DE BEERS
GROUP OF COMPANIES

August 31, 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: July 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 July 2017.

Samples were collected from four (4) stations during the reporting period (Figure 1). Underground retreat was completed on February 9 and flooding of the underground workings is on-going.

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 867-767-8967 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: 2017.08.31 17:13:31 -06'00'

Michelle Peters
Superintendent, Environment & Asset

Copied to: M. Sanderson, T.Covey — GNWT
P. di Pizzo, Z. Liu — SLEMA

Snap Lake Mine
Surveillance Network Program
July 2017

Active SNP Stations July 2017

Note: Map excludes station 02-18

Snap Lake Mine
Surveillance Network Program
July 2017

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 The station no longer active.

SNP STATION 02-14: No samples were collected at the SNP 02-14 station in July. No water was pumped to the Water Treatment Plant from the water management pond in the month of July.

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

SNP STATION 02-17 b: Discharge to Snap Lake occurred between May 25th, 2017 and June 30th, ending at 0230 hrs.

SNP STATION 02-20: Samples were collected at the SNP 02-20 stations in July.

RAW WATER CONSUMPTION

The quantity of water extracted from Snap Lake for camp operations, site services, and construction is tabulated in Table 10. 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 on July 6th.

ENVIROMENTAL STUDIES/SURVEYS

Regulatory monitoring of Snap Lake included the following:

- Air Quality Monitoring;
- Monthly SNP monitoring; and

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;
- Wildlife Surveillance Audits.

CONSTRUCTION ACTIVITIES

Crack repair at the upstream slope of the east cell embankment.

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.

WATER MANAGEMENT ACTIVITIES

Water Balance	Table 10
Runoff Water Pumped to Water Management Pond	Table 11

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 are no further processing of ore, depositing of slurry, paste, solids, or liquids to the North Pile or paste underground at this time (Reference Table 12-16).

FUEL STORAGE/TANK FARM

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

SPILLS

There were no reportable spills during the month of July.

AIRSTRIP

Regular monitoring and airstrip maintenance was carried out in July.

CONTAINMENT DAMS

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

Attachment:
SNP Report Data Tables and Figures

SNP Sampling Status July 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.	Inactive	no	–
02-02	North Pile drainage collection ditch	Active	no	–
02-03	Core Facilities area collection ditch near Water Management Pond	Active	no	–
02-04	Uncontrolled surface runoff at culvert by airstrip (3)	Active	no	–
02-05	Uncontrolled surface runoff at Bulk Sample Mine Rock Pad	Active	no	--
02-06	Uncontrolled surface runoff at Quarry Site	Active	no	–
02-07	Uncontrolled surface runoff at Road to Bulk Emulsion Plant (6)	Active	no	--
02-08	Uncontrolled surface runoff at Winter Access Road	Active	no	--
02-09	Uncontrolled surface runoff at Emulsion Plant Area (6)	Active	no	–
02-10	Any other points where observable flow to Snap Lake or IL5 is observed	Active	no	--
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	no	–
02-15	Water Intake from Snap Lake	Active	yes	2
02-16 i	Sewage Discharge from Sewage Treatment Plant prior to mixing with Water Treatment Plant Effluent (2)	Active	yes	3
02-17 b	Final Combined Water Treatment Plant, Water Treatment Plant Monthly Rolling Average and Daily Inline Chloride and Measured Total Dissolved Solids of Effluent	Active	no	–
02-18	Whole Lake Total Dissolved Solids, Calcium, and Chloride (several sites within the main lake basin of Snap Lake)	Active	Yes	7
02-19	SNP Station Removed effective November 16th 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	yes	8
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	–

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: 02-15
WATER INTAKE FROM SNAP LAKE
LICENCE # MV2011L2-0004

Date Sampled:	2017-Jul-03	2017-Jul-05	2017-Jul-03	2017-Jul-03	2017-Jul-03	2017-Jul-03
Sample Control Number:	2017-0651	2017-0664	2017-0652	2017-0656	2017-0653	2017-0657
QAQC Type:	Sample	Split Sample	Duplicate Sample	Split Sample	Triplicate Sample	Split Sample
pH (unitless) [Physical]	7.54		7.54		n/a	
Specific Conductivity (µS/cm) [Physical]	478		477		n/a	
Total Dissolved Solids (mg/L) (Measured)	331		325		346	
Total Dissolved Solids, calculated (lab) (mg/L)	228		231		225	
Calcium (mg/L)	43.8		45.1		47.7	
Chloride (mg/L)	107		108		104	
Fluoride (mg/L)	0.176		0.181		0.15	
Hardness, as CaCO3 (mg/L)	136		139		144	
Magnesium (mg/L)	6.36		6.37			
Potassium (mg/L)	2.50		2.55		2.26	
Sodium (mg/L)	24.5		25.6		23.7	
Sulphate (mg/L)	21.0		21.4		19	
Total Alkalinity, as CaCO3 (mg/L) [Major Ions]	33.7		32.9		33.2	
Nitrate, as N (mg/L)	0.439		0.445		0.449	
Total Magnesium (µg/L)					5980	
E. coli MPN/100ml		< 1.0		< 1.0		< 1.0
pH (unitless) [Field]	7.1	n/a	n/a	n/a	7.1	n/a
Specific Conductivity (µS/cm) [Field]	665	n/a	n/a	n/a	665	n/a
Water Temperature (deg. C) [Field]	15.9	n/a	n/a	n/a	15.9	n/a

TABLE 3

SNP STATION: 02-16i

SEWAGE DISCHARGE FROM SEWAGE TREATMENT PLANT PRIOR TO MIXING WITH WATER TREATMENT PLANT EFFLUENT

Date Sampled:	3-Jul-17	3-Jul-17	10-Jul-17	17-Jul-17	24-Jul-17	31-Jul-17
Sample Control Number:	2017-0649	2017-0650	2017-0668	2017-0671	2017-0672	2017-0373
QAQC Type:	Sample	Duplicate Sample	Sample	Sample	Sample	Sample
Ammonia as Nitrogen	2.19	2.21	2.84	5.33	6.48	5.48
Biochemical Oxygen Demand	< 2	< 2	6	5	6	5
Organic Carbon, Total	20.1	20.2	21.4	21.9	33.3	25.8
Ortho-Phosphate as Phosphorus	6.68	6.69	6.70	6.28	6.41	6.12
Phosphorous, Dissolved	6.62	6.78	6.84	6.34	6.06	6.90
Phosphorous, Total	7.04	6.97	7.64	7.57	6.89	7.72
Solids, Total Suspended	12	14	48	47	35	29
Nitrate as Nitrogen	30.8	30.8	30	33.5	33.0	36.0
Nitrite as Nitrogen	0.29	0.3	0.69	0.47	0.25	0.23
Coliforms, Fecal	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Escherichia coli	< 1	< 1	< 1	< 1	< 1	< 1
Hexane Extractable Material	< 2.0	< 2.0	< 2.0	2.1	< 2.0	<2.0
Kjeldahl Nitrogen, Total	4.6	4.3	8.42	11.7	8.01	8.81
pH (unitless) [Field]	6.25	6.25	6.23	5.65	5.71	5.64
Specific Conductivity (µS/cm) [Field]	1059	1059	1040	1051	981	1020
Water Temperature (deg. C) [Field]	22.8	22.8	23.2	19.9	19.6	19.0

General Notes: Parameters in addition to those requested by the water license were analyzed. This data will be used in water quality modeling for the mine.

TABLE 4

QA/QC: Travel Blank (ALS)

LICENCE # MV2011L2-0004

Date Sampled:	2017-07-03
Sample Control Number:	2017-0661
QAQC Type:	Travel Blank
pH (unitless) [Physical]	4.92
Specific Conductivity (µS/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)	< 0.10
Acidity to pH 4.5, as CaCO3 (mg/L)	< 5.0
Bicarbonate, as HCO3 (mg/L)	< 5.0
Calcium (mg/L)	< 0.020
Carbonate, as CO3 (mg/L)	< 5.0
Chloride (mg/L)	< 0.50
Fluoride (mg/L)	< 0.020
Hardness, as CaCO3 (mg/L)	< 1.0
Hydroxide, as OH (mg/L)	< 5.0
Ion Balance (%)	Low TDS
Magnesium (mg/L)	< 0.0050
Potassium (mg/L)	< 0.050
Reactive Silica, as SiO2 (mg/L)	< 0.010
Sodium (mg/L)	< 0.050
Sulphate (mg/L)	< 0.050
Total Alkalinity, as CaCO3 (mg/L) [Major Ions]	< 2.0
BOD (5-day) (mg/L)	< 2.0
Nitrate, as N (mg/L)	< 0.0050
Nitrate/Nitrite, as N (mg/L)	< 0.0051
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 (µg/L)	< 0.30
Total Antimony (µg/L)	< 0.020
Total Arsenic (µg/L)	< 0.020
Total Barium (µg/L)	< 0.050
Total Beryllium (µg/L)	< 0.010
Total Bismuth (µg/L)	< 0.010
Total Boron (µg/L)	< 1.0
Total Cadmium (µg/L)	< 0.0050
Total Cesium (µg/L)	< 0.0050
Total Chromium (µg/L)	< 0.060

TABLE 4

QA/QC: Travel Blank (ALS)

LICENCE # MV2011L2-0004

Date Sampled:	2017-07-03
Sample Control Number:	2017-0661
QAQC Type:	Travel Blank
Total Cobalt (µg/L)	< 0.010
Total Copper (µg/L)	< 0.10
Total Iron (µg/L)	1.1
Total Lead (µg/L)	< 0.010
Total Lithium (µg/L)	< 0.50
Total Manganese (µg/L)	< 0.050
Total Mercury (µg/L)	< 0.020
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 Silver (µg/L)	< 0.0050
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 Bismuth (µg/L)	< 0.010
Dissolved Boron (µg/L)	< 1.0
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)	0.080 XM XM
Dissolved Rubidium (µg/L)	< 1.0
Dissolved Selenium (µg/L)	< 0.040
Dissolved Silver (µg/L)	< 0.0050

TABLE 4

QA/QC: Travel Blank (ALS)

LICENCE # MV2011L2-0004

Date Sampled:	2017-07-03
Sample Control Number:	2017-0661
QAQC Type:	Travel Blank
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
o-Xylene (mg/L)	< 0.00050
Toluene (mg/L)	< 0.00050
Xylene (mg/L)	< 0.00071

TABLE 5
QA/QC: Field Blank (ALS)
LICENCE # MV2011L2-0004

Date Sampled:	2017-07-03
Sample Control Number:	2017-0654
QAQC Type:	Field Blank
pH (unitless) [Physical]	5.07
Specific Conductivity (µS/cm) [Physical]	< 2.0
Total Dissolved Solids (mg/L) (Measured)	< 10
Total Dissolved Solids, calculated (lab) (mg/L)	< 1.3
Calcium (mg/L)	< 0.020
Chloride (mg/L)	< 0.50
Fluoride (mg/L)	< 0.020
Hardness, as CaCO3 (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 CaCO3 (mg/L) [Major Ions]	< 2.0
Nitrate, as N (mg/L)	< 0.0050

TABLE 6
QA/QC: FIELD BLANK (TAIGA)
LICENCE # MV2011L2-0004

Date Sampled:	24-Jul-17
Sample Control Number:	2017-0673
QAQC Type:	Sample
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)	< 0.002
Total Ammonia, as N (mg/L)	0.028
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)	< 2.0
E. coli (MPN/100mL)	< 1.0
Fecal Coliform (CFU/100mL)	< 1

TABLE 7
SNP 02-18 (SNAP 03, SNAP 05, SNAP 06, SNAP 08, SNAP 11A)
LICENCE # MV2011L2-0004

Station:	SNAP03	SNAP05	SNAP06	SNAP08	SNAP11A
Date Sampled:	2017-07-21	2017-07-21	2017-07-20	2017-07-20	2017-07-20
Sample Control Number:	2017-5042	2017-5043	2017-5044	2017-5046	2017-5045
QAQC Type:	Sample	Sample	Sample	Sample	Sample
pH (unitless) [Physical]	7.88 WH	7.9 WH	7.9 WH	7.83 WH	7.82 WH
Specific Conductivity (µS/cm) [Physical]	659	661	667	671	667
Total Dissolved Solids, calculated (mg/L)[(a)]	334 WH	339 WH	339 WH	341 WH	349 WH
Total Dissolved Solids (mg/L) (Measured)	552	536	537	551	530
Total Suspended Solids (mg/L)	<3	<3	<3	<3	<3
Turbidity-Unfiltered (NTU)	0.61 WH	0.48 WH	0.49 WH	0.47 WH	0.48 WH
Bicarbonate, as HCO_3 (mg/L)	54.5	54.8	53.9	54	54.4
Calcium (mg/L)	70.5	72.7	71.1	69.2	71.4
Carbonate, as CO_3 (mg/L)	<5	<5	<5	<5	<5
Chloride (mg/L)	157	158	158	162	158
Fluoride (mg/L)	0.237	0.226	0.243	0.236	0.234
Hardness, as $CaCO_3$ (mg/L)	211	218	215	210	223
Hydroxide, as OH (mg/L)	<5	<5	<5	<5	<5
Ion Balance (%)	97.2	100	99.9	96.7	108
Magnesium (mg/L)	8.38	8.76	8.98	9	10.9
Potassium (mg/L)	2.74	2.86	3.01	2.93	3.49
Reactive Silica, as SiO_2 (mg/L)	0.202	0.221	0.212	0.168	0.202
Sodium (mg/L)	35.7	37.1	38	38.2	45.8
Sulphate (mg/L)	29.4	29.5	29.6	29.8	29.5
Total Alkalinity, as $CaCO_3$ (mg/L) [Major Ions]	44.7	44.9	44.2	44.3	44.6
Dissolved Inorganic Phosphorus (mg-P/L) [Nutrients]	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Organic Phosphorus, calculated (mg-P/L) [Nutrients]	<0.0014	<0.0014	0.047	0.0587	0.0456
Nitrate, as N, (mg-N/L)	0.674 WH	0.674 WH	0.679 WH	0.586 WH	0.68 WH
Nitrate/Nitrite, as N, calculated (mg-N/L)	0.679 WH	0.68 WH	0.685 WH	0.593 WH	0.684 WH
Nitrite, as N (mg-N/L)	0.0053 WH	0.0051 WH	0.0056 WH	0.0067 WH	0.0048 WH
ortho-Phosphate, as P (mg-P/L) [Nutrients]	<0.001 WH	<0.001 WH	<0.001 WH	<0.001 WH	<0.001 WH
Total Ammonia, as N (mg-N/L)	0.0088	0.0077	0.0065	0.0123	0.0056
Total Dissolved Phosphorus (mg-P/L) [Nutrients]	<0.001	<0.001	0.047[(b)]	0.0587[(b)]	0.0456
Total Inorganic Phosphorus (mg-P/L) [Nutrients]	<0.001	<0.001	<0.001	<0.001	<0.001
Total Kjeldahl Nitrogen (mg-N/L)	0.314	0.246	0.282	0.251	0.29

TABLE 7
SNP 02-18 (SNAP 03, SNAP 05, SNAP 06, SNAP 08, SNAP 11A)
LICENCE # MV2011L2-0004

Station:	SNAP03	SNAP05	SNAP06	SNAP08	SNAP11A
Date Sampled:	2017-07-21	2017-07-21	2017-07-20	2017-07-20	2017-07-20
Sample Control Number:	2017-5042	2017-5043	2017-5044	2017-5046	2017-5045
QAQC Type:	Sample	Sample	Sample	Sample	Sample
Total Organic Carbon (mg/L)	3	3.2	3.1	3.1	2.9
Total Organic Phosphorus, calculated (mg-P/L) [Nutrients]	0.0087	0.0575	0.003	0.0032	0.0519
Total Phosphorus (mg-P/L) [Nutrients]	0.0087	0.0575	0.003[(b)]	0.0032[(b)]	0.0519
pH (unitless) [Field]	8.16	7.86	8.11	7.95	8.07
Specific Conductivity (µS/cm) [Field]	694.7	697.2	698.5	709.2	700.1
Water Temperature (deg. C) [Field]	15.26	15.12	15.03	14.01	14.87
Dissolved Oxygen (mg/L) [Field]	9.87	9.93	9.9	10.13	9.9

Notes:

Results are DRAFT and are subject to change pending completion of final quality assurance checks.

Water samples were collected from the mid-depth of the water column; conductivity gradients were not observed.

WH = warning, hold time was exceeded.

a) Total dissolved solids calculated using Methods 1030 E in Standard Methods for the Examination of Water and Wastewater, 22nd Edition (APHA 2012).

b) Value was of questionable data quality due to the variance in duplicate samples and is under review. Repeat analysis of the sample was requested for confirmation.

Abbreviations in parameter names: HCO_3 = bicarbonate; $CaCO_3$ = calcium carbonate; CO_3 = carbonate; OH = hydroxide; SiO_2 = silicate; BOD = biochemical oxygen demand; N = nitrogen; P = phosphorus; BTEX = benzene, toluene, ethylbenzene, and xylene; *E. coli* = *Escherichia coli* ; F1 (C_6-C_{10}) = hydrocarbon fraction 1 encompasses the range of equivalent carbon number from C_6 to C_{10}; F2 (>C_{10}-C_{16}) = hydrocarbon fraction 2 encompasses the range of equivalent carbon number from >C_{10} to C_{16}; Flett = Flett Research Limited; Taiga = Taiga Environmental Laboratory.

Other symbols and abbreviations: < = less than; > = greater than.

Abbreviations for units: deg. C = degree Celsius; µS/cm = microSiemens per centimetre; mg/L = milligrams per litre; NTU = nephelometric turbidity units; mg-P/L = milligrams of phosphorus per litre; mg-N/L = milligrams of nitrogen per litre; µg/L = micrograms per litre; % = percent; MPN/100 mL = most probable number per 100 millilitres.

APHA (American Public Health Association). 2012 . Standard Methods for the Examination of Water and Wastewater, 22nd Edition, with updates to 2015. Washington, DC, USA.

TABLE 8
SNP Station: 02-20 (d, e, f)
LICENCE # MV2011L2-0004

Station	02-20d	02-20e	02-20f	02-20d
Date Sampled:	2017-07-22	2017-07-22	2017-07-22	2017-07-22
Sample Control Number:	2017-5039	2017-5040	2017-5041	2017-5052
QAQC Type:	Sample	Sample	Sample	Duplicate Sample
pH (unitless) [Physical]	7.91 WH	7.81 WH	7.88 WH	7.92 WH
Specific Conductivity (µS/cm) [Physical]	677	667	671	672
Total Dissolved Solids, calculated (mg/L)[(a)]	330 WH	329 WH	329 WH	330 WH
Total Dissolved Solids (mg/L) (Measured)	475	548	443	498
Total Suspended Solids (mg/L)	<3	<3	<3	<3
Turbidity-Unfiltered (NTU)	0.29 WH	0.55 WH	0.28 WH	0.37 WH
Bicarbonate, as HCO_3 (mg/L)	56	55.1	55.1	55.6
Calcium (mg/L)	66.5	65.4	66.6	67.6
Carbonate, as CO_3 (mg/L)	<5	<5	<5	<5
Chloride (mg/L)	157	157	157	157
Fluoride (mg/L)	0.203	0.203	0.199	0.205
Hardness, as $CaCO_3$ (mg/L)	201	199	200	203
Hydroxide, as OH (mg/L)	<5	<5	<5	<5
Ion Balance (%)	93.3	93.2	93.2	93.3
Magnesium (mg/L)	8.52	8.59	8.24	8.25
Potassium (mg/L)	2.97	2.99	2.95	2.89
Reactive Silica, as SiO_2 (mg/L)	0.21	0.329	0.189	0.194
Sodium (mg/L)	35	35.7	34.8	34.1
Sulphate (mg/L)	29.3	29.1	29.1	29.3
Total Alkalinity, as $CaCO_3$ (mg/L) [Major Ions]	45.9	45.2	45.2	45.6
BOD (5-day) (mg/L)	<2 WH	<2 WH	<2 WH	<2 WH
Dissolved Inorganic Phosphorus (mg-P/L) [Nutrients]	<0.001	<0.001	<0.001	<0.001
Dissolved Organic Phosphorus, calculated (mg-P/L) [Nutrients]	0.0029	0.0372	0.0014	<0.0014
Nitrate, as N, (mg-N/L)	0.67 WH	0.672 WH	0.659 WH	0.668 WH
Nitrate/Nitrite, as N, calculated (mg-N/L)	0.675 WH	0.676 WH	0.664 WH	0.673 WH
Nitrite, as N (mg-N/L)	0.0045 WH	0.0048 WH	0.0041 WH	0.0046 WH

TABLE 8
SNP Station: 02-20 (d, e, f)
LICENCE # MV2011L2-0004

Station	02-20d	02-20e	02-20f	02-20d
Date Sampled:	2017-07-22	2017-07-22	2017-07-22	2017-07-22
Sample Control Number:	2017-5039	2017-5040	2017-5041	2017-5052
QAQC Type:	Sample	Sample	Sample	Duplicate Sample
ortho-Phosphate, as P (mg-P/L) [Nutrients]	<0.001 WH	<0.001 WH	<0.001 WH	<0.001 WH
Total Ammonia, as N (mg-N/L)	0.0071	<0.005	<0.005	<0.005
Total Dissolved Phosphorus (mg-P/L) [Nutrients]	0.0029	0.0372	0.0014	<0.001
Total Inorganic Phosphorus (mg-P/L) [Nutrients]	<0.001	<0.001	<0.001	<0.001
Total Kjeldahl Nitrogen (mg-N/L)	0.285	0.271	0.252	0.315
Total Organic Carbon (mg/L)	2.8	3	3	3.2
Total Organic Phosphorus, calculated (mg-P/L) [Nutrients]	0.0065[(b)]	0.0418	0.0603	0.0378[(b)]
Total Phosphorus (mg-P/L) [Nutrients]	0.0065[(b)]	0.0418	0.0603	0.0378[(b)]
Hexavalent Chromium (µg/L)	<1	<1	<1	<1
Total Aluminum (µg/L)	6.26	6.47	6.48	5.98
Total Antimony (µg/L)	0.05	0.367	0.037	0.027
Total Arsenic (µg/L)	0.068	0.076	0.076	0.068
Total Barium (µg/L)	24.7	24.1	24	24.2
Total Beryllium (µg/L)	<0.01	<0.01	<0.01	<0.01
Total Bismuth (µg/L)	<0.01	<0.01	<0.01	<0.01
Total Boron (µg/L)	61	63.8	59.5	71.4
Total Cadmium (µg/L)	<0.005	<0.005	<0.005	<0.005
Total Cesium (µg/L)	0.0399	0.0396	0.0399	0.0396
Total Chromium (µg/L)	<0.06	<0.06	<0.06	<0.06
Total Cobalt (µg/L)	0.024	0.028	0.024	0.022
Total Copper (µg/L)	0.48	0.5	0.44	0.47
Total Iron (µg/L)	7.8	8.7	8	7.6
Total Lead (µg/L)	<0.01	<0.01	<0.01	<0.01
Total Lithium (µg/L)	9.78	10.1	9.63	9.76
Total Manganese (µg/L)	6.15	6.68	6.48	6.12
Total Mercury (µg/L)	<0.02	<0.02	<0.02	<0.02

TABLE 8
SNP Station: 02-20 (d, e, f)
LICENCE # MV2011L2-0004

Station	02-20d	02-20e	02-20f	02-20d
Date Sampled:	2017-07-22	2017-07-22	2017-07-22	2017-07-22
Sample Control Number:	2017-5039	2017-5040	2017-5041	2017-5052
QAQC Type:	Sample	Sample	Sample	Duplicate Sample
Total Mercury (µg/L) (Lab: Flett)	<0.0005	0.00051	<0.0005	<0.0005
Total Molybdenum (µg/L)	1.42	1.49	1.45	1.42
Total Nickel (µg/L)	1.3	1.37	1.26	1.29
Total Rubidium (µg/L)	4	4	4	4
Total Selenium (µg/L)	<0.04	<0.04	<0.04	<0.04
Total Silver (µg/L)	<0.005	<0.005	<0.005	<0.005
Total Strontium (µg/L)	835	837	830	829
Total Thallium (µg/L)	0.007	0.0075	0.0068	0.008
Total Titanium (µg/L)	<0.1	<0.1	<0.1	<0.1
Total Uranium (µg/L)	0.459	0.457	0.473	0.472
Total Vanadium (µg/L)	<0.05	<0.05	<0.05	<0.05
Total Zinc (µg/L)	<0.8	<0.8	<0.8	<0.8
Dissolved Aluminum (µg/L)	5.59	5.14	5.3	5.5
Dissolved Antimony (µg/L)	0.044	0.148	0.029	0.034
Dissolved Arsenic (µg/L)	0.071	0.066	0.067	0.066
Dissolved Barium (µg/L)	24	24.1	24.2	23.9
Dissolved Beryllium (µg/L)	<0.01	<0.01	<0.01	<0.01
Dissolved Bismuth (µg/L)	<0.01	<0.01	<0.01	<0.01
Dissolved Boron (µg/L)	67.1	72.2	65.5	68.4
Dissolved Cadmium (µg/L)	<0.005	<0.005	<0.005	<0.005
Dissolved Cesium (µg/L)	0.0404	0.0403	0.0406	0.0395
Dissolved Chromium (µg/L)	<0.06	<0.06	<0.06	<0.06
Dissolved Cobalt (µg/L)	0.019	0.02	0.023	0.023
Dissolved Copper (µg/L)	0.44	0.58	0.45	0.45
Dissolved Iron (µg/L)	1.8	2.2	2.2	2.9
Dissolved Lead (µg/L)	<0.01	<0.01	<0.01	<0.01

TABLE 8
SNP Station: 02-20 (d, e, f)
LICENCE # MV2011L2-0004

Station	02-20d	02-20e	02-20f	02-20d
Date Sampled:	2017-07-22	2017-07-22	2017-07-22	2017-07-22
Sample Control Number:	2017-5039	2017-5040	2017-5041	2017-5052
QAQC Type:	Sample	Sample	Sample	Duplicate Sample
Dissolved Lithium (µg/L)	10.7	10.5	10.3	10.7
Dissolved Manganese (µg/L)	1.94	1.63	1.98	1.88
Dissolved Mercury (µg/L)	<0.02	<0.02	<0.02	<0.02
Dissolved Molybdenum (µg/L)	1.54	1.44	1.48	1.53
Dissolved Nickel (µg/L)	1.28	1.28	1.27	1.24
Dissolved Rubidium (µg/L)	4.1	4.1	4	4
Dissolved Selenium (µg/L)	<0.04	<0.04	<0.04	<0.04
Dissolved Silver (µg/L)	<0.005	<0.005	<0.005	<0.005
Dissolved Strontium (µg/L)	886	856	871	881
Dissolved Thallium (µg/L)	0.0073	0.0082	0.0071	0.0068
Dissolved Titanium (µg/L)	<0.1	<0.1	<0.1	<0.1
Dissolved Uranium (µg/L)	0.458	0.459	0.47	0.464
Dissolved Vanadium (µg/L)	<0.05	<0.05	<0.05	<0.05
Dissolved Zinc (µg/L)	1.02	2.58	<0.8	0.85
F2 (>C_{10}-C_{16}) (mg/L)	<0.1	<0.1	<0.1	<0.1
Oil & Grease (mg/L)	<1	<1	<1	4.4
BTEX, calculated (mg/L)	<0.00071	<0.00071	<0.00071	<0.00071
Benzene (mg/L)	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene (mg/L)	<0.0005	<0.0005	<0.0005	<0.0005
F1 (C_6-C_{10}) (mg/L)	<0.1	<0.1	<0.1	<0.1
F1-BTEX (mg/L)	<0.1	<0.1	<0.1	<0.1
m&p-Xylene (mg/L)	<0.0005	<0.0005	<0.0005	<0.0005
o-Xylene (mg/L)	<0.0005	<0.0005	<0.0005	<0.0005
Toluene (mg/L)	<0.0005	<0.0005	<0.0005	<0.0005
Xylene (mg/L)	<0.00071	<0.00071	<0.00071	<0.00071
E. coli (MPN/100 mL) (Lab: Taiga)	<1 WH	<1 WH	<1 WH	<1 WH

TABLE 8
SNP Station: 02-20 (d, e, f)
LICENCE # MV2011L2-0004

Station	02-20d	02-20e	02-20f	02-20d
Date Sampled:	2017-07-22	2017-07-22	2017-07-22	2017-07-22
Sample Control Number:	2017-5039	2017-5040	2017-5041	2017-5052
QAQC Type:	Sample	Sample	Sample	Duplicate Sample
pH (unitless) [Field]	8.09	7.67	8.16	8.09
Specific Conductivity (µS/cm) [Field]	695.6	695.6	696	695.6
Water Temperature (deg. C) [Field]	15.57	14.93	15.53	15.57
Dissolved Oxygen (mg/L) [Field]	9.88	9.9	9.91	9.88

Notes:

Results are DRAFT and are subject to change pending completion of final quality assurance checks.

Water samples were collected from the mid-depth of the water column; conductivity gradients were not observed.

WH = warning, hold time was exceeded.

a) Total dissolved solids calculated using Methods 1030 E in Standard Methods for the Examination of Water and Wastewater, 22nd Edition (APHA 2012).

b) Value was of questionable data quality due to the variance in duplicate samples and is under review. Repeat analysis of the sample was requested for confirmation.

Abbreviations in parameter names: HCO_3 = bicarbonate; $CaCO_3$ = calcium carbonate; CO_3 = carbonate; OH = hydroxide; SiO_2 = silicate; BOD = biochemical oxygen demand; N = nitrogen; P = phosphorus; BTEX = benzene, toluene, ethylbenzene, and xylene; *E. coli* = *Escherichia coli*; F1 (C_6-C_{10}) = hydrocarbon fraction 1 encompasses the range of equivalent carbon number from C_6 to C_{10}; F2 ($>C_{10}$-C_{16}) = hydrocarbon fraction 2 encompasses the range of equivalent carbon number from $>C_{10}$ to C_{16}; Flett = Flett Research Limited; Taiga = Taiga Environmental Laboratory.

Other symbols and abbreviations: < = less than; > = greater than.

Abbreviations for units: deg. C = degree Celsius; µS/cm = microSiemens per centimetre; mg/L = milligrams per litre; NTU = nephelometric turbidity units; mg-P/L = milligrams of phosphorus per litre; mg-N/L = milligrams of nitrogen per litre; µg/L = micrograms per litre; % = percent; MPN/100 mL = most probable number per 100 millilitres.

APHA (American Public Health Association). 2012 . Standard Methods for the Examination of Water and Wastewater, 22nd Edition, with updates to 2015. Washington, DC, USA.

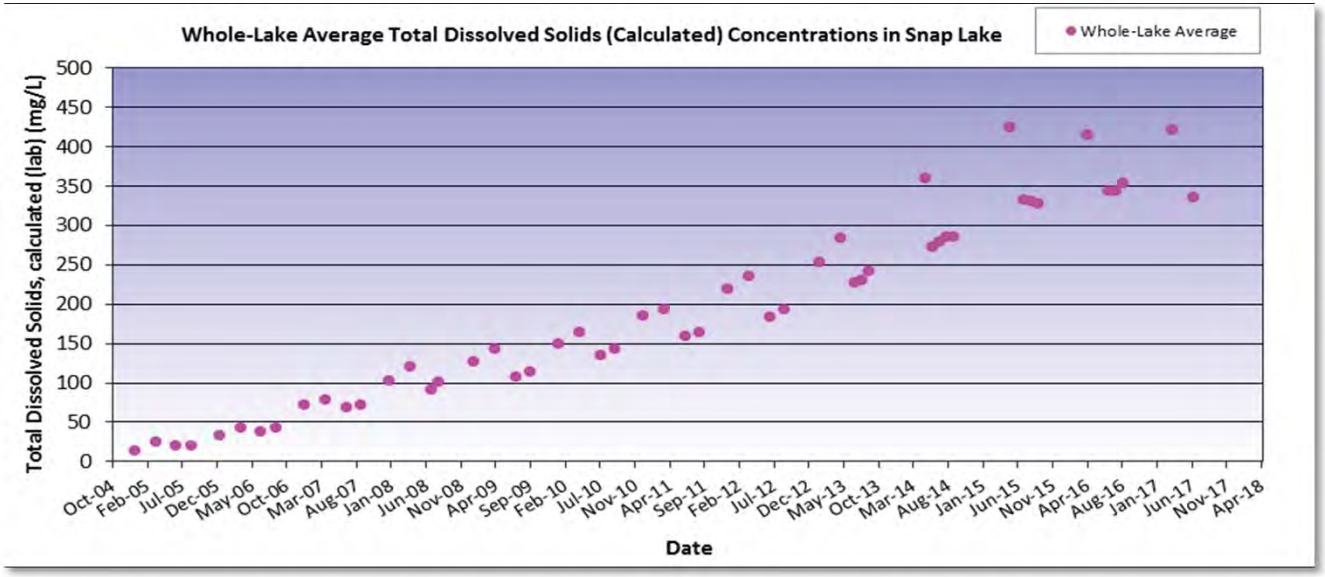
TABLE 9 & FIGURES 1, 2 3

SNP Snap Lake Whole-Lake Average

LICENCE # MV2011L2-0004

MONTH	TOTAL DISSOLVED SOLIDS, CALCULATED	CHLORIDE	SULPHATE
APR	423	201	36.6
JUL	336	158	29.4
AUG	-	-	-
SEP	-	-	-

Figure 1. Whole Lake Average Total Dissolved Solids (Calculated) Concentrations in Snap Lake



Note: Total dissolved solids concentrations were calculated as per Method 1030 E in the Standard Methods for the Examination of Water and Wastewater (APHA 2005).

TABLE 9 & FIGURES 1, 2 3

SNP Snap Lake Whole-Lake Average

LICENCE # MV2011L2-0004

Figure 2. Whole Lake Average Chloride Concentrations in Snap Lake

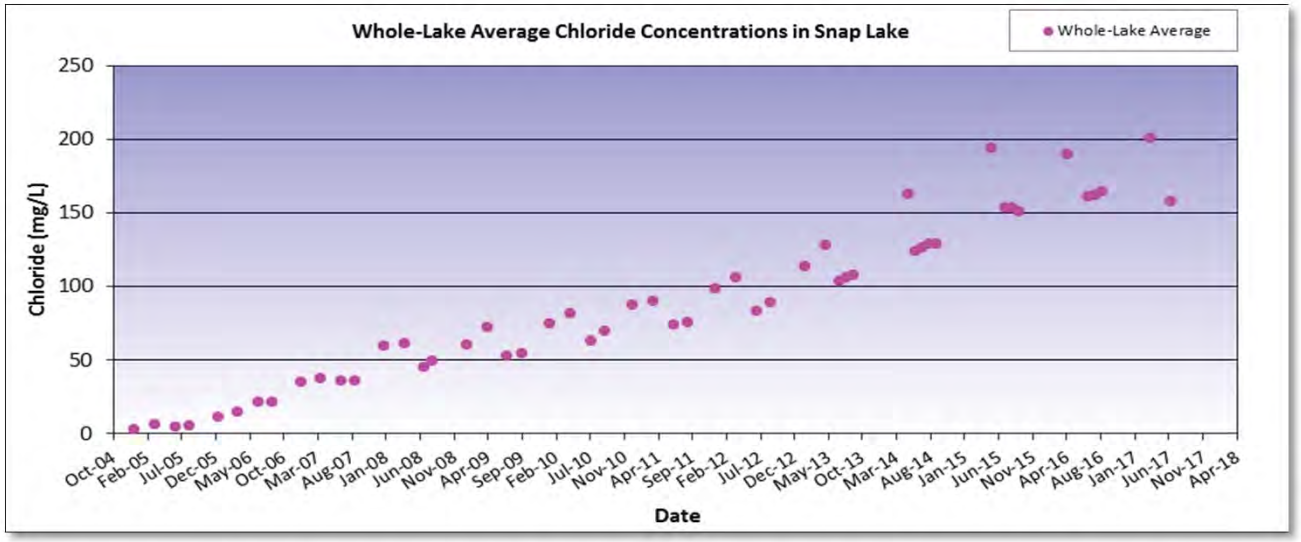


Figure 3. Whole Lake Average Sulphate Concentrations in Snap Lake

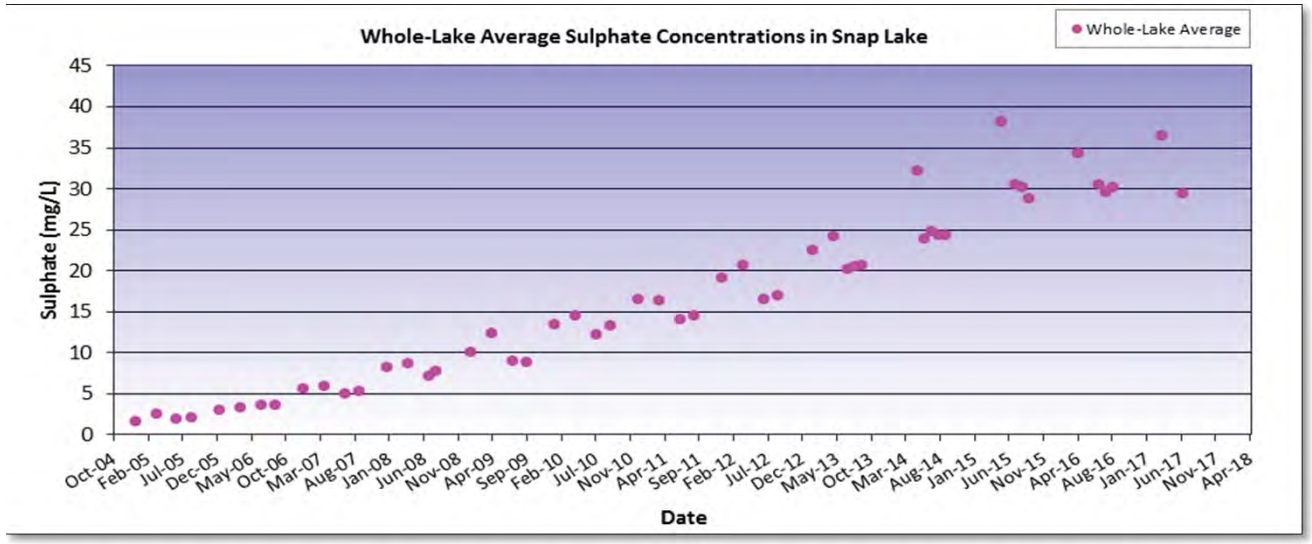


TABLE 10
WATER BALANCE

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	2,620	210	0	0	0	0	0	178,871	0
JUL	1,819	218	0	30	0	0	0	0	0
AUG									
SEP									
OCT									
NOV									
DEC									
TOTAL	25,935	3,227	15,644	30	600,075	162,774	274,874	1,124,228	143,334

TABLE 11

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	123,036	0	0	0	0	0	123,036
JUL	7,629	0	0	0	0	0	7,629
AUG							
SEP							
OCT							
NOV							
DEC							
TOTAL	**219,257**	**0**	**0**	**0**	**0**	**143,475**	**362,732**

TABLE 12

QUANTITY OF ORE PROCESSED

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

TABLE 13

QUANTITY OF SLIMES AND PASTE 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	0	0
AUG		
SEP		
OCT		
NOV		
DEC		
TOTAL	0	0

TABLE 14
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	0	0
AUG		
SEP		
OCT		
NOV		
DEC		
TOTAL	0	0

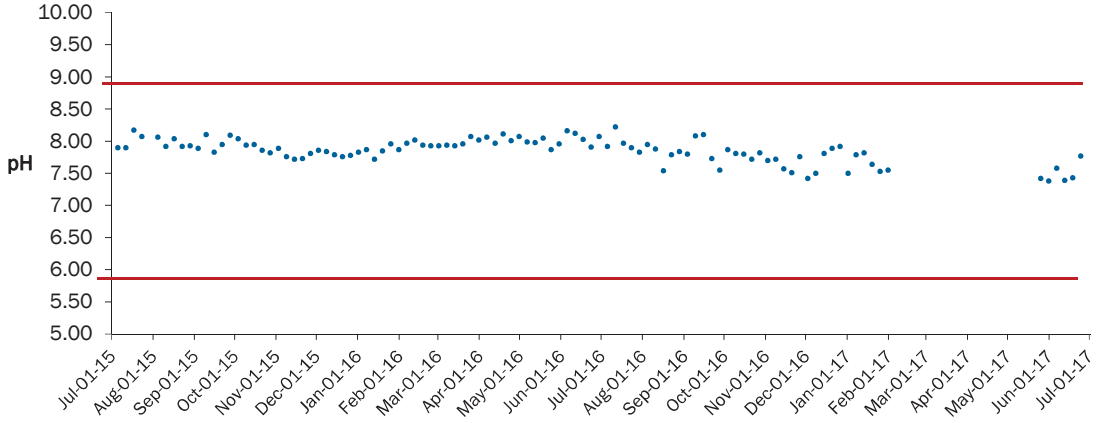
TABLE 15
QUANTITY OF SOLIDS DEPOSITED TO THE NORTH PILE

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	0	0
JUL	0	0
AUG		
SEP		
OCT		
NOV		
DEC		
TOTAL	0	0

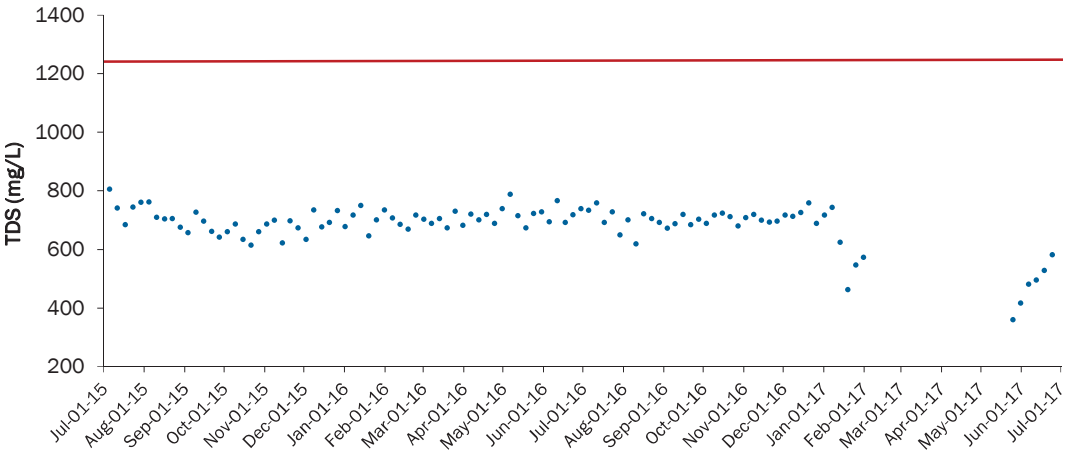
TABLE 16
QUANTITY OF PASTE DEPOSITED UNDERGROUND

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

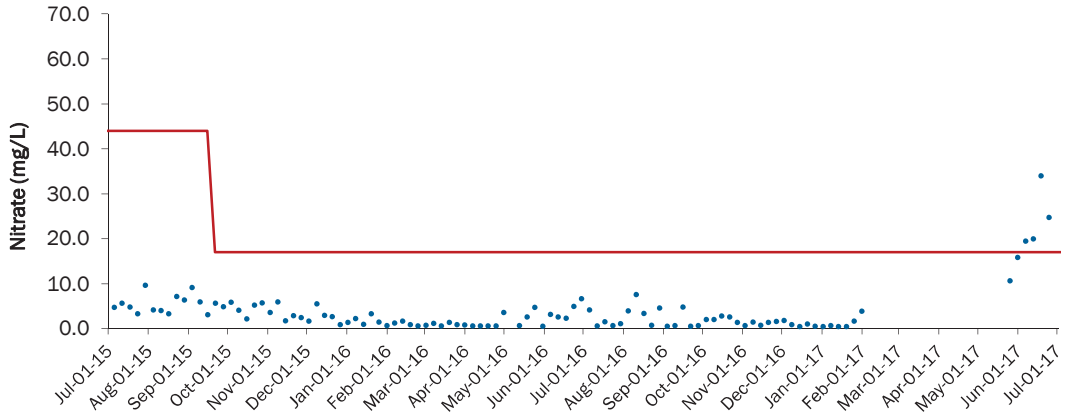
SNP 02-17B: Final Combined WTP & STP pH Profile



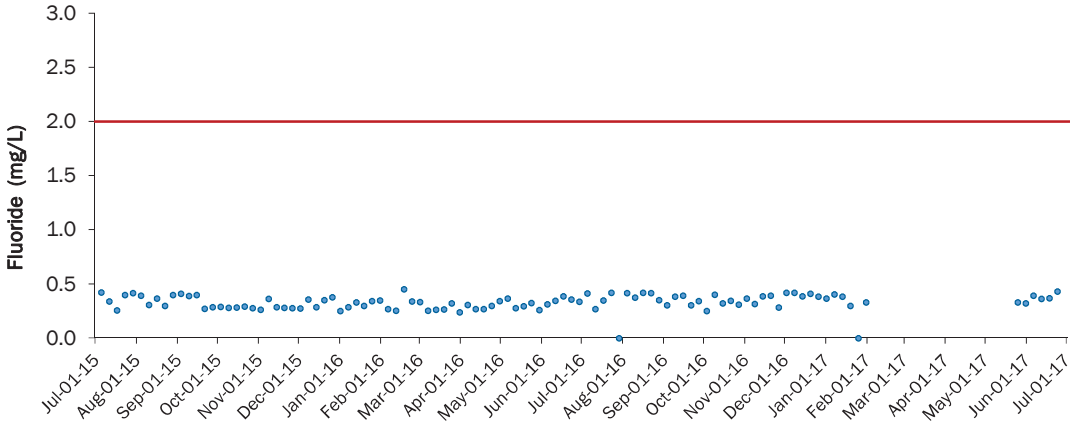
SNP 02-17B: Final Combined WTP TDS (Calc) Profile



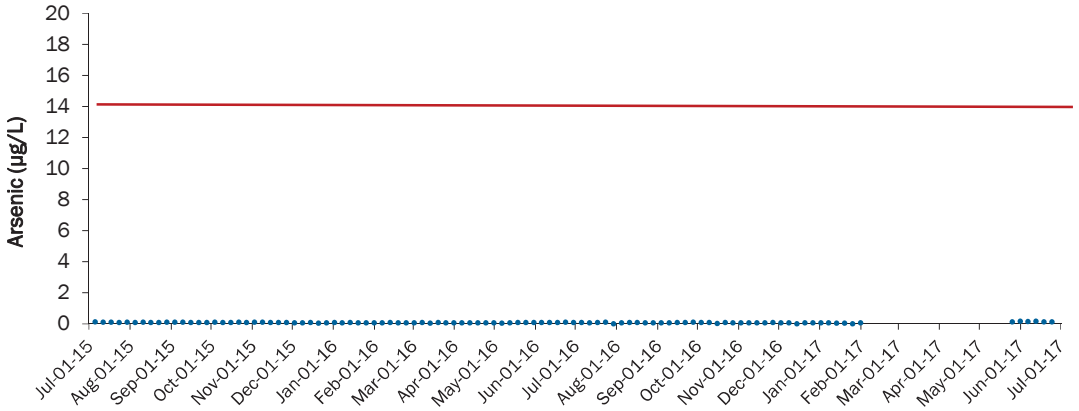
SNP 02-17B: Final Combined WTP & STP Nitrate Profile



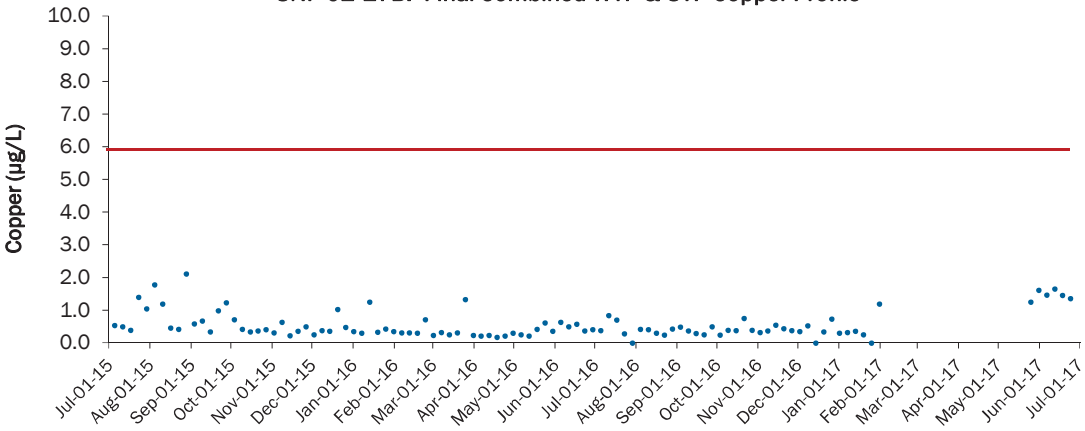
SNP 02-17B: Final Combined WTP & STP Fluoride Profile



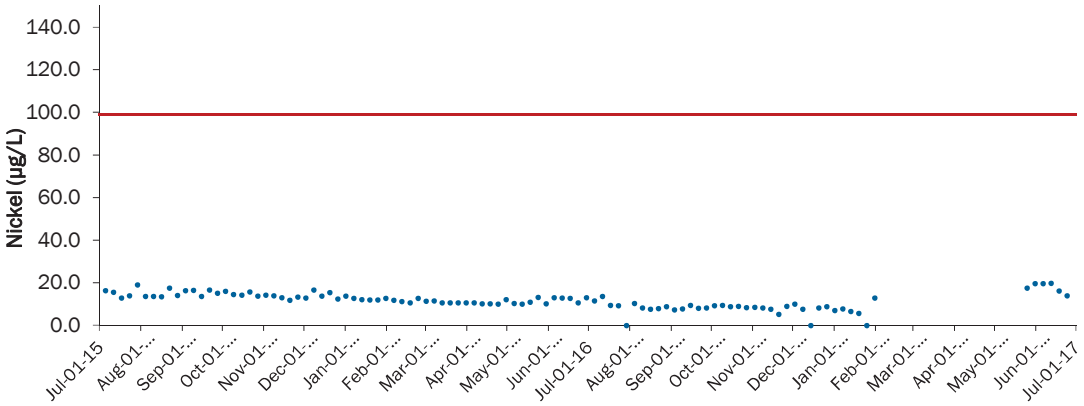
SNP 02-17B: Final Combined WTP & STP Arsenic Profile



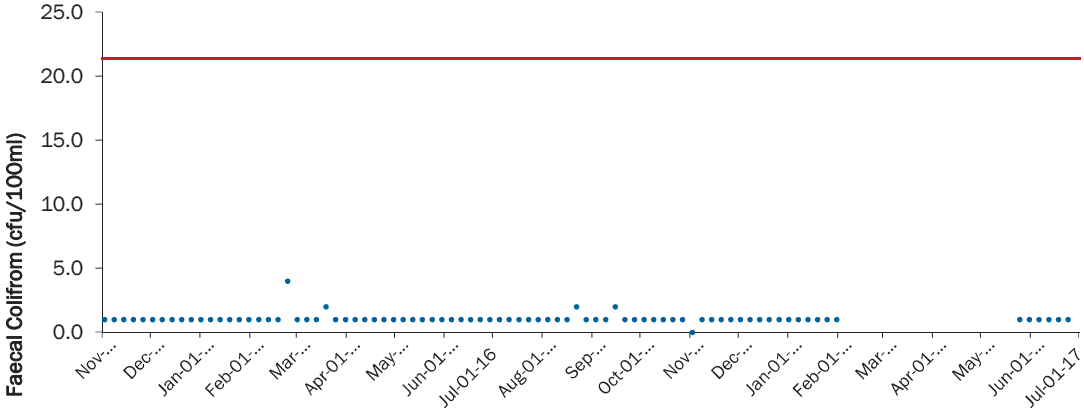
SNP 02-17B: Final Combined WTP & STP Copper Profile



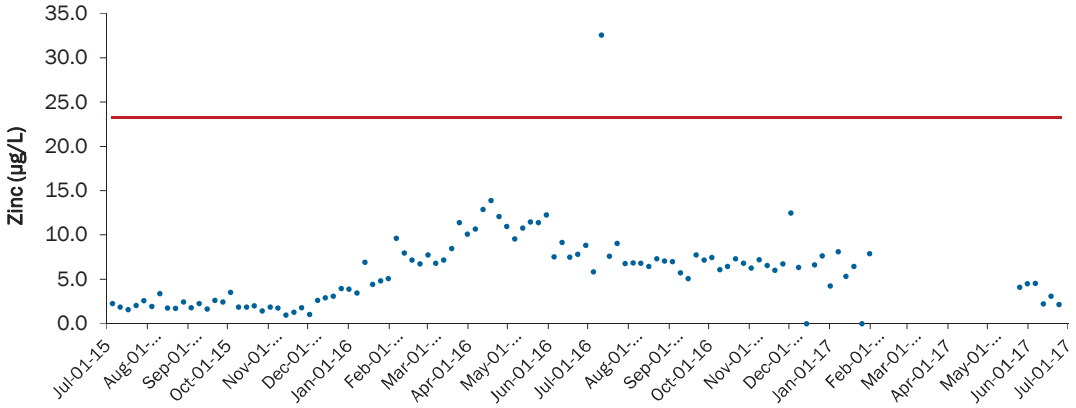
SNP 02-17B: Final Combined WTP & STP Nickel Profile



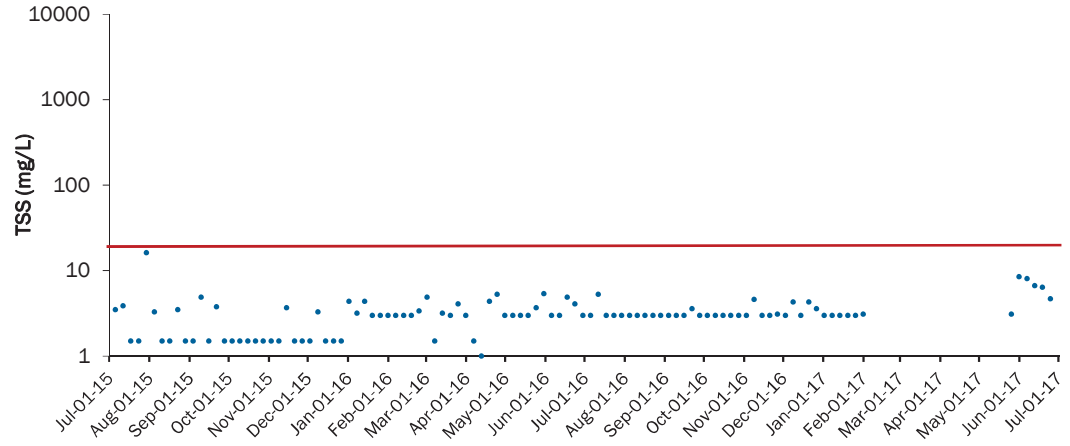
SNP 02-17B: Final Combined WTP & STP Faecal Coliform Profile



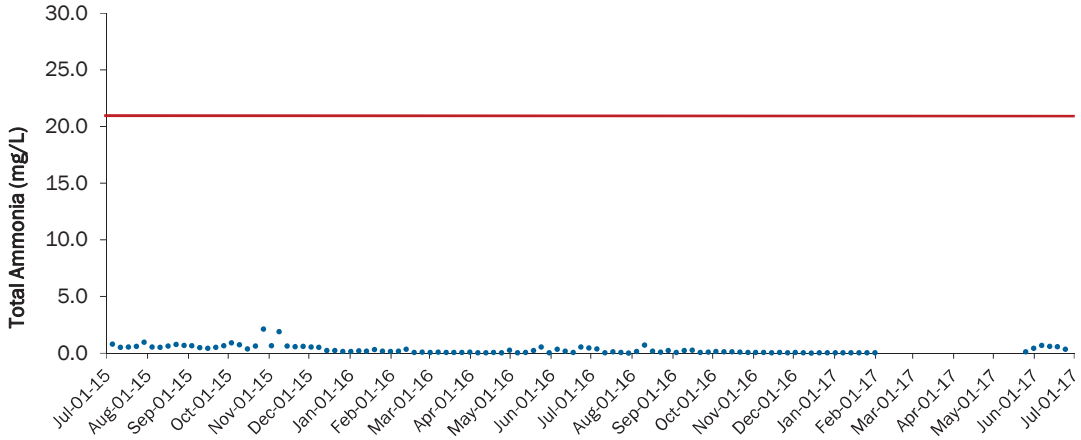
SNP 02-17B: Final Combined WTP & STP Zinc Profile



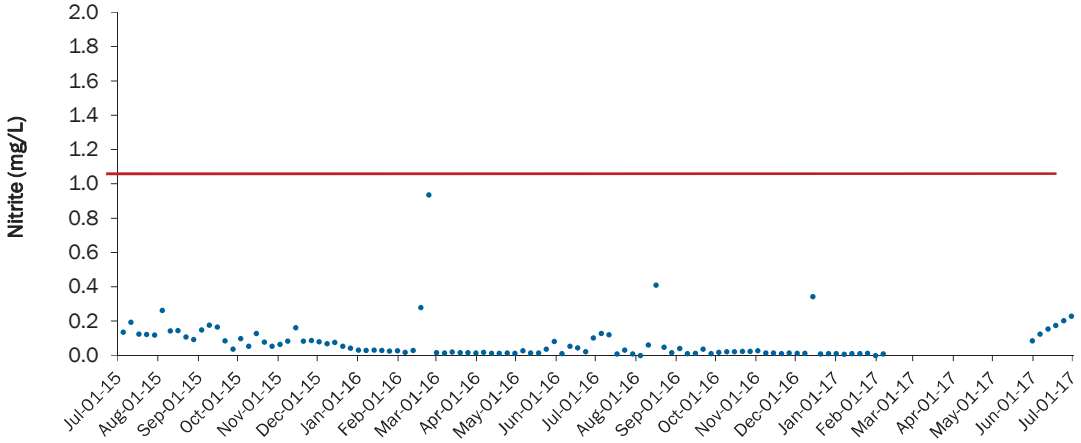
SNP 02-17B: Final Combined WTP & STP Total Suspended Solids Profile



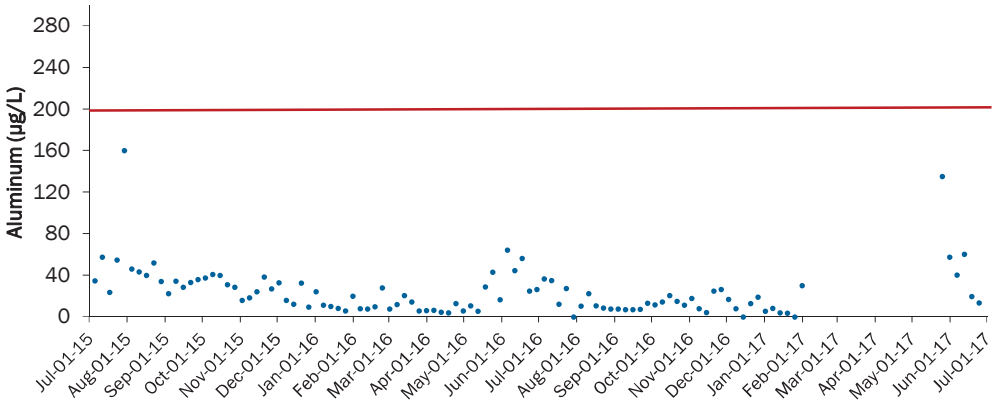
SNP 02-17B: Final Combined WTP & STP Ammonia Profile



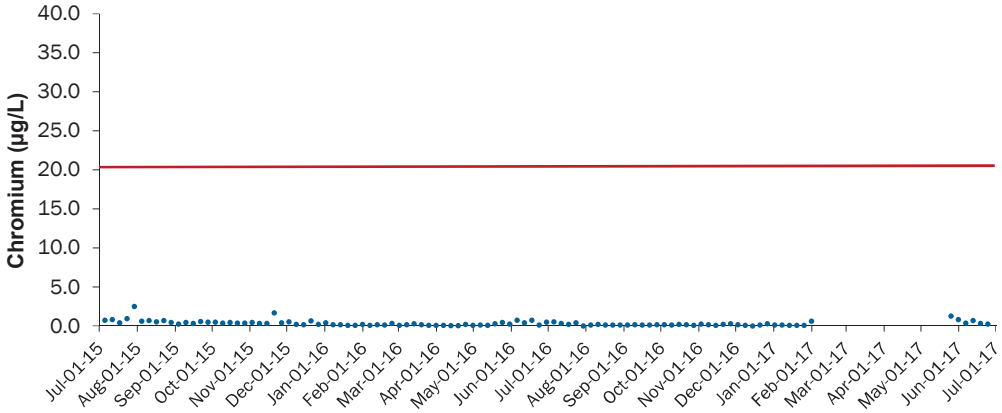
SNP 02-17B: Final Combined WTP & STP Nitrite Profile



SNP 02-17B: Final Combined WTP & STP Aluminum Profile



SNP 02-17B: Final Combined WTP & STP Chromium Profile



SNP 02-17B: Final Combined WTP & STP Lead Profile