.6 Sampling Results Findings

Based on the findings of the sampling, the following conclusions were made:

- If lead is present at a sampling location, it is likely due to building plumbing;
- Flushing for 30 seconds was sufficient to lower the lead concentration to below the MAC for residential and non-residential locations; and
- The water is corrosive, so if lead piping or lead-containing plumbing/fixtures/appurtenances are present, leaching may occur.

# 4 CONCLUSIONS AND RECOMMENDATIONS

The goal of this project was to develop a sampling program, and based on the results, determine if corrosion is a concern for the DOW. Lead was used as an indicator of corrosion as its presence is most likely to result in adverse health effects.

Based on the Tier 1 and Tier 2 data, lead concentrations were above the MAC in 2 of the 5 residential locations that were sampled. One of the two locations had a first 1 L sample that was above the MAC, while the other samples were below the MAC. The second location had first and second 1 L samples that were above the MAC, while the other samples were below the MAC. This indicates that the lead concerns originate from the plumbing around the tap in these residences.

Of the 11 non-residential locations that were tested, lead concentrations of 6 locations were above the MAC upon initial sampling. After flushing, all were under the MAC with the exception of the School Portable Services Line (unable to be sampled as the CC was inaccessible). This indicates that flushing can reduce lead exposure and that the lead concerns originate from the plumbing in these locations and not the distribution system.

Four multi-family locations were measured similarly to the non-residential locations. Of the four locations, only one location (Hubs Motel) had a lead concentration above the MAC. However, upon flushing, the lead concentration of the sample was under the MAC, indicating that the lead concerns originate from the plumbing in the building.

To determine if the source of lead is from the water treatment plant, additional sampling was performed at the water treatment plant. Initial results showed elevated lead levels from the treated water tap. Further investigations and additional sampling found that the piping around the sampling taps may be the source of lead and not the treatment process itself. Additional testing indicated that, based on the DIC levels and the pH of the water leaving the water treatment plant, the water is considered corrosive, which can cause lead to release into the water system, if it is present. It is recommended that the piping near the sample taps be replaced with lead-free piping and lead-free solder.

There are two main concerns that are raised based on the sampling data:

- 1. The lead data within the system is due to the internal building plumbing in certain locations (not the WTP or the distribution system infrastructure).
- 2. The water chemistry is such that lead may leach into the water if there are lead-containing pipes/appurtenances present.

Based on the study findings, it is recommended that the DOW consider lead mitigation. This may involve:

- Replacing the plumbing fixtures in locations where lead is above the MAC with lead-free appurtenances
- Working with Northern Health Authority to educate residents about purchasing lead-free appurtenances and about flushing if lead is a concern.

In addition, it is recommended that the DOW investigate the feasibility of centralized chemical corrosion control at the water treatment plant (e.g., orthophosphate or soda ash) to be investigated through bench-scale testing.

# **CLOSURE**

This report was prepared for R. Radloff & Associates to review the sampling results of the Lead Assessment Program.

The services provided by Associated Engineering (B.C.) Ltd. in the preparation of this report were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty expressed or implied is made.

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# APPENDIX A - LEAD SAMPLING PLAN (TIER 1 AND TIER 2)





Date:	March 1, 2021	File:	2021-2137
То:	R. Radloff & Associates Inc.	Page:	Page 1 of 5
From:	Sarah Larlee, M.A.Sc., P.Eng. and Grant Dixon		
Project:	District of Wells Lead Assessment		
Subject:	Sampling Plan V2		

#### 1 INTRODUCTION AND BACKGROUND

The District of Wells (Wells) is undertaking sampling of the District-owned and public buildings to determine the risk of corrosion. This document outlines the proposed sampling plan.

This sampling plan was developed using the *Guidelines on Evaluating and Mitigating Lead in Drinking Water Supplies*, Schools, Daycares and Other Buildings (British Columbia Health Protection Branch, April 2019) (referred to in the following document as the *Guidelines*) and the project Terms of Reference provided by Wells.

The Guideline notes that, for the evaluation of corrosion risk, the 2-tier protocol outlined in Health Canada's Guidance on Controlling Corrosion in Drinking Water Distribution Systems (Health Canada, June 2009) should be used.

#### The 2-tiers are as follows for residential sites:

- First Tier: establish if corrosion is a concern
  - o Collect 1 L sample after 6 hours of stagnation.
  - o If more than 10% of the samples have lead greater than 15 ug/L, proceed to Second Tier.
- Second Tier: collect information on how lead enters the drinking water to assist in mitigation measures
  - Conduct samples at 10% of the sites sampled in Tier 1, specifically those with the highest lead concentrations. Note: For systems servicing fewer than 500 people, a minimum of two sites should be sampled.
  - Collect 4 x 1 L samples after 6 hours of stagnation. Analyze samples separately to create a profile of where the lead originates.

#### The 2-tiers are as follows for non-residential sites:

- First Tier: establish if corrosion is a concern
  - Identify all locations where drinking water may be consumed
  - o Collect a 250 mL first draw sample after 8 hours of stagnation.
  - Note that the *Guidelines* state that after the first sample, and additional sample should be taken, but the volume is not defined. It is recommended to take a 1 L sample.
  - o If lead concentration exceeds 5 ug/L at any of the locations, further investigation and remedial action is required.
- Second Tier: collect information on how lead enters the drinking water to assist in mitigation measures
  - Monitor locations exceeding 5 ug/L by taking a 250 mL sample after 8 hours of stagnation plus 30 seconds of flushing.
  - o If the lead concentration of any samples exceeds 20 ug/L, corrective measures should be undertaken immediately.







Memo To: R. Radloff & Associates Inc. March 01, 2021 - 2 -

Previous lead sampling has been performed at Wells, but it was not completed in accordance with the 2-tier sampling outlined in the *Guidelines*. The following sampling plan outlines the sampling required for First Tier sampling.

#### 2 SAMPLING PLAN

The following tables outlines buildings that were determined by Wells to be sampling locations. Note that while the *Guideline* and the Health Canada *Guidance on Controlling Corrosion in Drinking Water Distribution Systems* refers to residential sites, Wells has decided to only measure lead at public and District-owned buildings with the exception of the RCMP house. The table outlines how many samples will be taken at each location, and for what each sample will be analyzed. Note that sampling at the water treatment plant is recommended to provide baseline water quality results.

Although corrosion will affect the leaching of several contaminants, the primary focus is sampling for lead as its presence is most likely to result in adverse health effects (Health Canada, 2009).



Table 1: Sampling Locations, Number of Samples, Sample Analyte -Residential Sites

Building	Sampling Location	Number of Samples	Sample Bottle Type	Sample Analysis
RCMP House	Kitchen Tap (Cold)	1	1 L	Lead

Table 2: Sampling Locations, Number of Samples, Sample Analyte - Non-Residential Sites

Building	Sampling Location	Number of Samples	Sample Bottle Type	Sample Analysis
Fire Hall	Kitchen Tap (Cold)	2	1 x 250 mL and 1 x 1L	Lead
Community Hall	Kitchen Tap (Cold)	2	1 x 250 mL and 1 x 1L	Lead
Municipal Hall	Kitchen Tap (Cold)	2	1 x 250 mL and 1 x 1L	Lead
School	Water Fountain 1	2	1 x 250 mL and 1 x 1L	Lead
School	Water Fountain 2	2	1 x 250 mL and 1 x 1L	Lead
School	Bathroom 1 (Cold)	2	1 x 250 mL and 1 x 1L	Lead
School	Bathroom 2 (Cold)	2	1 x 250 mL and 1 x 1L	Lead
School Portables	Water Fountain	2	1 x 250 mL and 1 x 1L	Lead
RCMP Detachment	Kitchen Tap (Cold)	2	1 x 250 mL and 1 x 1L	Lead
Highway Maintenance Yard (EMCON)	Drinking Water Tap (Cold)	2	1 x 250 mL and 1 x 1L	Lead
Curling Rink	Concession Tap (Cold)	2	1 x 250 mL and 1 x 1L	Lead
Water Treatment Plant	Raw Water	2	1 x 250 mL and 1 x 1L	Lead





Memo To: R. Radloff & Associates Inc.

March 01, 2021

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Building	Sampling Location	Number of Samples	Sample Bottle Type	Sample Analysis
Water Treatment Plant	Raw Water	1	250 mL (General Bottle)	Dissolved Inorganic Carbon, Alkalinity, pH
Water Treatment Plant	Raw Water	1	120 mL (Total Metals)	Hardness and Metals
Water Treatment Plant	Utility Sink, Post- Treatment	2	1 x 250 mL and 1 x 1L	Lead
Water Treatment Plant	Utility Sink, Post- Treatment	1	250 mL (General Bottle)	Dissolved Inorganic Carbon, Alkalinity, pH
Water Treatment Plant	Utility Sink, Post- Treatment	1	120 mL (Total Metals)	Hardness and Metals

Note that 1 L sample bottles will need to be ordered in advance as the ALS lab will need to coordinate their delivery.



The following table summarizes how many sample bottles are required. Note that the sampling bottles are based on the recommendations from ALS Laboratory in Kelowna.

**Table 2: Sampling Bottle Requirements** 

Bottle Volume	Number of Bottles Required
1 L	14
250 mL (General Bottle)	16 (already procured)
120 mL (Total Metals)	2 (already procured)

#### 3 ADDITIONAL DATA

Barkerville Gold Mine has monitoring wells throughout Wells and there is a monitoring well at the old school building. Historical results would be beneficial to the analysis of the lead results that will be collected as part of this sampling plan.

#### 4 CLOSURE

It is recommended that Northern Health be engaged prior to sampling to review this sampling plan.

If you have any questions regarding the above sampling plan, please contact the undersigned.

Prepared by:

Sarah Larlee, M.A.Sc., P.Eng.

**Process Engineer** 

larlees@ae.ca

**Grant Dixon** 

Sampling Manager

dixong@ae.ca









Date:April 8, 2021File:2021-2137To:R. Radloff & Associates Inc.Page:Page 1 of 7From:Grant Dixon and Sarah Larlee, M.A.Sc., P.Eng.Project:District of Wells Lead AssessmentSubject:Tier 2 Sampling Plan

#### 1 INTRODUCTION AND BACKGROUND

This memorandum was prepared to outline the proposed District of Wells (DOW) Tier 2 sampling program.

Based on the results of the Tier 1 sampling that was performed in March 2021, 6 non-residential locations had lead results higher than the maximum acceptable concentration (MAC) of 5  $\mu$ g/L and will therefore proceed to Tier 2 sampling. The locations are as follows:

- School (Staff Washroom Sink, Student Washroom Sink)
- School Portable Service Line
- Fire Hall (Bathroom Sink)
- Municipal Hall (Kitchen Sink)
- BC Ambulance Station (BCAS) (Hose Bib)

In addition, the following location will also be included in Tier 2 sampling:

RCMP House (south side)

While the *Guidelines on Evaluating and Mitigating Lead in Drinking Water Supplies*, *Schools*, *Daycares and Other Buildings* (British Columbia Health Protection Branch, April 2019) (referred to in the following document as the *Guidelines*) note that Tier 2 sampling is required if more than 10% of the residential locations are above 15 ug/L, only one location was sampled, and the second sample exceeded the MAC by 150 times. Therefore, the RCMP House on the south side of town will be sampled according to Tier 2.

Through the Tier 1 sampling, samples were also collected at the water treatment plant (WTP) to determine baseline conditions. Results at the WTP were above the MAC, so additional sampling will be performed at the WTP as part of this sampling plan.

In addition to sampling for Tier 2, DOW, in consultation with Northern Health, has selected other locations to sample for both Tier 1 and Tier 2 at the same time. They include the following locations (also shown in Figure 1):

- Yellow House
- Hayley's House
- RCMP House (north side)

A Carbon Neutral Company





Memo To: R. Radloff & Associates Inc. April 08, 2021

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- Lebeck House
- Mayor's House
- Community Relations Office, Residential Apartment
- Hubs Motel
- BGM Camp
- BGM Apartments

One hydrant and the reservoir will also be sampled.

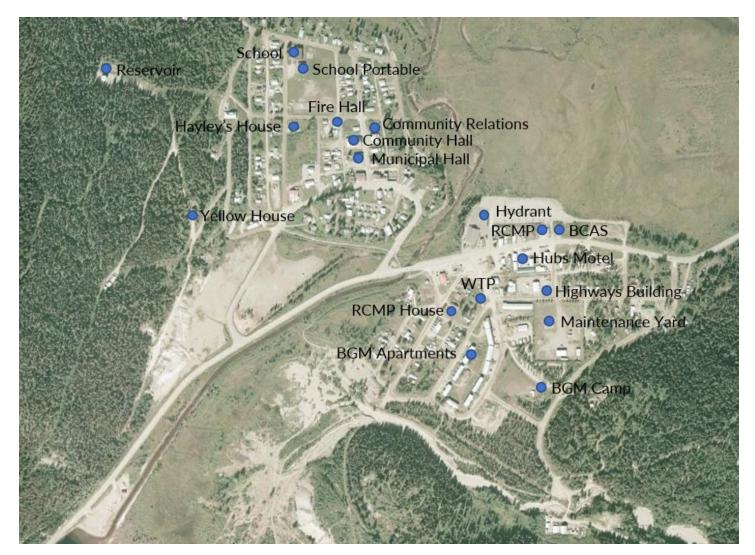


Figure 1: Sampling Locations



Memo To: R. Radloff & Associates Inc. April 08, 2021 - 3 -

The following sampling plan outlines the sampling required for Tier 2 sampling at locations that were previously sampled, as well as Tier 1 and Tier 2 sampling for locations that were not previously sampled. Additional distribution samples will be outlined as well. This sampling plan was developed using the *Guidelines*.

#### 2 SAMPLING PLAN

Depending on the location and whether Tier 2 only or Tier 1 and Tier 2 will be performed will determine the type of sampling required. The following sections outline the type of samples that should be taken at each location. It should be noted that in many of the sections, additional fully flushed samples are recommended that are not required according to Tier 2. These samples will provide additional insight into the source of lead (i.e. in the building plumbing or the distribution system).

## 2.1 Tier 2 Sampling for Non-Residential Locations

The locations identified in the table below were sampled in March 2021 through Tier 1 sampling and had lead concentrations above the MAC of 5  $\mu$ g/L.

Tier 2 sampling will involve stagnating the water for 8 hours, then running the tap for 30 seconds, then taking a 250 mL sample. An additional 250 mL fully-flushed sample (defined as running the water until there is a noticeable temperature drop) will also be taken.

**Building** Sampling Location **Number of Samples** Sample Bottle Type School Staff Washroom Sink 2 250 mL Student Washroom School 2 250 mL Sink Portable Service Line 2 School 250 mL Bathroom Sink 2 Fire Hall 250 mL Municipal Hall Kitchen Sink 2 250 mL **BCAS** Hose Bib 2 250 mL

Table 1: Tier 2 Sampling for Non-Residential Locations

#### 2.2 Tier 2 Sampling for Residential Locations

Tier 2 residential sampling will be performed at the RCMP house on the south side of town. Tier 2 Sampling will involve stagnating the water for 6 hours, then taking 4 consecutive 1 L samples. Samples are to be analyzed separately. An additional 1 L fully-flushed sample (defined as running the water until there is a noticeable temperature drop) will also be taken.



Memo To: R. Radloff & Associates Inc. April 08, 2021

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**Table 2: Tier 2 Sampling for Residential Locations** 

Building	Sampling Location	Number of Samples	Sample Bottle Type
RCMP House (South Side)	Kitchen Sink	5	1 L

## 2.3 Tier 1+2 Sampling for Residential Locations (Houses)

Additional residential houses will be sampled for both Tier 1 and Tier 2 at the same time. They are identified in the following table.

Sampling will involve stagnating the water for 6 hours, then taking 4 consecutive 1 L samples. Samples are to be analyzed separately. An additional 1 L fully-flushed sample (defined as running the water until there is a noticeable temperature drop) will also be taken.

Table 3: Tier 1 and Tier 2 Sampling for Residential Locations

Building	Sampling Location	Number of Samples	Sample Bottle Type
Yellow House	Kitchen Sink	5	1 L
Hayley's House	Kitchen Sink	5	1 L
RCMP House (North Side)	Kitchen Sink	5	1 L
Lebeck House	Kitchen Sink	5	1 L
Mayor's House	Kitchen Sink	5	1 L

### 2.4 Tier 1+2 Sampling for Multi-Family Locations (Apartments)

The *Guideline* does not specify a method for sampling multi-family residences (i.e. locations where there are multiple services off of one connection to the network). Therefore, it is proposed to follow the non-residential sampling program protocol at the locations noted in the following table.

Sampling will involve stagnating the water for 8 hours, taking at 250 mL sample, then running the tap for 30 s, then taking a 250 mL sample. An additional 250 mL fully-flushed sample (defined as running the water until there is a noticeable temperature drop) will also be taken.



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Table 4: Tier 1 and Tier 2 Sampling for Multi-Family Locations

Building	Sampling Location	Number of Samples	Sample Bottle Type
Community Relations Office, Residential Apartment	Kitchen Sink	3	250 mL
Hubs Motel	Main House Kitchen Tap	3	250 mL
BGM Camp	BGM Camp First Washroom at Main Entrance		250 mL
BGM Apartments	Kitchen Sink at apartment 304 or 201	3	250 mL

## 2.5 Additional WTP Sampling

Additional sampling will be performed at the WTP to determine the source of lead in the samples that were previously taken. The locations are noted in the following table.

Sampling will involve shutting down the plant for 8 hours, then taking a sample at the filter sample tap, a sample at the treated water tap, then consecutive 1 L samples will be taken until the volume equivalent to the WTP piping (approximately 11 L) has been sampled. A fully flushed sample will also be taken at the WTP.

**Table 5: Additional WTP Sampling** 

Building	Sampling Location	Number of Samples	Sample Bottle Type
WTP	Treated Water Sample Tap	13	1 L
WTP	Filter Sample Tap	1	1 L



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#### 2.6 Hydrant Sampling

One hydrant will be selected at a dead end in the system to represent high water age. Sampling will involve fully flushing the hydrant (clear hydrant lead and hydrant body, 5 minutes at full hydrant flow), then taking a sample.

**Table 6: Hydrant Sampling** 

Sampling Location	Number of Samples	Sample Bottle Type
Hydrant	1	250 mL

#### 2.7 Reservoir Sampling

Sampling will involve taking a grab sample at the reservoir. If sampling from a tap, make sure that sufficient turnover takes place prior to sampling.

**Table 7: Reservoir Sampling** 

Sampling Location	Number of Samples	Sample Bottle Type
Reservoir	1	250 mL

## 2.8 Sampling Summary

The following table summarizes how many sample bottles are required to complete the sampling outlined above.

**Table 8: Sampling Bottle Requirements** 

Bottle Volume	Number of Bottles Required
1 L	44
250 mL	26

Note that 1 L sample bottles will need to be ordered in advance as the ALS lab will need to coordinate their delivery.





## 3 CLOSURE

It is recommended that Northern Health be engaged prior to sampling to review this sampling plan.

If you have any questions regarding the above sampling plan, please contact the undersigned.

Prepared by:

Grant Dixon
Sampling Manager

dixong@ae.ca

Sarah Larlee, M.A.Sc., P.Eng.

Process Engineer larlees@ae.ca





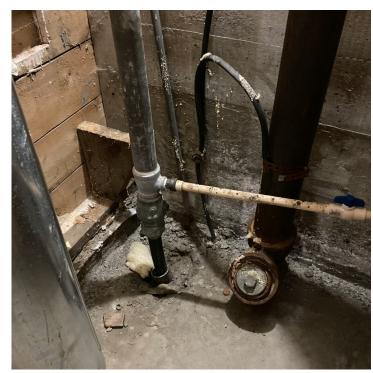
# **APPENDIX B - INSPECTION PHOTOS**



School Water Service #1



School Staff Washroom Sink



School Water Service #2



School Student Washroom Sink





Highways Kitchen Sink



School Daycare Bathroom Sink



Firehall Water Service



Firehall Bathroom Sink



Municipal Hall Kitchen Sink



Municipal Hall Water Service



**RCMP Detachment Water Service** 



RCMP Detachment Kitchen Sink



RCMP House Water Service



School New Kitchen Line Water Service



WTP Raw Water Supply Line



WTP Raw Water Sample Point



WTP Treat Water Sample Tap

# APPENDIX C - LEAD RESULTS: MARCH 5, 2021 SAMPLING AND APRIL 27, 2021



# **CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)**

Work Order : VA21A4279

Client : **District of Wells**Contact : Richard Radloff

Address : Box 219 4243 Saunders Avenue

Wells BC Canada V0K 2R0

Telephone : ---Project : ---PO : ----

C-O-C number : 20-885694

Sampler : ----Site : ----

Quote number ; KS21-DOWL100-001

No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 4

Laboratory : Vancouver - Environmental

Account Manager : Amanda Lampreau

Address : 8081 Lougheed Highway

Burnaby, British Columbia Canada V5A 1W9

Telephone : 1 250 372 3588

Date Samples Received : 09-Mar-2021 08:25

Date Analysis Commenced : 10-Mar-2021

Issue Date : 12-Mar-2021 09:22

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

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

#### Signatories

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

Signatories Position Laboratory Department

Kim Jensen Department Manager - Metals Metals, Burnaby, British Columbia

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 Work Order
 : VA21A4279

 Client
 : District of Wells

Project : --



#### **General Comments**

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

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

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

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

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

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

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

Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

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

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 : District of Wells

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## Analytical Results Evaluation

Matrix: Water		С	lient sample ID	# 1L	# 2L	# 3L	# 4L	# 5L
	Sampling date/time						04-Mar-2021 07:55	04-Mar-2021 08:05
	Water	Water	Water	Water	Water			
Analyte	Method	LOR	Unit	VA21A4279-001	VA21A4279-002	VA21A4279-003	VA21A4279-004	VA21A4279-005
Total Metals								
lead, total	E420	0.000050	mg/L	0.00264	0.000922	0.000578	0.00311	0.000693

# Analytical Results Evaluation

Matrix: Water		# 6L	# 7L	 			
Sampling date/time					04-Mar-2021 08:19	 	
	Water	Water	 				
Analyte	Method	LOR	Unit	VA21A4279-006	VA21A4279-007	 	
Total Metals							
lead, total	E420	0.000050	mg/L	0.0167	0.000904	 	

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

## **Summary of Guideline Breaches by Sample**

Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
# 6L	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0167 mg/L	0.005 mg/L

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# **Summary of Guideline Limits**

Guideline	Category		Limit
BCDWQG	MAC	lead, total	0.01 mg/L

Keys:

BCDWQG British Columbia Drinking Water Quality Guidelines (JAN, 2021)

MAC Maximium Acceptable Concentrations



## QUALITY CONTROL INTERPRETIVE REPORT

: VA21A4279 **Work Order** : 1 of 6 Page

Client **District of Wells** Laboratory : Vancouver - Environmental

Contact Richard Radloff **Account Manager** : Amanda Lampreau Address Address Box 219 4243 Saunders Avenue : 8081 Lougheed Highway

Burnaby, British Columbia Canada V5A 1W9

Wells BC Canada V0K 2R0 Telephone : 1 250 372 3588

: 09-Mar-2021 08:25 **Project Date Samples Received** PO Issue Date : 12-Mar-2021 09:22

C-O-C number 20-885694

Sampler

Quote number : KS21-DOWL100-001

No. of samples received :7 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

Telephone

Site

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)

• No Analysis Holding Time Outliers exist.

#### **Outliers : Frequency of Quality Control Samples**

• No Quality Control Sample Frequency Outliers occur.

## RIGHT SOLUTIONS | RIGHT PARTNER

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 : District of Wells

Project : ---



## **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.

Evaluation: **x** = Holding time exceedance; ✓ = Within Holding Time Matrix: Water Analyte Group Extraction / Preparation Analysis Method Sampling Date Container / Client Sample ID(s) **Holding Times** Eval Analysis Date Holding Times Eval Preparation Rec Actual Date Rec Actual Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) # 1L F420 04-Mar-2021 1 10-Mar-2021 180 6 days days Total Metals : Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 04-Mar-2021 10-Mar-2021 6 days ✓ # 2L 180 ---days **Total Metals: Total Metals in Water by CRC ICPMS** HDPE - total (lab preserved) E420 10-Mar-2021 # 3L 04-Mar-2021 6 days 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) # 4L E420 04-Mar-2021 10-Mar-2021 6 davs 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) # 5L E420 04-Mar-2021 10-Mar-2021 6 days 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 04-Mar-2021 # 6L 10-Mar-2021 180 6 days -------days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 ✓ # 7L 04-Mar-2021 10-Mar-2021 6 days 180 days

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ALS

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

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Project : --



# **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 speci												
Quality Control Sample Type			С	ount	Frequency (%)									
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation							
Laboratory Duplicates (DUP)														
Total Metals in Water by CRC ICPMS	E420	161438	1	14	7.1	5.0	✓							
Laboratory Control Samples (LCS)														
Total Metals in Water by CRC ICPMS	E420	161438	1	14	7.1	5.0	✓							
Method Blanks (MB)														
Total Metals in Water by CRC ICPMS	E420	161438	1	14	7.1	5.0	✓							
Matrix Spikes (MS)														
Total Metals in Water by CRC ICPMS	E420	161438	1	14	7.1	5.0	-/							

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 : District of Wells

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# **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
Total Metals in Water by CRC ICPMS	E420	Water	EPA 200.2/6020B	Water samples are digested with nitric and hydrochloric acids, and analyzed by
			(mod)	Collision/Reaction Cell ICPMS.
	Vancouver -			
	Environmental			Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered
				by this method.



# **QUALITY CONTROL REPORT**

Address

**Work Order** :VA21A4279 Page : 1 of 3

Client : District of Wells Contact : Richard Radloff Laboratory : Vancouver - Environmental **Account Manager** 

: Box 219 4243 Saunders Avenue

:8081 Lougheed Highway

: Amanda Lampreau

Wells BC Canada V0K 2R0

Burnaby, British Columbia Canada V5A 1W9

Telephone Project

Address

Telephone :1 250 372 3588 **Date Samples Received** :09-Mar-2021 08:25

PO C-O-C number :20-885694 **Date Analysis Commenced** : 10-Mar-2021

Sampler

: 12-Mar-2021 09:22 Issue Date

Site

Quote number : KS21-DOWL100-001

No. of samples received : 7 No. of samples analysed . 7

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

Kim Jensen Department Manager - Metals Metals, Burnaby, British Columbia 
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 Client
 : District of Wells

Project : --



#### **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
Total Metals (QC Lo	t: 161438)										
VA21A4279-001	# 1L	lead, total	7439-92-1	E420	0.000050	mg/L	0.00264	0.00262	0.913%	20%	

#### 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 Me	lethod	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 161438)						
lead, total	7439-92-1 E4	420	0.00005	mg/L	<0.000050	

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 : District of Wells

Project : ----



## 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
Total Metals (QCLot: 161438)									
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	102	80.0	120	

#### 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								
					Spi	ke	Recovery (%)	Recovery	Limits (%)	
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QC	Lot: 161438)									
VA21A4279-001	# 1L	lead, total	7439-92-1	E420	0.0208 mg/L	0.02 mg/L	104	70.0	130	

## Chain of Custody (COC) / Analytical Request Form

ALS

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 885694

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Report To	Contact and company name below will appea	or on the final report	Re	oorts / R	Recipients		$\top$		Turnaround Tir	me (TAT) F	Request	ed	ľ	Mar 1888		
Company:	R. Radloff and Associat				<b>75</b> EXCBL ☐ ED	D (DIGITAL)	E	Routine FD7 16	freceived by 3pm M		<del></del>		1.	4000	is.	lige .
Contact:	) DILE	<u> </u>	/QCI Reports wit		LON DELYES ☐ NO		١, ١		received by 3pm M					. Š.	46.	
Phone:	150-561-6661		• • • • • • • • • • • • • • • • • • • •					3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum					AFFIX		DE LABEL	HERE
T TIONS:	Company address below will appear on the final							2 day [P2] If received by 3pm M-F - 50% rush surcharge minimum						(ALS us	e only)	
Street:	820 3rd Aug	· ·	1 116 116					1 day [E] if received by 3pm M-F - 100% rush surcharge minimum					J## 1		A. Ø	in All
	Prince George / BC	Email 1 or F	ax monaro	, 5 q.a	118 Wilde	on organ	<b>~</b>	may apply to r	if received by 10am rush requests on weel	i M-5 - 2009 kends, statut	% rush su tory holida	rcharge. Additional fee: ys and non-routine test	i i	a di	9	
	V2M 164	Email 3						Date and	Time Required for a	all E&P TAT	s:		dd-mmm-yy	hh:mm an	ı/o:m	radio di Mil
	Same as Report To	] NO	În	volce R	ecipients				For all tests	s with rush Ta	ATs reque	ested, please contact yo	ur AM to confirm	aveilability.	•	
C	Copy of Invoice with Report	] NO Select Invoice	ce Distribution:	<u>15</u> 7 B	MAIL   MAIL	FAX			•		Ar	nalysis Request				
Company:		Email 1 or F	ax admin	100	ells.ca		ာ		Indicate Filtere	ed (F), Prese	erved (P)	or Filtered and Presen	ved (F/P) below		T	و و
Contact:		Email 2					CONTAINERS									REQUIRED (see notes)
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Tellure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW). System, please submit using an Authorized DW COC form.



# **CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)**

Work Order : VA21A4281

Client : District of Wells

Contact : Richard Radloff

Address : Box 219 4243 Saunders Avenue

Wells BC Canada V0K 2R0

 Telephone
 : --- 

 Project
 : --- 

 PO
 : ---

C-O-C number : 20-885693

Sampler : ----Site : ----

Quote number ; KS21-DOWL100-001

No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 4

Laboratory : Vancouver - Environmental

Account Manager : Amanda Lampreau

Address : 8081 Lougheed Highway

Burnaby, British Columbia Canada V5A 1W9

Telephone : 1 250 372 3588

Date Samples Received : 09-Mar-2021 08:25

Date Analysis Commenced : 10-Mar-2021

Issue Date : 12-Mar-2021 09:34

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
- Guideline Comparison

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

#### Signatories

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

 Signatories
 Position
 Laboratory Department

 Kim Jensen
 Department Manager - Metals
 Metals, Burnaby, British Columbia

 Page
 : 2 of 4

 Work Order
 : VA21A4281

 Client
 : District of Wells

Project : --



#### **General Comments**

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

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

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

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

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

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

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

Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

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

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 : 3 of 4

 Work Order
 : VA21A4281

 Client
 : District of Wells

Project : --



# Analytical Results Evaluation

Matrix: Water		# 8L	# 9L	# 10L	# 11L	# 12L		
	04-Mar-2021 08:33	04-Mar-2021 09:00	04-Mar-2021 09:04	04-Mar-2021 11:40	04-Mar-2021 15:02			
			Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit	VA21A4281-001	VA21A4281-002	VA21A4281-003	VA21A4281-004	VA21A4281-005
Total Metals								
lead, total	E420	0.000050	mg/L	0.000500	0.0129	0.000754	0.103	0.731

# Analytical Results Evaluation

Matrix: Water		# IOAL	# 1-74	 			
	04-Mar-2021 15:11	04-Mar-2021 15:19	 				
			Sub-Matrix	Water	Water	 	
Analyte	Method	LOR	Unit	VA21A4281-006	VA21A4281-007	 	
Total Metals							
lead, total	E420	0.000050	mg/L	0.00155	0.0115	 	

Client sample ID

# 13AL

# 14AL

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

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 : 4 of 4

 Work Order
 : VA21A4281

 Client
 : District of Wells

Project : ---



## **Summary of Guideline Breaches by Sample**

Client sample ID	Matrix	Analyte	Analyte Summary			Result	Limit
# 9L	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0129 mg/L	0.005 mg/L
# 11L	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.103 mg/L	0.005 mg/L
# 12L	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.731 mg/L	0.005 mg/L
# 14AL	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0115 mg/L	0.005 mg/L

## **Summary of Guideline Limits**

Guideline	Category		Limit
BCDWQG	MAC	lead, total	0.01 mg/L

Keys:

BCDWQG British Columbia Drinking Water Quality Guidelines (JAN, 2021)

MAC Maximium Acceptable Concentrations



Wells BC Canada V0K 2R0

## QUALITY CONTROL INTERPRETIVE REPORT

: VA21A4281 **Work Order** : 1 of 6 Page

Client **District of Wells** Laboratory : Vancouver - Environmental

Contact Richard Radloff **Account Manager** : Amanda Lampreau Address Address Box 219 4243 Saunders Avenue : 8081 Lougheed Highway

Burnaby, British Columbia Canada V5A 1W9

Telephone Telephone : 1 250 372 3588 : 09-Mar-2021 08:25 **Project Date Samples Received** 

PO Issue Date : 12-Mar-2021 09:34 C-O-C number

20-885693

Sampler Site

Quote number : KS21-DOWL100-001

No. of samples received :7 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.
- No Test sample Surrogate recovery outliers exist.

#### Outliers: Reference Material (RM) Samples

No Reference Material (RM) Sample outliers occur.

#### Outliers: Analysis Holding Time Compliance (Breaches)

• No Analysis Holding Time Outliers exist.

## **Outliers : Frequency of Quality Control Samples**

• No Quality Control Sample Frequency Outliers occur.

## RIGHT SOLUTIONS | RIGHT PARTNER

 Page
 : 3 of 6

 Work Order
 : VA21A4281

 Client
 : District of Wells

Project : ---



# **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	Method	Sampling Date	Ext		Analysis					
Container / Client Sample ID(s)			Preparation	Holding	g Times	Eval	Analysis Date	Holding	g Times	Eval
			Date	Rec	Actual			Rec	Actual	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
# 10L	E420	04-Mar-2021					10-Mar-2021	180	6 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
# 11L	E420	04-Mar-2021					10-Mar-2021	180	6 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
# 12L	E420	04-Mar-2021					10-Mar-2021	180	6 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
# 13AL	E420	04-Mar-2021					10-Mar-2021	180	6 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
# 14AL	E420	04-Mar-2021					10-Mar-2021	180	6 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
# 8L	E420	04-Mar-2021					10-Mar-2021	180	6 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
# 9L	E420	04-Mar-2021					10-Mar-2021	180	6 days	✓
								days		

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 : 4 of 6

 Work Order
 : VA21A4281

 Client
 : District of Wells

Project : ---



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

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 : 5 of 6

 Work Order
 : VA21A4281

 Client
 : District of Wells

Project : --



# **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: **x** = QC frequency outside specification; ✓ = QC frequency within specification. Quality Control Sample Type Count Frequency (%) Method QC Lot # QC Regular Actual Expected Evaluation Analytical Methods Laboratory Duplicates (DUP) Total Metals in Water by CRC ICPMS 161438 14 7.1 5.0 E420 Laboratory Control Samples (LCS) Total Metals in Water by CRC ICPMS 161438 1 14 7.1 5.0 E420 Method Blanks (MB) Total Metals in Water by CRC ICPMS 161438 E420 1 14 7.1 5.0 Matrix Spikes (MS) Total Metals in Water by CRC ICPMS 161438 1 14 7.1 5.0 E420

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 : 6 of 6

 Work Order
 : VA21A4281

 Client
 : District of Wells

Project : ---



# **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
Total Metals in Water by CRC ICPMS	E420	Water	EPA 200.2/6020B	Water samples are digested with nitric and hydrochloric acids, and analyzed by
			(mod)	Collision/Reaction Cell ICPMS.
	Vancouver -			
	Environmental			Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered
				by this method.



# **QUALITY CONTROL REPORT**

Address

**Work Order** :VA21A4281 Page : 1 of 3

Client : District of Wells Contact : Richard Radloff Laboratory : Vancouver - Environmental

: Box 219 4243 Saunders Avenue

**Account Manager** : Amanda Lampreau

Wells BC Canada V0K 2R0

:8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9

Telephone Project

Address

Telephone :1 250 372 3588

PO C-O-C number **Date Samples Received** :09-Mar-2021 08:25

Sampler

**Date Analysis Commenced** : 10-Mar-2021 : 12-Mar-2021 09:34 Issue Date

Site

Quote number : KS21-DOWL100-001

No. of samples received : 7 No. of samples analysed . 7

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

:20-885693

- 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

Kim Jensen Department Manager - Metals Metals, Burnaby, British Columbia 
 Page
 : 2 of 3

 Work Order
 : VA21A4281

 Client
 : District of Wells

Project : --



#### **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
Total Metals (QC Lot: 161438)											
VA21A4279-001	Anonymous	lead, total	7439-92-1	E420	0.000050	mg/L	0.00264	0.00262	0.913%	20%	

#### 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 Me	lethod	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 161438)						
lead, total	7439-92-1 E4	420	0.00005	mg/L	<0.000050	

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 : 3 of 3

 Work Order
 : VA21A4281

 Client
 : District of Wells

Project : ---



## 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 Co	ontrol Sample (LCS)	(LCS) Report								
	Spike	Recovery (%)	Recovery	Limits (%)								
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier			
Total Metals (QCLot: 161438)												
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	102 80.0		120				

#### 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								
							Recovery (%)	Recovery		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 161438)										
VA21A4279-001	Anonymous	lead, total	7439-92-1	E420	0.0208 mg/L	0.02 mg/L	104	70.0	130	

## Chain of Custody (COC) / Analytical Request Form

Chain of Custody (CC

Canada Toll Free: 1 800 668 9878

coc Number: 20 - 885693

Page of

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Kirhava	Date: 2021/63/0 PAGE FOR ALS LOCATIONS AND SAMPLING INF	8 (0:30	Treceived by	William	TE - LABORATORY	CORV VELLO	16 K	ENT COI	29		MI	9	ite	<b>M</b>	CID	4	.88	<u> </u>	°2°	<u>tar</u>

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



Wells BC Canada V0K 2R0

# **CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)**

**Work Order** : VA21A4293 Page : 1 of 9

Client District of Wells Laboratory : Vancouver - Environmental

Contact : Richard Radloff **Account Manager** : Amanda Lampreau Address

Address : Box 219 4243 Saunders Avenue : 8081 Lougheed Highway

Burnaby, British Columbia Canada V5A 1W9

Metals, Burnaby, British Columbia

Telephone Telephone : 1 250 372 3588 Project **Date Samples Received** : 09-Mar-2021 13:38 : ----

PO **Date Analysis Commenced** : 10-Mar-2021

Issue Date C-O-C number : 20-885691/92 : 16-Mar-2021 10:49 Sampler

Site : ----

: KS21-DOWL100-001 Quote number

No. of samples received : 18 No. of samples analysed : 18

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

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

#### Signatories

Robin Weeks

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

Team Leader - Metals

Signatories	Position	Laboratory Department
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia

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 : 2 of 9

 Work Order
 : VA21A4293

 Client
 : District of Wells

Project : ---



#### **General Comments**

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

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

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

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

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

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

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

Unit	Description
mg/L pH units	milligrams per litre pH units

>: greater than.

<: less than.

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

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Work Order : VA21A4293
Client : District of Wells

Project : --



# Analytical Results Evaluation

Matrix: Water		C	lient sample ID	#1	#2	#3	#4	#5
		San	npling date/time	04-Mar-2021 07:41	04-Mar-2021 07:44	04-Mar-2021 07:50	04-Mar-2021 07:55	04-Mar-2021 08:05
			Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit	VA21A4293-001	VA21A4293-002	VA21A4293-003	VA21A4293-004	VA21A4293-005
Total Metals								
lead, total	E420	0.000050	mg/L	0.00583	0.00820	0.00132	0.000903	0.00201

Matrix: Water		C	lient sample ID	#6	#7	#8	#9	#10
Sampling date/time				04-Mar-2021 08:12	04-Mar-2021 08:19	04-Mar-2021 08:33	04-Mar-2021 09:00	04-Mar-2021 09:04
			Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit	VA21A4293-006	VA21A4293-007	VA21A4293-008	VA21A4293-009	VA21A4293-010
Total Metals								
lead, total	E420	0.000050	mg/L	0.0659	0.00773	0.00366	0.0247	0.000672

Page : 4 of 9
Work Order : VA21A4293
Client : District of Wells

Project : ---



Matrix: Water		C	lient sample ID	#11	#12	#13A1	#13B1	#13B
		Sampling date/time			04-Mar-2021 15:02	04-Mar-2021 15:11	04-Mar-2021 15:11	04-Mar-2021 15:11
			Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit	VA21A4293-011	VA21A4293-012	VA21A4293-013	VA21A4293-014	VA21A4293-015
Physical Tests								
alkalinity, total (as CaCO3)	E290	1.0	mg/L				147	
hardness (as CaCO3), from total Ca/Mg	EC100A	0.60	mg/L					249
рН	E108	0.10	pH units				7.97	
Organic / Inorganic Carbon								
carbon, dissolved inorganic [DIC]	E353-L	0.50	mg/L				32.4	
Total Metals								
aluminum, total	E420	0.0030	mg/L					<0.0030
antimony, total	E420	0.00010	mg/L					<0.00010
arsenic, total	E420	0.00010	mg/L					0.00733
barium, total	E420	0.00010	mg/L					0.0407
beryllium, total	E420	0.000020	mg/L					<0.000020
bismuth, total	E420	0.000050	mg/L					<0.000050
boron, total	E420	0.010	mg/L					<0.010
cadmium, total	E420	0.0000050	mg/L					<0.0000050
calcium, total	E420	0.050	mg/L					67.6
cesium, total	E420	0.000010	mg/L					0.000014
chromium, total	E420	0.00050	mg/L					<0.00050
cobalt, total	E420	0.00010	mg/L					<0.00010
copper, total	E420	0.00050	mg/L					0.00433
iron, total	E420	0.010	mg/L					2.57
lead, total	E420	0.000050	mg/L	0.200	0.00986	0.000086		0.00263
lithium, total	E420	0.0010	mg/L					0.0015
magnesium, total	E420	0.0050	mg/L					19.4
manganese, total	E420	0.00010	mg/L					0.442
molybdenum, total	E420	0.000050	mg/L					0.000896
nickel, total	E420	0.00050	mg/L					<0.00050
phosphorus, total	E420	0.050	mg/L					<0.050
potassium, total	E420	0.050	mg/L					0.376
rubidium, total	E420	0.00020	mg/L					0.00033

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 Work Order
 : VA21A4293

 Client
 : District of Wells

Project : --



		C	lient sample ID	#11	#12	#13A1	#13B1	#13B
Matrix: Water								
		San	npling date/time	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021	04-Mar-2021
				11:40	15:02	15:11	15:11	15:11
			Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit	VA21A4293-011	VA21A4293-012	VA21A4293-013	VA21A4293-014	VA21A4293-015
Total Metals								
selenium, total	E420	0.000050	mg/L					<0.000050
silicon, total	E420	0.10	mg/L					3.68
silver, total	E420	0.000010	mg/L					<0.000010
sodium, total	E420	0.050	mg/L					1.59
strontium, total	E420	0.00020	mg/L					0.322
sulfur, total	E420	0.50	mg/L					30.9
tellurium, total	E420	0.00020	mg/L					<0.00020
thallium, total	E420	0.000010	mg/L					<0.000010
thorium, total	E420	0.00010	mg/L					<0.00010
tin, total	E420	0.00010	mg/L					<0.00010
titanium, total	E420	0.00030	mg/L					<0.00030
tungsten, total	E420	0.00010	mg/L					0.00010
uranium, total	E420	0.000010	mg/L					0.000801
vanadium, total	E420	0.00050	mg/L					<0.00050
zinc, total	E420	0.0030	mg/L					0.0133
zirconium, total	E420	0.00020	mg/L					<0.00020

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Work Order : VA21A4293
Client : District of Wells

Project : ---



		C	lient sample ID	#14A1	#14B1	#14B	 
Matrix: Water							
		San	npling date/time		04-Mar-2021	04-Mar-2021	 
				15:19	15:19	15:19	
			Sub-Matrix		Water	Water	 
Analyte	Method	LOR	Unit	VA21A4293-016	VA21A4293-017	VA21A4293-018	 
Physical Tests							
alkalinity, total (as CaCO3)	E290	1.0	mg/L		155		 
hardness (as CaCO3), from total Ca/Mg	EC100A	0.60	mg/L			246	 
рН	E108	0.10	pH units		8.00		 
Organic / Inorganic Carbon							
carbon, dissolved inorganic [DIC]	E353-L	0.50	mg/L		37.9		 
Total Metals							
aluminum, total	E420	0.0030	mg/L			<0.0030	 
antimony, total	E420	0.00010	mg/L			<0.00010	 
arsenic, total	E420	0.00010	mg/L			0.00087	 
barium, total	E420	0.00010	mg/L			0.0360	 
beryllium, total	E420	0.000020	mg/L			<0.000020	 
bismuth, total	E420	0.000050	mg/L			<0.000050	 
boron, total	E420	0.010	mg/L			<0.010	 
cadmium, total	E420	0.0000050	mg/L			<0.000050	 
calcium, total	E420	0.050	mg/L			66.8	 
cesium, total	E420	0.000010	mg/L			<0.000010	 
chromium, total	E420	0.00050	mg/L			<0.00050	 
cobalt, total	E420	0.00010	mg/L			<0.00010	 
copper, total	E420	0.00050	mg/L			0.0406	 
iron, total	E420	0.010	mg/L			0.024	 
lead, total	E420	0.000050	mg/L	0.0170		0.0108	 
lithium, total	E420	0.0010	mg/L			0.0012	 
magnesium, total	E420	0.0050	mg/L			19.2	 
manganese, total	E420	0.00010	mg/L			0.00288	 
molybdenum, total	E420	0.000050	mg/L			0.000741	 
nickel, total	E420	0.00050	mg/L			0.00397	 
phosphorus, total	E420	0.050	mg/L			<0.050	 
potassium, total	E420	0.050	mg/L			0.337	 
rubidium, total	E420	0.00020	mg/L			0.00023	 

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 Work Order
 : VA21A4293

 Client
 : District of Wells

Project : ---



## Analytical Results Evaluation

		C	Client sample ID	#14A1	#14B1	#14B	 
Matrix: Water							
		San	npling date/time	04-Mar-2021	04-Mar-2021	04-Mar-2021	 
				15:19	15:19	15:19	
			Sub-Matrix	Water	Water	Water	 
Analyte	Method	LOR	Unit	VA21A4293-016	VA21A4293-017	VA21A4293-018	 
Total Metals							
selenium, total	E420	0.000050	mg/L			<0.000050	 
silicon, total	E420	0.10	mg/L			3.49	 
silver, total	E420	0.000010	mg/L			<0.000010	 
sodium, total	E420	0.050	mg/L			2.76	 
strontium, total	E420	0.00020	mg/L			0.320	 
sulfur, total	E420	0.50	mg/L			30.8	 
tellurium, total	E420	0.00020	mg/L			<0.00020	 
thallium, total	E420	0.000010	mg/L			<0.000010	 
thorium, total	E420	0.00010	mg/L			<0.00010	 
tin, total	E420	0.00010	mg/L			0.00038	 
titanium, total	E420	0.00030	mg/L			<0.00030	 
tungsten, total	E420	0.00010	mg/L			<0.00010	 
uranium, total	E420	0.000010	mg/L			0.000952	 
vanadium, total	E420	0.00050	mg/L			<0.00050	 
zinc, total	E420	0.0030	mg/L			0.0577	 
zirconium, total	E420	0.00020	mg/L			<0.00020	 

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

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 Work Order
 : VA21A4293

 Client
 : District of Wells

Project : ---



## **Summary of Guideline Breaches by Sample**

Client sample ID	Matrix	Analyte	Analyte Summary			Result	Limit
#1	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00583 mg/L	0.005 mg/L
#2	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00820 mg/L	0.005 mg/L
#6	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0659 mg/L	0.005 mg/L
#7	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00773 mg/L	0.005 mg/L
#9	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0247 mg/L	0.005 mg/L
#11	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.200 mg/L	0.005 mg/L
#12	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00986 mg/L	0.005 mg/L
#13B	Water	iron, total	No summary description available for this compound in this guideline.	BCDWQG	AO	2.57 mg/L	0.3 mg/L
	Water	manganese, total	No summary description available for this compound in this guideline.	BCDWQG	AO	0.442 mg/L	0.05 mg/L
#14A1	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0170 mg/L	0.005 mg/L
#14B	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0108 mg/L	0.005 mg/L

## **Summary of Guideline Limits**

Guideline	Category		Limit
BCDWQG	AO	iron, total	0.30 mg/L
	AO	manganese, total	0.05 mg/L
	MAC	lead, total	0.01 mg/L

Keys:

BCDWQG British Columbia Drinking Water Quality Guidelines (JAN, 2021)

AO Aesthetic Objective/Other Value
MAC Maximium Acceptable Concentrations

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 Work Order
 : VA21A4293

 Client
 : District of Wells





## **CERTIFICATE OF ANALYSIS**

Work Order : VA21A4293

Client : **District of Wells**Contact : Richard Radloff

Address : Box 219 4243 Saunders Avenue

Wells BC Canada V0K 2R0

Telephone : ---Project : ----

C-O-C number : 20-885691/92

Sampler : ---Site : ----

Quote number : KS21-DOWL100-001

No. of samples received : 18
No. of samples analysed : 18

Page : 1 of 7

Laboratory : Vancouver - Environmental

Account Manager : Amanda Lampreau

Address : 8081 Lougheed Highway

Burnaby BC Canada V5A 1W9

Telephone : 1 250 372 3588

Date Samples Received : 09-Mar-2021 13:38

Date Analysis Commenced : 10-Mar-2021

Issue Date : 16-Mar-2021 10:49

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

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
Lindsay Gung Supervisor - Water Chemistry Inorganics, Burnaby, British Columbia
Robin Weeks Team Leader - Metals Metals, Burnaby, British Columbia

Page : 2 of 7

Work Order : VA21A4293
Client : District of Wells

Project · ---



#### **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).

mg/L milligrams per litre pH units pH units	Unit	Description

<: 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.

Page : 3 of 7
Work Order : VA21A4293
Client : District of Wells

Project : ----



## Analytical Results

Sub-Matrix: Water			Cli	ient sample ID	#1	#2	#3	#4	#5
(Matrix: Water)									
Analyte	CAS Number	Method	Client samp	ling date / time  Unit	04-Mar-2021 07:41 <b>VA21A4293-001</b>	04-Mar-2021 07:44 <b>VA21A4293-002</b>	04-Mar-2021 07:50 VA21A4293-003	04-Mar-2021 07:55 VA21A4293-004	04-Mar-2021 08:05 VA21A4293-005
					Result	Result	Result	Result	Result
Total Metals									
lead, total	7439-92-1	E420	0.000050	mg/L	0.00583	0.00820	0.00132	0.000903	0.00201

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

## Analytical Results

Sub-Matrix: Water			Cli	ient sample ID	#6	#7	#8	#9	#10
(Matrix: Water)									
				ling date / time	04-Mar-2021 08:12	04-Mar-2021 08:19	04-Mar-2021 08:33	04-Mar-2021 09:00	04-Mar-2021 09:04
Analyte	CAS Number	Method	LOR	Unit	VA21A4293-006	VA21A4293-007	VA21A4293-008	VA21A4293-009	VA21A4293-010
					Result	Result	Result	Result	Result
Total Metals									
lead, total	7439-92-1	E420	0.000050	mg/L	0.0659	0.00773	0.00366	0.0247	0.000672

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

Page : 4 of 7
Work Order : VA21A4293
Client : District of Wells

Project : ---



## Analytical Results

Sub-Matrix: Water			Cl	ient sample ID	#11	#12	#13A1	#13B1	#13B
(Matrix: Water)									
			Client samp	ling date / time	04-Mar-2021 11:40	04-Mar-2021 15:02	04-Mar-2021 15:11	04-Mar-2021 15:11	04-Mar-2021 15:11
Analyte	CAS Number	Method	LOR	Unit	VA21A4293-011	VA21A4293-012	VA21A4293-013	VA21A4293-014	VA21A4293-015
					Result	Result	Result	Result	Result
Physical Tests						ı			
alkalinity, total (as CaCO3)		E290	1.0	mg/L				147	
hardness (as CaCO3), from total Ca/Mg		EC100A	0.60	mg/L					249
рН		E108	0.10	pH units				7.97	
Organic / Inorganic Carbon		E353-L	0.50					32.4	
carbon, dissolved inorganic [DIC]		E333-L	0.50	mg/L				32.4	
Total Metals	7100.00.5	E420	0.0030	m a/l					<0.0030
aluminum, total antimony, total	7429-90-5 7440-36-0	E420	0.0030	mg/L mg/L					<0.0030
arsenic, total		E420	0.00010	- 1					0.00733
barium, total	7440-38-2	E420	0.00010	mg/L					0.0407
beryllium, total	7440-39-3 7440-41-7	E420	0.00010	mg/L mg/L					<0.00020
bismuth, total	7440-69-9	E420	0.000050	mg/L					<0.000050
boron, total	7440-69-9	E420	0.000	mg/L					<0.010
cadmium, total	7440-43-9	E420	0.0000050	mg/L					<0.0000050
calcium, total	7440-70-2	E420	0.050	mg/L					67.6
cesium, total	7440-46-2	E420	0.000010	mg/L					0.000014
chromium, total	7440-47-3	E420	0.00050	mg/L					<0.00050
cobalt, total	7440-48-4	E420	0.00010	mg/L					<0.00010
copper, total	7440-50-8	E420	0.00050	mg/L					0.00433
iron, total	7439-89-6	E420	0.010	mg/L					2.57
lead, total	7439-92-1	E420	0.000050	mg/L	0.200	0.00986	0.000086		0.00263
lithium, total	7439-93-2	E420	0.0010	mg/L					0.0015
magnesium, total	7439-95-4	E420	0.0050	mg/L					19.4
manganese, total	7439-96-5	E420	0.00010	mg/L					0.442
molybdenum, total	7439-98-7	E420	0.000050	mg/L					0.000896
nickel, total	7440-02-0	E420	0.00050	mg/L					<0.00050
phosphorus, total	7723-14-0	E420	0.050	mg/L					<0.050
potassium, total	7440-09-7	E420	0.050	mg/L					0.376
rubidium, total	7440-17-7	E420	0.00020	mg/L					0.00033
selenium, total	7782-49-2	E420	0.000050	mg/L					<0.000050
silicon, total	7440-21-3	E420	0.10	mg/L					3.68

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Work Order : VA21A4293
Client : District of Wells

Project : ---



## Analytical Results

Sub-Matrix: Water			Cli	ent sample ID	#11	#12	#13A1	#13B1	#13B
(Matrix: Water)									
			Client samp	ling date / time	04-Mar-2021 11:40	04-Mar-2021 15:02	04-Mar-2021 15:11	04-Mar-2021 15:11	04-Mar-2021 15:11
Analyte	CAS Number	Method	LOR	Unit	VA21A4293-011	VA21A4293-012	VA21A4293-013	VA21A4293-014	VA21A4293-015
					Result	Result	Result	Result	Result
Total Metals									
silver, total	7440-22-4	E420	0.000010	mg/L					<0.000010
sodium, total	17341-25-2	E420	0.050	mg/L					1.59
strontium, total	7440-24-6	E420	0.00020	mg/L					0.322
sulfur, total	7704-34-9	E420	0.50	mg/L					30.9
tellurium, total	13494-80-9	E420	0.00020	mg/L					<0.00020
thallium, total	7440-28-0	E420	0.000010	mg/L					<0.000010
thorium, total	7440-29-1	E420	0.00010	mg/L					<0.00010
tin, total	7440-31-5	E420	0.00010	mg/L					<0.00010
titanium, total	7440-32-6	E420	0.00030	mg/L					<0.00030
tungsten, total	7440-33-7	E420	0.00010	mg/L					0.00010
uranium, total	7440-61-1	E420	0.000010	mg/L					0.000801
vanadium, total	7440-62-2	E420	0.00050	mg/L					<0.00050
zinc, total	7440-66-6	E420	0.0030	mg/L					0.0133
zirconium, total	7440-67-7	E420	0.00020	mg/L					<0.00020

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

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Work Order : VA21A4293
Client : District of Wells

Project : ----



## Analytical Results

Sub-Matrix: Water			CI	ient sample ID	#14A1	#14B1	#14B	 
(Matrix: Water)								
			Client samp	ling date / time	04-Mar-2021 15:19	04-Mar-2021 15:19	04-Mar-2021 15:19	 
Analyte	CAS Number	Method	LOR	Unit	VA21A4293-016	VA21A4293-017	VA21A4293-018	 
					Result	Result	Result	 
Physical Tests								
alkalinity, total (as CaCO3)		E290	1.0	mg/L		155		 
hardness (as CaCO3), from total Ca/Mg		EC100A	0.60	mg/L			246	 
рН		E108	0.10	pH units		8.00		 
Organic / Inorganic Carbon								
carbon, dissolved inorganic [DIC]		E353-L	0.50	mg/L		37.9		 
Total Metals								
aluminum, total	7429-90-5	E420	0.0030	mg/L			<0.0030	 
antimony, total	7440-36-0	E420	0.00010	mg/L			<0.00010	 
arsenic, total	7440-38-2	E420	0.00010	mg/L			0.00087	 
barium, total	7440-39-3	E420	0.00010	mg/L			0.0360	 
beryllium, total	7440-41-7	E420	0.000020	mg/L			<0.000020	 
bismuth, total	7440-69-9	E420	0.000050	mg/L			<0.000050	 
boron, total	7440-42-8	E420	0.010	mg/L			<0.010	 
cadmium, total	7440-43-9	E420	0.0000050	mg/L			<0.0000050	 
calcium, total	7440-70-2	E420	0.050	mg/L			66.8	 
cesium, total	7440-46-2	E420	0.000010	mg/L			<0.000010	 
chromium, total	7440-47-3	E420	0.00050	mg/L			<0.00050	 
cobalt, total	7440-48-4	E420	0.00010	mg/L			<0.00010	 
copper, total	7440-50-8	E420	0.00050	mg/L			0.0406	 
iron, total	7439-89-6	E420	0.010	mg/L			0.024	 
lead, total	7439-92-1	E420	0.000050	mg/L	0.0170		0.0108	 
lithium, total	7439-93-2	E420	0.0010	mg/L			0.0012	 
magnesium, total	7439-95-4	E420	0.0050	mg/L			19.2	 
manganese, total	7439-96-5	E420	0.00010	mg/L			0.00288	 
molybdenum, total	7439-98-7	E420	0.000050	mg/L			0.000741	 
nickel, total	7440-02-0	E420	0.00050	mg/L			0.00397	 
phosphorus, total	7723-14-0	E420	0.050	mg/L			<0.050	 
potassium, total	7440-09-7	E420	0.050	mg/L			0.337	 
rubidium, total	7440-17-7	E420	0.00020	mg/L			0.00023	 
selenium, total	7782-49-2	E420	0.000050	mg/L			<0.000050	 
silicon, total	7440-21-3	E420	0.10	mg/L			3.49	 

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Client : District of Wells

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## Analytical Results

Sub-Matrix: Water			Cli	ient sample ID	#14A1	#14B1	#14B	 
(Matrix: Water)								
			Client samp	ling date / time	04-Mar-2021 15:19	04-Mar-2021 15:19	04-Mar-2021 15:19	 
Analyte	CAS Number	Method	LOR	Unit	VA21A4293-016	VA21A4293-017	VA21A4293-018	 
					Result	Result	Result	 
Total Metals								
silver, total	7440-22-4	E420	0.000010	mg/L			<0.000010	 
sodium, total	17341-25-2	E420	0.050	mg/L			2.76	 
strontium, total	7440-24-6	E420	0.00020	mg/L			0.320	 
sulfur, total	7704-34-9	E420	0.50	mg/L			30.8	 
tellurium, total	13494-80-9	E420	0.00020	mg/L			<0.00020	 
thallium, total	7440-28-0	E420	0.000010	mg/L			<0.000010	 
thorium, total	7440-29-1	E420	0.00010	mg/L			<0.00010	 
tin, total	7440-31-5	E420	0.00010	mg/L			0.00038	 
titanium, total	7440-32-6	E420	0.00030	mg/L			<0.00030	 
tungsten, total	7440-33-7	E420	0.00010	mg/L			<0.00010	 
uranium, total	7440-61-1	E420	0.000010	mg/L			0.000952	 
vanadium, total	7440-62-2	E420	0.00050	mg/L			<0.00050	 
zinc, total	7440-66-6	E420	0.0030	mg/L			0.0577	 
zirconium, total	7440-67-7	E420	0.00020	mg/L			<0.00020	 

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



## **QUALITY CONTROL INTERPRETIVE REPORT**

Work Order : VA21A4293 Page : 1 of 8

Client : District of Wells Laboratory : Vancouver - Environmental

Contact : Richard Radloff Account Manager : Amanda Lampreau

Address : Box 219 4243 Saunders Avenue Address : 8081 Lougheed High

Box 219 4243 Saunders Avenue

Address

8081 Lougheed Highway

Burnaby, British Columbia Canada V5A 1W9

 Telephone
 : --- Telephone
 : 1 250 372 3588

 Project
 : --- Date Samples Received
 : 09-Mar-2021 13:38

PO : --- Issue Date : 16-Mar-2021 10:49

C-O-C number : 20-885691/92 Sampler : ----

Site : ----

Quote number : KS21-DOWL100-001

No. of samples received : 18
No. of samples analysed : 18

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 Matrix Spike outliers occur.
- 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

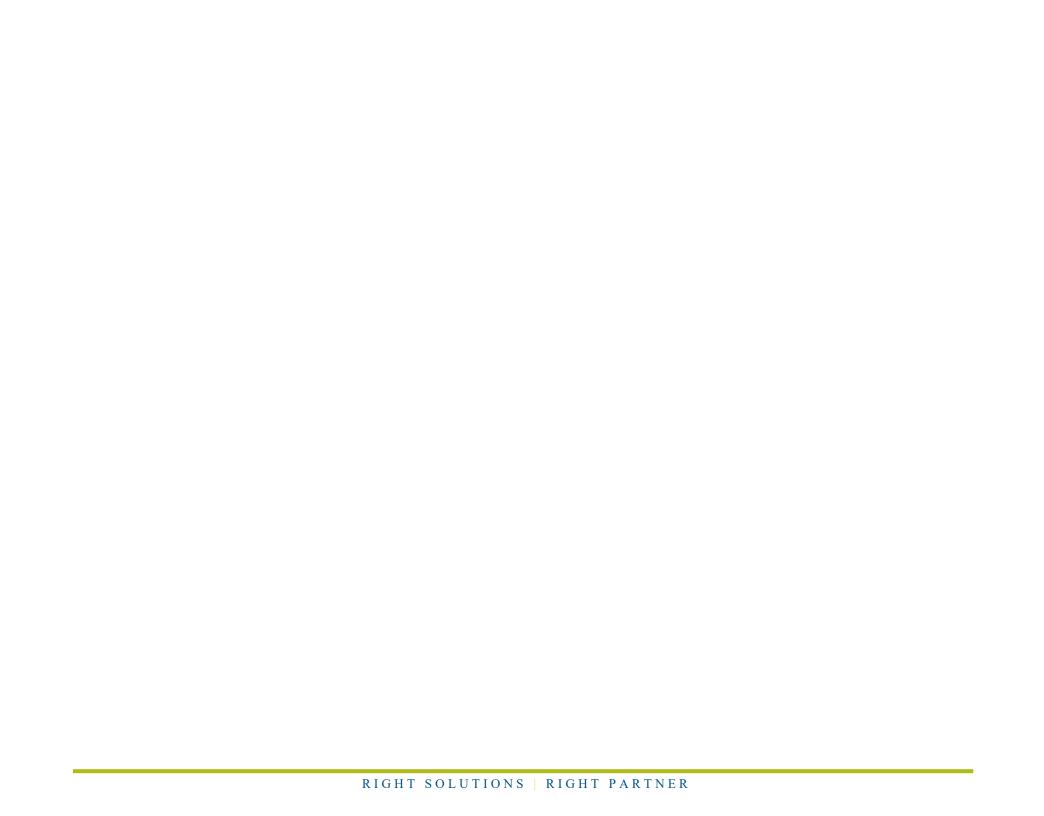
• No Reference Material (RM) Sample outliers occur.

#### **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.



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Outliers: Quality Control Samples
Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

#### Matrix: Water

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recover	ies							
Total Metals	QC-MRG3-1611350		sulfur, total	7704-34-9	E420	122 % MES	80.0-120%	Recovery greater than
	02							upper control limit

#### **Result Qualifiers**

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

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## **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					Ev	/aluation: × =	Holding time excee	edance ; 🔻	/ = Within	Holding Time
Analyte Group	Method	Sampling Date	Ext	raction / Pre	eparation			Analys	sis	
Container / Client Sample ID(s)			Preparation	Holding	Times	Eval	Analysis Date	Holding	g Times	Eval
			Date	Rec	Actual			Rec	Actual	
Organic / Inorganic Carbon : Dissolved Inorganic Carbon by Combustion										
HDPE										
#13B1	E353-L	04-Mar-2021					12-Mar-2021	13 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Inorganic Carbon by Combustion										
HDPE										
#14B1	E353-L	04-Mar-2021					12-Mar-2021	13 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
#13B1	E290	04-Mar-2021					15-Mar-2021	13 days	10 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
#14B1	E290	04-Mar-2021					15-Mar-2021	13 days	10 days	✓
Physical Tests : pH by Meter										
HDPE										
#13B1	E108	04-Mar-2021					15-Mar-2021	-11.90	261 hrs	*
								hrs		EHTR-FM
Physical Tests : pH by Meter										
HDPE										
#14B1	E108	04-Mar-2021					15-Mar-2021	-12.03	261 hrs	×
								hrs		EHTR-FM
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
#12	E420	04-Mar-2021					10-Mar-2021	179	5 days	✓
								days		
		-								

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Matrix: Water Evaluation: x = Holding time exceedance; ✓ = Within Holding Time Analyte Group Extraction / Preparation Method Sampling Date Analysis Container / Client Sample ID(s) Preparation **Holding Times** Eval Analysis Date Holding Times Eval Rec Date Rec Actual Actual Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 04-Mar-2021 10-Mar-2021 5 days ✓ #13A1 179 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 1 #14A1 E420 04-Mar-2021 10-Mar-2021 179 5 days -------days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) #1 E420 04-Mar-2021 10-Mar-2021 6 days ✓ 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 10-Mar-2021 ✓ #10 04-Mar-2021 180 6 days days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 04-Mar-2021 10-Mar-2021 6 days ✓ #11 180 days **Total Metals: Total Metals in Water by CRC ICPMS** HDPE - total (lab preserved) E420 04-Mar-2021 10-Mar-2021 ✓ #2 180 6 days days **Total Metals: Total Metals in Water by CRC ICPMS** HDPE - total (lab preserved) #3 E420 04-Mar-2021 10-Mar-2021 6 days 1 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) ✓ #4 E420 04-Mar-2021 10-Mar-2021 180 6 days days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 ✓ #5 04-Mar-2021 10-Mar-2021 6 days ----180 ---days

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

Matrix. Water						araation.	Holding time excee	, autiou ,	***************************************	riolaning rini
Analyte Group	Method	Sampling Date	Ext	raction / Pr	eparation			Analys	sis	
Container / Client Sample ID(s)			Preparation	Holding	g Times	Eval	Analysis Date	Holding	g Times	Eval
			Date	Rec	Actual			Rec	Actual	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
#6	E420	04-Mar-2021					10-Mar-2021	180	6 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
#7	E420	04-Mar-2021					10-Mar-2021	180	6 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
#8	E420	04-Mar-2021					10-Mar-2021	180	6 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
#9	E420	04-Mar-2021					10-Mar-2021	180	6 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
#13B	E420	04-Mar-2021					11-Mar-2021	184	6 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
#14B	E420	04-Mar-2021					11-Mar-2021	184	6 days	✓
								days		

#### **Legend & Qualifier Definitions**

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended Rec. HT: ALS recommended hold time (see units).

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## **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			Co	ount		Frequency (%)				
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation			
Laboratory Duplicates (DUP)										
Alkalinity Species by Titration	E290	163530	1	4	25.0	5.0	✓			
Dissolved Inorganic Carbon by Combustion	E353-L	162233	1	2	50.0	5.0	✓			
pH by Meter	E108	163531	1	4	25.0	5.0	✓			
Total Metals in Water by CRC ICPMS	E420	161111	3	59	5.0	5.0	✓			
Laboratory Control Samples (LCS)										
Alkalinity Species by Titration	E290	163530	1	4	25.0	5.0	✓			
Dissolved Inorganic Carbon by Combustion	E353-L	162233	1	2	50.0	5.0	✓			
pH by Meter	E108	163531	1	4	25.0	5.0	✓			
Total Metals in Water by CRC ICPMS	E420	161111	3	59	5.0	5.0	✓			
Method Blanks (MB)										
Alkalinity Species by Titration	E290	163530	1	4	25.0	5.0	✓			
Dissolved Inorganic Carbon by Combustion	E353-L	162233	1	2	50.0	5.0	✓			
Total Metals in Water by CRC ICPMS	E420	161111	3	59	5.0	5.0	✓			
Matrix Spikes (MS)										
Dissolved Inorganic Carbon by Combustion	E353-L	162233	1	2	50.0	5.0	✓			
Total Metals in Water by CRC ICPMS	E420	161111	3	59	5.0	5.0	1			

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## **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
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 $20 \pm 5^{\circ}$ C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
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.
Dissolved Inorganic Carbon by Combustion	E353-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Inorganic Carbon is determined on a sample which is filtered through a 0.45 micron filter prior to analysis by the high temperature combustion method with measurement by an infrared detector, where the sample is acidified in a reaction chamber to convert all inorganic carbons (carbonates) to carbon dioxide for analysis.
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.
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.



## **QUALITY CONTROL REPORT**

Issue Date

**Work Order** VA21A4293 Page : 1 of 18

Client : District of Wells Contact : Richard Radloff Laboratory : Vancouver - Environmental

: Box 219 4243 Saunders Avenue

**Account Manager** : Amanda Lampreau Address :8081 Lougheed Highway

Wells BC Canada V0K 2R0

Burnaby, British Columbia Canada V5A 1W9

Telephone Project

Address

Quote number

Telephone :1 250 372 3588

PO

**Date Samples Received** :09-Mar-2021 13:38

C-O-C number : 20-885691/92 Sampler

**Date Analysis Commenced** : 10-Mar-2021 : 16-Mar-2021 10:49

Site

: KS21-DOWL100-001

No. of samples received : 18 No. of samples analysed

: 18

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.

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.

Signatories Position Laboratory Department

Angela Ren Team Leader - Metals Metals, Burnaby, British Columbia Lindsay Gung Supervisor - Water Chemistry Inorganics, Burnaby, British Columbia Robin Weeks Team Leader - Metals Metals, Burnaby, British Columbia

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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.

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### 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	
Physical Tests (QC	Lot: 163530)											
VA21A4296-006	Anonymous	alkalinity, total (as CaCO3)		E290	1.0	mg/L	454	455	0.110%	20%		
Physical Tests (QC	Lot: 163531)											
VA21A4296-006	Anonymous	рН		E108	0.10	pH units	7.88	7.89	0.127%	4%		
Organic / Inorganic	Carbon (QC Lot: 16	2233)										
VA21A4293-014	#13B1	carbon, dissolved inorganic [DIC]		E353-L	1.00	mg/L	32.4	36.2	10.9%	20%		
Total Metals (QC L	ot: 161111)											
/A21A4273-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0933	0.0874	6.59%	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	<0.00010	<0.00010	0	Diff <2x LOR		
		barium, total	7440-39-3	E420	0.00010	mg/L	0.00285	0.00290	1.85%	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	0.0000060	<0.0000050	0.0000010	Diff <2x LOR		
		calcium, total	7440-70-2	E420	0.050	mg/L	3.80	3.80	0.0773%	20%		
		cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR		
		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	<0.00010	<0.00010	0	Diff <2x LOR		
		copper, total	7440-50-8	E420	0.00050	mg/L	0.00067	0.00061	0.00005	Diff <2x LOR		
		iron, total	7439-89-6	E420	0.010	mg/L	0.082	0.065	0.017	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	0.313	0.315	0.616%	20%		
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.00648	0.00636	1.89%	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		
		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	0.087	0.084	0.003	Diff <2x LOR		
		rubidium, total	7440-17-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	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	1.14	1.18	3.56%	20%		

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ub-Matrix: Water							Labora	tory Duplicate (D	UP) Report		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifie
<u> </u>	ot: 161111) - continued										
/A21A4273-001	Anonymous	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	0.824	0.830	0.700%	20%	
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.0112	0.0112	0.0471%	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	0.00264	0.00280	0.00016	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	0.000012	0.000012	0.0000003	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	
otal Metals (QC Lo	ot: 161135)										
(S2100655-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	<0.0030	0	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	0.00644	0.00642	0.389%	20%	
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0616	0.0607	1.35%	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	0.125	0.123	1.58%	20%	
		cadmium, total	7440-43-9	E420	0.0000100	mg/L	<0.0000100	<0.0000100	0	Diff <2x LOR	
		calcium, total	7440-70-2	E420	0.050	mg/L	108	108	0.424%	20%	
		cesium, total	7440-46-2	E420	0.000010	mg/L	0.000010	0.000012	0.000002	Diff <2x LOR	
		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	<0.00010	<0.00010	0	Diff <2x LOR	
		copper, total	7440-50-8	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	
		iron, total	7439-89-6	E420	0.000	mg/L	0.141	0.140	0.488%	20%	
			7439-69-6	E420	0.000050	-	<0.000050	<0.000050	0.466%	Diff <2x LOR	
		lead, total	7439-92-1	E420	0.000050	mg/L	0.0065	0.0064	0.00003	Diff <2x LOR	
		lithium, total				mg/L					
		magnesium, total	7439-95-4	E420	0.0050	mg/L	103	103	0.211%	20%	
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.323	0.321	0.449%	20%	
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00760	0.00758	0.224%	20%	
		nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	

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ub-Matrix: Water							Labora	tory Duplicate (D	UP) Report		
aboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifie
otal Metals (QC Lo	ot: 161135) - continued										
(S2100655-001	Anonymous	phosphorus, total	7723-14-0	E420	0.050	mg/L	0.085	0.076	0.009	Diff <2x LOR	
		potassium, total	7440-09-7	E420	0.050	mg/L	11.4	11.2	0.944%	20%	
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00117	0.00110	0.00007	Diff <2x LOR	
		selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	0.000052	0.000002	Diff <2x LOR	
		silicon, total	7440-21-3	E420	0.10	mg/L	10.6	10.4	1.50%	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	76.6	76.5	0.154%	20%	
		strontium, total	7440-24-6	E420	0.00020	mg/L	1.74	1.75	0.321%	20%	
		sulfur, total	7704-34-9	E420	0.50	mg/L	170	167	1.38%	20%	
		tellurium, total	13494-80-9	E420	0.00020	mg/L	0.00033	0.00050	0.00017	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	0.00236	0.00239	1.12%	20%	
		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	0.0060	0.0052	0.0008	Diff <2x LOR	
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	
otal Metals (QC Lo	ot: 161610)										
A21A4461-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.160	0.157	1.48%	20%	
	, <b>,</b>	antimony, total	7440-36-0	E420	0.00010	mg/L	0.0100	0.0101	0.432%	20%	
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00844	0.00856	1.43%	20%	
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0430	0.0428	0.585%	20%	
		beryllium, total	7440-41-7	E420	0.00010	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000100	<0.000050	0	Diff <2x LOR	
		boron, total	7440-42-8	E420	0.010	mg/L	0.107	0.110	2.76%	20%	
			7440-43-9	E420	0.000050	mg/L	0.0000082	0.0000059	0.0000023	Diff <2x LOR	
		cadmium, total	7440-43-9	E420	0.050	mg/L	25.7	26.9	4.31%	20%	
			7440-70-2	E420	0.000010	•	0.00140	0.00140	0.0498%	20%	
		cesium, total	7440-46-2	E420	0.00050	mg/L	<0.00140	<0.00140	0.0498%	Diff <2x LOR	
		chromium, total				mg/L					
		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	0.018	0.018	0.0003	Diff <2x LOR	
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000283	0.000273	0.000010	Diff <2x LOR	

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Sub-Matrix: Water	ub-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	
Total Metals (QC L	ot: 161610) - continue	d Control of the Cont										
VA21A4461-001	Anonymous	lithium, total	7439-93-2	E420	0.0010	mg/L	0.0562	0.0587	4.34%	20%		
		magnesium, total	7439-95-4	E420	0.100	mg/L	1.44	1.47	1.49%	20%		
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.0332	0.0313	5.93%	20%		
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00725	0.00727	0.299%	20%		
		nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0	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	11.0	11.1	0.962%	20%		
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.0138	0.0140	0.757%	20%		
		selenium, total	7782-49-2	E420	0.000050	mg/L	0.00134	0.00136	1.51%	20%		
		silicon, total	7440-21-3	E420	0.10	mg/L	1.92	2.00	3.89%	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	30.8	30.8	0.134%	20%		
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.568	0.584	2.77%	20%		
		sulfur, total	7704-34-9	E420	0.50	mg/L	21.5	21.7	0.870%	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	0.000065	0.000059	0.000005	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		
		tungsten, total	7440-33-7	E420	0.00010	mg/L	0.00117	0.00115	1.67%	20%		
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000522	0.000499	4.43%	20%		
		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		

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### 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
Physical Tests (QCLot: 163530)						
alkalinity, total (as CaCO3)		E290	1	mg/L	<1.0	
Organic / Inorganic Carbon (QCLot: 1	62233)					
carbon, dissolved inorganic [DIC]		E353-L	0.5	mg/L	<0.50	
Total Metals (QCLot: 161111)						
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	

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# ALS

#### Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Fotal Metals (QCLot: 161111) -	continued					
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	
hallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	
horium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	
in, total	7440-31-5	E420	0.0001	mg/L	<0.00010	
itanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	
ungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	
ıranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	
anadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	
inc, total	7440-66-6	E420	0.003	mg/L	<0.0030	
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	
Fotal Metals (QCLot: 161135)						I
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	
rsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	
parium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	
eryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	
ismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	
oron, total	7440-42-8	E420	0.01	mg/L	<0.010	
admium, total	7440-43-9	E420	0.000005	mg/L	<0.000050	
alcium, total	7440-70-2	E420	0.05	mg/L	<0.050	
esium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	
hromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	
obalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	
opper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	
ron, total	7439-89-6	E420	0.01	mg/L	<0.010	
ead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	
thium, total	7439-93-2	E420	0.001	mg/L	<0.0010	
nagnesium, total	7439-95-4		0.005	mg/L	<0.0050	
nanganese, total	7439-96-5		0.0001	mg/L	<0.00010	
nolybdenum, total	7439-98-7		0.00005	mg/L	<0.000050	
ickel, total	7440-02-0		0.0005	mg/L	<0.00050	
hosphorus, total	7723-14-0		0.05	mg/L	<0.050	
potassium, total	7440-09-7		0.05	mg/L	<0.050	
ubidium, total	7440-17-7		0.0002	mg/L	<0.00020	
selenium, total	7782-49-2		0.00005	mg/L	<0.000050	
silicon, total	7440-21-3		0.1	mg/L	<0.10	

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Sub-Matrix: Water

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sulfur, total         7704.34.8         8420         0.5         mgl.         <0.500	Analyte	CAS Number Method	LOR	Unit	Result	Qualifier
socium, total         17341-25-2         2420         0.05         mgt.         <0.050	Total Metals (QCLot: 161135) - co	ontinued				
teronium, total 1446-244 2420 0.0002	silver, total	7440-22-4 E420	0.00001	mg/L	<0.000010	
sulfur, total         7704.34.9         E420         0.5         mgl.         <0.500         —           leuturian, total         13494-80-9         E420         0.0002         mgl.         <0.000010	sodium, total	17341-25-2 E420	0.05	mg/L	<0.050	
Institutum, Iodal         13404-80-9         F420         0.00022         mgil.         <0.00020	strontium, total	7440-24-6 E420	0.0002	mg/L	<0.00020	
healium, total 7440-28-0 E420 0.00001 mg.L <0.000010 tocal 7440-28-1 E420 0.00011 mg.L <0.00010 no. total 7440-28-1 E420 0.0001 mg.L <0.00010 tennium, total 7440-32-8 E420 0.0001 mg.L <0.00010 tennium, total 7440-32-8 E420 0.0003 mg.L <0.00010 tennium, total 7440-32-8 E420 0.0001 mg.L <0.00010 tennium, total 7440-32-8 E420 0.0001 mg.L <0.00010 randourn, total 7440-82-2 E420 0.0005 mg.L <0.00010 randourn, total 7440-82-8 E420 0.0005 mg.L <0.00001 randourn, total 7440-82-8 E420 0.0005 mg.L <0.00001 randourn, total 7440-82-8 E420 0.0009 mg.L <0.00000 randourn, total 7440-82-8 E420 0.0009 mg.L <0.00000 randourn, total 7440-82-8 E420 0.0009 mg.L <0.00000 randourn, total 7440-82-8 E420 0.0001 mg.L <0.00001 randourn, total 7440-82-8 E420 0.0001 mg.L <0.00010 randourn, total 7440-82-9 E420 0.0001 mg.L <0.00010 randourn, total 7440-82-9 E420 0.0001 mg.L <0.00010 randourn, total 7440-82-9 E420 0.0001 mg.L <0.00010 randourn, total 7440-83-9 E420 0.0001 mg.L <0.00010 randourn, total 7440-83-9 E420 0.00001 mg.L <0.000010 randourn, total 7440-83-9 E420 0.00005 mg.L <0.000050 randourn, total 7440-83-9 E420 0.00005 mg.L <0.000050 randourn, total 7440-84-9 E420 0.00005 mg.L <0.000050 randourn, total 7440-84-8 E420 0.00005 mg.L <0.000050 randourn, total 7440-85-8 E420 0.00005 mg.L <0.000050	sulfur, total	7704-34-9 E420	0.5	mg/L	<0.50	
thorum, total         7440-28-1         E420         0.0001         mgl.         <0,00010	tellurium, total	13494-80-9 E420	0.0002	mg/L	<0.00020	
In total	thallium, total	7440-28-0 E420	0.00001	mg/L	<0.000010	
themium, total 7440-32-8 E420 0.0003 mg.L <0.00030	thorium, total	7440-29-1 E420	0.0001	mg/L	<0.00010	
tungsten, total         7440-33-7         £420         0.0001         mglt.         <0.00010	tin, total	7440-31-5 E420	0.0001	mg/L	<0.00010	
uranium, total         7440-61-1         E420         0.00001         mgl.         <0.000010	titanium, total	7440-32-6 E420	0.0003	mg/L	<0.00030	
vanadium, total         7440-82-2         E420         0.0005         mgl.         <0.0050	tungsten, total	7440-33-7 E420	0.0001	mg/L	<0.00010	
zirc, total 7440-68-6 E420 0.003 mg/L <0.0030  Total 7440-67-7 E420 0.0002 mg/L <0.00020  Total Metals (CCLot: 161610)  antimony, total 7440-87-8 E420 0.0031 mg/L <0.0030  Total 7440-88-8 E420 0.0001 mg/L <0.00010  barium, total 7440-88-9 E420 0.0001 mg/L <0.00010  barium, total 7440-48-9 E420 0.0001 mg/L <0.00010  barium, total 7440-48-9 E420 0.0001 mg/L <0.000010  barium, total 7440-48-9 E420 0.0000 mg/L <0.00005  boron, total 7440-48-9 E420 0.00005 mg/L <0.000050  cadmium, total 7440-48-9 E420 0.00001 mg/L <0.00001  chromium, total 7440-48-9 E420 0.00001 mg/L <0.00001  chromium, total 7440-48-9 E420 0.00001 mg/L <0.00050  chromium, total 7440-89-9 E420 0.0001 mg/L <0.00050  chromium, total 7440-89-9 E420 0.0001 mg/L <0.00050  chromium, total 7440-89-9 E420 0.0001 mg/L <0.00050  chromium, total 7439-98-9 E420 0.0001 mg/L <0.00050  ithium, total 7439-98-8 E420 0.0	uranium, total	7440-61-1 E420	0.00001	mg/L	<0.000010	
Total Metals (QCLot: 161610)   T449-40-5   E420   D.002   mg/L   C.00020   C.   Total Metals (QCLot: 161610)   T449-40-5   E420   D.003   mg/L   C.00030   C.   Tatal Metals (QCLot: 161610)   T449-36-0   E420   D.0001   mg/L   C.00010   C.   Tatal Metals (Data (D	vanadium, total	7440-62-2 E420	0.0005	mg/L	<0.00050	
Total Metals (QCLot: 181610) aluminum, total 7429-90-5 E420 0.003 mg/L <0.0030 antimory, total 7440-38-0 E420 0.0001 mg/L <0.00010 arsenic, total 7440-38-2 E420 0.0001 mg/L <0.00010 barrum, total 7440-38-3 E420 0.0001 mg/L <0.00010 beryllium, total 7440-38-3 E420 0.0001 mg/L <0.00010 beryllium, total 7440-41-7 E420 0.0002 mg/L <0.00020 bismuth, total 7440-48-9 E420 0.00005 mg/L <0.000050 borron, total 7440-43-9 E420 0.00005 mg/L <0.000050 calcium, total 7440-43-9 E420 0.00005 mg/L <0.000050 calcium, total 7440-43-9 E420 0.00005 mg/L <0.000050 calcium, total 7440-42-0 E420 0.00005 mg/L <0.0000050 calcium, total 7440-42-0 E420 0.00005 mg/L <0.000010 calcium, total 7440-43-0 E420 0.00005 mg/L <0.000010 calcium, total 7440-48-2 E420 0.00001 mg/L <0.000010 calcium, total 7440-48-2 E420 0.00005 mg/L <0.00005 calcium, total 7430-89-2 E420 0.00005 mg/L <0.000	zinc, total	7440-66-6 E420	0.003	mg/L	<0.0030	
aluminum, total 7429-905 E420 0.003 mg/L < 0.0030	zirconium, total	7440-67-7 E420	0.0002	mg/L	<0.00020	
antimony, total 7440-36-0 E420 0.0001 mg/L <0.00010	Total Metals (QCLot: 161610)					
arsenic, total 7440-38-2 E420 0.0001 mg/L <0.00010	aluminum, total	7429-90-5 E420	0.003	mg/L	<0.0030	
barium, total       7440-39-3       E420       0.0001       mg/L       <0.00010	antimony, total	7440-36-0 E420	0.0001	mg/L	<0.00010	
beryllium, total         7440-41-7         E420         0.00002         mg/L         <0.000020	arsenic, total	7440-38-2 E420	0.0001	mg/L	<0.00010	
bismuth, total 7440-69-9 boron, total 7440-42-8 boron, total 7440-42-8 boron, total 7440-42-8 boron, total 7440-42-8 boron, total 7440-43-9 boron, total 7440-43-1 boron, total 7440-43	barium, total	7440-39-3 E420	0.0001	mg/L	<0.00010	
boron, total 7440-42-8 E420 0.01 mg/L <0.010	beryllium, total	7440-41-7 E420	0.00002	mg/L	<0.000020	
cadmium, total       7440-43-9       E420       0.000005       mg/L       <0.000050          calcium, total       7440-70-2       E420       0.05       mg/L       <0.050	bismuth, total	7440-69-9 E420	0.00005	mg/L	<0.000050	
calcium, total       7440-70-2       E420       0.05       mg/L       <0.050	boron, total	7440-42-8 E420	0.01	mg/L	<0.010	
cesium, total       7440-46-2       E420       0.00001       mg/L       <0.000010	cadmium, total	7440-43-9 E420	0.000005	mg/L	<0.0000050	
chromium, total       7440-47-3       E420       0.0005       mg/L       <0.00050	calcium, total	7440-70-2 E420	0.05	mg/L	<0.050	
cobalt, total       7440-48-4       E420       0.0001       mg/L       <0.00010	cesium, total	7440-46-2 E420	0.00001	mg/L	<0.000010	
copper, total         7440-50-8 iron, total         E420         0.0005 mg/L         <0.00050         iron, total           lead, total         7439-89-6 lead         E420         0.01 mg/L         <0.010	chromium, total	7440-47-3 E420	0.0005	mg/L	<0.00050	
iron, total 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 magnese, total 7439-96-5 E420 0.0001 mg/L <0.00010 magnese, total molybdenum, total 7439-98-7 E420 0.0005 mg/L <0.00010	cobalt, total	7440-48-4 E420	0.0001	mg/L	<0.00010	
lead, total     7439-92-1     E420     0.00005     mg/L     <0.000050	copper, total	7440-50-8 E420	0.0005	mg/L	<0.00050	
lithium, total         7439-93-2         E420         0.001         mg/L         <0.0010            magnesium, total         7439-95-4         E420         0.005         mg/L         <0.0050	iron, total	7439-89-6 E420	0.01	mg/L	<0.010	
magnesium, total     7439-95-4     E420     0.005     mg/L     <0.0050        manganese, total     7439-96-5     E420     0.0001     mg/L     <0.00010	lead, total	7439-92-1 E420	0.00005	mg/L	<0.000050	
manganese, total         7439-96-5         E420         0.0001         mg/L         <0.00010            molybdenum, total         7439-98-7         E420         0.00005         mg/L         <0.000050	lithium, total	7439-93-2 E420	0.001	mg/L	<0.0010	
molybdenum, total 7439-98-7 E420 0.00005 mg/L <0.000050 nickel, total 0.0005 mg/L <0.00050	magnesium, total	7439-95-4 E420	0.005	mg/L	<0.0050	
nickel, total 7440-02-0 E420 0.0005 mg/L <0.00050	manganese, total	7439-96-5 E420	0.0001	mg/L	<0.00010	
	molybdenum, total	7439-98-7 E420	0.00005	mg/L	<0.000050	
phosphorus total 7723-14-0 F420 0.05 mg/l <0.050	nickel, total	7440-02-0 E420	0.0005	mg/L	<0.00050	
prioripriorias, total 7720 17 0 1720 17 0 1720 17 0 1720 17 0 1720 17 0 1720 17 0 1720 17 0 1720 17 0 1720 17 0 1720 17 0 1720 17 0 1720 17 0 1720 17 0 1720 17 0 1720 17 0 1720 17 0 1720 17 0 17	phosphorus, total	7723-14-0 E420	0.05	mg/L	<0.050	

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## ALS

#### Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 161610) - c	ontinued					
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	

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## 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 Co	entrol Sample (LCS)	Report					
				Spike	Recovery (%)	Recovery	Limits (%)					
Analyte	CAS Number Method	d LOR	Unit	Concentration	LCS	Low	High	Qualifier				
Physical Tests (QCLot: 163530)												
alkalinity, total (as CaCO3)	E290	1	mg/L	500 mg/L	98.6	85.0	115					
Physical Tests (QCLot: 163531)												
рН	E108		pH units	7 pH units	100	98.0	102					
Organic / Inorganic Carbon (QCLot: 162233)												
carbon, dissolved inorganic [DIC]	E353-L	0.5	mg/L	8 mg/L	99.7	80.0	120					
Total Metals (QCLot: 161111)												
aluminum, total	7429-90-5 E420	0.003	mg/L	2 mg/L	99.1	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	101	80.0	120					
barium, total	7440-39-3 E420	0.0001	mg/L	0.25 mg/L	101	80.0	120					
beryllium, total	7440-41-7 E420	0.00002	mg/L	0.1 mg/L	98.9	80.0	120					
bismuth, total	7440-69-9 E420	0.00005	mg/L	1 mg/L	100.0	80.0	120					
boron, total	7440-42-8 E420	0.01	mg/L	1 mg/L	92.2	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	98.3	80.0	120					
cesium, total	7440-46-2 E420	0.00001	mg/L	0.05 mg/L	102	80.0	120					
chromium, total	7440-47-3 E420	0.0005	mg/L	0.25 mg/L	100	80.0	120					
cobalt, total	7440-48-4 E420	0.0001	mg/L	0.25 mg/L	101	80.0	120					
copper, total	7440-50-8 E420	0.0005	mg/L	0.25 mg/L	100	80.0	120					
iron, total	7439-89-6 E420	0.01	mg/L	1 mg/L	101	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	98.7	80.0	120					
magnesium, total	7439-95-4 E420	0.005	mg/L	50 mg/L	96.9	80.0	120					
manganese, total	7439-96-5 E420	0.0001	mg/L	0.25 mg/L	99.4	80.0	120					
molybdenum, total	7439-98-7 E420	0.00005	mg/L	0.25 mg/L	95.9	80.0	120					
nickel, total	7440-02-0 E420	0.0005	mg/L	0.5 mg/L	100	80.0	120					
phosphorus, total	7723-14-0 E420	0.05	mg/L	10 mg/L	106	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	101	80.0	120					
selenium, total	7782-49-2 E420	0.00005	mg/L	1 mg/L	99.9	80.0	120					
silicon, total	7440-21-3 E420	0.1	mg/L	10 mg/L	103	80.0	120					
silver, total	7440-22-4 E420	0.00001	mg/L	0.1 mg/L	101	80.0	120					

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Sub-Matrix: Water			Laboratory Control Sample (LCS) Report						
					Spike	Recovery (%)	Recovery	Limits (%)	
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 161111) - continue	ed								
sodium, total	17341-25-2	E420	0.05	mg/L	50 mg/L	104	80.0	120	
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	104	80.0	120	
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	94.6	80.0	120	
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	103	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	98.0	80.0	120	
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	98.1	80.0	120	
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	92.4	80.0	120	
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	99.1	80.0	120	
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	102	80.0	120	
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	104	80.0	120	
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	99.0	80.0	120	
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	95.6	80.0	120	
Total Metals (QCLot: 161135)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	108	80.0	120	
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	105	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	102	80.0	120	
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	101	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	96.1	80.0	120	
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	99.8	80.0	120	
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	104	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	104	80.0	120	
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	104	80.0	120	
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	102	80.0	120	
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	108	80.0	120	
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	101	80.0	120	
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	98.9	80.0	120	
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	105	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	105	80.0	120	
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	103	80.0	120	
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	108	80.0	120	
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	105	80.0	120	
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	106	80.0	120	

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Sub-Matrix: Water		Laboratory Control Sample (LCS) Report							
					Spike	Recovery (%)	Recovery	Limits (%)	
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 161135) - continued									
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	110	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	104	80.0	120	
sodium, total	17341-25-2	E420	0.05	mg/L	50 mg/L	107	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	# 122	80.0	120	MES
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	103	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	95.7	80.0	120	
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	99.4	80.0	120	
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	94.6	80.0	120	
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	101	80.0	120	
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	95.1	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	95.2	80.0	120	
Total Metals (QCLot: 161610)									
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	111	80.0	120	
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	104	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	104	80.0	120	
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	110	80.0	120	
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	106	80.0	120	
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	104	80.0	120	
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	107	80.0	120	
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	105	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	
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	97.6	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	101	80.0	120	
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	107	80.0	120	
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	105	80.0	120	
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	104	80.0	120	
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	106	80.0	120	

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Sub-Matrix: Water	Sub-Matrix: Water					Laboratory Co	ntrol Sample (LCS)	Report	ort					
					Spike	Recovery (%)	Recovery	Limits (%)						
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier					
Total Metals (QCLot: 161610) - continued														
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	110	80.0	120						
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	104	80.0	120						
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	103	80.0	120						
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	107	80.0	120						
sodium, total	17341-25-2	E420	0.05	mg/L	50 mg/L	108	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	103	80.0	120						
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	101	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	101	80.0	120						
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	102	80.0	120						
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	101	80.0	120						
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	101	80.0	120						
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	100	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	108	80.0	120						
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	99.7	80.0	120						

## Qualifiers

Qualifier Description

MES

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

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### 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.

ub-Matrix: Water			Matrix Spike (MS) Report							
					Spi	ke	Recovery (%)	Recovery	Limits (%)	
aboratory sample	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifie
	nic Carbon (QCLot:	162233)								
/A21A4293-017	#14B1	carbon, dissolved inorganic [DIC]		E353-L	ND mg/L	10 mg/L	ND	70.0	130	
otal Metals (QC	Lot: 161111)						·		1	
VA21A4273-001	Anonymous	aluminum, total	7429-90-5	E420	0.181 mg/L	0.2 mg/L	90.4	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	0.0199 mg/L	0.02 mg/L	99.5	70.0	High  130  130  130  130  130  130  130  13	
		barium, total	7440-39-3	E420	0.0196 mg/L	0.02 mg/L	98.1	70.0	130	
		beryllium, total	7440-41-7	E420	0.0394 mg/L	0.04 mg/L	98.6	70.0	130 130 130 130 130 130 130 130 130	
		bismuth, total	7440-69-9	E420	0.0107 mg/L	0.01 mg/L	107	70.0	130	
		boron, total	7440-42-8	E420	0.095 mg/L	0.1 mg/L	94.6	70.0	130	
		cadmium, total	7440-43-9	E420	0.00423 mg/L	0.004 mg/L	106	70.0	130	
		calcium, total	7440-70-2	E420	3.78 mg/L	4 mg/L	94.6	70.0	130	
		cesium, total	7440-46-2	E420	0.0108 mg/L	0.01 mg/L	108	70.0	130	
		chromium, total	7440-47-3	E420	0.0410 mg/L	0.04 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	0.0203 mg/L	0.02 mg/L	102	70.0	130	
		iron, total	7439-89-6	E420	2.01 mg/L	2 mg/L	100	70.0	130	
		lead, total	7439-92-1	E420	0.0207 mg/L	0.02 mg/L	103	70.0	130	
		lithium, total	7439-93-2	E420	0.0990 mg/L	0.1 mg/L	99.0	70.0	130 130 130 130 130 130 130 130 130 130	
		magnesium, total	7439-95-4	E420	0.941 mg/L	1 mg/L	94.1	70.0		
		manganese, total	7439-96-5	E420	0.0199 mg/L	0.02 mg/L	99.7	70.0	130	
		molybdenum, total	7439-98-7	E420	0.0189 mg/L	0.02 mg/L	94.4	70.0	130	
		nickel, total	7440-02-0	E420	0.0408 mg/L	0.04 mg/L	102	70.0	130	
		phosphorus, total	7723-14-0	E420	9.55 mg/L	10 mg/L	95.5	70.0	130	
		potassium, total	7440-09-7	E420	4.02 mg/L	4 mg/L	100	70.0	130	
		rubidium, total	7440-17-7	E420	0.0194 mg/L	0.02 mg/L	97.0	70.0	130	
		selenium, total	7782-49-2	E420	0.0411 mg/L	0.04 mg/L	103	70.0	130	
		silicon, total	7440-21-3	E420	9.49 mg/L	10 mg/L	94.9	70.0	130	
		silver, total	7440-22-4	E420	0.00411 mg/L	0.004 mg/L	103	70.0	130	
		sodium, total	17341-25-2	E420	2.20 mg/L	2 mg/L	110	70.0	130	
		strontium, total	7440-24-6	E420	0.0208 mg/L	0.02 mg/L	104	70.0	130 130 130 130 130 130 130 130 130 130	
	I	sulfur, total	7704-34-9	E420	20.1 mg/L	20 mg/L	101	70.0	130	

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Sub-Matrix: Water				Matrix Spike (MS) Report						
					Spi	ike	Recovery (%)	Recovery	Limits (%)	
Laboratory sample	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QC	Lot: 161111) - contin	ued								
VA21A4273-001	Anonymous	tellurium, total	13494-80-9	E420	0.0404 mg/L	0.04 mg/L	101	70.0	130	
		thallium, total	7440-28-0	E420	0.00402 mg/L	0.004 mg/L	101	70.0	130	
		thorium, total	7440-29-1	E420	0.0215 mg/L	0.02 mg/L	107	70.0	130	
		tin, total	7440-31-5	E420	0.0194 mg/L	0.02 mg/L	97.2	70.0	130	
		titanium, total	7440-32-6	E420	0.0388 mg/L	0.04 mg/L	96.9	70.0	130	
		tungsten, total	7440-33-7	E420	0.0193 mg/L	0.02 mg/L	96.6	70.0	130	
		uranium, total	7440-61-1	E420	0.00413 mg/L	0.004 mg/L	103	70.0	130	
		vanadium, total	7440-62-2	E420	0.103 mg/L	0.1 mg/L	103	70.0	130	
		zinc, total	7440-66-6	E420	0.398 mg/L	0.4 mg/L	99.4	70.0	130	
		zirconium, total	7440-67-7	E420	0.0409 mg/L	0.04 mg/L	102	70.0	130	
Total Metals (QC	Lot: 161135)									
KS2100655-001	Anonymous	aluminum, total	7429-90-5	E420	0.210 mg/L	0.2 mg/L	105	70.0	130	
		antimony, total	7440-36-0	E420	0.0200 mg/L	0.02 mg/L	99.9	70.0	130	
		arsenic, total	7440-38-2	E420	0.0199 mg/L	0.02 mg/L	99.4	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	0.0386 mg/L	0.04 mg/L	96.6	70.0	130	
		bismuth, total	7440-69-9	E420	0.00859 mg/L	0.01 mg/L	85.9	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	0.00386 mg/L	0.004 mg/L	96.6	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	0.00965 mg/L	0.01 mg/L	96.5	70.0	130	
		chromium, total	7440-47-3	E420	0.0399 mg/L	0.04 mg/L	99.7	70.0	130	
		cobalt, total	7440-48-4	E420	0.0189 mg/L	0.02 mg/L	94.3	70.0	130	
		copper, total	7440-50-8	E420	0.0180 mg/L	0.02 mg/L	90.1	70.0	130	
		iron, total	7439-89-6	E420	1.95 mg/L	2 mg/L	97.7	70.0	130	
		lead, total	7439-92-1	E420	0.0176 mg/L	0.02 mg/L	88.2	70.0	130	
		lithium, total	7439-93-2	E420	0.0948 mg/L	0.1 mg/L	94.8	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	0.0201 mg/L	0.02 mg/L	101	70.0	130	
		nickel, total	7440-02-0	E420	0.0373 mg/L	0.04 mg/L	93.2	70.0	130	
		phosphorus, total	7723-14-0	E420	10.8 mg/L	10 mg/L	108	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	0.0196 mg/L	0.02 mg/L	98.1	70.0	130	
		selenium, total	7782-49-2	E420	0.0461 mg/L	0.04 mg/L	115	70.0	130	
1	T .	silicon, total	7440-21-3	E420	ND mg/L	10 mg/L	ND	70.0	130	

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Sub-Matrix: Water	b-Matrix: Water				Matrix Spike (MS) Report						
					Spi	ke	Recovery (%)	Recovery	Limits (%)		
aboratory sample	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifie	
	CLot: 161135) - cont	inued									
KS2100655-001	Anonymous	silver, total	7440-22-4	E420	0.00386 mg/L	0.004 mg/L	96.4	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	0.0404 mg/L	0.04 mg/L	101	70.0	130		
		thallium, total	7440-28-0	E420	0.00356 mg/L	0.004 mg/L	88.9	70.0	130		
		thorium, total	7440-29-1	E420	0.0183 mg/L	0.02 mg/L	91.6	70.0	130		
		tin, total	7440-31-5	E420	0.0196 mg/L	0.02 mg/L	98.2	70.0	130		
		titanium, total	7440-32-6	E420	0.0400 mg/L	0.04 mg/L	99.9	70.0	130		
		tungsten, total	7440-33-7	E420	0.0192 mg/L	0.02 mg/L	95.9	70.0	130		
		uranium, total	7440-61-1	E420	0.00352 mg/L	0.004 mg/L	88.0	70.0	130		
		vanadium, total	7440-62-2	E420	0.102 mg/L	0.1 mg/L	102	70.0	130		
		zinc, total	7440-66-6	E420	0.368 mg/L	0.4 mg/L	92.0	70.0	130		
		zirconium, total	7440-67-7	E420	0.0397 mg/L	0.04 mg/L	99.2	70.0	130		
otal Metals (QC	CLot: 161610)										
'A21A4461-001	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	0.0210 mg/L	0.02 mg/L	105	70.0	130		
		arsenic, total	7440-38-2	E420	0.0211 mg/L	0.02 mg/L	106	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	0.0428 mg/L	0.04 mg/L	107	70.0	130		
		bismuth, total	7440-69-9	E420	0.0104 mg/L	0.01 mg/L	104	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	0.00413 mg/L	0.004 mg/L	103	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	0.0109 mg/L	0.01 mg/L	109	70.0	130		
		chromium, total	7440-47-3	E420	0.0419 mg/L	0.04 mg/L	105	70.0	130 130 130 130 130 130 130 130 130 130		
		cobalt, total	7440-48-4	E420	0.0209 mg/L	0.02 mg/L	105	70.0	130		
		copper, total	7440-50-8	E420	0.0206 mg/L	0.02 mg/L	103	70.0	130		
		iron, total	7439-89-6	E420	2.00 mg/L	2 mg/L	100	70.0	130		
		lead, total	7439-92-1	E420	0.0198 mg/L	0.02 mg/L	99.3	70.0	130		
		lithium, total	7439-93-2	E420	0.102 mg/L	0.1 mg/L	102	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		
		aluminum, total antimony, total arsenic, total barium, total beryllium, total bismuth, total boron, total cadmium, total calcium, total cesium, total chromium, total cobalt, total copper, total iron, total lead, total lithium, total magnesium, total	7439-98-7	E420	0.0206 mg/L	0.02 mg/L	103	70.0	130		
		nickel, total	7440-02-0	E420	0.0413 mg/L	0.04 mg/L	103	70.0	130		
	1	phosphorus, total	7723-14-0	E420	11.5 mg/L	10 mg/L	115	70.0	130 130 130 130 130 130 130 130 130 130		

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Sub-Matrix: Water			tum, total 7440-09-7 E420 m, total 7440-17-7 E420 m, total 7782-49-2 E420 total 7440-21-3 E420 total 7440-22-4 E420 total 17341-25-2 E420 m, total 7440-24-6 E420 total 7704-34-9 E420 total 7440-28-0 E420 n, total 7440-29-1 E420 n, total 7440-31-5 E420 n, total 7440-31-5 E420 n, total 7440-32-6 E420			Matrix Spike (MS) Report				
					Spi	ke	Recovery (%)	Recovery	Limits (%)	
Laboratory sample	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QC	Lot: 161610) - continu	ed								
VA21A4461-001	Anonymous	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	0.0433 mg/L	0.04 mg/L	108	70.0	130	
		silicon, total	7440-21-3	E420	9.52 mg/L	10 mg/L	95.2	70.0	130	
		silver, total	7440-22-4	E420	0.00422 mg/L	0.004 mg/L	106	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	0.0423 mg/L	0.04 mg/L	106	70.0	130	
		thallium, total	7440-28-0	E420	0.00396 mg/L	0.004 mg/L	99.0	70.0	130	
		thorium, total	7440-29-1	E420	0.0215 mg/L	0.02 mg/L	107	70.0	130	
		tin, total	7440-31-5	E420	0.0213 mg/L	0.02 mg/L	106	70.0	130	
		titanium, total	7440-32-6	E420	0.0414 mg/L	0.04 mg/L	103	70.0	130	
		tungsten, total	7440-33-7	E420	0.0198 mg/L	0.02 mg/L	99.1	70.0	130	
		uranium, total	7440-61-1	E420	0.00405 mg/L	0.004 mg/L	101	70.0	130	
		vanadium, total	7440-62-2	E420	0.108 mg/L	0.1 mg/L	108	70.0	130	
		zinc, total	7440-66-6	E420	0.428 mg/L	0.4 mg/L	107	70.0	130	
		zirconium, total	7440-67-7	E420	0.0416 mg/L	0.04 mg/L	104	70.0	130	

### Chain of Custody (COC) / Analytical Request Form

ALS www.als

Canada Toll Free: 1 800 668 9878

coc Number: 20 ~ 885691

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Report To	Contact and company name below will appe	ar on the final report		Reports	/ Recipients	***	$\top$		Turna	round Time (T	AT) Reques	sted	170)	49	-30400	A.	<b>4</b> 49
Company:	R. Rad off and Asso	cia-es Selec	t Report For	mat: 🔀 PDF	SO EXCEL E	D (DIGITAL)	K	Routine [R	] if received	by 3pm M-F - r	no surcharges	apply	. s		, A	station.	
Contact:	Richard Radioff		ge QC/QCI i	Reports with CO	A YES NO	D N/A				by 3pm M-F - 20			<u></u>	CCIV ALC BABO	00514	DEL UE	
Phone:	250-4562-6861	[38 c	Compare Results	s to Criteria on Repor	t - provide details below If			3 day [P3] if received by 3pm M-F - 25% rush surcharge mirimum 2 day [P2] if received by 3pm M-F - 50% rush surcharge mirimum (ALS use only)							KE .		
	Company address below will appear on the final	report Selec	t Distribution	: Zi EMAI	<del>_</del>		J٦	☐ 1 day [E] If received by 3pm M-F - 100% rush surcharge minimum							1460		
Street:	1820 3rd Ave	Email	Email 1 or Fax y: chard or adloff @ radloffeng. co					1 Same day (E2) if received by 10am M-S - 200% rush surcharge, Additional fees							*		
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Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

### Chain of Custody (COC) / Analytical Request Form

COC Number: 20 - 885692



www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page 2 of 2

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Feliure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW). System, please submit using an Authorized DW COC form.



# **CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)**

Work Order : VA21A8306

Client : **District of Wells**Contact : Donna Forseille

Address : Box 219 4243 Saunders Avenue

Wells BC Canada V0K 2R0

 Telephone
 : --- 

 Project
 : --- 

 PO
 : ---

C-O-C number : 20-886018 Sampler : Richard Radloff

Site : ----

Quote number ; KS21-DOWL100-001

No. of samples received : 10
No. of samples analysed : 10

Page : 1 of 4

Laboratory : Vancouver - Environmental

Account Manager : Amanda Lampreau

Address : 8081 Lougheed Highway

Burnaby, British Columbia Canada V5A 1W9

 Telephone
 : 1 250 372 3588

 Date Samples Received
 : 03-May-2021 12:50

 Date Analysis Commenced
 : 04-May-2021

 Issue Date
 : 07-May-2021 17:19

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

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

#### Signatories

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

 Signatories
 Position
 Laboratory Department

 Kim Jensen
 Department Manager - Metals
 Metals, Burnaby, British Columbia

 Page
 : 2 of 4

 Work Order
 : VA21A8306

 Client
 : District of Wells

Project : ---



#### **General Comments**

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

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

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

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

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

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

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

Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

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

 Page
 : 3 of 4

 Work Order
 : VA21A8306

 Client
 : District of Wells

Project : --



# Analytical Results Evaluation

	Client	t sample ID	207 A	208 A	209 A	210 A	211 A	226	227
Matrix: Water									
	Sampling	g date/time	19-Apr-2021	19-Apr-2021	19-Apr-2021	19-Apr-2021	19-Apr-2021	27-Apr-2021	27-Apr-2021
			03:30	03:30	03:30	03:30	03:32	16:09	16:09
		Sub-Matrix	Water						
Analyte	CAS Number	Unit	VA21A8306-001	VA21A8306-002	VA21A8306-003	VA21A8306-004	VA21A8306-005	VA21A8306-006	VA21A8306-007
Total Metals									
lead, total	7439-92-1	mg/L	0.000487	0.000070	0.000058	0.000075	0.000190	0.00593	0.00108
Analytical Results Evaluation	n								
	Client	t sample ID	228	406	407				
Matrix: Water									
	Sampling	g date/time	27-Apr-2021	27-Apr-2021	27-Apr-2021				
			16:09	12:59	12:17				
		Sub-Matrix	Water	Water	Water				
Analyte	CAS Number	Unit	VA21A8306-008	VA21A8306-009	VA21A8306-010				
Total Metals									
lead, total	7439-92-1	mg/L	0.00227	0.000138	0.00347				

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

### **Summary of Guideline Breaches by Sample**

Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
226	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00593 mg/L	0.005 mg/L

 Page
 : 4 of 4

 Work Order
 : VA21A8306

 Client
 : District of Wells

Project : --



### **Summary of Guideline Limits**

Analyte CAS Number	Unit	BCDWQG MAC			
Total Metals					
lead, total 7439-92-1	mg/L	0.005			

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

Key:

BCDWQG British Columbia Drinking Water Quality Guidelines (JAN, 2021)

MAC Maximium Acceptable Concentrations



### **CERTIFICATE OF ANALYSIS**

**Work Order** : VA21A8306

Client **District of Wells** Donna Forseille

Address Box 219 4243 Saunders Avenue

Wells BC Canada V0K 2R0

Telephone **Project** 

C-O-C number : 20-886018 Sampler : Richard Radloff

Site

Quote number : KS21-DOWL100-001

No. of samples received : 10 : 10 No. of samples analysed

Page : 1 of 3

> Laboratory : Vancouver - Environmental

Account Manager : Amanda Lampreau

Address : 8081 Lougheed Highway

Burnaby BC Canada V5A 1W9

Telephone : 1 250 372 3588 **Date Samples Received** : 03-May-2021 12:50

**Date Analysis Commenced** : 04-May-2021

Issue Date : 07-May-2021 17:19

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

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**

Contact

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

Kim Jensen Department Manager - Metals Metals, Burnaby, British Columbia Page : 2 of 3

Work Order : VA21A8306
Client : District of Wells

Project · ----



#### **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
mg/L	milligrams per litre

<: 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.

Page : 3 of 3 Work Order : VA21A8306 Client : District of Wells

Project : ---



# Analytical Results

Sub-Matrix: Water	ient sample ID	207 A	208 A	209 A	210 A	211 A			
(Matrix: Water)							7.1	الناب المالية	ت ا
Analyte	CAS Number	Method	Client samp	ling date / time	19-Apr-2021 03:30 <b>VA21A8306-001</b>	19-Apr-2021 03:30 VA21A8306-002	19-Apr-2021 03:30 VA21A8306-003	19-Apr-2021 03:30 VA21A8306-004	19-Apr-2021 03:32 VA21A8306-005
, what is	S/10 /vaimsor				Result	Result	Result	Result	Result
Total Metals									
lead, total	7439-92-1	E420	0.000050	mg/L	0.000487	0.000070	0.000058	0.000075	0.000190

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

# Analytical Results

		Cli	ient sample ID	226	227	228	406	407
21211	Mathad		_	27-Apr-2021 16:09	27-Apr-2021 16:09	27-Apr-2021 16:09	27-Apr-2021 12:59	27-Apr-2021 12:17
CAS Number	Metnoa	LOR	Unit					VA21A8306-010
				Result	Result	Result	Result	Result
7439-92-1	E420	0.000050	mg/L	0.00593	0.00108	0.00227	0.000138	0.00347
	CAS Number 7439-92-1		Client samp  CAS Number Method LOR		Client sampling date / time 27-Apr-2021 16:09  CAS Number Method LOR Unit VA21A8306-006  Result	Client sampling date / time   27-Apr-2021   27-Apr-2021   16:09   16:09	Client sampling date / time   27-Apr-2021   27-Apr-2021   27-Apr-2021   16:09   16:09   16:09     CAS Number   Method   LOR   Unit   VA21A8306-006   VA21A8306-007   VA21A8306-008     Result   Result   Result   Result   Result	Client sampling date / time   27-Apr-2021   27-Apr-2021   27-Apr-2021   27-Apr-2021   27-Apr-2021   16:09   16:09   12:59

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



# **QUALITY CONTROL INTERPRETIVE REPORT**

**Work Order** : VA21A8306 Page : 1 of 5

Client District of Wells Laboratory : Vancouver - Environmental

Contact · Donna Forseille Account Manager : Amanda Lampreau Address

Box 219 4243 Saunders Avenue Address : 8081 Lougheed Highway

Wells BC Canada V0K 2R0 Burnaby, British Columbia Canada V5A 1W9

Telephone Telephone : 1 250 372 3588 **Project Date Samples Received** : 03-May-2021 12:50 PO Issue Date : 07-May-2021 17:19

C-O-C number : 20-886018 Sampler : Richard Radloff

Site

Quote number : KS21-DOWL100-001

No. of samples received : 10 No. of samples analysed : 10

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

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)**

• No Analysis Holding Time Outliers exist.

#### **Outliers: Frequency of Quality Control Samples**

• No Quality Control Sample Frequency Outliers occur.

 Page
 : 2 of 5

 Work Order
 : VA21A8306

 Client
 : District of Wells

Project : ---

Matrix: Water

Analyte Group



Evaluation: **x** = Holding time exceedance; ✓ = Within Holding Time

Analysis

days

180 days

180

days

180 days 16 days

8 days

8 days

✓

04-May-2021

04-May-2021

04-May-2021

### **Analysis Holding Time Compliance**

Total Metals: Total Metals in Water by CRC ICPMS

Total Metals: Total Metals in Water by CRC ICPMS

Total Metals: Total Metals in Water by CRC ICPMS

HDPE - total (lab preserved)

HDPE - total (lab preserved)

HDPE - total (lab preserved)

211

226

227

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.

Sampling Date

Method

E420

E420

E420

Extraction / Preparation

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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.

Container / Client Sample ID(s) **Holding Times** Eval Analysis Date Holding Times Eval Preparation Rec Actual Rec Actual Date Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) F420 19-Apr-2021 04-May-2021 1 207 180 16 days days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 208 E420 19-Apr-2021 04-May-2021 16 days ✓ 180 ---days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 209 E420 19-Apr-2021 04-May-2021 16 days 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 210 E420 19-Apr-2021 04-May-2021 180 16 days

19-Apr-2021

27-Apr-2021

27-Apr-2021

Page : 3 of 5 Work Order : VA21A8306 Client : District of Wells

Project

Matrix: Water



Evaluation: **x** = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Method Sampling Date Extraction / Preparation Analysis

Container / Client Sample ID(s)			Preparation	Holding Times		Eval	Analysis Date	Holding Times		Eval
			Date	Rec	Actual			Rec	Actual	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 228	E420	27-Apr-2021					04-May-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 406	E420	27-Apr-2021					04-May-2021	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) 407	E420	27-Apr-2021					04-May-2021	180 days	8 days	<b>✓</b>

#### Legend & Qualifier Definitions

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

 Page
 : 4 of 5

 Work Order
 : VA21A8306

 Client
 : District of Wells

Project : ---



# **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: <b>Water</b> Evaluation: <b>x</b> = QC frequency outside specification; ✓ = QC frequency within spec								
Quality Control Sample Type			Co	ount	Frequency (%)			
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)								
Total Metals in Water by CRC ICPMS	E420	190574	2	39	5.1	5.0	✓	
Laboratory Control Samples (LCS)								
Total Metals in Water by CRC ICPMS	E420	190574	2	39	5.1	5.0	✓	
Method Blanks (MB)								
Total Metals in Water by CRC ICPMS	E420	190574	2	39	5.1	5.0	✓	
Matrix Spikes (MS)								
Total Metals in Water by CRC ICPMS	E420	190574	2	39	5.1	5.0	✓	

 Page
 : 5 of 5

 Work Order
 : VA21A8306

 Client
 : District of Wells

Project : ---



# **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
Total Metals in Water by CRC ICPMS	E420	Water	EPA 200.2/6020B	Water samples are digested with nitric and hydrochloric acids, and analyzed by
			(mod)	Collision/Reaction Cell ICPMS.
	Vancouver -			
	Environmental			Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered
				by this method.



# **QUALITY CONTROL REPORT**

Page

Laboratory

**Account Manager** 

: 1 of 3

: Vancouver - Environmental

Burnaby, British Columbia Canada V5A 1W9

: Amanda Lampreau

Work Order :VA21A8306

Client : District of Wells
Contact : Donna Forseille

Address : Box 219 4243 Saunders Avenue Address : 8081 Lougheed Highway

Wells BC Canada V0K 2R0

:---- Telephone :1 250 372 3588 :---- Date Samples Received :03-May-2021 12:50

 PO
 :--- Date Analysis Commenced
 : 04-May-2021

 C-O-C number
 : 20-886018
 Issue Date
 : 07-May-2021 17:19

 Sampler
 : Richard Radloff

Site · ---

Quote number : KS21-DOWL100-001

No. of samples received : 10
No. of samples analysed : 10

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

Telephone

Project

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

Kim Jensen Department Manager - Metals Metals, Burnaby, British Columbia

 Page
 : 2 of 3

 Work Order
 : VA21A8306

 Client
 : District of Wells

Project : --



#### **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							Labora	tory Duplicate (D	UP) Report		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lo	ot: 190574)										
VA21A8300-001	Anonymous	lead, total	7439-92-1	E420	0.000050	mg/L	0.0189	0.0184	2.53%	20%	
Total Metals (QC Lo	ot: 190585)										
VA21A8306-006	226	lead, total	7439-92-1	E420	0.000050	mg/L	0.00593	0.00584	1.55%	20%	

#### 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
Total Metals (QCLot: 190574)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	
Total Metals (QCLot: 190585)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	

 Page
 : 3 of 3

 Work Order
 : VA21A8306

 Client
 : District of Wells

Project : --



### 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 Co	ontrol Sample (LCS)	Report	
					Spike	Recovery (%)	Recovery	Limits (%)	
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 190574)									
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	98.5	80.0	120	
Total Metals (QCLot: 190585)									
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	98.5	80.0	120	

#### 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 Spil	re (MS) Report		
					Spi	ke	Recovery (%)	Recovery	Limits (%)	
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QC	Lot: 190574)									
VA21A8300-001	Anonymous	lead, total	7439-92-1	E420	0.0201 mg/L	0.02 mg/L	100	70.0	130	
Total Metals (QC	Lot: 190585)									
VA21A8306-006	226	lead, total	7439-92-1	E420	0.0186 mg/L	0.02 mg/L	93.3	70.0	130	



Canada Toll Free: 1 800 668 9878

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REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form. Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

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WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Control



# **CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)**

Issue Date

Work Order : VA21A8300

Client : **District of Wells**Contact : Donna Forseille

Address : Box 219 4243 Saunders Avenue

Wells BC Canada V0K 2R0

Telephone : ---Project : ---PO : ----

C-O-C number : 20-907460

Sampler : ---Site : ----

Quote number ; KS21-DOWL100-001

No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 4

Laboratory : Vancouver - Environmental

Account Manager : Amanda Lampreau

Address : 8081 Lougheed Highway

: 07-May-2021 17:26

Burnaby, British Columbia Canada V5A 1W9

 Telephone
 : 1 250 372 3588

 Date Samples Received
 : 03-May-2021 12:50

 Date Analysis Commenced
 : 04-May-2021

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

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

#### Signatories

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

 Signatories
 Position
 Laboratory Department

 Kim Jensen
 Department Manager - Metals
 Metals, Burnaby, British Columbia

 Page
 : 2 of 4

 Work Order
 : VA21A8300

 Client
 : District of Wells

Project : ---



#### **General Comments**

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

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

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

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

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

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

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

Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

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

Page : 3 of 4
Work Order : VA21A8300
Client : District of Wells

Project : ---



# Analytical Results Evaluation

Matrix: Water	Clie	nt sample ID	212	213	214	215	216	217	218
waux: water	Sampl	ing date/time	19-Apr-2021 03:45	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50
		Sub-Matrix	Water						
Analyte	CAS Number	Unit	VA21A8300-001	VA21A8300-002	VA21A8300-003	VA21A8300-004	VA21A8300-005	VA21A8300-006	VA21A8300-007
Total Metals									
lead, total	7439-92-1	mg/L	0.0189	0.0139	0.00834	0.0143	0.0408	0.0410	0.0193

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

# **Summary of Guideline Breaches by Sample**

Client sample ID	Matrix	Analyte	Analyte Summary			Result	Limit
212	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0189 mg/L	0.005 mg/L
213	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0139 mg/L	0.005 mg/L
214	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00834 mg/L	0.005 mg/L
215	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0143 mg/L	0.005 mg/L
216	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0408 mg/L	0.005 mg/L
217	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0410 mg/L	0.005 mg/L
218	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0193 mg/L	0.005 mg/L

 Page
 : 4 of 4

 Work Order
 : VA21A8300

 Client
 : District of Wells

Project : ---



### **Summary of Guideline Limits**

Analyte CAS Number	r Unit	BCDWQG			
		MAC			
Total Metals					
lead, total 7439-92-	mg/L	0.005			

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

Key:

BCDWQG British Columbia Drinking Water Quality Guidelines (JAN, 2021)

MAC Maximium Acceptable Concentrations



### **CERTIFICATE OF ANALYSIS**

**Work Order** : VA21A8300

Client **District of Wells** Donna Forseille

Address Box 219 4243 Saunders Avenue

Wells BC Canada V0K 2R0

Telephone **Project** 

C-O-C number : 20-907460

Sampler Site

Quote number : KS21-DOWL100-001

No. of samples received : 7 No. of samples analysed : 7

Page : 1 of 3

> Laboratory : Vancouver - Environmental

Account Manager : Amanda Lampreau

Address : 8081 Lougheed Highway

Burnaby BC Canada V5A 1W9

Telephone : 1 250 372 3588 **Date Samples Received** : 03-May-2021 12:50

**Date Analysis Commenced** : 04-May-2021

Issue Date : 07-May-2021 17:26

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

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**

Contact

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

Kim Jensen Department Manager - Metals Metals, Burnaby, British Columbia Page : 2 of 3

Work Order : VA21A8300
Client : District of Wells

Project : ---



#### **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
mg/L	milligrams per litre

<: 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.

Page : 3 of 3 Work Order : VA21A8300 Client : District of Wells

Project : ---



# Analytical Results

Sub-Matrix: Water			Cli	ent sample ID	212	213	214	215	216
(Matrix: Water)									
			Client sampl	ling date / time	19-Apr-2021 03:45	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50
Analyte	CAS Number	Method	LOR	Unit	VA21A8300-001	VA21A8300-002	VA21A8300-003	VA21A8300-004	VA21A8300-005
				Î	Result	Result	Result	Result	Result
Total Metals									
lead, total	7439-92-1	E420	0.000050	mg/L	0.0189	0.0139	0.00834	0.0143	0.0408

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

# Analytical Results

Sub-Matrix: Water			Cli	ient sample ID	217	218	 	
(Matrix: Water)								
			Client samp	ling date / time	19-Apr-2021 15:50	19-Apr-2021 15:50	 	
Analyte	CAS Number	Method	LOR	Unit	VA21A8300-006	VA21A8300-007	 	
					Result	Result	 	
Total Metals								
lead, total	7439-92-1	E420	0.000050	mg/L	0.0410	0.0193	 	

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



Wells BC Canada V0K 2R0

# **QUALITY CONTROL INTERPRETIVE REPORT**

**Work Order** : VA21A8300 Page : 1 of 5

Client District of Wells Laboratory : Vancouver - Environmental

Contact · Donna Forseille Account Manager : Amanda Lampreau Address

Box 219 4243 Saunders Avenue Address : 8081 Lougheed Highway

Burnaby, British Columbia Canada V5A 1W9

Telephone Telephone : 1 250 372 3588 **Project Date Samples Received** : 03-May-2021 12:50

PO Issue Date : 07-May-2021 17:26 C-O-C number : 20-907460

Sampler Site

Quote number : KS21-DOWL100-001

No. of samples received : 7 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.

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)**

• No Analysis Holding Time Outliers exist.

### **Outliers: Frequency of Quality Control Samples**

• No Quality Control Sample Frequency Outliers occur.

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 : 2 of 5

 Work Order
 : VA21A8300

 Client
 : District of Wells

Project : ---



### **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.

Evaluation: **x** = Holding time exceedance; ✓ = Within Holding Time Matrix: Water Analyte Group Extraction / Preparation Analysis Method Sampling Date Container / Client Sample ID(s) **Holding Times** Eval Analysis Date **Holding Times** Eval Preparation Rec Actual Date Rec Actual Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 19-Apr-2021 1 212 04-May-2021 180 16 days days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 16 days E420 19-Apr-2021 04-May-2021 ✓ 213 180 ---days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 04-May-2021 214 19-Apr-2021 16 days 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 215 E420 19-Apr-2021 04-May-2021 16 days 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 216 E420 19-Apr-2021 04-May-2021 16 days 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 19-Apr-2021 217 04-May-2021 180 16 days -------days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 04-May-2021 1 218 19-Apr-2021 16 days 180 days

 Page
 : 3 of 5

 Work Order
 : VA21A8300

 Client
 : District of Wells

Project : ---





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 : 4 of 5

 Work Order
 : VA21A8300

 Client
 : District of Wells

Project : ---



# **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 Count Frequency (%) Method QC Lot # QC Regular Actual Expected Evaluation Analytical Methods Laboratory Duplicates (DUP) Total Metals in Water by CRC ICPMS 190574 19 5.2 5.0 E420 Laboratory Control Samples (LCS) Total Metals in Water by CRC ICPMS 190574 1 19 5.2 5.0 E420 Method Blanks (MB) Total Metals in Water by CRC ICPMS 190574 E420 1 19 5.2 5.0 Matrix Spikes (MS) Total Metals in Water by CRC ICPMS 190574 1 19 5.2 5.0 E420

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 : 5 of 5

 Work Order
 : VA21A8300

 Client
 : District of Wells

Project : --



# **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
Total Metals in Water by CRC ICPMS	E420	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.
	Vancouver -		(IIIOd)	Collision/Reaction Cell for W.S.
	Environmental			Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered
				by this method.



# **QUALITY CONTROL REPORT**

Work Order : VA21A8300

Contact ; Donna Forseille

Address : Box 219 4243 Saunders Avenue

: District of Wells

Wells BC Canada V0K 2R0

Telephone :---Project :---PO :----

Client

C-O-C number : 20-907460

Sampler : --Site : ---

Quote number : KS21-DOWL100-001

No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 3

Laboratory : Vancouver - Environmental

Account Manager : Amanda Lampreau

Address : 8081 Lougheed Highway

Burnaby, British Columbia Canada V5A 1W9

Telephone : 1 250 372 3588

Date Samples Received : 03-May-2021 12:50

Date Analysis Commenced : 04-May-2021

Issue Date : 07-May-2021 17:26

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

Kim Jensen Department Manager - Metals Metals, Burnaby, British Columbia

 Page
 : 2 of 3

 Work Order
 : VA21A8300

 Client
 : District of Wells

Project : ---



#### **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	ub-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	
Total Metals (QC Lo	t: 190574)											
VA21A8300-001	212	lead, total	7439-92-1	E420	0.000050	mg/L	0.0189	0.0184	2.53%	20%		

#### 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
Total Metals (QCLot: 190574)					
lead, total	7439-92-1 E420	0.00005	mg/L	<0.000050	

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 Work Order
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 Client
 : District of Wells

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### 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
Total Metals (QCLot: 190574)									
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	98.5	80.0	120	

#### 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	ub-Matrix: Water						Matrix Spike (MS) Report							
					Spi	ke	Recovery (%)	Recovery	Limits (%)					
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier				
Total Metals (QC	Lot: 190574)													
VA21A8300-001	212	lead, total	7439-92-1	E420	0.0201 mg/L	0.02 mg/L	100	70.0	130					

# Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

coc Number: 20 - 90**7460** 

Page of

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# **CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)**

Issue Date

Work Order : VA21A8303

Client : **District of Wells**Contact : Donna Forseille

Address : Box 219 4243 Saunders Avenue

Wells BC Canada V0K 2R0

 Telephone
 : --- 

 Project
 : --- 

 PO
 : ---

C-O-C number : 20-907461

Sampler : ---Site : ----

Quote number ; KS21-DOWL100-001

No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 4

Laboratory : Vancouver - Environmental

Account Manager : Amanda Lampreau

Address : 8081 Lougheed Highway

: 07-May-2021 17:28

Burnaby, British Columbia Canada V5A 1W9

 Telephone
 : 1 250 372 3588

 Date Samples Received
 : 03-May-2021 12:50

 Date Analysis Commenced
 : 04-May-2021

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

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

#### Signatories

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

 Signatories
 Position
 Laboratory Department

 Kim Jensen
 Department Manager - Metals
 Metals, Burnaby, British Columbia

 Page
 : 2 of 4

 Work Order
 : VA21A8303

 Client
 : District of Wells

Project : ---



#### **General Comments**

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

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

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

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

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

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

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

Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

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

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 Work Order
 : VA21A8303

 Client
 : District of Wells

Project : --



# Analytical Results Evaluation

Matrix: Water	Clier	nt sample ID	219	220	221	222	223	224	225
Wautx. water	Sampli	ing date/time	19-Apr-2021 03:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50	19-Apr-2021 15:50
		Sub-Matrix	Water						
Analyte	CAS Number	Unit	VA21A8303-001	VA21A8303-002	VA21A8303-003	VA21A8303-004	VA21A8303-005	VA21A8303-006	VA21A8303-007
Total Metals									
lead, total	7439-92-1	mg/L	0.00978	0.00647	0.00523	0.00458	0.00428	0.00410	0.00391

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

## **Summary of Guideline Breaches by Sample**

Client sample ID	Matrix	Analyte	Analyte Summary			Result	Limit
219	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00978 mg/L	0.005 mg/L
220	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00647 mg/L	0.005 mg/L
221	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00523 mg/L	0.005 mg/L

### **Summary of Guideline Limits**

Analyte CAS Number	Unit	BCDWQG MAC			
Total Metals		WAC			
lead, total 7439-92-1	mg/L	0.005			

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

Page : 4 of 4
Work Order : VA21A8303
Client : District of Wells

Project : --



Key:

BCDWQG British Columbia Drinking Water Quality Guidelines (JAN, 2021)

MAC Maximium Acceptable Concentrations



## **CERTIFICATE OF ANALYSIS**

Work Order : VA21A8303

Client : District of Wells
Contact : Donna Forseille

Address : Box 219 4243 Saunders Avenue

Wells BC Canada V0K 2R0

Telephone : ---Project : ----

C-O-C number : 20-907461

Sampler : ---Site : ----

Quote number : KS21-DOWL100-001

No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 3

Laboratory : Vancouver - Environmental

Account Manager : Amanda Lampreau

Address : 8081 Lougheed Highway

Burnaby BC Canada V5A 1W9

Telephone : 1 250 372 3588

Date Samples Received : 03-May-2021 12:50

Date Analysis Commenced : 04-May-2021

Issue Date : 07-May-2021 17:28

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

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

Kim Jensen Department Manager - Metals Metals, Burnaby, British Columbia

Page : 2 of 3

Work Order : VA21A8303
Client : District of Wells

Project · ---



#### **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
mg/L	milligrams per litre

<: 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.

Page : 3 of 3
Work Order : VA21A8303
Client : District of Wells

Project : ---



# Analytical Results

Sub-Matrix: Water			Cli	ient sample ID	219	220	221	222	223
(Matrix: Water)									
Analyte	CAS Number	Method	Client samp	ling date / time	19-Apr-2021 03:50 <b>VA21A8303-001</b>	19-Apr-2021 15:50 <b>VA21A8303-002</b>	19-Apr-2021 15:50 VA21A8303-003	19-Apr-2021 15:50 VA21A8303-004	19-Apr-2021 15:50 VA21A8303-005
					Result	Result	Result	Result	Result
Total Metals									
lead, total	7439-92-1	E420	0.000050	mg/L	0.00978	0.00647	0.00523	0.00458	0.00428

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

# Analytical Results

Sub-Matrix: Water			Cli	ient sample ID	224	225	 	
(Matrix: Water)								
			Client samp	ling date / time	19-Apr-2021 15:50	19-Apr-2021 15:50	 	
Analyte	CAS Number	Method	LOR	Unit	VA21A8303-006	VA21A8303-007	 	
					Result	Result	 	
Total Metals								
lead, total	7439-92-1	E420	0.000050	mg/L	0.00410	0.00391	 	

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



# **QUALITY CONTROL INTERPRETIVE REPORT**

Work Order : VA21A8303 Page : 1 of 5

Client : District of Wells Laboratory : Vancouver - Environmental

Contact : Donna Forseille Account Manager : Amanda Lampreau

Address : Box 219 4243 Saunders Avenue Address : 8081 Lougheed High

Box 219 4243 Saunders Avenue

Address

8081 Lougheed Highway

Wells BC Canada V0K 2R0

Burnaby, British Columbia

Burnaby, British Columbia Canada V5A 1W9

 Telephone
 : -- Telephone
 : 1 250 372 3588

 Project
 : -- Date Samples Received
 : 03-May-2021 12:50

 PO
 : -- Issue Date
 : 07-May-2021 17:28

PO : --- Issue Date

C-O-C number : 20-907461

Sampler : ----

Quote number : KS21-DOWL100-001

No. of samples received : 7
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.
- No Test sample Surrogate recovery outliers exist.

### Outliers: Reference Material (RM) Samples

• No Reference Material (RM) Sample outliers occur.

### **Outliers : Analysis Holding Time Compliance (Breaches)**

• No Analysis Holding Time Outliers exist.

### **Outliers: Frequency of Quality Control Samples**

• No Quality Control Sample Frequency Outliers occur.

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 Work Order
 : VA21A8303

 Client
 : District of Wells

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## **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.

Evaluation: **x** = Holding time exceedance; ✓ = Within Holding Time Matrix: Water Analyte Group Extraction / Preparation Analysis Method Sampling Date Container / Client Sample ID(s) **Holding Times** Eval Analysis Date **Holding Times** Eval Preparation Rec Actual Date Rec Actual Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 19-Apr-2021 1 219 04-May-2021 180 16 days days Total Metals : Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 19-Apr-2021 04-May-2021 16 days ✓ 220 180 ---days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 04-May-2021 221 19-Apr-2021 16 days 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 222 E420 19-Apr-2021 04-May-2021 16 days 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 223 E420 19-Apr-2021 04-May-2021 16 days 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 19-Apr-2021 224 04-May-2021 180 16 days -------days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 225 E420 04-May-2021 1 19-Apr-2021 16 days 180 days

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

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 Client
 : District of Wells

Project : --



# **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	on: 🗴 = QC frequ	ency outside spe	ecification; 🗸 =	QC frequency with	nin specificatio	
Quality Control Sample Type			C	ount		Frequency (%)	requency (%)	
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)								
Total Metals in Water by CRC ICPMS	E420	190574	1	19	5.2	5.0	✓	
Laboratory Control Samples (LCS)								
Total Metals in Water by CRC ICPMS	E420	190574	1	19	5.2	5.0	✓	
Method Blanks (MB)								
Total Metals in Water by CRC ICPMS	E420	190574	1	19	5.2	5.0	✓	
Matrix Spikes (MS)								
Total Metals in Water by CRC ICPMS	E420	190574	1	19	5.2	5.0		

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 Work Order
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 Client
 : District of Wells

Project : ---



# **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
Total Metals in Water by CRC ICPMS	E420	Water	EPA 200.2/6020B	Water samples are digested with nitric and hydrochloric acids, and analyzed by
			(mod)	Collision/Reaction Cell ICPMS.
	Vancouver -			
	Environmental			Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered
				by this method.



# **QUALITY CONTROL REPORT**

Work Order :VA21A8303

Page : 1 of 3

Client : District of Wells
Contact : Donna Forseille

Laboratory : Vancouver - Environmental

Box 219 4243 Saunders Avenue

Account Manager : Amanda Lampreau

Address : 8081 Lougheed Highway

Wells BC Canada V0K 2R0

Burnaby, British Columbia Canada V5A 1W9

Telephone :---Project :----

Address

Telephone : 1 250 372 3588

Date Samples Received : 03-May-2021 12:50

C-O-C number : 20-907461

Date Analysis Commenced :04-May-2021

Sampler : --Site : ---

Issue Date : 07-May-2021 17:28

Quote number : KS21-DOWL100-001

No. of samples received : 7
No. of samples analysed : 7

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

Kim Jensen Department Manager - Metals Metals, Burnaby, British Columbia

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 : District of Wells

Project : ---



#### **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							Labora	tory Duplicate (DI	JP) Report		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lo	t: 190574)										
VA21A8300-001	Anonymous	lead, total	7439-92-1	E420	0.000050	mg/L	0.0189	0.0184	2.53%	20%	

### 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 N	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 190574)						
lead, total	7439-92-1 E	<del>-</del> 420	0.00005	mg/L	<0.000050	

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 Client
 : District of Wells

Project : ---



## 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	ıb-Matrix: Water						Laboratory Control Sample (LCS) Report					
					Spike	Recovery (%)	Recovery	Limits (%)				
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier			
Total Metals (QCLot: 190574)												
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	98.5	80.0	120				

### 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						
					Spi	ke	Recovery (%)	Recovery	Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier	
Total Metals (QC	Lot: 190574)										
VA21A8300-001	Anonymous	lead, total	7439-92-1	E420	0.0201 mg/L	0.02 mg/L	100	70.0	130		

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 907461Page V of V

www.alsglobal.com

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1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form. REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY

YELLOW - CLIENT COPY



# **CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)**

Page

Work Order : VA21A8309

Wells BC Canada V0K 2R0

Client : District of Wells Laboratory : Vancouver - Environmental

Contact : Donna Forseille : Account Manager : Amanda Lampreau

Box 219 4243 Saunders Avenue Address : 8081 Lougheed Highway

Burnaby, British Columbia Canada V5A 1W9

: 1 of 4

 Telephone
 : -- Telephone
 : 1 250 372 3588

 Project
 : -- Date Samples Received
 : 03-May-2021 12:50

PO : ---- Date Analysis Commenced : 04-May-2021 C-O-C number : 20-886017 Issue Date : 07-May-2021 17:24

Sampler : Richard

Site : ---Quote number : KS21-DOWL100-001

No. of samples received : 11

No. of samples analysed : 11

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

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

#### Signatories

Address

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

Kim Jensen Department Manager - Metals Metals, Burnaby, British Columbia

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 : 2 of 4

 Work Order
 : VA21A8309

 Client
 : District of Wells

Project : ---



#### **General Comments**

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

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

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

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

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

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

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

Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

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

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 Work Order
 : VA21A8309

 Client
 : District of Wells

Project : --



# Analytical Results Evaluation

Matrix: Water	Clie	ent sample ID	200	201	202	203	204	205	206
	Sampl	ling date/time	19-Apr-2021 08:24	19-Apr-2021 08:24	19-Apr-2021 08:25	19-Apr-2021 09:09	19-Apr-2021 09:09	19-Apr-2021 09:13	19-Apr-2021 09:25
		Sub-Matrix	Water	Water	Water	Water	Water	Water	Water
Analyte	CAS Number	Unit	VA21A8309-001	VA21A8309-002	VA21A8309-003	VA21A8309-004	VA21A8309-005	VA21A8309-006	VA21A8309-007
Total Metals									
lead, total	7439-92-1	mg/L	0.000310	<0.000050	<0.000050	0.000789	0.000150	0.000054	0.00733
Analytical Results Evaluation									
Motivy Water	Client sample ID		207	208	000	210			
			201	200	209	210			
Matrix: Water	Sampi	ling date/time	19-Apr-2021 09:25	19-Apr-2021 09:26	19-Apr-2021 09:26	19-Apr-2021 09:26			
Mauix: water	Sampi	ling date/time Sub-Matrix	19-Apr-2021	19-Apr-2021	19-Apr-2021	19-Apr-2021			
Analyte	Sampl CAS Number		19-Apr-2021 09:25	19-Apr-2021 09:26	19-Apr-2021 09:26	19-Apr-2021 09:26			
		Sub-Matrix	19-Apr-2021 09:25 Water	19-Apr-2021 09:26 Water	19-Apr-2021 09:26 Water	19-Apr-2021 09:26 Water			

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

## **Summary of Guideline Breaches by Sample**

Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
206	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.00733 mg/L	0.005 mg/L

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 Client
 : District of Wells

Project : ---



## **Summary of Guideline Limits**

Analyte CAS Number	Unit	BCDWQG MAC			
Total Metals					
lead, total 7439-92-1	mg/L	0.005			

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

Key:

BCDWQG British Columbia Drinking Water Quality Guidelines (JAN, 2021)

MAC Maximium Acceptable Concentrations



Donna Forseille

## **CERTIFICATE OF ANALYSIS**

Work Order : VA21A8309

Client : District of Wells

Address : Box 219 4243 Saunders Avenue

Wells BC Canada V0K 2R0

Telephone : ---Project : ----

Contact

C-O-C number : 20-886017 Sampler : Richard

Site . \_\_\_

Quote number : KS21-DOWL100-001

No. of samples received : 11

No. of samples analysed : 11

Page : 1 of 3

Laboratory : Vancouver - Environmental

Account Manager : Amanda Lampreau

Address : 8081 Lougheed Highway

Burnaby BC Canada V5A 1W9

Telephone : 1 250 372 3588

Date Samples Received : 03-May-2021 12:50

Date Analysis Commenced : 04-May-2021

Issue Date : 07-May-2021 17:24

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

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

Kim Jensen Department Manager - Metals Metals, Burnaby, British Columbia

Page : 2 of 3

Work Order : VA21A8309
Client : District of Wells

Project · ---



#### **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
mg/L	milligrams per litre

<: 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.

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 Work Order
 : VA21A8309

 Client
 : District of Wells

Project : ---



## Analytical Results

Sub-Matrix: Water			Cli	ent sample ID	200	201	202	203	204
(Matrix: Water)									
Analyte	CAS Number	Method	Client samp	ling date / time Unit	19-Apr-2021 08:24 <b>VA21A8309-001</b>	19-Apr-2021 08:24 <b>VA21A8309-002</b>	19-Apr-2021 08:25 <b>VA21A8309-003</b>	19-Apr-2021 09:09 <b>VA21A8309-004</b>	19-Apr-2021 09:09 <b>VA21A8309-005</b>
					Result	Result	Result	Result	Result
Total Metals									
lead, total	7439-92-1	E420	0.000050	mg/L	0.000310	<0.000050	<0.000050	0.000789	0.000150

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

## Analytical Results

Sub-Matrix: Water			Cli	ient sample ID	205	206	207	208	209
(Matrix: Water)									
			Client samp	ling date / time	19-Apr-2021 09:13	19-Apr-2021 09:25	19-Apr-2021 09:25	19-Apr-2021 09:26	19-Apr-2021 09:26
Analyte	CAS Number	Method	LOR	Unit	VA21A8309-006	VA21A8309-007	VA21A8309-008	VA21A8309-009	VA21A8309-010
					Result	Result	Result	Result	Result
Total Metals									
lead, total	7439-92-1	E420	0.000050	mg/L	0.000054	0.00733	0.000696	0.000586	0.000326

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

## Analytical Results

Sub-Matrix: Water			Cli	ient sample ID	210	 	 
(Matrix: Water)							
			Client samp	ling date / time	19-Apr-2021 09:26	 	 
Analyte	CAS Number	Method	LOR	Unit	VA21A8309-011	 	 
					Result	 	 
Total Metals							
lead, total	7439-92-1	E420	0.000050	mg/L	0.000086	 	 

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



# **QUALITY CONTROL INTERPRETIVE REPORT**

Work Order : VA21A8309 Page : 1 of 5

Client : District of Wells : Vancouver - Environmental

Contact : Donna Forseille Account Manager : Amanda Lampreau

Address : Box 219 4243 Saunders Avenue Address : 8081 Lougheed High

Box 219 4243 Saunders Avenue

Wells BC Canada V0K 2R0

Address

8081 Lougheed Highway
Burnaby, British Columbia

Burnaby, British Columbia Canada V5A 1W9

 Telephone
 : -- Telephone
 : 1 250 372 3588

 Project
 : -- Date Samples Received
 : 03-May-2021 12:50

 PO
 : -- Issue Date
 : 07-May-2021 17:24

C-O-C number : 20-886017 Sampler : Richard

Site : ----

Quote number : KS21-DOWL100-001

No. of samples received : 11

No. of samples analysed : 11

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)**

• No Analysis Holding Time Outliers exist.

### **Outliers: Frequency of Quality Control Samples**

• No Quality Control Sample Frequency Outliers occur.

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# **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					Ev	aluation: 🗴 =	Holding time excee	edance ; •	<pre> = Within</pre>	Holding Tim
Analyte Group	Method	Sampling Date	Ext	raction / Pr	eparation			Analys	sis	
Container / Client Sample ID(s)			Preparation	Holding	g Times	Eval	Analysis Date	Holding	g Times	Eval
			Date	Rec	Actual			Rec	Actual	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
200	E420	19-Apr-2021					04-May-2021	180	16 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
201	E420	19-Apr-2021					04-May-2021	180	16 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
202	E420	19-Apr-2021					04-May-2021	180	16 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
203	E420	19-Apr-2021					04-May-2021	180	16 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
204	E420	19-Apr-2021					04-May-2021	180	16 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
205	E420	19-Apr-2021					04-May-2021	180	16 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
206	E420	19-Apr-2021					04-May-2021	180	16 days	✓
								days		

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Matrix: Water Evaluation: **x** = Holding time exceedance ; ✓ = Within Holding Time Analyte Group Sampling Date Extraction / Preparation Analysis Method Container / Client Sample ID(s) Preparation Holding Times Eval Analysis Date Holding Times Eval Rec Actual Rec Actual Date **Total Metals: Total Metals in Water by CRC ICPMS** HDPE - total (lab preserved) 207 E420 19-Apr-2021 04-May-2021 16 days ✓ 180 days Total Metals : Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 1 E420 19-Apr-2021 208 04-May-2021 180 16 days -------days Total Metals : Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 209 E420 19-Apr-2021 04-May-2021 16 days 1 180 days Total Metals : Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 04-May-2021 ✓ 210 E420 19-Apr-2021 16 days 180 days

#### **Legend & Qualifier Definitions**

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

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# **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	on: 🗴 = QC frequ	iency outside sp	ecification; ✓ =	QC frequency wit	hin specification
Quality Control Sample Type			С	ount		Frequency (%)	
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Total Metals in Water by CRC ICPMS	E420	190585	2	27	7.4	5.0	✓
Laboratory Control Samples (LCS)							
Total Metals in Water by CRC ICPMS	E420	190585	2	27	7.4	5.0	✓
Method Blanks (MB)							
Total Metals in Water by CRC ICPMS	E420	190585	2	27	7.4	5.0	✓
Matrix Spikes (MS)							
Total Metals in Water by CRC ICPMS	E420	190585	2	27	7.4	5.0	✓

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 Client
 : District of Wells

Project : ---



# **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
Total Metals in Water by CRC ICPMS	E420	Water	EPA 200.2/6020B	Water samples are digested with nitric and hydrochloric acids, and analyzed by
			(mod)	Collision/Reaction Cell ICPMS.
	Vancouver -			
	Environmental			Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered
				by this method.



# **QUALITY CONTROL REPORT**

Address

**Work Order** :VA21A8309 Page : 1 of 3

Client : District of Wells Contact : Donna Forseille Laboratory : Vancouver - Environmental **Account Manager** 

: Box 219 4243 Saunders Avenue

:8081 Lougheed Highway

Wells BC Canada V0K 2R0

Burnaby, British Columbia Canada V5A 1W9

: Amanda Lampreau

Telephone Project

Address

Telephone :1 250 372 3588 **Date Samples Received** :03-May-2021 12:50

C-O-C number :20-886017 **Date Analysis Commenced** :04-May-2021

Sampler : Richard Site

Issue Date :07-May-2021 17:25

Quote number :KS21-DOWL100-001

No. of samples received : 11 No. of samples analysed : 11

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

Kim Jensen Department Manager - Metals Metals, Burnaby, British Columbia 
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 Client
 : District of Wells

Project : --



#### **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
Total Metals (QC Lo	t: 190585)										
VA21A8306-006	Anonymous	lead, total	7439-92-1	E420	0.000050	mg/L	0.00593	0.00584	1.55%	20%	
Total Metals (QC Lo	Total Metals (QC Lot: 190588)										
VA21A8309-006	205	lead, total	7439-92-1	E420	0.000050	mg/L	0.000054	0.000051	0.000003	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
Total Metals (QCLot: 190585)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	
Total Metals (QCLot: 190588)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	

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### 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	ıb-Matrix: Water						Laboratory Control Sample (LCS) Report					
					Spike	Recovery (%)	Recovery	Limits (%)				
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier			
Total Metals (QCLot: 190585)												
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	98.5	80.0	120				
Total Metals (QCLot: 190588)												
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	99.3	80.0	120				

### 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	b-Matrix: Water					Matrix Spike (MS) Report					
					Spi	ke	Recovery (%)	Recovery	Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier	
Total Metals (QC	Lot: 190585)										
VA21A8306-006	Anonymous	lead, total	7439-92-1	E420	0.0186 mg/L	0.02 mg/L	93.3	70.0	130		
Total Metals (QC	Total Metals (QCLot: 190588)										
VA21A8309-006	205	lead, total	7439-92-1	E420	0.0184 mg/L	0.02 mg/L	91.8	70.0	130		

# Chain of Custody (COC) / Analytical Request Form

ALS www.alsglobal.com

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 886017

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Report To Contact and company name below will appear on the final report	<u> </u>	Reports / Re	cipients			Turnaround Ti	ime (TAT) Requ	iested ,	2 M %.	to his a his
	Select Report Fo	rmat: 😿 PDF 💈	P EXCEL [] ED	DD (DIGITAL)	<b>∏</b> ♥ Routine	[R] if received by 3pm N	M-F - no surcharg	ės apply		
Contact: Richard Radioff	Merge QC/QCI	Reports with COA	YES NO	D □ N/A	4 day [P	4] if received by 3pm M	1-F - 20% rush su	rcharge minimum	**	
Phone: 250-562-6861	Compare Resul	its to Criteria on Report - pro			☐ 3 day [F	P3] if received by 3pm N	M-F-25% rushs	urcharge minimum	1 1100 27	RCODE LABEL HERE ** S use only) ************************************
Company address below will appear on the final report	Select Distributio	elect distribution.			I day [F] if received by 3pm M-F - 100% rush surcharge minimum					
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City/Province: Prince George, BC	Email 2	·				ly to rush requests on wee		olidays and non-routine t	ests * * *	Y K & B
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Copy of Invoice with Report	Select Invoice Di		IL MAIL	FAX	Analysis Request					
Company: District of Vells	Email 1 or Fax	admin la	News-c	a	₩	Indicate Filter	ed (F), Preserved	(P) or Filtered and Pres	served (F/P) below	
Contact: Nonna Forse: NP Project Information	Email 2	NI and Can Bandard			┧╩┟──	╌┼╌╼╾╁┄╾═┼╌			<del></del>	LD REQUIRED (see notes)
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	·				<u> </u>					
Drinking Water (DW) Samples <sup>1</sup> (client use)  Notes / Spec		evaluation by selecting	from drop-down	below					ALS use only)	<b>3 30 300</b> 300
Are samples taken from a Regulated DW System?	(E	Excel COC only)				ethod:		ICE PACKS	FROZEN ☐ C	COOLING INITIATED
YES NO										
Are samples for human consumption/ use?	Cooler Custody Seals Intact. 4 1 16 Seals Intact. 4 Seals Intact. 4 Cooler Custody Seals Intact. 4 Seals Intac									
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REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION  Failure to complete all portions of this form area dalogy products. Please fill in this form LEGIBLY, By the use of the	Lie form the upon dalmor		E - LABORATORY				100	b) /,	/	OVV



# **CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)**

Work Order : VA21A8307

Client : **District of Wells**Contact : Donna Forseille

Address : Box 219 4243 Saunders Avenue

Wells BC Canada V0K 2R0

Telephone : ---Project : ---PO : ----

C-O-C number : 20-907459

Sampler : ----Site : ----

Quote number ; KS21-DOWL100-001

No. of samples received : 10

No. of samples analysed : 10

Page : 1 of 4

Laboratory : Vancouver - Environmental

Account Manager : Amanda Lampreau

Address : 8081 Lougheed Highway

Burnaby, British Columbia Canada V5A 1W9

 Telephone
 : 1 250 372 3588

 Date Samples Received
 : 03-May-2021 12:50

 Date Analysis Commenced
 : 04-May-2021

 Issue Date
 : 07-May-2021 17:21

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

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

### Signatories

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

 Signatories
 Position
 Laboratory Department

 Kim Jensen
 Department Manager - Metals
 Metals, Burnaby, British Columbia

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 : 2 of 4

 Work Order
 : VA21A8307

 Client
 : District of Wells

Project : ---



#### **General Comments**

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

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

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

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

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

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

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

mg/L milligrams per litre	

>: greater than.

<: less than.

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

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 Client
 : District of Wells

Project : ---



# Analytical Results Evaluation

Matrix: Water	Clie	nt sample ID	318	319	320	321	322	323	324
	Sampl	ing date/time	27-Apr-2021 10:01	27-Apr-2021 10:01	27-Apr-2021 10:01	27-Apr-2021 10:01	27-Apr-2021 10:02	27-Apr-2021 10:23	27-Apr-2021 10:23
		Sub-Matrix	Water						
Analyte	CAS Number	Unit	VA21A8307-001	VA21A8307-002	VA21A8307-003	VA21A8307-004	VA21A8307-005	VA21A8307-006	VA21A8307-007
Total Metals									
lead, total	7439-92-1	mg/L	0.000126	0.000257	0.000076	<0.000050	0.000084	0.0597	0.0149
Analytical Results Evaluation									
	Clie	nt sample ID	325	326	327				
Matrix: Water	Sampl	ing date/time	27-Apr-2021 10:23	27-Apr-2021 10:23	27-Apr-2021 10:24				
		Sub-Matrix	Water	Water	Water				
Analyte	CAS Number	Unit	VA21A8307-008	VA21A8307-009	VA21A8307-010				
Total Metals									
lead, total	7439-92-1	mg/L	0.00243	0.00290	0.00104				

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

## **Summary of Guideline Breaches by Sample**

Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
323	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0597 mg/L	0.005 mg/L
324	Water	lead, total	No summary description available for this compound in this guideline.	BCDWQG	MAC	0.0149 mg/L	0.005 mg/L

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## **Summary of Guideline Limits**

Analyte CAS Number	Unit	BCDWQG			
		MAC			
Total Metals					
lead, total 7439-92-1	mg/L	0.005			

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

Key:

BCDWQG British Columbia Drinking Water Quality Guidelines (JAN, 2021)

MAC Maximium Acceptable Concentrations



## **CERTIFICATE OF ANALYSIS**

Work Order : VA21A8307

Client : **District of Wells**Contact : Donna Forseille

Address : Box 219 4243 Saunders Avenue

Wells BC Canada V0K 2R0

Telephone : ---Project : ----

C-O-C number : 20-907459

Sampler : ---Site : ----

Quote number : KS21-DOWL100-001

No. of samples received : 10
No. of samples analysed : 10

Page : 1 of 3

Laboratory : Vancouver - Environmental

Account Manager : Amanda Lampreau

Address : 8081 Lougheed Highway

Burnaby BC Canada V5A 1W9

Telephone : 1 250 372 3588

Date Samples Received : 03-May-2021 12:50

Date Analysis Commenced : 04-May-2021

Issue Date : 07-May-2021 17:21

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

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

Kim Jensen Department Manager - Metals Metals, Burnaby, British Columbia

Page : 2 of 3

Work Order : VA21A8307 Client : District of Wells

Project · ---



#### **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
mg/L	milligrams per litre

<: 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.

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Work Order : VA21A8307
Client : District of Wells

Project : ----



# Analytical Results

Sub-Matrix: Water			Cli	ient sample ID	318	319	320	321	322
(Matrix: Water)									
		Makkad		ling date / time	27-Apr-2021 10:01	27-Apr-2021 10:01	27-Apr-2021 10:01	27-Apr-2021 10:01	27-Apr-2021 10:02
Analyte	CAS Number	Method	LOR	Unit	VA21A8307-001	VA21A8307-002	VA21A8307-003	VA21A8307-004	VA21A8307-005
					Result	Result	Result	Result	Result
Total Metals									
lead, total	7439-92-1	E420	0.000050	mg/L	0.000126	0.000257	0.000076	<0.000050	0.000084

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

# Analytical Results

Sub-Matrix: Water			Cli	ient sample ID	323	324	325	326	327
(Matrix: Water)									
			Client samp	ling date / time	27-Apr-2021 10:23	27-Apr-2021 10:23	27-Apr-2021 10:23	27-Apr-2021 10:23	27-Apr-2021 10:24
Analyte	CAS Number	Method	LOR	Unit	VA21A8307-006	VA21A8307-007	VA21A8307-008	VA21A8307-009	VA21A8307-010
					Result	Result	Result	Result	Result
Total Metals									
lead, total	7439-92-1	E420	0.000050	mg/L	0.0597	0.0149	0.00243	0.00290	0.00104

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



# **QUALITY CONTROL INTERPRETIVE REPORT**

**Work Order** : VA21A8307 Page : 1 of 5

Client District of Wells Laboratory : Vancouver - Environmental

Contact · Donna Forseille Account Manager : Amanda Lampreau Address

Box 219 4243 Saunders Avenue Address : 8081 Lougheed Highway

Wells BC Canada V0K 2R0 Burnaby, British Columbia Canada V5A 1W9

Telephone Telephone : 1 250 372 3588 **Project Date Samples Received** : 03-May-2021 12:50 PO Issue Date : 07-May-2021 17:21

C-O-C number : 20-907459

Sampler Site

Quote number : KS21-DOWL100-001

No. of samples received : 10 No. of samples analysed : 10

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

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)

• No Analysis Holding Time Outliers exist.

## **Outliers: Frequency of Quality Control Samples**

• No Quality Control Sample Frequency Outliers occur.

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 : 2 of 5

 Work Order
 : VA21A8307

 Client
 : District of Wells

Project : --



## **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: **x** = Holding time exceedance; ✓ = Within Holding Time Analyte Group Sampling Date Extraction / Preparation Analysis Method Container / Client Sample ID(s) **Holding Times** Eval Analysis Date Holding Times Eval Preparation Rec Actual Rec Actual Date Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) F420 27-Apr-2021 04-May-2021 1 318 180 8 days days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 319 E420 27-Apr-2021 04-May-2021 8 days ✓ 180 ---days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 320 E420 27-Apr-2021 04-May-2021 8 days 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 321 E420 27-Apr-2021 04-May-2021 180 8 davs days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 322 E420 27-Apr-2021 04-May-2021 8 days 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 04-May-2021 E420 27-Apr-2021 323 180 8 days -------days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 324 E420 27-Apr-2021 04-May-2021 ✓ 8 days 180 days

 Page
 : 3 of 5

 Work Order
 : VA21A8307

 Client
 : District of Wells

Project : ---

Matrix: Water

327



8 days

180 days ✓

Evaluation: **x** = Holding time exceedance ; ✓ = Within Holding Time

04-May-2021

Analyte Group Sampling Date Extraction / Preparation Analysis Method Container / Client Sample ID(s) Preparation **Holding Times** Eval Analysis Date Holding Times Eval Rec Rec Actual Actual Date **Total Metals: Total Metals in Water by CRC ICPMS** HDPE - total (lab preserved) 325 E420 27-Apr-2021 04-May-2021 8 days ✓ 180 days Total Metals : Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 1 E420 27-Apr-2021 326 ----04-May-2021 180 8 days ---days

27-Apr-2021

E420

### **Legend & Qualifier Definitions**

HDPE - total (lab preserved)

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

Total Metals : Total Metals in Water by CRC ICPMS

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 : 4 of 5

 Work Order
 : VA21A8307

 Client
 : District of Wells

Project : ---



# **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	n: 🗴 = QC freque	ency outside spe	ecification; ✓ = 0	QC frequency with	hin specification.
Quality Control Sample Type			Co	ount		Frequency (%)	
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Total Metals in Water by CRC ICPMS	E420	190585	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Total Metals in Water by CRC ICPMS	E420	190585	1	20	5.0	5.0	✓
Method Blanks (MB)							
Total Metals in Water by CRC ICPMS	E420	190585	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Total Metals in Water by CRC ICPMS	E420	190585	1	20	5.0	5.0	✓

 Page
 : 5 of 5

 Work Order
 : VA21A8307

 Client
 : District of Wells

Project : ---



# **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
Total Metals in Water by CRC ICPMS	E420	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.
	Vancouver -		(mod)	Collision/Reaction Cell ICFWS.
	Environmental			Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered
				by this method.



# **QUALITY CONTROL REPORT**

Work Order :VA21A8307

Page : 1 of 3

Client : District of Wells
Contact : Donna Forseille

Laboratory : Vancouver - Environmental
Account Manager : Amanda Lampreau

Box 219 4243 Saunders Avenue

Address : 8081 Lougheed Highway

Wells BC Canada V0K 2R0

Burnaby, British Columbia Canada V5A 1W9

Telephone :--Project :---

Address

Telephone : 1 250 372 3588

Date Samples Received : 03-May-2021 12:50

C-O-C number : 20-907459

Date Analysis Commenced : 04-May-2021

Sampler : --Site : ---

Issue Date : 07-May-2021 17:21

Quote number : KS21-DOWL100-001

No. of samples received : 10

No. of samples analysed : 10

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

Kim Jensen Department Manager - Metals Metals, Burnaby, British Columbia

 Page
 : 2 of 3

 Work Order
 : VA21A8307

 Client
 : District of Wells

Project : --



### **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							Labora	tory Duplicate (DI	JP) Report		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lo	t: 190585)										
VA21A8306-006	Anonymous	lead, total	7439-92-1	E420	0.000050	mg/L	0.00593	0.00584	1.55%	20%	

## 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
Total Metals (QCLot: 190585)						
lead, total	7439-92-1 E	E420	0.00005	mg/L	<0.000050	

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 Work Order
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 Client
 : District of Wells

Project : ----



## 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 Co	ontrol Sample (LCS)	Report	
					Spike	Recovery (%)	Recovery	Limits (%)	
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 190585)									
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	98.5	80.0	120	

## 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 Spil	ke (MS) Report		
					Spi	ke	Recovery (%)	Recovery	Limits (%)	
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QC	Lot: 190585)									
VA21A8306-006	Anonymous	lead, total	7439-92-1	E420	0.0186 mg/L	0.02 mg/L	93.3	70.0	130	



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Canada Toll Free: 1 800 668 9878

COC Number: 20 - 907459

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REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.





: Donna Forseille

Wells BC Canada V0K 2R0

# **CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)**

Work Order : VA21A8311 Page

Client : District of Wells : Vancouver - Environmental

Address : Box 219 4243 Saunders Avenue Address : 8081 Lougheed Highway

Durnahy Pritiah Calumbia Canada

: 1 of 4

Burnaby, British Columbia Canada V5A 1W9

: Amanda Lampreau

Telephone : 1 250 372 3588

Date Samples Received : 03-May-2021 12:50

Date Analysis Commenced : 04-May-2021

**Account Manager** 

Issue Date : 10-May-2021 16:07

 Telephone
 : --- 

 Project
 : --- 

 PO
 : ---

Contact

C-O-C number : 20-907457, 20-907458

Sampler : ----Site : ----

Quote number ; KS21-DOWL100-001

No. of samples received : 18
No. of samples analysed : 18

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

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

### Signatories

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

Signatories	Position	Laboratory Department
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia

 Page
 : 2 of 4

 Work Order
 : VA21A8311

 Client
 : District of Wells

Project : ---



### **General Comments**

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

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

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

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

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

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

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

mg/L milligrams per litre	

>: greater than.

<: less than.

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

Page : 3 of 4
Work Order : VA21A8311
Client : District of Wells

Project : --



# Analytical Results Evaluation

Matrix: Water	Clie	ent sample ID	300	301	302	303	304	305	306
Wattis. Water	Sampl	ling date/time	27-Apr-2021 07:33	27-Apr-2021 07:34	27-Apr-2021 07:38	27-Apr-2021 07:39	27-Apr-2021 07:44	27-Apr-2021 07:45	27-Apr-2021 07:52
		Sub-Matrix	Water						
Analyte	CAS Number	Unit	VA21A8311-001	VA21A8311-002	VA21A8311-003	VA21A8311-004	VA21A8311-005	VA21A8311-006	VA21A8311-007
Total Metals									
lead, total	7439-92-1	mg/L	0.00102	0.000859	0.00130	0.00128	0.000988	0.00197	0.000241
Analytical Results Evaluation									
Matrix: <b>Water</b>	Clie	ent sample ID	307	308	309	310	311	312	313
wauix. water	Sampl	ling date/time	27-Apr-2021 07:53	27-Apr-2021 08:02	27-Apr-2021 08:02	27-Apr-2021 08:03	27-Apr-2021 09:22	27-Apr-2021 09:23	27-Apr-2021 09:31
		Sub-Matrix	Water						
Analyte	CAS Number	Unit	VA21A8311-008	VA21A8311-009	VA21A8311-010	VA21A8311-011	VA21A8311-012	VA21A8311-013	VA21A8311-014
Total Metals									
lead, total	7439-92-1	mg/L	0.000197	0.000695	0.000062	0.000062	0.00166	0.000664	0.00235
Analytical Results Evaluation									
Matrix: Water	Clie	ent sample ID	314	315	316	317			
	Sampl	ling date/time	27-Apr-2021 09:31	27-Apr-2021 09:31	27-Apr-2021 09:32	27-Apr-2021 09:32			
		Sub-Matrix	Water	Water	Water	Water			
Analyte	CAS Number	Unit	VA21A8311-015	VA21A8311-016	VA21A8311-017	VA21A8311-018			
Total Metals									
lead, total	7439-92-1	mg/L	0.000483	0.000263	0.00108	0.000519			

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

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 : 4 of 4

 Work Order
 : VA21A8311

 Client
 : District of Wells

Project : ----



## **No Breaches Found**

## **Summary of Guideline Limits**

Analyte CAS Number	Unit	BCDWQG			
		MAC			
Total Metals					
lead, total 7439-92-1	mg/L	0.005			

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

Key:

BCDWQG British Columbia Drinking Water Quality Guidelines (JAN, 2021)

MAC Maximium Acceptable Concentrations



Donna Forseille

## **CERTIFICATE OF ANALYSIS**

Work Order : VA21A8311

Client : District of Wells

Address : Box 219 4243 Saunders Avenue

Wells BC Canada V0K 2R0

Telephone : --Project : ---

Contact

PO : ---

C-O-C number : 20-907457, 20-907458

Sampler : ---Site : ---

Quote number : KS21-DOWL100-001

No. of samples received : 18
No. of samples analysed : 18

Page : 1 of 4

Laboratory : Vancouver - Environmental

Account Manager : Amanda Lampreau

Address : 8081 Lougheed Highway

Burnaby BC Canada V5A 1W9

Telephone : 1 250 372 3588

Date Samples Received : 03-May-2021 12:50

Date Analysis Commenced : 04-May-2021

Issue Date : 10-May-2021 16:07

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

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

Kevin Duarte Supervisor - Metals ICP Instrumentation Metals, Burnaby, British Columbia Robin Weeks Team Leader - Metals Metals Metals, Burnaby, British Columbia

 Page
 : 2 of 4

 Work Order
 : VA21A8311

 Client
 : District of Wells

Project · ----



### **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).

mg/L milligrams per litre	Unit	Description
	mg/L	milligrams per litre

<: 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.

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## Analytical Results

Sub-Matrix: Water			Cli	ient sample ID	300	301	302	303	304
(Matrix: Water)									
Analyte	CAS Number	Method	Client samp	ling date / time	27-Apr-2021 07:33 VA21A8311-001	27-Apr-2021 07:34 VA21A8311-002	27-Apr-2021 07:38 VA21A8311-003	27-Apr-2021 07:39 VA21A8311-004	27-Apr-2021 07:44 VA21A8311-005
, and the second	<i>57.10.1.10.01</i>				Result	Result	Result	Result	Result
Total Metals									
lead, total	7439-92-1	E420	0.000050	mg/L	0.00102	0.000859	0.00130	0.00128	0.000988

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

## Analytical Results

Sub-Matrix: Water			Cli	ient sample ID	305	306	307	308	309
(Matrix: Water)									
			Client samp	ling date / time	27-Apr-2021 07:45	27-Apr-2021 07:52	27-Apr-2021 07:53	27-Apr-2021 08:02	27-Apr-2021 08:02
Analyte	CAS Number	Method	LOR	Unit	VA21A8311-006	VA21A8311-007	VA21A8311-008	VA21A8311-009	VA21A8311-010
					Result	Result	Result	Result	Result
Total Metals									
lead, total	7439-92-1	E420	0.000050	mg/L	0.00197	0.000241	0.000197	0.000695	0.000062

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

## Analytical Results

Sub-Matrix: Water			Cli	ient sample ID	310	311	312	313	314
(Matrix: Water)									
Analyte	CAS Number	Method	Client samp	ling date / time  Unit	27-Apr-2021 08:03 <b>VA21A8311-011</b>	27-Apr-2021 09:22 <b>VA21A8311-012</b>	27-Apr-2021 09:23 VA21A8311-013	27-Apr-2021 09:31 <b>VA21A8311-014</b>	27-Apr-2021 09:31 <b>VA21A8311-015</b>
					Result	Result	Result	Result	Result
Total Metals									
lead, total	7439-92-1	E420	0.000050	mg/L	0.000062	0.00166	0.000664	0.00235	0.000483

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

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# Analytical Results

Sub-Matrix: Water			Cli	ient sample ID	315	316	317	 
(Matrix: Water)								
			Client samp	ling date / time	27-Apr-2021 09:31	27-Apr-2021 09:32	27-Apr-2021 09:32	 
Analyte	CAS Number	Method	LOR	Unit	VA21A8311-016	VA21A8311-017	VA21A8311-018	 
					Result	Result	Result	 
Total Metals								
lead, total	7439-92-1	E420	0.000050	mg/L	0.000263	0.00108	0.000519	 

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



# QUALITY CONTROL INTERPRETIVE REPORT

Work Order : VA21A8311 Page : 1 of 6

Client : District of Wells Laboratory : Vancouver - Environmental

Contact : Donna Forseille Account Manager : Amanda Lampreau

Address : Box 219 4243 Saunders Avenue Address : 8081 Lougheed High

Box 219 4243 Saunders Avenue

Address

8081 Lougheed Highway

Wells BC Canada V0K 2R0

Burnaby, British Columbia

Burnaby, British Columbia Canada V5A 1W9

 Telephone
 : -- Telephone
 : 1 250 372 3588

 Project
 : -- Date Samples Received
 : 03-May-2021 12:50

PO : ---- Issue Date : 10-May-2021 16:07 C-O-C number : 20-907457, 20-907458

Sampler : ---Site : ----

Quote number : KS21-DOWL100-001

No. of samples received : 18
No. of samples analysed : 18

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)**

• No Analysis Holding Time Outliers exist.

## **Outliers: Frequency of Quality Control Samples**

• No Quality Control Sample Frequency Outliers occur.

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# **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					Ev	aluation: 🗴 =	Holding time excee	edance ; •	= Within	Holding Tim
Analyte Group	Method	Sampling Date	Ext	raction / Pr	eparation			Analys	sis	
Container / Client Sample ID(s)			Preparation	Holding	g Times	Eval	Analysis Date	Holding	g Times	Eval
			Date	Rec	Actual			Rec	Actual	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
314	E420	27-Apr-2021					04-May-2021	180	8 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
300	E420	27-Apr-2021					05-May-2021	180	9 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
301	E420	27-Apr-2021					05-May-2021	180	9 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
302	E420	27-Apr-2021					05-May-2021	180	9 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
303	E420	27-Apr-2021					05-May-2021	180	9 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
304	E420	27-Apr-2021					05-May-2021	180	9 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
305	E420	27-Apr-2021					05-May-2021	180	9 days	✓
								days		

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Matrix: Water Evaluation: x = Holding time exceedance; ✓ = Within Holding Time Analyte Group Extraction / Preparation Method Sampling Date Analysis Container / Client Sample ID(s) Preparation **Holding Times** Eval Analysis Date Holding Times Eval Rec Date Rec Actual Actual Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 27-Apr-2021 05-May-2021 9 days ✓ 306 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 1 307 E420 27-Apr-2021 05-May-2021 180 9 days -------days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 308 E420 27-Apr-2021 05-May-2021 9 days ✓ 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 27-Apr-2021 05-May-2021 ✓ 309 180 9 days days **Total Metals: Total Metals in Water by CRC ICPMS** HDPE - total (lab preserved) E420 27-Apr-2021 05-May-2021 9 days ✓ 310 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 27-Apr-2021 05-May-2021 ✓ 311 180 9 days days Total Metals : Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 312 E420 27-Apr-2021 05-May-2021 9 days 1 180 days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) 05-May-2021 ✓ 313 E420 27-Apr-2021 180 9 days days Total Metals: Total Metals in Water by CRC ICPMS HDPE - total (lab preserved) E420 05-May-2021 ✓ 315 27-Apr-2021 9 days 180 -------days

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

Analyte Group	Method	Sampling Date	Ext	raction / Pr	action / Preparation			Analys	sis	
Container / Client Sample ID(s)			Preparation	Holding	g Times	Eval	Analysis Date	Holding	g Times	Eval
			Date	Rec	Actual			Rec	Actual	
otal Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
316	E420	27-Apr-2021					05-May-2021	180	9 days	✓
								days		
otal Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
317	E420	27-Apr-2021					05-May-2021	180	9 days	✓
								days		

### **Legend & Qualifier Definitions**

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

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# **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: **x** = QC frequency outside specification; ✓ = QC frequency within specification. Quality Control Sample Type Count Frequency (%) Method QC Lot # QC Regular Actual Expected Evaluation Analytical Methods Laboratory Duplicates (DUP) Total Metals in Water by CRC ICPMS 190588 2 24 8.3 5.0 E420 Laboratory Control Samples (LCS) Total Metals in Water by CRC ICPMS 2 24 190588 8.3 5.0 E420 Method Blanks (MB) Total Metals in Water by CRC ICPMS 190588 2 E420 24 8.3 5.0 Matrix Spikes (MS) Total Metals in Water by CRC ICPMS 190588 2 24 8.3 5.0 E420

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# **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
Total Metals in Water by CRC ICPMS	E420	Water	EPA 200.2/6020B	Water samples are digested with nitric and hydrochloric acids, and analyzed by
			(mod)	Collision/Reaction Cell ICPMS.
	Vancouver -			
	Environmental			Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered
				by this method.



# **QUALITY CONTROL REPORT**

Work Order :VA21A8311

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**Account Manager** 

Address

Client : District of Wells
Contact : Donna Forseille

Laboratory : Vancouver - Environmental

:Box 219 4243 Saunders Avenue

8081 Lougheed Highway

Wells BC Canada V0K 2R0

Burnaby, British Columbia Canada V5A 1W9

: Amanda Lampreau

Telephone :--Project :---

Address

Quote number

Telephone :1 250 372 3588

PO :----

Date Samples Received : 03-May-2021 12:50

C-O-C number : 20-907457, 20-907458

Date Analysis Commenced : 04-May-2021 Issue Date : 10-May-2021 16:07

Sampler : ----

:KS21-DOWL100-001

No. of samples received : 18
No. of samples analysed : 18

ilysed : 18

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.

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.

Signatories	Position	Laboratory Department

Kevin DuarteSupervisor - Metals ICP InstrumentationMetals, Burnaby, British ColumbiaRobin WeeksTeam Leader - MetalsMetals, Burnaby, British Columbia

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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
Total Metals (QC Lo	t: 190588)										
VA21A8309-006	Anonymous	lead, total	7439-92-1	E420	0.000050	mg/L	0.000054	0.000051	0.000003	Diff <2x LOR	
Total Metals (QC Lo	t: 190590)										
VA21A8311-001	300	lead, total	7439-92-1	E420	0.000050	mg/L	0.00102	0.00103	0.324%	20%	

## 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
Total Metals (QCLot: 190588)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	
Total Metals (QCLot: 190590)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	

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## 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		
Total Metals (QCLot: 190588)											
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	99.3	80.0	120			
Total Metals (QCLot: 190590)											
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	98.6	80.0	120			

## 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								
					Spi	ke	Recovery (%)	Recovery Limits (%)			
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier	
Total Metals (QC	Lot: 190588)										
VA21A8309-006	Anonymous	lead, total	7439-92-1	E420	0.0184 mg/L	0.02 mg/L	91.8	70.0	130		
Total Metals (QC	Lot: 190590)										
VA21A8311-001	300	lead, total	7439-92-1	E420	0.0184 mg/L	0.02 mg/L	91.8	70.0	130		

## Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

coc Number: 20 - 907457

Report To	Contact and company name below will appe	ar on the final report		Reports / R	ecipients		$\top$	<del></del>	Turna	round Ti	ne (TAT) R	equested			ľ		0.	*	ing.	7
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Drinking	Water (DW) Samples <sup>1</sup> (client use)	Excel COC only)			Coo	ling Met	nod:	NONE	ICE	* 🔲 ice	PACKS	☐ F	ROZEN		COOLIN	SINITIAT	ED .			
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1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

## Chain of Custody (COC) / Analytical Request Form

Mww.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 907458

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Report To	Contact and company name below will appear on the final report	below will appear on the final report Reports / Recipients							ime (TAT)	Requested			M (39)	4677	1954	×	<del></del>	
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Failure to complete all portions of this form may dejay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

# **APPENDIX D - LEAD RESULTS: EXTERNAL SAMPLING**



Wells BC Canada V0K 2R0

# **CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)**

**Work Order** : KS2100063 Page : 1 of 9

Client District of Wells Laboratory : Kamloops - Environmental Contact : Clint Stroud **Account Manager** 

Address Address : Box 219 4243 Saunders Avenue : 1445 McGill Road, Unit 2B

Kamloops, British Columbia Canada V2C 6K7 Telephone

: Amanda Lampreau

: 250 994 3330 : 1 250 372 3588 Date Samples Received : 08-Jan-2021 09:20 : Lead Testing

PO **Date Analysis Commenced** : 11-Jan-2021 Issue Date C-O-C number : 12-Jan-2021 10:53

Sampler Site Quote number

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:

: 6

: 6

- General Comments
- Analytical Results

No. of samples received

No. of samples analysed

Guideline Comparison

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

### Signatories

Telephone

Project

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

Kim Jensen Department Manager - Metals Metals, Burnaby, British Columbia 
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 : Lead Testing



### **General Comments**

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

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

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

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

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

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

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

Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

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

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# Analytical Results Evaluation

		Cli	ient sample ID	Wells School	Wells School	District Office	Fire Hall	Wells Hall
Matrix: Water				#1	#2			
		Samp	oling date/time	06-Jan-2021	06-Jan-2021	06-Jan-2021	06-Jan-2021	06-Jan-2021
				13:10	13:15	13:25	13:00	13:35
			Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit	KS2100063-001	KS2100063-002	KS2100063-003	KS2100063-004	KS2100063-005
Total Metals								
lead, total	E420	0.000050	mg/L	0.0109	0.250	0.0130	0.0117	0.00840

# Analytical Results Evaluation

Matrix: Water		Cli	ient sample ID	Raw Well	 	 
	Samp	06-Jan-2021 13:30	 	 		
			Sub-Matrix	Water	 	 
Analyte	Method	LOR	Unit	KS2100063-006	 	 
Total Metals						
lead, total	E420	0.000050	mg/L	0.000371	 	 

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

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# **Summary of Guideline Breaches by Sample**

Client sample ID	Matrix	Analyte	Analyte Summary			Result	Limit
Wells School #1	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC	0.0109 mg/L	0.005 mg/L
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-SGW	0.0109 mg/L	0.005 mg/L

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Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-TW	0.0109 mg/L	0.005 mg/L
Wells School #2	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC	0.250 mg/L	0.005 mg/L
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-SGW	0.250 mg/L	0.005 mg/L

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 : District of Wells

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 : Lead Testing



Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-TW	0.250 mg/L	0.005 mg/L
District Office	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC	0.0130 mg/L	0.005 mg/L
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-SGW	0.0130 mg/L	0.005 mg/L

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Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-TW	0.0130 mg/L	0.005 mg/L
Fire Hall	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC	0.0117 mg/L	0.005 mg/L
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-SGW	0.0117 mg/L	0.005 mg/L

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 : District of Wells

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Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-TW	0.0117 mg/L	0.005 mg/L
Wells Hall	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC	0.00840 mg/L	0.005 mg/L
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-SGW	0.00840 mg/L	0.005 mg/L

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Client sample ID	Matrix	Analyte	Analyte Summary			Result	Limit
	Water	lead, total	Health basis of MAC: Biochemical and neurobehavioural effects (intellectual development, behaviour) in infants and young children (under 6 years). Other: Anaemia, central nervous system effects; in pregnant women, can affect the unborn child; in infants and children under 6 years, can affect intellectual development, behaviour, size and hearing; classified as probably carcinogenic to humans. MAC is based on chronic effects, it is intended to apply to average concentrations in water consumed for extended periods. Exposure to lead should nevertheless be kept to a minimum; plumbing should be thoroughly flushed before water is used for consumption; most significant contribution is generally from lead service line entering the building.	CDWG	MAC-TW	0.00840 mg/L	0.005 mg/L

## **Summary of Guideline Limits**

Guideline	Category	Analyte	Limit
CDWG	MAC	lead, total	0.01 mg/L
	MAC-SGW	lead, total	0.01 mg/L
	MAC-TW	lead, total	0.01 mg/L

#### Keys:

CDWG Canada Guidelines for Canadian Drinking Water Quality (JAN, 2021)

MAC Maximum Acceptable Concentrations

MAC-SGW Maximum Acceptable Concentrations for Secure GW source
MAC-TW Maximum Acceptable Concentrations for Treated Water



Wells BC Canada V0K 2R0

250 994 3330

### QUALITY CONTROL INTERPRETIVE REPORT

Telephone

: KS2100063 **Work Order** : 1 of 5 Page

Client **District of Wells** Laboratory : Kamloops - Environmental Contact Clint Stroud **Account Manager** : Amanda Lampreau

Address Address Box 219 4243 Saunders Avenue : 1445 McGill Road, Unit 2B

Kamloops, British Columbia Canada V2C 6K7

: 1 250 372 3588 : 08-Jan-2021 09:20 : Lead Testing **Date Samples Received** 

PO Issue Date : 12-Jan-2021 10:53 C-O-C number

Sampler Site Quote number No. of samples received : 6 No. of samples analysed : 6

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

Telephone

**Project** 

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)

• No Analysis Holding Time Outliers exist.

### **Outliers : Frequency of Quality Control Samples**

• No Quality Control Sample Frequency Outliers occur.

## RIGHT SOLUTIONS | RIGHT PARTNER

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 Work Order
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 : District of Wells

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## **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

Matrix: water					E	/aluation. 🔻 –	Holding time excee	euance,	– vvitriiri	nolaling i ii
Analyte Group	Method	Sampling Date	Ext	raction / Pr	eparation			Analys	sis	
Container / Client Sample ID(s)			Preparation	Holding	g Times	Eval	Analysis Date	Holding	g Times	Eval
			Date	Rec	Actual			Rec	Actual	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
District Office	E420	06-Jan-2021					11-Jan-2021	180	5 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
Fire Hall	E420	06-Jan-2021					11-Jan-2021	180	5 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
Raw Well	E420	06-Jan-2021					11-Jan-2021	180	5 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
Wells Hall	E420	06-Jan-2021					11-Jan-2021	180	5 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
Wells School #1	E420	06-Jan-2021					11-Jan-2021	180	5 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
Wells School #2	E420	06-Jan-2021					11-Jan-2021	180	5 days	✓
								days		

#### **Legend & Qualifier Definitions**

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

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# **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 Count Frequency (%) Method QC Lot # QC Regular Actual Expected Evaluation Analytical Methods Laboratory Duplicates (DUP) Total Metals in Water by CRC ICPMS 139634 18 5.5 5.0 E420 Laboratory Control Samples (LCS) Total Metals in Water by CRC ICPMS 139634 1 18 5.5 5.0 E420 Method Blanks (MB) Total Metals in Water by CRC ICPMS 139634 E420 1 18 5.5 5.0 Matrix Spikes (MS) Total Metals in Water by CRC ICPMS 139634 1 18 5.5 5.0 E420

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 : District of Wells

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# **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
Total Metals in Water by CRC ICPMS	E420	Water	EPA 200.2/6020B	Water samples are digested with nitric and hydrochloric acids, and analyzed by
			(mod)	Collision/Reaction Cell ICPMS.
	Vancouver -			
	Environmental			Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered
				by this method.



# **QUALITY CONTROL REPORT**

Work Order : KS2100063

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Client : District of Wells
Contact : Clint Stroud

Laboratory : Kamloops - Environmental
Account Manager : Amanda Lampreau

Address : Box 219 4243 Saunders Avenue

Address : 1445 McGill Road, Unit 2B

Wells BC Canada V0K 2R0

Kamloops, British Columbia Canada V2C 6K7

Telephone : 250 994 3330

Telephone :1 250 372 3588

Project : Lead Testing

Date Samples Received : 08-Jan-2021 09:20

C-O-C number : ---- Sampler : ----

Date Analysis Commenced : 11-Jan-2021

Site :-Quote number :-No of samples received :--

Issue Date : 12-Jan-2021 10:53

Quote number

No. of samples received : 6

No. of samples analysed : 6

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

PO

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

Kim Jensen Department Manager - Metals Metals, Burnaby, British Columbia

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 Work Order
 : KS2100063

 Client
 : District of Wells

 Project
 : Lead Testing



#### **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							Laborat	tory Duplicate (DI	JP) Report		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lo	t: 139634)										
KS2100064-001	Anonymous	lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	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
Total Metals (QCLot: 139634)						
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	

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## 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	
Total Metals (QCLot: 139634)										
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	100	80.0	120		

### 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 Spil	ke (MS) Report		
					Spi	ike	Recovery (%)	Recovery	Limits (%)	
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QC	Lot: 139634)									
KS2100064-001	Anonymous	lead, total	7439-92-1	E420	0.0192 mg/L	0.02 mg/L	95.9	70.0	130	

COC Number: 20 - 885332

ALS www.alsglob

Canada Toll Free: 1 800 668 9878

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and the same of the same	Contact and company name below will appear on the final	report	Reports / R	ecipients			rnaround Time (TAT) Requested			
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ntact:	Clint Stroud.	Weige QC/QCI	to Criteria on Parort - n	rovide details below if box checked	□ 3	day [P3] if recei	ived by 3pm M-F - 25% rush surcharge minimum	(ALS use	only)	
one:	250-994-3330			MAIL FAX			ived by 3pm M-F - 50% rush surcharge minimum ed by 3pm M-F - 100% rush surcharge minimum			
	Company address below will appear on the final report	Select Distribution			-	A PERSON OF NA	by 10am M.S. 200% rush surcharge, Additional fer	85		
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re camples to	en from a Regulated DW System?		The state of the s					le Custody Seals Intact:	☐ YES	
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			INITIAL SHIPME	ENT RECEPTION (ALS use o	nly)		FINAL SHIPMENT RECI	PHON (ALS use only)	Time:	
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REFER TO BACK PAGE FOR ALS LOCATIONS AND CAMPLING IN COMMISSION AND CAMPLIN

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



: Donna Forseille

Wells BC Canada V0K 2R0

# **CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)**

**Account Manager** 

Work Order : **KS2100439** Page : 1 of 13

Client : District of Wells : Kamloops - Environmental

Address : Box 219 4243 Saunders Avenue Address : 1445 McGill Road, Unit 2B

I/ I Divis Of I O

Kamloops, British Columbia Canada V2C 6K7

: Amanda Lampreau

Telephone : 1 250 372 3588

Date Samples Received : 17-Feb-2021 09:30

Date Analysis Commenced : 20-Feb-2021

Issue Date : 23-Feb-2021 16:19

PO : ---C-O-C number : ---Sampler : ---Site : ---Quote number : ----

No. of samples received : 22
No. of samples analysed : 22

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

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

#### Signatories

Contact

Telephone

Project

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

SignatoriesPositionLaboratory DepartmentDee LeeAnalystMetals, Burnaby, British ColumbiaRobin WeeksTeam Leader - MetalsMetals, Burnaby, British Columbia

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 Work Order
 : KS2100439

 Client
 : District of Wells

Project : ---



#### **General Comments**

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

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

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

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

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

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

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

Unit	Description
mg/L	milligrams per litre

>: greater than.

<: less than.

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

Page : 3 of 13 Work Order : KS2100439 Client : District of Wells

**Project** 

**Total Metals** aluminum, total antimony, total arsenic, total barium, total beryllium, total bismuth, total boron, total cadmium, total calcium, total cesium, total chromium, total cobalt, total copper, total iron, total lead, total lithium, total magnesium, total manganese, total mercury, total molybdenum, total nickel, total phosphorus, total potassium, total rubidium, total selenium, total silicon, total



road maintenance building - tap after flushing

Client sample ID

road maintenance building - mercury test

EMCON #2

EMCON #3

WTP - tap ?before/ after flushing

Treatment Post | Treatment Post

## Analytical Results Evaluation

Matrix: Water Analyte

		7	7	EINIOOIT II/2	LINIOUN NO	Filter #1	Filter #2
	d maintenance	date/time	12-Feb-2021 12:45	12-Feb-2021 12:30	12-Feb-2021 12:00	12-Feb-2021 11:00	12-Feb-2021 11:30
	ding - tap	ub-Matrix	Water	Water	Water	Water	Water
befo	ore flushing	Unit	KS2100439-001	KS2100439-002	KS2100439-003	KS2100439-004	KS2100439-005
E420	0.0030	mg/L	0.0032	<0.0030		<0.0030	<0.0030
E420	0.00010	mg/L	<0.00010	<0.00010		0.00031	<0.00010
E420	0.00010	mg/L	0.00065	0.00091		0.00064	0.00093
E420	0.00010	mg/L	0.0362	0.0349		0.0359	0.0355
E420	0.000020	mg/L	<0.000020	<0.000020		<0.000020	<0.000020
E420	0.000050	mg/L	<0.000050	<0.000050		0.000165	<0.000050
E420	0.010	mg/L	0.031	<0.010		<0.010	<0.010
E420	0.0000050	mg/L	0.0000511	<0.0000050		0.0000496	<0.0000050
E420	0.050	mg/L	65.2	71.1		71.8	73.6
E420	0.000010	mg/L	0.000010	<0.000010		<0.000010	<0.000010
E420	0.00050	mg/L	<0.00050	<0.00050		<0.00050	<0.00050
E420	0.00010	mg/L	0.00015	<0.00010		<0.00010	<0.00010
E420	0.00050	mg/L	0.122	0.00334		0.0285	0.0432
E420	0.010	mg/L	0.132	0.027		<0.010	0.016
E420	0.000050	mg/L	0.00345	0.000062		0.0215	0.00426
E420	0.0010	mg/L	0.0060	0.0011		0.0011	0.0011
E420	0.0050	mg/L	18.1	18.6		18.4	18.2
E420	0.00010	mg/L	0.0141	0.00307		0.00317	0.00243
E508	0.0000050	mg/L			<0.0000050		
E420	0.000050	mg/L	0.000713	0.000757		0.000797	0.000793
E420	0.00050	mg/L	0.00560	<0.00050		0.0542	0.00073
E420	0.050	mg/L	<0.050	<0.050		<0.050	<0.050
E420	0.050	mg/L	0.300	0.282		0.282	0.279
E420	0.00020	mg/L	0.00024	0.00024		0.00022	0.00023
E420	0.000050	mg/L	<0.000050	<0.000050		<0.000050	<0.000050
E420	0.10	mg/L	3.73	3.56		3.73	3.69

EMCON #1

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 Work Order
 : KS2100439

 Client
 : District of Wells

Project : ----



Matrix: Water	Client sample ID				EMCON #2	EMCON #3	Treatment Post Filter #1	Treatment Post Filter #2
		Samp	ling date/time	12-Feb-2021 12:45	12-Feb-2021 12:30	12-Feb-2021 12:00	12-Feb-2021 11:00	12-Feb-2021 11:30
			Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit	KS2100439-001	KS2100439-002	KS2100439-003	KS2100439-004	KS2100439-005
Total Metals								
silver, total	E420	0.000010	mg/L	<0.000010	<0.000010		<0.000010	<0.000010
sodium, total	E420	0.050	mg/L	2.76	2.64		2.64	2.61
strontium, total	E420	0.00020	mg/L	0.309	0.326		0.331	0.330
sulfur, total	E420	0.50	mg/L	29.2	28.1		31.9	29.6
tellurium, total	E420	0.00020	mg/L	<0.00020	<0.00020		<0.00020	<0.00020
thallium, total	E420	0.000010	mg/L	<0.000010	<0.000010		<0.000010	<0.000010
thorium, total	E420	0.00010	mg/L	<0.00010	<0.00010		<0.00010	<0.00010
tin, total	E420	0.00010	mg/L	<0.00010	<0.00010		0.00241	<0.00010
titanium, total	E420	0.00030	mg/L	<0.00030	<0.00030		<0.00030	<0.00030
tungsten, total	E420	0.00010	mg/L	<0.00010	<0.00010		<0.00010	<0.00010
uranium, total	E420	0.000010	mg/L	0.000649	0.000994		0.000809	0.00100
vanadium, total	E420	0.00050	mg/L	<0.00050	<0.00050		<0.00050	<0.00050
zinc, total	E420	0.0030	mg/L	1.13	0.0054		1.60	0.0222
zirconium, total	E420	0.00020	mg/L	0.00032	<0.00020		<0.00020	<0.00020

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 Work Order
 : KS2100439

 Client
 : District of Wells

Project : ---

Water line to former modular school office before/after flushing Tap kitchen Municipal Hall before flushing



_								
∕latrix: <b>Water</b>	WTP mercu	ry test	ient sample ID	Treatment Post Filter #3	Portable #1	Portable #2	Portable #3	Hall Bar #1
		Samp	oling date/time	12-Feb-2021 11:30	12-Feb-2021 11:00	12-Feb-2021 11:00	12-Feb-2021 11:00	12-Feb-2021 10:00
		1 405	Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit	KS2100439-006	KS2100439-007	KS2100439-008	KS2100439-009	KS2100439-010
Total Metals								
aluminum, total	E420	0.0030	mg/L		0.0482	0.0034		<0.0030
antimony, total	E420	0.00010	mg/L		0.00023	<0.00010		<0.00010
arsenic, total	E420	0.00010	mg/L		0.00266	0.00173		0.00079
barium, total	E420	0.00010	mg/L		0.0379	0.0412		0.0345
beryllium, total	E420	0.000020	mg/L		<0.000020	<0.000020		<0.000020
bismuth, total	E420	0.000050	mg/L		0.0107	0.000542		<0.000050
boron, total	E420	0.010	mg/L		<0.010	<0.010		<0.010
cadmium, total	E420	0.0000050	mg/L		0.0000511	0.0000058		<0.0000050
calcium, total	E420	0.050	mg/L		70.8	73.4		71.4
cesium, total	E420	0.000010	mg/L		0.000011	<0.000010		<0.000010
chromium, total	E420	0.00050	mg/L		<0.00050	<0.00050		<0.00050
cobalt, total	E420	0.00010	mg/L		0.00010	<0.00010		<0.00010
copper, total	E420	0.00050	mg/L		0.129	0.00511		0.00330
iron, total	E420	0.010	mg/L		1.21	1.70		0.081
lead, total	E420	0.000050	mg/L		0.0361	0.00429		0.000418
lithium, total	E420	0.0010	mg/L		0.0011	0.0011		0.0010
magnesium, total	E420	0.0050	mg/L		18.7	20.7		18.1
manganese, total	E420	0.00010	mg/L		0.0390	0.00503		0.00234
mercury, total	E508	0.0000050	mg/L	<0.0000050			<0.0000050	
molybdenum, total	E420	0.000050	mg/L		0.000753	0.000785		0.000695
nickel, total	E420	0.00050	mg/L		0.00194	<0.00050		<0.00050
phosphorus, total	E420	0.050	mg/L		<0.050	<0.050		<0.050
potassium, total	E420	0.050	mg/L		0.295	0.335		0.282
rubidium, total	E420	0.00020	mg/L		0.00026	0.00028		0.00025
selenium, total	E420	0.000050	mg/L		<0.000050	<0.000050		<0.000050
silicon, total	E420	0.10	mg/L		3.66	3.79		3.54
silver, total	E420	0.000010	mg/L		<0.000010	<0.000010		<0.000010
sodium, total	E420	0.050	mg/L		2.66	2.93		2.59
strontium, total	E420	0.00020	mg/L		0.336	0.338		0.320

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 Work Order
 : KS2100439

 Client
 : District of Wells

Project : ----



Matrix: Water		Cli	ent sample ID	Treatment Post Filter #3	Portable #1	Portable #2	Portable #3	Hall Bar #1
		Samp	ling date/time	12-Feb-2021 11:30	12-Feb-2021 11:00	12-Feb-2021 11:00	12-Feb-2021 11:00	12-Feb-2021 10:00
			Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit	KS2100439-006	KS2100439-007	KS2100439-008	KS2100439-009	KS2100439-010
Total Metals								
sulfur, total	E420	0.50	mg/L		30.6	31.0		29.2
tellurium, total	E420	0.00020	mg/L		<0.00020	<0.00020		<0.00020
thallium, total	E420	0.000010	mg/L		<0.000010	<0.000010		<0.000010
thorium, total	E420	0.00010	mg/L		<0.00010	<0.00010		<0.00010
tin, total	E420	0.00010	mg/L		0.00874	0.00044		<0.00010
titanium, total	E420	0.00030	mg/L		0.00086	<0.00030		<0.00030
tungsten, total	E420	0.00010	mg/L		<0.00010	<0.00010		<0.00010
uranium, total	E420	0.000010	mg/L		0.00108	0.000971		0.000999
vanadium, total	E420	0.00050	mg/L		<0.00050	<0.00050		<0.00050
zinc, total	E420	0.0030	mg/L		0.0298	<0.0030		0.0215
zirconium, total	E420	0.00020	mg/L		<0.00020	<0.00020		<0.00020

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Fire Hall before flushing

District office tap before flushing



## Analytical Results Evaluation

Kitchen Municipal Hall after flushing

Analytical Results Evaluation	lHall after flu	Hall after flushing					<u> </u>			
Matrix: Water	From onco inc	<u>-</u>	Client sample 19	Hall Bar #2 Kitchen	Hall Bar #3	Fire Hall #2	Fire Hall #3	District Office #1		
		S	ampling date/time	12-Feb-2021 10:00	12-Feb-2021 10:00	12-Feb-2021 14:45	12-Feb-2021 13:30	16-Feb-2021 09:00		
			Sub-Matrix	Water	Water	Water	Water	Water		
Analyte	Method	LOR	Unit	KS2100439-011	KS2100439-012	KS2100439-014	KS2100439-015	KS2100439-016		
Total Metals										
aluminum, total	E420	0.0030	mg/L	<0.0030		<0.0030		0.0100		
antimony, total	E420	0.00010	0 mg/L	<0.00010		<0.00010		0.00193		
arsenic, total	E420	0.00010	0 mg/L	0.00110		0.00127		0.00112		
barium, total	E420	0.00010	) mg/L	0.0358		0.0349		0.0295		
beryllium, total	E420	0.00002	0 mg/L	<0.000020		<0.000020		<0.000020		
bismuth, total	E420	0.00005	0 mg/L	<0.000050		<0.000050		<0.000050		
boron, total	E420	0.010	mg/L	<0.010		<0.010		<0.010		
cadmium, total	E420	0.00000	50 mg/L	0.0000134		0.0000067		0.000416		
calcium, total	E420	0.050	mg/L	70.7		71.7		51.9		
cesium, total	E420	0.00001	0 mg/L	<0.000010		<0.000010		<0.000010		
chromium, total	E420	0.00050	0 mg/L	<0.00050		<0.00050		<0.00050		
cobalt, total	E420	0.00010	0 mg/L	<0.00010		<0.00010		0.00021		
copper, total	E420	0.00050	) mg/L	0.0160		0.0486		0.427		
iron, total	E420	0.010	mg/L	0.121		0.154		0.675		
lead, total	E420	0.00005	0 mg/L	0.00136		0.00638		0.0188		
lithium, total	E420	0.0010	mg/L	0.0011		0.0011		0.0012		
magnesium, total	E420	0.0050	mg/L	17.8		20.0		23.7		
manganese, total	E420	0.00010	0 mg/L	0.00560		0.00457		0.0369		
mercury, total	E508	0.00000	50 mg/L		<0.0000050		<0.0000050			
molybdenum, total	E420	0.00005	0 mg/L	0.000756		0.000703		0.000634		
nickel, total	E420	0.00050	0 mg/L	0.00068		0.0100		0.0723		
phosphorus, total	E420	0.050	mg/L	<0.050		<0.050		<0.050		
potassium, total	E420	0.050	mg/L	0.282		0.302		0.310		
rubidium, total	E420	0.00020	0 mg/L	0.00022		0.00026		0.00025		
selenium, total	E420	0.00005	0 mg/L	<0.000050		<0.000050		<0.000050		
silicon, total	E420	0.10	mg/L	3.64		3.63		2.37		
silver, total	E420	0.00001	0 mg/L	<0.000010		0.000024		0.000017		
sodium, total	E420	0.050	mg/L	2.56		2.71		2.82		
strontium, total	E420	0.00020	0 mg/L	0.331		0.331		0.202		

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Matrix: Water	Client sample ID			Hall Bar #2 Kitchen	Hall Bar #3	Fire Hall #2	Fire Hall #3	District Office #1
		Sampling date/time			12-Feb-2021	12-Feb-2021	12-Feb-2021	16-Feb-2021
				10:00	10:00	14:45	13:30	09:00
			Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit	KS2100439-011	KS2100439-012	KS2100439-014	KS2100439-015	KS2100439-016
Total Metals								
sulfur, total	E420	0.50	mg/L	30.5		32.9		40.8
tellurium, total	E420	0.00020	mg/L	<0.00020		<0.00020		<0.00020
thallium, total	E420	0.000010	mg/L	<0.000010		<0.000010		0.000179
thorium, total	E420	0.00010	mg/L	<0.00010		<0.00010		<0.00010
tin, total	E420	0.00010	mg/L	<0.00010		0.00207		0.00032
titanium, total	E420	0.00030	mg/L	<0.00030		<0.00030		<0.00030
tungsten, total	E420	0.00010	mg/L	<0.00010		<0.00010		<0.00010
uranium, total	E420	0.000010	mg/L	0.00100		0.00102		0.000334
vanadium, total	E420	0.00050	mg/L	<0.00050		<0.00050		<0.00050
zinc, total	E420	0.0030	mg/L	0.0253		0.0497		0.950
zirconium, total	E420	0.00020	mg/L	<0.00020		<0.00020		0.00022

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# Analytical Results Evaluation

limit Client sample ID

School lead detected below

		Clie	ent sample ID	limit	Office	School Staff	School Staff	School Staff
Matrix: Water				#2	#3	Kitchen #1	Ktichen #2	Kitchen #3
		Sampl	ling date/time	16-Feb-2021	16-Feb-2021	16-Feb-2021	16-Feb-2021	16-Feb-2021
				09:15	09:20	11:00	11:00	10:30
			Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit	KS2100439-017	KS2100439-018	KS2100439-019	KS2100439-020	KS2100439-021
Total Metals								
aluminum, total	E420	0.0030	mg/L	<0.0030		<0.0030	<0.0030	
antimony, total	E420	0.00010	mg/L	<0.00010		0.00037	<0.00010	
arsenic, total	E420	0.00010	mg/L	0.00100		0.00042	0.00066	
barium, total	E420	0.00010	mg/L	0.0361		0.0326	0.0342	
beryllium, total	E420	0.000020	mg/L	<0.000020		<0.000020	<0.000020	
bismuth, total	E420	0.000050	mg/L	<0.000050		0.000737	<0.000050	
boron, total	E420	0.010	mg/L	<0.010		<0.010	<0.010	
cadmium, total	E420	0.0000050	mg/L	0.0000194		0.0000117	<0.0000050	
calcium, total	E420	0.050	mg/L	70.8		65.9	71.6	
cesium, total	E420	0.000010	mg/L	<0.000010		<0.000010	<0.000010	
chromium, total	E420	0.00050	mg/L	<0.00050		<0.00050	<0.00050	
cobalt, total	E420	0.00010	mg/L	<0.00010		0.00141	<0.00010	
copper, total	E420	0.00050	mg/L	0.00571		0.0454	0.00640	
iron, total	E420	0.010	mg/L	0.121		0.028	0.068	
lead, total	E420	0.000050	mg/L	0.000395		0.00268	0.000052	
lithium, total	E420	0.0010	mg/L	0.0010		0.0013	0.0010	
magnesium, total	E420	0.0050	mg/L	18.3		18.3	18.0	
manganese, total	E420	0.00010	mg/L	0.00331		0.00396	0.00216	
mercury, total	E508	0.0000050	mg/L		<0.0000050			<0.0000050
molybdenum, total	E420	0.000050	mg/L	0.000740		0.000733	0.000690	
nickel, total	E420	0.00050	mg/L	<0.00050		2.88	0.00123	
phosphorus, total	E420	0.050	mg/L	<0.050		<0.050	<0.050	
potassium, total	E420	0.050	mg/L	0.288		0.280	0.284	
rubidium, total	E420	0.00020	mg/L	0.00022		0.00022	0.00023	
selenium, total	E420	0.000050	mg/L	<0.000050		<0.000050	<0.000050	
silicon, total	E420	0.10	mg/L	3.52		3.38	3.66	
silver, total	E420	0.000010	mg/L	<0.000010		<0.000010	<0.000010	
sodium, total	E420	0.050	mg/L	2.61		2.58	2.59	
strontium, total	E420	0.00020	mg/L	0.316		0.285	0.320	

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Matrix: Water		Client sample ID			Distrcit Office #3	School Staff Kitchen #1	School Staff Ktichen #2	School Staff Kitchen #3
		Samp	ling date/time	16-Feb-2021 09:15	16-Feb-2021 09:20	16-Feb-2021 11:00	16-Feb-2021 11:00	16-Feb-2021 10:30
			Sub-Matrix	Water	Water	Water	Water	Water
Analyte	Method	LOR	Unit	KS2100439-017	KS2100439-018	KS2100439-019	KS2100439-020	KS2100439-021
Total Metals								
sulfur, total	E420	0.50	mg/L	29.4		30.3	30.5	
tellurium, total	E420	0.00020	mg/L	<0.00020		<0.00020	<0.00020	
thallium, total	E420	0.000010	mg/L	<0.000010		<0.000010	<0.000010	
thorium, total	E420	0.00010	mg/L	<0.00010		<0.00010	<0.00010	
tin, total	E420	0.00010	mg/L	<0.00010		<0.00010	<0.00010	
titanium, total	E420	0.00030	mg/L	<0.00030		<0.00030	<0.00030	
tungsten, total	E420	0.00010	mg/L	<0.00010		<0.00010	<0.00010	
uranium, total	E420	0.000010	mg/L	0.000975		0.000786	0.000973	
vanadium, total	E420	0.00050	mg/L	<0.00050		<0.00050	<0.00050	
zinc, total	E420	0.0030	mg/L	0.0123		1.31	0.0276	
zirconium, total	E420	0.00020	mg/L	<0.00020		<0.00020	<0.00020	

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Sampling date			Cli	ent sample ID	3932 RCMP #1	3932 RCMP #2	 	
Name	Matrix: Water							
Analyto   Method   LOR   Unit   KS2100439-023			Samp	ling date/time			 	
Total Metals   E420				Sub-Matrix	Water	Water	 	
aluminum, total   E420   0.0030   mg/L   <0.0030   0.0035	Analyte	Method	LOR	Unit	KS2100439-022	KS2100439-023	 	
antimony, total   E420   0.00010   mg/L   0.00010   0.	Total Metals							
arsenic, total	aluminum, total	E420	0.0030	mg/L	<0.0030	0.0035	 	
berlum, total   E420	antimony, total	E420	0.00010	mg/L	<0.00010	<0.00010	 	
Despillium, total   E420	arsenic, total	E420	0.00010	mg/L	0.00027	0.00037	 	
Dismuth, total	barium, total	E420	0.00010	mg/L	0.0150	0.0199	 	
Department   E420   0.010   mg/L   <0.010   <0.010	beryllium, total	E420	0.000020	mg/L	<0.000020	<0.000020	 	
cadmum, total         E420         0.000050         mg/L         0.0000439         0.0000126 <th< th=""><td>bismuth, total</td><td>E420</td><td>0.000050</td><td>mg/L</td><td>&lt;0.000050</td><td>&lt;0.000050</td><td> </td><td></td></th<>	bismuth, total	E420	0.000050	mg/L	<0.000050	<0.000050	 	
calcitum, total         E420         0.050         mg/L         44.8         60.7	boron, total	E420	0.010	mg/L	<0.010	<0.010	 	
cesium, total         E420         0.000010         mg/L         <0.000010	cadmium, total	E420	0.0000050	mg/L	0.0000439	0.0000126	 	
chromium, total         E420         0.00050         mg/L         <0.00050	calcium, total	E420	0.050	mg/L	44.8	60.7	 	
cobalt, total         E420         0.00010         mg/L         0.00014         <0.00010	cesium, total	E420	0.000010	mg/L	<0.000010	<0.000010	 	
Copper, total   E420	chromium, total	E420	0.00050	mg/L	<0.00050	<0.00050	 	
Feat	cobalt, total	E420	0.00010	mg/L	0.00014	<0.00010	 	
lead, total   E420	copper, total	E420	0.00050	mg/L	0.105	0.0271	 	
Itihium, total	iron, total	E420	0.010	mg/L	0.010	0.022	 	
magnesium, total         E420         0.0050         mg/L         14.7         18.2	lead, total	E420	0.000050	mg/L	0.0106	0.00114	 	
manganese, total         E420         0.00010         mg/L         0.00110         0.00069              molybdenum, total         E420         0.00050         mg/L         0.000739         0.000700              nickel, total         E420         0.00050         mg/L         0.00066         <0.00050	lithium, total	E420	0.0010	mg/L	0.0022	0.0018	 	
molybdenum, total         E420         0.00050         mg/L         0.000739         0.000700 <t< th=""><td>magnesium, total</td><td>E420</td><td>0.0050</td><td>mg/L</td><td>14.7</td><td>18.2</td><td> </td><td></td></t<>	magnesium, total	E420	0.0050	mg/L	14.7	18.2	 	
nickel, total         E420         0.00050         mg/L         0.00066         <0.00050	manganese, total	E420	0.00010	mg/L	0.00110	0.00069	 	
phosphorus, total         E420         0.050         mg/L         <0.050	molybdenum, total	E420	0.000050	mg/L	0.000739	0.000700	 	
potassium, total         E420         0.050         mg/L         0.302         0.390 <td>nickel, total</td> <td>E420</td> <td>0.00050</td> <td>mg/L</td> <td>0.00066</td> <td>&lt;0.00050</td> <td> </td> <td></td>	nickel, total	E420	0.00050	mg/L	0.00066	<0.00050	 	
rubidium, total         E420         0.00020         mg/L         0.00028         0.00031  -	phosphorus, total	E420	0.050	mg/L	<0.050	<0.050	 	
selenium, total         E420         0.000050         mg/L         <0.000050	potassium, total	E420	0.050	mg/L	0.302	0.390	 	
silicon, total         E420         0.10         mg/L         3.68         3.63	rubidium, total	E420	0.00020	mg/L	0.00028	0.00031	 	
silver, total         E420         0.000010         mg/L         <0.000010	selenium, total	E420	0.000050	mg/L	<0.000050	<0.000050	 	
sodium, total         E420         0.050         mg/L         40.2         14.6               strontium, total         E420         0.00020         mg/L         0.185         0.239	silicon, total	E420	0.10	mg/L	3.68	3.63	 	
strontium, total         E420         0.00020         mg/L         0.185         0.239	silver, total	E420	0.000010	mg/L	<0.000010	<0.000010	 	
	sodium, total	E420	0.050	mg/L	40.2	14.6	 	
sulfur, total   E420   0.50   mg/L   30.9   28.7	strontium, total	E420	0.00020	mg/L	0.185	0.239	 	
	sulfur, total	E420	0.50	mg/L	30.9	28.7	 	

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## Analytical Results Evaluation

		Cli	ent sample ID	3932 RCMP #1	3932 RCMP #2	 	
Matrix: Water		Sampl	ling date/time	12-Feb-2021 12:15	12-Feb-2021 12:15	 	
			Sub-Matrix	Water	Water	 	
Analyte	Method	LOR	Unit	KS2100439-022	KS2100439-023	 	
Total Metals							
tellurium, total	E420	0.00020	mg/L	<0.00020	<0.00020	 	
thallium, total	E420	0.000010	mg/L	<0.000010	<0.000010	 	
thorium, total	E420	0.00010	mg/L	<0.00010	<0.00010	 	
tin, total	E420	0.00010	mg/L	<0.00010	<0.00010	 	
titanium, total	E420	0.00030	mg/L	<0.00030	<0.00030	 	
tungsten, total	E420	0.00010	mg/L	<0.00010	<0.00010	 	
uranium, total	E420	0.000010	mg/L	0.00164	0.000906	 	
vanadium, total	E420	0.00050	mg/L	<0.00050	<0.00050	 	
zinc, total	E420	0.0030	mg/L	0.205	0.0201	 	
zirconium, total	E420	0.00020	mg/L	<0.00020	<0.00020	 	

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

## **Summary of Guideline Breaches by Sample**

Client sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit

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Keys:

BCDWQG British Columbia Drinking Water Quality Guidelines (JAN, 2021)

AO Aesthetic Objective/Other Value
MAC Maximium Acceptable Concentrations



### QUALITY CONTROL INTERPRETIVE REPORT

: KS2100439 **Work Order** : 1 of 7 Page

Client **District of Wells** Laboratory : Kamloops - Environmental

Contact Donna Forseille **Account Manager** : Amanda Lampreau

> Address Box 219 4243 Saunders Avenue : 1445 McGill Road, Unit 2B Wells BC Canada V0K 2R0

Kamloops, British Columbia Canada V2C 6K7

Telephone Telephone : 1 250 372 3588 : 17-Feb-2021 09:30 **Project Date Samples Received** 

PO Issue Date : 23-Feb-2021 16:19

C-O-C number Sampler Site Quote number

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

No. of samples received

No. of samples analysed

Address

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**

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: 22

- 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)

• No Analysis Holding Time Outliers exist.

### **Outliers : Frequency of Quality Control Samples**

• No Quality Control Sample Frequency Outliers occur.

## RIGHT SOLUTIONS | RIGHT PARTNER

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# **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					Ev	/aluation: × =	Holding time exce	edance ; 🔻	= Within	Holding Time
Analyte Group	Method	Sampling Date	Exti	raction / Pr	eparation		Analysis			
Container / Client Sample ID(s)			Preparation	Holding	g Times	Eval	Analysis Date	Holding	Times	Eval
			Date	Rec	Actual			Rec	Actual	
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid)										
EMCON #3	E508	12-Feb-2021					23-Feb-2021	28 days	10 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid)										
Fire Hall #3	E508	12-Feb-2021					23-Feb-2021	28 days	10 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid)										
Hall Bar #3	E508	12-Feb-2021					23-Feb-2021	28 days	10 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid)										
Portable #3	E508	12-Feb-2021					23-Feb-2021	28 days	10 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid)										,
Treatment Post Filter #3	E508	12-Feb-2021					23-Feb-2021	28 days	10 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid)	<b>5500</b>	40.5.1.0004								,
Distrcit Office #3	E508	16-Feb-2021					23-Feb-2021	28 days	6 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid)	<b>5500</b>	10.5.1.005.					00 5 1 005 /			,
School Staff Kitchen #3	E508	16-Feb-2021					23-Feb-2021	28 days	6 days	✓

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Total Metals : Total Metals in Water by CRC ICPMS

Total Metals : Total Metals in Water by CRC ICPMS

HDPE - total (lab preserved)

HDPE - total (lab preserved)

EMCON #2

Fire Hall #2

ALS

days

180 days

180 days 7 days

7 days

20-Feb-2021

20-Feb-2021

✓

✓

Project : ---

fatrix: Water					Ev	⁄aluation: ≍ =	Holding time excee	edance ; •	= Within	Holding Ti
Analyte Group	Method	Sampling Date	Ext	raction / Pi	reparation			Analys	sis	
Container / Client Sample ID(s)			Preparation Holdin		g Times	Eval	Analysis Date	Holding Times		Eval
			Date	Rec	Actual			Rec	Actual	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
District Office #1	E420	16-Feb-2021					20-Feb-2021	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
District Office #2	E420	16-Feb-2021					20-Feb-2021	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
School Staff Kitchen #1	E420	16-Feb-2021					20-Feb-2021	180 days	4 days	✓
Fotal Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
School Staff Ktichen #2	E420	16-Feb-2021					20-Feb-2021	180 days	4 days	<b>√</b>
Fotal Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
3932 RCMP #1	E420	12-Feb-2021					20-Feb-2021	180 days	7 days	✓
otal Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
3932 RCMP #2	E420	12-Feb-2021					20-Feb-2021	180 days	7 days	✓
otal Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
EMCON #1	E420	12-Feb-2021					20-Feb-2021	180	7 days	✓

12-Feb-2021

12-Feb-2021

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E420

E420

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

Watti. Tratei							riolaling time exect	,,		
Analyte Group	Method	Sampling Date	Ext	raction / Pr	eparation		Analysis			
Container / Client Sample ID(s)			Preparation	Holding	g Times	Eval	Analysis Date	Holdin	g Times	Eval
			Date	Rec	Actual			Rec	Actual	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
Hall Bar #1	E420	12-Feb-2021					20-Feb-2021	180	8 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
Hall Bar #2 Kitchen	E420	12-Feb-2021					20-Feb-2021	180	8 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
Portable #1	E420	12-Feb-2021					20-Feb-2021	180	8 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
Portable #2	E420	12-Feb-2021					20-Feb-2021	180	8 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
Treatment Post Filter #1	E420	12-Feb-2021					20-Feb-2021	180	8 days	✓
								days		
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
Treatment Post Filter #2	E420	12-Feb-2021					20-Feb-2021	180	8 days	✓
								days		

### Legend & Qualifier Definitions

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

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# **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.

ix: Water Evaluation: × = QC frequency outside specification; ✓ = QC frequency within s										
Quality Control Sample Type			Co	ount	Frequency (%)					
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation			
Laboratory Duplicates (DUP)										
Total Mercury in Water by CVAAS	E508	154093	1	20	5.0	5.0	✓			
Total Metals in Water by CRC ICPMS	E420	152999	1	19	5.2	5.0	✓			
Laboratory Control Samples (LCS)										
Total Mercury in Water by CVAAS	E508	154093	1	20	5.0	5.0	✓			
Total Metals in Water by CRC ICPMS	E420	152999	1	19	5.2	5.0	✓			
Method Blanks (MB)										
Total Mercury in Water by CVAAS	E508	154093	1	20	5.0	5.0	✓			
Total Metals in Water by CRC ICPMS	E420	152999	1	19	5.2	5.0	✓			
Matrix Spikes (MS)										
Total Mercury in Water by CVAAS	E508	154093	1	20	5.0	5.0	✓			
Total Metals in Water by CRC ICPMS	E420	152999	1	19	5.2	5.0	✓			

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# **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
Total Metals in Water by CRC ICPMS	E420	Water	EPA 200.2/6020B	Water samples are digested with nitric and hydrochloric acids, and analyzed by
			(mod)	Collision/Reaction Cell ICPMS.
	Vancouver -			
	Environmental			Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered
				by this method.
Total Mercury in Water by CVAAS	E508	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction
				with stannous chloride, and analyzed by CVAAS
	Vancouver -			
	Environmental			



# **QUALITY CONTROL REPORT**

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Client : District of Wells : District of Wells : Eaboratory : Kamloops - Environmental Contact : Donna Forseille : Account Manager : Amanda Lampreau

19 4243 Saunders Avenue Address : 1445 McGill Road. Unit 2B

Kamloops, British Columbia Canada V2C 6K7

Telephone :1 250 372 3588

Date Samples Received :17-Feb-2021 09:30
Date Analysis Commenced :20-Feb-2021

Issue Date : 23-Feb-2021 16:19

 Contact
 : Donna Forseille

 Address
 : Box 219 4243 Saunders Avenue

 Wells BC Canada V0K 2R0

 Telephone
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 Project
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 PO
 :---- 

 C-O-C number
 :---- 

 Sampler
 :---- 

 Site
 :-----

Quote number :---No. of samples received : 22
No. of samples analysed : 22

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

Dee Lee Analyst Metals, Burnaby, British Columbia

Robin Weeks Team Leader - Metals Metals, Burnaby, British Columbia

Metals, Burnaby, British Columbia

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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.

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### 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).

ub-Matrix: Water								Laboratory Duplicate (DUP) Report							
aboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifie				
otal Metals (QC L	ot: 152999)														
(S2100442-001	Anonymous	aluminum, total	7429-90-5	E420	0.0060	mg/L	<0.0060	<0.0060	0	Diff <2x LOR					
		antimony, total	7440-36-0	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR					
		arsenic, total	7440-38-2	E420	0.00020	mg/L	0.00036	0.00036	0.0000001	Diff <2x LOR					
		barium, total	7440-39-3	E420	0.00020	mg/L	0.0118	0.0116	1.30%	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	<0.020	<0.020	0	Diff <2x LOR					
		cadmium, total	7440-43-9	E420	0.0000100	mg/L	<0.0000100	<0.0000100	0	Diff <2x LOR					
		calcium, total	7440-70-2	E420	0.100	mg/L	134	123	8.61%	20%					
		cesium, total	7440-46-2	E420	0.000020	mg/L	0.00246	0.00239	2.77%	20%					
		chromium, total	7440-47-3	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR					
		cobalt, total	7440-48-4	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR					
		copper, total	7440-50-8	E420	0.00100	mg/L	0.00122	<0.00100	0.00022	Diff <2x LOR					
	iron, total	iron, total	7439-89-6	E420	0.020	mg/L	0.663	0.678	2.20%	20%					
		7439-92-1	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR						
		lithium, total	7439-93-2	E420	0.0020	mg/L	0.0045	0.0040	0.0004	Diff <2x LOR					
		magnesium, total	7439-95-4	E420	0.0100	mg/L	85.0	82.1	3.54%	20%					
		manganese, total	7439-96-5	E420	0.00020	mg/L	0.138	0.135	1.65%	20%					
		molybdenum, total	7439-98-7	E420	0.000100	mg/L	0.000192	0.000195	0.000002	Diff <2x LOR					
		nickel, total	7440-02-0	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR					
		phosphorus, total	7723-14-0	E420	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR					
		potassium, total	7440-09-7	E420	0.100	mg/L	2.50	2.45	2.25%	20%					
		rubidium, total	7440-17-7	E420	0.00040	mg/L	0.00685	0.00679	0.959%	20%					
		selenium, total	7782-49-2	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR					
		silicon, total	7440-21-3	E420	0.20	mg/L	22.2	22.0	0.880%	20%					
		silver, total	7440-22-4	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR					
		sodium, total	17341-25-2	E420	0.100	mg/L	18.6	17.7	4.79%	20%					
		strontium, total	7440-24-6	E420	0.00040	mg/L	7.98	7.66	4.08%	20%					
		sulfur, total	7704-34-9	E420	1.00	mg/L	184	182	0.966%	20%					
		tellurium, total	13494-80-9	E420	0.00040	mg/L	0.00138	0.00118	0.00020	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					

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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	
Total Metals (QC Lo	t: 152999) - continued											
KS2100442-001	Anonymous	tin, total	7440-31-5	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR		
		titanium, total	7440-32-6	E420	0.00060	mg/L	<0.00060	<0.00060	0	Diff <2x LOR		
		tungsten, total	7440-33-7	E420	0.00020	mg/L	0.00020	<0.00020	0.000002	Diff <2x LOR		
		uranium, total	7440-61-1	E420	0.000020	mg/L	0.000029	0.000024	0.000005	Diff <2x LOR		
		vanadium, total	7440-62-2	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR		
		zinc, total	7440-66-6	E420	0.0060	mg/L	0.0210	0.0210	0.00002	Diff <2x LOR		
		zirconium, total	7440-67-7	E420	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR		
Total Metals (QC Lo	t: 154093)											
KS2100439-003	EMCON #3	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR		

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# 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
Total Metals (QCLot: 152999)					
aluminum, total	7429-90-5 E420	0.003	mg/L	<0.0030	
ntimony, total	7440-36-0 E420	0.0001	mg/L	<0.00010	
rsenic, total	7440-38-2 E420	0.0001	mg/L	<0.00010	
arium, total	7440-39-3 E420	0.0001	mg/L	<0.00010	
eryllium, total	7440-41-7 E420	0.00002	mg/L	<0.000020	
ismuth, total	7440-69-9 E420	0.00005	mg/L	<0.000050	
oron, total	7440-42-8 E420	0.01	mg/L	<0.010	
admium, total	7440-43-9 E420	0.000005	mg/L	<0.000050	
alcium, total	7440-70-2 E420	0.05	mg/L	<0.050	
esium, total	7440-46-2 E420	0.00001	mg/L	<0.000010	
hromium, total	7440-47-3 E420	0.0005	mg/L	<0.00050	
obalt, total	7440-48-4 E420	0.0001	mg/L	<0.00010	
opper, total	7440-50-8 E420	0.0005	mg/L	<0.00050	
on, total	7439-89-6 E420	0.01	mg/L	<0.010	
ad, total	7439-92-1 E420	0.00005	mg/L	<0.000050	
hium, total	7439-93-2 E420	0.001	mg/L	<0.0010	
agnesium, total	7439-95-4 E420	0.005	mg/L	<0.0050	
nanganese, total	7439-96-5 E420	0.0001	mg/L	<0.00010	
nolybdenum, total	7439-98-7 E420	0.00005	mg/L	<0.000050	
ickel, total	7440-02-0 E420	0.0005	mg/L	<0.00050	
hosphorus, total	7723-14-0 E420	0.05	mg/L	<0.050	
otassium, total	7440-09-7 E420	0.05	mg/L	<0.050	
ubidium, total	7440-17-7 E420	0.0002	mg/L	<0.00020	
elenium, total	7782-49-2 E420	0.00005	mg/L	<0.000050	
licon, total	7440-21-3 E420	0.1	mg/L	<0.10	
lver, total	7440-22-4 E420	0.00001	mg/L	<0.000010	
odium, total	17341-25-2 E420	0.05	mg/L	<0.050	
rontium, total	7440-24-6 E420	0.0002	mg/L	<0.00020	
ılfur, total	7704-34-9 E420	0.5	mg/L	<0.50	
llurium, total	13494-80-9 E420	0.0002	mg/L	<0.00020	
allium, total	7440-28-0 E420	0.00001	mg/L	<0.000010	
norium, total	7440-29-1 E420	0.0001	mg/L	<0.00010	
in, total	7440-31-5 E420	0.0001	mg/L	<0.00010	

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#### Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 152999) - continue	ed					
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	
Total Metals (QCLot: 154093)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	

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# 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
Total Metals (QCLot: 152999)									
aluminum, total	7429-90-5 I	E420	0.003	mg/L	2 mg/L	106	80.0	120	
antimony, total	7440-36-0 E	E420	0.0001	mg/L	1 mg/L	111	80.0	120	
arsenic, total	7440-38-2 I	E420	0.0001	mg/L	1 mg/L	110	80.0	120	
barium, total	7440-39-3 I	E420	0.0001	mg/L	0.25 mg/L	107	80.0	120	
beryllium, total	7440-41-7 E	E420	0.00002	mg/L	0.1 mg/L	102	80.0	120	
bismuth, total	7440-69-9 I	E420	0.00005	mg/L	1 mg/L	100	80.0	120	
boron, total	7440-42-8 E	E420	0.01	mg/L	1 mg/L	93.2	80.0	120	
cadmium, total	7440-43-9 I	E420	0.000005	mg/L	0.1 mg/L	108	80.0	120	
calcium, total	7440-70-2 I	E420	0.05	mg/L	50 mg/L	104	80.0	120	
cesium, total	7440-46-2 I	E420	0.00001	mg/L	0.05 mg/L	106	80.0	120	
chromium, total	7440-47-3 E	E420	0.0005	mg/L	0.25 mg/L	109	80.0	120	
cobalt, total	7440-48-4 I	E420	0.0001	mg/L	0.25 mg/L	109	80.0	120	
copper, total	7440-50-8 E	E420	0.0005	mg/L	0.25 mg/L	110	80.0	120	
iron, total	7439-89-6 I	E420	0.01	mg/L	1 mg/L	99.4	80.0	120	
lead, total	7439-92-1 E	E420	0.00005	mg/L	0.5 mg/L	102	80.0	120	
lithium, total	7439-93-2 I	E420	0.001	mg/L	0.25 mg/L	99.5	80.0	120	
magnesium, total	7439-95-4 E	E420	0.005	mg/L	50 mg/L	103	80.0	120	
manganese, total	7439-96-5 I	E420	0.0001	mg/L	0.25 mg/L	104	80.0	120	
molybdenum, total	7439-98-7 I	E420	0.00005	mg/L	0.25 mg/L	108	80.0	120	
nickel, total	7440-02-0 E	E420	0.0005	mg/L	0.5 mg/L	109	80.0	120	
phosphorus, total	7723-14-0 E	E420	0.05	mg/L	10 mg/L	106	80.0	120	
potassium, total	7440-09-7 I	E420	0.05	mg/L	50 mg/L	100	80.0	120	
rubidium, total	7440-17-7 E	E420	0.0002	mg/L	0.1 mg/L	111	80.0	120	
selenium, total	7782-49-2 I	E420	0.00005	mg/L	1 mg/L	107	80.0	120	
silicon, total	7440-21-3 E	E420	0.1	mg/L	10 mg/L	103	80.0	120	
silver, total	7440-22-4 E	E420	0.00001	mg/L	0.1 mg/L	110	80.0	120	
sodium, total	17341-25-2 E	E420	0.05	mg/L	50 mg/L	107	80.0	120	
strontium, total	7440-24-6 I	<b>E</b> 420	0.0002	mg/L	0.25 mg/L	111	80.0	120	
sulfur, total	7704-34-9 I	E420	0.5	mg/L	50 mg/L	90.2	80.0	120	
tellurium, total	13494-80-9 I	<b>E</b> 420	0.0002	mg/L	0.1 mg/L	106	80.0	120	
thallium, total	7440-28-0 I	<b>E</b> 420	0.00001	mg/L	1 mg/L	103	80.0	120	
thorium, total	7440-29-1 E	<b>E</b> 420	0.0001	mg/L	0.1 mg/L	99.6	80.0	120	
tin, total	7440-31-5 E	<b> 420</b>	0.0001	mg/L	0.5 mg/L	107	80.0	120	
titanium, total	7440-32-6 E	E420	0.0003	mg/L	0.25 mg/L	106	80.0	120	

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Sub-Matrix: Water	Laboratory Control Sample (LCS) Report								
					Spike	Recovery (%)	Recovery	Limits (%)	
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 152999) - continued									
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	102	80.0	120	
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	109	80.0	120	
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	105	80.0	120	
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	104	80.0	120	
Total Metals (QCLot: 154093)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	96.0	80.0	120	

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Project : ---



# 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.

ub-Matrix: Water						Matrix Spike (MS) Report							
					Spi	ke	Recovery (%)	Recovery	Limits (%)				
aboratory sample	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifie			
otal Metals (QC	Lot: 152999)												
(S2100442-001	Anonymous	aluminum, total	7429-90-5	E420	0.400 mg/L	0.4 mg/L	100.0	70.0	130				
		antimony, total	7440-36-0	E420	0.0416 mg/L	0.04 mg/L	104	70.0	130				
		arsenic, total	7440-38-2	E420	0.0427 mg/L	0.04 mg/L	107	70.0	130				
		barium, total	7440-39-3	E420	0.0418 mg/L	0.04 mg/L	104	70.0	130				
		beryllium, total	7440-41-7	E420	0.0766 mg/L	0.08 mg/L	95.8	70.0	130				
		bismuth, total	7440-69-9	E420	0.0188 mg/L	0.02 mg/L	94.3	70.0	130				
		boron, total	7440-42-8	E420	0.179 mg/L	0.2 mg/L	89.5	70.0	130				
		cadmium, total	7440-43-9	E420	0.00861 mg/L	0.008 mg/L	108	70.0	130				
		calcium, total	7440-70-2	E420	ND mg/L	8 mg/L	ND	70.0	130				
		cesium, total	7440-46-2	E420	0.0202 mg/L	0.02 mg/L	101	70.0	130				
		chromium, total	7440-47-3	E420	0.0823 mg/L	0.08 mg/L	103	70.0	130				
		cobalt, total	7440-48-4	E420	0.0409 mg/L	0.04 mg/L	102	70.0	130				
		copper, total	7440-50-8	E420	0.0408 mg/L	0.04 mg/L	102	70.0	130				
		iron, total	7439-89-6	E420	4.05 mg/L	4 mg/L	101	70.0	130				
		lead, total	7439-92-1	E420	0.0383 mg/L	0.04 mg/L	95.7	70.0	130				
		lithium, total	7439-93-2	E420	0.180 mg/L	0.2 mg/L	90.1	70.0	130				
		magnesium, total	7439-95-4	E420	ND mg/L	2 mg/L	ND	70.0	130				
		manganese, total	7439-96-5	E420	ND mg/L	0.04 mg/L	ND	70.0	130				
		molybdenum, total	7439-98-7	E420	0.0411 mg/L	0.04 mg/L	103	70.0	130				
		nickel, total	7440-02-0	E420	0.0830 mg/L	0.08 mg/L	104	70.0	130				
		phosphorus, total	7723-14-0	E420	20.8 mg/L	20 mg/L	104	70.0	130				
		potassium, total	7440-09-7	E420	8.32 mg/L	8 mg/L	104	70.0	130				
		rubidium, total	7440-17-7	E420	0.0413 mg/L	0.04 mg/L	103	70.0	130				
		selenium, total	7782-49-2	E420	0.0874 mg/L	0.08 mg/L	109	70.0	130				
		silicon, total	7440-21-3	E420	ND mg/L	20 mg/L	ND	70.0	130				
		silver, total	7440-22-4	E420	0.00805 mg/L	0.008 mg/L	101	70.0	130				
		sodium, total	17341-25-2	E420	ND mg/L	4 mg/L	ND	70.0	130				
		strontium, total	7440-24-6	E420	ND mg/L	0.04 mg/L	ND	70.0	130				
		sulfur, total	7704-34-9	E420	ND mg/L	40 mg/L	ND	70.0	130				
		tellurium, total	13494-80-9	E420	0.0815 mg/L	0.08 mg/L	102	70.0	130				
		thallium, total	7440-28-0	E420	0.00767 mg/L	0.008 mg/L	95.9	70.0	130				
		thorium, total	7440-29-1	E420	0.0416 mg/L	0.04 mg/L	104	70.0	130				

 Page
 : 10 of 10

 Work Order
 : KS2100439

 Client
 : District of Wells

Project : ---



Sub-Matrix: Water	Sub-Matrix: Water						Matrix Spike (MS) Report							
					Spi	ke	Recovery (%)	Recovery Limits (%)						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier				
Total Metals (QC	Lot: 152999) - continue	d												
KS2100442-001	Anonymous	tin, total	7440-31-5	E420	0.0410 mg/L	0.04 mg/L	103	70.0	130					
		titanium, total	7440-32-6	E420	0.0838 mg/L	0.08 mg/L	105	70.0	130					
		tungsten, total	7440-33-7	E420	0.0390 mg/L	0.04 mg/L	97.6	70.0	130					
		uranium, total	7440-61-1	E420	0.00803 mg/L	0.008 mg/L	100	70.0	130					
		vanadium, total	7440-62-2	E420	0.214 mg/L	0.2 mg/L	107	70.0	130					
		zinc, total	7440-66-6	E420	0.796 mg/L	0.8 mg/L	99.5	70.0	130					
		zirconium, total	7440-67-7	E420	0.0824 mg/L	0.08 mg/L	103	70.0	130					
Total Metals (QC	Lot: 154093)													
KS2100439-006	Treatment Post Filter #3	mercury, total	7439-97-6	E508	0.0000947 mg/L	0.0001 mg/L	94.7	70.0	130					

Canada Toll Free: 1 800 668 9878

Page

Environmental Division Kamloops Work Order Reference

Report To	Contact and company name below will appear on the fir	al report	Reports / Recipients Turnaround Time (TAT) Requested						r	S21	00	)43				
Company:	District of Wells	Select Repo	ort Format: PDF	D EXCEL D E	OD (DIGITAL)	Rot	itine [R]	] if received	by 3pm M-F -	no surcha	rges apply					
Contact:	Donna Forseille	Merge QC	C/QCI Reports with COA	_		☐ 4 d	lay [P4]	if received I	y 3pm M-F-	20% rush	suncharge mir	imum			AW	- BI
hone:	250 - 994 - 3330	☐ Compare	Results to Criteria on Report -	provide details below if	box checked				by 3pm M-F -						T. W	
nono.	Company address below will appear on the final report	Select Distr	ibution: MEMAIL	MAIL	FAX				by 3pm M-F -						14	9
treet:	4243 Sanders	Email 1 or F	ax Admin 1	e Wells.	ca	□ San	1 day [E] If received by 3pm M-F - 100% rush surcharge minimum  Same day [E2] If received by 10am M-S - 200% rush surcharge. Addition					Additio		140		W II
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Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

# ALS Environmental

## Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 - 722235

Page of

Papart To	www.alsglobal.com  Contact and company name below will appear on the final report	Report Format / Distribution					Select S	Service Leve	el Below	- Contac	ct your AM	to confirm a	II E&P TA	Ts (sur	harges m	ау арр	ly)	
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Contact:	Donna Forscille		sults to Criteria on Report -		f box checked	Same Day, Weekend or Statutory holiday [E2-20						-200%		_				
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# CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order : KS2100501

Client Cash Clients Canada

Contact : Stu Lebeck

Address

BC Canada

Telephone : 250-255-0419

Project :

PO : ---C-O-C number : ----

Sampler : ----Site : ----

Quote number : 21CASH100KS06 (Wells Lead)

No. of samples received 2
No. of samples analysed 2

Page : 1 of 4

Laboratory : Kamloops - Environmental

Account Manager : Caitlin Fountain

Address : 1445 McGill Road, Unit 2B

Kamloops, British Columbia Canada V2C 6K7

Telephone : 250 372 3588

Date Samples Received : 23-Feb-2021 12:00

Date Analysis Commenced 25-Feb-2021

Issue Date : 01-Mar-2021 09:39

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

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

## Signatories

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

Signatories Position Laboratory Department

Kim Jensen Department Manager - Metals Metals, Burnaby, British Columbia

Page Work Order 2 of 4 KS2100501

Client : Cash Clients Canada

Project

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#### General Comments

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

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

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

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

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

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

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

Unit	Description	
mg/L	milligrams per litre	

>: greater than.

<: less than.

Red shading is applied where the result is equal to or greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit,

he result is lower than the Guideline Lower Limit.

Volume 1900 on post flust.

## Analytical Results

			Client sample ID	Lebeck Post Flush			
Sub-Matrix: Water (Matrix: Water)		Se	ampling date/time	21-Feb-2021 07:15			
Analyte	Method	LOR	Unit	KS2100501-002	BCDWQG MAC		
Total Metals							
lead, total	E420	0.000050	mg/L	0.000118	0.005		

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

## Summary of Guideline Breaches by Sample

Client Sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
			No description available for this compound in this guideline				

Page 3 of 4
Work Order KS2100501

Client : Cash Clients Canada

Project

MAC



Keys:

BCDWQG British Columbia Drinking Water Quality Guidelines (JAN, 2021)

Maximium Acceptable Concentrations

### **General Comments**

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Unit	Description	
mg/L	milligrams per litre	

>: greater than.

<: less than.

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

Analytical Results

Client sample ID Lebeck Pre Flush Sub-Matrix: Water 21-Feb-2021 Sampling date/time (Matrix: Water) 07:00 LOR Unit KS2100501-001 Analyte Method **BCDWQG** MAC **Total Metals** E420 0.000050 lead, total mg/L 0.0184 0.005

Not good on Preflyn. Quite over really

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

Page 4 of 4 Work Order KS2100501

Client : Cash Clients Canada

Project



Summary of Guideline Breaches by Sample

Client Sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
			No description available for this compound in this guideline				

Keys:

BCDWQG

British Columbia Drinking Water Quality Guidelines (JAN, 2021)

MAC

Maximium Acceptable Concentrations