

September 29, 2014

File: PE-6858

Doug Hill Director, Mining Operations

Re: Myra Creek and Buttle Lake Water Quality of September 6, 2014 compared to Drinking Water and Aquatic Life Guidelines

A spill of 16 cubic metres of acidic wash water containing residue of aluminum sulphate and 2,2'-iminodiethanol occurred at the NVI-Myra Falls mine on September 5, 2014. Ministry of Environment staff collected water quality samples from Myra Creek and Buttle Lake on September 6, 2014 to determine potential impacts on aquatic life and human health. In addition to surface water grabs, samples were collected at specific depths at the mouth of Myra Creek and in Buttle Lake up to 200 metres from the mouth to target any plume associated with the spill. The collection of samples from within the plume can help determine "worst case" scenario, but don't actually represent water quality throughout the entire water column.

The parameters analysed include pH, conductivity, turbidity, total organic carbon, dissolved organic carbon, hardness, alkalinity, general ions, and total and dissolved metals. Results were compared to the BC water quality guidelines for aquatic life and drinking water, as well as to the 2013 Annual Environmental and Reclamation Report submitted by the mine as part of their operating permit requirements.

Water samples were collected from the following sites and depths:

- Source material (wash water)
- TP4 Myra Creek at Pumphouse (creek sample)
- Myra Creek below waterfall (creek sample)
- Myra Creek at Buttle Lake, 35 metres downstream from waterfall (lake samples, 0.5 and 3.0 metres deep)
- Three sites in Buttle Lake 200 metres down flow from Myra Creek outlet (lake samples, 0.5, 5.0 and 10.0 metres deep)

Results showed that there were no exceedances of the drinking water guidelines at any receiving environment sites for any of the parameters sampled.

In the source material, pH was 3.93, well below the aquatic life guideline of 6.5 to 9.0. Dissolved aluminum was 363 mg/L, well above the acute aquatic life guideline of 0.1 mg/L.

Sulphate was 2,080 mg/L, 16 times higher than the chronic aquatic life guideline of 128 mg/L. Note that chronic effects are based on long term exposure and thus chronic guidelines do not apply to a one-time sample result, but require a mean of a minimum of five evenly-spaced samples collected in 30 days.

In the receiving environment, most parameters met provincial guidelines for the protection of aquatic life.

Sulphate exceeded the chronic aquatic life guideline value at TP4 (174 mg/L, 1.4x the guideline) and Myra Creek at Buttle Lake at 3.0 metres depth (149 mg/L, 1.2x the guideline), and remained below the guideline at all other sites and depths. A proper comparison to the chronic guideline cannot be made without further sampling, as noted above.

Copper and zinc exceeded the acute aquatic life guidelines at TP4 (11.3 μ g/L and 140 μ g/L, 3.8x and 4.2x the guideline, respectively) and Myra Creek at Buttle Lake at 3.0 metres depth (9.1 μ g/L and 136 μ g/L, 3.0x and 4.1x the guideline, respectively); however, concentrations were similar to those measured before the spill and are therefore believed to be unrelated. Further evidence for this is the fact that these metals, as well as hardness, were lower in the source material than at these receiving environment sites. Silver was also slightly above the acute aquatic life guideline at TP4 (0.132 μ g/L, 1.3x the guideline); this parameter was not measured at this site prior to the spill, but the guideline exceedance is also believed to be unrelated to the spill.

At the three sites in Buttle Lake 200 metres down flow from Myra Creek, results were similar to typical conditions, as compared with the 2013 results measured monthly at the nearest regular lake monitoring site.

Based on the relatively small volume of material spilled, the short duration of the spill, and the significant dilution provided by Buttle Lake, there are no concerns for human health. Some parameters were elevated above aquatic life guidelines, but concentrations were similar to conditions prior to the spill.

Nicole Obee, R.P. Bio.

Micole Olde

Environmental Impact Assessment Biologist Ministry of Environment, Mining Operations

| Depth | Temp | Temp SpC | | рН |
|-------|-------|------------|-------|------|
| 0.6 | 21.99 | 81 | 9.37 | 6.68 |
| 1.0 | 19.98 | 195 | 9.70 | 6.97 |
| 2.0 | 16.62 | 341 | 9.79 | 6.99 |
| 3.0 | 15.35 | 413 | 10.06 | 7.06 |
| 4.0 | 15.23 | 416 | 10.14 | 7.10 |
| 5.0 | 15.26 | 415 | 10.12 | 7.13 |
| 6.0 | 15.24 | 416 | 10.10 | 7.14 |
| 7.0 | 15.25 | 419 | 10.11 | 7.18 |
| 8.0 | 15.24 | 417 | 10.11 | 7.19 |
| | Во | ttom @ 8.4 | l m | |
| Min | 15.23 | 81 | 9.37 | 6.68 |
| Max | 21.99 | 419 | 10.14 | 7.19 |
| Ave | 16.68 | 346 | 9.94 | 7.05 |

| From: Sent: To: Subject: | Environmental Emergencies Spill Reports ENV:EX Saturday, September 6, 2014 12:37 AM Pridham, Dave ENV:EX FW: DGIR 141821 - VIR - ACIDIC WASH WATER (CODE 2) |
|--|--|
| From: SGPEP.ECC1@gov.bc.ca[SM Sent: Saturday, September 06, 2014 To: Environmental Emergencies Spil Subject: DGIR 141821 - VIR - ACII Auto forwarded by a Rule | 12:37:05 AM Il Reports ENV:EX |
| DGIR 141821 PEP Task Number: 152629 | |
| Incident Date: 2014-09-05 12:00 Incident Time: 2014-09-05 12:00 Report Date: 2014-09-05 Report Time: 23:39 | |
| Spiller: NYRSTAR MYRA FALLS | |
| Caller 1 / Agency: IVOR MCWILLIAMS / NYRSTAR 250-287-9271 EXT 3316 | MYRA FALLS - Residence s.22 - Business: |
| Caller 2 / Agency: / - : - : | |
| Location: MYRA FALLS MINE SIT Area: CAMPBELL RIVER PEP Region: VIR MOE Region: Vancouver Island Reg | |
| Affected Env: Creek/Stream Spill Type: Equipment Failure Sector: Industrial Jurisdictions: 1: Federal 2: Provincial | |
| Material: ACIDIC WASH WATER (| |
| Details: Large totes used to hold cement catal were dumped in an open ditch which | • |

sump. The level controller did not activate the sump pump and the water overflowed and went to Myra Creek.

Response:

Samples were taken of the wash water and the creek and sent to Maxxum Labs for analysis. Caller estimates the ph to be around 4.

Notifications:

23:45 Paged MOE RO Dave Pridham 23:48 Briefed MOE RO Dave Pridham - Code 1 Fed/Prov 00:01 Faxed MOE Nanaimo / HQ 00:03 Emailed Mines

Report Compiled By: MERRICK Operations 5 ECC - 2014-09-05 23:39

Environmental Emergency Response Officer:

Date:

Notification Coding: Code 1 / Code 2

MOE Response: Exercise / Potential / No Field Response / Field Response /

IMT Activation

From: Environmental Emergencies Spill Reports ENV:EX Saturday, September 6, 2014 12:21 AM Sent: Pridham, Dave ENV:EX To: Subject: FW: DGIR 141821 - VIR - ACIDIC WASH WATER From: SGPEP.ECC1@gov.bc.ca[SMTP:SGPEP.ECC1@GOV.BC.CA] Sent: Saturday, September 06, 2014 12:21:05 AM To: Environmental Emergencies Spill Reports ENV:EX Subject: DGIR 141821 - VIR - ACIDIC WASH WATER Auto forwarded by a Rule DGIR 141821 PEP Task Number: 152629 Incident Date: 2014-09-05 12:00 Incident Time: 2014-09-05 12:00 Report Date: 2014-09-05 Report Time: 23:39 Spiller: NYRSTAR MYRA FALLS Caller 1 / Agency: s.22 IVOR MCWILLIAMS / NYRSTAR MYRA FALLS - Residence **Business:** 250-287-9271 EXT 3316 Caller 2 / Agency: /-:-: Location: MYRA FALLS MINE SITE, STRATHCONA Area: CAMPBELL RIVER PEP Region: VIR MOE Region: Vancouver Island Region Affected Env: Creek/Stream Spill Type: Equipment Failure Sector: Industrial Jurisdictions: 1: Federal 2: Provincial Material: ACIDIC WASH WATER 16,000 LITERS Details: Large totes used to hold cement catalytic were full of water. The totes

were dumped in an open ditch which travels to a open drain in a ground

sump. The level controller did not activate the sump pump and the water overflowed and went to Myra Creek.

Response:

Samples were taken of the wash water and the creek and sent to Maxxum Labs for analysis. Caller estimates the ph to be around 4.

Notifications:

23:45 Paged MOE RO Dave Pridham 23:48 Briefed MOE RO Dave Pridham - Code 1 Fed/Prov 00:01 Faxed MOE Nanaimo / HQ 00:03 Emailed Mines

Report Compiled By: MERRICK Operations 5 ECC - 2014-09-05 23:39

Environmental Emergency Response Officer:

Date:

Notification Coding: Code 1 / Code 2

MOE Response: Exercise / Potential / No Field Response / Field Response /

IMT Activation

From: Environmental Emergencies Spill Reports ENV:EX

Sent: Saturday, September 6, 2014 7:10 PM

To: Pridham, Dave ENV:EX

Subject: FW: DGIR 141821 UPDATE 10 - VIR

From: SGPEP.ECC1@gov.bc.ca[SMTP:SGPEP.ECC1@GOV.BC.CA]

Sent: Saturday, September 06, 2014 7:10:05 PM

To: Environmental Emergencies Spill Reports ENV:EX

Subject: DGIR 141821 UPDATE 10 - VIR

Auto forwarded by a Rule

PEP Task Number: 152629

Incident Date: 2014-09-05 Incident Time: 23:39

Location: MYRA FALLS MINE SITE, STRATHCONA

Area: CAMPBELL RIVER

PEP Region: VIR

MOE Region: Vancouver Island Region

Caller / Agency:

DAVE PRIDHAM BY EMAIL / MOE RO

Details:

Update #10 DGIR 141821

RO Pridham was contacted by John Knapp, Nyrstar Mine Manager @ 17:30-hrs. Mr. Knapp has confirmed the following details pertaining to the release of 16,000 liters of acidic wash water into the receiving environment at Nyrstar Mine, flowing into Myra Creek and subsequently flowing into Buttle Lake.

- Confirmed that there were 16x 1000 liter totes which had held Meyco SA-160, a product used in the cement process. Sometime within 2-4 years ago, these totes were filled with surface water (source not known), following being emptied. These water filled totes were then utilized as a make shift retaining wall on the mine site.
- It was recently decided to remove and empty these totes utilizing the on-site waste water treatment system to process the acidic wash water contained inside the totes.
- Once removed and re-located, the tank control valves were opened allowing the waste water to enter a sump system which in turn would direct the waste water into their treatment facility. It was found that there was a sump pump control circuit failure in the system which subsequently allowed the sump pump system to overflow. It was also noted that this control circuit failure didn't allow the pump to go into alarm mode. The

pump control switch was found in the 'auto' mode, but was not functioning. This system failure is what caused the overflow release of the waste water.

- It is reported that there was only a small amount of residual product inside the tanks prior to being filled with surface water.
- Preventative measures have been put in place to allow easier monitoring of tank levels in the event of a sudden rain event. A mine employee will be posted at the tote location to monitor tank levels in the likelihood of a rain event. System repairs are underway.
- Samples taken at the mine site are being stored at their on-site lab and will be shipped to Maxxam Labs for analysis Monday AM. Site environmental staff will also be conducting water sample testing Monday AM.
- Mr. Knapp will be meeting with the Provincial sampling team members this evening.

Report Compiled By: DAVID Operations 1 ECC - 2014-09-06 18:49 DGIR 141821 UPDATE 10 - Subject: INLAND UPDATE

Notifications:

18:50 faxed MOE Nanaimo, MOE HQ, MCTS 18:52 emailed Code 2 Dist List, Mines Emergencies, COS NIZ

Environmental Emergency Response Officer:

Date:

Notification Coding: Code 1 / Code 2

MOE Response: Exercise / Potential / No Field Response / Field Response /

IMT Activation

From: Environmental Emergencies Spill Reports ENV:EX

Sent: Saturday, September 6, 2014 11:42 PM

To: Pridham, Dave ENV:EX

Subject: FW: DGIR 141821 UPDATE 11 - VIR

From: SGPEP.ECC1@gov.bc.ca[SMTP:SGPEP.ECC1@GOV.BC.CA]

Sent: Saturday, September 06, 2014 11:42:04 PM
To: Environmental Emergencies Spill Reports ENV:EX

Subject: DGIR 141821 UPDATE 11 - VIR

Auto forwarded by a Rule

PEP Task Number: 152629

Incident Date: 2014-09-05 Incident Time: 23:39

Location: MYRA FALLS MINE SITE, STRATHCONA

Area: CAMPBELL RIVER

PEP Region: VIR

MOE Region: Vancouver Island Region

Caller / Agency:

ALEX GRANT / MOE RO - Cellular: s. 17

Details:

Advised the sampling team is returning from site. They were out on the lake checking quality of water in creek and lake. They will send samples for analysis first thing tomorrow. Preliminary pH values met water quality guidelines for aquatic health which is the primary concern. MOE RO Dave Pridham aware.

Report Compiled By: DAVID Operations 1 ECC - 2014-09-06 22:47

DGIR 141821 UPDATE 11 - Subject: INLAND UPDATE

Notifications:

23:03 Faxed MOE Nanaimo, MOE HQ, MCTS

23:05 Emailed Code 2 Dist List, Mines Emergencies, COS NIZ

Environmental Emergency Response Officer:

Date:

Notification Coding: Code 1 / Code 2

MOE Response: Exercise / Potential / No Field Response / Field Response /

IMT Activation

From: Environmental Emergencies Spill Reports ENV:EX

Sent: Sunday, September 7, 2014 5:26 PM

To: Pridham, Dave ENV:EX

Subject: FW: DGIR 141821 UPDATE 12 - VIR

From: SGPEP.ECC1@gov.bc.ca[SMTP:SGPEP.ECC1@GOV.BC.CA]

Sent: Sunday, September 07, 2014 5:26:04 PM

To: Environmental Emergencies Spill Reports ENV:EX

Subject: DGIR 141821 UPDATE 12 - VIR

Auto forwarded by a Rule

PEP Task Number: 152629

Incident Date: 2014-09-05 Incident Time: 23:39

Location: MYRA FALLS MINE SITE, STRATHCONA

Area: CAMPBELL RIVER

PEP Region: VIR

MOE Region: Vancouver Island Region

Caller / Agency:

DAVE PRIDHAM (VIA EMAIL) / MOE

Details:

Due to the incident circumstances regarding the spill at the Nyrstar Mine site, this DGIR can now be downgraded to a Code 1.

Report Compiled By: DAWN Operations 1 ECC - 2014-09-07 16:43

DGIR 141821 UPDATE 12 - Subject: INLAND UPDATE

Notifications:

16:53 briefed MOE HQ D'Arcy Sego 16:54 briefed PDM Ralph Mohrmann

16:56 briefed MOH Duty Officer, Katja

16:58 left message on cell EPC Howie Siemen

17:00 paged EC

17:12 EPC Howie Siemen confirmed receipt of downgrade notification

17:13 briefed Melanie/EC

17:15 faxed MOE Nanaimo, MOE HQ, MCTS

17:17 emailed Code 2 Dist, Mines Emerg. COS NIZ

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Environmental Emergency Response Officer:

Date:

Notification Coding: Code 1 / Code 2

MOE Response: Exercise / Potential / No Field Response / Field Response /

IMT Activation Notes:

From: Environmental Emergencies Spill Reports ENV:EX

Sent: Saturday, September 6, 2014 1:09 AM

To: Pridham, Dave ENV:EX

Subject: FW: DGIR 141821 UPDATE 1 - VIR

From: SGPEP.ECC1@gov.bc.ca[SMTP:SGPEP.ECC1@GOV.BC.CA]

Sent: Saturday, September 06, 2014 1:09:05 AM **To:** Environmental Emergencies Spill Reports ENV:EX

Subject: DGIR 141821 UPDATE 1 - VIR

Auto forwarded by a Rule

PEP Task Number: 152629

Incident Date: 2014-09-05 Incident Time: 23:39

Location: MYRA FALLS MINE SITE, STRATHCONA

Area: CAMPBELL RIVER

PEP Region: VIR

MOE Region: Vancouver Island Region

Caller / Agency:

DAVE PRIDHAM / MOE RO

Details:

Advised that he has talked with Dennis Redford and he agrees that the incident should be upgraded to code 2 due to the volume, the risk to the Campbell River watershed and heightened media interest.

Report Compiled By: MARIE Marie Bauder - 2014-09-06 00:09 DGIR 141821 UPDATE 1 - Subject: INLAND UPDATE

Notifications:

0016 called MOE HQ D'Arcy Sego on cell left message

0017 called MOE HQ D'Arcy Sego at res. left message.

0020 briefed Ron Duty RM, asked that the EPC be notified. (unless the

situation warrants, he can get further updates on his email)

0025 briefed Ralph Mohrmann Duty Mgr. (email notifications will be fine unless situation deteriorates)

0028 paged EC

0031 called EPC Howie Siemen on cell, said to contact assistant Kathy

0032 called Kathy Squires on cell, went straight to voice mail, no message

0033 briefed MOH Duty Officer, Katja

0039 briefed EPC Howie Siemen, (no need for verbal notification unless the

situation deteriorates)

0044 faxed MOE Nanaimo, MOE HQ, MCTS

0045 emailed Code 2 dissemination, mines emergencies.

Environmental Emergency Response Officer:

Date:

Notification Coding: Code 1 / Code 2 MOE Response: Exercise / Potential / No Field Response / Field Response /

IMT Activation

From: Environmental Emergencies Spill Reports ENV:EX

Sent: Saturday, September 6, 2014 3:48 AM

To: Pridham, Dave ENV:EX

Subject: FW: DGIR 141821 UPDATE 2 - VIR

From: SGPEP.ECC1@gov.bc.ca[SMTP:SGPEP.ECC1@GOV.BC.CA]

Sent: Saturday, September 06, 2014 3:48:05 AM
To: Environmental Emergencies Spill Reports ENV:EX

Subject: DGIR 141821 UPDATE 2 - VIR

Auto forwarded by a Rule

PEP Task Number: 152629

Incident Date: 2014-09-05 Incident Time: 23:39

Location: MYRA FALLS MINE SITE, STRATHCONA

Area: CAMPBELL RIVER

PEP Region: VIR

MOE Region: Vancouver Island Region

Caller / Agency:

DAVE PRIDHAM (BY EMAIL) / MOE RO

Details:

Update #2 DGIR 141821 (Please include CO Office if not already informed)

RO Pridham contacted Ivor McWilliams, Environmental Manager at Nyrstar Mine. Mr. McWilliams confirms the following:

- 16,000 litres of acidic wash water has entered Myra Creek and subsequently entered into Buttle Lake due to a failed level control switch in their system.
- Initial testing at the point of entry into Myra creek and residue in the totes has indicated a PH of 3.5-4.0
- Spill took place around 12:00 hrs Friday Sept 5th
- The mine has not initiated their spill notification procedure to his knowledge.
- Product name is Mayco SA-160
- Company personnel have sampled the wash water and Myra Creek and have submitted samples to Maxxam Labs for analysis. No fish mortality noted.

RO Pridham notified and briefed the following:

- Contacted VIHA Emergency Management Director Sue Monroe. Mrs. Monroe will advise VIMHO Dr. Paul Hasselback.
- Contacted Don Cadden, BC Parks Regional Director, West Coast Region.
- · Contacted City of Campbell River Fire Dispatch answering for City

Water Quality Dept. Dispatcher will contact ASAP.

- Direct contact with VIMHO Dr. Paul Hasselback.
- Contacted CANUTEC (CANUTEC advises that the product is suspected to be Meyco SA-160). Requesting confirmation and MSDS.
- Attempted to contact Nyrstar Mine directly- no contact.
- Attempted to contact Nyrstar Environmental Manager- no contact.
- Contacted Hubert Bunce, EP A/Mining Operations Director regarding water quality monitoring, compliance, etc.

Request for task value \$100.00

Report Compiled By: MARIE Marie Bauder - 2014-09-06 03:37 DGIR 141821 UPDATE 2 - Subject: INLAND UPDATE

Notifications:

0338 faxed MOE Nanaimo, MOE HQ, MCTS 0338 emailed Code 2 dissemination, mines emergencies.COS NIZ

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Environmental Emergency Response Officer:

Date:

Notification Coding: Code 1 / Code 2

MOE Response: Exercise / Potential / No Field Response / Field Response /

IMT Activation

From: Environmental Emergencies Spill Reports ENV:EX

Sent: Saturday, September 6, 2014 6:58 AM

To: Grant, Alex J ENV:EX

Subject: FW: DGIR 141821 UPDATE 3 - VIR

From: SGPEP.ECC1@gov.bc.ca[SMTP:SGPEP.ECC1@GOV.BC.CA]

Sent: Saturday, September 06, 2014 6:58:05 AM To: Environmental Emergencies Spill Reports ENV:EX

Subject: DGIR 141821 UPDATE 3 - VIR

Auto forwarded by a Rule

PEP Task Number: 152629

Incident Date: 2014-09-05 Incident Time: 23:39

Location: MYRA FALLS MINE SITE, STRATHCONA

Area: CAMPBELL RIVER

PEP Region: VIR

MOE Region: Vancouver Island Region

Caller / Agency:

KJ SADLER / EC - Business: 604-290-2006

Details:

Requesting contact with MOE EERO.

Report Compiled By: DAWN Operations 2 ECC - 2014-09-06 06:30 DGIR 141821 UPDATE 3 - Subject: INLAND UPDATE

Notifications:

06:38 paged Van Isl MOE EERO

06:40 briefed MOE EERO Dave Pridham

06:41 faxed MOE Nanaimo, MOE HQ, MCTS

06:42 emailed Code 2 Dist List, Mines Emergencies, COS NIZ

Environmental Emergency Response Officer:

Date:

Notification Coding: Code 1 / Code 2

MOE Response: Exercise / Potential / No Field Response / Field Response / IMT Activation

From: Environmental Emergencies Spill Reports ENV:EX

Sent: Saturday, September 6, 2014 9:36 AM

To: Pridham, Dave ENV:EX

Subject: FW: DGIR 141821 UPDATE 4 - VIR

From: SGPEP.ECC1@gov.bc.ca[SMTP:SGPEP.ECC1@GOV.BC.CA]

Sent: Saturday, September 06, 2014 9:36:06 AM **To:** Environmental Emergencies Spill Reports ENV:EX

Subject: DGIR 141821 UPDATE 4 - VIR

Auto forwarded by a Rule

PEP Task Number: 152629

Incident Date: 2014-09-05 Incident Time: 23:39

Location: MYRA FALLS MINE SITE, STRATHCONA

Area: CAMPBELL RIVER

PEP Region: VIR

MOE Region: Vancouver Island Region

Caller / Agency: ALEX GRANT / MOE

Details:

Requested contact with local COS.

Report Compiled By: DAWN Operations 1 ECC - 2014-09-06 09:20

DGIR 141821 UPDATE 4 - Subject: INLAND UPDATE

Notifications:

09:20 patched to CO Gord Gudbranson 09:24 faxed MOE Nanaimo, MOE HQ, MCTS

09:25 emailed Code 2 Dist List, Mines Emergencies, COS NIZ

Environmental Emergency Response Officer:

Date:

Notification Coding: Code 1 / Code 2

MOE Response: Exercise / Potential / No Field Response / Field Response /

IMT Activation

From: Environmental Emergencies Spill Reports ENV:EX

Sent: Saturday, September 6, 2014 10:08 AM

To: Pridham, Dave ENV:EX

Subject: FW: DGIR 141821 UPDATE 5 - VIR

From: SGPEP.ECC1@gov.bc.ca[SMTP:SGPEP.ECC1@GOV.BC.CA]

Sent: Saturday, September 06, 2014 10:08:06 AM To: Environmental Emergencies Spill Reports ENV:EX

Subject: DGIR 141821 UPDATE 5 - VIR

Auto forwarded by a Rule

PEP Task Number: 152629

Incident Date: 2014-09-05 Incident Time: 23:39

Location: MYRA FALLS MINE SITE, STRATHCONA

Area: CAMPBELL RIVER

PEP Region: VIR

MOE Region: Vancouver Island Region

Caller / Agency:

DAVE PRIDHAM (VIA EMAIL) / MOE

Details:

Update #5 for DGIR 141821

RO Pridham advises the following:

- Provincial sampling team has been assembled and will be on scene at Nyrstar Mine-Buttle Lake area @ 14:00-hrs today.
- EERO Grant will be accompanying Provincial Sampling team to site.
- EERO Grant has updated David Crebo, Communications Director, Environment Communications Office.
- · EERO Grant has updated CO's office.
- EERO Pridham has contacted Ivor McWilliams, Environmental Manager, Nyrstar Mine requesting an email copy of MSDS as soon as possible.
- EERO Pridham has updated K.J. Sadler, Environment Canada Enforcement Officer.

Report Compiled By: DAWN Operations 1 ECC - 2014-09-06 10:00 DGIR 141821 UPDATE 5 - Subject: INLAND UPDATE

Notifications:

10:01 faxed MOE Nanaimo/HQ/MCTS

10:02 emailed Code 2 Dist List, Mines Emerg. COS NIZ

Environmental Emergency Response Officer:

Date:

Notification Coding: Code 1 / Code 2 MOE Response: Exercise / Potential / No Field Response / Field Response / IMT Activation

From: Environmental Emergencies Spill Reports ENV:EX

Saturday, September 6, 2014 11:12 AM Sent:

Pridham, Dave ENV:EX To:

Subject: FW: DGIR 141821 UPDATE 6 - VIR

From: SGPEP.ECC1@gov.bc.ca[SMTP:SGPEP.ECC1@GOV.BC.CA]

Sent: Saturday, September 06, 2014 11:12:06 AM To: Environmental Emergencies Spill Reports ENV:EX

Subject: DGIR 141821 UPDATE 6 - VIR

Auto forwarded by a Rule

PEP Task Number: 152629

Incident Date: 2014-09-05 Incident Time: 23:39

Location: MYRA FALLS MINE SITE, STRATHCONA

Area: CAMPBELL RIVER

PEP Region: VIR

MOE Region: Vancouver Island Region

Caller / Agency:

KATJA MAGARIN / MOH DO - Cellular: s. 17

Details:

Advised she would like to conected MOE with the First Nation Health Authority for the water testing results.

Report Compiled By: IAN Operations 4 ECC - 2014-09-06 10:41 DGIR 141821 UPDATE 6 - Subject: INLAND UPDATE

Notifications:

10:44 paged duty MOE RO David Pridham 10:46 briefed MOE RO David Pridham 10:47 faxed MOE Nanaimo/HQ/MCTS 10:48 emailed Code 2 Dist List, AANDC DO, Mines Emerg. COS NIZ

Environmental Emergency Response Officer:

Notification Coding: Code 1 / Code 2

MOE Response: Exercise / Potential / No Field Response / Field Response /

IMT Activation

From: Environmental Emergencies Spill Reports ENV:EX

Sent: Saturday, September 6, 2014 12:00 PM

To: Pridham, Dave ENV:EX

Subject: FW: DGIR 141821 UPDATE 7 - VIR

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From: SGPEP.ECC1@gov.bc.ca[SMTP:SGPEP.ECC1@GOV.BC.CA]

Sent: Saturday, September 06, 2014 12:00:05 PM To: Environmental Emergencies Spill Reports ENV:EX

Subject: DGIR 141821 UPDATE 7 - VIR

Auto forwarded by a Rule

PEP Task Number: 152629

Incident Date: 2014-09-05 Incident Time: 23:39

Location: MYRA FALLS MINE SITE, STRATHCONA

Area: CAMPBELL RIVER

PEP Region: VIR

MOE Region: Vancouver Island Region

Caller / Agency:

RON EWANYSHYN / EMBC DRM

Details:

Requesting contact with MOE EERO Dave Pridham.

Report Compiled By: DAWN Operations 1 ECC - 2014-09-06 11:41

DGIR 141821 UPDATE 7 - Subject: INLAND UPDATE

Notifications:

11:42 patched to MOE EERO Dave Pridham 11:43 faxed MOE Nanaimo, MOE HQ, MCTS

11:44 emailed Code 2 Dist List, Mines Emergencies, COS NIZ

Environmental Emergency Response Officer:

Date:

Notification Coding: Code 1 / Code 2

MOE Response: Exercise / Potential / No Field Response / Field Response /

IMT Activation

From: Environmental Emergencies Spill Reports ENV:EX

Sent: Saturday, September 6, 2014 12:48 PM

To: Pridham, Dave ENV:EX

Subject: FW: DGIR 141821 UPDATE 8 - VIR

From: SGPEP.ECC1@gov.bc.ca[SMTP:SGPEP.ECC1@GOV.BC.CA]

Sent: Saturday, September 06, 2014 12:48:05 PM To: Environmental Emergencies Spill Reports ENV:EX

Subject: DGIR 141821 UPDATE 8 - VIR

Auto forwarded by a Rule

PEP Task Number: 152629

Incident Date: 2014-09-05 Incident Time: 23:39

Location: MYRA FALLS MINE SITE, STRATHCONA

Area: CAMPBELL RIVER

PEP Region: VIR

MOE Region: Vancouver Island Region

Caller / Agency:

RON EWANYSHYN / EMBC

Details:

Advised he has just spoken with the MOE RO and this will remain code 2 at this time, no new information is available at this time. Requesting phone patch to Strathcona Regional District EPC.

Report Compiled By: IAN Operations 4 ECC - 2014-09-06 11:51 DGIR 141821 UPDATE 8 - Subject: INLAND UPDATE

Notifications:

11:56 patched EMBC RDM Ron Ewanyshyn through to Strathcona RD EPC Howie Siemens - has sent the information to the Strathcona RD water monitoring group - RDM Ron Ewanyshyn offered EMBC support and requested the regional district maintain communication with all stakeholders and address any media attention as well as consider where to direct phone calls from the public if they start to pick up (Strathcona drinking water monitoring contact is aware this spill).

12:04 paged MOE RO David Pridham 12:07 briefed MOE RO David Pridham 12:09 faxed MOE Nanaimo, MOE HQ, MCTS

12:10 emailed Code 2 Dist List, Mines Emergencies, COS NIZ

Environmental Emergency Response Officer:

Date:

Notification Coding: Code 1 / Code 2

MOE Response: Exercise / Potential / No Field Response / Field Response / IMT Activation

From: Environmental Emergencies Spill Reports ENV:EX

Sent: Saturday, September 6, 2014 3:44 PM

To: Pridham, Dave ENV:EX

Subject: FW: DGIR 141821 UPDATE 9 - VIR

From: SGPEP.ECC1@gov.bc.ca[SMTP:SGPEP.ECC1@GOV.BC.CA]

Sent: Saturday, September 06, 2014 3:44:05 PM **To:** Environmental Emergencies Spill Reports ENV:EX

Subject: DGIR 141821 UPDATE 9 - VIR

Auto forwarded by a Rule

PEP Task Number: 152629

Incident Date: 2014-09-05 Incident Time: 23:39

Location: MYRA FALLS MINE SITE, STRATHCONA

Area: CAMPBELL RIVER

PEP Region: VIR

MOE Region: Vancouver Island Region

Caller / Agency:

DAVE PRIDHAM (VIA EMAIL) / MOE

Details:

Update #9 DGIR 141821

RO Pridham advises the following as of 14:30-hrs:

- Provincial water sampling team is on route to Nyrstar Mine/Buttle Lake area. Sampling team has been in contact with Environment Canada Enforcement Officer, K.J. Sadler.
- MOH Officer Dr. Paul Hasselback has initiated a MOH information system for addressing public health concerns- contact information has been forwarded to D'Arcy Sego for review.
- Briefed ECC Regional Director Ron Ewanyskyn. ECC ready to support MOE as needed.
- Briefed MOH DO Katja Magarin. DO Magarin requested that we add two local First Nations Health Authority contacts (Linda Pillsworth & Peter Mazey) to the contact stream to share water sampling results. DO Magarin also advises that the local First Nation communities will be initiating their own water sampling teams and will share findings with MOE.
- Briefed City of Campbell River Emergency Coordinator Howie Siemens. Directed Mr. Siemens to MOH Officer Dr. Hasselback to address regional health concerns from incident.
- Ongoing contact with Nyrstar Mine, Environmental Manager Ivor McWilliams for updates, contacts, follow-up.

• Received MSDS information from Nyrstar Mine. Product involved confirmed to be Meyco SA-160 (residue).

Task increase request to \$2000.00

Report Compiled By: DAWN Operations 1 ECC - 2014-09-06 15:35 DGIR 141821 UPDATE 9 - Subject: INLAND UPDATE

Notifications:

15:36 faxed MOE Nanaimo, MOE HQ, MCTS 15:38 emailed Code 2 Dist List, Mines Emergencies, COS NIZ

Environmental Emergency Response Officer:

Date:

Notification Coding: Code 1 / Code 2

MOE Response: Exercise / Potential / No Field Response / Field Response /

IMT Activation



BC MINISTRY OF ENVIRONMENT

ATTN: Deborah Epps

Section Head, Provincial Water Quality

2080A Labieux Road Nanaimo BC V9T 6J9 Date Received: 07-SEP-14

Report Date: 10-SEP-14 17:52 (MT)

Version: FINAL

Client Phone: 604-793-8770

Certificate of Analysis

Lab Work Order #: L1514217

Project P.O. #: NOT SUBMITTED

Job Reference: SITE 1 ~ 200M FROM MYRA FALLS

C of C Numbers: 50212392

Legal Site Desc:

Dean Watt Account Manager

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ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700 ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

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L1514217 CONTD.... PAGE 2 of 7 10-SEP-14 17:52 (MT)

ALS ENVIRONMENTAL ANALYTICAL REPORT

Version: FINAL

| | | | | | UII. | TINAL |
|-------------------------------|---|--|--|--|------|-------|
| | Sample ID Description Sampled Date Sampled Time Client ID | L1514217-1 WATER 06-SEP-14 18:20 SITE 1 ~ 200M | L1514217-2 WATER 06-SEP-14 18:23 SITE 1 ~ 200M | L1514217-3 WATER 06-SEP-14 18:26 SITE 1 ~ 200M | | |
| | Client ID | FROM MYRA FALLS 0.5M | FROM MYRA FALLS 5.0M | FROM MYRA FALLS 10.0M | | |
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Physical Tests | Hardness (as CaCO3) (mg/L) | 29.4 | 30.5 | 33.2 | | |
| | pH (pH) | 7.82 | 7.78 | 7.76 | | |
| | Turbidity (NTU) | 0.24 | 0.19 | 0.17 | | |
| Anions and Nutrients | Alkalinity, Total (as CaCO3) (mg/L) | 25.4 | 25.2 | 25.2 | | |
| | Sulfate (SO4) (mg/L) | 6.14 | 6.33 | 11.1 | | |
| Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | 0.78 | 1.04 | 0.77 | | |
| | Total Organic Carbon (mg/L) | 0.70 | 0.75 | 0.68 | | |
| Total Metals | Aluminum (Al)-Total (ug/L) | 11.9 | 12.1 | 15.7 | | |
| | Antimony (Sb)-Total (ug/L) | <0.10 | <0.10 | 0.11 | | |
| | Arsenic (As)-Total (ug/L) | 0.22 | 0.22 | 0.22 | | |
| | Barium (Ba)-Total (ug/L) | 4.71 | 4.74 | 5.64 | | |
| | Beryllium (Be)-Total (ug/L) | <0.10 | <0.10 | <0.10 | | |
| | Bismuth (Bi)-Total (ug/L) | <0.50 | <0.50 | <0.50 | | |
| | Boron (B)-Total (ug/L) | <10 | <10 | <10 | | |
| | Cadmium (Cd)-Total (ug/L) | 0.017 | 0.019 | 0.037 | | |
| | Calcium (Ca)-Total (ug/L) | 10900 | 10600 | 12200 | | |
| | Chromium (Cr)-Total (ug/L) | <0.10 | <0.10 | <0.10 | | |
| | Cobalt (Co)-Total (ug/L) | <0.10 | <0.10 | <0.10 | | |
| | Copper (Cu)-Total (ug/L) | 0.67 | 0.62 | 0.97 | | |
| | Iron (Fe)-Total (ug/L) | <10 | <10 | 13 | | |
| | Lead (Pb)-Total (ug/L) | <0.050 | <0.050 | <0.050 | | |
| | Lithium (Li)-Total (ug/L) | <0.50 | <0.50 | <0.50 | | |
| | Magnesium (Mg)-Total (ug/L) | 910 | 860 | 990 | | |
| | Manganese (Mn)-Total (ug/L) | 1.67 | 2.27 | 6.50 | | |
| | Mercury (Hg)-Total (ug/L) | <0.010 | <0.010 | <0.010 | | |
| | Molybdenum (Mo)-Total (ug/L) | 0.284 | 0.295 | 0.454 | | |
| | Nickel (Ni)-Total (ug/L) | <0.50 | <0.50 | <0.50 | | |
| | Phosphorus (P)-Total (ug/L) | <50 | <50 | <50 | | |
| | Potassium (K)-Total (ug/L) | 160 | 150 | 230 | | |
| | Selenium (Se)-Total (ug/L) | 0.12 | 0.12 | 0.15 | | |
| | Silicon (Si)-Total (ug/L) | 1290 | 1250 | 1290 | | |
| | Silver (Ag)-Total (ug/L) | <0.010 | <0.010 | <0.010 | | |
| | Sodium (Na)-Total (ug/L) | 1030 | 1050 | 1490 | | |
| | Strontium (Sr)-Total (ug/L) | 16.5 | 16.9 | 21.1 | | |
| | Sulfur (S)-Total (ug/L) | 2350 | 2310 | 3950 | | |
| | Thallium (TI)-Total (ug/L) | <0.010 | <0.010 | <0.010 | | |

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L1514217 CONTD.... PAGE 3 of 7 10-SEP-14 17:52 (MT)

ALS ENVIRONMENTAL ANALYTICAL REPORT

Version: FINAL

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Version: FINAL

| | Sample I Descripti Sampled Da | on WATER | L1514217-2 WATER | L1514217-3 WATER | |
|------------------|-------------------------------------|-------------------------|-------------------------|--------------------------|--|
| | Descripti Sampled Da | on WATER | | | |
| | Sampled Da | | | | |
| | | 06-SEP-14 | 06-SEP-14 | 06-SEP-14 | |
| | Sampled Tir Client | SITE 1 ~ 200M | 18:23 SITE 1 ~ 200M | 18:26 SITE 1 ~ 200M | |
| | Client | FROM MYRA FALLS 0.5M | FROM MYRA FALLS 5.0M | FROM MYRA FALLS 10.0M | |
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Dissolved Metals | Titanium (Ti)-Dissolved (ug/L) | <10 | <10 | <10 | |
| | Uranium (U)-Dissolved (ug/L) | <0.010 | 0.010 | 0.011 | |
| | Vanadium (V)-Dissolved (ug/L) | <1.0 | <1.0 | <1.0 | |
| | Zinc (Zn)-Dissolved (ug/L) | <6.0 DLB | <6.0 DLB | <8.0 DLB | |
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^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L1514217 CONTD....

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Reference Information

Qualifiers for Sample Submission Listed:

| Qualifier | Description |
|-----------|---|
| WSMT | Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low. |
| WSMD | Water sample(s) for dissolved mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low. |

QC Samples with Qualifiers & Comments:

| Parameter | Qualifier | Applies to Sample Number(s) |
|--------------------------|--|---|
| Zinc (Zn)-Dissolved | MB-LOR | L1514217-1, -2, -3 |
| Sulfate (SO4) | MS-B | L1514217-1, -2, -3 |
| Total Organic Carbon | MS-B | L1514217-1, -2, -3 |
| Dissolved Organic Carbon | MS-B | L1514217-1, -2, -3 |
| | Zinc (Zn)-Dissolved Sulfate (SO4) Total Organic Carbon | Zinc (Zn)-Dissolved MB-LOR Sulfate (SO4) MS-B Total Organic Carbon MS-B |

Qualifiers for Individual Parameters Listed:

| Qualifier | Description |
|-----------|---|
| DLB | Detection Limit was raised due to detection of analyte at comparable level in Method Blank. |
| DTC | Dissolved concentration exceeds total. Results were confirmed by re-analysis. |
| MB-LOR | Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---------------|--------|---|--------------------|
| ALK-COL-VA | Water | Alkalinity by Colourimetric (Automated) | EPA 310.2 |

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

CARBONS-DOC-VA Water Dissolved organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

Total organic carbon by combustion **CARBONS-TOC-VA** Water APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

Hardness **APHA 2340B** HARDNESS-CALC-VA Water

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) FPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-DIS-LOW-ICP-VA Water Dissolved Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

Reference Information

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This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-TOT-LOW-ICP-VA

Water

Total Metals in Water by ICPOES

EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

PH-PCT-VA

Water

pH by Meter (Automated)

APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA

Water

pH by Meter (Automated)

APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

S-DIS-ICP-VA

Water

Dissolved Sulfur in Water by ICPOES

EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

S-TOT-ICP-VA

Water

Total Sulfur in Water by ICPOES

EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

SO4-TUR-VA

Water

Sulfate(SO4) by Turbidity

APHA 4500-SO4 E. SULFATE

This analysis is carried out using procedures adapted from APHA Method 4500-SO4 "Sulfate". Sulfate is determined using the turbidimetric method.

TURBIDITY-VA

Water

Turbidity by Meter

APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA

Water

Turbidity by Meter

APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code

Laboratory Location

VA

ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

50212392

Reference Information

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GLOSSARY OF REPORT TERMS

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

mg/kg - milligrams per kilogram based on dry weight of sample. mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATÉD, ALL SAMPLES WERE RÉCEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L1514217 Report Date: 10-SEP-14 Page 1 of 10

Client: BC MINISTRY OF ENVIRONMENT

Section Head, Provincial Water Quality 2080A Labieux Road

Nanaimo BC V9T 6J9

Contact: Deborah Epps

| est | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|--------|---------------------------|----------------------|-----------|-------|-----|--------|-----------|
| ALK-COL-VA | Water | | | | | | | |
| Batch R294177 | _ | | | | | | | |
| WG1947162-2 CRM Alkalinity, Total (as Ca | | VA-ALKL-COI | NTROL 97.4 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-5 CRM | | VA-ALKM-CO | | | 70 | | 05-115 | 09-3EF-14 |
| Alkalinity, Total (as Ca | | VAALKIII-00 | 103.7 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-8 CRM Alkalinity, Total (as Ca | | VA-ALKH-CO | NTROL 100.8 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-1 MB Alkalinity, Total (as Ca | aCO3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-10 MB Alkalinity, Total (as Ca | CO3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-4 MB Alkalinity, Total (as Ca | iCO3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-7 MB Alkalinity, Total (as Ca | iCO3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| ARBONS-DOC-VA | Water | | | | | | | |
| Batch R294333 | 2 | | | | | | | |
| WG1947341-1 DUP Dissolved Organic Ca | | L1514217-3 0.77 | 0.79 | | mg/L | 2.3 | 20 | 09-SEP-14 |
| WG1947341-12 LCS Dissolved Organic Ca | | | 103.6 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-16 LCS Dissolved Organic Ca | | | 109.1 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-4 LCS Dissolved Organic Ca | | | 101.8 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-8 LCS Dissolved Organic Ca | | | 105.9 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-11 MB Dissolved Organic Ca | rbon | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-15 MB Dissolved Organic Ca | rbon | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-3 MB Dissolved Organic Ca | rbon | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-7 MB Dissolved Organic Ca | rbon | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-10 MS Dissolved Organic Ca | rbon | L1513619-2 | 100.6 | | % | | 70-130 | 09-SEP-14 |
| WG1947341-14 MS Dissolved Organic Ca | rbon | L1513418-11 | N/A | MS-B | % | | - | 09-SEP-14 |
| WG1947341-2 MS | | L1514231-1 | | | | | | |



Quality Control Report

Workorder: L1514217 Report Date: 10-SEP-14

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|--------|------------------------|--------|-----------|-------|-----|--------|-----------|
| CARBONS-DOC-VA Batch R2943332 | Water | | | | | | | |
| WG1947341-2 MS Dissolved Organic Carb | on | L1514231-1 | 104.6 | | % | | 70-130 | 09-SEP-14 |
| WG1947341-6 MS Dissolved Organic Carb | on | L1514251-1 | 106.5 | | % | | 70-130 | 09-SEP-14 |
| CARBONS-TOC-VA | Water | | | | | | | |
| Batch R2943331 WG1947339-2 DUP Total Organic Carbon | | L1514217-3 0.68 | 0.74 | | mg/L | 8.0 | 20 | 09-SEP-14 |
| WG1947339-1 LCS Total Organic Carbon | | | 100.0 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-13 LCS Total Organic Carbon | | | 99.6 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-17 LCS Total Organic Carbon | | | 101.1 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-5 LCS Total Organic Carbon | | | 102.0 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-9 LCS Total Organic Carbon | | | 99.95 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-12 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947339-16 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947339-4 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947339-8 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947339-15 MS Total Organic Carbon | | L1513418-11 | N/A | MS-B | % | | - | 09-SEP-14 |
| WG1947339-3 MS Total Organic Carbon | | L1514231-1 | 103.0 | | % | | 70-130 | 09-SEP-14 |
| WG1947339-7 MS Total Organic Carbon | | L1514251-1 | 102.5 | | % | | 70-130 | 09-SEP-14 |
| HG-DIS-LOW-CVAFS-VA | Water | | | | | | | |
| Batch R2942725 WG1947233-3 LCS | | | | | | | | |
| Mercury (Hg)-Dissolved | | | 89.2 | | % | | 80-120 | 09-SEP-14 |

Page 2 of 10



Quality Control Report

Workorder: L1514217

Report Date: 10-SEP-14 Page 3 of 10

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--------------------------------------|--------|--------------|----------|-----------|-------|-----|---------|-----------|
| HG-DIS-LOW-CVAFS-VA | Water | | | | | | | |
| Batch R2943546 | | | | | | | | |
| WG1947233-1 MB | | | | _ | | | | |
| Mercury (Hg)-Dissolved | | | <0.00001 | 0 | mg/L | | 0.00001 | 10-SEP-14 |
| HG-TOT-LOW-CVAFS-VA | Water | | | | | | | |
| Batch R2942725 | | | | | | | | |
| WG1947862-2 LCS | | | | | | | | |
| Mercury (Hg)-Total | | | 95.9 | | % | | 80-120 | 09-SEP-14 |
| WG1947862-1 MB | | | | _ | | | | |
| Mercury (Hg)-Total | | | <0.00001 | 0 | mg/L | | 0.00001 | 09-SEP-14 |
| WG1947862-3 MS Mercury (Hg)-Total | | L1514076-1 | 89.1 | | % | | 70.100 | 00.050.44 |
| | | 1 454 4070 0 | 03.1 | | 76 | | 70-130 | 09-SEP-14 |
| WG1947862-4 MS Mercury (Hg)-Total | | L1514076-3 | 94.6 | | % | | 70-130 | 09-SEP-14 |
| MET-D-CCMS-VA | Water | | | | | | | |
| Batch R2942770 | Water | | | | | | | |
| WG1947233-2 CRM | | VA-HIGH-WA | TRM | | | | | |
| Aluminum (Al)-Dissolved | | | 102.1 | | % | | 80-120 | 09-SEP-14 |
| Antimony (Sb)-Dissolved | | | 97.3 | | % | | 80-120 | 09-SEP-14 |
| Arsenic (As)-Dissolved | | | 97.4 | | % | | 80-120 | 09-SEP-14 |
| Barium (Ba)-Dissolved | | | 98.6 | | % | | 80-120 | 09-SEP-14 |
| Beryllium (Be)-Dissolved | | | 97.7 | | % | | 80-120 | 09-SEP-14 |
| Bismuth (Bi)-Dissolved | | | 97.7 | | % | | 80-120 | 09-SEP-14 |
| Boron (B)-Dissolved | | | 85.5 | | % | | 80-120 | 09-SEP-14 |
| Cadmium (Cd)-Dissolved | | | 96.8 | | % | | 80-120 | 09-SEP-14 |
| Chromium (Cr)-Dissolved | | | 96.9 | | % | | 80-120 | 09-SEP-14 |
| Cobalt (Co)-Dissolved | | | 96.3 | | % | | 80-120 | 09-SEP-14 |
| Copper (Cu)-Dissolved | | | 95.4 | | % | | 80-120 | 09-SEP-14 |
| Lead (Pb)-Dissolved | | | 96.9 | | % | | 80-120 | 09-SEP-14 |
| Lithium (Li)-Dissolved | | | 99.2 | | % | | 80-120 | 09-SEP-14 |
| Manganese (Mn)-Dissolve | ed | | 99.6 | | % | | 80-120 | 09-SEP-14 |
| Molybdenum (Mo)-Dissolv | ved | | 98.5 | | % | | 80-120 | 09-SEP-14 |
| Nickel (Ni)-Dissolved | | | 98.2 | | % | | 80-120 | 09-SEP-14 |
| Selenium (Se)-Dissolved | | | 98.9 | | % | | 80-120 | 09-SEP-14 |
| Silver (Ag)-Dissolved | | | 98.9 | | % | | 80-120 | 09-SEP-14 |
| Sodium (Na)-Dissolved | | | 97.2 | | % | | 80-120 | 09-SEP-14 |
| Strontium (Sr)-Dissolved | | | 99.1 | | % | | 80-120 | 09-SEP-14 |



Workorder: L1514217 Report Date: 10-SEP-14 Page 4 of 10

| Test I | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|--------|-----------|--------------------|-----------|---------|-----|---------|-----------|
| MET-D-CCMS-VA | Water | | | | | | | |
| Batch R2942770 | | | | | | | | |
| WG1947233-2 CRM | | VA-HIGH-W | | | | | | |
| Thallium (TI)-Dissolved | | | 98.2 | | % | | 80-120 | 09-SEP-14 |
| Tin (Sn)-Dissolved | | | 97.1 | | % | | 80-120 | 09-SEP-14 |
| Titanium (Ti)-Dissolved | | | 99.4 | | % | | 80-120 | 09-SEP-14 |
| Uranium (U)-Dissolved | | | 99.5 | | % | | 80-120 | 09-SEP-14 |
| Vanadium (V)-Dissolved | | | 97.4 | | % | | 80-120 | 09-SEP-14 |
| Zinc (Zn)-Dissolved | | | 95.8 | | % | | 80-120 | 09-SEP-14 |
| WG1947233-1 MB Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 09-SEP-14 |
| Antimony (Sb)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 09-SEP-14 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | | 09-SEP-14 |
| Beryllium (Be)-Dissolved | | | <0.00003 | | mg/L | | 0.00005 | 09-SEP-14 |
| , , , | | | <0.00010 | | | | 0.0001 | 09-SEP-14 |
| Bismuth (Bi)-Dissolved | | | | | mg/L | | 0.0005 | 09-SEP-14 |
| Boron (B)-Dissolved Cadmium (Cd)-Dissolved | | | <0.010 <0.00001 | 0 | mg/L | | 0.01 | 09-SEP-14 |
| , , | | | | | mg/L | | 0.00001 | 09-SEP-14 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 09-SEP-14 |
| Lead (Pb)-Dissolved | | | <0.00005 | | mg/L | | 0.00005 | 09-SEP-14 |
| Lithium (Li)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Manganese (Mn)-Dissolve | | | <0.00005 | | mg/L | | 0.00005 | 09-SEP-14 |
| Molybdenum (Mo)-Dissolv | ed | | <0.00005 | 0 | mg/L | | 0.00005 | 09-SEP-14 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Selenium (Se)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Silver (Ag)-Dissolved | | | <0.00001 | 0 | mg/L | | 0.00001 | 09-SEP-14 |
| Sodium (Na)-Dissolved | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 09-SEP-14 |
| Thallium (TI)-Dissolved | | | <0.00001 | 0 | mg/L | | 0.00001 | 09-SEP-14 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Titanium (Ti)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Uranium (U)-Dissolved | | | < 0.00001 | 0 | mg/L | | 0.00001 | 09-SEP-14 |
| Vanadium (V)-Dissolved | | | < 0.0010 | | mg/L | | 0.001 | 09-SEP-14 |
| Zinc (Zn)-Dissolved | | | 0.0024 | MB-L | OR mg/L | | 0.001 | 09-SEP-14 |

MET-DIS-LOW-ICP-VA Water



Workorder: L1514217 Report Date: 10-SEP-14

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|--------|-----------|----------------------|-----------|-------|-----|--------|-----------|
| MET-DIS-LOW-ICP-VA | Water | | | | | | | |
| Batch R2942645 | 5 | | | | | | | |
| WG1947233-2 CRM Calcium (Ca)-Dissolve | | VA-HIGH-W | ATRM 101.0 | | % | | 80-120 | 09-SEP-14 |
| Iron (Fe)-Dissolved | | | 95.0 | | % | | 80-120 | 09-SEP-14 |
| Magnesium (Mg)-Disso | olved | | 100.6 | | % | | 80-120 | 09-SEP-14 |
| Phosphorus (P)-Dissol | ved | | 99.6 | | % | | 80-120 | 09-SEP-14 |
| Potassium (K)-Dissolve | ed | | 97.4 | | % | | 80-120 | 09-SEP-14 |
| Silicon (Si)-Dissolved | | | 98.5 | | % | | 80-120 | 09-SEP-14 |
| WG1947233-1 MB Calcium (Ca)-Dissolve | d | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Iron (Fe)-Dissolved | - | | <0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Magnesium (Mg)-Disso | olved | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Phosphorus (P)-Dissol | | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Potassium (K)-Dissolve | | | <0.10 | | mg/L | | 0.1 | 09-SEP-14 |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| . , | Matau | | | | | | 0.00 | 00 021 14 |
| MET-T-CCMS-VA | Water | | | | | | | |
| Batch R2942770 WG1947258-3 CRM | | VA-HIGH-W | ATRM | | | | | |
| Aluminum (Al)-Total | | VATIONET | 101.1 | | % | | 80-120 | 09-SEP-14 |
| Antimony (Sb)-Total | | | 97.5 | | % | | 80-120 | 09-SEP-14 |
| Arsenic (As)-Total | | | 99.4 | | % | | 80-120 | 09-SEP-14 |
| Barium (Ba)-Total | | | 100.1 | | % | | 80-120 | 09-SEP-14 |
| Beryllium (Be)-Total | | | 97.0 | | % | | 80-120 | 09-SEP-14 |
| Bismuth (Bi)-Total | | | 96.9 | | % | | 80-120 | 09-SEP-14 |
| Boron (B)-Total | | | 83.9 | | % | | 80-120 | 09-SEP-14 |
| Cadmium (Cd)-Total | | | 98.7 | | % | | 80-120 | 09-SEP-14 |
| Chromium (Cr)-Total | | | 99.3 | | % | | 80-120 | 09-SEP-14 |
| Cobalt (Co)-Total | | | 98.5 | | % | | 80-120 | 09-SEP-14 |
| Copper (Cu)-Total | | | 96.3 | | % | | 80-120 | 09-SEP-14 |
| Lead (Pb)-Total | | | 96.6 | | % | | 80-120 | 09-SEP-14 |
| Lithium (Li)-Total | | | 96.9 | | % | | 80-120 | 09-SEP-14 |
| Manganese (Mn)-Total | | | 101.1 | | % | | 80-120 | 09-SEP-14 |
| Molybdenum (Mo)-Tota | al | | 99.1 | | % | | 80-120 | 09-SEP-14 |
| Nickel (Ni)-Total | | | 99.8 | | % | | 80-120 | 09-SEP-14 |
| Selenium (Se)-Total | | | 99.6 | | % | | 80-120 | 09-SEP-14 |
| Silver (Ag)-Total | | | 95.4 | | % | | 80-120 | 09-SEP-14 |

Page 5 of 10



Workorder: L1514217 Report Date: 10-SEP-14 Page 6 of 10

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|--------|-----------|-----------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | Water | | | | | | | |
| Batch R2942770 | | | | | | | | |
| WG1947258-3 CRM | | VA-HIGH-W | | | | | | |
| Sodium (Na)-Total | | | 98.7 | | % | | 80-120 | 09-SEP-14 |
| Strontium (Sr)-Total | | | 100.3 | | % | | 80-120 | 09-SEP-14 |
| Thallium (TI)-Total | | | 97.8 | | % | | 80-120 | 09-SEP-14 |
| Tin (Sn)-Total | | | 97.7 | | % | | 80-120 | 09-SEP-14 |
| Titanium (Ti)-Total | | | 91.4 | | % | | 80-120 | 09-SEP-14 |
| Uranium (U)-Total | | | 98.5 | | % | | 80-120 | 09-SEP-14 |
| Vanadium (V)-Total | | | 99.8 | | % | | 80-120 | 09-SEP-14 |
| Zinc (Zn)-Total | | | 96.6 | | % | | 80-120 | 09-SEP-14 |
| WG1947258-1 MB | | | <0.0030 | | ma/l | | 0.000 | 00 OED 44 |
| Aluminum (Al)-Total | | | | | mg/L | | 0.003 | 09-SEP-14 |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Barium (Ba)-Total | | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Beryllium (Be)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Bismuth (Bi)-Total | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Boron (B)-Total | | | <0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Cadmium (Cd)-Total | | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Copper (Cu)-Total | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Lead (Pb)-Total | | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Lithium (Li)-Total | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Manganese (Mn)-Total | | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Molybdenum (Mo)-Total | | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Selenium (Se)-Total | | | < 0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Silver (Ag)-Total | | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Sodium (Na)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 09-SEP-14 |
| Thallium (TI)-Total | | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Titanium (Ti)-Total | | | < 0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Uranium (U)-Total | | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Vanadium (V)-Total | | | < 0.0010 | | mg/L | | 0.001 | 09-SEP-14 |



Workorder: L1514217

Report Date: 10-SEP-14 Page 7 of 10

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|--------|-------------|---------------------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | Water | | | | | | | |
| Batch R2942770 WG1947258-1 MB Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 09-SEP-14 |
| MET-TOT-LOW-ICP-VA | Water | | | | | | | |
| Batch R2942851 | | | | | | | | |
| WG1947258-3 CRM Calcium (Ca)-Total | | VA-HIGH-WAT | 7 RM 98.5 | | % | | 80-120 | 09-SEP-14 |
| Iron (Fe)-Total | | | 95.5 | | % | | 80-120 | 09-SEP-14 |
| Magnesium (Mg)-Total | | | 101.0 | | % | | 80-120 | 09-SEP-14 |
| Phosphorus (P)-Total | | | 97.8 | | % | | 80-120 | 09-SEP-14 |
| Potassium (K)-Total | | | 96.6 | | % | | 80-120 | 09-SEP-14 |
| Silicon (Si)-Total | | | 96.1 | | % | | 80-120 | 09-SEP-14 |
| WG1947258-1 MB | | | | | | | | |
| Calcium (Ca)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Iron (Fe)-Total | | | < 0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Magnesium (Mg)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Phosphorus (P)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Potassium (K)-Total | | | < 0.10 | | mg/L | | 0.1 | 09-SEP-14 |
| Silicon (Si)-Total | | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| PH-PCT-VA | Water | | | | | | | |
| Batch R2943649 | | | | | | | | |
| WG1947450-25 CRM pH | | VA-PH7-BUF | 7.01 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-26 CRM pH | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-27 CRM pH | | VA-PH7-BUF | 7.01 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-28 CRM pH | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-29 CRM pH | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-30 CRM pH | | VA-PH7-BUF | 6.99 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-31 CRM pH | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-32 CRM pH | | VA-PH7-BUF | 7.03 | | рН | | 6.9-7.1 | 09-SEP-14 |



Workorder: L1514217

Report Date: 10-SEP-14

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|--------|-------------|---------------------|-----------|-------|-----|--------|-----------|
| S-DIS-ICP-VA | Water | | | | | | | |
| Batch R29426 | 15 | | | | | | | |
| WG1947233-2 CRI Sulfur (S)-Dissolved | И | VA-HIGH-WA | TRM 101.7 | | % | | 80-120 | 09-SEP-14 |
| WG1947233-1 MB Sulfur (S)-Dissolved | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| S-TOT-ICP-VA | Water | | | | | | | |
| Batch R294289 WG1947258-3 CRI | | VA-HIGH-WA | | | 0/ | | | |
| Sulfur (S)-Total | | | 101.6 | | % | | 80-120 | 09-SEP-14 |
| WG1947258-1 MB Sulfur (S)-Total | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| SO4-TUR-VA | Water | | | | | | | |
| Batch R294329 | 91 | | | | | | | |
| WG1948014-2 CRI Sulfate (SO4) | И | VA-SO4-L-CO | 98.4 | | % | | 85-115 | 10-SEP-14 |
| WG1948014-6 CRI Sulfate (SO4) | Л | VA-S04-H-C0 | ONTROL 102.8 | | % | | 85-115 | 10-SEP-14 |
| WG1948014-1 MB Sulfate (SO4) | | | <0.50 | | mg/L | | 0.5 | 10-SEP-14 |
| WG1948014-5 MB Sulfate (SO4) | | | <0.50 | | mg/L | | 0.5 | 10-SEP-14 |
| WG1948014-4 MS Sulfate (SO4) | | L1512411-2 | 92.1 | | % | | 75-125 | 10-SEP-14 |
| WG1948014-8 MS Sulfate (SO4) | | L1510555-1 | N/A | MS-B | % | | - | 10-SEP-14 |
| TURBIDITY-VA | Water | | | | | | | |
| Batch R294150 WG1947074-2 CRI | | VA FORM 40 | | | | | | |
| Turbidity | VI | VA-FORM-40 | 101.8 | | % | | 85-115 | 08-SEP-14 |
| WG1947074-1 MB Turbidity | | | <0.10 | | NTU | | 0.1 | 08-SEP-14 |

Workorder: L1514217 Report Date: 10-SEP-14 Page 9 of 10

Legend:

| Limit | ALS Control Limit (Data Quality Objectives) |
|-------|---|
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Sample Parameter Qualifier Definitions:

| Qualifier | Description |
|-----------|---|
| J | Duplicate results and limits are expressed in terms of absolute difference. |
| MB-LOR | Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Workorder: L1514217 Report Date: 10-SEP-14 Page 10 of 10

Hold Time Exceedances:

| ALS Product Description | Sample ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
|---|--------------|-----------------|-----------------|---------|-----------|-------|-----------|
| Physical Tests | | | | | | | |
| pH by Meter (Automated) | | | | | | | |
| , | 1 | 06-SEP-14 18:20 | 09-SEP-14 23:00 | 0.25 | 77 | hours | EHTR-FM |
| | 2 | 06-SEP-14 18:23 | 09-SEP-14 23:00 | 0.25 | 77 | hours | EHTR-FM |
| | 3 | 06-SEP-14 18:26 | 09-SEP-14 23:00 | 0.25 | 77 | hours | EHTR-FM |

Legend & Qualifier Definitions:

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

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

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

EHT: Exceeded ALS recommended hold time prior to analysis.

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

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes. Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L1514217 were received on 07-SEP-14 09:30.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Maxxam Analytics Inc. 4606 Canada Way Bumaby, BC V5G1K5

Ministry of Environment

L1514217-COFC

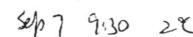
Reg # 50212302

| - 15 | | | | | | | | | | recq. | 30 | 4143 | 74 |
|--------------------|---|---|---------------|---------------|------------|--------|--------------------|--------------------|-------------|----------|---------------|----------|--------------|
| Urgent? | | Csr No. | Office 10 | Client CA | | Samp | ling Ag | ency | - | | - | | |
| Study | - | | Project | N/A | | Code | 10 | Name \ | Vancouver I | sland, N | lanaimo | | |
| Lab | | Maxxam Analytics In | | | | Addre | ess | 2080-A | Labieux R | oad | | 00000 | |
| | | tact NCOBEE Nicole Obe | e | | | П | | | | | | | |
| Sample | | Nicole Obee | | | | | | | | _ | | _ | |
| Signatu | re | | Well Plate | | | City | Cada | Nanain | | one /2 | E017E1 | 2100 | |
| EMS Id | | 1.1. | ^ | | | | | V9T6J9 | | one (2 | 30)/51• | 3100 | _ |
| Location | n _ | | on Mys | | | | per of Co | ontainen | 5 | - | | | |
| Instructi | ions | To Lab Pis include total | and dissolved | mercury at IC | CPMS level | | | | | | - | | |
| State | FW | Descriptor GE | Collection | on Method | GRB | | | | | | | - | |
| | lass | Collection Start | Collecti | | | epth | | | | | | | |
| | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | YYYY-MM-DD HH:MI | | -DD HH:MI | Upper | Lowe | r Tide | | C | ommen | t | | |
| | REG | 2014-09-06 | 2014-09-06 | 1820 | 10.5 | | | | | | | | |
| | <u>F6</u> | | " | 1823 | 5.0 | | | | | - 1 | | | _ |
| 4 | £6_ | /1 | " | 1826 | 10.0 | + | +- | - | | | | - | |
| 5 | _ | | | | | | | + | | | | | _ |
| 6 | | | | | | | | | | | | | |
| GENER | A1 (| 11) | Med'm | Pres'n | ISP | ECIFIC | | Test | ī | Med'm | Pres'n | Med'm | Pres'n |
| | 7.1.1.1.1.7. | pH 4.5 | medin | riesii | 5 | | | Oxygen D. | | 02 | 01 | I med in | Fittali |
| | | pH 8.3 | | | | | | m. Oxygen | D. | 02 | 01 | | |
| | | fration Curve | | | | - | on: DIC | | | | | | |
| | | nity: Phen. nity: Total: pH 4.5 | | 7.7 | | | on: DOC | | | | | | <u></u> |
| | | r: S.W. | | | | - | on: TOC | | | · · | - | | |
| | | r. TAC | | | - | | mical Oxy | | | 04 | 05 | | |
| | DH H | r. True | | | | Chlo | rophyll "a | 3* | | | | - | |
| | Resid | ue: Filterable: 0.45µm (TDS) | | | | | ide: SAD | | | 02 | 24 | | |
| | | ue: Nonfilt., fixed (TSS: fixed) | | | _ _ | | nide: WAI | D | | 02 | 24 | | ļ., |
| | | ue: Nonfikerable (TSS) | | | | | ophytin due NFR | Whole Bo | ottle | 03 | 01 | | - |
| | Resid | ue: Total, Fixed | | | | | | ction Prep | | | - | | - |
| | | ic Conductance | | | _ | Sutp | hide: Tot | al | | 03 | 08 | | † |
| - | Turbic | - 181 PART - | Mada | Decelo I | 05 | RGANIC | S | | | | 1 | Med'm | Pres'n |
| GENER | | 120 mL) Package (CI,Br,SO4) | Med'm | Pres'n | | AOX | | | | | $\overline{}$ | | |
| | Chlo | | | | | Acid | Extr. He | rbScan | | | | | - |
| | Fluor | | | | | BTE | 2 | | | | | | |
| | Nit.: | Nitrate and Nitrite (Colim) | | | | EPH | | | | | | | |
| | _ | gen: Nitrate (Col'm) | | | | | hosate / | AMPA se: Gravim | alda . | | - | | |
| | _ | gen: Nitrite (Col'm) | | | - | | | ne Pscar | | | | - | |
| × | Sutfa | | | | | 1 | | horus P | | _ | + | - | |
| 05115 | | | | 1 | | PAH | | | | | | _ | - |
| GENE | | | Med'm 55 | Pres'n | 64 | Pen | ta/Tetra (| CI-phenols | | 1,000 | | | |
| | | gen: Ammonia (Colim) gen: Organic | | | | Phe | nols (GC | MS) | | | | | |
| _ | | gen: Tot. Kjeldah: (Calc) gen: Total | | | | | | orimetric | | | - 1 | | |
| | | | | 11 | | | chlor. Bip | chenyls | | | _ | | |
| PHOS | | (120 1112) | Med'm | Pres'n | _ - | 1,100 | | nes (THM | | | - | | |
| | | Diss. O-phosphate (Col'm) phorus: Tot. Diss. (Col'm) | | | | | | | | | | | |
| | | phorus: Total (Corm) | | | | HER | Med'm | Pres'n | Total and d | | Test | -110014 | Name 1 |
| METAL | S (TC | OTAL) Medm | | Med'm Pre | s'n | | - | | Total and 0 | ssowed | mercury | aticpin | o iévei |
| High 1 | Low | 55 | 02 | | | | <u> </u> | + | 1 | | - | | _ |
| | Х | Metal Pkg. (ICP) Metal Pkg. (ICPMS) | | | | | | | | | | | |
| Х | Â | Hardness | | | | | _ | | | | | | - 1 |
| | Х | Mercury | | | | | <u> </u> | 1 | | ** | | | |
| | 200 | Sediment, Sieve to < 63µ | | | | LD TES | T | No. | Parameter | Metho | d R | esults | Units |
| | | SSOLVED; Med'm | | Med'm Pre | es'n_ | | | | | | - 1 | | |
| 0.45 Mid High L | | METERS) 55 | 62 | | | | | | | | | | 15 (1975) |
| | | Metal Pkg. (ICP) | | | | | | | | - | | | |
| | Х | Metal Pkg. (ICPMS) | | | | | | 1 | | - | + | + | |
| Х | Ü | Hardness | | | | 77 | _ | | - 12 | | | | _ |
| | XΙ | Mercury | | | | | | | | | | | |

Report ID: EMSR0900

Ree by Aml Sep 7 9:30 28

Date: 2014-09-06 11:46





BC MINISTRY OF ENVIRONMENT

ATTN: Deborah Epps

Section Head, Provincial Water Quality

2080A Labieux Road Nanaimo BC V9T 6J9 Date Received: 07-SEP-14

Report Date: 10-SEP-14 17:34 (MT)

Version: FINAL

Client Phone: 604-793-8770

Certificate of Analysis

Lab Work Order #: L1514222

Project P.O. #: NOT SUBMITTED

Job Reference: SITE 2 ~ 200M FROM MYRA FALLS

C of C Numbers: 50212393

Legal Site Desc:

Dean Watt Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700 ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

Environmental 🚂

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L1514222 CONTD.... PAGE 2 of 7 10-SEP-14 17:34 (MT)

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | | | | vers | FINAL |
|-------------------------------|---|---|---|--|------|-----------|
| | Sample ID Description Sampled Date Sampled Time Client ID | L1514222-1 WATER 06-SEP-14 18:50 SITE 2 ~ 200M FROM MYRA FALLS 0.5M | L1514222-2 WATER 06-SEP-14 18:53 SITE 2 ~ 200M FROM MYRA FALLS 5.0M | L1514222-3 WATER 06-SEP-14 18:56 SITE 2 ~ 200M FROM MYRA FALLS 10.0M | | |
| Grouping | Analyte | FALLS 0.5W | PALLS 5.0W | PALLS TO.UM | | |
| WATER | • | | | | | |
| Physical Tests | Hardness (as CaCO3) (mg/L) | 29.8 | 30.7 | 33.4 | | |
| • | pH (pH) | 7.78 | 7.77 | 7.74 | | |
| | Turbidity (NTU) | 0.28 | 0.14 | 0.22 | | |
| Anions and Nutrients | Alkalinity, Total (as CaCO3) (mg/L) | 25.2 | 24.4 | 25.8 | | |
| | Sulfate (SO4) (mg/L) | 6.28 | 6.32 | 9.20 | | |
| Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | 0.71 | 0.73 | 0.67 | | |
| | Total Organic Carbon (mg/L) | 0.69 | 0.65 | 0.66 | | |
| Total Metals | Aluminum (AI)-Total (ug/L) | 13.3 | 13.0 | 14.9 | | |
| | Antimony (Sb)-Total (ug/L) | <0.10 | <0.10 | <0.10 | | |
| | Arsenic (As)-Total (ug/L) | 0.22 | 0.19 | 0.22 | | |
| | Barium (Ba)-Total (ug/L) | 4.71 | 4.72 | 5.33 | | |
| | Beryllium (Be)-Total (ug/L) | <0.10 | <0.10 | <0.10 | | |
| | Bismuth (Bi)-Total (ug/L) | <0.50 | <0.50 | <0.50 | | |
| | Boron (B)-Total (ug/L) | <10 | <10 | <10 | | |
| | Cadmium (Cd)-Total (ug/L) | 0.022 | 0.020 | 0.030 | | |
| | Calcium (Ca)-Total (ug/L) | 10800 | 10800 | 12100 | | |
| | Chromium (Cr)-Total (ug/L) | <0.10 | <0.10 | <0.10 | | |
| | Cobalt (Co)-Total (ug/L) | <0.10 | <0.10 | <0.10 | | |
| | Copper (Cu)-Total (ug/L) | 0.64 | 0.59 | 0.79 | | |
| | Iron (Fe)-Total (ug/L) | <10 | <10 | 15 | | |
| | Lead (Pb)-Total (ug/L) | <0.050 | <0.050 | <0.050 | | |
| | Lithium (Li)-Total (ug/L) | <0.50 | <0.50 | <0.50 | | |
| | Magnesium (Mg)-Total (ug/L) | 900 | 900 | 980 | | |
| | Manganese (Mn)-Total (ug/L) | 1.69 | 2.14 | 4.90 | | |
| | Mercury (Hg)-Total (ug/L) | <0.010 | <0.010 | <0.010 | | |
| | Molybdenum (Mo)-Total (ug/L) | 0.278 | 0.292 | 0.390 | | |
| | Nickel (Ni)-Total (ug/L) | <0.50 | <0.50 | <0.50 | | |
| | Phosphorus (P)-Total (ug/L) | <50 | <50 | <50 | | |
| | Potassium (K)-Total (ug/L) | 150 | 150 | 170 | | |
| | Selenium (Se)-Total (ug/L) | 0.12 | 0.13 | 0.14 | | |
| | Silicon (Si)-Total (ug/L) | 1270 | 1270 | 1320 | | |
| | Silver (Ag)-Total (ug/L) | <0.010 | <0.010 | <0.010 | | |
| | Sodium (Na)-Total (ug/L) | 1010 | 1030 | 1350 | | |
| | Strontium (Sr)-Total (ug/L) | 16.6 | 16.9 | 20.3 | | |
| | Sulfur (S)-Total (ug/L) | 2350 | 2340 | 3350 | | |
| | Thallium (TI)-Total (ug/L) | <0.010 | <0.010 | <0.010 | | |

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L1514222 CONTD.... PAGE 3 of 7 10-SEP-14 17:34 (MT)

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | | | | V C1 3 | TINAL |
|------------------|---|--|--|--|--------|-----------|
| | Sample ID Description Sampled Date Sampled Time Client ID | L1514222-1 WATER 06-SEP-14 18:50 SITE 2 ~ 200M | L1514222-2 WATER 06-SEP-14 18:53 SITE 2 ~ 200M | L1514222-3 WATER 06-SEP-14 18:56 SITE 2 ~ 200M | | |
| | Silent 12 | FROM MYRA FALLS 0.5M | FROM MYRA FALLS 5.0M | FROM MYRA FALLS 10.0M | | |
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Total Metals | Tin (Sn)-Total (ug/L) | <0.10 | <0.10 | <0.10 | | |
| | Titanium (Ti)-Total (ug/L) | <10 | <10 | <10 | | |
| | Uranium (U)-Total (ug/L) | 0.011 | 0.011 | 0.011 | | |
| | Vanadium (V)-Total (ug/L) | <1.0 | <1.0 | <1.0 | | |
| | Zinc (Zn)-Total (ug/L) | 6.0 | 5.3 | 7.7 | | |
| Dissolved Metals | Dissolved Mercury Filtration Location | LAB | LAB | LAB | | |
| | Dissolved Metals Filtration Location | LAB | LAB | LAB | | |
| | Aluminum (Al)-Dissolved (ug/L) | 8.7 | 9.7 | 10.4 | | |
| | Antimony (Sb)-Dissolved (ug/L) | <0.10 | <0.10 | <0.10 | | |
| | Arsenic (As)-Dissolved (ug/L) | 0.20 | 0.20 | 0.21 | | |
| | Barium (Ba)-Dissolved (ug/L) | 4.64 | 4.56 | 5.15 | | |
| | Beryllium (Be)-Dissolved (ug/L) | <0.10 | <0.10 | <0.10 | | |
| | Bismuth (Bi)-Dissolved (ug/L) | <0.50 | <0.50 | <0.50 | | |
| | Boron (B)-Dissolved (ug/L) | <10 | <10 | <10 | | |
| | Cadmium (Cd)-Dissolved (ug/L) | 0.017 | 0.016 | 0.019 | | |
| | Calcium (Ca)-Dissolved (ug/L) | 10500 | 10800 | 11800 | | |
| | Chromium (Cr)-Dissolved (ug/L) | <0.10 | <0.10 | <0.10 | | |
| | Cobalt (Co)-Dissolved (ug/L) | <0.10 | <0.10 | <0.10 | | |
| | Copper (Cu)-Dissolved (ug/L) | 0.48 | 0.48 | 0.56 | | |
| | Iron (Fe)-Dissolved (ug/L) | <10 | <10 | <10 | | |
| | Lead (Pb)-Dissolved (ug/L) | <0.050 | <0.050 | <0.050 | | |
| | Lithium (Li)-Dissolved (ug/L) | <0.50 | <0.50 | <0.50 | | |
| | Magnesium (Mg)-Dissolved (ug/L) | 860 | 890 | 940 | | |
| | Manganese (Mn)-Dissolved (ug/L) | 0.164 | 0.103 | <0.050 | | |
| | Mercury (Hg)-Dissolved (ug/L) | <0.010 | <0.010 | <0.010 | | |
| | Molybdenum (Mo)-Dissolved (ug/L) | 0.291 | 0.297 | 0.390 | | |
| | Nickel (Ni)-Dissolved (ug/L) | <0.50 | <0.50 | <0.50 | | |
| | Phosphorus (P)-Dissolved (ug/L) | <50 | <50 | <50 | | |
| | Potassium (K)-Dissolved (ug/L) | 150 | 120 | 170 | | |
| | Selenium (Se)-Dissolved (ug/L) | 0.13 | 0.11 | 0.11 | | |
| | Silicon (Si)-Dissolved (ug/L) | 1210 | 1250 | 1280 | | |
| | Silver (Ag)-Dissolved (ug/L) | <0.010 | <0.010 | <0.010 | | |
| | Sodium (Na)-Dissolved (ug/L) | 1050 | 1030 | 1280 | | |
| | Strontium (Sr)-Dissolved (ug/L) | 16.4 | 16.7 | 19.2 | | |
| | Sulfur (S)-Dissolved (ug/L) | 2210 | 2290 | 3220 | | |
| | Thallium (TI)-Dissolved (ug/L) | <0.010 | <0.010 | <0.010 | | |
| | Tin (Sn)-Dissolved (ug/L) | <0.10 | <0.10 | <0.10 | | |

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L1514222 CONTD.... PAGE 4 of 7 10-SEP-14 17:34 (MT)

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | | | | Versi | TINAL |
|------------------|--|----------------------------|---|---|-------|-------|
| | Sample ID Description Sampled Date Sampled Time | 06-SEP-14 18:50 | L1514222-2 WATER 06-SEP-14 18:53 | L1514222-3 WATER 06-SEP-14 18:56 | | |
| | Client ID | SITE 2 ~ 200M FROM MYRA | SITE 2 ~ 200M FROM MYRA | SITE 2 ~ 200M FROM MYRA | | |
| Grouping | Analyte | FALLS 0.5M | FALLS 5.0M | FALLS 10.0M | | |
| WATER | | | | | | |
| Dissolved Metals | Titanium (Ti)-Dissolved (ug/L) | -10 | -10 | <10 | | |
| | Uranium (U)-Dissolved (ug/L) | <10 | <10 | | | |
| | Vanadium (V)-Dissolved (ug/L) | 0.011 | 0.010 | 0.010 | | |
| | Zinc (Zn)-Dissolved (ug/L) | <1.0 DLB | <1.0 DLB | <1.0 DLB | | |
| | 2110 (211) Dissolved (dg/2) | <5.0 | <6.0 | <7.0 | | |
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^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L1514222 CONTD....

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Reference Information

Qualifiers for Sample Submission Listed:

| Qualifier | Description |
|-----------|---|
| WSMT | Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low. |
| WSMD | Water sample(s) for dissolved mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low. |

| QC Sa | mples | with | Qualifiers | & | Comments: |
|-------|-------|------|------------|---|-----------|
|-------|-------|------|------------|---|-----------|

| QC Type Description | Parameter | Qualifier | Applies to Sample Number(s) |
|---------------------|--------------------------|-----------|-----------------------------|
| Method Blank | Zinc (Zn)-Dissolved | MB-LOR | L1514222-1, -2, -3 |
| Matrix Spike | Sulfate (SO4) | MS-B | L1514222-1, -2, -3 |
| Matrix Spike | Total Organic Carbon | MS-B | L1514222-1, -2, -3 |
| Matrix Spike | Dissolved Organic Carbon | MS-B | L1514222-1, -2, -3 |

Qualifiers for Individual Parameters Listed:

| Qualifier | Description |
|-----------|---|
| DLB | Detection Limit was raised due to detection of analyte at comparable level in Method Blank. |
| MB-LOR | Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---------------|--------|---|--------------------|
| ALK-COL-VA | Water | Alkalinity by Colourimetric (Automated) | EPA 310.2 |

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

CARBONS-DOC-VA

Water Dissolved organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-TOC-VA

Water

Total organic carbon by combustion

APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

HARDNESS-CALC-VA

Water

Hardness

APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-DIS-LOW-CVAFS-VA

Dissolved Mercury in Water by CVAFS(Low)

EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low)

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-D-CCMS-VA

Dissolved Metals in Water by CRC ICPMS

APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-DIS-LOW-ICP-VA

Water

Dissolved Metals in Water by ICPOES

EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA

Total Metals in Water by CRC ICPMS

APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United

Reference Information

L1514222 CONTD....

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States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-TOT-LOW-ICP-VA

Water

Total Metals in Water by ICPOES

EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

PH-PCT-VA

Water

pH by Meter (Automated)

APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH

It is recommended that this analysis be conducted in the field.

PH-PCT-VA

Water

pH by Meter (Automated)

APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

S-DIS-ICP-VA

Water

Dissolved Sulfur in Water by ICPOES

EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

S-TOT-ICP-VA

Water

Total Sulfur in Water by ICPOES

EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

SO4-TUR-VA

Water

Sulfate(SO4) by Turbidity

APHA 4500-SO4 E. SULFATE

This analysis is carried out using procedures adapted from APHA Method 4500-SO4 "Sulfate". Sulfate is determined using the turbidimetric method.

TURBIDITY-VA

Water

Turbidity by Meter

APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA

Water

Turbidity by Meter

APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code

Laboratory Location

VA

ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

50212393

Reference Information

L1514222 CONTD.... PAGE 7 of 7 10-SEP-14 17:34 (MT) Version: **FINAL**

GLOSSARY OF REPORT TERMS

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

mg/kg - milligrams per kilogram based on dry weight of sample. mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATÉD, ALL SAMPLES WERE RÉCEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Workorder: L1514222 Report Date: 10-SEP-14 Page 1 of 10

Client: BC MINISTRY OF ENVIRONMENT

Section Head, Provincial Water Quality 2080A Labieux Road

Nanaimo BC V9T 6J9

Contact: Deborah Epps

| est | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|--------|------------------------|----------------------|-----------|-------|-----|--------|-----------|
| LK-COL-VA | Water | | | | | | | |
| Batch R2941773 | | | | | | | | |
| WG1947162-2 CRM Alkalinity, Total (as CaC | (O3) | VA-ALKL-CON | NTROL 97.4 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-5 CRM | | VA-ALKM-CO | | | ,,, | | 00 110 | 00 021 14 |
| Alkalinity, Total (as CaC | O3) | | 103.7 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-8 CRM Alkalinity, Total (as CaC | O3) | VA-ALKH-COI | NTROL 100.8 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-6 DUP Alkalinity, Total (as CaC | O3) | L1514222-1 25.2 | 25.5 | | mg/L | 1.1 | 20 | 09-SEP-14 |
| WG1947162-1 MB Alkalinity, Total (as CaC | O3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-10 MB Alkalinity, Total (as CaC | (O3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-4 MB Alkalinity, Total (as CaC | O3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-7 MB Alkalinity, Total (as CaC | O3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| ARBONS-DOC-VA | Water | | | | | | | |
| Batch R2943332 | | | | | | | | |
| WG1947341-12 LCS Dissolved Organic Carb | on | | 103.6 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-16 LCS Dissolved Organic Carb | on | | 109.1 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-4 LCS | | | | | | | | |
| Dissolved Organic Carb | on | | 101.8 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-8 LCS Dissolved Organic Carb | on | | 105.9 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-11 MB Dissolved Organic Carb | on | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-15 MB Dissolved Organic Carb | on | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-3 MB Dissolved Organic Carb | on | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-7 MB Dissolved Organic Carb | on | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-10 MS Dissolved Organic Carb | on | L1513619-2 | 100.6 | | % | | 70-130 | 09-SEP-14 |
| WG1947341-14 MS Dissolved Organic Carb | on | L1513418-11 | N/A | MS-B | % | | - | 09-SEP-14 |
| WG1947341-2 MS | | L1514231-1 | | | | | | |



Report Date: 10-SEP-14 Workorder: L1514222

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|--------|-------------|--------|-----------|-------|-----|--------|-----------|
| CARBONS-DOC-VA | Water | | | | | | | |
| Batch R2943332 WG1947341-2 MS Dissolved Organic Carb | on | L1514231-1 | 104.6 | | % | | 70-130 | 09-SEP-14 |
| WG1947341-6 MS Dissolved Organic Carb | on | L1514251-1 | 106.5 | | % | | 70-130 | 09-SEP-14 |
| CARBONS-TOC-VA | Water | | | | | | | |
| Batch R2943331 WG1947339-1 LCS Total Organic Carbon | | | 100.0 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-13 LCS Total Organic Carbon | | | 99.6 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-17 LCS Total Organic Carbon | | | 101.1 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-5 LCS Total Organic Carbon | | | 102.0 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-9 LCS Total Organic Carbon | | | 99.95 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-12 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947339-16 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947339-4 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947339-8 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947339-15 MS Total Organic Carbon | | L1513418-11 | N/A | MS-B | % | | - | 09-SEP-14 |
| WG1947339-3 MS Total Organic Carbon | | L1514231-1 | 103.0 | | % | | 70-130 | 09-SEP-14 |
| WG1947339-7 MS Total Organic Carbon | | L1514251-1 | 102.5 | | % | | 70-130 | 09-SEP-14 |
| HG-DIS-LOW-CVAFS-VA | Water | | | | | | | |
| Batch R2942725 WG1947233-3 LCS | | | | | | | | |
| Mercury (Hg)-Dissolved | | | 89.2 | | % | | 80-120 | 09-SEP-14 |

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|--------|------------|--------------|-----------|-------|-----|---------|-----------|
| HG-DIS-LOW-CVAFS-VA Batch R2943546 WG1947233-1 MB | Water | | | | | | | |
| Mercury (Hg)-Dissolved | | | <0.000010 |) | mg/L | | 0.00001 | 10-SEP-14 |
| HG-TOT-LOW-CVAFS-VA | Water | | | | | | | |
| Batch R2942725 WG1947862-2 LCS Mercury (Hg)-Total | | | 95.9 | | % | | 80-120 | 09-SEP-14 |
| WG1947862-1 MB Mercury (Hg)-Total | | | <0.000010 |) | mg/L | | 0.00001 | 09-SEP-14 |
| WG1947862-3 MS Mercury (Hg)-Total | | L1514076-1 | 89.1 | | % | | 70-130 | 09-SEP-14 |
| WG1947862-4 MS Mercury (Hg)-Total | | L1514076-3 | 94.6 | | % | | 70-130 | 09-SEP-14 |
| MET-D-CCMS-VA | Water | | | | | | | |
| Batch R2942770 | | | | | | | | |
| WG1947233-2 CRM Aluminum (Al)-Dissolved | d | VA-HIGH-WA | TRM 102.1 | | % | | 80-120 | 09-SEP-14 |
| Antimony (Sb)-Dissolved | d | | 97.3 | | % | | 80-120 | 09-SEP-14 |
| Arsenic (As)-Dissolved | | | 97.4 | | % | | 80-120 | 09-SEP-14 |
| Barium (Ba)-Dissolved | | | 98.6 | | % | | 80-120 | 09-SEP-14 |
| Beryllium (Be)-Dissolved | d | | 97.7 | | % | | 80-120 | 09-SEP-14 |
| Bismuth (Bi)-Dissolved | | | 97.7 | | % | | 80-120 | 09-SEP-14 |
| Boron (B)-Dissolved | | | 85.5 | | % | | 80-120 | 09-SEP-14 |
| Cadmium (Cd)-Dissolve | ed | | 96.8 | | % | | 80-120 | 09-SEP-14 |
| Chromium (Cr)-Dissolve | ed | | 96.9 | | % | | 80-120 | 09-SEP-14 |
| Cobalt (Co)-Dissolved | | | 96.3 | | % | | 80-120 | 09-SEP-14 |
| Copper (Cu)-Dissolved | | | 95.4 | | % | | 80-120 | 09-SEP-14 |
| Lead (Pb)-Dissolved | | | 96.9 | | % | | 80-120 | 09-SEP-14 |
| Lithium (Li)-Dissolved | | | 99.2 | | % | | 80-120 | 09-SEP-14 |
| Manganese (Mn)-Dissol | lved | | 99.6 | | % | | 80-120 | 09-SEP-14 |
| Molybdenum (Mo)-Disso | olved | | 98.5 | | % | | 80-120 | 09-SEP-14 |
| Nickel (Ni)-Dissolved | | | 98.2 | | % | | 80-120 | 09-SEP-14 |
| Selenium (Se)-Dissolved | d | | 98.9 | | % | | 80-120 | 09-SEP-14 |
| Silver (Ag)-Dissolved | | | 98.9 | | % | | 80-120 | 09-SEP-14 |
| Sodium (Na)-Dissolved | | | 97.2 | | % | | 80-120 | 09-SEP-14 |
| Strontium (Sr)-Dissolved | d | | 99.1 | | % | | 80-120 | 09-SEP-14 |



Workorder: L1514222 Report Date: 10-SEP-14 Page 4 of 10

| Test N | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---------------|-----------|-----------|-----------|-------|-----|---------|-----------|
| MET-D-CCMS-VA V | Vater | | | | | | | |
| Batch R2942770 | | | | | | | | |
| WG1947233-2 CRM | | VA-HIGH-W | | | | | | |
| Thallium (TI)-Dissolved | | | 98.2 | | % | | 80-120 | 09-SEP-14 |
| Tin (Sn)-Dissolved | | | 97.1 | | % | | 80-120 | 09-SEP-14 |
| Titanium (Ti)-Dissolved | | | 99.4 | | % | | 80-120 | 09-SEP-14 |
| Uranium (U)-Dissolved | | | 99.5 | | % | | 80-120 | 09-SEP-14 |
| Vanadium (V)-Dissolved | | | 97.4 | | % | | 80-120 | 09-SEP-14 |
| Zinc (Zn)-Dissolved | | | 95.8 | | % | | 80-120 | 09-SEP-14 |
| WG1947233-1 MB Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 09-SEP-14 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Barium (Ba)-Dissolved | | | <0.000050 |) | mg/L | | 0.00005 | 09-SEP-14 |
| Beryllium (Be)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Bismuth (Bi)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Boron (B)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Cadmium (Cd)-Dissolved | | | <0.000010 |) | mg/L | | 0.00001 | 09-SEP-14 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 09-SEP-14 |
| Lead (Pb)-Dissolved | | | <0.000050 |) | mg/L | | 0.00005 | 09-SEP-14 |
| Lithium (Li)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Manganese (Mn)-Dissolved | d | | <0.000050 |) | mg/L | | 0.00005 | 09-SEP-14 |
| Molybdenum (Mo)-Dissolve | ed | | <0.000050 |) | mg/L | | 0.00005 | 09-SEP-14 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Selenium (Se)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Silver (Ag)-Dissolved | | | <0.000010 |) | mg/L | | 0.00001 | 09-SEP-14 |
| Sodium (Na)-Dissolved | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 09-SEP-14 |
| Thallium (TI)-Dissolved | | | <0.000010 |) | mg/L | | 0.00001 | 09-SEP-14 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Titanium (Ti)-Dissolved | | | < 0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Uranium (U)-Dissolved | | | <0.000010 |) | mg/L | | 0.00001 | 09-SEP-14 |
| Vanadium (V)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 09-SEP-14 |
| Zinc (Zn)-Dissolved | | | 0.0024 | MB-LO | | | 0.001 | 09-SEP-14 |

MET-DIS-LOW-ICP-VA Water



Report Date: 10-SEP-14 Page 5 of 10 Workorder: L1514222

| Test Matrix | Reference Result Qual | ifier Units F | RPD Limit | Analyzed |
|--|---|---------------------------------|--|---|
| MET-DIS-LOW-ICP-VA Water | | | | |
| Batch R2942645 | | | | |
| WG1947233-2 CRM | VA-HIGH-WATRM | | | |
| Calcium (Ca)-Dissolved | 101.0 | % | 80-120 | 09-SEP-14 |
| Iron (Fe)-Dissolved | 95.0 | % | 80-120 | 09-SEP-14 |
| Magnesium (Mg)-Dissolved | 100.6 | % | 80-120 | 09-SEP-14 |
| Phosphorus (P)-Dissolved | 99.6 | % | 80-120 | 09-SEP-14 |
| Potassium (K)-Dissolved | 97.4 | % | 80-120 | 09-SEP-14 |
| Silicon (Si)-Dissolved | 98.5 | % | 80-120 | 09-SEP-14 |
| WG1947233-1 MB Calcium (Ca)-Dissolved | <0.050 | mg/L | 0.05 | 09-SEP-14 |
| Iron (Fe)-Dissolved | <0.010 | mg/L | 0.01 | 09-SEP-14 |
| Magnesium (Mg)-Dissolved | <0.050 | mg/L | 0.05 | 09-SEP-14 |
| Phosphorus (P)-Dissolved | <0.050 | mg/L | 0.05 | 09-SEP-14 |
| Potassium (K)-Dissolved | <0.10 | mg/L | 0.03 | 09-SEP-14 |
| Silicon (Si)-Dissolved | <0.050 | mg/L | 0.05 | 09-SEP-14 |
| | 10.000 | mg/L | 0.05 | 09-3LF-14 |
| MET-T-CCMS-VA Water | | | | |
| Batch R2942770 WG1947258-3 CRM | VA IIIOU WATER | | | |
| Aluminum (Al)-Total | VA-HIGH-WATRM 101.1 | % | 80-120 | 09-SEP-14 |
| Antimony (Sb)-Total | 97.5 | % | 80-120 | 09-SEP-14 |
| Arsenic (As)-Total | 99.4 | % | 80-120 | 09-SEP-14 |
| | 100.1 | % | 80-120 | |
| Barium (Ba)-Total | | | | 09-SEP-14 |
| Barium (Ba)-Total Beryllium (Be)-Total | 97.0 | % | 80-120 | 09-SEP-14 09-SEP-14 |
| | 97.0 96.9 | | | |
| Beryllium (Be)-Total | | % | 80-120 | 09-SEP-14 |
| Beryllium (Be)-Total Bismuth (Bi)-Total | 96.9 | % | 80-120 80-120 | 09-SEP-14 09-SEP-14 |
| Beryllium (Be)-Total Bismuth (Bi)-Total Boron (B)-Total | 96.9 83.9 | % % % | 80-120 80-120 80-120 80-120 | 09-SEP-14 09-SEP-14 09-SEP-14 |
| Beryllium (Be)-Total Bismuth (Bi)-Total Boron (B)-Total Cadmium (Cd)-Total | 96.9 83.9 98.7 | % % % % | 80-120 80-120 80-120 | 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 |
| Beryllium (Be)-Total Bismuth (Bi)-Total Boron (B)-Total Cadmium (Cd)-Total Chromium (Cr)-Total | 96.9 83.9 98.7 99.3 | % % % % | 80-120 80-120 80-120 80-120 80-120 | 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 |
| Beryllium (Be)-Total Bismuth (Bi)-Total Boron (B)-Total Cadmium (Cd)-Total Chromium (Cr)-Total Cobalt (Co)-Total | 96.9 83.9 98.7 99.3 98.5 | % % % % % | 80-120 80-120 80-120 80-120 80-120 80-120 | 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 |
| Beryllium (Be)-Total Bismuth (Bi)-Total Boron (B)-Total Cadmium (Cd)-Total Chromium (Cr)-Total Cobalt (Co)-Total Copper (Cu)-Total | 96.9 83.9 98.7 99.3 98.5 96.3 | % % % % % % | 80-120 80-120 80-120 80-120 80-120 80-120 80-120 | 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 |
| Beryllium (Be)-Total Bismuth (Bi)-Total Boron (B)-Total Cadmium (Cd)-Total Chromium (Cr)-Total Cobalt (Co)-Total Copper (Cu)-Total Lead (Pb)-Total | 96.9 83.9 98.7 99.3 98.5 96.3 | % % % % % % | 80-120 80-120 80-120 80-120 80-120 80-120 | 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 |
| Beryllium (Be)-Total Bismuth (Bi)-Total Boron (B)-Total Cadmium (Cd)-Total Chromium (Cr)-Total Cobalt (Co)-Total Copper (Cu)-Total Lead (Pb)-Total Lithium (Li)-Total | 96.9 83.9 98.7 99.3 98.5 96.3 96.6 96.9 | % % % % % % % | 80-120 80-120 80-120 80-120 80-120 80-120 80-120 80-120 | 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 |
| Beryllium (Be)-Total Bismuth (Bi)-Total Boron (B)-Total Cadmium (Cd)-Total Chromium (Cr)-Total Cobalt (Co)-Total Copper (Cu)-Total Lead (Pb)-Total Lithium (Li)-Total Manganese (Mn)-Total | 96.9 83.9 98.7 99.3 98.5 96.3 96.6 96.9 101.1 | % % % % % % % % % % % % | 80-120 80-120 80-120 80-120 80-120 80-120 80-120 80-120 80-120 80-120 | 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 |
| Beryllium (Be)-Total Bismuth (Bi)-Total Boron (B)-Total Cadmium (Cd)-Total Chromium (Cr)-Total Cobalt (Co)-Total Copper (Cu)-Total Lead (Pb)-Total Lithium (Li)-Total Manganese (Mn)-Total Molybdenum (Mo)-Total | 96.9 83.9 98.7 99.3 98.5 96.3 96.6 96.9 | % % % % % % % | 80-120 80-120 80-120 80-120 80-120 80-120 80-120 80-120 80-120 | 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 09-SEP-14 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|--------|------------|------------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | Water | | | | | | | |
| Batch R2942770 | | | | | | | | |
| WG1947258-3 CRM | | VA-HIGH-WA | | | | | | |
| Sodium (Na)-Total | | | 98.7 | | % | | 80-120 | 09-SEP-14 |
| Strontium (Sr)-Total | | | 100.3 | | % | | 80-120 | 09-SEP-14 |
| Thallium (TI)-Total | | | 97.8 | | % | | 80-120 | 09-SEP-14 |
| Tin (Sn)-Total | | | 97.7 | | % | | 80-120 | 09-SEP-14 |
| Titanium (Ti)-Total | | | 91.4 | | % | | 80-120 | 09-SEP-14 |
| Uranium (U)-Total | | | 98.5 | | % | | 80-120 | 09-SEP-14 |
| Vanadium (V)-Total | | | 99.8 | | % | | 80-120 | 09-SEP-14 |
| Zinc (Zn)-Total | | | 96.6 | | % | | 80-120 | 09-SEP-14 |
| WG1947258-1 MB | | | | | | | | |
| Aluminum (AI)-Total | | | <0.0030 | | mg/L | | 0.003 | 09-SEP-14 |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Barium (Ba)-Total | | | <0.000050 |) | mg/L | | 0.00005 | 09-SEP-14 |
| Beryllium (Be)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Bismuth (Bi)-Total | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Boron (B)-Total | | | < 0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Cadmium (Cd)-Total | | | <0.000010 |) | mg/L | | 0.00001 | 09-SEP-14 |
| Chromium (Cr)-Total | | | < 0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Cobalt (Co)-Total | | | < 0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Copper (Cu)-Total | | | < 0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Lead (Pb)-Total | | | < 0.000050 |) | mg/L | | 0.00005 | 09-SEP-14 |
| Lithium (Li)-Total | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Manganese (Mn)-Total | | | <0.000050 |) | mg/L | | 0.00005 | 09-SEP-14 |
| Molybdenum (Mo)-Total | l | | <0.000050 |) | mg/L | | 0.00005 | 09-SEP-14 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Selenium (Se)-Total | | | < 0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Silver (Ag)-Total | | | <0.000010 |) | mg/L | | 0.00001 | 09-SEP-14 |
| Sodium (Na)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 09-SEP-14 |
| Thallium (TI)-Total | | | <0.000010 |) | mg/L | | 0.00001 | 09-SEP-14 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Titanium (Ti)-Total | | | <0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Uranium (U)-Total | | | <0.000010 |) | mg/L | | 0.00001 | 09-SEP-14 |
| Vanadium (V)-Total | | | <0.0010 | | mg/L | | 0.001 | 09-SEP-14 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|--------|-------------|---------------------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | Water | | | | | | | |
| Batch R2942770 WG1947258-1 MB Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 09-SEP-14 |
| MET-TOT-LOW-ICP-VA | Water | | | | | | | |
| Batch R2942851 | | | | | | | | |
| WG1947258-3 CRM Calcium (Ca)-Total | | VA-HIGH-WAT | 7 RM 98.5 | | % | | 80-120 | 09-SEP-14 |
| Iron (Fe)-Total | | | 95.5 | | % | | 80-120 | 09-SEP-14 |
| Magnesium (Mg)-Total | | | 101.0 | | % | | 80-120 | 09-SEP-14 |
| Phosphorus (P)-Total | | | 97.8 | | % | | 80-120 | 09-SEP-14 |
| Potassium (K)-Total | | | 96.6 | | % | | 80-120 | 09-SEP-14 |
| Silicon (Si)-Total | | | 96.1 | | % | | 80-120 | 09-SEP-14 |
| WG1947258-1 MB | | | | | | | | |
| Calcium (Ca)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Iron (Fe)-Total | | | < 0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Magnesium (Mg)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Phosphorus (P)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Potassium (K)-Total | | | < 0.10 | | mg/L | | 0.1 | 09-SEP-14 |
| Silicon (Si)-Total | | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| PH-PCT-VA | Water | | | | | | | |
| Batch R2943649 | | | | | | | | |
| WG1947450-25 CRM pH | | VA-PH7-BUF | 7.01 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-26 CRM pH | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-27 CRM pH | | VA-PH7-BUF | 7.01 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-28 CRM pH | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-29 CRM pH | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-30 CRM pH | | VA-PH7-BUF | 6.99 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-31 CRM pH | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-32 CRM pH | | VA-PH7-BUF | 7.03 | | рН | | 6.9-7.1 | 09-SEP-14 |



Workorder: L1514222 Report Date: 10-SE

Report Date: 10-SEP-14 Page 8 of 10

| Test | | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------------------|-------------------------------------|--------|------------------------|---------------------|-----------|-------|-----|--------|-----------|
| S-DIS-ICP-VA | 240645 | Water | | | | | | | |
| | 042645 CRM Ived | | VA-HIGH-WA | TRM 101.7 | | % | | 80-120 | 09-SEP-14 |
| WG1947233-1 Sulfur (S)-Dissol | MB lved | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| S-TOT-ICP-VA | | Water | | | | | | | |
| WG1947258-3 | 942851 CRM | | VA-HIGH-WA | | | 0/ | | | |
| Sulfur (S)-Total WG1947258-1 | МВ | | | 101.6 | | % | | 80-120 | 09-SEP-14 |
| Sulfur (S)-Total SO4-TUR-VA | | Water | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| Batch R29 | 943291 | | | | | | | | |
| WG1948014-2 Sulfate (SO4) | CRM | | VA-SO4-L-CO | 98.4 | | % | | 85-115 | 10-SEP-14 |
| WG1948014-6 Sulfate (SO4) | CRM | | VA-SO4-H-C | ONTROL 102.8 | | % | | 85-115 | 10-SEP-14 |
| WG1948014-1 Sulfate (SO4) | МВ | | | <0.50 | | mg/L | | 0.5 | 10-SEP-14 |
| WG1948014-5 Sulfate (SO4) | МВ | | | <0.50 | | mg/L | | 0.5 | 10-SEP-14 |
| WG1948014-4 Sulfate (SO4) | MS | | L1512411-2 | 92.1 | | % | | 75-125 | 10-SEP-14 |
| WG1948014-8 Sulfate (SO4) | MS | | L1510555-1 | N/A | MS-B | % | | - | 10-SEP-14 |
| TURBIDITY-VA | | Water | | | | | | | |
| Batch R29 | 941561 | | | | | | | | |
| WG1947074-2 Turbidity | CRM | | VA-FORM-40 | 101.8 | | % | | 85-115 | 08-SEP-14 |
| WG1947074-3 Turbidity | DUP | | L1514222-1 0.28 | 0.27 | | NTU | 2.9 | 15 | 08-SEP-14 |
| WG1947074-1 Turbidity | МВ | | | <0.10 | | NTU | | 0.1 | 08-SEP-14 |

Workorder: L1514222 Report Date: 10-SEP-14 Page 9 of 10

Legend:

| Limit | ALS Control Limit (Data Quality Objectives) |
|-------|---|
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Sample Parameter Qualifier Definitions:

| Qualifier | Description |
|-----------|---|
| J | Duplicate results and limits are expressed in terms of absolute difference. |
| MB-LOR | Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Workorder: L1514222 Report Date: 10-SEP-14 Page 10 of 10

Hold Time Exceedances:

| | Sample | | | | | | |
|-------------------------|--------|------------------|------------------|---------|-----------|--------|-----------|
| ALS Product Description | ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
| Physical Tests | | | | | | | |
| pH by Meter (Automated) | | | | | | | |
| | 1 | 06-SEP-14 18:50 | 09-SEP-14 23:00 | 0.25 | 76 | hours | EHTR-FM |
| | 2 | 06-SEP-14 18:53 | 09-SEP-14 23:00 | 0.25 | 76 | hours | EHTR-FM |
| | 3 | 06-SEP-14 18:56 | 09-SEP-14 23:00 | 0.25 | 76 | hours | EHTR-FM |
| | 3 | 00-021 -14 10.50 | 03-0L1 -14 25.00 | 0.23 | 70 | 110013 | LIIII |

Legend & Qualifier Definitions:

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

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

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

EHT: Exceeded ALS recommended hold time prior to analysis.

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

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes. Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L1514222 were received on 07-SEP-14 09:30.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Ministry of Environment

Reg # 50212393

| | | | | | | | recy | " 31 | 04143 | 73 |
|--|--|-------------|--------------|-----------|------------|-----------------|----------------|---------------|------------|--------------|
| Irgent? Csr No. | Office 10 | Client C/ | A | Sampli | ng Age | ncy | | | | |
| Study | Project | N/A | | Code 1 | 0 1 | Name Vancou | uver Island, | Nanair | no | |
| | Analytics Inc. | | | Addres | | 2080-A Labie | | | 11 | - |
| Ministry Contact NCOBE | Nicole Obee | | | | | | | | | |
| Sampler Nicole O | bee | | | _ | | | | | | |
| Signature | | | | City | | Nanaimo | - 1075 (E | | | |
| MS Id | Well Plat | | | Postal | Code | V9T6J9 | Phone (2 | 250)75 | 1-3100 | |
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| | nclude total and dissolve | | | | | | | | | |
| | | | | | | | | | | |
| State W Descr | | ion Method | GRB |] | | | | | | |
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| YYYY-MM-D 1 REG 2014-09-06 | D HH:MI YYYY-MI 2014-09-06 | M:HH DD-M | Upper | Lower | Tide | ī | | No. of Co. | | |
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| 3 REG 11 | | 18564 | 10.0 | | | P | | 80 | | _ |
| 4 | | 1036 | 10.0 | | i | 1 | | | | |
| 5 | | | | | İ | Ī. | Prior | · | nroc | 255 |
| 6 | | | | I | | | Prior | ity | proc | 500 |
| ENERAL (1L) | Med'm | Pres'n | 110 | PECIFIC | T | 95\ | [Med'm | | 'n Med'm | |
| | inea m | Fresh | ² | | emical Ox | | 02 | D1 | I Med II | - res |
| Acidity pH 4.5 Acidity pH 8.3 | | | | | | Oxygen D. | 02 | 01 | | + |
| Alk. Titration Curve | | | | | n: DIC | ,3 | - | 1 | - | 1 |
| Alkalinity: Phen. | | | | | n; DOC | | 1 | 1 | | 1 |
| X Alkalinity: Total: pH 4.5 | 5 - N | | | Carbo | n: TIC | | 1 | | | |
| Colour, S.W. | | | | X Carbo | n: TOC | | | | | |
| Colour: True | | | | - | ical Oxyg | en D. | 04 | 05 | | I |
| X IpH | | | | | phyll "a" | | | | | 1 |
| Residue: Filterable: 0. | THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER. | | | | fe: SAD | + SCN | 02 | 24 | - | |
| Residue: Nonfilt., fixed | | | _ | | fe: WAD | | 02 | 24 | - | - |
| Residue: Nonfilterable Residue: Total | (199) | | | | phytin | Whole Bottle | 03 | 01 | | + |
| Residue: Total, Fixed | | | | | | ion Prep.) | - 03 | 1 | | - |
| Specific Conductance | | | | | de: Total | | 03 | 80 | | - |
| X Turbidity | | | | | | | | 1 | Med'm | Pres |
| SENERAL (120 mL) | Med'm | Pres'n | | RGANICS | | | | | | 1.103 |
| Anion Package (C1,B) | ,SO4) | | | | xtr. Hert | -Scan | | | | ļ |
| Chloride | | | | BTEX | | 73Call | · · | \dashv | | 1 |
| Fluoride | | | | EPH | | | | | | |
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| Nitrogen: Nitrate (Col | | | | | | : Gravimetric | | | | - |
| Nitrogen: Nitrite (Cof | n) | | | | | Pscan | | | | 1 |
| X Sulfate | | | | | | orus Pscan | | \rightarrow | | + |
| | | | | PAH | - Priospii | TIDAGE T OF THE | | | | + |
| GENERAL IONS (120 ml | .) Med'm 5 | 5 Pres'n | 64 | | /Tetra Cl | ohenois | | | | |
| Nitrogen: Ammonia (| Colim) | | | | ols (GC/M | | | -+ | | +- |
| Nitrogen: Organic Nitrogen: Tot. Kjeldal | nl (Calc) | | | 200 | ols: Color | | | | | - |
| Nitrogen: Total | | | | | ndor. Biph | | - | | | 1 |
| DVOCDUODIJE (400 - 1 | Med'm | Pres'n | | | Acids | | | | | 1 |
| PHOSPHORUS (120 mL) | | 7.6511 | | | ,r,- | es (THM) | | | | 1 |
| Phos. Diss. O-phospl Phosphorus: Tot. Dis | | | | | | | | 7 | | <u> </u> |
| Phosphorus: Total (C | | | | THER | wea.m | Pres'n | and dissolved | Test | N at ICDL | S level |
| METALS (TOTAL) | Med'm Pres'n | Med'm Pro | es'n | | - | Total | arki uissoived | ineron | iy at ICPM | 3 revei |
| igh Low | 55 02 | | | | | | | | | |
| Metal Pkg. (ICF | | | | 9 | | | | | | |
| X Metal Pkg. (ICF | MS) | | | | _ | | | | | - 12 |
| X Hardness | | | | | | 1 | | | | |
| X Mercury | n to < 63u | | F | IELD TEST | | No. Paran | neter Meth | od | Results | Units |
| Sediment, Siev | | | | ETAILS | | | | | | |
| METALS (DISSOLVED; 0.45 MICROMETERS) | Med'm Pres'n | Med'm Pr | res'n | | | | | | | |
| ligh Low | 33 62 | Ļ | | | | | | | | |
| Metal Pkg. (IC | P) | | | | | - | | $=\bot$ | | - |
| X Metal Pkg. (IC | | | | | | | - - | | | |
| X Hardness | | | - - | | | | | | - | |

Report ID: EMSR0900

X | Mercury

Rec by Paul sep 7 9:30 29C

Date: 2014-09-06 11:47



BC MINISTRY OF ENVIRONMENT

ATTN: Deborah Epps

Section Head, Provincial Water Quality

2080A Labieux Road Nanaimo BC V9T 6J9 Date Received: 07-SEP-14

Report Date: 10-SEP-14 17:56 (MT)

Version: FINAL

Client Phone: 604-793-8770

Certificate of Analysis

Lab Work Order #: L1514231

Project P.O. #: NOT SUBMITTED

Job Reference: SITE 3 ~ 200M FROM MYRA FALLS

C of C Numbers: 50212394

Legal Site Desc:

Dean Watt Account Manager

 $[This \ report \ shall \ not \ be \ reproduced \ except \ in \ full \ without \ the \ written \ authority \ of \ the \ Laboratory.]$

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700 ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

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L1514231 CONTD.... PAGE 2 of 7 10-SEP-14 17:56 (MT)

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | | | | V C I S I | |
|-------------------------------|---|--|--|--|--|--|
| | Sample ID Description Sampled Date Sampled Time Client ID | L1514231-1 WATER 06-SEP-14 19:10 SITE 3 ~ 200M | L1514231-2 WATER 06-SEP-14 19:13 SITE 3 ~ 200M | L1514231-3 WATER 06-SEP-14 19:16 SITE 3 ~ 200M | L1514231-4 WATER 06-SEP-14 19:16 SITE 3 ~ 200M | |
| | | FROM MYRA FALLS 0.5M | FROM MYRA FALLS 5.0M | FROM MYRA FALLS 10.0M | FROM MYRA FALLS DUP | |
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Physical Tests | Hardness (as CaCO3) (mg/L) | 31.2 | 31.7 | 33.7 | | |
| | pH (pH) | 7.76 | 7.77 | 7.76 | | |
| | Turbidity (NTU) | 0.16 | 0.26 | 0.15 | | |
| Anions and Nutrients | Alkalinity, Total (as CaCO3) (mg/L) | 25.4 | 25.5 | 25.8 | | |
| | Sulfate (SO4) (mg/L) | 5.97 | 16.6 | 7.07 | | |
| Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | 0.62 | 0.71 | 0.72 | | |
| | Total Organic Carbon (mg/L) | 0.73 | 0.60 | 0.63 | | |
| Total Metals | Aluminum (AI)-Total (ug/L) | 11.8 | 14.5 | 13.0 | | |
| | Antimony (Sb)-Total (ug/L) | <0.10 | <0.10 | <0.10 | | |
| | Arsenic (As)-Total (ug/L) | 0.21 | 0.22 | 0.22 | | |
| | Barium (Ba)-Total (ug/L) | 4.65 | 5.02 | 4.87 | | |
| | Beryllium (Be)-Total (ug/L) | <0.10 | <0.10 | <0.10 | | |
| | Bismuth (Bi)-Total (ug/L) | <0.50 | <0.50 | <0.50 | | |
| | Boron (B)-Total (ug/L) | <10 | <10 | <10 | | |
| | Cadmium (Cd)-Total (ug/L) | 0.019 | 0.025 | 0.022 | | |
| | Calcium (Ca)-Total (ug/L) | 11000 | 11500 | 11800 | | |
| | Chromium (Cr)-Total (ug/L) | <0.10 | 0.11 | 0.11 | | |
| | Cobalt (Co)-Total (ug/L) | <0.10 | <0.10 | <0.10 | | |
| | Copper (Cu)-Total (ug/L) | 0.67 | 0.70 | 1.02 | | |
| | Iron (Fe)-Total (ug/L) | <10 | 13 | 16 | | |
| | Lead (Pb)-Total (ug/L) | <0.050 | <0.050 | <0.050 | | |
| | Lithium (Li)-Total (ug/L) | <0.50 | <0.50 | <0.50 | | |
| | Magnesium (Mg)-Total (ug/L) | 930 | 970 | 980 | | |
| | Manganese (Mn)-Total (ug/L) | 1.49 | 2.60 | 3.62 | | |
| | Mercury (Hg)-Total (ug/L) | <0.010 | <0.010 | <0.010 | | |
| | Molybdenum (Mo)-Total (ug/L) | 0.297 | 0.325 | 0.335 | | |
| | Nickel (Ni)-Total (ug/L) | <0.50 | <0.50 | <0.50 | | |
| | Phosphorus (P)-Total (ug/L) | <50 | <50 | <50 | | |
| | Potassium (K)-Total (ug/L) | 130 | 140 | 180 | | |
| | Selenium (Se)-Total (ug/L) | 0.12 | 0.13 | 0.12 | | |
| | Silicon (Si)-Total (ug/L) | 1310 | 1330 | 1330 | | |
| | Silver (Ag)-Total (ug/L) | <0.010 | <0.010 | <0.010 | | |
| | Sodium (Na)-Total (ug/L) | 1010 | 1100 | 1120 | | |
| | Strontium (Sr)-Total (ug/L) | 17.0 | 18.1 | 18.1 | | |
| | Sulfur (S)-Total (ug/L) | 2200 | 2550 | 2700 | | |
| | Thallium (TI)-Total (ug/L) | <0.010 | <0.010 | <0.010 | | |

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L1514231 CONTD.... PAGE 3 of 7 10-SEP-14 17:56 (MT)

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | | | | V C1 310 | |
|------------------|---|--|--|--|--|--|
| | Sample ID Description Sampled Date Sampled Time Client ID | L1514231-1 WATER 06-SEP-14 19:10 SITE 3 ~ 200M | L1514231-2 WATER 06-SEP-14 19:13 SITE 3 ~ 200M | L1514231-3 WATER 06-SEP-14 19:16 SITE 3 ~ 200M | L1514231-4 WATER 06-SEP-14 19:16 SITE 3 ~ 200M | |
| | | FROM MYRA FALLS 0.5M | FROM MYRA FALLS 5.0M | FROM MYRA FALLS 10.0M | FROM MYRA FALLS DUP | |
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Total Metals | Tin (Sn)-Total (ug/L) | <0.10 | <0.10 | <0.10 | | |
| | Titanium (Ti)-Total (ug/L) | <10 | <10 | <10 | | |
| | Uranium (U)-Total (ug/L) | 0.012 | 0.013 | 0.011 | | |
| | Vanadium (V)-Total (ug/L) | <1.0 | <1.0 | <1.0 | | |
| | Zinc (Zn)-Total (ug/L) | 4.8 | 6.4 | 5.8 | | |
| Dissolved Metals | Dissolved Mercury Filtration Location | LAB | LAB | LAB | LAB | |
| | Dissolved Metals Filtration Location | LAB | LAB | LAB | LAB | |
| | Aluminum (Al)-Dissolved (ug/L) | 10.8 | 10.1 | 9.9 | 9.9 | |
| | Antimony (Sb)-Dissolved (ug/L) | <0.10 | <0.10 | <0.10 | <0.10 | |
| | Arsenic (As)-Dissolved (ug/L) | 0.18 | 0.19 | 0.20 | 0.18 | |
| | Barium (Ba)-Dissolved (ug/L) | 4.60 | 4.86 | 4.86 | 4.82 | |
| | Beryllium (Be)-Dissolved (ug/L) | <0.10 | <0.10 | <0.10 | <0.10 | |
| | Bismuth (Bi)-Dissolved (ug/L) | <0.50 | <0.50 | <0.50 | <0.50 | |
| | Boron (B)-Dissolved (ug/L) | <10 | <10 | <10 | <10 | |
| | Cadmium (Cd)-Dissolved (ug/L) | 0.016 | 0.016 | 0.016 | 0.015 | |
| | Calcium (Ca)-Dissolved (ug/L) | 11000 | 11200 | 11900 | 11900 | |
| | Chromium (Cr)-Dissolved (ug/L) | <0.10 | <0.10 | <0.10 | <0.10 | |
| | Cobalt (Co)-Dissolved (ug/L) | <0.10 | <0.10 | <0.10 | <0.10 | |
| | Copper (Cu)-Dissolved (ug/L) | 0.42 | 0.49 | 0.49 | 0.46 | |
| | Iron (Fe)-Dissolved (ug/L) | <10 | <10 | <10 | <10 | |
| | Lead (Pb)-Dissolved (ug/L) | <0.050 | <0.050 | <0.050 | <0.050 | |
| | Lithium (Li)-Dissolved (ug/L) | <0.50 | <0.50 | <0.50 | <0.50 | |
| | Magnesium (Mg)-Dissolved (ug/L) | 920 | 930 | 990 | 990 | |
| | Manganese (Mn)-Dissolved (ug/L) | 0.091 | 0.056 | <0.050 | <0.050 | |
| | Mercury (Hg)-Dissolved (ug/L) | <0.010 | <0.010 | <0.010 | <0.010 | |
| | Molybdenum (Mo)-Dissolved (ug/L) | 0.281 | 0.324 | 0.328 | 0.350 | |
| | Nickel (Ni)-Dissolved (ug/L) | <0.50 | <0.50 | <0.50 | <0.50 | |
| | Phosphorus (P)-Dissolved (ug/L) | <50 | <50 | <50 | <50 | |
| | Potassium (K)-Dissolved (ug/L) | 130 | 150 | 180 | 160 | |
| | Selenium (Se)-Dissolved (ug/L) | 0.14 | 0.12 | 0.10 | 0.11 | |
| | Silicon (Si)-Dissolved (ug/L) | 1290 | 1280 | 1340 | 1350 | |
| | Silver (Ag)-Dissolved (ug/L) | <0.010 | <0.010 | <0.010 | <0.010 | |
| | Sodium (Na)-Dissolved (ug/L) | 991 | 1070 | 1120 | 1110 | |
| | Strontium (Sr)-Dissolved (ug/L) | 16.4 | 17.3 | 17.7 | 17.8 | |
| | Sulfur (S)-Dissolved (ug/L) | 2270 | 2510 | 2680 | 2640 | |
| | Thallium (TI)-Dissolved (ug/L) | <0.010 | <0.010 | <0.010 | <0.010 | |
| | Tin (Sn)-Dissolved (ug/L) | <0.10 | <0.10 | <0.10 | <0.10 | |

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L1514231 CONTD.... PAGE 4 of 7 10-SEP-14 17:56 (MT)

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | | | | V C I S I | OII. TINAL |
|------------------|---|---|---|---|---|------------|
| | Sample ID Description Sampled Date Sampled Time Client ID | L1514231-1 WATER 06-SEP-14 19:10 SITE 3 ~ 200M FROM MYRA | L1514231-2 WATER 06-SEP-14 19:13 SITE 3 ~ 200M FROM MYRA | L1514231-3 WATER 06-SEP-14 19:16 SITE 3 ~ 200M FROM MYRA | L1514231-4 WATER 06-SEP-14 19:16 SITE 3 ~ 200M FROM MYRA | |
| | | FALLS 0.5M | FALLS 5.0M | FALLS 10.0M | FALLS DUP | |
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Dissolved Metals | Titanium (Ti)-Dissolved (ug/L) | <10 | <10 | <10 | <10 | |
| | Uranium (U)-Dissolved (ug/L) | 0.011 | 0.011 | 0.011 | 0.011 | |
| | Vanadium (V)-Dissolved (ug/L) | <1.0 DLB | <1.0 DLB | <1.0 DLB | <1.0 DLB | |
| | Zinc (Zn)-Dissolved (ug/L) | <5.0 | <6.0 | <6.0 | <6.0 | |
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^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L1514231 CONTD....

PAGE 5 of 7

10-SEP-14 17:56 (MT) Version: FINAL

Reference Information

Qualifiers for Sample Submission Listed:

| Qualifier | Description |
|-----------|---|
| WSMT | Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low. |
| WSMD | Water sample(s) for dissolved mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low. |

QC Samples with Qualifiers & Comments:

| Parameter | Qualifier | Applies to Sample Number(s) |
|--------------------------|--|---|
| Zinc (Zn)-Dissolved | MB-LOR | L1514231-1, -2, -3, -4 |
| Sulfate (SO4) | MS-B | L1514231-1, -2, -3 |
| Total Organic Carbon | MS-B | L1514231-1, -2, -3 |
| Dissolved Organic Carbon | MS-B | L1514231-1, -2, -3 |
| | Zinc (Zn)-Dissolved Sulfate (SO4) Total Organic Carbon | Zinc (Zn)-Dissolved MB-LOR Sulfate (SO4) MS-B Total Organic Carbon MS-B |

Qualifiers for Individual Parameters Listed:

| Qualifier | Description |
|-----------|---|
| DLB | Detection Limit was raised due to detection of analyte at comparable level in Method Blank. |
| MB-LOR | Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---------------|--------|---|--------------------|
| ALK-COL-VA | Water | Alkalinity by Colourimetric (Automated) | EPA 310.2 |

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

CARBONS-DOC-VA

Water D

Dissolved organic carbon by combustion

APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-TOC-VA

Water

Total organic carbon by combustion

APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

HARDNESS-CALC-VA

Water

Hardness

APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-DIS-LOW-CVAES-VA

Wa

Dissolved Mercury in Water by CVAFS(Low)

EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water

Total Mercury in Water by CVAFS(Low)

EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-D-CCMS-VA

Wate

Dissolved Metals in Water by CRC ICPMS

APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-DIS-LOW-ICP-VA

Water

Dissolved Metals in Water by ICPOES

EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA

Water

Total Metals in Water by CRC ICPMS

APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United

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States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-TOT-LOW-ICP-VA

Water

Total Metals in Water by ICPOES

EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

PH-PCT-VA

Water

pH by Meter (Automated)

APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA

Water

pH by Meter (Automated)

APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

S-DIS-ICP-VA

Water

Dissolved Sulfur in Water by ICPOES

EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

S-TOT-ICP-VA

Water

Total Sulfur in Water by ICPOES

EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

SO4-TUR-VA

Water

Sulfate(SO4) by Turbidity

APHA 4500-SO4 E. SULFATE

This analysis is carried out using procedures adapted from APHA Method 4500-SO4 "Sulfate". Sulfate is determined using the turbidimetric method.

TURBIDITY-VA

Water

Turbidity by Meter

APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA

Water

Turbidity by Meter

APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code

Laboratory Location

VA AL

ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

50212394

Reference Information

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GLOSSARY OF REPORT TERMS

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

mg/kg - milligrams per kilogram based on dry weight of sample. mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATÉD, ALL SAMPLES WERE RÉCEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



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Client: BC MINISTRY OF ENVIRONMENT

Section Head, Provincial Water Quality 2080A Labieux Road

Nanaimo BC V9T 6J9

Contact: Deborah Epps

| Contact: Di | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|-------------------------|-------------|-------------------|-----------|-------|-----|--------|------------|
| ALK-COL-VA | Water | | | | | | | |
| | 941773 | | | | | | | |
| WG1947162-2 Alkalinity, Total (| CRM as CaCO3) | VA-ALKL-CO | NTROL 97.4 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-5 Alkalinity, Total (| CRM as CaCO3) | VA-ALKM-CC | 103.7 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-8 Alkalinity, Total (| CRM as CaCO3) | VA-ALKH-CO | NTROL 100.8 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-1 Alkalinity, Total (| MB as CaCO3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-10 Alkalinity, Total (| | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-4 Alkalinity, Total (| MB as CaCO3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-7 Alkalinity, Total (| MB as CaCO3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| ARBONS-DOC-VA | Water | | | | | | | |
| Batch R29 | 943332 | | | | | | | |
| WG1947341-12 Dissolved Organ | | | 103.6 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-16 Dissolved Organ | | | 109.1 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-4 Dissolved Organ | | | 101.8 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-8 Dissolved Organ | | | 105.9 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-11 Dissolved Organ | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-15 Dissolved Organ | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-3 Dissolved Organ | MB ic Carbon | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-7 Dissolved Organ | MB iic Carbon | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-10 Dissolved Organ | | L1513619-2 | 100.6 | | % | | 70-130 | 09-SEP-14 |
| WG1947341-14 Dissolved Organ | MS | L1513418-11 | N/A | MS-B | % | | - | 09-SEP-14 |
| WG1947341-2 Dissolved Organ | MS | L1514231-1 | 104.6 | | % | | 70-130 | 09-SEP-14 |
| WG1947341-6 | MS | L1514251-1 | | | | | 70-100 | 00 OEI -14 |



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| | | | 2101120 | | toport Bato. | O OLI 14 | rage 2 or ro | | |
|--|--------|-------------|-----------|-----------|--------------|----------|--------------|-----------|--|
| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed | |
| CARBONS-DOC-VA Batch R2943332 WG1947341-6 MS Dissolved Organic Carb | | L1514251-1 | 106.5 | | % | | 70-130 | 09-SEP-14 | |
| CARBONS-TOC-VA | Water | | | | | | | | |
| Batch R2943331 WG1947339-1 LCS Total Organic Carbon | | | 100.0 | | % | | 80-120 | 09-SEP-14 | |
| WG1947339-13 LCS Total Organic Carbon | | | 99.6 | | % | | 80-120 | 09-SEP-14 | |
| WG1947339-17 LCS Total Organic Carbon | | | 101.1 | | % | | 80-120 | 09-SEP-14 | |
| WG1947339-5 LCS Total Organic Carbon | | | 102.0 | | % | | 80-120 | 09-SEP-14 | |
| WG1947339-9 LCS Total Organic Carbon | | | 99.95 | | % | | 80-120 | 09-SEP-14 | |
| WG1947339-12 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 | |
| WG1947339-16 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 | |
| WG1947339-4 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 | |
| WG1947339-8 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 | |
| WG1947339-15 MS Total Organic Carbon | | L1513418-11 | N/A | MS-B | % | | - | 09-SEP-14 | |
| WG1947339-3 MS Total Organic Carbon | | L1514231-1 | 103.0 | | % | | 70-130 | 09-SEP-14 | |
| WG1947339-7 MS Total Organic Carbon | | L1514251-1 | 102.5 | | % | | 70-130 | 09-SEP-14 | |
| HG-DIS-LOW-CVAFS-VA | Water | | | | | | | | |
| Batch R2942725 WG1947233-3 LCS Mercury (Hg)-Dissolved | | | 89.2 | | % | | 80-120 | 09-SEP-14 | |
| Batch R2943546 WG1947233-1 MB Mercury (Hg)-Dissolved | | | <0.000010 |) | mg/L | | 0.00001 | 10-SEP-14 | |



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| | | | | | | | ι α | 0 |
|--------------------------------------|--------|------------|-----------|-----------|-------|-----|-------------|-----------|
| Test N | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
| HG-TOT-LOW-CVAFS-VA | Water | | | | | | | |
| Batch R2942725 | | | | | | | | |
| WG1947862-2 LCS | | | | | | | | |
| Mercury (Hg)-Total | | | 95.9 | | % | | 80-120 | 09-SEP-14 |
| WG1947862-1 MB | | | 0.000010 | | (I | | | |
| Mercury (Hg)-Total | | | <0.000010 |) | mg/L | | 0.00001 | 09-SEP-14 |
| WG1947862-3 MS Mercury (Hg)-Total | | L1514076-1 | 89.1 | | % | | 70-130 | 09-SEP-14 |
| WG1947862-4 MS | | L1514076-3 | 03.1 | | 76 | | 70-130 | 09-5EP-14 |
| Mercury (Hg)-Total | | L1514076-3 | 94.6 | | % | | 70-130 | 09-SEP-14 |
| | Water | | | | | | , , , , , , | 00 02 |
| Batch R2942770 | water | | | | | | | |
| WG1947233-2 CRM | | VA-HIGH-WA | TRM | | | | | |
| Aluminum (AI)-Dissolved | | | 102.1 | | % | | 80-120 | 09-SEP-14 |
| Antimony (Sb)-Dissolved | | | 97.3 | | % | | 80-120 | 09-SEP-14 |
| Arsenic (As)-Dissolved | | | 97.4 | | % | | 80-120 | 09-SEP-14 |
| Barium (Ba)-Dissolved | | | 98.6 | | % | | 80-120 | 09-SEP-14 |
| Beryllium (Be)-Dissolved | | | 97.7 | | % | | 80-120 | 09-SEP-14 |
| Bismuth (Bi)-Dissolved | | | 97.7 | | % | | 80-120 | 09-SEP-14 |
| Boron (B)-Dissolved | | | 85.5 | | % | | 80-120 | 09-SEP-14 |
| Cadmium (Cd)-Dissolved | | | 96.8 | | % | | 80-120 | 09-SEP-14 |
| Chromium (Cr)-Dissolved | | | 96.9 | | % | | 80-120 | 09-SEP-14 |
| Cobalt (Co)-Dissolved | | | 96.3 | | % | | 80-120 | 09-SEP-14 |
| Copper (Cu)-Dissolved | | | 95.4 | | % | | 80-120 | 09-SEP-14 |
| Lead (Pb)-Dissolved | | | 96.9 | | % | | 80-120 | 09-SEP-14 |
| Lithium (Li)-Dissolved | | | 99.2 | | % | | 80-120 | 09-SEP-14 |
| Manganese (Mn)-Dissolve | d | | 99.6 | | % | | 80-120 | 09-SEP-14 |
| Molybdenum (Mo)-Dissolve | ed | | 98.5 | | % | | 80-120 | 09-SEP-14 |
| Nickel (Ni)-Dissolved | | | 98.2 | | % | | 80-120 | 09-SEP-14 |
| Selenium (Se)-Dissolved | | | 98.9 | | % | | 80-120 | 09-SEP-14 |
| Silver (Ag)-Dissolved | | | 98.9 | | % | | 80-120 | 09-SEP-14 |
| Sodium (Na)-Dissolved | | | 97.2 | | % | | 80-120 | 09-SEP-14 |
| Strontium (Sr)-Dissolved | | | 99.1 | | % | | 80-120 | 09-SEP-14 |
| Thallium (TI)-Dissolved | | | 98.2 | | % | | 80-120 | 09-SEP-14 |
| Tin (Sn)-Dissolved | | | 97.1 | | % | | 80-120 | 09-SEP-14 |
| Titanium (Ti)-Dissolved | | | 99.4 | | % | | 80-120 | 09-SEP-14 |
| Uranium (U)-Dissolved | | | 99.5 | | % | | 80-120 | 09-SEP-14 |
| Vanadium (V)-Dissolved | | | 97.4 | | % | | 80-120 | 09-SEP-14 |



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| Test Matri | ix Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|--------------|-----------------------|-----------|-------|-----|------------------|------------------------|
| MET-D-CCMS-VA Wate | er | | | | | | |
| Batch R2942770 | | | | | | | |
| WG1947233-2 CRM | VA-HIGH-WA | | | | | | |
| Zinc (Zn)-Dissolved | | 95.8 | | % | | 80-120 | 09-SEP-14 |
| WG1947233-1 MB Aluminum (Al)-Dissolved | | <0.0010 | | mg/L | | 0.001 | 09-SEP-14 |
| Antimony (Sb)-Dissolved | | <0.0010 | | mg/L | | | |
| Arsenic (As)-Dissolved | | <0.00010 | | mg/L | | 0.0001 0.0001 | 09-SEP-14 09-SEP-14 |
| Barium (Ba)-Dissolved | | <0.00010 | | mg/L | | 0.0001 | |
| Beryllium (Be)-Dissolved | | <0.00010 | | mg/L | | | 09-SEP-14 |
| Bismuth (Bi)-Dissolved | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Boron (B)-Dissolved | | <0.00030 | | mg/L | | 0.0005 | 09-SEP-14 |
| Cadmium (Cd)-Dissolved | | <0.00010 | | | | 0.01 | 09-SEP-14 |
| Chromium (Cr)-Dissolved | | <0.00010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Cobalt (Co)-Dissolved | | | | mg/L | | 0.0001 | 09-SEP-14 |
| , , | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Copper (Cu)-Dissolved Lead (Pb)-Dissolved | | <0.00020 <0.000050 | | mg/L | | 0.0002 | 09-SEP-14 |
| Lithium (Li)-Dissolved | | <0.00050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Manganese (Mn)-Dissolved | | | | mg/L | | 0.0005 | 09-SEP-14 |
| | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Molybdenum (Mo)-Dissolved | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Nickel (Ni)-Dissolved | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Selenium (Se)-Dissolved | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Silver (Ag)-Dissolved | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Sodium (Na)-Dissolved | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Strontium (Sr)-Dissolved | | <0.00020 | | mg/L | | 0.0002 | 09-SEP-14 |
| Thallium (TI)-Dissolved | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Tin (Sn)-Dissolved | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Titanium (Ti)-Dissolved | | <0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Uranium (U)-Dissolved | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Vanadium (V)-Dissolved | | <0.0010 | | mg/L | | 0.001 | 09-SEP-14 |
| Zinc (Zn)-Dissolved | | 0.0024 | MB-LOR | mg/L | | 0.001 | 09-SEP-14 |
| MET-DIS-LOW-ICP-VA Wate | er | | | | | | |
| Batch R2942645 | | | | | | | |
| WG1947233-2 CRM Calcium (Ca)-Dissolved | VA-HIGH-WA | TRM 101.0 | | % | | 00 100 | 00 SED 44 |
| Iron (Fe)-Dissolved | | 95.0 | | % | | 80-120 | 09-SEP-14 |
| Magnesium (Mg)-Dissolved | | 100.6 | | % | | 80-120 | 09-SEP-14 |
| wagnesium (wg)-bissowed | | 0.001 | | 70 | | 80-120 | 09-SEP-14 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|----------------|-----------|--------|-----------|-------|-----|--------|------------------------|
| MET-DIS-LOW-ICP-VA | Water | | | | | | | |
| Batch R294264 | 15 | | | | | | | |
| WG1947233-2 CRM | | VA-HIGH-W | | | | | | |
| Phosphorus (P)-Disso | | | 99.6 | | % | | 80-120 | 09-SEP-14 |
| Potassium (K)-Dissolv | /ed | | 97.4 | | % | | 80-120 | 09-SEP-14 |
| Silicon (Si)-Dissolved | | | 98.5 | | % | | 80-120 | 09-SEP-14 |
| WG1947233-1 MB Calcium (Ca)-Dissolve | ad | | <0.050 | | mg/L | | 0.05 | 00 CED 14 |
| Iron (Fe)-Dissolved | o u | | <0.030 | | mg/L | | 0.05 | 09-SEP-14 09-SEP-14 |
| Magnesium (Mg)-Diss | colved | | <0.010 | | mg/L | | 0.01 | 09-SEP-14 09-SEP-14 |
| Phosphorus (P)-Disso | | | <0.050 | | mg/L | | 0.05 | |
| Potassium (K)-Dissolv | | | <0.10 | | mg/L | | 0.03 | 09-SEP-14 09-SEP-14 |
| Silicon (Si)-Dissolved | 760 | | <0.050 | | mg/L | | 0.05 | |
| | | | <0.030 | | mg/L | | 0.05 | 09-SEP-14 |
| MET-T-CCMS-VA | Water | | | | | | | |
| Batch R294277 | | | | | | | | |
| WG1947258-3 CRN Aluminum (Al)-Total | Л | VA-HIGH-W | 101.1 | | % | | 80-120 | 09-SEP-14 |
| Antimony (Sb)-Total | | | 97.5 | | % | | 80-120 | 09-SEP-14 |
| Arsenic (As)-Total | | | 99.4 | | % | | 80-120 | 09-SEP-14 |
| Barium (Ba)-Total | | | 100.1 | | % | | 80-120 | 09-SEP-14 |
| Beryllium (Be)-Total | | | 97.0 | | % | | 80-120 | 09-SEP-14 |
| Bismuth (Bi)-Total | | | 96.9 | | % | | 80-120 | 09-SEP-14 |
| Boron (B)-Total | | | 83.9 | | % | | 80-120 | 09-SEP-14 |
| Cadmium (Cd)-Total | | | 98.7 | | % | | 80-120 | 09-SEP-14 |
| Chromium (Cr)-Total | | | 99.3 | | % | | 80-120 | 09-SEP-14 |
| Cobalt (Co)-Total | | | 98.5 | | % | | 80-120 | 09-SEP-14 |
| Copper (Cu)-Total | | | 96.3 | | % | | 80-120 | 09-SEP-14 |
| Lead (Pb)-Total | | | 96.6 | | % | | 80-120 | 09-SEP-14 |
| Lithium (Li)-Total | | | 96.9 | | % | | 80-120 | 09-SEP-14 |
| Manganese (Mn)-Tota | al | | 101.1 | | % | | 80-120 | 09-SEP-14 |
| Molybdenum (Mo)-To | tal | | 99.1 | | % | | 80-120 | 09-SEP-14 |
| Nickel (Ni)-Total | | | 99.8 | | % | | 80-120 | 09-SEP-14 |
| Selenium (Se)-Total | | | 99.6 | | % | | 80-120 | 09-SEP-14 |
| Silver (Ag)-Total | | | 95.4 | | % | | 80-120 | 09-SEP-14 |
| Sodium (Na)-Total | | | 98.7 | | % | | 80-120 | 09-SEP-14 |
| Strontium (Sr)-Total | | | 100.3 | | % | | 80-120 | 09-SEP-14 |
| Thallium (TI)-Total | | | 97.8 | | % | | 80-120 | 09-SEP-14 |
| | | | | | | | | |



MET-TOT-LOW-ICP-VA

Water

Quality Control Report

Workorder: L1514231 Report Date: 10-SEP-14

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------------------|--------|-----------|-----------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | Water | | | | | | | |
| Batch R2942770 | | | | | | | | |
| WG1947258-3 CRM | | VA-HIGH-W | ATRM | | | | | |
| Tin (Sn)-Total | | | 97.7 | | % | | 80-120 | 09-SEP-14 |
| Titanium (Ti)-Total | | | 91.4 | | % | | 80-120 | 09-SEP-14 |
| Uranium (U)-Total | | | 98.5 | | % | | 80-120 | 09-SEP-14 |
| Vanadium (V)-Total | | | 99.8 | | % | | 80-120 | 09-SEP-14 |
| Zinc (Zn)-Total | | | 96.6 | | % | | 80-120 | 09-SEP-14 |
| WG1947258-1 MB Aluminum (Al)-Total | | | <0.0030 | | mg/L | | 0.003 | 09-SEP-14 |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Barium (Ba)-Total | | | < 0.00005 | 0 | mg/L | | 0.00005 | 09-SEP-14 |
| Beryllium (Be)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Bismuth (Bi)-Total | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Boron (B)-Total | | | < 0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Cadmium (Cd)-Total | | | < 0.00001 | 0 | mg/L | | 0.00001 | 09-SEP-14 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Copper (Cu)-Total | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Lead (Pb)-Total | | | < 0.00005 | 0 | mg/L | | 0.00005 | 09-SEP-14 |
| Lithium (Li)-Total | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Manganese (Mn)-Total | | | < 0.00005 | 0 | mg/L | | 0.00005 | 09-SEP-14 |
| Molybdenum (Mo)-Total | | | < 0.00005 | 0 | mg/L | | 0.00005 | 09-SEP-14 |
| Nickel (Ni)-Total | | | < 0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Selenium (Se)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Silver (Ag)-Total | | | < 0.00001 | 0 | mg/L | | 0.00001 | 09-SEP-14 |
| Sodium (Na)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 09-SEP-14 |
| Thallium (TI)-Total | | | < 0.00001 | 0 | mg/L | | 0.00001 | 09-SEP-14 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Titanium (Ti)-Total | | | < 0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Uranium (U)-Total | | | < 0.00001 | 0 | mg/L | | 0.00001 | 09-SEP-14 |
| Vanadium (V)-Total | | | < 0.0010 | | mg/L | | 0.001 | 09-SEP-14 |
| Zinc (Zn)-Total | | | < 0.0030 | | mg/L | | 0.003 | 09-SEP-14 |

Page 6 of 10



Workorder: L1514231

Report Date: 10-SEP-14

Page 7 of 10

| Test | | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------------------|--------------|--------|------------|---------------------|-----------|-------|-----|---------|-----------|
| MET-TOT-LOV | V-ICP-VA | Water | | | | | | | |
| Batch | R2942851 | | | | | | | | |
| WG1947256 Calcium (C | | | VA-HIGH-WA | TRM 98.5 | | % | | 80-120 | 09-SEP-14 |
| Iron (Fe)-T | | | | 95.5 | | % | | 80-120 | 09-SEP-14 |
| | n (Mg)-Total | | | 101.0 | | % | | 80-120 | 09-SEP-14 |
| Phosphoru | | | | 97.8 | | % | | 80-120 | 09-SEP-14 |
| Potassium | | | | 96.6 | | % | | 80-120 | 09-SEP-14 |
| Silicon (Si) | | | | 96.1 | | % | | 80-120 | 09-SEP-14 |
| WG194725 | 8-1 MB | | | | | | | | |
| Calcium (C | a)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Iron (Fe)-T | otal | | | < 0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Magnesiun | n (Mg)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Phosphoru | s (P)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Potassium | (K)-Total | | | < 0.10 | | mg/L | | 0.1 | 09-SEP-14 |
| Silicon (Si) | -Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| PH-PCT-VA | | Water | | | | | | | |
| Batch | R2943649 | | | | | | | | |
| WG194745 6 pH | 0-25 CRM | | VA-PH7-BUF | 7.01 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG194745 6 pH | 0-26 CRM | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG194745 6 | 0-27 CRM | | VA-PH7-BUF | 7.01 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG194745 | 0-28 CRM | | VA-PH7-BUF | | | • | | | |
| рН | | | | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG194745 6 pH | 0-29 CRM | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG194745 6 pH | 0-30 CRM | | VA-PH7-BUF | 6.99 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG194745 6 pH | 0-31 CRM | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG194745 6 pH | 0-32 CRM | | VA-PH7-BUF | 7.03 | | рН | | 6.9-7.1 | 09-SEP-14 |
| S-DIS-ICP-VA | | Water | | | | | | | |
| Batch | R2942645 | | | | | | | | |
| WG194723 : Sulfur (S)-I | 3-2 CRM | | VA-HIGH-WA | TRM 101.7 | | % | | 80-120 | 09-SEP-14 |
| WG194723 | 3-1 MB | | | | | | | | |



Workorder: L1514231

Report Date: 10-SEP-14 Page 8 of 10

| Test | | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------------------|-------------------|--------|-------------|---------------------|-----------|-------|-----|--------|-----------|
| S-DIS-ICP-VA | | Water | | | | | | | |
| Batch R29 | 942645 | | | | | | | | |
| WG1947233-1 Sulfur (S)-Disso | MB lved | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| S-TOT-ICP-VA | | Water | | | | | | | |
| Batch R29 | 942851 | | | | | | | | |
| WG1947258-3 Sulfur (S)-Total | CRM | | VA-HIGH-WA | TRM 101.6 | | % | | 80-120 | 09-SEP-14 |
| WG1947258-1 Sulfur (S)-Total | МВ | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| SO4-TUR-VA | | Water | | | | | | | |
| Batch R29 | 943291 | | | | | | | | |
| WG1948014-2 Sulfate (SO4) | CRM | | VA-SO4-L-CO | 98.4 | | % | | 85-115 | 10-SEP-14 |
| WG1948014-6 Sulfate (SO4) | CRM | | VA-SO4-H-CC | NTROL 102.8 | | % | | 85-115 | 10-SEP-14 |
| WG1948014-1 Sulfate (SO4) | МВ | | | <0.50 | | mg/L | | 0.5 | 10-SEP-14 |
| WG1948014-5 Sulfate (SO4) | МВ | | | <0.50 | | mg/L | | 0.5 | 10-SEP-14 |
| WG1948014-4 Sulfate (SO4) | MS | | L1512411-2 | 92.1 | | % | | 75-125 | 10-SEP-14 |
| WG1948014-8 Sulfate (SO4) | MS | | L1510555-1 | N/A | MS-B | % | | - | 10-SEP-14 |
| TURBIDITY-VA | | Water | | 1 4/ 1 | WO B | , , | | - | 10-0LF-14 |
| | 941561 | | | | | | | | |
| WG1947074-2 Turbidity | CRM | | VA-FORM-40 | 101.8 | | % | | 85-115 | 08-SEP-14 |
| WG1947074-1 | МВ | | | | | | | | |
| Turbidity | | | | <0.10 | | NTU | | 0.1 | 08-SEP-14 |

Workorder: L1514231 Report Date: 10-SEP-14 Page 9 of 10

Legend:

| Limit | ALS Control Limit (Data Quality Objectives) |
|-------|---|
| DUP | Duplicate Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Sample Parameter Qualifier Definitions:

| Qualifier | Description |
|-----------|---|
| J | Duplicate results and limits are expressed in terms of absolute difference. |
| MB-LOR | Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Workorder: L1514231 Report Date: 10-SEP-14 Page 10 of 10

Hold Time Exceedances:

| | Sample | | | | | | |
|-------------------------|--------|-----------------|-----------------|---------|-----------|-------|-----------|
| ALS Product Description | ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
| Physical Tests | | | | | | | |
| pH by Meter (Automated) | | | | | | | |
| | 1 | 06-SEP-14 19:10 | 09-SEP-14 23:00 | 0.25 | 76 | hours | EHTR-FM |
| | 2 | 06-SEP-14 19:13 | 09-SEP-14 23:00 | 0.25 | 76 | hours | EHTR-FM |
| | 3 | 06-SEP-14 19:16 | 09-SEP-14 23:00 | 0.25 | 76 | hours | EHTR-FM |

Legend & Qualifier Definitions:

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

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

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

EHT: Exceeded ALS recommended hold time prior to analysis.

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

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes. Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L1514231 were received on 07-SEP-14 09:30.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

WATER & GENERAL CHEMISTRY REQUISITION

Province Of British Columbia

Ministry of Environment

Reg # 50212394

| maxicam Arialytics inc |
|------------------------|
| 4606 Canada Way |
| Burnaby, BC V5G1K |
| |

| | | | | | | | | | | | 2125 | <u> </u> |
|--------------|--|--------------|-------------|---------|---------|--|------------|--------------|----------|---------|--|---------------|
| Irgent | ? Csr No. | Office 10 | Client | CA | Sa | mpling Age | ncy | | | | | 1 |
| tu dy | | | | | Co | Code 10 Name Vancouver Island, Nanaimo | | | | | | |
| ab | Maxxam Analytics II | nc. | | | Ad | dress | 2080-A | Labieux Ro | ad | | | |
| Ainistr | ry Contact NCOBEE Nicole Ob | œe | | | | | | | | | | 10.00 |
| ampl | er Nicole Obee | 19 20 | | | | | | | | | | |
| ignat | ture | | | | Cit | y | Nanaim | | | 138 | | |
| MS 1 | d | Well Pla | te# | | Po | stal Code | V9T6J9 | Ph | one (2 | 50)751- | -3100 | |
| ocati | on Site 3 v200m | from N | IM F | 7115 | Nu | mber of Cor | ntainers | | | | | $\overline{}$ |
| _ | Die is al ale tota | | | | | | | - | | | auti | |
| istruc | ctions To Lab Pis include tota | | , | | | | | | | | | 2.5 |
| Stat | te FW Descriptor GE | Collec | tion Method | GRB | \neg | | | | | | | |
| | Class Collection Start | _ | tion End | | Depth | | | | | | | |
| 10. | YYYY-MM-DD HH:MI | | M-DD HH:M | II Up | | wer Tide | | | | | | |
| 1 | REG 2014-09-06 | 2014-09-06 | 1910 | _0 | 5 | | T | | 9 | T C | 770 | 100 |
| 2 | 256 11 | .// | 1913 | | 0 | | | 7 | _ } | 16.0 | US | |
| 3 | REG 11 | H | 1916 | 1 | OD | | | J | _ | | | |
| 4 | DUP 11 | | 1916 | | | | _ | | | | | |
| 5 | | | | | | | _ | F | Prior | ritv | proc | cessi |
| 6 | | | | | | | L | • | | ny , | proc | ,0331 |
| ENE | RAL (1L) | Med'm | Pres'n | 1 | SPECIFI | IC Te | est | T | Medim | Pres'r | Medin | Pres'n |
| | Acidity pH 4.5 | | 110011 | | | liochemical Ox | | - | 02 | 01 | 1 | † |
| | Addity pH 8.3 | | | | 1 | arb. Biochem | | D. | 02 | 01 | 1 | |
| | Alk. Titration Curve | | | | C | Carbon: DIC | | | | | 1 | |
| | Alkalinity: Phen. | | - | | X C | Carbon: DOC | | | | | | |
| <u>x</u> | Alkalinity: Total: pH 4.5 | | | | | Carbon: TIC | | | | | | 1 |
| | Colour: S.W. | | | | | arbon: TOC | | | | 1 | 1 | |
| | Colour. True | | | | | hemical Oxyg | en D. | | 04 | 05 | 1 | |
| Х | pH | | | | | chlorophyll "a" | . 0.0** | | 00 | | - | <u> </u> |
| | Residue: Filterable: 0.45µm (TDS) | | | | | yanide: SAD | | | 02 | 24 | - | |
| | Residue: Nortfilt., fixed (TSS: fixed) | | | | | yanide: WAD | | <u> </u> | 02 | 24 | - | |
| _ | Residue: Nonfilterable (TSS) | | | | | haeophylin | Abole De | 110 | 03 | - 04 | | - |
| | Residue: Total Residue: Total, Fixed | | | | | Residue:NFR V | | | 03 | 01 | - | - |
| _ | Specific Conductance | | | | | WEP (Extract Sulphide: Total | | , | 03 | 1 08 | - | 1 |
| Χ | Turbidity | | | | | | | | | 1 | Madie | I Done' |
| ENE | RAL (120 mL) | Medim | Pres'n | | ORGAN | | | | | | Med'm | Pres'n |
| | Anion Package (CI,Br,SO4) | | | | - | AOX | | | | | | <u> </u> |
| | Chloride | - | _ | | | Acid Extr. Hert | nScan | | | | | |
| | Fluoride | | | | | BTEX | | | | | | |
| | Nit.: Nitrate and Nitrite (Col'm) | | | - | | EPH | | | | | | |
| | Nitrogen: Nitrate (Col'm) | | | | 1 | Styphosate / A | | | | | | |
| | Nitrogen: Nitrite (Col'm) | 2077 | | - | | Oil and Grease | | 200 | | | | |
| | Silica: Reactive | | | | | Organochlorine | е Рѕсал | P | | | | |
| Х | Sulfate | | | | | Organophosph | norus P,-s | can | | i | | |
| GEN | ERAL IONS (120 mL) | Med'm | SS Proc'n | 64 | Ĩ F | PAH | | | | | | |
| JEN | | wied in 1 | Ju Presi | 04 | F | Penta/Tetra Cl | l-phenols | | | | 7 | 1 |
| _ | Nitrogen: Ammonia (Cofm) Nitrogen: Organic | | | _ | Į. | Phenois (GC/N | MS) | | | | | 1 |
| _ | Nitrogen: Tot. Kjeldahl (Calc) | | | | F | Phenots: Color | rimetric | | | | | |
| | Nitrogen: Total | | | | 1 F | Polychlor, Biph | nerryls | | | 1 | | |
| PHO | SPHORUS (120 mL) | Med'm | Pres'n | | F | Resin Acids | _ | | | | | |
| | Phos. Diss. O-phosphate (Col'm) | | | <u></u> | 1 | rihalomethan | es (THM) | | | | | |
| _ | Phosphorus: Tot. Diss. (Col'rn) | | | | OTHER | Medim | Pres'n | | | Test | | |
| | Phosphorus: Total (Col'm) | | | | I OTHER | Medin | - resil | iTotal and d | | | v at ICPM | S level |
| ETA | LS (TOTAL) Med'm | Pres'n | Med'm | Pres'n | | 1 | - | , oran and o | SSO WE'U | mercury | , allorm | O IEVEI |
| igh | Low 55 | 02 | | - | 11 | <u> </u> | - | | | _ | | |
| | Metal Pkg. (ICP) | | | | | _ | 1 | 1 | | | | |
| | X Metal Pkg. (ICPMS) | | | - | | | 1 | | | 7 | | |
| Х | Hardness | | | | | | | | | | | |
| | X Mercury | | | | FIELD T | EST | No. | Parameter | Metho | w(r | Results | Units |
| | Sediment, Sieve to < 63µ | | | | DETAIL | | | , aranneter | m.cur. | ~ - | i | Jines |
| .45 N | LS (DISSOLVED; Med'm MICROMETERS) 55 | Pres'n 62 | Med'm | Pres'n | | | | | | | | |

Report ID: EMSR0900

Metal Pkg. (ICP) Metal Pkg. (ICPMS) Hardness Mercury

Date: 2014-09-06 11:47



BC MINISTRY OF ENVIRONMENT

ATTN: Deborah Epps

Section Head, Provincial Water Quality

2080A Labieux Road Nanaimo BC V9T 6J9 Date Received: 07-SEP-14

Report Date: 10-SEP-14 17:39 (MT)

Version: **FINAL**

Client Phone: 604-793-8770

Certificate of Analysis

L1514241 Lab Work Order #:

Project P.O. #: NOT SUBMITTED

Job Reference:

C of C Numbers: 50212391

Legal Site Desc:

Dean Watt Account Manager

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ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700 ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

Environmental 🕽

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RIGHT SOLUTIONS RIGHT PARTNER

L1514241 CONTD.... PAGE 2 of 7 10-SEP-14 17:39 (MT)

ALS ENVIRONMENTAL ANALYTICAL REPORT

Version: FINAL

| | | | | V C I 3 | TINAL |
|-------------------------------|---|---|---|-------------|-----------|
| | Sample ID Description Sampled Date Sampled Time Client ID | L1514241-1 WATER 06-SEP-14 18:00 MYRA CREEK @ | L1514241-2 WATER 06-SEP-14 18:05 MYRA CREEK @ | | |
| Q | | BUTTLE LAKE 0.5M | BATTLE LAKE 3.0M | | |
| Grouping | Analyte | | | | |
| WATER | Handana (a. 0.000) (a.a.(i.) | | | | |
| Physical Tests | Hardness (as CaCO3) (mg/L) | 35.2 | 153 | | |
| | pH (pH) | 7.77 | 7.58 | | |
| A-1 | Turbidity (NTU) | 0.20 | 0.38 | | |
| Anions and Nutrients | Alkalinity, Total (as CaCO3) (mg/L) | 24.9 | 24.6 | | |
| | Sulfate (SO4) (mg/L) | 9.89 | 149 | | |
| Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | 0.85 | 0.87 | | |
| | Total Organic Carbon (mg/L) | 0.70 | 0.84 | | |
| Total Metals | Aluminum (Al)-Total (ug/L) | 22.6 | 66.7 | | |
| | Antimony (Sb)-Total (ug/L) | 0.14 | 1.40 | | |
| | Arsenic (As)-Total (ug/L) | 0.22 | 0.34 | | |
| | Barium (Ba)-Total (ug/L) | 6.83 | 18.8 | | |
| | Beryllium (Be)-Total (ug/L) | <0.10 | <0.10 | | |
| | Bismuth (Bi)-Total (ug/L) | <0.50 | <0.50 | | |
| | Boron (B)-Total (ug/L) | <10 | 13 | | |
| | Cadmium (Cd)-Total (ug/L) | 0.055 | 0.625 | | |
| | Calcium (Ca)-Total (ug/L) | 12800 | 54800 | | |
| | Chromium (Cr)-Total (ug/L) | <0.10 | <0.10 | | |
| | Cobalt (Co)-Total (ug/L) | <0.10 | 0.54 | | |
| | Copper (Cu)-Total (ug/L) | 1.28 | 9.10 | | |
| | Iron (Fe)-Total (ug/L) | 28 | 19 | | |
| | Lead (Pb)-Total (ug/L) | 0.061 | 0.550 | | |
| | Lithium (Li)-Total (ug/L) | <0.50 | 0.90 | | |
| | Magnesium (Mg)-Total (ug/L) | 1070 | 4470 | | |
| | Manganese (Mn)-Total (ug/L) | 10.2 | 172 | | |
| | Mercury (Hg)-Total (ug/L) | <0.010 | <0.010 | | |
| | Molybdenum (Mo)-Total (ug/L) | 0.492 | 4.88 | | |
| | Nickel (Ni)-Total (ug/L) | <0.50 | 1.23 | | |
| | Phosphorus (P)-Total (ug/L) | <50 | <50 | | |
| | Potassium (K)-Total (ug/L) | 250 | 2630 | | |
| | Selenium (Se)-Total (ug/L) | 0.15 | 0.60 | | |
| | Silicon (Si)-Total (ug/L) | 1320 | 1900 | | |
| | Silver (Ag)-Total (ug/L) | <0.010 | 0.093 | | |
| | Sodium (Na)-Total (ug/L) | 1650 | 16000 | | |
| | Strontium (Sr)-Total (ug/L) | 22.6 | 157 | | |
| | Sulfur (S)-Total (ug/L) | 4440 | 54200 | | |
| | Thallium (TI)-Total (ug/L) | <0.010 | <0.010 | | |

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L1514241 CONTD.... PAGE 3 of 7 10-SEP-14 17:39 (MT)

ALS ENVIRONMENTAL ANALYTICAL REPORT

Version: FINAL

| | Sample ID Description Sampled Date Sampled Time Client ID | L1514241-1 WATER 06-SEP-14 18:00 MYRA CREEK @ BUTTLE LAKE 0.5M | L1514241-2 WATER 06-SEP-14 18:05 MYRA CREEK @ BATTLE LAKE 3.0M | | |
|------------------|---|--|--|--|--|
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Total Metals | Tin (Sn)-Total (ug/L) | <0.10 | <0.10 | | |
| | Titanium (Ti)-Total (ug/L) | <10 | <10 | | |
| | Uranium (U)-Total (ug/L) | 0.013 | 0.022 | | |
| | Vanadium (V)-Total (ug/L) | <1.0 | <1.0 | | |
| | Zinc (Zn)-Total (ug/L) | 10.9 | 136 | | |
| Dissolved Metals | Dissolved Mercury Filtration Location | LAB | LAB | | |
| | Dissolved Metals Filtration Location | LAB | LAB | | |
| | Aluminum (Al)-Dissolved (ug/L) | 18.1 | 44.7 | | |
| | Antimony (Sb)-Dissolved (ug/L) | <0.10 | 1.33 | | |
| | Arsenic (As)-Dissolved (ug/L) | 0.21 | 0.33 | | |
| | Barium (Ba)-Dissolved (ug/L) | 6.49 | 17.1 | | |
| | Beryllium (Be)-Dissolved (ug/L) | <0.10 | <0.10 | | |
| | Bismuth (Bi)-Dissolved (ug/L) | <0.50 | <0.50 | | |
| | Boron (B)-Dissolved (ug/L) | <10 | 13 | | |
| | Cadmium (Cd)-Dissolved (ug/L) | 0.075 | 0.627 | | |
| | Calcium (Ca)-Dissolved (ug/L) | 12400 | 54300 | | |
| | Chromium (Cr)-Dissolved (ug/L) | <0.10 | <0.10 | | |
| | Cobalt (Co)-Dissolved (ug/L) | <0.10 | 0.53 | | |
| | Copper (Cu)-Dissolved (ug/L) | 0.94 | 5.90 | | |
| | Iron (Fe)-Dissolved (ug/L) | 14 | <10 | | |
| | Lead (Pb)-Dissolved (ug/L) | 0.096 | 0.066 | | |
| | Lithium (Li)-Dissolved (ug/L) | <0.50 | 0.89 | | |
| | Magnesium (Mg)-Dissolved (ug/L) | 1040 | 4290 | | |
| | Manganese (Mn)-Dissolved (ug/L) | 0.548 | 170 | | |
| | Mercury (Hg)-Dissolved (ug/L) | <0.010 | <0.010 | | |
| | Molybdenum (Mo)-Dissolved (ug/L) | 0.403 | 4.56 | | |
| | Nickel (Ni)-Dissolved (ug/L) | <0.50 | 1.20 | | |
| | Phosphorus (P)-Dissolved (ug/L) | <50 | <50 | | |
| | Potassium (K)-Dissolved (ug/L) | 230 | 2440 | | |
| | Selenium (Se)-Dissolved (ug/L) | 0.15 | 0.60 | | |
| | Silicon (Si)-Dissolved (ug/L) | 1320 | 1820 | | |
| | Silver (Ag)-Dissolved (ug/L) | <0.010 | 0.092 | | |
| | Sodium (Na)-Dissolved (ug/L) | 1410 | 15000 | | |
| | Strontium (Sr)-Dissolved (ug/L) | 19.5 | 149 | | |
| | Sulfur (S)-Dissolved (ug/L) | 3640 | 56000 | | |
| | Thallium (TI)-Dissolved (ug/L) | <0.010 | <0.010 | | |
| | Tin (Sn)-Dissolved (ug/L) | <0.10 | <0.10 | | |

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Version: FINAL

| | | | 1 | | | |
|------------------|-------------------------------------|------------------|-------------------------------------|---|--|--|
| | Samp Descr Sampled Sampled | iption d Date | 06-SEP-14 18:00 | L1514241-2 WATER 06-SEP-14 18:05 MYRA CREEK @ | | |
| | | | MYRA CREEK @ BUTTLE LAKE 0.5M | MYRA CREEK @ BATTLE LAKE 3.0M | | |
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Dissolved Metals | Titanium (Ti)-Dissolved (ug/L) | | <10 | <10 | | |
| | Uranium (U)-Dissolved (ug/L) | | 0.013 | 0.021 | | |
| | Vanadium (V)-Dissolved (ug/L) | | <1.0 | <1.0 | | |
| | Zinc (Zn)-Dissolved (ug/L) | | 9.9 | 131 | | |
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^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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Qualifiers for Sample Submission Listed:

| Qualifier | Description | | | | | | | | |
|-------------------|-----------------------------|---|-------------------|--|--|--|--|--|--|
| WSMT | Water sample(s) biased low. | Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low. | | | | | | | |
| WSMD | | Water sample(s) for dissolved mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low. | | | | | | | |
| QC Samples with | Qualifiers & Comment | s: | | | | | | | |
| QC Type Descrip | otion | Parameter | Qualifier | Applies to Sample Number(s) | | | | | |
| Method Blank | | Zinc (Zn)-Dissolved | MB-LOR | L1514241-1, -2 | | | | | |
| Matrix Spike | | Sulfate (SO4) | MS-B | L1514241-1, -2 | | | | | |
| Matrix Spike | | Total Organic Carbon | MS-B | L1514241-1, -2 | | | | | |
| Matrix Spike | | Dissolved Organic Carbon | MS-B | L1514241-1, -2 | | | | | |
| Qualifiers for In | dividual Parameters Li | sted: | | | | | | | |
| Qualifier | Description | | | | | | | | |
| MB-LOR | Method Blank exceeds / | ALS DQO. Limits of Reporting have | been adjusted for | samples with positive hits below 5x blank level. | | | | | |

Test Method References:

MS-B

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---------------|--------|---|--------------------|
| ALK-COL-VA | Water | Alkalinity by Colourimetric (Automated) | EPA 310.2 |

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

CARBONS-DOC-VA Water Dissolved organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-TOC-VA Water Total organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-DIS-LOW-ICP-VA Water Dissolved Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method

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6020A).

MET-TOT-LOW-ICP-VA

Water

Total Metals in Water by ICPOES

EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

PH-PCT-VA

Water

pH by Meter (Automated)

APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA

Water

pH by Meter (Automated)

APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

S-DIS-ICP-VA

Water

Dissolved Sulfur in Water by ICPOES

EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

S-TOT-ICP-VA

Water

Total Sulfur in Water by ICPOES

EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

SO4-TUR-VA

Water

Sulfate(SO4) by Turbidity

APHA 4500-SO4 E. SULFATE

This analysis is carried out using procedures adapted from APHA Method 4500-SO4 "Sulfate". Sulfate is determined using the turbidimetric method.

TURBIDITY-VA

Water

Turbidity by Meter

APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA

Water

Turbidity by Meter

APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code

Laboratory Location

VA

ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

50212391

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GLOSSARY OF REPORT TERMS

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

mg/kg - milligrams per kilogram based on dry weight of sample. mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATÉD, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Workorder: L1514241 Report Date: 10-SEP-14 Page 1 of 10

Client: BC MINISTRY OF ENVIRONMENT

Section Head, Provincial Water Quality 2080A Labieux Road

Nanaimo BC V9T 6J9

Contact: Deborah Epps

| est Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|---------------------------|----------------|-----------|-------|-----|--------|-----------|
| ALK-COL-VA Water | | | | | | | |
| Batch R2941773 | | | | | | | |
| WG1947162-2 CRM Alkalinity, Total (as CaCO3) | VA-ALKL-COI | 97.4 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-5 CRM Alkalinity, Total (as CaCO3) | VA-ALKM-CO | NTROL 103.7 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-8 CRM Alkalinity, Total (as CaCO3) | VA-ALKH-CO | NTROL 100.8 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-1 MB Alkalinity, Total (as CaCO3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-10 MB Alkalinity, Total (as CaCO3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-4 MB Alkalinity, Total (as CaCO3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-7 MB Alkalinity, Total (as CaCO3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| CARBONS-DOC-VA Water | | | | | | | |
| Batch R2943332 | | | | | | | |
| WG1947341-5 DUP Dissolved Organic Carbon | L1514241-1 0.85 | 0.91 | | mg/L | 7.1 | 20 | 09-SEP-14 |
| WG1947341-12 LCS Dissolved Organic Carbon | | 103.6 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-16 LCS Dissolved Organic Carbon | | 109.1 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-4 LCS Dissolved Organic Carbon | | 101.8 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-8 LCS Dissolved Organic Carbon | | 105.9 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-11 MB Dissolved Organic Carbon | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-15 MB Dissolved Organic Carbon | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-3 MB Dissolved Organic Carbon | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-7 MB Dissolved Organic Carbon | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-10 MS Dissolved Organic Carbon | L1513619-2 | 100.6 | | % | | 70-130 | 09-SEP-14 |
| WG1947341-14 MS Dissolved Organic Carbon | L1513418-11 | N/A | MS-B | % | | | |
| WG1947341-2 MS | L1514231-1 | IN/ A | IVIO-D | /0 | | - | 09-SEP-14 |



Workorder: L1514241 Report Date: 10-SEP-14

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| | | | | | | | | 9 |
|--|-------|-------------|--------|-----------|----------|-----|--------|-----------|
| Test M | atrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
| CARBONS-DOC-VA W | /ater | | | | | | | |
| Batch R2943332 | | | | | | | | |
| WG1947341-2 MS | | L1514231-1 | | | | | | |
| Dissolved Organic Carbon | | | 104.6 | | % | | 70-130 | 09-SEP-14 |
| WG1947341-6 MS Dissolved Organic Carbon | | L1514251-1 | 106 E | | % | | 70.100 | 00.050.44 |
| Dissolved Organic Carbon | | | 106.5 | | 70 | | 70-130 | 09-SEP-14 |
| CARBONS-TOC-VA W | /ater | | | | | | | |
| Batch R2943331 | | | | | | | | |
| WG1947339-6 DUP | | L1514241-1 | 0.71 | | ma er /1 | 0.5 | 00 | 00.055.44 |
| Total Organic Carbon | | 0.70 | 0.71 | | mg/L | 0.5 | 20 | 09-SEP-14 |
| WG1947339-1 LCS Total Organic Carbon | | | 100.0 | | % | | 00.100 | 00 SED 14 |
| _ | | | 100.0 | | 76 | | 80-120 | 09-SEP-14 |
| WG1947339-13 LCS Total Organic Carbon | | | 99.6 | | % | | 80-120 | 09-SEP-14 |
| | | | 33.0 | | 76 | | 00-120 | 09-3EP-14 |
| WG1947339-17 LCS Total Organic Carbon | | | 101.1 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-5 LCS | | | 101.1 | | ,0 | | 00-120 | 09-3LF-14 |
| Total Organic Carbon | | | 102.0 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-9 LCS | | | | | | | 00 120 | 00 021 14 |
| Total Organic Carbon | | | 99.95 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-12 MB | | | | | | | | |
| Total Organic Carbon | | | < 0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947339-16 MB | | | | | | | | |
| Total Organic Carbon | | | < 0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947339-4 MB | | | | | | | | |
| Total Organic Carbon | | | < 0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947339-8 MB | | | | | | | | |
| Total Organic Carbon | | | < 0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947339-15 MS | | L1513418-11 | | | | | | |
| Total Organic Carbon | | | N/A | MS-B | % | | - | 09-SEP-14 |
| WG1947339-3 MS | | L1514231-1 | | | | | | |
| Total Organic Carbon | | | 103.0 | | % | | 70-130 | 09-SEP-14 |
| WG1947339-7 MS | | L1514251-1 | | | | | | |
| Total Organic Carbon | | | 102.5 | | % | | 70-130 | 09-SEP-14 |
| HG-DIS-LOW-CVAFS-VA W | /ater | | | | | | | |
| Batch R2942725 | | | | | | | | |
| WG1947233-3 LCS | | | | | | | | |
| Mercury (Hg)-Dissolved | | | 89.2 | | % | | 80-120 | 09-SEP-14 |
| | | | | | | | | |



Workorder: L1514241 Report Date: 10-SEP-14 Page 3 of 10

| Test | Matrix | Reference | Result | Qualifier (| Jnits R | PD | Limit | Analyzed |
|--|--------|------------|--------------|-------------|---------|----|---------|-----------|
| HG-DIS-LOW-CVAFS-VA | Water | | | | | | | |
| Batch R2943546 WG1947233-1 MB | | | | | | | | |
| Mercury (Hg)-Dissolved | | | <0.000010 | ı | mg/L | | 0.00001 | 10-SEP-14 |
| HG-TOT-LOW-CVAFS-VA | Water | | | | | | | |
| Batch R2942725 | | | | | | | | |
| WG1947862-2 LCS Mercury (Hg)-Total | | | 95.9 | | % | | 80-120 | 09-SEP-14 |
| WG1947862-1 MB | | | | | | | 00 120 | 00-021-14 |
| Mercury (Hg)-Total | | | <0.000010 | 1 | mg/L | | 0.00001 | 09-SEP-14 |
| WG1947862-3 MS | | L1514076-1 | | | | | | |
| Mercury (Hg)-Total | | | 89.1 | • | % | | 70-130 | 09-SEP-14 |
| WG1947862-4 MS Mercury (Hg)-Total | | L1514076-3 | 94.6 | | % | | 70-130 | 09-SEP-14 |
| MET-D-CCMS-VA | Water | | | | | | | |
| Batch R2942770 | | | | | | | | |
| WG1947233-2 CRM Aluminum (Al)-Dissolved | | VA-HIGH-WA | TRM 102.1 | | % | | 80-120 | 09-SEP-14 |
| Antimony (Sb)-Dissolved | | | 97.3 | | % | | 80-120 | 09-SEP-14 |
| Arsenic (As)-Dissolved | | | 97.4 | | % | | 80-120 | 09-SEP-14 |
| Barium (Ba)-Dissolved | | | 98.6 | | % | | 80-120 | 09-SEP-14 |
| Beryllium (Be)-Dissolved | | | 97.7 | • | % | | 80-120 | 09-SEP-14 |
| Bismuth (Bi)-Dissolved | | | 97.7 | | % | | 80-120 | 09-SEP-14 |
| Boron (B)-Dissolved | | | 85.5 | | % | | 80-120 | 09-SEP-14 |
| Cadmium (Cd)-Dissolved | I | | 96.8 | • | % | | 80-120 | 09-SEP-14 |
| Chromium (Cr)-Dissolved | d | | 96.9 | • | % | | 80-120 | 09-SEP-14 |
| Cobalt (Co)-Dissolved | | | 96.3 | | % | | 80-120 | 09-SEP-14 |
| Copper (Cu)-Dissolved | | | 95.4 | | % | | 80-120 | 09-SEP-14 |
| Lead (Pb)-Dissolved | | | 96.9 | | % | | 80-120 | 09-SEP-14 |
| Lithium (Li)-Dissolved | | | 99.2 | • | % | | 80-120 | 09-SEP-14 |
| Manganese (Mn)-Dissolv | red | | 99.6 | • | % | | 80-120 | 09-SEP-14 |
| Molybdenum (Mo)-Dissol | ved | | 98.5 | • | % | | 80-120 | 09-SEP-14 |
| Nickel (Ni)-Dissolved | | | 98.2 | • | % | | 80-120 | 09-SEP-14 |
| Selenium (Se)-Dissolved | | | 98.9 | • | % | | 80-120 | 09-SEP-14 |
| Silver (Ag)-Dissolved | | | 98.9 | | % | | 80-120 | 09-SEP-14 |
| Sodium (Na)-Dissolved | | | 97.2 | | % | | 80-120 | 09-SEP-14 |
| Strontium (Sr)-Dissolved | | | 99.1 | • | % | | 80-120 | 09-SEP-14 |



Workorder: L1514241 Report Date: 10-SEP-14 Page 4 of 10

| Test I | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|--------|-----------|--------------------|-----------|---------|-----|---------|-----------|
| MET-D-CCMS-VA | Water | | | | | | | |
| Batch R2942770 | | | | | | | | |
| WG1947233-2 CRM | | VA-HIGH-W | | | | | | |
| Thallium (TI)-Dissolved | | | 98.2 | | % | | 80-120 | 09-SEP-14 |
| Tin (Sn)-Dissolved | | | 97.1 | | % | | 80-120 | 09-SEP-14 |
| Titanium (Ti)-Dissolved | | | 99.4 | | % | | 80-120 | 09-SEP-14 |
| Uranium (U)-Dissolved | | | 99.5 | | % | | 80-120 | 09-SEP-14 |
| Vanadium (V)-Dissolved | | | 97.4 | | % | | 80-120 | 09-SEP-14 |
| Zinc (Zn)-Dissolved | | | 95.8 | | % | | 80-120 | 09-SEP-14 |
| WG1947233-1 MB Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 09-SEP-14 |
| Antimony (Sb)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 09-SEP-14 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | | 09-SEP-14 |
| Beryllium (Be)-Dissolved | | | <0.00003 | | mg/L | | 0.00005 | 09-SEP-14 |
| , , , | | | <0.00010 | | | | 0.0001 | 09-SEP-14 |
| Bismuth (Bi)-Dissolved | | | | | mg/L | | 0.0005 | 09-SEP-14 |
| Boron (B)-Dissolved Cadmium (Cd)-Dissolved | | | <0.010 <0.00001 | 0 | mg/L | | 0.01 | 09-SEP-14 |
| , , | | | | | mg/L | | 0.00001 | 09-SEP-14 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 09-SEP-14 |
| Lead (Pb)-Dissolved | | | <0.00005 | | mg/L | | 0.00005 | 09-SEP-14 |
| Lithium (Li)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Manganese (Mn)-Dissolve | | | <0.00005 | | mg/L | | 0.00005 | 09-SEP-14 |
| Molybdenum (Mo)-Dissolv | ed | | <0.00005 | 0 | mg/L | | 0.00005 | 09-SEP-14 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Selenium (Se)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Silver (Ag)-Dissolved | | | <0.00001 | 0 | mg/L | | 0.00001 | 09-SEP-14 |
| Sodium (Na)-Dissolved | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 09-SEP-14 |
| Thallium (TI)-Dissolved | | | <0.00001 | 0 | mg/L | | 0.00001 | 09-SEP-14 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Titanium (Ti)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Uranium (U)-Dissolved | | | < 0.00001 | 0 | mg/L | | 0.00001 | 09-SEP-14 |
| Vanadium (V)-Dissolved | | | < 0.0010 | | mg/L | | 0.001 | 09-SEP-14 |
| Zinc (Zn)-Dissolved | | | 0.0024 | MB-L | OR mg/L | | 0.001 | 09-SEP-14 |

MET-DIS-LOW-ICP-VA Water



Workorder: L1514241 Report D

Report Date: 10-SEP-14

Page 5 of 10

| Test Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|------------|---------------|-----------|-------|-----|--------|-----------|
| MET-DIS-LOW-ICP-VA Water | | | | | | | |
| Batch R2942645 | | | | | | | |
| WG1947233-2 CRM Calcium (Ca)-Dissolved | VA-HIGH-WA | TRM 101.0 | | % | | 80-120 | 09-SEP-14 |
| Iron (Fe)-Dissolved | | 95.0 | | % | | 80-120 | 09-SEP-14 |
| Magnesium (Mg)-Dissolved | | 100.6 | | % | | 80-120 | 09-SEP-14 |
| Phosphorus (P)-Dissolved | | 99.6 | | % | | 80-120 | 09-SEP-14 |
| Potassium (K)-Dissolved | | 97.4 | | % | | 80-120 | 09-SEP-14 |
| Silicon (Si)-Dissolved | | 98.5 | | % | | 80-120 | 09-SEP-14 |
| WG1947233-1 MB | | 0.050 | | | | | |
| Calcium (Ca)-Dissolved | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Iron (Fe)-Dissolved | | <0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Magnesium (Mg)-Dissolved | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Phosphorus (P)-Dissolved | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Potassium (K)-Dissolved | | <0.10 | | mg/L | | 0.1 | 09-SEP-14 |
| Silicon (Si)-Dissolved | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| MET-T-CCMS-VA Water | | | | | | | |
| Batch R2942770 | | | | | | | |
| WG1947258-3 CRM | VA-HIGH-WA | | | 9/ | | 00.400 | 00.055.44 |
| Aluminum (Al)-Total | | 101.1 97.5 | | % | | 80-120 | 09-SEP-14 |
| Antimony (Sb)-Total | | | | % | | 80-120 | 09-SEP-14 |
| Arsenic (As)-Total | | 99.4 | | | | 80-120 | 09-SEP-14 |
| Barium (Ba)-Total | | 100.1 | | % | | 80-120 | 09-SEP-14 |
| Beryllium (Be)-Total | | 97.0 | | % | | 80-120 | 09-SEP-14 |
| Bismuth (Bi)-Total | | 96.9 | | % | | 80-120 | 09-SEP-14 |
| Boron (B)-Total | | 83.9 | | % | | 80-120 | 09-SEP-14 |
| Cadmium (Cd)-Total | | 98.7 | | % | | 80-120 | 09-SEP-14 |
| Chromium (Cr)-Total | | 99.3 | | % | | 80-120 | 09-SEP-14 |
| Cobalt (Co)-Total | | 98.5 | | % | | 80-120 | 09-SEP-14 |
| Copper (Cu)-Total | | 96.3 | | % | | 80-120 | 09-SEP-14 |
| Lead (Pb)-Total | | 96.6 | | % | | 80-120 | 09-SEP-14 |
| Lithium (Li)-Total | | 96.9 | | % | | 80-120 | 09-SEP-14 |
| Manganese (Mn)-Total | | 101.1 | | % | | 80-120 | 09-SEP-14 |
| Molybdenum (Mo)-Total | | 99.1 | | % | | 80-120 | 09-SEP-14 |
| Nickel (Ni)-Total | | 99.8 | | % | | 80-120 | 09-SEP-14 |
| Selenium (Se)-Total | | 99.6 | | % | | 80-120 | 09-SEP-14 |
| Silver (Ag)-Total | | 95.4 | | % | | 80-120 | 09-SEP-14 |



Workorder: L1514241 Report Date: 10-SEP-14 Page 6 of 10

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|--------|-----------|-----------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | Water | | | | | | | |
| Batch R2942770 | | | | | | | | |
| WG1947258-3 CRM | | VA-HIGH-W | | | | | | |
| Sodium (Na)-Total | | | 98.7 | | % | | 80-120 | 09-SEP-14 |
| Strontium (Sr)-Total | | | 100.3 | | % | | 80-120 | 09-SEP-14 |
| Thallium (TI)-Total | | | 97.8 | | % | | 80-120 | 09-SEP-14 |
| Tin (Sn)-Total | | | 97.7 | | % | | 80-120 | 09-SEP-14 |
| Titanium (Ti)-Total | | | 91.4 | | % | | 80-120 | 09-SEP-14 |
| Uranium (U)-Total | | | 98.5 | | % | | 80-120 | 09-SEP-14 |
| Vanadium (V)-Total | | | 99.8 | | % | | 80-120 | 09-SEP-14 |
| Zinc (Zn)-Total | | | 96.6 | | % | | 80-120 | 09-SEP-14 |
| WG1947258-1 MB | | | <0.0030 | | ma/l | | 0.000 | 00 OED 44 |
| Aluminum (Al)-Total | | | | | mg/L | | 0.003 | 09-SEP-14 |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Barium (Ba)-Total | | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Beryllium (Be)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Bismuth (Bi)-Total | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Boron (B)-Total | | | <0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Cadmium (Cd)-Total | | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Copper (Cu)-Total | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Lead (Pb)-Total | | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Lithium (Li)-Total | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Manganese (Mn)-Total | | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Molybdenum (Mo)-Total | | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Selenium (Se)-Total | | | < 0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Silver (Ag)-Total | | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Sodium (Na)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 09-SEP-14 |
| Thallium (TI)-Total | | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Titanium (Ti)-Total | | | < 0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Uranium (U)-Total | | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Vanadium (V)-Total | | | < 0.0010 | | mg/L | | 0.001 | 09-SEP-14 |



Workorder: L1514241

Report Date: 10-SEP-14 Page 7 of 10

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|--------|-------------|---------------------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | Water | | | | | | | |
| Batch R2942770 WG1947258-1 MB Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 09-SEP-14 |
| MET-TOT-LOW-ICP-VA | Water | | | | | | | |
| Batch R2942851 | | | | | | | | |
| WG1947258-3 CRM Calcium (Ca)-Total | | VA-HIGH-WAT | 7 RM 98.5 | | % | | 80-120 | 09-SEP-14 |
| Iron (Fe)-Total | | | 95.5 | | % | | 80-120 | 09-SEP-14 |
| Magnesium (Mg)-Total | | | 101.0 | | % | | 80-120 | 09-SEP-14 |
| Phosphorus (P)-Total | | | 97.8 | | % | | 80-120 | 09-SEP-14 |
| Potassium (K)-Total | | | 96.6 | | % | | 80-120 | 09-SEP-14 |
| Silicon (Si)-Total | | | 96.1 | | % | | 80-120 | 09-SEP-14 |
| WG1947258-1 MB | | | | | | | | |
| Calcium (Ca)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Iron (Fe)-Total | | | < 0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Magnesium (Mg)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Phosphorus (P)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Potassium (K)-Total | | | < 0.10 | | mg/L | | 0.1 | 09-SEP-14 |
| Silicon (Si)-Total | | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| PH-PCT-VA | Water | | | | | | | |
| Batch R2943649 | | | | | | | | |
| WG1947450-25 CRM pH | | VA-PH7-BUF | 7.01 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-26 CRM pH | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-27 CRM pH | | VA-PH7-BUF | 7.01 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-28 CRM pH | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-29 CRM pH | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-30 CRM pH | | VA-PH7-BUF | 6.99 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-31 CRM pH | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-32 CRM pH | | VA-PH7-BUF | 7.03 | | рН | | 6.9-7.1 | 09-SEP-14 |



Workorder: L1514241

Report Date: 10-SEP-14

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|--------|-------------|---------------------|-----------|-------|-----|--------|-----------|
| S-DIS-ICP-VA | Water | | | | | | | |
| Batch R29426 | 15 | | | | | | | |
| WG1947233-2 CRI Sulfur (S)-Dissolved | И | VA-HIGH-WA | TRM 101.7 | | % | | 80-120 | 09-SEP-14 |
| WG1947233-1 MB Sulfur (S)-Dissolved | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| S-TOT-ICP-VA | Water | | | | | | | |
| Batch R294289 WG1947258-3 CRI | | VA-HIGH-WA | | | 0/ | | | |
| Sulfur (S)-Total | | | 101.6 | | % | | 80-120 | 09-SEP-14 |
| WG1947258-1 MB Sulfur (S)-Total | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| SO4-TUR-VA | Water | | | | | | | |
| Batch R294329 | 91 | | | | | | | |
| WG1948014-2 CRI Sulfate (SO4) | И | VA-SO4-L-CO | 98.4 | | % | | 85-115 | 10-SEP-14 |
| WG1948014-6 CRI Sulfate (SO4) | Л | VA-S04-H-C0 | ONTROL 102.8 | | % | | 85-115 | 10-SEP-14 |
| WG1948014-1 MB Sulfate (SO4) | | | <0.50 | | mg/L | | 0.5 | 10-SEP-14 |
| WG1948014-5 MB Sulfate (SO4) | | | <0.50 | | mg/L | | 0.5 | 10-SEP-14 |
| WG1948014-4 MS Sulfate (SO4) | | L1512411-2 | 92.1 | | % | | 75-125 | 10-SEP-14 |
| WG1948014-8 MS Sulfate (SO4) | | L1510555-1 | N/A | MS-B | % | | - | 10-SEP-14 |
| TURBIDITY-VA | Water | | | | | | | |
| Batch R294150 WG1947074-2 CRI | | VA FORM 40 | | | | | | |
| Turbidity | VI | VA-FORM-40 | 101.8 | | % | | 85-115 | 08-SEP-14 |
| WG1947074-1 MB Turbidity | | | <0.10 | | NTU | | 0.1 | 08-SEP-14 |

Workorder: L1514241 Report Date: 10-SEP-14 Page 9 of 10

Legend:

| Limit | ALS Control Limit (Data Quality Objectives) |
|-------|---|
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Sample Parameter Qualifier Definitions:

| Qualifier | Description |
|-----------|---|
| J | Duplicate results and limits are expressed in terms of absolute difference. |
| MB-LOR | Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Workorder: L1514241 Report Date: 10-SEP-14 Page 10 of 10

Hold Time Exceedances:

| Sample | Compling Data | Data Processed | Poc HT | Actual HT | Unite | Qualifier |
|--------|-----------------|-------------------|-----------------------------------|--|---|---|
| שו | Sampling Date | Date Flocessed | nec. III | Actual III | Ullits | Qualifier |
| | | | | | | |
| | | | | | | |
| 1 | 06-SEP-14 18:00 | 09-SEP-14 23:00 | 0.25 | 77 | hours | EHTR-FM |
| 2 | 06-SEP-14 18:05 | 09-SEP-14 23:00 | 0.25 | 77 | hours | EHTR-FM |
| | ID 1 | 1 06-SEP-14 18:00 | 1 06-SEP-14 18:00 09-SEP-14 23:00 | ID Sampling Date Date Processed Rec. HT 1 06-SEP-14 18:00 09-SEP-14 23:00 0.25 | ID Sampling Date Date Processed Rec. HT Actual HT 1 06-SEP-14 18:00 09-SEP-14 23:00 0.25 77 | 1 06-SEP-14 18:00 09-SEP-14 23:00 0.25 77 hours |

Legend & Qualifier Definitions:

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

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

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

EHT: Exceeded ALS recommended hold time prior to analysis.

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

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes. Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L1514241 were received on 07-SEP-14 09:30.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Maxxam Analytics Inc. 4606 Canada Way Burnaby, BC V5G1K5

Ministry of Environment

Req # 50212391

| Sample Signatu EMS Id Location | r Contact NCC r Nicc re | oxam Analytics In DBEE Nicole Obee Obee Obee Pls include total escriptor | Well Pl | ate# | at ICPMS | La Sevel | Sampling Ag Code 10 Address City Postal Code Number of Co | Name Vanco 2080-A Labi Nanaimo V9T6J9 | eux Road Phone (25 | | | |
|--|--|--|------------------|-----------------------------------|-----------|--------------|--|--|---------------------|----------|-------------|---------|
| No. C | lass Collec | ction Start MM-DD HH:MI | Colle YYYY- | ection End MM-DD HH 06 1800 | MI U | Dept pper | h Lower Tide | | ρ | | RI ority | |
| GENER | AL (1L) | | Med'm | Pres' | 1 | SPEC | IFIC | rest | Med'm | Pres'n | Med'm | Pres'n |
| - 1 | Acidity pH 4.5 Acidity pH 8.3 Alk. Titration Cur Alkalinity: Phen. | | valii | 71631 | | X | Biochemical C Carb. Biocher Carbon: DIC Carbon: DOC | xygen D. | 02 | 01 | | . 70011 |
| 1 | Alkalinity: Total: p Colour: S.W. | DH 4.5 | | | | X | Carbon: TIC | | | | | |
| - | Colour: TAC Colour: True | | | | | | Chemical Oxy | | 04 | 05 | | |
| X | рН | le: 0.45µm (TDS) | 1 <u>1</u> 1 1 1 | | | | Chlorophyll "a Cyanide: SAD | | 02 | 24 | | |
| | Residue: Nonfitt., | fixed (TSS: fixed) | | 7 | | | Cyanide: WAI | | 02 | 24 | | |
| | Residue: Nonfilte Residue: Total | | | | | | Phaeophytin Residue:NFR | Whole Bottle | 03 | 01 | - | |
| | Residue: Total, F Specific Conduct | | | | | | SWEP (Extra | | 1 | | | |
| | Turbidity | ance | | | | | Sulphide: Total | al | 03 | 08 | 14-di- | Pt- |
| SENER | RAL (120 mL) | | Med'm | Pres | n i | ORG | ANICS | | | | Med'm | Pres'n |
| | Anion Package Chloride | (CI,Br,SO4) | | | | | Add Extr. He | rbScan | | \dashv | | |
| | Fluoride | | | | | 1 | BTEX | | | | | |
| | Nit.: Nitrate and | | | | |] | EPH Glyphosate / | AMDA | | | | |
| | Nitrogen: Nitrate Nitrogen: Nitrite | | | | | 1- | | e: Gravimetric | | | | |
| | Silica: Reactive | (00/11) | | | | 1 | Organochłorie | ne Pscan | | | | |
| Х | Suffate | | | | | | | horus Pscan | | | | |
| GENE | RAL IONS (12 | 10 mL) | Med'm | 55 Pres' | 64 |] | PAH Penta/Tetra (| Lohonots | | - | | - |
| | Nitrogen: Arryno Nitrogen: Organi | | | | | 1 | Phenols (GC/ | | | + | | |
| | Nitrogen: Tot. K | | | | | | Phenols: Cold | | | i | | |
| | Nitrogen: Total | | lu-r-1 | la · | | | Polychlor, Bip Resin Acids | henyls | | | | |
| | PHORUS (120 | | Med'm | Pres | " | | Trihalometha | nes (THM) | | - | | |
| PHOS | | t. Diss. (Col'm) | | | | OTHE | | Pres'n | | Test | | |
| PHOS | Phos. Diss. O-p Phosphorus: To | | | | Pres'n | 1 | | Tota | and dissolved | mercury | at ICPMS | Slevel |
| | Phosphorus: To Phosphorus: To | | Descio | Madion | P 1875 ET | 11 | | 1 | | | | |
| METAL | Phosphorus: To Phosphorus: To S (TOTAL) | tat (Col'm) Med'm 55 | Pres'n | Med'm | 110311 | H | | | | | | |
| METAL | Phosphorus: To Phosphorus: To S (TOTAL) Low Metal Pkg | Med'm 55 | | Med'm | | | | | · | - | | |
| METAL ligh | Phosphorus: To Phosphorus: To S (TOTAL) Low | Med'm 55 | | Med'm | | | | | | _ | | |
| METAL | Phosphorus: To Phosphorus: To S (TOTAL) Low Metal Pkg X Metal Pkg Hardness X Mercury | Med'm 55 (ICP) (ICPMS) | | Med'm | | FIEL | TEOY | No. Ba- | mater Hells | 1 5 | oculte. | Unite |
| METAL ligh | Phosphorus: To Phosphorus: To S (TOTAL) Low Metal Pkg X Metal Pkg Hardness X Mercury Sediment, | Med'm 55 (ICP) (ICPMS) (ICPMS) Sieve to < 63µ | 02 | | | FIELD | O TEST | No. Para | meter Metho | d R | esults | Units |
| METAL High | Phosphorus: To Phosphorus: To S (TOTAL) Low Metal Pkg X Metal Pkg Hardness X Mercury | Med'm 55 (ICP) (ICPMS) Sieve to < 63µ D; Med'm Med'm | 02 | Med'm | Pres'n | | | No. Para | meter Metho | d R | esults | Units |
| METAL High X METAL 0.45 MIII | Phosphorus: To Phosphorus: To S (TOTAL) Low Metal Pkg Hardness X Mercury Sediment, S (DISSOLVE CROMETERS, | Med'm 55 (ICP) (ICPMS) Sieve to < 63µ D; Med'm 55 | 02 | | | | | No. Para | meter Metho | d R | esults | Units |
| METAL High X METAL 0.45 MIII | Phosphorus: To Phosphorus: To S (TOTAL) Low Metal Pkg Hardness X Mercury Sediment, S (DISSOLVE CROMETERS, Low Metal Pkg | Med'm 55 (ICP) (ICPMS) Sieve to < 63\(\mu\) Med'm 55 (ICP) | 02 | | | | | No. Para | meter Metho | d R | esults | Units |
| METAL High X | Phosphorus: To Phosphorus: To Phosphorus: To S (TOTAL) Low Metal Pkg X Metal Pkg Hardness X Mercury Sediment, S (DISSOLVE CROMETERS, Low Metal Pkg X Metal Pkg Hardness | Med'm 55 (ICP) (ICPMS) Sieve to < 63\(\mu\) Med'm 55 (ICP) g. (ICPMS) | 02 | | | | | No. Para | meter Metho | d R | esults | Units |
| METAL High X METAL 0.45 Mile High L | Phosphorus: To Phosphorus: To Phosphorus: To S (TOTAL) Low Metal Pkg Hardness X Mercury Sediment, S (DISSOLVE CROMETERS, Low Metal Pkg X Metal Pkg Metal Pkg X Metal Pkg X Metal Pkg | Med'm 55 (ICP) (ICPMS) Sieve to < 63\(\mu\) Med'm 55 (ICP) g. (ICPMS) | Pres'n 62 | Med'm | Pres'n | DETA | MLS | No. Para | meter Metho | d R | esults | Units |
| X X X X X X X X X X X X X X X X X X X | Phosphorus: To Phosphorus: To Phosphorus: To S (TOTAL) Low Metal Pkg X Metal Pkg Hardness X Mercury Sediment, S (DISSOLVE CROMETERS, Low Metal Pkg X Metal Pkg Hardness | Med'm 55 (ICP) (ICPMS) Sieve to < 63\(\mu\) Med'm 55 (ICP) g. (ICPMS) | Pres'n 62 | | Pres'n | DETA | MLS | No. Para | meter Metho | | | Units |



BC MINISTRY OF ENVIRONMENT

ATTN: Deborah Epps

Section Head, Provincial Water Quality

2080A Labieux Road Nanaimo BC V9T 6J9 Date Received: 07-SEP-14

Report Date: 10-SEP-14 17:46 (MT)

Version: FINAL

Client Phone: 604-793-8770

Certificate of Analysis

Lab Work Order #: L1514251

Project P.O. #: NOT SUBMITTED

Job Reference:

C of C Numbers: 50212390

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Dean Watt Account Manager

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L1514251 CONTD.... PAGE 2 of 7 10-SEP-14 17:46 (MT)

ALS ENVIRONMENTAL ANALYTICAL REPORT

Version: **FINAL** L1514251-1 Sample ID Description WATER Sampled Date 06-SEP-14 Sampled Time 17:30 MYRA CREEK Client ID BELOW FALLS 0.5M Grouping Analyte WATER Hardness (as CaCO3) (mg/L) **Physical Tests** 35.6 pH (pH) 7.80 Turbidity (NTU) 0.16 Alkalinity, Total (as CaCO3) (mg/L) Anions and 25.0 **Nutrients** Sulfate (SO4) (mg/L) 15.0 Organic / Dissolved Organic Carbon (mg/L) 0.65 Inorganic Carbon Total Organic Carbon (mg/L) 0.80 **Total Metals** Aluminum (AI)-Total (ug/L) 21.4 Antimony (Sb)-Total (ug/L) 0.12 Arsenic (As)-Total (ug/L) 0.22 Barium (Ba)-Total (ug/L) 6.47 Beryllium (Be)-Total (ug/L) < 0.10 Bismuth (Bi)-Total (ug/L) < 0.50 Boron (B)-Total (ug/L) <10 Cadmium (Cd)-Total (ug/L) 0.111 Calcium (Ca)-Total (ug/L) 12500 Chromium (Cr)-Total (ug/L) 0.12 Cobalt (Co)-Total (ug/L) < 0.10 Copper (Cu)-Total (ug/L) 2.07 Iron (Fe)-Total (ug/L) 34 Lead (Pb)-Total (ug/L) 0.112 Lithium (Li)-Total (ug/L) < 0.50 Magnesium (Mg)-Total (ug/L) 1040 Manganese (Mn)-Total (ug/L) 7.37 Mercury (Hg)-Total (ug/L) < 0.010 Molybdenum (Mo)-Total (ug/L) 0.424 Nickel (Ni)-Total (ug/L) < 0.50 Phosphorus (P)-Total (ug/L) < 50 Potassium (K)-Total (ug/L) 220 Selenium (Se)-Total (ug/L) 0.15 Silicon (Si)-Total (ug/L) 1340 Silver (Ag)-Total (ug/L) < 0.010 Sodium (Na)-Total (ug/L) 1430 Strontium (Sr)-Total (ug/L) 20.0 Sulfur (S)-Total (ug/L) 3720 Thallium (TI)-Total (ug/L) < 0.010

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L1514251 CONTD.... PAGE 3 of 7 10-SEP-14 17:46 (MT)

FINAL

Version:

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID L1514251-1 Description WATER 06-SEP-14 Sampled Date Sampled Time 17:30 MYRA CREEK Client ID BELOW FALLS 0.5M Grouping **Analyte** WATER **Total Metals** Tin (Sn)-Total (ug/L) 0.15 Titanium (Ti)-Total (ug/L) <10 Uranium (U)-Total (ug/L) 0.012 Vanadium (V)-Total (ug/L) <1.0 Zinc (Zn)-Total (ug/L) 10.5 Dissolved Mercury Filtration Location **Dissolved Metals** LAB Dissolved Metals Filtration Location LAB Aluminum (AI)-Dissolved (ug/L) 15.5 Antimony (Sb)-Dissolved (ug/L) < 0.10 Arsenic (As)-Dissolved (ug/L) 0.20 Barium (Ba)-Dissolved (ug/L) 6.46 Beryllium (Be)-Dissolved (ug/L) < 0.10 Bismuth (Bi)-Dissolved (ug/L) < 0.50 Boron (B)-Dissolved (ug/L) <10 Cadmium (Cd)-Dissolved (ug/L) 0.092 Calcium (Ca)-Dissolved (ug/L) 12500 Chromium (Cr)-Dissolved (ug/L) < 0.10 Cobalt (Co)-Dissolved (ug/L) < 0.10 Copper (Cu)-Dissolved (ug/L) 0.83 Iron (Fe)-Dissolved (ug/L) 13 Lead (Pb)-Dissolved (ug/L) < 0.050 Lithium (Li)-Dissolved (ug/L) < 0.50 Magnesium (Mg)-Dissolved (ug/L) 1040 Manganese (Mn)-Dissolved (ug/L) 0.975 Mercury (Hg)-Dissolved (ug/L) < 0.010 Molybdenum (Mo)-Dissolved (ug/L) 0.405 Nickel (Ni)-Dissolved (ug/L) < 0.50 Phosphorus (P)-Dissolved (ug/L) < 50 Potassium (K)-Dissolved (ug/L) 220 Selenium (Se)-Dissolved (ug/L) 0.14 Silicon (Si)-Dissolved (ug/L) 1310 Silver (Ag)-Dissolved (ug/L) < 0.010 Sodium (Na)-Dissolved (ug/L) 1420 Strontium (Sr)-Dissolved (ug/L) 19.6 Sulfur (S)-Dissolved (ug/L) 3710 Thallium (TI)-Dissolved (ug/L) < 0.010 Tin (Sn)-Dissolved (ug/L) < 0.10

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L1514251 CONTD.... PAGE 4 of 7 10-SEP-14 17:46 (MT)

ALS ENVIRONMENTAL ANALYTICAL REPORT

Version: **FINAL** L1514251-1 Sample ID Description WATER Sampled Date 06-SEP-14 Sampled Time 17:30 MYRA CREEK BELOW FALLS Client ID 0.5M Grouping Analyte **WATER Dissolved Metals** Titanium (Ti)-Dissolved (ug/L) <10 Uranium (U)-Dissolved (ug/L) 0.011 Vanadium (V)-Dissolved (ug/L) <1.0 Zinc (Zn)-Dissolved (ug/L) 10.3

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L1514251 CONTD.... PAGE 5 of 7 10-SEP-14 17:46 (MT) Version: FINΔI

Qualifiers for Sample Submission Listed:

| Qualifier | Description | | | | | | | | |
|----------------------|---|---------------------------------------|--|--|--|--|--|--|--|
| WSMT | Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low. | | | | | | | | |
| WSMD | Water sample(s) for dissolved mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low. | | | | | | | | |
| QC Samples with Qual | lifiers & Comments: | | | | | | | | |
| QC Type Description | Parameter | Qualifier Applies to Sample Number(s) | | | | | | | |

MB-LOR

MS-B

MS-B

MS-B

L1514251-1

L1514251-1

L1514251-1

L1514251-1

Matrix Spike Dissolved Organic Carbon

| Qualifiers for | Qualifiers for Individual Parameters Listed: | | | | | | | | |
|----------------|---|--|--|--|--|--|--|--|--|
| Qualifier | Description | | | | | | | | |
| MB-LOR MS-B | Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level. Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. | | | | | | | | |

Test Method References:

Method Blank

Matrix Spike

Matrix Spike

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---------------|--------|---|--------------------|
| ALK-COL-VA | Water | Alkalinity by Colourimetric (Automated) | EPA 310.2 |

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

CARBONS-DOC-VA APHA 5310 TOTAL ORGANIC CARBON (TOC) Water Dissolved organic carbon by combustion

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

Total organic carbon by combustion CARBONS-TOC-VA Water APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

Sulfate (SO4)

Zinc (Zn)-Dissolved

Total Organic Carbon

HARDNESS-CALC-VA Water Hardness **APHA 2340B**

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

Dissolved Mercury in Water by CVAFS(Low) **HG-DIS-LOW-CVAFS-VA** Water EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

Total Mercury in Water by CVAFS(Low) EPA 245.7 HG-TOT-LOW-CVAFS-VA Water

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-DIS-LOW-ICP-VA Water Dissolved Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method

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6020A).

MET-TOT-LOW-ICP-VA

Water

Total Metals in Water by ICPOES

EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

PH-PCT-VA

Water

pH by Meter (Automated)

APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA

Water

pH by Meter (Automated)

APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

S-DIS-ICP-VA

Water

Dissolved Sulfur in Water by ICPOES

EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

S-TOT-ICP-VA

Water

Total Sulfur in Water by ICPOES

EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

SO4-TUR-VA

Water

Sulfate(SO4) by Turbidity

APHA 4500-SO4 E. SULFATE

This analysis is carried out using procedures adapted from APHA Method 4500-SO4 "Sulfate". Sulfate is determined using the turbidimetric method.

TURBIDITY-VA

Water

Turbidity by Meter

APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA

Water

Turbidity by Meter

APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code

Laboratory Location

VA

ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

50212390

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GLOSSARY OF REPORT TERMS

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

mg/kg - milligrams per kilogram based on dry weight of sample. mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATÉD, ALL SAMPLES WERE RÉCEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Workorder: L1514251 Report Date: 10-SEP-14 Page 1 of 10

Client: BC MINISTRY OF ENVIRONMENT

Section Head, Provincial Water Quality 2080A Labieux Road

Nanaimo BC V9T 6J9

Contact: Deborah Epps

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|-----------------------|-------------|----------------|-----------|-------|-----|--------|-----------|
| ALK-COL-VA | Water | | | | | | | |
| Batch R294 | 11773 | | | | | | | |
| WG1947162-2 Alkalinity, Total (a | CRM s CaCO3) | VA-ALKL-CO | 97.4 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-5 Alkalinity, Total (a | CRM s CaCO3) | VA-ALKM-CO | 103.7 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-8 Alkalinity, Total (a | CRM is CaCO3) | VA-ALKH-CO | NTROL 100.8 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-1 I Alkalinity, Total (a | MB s CaCO3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-10 I Alkalinity, Total (a | | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-4 I Alkalinity, Total (a | MB s CaCO3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-7 I Alkalinity, Total (a | MB s CaCO3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| CARBONS-DOC-VA | Water | | | | | | | |
| Batch R294 | 13332 | | | | | | | |
| WG1947341-12 I Dissolved Organic | | | 103.6 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-16 I Dissolved Organic | | | 109.1 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-4 I Dissolved Organic | | | 101.8 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-8 I Dissolved Organic | | | 105.9 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-11 I Dissolved Organic | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-15 I Dissolved Organic | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-3 I Dissolved Organic | MB c Carbon | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-7 I Dissolved Organic | MB c Carbon | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-10 I Dissolved Organic | | L1513619-2 | 100.6 | | % | | 70-130 | 09-SEP-14 |
| WG1947341-14 I Dissolved Organic | | L1513418-11 | N/A | MS-B | % | | - | 09-SEP-14 |
| WG1947341-2 I Dissolved Organic | | L1514231-1 | 104.6 | | % | | 70-130 | 09-SEP-14 |
| | MS | L1514251-1 | | | | | | |



Workorder: L1514251 Report Date: 10-SEP-14 Page 2 of 10

| | | | Topoli Bato. 10 OEI | | | | 1 14 1 age 2 01 10 | | | |
|--|--------------------|-------------|---------------------|-----------|-------|-----|--------------------|-----------|--|--|
| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed | | |
| CARBONS-DOC-VA Batch R2943332 WG1947341-6 MS Dissolved Organic Carb | Water on | L1514251-1 | 106.5 | | % | | 70-130 | 09-SEP-14 | | |
| CARBONS-TOC-VA | Water | | | | | | | | | |
| Batch R2943331 WG1947339-1 LCS Total Organic Carbon | | | 100.0 | | % | | 80-120 | 09-SEP-14 | | |
| WG1947339-13 LCS Total Organic Carbon | | | 99.6 | | % | | 80-120 | 09-SEP-14 | | |
| WG1947339-17 LCS Total Organic Carbon | | | 101.1 | | % | | 80-120 | 09-SEP-14 | | |
| WG1947339-5 LCS Total Organic Carbon | | | 102.0 | | % | | 80-120 | 09-SEP-14 | | |
| WG1947339-9 LCS Total Organic Carbon | | | 99.95 | | % | | 80-120 | 09-SEP-14 | | |
| WG1947339-12 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 | | |
| WG1947339-16 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 | | |
| WG1947339-4 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 | | |
| WG1947339-8 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 | | |
| WG1947339-15 MS Total Organic Carbon | | L1513418-11 | N/A | MS-B | % | | _ | 09-SEP-14 | | |
| WG1947339-3 MS Total Organic Carbon | | L1514231-1 | 103.0 | | % | | 70-130 | 09-SEP-14 | | |
| WG1947339-7 MS Total Organic Carbon | | L1514251-1 | 102.5 | | % | | 70-130 | 09-SEP-14 | | |
| HG-DIS-LOW-CVAFS-VA | Water | | | | | | | | | |
| Batch R2942725 WG1947233-3 LCS Mercury (Hg)-Dissolved | | | 89.2 | | % | | 80-120 | 09-SEP-14 | | |
| Batch R2943546 WG1947233-1 MB Mercury (Hg)-Dissolved | | | <0.000010 | 1 | mg/L | | 0.00001 | 10-SEP-14 | | |



Workorder: L1514251 Report Date: 10-SEP-14

| | | Workorder. | L101420 | | rioport Bato. | 0-011-14 | rage 5 of 10 | | | |
|--|-------|------------|--------------|-----------|---------------|----------|--------------|------------------------|--|--|
| Test Ma | atrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed | | |
| HG-TOT-LOW-CVAFS-VA W | /ater | | | | | | | | | |
| Batch R2942725 | | | | | | | | | | |
| WG1947862-2 LCS | | | | | | | | | | |
| Mercury (Hg)-Total | | | 95.9 | | % | | 80-120 | 09-SEP-14 | | |
| WG1947862-1 MB Mercury (Hg)-Total | | | <0.00001 | 0 | mg/L | | 0.00001 | 09-SEP-14 | | |
| WG1947862-3 MS | | L1514076-1 | | | | | | | | |
| Mercury (Hg)-Total | | | 89.1 | | % | | 70-130 | 09-SEP-14 | | |
| WG1947862-4 MS | | L1514076-3 | | | | | | | | |
| Mercury (Hg)-Total | | | 94.6 | | % | | 70-130 | 09-SEP-14 | | |
| MET-D-CCMS-VA W | /ater | | | | | | | | | |
| Batch R2942770 | | | | | | | | | | |
| WG1947233-2 CRM Aluminum (Al)-Dissolved | | VA-HIGH-WA | TRM 102.1 | | % | | 80-120 | 00 SED 14 | | |
| Antimony (Sb)-Dissolved | | | 97.3 | | % | | 80-120 | 09-SEP-14 09-SEP-14 | | |
| Arsenic (As)-Dissolved | | | 97.4 | | % | | 80-120 | 09-SEP-14 | | |
| Barium (Ba)-Dissolved | | | 98.6 | | % | | 80-120 | 09-SEP-14 | | |
| Beryllium (Be)-Dissolved | | | 97.7 | | % | | 80-120 | 09-SEP-14 | | |
| Bismuth (Bi)-Dissolved | | | 97.7 | | % | | 80-120 | 09-SEP-14 | | |
| Boron (B)-Dissolved | | | 85.5 | | % | | 80-120 | 09-SEP-14 | | |
| Cadmium (Cd)-Dissolved | | | 96.8 | | % | | 80-120 | 09-SEP-14 | | |
| Chromium (Cr)-Dissolved | | | 96.9 | | % | | 80-120 | 09-SEP-14 | | |
| Cobalt (Co)-Dissolved | | | 96.3 | | % | | 80-120 | 09-SEP-14 | | |
| Copper (Cu)-Dissolved | | | 95.4 | | % | | 80-120 | 09-SEP-14 | | |
| Lead (Pb)-Dissolved | | | 96.9 | | % | | 80-120 | 09-SEP-14 | | |
| Lithium (Li)-Dissolved | | | 99.2 | | % | | 80-120 | 09-SEP-14 | | |
| Manganese (Mn)-Dissolved | | | 99.6 | | % | | 80-120 | 09-SEP-14 | | |
| Molybdenum (Mo)-Dissolved | d | | 98.5 | | % | | 80-120 | 09-SEP-14 | | |
| Nickel (Ni)-Dissolved | | | 98.2 | | % | | 80-120 | 09-SEP-14 | | |
| Selenium (Se)-Dissolved | | | 98.9 | | % | | 80-120 | 09-SEP-14 | | |
| Silver (Ag)-Dissolved | | | 98.9 | | % | | 80-120 | 09-SEP-14 | | |
| Sodium (Na)-Dissolved | | | 97.2 | | % | | 80-120 | 09-SEP-14 | | |
| Strontium (Sr)-Dissolved | | | 99.1 | | % | | 80-120 | 09-SEP-14 | | |
| Thallium (TI)-Dissolved | | | 98.2 | | % | | 80-120 | 09-SEP-14 | | |
| Tin (Sn)-Dissolved | | | 97.1 | | % | | 80-120 | 09-SEP-14 | | |
| Titanium (Ti)-Dissolved | | | 99.4 | | % | | 80-120 | 09-SEP-14 | | |
| Uranium (U)-Dissolved | | | 99.5 | | % | | 80-120 | 09-SEP-14 | | |
| Vanadium (V)-Dissolved | | | 97.4 | | % | | 80-120 | 09-SEP-14 | | |
| | | | | | | | | | | |

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Workorder: L1514251 Report Date: 10-SEP-14 Page 4 of 10

| Test Matri | ix Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|--------------|-----------------------|-----------|-------|-----|------------------|------------------------|
| MET-D-CCMS-VA Wate | er | | | | | | |
| Batch R2942770 | | | | | | | |
| WG1947233-2 CRM | VA-HIGH-WA | | | | | | |
| Zinc (Zn)-Dissolved | | 95.8 | | % | | 80-120 | 09-SEP-14 |
| WG1947233-1 MB Aluminum (Al)-Dissolved | | <0.0010 | | mg/L | | 0.001 | 09-SEP-14 |
| Antimony (Sb)-Dissolved | | <0.0010 | | mg/L | | | |
| Arsenic (As)-Dissolved | | <0.00010 | | mg/L | | 0.0001 0.0001 | 09-SEP-14 09-SEP-14 |
| Barium (Ba)-Dissolved | | <0.00010 | | mg/L | | 0.0001 | |
| Beryllium (Be)-Dissolved | | <0.00010 | | mg/L | | | 09-SEP-14 |
| Bismuth (Bi)-Dissolved | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Boron (B)-Dissolved | | <0.00030 | | mg/L | | 0.0005 | 09-SEP-14 |
| Cadmium (Cd)-Dissolved | | <0.00010 | | | | 0.01 | 09-SEP-14 |
| Chromium (Cr)-Dissolved | | <0.00010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Cobalt (Co)-Dissolved | | | | mg/L | | 0.0001 | 09-SEP-14 |
| , , | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Copper (Cu)-Dissolved Lead (Pb)-Dissolved | | <0.00020 <0.000050 | | mg/L | | 0.0002 | 09-SEP-14 |
| Lithium (Li)-Dissolved | | <0.00050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Manganese (Mn)-Dissolved | | | | mg/L | | 0.0005 | 09-SEP-14 |
| | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Molybdenum (Mo)-Dissolved | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Nickel (Ni)-Dissolved | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Selenium (Se)-Dissolved | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Silver (Ag)-Dissolved | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Sodium (Na)-Dissolved | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Strontium (Sr)-Dissolved | | <0.00020 | | mg/L | | 0.0002 | 09-SEP-14 |
| Thallium (TI)-Dissolved | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Tin (Sn)-Dissolved | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Titanium (Ti)-Dissolved | | <0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Uranium (U)-Dissolved | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Vanadium (V)-Dissolved | | <0.0010 | | mg/L | | 0.001 | 09-SEP-14 |
| Zinc (Zn)-Dissolved | | 0.0024 | MB-LOR | mg/L | | 0.001 | 09-SEP-14 |
| MET-DIS-LOW-ICP-VA Wate | er | | | | | | |
| Batch R2942645 | | | | | | | |
| WG1947233-2 CRM Calcium (Ca)-Dissolved | VA-HIGH-WA | TRM 101.0 | | % | | 00 100 | 00 SED 44 |
| Iron (Fe)-Dissolved | | 95.0 | | % | | 80-120 | 09-SEP-14 |
| Magnesium (Mg)-Dissolved | | 100.6 | | % | | 80-120 | 09-SEP-14 |
| wagnesium (wg)-bissowed | | 0.001 | | 70 | | 80-120 | 09-SEP-14 |



Workorder: L1514251 Report Date: 10-SEP-14 Page 5 of 10

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|--------|------------|--------|-----------|-------|-----|--------|-----------|
| MET-DIS-LOW-ICP-VA | Water | | | | | | | |
| Batch R2942645 | | | | | | | | |
| WG1947233-2 CRM | | VA-HIGH-WA | | | 0/ | | | |
| Phosphorus (P)-Dissolv | | | 99.6 | | % | | 80-120 | 09-SEP-14 |
| Potassium (K)-Dissolve | a | | 97.4 | | % | | 80-120 | 09-SEP-14 |
| Silicon (Si)-Dissolved | | | 98.5 | | % | | 80-120 | 09-SEP-14 |
| WG1947233-1 MB Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.03 | 09-SEP-14 |
| Magnesium (Mg)-Dissol | lved | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Phosphorus (P)-Dissolv | | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Potassium (K)-Dissolve | | | <0.10 | | mg/L | | 0.00 | 09-SEP-14 |
| Silicon (Si)-Dissolved | - | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| MET-T-CCMS-VA | Water | | | | 9 = | | 0.00 | 00 021 14 |
| Batch R2942770 | | | | | | | | |
| WG1947258-3 CRM | | VA-HIGH-WA | ATRM | | | | | |
| Aluminum (AI)-Total | | | 101.1 | | % | | 80-120 | 09-SEP-14 |
| Antimony (Sb)-Total | | | 97.5 | | % | | 80-120 | 09-SEP-14 |
| Arsenic (As)-Total | | | 99.4 | | % | | 80-120 | 09-SEP-14 |
| Barium (Ba)-Total | | | 100.1 | | % | | 80-120 | 09-SEP-14 |
| Beryllium (Be)-Total | | | 97.0 | | % | | 80-120 | 09-SEP-14 |
| Bismuth (Bi)-Total | | | 96.9 | | % | | 80-120 | 09-SEP-14 |
| Boron (B)-Total | | | 83.9 | | % | | 80-120 | 09-SEP-14 |
| Cadmium (Cd)-Total | | | 98.7 | | % | | 80-120 | 09-SEP-14 |
| Chromium (Cr)-Total | | | 99.3 | | % | | 80-120 | 09-SEP-14 |
| Cobalt (Co)-Total | | | 98.5 | | % | | 80-120 | 09-SEP-14 |
| Copper (Cu)-Total | | | 96.3 | | % | | 80-120 | 09-SEP-14 |
| Lead (Pb)-Total | | | 96.6 | | % | | 80-120 | 09-SEP-14 |
| Lithium (Li)-Total | | | 96.9 | | % | | 80-120 | 09-SEP-14 |
| Manganese (Mn)-Total | | | 101.1 | | % | | 80-120 | 09-SEP-14 |
| Molybdenum (Mo)-Total | l | | 99.1 | | % | | 80-120 | 09-SEP-14 |
| Nickel (Ni)-Total | | | 99.8 | | % | | 80-120 | 09-SEP-14 |
| Selenium (Se)-Total | | | 99.6 | | % | | 80-120 | 09-SEP-14 |
| Silver (Ag)-Total | | | 95.4 | | % | | 80-120 | 09-SEP-14 |
| Sodium (Na)-Total | | | 98.7 | | % | | 80-120 | 09-SEP-14 |
| Strontium (Sr)-Total | | | 100.3 | | % | | 80-120 | 09-SEP-14 |
| Thallium (TI)-Total | | | 97.8 | | % | | 80-120 | 09-SEP-14 |



Workorder: L1514251 Report Date: 10-SEP-14

Test Matrix Reference Result Qualifier Units RPD Limit Analyzed MET-T-CCMS-VA Water Batch R2942770 WG1947258-3 CRM **VA-HIGH-WATRM** Tin (Sn)-Total % 97.7 80-120 09-SEP-14 Titanium (Ti)-Total 91.4 % 09-SEP-14 80-120 Uranium (U)-Total 98.5 % 80-120 09-SEP-14 Vanadium (V)-Total 99.8 % 80-120 09-SEP-14 Zinc (Zn)-Total 96.6 % 80-120 09-SEP-14 WG1947258-1 < 0.0030 Aluminum (Al)-Total mg/L 0.003 09-SEP-14 Antimony (Sb)-Total < 0.00010 mg/L 0.0001 09-SEP-14 Arsenic (As)-Total < 0.00010 mg/L 0.0001 09-SEP-14 Barium (Ba)-Total < 0.000050 mg/L 0.00005 09-SEP-14 Beryllium (Be)-Total < 0.00010 mg/L 0.0001 09-SEP-14 Bismuth (Bi)-Total < 0.00050 mg/L 0.0005 09-SEP-14 Boron (B)-Total < 0.010 mg/L 0.01 09-SEP-14 Cadmium (Cd)-Total < 0.000010 mg/L 0.00001 09-SEP-14 Chromium (Cr)-Total < 0.00010 mg/L 0.0001 09-SEP-14 Cobalt (Co)-Total < 0.00010 mg/L 0.0001 09-SEP-14 Copper (Cu)-Total < 0.00050 mg/L 0.0005 09-SEP-14 Lead (Pb)-Total < 0.000050 mg/L 0.00005 09-SEP-14 Lithium (Li)-Total < 0.00050 mg/L 0.0005 09-SEP-14 Manganese (Mn)-Total < 0.000050 mg/L 0.00005 09-SEP-14 Molybdenum (Mo)-Total < 0.000050 mg/L 0.00005 09-SEP-14 Nickel (Ni)-Total < 0.00050 mg/L 0.0005 09-SEP-14 Selenium (Se)-Total < 0.00010 mg/L 0.0001 09-SEP-14 Silver (Ag)-Total < 0.000010 mg/L 0.00001 09-SEP-14 Sodium (Na)-Total < 0.050 mg/L 0.05 09-SEP-14 Strontium (Sr)-Total < 0.00020 mg/L 0.0002 09-SEP-14 Thallium (TI)-Total < 0.000010 mg/L 0.00001 09-SEP-14 Tin (Sn)-Total < 0.00010 mg/L 0.0001 09-SEP-14 Titanium (Ti)-Total < 0.010 mg/L 0.01 09-SEP-14 Uranium (U)-Total < 0.000010 mg/L 0.00001 09-SEP-14 Vanadium (V)-Total < 0.0010 mg/L 0.001 09-SEP-14 Zinc (Zn)-Total < 0.0030 mg/L 0.003 09-SEP-14

MET-TOT-LOW-ICP-VA Water

Page 6 of 10



Workorder: L1514251

Report Date: 10-SEP-14 Page 7 of 10

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--------------------------------------|--------|------------|---------|-----------|-------|------|---------|-----------|
| MET-TOT-LOW-ICP-VA | Water | | | | | | | |
| Batch R294285 | 1 | | | | | | | |
| WG1947258-3 CRM | | VA-HIGH-WA | | | 0/ | | | |
| Calcium (Ca)-Total | | | 98.5 | | % | | 80-120 | 09-SEP-14 |
| Iron (Fe)-Total | | | 95.5 | | % | | 80-120 | 09-SEP-14 |
| Magnesium (Mg)-Tota | | | 101.0 | | % | | 80-120 | 09-SEP-14 |
| Phosphorus (P)-Total | | | 97.8 | | % | | 80-120 | 09-SEP-14 |
| Potassium (K)-Total | | | 96.6 | | % | | 80-120 | 09-SEP-14 |
| Silicon (Si)-Total | | | 96.1 | | % | | 80-120 | 09-SEP-14 |
| WG1947258-1 MB Calcium (Ca)-Total | | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Iron (Fe)-Total | | | < 0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Magnesium (Mg)-Tota | l | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Phosphorus (P)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Potassium (K)-Total | | | <0.10 | | mg/L | | 0.1 | 09-SEP-14 |
| Silicon (Si)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| PH-PCT-VA | Water | | | | | | | |
| Batch R294364 | 9 | | | | | | | |
| WG1947450-25 CRM | | VA-PH7-BUF | | | | | | |
| рН | | | 7.01 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-26 CRM | | VA-PH7-BUF | | | | | | |
| рН | | | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-27 CRM | | VA-PH7-BUF | 7.04 | | | | | |
| pH | | | 7.01 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-28 CRM pH | | VA-PH7-BUF | 7.02 | | Hq | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-29 CRM | | VA-PH7-BUF | 7.02 | | pi i | | 0.5-7.1 | 09-3EF-14 |
| pH | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-30 CRM | | VA-PH7-BUF | | | • | | | |
| рН | | | 6.99 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-31 CRM | | VA-PH7-BUF | | | | | | |
| рН | | | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-32 CRM | | VA-PH7-BUF | | | | | | |
| рН | | | 7.03 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-33 DUP | | L1514251-1 | 7 77 | | nl.l | 2.22 | 0.6 | 00.055.44 |
| рН | | 7.80 | 7.77 | J | рН | 0.03 | 0.3 | 09-SEP-14 |
| S-DIS-ICP-VA | Water | | | | | | | |



WG1947074-1 Turbidity

Quality Control Report

Workorder: L1514251 Report Date: 10-SEP-14

Page 8 of 10 Test Matrix Reference Result Qualifier Units RPD Limit Analyzed S-DIS-ICP-VA Water Batch R2942645 WG1947233-2 CRM **VA-HIGH-WATRM** Sulfur (S)-Dissolved 101.7 % 80-120 09-SEP-14 WG1947233-1 Sulfur (S)-Dissolved < 0.50 mg/L 0.5 09-SEP-14 S-TOT-ICP-VA Water Batch R2942851 WG1947258-3 CRM **VA-HIGH-WATRM** Sulfur (S)-Total % 101.6 80-120 09-SEP-14 WG1947258-1 Sulfur (S)-Total < 0.50 mg/L 0.5 09-SEP-14 SO4-TUR-VA Water Batch R2943291 WG1948014-2 CRM VA-SO4-L-CONTROL Sulfate (SO4) 98.4 % 85-115 10-SEP-14 WG1948014-6 CRM VA-SO4-H-CONTROL Sulfate (SO4) % 102.8 85-115 10-SEP-14 WG1948014-1 MB Sulfate (SO4) < 0.50 mg/L 0.5 10-SEP-14 WG1948014-5 MB Sulfate (SO4) < 0.50 mg/L 0.5 10-SEP-14 WG1948014-4 MS L1512411-2 Sulfate (SO4) 92.1 % 75-125 10-SEP-14 WG1948014-8 MS L1510555-1 Sulfate (SO4) N/A MS-B % 10-SEP-14 **TURBIDITY-VA** Water R2941561 Batch WG1947074-2 CRM VA-FORM-40 Turbidity 101.8 % 85-115 08-SEP-14

< 0.10

NTU

08-SEP-14

0.1

Workorder: L1514251 Report Date: 10-SEP-14 Page 9 of 10

Legend:

| Limit | ALS Control Limit (Data Quality Objectives) |
|-------|---|
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Sample Parameter Qualifier Definitions:

| Qualifier | Description |
|-----------|---|
| J | Duplicate results and limits are expressed in terms of absolute difference. |
| MB-LOR | Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Workorder: L1514251 Report Date: 10-SEP-14 Page 10 of 10

Hold Time Exceedances:

| | Sample | | | | | | |
|-------------------------|--------|-----------------|-----------------|---------|-----------|-------|-----------|
| ALS Product Description | ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
| Physical Tests | | | | | | | |
| pH by Meter (Automated) | | | | | | | |
| | 1 | 06-SEP-14 17:30 | 09-SEP-14 23:00 | 0.25 | 78 | hours | EHTR-FM |

Legend & Qualifier Definitions:

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

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

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

EHT: Exceeded ALS recommended hold time prior to analysis.

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

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes. Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L1514251 were received on 07-SEP-14 09:30.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Page 115 of 151 MOE-2015-50087

WATER & GENERAL CHEMISTRY REQUISITION

Province Of British Columbia

Ministry of Environment

Maxxam Analytics Inc. 4606 Canada Way Burnaby, BC V5G1K5

| | 5735. | | | | | | Keq | # 50 | 2123 | 90 |
|--|---------------------|---------------|---------------|--------------|-------------------|------------------------------------|----------------|----------|----------|--------|
| gent? Csr l | ło. | Office 10 | ClientCA | | Sampling A | Agency | | | | |
| udy | | Project | N/A | | Code 10 | Name Vancou | uver Island, N | lanaim |) | |
| | oxam Analytics Inc | | | | Address | 2080-A Labie | ux Road | | | |
| inistry Contact NC | | e | | | | | | | | |
| gnature | ole Obee | | | | City | Nessia | | | | |
| WS Id | | Well Plate | # | | Postal Cod | Nanaimo Nanaimo | Phone (2: | 50)751 | 3100 | |
| cation M., | co Carol | DI | aw Fal | 1 | | | 7 110116 (2. | 30)/31- | 3100 | |
| | acree | | | | | Containers | | | | |
| tructions To Lab | Pls include total a | ind dissolved | mercury at it | PMS lev | ei | | _ | | - | |
| State FW D | escriptor GE | Collection | on Method | GRB | 1 | _ | | | | |
| | tion Start | Collection | | | ⊿ Depth | | | | | |
| | M-DD HH:MI | | -DD HH:MI | Uppe | | de | | | - | |
| REG 2014-09 |)6 | 2014-09-06 | 1730h | 0.5 | | | ' | RI | JS | H |
| 2 | | | | -1 | | | • | | | |
| | | | | + | | | | | | |
| | | - | | - | | | Prio | ritv | proc | ess |
| | | | | 1 | | | | | | |
| NEDAL (41) | | | T | | DEGIE | Total | | | 1.00 # | |
| NERAL (1L) | | Med'm j | Pres'n | <u>-</u> | PECIFIC | Test al Oxygen D. | Med m | O1 | Med'm | Pres'n |
| Acidity pH 4.5 Acidity pH 8.3 | | | | | | nem. Oxygen D. | 02 | 01 | | |
| Alk. Titration Cur | <i>r</i> e | | | | Carbon: DI | | | | | - |
| Alkalinity: Phen. | | | | | X Carbon: Do | | | | 1 | |
| K Askalinity: Total: p Colour: S.W. | r1 4.3 | | | | Carbon: Ti | | | | | |
| Colour: TAC | | | | - | X Carbon: TO | | 04 | 05 | | |
| Colour: True | | | | | Chlorophyl | | | | 1 | |
| K pH Residue: Filterab | le: 0.45µm (TDS) | | | | Cyanide: S | | 02 | 24 | | |
| | fixed (TSS: fixed) | | | | Cyanide: W | /AD | 02 | 24 | | |
| Residue: Nonfilte | rable (TSS) | | | | Phaeophyti | | | -27 | | |
| Residue: Total Residue: Total, F | ixed | | | | | FR Whole Bottle traction Prep.) | 03 | 01 | - | |
| Specific Conduct | | | | | Sulphide: T | | 03 | 08 | | |
| X Turbidity | | - | | | DRGANICS | | | | Med'm | Pres'n |
| NERAL (120 mL) | | Med'm | Pres'n | | AOX | | | -+ | | |
| Anion Package | CI,Br,SO4) | | | | | HerbScan | | - | | |
| Chloride | | | | | BTEX | | _ | - | - 1 | |
| Fluoride | Nitrita (Calm) | | | # | EPH | | | | | |
| Nit.: Nitrate and Nitrogen: Nitrate | | | | | | - | | - | - | |
| Nitrogen: Nitrite | | | A | ^- | . [| Imetric | | | | |
| Silica: Reactive | | | AIK | -// | 21 | an an | | | T İ | |
| X Sulfate | | | | 1 | DIMDI | scan | | | | |
| SENERAL IONS (12 | (lm 0 | Med'm 55 | Mota | 15 - | BLMDO | | | | | |
| 1 Nitrogen: Ammk | | | | | | | | | | |
| Nitrogen: Organ | ic | | _ | | | | | _ | | |
| Nitrogen: Tot. K | eldahi (Calc) | | _ | | | | | | | |
| | | | = | | | - | | | _ | |
| HOSPHORUS (120 | ····-) | Medim | | | | * (Mnr) | | | | |
| Phos. Diss. O-p Phosphorus: To | hosphate (Cofm) | | <u>-</u> | | | | | | | |
| Phosphorus: To | | | · | -110 | THER Med | I'm Pres'n | | Test | ed ICDMS | lovel |
| ETALS (TOTAL) | Med'm | Pres'n N | fed'm Pres | s'n | | Total | and dissolved | mercury | at ICPMS | ievei |
| gh Low | 55 | 02 | | | | | | _ | | |
| Metal Pkg | | | | | - | | | | | - |
| X Metal Pkg | (ICPMS) | | | | | | | | | |
| X Hardness X Mercury | | | | ╼⊣╚ | | | | | | |
| | Sieve to < 63µ | | | | TELD TEST | No. Param | neter Metho | d R | esults | Units |
| ETALS (DISSOLVE | D; Med'm | Pres'n | Med'm Pre | | DETAILS | i l | | +- | | - |
| 45 MICROMETERS | 55 | 62 | | [| | | | | | - |
| gh Low | a (ICD) | | | $-\parallel$ | | | | | -i | - |
| Metal Pk | g. (ICP) | | | [[| | | | 1 | | |
| | at the me | | · · · · | | | | | | | 200 |
| X Metal Pk | | | | | | | | | | |
| X Metal Pk | | | | | | | | | | |
| X Metal Pk X Hardnes X Mercury | | | | | h 1 | | | | | |
| X Metal Pk X Hardnes | | | Rec b | M | Paul 9:30 | | Date: 20 | 014-09-0 | 6 11:45 | |



BC MINISTRY OF ENVIRONMENT

ATTN: Deborah Epps

Section Head, Provincial Water Quality

2080A Labieux Road Nanaimo BC V9T 6J9 Date Received: 07-SEP-14

Report Date: 12-SEP-14 18:30 (MT)

Version: FINAL

Client Phone: 604-793-8770

Certificate of Analysis

Lab Work Order #: L1514340

Project P.O. #: NOT SUBMITTED

Job Reference:

C of C Numbers: 50212395

Legal Site Desc:

Dean Watt Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700 ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

Environmental 🚂

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RIGHT SOLUTIONS RIGHT PARTNER

L1514340 CONTD.... PAGE 2 of 6 12-SEP-14 18:30 (MT)

FINAL

Version:

ALS ENVIRONMENTAL ANALYTICAL REPORT

L1514340-1 Sample ID WATER Description 06-SEP-14 Sampled Date Sampled Time 20:50 MYRA FALLS Client ID MINE SOURCE MATERIAL Grouping Analyte WATER Hardness (as CaCO3) (mg/L) **Physical Tests** 40.1 pH (pH) 3.93 Anions and Sulfate (SO4) (mg/L) 2080 **Nutrients Total Metals** Aluminum (Al)-Total (ug/L) 385000 DLA Antimony (Sb)-Total (ug/L) <2.0 DLA Arsenic (As)-Total (ug/L) <2.0 Barium (Ba)-Total (ug/L) 7.3 DLA Beryllium (Be)-Total (ug/L) <2.0 DLA Bismuth (Bi)-Total (ug/L) <10 DLA Boron (B)-Total (ug/L) <200 Cadmium (Cd)-Total (ug/L) 0.21 Calcium (Ca)-Total (ug/L) 12600 Chromium (Cr)-Total (ug/L) 2.9 Cobalt (Co)-Total (ug/L) <2.0 Copper (Cu)-Total (ug/L) <10 Iron (Fe)-Total (ug/L) 73 Lead (Pb)-Total (ug/L) 7.6 Lithium (Li)-Total (ug/L) <10 Magnesium (Mg)-Total (ug/L) 1920 Manganese (Mn)-Total (ug/L) 13.0 Mercury (Hg)-Total (ug/L) < 0.010 Molybdenum (Mo)-Total (ug/L) <1.0 Nickel (Ni)-Total (ug/L) <10 DLA Phosphorus (P)-Total (ug/L) <250 DLA Potassium (K)-Total (ug/L) <500 DLA Selenium (Se)-Total (ug/L) <2.0 Silicon (Si)-Total (ug/L) 2290 DLA Silver (Ag)-Total (ug/L) < 0.20 Sodium (Na)-Total (ug/L) 2900 Strontium (Sr)-Total (ug/L) 13.7 Sulfur (S)-Total (ug/L) 714000 Thallium (TI)-Total (ug/L) < 0.20 DLA Tin (Sn)-Total (ug/L) <2.0 DLA Titanium (Ti)-Total (ug/L) <200 Uranium (U)-Total (ug/L) 0.28 Vanadium (V)-Total (ug/L) <20 Zinc (Zn)-Total (ug/L) 137

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L1514340 CONTD.... PAGE 3 of 6 12-SEP-14 18:30 (MT)

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Version:

ALS ENVIRONMENTAL ANALYTICAL REPORT

L1514340-1 Sample ID Description WATER 06-SEP-14 Sampled Date Sampled Time 20:50 MYRA FALLS Client ID MINE SOURCE MATERIAL Grouping **Analyte** WATER Dissolved Mercury Filtration Location **Dissolved Metals** LAB Dissolved Metals Filtration Location LAB Aluminum (AI)-Dissolved (ug/L) 363000 Antimony (Sb)-Dissolved (ug/L) <2.0 DLA Arsenic (As)-Dissolved (ug/L) <2.0 Barium (Ba)-Dissolved (ug/L) 5.4 DLA Beryllium (Be)-Dissolved (ug/L) <2.0 DLA Bismuth (Bi)-Dissolved (ug/L) <10 DLA Boron (B)-Dissolved (ug/L) <200 DLA Cadmium (Cd)-Dissolved (ug/L) < 0.20 Calcium (Ca)-Dissolved (ug/L) 12800 Chromium (Cr)-Dissolved (ug/L) 2.5 Cobalt (Co)-Dissolved (ug/L) <2.0 DLA Copper (Cu)-Dissolved (ug/L) <4.0 DLA Iron (Fe)-Dissolved (ug/L) <50 Lead (Pb)-Dissolved (ug/L) 6.4 Lithium (Li)-Dissolved (ug/L) <10 Magnesium (Mg)-Dissolved (ug/L) 1940 Manganese (Mn)-Dissolved (ug/L) 9.2 Mercury (Hg)-Dissolved (ug/L) < 0.010 Molybdenum (Mo)-Dissolved (ug/L) <1.0 DLA Nickel (Ni)-Dissolved (ug/L) <10 Phosphorus (P)-Dissolved (ug/L) <250 DLA Potassium (K)-Dissolved (ug/L) < 500 Selenium (Se)-Dissolved (ug/L) <2.0 Silicon (Si)-Dissolved (ug/L) 2260 Silver (Ag)-Dissolved (ug/L) < 0.20 Sodium (Na)-Dissolved (ug/L) 2600 Strontium (Sr)-Dissolved (ug/L) 13.3 Sulfur (S)-Dissolved (ug/L) 711000 Thallium (TI)-Dissolved (ug/L) < 0.20 DLA Tin (Sn)-Dissolved (ug/L) <2.0 DLA Titanium (Ti)-Dissolved (ug/L) <200 DLA Uranium (U)-Dissolved (ug/L) <0.20 Vanadium (V)-Dissolved (ug/L) <20 Zinc (Zn)-Dissolved (ug/L) 122

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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Reference Information

Qualifiers for Sample Submission Listed:

| Qualifier | Description |
|-----------|---|
| WSMD | Water sample(s) for dissolved mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low. |
| WSMT | Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low. |

| QC | Samples | with | Qualifiers | & | Comments: |
|----|---------|------|------------|---|-----------|
|----|---------|------|------------|---|-----------|

| QC Type Description | Parameter | Qualifier | Applies to Sample Number(s) |
|---------------------|--------------------------|-----------|-----------------------------|
| Duplicate | Antimony (Sb)-Total | DLA | L1514340-1 |
| Duplicate | Arsenic (As)-Total | DLA | L1514340-1 |
| Duplicate | Beryllium (Be)-Total | DLA | L1514340-1 |
| Duplicate | Bismuth (Bi)-Total | DLA | L1514340-1 |
| Duplicate | Boron (B)-Total | DLA | L1514340-1 |
| Duplicate | Cadmium (Cd)-Total | DLA | L1514340-1 |
| Duplicate | Cobalt (Co)-Total | DLA | L1514340-1 |
| Duplicate | Copper (Cu)-Total | DLA | L1514340-1 |
| Duplicate | Lithium (Li)-Total | DLA | L1514340-1 |
| Duplicate | Molybdenum (Mo)-Total | DLA | L1514340-1 |
| Duplicate | Nickel (Ni)-Total | DLA | L1514340-1 |
| Duplicate | Selenium (Se)-Total | DLA | L1514340-1 |
| Duplicate | Silver (Ag)-Total | DLA | L1514340-1 |
| Duplicate | Thallium (TI)-Total | DLA | L1514340-1 |
| Duplicate | Tin (Sn)-Total | DLA | L1514340-1 |
| Duplicate | Titanium (Ti)-Total | DLA | L1514340-1 |
| Duplicate | Vanadium (V)-Total | DLA | L1514340-1 |
| Matrix Spike | Sulfate (SO4) | MS-B | L1514340-1 |
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L1514340-1 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L1514340-1 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L1514340-1 |

Qualifiers for Individual Parameters Listed:

| Qualifier | Description |
|-----------|--|
| DLA | Detection Limit adjusted for required dilution |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|------------------|--------|------------------|--------------------|
| HARDNESS-CALC-VA | Water | Hardness | APHA 2340B |

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method

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6020A).

MET-DIS-LOW-ICP-VA

Water

Dissolved Metals in Water by ICPOES

EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA

Water

Total Metals in Water by CRC ICPMS

APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-TOT-LOW-ICP-VA

Water

Total Metals in Water by ICPOES

EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

PH-PCT-VA

Water

pH by Meter (Automated)

APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA

Water

pH by Meter (Automated)

APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

S-DIS-ICP-VA

Water

Dissolved Sulfur in Water by ICPOES

EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

S-TOT-ICP-VA

Water

Total Sulfur in Water by ICPOES

EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

SO4-TUR-VA

Water

Sulfate(SO4) by Turbidity

APHA 4500-SO4 E. SULFATE

This analysis is carried out using procedures adapted from APHA Method 4500-SO4 "Sulfate". Sulfate is determined using the turbidimetric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code Laboratory Location

VA ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

50212395

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GLOSSARY OF REPORT TERMS

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

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

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

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Workorder: L1514340 Report Date: 12-SEP-14 Page 1 of 10

Client: BC MINISTRY OF ENVIRONMENT

Section Head, Provincial Water Quality 2080A Labieux Road

Nanaimo BC V9T 6J9

Contact: Deborah Epps

| Test Matr | ix Reference | Result Qualifier | Units | RPD | Limit | Analyzed |
|--|--------------|------------------|-------|-----|---------|-----------|
| HG-DIS-LOW-CVAFS-VA Wat | er | | | | | |
| Batch R2943546 | | | | | | |
| WG1947666-3 LCS | | 00.4 | 0/ | | | |
| Mercury (Hg)-Dissolved | | 98.4 | % | | 80-120 | 10-SEP-14 |
| WG1947666-1 MB Mercury (Hg)-Dissolved | | <0.000010 | mg/L | | 0.00001 | 10-SEP-14 |
| HG-TOT-LOW-CVAFS-VA Wat | or | | | | 0.00001 | 10 021 14 |
| Batch R2943546 | | | | | | |
| WG1948561-2 LCS | | | | | | |
| Mercury (Hg)-Total | | 94.4 | % | | 80-120 | 10-SEP-14 |
| WG1948561-1 MB | | | | | | |
| Mercury (Hg)-Total | | <0.000010 | mg/L | | 0.00001 | 10-SEP-14 |
| WG1948561-4 MS Mercury (Hg)-Total | L1514553-10 | 102.0 | % | | 70 120 | 10 CED 14 |
| WG1948561-5 MS | L1514611-1 | 102.0 | /6 | | 70-130 | 10-SEP-14 |
| Mercury (Hg)-Total | L1514011-1 | 85.0 | % | | 70-130 | 10-SEP-14 |
| MET-D-CCMS-VA Wate | er | | | | | |
| Batch R2943403 | | | | | | |
| WG1947666-2 CRM | VA-HIGH-WA | ГВМ | | | | |
| Aluminum (Al)-Dissolved | | 97.8 | % | | 80-120 | 09-SEP-14 |
| Antimony (Sb)-Dissolved | | 98.9 | % | | 80-120 | 09-SEP-14 |
| Arsenic (As)-Dissolved | | 98.2 | % | | 80-120 | 09-SEP-14 |
| Barium (Ba)-Dissolved | | 97.6 | % | | 80-120 | 09-SEP-14 |
| Beryllium (Be)-Dissolved | | 99.6 | % | | 80-120 | 09-SEP-14 |
| Bismuth (Bi)-Dissolved | | 93.5 | % | | 80-120 | 09-SEP-14 |
| Boron (B)-Dissolved | | 87.1 | % | | 80-120 | 09-SEP-14 |
| Cadmium (Cd)-Dissolved | | 97.1 | % | | 80-120 | 09-SEP-14 |
| Chromium (Cr)-Dissolved | | 100.1 | % | | 80-120 | 09-SEP-14 |
| Cobalt (Co)-Dissolved | | 96.5 | % | | 80-120 | 09-SEP-14 |
| Copper (Cu)-Dissolved | | 96.1 | % | | 80-120 | 09-SEP-14 |
| Lead (Pb)-Dissolved | | 94.9 | % | | 80-120 | 09-SEP-14 |
| Lithium (Li)-Dissolved | | 98.1 | % | | 80-120 | 09-SEP-14 |
| Manganese (Mn)-Dissolved | | 99.0 | % | | 80-120 | 09-SEP-14 |
| Molybdenum (Mo)-Dissolved | | 98.7 | % | | 80-120 | 09-SEP-14 |
| Nickel (Ni)-Dissolved | | 97.1 | % | | 80-120 | 09-SEP-14 |
| Selenium (Se)-Dissolved | | 98.6 | % | | 80-120 | 09-SEP-14 |
| Silver (Ag)-Dissolved | | 98.7 | % | | 80-120 | 09-SEP-14 |
| Sodium (Na)-Dissolved | | 98.8 | % | | 80-120 | 09-SEP-14 |



Workorder: L1514340 Report Date: 12-SEP-14 Page 2 of 10

| Batch R2943403 WG1947656-2 CRM VA-HIGH-WATRM | Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|-------------------------|--------|-----------|-----------|-----------|-------|-----|---------|-----------|
| WG1947566-2 CRM VA-HIGH-WATRM Strottum (Sr)-Dissolved 100.6 % 80-120 09-SEP-14 Thailium (Ti)-Dissolved 98.0 % 80-120 09-SEP-14 Tin (Sn)-Dissolved 98.0 % 80-120 09-SEP-14 Tin (Sn)-Dissolved 87.9 % 80-120 09-SEP-14 Uranium (Ti)-Dissolved 96.3 % 80-120 09-SEP-14 Uranium (U)-Dissolved 99.2 % 80-120 09-SEP-14 Zinc (Zn)-Dissolved 99.2 % 80-120 09-SEP-14 Zinc (Zn)-Dissolved 96.6 % 80-120 09-SEP-14 Zinc (Zn)-Dissolved 96.6 % 80-120 09-SEP-14 Zinc (Zn)-Dissolved 90-SEP-14 Zinc (Zn)-Dissol | MET-D-CCMS-VA | Water | | | | | | | |
| Strontium (Sr)-Dissolved 100.6 | Batch R2943403 | | | | | | | | |
| Thallium (TI)-Dissolved 95.1 % 80.120 09-SEP-14 Tin (Si)-Dissolved 98.0 % 80-120 09-SEP-14 Titanium (TI)-Dissolved 97.9 % 80-120 09-SEP-14 Uranium (U)-Dissolved 96.3 % 80-120 09-SEP-14 Vanadium (V)-Dissolved 99.2 % 80.120 09-SEP-14 Vanadium (V)-Dissolved 99.2 % 80.120 09-SEP-14 Vanadium (V)-Dissolved 99.6 % 80-120 09-SEP-14 VG1947666-1 MB Aluminum (Al)-Dissolved 99.8 % 80-120 09-SEP-14 Antmony (Sb)-Dissolved 99.8 % 80-120 09-SEP-14 Antmony (Sb)-Dissolved 90.0010 mg/L 0.0011 09-SEP-14 Arsenic (As)-Dissolved 40.00010 mg/L 0.0001 09-SEP-14 Arsenic (As)-Dissolved 40.00010 mg/L 0.0001 09-SEP-14 Barium (Ba)-Dissolved 40.00010 mg/L 0.0001 09-SEP-14 Beryllium (Be)-Dissolved 40.00010 mg/L 0.0001 09-SEP-14 Beryllium (Be)-Dissolved 40.00010 mg/L 0.0001 09-SEP-14 Boron (B)-Dissolved 40.00010 mg/L 0.0005 09-SEP-14 Cadmium (Cd)-Dissolved 40.00010 mg/L 0.0001 09-SEP-14 Chromium (Cd)-Dissolved 40.00010 mg/L 0.0001 09-SEP-14 Chyoper (Cu)-Dissolved 40.00010 mg/L 0.0001 09-SEP-14 Lithium (Li)-Dissolved 40.00050 mg/L 0.0002 09-SEP-14 Lithium (Li)-Dissolved 40.00050 mg/L 0.0002 09-SEP-14 Lithium (Li)-Dissolved 40.00050 mg/L 0.0005 09-SEP-14 Manganese (Mn)-Dissolved 40.00050 mg/L 0.0005 09-SEP-14 Molybdenum (Mo)-Dissolved 40.00050 mg/L 0.0005 09-SEP-14 Selenium (Se)-Dissolved 40.00050 mg/L 0.0005 09-SEP-14 Selenium (Se)-Dissolved 40.00050 mg/L 0.0005 09-SEP-14 Selenium (Se)-Dissolved 40.00010 mg/L 0.0001 09-SEP-14 Tin (Si)-Dissolved 40.00010 mg/L 0.0001 09-SEP-14 Tin (Si)-Dissol | | | VA-HIGH-W | | | | | | |
| Tin (Sn)-Dissolved 98.0 % 80.120 09-SEP-14 Titanium (Ti)-Dissolved 87.9 % 80.120 09-SEP-14 Uranium (Ui)-Dissolved 96.3 % 80.120 09-SEP-14 Vanadium (V)-Dissolved 99.2 % 80.120 09-SEP-14 Zinc (Zn)-Dissolved 99.6 % 80.120 09-SEP-14 Zinc (Zn)-Dissolved 99.6 % 80.120 09-SEP-14 WG1947666-1 MB Aluminum (Al)-Dissolved 09.6 % 80.120 09-SEP-14 Arsenic (As)-Dissolved 09.00010 mg/L 0.0001 09-SEP-14 Arsenic (As)-Dissolved 0.00010 mg/L 0.0001 09-SEP-14 Arsenic (As)-Dissolved 0.00010 mg/L 0.0001 09-SEP-14 Barium (Ba)-Dissolved 0.00010 mg/L 0.0001 09-SEP-14 Beryllium (Bi)-Dissolved 0.00010 mg/L 0.0001 09-SEP-14 Bismuth (Bi)-Dissolved 0.00010 mg/L 0.0001 09-SEP-14 Boron (B)-Dissolved 0.00010 mg/L 0.0001 09-SEP-14 Cadmium (Cd)-Dissolved 0.00010 mg/L 0.0001 09-SEP-14 Cadmium (Cd)-Dissolved 0.00010 mg/L 0.0001 09-SEP-14 Cobalt (Co)-Dissolved 0.00010 mg/L 0.0001 09-SEP-14 Cobalt (Co)-Dissolved 0.00010 mg/L 0.0001 09-SEP-14 Copper (Cu)-Dissolved 0.00010 mg/L 0.0001 09-SEP-14 Copper (Cu)-Dissolved 0.000010 mg/L 0.0001 09-SEP-14 Lead (Pb)-Dissolved 0.000050 mg/L 0.00005 09-SEP-14 Lead (Pb)-Dissolved 0.000050 mg/L 0.0005 09-SEP-14 Lithium (Li)-Dissolved 0.000050 mg/L 0.0005 09-SEP-14 Manganese (Mn)-Dissolved 0.000050 mg/L 0.0005 09-SEP-14 Molybdenum (Mo)-Dissolved 0.000050 mg/L 0.0005 09-SEP-14 Nickel (Ni)-Dissolved 0.000010 mg/L 0.0001 09-SEP-14 Silver (Ag)-Dissolved 0.000010 mg/L 0.0001 09-SEP-14 Titanium (Ti)-Dissolved 0.00010 mg/L 0.0001 09-SEP-14 Titanium (Ti)-Dissolved 0.00010 mg/L 0.0001 09-SEP-14 Titanium (Ti)-Dissolved 0.00010 mg/L 0.0001 09-SEP-14 Uranium (Ti)-Dissolved 0.00010 mg/L 0.0001 09-SEP-14 Uranium (Ti)-Dissolved 0.00010 mg/L 0.0001 09-SEP-14 | | | | | | | | 80-120 | 09-SEP-14 |
| Titanium (Ti)-Dissolved 87.9 % 80.120 09-SEP-14 Uranium (U)-Dissolved 96.3 % 80-120 09-SEP-14 Vanadium (V)-Dissolved 99.2 % 80-120 09-SEP-14 Zinc (Zn)-Dissolved 96.6 % 80-120 09-SEP-14 WG1947666-1 MB WG1947666-1 MB Aluminum (Al)-Dissolved <0.0010 | , , | | | 95.1 | | % | | 80-120 | 09-SEP-14 |
| Uranium (U)-Dissolved 96.3 % 80-120 09-SEP-14 Vanadium (V)-Dissolved 99.2 % 80-120 09-SEP-14 Zinc (Zn)-Dissolved 96.6 % 80-120 09-SEP-14 WG1947666-1 MB Aluminum (Al)-Dissolved -0.0010 mg/L 0.001 09-SEP-14 Antimony (Sb)-Dissolved <0.00010 | Tin (Sn)-Dissolved | | | 98.0 | | % | | 80-120 | 09-SEP-14 |
| Vanadium (V)-Dissolved 99.2 % 80-120 09-SEP-14 Zinc (Zn)-Dissolved 96.6 % 80-120 09-SEP-14 WG1947666-1 MB Aluminum (Al)-Dissolved <0.0010 | Titanium (Ti)-Dissolved | | | 87.9 | | % | | 80-120 | 09-SEP-14 |
| Zinc (Zh)-Dissolved 96.6 % 80-120 0g-SEP-14 WG1947666-1 MB Aluminum (Al)-Dissolved <0.0010 mg/L 0.001 0g-SEP-14 Antimory (Sb)-Dissolved <0.00010 mg/L 0.0001 0g-SEP-14 Arsenic (As)-Dissolved <0.00010 mg/L 0.0001 0g-SEP-14 Barium (Ba)-Dissolved <0.00010 mg/L 0.0001 0g-SEP-14 Beryllium (Be)-Dissolved <0.00010 mg/L 0.0001 0g-SEP-14 Bismuth (B)-Dissolved <0.00050 mg/L 0.0001 0g-SEP-14 Boron (B)-Dissolved <0.00050 mg/L 0.0001 0g-SEP-14 Cadmium (Cd)-Dissolved <0.00010 mg/L 0.0001 0g-SEP-14 Chromium (Cf)-Dissolved <0.00010 mg/L 0.0001 0g-SEP-14 Cobalt (Co)-Dissolved <0.00010 mg/L 0.0001 0g-SEP-14 Cobalt (Co)-Dissolved <0.00020 mg/L 0.0001 0g-SEP-14 Cobalt (Co)-Dissolved <0.00002 mg/L 0.000 | Uranium (U)-Dissolved | | | 96.3 | | % | | 80-120 | 09-SEP-14 |
| WG1947666-1 MB Aluminum (Al)-Dissolved <0.0010 mg/L 0.001 09-SEP-14 Antimony (Sb)-Dissolved <0.00010 | Vanadium (V)-Dissolve | d | | 99.2 | | % | | 80-120 | 09-SEP-14 |
| Aluminum (Al)-Dissolved <0.0010 mg/L 0.0011 09-SEP-14 Antimony (Sb)-Dissolved <0.00010 | Zinc (Zn)-Dissolved | | | 96.6 | | % | | 80-120 | 09-SEP-14 |
| Antimony (Sb)-Dissolved | | | | | | | | | |
| Arsenic (As)-Dissolved <0.00010 | ` ' | | | | | _ | | 0.001 | |
| Barium (Ba)-Dissolved <0.000050 | | d | | | | mg/L | | 0.0001 | 09-SEP-14 |
| Beryllium (Be)-Dissolved <0.00010 mg/L 0.0001 09-SEP-14 Bismuth (Bi)-Dissolved <0.00050 | ` ' | | | <0.00010 | | • | | 0.0001 | 09-SEP-14 |
| Bismuth (Bi)-Dissolved <0.00050 | ` , | | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Boron (B)-Dissolved <0.010 | Beryllium (Be)-Dissolve | d | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Cadmium (Cd)-Dissolved <0.000010 | Bismuth (Bi)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Chromium (Cr)-Dissolved <0.00010 mg/L 0.0001 09-SEP-14 Cobalt (Co)-Dissolved <0.00010 | Boron (B)-Dissolved | | | < 0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Cobalt (Co)-Dissolved <0.00010 | Cadmium (Cd)-Dissolve | ed | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Copper (Cu)-Dissolved <0.00020 mg/L 0.0002 09-SEP-14 Lead (Pb)-Dissolved <0.00050 | Chromium (Cr)-Dissolve | ed | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Lead (Pb)-Dissolved <0.000050 | Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Lithium (Li)-Dissolved <0.00050 mg/L 0.0005 09-SEP-14 Manganese (Mn)-Dissolved <0.000050 | Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 09-SEP-14 |
| Manganese (Mn)-Dissolved <0.000050 | Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Molybdenum (Mo)-Dissolved <0.000050 | Lithium (Li)-Dissolved | | | < 0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Nickel (Ni)-Dissolved <0.00050 mg/L 0.0005 09-SEP-14 Selenium (Se)-Dissolved <0.00010 | Manganese (Mn)-Disso | lved | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Selenium (Se)-Dissolved <0.00010 mg/L 0.0001 09-SEP-14 Silver (Ag)-Dissolved <0.000010 | Molybdenum (Mo)-Diss | olved | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Silver (Ag)-Dissolved <0.000010 | Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Sodium (Na)-Dissolved <0.050 mg/L 0.05 09-SEP-14 Strontium (Sr)-Dissolved <0.00020 | Selenium (Se)-Dissolve | ed | | < 0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Strontium (Sr)-Dissolved <0.00020 mg/L 0.0002 09-SEP-14 Thallium (TI)-Dissolved <0.000010 | Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Thallium (TI)-Dissolved <0.000010 | Sodium (Na)-Dissolved | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Tin (Sn)-Dissolved <0.00010 mg/L 0.0001 09-SEP-14 Titanium (Ti)-Dissolved <0.010 | Strontium (Sr)-Dissolve | d | | <0.00020 | | mg/L | | 0.0002 | 09-SEP-14 |
| Titanium (Ti)-Dissolved <0.010 mg/L 0.01 09-SEP-14 Uranium (U)-Dissolved <0.000010 | Thallium (TI)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Titanium (Ti)-Dissolved <0.010 mg/L 0.01 09-SEP-14 Uranium (U)-Dissolved <0.000010 | Tin (Sn)-Dissolved | | | < 0.00010 | | mg/L | | 0.0001 | |
| Uranium (U)-Dissolved <0.000010 | Titanium (Ti)-Dissolved | | | < 0.010 | | mg/L | | | |
| Vanadium (V)-Dissolved <0.0010 mg/L 0.001 09-SEP-14 | Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | | |
| | Vanadium (V)-Dissolve | d | | <0.0010 | | _ | | | |
| | | | | | | mg/L | | 0.001 | 09-SEP-14 |



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| | Workorder: Eror | 10 10 | rioport Bato. | 2-021-14 | Гс | ige 3 of to |
|---|-----------------------|---------------|---------------|----------|--------|--|
| Test Matrix | Reference Res | ult Qualifier | Units | RPD | Limit | Analyzed |
| MET-D-CCMS-VA Water | | | | | | |
| Batch R2943770 | | | | | | |
| WG1947666-5 MS | L1514011-4 | | | | | |
| Aluminum (Al)-Dissolved | 96.2 | | % | | 70-130 | 10-SEP-14 |
| Antimony (Sb)-Dissolved | 99.5 | | % | | 70-130 | 10-SEP-14 |
| Arsenic (As)-Dissolved | 99.5 | | % | | 70-130 | 10-SEP-14 |
| Barium (Ba)-Dissolved | N/A | MS-B | % | | - | 10-SEP-14 |
| Beryllium (Be)-Dissolved | 96.1 | | % | | 70-130 | 10-SEP-14 |
| Bismuth (Bi)-Dissolved | 97.4 | | % | | 70-130 | 10-SEP-14 |
| Boron (B)-Dissolved | 104. | | % | | 70-130 | 10-SEP-14 |
| Cadmium (Cd)-Dissolved | 97.4 | | % | | 70-130 | 10-SEP-14 |
| Chromium (Cr)-Dissolved | 96.7 | | % | | 70-130 | 10-SEP-14 |
| Cobalt (Co)-Dissolved | 95.6 | | % | | 70-130 | 10-SEP-14 |
| Copper (Cu)-Dissolved | 93.9 | | % | | 70-130 | 10-SEP-14 |
| Lead (Pb)-Dissolved | 96.7 | | % | | 70-130 | 10-SEP-14 |
| Lithium (Li)-Dissolved | 96.0 | | % | | 70-130 | 10-SEP-14 |
| Manganese (Mn)-Dissolved | 94.5 | | % | | 70-130 | 10-SEP-14 |
| Molybdenum (Mo)-Dissolved | 96.6 | | % | | 70-130 | 10-SEP-14 |
| Nickel (Ni)-Dissolved | 92.6 | | % | | 70-130 | 10-SEP-14 |
| Selenium (Se)-Dissolved | 100 | 3 | % | | 70-130 | 10-SEP-14 |
| Silver (Ag)-Dissolved | 97.1 | | % | | 70-130 | 10-SEP-14 |
| Sodium (Na)-Dissolved | N/A | MS-B | % | | - | 10-SEP-14 |
| Strontium (Sr)-Dissolved | N/A | MS-B | % | | - | 10-SEP-14 |
| Thallium (TI)-Dissolved | 98.9 |) | % | | 70-130 | 10-SEP-14 |
| Tin (Sn)-Dissolved | 98.9 |) | % | | 70-130 | 10-SEP-14 |
| Titanium (Ti)-Dissolved | 94.0 |) | % | | 70-130 | 10-SEP-14 |
| Uranium (U)-Dissolved | 99.7 | • | % | | 70-130 | 10-SEP-14 |
| Vanadium (V)-Dissolved | 98.0 |) | % | | 70-130 | 10-SEP-14 |
| Zinc (Zn)-Dissolved | 95.0 |) | % | | 70-130 | 10-SEP-14 |
| MET-DIS-LOW-ICP-VA Water | | | | | | |
| Batch R2943812 | | | | | | |
| WG1947666-2 CRM Calcium (Ca)-Dissolved | VA-HIGH-WATRM 103. | 1 | % | | 80-120 | 09-SEP-14 |
| Iron (Fe)-Dissolved | 99.1 | | % | | 80-120 | 09-SEP-14 |
| Magnesium (Mg)-Dissolved | 104 | | % | | 80-120 | 09-SEP-14 |
| Phosphorus (P)-Dissolved | 98.6 | ; | % | | 80-120 | 09-SEP-14 |
| Potassium (K)-Dissolved | 99.5 | | % | | 80-120 | 09-SEP-14 |
| , , | | | | | JJ 1E0 | 00 0=1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |



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| Metro-Dis-Low-ICP-VA | Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|----------------------|-----------|-----------|---------|-----------|-------|-----|--------|-----------|
| WG1947666-1 MB WG1947666-1 MB Galcium (Ca)-Dissolved Galcium (| MET-DIS-LOW-ICP-V/ | A Water | | | | | | | |
| Silicon (Si)-Dissolved 100.7 % 80-120 09-SEP-14 WG1947686-1 MB Calcium (Ca)-Dissolved 0.050 09-SEP-14 Iron (Fe)-Dissolved <0.050 | Batch R2943 | 3812 | | | | | | | |
| Calcium (Ca)-Dissolved | | | VA-HIGH-W | | | % | | 80-120 | 09-SEP-14 |
| Iron (Fe)-Dissolved | WG1947666-1 M | 1B | | | | | | | |
| Magnesium (Mg)-Dissolved <0.050 mg/L 0.05 09-SEP-14 Phosphorus (P)-Dissolved <0.050 | Calcium (Ca)-Disso | olved | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Phosphorus (P)-Dissolved | Iron (Fe)-Dissolved | t | | <0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Potassium (K)-Dissolved | Magnesium (Mg)-D | Dissolved | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| MET-T-CCMS-VA Water | Phosphorus (P)-Di | ssolved | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| MET-T-CCMS-VA Water | Potassium (K)-Diss | solved | | <0.10 | | mg/L | | 0.1 | 09-SEP-14 |
| Batch R2943403 WG1947899-3 CRM VA-HIGH-WATRM Aluminum (Al)-Total 109.3 % 80-120 09-SEP-14 Antimony (Sb)-Total 108.9 % 80-120 09-SEP-14 Arsenic (As)-Total 106.6 % 80-120 09-SEP-14 Barium (Ba)-Total 106.9 % 80-120 09-SEP-14 Beryllium (Ba)-Total 109.0 % 80-120 09-SEP-14 Bismuth (Bi)-Total 105.8 % 80-120 09-SEP-14 Bismuth (Bi)-Total 105.8 % 80-120 09-SEP-14 Bismuth (Ca)-Total 105.8 % 80-120 09-SEP-14 Reversion (Ca)-Total 104.8 % 80-120 09-SEP-14 Reversion (Ca)-Total 104.8 % 80-120 09-SEP-14 Reversion (Ca)-Total 105.3 % 80-120 09-SEP-14 Reversion (Ca)-Total 105.3 % 80-120 09-SEP-14 Reversion (Ca)-Total 105.3 % 80-120 09-SEP-14 Reversion (Ca)-Total 106.0 % 80-120 09-SEP-14 Reversion (Ca)-Total 106.0 % 80-120 09-SEP-14 Reversion (Ca)-Total 106.0 % 80-120 09-SEP-14 Reversion (Ca)-Total 106.8 % 80-120 09-SEP-14 Reversion (Ca)-Total 106.4 % 80-120 | Silicon (Si)-Dissolv | red | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| WG1947899-3 CRM CAHIGH-WATRM Aluminum (Al)-Total 109.3 % 80-120 09-SEP-14 Antimory (Sb)-Total 108.9 % 80-120 09-SEP-14 Arsenic (As)-Total 106.6 % 80-120 09-SEP-14 Arsenic (As)-Total 106.9 % 80-120 09-SEP-14 Beryllium (Be)-Total 106.9 % 80-120 09-SEP-14 Beryllium (Be)-Total 109.0 % 80-120 09-SEP-14 Bismuth (Bi)-Total 105.8 % 80-120 09-SEP-14 Bismuth (Bi)-Total 105.8 % 80-120 09-SEP-14 Recyllium (Co)-Total 104.8 % 80-120 09-SEP-14 Recyllium (Co)-Total 104.8 % 80-120 09-SEP-14 Recyllium (Co)-Total 105.3 % 80-120 09-SEP-14 Recyllium (Co)-Total 105.3 % 80-120 09-SEP-14 Recyllium (Co)-Total 102.6 % 80-120 09-SEP-14 Recyllium (Co)-Total 106.0 % 80-120 09-SEP-14 Recyllium (Co)-Total 106.0 % 80-120 09-SEP-14 Recyllium (Co)-Total 106.8 % 80-120 09-SEP-14 Recyllium (Co)-Total 106.2 % 80-120 09-SEP-14 Recyllium (Co)-Total 106.4 % 80-120 09-SEP-14 Recyl | MET-T-CCMS-VA | Water | | | | | | | |
| Aluminum (Al)-Total 109.3 % 80-120 09-SEP-14 Antimony (Sb)-Total 108.9 % 80-120 09-SEP-14 Arsenic (As)-Total 106.6 % 80-120 09-SEP-14 Arsenic (As)-Total 106.6 % 80-120 09-SEP-14 Barium (Ba)-Total 106.9 % 80-120 09-SEP-14 Beryllium (Be)-Total 109.0 % 80-120 09-SEP-14 Bismuth (Bi)-Total 109.0 % 80-120 09-SEP-14 Bismuth (Bi)-Total 105.8 % 80-120 09-SEP-14 Cadmium (Cd)-Total 104.8 % 80-120 09-SEP-14 Cadmium (Cd)-Total 104.8 % 80-120 09-SEP-14 Chromium (Cr)-Total 105.9 % 80-120 09-SEP-14 Cobalt (Co)-Total 105.3 % 80-120 09-SEP-14 Copper (Cu)-Total 105.3 % 80-120 09-SEP-14 Copper (Cu)-Total 106.0 % 80-120 09-SEP-14 Lead (Pb)-Total 106.0 % 80-120 09-SEP-14 Lithium (Li)-Total 106.0 % 80-120 09-SEP-14 Manganese (Mn)-Total 106.8 % 80-120 09-SEP-14 Molybdenum (Mo)-Total 106.2 % 80-120 09-SEP-14 Nickel (Ni)-Total 106.2 % 80-120 09-SEP-14 Selenium (Se)-Total 108.1 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.2 % 80-120 09-SEP-14 Silver (Ag)-Total 106.2 % 80-120 09-SEP-14 Silver (Ag)-Total 106.2 % 80-120 09-SEP-14 Silver (Ag)-Total 106.2 % 80-120 09-SEP-14 Silver (Ag)-Total 106.2 % 80-120 09-SEP-14 Silver (Ag)-Total 106.2 % 80-120 09-SEP-14 Silver (Ag)-Total 106.2 % 80-120 09-SEP-14 Silver (Ag)-Total 106.2 % 80-120 09-SEP-14 Silver (Ag)-Total 106.2 % 80-120 09-SEP-14 Silver (Ag)-Total 106.2 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Si | Batch R2943 | 3403 | | | | | | | |
| Antimony (Sb)-Total 108.9 % 80-120 09-SEP-14 Arsenic (As)-Total 106.6 % 80-120 09-SEP-14 Barium (Ba)-Total 106.9 % 80-120 09-SEP-14 Beryllium (Be)-Total 109.0 % 80-120 09-SEP-14 Bismuth (Bi)-Total 105.8 % 80-120 09-SEP-14 Bismuth (Bi)-Total 105.8 % 80-120 09-SEP-14 Boron (B)-Total 98.4 % 80-120 09-SEP-14 Cadmium (Cd)-Total 104.8 % 80-120 09-SEP-14 Chromium (Cr)-Total 105.9 % 80-120 09-SEP-14 Chopar (Cu)-Total 105.3 % 80-120 09-SEP-14 Copler (Cu)-Total 105.3 % 80-120 09-SEP-14 Copper (Cu)-Total 102.6 % 80-120 09-SEP-14 Lead (Pb)-Total 106.0 % 80-120 09-SEP-14 Lithium (Li)-Total 107.4 % 80-120 09-SEP-14 Manganese (Mn)-Total 106.8 % 80-120 09-SEP-14 Molybdenum (Mo)-Total 107.4 % 80-120 09-SEP-14 Nickel (Ni)-Total 106.2 % 80-120 09-SEP-14 Selenium (Se)-Total 106.4 % 80-120 09-SEP-14 Selenium (Se)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.2 % 80-120 09-SEP-14 Sodium (Na)-Total 106.2 % 80-120 09-SEP-14 Sodium (Sr)-Total 106.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 | | | VA-HIGH-W | | | | | | |
| Arsenic (As)-Total 106.6 % 80.120 09-SEP-14 Barium (Ba)-Total 106.9 % 80.120 09-SEP-14 Beryllium (Be)-Total 109.0 % 80.120 09-SEP-14 Bismuth (Bi)-Total 105.8 % 80.120 09-SEP-14 Bismuth (Bi)-Total 105.8 % 80.120 09-SEP-14 Boron (B)-Total 98.4 % 80.120 09-SEP-14 Cadmium (Cd)-Total 104.8 % 80.120 09-SEP-14 Chromium (Cr)-Total 105.9 % 80.120 09-SEP-14 Cobalt (Co)-Total 105.3 % 80.120 09-SEP-14 Copper (Cu)-Total 102.6 % 80.120 09-SEP-14 Lead (Pb)-Total 106.0 % 80.120 09-SEP-14 Lithium (L)-Total 107.4 % 80.120 09-SEP-14 Manganese (Mn)-Total 106.8 % 80.120 09-SEP-14 Molybdenum (Mo)-Total 106.8 % 80.120 09-SEP-14 Nickel (Ni)-Total 106.2 % 80.120 09-SEP-14 Selenium (Se)-Total 108.1 % 80.120 09-SEP-14 Silver (Ag)-Total 106.4 % 80.120 09-SEP-14 Sodium (Na)-Total 106.2 % 80.120 09-SEP-14 Sodium (Na)-Total 106.4 % 80.120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80.120 09-SEP-14 Strontium (Sr)-Total 106.4 % 80.120 09-SEP-14 Thallium (Tl)-Total 106.4 % 80.120 09-SEP-14 Tin (Sn)-Total 106.4 % 80.120 09-SEP-14 Tin (Sn)-Total 106.4 % 80.120 09-SEP-14 Tin (Sn)-Total 106.4 % 80.120 09-SEP-14 | , , | | | | | | | | |
| Barium (Ba)-Total 106.9 % 80-120 09-SEP-14 Beryllium (Be)-Total 109.0 % 80-120 09-SEP-14 Bismuth (Bi)-Total 105.8 % 80-120 09-SEP-14 Boron (B)-Total 98.4 % 80-120 09-SEP-14 Cadmium (Cd)-Total 104.8 % 80-120 09-SEP-14 Chromium (Cr)-Total 105.9 % 80-120 09-SEP-14 Cobalt (Co)-Total 105.3 % 80-120 09-SEP-14 Copper (Cu)-Total 102.6 % 80-120 09-SEP-14 Lead (Pb)-Total 106.0 % 80-120 09-SEP-14 Lithium (Li)-Total 107.4 % 80-120 09-SEP-14 Manganese (Mn)-Total 106.8 % 80-120 09-SEP-14 Molybdenum (Mo)-Total 106.2 % 80-120 09-SEP-14 Selenium (Se)-Total 108.1 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (Tl)-Total 106.4 % 80-120 09-SEP-14 Trotal 107.7 % 80-120 09-SEP-14 Trotal 108.7 % 80-120 09-SEP-14 | | al | | | | | | 80-120 | |
| Beryllium (Be)-Total 109.0 % 80-120 09-SEP-14 Bismuth (Bi)-Total 105.8 % 80-120 09-SEP-14 Boron (B)-Total 98.4 % 80-120 09-SEP-14 Cadmium (Cd)-Total 104.8 % 80-120 09-SEP-14 Chromium (Cr)-Total 105.9 % 80-120 09-SEP-14 Cobalt (Co)-Total 105.3 % 80-120 09-SEP-14 Copper (Cu)-Total 102.6 % 80-120 09-SEP-14 Lead (Pb)-Total 106.0 % 80-120 09-SEP-14 Lithium (Li)-Total 107.4 % 80-120 09-SEP-14 Manganese (Mn)-Total 106.8 % 80-120 09-SEP-14 Molybdenum (Mo)-Total 107.4 % 80-120 09-SEP-14 Nickel (Ni)-Total 106.2 % 80-120 09-SEP-14 Selenium (Se)-Total 106.4 % 80-120 09-SEP-14 Silver (Ag)-Total 106.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 106.4 % 80-120 | ` ′ | | | | | | | | |
| Bismuth (Bi)-Total 105.8 % 80-120 09-SEP-14 80ron (B)-Total 98.4 % 80-120 09-SEP-14 Cadmium (Cd)-Total 104.8 % 80-120 09-SEP-14 Chromium (Cr)-Total 105.9 % 80-120 09-SEP-14 Chromium (Cr)-Total 105.9 % 80-120 09-SEP-14 Cobalt (Co)-Total 105.3 % 80-120 09-SEP-14 Copper (Cu)-Total 102.6 % 80-120 09-SEP-14 Lead (Pb)-Total 106.0 % 80-120 09-SEP-14 Lithium (Li)-Total 107.4 % 80-120 09-SEP-14 Manganese (Mn)-Total 106.8 % 80-120 09-SEP-14 Molybdenum (Mo)-Total 106.8 % 80-120 09-SEP-14 Nickel (Ni)-Total 106.2 % 80-120 09-SEP-14 Selenium (Se)-Total 108.1 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Sodium (Na)-Total 106.2 % 80-120 09-SEP-14 Sodium (Na)-Total 106.2 % 80-120 09-SEP-14 Sodium (Sr)-Total 106.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (Tl)-Total 106.4 % 80-120 09-SEP-14 Thallium (Tl)-Total 106.4 % 80-120 09-SEP-14 Thallium (Tl)-Total 106.4 % 80-120 09-SEP-14 Tin (Sn)-Total 106.4 % 80-120 09-SEP- | , | | | | | | | 80-120 | 09-SEP-14 |
| Boron (B)-Total 98.4 % 80-120 09-SEP-14 Cadmium (Cd)-Total 104.8 % 80-120 09-SEP-14 Chromium (Cr)-Total 105.9 % 80-120 09-SEP-14 Cobalt (Co)-Total 105.3 % 80-120 09-SEP-14 Copper (Cu)-Total 102.6 % 80-120 09-SEP-14 Lead (Pb)-Total 106.0 % 80-120 09-SEP-14 Lithium (Li)-Total 107.4 % 80-120 09-SEP-14 Manganese (Mn)-Total 106.8 % 80-120 09-SEP-14 Molybdenum (Mo)-Total 107.4 % 80-120 09-SEP-14 Nickel (Ni)-Total 106.2 % 80-120 09-SEP-14 Selenium (Se)-Total 108.1 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Sodium (Na)-Total 106.2 % 80-120 09-SEP-14 Sodium (Se)-Total 106.4 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (Ti)-Total 106.4 % 80-120 09-SEP-14 Thallium (Ti)-Total 106.4 % 80-120 09-SEP-14 Tin (Sn)-Total 106.4 % 80-120 09-SEP-14 | Beryllium (Be)-Tota | al | | | | | | 80-120 | 09-SEP-14 |
| Cadmium (Cd)-Total 104.8 % 80-120 09-SEP-14 Chromium (Cr)-Total 105.9 % 80-120 09-SEP-14 Cobalt (Co)-Total 105.3 % 80-120 09-SEP-14 Copper (Cu)-Total 102.6 % 80-120 09-SEP-14 Lead (Pb)-Total 106.0 % 80-120 09-SEP-14 Lithium (Li)-Total 107.4 % 80-120 09-SEP-14 Manganese (Mn)-Total 106.8 % 80-120 09-SEP-14 Molybdenum (Mo)-Total 107.4 % 80-120 09-SEP-14 Nickel (Ni)-Total 106.2 % 80-120 09-SEP-14 Selenium (Se)-Total 108.1 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (Tl)-Total 106.4 % 80-120 09-SEP-14 Tin (Sn)-Total 107.7 % 80-120 09-SEP-14 | , , | | | 105.8 | | | | 80-120 | 09-SEP-14 |
| Chromium (Cr)-Total 105.9 % 80-120 09-SEP-14 Cobalt (Co)-Total 105.3 % 80-120 09-SEP-14 Copper (Cu)-Total 102.6 % 80-120 09-SEP-14 Lead (Pb)-Total 106.0 % 80-120 09-SEP-14 Lithium (Li)-Total 107.4 % 80-120 09-SEP-14 Manganese (Mn)-Total 106.8 % 80-120 09-SEP-14 Molybdenum (Mo)-Total 107.4 % 80-120 09-SEP-14 Nickel (Ni)-Total 106.2 % 80-120 09-SEP-14 Selenium (Se)-Total 108.1 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (Tl)-Total 106.4 % 80-120 09-SEP-14 Tin (Sn)-Total 106.4 % 80-120 09-SEP-14 Tin (Sn)-Total 106.4 % 80-120 09-SEP-14 | Boron (B)-Total | | | 98.4 | | % | | 80-120 | 09-SEP-14 |
| Cobalt (Co)-Total 105.3 % 80-120 09-SEP-14 Copper (Cu)-Total 102.6 % 80-120 09-SEP-14 Lead (Pb)-Total 106.0 % 80-120 09-SEP-14 Lithium (Li)-Total 107.4 % 80-120 09-SEP-14 Manganese (Mn)-Total 106.8 % 80-120 09-SEP-14 Molybdenum (Mo)-Total 107.4 % 80-120 09-SEP-14 Nickel (Ni)-Total 106.2 % 80-120 09-SEP-14 Selenium (Se)-Total 108.1 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Sodium (Na)-Total 106.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (Tl)-Total 106.4 % 80-120 09-SEP-14 Tin (Sn)-Total 107.7 % 80-120 09-SEP-14 | Cadmium (Cd)-Tot | tal | | 104.8 | | % | | 80-120 | 09-SEP-14 |
| Copper (Cu)-Total 102.6 % 80-120 09-SEP-14 Lead (Pb)-Total 106.0 % 80-120 09-SEP-14 Lithium (Li)-Total 107.4 % 80-120 09-SEP-14 Manganese (Mn)-Total 106.8 % 80-120 09-SEP-14 Molybdenum (Mo)-Total 107.4 % 80-120 09-SEP-14 Nickel (Ni)-Total 106.2 % 80-120 09-SEP-14 Selenium (Se)-Total 108.1 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Sodium (Na)-Total 106.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (Tl)-Total 106.4 % 80-120 09-SEP-14 Tin (Sn)-Total 107.7 % 80-120 09-SEP-14 | Chromium (Cr)-To | tal | | 105.9 | | % | | 80-120 | 09-SEP-14 |
| Lead (Pb)-Total 106.0 % 80-120 09-SEP-14 Lithium (Li)-Total 107.4 % 80-120 09-SEP-14 Manganese (Mn)-Total 106.8 % 80-120 09-SEP-14 Molybdenum (Mo)-Total 107.4 % 80-120 09-SEP-14 Nickel (Ni)-Total 106.2 % 80-120 09-SEP-14 Selenium (Se)-Total 108.1 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Sodium (Na)-Total 106.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Tin (Sn)-Total 107.7 % 80-120 09-SEP-14 | Cobalt (Co)-Total | | | 105.3 | | % | | 80-120 | 09-SEP-14 |
| Lithium (Li)-Total 107.4 % 80-120 09-SEP-14 Manganese (Mn)-Total 106.8 % 80-120 09-SEP-14 Molybdenum (Mo)-Total 107.4 % 80-120 09-SEP-14 Nickel (Ni)-Total 106.2 % 80-120 09-SEP-14 Selenium (Se)-Total 108.1 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Sodium (Na)-Total 106.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (Tl)-Total 106.4 % 80-120 09-SEP-14 Tin (Sn)-Total 107.7 % 80-120 09-SEP-14 | Copper (Cu)-Total | | | 102.6 | | % | | 80-120 | 09-SEP-14 |
| Manganese (Mn)-Total 106.8 % 80-120 09-SEP-14 Molybdenum (Mo)-Total 107.4 % 80-120 09-SEP-14 Nickel (Ni)-Total 106.2 % 80-120 09-SEP-14 Selenium (Se)-Total 108.1 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Sodium (Na)-Total 106.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Tin (Sn)-Total 107.7 % 80-120 09-SEP-14 | Lead (Pb)-Total | | | 106.0 | | % | | 80-120 | 09-SEP-14 |
| Molybdenum (Mo)-Total 107.4 % 80-120 09-SEP-14 Nickel (Ni)-Total 106.2 % 80-120 09-SEP-14 Selenium (Se)-Total 108.1 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Sodium (Na)-Total 106.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Tin (Sn)-Total 107.7 % 80-120 09-SEP-14 | Lithium (Li)-Total | | | 107.4 | | % | | 80-120 | 09-SEP-14 |
| Nickel (Ni)-Total 106.2 % 80-120 09-SEP-14 Selenium (Se)-Total 108.1 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Sodium (Na)-Total 106.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Tin (Sn)-Total 107.7 % 80-120 09-SEP-14 | Manganese (Mn)-T | Γotal | | 106.8 | | % | | 80-120 | 09-SEP-14 |
| Selenium (Se)-Total 108.1 % 80-120 09-SEP-14 Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Sodium (Na)-Total 106.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Tin (Sn)-Total 107.7 % 80-120 09-SEP-14 | Molybdenum (Mo)- | -Total | | 107.4 | | % | | 80-120 | 09-SEP-14 |
| Silver (Ag)-Total 106.4 % 80-120 09-SEP-14 Sodium (Na)-Total 106.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Tin (Sn)-Total 107.7 % 80-120 09-SEP-14 | Nickel (Ni)-Total | | | 106.2 | | % | | 80-120 | 09-SEP-14 |
| Sodium (Na)-Total 106.2 % 80-120 09-SEP-14 Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Tin (Sn)-Total 107.7 % 80-120 09-SEP-14 | Selenium (Se)-Tota | al | | 108.1 | | % | | 80-120 | 09-SEP-14 |
| Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Tin (Sn)-Total 107.7 % 80-120 09-SEP-14 | Silver (Ag)-Total | | | 106.4 | | % | | 80-120 | 09-SEP-14 |
| Strontium (Sr)-Total 108.2 % 80-120 09-SEP-14 Thallium (TI)-Total 106.4 % 80-120 09-SEP-14 Tin (Sn)-Total 107.7 % 80-120 09-SEP-14 | Sodium (Na)-Total | | | 106.2 | | % | | 80-120 | 09-SEP-14 |
| Tin (Sn)-Total 107.7 % 80-120 09-SEP-14 | Strontium (Sr)-Tota | al | | 108.2 | | % | | 80-120 | |
| Tin (Sn)-Total 107.7 % 80-120 09-SEP-14 | Thallium (TI)-Total | | | 106.4 | | % | | 80-120 | 09-SEP-14 |
| | Tin (Sn)-Total | | | | | % | | | |
| | , , | | | 100.9 | | % | | 80-120 | 09-SEP-14 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|--------|--------------------------|-----------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | Water | | | | | | | |
| Batch R2943403 | | | | | | | | |
| WG1947899-3 CRM | | VA-HIGH-WA | | | | | | |
| Uranium (U)-Total | | | 106.1 | | % | | 80-120 | 09-SEP-14 |
| Vanadium (V)-Total | | | 106.5 | | % | | 80-120 | 09-SEP-14 |
| Zinc (Zn)-Total | | | 102.7 | | % | | 80-120 | 09-SEP-14 |
| WG1947899-1 MB Aluminum (Al)-Total | | | <0.0030 | | mg/L | | 0.003 | 09-SEP-14 |
| Antimony (Sb)-Total | | | < 0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Arsenic (As)-Total | | | < 0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Barium (Ba)-Total | | | <0.000050 |) | mg/L | | 0.00005 | 09-SEP-14 |
| Beryllium (Be)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Bismuth (Bi)-Total | | | < 0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Boron (B)-Total | | | < 0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Cadmium (Cd)-Total | | | <0.000010 |) | mg/L | | 0.00001 | 09-SEP-14 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Cobalt (Co)-Total | | | < 0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Copper (Cu)-Total | | | < 0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Lead (Pb)-Total | | | <0.000050 |) | mg/L | | 0.00005 | 09-SEP-14 |
| Lithium (Li)-Total | | | < 0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Molybdenum (Mo)-Total | | | <0.000050 |) | mg/L | | 0.00005 | 09-SEP-14 |
| Nickel (Ni)-Total | | | < 0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Selenium (Se)-Total | | | < 0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Silver (Ag)-Total | | | <0.000010 |) | mg/L | | 0.00001 | 09-SEP-14 |
| Sodium (Na)-Total | | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 09-SEP-14 |
| Thallium (TI)-Total | | | <0.000010 |) | mg/L | | 0.00001 | 09-SEP-14 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Titanium (Ti)-Total | | | < 0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Uranium (U)-Total | | | <0.000010 |) | mg/L | | 0.00001 | 09-SEP-14 |
| Vanadium (V)-Total | | | < 0.0010 | | mg/L | | 0.001 | 09-SEP-14 |
| Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 09-SEP-14 |
| Batch R2943770 | | | | | | | | |
| WG1947899-2 DUP Aluminum (Al)-Total | | L1514340-1 385 | 384 | | mg/L | 0.2 | 20 | 10-SEP-14 |
| Antimony (Sb)-Total | | <0.0020 | <0.0020 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Arsenic (As)-Total | | <0.0020 | <0.0020 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Barium (Ba)-Total | | 0.0073 | 0.0075 | | mg/L | 2.8 | 20 | 10-SEP-14 |



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| | | Worker der. | L1014040 | , , , , | port Bato. | 2-0L1-14 | ı a | ge o oi io |
|--|--------|-------------|-----------|-----------|------------|----------|---------|------------|
| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
| MET-T-CCMS-VA | Water | | | | | | | |
| Batch R2943770 | | | | | | | | |
| WG1947899-2 DUP | | L1514340-1 | | | | | | |
| Beryllium (Be)-Total | | <0.0020 | <0.0020 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Bismuth (Bi)-Total | | <0.010 | <0.010 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Boron (B)-Total | | <0.20 | <0.20 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Cadmium (Cd)-Total | | 0.00021 | <0.00020 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Chromium (Cr)-Total | | 0.0029 | 0.0025 | | mg/L | 17 | 20 | 10-SEP-14 |
| Cobalt (Co)-Total | | <0.0020 | <0.0020 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Copper (Cu)-Total | | <0.010 | <0.010 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Lead (Pb)-Total | | 0.0076 | 0.0075 | | mg/L | 1.2 | 20 | 10-SEP-14 |
| Lithium (Li)-Total | | < 0.010 | <0.010 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Manganese (Mn)-Total | | 0.0130 | 0.0113 | | mg/L | 14 | 20 | 10-SEP-14 |
| Molybdenum (Mo)-Total | | < 0.0010 | <0.0010 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Nickel (Ni)-Total | | <0.010 | < 0.010 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Selenium (Se)-Total | | <0.0020 | < 0.0020 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Silver (Ag)-Total | | <0.00020 | <0.00020 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Sodium (Na)-Total | | 2.9 | 2.8 | | mg/L | 4.1 | 20 | 10-SEP-14 |
| Strontium (Sr)-Total | | 0.0137 | 0.0136 | | mg/L | 0.9 | 20 | 10-SEP-14 |
| Thallium (TI)-Total | | <0.00020 | <0.00020 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Tin (Sn)-Total | | <0.0020 | <0.0020 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Titanium (Ti)-Total | | <0.20 | < 0.20 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Uranium (U)-Total | | 0.00028 | 0.00021 | J | mg/L | 0.00006 | 0.0004 | 10-SEP-14 |
| Vanadium (V)-Total | | < 0.020 | < 0.020 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Zinc (Zn)-Total | | 0.137 | 0.145 | | mg/L | 5.7 | 20 | 10-SEP-14 |
| WG1947899-1 MB Manganese (Mn)-Total | | | <0.000050 |) | mg/L | | 0.00005 | 10-SEP-14 |
| MET-TOT-LOW-ICP-VA | Water | | | | | | | |
| Batch R2943458 | | | | | | | | |
| WG1947899-3 CRM | | VA-HIGH-WA | TRM | | | | | |
| Calcium (Ca)-Total | | | 103.2 | | % | | 80-120 | 09-SEP-14 |
| Iron (Fe)-Total | | | 97.3 | | % | | 80-120 | 09-SEP-14 |
| Magnesium (Mg)-Total | | | 102.4 | | % | | 80-120 | 09-SEP-14 |
| Phosphorus (P)-Total | | | 101.8 | | % | | 80-120 | 09-SEP-14 |
| Potassium (K)-Total | | | 99.7 | | % | | 80-120 | 09-SEP-14 |
| Silicon (Si)-Total | | | 98.9 | | % | | 80-120 | 09-SEP-14 |
| WG1947899-1 MB Calcium (Ca)-Total | | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| | | | | | | | | |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--------------------------------------|--------|---------------------------|--------|-----------|-------|-----|---------|------------------------|
| MET-TOT-LOW-ICP-VA | Water | | | | | | | |
| Batch R29434 | 58 | | | | | | | |
| WG1947899-1 MB | | | -0.010 | | | | 0.04 | 00 055 44 |
| Iron (Fe)-Total | in! | | <0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Magnesium (Mg)-Tota | | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Phosphorus (P)-Tota | ı | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Potassium (K)-Total | | | <0.10 | | mg/L | | 0.1 | 09-SEP-14 |
| Silicon (Si)-Total | | | <0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Batch R29437 | | | | | | | | |
| WG1947899-2 DU Calcium (Ca)-Total | P | L1514340-1 12.6 | 12.6 | | mg/L | 0.1 | 20 | 10-SEP-14 |
| Iron (Fe)-Total | | 0.073 | 0.068 | | mg/L | 7.2 | 20 | 10-SEP-14 |
| Magnesium (Mg)-Total | al | 1.92 | 1.92 | | mg/L | 0.3 | 20 | 10-SEP-14 10-SEP-14 |
| Phosphorus (P)-Tota | | <0.25 | <0.25 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Potassium (K)-Total | | <0.50 | <0.50 | RPD-NA | mg/L | N/A | 20 | 10-SEP-14 |
| Silicon (Si)-Total | | 2.29 | 2.27 | THE D-INA | mg/L | 1.0 | 20 | 10-SEP-14 |
| | | 2.20 | , | | g/ = | 1.0 | 20 | 10-3E1-14 |
| PH-PCT-VA | Water | | | | | | | |
| Batch R29436 WG1947450-25 CR | | VA DUZ DUE | | | | | | |
| pH | IVI | VA-PH7-BUF | 7.01 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-26 CR | м | VA-PH7-BUF | | | | | | |
| рН | | | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-27 CR | М | VA-PH7-BUF | | | | | | |
| рН | | | 7.01 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-28 CR | М | VA-PH7-BUF | 7.00 | | | | | |
| рН | | | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-29 CR pH | М | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-30 CR | | VA DUZ DUE | 7.02 | | рп | | 0.9-7.1 | 09-3EF-14 |
| pH | IVI | VA-PH7-BUF | 6.99 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-31 CR | М | VA-PH7-BUF | | | · | | | |
| pН | | | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-32 CR | М | VA-PH7-BUF | | | | | | |
| рН | | | 7.03 | | рН | | 6.9-7.1 | 09-SEP-14 |
| S-DIS-ICP-VA | Water | | | | | | | |
| Batch R29438 | 12 | | | | | | | |
| WG1947666-2 CR | М | VA-HIGH-WA | | | | | | |
| Sulfur (S)-Dissolved | | | 102.2 | | % | | 80-120 | 09-SEP-14 |
| WG1947666-1 MB | | | | | | | | |



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| | | | | | • | | | 3 |
|----------------------|--------|-------------|--------|-----------|-------|-----|--------|-----------|
| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
| S-DIS-ICP-VA | Water | | | | | | | |
| Batch R2943812 | ! | | | | | | | |
| WG1947666-1 MB | | | | | | | | |
| Sulfur (S)-Dissolved | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| S-TOT-ICP-VA | Water | | | | | | | |
| Batch R2943458 | } | | | | | | | |
| WG1947899-3 CRM | | VA-HIGH-WA | TRM | | | | | |
| Sulfur (S)-Total | | | 104.2 | | % | | 80-120 | 09-SEP-14 |
| WG1947899-1 MB | | | | | | | | |
| Sulfur (S)-Total | | | < 0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| Batch R2943758 | } | | | | | | | |
| WG1947899-2 DUP | | L1514340-1 | | | | | | |
| Sulfur (S)-Total | | 714 | 711 | | mg/L | 0.4 | 20 | 10-SEP-14 |
| | | | | | | | | |
| SO4-TUR-VA | Water | | | | | | | |
| Batch R2943291 | | | | | | | | |
| WG1948014-2 CRM | | VA-SO4-L-CO | NTROL | | | | | |
| Sulfate (SO4) | | | 98.4 | | % | | 85-115 | 10-SEP-14 |
| WG1948014-6 CRM | | VA-SO4-H-CC | ONTROL | | | | | |
| Sulfate (SO4) | | | 102.8 | | % | | 85-115 | 10-SEP-14 |
| WG1948014-1 MB | | | | | | | | |
| Sulfate (SO4) | | | < 0.50 | | mg/L | | 0.5 | 10-SEP-14 |
| WG1948014-5 MB | | | | | | | | |
| Sulfate (SO4) | | | <0.50 | | mg/L | | 0.5 | 10-SEP-14 |
| WG1948014-4 MS | | L1512411-2 | | | | | | |
| Sulfate (SO4) | | | 92.1 | | % | | 75-125 | 10-SEP-14 |
| WG1948014-8 MS | | L1510555-1 | | | | | | |
| Sulfate (SO4) | | | N/A | MS-B | % | | - | 10-SEP-14 |
| | | | | | | | | |

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Legend:

| Limit | ALS Control Limit (Data Quality Objectives) |
|-------|---|
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Sample Parameter Qualifier Definitions:

| Qualifier | Description |
|-----------|--|
| DLA | Detection Limit adjusted for required dilution |
| J | Duplicate results and limits are expressed in terms of absolute difference. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |
| RPD-NA | Relative Percent Difference Not Available due to result(s) being less than detection limit. |

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Hold Time Exceedances:

| | Sample | | | | | | |
|-------------------------|--------|-----------------|-----------------|---------|-----------|-------|-----------|
| ALS Product Description | ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
| Physical Tests | | | | | | | |
| pH by Meter (Automated) | | | | | | | |
| | 1 | 06-SEP-14 20:50 | 09-SEP-14 23:00 | 0.25 | 74 | hours | EHTR-FM |

Legend & Qualifier Definitions:

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

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

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

EHT: Exceeded ALS recommended hold time prior to analysis.

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

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes. Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L1514340 were received on 07-SEP-14 09:30.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

WATER & GENERAL CHEMISTRY REQUISITION

Province Of British Columbia

Maxxam Analytics Inc. 4606 Canada Way Burnaby, BC V5G1K5

Ministry of Environment

Req # 50212395

| Urgent? Csr No. Office 10 Client CA | Sampling Agency | |
|--|---|---------------|
| Study Project N/A | Code 10 Name Vancouver Island, Nanaimo | |
| Lab Maxxam Analytics Inc. | Address 2080-A Labieux Road | |
| Ministry Contact NCOBEE Nicole Obee | | |
| Sampler Nicole Obee | | |
| Signature | City Nanaimo | |
| EMS Id Well Plate # | Postal Code V9T6J9 Phone (250)751-3100 | |
| Location Myle Fall'S Nine Saree Material | Number of Containers | |
| Instructions To Lab Pls include total and dissolved mercury at ICPMS level | | |
| State W Descriptor GE Collection Method GRB | | |
| | l Depth | |
| No. Class Collection Start Collection End D YYYY-MM-DD HH:MI YYYY-MM-DD HH:MI Upper | | , |
| 1 REG 2014-09-06 2014-09-06 2050 | Lower Tide RUSH | |
| 2 166 11 11 2050 | D 86000 | |
| 3 4 | <u></u> | |
| 5 | Priority proces | sıng |
| 6 | Thomas P | |
| CENERAL (III) | PECIFIC Test Med'm Pres'n Med'mi Pres'n | |
| GENERAL (1L) Med'm Pres'n SP | PECIFIC Test Med'm Pres'n Med'm Pres'n Biochemical Oxygen D. 02 01 | |
| Acidity pH 8.3 | Carb. Biochem. Oxygen D. 02 01 | |
| Alk. Titration Curve | Carbon: DIC | |
| Alkalinity: Phen. X Alkalinity: Total: pH 4.5 | X Carbon: DOC | _ |
| Colour S W | Carbon: TIC X Carbon: TOC | |
| Colour. TAC | Chemical Oxygen D. 04 05 | |
| Colour True | Chlorophyfi "a" | |
| Residue: Filterable: 0.45µm (TDS) | Cyanide: SAD + SCN 02 24 | |
| Residue: Nonfilt., fixed (TSS: fixed) | Cyanide: WAD 02 24 | - i |
| Residue: Nonfilterable (TSS) Residue: Total | Phaeophytin Residue:NFR Whole Bottle 03 01 | 1/ |
| ;Residue: Total, Fixed | SWEP (Extraction Prep.) | ₩. |
| Spedific Conductance | Sulphide: Total 03 . 08 | Ö. |
| X Turbidity OF | RGANICS Med'm Pres'n | L1514340-COFC |
| GENERAL (120 mL) Med'm Pres'n Anion Package (CI,Br,SO4) | AOX | 为 |
| Chloride | Acid Extr. HerbScan | |
| | BTEX | - |
| Fluoride | | - : |
| | EPH | |
| Fluoride Nit.: Nitrate and Nitrite (Col'm) Nitrogen: Nitrate (Col'm) | EPH Glyphosate / AMPA | |
| Fluoride Nit.: Nitrate and Nitrite (Col'm) Nitrogen: Nitrate (Col'm) Nitrogen: Nitrite (Col'm) | EPH Glyphosate / AMPA Oil and Grease: Gravimetric | |
| Fituoride Nit.: Nitrate and Nitrite (Col'm) Nitrogen: Nitrate (Col'm) Nitrogen: Nitrite (Col'm) Silica: Reactive | EPH Glyphosate / AMPA Oil and Grease: Gravimetric Organochlorine Pscan | |
| Fituoride Nit.: Nitrate and Nitrite (Cof'm) Nitrogen: Nitrate (Cof'm) Nitrogen: Nitrite (Cof'm) Silica: Reactive X Sulfate | EPH Glyphosate / AMPA Oil and Grease: Gravimetric Organochlorine Pscan Organophosphorus Pscan | |
| Fituoride Nit.: Nitrate and Nitrite (Col'm) Nitrogen: Nitrate (Col'm) Nitrogen: Nitrite (Col'm) Silica: Reactive X Sulfate GENERAL IONS (120 mL) Med'm 55 Pres'n 64 | EPH Glyphosate / AMPA Oil and Grease: Gravimetric Organochlorine Pscan Organophosphorus Pscan | |
| Fituoride Nit.: Nitrate and Nitrite (Cof'm) Nitrogen: Nitrate (Cof'm) Nitrogen: Nitrite (Cof'm) Silica: Reactive X Sulfate GENERAL IONS (120 mL) Med'm 55 Pres'n 64 Nitrogen: Armnonia (Cof'm) | EPH Glyphosate / AMPA Oil and Grease: Gravimetric Organochlorine Pscan Organophosphorus Pscan | |
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| Fituoride Nit.: Nitrate and Nitrite (Col'm) Nitrogen: Nitrate (Col'm) Nitrogen: Nitrite (Col'm) Silica: Reactive X Sulfate GENERAL IONS (120 mL) Med'm 55 Pres'n 64 Nitrogen: Arranonia (Col'm) Nitrogen: Organic Nitrogen: Tot Kjeldahl (Calc) Nitrogen: Total PHOSPHORUS (120 mL) Med'm Pres'n Phos Diss. O-phosphate (Col'm) | EPH Glyphosate / AMPA Oil and Grease: Gravimetric Organochlorine Pscan Organophosphorus Pscan PAH Penta/Tetra CI-phenols Phenols (GC/MS) Phenols: Colorimetric Polychlor, Biphenyls | |
| Fituoride Nit.: Nitrate and Nitrite (Col'm) Nitrogen: Nitrate (Col'm) Nitrogen: Nitrite (Col'm) Silica: Reactive X Sulfate | EPH Glyphosate / AMPA Oil and Grease: Gravimetric Organochlorine Pscan Organophosphorus Pscan PAH Penta/Tetra CI-phenols Phenols (GC/MS) Phenols: Colorimetric Polychlor. Biphenyls Resin Acids | |
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| Fituaride Nit.: Nitrate and Nitrite (Col'm) Nitrogen: Nitrate (Col'm) Nitrogen: Nitrite (Col'm) Nitrogen: Nitrite (Col'm) Silica: Reactive X Sulfate S | EPH Glyphosate / AMPA Oil and Grease: Gravimetric Organochlorine Pscan Organophosphorus Pscan PAH Penta/Tetra Cl-phenols Phenols (GC/MS) Phenols: Colorimetric Polychlor. Biphenyls Resin Acids Trihalomethanes (THM) THER Med'm Pres'n Test Total and dissolved mercury at ICPMS level | |
| Fituoride Nit.: Nitrate and Nitrite (Col'm) Nitrogen: Nitrate (Col'm) Nitrogen: Nitrite (Col'm) Silica: Reactive X Sulfate GENERAL IONS (120 mL) Nitrogen: Armnonia (Col'm) Nitrogen: Tort Kjeldahi (Calc) Nitrogen: Tot Kjeldahi (Calc) Nitrogen: Total PHOSPHORUS (120 mL) Phos Diss. O-phosphate (Col'm) Phosphorus: Tot. Diss. (Col'm) Phosphorus: Total (Col'm) METALS (TOTAL) Med'm Pres'n Med'm Pres'n High Low Metal Pkg. (ICP) X Metal Pkg. (ICP) X Metal Pkg. (ICPMS) X Hardness X Mercury Sediment, Sieve to < 63µ FIE DE | EPH Glyphosate / AMPA Oil and Grease: Gravimetric Organochlorine Pscan Organophosphorus Pscan PAH Penta/Tetra CI-phenols Phenols (GC/MS) Phenols: Colorenetric Polychlor. Biphenyls Resin Acids Trihafomethanes (THM) THER Med'm Pres'n Test Total and dissolved mercury at ICPMS level | |
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| Fituaride | EPH Glyphosate / AMPA Oil and Grease: Gravimetric Organochlorine Pscan Organophosphorus Pscan PAH Penta/Tetra Cl-phenols Phenols (GC/MS) Phenols: Colorimetric Polychlor. Biphenyls Resin Acids Trihalomethanes (THM) THER Med'm Pres'n Test Total and dissolved mercury at ICPMS level | |
| Fituaride | EPH Glyphosate / AMPA Oil and Grease: Gravimetric Organochlorine Pscan Organophosphorus Pscan PAH Penta/Tetra Cl-phenols Phenols (GC/MS) Phenols: Colorimetric Polychlor. Biphenyls Resin Acids Trihalomethanes (THM) THER Med'm Pres'n Test Total and dissolved mercury at ICPMS level | |
| Fituaride | EPH Glyphosate / AMPA Oil and Grease: Gravimetric Organochlorine Pscan Organophosphorus Pscan PAH Penta/Tetra Cl-phenols Phenols (GC/MS) Phenols: Colorimetric Polychlor. Biphenyls Resin Acids Trihalomethanes (THM) THER Med'm Pres'n Test Total and dissolved mercury at ICPMS level | |

Report ID: EMSR0900

Enail to Don for Deb Epps re: sourche analysis C) pH & Metals (?) @ 2 to distors

Rec by Paul

Date: 2014-09-06 12:04





BC MINISTRY OF ENVIRONMENT

ATTN: Deborah Epps

Section Head, Provincial Water Quality

2080A Labieux Road Nanaimo BC V9T 6J9 Date Received: 07-SEP-14

Report Date: 10-SEP-14 17:31 (MT)

Version: FINAL

Client Phone: 604-793-8770

Certificate of Analysis

Lab Work Order #: L1514194

Project P.O. #: NOT SUBMITTED

Job Reference:

C of C Numbers: 50212388

Legal Site Desc:

Dean Watt Account Manager

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L1514194 CONTD.... PAGE 2 of 7 10-SEP-14 17:31 (MT)

ALS ENVIRONMENTAL ANALYTICAL REPORT

Version: **FINAL** L1514194-1 Sample ID Description WATER Sampled Date 06-SEP-14 Sampled Time 20:45 MYRA CREEK AT Client ID PUMPHOUSE #4. (PE-06858) 0.5M Grouping Analyte WATER Hardness (as CaCO3) (mg/L) **Physical Tests** 170 pH (pH) 7.05 Turbidity (NTU) 0.26 Alkalinity, Total (as CaCO3) (mg/L) Anions and 23.9 **Nutrients** Sulfate (SO4) (mg/L) 174 Organic / Dissolved Organic Carbon (mg/L) 1.08 Inorganic Carbon Total Organic Carbon (mg/L) 1.08 **Total Metals** Aluminum (AI)-Total (ug/L) 65.0 Antimony (Sb)-Total (ug/L) 1.73 Arsenic (As)-Total (ug/L) 0.45 Barium (Ba)-Total (ug/L) 18.2 Beryllium (Be)-Total (ug/L) < 0.10 Bismuth (Bi)-Total (ug/L) < 0.50 Boron (B)-Total (ug/L) 16 Cadmium (Cd)-Total (ug/L) 0.621 Calcium (Ca)-Total (ug/L) 61700 Chromium (Cr)-Total (ug/L) < 0.10 Cobalt (Co)-Total (ug/L) 0.63 Copper (Cu)-Total (ug/L) 11.3 Iron (Fe)-Total (ug/L) 15 Lead (Pb)-Total (ug/L) 0.624 Lithium (Li)-Total (ug/L) 1.58 Magnesium (Mg)-Total (ug/L) 4510 Manganese (Mn)-Total (ug/L) 186 Mercury (Hg)-Total (ug/L) < 0.010 Molybdenum (Mo)-Total (ug/L) 6.88 Nickel (Ni)-Total (ug/L) 1.34 Phosphorus (P)-Total (ug/L) < 50 Potassium (K)-Total (ug/L) 3170 Selenium (Se)-Total (ug/L) 0.69 Silicon (Si)-Total (ug/L) 1950 Silver (Ag)-Total (ug/L) 0.132 Sodium (Na)-Total (ug/L) 20700 Strontium (Sr)-Total (ug/L) 197 Sulfur (S)-Total (ug/L) 62400 Thallium (TI)-Total (ug/L) < 0.010

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L1514194 CONTD.... PAGE 3 of 7 10-SEP-14 17:31 (MT)

FINAL

Version:

ALS ENVIRONMENTAL ANALYTICAL REPORT

L1514194-1 Sample ID Description WATER 06-SEP-14 Sampled Date Sampled Time 20:45 MYRA CREEK AT Client ID PUMPHOUSE #4. (PE-06858) 0.5M Grouping **Analyte** WATER **Total Metals** Tin (Sn)-Total (ug/L) < 0.10 Titanium (Ti)-Total (ug/L) <10 Uranium (U)-Total (ug/L) 0.023 Vanadium (V)-Total (ug/L) <1.0 Zinc (Zn)-Total (ug/L) 140 Dissolved Mercury Filtration Location **Dissolved Metals** LAB Dissolved Metals Filtration Location LAB Aluminum (AI)-Dissolved (ug/L) 49.2 Antimony (Sb)-Dissolved (ug/L) 1.72 Arsenic (As)-Dissolved (ug/L) 0.41 Barium (Ba)-Dissolved (ug/L) 16.8 Beryllium (Be)-Dissolved (ug/L) < 0.10 Bismuth (Bi)-Dissolved (ug/L) < 0.50 Boron (B)-Dissolved (ug/L) 18 Cadmium (Cd)-Dissolved (ug/L) 0.599 Calcium (Ca)-Dissolved (ug/L) 61000 Chromium (Cr)-Dissolved (ug/L) < 0.10 Cobalt (Co)-Dissolved (ug/L) 0.58 Copper (Cu)-Dissolved (ug/L) 7.90 Iron (Fe)-Dissolved (ug/L) <10 Lead (Pb)-Dissolved (ug/L) 0.10 Lithium (Li)-Dissolved (ug/L) 1.69 Magnesium (Mg)-Dissolved (ug/L) 4220 Manganese (Mn)-Dissolved (ug/L) 182 Mercury (Hg)-Dissolved (ug/L) < 0.010 Molybdenum (Mo)-Dissolved (ug/L) 6.80 Nickel (Ni)-Dissolved (ug/L) 1.31 Phosphorus (P)-Dissolved (ug/L) < 50 Potassium (K)-Dissolved (ug/L) 2770 Selenium (Se)-Dissolved (ug/L) 0.63 Silicon (Si)-Dissolved (ug/L) 1850 Silver (Ag)-Dissolved (ug/L) 0.127 Sodium (Na)-Dissolved (ug/L) 20700 Strontium (Sr)-Dissolved (ug/L) 197 Sulfur (S)-Dissolved (ug/L) 70700 Thallium (TI)-Dissolved (ug/L) < 0.010 Tin (Sn)-Dissolved (ug/L) < 0.10

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L1514194 CONTD.... PAGE 4 of 7 10-SEP-14 17:31 (MT)

FINAL

Version:

ALS ENVIRONMENTAL ANALYTICAL REPORT

L1514194-1 Sample ID Description WATER 06-SEP-14 Sampled Date 20:45 Sampled Time MYRA CREEK AT Client ID PUMPHOUSE #4. (PE-06858) 0.5M Grouping Analyte **WATER Dissolved Metals** Titanium (Ti)-Dissolved (ug/L) <10 Uranium (U)-Dissolved (ug/L) 0.022 Vanadium (V)-Dissolved (ug/L) <1.0 Zinc (Zn)-Dissolved (ug/L) 135

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L1514194 CONTD.... PAGE 5 of 7 10-SEP-14 17:31 (MT) Version: FINΔI

| Qualifiers | for Sample | Submission | Listed: |
|------------|------------|------------|---------|
|------------|------------|------------|---------|

| Qualifier | Description | | | | | | | | |
|---------------------|---|---|--|--|--|--|--|--|--|
| WSMT | Water sample(s) for total mercury analysis values biased low. | Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low. | | | | | | | |
| WSMD | Water sample(s) for dissolved mercury anal may be biased low. | lysis was not submitted in glass or PTFE container with HCl preservative. Results | | | | | | | |
| QC Samples with Qua | lifiers & Comments: | | | | | | | | |
| OC Type Description | Parameter | Qualifier Applies to Sample Number(s) | | | | | | | |

| QC Type Description | Parameter | Qualifier | Applies to Sample Number(s) | | |
|---------------------------------|--------------------------|-----------|-----------------------------|--|--|
| Method Blank | Zinc (Zn)-Dissolved | MB-LOR | L1514194-1 | | |
| Matrix Spike | Sulfate (SO4) | MS-B | L1514194-1 | | |
| Matrix Spike | Total Organic Carbon | MS-B | L1514194-1 | | |
| Matrix Spike | Dissolved Organic Carbon | MS-B | L1514194-1 | | |
| Qualifiers for Individual Paran | neters Listed: | | | | |

| Qualifier | Description |
|-----------|---|
| MB-LOR | Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---------------|--------|---|--------------------|
| ALK-COL-VA | Water | Alkalinity by Colourimetric (Automated) | EPA 310.2 |

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

CARBONS-DOC-VA Dissolved organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC) Water

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

Water Total organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC) CARBONS-TOC-VA

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

HARDNESS-CALC-VA Water Hardness **APHA 2340B**

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7 **HG-DIS-LOW-CVAFS-VA** Water

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-DIS-LOW-ICP-VA Water Dissolved Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method

L1514194 CONTD....

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10-SEP-14 17:31 (MT)

Version: FINAL

6020A).

MET-TOT-LOW-ICP-VA

Water

Total Metals in Water by ICPOES

EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

PH-PCT-VA

Water

pH by Meter (Automated)

APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA

Water

pH by Meter (Automated)

APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

S-DIS-ICP-VA

Water

Dissolved Sulfur in Water by ICPOES

EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

S-TOT-ICP-VA

Water

Total Sulfur in Water by ICPOES

EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

SO4-TUR-VA

Water

Sulfate(SO4) by Turbidity

APHA 4500-SO4 E. SULFATE

This analysis is carried out using procedures adapted from APHA Method 4500-SO4 "Sulfate". Sulfate is determined using the turbidimetric method.

TURBIDITY-VA

Water

Turbidity by Meter

APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA

Water

Turbidity by Meter

APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code

Laboratory Location

VA

ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

50212388

L1514194 CONTD.... PAGE 7 of 7 10-SEP-14 17:31 (MT) Version: **FINAL**

GLOSSARY OF REPORT TERMS

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

mg/kg - milligrams per kilogram based on dry weight of sample. mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory. UNLESS OTHERWISE STATÉD, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION. Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Workorder: L1514194 Report Date: 10-SEP-14 Page 1 of 10

Client: BC MINISTRY OF ENVIRONMENT

Section Head, Provincial Water Quality 2080A Labieux Road

Nanaimo BC V9T 6J9

Contact: Deborah Epps

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|-----------------------|-------------|----------------|-----------|-------|-----|--------|-----------|
| ALK-COL-VA | Water | | | | | | | |
| Batch R294 | 11773 | | | | | | | |
| WG1947162-2 Alkalinity, Total (a | CRM s CaCO3) | VA-ALKL-CO | 97.4 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-5 Alkalinity, Total (a | CRM s CaCO3) | VA-ALKM-CO | 103.7 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-8 Alkalinity, Total (a | CRM is CaCO3) | VA-ALKH-CO | NTROL 100.8 | | % | | 85-115 | 09-SEP-14 |
| WG1947162-1 I Alkalinity, Total (a | MB s CaCO3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-10 I Alkalinity, Total (a | | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-4 I Alkalinity, Total (a | MB s CaCO3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| WG1947162-7 I Alkalinity, Total (a | MB s CaCO3) | | <2.0 | | mg/L | | 2 | 09-SEP-14 |
| CARBONS-DOC-VA | Water | | | | | | | |
| Batch R294 | 13332 | | | | | | | |
| WG1947341-12 I Dissolved Organic | | | 103.6 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-16 I Dissolved Organic | | | 109.1 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-4 I Dissolved Organic | | | 101.8 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-8 I Dissolved Organic | | | 105.9 | | % | | 80-120 | 09-SEP-14 |
| WG1947341-11 I Dissolved Organic | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-15 I Dissolved Organic | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-3 I Dissolved Organic | MB c Carbon | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-7 I Dissolved Organic | MB c Carbon | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947341-10 I Dissolved Organic | | L1513619-2 | 100.6 | | % | | 70-130 | 09-SEP-14 |
| WG1947341-14 I Dissolved Organic | | L1513418-11 | N/A | MS-B | % | | - | 09-SEP-14 |
| WG1947341-2 I Dissolved Organic | | L1514231-1 | 104.6 | | % | | 70-130 | 09-SEP-14 |
| | MS | L1514251-1 | | | | | | |



Report Date: 10-SEP-14 Page 2 of 10 Workorder: L1514194

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|--------|-------------|-----------|-----------|-------|-----|---------|-----------|
| CARBONS-DOC-VA Batch R2943332 WG1947341-6 MS Dissolved Organic Carb | | L1514251-1 | 106.5 | | % | | 70-130 | 09-SEP-14 |
| CARBONS-TOC-VA Batch R2943331 WG1947339-1 LCS | Water | | | | | | | |
| Total Organic Carbon | | | 100.0 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-13 LCS Total Organic Carbon | | | 99.6 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-17 LCS Total Organic Carbon | | | 101.1 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-5 LCS Total Organic Carbon | | | 102.0 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-9 LCS Total Organic Carbon | | | 99.95 | | % | | 80-120 | 09-SEP-14 |
| WG1947339-12 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947339-16 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947339-4 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947339-8 MB Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| WG1947339-15 MS Total Organic Carbon | | L1513418-11 | N/A | MS-B | % | | - | 09-SEP-14 |
| WG1947339-3 MS Total Organic Carbon | | L1514231-1 | 103.0 | | % | | 70-130 | 09-SEP-14 |
| WG1947339-7 MS Total Organic Carbon | | L1514251-1 | 102.5 | | % | | 70-130 | 09-SEP-14 |
| HG-DIS-LOW-CVAFS-VA | Water | | | | | | | |
| Batch R2942725 WG1947233-3 LCS Mercury (Hg)-Dissolved | | | 89.2 | | % | | 80-120 | 09-SEP-14 |
| Batch R2943546 WG1947233-1 MB Mercury (Hg)-Dissolved | | | <0.000010 |) | mg/L | | 0.00001 | 10-SEP-14 |



Workorder: L1514194 Report Date: 10-SEP-14

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--------------------------------------|--------|---------------|----------|-----------|-------|-----|---------|-----------|
| HG-TOT-LOW-CVAFS-VA | Water | | | | | | | |
| Batch R2943546 | | | | | | | | |
| WG1948561-2 LCS | | | | | | | | |
| Mercury (Hg)-Total | | | 94.4 | | % | | 80-120 | 10-SEP-14 |
| WG1948561-1 MB | | | ~0.00004 | 0 | ma/l | | 0.00004 | 10 OED 11 |
| Mercury (Hg)-Total | | 1 454 4550 40 | <0.00001 | U | mg/L | | 0.00001 | 10-SEP-14 |
| WG1948561-4 MS Mercury (Hg)-Total | | L1514553-10 | 102.0 | | % | | 70-130 | 10-SEP-14 |
| WG1948561-5 MS | | L1514611-1 | | | | | | |
| Mercury (Hg)-Total | | | 85.0 | | % | | 70-130 | 10-SEP-14 |
| MET-D-CCMS-VA | Water | | | | | | | |
| Batch R2942770 | | | | | | | | |
| WG1947233-2 CRM | _ | VA-HIGH-WA | | | 0/ | | | |
| Aluminum (Al)-Dissolve | | | 102.1 | | % | | 80-120 | 09-SEP-14 |
| Antimony (Sb)-Dissolved | d | | 97.3 | | % | | 80-120 | 09-SEP-14 |
| Arsenic (As)-Dissolved | | | 97.4 | | % | | 80-120 | 09-SEP-14 |
| Barium (Ba)-Dissolved | | | 98.6 | | % | | 80-120 | 09-SEP-14 |
| Beryllium (Be)-Dissolved | d | | 97.7 | | % | | 80-120 | 09-SEP-14 |
| Bismuth (Bi)-Dissolved | | | 97.7 | | % | | 80-120 | 09-SEP-14 |
| Boron (B)-Dissolved | | | 85.5 | | % | | 80-120 | 09-SEP-14 |
| Cadmium (Cd)-Dissolve | | | 96.8 | | % | | 80-120 | 09-SEP-14 |
| Chromium (Cr)-Dissolve | ed | | 96.9 | | % | | 80-120 | 09-SEP-14 |
| Cobalt (Co)-Dissolved | | | 96.3 | | % | | 80-120 | 09-SEP-14 |
| Copper (Cu)-Dissolved | | | 95.4 | | % | | 80-120 | 09-SEP-14 |
| Lead (Pb)-Dissolved | | | 96.9 | | % | | 80-120 | 09-SEP-14 |
| Lithium (Li)-Dissolved | | | 99.2 | | % | | 80-120 | 09-SEP-14 |
| Manganese (Mn)-Dissol | | | 99.6 | | % | | 80-120 | 09-SEP-14 |
| Molybdenum (Mo)-Disso | olved | | 98.5 | | % | | 80-120 | 09-SEP-14 |
| Nickel (Ni)-Dissolved | | | 98.2 | | % | | 80-120 | 09-SEP-14 |
| Selenium (Se)-Dissolve | d | | 98.9 | | % | | 80-120 | 09-SEP-14 |
| Silver (Ag)-Dissolved | | | 98.9 | | % | | 80-120 | 09-SEP-14 |
| Sodium (Na)-Dissolved | | | 97.2 | | % | | 80-120 | 09-SEP-14 |
| Strontium (Sr)-Dissolved | d | | 99.1 | | % | | 80-120 | 09-SEP-14 |
| Thallium (TI)-Dissolved | | | 98.2 | | % | | 80-120 | 09-SEP-14 |
| Tin (Sn)-Dissolved | | | 97.1 | | % | | 80-120 | 09-SEP-14 |
| Titanium (Ti)-Dissolved | | | 99.4 | | % | | 80-120 | 09-SEP-14 |
| Uranium (U)-Dissolved | | | 99.5 | | % | | 80-120 | 09-SEP-14 |
| Vanadium (V)-Dissolved | d | | 97.4 | | % | | 80-120 | 09-SEP-14 |

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| | | | | | | | 90 . 0 |
|---|-----------|----------------------|-----------|-------|-----|------------------|-----------|
| est Matrix | Reference | Result (| Qualifier | Units | RPD | Limit | Analyzed |
| ET-D-CCMS-VA Water | | | | | | | |
| Batch R2942770 | | | | | | | |
| WG1947233-2 CRM | VA-HIGH-W | | | 0/ | | | |
| Zinc (Zn)-Dissolved | | 95.8 | | % | | 80-120 | 09-SEP-14 |
| WG1947233-1 MB Aluminum (Al)-Dissolved | | <0.0010 | | mg/L | | 0.001 | 09-SEP-14 |
| Antimony (Sb)-Dissolved | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Arsenic (As)-Dissolved | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Barium (Ba)-Dissolved | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Beryllium (Be)-Dissolved | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Bismuth (Bi)-Dissolved | | <0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Boron (B)-Dissolved | | <0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Cadmium (Cd)-Dissolved | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Chromium (Cr)-Dissolved | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Cobalt (Co)-Dissolved | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Copper (Cu)-Dissolved | | <0.00020 | | mg/L | | 0.0002 | 09-SEP-14 |
| Lead (Pb)-Dissolved | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Lithium (Li)-Dissolved | | < 0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Manganese (Mn)-Dissolved | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Molybdenum (Mo)-Dissolved | | <0.000050 | | mg/L | | 0.00005 | 09-SEP-14 |
| Nickel (Ni)-Dissolved | | < 0.00050 | | mg/L | | 0.0005 | 09-SEP-14 |
| Selenium (Se)-Dissolved | | < 0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Silver (Ag)-Dissolved | | < 0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Sodium (Na)-Dissolved | | < 0.050 | | mg/L | | 0.05 | 09-SEP-14 |
| Strontium (Sr)-Dissolved | | <0.00020 | | mg/L | | 0.0002 | 09-SEP-14 |
| Thallium (TI)-Dissolved | | < 0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Tin (Sn)-Dissolved | | <0.00010 | | mg/L | | 0.0001 | 09-SEP-14 |
| Titanium (Ti)-Dissolved | | <0.010 | | mg/L | | 0.01 | 09-SEP-14 |
| Uranium (U)-Dissolved | | <0.000010 | | mg/L | | 0.00001 | 09-SEP-14 |
| Vanadium (V)-Dissolved | | <0.0010 | | mg/L | | 0.001 | 09-SEP-14 |
| Zinc (Zn)-Dissolved | | 0.0024 | MB-LOR | mg/L | | 0.001 | 09-SEP-14 |
| ET-DIS-LOW-ICP-VA Water | | | | | | | |
| Batch R2942645 | | | | | | | |
| WG1947233-2 CRM Calcium (Ca)-Dissolved | VA-HIGH-W | ATRM 101.0 | | % | | 00 100 | 00 SED 44 |
| Iron (Fe)-Dissolved | | 95.0 | | % | | 80-120 80-120 | 09-SEP-14 |
| Magnesium (Mg)-Dissolved | | 100.6 | | % | | 80-120 | 09-SEP-14 |
| wagnesium (wg)-Dissolved | | 0.001 | | 70 | | 80-120 | 09-SEP-14 |



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Test Matrix Reference Result Qualifier Units RPD Limit Analyzed MET-DIS-LOW-ICP-VA Water Batch R2942645 WG1947233-2 CRM **VA-HIGH-WATRM** Phosphorus (P)-Dissolved % 99.6 80-120 09-SEP-14 Potassium (K)-Dissolved 97.4 % 80-120 09-SEP-14 Silicon (Si)-Dissolved 98.5 % 80-120 09-SEP-14 WG1947233-1 Calcium (Ca)-Dissolved < 0.050 mg/L 0.05 09-SEP-14 Iron (Fe)-Dissolved < 0.010 mg/L 0.01 09-SEP-14 < 0.050 Magnesium (Mg)-Dissolved mg/L 0.05 09-SEP-14 Phosphorus (P)-Dissolved < 0.050 mg/L 0.05 09-SEP-14 Potassium (K)-Dissolved < 0.10 mg/L 0.1 09-SEP-14 Silicon (Si)-Dissolved < 0.050 mg/L 0.05 09-SEP-14 MET-T-CCMS-VA Water Batch R2943713 WG1948036-3 CRM **VA-HIGH-WATRM** Aluminum (Al)-Total 97.2 % 80-120 10-SEP-14 Antimony (Sb)-Total 97.6 % 80-120 10-SEP-14 Arsenic (As)-Total 97.1 % 80-120 10-SEP-14 Barium (Ba)-Total 102.9 % 80-120 10-SEP-14 Beryllium (Be)-Total 93.5 % 80-120 10-SEP-14 Bismuth (Bi)-Total 92.8 % 80-120 10-SEP-14 Boron (B)-Total 91.0 % 80-120 10-SEP-14 Cadmium (Cd)-Total 96.7 % 80-120 10-SEP-14 Chromium (Cr)-Total 97.3 % 80-120 10-SEP-14 Cobalt (Co)-Total 97.1 % 80-120 10-SEP-14 Copper (Cu)-Total 94.3 % 80-120 10-SEP-14 Lead (Pb)-Total 91.4 % 80-120 10-SEP-14 Lithium (Li)-Total 94.8 % 80-120 10-SEP-14 Manganese (Mn)-Total 98.1 % 80-120 10-SEP-14 Molybdenum (Mo)-Total 93.8 % 80-120 10-SEP-14 % Nickel (Ni)-Total 95.4 80-120 10-SEP-14 Selenium (Se)-Total 93.9 % 10-SEP-14 80-120 Silver (Ag)-Total 91.8 % 80-120 10-SEP-14 Sodium (Na)-Total 98.1 % 80-120 10-SEP-14 Strontium (Sr)-Total 94.4 % 80-120 10-SEP-14 Thallium (TI)-Total 92.6 % 80-120 10-SEP-14

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Report Date: 10-SEP-14

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------------------|--------|-----------|----------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | Water | | | | | | | |
| Batch R2943713 | | | | | | | | |
| WG1948036-3 CRM | | VA-HIGH-W | | | | | | |
| Tin (Sn)-Total | | | 95.5 | | % | | 80-120 | 10-SEP-14 |
| Titanium (Ti)-Total | | | 100.5 | | % | | 80-120 | 10-SEP-14 |
| Uranium (U)-Total | | | 91.5 | | % | | 80-120 | 10-SEP-14 |
| Vanadium (V)-Total | | | 98.4 | | % | | 80-120 | 10-SEP-14 |
| Zinc (Zn)-Total | | | 93.4 | | % | | 80-120 | 10-SEP-14 |
| WG1948036-1 MB Aluminum (Al)-Total | | | <0.0030 | | mg/L | | 0.003 | 10-SEP-14 |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 10-SEP-14 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 10-SEP-14 |
| Barium (Ba)-Total | | | <0.00005 | 0 | mg/L | | 0.00005 | 10-SEP-14 |
| Beryllium (Be)-Total | | | <0.00010 | | mg/L | | 0.0001 | 10-SEP-14 |
| Bismuth (Bi)-Total | | | <0.00050 | | mg/L | | 0.0005 | 10-SEP-14 |
| Boron (B)-Total | | | < 0.010 | | mg/L | | 0.01 | 10-SEP-14 |
| Cadmium (Cd)-Total | | | <0.00001 | 0 | mg/L | | 0.00001 | 10-SEP-14 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 10-SEP-14 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 10-SEP-14 |
| Copper (Cu)-Total | | | <0.00050 | | mg/L | | 0.0005 | 10-SEP-14 |
| Lead (Pb)-Total | | | <0.00005 | 0 | mg/L | | 0.00005 | 10-SEP-14 |
| Lithium (Li)-Total | | | <0.00050 | | mg/L | | 0.0005 | 10-SEP-14 |
| Manganese (Mn)-Total | | | <0.00005 | 0 | mg/L | | 0.00005 | 10-SEP-14 |
| Molybdenum (Mo)-Total | | | <0.00005 | 0 | mg/L | | 0.00005 | 10-SEP-14 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 10-SEP-14 |
| Selenium (Se)-Total | | | <0.00010 | | mg/L | | 0.0001 | 10-SEP-14 |
| Silver (Ag)-Total | | | <0.00001 | 0 | mg/L | | 0.00001 | 10-SEP-14 |
| Sodium (Na)-Total | | | < 0.050 | | mg/L | | 0.05 | 10-SEP-14 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 10-SEP-14 |
| Thallium (TI)-Total | | | <0.00001 | 0 | mg/L | | 0.00001 | 10-SEP-14 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 10-SEP-14 |
| Titanium (Ti)-Total | | | < 0.010 | | mg/L | | 0.01 | 10-SEP-14 |
| Uranium (U)-Total | | | <0.00001 | 0 | mg/L | | 0.00001 | 10-SEP-14 |
| Vanadium (V)-Total | | | <0.0010 | | mg/L | | 0.001 | 10-SEP-14 |
| Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 10-SEP-14 |

MET-TOT-LOW-ICP-VA Water



Workorder: L1514194

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---|--------|------------|------------------|-----------|-------|-----|---------|-----------|
| MET-TOT-LOW-ICP-VA | Water | | | | | | | |
| Batch R294370 | 4 | | | | | | | |
| WG1948036-3 CRM Calcium (Ca)-Total | | VA-HIGH-WA | TRM 104.6 | | % | | 80-120 | 10-SEP-14 |
| Iron (Fe)-Total | | | 98.6 | | % | | 80-120 | 10-SEP-14 |
| Magnesium (Mg)-Tota | I | | 104.4 | | % | | 80-120 | 10-SEP-14 |
| Phosphorus (P)-Total | | | 98.7 | | % | | 80-120 | 10-SEP-14 |
| Potassium (K)-Total | | | 101.5 | | % | | 80-120 | 10-SEP-14 |
| Silicon (Si)-Total | | | 103.4 | | % | | 80-120 | 10-SEP-14 |
| WG1948036-1 MB | | | | | | | | |
| Calcium (Ca)-Total | | | < 0.050 | | mg/L | | 0.05 | 10-SEP-14 |
| Iron (Fe)-Total | | | < 0.010 | | mg/L | | 0.01 | 10-SEP-14 |
| Magnesium (Mg)-Tota | I | | < 0.050 | | mg/L | | 0.05 | 10-SEP-14 |
| Phosphorus (P)-Total | | | < 0.050 | | mg/L | | 0.05 | 10-SEP-14 |
| Potassium (K)-Total | | | < 0.10 | | mg/L | | 0.1 | 10-SEP-14 |
| Silicon (Si)-Total | | | < 0.050 | | mg/L | | 0.05 | 10-SEP-14 |
| PH-PCT-VA | Water | | | | | | | |
| Batch R294364 | 9 | | | | | | | |
| WG1947450-25 CRM pH | | VA-PH7-BUF | 7.01 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-26 CRM pH | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-27 CRM | | VA-PH7-BUF | 7.01 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-28 CRM | | VA DUZ DUE | 7.01 | | pri | | 0.9-7.1 | 09-3EP-14 |
| pH | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-29 CRM pH | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-30 CRM pH | | VA-PH7-BUF | 6.99 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-31 CRM pH | | VA-PH7-BUF | 7.02 | | рН | | 6.9-7.1 | 09-SEP-14 |
| WG1947450-32 CRM | | VA-PH7-BUF | 7.03 | | рН | | 6.9-7.1 | 09-SEP-14 |
| S-DIS-ICP-VA | Water | | | | , | | | |
| Batch R294264 | | | | | | | | |
| WG1947233-2 CRM Sulfur (S)-Dissolved | | VA-HIGH-WA | TRM 101.7 | | % | | 80-120 | 09-SEP-14 |
| WG1947233-1 MB | | | | | | | | |



Workorder: L1514194

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--|--------|-------------|--------------|-----------|-------|-----|--------|-----------|
| S-DIS-ICP-VA | Water | | | | | | | |
| Batch R2942645 | | | | | | | | |
| WG1947233-1 MB Sulfur (S)-Dissolved | | | <0.50 | | mg/L | | 0.5 | 09-SEP-14 |
| S-TOT-ICP-VA | Water | | | | | | | |
| Batch R2943704 | | | | | | | | |
| WG1948036-3 CRM Sulfur (S)-Total | | VA-HIGH-WA | TRM 102.3 | | % | | 80-120 | 10-SEP-14 |
| WG1948036-1 MB Sulfur (S)-Total | | | <0.50 | | mg/L | | 0.5 | 10-SEP-14 |
| SO4-TUR-VA | Water | | | | | | | |
| Batch R2943291 | | | | | | | | |
| WG1948014-2 CRM Sulfate (SO4) | | VA-SO4-L-CO | 98.4 | | % | | 85-115 | 10-SEP-14 |
| WG1948014-6 CRM Sulfate (SO4) | | VA-SO4-H-CC | 102.8 | | % | | 85-115 | 10-SEP-14 |
| WG1948014-1 MB Sulfate (SO4) | | | <0.50 | | mg/L | | 0.5 | 10-SEP-14 |
| WG1948014-5 MB Sulfate (SO4) | | | <0.50 | | mg/L | | 0.5 | 10-SEP-14 |
| WG1948014-4 MS Sulfate (SO4) | | L1512411-2 | 92.1 | | % | | 75-125 | 10-SEP-14 |
| WG1948014-8 MS Sulfate (SO4) | | L1510555-1 | N/A | MS-B | % | | - | 10-SEP-14 |
| TURBIDITY-VA | Water | | | | | | | |
| Batch R2941561 | | | | | | | | |
| WG1947074-2 CRM Turbidity | | VA-FORM-40 | 101.8 | | % | | 85-115 | 08-SEP-14 |
| WG1947074-1 MB | | | | | | | 00 | 30 02. 14 |

Workorder: L1514194 Report Date: 10-SEP-14 Page 9 of 10

Legend:

| Limit | ALS Control Limit (Data Quality Objectives) |
|-------|---|
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Sample Parameter Qualifier Definitions:

| Qualifier | Description |
|-----------|---|
| J | Duplicate results and limits are expressed in terms of absolute difference. |
| MB-LOR | Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Workorder: L1514194 Report Date: 10-SEP-14 Page 10 of 10

Hold Time Exceedances:

| | Sample | | | | | | |
|-------------------------|--------|-----------------|-----------------|---------|-----------|-------|-----------|
| ALS Product Description | ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
| Physical Tests | | | | | | | |
| pH by Meter (Automated) | | | | | | | |
| | 1 | 06-SEP-14 20:45 | 09-SEP-14 23:00 | 0.25 | 74 | hours | EHTR-FM |

Legend & Qualifier Definitions:

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

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

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

EHT: Exceeded ALS recommended hold time prior to analysis.

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

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes. Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L1514194 were received on 07-SEP-14 09:30.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Page 150 of 151 MOE-2015-50087

Maxxam Analytics Inc. 4606 Canada Way Burnaby, BC V5G1K5

Ministry of Environment

Req # 50212388

| gent | | | | | | | | |
|-------|--|---|--------------------|------------------------------|----------------|---------------|------------|----------------|
| gen | ? Csr No. Office 10 | Client CA | | Sampling Age | ency | | | |
| udy | Projec | | Code 10 | Name Vanco | uver Island, N | lanaimo | | |
| b | Maxxam Analytics Inc. | 7 5 | Address | 2080-A Labieux Road | | | | |
| nist | ry Contact NCOBEE Nicole Obee | | | | 2000112001 | | | |
| mpl | er Nicole Obee | | | | | | | |
| gnat | ure | | | City | Nanaimo | | | |
| MS Id | d E206805 Well P | late# | | Postal Code | V9T6J9 | Phone (2 | 50)751-31 | 00 |
| catio | on MYRA CREEK AT PUMPHOUSE #4. | (PE-06858) | | Number of Co | ntainers | | | |
| _ | tions To Lab Pls include total and disso | lved mercury at IC | PMS leve | | illuminer 3 | | | |
| aruc | tions To Lab | , | | | | | | |
| State | e FW Descriptor GE Colle | ection Method | GRB | | | | | |
| | | lection End | |) Depth | | | | |
| | | -MM-DD HH:MI | Upper | N 02 W 12 12 0 | | _ | | |
| T | REG 2014-09-06 2014-09 | | 0.5 | | | $ \rho$ | | RUS |
| | | | | | | | • | |
| | | | | | | | | |
| 1 | | | | | 1 | _ | Pric | rity pro |
| - | | | | | | - | 1 110 | inly pio |
| | | | 1 | L | | | | |
| ΝĒ | RAL (1L) Med'm | Pres'n | Isi | PECIFIC T | est | Med'm | Pres'n ! | Med'm Pres'n |
| - | Acidity pH 4.5 | 13,44.1 | | Biochemical O | | 02 | 01 | 1 |
| | Acidity pH 8.3 | | | Carb. Biochen | | 02 | 01 | |
| | Alk. Titration Curve | | | Carbon: DIC | | | | |
| _ | Alkalinity: Phen. | | [| X Carbon: DOC | 1,200 | | | |
| _ | Alkalinity: Total; pH 4.5 Colour: S.W. | | [| Carbon: TIC | | 1 | F | |
| - | Colour, TAC | | | X Carbon: TOC | | | | |
| | Colour, True | | _ | Chemical Oxy | | 04 | 05 | |
| _ | рН | | | Chlorophyli "a" | | | 24 | |
| _ | Residue: Filterable: 0.45µm (TDS) | | | Cyanide: SAD Cyanide: WAD | | 02 | 24 | - |
| - | Residue: Nonfilt., fixed (TSS; fixed) Residue: Nonfilterable (TSS) | | | Phaeophytin | <u> </u> | 1 02 | 44 | |
| - | Residue: Total | | $ \vdash$ \vdash | Residue:NFR | Whole Bottle | 03 | 01 | |
| _ | Residue: Total, Fixed | | - | SWEP (Extrac | | | | |
| | Specific Conductance | | | Sulphide: Tota | | 03 | D8 | |
| | Turbidity | | <u> </u> | | | | | d'm Pres'n |
| E | RAL (120 mL) Med'm | Pres'n | 0 | RGANICS | | | I ME | - riesii |
| | Anion Package (CI.Br,SO4) | | | AOX | h Coop | | | |
| | Chloride | | | Acid Extr. Her | uscan | | | |
| | Fluoride | | - | BTEX | - | | | - |
| _ | Nit.: Nitrate and Nitrite (Cofm) | | | EPH | MOA | | ļ | |
| | Nitrogen: Nitrate (Cořm) | | - | Glyphosate / A | | | | |
| _ | Nitrogen: Nitrite (Col'm) | | _ | Oil and Greas | | | ļ | |
| _ | Silica: Reactive | | _ | Organochlorin | | | | |
| | Sulfate | | | Organophospi | norus Pscan | | | |
| N | ERAL IONS (120 mL) Med'm | 55 Pres'n | 64 | PAH | l aborata | | | |
| | Nitrogen: Ammonia (Col'm) | | | Penta/Tetra C | | | | |
| | Nitrogen: Organic | | | Phenois (GC/I | | | | |
| - | Nitrogen: Tot. Kjeldahl (Calc) Nitrogen: Total | | | Phenols: Colo | | | | |
| = | | 1- 1 | = - | Polychlor, Bipl | nenyls | | | |
| 10 | SPHORUS (120 mL) Med'm | Pres'n | []_ | Resin Acids | | | | |
| | Phos. Diss. O-phosphate (Col'm) | | | Trihalomethan | es (THM) | <u>, S</u> | | |
| _ | Phosphorus: Tot. Diss. (Col'm) Phosphorus: Total (Col'm) | | 0 | THER Med'm | Pres'n | | Test | |
| TA | | I Modern ! n | | | Total | and dissolved | mercury at | ICPMS level |
| | LS (TOTAL) Med'm Pres'n | Med'rn Pres | 5 n | | | | | |
| 7 | Low 55 U2 | | | | | | 1/2 | |
| | X Metal Pkg. (ICPMS) | | | 1 | | | | |
| ٦ | Hardness | | | - | | | | |
| ď | X Mercury | | | | N | | | |
| 1 | Sediment, Sieve to < 63µ | | | ELD TEST ETAILS | No. Parar | meter Metho | d Res | ults Units |
| | LS (DISSOLVED; Med'm Pres'n | Med'm Pre | | LIMILS | - | | - +- | |
| TA | | 1 " | | | | 7 | _ | |
| 5 M | IICROMETERS) 55 62 | | | | | ! | | |
| 5 M | Low | | | | | | , | |
| M | Low Metal Pkg. (ICP) | | | | | | | |
| М | Low | | | | | | + | - |

Page 151 of 151 MOE-2015-50087

Austad, Bob ENV:EX

From:

Miller, Aaron W ENV:EX

Sent:

Friday, September 19, 2014 4:01 PM

To:

ENV PPA Situation Report

Cc:

Smith, Andy B ENV:EX; Cadden, Don ENV:EX; Miller, Aaron W ENV:EX; Nanaimo ENV

Filing ENV:EX

Subject:

SR-WC-1 - Nystar Spill, Strathcona Park - UPDATE

Attachments:

Nyrstar Mine Spill Situation Report Update Sept 17 2014.pdf

Hi folks:

Here is an updated Situation Report for the above noted occurrence with most recent monitoring results taken by EP on site.

Thanks,

Aaron Miller
Section Head, BC Parks, Central Coast/North Island
Ministry of Environment
BC Parks and Conservation Officer Service Division
1812 Miracle Beach Dr
Black Creek B.C. V9J 1K1
Phone: 250 337-2402

Phone: 250 337-2402 Toll Free: 1 800 663-7867

Situation Report - Update September 17, 2014

To:

(ADM) Assistant Deputy Minister, - Lori Halls;

(EDRO) Executive Director, Regional Operations, BC Parks - A/Tom Bell;

Division Issues Manager, ADM's Office - Danielle Grbavac;

(GCPE) Government Communications & Public Engagement - Kimberley Franklin;

Safety, Compliance & Enforcement Officer - Stuart Walsh;

Region Specific:

Regional Director Don Cadden;

PPA Section Head Aaron Miller;

Cc:

(EDVS) Executive Director, Visitor Services - A/Bob Austad;

(EDPP&M) Executive Director, Parks Planning and Management - Brian Bawtinheimer;

Area Supervisor - Andy Smith;

(Manager, Visitor Programs) - Angus Carnie;

(Admin Co-ordinator) - Dorothy Hewison

Occurrence Date/Time:

2014-09-05 Time: 12:00 p.m.

Environmental Protection Branch staff reported a spill of cement catalyst from Nyrstar Mine into Myra Creek, Strathcona-Westmin Park. Spill occurred at 12:00 p.m. Friday and EP reported the spill to BC Parks (Don Cadden) at 1:00 a.m. Saturday.;

Title: Nyrstar Mining Spill

SR-WC - 1

Location:

Strathcona-Westmin Park upstream from Buttle Lake. Closest community is Campbell River. Closest park facility is Ralph River campground which is located on Buttle Lake approximately 5 kilometres from the spill site.

More detailed location if necessary (include map if useful)

Agency Response:

Ministry of Mines is lead agency and staff have been notified – Mines Inspector on way to site. Environmental Protection Branch staff (Spill Response officer) is on site to take samples. COS, Vancouver Island Health Authority and City of Campbell River have also been notified.

Alex Grant (Spill Response Officer) from MOE Nanaimo office is the lead contact for MOE.

Aaron Miller is lead contact for BC Parks.

Occurrence Details:

- Sept 8, 2014 Approximately 16,000 litres of cement catalyst was accidently released into Myra Creek, upstream from Buttle take. Mine staff responded immediately and contacted government agencies responsible for response (MOE spill response staff and MEM staff).
- Response staff arrived on site the following morning and samples were taken <u>(see details below under Sept 17, update below)</u>.
- No health or public safety concerns for park visitors.
- No need for park operational staff to be on the site.

Updates:

September 8, 2014

- Don Cadden had a follow up meeting with the Environmental Protection Branch (EP) staff Sept
 8. EP confirmed that Nyrstar mine staff only notified EP at 12:00 a.m. 12 hours after the event. EP notified BC Parks as soon as they received notification.
- The emergency response plan for Nyrstar mine requires the mine staff to notify government immediately when a spill occurs. That plan was not followed and EP is following up.
- EP will provide BC Parks with a summary of the actions taken since they received notification of the spill and will also provide an update on discussions with Nyrstar around their reporting requirements.

September 9, 2014

Andy Smith, Area Supervisor contacted Ivor McWilliams, Environmental Superintendent of Nyrstar Mining to get more details of spill incident.

• Spill Details: As a safety precaution to deflect random rocks falling from the high wall above the main office complex, surplus 1000 litre plastic "totes" were being used (previously cement barriers had been used but replaced when they were found to cause ricocheting into the parking lot area). These plastic totes originally held "Meyco FA 160", an accelerant used to speed curing of the shotcrete in the underground mine areas. The totes after being emptied as much as possible still had residual amounts of compound contained in them, which could not be easily flushed out due to treatment needs. As a result when filled with clean water to provide weight and prevent movement in their new containment/protection role, the residual compound mixed with the water to form a low pH solution between 2 and 3 pH.

During September 5th, as part of an enhancement and upgrade project,16 of these totes were emptied into a ditch catchment system. The water flowed to a sump pump which would normally pump the effluent to the mine's super pond, however the pump's automatic controls failed resulting in an overflow which ultimately lead into Myra Creek. While it is not known why the controls failed at this time, the pump itself was confirmed OK when manually operated.

As the totes each had a volume of 1000 litres and 16 were emptied, the spill was reported as 16,000 litres of a high acidic solution.

Water Sampling: Following the spill, samples were taken at the confluence of the ditch and Myra Creek where a pH reading of 4.16 was recorded. Further downstream approximately 50m the pH was recorded at 5.5 while further downstream, approximately 250 m, another sample was taken with a recorded 6.8 pH. The normal average pH of Myra Creek is approximately 7.1 (for information only, the mine's sampling regime has samples taken automatically every 3 hours totalling 8 samples per day). The discharged effluent has no metal content and therefore the impact is believed to be more of a pH related issue.

Minstry of Environment staff were on site early Sept. 6th to carry out their own sampling procedures. The results of those samples are not known yet.

 Spill Reporting: Protocol was for Environmental Superintendent to report an incident immediately to all official stakeholders including BC Parks.

The Environmental Superintendent, Ivor McWilliams \$5.22 at the time and was not reached until 4pm on Sept 5th. The Superintendent relayed known information to Ministry

| of Environment staff by 5:30 that same day. Under normal circ | cumstances the Environmental |
|---|------------------------------|
| Technician would follow reporting protoco \$.22 | |
| s.22 | A summer student did what |
| • | |

they could by gathering information and collecting samples immediately.

Provincial Emergency Program was called by 11:45 pm on Sept 5th once the Superintendent returned and was provided with more information. A notification email was sent out to all official stakeholders/agencies, including BC Parks, at 12:50 am, whose email addresses could be accessed from home. It was later learned that some of these addresses were wrong and a second email was sent on Sept 6th.

- Media: The General Manager of Nyrstar Mine was interviewed by CHEK TV on Sunday morning September 7th and later aired on TV that day.
- Official Incident Report: The mine is required to submit a full report on the incident within 30 days. The report will detail the reasons for the spill, the impacts recorded and solutions

September 17, 2014

The following report was prepared by Nicole Obee, R.P. Bio., Environmental Impact Assessment, Ministry of Environment, Mining Operations (file # PE : 6858):

"A spill of 16 cubic metres of acidic wash water containing aluminum sulphate and 2,2'-iminodiethanol occurred at the NVI-Myra Falls mine on September 5, 2014. Ministry of Environment staff collected water quality samples from Myra Creek and Buttle Lake on September 6, 2014 to determine potential impacts on aquatic life and human health. In addition to surface water grabs, samples were collected at specific depths at the mouth of Myra Creek and in Buttle Lake up to 200 metres from the mouth to target any plume associated with the spill. The collection of samples from within the plume can help determine "worst case" scenario, but don't actually represent water quality throughout the entire water column.

The parameters analysed include pH, conductivity, turbidity, total organic carbon, dissolved organic carbon, hardness, alkalinity, general ions, total and dissolved metals. Samples were not analysed for E.coli. Due to a short hold time for pH samples, field pH results were used instead of the lab samples. Results were compared to the BC water quality guidelines for aquatic life and drinking water, as well as to the 2013 Annual Environmental and Reclamation Report submitted by the mine as part of their operating permit requirements.

Water samples were collected from the following sites and depths:

- Source material
- TP4 Myra Creek at Pumphouse (creek sample)
- Myra Creek below waterfall (creek sample)
- Myra Creek at Buttle Lake, 35 metres from waterfall (lake samples, 0.5 and 3.0 metres deep)
- Three sites in Buttle Lake 200 metres from Myra Falls (lake samples, 0.5, 5.0 and 10.0 metres deep)

Results showed that there were no exceedances of the drinking water guidelines at any receiving environment sites for any of the parameters sampled.

In the source material, pH was very low (3.93) and aluminum and sulphate were very high (385 mg/L and 2,080 mg/L, respectively). Hardness was 40.1 mg/L.

At TP4, the first sample site downstream, pH and aluminum results were similar to levels seen at this site in 2013. Sulphate exceeded the aquatic life guideline, but was not measured at this site in 2013 and so no comparison with typical conditions can be made. Other metals (cadmium, copper and zinc) also exceeded the aquatic life guidelines and were slightly higher than in 2013. However, these metals were higher at TP4 than in the source material, and therefore appear to be unrelated to the spill.

At Myra Creek below the waterfall, surface pH, aluminum and sulphate met the aquatic life guidelines. At Myra Creek at Buttle Lake, at a depth of 3 metres, hardness, sulphate and aluminum were higher than at other sites and depths. Aluminum met the aquatic life guideline, but the measured sulphate (149 mg/L) exceeded the guideline (128 mg/L). As the hardness at this site was 153 mg/L, much higher than in the source material, it is unlikely that these elevated values were the result of the spill.

At Buttle Lake 200 metres from the waterfall, pH, aluminum and sulphate all met the aquatic life guidelines. Results were not elevated above typical conditions, as compared with the 2013 results measured at the nearest regular lake monitoring site.

Based on the relatively small volume of material spilled, the short duration of the spill, and the significant dilution provided by Buttle Lake, there are no concerns for human health, and impacts to aquatic life are expected to be minimal. No further sampling is planned at this time."

Nicole Obee, R.P. Bio.
Environmental Impact Assessment Biologist
Ministry of Environment, Mining Operations

Austad, Bob ENV:EX

From:

Cadden, Don ENV:EX

Sent:

Wednesday, September 10, 2014 11:04 AM

To:

Halls, Lori D ENV:EX; Bell, Tom G ENV:EX; Grbavac, Danielle ENV:EX; Franklin, Kimberley

GCPE:EX; Walsh, Stuart G ENV:EX; Miller, Aaron W ENV:EX

Cc:

Austad, Bob ENV:EX; Bawtinheimer, Brian ENV:EX; Smith, Andy B ENV:EX; Hewison,

Dorothy J ENV:EX; Carnie, Angus A ENV:EX

Subject:

RE: Myra Spill Sit Rep.dotx

Attachments:

Nyrstar Mine Spill Situation Report Update Sept 9 2014.docx

Updated sit rep to Sept 9, 2014.

Don

Situation Report

To:

(ADM) Assistant Deputy Minister, - Lori Halls;

(EDRO) Executive Director, Regional Operations, BC Parks - A/Tom Bell;

Division Issues Manager, ADM's Office - Danielle Grbavac;

(GCPE) Government Communications & Public Engagement - Kimberley Franklin;

Safety, Compliance & Enforcement Officer - Stuart Walsh;

Region Specific:

Regional Director Don Cadden;

PPA Section Head Aaron Miller;

Cc:

(EDVS) Executive Director, Visitor Services – A/Bob Austad;

(EDPP&M) Executive Director, Parks Planning and Management - Brian Bawtinheimer;

Area Supervisor - Andy Smith;

(Manager, Visitor Programs) - Angus Carnie;

(Admin Co-ordinator) - Dorothy Hewison

Occurrence Date/Time:

2014-09-05 Time: 12:00 p.m.

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Title: Nyrstar Mining Spill

SR-WC-1

Location:

Strathcona-Westmin Park upstream from Buttle Lake. Closest community is Campbell River. Closest park facility is Ralph River campground which is located on Buttle Lake approximately 5 kilometres from the spill site.

More detailed location if necessary (include map if useful)

Agency Response:

Ministry of Mines is lead agency and staff have been notified – Mines Inspector on way to site. Environmental Protection Branch staff (Spill Response officer) is on site to take samples. COS, Vancouver Island Health Authority and City of Campbell River have also been notified.

Alex Grant (Spill Response Officer) from MOE Nanaimo office is the lead contact for MOE.

Aaron Miller is lead contact for BC Parks.

Occurrence Details:

- Approximately 16,000 litres of cement catalyst were accidently released into Myra Creek, upstream from Buttle Lake. Mine staff responded immediately and contacted government agencies responsible for response – MOE spill response staff and MEM staff.
- Response staff are on site and samples are being taken.
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- No need for park operational staff to be on the site.

Update:

September 8, 2014

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| Technician would follow reporting protocol s.22 | |
|---|---------------------------|
| s.22 | A summer student did what |

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Provincial Emergency Program was called by 11:45 pm on Sept 5th once the Superintendent returned and was provided with more information. A notification email was sent out to all official stakeholders/agencies, including BC Parks, at 12:50 am, whose email addresses could be accessed from home. It was later learned that some of these addresses were wrong and a second email was sent on Sept 6th.

- Media: The General Manager of Nyrstar Mine was interviewed by CHEK TV on Sunday morning September 7th and later aired on TV that day.
- Official Incident Report: The mine is required to submit a full report on the incident within 30 days. The report will detail the reasons for the spill, the impacts recorded and solutions

Austad, Bob ENV:EX

From:

Cadden, Don ENV:EX

Sent:

Saturday, September 6, 2014 2:31 PM

To:

Halls, Lori D ENV:EX; Bell, Tom G ENV:EX; Grbavac, Danielle ENV:EX; Franklin, Kimberley

GCPE:EX; Walsh, Stuart G ENV:EX; Miller, Aaron W ENV:EX

Cc:

Austad, Bob ENV:EX; Bawtinheimer, Brian ENV:EX; Smith, Andy B ENV:EX; Hewison,

Dorothy J ENV:EX; Carnie, Angus A ENV:EX

Subject:

Myra Spill Sit Rep.dotx

Attachments:

Myra Spill Sit Rep.dotx

Sit Rep re: Myra Creek spill.

Situation Report

To:

(ADM) Assistant Deputy Minister, - Lori Halls;

(EDRO) Executive Director, Regional Operations, BC Parks - A/Tom Bell;

Division Issues Manager, ADM's Office - Danielle Grbavac;

(GCPE) Government Communications & Public Engagement - Kimberley Franklin;

Safety, Compliance & Enforcement Officer - Stuart Walsh;

Region Specific:

(RD), Regional Director Don Cadden;

(PPA SH), PPA Section Head Aaron Miller;

Cc:

(EDVS) Executive Director, Visitor Services – A/Bob Austad;

(EDPP&M) Executive Director, Parks Planning and Management - Brian Bawtinheimer;

Area Supervisor - Andy Smith;

(Manager, Visitor Programs) - Angus Carnie;

(Admin Co-ordinator) - Dorothy Hewison

Overwrite with Name(s) add name if required .

Please note that there are additional ccs for the Wildfire report section.

Occurrence Date/Time:

2014-09-05 Time: 12:00 p.m.

Environmental Protection Branch staff reported a spill of cement catalyst from Nyrstar Mine into Myra Creek, Strathcona-Westmin Park. Spill occurred at 12:00 p.m. Friday and EP reported the spill to BC Parks (Don Cadden) at 1:00 a.m. Saturday.;

Title:

SR-WC - , 1 (number created by person sending email), Snill from r (Title of Occurrence=relates to occurrence type)

Location:

Provincial Park Strathcona-Westmin Park upstream from Buttle Lake. Closest community is Campbell River. Closest park facility is Ralph River campground which is located on Buttle Lake approximately 10 kilometres from the spill site.

More detailed location if necessary (include map if useful)

Agency Response:

Ministry of Mines is lead agency and staff have been notified – Mines Inspector on way to site. Environmental Protection Branch staff (Spill Response officer) is on site to take samples. COS, Vancouver Island Health Authority and City of Campbell River have also been notified.

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- Response staff are on site and samples are being taken.
- No health or public safety concerns for park visitors
- No need for park operational staff to be on the site.

Update:

Click here to enter a date.

• Next update will be Monday morning, Sept 8 when spill response staff provide specific information regarding the nature of the spill and provide estimate of time for lab analysis results.

Page 15 to/à Page 16

Withheld pursuant to/removed as

NR

Austad, Bob ENV:EX

From:

Cadden, Don ENV;EX

Sent:

Monday, September 8, 2014 11:02 AM

To:

Cc:

Cadden, Don ENV:EX; Halls, Lori D ENV:EX; Bell, Tom G ENV:EX; Grbavac, Danielle

ENV:EX; Franklin, Kimberley GCPE:EX; Walsh, Stuart G ENV:EX; Miller, Aaron W ENV:EX

Austad, Bob ENV:EX; Bawtinheimer, Brian ENV:EX; Smith, Andy B ENV:EX; Hewison,

Dorothy J ENV:EX; Carnie, Angus A ENV:EX

Subject:

RE: Myra Spill Sit Rep.dotx

Attachments:

Myra Spill Sit Rep.dotx

Updated sit rep attached.

Don

Situation Report

To:

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(ADM) Assistant Deputy Minister, - Lori Halls;
(EDRO) Executive Director, Regional Operations, BC Parks - A/Tom Bell;
Division Issues Manager, ADM's Office - Danielle Grbavac;
(GCPE) Government Communications & Public Engagement - Kimberley Franklin;
Safety, Compliance & Enforcement Officer - Stuart Walsh;
Region Specific:

Regional Director Don Cadden;
PPA Section Head Aaron Miller;
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<u>Cc:</u>

(EDVS) Executive Director, Visitor Services – A/Bob Austad;
(EDPP&M) Executive Director, Parks Planning and Management - Brian Bawtinheimer;
Area Supervisor – Andy Smith;
(Manager, Visitor Programs) - Angus Carnie;
(Admin Co-ordinator) - Dorothy Hewison

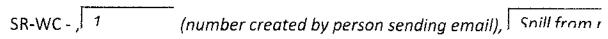
Please note that there are additional ccs for the Wildfire report section.

Occurrence Date/Time:

2014-09-05 Time: 12:00 p.m.

Environmental Protection Branch staff reported a spill of cement catalyst from Nyrstar Mine into Myra Creek, Strathcona-Westmin Park. Spill occurred at 12:00 p.m. Friday and EP reported the spill to BC Parks (Don Cadden) at 1:00 a.m. Saturday.;

<u>Title:</u>



Location:

Strathcona-Westmin Park upstream from Buttle Lake. Closest community is Campbell River. Closest park facility is Ralph River campground which is located on Buttle Lake approximately 10 kilometres from the spill site.

More detailed location if necessary (include map if useful)

Agency Response:

Ministry of Mines is lead agency and staff have been notified – Mines Inspector on way to site. Environmental Protection Branch staff (Spill Response officer) is on site to take samples. COS, Vancouver Island Health Authority and City of Campbell River have also been notified.

Alex Grant (Spill Response Officer) from MOE Nanaimo office is the lead contact for MOE.

Aaron Miller is lead contact for BC Parks.

Occurrence Details:

- Approximately 16,000 litres of cement catalyst were accidently released into Myra Creek, upstream from Buttle Lake. Mine staff responded immediately and contacted government agencies responsible for response MOE spill response staff and MEM staff.
- Response staff are on site and samples are being taken.
- No health or public safety concerns for park visitors
- No need for park operational staff to be on the site.

Update:

Click here to enter a date.

 Next update will be Monday morning, Sept 8 when spill response staff provide specific information regarding the nature of the spill and provide estimate of time for lab analysis results.

September 8, 2014

- Don Cadden had a follow up meeting with the Environmental Protection Branch (EP) staff Sept 8. EP confirmed that Nyrstar mine staff only notified EP at 12:00 a.m. 12 hours after the event. EP notified BC Parks as soon as they received notification.
- The emergency response plan for Nyrstar mine requires the mine staff to notify government immediately when a spill occurs. That plan was not followed and EP is following up.

 EP will provide BC Parks with a summary of the actions taken since they received notification of the spill and will also provide an update on discussions with Nyrstar around their reporting requirements. Page 21 to/à Page 22

Withheld pursuant to/removed as

NR