

Table 1.1: List of Reporting Requirements

Authorization Reference	Reporting Requirement	Report Section
NIRB Project Certificate No.004 Condition 4	Take prompt and appropriate action to remedy any noncompliance with environmental laws and regulations and/or regulatory instruments, and shall report any non compliance as required by law immediately and report the same to NIRB annually.	11.3
NIRB Project Certificate No.004 Condition 8	Continue to undertake semi-annual groundwater samples and re-evaluate the groundwater quality after each sample collection; report the results of each re-evaluation to NIRB's Monitoring Officer, INAC and EC	8.6
NIRB Project Certificate No.004 Condition 15	Within two (2) years of commencing operations re-evaluate the characterization of mine waste materials, including the Vault area, for acid generating potential, metal leaching and non-metal constituents to confirm FEIS predictions, and re-evaluate rock disposal practices by conducting systematic sampling of the waste rock and tailings in order to incorporate preventive and control measures into the Waste Management Plan to enhance tailing management during operations and closure; results of the re-evaluations shall be provided to the NWB and NIRB's Monitoring Officer	5.1
NIRB Project Certificate No.004 Condition 19	Report to NIRB's Monitoring Officer for the annual reporting of freezeback effectiveness.	5.3.2
NIRB Project Certificate No.004 Condition 23	Ensure that water quality monitoring performed at locations within receiving waters that allow for an assimilative capacity assessment of concern to regulators, be carried out by an independent contractor and submitted to an independent accredited lab for analysis, on a type and frequency basis as determined by the NWB; results of analysis shall be provided to the NWB and NIRB's Monitoring Officer	8.3.6
NIRB Project Certificate No.004 Condition 28	Cumberland shall become a signatory to the International Cyanide Management Code, communicate this to shippers, and do so prior to Cumberland storing or handling cyanide for the Project.	11.2
NIRB Project Certificate No.004 Condition 29	Report to NIRB if and when [Cumberland] develops plans for an expansion of the Meadowbank Gold Mine, and in particular if those plans affect the selection of Second Portage Lake as the preferred alternative for tailings management	11.7
NIRB Project Certificate No.004 Condition 32e	Prior to opening of the road, and annually thereafter, advertise and hold at least one community meeting in the Hamlet of Baker Lake to explain to the community that the road is a private road with non-mine use of the road limited to approved, safe and controlled use by all-terrain-vehicles for the purpose of carrying out traditional Inuit activities.	11.4.2
NIRB Project Certificate No.004 Condition 32f	Place notices at least quarterly on the radio and television to explain to the community that the road is a private road with non-mine use of road limited to authorized, safe and controlled use by all-terrain-vehicles for the purpose of carrying out traditional Inuit activities.	11.4.2
NIRB Project Certificate No.004 Condition 32g	Record all authorized non-mine use of the road, and require all mine personnel using the road to monitor and report unauthorized non-mine use of the road, and collect and report this data to NIRB one (1) year after the road is opened and annually thereafter.	11.4.1
NIRB Project Certificate No.004 Condition 32h	Report all accidents or other safety incidents on the road, to the GN, KivIA [KIA], and the Hamlet immediately, and to NIRB annually.	11.4.2
NIRB Project Certificate No.004 Condition 33	Cumberland shall update the Access and Air Traffic Management Plan to: 1. include an All-weather Private Access Road Management Plan, including a right-of-way policy developed in consultation with the KivIA, GN, INAC and the Hamlet of Baker Lake, for the safe operation of the all-weather private access road; and 2. to facilitate monitoring of the environmental and socio-economic impacts of the private road and undertake adaptive management practices as required, including responding to any concerns regarding the locked gates.	11.4.1
NIRB Project Certificate No.004 Condition 36	Inuit observation and encounter reports for on-board vessels transporting goods and fuel through Chesterfield Inlet	11.5
NIRB Project Certificate No.004 Condition 39	Annually advertise and hold a community information meeting in Chesterfield Inlet to report on the Project and to hear from Chesterfield Inlet residents and respond to concerns; a consultation report shall be submitted to NIRB's Monitoring Officer within one month of the meeting.	11.6
NIRB Project Certificate No.004 Condition 40	Report to KIA and NIRB's Monitoring Officer annually on the Traditional Knowledge gathered including any operational changes that resulted from concerns shared at the workshop.	11.6
NIRB Project Certificate No.004 Condition 45	[Cumberland] shall carry, and require contracted shippers to carry adequate insurance to fully compensate losses arising from a spill or accident, including but not limited to the loss of resources arising from the spill or accident; any claims are to be reported to proper officials with a copy to NIRB's Monitoring Officer	11.8

Authorization Reference	Reporting Requirement	Report Section
NIRB Project Certificate No.004 Condition 49	Develop, implement and report on the fish-out programs for the dewatering of Second Portage Lake, Third Portage Lake and Vault Lake	8.8
NIRB Project Certificate No.004 Condition 51	Engage the HTOs in the development, implementation and reporting of creel surveys within waterbodies affected by the Project to the GN, DFO and local HTO	8.12
NIRB Project Certificate No.004 Condition 54	a. Updated terrestrial ecosystem baseline data; e. Details of a comprehensive hunter harvest survey to determine the effect on ungulate populations resulting from increased human access caused by the all-weather private access road, including establishing preconstruction baseline harvesting data, to be developed in consultation with local HTOs, the GN-DOE and the Nunavut Wildlife Management Board; f. Details of annual aerial surveys to be conducted to assess waterfowl densities in the regional study area during the construction phase and for at least the first three (3) years of operation, with the data analyzed and compared to baseline data to determine if significant effects are occurring and require mitigation. g. Details of an annual breeding bird plot surveys and transects along the all-weather road to be conducted during the construction phase and for at least the first three (3) years of operation.	8.13.2
NIRB Project Certificate No.004 Condition 55	Annual Wildlife Summary Monitoring Report	8.13.1
NIRB Project Certificate No.004 Condition 56	Information on caribou migration corridors shall be reported to the GN, KIA and NIRB's Monitoring Officer annually.	8.13.3
NIRB Project Certificate No.004 Condition 57	Participate in a caribou collaring program as directed by the GN-DOE.	8.13.4
NIRB Project Certificate No.004 Condition 58	In consultation with Elders and the HTOs and subject to safety requirements, design the lighting and use of lights at the mine site to minimize the disturbance of lights on sensitive wildlife and birds	11.6
NIRB Project Certificate No.004 Condition 59	In consultation with Elders and the HTOs, design and implement means of deterring caribou from the tailing ponds, such as temporary ribbon placement or Inukshuks, with such designs not to include the use of fencing	11.6
NIRB Project Certificate No.004 Condition 62	Develop and implement a noise abatement plan to protect wildlife from significant mine activity noise, including blasting, drilling, equipment, vehicles and aircraft; sound meters are to be set up immediately upon issuance of the Project Certificate for the purpose of obtaining baseline data, and monitoring during and after operations	8.10
NIRB Project Certificate No.004 Condition 63	GN and INAC shall form a Meadowbank Gold Mine Socio-Economic Monitoring Committee ("Meadowbank SEMC") to monitor the socio-economic impacts of the Project and the effectiveness of the Project's mitigation strategies; the monitoring shall supplement, not duplicate, the monitoring required pursuant to the IIBA negotiated for the Project, and on the request of Government or NPC, could assist in the coordination of data collection and tracking data trends in a comparable form to facilitate the analysis of cumulative effects; the terms of reference shall focus on the Project, include a plan for ongoing consultation with KivIA and affected local governments and a funding formula jointly submitted by GN, INAC and [Cumberland]; the terms of reference shall be submitted to NIRB for review and subsequent direction within six (6) months of the issuance of a Project Certificate; [Cumberland] is entitled to be included in the Meadowbank SEMC	11.90
NIRB Project Certificate No.004 Condition 64	[Cumberland] shall work with the GN and INAC to develop the terms of reference for a socio-economic monitoring program for the Meadowbank Project, including the carrying out of monitoring and research activities in a manner which will provide project specific data which will be useful in cumulative effects monitoring (upon request of Government or NPC) and consulting and cooperating with agencies undertaking such programs; [Cumberland] shall submit draft terms of reference for the socio-economic monitoring program to the Meadowbank SEMC for review and comment within six (6) months of the issuance of a Project Certificate, with a copy to NIRB's Monitoring Officer	11.90
NIRB Project Certificate No.004 Condition 65	Cumberland shall include in its socio-economic monitoring program for the Meadowbank Project the collection and reporting of data of community of origin of hired Nunavummiut	11.10
NIRB Project Certificate No.004 Condition 67	Develop and implement a program to monitor contaminant levels in country foods in consultation with HC; a copy of the plan shall be submitted to NIRB's Monitoring Officer	8.14
NIRB Project Certificate No.004 Condition 69	Carry out the Project to minimize the impacts on archeological sites, including conducting proper archeological surveys of the Project area (including the all-weather road and all quarry sites); [Cumberland] shall provide to the GN an updated baseline report for archeological sites in the Project area"	8.15
NIRB Project Certificate No.004 Condition 71	In consultation with EC, install and fund an atmospheric monitoring station to focus on particulates of concern generated at the mine site. The results of air-quality monitoring are to be reported annually to NIRB.	8.11

Authorization Reference	Reporting Requirement	Report Section
NIRB Project Certificate No.004 Condition 72	Conduct annual stack testing to demonstrate that the on-site incinerators are operating in compliance with these standards. The results of stack testing shall be contained in an annual monitoring report submitted to GN, EC and NIRB's Monitoring Officer.	6.3
NIRB Project Certificate No.004 Commitment 74	Provide annual report of the quantity and type of waste generated at the mine site distinguishing landfilled, recycled and incinerated streams.	6.2
NIRB Project Certificate No.004 Condition 75	Provide a complete list of possible accidents and malfunctions for the Project; it must consider the all-weather road, shipping spills, cyanide and other hazardous material spills, and pitwall/dikes /dam failure, and include an assessment of the accident risk and mitigation developed in consultation with Elders and potentially affected communities	7
NIRB Project Certificate No.004 Condition 80	File annually with NIRB's Monitoring Officer an updated report on progressive reclamation and the amount of security posted, as required by KivIA, INAC, and/or the NWB.	9.2.1
NIRB Project Certificate No.004 Condition 82	Monitor the ingress/egress of ship cargo at Baker Lake and report any accidents or spills immediately to the regulatory agencies as required by law and to NIRB's Monitoring Officer annually.	7
NIRB Project Certificate No.004 Condition 85	Develop a detailed blasting program to minimize the effects of blasting on fish and fish habitat, water quality, and wildlife and terrestrial VECs	8.5
NWB 2AM-MEA1525 Schedule B-1	Construction Details for dikes and dams.	3.1.1
NWB 2AM-MEA1525 Schedule B-2	Monthly and annual volume of fresh Water obtained from Third Portage Lake.	4.1
NWB 2AM-MEA1525 Schedule B-3	Monthly and annual volume of fresh Water obtained from Wally Lake.	4.2
NWB 2AM-MEA1525 Schedule B-4	Results of lake level monitoring conducted under the protocol developed as per Part D Item 5.	4.3
NWB 2AM-MEA1525 Schedule B-5	Summary of reporting results for the Water Balance Water Quality model and any calibrations as required in Part E Items 7-9.	4.4
NWB 2AM-MEA1525 Schedule B-6	The bathymetric survey(s) conducted prior to each year of shipping at the Baker Lake Marshalling Facility.	4.5
NWB 2AM-MEA1525 Schedule B-7	Geochemical monitoring results.	5.1
NWB 2AM-MEA1525 Schedule B-8	Volumes of waste rock used in construction and placed in the Rock Storage Facilities.	5.2
NWB 2AM-MEA1525 Schedule B-9	An update on the remaining capacity of the Tailings Storage Facility.	5.3.1
NWB 2AM-MEA1525 Schedule B-10	Summary of quantities and analysis of seepage and runoff monitoring from the Landfills, Waste Rock Storage facility and Central Dike.	6.1
NWB 2AM-MEA1525 Schedule B-11	A summary report of all general waste disposal activities including monthly and annual quantities in cubic metres of waste generated and location of disposal.	6.2
NWB 2AM-MEA1525 Schedule B-12	Report of Incinerator test results including the materials burned and the efficiency of the Incinerator as they relate to water and the deposit of waste into water.	6.3
NWB 2AM-MEA1525 Schedule B-13	A list and description of all unauthorized discharges including volumes, spill report line identification number and summaries of follow-up action taken.	7
NWB 2AM-MEA1525 Schedule B-14	A summary of modifications and/or major maintenance work carried out on all water and waste related structures and facilities.	11.1
NWB 2AM-MEA1525 Schedule B-15	The results and interpretation of the Monitoring Program in accordance with Part I and Schedule I.	8.3
NWB 2AM-MEA1525 Schedule B-16	The results of monitoring under the AEMP including Core Receiving Monitoring Program (CREMP), Metal Mining Effluent Regulation (MMER) Monitoring, Mine Site Water Quality and Flow Monitoring (and evaluation of NP-2), visual AWAR water quality monitoring, Blast Monitoring and Groundwater Monitoring.	8
NWB 2AM-MEA1525 Schedule B-17	A summary of any progressive closure and reclamation work undertaken including photographic records of site conditions before and after completion of operations, and an outline of any work anticipated for the next year, including any changes to implementation and scheduling.	9.1.1
NWB 2AM-MEA1525 Schedule B-18	A summary of on-going field trials to determine effective capping thickness for the Tailings Storage Facility and Waste Rock Storage Facilities for the purpose of long term environmental protection.	5.3.2
NWB 2AM-MEA1525 Schedule B-19	An updated estimate of the current restoration liability based on project development monitoring, results of restoration research and any changes or modifications to the Appurtenant Undertaking.	9.2.1
NWB 2AM-MEA1525 Schedule B-20	A summary of any studies requested by the Board that relate to Water use, Waste disposal or Reclamation, and a brief description of any future studies planned.	10.1
NWB 2AM-MEA1525 Schedule B-21	Where applicable, revisions as Addendums, with an indication of where changes have been made, for Plans, Reports, and Manuals.	10.2
NWB 2AM-MEA1525 Schedule B-22	An executive summary in English, Inuktitut and French of all plans, reports, or studies conducted under this licence.	10.3
NWB 2AM-MEA1525 Schedule B-23	A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an inspector.	11.3
NWB 2AM-MEA1525 Schedule B-24	A summary of public consultation and participation with local organizations and the residents of the nearby communities, including a schedule of upcoming community events and information sessions.	11.6
NWB 2AM-MEA1525 Schedule B-25	Any other details on Water use or Waste Disposal requested by the Board by November 1st of the year being reported.	4.7/6.4

Authorization Reference	Reporting Requirement	Report Section
NWB 2AM-MEA1525 Part E Item 9	The Licensee shall, on an annual basis during Operations, compare the predicted water quantity and quality within the pits, to the measured water quantity and quality.	4.6

Authorization Reference	Reporting Requirement	Report Section
NWB 2AM-MEA1525 Part I Item 12	The Licensee shall submit to the Board as part of the Annual Report required under Part B Item 2, all reports and performance evaluations prepared by the Independent Geotechnical Expert Review Panel.	3.1.2
NWB 2AM-MEA1525 Part I Item 14	The Licensee shall submit the results and interpretation of the Seepage Monitoring program required in Part I, Item 13 in the Annual Report required under Part B, Item 2.	8.3.7
DFO S-08/09-1040 NU	The result of monitoring under the AEMP	8.9
DFO NU-03-191.3 Condition 3-6, NU-03-0191.1 Condition 3-6, Nu-03-0190 Condition 5, NU-14-1046 Condition 3-6	Result of fisheries monitoring along AWAR and on mine site	8.3.5
DFO 14-1046 condition 3.2.2	Results of the fish out program	8.8
DFO NU-03-0190 AWP/AR Condition 5.2.4	Creel survey results.	8.12
DFO NU-03-191.3 Condition 3-6, NU-03-0191.1 Condition 3-6, Nu-03-0190 Condition 5, NU-14-1046 Condition 3-6	Submit Written Report and Photographic Record summarizing monitoring program results.	8.7
INAC Land Lease 66A/8-71-2 Condition 19	The lessee shall submit to the Minister every two years after the commencement date of this lease, a report describing any variations from the Abandonment and Restoration Plan and updated cost estimates.	9.2.2
INAC Land Lease 66A/8-71-2 Condition 33	The lessee shall file annually a report for the preceding year, outlining ongoing restoration completed in conformity with the approved Abandonment and Restoration Plan, as well as any variations from the said Plan.	9.1.2
INAC Land Lease 66A/8-72-2 Condition 8	The lessee shall file a report, annually ...	3.2
	i. Quantity of material removed and location of removal, for the immediately preceding calendar year	
	ii. Such other data as are reasonably required by the Minister from time to time.	
INAC Land Lease 66A/8-72-2 Condition 25	The lessee shall file, annually, a report for the preceding year, outlining the ongoing borrow area operations completed in conformity with the approved Borrow Management Plan, as well as any variations from the Plan.	3.2
INAC Quarry Lease 66A/8-72-2 Condition 33	The lessee shall file annually a report for the preceding year, outlining ongoing restoration completed in conformity with C&R Plan, as well as any variations from the said Plan.	9.1.2
INAC Land Lease 66A/8-72-2 Condition 37	The lessee shall submit to the Minister every 2 years after the commencement date of this lease, a report describing cumulative variations from the C&R Plan with updated cost estimates.	9.2.2
KIA ROW KVRW06F04 Condition 14	Submit to KIA every two years on each anniversary of the commencement date, a report describing any variations from the Abandonment and Restoration Plan and updated cost estimates.	9.2.2
KIA ROW KVRW06F04 Condition 26	File annually a progress report for the preceding year, outlining any ongoing restoration completed, in conformity with the Abandonment and Restoration plan.	9.1.2
KIA ROW KVRW06F04 Schedule E - Condition 8	The lessee shall file annually a report for the preceding year, outlining the ongoing borrow area operations completed in conformity with the approved Borrow Management Plan, as well as any variations from the Plan.	3.2
KIA KVPL08D280 Condition 6.01 (9)	Plan detailing the activities taken in the last year and to be undertaken in the next year and planned for the balance of the Term, that includes, but is not limited to the proposed methods and procedures for progressive reclamation.	9.1.1
GN - Department of Cultural and Heritage	Annual Permit Report. Annual Archaeology Site Status Report.	Submitted on February 28 2017 to Department of Culture and Heritage.

Table 1.2: Status of Sampling Stations

NWB Station	Description	Phase	2017 Reporting Status
ST-DC-1 to TBD	Monitoring stations during Dike Construction as defined in Part D Item 5	Construction	Not applicable in 2017
ST-DD-1 to TBD	Monitoring stations during Dike Dewatering as defined in Part D Item 5	Construction	Not applicable in 2017
ST-1	Water Intake for camp, mill and re-flooding	Water Intake for camp, mill and re-flooding	Section 4.1
ST-1W	Water Intake for re-flooding	Water Intake for camp, mill and re-flooding	Not applicable in 2017
ST-3	Water Intake for Emulsion Plant	Late operation, closure	Section 4.1
ST-4	Water reclaimed from Tailings Storage Facility	Late operation, closure	Not applicable in 2017
ST-5	Portage Area (east) diversion ditch	Late operation, closure	Section 8.3.3.21
ST-6	Portage Area (west) diversion ditch	Late operation, closure	Section 8.3.3.21
ST-8	East Dike Seepage Discharge	Late operation, closure	Section 8.3.3.5
ST-9	Portage Attenuation Pond prior to discharge through Third Portage Lake Outfall Diffuser	Early operation	Not applicable in 2017
ST-10	Vault Attenuation Pond prior to discharge through Wally Lake Outfall Diffuser	Late operation	Section 8.3.3.4
ST-11	Tailings Storage Facility	Post closure	Not applicable in 2017
ST-12	Portage/ Goose Pit Lake	Post closure	Not applicable in 2017
ST-13	Vault Pit Lake	Post closure	Not applicable in 2017
ST-14	Discharge to the land from Landfarm sump at mine site	Late operation, closure	Section 8.3.3.17
ST-16	Portage Rock Storage Facility	Late operation, closure	Section 8.3.3.11
ST-17**	North Portage Pit Sump	Operations	Section 8.3.3.7
	Portage Pit Lake	Late operation, closure	Not applicable in 2017
ST-19**	South Portage Pit Sump	Early operations	Section 8.3.3.8
	Portage Pit Lake	Late operations	Not applicable in 2017
ST-20	Goose Island Pit Sump	Early operations	Section 8.3.3.9
	Goose Island Pit Lake	Late operations, closure	Section 8.3.3.9
ST-21	Tailings Reclaim Pond	Late operations	Section 8.3.3.6
ST-22	Tailings Storage Facility	Closure (drainage run-off)	Not Applicable in 2017

NWB Station	Description	Phase	2017 Reporting Status
ST-23	Vault Pit Sump	Late operations	Section 8.3.3.10
ST-24	Vault Rock Storage Facility	Late operation, closure	Section 8.3.3.13
ST-25	Vault Attenuation Pond	Late operation	Section 8.3.3.3
ST-26	Vault Pit Lake	Closure	Not Applicable in 2017
ST-30	WEP 1	Late operations, closure	Section 8.3.3.12
ST-31	WEP 2	Late operations, closure	Section 8.3.3.12
ST-32	Saddle Dam 3	Late operations, closure	Section 8.3.3.16
ST-S-1 to TBD	Seeps (to be determined)	Late operations, closure	Sections 8.3.3.14/8.3.3.15
ST-GW-1 to TBD	Groundwater wells (to be determined)	Late operations, closure	Section 8.6
ST-AEMP-1 to TBD	Receiving AEMP	Late operations, closure	Section 8.9
ST-MMER-1 to TBD	Vault, East dike and Portage effluent outfall	Late operations	Section 8.2/8.3
ST-37	Secondary containment sump at the Bulk Fuel Storage Facility at Meadowbank	Late operation, closure	Sections 8.3.3.20
ST-38	Secondary containment at the Bulk Fuel Storage Facility in Baker Lake - Jet-A containment	Late operation, closure	Sections 8.3.4
ST-40.1 (MEA-4)	Secondary containment sump at the Bulk Fuel Diesel Storage Facility in Baker Lake (Fuel tanks 5&6)	Late operation, closure	Sections 8.3.4
ST-40.2 (MEA-4)	Secondary containment sump at the Bulk Fuel Diesel Storage Facility in Baker Lake (Fuel tanks 1-4)	Late operation, closure	Sections 8.3.4

Table 8.1. Meadowbank GPS Coordinates

Sample Location Description	Sample ID	GPS Coordinates Easting / Northing
MMER and EEM		
Vault effluent water quality monitoring and toxicity testing	ST-10 / ST-MMER-2	15W 0359842 7219555
East Dike Seepage effluent water quality monitoring and toxicity testing	ST-8 / ST-MMER-3	14W 0639336 7213920
Vault water quality monitoring in receiving environment - discharge area	WLE	15W 0360880 7220513
East Dike Seepage water quality monitoring in receiving environment - discharge area	SPLE	14W 0639459 7213913
Water quality monitoring in receiving environment - reference area	TPS	14W 0633840 7208079
Sewage Treatment Plant		
STP discharge to stormwater management pond	STP	14W 0638042 7214140
Incinerator		
Ash sampling; waste oil sampling	Incinerator	14W 0638189 7213412
Meadowbank Bulk Fuel Storage Facilities		
Water quality monitoring of discharge from secondary containment area	ST-37	14W 0638258 7213430
Baker Lake Bulk Fuel Storage Facility		
Water quality monitoring of discharge from secondary containment area for Jet-A tank	ST-38	15W 0357487 7134617
Water quality monitoring of discharge from secondary containment area for new tank 5-6	ST-40.1	15W 0357598 7134539
Water quality monitoring of discharge from secondary containment area for old tank 1-4	ST-40.2	15W 0357543 7134445
Tailings Reclaim Pond		
Water quality monitoring in North Cell	ST-21	14W 0637608 7215745
Water quality monitoring in South Cell	ST-21	14W 0638166 7215045
North Portage Pit Sump		
Water quality monitoring from area of water accumulation	ST-17	14W 0638951 7214783
South Portage Pit Sump		
Water quality monitoring from area of water accumulation	ST-19	14W 0638898 7213939
Bay Goose Pit Sump		
Water quality monitoring from area of water accumulation	ST-20	14W 0638339 7212681
Bay Goose Pit Lake		
Water quality monitoring from area of water accumulation	ST-20	14W 0638692 7212294
Vault Pit Sump		
Water quality monitoring from area of water accumulation	ST-23	14W 0640865 7220103
East Dike Seepage		
Water quality monitoring of seepage from East Dike	ST-S-1	14W 0639316 7213937
Vault Attenuation Pond		
Water quality monitoring	ST-25	15W 0359030 7219607

Table 8.2 - 2017 Vault Discharge MMER Effluent Monitoring (ST-10/ST-MMER-2)

	Units	Maximum monthly average concentration	Maximum grab concentration	January	February	March	April	May	19-Jun-17	26-Jun-17
Date										
Arsenic	mg/L	0.5	1	NDEP	NDEP	NDEP	NDEP	NDEP	<0.0005	<0.0005
Copper	mg/L	0.3	0.6	NDEP	NDEP	NDEP	NDEP	NDEP	0.0025	0.0033
Cyanide	mg/L	1	2	NDEP	NDEP	NDEP	NDEP	NDEP	0.001	0.003
Total Suspended Solids	mg/L	15	30	NDEP	NDEP	NDEP	NDEP	NDEP	10	<1
Nickel	mg/L	0.5	1	NDEP	NDEP	NDEP	NDEP	NDEP	0.0041	0.0043
Lead	mg/L	0.2	0.4	NDEP	NDEP	NDEP	NDEP	NDEP	0.0009	0.0016
Zinc	mg/L	0.5	1	NDEP	NDEP	NDEP	NDEP	NDEP	0.002	0.005
Radium 226	Bq/L	0.37	1.11	NDEP	NDEP	NDEP	NDEP	NDEP	0.003	NMR
pH *	units	6-9.5	6-9.5	NDEP	NDEP	NDEP	NDEP	NDEP	7.45	NA
Daphnia magna	LC50 %			NDEP	NDEP	NDEP	NDEP	NDEP	>100	NMR
Rainbow trout	LC50 %			NDEP	NDEP	NDEP	NDEP	NDEP	>100	NMR

	Units	Maximum monthly average concentration	Maximum grab concentration	3-Jul-17	10-Jul-17	17-Jul-17	24-Jul-17	1-Aug-17	7-Aug-17	21-Aug-17
Date										
Arsenic	mg/L	0.5	1	<0.0005	0.0043	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper	mg/L	0.3	0.6	0.0026	0.0024	0.0031	0.0028	0.0027	0.0023	0.0052
Cyanide	mg/L	1	2	<0.001	0.205	0.002	0.001	0.001	<0.001	0.001
Total Suspended Solids	mg/L	15	30	<1	4	4	<1	1	10	22
Nickel	mg/L	0.5	1	0.0045	0.0038	0.0048	0.0051	0.0047	0.0041	0.0056
Lead	mg/L	0.2	0.4	0.0083	0.1225	<0.0003	<0.0003	0.0004	<0.0003	<0.0003
Zinc	mg/L	0.5	1	0.003	<0.001	<0.0010	0.002	0.002	0.006	<0.001
Radium 226	Bq/L	0.37	1.11	0.003	NA	NA	0.003	0.009	0.008	NA
pH *	units	6-9.5	6-9.5	7.57	8.05	8.32	7.73	7.44	7.95	7.71
Daphnia magna	LC50 %			>100	NMR	NMR	NMR	>100	NMR	NMR
Rainbow trout	LC50 %			>100	NMR	NMR	NMR	>100	NMR	NMR

		Maximum monthly average concentration	Maximum grab concentration	29-Aug-18	11-Sep-17	5-Oct-17	9-Oct-17	November	December
Date	Units								
Arsenic	mg/L	0.5	1	<0.0005	<0.0005	<0.0005	0.0022	NDEP	NDEP
Copper	mg/L	0.3	0.6	0.003	0.0032	0.0027	0.0033	NDEP	NDEP
Cyanide	mg/L	1	2	0.014	0.019	0.005	0.005	NDEP	NDEP
Total Suspended Solids	mg/L	15	30	11	9	6	10	NDEP	NDEP
Nickel	mg/L	0.5	1	0.0045	0.0037	0.0068	0.0076	NDEP	NDEP
Lead	mg/L	0.2	0.4	<0.0003	<0.0003	<0.0003	<0.0003	NDEP	NDEP
Zinc	mg/L	0.5	1	0.001	0.0003	0.015	0.001	NDEP	NDEP
Radium 226	Bq/L	0.37	1.11	0.019	NA	0.011	NA	NDEP	NDEP
pH *	units	6-9.5	6-9.5	7.73	8.17	7.34	7.8	NDEP	NDEP
Daphnia magna	LC50 %			NMR	>100	>100	NMR	NDEP	NDEP
Rainbow trout	LC50 %			NMR	>100	>100	NMR	NDEP	NDEP

Footnotes:

* Parameter measured in the field by Environmental Technicians

NDEP (No Deposit) = measurement not taken because there was no deposit from the final discharge point

NMR (No Measurement Required) = measurement not taken in accordance with the conditions set out in section 12 or 13 of the MMER

Sample Location Description	Sample ID	GPS Coordinates Easting / Northing
<i>Portage Rock Storage Facility</i>		
Water quality monitoring of seepage from Waste Rock Storage Facility	ST-16	14W 0638617 7216164
<i>Vault Rock Storage Facility</i>		
Water quality monitoring of seepage from Waste Rock Storage Facility	ST-24	14W 0640919 7220711
<i>Saddle Dam 1 Seepage</i>		
Water quality monitoring of seepage from Saddle Dam 1	ST-S-2	14W 0636977 7216000
<i>Central Dike Seepage</i>		
Water quality monitoring of seepage from Central Dike	ST-S-5	14W 0638743 7214571
<i>Landfarm</i>		
Discharge to the land from landfarm sump	ST-14	14W 0637537 7215195
<i>Diversion Ditch Non-Contact Water</i>		
Portage Area (West) diversion ditch (North Cell Diversion Ditch)	ST-6	14W 0636771 7216026
Portage area (East) diversion ditch around RSF	ST-5	14W 0638732 7216495
<i>West Extension Pool</i>		
Water Quality monitoring of seepage from RSF - WEP1	ST-30	14W 0638419 7216707
Water Quality monitoring of seepage from RSF - WEP2	ST-31	14W 0638625 7216557
<i>Saddle Dam 3 Seepage</i>		
Water Quality monitoring of seepage from Saddle Dam 3	ST-32	14W 0637499 7214966

Table 8.4: 2017 EEM Monitoring at Vault

Vault Discharge Effluent characterization		Date Units	19-Jun-17	24-Jul-17	7-Aug-17	11-Sep-17
Alkalinity	mg CaCO ₃ /L		30	53	53	63
Aluminium	mg/L		0.23	0.101	0.202	0.283
Ammonia nitrogen	mg N/L		0.54	0.98	0.63	3.1
Cadmium	mg/L		0.00003	< 0.00002	0.00002	< 0.00002
Conductivity	µs/cm		170	212.1	274	459
Hardness	mg CaCO ₃ /L		38	77	85	148
Iron	mg/L		0.39	0.21	0.32	0.47
Mercury	mg/L		< 0.00001	< 0.00001	< 0.00001	0.00004
Molybdenum	mg/L		0.0037	0.0081	0.0102	0.0227
Nitrate	mg N/L		0.68	2.9	2.97	7.48
Selenium	mg/L		< 0.001	< 0.001	< 0.001	0.002
Temperature	C		14.1	12.12	9	8.7

Vault Discharge Sub-lethal toxicity testing		Date Units	7-Aug-17	11-Sep-17
Fathead Minnow IC25	% v/v		>100	>100
Fathead Minnow LC50	% v/v		>100	>100
Ceriodaphnia dubia IC25	% v/v		59.3	>100
Ceriodaphnia dubia LC50	% v/v		>100	>100
Freshwater Alga IC25	% v/v		>90.91	>90.91
Lemna minor IC25 (dw)	% v/v		>97	>97
Lemna minor IC25 (f#)	% v/v		>97	>97

Vault Discharge WLE (Exposure Water Quality Monitoring)		Date Units	23-Jul-17	29-Aug-17
Alkalinity	mg CaCO ₃ /L		42	16
Aluminum	mg/L		0.008	<0.06
Ammonia nitrogen	mg N/L		0.04	<0.01
Arsenic	mg/L		<0.0005	<0.0005
Cadmium	mg/L		<0.0002	<0.0002
Conductivity	µs/cm		59.1	56.7
Copper	mg/L		0.0011	0.0006
Cyanide	mg/L		<0.001	0.002
Dissolved oxygen *	mg/L		9.56	10.27
Hardness	mg CaCO ₃ /L		18	23
Iron	mg/L		0.02	<0.01
Lead	mg/L		0.0018	<0.0003
Mercury	mg/L		< 0.00001	0.00003
Molybdenum	mg/L		< 0.0005	0.001
Nickel	mg/L		0.0005	<0.0005
Nitrate	mg N/L		0.12	0.29
pH *	Units		7.39	6.55
Radium 226	Bq/L		NMR	NMR
Selenium	mg/L		<0.001	<0.001
Temperature *	(°C)		10.95	11.2
Total suspended solids	mg/L		1	<1
Zinc	mg/L		<0.001	<0.001

TPS (Reference Area) Water Quality Monitoring	Date Units	23-Jul-17	28-Aug-17
Alkalinity	mg CaCO ₃ /L	16	8
Aluminum	mg/L	<0.006	<0.006
Ammonia nitrogen	mg N/L	0.01	<0.01
Arsenic	mg/L	<0.0005	<0.0005
Cadmium	mg/L	<0.00002	<0.00002
Conductivity	µs/cm	25.6	27.9
Copper	mg/L	<0.0005	<0.0005
Cyanide	mg/L	<0.001	0.003
Dissolved oxygen *	mg/L	10.54	10.41
Hardness	mg CaCO ₃ /L	7	7
Iron	mg/L	<0.01	<0.01
Lead	mg/L	<0.0003	<0.0003
Mercury	mg/L	<0.00001	0.00001
Molybdenum	mg/L	< 0.0005	< 0.0005
Nickel	mg/L	< 0.0005	< 0.0005
Nitrate	mg N/L	0.03	0.03
pH *	Units	7.51	7.85
Radium 226	Bq/L	NMR	NMR
Selenium	mg/L	< 0.001	< 0.001
Temperature *	(°C)	9.4	12.6
Total suspended solids	mg/L	1	<1
Zinc	mg/L	<0.001	<0.001

Footnotes:

NMR: no measurement required

NDEP: No deposit

* Parameter measured in the field by Environmental Technicians

Table 8.3 - 2017 Vault Discharge MMER Effluent Volume (ST-10/ST-MMER-2)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
1	0	0	0	0	0	0	16,622	3,465	0	0	0	0	
2	0	0	0	0	0	0	17,143	15,840	0	0	0	0	
3	0	0	0	0	0	0	16,980	0	0	0	0	0	
4	0	0	0	0	0	0	16,320	0	0	0	0	0	
5	0	0	0	0	0	0	16,528	0	0	1,655	0	0	
6	0	0	0	0	0	0	0	0	0	16,125	0	0	
7	0	0	0	0	0	0	0	2,602	0	14,417	0	0	
8	0	0	0	0	0	0	15,787	0	0	13,055	0	0	
9	0	0	0	0	0	0	11,076	0	0	11,695	0	0	
10	0	0	0	0	0	0	22,559	0	0	0	0	0	
11	0	0	0	0	0	0	779	0	139	0	0	0	
12	0	0	0	0	0	0	21,029	0	12,535	0	0	0	
13	0	0	0	0	0	0	16,733	0	10,794	0	0	0	
14	0	0	0	0	0	0	11,633	0	13,170	0	0	0	
15	0	0	0	0	0	0	15,771	0	6,279	0	0	0	
16	0	0	0	0	0	0	16,855	4,095	0	0	0	0	
17	0	0	0	0	0	0	10,035	12,000	0	0	0	0	
18	0	0	0	0	0	0	0	11,424	0	0	0	0	
19	0	0	0	0	0	12165	0	11,424	0	0	0	0	
20	0	0	0	0	0	18504	0	3,639	0	0	0	0	
21	0	0	0	0	0	18960	16,301	9,312	0	0	0	0	
22	0	0	0	0	0	18665	15,169	9,480	0	0	0	0	
23	0	0	0	0	0	16767	9,652	9,480	0	0	0	0	
24	0	0	0	0	0	17758	10,093	9,000	0	0	0	0	
25	0	0	0	0	0	14290	0	8,640	0	0	0	0	
26	0	0	0	0	0	17528	0	7,920	0	0	0	0	
27	0	0	0	0	0	17012	0	6,792	0	0	0	0	
28	0	0	0	0	0	11760	0	7,368	0	0	0	0	
29	0	0	0	0	0	16258	0	6,720	0	0	0	0	
30	0	0	0	0	0	17897	0	1,912	0	0	0	0	
31	0	0	0	0	0	0	0	0	0	0	0	0	
Total (m³)	0	0	0	0	0	197,564	277,065	141,113	42,917	56,947	0	0	715,606

Table 8.5 - 2017 East Dike Seepage Discharge MMR Effluent Monitoring (ST-8/ ST-MMER-3)

Date Units	Arsenic mg/L	Copper mg/L	Cyanide mg/L	Lead mg/L	Nickel mg/L	Zinc mg/L	TSS mg/L	Radium 226 Bq/L	pH * units	Daphnia magna LC50 %	Rainbow trout LC50 %
Maximum monthly average concentration	0.5	0.3	1	0.2	0.5	0.5	15	0.37	6 - 9.5		
Maximum grab concentration	1	0.6	2	0.4	1	1	30	1.11	6 - 9.5		
3-Jan-17	NMR	NMR	NMR	NMR	NMR	NMR	11	NMR	8.18	NMR	NMR
9-Jan-17	0.0009	0.0012	0.005	< 0.0003	0.0006	< 0.001	6	0.0030	7.65	>100	>100
16-Jan-17	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	8.15	NMR	NMR
23-Jan-17	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.71	NMR	NMR
30-Jan-17	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.81	NMR	NMR
6-Feb-17	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.95	NMR	NMR
13-Feb-17	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	7.97	NMR	NMR
21-Feb-17	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	8.02	NMR	NMR
27-Feb-17	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	7.66	NMR	NMR
6-Mar-17	NMR	NMR	NMR	NMR	NMR	NMR	14	NMR	8.42	NMR	NMR
13-Mar-17	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.38	NMR	NMR
22-Mar-17	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.50	NMR	NMR
29-Mar-17	NMR	NMR	NMR	NMR	NMR	NMR	9	NMR	7.70	NMR	NMR
3-Apr-17	< 0.0005	0.0018	0.002	< 0.0003	0.0007	< 0.001	8	< 0.002	7.85	>100	>100
12-Apr-17	NMR	NMR	NMR	NMR	NMR	NMR	11	NMR	8.55	NMR	NMR
17-Apr-17	NMR	NMR	NMR	NMR	NMR	NMR	11	NMR	7.62	NMR	NMR
24-Apr-17	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	8	NMR	NMR
1-May-17	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.54	NMR	NMR
9-May-17	NMR	NMR	NMR	NMR	NMR	NMR	34	NMR	8.11	NMR	NMR
6-Sep-17	< 0.0005	0.0008	0.003	< 0.0003	0.0008	< 0.001	3	< 0.002	7.72	>100	>100
11-Sep-17	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.60	NMR	NMR
18-Sep-17	NMR	NMR	NMR	NMR	NMR	NMR	32	NMR	8.57	NMR	NMR
30-Oct-17	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.34	NMR	NMR
6-Nov-17	< 0.0005	0.0005	< 0.001	< 0.0003	0.0009	0.001	5	< 0.002	7.2	0	>100
14-Nov-17	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	7.1	NMR	NMR
20-Nov-17	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	7.52	NMR	NMR
27-Nov-17	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	8.26	NMR	NMR
4-Dec-17	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	9.01	NMR	NMR
11-Dec-17	NMR	NMR	NMR	NMR	NMR	NMR	10	NMR	7.74	NMR	NMR
19-Dec-17	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	7.93	NMR	NMR
27-Dec-17	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	8.77	NMR	NMR

Table 8.7: 2017 EEM Monitoring

East Dike Discharge Effluent characterization	Date Units	9-Jan-17	4-Apr-17	19-Nov-17	19-Dec-17
Alkalinity	mg CaCO ₃ /L	25	32	26	27
Aluminium	mg/L	0.052	0.064	0.05	0.052
Ammonia nitrogen	mg N/L	<0.01	0.03	0.02	0.02
Cadmium	mg/L	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Conductivity	µs/cm	70.7	87.2	72.8	75.3
Hardness	mg CaCO ₃ /L	24	25	25	24
Iron	mg/L	0.05	0.05	0.06	0.041
Mercury	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Nitrate	mg N/L	0.06	0.08	0.05	0.07
Selenium	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Temperature	C	7.6	2.8	2.9	9.3

East Dike Discharge - SPLE (Exposure Area) Water Quality Monitoring	Date Units	10-Jan-17	3-Apr-17	19-Nov-17	19-Dec-17
Alkalinity	mg CaCO ₃ /L	13	19	13	15
Aluminium	mg/L	0.007	<0.006	<0.006	<0.006
Ammonia nitrogen	mg N/L	0.07	0.03	0.02	0.03
Arsenic	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Conductivity	µs/cm	42.6	46.5	40.4	44
Copper	mg/L	< 0.0005	< 0.0005	0.0007	< 0.0005
Cyanide	mg/L	< 0.001	0.001	< 0.001	< 0.001
Dissolved oxygen *	mg/L	11.2	11.4	15.43	15.68
Hardness	mg CaCO ₃ /L	12	13	13	16
Iron	mg/L	< 0.01	0.01	< 0.01	< 0.01
Lead	mg/L	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Mercury	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Nitrate	mg N/L	<0.01	0.2	< 0.01	0.03
pH *	Units	7.79	7.79	7.18	7.17
Radium 226	Bq/L	NMR	NMR	NMR	NMR
Selenium	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Temperature *	(°C)	3.50	3.2	0.59	0.1
Total suspended solids	mg/L	< 1	< 2	2	< 1
Zinc	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

TPS (Reference Area) Water Quality Monitoring	Date Units	10-Jan-17	3-Apr-17	19-Nov-17	19-Dec-17
Alkalinity	mg CaCO ₃ /L	11	15	9	9
Aluminum	mg/L	< 0.006	0.02	< 0.006	0.007
Ammonia nitrogen	mg N/L	0.2	0.03	0.03	0.03
Arsenic	mg/L	0.0006	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Conductivity	µs/cm	28	42.8	32.2	28.5
Copper	mg/L	< 0.0005	< 0.0005	0.0005	< 0.0005
Cyanide	mg/L	0.002	< 0.001	< 0.001	< 0.001
Dissolved oxygen *	mg/L	13.6	11.6	14.53	15.35
Hardness	mg CaCO ₃ /L	9	9	9	9
Iron	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Lead	mg/L	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Mercury	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Nitrate	mg N/L	0.02	0.04	0.01	0.04
pH *	Units	7.42	7.72	7.07	7.27
Radium 226	Bq/L	NMR	NMR	NMR	NMR
Selenium	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Temperature *	(°C)	8.6	3	0.64	0.4
Total suspended solids	mg/L	< 1	3	< 1	< 1
Zinc	mg/L	< 0.001	< 0.001	< 0.001	0.003

Footnotes:

NMR: no measurement required

* Parameters measured in the field

Table 8.6 - 2017 East Dike Seepage Discharge MMR Effluent Volume (ST-8/ST-MMER-3)

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
1	444	400	435	399	404	0	0	0	0	0	495	381	
2	429	400	431	421	405	0	0	0	0	0	495	559	
3	417	400	436	406	405	0	0	0	0	0	495	461	
4	415	400	428	405	404	0	0	0	0	0	495	380	
5	417	400	431	403	404	0	0	0	187	0	495	378	
6	416	400	429	405	404	0	0	0	612	0	395	378	
7	415	400	430	405	396	0	0	0	909	0	395	375	
8	431	398	431	406	404	0	0	0	906	0	396	467	
9	425	398	432	405	403	0	0	0	931	0	399	470	
10	413	397	433	406	403	0	0	0	918	0	400	628	
11	426	396	413	405	403	0	0	0	935	0	485	627	
12	429	391	399	405	0	0	0	0	914	0	680	628	
13	403	396	411	406	0	0	0	0	916	0	661	624	
14	410	395	428	405	0	0	0	0	882	0	661	623	
15	410	393	416	402	0	0	0	0	901	0	666	608	
16	409	393	400	406	0	0	0	0	872	0	497	605	
17	408	396	394	405	0	0	0	0	807	0	401	629	
18	407	394	400	406	0	0	0	0	793	0	479	623	
19	406	396	401	401	0	0	0	0	745	0	656	633	
20	406	396	399	405	0	0	0	0	707	0	430	453	
21	406	396	401	404	0	0	0	0	734	0	387	369	
22	403	396	401	404	0	0	0	0	485	0	388	370	
23	405	395	400	404	0	0	0	0	0	0	476	374	
24	405	396	400	402	0	0	0	0	0	0	576	373	
25	405	396	397	404	0	0	0	0	0	0	646	374	
26	404	394	381	405	0	0	0	0	0	0	470	379	
27	416	419	363	404	0	0	0	0	0	0	521	632	
28	424	434	341	404	0	0	0	0	0	0	399	617	
29	414		293	404	0	0	0	0	0	433	415	617	
30	415		254	400	0	0	0	0	0	799	482	619	
31	413		314		0		0			799		616	
Total (m³)	12,848	11,162	12,321	12,141	4,435	0	0	0	14,154	2,031	14,836	15,870	99,798

Table 8.8: 2017 Water Transfers around the Mine Site

Water Pumped From	North Portage Pit (ST-17)	South Portage Pit (ST-19)	Stormwater Management Pond	Goose Pit (ST-20)	Portage Rock Storage Facility (ST-16)*	Waste Extension Pool (WEP1) Collection System	Waste Extension Pool (WEP2) Collection System	Vault Pit (ST-23)	North Cell TSF	Saddle Dam 1 (ST-S-2)	Saddle Dam 3 (ST-32)	Central Dike Seepage (ST-S-5)
Water Pumped To	South Cell TSF	South Cell TSF	South Cell TSF/ Only September water pumped to Goose Pit	South Cell TSF	North Cell TSF	North Cell TSF	North Cell TSF	Vault Attenuation Pond	South Cell TSF	North Cell TSF	South Cell TSF	South Cell TSF/ Aug- Sept and October South Cell TSF and Goose Pit
January	7,698	0	0	0	0	0	0	0	0	0	0	447,165
February	0	0	0	0	0	0	0	0	0	0	0	408,856
March	10,351	0	0	0	0	0	0	0	0	0	0	449,239
April	7,200	0	0	0	0	0	0	0	0	0	0	427,944
May	15,345	0	33,664	0	12,916	2,141	1,635	15,263	0	5,197	2,863	494,484
June	86,268	0	9,576	0	7,382	8,345	5,154	49,924	172,533	1,767	8,363	466,642
July	21,273	0	28,193	0	2,229	960	1,836	31,502	0	1,402	1,922	424,499
August	4,193	0	0	0	2,553	1,741	510	22,497	0	2,848	565	401,537
September	13,940	0	32,461	0	388	1,269	1,147	17,745	66,229	1,658	2,348	388,327
October	10,937	0	0	0	347	0	0	8,130	0	230	0	282,043
November	6,800	0	0	0	0	0	0	4,815	0	0	0	256,514
December	0	0	0	0	0	0	0	0	0	0	0	251,796
Total	184,005	0	103,894	0	25,815	14,456	10,282	149,876	238,762	13,102	16,061	4,699,046

*Do not include volume of water from WEP system.

Table 8.9: 2017 Vault Attenuation Pond Water Quality Monitoring (ST-25)

Date	Units	11-Jun-2017	17-Jul-2017	16-Aug-2017	3-Sep-2017
Field Parameters					
pH		6.82	8.16	8.00	8.32
Conductivity	µS/cm	241	251	348	398
Turbidity	NTU	32.80	7.51	3.86	21.4
Conventional Parameters					
Alkalinity	mg CaCO ₃ /L	53	54	58	52
Hardness	mg CaCO ₃ /L	86	85	129	170
TSS	mg/L	28	6	1	86
TDS	mg/L	142	156	215	237
Nutrients and Biological Indicators					
Ammonia (NH ₃)	mg N/L	< 0.01	0.02	0.03	0.03
Ammonia-nitrogen (NH ₃ -NH ₄)	mg N/L	1.90	1.55	1.77	2.20
Nitrate	mg N/L	2.70	0.30	5.68	5.38
Nitrite	mg N/L	0.07	0.06	0.08	0.06
Major Ions					
Chloride	mg/L	10.0	7.2	10.6	11.5
Fluoride	mg/L	0.12	NA	0.11	0.07
Sulphate	mg/L	26.4	44.1	206.0	77.2
Cyanide					
Total Cyanide	mg/L	0.005	0.004	0.004	0.006
Total Metals					
Aluminum	mg/L	0.916	0.135	0.083	1.4
Arsenic	mg/L	0.0006	< 0.0005	0.0149	< 0.0005
Barium	mg/L	0.015	0.016	0.025	0.0381
Cadmium	mg/L	0.00003	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.0021	< 0.0006	0.0036	0.0026
Copper	mg/L	0.0032	0.0024	0.0029	0.0062
Iron	mg/L	1.690	0.27	0.07	1.91
Lead	mg/L	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	0.092	0.044	0.056	0.0845
Mercury	mg/L	< 0.00001	< 0.00001	< 0.00001	0.00002
Molybdenum	mg/L	0.0190	0.0108	0.0211	0.0178
Nickel	mg/L	0.0080	0.0039	0.0036	0.0053
Selenium	mg/L	< 0.001	< 0.001	0.002	< 0.001
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	< 0.001	< 0.0008	< 0.0008	< 0.0008
Zinc	mg/L	0.002	0.001	< 0.001	0.003

Table 8.10: 2017 Vault Attenuation Pond Discharge (ST-10)

Parameters	Units	Maximum Average Concentration	Maximum Allowable Grab Sample Concentration	Prior to discharge 6/5/2017	19-Jun-2017	26-Jun-2017	3-Jul-2017	10-Jul-2017	17-Jul-2017	24-Jul-2017	1-Aug-2017	7-Aug-2017	Prior to discharge 8/14/2017	21-Aug-2017	29-Aug-2017	11-Sep-2017
Field Parameters																
pH	pH Unit	6-9.0	6-9.0	7.32	7.45	not on data sheet	7.57	8.05	8.32	7.73	7.44	7.95	7.66	7.71	7.73	8.17
Conductivity	µS/cm			157.6	148.5	not on data sheet	172.6	225	206	212.1	223	274	259	363	381	459
Turbidity	NTU	15	15	13.1	9.21	not on data sheet	3.46	3.54	2.96	4.2	1.76	7	2.83	9.72	6.72	21.3
Conventional Parameters																
Total alkalinity	mg CaCO ₃ /L			32	30	52	52	52	53	53	51	53	53	58	54	63
Bicarbonate alkalinity	mg/L			32	30	52	52	52	53	53	51	53	56	58	54	63
Carbonate alkalinity	mg/L			< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Hardness	mg CaCO ₃ /L			49	40	52	54	63	73	83	90	85	97	138	151	136
DOC	mg/L			4.9	3.7	4	4.7	5.1	5.3	5	4.8	4.4	4.5	5.1	5.3	5.8
TOC	mg/L			5.3	4.6	4.7	5.4	5.6	5.8	5.6	4.8	4.4	4.5	5.1	5.3	5.8
TDS	mg/L	1400	1400	92	91	102	110	118	129	141	147	147	161	226	234	276
TSS	mg/L	15	30	12	10	< 1	< 1	4	4	< 1	1	10	3	22	11	9
Nutrients and Biological Indicators																
Ammonia-nitrogen	mg N/L	20	40	0.6	0.64	0.87	1.02	1.1	0.83	0.95	0.91	0.63	0.53	1.7	1.82	2.86
Total Kjeldahl nitrogen	mg N/L			1.1	0.86	1.1	0.96	1.1	2.66	0.96	0.75	1.54	1.26	2.2	2.5	3.28
Nitrate	mg N/L	50	100	0.92	0.94	1.12	1.71	2.23	2.55	2.85	2.98	2.97	3.25	5.8	6.34	7.46
Nitrite	mg N/L			0.01	0.03	0.02	0.04	0.05	0.04	0.04	0.03	0.03	0.04	0.07	0.017	0.11
Ortho-phosphate	mg P/L			0.02	0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01
Total phosphorous	mg P/L	1.5	3.0	< 0.04	< 0.04	< 0.04	< 0.04	0.05	0.02	0.03	< 0.01	0.03	< 0.01	0.03	0.06	< 0.01
Reactive silica	mg/L			1.7	1.3	1.5	1.6	2.6	1.1	1.4	1	0.95	0.68	1.4	1.3	1.5
Major Ions																
Chloride	mg/L	500	1000	4.6	4.3	4.4	5.3	5.6	5.6	6.2	6.4	6.4	7.5	10.5	11.4	13.7
Sulphate	mg/L			25.5	26	32	31	33	40	42	49	41	38	63	71	89
Cyanide																
Total cyanide	mg/L			0.002	0.001	0.003	< 0.001	0.205	0.002	0.001	0.001	< 0.001	< 0.001	0.001	0.014	0.019
Total Metal																
Aluminum	mg/L	1.5	3.0	0.312	0.218	0.162	0.104	0.101	0.098	0.092	0.069	0.202	0.091	0.507	0.389	0.273
Antimony	mg/L			< 0.0001	0.0002	0.0005	0.0008	0.0008	0.0011	0.0013	0.001	0.0009	0.011	0.0021	0.0024	0.003
Arsenic	mg/L	0.10	0.20	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0043	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Barium	mg/L			0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03
Beryllium	mg/L			< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	0.002	0.004	0.00004	0.00002	< 0.00002	0.00003	0.00003	0.00003	0.00006	< 0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002	0.00005
Calcium	mg/L			13	11	15	15	18	21	24	26	23	26	38	42	38
Chromium	mg/L			0.0007	0.0024	0.0024	0.0006	0.0008	< 0.0006	< 0.0006	< 0.0006	0.00	< 0.0006	0.0034	< 0.0006	< 0.0006
Copper	mg/L	0.1	0.2	< 0.0005	0.0025	0.0033	0.0026	0.0024	0.0031	0.0028	0.0027	0.0023	0.003	0.0052	0.003	0.0032
Iron	mg/L			0.43	0.36	0.26	0.11	0.19	0.17	0.2	0.04	0.32	0.18	0.75	0.47	0.79
Lead	mg/L	0.1	0.2	0.0015	0.0009	0.0016	0.0083	0.1225	< 0.0003	< 0.0003	0.0004	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Lithium	mg/L			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.023	< 0.005	< 0.005
Magnesium	mg/L			3.9	3.1	4.0	4.3	4.7	5.2	6.0	6.2	7.0	7.7	10.5	11.4	10.3
Manganese	mg/L			0.065	0.0605	0.063	0.053	0.054	0.0493	0.056	0.028	0.045	0.0419	0.066	0.0551	0.055
Mercury	mg/L	0.004	0.008	0.00002	< 0.00001	< 0.00001	< 0.00001	0.0003	< 0.00001	< 0.00001	0.0002	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00005
Molybdenum	mg/L			0.0052	0.0036	0.0057	0.0064	0.0084	0.0094	0.0104	0.0098	0.0102	0.0107	0.0191	0.0198	0.0213
Nickel	mg/L	0.2	0.4	0.0046	0.0041	0.0043	0.0045	0.0038	0.0048	0.0051	0.0047	0.0041	0.0043	0.0056	0.0045	0.0037
Potassium	mg/L			2.2	1.5	2.1	2.1	2.7	2.8	2.9	3.6	2.2	3.5	5.4	4.5	5.4
Selenium	mg/L			< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.001	< 0.001
Sodium	mg/L			1.9	1.3	6.4	2.3	2.5	2.6	3.2	3.4	4.0	3.9	6.3	6.7	5.9
Strontium	mg/L			0.079	0.067	0.094	0.099	0.104	0.132	0.131	0.149	0.142	0.15	0.296	0.338	0.325
Tin	mg/L			< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium	mg/L			0.02	0.01	0.01	0.01	0.02	0.01	0.03	0.02	0.03	0.02	0.06	0.05	0.04
Thallium	mg/L			< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Uranium	mg/L			0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.005	0.007
Vanadium	mg/L			< 0.0005	0.00008	< 0.0005	< 0.0005	0.0013	0.003	< 0.0005	< 0.0005	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	0.2	0.4	< 0.001	0.002	0.005	0.003	< 0.001	< 0.001	0.002	0.002	0.006	< 0.001	< 0.001	0.001	0.003

Parameters	Units	Maximum Average Concentration	Maximum Allowable Grab Sample Concentration	Prior to discharge 6/5/2017	19-Jun-2017	26-Jun-2017	3-Jul-2017	10-Jul-2017	17-Jul-2017	24-Jul-2017	1-Aug-2017	7-Aug-2017	Prior to discharge 8/14/2017	21-Aug-2017	29-Aug-2017	11-Sep-2017
Dissolved Metals																
Aluminum	mg/L	1.0	2.0	< 0.006	< 0.006	0.022	0.006	< 0.006	0.017	0.014	0.03	0.015	0.024	< 0.006	0.389	< 0.006
Antimony	mg/L			< 0.0001	0.0001	< 0.0001	< 0.0001	0.0015	0.001	0.0012	0.0012	0.001	0.001	0.002	0.0027	0.0033
Arsenic	mg/L			< 0.0005	< 0.0005	< 0.0005	0.0005	0.0193	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0029	< 0.0005	< 0.0005
Boron	mg/L			< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Barium	mg/L			0.00	0.00	0.011	0.001	0.011	0.118	0.0166	0.016	0.0199	0.0228	0.0294	0.03	0.034
Beryllium	mg/L			< 0.0005	< 0.0005	< 0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L			0.00003	0.00003	< 0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00012	< 0.00002	0.00002	< 0.00002	0.00008
Chromium	mg/L			< 0.0006	< 0.0006	0.0031	0.0006	0.0016	< 0.0006	< 0.0006	0.0008	0.0009	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L			< 0.0005	0.0016	0.0026	0.0005	0.0163	0.001	0.002	0.0022	< 0.0005	0.0027	0.0012	0.0018	0.0045
Iron	mg/L			0.01	0.01	0.01	0.01	0.01	0.02	0.2	0.01	0.03	0.21	0.03	< 0.01	0.01
Lead	mg/L			< 0.0003	< 0.0003	0.0014	0.0025	0.019	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Lithium	mg/L			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.023	< 0.005	< 0.005
Manganese	mg/L			0.045	0.054	0.064	0.0005	0.0354	0.049	0.047	< 0.001	0.040	0.021	0.039	0.040	0.049
Mercury	mg/L			0.00003	< 0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00008	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L			0.004	0.0039	0.0064	0.0005	0.0084	0.008	0.0099	0.0087	0.011	0.011	0.0176	0.0208	0.0244
Nickel	mg/L			0.0029	0.0034	0.0043	< 0.0005	0.0034	0.0036	0.0045	0.0044	0.0047	0.0045	0.0027	0.0034	0.0033
Selenium	mg/L			< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001
Strontium	mg/L			0.073	0.067	0.08	< 0.005	0.105	0.107	0.139	0.164	0.15	0.15	0.25	0.356	0.335
Tin	mg/L			< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium	mg/L			0.01	0.01	0.01	< 0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.03	0.03
Thallium	mg/L			< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Uranium	mg/L			0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.005	0.005	0.007
Vanadium	mg/L			< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0013	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L			< 0.001	< 0.001	0.001	0.001	< 0.0001	0.006	< 0.001	0.003	0.009	< 0.001	< 0.001	< 0.001	< 0.001
Hydrocarbons																
TPH	mg/L			< 0.1	< 0.1	< 0.1	< 0.3	< 0.1	< 0.3	< 0.3	< 0.1	not on certificate	< 0.1	0.1	< 0.1	< 0.1
Toxicity																
Daphnia Magna	%v/v				> 100		> 100				> 100					> 100
Rainbow trout	%v/v				> 100		> 100				> 100					> 100

Table 8.11: 2017 East Dike Seepage Discharge (ST-8)

Date	Units	Maximum Average Concentration	Maximum Allowable Grab Sample Concentration	9-Jan-2017	6-Feb-2017	29-Mar-2017	3-Apr-2017	1-May-2017	6-Sep-2017	30-Oct-2017	6-Nov-2017	4-Dec-2017
pH*				7.65	7.95	7.70	7.85	7.54	7.72	7.34	7.20	9.01
Turbidity*	NTU			2.34	4.87	0.92	1.86	1.22	1.72	1.60	6.03	4.13
Aluminum	mg/L			0.064	0.046	0.035	0.042	0.039	0.015	0.027	0.059	0.054
Arsenic	mg/L			0.0009	< 0.0005	0.0023	< 0.0005	< 0.0005	< 0.0005	0.0026	< 0.0005	< 0.0005
Copper	mg/L			0.0012	0.0021	0.0005	0.0018	0.0020	0.0008	< 0.0005	0.0005	0.0018
Total Cyanide	mg/L			0.005	< 0.001	< 0.001	0.002	0.007	0.003	< 0.001	0.001	< 0.001
TSS	mg/L	15	30	6	4	9	8	1	3	4	5	8
Nickel	mg/L			0.0006	0.0005	< 0.0005	0.0007	< 0.0005	0.0008	0.0005	0.0009	0.0006
Lead	mg/L			< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Radium 226	mg/L			0.003	0.002	< 0.002	< 0.002	0.002	< 0.002	< 0.002	< 0.002	
Sulphate	mg/L			4.1	2.9	15.8	16.6	6.3	19	7	6.8	6.8
Zinc	mg/L			< 0.001	0.005	< 0.001	< 0.001	< 0.001	< 0.001	0.002	0.001	< 0.001

Footnotes:

*Measured in the field by Environmental Technicians.

** Parameter was not analysed. When Agnico noticed, it was too late to collect another sample for the month.

Table 8.12: 2017 Tailings Reclaim Pond Water Quality Monitoring (ST-21)

Date	Units	3-Jan-2017	6-Feb-2017	6-Mar-2017	6-Apr-2017	1-May-2017	12-Jun-2017	10-Jul-2017	1-Aug-2017	7-Aug-2017	14-Aug-2017	21-Aug-2017	28-Aug-2017	3-Sep-2017
Field Parameters														
pH		8.68	8.57	8.77	8.35	8.38	8.14	8.02	8.13	8.16	7.94	8.13		8.38
Turbidity	NTU	4.98	11.3	7.85	8.19	13.2	11	5.88	6.15	9.92	3.1	4.44		15.1
Conventional Parameters														
Alkalinity	mg CaCO ₃ /L	134	135	132	128	125	104	123	138	133	144	139	127	128
Hardness	mg CaCO ₃ /L	1284	1404	1261	1333	not on certificate	980	828	1192	1740	1238	2228	1175	1350
TDS	mg/L	3213	3414	3681	3730	3680	2750	2460	2584	2664	2691	2717	2896	2776
TSS	mg/L	14	7	11	9	16	2	7	10	16	3	4	31	35
Nutrients and Biological Indicators														
Ammonia (NH ₃)	mg N/L	2.46	1.82	2.45	0.28	1.61	0.78	0.45	1.24	not on certificate	0.87	1.24	1.53	0.73
Ammonia-Nitrogen	mg N/L	48.4	38.3	49.3	5.2	56.2	39.0	37.0	43.4	41.4	41.9	42.4	50.0	47.0
Nitrate	mg N/L	5.8	5.3	6.01	4.93	4.98	3.86	2.36	2.1	2.8	1.2	2.1	3.0	3.5
Nitrite	mg N/L	0.21	0.23	0.35	0.33	0.39	0.24	0.4	0.16	0.15	0.17	0.15	0.15	0.16
Major Ions														
Chloride	mg/L	430	447	545	550.9	563.4	333	307	34	310	323	323	377	356
Fluoride	mg/L	0.41	0.44	0.33	0.25	0.4	0.36	0.39	0.37	0.38	0.46	0.421	0.41	0.45
Sulphate	mg SO ₄ /L	2137	2199	2180	2216	2322	1585	1445	1772	not on certificate	1037	1813	1823	2014
Cyanide														
Total cyanide	mg/L	2.190	2.560	2.960	3.620	3.020	0.143	0.100	0.112	0.228	0.105	0.139	0.213	0.538
CN Free	mg/L	0.016	0.008	6.060	0.007	0.007	< 0.005	< 0.005	0.008	0.024	0.017	< 0.005	< 0.005	0.043
Cyanide WAD	mg/L	0.1990	0.2510	0.0780	0.6150	0.7950	0.1100	0.0370	0.0690	0.0970	0.0660	0.1000	0.0940	0.3410
Total Metals														
Aluminum	mg/L	0.062	0.059	0.111	0.102	0.100	0.034	0.070	0.069	0.198	0.078	0.040	0.276	0.577
Arsenic	mg/L	0.0134	0.0138	0.0151	0.0098	0.0027	0.0043	0.0218	< 0.0005	0.0095	0.0184	0.0005	0.0158	0.0092
Barium	mg/L	0.1133	0.1098	0.0988	0.1077	0.0874	0.0530	0.0408	0.0639	0.0918	0.0753	0.1558	0.0955	0.0865
Cadmium	mg/L	0.00200	0.00218	0.00179	0.00136	0.00125	0.00162	0.00102	0.00127	0.00020	< 0.00002	0.00261	0.00104	0.00129
Chromium	mg/L	0.0012	< 0.0006	0.0010	0.0006	< 0.0006	< 0.0006	0.0009	< 0.0006	< 0.0006	< 0.0006	< 0.0006	0.0081	0.0035
Copper	mg/L	0.2485	0.7090	0.2742	0.2142	0.7502	0.1097	0.1046	0.0707	0.1096	0.0554	0.1466	0.0729	0.7155
Iron	mg/L	1.37	0.99	0.99	0.71	0.99	0.19	0.29	0.03	0.37	0.21	0.37	0.63	1.14
Mercury	mg/L	0.00042	0.00042	0.00056	0.00050	0.00027	0.00032	< 0.00001	< 0.00001	< 0.00001	0.00016	0.00015	< 0.00001	< 0.00001
Lead	mg/L	0.0007	< 0.0003	< 0.0003	0.0045	< 0.0003	< 0.0003	< 0.0003	0.0018	< 0.0005	< 0.0003	< 0.0003	0.0095	0.0024
Manganese	mg/L	0.1739	0.2310	0.1377	0.2864	0.2540	0.4497	0.4063	0.4263	0.4228	0.4117	0.6219	0.3078	0.2202
Molybdenum	mg/L	0.5372	0.5706	0.5427	0.5377	0.5087	0.3588	0.3588	0.4262	0.4203	0.5212	0.9770	0.4941	0.5631
Nickel	mg/L	0.0742	0.0573	0.0657	0.1240	0.0654	0.0752	0.0739	0.0714	0.0550	0.0558	0.1055	0.0498	0.1684
Selenium	mg/L	0.078	0.054	0.055	0.045	0.038	0.038	0.025	0.035	0.026	0.042	0.067	0.039	0.035
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001	0.0003	< 0.0001	< 0.0001	0.0002	< 0.0001	< 0.0005	< 0.0001	< 0.0001	< 0.0001	0.0025
Thallium	mg/L	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Zinc	mg/L	0.005	0.001	0.001	0.166	< 0.001	< 0.001	< 0.001	0.002	0.005	< 0.001	< 0.001	0.003	0.003

Table 8.12: 2017 Tailings Reclaim P.

Date	Units	11-Sep-2017	18-Sep-2017	25-Sep-2017	2-Oct-2017	9-Oct-2017	7-Nov-2017	4-Dec-2017
Field Parameters								
pH		7.97	8.13	8.06	8.01	7.64		8.60
Turbidity	NTU	8.01	3.58	2.27	4.94	5.17		16.2
Conventional Parameters								
Alkalinity	mg CaCO ₃ /L	124	122	121	112	123	123	122
Hardness	mg CaCO ₃ /L	1178	1026	952	918	959	991	1214
TDS	mg/L	2702	2835	2832	2864	2852	3837	3483
TSS	mg/L	9	5	3		8	8	8
Nutrients and Biological Indicator								
Ammonia (NH ₃)	mg N/L	0.89	0.80	0.94	1.29	1.34	1.31	2.36
Ammonia-Nitrogen	mg N/L	38.0	49.0	43.0	51.8	48.1	50.3	51.8
Nitrate	mg N/L	2.9	3.1	3.0	2.9	3.2	3.4	4.3
Nitrite	mg N/L	0.18	0.19	0.19	0.16	0.18	0.23	0.2
Major Ions								
Chloride	mg/L	320	321	340	338	351	407	440
Fluoride	mg/L	0.32	0.39	0.45	0.58	0.46	0.45	0.37
Sulphate	mg SO ₄ /L	2001	1982	1991	74.2	1889	2343	2430
Cyanide								
Total cyanide	mg/L	0.080	0.195	0.113	0.096	0.123	0.194	1.000
CN Free	mg/L	0.007	0.185	0.056		0.100	0.042	0.430
Cyanide WAD	mg/L	0.0740	0.1810	0.0940	0.0610	0.0620	0.0250	0.0730
Total Metals								
Aluminum	mg/L	0.173	0.037	0.058	0.052	0.033	0.045	0.020
Arsenic	mg/L	0.0027	< 0.0005	0.0058	0.0076	0.0131	0.0035	0.0030
Barium	mg/L	0.0931	0.0879	0.0689	0.0592	0.0703	0.0716	0.0915
Cadmium	mg/L	0.00193	0.00170	0.00119	0.00162	0.00201	0.00212	0.00222
Chromium	mg/L	< 0.0006	< 0.0006	0.0043	0.0013	0.0018	0.0011	< 0.0006
Copper	mg/L	0.4203	0.5813	0.4003	0.3148	0.3398	0.5677	1.1920
Iron	mg/L	0.26	0.20	0.17	0.27	0.16	0.18	0.37
Mercury	mg/L	0.00044	0.00030	< 0.00001	0.00028	0.00044	0.00062	0.00054
Lead	mg/L	< 0.0003	0.0041	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	0.1600	0.1147	0.1559	0.2341	0.2230	0.2242	0.2183
Molybdenum	mg/L	0.5372	0.5903	0.4882	0.4269	0.5103	0.5552	0.6859
Nickel	mg/L	0.1622	0.2446	0.2147	0.2159	0.2911	0.1241	0.3100
Selenium	mg/L	0.042	0.051	0.047	0.044	0.046	0.058	0.087
Silver	mg/L	0.0007	0.0013	0.0006	< 0.0001		< 0.0001	< 0.0001
Thallium	mg/L	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Zinc	mg/L	< 0.001	0.004	< 0.001	< 0.001	< 0.001	0.001	0.001

Table 8.13: 2017 North Portage Pit Sump Water Quality Monitoring (ST-17)

Date	Units	4-Apr-2017	12-Jun-2017	10-Jul-2017	1-Aug-2017	7-Aug-2017	14-Aug-2017	21-Aug-2017
Field Parameters								
pH		8.14	8.08	8.00	8.15		8.00	7.56
Turbidity	NTU	meter malfunction	30.6	7.5	7.7		30.0	5.5
Conventional Parameters								
Alkalinity	mg CaCO3/L	279	83	84	86	87	112	89
Hardness	mg CaCO3/L	55	193	205	221	275	313	19
TDS	mg/L	1131	387	395	372	356	442	397
TSS	mg/L	673	16	7	50	< 1	38	1
Nutrients and Biological Indicators								
Ammonia (NH3)	mg N/L	0.35	0.41	< 0.01	0.01	0.01	0.06	0.01
Ammonia nitrogen	mg N/L	14.7	4.3	2.0	0.8	0.7	3.0	0.7
Nitrate	mg N/L	24.90	4.48	8.6	6.16	5.9	10.3	6.2
Nitrite	mg N/L	0.75	0.11	0.07	0.04	0.03	0.14	0.03
Major Ions								
Chloride	mg/L	70.2	12.7	14.4	76.6	13.8	26.2	15.5
Fluoride	mg/L	0.56	0.36	0.43	0.39	0.37	0.20	0.41
Sulphate	mg SO4/L	436	148	150	173	186.0	101	163
Cyanide								
Total cyanide	mg/L	0.392	0.062	0.014	0.005	0.003	0.048	0.003
Free cyanide	mg/L	0.099	0.035	0.009	< 0.005	< 0.005	0.013	< 0.005
Total Metals								
Aluminum	mg/L	4.440	0.134	0.108	0.333	0.143	1.220	0.123
Arsenic	mg/L	0.0017	0.0239	0.0231	0.0105	0.0255	0.0100	0.0271
Barium	mg/L	0.058	0.006	0.010	0.014	0.015	0.032	0.019
Cadmium	mg/L	0.00049	0.00019	0.00009	< 0.00002	< 0.00005	< 0.00002	< 0.00002
Chromium	mg/L	0.008	0.001	0.002	0.001	0.007	0.0014	0.0054
Copper	mg/L	0.0083	0.0006	< 0.0005	0.0008	< 0.0005	0.0025	0.0009
Iron	mg/L	9.07	0.42	0.30	0.60	0.19	2.01	0.24
Lead	mg/L	< 0.0003	0.0165	< 0.0003	0.0005	< 0.0005	< 0.0003	0.0056
Manganese	mg/L	0.2825	0.0713	0.1424	0.1177	0.1248	0.3123	0.1309
Mercury	mg/L	0.00009	0.00001	< 0.00001	< 0.00001	< 0.00001	0.00002	0.00026
Molybdenum	mg/L	0.2144	0.0594	0.0425	0.0368	0.0376	0.04	0.04
Nickel	mg/L	0.02	0.03	0.03	0.03	0.03	0.01	0.03
Selenium	mg/L	0.002	< 0.001	< 0.001	0.001	< 0.001	0.001	0.001
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0005	< 0.0001	< 0.0001
Thallium	mg/L	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Zinc	mg/L	0.016	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.004
Dissolved Metals								
Aluminum	mg/L	0.029	< 0.006	< 0.006	0.016	0.023	0.038	0.011
Arsenic	mg/L	0.0005	0.015	0.040	0.012	0.0267	0.0024	0.0268
Barium	mg/L	0.0380	0.004	0.009	0.013	0.02	0.02	0.017
Cadmium	mg/L	0.00044	< 0.000	0.00007	< 0.00002	< 0.00005	< 0.00002	< 0.00002
Copper	mg/L	0.0032	< 0.001	0.0092	0.0005	< 0.0005	0.0016	0.0008
Iron	mg/L	0.14	0.010	< 0.01	< 0.01	< 0.01	0.01	< 0.01
Manganese	mg/L	0.093	0.071	0.136	0.118	0.109	0.285	0.132
Mercury	mg/L	0.00009	0.000	< 0.000	< 0.00001	< 0.00001	< 0.00001	0.00011
Molybdenum	mg/L	0.231	0.050	0.043	0.035	0.034	0.039	0.042
Nickel	mg/L	0.015	0.029	0.026	0.026	0.024	0.009	0.033
Lead	mg/L	< 0.0003	0.006	< 0.0003	< 0.0003	< 0.0005	< 0.0003	< 0.0003
Selenium	mg/L	0.002	< 0.001	< 0.001	< 0.001	< 0.001	0.001	0.001
Silver	mg/L	< 0.0001	< 0.000	< 0.0001	< 0.0003	0.0007	< 0.0001	< 0.0001
Thallium	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Zinc	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001

28-Aug-2017	3-Sep-2017	11-Sep-2017	18-Sep-2017	25-Sep-2017	2-Oct-2017	9-Oct-2017	3-Dec-2017
	8.23	7.22	7.65	7.21	8.01	7.93	8.28
	6.3	2.4	2.9	2.5	4.9	6.1	3.1
77	83	80	79	82	79	85	91
242	275	255	197	212	270	250	232
419	430	405	405	419	533	453	408
7	7	3	3	5	51	6	2
< 0.05	< 0.05	< 0.01	< 0.01	0.01	0.13	0.01	0.01
0.8	3.9	1.5	1.0	0.5	4.0	0.6	0.6
6.7	9.4	7.9	6.5	7.9	13.1	8.2	6.1
0.03	0.10	0.06	0.05	0.07	0.13	0.05	0.03
17.7	19.0	17.3	15.9	16.9	21.2	19.4	18.6
0.40	0.45	0.34	0.40	0.47	0.56	0.49	0.47
158	168	160	170	170	224	204	179
0.013	0.042	0.010	0.009	0.009	0.057	0.012	0.005
< 0.005	0.012	0.005	< 0.005	< 0.005	0.033	< 0.005	< 0.005
0.045	0.157	0.064	0.034	0.019	0.627	0.013	< 0.006
0.0289	0.0270	0.0172	0.0079	0.0176	0.0404	0.0231	0.0359
0.026	0.018	0.018	0.015	0.014	0.016	0.015	0.018
< 0.00002	0.00009	< 0.00002	0.00013	< 0.00002	0.00019	0.00006	0.00010
0.0082	0.0017	< 0.0006	< 0.0006	0.0011	0.0086	< 0.0006	< 0.0006
< 0.0005	0.0010	0.0005	< 0.0005	< 0.0005	0.0013	0.0016	0.0005
0.14	0.33	0.08	0.24	0.04	1.69	0.08	0.04
0.0021	0.0006	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
0.1283	0.1220	0.1211	0.1125	0.1214	0.1403	0.1237	0.1284
< 0.00001	< 0.00001	0.00002	< 0.00001	< 0.00001	< 0.00001	0.00004	0.00002
0.04	0.05	0.05	0.05	0.05	0.08	0.06	0.04
0.03	0.04	0.03	0.03	0.03	0.59	0.04	0.04
0.001	< 0.001	0.001	< 0.001	0.001	0.002	0.001	0.001
< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
0.003	0.008	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
< 0.003	< 0.006	0.011	< 0.006	0.111	< 0.006	< 0.006	0.024
0.0281	0.0238	0.0178	0.0077	0.0120	0.0343	0.0181	0.0394
0.022	0.015	0.015	0.014	0.014	0.013	0.013	0.013
< 0.00002	0.00009	< 0.00002	0.00015	< 0.00002	0.00023	< 0.00002	0.00011
0.0005	0.0008	0.0036	< 0.0005	< 0.0005	< 0.0005	0.0016	< 0.0005
< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	0.07	< 0.01
0.109	0.117	0.119	0.113	0.121	0.119	0.120	0.121
< 0.00001	0.00002	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00002
0.047	0.053	0.044	0.049	0.046	0.081	0.062	0.034
0.024	0.038	0.029	0.026	0.026	0.053	0.035	0.041
0.0050	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0005	< 0.0003	< 0.0003
0.001	< 0.001	< 0.001	0.001	0.002	0.001	0.001	0.001
< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Table 8.14: 2017 South Portage Pit Sump Water Quality Monitoring (ST-19)

Date	Units	17-Jul-2017	17-Aug-2017	3-Sep-2017
Field Parameters				
pH		8.32	8.01	8.08
Turbidity	NTU	0.8	2.9	1.7
Conventional Parameters				
Alkalinity	mg CaCO ₃ /L	74	82	74
Hardness	mg CaCO ₃ /L	185	217	173
TSS	mg/L	3	1	< 1
TDS	mg/L	363	388	413
Nutrients and Biological Indicators				
Ammonia (NH ₃)	mg N/L	0.08	0.10	< 0.01
Ammonia nitrogen (NH ₃ -NH ₄)	mg N/L	3.35	4.05	5.20
Nitrate	mg N/L	0.7	10.30	11.7
Nitrite	mg N/L	0.19	0.31	0.56
Major Ions				
Chloride	mg/L	28	28	30.1
Fluoride	mg/L	0.41	0.38	0.37
Sulphate	mg SO ₄ /L	110	137	140.0
Total Metals				
Arsenic	mg/L	< 0.0005	< 0.0005	< 0.0005
Aluminium	mg/L	0.0190	0.0160	0.0200
Barium	mg/L	0.0141	0.0136	0.0143
Cadmium	mg/L	0.00003	< 0.00002	0.00004
Chromium	mg/L	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	0.0015	< 0.0005	0.0005
Iron	mg/L	0.03	< 0.01	0.05
Lead	mg/L	< 0.0003	< 0.0003	0.0266
Manganese	mg/L	0.1198	0.0852	0.0593
Mercury	mg/L	0.00001	< 0.00010	0.00006
Molybdenum	mg/L	0.0267	0.0315	0.0280
Nickel	mg/L	0.0244	0.0199	0.0115
Selenium	mg/L	0.0010	0.0030	0.0010
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	< 0.0008	< 0.0008	< 0.0008
Zinc	mg/L	0.001	< 0.001	< 0.001
Dissolved Metals				
Aluminum	mg/L	< 0.006	0.008	< 0.006
Arsenic	mg/L	< 0.001	< 0.001	< 0.0005
Barium	mg/L	0.009	0.01	0.01
Cadmium	mg/L	< 0.00002	< 0.00002	0.00007
Copper	mg/L	< 0.0005	0.0006	< 0.001
Iron	mg/L	< 0.01	< 0.01	< 0.01
Manganese	mg/L	0.105	0.06	0.0515
Mercury	mg/L	0.00002	< 0.00010	0.00006
Molybdenum	mg/L	0.03	0.030	0.027
Nickel	mg/L	0.025	0.02	0.011
Lead	mg/L	< 0.0003	< 0.0003	< 0.0003
Selenium	mg/L	0.001	0.003	0.001
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	< 0.001	< 0.001	< 0.001
Zinc	mg/L	< 0.001	< 0.001	< 0.001

Table 8.15: 2017 Goose Island Pit Lake Water Quality Monitoring (ST-20)

Date	Units	20-Aug-17	28-Aug-17	3-Sep-17	5-Oct-17
Field Parameters					
pH		7.35	7.37	8.19	7.21
Conductivity	µS/cm	576	545	607	746
Turbidity	NTU	10	6	13	30
Conventional Parameters					
Alkalinity	mg CaCO ₃ /L	92	78	86	82
Bicarbonate alkalinity	mg CaCO ₃ /L	92	78	86	82
Carbonate alkalinity	mg CaCO ₃ /L	< 2	< 2	< 2	< 2
Hardness	mg CaCO ₃ /L	175	182	135	197
TDS	mg/L	364	362	323	468
TSS	mg/L	2	7	14	12
TOC	mg/L	3	0	4	6
DOC	mg/L	3.1	0.2	3.0	6.2
Nutrients and Biological Indicators					
Ammonia nitrogen (NH ₃ -NH ₄)	mg N/L	0.70	0.68	0.70	1.70
Total Kjeldahl Nitrogen	mg N/L	0.89	1.10	0.31	3.26
Nitrate	mg N/L	3.65	4.02	3.38	4.27
Nitrite	mg N/L	0.08	0.08	0.04	0.14
Total Phosphorus	mg P/L	0.01	0.05	< 0.04	0.02
Ortho-phosphate	mg P/L	< 0.01	0.01	0.01	0.02
Major Ions					
Calcium	mg/L	43.9	45.5	34.0	51.0
Potassium	mg/L	9.33	7.90	7.07	12.10
Magnesium	mg/L	15.9	16.7	12.2	17.1
Sodium	mg/L	33.1	38.3	25.3	49.2
Chloride	mg/L	21.9	22.7	21.7	34.7
Sulphate	mg SO ₄ /L	145	128	111	210
Reactive Silica	mg/L	4.8	4.6	5.8	6.5
Cyanide					
Total cyanide	mg/L	< 0.001	< 0.001	0.003	0.019
Free cyanide	mg/L	< 0.005	< 0.005	< 0.005	< 0.005

Date	Units	20-Aug-17	28-Aug-17	3-Sep-17	5-Oct-17
Total Metals					
Aluminum	mg/L	0.131	0.228	0.283	0.802
Antimony	mg/L	0.001	0.001	0.001	0.001
Arsenic	mg/L	< 0.0005	< 0.0005	< 0.0005	0.0017
Barium	mg/L	0.055	0.050	0.052	0.057
Boron	mg/L	0.07	0.10	0.08	0.07
Beryllium	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Cadmium	mg/L	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.0023	0.0014	0.0021	0.0086
Copper	mg/L	0.0011	0.0006	0.0008	0.0020
Iron	mg/L	0.16	0.68	0.67	1.67
Lead	mg/L	< 0.0003	< 0.0003	0.0210	< 0.0003
Lithium	mg/L	< 0.005	< 0.005	0.001	0.006
Manganese	mg/L	0.062	0.051	0.072	0.209
Mercury	mg/L	< 0.00001	< 0.00001	0.00006	0.00015
Molybdenum	mg/L	0.020	0.020	0.017	0.026
Nickel	mg/L	0.0136	0.0143	0.0176	0.0239
Selenium	mg/L	0.001	0.001	< 0.001	0.003
Strontium	mg/L	0.30	0.34	0.26	0.41
Tin	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Titanium	mg/L	0.05	0.06	0.04	0.07
Thallium	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Uranium	mg/L	0.011	0.011	0.010	0.013
Vanadium	mg/L	< 0.0005	< 0.0005	< 0.0005	0.0014
Zinc	mg/L	< 0.001	< 0.001	0.001	0.003

Date	Units	20-Aug-17	28-Aug-17	3-Sep-17	5-Oct-17
Dissolved Metals					
Aluminum	mg/L	< 0.006	< 0.006	< 0.006	< 0.006
Arsenic	mg/L	0.0016	< 0.0005	< 0.0005	< 0.0005
Antimony	mg/L	0.000	0.001	0.001	0.001
Barium	mg/L	0.04	0.05	0.05	0.05
Boron	mg/L	0.03	0.10	0.09	0.04
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	0.0011	0.0005	< 0.0005	0.0015
Iron	mg/L	0.01	< 0.01	< 0.01	0.03
Lead	mg/L	< 0.0003	< 0.0003	0.0207	< 0.0003
Lithium	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Manganese	mg/L	0.0308	0.0197	0.0561	0.1822
Mercury	mg/L	< 0.00001	0.00001	0.00005	0.00008
Molybdenum	mg/L	0.0197	0.0195	0.0181	0.0275
Nickel	mg/L	0.0114	0.0125	0.0115	0.0149
Selenium	mg/L	0.001	< 0.001	< 0.001	0.002
Strontium	mg/L	0.271	0.284	0.351	0.387
Thallium	mg/L	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Tin	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Titanium	mg/L	0.04	0.05	0.03	0.07
Uranium	mg/L	0.012	0.011	0.011	0.013
Vanadium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	0.001	0.002	< 0.001	< 0.001

Table 8.16: 2017 Goose Island Pit Sump Water Quality Monitoring (ST-20)

Date	Units	17-Jul-17	16-Aug-17	3-Sep-17
Field Parameters				
pH		7.48	8.13	8.16
Turbidity	NTU	7.7	11.9	7.4
Conventional Parameters				
Alkalinity	mg CaCO ₃ /L	85	91	81
Hardness	mg CaCO ₃ /L	202	262	214
TDS	mg/L	369	443	458
TSS	mg/L	6	8	1
Nutrients and Biological Indicators				
Ammonia	mg N/L	0.02	0.03	< 0.01
Ammonia nitrogen (NH ₃ -NH ₄)	mg N/L	0.76	1.22	1.50
Nitrate	mg N/L	2.35	17.00	20.3
Nitrite	mg N/L	0.14	0.12	0.13
Major Ions				
Chloride	mg/L	11.1	12.9	14.1
Fluoride	mg/L	0.22	0.17	0.16
Sulphate	mg SO ₄ /L	112.0	156.0	174.0
Cyanide				
Total cyanide	mg/L	< 0.001	0.001	0.004
Total Metals				
Aluminum	mg/L	0.096	0.134	0.107
Arsenic	mg/L	< 0.0005	0.0076	< 0.0005
Barium	mg/L	0.031	0.045	0.048
Cadmium	mg/L	< 0.00002	< 0.00002	0.00004
Chromium	mg/L	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	0.0024	0.0016	0.0021
Iron	mg/L	0.21	0.20	0.21
Lead	mg/L	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	0.1028	0.1231	0.0716
Mercury	mg/L	< 0.00001	< 0.00001	0.00004
Molybdenum	mg/L	0.0069	0.0069	0.0060
Nickel	mg/L	0.0538	0.0995	0.0737
Selenium	mg/L	< 0.001	0.002	0.002
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	< 0.0008	< 0.0008	< 0.0008
Zinc	mg/L	0.005	< 0.001	0.001

Date	Units	17-Jul-17	16-Aug-17	3-Sep-17
Dissolved Metals				
Aluminum	mg/L	0.013	< 0.006	< 0.006
Arsenic	mg/L	< 0.0005	< 0.001	< 0.0005
Barium	mg/L	0.0303	0.0378	0.0454
Cadmium	mg/L	< 0.00002	< 0.00002	< 0.00002
Copper	mg/L	0.0005	0.0009	0.0012
Iron	mg/L	< 0.01	< 0.010	< 0.01
Manganese	mg/L	0.10	0.09	0.07
Mercury	mg/L	0.00001	< 0.00001	0.00003
Molybdenum	mg/L	0.0079	0.0066	0.0064
Nickel	mg/L	0.0569	0.0831	0.0706
Lead	mg/L	< 0.0003	< 0.0003	< 0.0003
Selenium	mg/L	< 0.001	0.002	0.002
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	< 0.001	< 0.001	< 0.001
Zinc	mg/L	0.004	< 0.001	0.001

Table 8.17: 2017 Vault Pit Sump Water Quality Monitoring (ST-23)

Date	Units	4-Apr-2017	11-Jun-2017	17-Jul-2017	16-Aug-2017	3-Sep-2017	13-Nov-2017
Field Parameters							
pH		8.21	6.64	8.11	7.31	8.21	7.82
Conductivity	us/m	682	591	669	714	794	1051
Turbidity	NTU	5.12	23.6	42.7	19.1	63.7	6.29
Conventional Parameters							
Alkalinity	mg CaCO ₃ /L	122	96	115	114	109	161
Hardness	mg CaCO ₃ /L	217	248	265	298	250	461
TDS	mg/L	404	358	432	453	467	670
TSS	mg/L	6	22	55	8	85	9
Nutrients and Biological Indicators							
Ammonia (NH ₃)	mg N/L	0.06	0.07	0.09	0.11	0.07	0.1
Ammonia-nitrogen (NH ₃ -NH ₄)	mg N/L	2.31	3.49	3.61	3.64	6.2	3.75
Nitrate	mg N/L	1.48	4.31	0.82	8.86	8.67	1.21
Nitrite	mg N/L	0.01	0.11	0.29	0.23	0.20	0.03
Major Ions							
Chloride	mg/L	69.5	31.5	26.1	24.5	25.8	36.1
Fluoride	mg/L	0.24	0.18	0.20	0.16	0.13	0.21
Sulphate	mg SO ₄ /L	69	94	125	61	190	339
Cyanide							
Total cyanide	mg/L	0.008	0.062	0.061	0.067	0.113	0.021
Free cyanide	mg/L	0.006	0.036	0.012	0.028	0.022	0.001
Total Metals							
Aluminium	mg/L	0.091	0.605	1.15	0.16	0.936	0.133
Arsenic	mg/L	0.0068	0.0066	< 0.0005	0.0116	< 0.0005	0.0143
Barium	mg/L	0.036	0.0208	0.0232	0.0346	0.0319	0.061
Cadmium	mg/L	< 0.00002	0.0001	< 0.00002	< 0.00002	0.00005	0.00005
Copper	mg/L	< 0.0005	< 0.0005	< 0.0005	0.0017	0.0022	0.0007
Chromium	mg/L	< 0.0006	0.0028	0.0017	0.0031	0.0020	0.0006
Iron	mg/L	0.31	1.24	2.37	0.26	2.33	0.46
Manganese	mg/L	0.2339	0.2472	0.2094	0.2239	0.2149	0.7399
Mercury	mg/L	0.00003	0.00003	< 0.00001	< 0.00001	0.00001	< 0.00001
Molybdenum	mg/L	0.0106	0.0419	0.0474	0.0504	0.0477	0.0230
Nickel	mg/L	0.0018	0.0098	0.0115	0.0079	0.0107	0.0184
Lead	mg/L	< 0.0003	< 0.0003	0.002	< 0.0003	< 0.0003	< 0.0003
Selenium	mg/L	0.001	0.002	0.001	0.002	0.003	0.002
Thallium	mg/L	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Zinc	mg/L	< 0.001	0.004	0.009	< 0.001	0.004	0.002

Date	Units	4-Apr-2017	11-Jun-2017	17-Jul-2017	16-Aug-2017	3-Sep-2017	13-Nov-2017
Dissolved Metals							
Aluminum	mg/L	< 0.006	0.605	< 0.006	0.015	0.008	0.654
Arsenic	mg/L	0.0093	0.0053	< 0.0005	< 0.0005	< 0.0005	0.0121
Barium	mg/L	0.0299	0.0208	< 0.0005	0.0291	0.0229	0.0599
Cadmium	mg/L	< 0.00002	0.00010	< 0.00002	< 0.00002	0.00003	0.00007
Copper	mg/L	< 0.0005	< 0.0005	< 0.0005	0.0019	0.0017	0.0033
Iron	mg/L	< 0.01	1.24	2.37	< 0.01	0.03	0.07
Lead	mg/L	< 0.0003	< 0.0003	< 0.0003	0.0021	< 0.0003	< 0.0003
Manganese	mg/L	0.239	0.247	0.002	0.211	0.176	0.731
Mercury	mg/L	0.00003	0.00004	< 0.00001	< 0.00001	< 0.00001	0.00125
Molybdenum	mg/L	0.0115	0.0419	< 0.0005	0.05	0.05	0.02
Nickel	mg/L	0.0018	0.0098	< 0.0005	0.01	0.01	0.02
Selenium	mg/L	0.0020	0.0020	< 0.0010	0.002	0.001	0.002
Silver	mg/L	not in the requirement and WL group 2					
Thallium	mg/L	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Zinc	mg/L	< 0.0010	0.001	< 0.001	< 0.001	< 0.001	0.002

Table 8.18: 2017 ST-16 Water Quality Monitoring

Date	Units	26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17
Field Parameters					
pH		7.74	7.1	7.12	7.95
Conductivity	µmhos/cm	159.2	417	476	689
Turbidity	NTU	2.91	1.97	3.2	2.88
Dissolved oxygen	mg/L		8.6	7.8	10
Temperature	°c	16.5	23.9	11.9	4.1
Conventional Parameters					
TDS	mg/L	202	357	309	393
TSS	mg/L	3	<1	3	10
Alkalinity	mg CaCo3/L	53	59	97	100
Hardness	mg CaCo3/L	103	141	186	185
Colour	colour	12	20	17	15
D.O.C	mg/L	7.8	8.6	9.2	9
T.O.C	mg/L	7.8	8.6	9.2	9.1
Nutrient and Biological Indicators					
Ammonia (NH3)	mg N/L	<0.05	<0.05	<0.05	<0.01
Ammonia nitrogen (NH3-NH4)	mg N/L	0.23	0.94	<0.05	<0.05
Nitrate	mg N/L	0.78	9.9	6.13	8.38
Nitrite	mg N/L	0.09	0.17	0.01	<0.01
Kjeldahl nitrogen	mg N/L	0.97	1.5	1.1	1.7
Ortho-phosphate (O-PO4)	mg P/L	<0.01	<0.01	<0.01	<0.01
Chlorophyll A	µg / L	0.3	0.27	0.27	0.27
Major Ions					
Bromides	mg/L	0.08	0.12	0.06	0.11
Chloride	mg/L	8.6	12.7	8	9.2
Fluoride	mg/L	0.19	0.24	0.22	0.25
Calcium	mg/L	23.7	33.2	40	39.9
Sodium	mg/L	10.7	14.8	18.1	14.7
Sulphate	mg/L	48.3	58.5	106	157
Thiosulfates (S2O3)	mg/L	<0.02	<0.02	<0.02	<0.02
Thiocyanates (SNC)	mg/L	<0.05	<0.05	<0.05	0.23
Cyanide					
CN total	mg/L	0.002	0.271	0.02	0.004
CN Free (SGS)	mg/L	<0.005	<0.005	<0.005	< 0.005
CN WAD	mg/L	0.001	0.2	0.009	0.001

Date	Units	26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17
Dissolved Metals					
Aluminium	mg/L	<0.006	<0.006	<0.006	<0.006
Antimony	mg/L	0.0002	0.0003	<0.0001	0.0003
Arsenic	mg/L	0.0016	<0.0005	<0.0005	<0.0005
Boron	mg/L	<0.01	<0.01	<0.01	0.01
Barium	mg/L	0.0125	0.0135	0.0158	0.0196
Beryllium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Cadmium	mg/L	<0.00002	<0.00002	<0.00002	<0.00002
Chromium	mg/L	<0.0006	<0.0006	<0.0006	<0.0006
Cobalt	mg/L	0.0009	0.0013	0.0013	0.0014
Copper	mg/L	0.016	0.016	0.0151	0.0102
Iron	mg/L	0.08	0.25	0.18	0.07
Lead	mg/L	<0.0003	<0.0003	<0.0003	<0.0003
Lithium	mg/L	<0.005	<0.005	<0.005	<0.005
Manganese	mg/L	0.1256	0.1555	0.1097	0.065
Magnesium	mg/L			15.4	21.6
Mercury	mg/L	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	mg/L	0.0085	0.0128	0.0078	0.0102
Nickel	mg/L	0.0185	0.018	0.016	0.018
Selenium	mg/L	<0.001	<0.001	<0.001	0.001
Strontium	mg/L	0.094	0.148	0.189	0.188
Silver	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Tin	mg/L	<0.001	<0.001	<0.001	<0.001
Thallium	mg/L	<0.0008	<0.0008	<0.0008	<0.0008
Titanium	mg/L	0.02	0.02	0.03	0.05
Uranium	mg/L	0.001	0.002	0.004	0.01
Vanadium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	mg/L	<0.001	<0.001	0.001	<0.001

Date	Units	26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17
Total Metals					
Aluminium	mg/L	0.068	0.052	0.027	<0.006
Antimony	mg/L	<0.0001	0.0004	<0.0001	0.0003
Arsenic	mg/L	0.0008	<0.0005	<0.0005	<0.0005
Boron	mg/L	<0.01	<0.01	0.02	0.01
Barium	mg/L	0.0133	0.0178	0.0144	0.0196
Beryllium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Cadmium	mg/L	<0.00002	<0.00002	<0.00002	<0.00002
Copper	mg/L	0.0182	0.0216	0.02	0.0122
Chromium	mg/L	0.0006	<0.0006	0.0006	<0.0006
Cobalt	mg/L	0.0008	0.0016	0.0015	0.0014
Iron	mg/L	0.21	0.48	0.39	0.18
Lithium	mg/L	<0.005	<0.005	0.057	<0.005
Manganese	mg/L	0.1348	0.1922	0.1312	0.0679
Magnesium	mg/L	10.7	14.3	21	22.2
Mercury	mg/L	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	mg/L	0.0091	0.0151	0.0079	0.0102
Nickel	mg/L	0.0199	0.0227	0.02	0.0184
Lead	mg/L	0.0055	<0.0003	<0.0003	<0.0003
Phosphorus	mg P/L	0.012	0.04	16	<0.04
Potassium	mg/L	6.91	10.5	8.39	7.58
Selenium	mg/L	<0.001	<0.001	<0.001	0.001
Silver	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Silica	mg/l	1.3	1.6	4.3	4.7
Tin	mg/L	<0.001	<0.001	<0.001	<0.001
Strontium	mg/L	0.098	0.145	0.191	0.194
Tellurium	mg/L	<0.0005	<0.0005		<0.0005
Titanium	mg/L	0.02	0.03	0.04	0.05
Thallium	mg/L	<0.0008	<0.0008	<0.0008	<0.0008
Uranium	mg/L	0.002	0.003	0.005	0.01
Vanadium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	mg/L	<0.001	<0.001	<0.001	<0.001

Table 8.19: 2017 NP2 Water Quality Monitoring

Date	Units	NP2 South				NP2 East				NP2 West				NP2 Winter							
		26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17	26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17	26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17	10-Jan-17	08-Feb-17	26-Mar-17	23-Apr-17	08-May-17	13-Nov-17	10-Dec-17	
Field Parameters																					
pH		7.87	7.53	7.33	8.07	7.53	7.93	7.25	7.93	7.74	7.68	7.44	8.18	7.58	7.07	7.21	7.53	7.14	7.11	7.72	
Conductivity	µmhos/cm	211	230	239	262	310	236	233	267	210.00	230	234.00	270	318.00	375.00	383	402	390.00	302.6	299	
Turbidity	NTU	1.34	1.21	2.07	1.46	1.6	1.1	2.26	1.34	2.04	1.41	2.86	1.66	1.76	0.97	2.07	0.83	0.84	1.22	1.14	
Dissolved oxygen	%												10.4		8.4						
Dissolved oxygen	mg/L		8.9		11		9.1	11.5	10.2	17.20	9.2		11		8.80	11.3	6.5	6.60	13.32	13.62	
Temperature	°C	16.6		10.3	7.3	16.3	24.3		11	5.5			10.6	6	8	0.8	2.8	0.9	8.7	6.18	4.5
Conventional Parameters																					
TDS	mg/L	138	142	153	156	138	142	149	153	135	141	148	156	213	250	251	269	260	184	197	
TSS	mg/L	2	4	1	5	3	<1	<1	2	3	<1	<1	4	<1	<1	3	6	9	7	7	
Alkalinity	mg CaCO3/L	53	55	61	54	54	55	60	53	52	56	60	54	69	83	87	96	86	65	72	
Hardness	mg CaCO3/L	70	77	84	64	64	69	79	61	66	73	68	79	65	116	107	140	144	145	111	126
Colour	colour	5	6	5	9	5	5	2	6	5	5	1	6	3	8	9	8	<1	2	1	
D.O.C	mg/L	5.7	5.7	6.2	6	5.9	6.4	5.8	5.9	6	5.8	6	6.1	6.9	5.9	7.9	6.9	8.6	4.4	5.7	
T.O.C	mg/L	5.7	5.7	6.2	6	6	6.4	5.8	5.9	6	5.8	6	6.1	8	7.1	8.1	8.8	9.2	5.4	5.7	
Nutrient and Biological Indicators																					
Ammonia (NH3)	mg N/L	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	0.05	<0.01	<0.01	<0.01	<0.01	
Ammonia nitrogen (NH3-NH4)	mg N/L	<0.05	0.06	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	0.12	0.1	0.17	0.05	0.05	0.03	0.04	
Nitrate	mg N/L	0.16	0.1	0.04	0.07	0.17	0.14	0.03	0.02	0.14	0.17	0.01	0.04	1.74	0.49	0.41	0.52	0.46	0.1	0.11	
Nitrite	mg N/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	
Kjeldahl nitrogen	mg N/L	<0.7	0.38	<0.7	<0.70	<0.7	0.4	<0.7	<0.70	<0.7	0.4	<0.7	<0.70	0.58	0.33	1.72	0.6	0.83	<0.05	0.16	
Ortho-phosphate (O-PO4)	mg P/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Chlorophyll A	µg / L	0.59	1.2	1.6	0.8	0.93	1.9	2.5		12000	1.7	2.7	1.3	0.99	0.57	<0.13	<0.13	0.86	1.4	0.29	
Major Ions																					
Bromides	mg/L	0.03	0.08	0.03	0.06	0.03	0.03	0.02	0.05	0.03	0.04	0.04	0.05	0.09	0.07	0.1	0.17	0.1	0.03	0.06	
Chloride	mg/L	4.1	4.8	4.7	4.3	4.3	4.5	4.4	4.2	4.10	4.9	4.50	4.3	7.10	7.9	8.7	8.50	6.2	7	7	
Fluoride	mg/L	0.13	0.14	0.13	0.13	0.13	0.14	0.12	0.14	0.13	0.13	0.12	0.14	0.18	0.18	0.19	0.11	0.19	0.18	0.19	
Calcium	mg/L	17.9	19.9	22.1	16.5	17.5	20.4	23.7	17	18.60	18.1	20.50	16.8	30.90	27.00	34.7	34.9	38.00	27.9	31.2	
Sodium	mg/L	11	10.5	9.92	7.61	8.4	10.8	10.8	7.54	8.60	5.52	9.35	7.62	15.10	14.90	19.8	18.9	19.30	12.6	13.7	
Sulphate	mg/L	42.6	38.2	46.8	56.1	42.6	40	45.1	49.9	43.5	41	44.1	54.9	80.1	83.1	72.6	88.5	68.6	63.9	63.9	
Thiosulfates (S2O3)	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Thiocyanates (SNC)	mg/L	<0.05	<0.05	<0.05	0.28	<0.05	<0.05	<0.05	0.23	<0.05	<0.05	<0.05	0.25	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05	
Cyanide																					
CN total	mg/L	<0.001	<0.001	0.012	0.003	<0.001	<0.001	0.015	0.002	<0.001	0.002	0.012	0.002	<0.001	0.015	0.01	<0.001	0.033	<0.001	<0.001	
CN Free (SGS)	mg/L	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005		<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	0.008	<0.005	<0.005	
CN WAD	mg/L	<0.001	<0.001	0.01	<0.001	<0.001	<0.001	0.01		<0.001	<0.001	0.009	<0.001	<0.001	<0.001	<0.001	<0.001	0.007	<0.001	<0.001	
Dissolved Metals																					
Aluminium	mg/L	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.033	0.015	
Antimony	mg/L	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Arsenic	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.002	<0.0005	<0.0005	
Boron	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Barium	mg/L	0.005	0.0019	0.0067	0.0064	0.0039	0.0023	0.0059	0.0066	0.0035	0.0025	0.0062	0.0063	0.0108	0.0126	0.0156	0.0138	0.0173	0.0078	0.01	
Beryllium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Cadmium	mg/L	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00003	<0.00002	<0.00002	
Chromium	mg/L	0.0014	<0.0006	<0.0006	<0.0006	0.0026	<0.0006	<0.0006	<0.0006	0.0009	<0.0006	<0.0006	<0.0006	0.0007	0.0012	<0.0006	0.0006	0.0041	0.0008	0.0006	
Cobalt	mg/L	0.0012	<0.0005	<0.0005	<0.0005	0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0029	<0.0005	<0.0005	<0.0005	
Copper	mg/L	0.0034	0.002	0.0037	0.0028	0.0028	0.0017	0.003	0.0022	0.0024	0.002	0.0028	0.0019	0.0042	0.0044	0.0051	0.0062	0.0044	0.0034	0.0031	
Iron	mg/L	0.01	0.03	0.07	0.01	0.01	0.02	0.01	<0.01	0.01	0.08	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.03	<0.01	
Lead	mg/L	0.0012	<0.0003	<0.0003	<0.0003	0.0337	0.0009	<0.0003	0.1397	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.0061	0.0007	<0.0003	
Lithium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.046	<0.005	<0.005	<0.005	
Manganese	mg/L	0.0007	<0.0005	0.0156	0.0059	<0.0005	0.0007	<0.0005	0.0008	0.0006	<0.0005	<0.0005	0.0014	<0.0005	0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Magnesium	mg/L			7.22	5.81			6.94	5.8			6.94	5.7					9.09	9.87		
Mercury	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00001	0.00001	
Molybdenum	mg/L	<0.0005	<0.0005	0.0005	0.0007	<0.0005	<0.0005	<0.0005	0.0007	<0.0005	<0.0005	0.0006	0.0007	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Nickel	mg/L	0.0041	0.004	0.0035	0.0061	0.0059	0.004	0.0012	0.0057	0.0042	0.0031	0.0015	0.0053	0.0089	0.0077	0.0097	0.0087	0.0105	0.0073	0.0077	
Selenium	mg/L	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Strontium	mg/L	0.064	0.073	0.08	0.061	0.073	0.068	0.078	0.063	0.064	0.074	0.075	0.062	0.119	0.133	0.154	3.08	<0.005	0.107	0.	

Date	Units	26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17	26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17	26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17	10-Jan-17	08-Feb-17	26-Mar-17	23-Apr-17	08-May-17	13-Nov-17	10-Dec-17
Total Metals																				
Aluminium	mg/L	0.04	0.011	0.21	<0.006	0.031	0.011	0.023	<0.006	0.056	0.033	0.008	<0.006	<0.006	<0.006	<0.006	<0.006	0.009	0.018	0.01
Antimony	mg/L	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	0.0072
Boron	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.07	<0.01	<0.01
Barium	mg/L	0.0054	0.0027	0.0091	0.0049	0.0066	0.003	0.0076	0.0051	0.0052	0.0026	0.0077	0.0061	0.0116	0.0116	0.0165	0.0156	0.0162	0.0104	0.01
Beryllium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Cadmium	mg/L	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Copper	mg/L	0.0037	0.0029	0.0047	0.003	0.0033	0.0024	0.0028	0.0022	0.0035	0.0007	0.0027	0.0024	0.0054	0.0047	0.0053	0.003	0.0045	0.0036	0.0036
Chromium	mg/L	<0.0006	<0.0006	<0.0006	<0.0006	0.0006	<0.0006	<0.0006	<0.0006	0.0006	<0.0006	<0.0006	<0.0006	0.001	<0.0006	<0.0006	0.0006	0.0007	0.0024	0.0007
Cobalt	mg/L	0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Iron	mg/L	0.09	0.12	0.24	0.05	0.09	0.12	0.11	0.03	0.08	0.08	0.05	0.03	0.03	0.06	0.05	0.05	0.06	0.05	0.05
Lithium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.038	0.02
Manganese	mg/L	0.0119	0.011	0.0264	0.0102	0.0173	0.0206	0.011	0.0065	0.0175	0.0073	0.0076	0.007	0.0096	0.0133	0.0371	0.0298	0.0344	0.0043	0.0045
Magnesium	mg/L	6.26	6.74	7.17	6.11	6.16	6.84	7.96	6.14	6.48	5.65	6.8	6.19	9.59	9.77	12.9	13.8	12.6	10.2	11.8
Mercury	mg/L	<0.00001	<0.00001	<0.00001	0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00001	<0.00001	<0.00001	<0.00001	0.00001	<0.00001	<0.00001
Molybdenum	mg/L	<0.0005	<0.0005	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	0.0017	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	mg/L	0.0061	0.0058	0.0045	0.0071	0.0056	0.0045	0.0023	0.0062	0.0055	0.002	0.0012	0.0063	0.0093	0.0075	0.0116	0.0084	0.0104	0.0084	0.0087
Lead	mg/L	0.0023	<0.0003	<0.0003	0.0307	<0.0003	<0.0003	<0.0003	0.0025	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Phosphorus	mg P/L	0.0052	<0.04	11	<0.04	0.0048	<0.04	6.9	<0.04	0.0045	<0.04	6.1	<0.04	3.2	6.3	<0.1	<0.1	<0.1	3.4	<0.1
Potassium	mg/L	2.35	2.4	2.45	2.11	2.2	2.42	2.73	2.07	2.29	2.02	2.5	2.09	3.62	3.73	4.16	3.92	4.46	3.24	3.3
Selenium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silica	mg/L	0.62	0.6	0.37	0.35	0.88	0.66	0.42	0.34	0.94	0.62	0.35	0.38	0.9	1.4	2.66	2.2	2.3	0.5	0.49
Silver	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Tin	mg/L	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.05	<0.001
Strontium	mg/L	0.074	0.112	0.079	0.068	0.074	0.075	0.08	0.065	0.074	0.079	0.082	0.068	0.121	0.135	0.146	0.147	0.15	0.086	0.115
Tellurium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Titanium	mg/L	0.01	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.03	0.04	0.03	0.02	0.02	0.02
Thallium	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Uranium	mg/L	<0.001	0.001	<0.001	0.001	<0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Vanadium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	mg/L	0.004	<0.001	0.004	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.005	<0.001

Table 8.20: 2017 Downstream Lakes Water Quality Monitoring

Date	Units	NP1 West				Dogleg				SPL-RSF			
		26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17	26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17	26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17
Field Parameters													
pH		7.69	7.73	7.53	8.21	7.72	7.43	7.08	7.9	7.82	7.62	7.38	8.01
Conductivity	µmhos/cm	98.3	190	241	308	111.8	117.8	122.9	140.3	206	106.6	42.7	54.5
Turbidity	NTU	3.48	0.93	1.4	2.66	1.37	1.55	3.48	1.3	1.03	0.58	1.08	0.75
Dissolved oxygen	mg/L		9	10.8	11.3		9.6		10.6		8.9	10.7	10.6
Temperature	°c	17.2	24.4	11.9	6	16.2	21.6	13.3	3.1	15.9	24.2	11.9	4.9
Conventional Parameters													
TDS	mg/L	102	113	158	174	71	68	73	74	66	62	25	30
TSS	mg/L	2	2	7	4	2	2	4	1	2	<1	1	4
Alkalinity	mg CaCo3/L	53	55	71	63	31	51	49	27	29	30	49	14
Hardness	mg CaCo3/L	59	80	92	80	37	39	38	33	35	31	12	12
Colour	colour	6	4	2	5	5	5	13	5	4	2	<1	3
D.O.C	mg/L	5.4	5.3	5.6	5.6	4.4	4.4	4.4	4	4.2	3.8	2.4	2.3
T.O.C	mg/L	5.6	5.3	5.6	5.6	5.1	4.4	4.4	4	4.2	3.8	2.7	2.5
Nutrient and Biological Indicators													
Ammonia (NH3)	mg N/L	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05	<0.01
Ammonia nitrogen (NH3-NH4)	mg N/L	<0.05	0.06	0.15	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05
Nitrate	mg N/L	0.08	0.1	0.12	0.1	0.04	<0.01	0.01	<0.01	0.02	0.12	<0.01	<0.01
Nitrite	mg N/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Kjeldahl nitrogen	mg N/L	<0.7	0.48	0.62	0.73	<0.7	0.47	0.59	<0.7	<0.7	0.34	0.46	<0.70
Ortho-phosphate (O-PO4)	mg P/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chlorophyll A	µg / L	0.96	1.1	0.82	1.9	2.3	2.7	2.1	4.1	1.2	1.1	0.61	0.96
Major Ions													
Bromides	mg/L	0.03	0.03	<0.01	0.09	0.02	0.01	0.04	0.03	0.02	0.02	<0.01	<0.01
Chloride	mg/L	6.3	7.1	11.2	12.1	4.6	4.7	4.4	4.1	4.4	3.6	0.7	1.1
Fluoride	mg/L	0.14	0.16	0.16	0.2	0.13	0.13	0.12	0.14	0.14	0.13	0.07	0.08
Calcium	mg/L	15.5	20.8	24.2	20.4	9.37	9.79	9.81	8.35	8.75	7.94	3.24	3.18
Sodium	mg/L	4.4	10.7	5.95	5.17	2.8	3.33	2.62	2.5	2.7	2.65	0.73	0.79
Sulphate	mg/L	21.9	23.9	33.4	43.9	17.9	13.8	20.4	19.3	16.7	14.4	5.7	6.4
Thiosulfates (S2O3)	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Thiocyanates (SNC)	mg/L	<0.05	<0.05	<0.05	0.24	<0.05	<0.05	<0.05	0.2	<0.05	<0.05	<0.05	0.17
Cyanide													
CN total	mg/L	<0.001	<0.001	0.006	0.002	<0.001	<0.001	0.017	0.002	<0.001	<0.001	0.011	0.002
CN Free (SGS)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
CN WAD	mg/L	<0.001	<0.001	0.006	0.001	<0.001	<0.001	0.009	0.001	0.002	<0.001	0.009	0.001

Date	Units	26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17	26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17	26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17
Dissolved Metals													
Aluminium	mg/L	<0.006	0.009	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Antimony	mg/L	<0.0001	<0.0001	0.0006	0.0002	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium	mg/L	0.0018	0.0012	0.008	0.0078	0.0011	<0.0005	0.0046	0.0044	0.0014	<0.0005	0.0019	0.0025
Beryllium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Cadmium	mg/L	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	<0.00002	<0.00002	<0.00002
Chromium	mg/L	0.001	<0.0006	<0.0006	<0.0006	0.0011	<0.0006	<0.0006	<0.0006	0.0009	<0.0006	<0.0006	<0.0006
Cobalt	mg/L	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper	mg/L	0.0015	<0.0005	0.0007	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	0.0009	<0.0005	<0.0005	<0.0005
Iron	mg/L	<0.01	<0.01	<0.01	<0.01	0.02	0.02	0.08	<0.01	<0.01	0.01	<0.01	<0.01
Lead	mg/L	0.0005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.0008	<0.0003	<0.0003
Lithium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Manganese	mg/L	0.0005	0.0007	<0.0005	0.0024	0.0078	<0.0005	0.0584	<0.0005	0.0015	0.0005	<0.0005	<0.0005
Magnesium	mg/L	5.05	6.95	10.2	7.06			4.67	2.91			1.59	1.11
Mercury	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	mg/L	0.0014	0.0012	0.0026	0.0027	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	mg/L	0.0036	0.0016	<0.0005	0.0029	0.0013	0.0005	<0.0005	0.0005	0.0006	<0.0005	<0.0005	<0.0005
Selenium	mg/L	<0.001	<0.001	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Strontium	mg/L	0.056	0.077	0.112	0.09	0.036	0.037	0.043	0.033	0.037	0.031	0.017	0.015
Silver	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Tin	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Thallium	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Titanium	mg/L	0.01	0.01	0.03	0.02	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium	mg/L	<0.001	0.001	0.002	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0018	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	mg/L	0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Date	Units	26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17	26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17	26-Jun-17	05-Jul-17	22-Aug-17	13-Sep-17
Total Metals													
Aluminium	mg/L	0.12	0.014	0.007	<0.006	0.026	0.016	0.017	<0.006	0.033	<0.006	<0.006	<0.006
Antimony	mg/L	<0.0001	<0.0001	0.0002	0.0002	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0001	<0.0005	<0.0005
Boron	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium	mg/L	0.0041	0.0031	0.0095	0.0069	0.0025	<0.0005	0.0086	0.0025	0.0023	<0.0005	0.0031	<0.0005
Beryllium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005
Cadmium	mg/L	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	<0.00002	<0.00002	<0.00002
Copper	mg/L	0.0019	0.0026	0.0015	0.0006	0.0009	<0.0005	0.001	<0.0005	0.0009	<0.0005	0.0006	<0.0005
Chromium	mg/L	0.0014	0.0007	<0.0006	<0.0006	0.0006	<0.0006	0.0008	<0.0006	0.0006	<0.0006	<0.0006	<0.0006
Cobalt	mg/L	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Iron	mg/L	0.15	0.11	0.09	0.03	0.11	0.08	0.65	0.02	0.5	0.05	0.02	<0.01
Lithium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.111	<0.005
Manganese	mg/L	0.0135	0.0166	0.0073	0.0049	0.015	0.0135	0.0421	0.0082	0.0021	0.0032	0.0018	0.002
Magnesium	mg/L	5.05	6.95	7.89	7.76	3.45	3.54	3.28	3.25	3.32	2.89	1.11	1.21
Mercury	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00006	0.00007	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	mg/L	0.001	<0.0005	0.0027	0.0029	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	mg/L	0.0031	0.0046	0.0026	0.0031	0.0015	0.0008	0.0016	0.0008	0.0023	<0.0005	<0.0005	<0.0005
Lead	mg/L	0.0026	<0.0003	<0.0003	<0.0003	0.0005	0.001	<0.0003	<0.0003	<0.0003	0.0027	<0.0003	<0.0003
Phosphorus	mg P/L	0.0082	<0.04	5.7	<0.04	0.0073	<0.04	6.8	<0.04	0.0074	<0.04	4	<0.04
Potassium	mg/L	1.85	2.53	2.73	2.48	1.2	1.27	1.1	1.05	1.16	1.02	0.37	0.45
Selenium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Silica	mg/L	0.48	0.41	0.43	0.29	0.69	0.74	0.75	0.25	0.86	0.73	0.28	0.25
Tin	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Strontium	mg/L	0.069	0.077	<0.005	0.092	0.041	0.041	0.041	0.034	0.04	0.036	0.017	0.015
Titanium	mg/L	0.01	0.02	0.02	0.02	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Thallium	mg/L	<0.008	<0.008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Tellurium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Uranium	mg/L	0.001	0.001	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium	mg/L	<0.0005	<0.0005	0.0009	<0.0005	<0.0005	<0.0005	0.002	<0.0005	<0.0005	<0.0005	0.0011	<0.0005
Zinc	mg/L	0.001	0.001	0.004	<0.001	<0.001	<0.001	0.003	<0.001	0.002	<0.001	0.001	<0.001

Table 8.25: 2017 Waste Extension Pool Collection System WEP 1 (ST-30)

Date	Units	5-Jun-2017	10-Jul-2017	7-Aug-2017	3-Sep-2017	24-Sep-2017
Field Parameters						
pH		7.26	7.80	7.39	8.15	6.86
Turbidity	NTU	13.5	18.4	15.4	155.0	19.0
Conventional Parameters						
Alkalinity	mg CaCO ₃ /L	29	88	98	134	175
Hardness	mg CaCO ₃ /L	32	110	150	263	230
TDS	mg/L	62	185	235	314	386
TSS	mg/L	9	4	8	39	9
Nutrients and Biological Indicators						
Ammonia (NH ₃)	mg N/L	< 0.05	0.02	0.01	< 0.01	< 0.01
Ammonia-nitrogen	mg N/L	0.37	1.5	0.95	1.9	2.12
Nitrate	mg N/L	1.01	0.81	0.65	1.09	0.39
Nitrite	mg N/L	0.01	0.06	0.05	0.10	0.02
Major Ions						
Chloride	mg/L	1.3	5.0	5.0	11.3	10.9
Fluoride	mg/L	0.07	0.24	0.16	0.14	0.27
Sulphate	mg/L	11.90	49.20	68.10	91.70	136
Cyanide						
Total cyanide	mg/L	0.006	0.089	0.032	0.018	0.014
WAD cyanide	mg/L	0.002	0.002	0.003	0.007	0.002
Free cyanide	mg/L	0.010	0.009	< 0.005	< 0.005	< 0.005
Total Metals						
Aluminum	mg/L	0.216	0.195	0.155	3.49	0.263
Arsenic	mg/L	0.0028	0.195	0.0089	< 0.0005	< 0.0005
Barium	mg/L	0.0009	0.0109	0.0205	0.037	0.025
Cadmium	mg/L	< 0.00002	< 0.00002	0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.0015	< 0.0006	0.006	0.0086	0.0011
Copper	mg/L	0.0052	0.0148	0.0169	0.0168	0.0058
Iron	mg/L	0.6	2.68	2	6.9	3.5
Lead	mg/L	< 0.0003	< 0.0003	0.0031	< 0.0003	< 0.0003
Manganese	mg/L	0.0636	0.2604	0.3472	1.198	1.512
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	0.00001
Molybdenum	mg/L	0.0031	0.0028	0.0019	< 0.0005	< 0.0005
Nickel	mg/L	0.0024	0.0054	0.0089	0.0225	0.0191
Selenium	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Zinc	mg/L	< 0.001	0.001	0.003	0.008	0.002

Table 8.26: 2017 Waste Extension Pool Collection System WEP 2 (ST-31)

Date	Units	5-Jun-2017	10-Jul-2017	7-Aug-2017	3-Sep-2017
Field Parameters					
pH		7.19	7.66	7.31	8.46
Turbidity	NTU	20.40	2.25	22.30	6.81
Conventional Parameters					
Alkalinity	mg CaCO ₃ /L	28	61	111	115
Hardness	mg CaCO ₃ /L	29	1	162	190
TDS	mg/L	53	302	254	238
TSS	mg/L	19	1	18	3
Nutrients and Biological Indicators					
Ammonia (NH ₃)	mg N/L	< 0.05	0.04	< 0.01	< 0.01
Ammonia-nitrogen	mg N/L	0.13	6.7	0.18	0.26
Nitrate	mg N/L	0.38	10.50	1.45	< 0.01
Nitrite	mg N/L	< 0.01	0.26	0.03	0.45
Major Ions					
Chloride	mg/L	1.1	21.7	13.8	12.1
Fluoride	mg/L	0.07	0.19	0.20	0.15
Sulphate	mg/L	11.50	51.70	54.40	49.2
Cyanide					
Total cyanide	mg/L	< 0.001	< 0.001	0.002	0.005
WAD cyanide	mg/L	< 0.001	< 0.001	< 0.001	0.004
Free cyanide	mg/L	0.006	0.032	< 0.005	< 0.005
Total Metals					
Aluminum	mg/L	0.269	0.006	0.384	0.11
Arsenic	mg/L	< 0.0005	< 0.0041	0.0132	< 0.0005
Barium	mg/L	< 0.0005	< 0.0005	0.0209	0.0167
Cadmium	mg/L	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.0015	< 0.0006	0.008	< 0.0006
Copper	mg/L	< 0.0005	0.0011	0.003	0.0018
Iron	mg/L	0.51	0.01	1.04	0.96
Lead	mg/L	0.0053	< 0.0003	0.0028	< 0.0003
Manganese	mg/L	0.0425	0.0005	0.2204	0.320
Mercury	mg/L	0.00001	0.00001	< 0.00001	0.00007
Molybdenum	mg/L	< 0.0005	< 0.0005	0.0038	0.0008
Nickel	mg/L	0.0027	0.0005	0.0072	0.0052
Selenium	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Zinc	mg/L	< 0.001	< 0.001	0.005	< 0.001

Table 8.27: 2017 Non Contact Water East Diversion Ditch Water Quality Monitoring (ST-5)

Parameters	Units	4-Jun-2017	3-Jul-2017	7-Aug-2017	3-Sep-2017
pH*			7.70	7.82	8.51
Turbidity*	NTU		4.59	1.40	3.78
TSS	mg/l	7	1	2	< 1
Sulphate	mg/L	2.7	63.7	43.5	50.5
Aluminum	mg/l	0.124	0.010	< 0.006	< 0.006
Arsenic	mg/L	0.0020	< 0.0005		< 0.0005
Copper	mg/L	0.0005	0.0013	0.0032	0.0035
Lead	mg/L	0.0033	0.0086		< 0.0003
Nickel	mg/L	0.0031	0.0045	0.0054	0.0056
Zinc	mg/L	< 0.001	< 0.001		< 0.001
Cyanide	mg/L	< 0.001	< 0.001	< 0.001	0.002
Radium	Bq/l	0.002	< 0.002	< 0.002	0.002

Footnotes:

* Parameters measured in the field by Environmental Technicians.

Table 8.28: 2017 Vault Rock Storage Facility Seepage Water Quality Monitoring (ST-24)

Date	Units	11-Jun-2017
Field Parameters		
pH		6.36
Turbidity	NTU	91.6
Conventional Parameters		
Alkalinity	mg CaCO ₃ /L	32
Hardness	mg CaCO ₃ /L	86
TDS	mg/L	118
TSS	mg/L	38
Nutrients and Biological Indicators		
Ammonia (NH ₃)	mg N/L	< 0.01
Ammonia-nitrogen	mg N/L	0.29
Nitrate	mg N/L	2.41
Nitrite	mg N/L	0.02
Major Ions		
Chloride	mg/L	1.5
Fluoride	mg/L	0.08
Sulphate	mg/L	43.60
Cyanide		
Total cyanide	mg/L	< 0.001
Total Metals		
Aluminum	mg/L	2.01
Arsenic	mg/L	< 0.0005
Barium	mg/L	0.0253
Cadmium	mg/L	0.00008
Chromium	mg/L	0.0062
Copper	mg/L	0.0072
Iron	mg/L	2.92
Lead	mg/L	< 0.0003
Manganese	mg/L	0.1912
Mercury	mg/L	< 0.00001
Molybdenum	mg/L	0.0072
Nickel	mg/L	0.0125
Selenium	mg/L	< 0.001
Silver	mg/L	< 0.0001
Thallium	mg/L	< 0.0008
Zinc	mg/L	0.013

Table 8.29: 2017 Saddle Dam 1 Water Quality Monitoring (ST-S-2)

Date	Units	12-Jun-2017	18-Jul-2017	8-Aug-2017	3-Sep-2017
Field Parameters					
pH		8.25	7.78	7.50	8.16
Turbidity	NTU	34.9	30.2	14.9	4.2
Conventional Parameters					
Alkalinity	mg CaCO ₃ /L	21	57	73	123
Hardness	mg CaCO ₃ /L	23	190	267	381
TDS	mg N/L	46	341	392	430
TSS	mg N/L	9	16	6	3
Major Ions					
Chloride	mg/L	1.1	5.1	6.7	8.7
Fluoride	mg/L	0.05	0.30	0.25	0.22
Sulphate	mg SO ₄ /L	13.9	118	134	175
Nutrients and Biological Indicators					
Ammonia nitrogen (NH ₃ -NH ₄)	mg N/L	0.21	0.05	0.04	0.08
Ammonia (NH ₃)	mg N/L	< 0.01	< 0.01	< 0.01	< 0.01
Nitrite	mg N/L	0.01	0.04	0.01	0.02
Nitrate	mg N/L	0.6	15.0	13.3	10.0
Cyanide					
Total cyanide	mg/L	0.006	0.011	0.007	0.01
Free cyanide	mg/L	0.041	< 0.005	< 0.005	< 0.005
WAD cyanide	mg/L	< 0.001	0.021	< 0.001	0.006
Total Metals					
Aluminium	mg/L	0.63	0.21	0.20	0.07
Arsenic	mg/L	0.0010	0.0402	0.0818	0.022
Barium	mg/L	0.004	0.014	0.020	0.023
Cadmium	mg/L	< 0.00002	0.00004	< 0.00002	< 0.00002
Chromium	mg/L	0.0092	0.0013	0.0068	0.0009
Copper	mg/L	0.003	0.003	0.0041	0.0042
Iron	mg/L	1.01	0.56	0.38	0.14
Lead	mg/L	< 0.0003	< 0.0003	0.0052	< 0.0003
Manganese	mg/L	0.0538	0.1177	0.0899	0.0625
Mercury	mg/L	0.00091	< 0.00001	< 0.00001	0.00003
Molybdenum	mg/L	0.0015	0.0135	0.0173	0.0119
Nickel	mg/L	0.0079	0.0262	0.0313	0.0354
Selenium	mg/L	< 0.001	0.001	0.001	0.001
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Zinc	mg/L	0.002	0.00	0.005	< 0.00

Table 8.30: 2017 Central Dike Seepage Water Quality Monitoring (ST-S-5)

Date	Units	3-Jan-17	6-Feb-17	6-Mar-17	3-Apr-17	1-May-17	12-Jun-17	10-Jul-17	19-Jul-17	22-Jul-17	7/22/2017 north	1-Aug-17	7-Aug-17
Field Parameters													
pH		7.99	7.51	7.36	7.59	7.71	7.42	7.65		7.63	7.62	7.80	7.74
Turbidity	NTU	6.67	8.62	6.43	3.73	7.65	9.52	12.40	15.20	14.90	16.80	10.30	11.40
Conventional Parameters													
Alkalinity	mg CaCO ₃ /L	130	135	138	130	126	117	120	122	125	120	128	125
Hardness	mg CaCO ₃ /L	1222	1229	1009	1027	1248	925	1006	1026	900	876	1211	1841
TDS	mg/L	2814	2976	3102	3131	3161	2838	2729	2664	2717	2552	2676	2592
TSS	mg/L	4	5	8	9	5	4	5	13	7	13	6	< 1
Major Ions													
Chloride	mg/L	482	523	508	572	532	99	438	83	396	349	14	377
Fluoride	mg/L	0.46	0.6	0.45	0.5	0.46	0.47	0.52	0.46	0.48	0.45	0.43	0.41
Sulphate	mg SO ₄ /L	1913	1838	1950	1968	1881	1596	1468	1731	1656	1514	1450	1654
Nutrients and Biological Indicators													
Ammonia (NH ₃)	mg N/L	0.37	0.50	0.30	0.28	0.40	0.18	0.16	0.45	0.25	0.49	0.30	0.48
Ammonia nitrogen (NH ₃ -NH ₄)	mg N/L	28.8	27.5	26.0	29.4	29.4	34.0	33.0	29.6	24.5	26.1	29.7	29.8
Nitrate	mg N/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.19	0.11	0.13	0.15	0.62	< 0.01	0.20
Nitrite	mg N/L	0.01	0.02	0.01	0.03	0.01	0.02	0.02	0.02	0.01	0.04	0.04	0.03
Cyanide													
Total cyanide	mg/L	0.10	0.14	0.24	0.18	0.21	0.33	0.25	0.25	0.12	0.10	0.34	0.20
Cyanide WAD	mg/L	0.06	0.08	0.10	0.10	0.11	0.18	0.09	0.10	0.06	0.09	0.09	0.08
Cyanide Free	mg/L	0.05	0.37	6.25	0.09	0.11	0.10	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01
Total Metals													
Aluminium	mg/L	0.023	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	0.018	< 0.006	0.074	0.010	< 0.003
Arsenic	mg/L	0.0563	0.0472	0.0480	0.0307	0.0395	0.0325	0.0329	0.0174	0.4510	0.0210	< 0.0005	0.0292
Barium	mg/L	0.0314	0.0216	0.0256	0.0174	0.0212	0.0147	0.0202	0.0225	< 0.0005	< 0.0005	0.0210	0.0243
Cadmium	mg/L	0.00134	0.00129	0.00119	0.00073	0.00081	0.00109	0.00077	0.00105	0.00043	0.00083	0.00074	0.00020
Chromium	mg/L	0.0015	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	0.0009	< 0.0006	< 0.0006	0.0008	< 0.0006	< 0.0001
Copper	mg/L	0.007	0.006	0.01	0.00	0.01	0.0041	0.0063	0.0080	0.0061	0.0066	0.006	0.0005
Iron	mg/L	2.7	2.18	2.42	1.89	2.36	1.74	1.29	1.02	2.05	0.79	0.09	0.89
Lead	mg/L	< 0.0003	< 0.0003	0.0011	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0408	< 0.0003	< 0.0003	< 0.0003	< 0.0005
Manganese	mg/L	2.36	2.45	2.44	2.07	2.33	2.16	2.04	1.82	2.09		1.54	2.15
Mercury	mg/L	< 0.00010	0.00005	0.00009	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00006	0.00065	0.00080	< 0.00001	< 0.00001
Molybdenum	mg/L	0.3593	0.3346	0.3369	0.3024	0.3659	0.2527	0.3052	0.2753	0.2364	0.3020	0.2799	0.3258
Nickel	mg/L	0.0209	0.0214	0.0249	0.0115	0.0155	0.0216	0.0174	0.0201	0.0196	0.0280	0.0196	0.0097
Selenium	mg/L	0.026	0.015	0.015	0.009	0.015	0.015	0.010	0.011	0.014	0.016	0.021	0.005
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0005
Thallium	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Zinc	mg/L	0.007	0.013	0.003	< 0.001	< 0.001	< 0.001	0.001	0.003	< 0.001	0.025	< 0.001	0.002
Dissolved Metals													
Aluminum	mg/L	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	< 0.006	0.008
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0003	< 0.0005
Arsenic	mg/L	0.0233	0.0181	0.0216	0.0128	0.0253	0.0167	0.0291	0.0083	0.0100	0.0086	< 0.0005	0.0130
Cadmium	mg/L	0.00131	0.00140	0.00103	0.00069	0.00069	0.00065	0.00082	0.00133	0.00089	0.00083	0.00069	< 0.00005
Chromium	mg/L	0.0015	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	0.0008	< 0.0006	< 0.0006	< 0.0006	0.0009	< 0.0001
Copper	mg/L	0.009	0.004	0.007	0.005	0.005	0.004	0.008	0.007	0.006	0.007	0.0069	< 0.0005
Iron	mg/L	0.07	0.09	0.05	< 0.01	0.03	0.06	0.04	0.15	0.03	0.02	0.04	0.10
Manganese	mg/L	2.261	2.544	2.248	2.215	2.340	2.022	2.071	1.773	2.357	1.407		1.932
Mercury	mg/L	< 0.00010	0.00014	0.00009	< 0.00001	< 0.00001	0.00010	< 0.00001	0.00010	0.00057	0.00076	< 0.00001	< 0.00001
Molybdenum	mg/L	0.334	0.361	0.323	0.333	0.341	0.236	0.311	0.317	0.255	0.264	0.3	0.30
Nickel	mg/L	0.0211	0.0209	0.0226	0.0126	0.0140	0.0217	0.0162	0.0201	0.0215	0.0257	0.0200	0.0089
Lead	mg/L	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0265	< 0.0003	0.0408	< 0.0003	< 0.0003	< 0.0005
Selenium	mg/L	0.037	0.037	0.024	0.024	0.014	0.018	0.015	0.014	0.017	0.013	0.017	0.001
Thallium	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Zinc	mg/L	0.008	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

14-Aug-17	21-Aug-17	28-Aug-17	3-Sep-17	11-Sep-17	18-Sep-17	25-Sep-17	2-Oct-17	9-Oct-17	6-Nov-17	4-Dec-17
7.30	7.63	7.80	7.48	7.76	7.73	7.10	7.20	7.15	7.21	7.83
12.20	8.10	22.40	23.40	17.50	17.60	14.90	17.60	9.06	11.40	11.90
133	132	115	120	122	123	122	117	124	119	121
1168	1184	1089	1327	1163	976	1003	980	1016	1021	1208
2642	2602	2652	2594	2593	2690	2689	2623	2602	2714	
6	5	4	1	1	9	3	8	8	6	
389	358	355	582	362	366	375	382	363	417	376
0.52	0.48	0.44	0.50	0.40	0.45	0.51	0.71	0.54	0.54	0.48
1159	1626	1513	1743	1892	1836	1728	168	1726	1947	
0.36	0.61	0.59	0.31	0.33	0.20	0.48	0.64	0.41	0.41	0.25
28.1	29.4	37.0	33.0	27.0	35.0	31.6	30.8	30.1	27.7	24.9
0.02	0.15	0.40	0.17	0.15	0.08	0.05	0.35	0.14	< 0.01	< 0.01
0.03	0.01	0.05	0.03	0.04	0.02	0.02	0.03	0.04	0.01	< 0.01
0.14	0.23	0.25	0.19	0.26	0.28	0.05	0.18	0.08	0.25	
0.06	0.11	0.08	0.10	0.08	0.05	0.01	0.05	0.04	0.05	
0.01	< 0.01	< 0.01	0.01	< 0.01	0.04	0.01	0.04	0.03	0.04	0.05
0.011	< 0.060	< 0.003	0.065	< 0.006	< 0.006	0.002	0.031	< 0.006	0.014	< 0.006
0.0474	0.0344	0.0320	0.0399	0.0248	0.0260	0.0300	0.0236	0.0332	0.0434	0.0528
0.0257	0.0230	0.0334	0.0279	0.0269	0.0213	0.0209	0.0163	0.0192	0.0264	0.0269
< 0.00002	0.00075	0.00057	0.00062	0.00088	0.00080	0.00052	0.00089	0.00094	0.00096	0.00097
< 0.0006	< 0.0006	0.0078	0.0030	< 0.0006	< 0.0006	0.0008	0.0015	0.0014	0.0009	< 0.0006
0.01	0.0072	0.0050	0.0047	0.0056	0.0046	< 0.001	0.0039	0.0071	0.0051	0.0056
2.04	2.24	1.19	1.96	1.65	2.24	1.53	1.39	1.29	2.27	3.24
< 0.0003	< 0.0003	0.0035	0.0026	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
2.24	2.44	1.89	2.38	2.25	1.92	2.05	1.96	1.94	2.08	2.60
0.00008	0.00047	< 0.00001	< 0.00001	0.00008	0.00003	< 0.00001	< 0.00001	0.00005	0.00017	0.00009
0.3138	0.3149	0.2777	0.2974	0.2892	0.2901	0.2942	0.2430	0.2817	0.2960	0.3267
0.0162	0.0169	0.0214	0.0145	0.0187	0.0150	0.0147	0.0181	0.0264	0.0187	0.0232
0.018	0.013	0.021	0.008	0.011	0.011	0.013	0.013	0.013	0.013	0.019
< 0.0000	< 0.0001	0.0005	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
< 0.001	< 0.001	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	
0.003	< 0.001	0.005	0.007	< 0.001	0.001	< 0.001	< 0.001	< 0.001	0.001	
< 0.006	< 0.006	0.003	< 0.006	< 0.006	< 0.006	0.013	< 0.006	< 0.006	< 0.006	
< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	
0.0118	0.0180	0.0126	0.0081	0.0069	0.0110	0.0102	0.0085	0.0125	0.0170	
< 0.00002	0.00066	< 0.00002	0.00064	0.00076	0.00077	0.00053	0.00088	0.00073	0.00124	
< 0.0006	< 0.0006	0.0010	< 0.0006	< 0.0006	< 0.0006	< 0.0006	0.0008	< 0.0006	< 0.0006	
0.007	0.007	0.007	0.004	0.005	0.004	< 0.0005	0.0033	0.0066	0.0042	
0.04	0.04	0.07	0.03	0.04	0.06	0.05	0.02	0.05	0.06	
2.243	2.205	1.803	2.342	2.201	2.076	2.075	1.951	2.140	2.054	
< 0.00001	0.00009	< 0.00001	0.00002	0.00004	0.00018	0.00030	0.00005	0.00009	0.00013	
0.318	0.298	0.297	0.298	0.286	0.309	0.3	0.25	0.30	0.29	
0.0184	0.0153	0.0214	0.0145	0.0182	0.0159	0.0148	0.0181	0.0268	0.0191	
< 0.0003	< 0.0003	0.0041	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	
0.023	0.013	0.015	0.011	0.016	0.015	0.017	0.014	0.015	0.017	
< 0.001	< 0.001	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	
< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.004	

Table 8.31: 2017 Base of Saddle Dam 3 (ST-32)

Date	Units	5-Jun-2017	18-Jul-2017	16-Aug-2017	3-Sep-2017
Field Parameters					
pH		7.12	7.63	7.63	7.88
Turbidity	NTU	166.00	213.00	20.70	18.50
Conventional Parameters					
Alkalinity	mg CaCO ₃ /L	28	102	193	160
Hardness	mg CaCO ₃ /L	85	431	423	487
TDS	mg/L	172	542	607	696
TSS	mg/L	100	NA	15	15
Nutrients and Biological Indicators					
Ammonia (NH ₃)	mg N/L	< 0.05	0.02	0.08	0.03
Ammonia-nitrogen	mg N/L	1.5	5.25	5.81	4.8
Nitrate	mg N/L	3.73	25.60	21.10	15.70
Nitrite	mg N/L	< 0.01	0.64	0.40	0.34
Major Ions					
Chloride	mg/L	9.7	16.2	19.8	19.0
Fluoride	mg/L	0.12	0.60	0.35	0.46
Sulphate	mg/L	62	201	145	332
Cyanide					
Total cyanide	mg/L	0.010	0.143	0.024	0.019
Total Metals					
Aluminum	mg/L	1.57	41.81	0.283	0.375
Arsenic	mg/L	0.0016	0.0171	0.0108	< 0.0005
Barium	mg/L	0.0216	0.6933	0.0966	0.0582
Cadmium	mg/L	0.00003	0.00039	< 0.00002	0.00006
Chromium	mg/L	0.0086	0.1761	0.0058	0.0075
Copper	mg/L	0.0075	0.2916	0.0173	0.0154
Iron	mg/L	3.45	NA	0.57	1.51
Lead	mg/L	0.002	0.0286	0.0055	0.0229
Manganese	mg/L	0.1901	6.868	1.683	2.750
Mercury	mg/L	0.00001	< 0.00001	0.00016	0.00001
Molybdenum	mg/L	0.0012	0.0006	0.0102	0.0028
Nickel	mg/L	0.018	0.356	0.0255	0.3177
Selenium	mg/L	< 0.001	0.002	0.006	0.003
Silver	mg/L	< 0.0001	0.0012	< 0.0001	0.0003
Thallium	mg/L	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Zinc	mg/L	0.041	0.235	0.004	0.011

NA: Lab error

Table 8.32: 2017 Sewage Treatment Plant Water Quality Monitoring

Sample Location: STP-SEP

Parameter	Units	9-Jan-2017	6-Feb-2017	6-Mar-2017	3-Apr-2017	1-May-2017	5-Jun-2017	17-Jul-2017	7-Aug-2017	5-Sep-2017	3-Oct-2017	6-Nov-2017	#####
Ammonia (NH3)	mg N/L	0.53	1.14	0.77	0.3	0.55	0.96	0.17	0.97	0.32	1.44	0.76	1.39
Ammonia-Nitrogen (NH3-NH)	mg N/L	34.8	61.4	52.2	51.11	44.29	59	7.27	52.1	54	70.7	46.6	55.6
Total Kjeldahl Nitrogen	mg N/L	80.5	67.3	49.5	58.69	50.87	6.1	42.9	60.9	55	71.7	59.6	57.4
BOD-5	mg/L	12	22	17	10	10	10	10	8	7	10	23	11
COD	mg/L	62	91	74	69	62	79	84	73	76	103	98	86
Total Suspended Solids	mg/L	19	59	13	2	20	16	14	16	9	16	15	26
Nitrate (NO3)	mg N/L	6.55	0.24	1.8	0.95	2.31	0.37	3.5	1.42	1.4	0.23	1.22	2.85
Nitrite (NO2)	mg N/L	0.65	1.19	1.81	1.61	1.81	2.09	1.22	1.44	1.59	1.25	1.85	1.14
Total Phosphorus**	mg P/L												
pH *	units	7.38	7.6	7.7	7.6	7.5	7.5	7.2	7.6	7.4	7.7	7.3	7.1
Fecal Coliform	UFC/100 mL	360	48,000	120	80	50	100	480	440	300	90	320,000	30
Total Coliform	UFC/100 mL	1,380,000	>800,000	>8,000	>8,000	1,300	<10,000	***	<10,000	10,000	3,000	370,000	90,000

Sample Location: LJ-Mix

Parameter	Units	9-Jan-2017	6-Feb-2017	6-Mar-2017	3-Apr-2017	1-May-2017	5-Jun-2017	17-Jul-2017	7-Aug-2017	5-Sep-2017	3-Oct-2017	6-Nov-2017	#####
Ammonia (NH3)	mg N/L	<0.01	0.35	<0.01	0.02	0.02	0.03	0.04	0.06	<0.01	0.08	<0.01	0.04
Ammonia-nitrogen (NH3-NH)	mg N/L	0.97	28.3	2.42	9.51	10.1	5.4	11.4	15.6	7.6	13.5	2	6.56
Total Kjeldahl Nitrogen	mg N/L	3.75	35.8	5.63	11.07	13.55	7.8	18	24.7	11	17	6.41	13.5
BOD-5	mg/L	28	11	10	5	8	27	7	5	6	12	22	25
COD	mg/L	47	59	59	55	54	93	25	63	55	83	85	106
Total Suspended Solids	mg/L	11	17	8	18	17	19	14	16	4	15	18	31
Nitrate (NO3)	mg N/L	15.5	8.56	15.1	13.7	17	8.95	16.1	18.1	21.9	17.6	16.4	6.72
Nitrite (NO2)	mg N/L	0.15	0.37	0.24	0.26	0.24	2.45	0.34	0.73	0.65	0.77	0.26	1.43
Total Phosphorus**	mg P/L												
pH *	units	6.32	6.6	6.9	7.2	6.4	6.8	6.4	6.8	6.9	7.3	7.3	6
Fecal Coliform	UFC/100 mL	48	170	130	190	320	>600	3,100	>6000	> 6000	1,500	1,300	3,800
Total Coliform	UFC/100 mL	14,000	22,000	>80000	14,000	<1000	300,000	110,000	210,000	300,000	12,000	7,000	30,000

Sample Location: STP-IN

Parameter	Units	9-Jan-2017	6-Feb-2017	6-Mar-2017	3-Apr-2017	1-May-2017	5-Jun-2017	17-Jul-2017	7-Aug-2017	5-Sep-2017	3-Oct-2017	6-Nov-2017	#####
Ammonia (NH3)	mg N/L	1.03	1.11	0.82	0.54	0.49	0.7	0.09	1.09	0.56	1.13	0.96	0.54
Ammonia-nitrogen (NH3-NH)	mg N/L	63.2	89.6	72.9	86.36	76.94	81	8.31	83.8	85	91.5	86.9	79.6
Total Kjeldahl Nitrogen	mg N/L	72.3	104	80	102.58	92.41	112	104	105	92	109	104	93.3
BOD-5	mg/L	216	209	242	323	134	133	126	126	267	237	83	205
COD	mg/L	399	430	438	422	461	517	495	468	534	692	301	460
Total Suspended Solids	mg/L	48	43	94	133	93	76	246	255	153	400	156	105
Nitrate (NO3)	mg N/L	0.02	<0.01	0.01	0.04	0.01	<0.01	0.07	0.04	0.21	0.02	0.03	0.03
Nitrite (NO2)	mg N/L	0.02	0.03	0.03	0.04	0.02	<0.01	0.02	0.02	0.01	0.03	0.03	0.04
Total Phosphorus	mg P/L	7.89	10.3	8.89	9.41	12.3	9.1	12.7	10	10	12.6	8.7	8.97
pH *	units	7.89	7.7	8.7	8.3	8.5	8.3	8.1	8	7.9	7.9	7.4	7.6
Fecal Coliform	UFC/100 mL	2,500,000	1,100,000	2,800,000	2,900,000	2,800,000	5,000,000	7,000,000	11,000,000	12,000,000	13,000,000	2,300,000	4,600,000
Total Coliform	UFC/100 mL	***	22,000,000	<1,000,000	67,000,000	ND	ND	***	***	***	48,000,000	35,000,000	59,000,000

Footnotes:

* Parameter measured in the field by STP operators.

**Sample monitoring for total phosphorus in the treated effluent has been discontinued because the units do not have phosphorus removal capability. Agnico will continue to monitor phosphorus in the influent sewage.

***The great number of bacteria restrain distinction of total coliforms and atypical colony

Table 8.33: 2017 Sewage Treatment Plant Waste Volume

Month	Liquid Sewage Volume (m ³)	Sewage Sludge Volume (m ³)
	Readings from Equalization Tank at STP	STP
January	2952	0
February	2641	48
March	2835	41
April	2848	39
May	2941	37
June	2723	39
July	2723	284
August	2727	55
September	2506	94
October	2814	61
November	2543	15
December	2865	31
Total	33,118	744

Table 8.34: 2017 Secondary Containment Water Quality at ST-37 (Meadowbank Tankfarm)

Parameters	Units	Maximum Average Concentration	Maximum Concentration of any Grab sample	29-May-17
pH*	units	6.0-9.5	6.0-9.5	7.80
TSS	mg/L	15	30	11
Ammonia	mg/L	6	6	0.090
Benzene	µg/L	370	370	< 0.2
Toluene	µg/L	2	2	< 0.1
Ethylbenzene	µg/L	90	90	0.28
Total Xylenes	µg/L			1.1
Total oil and grease	mg/L	5	5	< 1
Arsenic	mg/L	0.5	1	< 0.001
Copper	mg/L	0.3	0.6	< 0.0005
Lead	mg/L	0.1	0.1	< 0.0003
Nickel	mg/L	0.5	1	0.0049
Zinc	mg/L	0.5	1	< 0.001

Footnotes:

*Parameter was measured in the field by Environmental Technicians.

Table 8.35: 2017 Non Contact Water West Diversion Ditch Water Quality Monitoring (ST-6)

Parameters	Units	Maximum Average Concentration	Maximum Allowable Grab Sample	4-Jun-2017	3-Jul-2017	7-Aug-2017	3-Sep-2017
pH*					6.95	7.82	8.54
Turbidity*	NTU				2.20	1.40	1.95
TSS	mg/l	15	30	1	< 1	3	< 1
Sulphate	mg/L			8.4	4.5	4.1	7.5
Aluminum	mg/l			0.025	0.010	< 0.006	< 0.006
Arsenic	mg/L			< 0.0005	< 0.0005	< 0.0005	< 0.0005
Copper	mg/L			< 0.0005	< 0.0005	< 0.0005	< 0.0005
Lead	mg/L			0.0040	< 0.0003	< 0.0003	< 0.0003
Nickel	mg/L			0.0008	0.0005	< 0.0005	< 0.0005
Zinc	mg/L			< 0.001	0.001	0.002	< 0.001
Cyanide	mg/L			0.002	< 0.001	< 0.001	0.002
Radium	Bq/l			< 0.002	0.002	< 0.002	< 0.002

Footnotes:

*Measured in the field by Environmental Technicians

Table 8.36: 2017 Secondary Containment Water Quality at the Baker Lake Bulk Fuel Storage Facility (ST-40)

Parameters	Units	Maximum Average Concentration	Maximum Concentration of any Grab sample	5/30/2017 ST-40.2	5/31/2017 ST-40.1	6/18/2017 ST-40.1
pH*	units	6.0-9.5	6.0-9.5	7.34	7.58	7.50
TSS	mg/L	15	30	8	12	21
Ammonia	mg/L	6	6	< 0.05	< 0.05	< 0.01
Benzene	µg/L	370	370	< 0.3	< 0.3	< 0.3
Toluene	µg/L	2	2	< 0.3	< 0.3	< 0.3
Ethylbenzene	µg/L	90	90	< 0.3	< 0.3	< 0.3
Total Xylenes	µg/L			< 0.3	< 0.3	< 0.3
Total oil and grease	mg/L	5	5	1	1	< 1
Arsenic	mg/L	0.5	1	< 0.0005	< 0.0005	< 0.0005
Copper	mg/L	0.3	0.6	0.0026	0.0058	0.0040
Lead	mg/L	0.1	0.1	0.0010	0.0042	0.0054
Nickel	mg/L	0.5	1	0.0007	0.0011	0.0006
Zinc	mg/L	0.5	1	< 0.001	< 0.001	0.001

Footnotes:

*Parameter was measured in the field by Environmental Technicians.

Table 8.37: 2017 MMER QAQC

Vault Final Discharge Point														
Parameter / QAQC	Units	DL	3-Jul-17				17-Jul-17				24-Jul-17			
			Original	Duplicate	RPD	Field Blank	Original	Field Blank	Original	Duplicate	RPD	Field Blank		
Arsenic	mg/L	0.005	< 0.005	< 0.005	0	0.006	0.005	< 0.005	< 0.005	0.010	67	0.022		
Copper	mg/L	0.005	0.026	0.026	0	< 0.005	0.031	< 0.005	0.028	0.030	7	0.063		
Total Cyanide	mg/L	0.0010	< 0.001	< 0.001	0	< 0.001	0.001	.001	0.001	0.001	0	< 0.001		
TSS	mg/L	1	< 1	< 1	0	< 1	4	< 1	< 1	2	67	1		
Nickel	mg/L	0.005	0.045	0.048	0	< 0.005	0.048	< 0.005	0.051	0.051	0	< 0.005		
Lead	mg/L	0.003	0.003	0.005	177	0.065	< 0.003	< 0.003	0.003	171	< 0.003			
Radium 226	mg/L	0.002	0.003	0.005	50	< 0.002	NA	NA	0.003	< 0.002	40	< 0.002		
Zinc	mg NL	0.001	0.003	0.004	29	0.002	0.006	< 0.001	0.002	< 0.001	67	< 0.001		
% Exceedances*					0%						0%			

Vault Final Discharge Point																					
Parameter / QAQC	Units	DL	6-Feb-17				13-Mar-17				3-Apr-17				6-Sep-17				27-Nov-17		
			Original	Duplicate	RPD	Field Blank	Original	Duplicate	RPD	Field Blank	Original	Duplicate	RPD	Field Blank	Original	Duplicate	RPD	Field Blank	Original	Duplicate	RPD
Arsenic	mg/L	0.005	< 0.005	< 0.005	0	< 0.005				< 0.005	< 0.005	0	< 0.005	< 0.005	< 0.005	0	< 0.005				
Copper	mg/L	0.005	0.021	0.021	0	0.005				0.018	0.005	113	< 0.005	0.008	0.008	0	1.0210				
Total Cyanide	mg/L	0.0010	< 0.001	< 0.001	0	< 0.001				0.002	< 0.001	67	< 0.001	0.003	0.001	100	0.001				
TSS	mg/L	1	4	5	67	< 1	3	3	0	< 1	6	29	3	3	1	100	1	5	6	18	
Nickel	mg/L	0.005	0.005	< 0.005	0	< 0.005				0.007	0.006	13	< 0.005	0.008	0.009	12	0.0194				
Lead	mg/L	0.003	< 0.003	< 0.003	0	< 0.003				< 0.003	0.003	0	< 0.003	< 0.003	< 0.003	0	< 0.003				
Radium 226	mg/L	0.002	0.002	0.003	40	< 0.002				< 0.002	0.002	0	< 0.002	< 0.002	< 0.002	0	< 0.002				
Zinc	mg NL	0.001	0.005	< 0.001	133	< 0.001				< 0.001	< 0.001	0	< 0.001	< 0.001	< 0.001	0	0.234				
% Exceedances*					0%				0%			0%				0%					0%

Footnotes:

NA: missing data

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8.38: 2017 EEM QAQC Data

Effluent characterization Vault Final Discharge Point						
Date	Units	DL	24-Jul-17			
Parameter / QAQC			Original	Duplicate	RPD	Field Blank
Alkalinity	mg CaCO3/L	2	53	53	0	10
Aluminium	mg/L	0.006	0.101	0.125	21	0.011
Ammonia nitrogen	mg N/L	0.01	0.98	1.00	2	0.01
Cadmium	mg/L	0.00002	< 0.00002	0.00004	67	< 0.00002
Hardness	mg CaCO3/L	1	77	97	23	< 1
Iron	mg/L	0.01	0.21	0.22	5	< 0.01
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0	< 0.00001
Molybdenum	mg/L	0.0005	0.0081	0.0104	25	< 0.0005
Nitrate	mg N/L	0.01	2.90	2.89	0	0.02
Selenium	mg/L	0.001	< 0.001	< 0.001	0	< 0.001
% Exceedances*					15%	

Effluent characterization East Dike Final Discharge Point						
Date	Units	DL	4-Apr-17			
Parameter / QAQC			Original	Duplicate	RPD	Field Blank
Alkalinity	mg CaCO3/L	2	32	31	3	6
Aluminium	mg/L	0.006	0.064	0.051	23	< 0.006
Ammonia nitrogen	mg N/L	0.01	0.03	0.01	100	< 0.02
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0	< 0.00002
Hardness	mg CaCO3/L	1	25	25	0	< 1
Iron	mg/L	0.01	0.05	0.08	46	< 0.01
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0	< 0.00001
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Nitrate	mg N/L	0.01	0.08	0.08	0	< 0.01
Selenium	mg/L	0.001	< 0.001	< 0.001	0	< 0.001
% Exceedances*					0%	

Water Quality Monitoring Exposure Area Wally Lake (Vault Final Discharge Point)						
Date	Units	DL	23-Jul-17			
Parameter / QAQC			Original	Duplicate	RPD	Field Blank
Alkalinity	mg CaCO3/L	2	42	49	15	10
Aluminium	mg/L	0.006	0.008	0.009	12	< 0.006
Ammonia nitrogen	mg N/L	0.01	0.04	0.03	29	0.01
Arsenic	mg N/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0	< 0.00002
Copper	mg/L	0.0005	0.0011	0.0009	20	< 0.0005
Cyanide	mg/L	0.001	< 0.001	< 0.001	0	< 0.001
Hardness	mg CaCO3/L	1	18	19	5	< 1
Iron	mg/L	0.01	0.02	0.02	0	< 0.01
Lead	mg/L	0.0003	0.0018	< 0.0003	143	< 0.0007
Mercury	mg/L	0.00001	< 0.00001	0.00001	0	< 0.00001
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Nickel	mg N/L	0.0005	0.0005	< 0.0005	0	< 0.0005
Nitrate	mg N/L	0.01	0.12	0.09	29	< 0.01
Radium 226	mg/L	0.002	NMR	NMR	0	NMR
Total suspended solids	mg/L	1	1	< 1	0	< 1
Selenium	mg/L	0.001	< 0.001	< 0.001	0	< 0.001
Zinc	mg/L	0.001	< 0.001	< 0.001	0	< 0.001
% Exceedances*					0%	

Water Quality Monitoring Exposure Area Second Portage Lake (East Dike Final Discharge Point)							
Date	Units	DL	3-Apr-17			19-Dec-17	
Parameter / QAQC			Original	Duplicate	RPD	Original	Field Blank
Alkalinity	mg CaCO ₃ /L	2	19	18	5	15	4
Aluminium	mg/L	0.006	< 0.006	< 0.006	0	< 0.006	< 0.006
Ammonia nitrogen	mg N/L	0.01	0.03	0.02	40	0.03	0.03
Arsenic	mg N/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0	< 0.00002	< 0.00002
Copper	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005	0.1796
Cyanide	mg/L	0.001	0.001	< 0.001	0	< 0.001	0.001
Hardness	mg CaCO ₃ /L	1	13	13	0	16	< 1
Iron	mg/L	0.01	< 0.01	0.01	0	< 0.01	< 0.01
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0	< 0.0003	< 0.0003
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005
Nickel	mg N/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005	0.0099
Nitrate	mg N/L	0.01	0.02	0.02	0	0.03	0.02
Radium 226	mg/L	0.002	NMR	NMR		NMR	NMR
Total suspended solids	mg/L	1	< 1	4	120	< 1	< 1
Selenium	mg/L	0.001	< 0.001	< 0.001	0	< 0.001	< 0.001
Zinc	mg/L	0.001	< 0.001	< 0.001	0	< 0.001	0.102
% Exceedances*					0%		

Water Quality Monitoring Reference Area (Vault and East Dike Final Discharge Point)							
Date	Units	DL	28-Aug-17				
Parameter / QAQC			Original	Duplicate	RPD	Field Blank	
Alkalinity	mg CaCO ₃ /L	2	8	7	13	2	
Aluminium	mg/L	0.006	< 0.006	< 0.006	0	< 0.006	
Ammonia nitrogen	mg N/L	0.01	< 0.01	< 0.01	0	< 0.01	
Arsenic	mg N/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005	
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0	< 0.00002	
Copper	mg/L	0.0005	< 0.0005	< 0.0005	0	0.0339	
Cyanide	mg/L	0.001	0.003	< 0.001	100	0.003	
Hardness	mg CaCO ₃ /L	1	7	< 1	150	< 1	
Iron	mg/L	0.01	< 0.01	< 0.01	0	< 0.01	
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0	< 0.0003	
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0	< 0.00001	
Molybdenum	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005	
Nickel	mg N/L	0.0005	< 0.0005	< 0.0005	0	0.0006	
Nitrate	mg N/L	0.01	0.03	0.02	40	< 0.01	
Radium 226	mg/L	0.002	NMR	NMR		NMR	
Total suspended solids	mg/L	1	< 1	< 1	0	< 1	
Selenium	mg/L	0.001	< 0.001	< 0.001	0	< 0.001	
Zinc	mg/L	0.001	< 0.001	< 0.001	0	0.017	
% Exceedances*					0%		

Footnotes:

NA: missing data

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8.39: 2017 STP QAQC

LJ-MIX								
Date	Units	DL	6-Mar-17			5-Sep-17		
Parameter / QAQC			Original	Duplicate	RPD	Original	Duplicate	RPD
TSS	mg CaCO ₃ /L	1	8	4	67	4	6	40
BOD-5	mg/L	1	10	11	10	6	5	18
COD	mg N/L	2	59	57	3	55	54	2
Ammonia nitrogen	mg/L	0.01	2.4	2.6	7	7.6	9.3	20
Ammonia (NH ₃)	mg CaCO ₃ /L	0.01	< 0.01	< 0.01	0	< 0.01	< 0.01	0
Nitrate	mg/L	0.01	15.1	16.0	6	21.9	22.0	0
Nitrite	mg/L	0.01	0.24	0.22	9	0.65	0.64	2
TKN	mg/L	0.05	5.6	5.8	2	11.0	11.0	0
% Exceedances*					0%			0%

STP-SEP								
Date	Units	DL	6-Mar-17			5-Sep-17		
Parameter / QAQC			Original	Duplicate	RPD	Original	Duplicate	RPD
TSS	mg CaCO ₃ /L	1	13	13	0	9	11	20
BOD-5	mg/L	1	17	11	43	7	7	0
COD	mg N/L	2	74	75	1	76	72	5
Ammonia nitrogen	mg/L	0.01	52.2	51.8	1	54.0	50.0	8
Ammonia (NH ₃)	mg CaCO ₃ /L	0.01	0.77	0.80	4	0.32	0.32	0
Nitrate	mg/L	0.01	1.80	1.66	8	1.40	1.35	4
Nitrite	mg/L	0.01	1.81	1.84	2	1.59	1.59	0
TKN	mg/L	0.05	49.5	47.6	4	55.0	56.0	2
% Exceedances*					13%			0%

STP-IN								
Date	Units	DL	6-Mar-17			5-Sep-17		
Parameter / QAQC			Original	Duplicate	RPD	Original	Duplicate	RPD
TSS	mg CaCO ₃ /L	1	94	82	14	153	168	9
BOD-5	mg/L	1	242	247	2	267	237	12
COD	mg N/L	2	438	464	6	534	531	1
Ammonia nitrogen	mg/L	0.01	72.9	73.4	1	85.0	88.0	3
Ammonia (NH ₃)	mg CaCO ₃ /L	0.01	0.82	0.81	1	0.56	0.40	33
Nitrate	mg/L	0.01	0.01	0.02	67	0.21	0.03	<i>150</i>
Nitrite	mg/L	0.01	0.03	0.01	100	0.01	0.02	67
TKN	mg/L	0.05	80.0	82.2	3	92.0	93.0	1
% Exceedances*					0%			13%

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8.40: 2017 Non-Contact Diversion Ditches QAQC

Date	Units	DL	ST-5			ST-6			
			3-Jul-17			3-Jul-17			
			Original	Duplicate	RPD	Original	Duplicate	RPD	
Aluminum	mg/l	0.006	0.010	0.015	40	0.010	< 0.006	50	
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	0	
Copper	mg/l	0.0005	0.0013	0.0019	38	< 0.0005	< 0.0005	0	
Cyanide	mg/L	0.001	< 0.001	< 0.001	0	< 0.001	< 0.001	0	
TSS	mg/L	1	1	2	67	< 1	1	0	
Nickel	mg/L	0.0005	0.0045	0.0049	9	0.0005	0.0005	0	
Lead	mg/L	0.0003	0.0086	0.0048	57	< 0.0003	< 0.0003	0	
Radium	mg/L	0.002	< 0.002	< 0.002	0	0.002	< 0.002	0	
Sulphate	mg/L	0.6	63.7	31.2	68	4.5	5.5	20	
Zinc	Bq/l	0.001	< 0.001	< 0.001	0	0.001	0.002	67	
% Exceedances*						20%			0%

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8.41: 2017 ST-8 QAQC

Date	Units	DL	ST-8															
			6-Feb-2017				3-Apr-2017				6-Sep-2017							
			Original	Duplicate	RPD	Field Blank	Original	Duplicate	RPD	Field Blank	Original	Duplicate	RPD	Field Blank				
TSS	mg/L	1	4	8	67	<	1	5	6	29	<	3	3	<	1	100	<	1
Sulphate	mg SO4/L	0.6	2.9	3	3	<	0.6	16.6	<	12.7	27	<	0.6	19	18.8	1	<	0.6
Total Cyanide	mg/L	0.001	<	0.001	<	0.001	0.002	<	0.001	67	<	0.001	0.003	0.001	100	<	0.001	
Aluminum	mg/L	0.006	0.046	0.063	31	<	0.006	0.042	0.041	163	<	0.006	0.015	0.018	18	<	0.006	
Arsenic	mg/L	0.0005	<	0.0005	<	0.0005	<	0.0005	<	0.0005	0	<	0.0005	<	0.0005	0	<	0.0005
Copper	mg/L	0.0005	0.0021	0.0021	0	<	0.0005	0.0018	<	0.0005	113	<	0.0005	0.0008	0	<	1.021	
Lead	mg/L	0.0003	<	0.0003	<	0.0003	<	0.0003	<	0.0003	0	<	0.0003	<	0.0003	0	<	0.0003
Nickel	mg/L	0.0005	0.0005	<	0.0005	0	<	0.0005	0.0007	0.0008	13	<	0.0005	0.0008	0.0009	12	<	0.0194
Zinc	mg/L	0.001	0.005	<	0.001	133	>	0.001	<	0.001	0	<	0.001	<	0.001	0	<	0.234
Radium	Bq/L	0.002	0.002	0.003	40	>	0.002	<	0.002	0.002	0	<	0.002	<	0.002	0	<	0.002
% Exceedances*					0%					10%						0%		

Footnotes:

RPD = Relative Percent Difference; MDL = Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10x the MDL and the other one exceeds 10x the MDL.

Table 8.42: 2017 ST-10 QAQC

Date	Units	DL	ST-10									
			3-Jul-2017				17-Jul-2017			24-Jul-2017		
			Original	Duplicate	RPD	Field Blank	Original	Field Blank	Original	Duplicate	RPD	Field Blank
Conventional Parameters												
Alkalinity	mg CaCO3/L	2	52	37	34	9	53	9	53	53	0	10
Bicarbonate alkalinity	mg CaCO3/L	1	52	37	34	9	53	9	53	53	0	10
Carbonate alkalinity	mg CaCO3/L	1	< 2	< 2	0	< 2	< 2	< 2	< 2	< 2	0	< 2
Hardness	mg CaCO3/L	1	54	61	12	< 1	73	< 1	83	80	4	< 1
TDS	mg/L	1	110	110	0	1	129	< 1	141	141	0	< 1
TSS	mg/L	1	< 1	< 1	0	< 1	4	< 1	< 1	2	67	1
DOC	mg/L	0.2	4.7	4.6	2	< 0.2	5.3	< 0.2	5	5.1	2	0.3
TOC	mg/L	0.2	5.4	4.8	12	0.5	5.8	< 0.2	5.6	5.1	9	0.5
Nutrients and Biological Indicators												
Ammonia nitrogen	mg N/L	0.01	1.02	1.03	1	0.09	0.83	0.03	0.85	1.04	9	0.01
Total Kjeldahl nitrogen	mg N/L	0.05	0.96	1	4	< 0.05	2.66	0.59	0.96	1.1	14	< 0.05
Nitrate	mg N/L	0.01	1.71	1.69	1	< 0.01	2.55	< 0.01	2.85	2.86	0	< 0.01
Nitrite	mg N/L	0.01	0.04	0.04	0	< 0.01	0.04	< 0.01	0.04	0.04	0	< 0.01
Orthophosphate	mg P/L	0.01	< 0.01	< 0.01	0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0	< 0.01
Total Phosphorus	mg P/L	0.01	< 0.04	< 0.04	0	< 0.04	0.02	0.01	0.03	0.02	40	0.02
Reactive silica	mg P/L	0.01	1.6	1.6	0	< 0.13	1.1	NA	1.4	1.5	7	0.11
Major Ions												
Calcium	mg/L	0.03	14.8	16.6	11	< 0.03	21	0.05	24	22.8	5	< 0.03
Chloride	mg/L	0.5	5.3	5	6	< 0.5	5.6	< 0.5	6.2	6.2	0	< 0.5
Magnesium	mg/L	0.02	4.3	4.79	11	< 0.02	5.2	0.02	6	5.7	5	< 0.02
Potassium	mg/L	0.05	2.1	2.16	3	< 0.05	2.8	< 0.05	2.9	3.02	4	< 0.05
Sodium	mg/L	0.05	2.3	2.44	6	< 0.05	2.6	< 0.05	3.2	3.02	6	< 0.05
Sulphate	mg SO4/L	0.6	31	31.6	2	< 0.6	40	< 0.6	42	40.8	3	0.9
Cyanide												
Total cyanide	mg/L	0.001	< 0.001	< 0.001	0	< 0.001	0.002	0.001	0.001	0.001	0	< 0.001
Total Metals												
Aluminum	mg/L	0.006	0.104	0.095	9	< 0.006	0.098	0.007	0.092	0.081	13	< 0.006
Antimony	mg/L	0.0001	0.0008	0.0008	0	< 0.0001	0.0011	< 0.0001	0.0013	0.0013	0	< 0.0001
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.001	67	0.0022
Barium	mg/L	0.0005	0.0119	0.0138	15	< 0.0005	0.0186	0.0016	0.0197	0.0197	0	< 0.0005
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0	< 0.0005
Boron	mg/L	0.01	< 0.01	< 0.01	0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0	< 0.01
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0	< 0.00002	0.00003	< 0.00002	0.00006	0.00006	0	< 0.00002
Chromium	mg/L	0.0006	0.0006	0.0011	59	< 0.0006	0.0016	< 0.0006	< 0.0006	< 0.0006	0	0.0011
Copper	mg/L	0.0005	0.0026	0.0026	9	< 0.0005	0.0031	< 0.0005	0.0028	0.003	7	0.0063
Iron	mg/L	0.01	0.11	0.1	10	< 0.01	0.17	< 0.01	0.2	0.19	5	< 0.01
Lead	mg/L	0.0003	0.0083	0.0005	177	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0038	171	< 0.0003
Lithium	mg/L	0.005	< 0.005	< 0.005	0	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0	< 0.005
Manganese	mg/L	0.0005	0.0527	0.0577	9	< 0.0005	0.0493	< 0.0005	0.0555	0.0557	0	< 0.0005
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0	< 0.00001
Molybdenum	mg/L	0.0005	0.0064	0.0069	8	< 0.0005	0.0094	< 0.0005	0.0104	0.0103	1	< 0.0005
Nickel	mg/L	0.0005	0.0045	0.0048	6	< 0.0005	0.0048	< 0.0005	0.0051	0.0051	0	< 0.0005
Selenium	mg/L	0.001	< 0.001	< 0.001	0	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	< 0.001
Strontium	mg/L	0.005	0.099	0.099	0	< 0.005	0.132	< 0.005	0.131	0.114	14	< 0.005
Tin	mg/L	0.001	< 0.001	< 0.001	0	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	< 0.001
Titanium	mg/L	0.01	0.01	0.01	0	< 0.01	0.01	< 0.01	0.03	0.02	40	< 0.01
Thallium	mg/L	0.005	< 0.0008	< 0.0008	0	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	0	< 0.0008
Uranium	mg/L	0.001	0.001	0.001	0	< 0.001	0.002	< 0.001	0.002	0.002	0	< 0.001
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005	0.003	< 0.0005	< 0.0005	< 0.0005	0	< 0.0005
Zinc	mg/L	0.001	0.003	0.004	29	< 0.001	< 0.001	< 0.001	0.002	< 0.001	67	< 0.001

Date	Units	DL	ST-10													
			3-Jul-2017				17-Jul-2017				24-Jul-2017					
			Original	Duplicate	RPD	Field Blank	Original	Field Blank	Original	Duplicate	RPD	Field Blank				
Dissolved Metals																
Aluminum	mg/L	0.006	0.006	0.019	104	<	0.006	0.017	<	0.006	0.014	0.018	25	<	0.006	
Antimony	mg/L	0.0001	<	0.0001	0.0004	120	<	0.0001	<	0.0001	0.0012	0.0012	0	<	0.0001	
Arsenic	mg/L	0.0005	0.0005	<	0.0005	0	<	0.0005	<	0.0005	<	0.0005	<	0.0005	0	
Barium	mg/L	0.0005	0.0005	0.0138	186	<	0.0005	0.118	<	0.0005	0.0166	0.0168	1	<	0.0005	
Beryllium	mg/L	0.0005	0.0005	<	0.0005	0	<	0.0005	<	0.0005	<	0.0005	<	0.0005	0	
Boron	mg/L	0.01	0.01	<	0.01	0	<	0.01	<	0.01	<	0.01	<	0.01	0	
Cadmium	mg/L	0.0002	0.0002	<	0.0002	0	<	0.0002	<	0.0002	<	0.0002	0.0003	40	<	0.0002
Chromium	mg/L	0.0006	0.0006	0.0006	0	<	0.0016	<	0.0006	<	0.0006	0.0006	0	<	0.0006	
Copper	mg/L	0.0005	0.0005	0.0026	135	<	0.0005	0.001	<	0.0005	0.002	0.0027	30	<	0.0005	
Iron	mg/L	0.01	0.01	0.91	196	<	0.01	0.02	<	0.01	0.2	0.04	133	<	0.01	
Manganese	mg/L	0.0005	0.0005	0.0393	165	<	0.0005	0.0493	<	0.0005	0.0472	0.0496	5	<	0.0005	
Mercury	mg/L	0.00001	<	0.00001	<	0.00001	<	0.00001	<	0.00001	<	0.00001	<	0.00001	0	
Molybdenum	mg/L	0.0005	<	0.0005	0.0061	170	<	0.0005	0.008	<	0.0005	0.0099	0.0099	0	<	0.0005
Nickel	mg/L	0.0005	<	0.0005	0.0031	144	<	0.0005	0.0036	<	0.0005	0.0045	0.0047	4	<	0.0005
Lead	mg/L	0.0003	0.0025	<	0.0003	157	<	0.0005	<	0.0003	<	0.0003	<	0.0003	0	
Lithium	mg/L	0.0050	<	0.005	<	0.005	<	0.005	<	0.005	<	0.005	<	0.005	0	
Selenium	mg/L	0.001	<	0.001	<	0.001	<	0.001	<	0.001	<	0.001	<	0.001	0	
Strontium	mg/L	0.005	<	0.005	0.099	181	<	0.005	0.107	<	0.005	0.139	0.134	4	<	0.005
Thallium	mg/L	0.001	<	0.0008	<	0.0008	<	0.0008	<	0.0008	<	0.0008	<	0.0008	0	
Tin	mg/L	0.001	<	0.001	<	0.001	<	0.001	<	0.001	<	0.001	<	0.001	0	
Titanium	mg/L	0.01	<	0.01	0.01	0	<	0.01	<	0.01	0.02	0.02	0	<	0.01	
Uranium	mg/L	0.005	0.001	0.001	0	<	0.001	0.002	<	0.001	0.002	0.002	0	<	0.001	
Vanadium	mg/L	0.001	<	0.0005	<	0.0005	<	0.0005	<	0.0023	<	0.0005	<	0.0005	0	
Zinc	mg/L	0.0005	0.001	0.001	0	<	0.002	0.006	<	0.001	<	0.001	<	0.001	0	
Hydrocarbons																
Total petroleum hydrocarbons	mg/L	0.3	<	0.3	0.1	100	<	0.1	<	0.3	<	0.3	<	0.3	0	
% Exceedances*						3%									0%	

Footnotes:
 RPD = Relative Percent Difference; MDL: Mean Detection Limit
 * Percentage of parameters exceeding the QA/QC objectives for one sampling event which corresponds to grey shaded cells.
 Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
 Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
 Italic values correspond to a RPD higher than 20% and for which one of the result is within 10x the MDL and the other one exceeds 10x the MDL.

Table 8.43: 2017 ST-16 Seepage QAQC

Date	Units	DL	22-Aug-17			
			Original	Duplicate	RPD	FB
Conventional Parameters						
TDS	mg/L	1	309	307	1	1
TSS	mg/L	1	3	4	29	< 1
Alkalinity	mg CaCO ₃ /L	2	97	97	0	30
Hardness	mg CaCO ₃ /L	1	186	184	1	< 1
Colour	colour	1	17	16	6	< 1
D.O.C	mg/L	0.2	9.2	9.4	2	0.3
T.O.C	mg/L	0.2	9.2	9.4	2	0.6
Nutrient and Biological Indicators						
Ammonia (NH ₃)	mg N/L	0.01	< 0.05	< 0.05	0	< 0.05
Ammonia nitrogen (NH ₃ -NH ₄)	mg N/L	0.01	< 0.05	< 0.05	0	< 0.05
Nitrate	mg N/L	0.01	6.13	6.05	1	< 0.01
Nitrite	mg N/L	0.01	0.01	0.01	0	< 0.01
Kjeldahl nitrogen	mg N/L	0.01	1.1	1.3	17	0.4
Ortho-phosphate (O-PO ₄)	mg P/L	0.01	< 0.01	< 0.01	0	< 0.01
Chlorophyll A	µg / L	0.13	0.27	0.28	4	< 0.13
Major Ions						
Bromides	mg/L	0.01	0.06	0.08	29	< 0.01
Chloride	mg/L	0.5	8.0	7.9	1	< 0.5
Fluoride	mg/L	0.02	0.22	0.23	4	0.01
Calcium	mg/L	0.03	40	40	0	< 0.03
Sodium	mg/L	0.05	18.1	18	1	< 0.05
Sulphate	mg/L	0.6	106	99.2	7	< 0.6
Thiosulfates (S ₂ O ₃)	mg/L	0.02	< 0.02	< 0.02	0	< 0.02
Thiocyanates (SNC)	mg/L	0.05	< 0.05	< 0.05	0	< 0.05
Cyanide						
CN total	mg/L	0.005	0.02	0.015	29	0.016
CN Free (SGS)	mg/L	0.005	< 0.005	< 0.005	0	< 0.005
CN WAD	mg/L	0.005	0.009	0.009	0	0.009
Dissolved Metals						
Aluminium	mg/L	0.006	< 0.006	< 0.006	0	< 0.006
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	0	< 0.0001
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Boron	mg/L	0.01	< 0.01	< 0.01	0	< 0.01
Barium	mg/L	0.0005	0.0158	0.0153	3	< 0.0005
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0	< 0.00002
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0	< 0.0006
Cobalt	mg/L	0.0005	0.0013	0.0011	17	< 0.0005
Copper	mg/L	0.0005	0.0151	0.014	8	< 0.0005
Iron	mg/L	0.0005	0.18	0.15	18	< 0.01
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0	< 0.0003
Lithium	mg/L	0.005	< 0.005	< 0.005	0	< 0.005
Manganese	mg/L	0.0005	0.1097	0.1099	0	< 0.0005
Magnesium	mg/L	0.02	15.4	0.1284	197	< 0.02
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0	< 0.00001
Molybdenum	mg/L	0.0005	0.0078	0.0077	1	< 0.0005
Nickel	mg/L	0.0005	0.016	0.0154	4	< 0.0005
Selenium	mg/L	0.001	< 0.001	< 0.001	0	< 0.001
Strontium	mg/L	0.005	0.189	0.189	0	< 0.005
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0	< 0.0001
Tin	mg/L	0.001	< 0.001	< 0.001	0	< 0.001
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0	< 0.0008
Titanium	mg/L	0.01	0.03	0.03	0	< 0.01
Uranium	mg/L	0.001	0.004	0.004	0	< 0.001
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Zinc	mg/L	0.001	0.001	< 0.001	0	< 0.001
Total Metals						
Aluminium	mg/L	0.006	0.027	0.025	8	< 0.006
Antimony	mg/L	0.0001	< 0.0001	< 0.0001	0	< 0.0001
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Boron	mg/L	0.01	0.02	0.02	0	< 0.01
Barium	mg/L	0.0005	0.0144	0.0152	5	< 0.0005
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0	< 0.00002
Copper	mg/L	0.0005	0.02	0.0196	2	< 0.0005
Chromium	mg/L	0.0006	0.0006	0.0009	40	0.0019
Cobalt	mg/L	0.0005	0.0015	0.0014	7	< 0.0005
Iron	mg/L	0.0005	0.39	0.3	26	< 0.01
Lithium	mg/L	0.0005	0.057	0.051	11	0.046
Manganese	mg/L	0.0005	0.1312	0.1284	2	< 0.0005
Magnesium	mg/L	0.0005	21	20.5	2	< 0.02
Mercury	mg/L	0.00005	< 0.00001	< 0.00001	0	< 0.00001
Molybdenum	mg/L	0.0005	0.0079	0.0078	1	< 0.0005
Nickel	mg/L	0.0005	0.02	0.0193	4	< 0.0005
Lead	mg/L	0.0005	< 0.0003	< 0.0003	0	< 0.0003
Phosphorus	mg P/L	0.01	16	14	13	6.1
Potassium	mg/L	0.05	8.39	8.35	0	< 0.05
Selenium	mg/L	0.001	< 0.001	< 0.001	0	< 0.001
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0	< 0.0001
Silica	mg/l	0.1	4.3	3.9	10	0.18
Tin	mg/L	0.001	0.001	< 0.001	0	< 0.001
Strontium	mg/L	0.005	0.191	0.214	11	< 0.005
Tellurium	mg/L	0.0005	NA	< 0.0005	NA	0.0005
Titanium	mg/L	0.01	0.04	0.04	0	< 0.01
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0	< 0.0008
Uranium	mg/L	0.001	0.005	0.004	22	< 0.001
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Zinc	mg/L	0.001	< 0.001	< 0.001	0	< 0.001
% Exceedances*					1%	

Footnotes:

RPD = Relative Percent Difference; MDL = Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10x the MDL and the other one exceeds 10x the MDL.

Table 8.44: 2017 Seeps QAQC

Date	Units	DL	ST-S-2				ST-32		
			12-Jun-2017				18-Jul-2017		
			Original	Duplicate	RDP	Field Blank	Original	Duplicate	RDP
Conventional Parameters									
Alkalinity	mg CaCO ₃ /L	2	21	24	13	6	102	95	7
Hardness	mg CaCO ₃ /L	1	23	29	23	< 1	431	430	0
TDS	mg N/L	1	46	45	2	1	542	545	1
TSS	mg N/L	1	9	4	77	< 1	2528	2466	2
Major Ions									
Chloride	mg/L	0.5	1.1	1.1	0	< 0.5	16.2	16.1	1
Fluoride	mg/L	0.02	0.05	0.05	0	0.02	0.60	0.57	5
Sulphate	mg SO ₄ /L	0.6	13.9	14.0	1	< 0.6	201.0	205.0	2
Nutrients and Biological Indicators									
Ammonia nitrogen (NH ₃ -NH ₄)	mg N/L	0.01	0.21	0.16	27	0.05	5.25	5.19	1
Ammonia (NH ₃)	mg N/L	0.01	< 0.01	< 0.01	0	< 0.01	0.02	0.03	40
Nitrite	mg N/L	0.01	0.01	0.01	0	< 0.01	0.64	0.62	3
Nitrate	mg N/L	0.01	0.58	0.57	2	< 0.01	25.60	25.80	1
Cyanide									
Total cyanide	mg/L	0.001	0.006	0.005	18	< 0.001	0.143	0.139	3
Free cyanide	mg/L	0.005	0.041	0.044	7	0.005			
WAD cyanide	mg/L	0.001	< 0.001	< 0.001	0	< 0.001			
Total Metals									
Aluminium	mg/L	0.006	0.626	0.675	8	0.007	41.810	39.330	6
Arsenic	mg/L	0.0005	0.0010	0.0029	97	< 0.0005	0.0171	0.0162	5
Barium	mg/L	0.00002	0.0044	0.0037	17	0.00160	0.6933	0.6755	3
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0	< 0.00002	0.00039	0.00037	5
Chromium	mg/L	0.0006	0.0092	0.0092	0	0.0034	0.1761	0.1666	6
Copper	mg/L	0.0005	0.0030	0.0041	31	0.0126	0.2916	0.2963	2
Iron	mg/L	0.01	1.01	1.03	2	< 0.01	84.00	81.30	3
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0	< 0.0003	0.0286	0.0279	2
Manganese	mg/L	0.0005	0.0538	0.0632	16	< 0.0005	6.8680	6.9570	1
Mercury	mg/L	0.00001	0.00091	0.0002	191	0.00001	< 0.00001	< 0.00001	0
Molybdenum	mg/L	0.0005	0.0015	0.0017	13	< 0.0005	0.0006	< 0.0005	18
Nickel	mg/L	0.0005	0.0079	0.0096	19	< 0.0005	0.3560	0.3532	1
Selenium	mg/L	0.001	< 0.001	< 0.001	0	< 0.001	0.002	0.001	67
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0	< 0.0001	0.0012	0.0011	9
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0	< 0.0008	< 0.0008	< 0.0008	0
Zinc	mg/L	0.001	0.002	0.005	86	0.012	0.235	0.229	3
% Exceedances*					7%				0%

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8.45 2017 Seeps Central Dike QAQC

Date	Units	DL	ST-S-5											
			3-Apr-2017				19-Jul-2017				3-Sep-2017			
			Original	Duplicate	RDP	FB	Original	Duplicate	RDP	FB	Original	Duplicate	RDP	FB
Conventional Parameters														
Alkalinity	mg CaCO ₃ /L	2	130	131	1	6	122	122	0	120	121	1	3	
Hardness	mg CaCO ₃ /L	1	1027	1110	8	< 1	1026	995	3	1327	927	35	< 1	
TDS	mg N/L	1	3131	3099	1	2	2664	2670	0	2594	2596	0	2	
TSS	mg N/L	1	9	8	12	3	13	14	7	1	2	67	< 1	
Major Ions														
Chloride	mg/L	0.5	571.7	510.7	11	< 0.5	83.2	82.1	1	582	589	1	< 0.5	
Fluoride	mg/L	0.02	0.51	0.52	2	< 0.02	0.46	0.48	4	0.5	0.4	22	< 0.02	
Sulphate	mg SO ₄ /L	0.6	1968	1990	1	5	1731	1582	9	1743	1719	1	1.4	
Nutrients and Biological Indicators														
Ammonia nitrogen (NH ₃ -NH ₄)	mg N/L	0.01	29.41	29.61	1	0.01	29.6	29.4	1	33	31	6	< 0.05	
Ammonia (NH ₃)	mg N/L	0.01	0.28	0.29	4	< 0.01	0.45	0.44	2	0.31	0.26	18	< 0.01	
Nitrite	mg N/L	0.01	0.0115	0.0138	18	< 0.0005	0.02	0.02	0	0.0145	0.0155	7	< 0.0005	
Nitrate	mg N/L	0.01	< 0.01	0.02	67	< 0.01	0.13	0.13	0	0.17	0.17	0	< 0.01	
Cyanide														
Total cyanide	mg/L	0.005	0.179	0.182	2	0.003	0.246	0.316	25	0.185	0.091	68	0.006	
Free cyanide	mg/L	0.005	0.092	0.094	2	< 0.005	< 0.005	< 0.005	0	0.007	0.006	15	< 0.005	
WAD cyanide	mg/L	0.005	0.101	0.099	2	< 0.001	0.104	0.095	9	0.103	0.051	68	0.003	
Total Metals														
Aluminium	mg/L	0.006	< 0.006	< 0.006	0	< 0.006	0.018	< 0.006	100	0.065	0.054	18	< 0.006	
Arsenic	mg/L	0.0005	0.0307	0.0306	0	< 0.0005	0.0174	0.0285	48	0.0399	0.0209	63	< 0.0005	
Barium	mg/L	0.00002	0.0174	0.0166	5	< 0.0005	0.0225	0.0237	5	0.0279	0.0265	5	< 0.0005	
Cadmium	mg/L	0.00002	0.00073	0.00084	14	< 0.00002	0.00105	0.00089	16	0.00062	0.00068	9	< 0.00002	
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0	0.0012	< 0.0006	< 0.0006	0	0.003	< 0.0006	133	0.0009	
Copper	mg/L	0.0005	0.0041	0.0047	14	< 0.0005	0.008	0.0072	11	0.0047	0.0029	47	< 0.0005	
Iron	mg/L	0.01	1.89	1.91	1	< 0.01	1.02	1.23	19	1.96	1.7	14	< 0.01	
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0	< 0.0003	< 0.0003	< 0.0003	0	0.0026	< 0.0003	159	< 0.0003	
Manganese	mg/L	0.0005	2.074	2.175	5	< 0.0005	1.821	1.840	1	2.3840	1.9780	19	< 0.0005	
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0	< 0.00001	0.00006	< 0.00001	143	< 0.00001	0.00013	171	0.00001	
Molybdenum	mg/L	0.0005	0.3024	0.3274	8	0.0005	0.2753	0.3069	11	0.2974	0.2645	12	< 0.0005	
Nickel	mg/L	0.0005	0.0115	0.0138	18	< 0.0005	0.0201	0.0178	12	0.0145	0.0155	7	< 0.0005	
Selenium	mg/L	0.001	0.009	0.011	20	< 0.001	0.011	0.009	20	0.008	0.008	0	< 0.001	
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0	< 0.0001	< 0.0001	< 0.0001	0	< 0.0001	< 0.0001	0	< 0.0001	
Thallium	mg/L	0.002	< 0.0008	< 0.0008	0	< 0.0008	< 0.0008	< 0.0008	0	< 0.0008	< 0.0008	0	< 0.0008	
Zinc	mg/L	0.001	< 0.001	< 0.001	0	< 0.001	0.003	< 0.001	100	0.007	< 0.001	150	< 0.001	
Dissolved Metals														
Aluminium	mg/L	0.006	< 0.006	< 0.006	0	< 0.006	< 0.006	< 0.006	0	< 0.006	< 0.006	0	< 0.006	
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0	< 0.0001	< 0.0001	< 0.0001	0	< 0.0001	< 0.0001	0	< 0.0001	
Arsenic	mg/L	0.0005	0.0128	0.0146	13	< 0.0005	0.0083	0.0131	45	0.0081	< 0.0005	177	< 0.0005	
Cadmium	mg/L	0.00002	0.00069	0.00076	10	< 0.00002	0.00133	0.00075	56	0.00064	0.00063	2	< 0.00002	
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0	0.0006	< 0.0006	< 0.0006	0	< 0.0006	< 0.0006	0	< 0.0006	
Copper	mg/L	0.0005	0.0051	0.005	2	< 0.0005	0.0073	0.0063	15	0.0035	0.0026	30	< 0.0005	
Iron	mg/L	0.01	< 0.01	< 0.01	0	< 0.01	0.15	0.2	29	0.03	0.02	40	< 0.01	
Manganese	mg/L	0.001	2.215	2.13	4	< 0.0005	1.773	1.784	1	2.342	1.886	22	< 0.0005	
Mercury	mg/L	0.00001	< 0.00001	0.00006	143	< 0.00001	0.0001	< 0.00001	164	0.00002	0.00005	86	< 0.00001	
Molybdenum	mg/L	0.0005	0.3333	0.3265	2	< 0.0005	0.3174	0.2731	15	0.2977	0.2571	15	< 0.0005	
Nickel	mg/L	0.0005	0.0126	0.0127	1	< 0.0005	0.0201	0.0168	18	0.0145	0.0148	2	< 0.0005	
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0	0.0083	< 0.0003	< 0.0003	0	< 0.0003	< 0.0003	0	< 0.0003	
Selenium	mg/L	0.001	0.024	0.024	0	< 0.001	0.014	0.010	33	0.011	0.009	20	< 0.001	
Thallium	mg/L	0.0020	< 0.0008	< 0.0008	0	< 0.0008	< 0.0008	< 0.0008	0	< 0.0008	< 0.0008	0	< 0.0008	
Zinc	mg/L	0.001	< 0.001	< 0.001	0	< 0.001	< 0.001	0.001	0	< 0.001	0.001	0	< 0.001	
% Exceedances*						0%			11%			13%		

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8.46: 2017 Pit sumps QAQC

Date	Units	DL	ST-17						ST-19			ST-20 Pit sump			ST-23		
			12-Jun-2017			3-Dec-2017			17-Jul-2017			17-Jul-2017			11-Jun-2017		
			Original	Duplicate	RPD	Original	Duplicate	RPD	Original	Duplicate	RPD	Original	Duplicate	RPD	Original	Duplicate	RPD
Conventional Parameters																	
Alkalinity	mg CaCO ₃ /L	2	83	84	1	91	91	0	74	74	0	85	84	1	96	96	0
Hardness	mg CaCO ₃ /L	1	193	187	3	232	229	1	185	187	1	202	197	3	248	204	19
TDS	mg/L	1	387	388	0	408	411	1	363	361	1	369	365	1	358	356	1
TSS	mg/L	1	16	19	17	2	2	0	3	2	40	6	2	100	22	23	4
Nutrients and Biological Indicators																	
Ammonia (NH ₃)	mg N/L	0.01	0.41	0.05	157	0.01	0.01	0	0.08	0.08	0	0.02	0.02	0	0.07	0.08	13
Ammonia nitrogen	mg N/L	0.01	4.3	4.4	2	0.59	0.58	2	3.4	3.33	1	0.76	0.77	1	3.49	3.50	0
Nitrate	mg N/L	0.01	4.48	9.36	71	6.09	5.99	2	0.69	0.79	14	2.35	2.41	3	4.31	4.37	1
Nitrite	mg N/L	0.01	0.11	0.11	0	0.03	0.03	0	0.19	0.19	0	0.14	0.13	7	0.11	0.11	0
Major Ions																	
Chloride	mg/L	0.5	12.7	12.4	2	18.6	18.6	0	28	28	0	11.1	11.8	6	31.5	31.7	1
Fluoride	mg/L	0.02	0.36	0.37	3	0.47	0.48	2	0.41	0.41	0	0.22	0.23	4	0.18	0.19	5
Sulphate	mg SO ₄ /L	0.6	148	146	1	179	183	2	110	109	1	112	116	4	94	92.2	2
Cyanide																	
Total cyanide	mg/L	0.005	0.062	0.063	2	0.005	0.005	0	NA	NA	NA	< 0.001	< 0.001	0	0.062	0.068	9
Free cyanide	mg/L	0.005	0.035	0.037	6	< 0.005	< 0.005	0	NA	NA	NA	NA	NA	0	0.036	0.036	0
Total Metals																	
Aluminum	mg/L	0.006	0.134	0.131	2	< 0.006	< 0.006	0	0.019	0.025	27	0.096	0.098	2	0.605	0.532	13
Arsenic	mg/L	0.0005	0.0239	0.0234	2	0.0359	0.0352	2	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	0	0.0066	0.0044	40
Barium	mg/L	0.0005	0.006	0.006	6	0.018	0.0167	7	0.014	0.0122	14	0.031	0.0322	4	0.0268	0.0218	21
Cadmium	mg/L	0.00002	0.00019	0.00018	5	0.00010	0.00003	108	0.00003	< 0.00002	40	< 0.00002	< 0.00002	0	0.00010	0.00005	67
Chromium	mg/L	0.0005	0.0009	0.0008	0	< 0.0006	< 0.0006	0	< 0.001	< 0.0006	0	< 0.0006	< 0.0006	0	0.0028	0.0029	4
Copper	mg/L	0.0005	0.0006	< 0.0005	18	0.0005	< 0.0005	0	0.0015	0.0021	33	0.0024	0.0018	29	< 0.0005	< 0.0005	0
Iron	mg/L	0.01	0.42	0.41	2	0.04	0.07	55	0.03	0.04	29	0.21	0.21	0	1.24	1.11	11
Lead	mg/L	0.0003	0.0165	< 0.0003	193	< 0.0003	< 0.0003	0	< 0.0003	< 0.0003	0	< 0.0003	< 0.0003	0	< 0.0003	< 0.0003	0
Manganese	mg/L	0.0005	0.0713	0.0881	21	0.1284	0.1168	9	0.1198	0.1014	17	0.1028	0.1065	4	0.2472	0.2068	18
Mercury	mg/L	0.00001	0.00001	0.00003	100	0.00002	0.00004	67	0.00001	0.00003	100	< 0.00001	< 0.00001	0	0.00003	0.00004	29
Molybdenum	mg/L	0.0005	0.0594	0.06	1	0.0367	0.0366	0	0.0267	0.0271	1	0.0069	0.0072	4	0.0419	0.0345	19
Nickel	mg/L	0.0005	0.03	0.0282	3	0.0438	0.0431	2	0.02	0.0249	2	0.054	0.054	0	0.0098	0.0085	14
Selenium	mg/L	0.001	< 0.001	< 0.001	0	0.001	0.001	0	0.001	0.001	0	< 0.001	0.002	67	0.002	0.001	67
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0	< 0.0001	< 0.0001	0	< 0.0001	< 0.0001	0	< 0.0001	< 0.0001	0	NA	NA	NA
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0	< 0.0008	< 0.0008	0	< 0.0008	< 0.0008	0	< 0.0008	< 0.0008	0	< 0.0008	< 0.0008	0
Zinc	mg/L	0.001	< 0.001	< 0.001	0	< 0.001	< 0.001	0	0.001	0.003	100	0.005	0.002	86	0.004	0.003	29
Dissolved Metals																	
Aluminum	mg/L	0.006	< 0.006	< 0.006	0	0.024	0.008	100	< 0.006	< 0.006	0	0.013	< 0.006	74	0.041	0.037	10
Arsenic	mg/L	0.0005	0.0146	0.0195	29	0.0394	0.0352	11	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	0	0.0053	0.0055	4
Barium	mg/L	0.0005	0.0036	0.0052	36	0.0134	0.0121	10	0.0086	0.008	5	0.030	0.0302	0	0.0208	0.0186	11
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0	< 0.00002	< 0.00002	0	< 0.00002	< 0.00002	0	< 0.00002	< 0.00002	0	0.00002	0.00005	86
Copper	mg/L	0.0005	< 0.0005	0.0005	0	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	0	0.0005	< 0.0005	0	< 0.0005	< 0.0005	0
Chromium	mg/L	0.0006	0.0013	0.0017	0	< 0.0006	< 0.0006	0	NA	NA	NA	NA	NA	NA	0.0028	0.0018	43
Iron	mg/L	0.01	0.01	0.02	67	< 0.01	< 0.01	0	< 0.01	< 0.01	0	< 0.0100	0.01	0	0.01	0.01	0
Manganese	mg/L	0.0005	0.0713	0.0795	11	0.1214	0.1168	4	0.1051	< 0.101	4	0.095	0.091	4	0.16	0.1459	8
Mercury	mg/L	0.00001	0.00003	0.00004	29	0.00002	0.00002	0	0.00002	0.00002	0	0.00001	< 0.00001	0	0.00004	0.00003	29
Molybdenum	mg/L	0.0005	0.0497	0.0538	8	0.0335	0.0318	5	0.0268	0.026	3	0.0079	0.0074	7	0.0340	0.0309	10
Nickel	mg/L	0.0005	0.0290	0.0252	14	0.0412	0.0393	5	0.0251	0.025	2	0.0569	0.0548	4	0.00610	0.0055	10
Lead	mg/L	0.0003	0.006	< 0.0003	181	< 0.0003	< 0.0003	0	< 0.0003	< 0.0003	0	< 0.0003	0.004	29	< 0.0003	< 0.0003	0
Selenium	mg/L	0.001	< 0.001	< 0.001	0	0.001	0.001	0	0.001	0.002	67	< 0.001	0.002	67	0.001	0.001	0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0	< 0.0001	< 0.0001	0	< 0.0001	< 0.0001	0	< 0.0001	< 0.0001	0	NA	NA	NA
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0	< 0.0008	< 0.0008	0	< 0.0008	< 0.0008	0	< 0.0008	< 0.0008	0	< 0.0008	< 0.0008	0
Zinc	mg/L	0.001	< 0.001	< 0.001	0	< 0.001	0.001	0	< 0.001	0.002	67	0.004	0.004	0	0.0010	< 0.001	0
% Exceedances*					7%			0%			0%			0%			2%

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10x the MDL and the other one exceeds 10x the MDL.

Table 8.47: 2017 ST-20 Pit Lake QAQC

Date	Units	DI	20-Aug-17		
			Original	Duplicate	RPD
Conventional Parameters					
Alkalinity	mg CaCO3/L	2	92	92	0
Bicarbonate alkalinity	mg CaCO3/L	2	92	92	0
Carbonate alkalinity	mg CaCO3/L	2	< 2	< 2	0
Hardness	mg CaCO3/L	1	175	171	2
TDS	mg/L	1	364	365	0
TSS	mg/L	1	2	4	67
TOC	mg/L	0.2	3.1	3.8	20
DOC	mg/L	0.2	3.1	3.8	20
Nutrients and Biological Indicators					
Ammonia nitrogen (NH3-NH4)	mg N/L	0.01	0.70	0.71	1
Total Kjeldahl Nitrogen	mg N/L	0.05	0.89	1.03	15
Nitrate	mg N/L	0.01	3.65	3.60	1
Nitrite	mg N/L	0.01	0.08	0.08	0
Total Phosphorus	mg P/L	0.01	0.01	0.03	100
Ortho-phosphate	mg P/L	0.01	< 0.01	0.01	0
Major Ions					
Calcium	mg/L	0.03	43.90	42.30	4
Potassium	mg/L	0.05	9.33	9.53	2
Magnesium	mg/L	0.02	15.90	16.00	1
Sodium	mg/L	0.05	33.10	32.80	1
Chloride	mg/L	0.5	21.90	22.80	4
Sulphate	mg SO4/L	0.6	145	143	1
Reactive Silica	mg/L	0.01	4.8	5.4	12
Cyanide					
Total cyanide	mg/L	0.001	< 0.001	< 0.001	0
Free cyanide	mg/L	0.005	< 0.005	< 0.005	0
Total Metals					
Aluminum	mg/L	0.006	0.131	0.121	8
Antimony	mg/L	0.0005	0.0005	0.0005	0
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0
Barium	mg/L	0.0005	0.0553	0.0503	9
Boron	mg/L	0.01	0.07	0.08	13
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0
Chromium	mg/L	0.0006	0.0023	0.0020	14
Copper	mg/L	0.0005	0.0011	0.0010	10
Iron	mg/L	0.01	0.16	0.17	6
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0
Lithium	mg/L	0.0050	< 0.005	< 0.005	0
Manganese	mg/L	0.0005	0.062	0.057	7
Mercury	mg/L	0.00001	< 0.00001	0.00005	133
Molybdenum	mg/L	0.0005	0.0201	0.0197	2
Nickel	mg/L	0.0005	0.0136	0.0127	7
Selenium	mg/L	0.001	0.001	0.002	67
Strontium	mg/L	0.005	0.30	0.30	0
Tin	mg/L	0.001	< 0.001	< 0.001	0
Titanium	mg/L	0.01	0.05	0.05	0
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0
Uranium	mg/L	0.001	0.011	0.011	0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0
Zinc	mg/L	0.001	< 0.001	< 0.001	0

Date	Units	DI	Original	Duplicate	RPD
Conventional Parameters					
Alkalinity	mg CaCO ₃ /L	2	92	92	0
Dissolved Metals					
Aluminum	mg/L	0.006	< 0.006	< 0.006	0
Arsenic	mg/L	0.0005	0.0016	0.0038	81
Antimony	mg/L	0.0001	0.000	0.000	0
Barium	mg/L	0.0005	0.0434	0.0439	1
Boron	mg/L	0.01	0.03	0.03	0
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0
Cadmium	mg/L	0.00002	< 0.00002	0.00002	0
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0
Copper	mg/L	0.0005	0.0011	0.0010	10
Iron	mg/L	0.01	0.01	< 0.01	0
Lead	mg/L	0.0003	< 0.0003	0.0051	<i>178</i>
Lithium	mg/L	0.0050	< 0.005	< 0.005	0
Manganese	mg/L	0.0005	0.0308	0.0296	4
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0
Molybdenum	mg/L	0.0005	0.0197	0.0198	1
Nickel	mg/L	0.0005	0.0114	0.0115	1
Selenium	mg/L	0.001	0.001	0.001	0
Strontium	mg/L	0.005	0.271	0.263	3
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0
Tin	mg/L	0.001	< 0.001	< 0.001	0
Titanium	mg/L	0.01	0.04	0.04	0
Uranium	mg/L	0.005	0.012	0.012	0
Vanadium	mg/L	0.0005	< 0.0005	< 0.0005	0
Zinc	mg/L	0.0005	0.001	0.001	0
% Exceedances*					0%

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8.48: 2017 ST-21 QAQC

Date	Units	DL	ST-21 South Cell							
			6-Apr-2017				7-Nov-2017			
			Original	Duplicate	RPD	Field Blank	Original	Duplicate	RPD	
Conventional Parameters										
Alkalinity	mg CaCO3/L	2	128	128	0	9	123	122	1	
Hardness	mg CaCO3/L	1	1333	1337	0	< 1	991	1066	7	
TDS	mg/L	1	3730	3733	0	2	3837	3879	1	
TSS	mg/L	1	9	6	40	< 1	8	3	91	
Nutrients and Biological Indicators										
Ammonia (NH3)	mg N/L	0.01	0.28	0.29	4	< 0.01	1.31	1.43	9	
Ammonia nitrogen	mg N/L	0.01	5.17	5.19	0	< 0.01	50.3	51.2	2	
Nitrate	mg N/L	0.01	4.93	5.25	6	< 0.01	3.41	3.35	2	
Nitrite	mg N/L	0.01	0.33	0.33	0	< 0.01	0.23	0.22	4	
Major Ions										
Chloride	mg/L	0.5	550.9	560.1	2	< 0.5	407.0	382	6	
Fluoride	mg/L	0.02	0.25	0.25	0	< 0.02	0.45	0.45	0	
Sulphate	mg SO4/L	0.6	2216	2202	1	0.9	2343	2313	1	
Cyanide										
Total cyanide	mg/L	0.005	3.62	3.57	1	< 0.0016	0.194	0.200	3	
CN Free	mg/L	0.005	0.007	0.006	15	< 0.005	0.042	0.007	143	
Cyanide WAD	mg/L	0.001	0.615	0.566	8	< 0.001	0.025	0.030	18	
Total Metals										
Aluminum	mg/L	0.006	0.102	0.095	7	< 0.006	0.045	0.060	29	
Arsenic	mg/L	0.0005	0.0098	0.0151	43	< 0.0005	0.0035	0.0016	75	
Barium	mg/L	0.0005	0.1077	0.1124	4	< 0.0005	0.0716	0.0767	7	
Cadmium	mg/L	0.00002	0.00136	0.00159	16	< 0.00002	0.00212	0.00233	9	
Chromium	mg/L	0.0006	0.0006	< 0.0006	0	< 0.0006	0.0011	0.0019	53	
Copper	mg/L	0.0005	0.2142	0.215	0	0.0006	0.5677	0.5989	5	
Iron	mg/L	0.01	0.71	0.65	9	< 0.01	0.18	0.20	11	
Mercury	mg/L	0.00001	0.00050	0.00051	2	< 0.00001	0.000618	0.000639	3	
Lead	mg/L	0.0003	0.0045	0.0148	107	< 0.0003	< 0.0003	< 0.0003	0	
Manganese	mg/L	0.0005	0.2864	0.2832	1	< 0.0005	0.2242	0.2455	9	
Molybdenum	mg/L	0.0005	0.5377	0.5504	2	0.0005	0.5552	0.604	8	
Nickel	mg/L	0.0005	0.124	0.1143	8	< 0.0005	0.1241	0.1334	7	
Selenium	mg/L	0.001	0.045	0.044	2	< 0.001	0.058	0.061	5	
Silver	mg/L	0.0001	0.0003	0.0003	0	< 0.0001	< 0.0001	< 0.0001	0	
Thallium	mg/L	0.005	< 0.0008	< 0.0008	0	< 0.0008	< 0.0008	< 0.0008	0	
Zinc	mg/L	0.001	0.166	0.006	186	0.001	0.001	0.004	120	
% Exceedances*					7%	0%				

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8.49: 2017 ST-24 QAQC

Date	Units	DL	ST-24			
			11-Jun-2017			
			Original	Duplicate	RPD	Field Blank
Conventional Parameters						
Alkalinity	mg CaCO ₃ /L	2	32	24	29	6
Hardness	mg CaCO ₃ /L	1	86	76	12	< 1
TDS	mg/L	1	118	119	1	1
TSS	mg/L	1	38	42	10	< 1
Nutrients and Biological Indicators						
Ammonia (NH ₃)	mg N/L	0.01	< 0.01	< 0.01	0	< 0.01
Ammonia-nitrogen	mg N/L	0.01	0.29	0.31	7	0.1
Nitrate	mg N/L	0.01	2.41	2.56	6	< 0.01
Nitrite	mg N/L	0.01	0.02	0.02	0	0.01
Major Ions						
Chloride	mg/L	0.5	1.5	2.0	29	< 0.5
Fluoride	mg/L	0.02	0.08	0.09	12	< 0.02
Sulphate	mg/L	0.6	43.6	43	2	1
Cyanide						
Total cyanide	mg/L	0.001	< 0.001	< 0.001	0	< 0.001
Total Metals						
Aluminum	mg/L	0.006	2.01	1.95	3	0.0018
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005
Barium	mg/L	0.0005	0.0253	0.0231	9	< 0.0005
Cadmium	mg/L	0.00002	0.00008	0.00001	156	< 0.00002
Chromium	mg/L	0.0006	0.0062	0.0048	25	0.0017
Copper	mg/L	0.0005	0.0072	0.0064	12	0.0083
Iron	mg/L	0.01	2.92	2.92	0	< 0.01
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0	< 0.0003
Manganese	mg/L	0.0005	0.1912	0.1686	13	< 0.0005
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0	0.0001
Molybdenum	mg/L	0.0005	0.0072	0.0062	15	< 0.0005
Nickel	mg/L	0.0005	0.0125	0.0116	7	< 0.0005
Selenium	mg/L	0.001	< 0.001	< 0.001	0	< 0.001
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0	< 0.0001
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0	< 0.0008
Zinc	mg/L	0.001	0.013	0.014	7	0.005
% Exceedances*					4%	

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8.50: 2017 ST-25 QAQC

Date	Units	DL	17-Jul-2017				3-Sep-2017	
			Original	Duplicate	RPD	Field Blank	Original	Field Blank
Conventional Parameters								
Alkalinity	mg CaCO ₃ /L	2	54	54	0	9	52	2
Hardness	mg CaCO ₃ /L	1	85	77	10	1	170	< 1
TSS	mg/L	1	6	7	15	< 1	86	1
TDS	mg/L	1	156	156	0	< 1	237	1
Nutrients and Biological Indicators								
Ammonia (NH ₃)	mg N/L	0.01	0.02	0.02	0	< 0.01	0.03	< 0.01
Ammonia-nitrogen (NH ₃ -NH ₄)	mg N/L	0.01	1.55	1.58	2	0.03	2.20	0.10
Nitrate	mg N/L	0.01	0.30	3.20	166	< 0.01	5.38	< 0.01
Nitrite	mg N/L	0.01	0.06	0.08	29	< 0.01	0.06	< 0.01
Major Ions								
Chloride	mg/L	0.50	7.2	9.3	25	NA	11.5	< 0.5
Fluoride	mg/L	0.02	NA	0.12	NA	< 0.02	0.07	< 0.02
Sulphate	mg/L	0.60	44.1	39.9	10	< 0.6	77.2	< 0.6
Cyanide								
Total Cyanide	mg/L	0.005	0.004	0.004	0	0.001	0.006	0.004
Total Metals								
Aluminum	mg/L	0.006	0.135	0.125	8	0.007	1.4	< 0.0006
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	< 0.0005
Barium	mg/L	0.0005	0.0162	0.0144	12	0.0016	0.038	< 0.001
Cadmium	mg/L	0.00002	< 0.00002	0.00002	0	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0	< 0.0006	0.0026	0.0011
Copper	mg/L	0.0005	0.0024	0.0021	13	< 0.0005	0.0062	0.0094
Iron	mg/L	0.01	0.27	0.26	4	< 0.01	1.91	< 0.01
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	0.0005	0.0443	0.0414	7	< 0.001	0.085	< 0.001
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0	< 0.00001	0.00002	< 0.00001
Molybdenum	mg/L	0.0005	0.0108	0.0106	2	< 0.0005	0.0178	< 0.0005
Nickel	mg/L	0.0005	0.0039	0.0037	5	< 0.0005	0.0053	< 0.0005
Selenium	mg/L	0.001	< 0.001	< 0.001	0	< 0.001	< 0.001	< 0.001
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.005	< 0.0008	< 0.0008	0	< 0.0008	< 0.0008	< 0.0008
Zinc	mg/L	0.0005	0.001	< 0.001	0	< 0.001	0.003	0.006
% Exceedances*					7%			

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8.51: 2017 ST-30 QAQC

Date	Units	DL	ST-30		
			10-Jul-2017		RPD
			Original	Duplicate	
Conventional Parameters					
Alkalinity	mg CaCO ₃ /L	2	88	87	1
Hardness	mg CaCO ₃ /L	1	110	82	29
TDS	mg/L	1	185	NA	
TSS	mg/L	1	4	3	29
Nutrients and Biological Indicators					
Ammonia (NH ₃)	mg N/L	0.01	0.02	0.01	67
Ammonia-nitrogen	mg N/L	0.01	1.5	1.7	13
Nitrate	mg N/L	0.01	0.81	11.10	173
Nitrite	mg N/L	0.01	0.06	0.07	15
Major Ions					
Chloride	mg/L	0.5	5.0	5.0	0
Fluoride	mg/L	0.02	0.24	0.23	4
Sulphate	mg/L	0.6	49.2	48	3
Cyanide					
Total cyanide	mg/L	0.005	0.089	0.037	83
Total Metals					
Aluminum	mg/L	0.006	0.195	0.112	54
Arsenic	mg/L	0.0005	0.195	0.0061	188
Barium	mg/L	0.0005	0.0109	0.0075	37
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0
Copper	mg/L	0.0005	0.0148	0.0114	26
Iron	mg/L	0.01	2.68	2.27	17
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0
Manganese	mg/L	0.0005	0.2604	0.1979	27
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	0
Molybdenum	mg/L	0.0005	0.0028	0.0022	24
Nickel	mg/L	0.001	0.0054	0.0044	20
Selenium	mg/L	0.001	< 0.001	< 0.001	0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0
Zinc	mg/L	0.001	0.001	< 0.001	0
% Exceedances*					25%

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8.52: 2017 ST-31 QAQC

Date	Units	DL	ST-31		
			10-Jul-2017		RPD
			Original	Duplicate	
Conventional Parameters					
Alkalinity	mg CaCO ₃ /L	2	61	60	2
Hardness	mg CaCO ₃ /L	1	1	109	196
TDS	mg/L	1	302	302	0
TSS	mg/L	1	1	2	67
Nutrients and Biological Indicators					
Ammonia (NH ₃)	mg N/L	0.01	0.04	0.03	29
Ammonia-nitrogen	mg N/L	0.01	6.7	6.8	1
Nitrate	mg N/L	0.01	10.5	23.40	76
Nitrite	mg N/L	0.01	0.26	0.25	4
Major Ions					
Chloride	mg/L	0.5	21.7	2.3	162
Fluoride	mg/L	0.02	0.19	0.19	0
Sulphate	mg/L	0.6	51.7	43	18
Cyanide					
Total cyanide	mg/L	0.005	< 0.001	0.004	123
Total Metals					
Aluminum	mg/L	0.006	0.006	0.044	152
Arsenic	mg/L	0.0005	0.0041	0.0045	9
Barium	mg/L	0.0005	< 0.0005	0.0114	183
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002	0
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0
Copper	mg/L	0.0005	0.0011	0.001	10
Iron	mg/L	0.01	0.01	0.19	180
Lead	mg/L	0.0003	< 0.0003	< 0.0003	0
Manganese	mg/L	0.0005	0.0005	0.0497	196
Mercury	mg/L	0.00001	0.00001	< 0.00001	0
Molybdenum	mg/L	0.0005	< 0.0005	0.014	186
Nickel	mg/L	0.0005	0.0005	0.0025	133
Selenium	mg/L	0.001	< 0.001	< 0.001	0
Silver	mg/L	0.0001	< 0.0001	< 0.0001	0
Thallium	mg/L	0.0008	< 0.0008	< 0.0008	0
Zinc	mg/L	0.001	< 0.001	< 0.001	0
% Exceedances*					7%

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8.53: 2017 RSP Seepage downstream lake QAQC

Date	Units	DL	NP2 South			NP2 East			NP2 West			NP1 West			NP2 Winter			Dogleg			SPL-RSF			
			Original	Duplicate	RDP	Original	Duplicate	RDP	Original	Duplicate	RDP	Original	Duplicate	RDP	Original	Duplicate	RDP	Original	Duplicate	RDP	Original	Duplicate	RDP	
Conventional Parameters																								
TDS	mg/L	1	153	154	1	149	148	1	148	148	0	158	157	1	250	250	0	73	73	0	25	25	0	
Alkalinity	mg CaCO ₃ /L	1	63	62	2	14	60	0	60	60	0	71	71	0	83	83	0	49	44	11	49	40	10	
Hardness	mg CaCO ₃ /L	1	84	84	0	1	91	96	4	79	95	18	92	1	107	119	11	38	38	0	12	14	20	
Colour	colour	1	0.7	0.7	0	0.7	0.7	0	0.7	0.7	0	0.62	0.6	3	0.32	0.27	90	0.29	0.55	7	0.46	0.46	0	
D.O.C	mg/L	0.2	6.2	6.1	2	0.2	5.8	6.1	5	6	6.1	2	5.6	5.8	4	5.9	5.8	2	4.4	4.3	2	2.4	2.5	4
T.O.C	mg/L	0.2	6.2	6.1	2	0.5	5.8	6.1	5	6	6.1	2	5.6	5.9	5	7.1	8.1	13	4.4	4.3	2	2.7	2.7	0
Nutrient and Biological Indicators																								
Ammonia (NH ₃)	mg N/L	0.05	< 0.05	< 0.05	0	< 0.05	< 0.05	0.05	0	< 0.05	0.05	0	< 0.05	< 0.05	0	< 0.01	0.01	0	< 0.05	< 0.05	0	< 0.05	0.05	0
Ammonia Nitrogen (NH ₃ -N)	mg N/L	0.01	0.04	0.04	0	< 0.01	0.03	0.02	40	< 0.01	0.02	67	0.13	0.11	0	0.49	0.48	2	< 0.01	< 0.05	0	< 0.01	0.01	0
Nitrate	mg N/L	0.01	< 0.01	< 0.01	0	< 0.01	< 0.01	0.01	0	< 0.01	< 0.01	0	< 0.01	< 0.01	0	< 0.01	< 0.01	0	< 0.01	< 0.01	0	< 0.01	< 0.01	0
Nitrite	mg N/L	0.01	< 0.01	< 0.01	0	< 0.01	< 0.01	0.01	0	< 0.01	< 0.01	0	< 0.01	< 0.01	0	< 0.01	< 0.01	0	< 0.01	< 0.01	0	< 0.01	< 0.01	0
Urea Nitrogen	mg N/L	0.05	< 0.05	< 0.05	0	< 0.05	< 0.05	0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0
Ortho-phosphate (O-P)	mg P/L	0.01	< 0.01	< 0.01	0	< 0.01	< 0.01	0.01	0	< 0.01	< 0.01	0	< 0.01	< 0.01	0	< 0.01	< 0.01	0	< 0.01	< 0.01	0	< 0.01	< 0.01	0
Chlorophyll A	µg/L	0.13	1.6	1.9	17	NA	2.5	2	22	2.7	2	30	0.82	1.4	52	0.57	NA	2.1	1.7	23	0.61	0.78	24	
Metals																								
Bromine	mg/L	0.01	0.03	0.04	29	< 0.01	0.02	0.04	67	0.04	0.04	0	< 0.01	0.05	133	0.07	0.06	15	0.04	< 0.01	120	< 0.01	< 0.01	0
Chloride	mg/L	0.5	4.3	4.2	2	< 0.5	4.4	4.5	0	4.5	4.5	0	11.2	11.1	1	2.9	2.8	1	8.4	8.4	0	0.3	0.3	0
Fluoride	mg/L	0.02	0.13	0.12	8	0.01	0.12	0.12	0	0.12	0.12	0	0.16	0.12	29	0.18	0.19	5	0.12	0.12	0	0.07	0.07	0
Calcium	mg/L	0.03	2.1	2.1	5	0.12	23.7	24.5	3	20.5	24.5	18	24.2	24.3	0	27	29.7	10	9.81	9.66	2	3.24	3.61	11
Sodium	mg/L	0.05	19.2	19.1	1	< 0.05	19.8	19.2	4	19.9	19.2	18	19.9	19.5	3	14.9	16.5	10	2.62	2.76	5	0.73	0.81	26
Sulfate	mg/L	0.6	46.8	46.2	1	3.5	45.1	45.7	1	44.1	45.7	4	33.4	34.2	2	81.1	83.9	1	28.4	23.2	13	5.7	6.6	15
Thiosulfates (TS2O ₃)	mg/L	0.05	< 0.01	< 0.05	0	< 0.05	< 0.05	0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0
Thiosulfates (TSO ₃)	mg/L	0.05	< 0.05	< 0.05	0	< 0.05	< 0.05	0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0
Thiosulfates (TSO ₂)	mg/L	0.05	< 0.05	< 0.05	0	< 0.05	< 0.05	0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0
Vanadium	mg/L	0.05	< 0.05	< 0.05	0	< 0.05	< 0.05	0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0	< 0.05	< 0.05	0
Organics																								
Chloroform	mg/L	0.005	0.012	0.014	15	0.001	0.015	0.015	0	0.012	0.015	22	0.006	0.025	123	0.015	0.012	14	0.017	0.012	34	0.011	0.014	24
C6 Free (SOS)	mg/L	0.005	< 0.005	< 0.005	0	< 0.005	< 0.005	0.005	0	< 0.005	< 0.005	0	< 0.005	< 0.005	0	< 0.005	< 0.005	0	< 0.005	< 0.005	0	< 0.005	< 0.005	0
C8 WAO	mg/L	0.005	0.01	0.01	0	0.009	0.01	0.01	10	0.009	0.01	20	0.006	0.008	29	0.002	< 0.001	67	0.009	0.008	12	0.009	0.009	0
Residual Metals																								
Aluminium	mg/L	0.006	< 0.006	< 0.006	0	0.019	< 0.006	< 0.006	0	< 0.006	< 0.006	0	< 0.006	0.007	15	< 0.006	< 0.006	0	< 0.006	< 0.006	0	< 0.006	< 0.006	0
Antimony	mg/L	0.001	< 0.001	< 0.001	0	< 0.001	< 0.001	0.001	0	< 0.001	< 0.001	0	< 0.001	< 0.001	143	< 0.001	< 0.001	0	< 0.001	< 0.001	0	< 0.001	< 0.001	0
Arsenic	mg/L	0.005	< 0.005	< 0.005	0	< 0.005	< 0.005	0.005	0	< 0.005	0.005	0	< 0.005	< 0.005	0	< 0.005	< 0.005	0	< 0.005	< 0.005	0	< 0.005	< 0.005	0
Boron	mg/L	0.01	< 0.01	< 0.01	0	< 0.01	< 0.01	0.01	0	< 0.01	< 0.01	0	< 0.01	< 0.01	0	< 0.01	< 0.01	0	< 0.01	< 0.01	0	< 0.01	< 0.01	0
Barium	mg/L	0.005	0.005	0.007	7	< 0.005	0.005	0.004	7	0.004	0.004	2	0.008	0.017	4	< 0.005	0.012	0	0.004	0.004	1	0.019	0.028	81
Beryllium	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	0.0005	0	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	0
Caesium	mg/L	0.0002	< 0.0002	< 0.0002	0	< 0.0002	< 0.0002	0.0002	0	< 0.0002	< 0.0002	0	< 0.0002	< 0.0002	0	< 0.0002	< 0.0002	0	< 0.0002	< 0.0002	0	< 0.0002	< 0.0002	0
Chromium	mg/L	0.0006	< 0.0006	< 0.0006	0	< 0.0006	< 0.0006	0.0006	0	< 0.0006	< 0.0006	0	< 0.0006	< 0.0006	0	< 0.0006	< 0.0006	0	< 0.0006	< 0.0006	0	< 0.0006	< 0.0006	0
Cobalt	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	0.0005	0	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	0	0.0006	0.0007	15	< 0.0005	< 0.0005	0
Copper	mg/L	0.0005	0.0017	0.0014	8	< 0.0005	0.001	0.013	39	0.001	0.001	73	0.007	0.008	1	0.004	0.004	0	0.005	0.005	0	0.005	0.005	0
Iron	mg/L	0.01	0.07	0.09	25	< 0.01	0.01	0.02	67	0.01	0.01	0	< 0.01	< 0.01	0	< 0.01	< 0.01	0	0.08	0.09	12	< 0.01	< 0.01	0
Lead	mg/L	0.001	< 0.001	< 0.001	0	< 0.001	< 0.001	0.001	0	< 0.001	< 0.001	0	< 0.001	< 0.001	0	< 0.001	< 0.001	0	< 0.001	< 0.001	0	< 0.001	< 0.001	0
Lithium	mg/L	0.005	0.005	0.006	0	< 0.005	0.005	0.005	0	< 0.005	< 0.005	0	< 0.005	< 0.005	0	< 0.005	< 0.005	0	< 0.005	< 0.005	0	< 0.005	< 0.005	0
Manganese	mg/L	0.0005	0.0156	0.0155	1	< 0.0005	< 0.0005	0.0005	0	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	0	< 0.0005	0.0014	7	0.064	0.063	8	< 0.0005	< 0.0005	0
Mercury	mg/L	0.001	2.2	2.2	0	< 0.0001	0.0001	0.0001	0	0.0001	0.0001	133	0.001	0.001	0	< 0.0001	0.0001	0	0.0001	0.0001	0	< 0.0001	< 0.0001	0
Molybdenum	mg/L	0.0005	0.0005	0.0005	0	< 0.0005	< 0.0005	0.0005	0	0.0005	0.0005	18	0.0026	0.0022	17	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	0
Nickel	mg/L	0.0005	0.0005	0.0008	81	< 0.0005	0.0002	0.0001	53	0.0001	0.0001	73	< 0.0005	< 0.0005	0	0.0007	0.0003	19	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	0
Selenium	mg/L	0.001	< 0.001	< 0.001	0	< 0.001	< 0.001	0.001	0	< 0.001	< 0.001	0	< 0.001	< 0.001	0	< 0.001	< 0.001	0	< 0.001	< 0.001	0	< 0.001	< 0.001	0
Strontium	mg/L	0.005	0.08	0.83	4	< 0.005	0.078	0.092	16	0.075	0.092	20	0.112	0.112	0	0.133	0.134	1	0.043	0.039	10	0.017	0.015	13
Silver	mg/L	0.001																						

Table 8.54: 2017 Bulk Fuel Storage Facility QAQC

Date	Units	DL	ST-37				ST-40.2			
			29-May-2017				30-May-2017			
			Original	Duplicate	RPD	Field Blank	Original	Duplicate	RPD	Field Blank
TSS	mg/L	1	11	10	10	< 1	8	5	46	< 1
Ammonia	mg/L	0.01	0.09	0.08	12	< 0.01	< 0.05	< 0.05	0	< 0.05
Benzene	µg/L	0.3	< 0.2	< 0.2	0	< 0.2	< 0.3	< 0.3	0	< 0.3
Toluene	µg/L	0.3	< 0.1	< 0.1	0	< 0.2	< 0.3	< 0.3	0	< 0.3
Ethylbenzene	µg/L	0.3	0.28	0.23	20	< 0.1	< 0.3	< 0.3	0	< 0.3
Total Xylenes	µg/L	0.3	1.1	0.57	63	< 0.4	< 0.3	< 0.3	0	< 0.3
Total oil and grease	mg/L	1	< 1	< 1	0	< 1	1	< 1	0	< 1
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	< 0.0005	0	< 0.0005
Copper	mg/L	0.0005	< 0.0005	< 0.0005	0	0.0162	0.0026	0.0026	0	0.0074
Lead	mg/L	0.0003	< 0.0003	0.0006	-67	< 0.0003	0.001	0.0003	108	< 0.0003
Nickel	mg/L	0.0005	0.0049	0.0047	4	< 0.0005	0.0007	0.0007	0	< 0.0005
Zinc	mg/L	0.005	< 0.001	< 0.001	0	< 0.001	< 0.001	0.001	0	< 0.001
% Exceedances*					0%				0%	

Footnotes:

RPD = Relative Percent Difference; MDL: Mean Detection Limit

* Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.

Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.

Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.

Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

**Table 8.55: 2017 Analite NEP #2 calibration
datasheets**

Date	Turbidity meter		
	Standard	Initial reading NTU	Final reading NTU
2017-01-01	0.00	-0.29	-0.07
	10.00	5.33	8.30
	100.00	96.10	100.40
2017-01-02	0.00	-0.36	-0.28
	10.00	14.18	8.60
	100.00	108.00	99.90
2017-01-09	0.00	-1.00	0.01
	10.00		10.00
	100.00	95.60	99.90
2017-01-10	0.00	0.05	0.01
	10.00	9.60	10.01
	100.00	99.30	100.10
2017-01-14	0.00	-0.24	0.04
	10.00	10.05	10.04
	100.00	100.30	100.10
2017-02-13	0.00	0.20	0.00
	10.00	10.13	10.00
	100.00	100.80	100.10
2017-05-04	0.00	0.40	0.01
	10.00	9.79	10.02
	100.00	99.40	99.90
2017-06-04	0.00	0.10	0.01
	10.00	10.82	10.03
	100.00	99.70	100.10

Table 8.56: 2017 GMW Turbidity Meter calibration datasheets

Date	Standard	Initial reading	Final reading
yyyy/mm/dd		NTU	NTU
2017-02-12	0.00		0.00
	50.00		49.95
2017-02-25	0.00	0.00	0.00
	50.00	53.75	51.00
2017-03-24	0.00	0.00	0.00
	50.00	48.45	49.60
2017-03-25	0.00	0.00	0.00
	50.00	44.18	49.70
2017-03-26	0.00	0.00	0.00
	50.00	50.00	47.53
2017-03-27	0.00	0.00	0.00
	50.00	47.50	49.90
2017-03-14	0.00	0.00	0.00
	47.50	50.00	50.00

Table 8.57: 2017 Hatch Meter calibration datasheets

Date	Turbidity meter			Cal. Verification
	Standard	Initial reading NTU	Final reading NTU	
2017-01-01	20	19.6	20.40	
	100	97.8	99.60	
	800	811.0	795.00	
2017-01-03	20	20.4	20.00	
	100	99.6	100.00	
	800	795.0	800.00	
2017-01-05	20	20.6	20.00	
	100	99.6	99.90	
	800	816.0	798.00	
2017-01-06	20	19.9	20.00	
	100	99.5	100.00	
	800	803.0	798.00	
2017-01-07	20	20.3	20.10	
	100	99.6	99.70	
	800	786.0	792.00	
2017-01-09	20	20.2	20.00	
	100	98.8	100.00	
	800	788.0	786.00	
2017-01-10	20	20.1	20.50	
	100	100.0	99.80	
	800	821.0	783.00	
2017-01-11	20	20.0	20.00	
	100	99.9	99.80	
	800	786.0	812.00	
2017-01-13	20	20.3	20.00	
	100	99.5	100.00	
	800	785.0	793.00	
2017-01-15	20	20.1	19.90	
	100	101.0	99.80	
	800	805.0	798.00	
2017-01-18	20	18.0	20.00	
	100	96.0	99.00	
	800	791.0	797.00	
2017-01-20	20	22.2	19.60	
	100	101.0	99.50	
	800	793.0	799.00	
2017-01-22	20	19.6	19.60	
	100	101.0	101.00	
	800	799.0	799.00	
2017-01-23	20	18.7	19.50	
	100	102.0	101.00	
	800	777.0	801.00	
2017-01-24	20	17.9	19.90	
	100	97.4	99.80	
	800	799.0	796.00	

	20	21.3	19.90	
2017-01-26	100	103.0	99.70	
	800	800.0	799.00	
	20	18.9	20.10	
2017-01-28	100	98.2	99.60	
	800	807.0	792.00	
	20	20.1	20.00	
2017-01-30	100	100.0	99.80	
	800	814.0	793.00	
	20	20.0	19.90	
2017-02-01	100	99.5	100.00	
	800	804.0	798.00	
	20	20.0	19.90	
2017-02-03	100	99.8	100.00	
	800	804.0	798.00	
	20	20.6	20.10	
2017-02-05	100	99.4	100.00	
	800	789.0	788.00	
	20	19.9	20.10	
2017-02-06	100	101.0	100.00	
	800	799.0	799.00	
	20	20.3	20.00	
2017-02-08	100	99.5	100.00	
	800	800.0	802.00	
	20	21.9	20.00	
2017-02-10	100	101.0	100.00	
	800	795.0	806.00	
	20	20.2	20.00	
2017-02-12	100	101.0	100.00	
	800	801.0	801.00	
	20	20.1	20.00	
2017-02-16	100	99.9	100.00	
	800	803.0	799.00	
	20	20.0	20.10	
2017-02-22	100	100.0	99.90	
	800	793.0	800.00	
	20	20.1	19.90	
2017-02-24	100	101.0	100.00	
	800	801.0	800.00	
	20	20.6	19.90	
2017-02-25	100	92.6	101.00	
	800	796.0	800.00	
	20	18.7	20.40	
2017-02-27	100	108.0	99.60	
	800	803.0	799.00	
	20	20.7	19.90	
2017-03-03	100	103.0	103.00	
	800	798.0	796.00	
	20	21.0	19.90	
2017-03-06	100	100.0	100.00	
	800	803.0	799.00	

	20	20.2	20.00	
2017-03-10	100	102.0	99.50	
	800	792.0	794.00	
	20	20.0	20.00	
2017-03-12	100	100.0	101.00	
	800	786.0	786.00	
	20	20.4	20.10	
2017-03-13	100	99.9	99.50	
	800	785.0	792.00	
	20	19.9	20.00	
2017-03-16	100	101.0	101.00	
	800	802.0	799.00	
	20	19.9	20.00	
2017-03-18	100	98.5	99.70	
	800	796.0	799.00	
	20	19.7	19.90	
2017-03-21	100	99.9	99.90	
	800	803.0	800.00	
	20	20.3	20.10	
2017-03-22	100	101.0	99.80	
	800	802.0	799.00	
	20	20.4	19.90	
2017-03-23	100	99.8	99.80	
	800	797.0	796.00	
	20	20.2	19.90	
2017-03-25	100	99.5	99.80	
	800	800.0	796.00	
	20	20.1	19.60	
2017-03-26	100	99.7	99.80	
	800	801.0	797.00	
	20	19.6	20.70	
2017-03-29	100	99.1	99.20	
	800	784.0	787.00	
	20	21.5	20.10	
2017-03-31	100	99.5	99.30	
	800	783.0	785.00	
	20	20.0	20.20	
2017-04-02	100	100.0	99.70	
	800	791.0	788.00	
	20	20.2	20.20	
2017-04-03	100	101.0	99.30	
	800	787.0	791.00	
	20	20.1	20.10	
2017-04-04	100	100.0	100.00	
	800	794.0	797.00	
	20	20.1	19.90	
2017-04-05	100	99.3	100.00	
	800	798.0	778.00	
	20	20.4	20.10	
2017-04-06	100	101.0	99.50	
	800	778.0	793.00	
	20	20.3	20.20	
2017-04-07	100	101.0	99.90	
	800	786.0	788.00	

	20	21.1	20.10	
2017-04-10	100	101.0	99.90	
	800	782.0	789.00	
	20	20.3	20.20	
2017-04-12	100	100.0	99.80	
	800	788.0	807.00	
	20	20.3	20.00	
2017-04-14	100	99.4	99.80	
	800	799.0	799.00	
	20	17.8	21.00	
2017-04-15	100	101.0	99.50	
	800	807.0	796.00	
	20	22.4	20.10	
2017-04-16	100	98.9	99.90	
	800	787.0	800.00	
	20	21.6	20.20	
2017-04-17	100	97.9	99.70	
	800	786.0	799.00	
	20	20.0	20.00	
2017-04-19	100	100.0	100.00	
	800	812.0	799.00	
	20	19.5	19.90	
2017-04-21	100	101.0	101.00	
	800	769.0	796.00	
	20	20.5	19.80	
2017-04-23	100	101.0	99.90	
	800	821.0	798.00	
	20	19.7	20.00	
2017-04-24	100	102.0	100.00	
	800	793.0	799.00	
	20	19.6	19.90	
2017-04-25	100	101.0	99.80	
	800	804.0	800.00	
	20	19.6	19.80	
2017-04-27	100	99.6	99.90	
	800	802.0	800.00	
	20	20.6	20.00	
2017-04-28	100	99.6	100.00	
	800	787.0	801.00	
	20	20.9	20.20	
2017-04-29	100	99.3	99.60	
	800	779.0	791.00	
	20	20.1	19.90	
2017-04-30	100	101.0	99.70	
	800	789.0	793.00	
	20	20.1	20.10	
2017-05-01	100	100.0	99.80	
	800	786.0	797.00	
	20	19.9	20.10	
2017-05-03	100	100.0	100.00	
	800	781.0	790.00	
	20	20.0	20.10	
2017-05-04	100	99.2	99.60	
	800	759.0	804.00	

	20	20.2	20.10	
2017-05-05	100	99.7	100.00	
	800	802.0	797.00	
	20	20.0	19.90	
2017-05-06	100	100.0	99.90	
	800	798.0	792.00	
	20	20.1	20.00	
2017-05-07	100	99.6	99.90	
	800	801.0	783.00	
	20	20.0	19.90	
2017-05-08	100	101.0	99.70	
	800	797.0	797.00	
	20	20.2	20.10	
2017-05-09	100	101.0	99.40	
	800	788.0	798.00	
	20	20.3	20.10	
2017-05-11	100	99.7	99.70	
	800	797.0	798.00	
	20	20.2	20.10	
2017-05-12	100	99.6	100.00	
	800	797.0	802.00	
	20	20.0	20.00	
2017-05-13	100	99.8	99.90	
	800	798.0	800.00	
	20	19.8	19.80	
2017-05-14	100	101.0	100.00	
	800	802.0	798.00	
	20	20.1	19.90	
2017-05-15	100	99.7	99.60	
	800	807.0	803.00	
	20	20.2	20.10	
2017-05-16	100	100.0	100.00	
	800	803.0	800.00	
	20	20.1	20.10	
2017-05-18	100	99.3	99.50	
	800	801.0	798.00	
	20	20.7	19.50	
2017-05-19	100	101.0	98.30	
	800	790.0	797.00	
	20	21.4	20.10	
2017-05-22	100	99.4	99.60	
	800	804.0	795.00	
	20	20.5	20.60	
2017-05-24	100	104.0	99.00	
	800	793.0	793.00	
	20	20.1	20.10	
2017-05-25	100	99.8	99.30	
	800	779.0	792.00	
	20	20.3	20.00	
2017-05-26	100	99.9	99.60	
	800	787.0	798.00	
	20	20.5	20.40	
2017-05-27	100	100.0	99.50	
	800	813.0	794.00	

	20	20.3	20.70	
2017-05-28	100	100.0	99.80	
	800	803.0	798.00	
	20	20.0	19.90	
2017-05-29	100	99.9	99.60	
	800	813.0	791.00	
	20	21.0	19.90	
2017-05-30	100	103.0	99.40	
	800	795.0	788.00	
	20	20.3	19.90	
2017-05-31	100	101.0	99.00	
	800	788.0	782.00	
	20	20.5	19.80	
2017-06-01	100	104.0	99.10	
	800	785.0	792.00	
	20	19.8	19.80	
2017-06-02	100	98.2	98.50	
	800	796.0	794.00	
	20	19.7	19.70	
2017-06-03	100	101.0	100.00	
	800	804.0	802.00	
	20	20.2	20.10	
2017-06-04	100	100.0	100.00	
	800	804.0	802.00	
	20	ERR	18.00	
2017-06-04	100	ERR	101.00	
	800	ERR	797.00	
	20	22.2	22.30	
2017-06-05	100	99.4	99.90	
	800	803.0	800.00	
	20	20.3	19.90	
2017-06-06	100	100.0	100.00	
	800	801.0	800.00	
	20	20.2	20.10	
2017-06-07	100	100.0	100.00	
	800	803.0	803.00	
	20	20.6	20.00	
2017-06-08	100	102.0	99.90	
	800	809.0	796.00	
2017-06-09				
	20	32.2	19.30	
2017-06-10	100	160.0	98.70	
	800	941.0	779.00	
	20	20.8	21.40	
2017-06-12	100	101.0	99.80	
	800	812.0	800.00	
	20	18.2	18.70	
2017-06-14	100	95.7	93.00	
	800	762.0	815.00	
	20	17.4	20.10	
2017-06-15	100	98.3	99.90	
	800	763.0	784.00	
	20	19.9	20.50	
2017-06-16	100	97.2	98.20	
	800	806.0	789.00	

	20	19.4	19.40	
2017-06-17	100	94.0	100.00	
	800	806.0	798.00	
	20	17.1	20.40	
2017-06-18	100	97.8	100.00	
	800	804.0	802.00	
	20	17.1	20.80	
2017-06-19	100	97.8	100.00	
	800	804.0	802.00	
	20	18.9	23.50	
2017-06-20	100	91.2	103.00	
	800	797.0	802.00	
	20	19.9	19.90	
2017-06-21	100	106.0	106.00	
	800	808.0	789.00	
	20	21.8	19.90	
2017-06-22	100	95.3	97.60	
	800	800.0	783.00	
	20	19.3	20.10	
2017-06-23	100	99.1	102.00	
	800	790.0	800.00	
	20	20.7	19.10	
2017-06-24	100	102.0	102.00	
	800	788.0	792.00	
	20	20.4	20.10	
2017-06-25	100	102.0	98.30	
	800	789.0	787.00	
	20	19.9	18.90	
2017-06-26	100	97.5	99.80	
	800	789.0	801.00	
	20	20.0	19.30	
2017-06-27	100	98.6	102.00	
	800	791.0	794.00	
	20	21.4	20.20	
2017-06-28	100	1010.0	96.60	
	800	791.0	787.00	
	20	20.7	19.60	
2017-06-29	100	99.8	101.00	
	800	797.0	791.00	
	20	20.0	20.00	
2017-06-30	100	99.2	100.00	
	800	782.0	800.00	
	20	19.0	19.20	
2017-07-03	100	101.0	101.00	
	800	790.0	801.00	
	20	22.2	19.90	
2017-07-04	100	103.0	101.00	
	800	810.0	786.00	
	20	20.9	17.20	
2017-07-05	100	101.0	100.00	
	800	800.0	787.00	
	20	20.5	19.00	
2017-07-06	100	100.0	97.00	
	800	807.0	789.00	

	20	18.1	19.80	
2017-07-07	100	87.7	102.00	
	800	808.0	782.00	
	20	21.1	19.80	
2017-08-07	100	103.0	93.20	
	800	792.0	784.00	
	20	21.3	18.10	
2017-09-07	100	104.0	99.80	
	800	804.0	786.00	
	20	21.9	17.50	
2017-10-07	100	90.1	106.00	
	800	791.0	788.00	
	20	17.8	20.00	
2017-11-07	100	107.0	101.00	
	800	802.0	797.00	
	20	18.0	19.70	
2017-12-07	100	102.0	97.20	
	800	809.0	791.00	
	20	22.7	19.20	
2017-07-13	100	97.6	99.50	
	800	783.0	789.00	
	20	21.1	20.00	
2017-07-14	100	101.0	103.00	
	800	794.0	796.00	
	20	21.3	19.40	
2017-07-15	100	102.0	98.00	
	800	820.0	788.00	
	20	20.3	20.20	
2017-07-16	100	96.1	100.00	
	800	805.0	796.00	
	20	19.5	20.00	
2017-07-17	100	105.0	101.00	
	800	779.0	800.00	
	20	19.6	20.10	
2017-07-18	100	101.0	100.00	
	800	803.0	796.00	
	20	21.5	19.90	
2017-07-19	100	97.9	99.20	
	800	801.0	800.00	
	20	21.6	19.50	
2017-07-20	100	104.0	96.80	
	800	804.0	796.00	
	20	23.3	19.40	
2017-07-21	100	96.8	100.00	
	800	793.0	789.00	
	20	20.4	20.10	
2017-07-22	100	98.0	99.70	
	800	790.0	796.00	
	20	20.3	20.10	
2017-07-23	100	102.0	101.00	
	800	810.0	797.00	
	20	20.2	19.80	
2017-07-24	100	101.0	103.00	
	800	808.0	794.00	

	20	19.7	19.60	
2017-07-25	100	103.0	97.30	
	800	779.0	796.00	
	20	20.9	19.50	
2017-07-26	100	104.0	96.10	
	800	808.0	801.00	
	20	21.0	19.60	
2017-07-27	100	103.0	97.1	
	800	787.0	796.00	
	20	19.9	22.00	
2017-07-28	100	99.8	98.90	
	800	797.0	779.00	
	20	20.0	19.80	
2017-07-29	100	98.1	99.30	
	800	792.0	801.00	
	20	20.9	19.70	
2017-07-31	100	97.2	100.00	
	800	789.0	797.00	
	20	20.3	20.10	
2017-08-01	100	99.4	100.00	
	800	792.0	800.00	
	20	20.8	20.40	
2017-08-02	100	102.0	101.00	
	800	800.0	799.00	
	20	19.6	19.60	
2017-08-03	100	97.6	99.40	
	800	789.0	803.00	
	20	22.6	16.20	
2017-08-04	100	100.0	96.60	
	800	796.0	786.00	
	20	19.1	20.60	
2017-08-05	100	96.1	101.00	
	800	802.0	796.00	
	20	18.5	18.80	
2017-08-06	100	100.0	100.00	
	800	799.0	793.00	
	20	16.8	19.60	
2017-08-07	100	100.0	99.70	
	800	797.0	788.00	
	20	21.5	18.70	
2017-08-08	100	100.0	101.00	
	800	809.0	791.00	
	20	21.0	20.70	
2017-08-09	100	98.1	97.00	
	800	802.0	799.00	
	20	19.2	20.10	
2017-08-10	100	97.6	102.00	
	800	793.0	792.00	
	20	21.2	19.40	
2017-08-11	100	104.0	98.40	
	800	795.0	796.00	
	20	20.9	18.60	
2017-08-12	100	100.0	99.90	
	800	805.0	799.00	

	20	20.1	19.70	
2017-08-13	100	98.4	99.20	
	800	807.0	798.00	
	20	18.1	19.00	
2017-08-14	100	97.1	101.00	
	800	802.0	797.00	
	20	18.1	19.80	
2017-08-15	100	99.8	102.00	
	800	804.0	793.00	
	20	20.2	20.30	
2017-08-16	100	99.9	99.30	
	800	794.0	789.00	
	20	24.1	24.50	
2017-08-17	100	106.0	103.00	
	800	791.0	806.00	
	20	16.8	104.00	
2017-08-18	100	97.8	796.00	
	800	793.0	19.80	
	20	19.6	19.80	
2017-08-19	100	103.0	97.80	
	800	791.0	800.00	
	20	24.2	22.90	
2017-08-20	100	98.8	99.50	
	800	799.0	817.00	
	20	20.4	20.00	
2017-08-21	100	99.1	99.50	
	800	790.0	809.00	
	20	20.0	20.50	
2017-08-22	100	107.0	101.00	
	800	789.0	792.00	
	20	19.6	20.30	
2017-08-23	100	99.2	102.00	
	800	786.0	800.00	
	20	21.2	20.60	
2017-08-24	100	101.0	96.20	
	800	788.0	807.00	
	20	19.9	20.20	
2017-08-25	100	102.0	99.70	
	800	777.0	781.00	
	20	20.1	19.80	
2017-08-26	100	101.0	104.00	
	800	783.0	791.00	
	20	20.0	19.60	
2017-08-28	100	102.0	101.00	
	800	803.0	802.00	
	20	19.8	20.00	
2017-08-29	100	99.1	99.80	
	800	800.0	801.00	
	20	20.2	19.80	
2017-08-30	100	99.9	97.80	
	800	794.0	800.00	
	20	18.1	19.00	
2017-08-31	100	97.1	101.00	
	800	802.0	797.00	

	20	20.3	20.50	
2017-09-01	100	101.0	102.00	
	800	790.0	796.00	
	20	19.7	20.40	
2017-09-02	100	101.0	99.10	
	800	802.0	794.00	
	20	20.6	20.00	
2017-09-03	100	105.0	100.00	
	800	806.0	800.00	
	20	19.6	20.50	
2017-09-04	100	20.4	101.00	
	800	796.0	796.00	
	20	19.8	20.10	
2017-09-05	100	100.0	99.90	
	800	806.0	801.00	
	20	10.8	20.60	
2017-09-06	100	99.8	101.00	
	800	795.0	796.00	
	20	23.2	21.10	
2017-09-07	100	97.2	97.30	
	800	796.0	800.00	
	20	21.6	20.40	
2017-09-08	100	98.9	100.00	
	800	794.0	801.00	
	20	22.5	19.70	
2017-09-09	100	104.0	99.70	
	800	814.0	799.00	
	20	20.4	19.50	
2017-09-10	100	99.7	100.00	
	800	807.0	794.00	
	20	18.4	19.60	
2017-09-11	100	94.5	99.30	
	800	777.0	788.00	
	20	20.1	19.80	
2017-09-12	100	102.0	102.00	
	800	805.0	800.00	
	20	20.2	20.20	
2017-09-13	100	99.3	102.00	
	800	807.0	793.00	
	20	18.5	19.10	
2017-09-14	100	98.6	98.80	
	800	792.0	780.00	
	20	20.6	20.20	
2017-09-15	100	100.0	97.50	
	800	788.0	786.00	
	20	21.7	20.70	
2017-09-16	100	104.0	103.00	
	800	796.0	804.00	
	20	20.0	20.50	
2017-09-17	100	99.6	99.20	
	800	784.0	786.00	
	20	20.2	20.90	
2017-09-18	100	102.0	98.10	
	800	793.0	800.00	

2017-09-19	20	21.7	20.50	
	100	99.4	100.00	
	800	787.0	796.00	
2017-09-20	20	21.2	20.30	
	100	98.0	99.30	
	800	785.0	792.00	
2017-09-21	20	20.7	19.80	
	100	99.8	101.00	
	800	786.0	793.00	
2017-09-22	20	20.6	20.30	
	100	101.0	98.60	
	800	807.0	787.00	
2017-09-23	20	21.1	19.60	
	100	101.0	101.00	
	800	777.0	788.00	
2017-09-24	20	20.1	19.70	
	100	101.0	100.00	
	800	779.0	785.00	
2017-09-25	20	18.6	19.80	
	100	101.0	99.60	
	800	792.0	798.00	
2017-09-27	20	21.0	20.10	
	100	98.7	96.60	
	800	798.0	804.00	
2017-09-28	20	20.9	20.50	
	100	103.0	103.00	
	800	801.0	7.94	
2017-09-29	20	19.0	19.04	
	100	97.8	96.70	
	800	791.0	802.00	
2017-09-30	20	19.7	20.30	
	100	103.0	101.00	
	800	791.0	807.00	
2017-10-01	20	20.4	19.80	10.6
	100	101.0	102.00	
	800	795.0	798.00	
2017-10-02	20	20.1	20.50	9.52
	100	98.5	98.30	
	800	794.0	798.00	
2017-10-03	20	19.0	19.80	9.54
	100	102.0	106.00	
	800	799.0	809.00	
2017-10-04	20	18.4	18.60	11.3
	100	99.4	99.40	
	800	799.0	790.00	
2017-10-05	20	21.1	19.90	10
	100	99.3	101.00	
	800	795.0	798.00	
2017-10-06	20	20.5	19.80	10.5
	100	103.0	99.60	
	800	807.0	797.00	
2017-10-07	20	19.7	19.80	10.5
	100	101.0	98.50	
	800	794.0	804.00	

2017-10-08	20	20.2	19.80	10.1
	100	99.8	98.80	
	800	788.0	807.00	
2017-10-09	20	20.9	18.70	9.65
	100	98.4	99.20	
	800	796.0	799.00	
2017-10-10	20	18.9	20.00	10.7
	100	100.0	97.80	
	800	807.0	799.00	
2017-10-11	20	20.2	20.40	10.2
	100	96.2	104.00	
	800	797.0	799.00	
2017-10-12	20	20.2	20.20	10.1
	100	104.0	99.70	
	800	790.0	791.00	
2017-10-13	20	19.8	20.20	10.4
	100	99.3	99.60	
	800	798.0	803.00	
2017-10-14	20	21.0	20.30	10.4
	100	101.0	96.80	
	800	796.0	785.00	
2017-10-15	No readings taken, 1 sample, reading done on the 16			
2017-10-16	20	20.4	19.70	9.98
	100	99.7	102.00	
	800	785.0	791.00	
2017-10-17	20	19.9	20.00	9.92
	100	97.9	96.70	
	800	785.0	786.00	
2017-10-18	20	20.0	19.90	10.2
	100	96.7	99.50	
	800	798.0	799.00	
2017-10-19	20	21.1	20.20	10.3
	100	104.0	103.00	
	800	820.0	790.00	
2017-10-20	20	20.6	20.50	9.81
	100	102.0	101.00	
	800	785.0	790.00	
2017-10-21	20	20.1	20.30	10.3
	100	100.0	99.30	
	800	782.0	800.00	
2017-10-22	20	19.1	20.10	11
	100	94.6	100.00	
	800	783.0	799.00	
2017-10-23				
2017-10-24	20	21.6	19.80	9.85
	100	110.0	99.60	
	800	799.0	799.00	
2017-10-25	20	20.2	19.30	9.47
	100	97.8	101.00	
	800	799.0	804.00	

2017-10-26	20	19.8	19.70	10.3
	100	100.0	99.80	
	800	808.0	796.00	
2017-10-27	20	21.2	19.00	9.75
	100	102.0	103.00	
	800	800.0	795.00	
2017-10-28	20	20.0	20.00	9.58
	100	94.4	99.60	
	800	799.0	799.00	
2017-10-29	20	19.6	20.10	11
	100	99.6	100.00	
	800	804.0	798.00	
2017-10-30	20	19.6	20.10	10.5
	100	100.0	100.00	
	800	794.0	796.00	
2017-11-05	20	20.9	20.10	10.1
	100	99.6	102.00	
	800	799.0	804.00	
2017-11-06	20	20.0	19.50	10.1
	100	100.0	97.40	
	800	805.0	801.00	
2017-11-07	20	20.7	20.40	10.1
	100	99.5	97.90	
	800	793.0	790.00	
2017-11-08	20	21.5	19.60	10
	100	105.0	99.60	
	800	780.0	793.00	
2017-11-09	20	19.2	19.60	9.66
	100	99.5	99.00	
	800	799.0	789.00	
2017-11-10	20	20.4	20.40	10.3
	100	99.6	99.50	
	800	786.0	785.00	
2017-11-11	20	21.5	20.40	10.1
	100	98.3	105.00	
	800	776.0	792.00	
2017-11-12	20	20.2	20.10	10.4
	100	104.0	99.90	
	800	793.0	789.00	
2017-11-13	20	20.6	20.30	10.3
	100	99.9	98.40	
	800	804.0	787.00	
2017-11-14	20	20.1	20.90	10.2
	100	97.9	99.30	
	800	790.0	797.00	
2017-11-15	20	20.4	20.80	10.4
	100	101.0	101.00	
	800	791.0	791.00	
2017-11-16	20	21.3	20.40	9.94
	100	102.0	98.90	
	800	783.0	791.00	
2017-11-17	20	20.2	19.90	10
	100	99.6	100.00	
	800	794.0	799.00	

2017-11-18	20	19.8	20.80	10.3
	100	99.1	99.10	
	800	800.0	791.00	
2017-11-19	20	21.0	20.80	10.4
	100	99.2	99.90	
	800	797.0	789.00	
2017-11-20	20	22.2	20.10	10.1
	100	97.7	100.00	
	800	790.0	788.00	
2017-11-21	20			
	100			
	800			
2017-11-22	20	19.9	19.90	10.4
	100	98.1	100.00	
	800	785.0	798.00	
2017-11-23	20	20.4	20.00	10.4
	100	101.0	99.80	
	800	800.0	797.00	
2017-11-24	20	20.0	20.00	9.92
	100	98.9	99.70	
	800	805.0	803.00	
2017-11-25	20	20.7	20.70	10.1
	100	99.8	100.00	
	800	882.0	796.00	
2017-11-26	20	19.6	20.00	10.2
	100	98.2	99.20	
	800	792.0	806.00	
2017-11-27	20	23.2	20.60	10.8
	100	106.0	102.00	
	800	811.0	801.00	
2017-11-28	20	20.6	20.50	10.5
	100	97.1	97.00	
	800	793.0	791.00	
2017-11-29	20	21.6	20.20	10
	100	99.9	99.10	
	800	795.0	803.00	
2017-11-30	20	20.3	20.40	10.3
	100	98.8	99.50	
	800	806.0	797.00	
2017-12-01	20	20.2	20.10	10.4
	100	99.6	98.30	
	800	805.0	799.00	
2017-12-02	20	20.3	19.80	10.3
	100	99.2	100.00	
	800	800.0	798.00	
2017-12-03	20	20.8	19.80	10.2
	100	99.5	99.30	
	800	799.0	801.00	
2017-12-04	20	20.2	19.50	10.1
	100	98.7	100.00	
	800	815.0	797.00	
2017-12-05	20	20.9	20.50	10.3
	100	101.0	99.60	
	800	807.0	798.00	

2017-12-06	20	20.6	20.70	10.5
	100	101.0	100.00	
	800	791.0	796.00	
2017-12-07	20	20.8	19.90	10.4
	100	99.2	98.40	
	800	786.0	788.00	
2017-12-08	20	19.5	20.20	10.5
	100	99.5	100.00	
	800	796.0	812.00	
2017-12-10	20	20.8	20.30	10
	100	99.8	99.80	
	800	787.0	793.00	
2017-12-11	20	20.3	20.50	10.3
	100	98.1	99.10	
	800	801.0	800.00	
2017-12-12	20	20.4	20.00	10.2
	100	101.0	99.00	
	800	794.0	801.00	
2017-12-13	20	20.0	19.80	10.1
	100	97.8	99.30	
	800	788.0	794.00	
2017-12-14	20	20.9	19.80	10.2
	100	100.0	101.00	
	800	790.0	800.00	
2017-12-15	20	19.9	20.40	10.5
	100	99.2	101.00	
	800	797.0	792.00	
2017-12-16	20	20.0	20.30	10.5
	100	98.9	100.00	
	800	792.0	787.00	
2017-12-17	20			
	100			
	800			
2017-12-18	20	20.7	20.30	10.5
	100	101.0	99.60	
	800	790.0	791.00	
2017-12-26	20	20.1	20.40	10.6
	100	99.5	99.80	
	800	801.0	798.00	
2017-12-28	20	20.2	20.10	10.5
	100	99.1	100.00	
	800	789.0	798.00	
2017-12-29	20	20.3	19.80	10.5
	100	99.8	98.30	
	800	798.0	804.00	
2017-12-30	20	19.7	20.00	10.2
	100	101.0	101.00	
	800	790.0	797.00	
2017-12-31	20	20.2	20.10	10.3
	100	101.0	99.10	
	800	797.0	800.00	

Table 8.58: 2017 Oakton PCS35 calibration datasheets

Date	pH			Conductivity		
	Standard	Initial reading	Final reading	Standard	Initial reading (µS/cm)	Final reading (µS/cm)
1-Jan-17	4.00	4.08	3.99	1413	1423	1411
	7.00	7.12	6.97			
2-Jan-17	4.00	4.08	4.03			
	7.00	7.20	7.02			
3-Jan-17	4.00	4.13	4.01	1413	1397	1411
	7.00	7.04	6.99			
9-Jan-17	4.00	4.03	4.01	1413	1368	1414
	7.00	6.97	7.02			
10-Jan-17	4.00	4.01	4.01			
	7.00	7.00	7.02			
14-Jan-17	4.00	4.02	4.01			
	7.00	6.98	7.02			
16-Jan-17	4.00	4.05	4.03			
	7.00	7.05	7.01			
23-Jan-17	4.00	4.08	4.01			
	7.00	6.95	6.99			
29-Jan-17	4.00	3.98	4.01	1413	1205	1414
	7.00	6.98	7.02			
30-Jan-17	4.00	4.21	4			
	7.00	6.92	7.03			
6-Feb-17	4.00	3.52	3.98	1413	1356	1413
	7.00	6.92	7			
8-Feb-17	4.00	4.03	3.99	1413	1127	1415
	7.00	7.05	7			
10-Feb-17	4.00	4.02	4.01	1413	1736	1412
	7.00	7.01	7.01			
13-Feb-17	4.00	4.01	4.01			
	7.00	7.08	7.02			
6-Mar-17	4.00	4.05	4	1413	1250	1416
	7.00	6.93	6.99			
13-Mar-17	4.00	4.06	4.02			
	7.00	7.11	7.02			
18-Mar-17	4.00	4.05	4.01	1413	1304	1412
	7.00	7.11	7.03			
22-Mar-17	4.00	4.03	4.01	1413	1405	1410
	7.00	7.13	7.02			
24-Mar-17	4.00	3.91	4.01			
	7.00	6.87	6.99			
25-Mar-17	4.00	3.87	4.03			
	7.00	6.89	7.01			
26-Mar-17	4.00	3.95	4			
	7.00	6.97	7.01			
27-Mar-17	4.00	3.90	4			
	7.00	6.76	7.03			
3-Apr-17	4.00	4.24	4	1413	1420	1411
	7.00	7.04	7			
4-Apr-17	4.00	3.94	4.03	1413	1336	1415
	7.00	6.99	7.01			
6-Apr-17	4.00	3.87	4			
	7.00	7.04	7.02			
12-Apr-17	4.00	4.09	4.02	1413	1431	1413
	7.00	7.01	7			
13-Apr-17	4.00	4.31	4.02			
	7.00	6.91	7.04			
15-Apr-17	4.00	4.12	4.02			
	7.00	7.04	7.05			
17-Apr-17	4.00	4.12	4.01	1413	1394	1413
	7.00	6.99	7.01			

21-Apr-17	4.00	4.04	3.99	1413	1429	1413
	7.00	6.94	7.01			
23-Apr-17	4.00	3.98	3.99	1413	1410	1414
	7.00	7.03	6.98			
24-Apr-17	4.00	3.96	3.99	1413	1411	1412
	7.00	6.94	6.97			
25-Apr-17	4.00	4.07	3.99	1413	1319	1412
	7.00	7.14	7.04			
27-Apr-17	4.00	4.05	4	1413	1371	1413
	7.00	7.11	7.03			
28-Apr-17	4.00	4.02	4.01	1413	1483	1415
	7.00	7.04	7.04			
29-Apr-17	4.00	3.97	4.03	1413	1386	1410
	7.00	7.01	7.02			
30-Apr-17	4.00	4.04	4.02	1413	1391	1412
	7.00	7.00	7.02			
1-May-17	4.00	4.03	4.02	1413	1402	1414
	7.00	7.02	7.01			
3-May-17	4.00	4.02	4.01	1413	1423	1411
	7.00	6.98	7			
4-May-17	4.00	4.04	4.01	1413	1400	1415
	7.00		7.02			
5-May-17	4.00	4.68	4	1413	1407	1414
	7.00	7.03	7.02			
6-May-17	4.00	4.07	4.02	1413	1451	1412
	7.00	7.02	7			
7-May-17	4.00	4.07	4.01	1413	1431	1412
	7.00	7.04	7			
8-May-17	4.00	4.05	4.01			
	7.00	6.98	7.02			
9-May-17	4.00	4.00	4.02	1413	1398	1410
	7.00	6.99	7.01			
12-May-17	4.00	3.97	3.99	1413	1380	1414
	7.00	7.07	7			
13-May-17	4.00	3.97	3.99	1413	1386	1415
	7.00	6.98	7.02			
14-May-17	4.00	3.99	3.99	1413	1419	1415
	7.00	7.02	6.98			
15-May-17	4.00	3.98	4	1413	1434	1414
	7.00	6.98	7.01			
16-May-17	4.00	4.05	3.98	1413	1386	1412
	7.00	6.97	7.02			
18-May-17	4.00	4.02	3.99	1413	1386	1415
	7.00	6.98	6.99			
19-May-17	4.00	4.24	4.02	1413	1401	1415
	7.00	7.13	7.03			
22-May-17	4.00	4.04	4.01	1413	1477	1415
	7.00	6.97	7.03			
24-May-17	4.00	4.02	4.02	1413	1336	1415
	7.00	7.04	7			
25-May-17	4.00	4.03	4	1413	1419	1416
	7.00	6.99	7.04			
26-May-17	4.00	4.02	4.02	1413	1385	1413
	7.00	7.04	7.03			
27-May-17	4.00	4.04	4.01	1413	1448	1414
	7.00	7.04	7.03			
28-May-17	4.00	4.00	4.03	1413	1409	1410
	7.00	6.99	7.02			
29-May-17	4.00	4.08	4.02	1413	1470	1411
	7.00	7.02	7.02			
30-May-17	4.00	4.07	4.01	1413	1384	1411
	7.00	7.01	7			

31-May-17	4.00	4.09	4	1413	1374	1412
	7.00	7.04	7.01			
1-Jun-17	4.00	3.99	4.01	1413	1457	1414
	7.00	6.98	7.01			
2-Jun-17	4.00	3.98	4.02	1413	1422	1412
	7.00	6.98	7			
3-Jun-17	4.00	4.04	4.01	1413	1395	1415
	7.00	7.01	7.01			
4-Jun-17	4.00	4.02	4.01	1413	1388	1415
	7.00	7.06	7.02			
5-Jun-17	4.00	4.05	4.01	1413	1397	1416
	7.00	7.05	7.01			
6-Jun-17	4.00	4.02	4	1413	1385	1413
	7.00	6.98	7.02			
7-Jun-17	4.00	4.05	3.99	1413	1363	1416
	7.00	7.04	7.02			
8-Jun-17	4.00	4.03	4	1413	1395	1415
	7.00	7.05	7.01			
10-Jun-17	4.00	4.02	4	1413	1389	1418
	7.00	6.95	7.01			
11-Jun-17	4.00	4.19	4.01	1413	1418	1414
	7.00	7.11	7.01			
12-Jun-17	4.00	3.99	4	1413	1398	1412
	7.00	6.95	6.98			
14-Jun-17	4.00	4.04	4.01	1413	1390	1414
	7.00	7.05	7.01			
15-Jun-17	4.00	4.03	4.01	1413	1443	1413
	7.00	6.98	7			
16-Jun-17	4.00	4.26	4.06	1413	1362	1410
	7.00	7.70	7.07			
17-Jun-17	4.00	3.99	3.97	1413	1448	1411
	7.00	7.05	7.04			
19-Jun-17	4.00	4.05	4.02		1419	1416
	7.00	7.02	7.03			
21-Jun-17	4.00	4.08	4.03	1413	1389	1413
	7.00	7.01	7			
22-Jun-17	4.00	4.02	4.01	1413	1420	1413
	7.00	6.98	7.01			
23-Jun-17	4.00	4.07	4	1413	1380	1414
	7.00	7.02	7.03			
24-Jun-17	4.00	4.06	3.99	1413	1387	1413
	7.00	7.03	7.01			
25-Jun-17	4.00	4.02	4.01	1413	1347	1712
	7.00	6.98	7			
27-Jun-17	4.00	4.02	4.02	1413	1477	1414
	7.00	6.97	7			
28-Jun-17	4.00	4.04	4.01	1413	1384	1414
	7.00	6.99	7.02			
29-Jun-17	4.00	4.07	4.05	1413	1283	1415
	7.00	6.98	7			
30-Jun-17	4.00	4.02	4.01	1413	1498	1411
	7.00	6.97	7.03			
3-Jul-17	4.00	4.08	4	1413	1439	1413
	7.00	7.10	6.99			
4-Jul-17	4.00	4.02	3.99	1413	1375	1415
	7.00	7.05	7			
5-Jul-17	4.00	3.98	4.01	1413	1230	1415
	7.00	6.98	6.99			
6-Jul-17	4.00	4.05	4.04	1413	1353	1413
	7.00	7.05	7.03			
7-Jul-17	4.00	4.06	4.04	1413	1353	1413
	7.00	6.97	6.98		1390	1415
8-Jul-17	4.00	4.05	4.01			
	7.00	7.09	7.05			

9-Jul-17	4.00			1413	1475	1413
	7.00	6.97	6.98			
10-Jul-17	4.00			1413	1475	1413
	7.00	7.02	7			
11-Jul-17	4.00	3.58	4.06	1413	1467	1415
	7.00	6.97	7			
12-Jul-17	4.00	3.66	4.01	1413	1465	1413
	7.00	6.97	7			
13-Jul-17	4.00	3.70	4.05	1413	1692	1413
	7.00	7.02	7.08			
15-Jul-17	4.00	4.05	4.06	1413	1432	1415
	7.00	7.03	7.07			
16-Jul-17	4.00	4.05	4	1413	1408	1412
	7.00	7.10	7.03			
17-Jul-17	4.00	4.03	3.93	1413	1411	1413
	7.00	7.04	7.03			
19-Jul-17	4.00	3.92	4.01	1413	1450	1413
	7.00	7.06	7.06			
24-Jul-17	4.00	4.29	3.96	1413	1401	1415
	7.00	7.04	7			
25-Jul-17	4.00	4.11	4	1413	1342	1414
	7.00	6.95	7.02			
26-Jul-17	4.00	4.05	4.01	1413	1401	1411
	7.00	7.00	7.03			
27-Jul-17	4.00	4.03	3.98	1413	1406	1415
	7.00	7.01	6.99			
28-Jul-17	4.00	4.04	4.02	1413	1451	1414
	7.00	7.00	7.01			
29-Jul-17	4.00	4.04	4	1413	1442	1413
	7.00	7.05	7.02			
31-Jul-17	4.00	4.03	4	1413	1363	1411
	7.00	7.01	7.03			
1-Aug-17	4.00	4.07	4	1413	1363	1411
	7.00	7.01	7.03			
2-Aug-17	4.00	4.01	4.02	1413	1408	1412
	7.00	6.98	6.99			
3-Aug-17	4.00	4.03	3.99	1413	1406	1416
	7.00	7.06	6.98			
4-Aug-17	4.00	4.08	4	1413	1358	1414
	7.00	6.97	7.01			
5-Aug-17	4.00	4.01	3.96	1413	1401	1415
	7.00	7.03	6.99			
6-Aug-17	4.00	3.96	4	1413	1359	1416
	7.00	6.97	7.01			
7-Aug-17	4.00	4.04	4.01	1413	1481	1415
	7.00	7.01	7			
8-Aug-17	4.00	4.05	4.01	1413	1440	1411
	7.00	7.01	7			
9-Aug-17	4.00	4.06	3.97	1413	1414	1416
	7.00	7.00	7			
10-Aug-17	4.00	4.03	4.01	1413	1419	1411
	7.00	7.00	7.01			
11-Aug-17	4.00	3.98	4.01	1413	1408	1413
	7.00	7.06	7.04			
12-Aug-17	4.00	4.02	6.99	1413	1424	1413
	7.00	7.06	4.01			
13-Aug-17	4.00	4.05	4	1413	1447	1413
	7.00	6.98	7.04			
14-Aug-17	4.00	4.06	4.01	1413	1445	1411
	7.00	7.03	7.01			
15-Aug-17	4.00	4.09	4.02	1413	1444	1411
	7.00	7.03	7			
16-Aug-17	4.00	4.08	4.04	1413	1447	1412
	7.00	7.11	7.03			

17-Aug-17	4.00	4.09	4.08	1413	1398	1416
	7.00	7.03	7.03			
18-Aug-17	4.00	4.05	4.08	1413	1398	1415
	7.00	7.11	7.05			
19-Aug-17	4.00	3.92	4.01	1413	1396	1414
	7.00	7.08	7			
20-Aug-17	4.00	3.99	3.98	1413	1415	1414
	7.00	6.94	7.05			
21-Aug-17	4.00	4.01	4.03	1413	1420	1410
	7.00	7.03	7.01			
22-Aug-17	4.00	4.03	4.02	1413	1414	1415
	7.00	7.01	7.03			
23-Aug-17	4.00	4.03	4.02	1413	1414	1415
	7.00	7.01	7.03			
24-Aug-17	4.00	4.00	4.02	1413	1420	1415
	7.00	7.03	7.05			
25-Aug-17	4.00	4.09	3.98	1413	1410	1410
	7.00	7.02	7.05			
28-Aug-17	4.00	4.37	4.01	1413	1445	1413
	7.00	7.47	7.01			
29-Aug-17	4.00	4.02	4.01	1413	1409	1414
	7.00	7.09	7.04			
30-Aug-17	4.00	4.08	4.03	1413	1435	1415
	7.00	7.12	7.02			
31-Aug-17	4.00	4.02	4	1413	1441	1415
	7.00	7.12	7.02			
1-Sep-17	4.00			1413		
	7.00					
2-Sep-17	4.00			1413		
	7.00					
3-Sep-17	4.00			1413		
	7.00					
6-Sep-17	4.00	4.02	4.01	1413	1388	1415
	7.00	6.96	7.05			
7-Sep-17	4.00	4.05	4.01	1413	1380	1414
	7.00	7.04	7.02			
9-Sep-17	4.00	4.09	3.99	1413	1410	1412
	7.00	7.02	7.04			
10-Sep-17	4.00	3.78	4	1413	1476	1416
	7.00	7.00	7.01			
11-Sep-17	4.00	4.03	3.99	1413	1327	1417
	7.00	7.02	7.01			
12-Sep-17	4.00	3.98	3.99	1413	1425	1412
	7.00	7.03	7.01			
13-Sep-17	4.00	4.01	4.01	1413	1353	1414
	7.00	7.03	7.03			
14-Sep-17	4.00	4.01	4.01	1413	1403	1413
	7.00	7.05	7.09			
15-Sep-17	4.00	4.03	4	1413	1472	1411
	7.00	7.11	7.04			
16-Sep-17	4.00	4.08	4	1413	1336	1412
	7.00	7.07	7.01			
17-Sep-17	4.00	3.94	4.01	1413	1425	1412
	7.00	7.00	7.03			
18-Sep-17	4.00	3.98	4	1413	1380	1412
	7.00	7.01	7.02			
19-Sep-17	4.00	4.02	4.01	1413	1380	1410
	7.00	7.02	7.01			
20-Sep-17	4.00	4.04	3.99	1413	1380	1412
	7.00	7.00	7.02			
21-Sep-17	4.00	3.99	4	1413	1419	1413
	7.00	7.10	7.04			
22-Sep-17	4.00	3.93	4.01	1413	1394	1412
	7.00	7.00	7.05			

23-Sep-17	4.00	4.00	4.02	1413	1430	1412
	7.00	7.06	7.04			
23-Sep-17	4.00	4.00	4.01	1413	1405	1411
	7.00	7.01	7.02			
25-Sep-17	4.00	4.04	4.02	1413	1403	1412
	7.00	7.04	7.01			
27-Sep-17	4.00	4.00	4.01	1413	1413	1411
	7.00	6.97	7.02			
28-Sep-17	4.00	4.03	4.02	1413	1424	1412
	7.00	7.01	7.05			
29-Sep-17	4.00	3.86	4.01	1413	1405	1411
	7.00	6.81	7.03			
30-Sep-17	4.00	4.02	4.01	1413	1416	1414
	7.00	7.04	7.06			
1-Oct-17	4.00	4.03	4.01	1413	1422	1411
	7.00	7.01	7.03			
2-Oct-17	4.00	4.03	4.02	1413	1408	1412
	7.00	7.05	7.05			
3-Oct-17	4.00	4.05	4.04	1413	1415	1413
	7.00	7.03	7.07			
4-Oct-17	4.00	4.06	4.01	1413	1403	1411
	7.00	7.06	7.04			
5-Oct-17	4.00	4.03	4	1413	1410	1413
	7.00	7.11	7.05			
6-Oct-17	4.00	4.02	4	1413	1404	1411
	7.00	7.04	7.02			
7-Oct-17	4.00	4.11	4.01	1413	1384	1412
	7.00	7.14	7.03			
8-Oct-17	4.00	4.02	3.99	1413	1414	1413
	7.00	7.05	7.01			
9-Oct-17	4.00	4.03	4	1413	1407	1414
	7.00	7.04	7.02			
10-Oct-17	4.00	4.02	4	1413	1394	1413
	7.00	7.03	7.01			
11-Oct-17	4.00	4.05	4.02	1413	1410	1412
	7.00	7.03	7.04			
12-Oct-17	4.00	3.98	4.02	1413	1386	1410
	7.00	7.06	7.05			
13-Oct-17	4.00	3.97	4.01	1413	1456	1415
	7.00	7.12	7.03			
14-Oct-17	4.00	4.05	4.02	1413	1430	1412
	7.00	6.99	7.04			
15-Oct-17	4.00	3.97	no reading taken, 1 sample, reading done on the 16			
	7.00	7.12				
16-Oct-17	4.00	4.00	4	1413	1390	1415
	7.00	7.08	7.05			
17-Oct-17	4.00	4.02	4.02	1413	1435	1415
	7.00	6.98	7.01			
18-Oct-17	4.00	4.05	4.01	1413	1395	1414
	7.00	7.03	7.01			
19-Oct-17	4.00	4.01	4.02	1413	1376	1416
	7.00	7.02	7.02			
20-Oct-17	4.00	4.00	4.01	1413	1416	1412
	7.00	6.96	7.04			
21-Oct-17	4.00	4.05	4.01	1413	1412	1411
	7.00	7.02	7.03			
22-Oct-17	4.00	4.05	4.01	1413	1411	1414
	7.00	7.07	7.04			
23-Oct-17	Blizzard					
24-Oct-17	4.00	4.06	3.99	1413	1409	1414
	7.00	6.98	7.03			
25-Oct-17	4.00	3.97	4	1413	1421	1414
	7.00	7.03	7.02			

26-Oct-17	4.00	4.06	4.02	1413	1385	1413
	7.00	7.05	7.02			
27-Oct-17	4.00	4.06	4.02	1413	1406	1412
	7.00	7.08	7.01			
28-Oct-17	4.00	4.04	4	1413	1414	1413
	7.00	7.06	7.01			
29-Oct-17	4.00	4.06	4	1413	1406	1415
	7.00	6.99	7.01			
30-Oct-17	4.00	4.03	4.01	1413	1406	1415
	7.00	7.04	7.01			
5-Nov-17	4.00	4.09	4.02	1413	1461	1412
	7.00	7.04	7.05			
6-Nov-17	used the hoskin			1413	1421	1416
7-Nov-17	4.00	4.13	3.98	1413	1410	1414
	7.00	7.07	7.01			
8-Nov-17				1413	1397	1413
9-Nov-17				1413	1383	1413
10-Nov-17				1413	1391	1417
11-Nov-17				1413	1410	1413
12-Nov-17				1413	1414	1413
13-Nov-17	4.00	4.02	4.01	1413	1451	1410
	7.00	7.00	7.02			
14-Nov-17				1413	1418	1415
15-Nov-17				1413	1408	1411
16-Nov-17				1413	1419	1413
17-Nov-17	4.00	4.03	4.01	1413	1426	1411
	7.00	7.07	7			
18-Nov-17	4.00	3.86	3.99	1413	1383	1416
	7.00	6.95	7.03			
19-Nov-17	4.00	3.99	4.01	1413	1422	1415
	7.00	7.02	7.05			
20-Nov-17	4.00	3.90	4.04	1413	1386	1411
	7.00	7.06	7.03			
21 & 22	Blizzard					
23-Nov-17	4.00	4.10	4.02	1413	1380	1418
	7.00	7.00	7.02			
24-Nov-17	4.00	3.97	4	1413	1470	1412
	7.00	7.03	7.04			
25-Nov-17	4.00	4.00	3.99	1413	1417	1414
	7.00	7.11	7.01			
26-Nov-17	4.00	4.02	4.01	1413	1418	1416
	7.00	7.06	7.01			
27-Nov-17	4.00	4.01	4	1413	1408	1415
	7.00	7.07	7.01			
28-Nov-17	4.00	3.91	3.99	1413	1394	1414
	7.00	6.98	7.02			
29-Nov-17	4.00	4.03	4	1413	1399	1415
	7.00	7.05	7.01			
30-Nov-17	4.00	3.99	4	1413	1374	1413
	7.00	7.02	6.99			
1-Dec-17	4.00	4.02	3.99	1413	1412	1415
	7.00	6.97	6.96			
2-Dec-17	4.00	4.02	4.02	1413	1408	1412
	7.00	7.13	7			

3-Dec-17	4.00	3.95	3.99	1413	1274	1416
	7.00	6.98	6.97			
4-Dec-17	4.00	4.08	3.99	1413	1501	1413
	7.00	6.98	6.98			
5-Dec-17	4.00	4.02	4.04	1413	1442	1416
	7.00	6.90	7.01			
6-Dec-17	4.00	4.05	4.02	1413	1404	1417
	7.00	7.06	7.02			
7-Dec-17	4.00	4.02	4.03	1413	1418	1413
	7.00	7.01	6.99			
8-Dec-17	4.00	3.94	3.99	1413	1433	1411
	7.00	7.04	7.04			
	10.00	10.11	9.94			
10-Dec-17	4.00	4.03	4.03	1413	1390	1412
	7.00	6.94	7.01			
	10.00	9.90	10.2			
11-Dec-17	4.00	4.06	4	1413	1392	1411
	7.00	7.02	7.04			
	10.00	10.15	10.05			
12-Dec-17	4.00	4.07	4.03	1413	1418	1414
	7.00	7.12	6.97			
	10.00	10.08	9.99			
13-Dec-17	4.00	3.67	3.99	1413	1396	1412
	7.00	6.95	7.02			
	10.00	10.02	10.05			
14-Dec-17	4.00	4.06	3.98	1413	1433	1413
	7.00	6.99	7.02			
	10.00	10.10	10.05			
15-Dec-17	4.00	3.91	4.02	1413	1410	1412
	7.00	6.97	6.95			
	10.00	10.12	9.99			
16-Dec-17	4.00	4.10	4.05	1413	1426	1410
	7.00	7.03	7			
	10.00	10.15	10.05			
18-Dec-17	4.00	3.68	3.97	1413	1431	1411
	7.00	6.92	7.05			
	10.00	10.07	10.01			
26-Dec-17	4.00	4.02	3.99	1413	1442	1417
	7.00	7.14	6.95			
	10.00	10.22	10.01			
28-Dec-17	4.00	4.04	4	1413	1399	1416
	7.00	6.96	6.95			
	10.00	10.08	10.02			
29-Dec-17	4.00	4.01	4	1413	1438	1417
	7.00	6.96	6.97			
	10.00	10.16	10.02			
30-Dec-17	4.00	4.06	4.01	1413	1389	1413
	7.00	6.98	7			
	10.00	10.10	10			
31-Dec-17	4.00	4.01	3.99	1413	1356	1417
	7.00	6.98	6.99			
	10.00	10.12	10.01			

Table 8.59: 2017 Eureka Mantra+ 20 Calibration sheets

extracted from probe, File: cal.log2017.csv

Date	Time	Sensor	SN	Units	RV	Old	New	SRF	Status
1/6/2017	17:11:00	DPTH	7151055	m	1.44E+01	0	0	98	Done
1/6/2017	17:17:16	PH	12162589	pH	9.79E-03	7	7	105	
1/6/2017	17:18:19	PH	12162589	pH	-1.55E-01	7	10	112/94/109	Done
1/6/2017	17:19:09	COND	12162589	uS/cm	2.73E+02	0	1412	118	Done
1/6/2017	17:26:10	HDO	12162589	%SAT	9.94E+01	101.2	100	100	Done
7/4/2017	11:33:43	COND	12162589	uS/cm	2.78E+03	120.3	1413	10	Done
7/4/2017	11:34:55	PH	12162589	pH	-5.98E-03	7.27	7	96	
7/4/2017	11:35:48	PH	12162589	pH	1.49E-01	4.53	4	84	
7/4/2017	11:37:11	PH	12162589	pH	-1.70E-01	10.17	10	104/88/94	Done
7/5/2017	8:09:08	COND	12162589	uS/cm	2.63E+02	15810	1413	112	Done
7/8/2017	6:37:26	COND	12162589	uS/cm	2.82E+02	1407	1413	112	Done
7/8/2017	6:42:59	PH	12162589	pH	1.69E-01	3.54	4	95	
7/8/2017	6:45:04	PH	12162589	pH	-1.71E-01	10.09	10	103/2147483	Done
7/8/2017	6:47:15	PH	12162589	pH	-6.50E-03	7.09	7	96	
7/8/2017	6:48:55	PH	12162589	pH	1.67E-01	4.02	4	94/98/93	Done
7/16/2017	8:23:37	PH	12162589	pH	-5.55E-03	6.98	7	96	
7/16/2017	8:25:09	PH	12162589	pH	-1.76E-01	9.92	10	100	
7/16/2017	8:26:38	PH	12162589	pH	1.68E-01	3.98	4	95/97/94	Done
7/16/2017	8:31:52	COND	12162589	mS/cm	2.87E+02	1.396	1.413	110	Done
7/16/2017	8:38:22	HDO	12162589	%SAT	9.36E+01	95.3	100	100	Failed
7/23/2017	15:43:36	COND	12162589	uS/cm	2.52E+02	1522	1413	119	Done
7/23/2017	15:44:19	COND	12162589	uS/cm	2.50E+02	1426	1413	120	Done
7/23/2017	15:45:50	HDO	12162589	%SAT	9.77E+01	99.5	100	100	Done
7/24/2017	12:53:39	HDO	12162589	%SAT	1.03E+02	105	100	100	Done
7/24/2017	12:55:29	COND	12162589	uS/cm	2.53E+02	1406	1413	119	Done
7/24/2017	12:57:46	PH	12162589	pH	1.56E-01	4.21	4	88	
7/24/2017	12:58:27	PH	12162589	pH	-9.58E-03	7.07	7	94/93/90	Done
8/28/2017	8:15:13	PH	12162589	pH	1.67E-01	3.74	4	94	
8/28/2017	8:16:24	PH	12162589	pH	-5.52E-03	6.92	7	96/99/94	Done
8/28/2017	8:18:55	COND	12162589	uS/cm	3.03E+02	1313	1413	111	Done
8/28/2017	8:26:12	HDO	12162589	%SAT	9.55E+01	97.3	100	100	Done
9/3/2017	6:17:53	PH	12162589	pH	-1.10E-02	7.09	7	93	
9/3/2017	6:19:08	PH	12162589	pH	-2.78E-01	11.7	10	43/21474836	Done
9/3/2017	6:23:26	COND	12162589	uS/cm	2.88E+02	1413	1413	111	Done
9/4/2017	6:50:17	COND	12162589	uS/cm	2.92E+02	1405	1413	110	Done
9/4/2017	6:53:08	PH	12162589	pH	-9.46E-03	6.98	7	94	
9/4/2017	6:55:25	PH	12162589	pH	1.54E-01	5.15	4	87/93/90	Done
9/7/2017	13:19:14	PH	12162589	pH	2.91E-02	6.29	7	116	Quit
9/7/2017	13:21:29	PH	12162589	pH	-9.31E-03	6.99	7	94	
9/7/2017	13:21:52	PH	12162589	pH	1.61E-01	3.88	4	91	
9/7/2017	13:22:48	PH	12162589	pH	1.65E-01	3.82	4	93/1187/-182	Done
9/7/2017	13:24:33	COND	12162589	uS/cm	3.37E+02	1189	1413	93	Done
9/7/2017	13:26:35	COND	12162589	uS/cm	3.01E+02	1574	1413	104	Done
9/8/2017	6:26:50	COND	12162589	uS/cm	3.47E+02	1232	1413	90	Done
9/8/2017	6:29:25	PH	12162589	pH	1.63E-01	4.01	4	92	
9/8/2017	6:30:40	PH	12162589	pH	-3.34E-03	6.89	7	98/95/96	Done
9/8/2017	6:38:48	HDO	12162589	%SAT	9.75E+01	99.2	100	100	Done
9/9/2017	5:55:43	COND	12162589	uS/cm	3.39E+02	1792	1413	115	Done
9/9/2017	5:59:01	PH	12162589	pH	1.51E-01	4.15	4	85	
9/9/2017	5:59:34	PH	12162589	pH	1.52E-01	4.13	4	86/3119/-509	Done
9/9/2017	6:00:42	PH	12162589	pH	1.54E-01	4	4	87	

9/9/2017	6:02:19	PH	12162589	pH	-1.51E-02	4.09	7	91/98/84	Done
9/9/2017	6:14:02	HDO	12162589	%SAT	1.01E+02	103.2	100	100	Done
9/10/2017	5:53:31	COND	12162589	uS/cm	3.20E+02	1395	1413	113	Done
9/10/2017	5:58:08	PH	12162589	pH	-1.15E-02	6.93	7	93	
9/10/2017	5:59:47	PH	12162589	pH	1.54E-01	4.01	4	87/95/88	Done
9/10/2017	6:18:26	HDO	12162589	%SAT	9.87E+01	100.6	100	100	Done
9/11/2017	9:42:12	HDO	12162589	%SAT	9.59E+01	97.7	100	100	Done
9/14/2017	12:24:09	PH	12162589	pH	1.86E-03	6.76	7	101	
9/14/2017	12:25:06	PH	12162589	pH	1.58E-01	3.97	4	89	
9/14/2017	12:26:54	PH	12162589	pH	-1.72E-01	9.85	10	102/93/101	Done
9/14/2017	12:28:01	PH	12162589	pH	-3.63E-02	7.65	7	79	
9/14/2017	12:28:16	PH	12162589	pH	-3.69E-02	7.66	0	-149	
9/14/2017	12:28:51	PH	12162589	pH	-1.72E-01	10.01	10	102/38/63	Done
9/14/2017	12:30:23	PH	12162589	pH	-1.24E-02	276.3	7	93	Quit
9/14/2017	12:31:01	PH	12162589	pH	-1.19E-02	281.6	7	93	
9/14/2017	12:31:36	PH	12162589	pH	-1.72E-01	9.98	10	102/91/88	Done
9/14/2017	12:33:14	PH	12162589	pH	1.61E-01	3.74	4	91	
9/14/2017	12:33:36	PH	12162589	pH	-1.09E-02	6.98	7	93	
9/14/2017	12:34:11	PH	12162589	pH	-1.71E-01	9.99	10	103/94/89	Done
9/14/2017	12:35:57	COND	12162589	uS/cm	2.79E+02	1408	1413	113	Done
9/14/2017	12:39:47	HDO	12162589	%SAT	9.53E+01	97	100	100	Done
9/16/2017	12:19:35	PH	12162589	pH	-1.71E-01	9.99	10	103	
9/16/2017	12:20:31	PH	12162589	pH	-8.77E-03	6.96	7	95/92/91	Done
9/16/2017	12:21:41	COND	12162589	uS/cm	2.79E+02	1394	1413	111	Done
9/16/2017	12:22:18	COND	12162589	uS/cm	2.71E+02	1446	1413	114	Done
9/16/2017	12:24:02	HDO	12162589	%SAT	8.98E+01	91.4	100	100	Done
9/17/2017	7:34:24	PH	12162589	pH	1.59E-01	3.9	4	90	
9/17/2017	7:35:06	PH	12162589	pH	-1.23E-02	7.06	7	93	
9/17/2017	7:35:47	PH	12162589	pH	-1.72E-01	10	10	102/94/87	Done
9/17/2017	7:38:34	COND	12162589	uS/cm	2.77E+02	1385	1413	112	Done
9/17/2017	7:43:40	HDO	12162589	%SAT	1.12E+02	113.9	100	100	Done
9/18/2017	7:41:57	PH	12162589	pH	1.64E-01	3.9	4	92	
9/18/2017	7:42:32	PH	12162589	pH	-7.94E-03	6.92	7	95	
9/18/2017	7:43:14	PH	12162589	pH	-1.70E-01	9.97	10	103/95/92	Done
9/18/2017	7:45:24	COND	12162589	uS/cm	3.07E+02	1280	1413	101	Done
9/18/2017	7:48:46	HDO	12162589	%SAT	1.01E+02	103.3	100	100	Done
9/21/2017	7:34:11	PH	12162589	pH	1.68E-01	3.91	4	94	
9/21/2017	7:35:46	PH	12162589	pH	-5.79E-03	6.96	7	96	
9/21/2017	7:37:20	PH	12162589	pH	-1.77E-01	10.13	10	100/98/94	Done
9/23/2017	6:16:06	PH	12162589	pH	1.62E-01	4.08	4	91	
9/23/2017	6:17:54	PH	12162589	pH	-1.77E-01	10	10	100	
9/23/2017	6:19:21	PH	12162589	pH	-1.11E-02	7.09	7	93/97/88	Done
9/23/2017	6:21:37	COND	12162589	uS/cm	3.08E+02	1488	1413	107	Done
9/25/2017	7:05:14	PH	12162589	pH	1.67E-01	3.92	4	94	
9/25/2017	7:07:09	PH	12162589	pH	-6.76E-03	6.92	0	-133	
9/25/2017	7:08:32	PH	12162589	pH	-1.77E-01	10.01	10	99/11/246	Done
9/25/2017	7:11:06	COND	12162589	uS/cm	2.93E+02	1469	1413	111	Done
9/27/2017	6:09:14	PH	12162589	pH	7.88E-02	5.52	4	45	
9/27/2017	6:09:46	PH	12162589	pH	1.62E-01	4.1	4	91	Quit
9/27/2017	6:10:18	PH	12162589	pH	1.62E-01	4.09	4	91	

9/27/2017	6:11:40	PH	12162589	pH	-1.80E-01	10.02	10	98	
9/27/2017	6:12:57	PH	12162589	pH	-1.25E-02	7.12	7	93/97/87	Done
9/27/2017	6:15:09	COND	12162589	uS/cm	2.93E+02	1382	1413	109	Done
10/6/2017	7:19:15	HDO	12162589	mg/l	9.27E+01	9.5	0	100	Quit
10/6/2017	7:24:38	HDO	12162589	%SAT	9.18E+01	93.4	100	100	Done
10/9/2017	9:02:09	HDO	12162589	mg/l	9.92E+01	9.75	0	100	Quit
10/9/2017	9:06:31	HDO	12162589	mg/l	9.95E+01	9.84	0	100	Quit
10/9/2017	9:14:44	HDO	12162589	%SAT	1.02E+02	103.9	100	100	Done
11/11/2017	12:52:05	PH	12162589	pH	1.64E-01	3.95	4	92	
11/11/2017	12:53:30	PH	12162589	pH	-1.08E-02	6.97	7	93/100/89	Done
11/11/2017	12:56:28	COND	12162589	uS/cm	2.93E+02	1440	1413	111	Done
11/11/2017	12:58:49	HDO	12162589	%SAT	9.40E+01	95.7	100	100	Done
11/13/2017	16:30:51	PH	12162589	pH	1.46E-01	4.3	4	82	
11/13/2017	16:31:47	PH	12162589	pH	-1.57E-02	7.08	7	91/92/84	Done
11/16/2017	12:42:08	PH	12162589	pH	1.61E-01	3.71	4	91	
11/16/2017	12:43:08	PH	12162589	pH	-1.23E-02	6.93	7	93/99/87	Done
11/16/2017	12:44:54	COND	12162589	uS/cm	3.01E+02	1411	1413	111	Done
11/16/2017	12:47:02	HDO	12162589	%SAT	1.00E+02	101.8	100	100	Done
11/19/2017	7:22:37	PH	12162589	pH	1.68E-01	3.89	4	94	
11/19/2017	7:23:47	PH	12162589	pH	-1.07E-02	6.97	7	94/102/89	Done
11/19/2017	7:26:07	COND	12162589	uS/cm	2.95E+02	1432	1413	112	Done
11/19/2017	7:29:16	HDO	12162589	%SAT	1.05E+02	106.6	100	100	Done
11/19/2017	7:57:52	HDO	12162589	%SAT	9.30E+01	94.7	100	100	Done
11/19/2017	7:59:36	DPTH	7151055	m	1.44E+01	-0.05	0	97	Done
12/4/2017	10:45:54	HDO	12162589	%SAT	9.80E+01	99.8	100	100	
12/6/2017	9:19:48	PH	12162589	pH	1.59E-01	4.12	4	90	
12/6/2017	9:20:47	PH	12162589	pH	-1.40E-02	7.05	7	92/100/85	Done
12/6/2017	9:22:17	COND	12162589	uS/cm	3.07E+02	1415	1413	112	Done
12/6/2017	9:26:22	HDO	12162589	%SAT	9.82E+01	100	100	100	Done
12/10/2017	8:27:48	PH	12162589	pH	-1.82E-01	9.88	10	97	
12/10/2017	8:28:31	PH	12162589	pH	-1.53E-02	7.02	7	91/95/84	Done
12/10/2017	8:30:21	COND	12162589	uS/cm	2.89E+02	1413	1413	112	Done
12/10/2017	8:34:11	HDO	12162589	%SAT	9.89E+01	100.8	100	100	Done

Table 8.60: 2017 Hoskin Scientific calibration datasheets

Date	pH			
	Standard	Initial reading	Final reading	Slope
6-Nov-17	4.00	4.51	4.01	-12
	7.00	7.22	7.01	
8-Nov-17	4.00		4	-15
	7.00		7.01	
9-Nov-17	4.00	4.04	4	-15
	7.00	7.01	7.02	
10-Nov-17	4.00	4.00	4.01	-15
	7.00	6.98	7	
11-Nov-17	4.00	4.01	4.01	-14
	7.00	6.99	7	
12-Nov-17	4.00	4.02	4	-16
	7.00	7.01	7.2	
14-Nov-17	4.00	3.98	4.01	-15
	7.00	7.01	6.99	
15-Nov-17	4.00	3.96	3.99	-14
	7.00	6.98	7	
16-Nov-17	4.00	4.05	4.02	-15
	7.00	7.00	7.01	

Table 8.61: 2017 Hanna #1 calibration datasheets

Date	pH			DO %			Conductivity		
	Standard	Initial reading	Final reading	Standard	Initial reading	Final reading	Standard	Initial reading	Final reading
1-Jan-17							1413	1450	1409
2-Jan-17							1413	1458	1413
9-Jan-17							1413	1335	1415
10-Jan-17							1413	1442	1411
14-Jan-17							1413	1437	1412
24-Jan-17							1413	1456	1411
13-Feb-17							1413	1395	1413
25-Feb-17							1413	1382	1412
24-Mar-17							1413	1390	1412
25-Mar-17							1413	1338	1416
26-Mar-17							1413	1429	1413
27-Mar-17							1413	1524	1411
14-Apr-17							1413	1306	1413
14-Apr-17							1413	1431	1412
6-May-17							1413	1451	1412
8-May-17							1413	1435	1413

**Table 8.62: 2017 DO Probe
calibration datasheets**

Date	DO %	
	Initial reading	Final reading
1/1/2017	103	100
1/2/2017	103	100
1/3/2017	102	100
1/9/2017	107	99
1/10/2017	102	100
1/14/2017	100	100
1/24/2017	98	100
2/6/2017	101	100
2/8/2016	98	100
2/13/2017	160	100
2/25/2017	96	99
3/6/2017	98	100
3/24/2017	95	100
3/25/2017	101	100
3/26/2017	107	100
3/27/2017	105	100
4/3/2017	96	100
4/13/2017	114	100
4/15/2017	111	100
5/1/2017	97	100
5/4/2017	102	100
5/5/2017	103	100
5/7/2017	100	100
5/8/2017	101	100
8/22/2017	100	100
11/6/2017	104	100
12/3/2017	104	100

Table 8.64: 2017 Mill Seepage Regulatory Guidelines

Regulatory Guidelines			
Parameters	Water License	MMER	CCME
CN t (mg/L)	1	1	NA
CN WAD (mg/L)	NA	NA	NA
Free CN (mg/L)	NA	NA	0.005
Cu (mg/L)	0.2	0.6	0.002
Fe (mg/L)	NA	NA	0.3

Table 8.65: 2014-2017 Mill Seepage Water Quality Monitoring

Date	Mill Trench				MW-203			MW-05				MW-07				MW-08			
	CN t (mg/L)	Free CN (mg/L)	Cu (mg/L)	Fe (mg/L)	Free CN (mg/L)	Cu (mg/L)	Fe (mg/L)	CN t (mg/L)	Free CN (mg/L)	Cu (mg/L)	Fe (mg/L)	CN t (mg/L)	Free CN (mg/L)	Cu (mg/L)	Fe (mg/L)	CN t (mg/L)	Free CN (mg/L)	Cu (mg/L)	Fe (mg/L)
2014																			
5/26/2014	0.087		0.01	1	Dry			Dry				Dry				Dry			
6/17/2014	0.44	0.061	0.057	1.6	Dry			Dry				Dry				0.024	<0.005	0.11	0.41
7/21/2014	0.38	0.020	0.031	1.6	Dry			<0.005	<0.01	0.031	2.2	0.046	<0.01	0.1	9.4	<0.005	<0.01	0.014	0.43
8/19/2014	0.17	0.028	0.012	1.5	Dry			Dry				Dry				<0.005	<0.01	0.055	6.40
9/29/2014	0.03		0.008	0.77	Dry			Dry				Dry				Dry			
11/18/2014	Frozen				0.064	4.2	Dry				Dry				Dry				
2015																			
7/29/2015	0.024		0.005	0.72	Dry			<0.005		0.13	1.49	Dry				<0.005		0.27	2.92
8/4/2015	0.038	<0.005	0.008	0.6	<0.005	0.016	0.52	Dry				Dry				<0.005	<0.005	0.17	17.2
9/17/2015	0.030		0.005	0.2	Dry			Dry				0.008	<0.005	0.047	4.53	<0.005	<0.005	0.016	8.1
2016																			
5/16/2016	Frozen				<0.005	0.0156	7.57	Dry				Frozen				Frozen			
8/8/2016	0.022	0.016	0.0254	0.3	Dry			Dry				<0.005	<0.005	0.2948	39.8	<0.005	<0.005	0.3709	62.8
8/16/2016	No sample taken				Dry			Dry				0.007		0.1811	27.8	<0.005		0.1142	19.8
9/6/2016	0.007				<0.005			Dry				<0.005				Not enough water			
10/14/2016	Frozen				<0.005			Dry				0.005				Dry			
2017																			
6/3/2017	No sample taken				0.038	0.043	150	Dry				Frozen				Frozen			
6/11/2017	0.057		0.0047	1.33	No sample taken			Dry				Frozen				Frozen			
7/4/2017	No sample taken				Pump Problem			<0.005				<0.005				<0.005			
7/9/2017	0.024	0.017	0.0042		Pump Problem			Not enough water				<0.001				Not enough water			
7/14/2017	0.028	<0.005	0.0021		Pump Problem			Not enough water				No sample taken				Not enough water			
7/18/2017	0.013	<0.005	0.003	0.36	Pump Problem			<0.01	<0.005			0.002	<0.005	0.0668	23.8	<0.01	<0.005	0.0258	10.5
7/28/2017	0.011	<0.005	0.0039		Pump Problem			Not enough water				No sample taken				Dry			
8/22/2017	0.021	0.005	0.0026	0.61	Pump Problem			Dry				0.013	<0.005	0.3535	161	Dry			
9/19/2017	0.005	0.005	0.0049	0.05	Pump Problem			Dry				0.011	<0.005	0.1432	25.9	Dry			

Table 8.66: Water Quality Monitoring at Third Portage Lake as per Freshet Action Plan (Mill Seepage Action Plan) and KIA's request.

Date	Units	26-Jun-17	5-Jul-17	22-Aug-17	19-Sep-17
Field Parameters					
pH (Env. Dept.)		7.82	7.45	7.12	7.84
Conductivity (Env. Dept.)	µmhos/cm	105.1	105.5	99.4	107
Turbidity (Env. Dept.)	NTU	0.85	1.3	3.2	0.89
Temperature	°C	15.7	20.9	11.9	11.7
Dissolved oxygen	mg/L	10.1	9.5	7.8	10.1
Conventional Parameters					
Hardness	mg CaCo3/L	30	31	35	38
Alkalinity	mg CaCo3/L	30	50	51	26
TDS	mg/L	62	62	61	65
TSS	mg/L	3	2	<1	2
Colour	colour	<1	3	<1	1
D.O.C	mg/L	3.2	3.1	3.1	3.2
T.O.C	mg/L	3.7	3.1	3.7	3.5
Nutrients and Biological Indicators					
Ammonia (NH3)	mg N/L	<0.05	<0.05	<0.05	<0.01
Ammonia nitrogen (NH3-NH4)	mg N/L	<0.05	<0.05	<0.05	<0.05
Kjeldahl nitrogen	mg N/L	<0.7	0.34	<0.7	<0.7
Nitrate	mg/L	0.05	0.02	<0.01	<0.01
Nitrite	mg/L	<0.01	<0.01	<0.01	<0.01
Ortho-phosphate (O-PO4)	mg P/L	<0.01	<0.01	<0.01	<0.01
Chlorophyll A	µg/L	0.6	0.61	1	0.82
Major Ions					
Bromides	mg/L	0.03	0.05	0.05	0.14
Chloride	mg/L	3.7	4.8	4.2	4.3
Fluoride	mg/L	0.12	0.12	0.11	0.1
Sulphate	mg/L	13.4	9.9	12.1	13.2
Thiosulfates (S2O3)	S2O3/L	<0.02	<0.02	<0.02	<0.02
Cyanide					
Cyanide Total	mg/L	<0.001	<0.001	0.012	0.002
Cyanide Free (SGS)	mg/L	<0.005	<0.005	<0.005	<0.005
Cyanide WAD	mg/L	<0.001	<0.001	0.008	0.002
Thiocyanates (SNC)	SCN/L	<0.05	<0.05	<0.05	<0.05

Date	Units	26-Jun-17	5-Jul-17	22-Aug-17	19-Sep-17
Dissolved metals					
Aluminium	mg/L	<0.006	<0.006	<0.006	<0.006
Antimony	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Boron	mg/L	<0.01	<0.01	<0.01	<0.01
Barium	mg/L	0.0017	<0.0005	0.0034	0.0032
Beryllium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Cadmium	mg/L	<0.00002	<0.00002	<0.00002	<0.00002
Chromium	mg/L	0.0008	<0.0006	<0.0006	0.0007
Cobalt	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Copper	mg/L	0.0008	<0.0005	<0.0005	0.0013
Iron	mg/L	<0.01	<0.01	0.01	<0.01
Lead	mg/L	0.0094	<0.0003	<0.0003	<0.0003
Lithium	mg/L	<0.005	<0.005	<0.005	<0.005
Manganese	mg/L	0.0065	0.0015	0.0007	<0.0005
Magnesium	mg/L	2.5	2.61	2.42	2.93
Mercury	mg/L	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	mg/L	0.0008	<0.0005	0.0006	0.0005
Phosphorus	mg P/L	0.0021	<0.04	4.5 ug	<0.04
Selenium	mg/L	<0.001	<0.001	<0.001	<0.001
Strontium	mg/L	0.036	0.042	0.044	0.092
Silver	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Tin	mg/L	<0.001	<0.001	<0.001	<0.001
Thallium	mg/L	<0.0008	<0.0008	<0.0008	<0.0008
Titanium	mg/L	<0.01	<0.01	<0.01	<0.01
Uranium	mg/L	<0.001	<0.001	<0.001	<0.001
Vanadium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	mg/L	0.002	<0.001	0.008	<0.001

Date	Units	26-Jun-17	5-Jul-17	22-Aug-17	19-Sep-17
Total metals					
Aluminium	mg/L	0.009	<0.006	0.017	<0.006
Antimony	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	<0.0005	<0.0005	<0.0005	0.0055
Boron	mg/L	<0.01	<0.01	<0.01	<0.01
Barium	mg/L	0.0027	<0.0005	0.0057	0.0041
Beryllium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Cadmium	mg/L	<0.00002	<0.00002	<0.00002	<0.00002
Copper	mg/L	<0.0005	<0.0005	<0.0005	0.0021
Chromium	mg/L	<0.0006	<0.0006	<0.0006	0.0019
Cobalt	mg/L	0.0035	<0.0005	<0.0005	<0.0005
Iron	mg/L	0.04	0.06	0.23	<0.01
Lithium	mg/L	<0.005	<0.005	<0.005	<0.005
Manganese	mg/L	0.008	0.0072	0.0036	0.0044
Magnesium	mg/L	2.5	2.61	2.67	3.14
Mercury	mg/L	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	mg/L	0.0009	<0.0005	<0.0005	0.0008
Lead	mg/L	0.0314	<0.0003	<0.0003	<0.0003
Phosphorus	mg P/L	0.0021	<0.04	4.5	<0.04
Potassium	mg/L	1.17	1.13	1.23	1.39
Selenium	mg/L	<0.001	<0.001	<0.001	0.001
Silica	mg/L	0.47	0.57	0.51	0.43
Silver	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Tin	mg/L	<0.001	<0.001	<0.001	<0.001
Strontium	mg/L	0.045	0.043	0.046	0.037
Titanium	mg/L	<0.01	<0.01	<0.01	<0.01
Thallium	mg/L	<0.0008	<0.0008	<0.0008	<0.0008
Tellurium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Uranium	mg/L	<0.001	<0.001	<0.001	<0.001
Vanadium	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Zinc	mg/L	<0.001	<0.001	0.006	0.002