

June 30 , 2017

File: L020

Kierney Leach Regulatory Officer
Mackenzie Valley Land and Water Board
PO Box 2130
Yellowknife, Northwest Territories
X1A 2P6

Dear: Ms. Leach:

Re: Snap Lake Mine Monthly Water License Report: May 2017
Water License # MV2011L2-0004

De Beers Canada Inc., (De Beers) Snap Lake Mine is pleased to provide the Mackenzie Valley Land and Water Board (MVLWB) the Monthly Surveillance Network Program (SNP) Report for May 2017.

Samples were collected from thirteen (13) stations during the reporting period (Figure 1). Underground retreat was completed on February 9 and flooding of the underground workings is complete. De Beers received authorization from the Government of the Northwest Territories (GNWT) Inspector of Lands on May 21, 2017 to discharge freshet water from the water management pond to Snap Lake due to risk of overtopping of the mines water control structures. Discharge commenced on May 25, 2017, this reactivated SNP 02-17b for this reporting period.

This report satisfies the SNP requirements as prescribed in Snap Lake Mine Water License MV2011L2-0004.

Should you have any questions, comments or require further clarification, please do not hesitate to contact me at 867-767-8567 or e-mail me at the following address:
Michelle.Peters@debeersgroup.com.

Sincerely,
DE BEERS CANADA INC.



Digitally signed by Michelle H. Peters
DN: cn=Michelle H. Peters, o=De Beers Canada
Inc., ou=Snap Lake Mine,
email=Michelle.peters@debeersgroup.com, c=CA
Date: 2017.06.30 17:36:47 -06'00'

Michelle Peters
Environmental Monitoring Superintendent

Copied to: J. Steele, M. Sanderson, A.Howton
P. di Pizzo, Z. Liu

GNWT
SLEMA

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Snap Lake Mine
Surveillance Network Program
May 2017

Active SNP Stations May 2017



Snap Lake Mine
Surveillance Network Program
May 2017

Active SNP Stations May 2017 (continued)



Snap Lake Mine
 Surveillance Network Program
 May 2017

SNP Sampling Status March 2017 MV#2011L2-0004 (Amended September 8, 2016)

SNP STATION	DESCRIPTION	STATUS	SAMPLED	TABLE
02-01	Final mine water collection sump- Dirty minewater from underground stopped pumping to WTP as part of flooding operations in Extended Care & Maintenance.	Active	no	--
02-02	North Pile drainage collection ditch	Active	yes	2
02-03	Core Facilities area collection ditch near Water Management Pond	Active	yes	3
02-04	Uncontrolled surface runoff at culvert by airstrip (3)	Active	yes	4-6
02-05	Uncontrolled surface runoff at Bulk Sample Mine Rock Pad	Active	yes	7
02-06	Uncontrolled surface runoff at Quarry Site	Active	yes	8
02-07	Uncontrolled surface runoff at Road to Bulk Emulsion Plant (6)	Active	yes	9-11
02-08	Uncontrolled surface runoff at Winter Access Road	Active	yes	12
02-09	Uncontrolled surface runoff at Emulsion Plant Area (6)	Active	yes	13-17
02-10	Any other points where observable flow to Snap Lake or IL5 is observed	Active	yes	18
02-11	Seepage well down gradient from Dam 1 near Snap Lake shoreline	Active	no	--
02-12	Seepage well down gradient from Dam 1 at Water Management Pond	Active	no	--
02-13	Seepage well down gradient from Dam 2 at Water Management Pond	Active	no	--
02-14	Water Management Pond	Active	yes	19
02-15	Water Intake from Snap Lake	Active	yes	20
02-16 i	Sewage Discharge from Sewage Treatment Plant prior to mixing with Water Treatment Plant Effluent (2)	Active	yes	21
02-17 b	Final Combined Water Treatment Plant	Active	yes	22
02-18	Whole Lake Total Dissolved Solids, Calcium, and Chloride (several sites within the main lake basin of Snap Lake)	Active	no	
02-19	SNP Station Removed effective November 16 th 2007	Inactive	no	--
02-20	Snap Lake on the edge of the mixing zone around the diffuser (4 stations located in a radius of 120 degrees at 200 meters from diffuser)	Active	no	--
02-21	Outlet from Snap Lake flowing into the Lockhart System	Active	no	--
02-22	Diffuser Construction	Inactive	no	--
02-23	Intake Construction – completed September 2005	Inactive	no	--

WATER MANAGEMENT

SNP 02-01: Dirty mine water from underground final mine water collection sump stopped pumping to the Water Treatment Plant (WTP) as part of flooding operations in Extended Care & Maintenance. The station is no longer in service.

SNP STATION 02-16 J: The Sewage Treatment Plant (STP) operated for 31 days in the month of May.

SNP STATION 02-17 B: De Beers received authorization from the Government of the Northwest Territories (GNWT) Inspector of Lands on May 21, 2017 to discharge freshet water from the water management pond to Snap Lake due to risk of overtopping of the mines water control structures. Discharge to the lake commenced on 25 May, and a total of 2 samples were taken from Station 02-17B, on 25 May and 31 May as per the instructions issued by the GNWT Inspector with the authorization..

RAW WATER CONSUMPTION

The quantity of water extracted from Snap Lake for camp operations, site services, and construction is tabulated in Table 28. Please note that mine water results are subject to change pending completion of quality assurance checks.

GENERAL WASTE

Glass jars, tin cans, and most food related plastic containers are washed and shipped off site. Waste wood products and cardboard are burned in the authorized pit as per the Land Use Permit MV2010D0053. Waste Management Area staff ensures that waste is handled as per the approved operational procedures for waste handling.

REGULATORY

Regulatory inspections were conducted May 25 and May 31.

ENVIRONMENTAL STUDIES/SURVEYS

Regulatory monitoring of Snap Lake included the following:

- Air Quality Monitoring;
- Monthly and Quarterly SNP monitoring
- Toxicity sampling; and
- Freshet SNP monitoring.

OTHER ON-SITE ACTIVITIES

- Site Water Quality monitoring;
- North Pile Thermistor and Piezometer monitoring;
- Meteorological data downloads;
- Dam and Water Management Pond monitoring;
- North Pile ditch and sump monitoring;
- Potable water monitoring; and
- Wildlife Surveillance Audits.

CONSTRUCTION ACTIVITIES

There were no construction activities on site.

GEO-TECHNICAL ACTIVITIES

The Water Management Pond (WMP) water elevation survey and North Pile sump monitoring are ongoing. Thermistor and piezometer monitoring is ongoing. No anomalies were identified.

Snap Lake Mine
Surveillance Network Program
May 2017

Attachment:
SNP Report Data Tables and Figures

WATER MANAGEMENT ACTIVITIES

Water Balance	Table 28
Runoff Water Pumped to Water Management Pond	Table 29

PROCESSING PLANT ACTIVITIES

The mine is currently under extended care and maintenance conditions, and the process plant is not in operation at this time. There is no further processing of ore, depositing of slurry, paste, solids, or liquids to the North Pile or paste underground at this time (Reference Tables 31-35).

FUEL STORAGE/TANK FARM

Ongoing inspections of the tank farms and distribution systems continued in May.

SPILLS

Reportable spill #17-166 was logged and reported during the month of May.

AIRSTRIP

Regular monitoring and air strip maintenance was carried out in May.

CONTAINMENT DAMS

Weekly inspections of Dams # 1 and # 2 continued during the month of May. North Pile inspection was conducted weekly and report submitted to Geotechnical Engineers.

TABLE 1
SNAP LAKE WATER LICENSE WTP DISCHARGE CRITERIA
MV#2011L2-0004 (Amended September 8, 2016)
June 14, 2012 – June 13, 2020

PARAMETER	AVERAGE MONTHLY LIMIT	MAXIMUM CONCENTRATION OF ANY GRAB SAMPLE	ANNUAL LOADING
Ammonia as N	10 mg/L	20 mg/L	208,000 kg/yr
Extractable Petroleum Hydrocarbons - F1 Fraction (C6-C10)	4.6 mg/L		
Extractable Petroleum Hydrocarbons - F2 Fraction (C11-C16)	2.1 mg/L		
Faecal Coliforms	10 CFU/100ml*	20 CFU/100ml*	
* CFU - (Colony-forming units)			
Fluoride	1.3 mg/L	2.0 mg/L	
Nitrate as N	12 mg/L	17 mg/L	250,000 kg/yr
Nitrite as N	0.35 mg/L	0.5 mg/L	
pH	6.0 - 9.0		
Total Aluminum	100 µg/L	200 µg/l	
Total Arsenic	3 µg/L	10 µg/L	
Total Chromium	10 µg/L	20 µg/L	
Total Copper	3 µg/L	6 µg/L	
Total Lead	5 µg/L	10 µg/L	
Total Nickel	50 µg/L	100 µg/L	
Total Zinc	10 µg/L	20 µg/L	
Total Phosphorus Discharge from All Sources			229 kg/yr
Total Dissolved Solids (TDS) (calculated)	960 mg/L	1253 mg/L	
Total Suspended Sediments	7 mg/L	14 mg/L	
RUNOFF DISCHARGE CRITERIA			
pH*	5.0 - 9.0		
* Except SNP 02-04, SNP 02-07, SNP 02-08, or SNP 02-09			

TABLE 2
SNP STATION: 02-02
NORTH PILE COLLECTION DRAINAGE DITCH
LICENCE # MV2011L2-0004

Date Sampled:	2017-05-28
Sample Control Number:	2017-0298
QAQC Type:	Sample
pH (unitless) [Physical]	7.31
Specific Conductivity (µS/cm) [Physical]	743
Total Dissolved Solids (mg/L) (Measured)	479
Total Dissolved Solids, calculated (lab) (mg/L)	450
Total Suspended Solids (mg/L)	16.1
Turbidity-Unfiltered (NTU)	9.26
Calcium (mg/L)	51.7
Carbonate, as CO ₃ (mg/L)	< 5.0
Chloride (mg/L)	76.2
Fluoride (mg/L)	0.329
Hardness, as CaCO ₃ (mg/L)	241
Hydroxide, as OH (mg/L)	< 5.0
Ion Balance (%)	91.4
Magnesium (mg/L)	27.2
Potassium (mg/L)	8.66
Reactive Silica, as SiO ₂ (mg/L)	4.70
Sodium (mg/L)	34.9
Sulphate (mg/L)	137
Total Alkalinity, as CaCO ₃ (mg/L) [Major Ions]	33.2
Nitrate, as N (mg/L)	19.9
Nitrite, as N (mg/L)	0.141
ortho-Phosphate, as P (mg/L)	< 0.0010
Total Ammonia, as N (mg/L)	1.18
Total Dissolved Phosphorus (mg/L)	0.0125
Total Kjeldahl Nitrogen (mg/L)	1.63
Total Organic Carbon (mg/L)	5.1
Total Phosphorus (mg/L) [Nutrients]	0.0510
Total Aluminum (µg/L)	623
Total Antimony (µg/L)	0.18
Total Arsenic (µg/L)	0.31
Total Barium (µg/L)	28.4
Total Beryllium (µg/L)	< 0.10
Total Cadmium (µg/L)	0.0296
Total Cesium (µg/L)	0.157
Total Chromium (µg/L)	3.17
Total Cobalt (µg/L)	2.17
Total Copper (µg/L)	3.53
Total Iron (µg/L)	1300
Total Lead (µg/L)	0.590
Total Lithium (µg/L)	7.9
Total Manganese (µg/L)	103
Total Mercury (µg/L)	< 0.020
Total Molybdenum (µg/L)	21.0
Total Nickel (µg/L)	26.5
Total Rubidium (µg/L)	12.1
Total Selenium (µg/L)	0.165
Total Strontium (µg/L)	577
Total Thallium (µg/L)	0.027
Total Titanium (µg/L)	38.2

TABLE 2 (Continued)
SNP STATION: 02-02

Total Uranium (µg/L)	2.66
Total Vanadium (µg/L)	2.19
Total Zinc (µg/L)	7.8
Dissolved Aluminum (µg/L)	15.0
Dissolved Antimony (µg/L)	0.16
Dissolved Arsenic (µg/L)	0.11
Dissolved Barium (µg/L)	23.9
Dissolved Beryllium (µg/L)	< 0.10
Dissolved Cadmium (µg/L)	0.0238
Dissolved Cesium (µg/L)	0.053
Dissolved Chromium (µg/L)	0.26
Dissolved Cobalt (µg/L)	1.57
Dissolved Copper (µg/L)	1.35
Dissolved Iron (µg/L)	27
Dissolved Lead (µg/L)	< 0.050
Dissolved Lithium (µg/L)	5.0
Dissolved Manganese (µg/L)	93.1
Dissolved Mercury (µg/L)	< 0.020
Dissolved Molybdenum (µg/L)	16.6
Dissolved Nickel (µg/L)	19.8
Dissolved Rubidium (µg/L)	11.1
Dissolved Selenium (µg/L)	0.146
Dissolved Strontium (µg/L)	527
Dissolved Thallium (µg/L)	0.015
Dissolved Titanium (µg/L)	< 0.30
Dissolved Uranium (µg/L)	2.04
Dissolved Vanadium (µg/L)	< 0.50
Dissolved Zinc (µg/L)	13.0
F2 (>C10-C16) (mg/L)	< 0.10
F1 (C6-C10) (mg/L)	< 0.10
Benzene (mg/L)	< 0.00050
Ethylbenzene (mg/L)	< 0.00050
Toluene (mg/L)	< 0.00050
Xylene (mg/L)	< 0.00071
pH (unitless) [Field]	7.15
Specific Conductivity (µS/cm) [Field]	776
Water Temperature (deg. C) [Field]	8.0

TABLE 3**SNP STATION: 02-03.1****CORE FACILITIES AREA COLLECTION DITCH NEAR WATER MANAGEMENT POND****LICENCE # MV2011L2-0004**

Date Sampled:	2017-05-21	2017-05-23	2017-05-27
Sample Control Number:	2017-0517	2017-0534	2017-0296
QAQC Type:	Sample	Sample	Sample
pH (unitless) [Physical]	7.55	7.84	
Specific Conductivity (µS/cm) [Physical]	263	391	
Total Dissolved Solids (mg/L) (Measured)	152	228	
Total Dissolved Solids, calculated (lab) (mg/L)	161	210	
Total Suspended Solids (mg/L)	8.3	12.7	< 3.0
Turbidity-Unfiltered (NTU)	12.2	1.23	0.74
Calcium (mg/L)	20.2	21.0	
Carbonate, as CO ₃ (mg/L)	< 5.0	< 5.0	
Chloride (mg/L)	11.5	28.9	
Fluoride (mg/L)	0.358	0.542	
Hardness, as CaCO ₃ (mg/L)	104	106	
Hydroxide, as OH (mg/L)	< 5.0	< 5.0	
Ion Balance (%)	99.5	70.9	
Magnesium (mg/L)	13.0	13.0	
Potassium (mg/L)	4.88	4.48	
Reactive Silica, as SiO ₂ (mg/L)	3.0	4.24	
Sodium (mg/L)	8.96	10.8	
Sulphate (mg/L)	66.6	74.2	
Total Alkalinity, as CaCO ₃ (mg/L) [Major Ions]	26.4	43.9	
Nitrate, as N (mg/L)	3.54	5.74	
Nitrite, as N (mg/L)	< 0.010	0.0597	
ortho-Phosphate, as P (mg/L)	< 0.0010	< 0.0010	
Total Ammonia, as N (mg/L)	0.0507	0.0944	
Total Dissolved Phosphorus (mg/L)	0.0068	0.0235	
Total Kjeldahl Nitrogen (mg/L)	0.244	0.347	
Total Organic Carbon (mg/L)	1.7	2.9	
Total Phosphorus (mg/L) [Nutrients]	0.0497	0.0237	
Total Aluminum (µg/L)	516	251	
Total Antimony (µg/L)	0.17	0.22	
Total Arsenic (µg/L)	0.26	0.33	
Total Barium (µg/L)	24.4	19.1	
Total Beryllium (µg/L)	< 0.10	< 0.10	
Total Cadmium (µg/L)	0.0117	0.0063	
Total Cesium (µg/L)	0.085	0.040	
Total Chromium (µg/L)	4.12	3.33	
Total Cobalt (µg/L)	1.31	1.04	
Total Copper (µg/L)	2.80	0.78	
Total Iron (µg/L)	682	470	
Total Lead (µg/L)	0.425	0.286	
Total Lithium (µg/L)	7.8	1.9	
Total Manganese (µg/L)	62.7	25.5	
Total Mercury (µg/L)	< 0.020	< 0.020	
Total Molybdenum (µg/L)	11.0	19.3	
Total Nickel (µg/L)	27.4	24.0	
Total Rubidium (µg/L)	8.76	4.99	
Total Selenium (µg/L)	0.092	0.110	
Total Strontium (µg/L)	595	243	
Total Thallium (µg/L)	0.018	0.016	
Total Titanium (µg/L)	23.9	12.7	

TABLE 3 (Continued)
SNP STATION: 02-03.1

Total Uranium (µg/L)	2.71	2.90	
Total Vanadium (µg/L)	1.44	1.38	
Total Zinc (µg/L)	6.9	4.0	
Dissolved Aluminum (µg/L)	15.0	7.87	
Dissolved Antimony (µg/L)	0.20	0.152	
Dissolved Arsenic (µg/L)	0.26	0.285	
Dissolved Barium (µg/L)	13.9	14.0	
Dissolved Beryllium (µg/L)	< 0.10	< 0.010	
Dissolved Cadmium (µg/L)	0.0072	0.0071	
Dissolved Cesium (µg/L)	0.018	0.0167	
Dissolved Chromium (µg/L)	0.35	0.122	
Dissolved Cobalt (µg/L)	0.30	0.330	
Dissolved Copper (µg/L)	3.50	2.61	
Dissolved Iron (µg/L)	30	9.0	
Dissolved Lead (µg/L)	< 0.050	0.016	
Dissolved Lithium (µg/L)	1.9	1.87	
Dissolved Manganese (µg/L)	5.15	14.7	
Dissolved Mercury (µg/L)	< 0.020	< 0.020	
Dissolved Molybdenum (µg/L)	20.1 XM XM	18.4	
Dissolved Nickel (µg/L)	12.9	13.8	
Dissolved Rubidium (µg/L)	4.61	4.5	
Dissolved Selenium (µg/L)	0.170 XM XM	0.111	
Dissolved Strontium (µg/L)	240	231	
Dissolved Thallium (µg/L)	0.013	0.0150	
Dissolved Titanium (µg/L)	0.66	0.13	
Dissolved Uranium (µg/L)	2.30	2.36	
Dissolved Vanadium (µg/L)	0.79	0.666	
Dissolved Zinc (µg/L)	< 1.0	2.00	
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10	
F1 (C6-C10) (mg/L)	< 0.10	< 0.10	
Benzene (mg/L)	< 0.00050	< 0.00050	
Ethylbenzene (mg/L)	< 0.00050	< 0.00050	
Toluene (mg/L)	< 0.00050	< 0.00050	
Xylene (mg/L)	< 0.00071	< 0.00071	
pH (unitless) [Field]	6.95	7.36	7.20
Specific Conductivity (µS/cm) [Field]	233	310	763
Water Temperature (deg. C) [Field]	2.8	2.1	5.9

TABLE 4
SNP STATION: 02-04
UNCONTROLLED SURFACE RUNOFF AT CULVER BY AIRSTRIP
LICENCE # MV2011L2-0004

Date Sampled:	2017-05-19	2017-05-23	2017-05-27
Sample Control Number:	2017-0509	2017-0532	2017-0546
QAQC Type:	Sample	Sample	Sample
pH (unitless) [Physical]	6.26	6.71	6.03
Specific Conductivity (µS/cm) [Physical]	11.5	21.8	21.8
Total Dissolved Solids (mg/L) (Measured)	27	37	33
Total Dissolved Solids, calculated (lab) (mg/L)	6.2	14.0	13.6
Total Suspended Solids (mg/L)	10.2	5.1	37.0
Turbidity-Unfiltered (NTU)	14.4	20.4	8.49
Calcium (mg/L)	1.38	2.73	2.35
Carbonate, as CO ₃ (mg/L)	< 5.0	< 5.0	< 5.0
Chloride (mg/L)	< 0.50	< 0.50	< 0.50
Fluoride (mg/L)	0.034	0.072	0.059
Hardness, as CaCO ₃ (mg/L)	5.0	10.2	9.0
Hydroxide, as OH (mg/L)	< 5.0	< 5.0	< 5.0
Ion Balance (%)	Low EC	Low EC	Low EC
Magnesium (mg/L)	0.382	0.833	0.771
Potassium (mg/L)	0.646	1.19	0.933
Reactive Silica, as SiO ₂ (mg/L)	0.957	2.04	2.85
Sodium (mg/L)	0.242	0.727	0.882
Sulphate (mg/L)	0.282	1.46	1.01
Total Alkalinity, as CaCO ₃ (mg/L) [Major Ions]	3.2	7.1	6.3
Nitrate, as N (mg/L)	0.0123	0.0328	0.0442
Nitrite, as N (mg/L)	< 0.0010	< 0.0010	< 0.0010
ortho-Phosphate, as P (mg/L)	< 0.0010	< 0.0010	< 0.0010
Total Ammonia, as N (mg/L)	0.0166	0.0273	0.0410
Total Dissolved Phosphorus (mg/L)	0.0065	0.0191	0.0072
Total Kjeldahl Nitrogen (mg/L)	0.684	0.407	0.530
Total Organic Carbon (mg/L)	11.3	11.0	11.8
Total Phosphorus (mg/L) [Nutrients]	0.0305	0.0545	0.0345
Total Aluminum (µg/L)	995	1380	829
Total Antimony (µg/L)	< 0.10	< 0.10	< 0.10
Total Arsenic (µg/L)	0.18	0.22	0.23
Total Barium (µg/L)	10.4	12.1	9.87
Total Beryllium (µg/L)	< 0.10	< 0.10	< 0.10
Total Cadmium (µg/L)	0.0125	0.0173	0.0157
Total Cesium (µg/L)	0.108	0.136	0.123
Total Chromium (µg/L)	0.97	1.10	1.05
Total Cobalt (µg/L)	1.26	2.22	1.52
Total Copper (µg/L)	3.23	4.89	4.42
Total Iron (µg/L)	1160	1640	2400
Total Lead (µg/L)	0.543	0.636	0.339
Total Lithium (µg/L)	3.0	4.2	3.9
Total Manganese (µg/L)	42.0	82.1	54.7
Total Mercury (µg/L)	< 0.020	< 0.020	< 0.020
Total Molybdenum (µg/L)	0.719	2.02	1.12
Total Nickel (µg/L)	1.33	1.55	1.22
Total Rubidium (µg/L)	2.94	3.92	3.83
Total Selenium (µg/L)	< 0.050	< 0.050	< 0.050
Total Strontium (µg/L)	7.87	13.7	11.1
Total Thallium (µg/L)	0.015	0.021	0.015
Total Titanium (µg/L)	62.2	83.7	68.7

TABLE 4 (Continued)
SNP STATION: 02-04

Total Uranium (µg/L)	0.218	0.396	0.260
Total Vanadium (µg/L)	1.83	2.13	1.98
Total Zinc (µg/L)	9.0	10.6	9.3
Dissolved Aluminum (µg/L)	188	426	155
Dissolved Antimony (µg/L)	< 0.10	0.029	0.136 XM
Dissolved Arsenic (µg/L)	0.11	0.149	0.156
Dissolved Barium (µg/L)	2.57	5.84	4.77
Dissolved Beryllium (µg/L)	< 0.10	< 0.010	< 0.010
Dissolved Cadmium (µg/L)	0.0078	0.0196	0.0448 XM
Dissolved Cesium (µg/L)	< 0.010	0.0315	0.0074
Dissolved Chromium (µg/L)	0.24	0.454	0.418
Dissolved Cobalt (µg/L)	0.65	1.65	0.969
Dissolved Copper (µg/L)	12.5 XM XM	25.6	4.20
Dissolved Iron (µg/L)	156	555	891
Dissolved Lead (µg/L)	0.090	0.198	0.150
Dissolved Lithium (µg/L)	1.8	3.02	2.38
Dissolved Manganese (µg/L)	17.1	66.3	37.6
Dissolved Mercury (µg/L)	< 0.020	< 0.020	< 0.020
Dissolved Molybdenum (µg/L)	0.703	2.12	1.12
Dissolved Nickel (µg/L)	0.59	1.01	0.787
Dissolved Rubidium (µg/L)	1.13	2.3	1.6
Dissolved Selenium (µg/L)	< 0.050	< 0.040	< 0.040
Dissolved Strontium (µg/L)	6.04	11.7	11.7
Dissolved Thallium (µg/L)	< 0.010	0.0083	0.0060
Dissolved Titanium (µg/L)	2.67	17.0	2.23
Dissolved Uranium (µg/L)	0.131	0.291	0.175
Dissolved Vanadium (µg/L)	< 0.50	0.532	0.287
Dissolved Zinc (µg/L)	3.9	7.82	10.3
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10	< 0.10
F1 (C6-C10) (mg/L)	< 0.10	< 0.10	< 0.10
Benzene (mg/L)	< 0.00050	< 0.00050	< 0.00050
Ethylbenzene (mg/L)	< 0.00050	< 0.00050	< 0.00050
Toluene (mg/L)	< 0.00050	< 0.00050	< 0.00050
Xylene (mg/L)	< 0.00071	< 0.00071	< 0.00071
pH (unitless) [Field]	5.86	6.46	6.22
Specific Conductivity (µS/cm) [Field]	14.72	22.2	19.06
Water Temperature (deg. C) [Field]	0.9	2.6	2.2

TABLE 5
SNP STATION: 02-04.2
UNCONTROLLED SURFACE RUNOFF AT CULVER BY AIRSTRIP
LICENCE # MV2011L2-0004

Date Sampled:	2017-05-17	2017-05-17	2017-05-19	2017-05-23	2017-05-27
Sample Control Number:	2017-0500	2017-0501	2017-0511	2017-0529	2017-0552
QAQC Type:	Sample	Sample	Sample	Sample	Sample
pH (unitless) [Physical]	5.89	5.96	6.24	6.17	6.22
Specific Conductivity (µS/cm) [Physical]	11.5	10.7	11.4	11.7	19.2
Total Dissolved Solids (mg/L) (Measured)	27	28	23	16	31
Total Dissolved Solids, calculated (lab) (mg/L)	6.9	6.5	7.4	7.6	12.9
Total Suspended Solids (mg/L)	4.1	6.8	6.4	< 3.0	< 3.0
Turbidity-Unfiltered (NTU)	5.12	5.06	0.83	3.42	1.95
Calcium (mg/L)	1.39	1.17	1.22	1.27	1.31
Carbonate, as CO3 (mg/L)	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloride (mg/L)	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoride (mg/L)	< 0.020	0.025	0.033	0.039	0.059
Hardness, as CaCO3 (mg/L)	5.4	4.7	4.9	5.2	7.3
Hydroxide, as OH (mg/L)	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ion Balance (%)	Low EC	Low EC	Low EC	Low EC	Low EC
Magnesium (mg/L)	0.470	0.441	0.441	0.490	0.988
Potassium (mg/L)	0.879	0.861	0.817	0.553	0.642
Reactive Silica, as SiO2 (mg/L)	1.2	1.1	1.25	1.47	3.60
Sodium (mg/L)	0.435	0.318	0.398	0.559	0.816
Sulphate (mg/L)	0.495	0.542	1.01	1.16	2.37
Total Alkalinity, as CaCO3 (mg/L) [Major Ions]	2.6	2.8	3.1	2.7	3.0
Nitrate, as N (mg/L)	0.0261	0.0153	< 0.0050	< 0.0050	0.0765
Nitrite, as N (mg/L)	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
ortho-Phosphate, as P (mg/L)	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Ammonia, as N (mg/L)	< 0.0050	0.0052	0.0098	< 0.0050	0.0195
Total Dissolved Phosphorus (mg/L)	0.0093	0.0078	0.0073	0.0072	0.0120
Total Kjeldahl Nitrogen (mg/L)	0.379	0.386	0.367	0.316	0.665
Total Organic Carbon (mg/L)	8.7	8.8	8.3	9.2	11.5
Total Phosphorus (mg/L) [Nutrients]	0.0213	0.0291	0.0379	0.0256	0.0491
Total Aluminum (µg/L)	298	337	302	224	283
Total Antimony (µg/L)	< 0.10	< 0.10	< 0.020	< 0.10	0.31
Total Arsenic (µg/L)	0.12	0.13	0.109	0.11	0.15
Total Barium (µg/L)	5.36	5.72	5.31	4.58	6.71
Total Beryllium (µg/L)	< 0.10	< 0.10	< 0.010	< 0.10	< 0.10
Total Cadmium (µg/L)	0.0201	0.0200	0.0089	0.0059	0.0516
Total Cesium (µg/L)	0.027	0.034	0.0273	0.38	0.010
Total Chromium (µg/L)	0.47	0.44	0.264	0.51	0.56
Total Cobalt (µg/L)	0.98	0.97	0.717	1.54	0.93
Total Copper (µg/L)	1.96	1.76	1.56	428	3.17
Total Iron (µg/L)	496	538	441	0.083	350
Total Lead (µg/L)	0.236	0.182	0.173	< 1.0	0.081
Total Lithium (µg/L)	1.6	1.6	1.50	12.7	1.7
Total Manganese (µg/L)	36.2	36.1	26.7	0.235	22.4
Total Mercury (µg/L)			< 0.020	< 0.50	< 0.020
Total Molybdenum (µg/L)	0.217	0.216	0.282	1.22	0.259
Total Nickel (µg/L)	2.01	0.80	0.456	< 0.050	0.93
Total Rubidium (µg/L)	1.85	2.11	1.8	< 0.010	1.55
Total Selenium (µg/L)	< 0.050	< 0.050	< 0.040	< 0.10	< 0.050
Total Strontium (µg/L)	6.43	6.38	6.45	3.6	7.08
Total Thallium (µg/L)	0.012	< 0.010	0.0055	163	< 0.010
Total Titanium (µg/L)	13.9	17.7	11.8	0.116	5.41
Total Uranium (µg/L)	0.103	0.107	0.102	< 0.010	0.121
Total Vanadium (µg/L)	0.59	0.68	0.476	< 0.010	< 0.50
Total Zinc (µg/L)	4.5	5.5	4.36	1.7	8.2
Dissolved Aluminum (µg/L)	152	150	125	< 0.0050	253
Dissolved Antimony (µg/L)	0.24 XM XM	< 0.10	< 0.020	0.232	0.072
Dissolved Arsenic (µg/L)	< 0.10	< 0.10	0.097	0.433	0.145
Dissolved Barium (µg/L)	3.82	3.92	3.73	11.6	5.50
Dissolved Beryllium (µg/L)	< 0.10	< 0.10	< 0.010	237	0.017
Dissolved Cadmium (µg/L)	0.0134	0.0086	0.0111	11.7	0.0214

TABLE 5 (Continued)
SNP STATION: 02-04.2

Dissolved Cesium (µg/L)	< 0.010	< 0.010	0.0051	< 0.020	0.0054
Dissolved Chromium (µg/L)	0.21	0.18	0.181	0.195	0.374
Dissolved Cobalt (µg/L)	0.86	0.79	0.621	0.478	0.866
Dissolved Copper (µg/L)	17.6 XM XM	1.37	16.2 XM XM	1.2	11.3 XM
Dissolved Iron (µg/L)	235	234	225	< 0.040	254
Dissolved Lead (µg/L)	0.116	0.082	0.078	< 0.0050	0.062
Dissolved Lithium (µg/L)	1.5	1.4	1.10	6.96	2.29
Dissolved Manganese (µg/L)	32.8	31.3	23.2	< 0.0050	21.3
Dissolved Mercury (µg/L)			< 0.020	< 0.050	< 0.020
Dissolved Molybdenum (µg/L)	0.177	0.185	0.246	1.08	0.309
Dissolved Nickel (µg/L)	0.55	< 0.50	0.429	0.081	0.823
Dissolved Rubidium (µg/L)	1.62	1.57	1.6	0.201	1.3
Dissolved Selenium (µg/L)	< 0.050	< 0.050	< 0.040	3.38	< 0.040
Dissolved Strontium (µg/L)	8.99 XM XM	5.99	6.66	< 0.00071	10.0
Dissolved Thallium (µg/L)	0.011	< 0.010	< 0.0050	< 0.10	0.0066 XM
Dissolved Titanium (µg/L)	1.68	1.60	1.59	< 0.00050	1.97
Dissolved Uranium (µg/L)	0.085	0.079	0.081	< 0.10	0.119
Dissolved Vanadium (µg/L)	< 0.50	< 0.50	0.207	< 0.00050	0.319
Dissolved Zinc (µg/L)	4.8	6.0	4.01	< 0.00050	4.40
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10	< 0.10	< 0.00050	< 0.10
F1 (C6-C10) (mg/L)	< 0.10	< 0.10	< 0.10	5.84	< 0.10
Benzene (mg/L)	< 0.00050	< 0.00050	< 0.00050	13.20	< 0.00050
Ethylbenzene (mg/L)	< 0.00050	< 0.00050	< 0.00050	4.8	< 0.00050
Toluene (mg/L)	< 0.00050	< 0.00050	< 0.00050		< 0.00050
Xylene (mg/L)	< 0.00071	< 0.00071	< 0.00071		< 0.00071
pH (unitless) [Field]	6.13	6.13	5.70	5.84	6.98
Specific Conductivity (µS/cm) [Field]	13.30	13.30	17.61	13.20	16.50
Water Temperature (deg. C) [Field]	9.0	9.0	5.7	4.8	1.8

TABLE 6
SNP STATION: 02-04.3
UNCONTROLLED SURFACE RUNOFF AT CULVER BY AIRSTRIP
LICENCE # MV2011L2-0004

Date Sampled:	2017-05-17	2017-05-19	2017-05-23	2017-05-27
Sample Control Number:	2017-0502	2017-0510	2017-0533	2017-0547
QAQC Type:	Sample	Sample	Sample	Sample
pH (unitless) [Physical]	6.32	6.43	6.61	6.24
Specific Conductivity (µS/cm) [Physical]	12.0	11.2	23.8	18.6
Total Dissolved Solids (mg/L) (Measured)	< 10	16	43	34
Total Dissolved Solids, calculated (lab) (mg/L)	6.2	6.3	13.8	10.2
Total Suspended Solids (mg/L)	5.1	7.0	< 3.0	< 3.0
Turbidity-Unfiltered (NTU)	0.86	3.78	3.71	2.63
Calcium (mg/L)	1.14	0.939	1.79	1.42
Carbonate, as CO3 (mg/L)	< 5.0	< 5.0	< 5.0	< 5.0
Chloride (mg/L)	< 0.50	< 0.50	0.55	< 0.50
Fluoride (mg/L)	0.050	0.035	0.051	0.045
Hardness, as CaCO3 (mg/L)	5.1	4.7	10.2	7.8
Hydroxide, as OH (mg/L)	< 5.0	< 5.0	< 5.0	< 5.0
Ion Balance (%)	Low EC	Low EC	Low EC	Low EC
Magnesium (mg/L)	0.559	0.579	1.38	1.04
Potassium (mg/L)	0.653	0.550	0.813	0.651
Reactive Silica, as SiO2 (mg/L)	< 1.0	0.718	2.34	1.82
Sodium (mg/L)	0.400	0.392	0.861	0.730
Sulphate (mg/L)	0.605	0.661	0.974	0.732
Total Alkalinity, as CaCO3 (mg/L) [Major Ions]	4.1	3.5	7.3	5.4
Nitrate, as N (mg/L)	0.0658	0.0331	0.0121	0.0105
Nitrite, as N (mg/L)	0.0010	< 0.0010	0.0012	< 0.0010
ortho-Phosphate, as P (mg/L)	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Ammonia, as N (mg/L)	0.0672	0.0761	0.278	0.206
Total Dissolved Phosphorus (mg/L)	0.0017	0.0027	0.0090	0.0068
Total Kjeldahl Nitrogen (mg/L)	0.356	0.332	0.967	0.688
Total Organic Carbon (mg/L)	4.6	7.0	16.7	12.5
Total Phosphorus (mg/L) [Nutrients]	0.0224	0.0180	0.0276	0.0197
Total Aluminium (µg/L)	266	163	201	158
Total Antimony (µg/L)	0.030	< 0.10	< 0.10	0.27
Total Arsenic (µg/L)	0.103	< 0.10	0.17	0.14
Total Barium (µg/L)	4.36	3.54	7.04	5.41
Total Beryllium (µg/L)	< 0.010	< 0.10	< 0.10	< 0.10
Total Cadmium (µg/L)	0.0126	< 0.0050	0.0089	0.0146
Total Cesium (µg/L)	0.0383	0.019	0.017	0.013
Total Chromium (µg/L)	0.331	1.82	0.50	0.44
Total Cobalt (µg/L)	0.636	0.62	1.26	0.84
Total Copper (µg/L)	1.08	0.95	1.35	1.24
Total Iron (µg/L)	506	491	1800	1220
Total Lead (µg/L)	0.166	0.074	0.058	< 0.050
Total Lithium (µg/L)	2.08	< 1.0	2.2	2.0
Total Manganese (µg/L)	27.5	24.2	41.1	27.7
Total Mercury (µg/L)	< 0.020	< 0.020	< 0.020	< 0.020
Total Molybdenum (µg/L)	0.243	0.203	0.259	0.188
Total Nickel (µg/L)	0.593	< 0.50	0.90	0.64
Total Rubidium (µg/L)	1.8	1.18	1.88	1.67
Total Selenium (µg/L)	< 0.040	< 0.050	< 0.050	< 0.050
Total Strontium (µg/L)	5.79	5.01	11.0	7.26
Total Thallium (µg/L)	0.0062	< 0.010	< 0.010	< 0.010
Total Titanium (µg/L)	18.8	8.49	5.16	3.53
Total Uranium (µg/L)	0.073	0.049	0.058	0.040
Total Vanadium (µg/L)	0.515	< 0.50	0.70	< 0.50
Total Zinc (µg/L)	3.44	6.3	8.7	3.8
Dissolved Aluminium (µg/L)	47.8	66.2	164	117
Dissolved Antimony (µg/L)	< 0.020	< 0.10	< 0.020	0.041

TABLE 6 (Continued)
SNP 02-04.3

Dissolved Arsenic (µg/L)	0.063	< 0.10	0.141	0.131
Dissolved Barium (µg/L)	2.38	2.65	6.20	4.59
Dissolved Beryllium (µg/L)	< 0.010	< 0.10	< 0.010	< 0.010
Dissolved Cadmium (µg/L)	0.0056	< 0.0050	0.0062	0.0157
Dissolved Cesium (µg/L)	0.0050	< 0.010	0.0107	0.0108
Dissolved Chromium (µg/L)	0.098	0.16	0.422	0.344
Dissolved Cobalt (µg/L)	0.460	0.55	1.26	0.657
Dissolved Copper (µg/L)	5.05	19.8 XM XM	14.7	1.42
Dissolved Iron (µg/L)	169	287	1280	701
Dissolved Lead (µg/L)	0.037	< 0.050	0.040	0.039 XM XM
Dissolved Lithium (µg/L)	1.41	1.5 XM XM	3.10	2.77 XM XM
Dissolved Manganese (µg/L)	21.7	23.4	41.7	21.1
Dissolved Mercury (µg/L)	< 0.020	< 0.020	< 0.020	< 0.020
Dissolved Molybdenum (µg/L)	0.252	0.177	0.265	0.201
Dissolved Nickel (µg/L)	0.282	< 0.50	0.803	0.664
Dissolved Rubidium (µg/L)	1.2	1.15	2.1	1.6
Dissolved Selenium (µg/L)	< 0.040	< 0.050	< 0.040	< 0.040
Dissolved Strontium (µg/L)	5.93	5.54	11.3	9.60
Dissolved Thallium (µg/L)	< 0.0050	< 0.010	< 0.0050	< 0.0050
Dissolved Titanium (µg/L)	0.85	0.97	2.19	1.38
Dissolved Uranium (µg/L)	0.054	0.041	0.051	0.035
Dissolved Vanadium (µg/L)	0.102	< 0.50	0.323	0.239
Dissolved Zinc (µg/L)	1.76	1.9	4.11	4.51
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10
F1 (C6-C10) (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10
Benzene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Ethylbenzene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Toluene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Xylene (mg/L)	< 0.00071	< 0.00071	< 0.00071	< 0.00071
pH (unitless) [Field]	7.10	6.14	6.37	6.49
Specific Conductivity (µS/cm) [Field]	13.25	15.41	23.0	17.70
Water Temperature (deg. C) [Field]	4.7	3.3	3.9	6.49

TABLE 7

SNP STATION: 02-05

UNCONTROLLED SURFACE RUNOFF AT BULK SAMPLE MINE ROCK PAD

LICENCE # MV2011L2-0004

Date Sampled:	2017-05-17	2017-05-19	2017-05-23	2017-05-27
Sample Control Number:	2017-0503	2017-0508	2017-0535	2017-0542
QAQC Type:	Sample	Sample	Sample	Sample
pH (unitless) [Physical]	6.74	6.97	7.05	6.73
Specific Conductivity (µS/cm) [Physical]	88.0	66.0	86.5	98.5
Total Dissolved Solids (mg/L) (Measured)	88	47	56	67
Total Dissolved Solids, calculated (lab) (mg/L)	51.8	40.2	50.9	58.0
Total Suspended Solids (mg/L)	10.0	< 3.0	4.2	< 3.0
Turbidity-Unfiltered (NTU)	9.40	7.36	9.95	5.75
Calcium (mg/L)	9.45	6.87	8.07	8.95
Carbonate, as CO3 (mg/L)	< 5.0	< 5.0	< 5.0	< 5.0
Chloride (mg/L)	1.23	1.45	1.61	1.67
Fluoride (mg/L)	0.153	0.063	0.081	0.074
Hardness, as CaCO3 (mg/L)	41.2	29.6	36.3	41.2
Hydroxide, as OH (mg/L)	< 5.0	< 5.0	< 5.0	< 5.0
Ion Balance (%)	Low EC	Low EC	Low EC	Low EC
Magnesium (mg/L)	4.28	3.03	3.92	4.58
Potassium (mg/L)	2.09	1.76	1.49	1.61
Reactive Silica, as SiO2 (mg/L)	2.7	1.88	2.22	2.77
Sodium (mg/L)	1.32	1.09	1.22	1.44
Sulphate (mg/L)	20.3	16.9	23.7	28.1
Total Alkalinity, as CaCO3 (mg/L) [Major Ions]	14.0	9.3	11.3	11.5
Nitrate, as N (mg/L)	0.258	0.251	0.266	0.273
Nitrite, as N (mg/L)	0.0015	0.0019	0.0013	0.0014
ortho-Phosphate, as P (mg/L)	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Ammonia, as N (mg/L)	0.0275	0.0286	0.0248	0.0216
Total Dissolved Phosphorus (mg/L)	0.0145	0.0171	0.0130	0.0111
Total Kjeldahl Nitrogen (mg/L)	0.753	0.426	0.303	0.267
Total Organic Carbon (mg/L)	13.7	9.2	5.7	6.0
Total Phosphorus (mg/L) [Nutrients]	0.0477	0.0608	0.0341	0.0281
Total Aluminium (µg/L)	564	441	555	319
Total Antimony (µg/L)	0.34	0.25	0.31	0.12
Total Arsenic (µg/L)	0.28	0.20	0.21	0.16
Total Barium (µg/L)	16.2	11.8	13.3	12.9
Total Beryllium (µg/L)	< 0.10	< 0.10	< 0.10	< 0.10
Total Cadmium (µg/L)	0.0479	0.320	0.0408	0.0391
Total Cesium (µg/L)	0.059	0.063	0.081	0.038
Total Chromium (µg/L)	2.23	1.54	1.94	0.89
Total Cobalt (µg/L)	2.32	3.14	2.92	3.08
Total Copper (µg/L)	25.4	12.5	11.2	12.9
Total Iron (µg/L)	703	529	689	301
Total Lead (µg/L)	0.387	0.353	0.404	0.159
Total Lithium (µg/L)	2.2	1.7	2.1	1.9
Total Manganese (µg/L)	80.4	117	58.9	48.1
Total Mercury (µg/L)	< 0.020	< 0.020	< 0.020	< 0.020
Total Molybdenum (µg/L)	1.61	1.64	1.76	1.33
Total Nickel (µg/L)	15.3	10.3	12.0	13.1
Total Rubidium (µg/L)	2.96	2.53	2.91	2.72
Total Selenium (µg/L)	0.110	0.059	0.059	0.073
Total Strontium (µg/L)	31.9	23.6	27.0	32.3
Total Thallium (µg/L)	0.013	< 0.010	0.012	< 0.010
Total Titanium (µg/L)	28.6	22.0	30.3	11.3
Total Uranium (µg/L)	0.391	0.276	0.243	0.230
Total Vanadium (µg/L)	1.31	1.21	1.33	0.65
Total Zinc (µg/L)	28.8	49.7	13.1	12.4
Dissolved Aluminium (µg/L)	163	133	154	123
Dissolved Antimony (µg/L)	0.18	0.14	0.093	0.108

TABLE 7 (Continued)
SNP STATION: 02-05

Dissolved Arsenic (µg/L)	0.21	0.17	0.135	0.118
Dissolved Barium (µg/L)	8.53	7.40	9.03	10.5
Dissolved Beryllium (µg/L)	< 0.10	< 0.10	< 0.010	0.014
Dissolved Cadmium (µg/L)	0.0395	0.0339	0.0309	0.0375
Dissolved Cesium (µg/L)	< 0.010	< 0.010	0.0101	0.0078
Dissolved Chromium (µg/L)	0.54	0.39	0.348	0.253
Dissolved Cobalt (µg/L)	1.50	1.63	2.32	2.60
Dissolved Copper (µg/L)	43.8 XM XM	26.2	23.2	12.1
Dissolved Iron (µg/L)	130	81	91.4	59.3
Dissolved Lead (µg/L)	0.177	0.133	0.072	0.056
Dissolved Lithium (µg/L)	1.5	1.5	1.25	1.70
Dissolved Manganese (µg/L)	47.3	29.1	49.4	42.8
Dissolved Mercury (µg/L)	<0.020	< 0.020	< 0.020	< 0.020
Dissolved Molybdenum (µg/L)	1.56	1.66	1.68	1.34
Dissolved Nickel (µg/L)	10.3	6.34	8.47	11.2
Dissolved Rubidium (µg/L)	2.34	2.01	2.1	2.3
Dissolved Selenium (µg/L)	0.082	0.058	0.047	0.058
Dissolved Strontium (µg/L)	29.1	22.0	25.9	32.3
Dissolved Thallium (µg/L)	< 0.010	< 0.010	< 0.0050	< 0.0050
Dissolved Titanium (µg/L)	2.75	1.93	3.04	1.15
Dissolved Uranium (µg/L)	0.363	0.239	0.188	0.185
Dissolved Vanadium (µg/L)	< 0.50	< 0.50	0.282	0.212
Dissolved Zinc (µg/L)	8.0	6.8	5.06	8.27
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10
F1 (C6-C10) (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10
Benzene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Ethylbenzene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Toluene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Xylene (mg/L)	< 0.00071	< 0.00071	< 0.00071	< 0.00071
pH (unitless) [Field]	6.91	6.42	6.60	6.60
Specific Conductivity (µS/cm) [Field]	92.8	69.7	65.8	87.3
Water Temperature (deg. C) [Field]	7.7	3.7	5.2	7.1

TABLE 8
SNP STATION: 02-06
UNCONTROLLED SURFACE RUNOFF AT QUARRY SITE
LICENCE # MV2011L2-0004

Date Sampled:	2017-05-17	2017-05-19	2017-05-23	2017-05-27
Sample Control Number:	2017-0507	2017-0518	2017-0528	2017-0550
QAQC Type:	Sample	Sample	Sample	Sample
pH (unitless) [Physical]	7.13	7.41	7.58	7.43
Specific Conductivity ($\mu\text{S}/\text{cm}$) [Physical]	68.1	114	183	146
Total Dissolved Solids (mg/L) (Measured)	57	66	129	84
Total Dissolved Solids, calculated (lab) (mg/L)	41.2	67.0	114	87.4
Total Suspended Solids (mg/L)	119	814	5.5	< 3.0
Turbidity-Unfiltered (NTU)	136	621	45.2	7.12
Calcium (mg/L)	7.29	10.4	20.8	17.7
Carbonate, as CO_3 (mg/L)	< 5.0	< 5.0	< 5.0	< 5.0
Chloride (mg/L)	1.19	1.38	2.50	1.42
Fluoride (mg/L)	0.065	0.124	0.264	0.384
Hardness, as CaCO_3 (mg/L)	24.9	36.6	70.6	54.0
Hydroxide, as OH (mg/L)	< 5.0	< 5.0	< 5.0	< 5.0
Ion Balance (%)	Low EC	90.9	94.2	87.3
Magnesium (mg/L)	1.62	2.57	4.54	2.39
Potassium (mg/L)	1.94	2.49	3.72	3.49
Reactive Silica, as SiO_2 (mg/L)	2.1	1.53	2.40	2.71
Sodium (mg/L)	1.77	2.21	4.15	2.66
Sulphate (mg/L)	10.2	20.6	23.6	19.9
Total Alkalinity, as CaCO_3 (mg/L) [Major Ions]	12.0	15.8	31.9	31.9
Nitrate, as N (mg/L)	1.65	3.58	7.37	3.82
Nitrite, as N (mg/L)	0.0070	0.0132	0.0166	0.0145
ortho-Phosphate, as P (mg/L)	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Ammonia, as N (mg/L)	0.366	1.51	0.384	0.0447
Total Dissolved Phosphorus (mg/L)	0.0034	0.0017	0.0060	0.0050
Total Kjeldahl Nitrogen (mg/L)	0.802	1.97	0.826	0.220
Total Organic Carbon (mg/L)	< 5.0	7.3	4.1	2.7
Total Phosphorus (mg/L) [Nutrients]	0.231	0.387	0.0354	0.0176
Total Aluminium ($\mu\text{g}/\text{L}$)	12700	9720	1040	248
Total Antimony ($\mu\text{g}/\text{L}$)	0.35	0.28	0.14	0.22
Total Arsenic ($\mu\text{g}/\text{L}$)	1.32	1.08	0.32	0.15
Total Barium ($\mu\text{g}/\text{L}$)	140	80.4	13.3	8.26
Total Beryllium ($\mu\text{g}/\text{L}$)	0.46	0.37	< 0.10	< 0.10
Total Cadmium ($\mu\text{g}/\text{L}$)	0.0439	0.0395	0.0091	0.0089
Total Cesium ($\mu\text{g}/\text{L}$)	1.59	1.14	0.161	0.036
Total Chromium ($\mu\text{g}/\text{L}$)	38.2	19.5	2.01	0.54
Total Cobalt ($\mu\text{g}/\text{L}$)	12.0	10.1	1.09	0.23
Total Copper ($\mu\text{g}/\text{L}$)	15.3	11.1	3.57	2.82
Total Iron ($\mu\text{g}/\text{L}$)	19900	14000	1350	283
Total Lead ($\mu\text{g}/\text{L}$)	5.71	4.17	1.10	0.292
Total Lithium ($\mu\text{g}/\text{L}$)	36.6	26.9	3.7	2.1
Total Manganese ($\mu\text{g}/\text{L}$)	336	237	38.4	6.66
Total Mercury ($\mu\text{g}/\text{L}$)	< 0.020	< 0.020	< 0.020	< 0.020
Total Molybdenum ($\mu\text{g}/\text{L}$)	3.45	4.10	12.2	25.3
Total Nickel ($\mu\text{g}/\text{L}$)	74.0	40.0	5.85	2.44
Total Rubidium ($\mu\text{g}/\text{L}$)	30.6	20.6	4.84	3.49
Total Selenium ($\mu\text{g}/\text{L}$)	< 0.050	0.067	0.119	0.078
Total Strontium ($\mu\text{g}/\text{L}$)	60.1	52.4	67.6	65.2
Total Thallium ($\mu\text{g}/\text{L}$)	0.169	0.115	0.016	< 0.010
Total Titanium ($\mu\text{g}/\text{L}$)	1000	677	55.7	10.8
Total Uranium ($\mu\text{g}/\text{L}$)	2.18	1.69	4.50	1.98
Total Vanadium ($\mu\text{g}/\text{L}$)	29.0	21.8	2.73	0.76
Total Zinc ($\mu\text{g}/\text{L}$)	72.7	57.3	6.2	4.3
Dissolved Aluminium ($\mu\text{g}/\text{L}$)	60.6	163	78.2	31.2
Dissolved Antimony ($\mu\text{g}/\text{L}$)	0.13	0.17	0.101	0.268

TABLE 8 (Continued)
SNP STATION: 02-07

Dissolved Arsenic (µg/L)	< 0.10	< 0.10	0.152	0.093
Dissolved Barium (µg/L)	3.13	4.20	7.24	6.34
Dissolved Beryllium (µg/L)	< 0.10	< 0.10	< 0.010	< 0.010
Dissolved Cadmium (µg/L)	0.0051	< 0.0050	0.0054	0.0111
Dissolved Cesium (µg/L)	0.014	0.028	0.0189	0.0066
Dissolved Chromium (µg/L)	0.13	0.28	0.149	0.089
Dissolved Cobalt (µg/L)	0.25	0.45	0.356	0.080
Dissolved Copper (µg/L)	0.80	7.73	10.7	3.05
Dissolved Iron (µg/L)	36	111	43.3	10.8
Dissolved Lead (µg/L)	< 0.050	0.078	0.054	0.032
Dissolved Lithium (µg/L)	2.3	3.6	2.09	2.09
Dissolved Manganese (µg/L)	15.4	25.8	21.3	3.21
Dissolved Mercury (µg/L)	< 0.020	< 0.020	< 0.020	< 0.020
Dissolved Molybdenum (µg/L)	2.06	2.79	13.2	25.5
Dissolved Nickel (µg/L)	2.02	2.44	3.28	1.67
Dissolved Rubidium (µg/L)	1.98	3.21	3.8	2.9
Dissolved Selenium (µg/L)	< 0.050	< 0.050	0.147	0.087
Dissolved Strontium (µg/L)	23.7	32.5	70.1	69.4
Dissolved Thallium (µg/L)	< 0.010	< 0.010	0.0061	0.0054
Dissolved Titanium (µg/L)	1.55	4.65	2.60	0.50
Dissolved Uranium (µg/L)	0.210	0.395	4.12	1.83
Dissolved Vanadium (µg/L)	< 0.50	< 0.50	0.342	0.242
Dissolved Zinc (µg/L)	1.0	1.9	< 0.80	1.58
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10
F1 (C6-C10) (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10
Benzene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Ethylbenzene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Toluene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Xylene (mg/L)	< 0.00071	< 0.00071	< 0.00071	< 0.00071
pH (unitless) [Field]	6.85	7.15	7.91	7.35
Specific Conductivity (µS/cm) [Field]	73.8	101.9	148.1	132.0
Water Temperature (deg. C) [Field]	11.2	7.7	6.0	7.3

TABLE 9

SNP STATION: 02-07.1

UNCONTROLLED SURFACE RUNOFF AT ROAD TO BULK EMULSION PLANT

LICENCE # MV2011L2-0004

Date Sampled:	2017-05-17	2017-05-20	2017-05-22	2017-05-27
Sample Control Number:	2017-0504	2017-0512	2017-0516	2017-0551
QAQC Type:	Sample	Sample	Sample	Sample
pH (unitless) [Physical]	5.41	6.03	6.64	6.32
Specific Conductivity (µS/cm) [Physical]	17.1	12.3	25.2	25.2
Total Dissolved Solids (mg/L) (Measured)	45	24	24	30
Total Dissolved Solids, calculated (lab) (mg/L)	6.2	8.0	14.7	15.0
Total Suspended Solids (mg/L)	8.8	6.2	< 3.0	< 3.0
Turbidity-Unfiltered (NTU)	3.49	3.64	3.27	1.67
Calcium (mg/L)	1.11	1.26	1.92	2.14
Carbonate, as CO3 (mg/L)	< 5.0	< 5.0	< 5.0	< 5.0
Chloride (mg/L)	0.68	< 0.50	0.99	0.68
Fluoride (mg/L)	< 0.020	0.038	0.046	0.042
Hardness, as CaCO3 (mg/L)	5.6	5.7	9.4	10.2
Hydroxide, as OH (mg/L)	< 5.0	< 5.0	< 5.0	< 5.0
Ion Balance (%)	Low EC	Low EC	Low EC	Low EC
Magnesium (mg/L)	0.685	0.615	1.12	1.18
Potassium (mg/L)	0.943	0.612	0.734	0.706
Reactive Silica, as SiO2 (mg/L)	1.1	1.38	1.77	1.75
Sodium (mg/L)	0.585	0.456	1.08	1.13
Sulphate (mg/L)	0.680	1.24	2.44	2.68
Total Alkalinity, as CaCO3 (mg/L) [Major Ions]	< 2.0	2.6	6.1	6.3
Nitrate, as N (mg/L)	0.0181	0.117	0.0981	0.0908
Nitrite, as N (mg/L)	< 0.0010	0.0014	< 0.0010	< 0.0010
ortho-Phosphate, as P (mg/L)	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Ammonia, as N (mg/L)	0.0263	0.0107	0.0224	0.0082
Total Dissolved Phosphorus (mg/L)	0.0136	0.0134	0.0060	0.0100
Total Kjeldahl Nitrogen (mg/L)	1.15	0.303	0.315	0.358
Total Organic Carbon (mg/L)	23.9	12.0	9.2	8.9
Total Phosphorus (mg/L) [Nutrients]	0.0875	0.0257	0.0146	0.0216
Total Aluminium (µg/L)	277	281	148	112
Total Antimony (µg/L)	0.18	< 0.10	< 0.10	< 0.10
Total Arsenic (µg/L)	0.15	0.12	< 0.10	0.12
Total Barium (µg/L)	7.48	4.22	5.23	5.65
Total Beryllium (µg/L)	< 0.10	< 0.10	< 0.10	< 0.10
Total Cadmium (µg/L)	0.0624	0.0229	0.0120	0.0072
Total Cesium (µg/L)	0.030	0.018	0.015	0.012
Total Chromium (µg/L)	0.90	0.59	0.36	3.42
Total Cobalt (µg/L)	0.77	0.36	0.40	0.38
Total Copper (µg/L)	2.20	1.66	1.10	1.20
Total Iron (µg/L)	398	218	330	307
Total Lead (µg/L)	0.145	0.172	< 0.050	< 0.050
Total Lithium (µg/L)	1.6	< 1.0	< 1.0	1.3
Total Manganese (µg/L)	56.3	20.9	37.1	35.2
Total Mercury (µg/L)	< 0.020	< 0.020	< 0.020	< 0.020
Total Molybdenum (µg/L)	0.145	0.620	0.190	0.149
Total Nickel (µg/L)	1.57	1.31	0.83	1.93
Total Rubidium (µg/L)	2.02	1.25	1.49	1.46
Total Selenium (µg/L)	< 0.050	< 0.050	< 0.050	< 0.050
Total Strontium (µg/L)	6.46	5.29	9.85	11.2
Total Thallium (µg/L)	< 0.010	< 0.010	< 0.010	< 0.010
Total Titanium (µg/L)	8.76	6.87	3.47	2.23
Total Uranium (µg/L)	0.077	0.190	0.080	0.064
Total Vanadium (µg/L)	0.69	0.52	< 0.50	< 0.50
Total Zinc (µg/L)	8.8	4.4	< 3.0	4.5
Dissolved Aluminium (µg/L)	150	182	107	80.6
Dissolved Antimony (µg/L)	< 0.10	< 0.10	< 0.020	0.050

TABLE 9 (Continued)
SNP STATION: 02-07.1

Dissolved Arsenic (µg/L)	0.12	0.12	0.082	0.085
Dissolved Barium (µg/L)	2.94	3.37	4.86	5.35
Dissolved Beryllium (µg/L)	< 0.10	< 0.10	< 0.010	< 0.010
Dissolved Cadmium (µg/L)	0.0204	0.0129	0.0191	0.0066
Dissolved Cesium (µg/L)	< 0.010	< 0.010	0.0082	0.0075
Dissolved Chromium (µg/L)	0.48	0.37	0.216	0.186
Dissolved Cobalt (µg/L)	0.25	0.29	0.373	0.340
Dissolved Copper (µg/L)	28.7	7.38 XM XM	11.5	6.20 XM XM
Dissolved Iron (µg/L)	134	90	208	133
Dissolved Lead (µg/L)	0.104	0.066	0.027	0.022
Dissolved Lithium (µg/L)	1.7	< 1.0	1.34	1.56
Dissolved Manganese (µg/L)	17.2	19.8	36.8	34.7
Dissolved Mercury (µg/L)	< 0.020	< 0.020	< 0.020	< 0.020
Dissolved Molybdenum (µg/L)	0.112	0.592	0.179	0.131
Dissolved Nickel (µg/L)	1.11	1.15	0.772	0.645
Dissolved Rubidium (µg/L)	1.63	1.08	1.4	1.3
Dissolved Selenium (µg/L)	< 0.050	< 0.050	< 0.040	< 0.040
Dissolved Strontium (µg/L)	5.73	5.80	10.1	12.5
Dissolved Thallium (µg/L)	< 0.010	< 0.010	< 0.0050	< 0.0050
Dissolved Titanium (µg/L)	2.37	2.22	1.06	0.61
Dissolved Uranium (µg/L)	0.062	0.171	0.071	0.053
Dissolved Vanadium (µg/L)	< 0.50	< 0.50	0.150	0.089
Dissolved Zinc (µg/L)	5.5	4.0	3.75	2.07
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10
F1 (C6-C10) (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10
Benzene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Ethylbenzene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Toluene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Xylene (mg/L)	< 0.00071	< 0.00071	< 0.00071	< 0.00071
pH (unitless) [Field]	5.11	5.78	6.43	6.62
Specific Conductivity (µS/cm) [Field]	28.5	16.78	22.3	23.7
Water Temperature (deg. C) [Field]	4.9	5.4	5.6	6.5

TABLE 10
SNP STATION: 02-07.2
UNCONTROLLED SURFACE RUNOFF AT ROAD TO BULK EMULSION PLANT
LICENCE # MV2011L2-0004

Date Sampled:	2017-05-17	2017-05-19	2017-05-22	2017-05-22	2017-05-27
Sample Control Number:	2017-0506	2017-0515	2017-0519	2017-0523	2017-0548
QAQC Type:	Sample	Sample	Sample	Sample	Sample
pH (unitless) [Physical]	5.50	6.06	5.22	5.25	5.30
Specific Conductivity ($\mu\text{S}/\text{cm}$) [Physical]	17.1	14.9	17.9	18.2	22.1
Total Dissolved Solids (mg/L) (Measured)	32	21	29	29	36
Total Dissolved Solids, calculated (lab) (mg/L)	8.8	9.6	11.9	12.3	15.2
Total Suspended Solids (mg/L)	< 3.0	4.7	< 3.0	< 3.0	< 3.0
Turbidity-Unfiltered (NTU)	3.41	3.63	1.60	2.16	1.38
Calcium (mg/L)	1.09	0.922	1.06	1.06	1.27
Carbonate, as CO_3 (mg/L)	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloride (mg/L)	< 0.50	0.87	0.73	0.73	0.91
Fluoride (mg/L)	0.037	0.047	0.044	0.053	0.041
Hardness, as CaCO_3 (mg/L)	4.9	4.1	4.8	4.8	5.7
Hydroxide, as OH (mg/L)	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ion Balance (%)	Low EC	Low EC	Low EC	Low EC	Low EC
Magnesium (mg/L)	0.532	0.443	0.521	0.532	0.610
Potassium (mg/L)	1.49	1.22	0.836	0.855	0.773
Reactive Silica, as SiO_2 (mg/L)	1.8	1.55	3.25	3.45	4.79
Sodium (mg/L)	0.820	0.814	1.10	1.12	1.34
Sulphate (mg/L)	2.02	1.62	3.39	3.41	4.11
Total Alkalinity, as CaCO_3 (mg/L) [Major Ions]	< 2.0	2.4	< 2.0	< 2.0	< 2.0
Nitrate, as N (mg/L)	0.126	0.0648	0.0316	0.0278	0.0121
Nitrite, as N (mg/L)	0.0030	0.0025	< 0.0010	0.0014	< 0.0010
ortho-Phosphate, as P (mg/L)	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Ammonia, as N (mg/L)	0.0120	0.0242	0.0114	0.0110	0.0142
Total Dissolved Phosphorus (mg/L)	0.0115	0.0111	0.0139	0.0138	0.0142
Total Kjeldahl Nitrogen (mg/L)	0.514	0.494	0.445	0.449	0.533
Total Organic Carbon (mg/L)	12.2	10.0	10.2	10.3	12.0
Total Phosphorus (mg/L) [Nutrients]	0.0240	0.0326	0.0263	0.0271	0.0222
Total Aluminum ($\mu\text{g}/\text{L}$)	269	309	320	314	384
Total Antimony ($\mu\text{g}/\text{L}$)	< 0.10	< 0.10	< 0.10	< 0.10	0.26
Total Arsenic ($\mu\text{g}/\text{L}$)	0.12	0.12	0.13	0.12	0.17
Total Barium ($\mu\text{g}/\text{L}$)	7.06	8.63	8.14	7.93	10.8
Total Beryllium ($\mu\text{g}/\text{L}$)	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Cadmium ($\mu\text{g}/\text{L}$)	0.0195	0.0151	0.0158	0.0195	0.0444
Total Cesium ($\mu\text{g}/\text{L}$)	0.024	0.034	0.014	0.016	0.013
Total Chromium ($\mu\text{g}/\text{L}$)	0.43	0.56	1.36	0.68	0.62
Total Cobalt ($\mu\text{g}/\text{L}$)	0.25	0.25	0.33	0.34	0.44
Total Copper ($\mu\text{g}/\text{L}$)	1.61	1.45	1.45	1.30	1.69
Total Iron ($\mu\text{g}/\text{L}$)	204	277	170	168	182
Total Lead ($\mu\text{g}/\text{L}$)	0.267	0.219	0.139	0.109	0.118
Total Lithium ($\mu\text{g}/\text{L}$)	< 1.0	< 1.0	< 1.0	< 1.0	1.5
Total Manganese ($\mu\text{g}/\text{L}$)	9.00	11.9	5.73	5.78	6.01
Total Mercury ($\mu\text{g}/\text{L}$)	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Total Molybdenum ($\mu\text{g}/\text{L}$)	0.383	0.562	0.196	0.149	0.088
Total Nickel ($\mu\text{g}/\text{L}$)	1.06	0.90	1.21	0.90	1.05
Total Rubidium ($\mu\text{g}/\text{L}$)	2.68	2.14	1.71	1.79	1.88
Total Selenium ($\mu\text{g}/\text{L}$)	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Total Strontium ($\mu\text{g}/\text{L}$)	5.30	4.94	6.79	6.85	9.22
Total Thallium ($\mu\text{g}/\text{L}$)	< 0.010	0.012	< 0.010	< 0.010	< 0.010
Total Titanium ($\mu\text{g}/\text{L}$)	7.85	11.9	4.94	5.00	4.22
Total Uranium ($\mu\text{g}/\text{L}$)	0.102	0.100	0.101	0.094	0.107
Total Vanadium ($\mu\text{g}/\text{L}$)	< 0.50	0.57	< 0.50	< 0.50	< 0.50
Total Zinc ($\mu\text{g}/\text{L}$)	4.7	6.9	7.9	< 3.0	6.4
Dissolved Aluminum ($\mu\text{g}/\text{L}$)	190	163	317	327	372
Dissolved Antimony ($\mu\text{g}/\text{L}$)	< 0.10	< 0.10	< 0.020	< 0.020	0.060
Dissolved Arsenic ($\mu\text{g}/\text{L}$)	0.11	< 0.10	0.120	0.113	0.108
Dissolved Barium ($\mu\text{g}/\text{L}$)	6.22	5.01	7.73	7.71	9.95
Dissolved Beryllium ($\mu\text{g}/\text{L}$)	< 0.10	< 0.10	0.013	0.012	0.020
Dissolved Cadmium ($\mu\text{g}/\text{L}$)	0.0183	0.0355	0.0154	0.0162	0.0217
Dissolved Cesium ($\mu\text{g}/\text{L}$)	0.014	0.010	0.0100	0.0103	0.0089
Dissolved Chromium ($\mu\text{g}/\text{L}$)	0.27	0.26	0.387	0.384	0.471

TABLE 10 (Continued)
SNP STATION: 02-07.2

Dissolved Cobalt (µg/L)	0.20	0.15	0.311	0.308	0.399
Dissolved Copper (µg/L)	17.7	14.7	9.90	24.5	2.49 XM XM
Dissolved Iron (µg/L)	94	79	123	122	147
Dissolved Lead (µg/L)	0.160	0.131	0.093	0.106	0.100
Dissolved Lithium (µg/L)	< 1.0	< 1.0	1.30	1.33	1.67
Dissolved Manganese (µg/L)	9.78	5.17	5.18	5.28	5.89
Dissolved Mercury (µg/L)	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Dissolved Molybdenum (µg/L)	0.344	0.512	0.134	0.133	0.061
Dissolved Nickel (µg/L)	0.92	0.66	0.805	0.853	0.967
Dissolved Rubidium (µg/L)	2.85	2.02	1.8	1.9	1.7
Dissolved Selenium (µg/L)	< 0.050	< 0.050	< 0.040	< 0.040	< 0.040
Dissolved Strontium (µg/L)	5.83	4.84	7.08	7.01	10.0
Dissolved Thallium (µg/L)	< 0.010	< 0.010	< 0.0050	< 0.0050	< 0.0050
Dissolved Titanium (µg/L)	2.29	2.57	2.90	3.08	2.90
Dissolved Uranium (µg/L)	0.092	0.080	0.085	0.085	0.101
Dissolved Vanadium (µg/L)	< 0.50	< 0.50	0.271	0.268	0.285
Dissolved Zinc (µg/L)	4.9	4.1	3.76	3.06	4.95
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
F1 (C6-C10) (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Ethylbenzene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Toluene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Xylene (mg/L)	< 0.00071	< 0.00071	< 0.00071	< 0.00071	< 0.00071
pH (unitless) [Field]	5.36	5.69	5.49	5.49	5.49
Specific Conductivity (µS/cm) [Field]	25.9	17.20	22.6	22.6	21.58
Water Temperature (deg. C) [Field]	4.2	5.4	6.7	6.7	5.2

TABLE 11**SNP STATION: 02-07.3****UNCONTROLLED SURFACE RUNOFF AT ROAD TO BULK EMULSION PLANT****LICENCE # MV2011L2-0004**

Date Sampled:	2017-05-22	2017-05-27
Sample Control Number:	2017-0521	2017-0545
QAQC Type:	Sample	Sample
pH (unitless) [Physical]	6.24	6.07
Specific Conductivity ($\mu\text{S}/\text{cm}$) [Physical]	9.9	34.2
Total Dissolved Solids (mg/L) (Measured)	< 10	31
Total Dissolved Solids, calculated (lab) (mg/L)	6.5	20.7
Total Suspended Solids (mg/L)	< 3.0	5.8
Turbidity-Unfiltered (NTU)	1.09	14.8
Calcium (mg/L)	1.23	2.53
Carbonate, as CO_3 (mg/L)	< 5.0	< 5.0
Chloride (mg/L)	< 0.50	0.69
Fluoride (mg/L)	0.027	0.080
Hardness, as CaCO_3 (mg/L)	4.2	10.6
Hydroxide, as OH (mg/L)	< 5.0	< 5.0
Ion Balance (%)	Low EC	Low EC
Magnesium (mg/L)	0.282	1.04
Potassium (mg/L)	0.445	0.803
Reactive Silica, as SiO_2 (mg/L)	0.584	1.66
Sodium (mg/L)	0.296	0.725
Sulphate (mg/L)	1.47	6.86
Total Alkalinity, as CaCO_3 (mg/L) [Major Ions]	2.2	3.7
Nitrate, as N (mg/L)	0.167	0.823
Nitrite, as N (mg/L)	0.0010	0.0109
ortho-Phosphate, as P (mg/L)	< 0.0010	< 0.0010
Total Ammonia, as N (mg/L)	0.0177	0.270
Total Dissolved Phosphorus (mg/L)	0.0042	0.0051
Total Kjeldahl Nitrogen (mg/L)	0.109	0.514
Total Organic Carbon (mg/L)	3.5	6.4
Total Phosphorus (mg/L) [Nutrients]	0.0124	0.0250
Total Aluminum ($\mu\text{g}/\text{L}$)	264	597
Total Antimony ($\mu\text{g}/\text{L}$)	< 0.10	< 0.10
Total Arsenic ($\mu\text{g}/\text{L}$)	< 0.10	0.15
Total Barium ($\mu\text{g}/\text{L}$)	3.77	12.8
Total Beryllium ($\mu\text{g}/\text{L}$)	< 0.10	< 0.10
Total Cadmium ($\mu\text{g}/\text{L}$)	0.0102	0.0227
Total Cesium ($\mu\text{g}/\text{L}$)	0.035	0.090
Total Chromium ($\mu\text{g}/\text{L}$)	0.46	0.93
Total Cobalt ($\mu\text{g}/\text{L}$)	0.31	1.08
Total Copper ($\mu\text{g}/\text{L}$)	0.97	2.53
Total Iron ($\mu\text{g}/\text{L}$)	281	694
Total Lead ($\mu\text{g}/\text{L}$)	0.132	0.315
Total Lithium ($\mu\text{g}/\text{L}$)	< 1.0	2.0
Total Manganese ($\mu\text{g}/\text{L}$)	10.9	36.7
Total Mercury ($\mu\text{g}/\text{L}$)	< 0.020	< 0.020
Total Molybdenum ($\mu\text{g}/\text{L}$)	0.973	0.621
Total Nickel ($\mu\text{g}/\text{L}$)	0.62	1.51
Total Rubidium ($\mu\text{g}/\text{L}$)	0.90	2.78
Total Selenium ($\mu\text{g}/\text{L}$)	< 0.050	< 0.050
Total Strontium ($\mu\text{g}/\text{L}$)	4.69	15.0
Total Thallium ($\mu\text{g}/\text{L}$)	< 0.010	< 0.010
Total Titanium ($\mu\text{g}/\text{L}$)	15.4	36.2

TABLE 11 (Continued)
SNP STATION: 02-07.3

Total Uranium (µg/L)	0.116	0.178
Total Vanadium (µg/L)	0.63	1.14
Total Zinc (µg/L)	3.5	13.5
Dissolved Aluminum (µg/L)	55.5	122
Dissolved Antimony (µg/L)	< 0.020	0.045
Dissolved Arsenic (µg/L)	0.034	0.080
Dissolved Barium (µg/L)	2.04	7.98
Dissolved Beryllium (µg/L)	< 0.010	< 0.010
Dissolved Cadmium (µg/L)	0.0097	0.0187
Dissolved Cesium (µg/L)	< 0.0050	0.0115
Dissolved Chromium (µg/L)	0.092	0.147
Dissolved Cobalt (µg/L)	0.188	0.722
Dissolved Copper (µg/L)	8.62	2.32
Dissolved Iron (µg/L)	30.4	70.4
Dissolved Lead (µg/L)	0.027	0.039
Dissolved Lithium (µg/L)	< 0.50	0.97
Dissolved Manganese (µg/L)	7.68	27.3
Dissolved Mercury (µg/L)	< 0.020	< 0.020
Dissolved Molybdenum (µg/L)	0.954	0.553
Dissolved Nickel (µg/L)	0.330	0.706
Dissolved Rubidium (µg/L)	< 1.0	1.9
Dissolved Selenium (µg/L)	< 0.040	< 0.040
Dissolved Strontium (µg/L)	5.03	14.6
Dissolved Thallium (µg/L)	< 0.0050	0.0077 XM XM
Dissolved Titanium (µg/L)	0.82	1.08
Dissolved Uranium (µg/L)	0.091	0.102
Dissolved Vanadium (µg/L)	0.086	0.099
Dissolved Zinc (µg/L)	2.94	6.19
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10
F1 (C6-C10) (mg/L)	< 0.10	< 0.10
Benzene (mg/L)	< 0.00050	< 0.00050
Ethylbenzene (mg/L)	< 0.00050	< 0.00050
Toluene (mg/L)	< 0.00050	< 0.00050
Xylene (mg/L)	< 0.00071	< 0.00071
pH (unitless) [Field]	6.19	6.25
Specific Conductivity (µS/cm) [Field]	12.99	26.8
Water Temperature (deg. C) [Field]	4.1	2.9

TABLE 12
SNP STATION: 02-08
UNCONTROLLED SURFACE RUNOFF AT WINTER ACCESS ROAD
LICENCE # MV2011L2-0004

Date Sampled:	2017-05-23	2017-05-27
Sample Control Number:	2017-0531	2017-0541
QAQC Type:	Sample	Sample
pH (unitless) [Physical]	6.92	6.19
Specific Conductivity (µS/cm) [Physical]	138	187
Total Dissolved Solids (mg/L) (Measured)	96	126
Total Dissolved Solids, calculated (lab) (mg/L)	82.3	113
Total Suspended Solids (mg/L)	< 3.0	< 3.0
Turbidity-Unfiltered (NTU)	1.62	0.90
Calcium (mg/L)	9.32	13.4
Carbonate, as CO ₃ (mg/L)	< 5.0	< 5.0
Chloride (mg/L)	9.10	10.2
Fluoride (mg/L)	0.120	0.088
Hardness, as CaCO ₃ (mg/L)	40.8	57.5
Hydroxide, as OH (mg/L)	< 5.0	< 5.0
Ion Balance (%)	89.4	89.1
Magnesium (mg/L)	4.26	5.83
Potassium (mg/L)	3.48	3.93
Reactive Silica, as SiO ₂ (mg/L)	4.49	6.35
Sodium (mg/L)	7.15	9.18
Sulphate (mg/L)	32.3	49.8
Total Alkalinity, as CaCO ₃ (mg/L) [Major Ions]	9.6	10.0
Nitrate, as N (mg/L)	1.16	1.55
Nitrite, as N (mg/L)	0.0036	0.0022
ortho-Phosphate, as P (mg/L)	< 0.0010	< 0.0010
Total Ammonia, as N (mg/L)	0.0050	0.0071
Total Dissolved Phosphorus (mg/L)	0.0121	0.0109
Total Kjeldahl Nitrogen (mg/L)	0.408	0.372
Total Organic Carbon (mg/L)	8.0	8.0
Total Phosphorus (mg/L) [Nutrients]	0.0266	0.0179
Total Aluminum (µg/L)	259	204
Total Antimony (µg/L)	0.20	0.250
Total Arsenic (µg/L)	0.19	0.195
Total Barium (µg/L)	10.7	14.4
Total Beryllium (µg/L)	< 0.10	0.043
Total Cadmium (µg/L)	0.0145	0.0242
Total Cesium (µg/L)	0.029	0.0204
Total Chromium (µg/L)	2.32	0.192
Total Cobalt (µg/L)	2.07	2.85
Total Copper (µg/L)	1.16	0.99
Total Iron (µg/L)	294	69.6
Total Lead (µg/L)	0.072	0.030
Total Lithium (µg/L)	1.7	2.32
Total Manganese (µg/L)	13.5	6.56
Total Mercury (µg/L)	< 0.020	< 0.020
Total Molybdenum (µg/L)	6.37	6.71
Total Nickel (µg/L)	2.07	1.92
Total Rubidium (µg/L)	3.46	3.7
Total Selenium (µg/L)	< 0.050	0.044
Total Strontium (µg/L)	39.6	61.5
Total Thallium (µg/L)	< 0.010	< 0.0050
Total Titanium (µg/L)	12.7	2.03

TABLE 12 (Continued)**SNP STATION: 02-08**

Total Uranium (µg/L)	0.129	0.120
Total Vanadium (µg/L)	0.52	0.172
Total Zinc (µg/L)	< 3.0	4.37
Dissolved Aluminum (µg/L)	161	190
Dissolved Antimony (µg/L)	0.160	0.241
Dissolved Arsenic (µg/L)	0.144	0.164
Dissolved Barium (µg/L)	10.5	14.2
Dissolved Beryllium (µg/L)	0.023	0.045
Dissolved Cadmium (µg/L)	0.0132	0.0211
Dissolved Cesium (µg/L)	0.0166	0.0173
Dissolved Chromium (µg/L)	0.212	0.178
Dissolved Cobalt (µg/L)	1.98	2.74
Dissolved Copper (µg/L)	17.7	1.25
Dissolved Iron (µg/L)	54.7	53.8
Dissolved Lead (µg/L)	0.027	0.029
Dissolved Lithium (µg/L)	2.23	2.22
Dissolved Manganese (µg/L)	10.1	5.92
Dissolved Mercury (µg/L)	< 0.020	< 0.020
Dissolved Molybdenum (µg/L)	6.27	6.65
Dissolved Nickel (µg/L)	1.72	1.87
Dissolved Rubidium (µg/L)	3.5	3.7
Dissolved Selenium (µg/L)	< 0.040	< 0.040
Dissolved Strontium (µg/L)	41.7	57.5
Dissolved Thallium (µg/L)	< 0.0050	0.0053 XM XM
Dissolved Titanium (µg/L)	1.37	1.26
Dissolved Uranium (µg/L)	0.117	0.114
Dissolved Vanadium (µg/L)	0.123	0.139
Dissolved Zinc (µg/L)	2.01	7.60 XM XM
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10
F1 (C6-C10) (mg/L)	< 0.10	< 0.10
Benzene (mg/L)	< 0.00050	< 0.00050
Ethylbenzene (mg/L)	< 0.00050	< 0.00050
Toluene (mg/L)	< 0.00050	< 0.00050
Xylene (mg/L)	< 0.00071	< 0.00071
pH (unitless) [Field]	6.48	6.59
Specific Conductivity (µS/cm) [Field]	120.2	150
Water Temperature (deg. C) [Field]	1.1	0.4

TABLE 13
SNP STATION: 02-09
UNCONTROLLED SURFACE RUNOFF AT EMULSION PLANT
LICENCE # MV2011L2-0004

Date Sampled:	2017-05-17	2017-05-27	2017-05-19	2017-05-22
Sample Control Number:	2017-0505	2017-0549	2017-0513	2017-0524
QAQC Type:	Sample	Sample	Sample	Sample
pH (unitless) [Physical]	5.32	5.14	5.32	5.02
Specific Conductivity ($\mu\text{S}/\text{cm}$) [Physical]	33.3	20.2	26.0	14.0
Total Dissolved Solids (mg/L) (Measured)	55	49	54	35
Total Dissolved Solids, calculated (lab) (mg/L)	16.6	13.5	14.3	7.9
Total Suspended Solids (mg/L)	< 3.0	< 3.0	< 3.0	< 3.0
Turbidity-Unfiltered (NTU)	3.46	1.52	2.96	1.72
Calcium (mg/L)	2.42	1.44	1.82	1.07
Carbonate, as CO_3 (mg/L)	< 5.0	< 5.0	< 5.0	< 5.0
Chloride (mg/L)	1.00	< 0.50	1.51	< 0.50
Fluoride (mg/L)	0.039	0.047	0.043	0.042
Hardness, as CaCO_3 (mg/L)	10.2	6.2	7.8	4.5
Hydroxide, as OH (mg/L)	< 5.0	< 5.0	< 5.0	< 5.0
Ion Balance (%)	Low EC	Low EC	Low EC	Low EC
Magnesium (mg/L)	1.00	0.628	0.787	0.452
Potassium (mg/L)	2.05	0.742	1.59	0.725
Reactive Silica, as SiO_2 (mg/L)	1.3	4.16	1.56	2.33
Sodium (mg/L)	0.946	0.733	0.527	0.550
Sulphate (mg/L)	2.74	0.266	2.48	0.222
Total Alkalinity, as CaCO_3 (mg/L) [Major Ions]	< 2.0	< 2.0	< 2.0	< 2.0
Nitrate, as N (mg/L)	1.07	1.00	0.803	0.433
Nitrite, as N (mg/L)	< 0.0010	< 0.0010	0.0017	< 0.0010
ortho-Phosphate, as P (mg/L)	< 0.0010	< 0.0010	< 0.0010	0.0019
Total Ammonia, as N (mg/L)	0.287	0.0594	0.128	0.0327
Total Dissolved Phosphorus (mg/L)	0.0217	0.0238	0.0208	0.0177
Total Kjeldahl Nitrogen (mg/L)	1.62	0.807	0.811	0.692
Total Organic Carbon (mg/L)	21.8	16.3	19.4	15.2
Total Phosphorus (mg/L) [Nutrients]	0.0578	0.0477	0.0445	0.0370
Total Aluminum ($\mu\text{g}/\text{L}$)	711	662	472	534
Total Antimony ($\mu\text{g}/\text{L}$)	0.17	0.16	0.16	< 0.10
Total Arsenic ($\mu\text{g}/\text{L}$)	0.22	0.21	0.18	0.21
Total Barium ($\mu\text{g}/\text{L}$)	28.3	14.0	15.7	11.5
Total Beryllium ($\mu\text{g}/\text{L}$)	< 0.10	< 0.10	< 0.10	< 0.10
Total Cadmium ($\mu\text{g}/\text{L}$)	0.117	0.0618	0.0481	0.0279
Total Cesium ($\mu\text{g}/\text{L}$)	0.039	0.012	0.021	0.017
Total Chromium ($\mu\text{g}/\text{L}$)	1.08	0.99	3.34	1.92
Total Cobalt ($\mu\text{g}/\text{L}$)	1.19	0.76	0.76	0.54
Total Copper ($\mu\text{g}/\text{L}$)	4.04	2.82	3.00	2.16
Total Iron ($\mu\text{g}/\text{L}$)	402	249	253	243
Total Lead ($\mu\text{g}/\text{L}$)	0.220	0.066	0.122	0.085
Total Lithium ($\mu\text{g}/\text{L}$)	2.4	2.6	1.5	1.9
Total Manganese ($\mu\text{g}/\text{L}$)	40.1	12.7	28.0	12.5
Total Mercury ($\mu\text{g}/\text{L}$)	< 0.020	< 0.020	< 0.020	< 0.020
Total Molybdenum ($\mu\text{g}/\text{L}$)	0.121	0.056	0.102	0.064
Total Nickel ($\mu\text{g}/\text{L}$)	2.60	1.44	1.56	1.13
Total Rubidium ($\mu\text{g}/\text{L}$)	5.60	2.17	3.18	1.81
Total Selenium ($\mu\text{g}/\text{L}$)	< 0.050	< 0.050	< 0.050	< 0.050
Total Strontium ($\mu\text{g}/\text{L}$)	16.5	9.39	10.3	7.77
Total Thallium ($\mu\text{g}/\text{L}$)	0.013	< 0.010	< 0.010	< 0.010
Total Titanium ($\mu\text{g}/\text{L}$)	11.6	5.79	6.24	6.53
Total Uranium ($\mu\text{g}/\text{L}$)	0.190	0.128	0.154	0.112
Total Vanadium ($\mu\text{g}/\text{L}$)	0.76	0.57	< 0.50	0.64
Total Zinc ($\mu\text{g}/\text{L}$)	14.8	8.9	8.5	8.1
Dissolved Aluminum ($\mu\text{g}/\text{L}$)	548	682	483	529
Dissolved Antimony ($\mu\text{g}/\text{L}$)	0.13	0.057	< 0.10	< 0.020

TABLE 13 (continued)
SNP STATION: 02-09

Dissolved Arsenic (µg/L)	0.18	0.200	0.16	0.155
Dissolved Barium (µg/L)	21.2	13.7	15.9	9.36
Dissolved Beryllium (µg/L)	< 0.10	0.034	< 0.10	0.029
Dissolved Cadmium (µg/L)	0.148	0.0446	0.0343	0.0229
Dissolved Cesium (µg/L)	0.018	0.0108	0.012	0.0075
Dissolved Chromium (µg/L)	0.58	0.782	0.50	0.635
Dissolved Cobalt (µg/L)	0.99	0.725	0.78	0.503
Dissolved Copper (µg/L)	8.49 XM XM	2.92	13.6	17.1
Dissolved Iron (µg/L)	236	218	188	185
Dissolved Lead (µg/L)	0.149	0.071	0.098	0.071
Dissolved Lithium (µg/L)	2.4	3.29	2.1	3.06
Dissolved Manganese (µg/L)	33.8	12.2	28.5	8.88
Dissolved Mercury (µg/L)	< 0.020	< 0.020	< 0.020	< 0.020
Dissolved Molybdenum (µg/L)	0.093	< 0.050	0.094	< 0.050
Dissolved Nickel (µg/L)	2.17	1.32	1.57	1.07
Dissolved Rubidium (µg/L)	4.46	2.0	3.45	1.9
Dissolved Selenium (µg/L)	< 0.050	< 0.040	< 0.050	< 0.040
Dissolved Strontium (µg/L)	14.7	11.5	11.2	7.38
Dissolved Thallium (µg/L)	0.010	0.0088 XM XM	< 0.010	< 0.0050
Dissolved Titanium (µg/L)	3.75	4.27	3.10	4.20
Dissolved Uranium (µg/L)	0.167	0.145	0.148	0.107
Dissolved Vanadium (µg/L)	< 0.50	0.440	< 0.50	0.413
Dissolved Zinc (µg/L)	13.9	4.50	7.0	6.82
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10
F1 (C6-C10) (mg/L)	< 0.10	< 0.10	< 0.10	< 0.10
Benzene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Ethylbenzene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Toluene (mg/L)	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Xylene (mg/L)	< 0.00071	< 0.00071	< 0.00071	< 0.00071
pH (unitless) [Field]	5.61	5.17	5.18	5.27
Specific Conductivity (µS/cm) [Field]	47.1	19.08	21.5	16.44
Water Temperature (deg. C) [Field]	3.4	2.3	4.2	4.1

TABLE 14
SNP STATION: 02-09.2
UNCONTROLLED SURFACE RUNOFF AT EMULSION PLANT
LICENCE # MV2011L2-0004

Date Sampled:	2017-05-22	2017-05-27
Sample Control Number:	2017-0527	2017-0543
QAQC Type:	Sample	Sample
pH (unitless) [Physical]	4.65	5.01
Specific Conductivity (µS/cm) [Physical]	9.6	11.8
Total Dissolved Solids (mg/L) (Measured)	19	37
Total Dissolved Solids, calculated (lab) (mg/L)	3.2	4.7
Total Suspended Solids (mg/L)	< 3.0	< 3.0
Turbidity-Unfiltered (NTU)	0.74	1.64
Calcium (mg/L)	0.434	0.578
Carbonate, as CO ₃ (mg/L)	< 5.0	< 5.0
Chloride (mg/L)	< 0.50	< 0.50
Fluoride (mg/L)	0.029	0.028
Hardness, as CaCO ₃ (mg/L)	2.3	2.9
Hydroxide, as OH (mg/L)	< 5.0	< 5.0
Ion Balance (%)	Low EC	Low EC
Magnesium (mg/L)	0.288	0.352
Potassium (mg/L)	0.603	0.580
Reactive Silica, as SiO ₂ (mg/L)	1.04	1.62
Sodium (mg/L)	0.348	0.454
Sulphate (mg/L)	0.070	0.070
Total Alkalinity, as CaCO ₃ (mg/L) [Major Ions]	< 2.0	< 2.0
Nitrate, as N (mg/L)	0.0199	0.127
Nitrite, as N (mg/L)	< 0.0010	< 0.0010
ortho-Phosphate, as P (mg/L)	0.0041	< 0.0010
Total Ammonia, as N (mg/L)	0.0230	0.190
Total Dissolved Phosphorus (mg/L)	0.0199	0.0268
Total Kjeldahl Nitrogen (mg/L)	0.443	1.23
Total Organic Carbon (mg/L)	12.1	15.4
Total Phosphorus (mg/L) [Nutrients]	0.0272	0.0389
Total Aluminum (µg/L)	248	433
Total Antimony (µg/L)	< 0.020	0.32
Total Arsenic (µg/L)	0.101	0.18
Total Barium (µg/L)	4.12	8.29
Total Beryllium (µg/L)	0.018	< 0.10
Total Cadmium (µg/L)	0.0108	0.111
Total Cesium (µg/L)	0.0138	0.014
Total Chromium (µg/L)	0.463	1.18
Total Cobalt (µg/L)	0.297	0.48
Total Copper (µg/L)	1.38	4.01
Total Iron (µg/L)	165	335
Total Lead (µg/L)	0.069	0.140
Total Lithium (µg/L)	1.37	1.6
Total Manganese (µg/L)	6.03	7.50
Total Mercury (µg/L)	< 0.020	< 0.020
Total Molybdenum (µg/L)	< 0.050	< 0.050
Total Nickel (µg/L)	0.757	1.49
Total Rubidium (µg/L)	1.6	1.81
Total Selenium (µg/L)	< 0.040	< 0.050
Total Strontium (µg/L)	2.59	3.86
Total Thallium (µg/L)	< 0.0050	< 0.010
Total Titanium (µg/L)	3.59	8.17

TABLE 14 (Continued)
SNP STATION: 02-09.2

Total Uranium (µg/L)	0.066	0.123
Total Vanadium (µg/L)	0.401	0.62
Total Zinc (µg/L)	2.34	9.3
Dissolved Aluminum (µg/L)	253	407
Dissolved Antimony (µg/L)	< 0.020	0.130
Dissolved Arsenic (µg/L)	0.117	0.180
Dissolved Barium (µg/L)	4.15	6.02
Dissolved Beryllium (µg/L)	0.017	0.027
Dissolved Cadmium (µg/L)	0.0220	0.0863
Dissolved Cesium (µg/L)	0.0126	0.0090
Dissolved Chromium (µg/L)	0.488	0.769
Dissolved Cobalt (µg/L)	0.318	0.445
Dissolved Copper (µg/L)	20.2	3.75
Dissolved Iron (µg/L)	162	277
Dissolved Lead (µg/L)	0.079	0.138
Dissolved Lithium (µg/L)	1.44	2.04
Dissolved Manganese (µg/L)	6.64	6.67
Dissolved Mercury (µg/L)	< 0.020	< 0.020
Dissolved Molybdenum (µg/L)	< 0.050	< 0.050
Dissolved Nickel (µg/L)	0.859	1.28
Dissolved Rubidium (µg/L)	1.8	1.5
Dissolved Selenium (µg/L)	< 0.040	< 0.040
Dissolved Strontium (µg/L)	2.99	4.33
Dissolved Thallium (µg/L)	< 0.0050	0.0051
Dissolved Titanium (µg/L)	3.57	5.47
Dissolved Uranium (µg/L)	0.067	0.132
Dissolved Vanadium (µg/L)	0.415	0.497
Dissolved Zinc (µg/L)	5.19	8.56
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10
F1 (C6-C10) (mg/L)	< 0.10	< 0.10
Benzene (mg/L)	< 0.00050	< 0.00050
Ethylbenzene (mg/L)	< 0.00050	< 0.00050
Toluene (mg/L)	< 0.00050	< 0.00050
Xylene (mg/L)	< 0.00071	< 0.00071
pH (unitless) [Field]	5.00	5.35
Specific Conductivity (µS/cm) [Field]	12.81	11.79
Water Temperature (deg. C) [Field]	3.4	1.4

TABLE 15
SNP STATION: 02-09.3
UNCONTROLLED SURFACE RUNOFF AT EMULSION PLANT
LICENCE # MV2011L2-0004

Date Sampled:	2017-05-19	2017-05-22	2017-05-27
Sample Control Number:	2017-0514	2017-0525	2017-0540
QAQC Type:	Sample	Sample	Sample
pH (unitless) [Physical]	4.54	4.63	4.93
Specific Conductivity (µS/cm) [Physical]	18.4	11.1	12.7
Total Dissolved Solids (mg/L) (Measured)	46	25	33
Total Dissolved Solids, calculated (lab) (mg/L)	5.4	3.3	5.1
Total Suspended Solids (mg/L)	5.0	< 3.0	< 3.0
Turbidity-Unfiltered (NTU)	1.24	1.01	0.85
Calcium (mg/L)	0.813	0.476	0.617
Carbonate, as CO ₃ (mg/L)	< 5.0	< 5.0	< 5.0
Chloride (mg/L)	< 0.50	< 0.50	< 0.50
Fluoride (mg/L)	0.033	0.028	0.031
Hardness, as CaCO ₃ (mg/L)	4.8	2.7	3.2
Hydroxide, as OH (mg/L)	< 5.0	< 5.0	< 5.0
Ion Balance (%)	Low EC	Low EC	Low EC
Magnesium (mg/L)	0.677	0.358	0.415
Potassium (mg/L)	1.43	0.655	0.677
Reactive Silica, as SiO ₂ (mg/L)	1.61	1.19	2.03
Sodium (mg/L)	0.403	0.259	0.660
Sulphate (mg/L)	< 0.050	< 0.050	< 0.050
Total Alkalinity, as CaCO ₃ (mg/L) [Major Ions]	< 2.0	< 2.0	< 2.0
Nitrate, as N (mg/L)	0.0085	0.0094	0.0226
Nitrite, as N (mg/L)	< 0.0010	< 0.0010	< 0.0010
ortho-Phosphate, as P (mg/L)	< 0.0010	< 0.0010	< 0.0010
Total Ammonia, as N (mg/L)	0.0341	0.0101	0.0280
Total Dissolved Phosphorus (mg/L)	0.0212	0.0130	0.0192
Total Kjeldahl Nitrogen (mg/L)	1.03	0.507	0.622
Total Organic Carbon (mg/L)	10.8	14.2	15.7
Total Phosphorus (mg/L) [Nutrients]	0.0397	0.0236	0.0193
Total Aluminum (µg/L)	325	306	394
Total Antimony (µg/L)	< 0.10	< 0.020	0.107
Total Arsenic (µg/L)	0.17	0.142	0.167
Total Barium (µg/L)	6.63	5.60	6.19
Total Beryllium (µg/L)	< 0.10	0.017	0.024
Total Cadmium (µg/L)	0.0325	0.0120	0.0535
Total Cesium (µg/L)	0.047	0.0221	0.0152
Total Chromium (µg/L)	0.85	0.574	0.885
Total Cobalt (µg/L)	0.47	0.474	0.500
Total Copper (µg/L)	2.15	1.75	2.55
Total Iron (µg/L)	227	197	268
Total Lead (µg/L)	0.088	0.071	0.101
Total Lithium (µg/L)	1.3	1.89	2.56
Total Manganese (µg/L)	15.2	16.1	6.55
Total Mercury (µg/L)	< 0.020	< 0.020	< 0.020
Total Molybdenum (µg/L)	< 0.050	< 0.050	< 0.050
Total Nickel (µg/L)	1.63	0.955	1.14
Total Rubidium (µg/L)	3.72	2.3	1.6
Total Selenium (µg/L)	< 0.050	< 0.040	< 0.040
Total Strontium (µg/L)	4.96	3.61	4.78
Total Thallium (µg/L)	< 0.010	< 0.0050	< 0.0050
Total Titanium (µg/L)	6.27	4.28	5.26

TABLE 15 (Continued)
SNP STATION: 02-09.3

Total Uranium (µg/L)	0.085	0.089	0.138
Total Vanadium (µg/L)	0.61	0.427	0.496
Total Zinc (µg/L)	5.0	3.59	5.84
Dissolved Aluminum (µg/L)	414	273	389
Dissolved Antimony (µg/L)	< 0.020	< 0.020	0.147 XM XM
Dissolved Arsenic (µg/L)	0.163	0.123	0.160
Dissolved Barium (µg/L)	7.76	4.07	5.60
Dissolved Beryllium (µg/L)	0.023	0.016	0.021
Dissolved Cadmium (µg/L)	0.0454 XM XM	0.0112	0.126 XM XM
Dissolved Cesium (µg/L)	0.0492	0.0159	0.0117
Dissolved Chromium (µg/L)	0.770	0.573	0.889
Dissolved Cobalt (µg/L)	0.521	0.390	0.488
Dissolved Copper (µg/L)	21.7 XM XM	8.07	3.69 XM XM
Dissolved Iron (µg/L)	206	171	267
Dissolved Lead (µg/L)	0.134 XM XM	0.061	0.141 XM XM
Dissolved Lithium (µg/L)	1.99 XM XM	1.78	2.33
Dissolved Manganese (µg/L)	19.3	7.67	6.52
Dissolved Mercury (µg/L)	< 0.020	< 0.020	< 0.020
Dissolved Molybdenum (µg/L)	< 0.050	< 0.050	< 0.050
Dissolved Nickel (µg/L)	1.59	0.942	1.22
Dissolved Rubidium (µg/L)	5.0	2.3	1.8
Dissolved Selenium (µg/L)	< 0.040	< 0.040	< 0.040
Dissolved Strontium (µg/L)	5.75	3.38	4.92
Dissolved Thallium (µg/L)	0.0054	< 0.0050	< 0.0050
Dissolved Titanium (µg/L)	5.80	3.71	4.81
Dissolved Uranium (µg/L)	0.074	0.087	0.134
Dissolved Vanadium (µg/L)	0.553	0.427	0.483
Dissolved Zinc (µg/L)	6.84 XM XM	3.69	8.85 XM XM
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10	< 0.10
F1 (C6-C10) (mg/L)	< 0.10	< 0.10	< 0.10
Benzene (mg/L)	< 0.00050	< 0.00050	< 0.00050
Ethylbenzene (mg/L)	< 0.00050	< 0.00050	< 0.00050
Toluene (mg/L)	< 0.00050	< 0.00050	< 0.00050
Xylene (mg/L)	< 0.00071	< 0.00071	< 0.00071
pH (unitless) [Field]	4.64	5.00	5.34
Specific Conductivity (µS/cm) [Field]	20.8	17.07	12.64
Water Temperature (deg. C) [Field]	4.2	4.3	0.6

TABLE 16
SNP STATION: 02-09.4
UNCONTROLLED SURFACE RUNOFF AT EMULSION PLANT
LICENCE # MV2011L2-0004

Date Sampled:	2017-05-22	2017-05-27
Sample Control Number:	2017-0522	2017-0544
QAQC Type:	Sample	Sample
pH (unitless) [Physical]	6.25	6.08
Specific Conductivity (µS/cm) [Physical]	17.0	31.1
Total Dissolved Solids (mg/L) (Measured)	11	34
Total Dissolved Solids, calculated (lab) (mg/L)	10.8	19.4
Total Suspended Solids (mg/L)	< 3.0	5.2
Turbidity-Unfiltered (NTU)	1.58	8.64
Calcium (mg/L)	1.90	2.95
Carbonate, as CO ₃ (mg/L)	< 5.0	< 5.0
Chloride (mg/L)	< 0.50	< 0.50
Fluoride (mg/L)	0.047	0.054
Hardness, as CaCO ₃ (mg/L)	6.5	10.1
Hydroxide, as OH (mg/L)	< 5.0	< 5.0
Ion Balance (%)	Low EC	Low EC
Magnesium (mg/L)	0.430	0.654
Potassium (mg/L)	0.739	1.02
Reactive Silica, as SiO ₂ (mg/L)	1.15	2.22
Sodium (mg/L)	0.359	0.542
Sulphate (mg/L)	2.44	4.64
Total Alkalinity, as CaCO ₃ (mg/L) [Major Ions]	2.7	3.8
Nitrate, as N (mg/L)	0.412	0.995
Nitrite, as N (mg/L)	0.0018	0.0060
ortho-Phosphate, as P (mg/L)	0.0110	0.0035
Total Ammonia, as N (mg/L)	0.146	0.180
Total Dissolved Phosphorus (mg/L)	0.0193	0.0169
Total Kjeldahl Nitrogen (mg/L)	0.250	0.627
Total Organic Carbon (mg/L)	5.2	7.4
Total Phosphorus (mg/L) [Nutrients]	0.0271	0.0503
Total Aluminum (µg/L)	396	403
Total Antimony (µg/L)	< 0.10	< 0.10
Total Arsenic (µg/L)	0.12	0.18
Total Barium (µg/L)	4.90	8.36
Total Beryllium (µg/L)	< 0.10	< 0.10
Total Cadmium (µg/L)	0.0074	0.0117
Total Cesium (µg/L)	0.043	0.052
Total Chromium (µg/L)	0.68	0.72
Total Cobalt (µg/L)	0.33	0.48
Total Copper (µg/L)	2.12	3.06
Total Iron (µg/L)	341	382
Total Lead (µg/L)	0.189	0.234
Total Lithium (µg/L)	< 1.0	1.2
Total Manganese (µg/L)	13.9	25.2
Total Mercury (µg/L)	< 0.020	< 0.020
Total Molybdenum (µg/L)	2.31	2.50
Total Nickel (µg/L)	0.67	0.85
Total Rubidium (µg/L)	1.62	2.58
Total Selenium (µg/L)	< 0.050	< 0.050
Total Strontium (µg/L)	6.60	11.8
Total Thallium (µg/L)	< 0.010	< 0.010
Total Titanium (µg/L)	18.1	18.5

TABLE 16 (Continued)
SNP STATION: 02-09.4

Total Uranium (µg/L)	0.175	0.233
Total Vanadium (µg/L)	0.78	0.78
Total Zinc (µg/L)	3.8	4.5
Dissolved Aluminum (µg/L)	132	158
Dissolved Antimony (µg/L)	< 0.020	0.036
Dissolved Arsenic (µg/L)	0.076	0.118
Dissolved Barium (µg/L)	3.17	6.21
Dissolved Beryllium (µg/L)	< 0.010	0.010
Dissolved Cadmium (µg/L)	0.0110	0.0119
Dissolved Cesium (µg/L)	0.0061	0.0068
Dissolved Chromium (µg/L)	0.197	0.225
Dissolved Cobalt (µg/L)	0.202	0.248
Dissolved Copper (µg/L)	5.73	2.21
Dissolved Iron (µg/L)	56.0	74.1
Dissolved Lead (µg/L)	0.048	0.056
Dissolved Lithium (µg/L)	0.53	0.73
Dissolved Manganese (µg/L)	11.5	21.0
Dissolved Mercury (µg/L)	< 0.020	< 0.020
Dissolved Molybdenum (µg/L)	2.28	2.56
Dissolved Nickel (µg/L)	0.352	0.510
Dissolved Rubidium (µg/L)	1.5	1.9
Dissolved Selenium (µg/L)	< 0.040	< 0.040
Dissolved Strontium (µg/L)	6.70	11.5
Dissolved Thallium (µg/L)	< 0.0050	< 0.0050
Dissolved Titanium (µg/L)	1.81	1.48
Dissolved Uranium (µg/L)	0.132	0.174
Dissolved Vanadium (µg/L)	0.150	0.167
Dissolved Zinc (µg/L)	5.92	3.73
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10
F1 (C6-C10) (mg/L)	< 0.10	< 0.10
Benzene (mg/L)	< 0.00050	< 0.00050
Ethylbenzene (mg/L)	< 0.00050	< 0.00050
Toluene (mg/L)	< 0.00050	< 0.00050
Xylene (mg/L)	< 0.00071	< 0.00071
pH (unitless) [Field]	6.32	7.30
Specific Conductivity (µS/cm) [Field]	21.7	24.9
Water Temperature (deg. C) [Field]	2.4	0.5

TABLE 17
SNP STATION: 02-09.5
UNCONTROLLED SURFACE RUNOFF AT EMULSION PLANT
LICENCE # MV2011L2-0004

Date Sampled:	2017-05-22	2017-05-27
Sample Control Number:	2017-0526	2017-0537
QAQC Type:	Sample	Sample
pH (unitless) [Physical]	5.79	5.70
Specific Conductivity (µS/cm) [Physical]	17.0	39.8
Total Dissolved Solids (mg/L) (Measured)	14	38
Total Dissolved Solids, calculated (lab) (mg/L)	9.5	24.4
Total Suspended Solids (mg/L)	< 3.0	< 3.0
Turbidity-Unfiltered (NTU)	1.76	4.51
Calcium (mg/L)	1.80	3.64
Carbonate, as CO ₃ (mg/L)	< 5.0	< 5.0
Chloride (mg/L)	< 0.50	0.51
Fluoride (mg/L)	0.036	0.064
Hardness, as CaCO ₃ (mg/L)	6.4	12.7
Hydroxide, as OH (mg/L)	< 5.0	< 5.0
Ion Balance (%)	Low EC	Low EC
Magnesium (mg/L)	0.469	0.879
Potassium (mg/L)	0.776	0.991
Reactive Silica, as SiO ₂ (mg/L)	1.17	2.15
Sodium (mg/L)	0.429	0.951
Sulphate (mg/L)	3.10	6.58
Total Alkalinity, as CaCO ₃ (mg/L) [Major Ions]	< 2.0	< 2.0
Nitrate, as N (mg/L)	0.324	1.82
Nitrite, as N (mg/L)	0.0012	0.0053
ortho-Phosphate, as P (mg/L)	0.0063	< 0.0010
Total Ammonia, as N (mg/L)	0.0854	0.249
Total Dissolved Phosphorus (mg/L)	0.0164	0.0151
Total Kjeldahl Nitrogen (mg/L)	0.352	0.571
Total Organic Carbon (mg/L)	6.4	7.3
Total Phosphorus (mg/L) [Nutrients]	0.0256	0.0260
Total Aluminum (µg/L)	322	374
Total Antimony (µg/L)	0.11	< 0.10
Total Arsenic (µg/L)	0.11	0.15
Total Barium (µg/L)	5.72	7.92
Total Beryllium (µg/L)	< 0.10	< 0.10
Total Cadmium (µg/L)	0.0137	0.0188
Total Cesium (µg/L)	0.027	0.021
Total Chromium (µg/L)	0.57	0.62
Total Cobalt (µg/L)	0.28	0.53
Total Copper (µg/L)	1.50	1.94
Total Iron (µg/L)	231	219
Total Lead (µg/L)	0.119	0.087
Total Lithium (µg/L)	< 1.0	1.2
Total Manganese (µg/L)	12.7	30.0
Total Mercury (µg/L)	< 0.020	< 0.020
Total Molybdenum (µg/L)	1.69	1.47
Total Nickel (µg/L)	0.70	1.06
Total Rubidium (µg/L)	1.56	2.06
Total Selenium (µg/L)	< 0.050	< 0.050
Total Strontium (µg/L)	6.87	12.5
Total Thallium (µg/L)	< 0.010	< 0.010
Total Titanium (µg/L)	11.3	8.60

TABLE 17 (Continued)
SNP STATION: 02-09.5

Total Uranium (µg/L)	0.143	0.161
Total Vanadium (µg/L)	0.57	< 0.50
Total Zinc (µg/L)	4.7	7.6
Dissolved Aluminum (µg/L)	161	240
Dissolved Antimony (µg/L)	< 0.020	0.045
Dissolved Arsenic (µg/L)	0.075	0.107
Dissolved Barium (µg/L)	4.53	6.91
Dissolved Beryllium (µg/L)	< 0.010	0.011
Dissolved Cadmium (µg/L)	0.0130	0.0207
Dissolved Cesium (µg/L)	0.0058	0.0077
Dissolved Chromium (µg/L)	0.198	0.255
Dissolved Cobalt (µg/L)	0.205	0.444
Dissolved Copper (µg/L)	23.2	3.51 XM XM
Dissolved Iron (µg/L)	60.8	84.6
Dissolved Lead (µg/L)	0.057	0.056
Dissolved Lithium (µg/L)	0.89	1.29
Dissolved Manganese (µg/L)	11.4	27.8
Dissolved Mercury (µg/L)	< 0.020	< 0.020
Dissolved Molybdenum (µg/L)	1.71	1.40
Dissolved Nickel (µg/L)	0.492	0.878
Dissolved Rubidium (µg/L)	1.5	1.9
Dissolved Selenium (µg/L)	< 0.040	< 0.040
Dissolved Strontium (µg/L)	7.25	13.7
Dissolved Thallium (µg/L)	< 0.0050	0.0069 XM XM
Dissolved Titanium (µg/L)	1.40	1.59
Dissolved Uranium (µg/L)	0.121	0.139
Dissolved Vanadium (µg/L)	0.160	0.179
Dissolved Zinc (µg/L)	4.42	6.11
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10
F1 (C6-C10) (mg/L)	< 0.10	< 0.10
Benzene (mg/L)	< 0.00050	< 0.00050
Ethylbenzene (mg/L)	< 0.00050	< 0.00050
Toluene (mg/L)	< 0.00050	< 0.00050
Xylene (mg/L)	< 0.00071	< 0.00071
pH (unitless) [Field]	6.25	6.42
Specific Conductivity (µS/cm) [Field]	18.88	30.6
Water Temperature (deg. C) [Field]	3.6	2.8

TABLE 18**SNP STATION: 02-10****ANY OTHER POINT WHERE OBSERVED FLOW TO SNAP LAKE OR IL5 IS OBSERVED****LICENCE # MV2011L2-0004**

Date Sampled:	2017-05-23	2017-05-27
Sample Control Number:	2017-0530	2017-0539
QAQC Type:	Sample	Sample
pH (unitless) [Physical]	5.55	6.34
Specific Conductivity (µS/cm) [Physical]	16.5	33.2
Total Dissolved Solids (mg/L) (Measured)	29	29
Total Dissolved Solids, calculated (lab) (mg/L)	9.9	18.9
Total Suspended Solids (mg/L)	< 3.0	< 3.0
Turbidity-Unfiltered (NTU)	1.78	1.96
Calcium (mg/L)	1.35	2.84
Carbonate, as CO ₃ (mg/L)	< 5.0	< 5.0
Chloride (mg/L)	0.58	1.29
Fluoride (mg/L)	0.040	0.050
Hardness, as CaCO ₃ (mg/L)	6.5	12.4
Hydroxide, as OH (mg/L)	< 5.0	< 5.0
Ion Balance (%)	Low EC	Low EC
Magnesium (mg/L)	0.760	1.30
Potassium (mg/L)	0.573	0.997
Reactive Silica, as SiO ₂ (mg/L)	2.24	1.67
Sodium (mg/L)	0.735	1.09
Sulphate (mg/L)	2.95	4.83
Total Alkalinity, as CaCO ₃ (mg/L) [Major Ions]	< 2.0	6.2
Nitrate, as N (mg/L)	0.0251	0.145
Nitrite, as N (mg/L)	0.0028	0.0017
ortho-Phosphate, as P (mg/L)	< 0.0010	< 0.0010
Total Ammonia, as N (mg/L)	0.0183	0.102
Total Dissolved Phosphorus (mg/L)	0.0105	0.0074
Total Kjeldahl Nitrogen (mg/L)	0.371	0.559
Total Organic Carbon (mg/L)	10.2	9.6
Total Phosphorus (mg/L) [Nutrients]	0.0178	0.0163
Total Aluminum (µg/L)	283	110
Total Antimony (µg/L)	< 0.10	0.16
Total Arsenic (µg/L)	0.13	0.13
Total Barium (µg/L)	4.57	6.75
Total Beryllium (µg/L)	< 0.10	< 0.10
Total Cadmium (µg/L)	0.0094	0.0185
Total Cesium (µg/L)	< 0.010	0.015
Total Chromium (µg/L)	0.51	1.56
Total Cobalt (µg/L)	0.75	0.62
Total Copper (µg/L)	2.59	1.48
Total Iron (µg/L)	251	659
Total Lead (µg/L)	< 0.050	< 0.050
Total Lithium (µg/L)	< 1.0	1.6
Total Manganese (µg/L)	20.8	31.6
Total Mercury (µg/L)	< 0.020	< 0.020
Total Molybdenum (µg/L)	0.246	0.315
Total Nickel (µg/L)	0.79	0.56
Total Rubidium (µg/L)	1.15	1.88
Total Selenium (µg/L)	< 0.050	< 0.050
Total Strontium (µg/L)	7.66	12.2
Total Thallium (µg/L)	< 0.010	< 0.010
Total Titanium (µg/L)	2.96	2.08

TABLE 18 (Continued)
SNP STATION: 02-10

Total Uranium (µg/L)	0.117	0.049
Total Vanadium (µg/L)	< 0.50	< 0.50
Total Zinc (µg/L)	3.4	6.2
Dissolved Aluminum (µg/L)	319	91.0
Dissolved Antimony (µg/L)	< 0.020	0.089
Dissolved Arsenic (µg/L)	0.126	0.104
Dissolved Barium (µg/L)	4.56	6.43
Dissolved Beryllium (µg/L)	0.024	0.010
Dissolved Cadmium (µg/L)	0.0110	0.0161
Dissolved Cesium (µg/L)	0.0056	0.0143
Dissolved Chromium (µg/L)	0.292	0.199
Dissolved Cobalt (µg/L)	0.793	0.617
Dissolved Copper (µg/L)	21.9	7.60 XM XM
Dissolved Iron (µg/L)	200	430
Dissolved Lead (µg/L)	0.036	0.048 XM XM
Dissolved Lithium (µg/L)	1.39	1.96
Dissolved Manganese (µg/L)	19.9	31.0
Dissolved Mercury (µg/L)	< 0.020	< 0.020
Dissolved Molybdenum (µg/L)	0.180	0.282
Dissolved Nickel (µg/L)	0.787	0.550
Dissolved Rubidium (µg/L)	1.2	1.9
Dissolved Selenium (µg/L)	< 0.040	< 0.040
Dissolved Strontium (µg/L)	7.94	14.3
Dissolved Thallium (µg/L)	< 0.0050	0.0056
Dissolved Titanium (µg/L)	2.15	0.93
Dissolved Uranium (µg/L)	0.130	0.044
Dissolved Vanadium (µg/L)	0.212	0.167
Dissolved Zinc (µg/L)	4.82	3.41
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10
F1 (C6-C10) (mg/L)	< 0.10	< 0.10
Benzene (mg/L)	< 0.00050	< 0.00050
Ethylbenzene (mg/L)	< 0.00050	< 0.00050
Toluene (mg/L)	< 0.00050	< 0.00050
Xylene (mg/L)	< 0.00071	< 0.00071
pH (unitless) [Field]	6.62	7.45
Specific Conductivity (µS/cm) [Field]	18.11	29.8
Water Temperature (deg. C) [Field]	3.8	2.5

TABLE 19
SNP STATION: 02-14
WATER MANAGEMENT POND STILLING WELL BY THE PUMPHOUSE
LICENCE # MV2011L2-0004

Date Sampled:	2017-05-21	2017-05-28
Sample Control Number:	2017-0287	2017-0297
QAQC Type:	Sample	Sample
pH (unitless) [Physical]	7.69	7.53
Specific Conductivity ($\mu\text{S}/\text{cm}$) [Physical]	677	741
Total Dissolved Solids (mg/L) (Measured)	495	482
Total Dissolved Solids, calculated (lab) (mg/L)	399	440
Total Suspended Solids (mg/L)	12.3	15.0
Turbidity-Unfiltered (NTU)	19.6	9.51
Calcium (mg/L)	50.2	51.4
Carbonate, as CO_3 (mg/L)	< 5.0	< 5.0
Chloride (mg/L)	96.8	86.3
Fluoride (mg/L)	0.175	0.329
Hardness, as CaCO_3 (mg/L)	213	240
Hydroxide, as OH (mg/L)	< 5.0	< 5.0
Ion Balance (%)	87.8	90.9
Magnesium (mg/L)	21.4	27.0
Potassium (mg/L)	10.6	7.95
Reactive Silica, as SiO_2 (mg/L)	3.4	4.53
Sodium (mg/L)	30.0	35.1
Sulphate (mg/L)	95.9	124
Total Alkalinity, as CaCO_3 (mg/L) [Major Ions]	38.1	37.1
Nitrate, as N (mg/L)	15.0	18.1
Nitrite, as N (mg/L)	0.102	0.130
ortho-Phosphate, as P (mg/L)	< 0.0010	< 0.0010
Total Ammonia, as N (mg/L)	0.448	0.782
Total Dissolved Phosphorus (mg/L)	0.0362	0.0048
Total Kjeldahl Nitrogen (mg/L)	0.780	1.32
Total Organic Carbon (mg/L)	3.7	4.7
Total Phosphorus (mg/L) [Nutrients]	0.0559	0.0401
Total Aluminum ($\mu\text{g}/\text{L}$)	371	436
Total Antimony ($\mu\text{g}/\text{L}$)	0.22	0.16
Total Arsenic ($\mu\text{g}/\text{L}$)	0.29	0.27
Total Barium ($\mu\text{g}/\text{L}$)	15.4	27.4
Total Beryllium ($\mu\text{g}/\text{L}$)	< 0.10	< 0.10
Total Cadmium ($\mu\text{g}/\text{L}$)	0.0125	0.0247
Total Cesium ($\mu\text{g}/\text{L}$)	0.042	0.096
Total Chromium ($\mu\text{g}/\text{L}$)	5.01	3.60
Total Cobalt ($\mu\text{g}/\text{L}$)	1.73	1.85
Total Copper ($\mu\text{g}/\text{L}$)	1.01	2.39
Total Iron ($\mu\text{g}/\text{L}$)	671	866
Total Lead ($\mu\text{g}/\text{L}$)	0.533	0.360
Total Lithium ($\mu\text{g}/\text{L}$)	3.2	7.5
Total Manganese ($\mu\text{g}/\text{L}$)	13.1	93.8
Total Mercury ($\mu\text{g}/\text{L}$)	< 0.020	< 0.020
Total Molybdenum ($\mu\text{g}/\text{L}$)	18.4	15.7
Total Nickel ($\mu\text{g}/\text{L}$)	31.5	28.5
Total Rubidium ($\mu\text{g}/\text{L}$)	4.14	10.3
Total Selenium ($\mu\text{g}/\text{L}$)	0.140	0.132
Total Strontium ($\mu\text{g}/\text{L}$)	228	579
Total Thallium ($\mu\text{g}/\text{L}$)	0.016	0.020
Total Titanium ($\mu\text{g}/\text{L}$)	12.8	24.2

TABLE 19 (Continued)**SNP STATION: 02-14**

Total Uranium (µg/L)	2.49	2.93
Total Vanadium (µg/L)	1.73	1.71
Total Zinc (µg/L)	4.5	6.2
Dissolved Aluminum (µg/L)	27.8	17.4
Dissolved Antimony (µg/L)	0.14	0.14
Dissolved Arsenic (µg/L)	0.17	0.11
Dissolved Barium (µg/L)	21.9 XM XM	23.8
Dissolved Beryllium (µg/L)	< 0.10	< 0.10
Dissolved Cadmium (µg/L)	0.0101	0.0214
Dissolved Cesium (µg/L)	0.044	0.044
Dissolved Chromium (µg/L)	0.19	0.22
Dissolved Cobalt (µg/L)	0.51	1.20
Dissolved Copper (µg/L)	11.0 XM XM	1.49
Dissolved Iron (µg/L)	15	16
Dissolved Lead (µg/L)	< 0.050	< 0.050
Dissolved Lithium (µg/L)	6.4 XM XM	5.4
Dissolved Manganese (µg/L)	53.6 XM XM	84.8
Dissolved Mercury (µg/L)	< 0.020	< 0.020
Dissolved Molybdenum (µg/L)	10.1	13.0
Dissolved Nickel (µg/L)	18.6	20.4
Dissolved Rubidium (µg/L)	8.80 XM XM	9.84
Dissolved Selenium (µg/L)	0.098	0.122
Dissolved Strontium (µg/L)	600 XM XM	540
Dissolved Thallium (µg/L)	0.012	0.010
Dissolved Titanium (µg/L)	0.33	< 0.30
Dissolved Uranium (µg/L)	2.28	2.48
Dissolved Vanadium (µg/L)	< 0.50	< 0.50
Dissolved Zinc (µg/L)	4.3	4.3
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10
F1 (C6-C10) (mg/L)	< 0.10	< 0.10
Benzene (mg/L)	< 0.00050	< 0.00050
Ethylbenzene (mg/L)	< 0.00050	< 0.00050
Toluene (mg/L)	< 0.00050	< 0.00050
Xylene (mg/L)	< 0.00071	< 0.00071
pH (unitless) [Field]	7.30	7.70
Specific Conductivity (µS/cm) [Field]	734	762
Water Temperature (deg. C) [Field]	3.1	5.8

TABLE 20
SNP STATION: 02-15
WATER INTAKE FROM SNAP LAKE
LICENCE # MV2011L2-0004

Date Sampled:	2017-05-01	2017-05-01	2017-05-01	2017-05-01	2017-05-01	2017-05-01	2017-05-01
Sample Control Number:	2017-0227	2017-0226	2017-0228	2017-0229	2017-0230	2017-0231	2017-0232
QAQC Type:	Sample	Split Sample	Duplicate Sample	Split Sample	Sample	Triplicate Sample	Split Sample
Total Dissolved Solids (mg/L) (Measured)	394		415			550	
Total Dissolved Solids, calculated (lab) (mg/L)	337		335				
Calcium (mg/L)	70.2		69.8			69.2	
Chloride (mg/L)	158		157			150	
Fluoride (mg/L)	0.215		0.214			0.19	
Hardness, as CaCO ₃ (mg/L)	212		211			209	
Magnesium (mg/L)	8.83		8.88				
Potassium (mg/L)	3.13		3.04			2.87	
Reactive Silica, as SiO ₂ (mg/L)	1.01		1.01			1.04	
Sodium (mg/L)	34.8		34.2			34	
Sulphate (mg/L)	29.4		29.5			28.3	
Total Alkalinity, as CaCO ₃ (mg/L) [Major Ions]	47.3		47.5			47.6	
Nitrate, as N (mg/L)	0.677		0.681			0.697	
Nitrite, as N (mg/L)	0.0020		0.0012			< 0.002	
Total Magnesium (µg/L)						8710	
E. coli (MPN/100mL)		< 1.0		< 1.0			< 1.0
Cryptosporidium (oocyst/100mL)					0		
Giarida (cysts/10L)					0		
pH (unitless) [Field]	6.98						
Specific Conductivity (µS/cm) [Field]	833						
Water Temperature (deg. C) [Field]	7.1						

TABLE 21**SNP STATION: 02-16i****SEWAGE DISCHARGE FROM SEWAGE TREATMENT PLANT PRIOR TO MIXING WITH WATER TREATMENT PLANT EFFLUENT****LICENCE # MV2011L2-0004**

Date Sampled:	2017-05-01	5/8/2017	5/8/2017	15-May-17	23-May-17	25-May-17
Sample Control Number:	2017-0222	2017-0242	2017-0243	2017-0266	2017-0291	2017-0305
QAQC Type:	Sample	Sample	Duplicate Sample	Sample	Sample	Sample
Ammonia as Nitrogen	0.102	0.272	0.280	0.218	1.49	1.79
Biochemical Oxygen Demand	4	2	2	6	8	3
Organic Carbon, Total	25.2	13.1	13.2	14.4	18.1	20.3
Ortho-Phosphate as Phosphorus	3.83	5.14	5.07	4.01	4.83	5.65
Phosphorous, Dissolved	5.89	5.43	5.40	4.42	5.14	6.23
Phosphorous, Total	8.68	5.64	5.66	4.42	5.80	6.77
Solids, Total Suspended	16	3	4	4	29	16
Nitrate as Nitrogen	25.8	23.3	23.4	22.1	27.6	32.3
Nitrite as Nitrogen	0.61	0.58	0.61	0.72	0.73	0.01
Coliforms, Fecal	1	1	1	1	1	1
Escherichia coli	1.0	1.0	1.0	2.0	1.0	1.0
Hexane Extractable Material	2.0	2.0	2.0	1.0	2.0	2.0
Kjeldahl Nitrogen, Total	7.96	1.77	1.85	2.22	4.90	4.86
pH (unitless) [Field]	5.81	5.57	n/a	5.41	5.6	5.56
Specific Conductivity (μ S/cm) [Field]	1190	1032	n/a	927	903	110
Water Temperature (deg. C) [Field]	19.7	20.2	n/a	21.0	20.0	23.3

TABLE 22
SNP STATION: 02-17 b
WATER TREATMENT PLANT EFFLUENT
LICENCE # MV2011L2-0004

Date Sampled:	2017-05-25	2017-05-25	2017-05-31	2017-05-31
Sample Control Number:	2017-0294	2017-0295	2017-0307	2017-0555
QAQC Type:	Sample	Split Sample	Split Sample	Sample
pH (unitless) [Physical]	7.42			7.28
Specific Conductivity (µS/cm) [Physical]	626			634
Total Dissolved Solids (mg/L) (Measured)	428			429
Total Dissolved Solids, calculated (lab) (mg/L)	360			417
Total Suspended Solids (mg/L)	7.6			8.5
Turbidity-Unfiltered (NTU)	10.4			5.30
Calcium (mg/L)	53.2			53.2
Carbonate, as CO3 (mg/L)	< 5.0			< 5.0
Chloride (mg/L)	99.6			85.9
Fluoride (mg/L)	0.257			0.320
Hardness, as CaCO3 (mg/L)	207			231
Hydroxide, as OH (mg/L)	< 5.0			< 5.0
Ion Balance (%)	89.4			91.4
Magnesium (mg/L)	18.1			23.9
Potassium (mg/L)	5.78			7.37
Reactive Silica, as SiO2 (mg/L)	2.2			4.16
Sodium (mg/L)	27.4			32.6
Sulphate (mg/L)	84.6			119
Total Alkalinity, as CaCO3 (mg/L) [Major Ions]	35.4			32.4
BOD (5-day) (mg/L)	< 2.0			
Nitrate, as N (mg/L)	10.7			15.9
Nitrite, as N (mg/L)	0.0862			0.125
ortho-Phosphate, as P (mg/L)	< 0.0010			< 0.0010
Total Ammonia, as N (mg/L)	0.127			0.413
Total Dissolved Phosphorus (mg/L)	0.0034			0.0033
Total Kjeldahl Nitrogen (mg/L)	0.730			1.24
Total Organic Carbon (mg/L)	4.5			5.0
Total Phosphorus (mg/L) [Nutrients]	0.0377			0.0189
Total Aluminum (µg/L)	135			57.6
Total Antimony (µg/L)	0.151			0.19
Total Arsenic (µg/L)	0.122			0.17
Total Barium (µg/L)	24.1			23.6
Total Beryllium (µg/L)	0.011			< 0.10
Total Cadmium (µg/L)	0.0167			0.0149
Total Cesium (µg/L)	0.0475			0.047
Total Chromium (µg/L)	1.27			0.83
Total Cobalt (µg/L)	0.833			1.42
Total Copper (µg/L)	1.25			1.61
Total Iron (µg/L)	1270			1740
Total Lead (µg/L)	0.172			0.068
Total Lithium (µg/L)	6.95			6.3
Total Manganese (µg/L)	57.5			80.1
Total Mercury (µg/L)	< 0.020			< 0.020
Total Molybdenum (µg/L)	7.53			14.1
Total Nickel (µg/L)	17.5			19.6
Total Rubidium (µg/L)	7.6			9.72
Total Selenium (µg/L)	0.077			0.111
Total Strontium (µg/L)	567			601
Total Thallium (µg/L)	0.0083			0.014
Total Titanium (µg/L)	28.0			24.0
Total Uranium (µg/L)	1.93			2.07
Total Vanadium (µg/L)	0.563			< 0.50
Total Zinc (µg/L)	4.11			4.5
Dissolved Aluminum (µg/L)	4.72			

TABLE 22
SNP STATION: 02-17 b

Dissolved Antimony (µg/L)	0.135			
Dissolved Arsenic (µg/L)	0.087			
Dissolved Barium (µg/L)	21.9			
Dissolved Beryllium (µg/L)	< 0.010			
Dissolved Cadmium (µg/L)	0.0092			
Dissolved Cesium (µg/L)	0.0361			
Dissolved Chromium (µg/L)	0.233			
Dissolved Cobalt (µg/L)	0.632			
Dissolved Copper (µg/L)	4.83			
Dissolved Iron (µg/L)	13.6			
Dissolved Lead (µg/L)	0.027			
Dissolved Lithium (µg/L)	6.87			
Dissolved Manganese (µg/L)	52.0			
Dissolved Mercury (µg/L)	< 0.020			
Dissolved Molybdenum (µg/L)	7.53			
Dissolved Nickel (µg/L)	12.3			
Dissolved Rubidium (µg/L)	7.3			
Dissolved Selenium (µg/L)	0.083			
Dissolved Strontium (µg/L)	585			
Dissolved Thallium (µg/L)	0.0072			
Dissolved Titanium (µg/L)	0.30			
Dissolved Uranium (µg/L)	1.81			
Dissolved Vanadium (µg/L)	0.200			
Dissolved Zinc (µg/L)	4.00			
Fecal Coliform (cfu/100ml)		<1	<1	
F2 (>C10-C16) (mg/L)	< 0.10			< 0.10
Oil & Grease (mg/L)	< 1.0			
F1 (C6-C10) (mg/L)	< 0.10			< 0.10
Benzene (mg/L)	< 0.00050			< 0.00050
Ethylbenzene (mg/L)	< 0.00050			< 0.00050
Toluene (mg/L)	< 0.00050			< 0.00050
Xylene (mg/L)	< 0.00071			< 0.00071
pH (unitless) [Field]	6.71	6.71	6.8	6.8
Specific Conductivity (µS/cm) [Field]	515	515	688	688
Water Temperature (deg. C) [Field]	8.8	8.8	6.8	10.1

TABLE 23**QA/QC: Travel Blank (ALS)****LICENCE # MV2011L2-0004**

Date Sampled:	2017-05-01
Sample Control Number:	2017-0233
QAQC Type:	Travel Blank
pH (unitless) [Physical]	5.07
Specific Conductivity ($\mu\text{S}/\text{cm}$) [Physical]	< 2.0
Total Dissolved Solids (mg/L) (Measured)	< 10
Total Dissolved Solids, calculated (lab) (mg/L)	< 1.3
Total Suspended Solids (mg/L)	< 3.0
Turbidity-Unfiltered (NTU)	0.12
Bicarbonate, as HCO_3 (mg/L)	< 5.0
Calcium (mg/L)	< 0.020
Chloride (mg/L)	< 0.50
Fluoride (mg/L)	< 0.020
Hardness, as CaCO_3 (mg/L)	< 1.0
Magnesium (mg/L)	< 0.0050
Potassium (mg/L)	< 0.050
Sodium (mg/L)	< 0.050
Sulphate (mg/L)	< 0.050
Total Alkalinity, as CaCO_3 (mg/L) [Major Ions]	< 2.0
BOD (5-day) (mg/L)	< 2.0
Nitrate, as N (mg/L)	< 0.0050
Nitrite, as N (mg/L)	< 0.0010
ortho-Phosphate, as P (mg/L)	< 0.0010
Total Ammonia, as N (mg/L)	< 0.0050
Total Dissolved Phosphorus (mg/L)	< 0.0010
Total Kjeldahl Nitrogen (mg/L)	< 0.050
Total Organic Carbon (mg/L)	< 1.0
Total Phosphorus (mg/L) [Nutrients]	< 0.0010
Total Aluminum ($\mu\text{g}/\text{L}$)	< 0.30
Total Antimony ($\mu\text{g}/\text{L}$)	< 0.020
Total Arsenic ($\mu\text{g}/\text{L}$)	< 0.020
Total Barium ($\mu\text{g}/\text{L}$)	< 0.050
Total Beryllium ($\mu\text{g}/\text{L}$)	< 0.010
Total Cadmium ($\mu\text{g}/\text{L}$)	< 0.0050
Total Cesium ($\mu\text{g}/\text{L}$)	< 0.0050
Total Chromium ($\mu\text{g}/\text{L}$)	< 0.060
Total Cobalt ($\mu\text{g}/\text{L}$)	< 0.010
Total Copper ($\mu\text{g}/\text{L}$)	< 0.10
Total Iron ($\mu\text{g}/\text{L}$)	< 1.0
Total Lead ($\mu\text{g}/\text{L}$)	< 0.010
Total Lithium ($\mu\text{g}/\text{L}$)	2.61
Total Manganese ($\mu\text{g}/\text{L}$)	< 0.050
Total Mercury ($\mu\text{g}/\text{L}$)	< 0.020

TABLE 23**QA/QC: Travel Blank (ALS)**

Total Molybdenum (µg/L)	< 0.050
Total Nickel (µg/L)	< 0.060
Total Rubidium (µg/L)	< 1.0
Total Selenium (µg/L)	< 0.040
Total Strontium (µg/L)	< 0.050
Total Thallium (µg/L)	< 0.0050
Total Tin (µg/L)	< 0.050
Total Titanium (µg/L)	< 0.10
Total Uranium (µg/L)	< 0.010
Total Vanadium (µg/L)	< 0.050
Total Zinc (µg/L)	< 0.80
Dissolved Aluminum (µg/L)	< 0.30
Dissolved Antimony (µg/L)	< 0.020
Dissolved Arsenic (µg/L)	< 0.020
Dissolved Barium (µg/L)	< 0.050
Dissolved Beryllium (µg/L)	< 0.010
Dissolved Cadmium (µg/L)	< 0.0050
Dissolved Cesium (µg/L)	< 0.0050
Dissolved Chromium (µg/L)	< 0.060
Dissolved Cobalt (µg/L)	< 0.010
Dissolved Copper (µg/L)	< 0.10
Dissolved Iron (µg/L)	< 1.0
Dissolved Lead (µg/L)	< 0.010
Dissolved Lithium (µg/L)	< 0.50
Dissolved Manganese (µg/L)	< 0.050
Dissolved Mercury (µg/L)	< 0.020
Dissolved Molybdenum (µg/L)	< 0.050
Dissolved Nickel (µg/L)	< 0.060
Dissolved Rubidium (µg/L)	< 1.0
Dissolved Selenium (µg/L)	< 0.040
Dissolved Strontium (µg/L)	< 0.050
Dissolved Thallium (µg/L)	< 0.0050
Dissolved Tin (µg/L)	< 0.050
Dissolved Titanium (µg/L)	< 0.10
Dissolved Uranium (µg/L)	< 0.010
Dissolved Vanadium (µg/L)	< 0.050
Dissolved Zinc (µg/L)	< 0.80
F2 (>C10-C16) (mg/L)	< 0.10
Oil & Grease (mg/L)	< 1.0
BTEX (mg/L)	< 0.00071
F1 (C6-C10) (mg/L)	< 0.10
Benzene (mg/L)	< 0.00050
Ethylbenzene (mg/L)	< 0.00050
F1-BTEX (mg/L)	< 0.10
m&p-Xylene (mg/L)	< 0.00050

TABLE 23**QA/QC: Travel Blank (ALS)**

o-Xylene (mg/L)	< 0.00050
Toluene (mg/L)	< 0.00050
Xylene (mg/L)	< 0.00071

TABLE 24**QA/QC: Field Blank (ALS)****LICENCE # MV2011L2-0004**

Date Sampled:	2017-05-19	2017-05-23
Sample Control Number:	2017-0520	2017-0536
QAQC Type:	Field Blank	Field Blank
pH (unitless) [Physical]	5.22	5.15
Specific Conductivity ($\mu\text{S}/\text{cm}$) [Physical]	< 2.0	< 2.0
Total Dissolved Solids (mg/L) (Measured)	< 10	< 10
Total Dissolved Solids, calculated (lab) (mg/L)	< 1.3	< 1.3
Total Suspended Solids (mg/L)	< 3.0	< 3.0
Turbidity-Unfiltered (NTU)	1.23	< 0.10
Bicarbonate, as HCO_3 (mg/L)	< 5.0	< 5.0
Calcium (mg/L)	< 0.020	< 0.020
Chloride (mg/L)	< 0.50	< 0.50
Fluoride (mg/L)	< 0.020	< 0.020
Hardness, as CaCO_3 (mg/L)	< 1.0	< 1.0
Magnesium (mg/L)	< 0.0050	< 0.0050
Potassium (mg/L)	< 0.050	< 0.050
Sodium (mg/L)	< 0.050	< 0.050
Sulphate (mg/L)	< 0.050	< 0.050
Total Alkalinity, as CaCO_3 (mg/L) [Major Ions]	< 2.0	< 2.0
BOD (5-day) (mg/L)	< 2.0	< 2.0
Nitrate, as N (mg/L)	< 0.0050	< 0.0050
Nitrite, as N (mg/L)	< 0.0010	< 0.0010
ortho-Phosphate, as P (mg/L)	< 0.0010	< 0.0010
Total Ammonia, as N (mg/L)	< 0.0050	< 0.0050
Total Dissolved Phosphorus (mg/L)	< 0.0010	< 0.0010
Total Kjeldahl Nitrogen (mg/L)	< 0.050	< 0.050
Total Organic Carbon (mg/L)	< 1.0	< 1.0
Total Phosphorus (mg/L) [Nutrients]	< 0.0010	< 0.0010
Total Aluminum ($\mu\text{g}/\text{L}$)	< 3.0	< 0.30
Total Antimony ($\mu\text{g}/\text{L}$)	< 0.10	< 0.020
Total Arsenic ($\mu\text{g}/\text{L}$)	< 0.10	< 0.020
Total Barium ($\mu\text{g}/\text{L}$)	< 0.050	< 0.050
Total Beryllium ($\mu\text{g}/\text{L}$)	< 0.10	< 0.010
Total Cadmium ($\mu\text{g}/\text{L}$)	< 0.0050	< 0.0050
Total Cesium ($\mu\text{g}/\text{L}$)	< 0.010	< 0.0050
Total Chromium ($\mu\text{g}/\text{L}$)	< 0.10	< 0.060
Total Cobalt ($\mu\text{g}/\text{L}$)	< 0.10	< 0.010
Total Copper ($\mu\text{g}/\text{L}$)	< 0.50	< 0.10
Total Iron ($\mu\text{g}/\text{L}$)	< 10	< 1.0
Total Lead ($\mu\text{g}/\text{L}$)	< 0.050	< 0.010
Total Lithium ($\mu\text{g}/\text{L}$)	< 1.0	< 0.50
Total Manganese ($\mu\text{g}/\text{L}$)	< 0.10	< 0.050
Total Mercury ($\mu\text{g}/\text{L}$)	< 0.020	< 0.020
Total Molybdenum ($\mu\text{g}/\text{L}$)	< 0.050	< 0.050
Total Nickel ($\mu\text{g}/\text{L}$)	< 0.50	< 0.060
Total Rubidium ($\mu\text{g}/\text{L}$)	< 0.20	< 1.0
Total Selenium ($\mu\text{g}/\text{L}$)	< 0.050	< 0.040
Total Strontium ($\mu\text{g}/\text{L}$)	< 0.20	< 0.050
Total Thallium ($\mu\text{g}/\text{L}$)	< 0.010	< 0.0050
Total Tin ($\mu\text{g}/\text{L}$)	< 0.10	< 0.050
Total Titanium ($\mu\text{g}/\text{L}$)	< 0.30	< 0.10
Total Uranium ($\mu\text{g}/\text{L}$)	< 0.010	< 0.010
Total Vanadium ($\mu\text{g}/\text{L}$)	< 0.50	< 0.050

TABLE 24 (continued)
QA/QC: Field Blank (ALS)

Date Sampled:	2017-05-19	2017-05-23
Sample Control Number:	2017-0520	2017-0536
QA/QC Type:	Field Blank	Field Blank
Total Zinc (µg/L)	< 3.0	< 0.80
Dissolved Aluminum (µg/L)	< 1.0	< 0.30
Dissolved Antimony (µg/L)	< 0.10	< 0.020
Dissolved Arsenic (µg/L)	< 0.10	< 0.020
Dissolved Barium (µg/L)	< 0.050	< 0.050
Dissolved Beryllium (µg/L)	< 0.10	< 0.010
Dissolved Cadmium (µg/L)	< 0.0050	< 0.0050
Dissolved Cesium (µg/L)	< 0.010	< 0.0050
Dissolved Chromium (µg/L)	< 0.10	< 0.060
Dissolved Cobalt (µg/L)	< 0.10	< 0.010
Dissolved Copper (µg/L)	< 0.20	< 0.10
Dissolved Iron (µg/L)	< 10	< 1.0
Dissolved Lead (µg/L)	< 0.050	< 0.010
Dissolved Lithium (µg/L)	< 1.0	< 0.50
Dissolved Manganese (µg/L)	< 0.10	< 0.050
Dissolved Molybdenum (µg/L)	< 0.050	< 0.050
Dissolved Nickel (µg/L)	< 0.50	< 0.060
Dissolved Rubidium (µg/L)	< 0.20	< 1.0
Dissolved Selenium (µg/L)	< 0.050	< 0.040
Dissolved Strontium (µg/L)	< 0.20	< 0.050
Dissolved Thallium (µg/L)	< 0.010	< 0.0050
Dissolved Tin (µg/L)	< 0.10	< 0.050
Dissolved Titanium (µg/L)	< 0.30	< 0.10
Dissolved Uranium (µg/L)	< 0.010	< 0.010
Dissolved Vanadium (µg/L)	< 0.50	< 0.050
Dissolved Zinc (µg/L)	< 1.0	< 0.80
F2 (>C10-C16) (mg/L)	< 0.10	< 0.10
Oil & Grease (mg/L)	< 0.00071	< 0.00071
F1 (C6-C10) (mg/L)	< 0.10	< 0.10
Benzene (mg/L)	< 0.00050	< 0.00050
Ethylbenzene (mg/L)	< 0.00050	< 0.00050
F1-BTEX (mg/L)	< 0.10	< 0.10
m&p-Xylene (mg/L)	< 0.00050	< 0.00050
o-Xylene (mg/L)	< 0.00050	< 0.00050
Toluene (mg/L)	< 0.00050	< 0.00050
Xylene (mg/L)	< 0.00071	< 0.00071

TABLE 25**QA/QC: FIELD BLANK (TAIGA)****LICENCE # MV2011L2-0004**

Date Sampled:	1-May-17
Sample Control Number:	2017-0223
QAQC Type:	Field Blank
Biochemical Oxygen Demand (mg/L)	<2
Total Suspended Solids (mg/L)	<3
Dissolved Phosphorus (mg/L) [Nutrients]	<0.002
Nitrate, as N (mg/L)	<0.01
Nitrite, as N (mg/L)	<0.01
ortho-Phosphate, as P (mg/L)	0.005
Total Ammonia, as N (mg/L)	0.041
Total Kjeldahl Nitrogen (mg/L)	<0.05
Total Organic Carbon (mg/L)	<0.5
Total Phosphorus (mg/L) [Nutrients]	<0.002
Hexane Extractable Material (mg/L)	<0.02
E. coli (MPN/100mL)	< 1.0
Fecal Coliform (CFU/100mL)	< 1

TABLE 26**TOTAL DISSOLVED SOLIDS CALCIUM AND CHLORIDE LOADING TO SNAP LAKE 2017 (TONNES)**

MONTH	TDS	CALCIUM	CHLORIDE
	(tonnes)		
JAN	594	133	283
FEB	0	0	0
MAR	0	0	0
APR	0	0	0
MAY*	17	2	4
JUN			
JUL			
AUG			
SEP			
OCT			
NOV			
DEC			
TOTAL	611	135	287

***Based on two 6-day sample events during May**

TABLE 27**NUTRIENT LOADING TO SNAP LAKE 2017**

MONTH	PHOSPHORUS	AMMONIA	NITRATE
	(kg)		
JAN	5.52	27	558
FEB	0	0	0
MAR	0	0	0
APR	0	0	0
MAY*	0.15	13	622
JUN			
JUL			
AUG			
SEP			
OCT			
NOV			
DEC			
TOTAL	5.67	40	1,179

*Based on two 6-day sample events during May

**TABLE 28
WATER BALANCE**

MONTH	FRESHWATER VOLUME PUMPED	SEWAGE VOLUME DISPOSED	RECYCLED WATER Used in Process, Powerhouse, Utility Building	RECYCLED WATER *Dust control	DIRTY MINEWATER TO WTP	CLEAR MINEWATER TO WTP	CLEAR MINEWATER TO WMP	WTP DISCHARGE TO SNAP LAKE	WMP TO WTP
	(m ³)								
JAN	3,428	617	13,164	0	600,075	160,568	272,668	899,683	141,919
FEB	5,796	851	2,480	0	0	2,206	2,206	2,509	1,415
MAR	4,647	685	0	0	0	0	0	0	0
APR	4,133	303	0	0	0	0	0	0	0
MAY	3,492	343	0	0	0	0	0	43,165	0
JUN									
JUL									
AUG									
SEP									
OCT									
NOV									
DEC									
TOTAL	21,496	2,799	15,644	0	600,075	162,774	274,874	945,357	143,334

TABLE 29**RUNOFF WATER PUMPED TO WATER MANAGEMENT POND**

MONTH	NORTH PILE SUMPS	SOUTH PIT (TO WTP)	AIRPORT DEICING SUMP	AMMONIUM NITRATE SUMP	FUEL BERMS	WTP to WMP (OVERFLOW RETURN LINE)	TOTAL
JAN	2,651	0	0	0	0	140,727	143,378
FEB	2,832	0	0	0	0	2,748	5,580
MAR	5	0	0	0	0	0	5
APR	2,176	0	0	0	0	0	2,176
MAY	80,928	0	0	0	0	0	80,928
JUN							
JUL							
AUG							
SEP							
OCT							
NOV							
DEC							
TOTAL	88,592	0	0	0	0	143,475	232,067

TABLE 30
Spill Summary

DATE	PRODUCT	VOLUME	Units	AREA (m ²)	LOCATION	Incident Details	Spill Line #
May 16, 2017	Overflow water from Underground	~400	m3	900	Fresh Air Raise	At 12:00 hours water flow was identified originating from the Fresh Air Raise. Water pumping underground was suspended and flow slowed and stopped after 2 hours. Water was contained with a snow berm and use of a vacuum truck and excavator. Conductivity was 979us/cm and is likely not contaminated being consistent with conductivity from the lake. Samples were taken from all underground access points to be confirmed it is acceptable for direct discharge into the environment.	17-166

TABLE 31
QUANTITY OF ORE PROCESSED

MONTH	KIMBERLITE (tonnes)
JAN	0
FEB	0
MAR	0
APR	0
MAY	0
JUN	
JUL	
AUG	
SEP	
OCT	
NOV	
DEC	
TOTAL	0

TABLE 32
QUANTITY OF SLIMES AND PASTE DEPOSITED TO THE NORTH PILE

MONTH	PASTE (m³)	SLIME (m³)
JAN	0	0
FEB	0	0
MAR	0	0
APR	0	0
MAY	0	0
JUN		
JUL		
AUG		
SEP		
OCT		
NOV		
DEC		
TOTAL	0	0

TABLE 33**QUANTITY OF SOLIDS DEPOSITED TO THE NORTH PILE**

MONTH	PASTE (m ³)	SLIME (m ³)
JAN	0	0
FEB	0	0
MAR	0	0
APR	0	0
MAY	0	0
JUN	0	0
JUL		
AUG		
SEP		
OCT		
NOV		
DEC		
TOTAL	0	0

TABLE 34**QUANTITY OF SOLIDS DEPOSITED TO THE NORTH PILE**

MONTH	PASTE WATER (m ³)	SLIMES WATER (m ³)
JAN	0	0
FEB	0	0
MAR	0	0
APR	0	0
MAY	0	0
JUN		
JUL		
AUG		
SEP		
OCT		
NOV		
DEC		
TOTAL	0	0

TABLE 35**QUANTITY OF PASTE DEPOSITED UNDERGROUND**

MONTH	PASTE (m ³)
JAN	0
FEB	0
MAR	0
APR	0
MAY	0
JUN	
JUL	
AUG	
SEP	
OCT	
NOV	
DEC	
TOTAL	0

FIGURE 1

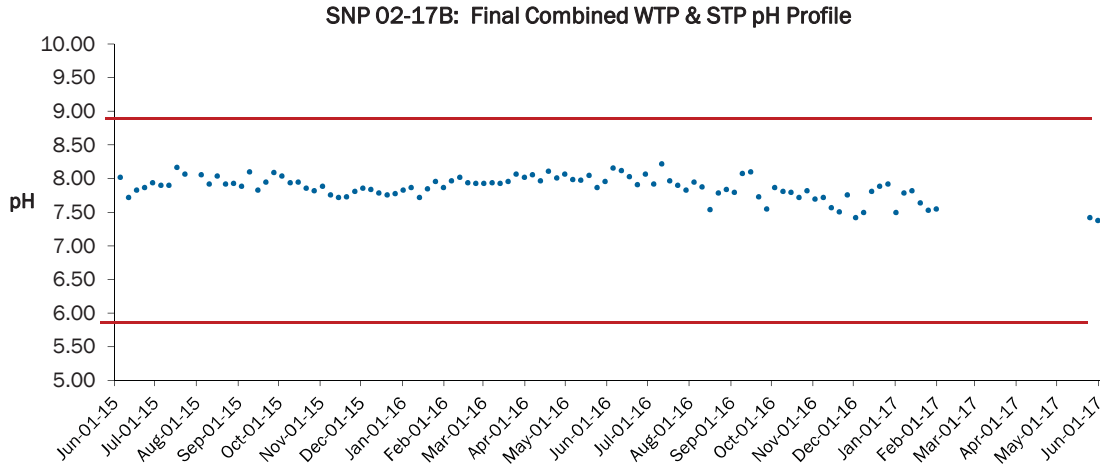


FIGURE 2

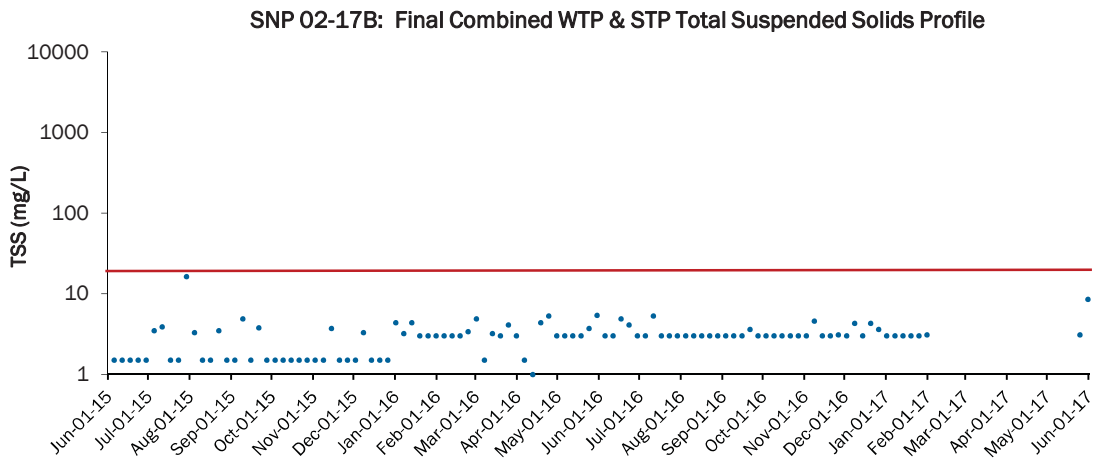


FIGURE 3

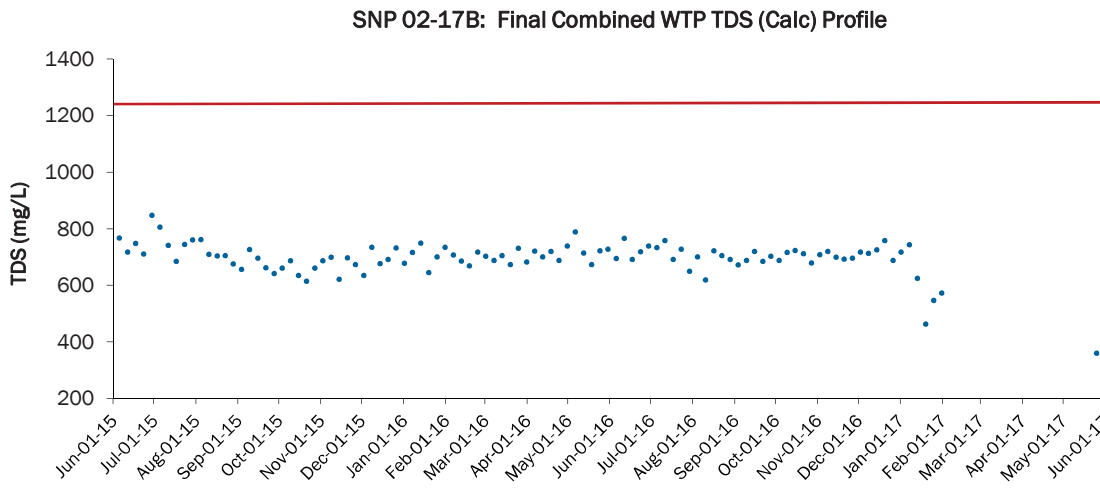


FIGURE 4

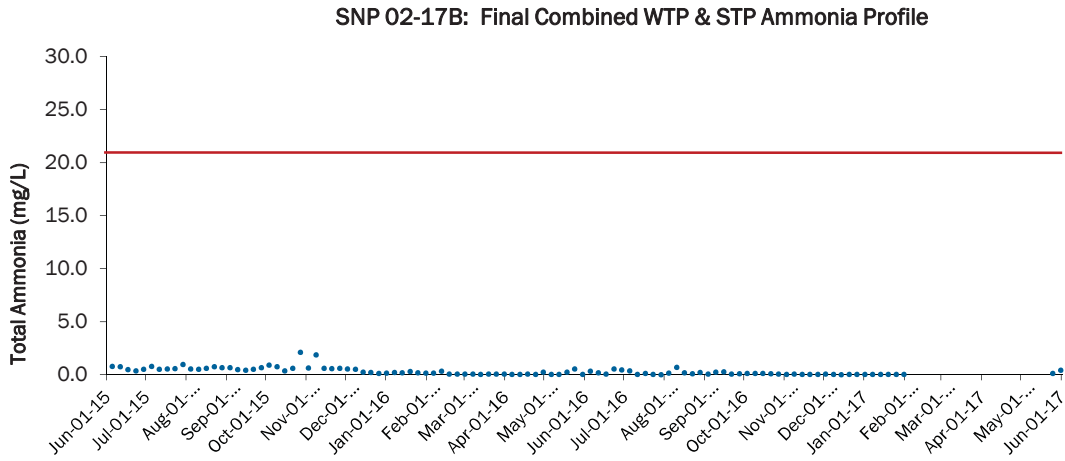


FIGURE 5

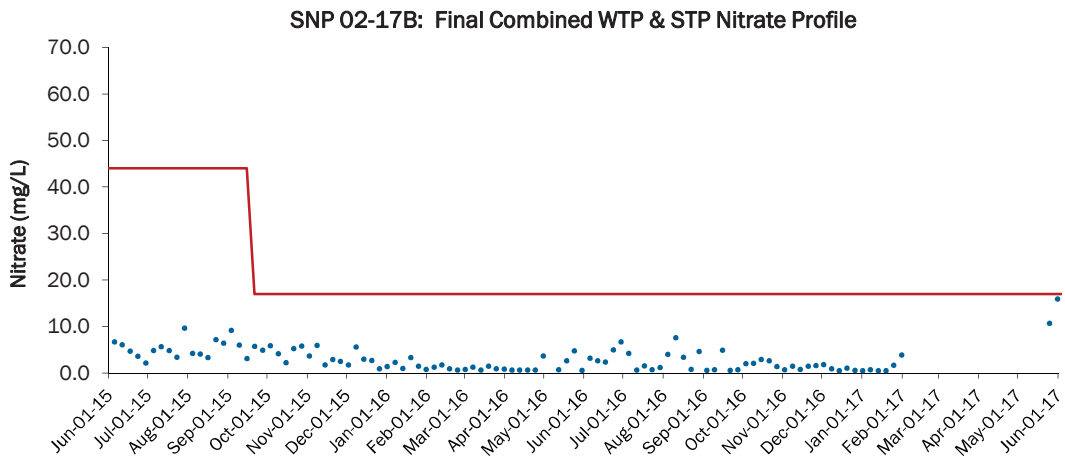


FIGURE 6

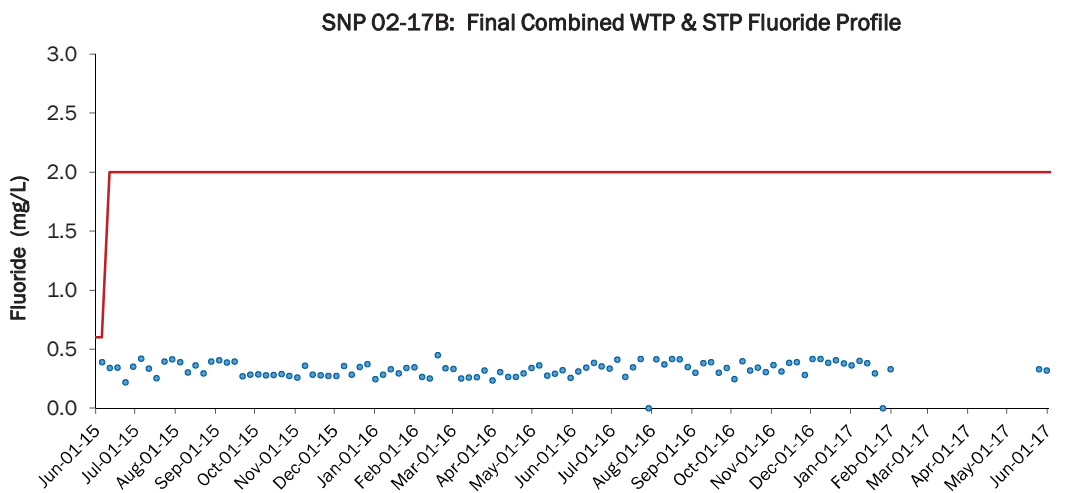


FIGURE 7

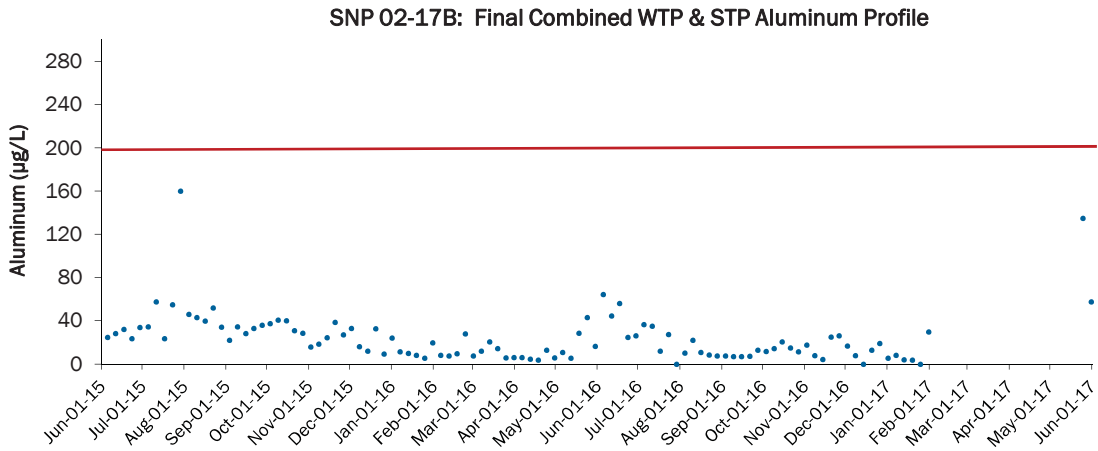


FIGURE 8

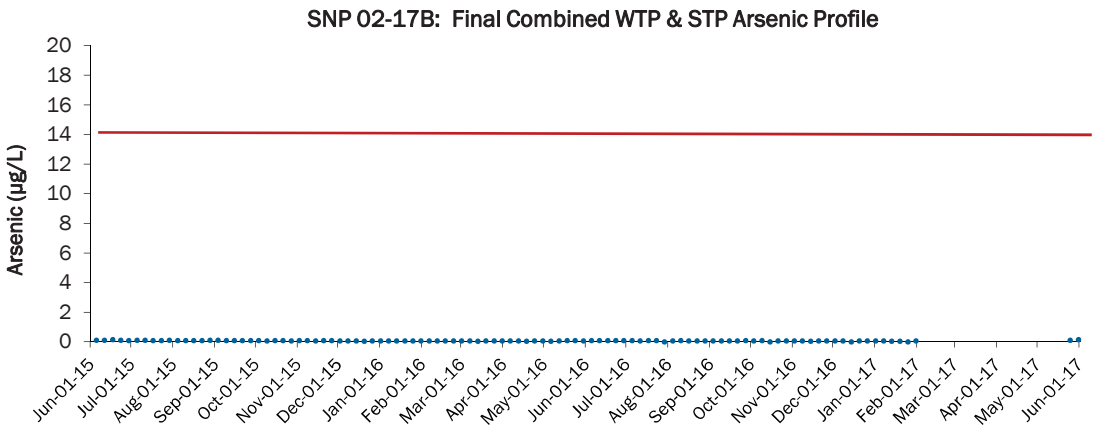


FIGURE 9

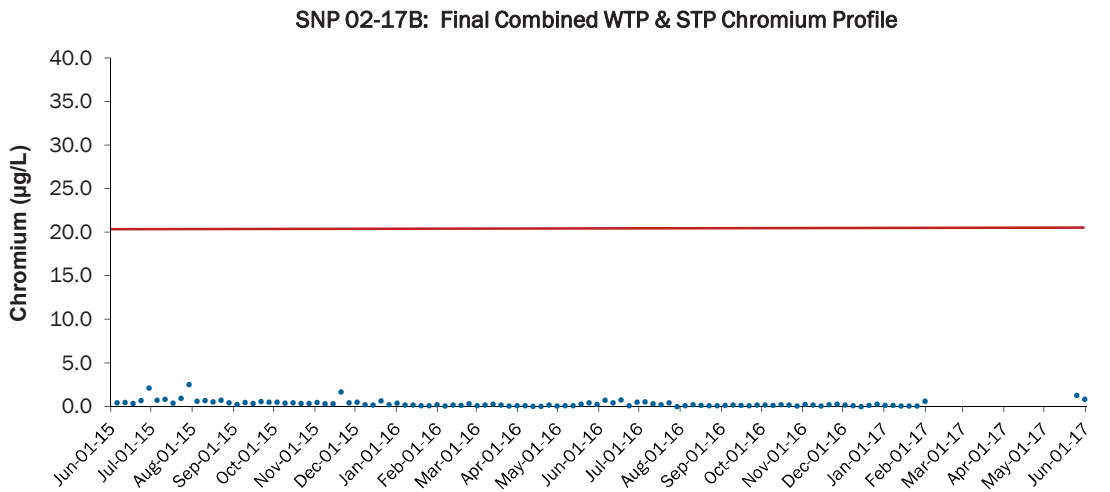


FIGURE 10

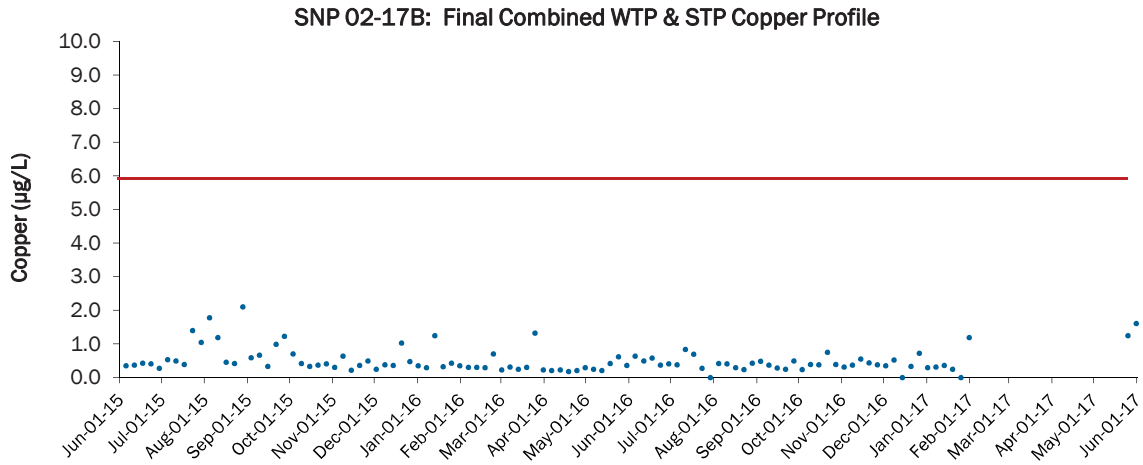


FIGURE 11

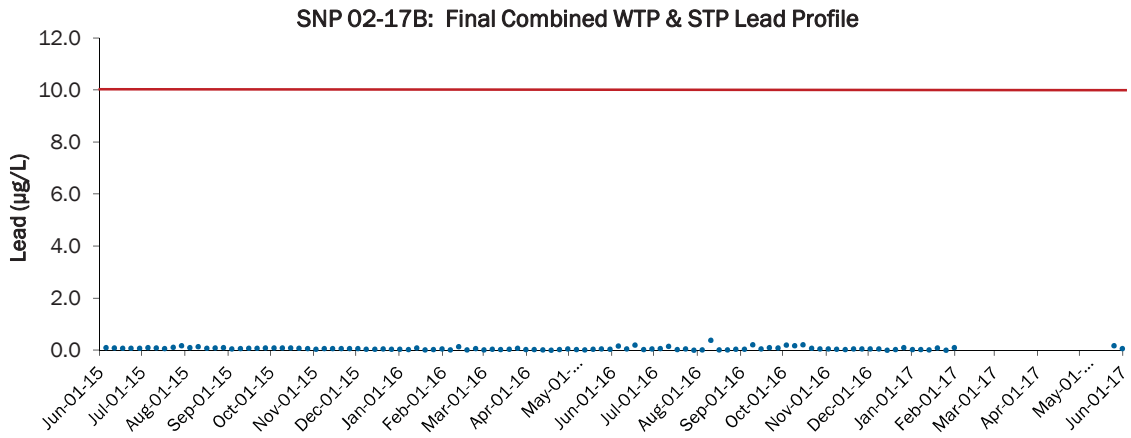


FIGURE 12

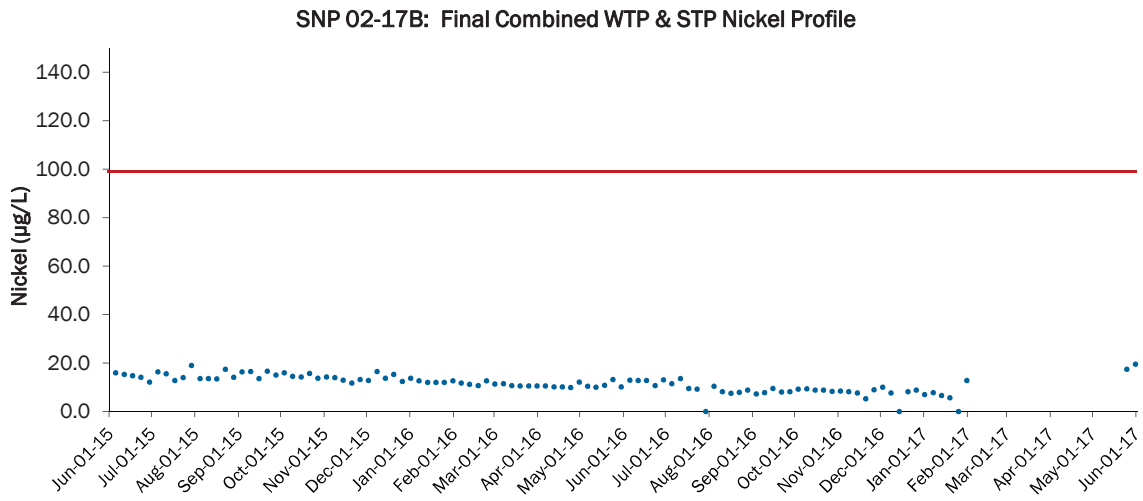


FIGURE 13

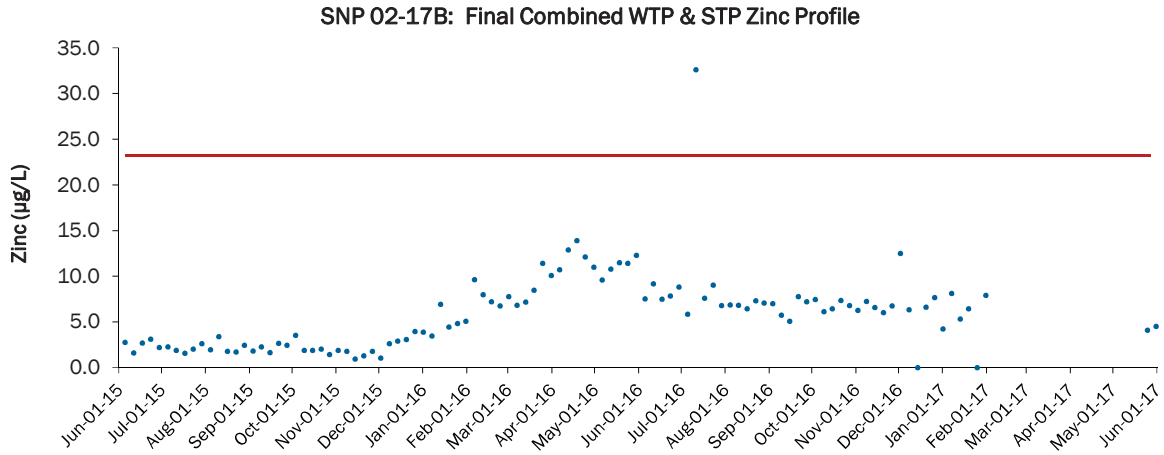


FIGURE 14

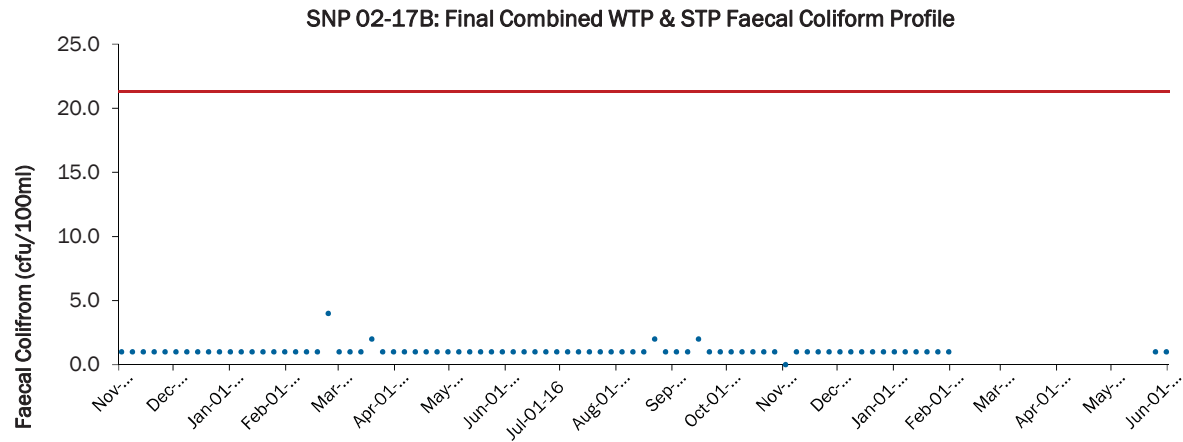
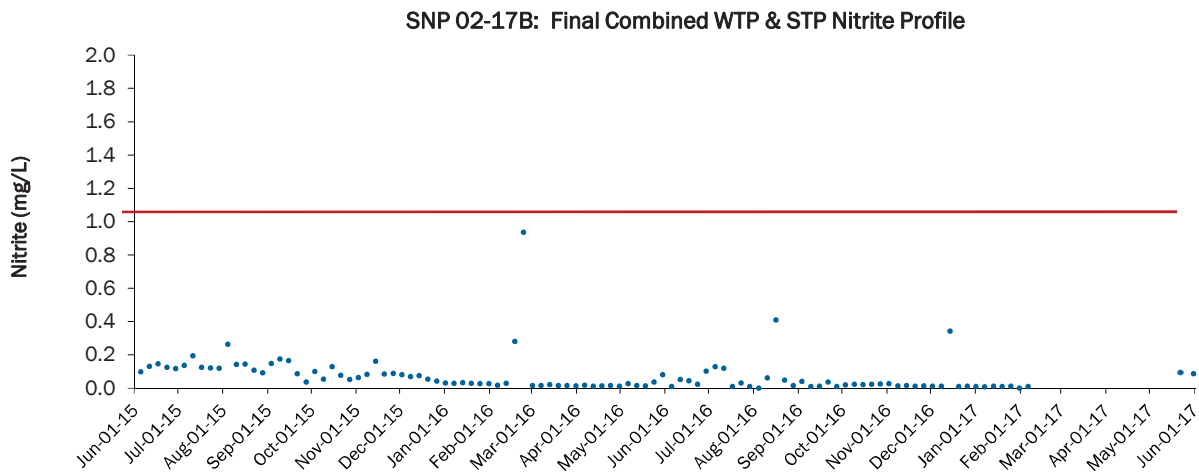


FIGURE 15



Client : 2333 DE BEERS CANADA INC., YELLOWKNIFE (BBY)
Client Project Name & Number : - SNP (MINE:WL MV2011L2-0004)

Job Number: B741552

Test Result:

96 hrs LC50 % vol/vol (95% CL): >100% (N/A) Statistical Method: Visual

Sample Name : 2017-0301 **Sample Matrix :** Water
Description: Yellow, clear **Sample Number:** RD7682-03
Sample Collected: May 28, 2017 04:40 PM **Sampling Method :** N/A **Site Collection:** N/A
Sample Collected By: N/A **Volume Received:** 40 L **Temp.Upon Arrival:** 6 °C **Storage:** 2-6°C
Sample Received: May 30, 2017 09:30 AM **pH:** 7.0 **Dissolved Oxygen:** 10.1 mg/L
Analysis Start : May 31, 2017 10:25 AM **Temperature :** 14 °C **Sample Conductance:** 577 µS/cm

Concentration	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	Start	Start	Start	Start	24 hrs	24 hrs	24 hrs	24 hrs	48 hrs	48 hrs	48 hrs	48 hrs
0	15	8.1	369	8.9	0	0	0	0	0	0	0	0
6.25	15	8.0	383	8.9	0	0	0	0	0	0	0	0
12.5	15	7.9	398	8.9	0	0	0	0	0	0	0	0
25	15	7.7	414	8.8	0	0	0	0	0	0	0	0
50	15	7.5	469	9.1	0	0	0	0	0	0	0	0
100	14	7.1	581	9.4	0	0	0	0	0	0	0	0

Concentration	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	72 hrs	72 hrs	72 hrs	72 hrs	96 hrs	96 hr	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs
0	0	0	0	0	15	7.7	379	8.1	0	0	0	0
6.25	0	0	0	0	15	7.8	393	8.3	0	0	0	0
12.5	0	0	0	0	16	7.9	418	8.1	0	0	0	0
25	0	0	0	0	16	7.8	432	8.0	0	0	0	0
50	0	0	0	0	16	7.7	492	8.2	0	0	0	0
100	0	0	0	0	15	7.4	610	8.6	0	0	0	0

Comments : None

Culture/Control/Dilution Water

City of Edmonton dechlorinated tap water

Hardness:

200 mg/L CaCO₃

Other parameters available on request.

Test Conditions

Test concentration : 0,6.25,12.5,25,50,100 (% vol/vol)

Organisms per Vessel : 10 **Test Temperature :** 15 ± 1 °C **Solution Depth :** >15 cm
Total # of Organisms Used : 60 **Pre-aeration Time :** 60 min. **Rate of Aeration :** 6.5±1 mL/min/L
Test Volume : 20 L **Vessel Volume :** 38L **Test pH Adjusted:** No
Loading Density : 0.2 g/L **Photoperiod :** 16:8 (light: dark)

Test Organism :

Rainbow Trout (*Oncorhynchus mykiss*) Source : Spring Valley Trout Hatchery

Culture Temperature : 15 ± 2 °C **Weight (Mean) +- SD :** 0.41 ± 0.08 g **Length (Mean) +- SD :** 3.70 ± 0.22 cm
Culture Water Renewal : ≥ 1.0 L/min/kg fish **Weight (Range) :** 0.32 – 0.56 g **Length (Range) :** 3.50 – 4.20 cm
Culture Photoperiod : 16:8 (light: dark) **% Mortality within 7 days :** 0%
Feeding rate and frequency : daily: 1-5% biomass of trout. **Acclimation Time:** >14 days

Client : 2333 DE BEERS CANADA INC., YELLOWKNIFE (BBY)
Client Project Name & Number: - SNP (MINE:WL MV2011L2-0004)

Job Number: B741552
Sample Number: RD7682-03

Reference chemical: Phenol
Test Date: May 19, 2017
Test Endpoint 96 hrs LC50 (95% confidence interval) : 8.94 (8.00, 10.0)mg/L
Statistical Method : Binomial
Historical Mean LC50 (warning limits) : 9.88 (6.13, 15.9) mg/L
Concentration : 0,8,10,12,15,20 mg/L

Test Method EPS 1/RM/13
Method Deviations : None

Note: The results contained in this report refer only to the testing of the sample submitted. This report may not be reproduced, except in its entirety, without the written approval of the laboratory.

Analyst : Arthur Juan Mathias, Chelsea Tessier, Natasha Mouck



Verified By : Chelsea Tessier, Senior Analyst

Date: Jun 05, 2017 07:34 AM

Client : 2333 DE BEERS CANADA INC., YELLOWKNIFE (BBY)
Client Project Name & Number : - SNP (MINE:WL MV2011L2-0004)

Job Number: B741552
Sample Number: RD7682-01

Test Result:

48 hrs LC50 % vol/vol (95% CL): >100% (N/A) Statistical Method: Visual

Sample Name : 2017-0301

Sample Matrix : Water

Description: Pale yellow, clear

Sample Prior to Analysis:

Sample Collected: May 28, 2017 04:40 PM

Sampling Method : N/A

pH: 7.1

Sample Collected By: N/A

Site Collection: N/A

Temperature : 20 °C

Sample Received: May 30, 2017 09:30 AM

Volume Received: 1 L

Dissolved Oxygen: 9.7 mg/L

Analysis Start : May 30, 2017 02:17 PM

Temp. Upon Arrival: 6 °C

Sample Conductance: 668 µS/cm

End : Jun 01, 2017 02:54 PM

Storage: 2-6°C

Hardness: 260 mg CaCO₃/L

Concentration	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Immobility (#)	Immobility (%)	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)
% vol/vol	Start	Start	Start	Start	24 hrs	24 hrs	24 hrs	24 hrs	48 hrs	48 hr	48 hrs	48 hrs
0	21	8.3	398	7.6	0	0	0	0	20	8.2	394	7.8
6.25	21	8.3	417	7.6	0	0	0	0	20	8.1	414	7.8
12.5	21	8.3	433	7.7	0	0	0	0	20	8.2	432	7.7
25	20	8.2	467	7.8	0	0	0	0	20	8.1	469	7.7
50	20	8.1	524	8.0	0	0	0	0	20	8.0	530	7.7
100	19	7.4	648	8.6	0	0	0	0	20	7.6	674	7.7

Concentration	Mortality (#)	Mortality (%)	Immobility (#)	Immobility (%)
% vol/vol	48 hrs	48 hrs	48 hrs	48 hrs
0	0	0	0	0
6.25	0	0	0	0
12.5	0	0	0	0
25	0	0	0	0
50	0	0	0	0
100	0	0	0	0

Comments : None

Culture/Control/Dilution Water: City of Edmonton dechlorinated tap water

Hardness: 160 mg/L CaCO₃ Other parameters available on request.

Test Conditions Test concentration : 0,6.25,12.5,25,50,100 (% vol/vol)

Organisms per Vessel : 10 **Pre-aeration Time :** 30 min **Rate of Pre-aeration :** 25-50 mL/min/L

Total # of Organisms Used : 60 **Test Temperature :** 20 ± 2 °C **Test Hardness Adjusted :** No

Test Volume : 150 mL **Vessel Volume :** 225 mL **Test pH Adjusted:** No

Loading Density : 15.0 mL/Daphnia **Photoperiod :** 16:8 (light: dark)

Test Organism : *Daphnia magna* **Source :** In House Culture

Age at Test Initiation : <24 hrs **Average Brood Size :** 23.2

Culture Photoperiod : 16:8 (light: dark) **% Mortality within 7 days :** 4.7

Culture Temperature : 20 ± 2 °C **Time To First Brood :** 9 Days

Culture Diet Pseudokirchneriella and YTC at a ratio of 2 mL/L of culture daily. New cultures weekly, 63 daphnids distributed into 6 culture vessels and 3 reproductive vessels.

Client : 2333 DE BEERS CANADA INC., YELLOWKNIFE (BBY)
Client Project Name & Number: - SNP (MINE:WL MV2011L2-0004)

Job Number: B741552
Sample Number: RD7682-01

Reference chemical: Sodium Chloride
Test Date: May 24, 2017
Test Endpoint 48 hrs LC50 (95% confidence interval) : 7.07 (5.00, 10.0)g/L
Statistical Method : Binomial
Historical Mean LC50 (warning limits) : 6.83 (6.09, 7.66) g/L
Concentration : 0,1.25,2.5,5,10,20 g/L

Test Method EPS 1/RM/14
Method Deviations: None

Note: The results contained in this report refer only to the testing of the sample submitted. This report may not be reproduced, except in its entirety, without the written approval of the laboratory.

Analyst : Arthur Juan Mathias, Chelsea Tessier, Sharon Gyalog



Verified By : Chelsea Tessier, Senior Analyst

Date: Jun 05, 2017 01:54 PM